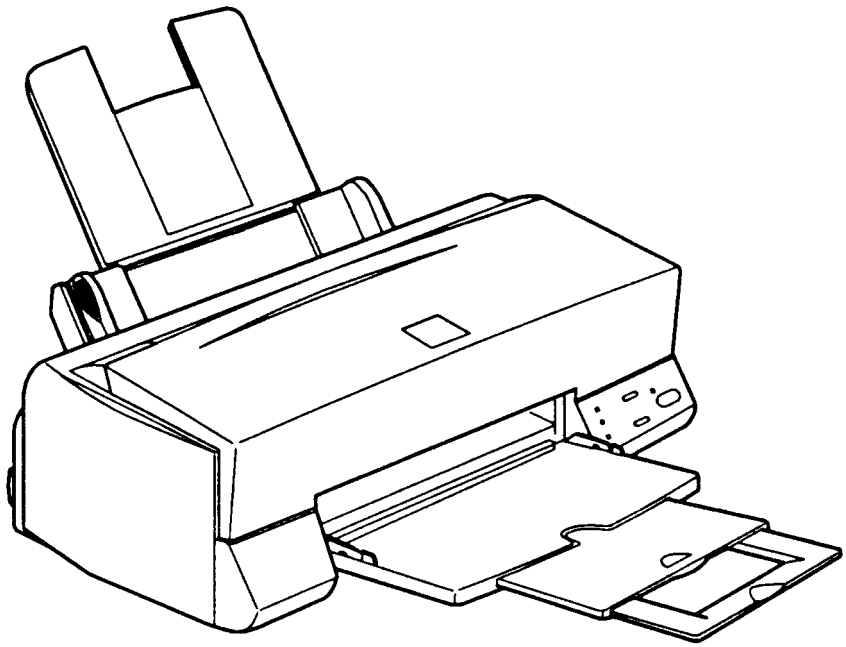
EPSON

COLOR INK-JET PRINTER

EPSON Stylus Color 600

SERVICE MANUAL



SEIKO EPSON CORPORATION

4007367

NOTICE

- All rights reserved. Reproduction of any part of this manual in any form whatsoever without SEIKO EPSON's express written permission is forbidden.
- The contents of this manual are subjects to change without notice.
- All efforts have been made to ensure the accuracy of the contents of this manual. However, should any errors be detected, SEIKO EPSON would greatly appreciate being informed of them.
- The above notwithstanding SEIKO EPSON can assume no responsibility for any errors in this manual or the consequences thereof.

EPSON is a registered trademark of SEIKO EPSON CORPORATION.

General Notice:

Other product names used herein are for identification purposes only and may be trademarks or registered trademarks of their respective companies.

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 EPSON Stylus Color 600.

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 20,1997	First issue

TABLE OF CONTENTS

Chapter 1
Product Descriptions

1.1 Features

EPSON Stylus Color 600 is designed for low price for that high performance. The major printer features are;

- High color print quality
  - 1440(H) x 720(V) dpi printing
  - Standard 4 color printing (CMY+Bk)
  - Traditional and New Microwave control to eliminate banding

- Built-in auto sheet feeder
  - Holds 100 cut-sheets (64g/‡u)
  - Holds 10 envelopes
  - Holds 10 transparency films
  - Holds 65 special papers

- High-speed print
  - 200cps (at LQ/10CPI; No-Draft mode)
  - By driving the printhead at frequency; 14.4KHz, printing speed is twice faster than Stylus Color.

- Compact size
  - Non-operating : 429mm(W) x 275mm(D) x 168mm(H)
  - Operating : 429mm(W) x 613mm(D) x 309mm(H)
  - Weight : 5.2Kg (without cartridge)

- Acoustic noise
  - Approximately 47dB(A)

- Two built-in standard I/F
  - Bi-directional Parallel I/F (IEEE-1284 level 1 device)
  - Serial I/F (Macintosh-compatible / up to 900Kbps)

The table below shows consumable for EPSON Stylus Color 600.

Table 1-1 Available Consumable

Item	Code	Remark
Black Ink Cartridge	S020093	Color: Black
Color Ink Cartridge	S020089	Color: Cyan/Magenta/Yellow
EPSON 360 dpi Ink Jet Paper	S041025	Size: A4(200 sheets)
EPSON 360 dpi Ink Jet Paper	S041059	Size: A4(100 sheets)
EPSON 360 dpi Ink Jet Paper	S041060	Size: Letter(100 sheets)
Photo Quality Ink Jet Paper	S041026	Size: A4(200 sheets)
Photo Quality Ink Jet Paper	S041061	Size: A4(100 sheets)
Photo Quality Ink Jet Paper	S041062	Size: Letter
Photo Quality Ink Jet Paper	S041067	Size: Legal
Photo Quality Glossy Paper(New Release)	S041126	Size: A4
Photo Quality Glossy Paper(New Release)	S041124	Size: Letter
Photo Quality Glossy Film	S041071	Size: A4
Photo Quality Glossy Film	S041072	Size: Letter
Photo Quality Glossy Film	S041107	Size: A6
Ink Jet Transparencies	S041063	Size: A4
Ink Jet Transparencies	S041064	Size: Letter
Photo Quality Ink Jet Card	S041054	Size: A6
Photo Quality Ink Jet Card	S041121	Size: 5 x 8 inches
Photo Quality Ink Jet Card	S041122	Size: 10 x 8 inches
Photo Quality Self Adhesive Sheet	S041106	Size: A4

1.2 Specifications

This section describes the product specifications for EPSON Stylus Color 600.

1.2.1 Printing Specification

- Print method
  - On-demand color ink jet printing
- Nozzle configuration
  - Black: 64 nozzles (32 nozzles x2 staggered / Nozzle pitch = 180dpi/vertical)
    Color: 32 nozzles (per color (CMY) / Nozzle pitch = 90dpi/vertical)
- Print Direction
  - Bi-directional printing with logical seeking for text and graphics
- Print Buffer: 32KBytes
- Print speed and Printable Columns

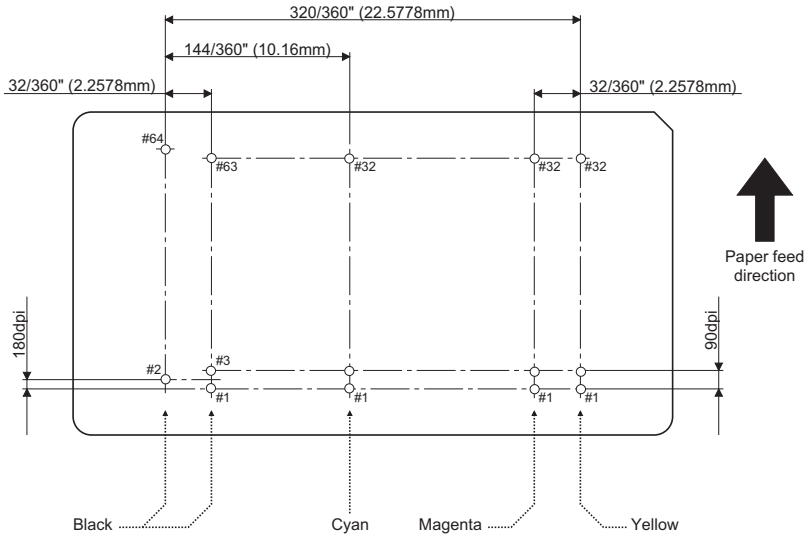
Table 1-2 Print Speed (Text Mode)

Character Pitch	Printable Column	Draft Speed (CPS)	LQ Speed (CPS)
10 CPI (Pica)	80	400	200
12 CPI (Elite)	96	480	240
15 CPI	120	600	300
17 CPI (Pica Condensed)	137	684	342
20 CPI (Elite Condensed)	160	800	400

Table 1-3 Print Speed (Raster Graphics Mode)

Horizontal Resolution	Printable Area	Available Dot	CR Speed (IPS)
180 dpi	8.26 inch	1488	20
360 dpi	8.26 inch	2976	20
720 dpi	8.26 inch	5952	20

- Nozzle arrangement: See figure below.



**Viewed from the back of the head*

Figure 1-1. Nozzle Layout

- Paper Feeding Method
  - Friction feed with built in ASF (Auto Sheet Feeder)

- Line Spacing
  - 1/6 inch or programmable at 1/360 inch

- Paper Path
  - Top entry (from ASF) only

- Feeding Speed
  - 66.6 ms (at 1/6 inch line-feed)
  - 3.0 inch/sec (76.2 mm/sec / at continuous-feed)

- ASF Capacity
  - Size :Index card to Legal
  - Thickness *1 :Less than 8mm
  - Paper capacity *2 :Normal cut sheets =100 sheets (64g/m^2)
    :Envelops =10
    :Coated papers (360dpi) =65
    :Coated papers (720dpi) =65
    :Glossy papers *3 *4 =30
    :Transparency films *4 =30
    :Index cards *4 =30

*Notes) *1: Total thickness of paper stack on the ASF.*
**2: Those numbers above should be considered as reference. The actual paper accumulation should be considered first.*
**3: Only when the top margin is set for 30mm with A4/Letter size paper, otherwise only one sheet can be set at a time.*
**4: Specified paper must be set at the bottom of stack to ensure proper feeding operation:*

- Normal paper =Glossy paper, Transparency film
- Card Board =Index card
  (The one packed with the index card package)

- Control Code
  - ESC/P2 and expanded raster graphics code
  - EPSON Remote command

- Character Tables
  Legal and 14 international character sets
  - Standard version: 11 character tables (See Table 1-4 for details)
  - NLSP version: 19 character tables (See Table 1-4 for details)

- Typeface *1
  - Bit map LQ font: EPSON Roman (10/12/15 CPI, Proportional)
    EPSON Sans Serif (10/12/15 CPI, Proportional)
    EPSON Courier (10/12/15 CPI)
    EPSON Prestige (10/12/15 CPI)
    EPSON Script (10/12/15 CPI)
  - Scaleable font: EPSON Roman (10.5 pt, 8 to 32 pt (every 2 pt))
    EPSON Sans Serif (10.5 pt, 8 to 32 pt (every 2 pt))
    EPSON Roman T (10.5 pt, 8 to 32 pt (every 2 pt))
    EPSON Sans Serif H (10.5 pt, 8 to 32 pt))

*Note) *1: Each typeface has four different font style; Normal, Bold, Italic and Bold-Italic.*

Table 1-4 Character Table and Typeface

Version	Character Table	Bit-map Font	Scaleable Font	
Common		EPSON - ; Roman Sans Serif Courier Prestige Script	EPSON - ; Roman Sans Serif	EPSON - ; Roman T Sans Serif H
Standard	Italic PC437 (US / Standard Europe) PC850 (Multilingual) PC860 (Portuguese) PC861 (Icelandic) PC863 (Canadian-French) PC865 (Nordic) BRASCII Abicomp Roman 8 ISO Latin 1	Supported	Supported	Supported
NLSP	Italic PC437 (US / Standard Europe) PC850 (Multilingual)	Supported	Supported	Supported
	PC437 Greek PC852 (East Europe) PC853 (Turkish) PC855 (Cyrillic) PC857 (Turkish) PC866 (Russian) PC869 (Greek) MAZOWIA (Poland) Code MJK (CSFR) ISO 8859-7 (Latin/Greek) ISO Latin 1T (Turkish) Bulgaria (Bulgaria) PC774 Estonia ISO 8859-2 (ISO Latin 2) PC866 LAT	Supported	Supported	Not Supported

1.2.2 Paper Specification

This section describes the types of paper that can be used in this printer.

1.2.2.1 Cut Sheet

[Size] :A4 [Width 210mm (8.3”) x Length 297mm (11.7”)]
:Letter [Width 216mm (8.5”) x Length 279mm (11.0”)]
:B5 [Width 182mm (7.2”) x Length 257mm (10.1”)]
:Legal [Width 216mm (8.5”) x Length 356mm (14.0”)]
:Half Letter [Width 139.7mm (5.5”) x Length 215.9mm (8.5”)]
:Exclusive [Width 190.5mm (7.5”) x Length 254mm (10”)]

[Thickness] :0.08mm (0.003”) - 0.11mm (0.004”)
[Weight] :64g/m^2 (17lb.) - 90g/m^2 (24lb.)
[Quality] :Exclusive paper, Bond paper, PPC

1.2.2.2 Transparency Film / Glossy Paper

[Size] :A4 [Width 210mm (8.3”) x Length 297mm (11.7”)]
:Letter [Width 216mm (8.5”) x Length 279mm (11.0”)]
:A6 [Width 105mm (4.1”) x Length 148mm (5.8”)]

[Thickness] :0.13mm (0.005”) - 0.15mm (0.006”)
:0.17mm (0.007”) - 0.18mm (0.007”) for glossy paper

Note) Transparency printing is only available at normal temperature.

1.2.2.3 Envelope

[Size] : No.10 [Width 241mm (9 1/2”) x Length 104.8mm (4 1/8”)]
: DL [Width 220mm (8.7”) x Length 110mm (4.3”)]
: C6 [Width 162mm (6.4”) x Length 114mm (4.5”)]

[Thickness] : 0.16mm (0.006”) - 0.43mm (0.017”)
[Weight] : 45g/m^2 (12lb.) - 75g/m^2 (20lb.)
[Quality] : Bond paper, Plain paper, Air mail

Note) 1. Envelop printing is only available at normal temperature.
2. Keep the longer side of the envelope horizontally at setting.

1.2.2.4 Index Card

[Size] :A6 Index card [Width 105mm (4.1”) x Length 148mm (5.8”)]
:5x8” Index card [Width 127mm (5.0”) x Length 203mm (8.0”)]
:10x8” Index card [Width 127mm (5.0”) x Length 203mm (8.0”)]

[Thickness] :Less than 0.23mm(0.0091”)
[Weight] :188g/m^2

Note) 1. No curled, wrinkled, scuffing or torn paper be used.
2. Set the lever to the proper position according to the paper type you print. (Refer to section 1.2.3 for details)
3. Printing should be performed at room temperature in spite of the paper types.

1.2.3 Adjust Lever Settings (PG adjust lever)

The adjust lever located on the right side (blue knob) under the printer cover needs to be set to the proper position according to the paper you print (Refer to the table below). Also, if there is any dirt caused by friction on the wavy or wrinkled paper, this can be prevented by changing the lever position to rear position (marked with “+”) in spite of paper types.

Table 1-5. Adjust Lever Settings

Paper	Lever position	PG adjustment value
Normal paper, Coated paper Transparency film Label	Front	0 mm (1.1mm between head and platen)
Envelopes	Rear	0.9 mm (2.0mm between head and platen)

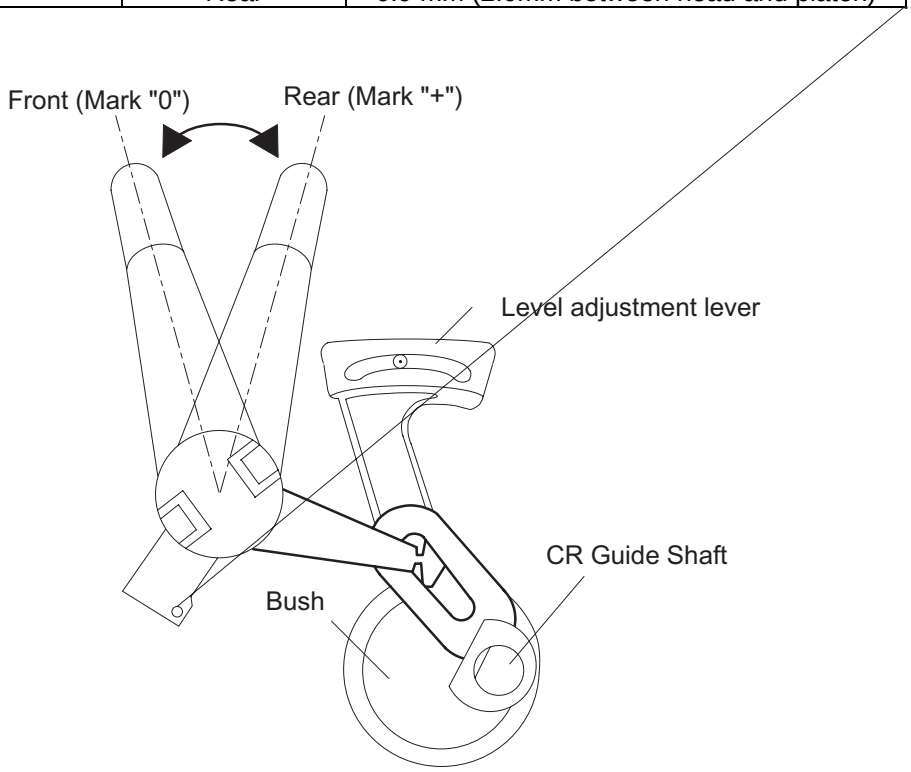


Figure 1-2. Adjust Lever Settings

1.2.4 Printable Area

1.2.4.1 Cut Sheet

Following tables show printable areas at Character mode and Raster Graphics mode.

Table 1-6. Character Table

Paper size	PW (Paper width) (typ.)	PL (Paper Length) (typ.)	LM (Left margin) (min.)	RM (Right margin) (min.)	TM (Top margin) (min.)	BM (Bottom margin) (min.)
A4	210mm(8.3”)	297mm(11.7”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Letter	216mm(8.5”)	279mm(11.0”)	3mm(0.12”)	9mm(0.35”)	3mm(0.12”)	14mm(0.54”)
B5	182mm(7.2”)	257mm(10.1”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Legal	216mm(8.5”)	356mm(14.0”)	3mm(0.12”)	9mm(0.35”)	3mm(0.12”)	14mm(0.54”)
Statement	139.7mm(5.5”)	215.9mm(8.5”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Executive	190.5mm(7.5”)	254mm(10”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)

Table 1-7. Raster Graphics Mode

Paper size	PW (Paper width) (typ.)	PL (Paper Length) (typ.)	LM Left margin) (min.)	RM (Right margin) (min.)	TM (Top margin) (min.)	BM (Bottom margin) (min.)
A4	210mm(8.3”)	297mm(11.7”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Letter	216mm(8.5”)	279mm(11.0”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
B5	182mm(7.2”)	257mm(10.1”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Legal	216mm(8.5”)	356mm(14.0”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Statement	139.7mm(5.5”)	215.9mm(8.5”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)
Executive	190.5mm(7.5”)	254mm(10”)	3mm(0.12”)	3mm(0.12”)	3mm(0.12”)	14mm(0.54”)

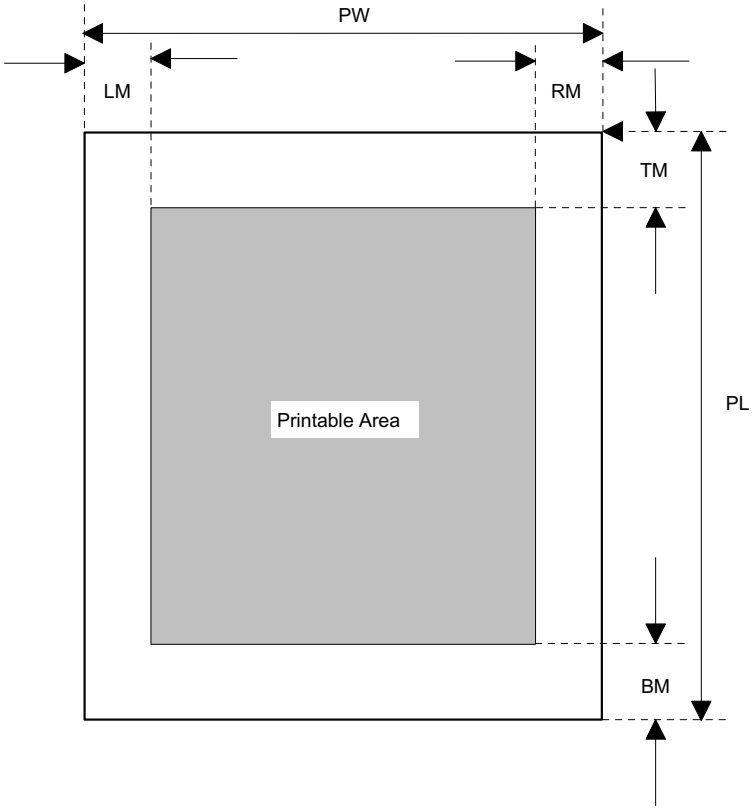


Figure 1-3. Printing Area for Cut Sheet

1.2.4.2 Envelope

The table and figure below show the printable area for envelopes.

Table 1-8. Envelope

Paper Size	LM (Left Margin) (min.)	RM (Right Margin) (min.)	TM (Top Margin) (min.)	BM (Bottom Margin) (min.)
#10	3mm (0.12”)	28mm (1.10”)	3mm (0.12”)	14mm (0.55”)
DL	3mm (0.12”)	7mm (0.28”)	3mm (0.12”)	14mm (0.55”)
C6	3mm (0.12”)	3mm (0.12”)	3mm (0.12”)	14mm (0.55”)

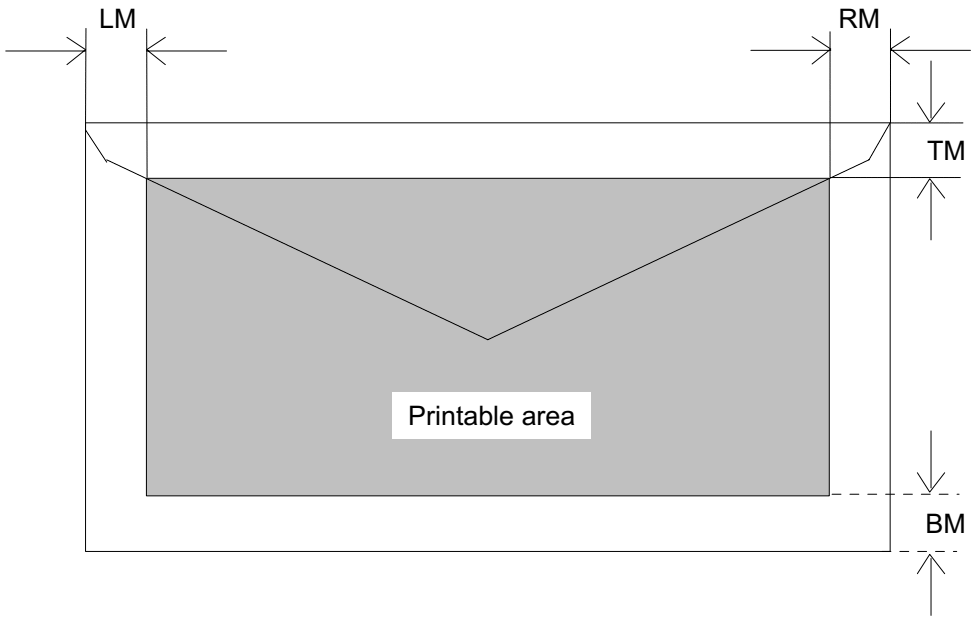


Figure 1-4. Printing Area for Envelope

1.2.5 Environmental Condition

- Temperature
  - Operating :10 - 35°C (Refer to the figure below for condition)
  - Non-operating :-20 - 60°C (with shipment container)

Note) Storage should be within one month at 40°C and 120 hours at 60°C.

- Humidity
  - Operating :20% - 80% RH
    (without condensation. Refer to the figure below for condition)
  - Non-operating :5% - 85% RH
    (without condensation and with shipment container)

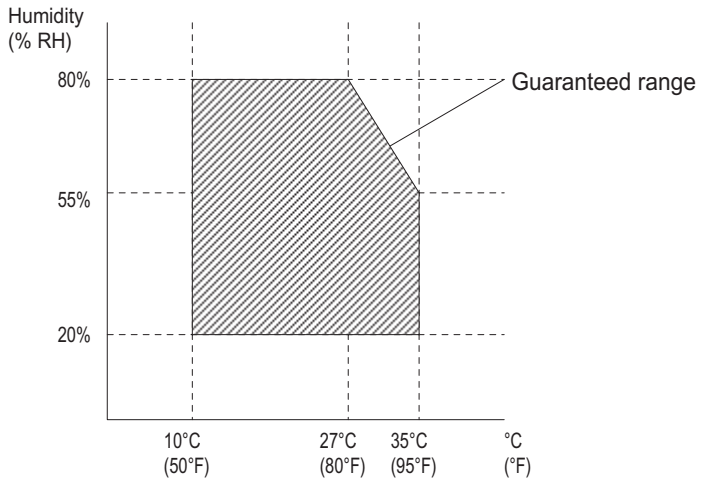


Figure 1-5. Temperature/Humidity of Range

- Resistance to shock
  - Operating :1G, within 1 ms (X,Y,Z directions)
  - Non-operating :2G, within 2 ms (X,Y,Z directions/with shipment container)

- Resistance to vibration
  - Operating :0.15G, 10•`55Hz (X,Y,Z directions)
  - Non-operating :0.50G, 10•`55Hz (X,Y,Z directions/with shipment container)

Note) 1. During non-operating, make sure that the head is capped.
2. During the transport, make sure that the head is capped and ink cartridge is installed to the printer.
3. If the head is not capped at the power-off state, turn the power on with the ink cartridge installed and turn off the power after confirming that the head is correctly capped.
4. Ink will be frozen under -4°C environment, however it will be useable after placing it more than 3 hours at 25°C.

1.2.6 Ink Cartridge Specifications

1.2.6.1 Black Ink Cartridge

Table 1-9. Black Ink Cartridge Specifications

Item	Specifications
Type	Black Ink Cartridge(Code: S020093)
Color	Black
Print capacity	540 pages / A4 (ISO/IE10561 Letter Pattern at 360 dpi)
Validity	2 years (sealed in package) / 6months(out of package)
Environmental conditions	❑ Temperature ■ Storage :-20 - 40°C (within a month at 40°C) ■ Packing storage :-30 - 40°C (within a month at 40°C) ■ Transit :-30 - 60°C (within 120 hours at 60°C and within a month at 40••) ❑ Humidity ■ 5% - 85% (without condensation) ❑ Resistance to vibration ■ Sealed in package :5 - 55Hz ■ Acceleration :Less than 29.4m/s (3G) ■ Direction :X, Y, Z direction ■ Time :1 hour ❑ Drop ■ Sealed in package: ☐ Dropping height :Less than 0.80m ☐ Direction :Drop the package facing the bottom, sides and one edge down. ■ Out of package: ☐ Dropping height :Less than 1.50m ☐ Frequency :Once
Dimension	19.8mm(W) x 52.7(D) x 38.5mm(H)
Weight	■ Total ink cartridge :54g ■ Total ink :16.4•}0.5g (Amount in the ink cartridge) ■ Consumable ink :More than 12.1g(Useable ink quantity until ink ends)

Note) 1. Ink cartridge can not re-fill, only ink cartridge is prepared for article of consumable.
2. Do not use the ink cartridge which is passed away the ink life.
3. Ink will be frozen under -4••environment, however it will be usual after placing it more than 3 hours at room temperature.

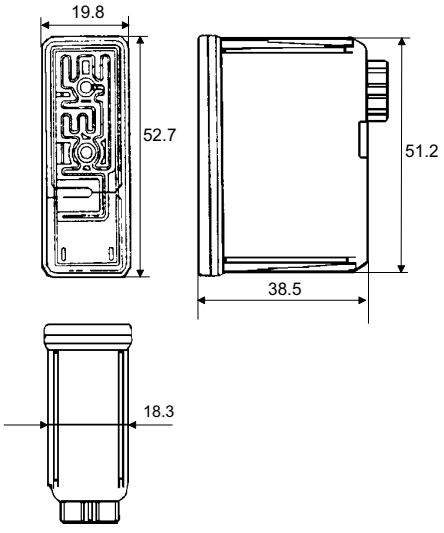


Figure 1-6. Ink Cartridge (Black)

1.2.6.2 Color Ink Cartridge

Table 1-10. Color Ink Cartridge Specification

Item	Specifications
Type	Color Ink Cartridge (Code: S020089)
Color	Magenta/Cyan/Yellow
Print capacity	300 pages / A4 (360 dpi, 5% duty each color)
Validity	2 years (sealed in package) / 6months(out of package)
Environmental conditions	❑ Temperature ■ Storage :-20•• - 40•• (within a month at 40••) ■ Packing storage :-30•• - 40•• (within a month at 40••) ■ Transit :-30•• - 60•• (within 120 hours at 60••and within a month at 40••) ❑ Humidity ■ 5% - 85% (without condensation) ❑ Resistance to vibration ■ Sealed in package :5 - 55Hz ■ Acceleration :Less than 29.4m/s (3G) ■ Direction :X, Y, Z direction ■ Time :1 hour ❑ Drop ■ Sealed in package : ☐ Dropping height :Less than 0.80m ☐ Direction :Drop the package facing the bottom, sides and one edge down. ■ Out of package: ☐ Dropping height :Less than 1.50m ☐ Frequency :Once
Dimension	42.9mm(W) x 52.7(D) x 38.5mm(H)
Weight	■ Total ink cartridge :68g ■ Total ink :13.3•}0.5g (Amount in the ink cartridge) ■ Consumable ink :More than 10.1g/each color (Useable ink quantity until ink ends)

Note) 1. Ink cartridge can not re-fill, only ink cartridge is prepared for article of consumable.
2. Do not use the ink cartridge which is passed away the ink life.
3. Ink will be frozen under -4••environment, however it will be usual after placing it more than 3 hours at room temperature.

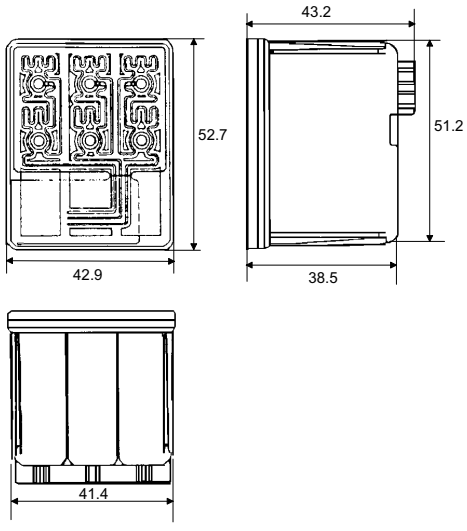


Figure 1-7. Ink Cartridge (Color)

1.2.7 Physical Specification

[Dimension] :429mm(W) x 234mm(D) x 162mm(H)
:429mm(W) x 695mm(D) x 309mm(H) with extended stacker and paper support.

[Weight] :5.2Kg

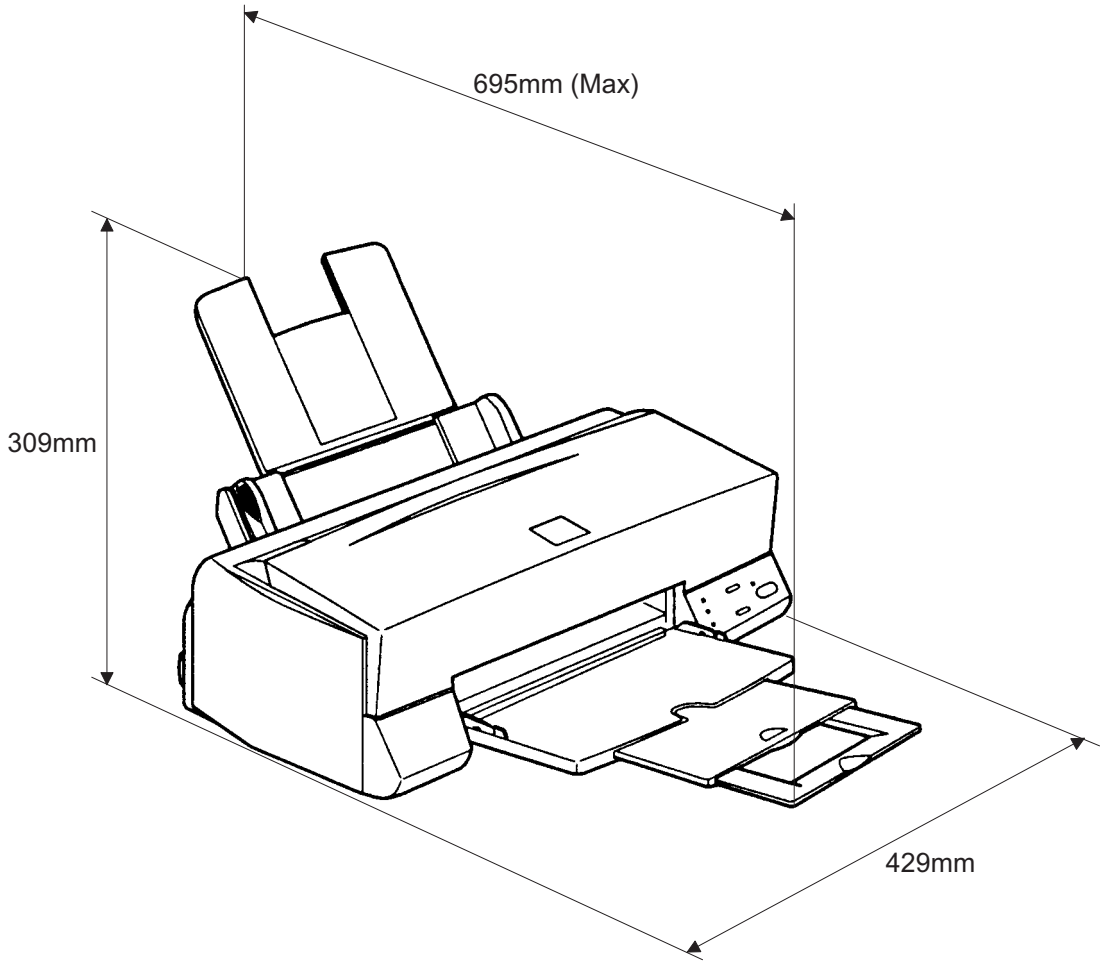


Figure 1-8. Dimension

1.2.8 Electric Specification

- [120V] Version
  - [Rated voltage] :AC120V
  - [Input voltage range] :AC103.5 - 132V
  - [Rated frequency range] :50 - 60Hz
  - [Input frequency range] :49.5• `60.5Hz
  - [Rated current] :0.4A(Max. 0.5A)
  - [Power consumption] :Approx.15W(ISO/IEC 10561 Letter pattern)
  - (Energy Star compliant)
  - [Insulation Resistance] :10M ohms min.(between AC line and chassis, DC500V)
  - [Dielectric strength] :AC1000 V rms. 1 minute or AC1200Vrms. 1 second (between AC line and chassis)

- [220 - 240V] Version
  - [Rated voltage] :AC220V - 240V
  - [Input voltage range] :AC198 - 264V
  - [Rated frequency range] :50 - 60Hz
  - [Input frequency range] :49.5 - 60.5Hz
  - [Rated current] :0.2 A(Max. 0.3A)
  - [Power consumption] :Approx.15W(ISO/IEC 10561 Letter pattern)
  - (Energy Star compliant)
  - [Insulation Resistance] :10M ohms min.(between AC line and chassis, DC500V)
  - [Dielectric strength] :AC1500 V rms. 1 minute (between AC line and chassis)

1.2.9 Reliability

- Total print volume :10,000 pages(A4, letter)
- Print head life :2000 million dots/nozzle

1.2.10 Safety Approvals

[120V version]

- Safety standard :UL1950 with D3
  :CSA22.2 No.950 with D3
- EMC :FCC part 15 subpart B class B
  :CSA C108.8 class B

[220 - 240V]

- Safety standard :EN 60950(VDE and NEMKO)
- EMC :EN55022(CISPR Pub.22) class B
  :AS/NZS 3548 class B

1.2.11 Acoustic Noise

- Noise Level :Approx.45 dB(A) (According to ISO 7779)

1.2.12 CE Marking

[220 - 240V 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

1.2.13 Printer Language and Emulation

- Printer Language :ESC/P2
  :EPSON Remote

- ESC/P control codes

  - General Operation:
    - Initialize Printer : ESC @
    - Unidirectional Printing : ESC U
    - CSF Mode Control : ESC EM

  - Paper feeding:
    - Form Feed : FF
    - Line Feed : LF
    - Line Spacing : ESC 0, ESC 2, ESC 3, ESC +
    - Carriage Return : CR

  - Page format:
    - Page Length :ESC (C, ESC C, ESC C0
    - Left / Right Margin :ESC Q, ESC1
    - Top / Bottom Margin :ESC (c, ESC N, ESC O

  - Printer position motion:
    - Horizontal Print Position :ESC $, ESC\
    - Vertical Print Position :ESC(V, ESC (v
    - Tab Horizontally :ESC D, HT
    - Tab Vertically :ESC B, VT
    - Advance paper :ESC J

  - Font Selection:
    - Typeface :ESC k, ESC x
    - Pitch and Point :ESC X
    - Pitch :ESC P, ESC M, ESC g, ESC p
    - Italic Font :ESC 4, ESC 5
    - Bold Font :ESC E, ESC F
    - Master Select :ESC!

  - Font enhancement:
    - Double-Width :ESC W, DC4, SO
    - Condensed :DC2, SI
    - Double-height :ESC w
    - Double-Strike :ESC G, ESC H
    - Super / Subscript :ESC T, ESC S
    - Underline :ESC-
    - Line / Score :ESC(-
    - Character Style :ESC q

  - Spacing:
    - Intercharacter Space :ESC Space
    - HMI :ESC c
    - Define Unit :ESC (U

  - Character handling:
    - Character Table :ESC t, ESC (t
    - International Character :ESC R
    - User-Defined Characters :ESC %, ESC &, ESC:
    - Upper Control Codes :ESC 6, ESC7
    - Print Data as Characters :ESC(^

- Bit image:
  - Bit Image :ESC*
- Graphics:
  - Graphics Mode :ESC (G
  - Raster Graphics :ESC.
  - Microweave control :ESC (i
  - Dot size control :ESC (e
  - Horizontal Position :ESC (\
  - Printing Speed :ESC(s
- Printing mode:
  - Printing mode :ESC (K
- Color:
  - Printing Color :ESC r, ESC (r
- EEPROM control
  - EEPROM control :ESC |

1.3 Interface

This printer provides both parallel and serial interface as standard.

1.3.1 Parallel Interface (Forward Channel)

[Transmission mode] :8 bit parallel, IEEE-1284 compatibility mode
[Synchronization] :By /STROBE pulse
[Handshaking] :BY BUSY and /ACKNLG signal
[Signal level] :TTL compatible level
[Adaptable connector] :57-30360 (amphenol) or equivalent

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.

Table 1-11 shows the signal and connector pin assignments for parallel interface(forward channel*1). In case of these signals, twist pair line is used and returning side is connected to signal GND (*1). Forward channel is the mode when the ordinary data such as print data is sent from the PC to the printer.

Table 1-11. Signal and Connector Pin Assignment for Parallel Interface

Pin No.	Signal Name	Return GND pin	I/O	Functional Description
1	/STROBE	19	In	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2-9	DATA0-7	20-27	In	The DATA0 through DATA7 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	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A high signal indicates that the printer cannot receive data.
12	PE	28	Out	A high signal indicates paper-out error.
13	SLCT	28	Out	Always at high level when the printer is powered 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 50 us pulse is necessary.
32	/ERROR	29	Out	A low signal indicates printer error condition.
36	/SLIN	30	In	Not used.
18	Logic H	-	Out	Pulled up to +5V via 3.9K ohm resistor.
35	+5V	-	Out	Pulled up to +5V via 3.3K ohm resistor.
17	Chassis GND	-	-	Chassis GND.
16,33,19-30	GND	-	-	Signal GND.
15,34	NC	-	-	Not connected.

Note) "I/O" refers to the direction of signal flow from the printer's point of view.

1.3.2 Parallel Interface (Reverse Channel)

[Transmission mode] :IEEE-1284 nibble mode
[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
:TTL compatible level
[Adaptable connector] :57-30360 (amphenol) or equivalent
[Extensibility request] :The printer responds affirmatively when the extensibility request values are 00H or 04H, that mean;
00H :Request Nibble Mode Reverse Channel Transfer.
04H :Request device ID; Return Data using Nibble Mode Rev Channel Transfer.

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

Table 1-12. Device ID Description

00H	3CH	Contents
MFG	EPSON	Production Maker
CMD	ESCPL2,BDC	Command system
MDL	Stylus[SP]Color[SP] 600	Model name
CLS	PRINTER	Class

- [00H] denotes a hexadecimal value of zero. MDL value depends on the EEPROM setting.
- MDL value depends on the EEPROM setting. Model name can be changed by changing a certain address in the EEPROM.

The table below shows pin assignment for reverse channel(*3). In these case of signals, twist pair line is used and returning side is connected to Signal GND. (*3):Reverse channel is the mode that any data is transferred from the printer to the PC.

Table 1-13. Pin Assignment for Reverse Channel

Pin No.	Signal Name	Return GND pin	I/O	Functional description
1	HostClk	19	In	Host clock signal.
2-9	Data0-7	20-27	In	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	PrtClk	28	Out	Printer clock signal.
11	PtrBusy, Data Bit-3,7	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckDataReq, DataBit-2,6	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag, DataBit-1,5	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
31	/INIT	30	In	Not used.
32	/DataAvail, DataBit-0,4	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	In	1284 active signal.
18	Logic-H	-	Out	Pulled up to +5V via 3.9K ohm resister.
35	+5V	-	Out	Pulled up to +5V via 3.3K ohm resister.
17	Chassis GND	-	-	Chassis GND.
16,33 19-30	GND	-	-	Signal GND.
15, 34	NC	-	-	Not connected.

Note) "I/O" refers to the direction of signal flow from the printer's point of view.

Following lists “Notes” when using Parallel Interface.

- “Return GND pin” in the table means twist pair return and is used for all control signals except for Logic H,+5V, Chassis, GND and NC. In this twist pair return, returning side is connected to GND (16,33, 19-30 pin) for twist pair return. Also, these cables are shielded wires and it is effective to connect to each chassis GND in the PC and printer for electrostatic noise.
- Conditions for Interface are based on TTL level. Rise and fall time should be within 0.2µs.
- Refer to the figure 1-9 for transmission timing of each signals.
- Do not perform data transmission ignoring /ACK or BUSY signal. (Perform the data transmission after confirming that /ACK and BUSY signals are Low.)
- It is possible to perform the printing test including interface circuit without using equipment from outside when 8-bit data signal(20-27 pin) is set to appropriate word code and connect them forcefully to /ACK and /STRB.

[Data Transmission Timing for Forward Channel]

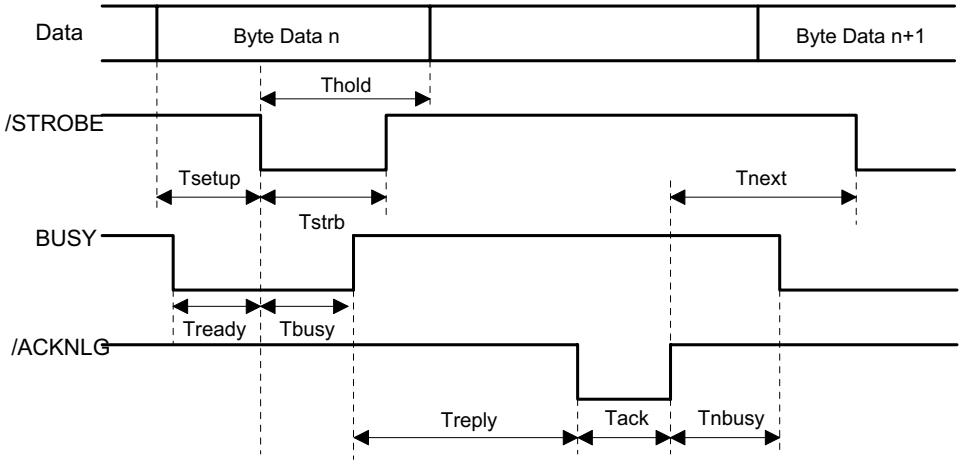


Figure 1-9. Parallel Interface Timing Chart(Forward Channel)

Table 1-14. Timing Parameters and Value

Parameter	Minimum	Maximum
tsetup	500ns	---
thold	500ns	---
tstb	500ns	---
tready	0	---
tbusy	---	500ns
tt-out*	---	120ns
tt-in**	---	200ns
treply	0	---
tack	500ns	10us
tnbusy	0	---
tnext	0	---

*Note) *: Rise and fall time of every output signals.*
***: Rise and fall time of every input signals.*

Table 1-15. Typical Time of Tack

Parallel I/F mode	Typical time of tack
High speed	2us
Normal speed	4us

[Signal level: TTL compatible (IEEE-1284 level 1 device)]

Table 1-16. Signal Level

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

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

[Data Transmission Timing for Reverse Channel]

The figure below shows timing chart of Parallel Interface Reverse channel.

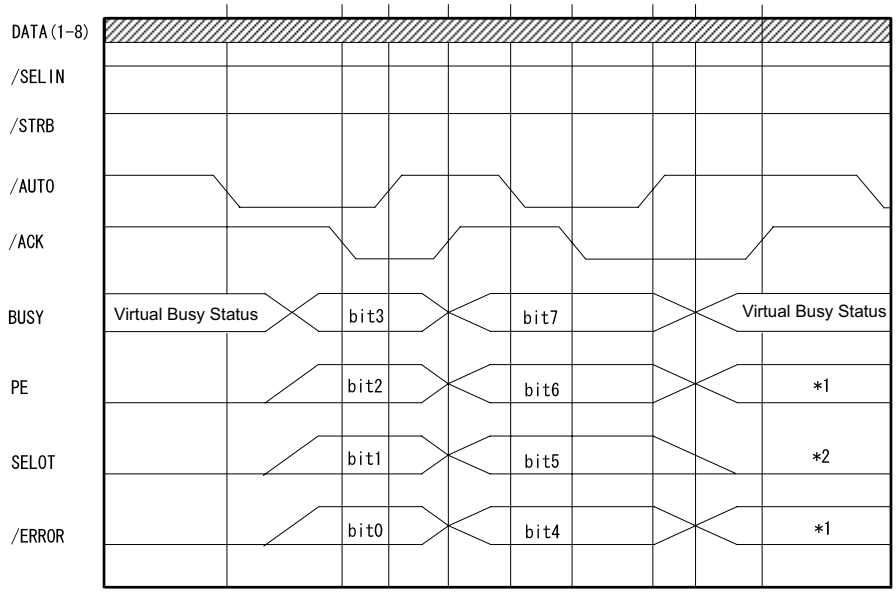


Figure 1-10. Parallel Interface Timing Chart(Reverse Channel)

1.3.2.1 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 this kind of time-out, the printer receives data very slowly, several bytes per minute, even if the printer is in busy state. This showdown is started when the rest of the input buffer becomes several hundreds of bytes. Finally, the printer is in the busy state continuously when the input buffer is full.

1.3.3 Serial Interface

[Standard] :Based on RS-423
[Synchronization] :Synchronous
[Bit Rate] :Approx. 900Kbps
[Handshaking] :X-ON/X-OFF, DTR Protocol
[Word Format] :Data Bit = 8 bits
:Parity Bit = None
:Start Bit = 1 bit
:Stop Bit = 1 bit
[Connector] :8-pin mini-circular connector
[Recommended Cable] :Apple System Peripheral-8 Cable
(Part #: M0197)

Table 1-17. Pin Assignment

Pin No.	Signal Name	I/O	Description
1	SCLK	O	Synchronous clock signal
2	CTS	I	Clear To Send
3	TXD-	O	Transmit Data (-)
4	SG	I	(Signal Ground)
5	RXD-	I	Receive Data (-)
6	TXD+	O	Balanced Transmit Data (+)
7	DTR	O	Data Terminal Ready
8	RXD+	I	Balanced Receive Data (+)

Table 1-18. X-ON/X-OFF and DTR Status

State	Buffer Space	X-ON/X-OFF	DTR
Busy	Less than 3072 bytes	Send X-OFF code	OFF
Ready	More than 5120 bytes	Send X-ON code	ON

1.4 Control Panel

Since EPSON Stylus Color 600 does not require many buttons since printer driver can start various settings and motions. Therefore, there are only 2 non-lock type push switches, 1 lock type push switch and 4 LEDs.
Following figure shows control panel of EPSON Stylus Color 600.

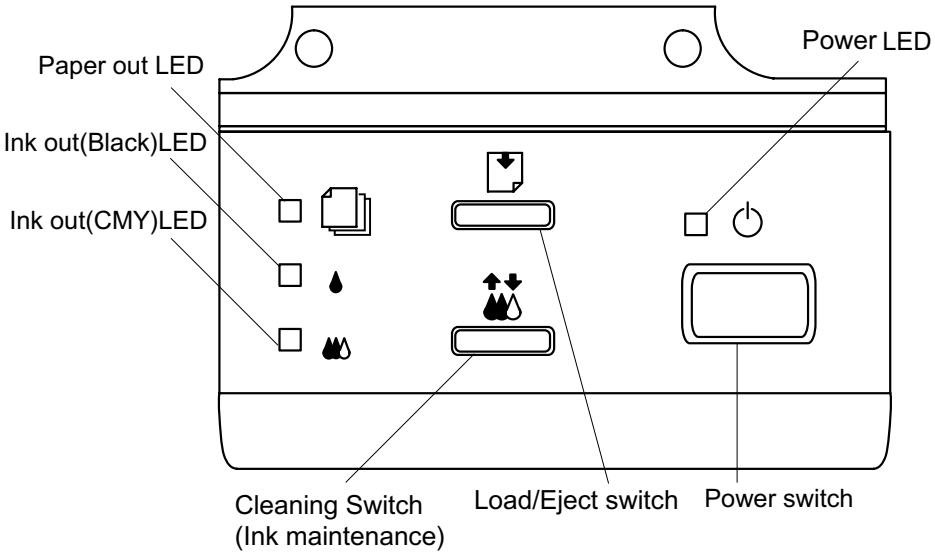


Figure 1-11. Control Panel

1.4.1 Indicators

- **Power**
  Lights when the operate switch is “ON”, and AC power is supplied.

- **Paper out**
  Lights during the paper-out condition, and blinks during the paper-jam condition.

- **Ink Out (Black)**
  Lights during no Black ink condition, and blinks during the Black ink low condition.

- **Ink Out (Color)**
  Lights during no Color ink condition, and blinks during the Color ink low condition.

1.4.2 Panel Functions

Table 1-19. Panel Function

Switch	Function
Load/Eject (Pushing within 0.5 seconds*)	❑ Loads or Eject the paper. ❑ When the carriage is on the Ink Cartridge change position, return the carriage from Ink Cartridge change position.
Load/Eject (Pushing for 2 seconds*)	❑ Starts the Ink Cartridge change sequence.** Moves the carriage to cartridge change position.
Cleaning (Pushing for 2 seconds*)	❑ Starts the Head Cleaning sequence. *** ❑ In the condition of "Ink Low" or "Ink Out" or "No Ink Cartridge" starts the Ink Cartridge change sequence.**
Cleaning (Pushing within 2 seconds*)	❑ When carriage is on the Ink Cartridge change position, return carriage from Ink Cartridge change position.

*Note) *: 3 seconds is required at the User's manual.*
***: This function is not available in printing status.*
****: The time to complete the sequence may vary depending on the printer's status.*

Panel Functions with Power ON

Table 1-20. Panel Function with Power ON

Switch	Function
Load/Eject	❑ Starts status printings.**
Cleaning	❑ Enter the Default Setting mode
Load/Eject + Cleaning	❑ Enters the particular settings mode. (Factory use only.) To enter the particular settings mode, it is necessary to push followings switch while Paper Out LED is blinking.(It blinks about 5 seconds)

*Note) **: status printings prints firmware version, ink counter, selected code page and nozzle check patterns.*

Particular setting mode

Table 1-21. Particular Setting Mode

Switch	Function
Load/Eject	❑ Initialize EEPROM *** and reset Timer IC.

*Note) ***: Refer to EEPROM map.*