SERVICE MANUAL

Color Large Format Inkjet Printer

EPSON Stylus PRO 7000

COLOR IMAGING EPSON

EPSON®

SEIJ99017

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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 THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
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 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.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES 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 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.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON EPSON Stylus PRO 7000. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING

Provides the step-by-step procedures for the troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE

Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

CHAPTER 7. APPENDIX

Provides the following additional information for reference:

- Connector pin assignments
- Parts list
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Indicates a reassembly procedure, practice, or condition that, if not strictly adhered to, could result in damage to, or nonoperability of, the equipment.

Revision Status

Revision	Issued Date	Description
Rev. A	February 17, 2000	First Release
Rev. B	April 12, 2000	Improved interface description (pg 31), nozzle check description (pg 43), paper thickness detection (pg 46), cutter replacement (pg 47), maintenance mode 2 description (pg 50), transportation mode (pg54) Fixed illustrations on pages 60, 61, 63, 71 Fixed paper sensor volume adjustment Added parts list and lubrication points Added troubleshooting information regarding proper gap between cap and printhead Added troubleshooting information regarding the cutter housing and encoder sensor

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The EPSON Stylus Pro 7000 is an 24-inch wide, 6-color ink jet printer with professional color output. It has the same printheads as the EPSON Stylus Pro 9000. The EPSON Stylus Pro 7000 provides the following major features and more.

- ☐ Large Format
  A1, full size
  24 inch-full size printing (A1+size supported)
- ☐ Excellent Photo-quality printing
  1440 (H) x 720 (V) dpi combined with EPSON's Microdot printing
  Same quality as the EPSON Stylus Pro 9000.
- ☐ High-speed throughput

Table 1-1. Throughput Speed

EPSON media	Slide Bar	Resolution	Dot	Mode	Speed
Plain Paper	Speed	360x360dpi	Normal 2 Dot	Bi-D 200cps	6 min.
	Quality	360x360dpi	Normal Dot x 2	Bi-D FOL 300cps	8 min.
Presentation Matte Paper	Speed	720x360dpi	Normal Dot	Bi-D FOL 300cps	8 min.
	Quality	720x360dpi	Normal Dot	Uni-D FOL 300cps	14 min.
Glossy Photo Semigloss Photo	Speed	720x360dpi	Normal Dot	Bi-D FOL 300cps	8 min.
	Quality	720x720dpi	Normal Dot	Bi-D FOL 300cps	15 min.
	Adv. Photo	1440x720dpi	Micro Dot	Bi-D 4P 300cps	30 min.
Photo Quality Glossy Film	Quality	720x720dpi	Micro Dot	Bi-D FOL 300cps	(Max. A3+)
	Adv. Photo	1440x720dpi	Micro Dot	Bi-D 4P 300cps	
Photo Quality Ink Jet	Quality	720x720dpi	Normal Dot	Uni-D FOL 300cps	(Max. A2)
	Adv. Photo	1440x720dpi	Micro Dot	Uni-D 4P 300cps	

- ☐ Low running cost
  - ■ Six separate ink cartridges so you only have to replace the empty ink cartridge (each cartridge holds 110ml of ink)
  - ■ Auto Rotate feature saves paper by automatically rotating an image if the width is shorter than the height
  - ■ Paper Save feature searches for the front edge of the roll paper before printing to make sure no paper at the leading edge is wasted
- ☐ Complete Software Compatibility With EPSON Stylus Pro 9000
- ☐ Latest RIP Technology
  CPSI Pro (software)
  PS Server
- ☐ Large format, yet provided as a desktop printer (optional stand available)
- ☐ Paper Handling:
  - ■ Standard roll paper feeder
  - ■ Straight paper path
  - ■ Automatic paper cutter

1.1.1 Consumable Products & Options

Table 1-2. Consumables & Options

Name	Code	Product
Ink cartridges	T460✶✶✶ T463✶✶✶ T462✶✶✶ T461✶✶✶ T465✶✶✶ T464✶✶✶	Black Ink Cyan Ink Magenta Ink Yellow Ink Light Cyan Ink Light Magenta Ink
Stand	C844022	Optional stand
Paper cutter blade	C815131	Consumable item
Roll Feed Spindle 2″	C811092	For two-inch diameter roll paper
Roll Feed Spindle 3″	C811102	For three-inch diameter roll paper
Glossy Photo Paper	S041225	610mm (24 in.) wide/20.7m long
Semigloss Photo Roll Paper	S041223	24 in wide/25m long
Presentation Matte Roll Paper	S041220	24 in wide/25m long
Photo Quality Ink Jet Paper	S041079 S041068/S041045 S041069/S041043 S041070/S041044	A2 A3 A3 Wide/B B
Photo Paper	S041142 S041143 S041156	A3 A3 Wide/B B
Photo Quality Glossy Film	S041073 S041074 S041075	A3 A3 Wide/B B
Rip Station 5100 PS Server Series II	EAI - C850092 Other - C850093	Fiery Adobe® PostScript® 3™ Server
Software RIP (CPSI Pro)		Software RIP (CPSI Pro)

Table 1-2. Consumables & Options (continued)

Name	Code	Product
Multi-protocol Ethernet interface card	C82362✶	Type-B 10Base-T
100Mbps Multi-protocol Ethernet interface card	C82363✶	Type-B 100Base-T
IEEE 1394 interface card	C82372✶	IEEE 1394 interface card

Note:
* Signifies a number that varies by market.

STANDARD ACCESSORIES

The following are standard accessories with the SP 7000:

Power cord x1

Roll paper spindle (2″) x1

Ink cartridges x6, one for each color

Printer driver utility set x1

Roll paper sample x1 (24″ semi-gloss Photo roll paper 5m)

Roll paper fixing belt x1

Paper cutter x1

User's manual set x1

1.1.2 Print Specifications

PRINTING SPECIFICATIONS

- Drop-On-Demand MACH (Multi-layer Actuator Head) inkjet - E-MACH type
- Nozzle configuration
  - 64 nozzles per color (same printhead as the EPSON Stylus Pro 9000)
- Print direction = Bi-direction (high-speed return, high-speed skip only)
- Print Speed and Printable Area
  - Character mode

    Character pitch 10cpi (Pica)

    Printable area 237 characters

    Printing speed 200 cps (one print-pass in which 1/2 of character matrix is printed at 360dpi: 2pass)
  - Graphic mode

Table 1-3. Print Area and Speed

Horizontal resolution (dpi)	Printable area	Max. printable dots	Speed
360	604mm 23.78 inches	8561	20 IPS
720	604mm 23.78 inches	17,123	30 IPS/FOL 30 IPS/4pass
1440	604mm 23.78 inches	34,246	20 IPS/FOL 30 IPS/4pass

CHARACTER SPECIFICATIONS

- Control codes
  ESC/P Raster
  EPSON Remote command
- Character tables (2 international sets)
  PC 437 (US, Standard Europe)
  PC 850 (Multilingual)
- Typeface
  Bitmap LQ font: EPSON Courier 10 CPI

PAPER FEEDING

Paper feeding method: Friction feed

Line spacing: 1/6″ or programmable at 1/720″

Paper path: Roll paper/manual

Feed speed: 1/6″ 200±10m seconds
Continuous 2.5″ (63.5mm)/second

1.1.3 Paper Specifications

ROLL PAPER SPECIFICATIONS

CAUTION

Paper must have no wrinkles, tears, or folds plus the surface should be smooth.

☐ Minimum-Quality Roll Paper

Paper meeting the requirements described below can be used with this printer, but neither the feeding nor printout quality is guaranteed.

•Size = Width 210~610mm (8.4~24.0″)
Length 279mm~90m (within roll size) (11.1″~298.8′)

•Roll Size = 2″ or 3″ core (with optional 3″ spindle) 150mm ext. diameter max.

•Thickness = 0.08~0.5mm (0.003~0.019″)

☐ Normal-Quality Roll Paper

For paper meeting the following requirements, the feeding operation only is guaranteed.

•Size = Width 210~610mm (8.4~24.0″)
Length 279mm~90m (within roll size) (11.1″~30′)

•Roll Size = 2″ or 3″ core (with optional 3″ spindle) 150mm ext. diameter max.

•Thickness = 0.08~0.11mm (0.003~0.0043″)

•Weight = 64~90gf/m^2 (17~24 lb.s)

•Quality = Normal paper, recycled paper

*1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
*2: The printer exerts between 300~500gf to peel off the rear edge of roll paper from the core
*3: At the point where the rear edge comes free from the core (approx. last 30 cm.), print quality is no longer guaranteed.
*4: If a 3″ core is used, the EPSON-exclusive optional 3″ roll paper spindle is required

☐ EPSON Special Roll Paper

The following special papers meet or exceed EPSON requirements, and paper feeding plus printout quality are assured.

Table 1-4. EPSON Special Paper

Type (US)	Type (outside US)	Paper Size (W x H)	Roll Size
Presentation Matte Paper	Presentation Matte Paper	610mm x 25m (24″ x 83′)	2″ core, maximum 103mm external diameter
Glossy Paper-Heavy Weight	Glossy Photo Paper	610mm x 20.7m (24″ x 68.7′)	
		210mm (same as A4) x 10m (8.4″ x 33.2′)	
		329mm (same as A3+) x 10m (13.1″ x 33.2′)	
Semi Glossy Paper-Heavy Weight	Semigloss Photo Paper	610mm x 25m (24″ x 83′)	
Photo quality glossy Film (TBD)	Photo quality glossy Film (TBD)	610mm x TBD (24″ x TBD)	

*1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
*2: At the point where the rear edge comes free from the core (approx. last 30 cm.), print quality is no longer guaranteed.

CUT SHEET SPECIFICATIONS

CAUTION

Paper must have no wrinkles, tears, or folds plus the surface should be smooth

- **Paper must be fed short-edge first (portrait)**
- **Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)**

☐ Minimum-quality paper

Paper meeting the requirements described below can be used with this printer, but neither the feeding nor printout quality is guaranteed.

Size = see the following table

Table 1-5. Supported Cut-Sheet Paper

Size	Dimensions (W x H)
B2	515 x 728mm
A1+	24 x 36″
A1	594 x 841mm
A2	420 x 594mm
A3+	329 x 483mm
A3	297 x 420mm
A4	210 x 297mm
ANSI D	22 x 34″
ANSI C	17 x 22″
ANSI B	11 x 17″
Letter	8.5 x 11″

Thickness = 0.08~1.5mm (for 297~728mm/ 11.8~29.0″ length paper (0.003~0.06″)
0.08~0.5mm (for 728~915mm/ 29.0~36.4″ length paper) (0.003~0.02″)

☐ Plain paper

For paper meeting the following requirements, only the feeding operation is guaranteed.

•Size = see Table 1-5 above (plus the following requirements)

•Thickness = 0.08~0.11mm (0.003~0.0044″)

•Weight = 64~90gf/m^2 (17~24 lb.s)

•Quality: Normal, recycled paper

*1: Load short edge first (portrait)

*2: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)

☐ EPSON Special Paper

The following special papers meet or exceed EPSON requirements, and paper feeding plus printout quality are assured.

•Size = see the following table

Table 1-6. Cut-Sheet Availability

Size	Dimensions (W x H)	SuperFine *1	PhotoPrint	Photo Quality Glossy Film	Art Board
A4	210 x 297mm	Yes	Yes	Yes	-
A3	297 x 420mm	Yes	Yes	Yes	-
A3+	329 x 483mm	Yes	Yes	Yes	-
A2	420 x 594mm	Yes	-	-	-
Letter	216 x 279mm	Yes	Yes	Yes	-
B	279 x 432mm	Yes	Yes	Yes	-
C	431 x 558mm	Yes	-	-	-
B2	515 x 728mm	-	-	-	Yes

Table note:
*1: Print quality optimized with uni-direction printing

1.1.4 Printable Area

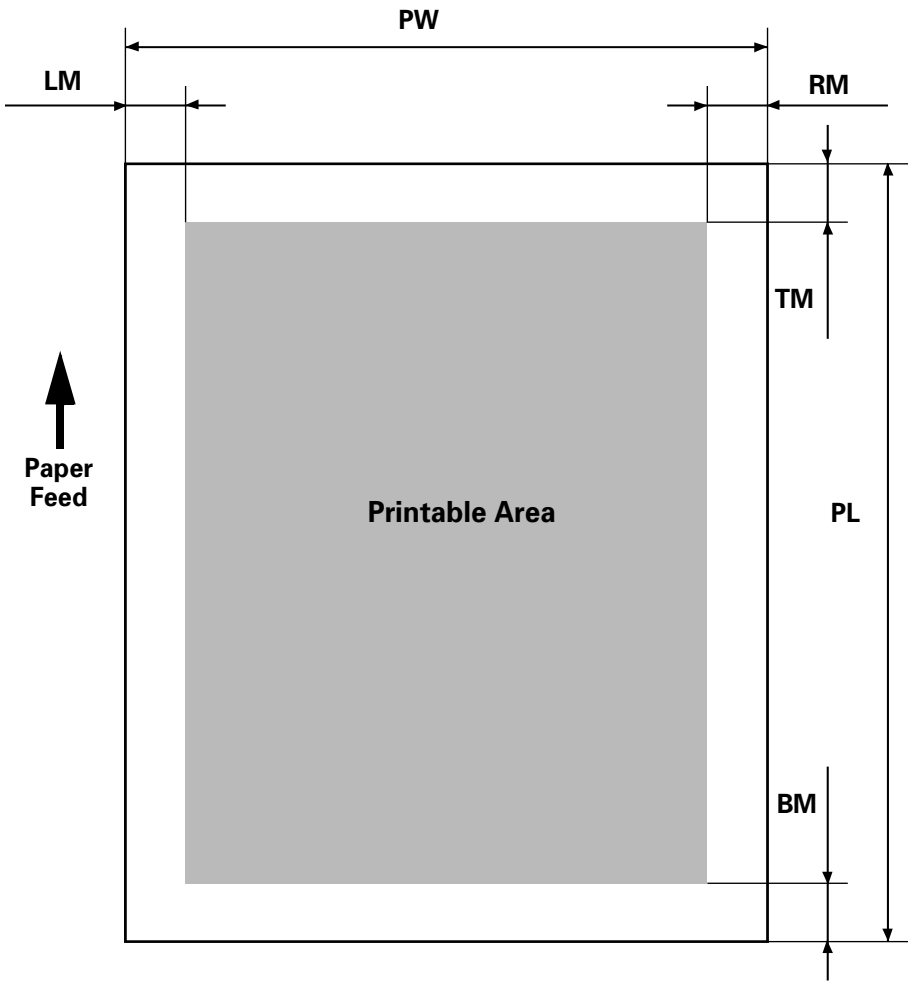

Figure 1-1. Printable Area

Table 1-7. Printable Area

Heading	Roll Paper	Cut Sheets
PW (width)	210 ~ 610mm (8.27 ~ 24")	210 ~ 610mm (8.27 ~ 24")
PL (length)	Max. 90m (298.8')	297~915mm (11.8~36.4")
LM (left margin)	3mm/15mm* (0.12~0.59")	3mm
TM (top)	3mm/15mm*	3mm
RM (right)	3mm/15mm*	3mm
BM (bottom)	3mm/15mm*	14mm

Note: *The size of the margin is determined by the control panel setting.

There are three margin settings via the control panel;

- **3mm = All margins are set to 3mm**
- **15mm = All margins are set to 15mm**
- **T/B 15mm TM and BM are 15mm, while LM and RM are 3mm**

Table 1-8. Optimal Margin Settings

To optimize for	Select this setting
largest printable area and decrease chance of paper rubbing printheads	Top/Bottom 15mm
exact paper size and decrease chance of paper rubbing printheads	15mm
largest printable area and exact paper size	3mm

When the Paper Set Lever is:

- Back
  The feed path is open and you can load, remove or change the position of paper in the feed path.
- Forward
  The feed path is closed and loaded paper is locked in place. You can print on the loaded paper.
  (It is not possible to change the lever position during printing.)

1.1.5 Ink Cartridges

Shape: Each ink cartridge is uniquely shaped so the cartridges do not fit in the wrong slots.

Ink colors: Black, Cyan, Magenta, Yellow, Light Cyan, Light Magenta

Ink life: Two years from production date

Ink volume: 110ml

Weight: 200g

Effective ink: 83.0g

Print capacity: A1 = approx. 28 pages at 720dpi and 40% coverage
A1 = approx. 11 pages at 720dpi and 100% coverage
D = approx. 26 pages at 720dpi and 40% coverage
A4 = approx. 3,800 pages at 360dpi and 5% coverage

Dimensions: 25.1 x 141.1 x 105.3mm (WxDxH)

Weight: Approx. 200g

Storage temperature: See the table below

Table 1-9. Ink Cartridge Specifications

Situation	Temperature	Notes
Transporting	-30~50°C (-22~122°F)	• Less than a month at 40°C (104°F) • Less than 120 hours at 50°C (122°F)
Storage	-20~40°C (-7.6~104°F)	Less than a month at 40°C (104°F)
Installed	-30~40°C (-22~104°F)	Less than a month at 40°C (104°F)

- **Do not refill or reuse cartridges; they are consumable items.**
- **Do not use ink that beyond its expiration date. See above.**
- **To use ink that has been frozen below -15 °C (5 °F), let it thaw at least 3 hours at room temperature.**

1.1.6 Electrical Specifications

Table 1-10. Electrical Specifications

	120V Model	220-240V Model
Rated voltage range	AC120V	AC220~240V
Input voltage range	AC90~132V	AC198~264V
Rated frequency range	50~60Hz	
Input frequency range	49.5~60.5Hz	
Rated current	1.0A (Max. 1.6A)	0.5A (Max.0.8A)
Power consumption	standby mode = 15W or less Energy Star Compliant	
Insulation resistance	10MΩ minimum (between AC line and chassis, DC 500 V)	
Dielectric strength	AC 1,000V rms per minute or AC 1,200V rms per second (between AC line and chassis)	AC 1,500V rms per minute (between AC line and chassis)

1.1.7 Reliability

Total print volume: 20,000 pages at A1 size

Printheads: 2,000,000,000 dots/nozzle

Cutter: Approximately 2,000 sheets (A1)

Maintenance parts: Approximately 12,000 sheets
Ink pad, Pump unit, Flushing box, Cap assembly, and Head Cleaner are all included in the SP-7000 Maintenance Kit (P/N 1054038)

1.1.8 Environmental Conditions

TEMPERATURE/HUMIDITY

See the following table.

Table 1-11. Environmental Conditions

Condition	Temperature	Humidity	Notes
Operating	10~35°C (50~95°F)	20~80%	• Less than a month at 40°C (104°F) • Less than 120 hours at 60°C (140°F) • With no freezing
Storage	-20~40°C (-4~104°F)	20~85%	
Transportation	-20~60°C (-4~140°F)	5-85%	

Notes:

1) When storing the printer, make sure the printheads are in the home (capped) position. If necessary switch power on, wait for the printheads to move to the home position, and then switch power off.

2) Before transporting the printer, remove the ink cartridges and turn the ink valves screws to the closed position. Also make sure the printheads are in the home, capped, position. After transporting the printer, install new ink cartridges.

3) If the temperature drops below -15°C (5°F), the ink in the cartridges and printheads freezes. The ink thaws completely after three hours at 25°C (77°F).

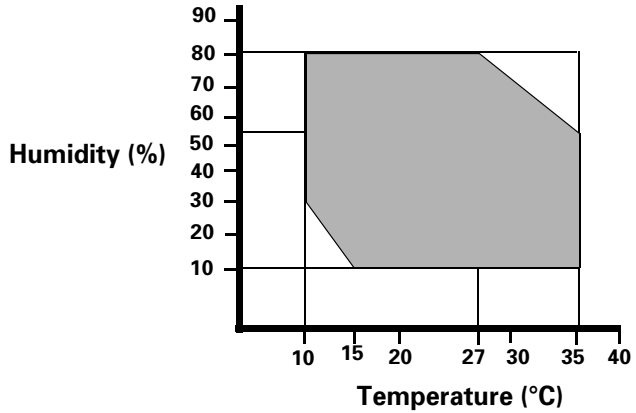

Figure 1-2. Print Temperature and Humidity

VIBRATION & SHOCK

See the following table.

Table 1-12. Vibration and Shock

Condition	Vibration Resistance	Shock Resistance	Notes
Operating	0.15G 10~55Hz	1G maximum 1ms	X/Y/Z directions
Storage	0.5G 10~55Hz	2G maximum 2ms	

Notes:

* Make sure the printhead is capped during transportation and storage. To cap the printhead, turn the power on (with ink cartridges installed) and turn the power off when the printheads are capped.
* To thaw frozen ink in the printer or cartridge, leave the printer out at a temperature of 25°C (77°F) for approximately three hours.

1.1.9 Controller

CPU:	Hitachi SH7043, 33Mhz
RAM:	8MB + 2MB (fixed)
Interfaces:	IEEE1284 USB Type B (one expansion port)

1.1.10 Conformity/Safety Approvals

120V Model

Safety Standards:

UL1950
CSA 22.2 No. 950

EMI:

FCC part 15 subpart B class B
CSA C108.8 class B

220~240V Model

Safety Standards:

EN 60950

EMI:

EN55022 (CISPR Pub. 22) class B
AS/NZS 3548 class B

1.1.11 Acoustic Noise

Approx. 50dB(A) (According to ISO 7779)

1.1.12 CE Marking

220~240V Model

Low Voltage Directive 73/23/EEC:	EN60950
EMC Directive 89/336/EEC	EN55022 Class B EN61000-3-2 EN61000-3-3 EN50082-1 IEC801-2 IEC801-3 IEC801-4

1.2 Interfaces

The EPSON Stylus Pro 7000 is equipped with parallel and USB interfaces as well as an expansion slot for an optional Type-B interface. This section provides information on each of these interfaces.

1.2.1 Parallel Interface - Compatibility Mode

Table 1-13. Parallel Interface Specifications

Item	Description
Transmission mode	8-bit parallel, IEEE-1284 compatibility mode
Synchronization	By STROBE pulse
Handshaking	By BUSY and $\overline{\text{ACKNLG}}$ signal
Logic Level	TTL compatible level (IEEE-1284 Level 1 device)
Connector	57-30360 (Amphenol) or equivalent
Note: Use a twisted-pair cable that is as short as possible.	

The BUSY signal is set high before setting the -ERROR signal low or the PE signal high. The BUSY signal remains high until all these signals return to their normal, inactive state.

The BUSY signal is high:

- When receiving data
- When the input data buffer is full
- When the -INIT signal is low, or during hardware initialization
- During a printer error
- When the parallel interface is not selected

The ERROR signal is low when there is a:

- Printer hardware error (fatal error)
- Paper-out error
- Paper-jam error
- Ink-out error

NOTE: *The PE signal is high during paper-out errors.*

DATA TRANSMISSION TIMING

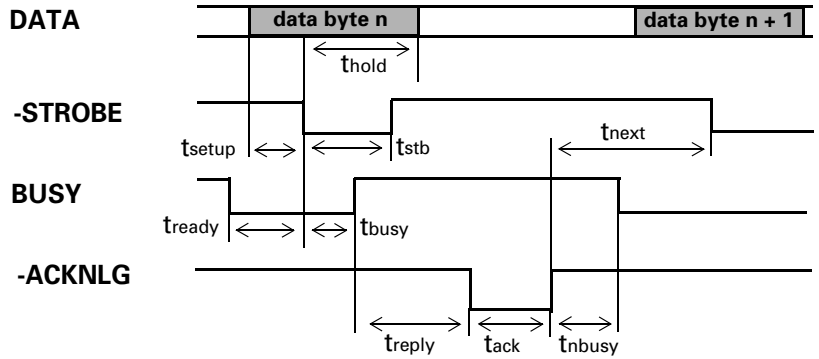

Figure 1-3. Data Transmission Timing

Table 1-14. Data transmission times

Parameter	Minimum	Maximum
tsetup	500 ns	-
thold	500 ns	-
tstb	500 ns	-
tready	0	-
tbusy	-	500 ns
tt-out*	-	120 ns
tt-in**	-	200 ns
treply	0	-
tack	Typical 2 us	
tnbusy	0	-
tnext	0	-

* Rise and fall time of every output signal

** Rise and fall time of every input signal

Table 1-15. Typical tack time

Parallel I/F mode	Time required
High speed (default)	0.5us
Normal speed	2us

Table 1-16. Connector Pin Assignments and signals - Forward Channel

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	-STROBE	19	I	Data reception pulse. Data is read at the falling edge of this pules.
2-9	DATA0~7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	-ACKNLG	28	O	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	O	HIGH means the printer cannot receive data. This occurs when the printer is receiving data or when the printer is in an error state.
12	PE	28	O	HIGH means no paper is loaded.
13	SLCT	28	O	Always HIGH when the printer is on.
14	-AFXT	30	I	Not used
15	NC	-	-	Not connected
16	GND			Ground for twisted pair return
17	Chassis GND			Ground for frame/body
18	Logic H			Pulled up to +5V via 3.9Kohm
19-30	GND			Ground for twisted pair return
31	-INIT	30	I	Pulse width of 50uS or more means LOW pulse, and the falling edge of LOW signal causes the printer to initialize.
32	-ERROR	29	O	LOW means printer error
33	GND	----	----	Ground for twisted pair return

Table 1-16. Connector Pin Assignments and signals - Forward Channel (continued)

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
34	NC	----	----	Not connected
35	+5V	----	O	HIGH during normal operation. Pulled up to +5V via 1.0Kohm
36	-SLIN	30	I	Not used

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.2 Parallel Interface - Nibble Mode

Table 1-17. Transmission Specifications

	Description
Transmission mode	IEEE-1284 nibble mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	TTL compatible (IEEE-1284 level 1 device)
Adaptable connector	57-30360 (Amphenol) or equivalent
Data trans. timing	Refer to IEEE-1284 specification
Extensibility request	The printer responds affirmatively when the extensibility request values are 00H or 04H: 00H: Request Nibble Mode Reverse Channel Transfer 04H: Request Device ID; Return Data Using Nibble Mode Reverse Channel Transfer
Device ID	The printer returns the following strings when the device ID is requested: <00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]7000 CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro{SP]7000 ***Note:*** [00H] denotes a hexadecimal value of zero MDL values depend on the EEPROM setting

Table 1-18. Connector Pin Assignments - Reverse Channel

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	HostClk	19	I	Host clock signal.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	PtrClk	28	O	Printer clock signal
11	PtrBusy/ DataBit-3,7	29	O	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckDataReq/ DataBit-2,6	28	O	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag/ DataBit-1,5	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	I	Host busy signal.
15	NC			Not connected
16	GND			Signal ground
17	Chassis GND			Chassis ground
18	Logic-H		O	Pulled up to +5V via 3.9K ohm resister.
19-30	GND			Ground for twisted pair return
31	-INIT	30	I	Not used.
32	-DataAvail/ DataBit-0,4	29	O	Data available signal and reverse channel transfer data bit 0 or 4.
33	GND			Signal ground
34	NC			Not connected
35	+5V	----	O	Pulled up to +5V via 1.0K ohm resister.
36	1284-Active	30	I	1284 Active Signal

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.3 Parallel interface - ECP mode

Table 1-19. Transmission Specifications

	Description
Transmission mode	IEEE-1284 ECP mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	IEEE-1284 level 1 device
Adaptable connector	See forward channel
Data trans. timing	Refer to IEEE-1284 specification
Extensibility request	The printer responds affirmatively when the extensibility request values are 10H or 14H: 10H: Request ECP Mode Reverse Channel Transfer 14H: Request Device ID; Return Data Using ECP Mode Reverse Channel Transfer
Device ID	The printer returns the following strings when the device ID is requested: <00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]7000 CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro{SP]7000 ***Note:*** [00H] denotes a hexadecimal value of zero MDL values depend on the EEPROM setting

Table 1-20. Connector Pin Assignments - ECP Mode

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	HostClk	19	I	Data or address information is transferred from the host to the printer.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	PeriphClk	28	O	Data is transferred from the printer to the host.
11	PeriphAck	29	O	The printer uses this signal for flow control in the forward direction. Also used for data bit 9 which indicates command information and data to be output on the data signal in the forward direction.
12	nAckReverse	28	O	The printer goes to Low and approves the nReverseRequest.Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostAck	30	I	The host uses this signal for flow control in the reverse direction. Also used for data bit 9 which indicates command information and data to be output on the data signal in the forward directions.
15	NC			Not connected
16	GND			Signal ground
17	Chassis GND			Chassis ground
18	PeriphLogic-H		O	Always HIGH. Pulled up to +5V via 3.9K ohm resister.
19-30	GND			Ground for twisted pair return

Table 1-20. Connector Pin Assignments - ECP Mode

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
31	nReverseRequest	30	I	This signal goes low to change to the reverse channel.
32	nPeriphRequest	29	O	This signal produces a host interrupt.
33	GND			Ground for twisted pair return
34	NC			Not connected
35	+5V	----	O	Always HIGH. Pulled up to +5V via 1.0K ohm resister.
36	1284-Active	30	I	1284 Active Signal. HIGH in ECP mode

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.4 USB

Standard :"Universal Serial Bus Specifications Revision 1.0"
"Universal Serial Bus Device Class Definition for Printing Devices Version 1.0"

Bit rate :12Mbps (Full speed device)

Data encoding :NRZI

Adaptable connector :USB series B

Suggested cable length :2 meters

Table 1-21. USB connector pin assignments and signals

Pin no.	Signal name	In/Out	Description
1	VCC	-	Cable power, max. power consumption is 100mA
2	-Data	bi-directional	data
3	+Data	bi-directional	data, pull up to +3.3V via 1.5K Ω resistor
4	Ground	-	Cable ground

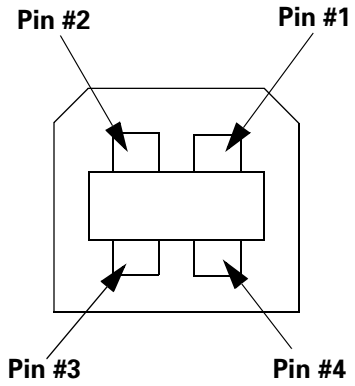

Figure 1-4. USB Pins

Device ID <00H><4EH>
MFG: EPSON
CMD: ESCPL2, BDC
MDL: Stylus[SP]Pro[SP]7000
CLS: PRINTER
DES: EPSON[SP]Stylus[SP]Pro{SP]7000

NOTE: *To use USB interface: set "PARA.I/F=COMPAT." in the Printer Settings Menu.*

1.2.5 TYPE-B Optional Interface

The EPSON Stylus Pro 7000 supports a Type-B interface (level 2).

Reply message (short version):

- When using a Co-ax/Twin-ax interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (B0xxxx)rev, AP1200ma
  Product name: Stylus[SP]Pro[SP]7000
  Emulation type: ESCPL2-00
  Entity type: EPSONLQ2
- When using a card other than a Co-ax/Twin-ax interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (B0xxx)rev, AP1200ma, SPD0fast
  Product name: Stylus[SP]Pro[SP]7000
  Emulation type:ESCPL2-00
  Entity type: ESPONLQ2

1.2.6 Preventing Data Transfer Time-Outs

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from entering this kind of time-out period, the printer slows down the data reception rate to about one byte per second when there is less than 4kB of free space in the printer buffer. Data reception comes to a complete stop if the free space is less than 32 bytes, but returns to one byte per second when free space reaches 1KB or more.