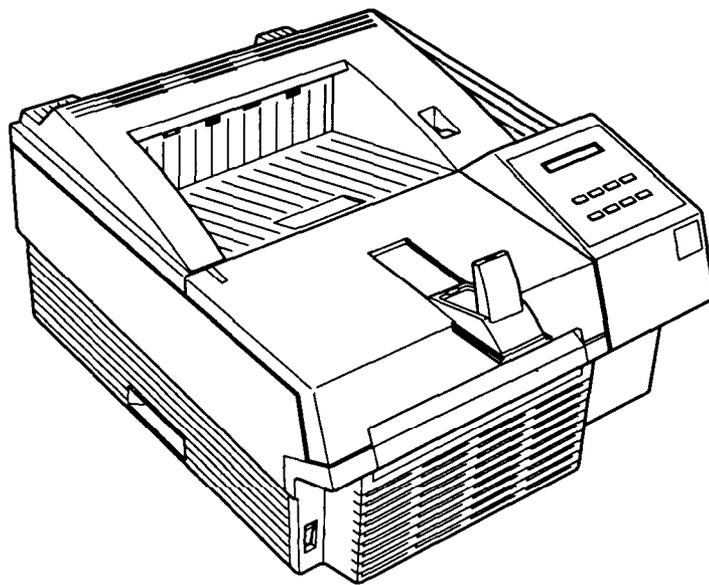# EPSON TERMINAL PRINTER

EPL-N1200
SERVICE MANUAL

EPSON

4006838

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) personal injury and 2) damage to equipment.

DANGER   Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/ maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND PERIPH-ERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURE.

2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.

3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CON-NECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WA RNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.

2. MARE CERTAIN THAT THE SOURCE VOLTAGE IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CON-NECT IT TO THE POWER SOURCE.

3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDMDUAL CHIPS.

4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAP-PROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

SAFETY INFORMATION

This printer is a page printer which operates by means of a laser. There is no possibility of danger from the laser, provided the printer is operated according to the instructions in this manual provided.

Since radiation emitted by the laser is completely confined within protective housings, the laser beam cannot escape from the machine during any phase of user operation.

For United States Users;

[Laser Safety]

This printer is certified as a Class 1 Laser product under the U.S. 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.

[CDRH Regulations]

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. Compliance is mandatory for products marketed in the United States. The label shown below indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

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

[Internal Laser Radiation]

Maximum Radiation Power:	5.0×10^{-4} (W)
Wave Length:	790 ± 20 nm

This is a Class IIIb Laser Diode Assay that has an invisible laser beam. The print head unit is NOT A FIELD SERVICE ITEM. Therefore, the print head unit should not be opened under any circumstances.

For Other Countries Users;

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

> This is a semiconductor laser. The maximum power of the laser diode is 5.0×10^{-4} W and the wavelength is 790 ± 20 nm.

For Denmark Users;

> **ADVARSEL**
> **Usynlig** laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion Undgå udsættelse for stråling.

> Klasse 1 laser produkt der onfvlder IEC825 sikkerheds kravene.

> **VAROITUS**
> Laitteen **käyttäminen** muulla kuin **tässä käyttöohjeessa** mainitulla tavalla **saat-** taa altistaa **käyttäjän** turvallisuusluokan 1 **ylittävälle näkymättömälle** lasersäteiylle.

> VARNING
> Om apparaten **används på** at-mat **sätt än** i denna bruksanvisning specificerats, kan **användaren utsättas för** osynlig **laserstrålning,** som **överskrider gränsen** for laser klass 1.

For Finland, Sweden Service People

> **VAROITUS**
> Avattaessa ja suojalukitus ohitettaessa olet alttiina **näkymättömälle** laser säteilylle. Ala katso **säteeseen.**

> VARNING
> Osynlig **laserstrålning när** denna **del är öppnad** och **spärren är** urkopplad Betrakta ei strblen.

For Norway Users;

> **ADVARSEL**
> Dersom apparatet brukes **på annen måte** enn spesifisert i denne bruksan visning, kan brukeren utsettes for **unsynlig laserstråling** som over&rider gren sen for laser klasse 1.

> Dette er en halvleder laser. Maksimal **effeckt** til laserdiode er 5.0 x 10^{-4} W og bølgelengde er 790 ± 20 **nm.**

Laser Safety Labels

[Label on rear printer case]

A laser safety labels is attached on the outside of the printer shown below.

For United State

> **This laser product conforms to the applicable requirement of 21 CFR Chapter I, subchapter J.**
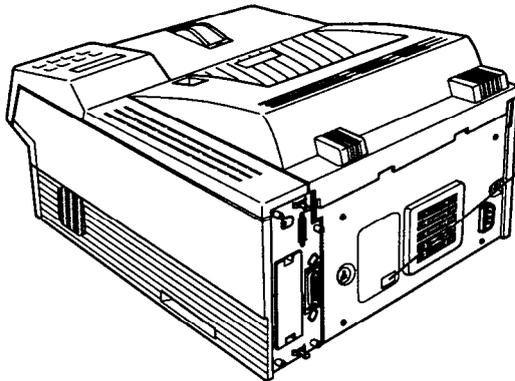> **SEIKO EPSON CORP.**
> **Hirooka Office**
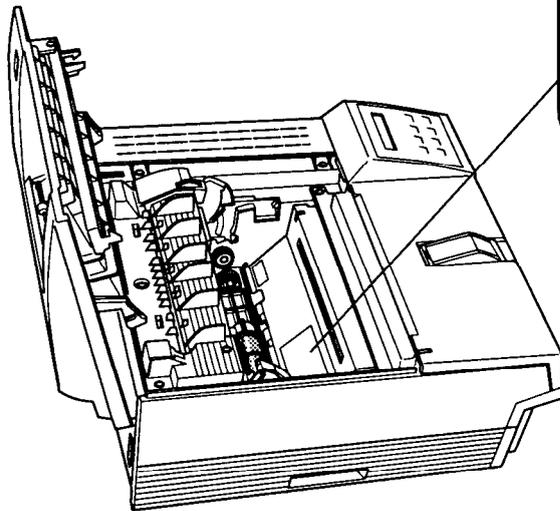> **80 Hirooka, Shiojiri-shi, Nagano-ken, Japan**
> **MANUFACTURED:**

For Europe

LASER KLASSE 1 NACH IEC 825
CLASS 1 LASER PRODUCT TO IEC 825
KLASSE 1 LASER PRODUKT LH.T. IEC 825
LUOKAN 1 LASERLAITE

[Label inside printer]

The following laser safely label will be attached inside the printer as shown below.

For Denmark, Finland, Sweden, and Norway

CAUTION -   INVISIBLE LASER RADIATION WHEN OPEN
AVOID EXPOSURE TO BEAM
VORSICHT-   UNSICHTBARE LASERSTRAHLUNG WENN
ABDECKUNG GEÖFFNET NICHT DEM STRAHL
AUSSETZEN
ADVARSEL-   USYNLIG LASERSTRÅLING NÅR DEKSEL
ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VAROI-   AVATTAESSA OLET ALTTIINA NÄKYMÄTÖN
LASERSÄTEILYLLE ÄLÄ KATSO SÄTEESEEN
ADVARSEL-   USYNLIG LASERSTRÅLING VED ÅBNING
UNDGÅ UDSÆTTELSE FOR STRÅLING
VARNING-   OSYNLIG LASERSTRÅLNING NÄR DENNA DEL
ÄR ÖPPNAD STRÅLEN ÄR FARLIG

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of EPL-N1200.
The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

CHAPTER 1. GENERAL DESCRIPTION

Provides a general product overview, lists specifications, and illustrates the main components of the printer.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of printer operation.

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Includes a step-by-step guide for product disassembly and assembly.

CHAPTER 4. ADJUSTMENTS

Includes a step-by-step guide for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides Epson-approved techniques for adjustment.

CHAPTER 6. MAINTENANCE

Describes preventive maintenance techniques and lists lubricants and adhesives required to service the equipment.

APPENDIX

Describes connector pin assignments, circuit diagrams, circuit board component layout and exploded diagram.

The contents of this manual are subject to change without notice.

REVISION SHEET

Revision	Issue Date	Revision Page
Rev. **A**	December 9 1996	1st issue

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Chapter 1   General Description

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1.1 FEATURES

The EPSON® EPL-N1200 is a non-impact page printer that combines a semi-conductor laser with electro-photographic technology. Resolution is 600/300 DPI and print speed is 12 PPM. The main features are:

o   Upward compatibility with the EPL-5600

o   No ozone generation

o   Printing speed — 12 PPM (pages per minute) for A4 size or letter paper

o   Resolution — 600/300 DPI (dots per inch)

o   Standard paper tray holds up to 250 sheets

o   Standard paper tray can be used as manual feed slot

o   Lower paper cassette (500 sheets) available as option

o   Small footprint because output tray is held within the printer

o   Support of HP® LaserJet® 4 (LJ4) emulation mode, EPSON GL/2 mode, ESC/P 2 mode, and IBM I239X mode in standard model

o   45 built-in scalable fonts (14 Windows TrueType compatible and 31 LJ4 compatible)

o   With memory improvement technology, standard RAM supports 600 DPI at full-page size in all modes (LJ4, GL/2, FX, ESC/P2, and I239X modes)

o   High-performance controller (20 MHz SPARKlite (MB86930) CPU)

o   Bi Resolution Improvement Technology (BiRITech) refines print quality, eliminating jagged edges from images and characters on 600 and 300 DPI printing.

o   Optional EPSONScript Level 2 (PostScript® compatible) module

o   Optional LocalTalk/Serial Module and Type-B interfaces can be used simultaneously

o   2 MB standard RAM and up to 64 MB RAM using optional SIMMs

o   Two bidirectional parallel interface ports, Parallel B and Parallel C
     Parallel B : Supports IEEE 1284 compatible, Nibble modes
     Parallel C: Supports IEEE 1284 compatible, Nibble, and ECP modes

o   High-speed parallel communication rate
     Parallel B : Approx. 400 KB / second in fast mode
     Parallel C: Approx. 2 MB / second in ECP mode

o   Support for EPA Energy Star program

o   Multi-port and multi-emulation are supported

o   IES (Intelligent Emulation Switch) allows switching between EPSONScript mode and other mode

o   Setting for automatic release of paper size errors

Figure 1-1 shows an exterior view of the EPL-N1200.
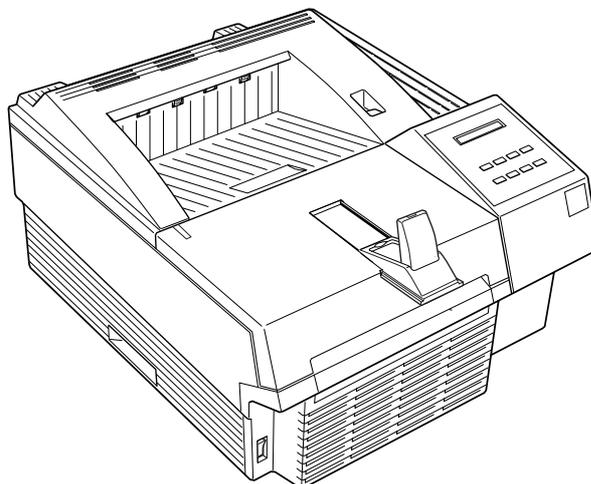
Figure 1-1. EPL-N1200 Exterior View

Table 1-1 lists optional units available for the EPL-N1200.

Table 1-1. EPL-N1200 Options

Cat. No.	Description	Note
C83219✳	EPSONScript Level 2 ROM Module	Supports EPSONScript Level 2 ROM mode (PostScript Level 2 compatible) fonts and commands
—	72-pin RAM SIMM memory modules	For IBM PC compatibles
C81262✳	500 sheet lower paper cassette A4	Lower paper cassette
C812631	500 sheet lower paper cassette Letter	Lower paper cassette
S051016	Imaging cartridge	Toner cartridge
C82334✳	LocalTalk™ / Serial Module	—
C83620✳	RS-232C intrerface cable (9 pin)	For C82334✳
C83619✳	RS-232C intrerface cable (25 pin)	For C82334✳
C83618✳	Current loop cable	For C82334✳
C82307✳/ C82308✳	32 KB serial interface card	—
C82310✳/ C82311	32 KB parallel interface card	—
C82312✳	LocalTalk™ interface card	—
C82314✳	COAX interface card	—
C82315✳	TWINAX interface card	—
C82323✳	GPIB interface card	—
C82331✳	Ethernet interface card for NetWare®	å

Note: The LocalTalk card (C82312✳) cannot be used with LocalTalk setting on the LocalTalk/Serial I/F module (C82355✳).

1.2 SPECIFICATIONS

This section provides statistical data for the EPL-N1200.

1.2.1 Basic Specifications

Print method: Laser beam scanning and dry electro-photography

Resolution: 600 DPI

Printing speed: 12 PPM (letter/A4)

First print time (A4/LT):   Less than 16 seconds (A4/Letter; at Polygon-motor stop)
                                    (Warm-up time must be added in above value at standby mode)

Warm-up time: 60 seconds (at rated current and 23° C (73° F) temperature)

Paper supply: See Table 1-2.

Table 1-2. Paper Feed Methods

Paper Supply	Capacity	Paper Size	Usable Thickness (Ream Weight)
Standard paper tray	250*3)	A5, B5, A4, LT, GLT, EXE, LGL, GLG, F4, HL, Custom	16 to 24 lb.*4) (60 to 90 g/m^2) 16 to 41.8 lb.*5) (60 to 157 g/m^2)
	10 (Envelope)	Monarch, DL, C5, C6, International B5, Commercial-10	Envelopes made of 16 to 24 lb. (60 to 90 g/m^2) paper
Lower paper cassette (optional)*1)	500*3)	A4 or LT*2)	16 to 24 lb. (60 to 90 g/m^2)

*1:Two units maximum can be mounted.

*2:Paper size is fixed either A4 or Letter.

*3:70g/m^2 (20lb.)paper

*4:When you set pieces of paper on standard paper tray.

*5:When you set a piece of paper on standard paper tray.

*6) It can be used as manual feeding paper slot.

Note 1: **The weight in pounds (lb.) is determined by how much 500 sheets cut to 17×22 inch would weigh; 1 g/m^2 = 0.2659763 lb.**

Note 2: Paper size range: width   3.62 to 8.5 inches (92 to 216 mm)
                           length   5.83 to 14.0 inches (148 to 356 mm)

Paper types: See Table 1-3.

Table 1-3. Paper Types

Standard paper	Xerox® 4024 DP paper 20 lb. (75 g/m^2)
Normal paper	Regular photocopier paper, Bond paper, Recycled paper, 16 to 24 lb. (60 to 90 g/m^2)
Special papers	Card stock (90 to 157 g/m^2), Envelopes, Labels,Letterhead, Transparency (OHP) sheets, Colored paper

Usability of special papers: See Table 1-4.

Table 1-4. of Special Papers Usability

Input	Output	OHP	Envelopes	Labels	Card Stock	Letterhead
Standard built-in paper tray	Face down	P	P	P	P	R
Lower paper cassette	Face down	N	N	N	N	P

R: Reliable feeding and good image quality.
P: Possible, but better avoided.
N: Not supported.

Paper feed alignment and direction: Center alignment for all sizes

Paper ejection: Face down

Output tray capacity: 250 sheets (standard paper ; 20 lb. (75g/m^2))

Printable area (standard paper):   See Figure 1-2.

Note: The actual printable area depends on the printer mode.

Harmonic noise: Less than 36 dB(A) standby
                         Less than 52 dB(A) operating

Ozone density: Less than 0.02 PPM

Toxicity: No toxicity exists in organic photo-conductor (OPC), toner, and plastic materials
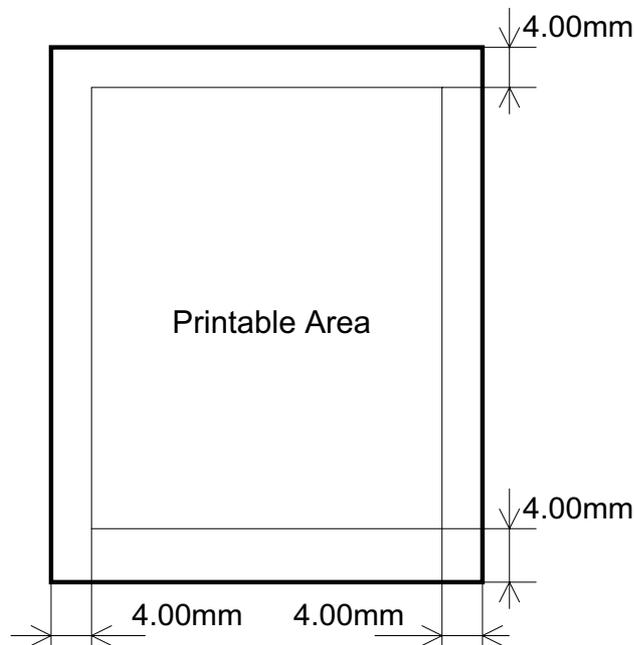
Figure 1-2. Printable Area

1.2.2 Electrical Specifications

Table 1-5. Electrical Specifications

Description	100 V Version	230 V Version
Rated voltage	100 ~ 120 VAC	230 VAC
Rated frequency range	50 ~ 60 Hz	
Input frequency range	47 ~ 63 Hz	
Power consumption	Less than 700 W	Less than 800 W
Power consumption in non-standby mode	Less than 150 W (Average)	
Power consumption in standby mode (Heater lamp is off.)	Less than 30 W (without any optionals installed)	

1.2.3 Reliability Specifications

MPBF (Mean Prints Between Failures): Over 50,000 sheets

Note: MPBF indicates average number of pages printed before an occurrence of a problem requiring replacement or service.

MTBF (Mean Time Between Failures): 3000 Power on hours (more than 10 months)
Jam rate: 1 out of 2,000 sheets or less (excluding multiple-sheet feeding)
Feed failure: 1 out of 2,000 sheets or less (excluding multiple-sheet feeding)
Multiple-sheet feeding: 1 out of 500 sheets or less
Paper curl height: 30 mm (1.2 inches) or less (Standard paper)
30 mm (1.2 inches) or less (OHP sheet)
Leading edge bending (1 cm or more): 1 out of 1,000 sheets
MTTR (Mean Time To Repair): 30 minutes or less
Durability: 5 years or 300,000 sheets

1.2.4 Environmental Conditions for Operating (Including Imaging Cartridge)

Temperature: 10 to 35°C (50 to 95°F)

Humidity: 15 to 85% RH

Altitude: 2,500m (8,200 feet) or lower

Levelness: 1 degree or less (front to rear,right to left)

Illuminance: 3,000 lux or less (must not be exposed to direct sunlight)

Surrounding space: Printer should have at least 100mm of clearance on sides and rear.

1.2.5 Environmental Conditions for Storage and Transportation (Excluding Imaging Cartridge)

Temperature: 0 t o 3 5 ° C (32 to 95°F) overfull storage period

Humidity: 30 to 85% RH overfull storage period

Drop test: Clear to JISZ0200-1987 Level1

Vibration: Vibration frequency 5 to 100Hz and 100 to 5Hz
Sweep time10 minutes
Acceleration1G
Acceleration direction 3 directions
Acceleration time180 minutes(60 minutes for ach direction X, Y, Z)

Resistance to atmospheric pressure: 61.3 to 101.3 KPa

Storage period: 18 months (after date of manufacture)

1.2.6 Applicable Standards (without any electrical optional unit)

Safety Standards

120 VAC model:	UL 1950 Deviation 3, CSA 22.2 No.950 Deviation 3
230 VAC model (Europe):	EN 60950 (IEC950), NEMKO (IEC950),
	CE marking (low voltage directive)

Safety Regulations (Laser Radiation)

120 VAC model:	FDA (NCDRH) Class 1
230 VAC model (Europe):	VDE 0837 (Laser Class 1)(IEC825)

EMI

120 VAC model:	FCC Part 15 Subpart B Class B, DOC Class B
230 VAC model (Europe):	Vfg 243 (VDE 0878 Part 3,30),
	EN55022 class B (CISPR Pub.22 class B),
	CE marking (EMC directive)
230 VAC model (Pacific):	AS/NZS 3548

Others

Toner:	No effect on human health (OSHA, TSCA, EINECS)
OPC:	No effect on human health (OSHA)
Ozone:	Less than 0.02 PPM
	other UL478 (5th edition)
Materials:	SWISS Environmental Law (No CdS must be contained)
Power Consumption	Applies to International Energy Star Program standard

1.2.7 Specification for Consumable (Imaging Cartridge)

Life:	6,000 pages

Note: In continuous print mode with A4/letter paper at a 5% image (black/white ratio) ratio. L life varies, depending on print mode (continuous or intermittent) and/or image ratio.

Environmental Conditions for Storage and Transportation

Temperature:	0 t o 3 0 ° C(32 to 86°F) overfull storage period
Humidity:	30 to 85% RH over full storage period
Drop test:	Height 76 cm (30.4 inches): 1 corner, 3 edges, 6 sides
Vibration:	Same as printer
Resistance to atmospheric pressure:	Same as printer
Storage period:	18 months after date of manufacture

1.2.8 Physical Specifications

Dimensions (Width $\times$ Depth $\times$ Height):

Printer:	411 $\times$ 484 $\times$ 265 mm (16.2 $\times$ 19.0 $\times$ 10.4 inches)
With one lower cassette:	411 $\times$ 484 $\times$ 365 mm (16.2 $\times$ 19.0 $\times$ 14.4 inches)
With two lower cassettes:	411 $\times$ 484 $\times$ 466 mm (16.2 $\times$ 19.0 $\times$ 18.3 inches)

Weight:	Approx. 15 Kg (33.1 lb.)
	(including imaging cartridge, excluding optional unit)

1.2.9 Software Specifications

Built-in modes: HP LaserJet4 emulation (PCL® 5e)
EPSON GL/2 mode (LJ4-GL/2 mode and GL-like mode)
FX (FX-870/1170,LX-100) emulation mode
ESC/P2 (Stylus800/1000) mode
I239X (IBM 2390/2391 Plus emulation)
EPSON PostScript Level 2 (Option)

Note: The EPSON GL/2 mode is similar to the GL/2 mode included in the HP LaserJet 4 emulation. Table 1-6 shows the differences between EPSON GL/2 mode and the GL/2 mode in the HP LaserJet 4 emulation. While in EPSON GL/2 mode, the operator can enter GL/2 mode without sending the ESC %#B (Enter GL/2 mode) command. If the operator's application software cannot send the ESC %#B command, then use this mode.

Table 1-6. Differences between EPSON GL/2 and GL/2 in the HP LaserJet 4 Emulation

	EPSON GL/2 Mode	**GL/2 for HP LaserJet 4 Emulation Mode**
PCL mode	Does not exist	Exists as the initial mode
Paper eject	Supports PG, AF commands	Supported in PCL
Auto eject	SelecType setting	Not available
Reduced printing	SelecType setting	Available in PCL
Switch to PCL (ESC %#A)	Not supported	Supported
Reset (ESC E)	Ejects paper and then initializes	Ejects paper, switches to PCL, and then initializes
PJL, EJL, and ES	Supported	Supported
Advance Full Page (PG, AF)	Supported	Not supported

Notes: EPSON GL/2 mode has two operational modes. One is LJ4-GL/2 mode; the other is the GL-like mode.

LJ4-GL/2 mode emulates the GL/2 mode in the HP LaserJet 4 emulation. The user can print with software that supports the HP 7600 series plotter.

The GL-like mode features all the commands of the LJ4-GL/2 mode, plus a few additional commands. The GL-like mode emulates some of the HP-GL® plotter (HP 7475A, etc.) commands. If the application software uses unsupported commands for the GL-like mode, print cannot be assured.

Optional modes: EPSON Script Level 2(PostScript Level 2 emulation) mode

Auxiliary software: Hexdump
Status sheet
Font sample

Built-in fonts: SeeTable1-7.

Table 1-7. Built-in Fonts (Bitmap Fonts)

Resident Fonts		**Applicable Mode**			
		HP LJ4 GL/2	**ESC/P 2**	**FX**	**I239X**
Line Printer	16.66 CPI (Portrait)	V	-	-	-
OCR B	10 CPI (Portrait)	-	V	V	V

V: Supported, -: Not Supported

Table 1-7. Built-in Fonts (Scalable Fonts)

Resident Fonts		Applicable Mode			
		HP LJ4 GL/2	ESC/P 2	FX	I239X
EPSON Roman		-	V	V	-
EPSON Sans serif		-	V	V	V
EPSON Prestige		-	V	V	V
EPSON Script		-	V	V	V
EPSON Gothic		-	-	-	V
EPSON Presentor		-	-	-	V
EPSON Orator		-	-	-	V
Dutch™ 801	Roman SWC	V	-	-	-
Dutch 801	Bold SWC	V	-	-	-
Dutch 801	Italic SWC	V	-	-	-
Dutch 801	Bold Italic SWC	V	-	-	-
Zapf Humanist 601	Demi SWC	V	-	-	-
Zapf Humanist 601	Bold SWC	V	-	-	-
Zapf Humanist 601	Demi Italic SWC	V	-	-	-
Zapf Humanist 601	Bold Italic SWC	V	-	-	-
Ribbon 131	SWC	V	-	-	-
Clarendon	Condensed SWC	V	-	-	-
Swiss™ 742	SWC	V	-	-	-
Swiss 742	Bold SWC	V	-	-	-
Swiss 742	Medium Italic SWC	V	-	-	-
Swiss 742	Bold Italic SWC	V	-	-	-
Swiss 742	Condensed SWC	V	-	-	-
Swiss 742	Bold Condensed SWC	V	-	-	-
Swiss 742	Condensed Italic SWC	V	-	-	-
Swiss 742	Bold Italic Condensed SWC	V	-	-	-
Incised 901	SWC	V	-	-	-
Incised 901	Black SWC	V	-	-	-
Incised 901	Italic SWC	V	-	-	-
Original Garamond	SWC	V	-	-	-
Original Garamond	Bold SWC	V	-	-	-
Original Garamond	Italic SWC	V	-	-	-
Original Garamond	Bold Italic SWC	V	-	-	-
Audrey Two	SWC	V	-	-	-
Flareserif 821	SWC	V	-	-	-
Flareserif 821	Extra Bold	V	-	-	-
Swiss 721	Roman SWM	V	V	-	-
Swiss 721	Bold SWM	V	V	-	-
Swiss 721	Oblique SWM	V	-	-	-
Swiss 721	Bold Oblique SWM	V	-	-	-
Dutch 801	Roman SWM	V	V	-	-
Dutch 801	Bold SWM	V	V	-	-
Dutch 801	Italic SWM	V	-	-	-
Dutch 801	Bold Italic SWM	V	-	-	-
Symbol Set	SWA	V	-	-	-
More WingBats	SWM	V	-	-	-

V: Supported, -: Not Supported

Table 1-7. Built-in Fonts (Scalable Fonts; Cont')

Resident Fonts		Applicable Mode			
		HP LJ4, GL/2	**ESC/P 2**	**FX**	**I239X**
Courier	SWC	V	V	V	V
Courier	Bold SWC	V	V	V	V
Courier	Italic SWC	V	-	-	-
Courier	Bold Italic SWC	V	-	-	-
Letter Gothic	Roman SWC	V	V	V	-
Letter Gothic	Bold SWC	V	V	V	-
Letter Gothic	Italic SWC	V	-	-	-
Ext. Graph		-	V	V	V

V: Supported, -: Not supported

Font Symbol Sets and Character Tables

HP LaserJet 4 Mode (bitmap fonts) : 28 symbol sets

Roman-8	Norweg1	Roman Extension	French
HP German	ItalianT	JIS ASCII	ECM94-1
Swedis2	ANSI ASCII	Norweg2	UK
French2	German	HP Spanish	Legal
Chinese	8859-2 ISO	Spanish	IRV
Swedish	Portuguese	8859-9 ISO	IBM Portuguese
IBM Spanish	IBM®-US	IBM-DN	PcMultilingual

HP LaserJet4 Mode (scalable fonts) : 45 symbol sets

Roman-8	Norweg1	Roman Extension	French
HP German	Italian	JIS ASCII	ECM94-1
Swedis2	ANSI ASCII	Norweg2	UK
French2	German	HP Spanish	Legal
Chinese	8859-2 ISO	Spanish	IRV
Swedish	Portuguese	PsMath	8859-9 ISO
IBM Portuguese	WiTurkish	DeskTop	Math-8WiE.Europe
PcTk437	Windows	PsText	IBM-US
IBM-DN	McText	PcMultilingual	VeInternational
VeUS	PiFont	PcE.Europe	Symbol
WiAnsi	TWingdings	MsPublishing	VeMathRIBM SPanish

ESC/P 2 Mode : 15 International characters and 9 code tables

USA	SPAIN1	FRANCE	JAPAN
GERMANY	NORWAY	UK	DENMARK2
DENMARK1	SPAIN2	SWEDEN	L.AMERICA
ITALY	KOREA	TLEGAL	

PcUSA(437)	PcMultilingual(850)	TPcPortuguese(860)
TPcCanFrench(863)	PcNordic(865) T	PcTurk2(857)
PcE.Europe(852)	BpBRASCII	BpAbicomp

FX Mode : 13 International characters and 9 code tables

USA	SPAIN1	FRANCE	JAPAN
GERMANY	NORWAY	UK	DENMARK2
DENMARK1	SPAIN2	SWEDENT	L.AMERICA
ITALY			

PcUSA(437)	PcMultilingual(850)	TPcPortuguese(860)
PcCanFrench(863)	PcNordic(865)	PcTurk2(857)
PcE.Europe(852)	BpBRASCII T	BpAbicomp

I239X Mode : 5 code tables

PcUSA(437)	PcMultilingual(850)
RPcPortuguese(860)	PcCanFrench(863)
PcNordic(865)	

1.2.10 Lower Paper Cassette (Option) Specifications

Paper Size:	A4 or Letter
Paper Weight:	60 to 90 g/m^2 (16 to 24 lb)
Print Speed:	12 PPM (letter/A4)
Paper Feed:	Automatic feed delivery system. Cassette capacity up to 500 sheets (75 g/m^2 or 20 lb paper)
Feeding Speed (first print):	First Lower Paper Cassette: 16 seconds or less; (A4 or letter) Second Lower Paper Cassette 16 seconds or less; (A4 or letter)
Feeding Speed (subsequent sheets)	12 PPM (A4/Letter)
Paper Type:	Plain paper, such as copier paper
Power Supply:	5 V DCand 24 VDC are supplied by the printer
Dimensions and Weight: (Width $\times$ Depth $\times$ Height)	Lower paper cassette entire housing; 405 $\times$ 477 $\times$ 107 mm (18.8 $\times$ 19.0 $\times$ 4.2 inches) 2.8 Kg (6.2 lb.) Paper Cassette; 252 $\times$ 318 $\times$ 82 mm (9.9 $\times$ 12.5 $\times$ 3.2 inches) 1.1 Kg (2.4 lb.)
Harmonic noise:	Less than 52 dB(A) (operating)

1.3 INTERFACE SPECIFICATIONS

The EPL-N1200 is equipped with the following external interfaces:

- ■ Parallel interface B
- ■ Parallel interface C
- ■ Serial interface on optional LocalTalk/Serial module
- ■ LocalTalk interface on optional LocalTalk/Serial module

1.3.1 Parallel Interfaces

There are two parallel interfaces: parallel interface B and parallel interface C. Each interface has his own connector.

Parallel Interface B

Interface specification complies with IEEE 1284-I.

Operating modes: Compatibility (standard) and nibble (reverse) modes

Transfer speed: APPROX. 400 KB/second (MAX.)

Connector type: Amphenol or equivalent (IEEE 1284B - type connector)

Parallel Interface C

Interface specification complies with IEEE 1284-II.

Operating modes: Compatibility (standard), nibble (reverse), and ECP modes

Transfer speed: APPROX. 2MB/second in ECP mode (MAX.)

Connector type: IEEE 1284C - type connector

1.3.1.1 Compatibility (Standard) Mode

System: $\overline{\text{STROBE}}$ synchronization, 8-bit parallel data transfer

Handshaking: BUSY and $\overline{\text{ACKNLG}}$ signals

Applicable plug: 57-30360 (Amphenol or equivalent)

Signal timing: See Figure 1-3.

Signal description: See Table 1-8.
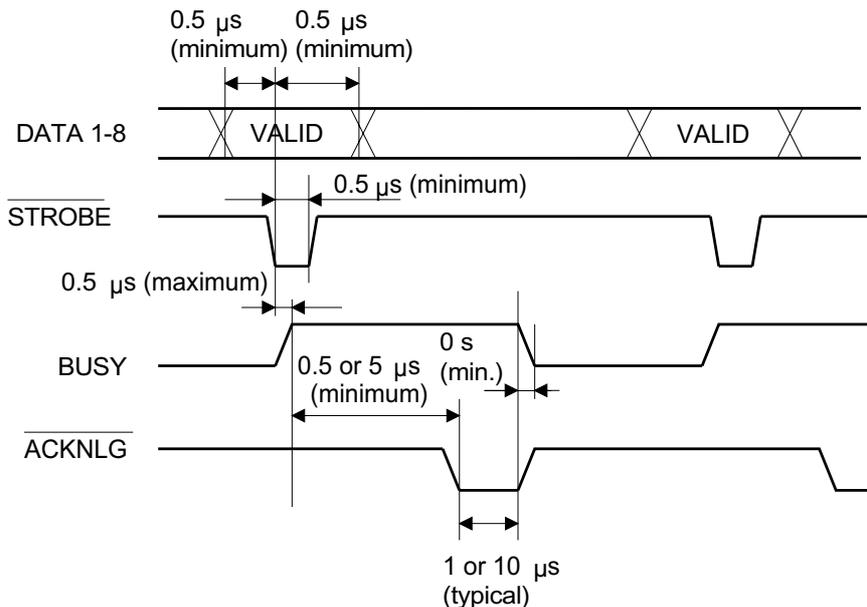

Figure 1-3. Compatibility Mode Signal Timing

Table 1-8. Parallel Interfaces Pin Assignment

Parallel-B			Parallel-C			Description
Pin No.	**Signal Name**	**I/O**	Pin No.	Signal Name	**I/O**	
1	$\overline{\text{STROBE}}$	I	15	$\overline{\text{STROBE}}$	I	STROBE is a strobe pulse used to read data from the host computer. The pulse width must be more than 0.5 μsec. Normally it is HIGH, and data is latched at the trailing edge of this signal.
2-9	DATA 1-8	I	6-13	DATA 1-8	I/O	DATA 1 to 8 are parallel data bits. When the signal is HIGH, the data bit is 1, and when it is LOW, the data bit is 0. The most significant bit (MSB) is DATA8. The signal state must be maintained for 0.5 μsec. on either side of the $\overline{\text{STROBE}}$ signal active edge.
10	$\overline{\text{ACKNLG}}$	O	3	$\overline{\text{ACKNLG}}$	O	ACKNLG is an acknowledge pulse with an approximate width of 1 or 10 μsec. This signal goes LOW when the data reception is completed, which indicates that the printer can accept new data. Timing with the BUSY signal is specified through SelecType.
11	BUSY	O	1	BUSY	O	The BUSY signal informs the host computer of the printer state. When the signal is HIGH, the printer cannot accept data.
12	PE	O	5	PE	O	The PE signal indicates paper empty for the standard tray selected through SelecType or command, or for the optional paper cassette. Paper empty is indicated by HIGH.
13	SLCT	O	2	SLCT	O	Use at reverse mode.
14	$\overline{\text{AUTO-FEED}}$	I	17	$\overline{\text{AUTO-FEED}}$	I	Not used.
15,18, 34	NC	-	-	-	-	Not used.
16	GND	-	-	-	-	Logic ground level.
17	CHASSIS GND	-	-	-	-	Connected to the printer chassis. The printer chassis GND and the signal GND are connected to each other.
19-30	GND	-	19-35	GND	-	Ground level for the twisted pair return signal.
31	$\overline{\text{INIT}}$	I	14	$\overline{\text{INIT}}$	I	The $\overline{\text{STROBE}}$ signal is ignored when this signal is LOW.
32	$\overline{\text{ERROR}}$	O	4	$\overline{\text{ERROR}}$	O	This level goes LOW when the printer is: out of paper paper jam in error state off line
33	GND	-	-	-	-	Same as for pins 19 to 30.
35	+5	-	-	-	-	Pulled up to +5V through 1.0 Kohm resistance.
36	$\overline{\text{SLCT IN}}$	-	16	$\overline{\text{SLCT IN}}$	I	Use the reverse mode.
-	-	-	18	Host Logic High	I	Hosyt logic high signal
-	-	-	36	Peripheral Logic High	O	Peripheral logic high signal

1.3.1.2 Nibble (Reverse), ECP Mode

The reverse mode for EPL-N1200 supports the IEEE-P1284 nibble mode. This printer can run in reverse mode, in which the printer can inform the computer of its status by EJL and PJL commands.

System: Nibble mode of IEEE-P1284

Connector type: P90-25027-1 (Amphenol) receptacle

Applicable plug: 57-30360(Amphenol or equivalent)

Signal description: See Table 1-9.

Table 1-9. Parallel Interface Pin Assignment

| Pin No.	Signal Name	I/O	Description
1	$\overline{\text{STROBE}}$	IN	HostClk: This signal is a strobe pulse used to read extension request values from the host computer during negotiation.
2-9	DATA 1-8	IN	The signals are data bits of extension request values during negotiation. This printer supports following values: 0000 0100: Request Device ID (by nibble mode sending) 0000 0000: Request nibble mode
10	$\overline{\text{ACKNLG}}$	OUT	PtrClk: Printer data sending clock.
11	BUSY	OUT	PtrBusy: Printer sending data bits 3 and 7 during data transfer to host computer.
12	PE	OUT	AckDataReq: Printer sending data bits 2 and 6 during data transfer to host computer.
13	SLCT	OUT	Xflag: Printer sending data bits 2 and 6 during data transfer to host computer.
14	$\overline{\text{AUTO-FEED}}$	IN	HostBusy: This signal informs the printer of the host computer state. When the signal is HIGH, the host computer cannot accept data.
15	NC	-	Not used.
16	GND	-	Logic ground level.
17	CHASSIS GND	-	Connected to the printer chassis. The printer chassis GND and the signal GND are connected to each other.
18	NC	-	Not connected.
19-30	GND	-	Ground level for the twisted pair return signal.
31	$\overline{\text{INIT}}$	IN	nInit: High level fixed
32	$\overline{\text{ERROR}}$	OUT	nDataAvail: Printer sending data bits 0 and 4 during data transfer to host computer.
33	GND	-	Same as for pins 19 to 30.
34	NC	-	Not used.
35	+5	-	Pulled up to +5V through 1.0 Kohm resistance.
36	$\overline{\text{SLCT IN}}$	IN	1284Active: If this signal is set to HIGH, this printer active P1284 (reverse mode).
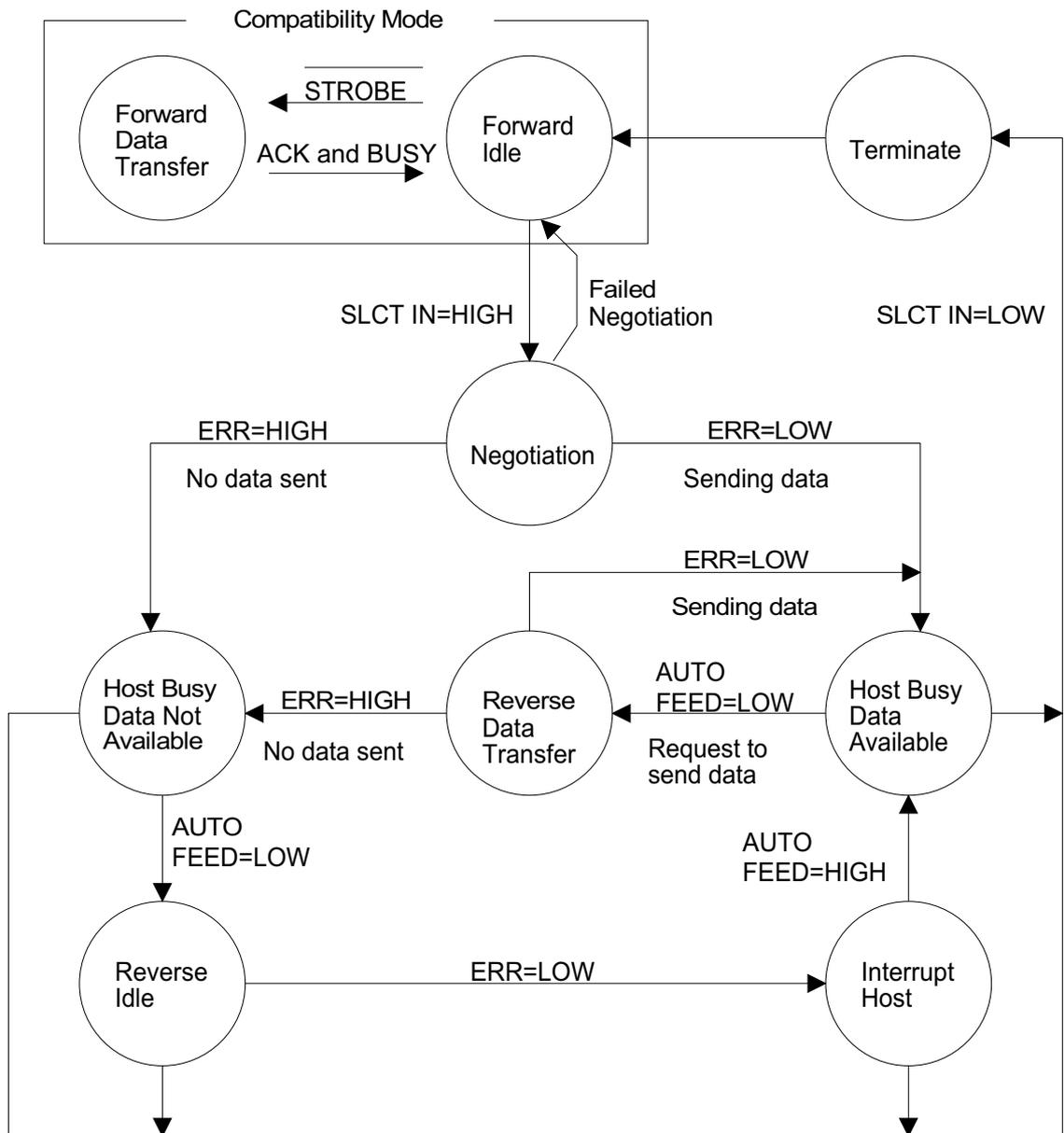
Figure 1-4. Parallel Interface State Switch Diagram

Figure 1-4 shows the parallel interface state switch diagram.
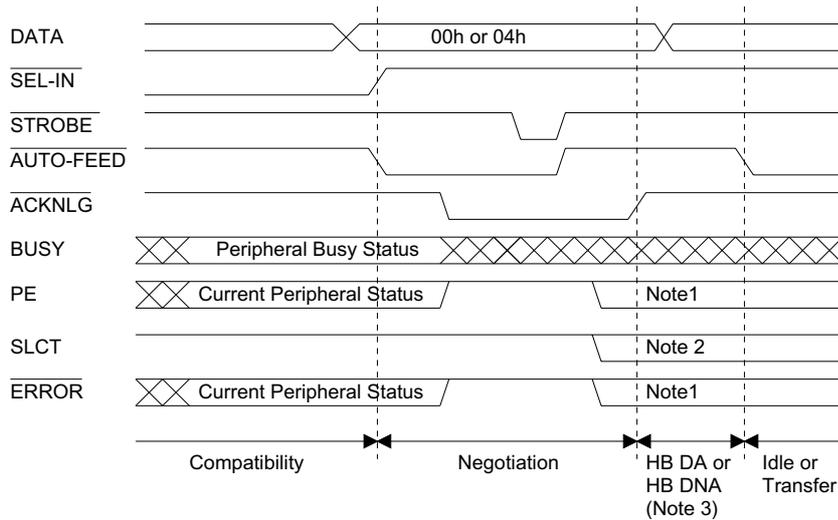
Figure 1-5 shows the timing chart for negotiation.

Figure 1-5. Negotiation Timing Chart

Note 1: The signal is set to HIGH when not sending data.
The signal is set to LOW when sending data.

Note 2: The signal is set to HIGH, if extension request value was 04h.

Note 3: HB DA: Host Busy Data Available
HB DNA: Host Busy Data Not Available
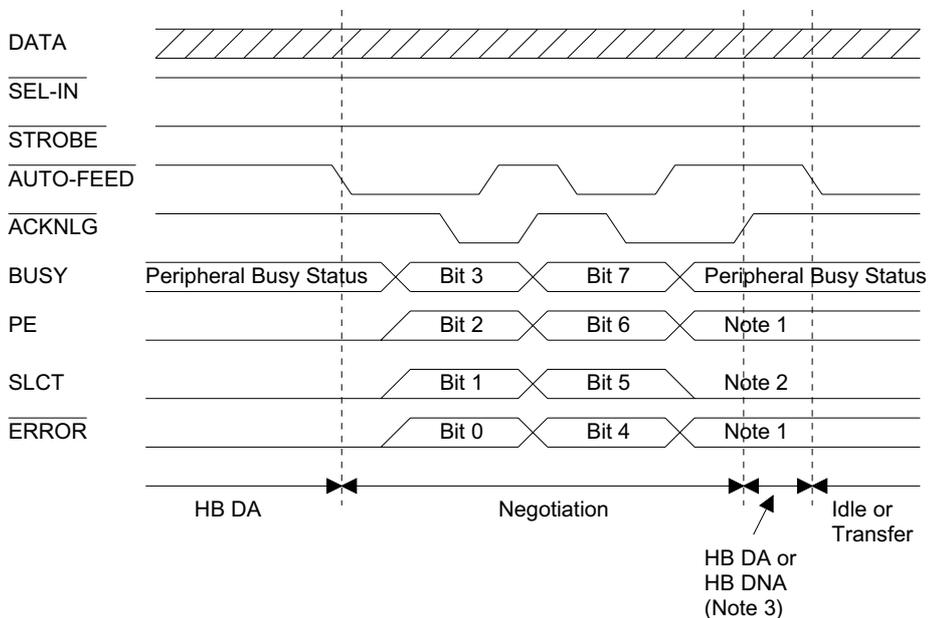
Figure 1-6 shows the timing chart for data transfer.

Figure 1-6. Data Transfer Timing Chart

Note 1: The signal is set to HIGH when not sending data.
The signal is set to LOW when sending data.

Note 2: The signal is set to HIGH, if extension request value was 04h.

Note 3: HB DA: Host Busy Data Available
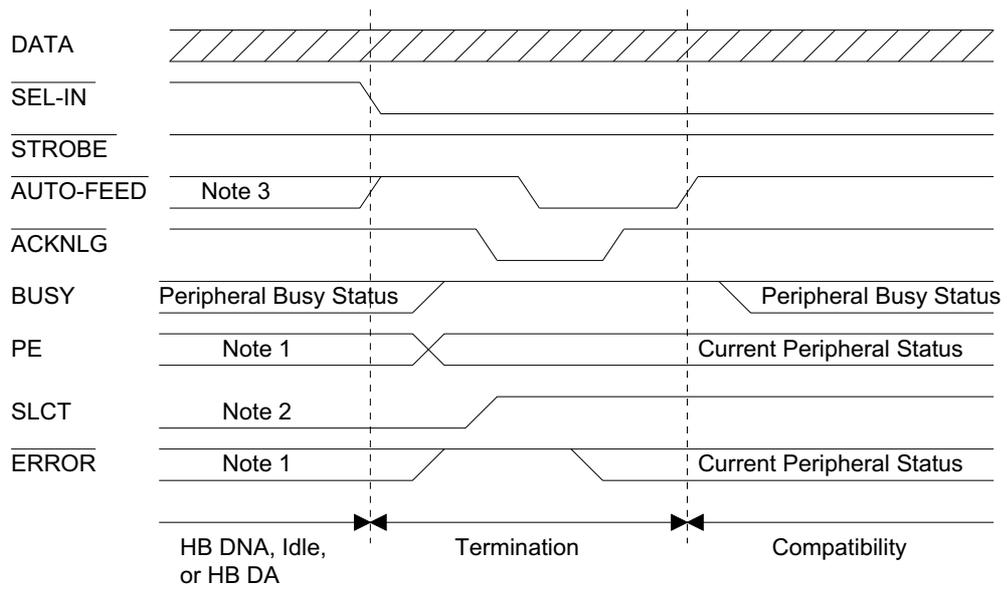HB DNA: Host Busy Data Not Available

Figure 1-7. Termination Timing Chart

Figure 1-7 shows the timing chart of termination.

Note 1:   The signal is HIGH when HB DNA.
             The signal is LOW when HB DA.

Note 2:   The signal is set to HIGH, if extension request value was 04h.

Note 3:   Idle = LOW
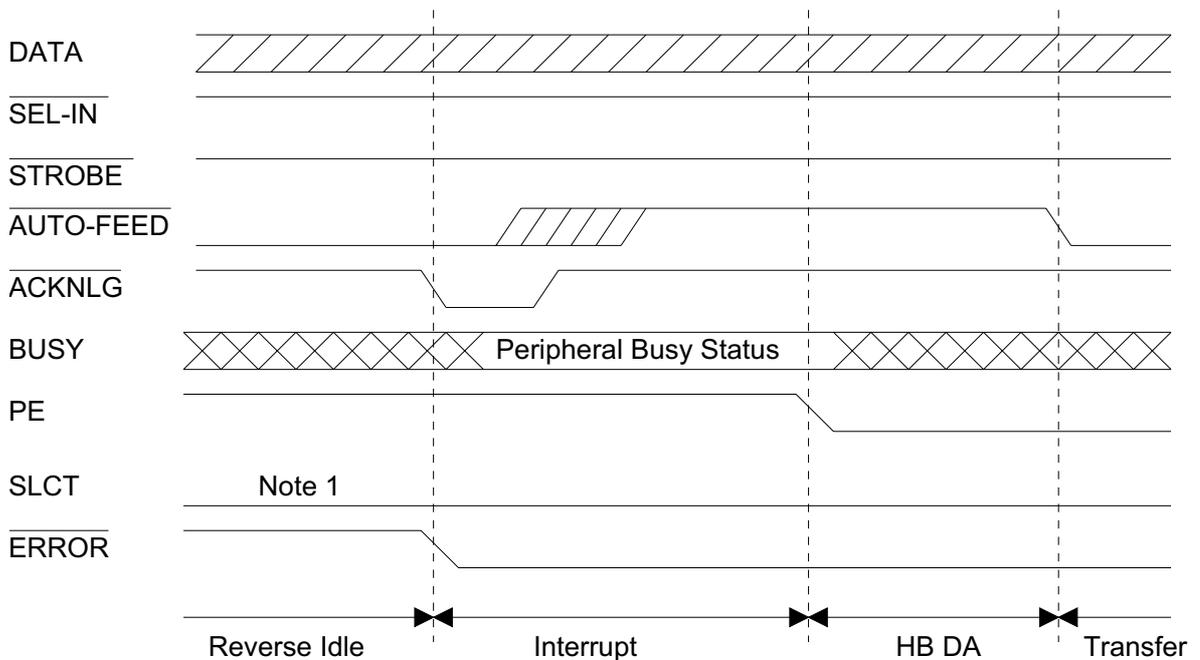
Figure 1-8 shows the timing chart for an interrupt.

Figure 1-8. Interrupt Timing Chart

Note :   The signal is set to HIGH, if extension request value was 04h.

1.3.2 Optional Serial Interface (LocalTalk/Serial Module)

The optional LocalTalk/Serial module contains serial interface with the following characteristics.

Type:	RS-232C or current loop
Transfer system:	Full duplex
Synchronization:	Asynchronous start-stop system

	Start-bit:	1 bit
	Stop-bit:	1 or 2 bits
	Data length:	7 bits or 8 bits
	Parity:	Odd, even, or none

Protocol:	X-ON/X-OFF (can be combined with DTR control)
	DTR control (can be combined with X-ON/X-OFF)
Transfer speed:	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, or 57600 BPS

Note 1: For RS-232C signal level, speeds of 38400 BPS and above place restrictions on the host computer, cable, and other operating conditions.

Note 2 For current loop signal level, speeds of 2400 BPS and above place restrictions on the host computer, cable, and other operationg conditions.

Error:	Overrun error:	Processed as missing data and replaced by "*"
	Parity error:	Replaced by "*"
	Framing error:	Replaced by "*"
	Breaking character:	Ignored
Applicable plug	Circular miniature DIN 8-pin plug	
Signal Level (EIA BASED) :	TXD, DTR	

Out put Voltage	(VOH)	5 to 15 V
	(VOL)	-5 to -15 V
Open circuit voltage	(VO)	within ±15 V
Impedance with power off	(rO)	300 ohms (MIN.)
Load capacitance	(CL)	2500 pF (MAX.)
Through rate		30 V/u SEC (MAX.)
Load resistance	(Lo)	3 K to 7 K ohms
RXD, CTS		
Input Voltage	(VIH)	3 V (MIN.)
	(VIL)	-5 V (MIN.)*1
Input signal range		+25 V (MAX.)*1
Input impedance	(RI)	3 K to 7 K ohms
Imput current	(II)	+ 8 mA (MAX)*1
Open-circuit input voltage	(EL)	-2 V (MAX>)*1

Note : Annotations "MIN". and "MAX." apply to absolute values.

Signal descriptions: See Table 1-10.