



Brother Laser Printer

HL-1230

HL-1440

HL-1450

HL-1470N

USER'S GUIDE

Please read this manual thoroughly before using the printer. You can print or view this manual from the CD-ROM at any time. Please keep the CD-ROM in a convenient place for quick and easy reference at all times.

The Brother Solutions Center (<http://solutions.brother.com>) is your one stop resource for all your printer needs. Download the latest drivers and utilities for your printers, read the FAQs and troubleshooting tips or learn about special printing solutions in the 'Solutions' and 'Customer Education' sections.

For USA & CANADA Only

**IMPORTANT NOTE: For technical and operational assistance, you must call.
Calls must be made from within that country.**

In USA 1-800-276-7746

In CANADA 1-800-853-6660
1-514-685-6464 (within Montreal)

If you have comments or suggestions, please write us at:

In USA Printer Customer Support
Brother International Corporation
15 Musick
Irvine, CA 92618

In CANADA Brother International Corporation (Canada), Ltd.
- Marketing Dept.
1, rue Hôtel de Ville
Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BROTHER FAX-BACK SYSTEM

Brother Customer Service has installed an easy to use fax-back system so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one from which you are calling.

Call and follow the voice prompts to receive faxed instructions on how to use the system and your index of fax-back subjects.

In USA 1-800-521-2846

**In Canada 1-800-685-5381
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DEALERS/SERVICE CENTERS (USA only)

For the name of a Brother authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)

For service center addresses in Canada, call 1-800-853-6660.

INTERNET ADDRESSES

<http://www.brother.com> and <http://solutions.brother.com>

Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:



Warning

Indicates warnings that must be observed to prevent possible personal injury.



Caution

Indicates cautions that must be observed to use the printer properly or prevent damage to the printer.



Note

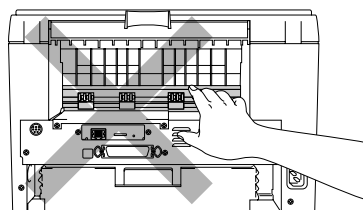
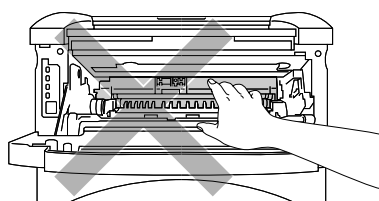
Indicates notes and useful tips to remember when using the printer.

To use the Printer Safely

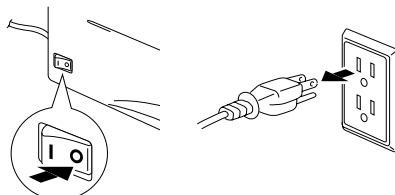


Warning

- After you have just used the printer, some internal parts of the printer are extremely **HOT!** When you open the front or back covers of the printer, never touch the shaded parts shown in the following illustrations.



- There are high voltage electrodes inside the printer. Before cleaning the printer, make sure you have turned off the power switch and unplugged the power cord from the power outlet.



Caution

- Use water or neutral detergents for cleaning. Cleaning with volatile liquids such as thinner or benzene will damage the surface of the printer.
 - Do not use cleaning materials that contain ammonia. They will damage the printer and the toner cartridge.
-

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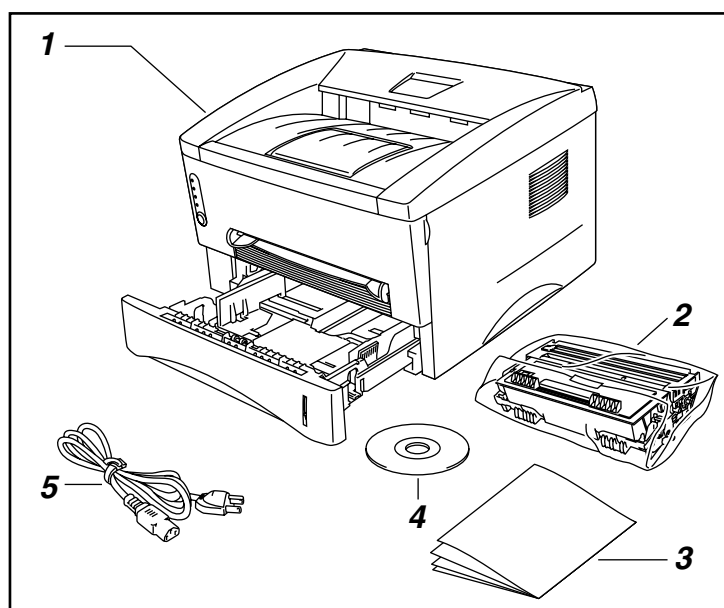
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CHAPTER 1

ABOUT THIS PRINTER

What is included in the Carton

Components When you unpack the printer, check to see that you have all of the following parts:



1. Printer
2. Drum unit assembly (with toner cartridge included)
3. Documents
4. CD-ROM
5. AC power cord

Components may differ from one country to another.

Note

The power cord may differ slightly from this figure depending on the country where you purchased the printer.

❖ ***Interface cable***

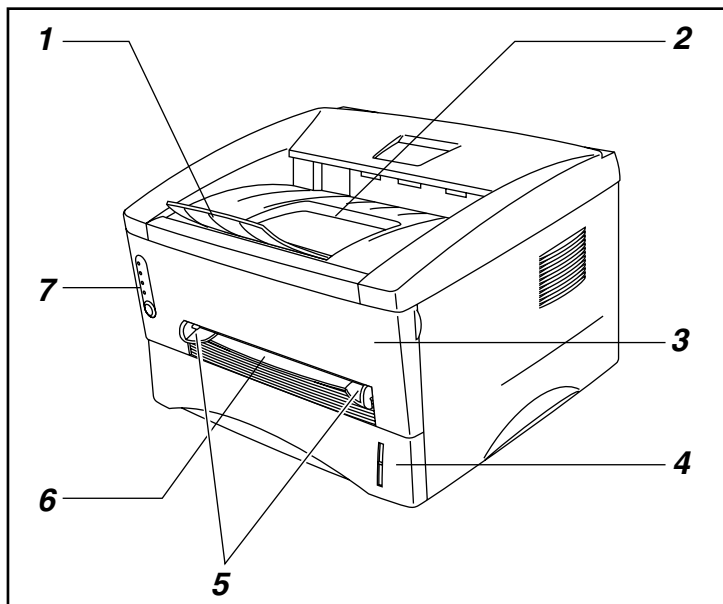
- An interface cable is not a standard accessory.
- Some computers have both a USB and a parallel port. Please purchase the appropriate cable for the interface you intend to use.
- Today most parallel cables support bi-directional communication, but some might have an incompatible pin assignment or may not be IEEE 1284-compliant.
- Do not use a parallel cable that is longer than 3 metres (10 feet).

(For HL-1440, HL-1450 and HL-1470N Users)

- When you use a USB cable, be sure to use a high-speed twisted cable (12 Mbps) and connect it to the USB connector of your PC.
- Do not use the USB connector on the front of your PC or on the iMac keyboard.

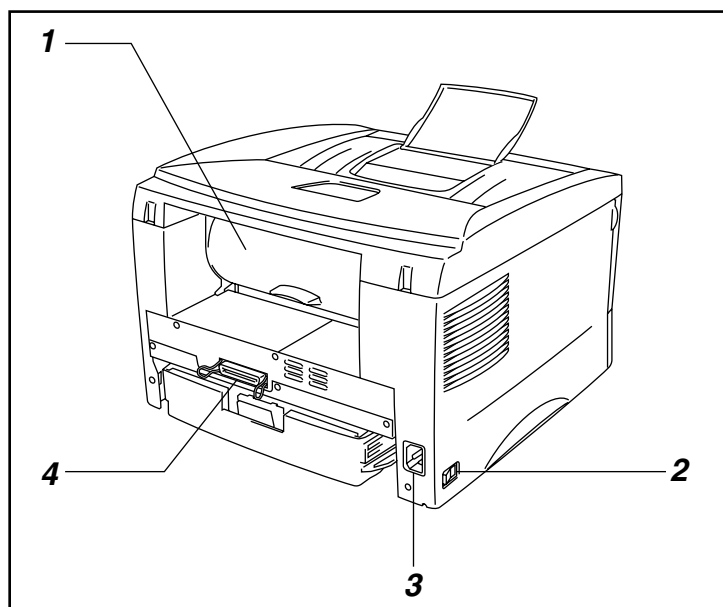
❖ General View

◆ Front View



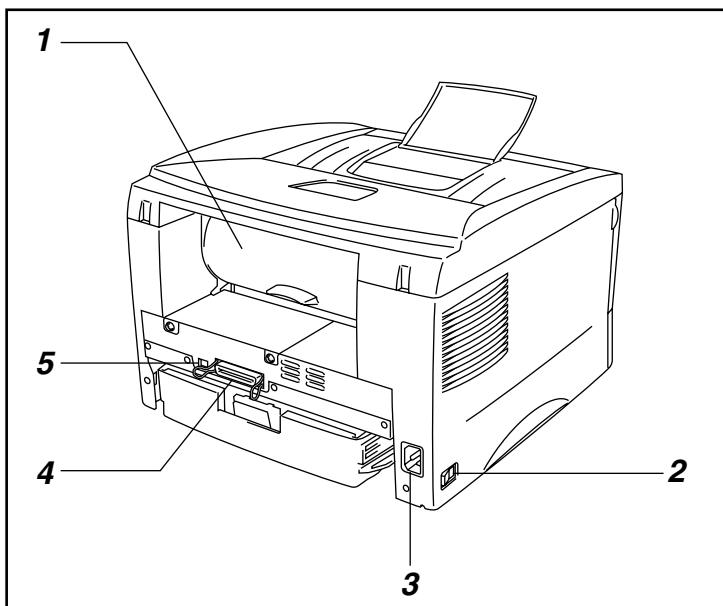
- 1. Tray extension flap
- 2. Face down output tray
- 3. Front cover
- 4. Paper cassette
- 5. Manual feed paper guides
- 6. Manual feed slot
- 7. Control panel

◆ Rear View (HL-1230)



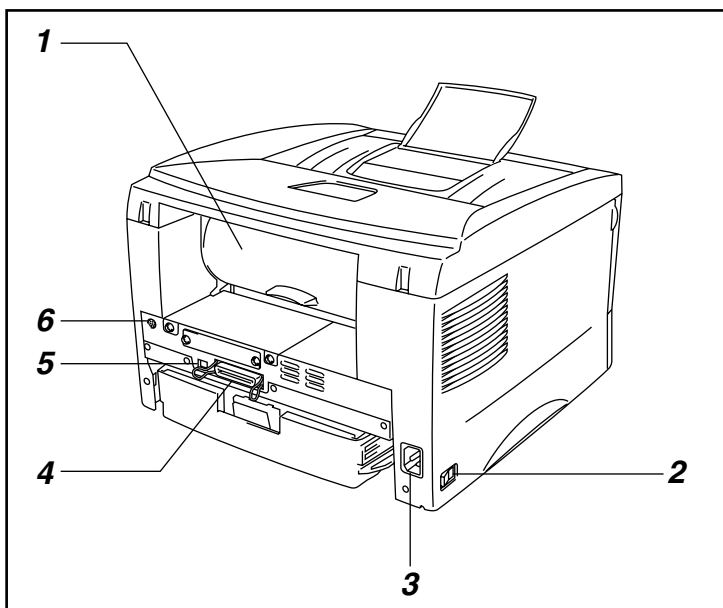
- 1. Rear cover
- 2. Power switch
- 3. AC power inlet
- 4. Parallel Interface connector

◆ Rear View (HL-1440)



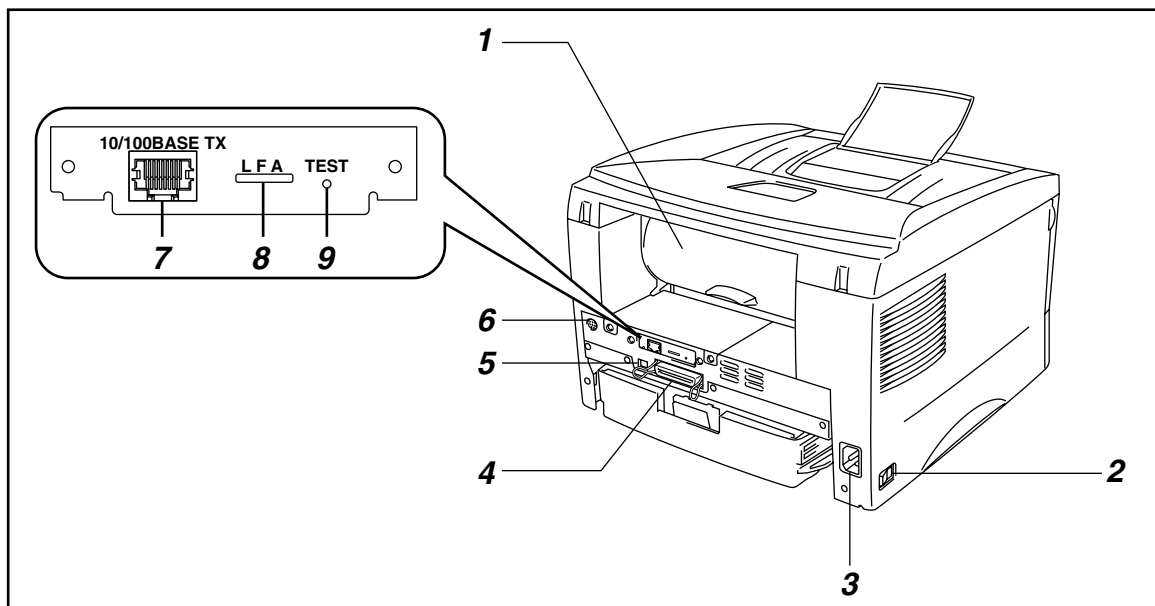
1. Rear cover
2. Power switch
3. AC power inlet
4. Parallel Interface connector
5. USB connector

◆ Rear View (HL-1450)



1. Rear cover
2. Power switch
3. AC power inlet
4. Parallel Interface connector
5. USB Interface connector
6. Mini Din connector for lower tray unit

◆ Rear View (HL-1470N)



1. Rear cover
2. Power switch
3. AC power inlet
4. Parallel Interface connector
5. USB Interface connector
6. Mini Din connector for lower tray unit
7. 10/100Base TX port
8. LED
9. Test button

Positioning the Printer

Please take note of the following before using the printer.

Power Supply

Use the printer within the specified power range.

AC power: AC 220 – 240V or AC 110 – 120V

Frequency: 50 Hz (220 V– 240 V) or 50/60 Hz (110–120 V)

The power cord, including extensions, should not exceed 5 metres (16.5 feet).

Do not share the same power circuit with other high-power appliances such as an air conditioner, copier, shredder and so on. If you cannot avoid using the printer with these appliances, we recommend that you use an isolation transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

- The printer should be installed near a power outlet that is easily accessible.
- Use the printer only within the following ranges of temperature and humidity:
- Ambient temperature: 10°C to 32.5°C (50°F to 90.5°F)
- Ambient humidity: 20% to 80% (without condensation)
- The printer should be used in a well-ventilated room.
- Place the printer on a flat, horizontal surface.
- Keep the printer clean. Do not place the printer in a dusty place.
- Do not place the printer where the ventilation hole of the printer is obstructed. Keep a gap of approximately 100 mm (4 inches) between the ventilation hole and the wall.
- Do not place the printer where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the printer from direct sunlight when the printer is unavoidably placed near a window.
- Do not place the printer near devices that contain magnets or generate magnetic fields.
- Do not subject the printer to strong physical shocks or vibrations.
- Do not expose the printer to open flames or salty or corrosive gasses.
- Do not place objects on top of the printer.
- Do not place the printer near an air conditioner.
- Keep the printer horizontal when carrying.

What kind of Paper can I Use?

Print Media and Size

The printer loads paper from the installed paper cassette, manual feed slot or optional lower tray unit.

Their descriptions used in the printer driver and this manual are as shown below.

Upper paper tray	Tray 1
Manual feed slot	Manual
Optional lower tray	Tray 2 (For HL-1450, HL-1470N users only)

Click the check mark in the following table to see the detailed information for each selection.

Media type	Tray 1	Manual feed slot	Tray 2	Select the Media type from the printer driver
Plain paper 60 g/m ² to 105 g/m ² (16 to 28 lbs.)	✓	✓	✓	Plain paper
Recycled paper	✓	✓	✓	
Bond paper		✓		Bond paper
Thick paper 105 g/m ² to 161 g/m ² (28 to 43 lbs.)		✓		Thick paper or Thicker paper
Transparencies	✓ Up to 10 sheets Only A4, Letter	✓ Only A4, Letter		Transparencies
Label		✓ Only A4, Letter		Plain paper
Envelopes		✓		Thicker paper
Card stock		✓		Thick paper or Thicker paper

	Upper paper tray	Manual feed slot	Optional lower tray
Paper size	A4, Letter, Legal (US and Canada only) , B5 (ISO), Executive, A5, A6, B6	Width: 70 to 216 mm (215 to 8.5 in.) Length: 116 to 356 mm (4.57 to 14.0 in.)	A4, Letter, Legal (US and Canada only), B5 (ISO), Executive, A5
Capacity	250 sheets (80 g/m ² or 21 lbs.)	Single sheet	250 sheets (80 g/m ² or 21 lbs.)

Recommended Paper

	Europe	USA
Plain paper	Xerox Premier 80 g/m ² Xerox Business 80 g/m ² Modo DATACOPY 80 g/m ² IGEPA X-Press 80 g/m ²	Xerox 4200DP 20 lb Champion Paper One 20 lb Hammermill Laser Paper 24 lb
Recycled paper	Steinbis Recycling Copy 80 g/m ²	
Transparencies	3M CG3300	3M CG 3300
Labels	Avery laser label L7163	Avery laser label #5160

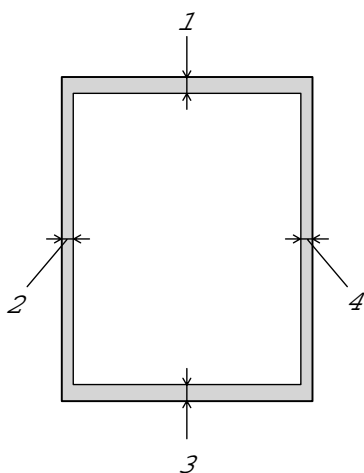
- Before you purchase large quantities of paper, please test print a small quantity to ensure that the paper is suitable.
- Use paper designed for plain paper copying.
- Use paper that is 75 to 90 g/m².
- Use neutral paper; avoid acidic or alkaline paper.
- Use Long grain paper.
- Use paper with a moisture content of approximately 5%.

You can see the information to help you choose paper to use with this printer. See [“Important Information for Choosing Your Paper”](#) in the Appendix.

Printable Area

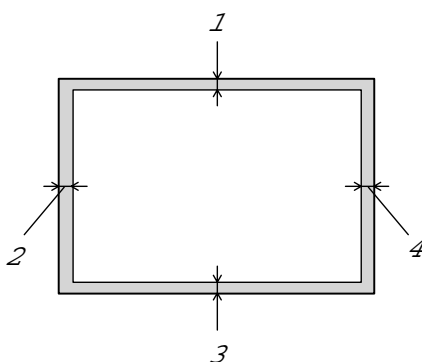
The figure below shows the printable area.

Portrait



	USA/Canada	Europe/other countries
1	0.17 inch (4.2 mm)	4.2 mm
2	0.25 inch (6.35 mm)	6.01 mm
3	0.17 inch (4.2 mm)	4.2 mm
4	0.25 inch (6.35 mm)	6.01 mm

Landscape



	USA/Canada	Europe/other countries
1	0.17 inch (4.2 mm)	4.2 mm
2	0.2 inch (5.08 mm)	5.0 mm
3	0.17 inch (4.2 mm)	4.2 mm
4	0.2 inch (5.08 mm)	5.0 mm

Printing on Plain Paper

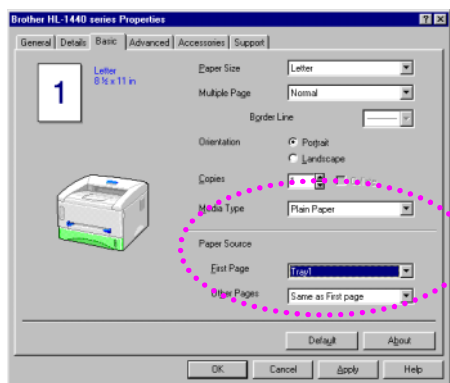
You can print on plain paper from the paper cassette or manual feed slot. Select the paper you use referring to “What Kind of Paper can I Use?” in this chapter.

Printing on Plain Paper from the Paper Cassette

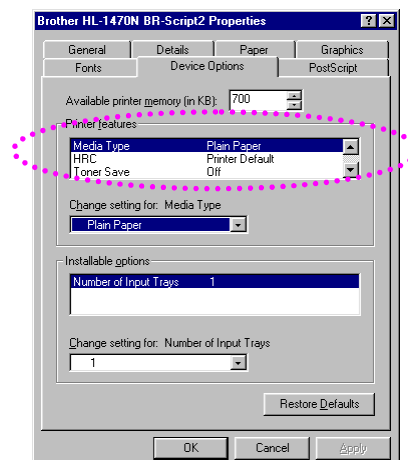
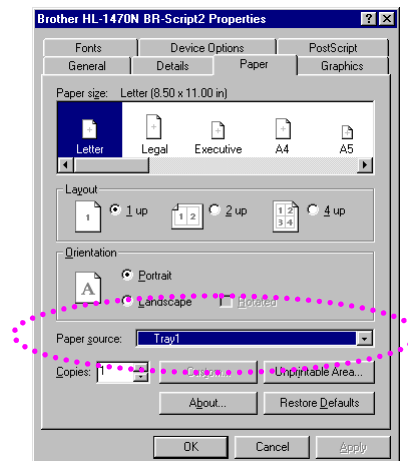
1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

Media Type: Plain Paper
Paper Source: Tray1

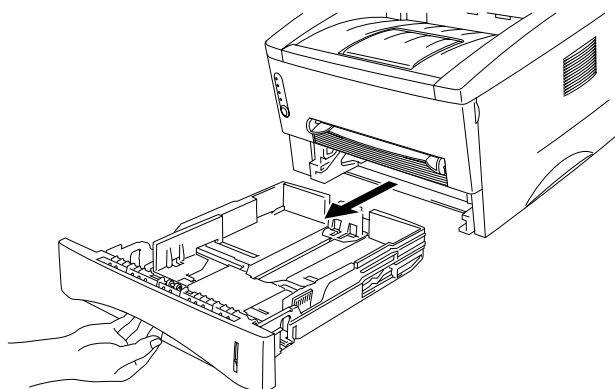
PCL driver



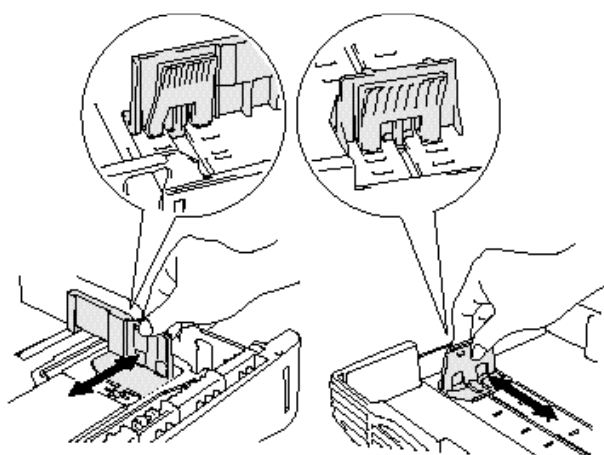
PS driver



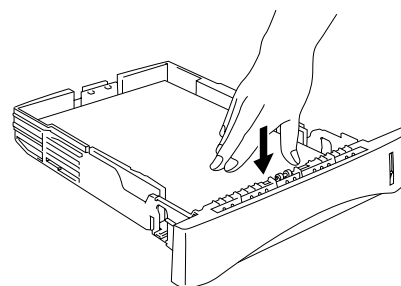
2. Pull the paper cassette completely out of the printer.



3. Adjust the paper guides at the right and rear of the paper cassette to match the paper size you want to load. Make sure that the tips of the paper guides fit into the slots correctly.

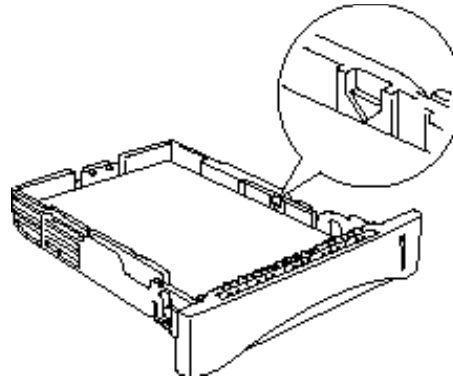


4. Load paper into the paper cassette. Make sure the paper is flat in the cassette at all four corners.



Note

- Do not load more than 250 sheets of paper (80 g/m²) in the cassette, or paper jams may occur. Paper can be loaded up to the lines on the sliding guide.

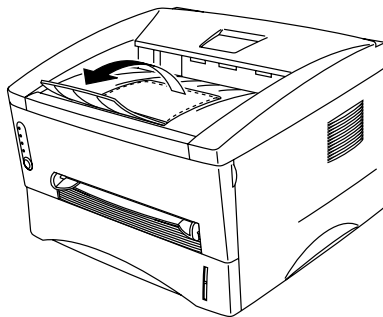


- When you print on the back of paper already printed on one side, load the side to be printed (blank side) face down in the cassette.
-

- 5.** Install the paper cassette in the printer. Make sure it is inserted fully into the printer.

Note

- Extend the output tray extension flap to prevent printouts from sliding off the face down output tray.



- If you choose not to extend the output tray extension flap, we recommend that you remove printed pages immediately after they exit the printer.
-

- 6.** Send the print data to the printer.

Printing on Plain Paper from the Manual Feed Slot

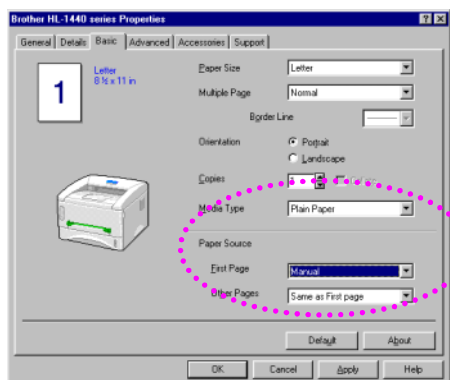
Note

The printer turns the Manual Feed mode on automatically when you insert paper into the manual feed slot.

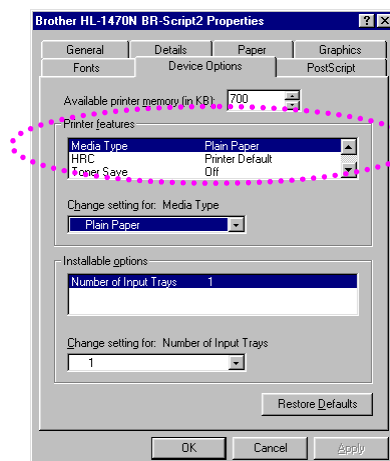
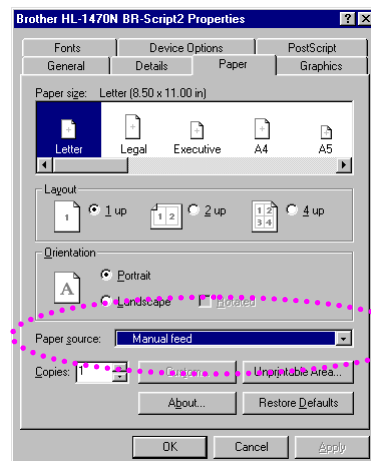
1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

Media Type: Plain Paper
Paper Source: Manual

PCL driver



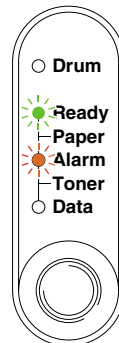
PS driver



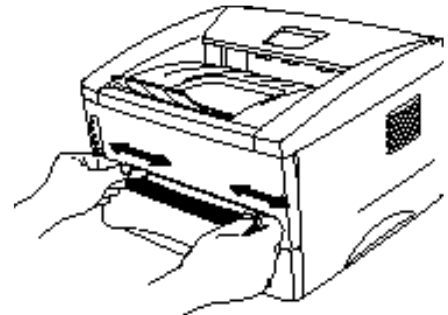
2. Send the print data to the printer.

 Note

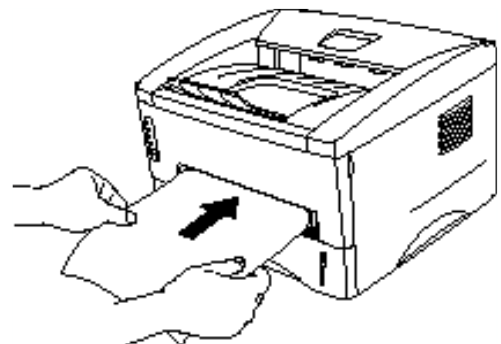
A “NO PAPER” message is shown in the Status Monitor and control panel LEDs until you insert a sheet of paper into the manual feed slot.



3. Using both hands, slide the manual feed slot paper guides to the paper width to be used.



4. Using both hands, insert the paper into the manual feed slot until the front edge of the paper touches the paper feed roller. Hold the paper in this position until the printer automatically feeds the paper in a short distance, and then let go of the paper.



 Note

Insert the paper into the manual feed slot with the side to be printed (blank side) face up.

5. After the printer ejects the printed page, insert the next sheet of paper as in Step 4 above. The printer will wait until you insert the next sheet of paper. Repeat this as necessary for the number of pages you need to print.

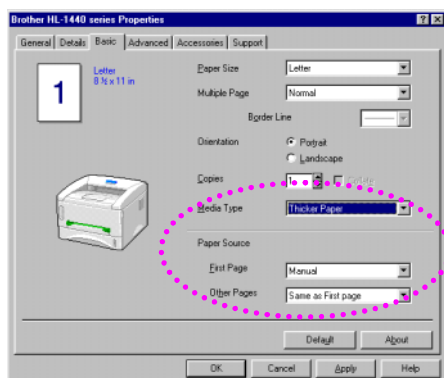
Printing on Thicker Paper and Card Stock

When the rear cover is lifted up, the printer has a straight paper path from the manual feed slot to the rear of the printer. Use this paper feed and output method when you want to print on thicker paper or card stock. Select the paper you want to use referring to “What Kind of Paper can I Use?” in this chapter.

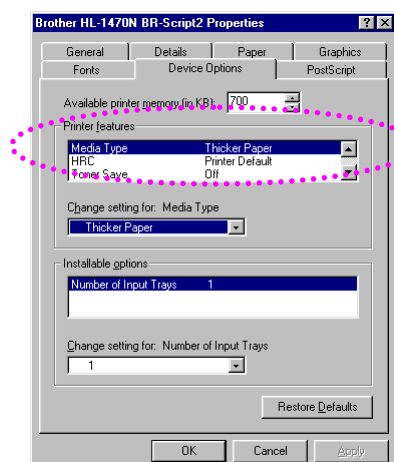
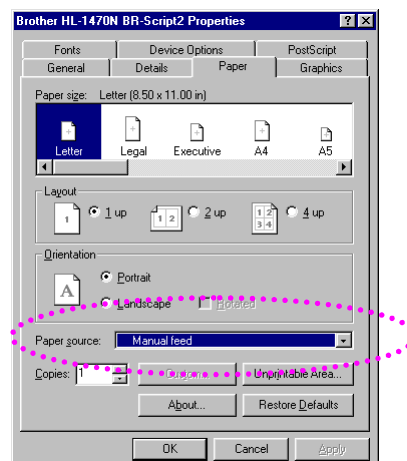
1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

Media Type: Thick paper or Thicker paper
Paper Source: Manual / Manual Feed

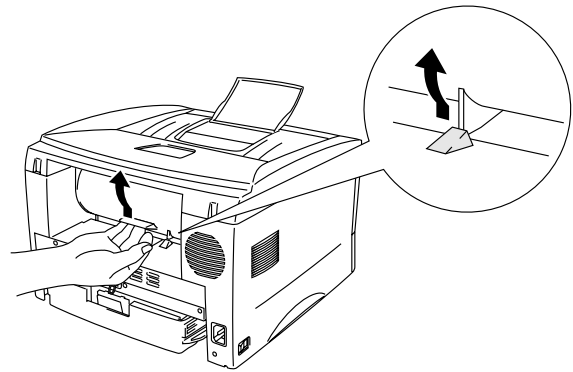
PCL driver



PS driver



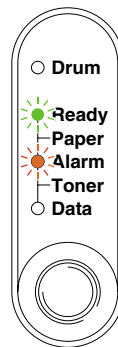
2. Open the rear cover.



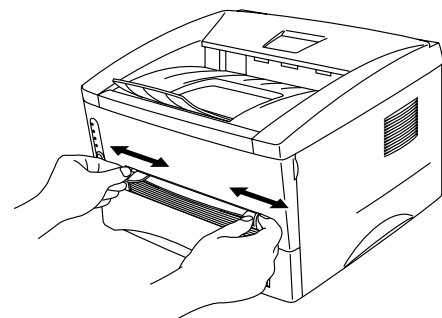
3. Send the print data to the printer.

 Note

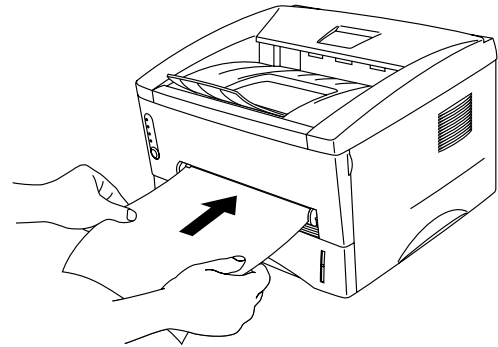
A “NO PAPER” message is shown in the Status Monitor and control panel LEDs until you insert a sheet of paper into the manual feed slot.



4. Using both hands, set the width of the manual feed paper guides to the paper width you want to use.



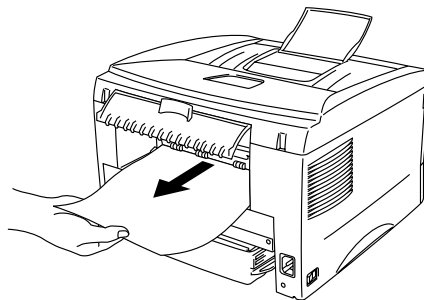
5. Using both hands, insert the paper into the manual feed slot until the front edge of the paper touches the paper feed roller. Hold the paper in this position until the printer automatically feeds the paper in a short distance, and then let go of the paper.



6. After the printer ejects the printed page, the printer will wait for you to insert the next sheet of paper. Repeat Step 5 for each page you want to print.
7. Close the rear cover.

! Caution

Remove each sheet immediately after printing. Stacking the sheets may cause the paper to curl or media feed jams.



Printing Envelopes

The printer has a straight paper path from the manual feed slot to the rear of the printer. Use this paper feed and output method when you want to print envelopes.

Note

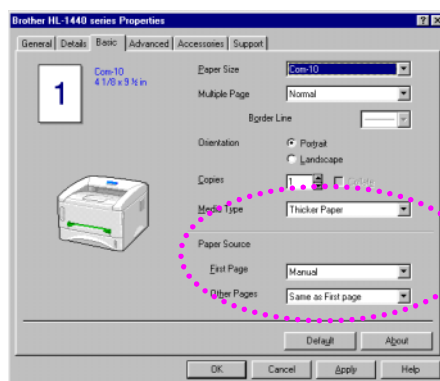
The printer turns the Manual Feed mode on automatically when you insert paper into the manual feed slot.

1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

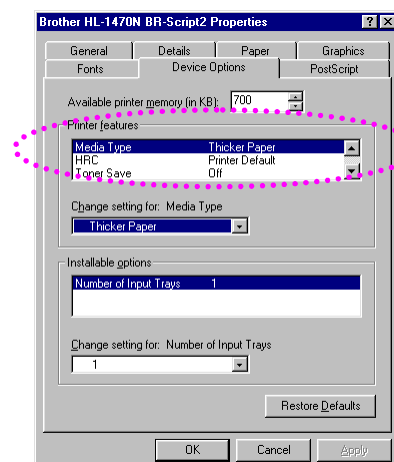
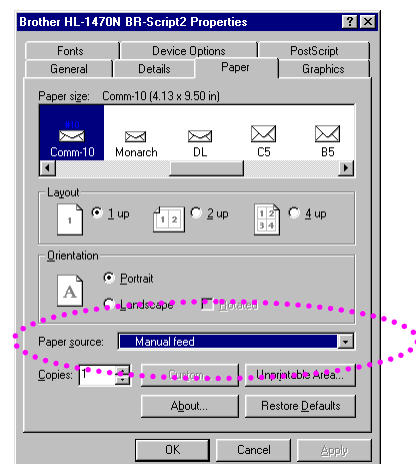
Media Type: Thicker Paper

Paper Source: Manual / Manual Feed

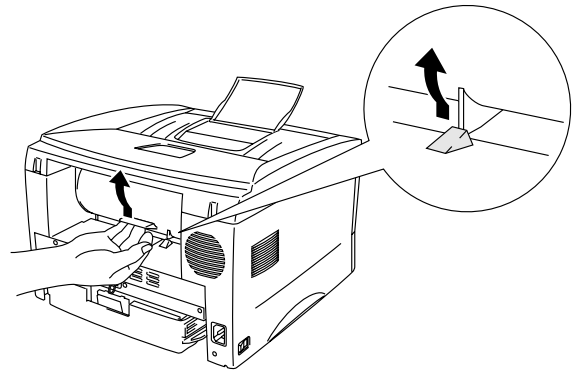
PCL driver



PS driver

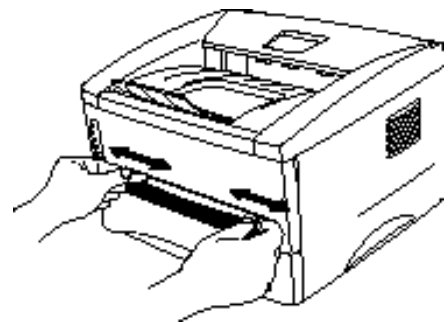


2. Open the rear cover.

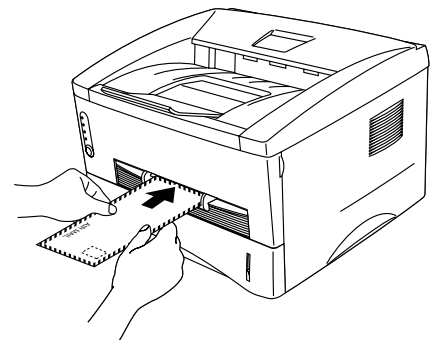


3. Send the print data.

4. Using both hands, set the width of the manual feed paper guides to the envelope width.



5. Using both hands, insert the envelope into the manual feed slot until the front edge of the envelope touches the paper feed roller. Hold the envelope in this position until the printer automatically feeds it in a short distance, and then let go of the envelope.



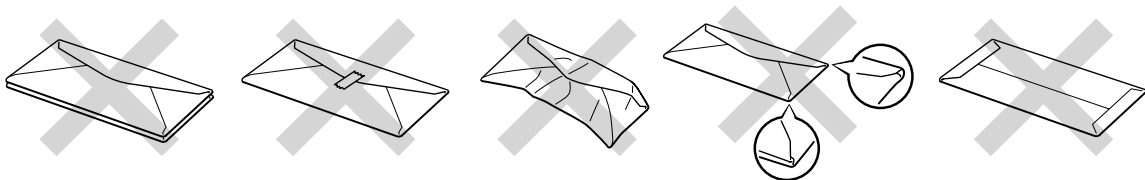
 Note

Insert the envelope into the manual feed slot with the side to be printed face up.

6. After the printer ejects the printed envelope, the printer will wait until you insert the next envelope. Repeat Step 5 for each envelope you want to print.
7. After you finish the print job, close the rear cover.

Envelope Types to Avoid

- Envelopes that are damaged, curled, wrinkled, or irregularly shaped.
- Envelopes that are extremely shiny or highly textured.
- Envelopes with clasps, snaps or tie strings.
- Envelopes with self-adhesive closures.
- Envelopes of baggy construction.
- Envelopes that are not sharply creased.
- Embossed envelopes.
- Envelopes that were previously printed by a laser printer.
- Envelopes that are pre-printed on the inside.
- Envelopes that cannot be arranged uniformly when placed in a pile.
- Envelopes constructed with paper that exceeds the paper weight specifications for the printer.
- Poorly manufactured envelopes with edges that are not straight or consistently square.
- Envelopes with transparent windows, holes, cutouts or perforations.



USE OF THE ENVELOPE TYPES LISTED ABOVE MAY CAUSE DAMAGE TO YOUR PRINTER. SUCH DAMAGE IS NOT COVERED UNDER ANY WARRANTY OR SERVICE AGREEMENT.

Note

- Before printing envelopes, you must fan the stack of envelopes well to avoid paper jams and misfeeds.
- Do not print envelopes using manual duplex printing.
- For correct printing, you must select the same paper size from within your software application as the paper in the tray.
- See “[What Kind of Paper can I Use?](#)” in this chapter.

Printing on Transparencies

You can print on transparencies from the paper cassette or manual feed slot.

Printing on Transparencies from the Paper Cassette

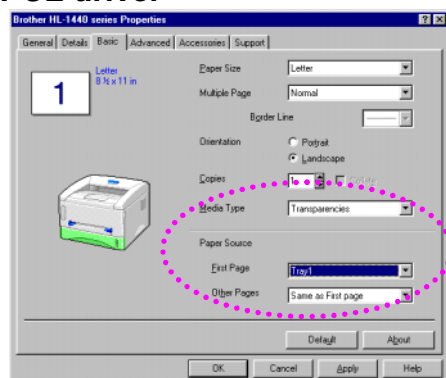
Note

Do not load more than 10 sheets of transparencies in the paper cassette.

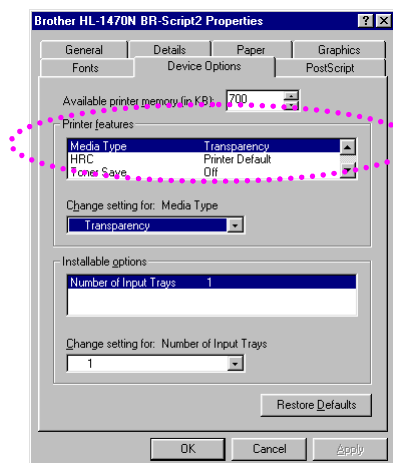
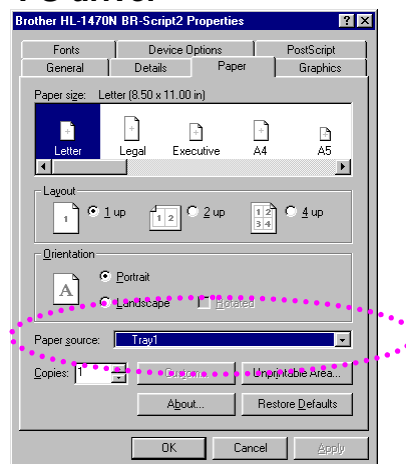
1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

Media Type: Transparency
Paper Source: Tray1

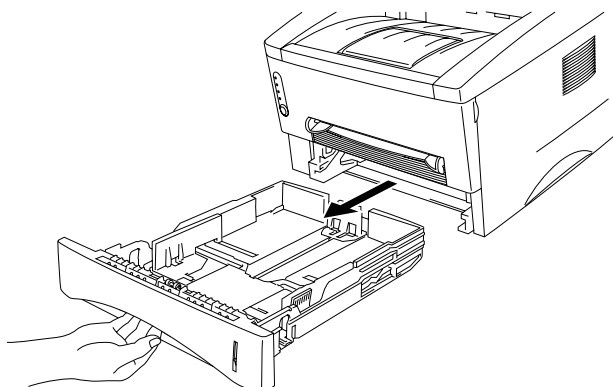
PCL driver



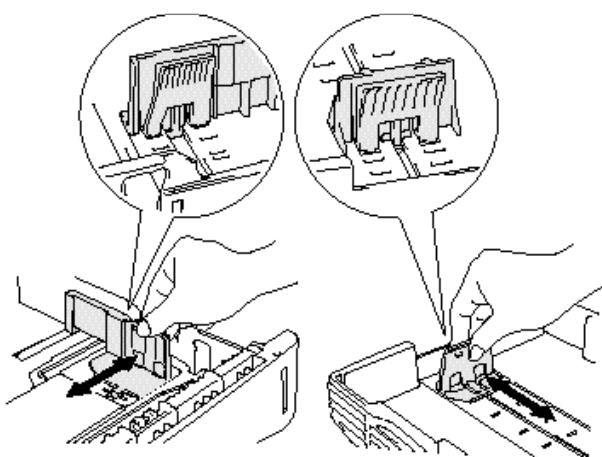
PS driver



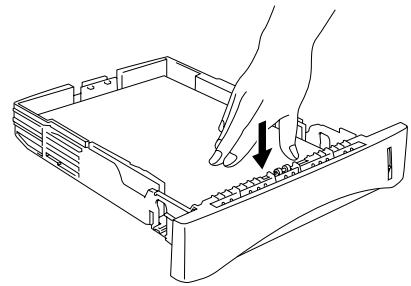
2. Pull the paper cassette completely out of the printer.



3. Adjust the paper guides at the right and rear of the paper cassette to match the transparency size you want to load. Make sure that the tips of the paper guides fit into the slots correctly.



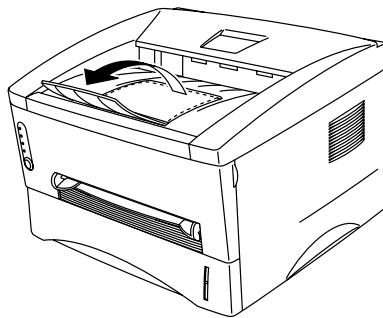
4. Load transparencies in the paper cassette. Make sure they are flat in the cassette at all four corners.



5. Install the paper cassette in the printer. Make sure it is inserted fully into the printer.

 Note

Extend the output tray extension flap to prevent printouts from sliding off the face down output tray.



 Caution

Remove each sheet immediately, especially when you use transparencies.



-
6. Send the print data to the printer.

Printing on Transparencies from the Manual Feed Slot

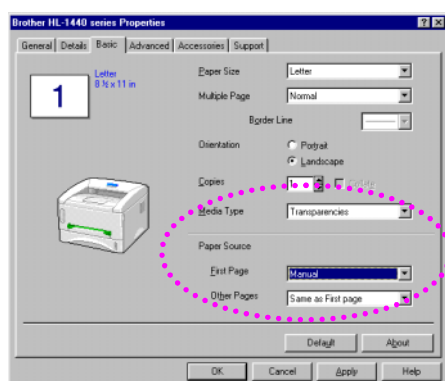
When the rear cover is lifted up, the printer has a straight paper path from the manual feed slot to the rear of the printer.

1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.

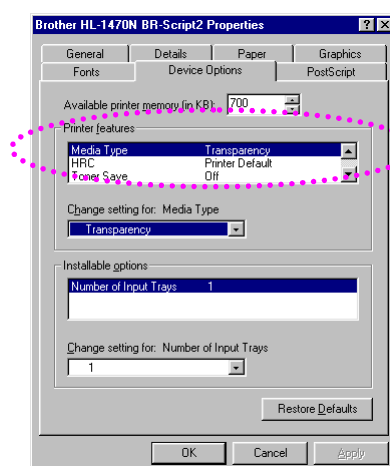
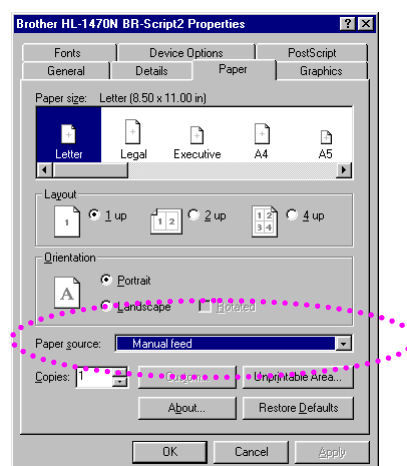
Media Type: Transparency

Paper Source: Manual / Manual Feed

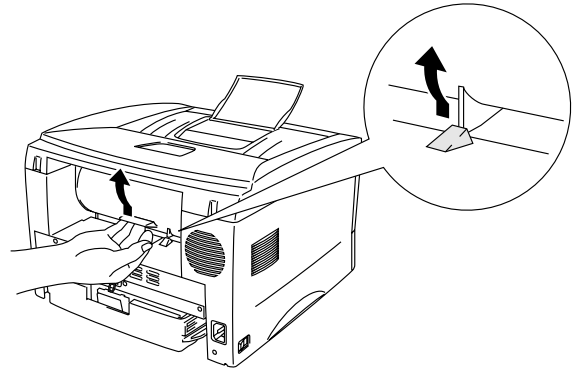
PCL driver



PS driver

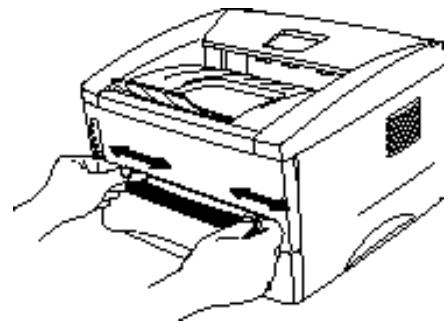


2. Open the rear cover.

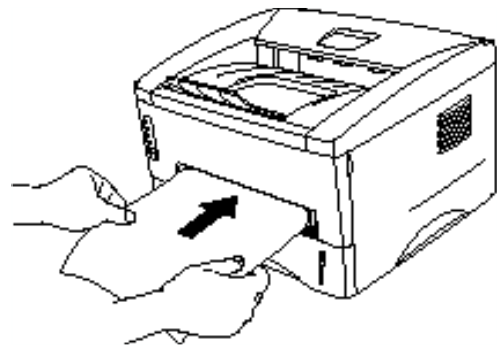


3. Send the print data.

4. Using both hands, slide the manual feed paper guides to the transparency width.



5. Using both hands, insert the transparency into the manual feed slot until its front edge touches the paper feed roller. Hold the transparency in this position until the printer automatically feeds it in a short distance, and then let go of the transparency.



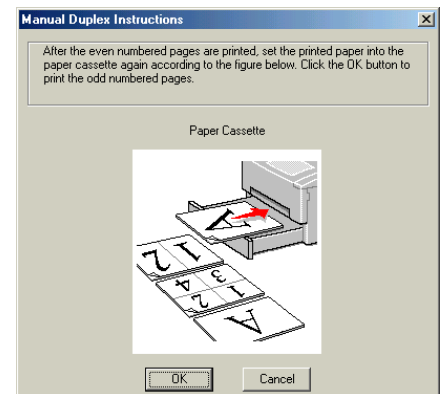
6. After the printer ejects the printed transparency, the printer will wait until you insert the next transparency. Repeat Step 5 for each transparency you want to print.
7. After you finish the print job, close the rear cover.

Printing on both sides of the Paper (Manual Duplex Printing)

The supplied printer drivers for Windows 95/98, Me, and Windows NT 4.0 / 2000 all enable manual duplex printing. For more information about how to make the settings, see the Help text in the printer driver.

❖ **Manual Duplex Printing from the Paper Cassette**

1. Select the Paper Size, Media Type and paper Source etc. in the printer driver.
2. The printer will automatically print all the even numbered pages on one side of the paper first.
3. Remove the printed even numbered pages from the output tray and re-insert them into the paper cassette, loading the paper with the side to be printed (blank side) face down. Follow the instructions on the computer screen.
4. The printer will now automatically print all the odd pages on the reverse side of the paper.

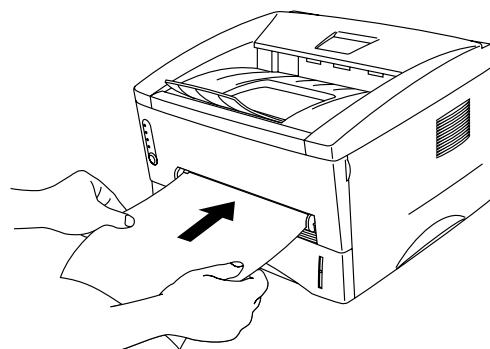


❖ **Manual Duplex Printing from the Manual Feed Slot**

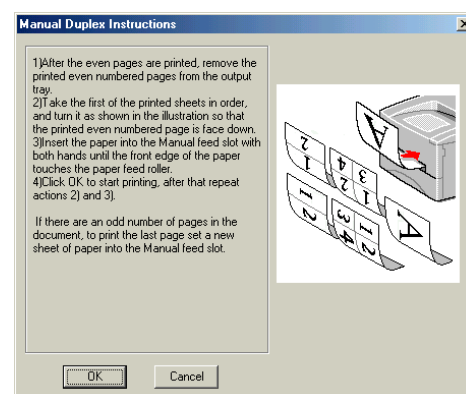
! **Caution**

- Before re-inserting the sheets, you will have to straighten them, or you may get paper feed errors.
- The use of very thin or very thick paper is not recommended.
- When you use the Manual Duplex function, it is possible that paper jams may occur or print quality might not be satisfactory. If a paper jam occurs, see [“Paper Jams and How to Clear Them”](#) in Chapter 6.

1. Select the required manual duplex printing mode and manual feed mode from the driver.
2. Using both hands, insert the paper into the manual feed slot with the side to be printed first facing up. Follow the instructions on the computer screen. Repeat this step until you have printed all the even numbered pages.



3. Remove the printed even numbered pages from the output tray and re-insert them in the same order into the manual feed slot. Load the paper with the side to be printed (blank side) face up. Follow the instructions on the computer screen.



4. Repeat Step 3 until you have printed all the odd numbered pages on the reverse side of the paper.

❖ ***Guidelines for Printing on Both Sides of the Paper***

- It may cause wrinkling if the paper is too thin.
- If paper is curled, straighten it and then load it in the paper cassette.
- The paper type should be regular paper. Do not use bond paper.
- When loading paper in the paper cassette, first empty the cassette, and then insert only the printed pages, with the printed side face up. (Do not add the printed pages to the top of the unprinted paper stack.)
- If the paper is not feeding correctly, it is possible that the paper is curled. Remove the paper and straighten it.

CHAPTER 2

PRINTER DRIVER AND SOFTWARE

Printer Driver

The printer drivers for the following operating systems are on the supplied CD-ROM. The latest printer driver can also be downloaded from the Brother Solutions Center at <http://solutions.brother.com>.

You can see the operations and detailed information in the Install Software section of the supplied CD-ROM.

For Windows® 95/98/Me, Windows NT® 4.0 and Windows® 2000

PCL (Hewlett-Packard LaserJet laser printer) driver

BR-Script (PostScript Level 2 language emulation) driver (HL-1450/HL-1470N user only)

For Macintosh (For HL-1440, HL-1450 and HL-1470N Only)

BR-Script (PostScript Level2 language emulation) driver (For more information, see the Network User's Guide on the CD-ROM.)

USB printer driver for Macintosh

	<i>PCL Driver</i>	<i>PS Driver</i>
Windows 95/98/Me	✓	✓
Windows 2000	✓	✓
Windows NT4.0	✓	✓
Macintosh (via Network)		✓
Macintosh (via USB)	✓	

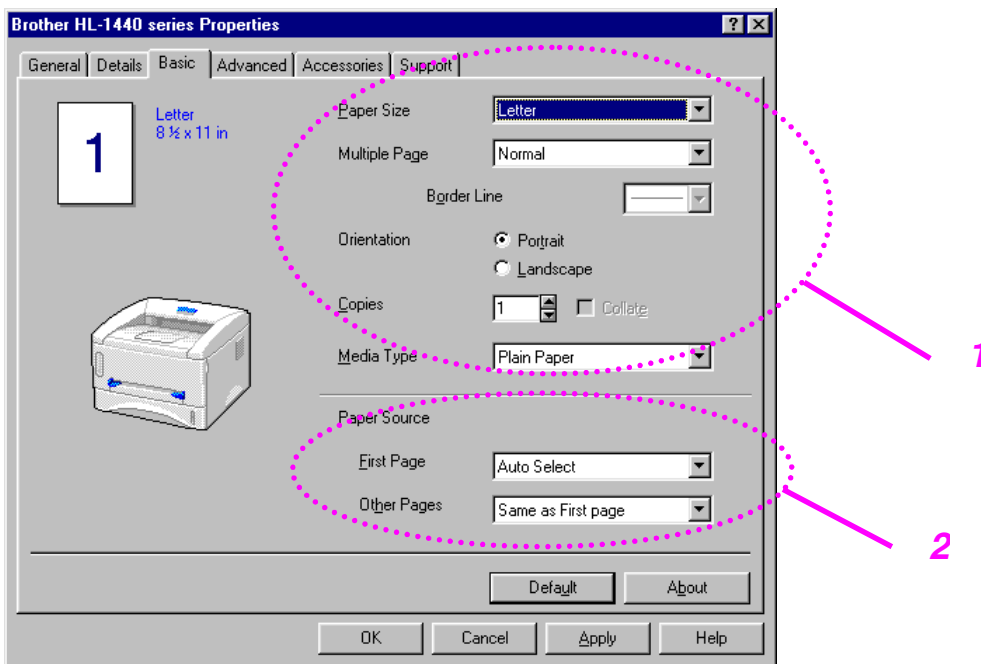
For Windows Users

❖ Features in the PCL Printer Driver

For more detailed information, please see the on-line Help in the printer driver or visit the Brother Solutions Center at <http://solutions.brother.com>

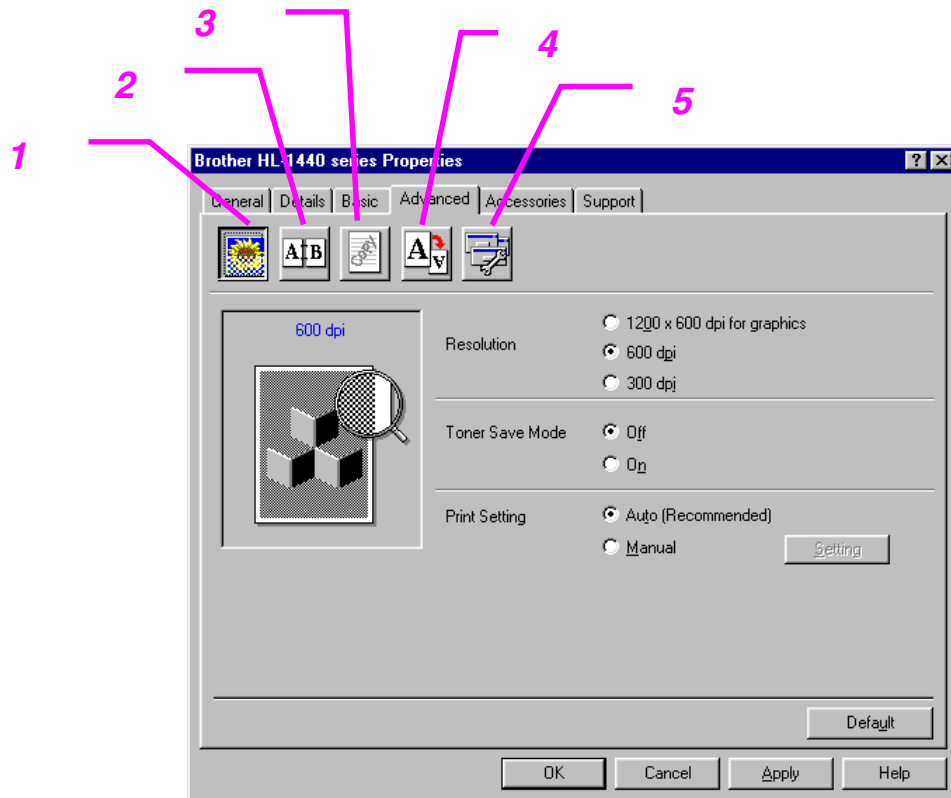
You can also change settings by clicking the illustration on the left side of the Basic tab in the Properties dialog box.

◆ Basic Tab



1. Select the Paper size, Multi-page, Orientation, etc.
2. Select the Paper source, etc.

◆ Advanced Tab



You can change the following settings by clicking the icons.

1. Print Quality
2. Manual Duplex
3. Watermark
4. Page Setting
5. Device Options

Print Quality

Select the resolution, toner save and print settings.

Resolution

You can change the resolution as follows:

300 x 300 dpi

600 x 600 dpi

1200 x 600 dpi for graphics (For HL-1440, HL-1450 and HL-1470N users only)

Toner Save

You can save running costs by turning on the toner save mode, which reduces the print density.

Print Setting (For Windows 95/98/Me users only)

With the Print setting set to MANUAL, you can manually change the Brightness, Contrast, Graphics mode settings and TrueType mode options.

Manual Duplex

If you select the manual duplex button, the dialogue box for the manual duplex settings appears. Six types of manual duplex binding directions are available for each orientation.

Watermark

You can place a watermarked logo or text into your documents.

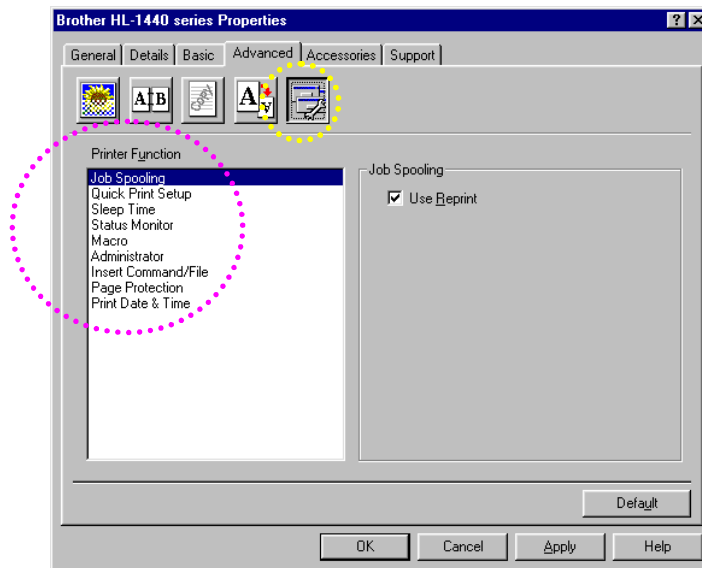
When you use a bitmap file as a watermark, you can change the size of the watermark and place it anywhere you like on the page.

When you use text as a watermark, you can change the font, darkness and angle settings.

Page Setting

You can change the print image scaling and select Mirror / Reverse print options.

Device Options



Set the following print function modes in this tab.

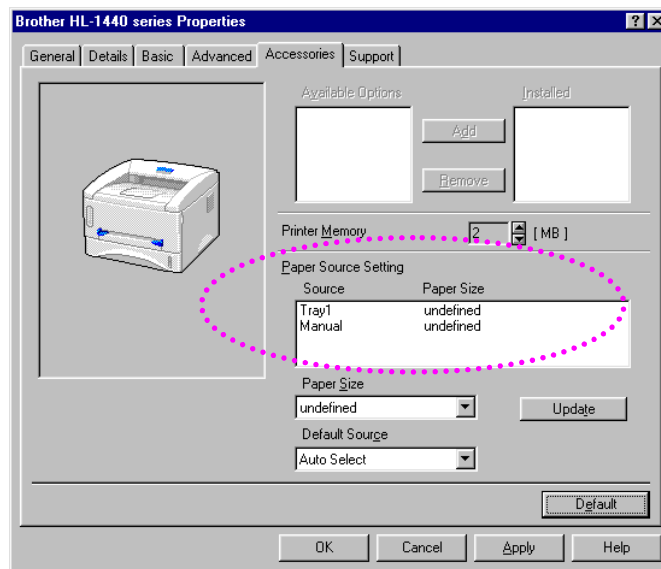
- Job Spooling
- Quick Print Setup
- Sleep Time
- Status Monitor
- Macro
- Administrator (For Windows 95/98/Me users only)
- Insert Command File (For Windows 95/98/Me users only)
- Page Protection
- Print Date & Time
- HRC (For Windows NT 4.0/2000 users only)
- True Type Mode (For Windows NT 4.0/2000 users only)

Note

The Printer Function list may differ depending on the model.

◆ Accessories Tab

When you install options, add those options and set them in the Accessories tab as follows.



Paper Source Setting

This feature recognizes the paper size in each paper tray.

◆ Support Tab

- You can download the latest driver or get additional product information by accessing the Brother Solutions Center at <http://solutions.brother.com>.
- You can see the printer driver version.
- You can check the current driver settings.
- You can print the Configuration page, Font list, etc. (HL-1440/HL-1450/HL-1470N users only)



❖ Features in the PS Printer Driver

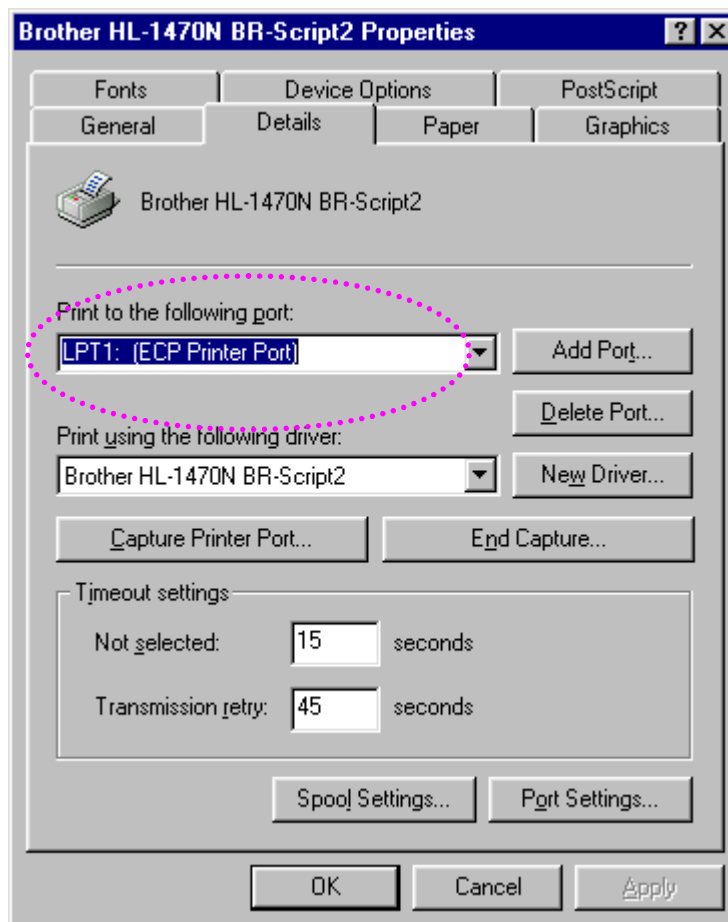
Note

This section is for HL-1450 and HL-1470N users only.

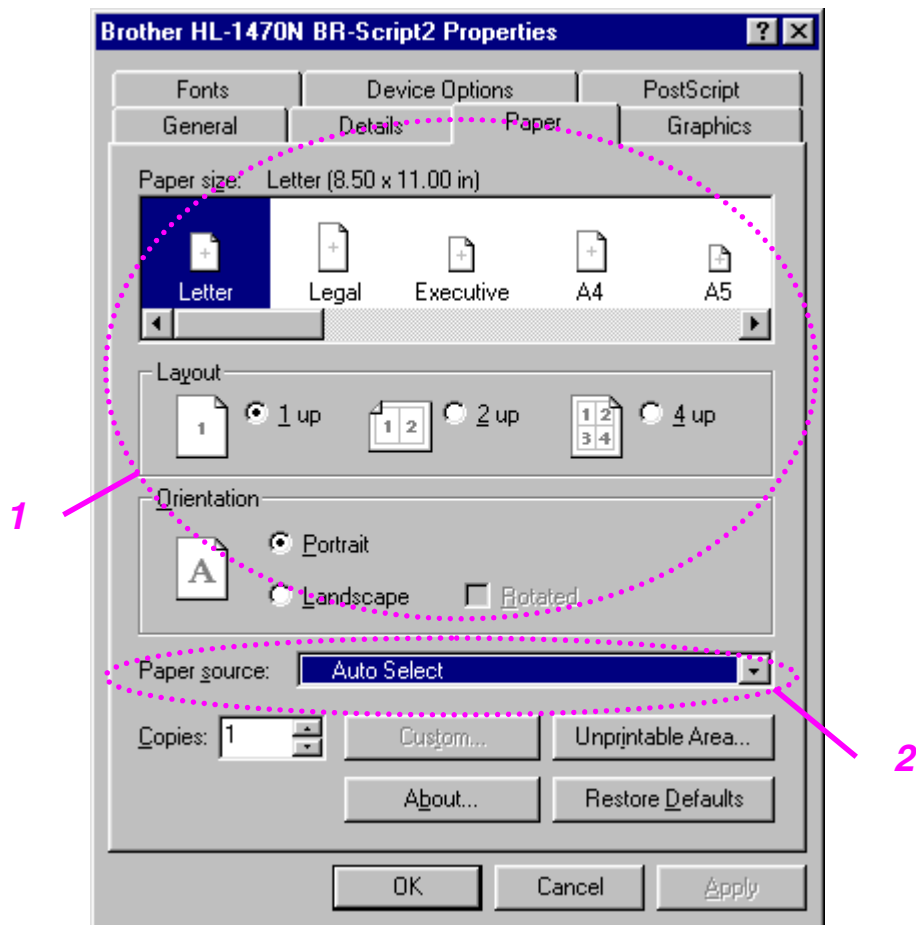
For more detailed information, please see the on-line Help in the printer driver or visit the Brother Solutions Center at <http://solutions.brother.com>

◆ Details Tab

1. Select the port where your printer is connected or the path to the network printer you are using.
2. Select the printer driver that you installed.



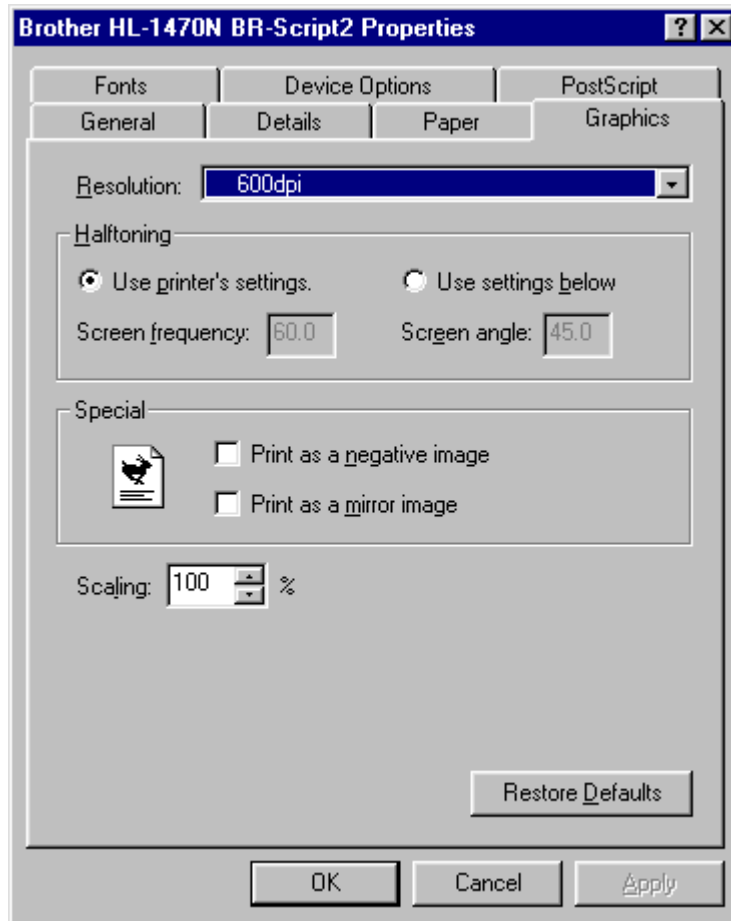
◆ Paper Tab



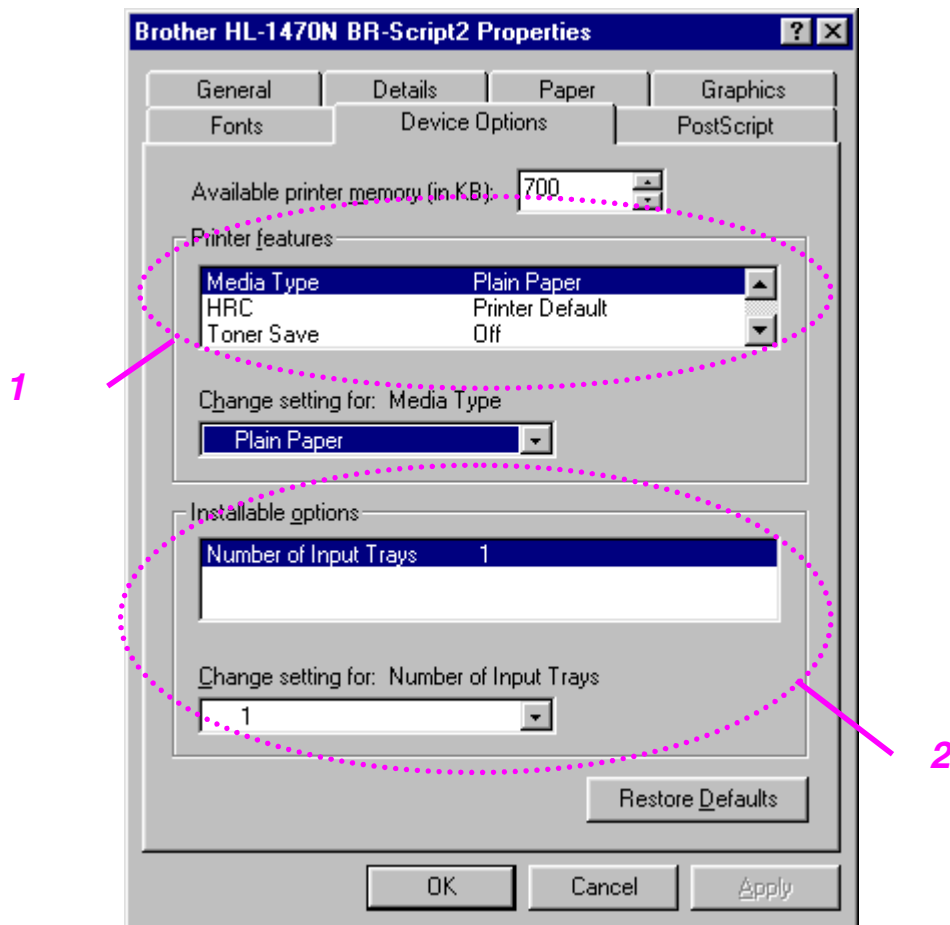
1. Select the Paper size, Multi-page, Orientation, etc.
2. Select the Paper source.

◆ Graphics Tab

You can select the print quality settings.



◆ Device Options Tab



1. You can change settings by clicking the setting and then selecting a new value in the Change Settings box.
 Toner Save Mode
 Sleep Mode
 Media Type
 HRC setting
2. Select the installed options from the list.

For Macintosh Users

This printer supports Macintosh® OS 8.51, 8.6, 9.0 and 9.1.
For more detailed information visit the Brother Solutions Center at
<http://solutions.brother.com>

❖ For USB Users (HL-1440/1450/1470N Users Only)

Computer Requirements:

- Power Macintosh having a pre-installed USB port
- 32MB RAM (64MB recommended)
- Mac OS 8.51, 8.6, 9.0 and 9.1 is required.

❖ For Network User (HL-1470N Users Only)

Computer Requirements:

- Power Macintosh having a pre-installed Ethernet port
- 32MB RAM (64MB recommended)
- Mac OS 8.51, 8.6, 9.0 and 9.1 is required.
- LaserWriter 8 version 8.6 and 8.7 is required.

◆ Apple LaserWriter 8 Driver

The Apple LaserWriter Driver may have been installed with your system. It is also available at <http://www.apple.com>.

LaserWriter 8 versions 8.6 and 8.7 have been tested for use with this printer.

Software

Note

This section is for Windows users only.

Automatic E-mail Printing

Automatic E-mail printing is used to download E-mail, receive mail at the selected time and print it automatically. You can also set it to select the mail to be printed automatically depending on the sender and the subject of the E-mail.

Search E-mail by sender and subject and then auto print

As soon as E-mail is received, the printer prints it automatically without your having to start the print operation. You can also choose the mail you want to print by having the printer search by sender and subject.

Auto access at the selected time

You can check incoming E-mail by accessing the server at pre-determined times.

Several mail users can share a PC

Usually, it is difficult to share E-mail software between several people on one PC. Automatic E-mail Printing supports multiple users, so several people can use E-mail software on one PC.

Software for Networks

Note

This section is for HL-1470N only.

❖ BRAdmin Professional

The BRAdmin Professional software is a utility for managing your Brother network enabled printers that are running under Windows 95/98/Me, Windows 2000 and Windows NT 4.0.

It allows you to easily configure and check the status of your printer on the network.

❖ Storage Manager

Brother Storage Manager software can manipulate the printer forms (Fonts, Macros or fixed forms) that you may have stored in the internal flash memory.

❖ **Network Printer Driver Wizard**

The Network Printer Driver Wizard software can be used to ease the installation of a printer in a network environment. It can also be used to create automatically running .exe files, which once run, automate the installation of a printer into a peer-to-peer environment.

❖ **Automatic Emulation Selection**

Note

This section is for HL-1450 and HL-1470N only.

This printer has an automatic emulation selection function. When the printer receives data from the computer, it automatically selects the emulation mode. This function has been factory set to ON.

The printer can select from among the following emulation combinations:

<i>EPSON (default)</i>	<i>IBM</i>
HP LaserJet	HP LaserJet
BR-Script 2	BR-Script 2
EPSON FX-850	IBM ProPrinter XL

CHAPTER 3

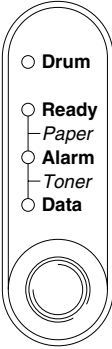
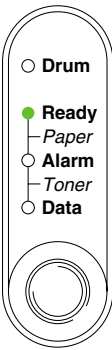
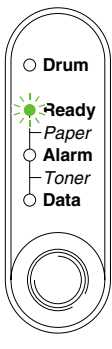
CONTROL PANEL

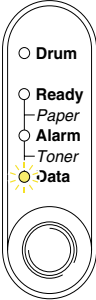
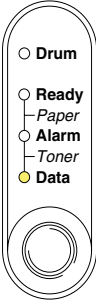
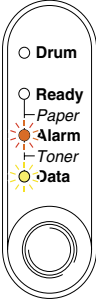
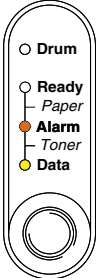
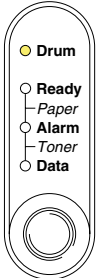
This section refers to the LEDs and control panel button on the control panel. The LED indications shown in the table below are used in the illustrations in this chapter.

-  LED is off
-  LED is blinking
-  LED is on

 Note

When the power switch is off or the printer is in Sleep mode, all LEDs including the **Ready** LED are off.

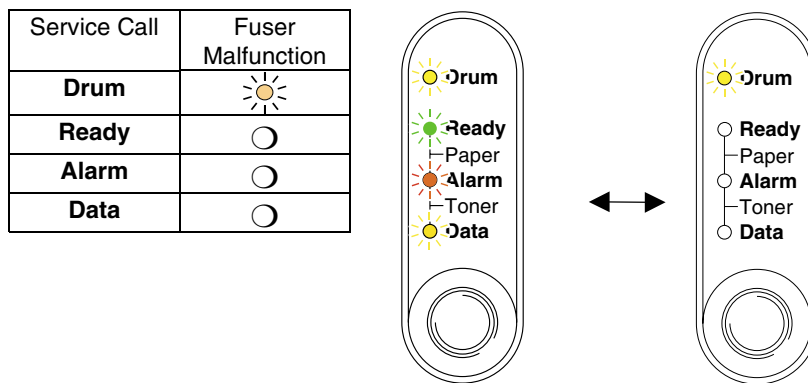
LED	Printer status	
	Sleep mode The power switch is off or the printer is in Sleep mode.	
	Ready to print The printer is ready to print. Pressing control panel button wakes up the printer to Ready mode.	
	Blinking at 1 second intervals	Warming up The printer is warming up.
	Blinking at 2 second intervals	Cooling down or stop printing The printer is cooling down and stops printing until the internal temperature of the printer lowers.
	Paper Jam Clear the paper jam referring to “ Paper Jams and How to Clear Them ” in Chapter 6. If the printer does not automatically resume printing, press the control panel button.	
	No Paper Load paper in the printer referring to “ Printing on Plain Paper ” in Chapter 1, and then press the control panel button.	
	Misfeed Reinstall the paper properly, and then press the control panel button. The printer will start printing again.	

LED	Printer status
	Receiving Data The printer is receiving data from the computer or the printer is processing data in memory.
	Data Remaining in Memory Print data remains in the printer memory. If the Data LED is on for a long period of time and nothing has printed, you will need to press the control panel button to print the remaining data.
 Blinking every 5 seconds	Toner Low Indicates that the toner cartridge is nearly empty. Purchase a new toner cartridge and have it ready for when Toner Empty is indicated.
	Toner Empty Replace the toner cartridge with a new one. See “Replacing the Toner Cartridge” in Chapter 5.
	Near End of Life The drum unit is near the end of its life. We recommend that you obtain a new drum unit to replace the current one. See “Replacing the Drum Unit” in Chapter 5.

Service Call Indications

If an unrecoverable error occurs, the printer will indicate the need for a service call by illuminating all the LEDs and then alternating the following combination of LEDs.

For example, the following two indications alternate when a fuser malfunction error occurs.



Service call	Fuser Malfunction	Laser BD Malfunction	Scanner Malfunction	ROM Error
Drum				
Ready				
Alarm				
Data				

Service Call	D-RAM Error	Service A	Service B	Engine Interface Error
Drum				
Ready				
Alarm				
Data				

Service Call	NV-RAM Error	Main Motor Malfunction	CPU Runtime Error
Drum			
Ready			
Alarm			
Data			

If you see any of these service call indications, turn off the power switch, wait a few seconds, and then turn it on and try to print again.

If you cannot clear the error and see the same service call indication after turning on the printer, consult your dealer or a Brother authorized service representative. Please note the indication and report the error status and problem by referring to the above table.

 Note

Ensure that the front cover is fully closed before reporting a service call.

Control Panel Button

The control panel button has the following functions.

Cancel printing

If you press the control panel button while printing, the printer immediately stops printing and ejects the paper.

Wake-up

If the printer is in Sleep mode, pressing the control panel button wakes it up and goes to the Ready state. It will take up to 25 seconds for the printer to reach the Ready state.

Form feed

If the **Data** LED is on, press the control panel button. The printer will print any data remaining in the printer memory.

Error recovery

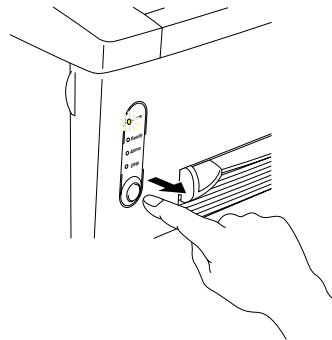
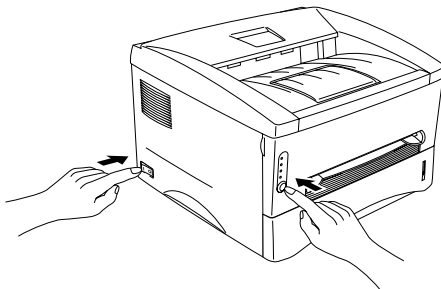
If an error occurs, the printer will recover from some errors automatically. If the error does not clear automatically, press the control panel button to clear the error, and then continue printer operation.

Print Test Sample Page

The printer prints a test sample page using the control panel button or printer driver.

❖ Using Control Panel Button

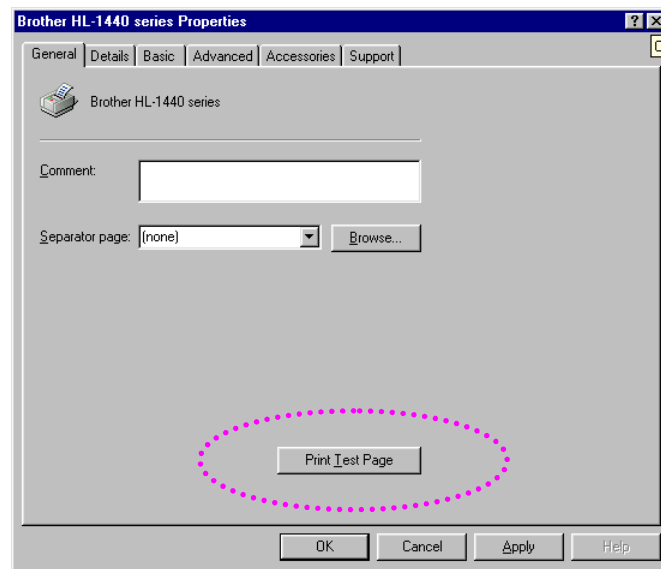
- 1.** Turn off the printer.
- 2.** Make sure that the front cover is closed and the power cord is plugged in.
- 3.** Hold down the control panel button as you turn on the power switch. All the LEDs will illuminate. Keep the button depressed until the **Drum** LED comes on. When the **Drum** LED comes on, release the button your finger.



- 4.** Press the control panel button again. The printer will print a test sample page.

❖ *Using the Printer Driver*

If you are using Brother's Windows PCL printer driver, use the "Print Test Page" button usually located in the General tab of the Windows printer driver.

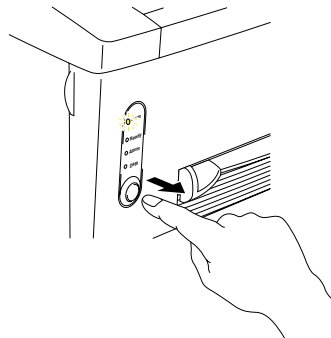
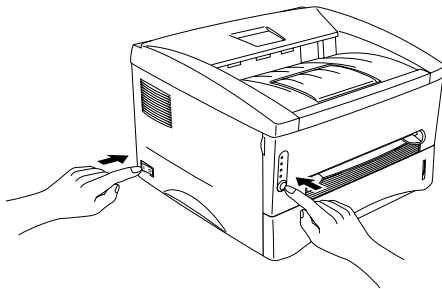


Print Configuration and Fonts

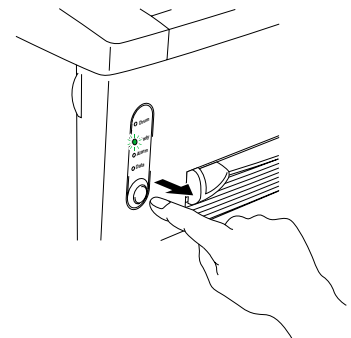
You can print the current configuration and a list of the internal fonts using the control panel button or printer driver.

❖ Using Control Panel Button

- 1.** Turn off the printer.
- 2.** Make sure that the front cover is closed and the power cord is plugged in.
- 3.** Hold down the control panel button as you turn on the power switch. All the LEDs will illuminate. Keep the button depressed until the **Drum** LED comes on. When the **Drum** LED comes on, release the button.



- 4.** Press the control panel button again and hold it down until the **Ready** LED comes on.
- 5.** When the **Ready** LED comes on, release the button. The printer prints the current configuration of the printer and a list of the internal fonts.



❖ Using the Printer Driver

Note

This section is for HL-1440, HL-1450, HL-1470N users only.

If you are using Brother's Windows PCL printer driver, you can print the current configuration and a list of the internal fonts by clicking the *Print Config* and *Print Font* buttons in the Support tab.



CHAPTER 4

OPTIONS

This printer has the following optional accessories. You can increase the capabilities of the printer with these items. Click the check mark in the following table to see the detailed information for each item.

Model	SIMM	Lower Tray Unit	Print Server	IrDA Interface
HL-1230			✓	✓
HL-1440	✓		✓	✓
HL-1450	✓	✓	✓	✓
HL-1470N	✓	✓	standard	✓

SIMM

Note

This section is for HL-1440, HL-1450, HL-1470N users only.

We recommend that you expand the printer memory to avoid any memory full errors.

For HL-1440 Users

This printer has 2 Mbytes of standard memory and a slot for optional additional memory. The memory can be expanded up to a total of 34 Mbytes by installing a commercially available SIMM (single in-line memory module).

For HL-1450 and HL-1470N Users

These printers have 8 Mbytes of standard memory and a slot for optional additional memory. 4 Mbytes of memory is fitted on the board, the other 4 Mbytes is on the installed SIMM. The memory can be expanded up to a total of 36 Mbytes by installing a commercially available SIMM (single in-line memory module). When you want to expand the memory, you need to remove the fitted SIMM, and then install a new SIMM of at least 8 Mbytes.

◆ **Minimum Memory Recommendation (Including Resident Memory)**

HL-1440 (Including 2 MB of internal memory)

	300 dpi	600 dpi	1200 dpi
Letter/A4	Standard	Standard	10 MB
Legal	Standard	Standard	10 MB

HL-1450 (Including 8 MB of internal memory)

HP LaserJet, EPSON FX-850 and IBM Proprinter XL emulation modes

	300 dpi	600 dpi	1200 dpi
Letter/A4	Standard	Standard	16 MB
Legal	Standard	Standard	16 MB

PostScript Level II language emulation mode

	300 dpi	600 dpi	1200 dpi
Letter/A4	Standard	Standard	16 MB
Legal	Standard	Standard	16 MB

HL-1470N (Including 8 MB of internal memory)

HP LaserJet, EPSON FX-850 and IBM Proprinter XL emulation modes

	300 dpi	600 dpi	1200 dpi
Letter/A4	Standard	Standard	16 MB
Legal	Standard	Standard	16 MB

PostScript Level II language emulation mode

	300 dpi	600 dpi	1200 dpi
Letter/A4	Standard	Standard	16 MB
Legal	Standard	Standard	16 MB

This printer can accept memory SIMM with the following specifications:

Speed	60 nsec - 80 nsec
Pin type	72 pin
Height	25.4 mm (1.00") or less
Output	32 bit or 36 bit

 Note

- Additional memory is useful and may be necessary if you are using the Page Protection function.

(For HL-1440 users)

- The resident memory of HL-1440 printer is 2 MB, you need to expand the printer memory by adding a SIMM to print at 1200 dpi.

(For HL-1470N users)

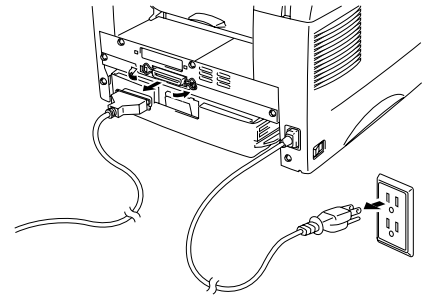
- You have to expand the printer memory by adding a SIMM to use the FTP/IPP protocol.
-

 Note

The printer has only one slot for a SIMM upgrade. If you want to increase your printer memory again after you have already installed a SIMM module in the slot, you will need to remove the previously installed SIMM.

Installing Additional Memory

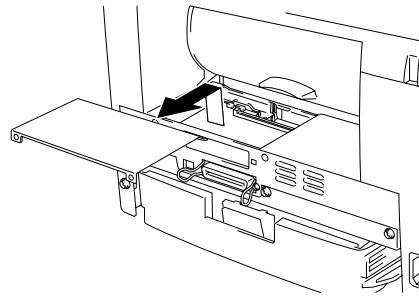
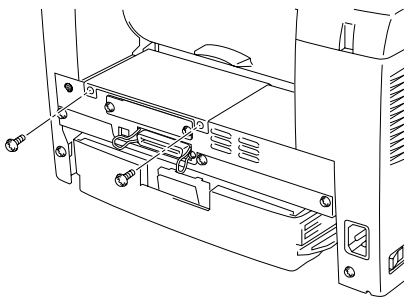
1. Turn off the printer and unplug the power cord from the AC outlet. Disconnect the interface cable from the printer.



! **Caution**

Be sure to turn off the printer before you install or remove SIMM.

2. Open the rear cover. Unscrew the two screws that secure the access cover and remove it.

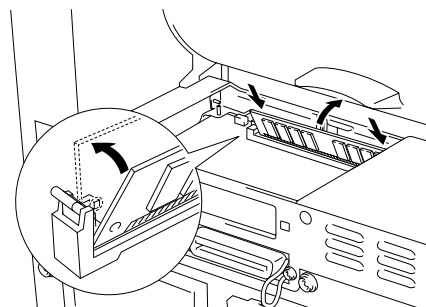


3. Unpack the SIMM and hold it by the edges.

! **Caution**

SIMM boards can be damaged by even a small amount of static electricity. Do not touch the memory chips or the board surface. Wear an antistatic wrist strap when you install or remove the board. If you do not have an antistatic wrist strap, frequently touch the bare metal on the printer.

4. Install the SIMM into the slot at an angle, and then push it gently toward the vertical until it clicks into place.



5. Re-install the access cover and secure the access cover with the two screws.
6. Close the rear cover.
7. Reconnect the interface cable (printer cable) to your computer. Plug the power cord into the AC outlet, and then turn on the power switch.

 Note

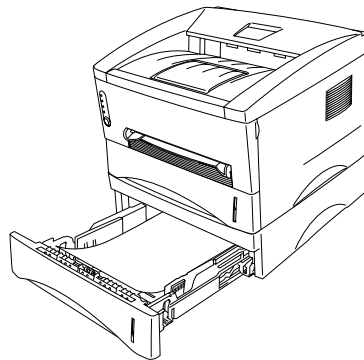
To check that you installed the SIMM correctly, print the configuration sheet by using the selection in the driver and check it to make sure it shows the additional memory. See [“Print Configuration and Fonts”](#) in Chapter 3.

Lower Tray Unit

Note

This section is for HL-1450 and HL-1470N users only.

The lower tray unit is a device that functions as an additional paper source. It can hold a maximum of 250 sheets of paper (80 g/m² or 21 lb.).



To purchase the optional lower tray unit, please consult the dealer where you purchased the printer.

For installation details, see the instructions supplied with the lower tray unit.

Print Server (NC-2010p)

Note

This section is for HL-1230, HL-1440 and HL-1450 users only.

An optional network print server (NC-2010p) allows your printer to be connected to your network via the parallel interface.

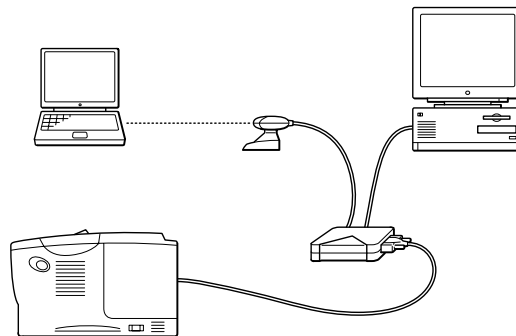
The NC-2010p print server offers the following protocol support when you use it on the HL-1230, HL-1440 or HL-1450 printers:

- TCP/IP, Netware, NetBIOS, Banyan VINES, LAT and DLC/LLC protocols
- Superior network and printer management:
 - BRAdmin Professional Windows-based Management utility.
 - SNMP MIB I and MIB II over IP or IPX
 - Remote console management via DEC NCP, TELNET or NetWare.
 - Embedded web server support.
- Flash memory for easy updating of firmware.

IrDA Interface (IR-1000)

The IR-1000 connects to any of these printers and can print data without the use of connecting cables.

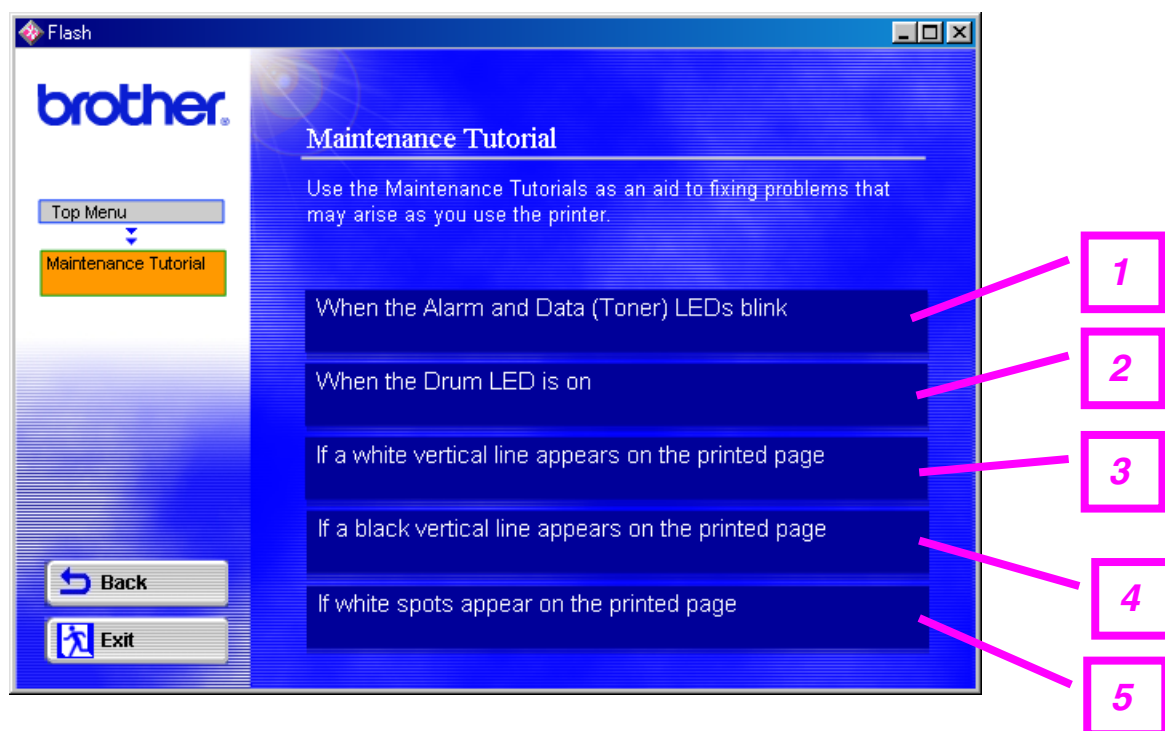
- Supports the IrDA1.1 Infrared communication standard.
- Fully compatible with Windows® 95/98/Windows® Me, Windows NT® 4.0, Windows® 2000 Infrared printer devices.
- Transmits and receives data up to 4 Mbits/s.
- Connects to the PC parallel port and the printer port.
- Allows a printer to communicate with an infrared-equipped portable computer.
- Transmission range: 1 cm (0.39 inch) up to 100 cm (39 inch), meets the IrDA standard.
- It is effective within a 30 degree cone angle.



CHAPTER 5

ROUTINE MAINTENANCE

You need to replace the consumables and clean the printer periodically.
You can see the maintenance movie in the supplied CD-ROM *Maintenance Tutorial* section.



1. You can see how to replace the toner cartridge.
2. You can see how to replace the drum unit.
3. You can see how to clean the scanner window.
4. You can see how to clean the corona wire in the drum unit.
5. You can see how to clean the surface of the OPC in the drum unit.

These instructions are also included in “Improving the Print Quality” in Chapter 6.

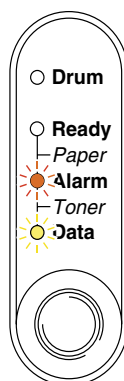
Toner Cartridge

A new toner cartridge contains enough toner to print approximately 3,000 (*standard* cartridge) or 6000 (*high yield* cartridge) A4/Letter-size single-sided pages at about 5% coverage.

Note

- Toner consumption varies according to the image coverage on the page and the print density setting. The greater the image coverage, the greater the toner consumption.
 - If you change the print density setting for lighter or darker printing, toner consumption varies accordingly.
 - Wait to unpack the toner cartridge until immediately before you install it in the printer.
-

Toner Low Message



Blinking every 5 seconds

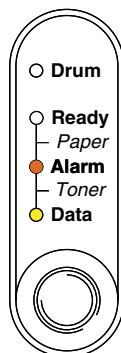
If the LED shows this message, the toner will soon run out. Purchase a new toner cartridge and have it ready before you get a Toner Empty message.

Note

Both Alarm and Data (Toner) LEDs will blink continuously to indicate that the toner cartridge is nearly empty. This blinking will not stop until you have installed a new toner cartridge.

Toner Empty Message

If the LED shows the following message, the printer has run out of toner or the toner is not evenly distributed inside the cartridge.

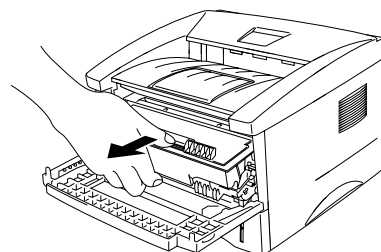


Replacing the Toner Cartridge

Note

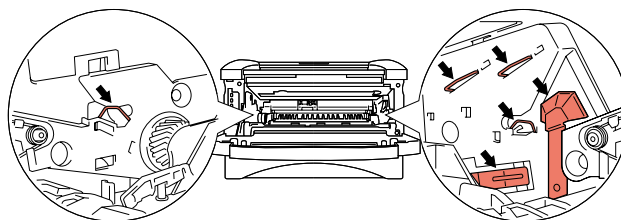
To ensure optimum print quality, be sure to use quality toner cartridges. To purchase toner cartridges, consult the dealer where you purchased the printer.

- 1.** Open the front cover.
- 2.** Pull out the drum unit assembly.

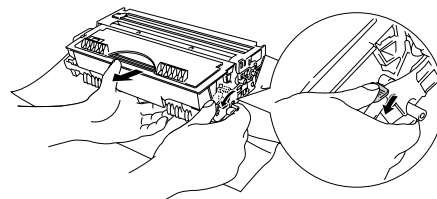


! Caution

We recommend that you place the drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner. To prevent damage to the printer from static electricity, do not touch the electrodes shown in the illustration.



3. Press the lock lever down, and then pull the toner cartridge out of the drum unit assembly.

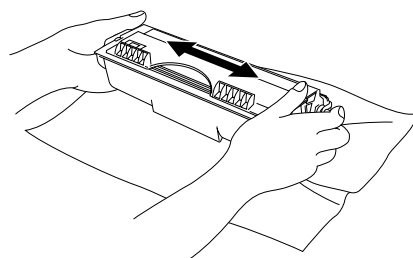
**! Caution**

Handle the toner cartridge carefully. If toner scatters on your hands or clothes, immediately wipe or wash it off with cold water.

Note

- Be sure to seal the toner cartridge tightly so that toner powder does not spill out of the cartridge.
- Dispose of the used toner cartridge in accordance with local plastic waste regulations.

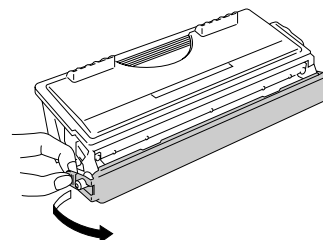
4. Unpack the new toner cartridge. Keeping the cartridge horizontal, gently rock it from side to side five or six times.



⚠ Caution

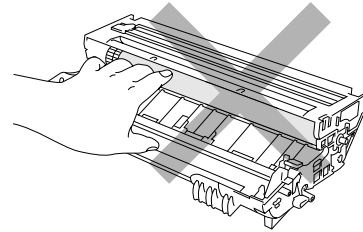
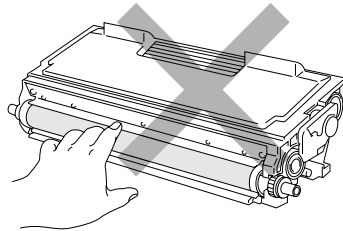
- Wait to unpack the toner cartridge until immediately before you install it in the printer. If toner cartridges are left unpacked for a long period of time the toner life will be shortened.
- If an unpacked drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.
- Use a genuine Brother toner cartridge that is specially formulated to ensure optimum print quality.
- Printing with a 3rd party toner or 3rd party toner cartridge may reduce not only the print quality but also the quality and life of the printer itself. It may also cause serious damage to the performance and life of a drum unit. Warranty coverage does not apply to problems caused by the use of 3rd party toner or 3rd party toner cartridges.

5. Remove the protective cover.

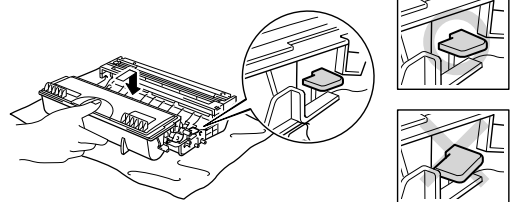


! Caution

Install the toner cartridge immediately after you remove the protective cover. Do not touch the shaded parts in the illustration to prevent any degradation to the print quality.

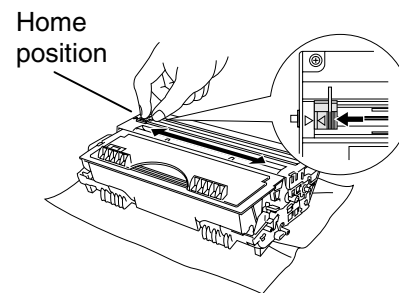


6. Install the new toner cartridge into the drum unit until you hear it lock into place. When the toner cartridge is installed correctly, the lock lever is lifted automatically.

**! Caution**

Make sure you install the toner cartridge correctly or it may separate from the drum unit.

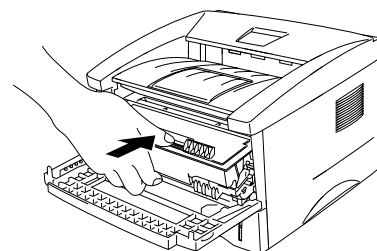
7. Clean the primary corona wire inside the drum unit by gently sliding the blue tab from right to left and left to right several times. Return the tab to the Home position (▲) before you re-install the drum unit assembly.



! Caution

Make sure that you return the tab to the Home position (▲) before you re-install the drum unit assembly in the printer; otherwise, printed pages may have vertical stripes.

8. Re-install the drum unit assembly in the printer. Close the front cover.



Note

We recommend that you clean the printer when you replace the toner cartridge. See “Cleaning” in this chapter.

Drum Unit

This printer can print approximately 20,000 pages ^{*1} with one drum unit.

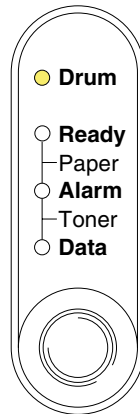
^{*1} At 5% print coverage (A4-Letter size). The actual number of printed pages may vary depending on the average type of print job and paper.

Note

- There are many factors that determine the actual drum life, such as the temperature, humidity, type of paper, type of toner used, number of pages per print job, etc. Under ideal conditions, the average drum life is estimated at approximately 20,000 pages. The actual number of pages that your drum will print may be significantly less than this estimate. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.
 - For best performance, use only genuine Brother toner. The printer should be used only in a clean, dust-free environment with adequate ventilation.
 - Printing with a 3rd party drum unit may reduce not only the print quality but also the quality and life of the printer itself. Warranty coverage does not apply to problems caused by the use of 3rd party drum unit.
-

❖ **Change Drum Message**

If the **Drum** LED is on, it means the drum unit is near the end of its life. We recommend that you replace the drum unit with a new one before there is a noticeable deterioration in the print quality.



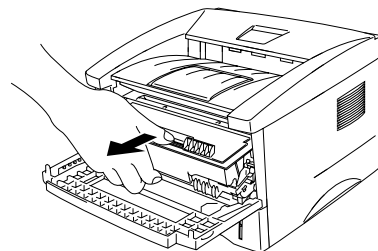
Caution

-
- While removing the drum unit, handle it carefully because it may contain toner.
 - You should clean the printer when you replace the drum unit. See “**Cleaning**” in this chapter.
-

Replacing the Drum Unit

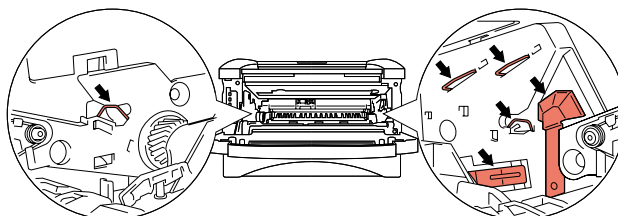
Follow these steps to replace the drum unit. You can also view the drum unit replacement method in the instructional movie on the supplied CD-ROM:

1. Open the front cover.
2. Pull out the drum unit assembly.

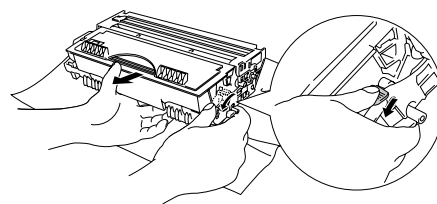


⚠ **Caution**

We recommend that you place the Drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner. To prevent damage to the printer from static electricity, do not touch the electrodes shown below.



3. While pressing the lock lever, pull the toner cartridge out of the drum unit assembly.



! Caution

Handle the toner cartridge carefully. If toner scatters on your hands or clothes, immediately wipe or wash it off with cold water.

Note

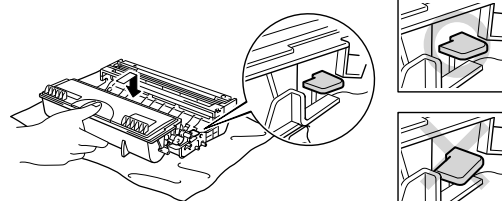
Discard the used drum unit according to local regulations. Be sure to seal up the drum unit tightly so that toner powder does not spill out of the unit.

4. Unpack the new drum unit.

! Caution

Wait to unpack a drum unit until immediately before you install it in the printer. If an unpacked drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.

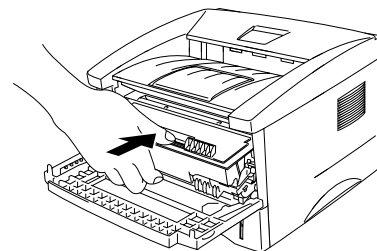
5. Install the toner cartridge into the new drum unit until you hear it lock into place with a click. When the toner cartridge is installed correctly, the lock lever is lifted automatically.



! Caution

Make sure you install the toner cartridge correctly, or it may separate from the drum unit.

6. Re-install the drum unit assembly in the printer. Make sure that the printer is turned on, the front cover is open and the **Drum** and **Alarm** LEDs are illuminated.



7. Reset the drum counter referring to the instructions supplied with the new drum unit.

⚠ Caution

- The Drum LED indication does not disappear until you reset the drum counter.
- Do not reset the drum counter when you replace only the toner cartridge.

8. Close the front cover.

9. Make sure that the Drum LED is now off.

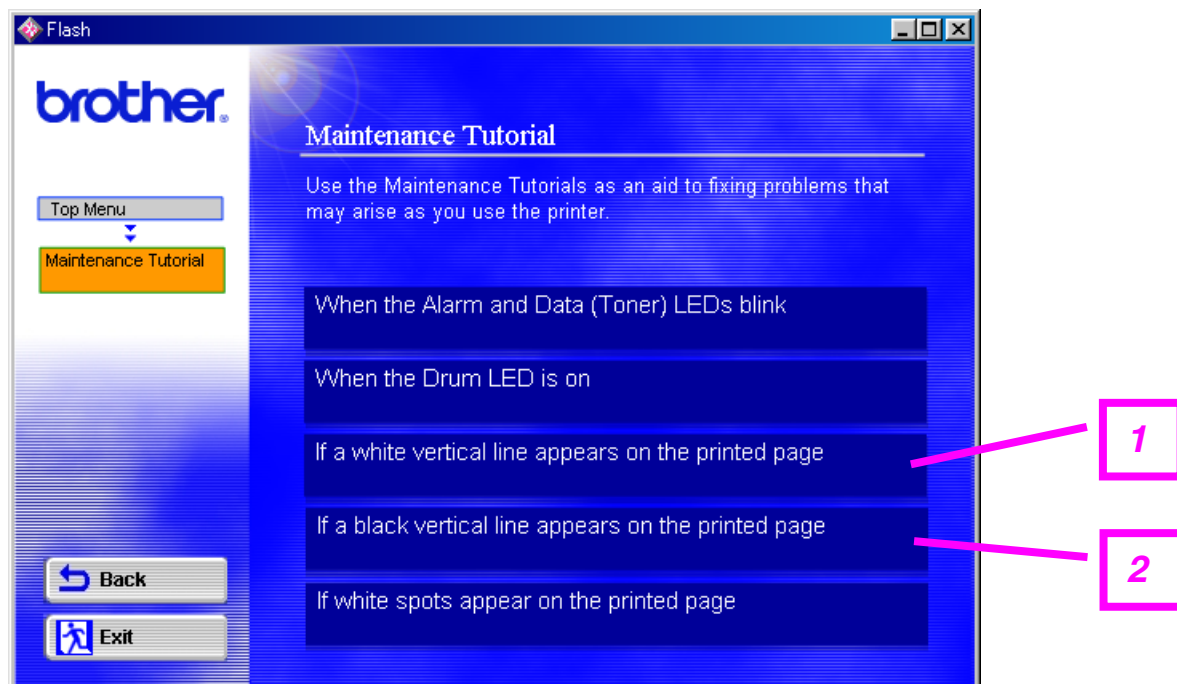
⚠ Caution

We recommend that you clean the printer when you replace the toner cartridge. See [“Cleaning”](#) in this chapter.

Cleaning

Clean the printer exterior and interior routinely. If printouts are stained with toner, clean the printer interior and drum unit.

See the Maintenance Tutorial section in the supplied CD-ROM. You can see the instructional movie.



1. You can see how to clean the scanner window.
2. You can see how to clean the corona wire in the drum unit.

Periodic Maintenance Parts

You need to replace the maintenance parts periodically to maintain print quality. The units listed below should be replaced after printing the following number of pages.

<i>Item</i>	<i>Approximate Life</i>	<i>To Purchase Replacement</i>
<i>Fixing unit</i>	50,000 pages *	Call Customer Support
<i>Separator pad holder assy</i>	50,000 pages *	Call Customer Support
<i>Pick up roller assy</i>	50,000 pages *	Call Customer Support

* The actual number of printed pages may vary depending on your average type of print job and paper. The figures quoted are based upon 5% coverage per page.

CHAPTER 6

TROUBLESHOOTING

Identifying Your Problem

First, check the following:

- The power plug is connected correctly and the printer is turned on.
- All of the protective parts have been removed.
- The toner cartridge and drum unit are installed correctly.
- The front cover is fully closed.
- Paper is inserted correctly into the paper cassette.
- The interface cable is securely connected between the printer and computer.
- The correct driver for the printer is installed and selected.
- The PC is set up to connect to the correct printer port.

Printer does not print:

If you did not solve your problem with the above checks, please find your problem in the following list and then go to the section listed.

Printer LED is blinking

See [“CONTROL PANEL”](#) in Chapter 3.

Status Monitor Error Message appears

See [“Error Messages in the Status Monitor”](#) in this chapter.

Printer printed “Error Message”

See [“Error Message Printouts”](#) in this chapter.

Paper handling

See [“Paper Handling”](#) or [“Paper Jams and How to Clear Them”](#) in this chapter.

Other Problems

See [“Other Problems”](#) in this chapter.

Pages are printed, however there are problems with:

Print quality

See [“Improving the Print Quality”](#) in this chapter.

Printout is incorrect

See [“How to Print Correctly”](#) in this chapter.

Error Messages in the Status Monitor

The Status Monitor will report problems with the printer. Take the corrective actions listed in the following table for the error message that the Status Monitor reports.

Error message	Action
COVER OPEN	Close the front cover of the printer.
MEMORY FULL	- Press the control panel button to print the data remaining in the printer. - Reduce the print resolution or reduce the complexity of your document. (For HL-1440, HL-1450 and HL-1470N Users) - Expand the printer memory by adding a commercially available SIMM memory. See “Installing Additional Memory” in Chapter 4.
NO PAPER or MISFEED	- The paper cassette may be out of paper or not properly installed. If it is empty, load a new stack of paper into the paper cassette. - If there is paper in the paper cassette, make sure it is straight. If the paper is curled, straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and put it back in the paper cassette. - Reduce the amount of paper in the paper cassette, and then try again. - Make sure you use paper that meets Brother’s recommended paper specifications. See “What Kind of Paper can I Use?” in Chapter 1.
PAPER JAM	See “Paper Jams and How to Clear Them” in this chapter.
PRINT OVERRUN	- Press the control panel button to print the data remaining in the printer. - If this does not clear the error, reduce the complexity of your document or reduce the print resolution. (For HL-1440, HL-/1450 and HL-/1470N Users) - Expand the printer memory by adding a commercially available SIMM. See “Installing Additional Memory” in Chapter 4. Set page protection to ON by using the supplied Windows driver or RPC program. - Change the following settings in the supplied Windows driver and try again. The best combination of settings below will vary depending on your document. - Graphics Mode - True Type™ mode - Use Printer True Type™ Fonts

Error message	Action
RESOLUTION ADAPTED (The printer has printed the document at a reduced resolution.)	- Reduce the complexity of your document before you print to prevent automatic reduction of the resolution. (For HL-1440, HL-1450 and HL-1470N Users) - Expand the printer memory by adding a commercially available SIMM memory. See “Installing Additional Memory” in Chapter 4.
TONER EMPTY	See “Replacing the Toner Cartridge” in Chapter 5.
TONER LOW	Purchase a new toner cartridge and have it ready for when the Toner Empty status is indicated.
FUSER MALFUNCTION	- Turn the power switch off, wait a few seconds and then turn it on again. - Leave the printer for 10 minutes with the power on. If the error occurs again, consult your dealer.
LASER BD MALFUNCTION	Turn the power switch off, wait a few seconds and then turn it on again. If the error occurs again, consult your dealer.
SCANNER MALFUNCTION	
D-RAM ERROR	
NV-RAM ERROR	
MAIN MOTOR ERROR	
ENGINE INTERFACE ERROR	

Error Message Printouts

The printer will report problems by printing an error message as defined in the following table. Take the corrective actions for the error message.

Error message	Action
MEMORY FULL	- Press the control panel button to print the data remaining in the printer. - Reduce the print resolution or reduce the complexity of your document. (For HL-1440, HL-1450 and HL-1470N Users) - Expand the printer memory by adding a commercially available SIMM. See “Installing Additional Memory” in Chapter 4.
PRINT OVERRUN	- Press the control panel button to print the data remaining in the printer. - If this does not clear the error, reduce the complexity of your document or reduce the print resolution. (For HL-1440, HL-1450 and HL-1470N Users) - Expand the printer memory by adding a commercially available SIMM. See “Installing Additional Memory” in Chapter 4. - Set page protection to ON by using the supplied Windows driver or RPC program. - Change the following settings in the supplied Windows driver and try again. The best combination of settings below will vary depending on your document. - Graphics Mode - True Type™ mode - Use Printer True Type™ Fonts
RESOLUTION ADAPTED (The printer has printed the document at a reduced resolution)	- Reduce the complexity of your document before you print to prevent automatic reduction in the resolution. (For HL-1440, HL-1450 and HL-1470N Users) - Expand the printer memory by adding a commercially available SIMM. See “Installing Additional Memory” in Chapter 4.

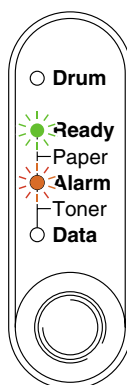
Paper Handling

First, ensure that you are using paper that meets Brother recommended paper specifications. See [“What Kind of Paper can I Use?”](#) in Chapter 1.

Problem	Recommendation
The printer does not load paper.	• If there is paper in the paper cassette, make sure it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and put it back in the paper cassette. • Reduce the amount of paper in the paper cassette, and then try again. • Check that manual feed mode is not selected in the printer driver.
The printer does not load paper from the manual feed slot.	• Re-insert the paper firmly, one sheet at a time. • Make sure that manual feed mode is selected in the printer driver.
The printer will not load envelopes.	• The printer can load envelopes from the manual feed slot. Your application software must be set up correctly to print on the envelope size you are using. This is usually done in the page setup or document setup menu of your software. Refer to your software application manual.
A paper jam has occurred.	• Clear the jammed paper referring to “Paper Jams and How to Clear Them” or the paper jam instructional video on the CD-ROM.
The printer does not print into the output tray.	• Close the rear cover.
The printer does not print on the specified paper. (For HL-1450 with optional lower tray unit user only)	• Make sure that the cable is connected to the printer • Make sure that the appropriate printer driver is selected.

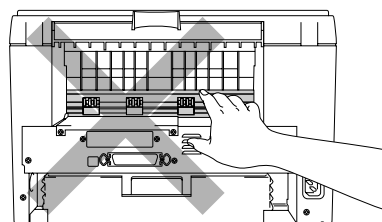
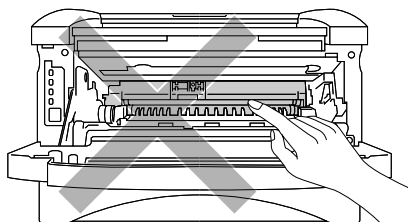
Paper Jams and How to Clear Them

When a paper jam occurs, the printer indicates it by lighting the control panel LEDs as shown below.



Warning

After you have just used the printer, some internal parts of the printer are extremely **HOT!** When you open the front or rear cover of the printer, never touch the shaded parts shown in the following diagram.



Clear the jammed paper referring to the following description.

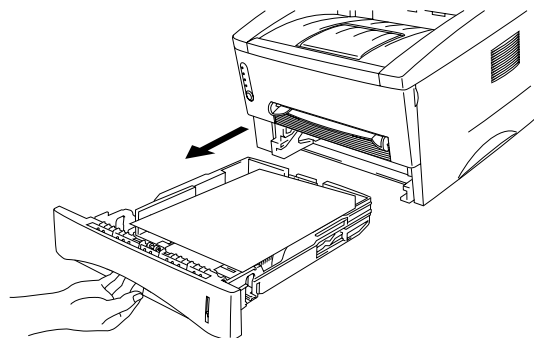
If the jammed paper is removed completely by using the information in the following steps, you can install the paper cassette first, and then close the front cover and the printer will resume printing automatically.

If the printer does not resume printing automatically, press the control panel button. If the printer still does not resume printing, please check that all the remaining jammed paper has been removed from the printer. Then try printing again.

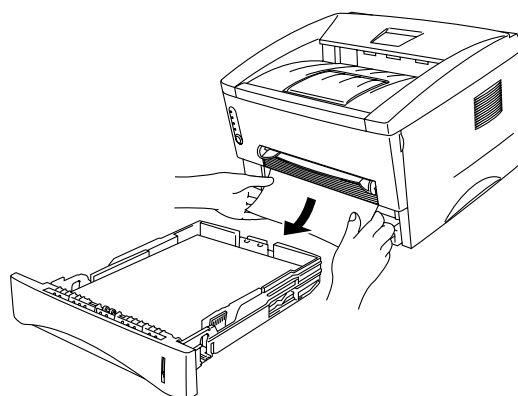
Note

- If a paper jam occurs when using the lower tray unit, check for correct installation of the upper paper cassette.
- Always remove all paper from the paper cassette and straighten the stack when new paper is added. This helps prevent multiple sheets of paper from feeding through the printer at one time and reduces paper jams.

1. Pull the paper cassette completely out of the printer.

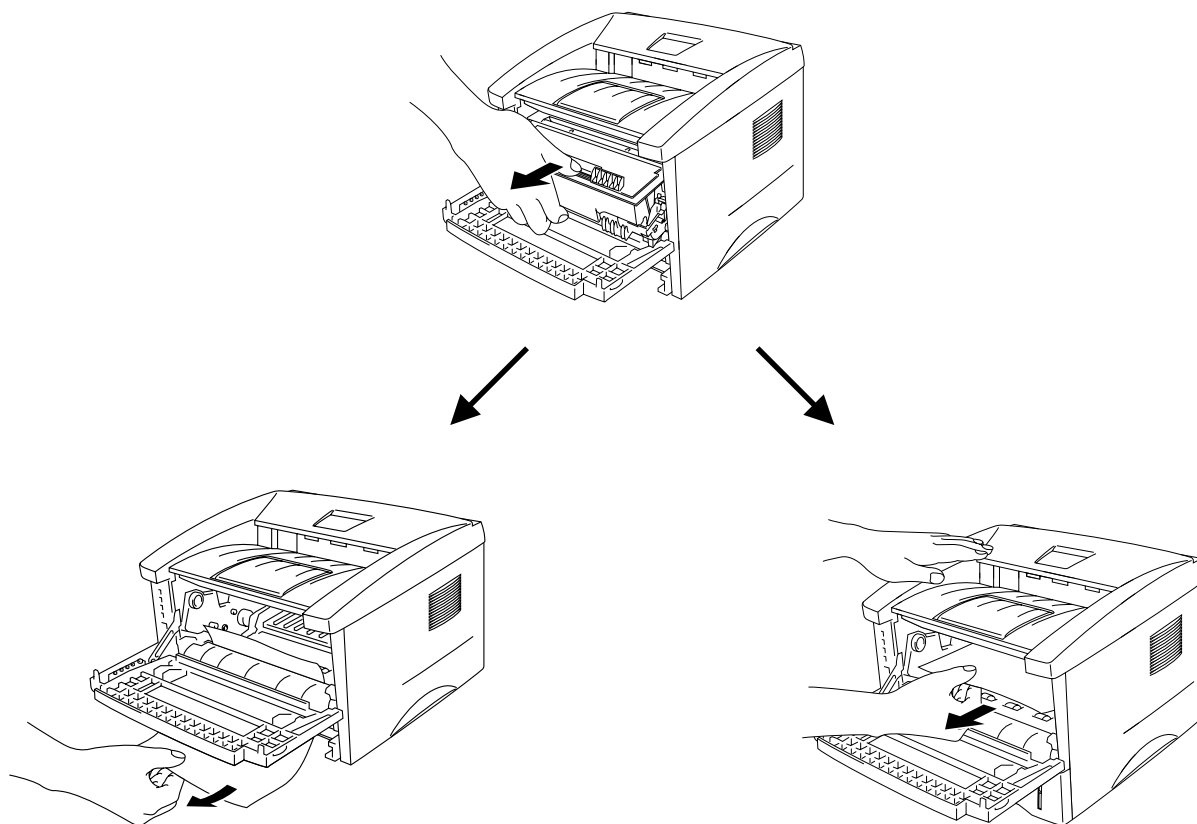


2. Pull the jammed paper up and out of the printer.



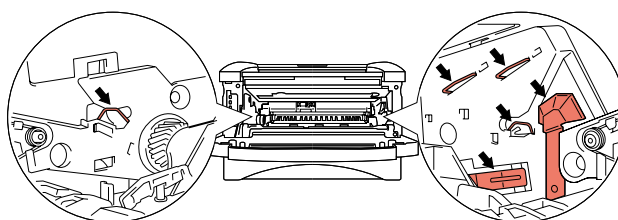
3. Open the front cover.

4. Pull out the drum unit assembly. Pull the jammed paper up and out of the printer. If you cannot remove the drum unit assembly easily at this time, do not use additional force. Instead, pull the edge of the jammed paper from the paper cassette.

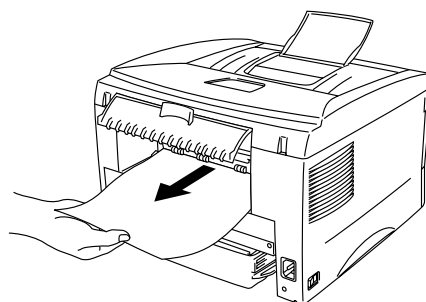


! **Caution**

To prevent damage to the printer caused by static electricity, do not touch the electrodes shown in the illustration.



5. Open the rear cover. Pull the jammed paper out of the fuser unit.



 Note

If you have to pull the paper toward the back of the printer, the fuser may get dirty with toner powder and it may scatter on the next printouts. Print a few copies of the test page until the scattering of toner stops.

6. Close the rear cover.
7. Install the drum unit assembly.
8. Install the paper cassette in the printer.
9. Close the front cover.

Other Problems

Problem	Recommendation
The printer cannot print. “There was an error writing to LPT1: (or BRUSB) for the printer.” error message occurs on your PC.	• Check that the printer cable is not damaged or broken. • If you have an interface-switching device, make sure the correct printer is selected.

For Macintosh with USB

Note

This section is for HL-1440, HL-1450 and HL-1470N users only.

Problem	Recommendation
HL-1440 (or HL-1450 and HL-1470N) does not appear in Chooser.	• Check that the printer is turned on. • Check that the USB interface cable is connected correctly. • Check the printer driver is installed correctly.
Unable to print from application software.	Make sure that the supplied Macintosh printer driver is installed in the System Folder and that it is selected with Chooser.

Improving the Print Quality

This section provides information on the following topics:

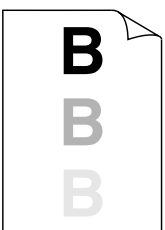
Image Defect Samples	Recommendation
 Faint	• Check the printer's environment. Conditions such as humidity, high temperatures, etc., may cause this print defect to occur. See "Positioning the Printer" in Chapter 1. • If the whole page is too light, toner save mode may be on. Disable toner save mode within the Printer Properties tab of the Driver. • Try installing a new toner cartridge. See "Replacing the Toner Cartridge" in Chapter 5. • Try installing a new drum unit. See "Replacing the Drum Unit" in Chapter 5.
 Gray background	• Make sure that you use paper that meets the Brother's recommended specifications. See "What Kind of Paper can I Use?" in Chapter 1. • Check the printer's environment; high temperature and high humidity conditions can increase the amount of background shading. • Installing a new toner cartridge. See "Replacing the Toner Cartridge" in Chapter 5. • Installing a new drum unit. See "Replacing the Drum Unit" in Chapter 5.
 Ghost	• Make sure that you use paper that meets the specifications. A rough surfaced paper, paper that has absorbed moisture or thick print media can cause the problem. • Make sure that you select the appropriate media type in the printer driver. See "What Kind of Paper can I Use?" in Chapter 1. • Try installing a new drum unit. See "Replacing the Drum Unit" in Chapter 5.

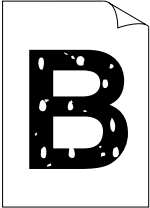
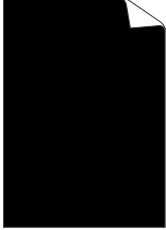
Image Defect Samples	Recommendation
 Toner specks	• Make sure that you use paper that meets the specifications. A rough surfaced paper may cause the problem. See “What Kind of Paper can I Use?” in Chapter 1. • The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5.
 Hollow print	• Make sure that you use paper that meets the specifications. See “What Kind of Paper can I Use?” in Chapter 1. • Select the ‘Thick paper mode’ in the printer driver, or use thinner paper than you are currently using. • Check the printer’s environment because conditions such as high humidity may cause this situation to occur.
 All black	• Clean the primary corona wire of the drum unit. See "Cleaning" in Chapter 5. • The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5.

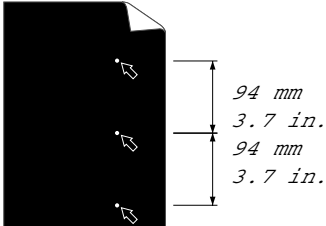
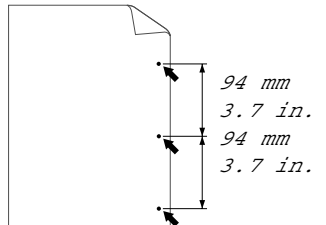
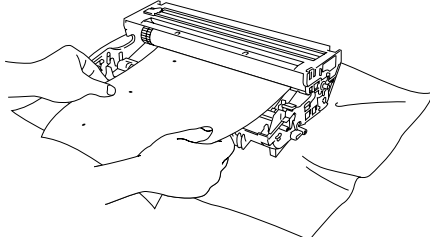
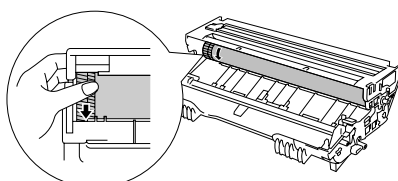
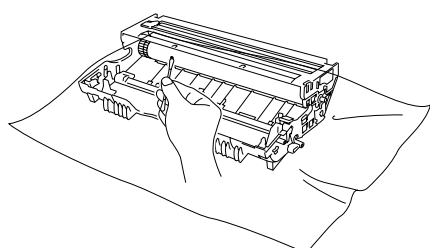
Image Defect Samples	Recommendation
 White Spots Printed pages have white spots in black text and graphics at intervals of 94 mm (3.7 in.).  Black Spots Printed pages have black spots at intervals of 94 mm (3.7 in.).	If the problem is not solved after printing a few pages, the drum unit may have glue from label stock on the OPC drum surface. Clean the drum unit as follows: 1. Position the print sample in front of the drum unit, and find the exact position of the image defect.  2. Turn the drum unit gear by hand while looking at the surface of the OPC drum.  3. When you have located the mark on the drum that matches the print sample, wipe the surface of the OPC drum with a cotton swab until the dust or paper powder on the surface comes off. 

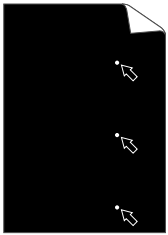
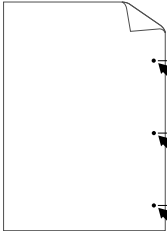
Image Defect Samples	Recommendation
 94 mm 3.7 in. 94 mm 3.7 in. White Spots Printed pages have white spots in black text and graphics at intervals of 94 mm (3.7 in.).  94 mm 3.7 in. 94 mm 3.7 in. Printed pages have black spots at intervals of 94 mm (3.7 in.).	 Caution Do not try to clean the surface of the photosensitive drum with a sharp object, such as a ball-point pen, etc. • The drum unit may be damaged. Install a new drum unit. See “Replacing the Drum Unit” in Chapter 5.

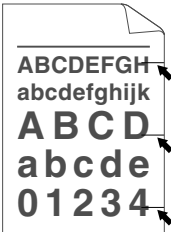
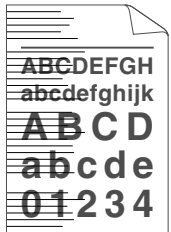
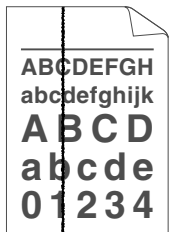
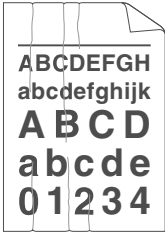
Image Defect Samples	Recommendation
 Black Horizontal repetitive defects Toner scatters and stains the printed page.	• The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5. • Make sure that you use paper that meets specifications. See "What Kind of Paper can I Use?" in Chapter 1. Note • If you use label sheets for laser printers, the glue from the sheets may sometimes stick to the OPC drum surface. Clean the drum unit. See "Improving the Print Quality" in this chapter. • Do not use paper that has clips or staples because they will scratch the surface of the drum. • If the unpacked drum unit is subject to excessive direct sunlight or room light, the unit may be damaged.
 White horizontal stripes	• Make sure that you use paper that meets the specifications. A rough surfaced paper or thick media can cause the problem. • Make sure that you select the appropriate media type in the printer driver. • The problem may disappear by itself. Try printing multiple pages to clear this problem, especially if the printer has not been used for a long time. • The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5.
 Horizontal Lines	• Clean the printer interior and the primary corona wire in the drum unit. See "Cleaning" in Chapter 5. • The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5.
 Black Vertical lines Printed pages are stained with toner or have vertical stripes.	• Clean the primary corona wire of the drum unit. See "Cleaning" in Chapter 5. • Make sure the primary corona wire cleaner is at the Home position (▲). • The drum unit may be damaged. Install a new drum unit. See "Replacing the Drum Unit" in Chapter 5. • The toner cartridge may be damaged. Install a new toner cartridge. See "Replacing the Toner Cartridge" in Chapter 5. Make sure that a torn piece of paper is not inside the printer covering the scanner window. • The fixing unit may be smudged. Call Customer Support.

Image Defect Samples	Recommendation
 White Vertical streaks	- You may clear the problem by wiping the scanner window with a soft cloth. See “Cleaning” in Chapter 5. - The toner cartridge may be damaged. Install a new toner cartridge. See “Replacing the Toner Cartridge” in Chapter 5.
 Page skew	- Make sure the paper or other media is loaded into the paper cassette correctly and that the guides are not too tight or too loose against the paper stack. - Set the paper guides correctly. Make sure that the tips of the paper guides fit into the slot correctly. See “Printing on Plain Paper from the Paper Cassette” in Chapter 1. - If you are using the manual feed slot, see “Printing on Plain Paper from the Manual Feed Slot” in Chapter 1. - The paper cassette may be too full. See “Printing on Plain Paper from the Paper Cassette” in Chapter 1. - Check the paper type and quality. See “What Kind of Paper can I Use?” in Chapter 1.
 Curl or wave	- Check the paper type and quality. Both high temperature and humidity will cause paper to curl. See “What Kind of Paper can I Use?” in Chapter 1. - If you use the printer infrequently, the paper may have sat for too long in the paper cassette. Turn over the stack of paper in the paper cassette. Also, try rotating the paper 180° in the paper cassette. - Try printing using the straight-through output path. See “Printing on Plain Paper from the Manual Feed Slot” in Chapter 1.
 Wrinkles or creases	- Make sure that paper is loaded properly. See “Printing on Plain Paper from the Paper Cassette” in Chapter 1. - Check the paper type and quality. See “What Kind of Paper can I Use?” in Chapter 1. - Try printing using the straight-through output path. See “Printing on Plain Paper from the Manual Feed Slot” in Chapter 1. - Turn over the stack of paper in the tray or try rotating the paper 180° in the input tray.

How to Print Correctly

Problem	Recommendation
The printer prints unexpectedly or it prints garbage.	• Make sure the printer cable is not too long. We recommend you use a parallel cable of less than 2 metres (6 1/2 feet) in length. • Check if the printer cable is damaged or broken. • If you are using an interface-switching device, remove it and connect your computer directly to your printer and try again. • Check that the appropriate printer driver is selected as 'Set as Default'. • Check that the printer is not connected to the same port that is also connected to a mass storage device or scanner. • Remove all other devices and connect the port to the printer only. • Turn off printer status reporting in the device options tab in the printer driver.
The printer cannot print full pages of a document. An error message "PRINT OVERRUN" occurs.	• Press the control panel button to print the data remaining in the printer. • If this does not clear the error, reduce the complexity of your document or reduce the print resolution. (HL-1440, HL-1450 and HL-1470N only) • Expand the printer memory by adding a commercially available SIMM. See "Installing Additional Memory" in Chapter 4. Set page protection to ON by using the supplied Windows driver or RPC program. • Change the following settings in the supplied Windows driver, and then try again. The best combination of settings below will vary depending on your document. - Graphics Mode - True Type™ mode - Use Printer True Type™ Fonts
The printer cannot print full pages of a document. A "MEMORY FULL" error message occurs.	• Press the control panel button to print the data remaining in the printer. • Reduce the print resolution or reduce the complexity of your document. (HL-1440, HL-1450 and HL-1470N only) • Expand the printer memory by adding a commercially available SIMM. See "Installing Additional Memory" in Chapter 4.
My headers or footers appear when I view my document on screen but do not show up when I print it.	Most laser printers have a restricted area that cannot be printed on. Usually the first two lines and the last two lines of a page cannot have print (leaving 62 printable lines). Adjust the top and bottom margins in your document to allow for this.

APPENDIX

Printer Specifications

♦ Engine

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Technology		Electrophotographic			
Print Speed		Up to 12 ppm	Up to 15 ppm (When Letter size paper is loaded)		
First Print Time		Less than 15 sec ^{*1}			
Resolution	Windows 95/98, Me or later and NT4.0/2000	600 x 600 dpi 300 x 300 dpi	1200 x 600 dpi for graphics 600 dpi x 600 dpi 300 dpi x 300 dpi		
	DOS	N/A	300 dpi	600 dpi	
	Mac OS	N/A	1200 x 600 dpi 600 x 600 dpi 300 x 300 dpi	1200 x 600 dpi for graphics 600 dpi x 600 dpi 300 dpi x 300 dpi	
	HRC ^{*2}	N/A	For 300 / 600 dpi		

*1 From standard paper cassette

*2 High Resolution Control

◆ Controller

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Processor		Fujitsu MB86832 66MHz			
Memory	Standard	2MB		8MB ^{*3}	
	Option	N/A	1 SIMM slot; expandable up to 34MB	1 SIMM slot; expandable up to 36MB	
Interface	Standard	IEEE 1284 Parallel	IEEE 1284 Parallel, USB		IEEE 1284 Parallel, USB, 10/100 BaseTX
	Option	10BaseT (NC-2010P), IrDA (IR-1000)			IrDA (IR-1000)
Network Connectivity	Interface	Optional 10BaseT (NC-2010P)			10/100 BaseTX (Auto Negotiation) - Standard
	Protocol	TCP/IP, IPX/SPX, NetBEUI, DLC/LLC, DEC LAT, Banyan VINES			TCP/IP, AppleTalk, IPX/SPX, DLC/LLC
	Management Tool	BRAdmin Professional ^{*4} Web Based Management ^{*5}			
Emulation		N/A	PCL4	PCL6, PostScript Level II language emulation, Epson FX-850, IBM ProPrinter XL	
Resident Fonts	PCL	N/A	24 Bitmap fonts	66 scalable fonts, 12 bitmap fonts, 11 bar codes ^{*6}	
	PS2 Language Emulation	N/A		66 fonts	

*3 4 Mbytes of memory is fitted on the board, the other 4 Mbytes is on the installed SIMM.

*4 Brother original Windows management utility

*5 Use a standard web browser to manage the device

*6 Code39, Interleaved 2 of 5, EAN-8, EAN-13, UPC-A, UPC-E, EAN-128, Codabar, FIM(US-PostNet), ISBN, Code128

◆ Software

MODEL	HL-1230	HL-1440	HL-1450	HL-1470N
Printer Driver	For Windows 95/98 /Me, and NT4.0/2000	PCL Driver for Windows 95/98/Me, and NT4.0/2000 and Mac OS 8.5-9.1	PCL Driver for Windows 95/98/Me, and NT4.0/2000 and Mac OS 8.5-9.1	
			PostScript Printer Description (PPD) file for Windows 95/98/Me, NT4.0/2000 and Mac OS 8.5-9.1 ^{*7}	
Utilities	Automatic E-mail Printing ^{*8} Interactive Help ^{*9} Status Monitor			Automatic E-mail Printing ^{*8} Interactive Help ^{*9} Status Monitor Driver Deployment Wizard ^{*10}

◆ Control Panel

MODEL	HL-1230	HL-1440	HL-1450	HL-1470N
LED	4 LEDs			
Switch	1 Key			

*7 AppleTalk only

*8 Utility software that automatically prints specified e-mail messages at a pres cheduled time.
(For Windows 95 / 98 / Me)

*9 Instructional animations for problem solving

*10 The Network Printer Driver Wizard automates the installation of a printer in a peer-to-peer network.

◆ Paper Handling

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Paper Input ^{*11}	Paper Cassette (Standard)	250 Sheets			
	Manual Feed	1 Sheet			
	Paper Cassette (Option)	N/A		250 Sheets	
Paper Output ^{*11}	Face Down	150 Sheets			
	Face Up	1 Sheet			

◆ Media Specifications

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Media Types	Manual Feed	Plain Paper, Bond Paper, Recycled Paper, Envelopes, Labels, and Transparencies			
	Paper Cassette (Standard)	Plain Paper, Bond Paper, Recycled Paper, Transparencies ^{*12}			
	Paper Cassette (Option)	N/A		Plain Paper, Bond Paper, Recycled Paper	
Media Weights	Manual Feed	16 - 43 lb (60 - 161 g/m ²)			
	Paper Cassette	16 - 28 lb (60 - 105 g/m ²)			
Media Sizes	Manual Feed	Custom : 2.75" x 4.57" - 8.5" x 14" (69.8 x 116 - 216 x 356 mm)			
	Paper Cassette (Standard)	A4, Letter, B5(ISO), A5, B6(ISO), A6, Executive, Legal (US & Canada only)			
	Paper Cassette (Option)	N/A		A4, Letter, B5(ISO), A5, Executive, Legal (US & Canada only)	

*11 Calculated with 80g/m² paper

*12 Up to 10 sheets

◆ *Printer Driver Functions* ^{*13}

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Page Layout	N in 1 Printing	2, 4, 9, 16, 25 in 1 page			
	Poster Printing	1 in 4, 9, 16, 25			
	Watermark Printing	Yes			
Other		Quick Print Setup ^{*14}			
		Manual Duplex			

◆ *Supplies*

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Toner	Standard Cartridge	3,000 pages A4/LTR pages @5% coverage			
	High Yield Cartridge	6,000 pages A4/LTR pages @5% coverage			
Drum		20,000 A4/LTR pages (1 page / job)			

◆ *Dimensions / Weights*

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Dimensions		14.2" (W) x 14.6" (D) x 9.3"(H) (360 x 370 x 235 mm)			
Weights		Approx. 9.2 kg (20.3 lbs.) including the drum unit and toner cartridge			Approx. 9.3 kg (20.5 lbs.) including the drum unit and toner cartridge

◆ *Other*

MODEL		HL-1230	HL-1440	HL-1450	HL-1470N
Power Consumption	Printing	Less than 340 W at 25°C (77°F)			
	Standby	Less than 70 W at 25°C (77°F)			
	Sleep	Less than 5 W	Less than 6 W	Less than 6 W	Less than 11 W
Noise Level	Printing	50 dB			
	Standby	Silent			
Ecology	Power Save	Yes			
	Toner Save	Yes			

*13 Some functions are not available on Postscript emulation and Macintosh Drivers.

*14 A function that enables changing the printer driver setting without opening the Property dialog box.

Important Information for Choosing Your Paper

This section provides information to help you choose paper to use with this printer.

Before you purchase a large quantity of paper

Make sure the paper is suitable for the printer.

Paper for plain paper copies

Paper is divided by usage, such as paper for printing and paper for copying. The usage is usually specified on the paper's package. Check the package to see whether it is suitable for laser printers. Use paper that is suitable for laser printers.

Basis weight

The basis weight of the paper in general use varies in different countries. We recommend that you use paper that weighs 75 g/m² to 90 g/m² (20 to 24 lb.), although this printer is able to cope with thinner or thicker paper than these weights.

<i>Unit</i>	<i>Europe</i>	<i>USA</i>
<i>g/m²</i>	80 to 90	75 to 90
<i>lb</i>		20 to 24

Long grain and short grain

The pulp fiber of the paper is aligned during paper manufacture. What we call long grain paper is paper where the fiber is [bp1]parallel to the paper carriage direction of the paper.

Paper can be classified into two types, long grain and short grain. Long grain paper's fiber direction is parallel to the carriage direction of the paper in the printer. Short grain paper's fiber direction is vertical to the carriage direction of the paper in the printer. Though most plain paper for copying is long grain, some is short grain. We recommend that you use long grain paper for this printer. Short grain paper is too weak for the paper carriage of the printer.

Acid paper and neutralized paper

Paper can be classified as either acid paper or neutralized paper.

Though modern paper manufacture methods started with acid paper, recently neutralized paper is taking the place of acid paper because of environment or preservation issues.

However, many forms of acid paper can be found in recycled paper. We recommend that you use neutralized paper for this printer.

You can use an acid paper check pen to distinguish acid paper from neutral paper.

Print surface

The characteristics may differ a little between the face side and reverse side of a sheet of paper.

Usually, the opening side of the ream of paper package is the print side.

Follow any indication of the print side on the paper package. Typically, the paper side is indicated with an arrow.

Moisture content

Moisture content is the amount of water left in the paper after manufacture. It is one of the important characteristics of the paper. This can change greatly depending on the storage environment, although usually paper contains around 5% water by weight. Because paper often absorbs water, the amount of water can sometimes be about 10% in a high humidity environment. When the amount of water increases, the characteristic of the paper changes greatly. The fixing of the toner may become worse. For storage of the paper and during use, we recommend that the humidity of the surrounding environment is between 50 % and 60%.

Rough estimate of basis weight

<i>g/m²</i>	<i>Lbs</i>	
	<i>Bond</i>	<i>Index</i>
60	16	
64	17	
75	20	
90	24	
105	28	
120	32	
135	36	
161	43	90
200	53	110

Paper size

Letter		8.5 x 11 in.
Legal		8.5 x 14 in.
Executive		7.25 x 10.5 in.
A4	210 x 297 mm	
A5	148 x 210 mm	
A6	105 x 148 mm	
B5 (ISO)	201 x 276 mm	
Envelope Monarch		3.875 x 7.5 in.
Envelope #9		3.875 x 8.9 in.
Envelope #10		4.12 x 9.5 in.
Envelope #11		4.5 x 10.375 in.
Envelope DL	110 x 220 mm	
Envelope C5	162 x 229 mm	
Envelope C6	114 x 162 mm	
Envelope B5	176 x 250 mm	
Envelope B6	176 x 125 mm	

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