SERVICE MANUAL

All-in-one printer, scanner, and copier

EPSON STYLUS Scan 2000

COLOR IMAGING
EPSON

EPSON®

SEIJ99006

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PRECAUTIONS

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

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

CAUTION — **Signals a precaution which, if ignored, could result in damage to equipment.**

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.

2. NOWORK 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 MADE BY THE MANUFACTURER; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON STYLUS Scan 2000. 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. The chapters are organized as follows:

CHAPTER 1.   "Product Description"

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 step-by-step procedures for troubleshooting.

CHAPTER 4.   "Disassembly & Assembly"

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

CHAPTER 5.   "Adjustment"

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:
• EEPROM Address Map
• Connector Pin Assignment
• Schematics
• Circuit Diagrams

Revision Status

Revision	Issued Date	Description
Revision A	October 4, 1999	Full version
Revision B	October 20, 1999	Changed Disassembly and Troubleshooting to account for ASP blue protective tape, also fixed scanner removal description

Contents

PRODUCT DESCRIPTION

1.1 Features

The major features of the EPSON Stylus Scan 2000 are:

□ High Color Print Quality

- ■ 1440 (H) X 720 (V) dpi printing
- ■ Four Color Printing (CMYK)
- ■ Traditional and New Microweave

□ Sheet-fed 300dpi scanning

□ High quality local copy

One color copy mode	Text & Graphics
Two B&W copy modes	Black & White, Grayscale

□ High speed local copy

Color normal mode copy	Max. 1.2 PPM
Gray mode copy	Max. 1.3 PPM
B/W normal mode copy	Max. 3.0 PPM

□ Local copy settings from the control panel

Enlargement	141%
Reduction	93%, 70%
Copy size protection	Letter/Half Letter/5 x 8″/Legal A4/B5/A6

(Copy size protection prevents the printhead from firing ink onto the platen in cases where the loaded paper size does not match the paper size selected in the software.)

□ Built-in Auto Sheet Feeder

- ■ Holds 100 cut-sheets (64g/m^2)
- ■ Holds 10 envelopes
- ■ Holds 30 transparency films

□ Two Built-in Interfaces

- ■ Bi-directional parallel I/F (IEEE-1284 level 1 device)
- ■ USB

□ Windows/Macintosh exclusive

□ Copy settings from the computer

Auto Photo Fine

Auto Enlarge

Auto Layout

Background reduction

□ Installed functions are the same or equivalent to the EPSON Stylus Color 740 and the GT-2200.

□ Small footprint   228 x 437 x 279 mm (HWD)

1.2 General Specifications

1.2.1 Local copy

1. Local copy

Table 1-1. Local Copy Specifications

Mode		Scan res.	Output mode	Print res.	Micro Weave	Variable dot	Head seq.	Media
B/W	B/W	300x300	Line art	360x360	Off	No	Bi-D	Normal
	Grayscale	300x300	Gray	360x360	On	No	Bi-D	Normal
Color	Text & Graphics	300x300	Full color	360x360	On	No	Bi-D	Normal

Output mode = data from the scanner ASIC to the printer

2. Enlargement: Default   100%
   Enlargement   141%
   Reduction   70%, 93%
   (not continuous)

3. Copy size Max. copy size 216 x 355.6mm (8.5 x 14inches)
   (Top, bottom, and both sides
   need 3mm margins)

   Copy size protection A4/B5/A6 (A-size version)
   Letter/Half Letter/5 x 8″/Legal
   (Letter size version)

4. Printing paper size Normal paper A4/Letter
   Photo paper   A4/Letter

1.2.2 Scan area
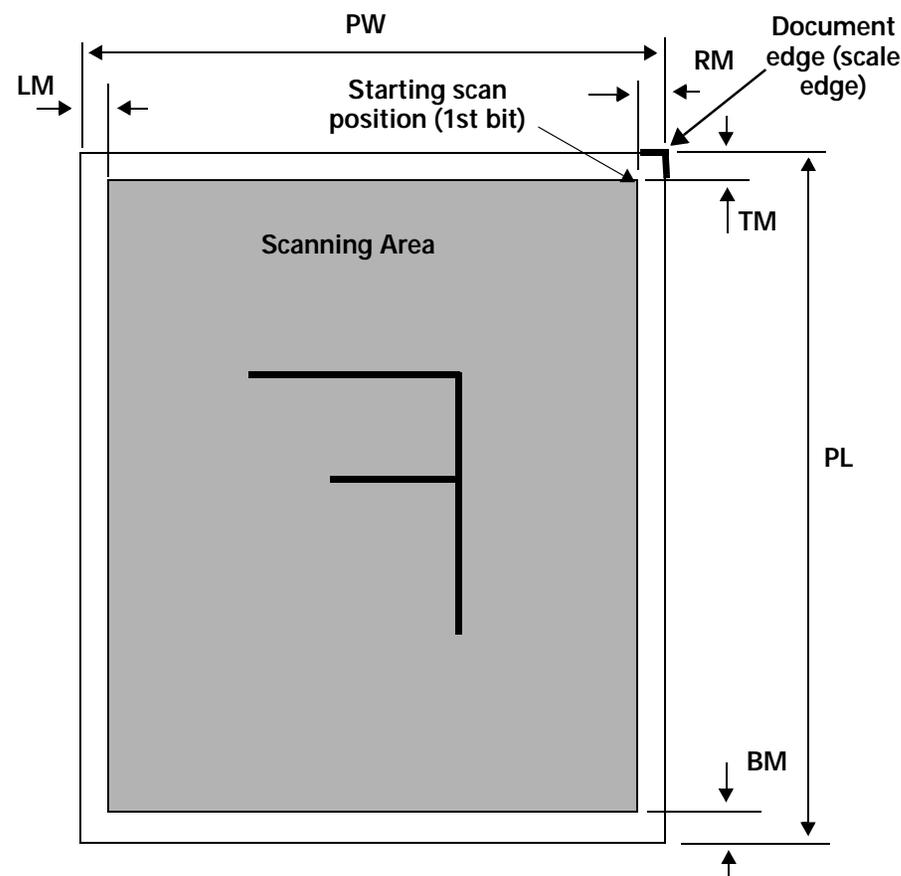
Figure 1-1. Scan Area

Table 1-2. Scan Area

Document size	PW (width)	PL (length)	LM (left)	RM (right)	TM (top)	BM (bottom)
A4	210mm	297mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Letter	216mm	355.6mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm

1.2.3 Print area
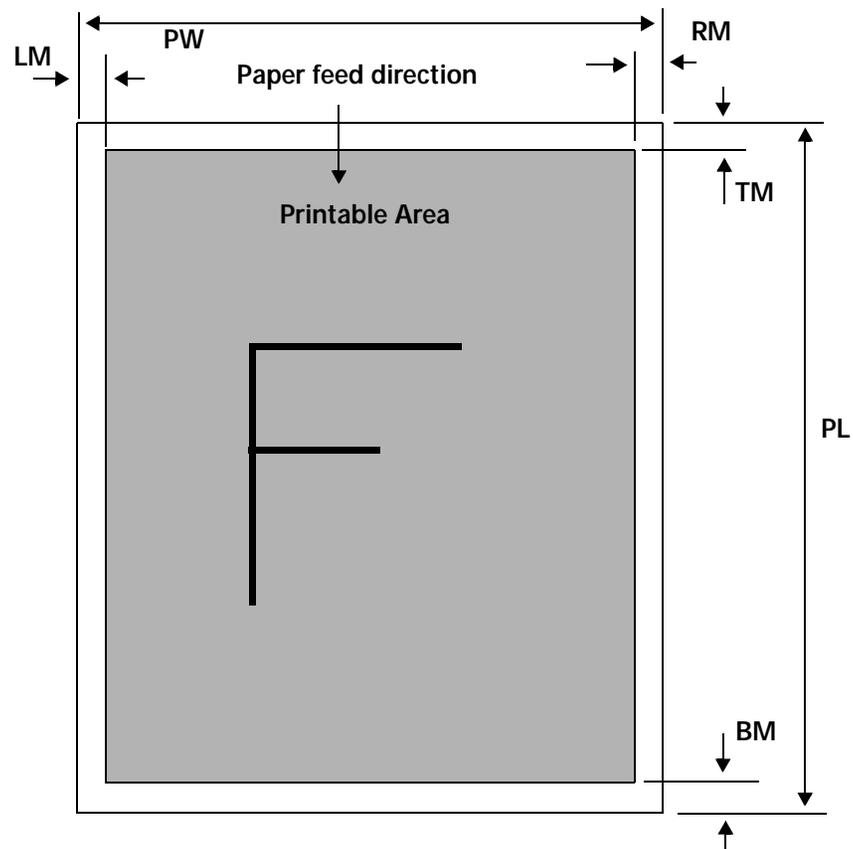
Figure 1-2. Print Area

Table 1-3. Print Area

Size	PW	PL	LM	RM	TM	BM
A4	210mm	297mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Letter	216mm	279mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
B5	182mm	257mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Legal	216mm	356mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm

1.2.4 Printer

PRINTING

☐ Print method   Drop On Demand ink jet

☐ Nozzle configuration   monochrome 144 nozzles (48 x 3 staggered)
                            color 48 nozzles each (cyan, magenta, yellow)

☐ Print direction   Bi-direction with logic seeking

☐ Print speed & printable columns

Table 1-4. Character mode

Character pitch	Printable columns	LQ speed
10 CPI (Pica)	80	200 cps

Table 1-5. Raster graphic mode

Horizontal resolution	Printable area	Available dots	CR speed
180 dpi	8.26 inch	1488	20 IPS
360 dpi	8.26 inch	2976	20 IPS
720 dpi	8.26 inch	5952	20 IPS

CONTROL CODES

☐ ESC/P Raster

☐ EPSON Remote Command

PAPER FEED

1. Feeding method   Friction feed with ASF

2. Line spacing   1/6 inch or programmable at 1/360 inch

3. Paper path   cut-sheet   ASF (front enter, front out)

4. Feed speed   2.36 inch/sec.   normal/ continuous
                        4.5 inch/sec.   fast/continuous

PAPER

☐ Cut-sheets

size:	A4 210(W) x 297mm (L) (8.3 x 11.7″)
	Letter 216 x 279mm (8.5 x 11.0″)
	B5 182 x 257mm (7.2 x 10.1″)
	Legal 216 x 356mm (8.5 x 14.0″)
	Statement 139.7 x 215.9mm (5.5 x 8.5″)
	Executive 184.2 x 266.7mm (7.25 x 10.5″)
	Photo paper 101.6 x 152.4mm (4 x 6″)

thickness: 0.08~0.11mm (0.003~0.004″)

weight: 64g/m^2~90g/m^2 (17~24lb.)

quality: Exclusive paper, bond paper, PPC

☐ OHP sheets, Glossy paper

size:	A4 210(W) x 297mm (L) (8.3 x 11.7″)
	Letter 216 x 279mm (8.5 x 11.0″)

thickness: 0.075~0.085mm (0.003~0.0033″)

NOTE: Transparency printing is only supported at normal temperature.

☐ Envelopes

size:	No.10 241(W) x 104.8mm (H) (9.5 x 4.125″)
	DL 220 x 110mm (8.7 x 4.3″)
	C6 162 x 114mm (6.4 x 4.5″)

thickness: 0.16~0.52mm (0.006~0.02″)

weight: 45g/m^2~75g/m^2 (12~20lb.)

quality: Exclusive paper, bond paper, Air mail
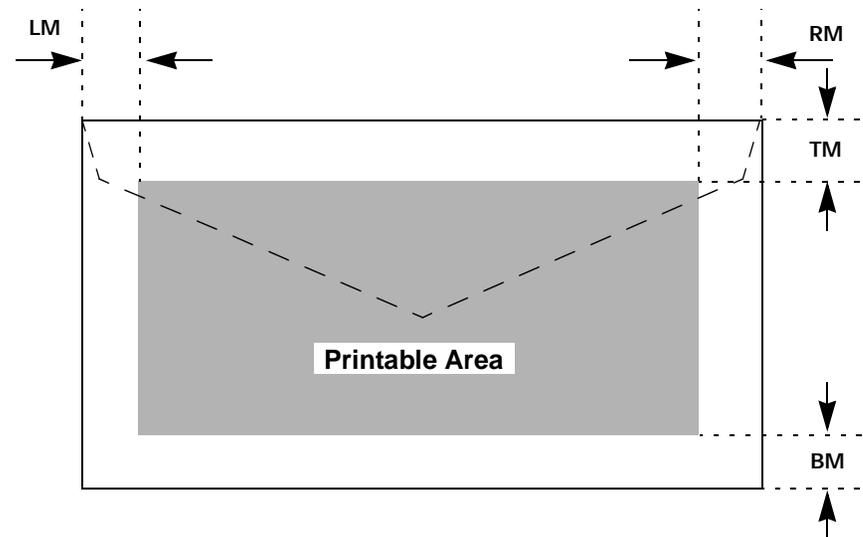
Figure 1-3. Printable Area for Envelopes

Table 1-6. Envelope Margin

Size	Left Margin (min.)	Right Margin (min.)	Top Margin (min.)	Bottom Margin (min.)
#10	3 mm (0.12″)	28 mm (1.10″)	3 mm (0.12″)	14 mm (0.55″)
DL	3 mm (0.12″)	7 mm (0.28″)	3 mm (0.12″)	14 mm (0.55″)
C6	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.55″)

NOTE: Envelope printing is only supported at normal temperature.
*   Load long edge first.*

☐ Index cards

size:	A6 index 105(W) x 148mm (L) (4.1 x 5.8″)
	A5 index 148 x 210mm (5.8 x 8.3″)
	5x8″ index 127 x 203mm (5.0 x 8.0″)
	10x8″ index 254 x 203mm (10.0 x 8.0″)

thickness: less than 0.23mm (0.0091″)

INK

1. Ink cartridge (black)

Type:	Exclusive cartridge
Color:	Black
Print capacity:	900 pages/A4 (ISO/IEC 10561 Letter pattern 360dpi)
Ink life:	Two years from production date
Storage temperature:	-20~40°C (storage, less than a month at 40°C) -30~40°C (packing storage, less than month at 40°C) -30~60°C (transit, within 120 hours at 60°C and within a month at 40°C)
Dimensions:	27.8 (W) x 52.7 (D) x 38.5mm (H)
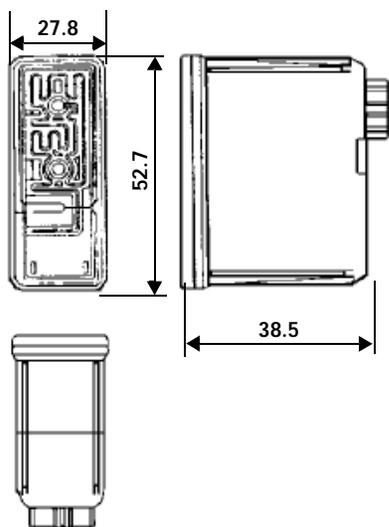
Figure 1-4. Black Ink Cartridge

2. Ink cartridge (color)

Type:	Exclusive cartridge
Colors:	Magenta, cyan, and yellow
Print capacity:	300 pages/A4 (360 dpi, 5% duty each color)
Ink life:	Two years from production date
Storage temperature:	-20~40°C (storage, less than a month at 40°C) -30~40°C (packing storage, less than month at 40°C) -30~60°C (transit, within 120 hours at 60°C and within a month at 40°C)
Dimensions:	42.9 (W) x 52.7 (D) x 38.5mm (H)
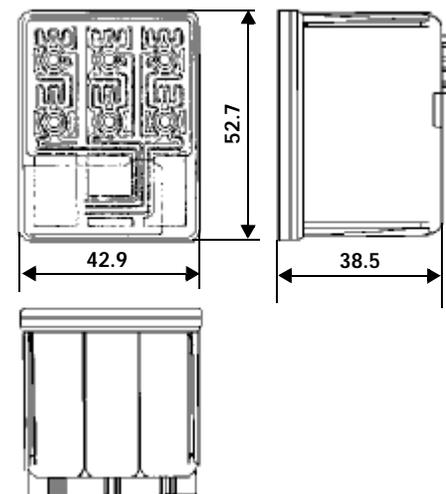
Figure 1-5. Color Ink Cartridge

NOTE: *Ink cartridges are consumable products and cannot by any means be refilled.*
Do not use cartridges that have passed their expiration date.
Ink will freeze at less than -4°C but can be used after thawing for three hours at room temperature.

INPUT DATA BUFFER

64K bytes

1.2.5 Scanner

Product type	Sheet-fed color image scanner (without ADF)
Sub scan method	Sheet-fed type
Photoelectric device	Color CCD line sensor
Max. scan area	8.5 x 14″ (216 x 355.6mm)
Max. effective pixels	2550 x 4220 pixels (300dpi)
Scan resolution	main = 300dpi and sub = 300dpi
Output resolution	50~4800 dpi (1dpi increments)
Scan speed (300dpi, Draft mode)	
	Color = 4.25 msec/line
	Monochrome (bi-level) = 1.68 msec/line
Color separation	By the CCD color filter
Command level	ESC/I - B7
Zoom	50~200% (1% increments)
Pixel depth	8 bits/color (input 12 bits/pixel/color, output 8 bits/pixel/color)
Gamma correction	CRT two levels (A,B)
	PRINTER three levels (A,B,C)
	User defined = one level
Color correction	Impact-dot printer
	Thermal printer
	Ink-jet printer
	CRT display
	User defined
Brightness	Seven levels
Line art	Fixed threshold
	TET
Digital halftoning	AAS
	Error diffusion three modes (A,B,C)
(Bi-level, Quad-level)	Dither (resident) four modes (A,B,C,D)
	Dither (user defined) two modes (A,B)
Interface	USB and IEEE1284.4
Light source	White cold cathode fluorescent lamp

1.2.6 Common

ELECTRICAL SPECIFICATIONS

Rated voltage	AC 120V AC 220~240V
Input voltage	AC 99~132V AC 198~264V
Rated current	0.6A (AC 120V model) 0.4A (AC 220-240V model)
Rated frequency range	50~60 Hz
Input frequency range	49.5~60.5 Hz
Power consumption	Approx. 29W (local copy printing)
Insulation resistance	10MΩ at 500V DC (between AC line and chassis)

SAFETY, EMC

Safety	UL1950 (UL) CSA C22.2 No. 950 (CSA) EN60950 (VDE)
EMC	FCC Part15 Subpart B Class B CSA C108.8 Class B AS/NZS3548 Class B

CE Marking

Low voltage directive 73/23/EEC	EN60950
EMC Directive 89/336/EEC	EN55022 Class B
	EN61000-3-2
	EN61000-3-3
	EN50082-1
	IEC 801-2/801-3/801-4

ENVIRONMENTAL CONDITIONS

Temperature	10~35°C (operating, see figure below)
	-20~60°C (non-operating, in packaging)
	     One month at 40°C
	     120 hours at 60°C

Humidity	20~80% RH (operating, without condensation, see figure below) 5~85% RH (non-operating, in packaging without condensation)

Figure 1-6. Environment

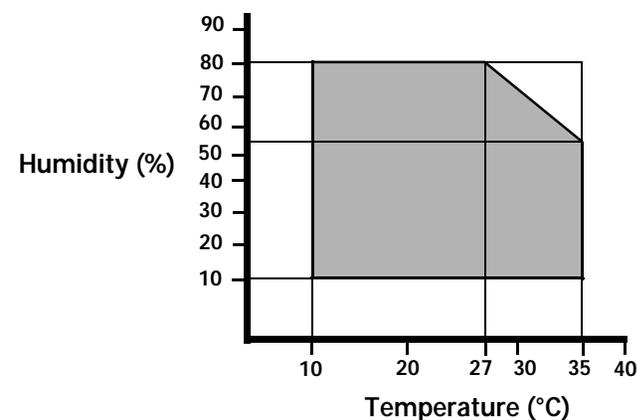|	
Resistance to shock	1 G, within one ms (operating) 2 G, within two ms (non-operating, in packaging)

Resistance to vibration 0.15G (operating)
0.50G (non-operating, in packaging)

RELIABILITY

Main unit	Life 75,000 pages
Lamp	Life 15,000 hours

1.3 Interfaces

This section is divided into printer and scanner interface specifications. See the following section for printer interface details or see "Scanner interfaces" on page 22 for scanner interface details.

1.3.1 Printer interface

PARALLEL

BUSY signal is set high before setting either -ERROR low or PE high, and held high until all these signals return to their inactive state.

BUSY signal is at high level in the following cases:

- During data entry (see data transmission timing)
- When input data buffer is full
- During -INIT signal is at low level or during hardware initialization
- During printer error (see -ERROR signal)
- When the parallel interface is not selected

ERROR signal is at low level when the printer is in one of the following states:

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

PE signal is at high level during paper-out error.

1. Specifications

Transmission mode	8 bit parallel, IEEE-1284 ECP compatibility/nibble mode
Synchronization	Refer to the IEEE-1284 specification
Handshaking	Refer to the IEEE-1284 specification
Packet	Refer to the IEEE-P1284.4 Standard for Data Delivery and Logical Channels for IEEE Std. 1284 Interface (Draft D1.50)
Signal level	TTL compatible level (IEEE-1284 Level 1 device)
Data trans. timing	Refer to the IEEE-1284 specification

2. Connector pin assignment and signals

Table 1-7. Forward channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
1	-STROBE	19	In	The strobe pulse. Read-in data is preformed at the falling edge of this pulse.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is high when data is logical 1 and low when data is logical 0.
3	DATA1	21	In	
4	DATA2	22	In	
5	DATA3	23	In	
6	DATA4	24	In	
7	DATA5	25	In	
8	DATA6	26	In	
9	DATA7	27	In	
10	-ACKNLG	28	Out	A negative signal that indicates the printer is ready to accept data
11	BUSY	29	Out	A high signal that indicates the printer is not ready and cannot receive data
12	PE	28	Out	A high signal indicates a paper-out error
13	SLCT	28	Out	Always at high level when the printer is on
14	-AFXT	30	In	Not used
31	-INIT	30	In	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50us pulse necessary.

Table 1-7. Forward channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
32	-ERROR	29	Out	A low signal indicates a printer error condition
36	-SLIN	30	In	Not used
18	Logic H	-	Out	Pulled up to +5V via 3.9KΩ resistor
35	+5V	-	Out	Pulled up to +5V via 3.3KΩ resistor
17	Chassis GND	-	-	Chassis GND
16, 33 19-30	GND	-	-	Signal GND
15,34	NC	-	-	Not connected.

Table 1-8. Reverse channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
1	HostClk	19	In	Data or address information transferred from host to product.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is high when data is logical 1 and low when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
3	DATA1	21	In	
4	DATA2	22	In	
5	DATA3	23	In	
6	DATA4	24	In	
7	DATA5	25	In	
8	DATA6	26	In	
9	DATA7	27	In	
10	PeriphClk	28	Out	Data transferred from product to host.
11	PeriphAck	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7
12	nAckReverse	28	Out	Printer goes to Low and approves nReverseRequest

Table 1-8. Reverse channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
13	Xflag	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5
14	HostAck	30	In	Host uses this signal for flow control in reverse direction. Also this signal offers the data bit 9 that is used to judge whether the data or command will be sent on the data signal in forward direction.
31	nReverseRequest	30	In	This signal goes low to change to the reverse channel.
32	nPeriphRequest	29	Out	This signal produces a host interrupt.
36	1284-Active	30	In	1284 active signal, High in ECP mode.
18	Periph-Logic H	-	Out	Always high. Pulled up to +5V via 3.9KΩ resistor
35	+5V	-	Out	Always high. Pulled up to +5V via 1.0KΩ resistor
17	Chassis GND	-	-	Chassis GND
16, 33 19-30	GND	-	-	Signal GND
15,34	NC	-	-	Not connected.

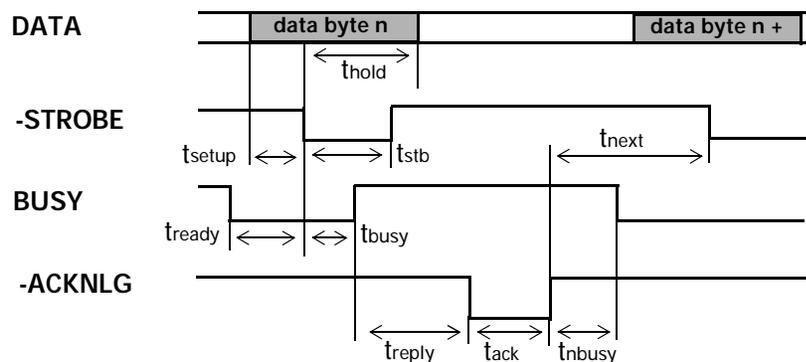3. Data trans. timing   Refer to the IEEE-1284 specification and the following.

DATA

-STROBE

BUSY

-ACKNLG

Figure 1-7. Data Transmission Timing

Table 1-9. 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	500 ns	10 us
tnbusy	0	-
tnext	0	-

* Rise and fall time of every output signal

** Rise and fall time of every input signal

Table 1-10. Typical tack time

Parallel I/F mode	Time required
High speed	1 us
Normal speed	3 us

* The Logic H signal goes low, 2.0 V or less, when the printer is turned off and goes high, 3.0 V or more, when the printer is turned on. The receiver shall provide an impedance equivalent to 7.5 KΩ to ground.

4. Extensibility Request:

The printer responds affirmatively when the extensibility request values are 00H or 04H, which mean

■ 00H   Request nibble mode reverse channel transfer

■ 04H   Request Device ID;
             Return data using nibble mode reverse channel transfer

Device ID:

The printer sends the following device ID string when it is requested.

IEEE 1284.4 is enabled,

[00H][5EH]
MFG:EPSON;
CMD:ESCPL2,BDC,D4,SPC;
MDL:Stylus[SP]Scan[SP]2000;
CLS:PRINTER
DES:EPSON[SP]Stylus[SP]Scan[SP]2000;

Note: (1)[00H] denotes a hexadecimal value of zero
           (2)MDL value depends on the EEPROM setting.

USB

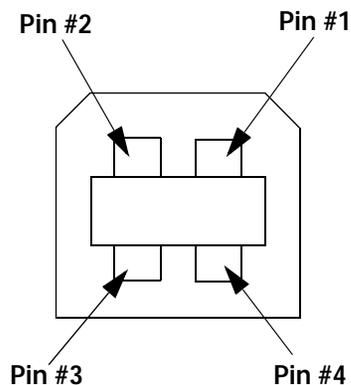|	
Standard	:based on "Universal Serial Bus Specifications Revision 1.0" "Universal Serial Bus Device Class Definition for Printing Devices Version 1.0"
Bit rate	:12Mbps (Full speed device)
Data encoding	:NRZI
Adaptable connector	:USB series B
Suggested cable length	:2 meters

Table 1-11. 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 1-8. USB Pins

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 around several bytes per minute, even if the printer is in the busy state. This slowdown starts when the remaining open buffer area decreases to several hundred bytes. The Stylus Scan enters a continuous busy state if the input buffer becomes full.

INTERFACE SELECTION

The Stylus Scan has two built-in interfaces; the USB and parallel interfaces. The interface in use is selected automatically.

■ Automatic selection

When the Stylus Scan is turned on, it initializes and then goes into an idle state. During this idle period the printer scans the interfaces for incoming data. The interface that receives data first is selected.

When the host stops transferring data and the printer is in the stand-by state for a certain amount of time, the printer returns to the idle state. As long as the host sends data or the printer interface is in the busy state, the interface selection does not change.

■ Interface status and selection

When the parallel interface is not selected, the interface goes into the busy state. When the printer initializes or returns to the idle state, the parallel interface goes into the ready state. Be aware that an interrupt signal such as the -INIT signal only takes effect on the parallel interface when the parallel interface is selected.

IEEE1284.4 PROTOCOL

The packet protocol described by IEEE1284.4 standard allows a device to carry on multiple exchanges or conversations which contain data and/or control information with another device at the same time across a single point-to-point link. The protocol is not, however, a device control language. It does provide basic transport-level flow control and multiplexing services. The multiplexed logical channels are independent of each other and blocking of one has no effect on the others. The protocol operates over IEEE1284.

☐ Automatic Selection
An initial state is compatible interface and starts IEEE1284.4 communication when magic strings (1284.4 synchronous commands) are received.

☐ On
An initial state is IEEE1284.4 communication and data that received it by the time it is able to take synchronization by magic string (1284.4 synchronous commands) is discarded.

☐ Off
An initial state is compatible interface and never starts IEEE1284.4 communication even if magic strings (1284.4 synchronous commands) are received.

1.3.2 Scanner interfaces

PARALLEL

1. Specification

Transmission mode	8 bit parallel, IEEE-1284 ECP (Compatibility/Nibble) mode
Synchronization	Refer to the IEEE-1284 specification
Handshaking	Refer to the IEEE-1284 specification
Packet	Refer to the IEEE P1284.4 Standard for Data Delivery and Logical Channels for IEEE Std. 1284 Interface (Draft D1.50) Refer to the IEEE 1284.4 specification
Signal level	TTL compatible level (IEEE-1284 Level 1 device)
Data trans. timing	Refer to the IEEE-1284 specification

2. Connector pin assignments
   Refer to the IEEE-1284 specification

USB

Any items not included in this specification shall be in compliance with the Universal Serial Bus Specification Revision 1.0

☐ Configuration - the scanner supports the following configurations

Table 1-12. USB Configuration

Element	Description
Device	Full Speed Mode (12Mbit/s) Class: Vendor-specific Subclass: Vendor-specific Protocol: Vendor-specific Vendor ID: 0x04B8 (Seiko Epson Corp.) Product ID: 0x0105 Number of possible configurations: 1
Configuration	Number of interfaces supported by this configuration: 1 Characteristics: Self-powered (Remote wake-up feature not supported) Max. power consumption from VBUS: 2mA (5V)
Interface	No alternate setting Number of endpoints used by this interface (excluding endpoint 0):2 Class: Vendor specific Subclass: Vendor specific Protocol: Vendor specific
Endpoint	Bulk IN transfer Max. data transfer size: 64 bytes
	Bulk OUT transfer Max. data transfer size: 64 bytes
String Descriptor	Language ID: English, US 1: iManufacturer "EPSON" 2: iProduct "Scanner Stylus Scan 2000"

☐ Requests

The scanner must support almost all standard device requests. The scanner does not support vendor specific requests.

Some requests and descriptors depend on the configuration (endpoint number) of each USB device. Therefore this specification recommends the configuration where Endpoint 1 is Bulk IN endpoint and Endpoint 2 is OUT endpoint.
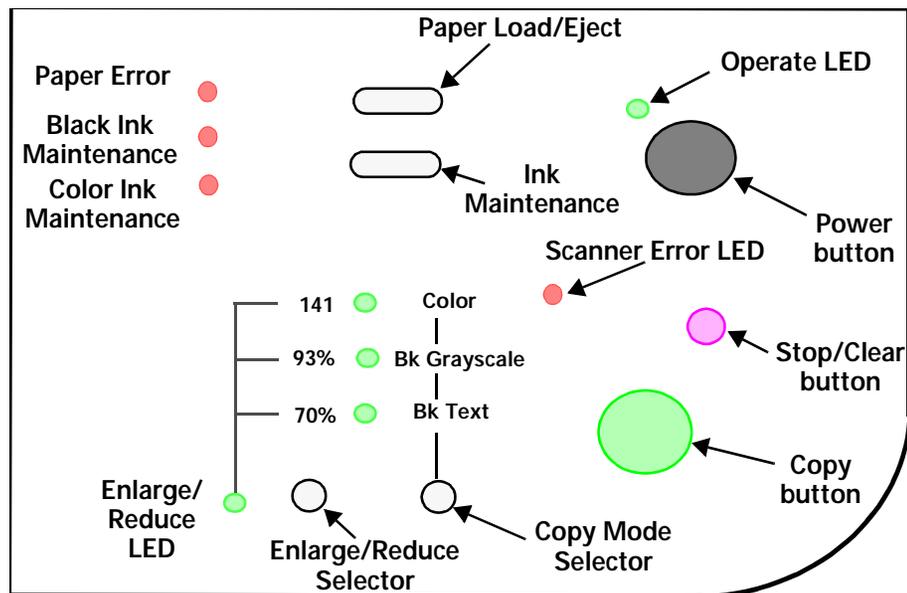
1.4 Control Panel

Figure 1-9. Control Panel

1.4.1 Buttons

Table 1-13. Normal button functions

Button	Function
Load/Eject	• Loads or ejects paper • If the carriage is at the ink cartridge installation position, returns the carriage back to the home position
Load/Eject (pushed for two* seconds)	• Starts the ink cartridge replacement sequence (not available during printing). The carriage moves to the black ink cartridge installation position first, and then to the color ink cartridge installation position when pushed a second time.
Cleaning (pushed for two* seconds)	• Starts the printhead cleaning cycle. • If the printer is in the "Ink Low" or "Ink Out" condition, starts the ink cartridge replacement sequence.
Cleaning	• Returns the carriage from the ink cartridge replacement position to the home position.

* The user's guides state three seconds.

Table 1-14. Power-on button functions

Button	Function
Load/Eject	Prints a status sheet that includes firmware version, ink counter, and nozzle check patterns.
Load/Eject + Cleaning	Enters the special-settings mode (see table below), which remains active for three seconds. If neither the Load/Eject nor Cleaning button is pushed in that three seconds, normal initialization begins.

Table 1-15. Special settings mode

Button	Function
Load/Eject	Resets the real-time counter (power-off time) in EEPROM
Cleaning (hold for ten seconds)	Resets the waste ink overflow counter

COPY BUTTON

Table 1-16. Copy button functions

Button	Function
Operate	• Sets Local Copy Mode as the default.
Stop/Clear	• Stops the current copy job and ejects the paper during copying. • Ejects paper during paper loading.
Copy	• The default setting for copying is **B & W** and **100%**
Copy Mode	• Selects **Grayscale**, **Black Text**, or **Color (Text & Graphics)** • First press = LED shows current status • Multiple presses (within 5 sec.s) = moves up one setting each time • Example First time = Black Text LED activated (default) Second time = Grayscale LED activated Third time = Color Text & Graph LED activated Fourth time = Black Text LED activated
Enlarge/Reduce	• Selects reduce or enlarge • Default = 100% • First press = LED shows current status • Multiple presses (within 5 sec.s) = moves up one setting each time • Example First time = Enlarge/Reduce LED only (100%) activated (default) Second time = Enlarge/Reduce and 70% LEDs activated Third time = Enlarge/Reduce and 93% LEDs activated Fourth time = Enlarge/Reduce and 141% LEDs activated Fifth time = Enlarge/Reduce LED only (100%) activated

Table 1-17. Power-on functions for the Copy button

Button	Function
Copy	Prints a status sheet including firmware version and paper size.
Stop/Clear	Changes printout paper size during copying (see below).

To change the printout paper size during copying, press the Stop/Clear button until the appropriate indicator combination activates, as described below.

Table 1-18. Changing printout paper sizes during local copying

Paper size	Control Panel Indicators			
	Scanner Error	Color	Grayscale	Black Text
A4	on	on	off	off
Letter	on	off	off	on

1.4.2 Control panel indicates the printer's condition

PRINTER

Table 1-19. Printer Condition

Printer status	Indicators			
	Power	**Ink Out (BK)**	**Ink Out (C)**	**Paper Out**
Printing	Flashing	-	-	-
Ink charging	Flashing	-	-	-
Ink cartridge replacement mode	Flashing	-	-	-
Paper Out	Flashing	-	-	On
Paper jam	-	Off	Off	Flashing
No ink cartridge/ ink end black	-	On	-	-
Ink low black	-	Flashing	-	-
No ink cartridge/ ink end color	-	-	On	-
Ink low color	-	-	Flashing	-
Enter EEPROM and Timer IC reset	-	On	On (one second only)	
Maintenance request	Flashing	Flashing	On	On
Fatal error	Flashing	On	On	Flashing

"-" = does not matter

SCANNER

Table 1-20. Scanner Condition

Scanner status	Indicators		
	Power	**Error**	**Priority**
Lamp warming up	Flashing	-	1
Fatal error	-	On	1
Paper jam	-	On	2

"-" = does not matter

LOCAL COPY

Table 1-21. Copy Status

Scanner status	Indicators		
	Power	**Error**	**Priority**
Power on	On	-	3
Copying	Flashing	-	2
Scanner/Printer error Paper jam	-	On	1

"-" = does not matter

1.4.3 Initialization

PRINTER

There are three initialization methods.

1. Power-on (hardware) initialization

    The printer initializes when turned on or when it recognizes the cold-reset command (remote RS command).
    When the printer initializes, the following actions are performed.

    - ■ Initialize printer mechanism

    - ■ Clear input data buffer

    - ■ Clear print buffer

    - ■ Set default values

2. Operator initialization

    The printer initializes when turned on, or when the printer recognizes the -INIT signal (negative pulse) from the parallel interface.
    When the printer initializes, the following actions are performed.

    - ■ Cap the printhead

    - ■ Eject paper

    - ■ Clear input data buffer

    - ■ Clear print buffer

    - ■ Set default values

3. Software initialization

    The ESC@ command also initializes the printer.
    When the printer initializes, the following actions are performed.

    - ■ Clear print buffer

    - ■ Set default values

Table 1-22. Initialization

Operation	Operating	Standby	Controller process	Scanner process	Printer process	Restart
Power on	Valid	Valid	Set the local copy setting to default	H/W initialization	H/W initialization	-
Panel Reset	Valid	Valid		Controller initialization	Panel initialization	-
Initialize by command	Valid	Valid		S/W initialization	S/W initialization	-
STOP	Valid	-	Stop copying Setting remains as is	Cancel	Eject paper	Copy button
CLEAR	-	Valid	• Setting mode: default • Copy mode: Multi-copies volume 1			

SCANNER

There are three initialization methods.

1. Hardware initialization

   The scanner initializes when turned on.
   When the scanner initializes, the following actions are performed.

   - ■ Initialize scanner mechanism

   - ■ Clear input/output data buffer

   - ■ Set default values

2. Operator initialization

   The scanner initializes when it recognizes the -INIT signal (negative pulse)
   from the parallel interface.
   When the scanner initializes, the following actions are performed.

   - ■ Clear input/output data buffer

   - ■ Set default values

3. Software initialization

   The ESC@ command also initializes the scanner.
   When the scanner initializes, the following actions are performed.

   - ■ Clear input/output data buffer

   - ■ Set default values

1.5 Stylus Scan Errors

PRINTER

Table 1-23. Printer Related Errors

Error	Cause	Solution
Ink out	When one or more ink cartridges are almost empty, the printer enters the low-ink state and continues printing. When the cartridge is completely empty, the printer indicates an ink-out error and stops printing.	Install a new ink cartridge.
Paper out	If the printer fails to properly load paper, it indicates a paper-out error.	Load paper and press the Load/Eject button.
Paper jam	If the printer fails to properly eject paper, it indicates a paper jam.	Press the Load/Eject button. If this does not clear the error, remove the paper by hand.
No ink cartridge	If the printer detects that one of the ink cartridges is not installed, it indicates a no-ink-cartridge error.	Install a new ink cartridge.
Maintenance request	When the total amount of waste ink reaches the limit, the printer indicates a maintenance request and stops printing.	Replace the waste ink pads.
Fatal error	A carriage control or CG access error has occurred.	Turn off the Stylus Scan and turn it back on. If the error does not clear, service.

NOTE: Do not re-install used ink cartridges. Doing so confuses the ink-level detection function and may cause a serious problem in the printhead.

SCANNER

Table 1-24. Scanner Related Errors

Error	Cause	Solution
Fatal error	• The lamp is broken. • System breakdown. • Scanner fails to eject the document. • (Disposition)	Turn off the Stylus Scan and turn it back on. If the error does not clear, service. Turn off the lamp and stop operation. Set bit 7 of the status byte.??
Command error	Unidentified command detected. (Disposition) The scanner sent a NACK signal and is waiting for the next command. If an incorrect command or parameter is received, it is disregarded and the previous value is maintained.	Send a correct command to clear the error.

1.6 Physical Characteristics

1.6.1 Dimensions

228 x 437 x 279 mm (HWD)
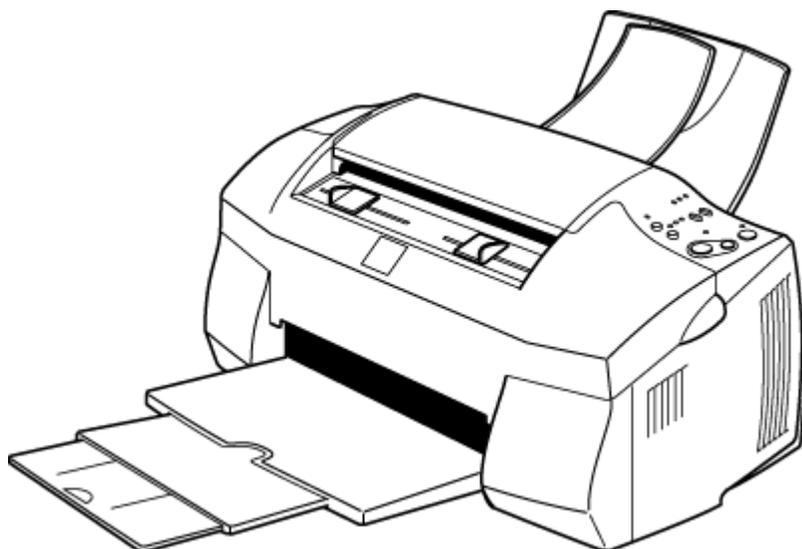
1.6.2 Weight

7.5 Kg

1.6.3 External view

Figure 1-10. EPSON Stylus Scan 2000

C H A P T E R

2

OPERATING PRINCIPLES