COMBINATION PRINTER

SCP700 SERIES

Programmer's Manual

Trademark acknowledgments

SCP700: Star Micronics Co. Ltd.

ESC/POS, TM-295, TM-T85: Seiko Epson Corporation

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Chapter 1: Outline

The SCP700 Series combines both a quick, quiet and highly reliable thermal receipt printer with an impact dot slip printer, enabling printing on single or multiple sheets of slip paper of an unspecified size.

The thermal printer enables receipt printing without a thermal ribbon and makes paper insertion extremely easy.

The biggest advantage of combining the two printer mechanisms into one unit is that less space, only one power supply and only one port are necessary, compared with using a slip printer which is separate from a thermal receipt printer, each requiring space and a power supply.

Thermal printing on receipt paper is quiet and fast.

Chapter 2: DIP Switch Settings

The printer's DIP switches let you change communications parameters, thermal printing density, interface type, input buffer size, and emulation. This chapter explains the settings you can make and tells you how to actually change DIP switch settings.

Accessing the DIP switches

The DIP switches are located inside the printer, underneath the document table. Use the following procedure to remove the document table so you can operate the DIP switches.

❑ Make sure that the printer is turned off and unplugged from its wall outlet.

❑ Open the printer cover.

❑ Use a Phillips head screwdriver to remove the two screws that secure the document table in place.
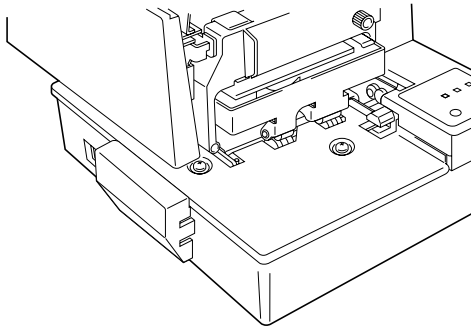
❏ Carefully work the document table loose and slide it to the left of the printer out of the way. It is not necessary to remove the document table complete, just move it enough so you can get at the DIP switches inside.
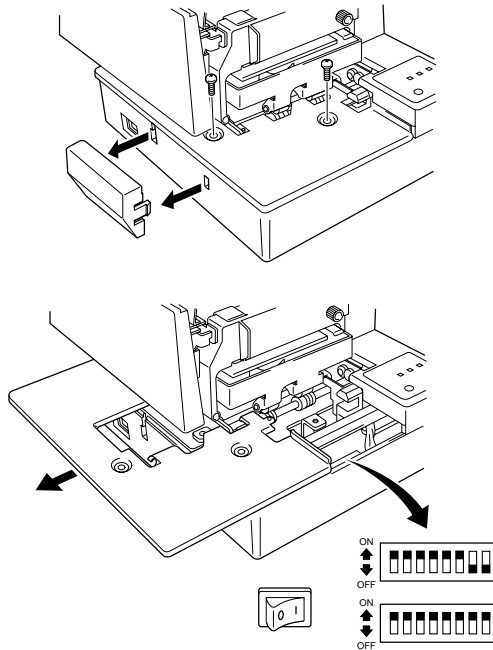
❏ After the document table is opened sufficiently, use a thin flat-blade screwdriver or some other similar object to change DIP switch settings.

❏ Carefully return the document table to its original position and secure it in place with the two screws.

Available DIP switch settings

There are two DIP switches inside the printer, named DIP Switch 1 and DIP Switch 2. DIP Switch 1 controls data communication parameters, while DIP Switch 2 controls other settings.

DIP Switch 1

The following table shows all the possible settings for DIP Switch 1. This switch sets the transmission parameters of the Standard Serial Interface. All switch settings, except for 1-7 and 1-8, are ON when the printer is shipped from the factory.

Switch	Parameter	ON	OFF
1-1	Baud Rate	See table below	
1-2			
1-3	Data Length	8 bits	7 bits
1-4	Parity Check	Disabled	Enabled
1-5	Parity Selection	Odd	Even
1-6	Handshake	DTR/mode	XON/XOFF mode
1-7	Serial I/F Pin 6 Reset Signal	Active	Inactive
1-8	Serial I/F Pin8 Reset Signal	Active	Inactive

Baud Rate	Switch 1-1	Switch 1-2
2400BPS	OFF	OFF
4800BPS	ON	OFF
9600BPS	ON	ON
19200BPS	OFF	ON

DIP Switch 2

The following table shows all the possible settings for DIP Switch 2. The factory default setting for this switch is all ON.

Switch	Parameter	ON	OFF
2-1	Thermal Print Density	See table below	
2-2			
2-3	Input Buffer Size	4 KB	45 bytes

Switch	Parameter	ON	OFF
2-4	Always ON		
2-5	Interface	Standard	Option
2-6	Always ON		
2-7	Not Used		
2-8	Not Used		

Thermal Print Density	Switch 2-1	Switch 2-2
Light	OFF	OFF
Standard	ON	ON
Heavy	ON	OFF
Very Heavy	OFF	ON

Chapter 3: Memory Switch Settings

Each memory switch is a 16-bit word store in EEPROM. For details on the functions and settings of memory switches, refer to "Chapter 9".

The table below shows the factory settings for the memory switches.

Memory Switch	Hexadecimal Code
0	0000
1	0000
2	0000
3	0000
4	0000
5	0000

Chapter 4: Control Panel Operations

The control panel gives you some push-button control over the printer's receipt and slip printer operations. It also includes indicator lights, which tell you the current status of the printer at a glance.

```
┌─────────────────────────────────┐
│                                 │
│      RECEIPT   SLIP   POWER     │
│        ☐        ☐       ☐        │
│                                 │
│                                 │
│        ◯              ◯          │
│     RECEIPT      SLIP/RESUME     │
└─────────────────────────────────┘
```
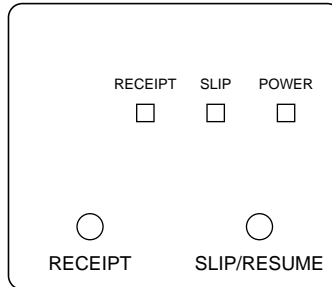
Indicator lights

The following table describes the meaning of indicator lights when it is on, off, or flashing.

Indicator Light	On	Off	Flashing (slow)	Flashing (fast)
POWER	Power on	Power off	Slip: Dot adjustment mode / Receipt: Stand-by TM-T85 macro	Automatic recovery Error
SLIP	Slip paper released	Slip paper engaged	Request slip paper	Slip printer error
RECEIPT	Receipt printer ready	Receipt printer not ready	Out of receipt paper/Near end	Receipt printer error

* All indicators flash to indicate a non-recoverable error.

Buttons

The following table describes the function of the two control buttons of the control panel.

Button	Description
RECEIPT	Press to feed the thermal paper. Holding down this button feeds paper at high speed.
SLIP/RESUME	1. Press this button to release or engage slip paper from the slip printer. (Switching from releasing to engaging is only possible if slip paper is inserted.) 2. Press this button to clear the errors of the slip printer and receipt printer.

Producing a test print

The following procedure can be used at any time to test the receipt printer and the slip printer.

❏ Turn on the printer and insert a piece of paper into the slip printer. Also make sure that roll paper is loaded for the receipt printer.

Note:

If you want to produce a test print on the receipt printer only, simply don't insert paper into the slip printer.

❏ Turn off printer power.

❏ While holding down the **RECEIPT** button, turn printer back on. Keep **RECEIPT** depressed for a few moments until the printer beeps and the receipt printer test print starts.

After the receipt test print is complete, the slip printer will produce a test print on the paper you inserted in the first step of this procedure. The slip printer test will continue until it reaches the end of the paper.

Note:

The slip printer momentarily releases the slip paper when you turn printer power back on. If you are using a large piece of paper, it may fall out of the slip printer when this happens, causing the slip printer test to be skipped. Because of this, it is a good idea to keep hold of the paper in the slip printer when you turn power back on.

Adjusting the slip printer's dot alignment

You may never have to use the procedure described in this section, but after you have been using your printer for some time you may find that the dots of some graphics do not align correctly. For example, what should look like:

H H H

may come out looking like one of the following:

H H H   or like this   H H H

This is caused when mechanical parts of the printer get out of alignment. This happens only rarely and you may never experience it at all throughout the life of the printer. If you do have problems, use the following procedure to correct it.

❏ Execute the test print

❏ When the slip printer produce the test print, hold down the control panel's **RECEIPT** and **SLIP/RESUME** buttons, to enter the Dot Alignment Adjust Mode. The **POWER** indicator flashes slowly to indicate this mode.

Entering the Dot Alignment Adjust Mode causes seven blocks of characters to be printed as shown below. An asterisk to the left of the blocks indicates which setting is currently selected. Use the **RECEIPT** button to specify which block has the best aligned characters. Press **RECEIPT** once to specify the first block, twice to specify the second block, and so on up to seven times to specify the seventh block. Pressing the **RECEIPT** button more than seven times specifies the seventh block, no matter how many times it is pressed.

```
Dot Alignment Adjust Mode
```
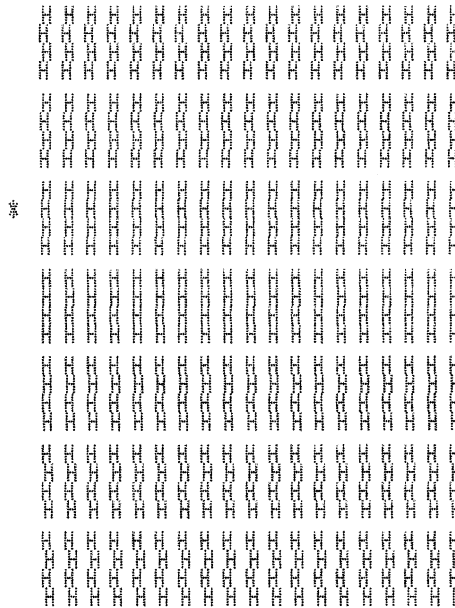
To exit this mode, press the **SLIP/RESUME** button. The dot alignment adjust mode setting is stored in the memory, a pattern using the selected setting, followed by "Adjust Completed" is printed, and the printer ejects the slip paper.

```
Adjust Completed!
```
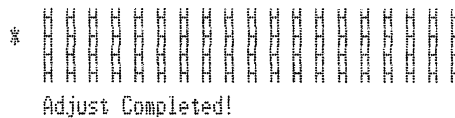
Note:

> *If you press the **SLIP/RESUME** button without pressing the **RECEIPT** button after entering the Dot Alignment Adjust Mode, the printer assumes that you do not want make any settings, so it prints the message "Adjust Complete!" and exits the mode.*
> *If a paper feed error occurs during this mode, the printer ejects the paper and this mode is cancelled.*

Hexadecimal dump

This procedure prints in hexadecimal format all codes (character codes and control codes) that are sent to the printer by the computer. The printer does not execute any control codes (such as 0A - linefeed), it just prints them out. The hexadecimal dump is useful when you are writing programs for printer control.

❏ Make sure that roll paper is loaded in the receipt printer.

❏ Turn off the printer.

❏ While holding down the control panel's **SLIP/RESUME** button, turn the printer back on to enter this mode. The printer beeps once to indicate in this mode.

❏ The printer will now print out the hexadecimal values of any data that is subsequently sent to it from your computer. The last line buffer should be flushed by pressing the **RECEIPT** button.

❏ To exit this mode, turn the printer off.

Errors

There are three types of errors: *automatic recovery* errors that clear automatically after some condition is attained, *recoverable* errors that require some action by you before they clear, and *non-recoverable* errors that require servicing by an authorized dealer. If a slip printer error occurs, the **SLIP** indicator flashes quickly. If a receipt printer error occurs, the **RECEIPT** indicator flashes quickly.

Automatic Recovery Error

Error Name	Cause	POWER Flashing Pattern	Recovery
Head Temperature Error	Abnormal thermal head temperature	Fast	Recovery occurs automatically after head temperature returns to normal.

Receipt Printer Recoverable Errors

Error Name	Cause	RECEIPT Flashing Pattern	Recovery
Paper Out Error	No roll paper	Slow	Insert paper and press SLIP/RESUME.
Head Up Error	Raised receipt printer head	Fast	Lower head and press SLIP/RESUME.
Near End	Roll paper near end	Slow	Press SLIP/RESUME to resume printing.
Cutter Error	Error during roll paper cutting	Fast	If the blade is in the home position, press SLIP/RESUME to continue printing. If the blade is not in the home position, this is a non-recoverable error.

Slip Printer Recoverable Errors

Error Name	Cause	SLIP Flashing Pattern	Recovery
Slip printer mechanism error	• Carriage motor lock • Timing signal defect • Abnormal home position check	Fast	Correct the problem and press SLIP/RESUME.

Non-recoverable Errors

First try turning the printer off and then on again. If the error persists or if a non-recoverable error is indicated by all indicators flashing, contact your nearest authorized dealer.

Chapter 5: Standard Serial Interface

❏ This chapter provides detailed specifications for the printer's standard serial interface (Connector Type: D-sub 9-pin).
Set the transmission parameters with DIP Switch 1.

Transmission type ....Asynchronous serial interface

Baud rate (bps).................2400, 4800, 9600, or 19200
(Selected by DIP switch)

Word format
Start bit: 1
Data bits: ....7 or 8 (Selected by DIP switch)
Parity: ....Odd, Even, or None
(Selected by DIP switch)
Stop bit: 1

Signal polarities
RS-232C ....Mark = Logic "1" (–3V to –15V)
Space = Logic "0" (+3V to +15V)

Handshaking ....DTR or XON/XOFF mode (Selected by DIP switch)

A: Start bit
B: Data bits
C: Vertical parity bit
D: Stop bit
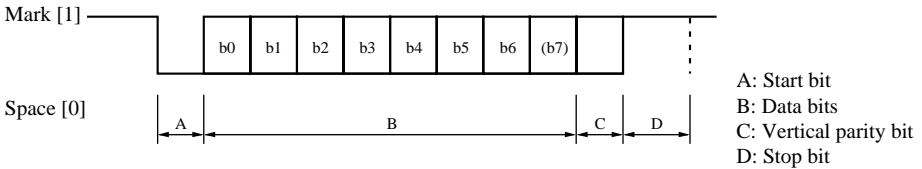
Input (RXD, DSR, INIT)
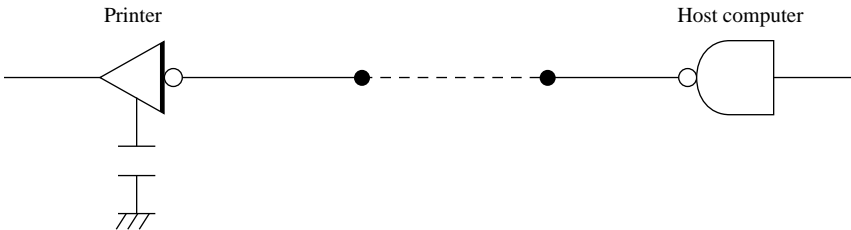
Output (DTR, TXD, RTS)
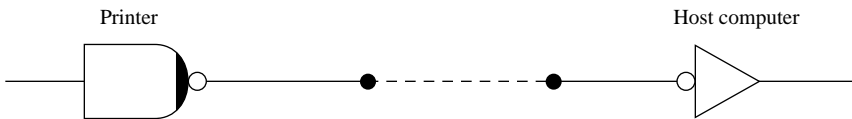
75188 or equivalent

Standard serial interface pins and signal names

Pin No.	Signal Name	Direction	Function
1	FG	—	Frame Ground
2	RXD	IN	Receive data
3	TXD	OUT	Transmission data
4	DTR	OUT	Data terminal ready signal. This signal changes to SPACE when the printer is ready to receive data.
5	SG	—	Signal ground
6	DSR	IN	Signal line that indicates if the host computer can receive data. 　SPACE: host can receive 　MARK: host cannot receive The status of this signal is not confirmed. This signal can be specified as an internal reset signal using Switch 7 of DIP Switch 1 (page 4). MARK of 1ms or longer activates the reset.
7	RTS	OUT	Same as DTR (Pin 4).
8	INIT	IN	This signal can be specified as an internal reset signal using Switch 8 of DIP Switch 1 (page 4). SPACE of 1ms or longer activates the reset.
9	N/C	—	Not connected

Interface connections

❏ Refer to the interface specifications for the host computer for details on connecting to its interface connector. The following illustration shows a typical connection configuration.

RS-232C

	Printer side (D-sub 9 pin)			IBM PC side (D-sub 25 pin)	
F-GND	1			1	F-GND
RXD	2			2	TXD
TXD	3			3	RXD
DTR	4			4	RTS
S-GND	5			5	CTS
DSR	6			6	DSR
RTS	7			7	S-GND
INIT	8			8	DCD
N/C	9			20	DTR

	Printer side (D-sub 9 pin)			IBM PC side (D-sub 9 pin)	
F-GND	1			1	DCD
RXD	2			2	RXD
TXD	3			3	TXD
DTR	4			4	DTR
S-GND	5			5	S-GND
DSR	6			6	DSR
RTS	7			7	RTS
INIT	8			8	CTS
N/C	9			9	RI
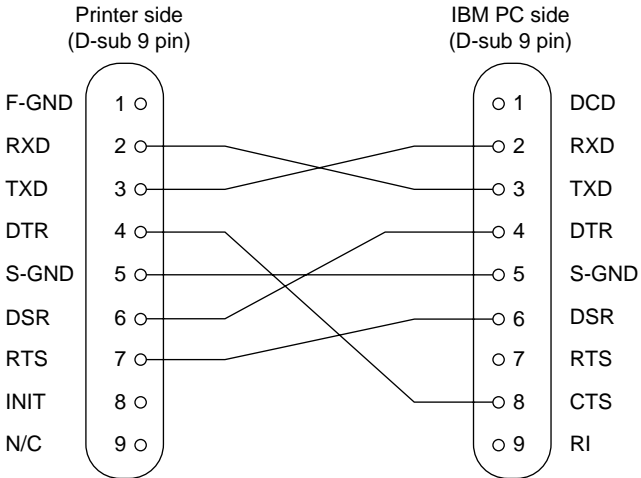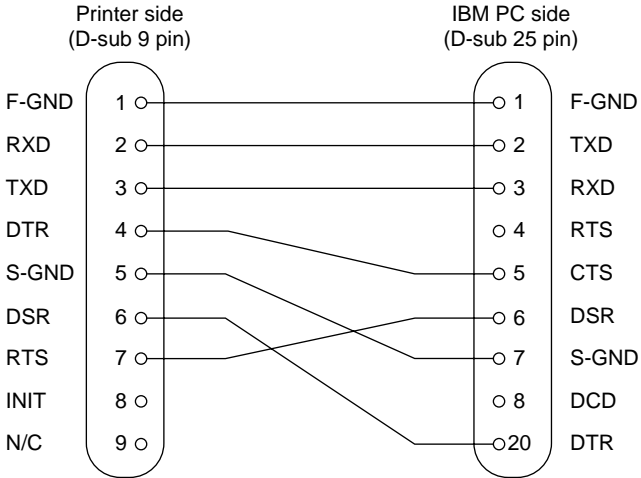
Data protocol

❑ DTR/DSR Mode

Set when dip switch #1-6 is ON. Communication is carried out while handshake is performed with the DTR and DSR signals. Control is executed by selecting the DTR signal for the busy signal when data is downloaded to the printer data. "SPACE" indicates the printer can receive data, and oppositely "MARK" indicates that data cannot be received.

In the ESC/POS mode, control is executed by selecting the DTR signal for the host computer's busy signal when data is uploaded from the printer. "SPACE" indicates the host can receive data, and oppositely "MARK" indicates that data cannot be received.
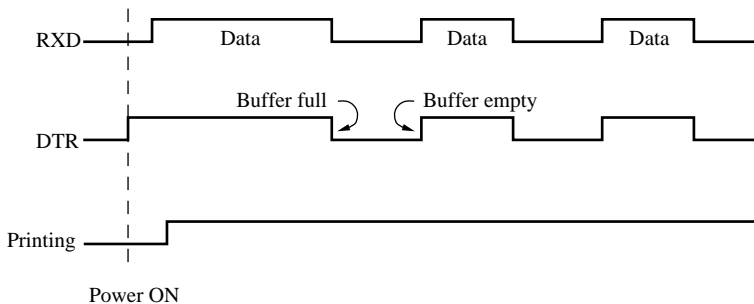
If no error occurs for the printer after turning the power on, the DTR signal line is set to "SPACE." After the host computer recognizes that the DTR signal line is "SPACE," data text is sent to the RXD signal line. When the printer's available buffer space drops below the specified number of bytes (256 bytes if using 4K-byte reception buffer, 16 bytes if using a 45-byte reception buffer; see 3-2 for details), the DTR signal line is set to "MARK." After the host computer recognizes that the DTR signal line is "MARK," data text transmission is interrupted, but the printer can receive data up until the data buffer becomes full. Available space in the data buffer increases as printing is executed, and when the printer's available buffer space drops below the specified number of bytes (256 bytes if using 4K-byte reception buffer, 16 bytes if using a 45-byte reception buffer), the DTR signal line is set to "SPACE."

In the ESC/POS mode, printer status transmission can be received by the host in the DTR/DSR communication mode (status is set after the DSR signal is confirmed as being "SPACE," with the exception of some status transmission commands).

Buffer full cancellation in DTR mode (the following is an example in the Combination mode).

A) Buffer set to "big size" (4K-bytes) (set with dip switch 2-3)
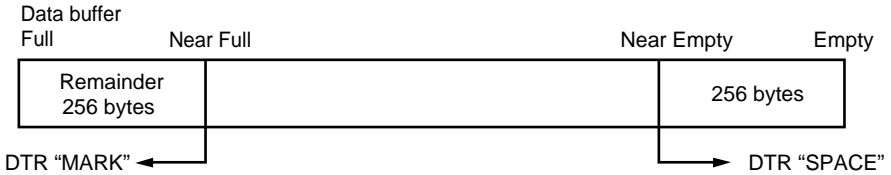
Data buffer

Full	Near Full		Near Empty	Empty
Remainder 256 bytes			256 bytes	

DTR "MARK" ◄——   ——► DTR "SPACE"

When available space drops below 256 bytes, DTR is set to "MARK." When data in the buffer drops below 256 bytes, DTR is set to "SPACE."

B) Buffer set to "small size" (45-bytes) (set with dip switch 2-3)

Data buffer

Full	Near Full		Near Empty	Empty
Remainder 16 bytes			16 bytes	

DTR "MARK" ◄——   ——► DTR "SPACE"

When available space drops below 16 bytes, DTR is set to "MARK." When data in the buffer drops below 16 bytes, DTR is set to "SPACE."

❏ X-ON / X-OFF Mode

Set when dip switch #1-6 is OFF. Mode whereby the host is informed by TXD signal of X-ON (DC1) when data can be received or X-OFF (DC3) when data cannot be received. In the Star mode, X-ON / X-OFF output timing conditions are set by memory switch 4-C.

In the Combination mode, when memory switch 4-C is set to "0" (factory setting), exactly one byte is output for X-ON when the printer switches from offline (printer busy) to online (printer ready), and exactly one byte is output for X-OFF when the printer switches from online (printer ready) to offline (printer busy). The same goes for the ESC/POS mode (Dual mode), regardless of the setting of memory switch C-4. When memory switch C-4 is set to "1," the X-ON signal is output is every three seconds.
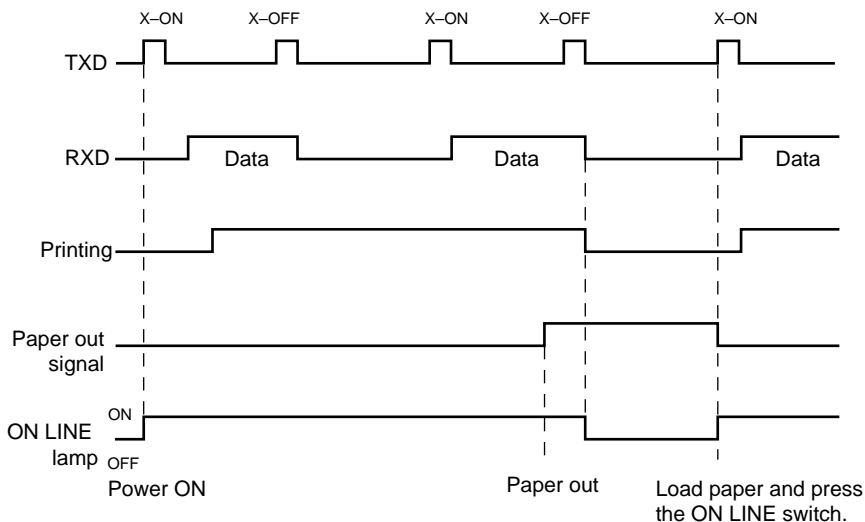
If no error occurs for the printer after turning the power on, the X-ON signal ("DC1" by control code name, "11H" by hexadecimal data) is output by the TXD signal line. X-FF (DC3, 13H) is output when available buffer space drops below the specified number of bytes (256 bytes if using 4K-byte reception buffer, 16 bytes if using a 45-byte reception buffer). If memory switch 4C is set to "1," an X-OFF signal is output each time one byte of data is received. The host computer receiving the X-0FF signals interrupts data text transmission, but the printer can receive data up until the data buffer becomes full. If the amount of data sent exceeds the amount of available buffer space, the excess data is discarded. Available space in the data buffer increases as printing is executed, and the X-ON signal is output when the printer's available buffer space drops below the specified number of bytes (256 bytes if using 4K-byte reception buffer, 16 bytes if using a 45-byte reception buffer).
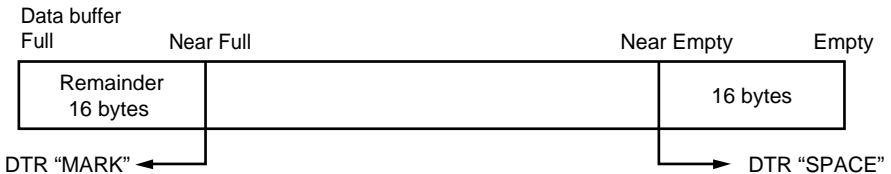
Buffer full cancellation in X-ON / X-OFF mode (the following is an example in the Combination mode).

A) Buffer set to "big size" (4K-bytes) (set with sip switch 2-3)

Data buffer

| Full | Near Full | | Near Empty | Empty |

| Remainder 256 bytes | | | 256 bytes | |

X-OFF ◄—— ——► X-ON

Printer setting conditions	Description of operation
• When in Star mode and memory switch is set to "0" • ESC/POS emulation	When available buffer space drops below 256 bytes, exactly one byte is output for X-OFF. When data in the buffer drops below 256 bytes, exactly one byte is output for X-ON.
• When in Star mode and memory switch is set to "1"	When available buffer space drops below 256 bytes, an X-OFF signal is output for each byte of data received. When data in the buffer drops below 256 bytes, and X-ON signal is output.

B) Buffer set to "big size" (45-bytes) (set with sip switch 2-3)

Data buffer

| Full | Near Full | | Near Empty | Empty |

| Remainder 16 bytes | | | 16 bytes | |

X-OFF ◄—— ——► X-ON

Printer setting conditions	Description of operation
• When in Star mode and memory switch is set to "0" • ESC/POS emulation	When available buffer space drops below 256 bytes, exactly one byte is output for X-OFF. When data in the buffer drops below 256 bytes, exactly one byte is output for X-ON.
• When in Star mode and memory switch is set to "1"	When available buffer space drops below 256 bytes, an X-OFF signal is output for each byte of data received. When data in the buffer drops below 256 bytes, and X-ON signal is output.

3-6) X-ON / X-OFF Signal Transmission Timing

An X-OFF signal is sent when the printer switches from online to offline.
An X-ON signal is sent when the printer switches from offline to online.
In the Star mode, an X-ON signal is sent every three seconds if memory switch 4-C is set to "1."

4) Suggestions when memory switch 4-4 is ON [only when using interface specially designed for for ESC/POS (Dual mode)]

   (1) Printing is interrupted in the event of an error, the cover is open, there is no paper, or paper is advanced by the paper advance switch, but the printer does not switch to busy status.

   (2) When handshake with the printer is executed by this setting, be sure to monitor the status of the printer using the "GS a" command and its automatic data transmission function. With this setting, the "GS a" command becomes initial value setting n = 2, and status is automatically transmitted when online/offline status changes.

   (3) If using DLE EOT or DLE ENQ, do not allow the reception buffer to become full.

      • Suggestions when the printer is busy and the host cannot transmit data DLE EOT or DLE ENQ cannot be used if an error occurs when the printer becomes busy because the reception buffer is full.

      • Suggestions when the printer is busy and the host can transmit data
When the reception buffer becomes full during transmission of bit image data, if a DLE EOT or DLE ENQ command is used in the bit image data, DLE EOT or DLE ENQ is processed as bit image data. Data sent when the reception buffer is full may be discarded.

   Usage Example: With a 4K-byte reception buffer, status is checked by "ESC v" or "ESC u" each time a printing line is sent. The amount of data per printing line is the amount whereby the reception buffer does not become full.

Chapter 6: Optional Interface

Optional serial interface

Use a thin flat-blade screwdriver or some other similar object to change DIP switch settings on the optional serial interface board.

The following table shows all the possible settings for the DIP switches. All switch settings, except for 1-7 and 1-8, are ON when the printer is shipped from the factory.

Switch	Parameter	ON	OFF
1	Baud Rate	See table below	
2			
3	Data Length	8 bits	7 bits
4	Parity Check	Disabled	Enabled
5	Parity Selection	Odd	Even
6	Handshake	DTR/DSR	XON/XOFF
7	Serial I/F Pin 6 Reset Signal	Active	Inactive
8	Serial I/F Pin 25 Reset Signal	Active	Inactive

Baud Rate	Switch 1	Switch 2
2400BPS	OFF	OFF
4800BPS	ON	OFF
9600BPS	ON	ON
19200BPS	OFF	ON

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Optional serial interface pins and signal names

Pin No.	Signal Name	Direction	Function
1	FG	—	Frame Ground
2	TXD	OUT	Transmission data
3	RXD	IN	Receive data
4	RTS	OUT	Data terminal ready signal. This signal changes to SPACE when the printer is ready to receive data.

6	DSR	IN	Signal line that indicates if the host computer can receive data.
			  SPACE: host can receive
			  MARK: host cannot receive
			The status of this signal is not confirmed.
			This signal can be specified as an internal reset signal using of DIP Switch 7 (page 21).
			MARK of 1ms or longer activates the reset.

7	SG	—	Signal ground
20	DTR	OUT	Same as RTS (Pin 4).
25	INIT	IN	This signal can be specified as an internal reset signal using of DIP Switch 8 (page 21). SPACE of 1ms or longer activates the reset.

Interface connections

❏ Refer to the interface specifications for the host computer for details on connecting to is its interface connector. The following illustration shows a typical connection configuration.

Printer side
(D-sub 25 pin)

IBM PC side
(D-sub 25 pin)

F-GND	1		1	F-GND
TXD	2		2	TXD
RXD	3		3	RXD
RTS	4		4	RTS
			5	CTS
DSR	6		6	DSR
S-GND	7		7	S-GND
DTR	20		8	DCD
INIT	25		20	DTR

Printer side
(D-sub 25 pin)

IBM PC side
(D-sub 9 pin)

F-GND	1			F-GND
TXD	2		3	TXD
RXD	3		2	RXD
RTS	4		7	RTS
			8	CTS
DSR	6		6	DSR
S-GND	7		5	S-GND
DTR	20		1	DCD
INIT	25		4	DTR
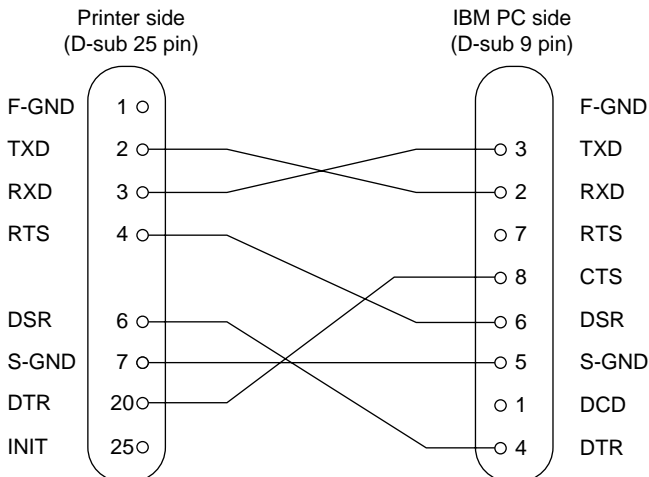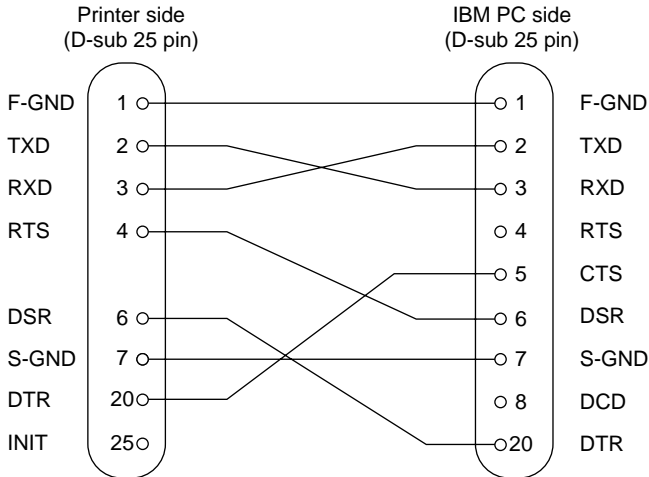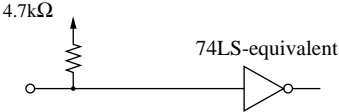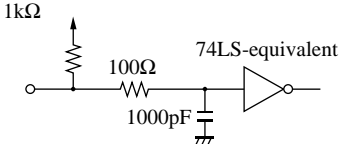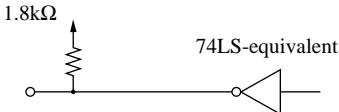
Data protocol

❏ The specifications for the DTR and X-ON/X-OFF modes are the same as for the Standard Serial Interface.

Optional parallel interface

Interface: Conforms with Centronics parallel interface standard
Data transfer speed: 1000 ~ 5000 CPS
Synchronization: External strobe pulse
Handshaking: Using ACK and BUSY
Logic level: TTL-level compatible

T: At least 0.5µs
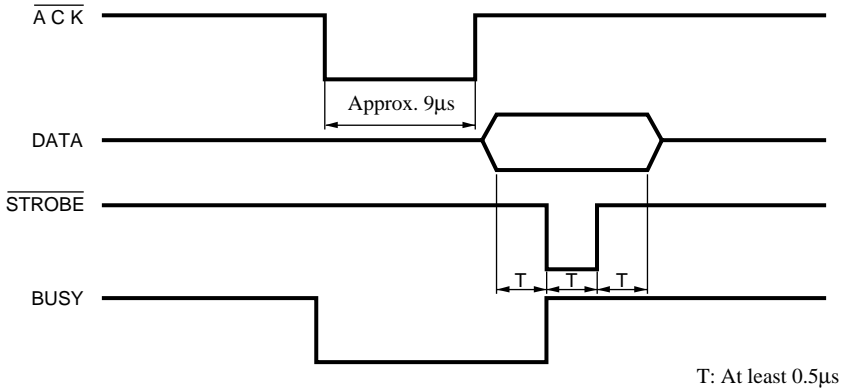
	Signal Name	Sample Circuit
Input	DATA 1 DATA 8	4.7kΩ 74LS-equivalent
Input	STROBE	1kΩ 100Ω 74LS-equivalent 1000pF
Output	BUSY ACK	1.8kΩ 74LS-equivalent

Optional parallel interface pins and signal names

(18)   (1)

(36)   (19)
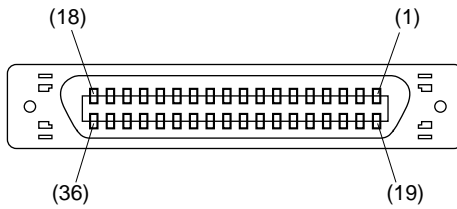
Pin No.	Signal Name	Direction	Function
1	$\overline{\text{STROBE}}$	IN	Signals when data is ready to be read. Signal goes from HIGH to LOW (for at least 0.5 µs) when data is available.
2 - 9	DATA 1 - 8	IN	Information on the first eight bits of parallel data. Each signal is HIGH for logical 1 and LOW for logical 0.
10	$\overline{\text{ACK}}$	OUT	9µs LOW pulse to acknowledge receipt of data
11	BUSY	OUT	Printer is ready to receive data when LOW. HIGH indicates one of the following conditions. • Data being entered • Printer off line • Error condition
12	PAPER OUT	OUT	Normally LOW, this signal goes HIGH when the printer is out of paper.
13	SELECTED	OUT	HIGH when the printer is on line
14	—	IN	This signal is not checked by printer.
15	N/C	—	Not connected
16	SIGNAL GND	—	Signal ground
17	CHASSIS GND	—	Chassis ground (isolated from logic ground)
18	+5VDC	—	+5V DC (max. 50mA)
19 - 30	GND	—	Twisted pair return signal ground level
31	$\overline{\text{RESET}}$	IN	LOW when printer is reset to power-on defaults
32	$\overline{\text{ERROR}}$	OUT	Normally HIGH, this signal goes LOW to signal that printing is disabled due to an error condition.
33	EXT GND	—	External ground
34 - 35	N/C	—	Not connected
36	—	IN	This signal is not checked by printer.

Chapter 7: Peripheral Unit Driver Circuit

The main logic board of this printer includes a circuit for driving peripheral units, such as cash drawers. A modular connector for connection of the peripheral unit is located on the back of the printer. To connect to the drive circuit, connect the peripheral unit to the modular connector using a cable supplied by you that meets the following specifications.

- Use a cable with a modular plug like that one shown in the figure below.

Important!

Never connect any other type of plug to the peripheral unit connector.

Modular plug

Modular plug: MOLEX 90075-0007, AMP641337, or JAPAN BURNDY B-66-4

Shield

Wire lead
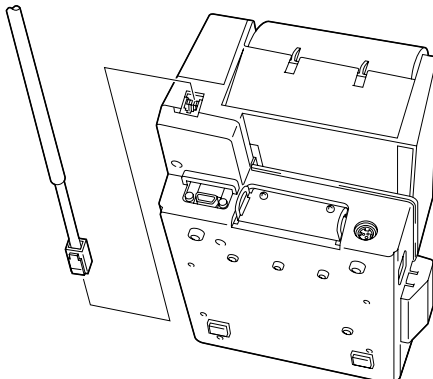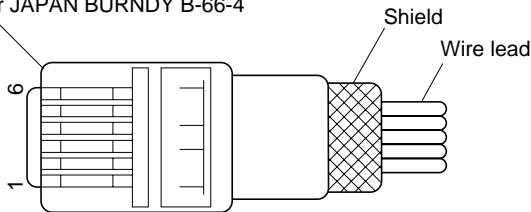
Drive circuit

The recommended drive unit is shown below.

[Drive output 24V, max. 1.0A]
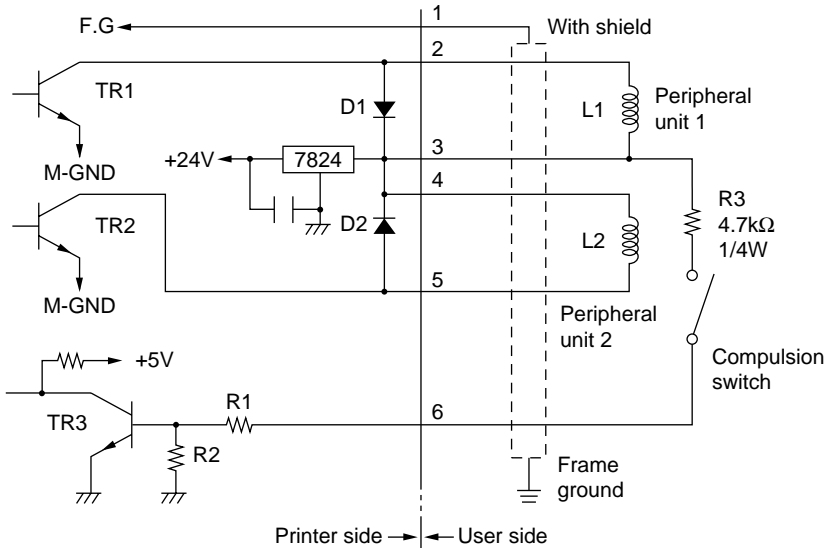
Notes

- Peripheral Units 1 and 2 cannot be driven simultaneously.

- For continuous driving, do not use drive duty above 20%.

- Compulsion switch status is available as status data.

- Minimum resistance for coils L1 and L2 is 24Ω.

- Absolute maximum ratings for diodes D1 and D2 (Ta = 25°C) are:
  Average Rectified Current Io = 1A
  Maximum forward surge current (60Hz, 1-cycle sine wave) I_{FSM} = 40A

- Absolute maximum rating for transistors TR1 and TR2 (Ta = 25°C) are:
  Collector current Ic = 2A

Chapter 8: Automatic Cutter

① The cutter operates in response to data commands. To enable cutter operation, set Memory Switch #2-8 to indicate that the cutter is installed.

② NEVER place fingers or metal objects in the cutter area.

③ If a jam occurs in the cutter area, switch off the power, use tweezers to remove the jammed paper, then switch the power back on. The printer will return the blade to the home position.

④ Never clean the cutter blade with alcohol or any other solvent, as this may remove the blade's lubrication and shorten the blade life.

Chapter 9: Control Codes

Important!

> *Please access the following URL*
> *http://www.star-micronics.co.jp/service/sp_sup_e.htm*
> *for the lastest revision of the manual.*

This printer has two command modes: Star mode and ESC/POS mode.

The Star mode emulates thermal receipt printers such as the TSP200 series and other previous models. The ESC/POS mode emulates the Epson TM-T85 receipt printer and the Epson TM-295 slip printer.

The Star mode commands are as follows.

Print Station Selection (Combo mode only)

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "+" "A" 0 <ESC> "+" "A" <0>	1B 2B 41 30 1B 2B 41 00	Select receipt printer		○	36
<ESC> "+" "A" 3 <ESC> "+" "A" <3>	1B 2B 41 33 1B 2B 41 03	Select slip printer	○		36

Character Selection

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "R" *n*	1B 52 *n*	Select international character set	○	○	36
<ESC> "/" "1" <ESC> "/" <1>	1B 2F 31 1B 2F 01	Select slash zero	○	○	36
<ESC> "/" "0" <ESC> "/" <0>	1B 2F 30 1B 2F 00	Select normal zero	○	○	36
<ESC> "b" *n1 n2 n3 n4 d1* ... <RS>	1B 62 *n1 n2 n3 n4 d1* ... 1E	Select bar code printing	○		37
<ESC> "M"	1B 4D	Select 12-dot pitch printing	○		41
		Select 7×9 (half dot) font		○	41
<ESC> "p"	1B 70	Select 14-dot pitch printing	○		41
<ESC> "P"	1B 50	Select 15-dot pitch printing	○		41
		Select 5×9 (2 pulses = 1 dot) font		○	41

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> ":"	1B 3A	Select 16-dot pitch printing	O		41
		Select 5 × 9 (3 pulses = 1 dot) font		O	41
<ESC> <SP> *n*	1B 20 *n*	Set character spacing	O	O	41
<SO>	0E	Set the printing magnified double in character width.	O	O	42
<DC4>	14	Resets the printing magnified in character width.	O	O	42
<ESC> "W" *n*	1B 57 *n*	Set the magnification rate in character width.	O	O	42
<ESC> <SO>	1B 0E	Sets the printing magnified double in character width.	O		42
<ESC> <DC4>	1B 14	Resets the printing magnified in character width.	O		42
<ESC> "h" *n*	1B 68 *n*	Sets the magnification rate in character height.	O	O	43
<ESC> "i" *n1 n2*	1B 69 *n1 n2*	Sets the magnification rates in character width and height.	O		43
<ESC> "–" "1" <ESC> "–" <1>	1B 2D 31 1B 2D 01	Select underlining	O	O	43
<ESC> "–" "0" <ESC> "–" <0>	1B 2D 30 1B 2D 00	Cancel underlining	O	O	43
<ESC> "_" "1" <ESC> "_" <1>	1B 5F 31 1B 5F 01	Select upperlining	O	O	44
<ESC> "_" "0" <ESC> "_" <0>	1B 5F 30 1B 5F 00	Cancel upperlining	O	O	44
<ESC> "4"	1B 34	Select highlight printing	O	O	44
<ESC> "5"	1B 35	Cancel highlight printing	O	O	44
<SI>	0F	Inverted printing	O	O	44
<DC2>	12	Cancel inverted printing	O	O	44
<ESC> "E"	1B 45	Select emphasized printing	O	O	45
<ESC> "F"	1B 46	Cancel emphasized printing	O	O	45
<ESC> "U" "1" <ESC> "U" <1>	1B 55 31 1B 55 01	Select uni-directional printing		O	45
<ESC> "U" "0" <ESC> "U" <0>	1B 55 30 1B 55 00	Select bi-directional printing		O	45

Page Formatting

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "C" *n*	1B 43 *n*	Set page length in lines	O		46
<ESC> "C" <0> *n*	1B 43 00 *n*	Set page length in inches	O		46
<ESC> "N" *n*	1B 4E *n*	Set bottom margin	O		46
<ESC> "O"	1B 4F	Cancel bottom margin	O		46
<ESC> "1" *n*	1B 6C *n*	Set left margin	O	O	47
<ESC> "Q" *n*	1B 51 *n*	Set right margin	O	O	47

Print Position Control

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<LF>	0A	Line feed	O	O	48
<CR>	0D	Carriage Return	O	O	48
<ESC> "a" *n*	1B 61 *n*	Feed paper *n* lines	O	O	48
<FF>	0C	Form feed	O		48
<HT>	09	Horizontal tab	O	O	48
<VT>	0B	Vertical tab	O		49
<ESC> "A" *n*	1B 41 *n*	Define *n*/72-inch line spacing		O	49
<ESC> "2"	1B 32	Set line spacing to *n*/72-inch		O	49
<ESC> "z" "1" <ESC> "z" <1>	1B 7A 31 1B 7A 01	Set line spacing to 4 mm	O		49
		Set line spacing to 1/6-inch		O	49
<ESC> "0"	1B 30	Set line spacing to 3 mm	O		50
		Set line spacing to 1/8-inch		O	50
<ESC> "1"	1B 31	Set line spacing to 7/72-inch		O	50
<ESC> "J" *n*	1B 4A *n*	One time *n*/4 mm feed	O		50
		One time *n*/72-inch feed		O	50
<ESC> "j" *n*	1B 6A *n*	One time *n*/4 mm backfeed	O		51
		One time *n*/72-inch backfeed		O	51
<ESC> "3" *n*	1B 33 *n*	Set line spacing to *n*/216-inch		O	51
<ESC> "y" *n*	1B 79 *n*	Set line spacing to *n*/144-inch		O	51
<ESC> "I" *n*	1B 49 *n*	One time *n*/8-mm feed	O		51
<ESC> "B" *n1 n2 ... <0>*	1B 42 *n1 n2 ... 00*	Set vertical tab stops	O		52
<ESC> "D" *n1 n2 ... <0>*	1B 44 *n1 n2 ... 00*	Set horizontal tab stops	O	O	52

Dot Graphics Printing

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "K" *n* <0> *m1 m2* ...	1B 4B *n* 00 *m1 m2* ...	Print normal density graphics	○	○	53
<ESC> "L" *n1 n2* *m1 m2* ...	1B 4C *n1 n2 m1 m2* ...	Print high density graphics	○	○	56
<ESC> "k" *n* <0> *m1* ...	1B 6B *n* 00 *m1* ...	Print fine density graphics	○		58
<ESC> "X" *n1n2 m1* ...	1B 58 *n1n2 m1*...	Print fine density graphics	○		61

Download Graphics Printing

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "&" "1" "1" *n m1 m2 ... m48*	1B 26 31 31 *n m1 m2 ... m48*	Define download character (12×24 dot font)	○		62
<ESC> "&" <1> <1> *n m1 m2 ... m48*	1B 26 01 01 *n m1 m2 ... m48*				
<ESC> "&" <0> *n1 n2*	1B 26 00 *n1 n2*	Define download character (7×9, 5×9 dot font)		○	65
<ESC> "&" "1" "0" *n*	1B 26 31 30 *n*	Delete a download character (12×24 dot font)	○		65
<ESC> "&" <1> <0> *n*	1B 26 01 00 *n*				
<ESC> "%" "1" <ESC> "%" <1>	1B 25 31 1B 25 01	Enable download character set	○	○	65
<ESC> "%" "0" <ESC> "%" <0>	1B 25 30 1B 25 00	Disable download character set	○	○	65

Peripheral Device Control

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> <BEL> *n1 n2*	1B 07 *n1 n2*	Define drive pulse width for peripheral device #1	○	○	66
<BEL>	07	Control peripheral device #1	○	○	66
<FS>	1C	Control peripheral device #1 immediately	○	○	66
<EM>	19	Control peripheral device #2 immediately	○	○	66
<SUB>	1A	Control peripheral device #2 immediately	○	○	66

Auto Cutter Control

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "d" "0" <ESC> "d" <0>	1B 64 30 1B 64 00	Full-cut command to the auto cutter	○		67
<ESC> "d" "1" <ESC> "d" <1>	1B 64 31 1B 64 01	Partial-cut command to the auto cutter	○		67

Slip Printer Control

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> <SI> *n*	1B 0F *n*	Setting slip sensor		○	68
<ESC> <FF> *n*	1B 0C *n*	Slip function		○	68
<ESC> <VT> *m n*	1B 0B *m n*	Set the paper eject direction/length		○	69
<EOT>	04	Slip status enquiry		○	69
<ESC> <EM> *n m* <LF> <NUL>	1B 19 *n m* 0A 00	Set the wait time until the automatic clamp is activated		○	70

Page Mode

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "n"	1B 6E	Select page mode		○	70
<ESC> "!"	1B 21	Select line mode		○	71
<ESC> "*" ...	1B 2A ...	Setting print area in page mode		○	72
<ESC> "T" *n*	1B 54 *n*	Setting print direction in page mode		○	73
<FF>	0C	Print in page mode		○	74

Customer Display Commands (Combo mode only)

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
<ESC> "S"	1B 53	Start customer display	○	○	75
<ESC> "G"	1B 47	End customer display	○	○	75

Other Commands

Control codes	Hexadecimal codes	Function	Receipt-printer	Slip printer	Page
\<CAN\>	18	Cancel printer buffer & Initialize printer	○	○	76
\<DC3\>	13	Deselect printer	○	○	76
\<DC1\>	11	Set select mode	○	○	76
\<RS\>	1E	Beep the buzzer	○	○	76
\<ESC\> "#N, *n1 n2 n3 n4*" \<LF\> \<NUL\>	1B 23 N 2C *n1 n2 n3 n4* 0A 00	Set memory switch	○	○	77
\<ESC\> "@"	1B 40	Initialize printer	○	○	80
\<ENQ\>	05	Enquiry	○	○	80
\<ESC\> "?" \<LF\> \<NUL\>	1B 3F 0A 00	Reset printer hardware and produce a test print.	○	○	83

Printer Station Selection (Combo mode only)

CODE	<ESC>	"+"	"A"	*n*
HEX	1B	2B	41	*n*
FUNCTION				

Print Station Selection
n = 0, "0" : Selects the receipt printer
   3, "3" : Selects the slip printer

This command is only valid when it entered at the beginning of a line. If this command is not set at the beginning of a line, the printer will ignore the command and continue to print on previously selected print station.

Character Selection

CODE	<ESC>	"R"	*n*
HEX	1B	52	*n*
FUNCTION			

Select international character set

Selects an international character set according to the value of *n*, as shown below:

$0 \leqq n \leqq 12$, "0" $\leqq n \leqq$ "9", "A" $\leqq n \leqq$ "C"

n = 0, "0" : U.S.A.   1, "1" : France   2, "2" : Germany
   3, "3" : England   4, "4" : Denmark 1   5, "5" : Sweden
   6, "6" : Italy   7, "7" : Spain 1   8, "8" : Japan
   9, "9" : Norway   10, "A" : Denmark 2   11, "B" : Spain 2
   12, "C" : Latin America

Although the international character set can also be selected using a memory switch, the control code setting is given priority.

CODE	<ESC>	"/"	*n*
HEX	1B	2F	*n*
FUNCTION			

Select zero style

Causes subsequent zero characters to be printed with a slash when *n* is 1, and without a slash when *n* is 0.
The valve of *n* can be set to 0(00H) or "0"(30H), or 1(0H) or "1"(31H).

The default may differ depending on the memory switch setting.

CODE	<ESC>	"b"	*n1*	*n2*	*n3*	*n4*	*d1*	*... dk* <RS>
HEX	1B	62	*n1*	*n2*	*n3*	*n4*	*d1*	*... dk 1E*

FUNCTION Select bar code printing

Prints bar code according to the value of *n1*, as shown below:
This command is only valid with the receipt printer.

n1: Type of bar code

0	UPC-E
1	UPC-A
2	JAN/EAN-8
3	JAN/EAN-13
4	CODE 39
5	ITF
6	CODE 128
7	CODE 93
8	NW-7

The value of *n1* can be set to 0(00H) or 8(08H) or "0"(30H) to "8"(38H).

n2: Printing character below bar code or line feed

1	Character below bar code is not printed, Line feed is performed after execution of command.
2	Character below bar code is printed, Line feed is performed after execution of command.
3	Character below bar code is not printed, Line feed is not performed after execution of command.
4	Character below bar code is printed, Line feed is not performed after execution of command.

The value of *n2* can be set to 1(01H) to 4(04H) or "1"(31H) to "4"(34H).

n3: Mode of bar code

UPC-E, UPC-A, JAN/EAN-8, JAN/EAN-13, CODE 128, CODE 93

1	Minimum module 2 dots
2	Minimum module 3 dots
3	Minimum module 4 dots

CODE 39, NW-7, ITF

		CODE 39, NW-7	ITF
1	Narrow : wide	2:6 dots	2:5 dots
2	Narrow : wide	3:9 dots	4:10 dots
3	Narrow : wide	4:12 dots	6:15 dots
4	Narrow : wide	2:5 dots	2:4 dots
5	Narrow : wide	3:8 dots	4:8 dots
6	Narrow : wide	4:10 dots	6:12 dots
7	Narrow : wide	2:4 dots	2:6 dots
8	Narrow : wide	3:6 dots	3:9 dots
9	Narrow : wide	4:8 dots	4:12 dots

When the value of *n3* is UPC-E, UPC-A, JAN/EAN-8, JAN/EAN-13, CODE 128 or CODE 93, 1(01H) to 3(03H) or "1"(31H) to "3"(33H) can be set. When the value of n3 is CODE39, NW-7 or ITF, 1(01H) to 9(09H) or "1"(31H) to "9"(39H) can be set.

n4: Height of bar code
    Can be up to 255 dots (31.9 mm).
    If the bar code height is larger than the line feed amount, the line feed amount is automatically multiplied by an integer.

d1...dk: Bar code data

    UPC-E/UPC-A: K = 11 (or 12)
        The check digit at the 12th digit is automatically added, and ignored even if it is specified.

    JAN/EAN-8: K = 7 (or 8)
        The check digit at the 8th digit is automatically added, and ignored even if it is specified.

    JAN/EAN-13: K = 12 (or 13)
        The check digit at the 13th digit is automatically added, and ignored even if it is specified.

    CODE39:   The value of k is optional, and the maximum value also differs according to the modes (21 digits maximum in mode 7).
               The start/stop code ("∗") is automatically added.

ITF	The value of k is optional, and the maximum value also differs according to the modes (40 digits maximum in mode 4). If the data is number of an odd digits, 0 is automatically added at the beginning of the data.
CODE 128:	The value of k is optional, and the maximum value also differs according to the modes and the types of character number (51 digits maximum in mode 1). The check character is automatically added.
CODE 93:	The value of k is optional, and the maximum value also differs according to the modes and the types of character (30 digits maximum in mode 1). The check characters (C and K) are automatically added.
NW-7:	The value of k is optional, and the maximum value also differs according to the modes and the types of character number (29 digits maximum in mode 7). The start/stop code is also contained in the data (it is not automatically added).

The bar code printing start position is at the upper end of the current line.

If the bar code is positioned beyond the right margin, neither the bar code nor the character below the bar code will be printed.

Data of CODE 128 and CODE 93

When <LF> is used in a command, some kinds of control code cannot be sent by the host PC. The control code should be sent as the data as shown below:

• When sending the following data, express as a set of two characters.
Express "% (25H)" as "%0 (25H30H)".
Add "40H-5FH" after "%" for the control codes (00H-1FH).
Express the control code (7FH) as "%5(25H35H)".
Add "1 - 4 (31H - 34H)" after "%" for the function code.
Add "6 - 8 (36H - 38H)" after "%" for the start code.

3) 2-character codes

Control codes

CODE		FORMAT		
NUL	00H	%@	25H	40H
SOH	01H	%A	25H	41H
STX	02H	%B	25H	42H
ETX	03H	%C	25H	43H
EOT	04H	%D	25H	44H
ENQ	05H	%E	25H	45H
ACK	06H	%F	25H	46H
BEL	07H	%G	25H	47H
BS	08H	%H	25H	48H
HT	09H	%I	25H	49H
LF	0AH	%J	25H	4AH
VT	0BH	%K	25H	4BH
FF	0CH	%L	25H	4CH
CR	0DH	%M	25H	4DH
SO	0EH	%N	25H	4EH
SI	0FH	%O	25H	4FH
DLE	10H	%P	25H	50H
DC1	11H	%Q	25H	51H
DC2	12H	%R	25H	52H
DC3	13H	%S	25H	53H
DC4	14H	%T	25H	54H
NAK	15H	%U	25H	55H
SYN	16H	%V	25H	56H
ETB	17H	%W	25H	57H
CAN	18H	%X	25H	58H
EM	19H	%Y	25H	59H
SUB	1AH	%Z	25H	5AH
ESC	1BH	%[	25H	5BH
FC	1CH	%¥	25H	5CH
GS	1DH	%]	25H	5DH
RS	1EH	%^	25H	5EH
US	1FH	%_	25H	5FH
DEL	7FH	%5	25H	35H

Special code

CODE		FORMAT		
%	25H	%0	25H	30H

Function codes

CODE		FORMAT			
FNC1		%1	25H	31H	☆
FNC2		%2	25H	32H	☆
FNC3		%3	25H	33H	☆
FNC4		%4	25H	34H	☆

Start codes

CODE		FORMAT			
START A		%6	25H	36H	☆
START B		%7	25H	37H	☆
START C		%8	25H	38H	☆

☆ For CODE 128 only.

CODE		<ESC>	"M"
HEX		1B	4D

FUNCTION Receipt printer: Select 12-dot pitch printing
Prints in a 12×24 dot font with no spacing between characters.
Slip printer　　　: Select 7×9 (half dot) font

CODE		<ESC>	"p"
HEX		1B	70

FUNCTION Select 14-dot pitch printing
Prints in a 12×24 dot font with 2-dot spacing between characters.
This command is only valid with the receipt printer.

CODE		<ESC>	"P"
HEX		1B	50

FUNCTION Receipt printer: Select 15-dot pitch printing
Prints in a 12×24 dot font with 3-dot spacing between characters.
Slip printer　　　: Select 5×9 (2 pulses = 1 dot) font

CODE		<ESC>	":"
HEX		1B	3A

FUNCTION Receipt printer: Select 16-dot pitch printing
Prints in a 12×24 dot font with 4-dot spacing between characters.
Slip printer　　　: Select 5×9 (3 pulses = 1 dot) font

CODE		<ESC>	<SP>	*n*
HEX		1B	20	*n*

FUNCTION Set character spacing
Sets the spacing between characters according to the value of *n*.
The value of *n* can be set from 0 through 15, or from "0" through "9" and "A" through "F".
The default value of *n* is 0.

42

CODE	<SO>

HEX	0E

FUNCTION Sets the printing magnified double in character width.
Prints the subsequent data including a character spacing set by
<ESC><SP> *n*, magnified double in character width.

CODE	<DC4>

HEX	14

FUNCTION Resets the printing magnified in character width.
Resets the printing magnified in character width set by <SO>,
<ESC><SO>, <ESC> "W" *n* and <ESC> "i"*n1n2*.

CODE	<ESC> "W" *n*

HEX	1B 57 *n*

FUNCTION Set the magnification rate in character width
Prints the subsequent data with a character width magnified by a rate
specified by the value of n.
Receipt printer: n= 0, "0": Reset magnification (same as <DC4>)
            1, "1": Double magnification (same as <SO>)
            2, "2": Triple magnification
            3, "3": Quadruple magnification
            4, "4": Quintuple magnification
            5, "5": Sextuple magnification

Slip printer: n= 0, "0": Reset magnification (same as <DC4>)
            1, "1": Double magnification (same as <SO>)

CODE	<ESC> <SO>

HEX	1B 0E

FUNCTION Sets the printing magnified double in character width.
Prints the subsequent data magnified double in character width.
This command is only valid with the receipt printer.

CODE	<ESC> <DC4>

HEX	1B 14

FUNCTION Resets the printing magnified in character width set by
<ESC><SO>, <ESC>"h"*n* and <ESC> "i" *n1n2*.
This command is only valid with the receipt printer.

CODE	<ESC> "h" *n*
HEX	1B 68 *n*
FUNCTION	Set the magnification rate in character height

Prints the subsequent data with a character height magnified by a rate specified by the value of *n*.

Receipt printer: n= 0, "0": Reset magnification (same as
<ESC><DC4>)
1, "1": Double magnification (same as
<ESC><SO>)
2, "2": Triple magnification
3, "3": Quadruple magnification
4, "4": Quintuple magnification
5, "5": Sextuple magnification

Slip printer: n= 0, "0": Reset magnification (same as <DC4>)
1, "1": Double magnification (same as <SO>)

CODE	<ESC> "i" *n1 n2*
HEX	1B 69 *n* 1 n2
FUNCTION	Sets the magnification rates in character width and height

Prints the subsequent data in the size specified by *n1* and *n2*. The value of *n1* indicates the height magnification and the value of *n2* indicates the width magnification.

Receipt printer: n1 (n2)= 0, "0": Normal height (or width) size
1, "1": Double height (or width) size
2, "2": Triple height (or width) size
3, "3": Quadruple height (or width) size
4, "4": Quintuple height (or width) size
5, "5": Sextuple height (or width) size

The value of n is between 0(00H) and 5(05H) or "0" (30H) and "5" (35H). This command is only valid with the receipt printer.

CODE	<ESC> "–" *n*
HEX	1B 2D *n*
FUNCTION	Underlining

When the value of *n* is 1, underlines the subsequent data including a character spacing set by <ESC><SP> *n*.
The part to be skipped by the horizontal tab setting and the block graphic characters are not underlined.
Resets the underline mode when the value of *n* is 0.
The value of *n* can be set to 0(00H) or "0"(30H), or 1(01H) or "1"(31H).

CODE			
	<ESC>	"_"	*n*

HEX			
	1B	5F	*n*

FUNCTION

Upperlining
When the value of *n* is 1, over lines the subsequent data including a character spacing set by <ESC><SP> *n*.
The part to be skipped by the horizontal tab setting and the block graphic characters are not upper lined.
Resets the upper line mode when the value of *n* is 0.
The value of *n* can be set to 0(00H) or "0"(30H), or 1(01H) or "1"(31H).

CODE		
	<ESC>	"4"

HEX		
	1B	34

FUNCTION

Select highlight printing
Prints the subsequent data including a character spacing set by <ESC><SP> *n* reversed.
The part to be skipped by the horizontal tab setting is not reversed.

CODE		
	<ESC>	"5"

HEX		
	1B	35

FUNCTION

Cancel highlight printing
Cancels highlight printing

CODE	
	<SI>

HEX	
	0F

FUNCTION

Inverted printing
Causes subsequent characters to be inverted.
Enter this command at the beginning of the line. If this code is entered at any other position, it will be invalid. Therefore, it is not possible to mix correct and inverted printing in one line.

CODE	
	<DC2>

HEX	
	12

FUNCTION

Cancel inverted printing
Cancels inverted printing
Enter this code at the beginning of the line.

CODE	<ESC> "E"
HEX	1B 45
FUNCTION	Select emphasized printing Causes subsequent characters to be emphasized.

CODE	<ESC> "F"
HEX	1B 46
FUNCTION	Cancel emphasized printing Cancels emphasized printing.

CODE	<ESC> "U" "1" or <ESC> "U" <1>
HEX	1B 55 31 1B 55 01
FUNCTION	Select uni-directional printing After printing the data in the line buffer, the printer enters the uni-directional mode. The subsequent data is printed when the print head moves from left to right. This command is only valid with the slip printer.

CODE	<ESC> "U" "0" or <ESC> "U" <0>
HEX	1B 55 30 1B 55 00
FUNCTION	Select bi-directional printing After printing the data in the line buffer, the printer enters the bi-directional mode. In this mode, the data is printed faster than the uni-directional mode. This command is only valid with the slip printer.

Page Formatting (Line Mode)

CODE	<ESC>	"C"	*n*
HEX	1B	43	*n*

FUNCTION	Set page length in lines

Sets the page length using the current line spacing, where *n* is between 1 and 127.

Changing the line spacing later does not alter the physical page length.

The current line becomes the top of the page.

Resets the bottom margin.

Default page length is 42 lines.

This command is only valid with the receipt printer.

CODE	<ESC>	"C"	<0>	*n*
HEX	1B	43	00	*n*

FUNCTION	Set page length in inches

Sets the page length to $n \times 24$ mm, where *n* is between 1 and 22.

The current line becomes the top of the page.

Resets the bottom margin

This command is only valid with the receipt printer.

CODE	<ESC>	"N"	*n*
HEX	1B	4E	*n*

FUNCTION	Set bottom margin

Sets the bottom margin to *n* lines at the current line spacing, where *n* is between 0 and 255.

Bottom margin is reset when you change the page length.

Setting is invalid if the printing area on one page is 36 mm or less.

This command is only valid with the receipt printer.

CODE	<ESC>	"O"
HEX	1B	4F

FUNCTION	Cancel bottom margin

Cancels the bottom margin.

This command is only valid with the receipt printer.

CODE	<ESC>	"1"	*n*

HEX	1B	6C	*n*

FUNCTION

Set left margin at column *n* at the current character pitch.
The left margin does not move if the character pitch is changed later.
If this function is set in the middle of a line, it will become valid starting with the following line. When the power is turned on, the left edge is set as the left margin.

Receipt printer : The setting is invalid if the print area for one line would be 36 mm or less.
The value of n is between 0 and 255.

Slip printer : The left margin must be at least 18 dots to the left of the right margin and within the limits below. If the size of one character and its spacing is larger than the print area defined by the margins, printing is not possible and "?" is printed, instead of the character. The value of n is between 0 and the value of the right margin - 2.

CODE	<ESC>	"Q"	*n*

HEX	1B	51	*n*

FUNCTION

Set right margin
Set right margin at column *n* at the current character pitch.
The right margin does not move if the character pitch is changed later.
If this function is set in the middle of a line, it will become valid starting with the following line. When the power is turned on, the right edge is set as the right margin.

Receipt printer : The setting is invalid if the print area for one line would be 36 mm or less. The value of n is between 0 and 255.

Slip printer : The right margin must be within the limits below and set so that the allowable print area is more than 18 dots. If the size of one character and its spacing is larger than the print area defined by the margins, printing is not possible and "?" is printed, instead of the character.
The value of n is between 2 and the value of the maximum number of print columns.

Print Position Control

CODE	<LF>
HEX	0A
FUNCTION	Line feed Prints the current line and feeds the paper to the next line.

CODE	<CR>
HEX	0D
FUNCTION	Carriage return The <CR> code is valid for both the receipt and slip printers only if memory switch 3-1 is set to 1. (The factory setting is 0.) If the <CR> code is valid: Receipt printer : Functions in the same way as an <LF> code. Slip printer : The function of the <CR> code changes according to the setting of memory switch 5-8. When memory switch 5-8 is set to 0 (factory setting): Functions in the same way as an <LF> code (CRLF). When memory switch 5-8 is set to 1: Executed only when printing. The paper is not fed (CR).

CODE	<ESC>	"a"	*n*
HEX	1B	61	*n*
FUNCTION	Feed paper *n* lines Prints the current line and feeds the paper *n* lines (where *n* is between 1 and 127).		

CODE	<FF>
HEX	0C
FUNCTION	From feed Feeds the paper to the top of the next page, according to the page length set by <ESC> "C"*n* or <ESC>"C"<0>*n*. This command is only valid with the receipt printer.

CODE	<HT>
HEX	09
FUNCTION	Horizontal tab Moves the print position to the next horizontal tab stop. Ignored if there is no next horizontal tab stop on the current line.

CODE <VT>

HEX 0B

FUNCTION Vertical tab
Prints the current line and feeds the paper to the next vertical tab stop and moves the print position to the left margin.
Performs paper feed if no vertical tabs are or if the current line is at or below the last vertical tab stop.
This command is only valid with the receipt printer.

CODE <ESC> "A" *n*

HEX 1B 41 *n*

FUNCTION Define *n*/72-inch line spacing
Defines the distance that the paper advances in subsequent line feed.
The line spacing defined here is set by <ESC> "2".
$0 \leq n \leq 85$
The default value of *n* is 12 (1/6-inch feed)
This command is only valid with the slip printer

CODE <ESC> "2"

HEX 1B 32

FUNCTION Set line spacing to *n*/72-inch
Set the line spacing to *n*/72-inch which is defined by <ESC> "A" *n*.
This command is only valid with the slip printer

CODE <ESC> "z" "0" or <ESC> "z" <0>

HEX 1B 7A 30 or 1B 7A 00

FUNCTION Receipt printer: Set line spacing to 3 mm
Sets the distance that the paper advances in subsequent line feed to 3 mm.

Slip printer : Set line spacing to 1/12 inch
Sets the distance that the paper advances in subsequent line feeds to 1/12 inch.

CODE <ESC> "z" "1" or <ESC> "z" <1>

HEX 1B 7A 31 or 1B 7A 01

FUNCTION Receipt printer: Set line spacing to 4 mm
Sets the distance that the paper advances in subsequent line feed to 4 mm.

Slip printer : Set line spacing to 1/6 inch
Sets the distance that the paper advances in subsequent line feeds to 1/6 inch.

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CODE	`<ESC>` "0"
HEX	1B 30

FUNCTION Receipt printer: Set line spacing to 3 mm
Sets the distance that the paper advances in subsequent line feed to 3 mm.

Slip printer : Set line spacing to 1/8 inch
Sets the distance that the paper advances in subsequent line feeds to 1/8 inch.

CODE	`<ESC>` "1"
HEX	1B 31

FUNCTION Receipt printer: Set line spacing to 3 mm
Sets the distance that the paper advances in subsequent line feed to 3 mm.

Slip printer : Set line spacing to 7/72-inch
Sets the distance that the paper advances in subsequent line feeds to 7/72-inch.

CODE	`<ESC>` "J" n
HEX	1B 4A n

FUNCTION Receipt printer: One time n/4-mm feed
Performs a line feed of n/4 mm only once after printing the data in the line buffer. The space setting for lines does not change. The value of n is between 1 and 255.

Slip printer : One time n/72-inch feed
Performs a line feed of n/72-inch only once after printing the data in the line buffer. The space setting for lines does not change. The value of n is between 1 and 255.

CODE	<ESC>	"j"	*n*
HEX	1B	6A	*n*

FUNCTION Receipt printer: One time *n*/4-mm backfeed
Feeds the paper back *n*/4 mm only once after printing the data in the line buffer. The space setting for lines do not change. This command can also feed the paper back to a previous page; however, the position in the line on the previous page is determined by the page length control.
The value of *n* is between 1 and 255.

Slip printer : One time *n*/72-inch backfeed
Performs a line feed of *n*/72-inch only once after printing the data in the line buffer. The space setting for lines do not change. The value of *n* is between 1 and 255.

CODE	<ESC>	"3"	*n*
HEX	1B	33	*n*

FUNCTION Set line spacing to *n*/216-inch
Sets the subsequent line spacing to *n*/216-inch.
The value of *n* is between 1 and 255.
Since the min. pitch of the slip paper feed mechanism is 1/144-inch, the set value is approximated by the following formula
INT $(n \times 2/3 + 0.5)/144$ inch
This command is only valid with the slip printer

CODE	<ESC>	"y"	*n*
HEX	1B	79	*n*

FUNCTION Set line spacing to *n*/144-inch
Sets the subsequent line spacing to *n*/144-inch.
The value of *n* is between 1 and 255.
This command is only valid with the slip printer

CODE	<ESC>	"I"	*n*
HEX	1B	49	*n*

FUNCTION One time *n*/8 mm feed
Performs a line feed of *n*/8 mm only once after printing the data in the line bufrer.
The space setting for lines does not change.
The value of *n* is between 1 and 255.
This command is only valid with the receipt printer.

CODE						
	<ESC>	"B"	*n1*	*n2*	...	<0>

HEX						
	1B	42	*n1*	*n2*	...	00

FUNCTION

Set vertical tab stops

Cancels all current vertical tab stops and sets new vertical tab stops at lines *n1*, *n2*, etc., where *n1*, *n2*, etc. are numbers between 0 and 255. A maximum of 16 vertical tab stops can be set.

The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code.

The vertical tab stops are set in terms of the current line spacing and do not move if the line spacing is changed later.

With <ESC> "B" <0>, all vertical tab stops are cancelled. This command is only valid with the receipt printer. When the power is turned on, no vertical tabs are set.

CODE						
	<ESC>	"D"	*n1*	*n2*	...	<0>

HEX						
	1B	44	*n1*	*n2*	...	00

FUNCTION

Set horizontal tab stops

Cancels all current horizontal tab stops and sets new tab stops at columns *n1*, *n2*, etc. at the current character pitch, where *n1*, *n2*, etc. are numbers between 1 and 255. A maximum of 16 horizontal tab stops can be set.

The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code.

With <ESC> "D" <0>, all horizontal tab stops are cancelled. The left edge of the paper is always the reference point for the horizontal tab positions, regardless of the left margin setting. When the power is turned on, no horizontal tabs are set.

Dot Graphics Printing

CODE	\<ESC\>	"K"	*n*	\<0\>	*m1*	*m2*	...
HEX	1B	4B	*n*	00	*m1*	*m2*	...

FUNCTION   Print normal density graphics
Receipt printer: Prints a 3 (horizontal) × 3 (vertical) dot bit image for
each dot of entered data. Data extending beyond the
right margin is ignored. The relationship between
the entered data and the actual printing is shown
below. The value of *n* is between 1 and 192.
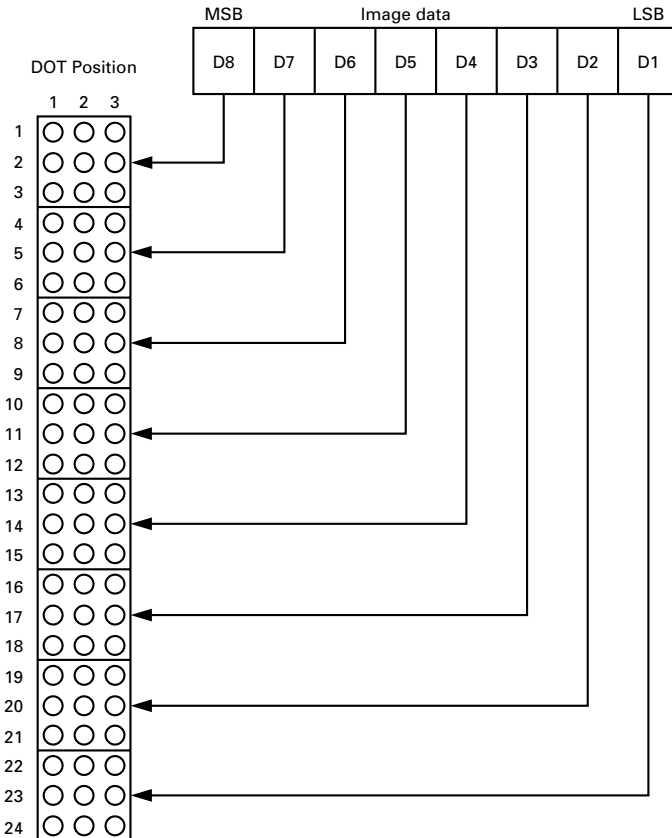
Slip printer: Prints a bit image of the number of dots specified by n. After printing the bit
image, the printer automatically returns to the character mode. The
relationship between the pins on the print head and the data is shown below.

	MSB		Image		data			LSB
	D_8	D_7	D_6	D_5	D_4	D_3	D_2	D_1

Dot Position

1 ●◄
2 ●◄
3 ●◄
4 ●◄
5 ●◄
6 ●◄
7 ●◄
8 ●◄
9 ● (Not Used)

The value of n is between 1 and 210.
A maximum of 210 data bytes can printed in one line. Any data exceeding
210 bytes is ignored. Only uni-directional printing is possible.

| EXAMPLE | We will create the design below using a bit image. |

	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	m21	m22	m23	m24	m25	m26	m27	m28	m29	m30
D8																														
D7				●		●																								
D6			●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D5		●	●	●	●	●	●	●		●	●			●	●			●			●			●			●	●		
D4		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D3		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D2		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
D1	●			●	●			●	●							●	●								●	●				

First, since the volume of data is 30, $n1 = (1E)_H$. If the data $m1 \sim m30$ is converted to hexadecimal, it appears as shown below.

Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00000001	01	*m11*	00111110	3E	*m21*	00111110	3E
m2	00011110	1E	*m12*	00000010	02	*m22*	00101110	2E
m3	00111110	3E	*m13*	00000010	02	*m23*	00101110	2E
m4	01011111	5F	*m14*	00111110	3E	*m24*	00111110	3E
m5	00011111	1F	*m15*	00111110	3E	*m25*	00101111	2F
m6	01011110	5E	*m16*	00101111	2F	*m26*	00101111	2F
m7	00011110	1E	*m17*	00101111	2F	*m27*	00111110	3E
m8	00111111	3F	*m18*	00111110	3E	*m28*	00111110	3E
m9	00101111	2F	*m19*	00101110	2E	*m29*	00000010	02
m10	00111110	3E	*m20*	00101110	2E	*m30*	00000010	02

| Printing Sample |

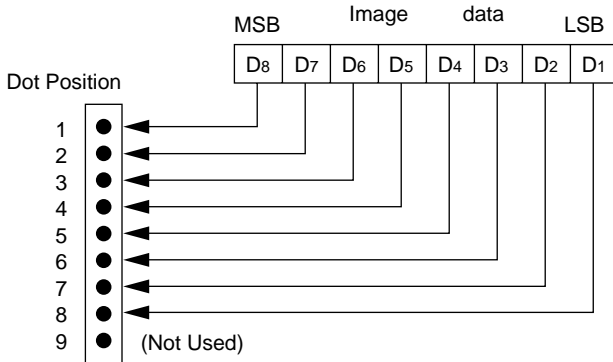| CODE	<ESC>	"L"	*n1*	*n2*	*m1*	*m2*	...
HEX	1B	4C	*n1*	*n2*	*m1*	*m2*	...

FUNCTION Print high density graphics

Receipt printer: Prints a 1 (horizontal) × 3 (vertical) dot bit image for each dot of entered data. Data extending beyond the right margin is ignored. The relationship between the entered data and the actual printing is shown below. The value of n1 + n2 × 256 is between 1 and 576.
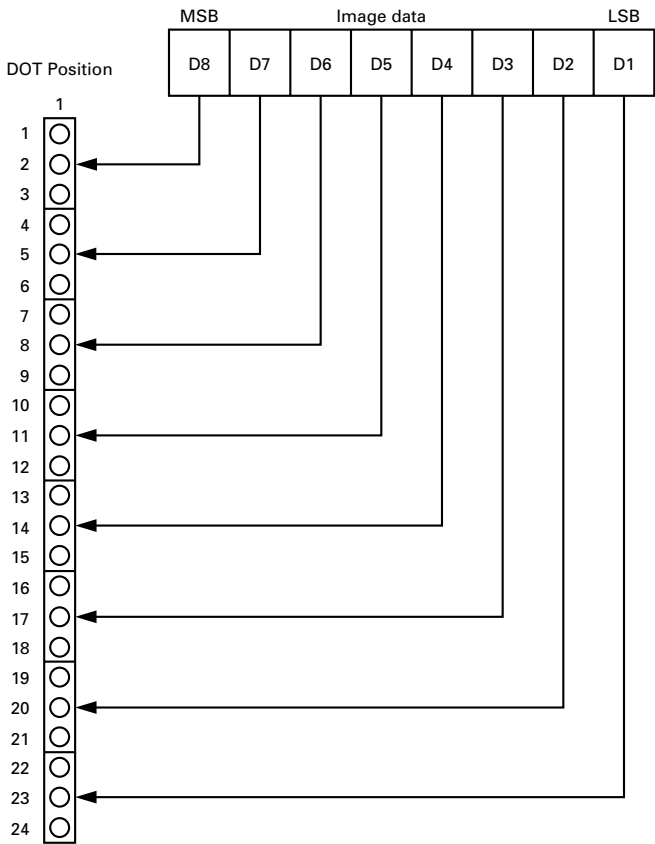
Slip printer: Prints a high density bit image of the number of dots specified by n1 and n2. The value of $n1 + 256 \times n2$ is between 1 and 420.

A maximum of 420 data bytes can printed in one line. Any data exceeding 420 bytes is ignored.

After printing the bit image, the printer automatically returns to the character mode. The relationship between the pins on the print head and the data is the same as those shown for the previous bit image code <ESC> "K".

While printing a high density bit image, the horizontally adjacent dots cannot be printed.

| EXAMPLE |

We will create the design below using a bit image.

	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	m21	m22	m23	m24	m25	m26	m27	m28	m29	m30
D8																														
D7				●		●																								
D6			●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D5		●	●	●	●	●	●	●		●	●			●	●			●			●			●			●	●		
D4		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D3		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D2		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
D1	●			●	●			●	●							●	●								●	●				

First, since the volume of data is 30, $n1 = (1E)_H$. If the data $m1 \sim m30$ is converted to hexadecimal, it appears as shown below.

Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00000001	01	*m11*	00111110	3E	*m21*	00111110	3E
m2	00011110	1E	*m12*	00000010	02	*m22*	00101110	2E
m3	00111110	3E	*m13*	00000010	02	*m23*	00101110	2E
m4	01011111	5F	*m14*	00111110	3E	*m24*	00111110	3E
m5	00011111	1F	*m15*	00111110	3E	*m25*	00101111	2F
m6	01011110	5E	*m16*	00101111	2F	*m26*	00101111	2F
m7	00011110	1E	*m17*	00101111	2F	*m27*	00111110	3E
m8	00111111	3F	*m18*	00111110	3E	*m28*	00111110	3E
m9	00101111	2F	*m19*	00101110	2E	*m29*	00000010	02
m10	00111110	3E	*m20*	00101110	2E	*m30*	00000010	02

Horizontal density is three times that of the bit image for <ESC>"k". (Compare the print samples.)

| Printing Sample |

CODE	\<ESC\>	"k"	*n*	\<0\>	*m1*	*m2*	...
HEX	1B	6B	*n*	00	*m1*	*m2*	...

FUNCTION   Print fine density graphics

Prints a 1 (horizontal) × 1 (vertical) dot bit image for each dot of entered data. Data extending beyond the right margin is ignored. The relationship between the entered data and the actual printing is shown below. The value of n is between 1 and 72.

This command is only valid with the receipt printer.

Relationship between image data and print dots

Image data

| b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |

Dot position

d_1	d_2	• • •	d_n
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{n+1}	d_{n+2}	• • •	d_{2n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{2n+1}	d_{2n+2}	• • •	d_{3n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{3n+1}	d_{3n+2}	• • •	d_{4n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{4n+1}	d_{4n+2}	• • •	d_{5n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{5n+1}	d_{5n+2}	• • •	d_{6n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{6n+1}	d_{6n+2}	• • •	d_{7n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{7n+1}	d_{7n+2}	• • •	d_{8n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{8n+1}	d_{8n+2}	• • •	d_{9n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{9n+1}	d_{9n+2}	• • •	d_{10n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{10n+1}	d_{10n+2}	• • •	d_{11n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{11n+1}	d_{11n+2}	• • •	d_{12n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{12n+1}	d_{12n+2}	• • •	d_{13n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{13n+1}	d_{13n+2}	• • •	d_{14n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{14n+1}	d_{14n+2}	• • •	d_{15n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{15n+1}	d_{15n+2}	• • •	d_{16n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{16n+1}	d_{16n+2}	• • •	d_{17n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{17n+1}	d_{17n+2}	• • •	d_{18n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{18n+1}	d_{18n+2}	• • •	d_{19n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{19n+1}	d_{19n+2}	• • •	d_{20n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{20n+1}	d_{20n+2}	• • •	d_{21n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{21n+1}	d_{21n+2}	• • •	d_{22n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{22n+1}	d_{22n+2}	• • •	d_{23n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0
d_{23n+1}	d_{23n+2}	• • •	d_{24n}
b7 b6 b5 b4 b3 b2 b1 b0	b7 b6 b5 b4 b3 b2 b1 b0	• • •	b7 b6 b5 b4 b3 b2 b1 b0

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EXAMPLE | Printing Sample
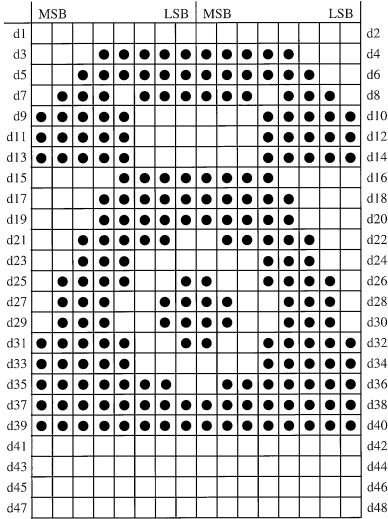
Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
d1	00000000	00	d2	00000000	00
d3	00011111	1F	d4	11111000	F8
d5	00111111	3F	d6	11111100	FC
d7	01110111	77	d8	01110111	EE
d9	11111000	F8	d10	00011111	1F
d11	11111000	F8	d12	00011111	1F
d13	11111000	F8	d14	00011111	1F
d15	00001111	0F	d16	11110000	F0
d17	00011111	1F	d18	11111000	F8
d19	00011111	1F	d20	11111000	F8
d21	00111110	3E	d22	01111100	7C
d23	00111000	38	d24	00011100	1C
d25	01111001	79	d26	10011110	9E
d27	01110011	73	d28	11001110	CE
d29	01110011	73	d30	11001110	CE
d31	11111001	F9	d32	10011111	9F
d33	11111000	F8	d34	00011111	1F
d35	11111110	FE	d36	01111111	7F
d37	11111111	FF	d38	11111111	FF
d39	11111111	FF	d40	11111111	FF
d41	00000000	00	d42	00000000	00
d43	00000000	00	d44	00000000	00
d45	00000000	00	d46	00000000	00
d47	00000000	00	d48	00000000	00

CODE	<ESC>	"X"	*n1*	*n2*	*m1*	*m2*	...
HEX	1B	5	*n1*	*n2*	*m1*	*m2*	...

FUNCTION Print fine density graphics
Prints a bit image of the input data using horizontal and vertical resolutions of 8 dots/mm.
Data extending past the right margin is ignored.
The relationship between the input data and the actual printing is shown below.
$1 \leqq n1 + n2 \times 256 \leqq 576$
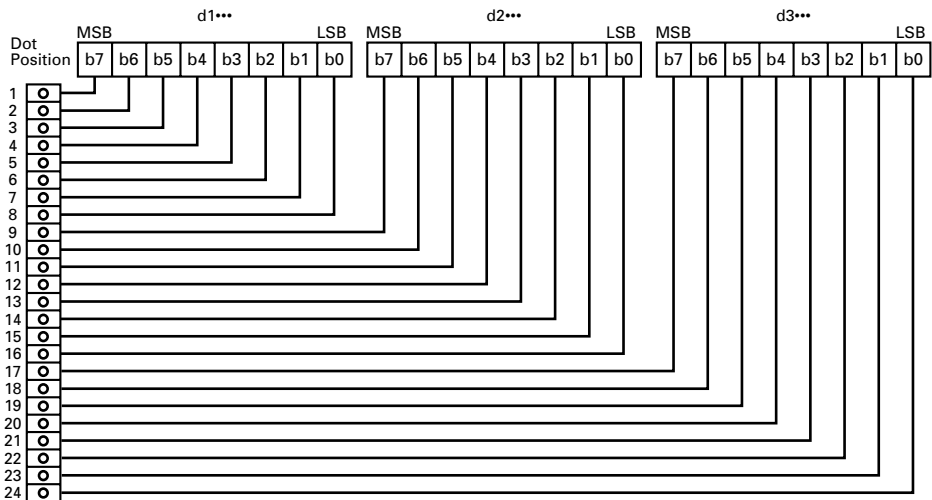
Download Graphics Printing

CODE   `<ESC>`   "&"   `<1>`   `<1>`   *n*   *m1*   *m2*   ...   *m48*

               `<ESC>`   "&"   "1"   "1"   *n*   *m1*   *m2*   ...   *m48*

HEX   1B   26   01   01   *n*   *m1*   *m2*   ...   *m48*

               1B   26   31   31   *n*   *m1*   *m2*   ...   *m48*

FUNCTION   Define download character

Defines one new character and stores it in RAM for later use.
n is the character code of the character defined and must be between 21H and 7F4.
If the maximum of 32 external characters have already been stored, the oldest stored external character are deleted so that new external character can be stored.
The character matrix is 12 dots wide and 24 dots high.
Relationship between the character pattern and the character data is shown below.
This command is only valid with the receipt printer.

EXAMPLE
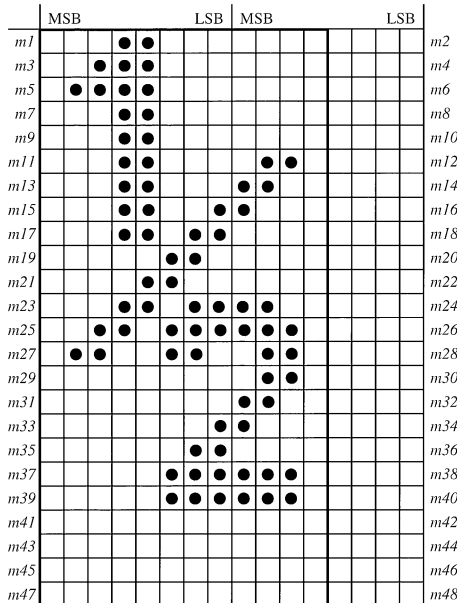
Ignored
4 bits

Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00011000	18	*m2*	00000000	00
m3	00111000	38	*m4*	00000000	00
m5	01111000	78	*m6*	00000000	00
m7	00011000	18	*m8*	00000000	00
m9	00011000	18	*m10*	00000000	00
m11	00011000	18	*m12*	01100000	60
m13	00011000	18	*m14*	11000000	C0
m15	00011001	19	*m16*	10000000	80
m17	00011011	1B	*m18*	00000000	00
m19	00000110	06	*m20*	00000000	00
m21	00001100	0C	*m22*	00000000	00
m23	00011011	1B	*m24*	11000000	C0
m25	00110111	37	*m26*	11100000	E0
m27	01100110	66	*m28*	01100000	60
m29	00000000	00	*m30*	01100000	60
m31	00000000	00	*m32*	11000000	C0
m33	00000001	01	*m34*	10000000	80
m35	00000011	03	*m36*	00000000	00
m37	00000111	07	*m38*	11100000	E0
m39	00000111	07	*m40*	11100000	E0
m41	00000000	00	*m42*	00000000	00
m43	00000000	00	*m44*	00000000	00
m45	00000000	00	*m46*	00000000	00
m47	00000000	00	*m48*	00000000	00

When the 7×9 (half dot) character size (default setting) is set:

CODE   <ESC> "&" <0> *n1 n2* [*m0 m1 m2 m3 m4 m5 m6 m7*] $_{n2 - n1 + 1}$

HEX   (1B)н (26)н (00)н *n1 n2* [*m0 m1 m2 m3 m4 m5 m6 m7*] $_{n2 - n1 + 1}$
When the 5×9 dot character size is set:

CODE   <ESC> "&" <0> *n1 n2* [*m0 m1 m2 m3 m4 m5*] $_{n2 - n1 + 1}$

HEX   (1B)н (26)н (00)н *n1 n2* [*m0 m1 m2 m3 m4 m5*] $_{n2 - n1 + 1}$

FUNCTION Define download character (7×9 (half dot) font or 5×9 dot font)
Defines download characters
Up to 10 download characters can be defined and the defined
character patterns can be stored in the printer's RAM.
The values of *n1* and *n2* are between (21)H and $(7F)$H with *n1* less
than or equal to *n2* and the value of *m0* is either (00)H or (80)H.
Defining of download characters begins with character code *n1* and
completes with *n2*. When only one character is defined, *n1 = n2*.
m0 indicates the relationship between the character pattern and print
head.
m1 m2.... Indicate the character pattern
This command is only valid with the slip printer.

When m0=(00)H
MSB · · · · · · · · LSB

	D8	D7	D6	D5	D4	D3	D2	D1

Pin No.
1 ● (Not used)
2 ●
3 ●
4 ●
5 ●
6 ●
7 ●
8 ●
9 ●

When m0=(80)H
MSB · · · · · · · · LSB

	D8	D7	D6	D5	D4	D3	D2	D1

Pin No.
1 ●
2 ●
3 ●
4 ●
5 ●
6 ●
7 ●
8 ●
9 ● (Not used)
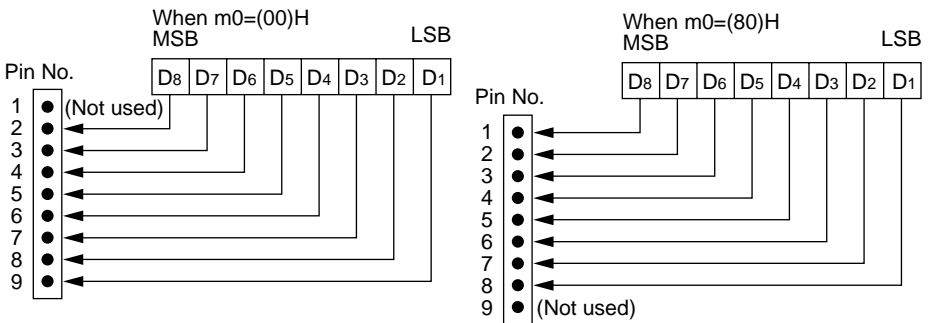
EXAMPLE When the 7×9 (half dot) character size (default setting) is set, the
horizontally adjacent dots cannot be printed.

Printing possible

	m2		m4		m6	
	m1	m3	m5	m7
D8	●	●	●	●
D7	●			
D6		●		●
D5		●	●	
D4			●	
D3			●	
D2			●	
D1	●	●	●	

Printing not possible

	m2		m4		m6	
	m1	m3	m5	m7
D8	●	●	●	●	← Over lapping horizontally
D7	●			●
D6		●		
D5		●	●	
D4			●	
D3			●	
D2			●	
D1	●	●	●	●	← Over lapping horizontally
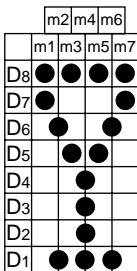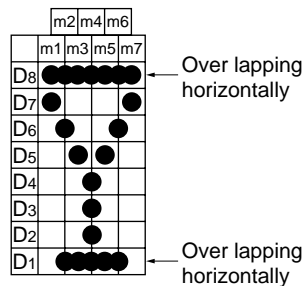
CODE	<ESC>	"&"	<1>	<0>	*n*
	<ESC>	"&"	"1"	"0"	*n*

HEX	1B	26	01	00	*n*
	1B	26	31	30	*n*

FUNCTION Delete a download character (12×24 dot font)
Deletes the download character which was assigned the value *n*.
This command is only valid with the receipt printer.

CODE	<ESC>	"%"	"1"	or	<ESC>	"%"	<1>
HEX	1B	25	31	or	1B	25	01

FUNCTION Enable download character set
Enables the download character set.

CODE	<ESC>	"%"	"0"	or	<ESC>	"%"	<0>
HEX	1B	25	30	or	1B	25	00

FUNCTION Disable download character set
Disables the selected download character set and returns to the built-in ROM character set.

Peripheral Device Control

CODE				
	<ESC>	<BEL>	*n1*	*n2*

HEX				
	1B	07	*n1*	*n2*

FUNCTION	
	Define drive pulse width for peripheral device #1

Defines the drive pulse width for peripheral devices requiring other than standard 200 ms pulse time and delay time.
n1 indicates the energizing time and *n2* indicates the delay time, using 10ms units.

CODE	
	<BEL>

HEX	
	07

FUNCTION	
	Control peripheral device #1

Executes drive pulse for peripheral device #1.

CODE	
	<FS>

HEX	
	1C

FUNCTION	
	Control peripheral device #1 immediately

Executes drive pulse for peripheral device #1 immediately.

CODE	
	<EM>

HEX	
	19

FUNCTION	
	Control peripheral device #2 immediately

Drives peripheral device #2. The drive pulse width and delay time are fixed at 200 ms.

CODE	
	<SUB>

HEX	
	1A

FUNCTION	
	Control peripheral device #2 immediately

Drives peripheral device #2. The drive pulse width and delay time are fixed at 200 ms.

Auto Cutter Control

CODE	<ESC>	"d"	"0"	or	<ESC>	"d"	<0>
HEX	1B	64	30	or	1B	64	00

FUNCTION   Full-cut command to the auto cutter
Cuts the receipt paper fully.
This command is only valid with the receipt printer.

CODE	<ESC>	"d"	"1"	or	<ESC>	"d"	<1>
HEX	1B	64	31	or	1B	64	01

FUNCTION   Partial-cut command to the auto cutter
Cuts the receipt paper partially.
This command is only valid with the receipt printer.

Slip Printer Control

CODE	<ESC>	<SI>	*n*
HEX	1B	0F	*n*
FUNCTION			

Setting slip sensor
Sets the slip printer TOF/BOF sensor according to the value of *n*.

	TOF Sensor	BOF Sensor
n = 00, "0" :	Valid	Valid
01, "1" :	Valid	Invalid
02, "2" :	Invalid	Valid
03, "3" :	Invalid	Invalid

Default values are:
n = 0 when memory switch 5-2 = 0 (factory setting)
n = 3 when memory switch 5-2 = 1

CODE	<ESC>	<FF>	*n*
HEX	1B	0C	*n*
FUNCTION			

Slip function
After printing the data in the line buffer, operates the slip printer according to the value of *n*.

n = 00, "0" :   Operates the clamp
      01, "1" :   Releases the paper
      02, "2" :   Releases the paper and waits until it is removed
      03, "3" :   Feeds the paper backward (backfeed) until it moves past the TOF sensor, then releases the paper. (See NOTE below.)
      04, "4" :   Feeds the paper into the printer (operational feed) until it moves past the BOF sensor, then releases the paper.
      05, "5" :   Feeds the paper according to the direction and length set by <ESC> <VT> m n (the paper is not released)

(NOTE) When the slip paper is attached to duplicates, a paper jam may occur if the paper is always fed backward. Therefore, the paper should not be ejected with n=3. To feed slip paper attached to duplicates backward, use <ESC> <VT> to set the eject length to about half of the paper length, then eject the paper using <ESC> <FF> 5.

This command is only valid with the slip printer.

CODE		<ESC>	<VT>	*m*	*n*
HEX		1B	0B	*m*	*n*

FUNCTION Set the paper eject direction/length
Sets the length of the ejection operation performed using <ESC> <FF> 5 in line mode.

The value of m determines the ejection direction.

When m= "+": the ejection direction is into the printer (operational feed), and the ejection length is n lines (at the current carriage return)
When m= "-": the ejection direction is backward (backfeed), and the ejection length is n lines (at the current carriage return)
When m= 0 : the ejection direction is backward (backfeed), and the ejection length is n inches
The default value of n is 0.

This command is only valid with the slip printer.

CODE		<EOT>
HEX		04

FUNCTION Slip status enquiry
Sends slip printer status information to the host computer.

Status b7 b6 b5 b4 b3 b2 b1 b0

Constantly set at "1"
Constantly set at "0"
TOF sensor   1: No paper
BOF sensor   1: No paper
Slip printer mechanical error   1: Error
Slip release/clamp   1: Clamp
0: Release
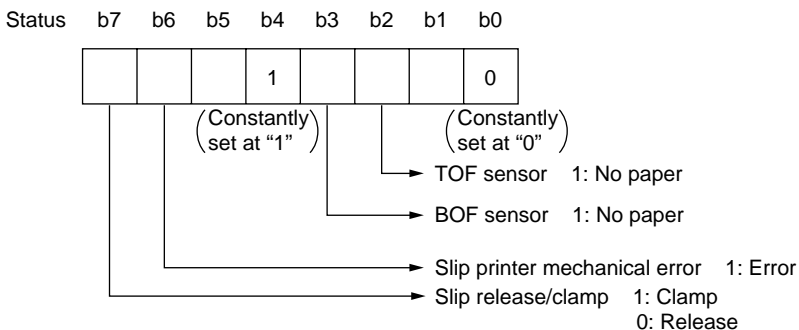
Status b1 and b5 is variable.

This command is only valid with the slip printer.

CODE	<ESC>	<EM>	*n*	*m*	<LF>	<NUL>
HEX	1B	19	*n*	*m*	0A	00

FUNCTION   Set the wait time until the automatic clamp is activated
Set the wait time between paper insertion (TOF/BOF sensor senses the paper) and automatic clamp activation by $n \times 0.1$ sec.
The default value of *n* is 7 (wait time is 0.7 sec.)
The value of *m* is fixed to 0.
This command is only valid with the slip printer, besides memory switch 5-1 is set to 0.

Page Mode

CODE	<ESC>	"*n*"
HEX	1B	6E

FUNCTION   Select page mode
Switches from line mode (default) to page mode.
This code is only valid when it is entered at the beginning of the line.
The page mode is suitable even though data is printed in the rotational direction specified by <ESC> "T" n and in the page coordinate range specified by <ESC> "*" •••, and though paper with a horizontal length of a check, etc. is rotated 90 or 270 and printing is carried out in all modes.
In page mode, since OR is applied to the data in the print area, characters and bit images can be printed overlapping each other and each character can be rotated and oriented independently.
In page mode, if printing data and a command such as <CR> or <LF> are sent in the same way as in line mode, there is an automatic rotation to the printer side.
All printing of data in the print area is performed according to <LF>. After printing according to <FF>, the printer returns to line mode. In addition, if <ESC> "!", <ESC> "@" or <CAN> are specified, printing is not performed and the printer leaves page mode and returns to line mode.
While returning to line mode, the data in the printer buffer, the area coordinates and the rotation directions are all cleared.
This command is only valid with the slip printer.

The following restrictions exist in page mode.

1)   In page mode, half-dot characters cannot be printed since printing is carried out in normal dot units.
When entering page mode, the ANK font is automatically set to a 5×9 (2 pulses = 1 dot) font.
Since the 7×9 font and 5×9 (3 pulses = 1 dot) font commands cannot be executed in page mode, they are executed after the

printer returns to line mode.
High density printing of graphics is ignored.

2) Paper feed command
In paper mode, the paper feed command and carriage return are executed in units of dots. A 1/72-inch (0.353-mm) paper feed is considered 1 dot. Since a 1-dot pitch in the horizontal direction is 0.30 mm and a 1-dot pitch in the vertical direction is 0.353 mm, the paper amount that is fed while printing using a 90 or 270 rotation is less when compared with a 0 or 150 rotation. As a result, when printing using a 90 or 270 rotation, execute a test print, check the horizontal and vertical dot alignment, then adjust the alignment as necessary.

3) The following commands are not executed in page mode, but are stored and executed when the printer returns to line mode.

Select 7 × 9 (half dot) font	<ESC> "M"
Select 5 × 9 (3 pulses = 1 dot) font	<ESC> ":"
Inverted printing/Cancel inverted printing	<SI>/<DC2>
Select highlight printing/Cancel highlight printing	<ESC> "4"/<ESC> "5"
Underlining	<ESC> "-" n
Upperlining	<ESC> "_" n
Select print direction	<ESC> "U" n
Select emphasized printing/Cancel emphasized printing	<ESC> "E"/<ESC> "F"
Select left margin	<ESC> "1" n
Select right margn	<ESC> "Q" n

4) The following commands are ignored in page mode.

One time backfeed	<ESC> "j" n
Print high density graphics	<ESC> "L" •••
Slip function	<ESC> <FF> n
Select print station	<ESC> "+" "A" n
STX-ETX mode	<STX> ••• <ETX>

CODE <ESC> "!"

HEX 1B 21

FUNCTION Select line mode (default)
If this command is specified while in page mode, printing is not carried out and the printer returns to line mode.
This command is only valid with the slip printer.

CODE										
	<ESC>	"*"	XL	XH	YL	YH	dXL	dXH	dYL	dYH

HEX										
	1B	2A	XL	XH	YL	YH	dXL	dXH	dYL	dYH

FUNCTION   Setting print area in page mode

The coordinates of the current position at the moment that page mode is entered are (0,0). The starting point of the print area is defined by X_L, X_H, Y_L and Y_H. In addition, the length DX in the X direction is specified by dX_L and dX_H, and the length DY in the Y direction is specified by dY_L and dY_H.
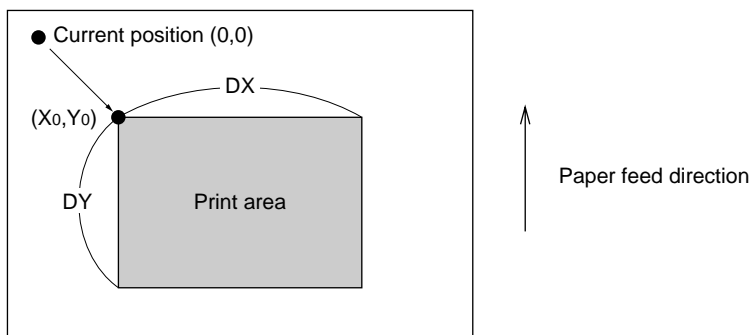
Starting point $X_0 = X_L + (X_H \times 256)$ dots
Starting point $Y_0 = Y_L + (Y_H \times 256)$ dots
Length in horizontal direction $DX = dX_L + (dX_H \times 256)$ dots
Length in vertical direction $DY = dY_L + (dY_H \times 256)$ dots

The values of XL, YL, dXL and dYL are between 0 and 255, and the values of XH, YH, dXH and dYH are between 0 and 1.
However, $dX_L = dX_H = 0$ and $dY_L = dY_H = 0$ are not included.
In addition, since the maximum range in the X direction ($X_O + DX$) is 210 dots and the maximum range in the Y direction ($Y_O + DY$) is 720 dots, each parameter should be specified to satisfy these ranges.
When the power is turned on, $XL = XH = YL = YH = 0$ ($X_O, Y_O = 0,0$)

   $dX_L = 210$, $dX_H = 0$ ($DX = 210$) and
   $dY_L = 64$, $dY_H = 2$ ($DY = 576$).

This command is stored, even in line mode, and the position at the time that page mode is entered is used as the standard point (0,0). Since the bottom of the character is used as the baseline, a minimum print area of 8 dots are necessary in the character height direction to print data in the page. (When printing a magnified character height, the paper must be fed before printing.)

This command is only valid with the slip printer.

When n = 4, "4," special mode page mode functions as check high-speed printing mode.

CODE	<ESC> "T" *n*
HEX	1B 54 *n*
FUNCTION	Setting print direction in page mode

Sets the direction in which the printing will be executed in page mode according to the value of n.
This command is only valid in line mode.

Value of n	Mode
0 or "0"	0 rotation mode (uni-directional printing)
1 or "1"	270 rotation mode (uni-directional printing)
2 or "2"	180 rotation mode (uni-directional printing)
3 or "3"	90 rotation mode (uni-directional printing)
4 or "4"	270 rotation mode (bi-directional printing)

The default value of n is 0.

<Rotation direction examples>

n = 0   n = 1 or 4   n = 2   n = 3

0° rotation   270° rotation   180° rotation   90° rotation

<N=4,"4": Check high-speed printing mode>
This parameter is only valid when no character data is expanded into the page area, and this command is added immediately after <ESC>"n".
Also, once the check high-speed printing mode has been entered with <ESC>"T"4, it is not possible to move across to a different rotation mode (<ESC>"T"0-3) until the page mode has been exited. The check high-speed printing mode provides high-speed printing with the check at a 270 degree rotation angle and bi-directional printing, and a wide range of limitations have been included to enable bi-directional printing.

This mode can only be used with printing data that uses a 5 X 9 (2P-1) font without decorations.

The limitations are listed below. The quality of the printed product cannot be guaranteed if these limitations are removed and the unit used.

[Limitations on the check high-speed printing mode]

- The only characters that can be printed are the 5 X 9 (2P-1) font ANK characters.

- The double-sized width command cannot be used (the double-sized height command may be used.)

- The bit image command cannot be used.

- Horizontal tabs cannot be used.

- The space setting command for the space between characters cannot be used.

- The following limitations apply for the Y direction in the printing area (value set with <ESC> "*"...)
    ① As To=0 has been fixed as the starting point for the printing area, the printing area command set with <ESC> "*" .... Must be specified with Yo=YL=YH=0. (It will forcibly set at 0 if it is at any other setting.)
    ② The value of Dy must be a six-fold value.
       As bi-directional printing in 6-pin units will be performed in this mode, there are cases where the characters that have been entered in a misaligned state will be printed in a wave-like style and will not be able to be distinguished when the value of Dy is anything other than a six-fold value as a joint will be established within a single character for return printing. Consequently, setting anything other than the six-fold value must not be carried out. However, the printer will discard any remainders from dividing by six and automatically correct it into six-fold when any value other than six -fold has been set.

This command is only valid with the slip printer.

CODE	<FF>
HEX	0C
FUNCTION	Print in page mode (only valid when in page mode)

This command can only activate the slip printer. In page mode, all page data in the page area is printed, then the printer returns to line mode. After all the page data is printed, the data in the page, the page print area and the print direction are all initialized.

In addition, this command has no function in line mode.

Customer display commands (Combo mode only)

CODE   `<ESC>`   "S"

HEX   1B   53

FUNCTION   Start customer display
Subsequent data is sent through the customer display. Customer
display data is sent as follows.
This command is saved in the print buffer and retrieved from the
print buffer and executed in the same way as the other print data.

      `<ESC>` "S"   Customer display data   `<ESC>` "G"

              Through the customer display

This command is only effective in the combination mode and when
memory switch 0-8 = 0.
When the customer display is being used, the option RS232C I/F
communication conditions must be baud rate = 9699BPS, data
length = 8 bits, no parity, so set the dip switches accordingly.

CODE   `<ESC>`   "G"

HEX   1B   47

FUNCTION   End customer display
This command is regarded as the customer display data end code and
subsequent data is processed as print data. This command is saved in
the print buffer and retrieved from the print buffer and executed in
the same way as the other print data. This command is only effective
in the combination mode and when memory switch 0-8 = 0.
This command is only valid with the slip printer.

Other Commands

CODE	<CAN>
HEX	18

FUNCTION Cancel printer buffer & Initialize printer
Clears the line buffer, and initializes the commands set already.
Does not affect the external equipment drive conditions set by the
code <ESC> <BEL> *n1 n2*. (This is the same during a mechanical
error.)
(Line buffer means the print data expansion area.)
If <CAN> is specified in page mode while printing using the slip
printer, printing is not carried out and the printer returns to line mode
from page mode.
In addition, <CAN> initializes the print station selection. If the slip
printer was selected, the receipt printer will be re-selected.
This command cannot recover from errors or return to the on-line
status from off-line.

CODE	<DC3>
HEX	13

FUNCTION Deselect printer
Deselects the printer. The printer disregards all subsequent
characters and commands except <DC1>, which activates the
printer.

CODE	<DC1>
HEX	11

FUNCTION Set select mode
When the printer receives a <DC1> code, the deselect mode is
canceled and data following this code is input to the buffer.

CODE	<RS>
HEX	1E

FUNCTION Beep the buzzer
Sounds a brief beep tone.

CODE	<ESC>	"#	N	,	n1n2n3n4"	<LF>	<NUL>
HEX	1B	23	N	2C	n1n2n3n4	0A	00

FUNCTION Set the memory switch. In order to enable changed memory switch setting, turn the printer OFF and ON again or send printer reset command (<ESC> "?"<LF><NUL>") to the printer. Changed memory switch settings are stored in EEPROM and these setting will be stored as long as the time when they are changed again.

N :Memory switch number ("0", "1", "2", "3", "4", "5")

n1n2n3n4 :Mode settings (For details see below)

1) N=0 (Star mode only)
     n1 :Always "0"
     n3 :Always "0"

(Default)

Parameter	Setting	"0"	"1"
n2	Customer display commands	Valid	Invalid

(Default)

Parameter	Setting	"0" to "3"	"4" to "7"	"8" to "A"	"B" to "F"
n4	Receipt FF command	Form Feed	Paper Feed, Cut & Back	Form Feed	Paper Feed, Cut & Back
	FF cut mode	—	Full-cut	—	Partial-cut

2) N=1 (Star mode only)
     n1 :Always "0"
     n2 :Always "0"

(Default)

Parameter	Setting	"0"	"1"
n3	Zero style	Normal zero	Slashed zero
n4	International character set	See below	

n4	Country
"0"	USA
"1"	France
"2"	Germany

n4	Country
"3"	UK
"4"	Denmark #1
"5"	Sweden

n4	Country
"6"	Italy
"7"	Spain #1
"8"	Japan

n4	Country
"9"	Norway
"A"	Denmark #2
"B"	Spain #2

n4	Country
"C"	Latin America

3) N=2
    n3 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	Remark
n1	Receipt printer ESC d command Receipt printer	Cut	Paper feed, & Cut	Star mode only
n2	Receipt printer cutter	Valid	Invalid	Star and ESC/POS
n4	Receipt printer paper near end	Invalid	Valid	Star mode only

4) N=3 (Star mode only)
    n1 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	"2"	"3"
n2	Character table (Code page)	See belows			
n3	Receipt printer printer column	48	38	–	–
n4	CR code	Invalid	Invalid	Valid	Valid
	Receipt printer line feed (mm)	4	3	4	3

n2	Code page
"0"	Normal
"1"	katakana
"2"	437

n2	Code page
"3"	437
"4"	850
"5"	852

n2	Code page
"6"	860
"7"	861
"8"	863

n2	Code page
"9"	865
"A"	866

5) N=4 (Star mode)
    n2 :Always "0"
    n3 :Always "0"
    n4 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	"2"	"3"
n1	X on/X off Timing	When Toggled	every 3 sec	When Toggled	every 3 sec
	RTS Signal Condition	Save as DTR	Save as DTR	always SPACE	always SPACE

N=4 (ESC/POS mode)

    n1 :Always "0"

    n2 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	"2"	"3"
n3	DTR signal during setting status transmission	See belows			
n4	Data receipt error	"?" printed	Ignored	"?" printed	Ignored

Parameter :n3

Setting (DTR signal)	"0", "1"	"2", "3"
1. From when the power is turned on or I/F reset until communication possible	BUSY	BUSY
2. Test printing	BUSY	BUSY
3. Paper feed by paper feed switch	—	BUSY
4. Stop due to no paper	—	BUSY
5. During waiting for switch input in macro execution	—	BUSY
6. Other error	—	BUSY
7. Receiving buffer full	BUSY	BUSY

6) N=5 (Star mode)
      n1 :Always "0"
      n3 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	"2"	"3"
n2	When slip printer <CR> code is valid	Print + line feed (CRLF)	print (CR)	Print + line feed (CRLF)	print (CR)
n4	Initial status of the TOF/ BOF sensor	Valid	Valid	Valid	Valid
	Slip printer automatic clamp	Valid	Valid	Invalid	Invalid
	Slip printer automatic starting print positioning	Valid	Invalid	Valid	Invalid

Parameter	Setting	"4"	"5"	"6"	"7"
n2	When slip printer <CR> code is valid	Print + line feed (CRLF)	print (CR)	Print + line feed (CRLF)	print (CR)
n4	Initial status of the TOF/ BOF sensor	Invalid	Invalid	Invalid	Invalid
	Slip printer automatic clamp	Valid	Valid	Invalid	Invalid
	Slip printer automatic starting print positioning	Valid	Invalid	Valid	Invalid

N=5 (ESC/POS mode)
      n1 :Always "0"
      n2 :Always "0"
      n3 :Always "0"

(Default)

Parameter	Setting	"0"	"1"	"2"	"3"
n4	Slip printer automatic clamp	Valid	Valid	Invalid	Invalid
	Slip printer automatic starting print positioning	Valid	Invalid	Valid	Invalid

N=A
      n1 :Always "0"
      n2 :Always "0"
      n3 :Always "0"

(Default)

Parameter	Setting	"0"	"1"
n4	Receipt adherence-prevention control	Valid	Invalid

N=D
    n1 :Always "0"
    n2 :Always "0"
    n3 :Always "0"

Parameter	Setting	"0"	"1"	"2"	"3"
n2	Thermal head rank	A	B	C	C

Rank	Average resistance value
A	$1215 \pm 67\ \Omega$
B	$1350 \pm 67\ \Omega$
C	$1485 \pm 67\ \Omega$

CODE	<ESC> "@"

HEX	1B 40

FUNCTION   Initialize printer
Reinitializes the printer. Clears the print buffer and returns settings to their power-up values.
Does not clear the input buffer, downloaded characters, or conditions for peripheral devices.
If this command is specified in page mode while printing using the slip printer, printing is not carried out and the printer returns to line mode from page mode.
This command cannot recover from errors or return to the on-line status from off-line.

CODE	<ENQ>

HEX	05

FUNCTION   Enquiry
Causes the printer to transmit a status byte.

Status byte

Status

b7	b6	b5	b4	b3	b2	b1	b0
			0				

$\left(\begin{array}{c}\text{Constantly} \\ \text{set at } 0\end{array}\right)$

Vertical parity error
1: Error

Framing error
1: Error

Receipt printer head-up error
Receipt printer auto cutter error
Receipt printer thermistor error
Cover open error
Slip printer mechanical error
1: Error

Receipt paper empty
1: Empty

Buffer empty
1: Empty

Buffer overflow
1: Overflow

Compulsion switch
1: High level (Switch is set to ON.)

Status b3 is variable.

CODE	\<ESC\>	"?"	\<LF\>	\<NUL\>
HEX	1B	3F	0A	00

FUNCTION   Reset the printer hardware.
Resets the printer hardware and produces a test print

Chapter 10: ESC/POS Mode

TM-T85 mode

Code	Function
HT	Horizontal tab
LF	Print line feed
FF	Page mode print and return
DLE EOT	Real time transmission of status
DLE ENQ	Real time request to printer
CAN	Cancel print data in page mode
ESC FF	Print page mode data
ESC SP	Set right space amount of character
ESC !	Universal print mode designation
ESC $	Designate absolute printing
ESC %	Designate/cancel download characters set
ESC &	Define download characters
ESC *	Designate bit image mode
ESC -	Designate/cancel underline
ESC 2	Set 1/6 inch line feed amount
ESC 3	Set line feed amount
ESC =	Select peripheral equipment
ESC ?	Delete download characters
ESC @	Initialize printer
ESC D	Set horizontal tab position
ESC E	Designate/cancel emphasized print
ESC G	Designate/cancel double print
ESC J	Print and paper feed
ESC L	Select page mode
ESC R	Select international characters
ESC S	Select standard mode
ESC T	Select character print direction in print mode
ESC V	Designate/cancel 90° character rotation
ESC W	Set print range in page mode
ESC \	Designate relative position
ESC a	Align position
ESC c4	Select no effective paper detector at print stop
ESC c5	Enable/disable panel switch

Code	Function
ESC d	Print and paper feed "*n*" lines
ESC i	Partial cut (one section remaining)
ESC p	Designate pulse generation
ESC t	Select character code table
ESC u	Transmission of peripheral equipment status
ESC v	Transmission of paper detection status
ESC {	Designate/cancel inverted printing
GS !	Designate character size
GS $	Designate absolute position of vertical direction of characters in page mode
GS *	Define download bit image
GS /	Print download bit image
GS :	Start/finish macro definition
GS B	Designate/cancel reverse printing
GS H	Select print position of HRI characters
GS I	Printer ID transmission
GS L	Set left margin
GS P	Set basic calculated pitch
GS V	Paper cut
GS W	Set print range
GS \	Designate the relative position of vertical characters when printing in the page mode
GS ^	Execute macro
GS a	Enable/disable automatic status transmission
GS b	Designate/cancel smoothing
GS f	Select HRI character font
GS h	Set bar code height
GS k	Printing of bar code
GS r	Transmission of status
GS w	Set lateral size of bar code

TM-295 mode

Code	Function
HT	Horizontal tab
LF	Print line feed
FF	Page mode print and return
DLE EOT	Real time transmission of status
CAN	Cancel print data in page mode
ESC SP	Set right space amount of character
ESC !	Universal print mode designation
ESC %	Designate/cancel download characters set
ESC &	Define download characters
ESC *	Designate bit image mode
ESC 2	Set 1/6 inch line feed amount
ESC 3	Set line feed amount
ESC =	Select peripheral equipment
ESC @	Initialize printer
ESC C	Single sheet paper eject length setting
ESC D	Set horizontal tab position
ESC F	Designation/cancel single sheet paper reverse direction ejection
ESC J	Print and feed
ESC K	Print and reverse direction feed
ESC L	Select page mode
ESC R	Select international characters
ESC T	Select character print direction in print mode
ESC W	Set print range in page mode
ESC c4	Select no effective paper detector at print stop
ESC c5	Enable/disable panel switch
ESC d	Print and paper feed "*n*" lines
ESC e	Print and reverse direction feed "*n*" lines
ESC f	Single sheet paper hold time setting
ESC p	Designate pulse generation
ESC q	Release
ESC t	Select character code table
ESC u	Transmission of peripheral equipment status
ESC v	Transmission of paper detection status
ESC {	Designate/cancel inverted printing
GS I	Printer ID transmission
GS a	Enable/disable automatic status transmission
GS r	Transmission of status

TM-295 mode emulation cautionary items

Since, as shown below, the paper feed pitch, dot pitch and the installation distances between the TOF/BOF sensors and the print head differ depending on the mechanism of the SCP700 slip and TM-295, the printing results may not be the same because of the differences in the mechanism. Also, even though, since the TM-295 is a shuttle printer, the paper feed set values and actual paper feed amount are different.

Difference	SCP700 slip	TM-295
Difference in the paper feed motor pitch	1/144 inch units	1/60 inch units
Difference in the vertical direction dot pitch	0.353mm	0.423mm
Difference in the horizontal direction dot pitch	0.30mm	0.315mm
Difference in the distance from the top of the paper to the top of the print head	26.5mm (When automatically feeding)	26.5mm ~ 36.5mm Variable with mechanical stopper
Difference in the distance from the TOF sensor to the top of the print head	26.0mm	3.0mm ~ 13.0mm Variable with mechanical stopper
Difference in the distance from the BOF sensor to the bottom of the print head	38.1mm	27.3mm

<Influence and command differences due to differences in paper feed motor pitch and horizontal/vertical dot pitch>
Since the pitches are different, the printing results are reduced in the vertical/horizontal direction compared to the TM-295. Especially in the page mode, since the coordinates are controlled in dots, the printing results are reduced. (There is a difference of $n/60$" dots - $n/72$" dots in the Y direction.)
In the case of the line mode, since the difference in the paper feed pitch is absorbed as much as possible, the commands which are connected with the $n/60$ inch unit paper feed (<ESC> "3" n, <ESC> "J" n, <ESC> "K" n) use INT($(6n/5)+0.5$).
However, since even in this case, depending on the value of n, the paper feed amount may not be exactly the same, the vertical direction printing position may be different.

<Influence due to the difference in the TOF and BOF sensor positions>
The paper position when the condition of the TOF or BOF sensor changes due to the status is different to that of the TM-295.
Since the position of the BOF sensor is especially different, whereas the BOF sensor reports "no paper" at 27.3mm from the bottom of the paper with the TM-295, the BOF sensor reports "no paper" at approximately 38mm from the bottom of the paper with the SCP700. Therefore, when the BOF "no paper" sensor is effective, the BOF sensor "no paper" is reported quicker than with the TM-295 and it may not be possible to print in the same position at the bottom of the same form.
For this reason, by controlling the printing so that it does not stop until approximately 27.3mm from the bottom of the paper even if the paper has passed the BOF sensor at the 38.1mm position, this difference is compensated. However, due to the differences in the paper feed pitch (star = n/72", TM-295 = n/60"), the emulation is not perfect.

<Influence due to mechanical stopper position>
With the TM-295, by adjusting the mechanical stopper position, the paper top position can be changed between 0 to 10mm. However, since the mechanical stopper position is fixed with the SCP700, if the TM-295 mechanical stopper position is changed and the printing results are compared, they may be different.

Appendix : Character Code Tables

Star Mode

(Character table: Normal)

Hexa-decimal	0	1	2	3	4	5	6	7
0	<NUL> 0	16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	<DC1> 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	<DC2> 18	" 34	2 50	B 66	R 82	b 98	r 114
3	3	<DC3> 19	# 35	3 51	C 67	S 83	c 99	s 115
4	4	<DC4> 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	<ENQ> 5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	<BEL> 7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	8	<CAN> 24	(40	8 56	H 72	X 88	h 104	x 120
9	<HT> 9	<EM> 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	<LF> 10	<SUB> 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	<VT> 11	<ESC> 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	<FF> 12	<FS> 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	<CR> 13	29	– 45	= 61	M 77	] 93	m 109	} 125
E	<SO> 14	<RS> 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	<SI> 15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127

Note: The (7F)H code is a space when neither normal nor katakana.

Star Mode
(Character table: Normal)

Hexa-decimal	8	9	A	B	C	D	E	F
0	128	⌐ 144	Ä 160	é 176	ù 192	ā 208	▌ 224	⊤ 240
1	│ 129	⌐ 145	Ö 161	è 177	ū 193	â 209	▬ 225	─ 241
2	─ 130	▪ 146	Ü 162	ē 178	û 194	° 210	▬ 226	─ 242
3	│ 131	▪ 147	ß 163	ê 179	ç 195	℃ 211	▌ 227	─ 243
4	─ 132	▪ 148	§ 164	ï 180	¿ 196	℉ 212	⊥ 228	│ 244
5	│ 133	▪ 149	ª 165	í 181	Ñ 197	Ω 213	⌐ 229	│ 245
6	─ 134	╱ 150	º 166	ì 182	n̄ 198	μ 214	∟ 230	│ 246
7	│ 135	╲ 151	f̲ 167	Ī 183	Ē 199	Σ 215	⌐ 231	▪ 247
8	─ 136	◀ 152	¢ 168	î 184	ɔ 200	σ 216	■ 232	▪ 248
9	│ 137	▼ 153	½ 169	ö 185	ı 201	x̄ 217	▨ 233	◢ 249
A	─ 138	⌐ 154	^N_T 170	ó 186	Å 202	TL 218	⊥ 234	◣ 250
B	│ 139	┴ 155	^T_X 171	ò 187	ϕ 203	X 219	← 235	= 251
C	├ 140	⊤ 156	¥ 172	ō 188	θ 204	∞ 220	↑ 236	‖ 252
D	─ 141	◢ 157	¼ 173	ô 189	ä 205	± 221	→ 237	⌐ 253
E	∟ 142	◆ 158	Ā 174	ü 190	á 206	÷ 222	↓ 238	⌐ 254
F	⌐ 143	✕ 159	ë 175	ú 191	à 207	π 223	⌐ 239	⌐ 255

Star Mode
(Character table: katakana)

Hexa-decimal	8	9	A	B	C	D	E	F
0	128	┘ 144	ー 160	176	タ 192	ミ 208	▌ 224	┬ 240
1	| 129	┌ 145	° 161	ア 177	チ 193	ム 209	▬ 225	─ 241
2	─ 130	▪ 146	「 162	イ 178	ツ 194	メ 210	▬ 226	─ 242
3	| 131	▪ 147	」 163	ウ 179	テ 195	モ 211	▌ 227	─ 243
4	─ 132	、 148	、 164	エ 180	ト 196	ヤ 212	┴ 228	| 244
5	| 133	▪ 149	・ 165	オ 181	ナ 197	ユ 213	┘ 229	| 245
6	─ 134	╱ 150	ヲ 166	カ 182	ニ 198	ヨ 214	└ 230	| 246
7	| 135	╲ 151	ァ 167	キ 183	ヌ 199	ラ 215	┐ 231	ヽ 247
8	─ 136	◣ 152	ィ 168	ク 184	ネ 200	リ 216	■ 232	▫ 248
9	| 137	◢ 153	ゥ 169	ケ 185	ノ 201	ル 217	▓ 233	◢ 249
A	─ 138	┌ 154	ェ 170	コ 186	ハ 202	レ 218	┴ 234	◣ 250
B	| 139	┴ 155	ォ 171	サ 187	ヒ 203	ロ 219	← 235	= 251
C	├ 140	┬ 156	ャ 172	シ 188	フ 204	ワ 220	↑ 236	‖ 252
D	─ 141	┤ 157	ュ 173	ス 189	ヘ 205	ン 221	→ 237	⌐ 253
E	└ 142	♦ 158	ョ 174	セ 190	ホ 206	゛ 222	↓ 238	⌐ 254
F	┐ 143	✕ 159	ッ 175	ソ 191	マ 207	° 223	⌐ 239	⌐ 255

Note: Other characters are the same as those for Character table: Normal.

Star Mode
(Character table: IBM (Code page 437))

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▦ 176	└ 192	⊥⊥ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	π 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	⊥⊥ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	⊢ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	π 214	μ 230	÷ 246
7	ç 135	ù 151	º 167	π 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	⊥⊥ 202	┌ 218	Ω 234	− 250
B	ï 139	¢ 155	½ 171	╗ 187	╥ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╟ 204	▪ 220	∞ 236	∩ 252
D	ì 141	¥ 157	¡ 173	╜ 189	= 205	▐ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╧ 206	▌ 222	∈ 238	▪ 254
F	Å 143	ƒ 159	» 175	┐ 191	⊥ 207	▪ 223	∩ 239	255

Note: Other characters are the same as those for Character table: Normal.

Star Mode

Code Page #850
Multi-lingual

	8	9	A	B	C	D	E	F
0	Ç	É	á	░	L	ð	Ó	-
1	ü	æ	í	░	⊥	Ð	ß	±
2	é	Æ	ó	▓	T	Ê	Ô	=
3	â	ô	ú	│	├	Ë	Ò	¾
4	ä	ö	ñ	┤	—	È	õ	¶
5	à	ò	Ñ	Á	+	ı	Õ	§
6	å	û	ª	Â	ã	Í	µ	÷
7	ç	ù	º	À	Ã	Î	þ	‚
8	ê	ÿ	¿	©	╚	Ï	Þ	°
9	ë	Ö	®	╣	╔	┘	Ú	¨
A	è	Ü	¬	║	╩	┌	Û	·
B	ï	ø	½	╗	╦	█	Ù	¹
C	î	£	¼	╝	╠	■	ý	³
D	ì	Ø	¡	¢	=	¦	Ý	²
E	Ä	×	«	¥	╬	Ì	■	
F	Å	ƒ	»	┐	¤	■	´	

Code Page #852
Latin-2

	8	9	A	B	C	D	E	F
0	Ç	É	á	░	L	đ	Ó	-
1	ü	Ĺ	í	░	⊥	Đ	ß	˝
2	é	í	ó	▓	T	Ď	Ô	˛
3	â	ô	ú	│	├	Ë	Ň	˘
4	ä	ö	Ą	┤	—	ď	ń	ˇ
5	ů	Ĺ	ą	Á	+	Ň	ň	§
6	ć	Ï	Ž	Â	Ă	Í	Š	÷
7	ç	Ś	ž	Ě	ă	Î	š	¸
8	ł	ś	Ę	Ş	╚	ě	Ř	°
9	ë	Ö	ę	╣	╔	┘	Ú	¨
A	Ő	Ü	¬	║	╩	┌	ŕ	·
B	ő	Ť	ź	╗	╦	█	Ű	ű
C	î	ť	Č	╝	╠	■	ý	Ř
D	Ź	Ł	ş	Ż	=	Ţ	Ý	ř
E	Ä	×	«	ż	╬	Ů	ţ	■
F	Ć	č	»	┐	¤	■	´	

Code Page #860
Portuguese

	8	9	A	B	C	D	E	F
0	Ç	É	á	░	L	╨	α	≡
1	ü	À	í	░	⊥	╤	ß	±
2	é	È	ó	▓	T	╥	Γ	≥
3	â	ô	ú	│	├	╙	π	≤
4	ã	õ	ñ	┤	—	╘	Σ	⌠
5	à	ò	Ñ	╡	+	╒	σ	⌡
6	Á	Ú	ª	╢	╞	╓	µ	÷
7	ç	ù	º	╖	╟	╫	τ	≈
8	ê	Ì	¿	╕	╚	╪	Φ	°
9	Ê	Õ	Ò	╣	╔	┘	θ	•
A	è	Ü	¬	║	╩	┌	Ω	·
B	Í	¢	½	╗	╦	█	δ	√
C	Ô	£	¼	╝	╠	▄	∞	ⁿ
D	ì	Ù	¡	╜	=	█	ø	²
E	Ã	₧	«	╛	╬	▐	∈	■
F	Â	Ó	»	┐	╧	▀	∩	

Code Page #861
Icelandic

	8	9	A	B	C	D	E	F
0	Ç	É	á	░	L	╨	α	≡
1	ü	æ	í	░	⊥	╤	ß	±
2	é	Æ	ó	▓	T	╥	Γ	≥
3	â	ô	ú	│	├	╙	π	≤
4	ä	ö	Á	┤	—	╘	Σ	⌠
5	à	þ	Í	╡	+	╒	σ	⌡
6	å	û	Ó	╢	╞	╓	µ	÷
7	ç	Ý	Ú	╖	╟	╫	τ	≈
8	ê	ý	¿	╕	╚	╪	Φ	°
9	ë	Ö	⌐	╣	╔	┘	θ	•
A	è	Ü	¬	║	╩	┌	Ω	·
B	Ð	ø	½	╗	╦	█	δ	√
C	ð	£	¼	╝	╠	▄	∞	ⁿ
D	Þ	Ø	¡	╜	=	█	ø	²
E	Ä	₧	«	╛	╬	▐	∈	■
F	Å	ƒ	»	┐	╧	▀	∩	

Note: Other characters are the same as those for Character table: Normal

Code Page #863
Canadian French

	8	9	A	B	C	D	E	F
0	Ç	É	¦	░	└	╨	α	≡
1	ü	È	´	▒	┴	╤	β	±
2	é	Ê	ó	▓	┬	╥	Γ	≥
3	â	ô	ú	│	├	╙	π	≤
4	Â	Ë	¨	┤	─	╘	Σ	⌠
5	à	Ï	¸	╡	┼	╒	σ	⌡
6	¶	û	³	╢	╞	╓	μ	÷
7	ç	ù	¯	╖	╟	╫	τ	≈
8	ê	¤	Î	╕	╚	╪	Φ	°
9	ë	Ô	⌐	╣	╔	┘	θ	•
A	è	Ü	¬	║	╩	┌	Ω	·
B	ï	¢	½	╗	╦	█	δ	√
C	î	£	¼	╝	╠	▄	∞	ⁿ
D	=	Ù	¾	╜	=	▌	ø	²
E	À	Û	«	┘	╬	▐	∈	■
F	§	ƒ	»	┐	┴	▀	∩	

Code Page #865
Nordic

	8	9	A	B	C	D	E	F
0	Ç	É	á	░	└	╨	α	≡
1	ü	æ	í	▒	┴	╤	β	±
2	é	Æ	ó	▓	┬	╥	Γ	≥
3	â	ô	ú	│	├	╙	π	≤
4	ä	ö	ñ	┤	─	╘	Σ	⌠
5	à	ò	Ñ	╡	┼	╒	σ	⌡
6	å	û	ª	╢	╞	╓	μ	÷
7	ç	ù	º	╖	╟	╫	τ	≈
8	ê	ÿ	¿	╕	╚	╪	Φ	°
9	ë	ö	⌐	╣	╔	┘	θ	•
A	è	Ü	¬	║	╩	┌	Ω	·
B	ï	ø	½	╗	╦	█	δ	√
C	î	£	¼	╝	╠	█	∞	ⁿ
D	ì	Ø	¡	╜	=	█	ø	²
E	Ä	₧	«	┘	╬	█	∈	■
F	Å	ƒ	¤	┐	┴	█	∩	

Code Page #866
Russian

	8	9	A	B	C	D	E	F
0	А	Р	а	░	└	╨	р	Ё
1	Б	С	б	▒	┴	╤	с	ё
2	В	Т	в	▓	┬	╥	т	Є
3	Г	У	г	│	├	╙	у	є
4	Д	Ф	д	┤	─	╘	ф	Ї
5	Е	Х	е	╡	┼	╒	х	ї
6	Ж	Ц	ж	╢	╞	╓	ц	ў
7	З	Ч	з	╖	╟	╫	ч	ў
8	И	Ш	и	╕	╚	╪	ш	°
9	Й	Щ	й	╣	╔	┘	щ	•
A	К	Ъ	к	║	╩	┌	ъ	·
B	Л	Ы	л	╗	╦	█	ы	√
C	М	Ь	м	╝	╠	█	ь	№
D	Н	Э	н	╜	=	█	э	¤
E	О	Ю	о	┘	╬	█	ю	■
F	П	Я	п	┐	┴	█	я	

Note: Other characters are the same as those for Character table: Normal

Star Mode
International Character Set

	35	36	64	91	92	93	94	96	123	124	125	126
U. S. A.	#	$	@	[	\	]	^	`	{	|	}	~
France	#	$	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
England	£	$	@	[	\	]	^	`	{	|	}	~
Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain 1	₧	$	@	¡	Ñ	¿	^	'	¨	ñ	}	~
Japan	#	$	@	[	¥	]	^	`	{	|	}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain 2	#	$	á	¡	Ñ	¿	é	'	í	ñ	ó	ú
Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú

ESC/POS Mode

Page 0 (PC437)

Hexa-decimal	0	1	2	3	4	5	6	7
0	\<NUL\> 0	\<DLE\> 16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	\<XON\> 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	18	” 34	2 50	B 66	R 82	b 98	r 114
3	3	\<XOFF\> 19	# 35	3 51	C 67	S 83	c 99	s 115
4	\<EOT\> 4	20	$ 36	4 52	D 68	T 84	d 100	t 116
5	\<ENQ\> 5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	8	\<CAN\> 24	(40	8 56	H 72	X 88	h 104	x 120
9	\<HT\> 9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	\<LF\> 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	\<ESC\> 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	\<FF\> 12	28	, 44	\< 60	L 76	\ 92	l 108	¦ 124
D	13	\<GS\> 29	– 45	= 61	M 77	] 93	m 109	} 125
E	14	30	. 46	\> 62	N 78	^ 94	n 110	~ 126
F	15	31	/ 47	? 63	O 79	_ 95	o 111	SP 127

ESC/POS Mode

Page 0 (PC437)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▓ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ì 141	¥ 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

ESC/POS Mode

Page 1 (Katakana)

Hexa-decimal	8	9	A	B	C	D	E	F
0	─ 128	┴ 144	SP 160	─ 176	タ 192	ミ 208	= 224	✕ 240
1	─ 129	┬ 145	｡ 161	ア 177	チ 193	ム 209	╟ 225	円 241
2	▬ 130	┤ 146	「 162	イ 178	ツ 194	メ 210	╫ 226	年 242
3	▬ 131	├ 147	」 163	ウ 179	テ 195	モ 211	╢ 227	月 243
4	▬ 132	─ 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	▬ 133	─ 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	■ 134	│ 150	ヲ 166	カ 182	ニ 198	ヨ 214	◣ 230	分 246
7	■ 135	│ 151	ァ 167	キ 183	ヌ 199	ラ 215	◢ 231	秒 247
8	┆ 136	┌ 152	ィ 168	ク 184	ネ 200	リ 216	♠ 232	〒 248
9	│ 137	┐ 153	ゥ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	▮ 138	└ 154	ェ 170	コ 186	ハ 202	レ 218	♦ 234	区 250
B	▮ 139	┘ 155	ォ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	■ 140	⌒ 156	ャ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	■ 141	⌐ 157	ュ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	■ 142	⌐ 158	ョ 174	セ 190	ホ 206	゛ 222	/ 238	▨ 254
F	✛ 143	⌐ 159	ッ 175	ソ 191	マ 207	゜ 223	\ 239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode

Page 2 (PC850: Multilingual)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▦ 176	└ 192	ð 208	α 224	— 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	Đ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	— 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	+ 197	ı 213	Õ 229	§ 245
6	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	Þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	ì 141	Ø 157	¡ 173	¢ 189	= 205	¦ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	■ 223	´ 239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode *(Receipt printer only)*

Page 3 (PC860: Portuguese)

Hexa-decimal	8		9		A		B		C		D		E		F	
0	Ç	128	É	144	á	160	▦	176	└	192	⊥	208	α	224	≡	240
1	ü	129	À	145	í	161	▓	177	┴	193	╤	209	β	225	±	241
2	é	130	È	146	ó	162	▓	178	┬	194	π	210	Γ	226	≥	242
3	â	131	ô	147	ú	163	│	179	├	195	╙	211	π	227	≤	243
4	ã	132	õ	148	ñ	164	┤	180	─	196	╘	212	Σ	228	⌠	244
5	à	133	ò	149	Ñ	165	╡	181	┼	197	╒	213	σ	229	⌡	245
6	Á	134	Ú	150	ª	166	╢	182	╞	198	╓	214	μ	230	÷	246
7	ç	135	ù	151	º	167	╖	183	╟	199	╫	215	τ	231	≈	247
8	ê	136	Ì	152	¿	168	╕	184	╚	200	╪	216	Φ	232	°	248
9	Ê	137	Õ	153	Ò	169	╣	185	╔	201	┘	217	Θ	233	•	249
A	è	138	Ü	154	¬	170	║	186	╩	202	┌	218	Ω	234	·	250
B	Í	139	¢	155	½	171	╗	187	╦	203	█	219	δ	235	√	251
C	Ô	140	£	156	¼	172	╝	188	╠	204	▄	220	∞	236	ⁿ	252
D	ì	141	Ù	157	¡	173	╜	189	═	205	▌	221	φ	237	²	253
E	Ã	142	₧	158	«	174	╛	190	╬	206	▐	222	∈	238	■	254
F	Â	143	Ó	159	»	175	┐	191	⊥	207	▀	223	∩	239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode (*Receipt printer only*)

Page 4 (PC863: Canadian-French)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	¦ 160	▦ 176	└ 192	⊥ 208	α 224	≡ 240
1	ü 129	È 145	´ 161	▤ 177	┴ 193	┬ 209	β 225	± 241
2	é 130	Ê 146	ó 162	▥ 178	┬ 194	π 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	⊥ 211	π 227	≤ 243
4	Â 132	Ë 148	¨ 164	┤ 180	─ 196	┕ 212	Σ 228	⌠ 244
5	à 133	Ï 149	⌐ 165	╡ 181	┼ 197	╔ 213	σ 229	⌡ 245
6	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	ç 135	ù 151	― 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	Ç 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	= 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	∎ 254
F	§ 143	ƒ 159	» 175	┐ 191	⊥ 207	▀ 223	∩ 239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode (*Receipt printer only*)

Page 5 (PC865: Nordic)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▦ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	ì 141	Ø 157	¡ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	∎ 254
F	Å 143	ƒ 159	¤ 175	┐ 191	┴ 207	▀ 223	∩ 239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode *(Receipt printer only)*

Page 255 (Space Page)

Hexa-decimal	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	SP 176	SP 192	SP 208	SP 224	SP 240
1	SP 129	SP 145	SP 161	SP 177	SP 193	SP 209	SP 225	SP 241
2	SP 130	SP 146	SP 162	SP 178	SP 194	SP 210	SP 226	SP 242
3	SP 131	SP 147	SP 163	SP 179	SP 195	SP 211	SP 227	SP 243
4	SP 132	SP 148	SP 164	SP 180	SP 196	SP 212	SP 228	SP 244
5	SP 133	SP 149	SP 165	SP 181	SP 197	SP 213	SP 229	SP 245
6	SP 134	SP 150	SP 166	SP 182	SP 198	SP 214	SP 230	SP 246
7	SP 135	SP 151	SP 167	SP 183	SP 199	SP 215	SP 231	SP 247
8	SP 136	SP 152	SP 168	SP 184	SP 200	SP 216	SP 232	SP 248
9	SP 137	SP 153	SP 169	SP 185	SP 201	SP 217	SP 233	SP 249
A	SP 138	SP 154	SP 170	SP 186	SP 202	SP 218	SP 234	SP 250
B	SP 139	SP 155	SP 171	SP 187	SP 203	SP 219	SP 235	SP 251
C	SP 140	SP 156	SP 172	SP 188	SP 204	SP 220	SP 236	SP 252
D	SP 141	SP 157	SP 173	SP 189	SP 205	SP 221	SP 237	SP 253
E	SP 142	SP 158	SP 174	SP 190	SP 206	SP 222	SP 238	SP 254
F	SP 143	SP 159	SP 175	SP 191	SP 207	SP 223	SP 239	SP 255

Note: Other characters are the same as those for Page 0.

ESC/POS Mode

International Character Set

	35	36	64	91	92	93	94	96	123	124	125	126
U. S. A.	#	$	@	[	\	]	^	`	{			}	~
France	#	$	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
England	£	$	@	[	\	]	^	`	{			}	~
Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain	₧	$	@	¡	Ñ	¿	^	'	¨	ñ	}	~
Japan	#	$	@	[	¥	]	^	`	{			}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

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