thermal line printer

TM-L60II/L60IIP

Operator's Manual

400507202

FCC CLASS A

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.

WARNING

The connection of a non-shielded printer interface cable to this printer will invalidate the FCC Verification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

FOR CANADIAN USERS

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigenves du Règlement sur le matériel brouileur du Canada.

GEREÄUSCHPEGEL

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

DECLARATION of CONFORMITY for CE MARKING

Product Name: Printer
Type Name: M67LA

The printer conforms to the following Directives and Norms

Directive 89/336/EEC
- EN 55022 (1986 and 1994) class B
- EN 50082-1 (1992)
- IEC 801-2 (1991)
- IEC 801-3 (1984)
- IEC 801-4 (1991)

Directive 90/384/EEC
- EN45501: (1992)

DECLARATION of CONFORMITY for CE MARKING

Product Name: Printer
Type Name: M121A

The printer conforms to the following Directives and Norms

Directive 89/336/EEC
- EN 55022 (1986 and 1994) class B
- EN 50082-1 (1992)
- IEC 801-2 (1991)
- IEC 801-3 (1984)
- IEC 801-4 (1991)

Directive 90/384/EEC
- EN45501: (1992)

Introduction

The TM-L60II and TM-L60IIP are compact, easy-to-use printers that can be employed in the following applications.

- ❏ As a one-station printer with an ECR or POS system
- ❏ Output device for scaling or measuring
- ❏ As a ticket issuing device

The TM-L60II and TM-L60IIP have the following features:

- ❏ Compact, lightweight configuration
- ❏ High-speed printing of 12 lines/second
- ❏ Low-noise thermal printing
- ❏ Durable design for high reliability
- ❏ Easy maintenance and head cleaning
- ❏ ESC/POS® standard command protocol
- ❏ Routing of interface cable, drawer control cable, and power cable in any direction: sides, underneath, back
- ❏ Repeated operation and copy printing are possible by using macro definitions
- ❏ Built-in interface for 2-drawer control
- ❏ Print and eject label command reduces paper waste
- ❏ Characters can be scaled up to 64 times as large as the standard size. Smoothing is also possible
- ❏ Bar code printing is possible by using a bar code command. Bar codes can be printed both in the vertical direction (fence bar code) and in the horizontal direction (ladder bar code) (effective in page mode)
- ❏ Various layouts are possible by using page mode
- ❏ Serial number printing on label paper
- ❏ Water-resistant control panel
- ❏ Command selection of font sizes (12 x 24, 9 x 24)
- ❏ Four different print densities can be selected by DIP switches
- ❏ Bidirectional parallel interface in accordance with the IEEE 1284 Nibble/Byte Modes (TM-60IIP)

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

About This Manual

I. Setting Up

- ❑ **Chapter 1** contains information on unpacking the printer, choosing the place for the printer, and names and functions of parts.
- ❑ **Chapter 2** and **Chapter 3** contain information on connecting and setting up the printer.
- ❑ **Chapter 4** contains information on testing the printer.

II. Reference

- ❑ **Chapter 5** contains information on using the printer.
- ❑ **Chapter 6** contains information on software control including printer command descriptions.

APPENDIX

Appendixes contain information on general specifications, character code tables and a list of commands.

CONTENTS

I. Setting Up

II. REFERENCE

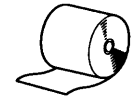
I. SETTING UP

Chapter 1 Unpacking the Printer

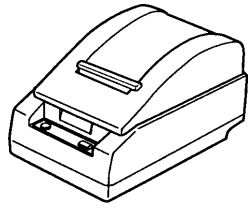
1-1 Checking the Contents of the Box

■ Checking the parts

Remove the printer and other parts from the box.



Roll paper



Printer

Operator's Manual

Make sure no parts are missing or damaged.

If you find any damaged or missing parts, please contact your dealer for assistance.

■ Maintenance

Keep the packing case and packing materials in case you ever need to transport or store your printer.

■ Optional parts

Power supply (PS-150)

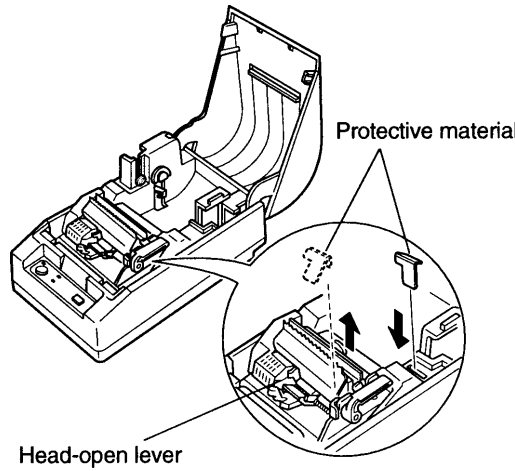
1-2 Choosing a Place for the Printer

- Avoid locations that are subject to direct sunlight or excessive heat (near heaters).
- Avoid using or storing the printer in places subject to excessive temperatures or moisture.
- Avoid using or storing the printer in locations subject to dust or dirt.
- Locate the printer on a flat, stable surface. Strong vibration or impact can damage the printer.
- Make sure there is enough space around the printer to allow normal operation.

1-3 Removing the Protective Material

An orange plastic spacer is put into the printing mechanism section to protect the printer from damage during transportation. Before you turn on the printer, be sure to remove the spacer according to the following steps.

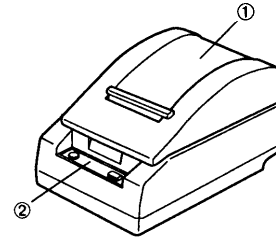
1. Open the printer cover.
2. Raise the head-open lever to remove the spacer.
3. Place the spacer in the storage space provided on the printer (see the illustration below). Remember to reinstall the spacer whenever transporting the printer.
4. Lower the head-open lever.

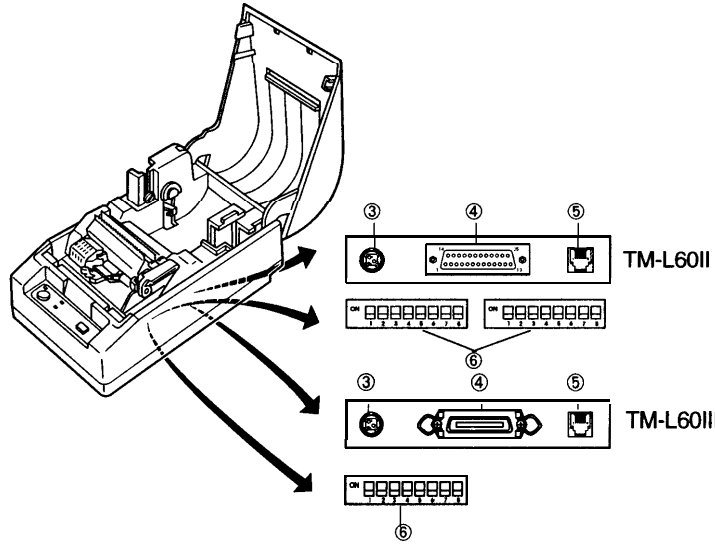


1-4 General Guide

■ **Part names**

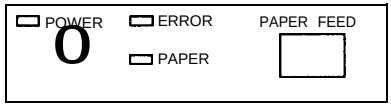
① Printer cover
② Operation panel
③ Power connector
④ Interface connector
⑤ Drawer kick-out connector
⑥ DIP switches (✻1)





✻ 1: The DIP switches are located behind the small cover on the bottom of the printer.

■ Operation panel



Panel buttons

① POWER

Press the POWER button to turn the printer ON and OFF. When the button is pushed down, power is on. When pressed again, the button returns to its original position, turning power off.

- Do not turn power off during printing.

② PAPER FEED

Press the PAPER FEED button to feed roll paper.

- Pressing PAPER FEED while the printer is in standby (caused by **GS FF** and **GS^)** exits the standby state.
- Pressing PAPER FEED while a self-test print operation is being performed interrupts the operation. Press PAPER FEED again to resume the self-test print.
- You also use this button to execute a macro.

Panel Lights (LED)

③ POWER (green)

The POWER light is on when power is turned on.

④ ERROR (red)

The ERROR light is on when the printer cover is not closed completely. The light blinks during an error condition.

⑤ PAPER (red)

The PAPER light is on when roll paper is not loaded or when the paper roll is near the end.

The light blinks when the printer is in the self-test standby mode, in the **GS FF** standby state, or in the macro ready mode.

Chapter 2 Before Setting Up

2-1 Connecting the Printer to the Computer

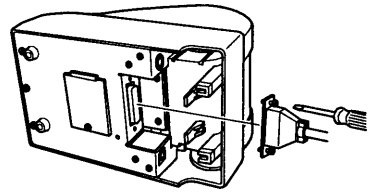
■ Connecting the Printer to a Host Machine

Use an interface cable that matches the specifications of both the printer and host machine (ECR or computer). Use the following procedure to connect the printer to a host machine.

TM-L60II

① Make sure that the printer and the computer are turned off.

② Plug the interface cable into the printer's interface port, and use a screwdriver to secure the cable in place with its screws, as shown.

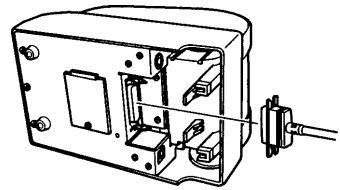


③ Connect the other end of the cable to the connector on your computer.

TM-L60IIP

① Make sure that the printer and the computer are turned off.

② Plug the interface cable into the printer's interface port, as shown.



NOTE:

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

③ Connect the other end of the cable to the connector on your computer.

2-2 Connecting the Printer to the Drawer

■ 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.

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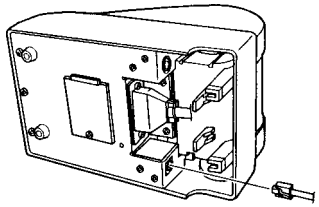

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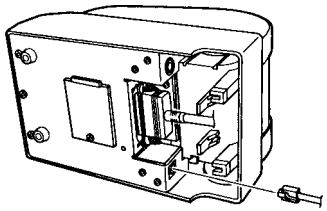

⚠ CAUTION:

Do not connect a telephone line to the Drawer kick-out connector.
Kein Telefonkabel an die Schnappsteckerbuchse anschließen.

- To unplug the drawer kick-out cable, press down on the connector's clip and pull.

2-3 Grounding the Printer

You need a ground wire to ground your printer. Make sure that the wire meets the specification 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.

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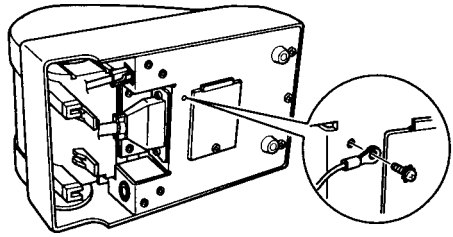

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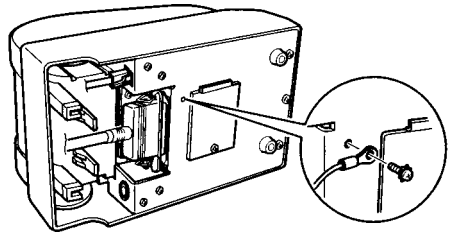

2-4 Connecting the Power Supply

■ Plugging in AC adapter

The printer must be connected to an external power supply using an AC adapter. Check to make sure that the power supply you are plugging into has the same voltage rating as that marked on your AC adapter.

⚠CAUTIONS:

- Before connecting the power supply, make sure that the voltage (24V DC) and other electrical specifications match the printer's requirements.
- Using an incorrect power supply can seriously damage your printer.

Use the following procedure to connect the power supply.

① Make sure that the power supply is turned off.

② Plug the power cable connector into the printer's power connector. Make sure that the arrow mark of the connector is facing towards the bottom of the printer.

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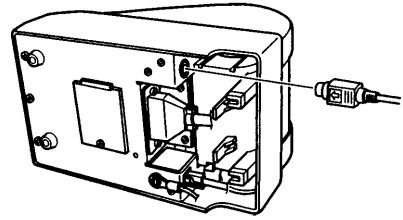

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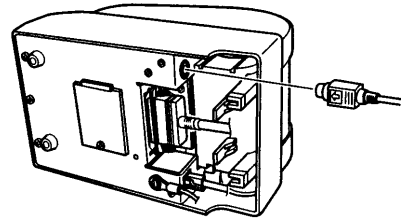


③ Plug the power supply's cord into an outlet.

- When unplugging the power cable from the printer, make sure you grasp the connector and pull it straight out.

Chapter 3 Installing the Parts

3-1 Installing the Roll Paper

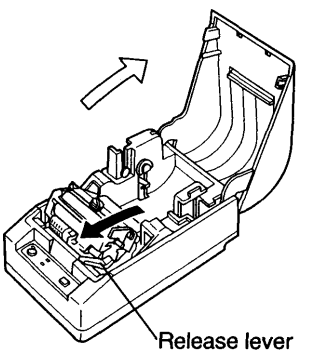
■ **Installing the roll paper**

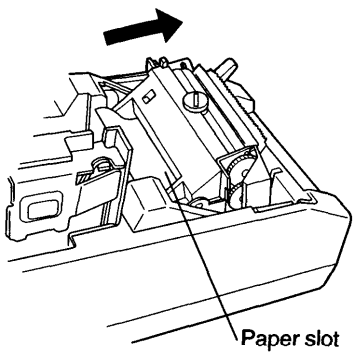
Be sure to use roll paper that matches the printer's specifications.

① Using scissors, cut the leading edge of the roll paper perpendicular to the paper feed direction.

② Open the printer cover and raise the release lever toward you.

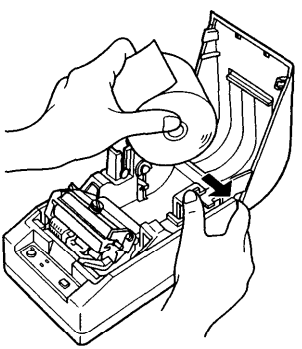
Make sure to pull the release lever out until the paper slot of the printer mechanism is facing up.

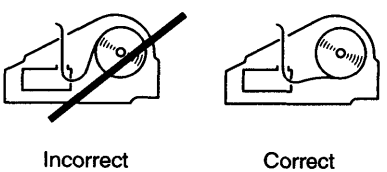




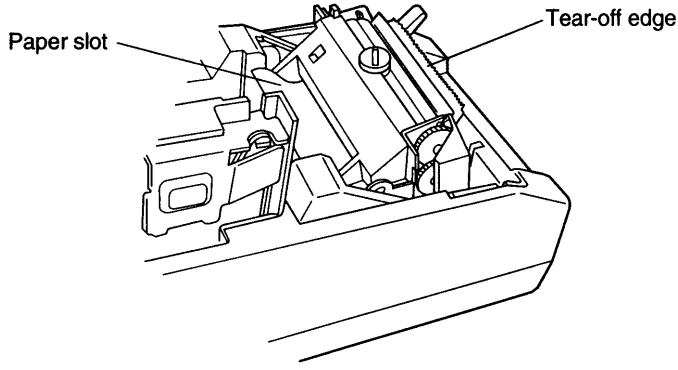
③ Load the roll paper while lightly pressing the right roll paper holder outward. Release the holder after fitting the paper core onto the holder. Make sure the roll paper turns freely.

- When loading roll paper, make sure to insert so that it feeds from the bottom.



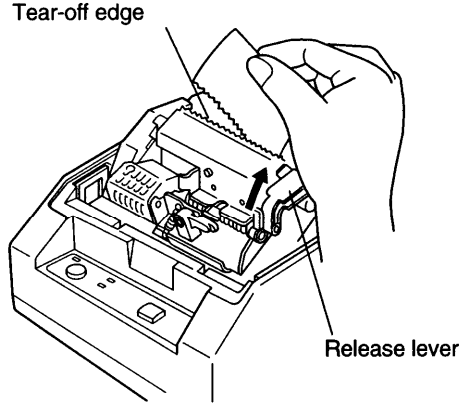


④ Insert the edge of the roll paper into the paper slot and feed the paper 5 cm beyond the tear-off edge.



⑤ Align the paper coming out of the paper exit with the paper on the paper roll, and pull the paper towards the roll to take up any slack.

⑥ Push down the release lever. Tear off any extra paper at the tear-off edge by pulling the paper toward you.



⑦ Close the printer cover.

3-2 Adjusting the Paper-end Detector

The printer has two paper detectors. A paper near-end detector detects that a roll of paper is nearing its end, which causes the PAPER LED lamp to light on the printer's control panel. In addition, a paper-end detector causes printer operation to stop automatically whenever it runs out of paper.

The paper near-end detector can be adjusted according to the thickness of the paper you are using.

■ How to adjust the paper near-end detector

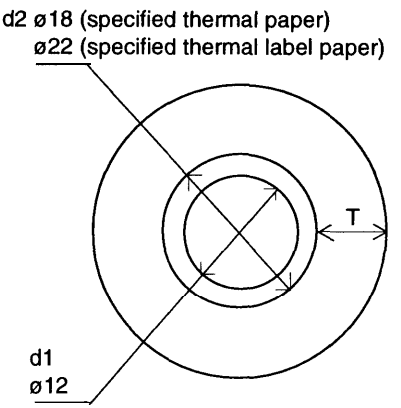
Roll paper may differ in spool size, so it may be necessary to adjust the paper near-end detector.

① Use the specified thermal paper roll with a core inside diameter (d1) of 12 mm and an outside diameter (d2) of 18 mm, or the specified thermal label paper with a core inside diameter (d1) of 12 mm and an outside diameter (d2) of 22 mm.

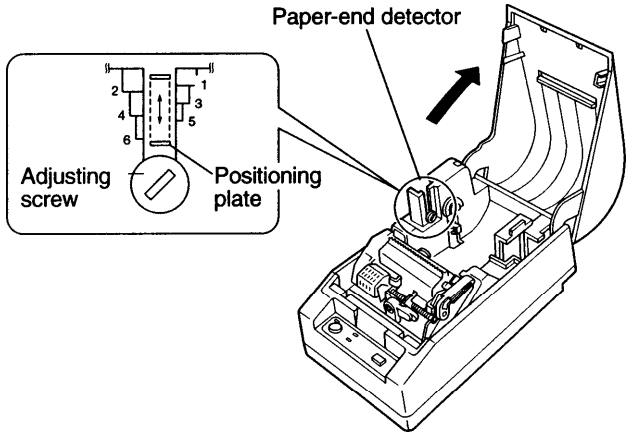
② The thickness of the spool can vary; use the table to determine the paper near-end detector adjustment.

Table 3-1. Adjustment Values of the Paper near-end Detector

Adjustment Value	Dimension of T (mm)	
	Specified thermal paper	Specified thermal label paper
#1	Approx. 0	Do not use
#2	Approx. 2 (0.08")	Approx. 0
#3	Approx. 4 (0.16")	Approx. 2 (0.08")
#4	Approx. 6 (0.24")	Approx. 4 (0.16")
#5	Approx. 8 (0.32")	Approx. 6 (0.24")
#6	Approx. 10 (0.39")	Approx. 8 (0.34")



③ Loosen the adjusting screw that holds the paper near-end detector. Then set the top of the positioning plate to the appropriate adjustment position, and tighten the adjusting screw.



NOTES:

- The T dimensions corresponding to the adjustment values in the table are calculated from standard measurements. There may be some variations in the actual mechanism.
- After adjusting, ensure that the detector operates smoothly.

3-3 Setting the DIP Switches

■ Setting the DIP switches

Follow these steps when changing DIP switch settings.

① Turn the printer off. If you are using a power unit, turn it off, too.

- Always make sure that power is turned off whenever you change DIP switch settings.

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

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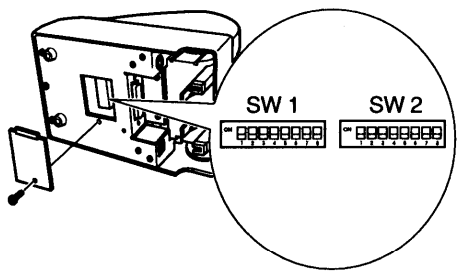

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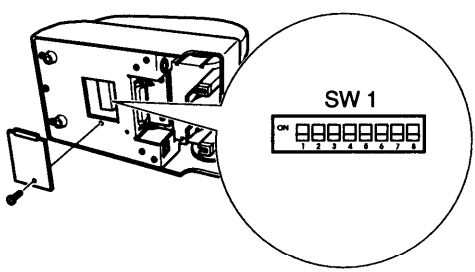


③ Notice that ON is marked on the switches. Use tweezers or another narrow tool to move the switches.

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-L60II).

TM-L60II DIP-Switch Functions

DIP Switch Set 1

SW Number	Function	ON	OFF
1	Data receive error	Ignored	Prints "?"
2	Receive buffer capacity	45 bytes	4K bytes
3	Handshaking	XON/XOFF	DTR/DSR
4	Word length	7 bits	8 bits
5	Parity check	Yes	No
6	Parity	Even	Odd
7	Data transmission speed	See Transmission Speed Table below	
8			

Transmission Speeds

Transmission Speed (BPS)	SW1-7	SW1-8
2400	ON	ON
4800	OFF	ON
9600	ON	OFF
19200	OFF	OFF

DIP Switch Set 2

SW Number	Function	ON	OFF
1	Handshaking (BUSY condition)	Receive buffer full	Off-line or receive buffer full
2	Select print density	See Print Density Table below	
3			
4	Undefined	-	-
5	Reserved. Setting must not be changed	Fixed to ON	
6	Select paper type	Thermal label paper	Thermal paper
7	I/F pin 6 reset signal	Used	Not used
8	I/F pin 25 reset signal	Used	Not used

Print Density

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

TM-L60IIP DIP-Switch Functions

DIP Switch Set 1

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

Print Density

Print Density	SW 2	SW 3
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-L60II).

Chapter 4 The Self Test

4-1 Checking Operation with the Self Test

■ The purpose of the self test

The self test checks whether the printer has any problems.
When the printer does not function properly, please contact the dealer.

■ The self test checks the following

- Control circuit functions
- Printer mechanism
- Print quality
- Control ROM version
- DIP-switch settings

■ Running the self test

① Make sure the roll-paper cover is closed and the roll paper is installed correctly.

② Turn on the power while holding down the PAPER FEED button. The self test begins.

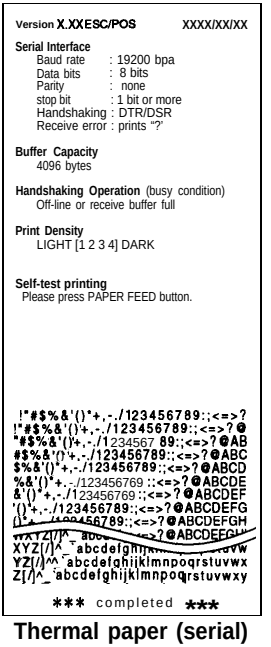
③ The following contents are printed for printer current status printing first.
- Control ROM version
- DIP-switch settings
- Interface settings
- Print density

④ After printing the printer current status, the printer blinks the PAPER LED and enters the test printing standby state.
Press the PAPER FEED button to restart test printing.

⑤ After the printer completes a certain number of lines, it prints "*** completed ***".

⑥ The printer performs initializing; then enters the normal mode.

* The printer goes off-line during and after self-test printing. Turn the power off and on again to put the printer on-line before transmitting data from the host computer.



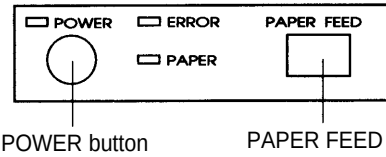
Thermal paper (serial)

II. REFERENCE

Chapter 5 Cautions while Using the Printer

5-1 Panel Buttons and Commands

■ **Buttons**



(1) POWER button

[Function] Turns the power supply on/off.

[Note]
- The RAM is initialized after turning off the circuit power supply.
- Do not touch the power button during printing.
- When label paper is used, the printer automatically sets the label at the starting position for printing just after turning on the power. (Paper feed amount varies by the type of label paper.)

(2) **PAPER FEED button**

[Function] If this button is pressed, when thermal paper is selected, the thermal paper is fed one line based on the currently specified line spacing. When label is selected, paper feeding is performed in label units regardless of the predetermined line spacing.

If this button is held for 200 ms or more, paper is fed as long as the button is pressed, and stops when the button is released.

- The defined macro is executed when the button is pressed in the macro executing command standby state.
- Paper is fed by operating this button, except during printing, in an error state, and in the macro executing command standby state.
- Pressing the PAPER FEED button recovers from waiting state of label ejection command **(GS FF)** execution or from self-test printing standby state.

[Note]
- The PAPER FEED button can be enabled or disabled by the **ESC c 5** command. When this button is disabled, you cannot feed paper with the button.

5-2 Printable Area and Label Paper Conditions

■ Printable area

The print area must be within the range indicated below.

Roll paper

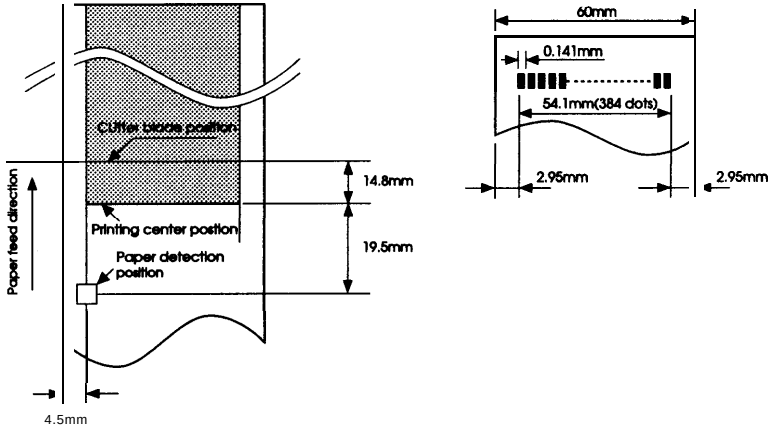


Figure 5-1. Roll Paper Printable Area

Label paper

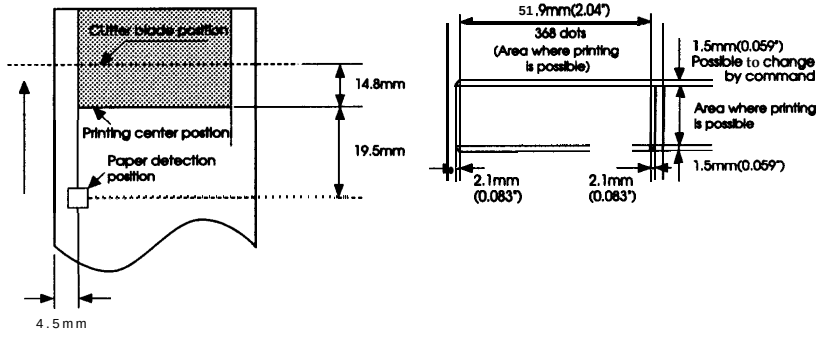


Figure 5-2. Label Paper Printable Area

■ **Label paper hole conditions**

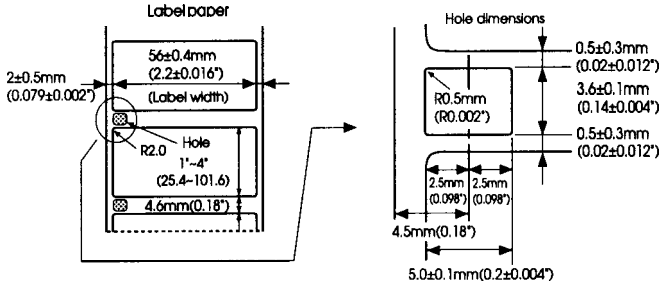


Figure 5-3. Label Paper Hole Conditions

■ **Label paper marker conditions**

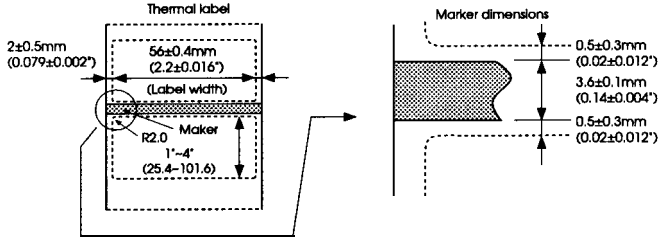


Figure 5-4. Label Paper Marker Conditions

NOTE
- Markers are printed on back of labels.
- OD value of the marker must be 1.2 mm (0.047") or more (reflectivity must be 7% or less).
- Do not use anything other than label rolls with the dimensions shown above. Do not mix labels with different lengths in one roll.

5-3 Miscellaneous Notes

■ Notes on printing and paper feeding

(1) Because the TM-L60II is a line printer, it automatically feeds paper after printing the data.

When the line spacing is set to a small value, the paper may be fed more than the set amount to print the data.

For example, when the line spacing is set to 10 dots (10/180 inch), the printer feeds just 10 dots; but 24 dots is fed when printing normal characters. (Refer to Table 5-1.)

When all the characters on one line are rotated, refer to Table 5-2 for paper feeding.

Table 5-1. Required Paper Feed Amount Dots (When the line spacing is set to 10 dots)

	Required Paper Feed Amount (dots)	
Characters	Normal characters	24
	Double-height	48
	Double-width	24
	Quadruple	48
Bit image		24

Table 5-2. Required Paper Feed Amount Dots (When all the characters on one line are rotated)

	Required Paper Feed Amount (dots)
Normal characters	12
Double-height	24
Double-width	12
Quadruple	24

(2) When the printer goes to the standby (data-waiting) state during printing, the printer stops printing and feeding paper temporarily. When the printer restarts, the paper may shift 1 to 3 dots at the start of printing. Graphics printing is especially affected by this.

■ Notes on the power supply

- Turn the external power supply on after connecting it to the power supply connector.
- Be sure you do not connect the external power supply with the wrong polarity. If it is connected incorrectly, the internal circuit fuse may blow or the external power supply may be damaged.
- The power supply voltage should be 24 VDC ±7%. The voltage fluctuation between no-load and printing should be ±2% or less. If the power supply voltage fluctuates more than this, print quality will be poor.

■ Notes on handling the printer mechanism

- Do not pull paper out (forward/backward directions) while the print head is down.
- The thermal elements of the head and driver IC are liable to be damaged; avoid touching them with anything made of metal.
- The areas around the print head and motor surface are very hot during and just after printing; do not touch directly with your fingers.
- Do not operate the head-open lever except when necessary.
- Do not touch the surface of the head thermal elements directly with your fingers. (Dust and dirt can stick to the surface, which will affect the thermal elements.)
- Thermal paper containing Na^-, K^-, and Cl^- ions will affect the head thermal elements. Be sure to use only the paper specified.

■ Notes on handling thermal paper and label paper

(1) Notes on using thermal paper

Chemicals and oil that come into contact with the thermal paper may cause discoloration, and can also cause the printing to fade.

Therefore, pay attention to the following:

a) Use water-based paste, starch paste, polyvinyl paste, or CMC paste when gluing thermal paper.

b) Volatile organic solvents such as alcohol, ester, and ketone can cause discoloration.

c) Some adhesive tapes may cause discoloration, and may also cause the printed image to fade.

d) If thermal paper touches anything which includes phthalic acid ester plasticizer for a long period, it can reduce the image formation ability of the paper and can cause the printed image to fade. When storing thermal paper in a card case or sample notebook, be sure to use only products made from polyethylene, polypropylene, or polyester.

e) If thermal paper touches diazo copy paper immediately after copying, the printed surface may discolor.

f) Thermal paper must not be stored with the printed surfaces against each other because the printing may be transferred between the surfaces.

g) If the surface of thermal paper is scratched with a nail or other hard metal object, it may discolor.

(2) Notes on thermal paper storage

Color development begins at 70°C, so the following precautions should be taken.

a) Store paper away from high temperature and humidity.

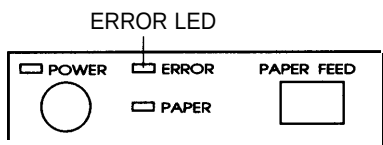
Do not store thermal paper near a heater or in direct sunlight.

b) Avoid direct light.

If exposed to direct light for a while, paper color may change or printed images may fade.

5-4 Error Correction

■ ERROR LED (red)

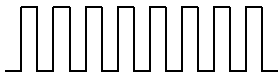
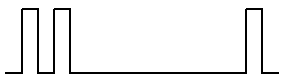
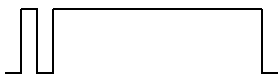
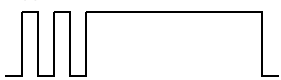
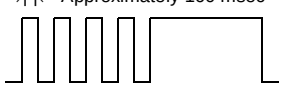
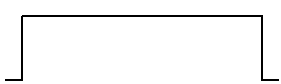


On: If this LED lights when the near-end LED is off, it means the printer cover is not closed.

If this LED lights the near-end LED is on, it means the printer went OFF-LINE after detecting a paper near-end.

Off: Normal state.

Table 5-3 Error Display

Print head temperature error	→| |← Approximately 160 msec  |←Approximately 2.56 sec→|	Recovers automatically when the print head cools.
Label detection error	|←Approximately 2.56 sec →|  →| |← Approximately 160 msec	Recovers by using a specified label.
Memory read/write error	→| |← Approximately 160 msec  |←Approximately 2.56 sec→|	Impossible to recover.
High voltage error	→| |← Approximately 160 msec  |←Approximately 2.56 sec→|	Impossible to recover.
Low voltage error	→| |← Approximately 160 msec  |←Approximately 2.56 sec→|	Impossible to recover.
CPU error	→| |← Approximately 160 msec  |←Approximately 2.56 sec→|	Impossible to recover.
Thermistor error	 |←Approximately 2.56 sec→|	Impossible to recover.

5-5 Cleaning the Head

■ Cleaning the head

Clean the head according to the following procedure.

⚠ CAUTION:

Do not clean the head immediately after printing; the head maybe hot.

① Open the printer cover and the head-open lever. If roll paper is loaded, remove it from the head area. The release lever should be down at this time.

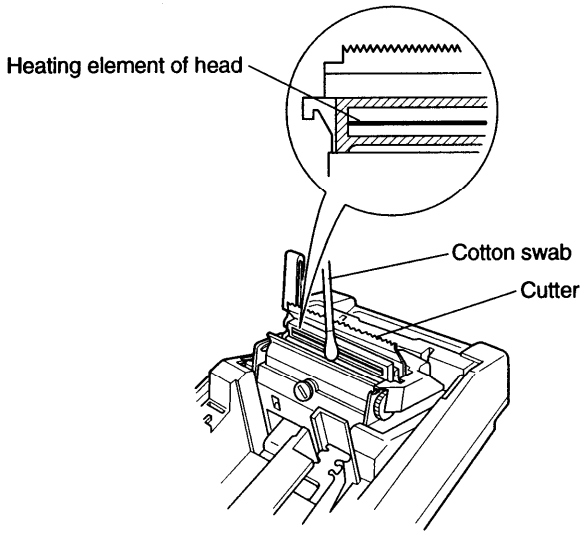
② Clean the heating element of the head with a cotton swab moistened with an alcohol solvent (ethanol, methanol, or IPA).

- Clean the cutter also with an alcohol solvent.

⚠ CAUTION:

Never touch the head; oils on your skin can damage the head.

③ Push the head-open lever down. Reload roll paper and close the printer cover. See 3-1.



5-6 The Cover-open Detector

■ The cover-open detector

This unit has a cover-open detector located inside the printer cover.

- Data is not printed when the printer cover is open.
- Opening the cover sets the printer OFF-LINE; data cannot be received when the printer & OFF-LINE.
- Closing the cover sets the printer ON-LINE automatically.

NOTE:
The printer cover cannot be closed unless the release lever and the head-open lever are down.

5-7 Removing Jammed Paper

Use the following procedure to clear a paper jam.

① Open the printer cover.

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

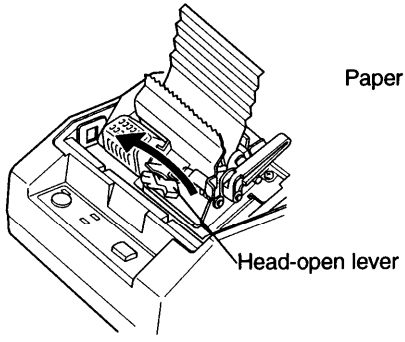
② Pull up the head-open lever to raise the print head. The release lever should be down at this time.

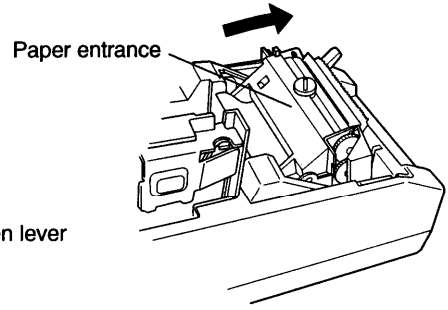
③ Loosen the paper guide screw to remove the upper part of the paper guide.

④ Remove the jammed paper.

⑤ Close the print head using the print head open lever.

⑥ Attach the upper part of the paper guide by using the paper guide fixing screw.





Chapter 6 Software Control

6-1 Printer Control

■ Controlling the printer with commands

The printer is controlled by “commands” that can change the size of the characters, and perform other functions.

There are two types of commands.

① One-byte commands

- **HT** Horizontal tab
- **LF** Print and line feed

② Multiple-byte commands

- **ESC SP** Set character right-side spacing
- **ESC 3 *n*** Set line spacing using minimum units

■ How commands are written

Commands must be issued as hexadecimal values, as shown below.

Command	Input Format	Meaning
HT	<09>H	'09' is the hexadecimal value for 'HT'.
LF	<OA>H	'OA' is the hexadecimal value for 'LF'.
ESC 2	<1B>H<32>H	'1B' is the hexadecimal value for 'ESC'. '32' is the hexadecimal value for '2'.
ESC 3 *n*	<1B>H<33>H<n>	'1B' is the hexadecimal value for 'ESC'. '33' is the hexadecimal value for '3'. 'n' is any decimal value you want.

The hexadecimal equivalents for all commands, letters, and numbers can be found in the Character Code Table on page 96.

Find the command, letter, or number you want to input, and then follow its column straight up to find the first digit of its hexadecimal equivalent. Next, follow the row to the left to find the second digit of the hexadecimal equivalent.

Note that the Character Code Table can also be used to find out binary equivalents if you need them.

6-2 Command Descriptions

■ Command descriptions

Command Notation

[Name]	The name of the command.
[Format]	The code sequence.
	In this description, < >H denotes hexadecimal numbers, < > denotes decimal numbers and < >B denotes binary numbers.
	[ ]*k* indicates the contents of the [ ] should be repeated *k* times.
[Range]	The allowable range for the arguments.
[Description]	Description of the command function.
[Notes]	(Included only when necessary.)
[Default]	The default values for the commands.
[Reference]	Related commands.
[Example]	Example of using the commands.

NOTE: Some of the command description include the sentence “This command is enabled only when input at the beginning of a line.” The phrase “beginning of a line” assumes that the following conditions have been met:

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

6-3 Commands

HT

[Name] Horizontal tab

[Format] ASCII HT
Hex 09
Decimal 9

[Description] Moves the print position to the next horizontal tab position.
- This command is ignored unless the next horizontal tab position has been set.

[Notes]
- Horizontal tab positions are set using **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 performs 1 line feed based on the current line spacing.
- Sets the print starting position to the beginning of the line.

[Reference] **ESC 2, ESC 3**, 5-3 *Miscellaneous Notes*

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.

FF

[Name] ① Print and return to standard mode (in page mode)
② Print and feed label to print starting position (on label)

[Format]

ASCII	FF
Hex	0C
Decimal	12

① When page mode is selected:

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

[Notes]
- The printing area set by **ESC W** is reset to the default setting.
- This command is effective only when page mode is selected.
- All data are cleared after printing.
- This command sets the print position to the beginning of the line.

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

② When label is selected:

[Description] Prints the data in the print buffer and feeds the next label to the print starting position.

[Notes]
- This command is effective only when the thermal label paper is selected by the DIP switch.
- This command sets the print position to the beginning of the line.

[Reference] **GS FF**, *3-3 DIP-Switch Functions*

DEL EOT *n*

[Name] Real-time status transmission

[Format]

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

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

[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 executes this command upon receiving it.

- When transmitting status, the printer transmits only 1 byte without confirming the condition of DSR signal.
- This command is executed even when the printer is off-line, the receive buffer is full, or an error occurs.
- This status is transmitted whenever the data sequence of 10H (16) 04H (4) *n* ($1 \leq n \leq 4$) is received.

Example:

In **ESC * *m nL nH[d1...dk],*** *d1* = 10H(16), *d2* = 04H(4), *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 kick-out signal is LOW (connector pin 3).
	On	04	4	Drawer kick-out signal is HIGH (connector 3).
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5	-	-	-	Undefined.
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 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.
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 stop due to a paper-end detected by the paper-end sensor or due to a paper near-end enabled by **ESC c 4**. Bit 5 = 1.

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	Off	00	0	No label detection error.
	On	04	4	Label detection error occurs.
3	—	—	—	Undefined.
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 6: When printing is stopped due to high print head temperature, bit 6 is On until the print head temperature drops sufficiently.

n=4: Paper roll 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 near-end sensor. Paper adequate.
	On	04	4	Paper near-end is detected by the paper near-end sensor.
3	-	-	-	Undefined.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Paper-end sensor. Paper adequate.
	On	20	32	Paper-end is detected by the paper-end sensor.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

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

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 printable area also exists in the currently specified printable 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 printable 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 [*n* x horizontal or vertical motion units].

[Notes]
- The right-side character spacing is [*n*x(horizontal or vertical motion unit)] inches.
- The right-side character spacing for double-width mode is twice the normal value.
- This command sets values independently in each mode (standard and page modes).
- The horizontal and vertical motion units are specified by **GS P.** Changing the horizontal or vertical motion units does not affect the current right-side spacing.
- 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.
- The horizontal or vertical motion unit differs in page mode, 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 **ES 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 x 24) selected.
	On	01	1	Character font B (9 x 24) selected.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	Emphasized mode not selected.
	ON	08	8	Emphasized mode selected.
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.

[Notes]

- When both double-height and double-width modes are selected, quadruple size characters are printed.
- The printer can underline all characters, but cannot underline the space set by **HT, ESC** $, **ESC \,** or 90° clockwise-rotated characters.
- The thickness of the underline is selected by **ESC** -, regardless 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 turn 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 E, ESC -, 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.

[Notes]
- The distance from the beginning of the line to the print position is [(*nL* + *nH* x 256) x (vertical or horizontal motion unit)] inches.
- Settings outside the specified printable area are ignored.
- The horizontal and vertical motion units 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 horizontat movement amount.
- In standard mode, the horizontal motion unit (*x*) is used.
- The horizontal or vertical motion unit differs in page mode, 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/cancels 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.

- Only the lowest bit of *n* is valid.

  When *n* = <* * * * * * * 1>B, the user-defined character set is selected.

  When *n* = <* * * * * * * 0>B, the user-defined character set is canceled.

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

[Default] *n* = 0

[Reference] **ESC &**

ESC & *y c1 c2 [x1 d1...d(y x x1)]..m[xk d1...d(y x xk)]*

[Name] Define user-defined characters

[Format]

ASCII	ESC	&	y	*c1*	*c2*
Hex	1B	26	*y*	*c1*	*c2*
Decimal	27	38	*y*	*c1*	*c2*

[Range] y= 3

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

$0 \le x \le 12$ Font A (12 x 24 font)

$0 \le x \le 9$ Font B (9 x 24 font)

$0 \le d1...d(y \times xk) \le 255$

$k = c2-c1+1$

[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).

[Notes]
- It is possible to define multiple characters for consecutive character codes.

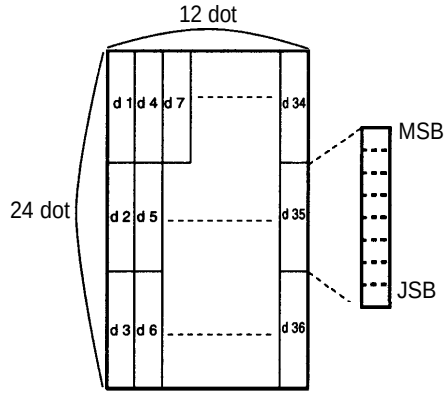
  If only one character is desired use *c1= c2.*
- This command can define different user-defined character patterns by each fonts. To select a font, use **ESC !.**
- A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.

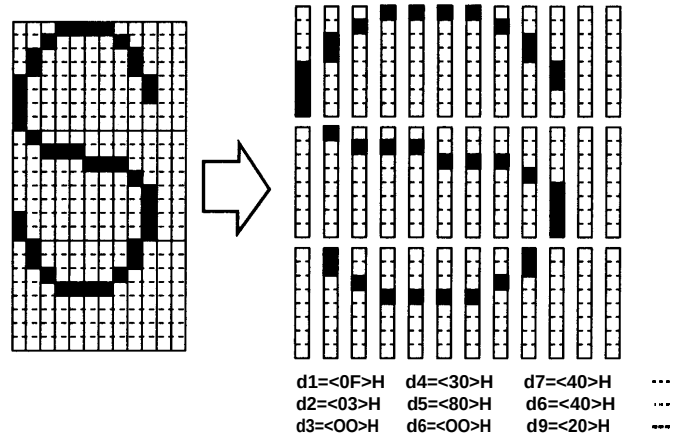
- After user-defined characters are defined, they are available until another definition is made; **ESC** @ , **GS** ✱ **,** or **ESC ?** is executed; the printer is reset; or the power is turned off.

[Default] The internal character set.

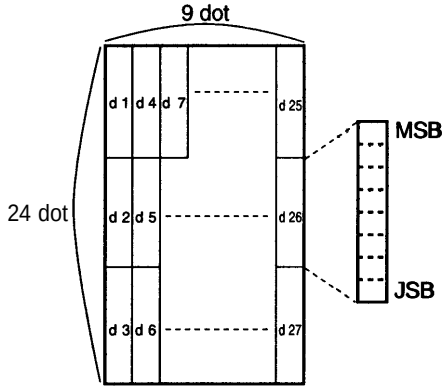
[Reference] **ESC %** , **ESC ?**

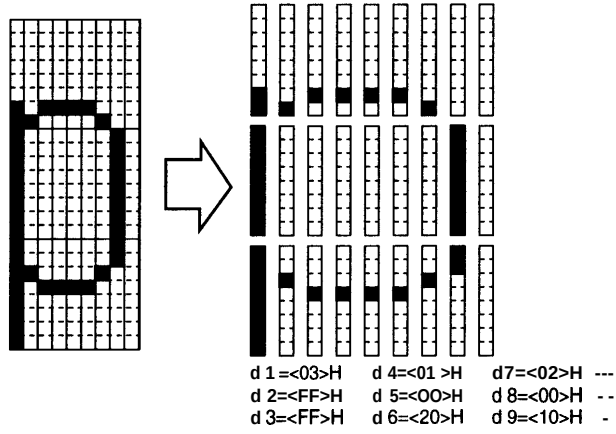
[Example] • When font A (12 X 24) is selected:





• When font B (9 X 24) is selected.





ESC * *m nL nH [d1...dk]*

[Name] Select bit-image mode

[Format]

ASCII	ESC	*	*m*	*nL*	*nH*	*[d1... dk]*
Hex	1B	2A	*m*	*nL*	*nH*	*[d1... .dk]*
Decimal	27	42	*m*	*nL*	*nH*	*[d1.. .dk]*

[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 *n* for the number of dots specified by *nL* and *nH,* as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		No. of Dots	Dot Density	Dot Density	Number of Data(K)
0	8-dot single-density	8	60DPI	90DPI	*nL* + *nH* x 256
1	8-dot double-density	8	60DPI	180DPI	*nL* + *nH* x 256
32	24-dot single-density	24	180DPI	90DPI	(*nL* + *nH* x 256) x 3
33	24-dot double-density	24	180DPI	180DPI	(*nL* + *nH* x 256) x 3

[Notes]

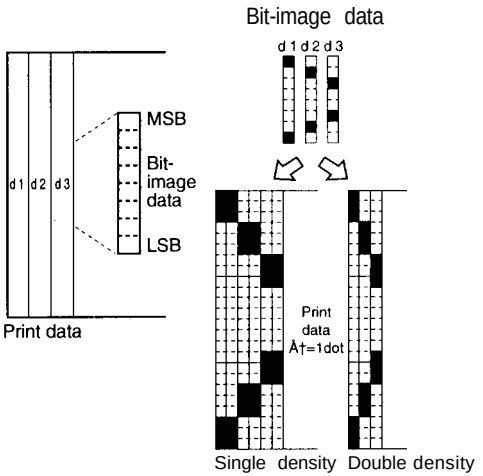
- The *nL* and *nH* indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by *nL* + *nH* x 256.
- If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
- *d* indicates the bit-image data. Set a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

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

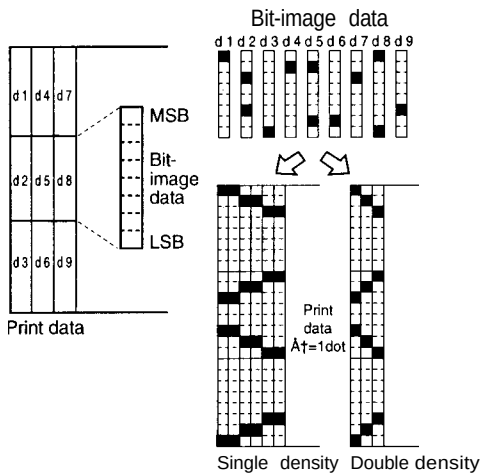
  ②If step ① does not provide sufficient width for the data, the left margin is reduced to accommodate the data. For each bit of data in single-density mode, the printer prints two dots: for each bit of data in double-density mode, the printer prints one dot. This must be considered in calculating the 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 is 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] Set 1/6 inch line spacing

[Format]

ASCII	ESC	2
Hex	1B	32
Decimal	27	50

[Description] Sets the line spacing to 1/6 of an inch.

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

[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 amount, and it must be in even units of the minimum vertical movement amount.
- In standard mode, the vertical motion until *(y)* is used.
- This command function as follows in page mode, 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 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] Select device

[Format]

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

[Range] $\boldsymbol{0} \leq \boldsymbol{n} \leq 255$

[Description] Selects a device to receive data from the host computer.

- If the printer is not selected, the printer ignores all received data (the data is lost) until it is selected by this command.
- 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.
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 until it is enabled by this command.
- Even if the printer is disabled, it may go off-line under certain conditions.

[Default] $n = 1$

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 character is canceled, the corresponding pattern for the internal character is printed.
- If a user-defined character has not been defined for the specified character code, the printer ignores this command.
- If ***n*** is out of the range, this command is ignored.

[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 same state as when the power is turned on).

[Notes]
- The DIP switches are not read again.
- The data in the receive buffer is not cleared.
- Adjustment amount of the label starting position using **GS A** command is not cleared.

ESC D [*n1...nk*] NUL

[Name] Set horizontal tab positions

[Format]

ASCII	ESC	D	NUL
Hex	1B	44	00
Decimal	27	68	0

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

$0 \leq k \leq 32$

[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 x *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 X 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] $0 \leq n \leq 255$

[Description] Turns emphasized mode on or off.

- Only the lowest bit of ***n*** is valid.

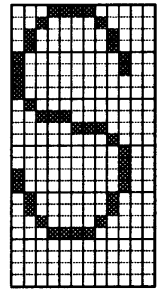
  When ***n*** =<*******1>B, the emphasized characters are selected.

  When ***n*** =<*******0>B, the emphasized characters are canceled.

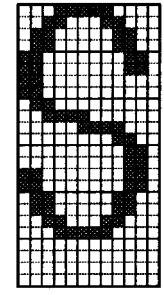
[Notes]
- **ESC !** also turns on and off emphasized mode. However, the last received command is effective.

[Default] $n = 0$

[Reference] **ESC !**



Normal character



Emphasized character

ESC G *n*

[Name] Select/cancel double-strike mode

[Format]

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

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

[Description] Selects or cancels double-strike mode.

- This command is available for all character types.
- Only the lowest bit of ***n*** is valid.

  When ***n*****=** <*******1>B**,** the double-strike mode is selected.

  When ***n*** **=** <*******0>B, the double-strike mode is canceled.

[Notes]

- In this printer, double-strike mode has the same function as emphasized mode.

[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] $0 \leq n \leq 255$

[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, and it must be in even units of the minimum 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.
- When label mode is selected and a paper feed amount that exceeds the length of one label is set, the printer feeds the label paper to the next print starting position.

[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 effect 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**
- Settings for the following commands are effective only in page mode:
  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 @.**

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

ESC R *n*

[Name] Select international character set

[Format]

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

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

[Description] *n* selects an international character set 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 and the printable area developed in page mode are cleared.
- 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**

- Settings for the following Commands are effective only in standard mode:

  ① Select print direction in page mode: **ESC T**

  ② Set printing area in page mode: **ESC W**

- This command is enabled only in page mode.
- This command sets the print position to the beginning of the line.

[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***

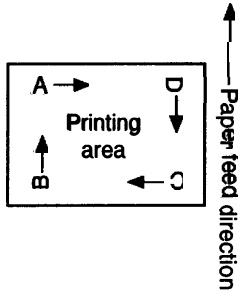
[Range] $0 \leq n \leq 3$

$48 \leq n \leq 51$

[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 perpendicular 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 **

Commands 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] $0 \leq n \leq 1, 48 \leq n \leq 49$

[Description] Turns 90° clockwise rotation mode on or off.

- When ***n*** = 1 or 49, 90° cw rotated characters are set.
- When ***n*** = 0 or 48, 90° cw rotated characters are canceled.

[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 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]

ASCII	ESC	W	*xL xH yL yH dXL dxH dyL dyH*
Hex	1B	57	*xL xH yL yH dXL dxH dyL dyH*
Decimal	27	87	x_L x_H y_L y_H *dxL dxH dyL dyH*

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

[Description] Sets the position and size of the printing area.

- 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 printable area is calculated as follows:

  $x0 = [(x_L + x_H \times 256) \times$ (horizontal motion unit)]

  $y0\ [(y_L + y_H \times 256 \times$ (vertical motion unit)]

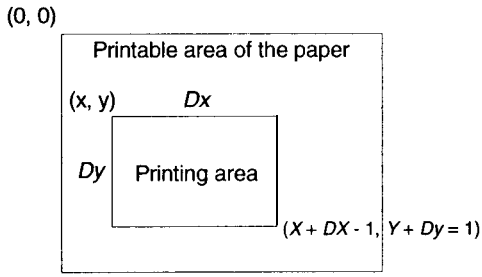
  $dx = [(dx_L + dxH \times 256) \times$ (horizontal motion unit)]

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

[Notes]

- If this command is input in standard mode, the printer executes printing in standard mode.
- If the horizontal 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 units 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 shown in the figure below.



[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] $0 \leq nL \leq 255$

$0 \leq nH \leq 255$

[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* x 256) x (horizontal or vertical unit)].

[Notes]

- When pitch *N* is specified to the right:

  nL + *nH* x 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* x *256=65536- N*

- The print starting position moves from the current position to [***N*** x (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.
- Any setting that exceeds the printable area is ignored.
- 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 justified within the specified printing area.
- Spaces set by **HT, ESC $,** and **ESC ** are all justified.

[Default] $n = 0$

[Example]

Left justification

```
ABC
ABCD
ABCDE
```

Centering

```
 ABC
ABCD
ABCDE
```

Right justification

```
  ABC
 ABCD
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] $0 \leq n \leq 255$

[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 end sensor enabled.
3	off	00	0	Paper roll end sensor disabled.
	On	08	8	Paper roll end sensor enabled.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	-	-	-	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.

[Default] *n* = 3

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 detector(s) used to stop printing when a paper-end is detected, using *n* as follows:

- Each bit of *n* is used 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] $0 \leq n \leq 255$

[Description] Enables or disables the panel buttons.

- Only the lowest bit of *n* is valid.

  When *n* = < * * * * * * * * 0>B, the panel buttons are enabled.

  When *n* = < * * * * * * * * 1>B, the panel buttons are disabled.

[Notes]

- When the panel buttons are disabled, none of them are usable.
- 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 or when the **GS FF** is executed, 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 paper *n* lines

[Format]

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

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

[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.
- When label mode is selected and a paper feed amount that exceeds the length of one label is set, the printer feeds the label paper to the next print starting position.

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

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] $0 \leq m \leq 1, 48 \leq m \leq 49$

$0 \leq t1, t2 \leq 255$

[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* x 2 ms] and the OFF time is [*t2* x 2 ms].
- If *t2* < *t1*, the OFF time is [*t1* x 2 ms].

ESC t *n*

[Name] Select character code table

[Format]

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

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

[Description] Selects a page *n* from the character code table, as follows:

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

[Notes]
- If *n* is outside the specified range, the printer ignores this command.

[Default] *n* = 0
[Reference] *Character Code Tables*

ESC u *n*

[Name] Transmit printer status
[Format]

ASCII	ESC	u	*n*
Hex	18	75	*n*
Decimal	27	117	*n*

[Range] *n* = 0, 48
[Description] Transmit the current status of connector pin.

- n is specified as follows:

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

[Notes]

- When the connector is not used, the value of bit 0 is always 1.

When using the serial interface RS-232:

- 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 u** 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	0	00	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 printer status

[Format] ASCII ESC v
Hex 1B 76
Decimal 27 118

[Description] The current printer status is transmitted to the host computer.

[Notes] When using the serial interface RS-232:

- 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.
- The 1-byte status data is transmitted after printing and paper feeding operations completely stop. (Transmit timing differs from **ESC u, GS I,** and **GS r).**
- 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	(OC)	(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 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.

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

ESC { *n*

[Name] Set/cancel upside-down character printing

[Format]

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

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

[Description] Sets or cancels upside-down character printing.

• Only the lowest bit of *n* is valid.

When ***n*** **=** <*******1>B, upside-down character printing is set.

When ***n*** **=** <*******0>B, upside-down character printing is canceled.

[Notes]

• The upside-down character specification rotates normal characters on the line by 180° and prints them.

• Valid only when input at the beginning of a line.

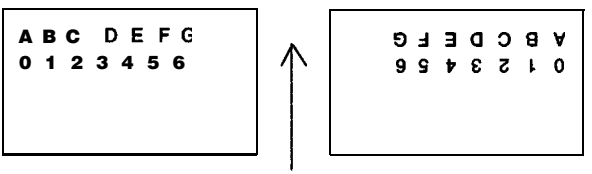
- When this command is input in page mode, the printer performs only internal flag operations.
- This command is disabled in page mode; settings in page mode are not affected.

[Default] $n = 0$

[Example]

When upside-down character printing is canceled.

When upside-down character printing is set.



GS FF

[Name] Print and eject label

[Format]

ASCII	GS	FF
Hex	1D	0C
Decimal	29	12

[Description] Prints the data in the print buffer on the label and ejects it.

[Notes]
- This command is effective only when the thermal label paper is selected by the DIP switches.
- Ejects the label until it can be peeled off by fingers.
- After ejection, an PAPER LED blinks and waits until the PAPER FEED button is pressed.
- When the PAPER FEED button is pressed, it is assumed that the label has been peeled off, and then paper feeding is performed to set the next label at the starting position for printing.
- After label ejection, the printer sets the next print position to the beginning of the line.

[Reference] **FF,** *3-3 Setting the DIP Switches*

GS ! *n*

[Name] Select character size

[Format]

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

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

[Description] Selects the character height using bits 0 to 3 and selects the character width using bits 4 to 7, as follows:

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

Table 1. Character Height Selection

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

Table 2. Character Width Selection

Hex	Decimal	Width (number of times)
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

[Notes]

- This command is effective for all characters (except for HRI characters).
- If *n* is outside of the defined range, this command is ignored.
- In standard mode, the vertical direction is the paper feed direction, and the horizontal direction 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 !**

GS $ *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* x** 256) x (vertical or horizontal motion unit)] inches.

[Notes]
- This command is effective only in page mode.
- If the **[(*nL* + *nH* x** 256) x (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 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 * *x y*[*d1...d*(*x* x *y* x *8*)]

[Name] Define down-loaded bit image

[Format]

ASCII	GS	*	*x*	*y*
Hex	1D	2A	*x*	*y*
Decimal	29	42	*x*	*y*

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

$1 \le y \le 48$

$x \times y \le 1536$

$0 \le d \le 255$

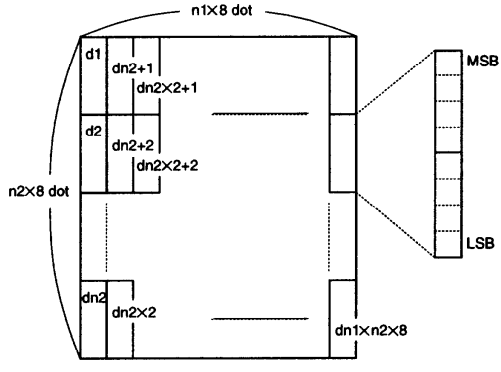
[Description] Defines a down-loaded bit image with the number of dots specified by x and y.

- *x* indicates the number of dots in the horizontal direction.
- *y* indicates the number of dots in the vertical 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 until **ESC @** or **ESC $** is executed; the printer is reset; or the power is turned off.

[Reference] **GS /**



GS / *m*

[Name] Print down-loaded 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 down-loaded bit image in mode *m*.

- *m* selects the print mode from the following table.

m	Mode	Vertical Direction Dot Density	Horizontal Direction Dot Density
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 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 printing area set by **GS L** and **GS W** is 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 the 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 normal mode (*m* = 0, 48) and double height 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 printer 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 exceeds 2048 bytes, excess data is not stored.

[Reference] **GS ✱**

GS <

[Name] Initialize printer mechanism

[Format]

ASCII	GS	<
Hex	1D	3C
Decimal	29	60

[Description] Initializes the label for printing.

[Notes]
- This command is effective only when the thermal label paper is selected depending on the DIP switches.
- Because the maximum label length is 4 inches, any labels exceeding 4 inches in length will cause error.
- The settings set by each command will not be initialized.

[Reference] *3-3 Setting the DIP Switches*

GS A *m n*

[Name] Adjust label paper position to start printing

[Format]

ASCII	GS	A	*m*	*n*
Hex	1D	41	*m*	*n*
Decimal	29	65	*m*	*n*

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

$0 \le n \le 255$

[Description] Sets the label position in terms of adjustment amount against default position.

- "*m*" indicates adjusting direction.

  When *m* =<*******0>B, positioning is adjusted in the normal direction.

  When *m* =<*******1>B, positioning is adjusted in the reverse direction.

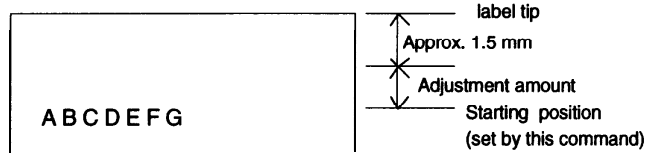
- "*n*" means the adjustment amount. It is *n* x (horizontal or vertical unit) inches.

[Notes]

- The default setting for the starting position is about 1.5 mm below the label tip.
- This command is effective only when "label print" is selected.
- This command is valid only after setting for the starting position by executing commands **(FF, GS FF, GS <, GS A),** pressing the PAPER FEED button or turning the power on.
- Because the maximum adjustment amount in reverse direction is 0.5 mm, any settings exceeding the maximum adjustment amount is set to the maximum adjustment amount.
- When adjusting the print starting position in the normal direction, any adjustment amount that will cause the printable area on a label to be narrower than 255/360 inches cannot be set. The maximum adjustment amount in the normal direction is (label length -1.5 mm, -1.5 mm, -255/360 inches). Any settings exceeding the maximum adjustment amount is set to the maximum adjustment amount.
- Make sure to set the starting position by considering the alignment of the starting position will be split out approx. ±1 mm because the paper is bent.

The starting position should not be outside the tip of the label.

- The vertical motion unit is specified by **GS P.**
- The vertical motion unit *(y) is* used for calculating the adjustment amount. The value cannot be less than the minimum vertical movement amount, and it must be in even units of the minimum vertical movement amount.



[Default] *m* = 0, *n* = 0

[Reference] **FF, GS FF, GS P,** *3-3 Setting the DIP Switches*

GS B *n*

[Name] Turn white/black reverse printing mode

[Format]

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

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

[Description] Turns on or off white/black reverse printing mode.

- When the LSB of *n* is 0, white/black reverse printing mode is turned off.
- When the LSB of *n* is 1, white/black reverse printing mode is turned on.

[Notes]

- Only the LSB of *n* is effective.
- 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.
- White/black reverse printing mode has a higher priority than underline mode. If underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.
- When white/black reverse printing mode is on, it applies to character spacing set by **ESC SP.**
- This command does not affect spacing skipped by bit images, downloaded bit images, bar codes (including Human Readable Interpretation (HRI) characters), **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 C 0 *n m*

[Name] Select counter print mode

[Format]

ASCII	GS	C	0	*n*	*m*
Hex	1D	43	30	*n*	*m*
Decimal	29	67	48	*n*	*m*

[Range] $0 \leq n \leq 5$

$0 \leq m \leq 2, 48 \leq m \leq 50$

[Description] Selects a print mode for the serial number counter.

- *n* specifies the number of digits to be printed as follows:

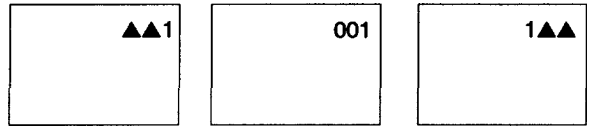
  When *n = 0,* the printer prints the actual digits indicated by the number value.

  When *n* = 1 to 5, this command sets the number of digits to be printed.

- *m* specifies the printing position within the entire range of printed digits, as follows:

m	Printing Position	Processing of Digits Less Than Those Specified
0, 48	Align right	Adds spaces to the left
1,49	Align right	Adds 0 to the left
2,50	Align left	Adds spaces to the right

[Examples] n=3, m=0 n=3, m= 1 n=3, m=2



▲ indicates a space

[Notes]

- If *n* or *m* is out of the defined range, the previously set print mode is not changed.
- If *n* = 0, *m* does not have any meanings.

[Default] *n* = 0, *m* = 0

[Reference] **GS C 1, GS C 2, GS c, GS C;**

GS C 1 *aL aH bL bH n r*

[Name] Select count mode (A)

[Format]

ASCII	G	S	C	1	*aL*	*aH*	*bL*	*bH*	*n*	*r*
Hex	1D	42	31	*aL*	*aH*	*bL*	*bH*	*n*	*r*	
Decimal	29	67	49	*aL*	*aH*	*bL*	*bH*	*n*	*r*	

[Range]
$0 \le aL \le 255$
$0 \le aH \le 255$
$0 \le bL \le 255$
$0 \le bH \le 255$
$0 \le n \le 255$
$0 \le r \le 255$

[Description] Selects a count mode for the serial number counter.

- *aL, aH* and *bL, bH* specify the range of the counter.
- *n* indicates the stepping amount when counting up or down.
- *r* indicates the repetition number when the counter value is fixed.
- Count-up mode is specified when:
  [*aL* + *aH* x 256] < [*bL* + *bH* x 256] and $n \neq 0$ and $r \neq 0$
- Count-down mode is specified when:
  [*aL* + *aH* x 256] < [*bL* + *bH* x 256] and $n \neq 0$ and $r \neq 0$
- Counting stops when:
  [*aL* + *aH* x 256] = [*bL* + *bH* x 256] or $n = 0$ and $r = 0$

[Notes]

- When this command is executed, the internal counter that indicates the repetition number specified by *r* is cleared.
- In setting count-up mode, the minimum value of the counter is *[aL* + *aH* x 256] and the maximum value is *[bL* + *bH* x 256] . If counting up reaches a value exceeding the maximum, it is resumed with the minimum value.
- In setting count-down mode, the maximum value of the counter is *[aL* + *aH* x 256] and the minimum value is *[bL* + *bH* x 256]. If counting down reaches a value less than the minimum, it is resumed with the maximum value.

[Default] *aL*=1, *aH*=0, *bL*=255, *bH*=255, *n*=1, *r*=1

[Reference] **GS C 0, GS C 2, GS C;, GS c**

GS C 2 *nL nH*

[Name] Set counter (in label mode)

[Format]

ASCII	GS	C	2	*nL*	*nH*
Hex	1D	43	32	*nL*	*nH*
Decimal	29	67	50	*nL*	*nH*

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

$0 \leq nH \leq 255$

[Description] Sets the serial number value.

- *nL* + *nH* determine the value of the serial number counter is set by [*nL* + *nH* x 256].

[Notes]

- In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C;** it is forced to convert to the minimum value by **GS c.**
- In count-down, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C;** it is forced to convert to the maximum value by **GS c.**

[Default] *nL* =1, *nH* = 0

[Reference] **GS C 0, GS C 1, GS C;, GS c**

GS C; *sa*; *sb*; *sn*; *sr*; *sc*;

[Name] Select count mode (B)

[Format]

ASCII	GS	C	;	*sa*	;	*sb*	;	*sn*	;	*sr*	;	*sc*	;	
Hex	1D	43	3B	*sa*	3B	*sb*	3B	*sn*	3B	*sr*	3B	sc	3B	
Decimal	29	67	59	*sa*	59	*sb*	59	*sn*	59	*sr*	59	*sc*	59	

[Range] $0 \leq sa \leq 65535$

$0 \leq sb \leq 65535$

$0 \leq sn \leq 255$

$0 \leq sr \leq 255$

$0 \leq sc \leq 65535$

These values are all character strings.

[Description] Select count mode of the serial number counter and specifies the value of the counter.

- *sa* and *sb* specify the range of the counter.
- *sn* indicates the stepping amount for counting up or down.
- *sr* indicates the repetition number with the counter value fixed.
- *sc* indicates the counter value.

- Count-up mode is specified when:

  $sa < ab$ and $sn \neq 0$ and $sr \neq 0$

- Count-down mode is specified when:

  $sa > sb$ and $sn \neq 0$ and $sr \neq 0$

- Counting stops when:

  $sa = ab$ or $sn = 0$ or $sr = 0$

[Notes]

- When count-up mode is specified, *sa* is the minimum counter value and *sb* is the maximum counter value. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by *sc* is outside the counter operation range, the counter value is forced to convert to the minimum value by **GS c.**
- When count-down mode is specified, *sa* is the maximum counter value and *sb* is the minimum counter value. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the maximum value by executing **GS c**
- Parameters *sa* to *sc* can be omitted. If omitted, these argument values are unchanged.
- If an incorrect syntax is used, the corresponding parameter setting has no effect and the data after that is processed as normal data.

[Default] *sa* = 1, *sb* = 65535, *sn* = 1, *sr* = 1, *sc* = 1

[Reference] **GS C 0, GS C 1, GS C 2, GS c**

GS H *n*

[Name] Select printing position of HRI characters

[Format]

ASCII	G	S	H	n
Hex	ID	48	*n*	
Decimal	29	72	*n*	

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

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

• *n* selects the printing position from the following table.

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 means Human Readable Interpretation.

[Notes] • 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-L60II/L60IIP	0BH
2, 50	Type ID	Refer to table below.	
3, 51	ROM version ID	Depends on ROM version.	

Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two-byte character code not supported.
1	Off	00	0	Auto cutter not equipped.
2	Off	00	0	Non-label thermal paper.
	On	04	4	Label thermal paper.
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 using the serial interface RS-232:

- 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.
- 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]

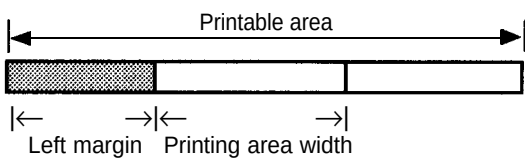
ASCII	GS	L	*nL*	*nH*
Hex	1D	4C	*nL*	*nH*
Decimal	29	76	*nL*	*nH*

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

$0 \leq nH \leq 255$

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

- The left margin is set to [(*nL* + *nH* x 256) x (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 units. 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 W, GS P**

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] $0 \leq x \leq 255$

$0 \leq y \leq 255$

[Description] Sets the horizontal and vertical motion units to 1/x inch and 1/y inch, 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 of 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 $, ESC W, ESC **

  Command using *y*: **ESC 3, ESC J, ESC W, GS $, GS A, GS **

  ② When the print starting position is set to the upper right or lower left of the printing area using **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 \, GS A**

- This command does not affect the previously specified values.
- The calculated result from combining this command with others is truncated 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 A, GS L, GS W, GS **

GS W *nL nH*

[Name] Set printing area width

[Format]

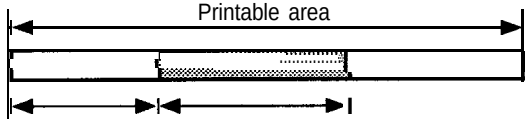
ASCII	GS	W	*nL*	*nH*
Hex	1D	57	*nL*	*nH*
Decimal	29	87	*nL*	*nH*

[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* x 256) x horizontal motion unit] inches.

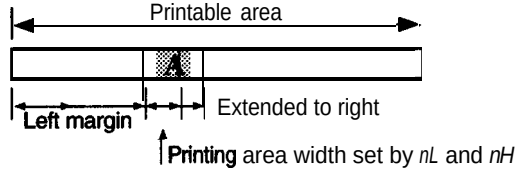


[Notes]

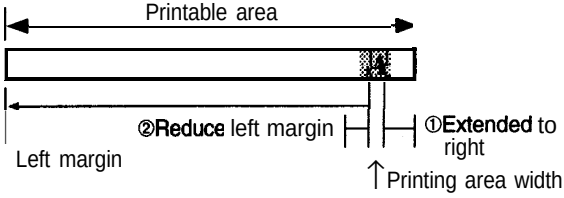
- This command is effective only at the beginning of a line.
- If this command is input in page mode, the printer performs only internal flag operations.
- This command does not affect the printing in page mode.
- The maximum possible setting for the print range is the same as the maximum printable area 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] Setting by the DIP Switches:

Thermal paper mode: *nL*= 128, *nH* = 1

Thermal label mode: *nL* =112, *nH* = 2

[Reference] **GS L, GS P,** 3-3 *Setting the DIP Switches*

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] $0 \leq nL \leq 255$

$0 \leq nH \leq 255$

[Description] This command sets the distance from the current position to [(*nL* + *nH* x 256) x (vertical or horizontal motion unit)] inches.

[Notes]

- When pitch N is specified to the movement downward:

  nL+ *nH* x 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* x 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 functions 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 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.

[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] $0 \leq r \leq 255$

$0 \leq t \leq 255$

$0 \leq m \leq 1$

[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* x 100 msec for every macro execution.
- *m* specifies macro executing mode.
- When the LSB of *m* = O:

  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 cannot be fed by using the PAPER FEED button.

[Reference] **GS:**

GS a *n*

[Name] Enable/disable Automatic Status Back (ASB)

[Format]

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

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

[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	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]

- 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 after 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 using 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	Off	00	0	Undefined.
	On	01	1	Undefined.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	off	00	0	No label detection error.
	On	04	4	Label detection error occurs.
3	off	00	0	Undefined.
	On	08	8	Undefined.
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.
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	00	12	Paper roll end sensor detects a paper-end.
4	off	00	0	Not used. Fixed to Off.
5	off	00	0	Undefined.
	On	20	32	Undefined.
6	off	00	0	Undefined.
	On	40	64	Undefined.
7	off	00	0	Not used. Fixed to Off.

Fourth byte (paper sensor information):

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Undefined.
	On	01	1	Undefined.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	04	4	Undefined.
3	off	00	0	Undefined.
	On	08	8	Undefined.
4	off	00	0	Not used. Fixed to Off.
5	off	00	0	Undefined.
	On	20	32	Undefined.
6	off	00	0	Undefined.
	On	40	64	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] **DEL EOT, ESC u, ESC v, GS r,** 3-3 *Setting the DIP Switches*

GS b *n*

[Name] Turn smoothing mode on/off

[Format]

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

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

[Description] Turns smoothing mode on or off.

- When the LSB of *n* is 0, smoothing mode is turned off.
- When the 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 is the normal size.

[Default] *n* =0.

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

GS c

[Name] Print counter

[Format]

ASCII	GS	c
Hex	1D	63
Decimal	29	99

[Description] Prints the serial counter.

- Sets the current counter value in the print buffer as a print data (character string) and then counts up or down the counter based on the count mode set.

[Notes]

- The printer prints the counter values developed in the print buffer when the printer receives the print command or is in the print buffer-full state.
- The print mode of the counter is set by **GS C 0.**
- The counter mode is set by **GS C 1** or **GS C;.**

With counting up

- If the counter value set by this command goes out of the counter operation range set by **GS C 1** or **GS C;,** it will be forced to convert to the minimum by **GS c.**

With counting down

- If the counter value set by this command goes out of the counter operation range set by **GS C 1 or GS C:,** it will be forced to convert to the maximum by **GS c.**

[Reference] **GS C 0, GS C 1, GS C 2, GS C;**

GS f *n*

[Name] Select font for HRI characters.

[Format]

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

[Range] *n* = 0, 1, 48, 49

[Description] Selects a font for the HRI characters used when printing a bar code.

- *n selects* the font from the following table.

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

- HRI means Human Readable Interpretation.

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

[Default] *n* = 0

[Reference] **GS H, GS k**

GS h *n*

[Name] Select height of bar code

[Format]

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

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

[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]

①	ASCII	GS	*k*	*m*	NUL
	Hex	1D	6B	*m*	00
	Decimal	29	107	*m*	0

② ASCII GS *k m n*
Hex 1D 6B *m n*
Decimal 29 107 *m n*

[Range] ① $0 \le m \le 6$ (*k* and *d* depends on the bar code system used)
② $65 \le m \le 73$ (*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	$11 \le k \le 12$	$48 \le d \le 57$
	1	UPC-E	$11 \le k \le 12$	$48 \le d \le 57$
	2	JAN13 (EAN)	$12 \le k \le 13$	$48 \le d \le 57$
	3	JAN8 (EAN)	$7 \le k \le 8$	$48 \le d \le 57$
	4	CODE39	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	5	ITF	$1 \le k$ (even number)	$48 \le d \le 57$
	6	CODABAR(NW-7)	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 68$, 36, 43, 45, 46, 47, 58
②	65	UPC-A	$11 \le n \le 12$	$48 \le d \le 57$
	66	UPC-E	$11 \le n \le 12$	$48 \le d \le 57$
	67	JAN13(EAN)	$12 \le n \le 13$	$48 \le d \le 57$
	68	JAN8(EAN)	$7 \le n \le 8$	$48 \le d \le 57$
	69	CODE39	$1 \le n \le 255$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	70	ITF	$1 \le n \le 255$ (even number)	$48 \le d \le 57$
	71	CODABAR	$1 \le n \le 255$	$48 \le d \le 57$ $65 \le d \le 68$, 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \le n \le 255$	$0 \le d \le 127$
	73	CODE128	$2 \le n \le 255$	$0 \le d \le 127$

[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 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.
- If height of the bar code exceeds the label, exceeding part of the bar code is printed on the next label.

[Reference] **GS H, 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 using the serial interface RS-232:

- 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.
- 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	Off	(0C)	(12)	Paper end is detected by the paper roll end sensor.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	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.
51	-	-		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] Select bar code width

[Code]

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

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

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

n	Module Width (mm) for Multi-level Bar Code	Binary-level Bar 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, JAN8, CODE93, CODE128
- Binary-level bar codes are as follows:
  CODE39, ITF, CODABAR

[Default] *n* = 3

[Reference] **GS k**

Ignored Commands

The TM-L60II ignores the following commands:

CR
ESC c 3 *n*

APPENDIX

APPENDIX A General Specifications

1. Printing specifications

Printing method:	Thermal line printing
Dot density:	180 dpi x 180 dp
Printing direction:	Uni-directional with friction feed When the **GS FF** command or an initializing operation in label mode is executed, printing is performed in the reverse direction.
Print width:	54 mm, 384-dot positions
Characters per line:	Thermal paper: 32 (Font A) 42 (Font B) Label paper 30 (Font A) 40 (Font B)
Character spacing:	0.28 mm (.01") (2dots) (Font A) 0.28 mm (.01") (2dots) (Font B) Programmable by control command.
Printing speed:	Approx. 12 lines/second (1/6 inch feed) (*1) Approx. 2.0 inches/second (*1) Approximately inches (28mm) / second when a ladder bar code is printed. Printing speed may slow down depending on the data transmission speed and combination of control commands.
Paper feeding speed:	Approx. 2.0 inches/second (*1) (Approx. 50.0 mm/second)
Line spacing:	1/6 inch (4.23 mm) default Programmable by control command. (Minimum 1/360 inch)

(*1): In label mode, the printing speed above applies only to printing within the area of single label.

2. Characters specifications

Character sets:	Alphanumeric:	95
	Enlarged graphics:	128 X 7 pages (including one space page)
	International:	32
Character structure:	Font A:	12 x 24 (includes the horizontal 2-dot space)
	Font B:	9 x 24 (includes the horizontal 2-dot space)
	Default:	Font A
Character size:	1.41 mm (W) X 3.39 mm (H) (Font A) 0.99 mm (W) X 3.39 mm (H) (Font B)	

Table A-1. Character Sizes

	Standard		Double-height		Double-Width		Quadruple	
	W X H (mm)	CPL	W X H (mm)	CPL	W x H (mm)	CPL	W X H (mm)	CPL
Font A (12 x 24)	1.41 x 3.39 (.06" x .13")	32 30	1.41 x 6.77 (0.6" x .27")	32 30	2.82 x 3.39 (.11" x .27")	16 15	2.82 x 6.77 (.11" x .27")	16 15
Font B (9 x 24)	0.99 x 3.39 (.04" x .13")	42 40	0.99 x 6.77 (.04" x .27")	42 40	1.98 x 3.39 (.08" x .03")	21 20	1.98 x 6.77 (.08" x .27")	21 20

Space between characters is not included.
Characters can be scaled up to 64 times as large as the standard size
CPL = Character per line.

NOTE: Concerning CPL in the table above, the upper value is for thermal paper and the lower for label paper.

3. Near-end detector

Detection method:	Micro switch	
Roll paper core diameter:		
Specified thermal paper	Inside diameter Outside diamete:	12 mm 18 mm
Specified thermal label paper	Inside diameter: Outside diameter:	12 mm 22 mm
Adjustment mechanism:	Adjusting screw The near-end detection processing is program table by control command.	
Adjustment units:	Approx. 2 mm/scale division	

4. Paper

4.1 Thermal paper

Paper type:	Specified thermal paper: Nakagawa Seisakujo, NTP060-80 (Original paper: Nippon paper Industries co., Ltd.,TF50KS-E)
Paper thickness:	65±5 µm
Form:	Roll paper
Paper width:	60±0/1 mm (2.36" ± 0"/0.04")
Roll size:	Roll diameter Max. Ø83 mm (3.27") Taken up paper roll width: 60 ± 0.5/1.0 mm (2.36" ± 0.02"/0.04")
Paper roll core:	Inside diameter 12 mm Outside diameter 18 mm Paper should never be pasted to the paper core.

4.2 Thermal label paper

Paper type:	Specified thermal label paper (1-inch long (25.4mm) label: Nakagawa Seisakujo, NTL060-80) (Original paper Nippon paper Industries co., Ltd., HD75)
Paper thickness:	143 µm (±15 µm)
Form:	Paper roll
Paper width:	6 ± 0.2"/0.5"mm (2.36" ± 0.008"/0.020")
Roll size:	Roll diameter Max. Ø83 mm (3.1 5") Taken up paper roll width: 60 ± 1.0"/0.5" mm (2.36" ± 0.39"/0.020")
Paper roll core:	Inside diameter: 12mm (.47") Outside diameter: 22 mm (0.87") Paper should never be pasted to the paper core.

NOTE: The printing position within the printable area of the thermal elements for dots 193 to 384 is shifted approximately 0.07mm (.003") in the paper feed direction from the position for dots 1 to 192. Be sure not to print a ladder bar across both printable areas, as this can cause variations in printing which are difficult to read.

5. Receive buffer

Either 4K or 45 bytes is selectable by a DIP switch.

6. Electrical characteristics

Supply voltage:	24 VDC ± 7% (Optional power supply: EPSON PS-150)		
Current consumption:	Operating:	Mean:	Approx. 1.5A
		Peak:	Approx. 5.0A
	Standby:	Mean:	Approx. 0.1A

7. Safety and EMI Standards Applied

(measured with the EPSON PS-150 power supply)

Europe:	CE marking:
	EN55022
	EN50082-1
	EN45501
	Safety standard:
	TÜV
North America:	EMI:
	FCC class A
	Safety standard:
	UL1950-2TH-D3
	C-UL

8. Reliability

Life:	Thermal paper:	12,000,000 lines
	Thermal labels:	5,000,000 lines (equivalent to printing of 800,000 1-inch long labels)

- End of Life is defined as the point at which the printer reaches the beginning of the Wearout Period.

MTBF:	180,000 hours	

- Failure is defined as Random Failure occurring at the time of the Random failure Period.

MCBF:	Thermal paper:	29,000,000 lines
	Thermal labels:	12,000,000 lines (equivalent to printing of 2,000,000 1-inch long labels)

- This is an average failure interval based on failures relating to wearout and random failures up to the life.

9. Environmental conditions

Temperature	Operating: 5 to 40°C
	Storage: -10 to 50°C (except for paper)
Humidity	Operating: 30 to 85% (non-condensing)
	Storage: 30 to 90% (non-condensing, except for paper)

10. Interface Specifications

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

NOTES:

- The interface is a factory installed option. One of the interfaces (serial or parallel) is already installed.
- Refer to the EPSON TM-L60II/L60IIP Specification for details.

APPENDIX B Character Code Tables

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

	HEX	0	1	2	3	4	5	6	7
HEX	BIN	0000	0001	0010	0011	0100	0101	0110	0111
0	0000	NUL 00	DLE 16	SP 32	0 48	@ 64	P 80	96	p 112
1	0001	01	XON 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	0010	02	18	" 34	2 50	B 66	R 82	b 98	r 114
3	0011	03	XOFF 19	# 35	3 51	C 67	S 83	c 99	s 115
4	0100	EOT 04	20	$ 36	4 52	D 68	T 84	d 100	t 116
5	0101	05	21	% 37	5 53	E 69	U 85	e 101	u 117
6	0110	06	22	& 38	6 54	F 70	V 86	f 102	v 118
7	0111	07	23	' 39	7 55	G 71	W 87	g 103	w 119
8	1000	08	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
9	1001	HT 09	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	1011	11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	1100	FF 12	28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	1101	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125
E	1110	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	1111	15	US 31	/ 47	? 63	O 79	_ 95	o 111	SP 127

(Continued)

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

	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	1000	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	¢ 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	¥ 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

■ **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	工 144	SP 160	ー 176	タ 192	ミ 208	二 224	× 240
1	0001	▬ 129	丅 145	。 161	ア 177	チ 193	ム 209	卜 225	円 241
2	0010	▬ 130	十 146	「 162	イ 178	ツ 194	メ 210	丰 226	年 242
3	0011	▬ 131	卜 147	」 163	ウ 179	テ 195	モ 211	彐 227	月 243
4	0100	■ 132	一 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	0101	■ 133	一 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	0110	■ 134	丨 150	ヲ 166	カ 182	ニ 198	ヨ 214	◥ 230	分 246
7	0111	■ 135	丨 151	ァ 167	キ 183	ヌ 199	ラ 215	◤ 231	秒 247
8	1000	丨 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	厂 156	ャ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	1101	▌ 141	丶 157	ュ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	1110	▌ 142	乀 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	0100	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	≥ 243
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	1000	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	Ü 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

■ Page 5 (PC865: Nordic)

	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	1000	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	Pt 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

■ **Page 255 (Space)**

	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	SP 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 set

Country	ASCII code												
	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

APPENDIX C Command Summary

Command	Name	Reference Page
HT	Horizontal tab	30
LF	Print and line feed	30
CR	Print and carriage return	30
FF	① Print and return to standard mode (in page mode) ② Print and position label to start printing	31
DLE EOT	Real-time status transmission	31
CAN	Cancel print data in page mode	34
ESC FF	Print data in page mode	34
ESC SP	Set character right-side spacing	35
ESC !	Set print mode	36
ESC $	Set absolute position	37
ESC %	Select/cancel user-defined character set	37
ESC &	Define user-defined characters	38
ESC *	Set bit image mode	41
ESC -	Turn underline mode on/off	43
ESC 2	Set 1/6 inch line spacing	43
ESC 3	Set line spacing using minimum units	44
ESC =	Select device	44
ESC ?	Cancel user-defined characters	45
ESC @	Initialize printer	46
ESC D	Set horizontal tab positions	46
ESC E	Select emphasized mode	47
ESC G	Select double-strike mode	48
ESC J	Print and feed paper using minimum units	48
ESC L	Select page mode	49
ESC R	Select international character set	50

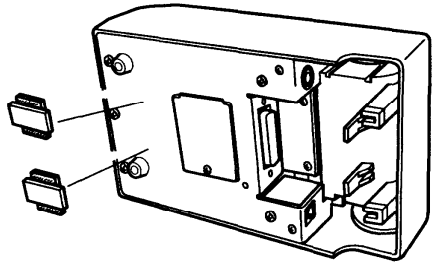
Command	Name	Reference Page
ESC S	Select standard mode	50
ESC T	Select print direction in page mode	51
ESC V	Set/cancel 90° cw rotated characters	52
ESC W	Set printing area in page mode	53
ESC \	Set relative position	54
ESC a	Align positions	55
ESC c 3	Select paper sensor(s) to output paper and signals	56
ESC c 4	Select paper detectors to stop printing	57
ESC c 5	Enable/disable panel switches	58
ESC d	Print and feed paper *n* lines	58
ESC p	Generate pulse	59
ESC t	Select character code table	59
ESC u	Transmit peripheral device status	60
ESC v	Transmit printer status	61
ESC {	Set/cancel upside-down character/printing	62
GS FF	Print and eject label	63
GS !	Select character size	63
GS $	Set absolute vertical print position in page mode	65
GS *	Define down-loaded bit image	65
GS /	Print down-loaded bit image	67
GS :	Set starting/ending of macro definition	68
GS <	Initialize printer mechanism	68
GS A	Adjust label paper position to start printing	68
GS B	Turn white/black reverse printing mode on/off	70
GS C 0	Select counter print mode	71
GS C 1	Select count mode (A)	72
GS C 2	Set counter	73

Command	Name	Reference Page
GS C;	Select count mode (B)	73
GS H	Select printing position of HRI characters	74
GS I	Transmit printer ID	75
GS L	Set left margin	76
GS P	Set horizontal and vertical motion units	77
GS W	Set printing area width	78
GS \	Set relative vertical print position in page mode	80
GS ^	Execute macro	80
GS a	Enable/dosable Automatic Status Back (ASB)	81
GS b	Turn smoothing on/off	85
GS c	Print counter	85
GS f	Select font for HRI characters	86
GS h	Select height of bar code	86
GS k	Print bar code	86
GS r	Transmit status	89
GS w	Select horizontal size (magnification) of bar code	91

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.