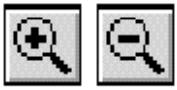
TM-U295/U295P
Operator's Manual

Using this online operator's guide

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

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

Use the **scroll bar** on the right side of this screen to move through the text.



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

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

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

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TM-U295/U295P

Operator's Manual

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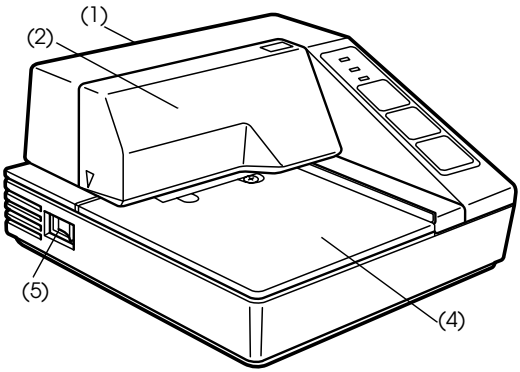
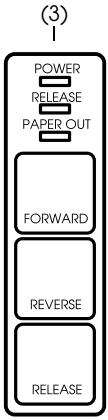
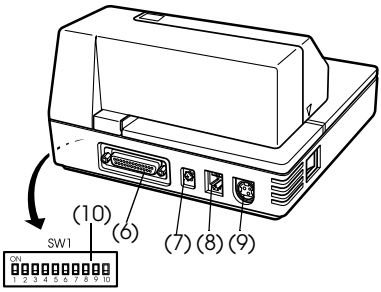
Printer parts

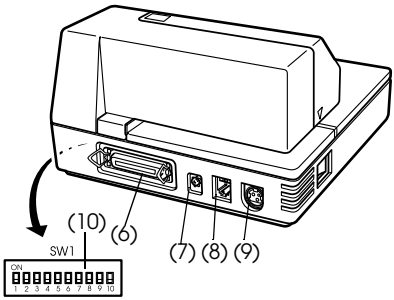
(1) Upper case
(2) Printer cover
(3) Operation panel
(4) Document table
(5) POWER switch
(6) Interface connector
(7) FG
(8) Drawer kick-out connector
(9) Power connector
(10) DIP switches







TM-U295



TM-U295P

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: M66SA

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: M117A

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-U295 and TM-U295P are terminal slip printers which use a 7-pin shuttle dot printing method, and provide the different modes, standard and page*.

The main features of the TM-U295 and TM-U295P printers are the following:

- ❑ Programmable page length
- ❑ Programmable print starting position
- ❑ Multiple character sizes (standard, double-width, double-height, and quadruple)
- ❑ Character directions: 4
- ❑ International character set selection
- ❑ Forward and backward paper feeding
- ❑ Command protocol based on ESC/POS®, a widely used standard
- ❑ Programmable paper feed amount
- ❑ Paper eject function
- ❑ Top Of Form (TOF) and Bottom Of Form (BOF) sensors
- ❑ Data reception during printing (improved throughput and less waiting time for the host computer)
- ❑ 512 byte printer buffer memory
- ❑ Compact, space efficient design
- ❑ Drawer kick-out function
- ❑ Automatic Status Back (ASB) function to automatically send printer status changes.

  * In page mode, the print data for each page is stored in a specified printing area in memory. After all the data for a page has been stored, it is printed.

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

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

About This Manual

Setting Up and Using

- ❏ **Chapter 1** contains information on setting the printer up and setting the DIP switches.
- ❏ **Chapter 2** contains information on using the printer.
- ❏ **Chapter 3** contains troubleshooting information.

Reference

- ❏ **Chapter 4** contains specifications

Notes, Cautions, and Warnings

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

⚠ CAUTION:

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

⚠ WARNING:

Warnings must be followed carefully to avoid serious bodily injury.

Contents

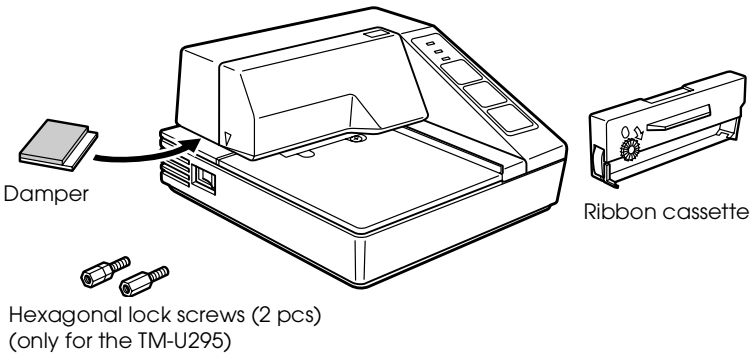
Chapter 1

Installation

Unpacking

When you unpack the TM-U295 or TM-U295P printer, make sure you have these items.

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

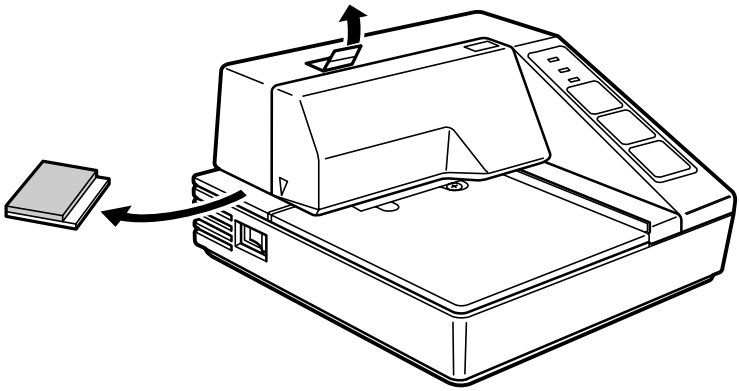


Note:
See the Note on page 1-3 for information about the screws.

Removing the Transportation Damper

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

1. Pull the damper out and remove the strip of tape from the top of the printer, as shown below.



Note:
If you ever ship or store your printer, prepare it by performing these steps: turn on the printer, press the RELEASE *button, press the* FORWARD *button, turn off the printer, and put the transportation damper back where it was when you received the printer.*

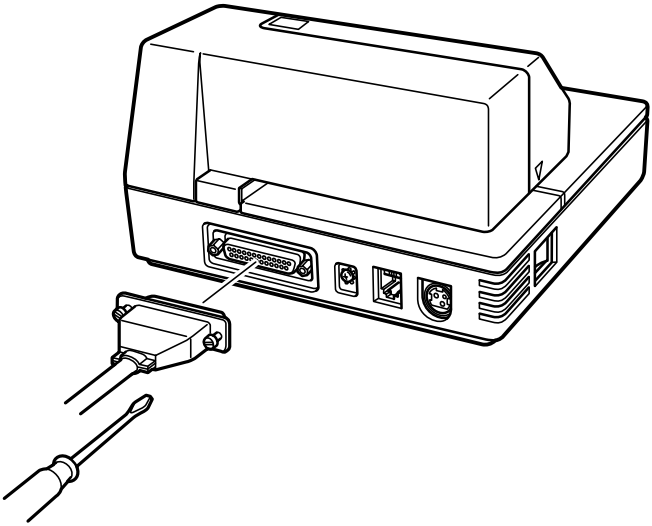
Connecting the Printer to the Computer

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

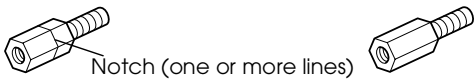
TM-U295

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

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



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

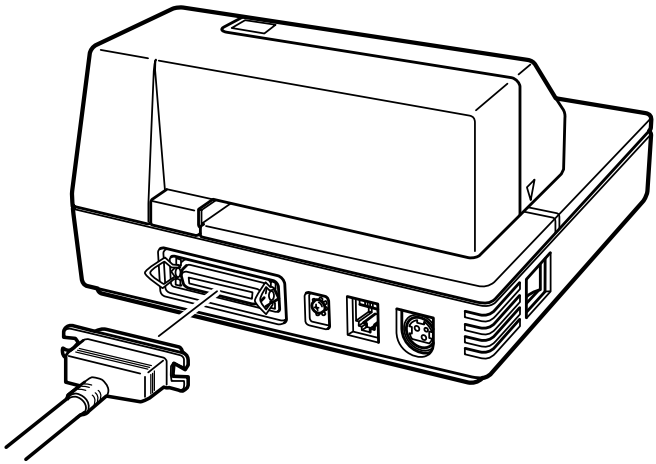


2. Connect the other end of the cable to the connector on your computer.

TM-U295P

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

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



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

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

Connecting the Printer to the Drawer

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

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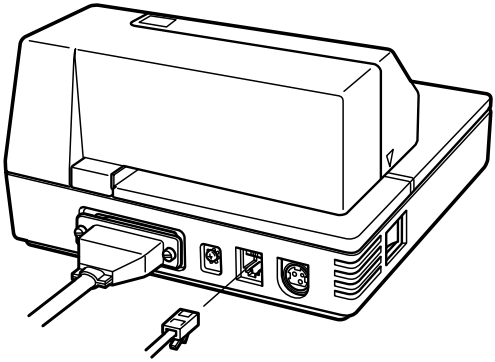

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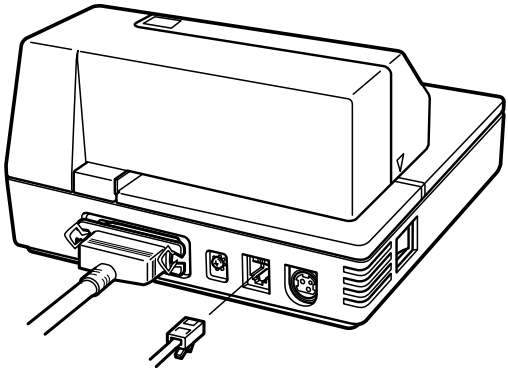

⚠ CAUTION:

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

Den Drucker an die Lade anschließen

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

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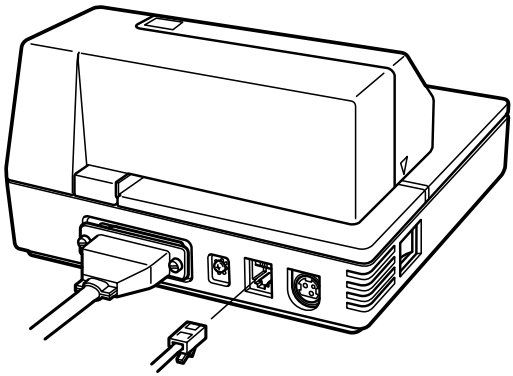

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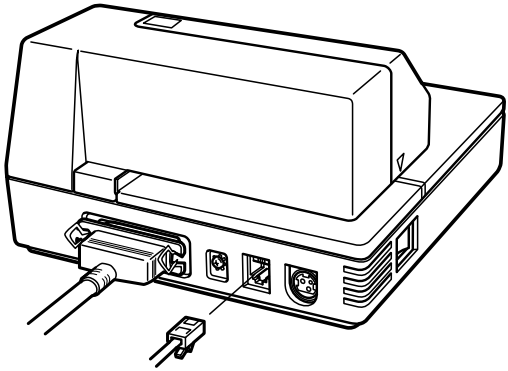

⚠ CAUTION:

Kein Telefonkabel an die Schnappsteckerbuchse anschließen.

Grounding the Printer

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

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

1. Make sure that the printer is turned off.

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

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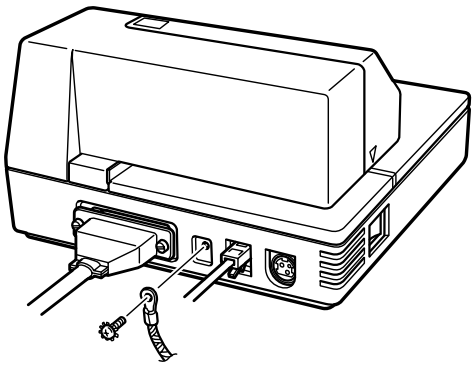

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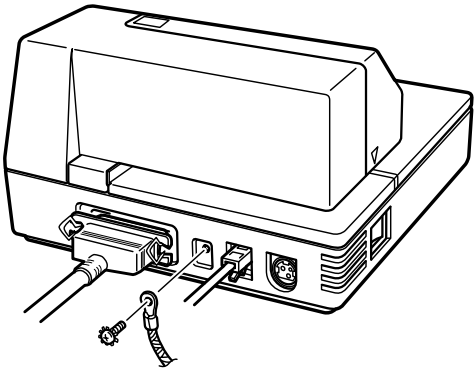

Connecting the Power Supply

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

⚠ CAUTION:

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

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

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

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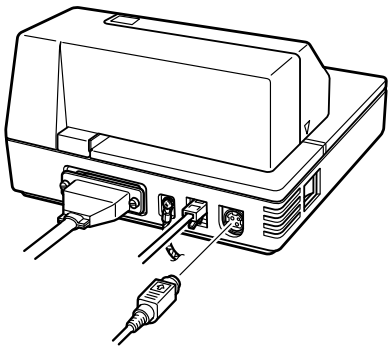

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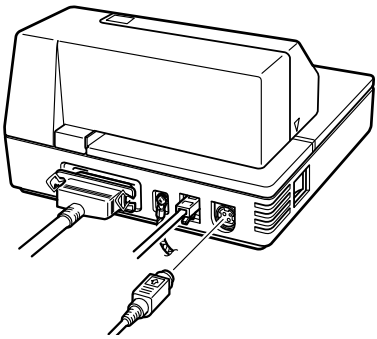


3. Plug the power cord into an outlet.

Installing the Ribbon

Be sure to use a ribbon cassette that meets the printer's specifications. The EPSON ERC-27 is recommended.

Note:
For instructions on replacing a used ribbon, see Chapter 2.

1. Turn the printer on using the power switch on its left side.

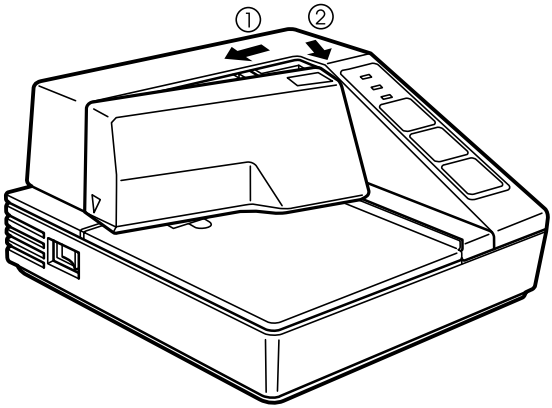
2. Press the RELEASE button to turn the light on. This puts the printer in the paper release mode.

3. Turn the printer off.

⚠ CAUTION:

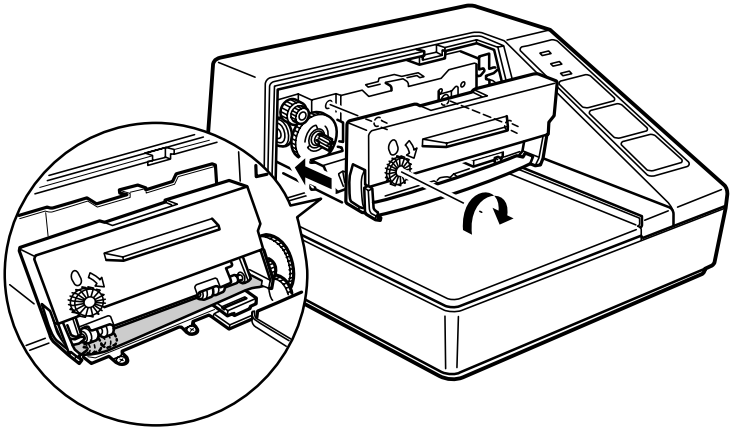
Be sure to perform the steps above because it is necessary to make sure that the printer is in the paper release mode before you install the ribbon cassette.

4. Open the printer cover by slightly pressing the ridges on the top left and pulling the cover forward, as shown in the illustration below.



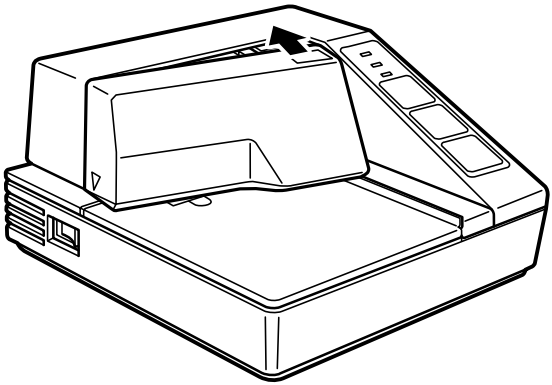
5. Check to see that the ribbon in the cassette is not creased or twisted. Then turn the feed knob in the direction of the arrow on the ribbon cassette to take up any slack in the ribbon.

6. Carefully insert the ribbon cassette in the printer as shown in the illustration below. Notice exactly where the ribbon must go.



7. Then push firmly on the right side and then the left side of the ribbon cartridge until each side clicks into place.

8. To put the cover back on the printer, first align the left and insert the tab on the top; then press the bottom until it clicks into place, as shown below.



Inserting Paper

Note:
Do not use wrinkled or curled paper. For full information and specifications on the paper you can use, see Chapter 4.

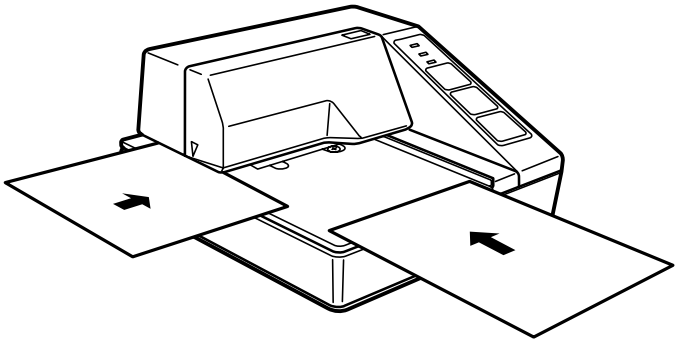
To insert paper, follow these steps:

1. Make sure that a ribbon cassette is installed in the printer.

2. Turn on the printer. The POWER light comes on.

3. Press the RELEASE button. The RELEASE light comes on, which indicates that the printer is in the paper release mode. In this mode, the printer can accept paper and paper can be removed from it.

4. Insert the paper from either the front or the side, as shown in the illustration below. Insert the paper into the printer until it is stopped by the form stopper. The markings on the side of the printer can also be used to judge how far to insert paper.



5. Check the PAPER OUT light. When you insert the paper correctly, the PAPER OUT light goes out. If the PAPER OUT light is still on, remove the paper and re-insert it.

Running the Self Test

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

The self test checks the control circuits, printer mechanisms, print quality, RAM, ROM version, and DIP switch settings.

To perform the self test, follow the steps below:

1. Insert a sheet of paper following the instructions on page 1-12.

2. Turn off the printer.

3. While holding down the RELEASE button, turn the printer back on.

4. Remove your finger from the RELEASE button. The printer prints the current printer settings and then eject the paper.

5. Press the RELEASE button to eject the paper completely and insert new paper to begin the second part of the test.

After the printer prints a pattern, it prints the following message:

completed

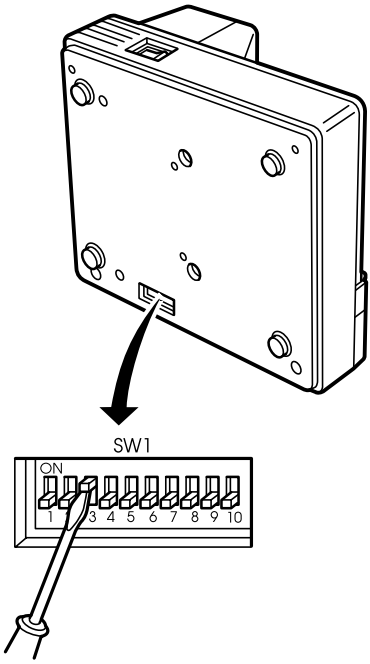
The printer ejects the paper; then enters the normal mode.

Setting the DIP Switches

You can change several interface settings by changing the DIP switch settings. If you need to change any of these settings, follow the steps below:

1. Make sure that the printer is off.

2. Turn the printer over and locate the DIP switches, as shown below.



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

4. Use the following tables to set the DIP switches.

Switch	Function	ON	OFF
1	Data reception error	Ignored	Prints"?"
2	Receive buffer capacity	35 bytes	512 bytes
3	Handshaking	XON/XOFF	DTR/DSR
4	Word length	7 bits	8 bits
5	Parity check	Yes	No
6	Parity selection	Even	Odd
7	See Transmission Speeds table below.		
8			
9	Pin 6 reset signal	Used	Not used
10	Pin 25 reset signal	Used	Not used

Transmission Speeds

Speed in Bits per Second	SW 7	SW 8
1200	ON	ON
2400	OFF	ON
4800	ON	OFF
9600	OFF	OFF

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Switch	Function	ON	OFF
1	Auto-line feed	Normally enabled	Normally disabled
2	Receive buffer capacity	35 bytes	512 bytes
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		
8	Undefined		
9	Undefined		
10	Reserved. Setting must not be changed		

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.

Chapter 2

Using the Printer

The control panel has three buttons and three lights.

Buttons

All three of these buttons can be disabled or enabled by the **ESC c 5** command.

RELEASE

Pressing this button moves the rollers so that paper can be inserted or removed.

REVERSE

Feeds the paper backward based on the line feed amount set by **ESC 2** and **ESC 3**.

FORWARD

Feeds the paper forward based on the line feed amount set by **ESC 2** and **ESC 3**.

You can also use the RELEASE button to start a self test. See Chapter 1 for details.

Indicator Lights

POWER

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

RELEASE

This light is on when the printer is in the paper release mode and it is off when the printer is in the clamp mode. Paper can be inserted only when the printer is in the paper release mode.

This light blinks to indicate an error condition in the following cases:

- ❏ Paper jam
- ❏ Home position error
- ❏ Timing error
- ❏ Drive circuit error
- ❏ Power supply voltage error

If this light blinks, turn off the printer, make sure that no paper is jammed in it, and then turn it back on. If the light is still blinking, contact a qualified service person.

PAPER OUT

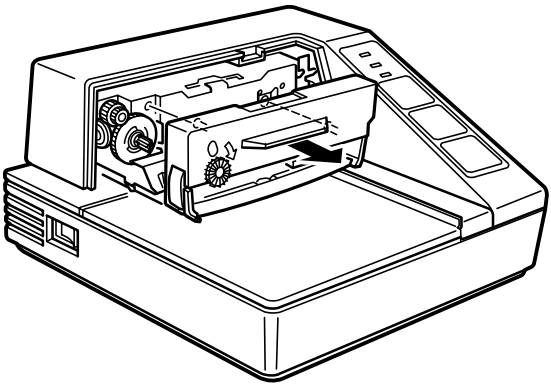
This light is on when paper is not inserted or is not inserted correctly.

Replacing a Used Ribbon

When your printing is not dark enough, it is time to replace the ribbon.

First follow steps 1 through 4 in the “Installing the Ribbon” in Chapter 1.

Then remove the used ribbon by grasping the handle and pulling straight out, as shown by the arrow in the illustration below.



Then follow the rest of the steps in “Installing the Ribbon” in Chapter 1.

Chapter 3

Troubleshooting

This chapter gives the solutions to some printer problems.

Power problems

The POWER light does not come on.

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

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

Printing problems

The PAPER OUT light is on and nothing is printed.

If the PAPER OUT light is on, the paper is not inserted or is not inserted correctly.

The RELEASE light is flashing and nothing is printed.

This indicates an error condition. Turn off the printer, make sure that no paper is jammed in it, and then turn it back on. If the RELEASE light is still flashing, contact a qualified service person.

Chapter 4

Reference Information

Printing Specifications

Printing Method:	Impact dot matrix
Head Wires	7-pin shuttle type
Printing Direction:	Unidirectional
Lines per second	5 x 7 font: 1.9 to 2.3 7 x 7 font: 1.9 to 2.3
Characters per line	5 x 7 font: 35 7 x 7 font : 42
Characters per inch:	5 x 7 font: ANK: 0.63 Graphics: 0.315 7 x 7 font: ANK: 0.63 Graphics: 0.315
Paper feed speed:	Approximately 12.5 lines (52.5 mm (2.10”))/second (When the **ESC d** and **FF** commands are used.)

Character Specifications

Number of characters	Alphanumeric characters: 95 Extended graphics: 128 x 3 International characters: 32

Character structure:	5 x 7 with 1-dot spacing (normal dot) 7 x 7 with 3-dot spacing (half dot)
Character size:	5 x 7 font: ANK: 1.6 mm (.063”) x 2.9 mm (.114”) Graphics: 1.9 mm (.075”) x 2.9 mm (.114”) 7 x 7 font: ANK: 1.3 mm (.051”) x 2.9 mm (.114”) Graphics: 1.6 mm (.063”) x 2.9 mm (.114”)

Paper Specifications

Paper type:	Normal (high quality), pressure sensitive, and carbon copy papers	
Total thickness:	Single-play paper: 0.09 to 0.25 mm (.0035 to .0098”) Copy paper: 0.09 to 0.35 mm (.0035 to .0138”)	
Paper size:	80 mm (W) × 69 mm (L) to 182 mm (W) × 257 mm (L) (3.15” × 2.72” to 7.17” × 10.12”) Up to the European B5 size.	
Copy capability and paper thickness:	No copies (single-ply):	0.09 to 0.25 mm (.0035 to .0098”) (135 kg paper or equivalent)
	Combination of normal paper and pressure sensitive paper:	3 sheets maximum (1 original and 2 copies) (0.09 to 0.35 mm (.0035 to .0138”))
		Backing paper: 0.07 to 0.20 mm (.0028 to .0079”) Copy and original paper: 0.04 to 0.07 mm (.0016 to .0028”) Carbon copy paper: Approximately 0.035 mm (.0014”)

Copy capability and ambient temperature for printing:

Copying capability is influenced by the ambient temperature. Printing must be performed under the conditions, described in a Table below:

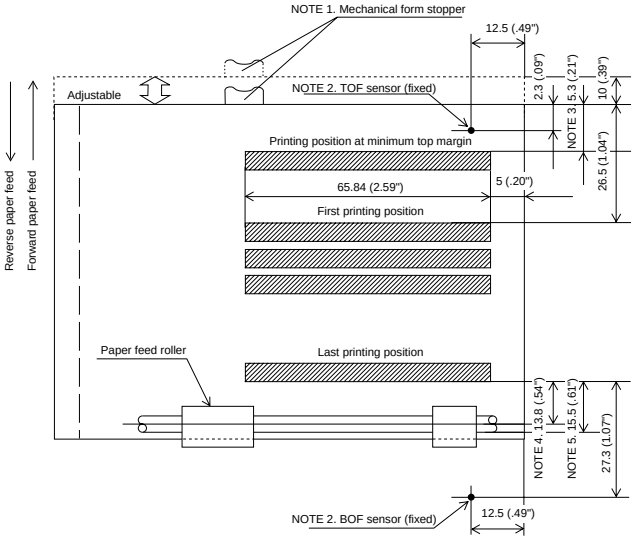
Relationship between ambient temperature and number of copies

Number of copies	Ambient temperature (print mode)
Original + 1 to 2 copies	5° to 40°C (41° to 104°F)

Notes on slip paper

- ❏ Slip paper should be flat, without curls, wrinkles, or camber, especially at the paper edges. Otherwise, the paper may become ink stained.
- ❏ When using multiply-ply carbon copy paper, it should be flat and the glue area should be as small as possible.
- ❏ Glue area should be located at the top or left edge of the slip paper.
- ❏ Since TOF and BOF sensors are optical sensors, paper having holes at the sensor positions or translucent paper should not be used normallly. When using these papers, be sure to disable the paper sensors by **ESC c 4**.
- ❏ When using slip paper of 80 mm (3.15”) long or less, load the paper so that it is fed straight.
- ❏ Use thinner paper (N30 or equivalent) between the top and bottom sheets of multi-ply paper. If thick paper is used, the copy capability is lowered.

Printing position



Notes

1. The mechanical form stopper is adjustable in the range 26.5 to 36.5 mm (1.04 to 1.44").

2. The TOF and BOF sensors are fixed and cannot be adjusted.

3. After slip paper is set at the mechanical form stopper, the top margin can be shortened up to 21.2 mm (.83") by feeding the paper backwards (ejection feeding).

4. When ejection feeding is not performed after printing, printing can be performed up to the position at which the paper edge is no longer held by the paper feed roller (13.8 mm (.54") from the paper edge).

5. When ejection feeding is performed after printing, the paper can be fed forward up to 11.8 mm (.46") (28 dots) after the bottom edge is detected.

Electrical Specifications

Supply voltage:	+24 VDC ± 10%	
Current consumption:	Operating (except for drawer kick-out):	Mean - approx. 600 mA at 24 VDC (full-column printing and data transmission of ANK characters) Peak - approx. 5.5 A at 24 VDC (full-column printing and data transmission of ANK characters) Standby: approx. 100 mA (at 24 VDC, 25°C (77°F)

EMI and Safety Standards

EMI standards (measured when using the printer with the Epson PS-150):	FCC:	Class A
	CE marking:	
Safety standards:	UL1950-2TH-D3 (Recognized component)	
	CSA950-D3 (Recognized component)	
	EN60950 (IEC950 2TH)	

Reliability

Life: 3,000,000 lines

- ❑ 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: 7,000,000 lines

- ❑ This is an average failure interval based on failures relating to wearout and random failures up to the life of 3 million lines.

Environmental Conditions

Temperature:	Operating:	5° to 40°C (41° to 104°F)
	Storage:	-10° to 50°C (14° to 122°F) (except for ribbon and paper)
Humidity:	Operating:	30 to 85% (with no condensation)
	Storage:	30 to 90% (with no condensation, except for ribbon and paper)

Interface Specifications

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

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

Note:
Refer to the EPSON TM-U295/U295P Specification for details.

Chapter 5
Commands

Command Notation

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

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

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

- Print data, including spaces skipped by HT, is not in the current print buffer.

HT

[Name] Horizontal tab

[Format] ASCII HT
Hex 09
Decimal 9

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

[Notes]
- Horizontal tab positions are set with **ESC D**.
- Ignored unless the next horizontal tab position has been set.
- The default tab positions are at intervals of 8 characters in the 5 x 7 font 9th column, 17th column, 25th column,. . .).

[Reference] **ESC D**

LF

[Name] Print and line feed

[Format] ASCII LF
Hex 0A
Decimal 10

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

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

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

FF

[Name] ①Print and eject sheet (in standard mode)
②Print and return to standard mode (in page mode)

[Format] ASCII FF
Hex 0C
Decimal 12

This command functions differently depending on the printer mode selected.

①When standard mode is selected:

[Description] Prints the data in print buffer and ejects the sheet.

[Notes]
- When the eject length has been set by **ESC C**, the printer ejects the sheet based on the current eject length. Otherwise, the printer ejects the sheet completely. If a paper out is detected during ejection, the printer stops ejecting the sheet even if the specified amount of paper has not been ejected.
- The ejecting direction is specified by **ESC F**.

[Reference] **ESC F**, **ESC C**

②When page mode is selected:

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

[Notes]
- The buffer data is deleted after being printed.
- The printer does not execute paper ejection.
- This command sets the print position to the beginning of the line.

[Reference] **ESC L**

CR

[Name] Print and carriage return

[Format]

ASCII	CR	
Hex	0D	
Decimal	13	

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

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

DLE EOT *n*

[Name] Real-time status transmission

[Format]

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

[Range] $1 \le n \le 3$, $n = 5$

[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 = 5: Transmit slip paper status

[Notes]
- The printer executes this command upon receiving it.
- When transmitting status, the printer transmits only 1 byte without confirming the condition of the DSR signal.
- With the serial interface model, this command is executed even in off-line or receive buffer-full state. However, with the parallel interface model, this command is not executed in off-line or receive buffer-full state because the printer is busy and unable to receive this command from the host.
- The status is transmitted whenever the data sequence of <10>H<04>H<n> (1 ≤ n ≤ 3, n = 5) is received even if it appears as part of another command. For example,

  In **ESC * *m n* L *n* H [d] *n* L+256×*n* H**, d1=<10>H, d2=<04>H, d3=<1>H

- This command should not be used within the data sequence of another command that consists of 2 or more bytes. For 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 <10>H for **DLE EOT 3** is processed as the code for **ESC 3** <10>H.
- 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 *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 pin 3)
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
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.

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	Undefined.
	On	04	4	Undefined.

Bit	Off/On	Hex	Decimal	Function
3	Off	00	0	Paper is not being fed by using the paper feed button.
	On	08	8	Paper is being fed by the paper feed button.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error.
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off.

Bit 5: On (printing stops due to paper-end) indicates printing stops as a result of the paper state and TOF or BOF sensor selected by **ESC c 4**.

n = 3: Error status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used.Fixed to On.
2	Off	00	0	Undefined.
	On	04	4	Undefined.
3	Off	00	0	Undefined.
	On	08	8	Undefined.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	Undefined.
	On	40	64	Undefined.
7	Off	00	0	Not used. Fixed to Off.

n = 5: Slip paper status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to Off.
2	Off	00	0	Slip paper selected.
3	Off	00	0	Does not wait for slip paper insertion.
	On	08	8	Waits for slip paper insertion.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Slip is detected by the BOF sensor.
	On	20	32	Slip is not detected by the BOF sensor.
6	Off	00	0	Slip is not detected by the TOF sensor.
	On	40	64	Slip is detected by the TOF sensor.
7	Off	00	0	Not used. Fixed to Off.

Bit 3: Becomes Off (not waiting) just before actual slip selection takes place after slip paper is detected

Bit 5 and 6: Transmits the current status of the TOF and BOF sensors.

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

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 W**

ESC SP *n*

[Name] Set right-side character spacing

[Format]

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

[Range] $0 \le n \le 32$

[Description] Sets the character spacing for the right side of the character.

[Notes]
- The right-side character spacing for double-width mode is twice the normal value.
- The character spacing is set in increment of half dot.
- In page mode, the actual dot positions shift by half dot.
- This command sets values independently in standard mode and in page mode.

[Default] *n*=0

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 5 × 7 selected.
	On	01	1	Character font 7 × 7 selected.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	00	0	Undefined
	On	04	4	Undefined.
3	Off	00	0	Undefined.
	On	08	8	Undefined.
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	Off	00	0	Undefined.
	On	40	64	Undefined.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

[Notes]
- The printer can underline all characters (including the right-side character spacing), but cannot underline the space set by an **HT**.
- When both double-height and double-width modes are selected, quadruple size characters are printed.
- Only setting of underline mode specification have effect in page mode.
- Only setting of 7 × 7 font specification have effect in page mode.

[Default] $n = 0$

ESC % *n*

[Name] Select / cancel user-defined character set

[Format]

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

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

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

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

When the LSB is 1, the user-defined character set is selected.

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

[Default] $n = 0$

[Reference] **ESC &**

ESC & *y c1 c2* [*X* [*d*] *y* × *x*] *c2-c1*+1

[Name] Define user-defined characters

[Format]

ASCII	ESC	&	*y c1 c2* [*x* [*d*] *y* × *x*] *c2* - *c1* + 1
Hex	1B	26	*y c1 c2* [*x* [*d*] *y* × *x*] *c2* - *c1* + 1
Decimal	27	38	*y c1 c2* [*x* [*d*] *y* × *x*] *c2* - *c1* + 1

[Range] $y = 1$

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

$0 \le x \le 6$ (5 × 7 font)

$0 \le x \le 10$ (7 × 7 font)

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

[Description] Defines user-defined characters.
- The *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. When only one character is desired, use *c1* = *c2*.
- The allowable character code range is from decimal code 32 to 126.
- *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 right side are blank.
- The data to define a user-defined character is ($y \times x$) bytes.
- Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.
- It is possible to define multiple characters for consecutive character codes.

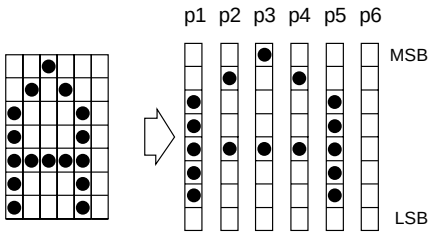
[Notes]
- After user-defined characters are defined, they are available until another definition is made; **ESC @** is executed; the printer is reset; or the power is turned off.
- If the values of *y, c1, c2,* or *x* are out of the specified range, the printer ignores the command and processes the following data as normal data.
- In 7×7 font, horizontally adjacent dots cannot be printed. Define the character so that it does not include horizontally adjacent dots.

[Default] The internal character set

[Reference] **ESC %**

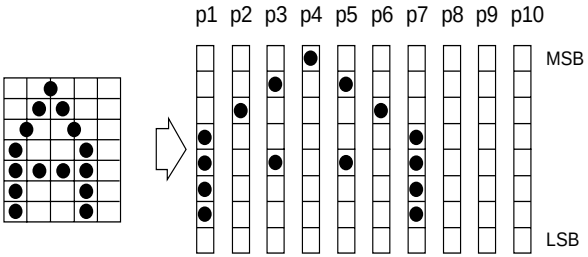
[Example]

•5×7 font when the dot pattern for code 32 (20H) is defined as shown below:



ASCII code	ESC	&	*y*	*c1*	*c2*	*x*	*p1*	*p2*	*p3*	*p4*	*p5*
Hex code	1B	26	01	20	20	05	3E	48	88	48	3E

• 7 × 7 font when the dot pattern for code 32 (20H) is defined as shown below:



ASCII code	ESC	&	*y*	*c1*	*c2*	*x*	*p1*	*p2*	*p3*	*p4*	*p5*	*p6*	*p7*
Hex code	1B	25	01	20	20	07	1E	20	48	80	48	20	1E

ESC ✻ *m nL n H* [*d*]*k*

[Name] Select bit-image mode

[Format]

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

[Range] $m = 0, 1$

$0 \le nL \le 255$

$0 \le nH \le 3$

$0 \le d \le 255$

$k = nL + nH \times 255$

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

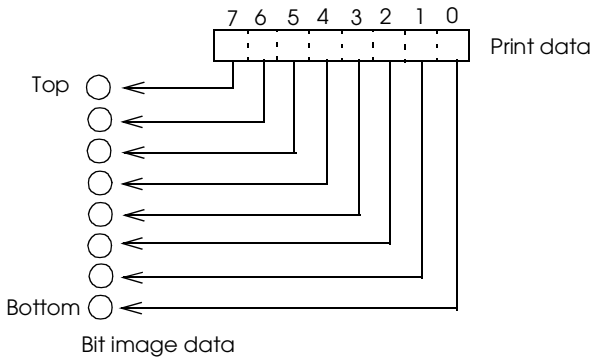
m	Mode	Vertical direction		Horizontal direction	
		The number of dots	Dot density	Dot density	Maximum number of dots
0	8-dot single-density	8	60 DPI	80 DPI	210
1	8-dot double-density	8	60 DPI	160 DPI	420

The number of dots in the horizontal direction depends on the printing area and the printing direction specified by **ESC W** and **ESC T**.

[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* × 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 values of *m* and *nH* are out of the specified range, the following data is processed as normal data.
- After printing a bit image, the printer returns to normal data processing mode.
- In page mode, double density bit image data is not available.
- The relationship between the image data and the dots to be printed is shown on the next page.

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



ESC 2

[Name] Select 1/6-inch line spacing

[Format]

ASCII	ESC	2	
Hex	1B	32	
Decimal	27	50	

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

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

[Reference] **ESC 3**

ESC 3 *n*

[Name] Set line spacing

[Format]

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

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

[Description] Sets the line spacing to $n/60$ inches.

[Notes]
- This command sets values independently in standard mode and in page mode.

[Default] $n = 10$ (1/6 inch)

[Reference] **ESC 2**

ESC = *n*

[Name] Set device

[Format]

ASCII	ESC	=	*n*

Hex	1B	3D	*n*
Decimal	27	61	*n*

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

[Description] Selects device to which host computer sends data, using *n* as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer disabled.
	On	01	1	Printer enabled.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	00	0	Undefined.
	On	04	4	Undefined.
3	Off	00	0	Undefined.
	On	08	8	Undefined.
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]
- When the printer is not selected, the printer ignores all received data until it is selected by this command.
- Even if the printer is disabled, it may go off-line due to printer operation.

[Default] *n* = 1

ESC @

[Name] Initialize printer

[Format]	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64

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

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

ESC C *n*

[Name] Set cut sheet eject length

[Format]

	ASCII	ESC	C	*n*
	Hex	1B	43	*n*
	Decimal	27	67	*n*

[Range] $0 \leq n \leq 127$

[Description] Sets the eject length for a cut sheet to *n* lines.

[Notes]
- When n = 0, no eject length is set.
- The previously specified eject length does not change, even if the line spacing changes.
- This command is available only when **FF** is executed.

[Default] n = 0

[Reference] **FF**

ESC D [*n*] *k* NUL

[Name] Set horizontal tab positions

[Format]

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

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

$0 \leq k \leq 32$

[Description] Sets horizontal tab positions.
- *n* specifies the column number for setting a horizontal tab position from the beginning of the line.
- This command cancels the previous horizontal tab settings.
- *n* = column number to be set - 1. When setting n = 8, the print position is moved to column 9 by sending **HT**.
- *k* indicates the total number of horizontal tab positions to be set.
- The horizontal tab position is stored as an absolute value of [character width × *n*] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters. Also, when character is enlarged in the horizontal direction in page mode, the horizontal position is set as the same way as in standard mode.
- Transmit [*n*]*k* in ascending order and place a NUL code 0 at the end.
- **ESC D NUL** cancels all horizontal tab positions. An HT received after clearing tabs is ignored.

[Notes]
- Up to 32 tab positions (k = 32) can be set. Data exceeding 32 tab positions is processed as normal data.
- 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.
- 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.
- The right-side spacing is set independently in standard and page modes. The horizontal tab setting is set by using amount of the right-side spacing of the mode used.

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

ESC F *n*

[Name] Set / cancel cut sheet reverse eject

[Format]				
	ASCII	ESC	F	*n*
	Hex	1B	46	*n*
	Decimal	27	70	*n*

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

[Description] Sets or cancels the cut sheet reverse eject specified by FF.
- When the LSB of n is 0, reverse eject is canceled and forwqrd eject is set.
- When the LSB of n is 1, reverse eject is set.

[Note] When n cancels reverse eject, this command sets forward ejection automatically.

[Default] n = 0

[Reference] **FF**

ESC J *n*

[Name] Print and feed paper

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

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

[Description] Prints the data in the print buffer and feeds the paper by n / 60 inches.

[Note] Sets the print position to the beginning of the line.

ESC K *n*

[Name] print and revers feed

[Format]	ASCII	ESC	K	*n*
	Hex	1B	4B	*n*
	Decimal	27	75	*n*

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

[Description] Prints the data in the print buffer and feeds the paper by $n/60$ inches in the reverse direction.

[Notes]
- This command is available only in standard mode.
- The setting values do not remain.
- After printing is completed, this command sets the print position to the beginning of the line.

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 is available only in standard mode.
- After printing by **FF** is completed, the printer returns to standard mode.
- This command sets the position where data is buffered to the position specified by **ESC T** within the printable area defined by **ESC W**.
- In page mode, the printer buffer receives data in the printable area specified by **ESC W** and prints the data collectively upon receipt of **FF** command. The print and line feed commands, such as **LF**, **ESC J, ESC K, ESC d,** and **ESC e**, only move the print start position from which subsequent data is buffered and do not perform actual printing.
- In page mode, the printer porcesses data referring to normal dot. Therefore, be careful when using half dot in standard mode.
- Only character fonts with normal dot configuration are available.
- 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:

  Set character spacing: **ESC SP**

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

  Set line spacing: **ESC 3**
- In page mode, the following commands are ignored.

  Print and reverse feed *n* lines: **ESC e**

  Print and reverse feed: **ESC K**

Double-density bit image: **ESC ***

Paper release: **ESC q**

- The following commands are settable but do not have any effect in page mode.

  Upside-down character mode: **ESC {**

  7 × 7 font and underline mode specification and cancel: **ESC !**
- This command is effective only in standard mode.
- **ESC @** command returns the printer to standard mode without printing any data.

[Default] Standard mode

[Reference] FF

ESC R *n*

[Name] Select an international character set

[Format]

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

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

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

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

[Note] If the value of *n* is out of specified range, printer ignores the command.

[Default] *n* = 0

[Reference] *Character Code Tables*

ESC T *n*

[Name] Select print direction in page mode

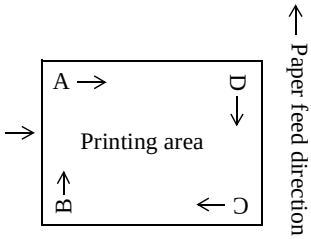
[Format]

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

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

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

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



[Notes]
- When the printing direction is changed, the printing direction and print starting position for the data following are those specified by *n*.
- Only setting of this command is effective in standard mode.
- If *n* is out of the specified range, this command is ignored.

[Default] *n* = 0

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

[Name] Set printing area in page mode

[Format]

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

[Range] *0 ≤ xL≤ 255, xH=0, 0 ≤ yL≤ 255, 0 ≤ yH≤ 1, 0 ≤ dxL≤ 255, dxH=0, 0 ≤ dyL≤ 255, 0 ≤ dyH≤ 1 (Except for dxL=dxH=0 or dyL=dyH=0)*

[Description] Sets the position and the size of the printing area.
- When the horizontal print start position, vertical print start position, horizontal length, and vertical length are defined as *x*0, *y*0, *dx* (dot), *dy* (dot), respectively.

  Each setting for the printable area is calculated as follows:

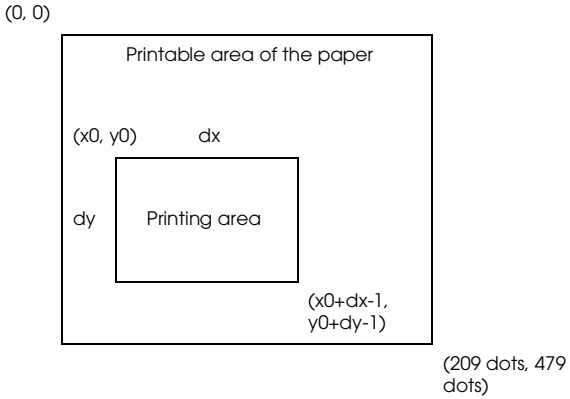
  $x0 = [(xL + xH \times 256)]$

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

$dx = [dxL + dxH \times 256]$

$dy = [dyL + dyH \times 256]$

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



[Notes]
- The maximum printable area in the horizontal direction (*x* direction) is 210 dots.
- The maximum printable area in the vertical direction (*y* direction) is 480 dots.
- If the setting values exceed the printing area, it set to the maximum printing area automatically, depending on the values from *xL* to *dyH*.
- If (horizontal print starting position + horizontal length) or (vertical print starting position + vertical length) is outside the printable area, the maximum printing area is set to the printable area.
- When the print data is buffered in the specified printing area, the length of the printing area in both the horizontal and vertical direction should be 8 dots or more.
- The printing area should accommodate to the size of the print sheet.
- When the starting point (*x*0, *y*0) exceeds the printing area, this command is ignored.
- In standard mode, only setting of this command is effective.

[Default] $xL = xH = yL = yH = 0$

$dxL = 210$, $dxH = 0$, $dyL = 224$, $dyH = 1$

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

ESC c 3 *n*

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

[Format] ASCII ESC c 3 *n*

	Hex	1B	63	33	*n*
	Decimal	27	99	51	*n*

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

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

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

[Notes]
- It is possible to select multiple sensors to output signals. Then, if any of the sensors detects a paper-end, the paper end signal is output.
- This command is available only with a parallel interface and is ignored with a serial interface.

[Default] *n* = 0

ESC c 4 *n*

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

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

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

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

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

[Notes]
- It is possible to select multiple sensors to stop printing. Then, if any of the selected sensors detects a paper-end, the printer stops printing.
- When a paper-end is detected, printing stops after printing and feeding the current line. In this time, if the panel buttons are disabled, the printer release the paper and waits the next paper automatically.

[Default] *n* = 0

[Reference] **ESC c 5**

ESC c 5 *n*

[Name] Enable / disable panel buttons

[Format]	ASCII	ESC	c	5	*n*
	Hex	1B	63	35	*n*

	Decimal	27	99	53	*n*

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

[Description] Enables or disables the panel buttons.

- When the LSB of *n* is 0, the panel buttons are enabled.
- When the LSB of *n* is 1, the panel buttons are disabled.

[Notes]
- When the panel buttons are disabled, none of them are usable when the printer cover is closed.

[Default] *n* = 0

ESC d *n*

[Name] Print and feed *n* lines

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

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

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

[Notes]
- This command sets the print starting position to the beginning of the line.
- This command does not affect the line spacing set by **ESC 2** or **ESC 3**.

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

ESC e *n*

[Name] Print and reverse feed n lines

[Format]	ASCII	ESC	e	*n*
	Hex	1B	65	*n*
	Decimal	27	101	*n*

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

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

[Notes]
- The command is available only in standard mode.
- This command sets the print position to the beginning of the line.
- The setting values do not remain.

ESC f *t1 t2*

[Name] Set cut sheet wait time

[Format]	ASCII	ESC	f	*t1*	*t2*
	Hex	1B	66	*t1*	*t2*
	Decimal	27	102	*t1*	*t2*

[Range] *t1* = 0

$0 \le t2 \le 64$

[Description] Sets the time that the printer waits for slip paper to be inserted and the time from insertion of the sheet to the start of printing.

- *t1* specifies the wait time for a cut sheet to be inserted. There is no limitation for the wait time and the printer waits until slip paper is inserted.
- *t2* specifies the time from insertion of the sheet to the start of printing.
- The printer starts operation [$t2 \times 0.1$] seconds after detecting slip paper.

[Note] When either *t1* or *t2* is out of the specified range, this command does not change the previously set wait time.

[Default] *t1* = 0, *t2* = 10

ESC p *m t1 t2*

[Name] Generate pulse

[Format]

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

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

$0 \le t1 \le 255$

$0 \le t2 \le 255$

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

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

[Notes]

- The pulse ON time is [$t1 \times 2$ ms] and the OFF time is [$t2 \times 2$ ms].
- If *m* is outside the specified range, the printer ignores this command and the following data is processed as normal data.

ESC q

[Name] Paper release

[Format]

ASCII	ESC	q
Hex	1B	71
Decimal	27	113

[Description] Releases the paper

[Notes]

- This command is available only in standard mode.
- When the panel button is disabled and the specified paper sensor detects a paper-end, the printer releases the paper, regardless of this command.

[Reference] **ESC c 4**, **ESC c5**

ESC t *n*

[Name] Select character code table

[Format]

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

[Range] $0 \leq n \leq 2$

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

n	Page	
0	0	(PC437 (U.S.A., Standard Europe))
1	1	(Katakana)
2	2	(PC850 (Multilingual))

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

[Default] *n* = 0

ESC u *n*

[Name] Transmit peripheral device status

[Format]

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

[Range] *n* = 0, 48

[Description] Transmits the status of connector pin *n* upon receiving this command, using *n* 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 DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer keeps waiting until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without checking the DSR signal.
- This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.

- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **ESC u** and the ASB status must be differentiated.
- If *n* is out of the specified range, the printer ignores this command.
- The status to be transmitted is shown in the table below.

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Level of pin 3 is Low.
	On	01	1	Level of pin 3 is High.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	00	0	Undefined.
	On	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 defined. Fixed to Off.

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

ESC v

[Name] Transmit paper sensor status

[Format]

ASCII	ESC	V
Hex	1B	76
Decimal	27	118

[Description] Transmits the current paper sensor status upon receiving this command.

[Notes]
- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE).
  If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without checking the DSR signal.

- The 1 byte status data is transmitted after printing and paper feed operation completely stop (transmit timing differs from **ESC u**, **GS I**).
- 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	Slip is detected by BOF sensor.
	On	01	1	Slip is not detected by BOF sensor.
1	Off	00	0	Slip is detected by TOF sensor.
	On	02	2	Slip is not detected by TOF sensor.
2	Off	00	0	Undefined.
	On	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.

[Reference] **DLE EOT**, **GS a**
Paper Specifications

ESC { *n*

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

[Format]

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

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

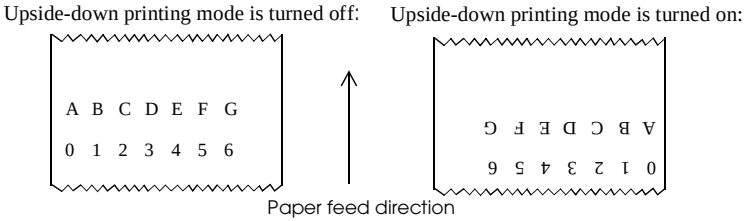
[Description] Turns upside-down printing mode on or off.

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

[Notes]
- In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.
- In page mode, only setting is effective.
- This command is enabled only when input at the beginning of a line.

[Default] *n* = 0

[Example]



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-295	02H
2, 50	Type ID	See table below.	
3, 51	ROM version ID	Depends on ROM version	

n = 2, Type ID

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Not used. Fixed to Off.
1	Off	00	0	Not used. Fixed to Off.
2	Off	00	0	Undefined.
	On	04	4	Undefined.

Bit	Off/On	Hex	Decimal	Function
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.

[Notes]
- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.
- The ROM version may be changed.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **GS I** and the ASB status must be differentiated.
- When *n* is out of the specified range, this command is ignored.

GS a *n*

[Name] Enable/Disable Automatic Status Back

[Format]

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

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

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

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Drawer kick-out connector pin 3 status disabled.
	On	0	1	Drawer kick-out connector pin 3 status enabled.

Bit	Off/On	Hex	Decimal	Status for ASB
1	Off	00	0	On-line/Off-line status disabled.
	On	02	2	On-line/Off-line status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Undefined.
	On	08	8	Undefined.
4	Off	00	0	Undefined.
	On	10	16	Undefined.
5	Off	00	0	Slip sensor status disabled.
	On	20	32	Slip sensor status enabled.
6	Off	00	0	Undefined.
	On	40	64	Undefined.
7	Off	00	0	Undefined.
	On	80	128	Undefined.

[Notes]

- If *n* = 0, ASB is disabled.
- ASB is enabled if only one status is selected. The printer automatically transmits a status of four bytes whenever the status changes.
- If ASB is enabled while processing this command, the current status is transmitted with no regulations.
- When transmitting a status, the printer transmits only four bytes without confirming the condition of the DSR signal.
- Four bytes of status data must be consecutive, except for XOFF code.
- 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 the printer is disabled by **ESC =**, this command is disabled but ASB is not disabled.
- When using **ESC u**, **ESC v**, **GS I** or **DLE EOT**, the status transmitted by this command, the ASB information, and the status transmitted by another commands 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	Not used. Fixed to Off.
6	Off	00	0	Paper feed button is not used.
	On	40	64	Paper feed button is used.
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	Undefined.
	On	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	No unrecoverable error.
	On	20	32	Unrecoverable error.
6	Off	00	0	Undefined.
	On	40	64	Undefined.
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	Undefined.
	On	01	1	Undefined.
1	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	00	0	Undefined.
	On	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	Slip is detected by BOF sensor.
	On	20	32	Slip is not detected by BOF sensor.
6	Off	00	0	Slip is detected by TOF sensor.
	On	40	64	Slip is not detected by TOF sensor.
7	Off	00	0	Not used. Fixed to Off.

Forth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Slip paper selected.
1	Off	00	0	Slip printing possible.
	On	02	2	Slip printing not possible.
2	Off	00	0	Undefined.
	On	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.

Bit	Off/On	Hex	Decimal	Status for ASB
6	Off	00	0	Undefined.
	On	40	64	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bit 1:
- Becomes On (slip printing possible) when slip paper is detected and becomes Off (slip printing is not possible) when slip ejection starts or time-out.
- When the printer goes to the slip wait status, bit 5 and 6 of the third byte are On (no paper) and bit 1 of the forth byte is On (slip printing is not possible).
- When paper-end stop is disabled by **ESC c 4**, bit 1 does not become On (slip printing is not possible) even if no printing area remains.
- When the release button is pressed during slip printing, bit 1 becomes On (slip printing is not possible).

[Default] *n* = 0

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

GS r *n*

[Name] Transmit status

[Format]

ASCII	GS	r	*n*
Hex	1D	72	*n*
Decimal	29	114	*n*

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

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

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

[Notes]
- When DTR/DSR control is selected, the printer transmits only 1 byte after confirming the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.
- This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.

- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **GS r** and the ASB status must be differentiated.
- If the value of *n* is out of the specified range, the printer ignores this command.
- 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	Slip is detected by BOF sensor.
	On	01	1	Slip is not detected by BOF sensor.
1	Off	00	0	Slip is detected by TOF sensor
	On	02	2	Slip is not detected by TOF sensor.
2	Off	00	0	Undefined.
	On	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.

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	Off	00	0	Undefined.
	On	02	2	Undefined.
2	Off	00	0	Undefined.
	On	04	4	Undefined.
3	Off	00	0	Undefined.
	On	08	8	Undefined.

Bit	Off/On	Hex	Decimal	Status for ASB
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.

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