SERVICE MANUAL

Color Inkjet Printer

EPSON EPSON Stylus COLOR 670

COLOR IMAGING
EPSON

EPSON ®

SEIJ99016

Notice

PRECAUTIONS

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

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

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

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

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

2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.

3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

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

2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.

3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.

4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON EPSON Stylus COLOR 670. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
Provides the step-by-step procedures for the troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS
Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX
Provides the following additional information for reference:

• Connector pin assignments
• Electric circuit boards components layout
• Exploded diagram
• Electrical circuit boards schematics

Symbols Used in This Manual

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

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

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

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

Revision Status

Revision	Issued Date	Description
Rev. A	January 27, 2000	First Release

Contents

Operating Principles

Troubleshooting

Disassembly and Assembly

Adjustment

Maintenance

Appendix

PRODUCT DESCRIPTION

1.1 Overview

The EPSON Stylus COLOR 670 is a color ink jet printer based on the
EPSON Stylus COLOR 660.

1.1.1 Features

Major features of EPSON Stylus COLOR 670 are as follows;

☐ High color print quality

  ■ 1440x720 (HxV) dpi printing

  ■ 4 color printing (YMCK)

  ■ Traditional and New Microweave

☐ Built-in auto sheet feeder

  ■ Holds 100 cut-sheets (64g/m^2)

  ■ Holds 10 envelopes

  ■ Holds 30 transparency film sheets

☐ Two built-in interfaces

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

  ■ USB (Universal Serial Bus)

☐ Windows/Macintosh exclusive

☐ ROM version: YUXXXX

Figure 1-1. External View

1.2 Basic Specifications

1.2.1 Printing Specifications

PRINTING METHOD

☐ On demand ink jet

NOZZLE CONFIGURATION

☐ Black: monochrome 64 nozzles (32 x 2 rows staggered)

☐ Color: 32 nozzles per color row x 3 colors
(Cyan, Magenta, Yellow)

PRINTING DIRECTION

☐ Bi-direction with logic seeking

PRINTING SPEED AND PRINTABLE COLUMNS

Table 1-1. Character Mode

Character pitch	Printable columns	LQ speed
10 cpi	80	200 CPS**

* This is not open to the user.
** This value is the speed of normal-dot printing.

Table 1-2. Printing Speed (Raster Graphics Mode)

Horizontal Resolution	Printable Area	Available Dot	CR Speed
180 dpi	209.8mm (8.26 inch)	1488	508mm/s (20 IPS)
360 dpi	209.8mm (8.26 inch)	2976	508mm/s (20 IPS)
720 dpi	209.8mm (8.26 inch)	5952	508mm/s (20 IPS)

CONTROL CODE

☐ ESC/P Raster command

☐ EPSON Remote command

CHARACTER TABLES

☐ 2 international character sets

■ PC437 (US, Standard Europe)

■ PC850 (Multilingual)

TYPEFACE

☐ Bit map LQ font

☐ EPSON Courier 10 cpi

1.2.2 Paper Feeding

☐ Feeding method: Friction feed with ASF

☐ Paper path: Cut-sheet ASF (Top entry/Front exit)

☐ Feed speed: 8.47mm (1/3inch) feed:190ms
Continuous feed: 51mm/s

1.2.3 Input data buffer

☐ Input data buffer: 32KB

1.2.4 Electric Specification

☐ 120 V Version

- ■ Rated voltage: AC 100V
- ■ Input voltage range: AC 99 -132V
- ■ Rated frequency range: 50 - 60Hz
- ■ Input frequency range: 49.5-60.5 Hz
- ■ Rated current: 0.4A
- ■ Power consumption: Approx.18W(ISO 10561 Letter pattern
                                   Approx. 2.5W in standby mode
                                   Energy Star compliant
- ■ Insulation Resistance: 10 M ohms min.
                                   (between AC line and chassis, DC 500V)
- ■ Dielectric: AC 1000 V rms. 1 minute or
                                   AC 1200 V rms 1 second
                                   (between AC line and chassis)

☐ 220-240 V Version

- ■ Rated voltage: AC 220 - 240V
- ■ Input voltage range: AC 198 - 264V
- ■ Rated frequency range: 50 - 60Hz
- ■ Input frequency range: 49.5-60.5 Hz
- ■ Rated current: 0.2A
- ■ Power consumption: Approx.18W(ISO 10561 Letter pattern
                                   Approx. 2.5W in standby mode
                                   Energy Star compliant
- ■ Insulation Resistance: 10 M ohms min.
                                   (between AC line and chassis, DC 500V)
- ■ Dielectric: AC 1500 V rms. 1 minute
                                   (between AC line and chassis)

1.2.5 Environmental Conditions

TEMPERATURE

☐ Operating: 10 to 35°C (see Figure 1-2, "Environmental
   Condition")

☐ Non-operating: -20 to 60°C (With shipment container)
   (within 120 hours at 60°C / within 1 month at 40°C)

HUMIDITY

☐ Operating: 20 to 80% RH (without condensation)

☐ Non-operating: 5 to 85% RH (without condensation)
    (With shipment container)

The environmental condition should be within the range shown in the figure below.
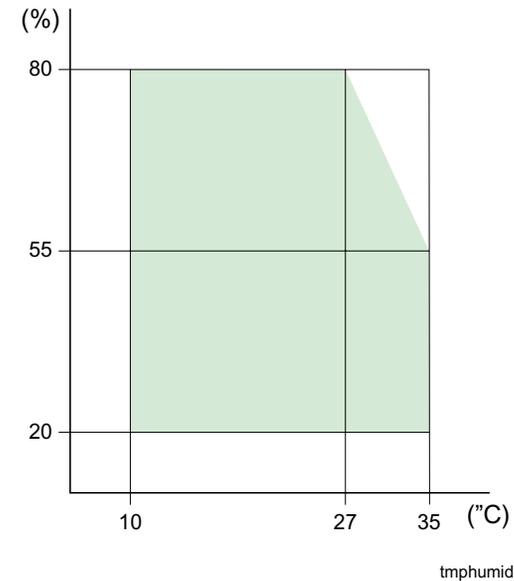
Figure 1-2. Environmental Condition

RESISTANCE TO SHOCK

☐ Operating: 1 G, within 1ms (operating)

☐ Non-operating: 2 G, within 2 ms (with shipment container)

RESISTANCE TO VIBRATION

☐ Operating: 0.15 G

☐ Non-operating: 0.50 G (with shipment container)

1.2.6 Reliability

☐ Total print volume: 25,000 pages (A4, Letter)

☐ Printhead Life: 3 billion dots / nozzle

1.2.7 Safety Approvals

☐ 120V version:
Safety standards: UL 1950
                   CSA22.2 subpart B class B
                   CSA C 108.8 class B

☐ 220 - 240V version:
Safety standards: EN 60950 (VDE)
EMI: EN 55022 (CISPR Pub. 22) class B
                   AS/NZS 3548 class B

1.2.8 Acoustic noise

☐ Level: Approx. 47 dB (A)
(According to ISO 7779)

☐ 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

1.3 Interface

1.3.1 Hardware interface

This printer provides USB and parallel interface as standard.

1.3.1.1 Parallel interface

- ☐ Transmission mode: 8-bit parallel, IEEE-1284 compatibility mode

- ☐ Synchronization mode: 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 Figure 1-3, "Data Transmission Timing Chart")
-When input data buffer is full.
-When -INIT signal is at low level or during hardware initialization
-During printer error (see the ERROR signal explanation below)
-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.

The figure below shows the timing chart of the parallel interface.
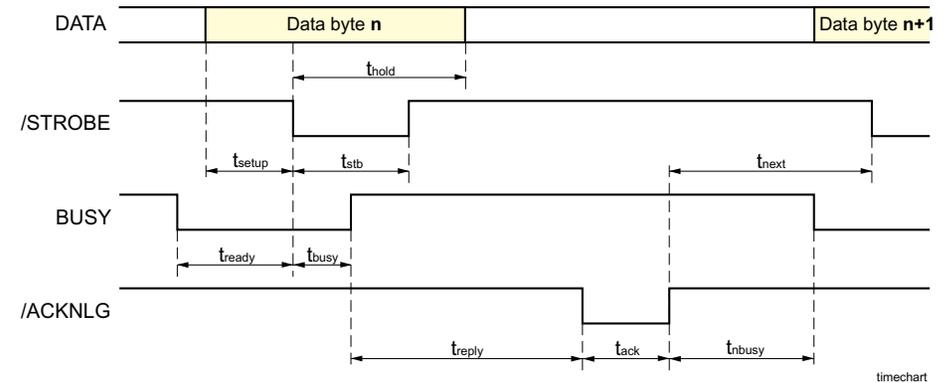
Figure 1-3. Data Transmission Timing Chart

On the above timing chart, T_{act} rated period is shown below.

Table 1-3. t_{act} Rated Period

Parallel I/F Mode	T_{act} Rated Period
High speed (default)	1µs
Normal speed	3µs

Table 1-4. Signal Level: TTL compatible (IEEE-1284 level 1 device)

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

NOTE: * A low logic level on the Logic H signal is 2.0 V 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 7.5 K ohm to ground.

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
1	-STROBE	19	In	The strobe pulse. Read-in of data is performed 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 at high level hen data is logical 1 and low level when data is logical 0.

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
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	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A high signal indicated 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.

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
17	Chassis GND	-	-	Chassis GND.
16, 33 19-30	GND	-	-	Signal GND.
15, 34	NC	-	-	Not connected.

NOTE: ** In/Out refers to the direction of signal flow from the printer's point of view.*

1.3.2 IEEE-1284 Parallel I/F (Reverse Channel)

Reverse channel is used to transfer the information data from the printer side to the PC side.

Table 1-6. Parallel I/F Specification (R-Channel)

Item	Specification
Transmission mode	IEEE-1284 nibble mode
Synchronization	Comply with the IEEE-1284 specification
Handshaking	Comply with the IEEE-1284 specification
Data trans. timing	Comply with the IEEE-1284 specification
Signal Level	TTL level (IEEE-1284-Level 1 device)

☐   Device ID

■   When IEEE-1284.4 protocol is enabled:
[00H] [5AH]
MFG: EPSON;
CMD: ESCPL2, BDC, D4;
MDL: Stylus[SP]COLOR[SP]670;
CLS: PRINTER;
DES: EPSON[SP]Stylus[SP]COLOR[SP]670;

■   When IEEE1284.4 protocol is NOT enabled:
[00H] [57H]
MFG: EPSON;
CMD: ESCPL2, BDC;
MDL: Stylus[SP]COLOR[SP]670;
CLS: PRINTER;
DES: EPSON[SP]Stylus[SP]COLOR[SP]670;

NOTE: *[00H] denotes a hexadecimal value of zero.*
MDL value depends on the EEPROM setting.
CMD value depends on the IEEE1284.4 setting.

Table 1-7. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	HostClk	19	In	Host clock signal.
2	DATA0	20	In	The DATA 0 through DATA7 signals represent data bits 0-7 respectively.
3	DATA1	20	In	
4	DATA2	20	In	Each signal is at high level when data is logical 1 and low level when data is logical 0.
5	DATA3	20	In	
6	DATA4	20	In	These signals are used to transfer the 1284 extensibility request to the printer.
7	DATA5	20	In	
8	DATA6	20	In	
9	DATA7	20	In	
10	PtrClk	28	Out	Printer clock signal.
11	PtrBusy/ DataBit-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 resistor.
35	+5V	-	Out	Pulled up to +5V via 3.3 K ohm resistor.

Table 1-7. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
17	Chassis	-	-	Printer chassis GND.
16, 33 19-30	GND	-	-	Twist pair return GND.
15, 34	NC	-	-	Not used.

NOTE: *In/Out refers to the direction of signal flow from the printer's point of view.*

1.3.3 USB (Universal Serious Bus)

Following shows specification.

☐ Standard:

■ Universal Serial Bus Specifications Revision 1.0

■ Universal Serial Bus Device Class Definition for Printing Devices version 1.0

☐ Bit rate: 12Mbps (Full Speed Device)

☐ Data encoding: NRZI

☐ Adaptable connector: USB Series B

☐ Recommended cable length: max. 2 meters

Table 1-8. Connector Pin Assignment and Signals

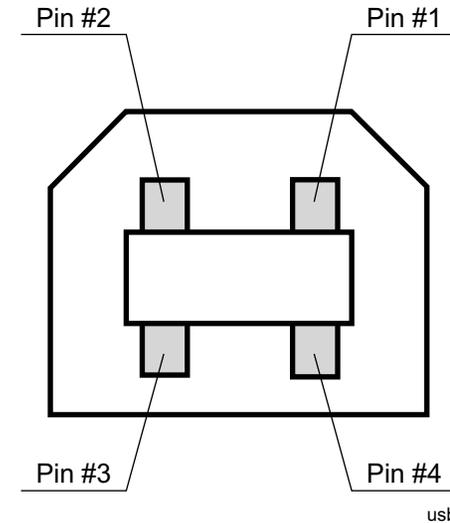| Pin. No	Signal Name	I/Out	Function Description
1	VCC	--	Cable power. Maximum power consumption is 100mA.
2	-Data	I/O	Data
3	+Data	I/O	Data. Pull up to +3.3V via 1.5K ohm resistor.
4	Ground	--	Cable ground.

usb

Figure 1-4. USB Interface Port

1.3.4 Miscellanea

1.3.4.1 Receive Data Buffer Full Operation

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 per minute, even if the printer is in busy state. This slowdown 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. USB and IEEE-1284.4 on the parallel interface do not require this function.

1.3.4.2 Interface Selection

The printer has 2 built-in interfaces; the USB and parallel interface. These interfaces are selected automatically.

AUTOMATIC SELECTION

In this automatic interface selection mode, when the printer is initialized to the idle state scanning which interface receives data when it is powered on. Then the interface that receives data first is selected. When the host stops data transfer and the printer is in the stand-by state for the seconds, the printer is returned to the idle state. As long as the host sends data or the printer interface is in the busy state, the selected interface is let as it is.

INTERFACE STATE AND INTERFACE SELECTION

When the parallel interface is not selected, the interface got into the busy state. When the printer is initialized or returned to the idle state, the parallel interface got into the ready state. Caution that the interrupt signal such as the -INIT signal on the parallel interface is not effective while that interface is not selected.

1.3.4.3 IEEE 1284.4 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 IEEE 1284.

☐ Automatic selection
   An initial state is compatible interface and starts IEEE12844 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. communication even if magic strings (1284.4 synchronous commands) are received.

1.3.5 Printer Language and Emulation

☐ Printer language: ESC/P Raster
                                  EPSON Remote

1.3.5.1 Control codes

CHARACTER MODE

☐ General Operation: Initialize Printer   ESC@

☐ Paper feeding: Form Feed   FF
                          Line Feed   LF
                          Carriage Return   CR

☐ EEPROM control: EEPROM control   ESC|

GRAPHICS MODE

☐ 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+
                          Carriage Return   CR

☐ Page format: Page Length   ESC(C
                          Top / Bottom Margin   ESC(c
                          Paper side   ESC8S

☐ Print position motion: Horizontal Print Position ESC$, ESC\, ESC($,
                                                    ESC(
                          Vertical Print Position   ESC(V, ESC(v

☐ Spacing: Define Unit   ESC(U

☐ Graphics: Graphics Mode   ESC(G
                          Raster Graphics   ESC., ESC(D, ESC i
                          Microweave control   ESC(i
                          Dot size control   ESC(e
                          Print a image   ESC ACK

☐ Printing mode: Printing mode   ESC(K
☐ Color: Printing color   ESC r, ESC(r

1.4 Operator Controls

1.4.1 Operate Switch

Operate switch is located on the control panel.

1.4.2 Control Panel

1.4.2.1 Switches

There are 2 non-lock type push switches, 1 lock type push switch and 4 LED.

1.4.3 Indicators

☐ Power
Lit when the operate switch is ON, and AC power is supplied.

☐ Paper Out
Lit during the paper-out condition and blinks during the paper-jam condition.

☐ Ink Out (Black)
Lit during no Black ink condition, and blinks during the Black ink low condition.

☐ Ink Out (Color)
Lit during no Color ink condition, and blinks during the Color ink low condition.

1.4.4 Panel Functions

Table 1-9. Panel Functions

Switch	Function
Load / Eject (Pushing within 2 seconds*)	• Loads or Ejects the paper. • When the carriage is on the ink cartridge change position, return carriage from ink cartridge change position.
Load / Eject (Pushing for 2 seconds*)	• Starts the ink cartridge change sequence.** Moves the carriage to the cartridge change position.
Cleaning (Pushing for 2 seconds*)	• Starts the cleaning of head. • 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: *Described as 3 seconds required in the User's guide.*
** This function is not available in printing status.

Table 1-10. Panel Functions with Power On

Switch	Pressing with Power on Function
Load / Eject	• Starts status sheet printing.
Cleaning	• Change code pages / Select IEEE 1284.4 mode for parallel I/F. *1
Cleaning + Load / Eject	• Enters the special settings mode. (Factory use only.)

NOTE: **1 Not described in the User's manual.*

Table 1-11. Special Setting Mode

Switch	Function
Load / Eject	• Initialize EEPROM and reset timer IC.
Cleaning (Pushing for 10 seconds*)	• Reset the ink overflow counter in EEPROM

1.4.5 Printer Condition and Panel Status

Table 1-12. Printer Condition & Indicator Status

Printer Status	Indicators				Priority
	Power	Ink Out (Black)	Ink Out (Color)	Paper Out	
Power on condition	On	--	--	--	9
Ink sequence	Blink	--	--	--	6
Ink Cartridge change mode	Blink	--	--	--	5
Data processing	Blink	--	--	--	8
Paper Out	--	--	--	On	4
Paper jam condition	--	Off	Off	Blink	3
No ink cartridge or ink end (black)	--	On	--	--	7
Ink level low (black)	--	Blink	--	--	7
No ink cartridge or ink end (color)	--	--	On	--	7
Ink level low (color)	--	--	Blink	--	7
Enter EEPROM and Timer IC reset	--	On (only for 1 second)			-
Maintenance request	Blink	Blink	Blink	Blink	2
Fatal error	Blink	On	On	Blink	1

1.4.6 Printer Initialization

There are three kinds of initialization method.

☐ Power-on initialization
This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command).
When the printer is initialized following action is performed.

- Initializes printer mechanism.

- Clears input data buffer.

- Clears print buffer.

- Sets default values.

☐ Operator initialization
This printer is initialized when turning the printer power on again within 10 seconds from last power off, or printer recognized the -INIT signal (native pulse) of parallel interface.
When printer is initialized, following action is performed.

- Cap the printhead.

- Eject a paper.

- Clears input data buffer.

- Clears print buffer.

- Sets default values.

☐ Software initialization
The ESC@ command also initializes the printer.
When printer is initialized, following action is performed.

- Clears print buffer.

- Sets default values.

1.4.7 Errors

☐ Ink End
When the printer runs out the most parts of the ink of any one color, it warns ink-low and keeps printing. When the printer runs out the whole ink of any one color, it stops printing and indicates ink-out error. User is requested to install a new ink-cartridge in this state. A ink-cartridge once taken out should never be used again. Re-installation of the cartridge not filled fully upsets the ink level detection and may cause a serious problem in the printhead as a result.

☐ Paper Out
When the printer fails to load a sheet, it goes paper out error.

☐ Paper Jam
When the printer fails to eject a sheet, it goes paper jam error.

☐ No Ink Cartridge
When the printer detects ink-cartridge is not installed or off, it goes this error mode.

☐ Maintenance request
When the total quantity of ink wasted through the cleaning and flushing is reaches to the limit, printer indicates this error and stops. The absorber in the printer enclosure is needed to be replaced with a new one by a service person.

☐ Fatal Errors
Carriage control error or CG access error.

1.4.8 Paper Handling

Do not perform reverse feed more than 9.5mm (0.38″).

1.4.9 Paper Specification

☐ Cut Sheet

■ Size:

A4 (210 x 297 mm)(8.3 x 11.7″)
Letter (216 x 279 mm)(8.5 x 11.0″)
B5 (182 x 257 mm)(7.2 x 10.1″)
Legal (216 x 356 mm)(8.5 x 14.0″)
Statement (139.7 x 215.9mm)(5.5 x 8.5″)
Executive (184.2 x 266.7 mm)(7.25 x 10.5″)
A5 (148 x 210 mm)
A6 (105 x 148 mm)

■ Thickness:
0.08mm to 0.11mm(0.003 to 0.004″)

■ Weight:
$64g/m^2$ to $90g/m^2$ (17lb to 24lb / 55 to 78 kg)

■ Paper quality:
exclusive paper, bond paper, PPC

☐ Transparency, Glossy paper

■ Size:

A4 (210 x 297 mm)(8.3 x 11.7″)
Letter (216 x 279 mm)(216 x 279 mm)(8.5 x 11.0″)

■ Thickness:
0.075mm to 0.085mm(0.003 to 0.0033″)

NOTE: Transparency printing is only available at normal temperature.

☐ Envelope

  ■ Size:
    No.10 (241.3 mm x 104.8 mm)(9.5 x 4.125″)
    DL (220 mm x 110 mm)(8.7 x 4.3″)
    C6 (162 mm x 114 mm)(6.4 x 4.5″)
    Paper Type/Weight/Flap

  ■ Thickness:
    0.16mm to 0.52mm(0.006 to 0.02″)

  ■ Weight:
    $45g/m^2$ to $75g/m^2$ (12lb to 20lb)

  ■ Paper quality:
    bond paper, plain paper, air mail

NOTE: *Envelope printing is only available at normal temperature.*
Keeping the longer side of the envelope horizontally at
setting.

☐ Index card

  ■ Size:
    A6 (105 x 148 mm)(4.1 x 5.8″)
    A5 (148 x 210 mm)(5.8 x 8.3″)
    5x8″ index card (127 x 203mm)
    10x8″ index card (154 x 203mm)

  ■ Thickness:
    Less than 0.23mm (0.0091″)
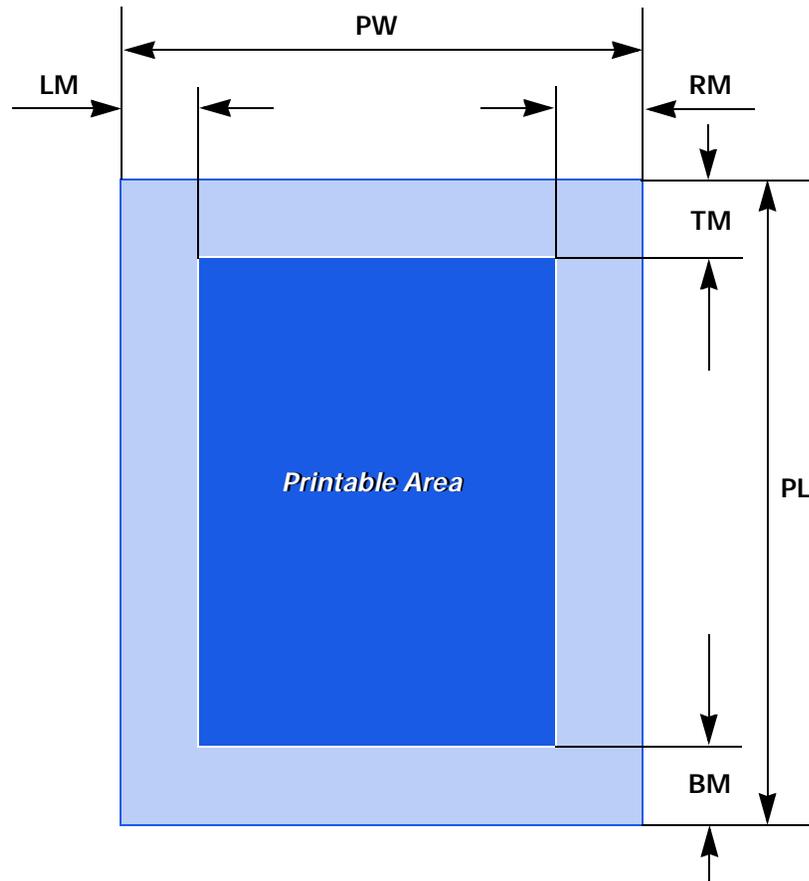
1.4.10 Printable Area

1.4.10.1 Cut Sheet

Figure 1-5. Printable Area for Cut Sheet

Table 1-13. Margins in Character Mode

Paper Size	Left Margin	Right Margin	Top Margin	Bottom Margin
A4	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14mm (0.54″)
Letter	3mm (0.12″)	9mm (0.35″)	3mm (0.12″)	14mm (0.54″)
B5	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14mm (0.54″)
Legal	3mm (0.12″)	9mm (0.35″)	3mm (0.12″)	14mm (0.54″)
Statement	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14mm (0.54″)
Executive	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14mm (0.54″)

Table 1-14. Margins in Raster Graphics Mode

Paper Size	Left Margin	Right Margin	Top Margin	Bottom Margin
A4	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)
Letter	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)
B5	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)
Legal	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)
Statement	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)
Executive	3mm (0.12″)	3mm (0.12″)	3mm (0.12″)	14 or 3mm (0.54 or 0.12″)

NOTE: * Bottom margin is expanded to 3mm when paper dimension is defined by using command, otherwise it is not expanded (14mm).
**From a form lower end 3mm as for 14mm area, a printing may scramble.
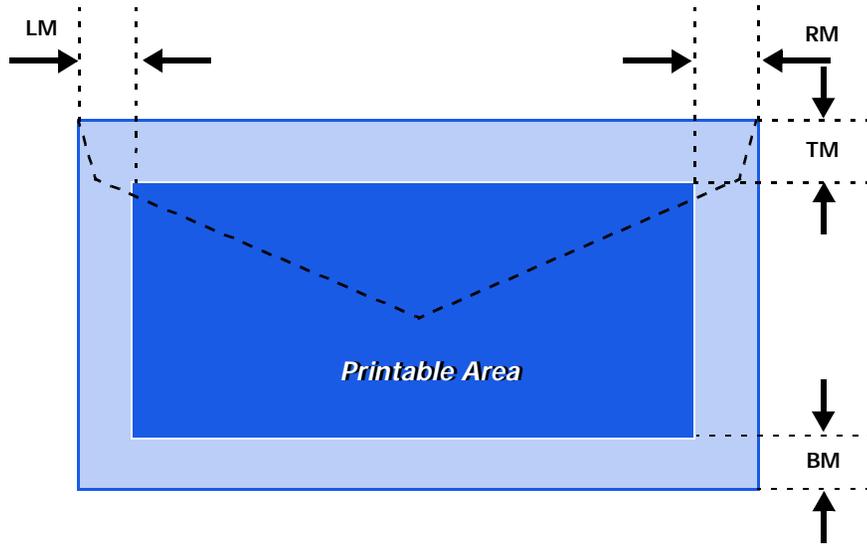
1.4.10.2 Envelope

Figure 1-6. Printable Area for Envelopes

Table 1-15. Envelope Margin

Size	Left Margin (minimum)	Right Margin (minimum)	Top Margin (minimum)	Bottom Margin (minimum)
#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″)

1.4.11 Ink Cartridge

BLACK INK CARTRIDGE

☐ Type: Exclusive cartridge

☐ Color: Black

☐ Print capacity: 540 pages / A4 (ISO/IEC10561 Letter pattern at 360 dpi)

☐ Ink life: 2 years from production date

☐ Storage temperature:

■ -20°C to 40°C
  Storage, within a month at 40°C

■ -30°C to 40°C
  Packing storage, within a month at 40°C

■ -30°C to 60°C
  Transit, within a month at 60°C
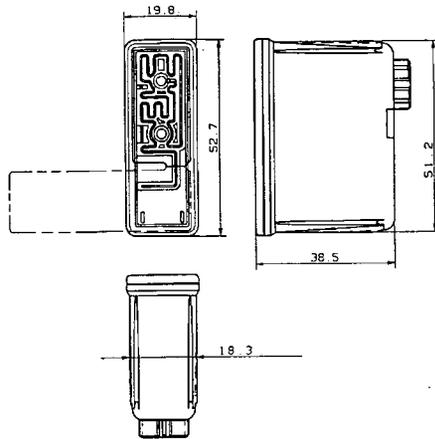
☐ Dimension: 19.8mm (W) x 52.7 mm (D) x 38.5mm (H)

Figure 1-7. Black Ink Cartridge

COLOR INK CARTRIDGE

☐ Type: Exclusive cartridge

☐ Color: Magenta, Cyan, Yellow

☐ Print capacity: 300 pages/A4 (360 dpi, 5% duty each color)

☐ Ink life: 2 years from production date

☐ Storage temperature:

■ -20°C to 40°C
  Storage, within a month at 40°C

■ -30°C to 40°C
  Packing storage, within a month at 40°C

■ -30°C to 60°C
  Transit, within a month at 60°C

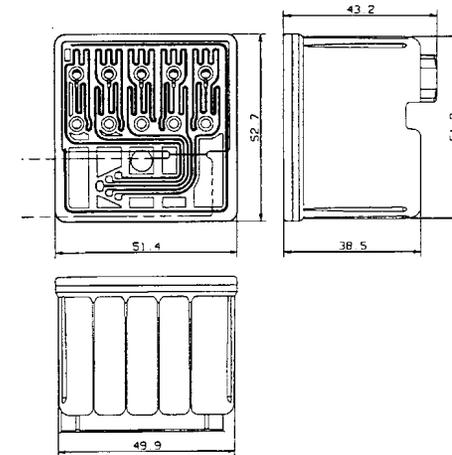☐ Dimension: 42.9mm (W) x 52.7 mm (D) x 38.5mm (H)

Figure 1-8. Color Ink Cartridge

NOTE: *Ink cartridges cannot be refilled, properly dispose of after use. Do not use the ink cartridge which is beyond its production date plus two years. Ink will be frozen under -4° C environment, however it will be usable after placing it more than 3 hours at room temperature.*

1.5 Physical Specification

☐ Weight: 5.2 kg without the ink cartridges

☐ Dimensions

  ■ Stylus Photo 720:   429 x 261 x 167 mm (WxDxH) (Storage)
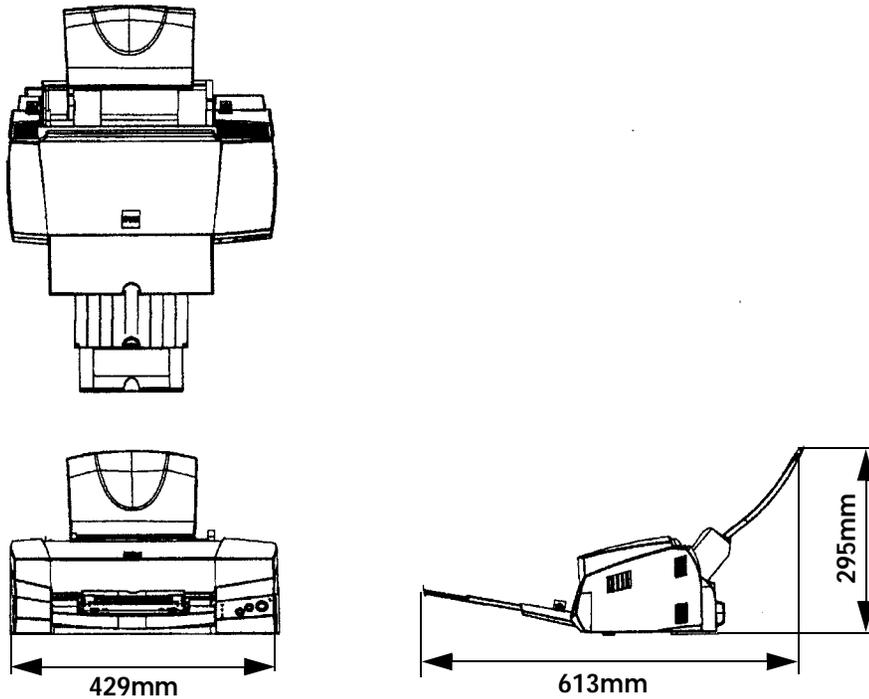   429 x 613 x 295 mm (WxDxH) (Printing)

429mm

613mm

295mm

Figure 1-9. EPSON Stylus COLOR 670 Dimensions

1.6 Accessories

User's manual: 1

Driver disk: 1

Black ink cartridge: 1

Color ink cartridge: 1

Power cord: 1 (220-240 version only)

C H A P T E R

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OPERATING PRINCIPLES