TM-U590

Ticket Printer

OPERATION
MANUAL

Printer Parts and Labels

front cover

table

control panel

On/Off switch

paper guide

document table

FORWARD

REVERSE

RELEASE

■ POWER
■ ERROR
■ RELEASE
■ SLIP
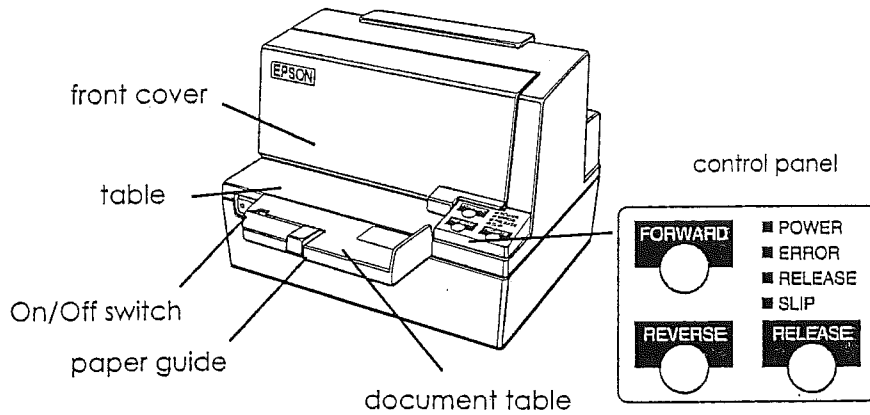
* Slide the paper guide
to fit the width of your paper.

Caution Labels

⚠ ♨ **CAUTION:**

Printer head is hot.

⚠ ♨ **ATTENTION:**

Téte d'impression chaude.
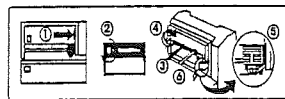
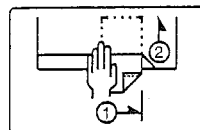⚠ ♨ **VORSICHT:**

Druckerkopf heiß

⚠ **CAUTION:**

Caution labels for drawer kick-out and display module connectors

Instruction Labels

ribbon installation label inside
front cover

label on the document table

Quick Reference

This Quick Reference will direct you to key areas of this Operator's Manual. For a complete listing of topics, see the Contents.

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EMC and Safety Standards Applied

Product Name: TM-U590/TM-U590P

Model Name: M128B

The following standards are applied only to the printers that are so labeled. (EMC is tested using the EPSON PS-170 power supply)

Europe: CE marking
                    Safety Standard: EN60950

North America: EMI: FCC/ICES-003 Class A
                    Safety standards: UL 1950/CSA22.2 No. 950

Oceania: EMC: AS/NZS 3548

WARNING

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

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

CE Marking

The printer conforms to the following Directives and Norms

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

Directive 90/384/EEC   EN45501

FCC Compliance Statement

For American Users

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

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

FOR CANADIAN USERS

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

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

GEREÄUSCHPEGEL

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

About This Manual

Setting Up and Using

❑   **Chapter 1** contains information on unpacking the printer, and setting it up.

❑   **Chapter 2** contains information on using the printer.

❑   **Chapter 3** contains troubleshooting information.

Reference

❑   **Chapter 4** contains specifications.

❑   **Appendix A** tells how to change the DIP switches.

Warnings, Cautions, and Notes

⚠ WARNING:

Warnings must be followed carefully to avoid serious bodily injury.

⚠ CAUTION:

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

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

Introduction

Features

The TM-U590 and TM-U590P are high-quality POS printers that can print on slip paper. The printers have the following features:

❑ Wide slip paper capability (maximum characters per line: 88 with 7 × 9 font)

❑ Copy printing is possible

❑ High throughput using bidirectional, minimum distance printing

❑ Optional magnetic Ink Character Recognition (MICR) reader that enables the printer to perform consecutive reading and processing of MICR characters and printing endorsements

❑ EPSON customer display series connection (DM-D102/DM-D203). (Available only for the serial interface model)

❑ Selectable receive buffer size (69 bytes or 4K bytes)

❑ Command protocol based on the ECS/POS® standard

❑ Automatic Status Back (ASB) function that automatically transmits changes in the printer status

Options

❑ Magnetic Ink Character Recognition (MICR) reader (factory installed option).

❑ Direct connection display modules, DM-D102 and DM-D203

❑ EPSON power supply unit, PS-170

Accessory

❑ EPSON ribbon cassette, Purple: ERC-31(P), Black: ERC-31(B)

Ordering ribbon cassettes

The TM-U590/U590P uses a long-lasting ribbon cassette. To order ribbon cassettes, contact your dealer or your local affiliate.

Contents

Chapter 4 *Reference Information*

Appendix A *Dip Switch Setting*

Chapter 1
Setting Up the Printer

Unpacking

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

ribbon

hexagonal
lock screws
(only for the serial interface)

switch
cover
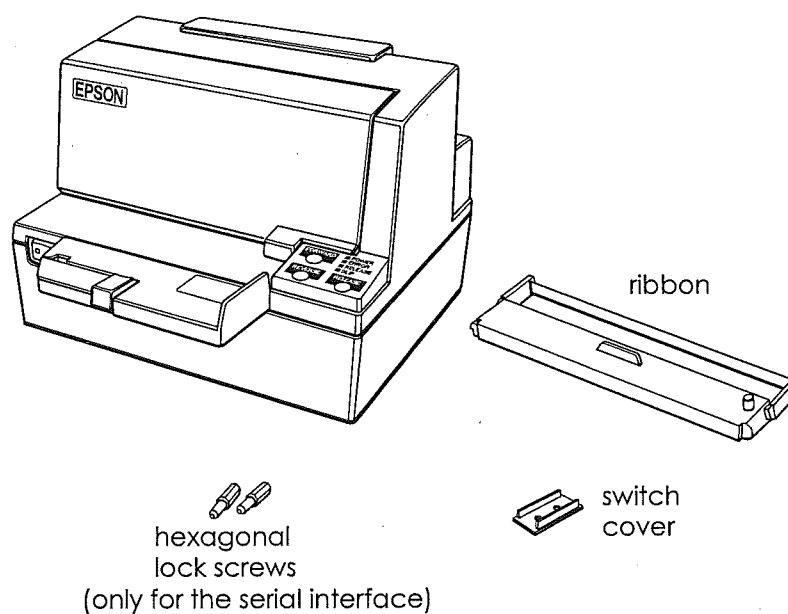
See the note on page 1-4 for information about the hexagonal lock screws.

✎ *Note:*
When you lift the printer, be sure to hold the bottom of the printer to prevent damage.

Removing the protective material

1. Open the printer by pulling up on the tab on the front cover.

tab
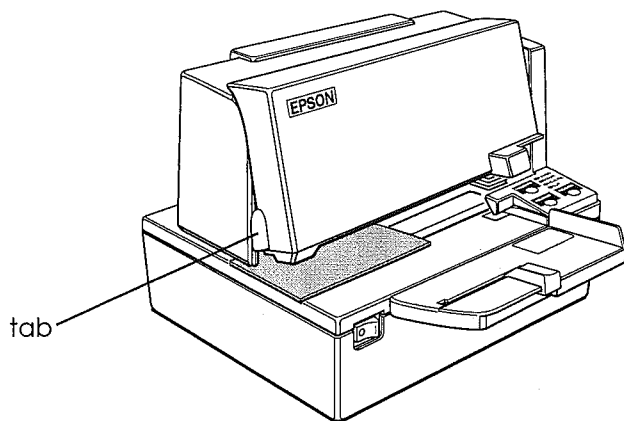
2. Remove the damper from the printer as shown below.
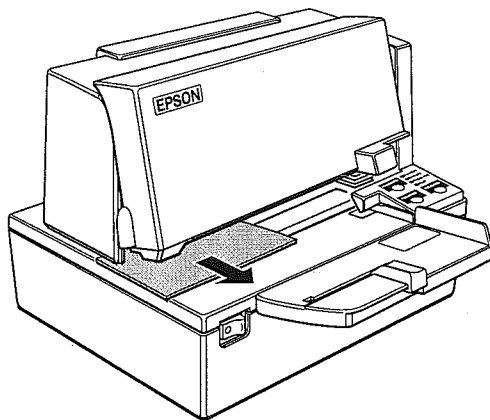
3. Store the dampers with the other packing materials and use them when transporting your printer.

Connecting the Cables and Grounding the Printer

You can connect up to five cables to the printer. They all connect to the connector panel on the bottom of the printer, which is shown below:

grounding screw

power supply

drawer kick-out

display module
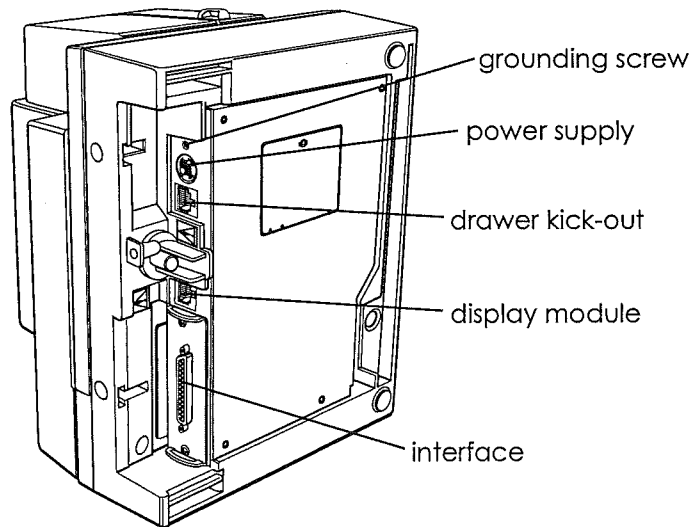
interface

✏ Notes:
There are caution labels beside the drawer kick-out connector and the display module connector.

Depending on the interface installed, the interface connector on your printer may look different from the one illustrated.

Before connecting any of the cables, make sure that both the printer and the computer are turned off.

Connecting the computer

You need an appropriate serial or parallel interface cable to connect your computer to the printer (null modem for serial or IEEE 1284 for parallel).

1. Plug the cable connector securely into the printer's interface connector.

2. Tighten the screws on both sides of the cable connector.
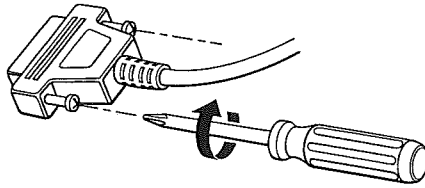
✎ *Note:*
Your printer has inch-type hexagonal lock screws installed. If your interface cable requires millimeter-type screws, replace the inch-type screws with the enclosed millimeter-type screws using a hex screwdriver (5 mm).
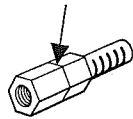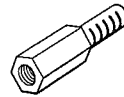
inch screw   millimeter screw

3. Attach the other end of the cable to the computer.

Connecting the drawer

⚠ WARNING:

Use a drawer that matches the printer specification. Using an improper drawer may damage the drawer as well as the printer.

⚠ CAUTION:

Do not connect a telephone line to the drawer kick-out connector; otherwise the printer and the telephone line may be damaged.

Plug the drawer cable into the drawer kick-out connector on the bottom of the printer next to the power supply connector.
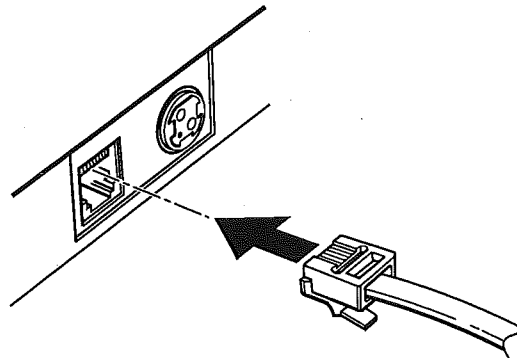
Anschließen der Schublade

⚠ WARNUNG:

Eine für den Drucker geeignete Schublade verwenden. Bei Verwendung einer falschen Schublade kann diese oder der Drucker beschädigt werden.

⚠ ACHTUNG:

Kein Telefonkabel an die Schnappsteckerbuchse anschließen, da sonst der Drucker und die Telefonkabel beschädigt werden können.

Das Kabel der Schublade an die Schnappsteckerbuchse unten am Drucker neben dem Netßzanschluß anschließen.
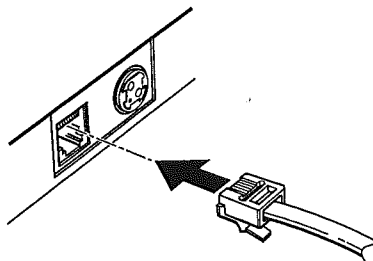
Connecting the display module

Plug the cable connector (provided with the direct connection display module) securely into the printer's display module connector until it clicks.
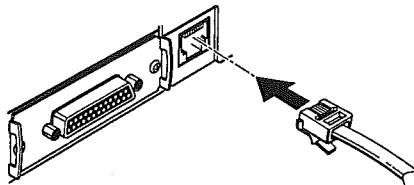
⚠ CAUTION:

Be sure not to connect this cable to the drawer kick-out connector, which is to the left of the power supply connector. Do not connect a telephone line to the display connector. If you do, the printer and the telephone line may be damaged.

⚠ ACHTUNG:

Darauf achten, daß dieses Kabel nicht an die Schnappsteckerbuchse links neben der Stromversorgungsbuchse angeschlossen wird. Kein Telefonkabel an die Anzeigebuchse anschließen. Andernfalls können der Drucker und das Telefonkabel beschädigt werden.

✎ *Notes:*
To remove the cable, squeeze the connector and pull it out.

The display module can be used only for the serial interface.

Grounding the printer

You need a ground wire to ground your printer. Make sure that the wire is AWG 18 or equivalent.

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.
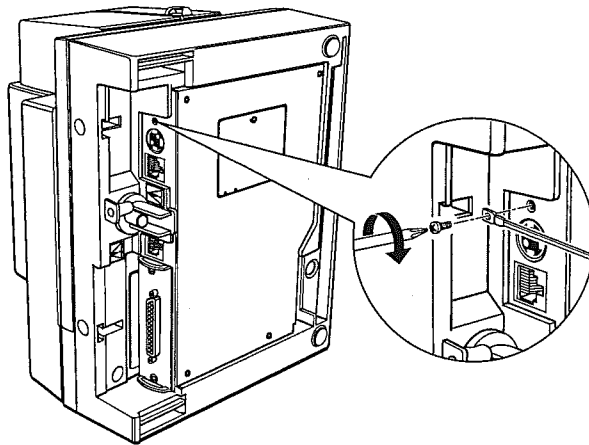
Connecting the power supply

Use the optional EPSON PS-170 or equivalent power supply for your printer.

⚠ WARNING:

Make sure that you use the EPSON PS-170 power supply or equivalent. Using an incorrect power supply may cause fire or electrical shock.

⚠️CAUTIONS:

When connecting or disconnecting the power supply from the printer, make sure that the power supply is not plugged into an electrical outlet. Otherwise you may damage the power supply or the printer.

If the power supply's rated voltage and your outlet's voltage do not match, contact your dealer for assistance. Do not plug in the power cord. Otherwise you may damage the power supply or the printer.

1. Make sure that the printer's power switch is turned off, and the power supply's power cord is unplugged from the electrical outlet.

2. Check the label on the power supply to make sure that the voltage required by the power supply matches that of your electrical outlet.

3. Plug in the power supply's cable as shown below. Notice that the flat side of the plug faces down.,
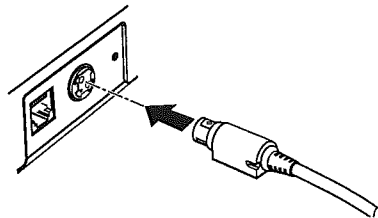
📝 *Note:*

To remove the DC cable connector, make sure that the power supply's power cord is unplugged; then grasp the connector at the arrow and pull it straight out.

Installing the Ribbon Cassette

Use the EPSON ERC-31(P) or ERC-31(B) ribbon cassette for your printer.

Note the label inside this section that can assist you in replacing the ribbon.
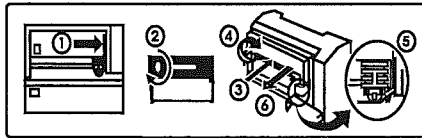
⚠ CAUTION:

Never turn the ribbon knob in the opposite direction of the arrow marked on the cassette; otherwise the ribbon cassette may be damaged.

1. Be sure the printer is not receiving data when you replace a ribbon cassette; otherwise data may be lost.

2. Turn on the printer and open the front cover by pulling up on the tab on the left side of the cover.
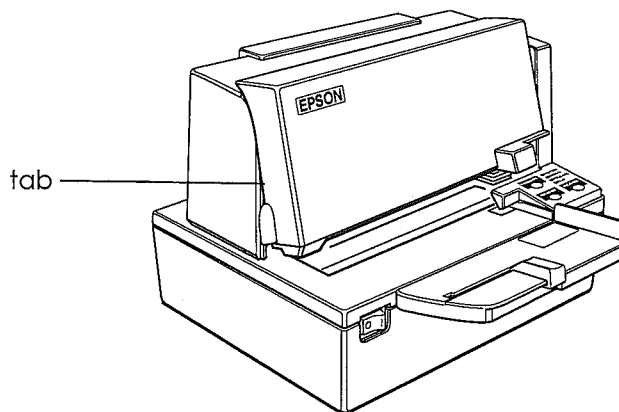
3. Make sure that the print head is on the right side.

4. If you are replacing a used ribbon, grasp the end of the tab and remove it from the printer. See the illustration in step 5 for the location of the tab.

5. Turn the ribbon knob two or three times in the direction of the arrow to take up any slack in the ribbon.
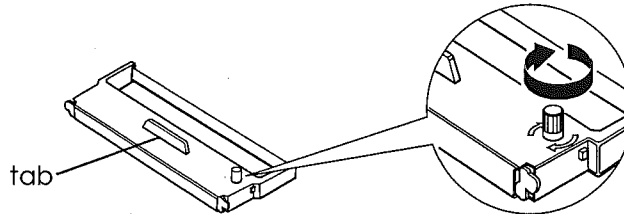
6. Insert the ribbon cassette in the printer and rotate the cassette's knob two or three more times. This is necessary to place the ribbon in the correct position.
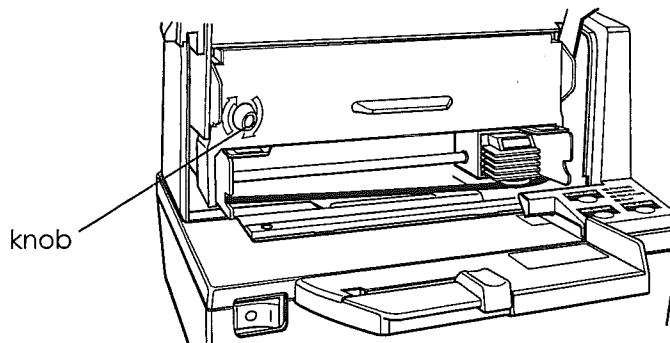
Make sure that the ribbon is installed below the print head without wrinkles or creases. (See ⑤ on the label for an illustration of where the ribbon should go.)

If the ribbon is not installed correctly, remove the cassette and repeat steps 5 and 6 above.

Using the Power Switch Cover

⚠ WARNING:

If an accident occurs when the power switch cover is attached, unplug the power supply cord from the outlet immediately. Continued usage may lead to fire or shock.

You can use the enclosed power switch cover to make sure that the power switch is not accidentally pressed. If you want to use this cover, install it as shown in the illustration below.
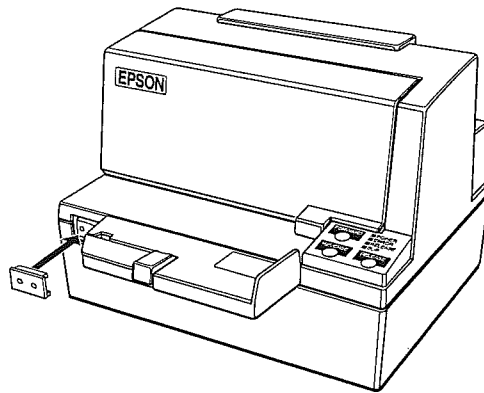
Self Test

The self test lets you know if your printer is operating properly. It checks the control circuits, printer mechanisms, print quality, ROM version, and DIP switch settings.

This test is independent of any other equipment or software.

Running the self test

1. Make sure the printer is turned off and the printer cover is closed properly.

2. While holding down the REVERSE button, turn on the printer to begin the self test. (The SLIP light blinks.)

3. Feed a sheet of slip paper into the printer. The printer loads the paper automatically, prints the printer settings, and then ejects the paper.

4. Remove the paper from the printer and feed another sheet of slip paper into the printer to print characters from the character table. Continue to feed slip paper into the printer until the self test prints the following:

completed

The printer is ready to receive data as soon as it completes the self test.

✎ *Note:*
If you want to pause the self test manually, press the REVERSE button. Press the REVERSE button again to continue the self test.

DIP Switch Settings

The TM-U590/U590P is set up at the factory to be appropriate for almost all users. It does, however, offer some settings for users with special requirements.

It has DIP switches that allow you to change communication settings, such as handshaking and parity check, as well as connection to a customer display.

See Appendix A if you need to make any changes.

Removing the Paper Guide

If you will use especially wide paper, you may not want to use the paper guide on the document table. You can remove it, as described below.

1. Open the printer by pulling up on the tab on the front cover.

2. Slide the large table to the left and remove it as shown in the illustration below.

3. Loosen the screws and remove the document table from the printer.
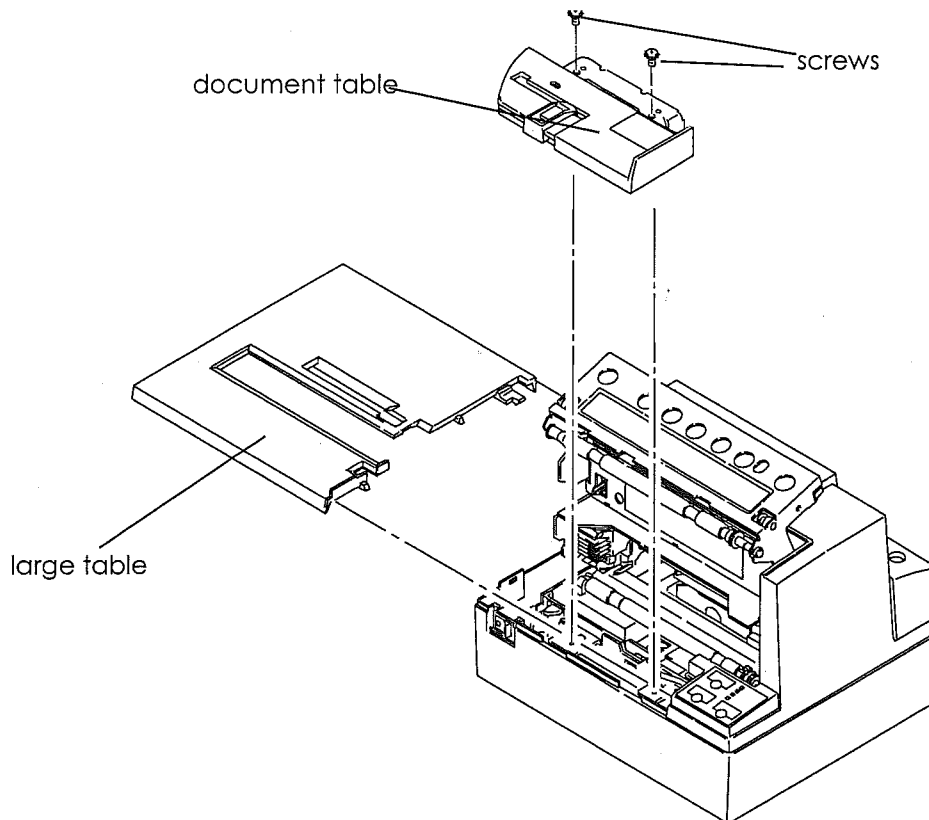
✎ *Note:*
Be sure not to drop the screws in the printer.

4. Turn the document table over, remove the screws shown below, and remove the plate.

plate

screws
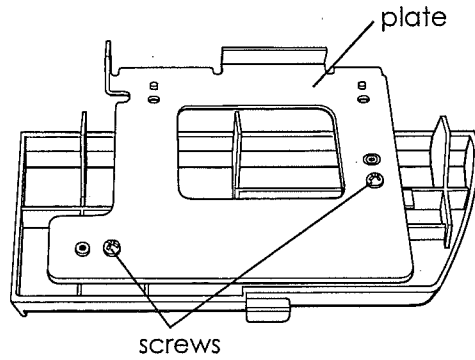
5. Slide the paper guide to the left to remove it.
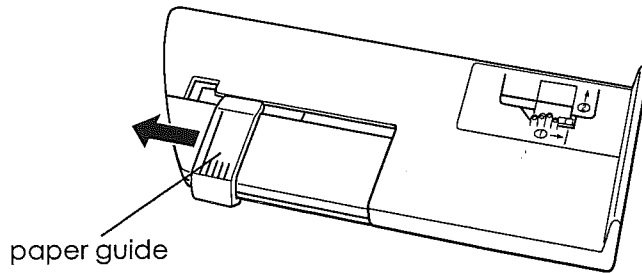
paper guide

6. Replace the plate and install the document table and the large table.

✎ *Note:*
Be sure to keep the paper guide with the manual.

Chapter 2
Using the Printer

Operating the Control Panels

You can control the basic paper feeding operations of the printer with the buttons on the control panels. The indicator lights help you monitor the printer's status.

Control panel
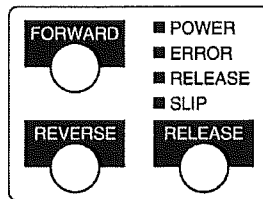
Buttons

The printer and these buttons will not operate when the cover is open. Also these buttons can be disabled with the **ESC c 5** command.

FORWARD

Press the FORWARD button once to advance slip paper one line. You can also hold down this button to feed slip paper continuously.

REVERSE

Press the REVERSE button once to reverse slip paper one line. You can also hold down this button to reverse slip paper continuously.

RELEASE

Press this button to release slip paper.

Indicator lights

The control panel lights provide information on printer conditions.

Panel lights

POWER

The POWER light is on when the printer is on.

ERROR

The printer is offline when the light is on (except during paper feed using the FORWARD or REVERSE buttons or during self-test printing).

There is an error when the light blinks. See Chapter 3 for information on what to do.

RELEASE

This light is on when the platen and paper feed roller are released so that slip paper can be inserted.

This light is off when platen and paper feed roller are cramped together (during printing on slip paper).

SLIP

This light is usually on when the power is on.

This light is off when ejecting a slip paper.

This light blinks when the printer is in the slip insertion/removal waiting state or personal check insertion/removal waiting state (only when the printer is used with the MICR reader).

Slip Paper Handling

✎ *Notes:*

Use only slip paper that matches the printer's specifications. See Paper Specifications in Chapter 4.

Be sure that the slip is flat, without curls, folds, or wrinkles.

1. Send the appropriate control commands from the computer.

2. When the SLIP light blinks, insert the slip paper into the slip paper inlet using the right edge of the slip paper inlet as a guide. (Follow steps ① and ② in the illustration.)
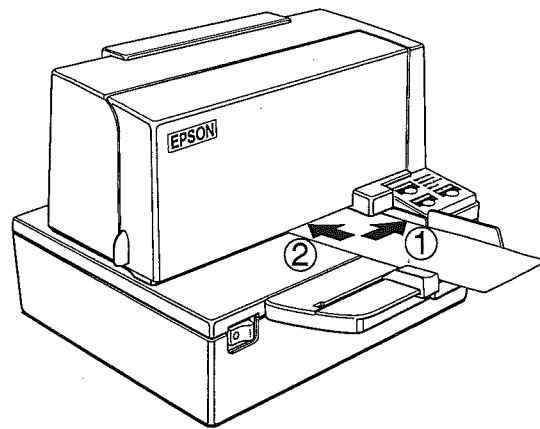
✎ *Note:*
There is a label on the document table to show you how to insert slip paper.

3. Make sure you insert the slip paper into the inlet as far as it will go.

4. When the slip sheet is detected by the sensor, the SLIP light is changed from blinking to on and the paper is automatically drawn into the printer and printing begins.

✎ *Note:*
After the slip is detected, the printer moves the slip back and forth to detect the position of the top edge of the slip. If the setting position of the slip is not correct, the printer takes a few seconds to detect the position of the top edge of the slip.

5. After printing, remove the slip.

Using the MICR Reader (Option)

If your printer has the factory installed optional Magnetic Ink Character Recognition (MICR) reader that enables the printer to read and process MICR characters on personal checks, read this section.

Reading MICR characters on personal checks

To use the MICR function with personal checks, follow the steps below:

⚠ CAUTION:

Do not insert checks with staples in them. This may cause paper jams, MICR reading errors, and damage to the MICR head.

✎ *Note:*
Be sure that the checks are flat, without curls, folds, or wrinkles.

1. Wait until the computer sends the **FS a 0** command to the printer, causing it to enter the MICR mode. The SLIP light blinks.

2. Turn the check over so that it is *face down* with the MICR characters on the right-hand side. The MICR characters must be next to the right edge of the paper inlet.
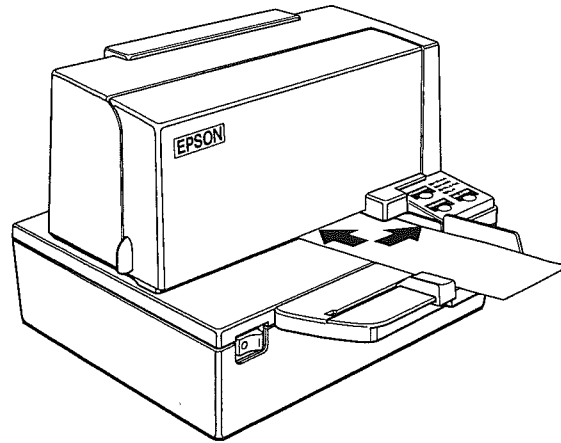
3. Insert the check straight into the paper inlet, using the right edge of the paper inlet as a guide.

4. Insert the check as far as it will go. The printer will detect the check and start drawing it in.

5. When the printer starts drawing it in, let go of the check immediately. The SLIP light quits blinking but stays on.

6. When printing and MICR reading are finished, the printer ejects the check and the SLIP light starts blinking again.

7. Remove the check by pulling it straight up; do not pull it at an angle. The SLIP light goes on.

See Chapter 3 to find out how to clean the MICR mechanism and see Chapter 4 for more details on the MICR function.

Chapter 3
Troubleshooting

Troubleshooting

This chapter gives solutions to some printer problems you may have.

General problems

The lights on the control panel do 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

An ERROR light is blinking and the printer does not print.

First, turn off the printer and check for a paper jam. (See the paper jam description on page 3-3.)

If there is no paper jam, turn off the printer and turn it back on after about 10 seconds. If the ERROR light is still flashing, contact a qualified service person.

The ERROR light is off, but nothing is printed.

Try to run the self test to check that the printer works properly. See the self test instructions in Chapter 1 to run the self test. If the self test does not work, contact your dealer or a qualified service person.

If the self test works properly, check the following:

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

2. The data transmission settings may be different between the printer and computer. Make sure that the printer's DIP switch settings for data transmission are the same as the computer's. You can print the printer's interface settings using the self test.

If the printer still does not print, contact your dealer or a qualified service person.

The printer sounds like it is printing, but nothing is printed.

The ribbon cassette may not be installed properly. See the instructions in Chapter 1.

The ribbon may be worn out. Replace the ribbon cassette as described in Chapter 1.

The printout is faint.

The ribbon may be worn out. Replace the ribbon cassette as described in Chapter 1.

A line of dots is missing in the printout.

The print head may be damaged. Stop printing and contact your dealer or a qualified service person.

Paper handling problems

Paper is jammed inside the printer.

⚠ CAUTION:

Do not touch the print head because it can be very hot after printing continuously for a long time.
Do not move the print head carriage.

To clear a paper jam, follow the steps below:

1. Turn the printer off and open the front cover.

2. Remove the jammed paper.

Cleaning the Optional MICR Mechanism

It is recommended that you clean the MICR head and feed rollers every 6,000 uses or every month, whichever comes first.

MICR cleaning sheets

There are two different cleaning sheets that you use to keep your MICR unit working well:

❑ EPSON FEED ROLLER CLEANING SHEET

❑ PRESAT (KIC) brand CHECK READER CLEANING CARD or equivalent.

The cleaning procedure

1. Make sure that a ribbon cassette is installed.

2. Turn off the power switch.

3. Open the front cover.

4. Turn on the power switch while holding down the RELEASE button. Release the button after the printer initializes itself.

5. Press the RELEASE button 6 times.

6. Close the front cover, and note that the slip light flashes.

7. Take a FEED ROLLER CLEANING SHEET and peel off the protective cover to expose the adhesive.
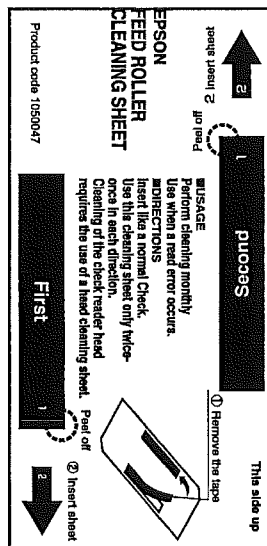
8. With the cleaning sheet positioned as shown above, insert it into the printer, being sure that the right side of the cleaning sheet is against the right side of the slip paper guide.

9. When the printer begins to pull the sheet, release it and allow the printer to advance the sheet through the printer and eject it.

10. Remove the FEED ROLLER sheet.

11. Take a presaturated CHECK READER CLEANING CARD and remove the protective cover.

12. Insert it into the printer exactly as you did the FEED ROLLER sheet.

13. After the printer ejects it, remove the CHECK READER card.

14. Turn off the power switch.

Command code sequence

The FS c command can be substituted for steps 2 through 6 above.

Hexadecimal Dump

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

To use the hex dump feature, follow these steps:

1. After you make sure that the printer is off, open the cover.

2. Hold down the REVERSE button while you turn on the printer.

3. Close the cover.

4. Run any software program that sends data to the printer. The printer prints "Hexadecimal Dump" and then all the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that correspond to the codes.

```
           Hexadecimal Dump

1B 21 00 1B 26 02 40 40     . ! . . & . @ @
1B 25 01 1B 63 34 00 1B     . % . . c 4 . .
41 42 43 44 45 46 47 48     A B C D E F G H
```

- A period (.) is printed for each code that has no ASCII equivalent.

- During the hex dump all commands except **DLE EOT** and **DLE ENQ** are disabled.

5. Open the cover to set the printer off line so that it will print the last line.

6. Close the cover and turn off the printer or reset it to turn off the hex dump mode.

Chapter 4

Reference Information

Printing Specifications

Printing method:	Serial impact dot matrix
Head wire configuration:	9-pin vertical line, 0.353 mm (1/72-inch) wire pitch
Head wire diameter:	0.29 mm (.01 in.)
Printing direction:	Bidirectional, minimum distance printing
Number of characters:	Alphanumeric characters: 95
	International characters: 32
	Extended graphics: 128 × 10 pages (including space page)
Character structure:	Font A: 9 × 9, 3-dot spacing (in half-dot units)
	Font B: 7 × 9, 2-dot spacing (in half-dot units)
	Larger spacing can be set by using **ESC SP**.

Character size and printing speed

Character structure (Horizontal dots × vertical dots)	Character spacing (half dots)	Characters per inch	Characters per second (carriage moving speed)	Characters per line	Character size (width×height)
9 × 9	3 dots	12.5	233	66	1.6 × 3.1 mm (.06" × .12")
7 × 9	2 dots	16.7	311	88	1.3 × 3.1 mm (.05" × .12")

Ribbon Specifications

Type: Exclusive cassette ribbon

Ribbon cassette   Part number: ERC-31 (P), ERC-31(B)
specifications:
                                   Color: (P) Purple

                                                  (B) Black

                                   Ribbon life: (P) 7,000,000 characters

                                                  (B) 4,500,000 characters
                                                      (when 1 character=18
                                                      dots)

MICR Reader (Option)

The MICR reader is a factory-installed option.

Available fonts: E-13B, CMC7

Reading method: Magnetic bias

Recognition rating: 98% or more at 25°C (75°F)
                              Rating = ([total checks – number misread
                              or not identified]/total checks) × 100
                              Check paper tested is EPSON standard
                              check paper. Checks must be flat, without
                              curls, folds, or wrinkles. The magnetic bias
                              method is used for reading.

Paper type: Normal check paper with thickness of 0.09
                              to 0.36 mm (0.0035 to 0.141″)
                              Size: 70 × 70 mm to 210 × 297 mm (A4)
                              (2.76 × 2.76″ to 8.27 × 11.69″)

Inserting direction and endorsement printing

Insert the check with the surface printed with the magnetic ink downward, following the table guide.

Endorsement printing can be performed continuously after check reading. In this case, the print starting position is point A in the illustration below.

❑   To print endorsements in the specified area (within 38.1 mm [1.5"] from the top), set the print position for the last line so that it is printed at least 3 mm (0.118") above the bottom of the printable area.

ENDORSE CHECK HERE :

X

"DO NOT SIGN WRITE STAMP BELOW THIS LINE
FOR FINANCIAL INSTITUTION USAGE ONLY"

Specified printing area

38.1

Inserting direction

8.7

A

3

[Units: mm (All the numeric values are typical.)]
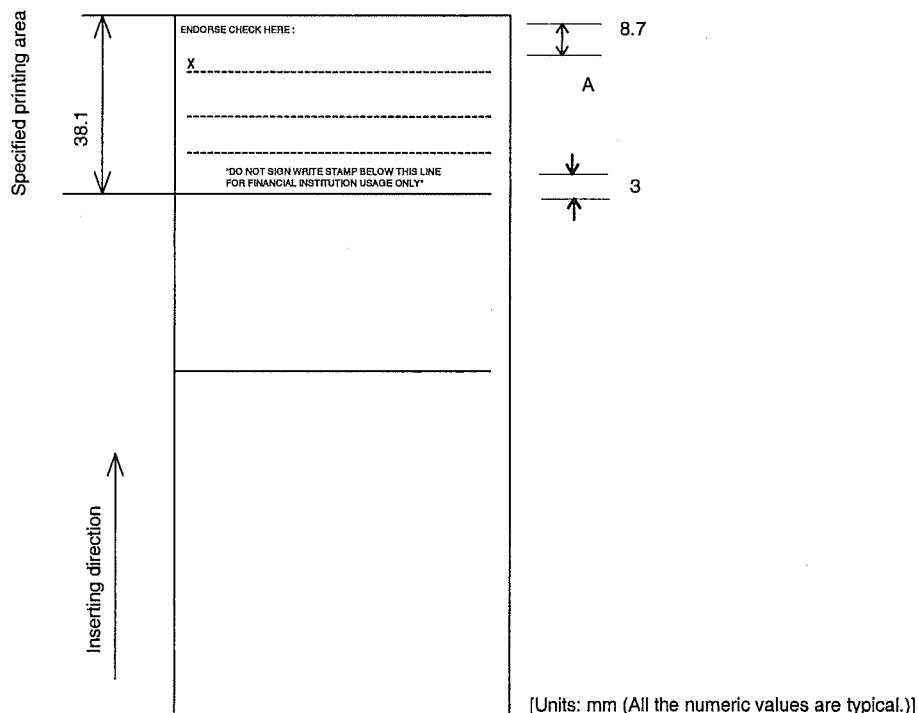
The illustraton below shows the area that the MICR reader cannot read.
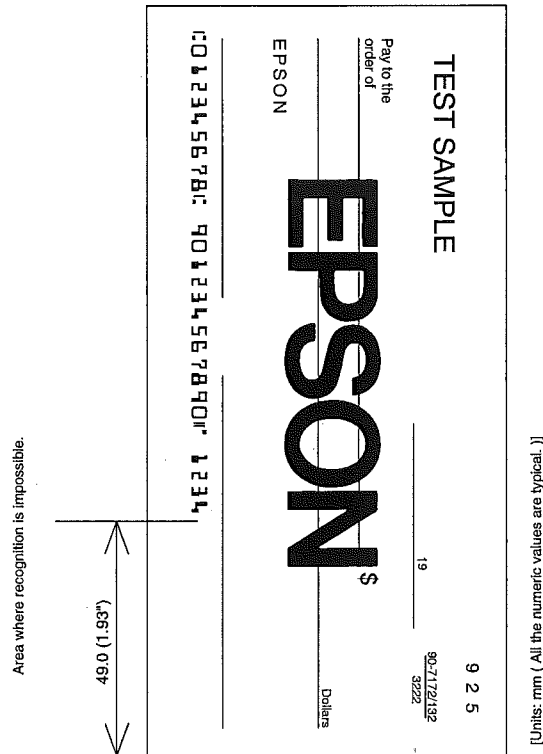
Paper Specifications

Paper feed method: Friction feed

Paper feed pitch: Default 4.23 mm (1/6″)
0.176 mm (1/144″) can be set by a command

Paper feed speed:

Approximately 60.3 msec/line
(4.23 mm (1/6″) feeding)

Approximately 86.4 mm/second (3.4 inches/second) (continuous feeding)

Paper

Paper type:	Normal paper
	Carbon copy paper
	Pressure sensitive paper
Total thickness:	0.09 to 0.36 mm (.0035 to .0141")

See "Copy capability and paper thickness" on the next page for more information.

Size (W × L):	70 × 70 mm to 210 × 297 mm (A4) (2.76 × 2.76" to 8.27 × 11.69")

Ambient temperature and copy capability

Copy capability is greatly influenced by the ambient temperature, so printing must be performed under the conditions described in the table below.

Number of copies	Ambient temperature (print mode)
Original + 4 copies	Approx. 20° to 45° C (68° to 113° F)
Original + 1 to 3 copies	5° to 45° C (41° to 113° F)

Copy capability and paper thickness:

Normal paper (single-ply): 0.09 to 0.2 mm (.0035 to .0079")

Carbon copy paper combination: 5 sheets maximum (original + 4 copies) at 20 to 45° C (68 to 113° F)

Backing paper: 0.06 to 0.15 mm (.0023 to .0059")

Copy and original: 0.04 to 0.07 mm (.0015 to .0028")

Carbon paper:	Approximately 0.035 mm (.0014″)
Total thickness:	0.30 mm (.0118″) or less (original to original + 3 copies)
	0.36 mm (.0141″) or less (original + 4 copies)
	Pressure sensitive paper: 5 sheets maximum (original + 4 copies) at 20° to 45° C (68° to 113° F)
Backing paper:	0.06 to 0.15 mm (.0023 to .0059″)
Copy and original:	0.06 to 0.075 mm (.0023 to .003″)
Total thickness:	0.24 mm (.0094″) or less (original to original + 3 copies)
	0.30 mm (.0118″) or less (original + 4 copies)

✎ *Note:*
When using multi-ply paper that consists of an original and three or four copies, be sure to print with a 9 × 9 font. If a 7 × 9 font is used, some characters on some of the copies may not be readable.

Notes on slip paper

❑ The slip paper must be flat, without curls or wrinkles, especially at the top edges. Otherwise, the paper may rub against the ribbon and become dirty.

❑ There must be no glue on the bottom edge. Choose slip paper carefully since paper feeding and insertion are affected by gluing conditions (such as glue quality, method, and length) and glue location (see the illustration below). Be especially careful when the slip paper is wide and has glue on the left edge, since it may not feed in a straight line.

OK to use   Do not use   Use carefully   OK to use

Paper feed direction   Glued area
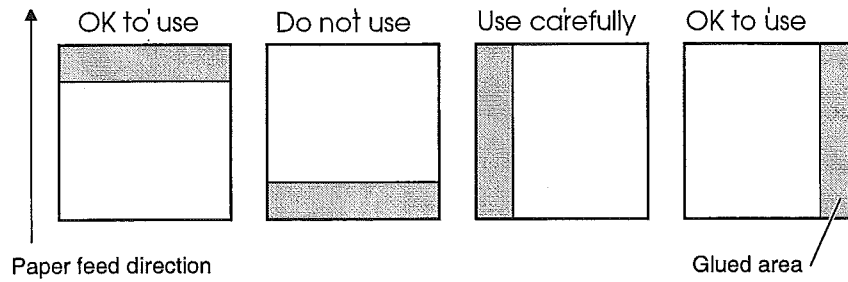
❑ Since the BOF sensor uses a photo sensor, do not use paper that has holes at the sensor position or is translucent.

❑ Since the TOF sensor uses a reflective photo sensor and it detects from the back of slip paper, do not use paper that has holes or dark portions with low reflection (less than 40% reflection) at the sensor position.

[All the numeric values are typical.]

Area where paper holes are prohibited and reflection rate for the back of paper should be 40% or more.

Paper holes and translucence prohibited area.

Paper feed direction

[Units: mm (All the numeric values are typical.)]

H504_8.eps
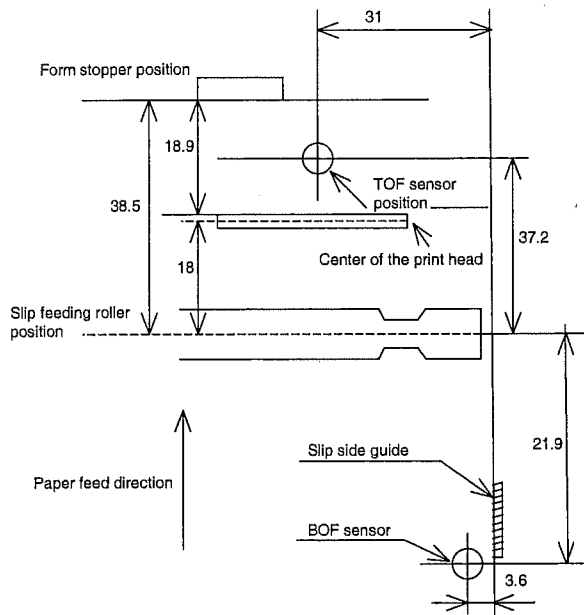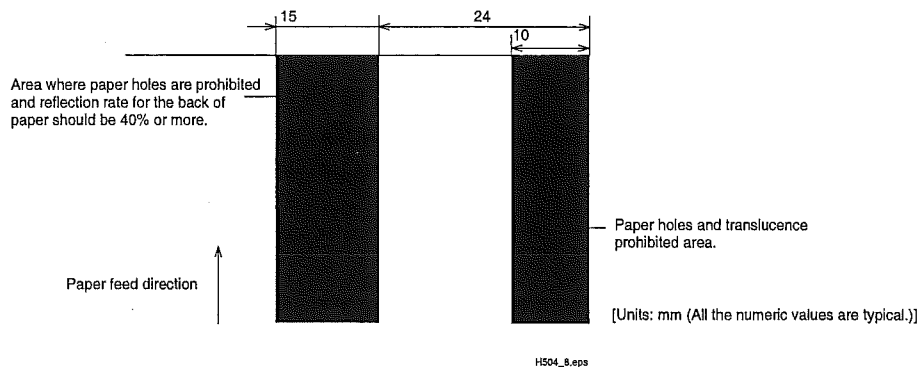
❏ Use thinner paper (N30 or equivalent) between the top and bottom sheets of multi-ply paper. If thick paper is used, the copy capability is lowered.

✎ *Notes:*

When inserting slip paper, be sure to use the slip side guide and form stopper. If you insert the slip paper beyond the form stopper, the slip paper may be ejected.

Do not print on slip paper in the reverse paper feed direction.

Electrical Characteristics

Supply voltage:	+24 VDC ± 10% (optional power supply: EPSON PS-170)
Ripple voltage:	300mVpp or less (only when the printer is used with the MICR reader).

Current consumption: (at 24V, except for drawer kick-out driving)

Operating: Mean: approximately 1.9A (character font A α-N all columns printing)
Peak: approximately 8.0A (20 msec) When the print platen is released: 2.0A (200 msec)

Standby: Mean: approximately 0.3A

Reliability

Life (when printing alphanumeric characters):	Mechanism:	12,000,000 lines

Print head: 200 million characters (when printing Font B)

The printer is defined to have reached the end of its life when it reaches the beginning of the Wearout Period.

MICR reader mechanism (only when printer is used with MICR reader):

240,000 passes
The MICR reader is defined to have reached the end of its life when it 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:

29,000,000 lines
This is an average failure interval based on failures relating to wearout and random failures up to the life of 12 million lines.

Environmental Conditions

Temperature:	Operating:	5° to 45°C (41° to 113°F)
	Storage:	-10° to 50°C (14° to 122°F) (except for paper)
Humidity:	Operating:	10 to 90% RH
	Storage:	10 to 90% RH (except for paper)

✎ *Notes:*
When the temperature is 34°C, the humidity must be 90% or less.
When the temperature is 40°C, the humidity must be 65% or less.
When the temperture is 45°C, the humidity must be 50% or less.

Appendix A

Dip Switch Setting

Although the factory settings are best for almost all uses, if you have special requirements, you can change DIP switch settings.

Setting the DIP Switches

DIP switch functions

Your printer has two sets of DIP switches. The functions of the switches are shown in the following tables.

✎ *Note:*
See page A-4 for an illustration and instructions on changing DIP switch settings.

Serial interface specification

Set 1

SW	Function	ON	OFF
1-1	Data receive error	Ignored	Prints "?"
1-2	Receive buffer capacity	69 bytes	4K bytes
1-3	Handshaking	XON/XOFF	DTR/DSR
1-4	Data word length	7 bits	8 bits
1-5	Parity check	Enabled	Disabled
1-6	Parity selection	Even	Odd
1-7	Transmission speed (See the table below)		
1-8			

Transmission speed

Transmission speed (BPS)-bits per second	1-7	1-8
2400	ON	ON
4800	OFF	ON
9600	ON	OFF
19200	OFF	OFF

Set 2

SW	Function	ON	OFF
2-1	Handshaking (BUSY condition)	Receive buffer full	Off line or receive buffer full
2-2	Customer display (DM-D) connection	Connected	Not connected
2-3~ 2-4	Undefined	—	
2.5~ 2.6	Internal use	Fixed to Off	
2-7*	I/F pin 6 reset signal	Enabled	Disabled
2-8*	I/F pin 25 reset signal	Enabled	Disabled

* With a RS-485 serial interface specification (a dealer option), DIP switches 2-7 and 2-8 are ignored.

Notes:

• Changes in DIP switch settings (excluding switches 2-7 and 2-8 interface reset signals) are recognized only when the printer power is turned on or when the printer is reset by using the interface. If the DIP switch setting is changed after the printer power is turned on, the change does not take effect until the printer is turned on again or is reset.

• If you turn on DIP switch 2-7 or 2-8 while the printer is turned on, the printer may be reset, depending on the signal state. DIP switches should not be changed while the printer power is on.

Parallel interface specification

Set 1

SW	Function	ON	OFF
1-1	Auto line feed	Always enabled	Always disabled
1-2	Receive buffer capacity	69 bytes	4K bytes
1-3 ~ 1-8	Undefined	—	—

Set 2

SW	Function	ON	OFF
2-1	Handshaking (BUSY condition)	• Receive buffer full • Reading data	• Off-line • Receive buffer full • Reading data
2-2	Reserved (Do not change settings)	Fixed to Off	
2-3 ~ 2-4	Undefined	—	
2-5 ~ 2-7	Reserved (Do not change settings)	Fixed to Off	
2-8	I/F pin 31 reset signal (Do not change settings)	Fixed to On	

Notes:

* Changes in DIP switch settings (excluding switch 2-8 interface reset signal) are recognized only when the printer power is turned on or when the printer is reset by using the interface. If the DIP switch setting is changed after the printer power is turned on, the change does not take effect until the printer is turned on again or is reset.

* If you turn on DIP switch 2-8 while the printer is turned on, the printer may be reset, depending on the signal state. DIP switches should not be changed while the printer power is on.

Changing the DIP switch settings

If you need to change settings, follow the steps below to make your changes:
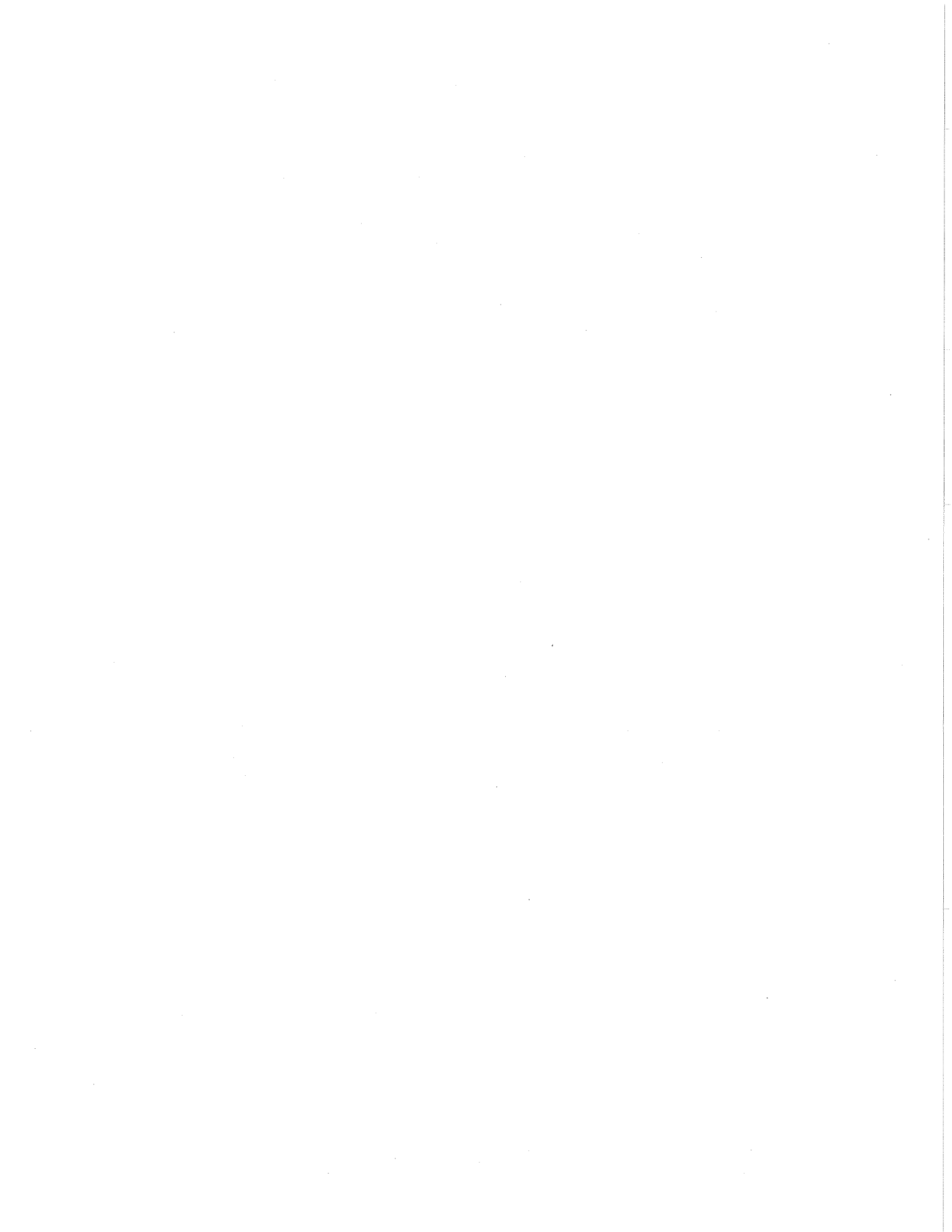
⚠ CAUTION:

Turn off the printer while removing the DIP switch cover to prevent an electric short, which can damage the printer.

1. Make sure the printer is turned off.

2. Remove the screw from the DIP switch cover. Then take off the DIP switch cover, as shown in the illustration below.
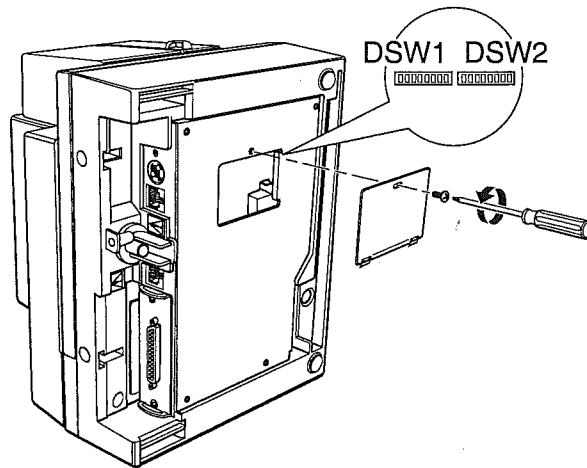
3. Set the switches using a pointed tool, such as tweezers or a small screwdriver.

4. Replace the DIP switch cover. Then secure it with the screw.

The new settings take effect when you turn on the printer.