EPSON TERMINAL PRINTER

EPL-9000

SERVICE MANUAL

EPSON

4003603

NOTICE

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 whenperforrning repair/ maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCE- DURE.

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 CONNECT THE UNITTOA 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.

WARNING

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

2. MAKE CERTAIN THAT THE SOURCE VOLTAGE IS THE SAME AS THE RATED VOLT- AGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT 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 INDIVIDUAL 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 NONAPPROVED 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 Europe 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 mW and the wavelength is 780 nm.

For Denmark Users;

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

> Klasse 1 laser produkt der opfylder IEC825 sikkerheds kravene.

For Finland, Sweden Users;

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

> VARNING
> Orn apparaten används på annat 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 säteilvlle. Älä katso säteeseen.

> VARNING
> Osynlig laserstrålning när denna del är oppnad och spärren är urkopplad. Betrakta ej strålen.

> ADVARSEL
> Dersom apparatet brukes på annen måte enn spesifisert i denne bruksan-
> visning, kan brukeren utsettes for unsynlig laserstråling som overskrider
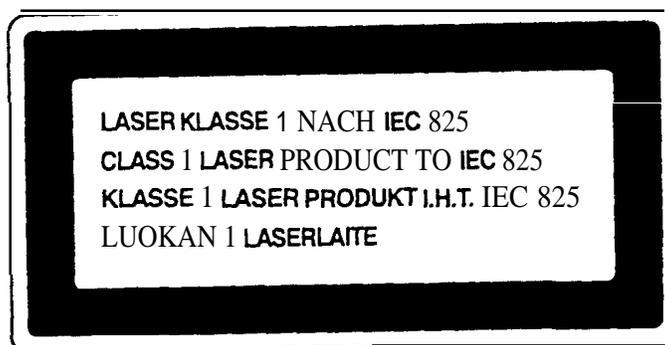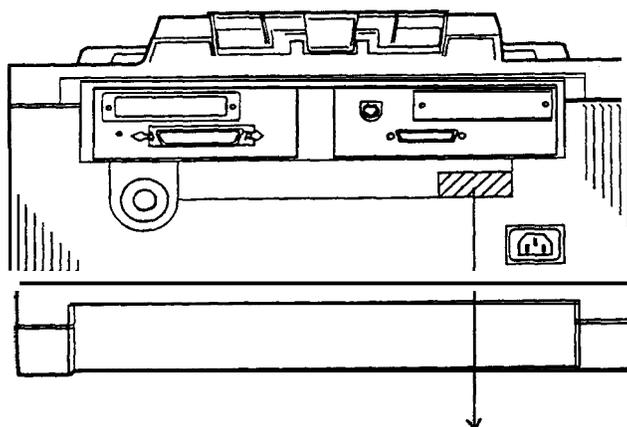> grensen for laser klasse 1.

> Dette er en halvleder laser. Maksimal effeckt til laserdiode er 5 mW og bøl-
> gelengde er 780 nm.

Laser Safety Labels

[Label on rear printer case]

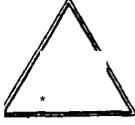A laser safety labels is attached on the outside of the printer shown below.

For Europe


```
LASER KLASSE 1 NACH IEC 825
CLASS 1 LASER PRODUCT TO IEC 825
KLASSE 1 LASER PRODUKT I.H.T. IEC 825
LUOKAN 1 LASERLAITE
```

[Label inside printer]

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

For Denmark, Finland, Sweden, and Norway

CLASS 3B 780nm 5mWmax	危険	開いたりインターロックを 無効にすると不可視のレーザー放射を受けます。直接放射や散乱放射 に目や皮膚が曝されないこと。
	DANGER	INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
	CAUTION	INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DE FEATED. AVOID EXPOSURE TOMAM.
	PRECAUCIÓN	RADIACIÓN LASÉRICA INVISIBLE CUANDO SE ABRA Y ANULE EL INTERBLOQUEO. EVITE IA EXPOSICIÓN DIRECTA AL HAZ.
	VARNING	OSYNLIG LAS ERSTRÅLNING NÄR DENNA DEL AR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN AR FARLIG.
	ADVARSEL	USYNLIG LASERSTRÅ LING NÄR DEKSEL ÅPNES OG SIKKERHETSLÅS BRYTES, UNNGÅ EKSPONERING FOR STRÅLEN.
	ADVERSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
	VARO!	NÄKYMÄTÖN AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE ÄLÄ KATSO SÄTEESEN.
	VORSICHT!	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT IN DER STRAHL BLICKEN.
	ATTENTION	EMISSION DE RADIATION LASER INVISIBLE QUAND L'APPAREIL EST OUVERT ET LORSQUE LA SÉCURITÉ EST NEUTRALISÉE. EVITER DES'EXPOSER AU RAYON LASER.
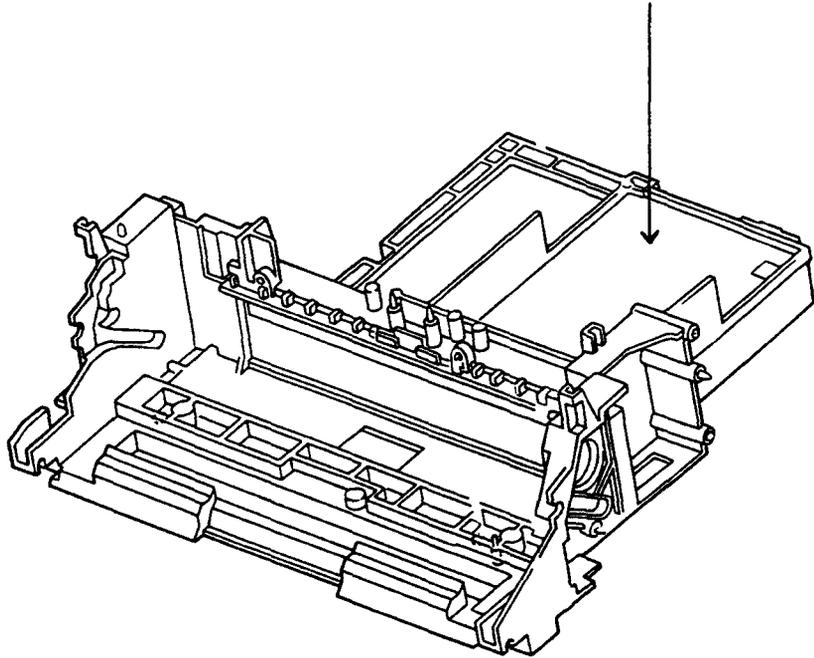
PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of EPL-9000.

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 to service the equipment.

APPENDIX

Describes connector pin assignments, circuit diagrams, circuit board component layout.

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

REVISION SHEET

Revision	Issue Date	Revision Page
Rev. A	August 5, 1994	1st issue

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Chapter 1 General Description

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1.1 FEATURES

The EPSON®EPL-9000 is a non-impact page printer that combines a semi-conductor laser with electro-photographic technology. This printer is small and light, and features high-speed, high-resolution printing. Maintenance is very easy as a result of various built-in diagnostic functions. The main features are:

Ll   No ozone

❏   Printing speed — 8 ppm (pages per minute) (A4 or letter size)

❏   Resolution — 600/300 dpi (dots per inch)

❏   Small footprint

❏   Easy maintenance

❏   HP® LaserJet®4 emulation mode

❏   45 built-in scalable fonts (35 Intellifonts and 10 TrueType fonts)

❏   ESC/P2™ emulation

❏   High-performance controller (the controller's CPU is a 19.2 MHz SPARKlite(MB86930))

❏   Bi Resolution Improvement Technology (BiRITech)refines the print quality by eliminating jagged edges from images and characters on 600 dpi and 300 dpi printing.

❏   Optional EPSONScript Level 2 (PostScript®compatible) module

❏   EPSON Micro Gray Technology (EMGTech), which is available when using EPSONScript Level 2 mode, refines gray scale printing to be comparable to printing on a 1200-dpi printer

❏   Small and low-cost optional LocalTalk™interface module

❏   2 MB standard RAM and up to 64 MB RAM with the addition of optional SIMMs

❏   Bidirectional parallel interface

❏   High-speed serial communication rate of 57.6K bps

❏   High-speed parallel communication rate of approximately 400 KB/second

❏   A multi-user, multi-emulation mode

❏   IES (Intelligent Emulation Switch) allows switching between EPSONScript mode and another mode

❏   SPL (Shared Printer Language) enables switching of the printer mode by command

Figure 1-1 shows an exterior view of the EPL-9000.
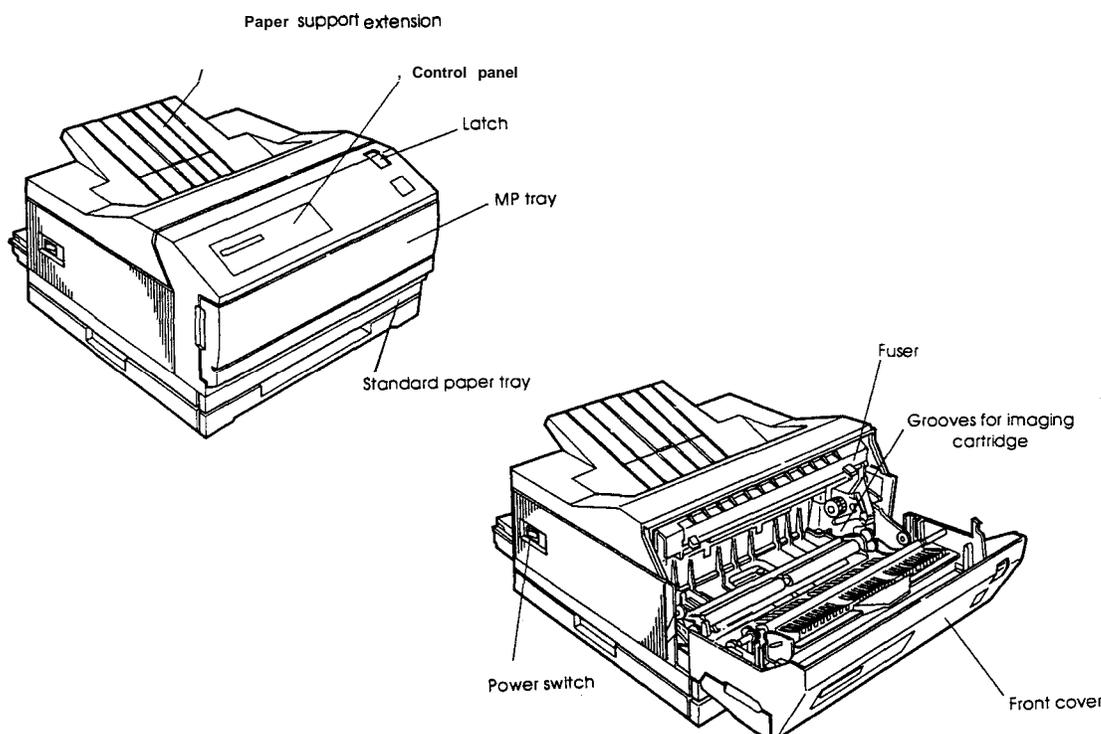
Figure 1-1. Exterior View of the EPL-9000

Table 1-1 lists the optional units available for the EPL-9000.

Table 1-1. Options for EPL-9000

Cat. No.	Description	Note	Machine Type
			EPL-9000
X3209*	EPSONScript Level 2 Module	Supports EPSONScript Level 2 mode (PostScript Level 2 compatible) fonts and commands	Yes
—	Local language ROM	Supports local language fonts	Yes
ι 8 1 2 4 2*	250 sheet universal paper tray (A4/Letter size)	A4/Letter size paper tray	Yes
C81243*	250 sheet universal paper tray (A3/Double-Letter size)	A3/Double-Letter size paper tray	Yes
C81241*	Lower paper cassette unit	Lower paper cassette unit (No include paper cassette)	Yes
S051022	Imaging cartridge	Toner cartridge	Yes
C82326*	LocalTalk I/F Module	—	Yes
C82307*/ C82308*	32 KB serial interface card	—	Yes
C82310*/ C82311'	32 KB parallel interface card	—	Yes
C82312*	LocalTalk card	—	Yes
C82314*	COAX interface card	—	Yes
C82315*	TWINAX interface card	—	Yes
C82324*	Ethernet interface card for NetWare®	—	Yes

Note: LocalTalk card (C82312*) cannot be used with LocalTalk I/F module (C82326*).

1.2 SPECIFICATIONS

This section provides statistical data for the EPL-9000.

1.2.1 Basic Specifications

Printing method:	Laser beam scanning and dry electro-photography
Resolution:	600/300 dpi
Printing speed:	8 ppm (letter/A4), 5 ppm (B4), 4.3 ppm (A3) by cassette feed
First printing time:	18.9 seconds (A4 cassette feed) 19.1 seconds (Letter cassette feed) 25.0 seconds (A3 cassette feed)
Warm-up time:	Less than 120 seconds (at rated current and 20° C (68° F) temperature)
Paper supply:	See Table 1-2.

Table 1-2. Paper Feed Methods

Paper Supply		Capacity (17 lb. (64 g/m^2) paper)	Paper Size	Usage Thickness (Ream Weight)
Standard built-in paper tray or optional lower paper cassette unit	A3/Double-letter paper cassette	250	A3, A4, A5, B4, B5, LT, HLT, LGL, EXE, GLG, B, F4	16 to 24 lb. (60 to 90 g/m^2)
	A4/Letter paper cassette	250	A4, A5, B5, LT, HLT, EXE	
Manual feeder (MSI)		50	A4, A5, B5, LT, HLT, EXE, GLG, GLT, B, F4	16 to 24 lb. (60 to 135 g/m^2)
		30	A4, A5, B5, LT, HLT, EXE	Special paper (label, OHP)
		5	International-B5, MON, C1O, DL, C5	Envelopes made of 16 to 28 lb. (60 to 105 g/m^2)

Notes:

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

2. The printer can use manual feed for A3, B4, LGL, GLG, B and F4 size paper, if user supports paper by hand.

3. When inserting A4, AS, B5, LT, HLT, EXE, and GLT size papers, keep the longer side horizontal.

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 paper	Card stock (90 to 135 g/m^2) **Envelopes** Labels Letterhead Transparency (OHP) sheets Colored paper

Usability of special papers: See Table 1-4.

Table 1-4. Usability of Special Paper

Input	Standard paper	Normal paper	OHP	Envelopes	Labels	Card Stock
Paper tray	R	R	P	N	P	N
Manual feed (MSI)	R	R	P	P	P	P
Envelope cassette	N	N	N	P	N	N

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

Paper size range: **98 mm (3.87 inches) to 297 mm (11.7 inches)** (Width)
                                 140 mm (5.5 inches) to 432 mm (17 inches) (Length)

Paper feed alignment and direction: Center alignment for all sizes

Paper ejection: Face down

Output tray capacity: 250 sheets (standard paper)

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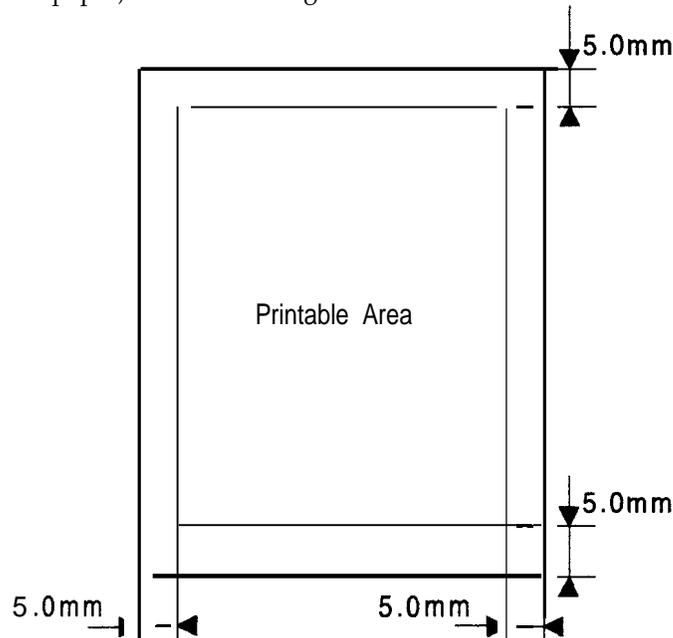
Figure 1-2. Printable Area

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

Noise: Less than 35 **dB(A)** (standby)
                                              Less than 48 **dB(A)** (operating)

Ozone density: 0.05 ppm (typical)

Toxicity: No toxicity exists in organic photo conductor (OPC), toner,
                                              or plastic materials

1.2.2 Electrical Specifications

Table 1-5. Electrical Specifications

Description	100 V Version	200 V Version
Rated voltage	115 **VAC**	220-240 **VAC**
Input voltage range	104-127 **VAC**	198-264 **VAC**
Rated frequency range	50-60 Hz	
Input frequency range	47-63 **Hz**	
Power consumption	Less than 500 W	Less than 600 W

1.2.3 Reliability Specifications

MPBF (Mean Prints Between Failures): Over 12,000 sheets

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

Jam rate: 1 out of 3,000 sheets or less (Standard paper)
                                              1 out of 2,000 sheets or less (Normal paper)
                                              1 out of 25 sheets or less (Label, Envelope, OHP)

Multiple paper feeds: 1 out of 800 sheets or less (Standard paper)
                                              1 out of 500 sheets or less (Normal paper)
                                              1 out of 25 sheets or less (Label, Envelope, OHP)

Paper curl height: 30 mm (1.2 inches) or less
MTTR (Mean Time To Repair):   30 minutes or less
Durability: 5 years or 300,0000 sheets

1.2.4 Environmental Conditions for Operation (Including Imaging Cartridge)

Temperature: 10 to 32° C (50 to 90° F)

Humidity: 20 to 80% RH

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

Levelness: Printer should be installed on a level plane.

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

1.2.5 Environmental Conditions for Storage and Transportation

Temperature: O to 35° C (32 to 95° F) over full storage term
                                      –20 to 40° C (-4 to 104° F) under extreme conditions
                                      (Extremes are allowable for up to 1/30 of full storage term)
                                      Temperature variation must be 10° C (18° F)/hour or less

Humidity: 20 to 80% RH over full storage term
                                      5 to 95% RH under extreme conditions
                                      (Extremes are allowable for up to 1/30 of full storage term)

Drop test: Height 52 cm

Vibration: Vibration frequency   5 to55 Hz and 55 to 5 Hz
                                      Acceleration   1 G
                                      Acceleration direction 3 direction

Resistance to atmospheric pressure: More than 740 hecto pascal

Storage term: 12 months (following date of manufacture)

1.2.6 Applicable Standards

Safety *Standards*

120 VAC model: None
220/240 VAC model: EN 60950 (IEC950), NEMKO (IEC950), SETI (IEC950),
                                      SEMKO (IEC950), DEMKO (IEC950)

Safety Regulations (Laser radiation)

120 VAC model: None
220/240 VAC model: VDE 0837 (Laser Class 1)(IEC825), SETI (IEC825),
                                      SEMKO(IEC825), DEMKO (IEC825)

EMI

120 VAC model: None
220/240 VAC model: DOC Class B
                                      Vfg 243 (VDE 0878 Part 3,30)
                                      EN55022 class B (CISPR Pub.22 class B)

Others

Toner: No effect on human health (OSHA-TSCA, EINECS)
OPC: No effect on human health (OSHA)
Ozone: UL478 (5th edition)
Materials: SWISS Environmental Law (No CdS must be contained)

1.2.7 Specification for Consumable (Imaging Cartridge)

Life: 6,500 pages

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

Environmental Conditions for Storage and Transportation

Temperature: O to 35° C (32 to 95° F) over full storage term
                                                 –20 to 40° C (-4 to 104° F) under extreme conditions
                                                 (Extremes are allowable for up to 1/30 of full storage term)
                                                 Temperature variations must be 10° C (18° F)/hour or less.

Humidity: 20 to **80%** RH over full storage term
                                                 5 to **95%** RH under extreme conditions
                                                 (Extremes are allowable for up to 1/30 of full storage term)

Drop test: Height 76 cm (30.4 inches)
Vibration: Same as printer
Resistance to atmospheric pressure: More than 740 **hecto pascal**
Storage term: 24 months (following date of manufacture)

1.2.8 Physical Specifications

Dimensions (Width x Depth x Height):

Printer: 437 x 473 x 270 mm (17.2 x 18.6x 10.6 inches)
Weight: Approx. 17 Kg (37.5 lb.) (consumable, excluding all options)

1.2.9 Software Specifications

Built-in modes: HP LaserJet 4 emulation (PCL® 5e)
                         EPSON GL/2 mode (LJ4-GL/2 mode and GL-like mode)
                         FX @$70/1170, LX-100) emulation mode
                         ESC/P 2 (LQ-570/1070) mode

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 initialize	Ejects paper, switches to PCL, and then initialize
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-GL2 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 cornmands 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.) coremands. If the application software uses unsupported coremands for the GL-like mode, print cannot be assured.

Optional modes: EPSONScript Level 2 (PostScript Level 2 emulation) mode

Auxiliary software: Hex dump
                     Status sheet
                     Font sample

Built-in fonts: See Table 1-7

Table 1-7. Built-in Fonts

Resident Fonts		Applicable Mode		
		HP LJ4 GL/2	ESC/P 2	FX
Bitmap fonts				
Line Printer	16.66 cpi (Portrait)	*s*	*NS*	*NS*
Prestige	12 cpi (Portrait)	NS	s	s
Prestige	20 cpi (Portrait)	NS	s	s

S: Supported, NS: Not Supported

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

Resident Fonts		Applicable Mode		
		HP LJ4 GL/2	ESC/P 2	FX
Scalable fonts				
Dutch™ 801	Roman SWC	s	NS	NS
Dutch 801	Bold SWC	s	NS	NS
Dutch 801	Italic SWC	s	NS	NS
Dutch 801	Bold Italic SWC	s	NS	NS
Zapf Humanist 601	Demi SWC	s	NS	NS
Zapf Humanist 601	Bold SWC	s	NS	NS
Zapf Humanist 601	Demi Italic SWC	s	NS	NS
Zapf Humanist 601	Bold Italic SWC	s	NS	NS
Ribbon 131	SWC	s	NS	NS
Clarendon	Condensed SWC	s	NS	NS
Swiss™ 742	SWC	s	NS	NS
Swiss 742	Bold SWC	s	NS	NS
Swiss 742	Medium Italic SWC	s	NS	NS
Swiss 742	Bold Italic SWC	s	NS	NS
Swiss 742	Condensed SWC	s	NS	NS
Swiss 742	Bold Condensed SWC	s	NS	NS
Swiss 742	Condensed Italic SWC	s	NS	NS
Swiss 742	Bold Italic Condensed SWC	s	NS	NS
Incised 901	SWC	s	NS	NS
Incised 901	Black SWC	s	NS	NS
Incised 901	Italic SWC	s	NS	NS
Original Garamond	SWC	s	NS	NS
Original Garamond	Bold SWC	s	NS	NS
Original Garamond	Italic SWC	s	NS	NS
Original Garamond	Bold Italic SWC	s	NS	NS
Audrey Two	SWC	s	NS	NS
Flareserif 821	SWC	s	NS	NS
Flareserif 821	Extra Bold	s	NS	NS
Swiss 721	Roman SWM	s	s	NS
Swiss 721	Bold SWM	s	s	NS
Swiss 721	Oblique SWM	s	NS	NS
Swiss 721	Bold Oblique SWM	s	NS	NS
Dutch 801	Roman SWM	s	s	NS
Dutch 801	Bold SWM	s	s	NS
Dutch 801	Italic SWM	s	NS	NS
Dutch 801	Bold Italic SWM	s	NS	NS
Symbol Set	SWA	s	NS	NS
More WingBats	SWM	s	NS	NS
Courier	SWC	s	s	s
Courier	Bold SWC	s	s	s
Courier	Italic SWC	s	NS	NS
Courier	Bold italic SWC	s	NS	NS
Letter Gothic	Roman SWC	s	s	s
Letter Gothic	Bold SWC	s	s	s
Letter Gothic	Italic SWC	s	s	s

S: Supported, NS: Not Supported

Font Symbol Sets

HP LaserJet 4 Mode (bitmap fonts): 15 symbol sets

Roman-8	Norweg1
Roman Extension	Italian
ECM94-1	Swedis2
ANSI ASCII	UK
French2	German
Legal	Spanish
IBM®-US	IBM-DN
PcMultilingual	

HP LaserJet4 Mode (scalable fonts) : 34 symbol sets

Roman-8	Norweg1
Italian	ECM94-1
Swedis2	ANSI ASCII
UK	French2
German	Legal
8859-2 1S0	Spanish
PsMath	8859-9 ISO
WiTurkish	MsPublishing
VeMath	DeskTop
Math-8	WiE.Europe
PcTk437	windows
PsText	IBM-US
IBM-DN	McText
PcMultilingual	VeInternational
VeUS	PiFont
PcE.Europe	symbol
WiAnsi	Wingdings

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

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

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

1.3 INTERFACE SPECIFICATIONS

The EPL-9000 is equipped with the following external interfaces:

- Parallel interface
- RS-232C/RS-422 interface
- Optional LocalTalk interface
- Optional Type B interface

1.3.1 Parallel Interface

The parallel interface has two modes as follows:

- Compatibility mode (same as parallel interface of EPSON's current page printer)
- Reverse mode

1.3.1.1 Compatibility Mode of Parallel Interface

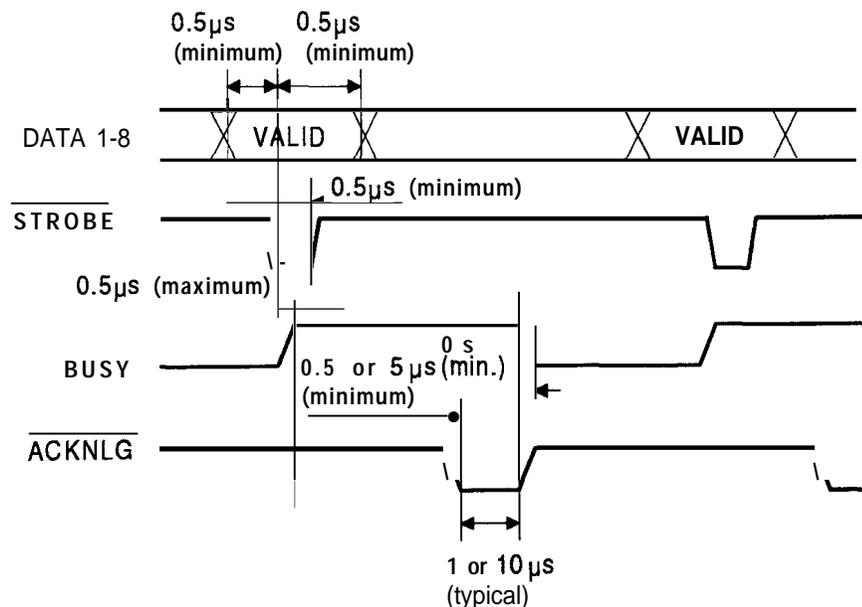|	
System:	$\overline{STROBE}$ synchronization, 8-bit parallel data transfer
Handshaking:	BUSY and $\overline{ACKNLG}$ signals
Connector type:	P90-25027-1 (Amphenol) receptacle
Applicable plug:	57-30360 (Amphenol or equivalent)
Transfer speed:	Approximately 400,000 bytes/second (max.)
Signal timing:	See Figure 1-3.
Signal description:	See Table 1-8.

Figure 1-3. Compatibility Mode Signal Timing

Table 1-8. Parallel Interface Pin Assignments

Pin No.	Signal Name	I/O	Description
1	STROBE	IN	STROBE is a strobe pulse used to read data from the host computer. The pulse width must be more than 0.5&c. Normally it is HIGH, and data is latched at the trailing edge of this signal.
2-9	DATA 1-8	IN	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 O. The most significant bit (MSB) is DATA8. The signal state must be maintained for 0.5 µsec. on either side of the STROBE signal active edge.
10	ACKNLG	OUT	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	OUT	**The BUSY** signal informs the host computer of the printer state. When the signal is HIGH. the minter cannot accept data
12	PE	OUT	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	OUT	Use in reverse mode.
14	AUTO-FEED	IN	Not used.
15	NC		Not used.
16	GND	-	Logic around 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	INIT	IN	The STROBE signal is ignored when this signal is LOW.
32	ERROR	OUT	This level goes LOW when the printer is: • out of paper • in paper jam state • in error state • off line
33	GND		Same as for tins19 to 30.
34	NC	-	Not used.
35	+5	-	Pulled up to +5V through 1.0 Kohm resistance.
36	SLCT IN	-	Use the reverse mode.

1.3.1.2 Reverse Mode

The reverse mode for EPL-9000 supports the nibble mode of IEEE-P1284. This printer can run in reverse mode, in which the printer can inform the computer of its status by EJL and PJL commands.

System: IEEE-P1284 nibble mode

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 Assignments

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	INIT	IN	nInit: High level fixed
32	$\overline{\text{ERROR}}$	OUT	nDataAvail: Printer sending data bits O and 4 during data transfer to host computer.
33	GND	.	Same as for pins19 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).

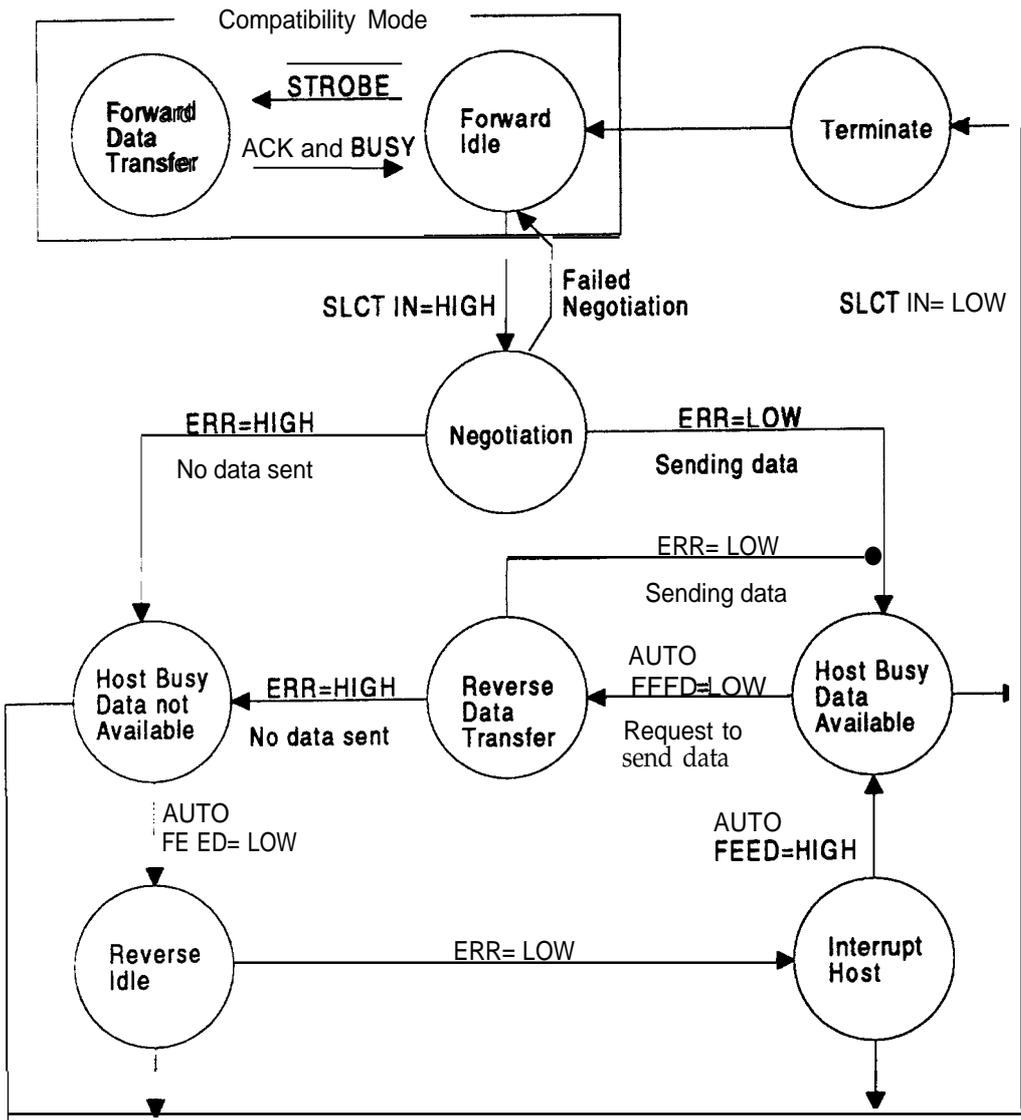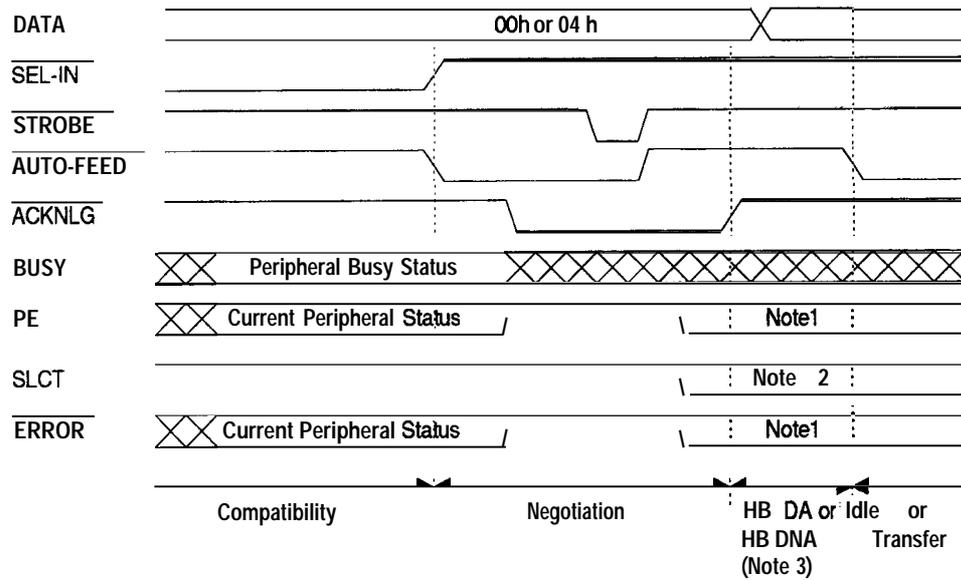Figure 1-4 shows the parallel interface state switch diagram.

Figure 1-4. Parallel Interface State Switch Diagram

Figure 1-5 shows the negotiation timing chart.

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.

Note3: HB DA: Host Busy Data Available
       HB DNA: Host Busy Data Not Available

Figure 1-6 shows the data transfer timing chart.

Figure 1-6. Data Transfer Timing Chart

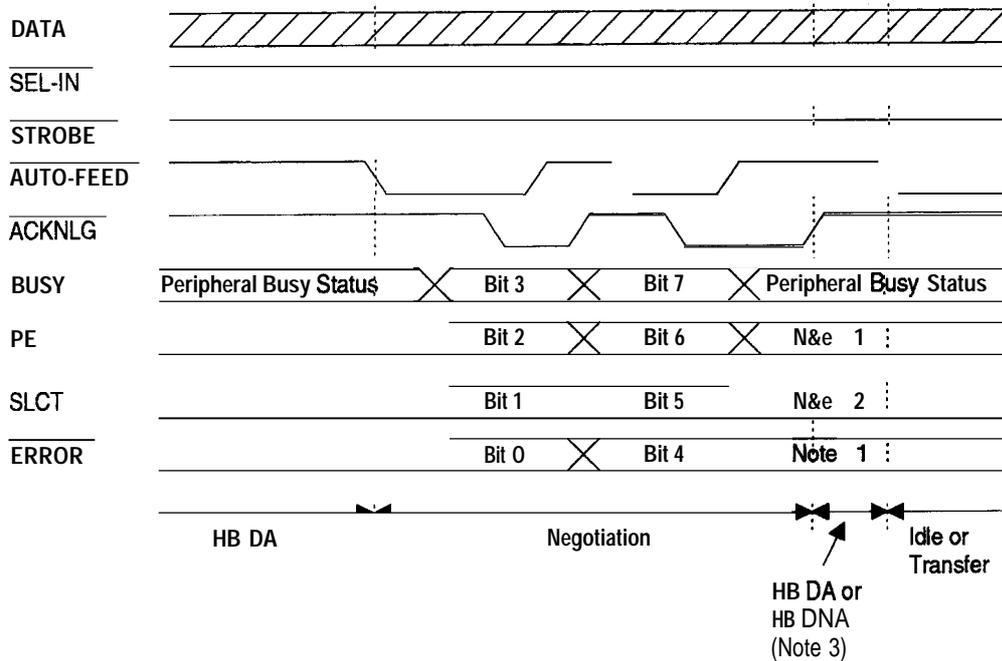Note 1: The signal is set to HIGH when not sending data.
       The signal is set to LOW when sending data.

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

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

Figure 1-7 shows the terrnination **timing** chart.
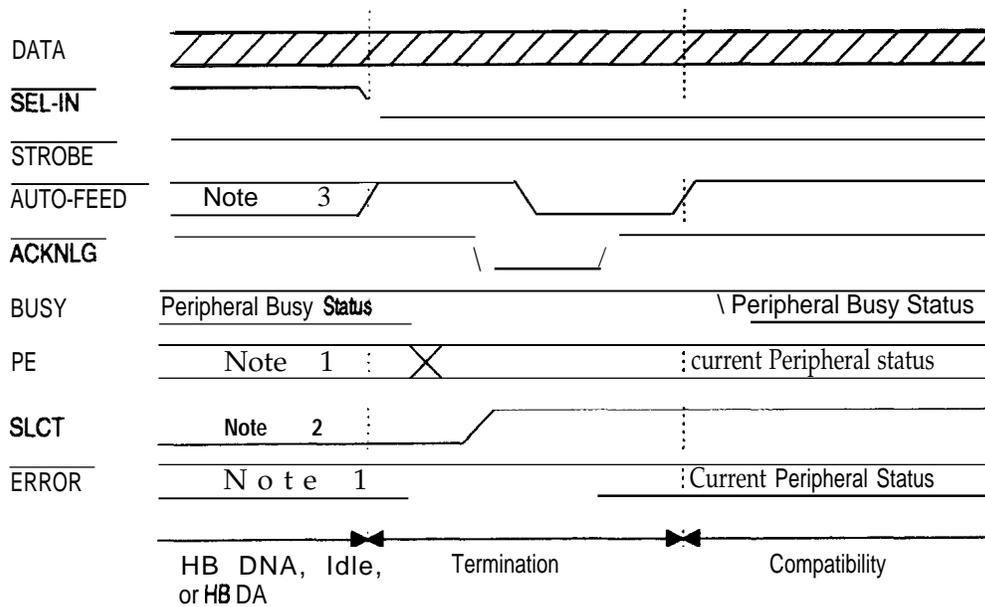
Figure 1-7. Termination Timing chart

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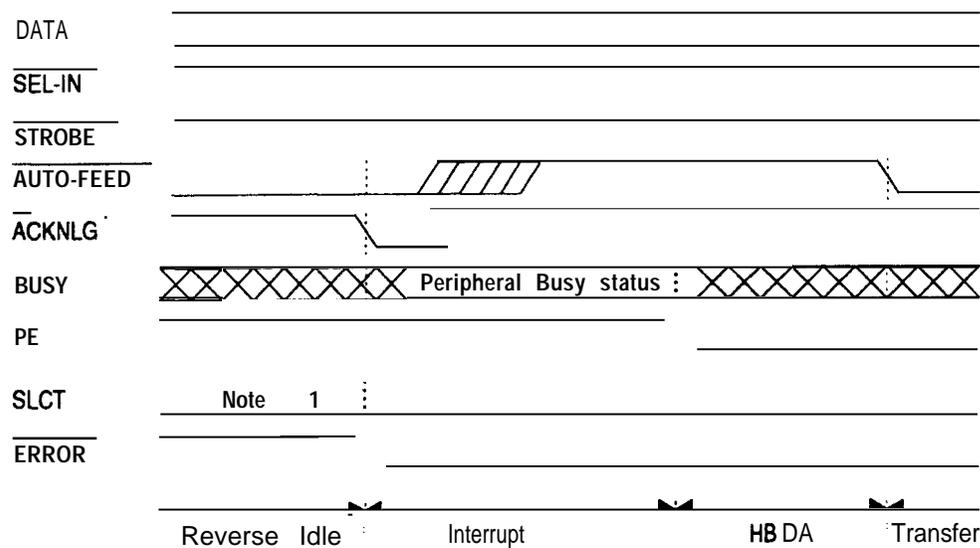   The signal is LOW when **HB** DA.

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

Note3: Idle= LOW

Figure 1-8 shows the interrupt **timing chart.**

Figure 1-8. Interrupt Timing Chart

Note 1: **The** signal is set to HIGH, if extension request value was **04h.**

1.3.2 Serial Interface

Type: RS-232C/RS-422

Transfer system: Full duplex

Synchronization: Asynchronous start-stop system

Start-bit:	1 bit
Stop-bit:	1 or 2 bits
Data length:	7 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

Error:

Overrun error:	Processed as missing data and replaced by "*"
Parity error:	Replaced by "*"
Framing error:	Replaced by "*"
Breaking Character:	Ignored

Signal description: See Table 1-10.

Table 1-10. Serial Interface Pin Assignments

Pin No.	Signal Name	I/O	Description
1	CHASSIS-GND	-	Connected to the printer chassis. The printer chassis GND and the signal GND are connected to each other.
2	TXD	OUT	Serial ASCII data output by the printer. It maintains "MARK' state (LOW level) between transmitted character codes. Logic O is at HIGH level ("SPACE") and logic 1 is at LOW level ("MARK").
3	RXD (RXD+)	IN	Serial ASCII data input to the printer. It maintains "MARK" state (LOW level) between received character codes.
4	RTS	OUT	Transmission request signal output from the printer. It is always at HIGH level during power ON.
5	CTS	IN	Always ignored.
6	DSR	IN	Signal input to the printer. The printer can transmit data through TXD while DSR is at HIGH level. X-ON/X-OFF, however, can be transmitted regardless of DSR state. It can always be ignored by setting SelecType (factory setting).
7	SIGNAL-GND	-	Ground.
8	DCD	IN	Always ignored.
9	(SD+)	OUT	See Note 4.
10	(SD-)	OUT	See Note 4.
11 to 17	NC		Not connected.
18	(RD-)	IN	See Note 4.
19	NC		Not connected.
20	DTR	OUT	Signal output by printer. When the DTR signals HIGH, the RXD signal can be received by the printer. The SelecType settings do not specify DTR control, the signal level is HIGH while the printer power is on. When SelecType setting is used for DTR control, DTR goes LOW in case of any error conditions. The data (RXD) from host computer must be stopped within 128 characters after DTR goes LOW.
21-25	NC		Not connected.

Note 1: ( ) indicates an RS-422 signal, which is **SelecType.**

Note 2: 'US", **"DSR",** and **"DTR"** states can be selected through **SelecType.**

Note3: Although the signals RTS, CTS, DSR, DTR, and DCD are RS-232C level, they can be used for RS-422 mode if selected through **SelecType.**

Note4: SD+, SD-:
   Serial ASCII data output from the printer.
   HIGH level; when SD+ voltage is higher than SD-voltage.
   LOW level; when SD+ voltage is less than SD-voltage.
   Logic O is "SPACE" and logic 1 is "MARK" state must be maintained between transmitted character codes.

   RD+, RD-:
   Serial ASCII data input from the computer.
   HIGH level; when RD+ voltage is higher than RD- voltage.
   LOW level; when RD+ voltage is less than RD- voltage.
   Logic O is "SPACE" and logic 1 is "MARK" state must be maintained between transmitted character codes.

Handshaking

When the vacant area for data in the input buffer drops to 256 bytes, the printer outputs an X-OFF cede or sets the DTR signal level to LOW, indicating that the printer cannot receive more data. Once the vacant area for data in the buffer recovers to 512 bytes, the printer outputs an X-ON code or sets the DTR flag to HIGH, indicating that the printer is again ready to receive data.

Protocol

There are two types of protocols, as listed below, and each of them can be designated by **SelecType** independently.

■ DTR/DSR protocol

SelecType is used to execute the DTR/DSR control protocol. The DTR signal is set to HIGH when the printer is ready to receive data, and to LOW when conditions indicate an error or that the receiving buffer is full.

When the error is cleared and the printer returns to on-line mode, the signal returns to HIGH. When **SelecType** is used to set the DTR control **OFF,** DTR is always set HIGH. The printer transmits TXD only when DSR is at the HIGH level (DSR is always considered HIGH when the **SelecType** setting for DSR is OFF). X-ON/X-OFF transmission is independent of the DSR state.

■ X-ON/X-OFF (DC1/DC3) protocol

SelecType is used to execute the X-ON/X-OFF protocol. The X-OFF (DC3) code is output if status indicates an error, and the printer warns the host to stop data transmission within 128 characters. No further X-OFF codes are sent in response to additional data received from the host after the X-OFF code has been sent once. The X-ON (DCl) code is output after **all** renditions given in the error are cleared.

When the remaining capacity of the receive buffer reaches 256 characters, X-OFF (DC3) is output once. It is sent only once, even if there are multiple errors. The printer goes on line automatically at power on, and outputs an X-ON code. Transmission of X-ON/X-OFF codes can be defined by **SelecType.**

1.3.3 Optional LocalTalk Interface

This printer can use the optional LocalTalk interface module.

Type:	LocalTalk
Signal level:	Same as RS-422 signal level
Protocol:	X-ON/X-OFF (cannot be combined with DTR control) DTR control (cannot be combined with X-ON/X-OFF)
Transfer speed:	230.4 K bps
Signal description:	See Table 1-11.

Table 1-11. LocalTalk Interface Pin Assignments

Pin No.	Signal Name	I/O	Description
1	DTR	OUT	Signal output by the printer. When the DTR signals HIGH, the RXD signal can be received by the printer.
2	CTS	IN	The printer transmits the data through TXD while CTS is HIGH
3	TXD-	OUT	Serial ASCII data output from the printer. HIGH level; when SD+ voltage is higher than SD- voltage. LOW level; when SD+ voltage is less than SD- voltage. Logic O is "SPACE" and logic 1 is "MARK" state must be maintained between transmitted character codes.
4	GND		Ground.
5	RXD-	IN	Serial ASCII data input from computer. HIGH level; when RD+ voltage is higher than RD- voltage. LOW level; when RD+ voltage is less than RD- voltage. Logic O is "SPACE" and logic 1 is "MARK" state must be maintained between transmitted character codes.
6	TXD+	OUT	Refer to TXD-.
7	NC		Not connected.
8	RXD+	IN	Refer to RXD-.