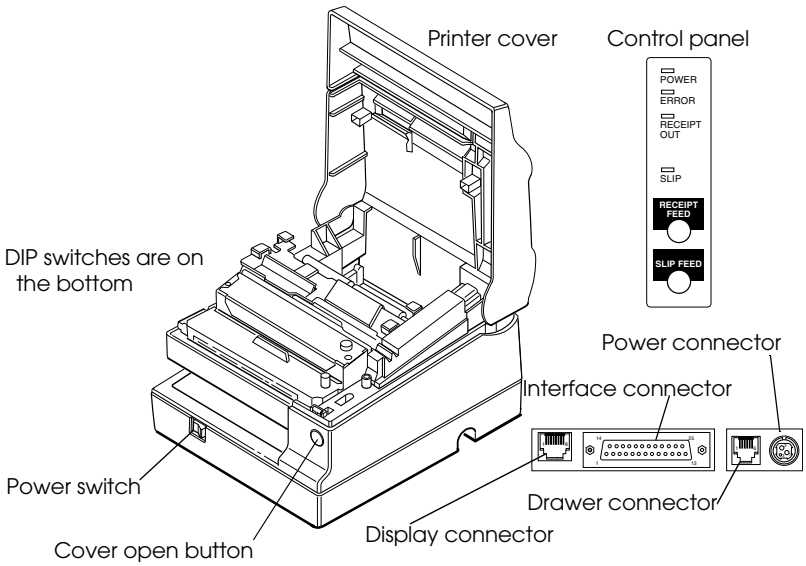
TM-U925

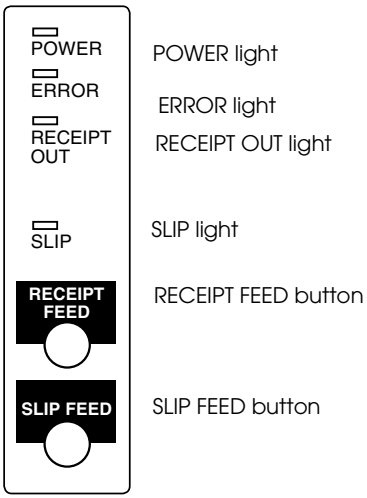
User's Manual

400485705

Printer parts



Control panel



EMC and Safety Standards Applied

Product Name: TM-U925

Model Name: M62UA

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

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

WARNING

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

You are cautioned that changes or modifications not expressly approved by SEIKO EPSON 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 55024
	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-8
	IEC 61000-4-11
Directive 90/384/EEC	EN45501

FCC Compliance Statement

For American Users

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

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

FOR CANADIAN USERS

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

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

GEREÄUSCHPEGEL

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

Introduction

Features

The TM-U925 is a high-quality POS printer that can print on both slip and roll paper. The printer has the following features:

- ❏ Wide slip paper capability (maximum characters per line: 88 with 7 x 9 font).
- ❏ Interface connector within the printer's external dimensions.
- ❏ High throughput using bidirectional, minimum distance printing.
- ❏ Precision paper feeding at 0.176mm {1/144 inch}.
- ❏ Selectable receive buffer size (32 bytes or 2K bytes).
- ❏ Slip ejection.
- ❏ Command protocol based on the ECS/POS® standard.
- ❏ ASB (Automatic Status Back) function that automatically transmits changes in printer status.
- ❏ EPSON® intelligent module connection.
- ❏ EPSON customer display series connection.
- ❏ Optional Magnetic Ink Character Recognition (MICR) reader that enables the printer to perform reading and processing of MICR characters in addition to printing endorsements.

Options and Accessories

- ❏ Magnetic Ink Character Recognition (MICR) reader (factory installed option)
- ❏ Direct connection customer displays, DM-D102 and DM-D203
- ❏ EPSON power supply unit, PS-170 (not required when the TM-U925 is connected to an intelligent module)
- ❏ EPSON ribbon cassette, ERC-31 (P)

About This Manual

Setting Up and Using

- ❏ **Chapter 1** contains information on unpacking the printer, setting it up, running the self test, setting the DIP switches, and adjusting the paper near end detector.
- ❏ **Chapter 2** contains information on using the printer, including the optional MICR reader.
- ❏ **Chapter 3** contains troubleshooting information, including how to clean the optional MICR reader.

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 4 ***Reference Information***

Chapter 1

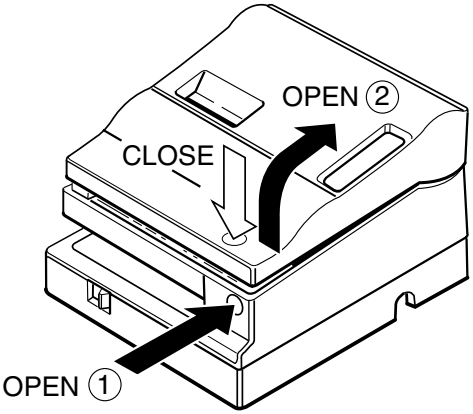
Setting Up the Printer

Opening and Closing the Printer Cover

Use these instructions whenever you need to open or close the printer.

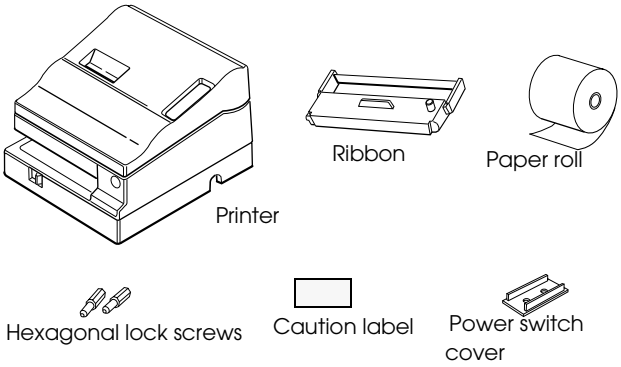
Open the printer by pushing the cover-open button and then lifting the printer cover.

Close the printer by pressing on the indentation on the right side of the printer cover until it audibly clicks into place.



Unpacking

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



See the note on page 1-3 for information about the hexagonal lock screws.

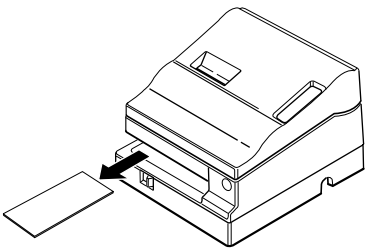
See the power switch cover section in Chapter 2 for information about the cover.

See the slip paper handling section in Chapter 2 for information about the label.

Removing the protective material

The printer is protected during shipping by a piece of protective material that must be removed before you turn on the printer.

Pull out the protective material and remove it from the printer as shown below.



Store the protective material with the other packing materials and use it when transporting your printer.

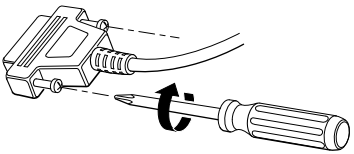
Connecting the Printer to Your Computer

Follow the procedures below only when you use the printer as a single unit (not connected to an intelligent module). When you use the printer with the intelligent module, see the *IM-403/405 User's Guide* for details.

You need an appropriate interface cable to connect your computer to the printer's built-in interface.

1. Make sure that both the printer and computer are turned off; then attach the cable connector securely into the printer's interface connector.

2. Tighten the screws on both sides of the cable connector.



Note:
Your printer comes with inch-type hexagonal lock screws installed. To use an interface cable that requires millimeter-type screws, replace the inch-type screws with the enclosed millimeter-type screws using a hex screwdriver (5 mm). To distinguish the two types of screws, see the figure below. The inch-type screw is on the left.

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

4. Plug the power supply's power cord into an electrical outlet.

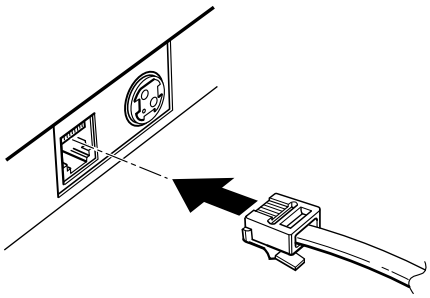
Connecting the Printer to the Drawer Connector

Follow the procedures below to connect a drawer to the printer only when you use the printer as a single unit (not connected to an intelligent module). When you use the printer with the intelligent module, see the *IM-403/405 User's Guide* for details.

You need an appropriate drawer kick-out cable to connect your drawer to the printer. See Chapter 4 for more information about the drawer interface.

1. Make sure that the printer is turned off.

2. Plug the cable connector into the printer's drawer kick-out connector until it clicks.



⚠ *CAUTION:*

Be sure not to connect this cable to the display module connector, which is on the other side of the interface connector.
Do not connect a telephone line to the drawer kick-out connector.

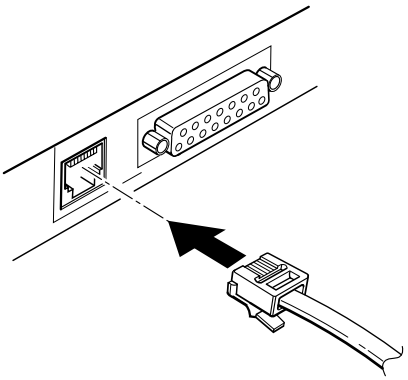
Note:
To remove the cable connector, squeeze the connector's clip and pull it out.

Connecting to a Direct Connection Display Module

If you are using the printer as a single unit (not connected to an intelligent module) and you plan to connect a direct connection display module, follow the steps below. When you use the printer with the intelligent module, see the *IM-403/405 User's Guide* for details.

1. Make sure that the printer is turned off.

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



⚠ CAUTION:

Do not connect this cable to the drawer kick out connector, which is on the other side of the interface connector.
Also do not connect a telephone line to the display module connector.

Note:
To remove the cable, squeeze the connector and pull it out.

Connecting the Power Supply

When the printer is used as a single unit, not connected to an intelligent module, use the optional EPSON PS-170 power supply for your printer.

When the printer is connected to an intelligent module, the power is supplied by the intelligent module. See the *IM-403/405 User's Guide* for details.

⚠ CAUTION:

Make sure that you use the EPSON PS-170 power supply. When connecting or disconnecting the power supply from the printer, make sure that the power supply is not plugged into an electrical outlet.

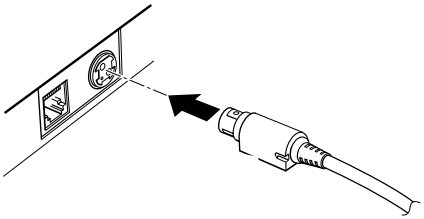
1. Make sure that the printer's power switch is turned off, and the power supply's power cord is unplugged from the electrical outlet.

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.

   ### ⚠ CAUTION:

   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.

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



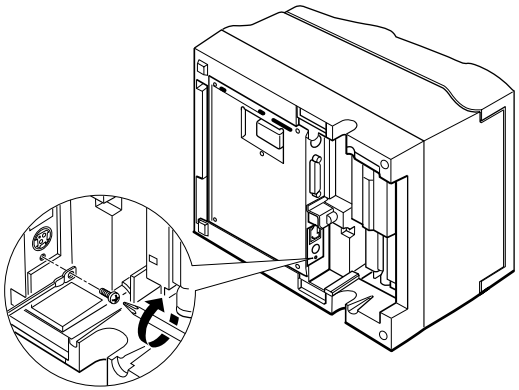
Note:
To remove the DC cable connector, make sure that the power supply's power cord is unplugged; then grasp the connector at the arrow and pull it straight out.

Grounding the Printer

When you use the printer as a single unit (not connected to an intelligent module), you need an appropriate ground wire to ground your printer.

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.



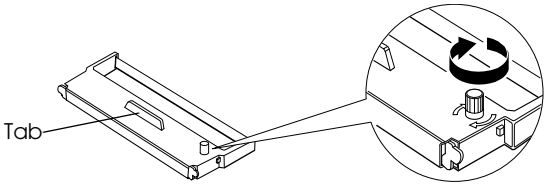
Installing the Ribbon Cassette

Use Epson ERC-31 (P) ribbon cassette for your printer.

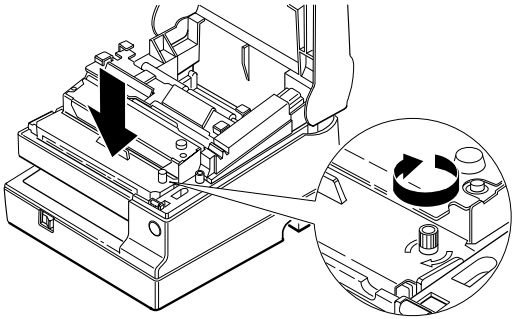
⚠ CAUTION:

Never turn the ribbon cassette's feed knob in the opposite direction of the arrow marked on the cassette.

1. Turn on the printer and open the printer cover.
2. Turn the ribbon cassette's knob two or three times in the direction of the arrow to take up any slack in the ribbon.



3. Insert the ribbon cassette in the printer and rotate the cassette's knob two or three more times as shown below. This is necessary to place the ribbon in the correct position.



Make sure that the ribbon is installed in front of the print head without wrinkles or creases. If it is hard to see, open the print head cover as described in Chapter 3.

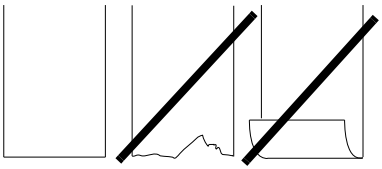
If the ribbon is not installed correctly, remove the cassette as described below and repeat steps 2 and 3 above.

Note:
To remove the ribbon cassette, grasp the ribbon cassette's tab and pull it out of the printer. See the illustration in step 2 above for the location of the tab.

Installing the Paper Roll

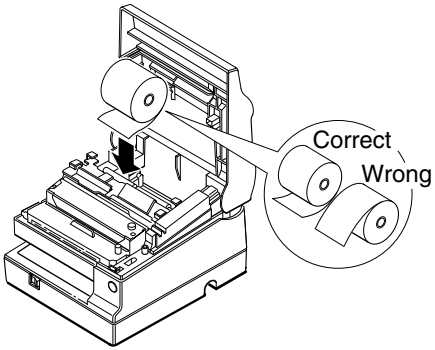
Use a paper roll that matches the printer's specifications. See Chapter 4 for paper specifications.

1. Make sure that the edge of the paper is straight, as shown on the left side of the illustration.

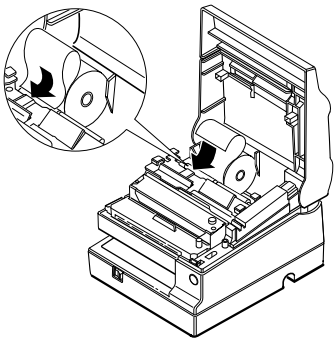


2. Turn on the printer and open the printer cover.

3. Insert a paper roll, as shown below.

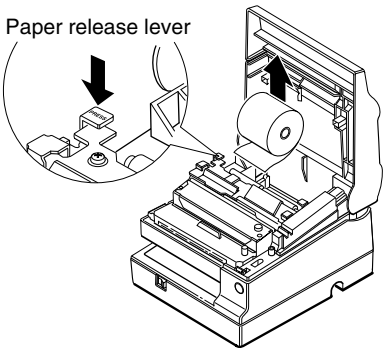


4. Insert the tip of the paper into the paper inlet and push it in until it is automatically detected and fed into the printer.



5. Tear off the paper on the cutter. If the paper was not fed far enough, press the RECEIPT FEED button to feed additional paper.

Note:
To remove the paper roll, hold down the paper release lever (marked PRESS*) and pull out the paper roll in the direction shown in the illustration.*



Self Test

The self test lets you know if your printer is operating properly. You can run the self test with either roll paper or slip paper.

Running the self test with roll paper

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

2. While holding down the RECEIPT FEED button, turn on the printer to begin the self test. The self test prints the printer settings and then pauses. (The RECEIPT OUT light blinks.)

3. Press the RECEIPT FEED button to continue printing. The printer prints a pattern using the built-in character set.

4. The self test automatically ends after printing 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* RECEIPT FEED *button. Then press the* RECEIPT FEED *button to continue the self test.*

Running the self test with slip paper

> ***Note:***
> *Be sure to install the paper roll to prevent slip paper jams.*

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

2. While holding down the SLIP FEED 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. (The SLIP light blinks.)

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* SLIP FEED *button. Press the* SLIP FEED *button to continue the self test.*

Setting the DIP Switches

DIP switch functions

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

Set 1

SW	Function	ON	OFF	Factory settings
1-1	Data word length	7 bits	8 bits	OFF
1-2	Parity	Enabled	Disabled	OFF
1-3	Parity selection	Even	Odd	OFF
1-4	Transmission speed selection (See the table below)			OFF
1-5				OFF
1-6	Customer display connection*	Connected	Not connected	OFF
1-7	Data receive error	Ignored	Prints ?	OFF
1-8	Handshaking	XON/XOFF	DTR/DSR	OFF

* Effective when a direct connection display module is connected to the printer's display module connector.

Transmission Speed

Transmission Speed (BPS)	1-4	1-5
1200	ON	ON
2400	OFF	ON
4800	ON	OFF
9600	OFF	OFF

Set 2

SW	Function	ON	OFF	Factory settings
2-1	Auto line feed	Always enabled	Always disabled	OFF
2-2	Receive buffer	32 bytes	2048 bytes	OFF
2-3	Font selection (default)	9 x 9	7 x 9	OFF
2-4	Carriage speed (default for paper roll printing)	Low	High	OFF
2-5	Handshaking (BUSY condition)	Receive buffer-full	Off-line or receive buffer-full	OFF
2-6	Internal use	Fixed	-	ON
2-7	I/F pin 6 reset signal	Enabled	Disabled	OFF
2-8	I/F pin 25 reset signal	Enabled	Disabled	OFF

Notes:

1. When pin 6 of the interface connector is used for the reset signal, the printer is reset at MARK on the RS-232C level.
2. When pin 25 of the interface connector is used for the reset signal, the printer is reset at SPACE on the RS-232C level or at HIGH on the TTL level.
3. DIP switches excluding switch 2-1 (Auto line feed) and switches 2-7 and 2-8 (interface reset signal) are effective only while the printer power is turned on. If the DIP switch setting is changed after the printer power is turned on, the change is not effective.
4. If DIP switch 2-7 or 2-8 is on while the printer power is turned on, the printer may be reset, depending on the signal state. DIP switches should not be operated while the printer power is turned on.

Changing the DIP switch settings

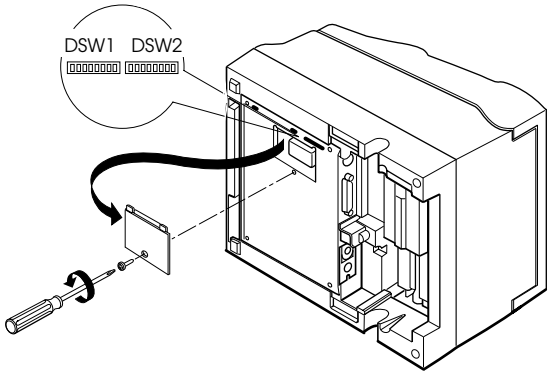
If you need to change settings, follow the steps below to make your changes:

⚠ CAUTION:

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

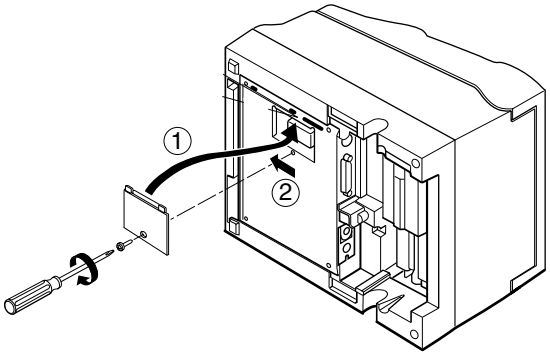
1. Make sure the printer is turned off.

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 by inserting it upward and sliding it to the left as shown below. Then secure it with the screw.



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

Adjusting the Paper Near End Detector

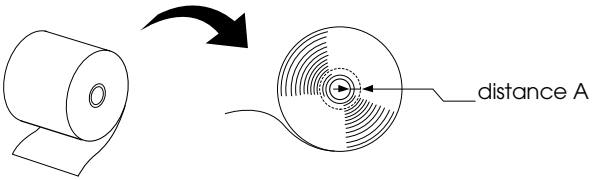
The paper near end detector detects when the paper is almost gone by measuring the diameter of the paper roll. Software programs can use the **ESC c 4** command to stop printing when the paper is almost gone.

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

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

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

2. Determine the point on the paper roll at which you want the paper roll end detection to be triggered. Then measure the distance A shown in the illustration.

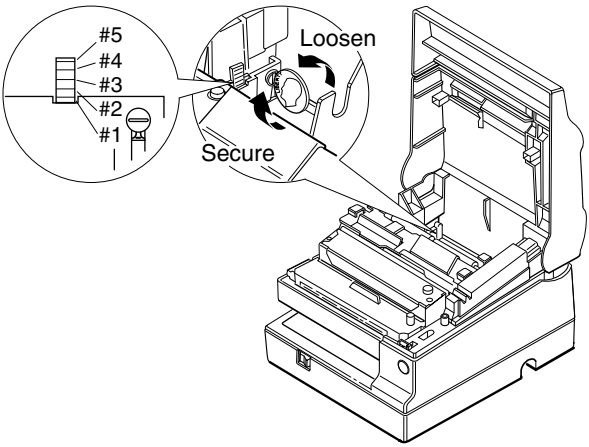


Note:
There may be some difference between the measured distance A and the actual sensing position.

3. Find the corresponding adjustment position number from the table below.

Distance A	Adjustment position number
10 mm (0.39 inch)	#1
8 mm (0.32 inch)	#2
6 mm (0.24 inch)	#3
4 mm (0.16 inch)	#4
2 mm (0.08 inch)	#5

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



5. Loosen the adjusting screw with a coin or a screwdriver.Move the positioning plate to the appropriate position and then tighten the adjusting screw, as shown below. Position 1 leaves the least paper on the roll, and position 5 leaves the most

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

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

Chapter 2

Using the Printer

Operating the Control Panel

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

Buttons

These buttons can be disabled by the **ESC c 5** command, but they work whenever the printer cover is open, even if they have been disabled by the **ESC c 5** command.

RECEIPT FEED

Press the RECEIPT FEED button once to advance receipt paper one line. You can also hold down RECEIPT FEED to feed receipt paper continuously.

SLIP FEED

You cannot load slip paper using this button. Slip paper can be loaded only by selecting slip paper with a command and then inserting the paper. When the printer is in the slip paper mode (the SLIP light is on or blinking) and slip paper is inserted, you can press the SLIP FEED button once to advance slip paper one line or hold down SLIP FEED to feed slip paper continuously.

Indicator lights

The control panel lights provide information on printer conditions.

POWER (green)

The POWER light is on when the printer power is on.

ERROR (red)

The ERROR light is on or blinking when the printer is not ready to print.

The ERROR light is on (not blinking) under the following conditions:

- ❏ When the printer is first turned on or reset through the interface. The light goes off as soon as the printer is initialized.
- ❏ When the printer cover is open.
- ❏ When the printer is at or near the end of a roll of paper.

The ERROR light blinks under the following conditions:

- ❏ When the print head is overheated. If this happens, the printer waits until the print head cools and then resumes printing.
- ❏ When an error occurs.

For more information on error conditions, see Chapter 4, "Troubleshooting."

RECEIPT OUT (red)

The RECEIPT OUT light is on (not blinking) when the paper roll is not installed or is at or near the end. The RECEIPT OUT light blinks after the self test prints the printer settings on the roll paper.

SLIP (green)

The SLIP light is on or blinking while the printer is in slip paper mode.

The SLIP light blinks while the printer is waiting for slip paper to be inserted or removed.

Slip Paper Handling

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

Note:
Be sure to install a paper roll in the printer even if you plan to print only on slip paper. This will prevent paper jams. You can also prevent paper jams by using slip paper that is flat and has no wrinkles, creases, or folds.

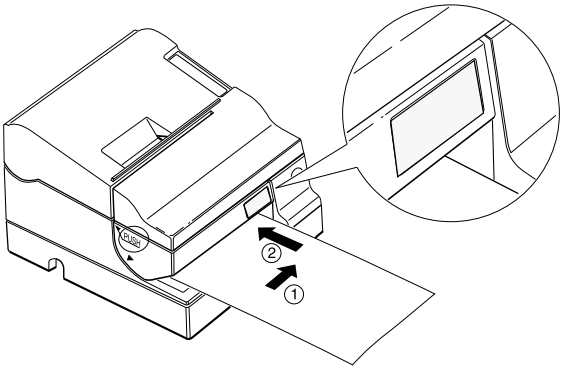
1. Send appropriate control commands from the computer to print on slip paper.

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.

   Make sure you insert the slip paper into the inlet as far as it will go (i.e., insert the slip paper up to the mark on the left side of the printer).

The paper is automatically drawn into the printer and printing begins.

Note:
Place the caution label, which reminds you how to insert slip paper, on the printer as shown in the illustration below, if necessary.

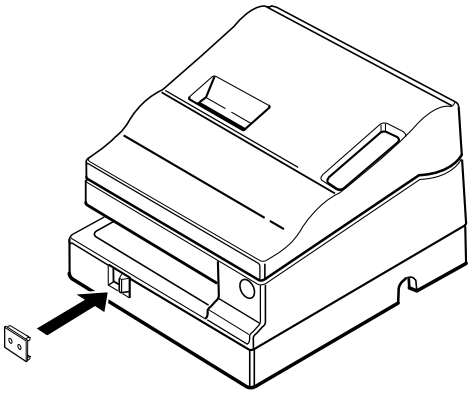


⚠ CAUTION:

Be sure to put the caution label exactly in the position shown. If you put it another place, such as over the slip paper inlet, the printer may be damaged.

Using the Power Switch Cover

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.



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.

⚠ CAUTION:

Be sure the paper roll is installed before you use the MICR function. Even when you are not using roll paper, this prevents paper jams.

Reading MICR characters on personal checks

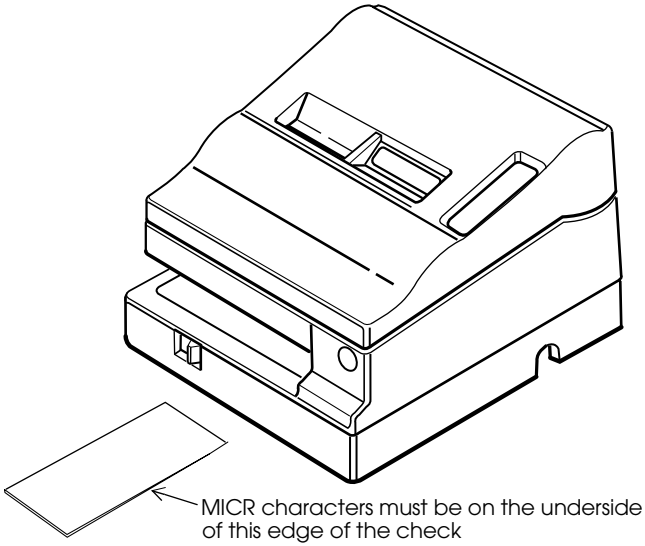
To use the MICR function with personal checks, follow the steps below:

⚠ CAUTION:

Do not insert checks with staples in them. This may cause paper jams, MICR reading errors, and damage to the MICR head.
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 righthand side, as shown in the illustration below. 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 off.

See Chapter 3 to find out how to clean the MICR mechanism, and see Chapter 4 for further details on using the MICR reader.

Chapter 3

Troubleshooting

Troubleshooting

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

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

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

If the RECEIPT OUT light is **on**, the paper roll is not installed or is at or near the end. Install a new paper roll in the printer. See Chapter 1 for instructions.

If the RECEIPT OUT light is **off**, make sure that the printer cover is properly closed. Press the round indentation on the printer cover until the cover audibly clicks into place. You may not be able to close the printer cover if one or both of the OPEN <-> LOCK levers is open. See the illustration on page 3-7 to help you close the levers.

The 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 and the printer has been printing for quite a while, the print head may be overheated. If the print head is overheated, the printer will resume printing when the head has cooled (usually within two or three minutes).

If there is no paper jam and the print head is not overheated, 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

Slip paper or personal checks are not fed properly or become jammed frequently.

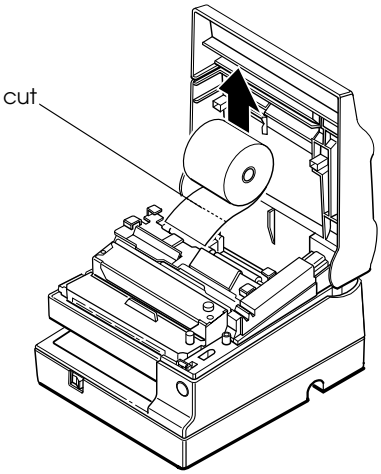
The paper roll is not installed properly. Remove and reinstall the paper roll as described in Chapter 1.

Paper is jammed inside the printer.

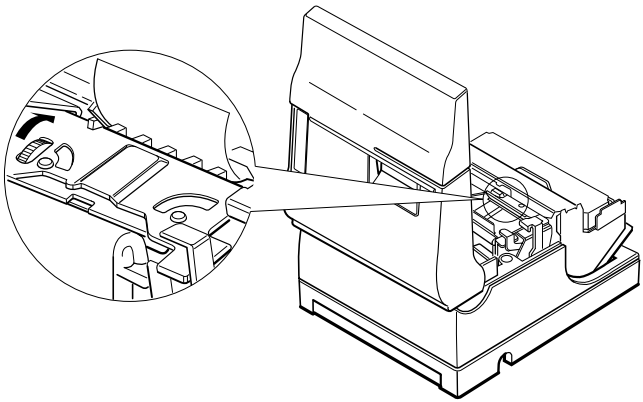
To clear a paper jam, follow the steps below:

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

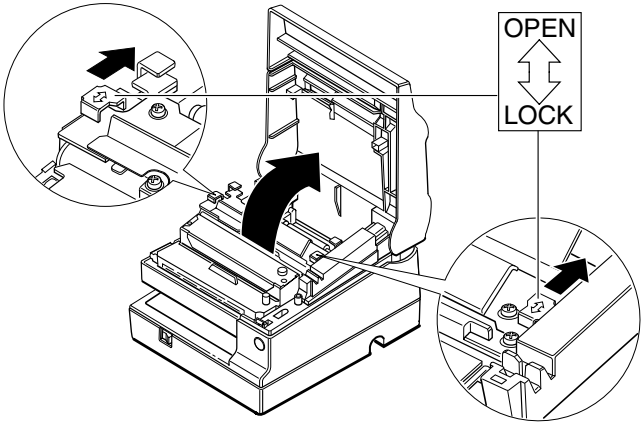
2. Cut the paper as shown in the illustration, using a pair of scissors or a knife; then remove the paper roll.



3. If the paper is caught in the automatic cutter blade, open the cutter blade by rotating the gear in the direction shown in the illustration.



4. Move the OPEN <-> LOCK lever on each side of the printer in the direction shown in the illustration; the cutter unit then opens automatically.

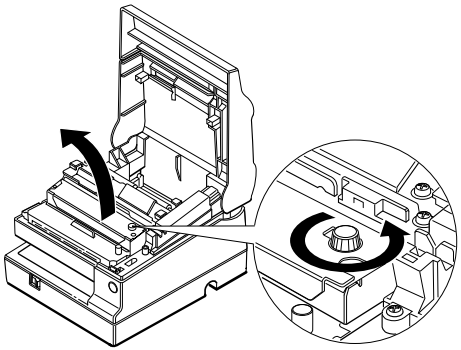


5. Pull the paper out gently. If the paper tears, make sure you remove any remaining pieces.

6. If you encounter difficulty in clearing a paper jam, remove the print head cover by loosening the screw on the right side of the cover, as shown in the illustration below.

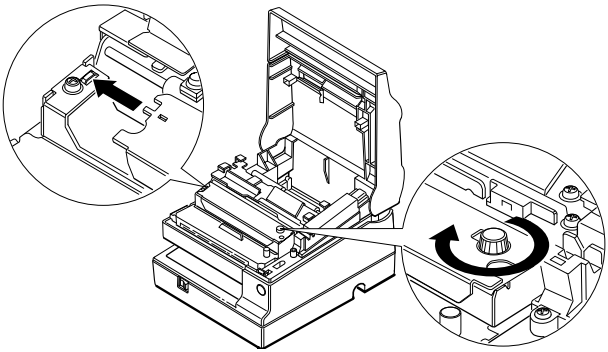
⚠ ♨ CAUTION:

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



7. Remove any paper from inside the printer.

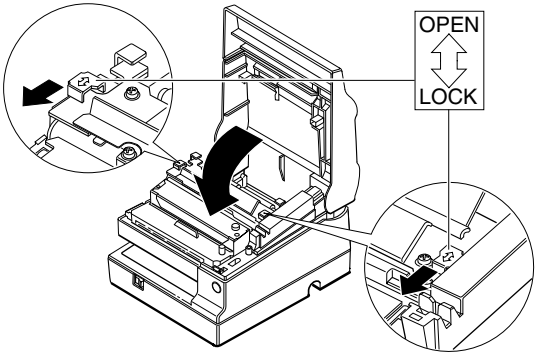
8. If you removed the print head cover, replace the cover and secure the screw, as shown in the illustration below.



9. Close the cutter unit and lock it by moving both OPEN <-> LOCK levers in the direction shown in the illustration.

⚠ CAUTION:

Make sure you lock the cutter unit with both OPEN <-> LOCK *levers.*



10. Install the paper roll following the steps in Chapter 1; then close the printer cover.

Cleaning the MICR Mechanism

Foreign matter on any part of the MICR mechanism can cause MICR reading errors.

Cleaning the MICR mechanism is simple. First, send the cleaning command (FS c) to the printer. Then insert the special MICR cleaning paper the same way you insert a check.

The printer feeds the paper through, cleaning the MICR head, roller, and paper path.

Perform this cleaning once a month or after every 6,000 checks .

Use a special MICR cleaning paper such as the KIC Products PRESAT brand check reader cleaning card or the equivalent. The size should be 63 x 152 mm (2.48 x 5.98"). (USA only)

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 RECEIPT FEED 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  :  .%. .c4. .
41 42 43  44 45 46 47 48  : ABCDEFGH
```

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

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"} wire pitch

Head wire diameter: 0.29 mm {.01"}

Printing direction: Bidirectional, minimum distance printing

Printing speed: See table on page 4-2.

Characters per line: See table on page 4-2.

Characters per inch: See table on page 4-2.

Print modes: See the print modes table below.

Print modes

Print mode	Printing speed*1	Print head energizing time	Paper roll		Slip paper	
			Default status	Switching*2	Default status	Switching*2
Normal	High	Normal	Depends on DIP SW 2-4	Possible	--	Possible
Low speed	Low	Normal		Possible	--	Possible
Copy	Low	Copy (long)	--	Possible	Selected	Possible

Note:

*1 The printer automatically goes to low speed mode during bit image printing, regardless of the type of selected paper.

*2 Print mode can be changed using the **GS E** command.

Character Specifications

Number of characters: Alphanumeric characters: 95

International characters: 32

Extended graphics: 128 × 8 pages (including space pages)

Character structure: 9 × 9 3-dot spacing (in half dot units)

7 × 9 2-dot spacing (in half dot units)

Larger spacing can be set by using **ESC SP**.

Character size: See the table below.

Characters per inch, characters per second, characters per line, character size

Character structure * 1	Character spacing (half dots)	CPI * 2	CPS * 3		CPL * 4		Character size (width x height)
			High	Low	Paper roll	Slip paper	
9 x 9	3 dots	12.5	233	200	30	66	1.6 x 3.1 mm {.06" x .12"}
7 x 9	2 dots	16.7	311	267	40	88	1.3 x 3.1 mm {.05" x .12"}

*1 Horizontal dots x vertical dots

*2 CPI: Characters Per Inch (number of characters per 25.4 mm)

*3 CPS: Characters Per Second (number of characters per second)

*4 CPL: Characters Per Line

Ribbon Specifications

Type:	Exclusive cassette ribbon	
Ribbon cassette specifications:	Part number	ERC-31 (P)
	Color	Purple
	Ribbon life	7,000,000 characters
	(when one character consists of 18 dots)	

MICR Specifications (Option)

The MICR mechanism is a factory-installed option.

Available fonts:	E-13B, CMC7
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.
Paper type:	Normal check paper with thickness of 0.09 to 0.2mm {0.0035 to 0.0079"} Size: 68 to 102mm × 152 to 210 mm {2.68 to 4.02 × 2.98 to 8.27"} Mass: 70 to 90 Kg.
Ripple voltage:	300 mVpp or less
Current consumption:	Mean approx. 2.3A (Approx. 1.4 sec)

Reliability: MICR reader mechanism (only when the printer is used with the MICR reader):
MCBF: 160,000 passes
Life: 240,000 passes
(One pass: from reading characters to printing endorsements on a U.S.A. personal check (152 mm {5.98"} long)
(The MICR reader is defined to have reached the end of its life when it cannot function properly because of the main parts (magnetic head, head holding roller, etc.) of wearing out.)

MICR use

Use the following procedure to read MICR characters.

	User Operation	Printer Operation
1	Transmits **FS a 0 <00>H**.	Mechanically switches to MICR mode and waits for a personal check to be loaded. The SLIP light blinks.
	(Transmits **DLE ENQ 3**.)	(when the check waiting state is canceled)
2	Inserts a check.	Detects the check, lights the SLIP light, and reads MICR characters. After reading, transmits the reading results.
3	(Transmits **FS a 0 <00>H**.)	(Re-reads the check and transmits the reading result.)
4	Transmits **FS a 1**.	Loads the check paper to the print starting position.
5	Transmits endorse-ment printing data.	Prints data and feeds paper.
6	Transmits **FF**.	After printing, ejects paper. The SLIP light blinks until the check is removed.
7	Removes the check paper.	The SLIP light blinks.

Notes on MICR use

- ❏ Personal checks are fed in the forward direction only.
- ❏ The paper roll must be loaded correctly before selecting MICR function. Otherwise, check paper is not fed properly.
- ❏ The check waiting state is canceled using **DLE ENQ 3**.
- ❏ After a personal check is ejected, the SLIP light comes on and the printer does not proceed to the next operation until the check is removed.
- ❏ The check waiting time and the interval from when a check is inserted to when the operation starts can be set using **ESC f**.
- ❏ To check the MICR function status exactly, use **DLE EOT BS 1**.
- ❏ Remove ejected personal checks by pulling them upward. Do not pull them out in the horizontal direction.

Paper Specifications

Paper feed method:	Friction feed
Paper feed pitch:	Default 4.23 mm {1/6 inch} Can be set in units of 0.353 mm {1/144 inch} by the **ESC 3** and **ESC J** commands.
Paper feed speed:	Approx. 60.3 ms/line (4.23 mm {1/6 inch} feeding) Approx. 86.36 mm/second {3.4 inches/second} (continuous feeding)
Paper size:	**Paper roll (single-ply)**

Size:	Width 69.5 mm ± 0.5 mm {2.74" ± 0.02"}
Maximum outside diameter:	83 mm {3.27"}
Thickness:	0.06 to 0.09 mm {.0024 to .0035"}
Mass:	52.3 to 64.0 g/m² {13.9 to 17 lbs} (JIS P8124) (45 to 55 Kg {20.41 to 24.94 lbs}/ 1000 sheets/788 mm × 1091mm {31.02" × 42.95"}
Paper roll inside diameter:	10 mm {0.39"} or more

Slip paper

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

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

Size (W × L):	70 mm × 70 mm to 210 mm × 297 mm (A4 size) {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.

Relationship between ambient temperature and number of copies

Number of copies	Ambient temperature (print mode)
Original + 4 copies	20° to 40°C {68° to 104°F} (copy mode)
Original + 1 to 3 copies	5° to 40°C {41° to 104°F} (copy mode)

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 40°C {68° to 104°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:	Approx. 0.035 mm {.0014"}

Total thickness:	0.30 mm {.0118"} or less (original to original + 3 copies)
	0.36 mm {.014"} or less (original + 4 copies)
Pressure sensitive paper:	5 sheets maximum (original + 4 copies, at 20° to 40°C {68° to 104°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)

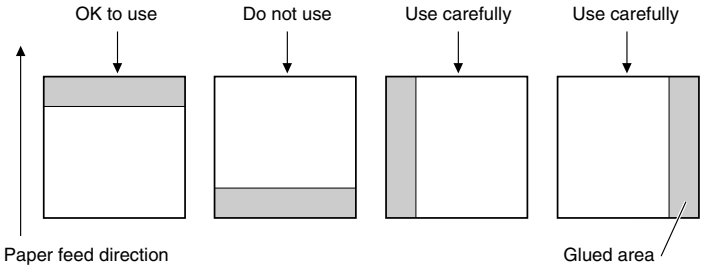
Note:
When using multi-ply paper that consists of an original and three copies, be sure to print with a 9 × 9 font. If a 7 × 9 font is used, some characters on some of the copies may not be readable.

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.

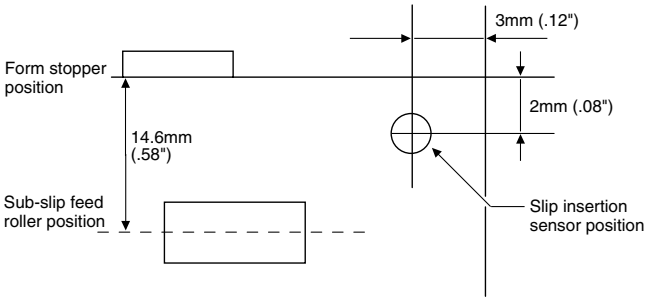
- ❏ There must be no glue on the bottom edge of slip paper. It is desirable for the glue to be on the top edge. Choose slip paper carefully when the glue is on the right or left edge, since paper feeding and insertion are affected by gluing conditions (e.g., glue quality, method, and length) and glue location. (See the

illustration below.) Be especially careful when slip paper is wide and has the glue on the right or left edge, since it may not feed in a straight line.



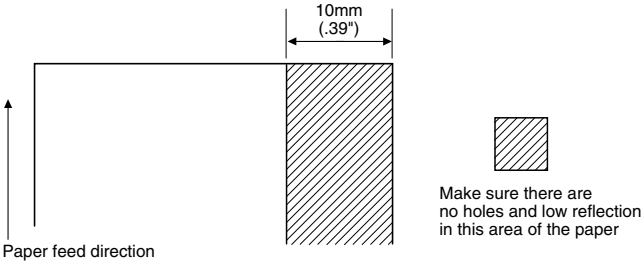
Slip paper glued area

❏ Since the slip insertion detector uses a photo detector, paper that has holes at the detector position, or is translucent, must not be used. (See the illustration on the next page.)



Slip insertion sensor position

- ❏ Since the slip ejection detector uses a reflective photo detector, paper that has holes or dark portions with low reflection (less than 40% reflection) at the detector position must not be used. (See the illustration below.)



Paper holes and low reflection prohibited area

- ❏ Be sure to perform slip printing with a paper roll loaded to avoid paper jams.
- ❏ 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

Electrical Characteristics

Supply voltage:	+24 VDC ± 10%	
Current consumption:	Operating:	
	When feeding slip paper to the print starting position:	Mean - approx. 2.3 A, approx. 1.4 seconds

Printing:	Mean - approx. 1.8 A (when printing alphanumeric characters for maximum number printing on paper roll)
	Peak - approx. 8.0 A
Standby:	Mean - approx. 0.3 A

Reliability

Printer mechanism (MCBF): 5,000,000 lines

- ❏ When performing autocutting and stamping once each for every 15 lines printed.

Life: 7,500,000 lines

- ❏ The printer is defined to have reached the end of its life when it cannot function properly because of the main parts (motors, solenoids, frames, shafts, etc.) wearing out.)

Print head life: 150 million characters

- ❏ When printing an average of 2 dots/wire per character.

Environmental Conditions

Temperature:	Operating:	5° to 40°C {41° to 104°F}
	Storage:	-10° to 50°C {14° to 122°F} (except for ribbon)
Humidity:	Operating:	30 to 80% RH (at 30°C or more, the upper limit condition is 30°C, 80% or equivalent, with no condensation)
	Storage:	30 to 90% RH (with no condensation, except for ribbon)

Printed in China

1999.12