DOT MATRIX PRINTER

SP200F SERIES

USERS MANUAL
MODE D'EMPLOI
BEDIENUNGSANLEITUNG
MANUALE DI ISTRUZIONI

Federal Communications Commission
Radio Frequency Interference
Statement

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 compliance with the Federal Noise Interference Standard, this equipment requires a shielded cable.

This statement will be applied only for the printers marketed in U.S.A.

Statement of
The Canadian Department of Communications
Radio Interference Regulations

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

The above statement applies only to printers marketed in Canada.

CE
Manufacturer's Declaration of Conformity

EC Council Directive 89/336/EEC of 3 May 1989

This product, has been designed and manufactured in accordance with the International Standards EN 50081-1/01.92 and EN 50082-1/01.92, following the provisions of the Electro Magnetic Compatibility Directive of the European Communities as of May 1989.

EC Council Directive 73/23/EEC and 93/68/EEC of 22 July 1993

This product, has been designed and manufactured in accordance with the International Standards EN 60950, following the provisions of the Low Voltage Directive of the European Communities as of July 1993.

The above statement applies only to printers marketed in EU.

Trademark acknowledgments

SP200F Series: Star Micronics Co. Ltd.

VeriFone: VeriFone, Inc.

ESC/POS: Seiko Epson Corporation

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- The above notwithstanding, STAR can assume no responsibility for any errors in this manual.

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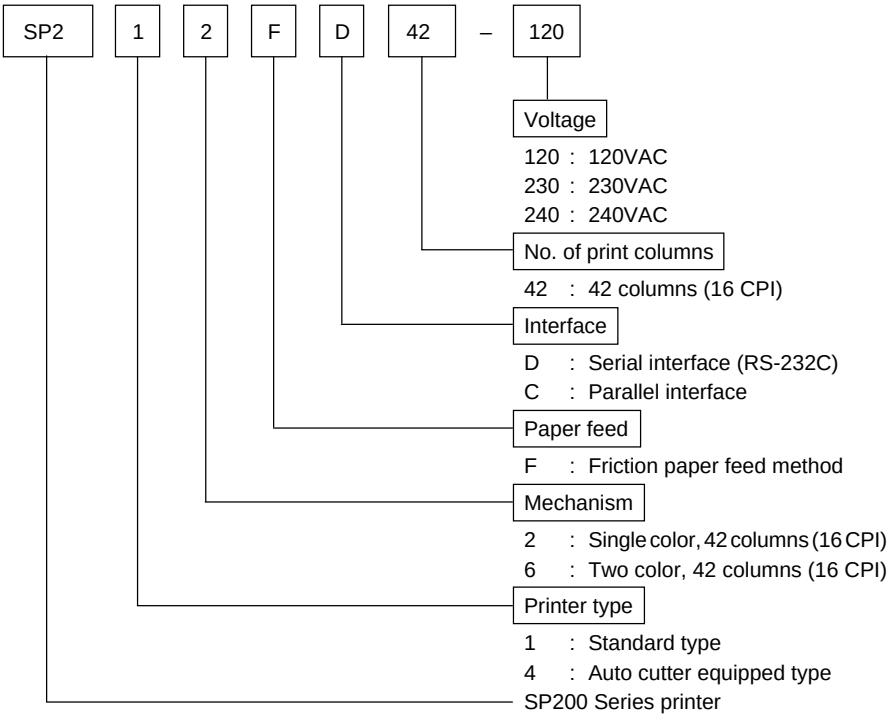
1. Outline

ENGLISH

The SP200 Series Serial Impact Dot Matrix Printer is designed for use with electronic instruments such as POS, banking equipment, computer peripheral equipment, etc.

The major features of the SP200 Series are as follows:

1. Bi-directional printing at approx. 2.5 lines/sec.
2. Serial interface or Parallel interface.
3. The data buffer allows the unit to receive print data even during printing.
4. Peripheral unit drive circuit enables control of external devices such as cash drawers.

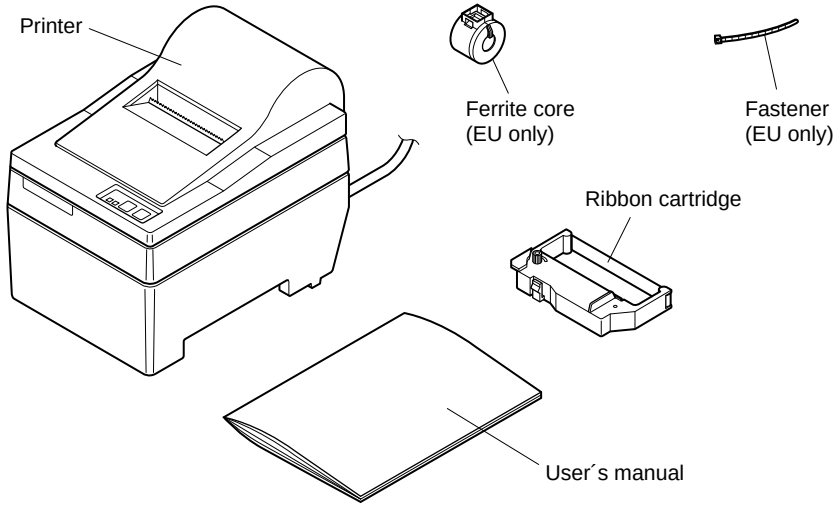


2. Unpacking and Installation

2-1. Unpacking

After unpacking the unit, check that all the necessary accessories are included in the package.

SP210 type



SP240 type

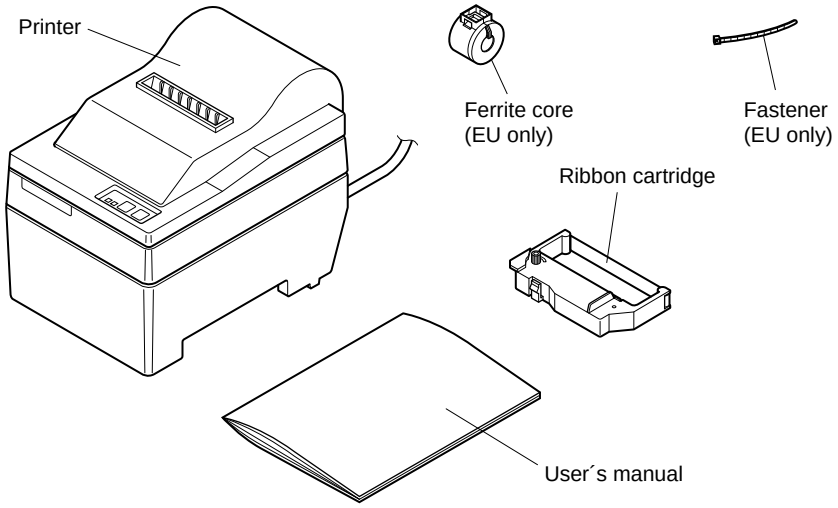


Fig. 2-1 Unpacking

2-2. Locating the printer

When you locate your printer, keep the following tips in mind:

1. Protect your printer from excessive heat such as direct sunlight or heaters, and keep it away from moisture and dust.
2. Place the printer on a firm, level surface which is fairly vibration-free.
3. A steady power supply that is not subject to power surges should be connected to the printer.
   For example, do not connect it to the same circuit as a large, noise-producing appliance such as a refrigerator or an air conditioner.
4. Make sure the line voltage is the voltage specified on the printer's identification plate.
5. To disconnect the printer, the plug has to be disconnected from the wall socket, which has to be located close to the printer, and easy to access.

2-3. Handling Care

1. Be careful not to drop paper clips, pins or other foreign matter into the unit as these cause the printer to malfunction.
2. Do not attempt to print when either paper or ribbon cartridge is not located in the printer, otherwise the print head can be damaged.
3. Do not open the cover while printing.
4. Do not touch the print head immediately after printing as it gets very hot.
5. Use only roll paper that is not glued to the core.
6. When the paper end mark appears on the paper, replace the roll paper before it runs out.

2-4. Maintenance

Essentially, your printer is a robust piece of equipment, but should be treated with a modicum of care in order to avoid malfunctions. For example:

1. Keep your printer in a "comfortable" environment. Roughly speaking, if you feel comfortable, then the environment is suitable for your printer.
2. Do not subject the printer to physical shocks or excessive vibration.
3. Avoid over-dusty environments. Dust is the enemy of all precision mechanical devices.
4. To clean the exterior of the printer, use a cloth barely dampened with either water with a little detergent or a little alcohol, but do not allow any liquid to fall inside the printer.
5. The interior of the printer may be cleaned with a small cleaner or a compressed-air aerosol (sold for this purpose). When performing this operation, be sure not to bend or damage any cable connections or electronic components.

3. Parts Identification and Nomenclature

SP210 type

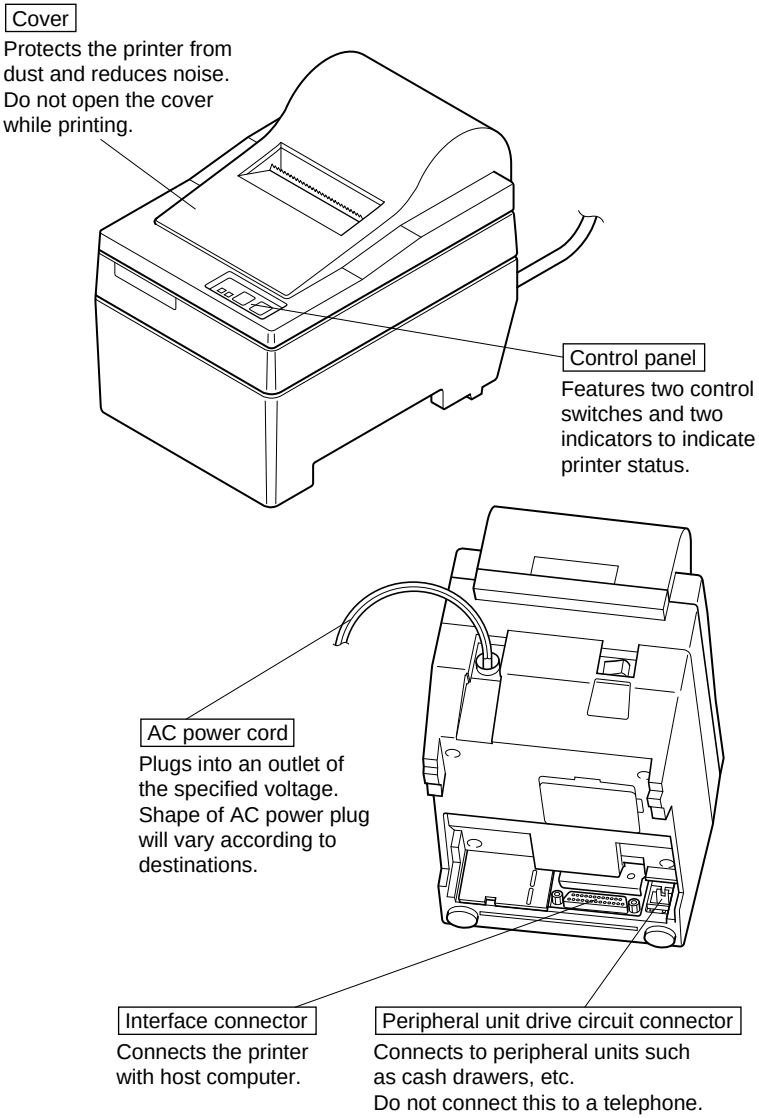


Fig. 3-1 External view of the printer (SP210 type)

SP240 type

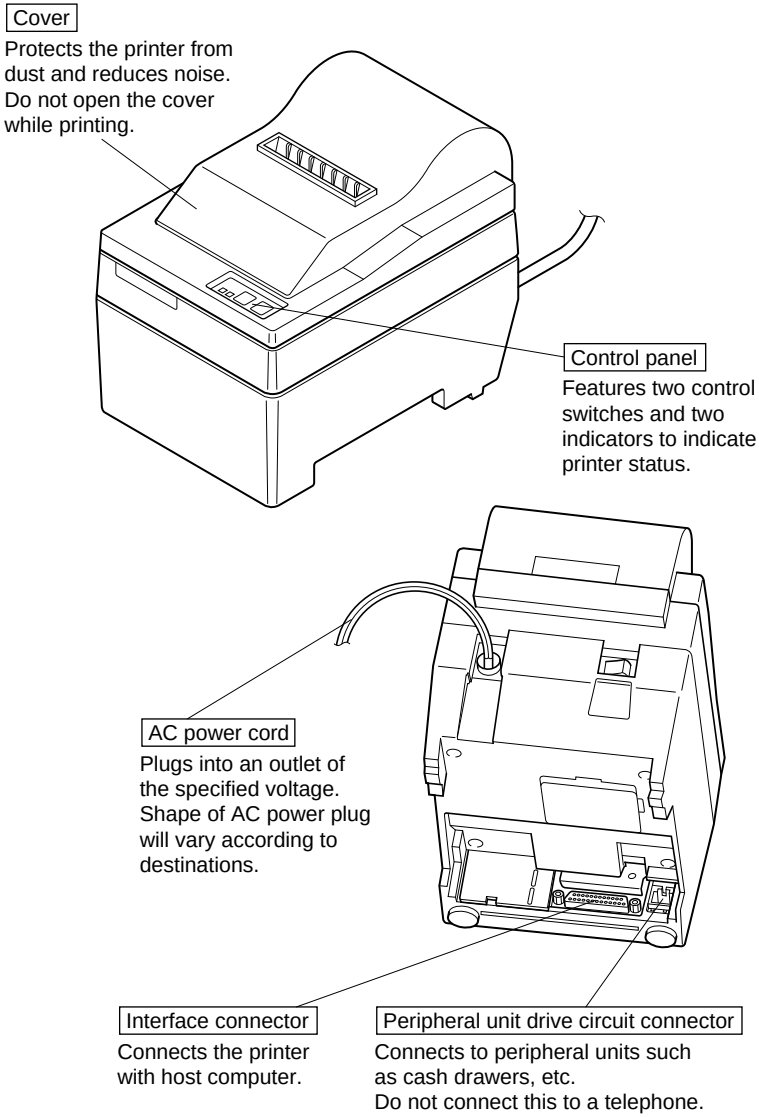


Fig. 3-2 External view of the printer (SP240 type)

4. Loading the Ribbon Cartridge and Paper

4-1. SP210 type

4-1-1. Loading the Ribbon Cartridge

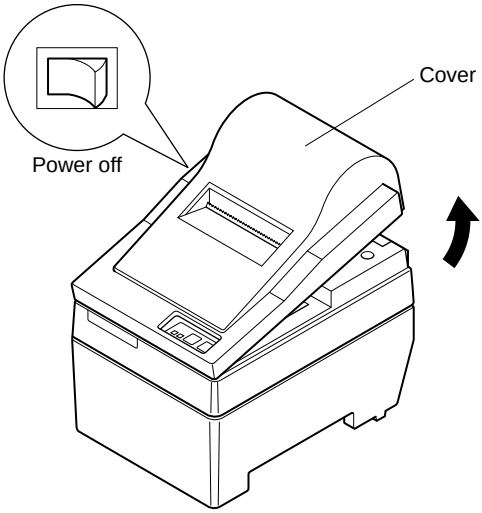


Fig. 4-1 Removing the cover

1 Turn off power to the printer.

2 Lift the cover up approx. 3 cm. Hold the cover tilted at this angle, then pull it toward you to remove it.

3 Place the ribbon cartridge in the direction shown in Fig. 4-2 and press it down to load it. If loading of the ribbon cartridge is not satisfactory, press down the cartridge while rotating the ribbon feed knob in the direction of the arrow.

4 Turn the ribbon feed knob of the ribbon cartridge in the direction of the arrow to remove slack in the ribbon.

5 Mount the cover by reversing the procedure outlined in step 2 above.

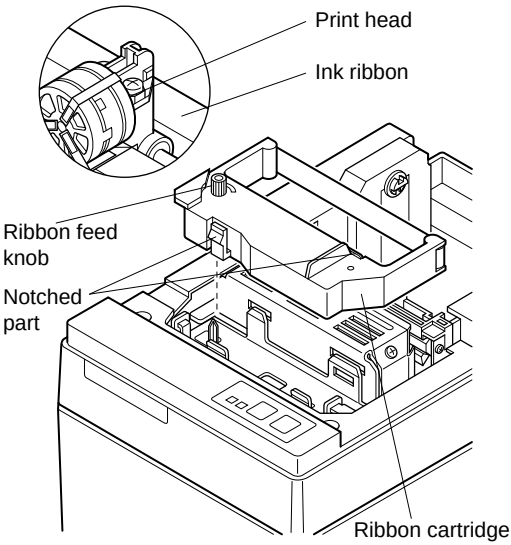


Fig. 4-2 Loading the ribbon cartridge

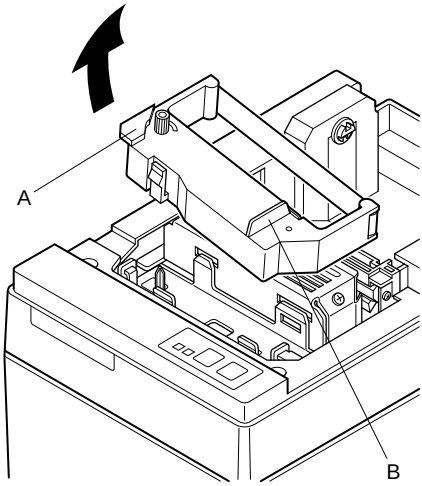


Fig. 4-3

Note: When removing the ribbon cartridge, raise the A section and then remove it by holding the B section as shown in Fig. 4-3.

4-1-2. Loading the Paper

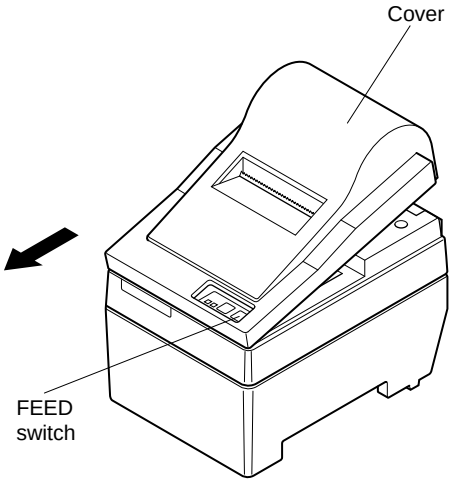


Fig. 4-4 Removing the cover

1 Lift the cover up approx. 3cm. Hold the cover tilted at this angle, then pull it toward you to remove it.

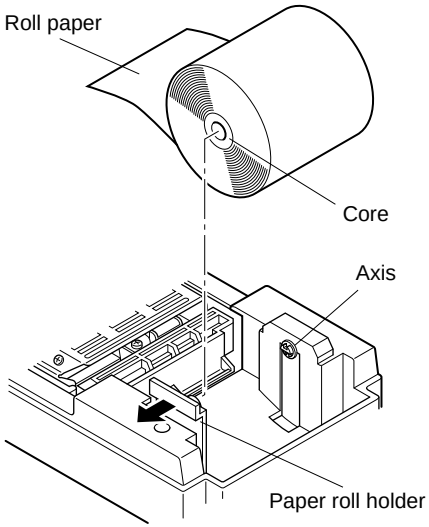


Fig. 4-5 Loading the paper

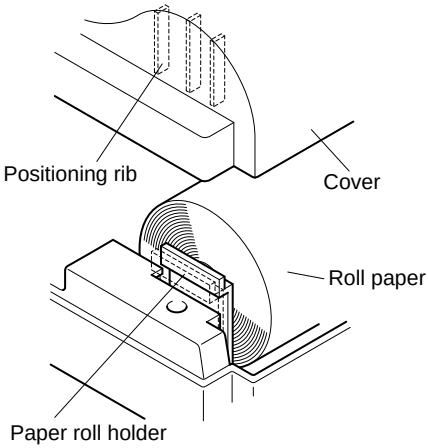


Fig. 4-6

2 Cut off the front edge of the roll paper perpendicularly.

3 Confirm that the power of the printer is turned on.

4 While observing the direction of the roll paper, insert the top end of the paper beneath the paper guide as far as it will go. If the roll paper is installed, the top end of the paper automatically comes out from the paper exit.

5 Move the paper roll holder in the direction of the arrow, and insert the roll so that the holes in the core align with the axes of the paper roll holder. Release the paper roll holder to secure the paper.

6 If the paper roll core has not been properly aligned with the paper roll holder, the cover cannot to properly seated until the paper position is corrected.

7 Press the FEED (paper feed) switch to feed the paper approximately 10cm.

8 Insert the top edge of the paper into the tear bar slot, then mount the cover by reversing the procedure for removing the cover in step 1 above.

Note: When the paper end mark appears on the paper, replace the roll paper before it runs out.

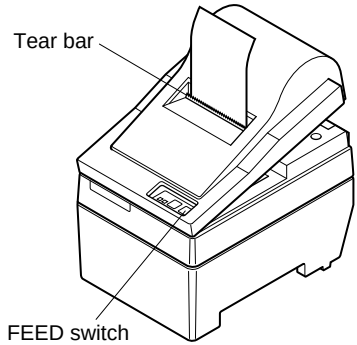


Fig. 4-7

4-2. SP240 type

4-2-1. Loading the Ribbon Cartridge

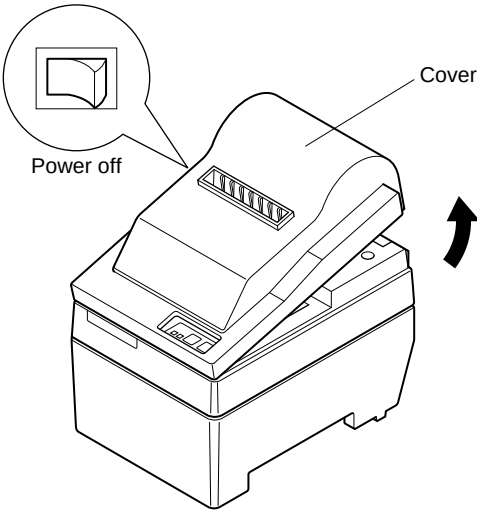


Fig. 4-8 Removing the cover

1 Turn off power to the printer.
2 Lift the cover up approx. 3 cm. Hold the cover tilted at this angle, then pull it toward you to remove it.

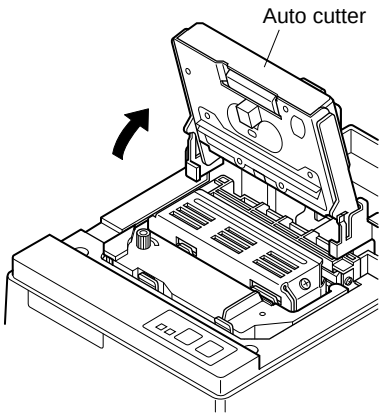


Fig. 4-9 Raise the auto cutter

3 Lift up the auto cutter and put it in a vertical position, as shown in Fig. 4-9.

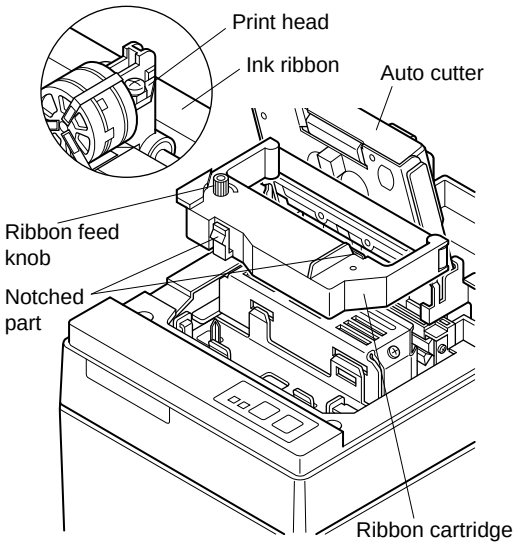


Fig. 4-10 Loading the ribbon cartridge

4 Place the ribbon cartridge in the direction shown in Fig. 4-10 and press it down to load it. If loading of the ribbon cartridge is not satisfactory, press down the cartridge while rotating the ribbon feed knob in the direction of the arrow.

5 Turn the ribbon feed knob of the ribbon cartridge in the direction of the arrow to remove slack in the ribbon.

6 Close the Auto Cutter.

7 Mount the cover by reversing the procedure outlined in step 2 above.

Note: When removing the ribbon cartridge, raise the A section and then remove it by holding the B section as shown in Fig. 4-11.

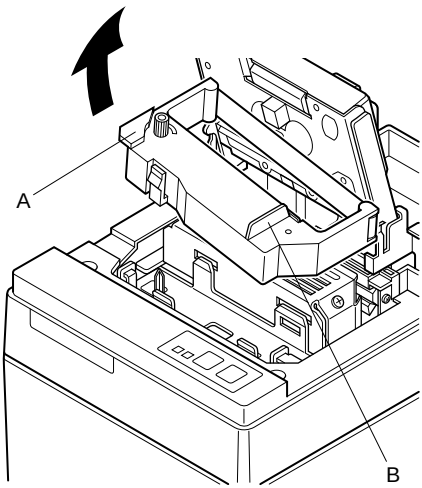


Fig. 4-11

4-2-2. Loading the Paper

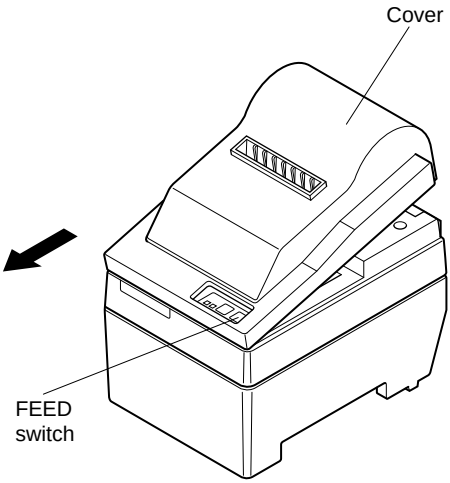


Fig. 4-12 Removing the cover

1 Lift the cover up approx. 3cm. Hold the cover tilted at this angle, then pull it toward you to remove it.

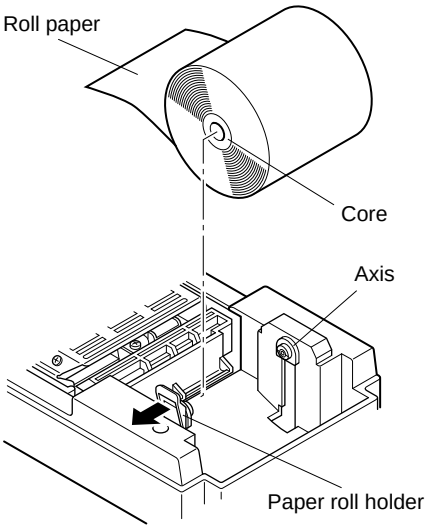


Fig. 4-13 Loading the paper

2 Cut off the front edge of the roll paper perpendicularly.

3 Confirm that the power of the printer is turned on.

4 While observing the direction of the roll paper, insert the top end of the paper beneath the paper guide as far as it will go. If the roll paper is installed, the top end of the paper automatically comes out from the paper exit. After 2cm of paper are fed out, the paper is automatically cut off.

5 Move the paper roll holder in the direction of the arrow, and insert the roll so that the holes in the core align with the axes of the paper roll holder. Release the paper roll holder to secure the paper.

6 If the paper roll core has not been properly aligned with the paper roll holder, the cover cannot to properly seated until the paper position is corrected.

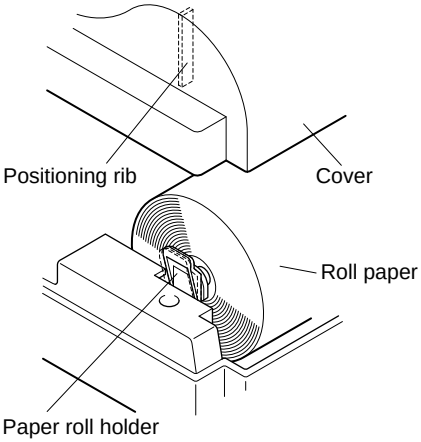


Fig. 4-14

7 Press the FEED (paper feed) switch to feed the paper approximately 10cm.

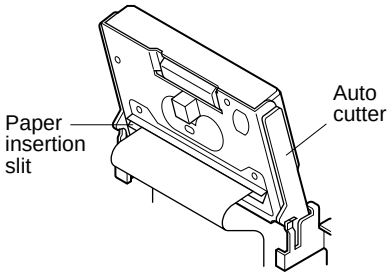


Fig. 4-15 Insertion of the paper into the auto cutter

8 Insert the tip of the roll paper in the auto cutter paper slit.

- When using copying paper, insert only the original (the upper paper) into the slit of the auto cutter. Insert the paper which is to be copied (the lower paper) between the platen and the auto cutter.

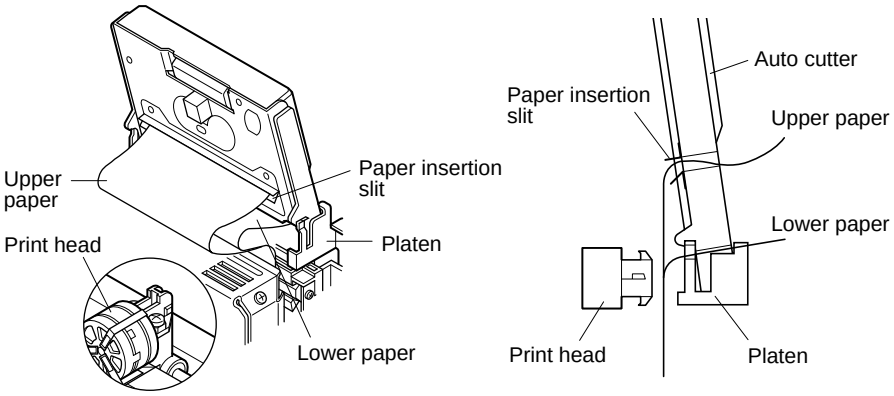


Fig. 4-16 Insertion of the paper into the auto cutter (When using copying paper)

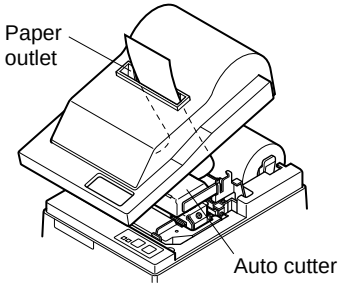


Fig. 4-17 Paper outlet of the front cover

9 Pull on the edge of the paper to remove any slack and then lower the auto cutter.

0 Insert the paper through the paper outlet and then replace the cover by reversing the removal steps.

Note: When the paper end mark appears on the paper, replace the roll paper before it runs out.

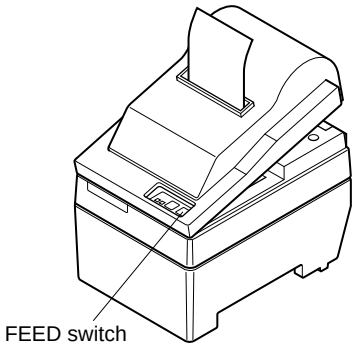


Fig. 4-18

4-3. Removing the Paper

Remove the cover, then cut off the paper near the rear of the paper guide and press the FEED switch to feed out the paper remaining in the unit.
When the paper runs out, the POWER lamp will blink.

Note
1. Remove the paper remaining in the printer by pressing the FEED switch.
2. When the paper end mark appears on the paper, replace the roll paper before it runs out.
3. When removing the core of the roll paper, open the roll paper holder.

4-4. Connecting the Interface Cable

4-4-1. Ferrite core installation (EU only)

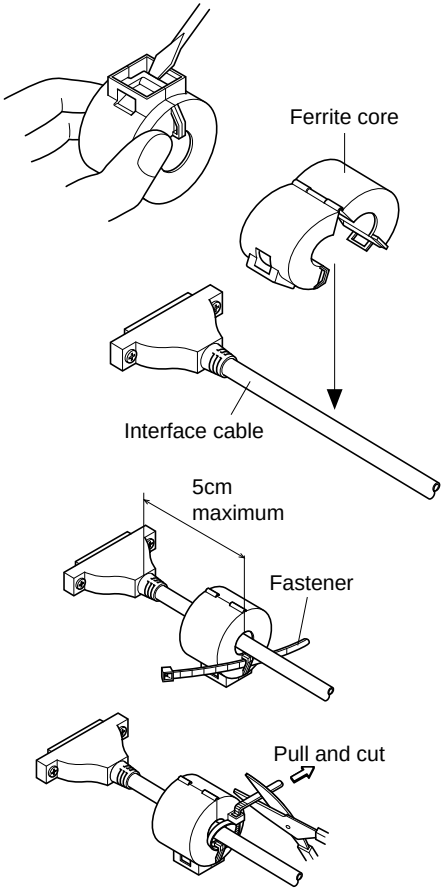


Fig. 4-19

1 Affix the ferrite core onto the serial/ parallel interface cable as shown in the illustration.
If a ferrite core is not open, use a screw driver to pry it apart, taking care not to damage the core or lock.
2 Pass fastener through ferrite core.
3 Pass fastener around cable and lock it.
Cut off excess with scissors.
Attach the ferrite core only to the cables of printers sold in the EU.

4-4-2. Serial Interface Cable

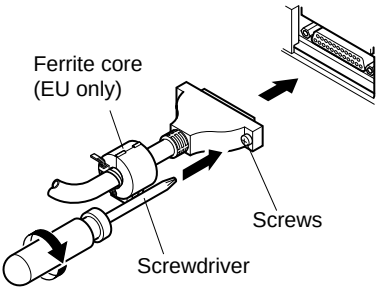


Fig. 4-20 Connecting the interface cable

1 Turn off power to both the host computer and the printer.
2 Insert the connector at one end of the interface cable into the connector on the printer and the other connector into the connector for the host computer.
3 Next, fasten the right and left screws for the respective interface connectors to fix them in place on the connectors.

4-4-3. Parallel Interface Cable

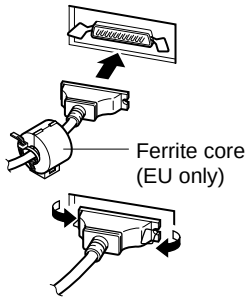


Fig. 4-21 Connecting the parallel interface cable

1 Turn off power to both the host computer and the printer.
2 Insert one terminal of the interface cable into the printer's connector, as shown in the diagram, and fasten it there with the clasp.
3 Insert the other terminal of interface cable into the host computer's connector, and again fasten it with the clasp.

5. Control Panel

5-1. Basic Operation

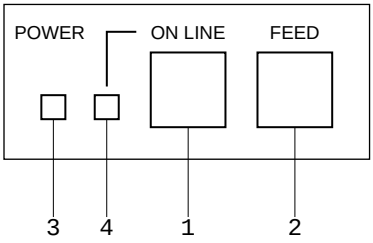


Fig. 5-1 Control panel

1 ON LINE switch
Switches the printer between ON LINE and OFF LINE. ON LINE and OFF LINE switching is possible only when paper is loaded in the printer.

2 FEED switch
- When this switch is pressed and then released within 0.5 sec., the paper feeds on line.
- When this switch is held depressed for more than 0.5 sec., the paper feeds continuously.
  (The above paper feed operation is possible for both ON LINE and OFF LINE modes.)

3 POWER lamp (green LED)
- Lights when the power to the printer is on.
- Flashes when paper is out, mechanical error occurs, when there is an alarm due to head temperature detection, or when a CPU error has occurred.
- If the paper is out, load new paper and press the ON LINE switch.
- When the POWER lamp flashes due to occurrence of a mechanical error, turn off the power and remove the cause of a mechanical error and then turn on the power again to reset the printer.
- If the POWER lamp flashes due to the alarm of the head temperature detection, the printer will be set automatically when the head temperature becomes low.

4 ON LINE lamp (green LED)
LED lit: Printer is ON LINE
LED off: Printer is OFF LINE
LED flashes: CPU error

When the POWER lamp and ON LINE lamp light simultaneously, a CPU error has occurred.

ENGLISH

5-2. Switch Operation (Combined Switch Operation)

1 <SELF PRINTING>

FEED + POWER ON (Turn the power on while holding the FEED switch depressed.)

Self-printing will be performed according to the VER. NO., DIP switch settings and character order. When the FEED switch is held continuously or when the FEED switch is depressed at the time of the end of self-printing, only the characters will be printed out repeatedly.

```
*** SP2S F 1.7 ***

DIP SW STATUS

   ON  OFF
 1  *       Command Mode              STAR
 2  *       Control Code CR        INVALID
 3  *       International
 4  *        Character              U.S.A.
 5  *         Set
 6  *       Data
 7  *        Transmission Rate      9600BPS
 8  *       Data Bit Length           8BIT
 9  *       Parity
10  *        Check             NONE PARITY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~ÄÖÜß§£¢
 !"#$%&'()*+,-./0123456789:;<=>?@AB
CDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
fghijklmnopqrstuvwxyz{|}~ÄÖÜß§£¢
```

Fig. 5-2 Self printing sample (when using serial interface printer)

2 <Hexadecimal dump mode>

ON LINE + POWER ON (Turn the power on while holding the ON LINE switch depressed.)

Each of the signals sent from the computer to the printer will be printed out in hexadecimal code.

This function allows you to check if a control code sent to the printer by the program being used is correct or not. The last line is not printed if its data is less than one full line. However, if the ON LINE switch is pressed to set the off line mode, the last line will be printed. To turn off the mode, it is necessary to turn off the printer completely.

```
00 01 02 03 04 05 06 07        ........
08 09 0A 0B 0C 0D 0E 0F        ........
10 11 12 13 14 15 16 17        ........
18 19 1A 1B 1C 1D 1E 1F        ........
20 21 22 23 24 25 26 27         !"#$%&'
28 29 2A 2B 2C 0A              ()*+,.
```

Fig. 5-3 Hexadecimal dump printing sample

6. Control Codes

STAR mode

6-1. Control Codes Used in Character Setting

Control codes	Hexadecimal codes	Function
<ESC> "R" n	1B 52 n	Select international character set. Default is according to the dip switch settings 3, 4 and 5.
<ESC> "M"	1B 4D	Select 7 × 7 (Half dots) character size (Default setting)
<ESC> "P"	1B 50	Select 9 × 7 (Half dots) character size
<SO>	0E	Select expanded character mode
<SI>	0F	Cancel expanded character mode (Default setting)
<DC4>	14	Cancel expanded character mode (Default setting)
<ESC> "W" "1" <ESC> "W" <1>	1B 57 31 1B 57 01	Select expanded character mode
<ESC> "W" "0" <ESC> "W" <0>	1B 57 30 1B 57 00	Cancel expanded character mode (Default setting)

6-2. Control Codes Used in Print Mode Setting

Control codes	Hexadecimal codes	Function
<ESC> "4"	1B 34	Red color print selection (enable for SP216)
<ESC> "5"	1B 35	Red color print deselection (enable for SP216) (Default setting)
<ESC> "E"	1B 45	Emphasized print mode selection
<ESC> "F"	1B 46	Emphasized print mode deselection (Default setting)

6-3. Control Codes Used in Line Spacing

Control codes	Hexadecimal codes	Function
<LF>	0A	Line feed
<CR>	0D	Line feed (same as LF)
<ESC> "a" n	1B 61 n	Feed paper n lines

6-4. Control Codes Used for Peripheral Units

Control codes	Hexadecimal codes	Function
<ESC> <BEL> n1 n2	1B 07 n1 n2	Adjust drive pulse width for peripheral unit (Default setting)
<BEL>	07	Deferred drive command “A” for peripheral unit 1
<FS>	1C	Immediate drive command “B” for peripheral unit 1

6-5. Auto Cutter Control (SP240 type only)

Control codes	Hexadecimal codes	Function
<ESC> “d” “0” <ESC> “d” <0>	1B 64 30 1B 64 00	Full-cut command to the auto cutter
<ESC> “d” “1” <ESC> “d” <1>	1B 64 31 1B 64 01	Partial-cut command to the auto cutter

6-6. Other Control Codes

Control codes	Hexadecimal codes	Function
<CAN>	18	Cancel print data in buffer
<ESC> “@”	1B 40	Initialize printer
<ESC> “e” “0” <ESC> “e” <0>	1B 65 30 1B 65 00	ON LINE/FEED switch valid (Default setting)
<ESC> “e” “1” <ESC> “e” <1>	1B 65 31 1B 65 01	ON LINE/FEED switch invalid
<ESC> “f” “0” <ESC> “f” <0>	1B 66 30 1B 66 00	ON LINE switch valid (Default setting)
<ESC> “f” “1” <ESC> “f” <1>	1B 66 31 1B 66 01	ON LINE switch invalid

Appendix A: Serial Interface

A-1. Connectors and Signals

RS-232C

Pin no.	Signal name	I/O direction	Function
1	F-GND	—	Frame ground
2	N/C		Not connected
3	RXD	IN	Received data
4	RTS	OUT	Data transmission request signal. This is always "SPACE" when the printer is turned on. (Always "SPACE" status)
5-6	N/C		Not connected
7	S-GND	—	Signal ground
8-10	N/C		Not connected
11	RCH	OUT	When the printer is ready to receive data, the signal line is same as pin 20.
12	N/C		Not connected
13	GND	—	Signal ground
14	$\overline{\text{FAULT}}$	OUT	When printer error occurs (such as paper out, mechanical error, etc.) this signal changes to "MARK".
15-19	N/C		Not connected
20	DTR	OUT	Data terminal ready signal. When the printer is ready to receive data, this signal changes to "SPACE".
21-25	N/C		Not connected

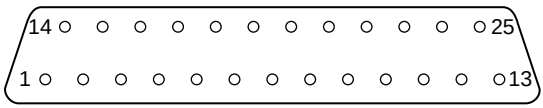


Fig. A-1 Serial interface connector

A-2. Interface Connections

The following is a basic example of interface connections. (For interface connections, refer to the specifications for the respective interface.)

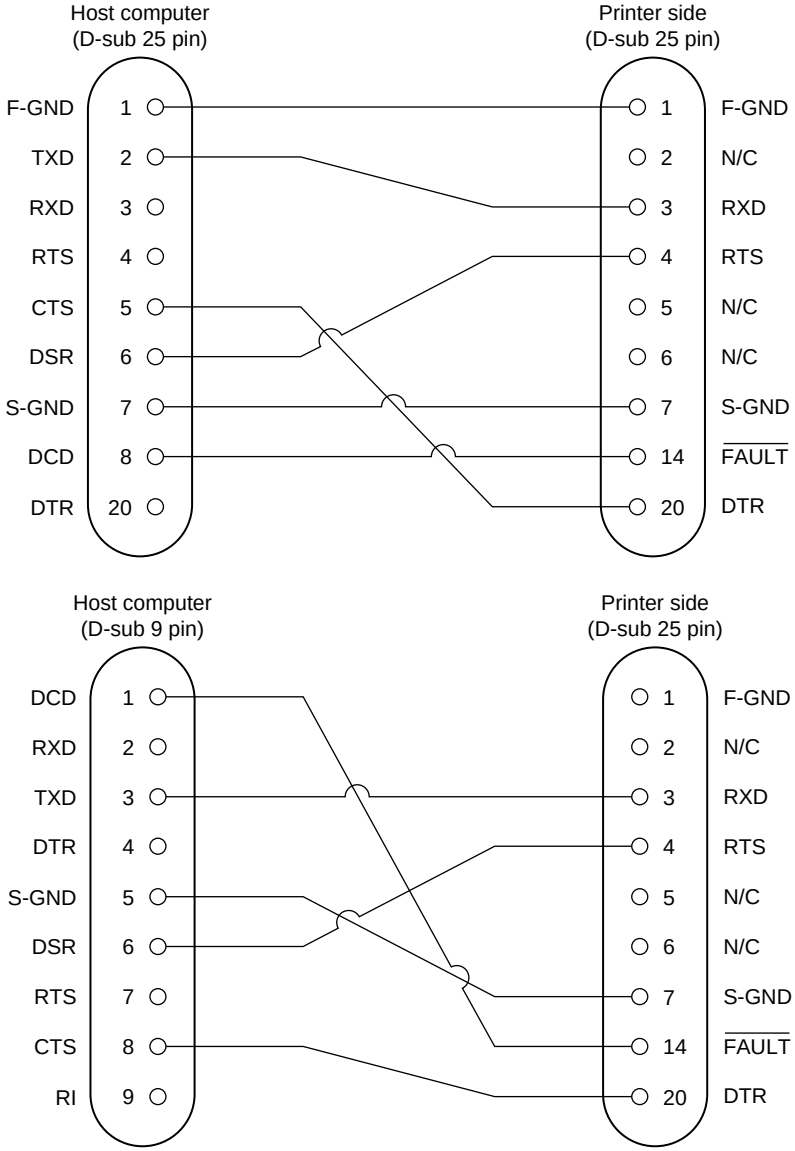


Fig. A-2 Example of interface connections

A-3. Dip Switch Setting

Each of the switches in the DIP switch array is factory preset to ON. Be sure to turn the power to both the printer and host computer off before changing the setting of the DIP switches.
The dip switch array will appear when the ROM cover is removed.

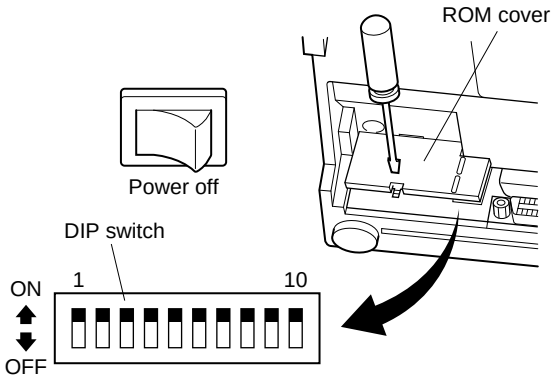


Fig. A-3 DIP switch array

■ DIP-SW

Factory presetting: all on

Switch	Function	ON	OFF
1	Command mode	STAR mode	VeriFone mode
2	Control code CR	Invalid	Valid
3	International character set	Refer to the following.	
4			
5			
6	Data transmission rate	Refer to the following.	
7			
8	Data bit	8-data bit	7-data bit
9	Parity check	No	Yes
10	Parity	Odd	Even

□ International character set

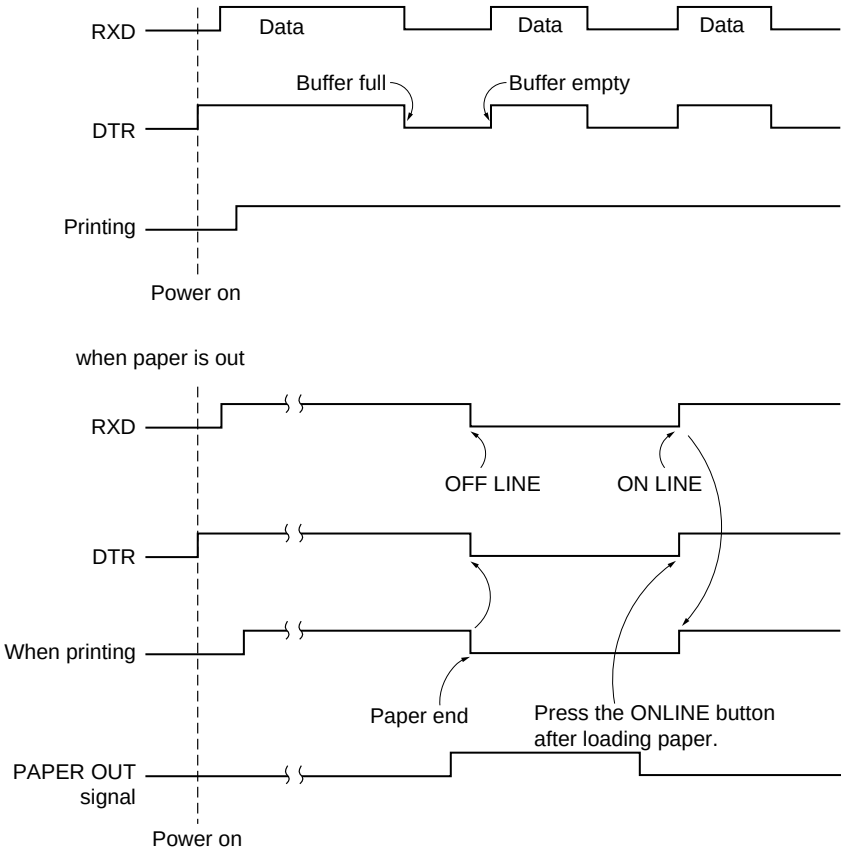
Switch	U.S.A.	France	Germany	England	Denmark	Sweden	Italy	Spain
3	ON	OFF	ON	OFF	ON	OFF	ON	OFF
4	ON	ON	OFF	OFF	ON	ON	OFF	OFF
5	ON	ON	ON	ON	OFF	OFF	OFF	OFF

☐ Data transmission rate (baud rate)

Baud rate	Switch 6	Switch 7
1200	OFF	OFF
2400	OFF	ON
4800	ON	OFF
9600	ON	ON

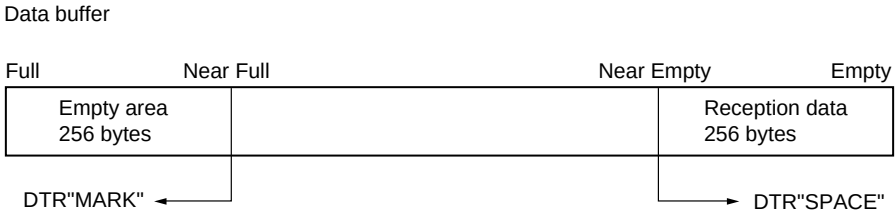
A-4. Communication Protcol

Signals are controlled using the DTR line as BUSY flag.



If printer errors do not occur after the power is turned on, the DTR signal line changes to “SPACE”.
When the host computer confirms that the DTR signal line is set to “SPACE”, the host computer sends the data text via the RXD signal line to the printer. Also, the printer will set the DTR signal line to “MARK” when the empty space in the data

buffer is below 256 bytes. After the host computer detects that the DTR signal line is at “MARK”, transmission of the data text is stopped. In this instance, data can still be received up until the data buffer becomes completely full.
When the empty space in the data buffer is increased by following printing (when the data in the data buffer is reduced to 256 bytes or less), the printer sets the DTR signal line to “SPACE”.



[Paper out]
When the “paper out” detector senses the end of the paper, the printer stops printing after printing or feeding a maximum of two more lines on the paper. Immediately after a “paper out” condition is detected, the printer sets to OFF LINE and the DTR changes to “MARK”. (To reset printer after a “paper out”, load paper into the printer and press the ON LINE switch to set the printer to ON LINE.)
[Mechanical error]
Mechanical errors are detected when the motor locks and the unit will not print. Immediately after a mechanical error occurs, the printer sets the DTR to “MARK” and then sets the printer to OFF LINE. To cancel a mechanical error, turn the power to the printer off and remove the cause of the error then turn the power on again to reset the printer.
[Framing error]
A framing error occurs when “SPACE” is detected at the stop bit. When a framing error or a vertical parity error occurs for the data which is received, the printer prints out a “?” mark to indicate that the error occurred.

Appendix B: Parallel Interface

B-1. Interface Specifications

The operating specifications of the parallel interface are as follows.

(1) Data transfer rate : 1000 to 6000 characters per second
(2) Synchronization : Via externally supplied $\overline{\text{STROBE}}$ pulses
(3) Handshaking : $\overline{\text{ACK}}$ and BUSY signals
(4) Logic level : Compatible with TTL level

B-2. Interface Timing

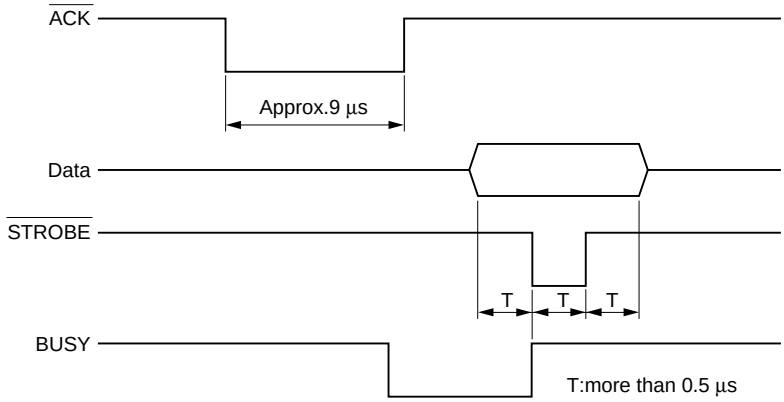


Fig. B-1 Interface timing diagram

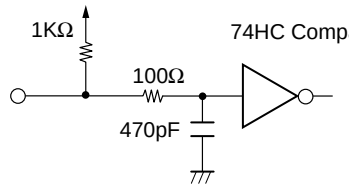
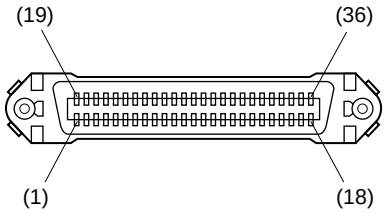
	Signal Name	Circuit Example
INPUT	DATA 1-DATA 8 (To Printer)	
INPUT	$\overline{\text{STROBE}}$ (To Printer)	
OUTPUT	BUSY, $\overline{\text{ACK}}$ (From Printer)	

Fig. B-2 Typical interface circuit

B-3. Connectors and Signals

Pin No.	Signal Name	IN/OUT	Function
1	$\overline{\text{STROBE}}$	IN	Signals when data is ready to be read. Signal goes from HIGH to LOW (for at least 0.5 microsec.) when data is available.
2-9	DATA1-8	IN	These signals provide the information of the first to eighth bits of parallel data. Each signal is at HIGH level for a logical 1 and at a LOW level for a logical 0.
10	$\overline{\text{ACK}}$	OUT	A 9 microsecond LOW pulse acknowledges receipt of data.
11	BUSY	OUT	When this signal goes LOW, the printer is ready to accept data. When the printer is in one of the conditions below. "HIGH" is set. 1. Data being entered. 2. Off line. 3. Error condition.
12	PAPER OUT	OUT	This signal is normally LOW. It will go HIGH if the printer runs out of paper.
13	SELECTED	OUT	This signal is HIGH when the printer is online.
14-15	N/C		Not connected
16	SIGNAL GND		Signal ground.
17	CHASSIS GND		Chassis ground, isolated from logic ground.
18	+5VDC		+5VDC (Max 50 mA)
19-30	GND		Twisted pair return signal ground level.
31	$\overline{\text{RESET}}$	IN	When this signal goes LOW, the printer is reset to its power-on condition.
32	$\overline{\text{ERROR}}$	OUT	This signal is normally HIGH. This signal goes LOW to signal that the printer cannot print due to an error condition. Refer to Item 8-4 Emergency Suspension.
33	EXT GND		External ground.
34	OUT1	OUT	Unused.
35	N/C		Not connected
36			The printer side is always set to HIGH.



This connector mates with an Amphenol 57-30360 connector

Fig. B-3. Parallel interface connector (printer side)

B-4. Dip Switch Setting

Each of the switches in the DIP switch array is factory preset to ON. Be sure to turn the power to both the printer and host computer off before changing the setting of the DIP switches.
The dip switch array will appear when the ROM cover is removed.

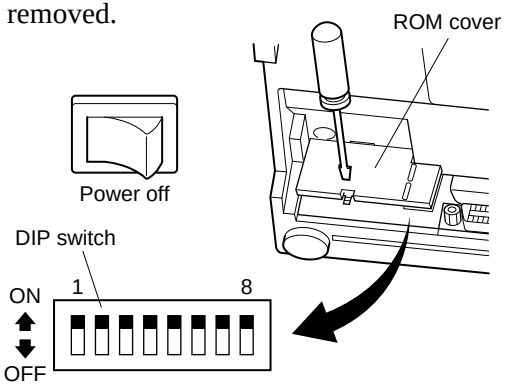


Fig. B-4 DIP switch array

■ DIP-SW

Factory presetting: all on

SW	Function	ON	OFF
1	Paper out detection	Valid	Invalid
2	Control code CR	Invalid	Valid
3	International character set	See below	
4			
5			
6	Data buffer	Available (approx. 1k byte)	Unavailable (1 line)
7	Character generation setting	See below	
8			

□ International character set

Switch	U.S.A.	France	Germany	England	Denmark	Sweden	Italy	Spain
3	ON	OFF	ON	OFF	ON	OFF	ON	OFF
4	ON	ON	OFF	OFF	ON	ON	OFF	OFF
5	ON	ON	ON	ON	OFF	OFF	OFF	OFF

□ Character generation

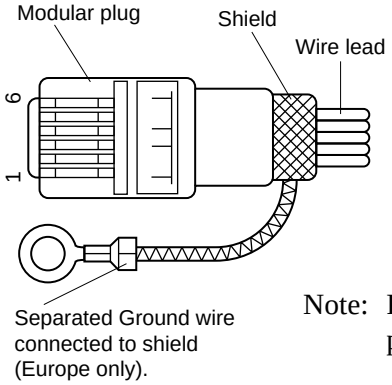
SW	US	EC	JP	JP
7	ON	ON	OFF	OFF
8	ON	OFF	ON	OFF

Appendix C: Peripheral Unit Drive Circuit

A drive circuit for driving peripheral units (such as cash drawers) is featured on the main logic board of this printer. A modular connector for driving peripheral unit is featured on the output side on the drive circuit. When using this circuit, connect the cable for the peripheral unit. (Cables must be prepared by the user.)

Note: Peripheral unit drive circuit connector only connects to peripheral units such as cash drawers, etc.
Do not connect it to a telephone.

Use cables which meet the following specifications.

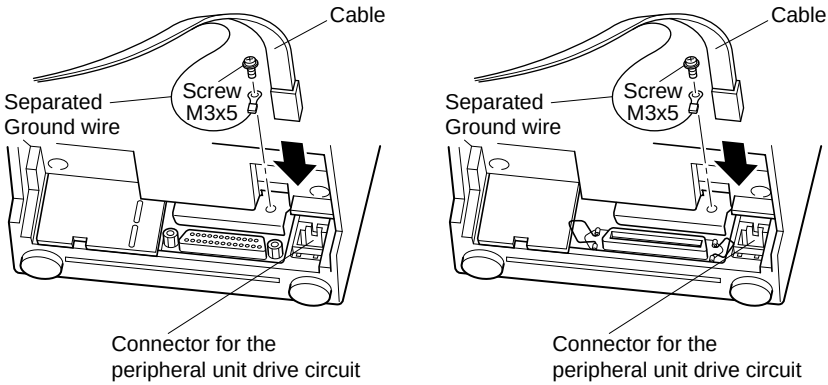


Manufacturer	Model
MOLEX	90075-0007
AMP	641337
JAPAN BURNDY	B-66-4

Note: Pin 1 must be shield drain wire connected to peripheral device frame ground.

Fig. C-1 Cable specifications

1 Connecting the cable

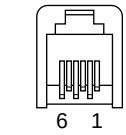


SERIAL INTERFACE PARALLEL INTERFACE

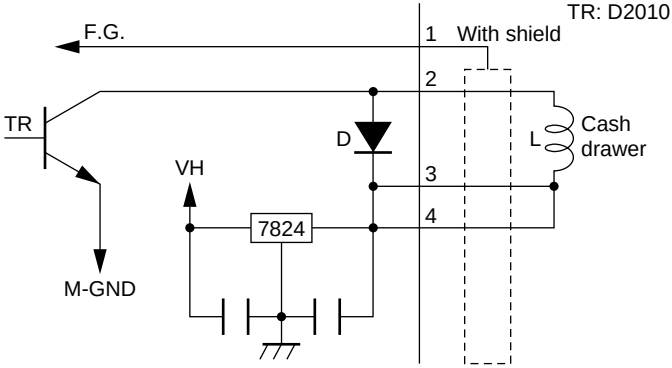
Separated ground wire is required for Europe only.

Fig. C-2 Connecting the cable

2 Drive circuit



6-P modular jack connector



Drive output	24V, max. 1.0 A

Fig. C-3 Drive circuit

Appendix D: General Specifications

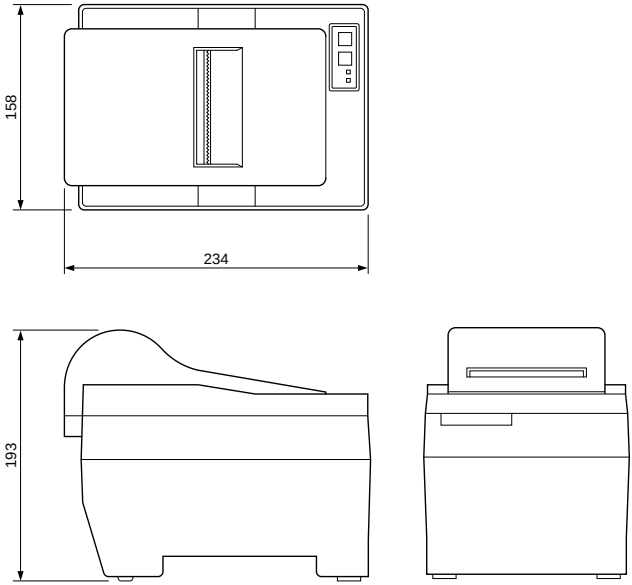
Printing method: Serial impact dot matrix
Print direction: Bi-directional
Number of head pins: 7 wires
Number of print columns: 42 columns, 16 CPI
Character set: ASCII 96 (characters)
Special characters 64
IBM special characters 83
International characters 12
Font configuration 7 (Half dots) × 7 or 9 (Half dots) × 7

Paper width		3.0 inch (76 mm)	
CPI		16	13.4
Number of columns		42	35
Column spacing	(mm)	1.58	1.90
Character size	(mm)	1.28 × 2.87	1.59 × 2.87
Dot space	(H × V mm)	0.316 × 0.423	0.316 × 0.423
Print area	(mm)	66.0	66.0

Print speed: Approx. 2.5 lines per sec.
Line spacing: 1/6-inch
Paper feed method: Friction feed
Paper feed speed: Approx. 9 lines/sec.
Paper specifications
Paper type: Ordinary bond and carbonless copy paper
Paper width: 76±0.5 mm (3.0 inches)
Roll diameter: 85mm (3.35 inches) max.
Thickness (single) 0.07 mm to 0.10 mm
(copies) Original + 2 copies (Max. 0.2 mm)
Internal diameter of roll: 12±1 mm
Note: The paper must not be glued to the core.
Paper cutter reliability (SP240 type only) 300,000 cut (MCBF)
Ink ribbon specifications
Ribbon type: Cartridge cassette
Color: SP212/242 type: Single color (Purple or black)
SP216/246 type: Two color (Black and red)
Ribbon material: Nylon 66 (#40 denier)

Ribbon life:	Single color: Purple 3,000,000 characters Black 1,200,000 characters Two color: Black on two color 600,000 characters Red on two color 300,000 characters
Interface	
Serial interface:	RS232C serial interface
Parallel interface:	Centronics compatible
Data buffer:	Approx. 1K
Peripheral unit drive circuit:	1 circuits (24V, max. 1A)
Overall dimensions:	SP210 type: 158W × 234 D × 193H (mm) SP240 type: 158W × 240 D × 193H (mm)
Weight:	SP210 type: Approx. 3.0kg SP240 type: Approx. 3.4kg
Power Supply:	120VAC ±10% 0.3A 60Hz 230 VAC + 6, –10% 0.2A 50/60Hz 240VAC ±10% 24W 50Hz
AC power cable:	Approx. 180 cm long
Power consumption:	Max. 24 W Avg. 19W (During continuous printing of ASCII characters)
Ambient temperature/humidity	
Operating temperature:	0°C to +50°C
Operating humidity:	10% to 90% RH (without condensation)
Storage temperature:	–20°C to +70°C
Storage humidity:	5% to 95%RH (at 40°C, without condensation)
Mechanism reliability:	2,500,000 lines MCBF (except head life and auto cutter)
Print head life:	75 million characters
Accessory	This printer has no optional accessory.

SP210 Type



SP240 Type

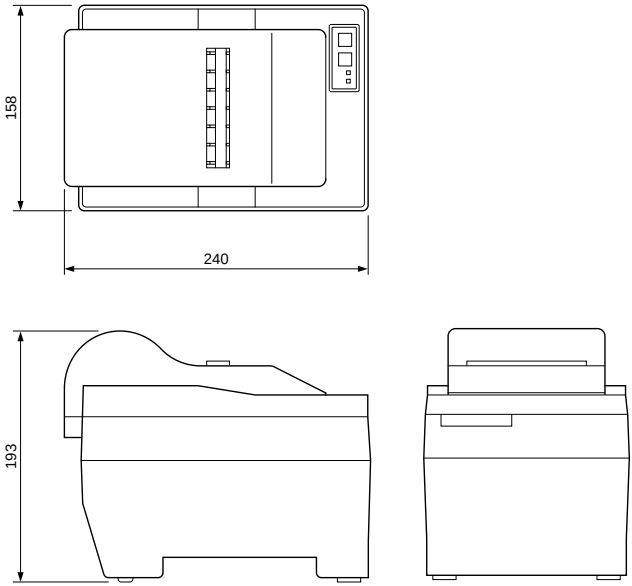


Fig. D-1 Overall dimensions (mm)

Appendix E: Character Font Table

E-1. U.S.A.

Hexa-decimal	0	1	2	3	4	5	6	7
0	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115
4	4	〈DC4〉 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	〈BEL〉 7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	8	〈CAN〉 24	(40	8 56	H 72	X 88	h 104	x 120
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	〈LF〉 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	〈ESC〉 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	12	〈FS〉 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	〈CR〉 13	29	− 45	= 61	M 77	] 93	m 109	} 125
E	〈SO〉 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	〈SI〉 15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127

(SP: Space)

Hexa-decimal	8	9	A	B	C	D	E	F
0	SP 128	SP 144	Ä 160	é 176	ù 192	ā 208	SP 224	SP 240
1	SP 129	SP 145	Ö 161	è 177	ū 193	â 209	SP 225	SP 241
2	SP 130	SP 146	Ü 162	ē 178	û 194	° 210	SP 226	SP 242
3	SP 131	SP 147	ß 163	ê 179	ç 195	°C 211	SP 227	SP 243
4	SP 132	SP 148	§ 164	ï 180	¿ 196	°F 212	SP 228	SP 244
5	SP 133	SP 149	a 165	í 181	Ñ 197	Ω 213	SP 229	SP 245
6	SP 134	SP 150	o 166	ì 182	ñ 198	μ 214	SP 230	SP 246
7	SP 135	SP 151	f 167	ī 183	Ē 199	Σ 215	SP 231	SP 247
8	SP 136	SP 152	¢ 168	î 184	ɔ 200	σ 216	SP 232	SP 248
9	SP 137	SP 153	1/2 169	ö 185	i 201	x̄ 217	SP 233	SP 249
A	SP 138	SP 154	N/T 170	ó 186	Å 202	T_L 218	SP 234	SP 250
B	SP 139	SP 155	T/X 171	ò 187	ϕ 203	X 219	SP 235	SP 251
C	SP 140	SP 156	¥ 172	ō 188	θ 204	∞ 220	SP 236	SP 252
D	SP 141	SP 157	1/4 173	ô 189	ä 205	$\pm$ 221	SP 237	SP 253
E	SP 142	SP 158	Ā 174	ü 190	á 206	$\div$ 222	SP 238	SP 254
F	SP 143	SP 159	ë 175	ú 191	à 207	π 223	SP 239	SP 255

(SP: Space)

E-2. Europe

Hexa-decimal	0	1	2	3	4	5	6	7
0	0	16	SP 32	0 48	@ 64	P 80	‘ 96	p 112
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114
3	♥ 3	19	# 35	3 51	C 67	S 83	c 99	s 115
4	♦ 4	〈DC4〉 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117
6	♠ 6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119
8	8	〈CAN〉 24	(40	8 56	H 72	X 88	h 104	x 120
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	〈LF〉 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	〈ESC〉 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	12	〈FS〉 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	〈CR〉 13	29	− 45	= 61	M 77	] 93	m 109	} 125
E	〈SO〉 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	〈SI〉 15	31	/ 47	? 63	O 79	_ 95	o 111	127

(SP: Space)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	SP 176	SP 192	SP 208	α 224	≡ 240
1	ü 129	æ 145	í 161	SP 177	SP 193	SP 209	β 225	± 241
2	é 130	Æ 146	ó 162	SP 178	SP 194	SP 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	SP 179	SP 195	SP 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	SP 180	SP 196	SP 212	Σ 228	SP 244
5	à 133	ò 149	Ñ 165	SP 181	SP 197	SP 213	σ 229	SP 245
6	å 134	û 150	a 166	SP 182	SP 198	SP 214	μ 230	÷ 246
7	ç 135	ù 151	o 167	SP 183	SP 199	SP 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	SP 184	SP 200	SP 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	SP 185	SP 201	SP 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	SP 186	SP 202	SP 218	Ω 234	– 250
B	ï 139	¢ 155	½ 171	SP 187	SP 203	SP 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	SP 188	SP 204	SP 220	∞ 236	n 252
D	ì 141	¥ 157	¡ 173	SP 189	SP 205	SP 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	SP 190	SP 206	SP 222	∈ 238	■ 254
F	Å 143	ƒ 159	» 175	SP 191	SP 207	SP 223	∩ 239	255

(SP: Space)

E-3. International Character Sets

Hexadecimal	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U. S. A.	#	$	@	[	\	]	^	`	{	¦	}	~
France	#	$	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
England	£	$	@	[	\	]	^	`	{	¦	}	~
Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain 1	₧	$	@	¡	Ñ	¿	^	'	¨	ñ	}	~
Japan	#	$	@	[	¥	]	^	`	{	¦	}	~
Norway *1	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2 *1	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

*1 VeriFont only

E-4. VeriFont

Hexa-decimal	0	1	2	3	4	5	6	7
0	0	16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	〈DC2〉 18	" 34	2 50	B 66	R 82	b 98	r 114
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	8	〈CAN〉 24	(40	8 56	H 72	X 88	h 104	x 120
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	〈LF〉 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	〈ESC〉 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	〈FF〉 12	〈FS〉 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	13	〈GS〉 29	− 45	= 61	M 77	] 93	m 109	} 125
E	〈SO〉 14	〈RS〉 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	〈SI〉 15	〈US〉 31	/ 47	? 63	O 79	_ 95	o 111	SP 127

(SP: Space)

Hexa-decimal	8	9	A	B	C	D	E	F
0	╌ 128	— 144	SP 160	° 176	À 192	D 208	à 224	õ 240
1	╎ 129	┃ 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	┤ 130	┫ 146	Ç 162	2 178	Â 194	Ò 210	â 226	ò 242
3	├ 131	┣ 147	£ 163	3 179	Ã 195	Ó 211	ã 227	ó 243
4	┴ 132	┻ 148	¤ 164	' 180	Ä 196	Ô 212	ä 228	ô 244
5	┬ 133	┳ 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	┼ 134	╋ 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	┘ 135	┛ 151	§ 167	⊙ 183	Ç 199	Œ 215	ç 231	œ 247
8	└ 136	┗ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	┌ 137	┏ 153	© 169	1 185	É 201	Ù 217	é 233	ù 249
A	┐ 138	┓ 154	a 170	o 186	Ê 202	Ú 218	ê 234	ú 250
B	1 139	6 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	2 140	7 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	3 141	8 157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	4 142	9 158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	5 143	10 159	- 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

(SP:Space)

ELECTRONIC PRODUCTS DIVISION
STAR MICRONICS CO., LTD.
536 Nanatsushinnya, Shimizu, Shizuoka,
424-0066 Japan
Tel: 0543-47-0112, Fax: 0543-48-5271

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OVERSEAS SUBSIDIARY COMPANIES
STAR MICRONICS AMERICA, INC.
70-D Ethel Road West, Piscataway, NJ 08854 U.S.A
Tel: 732-572-9512, Fax: 732-572-5095

STAR MICRONICS U.K. LTD.
Star House, Peregrine Business Park, Gomm Road,
High Wycombe, Bucks, HP13 7DL, U.K.
Tel: 01494-471111, Fax: 01494-473333

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