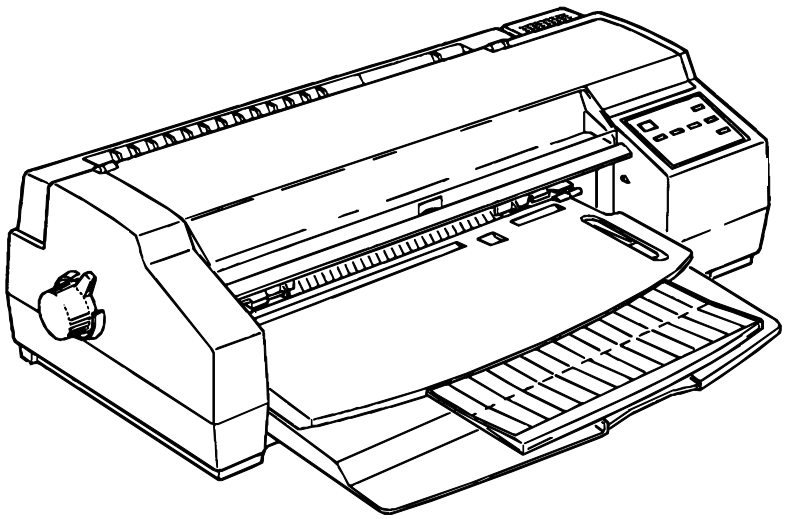
EPSON

COLOR INK JET PRINTER

EPSON Stylus COLOR 1520

SERVICE MANUAL



SEIKO EPSON CORPORATION

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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 serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by WARNING Headings.

CAUTION 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.

WARNING

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH 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.

CAUTION

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGE IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT 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.

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of Stylus COLOR 1520.

The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to die 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. ADJUSTMENT

Includes a step-by-step guide for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides EPSON-approved techniques for troubleshooting.

CHAPTER 6. MAINTENANCE

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

APPENDIX

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

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

REVISION SHEET

Revision	Issued Data	Contents
Rev. A	FEBRUARY 25 1997	First issue

TABLE OF CONTENTS

Chapter 1
Product Description

1.1 Features

The EPSON Stylus COLOR 1520 is a business-use, high speed, and high-quality color ink jet printer. The main features of this printer are:

- High Speed Printing
  - 400 cps for LQ mode
  - 800 cps for draft mode
- High print quality for color graphics
  - High Resolution :1440 (H) X 720 (V) dpi printing
  - Colors :Cyan, Magenta, Yellow, Black
  - Printing Method :Traditional and new micro weave printing
  - Smaller dot diameter for image improvement
- Built-in auto sheet feeder with a wide availability and high capacity
  - This printer holds :Envelope up to A2 size portrait
    :100 cut sheets (55 g/‡u)
    :10 envelopes
    :50 transparency films
    :70 special paper
- Built-in 2 interfaces and 1 optional interface card
  - Mac serial interface (up to approximately 900 kbps)
  - Bi-directional parallel interface (IEEE1284 level 1 device)
  - Optional Type-B interface card
- 4 scalable fonts and 5 LQ fonts
  - Scalable fonts :Roman T, Sans Serif H, Roman, Sans Serif
  - LQ fonts :Roman, Sans Serif, Courier, Prestige, Script
  - Useful character tables :Italic, PC437, PC850, PC860, PC861, PC863, PC865, BRASCII, Abicomp, Roman 8, ISO Latin 1
    PC437 Greek, PC852, PC853, PC855, PC857, PC866, PC869, MOZOAWIA, Code MJK, ISO 8559-7, Latin 1T, Bulgaria, PC774, Estonia, ISO 8859-2, PC866 LAT

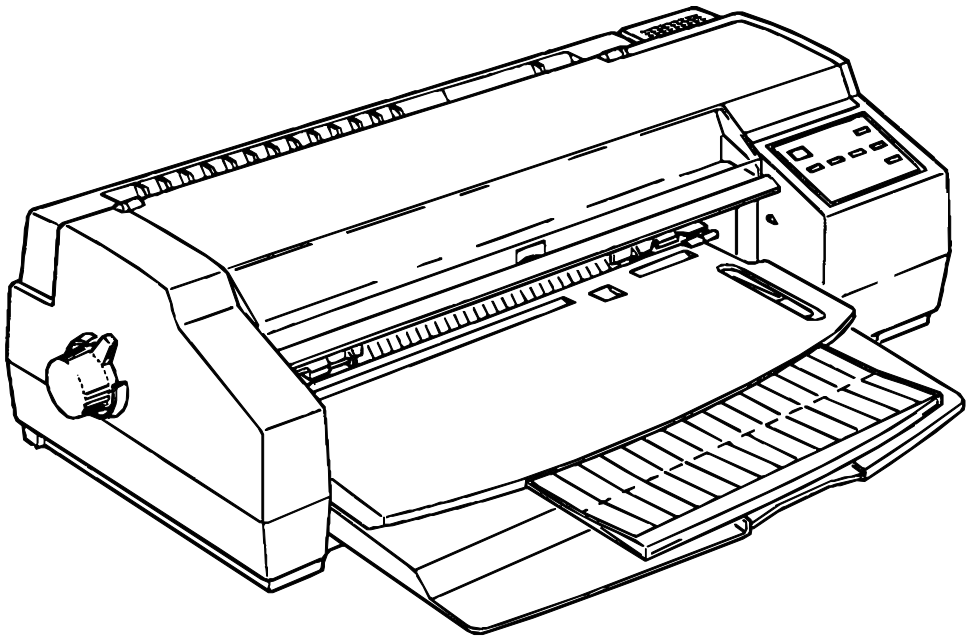


Figure 0-1. Exterior View of the EPSON Stylus COLOR 1520

Table 0-1. Options and Consumables

Model	Description
C82305∗/C82306∗	Serial interface card
C82307∗/C82308∗	32 KB serial interface card
C82310∗	32 KB parallel interface card
C82313∗	32 KB EEE-488 interface card
C82315∗	Twinax interface card
C82314∗	Coax interface card
C82312∗	LocalTalk™ interface card
C82331∗	Ethernet interface card
C82345∗	Type-B Bidirectional parallel interface card
C83602∗	Parallel interface cable (shielded) from D-SUB 25-pin (computer) to Amphenol 57 (printer)
C83603∗/C83604∗	Serial interface cable from D-SUB 25-pin (computer) to D-SUB 25-pin (printer)
C83605∗/C83606∗	Serial interface cable from D-SUB 9-pin (computer) to D-SUB 25-pin (printer)
C811**∗	Banner paper holder and cutting guide
S020108	Black ink cartridge
S020089	Color ink cartridge
S041059 / S041025	EPSON 360 dpi ink jet paper (A4)
S041060	EPSON 360 dpi ink jet paper (Letter)
S041065	EPSON 360 dpi ink jet paper (A3)
S041066	EPSON 360 dpi ink jet paper (Super A3/B)
S041061 / S041026	EPSON photo quality ink jet paper (A4)
S041062	EPSON photo quality ink jet paper (Letter)
S041067	EPSON photo quality ink jet paper (Legal)
S041068	EPSON photo quality ink jet paper (A3)
S041070	EPSON photo quality ink jet paper (B)
S041069	EPSON photo quality ink jet paper (Super A3/B)
S041054	EPSON photo quality ink jet card (A6)
S041121	EPSON photo quality ink jet card (5 X 8 inch)
S041122	EPSON photo quality ink jet card (8 X10 inch)
S041071	EPSON photo quality glossy film (A4)
S041072	EPSON photo quality glossy film (Letter)
S041107	EPSON photo quality glossy film (A6)
S041073	EPSON photo quality glossy film (A3)
S041075	EPSON photo quality glossy film (B)
S041074	EPSON photo quality glossy film (Super A3/B)
S041126	EPSON photo quality glossy paper (A4)
S041124	EPSON photo quality glossy paper (Letter)
S041125	EPSON photo quality glossy paper (A3)
S041123	EPSON photo quality glossy paper (A2)
S041063	EPSON ink jet transparencies (A4)
S041064	EPSON ink jet transparencies (Letter)
S041106	EPSON photo quality self adhesive sheet (A4)
S041103	EPSON 360 dpi ink jet banner paper
S041102	EPSON photo quality banner paper
S041***	EPSON ink jet canvas
S041***	EPSON back light film (A3)
S041***	EPSON back light film (A2)

Note) The asterisk is a substitute for the last digit of the product number, which varies by country.

1.2 Specification

This section provides detailed information on the EPSON Stylus COLOR 1520.

1.2.1 Printing Specifications

- ❑ Printing method :On demand Ink jet
- ❑ Nozzle configuration :Monochrome 128 nozzles (32 x 4 staggered)
  :Color 64 nozzles each (magenta, cyan, yellow)

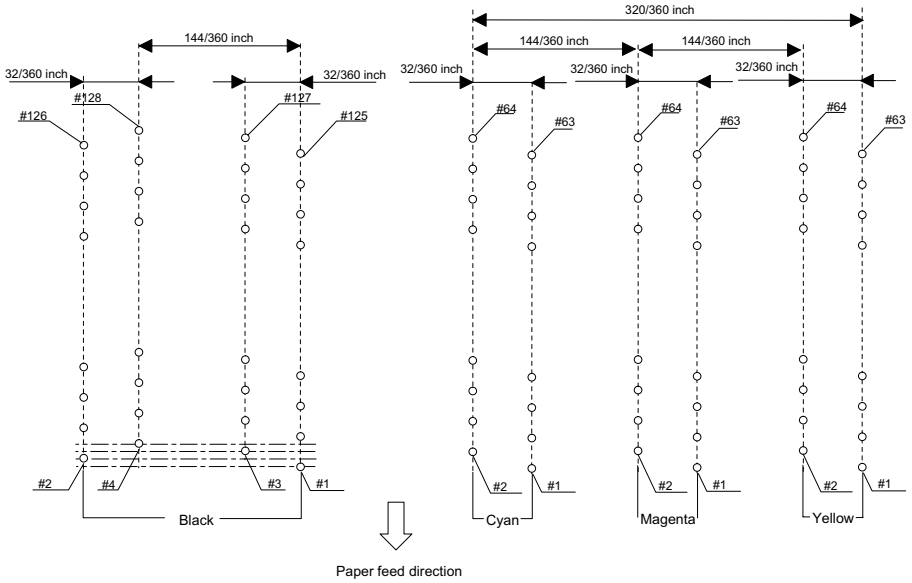


Figure 0-2. Nozzle Configuration

- ❑ Printing direction :Bi-directional with logic-seeking
- ❑ Printing speed and Printable columns

Table 0-2. Print Speed and Printable Columns for Character Mode

Character Pitch	Printable Columns	LQ Speed	Draft Speed
10 cpi (Pica)	136	400 cps	800 cps
12 cpi (Elite)	163	480 cps	960 cps
15 cpi	204	600 cps	1200 cps
17.1 cpi(Pica condensed)	233	684 cps	1378 cps
20 cpi(Elite dondensed)	272	800 cps	1600 cps

Table 0-3. Print Speed and Printable Columns for Raster Graphic Mode

Print Mode	Printable Area	Available Dot	CR Speed
180 dpi X 180 dpi	11 inch	1980	40 ips
360 dpi X 360 dpi	11 inch	3960	20 ips
720 dpi X 720 dpi	11 inch	7920	20 ips
1440 dpi X 1440 dpi *[1]	11 inch	7920 *[2]	10 ips

Note) 1: 1440 dpi X 720 dpi is available when using driver micro weave only.
2: 1440 dpi X 720 dpi can be printed by sending Following command sequence.
1. Set the print speed to 10 IPS.
2. Print 180 X 720 raster image.
3. Paper feed 31/720 inch.
4. Move 1/1440 inch print position.
5. Print 180 X 720 raster image.
6. Paper feed 31/720 inch.
Repeat the steps from 2 to 6.

1.2.2 Control codes

ESCP/2 and expanded raster graphics code
EPSON Remote command
IBMX24E emulation

1.2.3 Character tables

- Legal and 14 international character sets
  - Standard version: 27 character tables

Italic table	PC 437 (US, Standard Europe)
PC 850 (Multilingual)	PC 860 (Portuguese)
PC 861 (IceLandic)	PC 863 (Canadian-French)
PC 865 (Nordic)	Abicomp
BRASCII	Roman 8
ISO Latin 1	PC 437 (Greek)
PC 852 (East Europe)	PC 853 (Turkish)
PC 855 (Cyrillic)	PC 857 (Turkish)
PC 866 (Russian)	PC 869 (Greek)
MOZOAWIA (Poland)	Code MJK (CSFR)
ISO 8559-7 (Latin, Greek)	ISO Latin 1T (Turkish)
Bulgaria (Bulgaria)	PC 774
Estonia	ISO 8859-2 (ISO Latin 2)
PC 866 LAT	

- Typeface
  - Bit map LQ font

EPSON Roman	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Sans Serif	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Courier	10 cpi, 12 cpi, 15 cpi,
EPSON Prestige	10 cpi, 12 cpi, 15 cpi,
EPSON Prestige	10 cpi, 12 cpi, 15 cpi

  - Scalable font

EPSON Roman	10.5 pt., 8 pt. – 32 pt. (every 2 pt.)
EPSON Sans Serif	10.5 pt., 8 pt. – 32 pt. (every 2 pt.)
EPSON Courier	10.5 pt., 8 pt. – 32 pt. (every 2 pt.)
EPSON Prestige	10.5 pt., 8 pt. – 32 pt. (every 2 pt.)
EPSON Script	10.5 pt., 8 pt. – 32 pt. (every 2 pt.)

Note) Each typeface has 4 variations:
Normal, Bold, Italic, and Bold Italic
An example of variations for Epson Roman is as follows:
Epson Roman normal
Epsom Roman bold
Epson Roman italic
Epson Roman bold italic

- Combinations of Character tables and typefaces (font)
  Table 1-14 shows the available combinations of character tables and Typefaces.

Table 0-4. Character Tables and Fonts

Character Tables	Bitmap Fonts	Scalable Fonts	Scalable Fonts
	EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif	EPSON Roman T EPSON Sans Serif H
Italic PC 860 (Portuguese)) PC 861 (IceLandic) PC 863 (Canadian-French) PC 865 (Nordic) BRASCII Abicomp Roman 8 ISO Latin 1	Supported	Supported	Supported
Italic table PC 437 (US Standard Europe) PC 850 (Multilingual) PC 437 (Greek) PC 852 (East Europe) PC 853 (Turkish) PC 855 (Cyrillic) PC 857 (Turkish) PC 866 (Russian) PC 869 (Greek) MAZOWIA (Poland) Code MJK (CSFR) ISO 8859-7 (Latin/Greek) ISO Latin 1T (Turkish) Bulgaria (Bulgaria) PC 774 Estonia ISO 8859-2 (ISO Latin 2) PC 866 LAT	Supported	Supported	Not Supported

1.2.4 Paper Feeding

- Paper transport method :Friction feed with built-in auto sheet feeder (ASF)
- Line spacing :1/6, 1/8 inch or programmable at 1/360 inch
- Paper path :Cut-sheet ASF (Front entry)
  :FF Rear tractor
- Feed speed :66 ms / line (1 line = 1/6 inch)
  88.9 mm / sec
  3.5 inch / sec

1.2.5 Paper Specification

1.2.5.1 Cut Sheet

Table 0-5. Cut Sheet Size

Size	Width	Length
A4	210 mm (8.3")	297 mm (11.7")
Letter	215.9 mm (8.5")	279.4 mm (11.0")
B5	182 mm (7.2")	257 mm (10.1")
Legal	215.4 mm (8.5")	355.6 mm (14.3")
B4	257 mm (10.1")	364 mm (14.0")
A3	297 mm (11.7")	420 mm (16.5")
Ledger	279.4mm (11.0")	431.8 mm (17.0")
A3 wide	329 mm (13.0")	483 mm (19.0")
A2	420 mm (16.5")	594 mm (23.4")
US-C	431.8 mm (17.0")	558.8 mm (22.0")
B5 (ISO)	176 mm (6.9")	250 mm (9.8")
B4 (ISO)	250 mm (9.8")	353 mm (13.9)"

- ❑ Paper Thickness :0.065 mm (0.0025") to 0.11 mm (0.004")
- ❑ Paper Weight :64 g/ m^2 (17 lb.) to 90 g/ m^2 (24 lb.) (ASF)
  :52 g/ m^2 (14 lb.) to 90 g/ m^2 (24 lb.) (Manual insertion)
- ❑ Quality :Exclusive paper *[2], Bond paper, PPC

Note) 1. A2 portrait and US-C portrait are used by manual insertion only.
2. Be sure to use the designated side of exclusive paper.

1.2.5.2 Transparency

Table 0-6. Transparency Size

Size	Width	Length
A4	210 mm (8.3")	297 mm (11.7")
Letter	215.9 mm (8.5")	279.4 mm (11.0")

- ❑ Paper thickness :0.075 mm (0.003") to 0.085 mm (0.0033")

Note) Transparency printing is only available at normal temperatures.
Transparency paper must be printed on the designated side.

1.2.5.3 Envelope

Table 0-7. Envelope Size

Size	Width	Length
No.10	241.3 mm (9 1/2")	104.8 mm (4 1/8")
DL	220 mm (8.7")	110 mm (4.3)
C5	229 mm (9")	162 mm (6.4)

- ❑ Paper Thickness :0.16 mm (0.006") to 0.52 mm (0.02")
- ❑ Paper Weight :45 g/m^2 (12 lb.) to 90 g/ m^2 (24 lb.)
- ❑ Quality :Bond paper, Plain paper, Air mail

Note) Envelope printing is only available at normal temperatures.
Place the longer side of the envelope horizontally when setting.

1.2.5.4 Index Card

Table 0-8. Index Card Size

Size	Width	Length
A6 index card	105 mm (4.1")	148 mm (5.82")

- ❑ Card Thickness :0.23 mm (0.0091")

1.2.5.5 Labels (Cut Sheet)

Table 0-9. Label Size

Size	Width	Length
A4	210 mm (8.3”)	297 mm (11.7”)
Letter	216 mm(8.5”)	279 mm (11.0”)

- ❑ Paper thickness :0.2 mm (0.0079”) including base sheet
- ❑ Quality :Page printer label

Note) Label must be printed at normal room temperature.

1.2.5.6 Continuous Paper

- ❑ Paper size :Paper width 101.6 mm (4”) to 406.4 mm (16”)
  :Folding length 101.6 mm (4”)
- ❑ Paper thickness :0.065 mm (0.0026”) to 0.11 mm (0.0043”)
- ❑ Paper Weight :52 g/ m^2 (14 lb.) to 82 g/ m^2 (22 lb.)

1.2.5.7 Labels (Continuous)

- ❑ Paper size
  - Base sheet :Paper width 101.6 mm (4”) to 406.4 mm (16”)
    :Folding length 101.6 mm (4”)
  - Label :Width 63.5 mm (2.5”)
    :Length 23.9 mm (0.94”)
- ❑ Paper thickness :0.2 mm (0.0079”) or less including base sheet
  :0.12 mm (0.0047”) or less without base sheet
- ❑ Quality :Plain paper

Note) Label (continuous) must be printed under normal room temperatures.

1.2.5.8 Banner

- ❑ Size :Width :210 mm (8.32) to 432 mm (17.0”)
  :Length :5.0 m or less (196.9”)
- ❑ Thickness :0.08 mm (0.0031”) to 0.1 mm (0.0039”)
- ❑ Weight :64 g/m^2 (17 lb.) to 82 g/ m^2 (22 lb.)
- ❑ Quality :Plain paper

1.2.6 Printable Area

❑ Cut Sheet

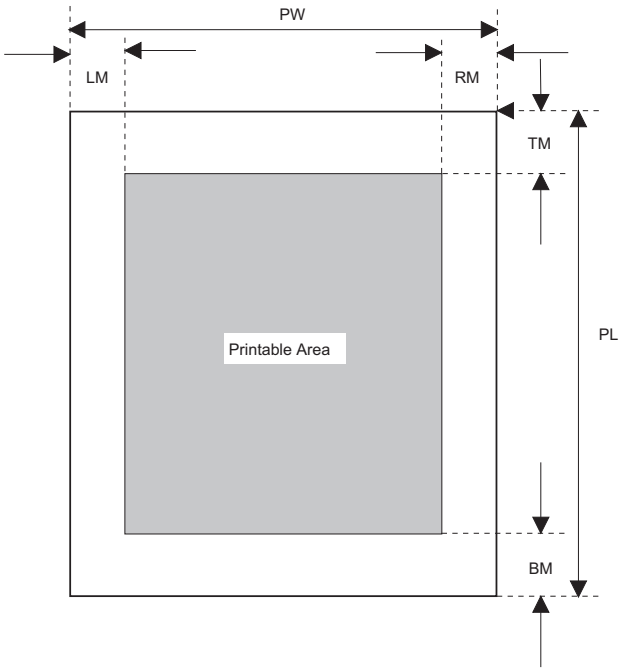


Figure 0-3. Printable Area for Cut Sheet

Table 0-10. Minimum Margins for Different Cut Sheet Sizes

PW (Paper Width)	LM (Left Margin)		RM (Right Margin)		TM (Top Margin)	BM (Bottom Margin)
	Set to right edge	Set to left edge	Set to right edge	Set to left edge		
A4 297 mm (11.87”)	3 mm (0.12”)	3 mm (0.12”)	3 mm (0.12”)	3 mm (0.12”)	3 mm (0.12”)	14 mm (0.54”)
Legal (L) 356 mm (14.0”)	3 mm (0.12”)	5 mm (0.20”)	5mm (0.20”)	3 mm (0.12”)	3 mm (0.12”)	14 mm (0.54”)
B4 (L) 364mm (14.3”)	3 mm (0.12”)	16 mm (0.51”)	16 mm (0.51”)	3 mm (0.12”)	3 mm (0.12”)	14 mm (0.54”)
A3 (L) 420 mm (16.5”)	13 mm (0.51”)	25 mm (0.98”)	62 mm (2.32”)	50 mm (1.85”)	3 mm (0.12”)	14 mm (0.54”)
Ledger (L) 432 mm (17.0”)	25 mm (0.98”)	25 mm (0.98”)	62 mm (2.32”)	62 mm (2.32”)	3 mm (0.12”)	14 mm (0.54”)

Note) 1. (L) : When the paper is placed in landscape orientation.
2. Printable are of label (cut sheet) is as same as cut sheet.

- Envelope

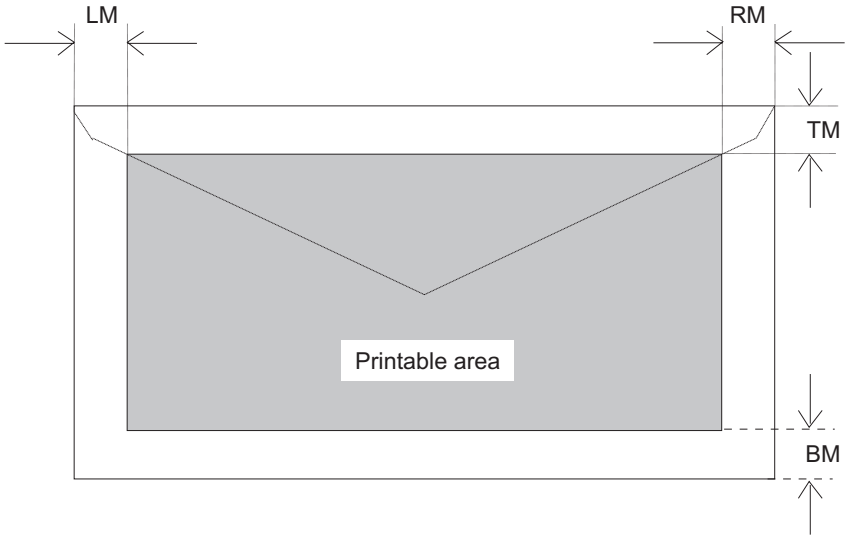


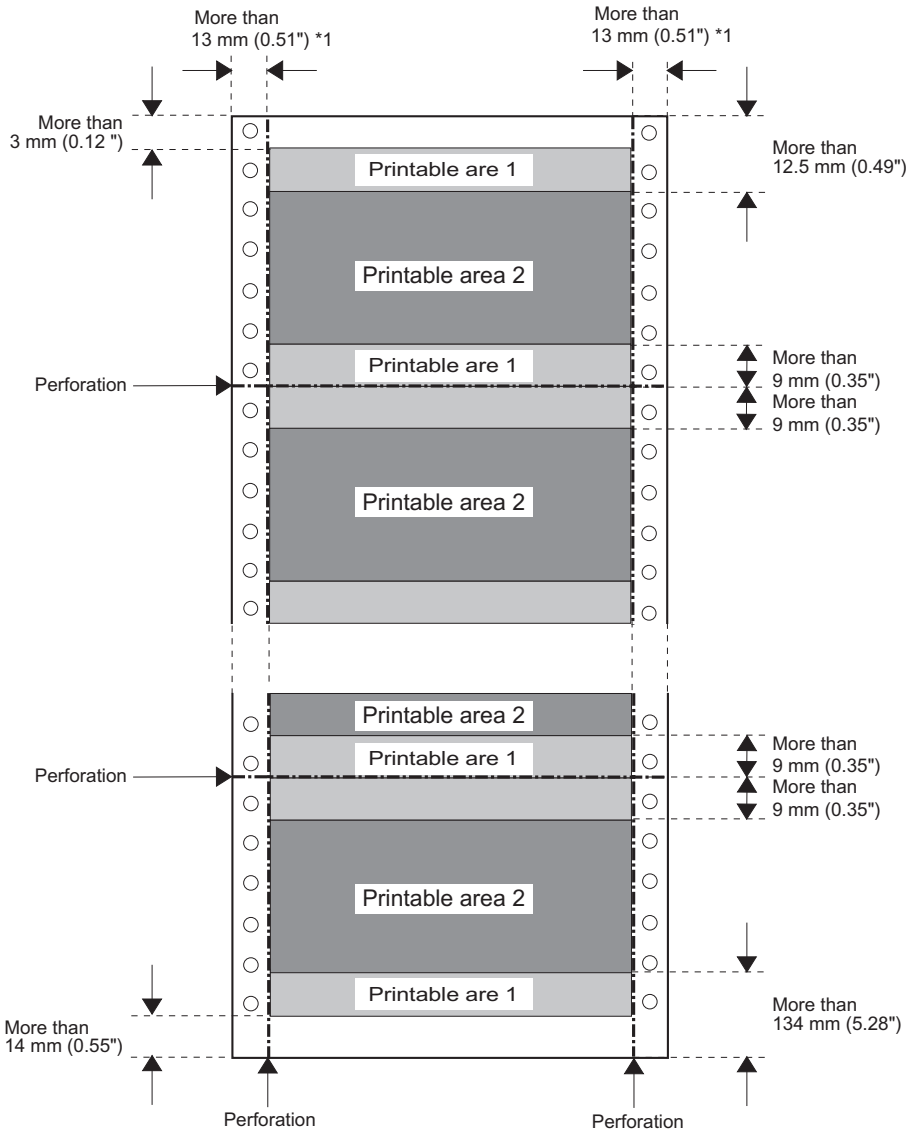
Figure 0-4. Printable Area for Envelopes

Table 0-11. Minimum Margin for Envelope

LM (Left Margin) (minimum)	RM (Right Margin) (minimum)	TM (Top Margin) (minimum)	BM (Bottom Margin) (minimum)
3 mm (0.12”)	3 mm (0.12”)	3 mm (0.12”)	14 mm (0.55”)

❑ Continuous Paper

Note) 1. Printable area of label (continuous) is as same as for continuous paper.
2. Base sheet of label (continuous) is not within the printing area.



Printable Area 1: Paper feed pitch is not guaranteed in this area.

Printable Area 2: Paper feed pitch is guaranteed in this area.

Perforation

*1 : When the paper width is more than 406.4 mm (16"), this width is more than 38 mm (1.50").

Figure 0-5. Printable Area for Continuous Paper

1.2.7 Adjust Lever

The adjust lever , located at the left and upper side of the printer , is used to adjust the gap between the paper and platen. The adjust lever must be set to the proper position the paper type in order to prevent the paper from smudging.

Table 0-12. Adjust Lever Position

Paper Type	Lever Position	Platen Gap Adjustment Value
Cut sheet Transparency Continuous paper Index card	Far side (0)	0 mm
Envelopes	Near side (+)	+ 0.7 mm

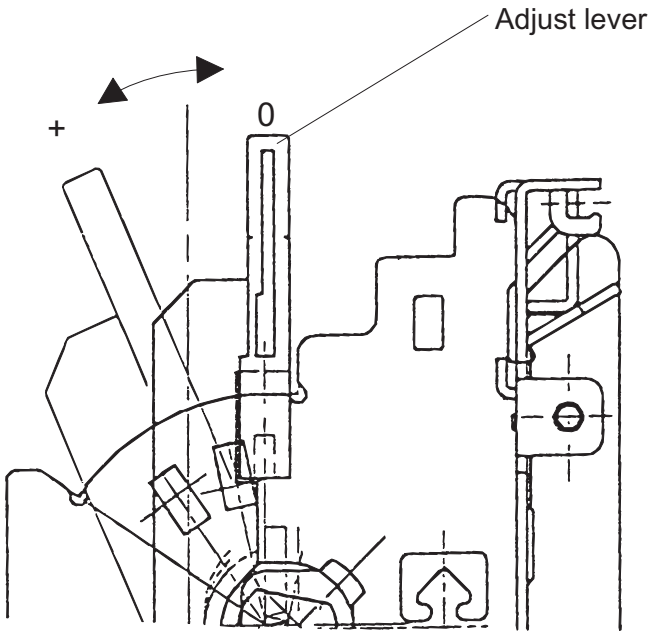


Figure 0-6. Adjust Lever Settings

1.2.8 Ink Specification

1.2.8.1 Black ink cartridge

Table 0-13. Black Ink Cartridge Specifications

Black Ink Cartridge	
Type	Exclusive ink cartridge
Color	Black
Print capacity	900 pages / A4 (ISO/IEC10561 Letter Pattern at 360 dpi)
Ink life	2 years from indicated production date
Storage Temperature	At storage : -20 •• to 40 •• *1 At packing storage : -30 •• to 40 •• *1 At transit (Packed) : -30 •• to 60 •• *1 *2
Dimension	30 mm (W) X 58 mm (D) X 38.5 mm (H) (1.22” X 2.36” X 1.57”)

*1 : Within a month at 40 ••

*2 : Within 120 hours at 60 •• for more than 120 hours.

1.2.8.2 Color ink cartridge

Table 0-14. Color Ink Cartridge Specifications

Color Ink Cartridge	
Type	Exclusive ink cartridge
Color	Magenta, Cyan, Yellow
Print capacity	300 pages A4 (at 360 dpi, 5 % duty each color)
Ink life	2 years from indicated production date
Storage Temperature	At storage : -20 •• to 40 •• *1 At packing storage : -30 •• to 40 •• *1 At transit (Packed) : -30 •• to 60 •• *1 *2
Dimension	42.9 mm (W) X 56.5 mm (D) X 38.5 mm (H) (1.75”X 2.30” X 1.57”)

*1 : Within a month at 40 •• for more than a month.

*2 : Within 120 hours at 60 •• for more than 120 hours.

Note)

1. *The cartridge must not be refilled. Only ink cartridge is prepared for article of consumption.*
2. *Do not used the cartridge that has exceeded the ink life.*
3. *When the ink is frozen under -4°C, leave it for more than 3 hours at the room temperature to defrost before using.*

1.2.9 Input Data Buffer

- Input data buffer :64 Kbytes

1.2.10 Electric Specifications

- 120 V version
  - Rated voltage :AC 120 V
  - Input voltage range :AC 103.5 to 132 V
  - Rated frequency renege :50 to 60 Hz
  - Input frequency range :49.5 to 60.5 Hz
  - Rated current :0.7 A (maximum)
  - Power consumption :Approximately 21 W (ISO/IEC 10561 Letter pattern)
    Conforms to Energy Star program
  - Insulation resistance :10 M ohms min. (Between AC line and chassis, DC 500 V))
  - Dielectric strength :AC 1,000 V rms. (1 minute) or AC 1,200 V rms. (1 second)
    (Between AC line and chassis)

- 220 - 240V version
  - Rated voltage :AC 220 to 240 V
  - Input voltage range :AC 198 to 264 V
  - Rated frequency renege :50 to 60 Hz
  - Input frequency range :49.5 to 60.5 Hz
  - Rated current :0.4 A (maximum)
  - Power consumption :Approximately 21 W (ISO/IEC 10561 Letter pattern)
    Conforms to Energy Star program
  - Insulation resistance :10 M ohms min. (Between AC line and chassis, DC 500 V)
  - Dielectric strength :AC 1,500 Vrms. (1 minute) (Between AC line and chassis)

1.2.11 Environmental Conditions

- Temperature
  - Operating*1 :10•• to 35••
  - Non operating*2 :-20•• to 40•• (1 month at 40••)
    -20•• to 60•• (120 hours at 60••)
- Humidity
  - Operating*1 *3 :20% to 80% RH (without condensation)
  - Non operating*2 *3 :5% to 85% RH (without condensation)
- Resistance to vibration
  - Operating :0.15 G
  - Non-operating*2 :0.50 G
- Resistance to shock
  - Operating :1 G within 1 ms
  - Non-operating*2 :2 G within 2 ms

*1 :Refer to the table below for guaranteed range.
*2 :In shipment container.
*3 :Without condensation

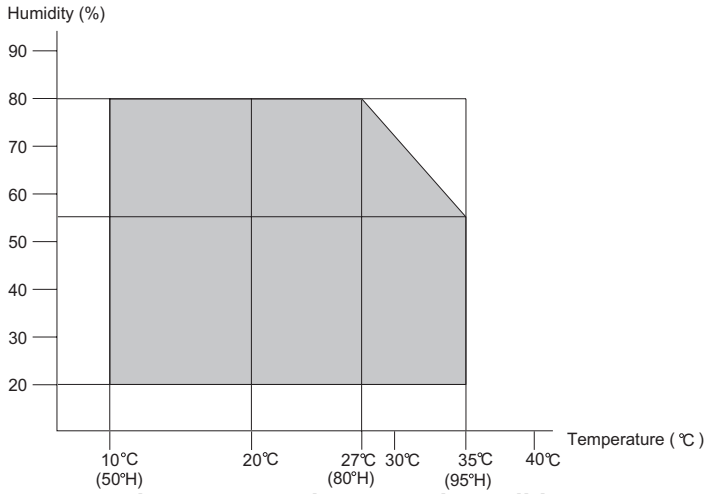


Figure 0-7. Environmental Conditions

1.2.12 Reliability

- Total print volume :75,000 pages (A4/Lletter)
- Print head life :2,000 million dots /nozzle

1.2.13 Safety Approvals

- 120 V version
  - Safety standards :UL1950 with D3
    CSA22.2 No. 950 with D3
  - EMI :FCC part15 subpart B class B
- 220 - 240 V version
  - Safety standards :EN 60950 (TÜV, NEMKO)
  - EMI :EN 55022 (CISPR Pub.22) class B
    :AS/NZS 3548 class B)

1.2.14 CE Marking

- 220 - 240 V version
  - 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

1.2.15 Acoustic Noise

- Noise level :Approximately 45 dB (A) (According to ISO 7779)

1.3 Interfaces

1.3.1 Parallel Interface

1.3.1.1 Forward Channel Specifications

- ❑ Transmission mode :8 bit parallel , IEEE-P1284 compatibility mode
- ❑ Synchronization :/STROBE pulse
- ❑ Handshaking :BUSY and /ACKNLG signal
- ❑ Signal level :TTL compatible level (IEEE-P1284 Level 1 device)

Table 0-15. Signal level of TTL Compatible (IEEE-1284 level 1 device)

Parameter	Minimum	Maximum	Condition
VOH*	-	5.5 V	
VOL*	-0.5 V	-	
IOH*	-	0.32 mA	VOH = 2.4 V
IOL*	-	12 mA	VOL = 0.4 V
CO	-	50 pf	
VIH	-	2.0 V	
VIL	0.8 V	-	
IIH	-	0.32 mA	VIH = 2.0 V
IIL	-	12 mA	VIL = 0.8 V
CI	-	60 pf	

*Note) * : A low logic level on the Logic H signal is as follows:*
2.0 V or less when the printer is powered off.
3.0 V or more when the printer is powered on.
The receiver shall provide an impedance equivalent to 7.5 K ohm top ground.

- ❑ Adaptable connector :57-30360 (Amphenol) or equivalent

The BUSY signal is set high before setting either /ERROR low or PE high and held high until all these signals return to the inactive state.
The BUSY signal is at high level in the following cases:

- During data entry (see Figure 0-8. Data Transmission Timing below.)
- When the input data buffer is full
- While /INIT signal is at low level or during hardware initialization
- During a printer error condition (See /ERROR signal)
- During test printing
- When the printer is in default setting mode
- When the parallel interface is not selected

The ERROR signal is at low level when one of the following errors has occurred:

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

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

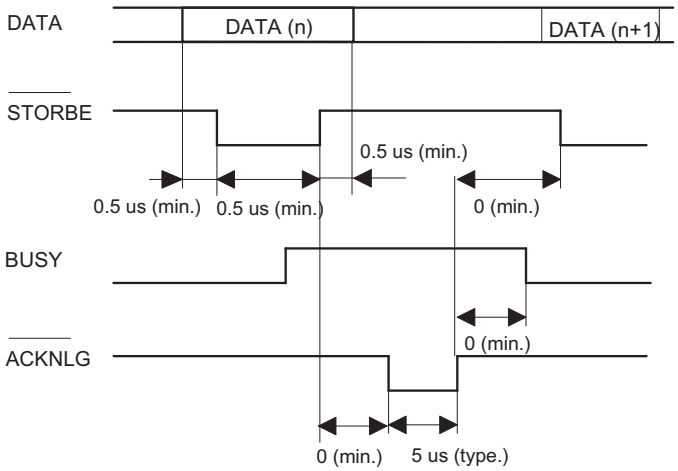


Figure 0-8. Data Transmission Timing

Table 1-16 shows the connector pin assignment and signals for forward channel of the parallel interface.

Table 0-16. Data Transmission Timing

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	-	-
tack	500 ns	10 us
tnbusy	0	-
tnext	0	-

*Note) * : Rises and falls in time of every output signals.*
***: Rises and falls in time of every input signal.*

Table 0-17. Connector Pin Assignments and Signals (Forward Channel)

Pin No.	Signal Name	Return GND Pin	I/O	Description
1	/STROBE	19	I	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2-9	DATA 0-9	20-27	I	The data 0 to data 7 signals represent data bits 0 to 7, 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	When this signal is at high level, the printer is not ready to accept data.
12	PE	28	O	When this sign is at high level, the paper empty status is detected.
13	SLCT	28	O	Always at high level when the printer is powered on.
14	/AFXT	30	I	Not used.
31	/INIT	30	I	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50 us pulse is necessary.
32	/ERROR	29	O	When the printer detects an error, this signal goes low.
36	/SLIN	30	I	Not used.
18	Logic H	-	O	Pulled up to +5V via 3.9 K ohm resistor.
35	+5V	-	O	Pulled up to +5V via 3.3 K ohm resistor.
17	Chassis GND	-	-	Chassis ground.
16,33,19-30	GND	-	-	Signal ground.
15,34	NC	-	-	Not connected.

*Note) 1. */* at the beginning of a signal means active low.*
2. The I/O column indicates the diction of the signal as viewed form the printer.

1.3.1.2 Reverse Channel Specifications

- ❑ Transmission mode :IEEE-1284 nibble mode
- ❑ Adaptable connector :Same as for the forward channel
- ❑ Synchronization :Refer to the IEEE-1284 specification
- ❑ Handshaking :Refer to the IEEE-1284 specification
- ❑ Data transmission timing :Refer to the IEEE-1284 specification
- ❑ Signal level :IEEE-1284 level 1 device
  See the forward channel specification.

Table 1-18 shows the connector pin assignment and signals for reverse channel of the parallel interface.

Table 0-18. Connector Pin Assignment and Signals (Reverse Channel)

Pin No.	Signal Name	Return GND Pin	I/O	Description
1	HostClk	19	I	Clock signal from the host computer.
2-9	DATA 0-7	20-27	I	These signals represent parallel data information on bits 2 to 9.Each signal is High when the data is logical 1 and low when the data is logical 0.
10	PtrClk	28	O	Clock signal from the printer
11	PtrBusy / Data bits 3,7	29	O	Busy signal from the printer. Data bit 3 or 7 in reverse channel.
12	AckDatareq / AckData Bits 2,6	28	O	Acknowledge request signal. Data bit 2 or 6 in reverse channel.
13	Xflag/Data bit 1,5	28	O	X flag signal. Data bit 1 or 5 in reverse channel.
14	HostBusy	30	I	Busy signal from the host computer
31	/INIT	30	I	Not used
32	/Data Avail / Data bits 0,4	29	O	Data available signal. Data bit 0 or 4 in reverse channel.
36	1284-Active	30	I	1284 active signal.
18	Logic-H	-	O	Pulled up to +5V via 3.9 K ohm resistor.
35	+5V	-	O	Pulled up to +5V via 3.3 K ohm resistor.
17	Chassis GND	-	-	Chassis ground for the printer.
16,33,19-30	GND	-	-	Signalground.
15,34	NC	-	-	Not connected.

*Note) The symbol */* at the beginning of a signal means active low.*

- ❑ Extensibility Request
  The printer responds affirmatively when the extensibility request values are 00H or 04H, as follows:
  00H :Request Nibble Mode Reverse Channel Transfer.
  04H :Request Device ID;
  Return Data Using Nibble Mode Rev Channel Transfer.
- ❑ Device ID
  The printer sends following device ID string when it is requested.
  [00H] [xxH]
  MFG :EPSON;
  CMD :ESCP2E, PRPXL;
  MDL :Stylus COLOR 1520;
  CLS :PRINTER

Note) [00H] denotes a hexadecimal values of zero.

1.3.2 Mac Serial Interface

1.3.2.1 Serial Interface Specifications

- ❑ Standard :RS-423 compliance
- ❑ Synchronization :Synchronous
- ❑ Bit rate :Approximately 900 Kbps, 1.8 Mbps
- ❑ Word format :Start bit 1 bit
  :Data bit 8 bit
  :Parity bit No parity bit
  :Stop bit 1 bit
- ❑ Handshaking :X-ON/XOFF, DTR protocol
- ❑ Adaptable connector :8-pin mini circular connector
- ❑ Recommended I/F cable :Apple System Peripheral-8 cable

Table 0-19. Connector Pin Assignment for Serial Interface

Pin No.	Signal Name	I/O	Function Description
1	SCLK	O	Synchronous clock
2	CTS	I	Clear to send
3	TxD-	O	Transmit data -
4	S.G.	I	Signal Ground
5	RxD-	I	Receive data -
6	TxD+	O	Balanced Transmit +
7	DTR	O	Data terminal ready
8	RxD+	I	Balanced Receive +

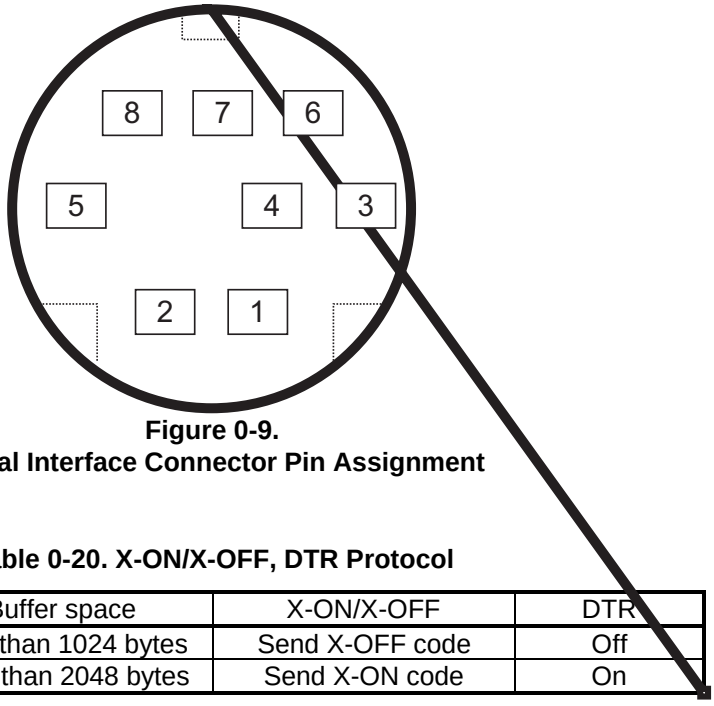


Figure 0-9.
Serial Interface Connector Pin Assignment

Table 0-20. X-ON/X-OFF, DTR Protocol

State	Buffer space	X-ON/X-OFF	DTR
Busy	Less than 1024 bytes	Send X-OFF code	Off
Ready	More than 2048 bytes	Send X-ON code	On

1.3.3 Optional Interface

The EPSON Stylus COLOR 1520 supports an optional Type-B interface (Level 2) with the following characteristics.

- Reply message
  - When ESC/P2 is selected:
    Main type :MTP48p, PW136cl10cpi, PRG(W0xxxx)rev, AP800ma, SPD0fast
    Product name :Stylus COLOR 1520
    Emulation type :ESCPL2-00
    Entity type :EPSONLQ2
  - When X24E is selected:
    Main type :MTP48p, PW136cl10cpi, PRG(W0xxxx)rev, AP800ma, SPD0fast
    Product name :Stylus COLOR 1520
    Emulation type :PRPXL24-00
    Entity type :EPSONPRPXL24

Table 0-21.Reply for Option Command

Option command No.	command name	Reply-A	Reply-B
00h	No Operation	Accept	None
01h	Start Hard Ware Reset	Accept	Excute OK
02h	Start Soft Ware Reset	Reject	
03h	Send Main System Type	Accept	
04h	Send Name Data	Reject	
05h	Inquire Name Data	Accept	
06h	Send Product Name	Accept	
07h	Send Soft Ware Emulation Type	Accept	
08h	Complete Buffered Data	Accept	Check Condition
09h	Stop Procedure	Reject	Execute OK
0Ah	Return Buffered Data	Reject	
0Bh	Send Entity Type	Accept	
0Ch	Send Status	Accept	
0Dh	Quit Procedure	Reject	
0Eh	Inquire ASCII Message	Reject	
0Fh	Send ASCII Message	Accept	None
10h - 13h		Unknown	None
14h	Inquire Emergency Message	Accept	Execute OK
15h	Send Emergency message	Accept	
16h - 1Fh		Unknown	None
20h - FFh		Reserved	None

Table 0-22. Supported Main Command and Sending Timing

Main Command No.	Command name	Sending Timing
01h	Start Software Reset	■/INIT signal on the std. parallel I/F ■Type-B I/F option command : 01h ■Cold Start
04h	Send Name Data	■Type-B I/F command : 05h
07h	Inquire Software Emulation Name	■Changing software Emulation Type
0Eh	Inquire ASCII Message	■Writing to DBIN register
14h	Inquire Emergency Reply	■Reply for Emergency command
15h	Send Emergency Message	■Receive Emergency Command

- Emergency Command
  0X00 :Get device ID
  0X01 :Get all status
- Sending BDC-ST through DBIN register
  When State-Reply is set “ON”, by ST from Type-B I/F, sending BDC-ST through DBIN register is started. When State-Reply is started, “Start” and “End” of BDC-ST characters are announced by sending the Main command 0Eh.

1.3.4 Prevention Hosts from Data Transfer Time-out

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from this kind of time-out, the printer receives data very slowly, several bytes par minute, even the printer is in busy state. This slowdown starts when the rest of input buffer drops under several hundreds of bytes. Finally, the printer is in the busy state continuously when the input buffer is full.

1.3.5 Interface Selection

The EPSON Stylus COLOR 1520 has three types of interface available :Parallel, Serial, and optional interfaces. Each interface can be selected manually or automatically. Both modes are selected thorough the default setting mode.

- Manual selection
  The interface selected through the default setting mode always prints out data from the host.

- Automatic selection
  When the printer is in this mode, the printer is initialized to the idle state when it is turned on. Then the interface that receives data first will print. When the host stops data transfer and the printer is in the stand-by state for the specific time, the printer returns to the idle state. As long as the host sends data or the printer interface is buy state, the selected interface remains active.

Interface State and Interface Selection
When the parallel interface is not selected, the interface goes into the busy state. When the serial interface is not selected, the interface sets the DTR signal MARK. When the printer is initialized or returned to the idle state, the parallel interface goes into the ready state and the serial interface sets the DTR signal SPACE. Caution that the interrupt signal such as the /INIT signal on the parallel interface is not effective while that interface is not selected.

1.3.6 Printer language and Control Codes

- Printer languages and control codes :ESC/PC
  :IBM X24E
  :EPSON Remote

1.4 Operation

This section describes the controls, settings and adjustment used to operate the EPSON Stylus COLOR 1520.

1.4.1 Control Panel

The control panel of this printer consists of 6 non-lock push switches, 1 lock type push switch, and 6 LED indicators for easy operation of the various printer functions. Refer to Figure 0-10 for button and LEDs descriptions and how they are arranged.

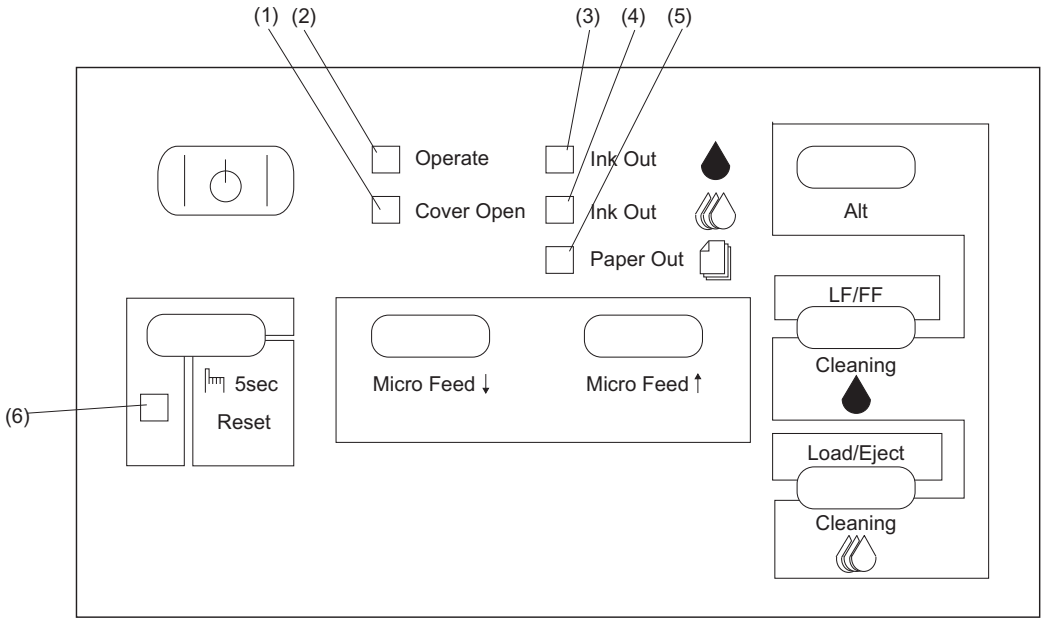


Figure 0-10. Control Panel Appearance

- Indicators
  - (1) Cover Open
  - (2) Operate
  - (3) Ink Out (Black)
  - (4) Ink Out (Color)
  - (5) Paper Out
  - (6) Pause

❑ Panel Functions :The function of each button is described below.

l/ ■ **Power** Function :Turns the printer off or on *[1].
Available condition :Always

■ **Load/Eject** Function :Loads and ejects the paper.
Available condition :Pause/Stand-by

■ **LF/FF** Function :Feeds one line or page.
Available conditions :Pause / Stand-by

■ **Pause** Function :Alternates the printer state between printing and non-printing.
Available conditions :Pause / Stand-by

Function : Pressing this button for 3 seconds resets the printer.
Available condition :Pause / Stand-by

■ **Micro-adjust ↑** Function :Feeds paper forward and is used to execute TOF adjustment *[2] and Tear off adjustment *[3].
Available conditions :Pause / Stand-by

■ **Micro-adjust ↓** Function :Feeds paper backward and performs TOF adjustment *[2] and Tear off adjustment *[3].
Available conditions :Pause / Stand-by

■ **Cleaning (Black)**
Function :Executes the black ink cartridge cleaning.
Available condition :Pause

■ **Cleaning (Color)**
Function :Executes the color ink cartridges cleaning.
Available condition :Pause

■ **Alt** Function :Enters ink cartridge change mode. Pressing this button for 3 seconds moves the ink cartridge to the position to be replaced.
Available conditions :Pause / Ink out

Note)

1. *Before the printer power is off, the printer executes the capping function.*
2. *When the micro adjust is performed at the TOF (Top Of Form position) for the ASF manual and tractor feed, the new setting is stored in the corresponding address in the EEPROM.*
3. *When the micro adjust is performed at the tear off position, the new setting is stored in the corresponding address in the EEPROM*

⚠CAUTION

☑ *The power switch is connected to the secondary side of the electrical circuit. Since it has a delay circuit, voltage is still applied for the specified period of time after the printer power is off.*

☑ *As long as the printer is plugged in, voltage is applied to the primary side of the electrical circuit. Therefore be sure to unplug the printer before servicing or replacing the interface.*