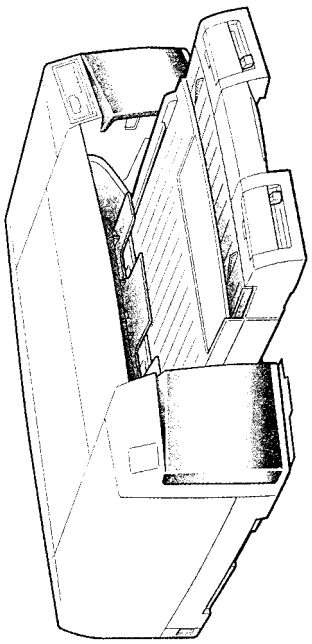
4008867

# SERVICE MANUAL

Color Ink Jet Printer

# EPSON Stylus Pro 5000





COLOR IMAGING EPSON

EPSON®

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# PRECAUTIONS

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

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

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

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

## *DANGER*

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NOWORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIER 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.

# PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of Stylus Pro5000. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

## CHAPTER 1. PRODUCT 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 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*

# REVISION STATUS

| Rev. | Date | Page(s) | Contents |
|---|---|---|---|
| A | 1998/01/23 | All | First release |
| B | 1998/03/10 | 4-68~4-93<br><br>4-8<br><br>4-59<br>4-60<br>Chapter4 | • Added “Disassembly and Assembly for ASF Unit”.<br>• Modified flow chart for disassembling the mechanism according to addition of “Disassembly and Assembly for ASF Unit”.<br>• Added “CAUTION”.<br>• Added sentences to “CHECKPOINT”.<br>• Word “phase” is replaced by “alignment”. |

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## PRODUCT DESCRIPTION



## OPERATING PRINCIPLES

## TROUBLESHOOTING



## ASSEMBLY AND DISASSEMBLY

## MAINTENANCE



## APPENDIX

CHAPTER

1

# PRODUCT DESCRIPTION

# 1.1 FEATURES

EPSON Stylus Pro 5000 is a 6-color ink jet printer , which can output colors for the professional level. Major features are following.

- ❑ Professional color print quality
  - ■ 1440(H) x 720(V) dpi printing at the highest resolution setting.
  - ■ Photo reproduction quality(6 color printing, C.M, Y, K, LC, LM)
  - ■ By micro dot + super micro dot, super fine printing equivalent to Comoro Wide is available.
  - ■ PostScript printing(option)

- ❑ High speed printing
  - ■ Color 360 dpi A4: 1.1 PPM
  - ■ Color 720 dpi A4: 0.39 PPM

- ❑ Built in 3 types of interfaces
  - ■ Bi-directional parallel interface (IEEEP1284.4/ECP support)
  - ■ Mac. Serial interface(up to approx. 1.8M bps)
  - ■ Type-B interface (SIM for copying up to approx. 98M is available to install on the same board;C228 main board)

- ❑ Low running cost
  - ■ Long life ink cartridge;
    Black: 3200 papers, Yellow: 3200 papers, Cyan/Magenta:3000 papers (5% ECOMA duty printing)

    *Note)* Cyan/Magenta ink is united as one, which light color and ordinary color ink are separated. The reason why that ink life span is not so different from others even though they are separated is that users are usually unable to perform printing which require strict separation of light color and ordinary color. Therefore, since light color and ordinary color inks are adjusted to be used alternately on the application, the life span of Cyan/Magenta does not become simply half life span of the other inks.
  - ■ Independent 4 colors ink cartridges: Black, Yellow, Cyan including with light cyan, Magenta including light magenta.
  - ■ Ink quantity sensor.
    *Note)* After ink near end is detected by the mechanical switch, the firmware counts the determined absorbing quantity.

- ❑ Paper handling
  - ■ Double bin ASF(second bin option)
  - ■ Manual feeding from the top cover of first bin and from the rear with opened rear cover.
  - ■ Paper volume for ASF/Paper size sensor/Paper type sensor
    *Note)* Those sensors do not work correctly, if users set the paper size or media type lever wrong.
  - ■ Increased paper loading capacity in the paper tray (55 g/$m^2$ 250 cut sheets/ Standard, option ASF)

- ❑ Windows/Macintosh exclusive

Following table shows optional items for Stylus Pro 5000.

✓CHECK POINT

***Since there are many kinds of exclusive papers, please refer to "Special Media" on the Reference Guide for Stylus Pro 5000.***

**Table 1-1. Optional Items and Available Consumable**

| Name | Remark | Code No. |
|---|---|---|
| Ink cartridge | Black ink cartridge | S020118 |
| | Cyan (including light cyan) | S020147 |
| | Magenta(including light magenta) | S020143 |
| | Yellow | S020122 |
| Paper tray unit | B5 ~A3 (55g/$m^2$:250 sheet) | C81275*(lower paper cassette)<br>C81276* |
| Exclusive Paper | Refer to the reference guide | --- |
| SIMM memory | Max.96MB(32MB x3), 72 pins | --- |
| Type-B I/F Card | 32KB Serial interface card | C82307*/C82308* |
| | LocalTalk™ interface card | C82312* |
| | Co-ax interface card | C82314* |
| | Twin-ax interface card | C82315* |
| | Ethernet interface card | C82357* |
| | Bi-directional Parallel interface card | C82345* |

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

# 1.2 SPECIFICATIONS

## PRINTING SPECIFICATION

- ❑ Print method: On demand MACH ink jet
- ❑ Nozzle configuration Black - 64 nozzles
  Color(5 colors) - 64 nozzles for each color(total: 320 colors, Y, M, C, LM, LC)
- ❑ Print direction Bi-direction with logic seeking
- ❑ Print speed See the tables below

**Table 1-2. Character Mode**

| Item | Content |
|---|---|
| Character quality | High quality |
| Character pitch | 10 CPI (Pica) |
| Printable columns | 127 columns |
| LQ speed | 200 CPS* |

*Note*)* This value is the speed of one print-pass in which the ¼ of character matrix is printed.

**Table 1-3. Raster Graphics Mode**

| Horizontal Resolution | Printable Area | Available dot | CR speed (IPS) |
|---|---|---|---|
| 360 dpi | 323mm(12.7 inch) | 4578 | 20 IPS |
| 720 dpi | 323mm(12.7 inch) | 9156 | 20 IPS |

*Note)* 20 IPS is equivalent to 200 CPS at printing 10 CPI.

## CHARACTER SPECIFICATION

- ❑ Character tables: 2 international character sets;
  PC437(US, Standard Europe)
  PC850(Multilingual)
- ❑ Type face: Bit map LQ font
  EPSON courier 10 CPI

## CONTROL CODE

- ❑ ESC/P Raster
- ❑ EPSON Remote command

## PAPER FEED SPECIFICATION

- ❑ Feeding method: Friction feed with ASF
- ❑ Line spacing: 1/6 inch or programmable at 1/360 inch
- ❑ Paper path: Cut-sheet ASF
- ❑ Paper feeding: Standard cassette, optional lower paper cassette, front manual feeding, rear manual feeding.(All friction feeding)
- ❑ Feed speed 79 ms. (1/6 inch paper feeding)
  6 inch/sec.(Continuous paper)

## PAPER SPECIFICATION

**Table 1-4. Cut sheet specification**

| Item | Remark |
|---|---|
| Paper size | •Super A3 327 mm(W) x 483 mm(L)<br>•A3 297 mm(W) x 420 mm(L)<br>•A5 148mm(W) x 210 mm(L)<br>•B4 257 mm(W) x 364 mm(L)<br>•Letter 216 mm(W) x 279 mm(L)<br>•A4 210 mm(W) x 297 mm(L)<br>•B5 182 mm(W) x 257 mm(L)<br>•Legal 216 mm(W) x 356 mm(L)<br>•Statement 139.7 mm(W) x 215.9 mm(L)<br>•Exclusive 190.5 mm(W) x 254 mm(L) |
| Thickness | 0.08 mm(0.003”) ~ 0.11 mm(0.004”) |
| Weight | 64 g/m$^2$ (17lb.) ~ 90 g/m$^2$ (24lb.) |
| Quality | Exclusive paper, Bond paper, PPC, Special papers. |
| Paper | •Regular plain paper<br>•EPSON Photo Quality Ink Jet Paper<br>•EPSON Photo Paper |
| *Note1)* No curled, wrinkled, scuffing or torn paper be used. | |

**Table 1-5. Transparency and Glossy film and paper specification**

| Item | Remark |
|---|---|
| Paper size | •Super A3/B 13”(W) x 19”(L)<br>•A3 297 mm(W) x 420 mm(L)<br>•A4 210 mm(W) x 297 mm(L)<br>•Letter 216 mm(W) x 279 mm(L)<br>•A6 105 mm(W) x 148 mm(L)** |
| Thickness | 0.075 mm(0.003”) - 0.085 mm(0.0033”) |
| Paper | •EPSON Photo Quality Glossy Film<br>•EPSON Photo Quality Glossy Paper<br>•EPSON Ink Jet Transparencies |
| *Note)* Transparency printing is only available at normal temperature.<br>*Note**)*Glossy film only. | |

**Table 1-6. Index card specification**

| Item | Remark |
|---|---|
| Size | •A6 Index card: 105 mm(4.1”)(W) x 148 mm(5.8”)(L)<br>•5x8” Index card 127 mm(5.0”)(W) x 203 mm(8.0”)(L)<br>•10x8” Index card 127 mm(5.0”)(W) x 203 mm(8.0”)(L) |
| Thickness | Less than 0.23 mm(0.0091”) |
| Paper | •EPSON Photo Quality Ink Jet Card<br>•EPSON Photo Card |

**Table 1-7. Envelope specification**

| Item | Remark |
|---|---|
| Size | •No.10 241 mm(9 1/2”)(W) x 104.8 mm(4 1/8”)(L)<br>•DL 220 mm(8.7”)(W) x 110 mm(4.3”)(L)<br>•C6 162 mm(6.4”)(W) x 114 mm(4.5”)(L) |
| Thickness | 0.16 mm(0.006”) - 0.52 mm(0.02”) |
| Weight | 45 g/m$^2$ (12lb.) - 75 g/m$^2$ (20lb.) |
| Quality | Bond paper, Plain paper, Air mail |
| *Note)* Envelope printing is only available at normal temperature.<br>*Note)* Keep the longer side of the envelope horizontally at setting. | |

## INK CARTRIDGE

**Table 1-8. Black, Yellow Ink Cartridge**

| Item | Specifications |
|---|---|
| Type | Exclusive ink cartridge |
| Color | Black, Yellow |
| Print capacity | 3200 pages/A4 (360 dpi, ECOMA 5% duty) |
| Validity | 2 years from production date(sealed in package, or being installed to the printer) |
| Environmental conditions | •Transit: –30°C ~ 60°C (within 120 hours at 60°C, and within a month at 40°C)<br>•Package storage: –30°C ~ 40°C (within a month at 40°C)<br>•Storage(installed to the printer):–20°C ~ 40°C (within a month at 40°C) |
| Dimension | 25.1 mm(W) x 139.6 mm(D) x 105.3 mm(H) |
| Weight | Approximately 200g |

**Table 1-9. Magenta and Cyan Ink Cartridge**

| Item | Specifications |
|---|---|
| Type | Exclusive ink cartridge |
| Color | Magenta +Light magenta(I/C1), Cyan + Light cyan(I/IC2) |
| Print capacity | 3000 pages/A4 (360 dpi, 5% duty) |
| Validity | 2 years from production date(sealed in package, or being installed to the printer) |
| Environmental conditions | •Transit: –30°C ~ 60°C (within 120 hours at 60°C, and within a month at 40°C)<br>•Package storage: –30°C ~ 40°C (within a month at 40°C)<br>•Storage(installed to the printer):–20°C ~ 40°C (within a month at 40°C) |
| Dimension | 35.1 mm(W) x 140.9 mm(D) x 105.3 mm(H) |
| Weight | Approximately 200g |

*Note1)* Ink cartridge can not re-fill, only ink cartridge is prepared for article of consumption.
*Note2)* Do not use the ink cartridge which was passed away the ink life.
*Note3)* Ink will be frozen under -15°C environment, however it will be useable after placing it more than 3 hours at room temperature.

## INPUT DATA BUFFER

- 6 K-byte

## ELECTRIC SPECIFICATION

### 1) 120V version

- Rated voltage: AC 120 V
- Input voltage range: AC 99 V - 132 V
- Rated frequency range: 50 - 60 K Hz
- Input frequency range: 49.5 - 60.5 Hz
- Rated current: 1.0A (Max.1.6A) Energy Star compliant
- Power consumption: Approx. 32W(ISO/IEC 10561 Letter pattern)
- Insulation resistance: 10 M ohms min. (between AC line and chassis, DC 500 V)
- Dielectric strength: AC 1000 V rms. 1 minute or AC1200 V rms. 1 second(between AC line and chassis)
- Sneak current: Less than 0.25 mA

### 2) 220-240V version

- Rated voltage: AC 220 V - 240 V
- Input voltage range: AC 198 V - 264 V
- Rated frequency range: 50 - 60 Hz
- Input frequency range: 49.5 - 60.5Hz
- Rated current: 0.5 A(Max.0.8 A)
- Power consumption: Approx. 32 W(ISO/IEC 10561 Letter pattern) Energy Star compliant
- Insulation Resistance: 10 M ohms min.(between AC line and chassis, DC 500 V)

❑ Dielectric strength: AC 1500 V rms. 1 minute(between AC line and chassis)

## RELIABILITY

❑ Total print volume: 75,000 pages (A4, letter)
❑ Print head life: 2000 million dots/nozzle

## SAFETY APPROVALS

**1)120 V version**

❑ Safety standards: UL1950 with D3
CSA22.2 No.950 with D3
❑ EMI: FCC part15 subpart B class B
CSA C108.8 class B

**2)220-240 V version**

❑ Safety standards: EN 60950 (VDE, NEMKO)
❑ EMI: EN 55022 (CISPR Pub.22) class B
AS/NZS 3548 class B

## ACOUSTIC NOISE

❑ Level: Approx.47dB(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

## ENVIRONMENT CONDITION

❑ Temperature: Operating: 10°C ~ 35°C
Storage: –20°C ~ 40°C
Non-operating: –20°C ~ 60°C

*Note)* Within 1 month at 40°C, within 120 hours at 60°C

❑ Humidity: Operating: 20% ~ 80% RH (without condensation)
Storage: 20% ~ 85% (without condensation)
Non-operating: 5% ~ 85% (without condensation)

*Note)* Refer to the figure below.

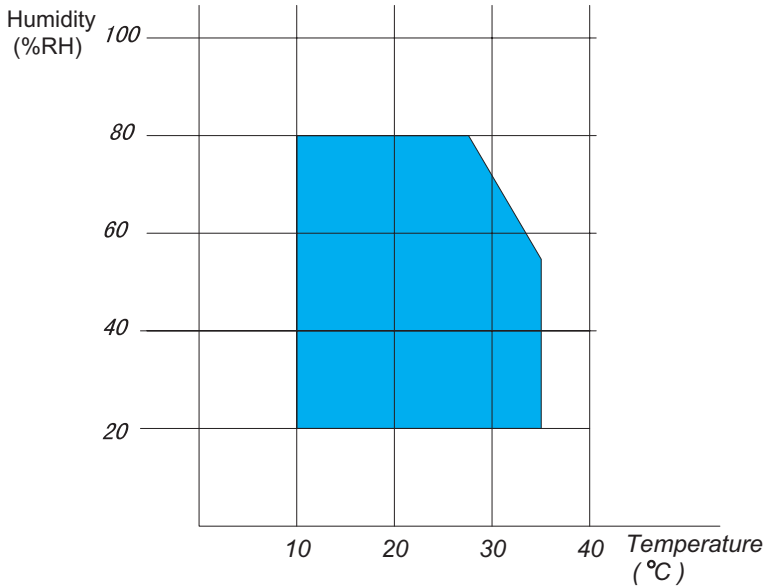


**Figure 1-1. Temperature/Humidity Range**

- ❑ Resistance to vibration: Operating: 0.15G, 10 ~ 55 Hz X,Y,Z directions
  Non-operating: 0.50G, 10 ~ 55 Hz X,Y,Z directions
- ❑ Resistance to shock: Operating: 1G, within 1 ms X,Y,Z directions
  Non-operating:2G, within 2 ms X,Y,Z directions

*Note1)* During non-operating, make sure that the cap is capped.
*Note2)* During the transport, make sure that the head is capped and ink cartridge is installed to the printer.
*Note3)* If the head is not capped at the power-off state, turn the printer on while the ink cartridge is installed, and turn off the power after capping the head.
*Note4)* Ink will be frozen under –15°C environment, however it will be useable after placing it more than 3 hours at 25°C.

## PHYSICAL SPECIFICATION

- ❑ Weight: 22 Kg (only a main frame)
- ❑ Dimension: 640 mm(W) x 439 mm(D) x 224 mm(H)(Body only)
  640 mm(W) x 704 mm(D) x 224 mm(H)(Printing on A3 size paper tray)
  640 mm(W) x 584 mm(D) x 318 mm(H)(Printing on A4 size paper, optional cassette installed)

## SERIAL INTERFACE SPECIFICATION

**Table 1-10. Serial Interface**

| Item | Content |
|---|---|
| Transmission mode | Based on RS-423 |
| Synchronization | Synchronous |
| Transfer speed | About 1.8M bps |
| Data format | Start bit: 1bit<br>Data bit: 8bit<br>Parity bit: none<br>Stop bit: 1bit |
| Handshaking | X-ON/X-Off, DTR protocol |
| Adaptable connector | 8-pin mini circular connector |
| Recommended I/F cable | Apple system peripheral-8cable |

## PARALLEL INTERFACE

**[Compatibility Mode]**

**Table 1-11. Compatibility Mode**

| Item | Content |
|---|---|
| Transmission mode | 8-bit Parallel, IEEE-1284 compatibility mode |
| Synchronization | By STROBE pulse |
| Handshaking | By BUSY and ACKLG signal |
| Logic Level | TTL compatible level (IEEE-1284 Level 1 device) |
| Adaptable connector | 57-30360(amphenol) or equivalent |
| *Note1):* Recommend to use short interface cable according to your necessity.<br>*Note2):* Use the twist pair line for each control signal of input connector and connect the return side to the signal ground. | |

*Note)* 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 /INT 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 one of the following states.

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

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

**[Nibble Mode]**

**Table 1-12. Nibble Mode**

| Item | Content |
|---|---|
| Transmission mode | IEEE-1284 nibble mode |
| Synchronization | Refer to IEEE-1284 specification |
| Handshaking | Refer to IEEE-1284 specification |
| Signal level | TTL level (IEEE-1284 level 1 device) |
| Adaptable connector | See forward channel |
| Data transfer timing | Refer to IEEE-1284 specification |
| Extensibility request data | The printer responds affirmatively when the extensibility request values are 00H or 04H, that mean,<br>00H :Request nibble mode reverse channel transfer.<br>04H :Request device ID; Return Data using Nibble Mode Rev channel transfer.<br>The printer sends following device ID string when it is requested.<br>[00H] [3BH]<br>MFG : EPSON<br>CMD : ESCPL2, BDC<br>MDL : Stylus[SP]Pro[SP]5000;<br>CLS : PRINTER<br>*Note)*[00H] denotes a hexadecimal value of zero.<br>MDL value depends on the EEPROM setting. |

## PARALLEL INTERFACE (CONT.)

**[ECP Mode]**

**Table 1-13. ECP Mode**

| Item | Content |
|---|---|
| Transmission mode | IEEE-1284 ECP mode |
| Synchronization | Refer to IEEE-1284 specification |
| Handshaking | Refer to IEEE-1284 specification |
| Signal level | TTL level (IEEE-1284 level 1 device)<br>See forward channel |
| Adaptable connector | See forward channel |
| Data transfer timing | Refer to IEEE-1284 specification |
| Extensibility request data | The printer responds affirmatively when the extensibility request values are 10H or 14H, that mean,<br>10H :Request ECP mode reverse channel transfer.<br>14H :Request device ID; Return Data using ECP Mode Rev channel transfer.<br>The printer sends following device ID string when it is requested.<br>[00H] [3BH]<br>MFG : EPSON<br>CMD : ESCPL2, BDC<br>MDL : Stylus[SP]Pro[SP]5000<br>CLS : PRINTER<br>*Note)* [00H] denotes a hexadecimal value of zero. MDL value depends on the EEPROM setting. |

## TYPE B OPTIONAL INTERFACE SPECIFICATION

Type-B interface level 2 is supported.

- Reply message (Short version):
  - Case of using Co-ax / Twin-ax I/F card:
    Main Type: MTP48p, PW127cl10cpi, PGR(KAxxxx)rev, AP1200ma
    Product Name: Stylus[SP]Pro[SP]5000
    Emulation Type: ESCPL2-00
    Entity Type: EPSONLQ2

- Reply message
  - Case of using except Co-ax / Twin-ax I/F card
    Main Type: MTP48p, PW127cl10cpi, PGR(KAxxx)rev, AP1200ma, SPD0fast
    Product Name: Stylus[SP]Pro[SP]5000
    Emulation Type: ESCPL2-00
    Entity Type: ESPONLQ2

## BUFFER OPERATION

Stylus Pro5000 starts sending BUSY signal when it acknowledges no available area left in the buffer. When the host keeps receiving this signal for a long time, it acknowledges as time out and stops sending data.

## INTERFACE SELECTION

The printer has 3-built in interfaces; the parallel interface and serial interface, and has 1 optional Type-B interface card slot. These interfaces are selected manually by the default setting mode or selected automatically. (However, it is necessary to set these settings within the maintenance mode level 1 of the panel operation.)

- Manual Selection:
  One of three interfaces can be selected by the default setting mode.

- Automatic Selection:
  The automatic interface selection is enabled by the default setting mode. In this automatic interface selection mode, 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 busy state, the selected interface is let as it is.

Following explains conditions of other interfaces when a particular interface is selected.

- When the parallel interface is not selected, the interface gets into BUSY state. At this time, LH signal is set to “L”. That means blocking power supply and no responds from 1284. Therefore, it is necessary for the host, which requires Reverse transfer, to check LH state.
- When the serial interface is not selected, the interface sets the DTR signal MARK.
- When the optional interface is not selected, Off-Line bit is set to Main Status Register(MNSTS).
- When the printer is initialized or returned to the idle state, Parallel interface becomes the ready condition and DTR of serial interface becomes SPACE(Low) condition and reset off-line bit of Main Status Register(MNSTS)to, option interface.
- /INIT signal on the parallel interface is not effective while that interface is not selected or nibble Mode, ECP Mode.

## CONTROL PANEL

There are 4 non-lock push buttons and 8 LEDs. Each button function and indicator are explained briefly below and on your right.

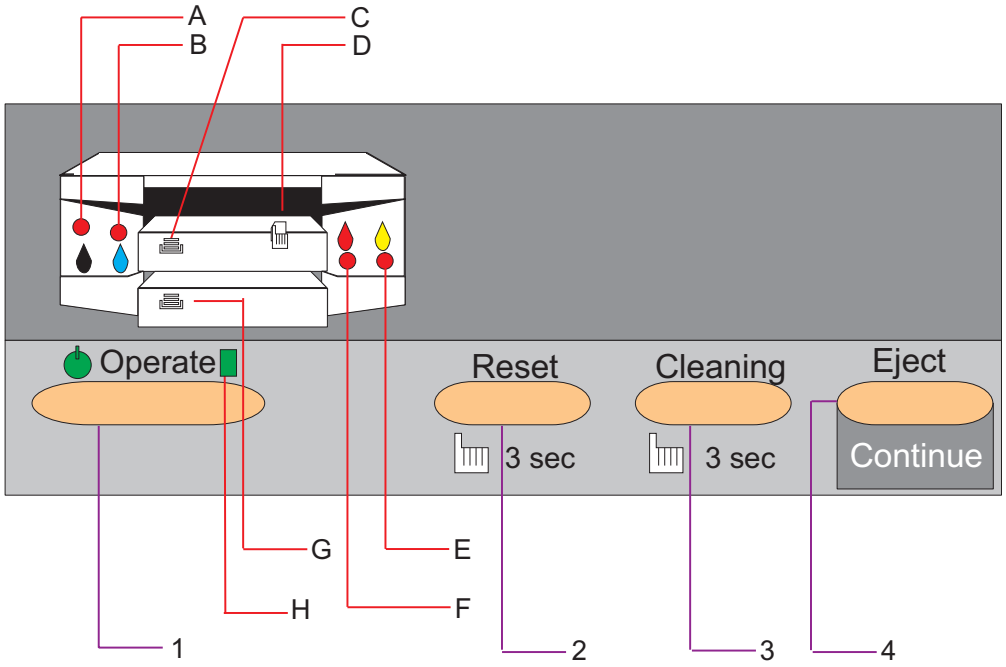


**Figure 1-2. Control Panel**

**Table 1-14. Control Panel Function**

| No. | Button / Indicator | Function |
|---|---|---|
| 1 | Operate button (power) | Power source switch on the secondary side. *Note)* Current is constantly flowing in the primary side. |
| 2 | Reset button(Pressing for 3 sec.) | Printer reset. Buffer clear. |
| 3 | Cleaning button(Pressing for 3 sec.) | Perform cleaning all heads of both sides. |
| 4 | Eject(Error recover) button (2 sec.) | Ejects the paper, or recovers from error. |
| A | Black I/C out indication LED | Blinks for low ink quantity and light is on for out of ink. |
| B | Cyan I/C out indication LED | Blinks for low ink quantity and light is on for out of ink. |
| C | Paper out indication LED for cassette (paper tray) 1 | Indication for paper out or paper loading miss of cassette 1. |
| D | Paper out indication LED for manual feed slots | All 3 LEDs (C, D, G) blink at the same time for paper loading miss. |
| E | Magenta I/C out LED | Blinks for low ink quantity, and light is on for out of ink. |
| F | Yellow I/C out LED | Blinks for low ink quantity, and light is on for out of ink. |
| G | Paper out indication LED for optional lower cassette (paper tray) 2. | Indication for paper out or paper loading miss of cassette 2. |
| H | Operate LED (power) | Green light is on while the current is flowing, or receiving data, or CL operation. |

Following table shows function when the power is turned on.

**Table 1-15. Functions with power on**

| No. | Name of switch | Function |
|---|---|---|
| 1 | Reset | Perform status printing (Refer to Note1) |
| 2 | Cleaning | Changes paper size, type verification. |
| 3 | Eject/Continue | Changes platen gap adjustment for the manual feed slots. |
| 4 | Reset + Cleaning | Changes parallel I/F ECP mode |
| 5 | Reset + Eject/Continue | Enters print head alignment mode. |
| 6 | Cleaning + Eject/Continue | Enters the maintenance mode, level1.(Factory use only) |
| 7 | Reset +Cleaning + Eject/Continue (All SW) | Enters the Firmware uploading mode. (Factory use only) |
| *Note1)*:This status printing prints firmware version, ink counter, selected code page and nozzle check patterns. Since the value of the waste ink counter is indicated by HEX, it is recommended to use the exclusive service program for checking the counter value. *Note2)*:Refer to Table1-17 for Download of Firmware and Maintenance mode. | | |

Following table shows LED indications.

**Table 1-16. Printer condition and Panel status**

| No. | Printer Status | Indicators (Figure 1-2) | | | | | Priority No. |
|---|---|---|---|---|---|---|---|
| | | H | AB EF | D | C | G | |
| 1 | Power On | On | --- | --- | --- | --- | 9 |
| 2 | Performing Ink sequence | blink | --- | --- | --- | --- | 6 |
| 3 | Receiving Data | blink | --- | --- | --- | --- | 8 |
| 4 | Paper jam | --- | --- | blink | blink | blink | 3 |
| 5 | Cassette 1/paper out, wrong paper feeding | --- | --- | --- | blink | --- | 5 |
| 6 | Out of paper in Cassette 1(paper tray1) | --- | --- | --- | On | --- | 5 |
| 7 | Cassette(Paper tray)2 | --- | --- | --- | --- | On | 5 |
| 8 | Paper out in Cassette(Paper tray)2 | -- | --- | --- | --- | On | 5 |
| 9 | SIMM copy error (over flow) | blink | On | On | On | On | 4 |
| 10 | Ink end, No I/C | --- | On | --- | --- | --- | 7 |
| 11 | Ink low | --- | blink | --- | --- | --- | 7 |
| 12 | Reset, Timer IC reset, EEPROM clear | --- | On (1 sec.) | | | | --- |
| 13 | Maintenance request (waste ink counter over flow) | blink | All On | blink | blink | blink | 2 |
| 14 | Fatal error | blink | All blink | blink | blink | blink | 1 |
| *Note):* "---" means no changes. | | | | | | | |

**Table 1-17. Download/Maintenance Mode**

| Name of Switch | Function | |
|---|---|---|
| All switches + Power on | 1.Manual feed LED turns on when the printer enters this mode correctly. Exclusive starting command(*IPL2.HEX*) is transmitted on the DOS (or DOS prompt). Black ink LED blinks during this transmission and Cyan ink LED will be turned on when the transmission is completed correctly.<br>2.Wait 2 or 3 seconds after the Cyan ink LED is turned on. Firmware*(KEYWEST.HEX*) is transmitted. At this time, Magenta ink LED is turned one during this transmission, and Yellow ink LED is turned on when it is completed.<br>3.Turn off the power. | |
| Cleaning + Eject Switch + Power on (Level1) | I/F Diseng age | 1. After the operation written in the left column is performed, press Reset switch until the black ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed.<br>2.When the black ink LED turns on, press Eject switch to determine.<br>3.Press the Reset switch until the corresponding LED turns on, according to the following explanation.<br>Black ink LED→Automatic, Cyan ink LED→Parallel, Magenta ink LED→Serial, Yellow ink LED→Option<br>4.Press either Eject switch or turn the power off for registering to EEPROM. |
| | Hexade cimal dump | 1.After the operation written in the left column is performed, press Reset switch until the Magenta ink LED is turned on. During entering mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the Reset switch is pressed. Press Eject switch to determine after Magenta LED turns on.<br>2.Turning power off is the only way to escape. |

**Table 1-18. Download/Maintenance Mode(Cont.)**

| Name of Switch | Function | |
|---|---|---|
| Cleaning + Eject Switch + Power on | P-I/F receiving speed | 1.After the operation written in the left column is performed, press Reset switch until the Cyan ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed.<br>2.Press Eject switch to determine after Cyan ink LED is turned on.<br>3.Press the Reset switch until the corresponding LED turns on, according to the following explanation.<br>Black ink LED→High speed, Cyan ink LED→Standard<br>4.Press Eject switch to register in the EEPROM.<br>Note)It is not registered to EEPROM, if power is turned off without pressing Eject switch. |
| | CG Disenga ge | 1. After the operation written in the left column is performed, press Reset switch until the Yellow ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed.<br>2.Press Eject switch to determine after Yellow ink LED is turned on.<br>3. Press the reset switch until the corresponding LED turns on, according to the following explanation.<br>Black ink LED→PC437, Cyan ink LED→PC850<br>4. Press Eject switch to register in the EEPROM. |

**Table 1-19. Download/Maintenance Mode(Cont.)**

| Name of Switch | Function |
|---|---|
| After inputting modes written in the previous page, press Cleaning, then, Reset switch. (Level 2) | Note)After entering maintenance mode level1, it becomes EEPROM reset function by pressing Cleaning switch, then, Reset switch.<br>1.Make sure that black ink LED is on. If it is not on, press Reset switch until the black ink LED turns on.<br>2.After black ink LED turns on, press Eject switch and confirm the reset.<br>3.To end this operation, turn the power off. |

## INITIALIZATION

Stylus Pro 5000 has following 3 initializations.

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

  1. Initializes printer mechanism
  2. Clears input data buffer
  3. Clears print buffer
  4. Resets default values

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

  1. Clears print buffer
  2. Resets default values

- Operator(Panel) initialization
  This printer is initialized when pushing the panel reset switch, or printer recognized the /INT signal(negative pulse) of parallel interface. When printer is initialized, following action is performed.

  1. Caps the print head
  2. Ejects a paper
  3. Clears input data buffer
  4. Clears print buffer
  5. Resets default values

## SETTING VALUES BY INITIALIZATION

By performing initialization, the following items return to the initial values. Also, the panel setting, default setting, and item that can be saved on the remote command will be default values.

1. Page position: Page heading location as present paper location
2. Line spacing: 1/6 inch
3. Right margin position: 127 lines
4. Left margin position: First line
5. Word pitch: 10 CPI
6. Printing mode: Text mode(Not raster graphics mode)

## ERROR CONDITION

Stylus Pro5000 goes to error condition when it falls to the following conditions. Out of Centronics interface signals, BUSY signal is set High and /ERROR signal is set LOW. Then, the printer goes to unprintable state, stopping data input from outside. Once the error happens, the printer can go back to the standby position or ready status for printing again by removing the error causes.

- Ink near end and Ink out Error
  When the printer runs out the most part 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 print head as a result.

**⚠CAUTION**

***Although there is no worry of bubble invasion by pulling out or installing the ink cartridge, it is necessary to pay attention to the following points.***
***1)If the ink cartridge is once removed and installed again in the condition that the ink out(end) sensor detects the ink is still in, ink consumption based on the previous ink life will be kept counting.***
***2)If the ink cartridge is once removed and the ink cartridge whose left ink quantity is little is installed again in the condition that the ink is still in, Stylus Pro5000 goes to the ink out error condition, even though there is still enough ink in it.***

- Paper out sensor
  When there is no paper in the paper tray, or paper tray itself is not installed, this sensor detects and goes paper out error.

- Paper loading miss:
  When printer fails to load a sheet or PE sensor does not detect the paper on the path, it goes paper out error.

- Paper Jam Error
  Even when the paper feeding is performed at the power on, if the PE sensor detects the paper on the paper path or fails to eject a paper by FF command or Eject button, the printer considers it as paper jam and goes to the error condition. In the Stylus Pro5000, the linear encoder monitors detection of paper jam in the carriage running range.

- No ink-cartridge
  When the printer detects that ink cartridge comes off or is not installed, it goes to the error condition.

- Maintenance Request
  When the total quantity of ink wasted through the cleanings and flushing reaches to the limit, printer indicates this error and stops. The absorber(waste ink pad) in the printer enclosure is needed to be replaced with new one by a service person. This error does not recover until the waste ink pad is replaced and “0” is written to the particular address in the EEPRON by a service man.

- Fatal Errors
  When fatal errors such as carriage control error or CG access error are detected, the printer goes to error condition and stops. Repair service is required for this error.

## PANEL SETTING FUNCTION

Here explains input method for each panel setting.

- Printing nozzle check pattern and printer configuration
  - •Operation: Reset SW + Power On
  - •Exit: Power Off
  - •Function: (Power LED blinking while in this mode)
    1)Reset SW + Power on →2)Position change to thick→3)Starts printing pattern→ 4)Printing 1-page→5)Eject paper→6) Stand by mode in self-test by pressing →Refer to followings.

**[Pressing Cleaning SW: in standby mode only]**
1)Execute cleaning→2)Eject paper 3)Reprint self test page→4)self-test stand by mode.

**[Pressing Eject SW: in standby mode only]**
1)Feed paper→2)Reprint self test page→3)self-test stand by mode.

*Note)* Ignore Cleaning SW while printing and Power off to exit this mode.

✓CHECK POINT

- ***Even if Cleaning or Eject switch is pressed during printing, the panel operation is ignored.***
- ***You can escape from the self-test mode only by turning the power off.***

Printing Pattern: Print nozzle test pattern, firmware version, the value of wasted ink count and current setting values are printed. Following shows printing pattern.

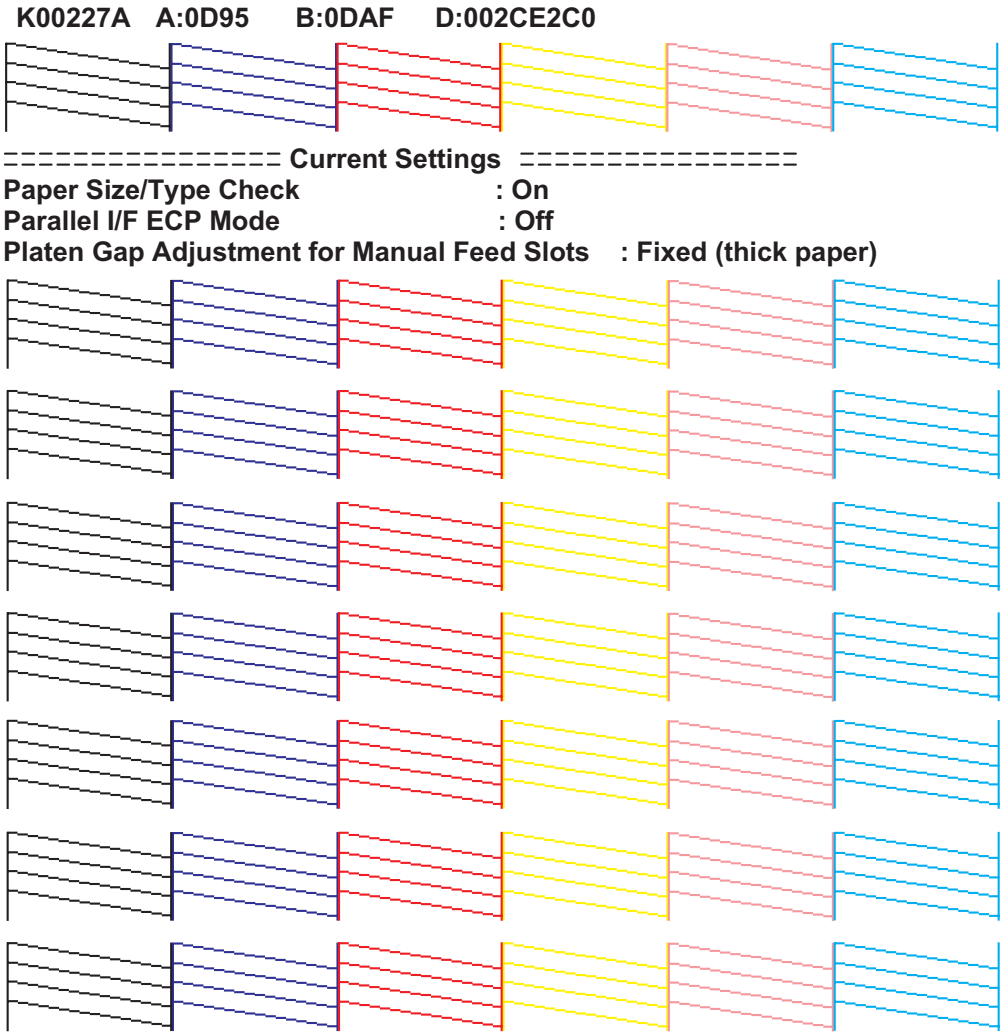


**Figure 1-3. Printing Sample**

**[Explanation]**

K00227A: Firmware version.

A:0D95 : The present counting value of ink absorber only for dark colors head.

B:0DAF : The present counting value of ink absorber for light color head only.

D: 002CE2C0 : The present counting value of waste ink absorber for flushing.

*Note)* Maintenance Error occurs at the point either A or B becomes full counter condition. In other words, it occurs when A becomes 46650, or B becomes 47200. Since the value is indicated by HEX indication, it is recommended to use the exclusive program to check the counter value.

By referring to the printing pattern on the previous page, it becomes possible to check ink discharge conditions (or dot missing or alignment failure) from all nozzles in each color. As an example, refer to “A” ~ “D” lines shown on the black nozzle pattern. “A” line is printed by black nozzle #1 to #16, “B” line is by #17 to #32, “C” line is by #33 to #48, and “D” is #49 to #64. Since the nozzle for different colors is also aligned in the same way, you can consider in the same way.

■ **Paper check mode**

This setting decides to turn the paper check function on or off. For Stylus Pro5000, it is necessary to match the lever located paper feed cassette(tray) above to the presently used paper type (media type) and its size. If the PC which supports bi-directional communication is used, it is not necessary to make this paper check setting effective(on), because the user can change the lever positions on the cassette, according to the error message on the PC screen. However, if the user uses the PC which does not support the bi-directional communication, it is necessary to set this mode on the printer body, since he/she can not check the error message on the computer screen.

- Operation: Cleaning SW + Power on to enter this mode.
- To change paper check mode setting On/Off: Reset SW
- Save setting: Press Eject switch or turn off the power.
- Setting and LED indicator:
  Paper check On→ Black ink LED On.
  Paper check Off→ Cyan ink LED On.
- Function: 1)Cleaning SW +Power on to enter this mode→2)Power LED blinks, Cassette1 LED turns on→3)Ink LED indicates current setting→ 4)Change paper check On/Off by Reset SW.

**[After completing the setting, if the power is turned off]**
1)Save setting→2)Exit mode→3)Power off
**[After completing the setting, if Eject switch is pressed]**
1)Save setting→2)Exit mode→3)Idle state

■ ECP Mode

- Operation: Reset SW + Cleaning SW + Power On to enter this mode.
- To change ECP mode On/Off: Reset SW
- Save setting : Turn off the power or press the Eject SW
- Setting and LED indicator:
  ECP mode off→Cyan LED on
  ECP mode on→Black ink LED on.
- Function: 1)Reset SW+ Cleaning SW+ Power on to enter this mode→2)Power LED turns on and Cassette1LED blinks→ 3)Indicate the current setting by blinking ink LED.→4)Change ECP On/Off by Reset SW.

**[After completing the setting, if the power is turned off]**
1)Printer escapes from the selected paper check mode.→2)Printer goes to the power off condition.

**[After completing the setting, if Eject switch is pressed]**
1)Printer escapes from the selected paper check mode. →2)Printer goes to the ordinal printing mode(idle state).

■ **Manual feed slots paper thickness - Auto mode**

The setting for Manual feed thick paper and auto mode is the function only to deal with using manual feed slots(front/rear). After checking the result of the printing by the manual feeding, this function becomes effective when the printing is blurry or faint. The reason why there is this kind of function only for manual feeding is that the printer can not recognize the paper thickness, unlike the other paper feed cassettes. There is no influence on the other paper feeding path(or standard cassette or optional cassette), when this function becomes effective. Also, unless this function is set effective, manual paper feeding always make PG(platen gap) big or wider and perform printing. Following shows conditions when the PG becomes wider(big).

**Table 1-20. Setting conditions when PG becomes thick paper mode**

| Setting | No. | Conditions |
|---|---|---|
| Setting on the Driver side. | 1 | In case A4 size paper (landscape) is set. |
| | 2 | In case SF exclusive paper (landscape) is set. |
| Lever setting on the cassette side. | 3 | In case Media type is the combination of ordinary paper and paper size A4(landscape). |
| | 4 | In case Media type is the combination of SF exclusive paper and A4 size(landscape). |
| Special Panel setting. | 5 | In case of thick paper mode for the manual feed. |

**⚠CAUTION**

***According to the Table above, priority order for each setting is determined as follows.***
***■ Paper Feed from paper feed cassette (standard/option).***
***Priority order1.:In case the media type is set to "Thick Paper".***
***Priority order2.:In case there is mis-matching between driver and lever position on the printer, the priority is given to the driver setting, if "Ignore" button is selected on the screen.***

**⚠CAUTION**

***■ Paper Feed from Manual Paper Feed Slot***
***Priority order1.:PG is wider(big) if thick paper mode is set.***
***Priority order2.:In case, media type is set to the envelope.***

- Operation: Eject switch + Power on to enter this mode.
- To change setting Manual/Auto mode: Reset SW
- Save setting: Turn off the power or press the Eject switch.
- Setting and LED indication: *Auto→Black ink LED On. Platen gap is defined by platen gap command 'PG'.
  *Manual feed(thick paper)→Cyan ink LED on. Platen gap ignores PG command and uses platen gap thick position.
- Function: 1)Eject SW + Power On to enter this mode→2)Power LED blinks and Cassette 2 LED turns on→3)Ink LED indicates current setting→4)Automatic or manual (thick paper) is changed over everytime the Reset SW is pressed.

**[After completing the setting, if the power is turned off]**
1)Save setting→ 2)Exit setting mode →3)Printer goes to the power off condition.

**[After completing the setting, if Eject switch is pressed]**
1)Save setting→ 2)Exit setting mode →3)Printer goes to the ordinary printing mode.(idle state)

## ■Maintenance Mode 1

- Operation: Cleaning SW + Eject SW + Power ON to enter this mode.
- To change maintenance item:
  Reset SW
- Determine the selection(maintenance item):
  Eject SW
- Maintenance item and LED indicator:
  I/F selection → Black ink LED is on.
  Parallel input speed→Cyan ink LED is on.
  HEX dump→Magenta ink LED is on.
  Character set→Yellow ink LED is on.
- Function: 1)Cleaning SW + Eject SW+ Power ON to enter this mode→2)Power LED blinks. Manual cassette(tray), Cassette1 and 2 turn on→3)Ink LED indicates current setting→4) Paper check, I/F selection, Parallel input speed, Hex change is changed over everytime the Reset SW is pressed.
  Ink LED turn on in the order of left to right and returns to left side.

**[In case of pressing Eject SW]**
1)Select item(Data registration)→2)Exit this mode→3)Enter each setting mode.

**⚠CAUTION** ***Following explains setting of each item in the maintenance mode selection.***

## ■Select I/F mode(Cont1. from Maintenance mode)

- Operation: After Eject SW + Power ON, turn the black ink LED on by pressing Reset SW, and determine that selection by pressing Eject SW.
- To select I/F mode:
  Reset SW(Parallel→Serial→Option)
- Save setting:
  Eject SW or Power off
- Setting item and LED indicator:
  Auto selection setting→Black ink LED is on.
  Parallel I/F mode→Cyan ink LED is on.
  Serial I/F mode→Magenta ink LED is on.
  Option I/F mode→Yellow ink LED is on.
- Function: 1)Select “Black” in maintenance mode to enter this mode.→2)Power LED blinks. Cassette1 and 2 turn on →3)Ink LED indicates current setting. →4)By pressing Reset SW, Auto, Parallel, Option is selected in this order. Ink LED moves left to right and return to left.

**[After completing the setting, if power is turned off]**
1)Save setting(Data registration)→ 2)Exit setting mode →3)Printer goes to the power off condition.

**[After completing the setting, if Eject switch is pressed**
1)Save setting(Data registration)→ 2)Exit setting mode →3)Printer goes to the ordinary printing mode(idle state).