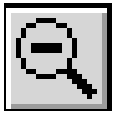
TM-T85/T85P

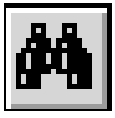
Using this online operator's guide

The words on the left side of this screen are **bookmarks** for all the topics in this guide.

Use the **scroll bar** next to the bookmarks to find any topic you want. Click a bookmark to instantly jump to its topic. (If you wish, you can increase the size of the bookmark area by dragging the dividing bar to the right.)

Use the **zoom** tools to magnify or reduce the page display.



Click the **Find** button if you want to search for a particular term. (However, using the bookmarks is usually quicker.)

Complete online documentation for Acrobat Reader is located in the Help directory for Acrobat Reader.

thermal line printer

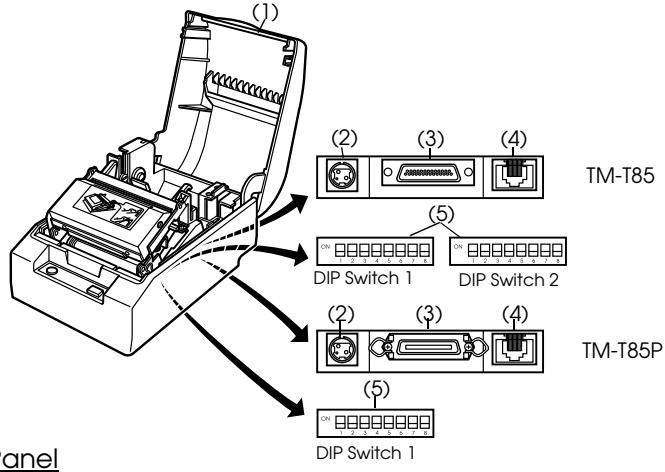
TM-T85/T85P

Operator's Manual

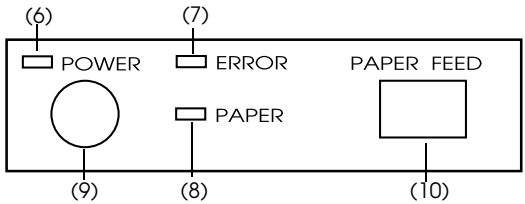
400471502

Printer parts

(1) Printer cover
(2) Power connector
(3) Interface connector
(4) Drawer kick-out connector
(5) DIP switches
(6) POWER light
(7) ERROR light
(8) PAPER light
(9) POWER button
(10) PAPER FEED button



Control Panel



EMC and Safety Standards Applied

Product Name: TM-T85/TM-T85P

Model Name: M65TA / M116A

The following standards are applied only to the printers that are so labeled.(EMC is tested using the EPSON power supply.)

Europe:	CE marking Safety: EN60950
North America:	
	EMI: FCC/ICES-003 Class A Safety standards: UL 1950 CSA C22.2 No. 950
Japan:	EMI: VCCI Class A
Oceania:	EMC: AS/NZS 3548

WARNING

The connection of a non-shielded printer interface cable to this printer will invalidate the EMC standards of this device.

You are cautioned that changes or modifications not expressly approved by SEIKO EPSON could void your authority to operate the equipment.

CE Marking

The printer conforms to the following Directives and Norms

Directive 89/336/EEC	
	EN 55022 Class B EN 50082-1 IEC 801-2 IEC 801-3 IEC 801-4
Directive 90/384/EEC	
	EN45501

FCC Compliance Statement For American Users

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

FOR CANADIAN USERS

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

GEREÄUSCHPEGEL

Gemäß der Dritten Verordnung zum Gerätesicherheitsgesetz (Maschinenlärminformations- Verordnung-3. GSGV) ist der arbeitsplatzbezogene Geräusch-Emissionswert kleiner als 70 dB(A) (basierend auf ISO 7779).

Introduction

The TM-T85 and TM-T85P are one-station printers for issuing coupons, ECR and POS use which can be used for printing the results of weighing or measuring.

The main features of the TM-T85 and TM-T85P printers are the following:

- ❏ Light weight and ultra-compact size
- ❏ High-speed printing: 12 lines per second
- ❏ Low noise thermal printing
- ❏ High reliability due to few moving parts
- ❏ Easy maintenance
- ❏ Easy paper insertion due to semi-auto loading
- ❏ Command protocol based on ESC/POS, a widely used standard
- ❏ Various layouts possible using page mode
- ❏ Font selecting (12 × 24 or 9 × 24) possible using a command
- ❏ Characters which can be extended up to 64 times as large as the standard size selecting possible and smoothing also possible
- ❏ Four different print densities selecting possible by changing DIP switch settings
- ❏ Four-way routing of the interface cable, drawer control cable, and power cable: on either side, underneath, or out the back of the case
- ❏ Power switch on the front of the printer for easy access; access to sides and back not necessary
- ❏ No water entering in the printer by touching the panel switches with a wet hand
- ❏ Bar code printing both in the vertical direction (fence bar code) and in the horizontal direction (ladder bar code (*1)) possible using a bar code command
- ❏ Repeated operation and copy printing possible through a macro definition
- ❏ Drawer control possible using the drawer kick out interface

(*1) Effective only in page mode

- ❑ Bidirectional parallel interface in accordance with the IEEE 1284 Nibble/Byte Modes

Please be sure to read the instructions in this manual carefully before using your new EPSON printer.

About This Manual

Setting Up and Using

- **Chapter 1** contains information on unpacking the printer, setting it up, setting the DIP switches, and adjusting the paper near end detector.
- **Chapter 2** contains information on using the printer.
- **Chapter 3** contains troubleshooting information.

Reference

- **Chapter 4** contains specifications and character code tables.

Notes, Cautions, and Warnings

Note:
Notes have important information and useful tips on the operation of your printer.

⚠CAUTION:

Cautions must be observed to avoid minor injury to yourself or damage to your equipment.

⚠WARNING:

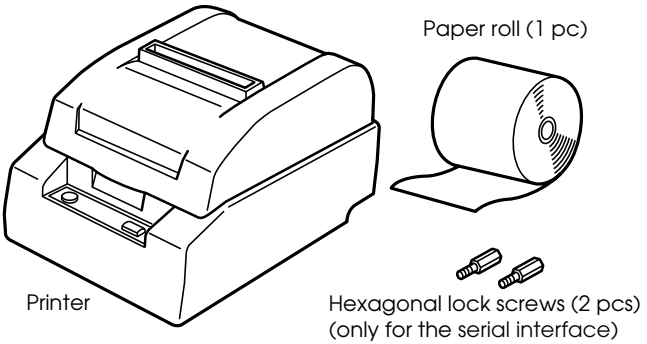
Warnings must be followed carefully to avoid serious bodily injury.

Contents

Installation

Unpacking

The illustration below shows the items included for the standard specification printer.



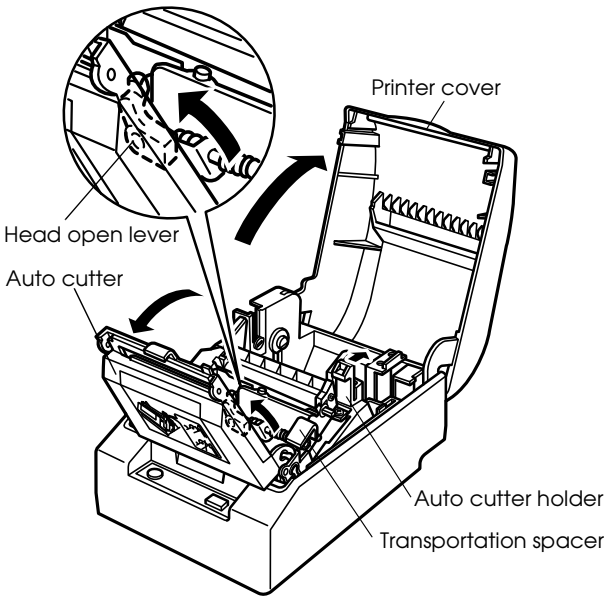
If any item is missing or damaged, please contact your dealer for assistance.

Note:
See the Note on page 1-4 for information about the screws.

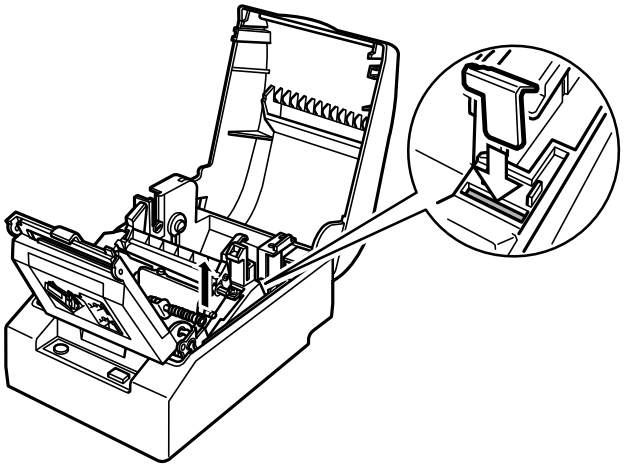
Removing the Transportation Spacer

The printer is protected during shipping by a spacer that must be removed before you turn on the printer.

1. First, open the printer cover; next, push the auto cutter holder back and open the auto cutter; then open the head open lever, as shown by the arrows below.



2. Next, remove the orange transportation spacer as shown by the black arrow in the illustration below. Then place the transportation spacer in the storage space provided on the printer as shown by the white arrow.



Note:
Put the transportation spacer back in its original position if you ever ship or store your printer.

3. Close the head open lever and the auto cutter. When you close the auto cutter, press firmly until it clicks.

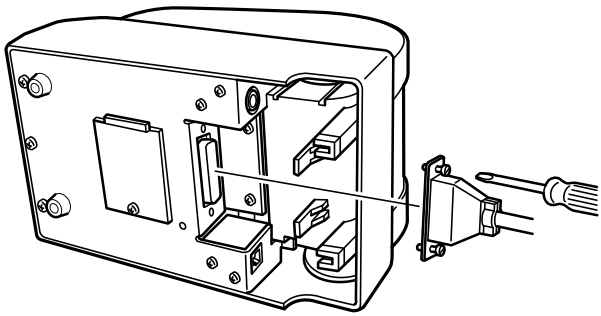
Note:
To prevent paper jams, make sure that the auto cutter tab is underneath the auto cutter holder as shown on the auto cutter label.

Connecting the Printer to the Computer

You need an appropriate serial interface cable to connect your computer to the printer.

TM-T85

1. Make sure that the printer and the computer are turned off. Then plug the cable into the connector on the printer, as shown.

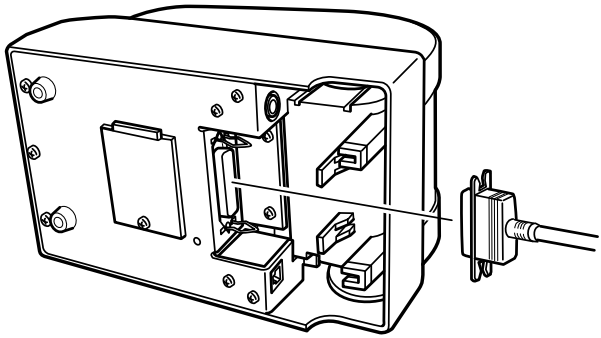


Note:
Your printer comes with inch-type hexagonal lock screws installed. If you plan to use an interface cable that requires millimeter-type lock screws, replace the inch-type screws with the enclosed millimeter-type screws by using a hex screwdriver (5 mm). To distinguish the two types of screws, see the illustration below.

2. Connect the other end of the cable to the connector on your computer.

You need an appropriate parallel interface cable to connect your computer to the printer.

1. Make sure that the printer and the computer are turned off. Then plug the cable into the connector on the printer, as shown.



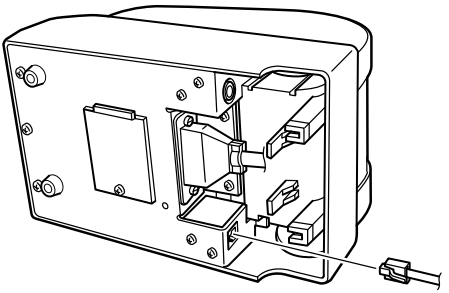
Note:
Squeeze the wire clips on the printer together until they lock in place on both sides of the connector.

2. Connect the other end of the cable to the connector on your computer.

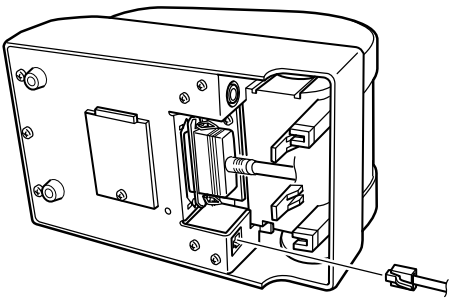
Connecting the Printer to the Drawer

Plug the drawer cable into the drawer kick-out connector on the bottom of the printer next to the computer interface connector.

TM-T85



TM-T85P



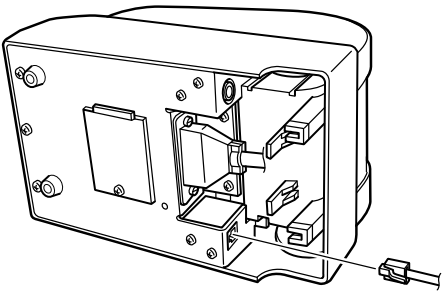
⚠ CAUTION:

Do not connect a telephone line to the drawer kick out connector.

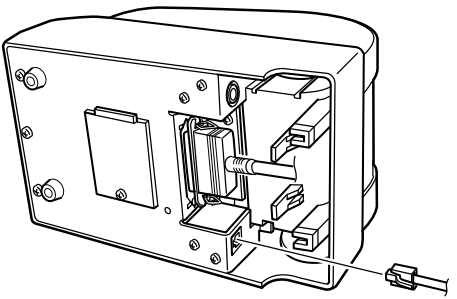
Den Drucker an die Lade anschließen

Das Kabel der Lade an die Schnappsteckerbuchse (neben der Schnittstellenbuchse) an der Uinterseite des Druckers anschließen.

TM-T85



TM-T85P



⚠ *ACHTUNG:*

Kein Telefonkabel an die Schnappsteckerbuchse anschließen.

Grounding the Printer

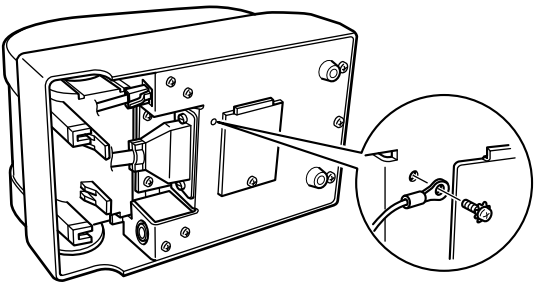
You need a ground wire to ground your printer. Recommended wire is described below.

Thickness of wire:	AWG 18 or equivalent
Diameter of terminal to be attached:	3.2

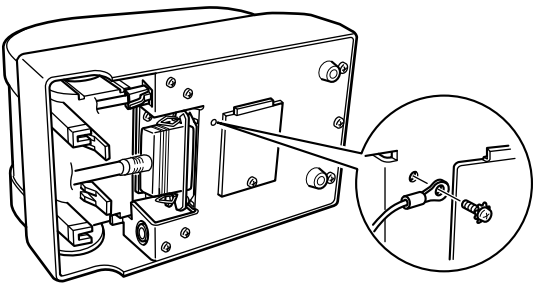
1. Make sure that the printer is turned off.

2. Connect the ground wire to the printer using the FG screw on the bottom of the printer, as shown.

TM-T85



TM-T85P



Connecting the Power Supply

This printer requires an external power supply. The Epson Power Supply PS-150 is recommended.

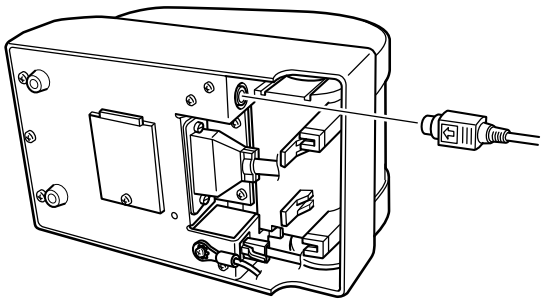
⚠ CAUTION:

Using an incorrect power supply can cause serious damage to the printer.

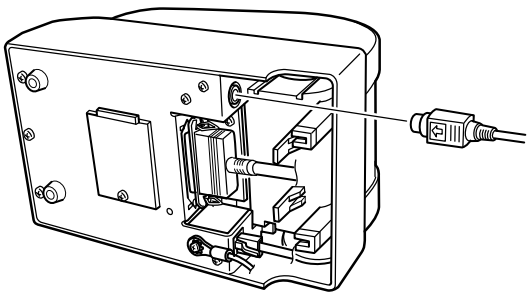
1. Make sure that the power supply is turned off.

2. Plug the power supply's cable into the printer's connector as shown below. Note that the flat side of the connector faces down.

TM-T85



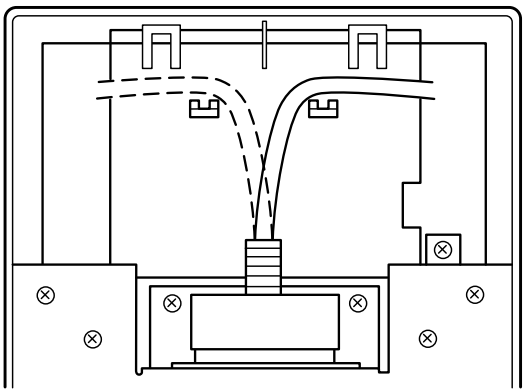
TM-T85P



3. Plug the power supply's cord into an outlet.

Arranging the Interface Cable

After you have plugged in all the cables, put the interface cable between the feet on the bottom of the printer and the cable-holding posts, as shown in the illustration below. This helps keep the cable securely fastened.



Installing the Paper Roll

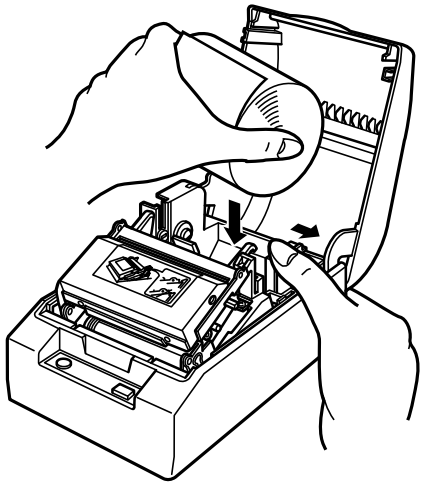
The procedure describes how to install a paper roll for the first time. If you are replacing a used-up paper roll, see page 2-2.

Note:
Be sure to use roll paper that meets the specifications.

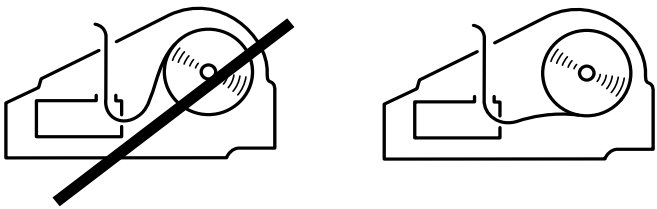
1. Open the printer cover. Do not open the auto cutter.

   Note:
   To prevent paper jams, make sure that the auto cutter tab is underneath the auto cutter holder as shown on the auto cutter label.

2. Spread the roll paper holder and insert the paper roll as shown.

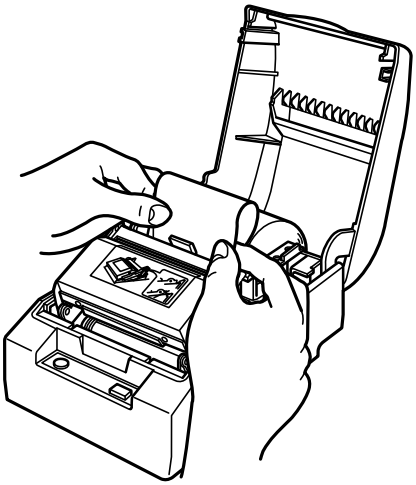


3. Be sure to note the correct direction that the paper comes off the roll.



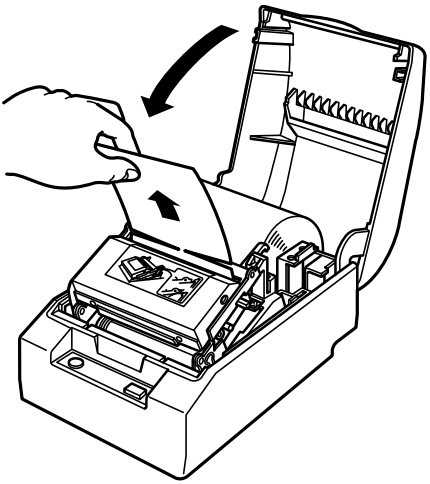
4. Hold both edges of the paper and insert it straight into the paper slot. Push the paper into the paper slot until the printer feeds the paper automatically and it comes out of the paper exit.

Note:
The paper is cut by the auto cutter.



Note:
If paper is inserted incorrectly, it may wrinkle. If it wrinkles, feed the paper with the PAPER FEED *button until it is smooth.*

5. Remove the cut paper and close the printer cover.



Running the Self Test

Any time that you want to check the performance of your printer you can run the self test described below. This shows whether your printer is working correctly. It is independent of any other equipment or software.

1. To perform the self test, close the printer cover if it is open and hold down the PAPER FEED button while you turn on the printer with the POWER button.

2. The printer prints the current printer settings and then the following message:

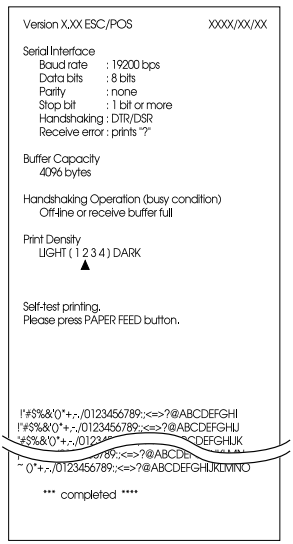
Self-test printing.
Please press the PAPER FEED button.

3. Press the PAPER FEED button to start the second part of the test, in which the printer prints a pattern using the built-in character set. It also performs several partial cuts and prints the following:

*** completed ***

4. Then it performs a full cut and enters the normal mode.

Part of a sample self test is shown below:



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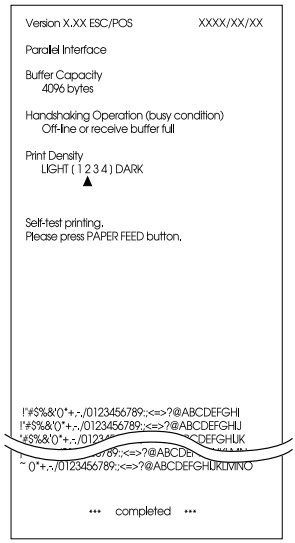

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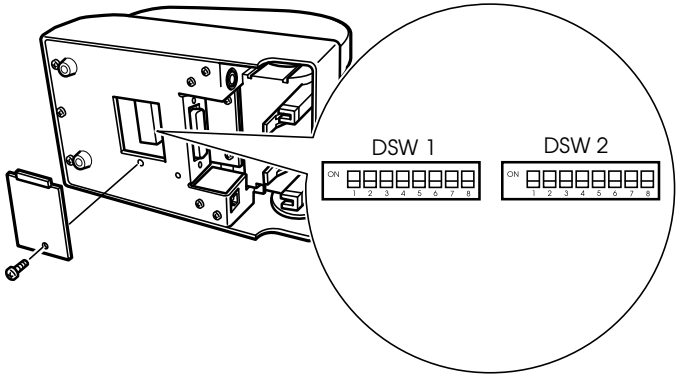
Setting the DIP Switches

You can change the print density or any of your interface settings by changing the DIP switch settings.

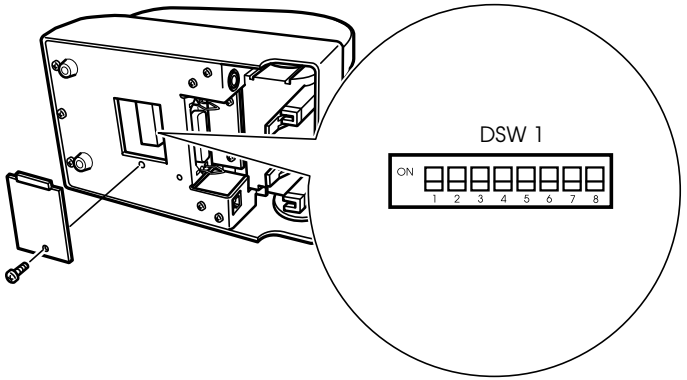
1. Make sure that the printer is off.

2. Turn the printer over and remove the DIP switch access cover, as shown below.

TM-T85



TM-T85P



3. Notice that ON is marked on the switches. Use tweezers or another narrow tool to move the switches.

4. Use the following tables to set the DIP switches. Numbers starting with 1 are in the first set, and numbers starting with 2 are in the second (only for TM-T85).

TM-T85 DIP-Switch Functions

DIP Switch Set 1

Switch	Function	ON	OFF
1-1	Data reception error	Ignored	Prints"?"
1-2	Receive buffer capacity	45 bytes	4K bytes
1-3	Handshaking	XON/XOFF	DTR/DSR
1-4	Word length	7 bits	8 bits
1-5	Parity check	Yes	No
1-6	Parity selection	Even	Odd
1-7	See Transmission Speeds table below		
1-8			

Transmission Speeds

Speed in Bits per Second	SW 1-7	SW 1-8
2400	ON	ON
4800	OFF	ON
9600	ON	OFF
19200	OFF	OFF

DIP Switch Set 2

Switch	Function	ON	OFF
2-1	Handshaking (BUSY condition)	Receive buffer full	Off line or receive buffer full
2-2	Selects print density	See Print Density Table below	
2-3			

DIP Switch Set 2

Switch	Function	ON	OFF
2-4	Reserved. Setting must not be changed	Normally OFF	
2-5		Normally OFF	
2-6		Normally OFF	
2-7	I/F pin 6 reset signal	Enabled	Disabled
2-8	I/F pin 25 reset signal	Enabled	Disabled

Print Density

Print Density	2-2	2-3
1 (Light)	ON	ON
2	OFF	OFF
3	ON	OFF
4 (Dark)	OFF	ON

TM-T85P DIP-Switch Functions

DIP Switch Set 1

Switch	Function	ON	OFF
1-1	Auto-line feed	Enabled	Disabled
1-2	Receive buffer capacity	45 byte	4K bytes
1-3	Handshaking (BUSY condition)	Receive buffer full or reading data	Off line, receive buffer full, or reading data
1-4	Select print density	See Print Density Table below	
1-5			
1-6	Reserved. Setting must not be changed	Normally OFF	
1-7		Normally OFF	
1-8	Undefined		

Print Density

Switch	Function	Switch	
		4	5
1	Light	ON	ON
2		OFF	OFF
3		ON	OFF
4	Dark	OFF	ON

Note:
If you change any DIP switch settings while the printer is turned on, the new settings will not take effect until you turn the printer off and back on or reset it (except for the DIP switches 2-7 and 2-8 of the TM-T85).

5. Replace the DIP switch cover and secure it with the screw.

Adjusting the Paper Near End Detector

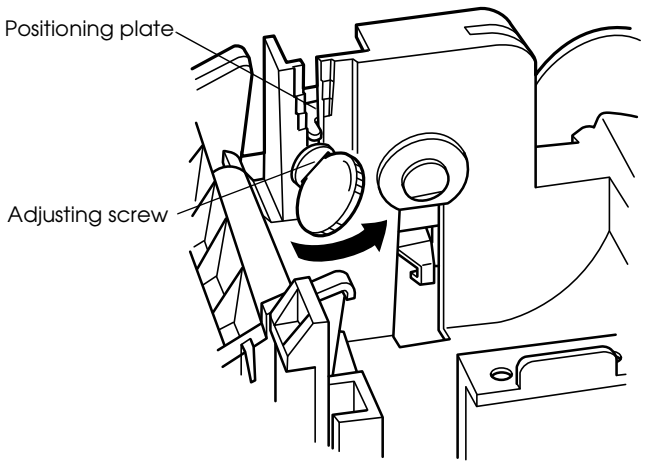
The paper near end detector detects when the paper is almost gone by measuring the diameter of the paper roll. Software programs can use the **ESC c 4** command to stop printing when the paper is almost gone.

If you want to change the amount of paper remaining when the printer stops printing, follow the steps below to adjust the paper near end detector.

Note:
The printer also has a paper end-detector that stops the printer at the very end of a roll. This detector cannot be turned off by software.

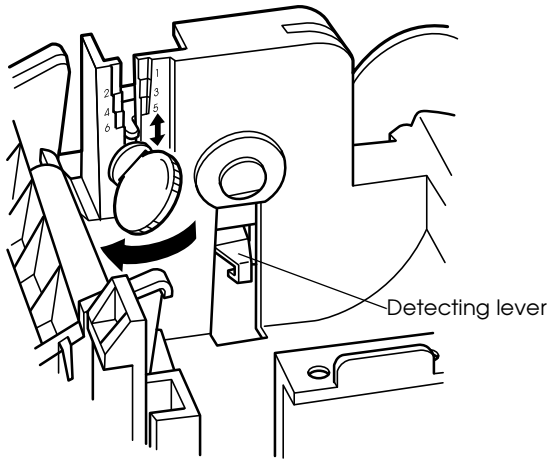
1. Open the printer cover and remove the paper roll.

2. Locate the adjusting screw and the positioning plate shown in the illustration below.



3. Loosen the adjusting screw with a coin or a screwdriver.

4. Move the positioning plate to the appropriate position and then tighten the adjusting screw, as shown below. Position 1 leaves the least paper on the roll, and position 6 leaves the most.



The table below shows the approximate amount of adjustment of the diameter for each position.

Adjustment Position Number	Adjustment amount
1	Approx. 0 mm (0 in)
2	Approx. 2 mm (0.08 in)
3	Approx. 4 mm (0.16 in)
4	Approx. 6 mm (0.24 in)
5	Approx. 8 mm (0.32 in)
6	Approx. 10 mm (0.39 in)

5. Be sure that the detecting lever moves freely after you finish the adjustment.

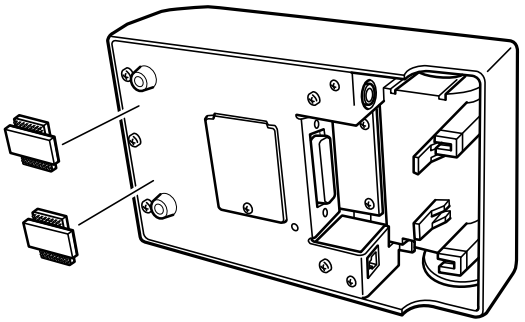
6. Re-install the paper roll, as described earlier in this chapter.

Affixing the Fastening Tape (Optional)

Two sets of tape are included as an option to fasten your printer to a countertop or other surface. Follow the steps below:

1. Clean the countertop or other surface where the printer will be installed.

2. Peel the green backing paper off of one side of each of the two sets of tape and affix them to the bottom of the printer, as shown below.



3. Peel the other green backing paper off of the sets of tape.

4. Press the printer onto the countertop; it will be held firmly in place by the fastening tape.

Chapter 2

Using the Printer

The control panel has two buttons and three lights.

Buttons

POWER

This button turns the printer on and off.

PAPER FEED

This button can be disabled by the **ESC c 5** command.

Press this button once to advance the paper one line. Press and hold this button down to feed the paper continuously.

Note:
You also use this button to execute a macro and to print the second part of the self test.

The POWER and PAPER FEED buttons also can be used to start the self test or the hexadecimal dump. The self test is described in Chapter 1, and the hex dump is described in Chapter 3.

Indicator Lights

POWER

This light is on whenever power is supplied to the printer.

PAPER

This light is on when the paper roll is at the end or near the end. This light blinks in the following cases:

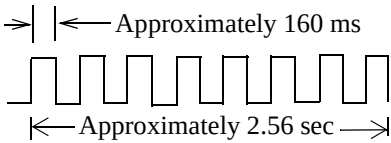
- ❑ In the self-test standby mode

❑ In the macro ready mode.

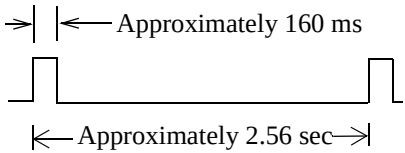
ERROR

This light is on when the printer is off line. It blinks to indicate an error condition.

The blinking pattern shown below indicates that the temperature of the print head is too high. The printer recovers automatically and resumes printing when the head cools.



The blinking pattern shown below indicates a paper jam in the auto cutter. If the printer stops working and the error light is blinking, turn the printer off, check for jammed paper, and remove it if necessary. Then turn the printer back on. If the printer still does not work, it probably requires service. Contact a qualified service person.

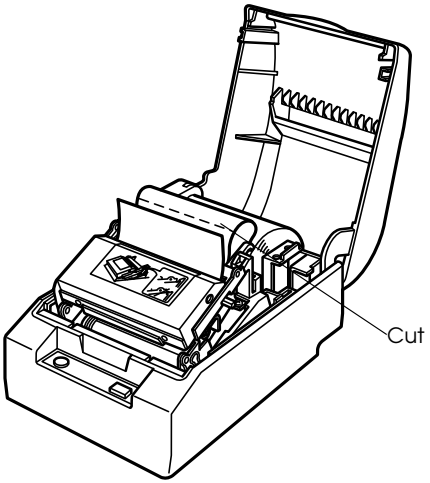


Replacing the Roll Paper

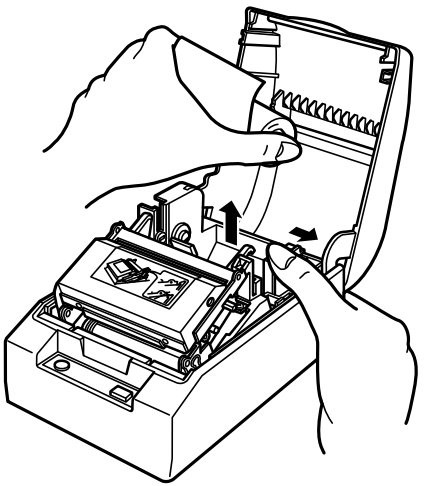
When the printer stops printing and the PAPER light comes on, it is time to replace the paper roll.

1. First, open the printer cover.

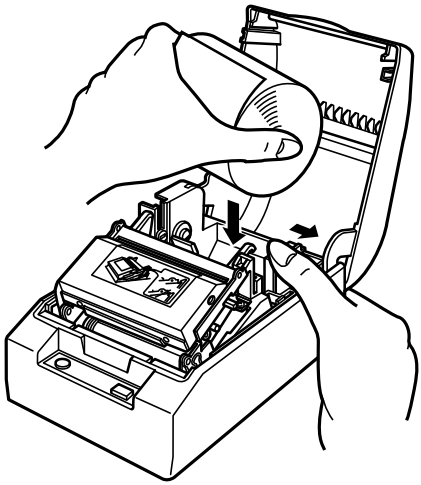
2. Pull up on the paper and cut it with scissors. Then press the PAPER FEED button to remove the cut paper.



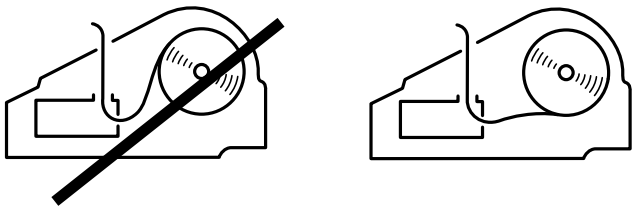
3. Spread the roll paper holder and remove the paper roll as shown.



4. Spread the roll paper holder and insert the paper as shown.

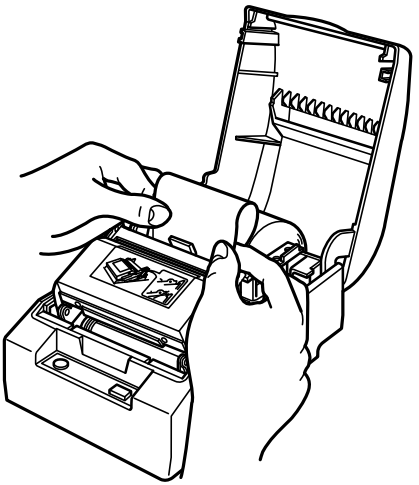


5. Be sure to note the correct direction that the paper comes off the roll.



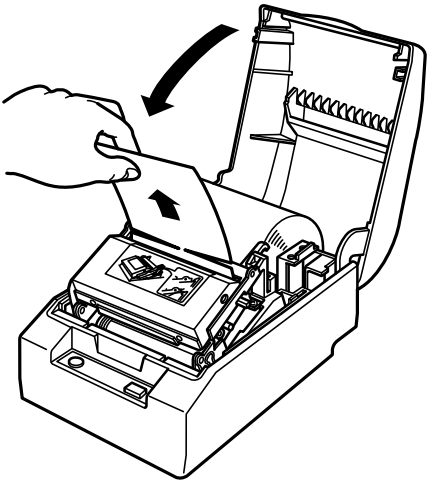
6. Hold both edges of the paper and insert it straight into the paper slot. Push the paper into the paper slot until the printer feeds the paper automatically and it comes out of the paper exit.

Note:
The paper is cut by the auto cutter.



Note:
If paper is inserted incorrectly, it may wrinkle.

7. Remove the cut paper and close the printer cover.



Chapter 3

Troubleshooting

This chapter gives the solutions to some of the more common printer problems.

Power problems

The POWER light does not come on.

Make sure that the power supply cables are correctly plugged into the printer, the power unit, and the power outlet.

Make sure that power is supplied to the power outlet. If the outlet is controlled by a switch or timer, use another outlet.

Printing problems

The ERROR light is on (not flashing) and nothing is printed.

If the PAPER light is also on, the paper is not loaded or is near the end of the roll. Install a new roll of paper.

If the PAPER light is not on, probably the printer cover is open. Close the printer cover.

The ERROR light is flashing and the printer does not print.

There may be a paper jam in the auto cutter. If there is a paper jam, clear it by following the instructions later in this chapter.

The print head may be too hot. Printing stops and the error light flashes if the print head is too hot. Printing automatically resumes when the print head cools.

If there is no paper jam and the print head is not too hot, turn the printer off and then turn it back on again after about 10 seconds. If the error light is still flashing, contact a qualified service person.

The ERROR light is off, but the printer does not print.

Try to run the self test to make sure that the printer works properly. To run the self test, close the printer cover if it is open, and hold down the PAPER FEED button while you turn on the printer. (For more information on the self test, see Chapter 1.)

If the self test works properly, check the following:

1. Check the connection at both ends of the interface cable between the printer and computer. Also make sure that the cable meets the specifications of the computer and printer.

2. Make sure that the data transmission settings for the printer are the same as those for the computer. You can print out the printer's interface settings by running a self test, and you can change the settings with the DIP switches.

The printout is faint or uneven.

Clean the print head by following the steps below:

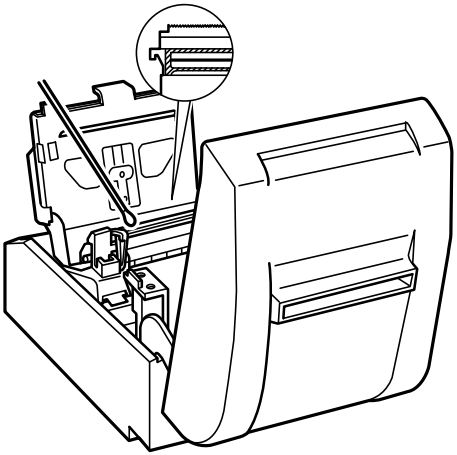
1. Open the printer cover.

   CAUTION:

   The print head becomes very hot during printing. Allow it to cool before you reach into the printer.

2. Open the auto cutter by pushing the auto cutter holder back and open the head open lever.

3. Clean the print head with a cotton swab moistened with alcohol.



⚠ CAUTION:

Be sure that you do not touch the print head with your fingers because you can damage it.

4. Close the head open lever and the auto cutter. When you close the auto cutter, press firmly until it clicks.

Note:
To prevent paper jams, make sure that the auto cutter tab is underneath the auto cutter holder as shown on the auto cutter label.

Paper handling problems

The paper is jammed inside the printer.

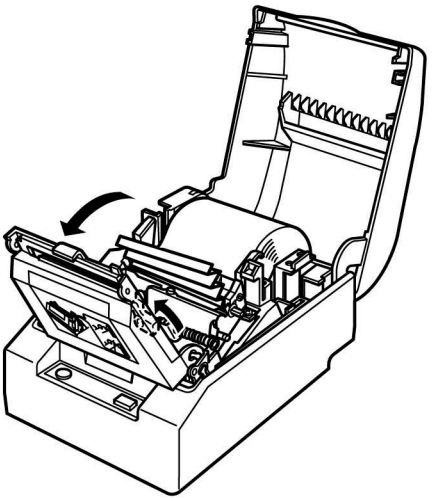
Follow these steps to clear a paper jam:

⚠ ♨ CAUTION:

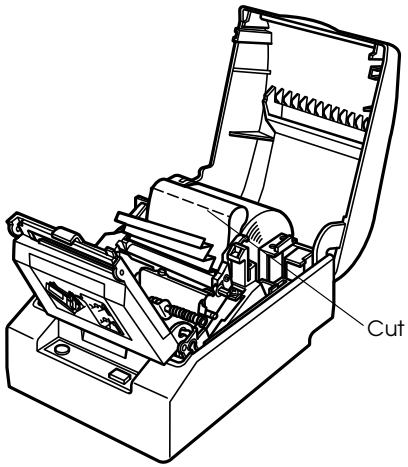
The print head becomes very hot during printing. Allow it to cool before you reach into the printer.

1. Open the printer cover; then push the auto cutter holder back and open the auto cutter.

2. Open the head open lever.



3. Pull up on the paper roll and cut the paper with scissors so that is straight as shown below. Remove the jammed paper carefully in the paper feeding direction.



⚠ CAUTION:

Do not touch the print head. You can damage it.

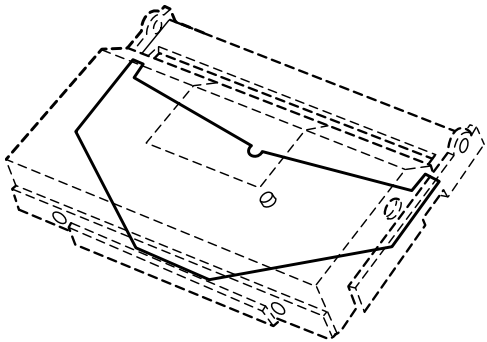
4. Close the head open lever.

5. Close the auto cutter. When you close it, press firmly until it clicks.

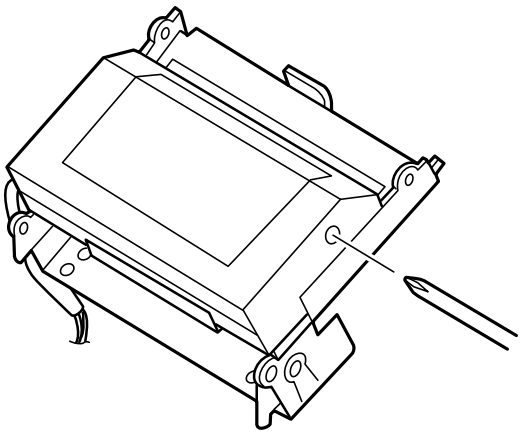
   Note:
   To prevent paper jams, make sure that the auto cutter tab is underneath the auto cutter holder as shown on the auto cutter label.

6. Re-load the paper.

If you have trouble re-loading the paper, the auto cutter blade may be in the wrong position. See the illustration below for the correct position.



If the blade is not in this position, insert a cross-head screwdriver in the hole on the right side of the auto cutter unit and turn the gear inside to return the cutter blade to its normal position. See the illustration below.



The remaining amount of roll paper is not detected correctly.

A microswitch attached to the paper roll near end detector lever detects when the roll paper is almost gone. You can adjust the detector lever if necessary. See Chapter 1 for instructions.

Hexadecimal Dump

This feature allows experienced users to see exactly what data is coming to the printer. This can be useful in finding software problems. When you turn on the hex dump function, the printer prints all commands and other data in hexadecimal format along with a guide section to help you find specific commands.

To use the hex dump feature, follow these steps:

1. Make sure that the printer is off.
2. Open the cover.
3. Hold down the PAPER FEED button while you turn on the printer by pressing the POWER button.
4. Close the cover. The printer prints "Hexadecimal Dump".
5. Run any software program that sends data to the printer. All the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that correspond to the codes.

   sample

   Hexadecimal Dump

   1B 21 **00** **1B** 26 **02** 40 40 **1B** 69 : . ! . . & . @ @.i
   1B 25 **01** **1B** 63 34 **00** **1B** 30 31 : . % . c4 . .. 01
   41 42 43 44 45 46 47 48 49 4A : ABCDEFGHIJ

- ❑ A period (.) is printed for each code that has no ASCII equivalent.
- ❑ Control codes are printed in bold for emphasis.
- ❑ During the hex dump all commands except **DLE EOT** and **DLE ENQ** are disabled.

6. Open the cover to set the printer off line so that it will print the last line.
7. Close the cover and turn off the printer or reset it to turn off the hex dump mode.

Reference Information

Printing Specifications

Printing Method:	Thermal line printing
Dot Density:	180 x 180 dpi
Printing Direction:	Unidirectional with friction feed
Printing width:	72mm (2.83"), 512 dot positions
Characters/line (default):	Font A: 42, Font B: 56
Character spacing (default) Fonts A and B:	2 dots: 0.28mm(.01") Programmable by control command
Printing speed:	Approx. 12 lines/second (1/6"feed) Approx. 50 mm(2")/second continuous feed Approx. 28 mm(1.1")/second when printing a ladder bar code Actual speed may be lower, depending on data transmission speed and control commands
Paper feed speed:	Approx. 50 mm (2")/second
Line spacing:	Default: 4.23 mm (1/6") Programmable in 1/360" units

Character Specifications

Number of characters

Alphanumeric characters: 95
Extended graphics: 128 x 7 pages, including 1 space page
International characters: 32

Character structure:

12 x 24 (Font A) incl. 2-dot spacing in horizontal
9 x 24 (Font B) incl. 2-dot spacing in horizontal

Font A is the default

Character size:

Font A: 1.41mm (.06") x 3.39mm (.13") (WxH)
Font B: 0.99mm (.04") x 3.39mm (.13") (WxH)

Character Sizes

	Standard		Double-height		Double width		Dbl Width/Height	
	W x H (mm)	CPL	W x H (mm)	CPL	W x H (mm)	CPL	W xH (mm)	CPL
Font A 12 x 24	1.41 x 3.39 (.06 x .13")	42	1.41x 6.77 (.06 x .27")	42	2.82 x 3.39 (.11 x .13")	21	2.82 x 6.77 (.11 x .27")	21
Font B 9 x 24	.99 x 3.39 (.04 x .13")	56	.99 x 6.77 (.04 x .27")	56	1.98 x 3.39 (.08 x .13")	28	1.98 x 6.77 (.08 x .27")	28

CPL = Characters per line

Space between characters is not included

Characters can be extended up to 64 times the standard size

Paper Specifications

Paper type:	Specified thermal paper roll
Paper width	80 $^{+0}_{-1}$ mm (3.15″ $^{+0\text{″}}_{-0.04\text{″}}$)
Roll paper specifications	Total dia: 83mm max Core dia: Inside: 12mm Outside: 18mm Paper must not be pasted to the core
paper	NTP080-80 (Nakagawa Seisakujo) [Original paper: Nippon Paper Industries Co., Ltd., TF50KS-E]

Electrical Specifications

Operating voltage	+24 VDC ± 7% (with optional power supply PS-150
Current consumption (at +24 V, excluding driving drawer kickout)	Operating: Mean approx. 1.5A Peak: approx. 6.0A Standby: Mean approx. 0.1A

Environmental Conditions

Temperature

Operating	5 to 40 °C (41 to 104 °F)
Storage	–10 to 50 ° C (14 to 122° F) except for paper

Humidity

Operating	30 to 85% RH
Storage	30 to 90% RH except for paper

Interface Specifications

Serial interface:	RS-232 compatible
Parallel interface:	IEEE 1284 compatible (Nibble/Byte Modes)

Note:
The interface is a factory installed option. One of the interfaces (serial or parallel) is already installed.

Note:
Refer to the EPSON TM-T85/T85P Specification for details.

Page 0 (PC437: U.S.A., Standard Europe)(International character set: U.S.A.)

HEX	BIN	0 0000	1 0001	2 0010	3 0011	4 0100	5 0101	6 0110	7 0111	8 1000	9 1001	A 1010	B 1011	C 1100	D 1101	E 1110	F 1111
0	0000	NUL 00	DLE 16	SP 32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	┴ 208	α 224	≡ 240
1	0001	XON 01	17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	┬ 209	ß 225	± 241
2	0010	02	18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▒ 178	┬ 194	┬ 210	Γ 226	≥ 242
3	0011	XOFF 03	19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	| 179	├ 195	└ 211	π 227	≤ 243
4	0100	EOT 04	20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	— 196	┌ 212	Σ 228	⌠ 244
5	0101	ENQ 05	21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	┤ 181	+ 197	┌ 213	σ 229	⌡ 245
6	0110	06	22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╡ 182	├ 198	┌ 214	µ 230	÷ 246
7	0111	07	23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	CAN 08	24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╖ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	HT 09	25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	‖ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ESC 11	27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╖ 187	╦ 203	219	δ 235	√ 251
C	1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	¦ 124	î 140	£ 156	¼ 172	╜ 188	╠ 204	220	∞ 236	n 252
D	1101	CR 13	GS 29	− 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	221	ø 237	² 253
E	1110	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╛ 190	╬ 206	222	∈ 238	■ 254
F	1111	15	31	/ 47	? 63	O 79	_ 95	o 111	SP 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	223	∩ 239	SP 255

Page 1 (Katakana)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ー 128	144	SP 160	176	タ 192	ミ 208	二 224	× 240
1	0001	129	145	。 161	ア 177	チ 193	ム 209	卜 225	円 241
2	0010	130	146	「 162	イ 178	ツ 194	メ 210	十 226	年 242
3	0011	131	147	」 163	ウ 179	テ 195	モ 211	卜 227	月 243
4	0100	132	148	、 164	エ 180	ト 196	ヤ 212	228	日 244
5	0101	133	149	・ 165	オ 181	ナ 197	ユ 213	229	時 245
6	0110	134	150	ヲ 166	カ 182	ニ 198	ヨ 214	230	分 246
7	0111	135	151	ァ 167	キ 183	ヌ 199	ラ 215	231	秒 247
8	1000	136	152	ィ 168	ク 184	ネ 200	リ 216	♠ 232	〒 248
9	1001	137	153	ゥ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	1010	138	154	ェ 170	コ 186	ハ 202	レ 218	✦ 234	区 250
B	1011	139	155	ォ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	1100	140	156	ャ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	1101	141	157	ュ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	1110	142	158	ョ 174	セ 190	ホ 206	゛ 222	／ 238	▒ 254
F	1111	＋ 143	ノ 159	ッ 175	ソ 191	マ 207	゜ 223	＼ 239	SP 255

Page 2 (PC850: Multilingual)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	Ó 224	— 240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	0010	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	0100	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	244
5	0101	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	0110	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	1000	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	1001	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	1011	ï 139	ø 155	½ 171	╗ 187	╦ 203	■ 219	Ù 235	¹ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	ý 236	³ 252
D	1101	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	1110	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	1111	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▬ 223	´ 239	SP 255

Page 3 (PC860: Portuguese)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	240
1	0001	ü 129	À 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	È 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	Á 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	Ê 137	Õ 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	Í 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	251
C	1100	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	1101	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	Ã 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	238	■ 254
F	1111	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	239	SP 255

Page 4 (PC863: Canadian-French)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	¦ 160	▒ 176	└ 192	╨ 208	α 224	240
1	0001	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	ç 135	ù 151	¯ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	0100	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	1010	è 138	Ù 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	1101	‗ 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	238	■ 254
F	1111	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	239	SP 255

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	0100	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	ø 155	½ 171	╗ 187	╦ 203	■ 219	δ 235	251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	∞ 236	n 252
D	1101	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	238	■ 254
F	1111	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	239	SP 255

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP 128	SP 144	SP 160	SP 176	SP 192	SP 208	SP 224	SP 240
1	0001	SP 129	SP 145	SP 161	SP 177	SP 193	SP 209	SP 225	SP 241
2	0010	SP 130	SP 146	SP 162	SP 178	SP 194	SP 210	SP 226	SP 242
3	0011	SP 131	SP 147	SP 163	SP 179	SP 195	SP 211	SP 227	SP 243
4	0100	SP 132	Ö 148	SP 164	SP 180	SP 196	SP 212	SP 228	SP 244
5	0101	SP 133	SP 149	SP 165	SP 181	SP 197	SP 213	SP 229	SP 245
6	0110	SP 134	SP 150	SP 166	SP 182	SP 198	SP 214	SP 230	SP 246
7	0111	SP 135	SP 151	SP 167	SP 183	SP 199	SP 215	SP 231	SP 247
8	1000	SP 136	SP 152	SP 168	SP 184	SP 200	SP 216	SP 232	SP 248
9	1001	SP 137	SP 153	SP 169	SP 185	SP 201	SP 217	SP 233	SP 249
A	1010	SP 138	SP 154	SP 170	SP 186	SP 202	SP 218	SP 234	SP 250
B	1011	SP 139	SP 155	SP 171	SP 187	SP 203	SP 219	SP 235	SP 251
C	1100	SP 140	SP 156	SP 172	SP 188	SP 204	SP 220	SP 236	SP 252
D	1101	SP 141	SP 157	SP 173	SP 189	SP 205	SP 221	SP 237	SP 253
E	1110	SP 142	SP 158	SP 174	SP 190	SP 206	SP 222	SP 238	SP 254
F	1111	SP 143	SP 159	SP 175	SP 191	SP 207	SP 223	SP 239	SP 255

International character sett

Country	ASCII code (hexadecimal)											
	Hex	**23**	**24**	**40**	**5B**	**5C**	**5D**	**5E**	**60**	**7B**	**7C**	**7D**	**7E**
	Dec	**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
U.K.		£	$	@	[	\	]	^	`	{	¦	}	~
Denmark I		#	$	@	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		Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Japan		#	$	@	[	¥	]	^	`	{	¦	}	~
Norway		#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II		#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

Chapter 5
Commands

Command Notation

[Name]	The name of the command.
[Format]	The code sequence. ASCII indicates the ASCII equivalents. Hex indicates the hexadecimal equivalents. Decimal indicates the decimal equivalents. [ ]*k* indicates the contents of the [ ] should be repeated *k* times.
[Range]	Gives the allowable ranges for the arguments.
[Description]	Describes the function of the command.
[Notes]	Provides important information on setting and using the printer command, if necessary.
[Default]	Gives the default values, if any, for the command parameters.
[Reference]	Lists related commands.
[Example]	Provides examples using the command.

The numbers denoted by < >H are hexadecimal.
The numbers denoted by < >B are binary.
The numbers denoted by < > are decimal.

NOTE: The phrase "beginning of a line" in command descriptions assumes that the following conditions have been met:

1. Print data, including spaces and **HT** command tabs, is not in the current print buffer.
2. The print position is not specified by the **ESC $** or **ESC ** command.

HT

[Name] Horizontal tab

[Format] ASCII HT
Hex 09
Decimal 9

[Description] Moves the print position to the next horizontal tab position.

[Notes]
- This command is ignored unless the next horizontal tab position has been set.
- If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [Printing area width + 1].
- Horizontal tab positions are set with **ESC D**.
- If this command is received when the printing position is at [printing area width + 1], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line.

[Reference] **ESC D**

LF

[Name] Print and line feed

[Format] ASCII LF
Hex 0A
Decimal 10

[Description] Prints the data in the print buffer and feeds one line based on the current line spacing.

[Note] This command sets the print position to the beginning of the line.

[Reference] **ESC 2**, **ESC 3**

FF

[Name] Print and return to standard mode (in page mode)

[Format] ASCII FF
Hex 0C
Decimal 12

[Description] Prints the data in the print buffer collectively and returns to standard mode.

[Notes]
- The buffer data is deleted after being printed.
- The printing area set by **ESC W** is reset to the default setting.
- The printer does not execute paper cutting.
- This command sets the print position to the beginning of the line.
- This command is enabled only in page mode.

[Reference] **ESC FF, ESC L, ESC S**

CR

[Name] Print and carriage return

[Format]

ASCII	CR	
Hex	0D	
Decimal	13	

[Description] When auto-line feed is enabled, this command functions in the same way as **LF**. When auto-line feed is disabled, this command is ignored.

[Notes]
- This command sets the print position to the beginning of the line.
- This command is available only with a parallel interface and is ignored with a serial interface.

DLE EOT *n*

[Name] Real-time status transmission

[Format]

ASCII	DLE	EOT	*n*
Hex	10	04	*n*
Decimal	16	4	*n*

[Range] $1 \leq n \leq 4$

[Description] Transmits the selected printer status specified by *n* in real time, according to the following parameters:

n = 1: Transmit printer status
n = 2: Transmit off-line status
n = 3: Transmit error status
n = 4: Transmit paper roll sensor status

[Notes]
- The printer transmits the current status. Each status is represented by one-byte data.
- The printer transmits the status without confirming whether the host computer can receive data.
- This command is executed even when the printer is in the off-line, receive buffer is full, or error staus.
- The printer executes this command upon receiving it.
- The status is transmitted whenever the data sequence of 10H(16)04H(4)n ($1 \leq n \leq 4$) is received.

  Example:

  In **ESC * *m* *n*L *n*H [d]K**, d1=10H(16), d2=04H(04), d3=01H(1)
- This command should not be used within the data sequence of another command that consists of 2 or more bytes.

  Example:

  If you attempt to transmit **ESC 3 *n*** to the printer, but DTR (DSR for the host computer) goes to MARK before *n* is transmitted and then **DLE EOT 3** interrupts before *n* is received, the code 10H(16) for **DLE EOT 3** is processed as the code for **ESC 3** 10H(16).

- When Auto Status Back (ASB) is enabled using the **GS a** command, the status transmitted by the **DLE EOT** command and the ASB status must be differentiated.
- If the value of *n* is out of the specified range, the printer ignores this command.

n = 1: Printer status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Drawer open/close signal is LOW (connector pin 3).
	On	04	4	Drawer open/close signal is HIGH (connector pin 3).
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

n = 2: Off-line status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed by using the PAPER FEED button.
	On	08	8	Paper is being fed by the PAPER FEED button.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper end.

Bit	Off/On	Hex	Decimal	Function
6	Off	00	0	No error.
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off.

Bit 5: Becomes on when printing stops due to paper-end detected by the paper roll end sensor or due to a paper near-end enabled by using the **ESC c 4**.

n = 3: Error status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used.Fixed to On.
2	-	-	-	Undefined.
3	Off	00	0	No auto-cutter error.
	On	08	8	Auto-cutter error occurs.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurs.
6	Off	00	0	No auto-recoverable error.
	On	40	64	Auto recoverable error occurs.
7	Off	00	0	Not used. Fixed to Off.

Bit 3: If these errors occur due to paper jams or the like, it is possible to recover by correcting the cause of the error and executing **DLE ENQ *n*** ($1 \le n \le 2$). If an error due to a circuit failure (e.g. wire break) occurs, it is impossible to recover.

Bit 6: When printing is stopped due to high print head temperature, bit 6 is On until the print head temperature drops sufficiently.

n = 4: Continuous paper sensor status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Paper roll near-end sensor. Paper adequate.

Bit	Off/On	Hex	Decimal	Function
3	On	0C	12	Paper near-end is detected by the paper roll near-end sensor.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Paper roll end sensor. Paper present.
6	On	60	96	Paper end is detected by the paper roll end sensor.
7	Off	00	0	Not used. Fixed to Off.

[Reference] **DLE ENQ**, **ESC u**, **ESC v**, **GS a**, **GS r**

DLE ENQ *n*

[Name] Real-time request to printer

[Format]

ASCII	DLE	ENQ	*n*
Hex	10	05	*n*
Decimal	16	5	*n*

[Range] $1 \le n \le 2$

[Description] The printer responds to a request from the host specified by *n*. The operations performed depend on the value of *n*, as follows:

n = 1: Restarts printing from the beginning of the line where an error occurred, after recovering from the error.

n = 2: Recovers from an error after clearing the receive and print buffers.

[Notes]

- The command is effective only when an auto-cutter error occurs.
- The printer executes this command upon receiving it.
- This command is also executed when the receive buffer is full.
- The status is transmitted whenever the data sequence of 10H(16) 05H(5)*n* ($1 \le n \le 2$) is received.

  Example:

  In **ESC *** ***m nL nH [d] K***, *d1*=10H(16) , *d2*=05H(5) , *d3*=01H(1)
- This command should not be used within the data sequence of another command that consists of two or more bytes.

  Example:

  If you attempt to transmit **ESC 3 *n*** to the printer, but DTR (DSR for the host computer) goes to MARK before *n* is transmitted, and **DLE ENQ 2** interrupts before *n* is received, the code 10H(16) for **DLE ENQ 2** is processed as the code for **ESC 3** 10H(16).

- Even if **DLE ENQ 2** is executed, the printer retains the settings (by **ESC !**, **ESC 3**, etc.) that were in effect when the error occurred. The printer can be initialized completely by using DLE ENQ and ESC **@**.

[Reference] **DLE EOT**

CAN

[Name] Cancel print data in page mode

[Format]

ASCII	CAN	
Hex	18	
Decimal	24	

[Description] In page mode, deletes all the print data in the current printable area.

[Notes]
- This command is enabled only in page mode.
- If data that existed in the previously specified printing area also exists in the currently specified printing area, it is deleted.

[Reference] **ESC L ESC W**

ESC FF

[Name] Print data in page mode

[Format]

ASCII	ESC	FF
Hex	1B	0C
Decimal	27	12

[Description] In page mode, prints all buffered data in the printing area collectively.

[Notes]
- This command is enabled only in page mode.
- After printing, the printer does not clear the buffered data, setting values for ESC T and ESC W, and the position for buffering character data.

[Reference] **FF**, **ESC L**, **ESC S**

ESC SP *n*

[Name] Set right-side character spacing

[Format]

ASCII	ESC	SP	*n*
Hex	1B	20	*n*
Decimal	27	32	*n*

[Range] $0 \leq n \leq 255$

[Description] Sets the character spacing for the right side of the character to [nx horizontal or vertical motion units].

[Notes]
- The right-side character spacing for double-width mode is twice the normal value. When characters are enlarged, the right-side character spacing is *n* times normal value.
- This command sets values independently in each mode (standard and page modes).

- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current right-side spacing.
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current right-side spacing.
- The **GS P** command can chahge the horizotal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.
- In standard mode, the horizontal motion unit is used.
- In page mode, the horizontal or vertical motion unit differs in page mode, depending on starting position of the printable area as follows:

  1 When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the horizontal motion unit (*x*) is used.

  2 When the starting position is set to the upper right or lower left of the printable area using **ESC T**, the vertical motion unit (*y*) is used.

  - The maximum right-side spacing is 255/180 inches. Any setting exceeding the maximum is converted to the maximum automatically.

[Default] *n*=0

[Reference] **GS P**

ESC ! *n*

[Name] Select print mode(s)

[Format]

ASCII	ESC	!	*n*
Hex	1B	21	*n*
Decimal	27	33	*n*

[Range] $0 \le n \le 255$

[Description] Selects print mode(s) using *n* as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A(12 × 24) selected.
	On	01	1	Character font B (9 × 24) selected.
1	-	-	-	Undefined.
2	-	-	-	Undefined
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.

Bit	Off/On	Hex	Decimal	Function
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	-	-	-	Undefined.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

- Determine the values of *n* by adding the values of all the characteristics you want to select.

[Notes]
- When both double-height and double-width modes are selected, quadruple size characters are printed.
- The printer can underline all characters, but can not underline the space set by **HT**, **ESC $**, or **ESC** \ or 90° clockwise rotated characters.
- The thickness of the underline is that selected by **ESC -**, regadless of the character size.
- When some characters in a line are double or more height, all the characters on the line are aligned at the baseline.
- **ESC E** can also tutn on or off emphasized mode. However, the setting of the last received command is effective.
- **ESC -** can also turn on or off underline mode. However , the setting of the last received command is effective.
- **GS !** can also select character size. However, the setting of the last received command is effective.

[Default] *n* = 0

[Reference] **ESC –, ESC E, GS !**

ESC $ *nL nH*

[Name] Set absolute print position

[Format]

ASCII	ESC	$	*nL nH*
Hex	1B	24	*nL nH*
Decimal	27	36	*nL nH*

[Range] $0 \le nL \le 255$

$0 \le nH \le 255$

[Description] Sets the distance from the beginning of the line to the position at which subsequent characters are to be printed.

- The distance from the beginning of the line to the print position is [($nL + nH \times 256$) × (vertical or horizontal motion unit)] inches.

[Notes]
- Settings outside the specified printable area are ignored.
- The horizontal and vertical motion unit are specified by **GS P**.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.
- In standard mode, the horizontal motion unit (x) is used.
- In page mode, horizontal or vertical motion unit differs depending on the starting position of the printable area as follows:
  1 When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the horizontal motion unit (x) is used.
  2 When the starting position is set to the upper right or lower left of the printable area using **ESC T**, the vertical motion unit (y) is used.

[Reference] **ESC **, **GS $**, **GS **, **GS P**

ESC % *n*

[Name] Select/cancel user-defined character set

[Format]

ASCII	ESC	%	*n*
Hex	1B	25	*n*
Decimal	27	37	*n*

[Range] $0 \le n \le 255$

[Description] Selects or cancels the user-defined character set.

- When the Least Significant Bit (LSB) is 0, the user-defined character set is canceled.
- When the LSB is 1, the user-defined character set is selected.

[Notes]
- When the user-defined character set is canceled, the internal character set is automatically selected.

[Default] $n = 0$

[Reference] **ESC &**, **ESC ?**

ESC & *y c1 c2* [*x1 d1...dy* × *x1*]...[*xk d1...dy* × *xk*]

[Name] Define user-defined characters

[Format]

ASCII	ESC	&	*y c1 c2* [*x1 d1...dy* × *x1*]...[*xk d1...dy* × *xk*]
Hex	1B	26	*y c1 c2* [*x1 d1...dy* × *x1*]...[*xk d1...dy* × *xk*]
Decimal	27	38	*y c1 c2* [*x1 d1...dy* × *x1*]...[*xk d1...dy* × *xk*]

[Range] $y = 3$

$32 \le c1 \le c2 \le 126$

$0 \le x \le 12$ Font A (12 × 24)

$0 \le x \le 9$ Font B (9 × 24)

$0 \le d1 \ldots dy \times xk \le 255$

$k = c2 - c1 + 1$

[Description] Defines user-defined characters.

- *y* specifies the number of bytes in the vertical direction.
- *c1* specifies the beginning character code for the definition, and *c2* specifies the final code.
- *x* specifies the number of dots in the horizontal direction.
- *d* is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.
- The allowable character code range is from ASCII code 20H(32) to 7EH(126) (95 characters).
- The data to define a user-defined character is (y x x) bytes.
- Set a corresponding bit to 1 to print a dot or 0 to not print a dot.

[Notes]
- It is possible to define multiple characters for consecutive character codes.
  If only one character is desired, use *c1 = c2* .
- This command can define different user-defined character patterns by each fonts. To select a font, use **ESC !**

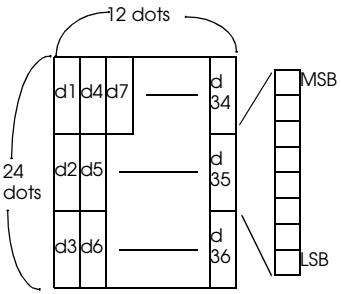
- A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.
- The user-defined character definition is cleared when:
  Esc@ is executed.
  GS ✻ is executed.
  ESC ? is executed.
  The printer is reset or the power is turnde off.

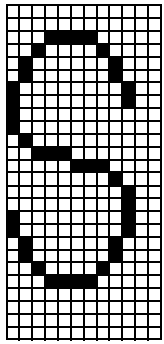
[Default] The internal character set

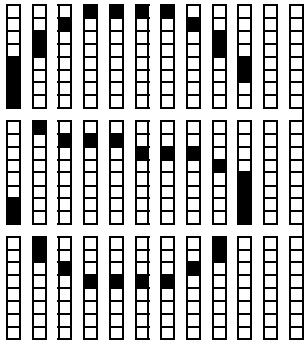
[Reference] **ESC %, ESC ?**

[Example]

- When font A is selected.

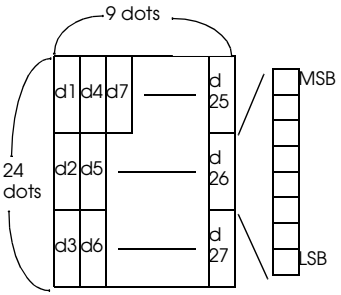


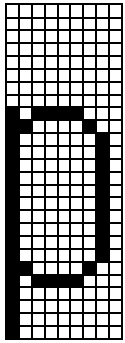


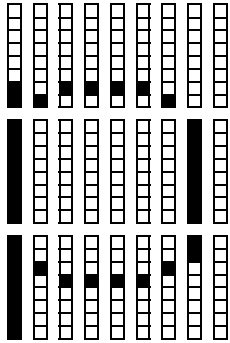


d1= <0F>H d4 = <30>H d7 = <40>H....
d2 = <03>H d5 = <80>H d8 = <40>H....
d3 = <00>H d6 = <00>H d9 = <20>H....

- When font B is selected.







d1 = <03>H d4 = <01>H d7 = <02>H....
d2 = <FF>H d5 = <00>H d8 = <00>H....
d3 = <FF>H d6 = <20>H d9 = <10>H....

ESC ✻ *m nL n H [d]k*

[Name] Select bit-image mode

[Format]

ASCII	ESC	✻	*m nL nH [d]k*
Hex	1B	2A	*m nL nH [d]k*
Decimal	27	42	*m nL nH [d]k*

[Range] $m = 0, 1, 32, 33$

$0 \le nL \le 255$

$0 \le nH \le 3$

$0 \le d \le 255$

[Description] Selects a bit-image mode using *m* for the number of dots specified by *nL* and *nH*, as follows:

m	Mode	Vertical Direction		Horizontal Direction (*1)	
		Number of Dots	Dot Density	Dot Density	Number of Data (K)
0	8-dot single-density	8	60 DPI	90 DPI	nL + nH × 256
1	8-dot double-density	8	60 DPI	180 DPI	nL + nH × 256
32	24-dot single-density	24	180 DPI	90 DPI	(nL + nH × 256)×3
33	24-dot double-density	24	180 DPI	180 DPI	(nL + nH × 256)×3

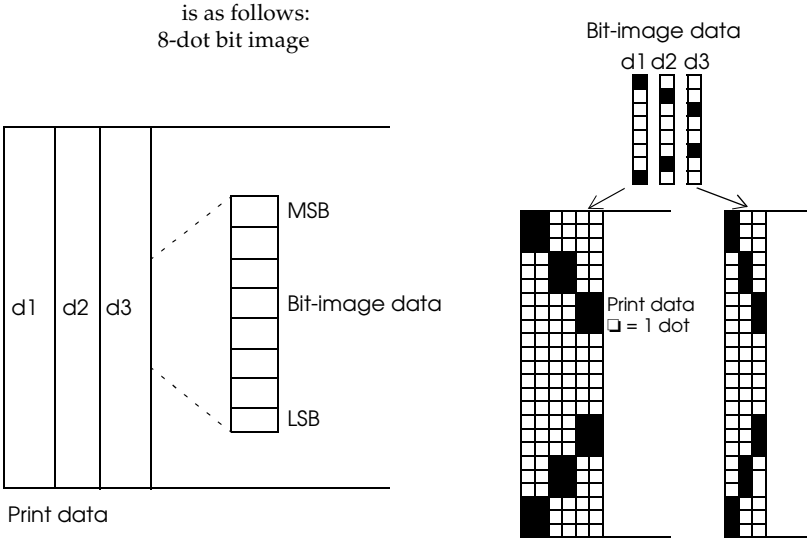
- The *nL* and *nH* indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by *nL* + *nH* × 256.
- If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
- *d* indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.

[Notes]
- If the values of *m* is out of the specified range, nL and data following are processed as normal data.
- If the width of the printing area set by **GS L** and **GS W** less than the width required by the data sent with the **ESC ✻** command, the following will be performed on the line in question (but the printing cannot exceed the maximum printable area):
  ① The width of the printing area is extended to the right to accommodate the amount of data.
  ② If step ① does not provide sufficient width for the data, the left margin is reduced to accommodate the data.
  For each bit of data in single-density mode, the printer prints two dots: for each bit of data in double-density mode, the printer prints one dot. This must be considered in calculating the amount of data that can be printed in one line.

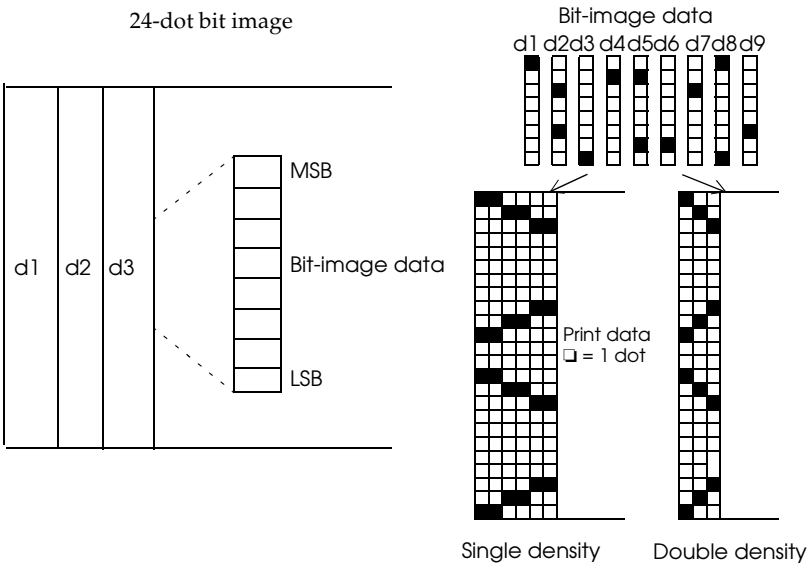
- After printing a bit image, the printer returns to normal data processing mode.
- This command is not affected by print modes (emphasized, double-strike, and underline, etc.), except upside-down mode.

• The relationship between the image data and the dots to be printed is as follows:

8-dot bit image



24-dot bit image



ESC - *n*

[Name] Turn underline mode on/off

[Format]

ASCII	ESC	-	*n*
Hex	1B	2D	*n*
Decimal	27	45	*n*

[Range] $0 \le n \le 2, 48 \le n \le 50$

[Description] Turns underline mode on or off, based on the following values of *n*.

n	Function
0, 48	Turns off underline mode
1, 49	Turns on underline mode (1-dot thick)
2, 50	Turns on underline mode (2-dots thick)

[Notes]

- The printer can underline all characters (including right-side character spacing), but cannot underline the space set by **HT.**
- The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
- When underline mode id turned off by setting the value of *n* to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off does not change. The default underline thickness is 1 dot.
- Changing the character size does not affect the current underline thickness.
- Underline mode can also be turned on or off by using **ESC !**. Note, however, that the last received command is effective.

[Default] *n* = 0

[Reference] **ESC !**

ESC 2

[Name] Select 1/6-inch line spacing

[Format]

ASCII	ESC	2
Hex	1B	32
Decimal	27	50

[Description] Selects 1/6-inch line spacing.

[Note] The line spacing can be set independently in standard mode and in page mode.

[Reference] **ESC 3**

ESC 3 *n*

[Name] Set line spacing

[Format]

ASCII	ESC	3	*n*
Hex	1B	33	*n*

	Decimal	27	51	*n*

[Range] $0 \le n \le 255$

[Description] Sets the line spacing to [*n* x vertical or horizontal motion unit] inches.

[Notes]
- The line spacing can be set independently in standard mode and in page mode.
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current line spacing.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum vertical movement amout, and it must be in even units of the minimum vertical movement amount.
- In standard mode, the vertical motion unit (y) is used.
- In page mode, this command functions as follows, depending on the starting position of the printable area:

  ① When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the vertical motion unit (y) is used.

  ② When the starting position is set to the upper right or lower left of the print able area using **ESC T**, the horizontal motion unit (*x*) is used.
- The maximum line spacing is 40 inches. When the setting value exceeds the maximum, it is converted to the maximum automatically.

[Default] *n* = 60 (1/6 inch)

[Reference] **ESC 2**, **GS P**

ESC = *n*

[Name] Set peripheral device

[Format]	ASCII	ESC	=	*n*
	Hex	1B	3D	*n*
	Decimal	27	61	*n*

[Range] $0 \le n \le 255$

[Description] Selects the device to which the host computer sends data, using *n* as follows:
- Each bit of *n* is used as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer disabled.
	On	01	1	Printer enabled.
1	-	-	-	Undefined.

Bit	Off/On	Hex	Decimal	Function
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	-	-	-	Undefined.

[Notes] • When the printer is disabled, it ignores all data except for error-recovery commands (**DLE ENQ 1**, **DLE ENQ 2**) until it is enabled by this command.

[Default] n = 1

[Reference] DLE ENQ

ESC ? *n*

[Name] Cancel user-defined characters

[Format]

ASCII	ESC	?	*n*
Hex	1B	3F	*n*
Decimal	27	63	*n*

[Range] $32 \leq n \leq 126$

[Description] Cancels user-defined characters.

[Notes] • This command cancels the pattern defined for the character code specified by *n*. After the user-defined characters is canceled, the corresponding pattern for the internal character is printed.
• This command deletes the pattern defined for the specified code in the font selected by **ESC !**
• If a user-defined character has not been defined for the specified character code, the printer ignores this command.

[Reference] **ESC &**, **ESC %**

ESC @

[Name] Initialize printer

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

[Description] Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.

[Notes] • The DIP switch settings are not checked again.
• The data in the receive buffer is not cleared.

- The macro definition is not cleared.

ESC D [*n*] *k* NUL

[Name] Set horizontal tab positions

[Format]

ASCII	ESC	D	[*n*] *k*	NUL
Hex	1B	44	[*n*] *k*	00
Decimal	27	68	[*n*] *k*	0

[Range] $1 \le n \le 255$

$0 \le k \le 32$

[Description] Sets horizontal tab positions.

- *n* specifies the column number for setting a horizontal tab position from the beginning of the line.
- *k* indicates the total number of horizontal tab positions to be set.

[Notes]
- The horizontal tab position is stored as a value of [character width × *n*] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters.
- This command cancels the previous horizontal tab settings.
- When setting *n* = 8, the print position is moved to column 9 by sending **HT**.
- Up to 32 tab positions (*k* = 32) can be set. Data exceeding 32 tab positions is processed as normal data.
- Transmit [*n*]*k* in ascending order and place a NUL code 0 at the end.
- When [*n*]*k* is less than or equal to the preceding value [*n*]*k*-1, tab setting is finished and the following data is processed as normal data.
- **ESC D NUL** cancels all horizontal tab positions.
- When [*n*]*k* exceeds the number of characters printable on one line, the tab position set is equal to the maximum printable column plus 1.
- The previously specified horizontal tab positions do not change, even if the character width changes.

[Default] The default tab positions are at intervals of 8 characters (columns 9, 17, 25,...) for the font A (12 × 24).

[Reference] **HT**

ESC E *n*

[Name] Turn emphasized mode on/off

[Format]

ASCII	ESC	E	*n*
Hex	1B	45	*n*
Decimal	27	69	*n*

[Range] $0 \le n \le 255$

[Description] Turns emphasized mode on or off.

- When the LSB of *n* is 0, emphasized mode is turned off.
- When the LSB of *n* is 1, emphasized mode is turned on.

[Notes]
- Bit image and downloaded bit image , and bar code cannot be emphasized.
- **ESC !** also turns on and off emphasized mode. However, the last received command is effective.

[Default] *n* = 0

[Reference] **ESC !**

ESC G *n*

[Name] Turn on/off double-strike mode

[Format]

ASCII	ESC	G	*n*
Hex	1B	47	*n*
Decimal	27	71	*n*

[Range] $0 \le n \le 255$

[Description] Turns double-strike mode on or off.

- When the LSB of *n* is 0, double-strike mode is turned off.
- When the LSB of *n* is 1, double-strike mode is turned on.

[Notes]
- Printer output is the same in double-strike mode and in emphasized mode.
- Double-strike mode can not be used for the bit image, downloaded bit image, and bar code.

[Default] *n* = 0

[Reference] **ESC E**

ESC J *n*

[Name] Print and feed paper

[Format]

ASCII	ESC	J	*n*
Hex	1B	4A	*n*
Decimal	27	74	*n*

[Range] $0 \le n \le 255$

[Description] Prints the data in the print buffer and feeds the paper [*n* x vertical or horizontal motion unit] inches.

[Notes]
- After printing is completed, this command sets the print starting position to the beginning of the line.
- The paper feed amount set by this command does not affect the values set by **ESC 2** or **ESC 3**.
- The horizontal and vertical motion unit are specified by **GS P**.
- The **GS P** command can change the vertical (and horizontal) motion unit. However, the value cannot be less than the minimum vertical movement amount, and it must be in even units of the minimun vertical movement amount.

- In standard mode, the printer uses the vertical motion unit (*y*).
- When this command is used in page mode, the command functions as follows, depending on the starting position of the printable area.

  ① When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the vertical motion unit (*y*) is used.

  ② When the starting position is set to the upper right or lower left of the printable area using **ESC T**, the horizontal motion unit (*x*) is used.
- The maximum paper feed amount is 40 inches. Even if a paper feed amount of more than 40 inches is set, the printer feeds the paper only 40 inches.

[Reference] **GS P**

ESC L

[Name] Select page mode

[Format]

ASCII	ESC	L
Hex	1B	4C
Decimal	27	76

[Description] Switches from standard mode to page mode.

[Notes]
- This command is enabled only when input at the beginning of a line.
- This command has no affect in page mode.
- After printing by **FF** is completed or by using **ESC S**, the printer returns to standard mode.
- This command sets the position where data is buffered to the position specified by **ESC T** within the printing area defined by **ESC W**.
- This command switches the settings for the following commands (in which the values can be set independently in standard mode and page mode) to those for page mode:

  ① Set right-side character spacing: **ESC SP**

  ② Select 1/6-inch line spacing: **ESC 2**

  ③ Set line spacing: **ESC 3**
- Only valve settings is possible for the following commands; these commands are not executed.

  ① Turn 90° clockwise rotation mode on/off: **ESC V**

  ② Select justification : ESC a

  ③ Turn upside-down printing mode on/off : ESC {

  ④ Set left margin: **GS L**

  ⑤ Set printable area width: **GS W**
  - The printer returns to standard mode by using the **ESC @** or **DLE ENQ 2**.

[Reference] **FF, CAN,ESC, FF, ESC S, ESC T, ESC W, GS $, GS**

ESC R *n*

[Name] Select an international character set

[Format]

ASCII	ESC	R	*n*
Hex	1B	52	*n*
Decimal	27	82	*n*

[Range] $0 \le n \le 10$

[Description] Selects an international character set *n* from the following table:

n	Character set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

[Default] $n = 0$

[Reference] *Character Code Tables*

ESC S

[Name] Select standard mode

[Format]

ASCII	ESC	S
Hex	1B	53
Decimal	27	83

[Description] Switches from page mode to standard mode.

[Notes]
- This command is effective only in page mode.
- Data buffered in page mode are cleared.
- This command sets the print position to the beginning of the line.
- The printing area set by ESC W are initialized.

- This command switches the settings for the following commands (in which the values can be set independently in standard mode and page mode) to those for standard mode:
  ① Set right-side character spacing: **ESC SP**
  ② Select 1/6-inch line spacing: **ESC 2**
  ③ Set line spacing: **ESC 3**

[Reference] **FF**, **ESC FF**, **ESC L**

ESC T *n*

[Name] Select print direction in page mode

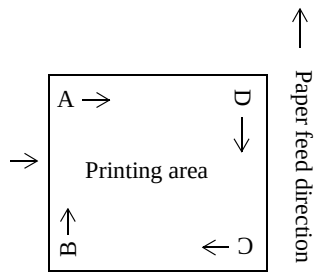
[Format]

ASCII	ESC	T	*n*
Hex	1B	54	*n*
Decimal	27	84	*n*

[Range] $0 \le n \le 3$
$48 \le n \le 51$

[Description] Selects the print direction and starting position in page mode.
n specifies the print direction and starting position as follows:

n	Print Direction	Starting Position
0, 48	Left to right	Upper left (A in the figure)
1, 49	Bottom to top	Lower left (B in the figure)
2, 50	Right to left	Lower right (C in the figure)
3, 51	Top to bottom	Upper right (D in the figure)



[Notes]
- When the command is input in standard mode, the printer executes only internal flag operation. This command does not affect printing in standard mode.
- This command sets the position where data is buffered within the printing area set by **ESC W**.
- Parameters for horizontal or vertical motion units (*X* or *y*) differ as follows, depending on the starting position of the printing area:
  ① If the starting position is the upper left or lower right of the printing area, data is buffered in the direction perpendiccular to the paper feed direction:
  Commands using horizontal motion units: **ESC SP, ESC $, ESC **
  Commands using vertical motion units: **ESC 3, ESC J, GS $, GS **

② If the starting position is the upper right or lower left of the printing area, data is buffered in the paper feed direction:
Commands using horizontal motion units: **ESC 3, ESC J, GS $, GS **
Cmmands using vertical motion units: **ESC SP, ESC $, ESC **

[Default] $n = 0$

[Reference] **ESC $, ESC L, ESC W, ESC \, GS $, GS P, GS **

ESC V *n*

[Name] Turn 90° clockwise rotation mode on/off

[Format]

ASCII	ESC	V	*n*
Hex	1B	56	*n*
Decimal	27	86	*n*

[Range] $0 \le n \le 1, 48 \le n \le 49$

[Description] Turns 90° clockwise rotation mode on or off.
n is used as follows:

n	Function
0, 48	Turns off 90 ° clockwise rotation mode
1, 49	Turns on 90 ° clockwise rotation mode

[Notes]
- When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters.
- Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions as from double-height and double-width commands in normal mode.
- This command has no effect in page mode.
- If this command is input in page mode, the printer performs only internal flag operations.

[Default] $n = 0$

[Reference] **ESC !**, **ESC -**

ESC W *xL xH yL yH dxL dxH dyL dyH*

[Name] Set printing area in page mode

[Format]

ASC II	ESC	W	*xL xH yL yH dxL dxH dyL dyH*
Hex	1B	57	*xL xH yL yH dxL dxH dyL dyH*
Decimal	27	87	*xL xH yL yH dxL dxH dyL dyH*

[Range] $0 \le xL, xH, yL, yH, dxL, dxH, dyL, dyH \le 255$

[Description]
- The horizontal starting position, vertical starting position, printing area width, and printing area height are defined as $x0$, $y0$, dx (inch), dy (inch), respectively.

Each setting for the printing area is calculated as follows:

$x0 = [(xL + xH \times 256) \times$ (horizontal motion unit)]

$y0 = [(yL + yH \times 256) \times$ (vertical motion unit)]

$dx = [dxL + dxH \times 256) \times$ (horizontal motion unit)]

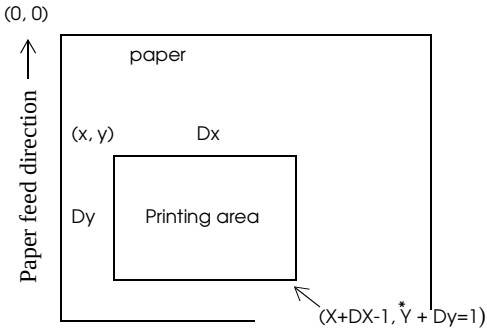
$dy = [dyL + dyH \times 256) \times$ (vertical motion unit)]

The printing area is set as shown in the figure below.

[Notes]

- If this command is input in standard mode, the printer executes only internal flag operation. This command does not affect printing in standard mode.
- If the horizlntal or vertical starting position is set outside the printable area, the printer stops command processing and processes the following data as normal data.
- If the printing area width or height is set to 0, the printer stops command processing and processes the following data as normal data.
- This command sets the position where data is buffered to the position specified by **ESC T** within the printing area.
- If (horizontal starting position + printing area width) exceeds the printable area, the printing area width is automatically set to (horizontal printable area - horizontal starting position).
- If (vertical starting position + printing area height) exceeds the printable area, the printing area height is automatically set to (vertical printable area - vertical starting position).
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current printing area.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of minimum horizontal movement amount.
- Use the horizontal motion unit (x) for setting the horizontal starting position and printing area width, and use the vertical motion unit (y) for setting the vertical starting position and printing area height.

- When the horizontal starting position , vertical starting position, printing area width, and printing area height are defined as *X*, *Y*, *Dx*, and *Dy* respectively, the printing area is set as show in the figure on the next page.



- The printable area for this printer is 512/180 inches in the horizontal direction and 1662/360 inches in the vertical direction.

[Default] $xL = xH = yL = yH = 0$
$dxL = 0$, $dxH = 2$, $dyL = 126$, $dyH = 6$

[Reference] **CAN**, **ESC L**, **ESC T**, **GS P**

ESC \ *nL nH*

[Name] Set relative print position

[Format]

ASCII	ESC	\	*nL nH*
Hex	1B	5C	*nL nH*
Decimal	27	92	*nL nH*

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the print starting position based on the current position by using the horizontal or vertical motion unit.

- This command sets the distance from the current position to [($nL + nH \times 256$) × horizontal or vertical motion unit]

[Notes]
- Any setting that exceeds the printable area is ignored.
- When pitch *N* is specified to the right:
  $nL + nH \times 256 = N$
  When pitch *N* is specified to the left (the negative direction), use the complement of 65536.
  When pitch *N* is specified to the left:
  $nL + nH \times 256 = 65536 - N$

- The print starting position moves from the current position to [N × horizontal or vertical motion unit]
- The horizontal and vertical motion unit are specified by **GS P**.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.
- In standard mode, the horizontal motion unit is used.
- In page mode, the horizontal or vertical motion unit differs as follows, depending on the starting point of the printing area:

  ① When the starting position is set to the upper left or lower right of the printable area using **ESC T**, the horizontal motion unit (x) is used.

  ② When the starting position is set to the upper right or lower left of the printable area using **ESC T**, the vertical motion unit (y) is used.

[Reference] **ESC $**, **GS P**

ESC a *n*

[Name] Select justification

[Format]

ASCII	ESC	a	*n*
Hex	1B	61	*n*
Decimal	27	97	*n*

[Range] $0 \le n \le 2$, $48 \le n \le 50$

[Description] Aligns all the data in one line to the specified position.

n selects the type of justification as follows:

n	Justification
0, 48	Left justification
1,49	Centering
2, 50	Right justification

[Notes]
- The command is enabled only when input at the beginning of the line.
- If this command is input in page mode, the printer performs only internal flag operation.
- This command does not affect printing in page mode.
- Lines are justifiedwithin the specified printing area.
- Spaces set by **HT**, **ESC $**, and **ESC** \ are all justified.

[Default] $n = 0$

[Example]

Left justification	Centering	Right justification
ABC	ABC	ABC
ABCD	ABCD	ABCD
ABCDE	ABCDE	ABCDE

ESC c 3 *n*

[Name] Select paper sensor(s) to output paper end signals

[Format]

ASCII	ESC	c	3	*n*
Hex	1B	63	33	*n*
Decimal	27	99	51	*n*

[Range] $0 \le n \le 255$

[Description] selects paper sensor(s) to output paper end signals, using n as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near-end sensor disabled.
	On	01	1	Paper roll near-end sensor enabled.
1	Off	00	0	Paper roll near-end sensor disabled.
	On	02	2	Paper roll near-end sensor enabled.
2	Off	00	0	Paper roll end sensor disabled.
	On	04	4	Paper roll sensor enabled.
3	Off	00	0	Paper roll end sensor disabled.
	On	08	8	Paper roll end sensor enabled.
4	Off	00	0	Undefined.
	On	10	16	Undefined.
5	Off	00	0	Undefined.
	On	20	32	Undefined.
6	Off	00	0	Undefined.
	On	40	64	Undefined.
7	Off	00	0	Undefined.
	On	80	128	Undefined.

[Notes]

- It is possible to select multiple sensors to output signals. Then, if any of the sensors detects a paper end, the paper end signal is output.
- This command is available only with a parallel interface and is ignored with a serial interface.
- Sensor is switched when executing this command. Because of this, the paper-out signal switching may delay depending on the receive buffer state.

[Default] $n = 15$

ESC c 4 *n*

[Name] Select paper sensor(s) to stop printing

[Format]

ASCII	ESC	c	4	*n*
Hex	1B	63	34	*n*
Decimal	27	99	52	*n*

[Range] $0 \le n \le 255$

[Description] Selects the paper sensor(s) used to stop printing when a paper-end is detected, using *n* as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near-end sensor disabled.
	On	01	1	Paper roll near-end sensor enabled.
1	Off	00	0	Paper roll near-end sensor disabled.
	On	02	2	Paper roll near-end sensor enabled.
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	-	-	-	Undefined.

[Notes]
- When a paper end is detected, printing stops after printing the current line and feeding the paper.
- The printer goes off-line after printing stops.
- The paper roll near-end sensor is enabled when either bit 0 or 1 is 1.

[Default] $n = 0$

ESC c 5 *n*

[Name] Enable/disable panel buttons

[Format]

ASCII	ESC	c	5	*n*
Hex	1B	63	35	*n*
Decimal	27	99	53	*n*

[Range] $0 \le n \le 255$

[Description] Enables or disables the panel buttons.
- When the LSB of *n* is 0, the panel buttons are enabled.
- When the LSB of *n* is 1, the panel buttons are disabled.

[Notes]
- When the panel buttons are disabled, none of them are usable when the printer cover is closed.
- In this printer, the panel button is the PAPER FEED button.
- When the printer cover is open, the PAPER FEED button is enabled regardless of the settings of this command.
- In the macro ready mode, the PAPER FEED button is enabled regardless of the settings of this command; however, the paper can not be fed by using this button.

[Default] $n = 0$

ESC d *n*

[Name] Print and feed *n* lines

[Format]

ASCII	ESC	d	*n*
Hex	1B	64	*n*
Decimal	27	100	*n*

[Range] $0 \le n \le 255$

[Description] Prints the data in the print buffer and feeds *n* lines.

[Notes]
- This command sets the print starting position to the beginning of the line.
- This command does not affect the line spacing set by **ESC 2** or **ESC 3**.
- The maximum paper feed amount is 40 inches. If the paper feed amount (*nx* line spacing) of more than 40 inches is specified, the printer feeds the paper only 40 inches.

ESC i

[Name] Execute partial cut (one point left uncut)

[Format]

ASCII	ESC	i
Hex	1B	69
Decimal	27	105

[Description] Executes a partial cut with one point left uncut.

[Notes]
- In standard mode, this command is enabled only when input at the beginning of a line.
- This command and **GS V 1** cut paper in the same way.

[Reference] **GS V**

ESC p *m t1 t2*

[Name] Generate pulse

[Format]

ASCII	ESC	p	*m t1 t2*
Hex	1B	70	*m t1 t2*
Decimal	27	112	*m t1 t2*

[Range] $m = 0, 1, 48, 49$

$0 \le t1 \le t2 \le 255$

[Description] Outputs the pulse specified by *t1* and *t2* to connector pin *m* as follows:

m	Connector pin
0, 48	Drawer kick-out connector pin 2
1, 49	Drawer kick-out connector pin 5

[Notes]
- The pulse ON time is [*t1* × 2 ms] and the OFF time is [*t2* × 2 ms].
- If t2 < t1, the OFF time is [*t1* × 2 ms]

ESC t *n*

[Name] Select character code table

[Format]

ASCII	ESC	t	*n*
Hex	1B	74	*n*
Decimal	27	116	*n*

[Range] $0 \le n \le 5$, $n = 255$

[Description] Selects a page *n* from the character code table.

n	Page
0	0 (PC437 [U.S.A., Standard Europe])
1	1 (Katakana)
2	2 (PC850 [Multilingual])
3	3 (PC860 [Portuguese])
4	4 (PC863 [Canadian-French])
5	5 (PC865 [Nordic])
255	Space page

[Default] $n = 0$

[Reference] *Character Code Tables*

ESC u *n*

[Name] Transmit peripheral device status

[Format]

ASCII	ESC	u	*n*
Hex	1B	75	*n*
Decimal	27	117	*n*

[Range] $n = 0, 48$

[Description] Transmits the status of connector pin *n*, using *n* as follows:

n	Connector pin
0, 48	Drawer kick-out connector pin 3

[Notes]
- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer keeps waiting until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without checking the DSR signal.
- This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **ESC u** and the ASB status must be differentiated.
- When the connector is not used, the value of bit 0 is always 1.
- The status to be transmitted is shown in the table below.

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Level of pin 3 is Low.
	On	01	1	Level of pin 3 is High.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Reference] **DLE EOT**, **GS a**, **GS r**

ESC v

[Name] Transmit paper sensor status

[Format]

ASCII	ESC	V
Hex	1B	76
Decimal	27	118

[Description] Transmits the current paper sensor status.

[Notes]
- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE).
  If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without checking the DSR signal.
- This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **ESC v** and the ASB status must be differentiated.
- The status to be transmitted is shown in the table below:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near-end sensor. Paper is present.
1	On	03	3	Paper roll near-end sensor. Paper is not present.
2	Off	00	0	Paper roll end sensor. Paper is present.
3	On	(0C)	(12)	Paper roll end sensor. Paper is not present.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bits 2and 3: When the paper roll end sensor detects a paper end, the printer goes off-line and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end.

[Reference] **DLE EOT**, **GS a**, **GS r**

ESC { *n*

[Name] Turns on/off upside-down printing mode

[Format]

ASCII	ESC	{	*n*
Hex	1B	7B	*n*
Decimal	27	123	*n*

[Range] $0 \le n \le 255$

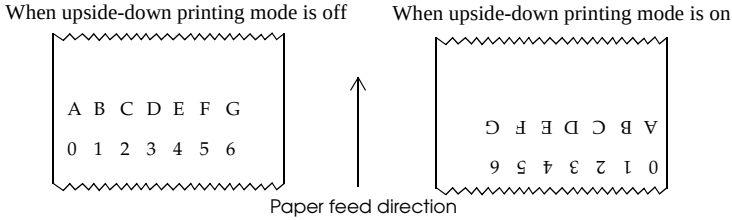
[Description] Turns upside-down printing mode on or off.

- When the LSB of *n* is 0, upside-down printing mode is turned off.
- When the LSB of *n* is 1, upside-down printing mode is turned on.

[Notes]
- This command is enabled only when input at the beginning of a line.
- When this command is input in page mode, the printer performs only internal flag operations.
- This command does not affect printing in page mode.
- In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.

[Default] *n* = 0

[Example]



GS ! *n*

[Name] Select character size

[Format]

ASCII	GS	!	*n*
Hex	1D	21	*n*
Decimal	29	33	*n*

[Range] $0 \le n \le 255$

($1 \le$ vertical number of times ≤ 8, $1 \le$ horizontal number of times ≤ 8)

[Description] Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Bit	Off/On	Hex	Decimal	Function
0	Character height selection. See Table 2.			
1				
2				
3				
4	Character width selection. See Table 1.			
5				
6				
7				

Table 1
Character Width Selection

Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (double-width)
20	32	3
30	48	4
40	64	5
50	80	6
60	96	7
70	112	8

Table 2
Character Height Selection

Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (double-hight)
02	2	3
03	3	4
04	4	5
05	5	6
06	6	7
07	7	8

[Notes]
- This command is effective for all characters (except for HRI characters).
- It *n* is outside of the defined range, this command is ignored.
- In standard mode, the vertical derection is the paper feed direction, and the horizontal derection is perpendicular to the paper feed direction. However, when character orientation changes in 90° clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.
- In page mode, vertical and horizontal directions are based on the character orientation.
- When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.
- The **ESC !** command can also turn double-width and double-height modes on or off. However, the setting of the last received command is effective.

[Default] *n* = 0

[Reference] **ESC !**

G S $ *nL nH*

[Name] Set absolute vertical print position in page mode

[Format]

ASCII	GS	$	*nL nH*
Hex	1D	24	*nL nH*
Decimal	29	36	*nL nH*

[Range] $0 \le nL, nH \le 255$

[Description]
- Sets the absolute vertical print starting position for buffer character data in page mode.
- This command sets the absolute print position to [(*nL* + *nH* × 256) × (vertical or horizontal motion unit)] inches.

[Notes]
- This command is effective only in page mode.
- If the [(*nL* + *nH* × 256) × (vertical or horizontal motion unit)] exceeds the specified printing area, this command is ignored.

- The horizontal starting buffer position does not move.
- The reference starting position is that specified by **ESC T.**
- This command operates as follows, depending on the starting position of the printing area specified by **ESC T**:
  ① When the starting position is set to the upper left or lower right, this command sets the absolute position in the vertical direction.
  ② When the starting position is set to the upper right or lower left, this command sets the absolute position in the horizontal direction.
- The horizontal and vertical motion unit are specified by **GS P**.
- The **GS P** command can change the horizpntal and vertical motion unit.However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

[Reference] **ESC $**, **ESC T**, **ESC W**, **ESC **, **GS P**, **GS **,

GS * *x y* [*d*] *x*×*y*×8

[Name] Define downloaded bit image

[Format]

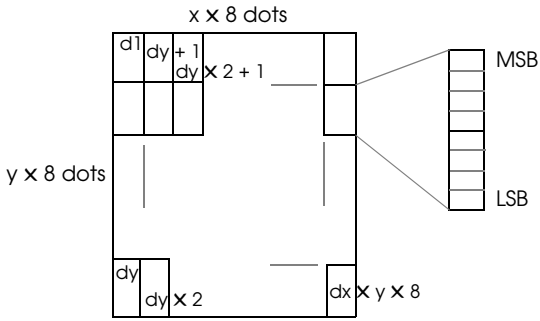
ASCII	GS	*	*x y* [*d*] *x* × *y* × 8
Hex	1D	2A	*x y* [*d*] *x* × *y* × 8
Decimal	29	42	*x y* [*d*] *x* × *y* × 8

[Range]
$1 \le x \le 255$
$1 \le y \le 48$
$x \times y \le 1536$
$0 \le d \le 255$

[Description] Defines a downloaded bit image using the dots specified by *x* and *y*.
- *x* indicates the number of dots in the horizontal direction.
- *y* indicates the number of dots in the verticall direction.
- The number of dots is *x* × 8 in the horizontal direction and *y* × 8 in the vertical direction.
- *d* indicates bit-image data. Set bit to 1 to print a dot and to 0 to not print a dot.

[Notes]
- If *x* × *y* is outside of the specified range, the printer ignores this command.
- A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the user-defined character is cleared.
- After a downloaded bit image is defined, it is available uutil **ESC @** or **ESC &** is executed; the printer is reset; or the power is turned off.

- The figure below shows the relationship between the bit-image data and dots to be defined.



[Reference] **GS /**

GS / *m*

[Name] Print downloaded bit image

[Format]

ASCII	GS	/	*m*
Hex	1D	2F	*m*
Decimal	29	47	*m*

[Range] $0 \le m \le 3, 48 \le m \le 51$

[Description] Prints a downloaded bit image in mode *m*.
The modes selectable by *m* are as follows:

m	Mode	Dot density in vertical	Dot density in horizontal
0, 48	Normal	180 DPI	180 DPI
1, 49	Double-width	180 DPI	90 DPI
2, 50	Double-height	90 DPI	180 DPI
3, 51	Quadruple	90 DPI	90 DPI

[Notes]
- This command is ignored if a downloaded bit image has not been defined.
- In standard mode, this command is effective only when the no data exists in the print buffer.
- This command is not affected by print modes (emphasized, double-strike, underline, or character size, white/black reverse printing), except for upsidedown mode.
- If a downloaded bit image exceeds the printing area, the excess data is not printed.

- If the width of the printing area set by **GS L** and **GS W** less than the width required by the data sent with the **GS /** command, the following will be performed on the line in question (but the printing cannot exceed the maximum printable area):
  ① The width of the printing area is extended to the right to accommodate the amount of data.
  ② If ① step does not provide sufficient width for the data, the left margin is reduced to accommodate the data.
  For each bit of data in normal mode (*m*=0, 48) and double heigh mode (*m*=2, 50), the printer prints one dot: for each bit of data in double width mode (*m*=1, 49) and quadruple mode (*m*=3, 51), the printer prints two dots.

[Reference] **GS ✻**

GS :

[Name] Start/end macro definition

[Format]

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

[Description] Starts or ends macro definition.

[Notes]
- Macro definition starts when this command is received during normal operation. Macro definition ends when this command is received during macro definition.
- When **GS ^** is received during macro definition, the priter ends macro definition and clears the definition.
- Macro is not defined when the power is turned on.
- The defined contents of the macro are not cleared by **ESC @**. Therefore, **ESC @** can be included in the contents of the macro definition.
- If the printer receives **GS :** again immediately after previously receiving **GS :** the printer remains in the macro undefined state.
- The contents of the macro can be defined up to 2048 bytes. If the macro definition exceed 2048 bytes, excess data is not stored.
- While the macro is defined, normal printing is executed.

[Reference] **GS ^**

GS B *n*

[Name] Turn white/black reverse printing mode

[Format]

ASCII	GS	B	*n*
Hex	1D	42	*n*
Decimal	29	66	*n*

[Range] $0 \le n \le 255$

[Description] Turns on or off white/black reverse printing mode.
- When the LSB of *n* is 0, white/black reverse mode is turned off.

- When the LSB of *n* is 1, white/black reverse mode is turned on.

[Notes]
- In white/black reverse printing mode, print dots and non-print dots are reversed. (Characters are printed in white on a black background.)
- This command is available for built-in characters and user-defined characters.
- When white/black reverse printing mode is on, it also applied to character spacing set by **ESC SP**.
- This command does not affect bit image, downloaded bit image, bar code, HRI characters, and spacing skipped by **HT**, **ESC $**, and **ESC** \.
- This command does not affect the space between lines.
- White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.

[Default] *n* = 0

GS H *n*

[Name] Select printing position for HRI characters

[Format]

ASCII	GS	H	*n*
Hex	1D	48	*n*
Decimal	29	72	*n*

[Range] $0 \le n \le 3, 48 \le n \le 51$

[Description] Selects the printing position of HRI characters when printing a bar code.

n selects the printing position as follows:

n	Printing position
0, 48	Not printed
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above and below the bar code

- HRI indicates Human Readable Interpretation.

[Note] HRI characters are printed using the font specified by **GS f**.

[Default] *n* = 0

[Reference] **GS f, GS K**

GS I *n*

[Name] Transmit printer ID

[Format]

ASCII	GS	I	*n*
Hex	1D	49	*n*

Decimal 29 73 *n*

[Range] $1 \le n \le 3, 49 \le n \le 51$

[Function] Transmits the printer ID specified by *n* as follows:

n	Printer ID	Specification	ID (hexadecimal)
1, 49	Printer model ID	TM-T85/T85P	08H
2, 50	Type ID	See table below.	
3, 51	ROM version ID	Depends on ROM version	

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two-byte character code not supported.
1	On	02	2	Auto-cutter equipped.
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Notes]

- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready.
- When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.
- The printer ID is transmitted when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
- The ROM version may be changed.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **GS I** and the ASB status must be differentiated.

GS L *nL nH*

[Name] Set left margin

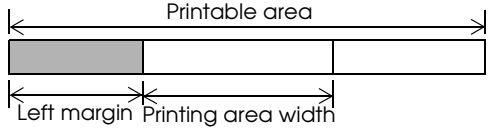
[Format]

ASCII	GS	L	*nL nH*
Hex	1D	4C	*nL nH*
Decimal	29	76	*nL nH*

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the left margin using *nL* and *nH*.

- The left margin is set to [(*nL* + *nH* × 256) × horizontal motion unit)] inches.



[Notes]

- This command is effective only at the beginning of a line.
- If this command is input in page mode, the printer performs only internal flag operations.
- This command does not affect printing in page mode.
- If the setting exceeds the printable area,the maximum value of the printable area is used.
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current left margin.
- The **GS P** command can change the horizontal (and vertical) motion unit.
  However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

[Default] *nL* = 0, *nH* = 0

[Reference] **GS P**, **GS W**

GS P *x y*

[Name] Set horizontal and vertical motion units

[Format]

ASCII	GS	P	*x y*
Hex	1D	50	*x y*
Decimal	29	80	*x y*

[Range] $0 \le x \le 255$
$0 \le y \le 255$

[Description] Sets the horizontal and vertical motion units to $1/x$ inch and $1/y$ inches, respectively.

When *x* and *y* are set to 0, the default setting of each value is used (*x* = 180, *y* = 360).

[Notes]

- The horizontal direction is perpendicular to the paper feed direction and the vertical direction is the paper feed direction.
- In standard mode, the following commands use x or y, regardless character rotation (upside-down or 90°clockwise rotation):
  ① Command using x: ESC SP, ESC $, ESC \, GS L, GS W

② Command using y: ESC 3, ESC J

- In page mode, the following commands use x or y, depending on character orientation:
  ① When the print starting position is set to the upper left or lower right of the printing area using ESC T (data is buffered in the direction perpendicular to the paper feed direction):
  Command using x: ESC SP, ESC $, ESCW, ESC\
  Command using y: ESC 3, ESC J, ESC W, GS $, GS\
  ② When the print starting position is set to the upper right or lower left of the printing area usinhg ESC T (data is buffered in the paper feed direction):
  Command using x: ESC 3, ESC J , ESC W, GS $, GS\
  Command using y: ESC SP, ESC $, ESC W, ESC\
- This command does not affect the previously specified values.
- The calculated result from combining this command with others is turncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default] $x = 180$, $y = 360$

[Reference] **ESC SP**, **ESC $**, **ESC 3**, **ESC J**, **ESC W**, **ESC **, **GS $**, **GS L**, **GS W**, **GS **

① GS V *m* ② GS V *m n*

[Name] Select cut mode and cut paper

[Format]

1ASCII	GS	V	*m*	
Hex	1D	56	*m*	
Decimal	29	86	*m*	
2ASCII	GS	V	*m*	*n*
Hex	1D	56	*m*	*n*
Decimal	29	86	*m*	*n*

[Range] $10 \le m \le 1$, $48 \le m \le 49$

$265 \le m \le 66$, $0 \le n \le 255$

[Description] Selects a mode for cutting paper and executes paper cutting. The value of *m* selects the mode as follows:

m	Print mode
0, 48	Full cut (cutting completely)
1, 49	Partial cut (one point left uncut)
65	Feeds paper for (cutting position + [n × (vertical motion unit)]), and cuts the paper completely.
66	Feeds paper for (cutting position + [n× (vertical motion unit)]), and cuts the paper partially(one point left uncut).

[Note for ① and ②]

- In standard mode, this command is effective only at the beginning of a line.

[Note for ①]
- When m = 1 or 49, this command operates the same way as **ESC i**.

[Notes for ②]
- When n= 0, the printer feeds the paper to the cutting position and cuts it.
- When $n \neq 0$, the printer feeds the paper to (cutting position + [$n \times$ vertical motion unit]) and cuts it.
- The horizontal and vertical motion unit are specified by **GS P**.
- The paper feed amount is calculated using the vertical motion unit (y). However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the mininmum horizontal movement amount.

[Reference] **ESC i**

GS W *nL nH*

[Name] Set printing area width

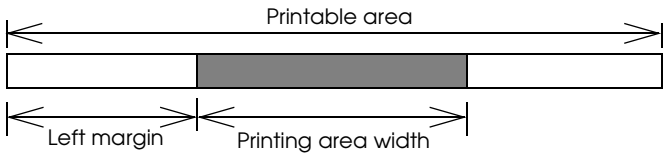
[Format]

ASCII	GS	W	*nL nH*
Hex	1D	57	*nL nH*
Decimal	29	87	*nL nH*

[Range] $0 \leq nL \leq 255$

$0 \leq nH \leq 255$

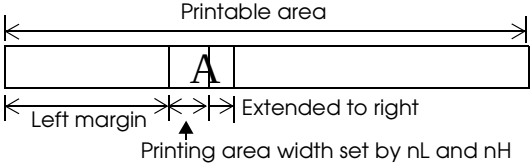
[Description] Sets the printing area width to the area specified by *nL* and *nH*.
- The printing area width is set to [(nL + nH × 256) × horizontal motion unit] inches.



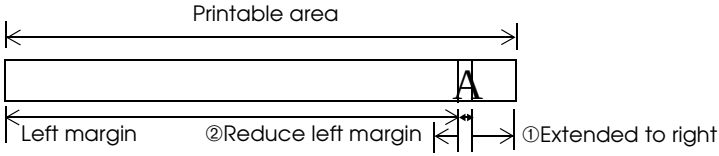
[Notes]
- This command is effective only at the beginning of a line.
- In page mode, the printer performs only internal flag operations.
- This command does not affect the printing in page mode.
- The maximum possible setting for the print range is the same as the maximum printable area in the horizontal position. Settings exceeding the maximum setting are rounded down to the maximum setting.
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current printing area width.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

- If the width set for the printing area is less than the width of one character, when the character data is developed, the following processing is performed:

  ① The set printing area width is extended to the right to accommodate one character.



  ② If the printing area width cannot be extended sufficiently, the left margin is reduced to accommodate one character.



- When developing the bit image for a downloaded bit image, the following processes are performed if the width of the printing area is less than the width required by the data sent with the **ESC ✻** or **GS /** command:

  ① The printing area width is extended to the right to accommodate the data.

  ② If the printing area is still insufficient at ①, the left margin is reduced to accommodate the data.

[Default] Thermal paper mode: $nL = 128$, $nH = 1$
Thermal label mode: $nL = 112$, $nH = 2$

[Reference] GSL, GS P

GS \ *nL nH*

[Name] Set relative vertical print position in page mode

[Format]

ASCII	GS	\	*nL nH*
Hex	1D	5C	*nL nH*
Decimal	29	92	*nL nH*

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the relative vertical print starting position from the current position in page mode.

- This command sets the distance from the current position to [($nL + nH \times 256$) × vertical or horizontal motion unit] inches.

[Notes]
- This command is ignored Unless page mode is selected.
- When pitch N is specified to the movement downward:
  $nL + nH \times 256 = N$
  When pitch N is specified to the movement upward (the negative direction), use the complement of 65536.
  When pitch N is specified to the movement upward:
  $nL + nH \times 256 = 65536 - N$
- Any setting that exceeds the specified printing area is ignored.
- The reference position is that at which data development starts.
- This command function as follows, depending on the print starting position set by **ESC T**:
  1 When the starting position is set to the upper left or lower left of the printing area, the vertical motion unit (y) is used.
  2 When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (x) is used.
- The horizontal and vertical motion unit are specifide by **GS P**.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

[Reference] **ESC $**,**ESC T**, **ESC W**, **ESC **, **GS $**, **GS P**

GS ^ *r t m*

[Name] Execute macro

[Format]

ASCII	GS	^	*r t m*
Hex	1D	5E	*r t m*
Decimal	29	94	*r t m*

[Range]
$0 \le r \le 255$
$0 \le t \le 255$
$0 \le m \le 1$

[Description] Executes a macro.
- r specifies the number of times to execute the macro.
- t specifies the waiting time for executing the macro.

The waiting time is $t \times 100$ msec for every macro execution.
- m specifies macro executing mode.
- When the LSB $m = 0$:

The macro executes r times continuously at the interval specified by t.
- When the LSB *of* $m = 1$:

After waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the PAPER FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation *r* times.

[Notes]
- If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.
- If the macro is not defined or if *r* is 0, nothing is executed.
- When the macro is executed by pressing the PAPER FEED button (*m* = 1), paper can not be fed by using the PAPER FEED button.

[Reference] **GS :**

GS a *n*

[Name] Enable/Disable Automatic Status Back

[Format]

ASCII	GS	a	*n*
Hex	1D	61	*n*
Decimal	29	97	*n*

[Range] $0 \le n \le 255$

[Description] Enables or disables ASB and specifies the status items to include, using *n* as follows:

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Drawer kick-out connector pin 3 status disabled.
	On	01	1	Drawer kick-out connector pin 3 status enabled.
1	Off	00	0	Off-line status disabled.
	On	02	2	Off-line status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Paper roll sensor status disabled.
	On	08	8	Paper roll sensor status enabled.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	-	-	-	Undefined.

[Notes]

- If any of the status items in the table above are enabled, the printer transmits the status when this command is executed. The printer automatically transmits the status whenever the enabled status item changes. The disabled status items may change, in this case, because each status transmission represents the current status.
- If all status items are disabled, the ASB function is also disabled.
- The following four status bytes are transmitted without confirming whether the host is ready to receive data. The four status bytes must be consecutive, except for the XOFF code.
- Since this command is executed sfter the data is processed in the receive buffer, there may be a time lag between data reception and status transmission.
- When the printer is disabled by **ESC =**, this command is disabled but ASB is not disabled.
- When using **DLE EOT, ESC u, ESC v, GS I,** or **GS r,** the status transmitted by these commands and ASB status must be differentiated.
- The status to be transmitted are as follows:

First byte (printer information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Not used. Fixed to Off.
1	Off	00	0	Not used. Fixed to Off.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Cover is closed.
	On	20	32	Cover is open.
6	Off	00	0	Paper is not being fed by the PAPER FEED button.
	On	40	64	Paper is being fed by the PAPER FEED button.
7	Off	00	0	Not used. Fixed to Off.

Second byte (error information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	No auto-cutter error.
	On	08	8	Auto-cutter error.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurs.
7	Off	00	0	Not used. Fixed to Off.

Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Paper roll near-end sensor. Paper adequate
1	On	03	3	Paper roll near-end sensor detects a paper near-end.
2	Off	00	0	Paper roll end sensor. Paper present.
3	On	0C	12	Paper roll end sensor detects a paper end.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Forth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Default] *n* = 0 when DIP SW 2-1 (serial interface) or DIP SW 1-3 (parallel interface) is off, *n* = 2 when DIP SW 2-1 (serial interface) or DIP SW 1-3 (parallel interface) is on.

[Reference] **DLE EOT**, **ESC u**, **ESC v**, **GS r**

GS b *n*

[Name] Turns smoothing mode on/off

[Format]

ASCII	GS	b	*n*
Hex	1D	62	*n*
Decimal	29	98	*n*

[Range] $0 \le n \le 255$

[Description] Turns smoothing mode on or off.

When LSB of *n* is 0, smoothing mode is turned off.

When LSB of *n* is 1, smoothing mode is turned on.

[Notes]
- Smoothing mode is available for built-in, user-defined characters.
- Even if smoothing mode is turned on, smoothing is not performed when either of character width or character height id the normal size.

[Default] *n* = 0

[Reference] **ESC !**, **GS !**

GS f *n*

[Name] Select font for Human Readable Interpretation (HRI) characters

[Format]

ASCII	GS	f	*n*
Hex	1D	66	*n*
Decimal	29	102	*n*

[Range] $0 \le n \le 1, 48 \le n \le 49$

[Description] Selects a font for the HRI characters used when printing a bar code.
n selects a font from the following table:

n	Font
0, 48	Font A (12 × 24)
1, 49	Font B (9 × 24)

- HRI indicates Human Readable Interpretation.

[Note]
- HRI characters are printed at the position specified by **GS H**.

[Default] *n* = 0
[Reference] **GS H, GS K**

GS h *n*

[Name] Select bar code height
[Format]

ASCII	GS	h	*n*	
Hex	1D	68	*n*	
Decimal	29	104	*n*	

[Range] 0 ≤ *n* ≤ 255
[Description] Selects the height of the bar code.
n specifies the number of dots in the vertical direction.
[Default] *n* = 162
[Reference] **GS K**

① GS k *m d1...dk NUL* ② GS k *m n d1...dn*

[Name] Print bar code
[Format]

①ASCII	GS	k	*m*	*d*1...d*k*	NUL	
Hex	1D	6B	*m*	*d*1...d*k*	00	
Decimal	29	107	*m*	*d*1...d*k*	0	
②ASCII	GS	k	*m*	*n*	*d*1...*dn*	
Hex	1D	6B	*m*	*n*	*d*1...*dn*	
Decimal	29	107	*m*	*n*	*d*1...*dn*	

[Range] ① 0 ≤ *m* ≤ 6 (k and d depends on the bar code system used)
② 65 ≤ *m* ≤ 73 (n and d depends on the bar code system used)
[Description] Selects a bar code system and prints the bar code.

m selects a bar code system as follows:

m		Bar Code System	Number of Characters	Remarks
①	0	UPC-A	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	1	UPC-E	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	2	JAN13 (EAN)	12 ≤ k ≤ 13	48 ≤ d ≤ 57
	3	JAN 8 (EAN)	7 ≤ k ≤ 8	48 ≤ d ≤ 57
	4	CODE39	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	5	ITF	1 ≤ k (even number)	48 ≤ d ≤ 57
	6	CODABAR	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d ≤ 68 , 36, 43, 45, 46, 47, 58
②	65	UPC-A	11 ≤ n ≤ 12	48 ≤ d ≤ 57
	66	UPC-E	11 ≤ n ≤12	48 ≤ d ≤ 57
	67	JAN13 (EAN)	12 ≤ n ≤13	48 ≤ d ≤ 57
	68	JAN 8 (EAN)	7 ≤ n ≤ 8	48 ≤ d ≤ 57
	69	CODE39	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47 d1 = dk = 42 ([1)
	70	ITF	1 ≤ n ≤ 255 (even number)	48≤ d ≤ 57
	71	CODABAR	1 ≤ n ≤ 255	48 ≤ d ≤ 57 65 ≤ d ≤ 68 , 36, 43, 45, 46, 47, 58
	72	CODE93	1 ≤ n ≤ 255	0 ≤ d ≤ 127
	73	CODE128	2 ≤ n ≤ 255	0 ≤ d ≤ 127

[Description for ①]

- *d* indicates the character code to be printed and *k* indicates the number of characters to be printed.

[Description for ②]

- *n* indicates the number of bar code data, and the printer processes *n* bytes from the next character data as bar code data.
- *d* indicates the character code to be printed.

[Notes for ①]

- This command ends with a NUL code.

- When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes bar code data and processes the following data as normal data.
- When the bar code system used is JAN13, the printer prints the bar code after receiving 13 bytes bar code data and processes the following data as normal data.
- When n the bar code system used is JAN8, the printer prints the bar code after receiving 8 bytes bar code data and processes the following data as normal data.
- The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

[Notes for ②]

- If n is outside of the specified range, the printer stops command processing and processes the following data as normal data.

[Notes in standard mode]

- If d is outside of the specified range, the printer only feeds paper and processes the following data as normal data.
- If the horizontal size exceeds printing area, the printer only feeds the paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
- This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following *m* as normal data.
- After printing bar code, this command sets the print position to the beginning of the line.
- This command is not affected by print modes (emphasized, double-strike, underline, or character size), except for upside-down mode.

[Notes in page mode]

- This command develops bar code data in the print buffer, but does not print it. After processing bar code data, this command moves the print position to the right side dot of the bar code.
- If *d* is out of the specified range, the printer stops command processing and processes the following data as normal data. In this case the data buffer position does not change.
- If bar code width exceeds the printing area, the printer does not print the bar code but moves the data buffer position to the left side out of the printing area.
- Refer to Figure 3.12.3 for bar code data buffer position.

[Reference] **GSH, GS f, GS h, GS w**

GS r *n*

[Name] Transmit status

[Format] ASCII GS r *n*

Hex	1D	72	*n*
Decimal	29	114	*n*

[Range] $1 \le n \le 2, 49 \le n \le 50$

[Description] Transmits the status specified by *n* as, follows:

n	Function
1, 49	Transmits paper sensor status (same as **ESC v**)
2, 50	Transmits drawer kick-out connector status (same as **ESC u 0**)

[Notes]

- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready.
  When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.
- This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **GS r** and the ASB status must be differentiated.
- The status types to be transmitted are shown below:

Paper sensor status (*n* = 1, 49):

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Paper roll near-end sensor. Paper adequate.
1	On	03	3	Paper near-end is detected by the paper roll near-end sensor.
2	Off	00	0	Paper end is not detected by the paper roll end sensor.
3	On	(0C)	(12)	Paper end is detected by the paper roll end sensor.
4	Off	00	0	Not used. Fixed to Off.
5	Off	-	-	Undefined.
6	Off	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bits 2 and 3: When the paper roll end sensor detects a paper end, the printer goes off-line and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end.

Drawer kick-out connector status (n = 2, 50):

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	01	1	Drawer kick-out connector pin 3 is HIGH.
1	-	-	-	Undefined
2	-	-	-	Undefined.
3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Reference] **DLE EOT**, **ESC u**, **ESC v**, **GS a**

GS w *n*

[Name] Set bar code width

[Format]

ASCII	GS	w	*n*
Hex	1D	77	*n*
Decimal	29	119	*n*

[Range] $2 \le n \le 6$

[Description] Set the horizontal size of the bar code.
n specified the bar code width as follows::

n	Module Width (mm) for Multi-level Bar Code	Binary-level Bsar Code	
		Thin element width (mm)	Thick element width (mm)
2	0.282	0.282	0.706
3	0.423	0.423	1.129
4	0.564	0.564	1.411
5	0.706	0.706	1.834
6	0.847	0.847	2.258

- Multi-level bar codes are as follows:
  UPC-A, UPC-E, JAN13, JNA8, CODE93, CODE128
- Binary-level bar codes are as follows:

CODE39, ITF, CODABAR

[Default] n=3

[Reference] **GS k**

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