EPSON®

24-pin Dot Matrix Printer

PLQ-20/PLQ-20M

User's Guide

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Introduction

Where to Find More Information

This User's Guide provides you with instructions on operating the impact dot matrix printer PLQ-20/PLQ-20M. You can find information on the basic operation in this guide. But if you wish for more information, refer to the *Reference Guide*, *Paper Specification*, and *Programming Guide*. These guides are included on the User CD-ROM. If you want the User CD-ROM, contact your dealer.

FCC Compliance Statement for United States Users

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

❏ Reorient of relocate the receiving antenna

❏ Increase the separation between the equipment and receiver

❏ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

❏ Consult the dealer or an experienced radio/TV technician for help

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

For Canadian users

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

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

DECLARATION of CONFORMITY

According to 47CFR, Part 2 and 15 for Class B Personal Computers and Peripherals; and/or CPU Boards and Power Supplies used with Class B Personal Computers:

We: EPSON AMERICA, INC.
Located at: MS 3-13
                  3840 Kilroy Airport Way
                  Long Beach, CA 90806
                  Telephone: (562) 290-5254

Declare under sole responsibility that the product identified herein, complies with 47CFR Part 2 and 15 of the FCC rules as a Class B digital device. Each product marketed, is identical to the representative unit tested and found to be compliant with the standards. Records maintained continue to reflect the equipment being produced can be expected to be within the variation accepted, due to quantity production and testing on a statistical basis as required by 47CFR §2.909 Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Trade Name: EPSON
Type of Product: Dot Impact Printer
Model: P381A

Chapter 1

Setting up the Printer

Unpacking the Printer

These items are included in the box with your printer.
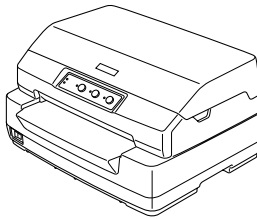
printer

power code
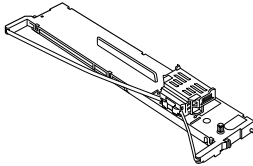
ribbon cartridge
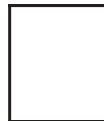
User's Guide

Remove the protective materials

Follow the directions written on the cardboard box to remove the protective materials.

Save all packing and protective materials in case you need to ship the printer in the future.

Assembling the Printer

1. Make sure the printer is turned off and unplugged.

2. Hold both sides of the printer cover and move it upward to open it.
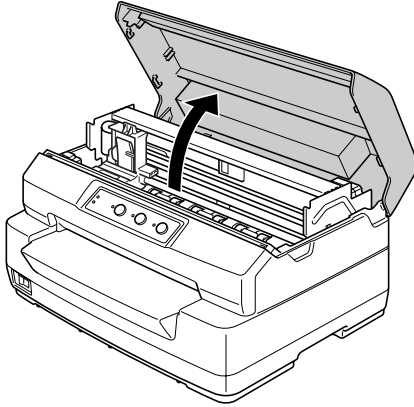
3. Push the release lever to move the upper mechanism forward. Make sure that you push the lever until it clicks.
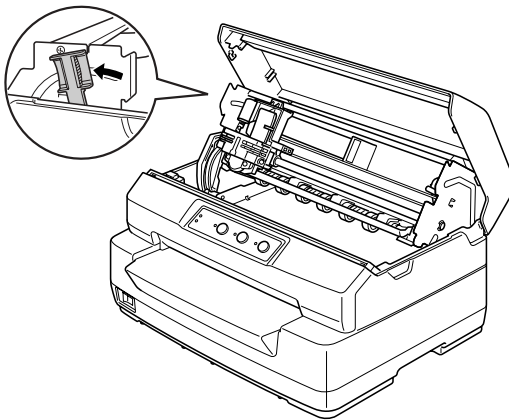
4. Slide the print head to the middle of the printer by hand.
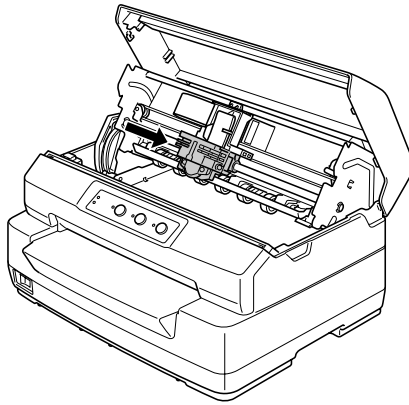
5. Remove the ribbon cartridge from the package.

6. Place the plastic hooks on the ribbon cartridge into the slots of the printer. Then press both sides of the cartridge until it clicks into place.
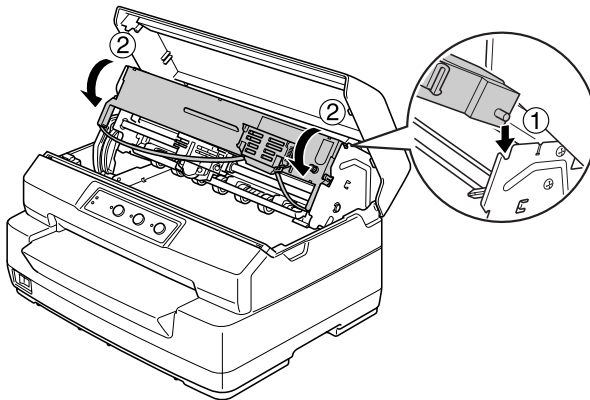
7. Hold both sides of the ribbon guide and pull it down until it is out of the cartridge.
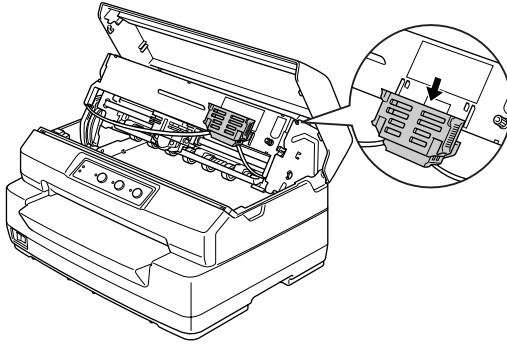
8. Put the ribbon guide at the bottom of the print head and push it up until it clicks into place.
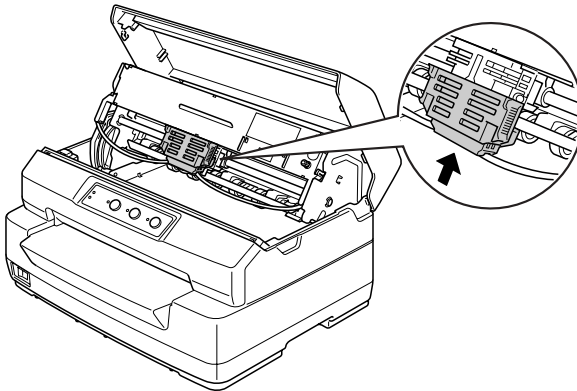
9. Turn the ribbon-tightening knob to help feed the ribbon into place.
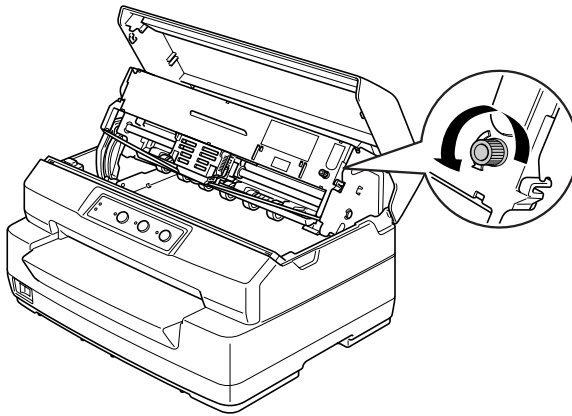
> ![] *Caution:*
> *The ribbon should not be twisted or creased.*

10. Pull the release lever back to move the upper mechanism to its original position. Make sure that you pull the lever until it clicks.
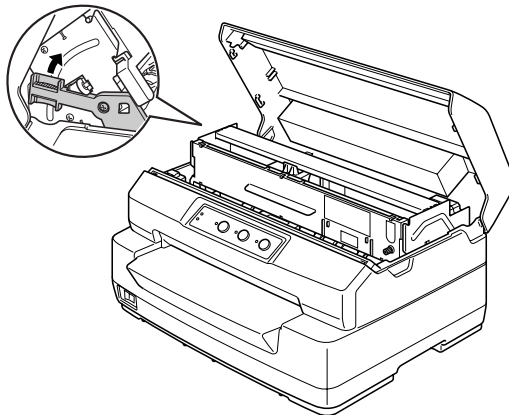
> **c** **Caution:**
> *Make sure that you move the upper mechanism by pulling the release lever. Do not pull the mechanism by hand. It may damage the printer.*

11. Close the printer cover.

Connecting the Printer to Your Computer

Connecting the printer

Make sure both the printer and computer are turned off, then connect the interface into the printer and computer. Use USB, Serial, or Parallel cable to connect the printer and computer.

Note:
The interface cable connectors have only one correct orientation. Ensure the correct orientation of a connector before inserting it into the appropriate port.
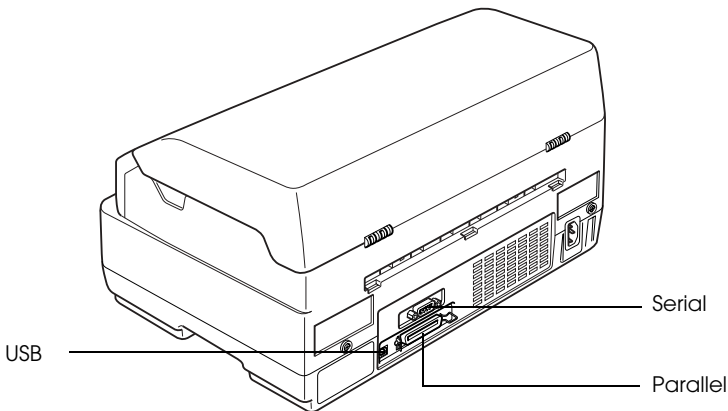
Plugging in the Printer

Make sure the printer is turned off, then plug the power cord into the printer's AC inlet and a properly grounded electrical outlet.

Chapter 2

Safety Instructions
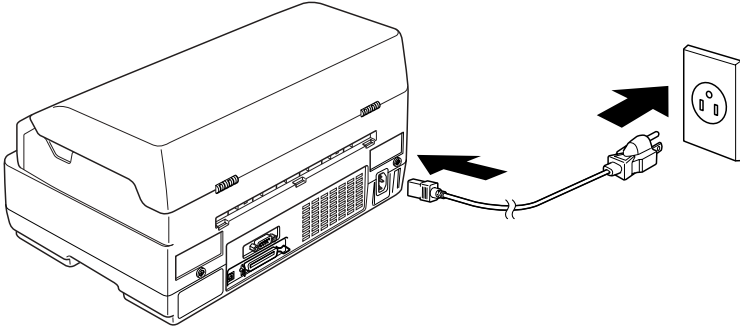
Warnings, Cautions, and Notes

Warnings *must be followed carefully to avoid bodily injury.*

Cautions *must be observed to avoid damage to your equipment.*

Notes contain important information and useful tips on the operation of your printer.

Hot Parts Caution Symbol

This symbol is placed on the print head and other parts to indicate that they may be hot. Never touch those parts just after the printer has been used. Let them cool for a few minutes before touching them.

Important Safety Instructions

Read all of these safety instructions before using the printer. In addition, follow all warnings and instructions marked on the printer itself.

When setting up the printer

Caution:
Be sure the AC power cord meets the relevant local safety standards.

❏ Do not place the printer on an unstable surface or near a radiator or heat source.

❏ Place the printer on a flat surface. The printer will not operate properly if it is tilted or placed at an angle.

❏ Do not place this product on a soft, unstable surface like a bed or a sofa, or a small, enclosed area, as this restricts ventilation.

❏ Do not block or cover the slots and openings in the printer's cabinet, and do not insert objects through the slots.

❏ Use only the type of power source indicated on the printer's label. If you are not sure of the power supply specifications in your area, contact your local power company or consult your dealer.

❏ Connect all equipment to properly grounded electrical outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.

❏ Do not use a damaged or frayed power cord.

❏ The power cord should be placed to avoid abrasions, cuts, fraying, crimping, kinking, and other damage.

❏ If you use an extension cord with the printer, make sure the total ampere rating of all devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total ampere of all devices plugged into the electrical outlet does not exceed the electrical outlet's ampere rating.

❏ Use only the power cord that comes with this product. Use of another cord may result in fire or electric shock.

❏ This product's power cord is for use with this product only. Use with other equipment may result in fire or electric shock.

❏ When connecting this product to a computer or other device with a cable, ensure the correct orientation of the connectors. Each connector has only one correct orientation. Inserting a connector in the wrong orientation may damage both devices connected by the cable.

❏ Place the printer where you can easily connect it to a network interface cable, if necessary.

❏ Leave adequate room around the printer for easy operation and maintenance.

❏ Avoid places subject to shocks and vibrations.

❏ Place the printer near a wall outlet where you can easily unplug the power code.

❏ Keep the entire computer system away from potential sources of electromagnetic interference, such as loudspeakers or the base units of cordless telephones.

❏ Avoid electrical outlet controlled by wall switches or automatic timers. An interruption in power can erase information in the memory of your printer or computer. Also avoid outlets on the same circuit as large motors or other appliances that can cause voltage fluctuations.

❏ Use a grounded power outlet; do not use an adapter plug.

❏ If you plan to use a printer stand, follow these guidelines:

Use a stand that can support at least 15 kg (33.1 lb) for PLQ-20 or 17 kg (37.5 lb) for PLQ-20M.

Never use a stand that tilts the printer. The printer should always be kept level.

Position your printer's power cord and interface cable so they do not interfere with paper feeding. If possible, secure the cables to a leg of the printer stand.

When maintaining the printer

❏ Unplug the printer before cleaning it, and always clean it with a piece of damp cloth only.

❏ Do not spill liquid onto the printer.

❏ Except as specifically explained in this guide, do not attempt to service the printer yourself.

❏ Unplug the printer and refer servicing to qualified service personnel under the following conditions:

i.   If the power cord or plug is damaged.

ii. If liquid has entered the printer.

iii. If the printer has been dropped or the cabinet damaged.

iv. If the printer does not operate normally or exhibits a distinct change in performance.

❏ Adjust only those controls that are covered by the operating instructions.

❏ If you plan to use the printer in Germany, observe the following:

To provide adequate short-circuit protection and over-current protection for this printer, the building installation must be protected by a 10- or 16-amp circuit breaker.

When loading paper

❏ Use passbooks and paper that have more than 60% reflectance.

❏ When you use a passbook, set Passbook mode to On and set Binding mode to the method for the passbook's binding in the default settings mode.

❏ Do not load passbooks that are creased or have ripped seam.

❏ Do not use a passbook that has any metallic parts such as staplers or metal clips.

❏ Do not use a passbook with sticky parts such as stamps or seals.

❏ Do not use a passbook that has any pages smaller than the cover page.

❏ Do not print on the front or back cover of a passbook. Printing can be done only when the passbook is opened.

❏ When you use paper that is shorter than 110.0 mm, set the paper eject direction to front. The factory set default is front. Refer to the *Programming Guide* for details.

❏ Do not insert paper that is curled or has been folded into the slot when you load it.

❏ Do not punch holes in the area from 25.0 to 40.0 mm from the left edge of paper.

When operating the printer

❏ Avoid using or storing the printer in places subject to rapid changes in temperature and humidity. Keep it away from direct sunlight, strong light, heat sources or excessive moisture or dust.

❏ Adjust only those controls that are covered in the user documentation. Improper adjustment of other controls may result in damage requiring extensive repair by a qualified technician.

❏ Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise, you may damage the printer.

❏ Do not turn off the printer while it is printing the self-test. Always press the Offline button to pause printing. Then turn off the printer.

❏ Do not turn off the printer while it is printing the hex dump. Always press the Offline button to pause printing. Then turn off the printer.

❏ Do not reconnect the power cord to an electrical outlet that has the wrong voltage for your printer.

❏ Never replace the print head yourself; you may damage the printer. Also, other parts of the printer must be checked when the print head is replaced.

❏ You need to move the print head by hand to replace the ribbon cartridge. If you have just used the printer, the print head may be hot; let it cool for a few minutes before touching it.

Note for German-speaking users:
Bei Anschluss des Druckers an die Stromversorgung muss sichergestellt werden, dass die Gebaudeinstallation mit einer 10 A- oder 16 A-Sicherung abgesichert ist.

ENERGY STAR® Compliance

As an ENERGY STAR® Partner, Epson has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

The International ENERGY STAR® Office Equipment Program is an international program that promotes energy saving through the penetration of energy efficient computers and other office equipment. The program backs the development and dissemination of products with functions that effectively reduce energy consumption. It is an open system in which business proprietors can participate voluntarily. The targeted products are office equipment such as computers, monitors, printers, facsimiles, copiers, scanners, and multifunction devices. Their standards and logos are uniform among participating nations.

Chapter 3

Paper Handling

Loading Passbooks

3

You can load vertical-fold and horizontal-fold passbooks. Follow the steps shown below to load passbooks.

1. Turn on the printer.

2. Open your passbook to the page to be printed.

    Note:
    Make sure that you press any bulging parts of the folded passbook down to 0.6 mm or less before inserting it into the front slot. For information on the thickness of passbooks you can print, see the Paper Specification that is included on the User CD-ROM.

3. Insert the passbook printable side up into the front slot until the top part of it reaches the roller inside. The printer loads it automatically to the correct position and the passbook is ready to be printed.
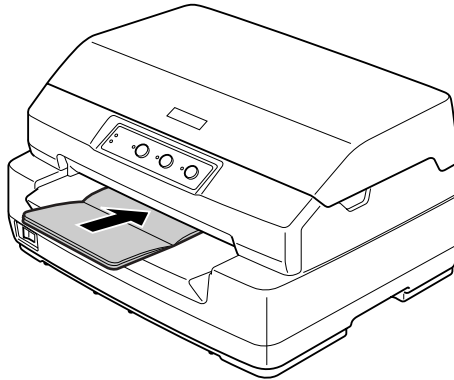
!> **Caution:**
❏ *When you use a passbook, set Passbook mode to On and set Binding mode to the method for the passbook's binding in the default settings mode.*

❏ *Use a passbook that has more than 60% reflectance.*

❏ *Do not load passbooks that are creased or have ripped seam.*

❏ *Do not use a passbook that has any metallic parts such as staplers or metal clips.*

❏ *Do not use a passbook with sticky parts such as stamps or seals.*

❏ *Do not use a passbook that has any pages smaller than the cover page.*

❏ *Do not print on the front or back cover of a passbook. Printing can be done only when the passbook is opened.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

Loading Single Sheets

You can load single sheets and carbonless single sheet multipart forms up to 7 parts (one original and six copies). Follow these steps to load single sheets.

1. Turn on the printer.

2. Insert a single sheet printable side up into the front slot until the top part of the paper reaches the roller inside. The printer loads the paper automatically to the correct position and the paper is ready to be printed.

Note:
❏ *Use paper that has more than 60% reflectance.*

❏ *Do not load paper that is curled or has been folded.*

❏ *Do not punch holes in the area from 25.0 to 40.0 mm from the left edge of paper.*

❏ *When you use paper that is shorter than 110.0 mm, set the paper eject direction to front. The factory set default is front. Refer to the Programming Guide for details.*

❏ *When you print a multipart form that is glued at the top, load the glued part first.*

❏ *Be sure your multipart forms do not exceed 0.53 mm (0.021 inch) in thickness.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

Adjusting the top-of-form position

The top-of-form position is the vertical position on the page where the printer starts printing. If the printout appears too high or low on the page, you can use this function to adjust the top-of-form position.

Follow these steps to adjust the top-of-form position:

Note:
❏ *The factory set default for the top-of-form position is set as shown below.*

PR2: 4.2 mm
ESC/P and IBM PPDS: 8.5 mm

❏ *This mode can be used even when the printer cover is open.*

❏ *If you wish to change the top-of-form position in PR40+, make sure that you set the TOF position for PR40+ to Off.*

❏ *Your top-of-form position setting remains in effect until you change it, even if you turn off the printer.*

❏ *The top margin setting made in some application software overrides the top-of-form position setting you make with this function. If necessary, adjust the top-of-form position in your software.*

❏ *Prepare an A4 size sheet of paper before using this function.*

1. Turn off the printer.

> ⚠ **Caution:**
> *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

2. Turn on the printer while holding the F2 button.

3. Press the Offline button while the F1/Eject, Offline, and F2 lights are flashing.

4. When the Ready light turns on, insert a sheet of A4 paper into the front slot. The printer prints triple H in capitals (HHH) on the current top-of-form position and ejects the sheet.

5. Press the F1/Eject button to move the top-of-form position up on the page, or press the F2 button to move the top-of-form position down on the page. Each time you press the F1/Eject or F2 button, the printer makes a short beep. Pressing these buttons executes micro feed in 0.282 mm (1/90-inch) increments.

Note:
The top-of-form position can be set from 1.0 mm to 33.8 mm in the
PR2 mode and from 1.0 mm to 33.9 mm in the ESC/P and IBM
PPDS modes.

```
    F1          Offline          F2
 ○   (  )      ○   (  )      ○   (  )
    Eject
```
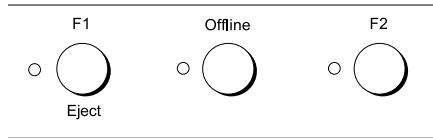
6. Insert a sheet of A4 paper into the front slot. The printer prints triple H in capitals (HHH) on the current top-of-form position and ejects the sheet. You may continue to adjust the position by pressing the F1/Eject and F2 buttons and checking the position by inserting another sheet.

7. After finishing the adjustment, turn off the printer. The setting does not change even if the printer is turned off.

Adjusting the printing start position

The printing start position is the horizontal position on the page where the printer starts printing. If the printout appears too for the left or right on the page, you can use this function to adjust the printing start position.

Follow these steps to adjust the printing start position:

Note:
❏ *Your printing start position setting remains in effect until you*
  change it, even if you turn off the printer.
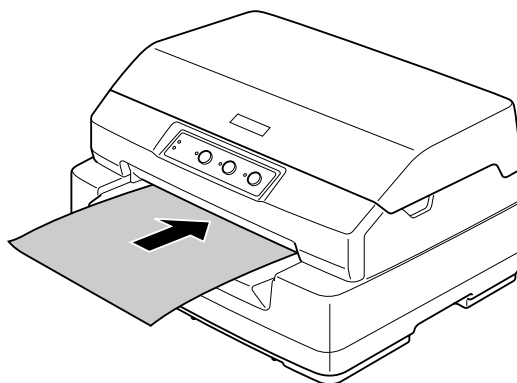
❏ *Prepare an A4 size sheet of paper before using this function.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

1. Turn off the printer.

   > **Caution:**
   > *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

2. Turn on the printer while holding the F2 button.

3. Press the F2 button while the F1/Eject, Offline, and F2 lights are flashing.

4. When the Ready light turns on, insert a sheet of A4 paper into the front slot. The printer prints the guide to adjust the printing start position and position patterns.

5. Press the F1/Eject button for the next pattern or F2 button for the previous pattern to select the printing start position. Each time you press the F1/Eject or F2 button, the printer makes a short beep. The F1/Eject, Offline and F2 lights show the pattern which is selected at that time.

6. After you select the printing start position, turn off the printer. The setting does not change even if the printer is turned off.

Chapter 4

Replacing the Ribbon Cartridge

Genuine Epson ribbon cartridge

When printing becomes faint, you need to replace the ribbon cartridge (S015339). Genuine Epson ribbon cartridges are designed and manufactured to work properly with your Epson printer. They ensure proper operation and long life of the print head and other printer parts.

Replacing the ribbon cartridge

Follow these steps to replace the ribbon cartridge:

Warning:
You need to move the print head by hand to replace the ribbon cartridge. If you have just used the printer, the print head may be hot; let it cool for a few minutes before touching it.

1. Make sure the printer is turned off.
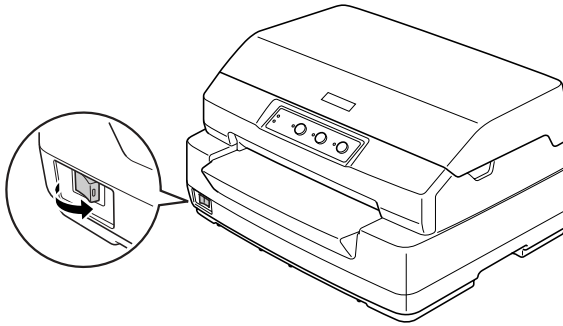
2. Unplug the printer from the electric outlet.

3. Hold both sides of the printer cover and move it upward to open it.
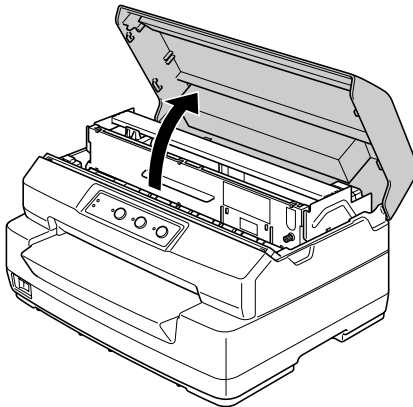
4. Push the release lever to move the upper mechanism forward. Make sure that you push the lever until it clicks.
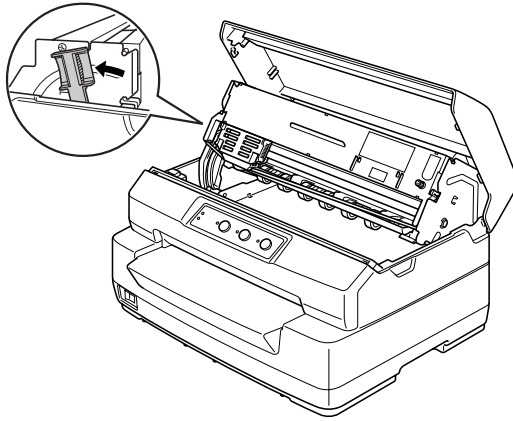
5. Slide the print head to the middle of the printer by hand.
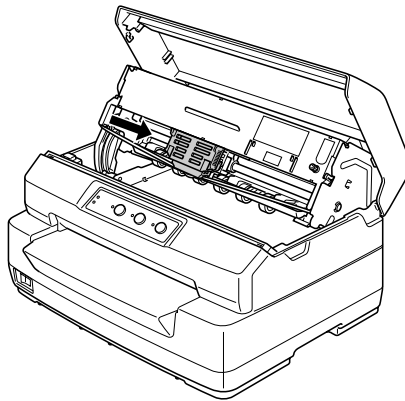
▣ *Caution:*
Never move the print head while the printer is turned on; this can damage the printer.

6. Hold both sides of the ribbon guide and pull it down until it is out of the print head.
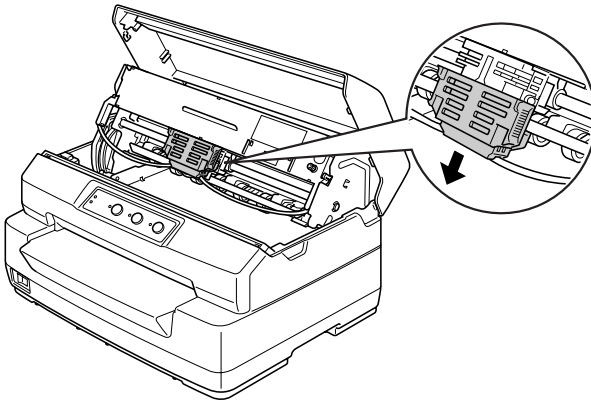
7. Hold both sides of the ribbon cartridge with both hands and rotate it on the plastic hooks. Then pull it up until it is out of the printer.
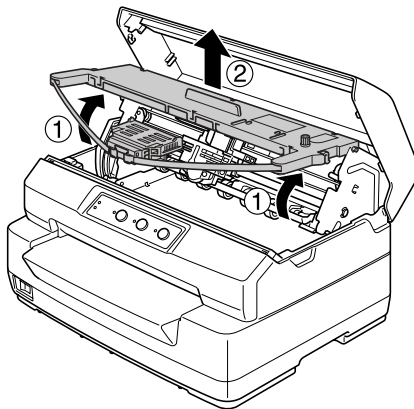
8. Remove the new ribbon cartridge from the package.

9. Place the plastic hooks on the ribbon cartridge into the slots of the printer. Then press the cartridge until it clicks into place.
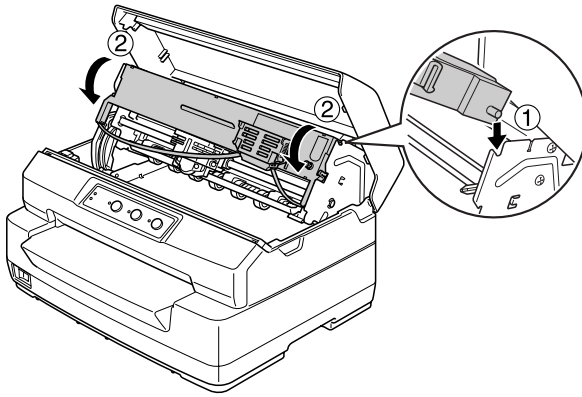
10. Hold both sides of the ribbon guide and pull it down until it is out of the cartridge.
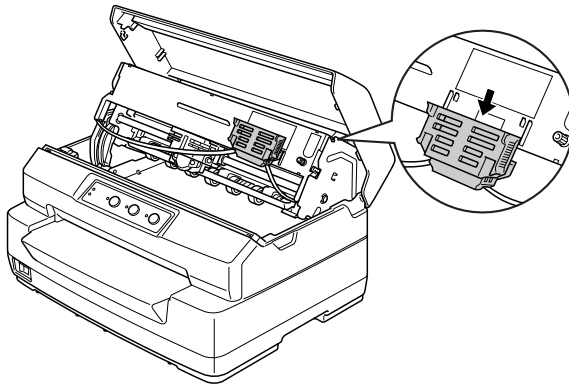
11. Put the ribbon guide at the bottom of the print head and push it up until it clicks.
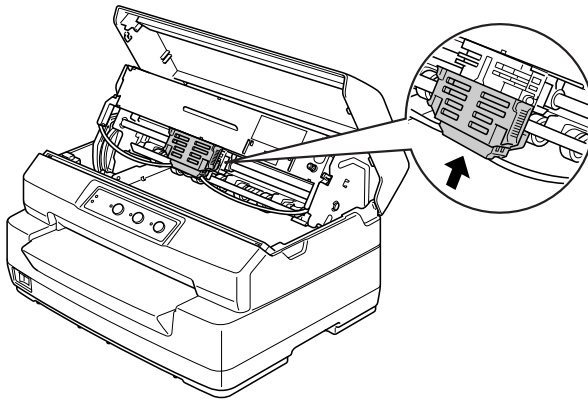
12. Turn the ribbon-tightening knob to help feed the ribbon into place.
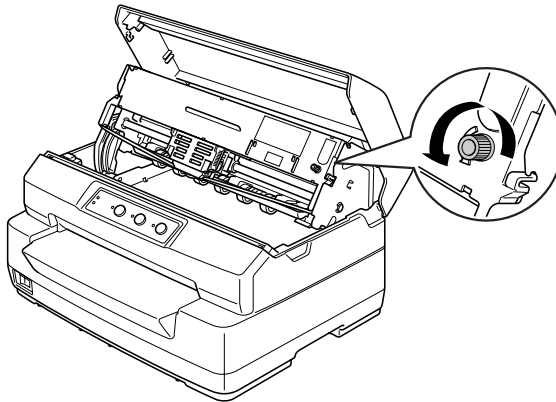
> ⚠ *Caution:*
> *The ribbon should not be twisted or creased.*

13. Pull the release lever back to move the upper mechanism to its original position. Make sure that you pull the lever until it clicks.

4
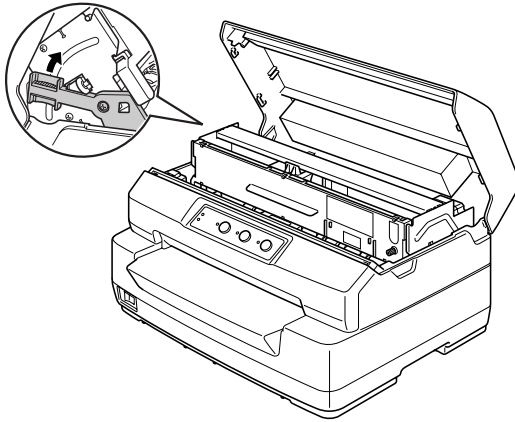
> **c** *Caution:*
> *Make sure that you move the upper mechanism by pulling the release lever. Do not pull the mechanism by hand. It may damage the printer.*

14. Close the printer cover.

Chapter 5

Control Panel

Buttons and Lights
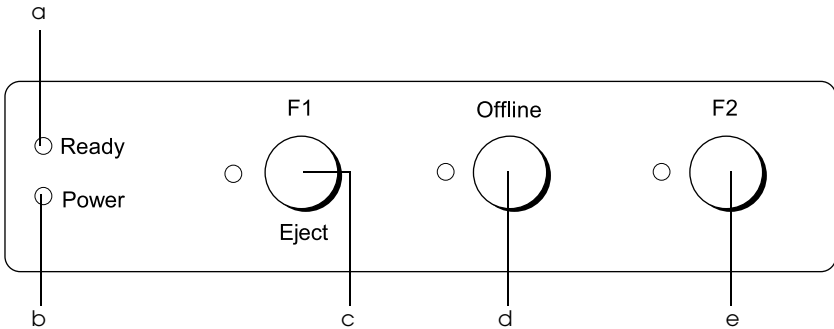
a   Ready light (Yellow)

❑ On when the printer is ready to receive or already receiving data.

❑ Flashes when an error has occurred during a printing operation.

b   Power light (Green)

❑ On for a few seconds when the printer is turned on.

❑ On when the printer is paused.

c   F1/Eject button

❏ Executes functions which are assigned to the F1/Eject button when the printer is in the PR2 mode. You can assign optional functions to it by programming them in the PR2 mode.

❏ Ejects paper when the printer is in the ESC/P or IBM PPDS mode.

❏ When the printer enters the default setting mode, the button works as a button to select the menu. You can select the next menu by pressing this button. See "Changing default settings" on page 53.

F1/Eject light (Yellow)

❏ Works as programmed only when the printer is in the PR2 mode. You can program it when it is on, off or flashes in the PR2 mode.

d   Offline button

❏ Alternates the printer activity between offline and online.

❏ When the printer enters the default setting mode, the button works as a button to select the menu. You can select the previous menu by pressing this button. See "Changing default settings" on page 53.

Offline light (Yellow)

❏ On when the printer is offline.

e   F2 button

❏ Executes functions which are assigned to the F2 button when the printer is in the PR2 mode. You can assign optional functions to it by programming them in the PR2 mode.

❏ When the printer enters the default setting mode, you can change the setting by pressing this button. See "Changing default settings" on page 53.

F2 light (Yellow)

❏ Works as programmed only when the printer is in the PR2 mode. You can program it when it is on, off or flashes in the PR2 mode.

5

Functions auxiliary

This section describes functions executed by turning on the printer while holding one or more buttons. These functions are shown in the following table and explained in detail after the table.

Switch	Function
F2*	Self-test
F1/Eject & F2	Default setting
F1/Eject & Offline	Compress printing mode
Offline	Data dump
Open the cover & F1/Eject	Paper removing
F2**	Bidirectional adjustment
F2***	Top-of-form adjustment
F2****	Printing start position adjustment

*   To enter this mode, press the F1/Eject and F2 button while the F1/Eject, Offline, and F2 lights are flashing.

**   To enter this mode, press the F1/Eject button while the F1/Eject, Offline, and F2 lights are flashing.

***   To enter this mode, press the Offline button while the F1/Eject, Offline, and F2 lights are flashing.

**** To enter this mode, press the F2 button while the F1/Eject, Offline, and F2 lights are flashing.

Self-test

Prints the self-test. See "Printing a Self-Test" on page 55 for more information.

Default setting

Starts the default setting mode. See "Changing default settings" on page 53 for more information.

Compress printing mode

Starts the compress printing mode. See "Compress Printing Mode" on page 38 for more information.

Data dump

Starts the data dump mode, in which all input data is printed as hexadecimal numbers and corresponding characters. See "Printing Hex Dump" on page 56 for more information.

Paper removing

Starts the paper removing mode. See "Clearing Paper Jams" on page 74 for instruction on feeding paper.

Bidirectional adjustment

Starts the bidirectional adjustment mode. See "Aligning Vertical Lines in Your Printout" on page 58 for more information.

Top-of-form adjustment

Starts the top-of-form position adjustment mode. See "Adjusting the top-of-form position" on page 20 for more information.

Printing start position adjustment

Starts the printing start position adjustment mode. See "Adjusting the printing start position" on page 22 for more information.

Compress Printing Mode

You can compress your printing data to the ratio of 75% by following the steps below.

Note:
Compress printing mode is effective only when the printer is in the ESC/P mode.

1. Turn off the printer.

   ! *Caution:*
   Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.

2. Turn on the printer while holding the F1/Eject and Offline buttons. The printer makes two short beeps and enters the compress printing mode.

Chapter 6

Changing your Printer's Settings

About Your Printer's Default Settings

The default settings control many printer functions. While you can often set these functions through your software or printer driver, you may sometimes need to change a default setting from the printer's control panel using the default-setting mode.

For a detailed description of the settings you can change in the default-setting mode, see "Understanding default settings" on page 39. For instructions on changing the settings, see "Changing default settings" on page 53.

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Understanding default settings

This section describes the settings and options available in the default-setting mode.

All items available in the default setting mode are divided into three groups depending on the applications. You can select the three main menus while making the default settings and then change the setting of each item which belongs to the menu you selected. On the Common Settings menu, you can change the settings which are effective in all three application modes. On the PR2 Mode Settings menu, you can change the settings which are active in the PR2 mode. Then you can change the settings active in the ESC/P and IBM PPDS modes on the Other Emulation Settings menu.
These settings are shown in the following tables and explained in detail after the each table.

To access and change a setting, see "Changing default settings" on page 53.

Default-setting mode

Common Settings

Menu	Values (default in bold)
Software	**PR2**, ESC/P2, IBM PPDS
High speed draft	**Off**, On
I/F mode *	**Auto**, Parallel, Serial, USB
Auto I/F wait time (Seconds)	**10**, 30
Parallel I/F bidirectional mode	Off, **On**
Packet mode **	**Auto**, Off
Baud rate (bps)	19200, **9600**, 4800, 2400, 1200, 600, 300
Data length (bit)	**8**, 7
Parity	**None**, Odd, Even
DSR (PR2)	**Off**, On
DCD (PR2)	**Off**, On
Passbook	Off, **On**
Binding	**Horizontal**, Vertical
Thin paper	**Off**, On
Buzzer	Off, **On**
Paper width measurement	**After loading**, Before printing
Right paper edge detection	Off, **On**
Low-noise mode	**Off**, On
Broken pin compensation	**Off**, On
Broken pin number	**1**, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

Menu	Values (default in bold)
Roll Paper	**Off**, On
Rear Paper Guide	**Off**, On

* When the printer turns on in Auto I/F mode and PR2 mode, this mode is set to Serial.

** When the printer turns on in the PR2 mode, Packet mode is set Off.

Software

This setting allows you to select the software format. When you select ESC/P2, the printer operates in the EPSON ESC/P mode. When you select PR2 or IBM PPDS, the printer emulates an Olivetti or IBM printer.

High speed draft

This option is available when the pitch is 10 and 12 cpi (characters per inch). When you choose On, the printer prints up to 480 cps (characters per second) at 10 cpi. When you choose Off, the printer prints up to 360 cps at 10 cpi.

I/F mode

The printer provides built-in slots for three kinds of interfaces; Parallel, Serial, and USB. You can choose Auto (automatic), Parallel, Serial, or USB, for the interface mode. When you select Auto, the printer automatically selects the interface that is receiving data, and uses that interface until the end of the print job. The Auto setting allows you to share the printer among multiple computers without changing the interface mode. When the printer turns on in Auto I/F mode and PR2 mode, this mode is set to Serial.

If only one computer is connected to the printer, you can select Parallel, Serial, or USB depending on which interface your computer uses.

Auto I/F wait time (Seconds)

When the printer is in the auto interface mode and it receives no data from the currently selected interface for the amount of time specified with this setting, it determines which interface is receiving data and switches to that interface. You can specify either 10 or 30 for the auto interface wait time. When the printer turns on in the PR2 mode, this mode is not activated.

Parallel I/F bidirectional mode

The Parallel Interface bidirectional transfer mode is used when this feature is set to On. If bidirectional transfer mode is unnecessary, select Off.

Packet mode

Make sure to select Auto when you print from Windows applications using the printer driver included on the User CD-ROM. Set this feature to Off if you have connection troubles while printing from applications based on other operating systems such as DOS. When the printer turns on in the PR2 mode, this mode is set to Off.

Baud rate (bps)

Use this option to set the data transfer rate (baud) for the serial interface. The baud rate is measured in bits per second (bps).

Data length (bit)

Set the data length of the serial interface to 7 or 8.

Parity

When this option is set to None, parity checking is disabled. The parity bit, if used, provides a basic form of error detection.

DSR (PR2)

When you select On, DSR (Data Set Ready) is activated.

This option is available only in the PR2 mode.

DCD (PR2)

When you select On, DCD (Data Carrier Detector) is activated.

This option is available only in the PR2 mode.

Passbook

When you use single sheet or passbook, set this option to On. When you use multipart forms, set this option to Off.

Binding

You need to set the method for binding when you use a passbook. Select Horizontal for a horizontal-fold passbook or Vertical for a vertical-fold passbook.

Thin paper

When you use thin paper, set this option to On. This mode is activated when you select On and the Passbook mode is set to Off.

Buzzer

If you set this feature to On, the printer beeps when an error occurs. See "Using the error indicators" on page 61 for more information on printer errors. If you do not want the printer to beep, select Off.

Paper width measurement

You can set the timing when the printer measures the width of the paper. When you select After loading, the printer measures the width just after it loads the paper. When you select Before printing, it makes the measurement just before printing the first line.

Right paper edge detection

This setting allows you to determine whether the printer prints excess data when the data is longer than the paper width. When you select On, the excess data is not printed. When you select Off, the printer prints the excess data on the next line.

Low-noise mode

When this mode is set to On, the noise is reduced, but the printing speed is slower.

Broken pin compensation

When this feature is On, printing is done at normal quality if one of the 24 pins is broken. You need to set the broken pin number at the Broken pin number setting.

Broken pin number

Select the pin number of the broken pin. The broken pin number is shown on the sheet of current default settings that can be printed in the default settings mode. The gap on the sloping line above the pin numbers shows the broken pin number.

Roll Paper

When you use roll paper with the optional roll paper holder, set this option to On. This mode is activated when you select On and the Passbook mode is set to Off.

When this option is set to Off and paper is left in the printer, the printer ejects the paper when the printer is turned on or the cover is opened. When this option is set to On, the printer does not eject the paper.

Rear Paper Guide

When you use the optional rear paper guide, set this option to On.

When you select On and the Roll Paper mode is also set to On, the Roll Paper mode is not available.

PR2 Mode Settings

Menu	Values (default in bold)
Emulation	**PR2**, PR40+, PR54+
Font	Draft, **NLQ1**, NLQ2, LQ2, OCR-A, OCR-B
Pitch (cpi)	10, **12**, 15, 16.6, 13, 17.1
Character table	**Olivetti**, PC, ISO
Olivetti character table	**ST15INT (International)**, ST15ITA (Italy), ST15P (Portugal), ST15USSR (USSR), ST15SDC (SDC),ST15E (Spain 1), ST15E2 (Spain 2), ST15S/SF (Sweden/Finland), ST15CH (Switzerland), ST31 (Olivetti TCV 370), ST15TR (Turkey), ST15USA (U.S.A.), ST15YU (Yugoslavia), ST15ARABIC (Arabic), ST15CND (Canada), ST15CIBC (CIBC), ST15DK/N (Denmark/Norway), ST15IL (Israel), ST15F (France), ST15UK (Great Britain), ST15D (Germany), ST15GR (Greece)

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Menu	Values (default in bold)
PC character table	**PC437 (INT)**, PC210 (GR), PC220 (E), PC850 (LATIN 1), PC851 (GREEK), PC 852 (LATIN 2), PC855 (CYRILLIC), PC857 (LATIN 5), PC858 (LATIN EURO), PC860 (P), PC862 (IL), PC863 (CANADIAN FRENCH), PC864 (ARABIC), PC865 (NORDIC), PC866 (CYRILLIC), DK/N (Denmark/Norway), DK (Denmark), PC1252 (PC-WIN LATIN1), PC1250 (PC-WIN LATIN2)
ISO character table	**CPOLUNIX**, ISO 8859/15, ISO 8859/1, ISO 8859/2, ISO 8859/5, ISO 8859/6, ISO 8859/7, ISO 8859/8, ISO 8859/9
8-pin bit image resolution	72, **96**
Condensed pitch (cpi)	**16.6**, 17.1
Vertical resolution	1/216", **1/240"**
Auto CR	**Off**, ON
Columns	90, **94**
Horizontal tab	4, 6, **8**
TOF position for PR40+	**Off**, On
Magnetic standard *	DIN/ISO, ANSI, **IBM3604**, IBM4746, ISO7811, HT2751CIZ, ISO8484
End sentinel * **	C, **F**
Displacement *	**Standard**, +10, +20
Duplicate *	**Off**, On
Retry *	**1**, 3

* These settings are available only for PLQ-20M.

** This setting is effective, when the format of IBM3604 or IBM4746 is selected.

Emulation

You can select emulation of PR2, PR40+, or PR54+.

Font

This setting allows you to set one of the six fonts.

Pitch (cpi)

This setting allows you to set one of six pitches.

Character table

You can set one of the three character tables; Olivetti, PC, ISO.

Olivetti character table

You can select a font. The setting you select in this table is effective only when you have chosen Olivetti in the Character table setting.

PC character table

You can select a font. The setting you select in this table is effective only when you have chosen PC in the Character table setting.

ISO character table

You can select a font. The setting you select in this table is effective only when you have chosen ISO in the Character table setting.

8-pin bit image resolution

You can select 72 or 96 as the default value of the 8 pin bit image resolution.

Condensed pitch (cpi)

You can set the pitch that is used in the condensed mode.

Vertical resolution

This setting allows you to select the vertical resolution.

Auto CR

When auto carriage return is set to On, each line feed (LF) code is accompanied by a carriage return (CR) code so the printer moves the next printing start position to the left margin. When this setting is set to Off, you must send a CR code after the line feed code to move the printing start position to the left margin.

Columns

You can select the number of columns in one line.

Horizontal tab

You can set the Tab key movement to 4, 6, or 8. If you select 4, the movement range is equivalent to 4 letters in the size you selected in Pitch.

TOF position for PR40+

When you select On in this option and PR40+ in Emulation, the top-of-form position is set to 6.5 mm which is unique to the PR40+ mode. When you select Off and PR40+, the top-of-form position is set to the same position as in the PR2 and PR54+ modes (the factory set default is 4.2 mm).

Magnetic standard

You can select the magnetic standard in this setting.

This feature is available only for PLQ-20M.

End sentinel

You can select C or F as the letter which will be attached to the end of the data recorded on magnetic stripes.

This setting is effective only when the format for IBM3604 or IBM4746 is selected in the Magnetic standard setting.

This feature is available only for PLQ-20M.

Displacement

This option allows you to select the displacement value of the magnetic stripe.

This feature is available only for PLQ-20M.

Duplicate

When this feature is set to On, the magnetic stripes record the data in duplicate.

This feature is available only for PLQ-20M.

Retry

This setting allows you to set the number of times the printer tries to receive data before it fails.

This feature is available only for PLQ-20M.

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Other Emulation Settings

Menu	Values (default in bold)
Print direction	**Bi-D.**, Uni-D., Auto
0 slash	**0**, ∅
Font	Draft, **Roman**, Sans Serif, Courier, Prestige, Script, OCR-B, Orator, Orator-S, Script C, Roman T, Sans Serif H
Pitch (cpi)	**10**, 12, 15, 17.1, 20, Proportional
Character table	Standard model: Italic, **PC437**, PC850, PC860, PC863, PC865, PC861, BRASCII, Abicomp, Roman 8, ISO Latin 1, PC858, ISO 8859-15 All other models: Italic, **PC437**, PC850, PC437 Greek, PC853, PC855, PC852, PC857, PC866, PC869, MAZOWIA, Code MJK, ISO 8859-7, ISO Latin IT, Bulgaria, PC774, Estonia, ISO 8859-2, PC 866 LAT., PC 866 UKR, PC860,PC861, PC865, PC864, PC APTEC, PC708, PC720, PC AR864, PC863, BRASCII, Abicomp, Roman 8, ISO Latin 1, PC858, ISO 8859-15, PC 771, PC437 Slovenia, PC MC, PC 1250, PC 1251
International character set for Italic table	**Italic U.S.A.**, Italic France, Italic Germany, Italic U.K., Italic Denmark 1, Italic Sweden, Italic Italy, Italic Spain 1
Auto line feed	**Off**, On
Auto CR (IBM PPDS) *	**Off**, On
AGM (IBM PPDS) *	**Off**, On
IBM character table (IBM PPDS) *	**Table2**, Table1
Columns	80, 90, **94**
Paper loading	**Auto loading**, Data exists

* These settings are effective when IBM PPDS emulation is selected.

Print direction

You can select auto print direction (Auto), bidirectional printing (Bi-D), or unidirectional printing (Uni-D). Printing is normally bidirectional; however, unidirectional printing allows for precise vertical printing alignment.

When set to Auto, the printer analyzes the data and uses unidirectional printing for any lines which require vertical printing alignment.

0 slash

The zero character has a slash (∅) when this feature is set to On; it has no slash (0) when set to Off. The slash allows you to easily distinguish between the uppercase letter "O" and a zero.

Font

This setting allows you to set one of the six fonts.

Pitch (cpi)

This setting allows you to set one of six pitches.

Character table

You can select among various character tables. This setting is used when you print without using the printer driver.

When using the printer driver, change the settings on the printer driver. For details, see *Reference Guide* that is included on the User CD-ROM.

International character set for italic table

You can select among several international character sets for the italic character table. Each character set contains eight characters that vary depending on the country or language, so you can customize the italic table to suit your printing needs.

Auto line feed

When auto line feed is set to On, the printer accompanies each carriage return (CR) code received with a line feed (LF) code.

Auto CR (IBM PPDS)

When auto carriage return is set to On, each line feed (LF) code or ESC J code is accompanied by a carriage return (CR) code so the printer moves the next printing start position to the left margin. When this setting is set to Off, you must send a CR code after the line feed code to move the printing start position to the left margin.

This feature is available only in IBM PPDS emulation mode.

A.G.M. (IBM PPDS)

When the alternate graphic mode (A.G.M.) is set to On, the ESC 3, ESC A, ESC J, ESC K, ESC L, ESC Y, ESC Z, and ESC * commands in IBM PPDS emulation mode work the same way as in ESC/P mode.

This feature is available only in IBM PPDS emulation mode.

IBM character table (IBM PPDS)

Select table2 or table1 for the IBM character table.

This feature is available only in IBM PPDS emulation mode.

Columns

You can select the number of columns in one line.

Paper loading

When you set Auto load, the printer loads paper just after it is inserted. When you set Data exists, the printer does not load the paper until it receives the data.

Changing default settings

The following table shows the basic function of each button in the default setting mode.

Button	Basic function
F1/Eject	Selects the next menu parameter.
Offline	Selects the previous menu parameter.
F2	Changes the value in the selected menu.

Follow these steps to enter the default-setting mode and change the printer's default settings:

Note:
❏ *Prepare an A4 size sheet of paper before entering the default setting mode.*

❏ *You need to load a new sheet of paper each time the printer ejects a printed sheet from the front slot.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

1. Turn off the printer.

   ⚠ *Caution:*
   Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.

2. Turn on the printer while holding the F1/Eject and F2 buttons on the control panel.

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3. When the Ready light turns on, insert a sheet of A4 paper into the front slot. The printer prints the version number and the language selection for the default settings menu. The underline shows the selected language. Select the language by pressing the F1/Eject button.

4. Press the F2 button to set the language. The printer prints a message asking if you wish to print the current settings. If you wish to print the current settings, press the F2 button. The printer prints the current settings. The underline shows the setting value that is currently selected for each item. You can also bypass printing the current setting by pressing the F1/Eject button.

5. The printer prints the setting method and the first selection of the main setup menu.

   Common Settings menu

   PR2 Mode Settings menu

   Other Emulation Settings menu

   You can select the main setup menu by pressing F2. Then press the F1/Eject to set it.

6. Select the menu parameters which you wish to change by pressing the F1/Eject button (for the next item) or the Offline button (for the previous item). The printer prints the item and the current setting value of that item is underlined.

7. Press the F2 button to change the value and the printer prints the next value.

8. You may either continue to make changes to other parameters by pressing the F1/Eject or Offline button. The menu selection will return to the selection of the three main setup menus after the selection of the last parameter on each menu is done.

Note:
When you press the Offline *button at the first item selection of each menu, the menu selection will also return to the main setup menu selection.*

9. After you finish the default setting, turn off the printer to exit the default setting mode.

Printing a Self-Test

Running the printer's self-test helps you determine whether the printer or the computer is causing the problem:

❏ If the self-test results are satisfactory, the printer is working properly and the problem probably results from your printer driver settings, application settings, computer, or interface cable. (Be sure to use a shielded interface cable.)

❏ If the self-test does not print properly, there is a problem with the printer. See "Problems and Solutions" on page 64 for possible causes and solutions to the problem.

Note:
❏ *Prepare an A4 size sheet of paper before entering the self-test printing mode.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

Follow these steps to perform a self-test:

1. Turn off the printer.

> ❗ *Caution:*
> *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

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2. Turn on the printer while holding the F2 button. Then press the F1/Eject and F2 button while the F1/Eject, Offline, and F2 lights are flashing.

3. When the Ready light turns on, insert a sheet of A4 paper into the front slot.

4. The printer prints the self-test pattern in the font selected in the default settings mode.

```
Roman
  !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}˜Ç
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}˜Çü
 "#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}˜Çüé
                                          .
                                          .
                                          .
                                          .
```

Note:
To stop the self-test temporarily, press the offline *button. To resume the test, press the* offline *button again.*

c *Caution:*
Do not turn off the printer while it is printing the self-test. Always press the Offline *button to pause printing. Then turn off the printer.*

Printing Hex Dump

If you are an experienced user or a programmer, you can print a hexadecimal dump to isolate communication problems between the printer and your software program. In hex dump mode, the printer prints all data it receives from the computer as hexadecimal values.

Note:
❏ *The hex dump feature is designed for use with DOS-based PC.*

❏ *Prepare an A4 size sheet of paper before entering the hex dump printing mode.*

❏ *Always close the printer cover before printing. The printer does not print when the printer cover is open.*

Follow these steps to print a hex dump:

1. Turn off the printer.

> ⚠ **Caution:**
> *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

2. Turn on the printer while holding the Offline button to enter hex dump.

3. Open a software program and send a print job to the printer. Your printer prints all the codes it receives in hexadecimal format.

```
1B 40 20 54 68 69 73 20 69 73 20 61 6E 20 65 78    .@ This is an ex
61 6D 70 6C 65 20 6F 66 20 61 20 68 65 78 20 64    ample of a hex d
75 6D 70 20 70 72 69 6E 74 6F 75 74 2E 0D 0A       ump printout....
```

By comparing the characters printed in the right column with the printout of the hexadecimal codes, you can check the codes the printer is receiving. If characters are printable, they appear in the right column as ASCII characters. Nonprintable codes, such as control codes, are represented by dots.

> ⚠ **Caution:**
> *Do not turn off the printer while it is printing the hex dump. Always press the Offline button to pause printing. Then turn off the printer.*

Aligning Vertical Lines in Your Printout

If you notice that the vertical lines in your printout are not properly aligned, you can use the printer's bidirectional adjustment mode to correct this problem.

During bidirectional adjustment, the printer prints three sheets of alignment patterns, labeled Draft, Bit image (ESC * 26H), and LQ (letter quality). As described below, you select the best alignment pattern from each sheet.

Note:
Prepare an A4 size sheet of paper before entering the bidirectional adjustment mode.

Follow these steps to perform the bidirectional adjustment:

1. Turn off the printer.

    > **Caution:**
    > *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

2. Turn on the printer while holing the F2 button.

3. Press the F1/Eject button while the F1/Eject, Offline, and F2 lights are flashing.

4. When the Ready light turns on, insert a sheet of A4 paper into the front slot. The printer prints the guide to adjust the bidirectional alignment and the first set of alignment patterns.

5. As described in the instructions, compare the alignment patterns and select the pattern with the best alignment. You can select the alignment pattern by pressing the F1/Eject button (for the next pattern) and the F2 button (for the previous pattern). The F1/Eject, Offline and F2 lights show the pattern which is selected at that time. Each time you press the F1/Eject or F2 button, the printer makes a short beep.

6. Set the pattern by pressing the Offline button. The printer prints the next set of alignment patterns.

7. After you select the best pattern in the final set of alignment patterns and set it by pressing the Offline button, turn off the printer. The setting does not change even if the printer is turned off.

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Chapter 7

Problem Solver

Using the error indicators

You can identify many common printer problems using the lights on the control panel. If your printer stops working and one or more control panel lights are on or flashing or the printer beeps, use the following table to diagnose and fix the problem. If you cannot fix your printer problem using this table, see "Problems and Solutions" on page 64.

Note:
The printer beeps once if you press a control panel button when the corresponding function is not available.

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PR2 mode

State of panel lights	Beep pattern	Problem
		Solution
● Power ○ Ready	—	There is no paper loaded in the slot.
		Load a paper into the front slot.
	—	Paper is not loaded correctly.
		Remove the paper and reload it correctly. See "Loading Passbooks" on page 17, or "Loading Single Sheets" on page 19.
	—	Paper is not fully ejected.
		See "Clearing Paper Jams" on page 74 for instruction on ejecting paper.
	—	Paper is jammed in the printer.
		To clear the paper jam, see "Clearing Paper Jams" on page 74.
● Power ● Offline	—	The printer cover is open.
		Stop the operation and close the printer cover.
● Power ○ Offline	—	The print head is overheated.
		Wait for a few minutes; the printer resumes printing automatically once the print head cools.
● Pause ○ Ready ○ F1/Eject ○ Offline ○ F2	•••••	An unknown printer error has occurred.
		Turn off the printer and leave it off for several minutes; then turn on the printer again. If the error recurs, contact your dealer.

● = on, ○ = flashing

••• = short series of beeps (three beeps), ••••• = long series of beeps (five beeps)

ESC/P and IBM PPDS modes

State of panel lights	Beep pattern	Problem
		Solution
● Power Ö Ready ● Offline	•••	There is no paper loaded in the slot.
		Load a paper into the front slot.
	•••	Paper is not loaded correctly.
		Remove the paper and reload it correctly. See "Loading Passbooks" on page 17, or "Loading Single Sheets" on page 19.
	•••	Paper is not fully ejected.
		Press the F1/Eject button to eject paper.
	•••	Paper is jammed in the printer.
		To clear the paper jam, see"Clearing Paper Jams" on page 74.
● Power ● Offline	•••	The printer cover is open.
		Stop the operation and close the printer cover.
● Power Ö Offline	—	The print head is overheated.
		Wait for a few minutes; the printer resumes printing automatically once the print head cools.
● Pause Ö Ready Ö F1/Eject Ö Offline Ö F2	•••••	An unknown printer error has occurred.
		Turn off the printer and leave it off for several minutes; then turn on the printer again. If the error recurs, contact your dealer.

● = on, Ö = flashing

••• = short series of beeps (three beeps), ••••• = long series of beeps (five beeps)

Problems and Solutions

Most problems you may encounter while operating your printer have simple solutions. Use the information in this section to find the source of and solution to printer problems that occur.

"Power supply problems" on page 65

"Paper loading or feeding problems" on page 66

"Printing position problems" on page 67

"Printing or printout quality problems" on page 68

"Network problems" on page 73

You can also use the self-test to determine whether the printer or the computer is causing the problem. See "Printing a Self-Test" on page 55 for instructions on printing a self-test. To pinpoint communication problems, experienced users may want to use the printer's hex dump mode described in "Printing Hex Dump" on page 56.

To clear a paper jam, see "Clearing Paper Jams" on page 74.

Power supply problems

The control panel lights come on briefly, but then go off and stay off.

Cause	What to do
The printer's voltage rating does not match the voltage of your electrical outlet.	Check the printer and the outlet voltage ratings. If the voltages do not match, unplug the printer immediately and contact your dealer.

⚠ *Warning:*
Do not reconnect the power cord to an electrical outlet that has the wrong voltage for your printer.

The printer does not work and the control panel lights are off even when you turn on the printer.

Cause	What to do
The power cord is not properly plugged into the electrical outlet or your printer.	Turn off the printer, and make sure the power cord is firmly plugged into the electrical outlet and the printer, if necessary. Then turn on the printer.
The electrical outlet does not work.	Use a different outlet.

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Paper loading or feeding problems

The printer does not load single-sheet paper or does not feed it properly.

Cause	What to do
Single-sheet paper is not loaded properly.	See "Loading Single Sheets" on page 19 for instructions on loading single-sheet paper.
Paper is creased, old, too thin, or too thick.	See the *Paper Specification* for information about the printable paper and use new, clean sheets of paper.

The printer does not fully eject a single sheet.

Cause	What to do
Paper is too long.	When the printer is in the PR2 mode, see "Clearing Paper Jams" on page 74 for instructions on ejecting paper. When you are in the ESC/P and IBM PPDS modes, press the F1/Eject button. Make sure the page length of your paper is within the range specified for single-sheet paper in *Paper Specification*. Also check and adjust the paper size setting in your application or printer driver.

The printer does not load passbook or does not feed it properly.

Cause	What to do
Passbook is not loaded properly.	See "Loading Passbooks" on page 17 for instructions on loading passbooks.

Printing position problems

Wrong top-of-form position

Your printing appears too high or low on the page.	
Cause	**What to do**
The paper size setting in your application software or printer driver does not match the size of the paper you are using.	Check the paper size setting in your application or printer driver.
The top margin or top-of-form position setting is incorrect.	Check and adjust the margin or top-of-form position settings in your application software. For information on printable areas, see the *Paper Specification*.
	You can also adjust the top-of-form position using the top-of-form adjusting function. See "Adjusting the top-of-form position" on page 20.
The printer driver settings you want to use are not selected in your software.	Choose the correct printer driver setting from the Windows desktop or in your application before printing.

7

Printing or printout quality problems

The printer is on but it doesn't print.	
Cause	**What to do**
The interface cable is broken or twisted.	Check that the interface cable is not broken or twisted. If you have another interface cable, replace the cable and check whether the printer works correctly.
The printer is not connected directly to your computer.	When you use a printer changer, printer buffer, or a extension cable, the printer does not print correctly due to the combination of these devices. Make sure that the printer works correctly when it is connected to your computer without these devices.
The printer driver is not installed correctly.	Check that the printer driver is installed properly. If necessary, reinstall the printer driver.
Paper is jammed or the ribbon or guard mechanism is stuck.	Turn the printer off, open the printer cover and remove the jammed paper or things that are stuck. To eject the jammed paper, see "Clearing Paper Jams" on page 74.
The USB setting is incorrect.	Confirm the USB setting is correct. For details, see *Reference Guide* that is included on the User CD-ROM.
The printer is hung-up (stopping in abnormal situations).	Turn the printer off and wait for a while. Then, turn the printer on again, and start printing.

The printer does not print when the computer sends data.

Cause	What to do
The printer is paused.	Press the Offline button to turn off the Power light.
The interface cable is not plugged in securely.	Check that both ends of the cable between the printer and the computer are plugged in securely. If the cable is connected correctly, run a self-test as described in "Printing a Self-Test" on page 55.
Your interface cable does not meet the printer and/or computer specifications.	Use an interface cable that meets the requirements of both the printer and computer. See "Electronic" on page 84 and your computer documentation.
Your software is not properly set up for your printer.	Select your printer from the Windows desktop or in your application. If necessary, install or reinstall the printer driver software. For details, see *Reference Guide* that is included on the User CD-ROM.

The printer makes noise, but nothing prints or printing stops abruptly.

Cause	What to do
The ribbon has too much slack, the ribbon has come loose, or the ribbon cartridge is not installed properly.	Remove any slack in the ribbon by turning the ribbon-tightening knob, or reinstall the ribbon cartridge as described in the section under "Replacing the ribbon cartridge" on page 25.

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The printout is pale.

Cause	What to do
The ribbon is worn out.	Replace the ribbon cartridge as described in "Replacing the ribbon cartridge" on page 25.

The printout is faint.

Cause	What to do
The ribbon is worn out.	Replace the ribbon cartridge as described in "Replacing the ribbon cartridge" on page 25.

Part of the printout is missing, or dots are missing in random positions.

Cause	What to do
The ribbon has too much slack, the ribbon has come loose, or the ribbon cartridge is not installed properly.	Remove any slack in the ribbon by turning the ribbon-tightening knob, or reinstall the ribbon cartridge as described in "Replacing the ribbon cartridge" on page 25.
The ribbon is worn out.	Replace the ribbon cartridge as described in "Replacing the ribbon cartridge" on page 25.

Lines of dots are missing in the printout.

Cause	What to do
The print head is damaged.	Print the current settings in the default settings mode and check the pin condition. See "Changing default settings" on page 53 to see how to print them.
	If only one pin is broken, other pins can compensate for it. See "Broken pin compensation" on page 44 for details.
	If more than two pins are broken, stop printing and contact your dealer to have the print head replaced.

> ⚠ *Caution:*
> *Never replace the print head yourself; you may damage the printer. Also, other parts of the printer must be checked when the print head is replaced.*

All the text is printed on the same line.

Cause	What to do
No line feed command is sent at the end of each line of text.	Set the Auto line feed setting to On in the default settings mode so that the printer automatically adds a line feed code to each carriage return. See "Changing default settings" on page 53.

The printout has extra blank lines between lines of text.

Cause	What to do
Two line feed commands are being sent at the end of each line of text, because the printer's auto line feed setting is on.	Set the Auto line feed setting to Off in the default settings mode. See "Changing default settings" on page 53.

| The line space setting in your application software is incorrect. | Adjust the line space setting in your application software. |

The printer prints strange symbols, incorrect fonts, or other inappropriate characters.

Cause	What to do
Your printer and computer are not communicating correctly.	Make sure that you use the correct interface cable and that the communications protocol is correct. See "Electronic" on page 84 and your computer documentation.
The wrong character table is selected in your software.	Select the correct character table using your software or the default-setting mode. The character table setting in your software overrides settings made in the default-setting mode.
The printer you want to use is not selected in your software.	Choose the correct printer from the Windows desktop or in your application before printing.
Your application software is not configured correctly for your printer.	Make sure that your application software is configured correctly for your printer. See your application documentation. If necessary, install or reinstall the printer driver software. For details, see *Reference Guide* that is included on the User CD-ROM.
Software settings override settings you make using the default-setting mode or the control panel buttons.	Use your application software to select the font.

Vertical printed lines are not aligned.

Cause	What to do
Bidirectional printing, which is the printer's standard printing mode, is out of alignment.	Use the printer's bidirectional adjustment mode to correct this problem. See "Aligning Vertical Lines in Your Printout" on page 58.

Network problems

The printer does not print when using a network.

Cause	What to do
The network setting is wrong.	Check whether or not print jobs from other computers are being printed through the network.
	When the print job is executed, the printer or your computer may have a problem. Check the connection between the printer and your computer, settings on the printer driver, and settings of your computer.
	When the print job is not executed, network settings may be incorrect. Ask your network administrator for help.

7

Clearing Paper Jams

If paper is not automatically ejected in the situations noted below, a paper jam may have occurred inside the printer.

❏ The printer is turned on or the cover is opened when the Roll paper mode is Off.

❏ You press the F1/Eject button in the ESC/P or IBM PPDS mode.

Follow the steps noted below to clear the paper jam.

> ⚠ *Warning:*
> *If you have just used the printer, the print head may be hot; let it cool for a few minutes before touching it.*

1. Turn off the printer.

   > ▉ *Caution:*
   > *Whenever you turn off the printer, wait at least five seconds before turning it back on; otherwise you may damage the printer.*

2. Open the cover and press the release lever to move the upper mechanism. Then hold the jammed paper with both hands and pull it out of the printer. If you can clear the paper jam, move the upper mechanism to its original position by pulling the release lever and then close the printer cover. If it is difficult to do that, go to the next step.

   > ▉ *Caution:*
   > *Make sure that you move the upper mechanism by pulling the release lever. Do not pull the mechanism by hand. It may damage the printer.*

3. Turn on the printer while pressing the F1/Eject button. The printer is in the paper removing mode and ready to start feed operations. See the table below to find out how the F1/Eject and F2 buttons work in this mode and execute the appropriate operation.

Button	Press	Hold for a few seconds
F1/Eject	Feeds paper forward a few lines every time you press it.	Eject paper forward.
F2	Feeds paper backward a few lines every time you press it.	Eject paper backward.

If you can clear the paper jam, turn off the printer, move the upper mechanism to its original position by pulling the release lever, and then close the printer cover to finish the operation. If you cannot clear the paper jam with this function, stop the operation and contact your dealer.

! *Caution:*
   Make sure that you move the upper mechanism by pulling the release lever. Do not pull the mechanism by hand. It may damage the printer.

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Chapter 8

Options

Optional products

The items listed below are available as optional products.

❏ Roll paper holder: C811141

❏ EpsonNet 802. 11b Wireless Ext.Print Server: C82396✽, C82397✽, C82398✽

❏ EpsonNet 10/100 Base TX USB Print Server: C82402✽

Note:
The asterisk (✽) is a substitute for the last digit, which varies by country.

For details of other optional products, contact your dealer.

8

Appendix A

Product Information

Printer and Ribbon Cartridge Parts

Printer parts

printer cover

control panel

power switch

front slot

rear outlet

AC inlet

USB interface

Parallel interface

Serial interface
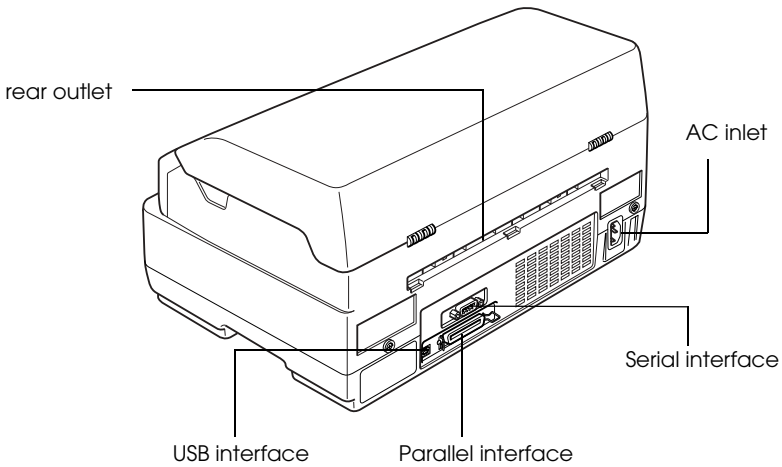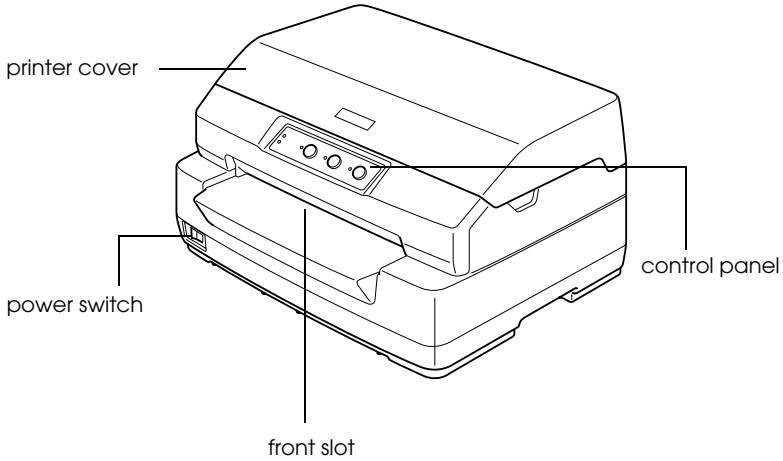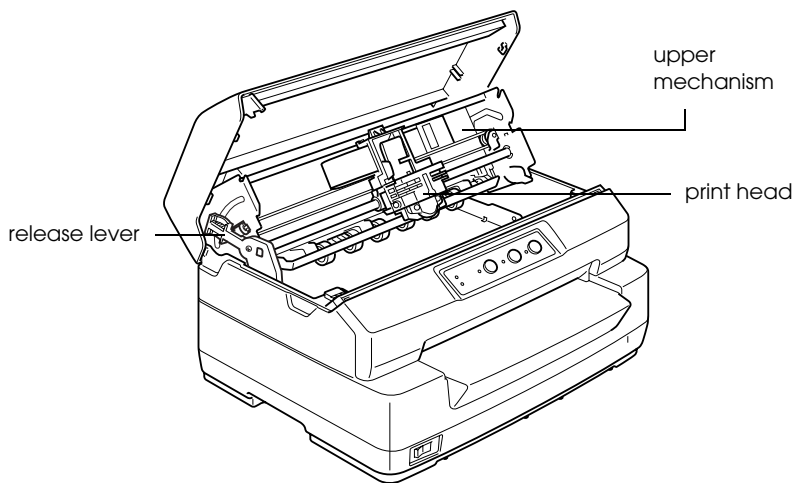
Ribbon cartridge parts
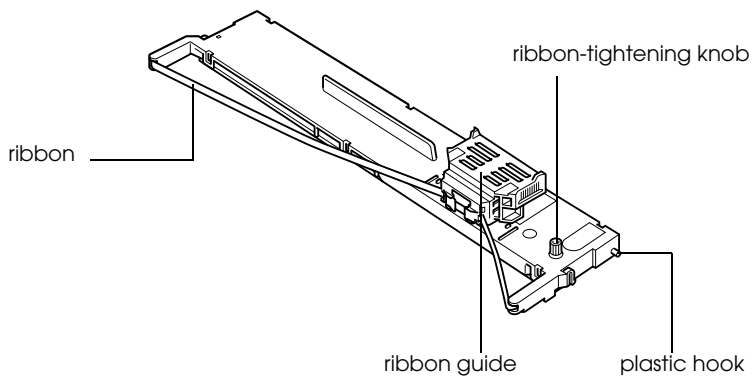
Printer Specifications

Mechanical

Printing method: 24-pin impact dot matrix

Printing speed: PR2:

	High speed draft	480 cps at 10 cpi
	Draft	360 cps at 10 cpi
	NLQ	180 cps at 10 cpi
	LQ	120 cps at 10 cpi

ESC/P:

	High speed draft	480 cps at 10 cpi
	Draft	360 cps at 10 cpi
	LQ	120 cps at 10 cpi

Printing direction: Bidirectional logic seeking for text and graphics printing. Unidirectional text or graphics printing can be selected using software commands.

Line spacing: 4.23 mm (1/6 inch)
PR2:
Programmable in increments of 0.106 mm (1/240 inch) or 0.118 mm (1/216 inch)
Other emulation:
Programmable in increments of 0.0706 mm (1/360 inch)

Printable columns: 94 columns (at 10 cpi)

Resolution: Maximum 360×180 dpi (letter quality)

Paper feed methods: Friction (front)
Roll paper holder (optional)

Paper feed speed:	Continuous	330 mm/second 13 inches/second
	Intermittent	35 msec/line at 1/6 inch line spacing
Reliability:	Total print volume	7 million lines (except print head)
		MTBF 10,000 POH
	Print head life	400 million strokes/wire
Dimensions and weight:	Height	203 mm (8.0 inches)
	Width	384 mm (15.1 inches)
	Depth	280 mm (11.0 inches)
		293 mm (11.5 inches) (including front slot projection)
	Weight	approx. 7.7kg (17.0 lb) (PLQ-20)
		approx. 8.7kg (19.2 lb) (PLQ-20M)
Ribbon:	Black ribbon cartridge	S015339
	Ribbon life	approx. 5 million characters (LQ, 10 cpi, 48 dots/character)
		approx. 10 million characters (Draft, 10 cpi, 24 dots/character)
Acoustic noise:	Approx. 53 dB (A) (ISO 7779 pattern) (PLQ-20)	
	Approx. 55 dB (A) (ISO 7779 pattern) (PLQ-20M)	

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Electronic

Interfaces:	Three built-in interface slots; Bidirectional, 8-bit, parallel interface with IEEE 1284 nibble mode support, USB (ver 1.1) interface, EIA-232D Serial interface
Buffer:	64KB
Fonts:	PR2 emulation

Bitmap fonts

High speed draft (=EPSON Super Draft)	10, 12 cpi
Draft (=EPSON Draft)	10, 12 cpi
NLQ1 (=EPSON Sans Serif)	10, 12, 15 cpi
NLQ2 (=EPSON Roman)	10, 12, 15 cpi
LQ2 (=EPSON Roman)	10, 12, 15 cpi
OCR-B (=EPSON OCR-B)	10 cpi
OCR-A (=EPSON OCR-A)	10 cpi

Scalable fonts

Not supported

Bar code fonts

EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Coda bar (NW-7), Industrial 2 of 5

ESC/P and IBM PPDS emulations

Bitmap fonts

EPSON Super Draft	10, 12 cpi, proportional
EPSON Draft	10, 12, 15 cpi, proportional
EPSON Roman	10, 12, 15 cpi, proportional
EPSON Sans Serif	10, 12, 15 cpi, proportional
EPSON Courier	10, 12, 15 cpi
EPSON Prestige	10, 12 cpi
EPSON Script	10 cpi
EPSON OCR-B	10 cpi
EPSON Orator	10 cpi
EPSON Orator-S	10 cpi
EPSON Script C	proportional

Scalable fonts

EPSON Roman	10.5 pt. 8-32 pt. (every 2 pt.)
EPSON Sans Serif	10.5 pt. 8-32 pt. (every 2 pt.)
EPSON Roman T	10.5 pt. 8-32 pt. (every 2 pt.)
EPSON Sans Serif H	10.5 pt. 8-32 pt. (every 2 pt.)

Bar code fonts

EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Code 128, POSTNET

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Character tables: PR2 emulation

(Olivetti)

22 graphics character tables:

International, Germany, Portugal,
Spain 1, Denmark/Norway, France, Italy,
Sweden/Finland, Switzerland, Great
Britain, USA ASCII, Greece, Israel, Spain 2,
USSR, Yugoslavia,
Olivetti TCV 370, Canada, SDC, Turkey,
Arabic, CIBC

(ISO)

9 graphics character tables:

ISO 8859-1 Latin 1, ISO 8859-9 Latin 5
ISO 8859-2 Latin 2, ISO 8859-5 Cyrillic, ISO
8859-15, ISO 8859-6 Latin Arabic,
ISO 8859-7 Greek, ISO 8859-8 Hebrew,
OLI-UNIX

(PC)

19 graphics character tables:

PC-437 International, PC-220 Spain 2,
PC-865 Nordic, PC-Denmark/Norway,
PC-Denmark OPE, PC-860 Portugal, PC-863
Canadian French,
PC-850 Latin 1, PC-858 Latin Euro, PC-875
Turkish Latin 5, PC-852 Latin 2, PC-851
Greek, PC-210 Greek,
PC-855 Cyrillic, PC-862 Israel,
PC-864 Arabic, PC-866 Cyrillic,
PC-1252 PC-WIN Latin 1
PC-1250 PC-WIN Latin 2

ESC/P and IBM PPDS emulations

Standard

One italic and 12 graphics character tables:

Italic table,
PC 437 (US, Standard Europe),
PC 850 (Multilingual),
PC 860 (Portuguese),
PC 861 (Icelandic), PC 865 (Nordic),
PC 863 (Canadian-French), BRASCII,
Abicomp, ISO Latin 1, Roman 8, PC 858,
ISO 8859-15

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Expanded

One italic and 39 graphics character tables:

Italic table,
PC 437 (US, Standard Europe),
PC 850 (Multilingual),
PC 860 (Portuguese),
PC 861 (Icelandic), PC 865 (Nordic),
PC 863 (Canadian-French), BRASCII,
Abicomp, ISO Latin 1, Roman 8, PC 858,
ISO 8859-15, PC 437 Greek,
PC 852 (Eastern Europe),
PC 853 (Turkish), PC 855 (Cyrillic),
PC 857 (Turkish), PC 866 (Russian),
PC 869 (Greek), MAZOWIA (Poland),
Code MJK (CSFR),
ISO 8859-7 (Latin/Greek),
ISO Latin 1T (Turkish),
Bulgaria (Bulgarian),
PC 774 (LST 1283: 1993),
Estonia (Estonian), PC 771 (Lithuanian),
ISO 8859-2, PC 866 LAT. (Latvian),
PC 866 UKR (Ukranian),
PC437 Slovenia, PC MC, PC1250,
PC1251, PC 864 (Arabic),
PC APTEC (Arabic), PC 708 (Arabic),
PC 720 (Arabic), PC AR 864 (Arabic)

Character sets: 14 international character sets and one legal character set:

USA, France, Germany, UK, Denmark I, Sweden, Italy, Spain I, Japan, Norway, Denmark II, Spain II, Latin America, Korea, Legal

Electrical

	120 V Model	**220 to 240 V Model**
Rated voltage range	120 V	220 to 240 V
Input voltage range	90 to 132 V	198 to 264 V
Rated frequency range	50 to 60 Hz	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz	49.5 to 60.5 Hz
Rated current	1.4 A (maximum 3.9 A depending on the character type)	0.7 A (maximum 1.9 A depending on the character type)
Power consumption	Approx. 59 W (ISO/IEC 10561 letter pattern)	Approx. 60 W (ISO/IEC 10561 letter pattern)

This product is also designed for IT power systems with a phase-to-phase voltage of 220 to 240 V.

Note:
Check the label on the back of the printer for the voltage of your printer.

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Environmental

	Temperature	Humidity (without condensation)
Operation (passbook, plain paper, recycled paper, and multipart forms)	5 to 35°C (41 to 95°F)	10 to 80% RH
Operation (roll paper)	15 to 25°C (59 to 77°F)	30 to 60% RH
Storage	-30 to 60°C (-22 to 140°F)	0 to 85% RH

Paper

For information about available paper types and their printable area, refer to the *Paper Specification*, which is included on the User CD-ROM.

Magnetic stripe reader/writer (horizontally installed only)

The horizontal magnetic stripe reader/writer is used to read and write data on the magnetic stripe on bank passbooks. See the following specifications of this device for details.

Recording code	BCD Binary Coded decimal, 4 data bits, 1 VRC parity control bit
Recordable characters	column 3 of the ASCII table
Recordable formats	IBM3604, DIN/ISO, ISO7811, IBM4746, ANSI, HT-2751-CIZ, ISO8484

Recorded track width	7 mm
Read track width	2 mm
Speed of medium	340 mm/second
Displacement	Standard, Standard + 10 mm, Standard + 20 mm
Number of retries	1 or 3
Field duplication	YES or NO

Recordable area

Back Cover
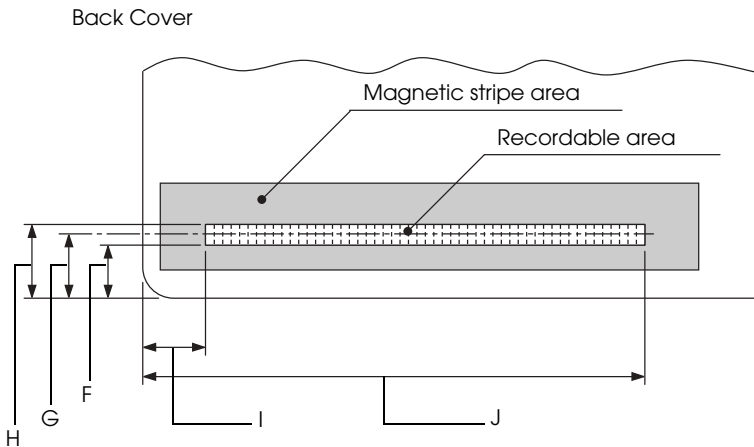
	F (max)	G	H (min)	I	J (max)
DIN/ISO, ANSI	12.5	13.9	15.5	9.5	85
IBM3604	8.9	10.4	11.9	10.4	81.3
ISO7811	8.9	10.4	11.9	14.8	—
IBM4746	8.9	10.4	11.9	9.8	—

	F (max)	G	H (min)	I	J (max)
ISO8484	12.5	13.9	15.3	9.5	85
HT-2751-CIZ	7.4	8.8	10.2	12.6	—

Recordable formats specification

DIN/ISO and ISO8484

Bit density	210 bpi ± 5%
Recording direction	Left to Right
Preamble	20 bits
SOM (Start sentinel)	D
Recordable characters	0-9, A, B, C, D, E
EOM (End sentinel)	F
LRC Parity	even
Postamble	20 bits
Maximum number of recordable characters (1 block)	105 characters
Maximum number of recordable characters (2 block)	45 characters
Number of separator	60 bits
Center of vertical position	13.9 mm
Horizontal start position	9.5 mm from the left edge

IBM3604

Bit density	210 bpi ± 5%
Recording direction	Left to Right
Preamble	20 bits
SOM (Start sentinel)	B
Recordable characters	0-9, A, B, D, E
EOM (End sentinel)	F or C
LRC Parity	even
Postamble	20 bits
Maximum number of recordable characters (1 block)	105 characters
Maximum number of recordable characters (2 block)	45 characters
Number of separator	120 bits
Center of vertical position	10.4 mm
Horizontal start position	10.4 mm from the left edge

ANSI

Bit density	210 bpi ± 5%
Recording direction	Left to Right
Preamble	20 bits
SOM (Start sentinel)	B
Recordable characters	0-9, A, B, C, D, E
EOM (End sentinel)	F
LRC Parity	even

A

Postamble	20 bits
Maximum number of recordable characters (1 block)	105 characters
Maximum number of recordable characters (2 block)	45 characters
Number of separator	60 bits
Center of vertical position	13.9 mm
Horizontal start position	9.5 mm from the left edge

ISO7811

Bit density	75 bpi ± 5%
Recording direction	Left to Right
Preamble	20 bits
SOM (Start sentinel)	B
Recordable characters	0-9, A, D, E
EOM (End sentinel)	F
LRC Parity	even
Postamble	20 bits
Maximum number of recordable characters (1 block)	37 characters
Maximum number of recordable characters (2 block)	23 characters
Number of separator	120 bits
Center of vertical position	10.4 mm
Horizontal start position	14.8 mm from the left edge

IBM4746

Bit density	210 bpi ± 5%
Recording direction	Left to Right
Preamble	20 bits
SOM (Start sentinel)	BA
Recordable characters	0-9, D
EOM (End sentinel)	F or C
LRC Parity	even
Postamble	20 bits
Maximum number of recordable characters (1 block)	105 characters
Maximum number of recordable characters (2 block)	45 characters
Number of separator	120 bits
Center of vertical position	10.4 mm
Horizontal start position	9.8 mm from the left edge

HT-2751-CIZ

Bit density	105 bpi ± 5%
Recording direction	Right to Left
Preamble	55 bits
SOM (Start sentinel)	F
Recordable characters	0-9
EOM (End sentinel)	F
LRC Parity	odd

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Postamble	40 bits
Maximum number of recordable characters (1 block)	60 characters
Maximum number of recordable characters (2 block)	27 characters
Number of separator	10 bits
Center of vertical position	8.8 mm
Horizontal start position	12.6 mm from the left edge

Character conversion table

DIN/ISO, ISO8484 and IBM3604

			Function		Recording codes				
Crt	ASCII	Line code	DIN/ISO, ISO8484	IBM3604	V R C	B I T 4	B I T 3	B I T 2	B I T 1
0	0	30H	crt	crt	1	0	0	0	0
1	1	31H	crt	crt	0	0	0	0	1
2	2	32H	crt	crt	0	0	0	1	0
3	3	33H	crt	crt	1	0	0	1	1
4	4	34H	crt	crt	0	0	1	0	0
5	5	35H	crt	crt	1	0	1	0	1
6	6	36H	crt	crt	1	0	1	1	0
7	7	37H	crt	crt	0	0	1	1	1
8	8	38H	crt	crt	0	1	0	0	0
9	9	39H	crt	crt	1	1	0	0	1
A	:	3AH	crt	crt	1	1	0	1	0
B	;	3BH	crt	SOM crt	0	1	0	1	1
C	<	3CH	crt	EOM —	1	1	1	0	0
D	=	3DH	SOM crt	crt	0	1	1	0	1
E	>	3EH	crt	crt	0	1	1	1	0
F	?	3FH	EOM	EOM	1	1	1	1	1

* crt means character.

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ANSI and ISO7811

Crt	ASCII	Line code	Function		Recording codes				
			ANSI	**ISO7811**	**V R C**	**B I T 4**	**B I T 3**	**B I T 2**	**B I T 1**
0	0	30H	crt	crt	1	0	0	0	0
1	1	31H	crt	crt	0	0	0	0	1
2	2	32H	crt	crt	0	0	0	1	0
3	3	33H	crt	crt	1	0	0	1	1
4	4	34H	crt	crt	0	0	1	0	0
5	5	35H	crt	crt	1	0	1	0	1
6	6	36H	crt	crt	1	0	1	1	0
7	7	37H	crt	crt	0	0	1	1	1
8	8	38H	crt	crt	0	1	0	0	0
9	9	39H	crt	crt	1	1	0	0	1
A	:	3AH	crt	crt	1	1	0	1	0
B	;	3BH	SOM crt	SOM —	0	1	0	1	1
C	<	3CH	crt	—	1	1	1	0	0
D	=	3DH	crt	crt	0	1	1	0	1
E	>	3EH	crt	crt	0	1	1	1	0
F	?	3FH	EOM	EOM	1	1	1	1	1

* crt means character.

IBM4746 and HT-2751-CIZ

|			Function		Recording codes				
Crt	ASCII	Line code	IBM4746	HT-2751-CIZ	V R C	B I T 4	B I T 3	B I T 2	B I T 1
0	0	30H	crt	crt	1	0	0	0	0
1	1	31H	crt	crt	0	0	0	0	1
2	2	32H	crt	crt	0	0	0	1	0
3	3	33H	crt	crt	1	0	0	1	1
4	4	34H	crt	crt	0	0	1	0	0
5	5	35H	crt	crt	1	0	1	0	1
6	6	36H	crt	crt	1	0	1	1	0
7	7	37H	crt	crt	0	0	1	1	1
8	8	38H	crt	crt	0	1	0	0	0
9	9	39H	crt	crt	1	1	0	0	1
A	:	3AH	SOM —	—	1	1	0	1	0
B	;	3BH	SOM —	—	0	1	0	1	1
C	<	3CH	EOM —	—	1	1	1	0	0
D	=	3DH	crt	—	0	1	1	0	1
E	>	3EH	—	—	0	1	1	1	0
F	?	3FH	EOM	SOM EOM	1	1	1	1	1

* crt means character.

A

Recording layout of magnetic stripe

DIN/ISO, IBM3604, ANSI, ISO7811, IBM4746, and ISO8484
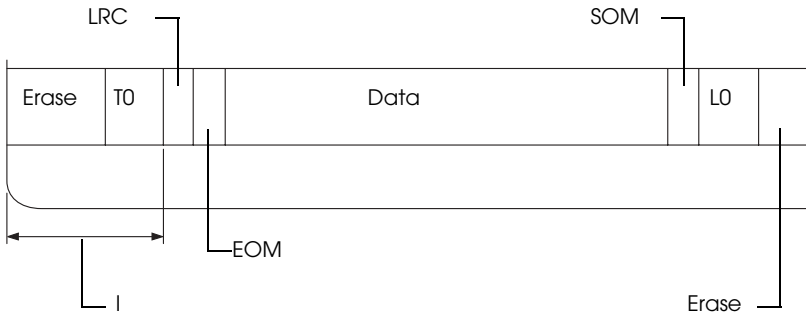
1 block format
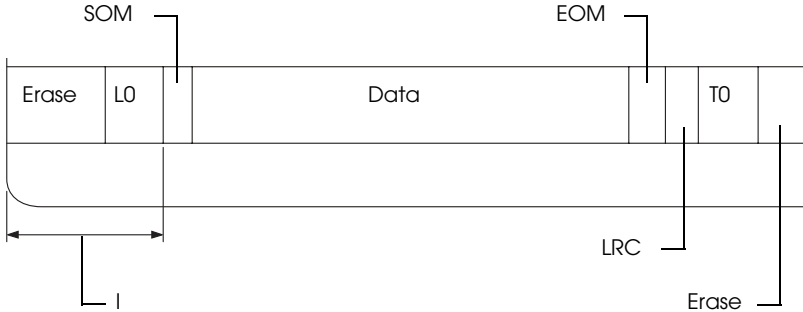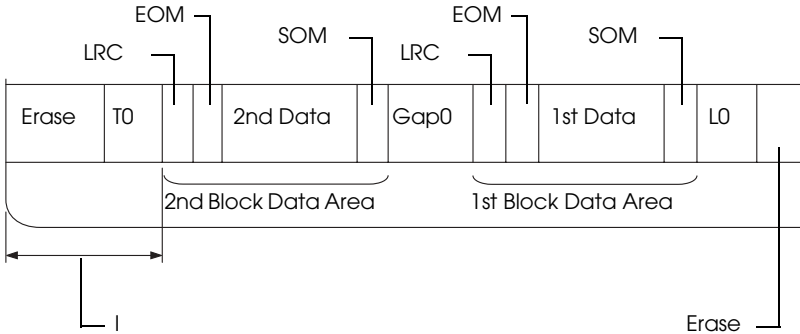

2 block format
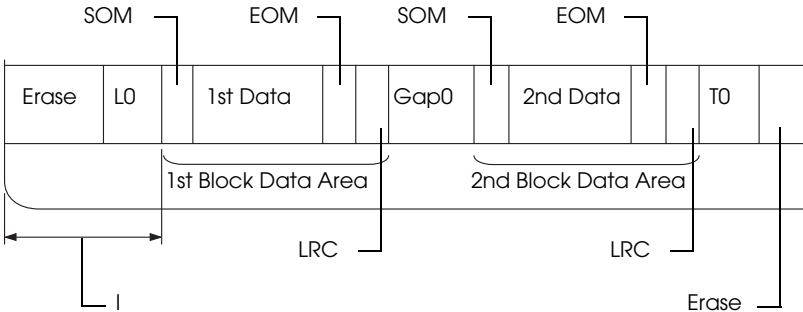
Direction of bit pattern

HT-2751-CIZ

1 block format

A

2 block format

Direction of bit pattern

Standards and Approvals

U. S. model:

Safety	UL60950
	CSA C22.2 No. 60950
EMC	FCC part 15 subpart B class B
	CSA C108.8 class B

European model:

Low Voltage Directive 73/23/EEC	EN 60950
EMC Directive 89/336/EEC	EN 55022 Class B
	EN 55024
	EN 61000-3-2
	EN 61000-3-3

Australian model:

EMC	AS/NZS CISPR 22 class B

A