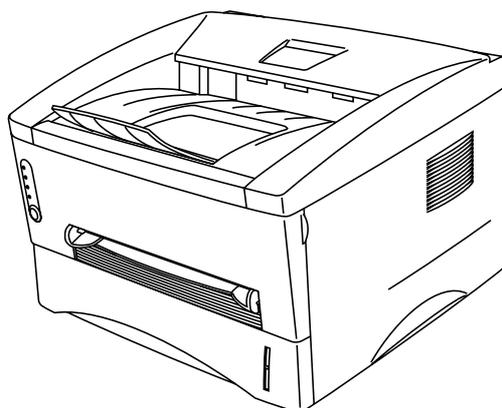




Brother Laser Printer **SERVICE MANUAL**

MODEL: HL-1230/1440/1450/1470N



Read this manual thoroughly before maintenance work.

Keep this manual in a convenient place for quick and easy reference at all times.

May 2001
PL-PRN016

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PREFACE

This service manual contains basic information required for after-sales service of the laser printer (hereinafter referred to as "this machine" or "the printer"). This information is vital to the service technician to maintain the high printing quality and performance of the printer.

This service manual covers the **HL-1230/1440/1450/1470N** printers.

This manual consists of the following chapters:

CHAPTER 1: GENERAL

Features, specifications, etc.

CHAPTER 2: INSTALLATION AND BASIC OPERATION

Installation conditions, Installation procedures, basic operation of the printer etc.

CHAPTER 3: THEORY OF OPERATION

Basic operation of the mechanical system, the electrical system and the electrical circuits and their timing information.

CHAPTER 4: DISASSEMBLY AND RE-ASSEMBLY

Procedures for disassembling and re-assembling the mechanical system.

CHAPTER 5: MAINTENANCE

Periodical replacements parts, consumable parts, etc.

CHAPTER 6: TROUBLESHOOTING

Reference values and adjustments, troubleshooting image defects, troubleshooting malfunctions, etc.

APPENDICES : Serial No. descriptions, Drum life & page counter, Diameter / circumference of rollers, Connection diagrams, PCB circuit diagrams, etc.

Information in this manual is subject to change due to improvement or redesign of the product. All relevant information in such cases will be supplied in service information bulletins (Technical Information).

A thorough understanding of this printer, based on information in this service manual and service information bulletins, is required for maintaining its print quality performance and for improving the practical ability to find the cause of problems.

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REGULATION

LASER SAFETY (110 - 120V MODEL ONLY)

This printer is certified as a Class I laser product under the US Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within the protective housing and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA REGULATIONS (110 - 120V MODEL ONLY)

The US Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

The label for Japanese manufactured products

MANUFACTURED: BROTHER INDUSTRIES, LTD. 15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan. This product complies with FDA radiation performance standards, 21 CFR Subchapter J.	K
---	---

The label for Chinese manufactured products

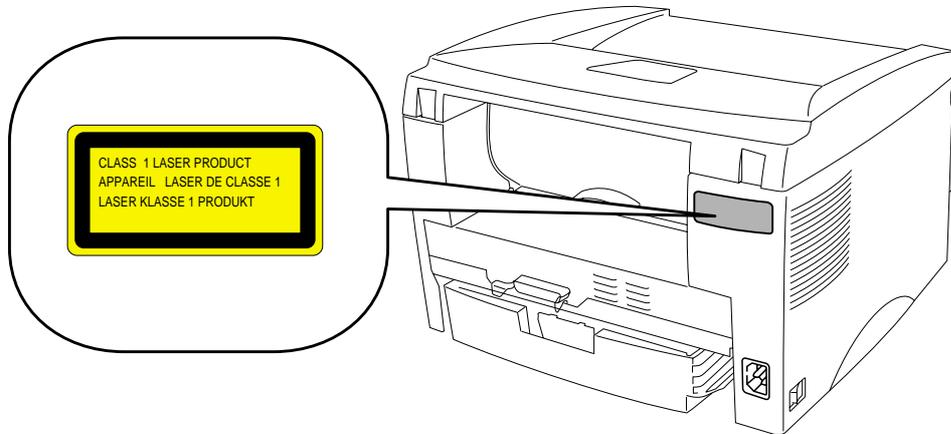
MANUFACTURED: BROTHER Corporation (Asia) Ltd. Shenzen Buji Nan Ling Factory Gold Garden Ind., Nan Ling Village, Buji, Rong Gang, Shenzen, CHINA This product complies with FDA radiation performance standards, 21 CFR Subchapter J.	C
--	---

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

IEC 825 (220-240V MODEL ONLY)

This printer is a Class I laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.



This printer has a laser diode which emits invisible laser radiation in the Laser Unit. The Laser Unit should not be opened without disconnecting the two connectors connected with the AC power supply and laser unit. Since the variable resistor in the laser unit is adjusted in accordance with the standards, never touch it.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

For Finland and Sweden**LUOKAN 1 LASERLAITE****KLASS 1 LASER APPARAT**

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

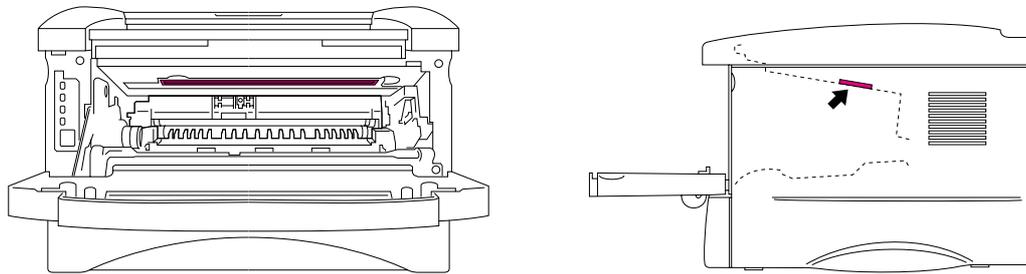
Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

SAFETY INFORMATION

CAUTION FOR LASER PRODUCT (WARNHINWEIS FÜR LASER DRUCKER)

- CAUTION:** When the machine during servicing is operated with the cover open, the regulations of VBG 93 and the performance instructions for VBG 93 are valid.
- CAUTION:** In case of any trouble with the laser unit, replace the laser unit itself. To prevent direct exposure to the laser beam, do not try to open the enclosure of the laser unit.
- ACHTUNG:** Im Falle von Störungen der Lasereinheit muß diese ersetzt werden. Das Gehäuse der Lasereinheit darf nicht geöffnet werden, da sonst Laserstrahlen austreten können.

<Location of the laser beam window>



ADDITIONAL INFORMATION

When servicing the optical system of the printer, be careful not to place a screwdriver or other reflective object in the path of the laser beam. Be sure to take off any personal accessories such as watches and rings before working on the printer. A reflected beam, though invisible, can permanently damage the eyes.

Since the beam is invisible, the following caution label is attached on the laser unit.

CAUTION	INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM. CLASS 3B LASER PRODUCT.
ADVARSEL	USYNLIG LASER STRÅLING NÅR KABINETLÅGET STÅR ÅBENT. UNGDÅ DIREKTE UDSÆTTELSE FOR STRÅLING. KLASSE 3B LASER.
VARNING	OSYNLIG LASERSTRÅLNING NÅR DEINNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG. KLASSE 3B LASER APPARAT.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALLTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLÄ. ÄLÄ KATSO SÄTEESEEN. LUOKAN 3B LASERLAITE.
ADVARSEL	USYNLIG LASERSTRÅLING UNGDÅ DIREKTE KONTAKT MED LASERENHETEN NÅR TOPPDEKSELET ER ÅPENT. KLASSE 3B LASERPRODUKT.
ATTENTION	RADIATIONS LASER INVISIBLES QUAND OUVERT ET VERROUILLAGE ENLEVÉ. ÉVITER EXPOSITIONS DIRECTES AU FAISCEAU. PRODUIT LASER CLASSE 3B.
VORSICHT	UNSICHTBARE LASERSTRALHUNG WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN. SICHERHEITSKLASSE 3B.
ATENCIÓN	RADIACION LASER INVISIBLE CUANDO SE ABRE LA TAPA Y EL INTERRUPTOR INTERNO ESTÁ ATASCADO. EVITE LA EXPOSICIÓN DIRECTA DE LOS OJOS. PRODUCTO LASER CLASE 3B.
	

DEFINITIONS OF WARNINGS, CAUTIONS AND NOTES

The following conventions are used in this service manual:

**WARNING**

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

**CAUTION:**

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

NOTE:

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

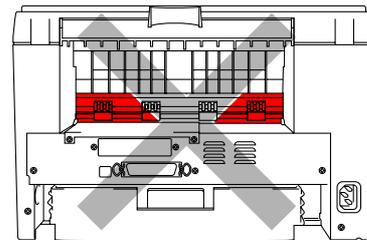
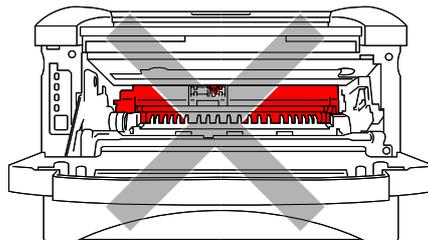
**Listed below are the various kinds of "WARNING" messages included in this manual.

**WARNING**

Always turn off the power switch and unplug the power cord from the power outlet before accessing any parts inside the printer.

**WARNING**

Some parts inside the printer are extremely hot immediately after the printer is used. When opening the front cover or rear cover to access any parts inside the printer, never touch the red colored parts shown in the following figures.

**WARNING**

If you analyze malfunctions with the power plug inserted into the power outlet, special caution should be exercised even if the power switch is OFF because it is a single pole switch.

CHAPTER 1 GENERAL

1. FEATURES

This printer has the following features;

High Resolution and Fast Print Speed

<HL-1230>

True 600 x 600 dots per inch (dpi) (GDI mode) and true 300 x 300 dots per inch (dpi) (GDI mode) with microfine toner and up to 12 pages per minute (ppm) print speed (A4 or Letter paper).

<HL-1440>

True 1200 x 600 dots per inch (dpi) for graphics and 600 x 600 dots per inch (dpi) (GDI mode) and true 300 x 300 dots per inch (dpi) (PCL mode) with microfine toner . Up to 14 pages per minute (ppm) print speed (A4)and up to 15 pages per minute (ppm) print speed (Letter paper).

<HL-1450/1470N>

True 600 x 600 , 300 x 300 dots per inch (dpi) and 1200 x 600 dots per inch (dpi) for graphics with microfine toner Up to 14 pages per minute (ppm) print speed (A4)and up to 15 pages per minute (ppm) print speed (Letter paper).Versatile Paper Handling

The printer loads paper automatically from the paper cassette. The paper cassette can hold A4, letter, B5, Executive A5 and A6 sizes of paper. The manual feed slot allows manual paper loading sheet by sheet so you can use a variety of types and sizes of paper.

Front Operation

Basic operation of the printer can be controlled from the front panel.

Enhanced Printing Performance and User-Friendly Operation for Windows®

The dedicated printer driver for Microsoft® Windows® 95/98/Me, and Windows® NT 4.0/2000 are available on the CD-ROM supplied with your printer. You can easily install them into your Windows® system using our installer program. The driver supports our unique compression mode to enhance printing speed in Windows® applications and allows you to choose various printer settings including toner save mode, custom paper size, sleep mode, gray scale adjustment, resolution, water mark and many layout functions. You can easily setup these print options through the Printer Setup Menu.

Printer Status Monitor with Bi-directional Parallel Interface

The printer driver can monitor the status of your printer using bi-directional parallel communications. IEEE-1284 bi-directional parallel printer cable is recommended.

The printer status monitor program can show the current status of your printer. If an error occurs, the printer status monitor will appear to let you know what to correct. If you have turned on the interactive Help (Windows 95/98/Me only) you can get visual guidance on your PC screen on the actions in the event of certain printer errors.

Quick Print Setup

The Quick Print Setup is a convenient utility to allow you to make changes to frequently used driver settings easily without having to open the printer properties selection box every time. It is launched automatically into the task tray when this printer driver is selected. You can change the settings by clicking on the icon with the right mouse button.

Enhanced Memory Management

The printer provides its own data compression technology in its printer hardware and the supplied printer driver software, which can automatically compress graphic data and font data efficiently into the printer's memory. You can avoid memory errors and print most full page 600 dpi graphic and text data, including large fonts, with the standard printer memory.

USB Interface (for Windows® 98/Me/2000, iMac and Power Macintosh G3 using USB with HL-1440/1450/1470N only)

The printer can be connected using the Universal Serial Bus (USB) interface to a PC or Mac which has a USB interface. Drivers that allow you to use the USB port are provided on the CD-ROM supplied with the printer.

Remote Printer Console Program for DOS (for HL-1440/1450/1470N only)

The utility program, Remote Printer Console (RPC), is available on the CD-ROM supplied with your printer. When you operate your computer in a DOS (Disk Operating System) environment, this program allows you to easily change the default settings of the printer such as fonts, page setup and emulations.

This program also provides a status monitor program, which is a Terminate-and-Stay Resident (TSR) program. It can monitor the printer status while running in the background and report the current status or errors on your computer screen.

Popular Printer Emulation Support (for HL-1440/1450/1470N only)

These printers support the following printer emulation modes;
The HL-1440 supports HP LaserJet IIP. The HL-1450/1470N supports HP LaserJet 6P (PCL6), PostScript® Level2 language emulation (Brother BR-Script Level 2), Epson FX-850 and IBM Proprinter XL.

When you use DOS application software or Windows® version 3.0 or earlier, you can use any of these emulations to operate the HL-1450/1470N printers. The printers also support auto-emulation switching between HP, Brother BR-Script 2 and Epson or HP, BR-Script 2 and IBM. If you want to set the printer emulation, you can do it using the Remote Printer Console Program.

High Resolution Control & Advanced Photoscale Technology (for HL-1450/1470N only)

High Resolution Control (HRC) technology provides clear and crisp printouts. Use this function to get smooth text print quality.

Advanced Photoscale Technology (APT) enables the printer to print graphics in 256 grayscales, producing nearly photographic quality. Use this function when you want to print photographic images.

Environment-Friendly

<Economy Printing Mode>

This feature will cut your printing cost by saving toner. It is useful for obtaining draft copies for proof-reading. You can select the economy modes through the Windows® printer driver supplied with your printer.

<Sleep Mode (Power Save Mode)>

Sleep mode automatically reduces power consumption when the printer is not in use for a certain period of time. The printer consumes less than 5W (HL-1230), 6W (HL-1440/1450) or 12W (HL-1470N) when in sleep mode.

<Low Running Cost>

Since the toner cartridge is separate from the drum unit, you need to replace only the toner cartridge after around 3,000 pages for the standard cartridge and around 6,000 pages for the optional high-capacity cartridge, which is both cost effective and ecologically friendly.

Bar Code Print (for HL-1450/1470N only)

The printer can print the following 11 types of bar codes;

- Code 39
- Code 128
- Interleaved 2 of 5
- Codabar
- US-PostNet
- ISBN
- UPC-A
- UPC-E
- EAN-8
- EAN-13
- EAN-128

Network Feature (for HL-1470N only)

The Brother printer has built in multi protocol network capability as standard. This allows multiple host computers to share the printer on a 10/100Mbit Ethernet network. Any users can print their jobs as if the printer was directly connected to their computer. Users on Windows® 95/98/Me, Windows NT4.0/2000®, UNIX, Novell, Apple Macintosh, LAN server and OS/2 Warp server computer simultaneously can access this printer. For further information, see the Network User's Guide supplied with the printer.

2. OVERVIEW

<Front View>

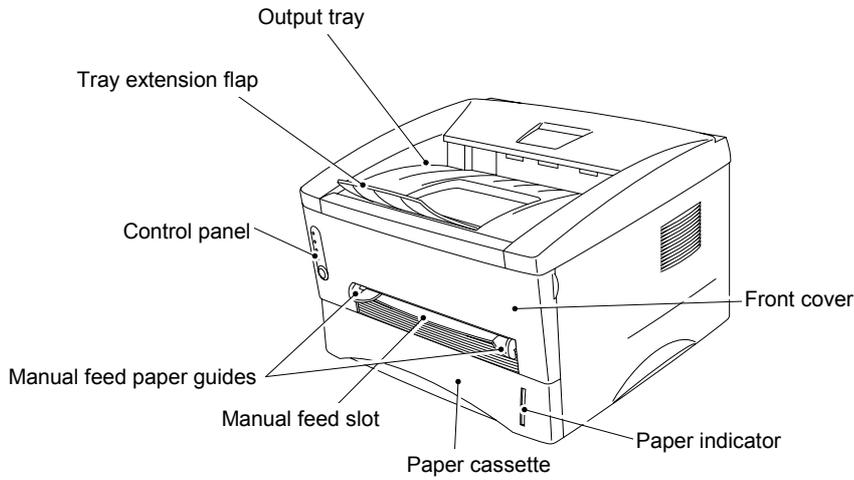


Fig. 1-1

<Rear View>

HL-1230/1440

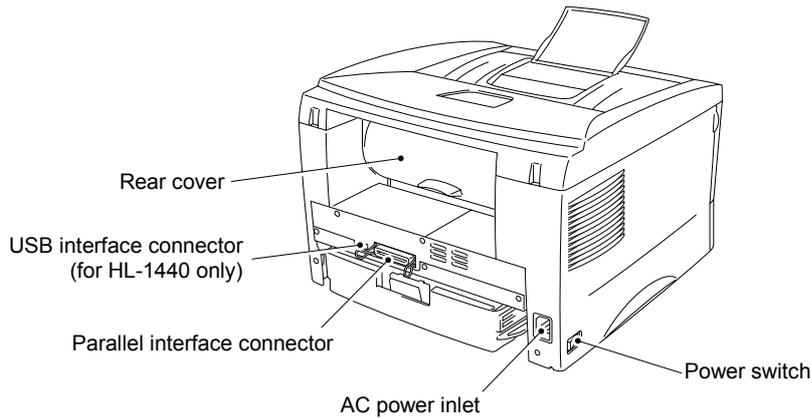


Fig. 1-2

HL-1450/1470N

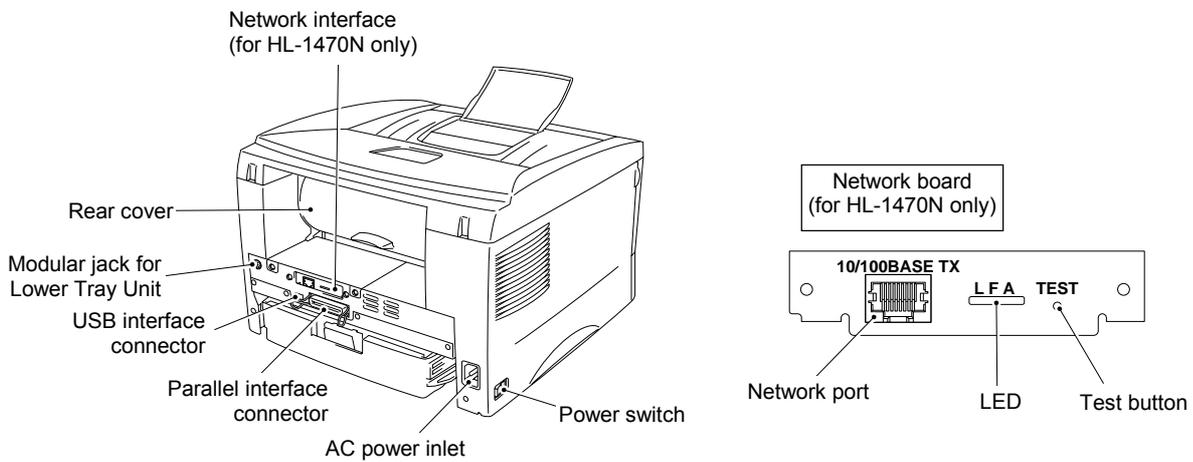


Fig. 1-3

3. SPECIFICATIONS

3.1 Printing

Print method	Electrophotography by semiconductor laser beam scanning
Laser	Wave length: 780 nm Output: 5mW max
Resolution	HL-1230: 600 x 600 dots/inch, 300 x 300 dots/inch (for Windows [®]) HL-1440: 1200(H) x 600(V) dots/inch (for Windows [®] DIB graphics and Machintosh for graphics) 600 x 600 dots/inch, 300 x 300 dots/inch (for Windows [®] and Machintosh) 300 x 300 dots/inch (under DOS) HL-1450: 1200(H) x 600(V) dots/inch (for Windows [®] DIB graphics and Machintosh for graphics) 600 x 600 dots/inch, 300 x 300 dots/inch (for Windows [®] and Machintosh) 600 x 600 dots/inch (under DOS) 600 x 600 dots/inch, 300 x 300 dots/inch (for HRC) HL-1470N: 1200(H) x 600(V) dots/inch (for Windows [®] DIB graphics and Machintosh for graphics) 600 x 600 dots/inch, 300 x 300 dots/inch (for Windows [®] and Machintosh) 600 x 600 dots/inch (for DOS) 600 x 600 dots/inch, 300 x 300 dots/inch (for HRC)
Print quality	Normal printing mode Economy printing mode
Print speed	HL-1230: Up to 12 pages/minute HL-1440/1450/1470N: Up to 14 pages/minute* (when loading A4 from the paper cassette.) Up to 15 pages/minute (when loading letter-size paper from the paper cassette.)
Warm-up	Max. 25 seconds at 23°C (73.4°F)
First print	15 seconds (when loading A4 or Letter-size paper from the paper cassette.)
Print media	Toner cartridge Life expectancy: 3,000 pages/cartridge (Standard cartridge) 6,000 pages/cartridge (High-capacity cartridge) (when printing A4 or Letter-size paper at 5% print coverage)
Developer	Drum unit

Life expectancy: 20,000 pages/drum unit

***NOTE:**

Print speed varies depending on the paper size or media type. For details, refer to [APPENDIX 3 'PRINT SPEEDS WITH VARIOUS SETTINGS'](#).

3.2 Functions

CPU	HL-1230/1440: MB86833 66MHz HL-1450/1470N: MB86832 66MHz
Emulation	HL-1230: Brother Printing Solution for Windows® HL-1440: Brother Printing Solution for Windows® HP LaserJet IIP (PCL level 4) HL-1450/1470N: Brother Printing Solution for Windows® Automatic emulation selection among HP LaserJet 6P (PCL level 6), Brother BR-Script Level 2, EPSON FX-850 or IBM Proprinter XL
Printer driver	<PCL Driver> <ul style="list-style-type: none"> Windows® 95/98/Me, Windows® NT 4.0/2000 driver, supporting Brother Native Compression mode Windows® 95/98/Me driver, supporting bi-directional capacity <PS Driver> PPD file driver for Windows® 95/98/Me and Windows NT® 4.0/2000 driver (for HL-1450/1470N) <Others> <ul style="list-style-type: none"> iMac, Power Macintosh G3 with USB printer driver (for HL-1440/1450/1470N only)
Interface	<ul style="list-style-type: none"> Bi-directional parallel Universal Serial Bus (USB) (for HL-1440/1450/1470N only) 10/100 BaseTX Ethernet network interface (for HL-1470N only)
Memory	HL-1230 No memory expansion is possible HL-1440: 2.0 Mbytes of standard memory and a slot for optional additional memory Expandable up to 34 Mbytes by installing an industry standard SIMM for HL-1440 HL-1450/1470N: 4.0 Mbytes of standard memory plus a standard 4.0 Mbytes SIMM. Expandable up to 36 Mbytes by Exchanging the industry standard SIMM
Control panel	1 button and 4 LEDs
Diagnostics	Self-diagnostic program

***NOTE:**

The SIMM must have the following specifications;

Type: 72 pin (Both EDO RAM and Fast page mode DRAM can be used.)

Access time: 60 nsec - 80 nsec

*Capacity: 1, 2, 4, 8, 16, 32 Mbyte
(Although the 64 Mbyte SIMM can be installed, only 32 Mbyte is effective.)*

Height: 25.4 mm (1.00 inches) or less

Output: 32 bit or 36 bit (independent of parity)

3.3 Electrical and Mechanical

Power source	U.S.A. and Canada: AC 110 to 120V, 50 Hz/60 Hz Europe and Australia: AC 220 to 240V, 50 Hz/60 Hz
Power consumption (Under 25°C / 77°F)	Printing (peak)*: 940 W or less Printing (average): 340 W or less Standing by: 70 W or less Sleep*: 5 W or less (HL-1230) 6 W or less (HL-1440/1450) 12 W or less (HL-1470N)
Noise	Printing: 50 dB A or less Standing by: Silent
Temperature	Operating: 10 to 32.5°C (50 to 90.5°F) Non operating: 0 to 40°C (38 to 104°F) Storage: -20 to 40°C (-4 to 104°F)
Humidity	Operating: 20 to 80% (non condensing) Storage: 10 to 85% (non condensing)
Dimensions (W x D x H)	A4 paper cassette installed: 360 x 370 x 235 mm (14.2 x 14.6 x 9.3 inches) Legal paper cassette installed: 360 x 430 x 235 mm (14.2 x 16.9 x 9.3 inches) A4 lower paper cassette installed: 360 x 370 x 345 mm (HL-1450/1470N only) (14.2 x 14.6 x 13.6 inches) Legal lower paper cassette installed: 360 x 430 x 345 mm (HL-1450/1470N only) (14.2 x 16.9 x 13.6 inches)
Weight	Approx. 9.2 kg (20.3 lb.) including the drum unit. Approx. 12.7 kg (27.9 lb.) including the drum unit and Lower Tray unit.

***NOTE:**

- *The peak figure of power consumption is worked out when the halogen heater lamp is turned ON.*
- *The peak figure of power consumption is worked out excluding inrush current value.*
- *The peak figure of power consumption is a reference value and should be used internally at Brother offices only.*
- *The power consumption figure quoted for sleep mode is when the fan has stopped.*

3.4 Network (for HL-1470N only ,Option for HL-1230/1440/1450)

Type / Speed	10/100 Base TX Ethernet Auto speed detection
Protocols	<ul style="list-style-type: none"> • HL-1230/1440/1450 • TCP/IP,IPX/SPX,NetBEUI,DLC/LLC,DEC LAT,Banyan VINES • HL-1470N • TCP/IP,AppleTalk,PIPX/SPX,DLC/LLC
Management	<ul style="list-style-type: none"> • Web Based Management • BRAdmin Professional Windows® based management utility • TELNET and Netware Command Console • SNMP/MIB II • HP JetAdmin / Web JetAdmin compatible
Firmware update	2MB flash ROM. Use BRAdmin Professional when upgrading print server software or BOOTP, TFTP PUT/GET or IPX for Netware.
Supplied software	<ul style="list-style-type: none"> • BRAdmin Professional management utility (for Windows® 95/98/Me/NT 4.0/2000) • Port driver for Windows® 95/98/Me/NT 4.0/2000 • LPR port driver (for Windows® 95/98/Me only) • NetBIOS port driver • SMTP port driver

3.5 Paper

3.5.1 Feedable paper

(1) Type & size

Feeding source	Paper type	Paper size
Paper cassette	Normal paper Transparencies	A4, Letter, B5 (ISO), A5, A6, Executive, Legal*
Manual feed slot	Normal paper	A4, Letter, B5 (JIS/ISO), A5, A6, Executive, Legal 70-216 x 116-356 mm (2.75-8.5 x 4.57-14 inches)
	Envelopes	DL, C5, COM10, Monarch, B5 (ISO)
	Labels	A4, Letter
	Transparencies	A4, Letter
	Other sizes	70-216 x 116-356 mm (2.75-8.5 x 4.57-14 inches)
Optional lower paper cassette (HL-1450/1470N only)	Normal paper Transparencies	A4, Letter, B5 (ISO), A5, Executive, Legal*

*NOTE:

Legal-size paper can be printed with the standard paper cassette or the optional lower cassette for the US and Canada models only.

Other paper specifications

<Paper Cassette>

	Cut sheet
Basis weight	60 to 105 g/m ² (16 to 28 lb.)
Caliper	0.08 to 0.13 mm (0.003 to 0.005 in.)
Moisture content	4% to 6% by weight

<Manual Feed Slot>

	Cut sheet	Envelope
Basis weight	60 to 161 g/m ² (16 to 43 lb.)	75 to 90 g/m ² (20 to 24 lb.) single thickness
Caliper	0.08 to 0.2 mm (0.003 to 0.008 in.)	0.084 to 0.14 mm (0.003 to 0.005 in.) single thickness
Moisture content	4% to 6% by weight	4% to 6% by weight

(3) Recommended paper

- Letter: Xerox 4200 (75 g/m²)
- A4: Xerox 80 Premier Paper (80 g/m²)
- Label: Avery laser label or equivalent
- Transparency: 3M CG3300 or equivalent



CAUTION:

When you are choosing print media, be sure to follow the information given below to prevent any paper jams, print quality problems or printer damage;

- It is recommended to use long-grained paper for the best print quality. If short-grained paper is being used, it might be the cause of paper jams.
- Use neutral paper. Do not use acid paper to avoid any damage to the drum unit.

- *Avoid using coated paper such as vinyl coated paper.*
- *Avoid using preprinted or highly textured paper.*
- *It is recommended to use labels or transparencies which are designed for use in laser printers.*
- *Avoid feeding labels with the carrier sheet exposed, or the printer will be damaged.*
- *Before loading paper with holes such as organizer sheets, be sure to fan the stack well.*
- *Do not use organizer sheets that are stuck together. The glue that is used might caused damaged to the printer.*
- *When printing on the back of pre-printed paper, if the paper is curled, be sure to straighten the paper as much as possible.*
- *Different types of paper should not be loaded at the same time in the paper cassette to avoid any paper jams or misfeeds.*

3.5.2 Paper cassette capacity

(1) Maximum load height

Paper cassette:

<Normal paper> Up to 27mm (1.06 inches) in height
(250 sheets of 80 g/m² A4/Letter paper)

<Transparencies> 10 sheets

(2) Paper feed conditions

Type	Weight	Cassette	Manual feed (1 sheet)
Normal paper (cut sheet)	60 to 105 g/m ²	○ (250 sheet)	○
	161 g/m ²	×	○
Special paper (cut sheet)	Labels	×	○
	Envelopes	×	○
	Organizers	×	○

3.5.3 Print delivery

(1) Output tray stacking

capacity: Maximum 150 sheets (80 g/m²)
face-down only

(2) Straight paper path output at the rear of the printer

capacity: 1 sheet **Thicker paper printing is recommended.
face-up only

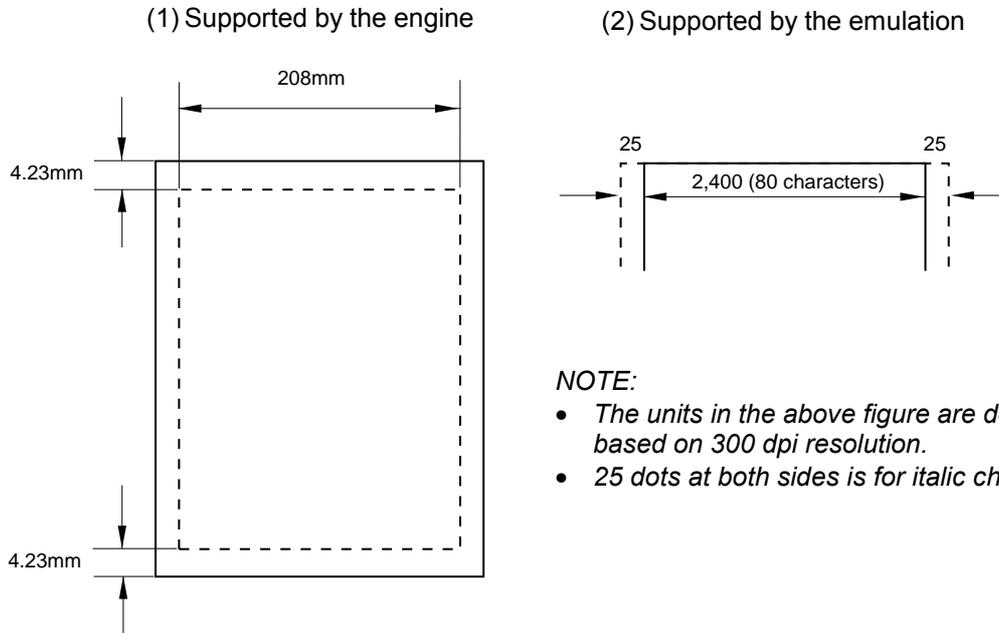
NOTE:

- *When using the straight paper path feed and the rear output method for thicker paper printing, lift up the rear cover at the rear of the printer.*
- *Face-down: Delivery with the printed face of the paper downwards.*
- *Face-up: Delivery with the printed face of the paper upwards.*

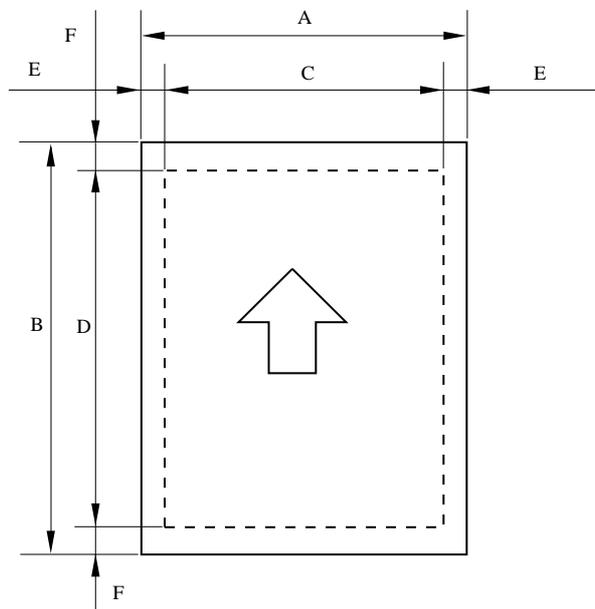
3.6 Printing Area

3.6.1 Effective printing area

The effective printing area means the area within which the printing of all the data received without any omissions can be guaranteed.



3.6.2 Print guaranteed area



The values above vary depending on the paper size. For details, see the table on the next page.

The table below shows the print guaranteed areas for each paper size.

Size	A	B	C	D	E	F
A 4	210.0 mm 8.27" (2,480 dots)	297.0 mm 11.69" (3,507 dots)	203.2 mm 8.0" (2,400 dots)	288.5 mm 11.36" (3,407 dots)	3.4 mm 0.13" (40 dots)	4.23 mm 0.17" (50 dots)
Letter	215.9 mm 8.5" (2,550 dots)	279.4 mm 11.0" (3,300 dots)	203.2 mm 8.0" (2,400 dots)	270.9 mm 10.67" (3,200 dots)	6.35 mm 0.25" (75 dots)	↑
Legal	215.9 mm 8.5" (2,550 dots)	355.6 mm 14.0" (4,200 dots)	203.2 mm 8.0" (2,400 dots)	347.1 mm 13.67" (4,100 dots)	↑	↑
B 5 (ISO)	176.0 mm 6.93" (2,078 dots)	250.0 mm 9.84" (2,952 dots)	164.0 mm 6.46" (1,936 dots)	241.5 mm 9.5" (2,852 dots)	↑	↑
Executive	184.15 mm 7.25" (2,175 dots)	266.7 mm 10.5" (3,150 dots)	175.7 mm 6.92" (2,025 dots)	258.2 mm 10.17" (3,050 dots)	6.35 mm 0.25" (75 dots)	↑
A 5	148.5 mm 5.85" (1,754 dots)	210.0 mm 8.27" (2,480 dots)	136.5 mm 5.37" (1,612 dots)	201.5 mm 7.93" (2,380 dots)	6.01 mm 0.24" (71 dots)	↑
A 6	105.0 mm 4.13" (1,240 dots)	148.5 mm 5.85" (1,754 dots)	93.0 mm 3.66" (1,098 dots)	140.0 mm 5.51" (1,654 dots)	↑	↑
Organizer (J size)	69.85 mm 2.75" (825 dots)	116.0 mm 4.57" (1,370 dots)	56.2 mm 2.21" (675 dots)	107.5 mm 4.23" (1,270 dots)	6.35 mm 0.25" (75 dots)	↑
Organizer (K size)	95.25 mm 3.75" (1,125 dots)	171.45 mm 6.75" (2,025 dots)	86.78 mm 3.42" (975 dots)	162.98 mm 6.42" (1,925 dots)	↑	↑
Organizer (L size)	139.7 mm 5.5" (1,650 dots)	215.9 mm 8.5" (2,550 dots)	131.23 mm 5.17" (1,500 dots)	207.43 mm 8.17" (2,450 dots)	↑	↑
COM10	104.78 mm 4.125" (1,237 dots)	241.3 mm 9.5" (2,850 dots)	92.11 mm 3.63" (1,087 dots)	232.8 mm 9.16" (2,750 dots)	↑	↑
MONARCH	98.43 mm 3.875" (1,162 dots)	190.5 mm 7.5" (2,250 dots)	85.7 mm 3.37" (1,012 dots)	182.0 mm 7.16" (2,150 dots)	↑	↑
C 5	162 mm 6.38" (1,913 dots)	229 mm 9.01" (2,704 dots)	150.0 mm 5.9" (1,771 dots)	220.5 mm 8.68" (2,604 dots)	6.01 mm 0.24" (71 dots)	↑
DL	110 mm 4.33" (1,299 dots)	220 mm 8.66" (2,598 dots)	98.0 mm 3.86" (1,157 dots)	211.5 mm 8.33" (2,498 dots)	↑	↑

NOTE:

- The paper sizes indicated here should conform to the nominal dimensions specified by JIS.
- A4 paper must accommodate 80 characters printed in pica pitch (203.2 mm).
- The dot size is based on 300 dpi resolution.
- Organizer is not supported by any printer emulations (commands).

CHAPTER 2 INSTALLATION AND BASIC OPERATION

1. CONDITIONS REQUIRED FOR INSTALLATION

1.1 Power Supply

- The source voltage must stay within $\pm 10\%$ of the rated voltage shown on the rating plate.
- The power cord, including extensions, should not exceed 5 meters (16.5 feet).
- Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier or shredder. If it is unavoidable that you must use the printer with these appliances, it is recommended that you use an isolation transformer or a high-frequency noise filter.
- Use a voltage regulator if the power source is not stable.

1.2 Environment

- The printer should be installed near a power outlet, which is easily accessible.
- The room temperature is maintained between 10°C and 32.5°C. The relative humidity is maintained between 20% and 80%.
- The printer should be used in a well ventilation 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 blocked. Keep 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 set up 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.
- Do not cover the slots in the side cover.

1.3 System Requirements for Brother Printer Solution for Windows®

Check the following system requirements to setup and operate the printer using Brother Printing Solution for Windows®:

- IBM PC or compatible with 80486 SX or higher microprocessor
- 10MB of space available on your hard disk for the printer driver and all fonts.
- , Windows® 95/98/Me or Windows® NT 4.0/2000

2. UNPACKING

When unpacking the printer, check to see that all of the following components are included in the carton.

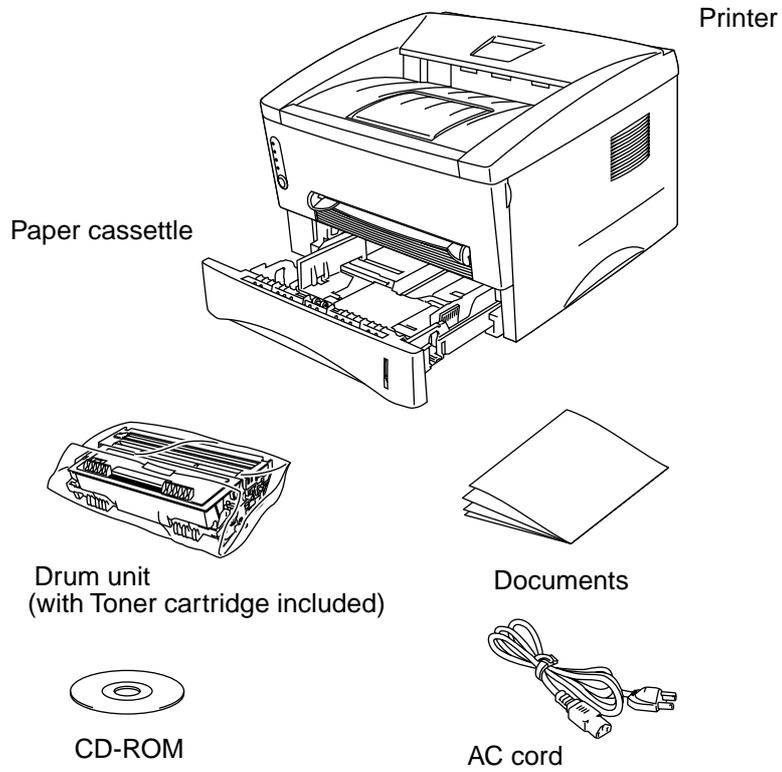


Fig. 2-1

NOTE:
Components may vary depending on the country.

3. INSTALL THE PRINTER

Implementation of hardware setup and driver installation to use the printer.

Firstly, identify the Operating System on your computer. (Windows® 95/98/Me, Windows NT® 4.0/2000 or Macintosh®) Then, purchase the appropriate interface cable (parallel or USB or network) for your computer. USB interface option is not available on HL-1230 printer.

The installation programs for the hardware setup and driver installation are contained on the supplied CD-ROM.

3.1 For All Users

For Windows® Users

- (1) Turn on your PC power. Close all the applications running on your PC.
- (2) Insert the supplied CD-ROM into the CD-ROM drive.
- (3) The opening screen will appear automatically in Windows® 95/98/Me, and NT4.0/2000
- (4) Click the model number of your printer. Select the appropriate language.
- (5) Click the initial set up icon.
- (6) The initial Setup instructions will appear on the display.

NOTE:

- *If the opening screen does not appear;*

Click **Start** and select **Run**. Then, type `D: \START.EXE` in the command line box and click **OK**.
 (If your CD-ROM drive is not D, type the correct drive letter instead of "D".)

For Macintosh® Users

- (1) Turn on your PC power. Close all the applications running on your PC.
- (2) Insert the supplied CD-ROM into the CD-ROM drive.
- (3) Double click the Initial Setup icon.
- (4) Click the model number of your printer. Select the appropriate language.
- (5) Click the initial set up icon.
- (6) The initial Setup instructions will appear on the display.

3.1.1 Install the drum unit assembly

- (1) Open the front cover.
- (2) Unpack the drum unit assembly and remove the protective part.
- (3) Rock it from side to side 5 or 6 times to distribute the toner evenly inside the assembly. (Fig. 2- 2)

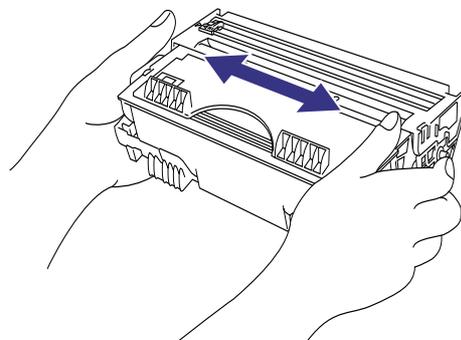


Fig. 2-2

- (4) Install the drum unit into the printer and close the front cover.