1 **station printer**

# TM-300A/B
# TM-300PA/PB

## Operator's Manual

400137501

**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 equipmentgenerates, 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 interface 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 digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de Class A prescrites dans le reglement sur le brouillage radioelectrique edict6 par le Ministere des Communications du Canada.

# INTRODUCTION

The TM-300A/B and TM-300PA/PB printers are designed to provide a high cost-performance ratio. They are compact, light-weight, and highly reliable one-station printers using plastic mechanical frames. They have the following features and are applicable to the POS 1 station printer market.

- Compact and light-weight.
- High speed printing using logic-seeking.
- High reliability and long life due to the use of stepping motors for both carriage return and paper feeding.
- Printing color switch (red/black) available.
- Various formats are possible because the paper feeding pitch is selectable.
- High general control utility based on the ESC/POS™ standard.
- 2 drawers can be driven due to the internal drawer interface.
- Character font (7 X 9, 9 X 9) is selectable.
- Semi-automatic paper loading.
- Compact AC adapter power supply.
- An auto-cutter unit is provided and full cut/partial cut is selectable by command.
- A take-up device is included. (Standard only for the TM-300A/300PA)

| | Function Available | Interface |
|---|---|---|
| TM-300A | With auto-cutter<br>With take-up device | Serial |
| TM-300B | With auto-cutter | Serial |
| TM-300PA | With auto-cutter<br>With take-up device | Parallel |
| TM-300PB | With auto-cutter | Parallel |

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

## About this manual

**I. SETTING UP**

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

**II. REFERENCE**

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

**APPENDIX**

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

## CONTENTS

**I. SETTING UP**

## II. REFERENCE

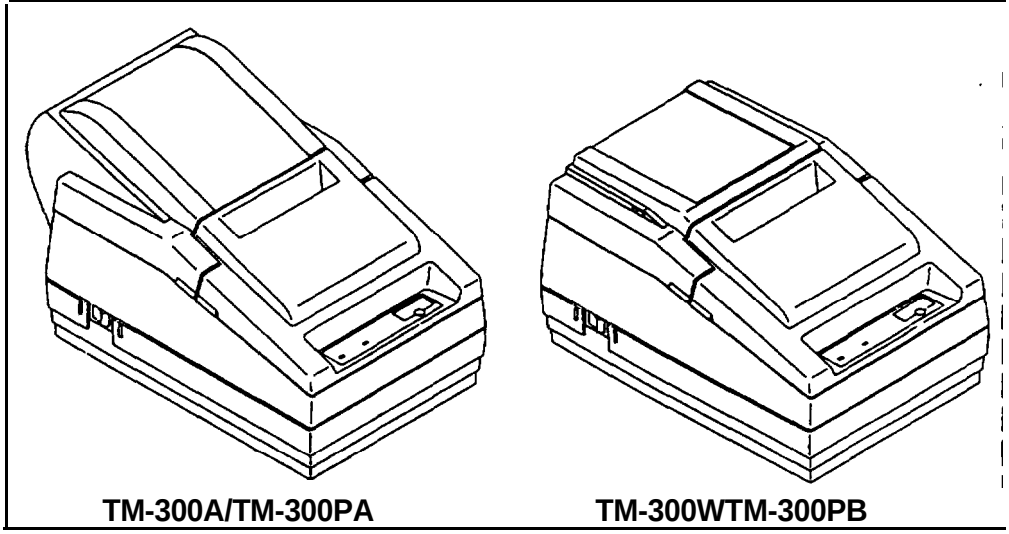
# I. SETTING UP

# Chapter 1 Unpacking the Printer

## 1-1 Checking the Contents of the Box

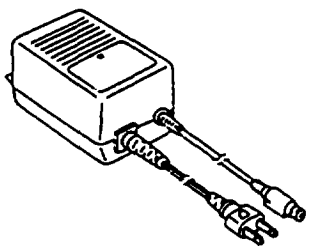
■ **Checking the parts**

Remove the printer and other parts from the box.

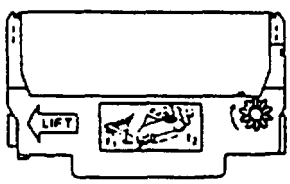


**TM-300A/TM-300PA** **TM-300WTM-300PB**

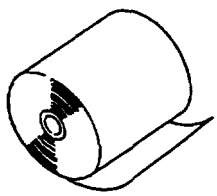
. Printer



. AC adapter (*)




. Ribbon cassette



. Roll paper

. Operator's Manual

(*) There are two types of AC adapters for the printer, which have different dimensions weights, and input voltages. Please refer to APPENDIX A of the specifications for details.

Make sure no parts are missing or damaged.

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

■ **Maintenance**

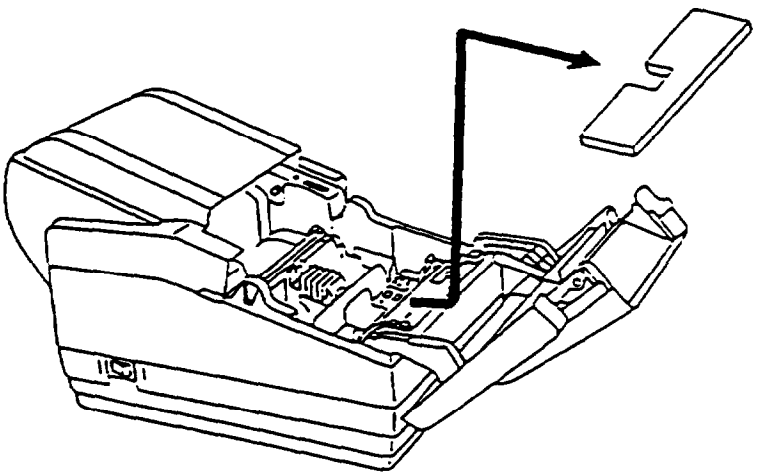
Keep the packing case in case you ever need to transport or store your printer.

## 1-2 Choosing a Place for the Printer

- Avoid locations that are subject to direct sunlight or excessive heat (near heaters).
- Avoid using or storing the printer in places subject to excessive temperatures or moisture.
- Do not use or store the printer in a dusty or dirty location
- When setting up the printer, choose a stable, horizontal location. Intense vibration or shock may damage the printer.
- Ensure the printer has enough space to be used easily.

## 1-3 Removing the Transportation Damper

The transportation damper must be removed before turning on the printer. Open the printer cover, and remove this material as follows:

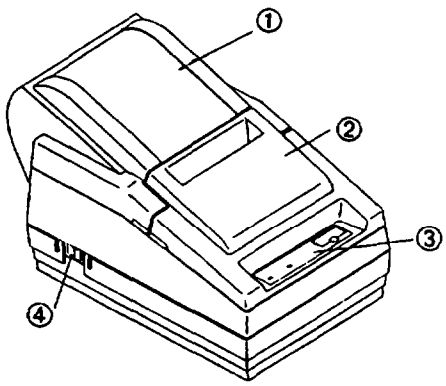


# 1-4 Names and Functions of Parts

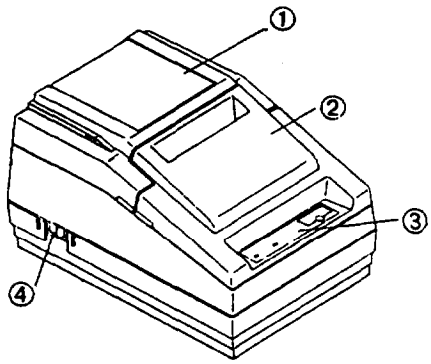
■ **Part names**

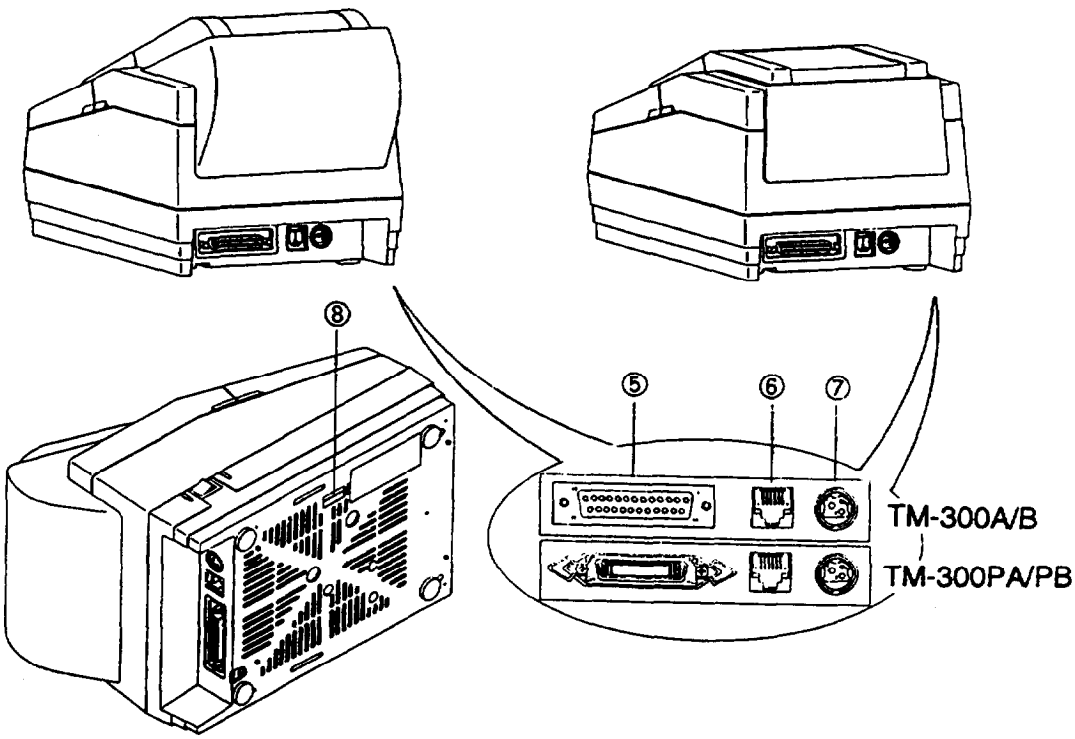
① TM-300A/TM-300PA: Take-up cover
TM-300B/TM-300PB: Roll-paper cover
② Printer cover
③ Operation panel
④ Power switch
⑤ Interface connector
⑥ Drawer kick-out connector
⑦ Power connector
⑧ DIP switches

TM-300WM-300PA

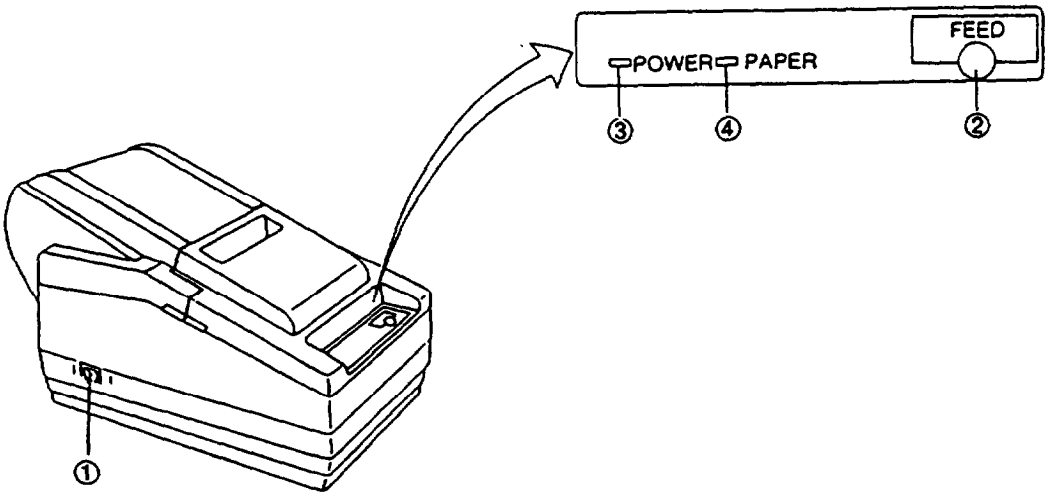



TM-300B/TM-300PB



- **Operation panel**




***Panel Switches***

**① POWER switch**

Turn the printer ON and OFF.

**② FEED switch**

Feeds roll paper.

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

Panel Lights (LED)

**③ POWER LED (green)**

**On** when power is turned on.

**④ PAPER LED (red)**

**On** when the paper roll near the end.

Blinks when an error has been detected, when the printer is in the test printing standby state, or when printing has stopped due to exceeding the allowable print duty cycle.

(See 5-2 The PAPER LED)

# Chapter 2 Before Setting Up

## 2-1 Connecting the AC adapter to the Printer

■ **Plugging in AC adapter**

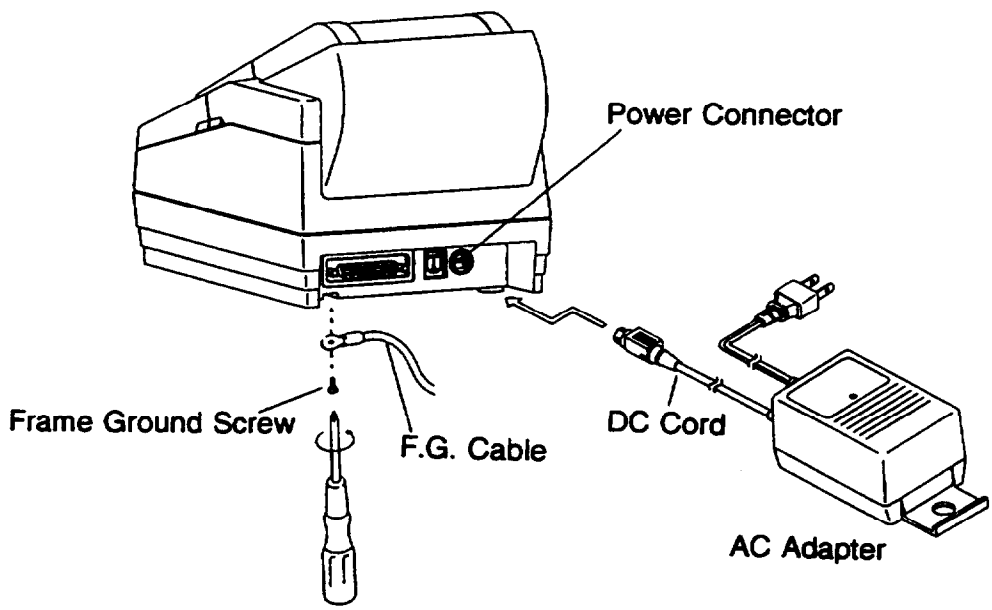
**CAUTIONS:**

- Before connecting the printer to the power supply, make sure that the voltage and power specifications match the printer's requirements.
- Using an incorrect power supply can cause serious damage to the printer.

Connect the AC adapter according to the following procedure.

① Make sure the printer is turned off.

② Plug the power cable connector into the printer's power connector with the arrow mark facing upward. (You can remove the power cable by grasping the connector firmly at the arrow mark and pulling straight out.)




③ Plug the power cord into the outlet, and turn on the power.

④ Be sure to ground the printer with the frame ground screw on the board at the rear side of the unit via a F.G cable.

## 2-2 Connecting the Host Computer to the Printer

### ■ Connecting the interface cable

Connect the printer with the host ECR (host computer) through an interface cable matching the specifications of the printer and the host ECR (host computer).

Be sure to use a drawer that matches the printer's specifications.

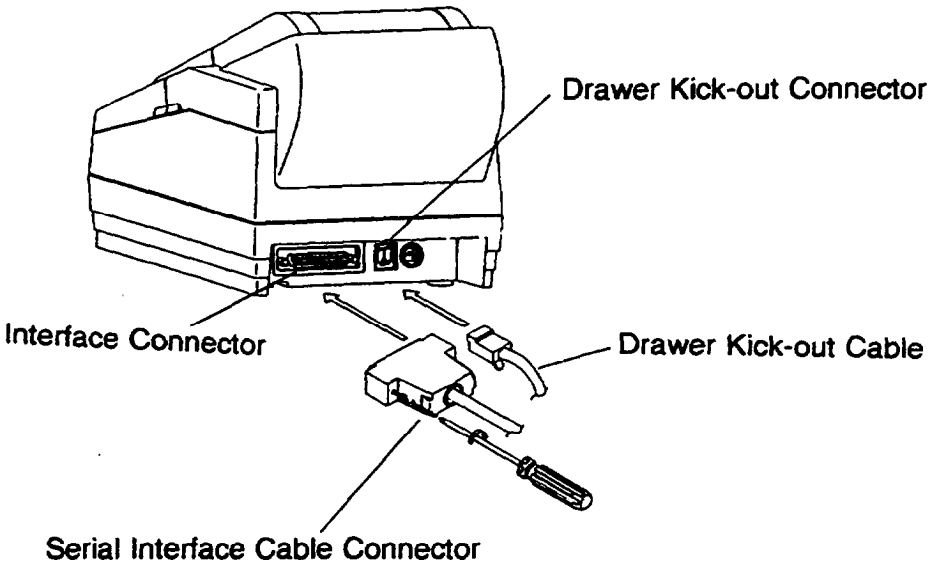
### <TM-300A/B>

Connect the interface cable according to the following procedure.

① Turn off the printer and the ECR (host computer).

② Plug the interface cable connector into the interface connector on the printer; then fasten the screw on both sides of the connector.

③ Plug the drawer kick-out cable connector into the drawer kick-out connector on the printer. (When removing the drawer kick-out cable, press in on the connector's clip and pulling out.)



## <TM-300PA/PB>

Connect the interface cable according to the following procedure.

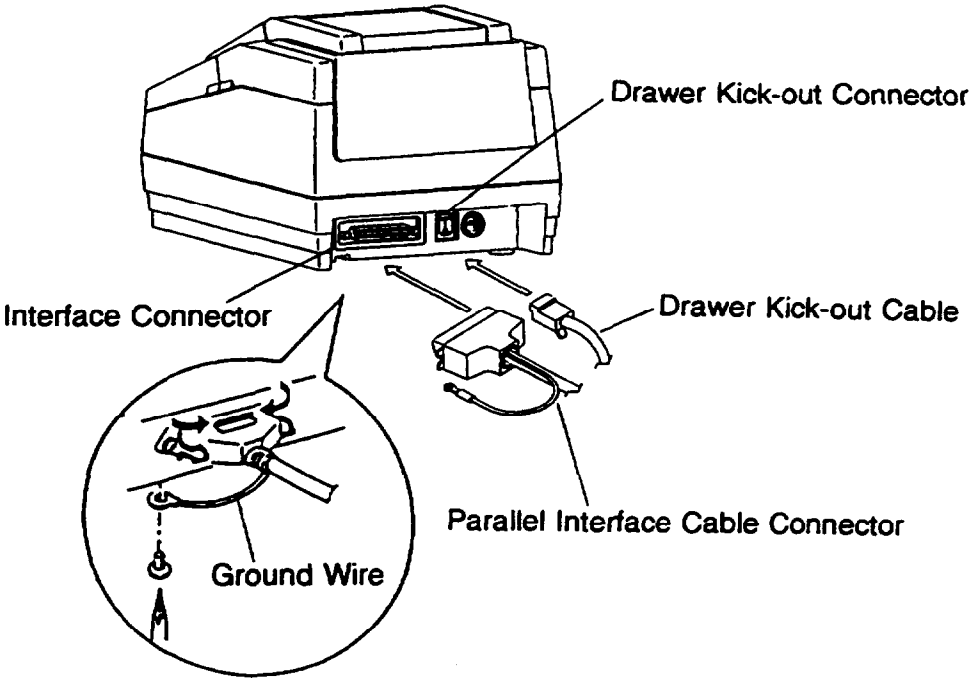
① Turn off the printer, and the ECR (host computer).

② Plug the interface cable connector into the interface connector on the printer.

③ Squeeze the wire clips together until they lock in place on both sides of the connector.

④ Attach the ground wire to the ground connector on the bottom of the printer.

⑤ Plug the drawer kick-out cable connector into the drawer kick-out connector on the printer. (When removing the drawer kick-out cable, press in on the connector's clip and pulling out.)



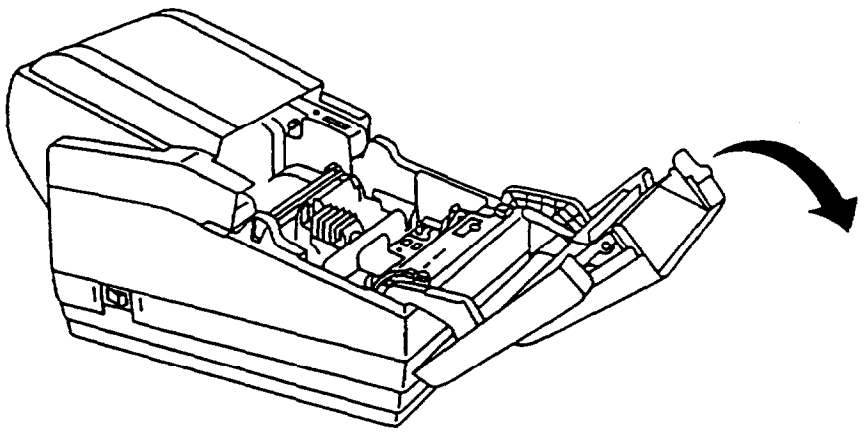
# Chapter 3 Installing the Parts

## 3-1 Installing the Ribbon Cassette

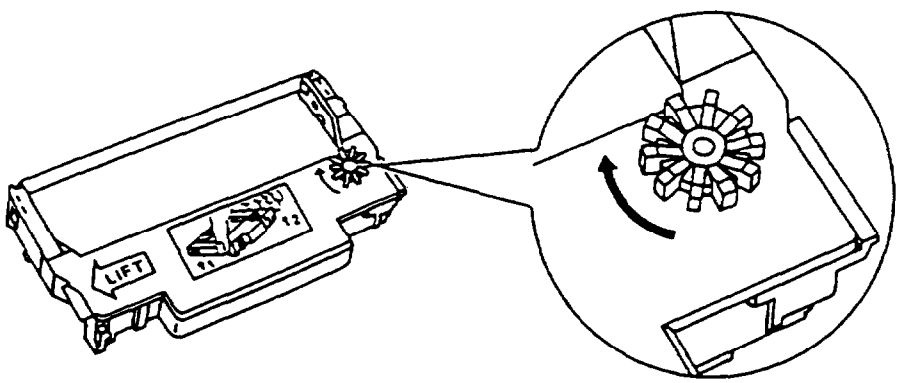
### ■ Installing the ribbon cassette

Be sure to use a ribbon cassette that matches the printer's specifications.

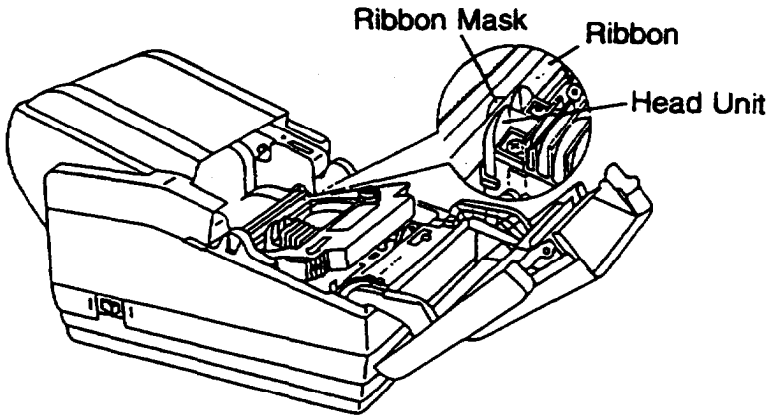
① Open the printer cover.



② Turn the ribbon-tightening knob in the direction of the *arrow* to take up any slack in the ribbon.



③ Fit the ribbon between the head unit and the ribbon mask. Then push the cassette firmly into position.

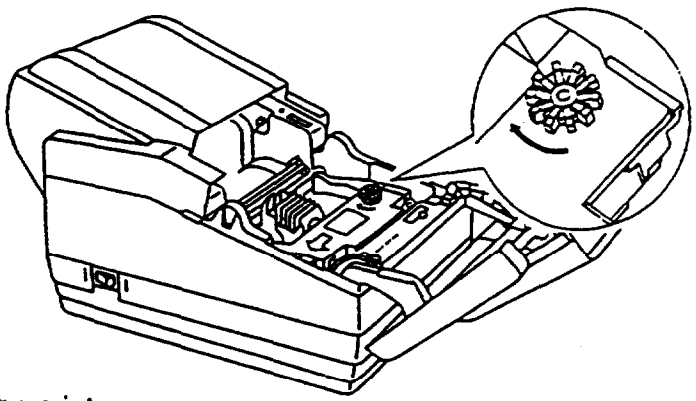



④ Turn the ribbon-tightening knob five or six times in the direction of the arrow to feed the ribbon smoothly into place between the head unit and the ribbon mask.

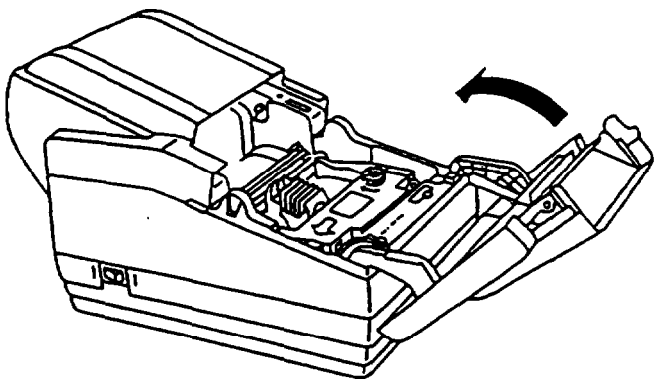
- Check that the ribbon is not twisted or creased.

**CAUTION:**

- Do not turn the ribbon-tightening knob in the reverse direction.



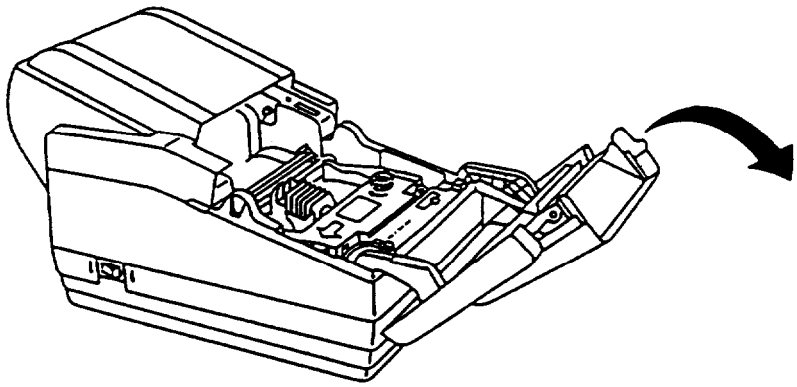
⑤ **Close the printer cover.**



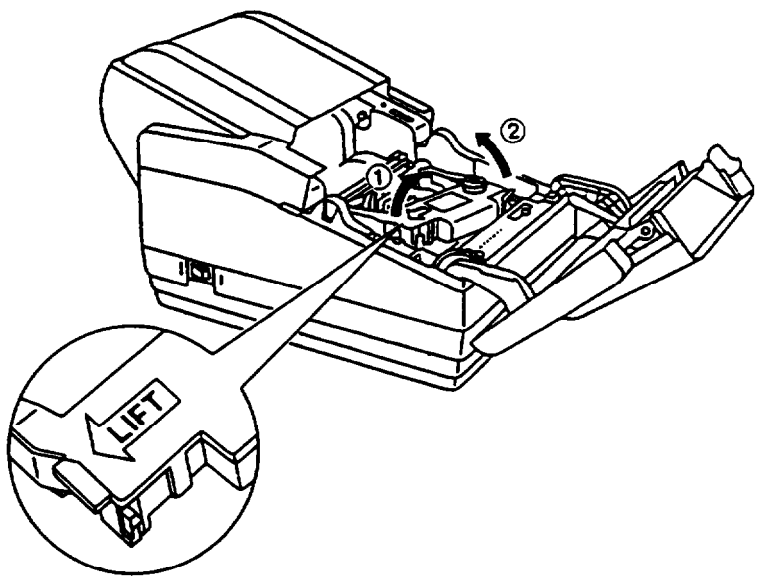
■ **Exchanging the ribbon cassette**

Be sure to use a ribbon cassette that matches the specifications.

① Open the printer cover.



② When the removing the ribbon cassette, grasp the tab on the left side and lift the left side out first.




③ Install a new ribbon cassette.

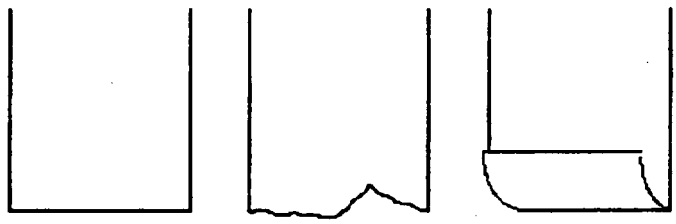
See **3-1** Installing the Ribbon Cassette ② to ⑤.

## 3-2 Installing the Roll Paper

- **Installing the roll paper for TM-300A/300PA**

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

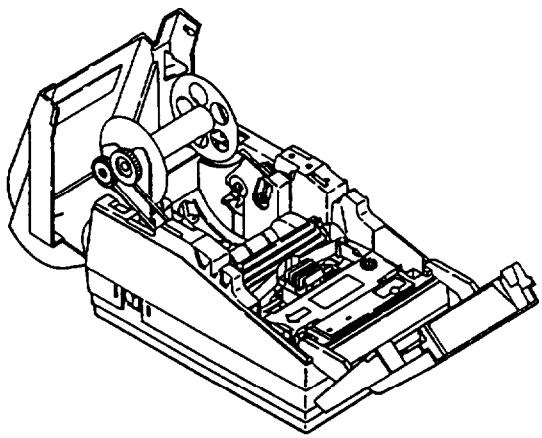
① Using scissors, cut the leading edge of the roll paper perpendicular to the paper feed direction.



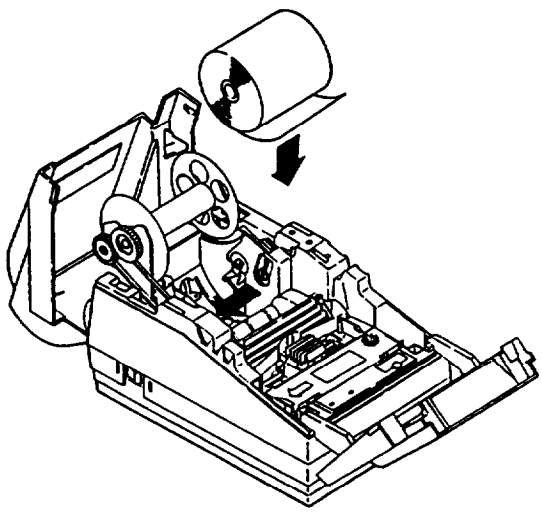
Good Bad Bad

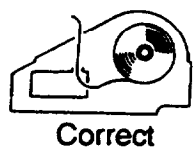
② Open the printer cover and the take-up cover.

- Check that the ribbon cassette is properly installed.

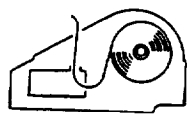


③ Load the roll paper while lightly pressing the left roll-paper holder outward. Release the holder after fitting the paper core onto the holder. Make sure the roll paper turns freely. When loading roll paper, **make sure to insert so that it** rotates in the correct direction.





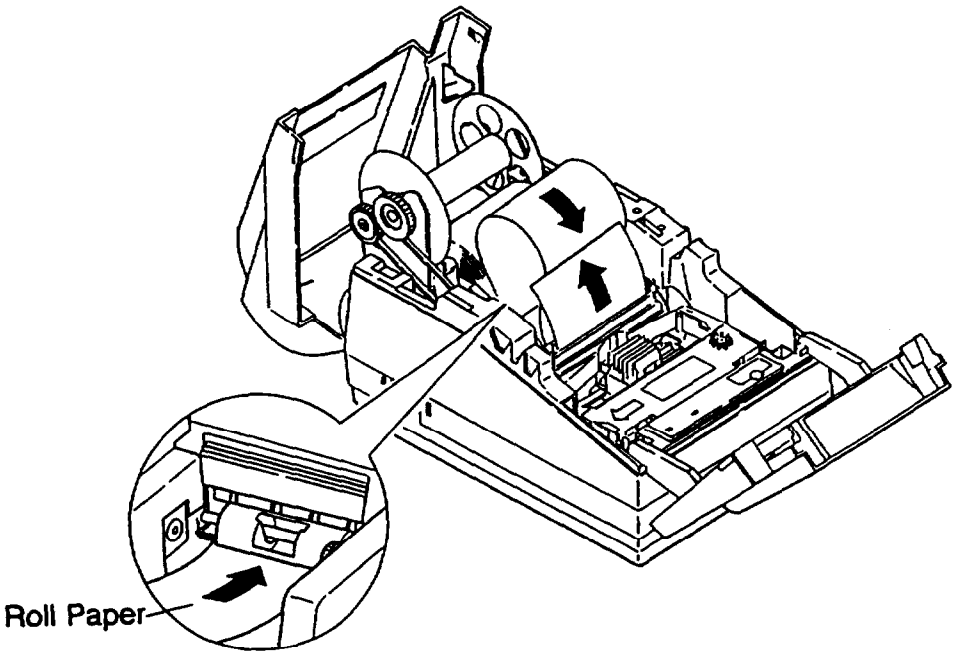
Correct



Incorrect

④ Turn on the printer.

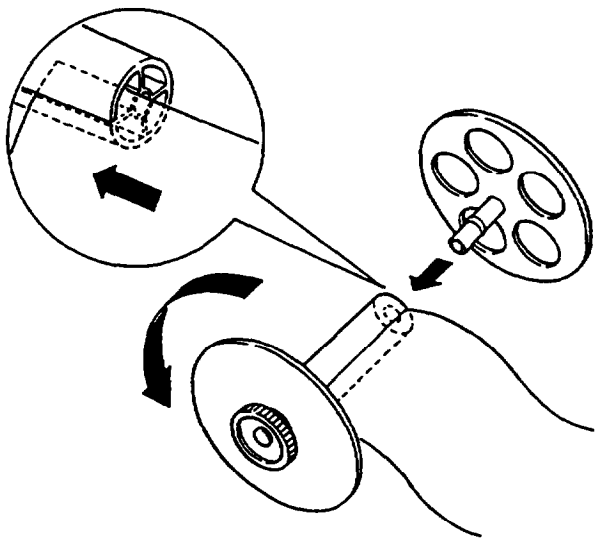
⑤ While leaving some slack in the roll paper, insert the end of the roll paper straight into the paper inlet. The printer automatically feeds the roll paper into the printer.



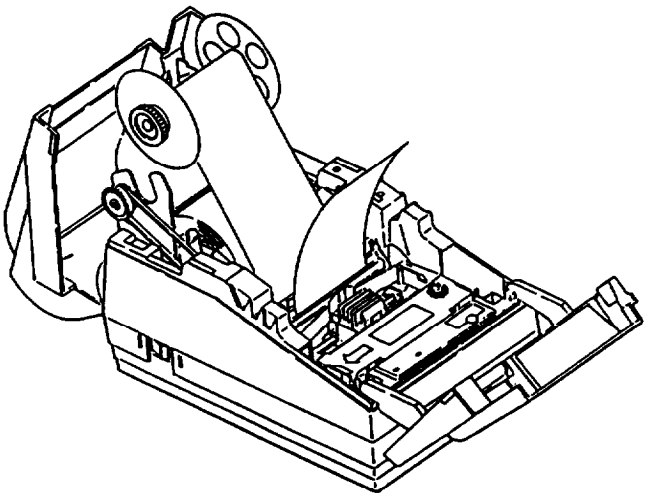

⑥ Press the FEED switch to continue feeding the paper until it extends about 20 cm beyond tear-off edge.

⑦ Remove the take-up spool from the take-up frame.

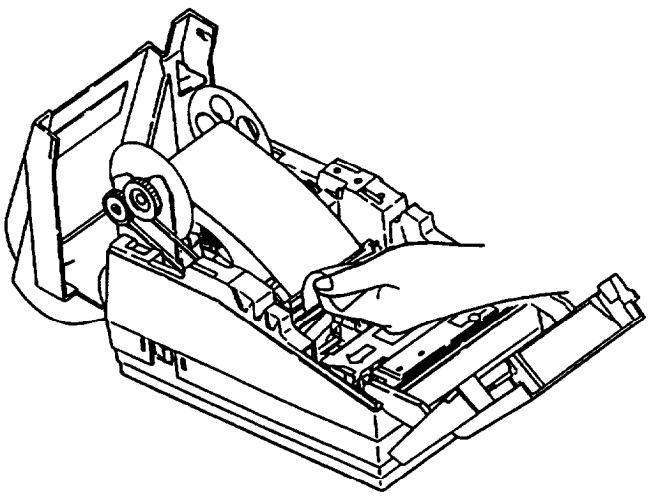
Remove the side of the spool and insert the end of the paper roll (journal paper when using 2-ply paper and 3-ply paper) into the groove on the spool and wrap the roll paper around the spool two or three times. Install the flange to flange shaft.



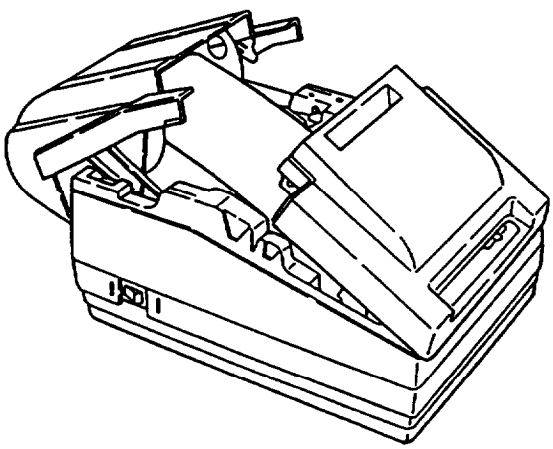
⑧ Install the take-up spool to the take-up frame.



⑨ Tear off the receipt paper by the cutter when using the 2-ply paper and 3-ply paper.



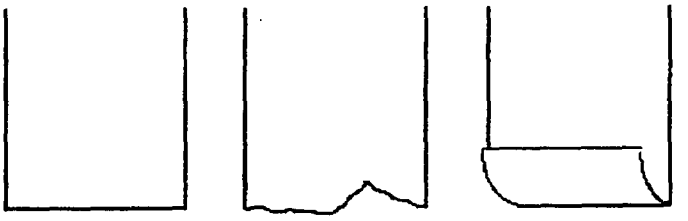
⑩ Close the printer cover and the take-up cover.



■ **Installing the roll paper for TM-300B/300PB**

Be sure to use roll paper that matches the printers specifications.

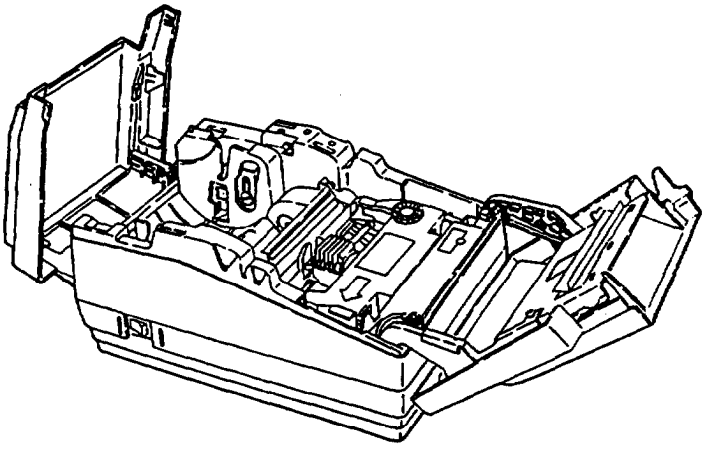
① Using scissors, cut the leading edge of the roll paper perpendicular to the paper feed direction.



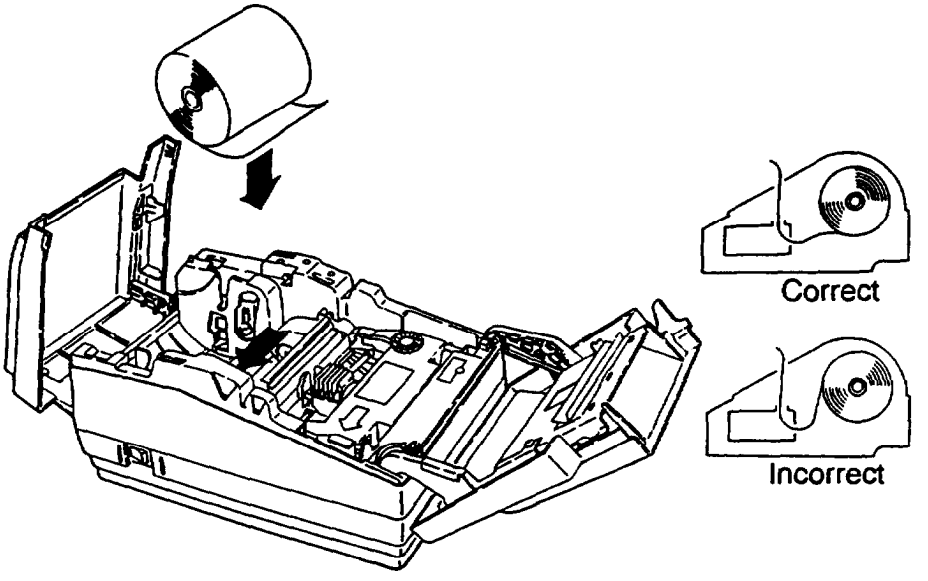
Good **Bad** Bad

② Open the printer cover and the roll-paper cover.

- Check that the ribbon cassette is properly installed.

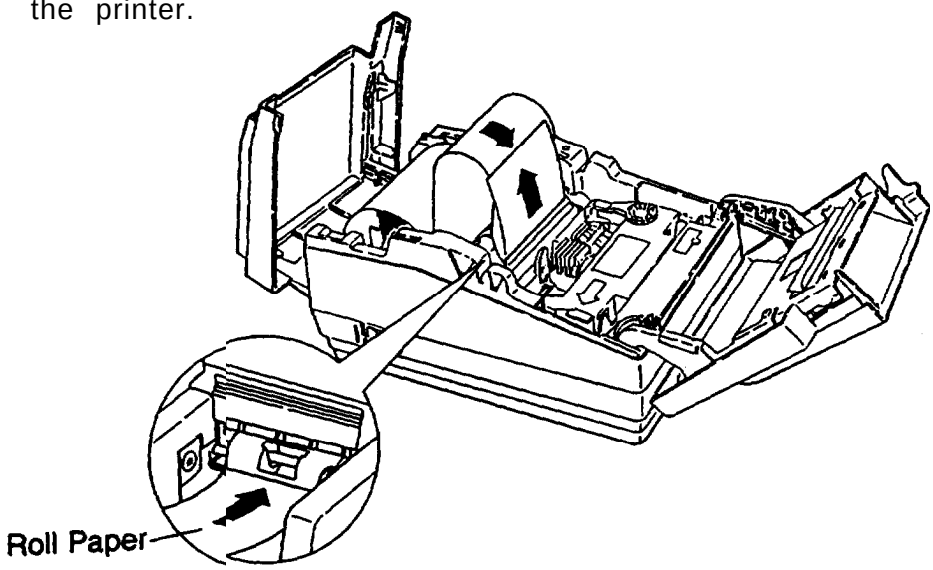


③ Load the roll paper while lightly pressing the left roll-paper holder outward. Release the holder after fitting the paper core onto the holder. Make sure the roll paper turns freely. When loading roll paper, make sure to insert so that it rotates in the correct direction.

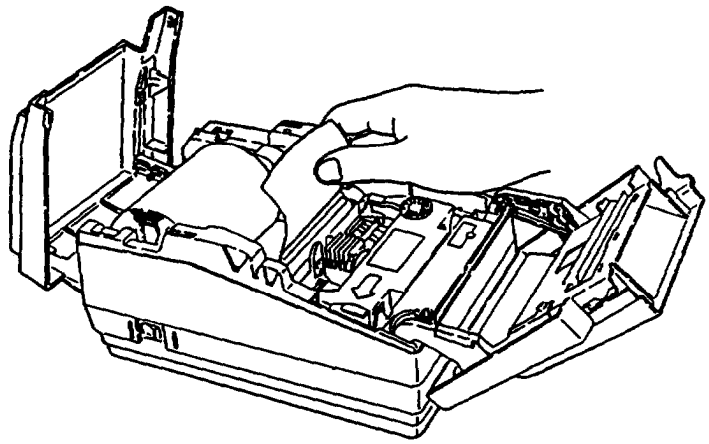


④ Turn on the printer.

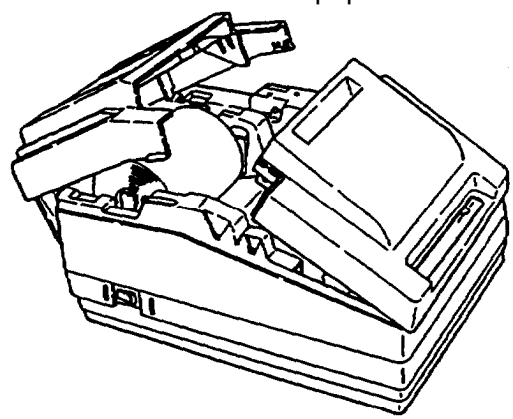
⑤ While leaving some slack in the roll paper, insert the end of the roll paper straight into the paper inlet. The printer automatically feeds the roll paper into the printer.




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



⑦ Close the printer cover and the roll-paper cover.



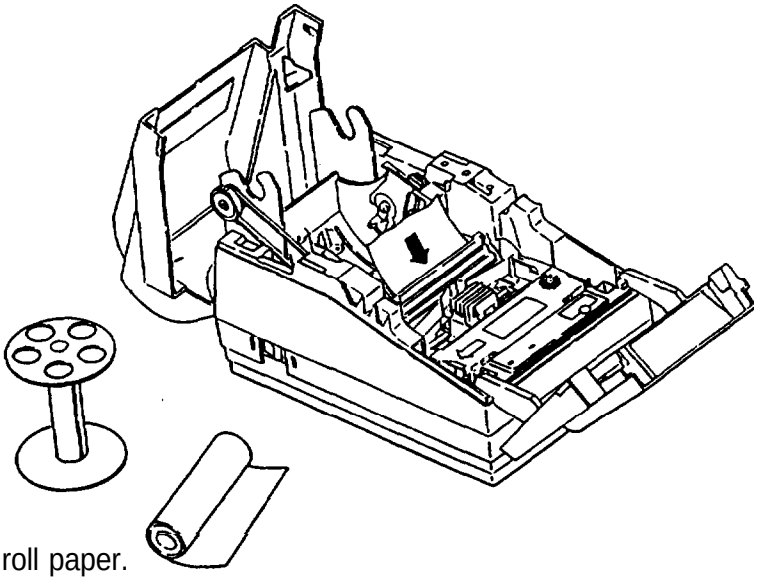
## ■ Exchanging the paper roll

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

### <TM-300A/300PA>

① Open the printer cover and the take-up cover.

Remove the journal paper and the receipt paper. While pressing the FEED switch, remove the remaining paper by pulling it out in the direction of the arrow.



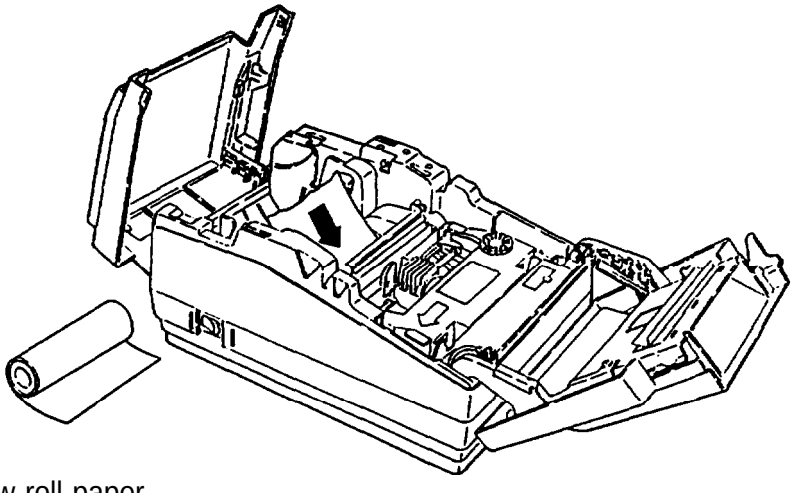
② Install a new roll paper.

See Installing the Roll Paper for TM-300A/300PA ⑩ ⑫.

### <TM-300B/300PB>

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

Remove the roll paper. While pressing the FEED switch, remove the remaining paper by pulling it out in the direction of the arrow.



② Install a new roll paper.

See Installing the Roll Paper for TM-300B/300PB ① to ⑦.

# 3-3 Adjusting the Paper Near-End Detector

### ■ The paper near-end detector

The paper near-end detector senses when the paper is nearing its end and turns on the PAPER LED.

The paper near-end detector can be adjusted according the thickness of the paper core.

### ● Adjusting the paper near-end detector

Roll paper differs in paper core size, so you may need to adjust the paper near-end detector.

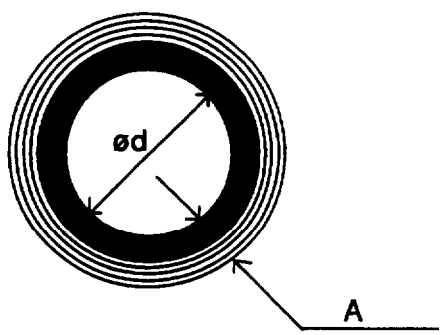
① Make sure the paper core inside diameter (ød) is 10.5 to 12.5 mm.

② Measure the paper core thickness A (Refer to Figure below) for the roll paper to be used.

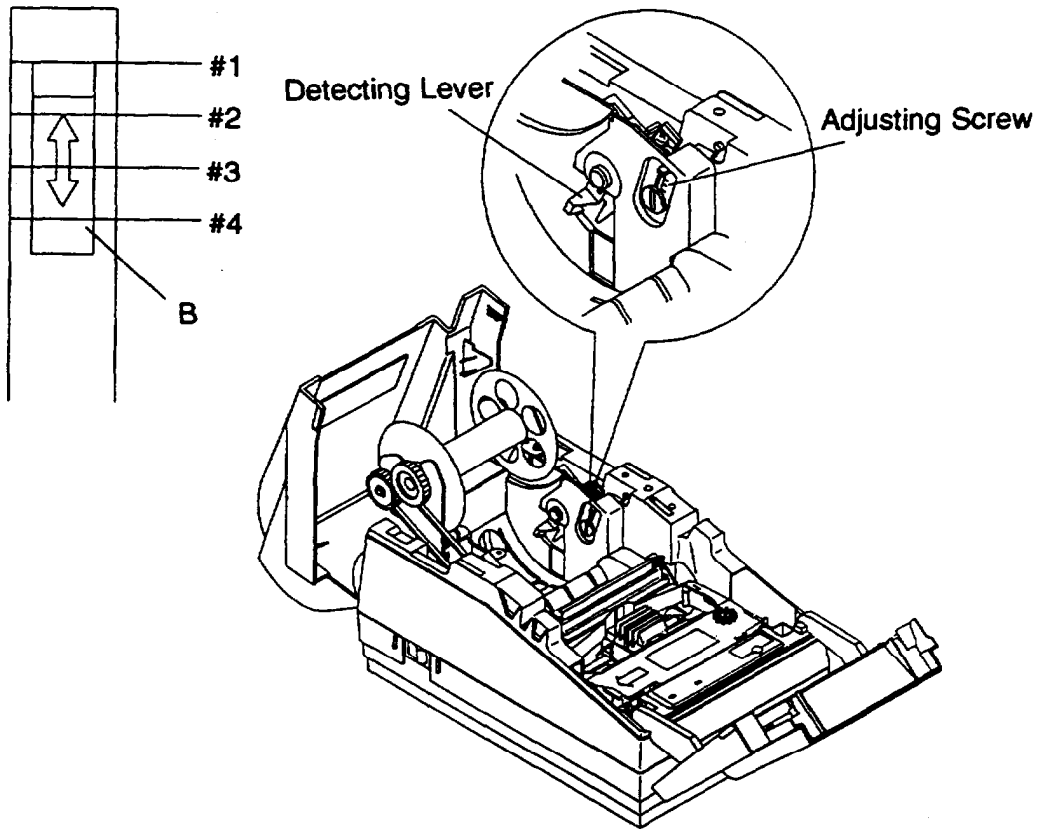
③ Determine the corresponding adjustment value from the table below.

**Table 3-1. Paper Core Thickness and its Graduation Degrees**

| Dimension A | Adjustment value |
|---|---|
| **4.5** mm | #1 |
| **6.5** mm | **# 2** |
| **8.5** mm | **# 3** |
| 10 mm | **# 4** |



④ The adjusting screw which holds the roll paper near-end detector, may be loosened and then set the top of "B" to the adjustment value found in ③, and tighten the adjusting screw. (The adjusting screw can be turned with a coin.)




⑤ Be sure that the detecting lever operates smoothly after finishing the adjustment.

**NOTES:**

- Since the adjustment values in Table 3-1 are calculated from standard measurements, there may be some variations depending on the model.
- If a roll paper with a red end mark at the paper end is used, this mark may cause the paper to stick together. If this occurs, the dimension A differs from the table.
- Be sure to that the detecting lever operates smoothly after finishing the adjustment.
- If the roll paper becomes loose due to poor paper quality, the detector may operate incorrectly.

# 3-4 DIP Switches

## ■ Locating DIP switches

On the bottom of your printer are DIP switches that allow the printer to be set or perform a number of different functions.

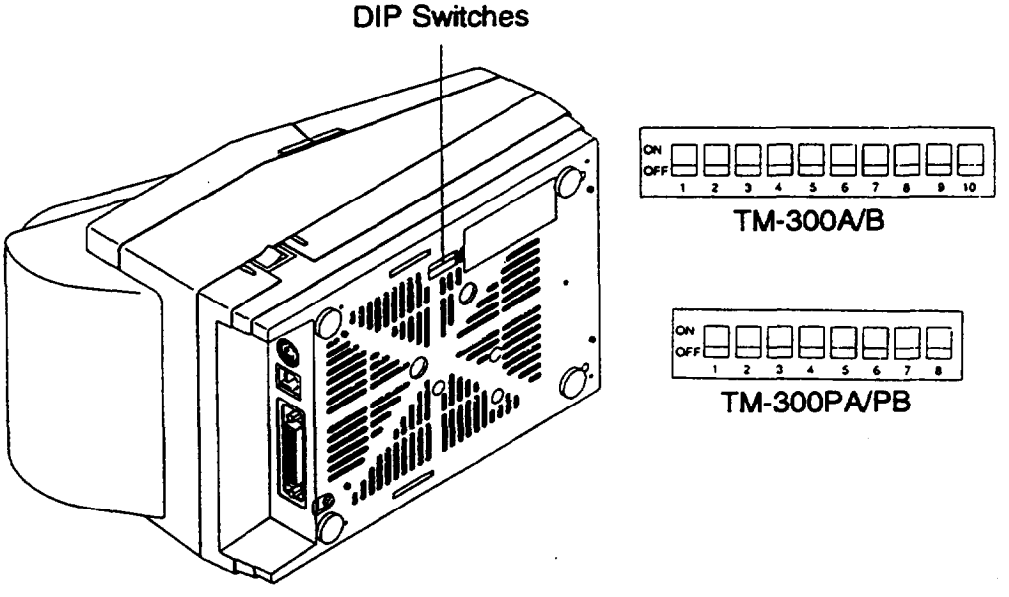
- The switches are numbered SW-l to SW-10, (TM-300A/B) or SW-l to SW-8 (TM-300PA/PB), from left to right as shown in figure below.
- The lists on the following page describe each switch's function.

## ■ Setting the DIP switches

Follow these steps when changing DIP switch settings.

① Turn the printer power switch off.

② Flip the DIP switches using tweezers or other narrow-ended tool. Switches are on when up and off when down.




③ The new setting takes effect when you turn on the printer.

**NOTES:**

- Always change DIP-switch settings when printer is turned off.
- Changes made with the power on have no effect until you turn the printer off and then on again.

## ■ TM-300A/B DIP-switch Functions

**Table 3-2. TM-300A/B DIP-switch Functions**

| Switch | Function | ON | OFF |
|---|---|---|---|
| SW-1 | Data receive error | Ignored | Prints "?" |
| SW-2 | Receive buffer capacity | 40 bytes | Approx. 1 Kbyte |
| SW-3 | Handshaking | XON/XOFF | DSR/DTR |
| SW-4 | Word length | 7 bits | 8 bits |
| SW-5 | Parity check | On | Off |
| SW-6 | Parity selection | Even | Odd |
| SW-7 | Baud rate selection (Refer to Table 3-3.) | | |
| SW-8 | | | |
| **SW-9** | (Internal use) | * ) | |
| SW-10 | (Internal **use)** | | |

* ) Do not change the setting of DIP switches 9 and 10 in the TM-300A/B.

**Table 3-3. Baud Rate Selection**

| Transmission Speed (bps) | SW-7 | SW-8 |
|---|---|---|
| 1200 | ON | ON |
| 2400 | OFF | ON |
| **4800** | **ON** | OFF |
| 9600 | OFF | OFF |

## ■ TM-300PA/PB DIP-switch Functions

**Table 3-4. TM-300PA/PB DIP-switch Functions**

| Switch | Function | ON | OFF |
|---|---|---|---|
| SW-1 | Auto-feed | Always enable | **Depends on** AUTO FEED XT |
| SW-2 | Receive buffer capacity | **0 byte** | **Approx. 1 Kbyte** |
| SW-3 | (Internal use) | *) Fixed to ON. | |
| SW-4 | (Internal use) | *) Fixed to OFF. | |
| SW-5 | (Internal use) | *) Fixed to ON. | |
| SW-6 | (Internal use) | ***) Fixed to ON.** | |
| SW-7 | (Internal use) | * ) | |
| SW-8 | (Internal use) | | |

* ) Do not change the setting of DIP switches 3 to 8 in the TM-300PA/PB.

# Chapter 4 The Self Test

## 4-1 The Self Test

### ■ The purpose of the self test

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

The self test checks the following

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

### ■ Running the self test

Run the self test only when roll paper is loaded the printer.

① Make sure the ribbon cassette and paper have been installed properly.

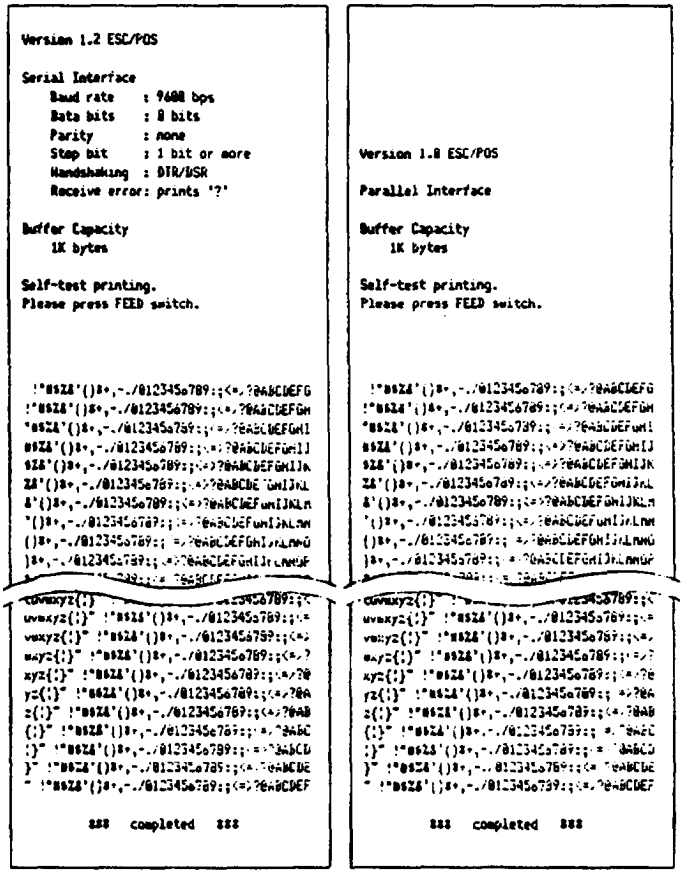
② Turn on the power while holding down the FEED switch.
The self test begins.

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

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

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

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




**(TM-300A/B)** **(TM-300PA/PB)**

**Self-test Printing Samples**

# II. REFERENCE

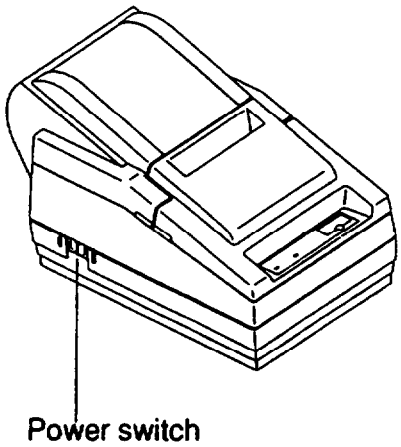
# Chapter 5 Cautions while Using the Printer

## 5-1 Panel Switches and Commands

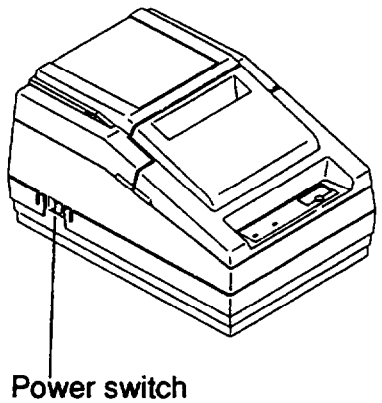
■ **Switches**

**(1) Power switch**

**TM-300A/TM-300PA**




**TM-300B/TM-300PB**

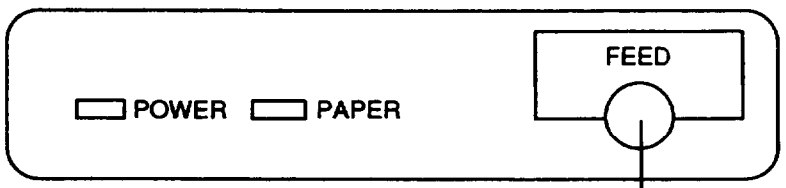



[Function] Turns the power supply on/off.

[Note]
- The RAM is initialized after turning off the power supply.
- Do not touch the power switch during printing.

**(2) FEED switch**

FEED switch is controlled by the **ESC** c 5 command. If the FEED switch is disabled with this command, you cannot use the FEED switch.




[Operation Panel] FEED switch

[Function] Feeds paper in the increment set with the **ESC 2** and **ESC 3** commands.

[Note] When the cover is open, you can use this switch regardless of the **ESC c 5** setting.

## 5-2 The PAPER LED

- **The PAPER LED functions**

On: Roll paper is near the end of the roll

off: Roll paper is present (normal condition)

Blinking: When an error has been detected, when the printer is in the test printing standby state, or when printing has stopped due to exceeding the allowable print duty cycle.

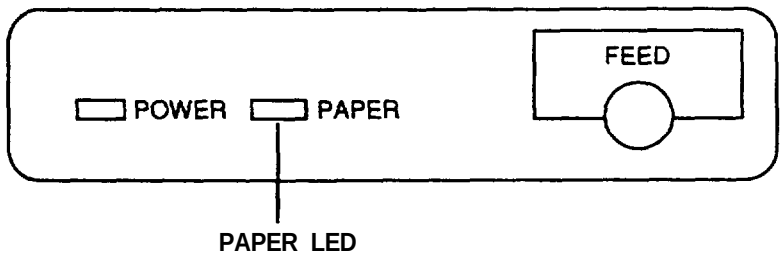
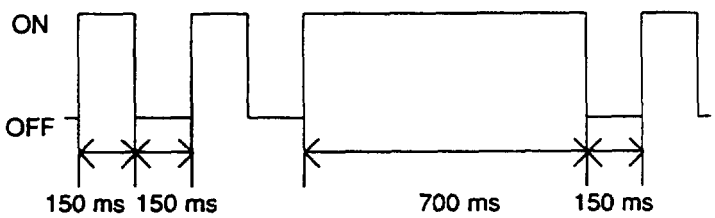
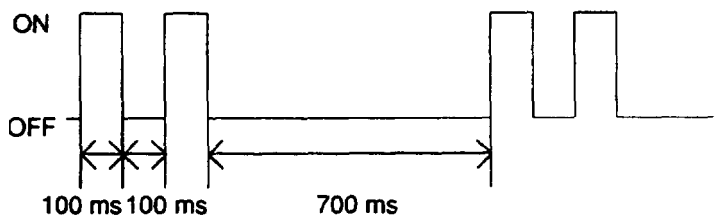
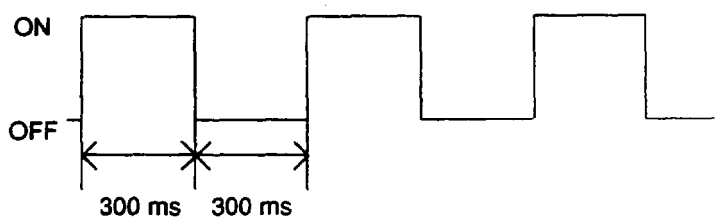


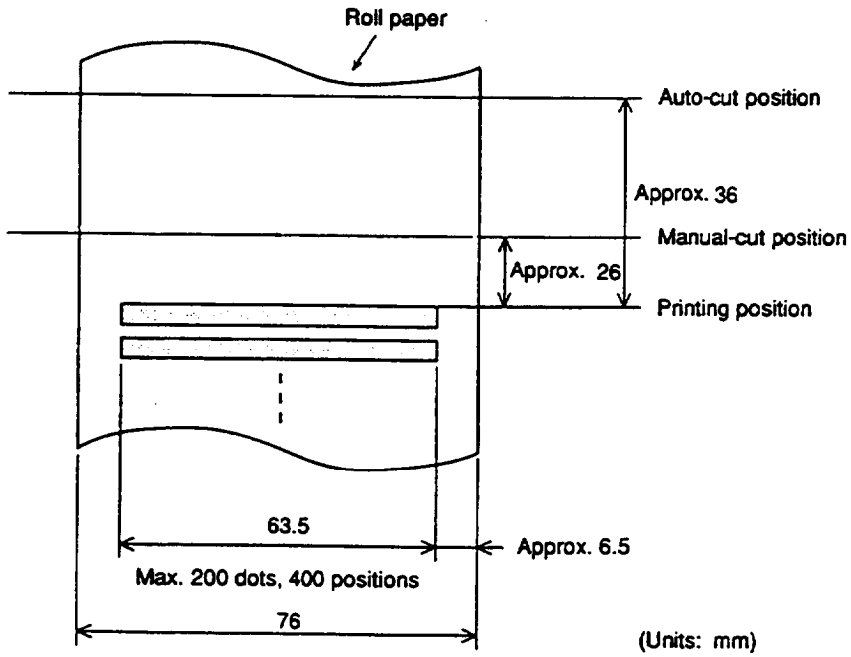

**Table 5-1. PAPER LED Display**

| Printer Status | Blinking Pattern |
|---|---|
| Error detection |   |
| While printing has stopped due to exceeding the allowable print duty cycle. |   |
| Test printing standby state |   |

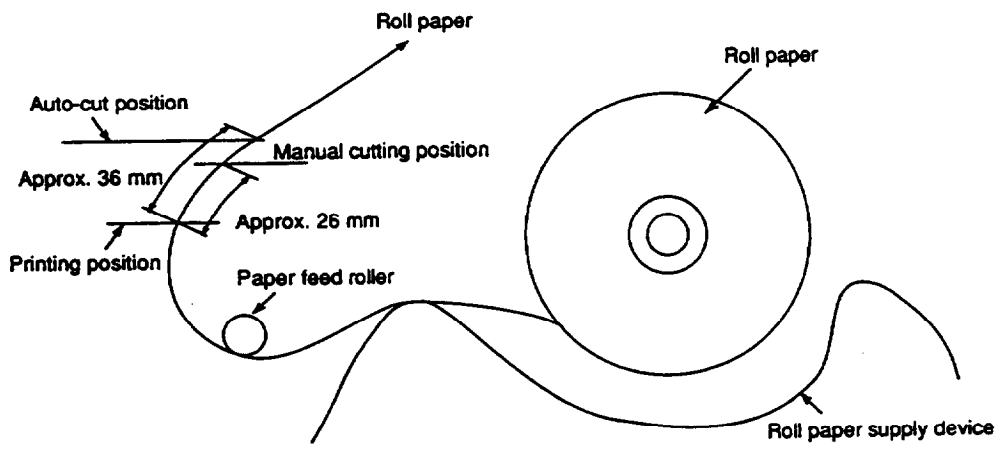
# 5-3 Printable Area, Printing Position and Paper Cutting Position

■ **Printable Area**

The printable area must be within the range indicated below.




■ **Printing Position and Paper Cutting Position**




(Units: mm)

The figure is as seen from the right-hand side of the printer.

## 5-4 Errors

### ■ TM-300A/B

(1) Error detection

The following errors are detected as mechanical errors.

- Home position detection abnormality
- Auto-cutting position detection abnormality

If something abnormal is detected, the printer will perform the following:

- Stops all normal operation.
- Sets the DTR signal to “MARK”.
- Blinks the PAPER LED (red).
- If XON/XOFF control is selected, transmits XOFF.

If a data reception error (parity error, framing error, or overrun error) occurs, the printer ignores the data prints question marks (?), according to the setting of the DIP switch.

(2) Recovery from Error State

To recovery from the error state, turn the power off and on again, after correcting the cause of the error.

### ■ TM-300PA/PB

(1) Error detection

The following errors are detected as mechanical errors.

- Home position detection abnormality
- Auto-cutting position detection abnormality

If something abnormal is detected, the printer will perform the following:

- Stops all normal operation.
- Change the interface signal to the error state
  - Sets the BUSY signal to HIGH level.
  - Sets the PE signal to HIGH level.
  - Sets the $\overline{\text{ACKNLG}}$ signal to HIGH level.
  - Sets $\overline{\text{ERROR}}$ signal to LOW level.
- Blinks the PAPER LED (red).

(2) Recovery from Error State

To recovery from the error state, turn the power off current the cause of the error, then turn the power on again, or correct the cause of the error, set the INT signal of the interface connector pin to LOW for 50 μs or more, then set it to HIGH again.

## 5-5 The Cover Open Detector

### ■ The cover open detector operation

This printer has cover open detectors, located inside the cover.

If the cover is opened when the power supply is activated, the printer automatically goes off-line and printing will be terminated (after the current line is printed).

### ■ Returning the printer on-line

Close the cover to set the printer on-line.

**NOTE:**

. Before printing, check that the cover are dosed properly.

## 5-6 Roll Paper End Detector

### ■ Roll paper end detector

Located in the roll paper path. This detector detects paper out. However, roll paper for which the end is glued to the roll core cannot be used. Roll paper semi-automatic loading is possible depending on the combination of the roll paper end detector and cover open detector. (See 3-2 Installing the Roll Paper)

### ■ Detectors and printing

The printer will either stop or continue printing according to the **ESC c** 4 setting when a paper-end is detected. The roll paper near-end detector and roll paper end detector are both available. (Refer to 5-2 The PAPER LED)

When stop printing mode is selected, the printer automatically goes off-line when the roll paper near-end detector or the roll paper end detector detects paper out. Therefore, the printer should go on-line after setting the paper to restart printing. Switching on-line is executed by closing the printer cover.

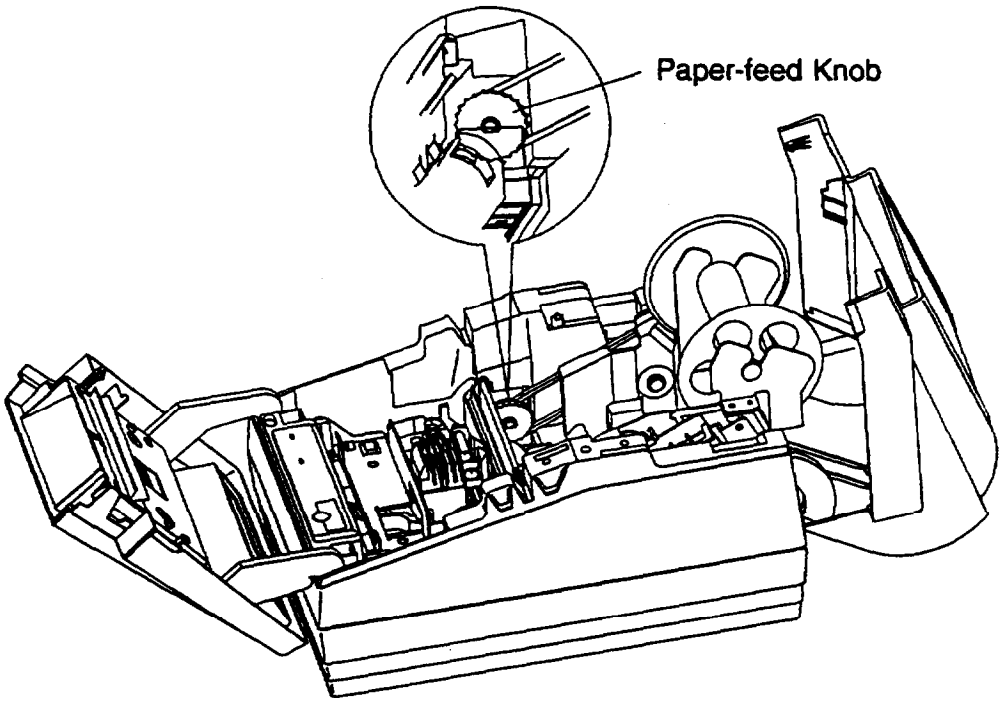
# 5-7 Removing Jammed Paper

■ **Removed jammed paper**

Remove jammed paper according to the following steps.

① Open the roll-paper take-up cover (TM-300A/300PA) or the roll-paper cover (TM-300B/300PB).

② Then the paper-feed knob and remove any jammed paper.




③ Reload roll paper, and close the roll-paper take-up cover (TM-300A/300PA) or the roll-paper cover (TM-300B/300PB).

See 3-2 Installing the Roll Paper.

# Chapter 6 Software Control

## 6-1 Printer Control

### ■ Controlling the printer by commands

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

See APPENDIX G character code table and APPENDIX H Command Summary.

There are two types of commands.

① One-byte commands

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

② Several-byte commands

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

### ■ How to use this table

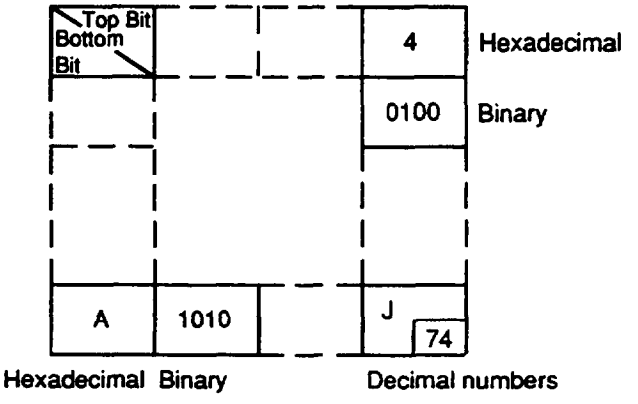
Horizontal by vertical hex

ie. 4A = J

< >H denotes hexadecimal

c > denotes decimal numbers

(Refer **to** APPENDIX G Page 0 (International character set: U.S.A.))



# 6-2 Command Descriptions

### Command descriptions

#### XXX Command

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

#### ■ Ignored Commands

The TM-300A/B ignores the following command:

**ESC c 3**

The TM-300PA/PB ignores the following commands:

**ESC u**
**ESC v**

# 6-3 Commands

## HT

[Name] Horizontal tab

[Format] <09>H

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

- This command is ignored unless the next horizontal tab position has been set.

[Notes]

- Horizontal tab positions are set by ESC D.
- The default horizontal tab positions are at intervals of 8 characters (9th column, 17th, 25th ...) for the 7 x 9 font

[Reference] ESC D

## LF

[Name] Print and line feed

[Format] <OA>H

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

- Sets the print starting position to the beginning of the line.

[Reference] ESC 2, ESC 3

## CR

[Name] Print and carriage return

[Format] <OD>H

[Description] Prints one-line of data from the print buffer and feeds no paper.

- Sets the print starting position to the beginning of the line.

## ESC SP n

[Name] Set character right-side spacing

[Format] <l B>H<20>H<n>

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

[Description] Sets the character right-side spacing.

[Notes]
- The character right-side spacing for double-width mode is twice the set value.
- The character right-side spacing is set in half-dot units.

[Default] n = 0

## ESC ! n

[Name] Set print mode

[Format] <1B>H<21>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Sets a print mode.

- Each bit of *n* is used as follows:

| Bit | Function | Value | |
|---|---|---|---|
| | | 0 | 1 |
| 0 | Character font | 9 × 9 font | 7 × 9 font |
| 1 | Undefined | | |
| 2 | Undefined | | |
| 3 | Undefined | | |
| 4 | Double-height mode | Canceled | Set |
| 5 | Double-width mode | Canceled | Set |
| 6 | Undefined | | |
| 7 | Underline | Canceled | Set |

[Note]
- Underlines can be printed for all characters, but not for the space skipped by an HT.
- When both double-height mode and double-width mode are set, quadruple-size characters are printed.
- The printer deletes the right-most dot of a character during double-width mode, if another character follows.
- When double-height mode is specified, some character dots cannot be printed due to the influence of the previous dots.
- For double-height and double-width mode printing, uni-directional printing is desirable.

[Default] *n* = 1

[Reference] APPENDIX E Notes on Character Printing

## ESC % n

[Name] Select/cancel user-defined character set.

[Format] <1B>H<25>H<n>

[Range] 0 ≤ n ≤ 255

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

- Only the lowest bit of n is valid.

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

  When n = <*******0>B, the user-defined character set is canceled (and the internal character set is selected.)

[Default] n = 0

[Reference] ESC &

## ESC & s n m [a[p]sXa]m-n+1

[Name] Define user-defined characters

[Format] <1B>H<26>H<s><n><m>[<a><p1><p2>…<psXa>]m-n+1

[Range] s = 2

32 ≤ n ≤ m ≤ 126

0 ≤ a ≤ 12 (9X 9 font)

0 ≤ a ≤ 10 (7X 9 font)

0 ≤ p1…psXa ≤ 255

[Description] Defines user-defined characters ANK character codes.

- "s" specifies the number of bytes in vertical direction.
- "n" specifies the beginning ASCII code for the definition and "rn " the final code. If only one character is defined, use n = m.
- The allowable character code range is from ASCII code <20>H to <7E>H.

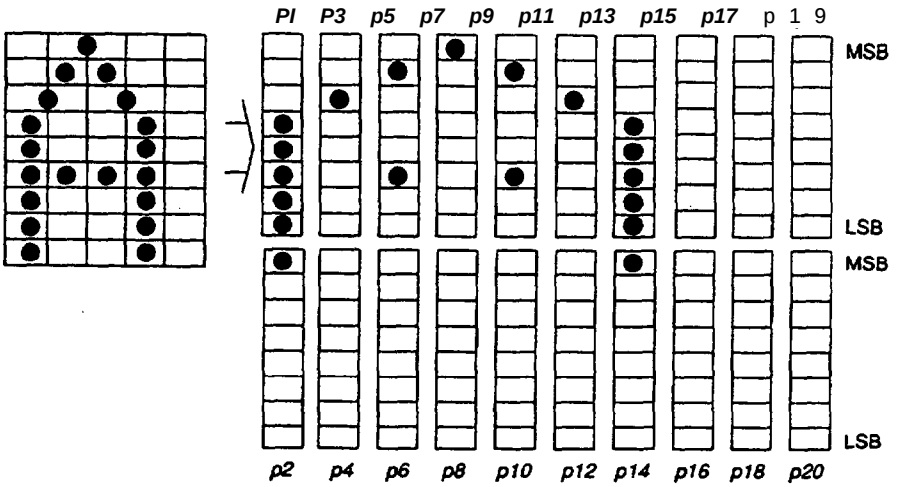
  When receive buffer capacity is 1 Kbyte, the maximum number of characters is 9, and when receive buffer capacity is 40 bytes, the maximum number of characters is 44.
- When the maximum number of user-defined characters has been defined, redefinition of the defined ASCII codes is possible but definition of new ASCII codes is impossible.
- "a" specifies the number of dots in the horizontal direction.
- "p" is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.
- After user-defined characters are defined once, they are available until they are redefined, until ESC @ is executed, until the printer is reset, or until the power is turned off.

[Default] The same as the internal character set.

[Notes]
- Horizontally adjacent dots cannot be printed.
- Only the top bit is valid in the secondary data bytes in the vertical direction.

[Reference] ESC %

[Example]
- 7 X 9 font




When the dot pattern for code 20H is defined as shown above.

| | ESC | & | s | n | m | a | p1 | p2 | p3 | p4 | p5 | p6 | p7 | p8 | p9 | p10 | p11 | p12 | p13 | p14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| coda (Hexadecimal) | 18 | 26 | 02 | 20 | 20 | 07 | 1F | 80 | 20 | 00 | 44 | 00 | 80 | 00 | 44 | 00 | 20 | 00 | 1F | 80 |

(The corresponding bit is 1 when printing, and 0 when not printing.)

## ESC * *mn1 n2 [d] n1 + 256 X n2*

[Name] Set bit image mode

[Format] <1B>H<2A>H<m><n1><n2>[<d>]n1+256Xn2

[Range] m = 0, 1

0 ≤ n 2 ≤ 3

0 ≤ n 1 ≤ 2 5 5

0 ≤ d ≤ 255

[Description] Sets the bit image mode using m and the number of dots using n1 and n2.
- Divide the number of dots to be printed by 256. The integer answer is n2 and the remainder is n1 . Therefore, the number of dots in the horizontal direction is calculated as : n1 + 256 X n2.
- 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, otherwise set it to 0.

. The bit image modes selectable by m are as follows:

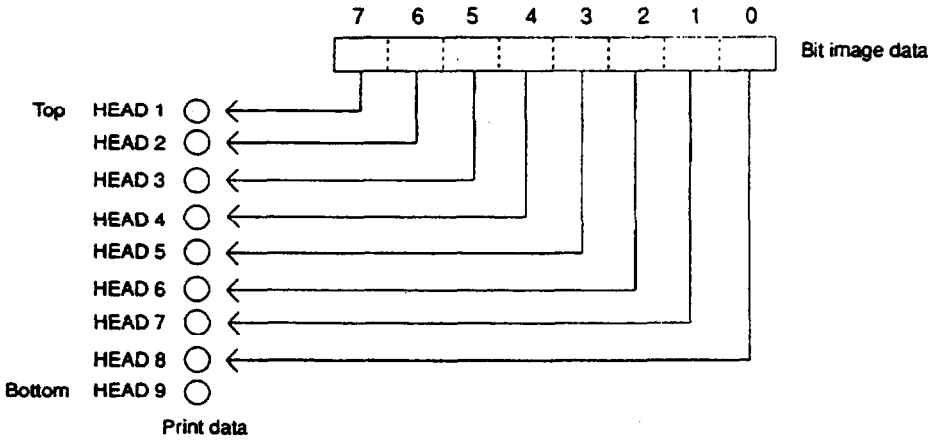
| m | Vertical Direction | Horizontal Direction | | |
|---|---|---|---|---|
| | Number of Vertical Dots | Dot Density | Horizontally Adjacent Dots | Total Number of Dots |
| 0 | 8 | Single density | Printable | 200 |
| 1 | 8 | Double density | Unprintable | 400 |

[Notes]

. If m is out of range, the data following n1 (and the data including n1) is processed as normal data.

. After printing a bit image, the printer returns to normal data processing.

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




## ESC 2

[Name] Set 1/6 inch line spacing

[Format] <1B>H<32>H

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

## ESC3n

[Name] Set line spacing using minimum units

[Format] <1B>H<33>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Sets the line spacing to n/144 inches.

[Default] n = 24 (1/6 of an inch)

## ESC <

[Name] Return home

[Format] <1B>H<3C>H

[Description] Moves the print head to the left-most position.

- Because this command initializes the carriage by detecting the home position, carriage motor malfunctions can be adjusted.

[Notes]

- Because carriage motor malfunctions cannot be detected, it is recommended that the carriage be initialized with this command each time a receipt is issued.
- The mechanical carriage initialization executed by this command may cause printing position misalignment before and/or after this command is executed.

## ESC @

[Name] Initialize printer

[Format] <1B>H<40>H

[Description] Clears the data in the print buffer and resets the printer mode.

(Notes)

- The DIP switches are not read again.
- The data in the receive buffer is not cleared.

## ESC D [n]k NUL

[Name] Set horizontal tab positions

[Format] <1B>H<44>H[<n>]k<00>H

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

$0 \leq k \leq 132$

[Description] Sets horizontal tab positions.

- "n" specifies the column number for setting a horizontal tab position. [n = (Column number) - 1)]. For example, when a tab is to be set at column 9, n = 8.
- "k" indicates the total number of the horizontal tab positions to be set.
- The horizontal tab position is stored as an absolute value of (character width X n) measured from the beginning of the line. The character width includes the character right-side spacing, and double-width characters should be set with twice the width of normal characters.
- Transmit <n> k in ascending order and place a NUL code <00>H at the end.

- ESC D NUL clears all tabs. Any HT commands received after clearing are ignored.

[Notes]
- When a data value <n>k is less than or equal to the preceding value <n>k-1, the setting will be considered to be finished. In this case, the following data is processed as normal data.
- Up to 32 tab positions can be set. Data which exceeds 32 tab positions is processed as normal data.
- When data value <n>k exceeds the number of characters printable on one line, the column position to be set = maximum printable columns + 1.
- Horizontal tab positions remain unchanged if the character widths are changed after setting the horizontal tab positions.

[Default] The default tab positions are at intervals of 8 characters (9th column, 17th, 25th, ...) for the 7 X 9 font.

[Reference] HT

## ESC J n

[Name] Print and feed paper using minimum units

[Format] <1B>H<4A>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Prints one line of data from the print buffer and feeds the paper n/144 inches

- Sets the print starting position to the beginning of the line
- The predetermined line spacing remains unchanged.

[Default] Not defined.

## ESC R n

[Name] Select international character set

[Format] <1B>H<52>H<n>

[Range] 0 ≤ n ≤ 10

[Description] *n* selects an international character set from the following table.

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

[Default] n = 0

[Reference] See APPENDIX G Character Code Table

## ESC U *n*

[Name] Set/cancel uni-directional printing

[Format] <1B>H<55>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Sets or cancels uni-directional printing.

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

  When n = <* * * * * * * 1>B, uni-directional printing is set.

  When n = < * * * * * * * 0>B, uni-directional printing is canceled. (And bi-directional printing is set.)

[Notes]

- When uni-directional printing is set, the printer prints from left to right.
- When the user wants to avoid horizontal misalignment, this command should be used to select uni-directional printing. (Double-height printing, line printing, and so on.)

[Default] n = 0

## ESC c 3 n

[Name] Selects the paper-end detectors that will control the paper-end signal

[Format] <1B>H<63>H<33>H<n>

[Range] 0 ≤ n ≤ 255

[Description] This command is supported only by the TM-300PA/PB.

Selects paper detectors to output signals on the paper-end status line.

Each bit of *n* is used a follows:

| Bit | Function | Value | |
|---|---|---|---|
| | | 0 | 1 |
| 0 | Roll paper-end | Disabled | Enabled |
| 1 | Undefined | - | - |
| 2 | Roll paper end | Disabled | Enabled |
| 3 | Undefined | - | - |
| 4 | Undefined | - | - |
| 5 | Undefined | - | - |
| 6 | Undefined | - | - |
| 7 | Undefined | - | - |

[Notes]

- It is possible to select multiple detectors to output signals. In this case, if only one paper detects no paper, the paper-end signal is output.
- The detector is switched when executing this command. In this case there will be a lag between receiving the command and switching the paper-end signal, according to the condition of the receive buffer.

[Default] n = 1

## ESCc4n

[Name] Select paper detectors used to stop printing

[Format] <1B>H<63>H<34>H<n>

[Range] 0 ≤ n≤ 255

[Description] selects the paper detectors used to stop printing.

- Each bit of *n* **is used** a follows:

| Bit | Function | 0 | 1 |
|---|---|---|---|
| 0 | Roll paper near-end | Disabled | Enabled |
| 1 | Undefined | | |
| 2 | **Roll paper end** | **Disabled** | **Enabled** |
| 3 | **Undefined** | — | — |
| 4 | Undefined | — | — |
| 5 | **Undefined** | — | — |
| **6** | **Undefined** | — | — |
| **7** | **Undefined** | — | — |

[Notes]
- It is possible to select multiple detectors for print control (to stop printing.) In this case, if only one detector detects no paper, the printer stops printing.

  Printing is stopped after the current line is completed and the paper is fed. (The printer goes OFF-LINE after printing stops.)

[Default] n = 0

## ESC c 5 n

[Name] Enable/disable panel switch

[Format] <1B>H<63>H<35>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Enables or disables the panel switch.

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

  When *n* = <* * * * * * *1>B, panel switch is disabled.

  When *n* = < * * * * * * * 0>B, panel switch is enabled.

[Notes]
- If the panel switch is disabled by this command, the panel switch is unusable. Therefore, paper feeding using the FEED switch cannot be executed (except when the printer cover is open)

[Default] n = 0

## ESCdn

[Name] Print and feed paper *n* lines

[Format] <1B>H<64>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Prints one-line of data from the print buffer and performs *n* line feeds.

- Sets the print starting position to the beginning of the line.
- The predetermined line spacing remains unchanged.

[Note]
- Printing speed slows down because this command causes the carriage to move before feeding paper.

[Default] Not defined.

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

## ESC i

[Name] Execute full-cut

[Format] <1B>H<69>H

[Description] Executes a full-cut of the paper.

[Note] . Valid only when input at the beginning of a line.

## ESC m

[Name] Execute partial-cut

[Format] <1B>H<6D>H

[Description] Executes a partial-cut of the paper.

[Note] . Valid only when input at the beginning of a line.

## *ESC p m n1 n2*

[Name] Generate drawer kick-out drive pulse

[Format] <1B>H<70>H<m><n1><n2>

[Range] $0 \leq m \leq 1$

$0 < n1 \leq n2 \leq 255$

[Description] The pulse set by n1 and n2 is output to the connector pin m.

. The value of m is used as follows:

| m | Connector pin |
|---|---|
| 0 | Drawer kick-out connector pin 2 |
| 1 | Drawer kick-out connector pin 5 |

[Notes] . The circuit on the user side should be designed so that the drawer drive duty will be as shown below.

$$\frac{\text{ON time}}{\text{ON time + OFF time}} \leq 0.2$$

ON time is n1 X 2 ms, and OFF time is n2 X 2 ms.

It is recommended that n2 be four times as much as n1.

. The resistance of the drawer kick-out solenoid shall be 24 Ω or more. Otherwise, the overcurrent will flow.

. Be sure to use the printer power supply (pin 4) for the drawer power source.

[Default] Neither m, n1, nor n2 is defined.

[Reference] APPENDIX B Connectors and APPENDIX E Notes on Using the Drawer Kick-out Connector.

## ESC r n

[Name] Select print color
[Format] <1B>H<72>H<n>
[Range] n=0, 1
[Description] Selects the print color for every line.
- When n = 0, black is selected.
- When n = 1, red is selected.

[Note] Valid only when input at the beginning of a line.
[Default] n = 0

## ESC t n

[Name] Select character code table
[Format] <1B>H<74>H<n>
[Range] 0 ≤ n ≤ l
[Description] Selects page n from the character code table.
[Default] n = 0
[Reference] APPENDIX G Character Code Tables

## ESC u n

[Name] Transmit peripheral device status
[Format] <1B>H<75>H<n>
[Range] n = 0
[Description] This command is supported only by the TM-300A/B.
Transmits the status of connector pin n.
- The value of n is used as follows:

| n | Connector pin |
|---|---|
| 0 | Drawer kick-out connector pin 3 |

[Notes] The status to be transmitted is shown in the table below.

| Bit | Function | Values | |
|---|---|---|---|
| | | 0 | 1 |
| 0 | Pin 3 level | "LOW" | "HIGH" |
| 1 | Undefined | | |
| 2 | Undefined | | |
| 3 | Undefined | | |
| 4 | Not used | Fixed to 0 | — |
| 5 | Undefined | | |
| 6 | Undefined | | |
| 7 | Undefined | | |

- 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 will keep waiting until the host is ready. When XON/XOFF control is selected, the printer is transmits only 1 byte without confirming the condition of the DSR signal.
- There may be a time lag between receiving this command and transmitting the status, so the user should be aware of this.

[Reference] APPENDIX B Connectors

## ESC v

[Name] Transmit printer status

[Format] <1B>H<76>H

[Description] This command is supported only by the TM-300A/B.

Transmits the current printer status.

[Notes] The status to be transmitted is shown below.

| Bit | Function | Value | |
|---|---|---|---|
| | | 0 | 1 |
| 0 | Roll paper near-end | Paper present | Near-end |
| 1 | Undefined | | |
| 2 | Roll paper end | Paper present | End |
| 3 | Undefined | | |
| 4 | Undefined | Fixed to 0 | - |
| 5 | Not used | | |
| 6 | Not used | | |
| 7 | Not used | | |

- 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 will keep waiting until the host is ready. When XON/XOFF control is selected, the printer transmits only **1** byte without checking the DSR signal.
- The status just after processing the data received before this command is transmitted after the data processing is finished. However, if printing is executed when this command has been processed, the status just after the current line is printed and fed is transmitted. There may be a time lag between receiving this command and transmitting the status, so the user should be aware of this.

## ESC{ *n*

[Name] Select/cancel upside-down character printing

[Format] <1B>H<7B>H<n>

[Range] 0 ≤ n ≤ 255

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

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

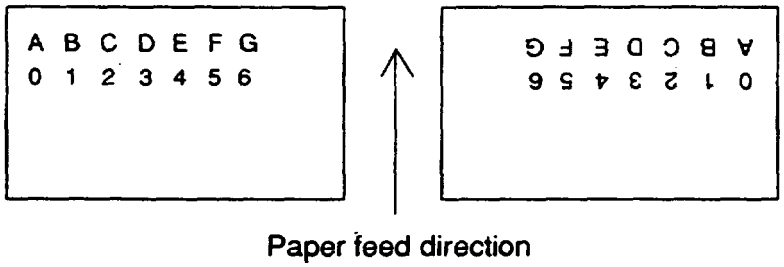
  When n = < * * * * * * * 1>B, upside-down character printing is selected.

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

[Notes]
- The upside-down character specification rotates normal characters on the line by 180° and prints them.
- Valid only when input at the beginning of a line.

[Default] n = 0

[Example] When upside-down character printing is canceled. When upside-down character printing is selected.




## GS E n

[Name] Set head energizing time

[Format] <1D>H<45>H<n>

[Range] 0 ≤ n ≤ 255

[Description] Sets the head energizing time.

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

  When n = < * * * * * * * 1>B, normal mode is selected.

  When n = <* * * * * * * 0>B, copy mode is selected (energizing time is longer.)

{Notes]
- When the roll paper contains two or more sheets, copy mode (energizing time is set longer) should be selected.

[Default] n = 1

# APPENDIX

## APPENDIX A General Specifications

### 1. Printing specifications

| | |
|---|---|
| Printing method: | Serial impact dot matrix |
| Head wire arrangement: | Serial-type 9 pin |
| Printing directions: | Bi-directional (logic-seeking) |
| Lines per second: | Approx. 3.5 LPS (40 columns, 16 CPI, Single color continuous printing) |
| | Approx. 5.8 LPS (20 columns, 16 CPI, Single color continuous printing) |
| | * In the case of heavy use, printing stops to protect the head. In this case the actual lines per second may be lower. |
| | (LPS: Lines Per Second) (CPI: Characters Per Inch) |
| Characters per line: | Refer to Table A-l |
| Character per inch: | Refer to Table A-l |
| Print duty: | Refer to APPENDIX D Miscellaneous Notes |
| Print color switching mechanism: | |
| | Selectable black or red printing |

### 2. Characters specifications

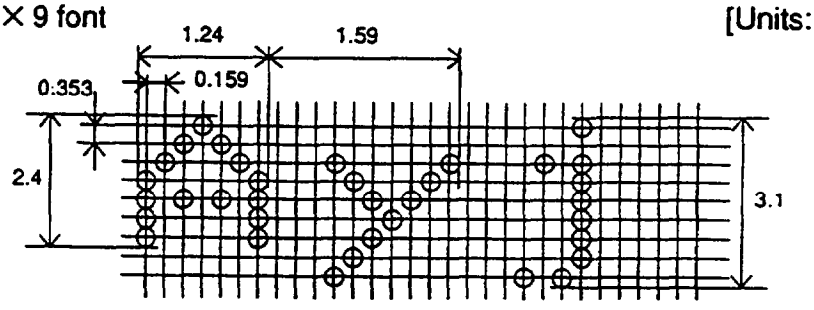
| | | |
|---|---|---|
| Number of characters: | Alphanumeric: | 95 |
| | Graphics: | 128 X 2 tables |
| | International characters: 32 | |
| Character structure: | 7 x 9 (Total number of dots in the horizontal direction: 400 half dots) | |
| | 9 x 9 (Total number of dots in the horizontal direction: 400 half dots) | |
| Character size: | Refer to Table A-1 | |

**Table A-l. Character Size, Characters Per Line, Characters Per inch**

| Character Structure | | Character Size W X H (mm) | Character Dot Spacing | Characters Per Line (CPL) | Characters Per Inch (CPI) |
|---|---|---|---|---|---|
| Horizontal X Vertical | Characters | | | | |
| 7 X 9 (* 1) | ANK (* 2) | 1.24 X 3.1 | 3 half dots | 4 0 | 16 |
| | Graphic | 1.59 X 3.1 | 0 | 40 | 16 |
| 9 X 9 | ANK (* 2) | 1.56 X 3.1 | 3 half dots | 3 3 | 13.3 |
| | Graphic | 1.91 X 3.1 | 0 | 3 3 | 13.3 |

(* 1) 7 x 9 font is the default. (* 2) ANK: Alphanumeric and Kana

Example) 7 × 9 font [Units: mm]




## 3. Ribbon

Ribbon cassette type: Exclusive ribbon cassette ERC-34 (B/R)

Color: 2-color (black and red) (*)

Ribbon life: Black: Approx. 1,500,000 characters

Red: Approx. 750,000 characters

Ribbon cassette overall dimensions:

Refer to Figure A-1

[Units: mm]

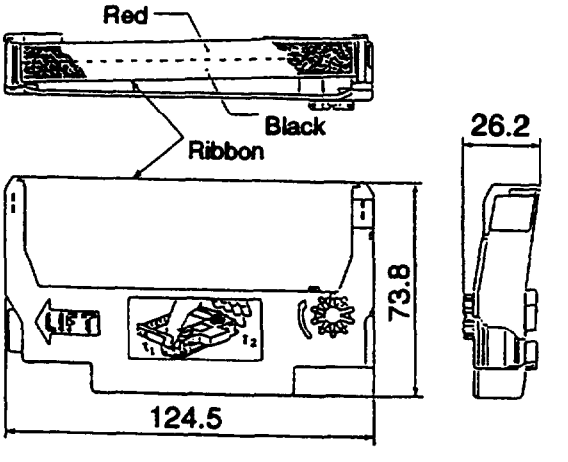



**Figure A-1. ERC-34 (B/R) Overall Dimensions**

(*) Single-color ribbons [Part No.: ERC-34(P) (purple) or ERC-34(B) (black)] are also available. In this case, the print color selection command **ERC r** command) must not be used.

[Condition]

- Character font: 7 X 9 font (with descenders)
- Printing pattern: ASCII 96-character rolling pattern continuous printing
- Temperature: 25°C

**4. Roll paper supply device**

Supply method: Roll paper shaft-support loading

Near-end detector:

- Detection method: Micro switch
- Roll paper core inside diameter: Ø 10.5 to 12.5 mm
- Near-end adjustment: Adjustable slider (Refer to 3-3 Adjusting the Paper Near-End Detector)

**5. Roll paper take-up device**

The TM-300A and TM-300PA are equipped with a take-up device. The paper is automatically taken-up by the paper feed motor.

**6. Auto-cutter**

Both the TM-300A/B and TM-300PA/PB are equipped with the auto-cutter. Full-cut/partial-cut can be executed by commands. (Refer to 6-3 Commands **ESCi, ESC m.)**

**7. Paper**

Paper feed method: Friction feed

Paper feed pitch: Default 1/6 inch

Can be set in 1/144 inch units by software command.

Paper feed speed: Approx. 4.17 IPS (25 LPS) (continuous feeding)

(IPS: Inches Per Second)
(LPS: Lines Per Second)

Paper size:

- Roll paper

Paper width: 76 mm ±0.5 mm

Maximum diameter: Ø83 mm (When 2-ply or 3-ply paper is used. When 1 -ply paper is employed, the maximum diameter shall be Ø60 mm.)

Paper core inside diameter:

Ø10.5 to 12.5 mm

- Normal paper

Paper thickness: **0.06** to 0.85 mm

Weight: **52.3** g/m$^2$to 64 g/m$^2$

(45 to 55 kg/l000 sheets/1091 X 788 mm)

- Pressure sensitive paper

Maximum. 1 original + 2 copies. Copy capability is considerably affected by the ambient temperature.

Refer to table A-2. Relationship between Ambient Temperature and Number of Copies.

Paper thickness: Total thickness shall be a 0.2 mm or less combination of 0.05 to 0.08 mm sheets. Paper thickness to be auto cut should be 0.06 mm + 0.06 mm, and the total thickness shall be a 0.12 mm or less.

**Table A-2. Relationship between Ambient Temperature and Number of Copies**

| Number of Copies | Temperature |
|---|---|
| 1 original + 1 copy | **5** to **40 ° C** |
| 1 original + 2 copies | Approx. 25°C |

## 8. Receive buffer

Either 40 bytes or approx. 1 Kbyte is selectable using DIP switch. (TM-300A/B)

Either 0 byte or approx. 1 Kbyte is selectable using DIP switch. (TM-300PA/PB)

## 9. Electrical characteristics

Opening power supply: Packaged AC adapter

One of the following 4 AC adapters is selected, depending on the local power:

**Table A-3. AC Adapter Types**

| Factory setting | Voltage | AC adapter type |
|---|---|---|
| North America | 120v | PA-6509 or PB-6509 |
| Europe (Germany) | 230 V | PA-6510 or PB-6510 |
| Europe (U.K.) | 240 V | PA-6511 or PB-6511 |
| Australia | 240 V | PA-6513 or PB-6513 |

Printer power consumption (except for drawer kick-out):

Operating: Mean 33 W

Standby: Mean 10 W (TM-300A/B)
Mean 12 W (TM-300PA/PB)

**10. EMI (using packaged AC adapter)**

FCC: Class A

VDE: Class B

**11. Safety standards (Packaged AC adapter only)**

UL/CSA

TÜV

**12. Reliability**

MCBF: Mechanical unit: 5,000,000 lines (excluding print head)

Auto-cutter mechanism: (total of full and partial cuts)

Print head life: 100 million characters
(When printing 2 dots/wire/character on average)

**13. Environmental conditions**

Temperature: Operating: 5 to 40°C
(30°C or more: Operating humidity is limited)

Storage: -10 to 50°C (excluding paper and ribbon cassette)

Humidity: Operating: 20 to 80°C (non-condensing)

Storage: 20 to 90%
(non-condensing, excluding paper and ribbon cassette)

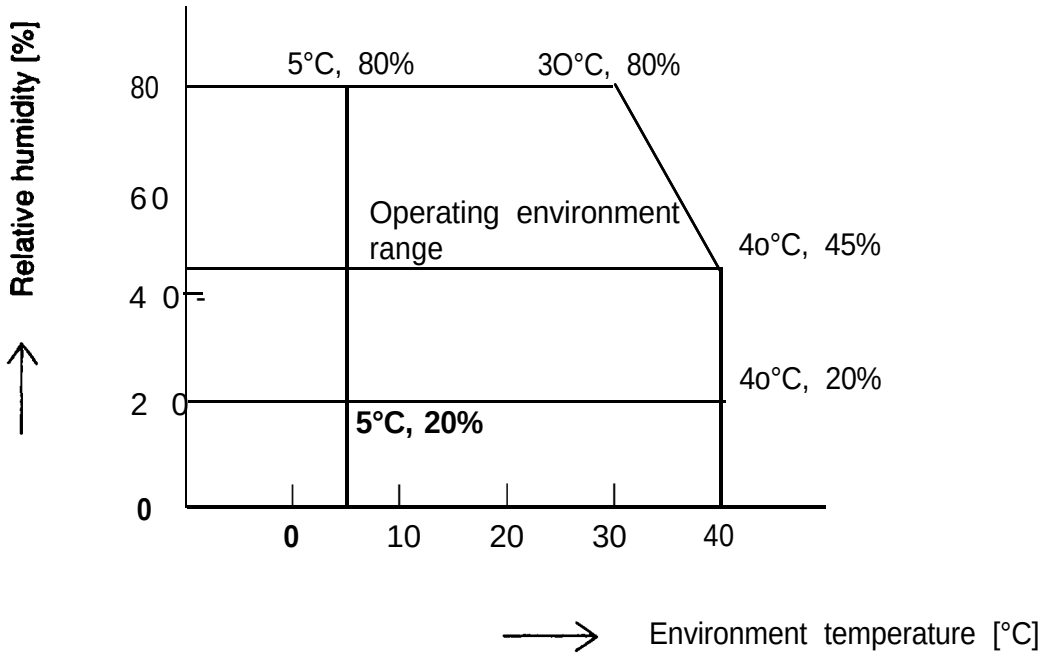



**Figure A-2. Operating Temperature and Humidity Range**

## 14. External dimensions and weight

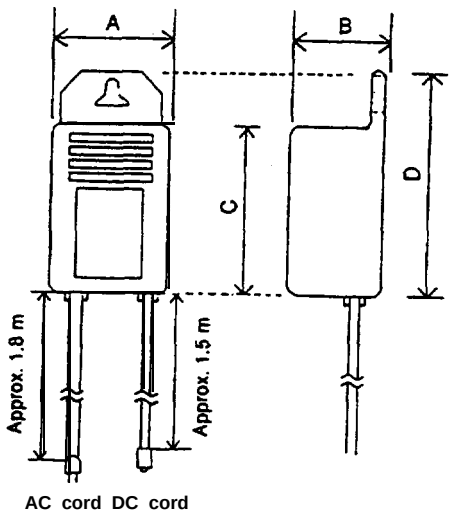
■ **Printer units**

| | | |
|---|---|---|
| TM-300A/TM-300PA: | Width: | 170 mm |
| | Depth: | 288 mm |
| | Height: | 183 mm |
| | Weight: | Approx. 2.8 kg |
| TM-300B/TM-300PB: | Width: | 170 mm |
| | Depth:, | 253 mm |
| | Height: | 148 mm |
| | Weight: | Approx. 2.6 kg |

## ■ AC adapters

1) Overall dimensions [Units: mm]

| | PA-XXXX | PB-XXXX |
|---|---|---|
| A | 75 | 80 |
| B | 61 | 68 |
| C | 110 | 125 |
| D | 135 | 146 |




2) Weight [Units: Kg]

| PA-XXXX | PB-XXXX |
|---|---|
| 1.25 | 1.35 |

NOTE: Refer to Table A-3 for AC adapter types.

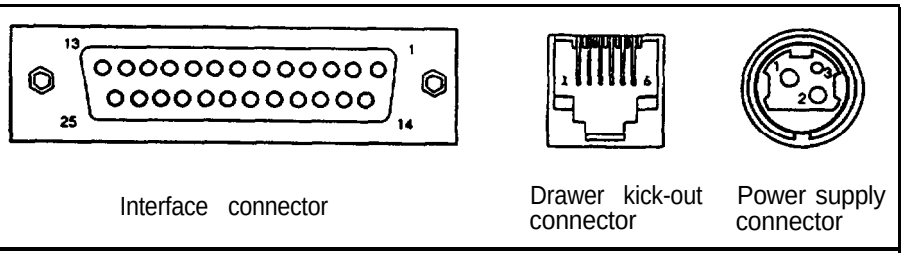
### 15. Case color

EPSON standard gray

# APPENDIX B Connectors

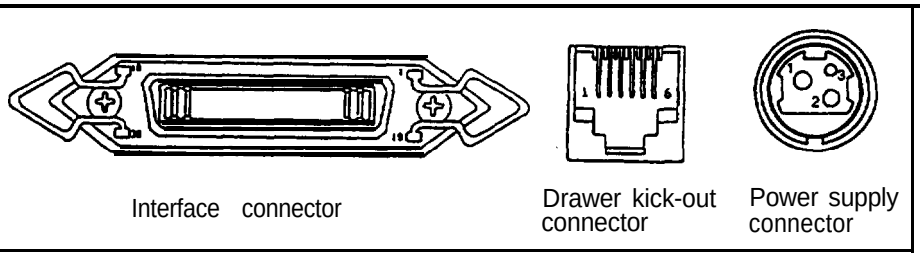
### 1. Connectors

**TM-300A/B**




Interface connector | Drawer kick-out connector | Power supply connector

**TM-300PA/PB**




Interface connector | Drawer kick-out connector | Power supply connector

## 2. Interface connectors

Refer to APPENDIX C Interfaces

## 3. Power supply connector

This connector is used to connect an external power source.

1) Pin assignment: Refer to Table B-l

2) Model: Hosiden TCS7960-53-2010

**Table B-1. Power Supply Connector Pin Assignment**

| Pin number | Function |
|---|---|
| 1 | 30 VDC (unregulated) |
| 2 | GND |
| 3 | NC |
| SHELL | F.G |

* Be sure to ground the frame ground screw on the board at the rear side of the unit.

## 4. Drawer kick-out connector (Modular connector)

The signal set by the **ESC p** command is output to this connector.
In the TM-300A/B, the host computer can confirm the input signals using **ESC u.**

In the TM-300PA/PB, the host computercan confirm the drawer open/close signal status by pin 34 of the interface connector.

1) Pin assignments

| Pin Number | Signal Name | Direction |
|---|---|---|
| 1 | Frame GND | — |
| 2 | Drawer kick-out drive signal 1 | Output |
| 3 | Drawer open/close signal | Input |
| 4 | +24 V | — |
| 5 | Drawer kick-out drive signal 2 | Output |
| 6 | Signal GND | — |

2) Drawer kick-out drive signal

output: Output voltage: Approx. 24 VDC

Output current: 1 A or less (Resistance of the drawer kick-out solenoid shall be 24 Ω or more.)

Output waveform: Outputs the waveform in Figure B-l to points A and B in Figure B-2 (n1 (ON time) and n2 (OFF time) are specified by the ESC p command.)

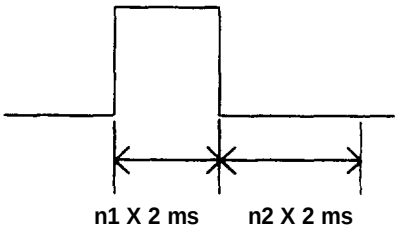



Figure **B-1. Drawer** kick-out **Drive Signal Output Waveform**

3) Drawer open/close signal

Input signal **level** (Connector pin 3): "L" = 0 to 0.8 VDC
"H"=2 to 5 VDC

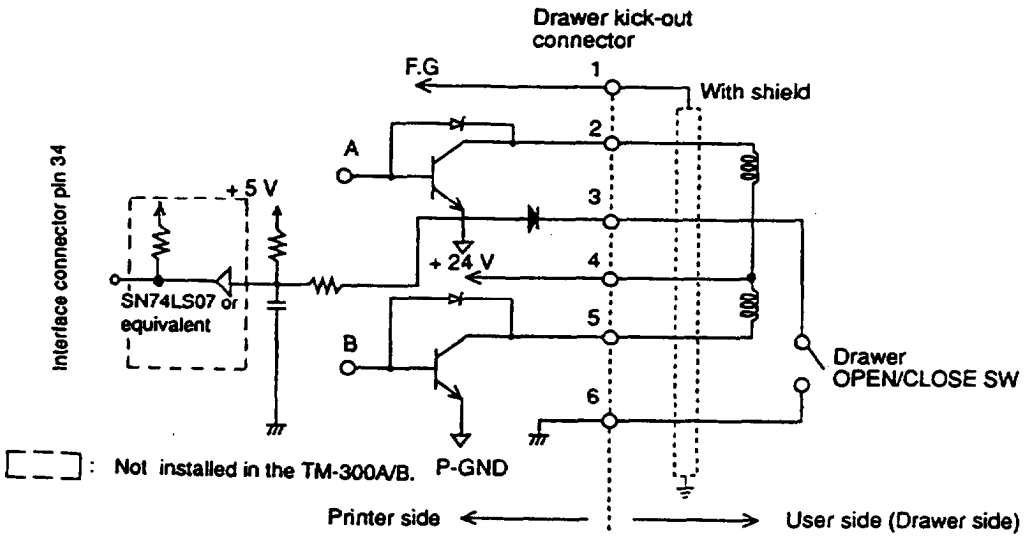



**Figure B-2. Drawer Kick-out Signal Drive Circuit**

* Use a shielded cable for the drawer connector **Cable.** Two driver transistors cannot be energized at **the** same time.
* The circuit on the user side should be designed so that the drawer drive duty will be as shown below.

$$\frac{\text{ON time}}{(\text{ON time} + \text{OFF time})} \leq 0.2$$

* Be sure to use the printer power supply (pin 4) for **the** drawer power source.
* The drawer drive solenoid whose resistance is less than the specified must not be used. Otherwise, the overcurrent could damage the solenoid.

# APPENDIX C Interfaces

## TM-300A/B

### 1. Specifications (RS-232C compatible)

Data transmission: Serial
Synchronization: Asynchronous
Handshaking: DTR/DSR or XON/XOFF control
Signal level: MARK = -3 to -15 V: Logic "1"
SPACE = +3 to + 15 V: Logic "0"
Baud rates: 1200, 2400, 4800, 9600 bps
Bit length: 7 or 8 bits
Parity: None, even, odd
Stop bits: 1 or more (data transmitted from the printer has 1 stop bit.)
Connector: D-SUB 25 (female) or equivalent

### 2. Interface connector terminal assignments and signal functions

| Pin Number | Signal Name | Signal Direction | Function |
|---|---|---|---|
| 1 | FG (GND) | - | Frame ground |
| 2 | SD (TXD) | output | Transmit data |
| 3 | RD (RXD) | Input | Receive data |
| 4 | RS (RTS) | output | The same signal as DTR |
| 5 | DR (DSR) | Input | This signal indicates whether the host computer can or cannot receive data. "SPACE" indicates that the host computer can receive data and MARK indicates that the host computer cannot receive data.<br>When DTF/DSR control is selected, the printer transmits data after checking this signal.<br>When XON/XOFF control is selected, the printer does not check this signal. |
| 7 | SG (GND) | - | Signal ground |

| Pin Number | Signal Name | Signal Direction | Function |
|---|---|---|---|
| 20 | ER (DTR) | output | This signal indicates whether the printer can or cannot receive data. When DTR/DSR control is selected, "SPACE" indicates that the printer can receive data and "MARK" indicates that the printer cannot receive data.<br>The signal turns to "MARK" in the following cases:<br>. When the receive buffer becomes full.<br>. When the printer is OFF -LINE.<br>When XON/XOFF control is selected, the signal is always "SPACE" except in the following cases:<br>. During the period from when the power is turned on to when data reception becomes possible after the printer initialization is completed.<br>. When an error has occurred.<br>. During and after the self-test printing. |

* When the remaining space in the receive buffer drops to 10 bytes the printer statusbecomes "buffer full' and this status continuous until the space in the receive buffer increases to 20 bytes.

* The TM-300A/B do not have ON-LINE/OFF/LINE switches.

The printer goes OFF-LINE in the following cases:

① During and after self-test printing.

② When the printer cover is open.

③ When the paper is fed using the paper feed switch.

④ When printing stops because of paper-out.
(The paper-out selected by ESC c 4)

⑤ During the period from when the power is turned on to when data reception becomes possible after printer initialization is completed.

⑥ When an error has occurred.

⑦ When printing is stopped due to exceeding the allowable print duty cycle.

### 3. XON/XOFF transmit timing

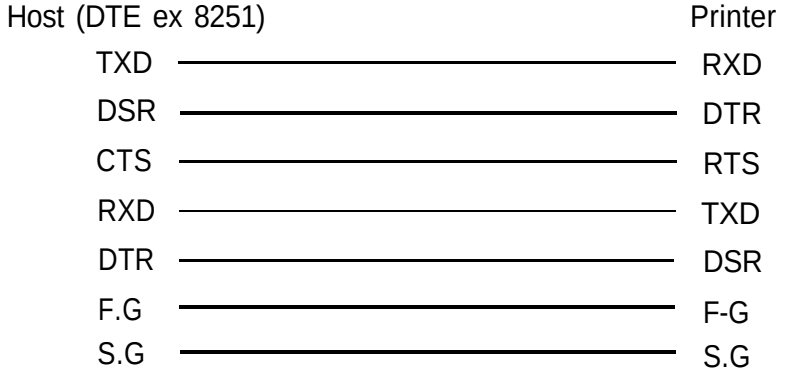
When XON/XOFF control is selected., the printer transmits XON and XOFF as follows:

[XON Transmission] ① When the receive buffer is released from the buffer-full state.
② When the printer switches from OFF-LINE to ON-LINE.

[XOFF Transmission] ③ When the receive buffer becomes full.
④ When the printer switches from ON-LINE to OFF-LINE.

NOTES: . The XON code is <11>H, XOFF code is <13>H.
. In case ②, XON is not transmitted when the receive buffer is full.
. In case ④, XOFF is not transmitted when the receive buffer is full.

### 4. Serial interface connection example




* When the side to connected is DCE, set the host so that data shall not be left unreceived.
(DTE: Data Terminal Equipment) (DCE: Data Communication Equipment)

■ TM-300PA/PB

### 1. Specifications (based on Centronics)

Data transmission: 8-bit parallel
Synchronization: $\overline{\text{STROBE}}$ pulse supplied by host computer.
Handshaking: $\overline{\text{ACKNLG}}$ and BUSY
Logic level: All of the interface control signals are TTL compatible
Connector: AMP 36P (female) connector or equivalent

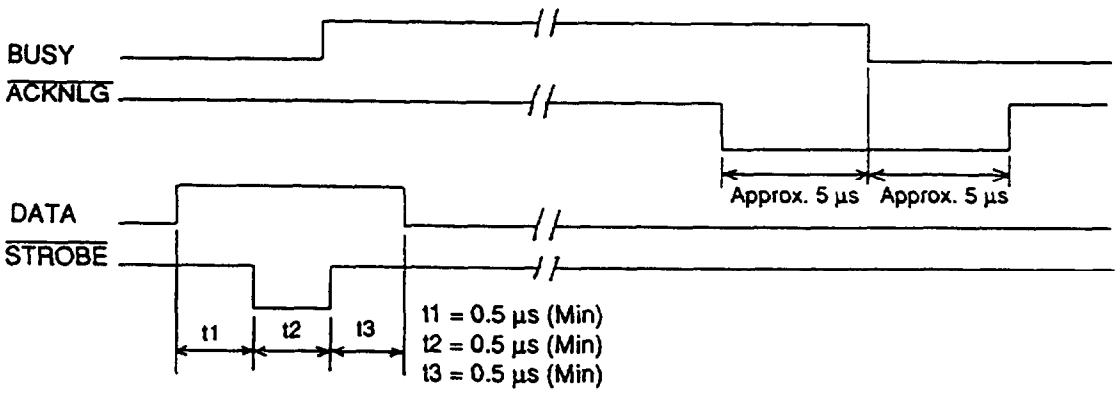
2. Interface connector terminal assignments and signal functions

| Pin Number | Signal Name | Signal Direction | Function |
|---|---|---|---|
| 1 | $\overline{\text{STROBE}}$ | Input | $\overline{\text{STROBE}}$ pulse for reading data. Normally, this signal is "HIGH", just after it goes "LOW", the printer reads the data. Pulse width must be 0.5 µs or more at the receive terminal. |
| 2 | DATA1 | Input | These signals are the eight parallel data bits. "HIGH" indicates that the bit is '1" and "LOW" indicates that it is "0". |
| 3 | DATA 2 | Input | |
| 4 | DATA 3 | Input | |
| 5 | DATA 4 | Input | |
| 6 | DATA 5 | Input | |
| 7 | DATA 6 | Input | |
| 8 | DATA 7 | Input | |
| 9 | DATA 8 | Input | |
| 10 | $\overline{\text{ACKNLG}}$ | Output | This signal indicates that the printer is ready to receive data. Under normal conditions, it is "HIGH" and goes "LOW" for approx 10 µs. |
| 11 | BUSY | Output | This signal indicates whether the printer can or cannot receive data. When this signal is "HIGH", it indicates that the printer cannot receive data. When it is "LOW", it is indicates that the printer is ready to receive data. |
| 12 | PE | Output | This indicates whether paper is present or not. 'HIGH" indicates that the paper has run out if paper end detection is enabled by the control command. "LOW" indicates that paper is present. |
| 13 | SLCT | Output | This signal is pulled up to +5 V through 3.3KΩ resistor. |
| 14 | $\overline{\text{AUTO FEED XT}}$ | Input | If this signal is "LOW", when executing the CR command, the printer executes 1 line feed automatically after printing. |
| 15 | NC | — | |
| 16 | GND | — | LogicGND level |
| 17 | CHASSIS GND | — | Chassis GND level |
| 18 | NC | — | Not used |
| 19 to 30 | GND | — | GND level signal for twisted pair return. |
| 31 | $\overline{\text{INIT}}$ | Input | Printer hardware reset signal. Normally, this signal is "HIGH". The printer is reinitialized, just as when power is turned on, by receiving a "LOW" pulse of 50 µs or more. |

| Pin Number | Signal Name | Signal Direction | Function |
|---|---|---|---|
| 32 | $\overline{\text{ERROR}}$ | Output | This signal indicates whether the printer is in an error state or not. This signal goes "LOW" in the following cases.<br>• If the OFF-LINE state. |
| 33 | GND | — | Signal ground |
| 34 | DRAWER KICK-OUT STATUS | Output | Pulled to +5V through a 3.3 KΩ resistor, and the status signal of the drawer kick-out connector is directly output. |
| 35 | + 5V | Output | This signal is pulled up to + + 5V through a 3.3K Ω resistor. |
| 36 | N C | — | |

NOTES:
- For interface wiring, be sure to use a twisted-pair cable for each signal and connect the return side to the signal GND level. To prevent noise, these cables should be shielded and connected to the chassis of the host computer.
- All of the interface conditions are based on TTL levels. The rising time and falling time of any signal should be 0.2 µs or less.
- Never transmit data without checking $\overline{\text{ACKNLG}}$ and BUSY. (Data should only be transmitted to this printer after confirming that $\overline{\text{ACKNLG}}$ is active, or when BUSY is "LOW".)
- The interface is cable should be as short as possible.

**3. Parallel interface timing chart**




Receipt of data is controlled by the $\overline{\text{ACKNLG}}$ or BUSY signal. The BUSY signal, goes "HIGH" depending on the receive buffer capacity as follows:

a) When the receive buffer capacity is **0**
- During data entry
- In the OFF-LINE state

b) When the receive buffer capacity is 1 Kbyte

- During data entry
- In the OFF-LINE state
- When the receive buffer is in the buffer-full state

NOTES:
- The state when the remaining space in the receive buffer is 0 byte is called the buffer-full state.
- If the BUSY signal is sent when the printer is HIGH, the data is ignored.
- The TM-300PA/PB do not have ON-LINE/OFF-LINE switch. The printer goes OFF-LINE in the following cases:
  ① During and after self-test printing.
  ② When the printer cover is open.
  ③ When paper is fed using the paper feed switch.
  ④ When printing stops because of paper end (paper-end status selected by ESC c 4.)
  ⑤ During the period from when the power is turned on to when data reception becomes possible after the printer initialization completes.
  ⑥ When an error has occurred.
  ⑦ When printing is stopped due to exceeding the allowable print duty cycle.

# APPENDIX D Miscellaneous Notes

## Print duty

- When printing exceeds the allowable print duty cycle, the TM-300A/B and the TM-300PA/PB automatically detect that the print head temperature is too high, stops logic-seeking, and starts full-column head movement operation. These operations restrain the head temperature rise by lowering the print duty per time unit. If the print head temperature continues rising due to excessive print duty, the printer stops printing, In this case, the user should be aware that the printing speed may slow down greatly.
- Avoid printings that continuously use the same printhead pin. (Especially, printing speed slows down greatly when pin 9 is continuously used because it is used to detect the print head temperature.)
- When printing stops due to a rise in the head temperature, the PAPER LED Minks according to the blinking pattern in Figure 5-1., and the printer goes OFF-LINE.

Notes on setting head energizing time:

The TM-300A/B and TM-300PA/PB have a command which sets the head energizing time and the normal mode is set to the default value. When using two or more roll paper sheets, the copy mode (head energizing time is longer) shall be selected. (Refer to 6-3 Commands GS E n.)

# APPENDIX E Notes on Character Printing

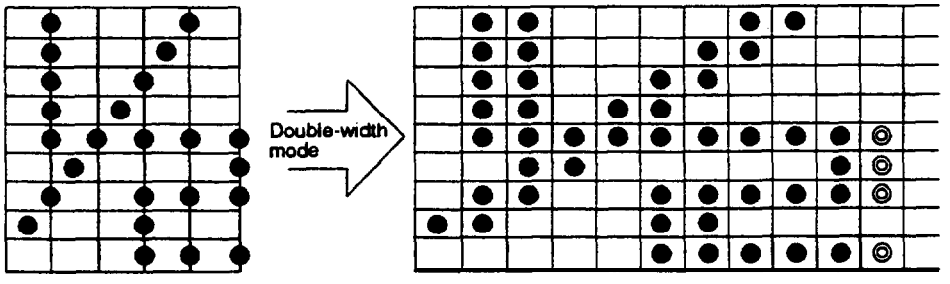
These notes apply to the user-defined characters and the following characters:

| Font | Page | Characte code |
|---|---|---|
| 7 x 9 | 0 | <B0>H, <B2>H |
| 9 x 9 | 1 | <E5>H, <E7>H |
| 9 x 9 | 0 | <B2>H |

1) The printer deletes the right-most dots of a character in double-width mode, if another character follows.

If the characters shown above are double-width enlarged (dots exists in the right-most position), the right-most dots of the enlarged character are not printed as shown in the figure below, if another character follows.

Example: 7 x 9 font is selected




◎ dots are not printed when another character follows.

◎ dots are printed when no character follows. (except ◎ dots on 401st dot position)

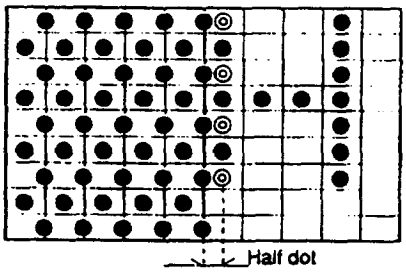
2) The TM300A/B and TM-300PA/PB cannot print horizontally adjacent half dots. A special procedure that avoids horizontally adjacent half dots is used when print data is buffered in the print buffer. Therefore, some dots of the character that follows the characters prescribed above are not printed due to the affect of the previous dots. Also, when the double-height mode is selected, the dots that are affected by the previous dots are not printed as shown in the following figure, because double-height processing is carried out during printing after the print pattern is buffered in the print buffer.

To avoid this, write software so that half-dots are not adjointed horizontally. For example, set the right side spacing of character to 1 or more (ESC SP). In this case the user should note that the total number of dots in the horizontal direction is 400.

Example: If the following codes are transmitted, some dots are not printed. (Graphic character <B2>H + "H" double-height enlarged)

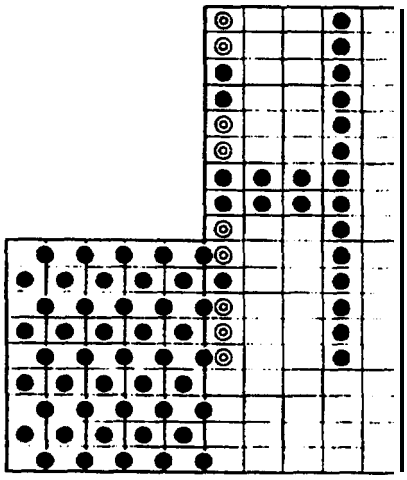
```
PRINT #1, CHR $ (&HB2)
PRINT #1, CHR $ (&H1B) ; "!" ; CHR $ (&H11);
PRINT #1, "H" ; CHR $ (&HA) ;
```

When the data is buffered in the print buffer.




◎ dots are deleted by the previous character and not printed in the print buffer.

Printed result (When uni-directional printing).



◎ dots are not printed.

**To** avoid this, write the software as follows.
(Set the right-side spacing of graphic character <B2>H to 1.)

```
PRINT #1 , CHR $ (&H1B) ; " " ; CHR $ (1); CHR $ (&HB2)
PRINT #1, CHR $ (&H1B) ; "!" ; CHR $ (&H11);
PRINT #1, "H" ; CHR $ (&HA) ;
```

# APPENDIX F Notes on Using the Drawer kick-out Connector

1) Usage conditions of drawer kick-out connector (Refer to APPENDIX B).

Because drawer specifications differ greatly depending on the manufacture and the part No., make sure that the specifications of the drawer to be used meet the following conditions before connecting it to the drawer kick-out connector of this printer. These conditions also apply to any devices that use the drawer kick-out connector.

Any devices that do not satisfy all the following conditions must not be used.

[Conditions]

- A load must be provided between the drawer kick-out connector pins 4 and 2 or between 4 and 5. (* 1)
- When the drawer open/close signal is used, the drawer open/close switch must be provided between the drawer kick-out connector pins 3 and 6. (* 2)
- The resistance of the drawer open/close solenoid load shall be 24 Ω or more, or the output current shall be 1 A or less. (* 3)
- Be sure to use the drawer kick-out connector pin 4 (24 V power output) to drive the device. Never connect any other power supply to the drawer kick-out connector. (* 4)

  In this case the peak current is 1 A, and the energizing conditions described in 2) must be followed.

NOTES:
* 1 . Operation of this printer with incorrectly installed devices voids the warranty.
*2. Connecting devices other than the switch voids this printer's warranty.
* 3 . If a device with the resistance of less than 24 Ω or the input current of over 1 A is used, the resulting overcurrent could damage the device.
*4. Operation of this printer with devices other than those specified voids the warranty.

2) Notes on using the specified pulse generation command (ESC p)

When the drawer is connected to the drawer kick-out connector and driven using the specified pulse generation command (ESC p), specify the parameters *n1* and *n2* in this command so that they will meet the following conditions.

**ESC p *m n1 n2***

OFF time

ON time

$$\frac{\text{ON time}}{\text{ON time + OFF time}} \leq 0.2 \qquad \text{(Formula F-1)}$$

$$\text{or OFF time} \geq \text{ON time X 4} \qquad \text{(Formula F-2)}$$

When the drawer is driven in accordance with the conditions above, the signal waveform of the drive signal is as shown in Figure F-1.

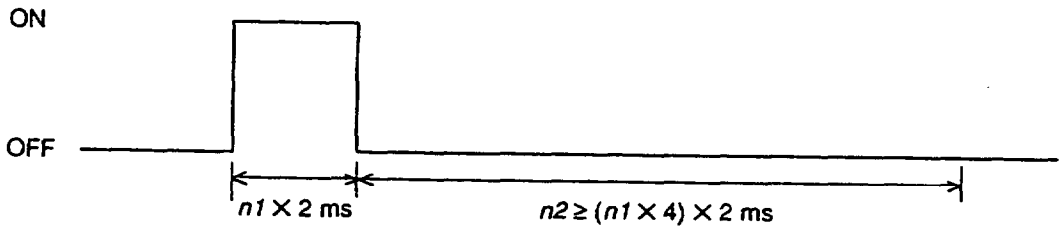



**Figure F-1. Drawer Drive Signal Waveform**

Because ON time differs depending on the drawer used, set the ON time according to the drawer specifications. However, drawers which do not meet formulas F-1 and F-2 cannot be used.

3) Notes on using the drawers that do not satisfy the conditions described in 2)

When the values of *n1* and *n2* are determined according to the conditions described in 2), the setting value range of *n1* is 0 to 255 and the *n1* value range inevitably becomes $0 \leq n1 \leq 63$, and the maximum ON time is 126 ms.

If the drawer needs more than 126 ms ON time, set the ON time and OFF time so that they can satisfy Formula C-3.

$$\frac{\text{ON time}}{\text{ON time + (OFF time + a)}} \leq 0.2 \qquad \text{(Formula F-3)}$$

α: other sequence processing time

NOTE: α means the drawer driving prohibited period from the end of OFF time to the start of ON.

The following shows an example program used when the drawer connected to the drawer drive signal 1 is driven using an ON time of 200 ms.

```
PRINT #1, CHR$ (&H1B); "P"; CHR$ (0); CHR$ (100);    CHR$ (250);
GOSUB * WAIT300MS
                                      ON time 200 ms  OFF time 500 ms
*WAIT300MS
  300 [ms] wait routine      (* NOTE)
RETURN
```

NOTE: * This part is indicated in Formula F-3. Set this value so that it can satisfy Formula F-3 (or provides an internal processing time at least as long as the wait routine time.)

When the drawer is driven according to the conditions above, the drive waveform is as shown in Figure F-2.

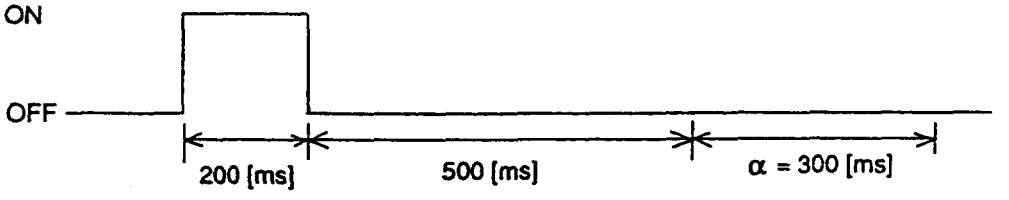
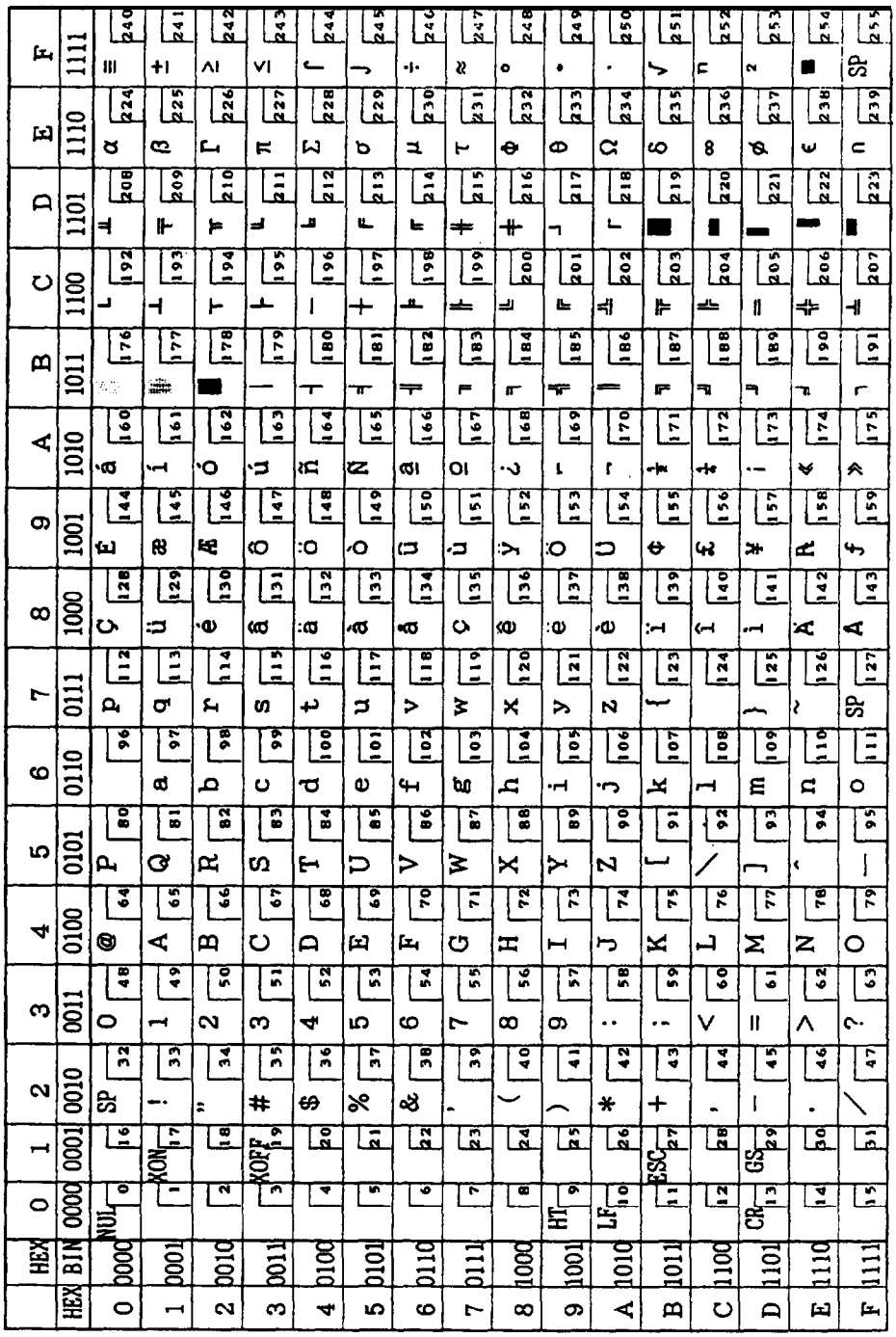



**Figure F-2. Example Drawer Drive. Signal Waveform**

# APPENDIX G Character Code Tables

■ **Page 0 (International character set: U.S.A.)**



## ■ Page 1 (International character set: U.S.A.)

| | HEX | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEX | BIN | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |
| 0 | 0000 | NUL 0 | 16 | SP 32 | 0 48 | @ 64 | P 80 | ` 96 | p 112 | ― 128 | 144 | SP 160 | ー 176 | タ 192 | ミ 208 | 三 224 | × 240 |
| 1 | 0001 | 1 | XON 17 | ! 33 | 1 49 | A 65 | Q 81 | a 97 | q 113 | ― 129 | 145 | 。 161 | ア 177 | チ 193 | ム 209 | ト 225 | 円 241 |
| 2 | 0010 | 2 | 18 | " 34 | 2 50 | B 66 | R 82 | b 98 | r 114 | ▬ 130 | 146 | 「 162 | イ 178 | ツ 194 | メ 210 | キ 226 | 年 242 |
| 3 | 0011 | 3 | XOFF 19 | # 35 | 3 51 | C 67 | S 83 | c 99 | s 115 | ▬ 131 | 147 | 」 163 | ウ 179 | テ 195 | モ 211 | ヨ 227 | 月 243 |
| 4 | 0100 | 4 | 20 | $ 36 | 4 52 | D 68 | T 84 | d 100 | t 116 | ▬ 132 | 148 | 、 164 | エ 180 | ト 196 | ヤ 212 | ◢ 228 | 日 244 |
| 5 | 0101 | 5 | 21 | % 37 | 5 53 | E 69 | U 85 | e 101 | u 117 | ▬ 133 | 149 | ・ 165 | オ 181 | ナ 197 | ユ 213 | ◣ 229 | 時 245 |
| 6 | 0110 | 6 | 22 | & 38 | 6 54 | F 70 | V 86 | f 102 | v 118 | ▬ 134 | 150 | ヲ 166 | カ 182 | ニ 198 | ヨ 214 | ◥ 230 | 分 246 |
| 7 | 0111 | 7 | 23 | ' 39 | 7 55 | G 71 | W 87 | g 103 | w 119 | ▬ 135 | 151 | ァ 167 | キ 183 | ヌ 199 | ラ 215 | ◤ 231 | 秒 247 |
| 8 | 1000 | 8 | 24 | ( 40 | 8 56 | H 72 | X 88 | h 104 | x 120 | ▌ 136 | 「 152 | ィ 168 | ク 184 | ネ 200 | リ 216 | ♠ 232 | 〒 248 |
| 9 | 1001 | HT 9 | 25 | ) 41 | 9 57 | I 73 | Y 89 | i 105 | y 121 | ▌ 137 | 」 153 | ゥ 169 | ケ 185 | ノ 201 | ル 217 | ♥ 233 | 市 249 |
| A | 1010 | LF 10 | 26 | * 42 | : 58 | J 74 | Z 90 | j 106 | z 122 | ▌ 138 | 「 154 | ェ 170 | コ 186 | ハ 202 | レ 218 | ♦ 234 | 区 250 |
| B | 1011 | 11 | ESC 27 | + 43 | ; 59 | K 75 | [ 91 | k 107 | { 123 | ▌ 139 | 」 155 | ォ 171 | サ 187 | ヒ 203 | ロ 219 | ♣ 235 | 町 251 |
| C | 1100 | 12 | 28 | , 44 | < 60 | L 76 | ＼ 92 | l 108 | 124 | ▌ 140 | 「 156 | ャ 172 | シ 188 | フ 204 | ワ 220 | ● 236 | 村 252 |
| D | 1101 | CR 13 | GS 29 | − 45 | = 61 | M 77 | ] 93 | m 109 | } 125 | ▌ 141 | ヽ 157 | ュ 173 | ス 189 | ヘ 205 | ン 221 | ○ 237 | 人 253 |
| E | 1110 | 14 | 30 | . 46 | > 62 | N 78 | ^ 94 | n 110 | ~ 126 | ▌ 142 | 」 158 | ョ 174 | セ 190 | ホ 206 | ゛ 222 | ／ 238 | ■ 254 |
| F | 1111 | 15 | 31 | ／ 47 | ? 63 | O 79 | ― 95 | o 111 | SP 127 | + 143 | ノ 159 | ッ 175 | ソ 191 | マ 207 | ° 223 | ＼ 239 | SP 255 |

■ International character set

| | Country | ASCII Code hex / dec | 23 35 | 24 36 | 40 64 | 5B 91 | 5C 92 | 5D 93 | 5E 94 | 60 96 | 7B 123 | 7C 124 | 7D 125 | 7E 126 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | U.S.A | | # | $ | @ | [ | \ | ] | ^ | ` | { | \| | } | ~ |
| 1 | France | | # | $ | à | ° | ç | § | ^ | ` | é | ù | è | ¨ |
| 2 | Germany | | # | $ | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | ß |
| 3 | U.K. | | £ | $ | @ | [ | \ | ] | ^ | ` | { | \| | } | ~ |
| 4 | Denmark I | | # | $ | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | ~ |
| 5 | Sweden | | # | ¤ | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| 6 | Italy | | # | $ | @ | ° | \ | é | ^ | ù | à | ò | è | ì |
| 7 | Spain | | ₧ | $ | @ | ¡ | Ñ | ¿ | ^ | ` | ¨ | ñ | } | ~ |
| 8 | Japan | | # | $ | @ | [ | ¥ | ] | ^ | ` | { | \| | } | ~ |
| 9 | Norway | | # | ¤ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |
| 10 | Denmark II | | # | $ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |