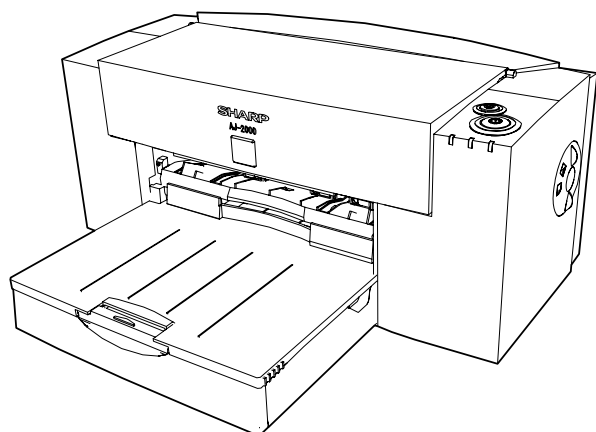


SHARP SERVICE MANUAL

CODE : 00ZAJ2000/A1E



COLOR INKJET PRINTER

AJ-1800
MODEL AJ-2000

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Parts marked with "△" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used
for after sales service only.
The contents are subject to change without notice.

[1] GENERAL

1. FEATURES

1 - 1. High speed printing

- High speed: Up to color 8 ppm/Mono 12 ppm (AJ-2000, Draft Mode sharp original document)
- High capacity paper cassette: 150 sheets

1 - 2. High quality Black ink

- Carbon black ink with Laser quality
- High Quality of 1200 x 1200 dpi with Photo quality
- High image Quality by the Sharp Original Color matching system

1 - 3. Ecology

- Separate Ink tank and Ink Head
- Separate Each Ink tank (Yellow/Magenta/Cyan/Black)
- High capacity ink tank: Color 350 pages/Mono 700 pages

1 - 4. User friendly

- Easy to connect to PC with USB
- Paper stock in the tray doesn't curl for U path design
- Avoid misprints with the Mechanical Ink empty sensor

[2] SPECIFICATIONS

This chapter shows specifications of the printer, paper and system requirement.

1. BASIC SPECIFICATIONS OF THE PRINTER

Name		AJ-1800	AJ-2000
Type		On demand, thermal inkjet type	
Resolution		Max. 1200dpi x 1200dpi (Super fine), 600dpi x 600dpi (Fine, Standard), 600dpi x 300dpi (Draft)	
Printing speed *1	Mono	Max. 10ppm	Max. 12ppm
	Color	Max. 6ppm	Max. 8ppm
Paper	Width	Max. 8.5" (215.9mm) Min. 3" (76.2mm)	
	Length *2	Max. 14" (355.6mm) Min. 5" (127mm)	
Void area	Min.	Top 0.12" (3mm), Bottom 0.12" (3mm), Left 0.12" (3mm), Right 0.12" (3mm)	
	Recommendation	Top 0.75" (19mm), Bottom 0.75" (19mm), Left 0.39" (10mm), Right 0.39" (10mm)	
Print description language		Host based printing system (GDI)	
Fonts		Dependant upon computer system	
Interface		IEEE1284-compliant parallel interface USB interface (B type)	
Paper tray capacity	Paper tray *3	Max. 150 sheets of plain paper *5	
	Output tray *4	Max. 50 sheets of plain paper *5	
	Bypass tray	1 sheet	
Ink life	Black	700 sheets	
	Color	350 sheets	
External dimensions (W x D x H)		17.3" x 14.1" x 7.5" (440mm x 358mm x 191mm)	
Weight		14.3 lbs. (6.5kg)	
Power supply		AC 100V-240V (±10%), 50Hz/60Hz (±10%)	
Power consumption	Idle	7.1W	
	Printing	Max. 45.0W	
Operation condition	Temperature	50°F - 95°F (10°C - 35°C)	
	Relative humidity	20% - 85%	
Storage condition	Temperature	-13°F - 104°F (-25°C - 40°C)	
	Relative humidity	15% - 90%	
Noise level		Sound Power Level LWA (1B=10db) Printing: 6.3[B(A)] Print mode: Sharp Special, Standby: Background noise level Sound Pressure Level LPA (bystander positions) Printing: 47[dB(A)] Print mode: Best, Standby: Background noise level Noise emission measurement in accordance with ISO 7779.	

*1: When using 8.5"x11"/A4 size paper at 5% toned area in normal area.

*2: For the Bypass Tray, the maximum paper size is 5-sheeted 8.5"x11"/A4 banner.

*3: Holds up to total thickness of 0.59" (15mm) paper stack.

*4: Holds up to total thickness of 0.2" (5mm) paper stack.

*5: With 20lbs. (75g/m²) plain paper.

*6: When using A4/8.5" x 11" size paper at 5% image area in normal usage.

2. PAPER TYPE

Paper type	Weight	Note
Plain paper	16lbs. - 110lbs. index (60g/m ² to 200g/m ²)	
Coated paper		Use whiter side for printing
Photo paper		Use whiter side for printing
Transparency		
T-shirt transfer		
Label		Use labels without a border area.
Banner	20lbs. (75g/m ²) Max. size : 8.5"x11" x 5, A4 x 5	Insert through bypass tray
Envelope	20lbs. - 24lbs. (75g/m ² - 90g/m ²)	
Card	110lbs. Index (110g/m ² - 200g/m ²) Max. thickness : 0.012" (0.3mm)	

3. SYSTEM REQUIREMENT

3 - 1. Windows

ITEM		CONTENTS
1	Support machine	AJ-1800 / 2000
2	Operating system compatibility	Win95 / 98 / NT4.0 / Windows 2000
3	Minimum system requirements	(System) 486 or better processor (Monitor) 640 x 480 dots (Memory) 16MB RAM (HD) 8MB HD space (Other) Parallel(standard Centronics) or USB *
4	Support Interface	IEEE-1284 or USB *

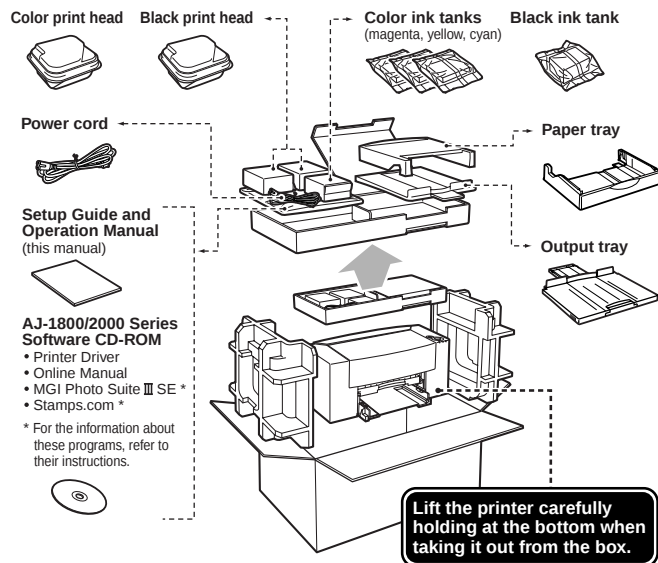
*: USB for Windows 98 or Windows 2000 pre-installed models.

3 - 2. Mac

ITEM		CONTENTS
1	Support machine	AJ-1800 / 2000
2	Operating system compatibility	Mac OS 8.5-9.04
3	Minimum system requirements	(System) PowerPC G3(750)/ 233MHz (Monitor) 640 x 480 dots (Memory) 32MB RAM (HD) 8MB HD space (Other) USB port
4	Support Interface	USB

[3] SETTING UP THE PRINTER

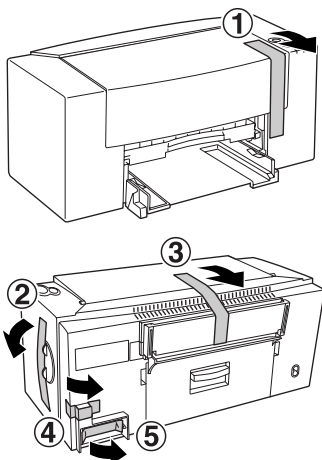
1. PACKING FORM



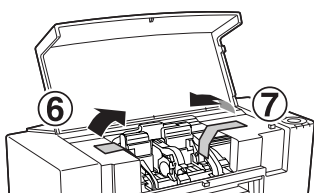
- Note:**
- Interface cables for connecting the printer to your computer are not included. Please purchase the appropriate cable for your computer.
 - Do not unpack the print heads and ink tanks until installing them in the printer.
 - The box and protective materials maybe needed for transportation. Do not throw them away.

2. UNPACKING

1. Remove the tape ①-⑤ shown in the illustrations.



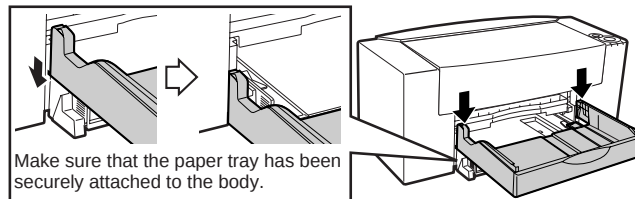
2. Open the front cover, and remove the tape , shown in the illustration.



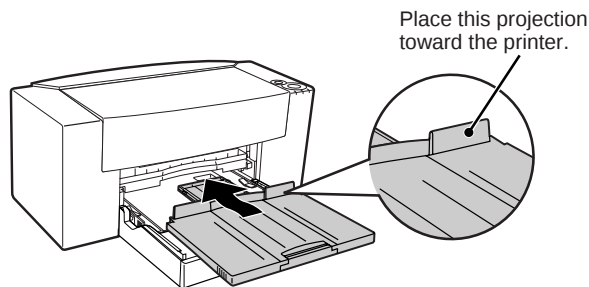
3. ATTACHING THE TRAYS

Attach the paper tray and output tray to the front of the printer. Follow the steps shown below.

1. Attach the paper tray by firmly pushing down both edges.



2. Attach the output tray as shown in the illustration.



4. CONNECTING THE INTERFACE CABLE

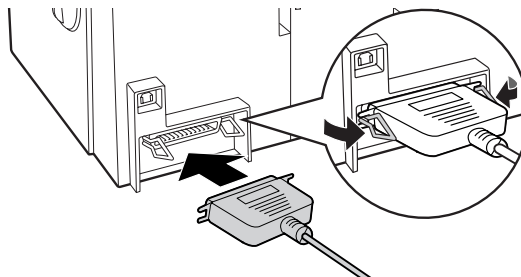
This printer includes both USB and parallel interface connectors.

Interface cables for connecting the printer to your computer are not included with this printer.

Please purchase the appropriate cable for your computer.

Connecting the Parallel Interface Cable

1. Obtain an IEEE1284 shielded parallel interface cable.
2. Ensure that your computer and printer are turned off.
3. Insert the cable into the parallel interface connector located on the rear of the printer, and fasten with clasps.



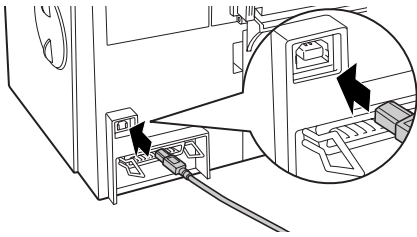
4. Insert the other end of the cable into the interface connector of your computer.

Connecting the USB Interface Cable

Note:

- USB is available with a PC/AT compatible computer that was originally equipped with USB and had Windows 98 or Windows 2000 preinstalled. As a Macintosh, USB is available with Mac OS 8.5 or later and a computer that was originally equipped with USB.

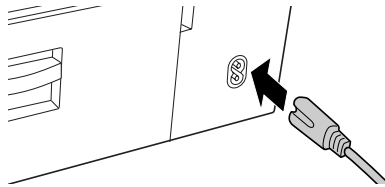
1. Obtain a shielded USB interface cable.
2. Insert the cable into the USB interface connector located on the rear of the printer.



3. Insert the other end of the cable into the interface connector of your computer, or the USB hub connected to your computer.

5. CONNECTING THE POWER CORD

1. Insert the power cord into the socket on the rear of the printer.



2. Connect the other end of the power cord to an outlet.

Power of the printer is turned on automatically.

- Warning**
- Do not connect the printer to other than 100V-240V outlet. Plugging the printer into an incompatible power supply may cause irreparable damage or fire.
- Caution:**
- Be sure that the plug in the outlet is readily accessible to all persons. Power is present in the product even if the power button is off in order to maintain good print quality.
 - To completely shut off the power, first turn off the power using the power button. Then unplug the power cord, after first ensuring that the carriage has returned to its home position on the right side of the printer.

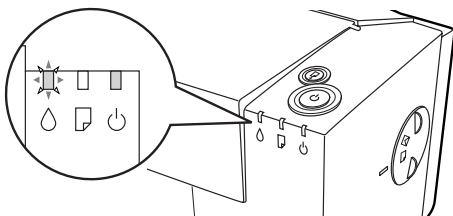
6. INSTALLING THE PRINT HEADS AND INK TANKS

Follow the steps below for installation.

- Note:**
- This section describes how to install the print heads and ink tanks when you install them for the first time after purchasing this printer. Refer to "Changing Ink Tank" in your online manual for the information on replacing the ink tank or print head in the printer with new ones.

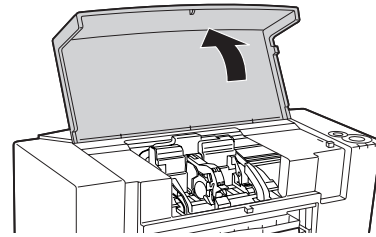
Installing the Print Heads

1. Make sure that the power lamp is lit, and the ink lamp is blinking rapidly.



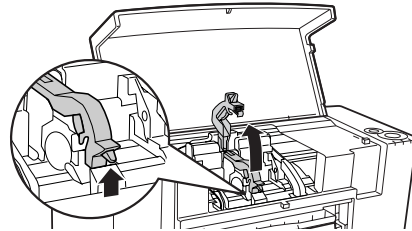
If the power lamp is not lit, press the power button.

2. Open the front cover.

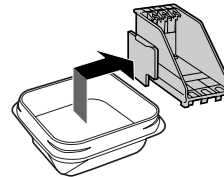


3. Raise the print head latch.

Raise the latch until it comes in contact with the front cover.



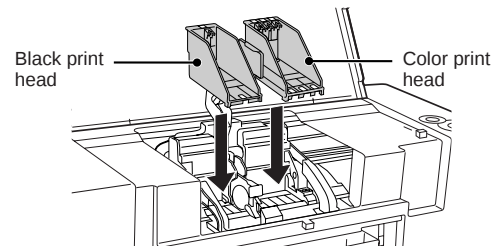
4. Remove the print heads from their protective cases.



- Caution:**
- Do not touch the metal portion of the print head directly. Doing so may lead to improper printing.

5. Insert the print heads.

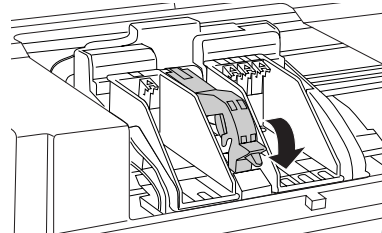
Insert the black print head into the left carriage opening, and a color print head into the right carriage opening.



- Caution:**
- Be careful not to damage the print heads. If any of them is damaged, the printer may not work properly.

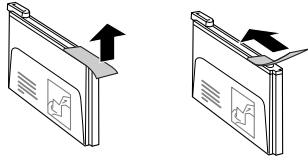
6. Lower the print head latch.

Lower the latch until it clicks into the latched position.

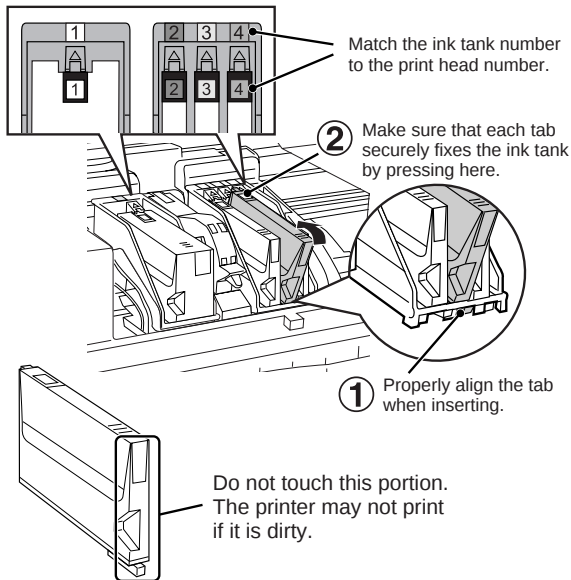


Inserting the ink tanks

1. Unpack the ink tanks from their protective wrapping and slowly remove the tape.

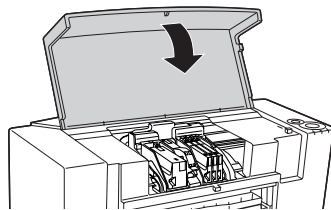


- Caution:**
- Hold the tank upright when removing the tape. Do not touch the uncovered opening on the ink tank, as ink will get on your hands.
 - Ensure that there are no pieces of tape remaining on the ink tank.
2. Turn the ink tanks upside down, and then immediately insert each of them to the print head of corresponding number.



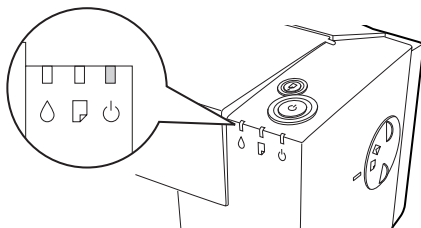
- Caution:**
- Ensure the number on the print head correspond to the number on the ink tank.

3. Close the front cover.



After closing the cover the carriage will return to its home position, and the ink will be fed to the print head (this could take a while).

4. Confirm the ink lamp is not blinking.



If the ink lamp continues to blink, open the front cover, return to step 5 of "Installing the Print Head" and follow the procedures once more.

- Caution:**
- To keep good print head quality, keep all the ink tanks installed to the corresponding print head.

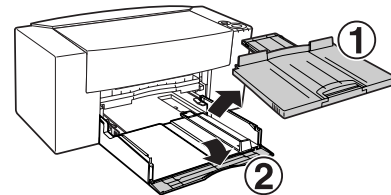
7. LOADING PAPER

Follow the steps below to load paper into the paper tray or bypass tray.

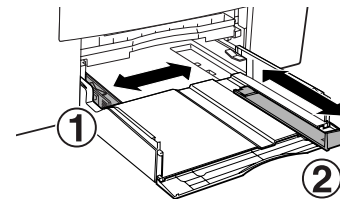
You can load plain paper and other special paper. For detailed information of paper type, see page 2 – 2.

LOADING PAPER INTO THE PAPER TRAY

1. Remove the output tray ①, and open the front lid of paper tray ②.

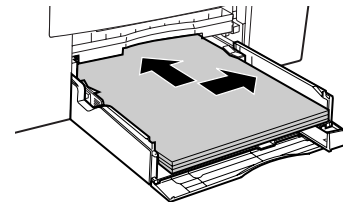


2. Adjust the guides ① and ② shown in the illustration to a little wider than the width of the paper.

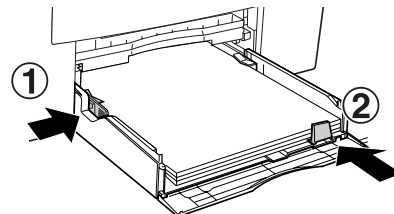


3. Load the paper.

Load the paper print side down into the paper tray. Make sure to push the paper to the right side and the back side of the tray.

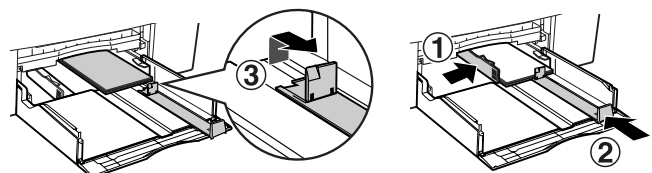


4. Align the edge of the paper with guides ① and ②.



When loading cards

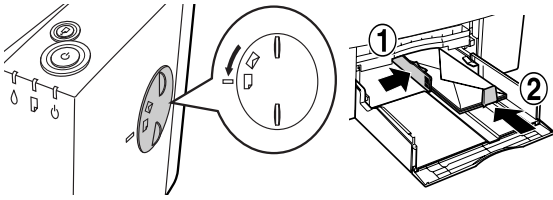
Set guide ③ up, and then fit guide ① and ② against the loaded cards.



When loading envelopes

Set the paper knob to the "Thick Paper" setting.

Load the envelope face down with the flap to the right, and then adjust the paper guides to the width of the envelope.



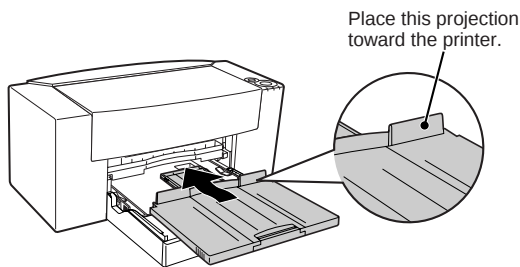
Notes for loading envelopes

- Load envelopes in portrait direction into the paper tray.
- Do not use non-standard envelopes, envelopes with clasps, or window envelopes.
- Be sure to select each of Com10, DL, C6, and Invitation A2 on the paper size setting of the printer driver. (For detailed information on printer driver, refer to the online manual.)

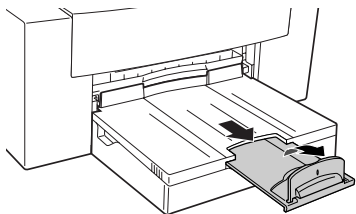
5. Close the front lid of paper tray firmly pushing the right edge.

Note: • With some sizes of paper, guide ② may stick out of the paper tray. In this case, print with the front lid of the paper tray open.

6. Attach the output tray.



7. Pull the output tray extension to the proper position, and then raise the paper stop guide.



- Note:**
- Be sure that paper is free of rips, dust, wrinkles, and curled or bent edge.
 - Make sure all the paper in the stack are the same size and type.
 - Fan the paper and tap them against a flat surface to ensure it is even before loading into the printer.
 - The paper tray can hold up to 150 sheets of 20lbs. (75g/m²) plain paper. Be sure to keep total thickness of the loaded paper stack below 0.59" (15mm).
 - When loading postcard size paper into the paper tray, load it in portrait direction.
 - When loading paper, ensure there is no space between the paper and the guide, and check if the guide is not set too narrow causing the paper to bend. Loading paper in these ways will result in bent printing or a paper jam.
 - The paper knob should always be set to the "Normal Paper" setting except while printing on thick paper or envelopes.

- When not using the printer for an extended period, remove all paper from the paper tray and store it in a dry place. If paper is left in the printer for an extended period, the paper will absorb moisture from the air, resulting in a paper jams.
- When adding paper to the paper tray, remove paper already contained in the printer, add it to the paper you intend to load, and then load into the paper tray. Placing new paper on top of paper already contained in the tray, may result in two pages supply to the printer.

8. LOADING THE BYPASS TRAY WITH PAPER

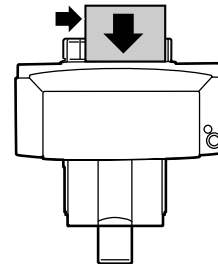
Note: • Only one sheet of paper can be placed in the bypass tray at a time.

1. Open the bypass tray located on the rear of the printer.



2. Load the paper print side up.

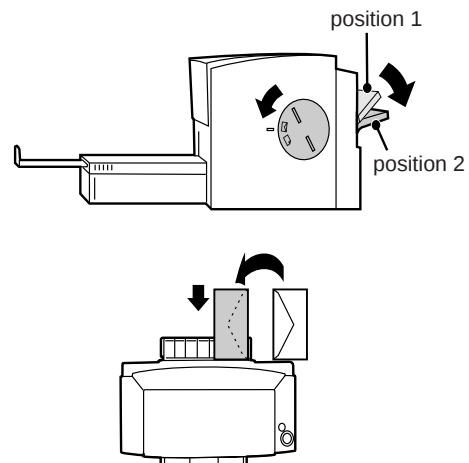
Align the paper with the right side of the bypass tray and insert the paper down until resistance is felt. If inserted correctly, the paper will be fed slightly into the printer.



When loading an envelope

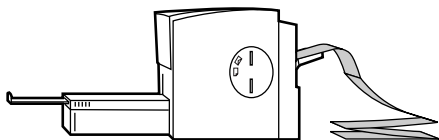
Open the bypass tray until it reaches position 2 (the tray has two positions), set the paper knob the "Thick Paper" setting.

Load the envelope face up with the flap to the right, and then adjust the opposite side to the right edge of the tray. Refer to "Notes for loading envelopes" on page 3 – 4.



When loading banner paper

Open the bypass tray until it stops, and set the paper along the right side edge of the tray.



- Note:**
- Maximum 5 sheets of banner paper can be used.
 - When printing onto banner paper, ensure to use an application software compatible with banner paper.
 - The paper knob should always be set to the "Normal Paper" setting except while printing on thick paper or envelopes.

9. INSTALLING THE PRINTER DRIVER (Windows)

To use this printer with your computer, the printer driver should be installed onto your computer's hard drive. In this chapter, you will learn how to install them and how to use the Online Manual.

The following terms are used in this chapter.

CD-ROM

Means the supplied CD-ROM with the AJ-1800/2000 Series Software.

Drive D (the field to be typed "D:\...")

This assumes that your computer's CD-ROM drive is drive D. (If your computer's CD-ROM drive letter is not Drive D, change the CD-ROM drive letter to correspond to the letter of your CD-ROM drive.)

Be sure to read the Readme.txt file before installing the printer driver. (The location of the Readme.txt file is D : \ README \ ENGLISH \ README.TXT)

HARDWARE AND SOFTWARE REQUIREMENTS

Check the following hardware and software requirements in order to install the AJ-1800/2000 Series Printer Driver.

Computer type	IBM PC/AT or compatible computer equipped with a USB* or parallel interface
Operating system	Windows 95, Windows 98, Windows NT 4.0 (Service Pack 3 or later), Windows 2000
Display	640 x 480dots (VGA) or better
Hard disk free space	10MB or more
Other requirement for hardware	An environment on which any of the operating systems listed above can fully operate

* Compatible with Windows 98 or Windows 2000 preinstalled model with USB interface equipped as standard.

BEFORE INSTALLATION

The method to install the printer driver varies depending on your operating system and the cable connecting the printer and your computer. Check your operating system and your cable type, and then follow the steps shown below to install the printer driver.

Operating system	Interface	Reference pages for how to install
Windows 95	Parallel interface	"Installing onto Windows 95" (page 3 – 6) or "Installing onto Windows 95 / 98" (page 3 – 7)
Windows 98	USB interface	"Installing the USB driver (Windows 98)" (page 3 – 5) next, step 6 and later of "Installing onto Windows 95 / 98" (page 3 – 7)
	Parallel interface	"Installing onto Windows 98 (Parallel interface) / 2000" (page 3 – 6) or "Installing onto Windows 95 / 98" (page 3 – 7)
Windows 2000 *	USB/Parallel interface	"Installing onto Windows 98 (Parallel interface) / 2000" (page 3 – 6) or "Installing onto Windows 2000 / NT 4.0" (page 3 – 8)
Windows NT 4.0 *	Parallel interface	Installing onto Windows 2000 / NT 4.0 (page 3 – 8)

* The administrator's authorisation is required to install a printer driver.

INSTALLING THE USB DRIVER (Windows 98)

If the printer is connected to your computer by USB cable, you have to install the USB driver before installing the printer driver. To install the USB driver, follow the steps shown below.

1. Make sure that the printer is connected to your computer by USB cable.
2. Turn on the printer, and then turn on your computer.

"Add New Hardware Wizard" window will appear. If this window does not appear, refer to "Failed to install the USB driver (Windows 98)" in "Troubleshooting" of the online manual.



3. Click the "Next" button.
4. Check the radio button for "Search for the best driver for your device (recommended)", and then click the "Next" button.
5. Insert the supplied CD-ROM into your CD-ROM drive.
6. Select the "Specify a location:", type "D:\ENGLISH\WIN9X\USB", and then click the "Next" button.
7. Click the "Next" button.
8. Click the "Finish" button.

You have completed the installation of the USB driver. After installing the USB driver, the "Add Printer Wizard" will appear. Move on to the step 6 of "Installing onto Windows 95 / 98" (page 3 – 7).

Note:

- The USB driver will remain in your system even after uninstalling the printer driver.

A. INSTALLING THE PRINTER DRIVER

Installing onto Windows 98 (Parallel interface) / 2000

Note:

- The screen images in this section are of Windows 98.
- The contents of each screen image are those of the AJ-1800.

1. Make sure that the printer is connected to your computer.
2. Turn on the printer, and then turn on your computer.

On this step, "Add New Hardware Wizard" on Windows 98 or "Found New Hardware Wizard" on Windows 2000 will appear.

Note:

- If neither of these screens will appear on your computer, refer to either of "Installing onto Windows 95 / 98" (page 3 – 7) or "Installing onto Windows 2000 / NT4.0" (page 3 – 8) according to your operating system.

3. Click the "Next" button.
4. Insert the supplied CD-ROM into your CD-ROM drive.
5. Check the radio button for "Search for the best driver for your device (recommended)", and then click the "Next" button.

On Windows 2000, check the radio button for "Search for a suitable driver for my device (recommended)", and then click the "Next" button.



6. Select the "Specify a location:", type "D:\ENGLISH\WIN9X", and then click the "Next" button.



On Windows 2000, perform the following steps:

- 1) Select the "Specify a location:" and click the "Next" button.
- 2) Type "D:\ENGLISH\WIN2000" and click the "OK" button.

Note:

- To install the driver successfully, be sure to select the "Specify a location".

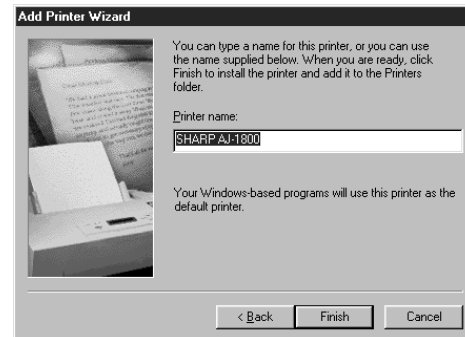


7. Click the "Next" button.

If "Digital Signature Not Found" window appears on Windows 2000, click the "Yes" button. This window will not affect your operation.

8. Click the "Finish" button.

If the program displays "Do you want your Windows-based programs to use this printer as the default printer?", check "Yes".



You have completed to install the printer driver.

Note:

- Before printing align the print head by the procedure on page 3 – 9.

Installing onto Windows 95

Note:

- The contents of each screen image are those of the AJ-1800.

1. Make sure that the printer is connected to your computer.
2. Turn on the printer, and then turn on your computer.

"Update Device Driver Wizard" or "New Hardware Found" window will appear.

Note:

- If neither the "Update Device Driver Wizard" window nor the "New Hardware Found" window appear, refer to "Installing onto Windows 95 / 98" (page 3 – 7).

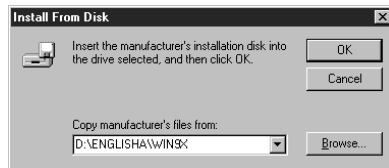
If the "Update Device Driver Wizard" window appears, click the "Next" button and proceed to step 3.



If the "New Hardware Found" window appears, perform the following steps and proceed to step 6.

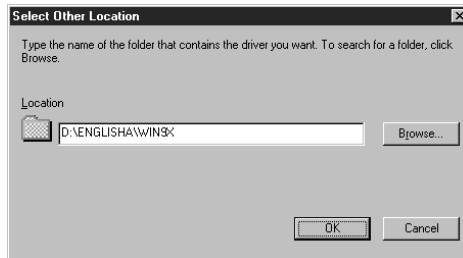


- 1) Check the radio button for "Driver from disk provided by hardware manufacturer", and click the "OK" button.
- 2) Insert the supplied CD-ROM into your CD-ROM drive, type "D:\ENGLISH\WIN9X", and then click the "OK" button.



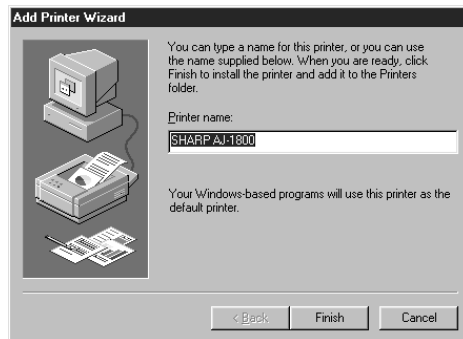
Go to step 6.

3. Click the "Other Locations" button.
4. Insert the supplied CD-ROM into your CD-ROM drive, type "D:\ENGLISH\WIN9X", and then click the "OK" button.



5. Click the "Finish" button to continue the installation.
6. Click the "Finish" button.

If the program displays "Do you want your Windows-based programs to use this printer as the default printer?", check "Yes".



If the "Insert Disk" window appears, perform the following steps:

- 1) Click the "OK" button.
- 2) When the "Copying Files" window appears, type "D:\ENGLISH\WIN9X" and click the "OK" button.

You have completed to install the printer driver.

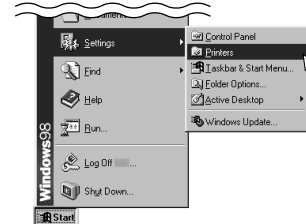
Note: • Before printing align the print head by the procedure on page 3 – 9.

B. INSTALLING THE PRINTER DRIVER BY "ADD PRINTER"

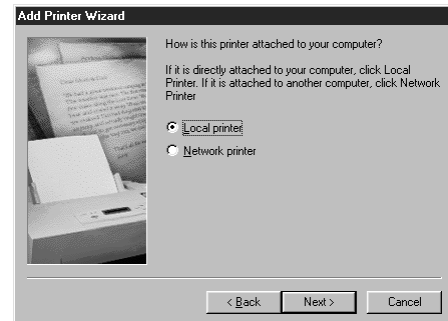
Installing onto Windows 95 / 98

Note: • The screen images in this section are of Windows 98.
• The contents of each screen image are those of the AJ-1800.

1. Make sure that the printer is connected to your computer.
2. Turn on the printer, and then turn on your computer.
3. Click the "Start" button, select "Settings" and then click "Printers".

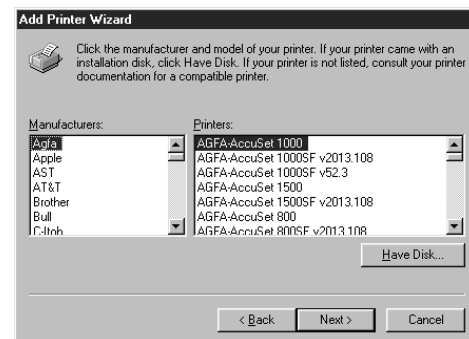


4. When the "Printers" window appears, double-click the "Add Printer" icon.
5. Click the "Next" button.
6. Check the radio button for "Local printer", and click the "Next" button.



To use this printer as a network printer, refer to "Network" in the online manual.

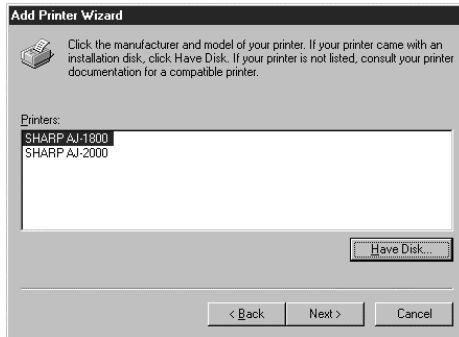
7. Click the "Have Disk" button.



8. Insert the supplied CD-ROM into your CD-ROM drive. (If you are using USB interface, confirm that CD-ROM is in the CD-ROM drive.)
9. Type "D:\ENGLISH\WIN9X", and then click the "OK" button.

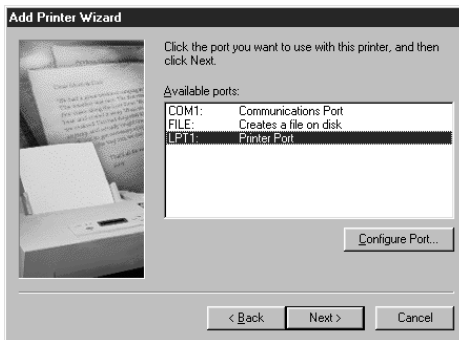


10. Select the model of your printer, and then click the "Next" button.



11. Select the port to be used, and click the "Next" button.

If you are using Windows 95 / 98, and your computer is connected by parallel interface cable, select LPT port (typically "LPT1"). On the other hand, if your operating system is Windows 98, and your computer is connected by USB cable, select "USB port" (typically "USB-PRN0").

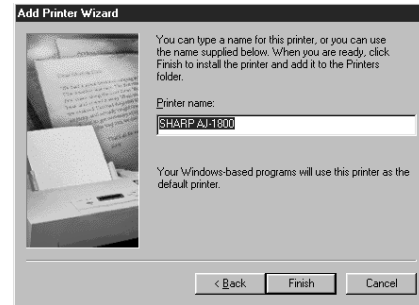


With a Windows98 preinstalled computer connected to this printer by USB cable

- If the "USB port" does not appear on the screen, install the USB driver onto your computer, following the steps shown in "Installing the USB driver (Windows 98)" (page 3 – 5).
- If you reinstalled the USB driver and printer driver after having had uninstalled the printer driver, more than two USB ports, for example, USB-PRN0, USB-PRN1, and USB-PRN2, may be displayed on the screen as your options. In this case, select the newest port, which has the largest port number. If there are any port numbers which are not in use, the printer will work properly.

12. Click the "Finish" button.

If the program displays "Do you want your Windows-based programs to use this printer as the default printer?", check "Yes".



You have completed to install the printer driver.

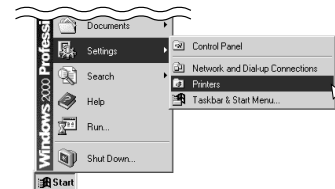
- Note:**
- Before printing align the print head by the procedure on page 3 – 9.

Installing onto Windows 2000 / NT 4.0

- Note:**
- The screen images on this section are of Windows 2000.
 - The contents of each screen image are those of the AJ-1800.

The screen images on this section are of Windows 2000.

1. Make sure that the printer is connected to your computer.
2. Turn on the printer, and then turn on your computer.
3. Click the "Start" button, select "Settings" and then click "Printers".

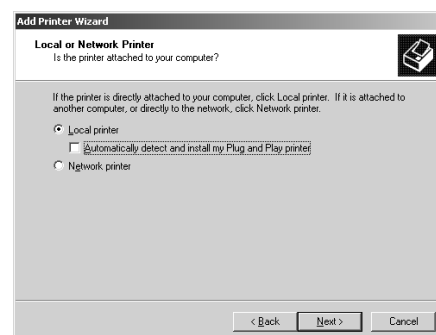


4. When the "Printers" window appears, double-click the "Add Printer" icon.
5. On Windows 2000, "Welcome to the Add Printer Wizard" window will appear. Click the "Next" button.

On Windows NT 4.0, the screen will not appear. Go on to the next step.

6. Check the radio button for "Local printer", and click the "Next" button.

On Windows NT 4.0, check "My Computer" and then click the "Next" button.



If you use this printer as a network printer, refer to the operation manual for Windows 2000 or Windows NT 4.0 for the detailed information.

7. Select the port to be used, and click the "Next" button.

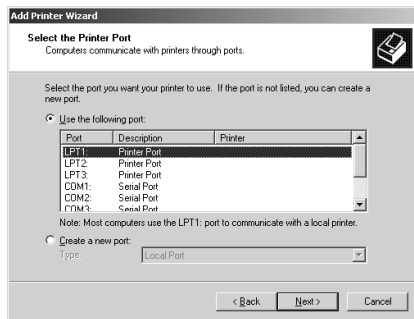
If your operating system is Windows 2000:

If your printer is connected a parallel interface cable, select the

LPT port (typically "LPT1"). If your printer connected by USB cable, select the USB port (typically "USB001").

If your operating system is Windows NT 4.0:

Select the LPT port (typically "LPT1").



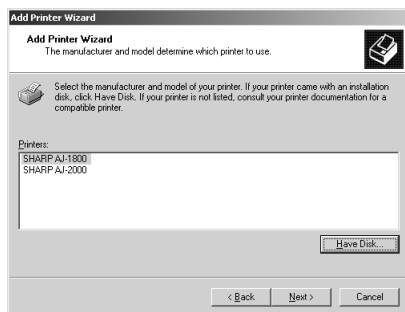
8. Click the "Have Disk" button.

9. Insert the supplied CD-ROM into your CD-ROM drive, type "D:\ENGLISHA\WIN2000", and then click the "OK" button.

On Windows NT 4.0, type "D:\ENGLISHA\WINNT40", and then click the "OK" button.

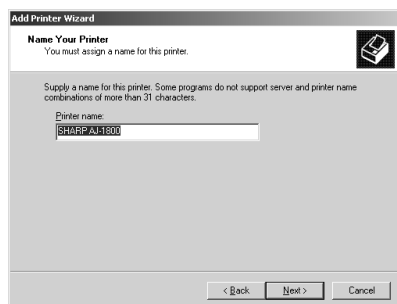


10. Select the model of your printer, and then click the "Next" button.



11. Click the "Next" button.

If the program displays "Do you want your Windows-based programs to use this printer as the default printer?", check "Yes".



12. Check the radio button for "Do not share this printer" and click the "Next" button.

On Windows NT 4.0, check "Not shared", and click the "Next" button.

Refer to "Network" in the online manual for the information on how to use this printer shared.

13. Check "Yes", and click the "Next" button.

On Windows NT 4.0, check "Yes", and click the "Finish" button.

You have completed to install the printer driver.

14. After confirming the message on the screen, click the "Finish" button.

15. If "Digital Signature Not Found" window appears, click the "Yes" button.

This window will not affect your operation.



You have completed to install the printer driver.

Note: • Before printing align the print head by the procedure on next item.

C. ALIGNING THE PRINT HEAD

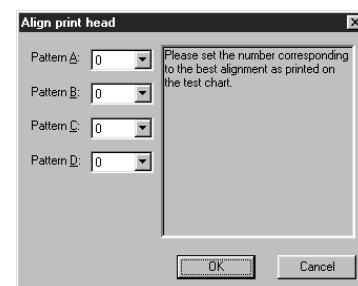
Before printing for the first time or after replacing the print head, make sure to align the print head position.

Follow the steps below to align the print head.

1. Click the "Start" button, select "Settings" and then click "Printers".
2. Click the "SHARP AJ-1800" or "SHARP AJ-2000" icon and from the "File" menu select "Properties".
3. Click the "Setup" button.
4. Click the "Advance" tab and then click the "Maintenance" button.
5. Click the "Start" button of "Print alignment patterns".
6. Click the "OK" button.

The "Align print head" dialogue box will appear, and a test chart will be printed.

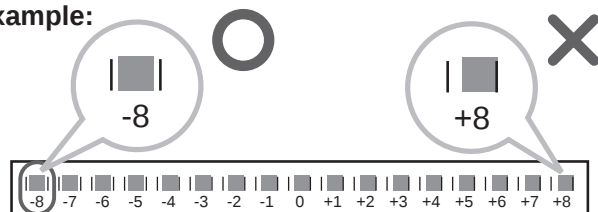
7. Check the test chart results, and change the preferences to the best setting for each pattern.



1) Select a pattern sample for "Pattern A".

Look at the chart A on your test chart. Select the number under the pattern sample, in which ■ is located the closest to the center of the two vertically parallel lines.

Example:

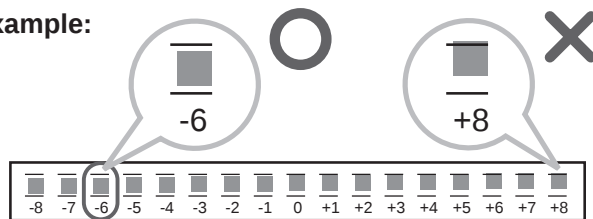


Pattern A: -8

2) Select a pattern sample for "Pattern B".

Look at the chart B on your test chart. Select the number under the pattern sample, in which ■ is located the closest to the center of the two horizontally paralleled lines.

Example:

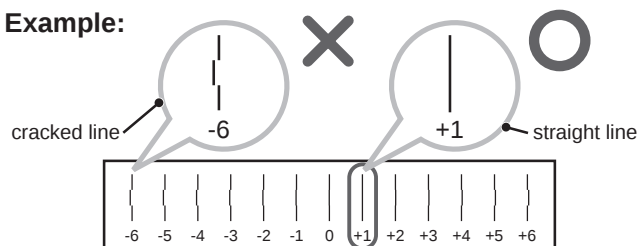


Pattern B: -6

3) Select pattern samples for "Pattern C" and "Pattern D" respectively.

Look at the chart C and D on your test chart. Select the numbers under the pattern samples, which have the least blurs on the lines respectively.

Example:



8. Click the "OK" button in the "Align print head" dialogue box.

The print head will align itself.

- Note:**
- If you cannot find any satisfactory pattern sample for each of "Pattern A" to "Pattern D" settings, select the best ones among the printed pattern samples, and then go back to step 2.
 - The printer cannot perform other operations while aligning the print head.

10. INSTALLING THE PRINTER DRIVER (Macintosh)

To use this printer with your computer, the printer driver should be installed onto your computer.

In this chapter, you will learn how to install them and how to use the online manual.

The following term is used in this chapter.

CD-ROM

Means the supplied CD-ROM with the AJ-1800/2000 Series Software.

Be sure to read the Readme.txt file before installing the printer driver. (The location of the Readme.txt file; CD-ROM - Readme folder - EnglishA folder - Readme.txt.)

HARDWARE AND SOFTWARE REQUIREMENTS

Check the following hardware and software requirements in order to install the AJ-1800/2000 series Printer Driver.

Computer type	Models equipped with USB interface as standard
Operating system	Mac OS 8.5 or later
Display	640 x 480dots (VGA) or better
Hard disk free space	10MB or more
Other requirement for hardware	An environment on which any of the operating systems listed above can fully operate

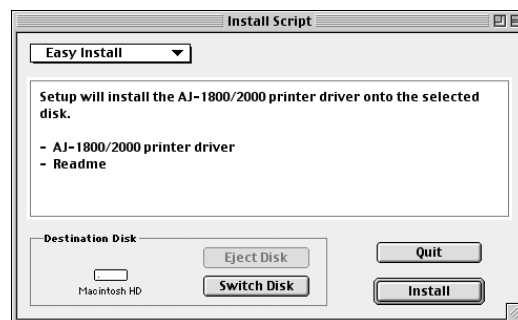
A. INSTALLING THE PRINTER DRIVER

The AJ-1800/2000 series printer driver is provided on a CD-ROM.

Note:

- The contents of each screen image are those of the AJ-1800.

1. Make sure that the printer is connected to your computer by USB cable.
2. Turn on the printer, and then turn on your computer.
3. Insert the supplied CD-ROM into your CD-ROM drive.
4. Double-click the CD-ROM icon on the desktop.
5. Double-click the "Installer" icon.
6. Check if the appropriate language has been selected, and then click the "Next" button.
Normally, the correct language is selected automatically.
7. After confirming the message on the screen, click the "Install" button and then click the "Continue..." button.
8. Make sure that "Easy Install" is selected, and click the "Install" button.



Note:

- If a dialogue box appears, which prompts you to confirm whether all the applications have been quitted, click the "Continue" button.

9. Click the "Restart" button.

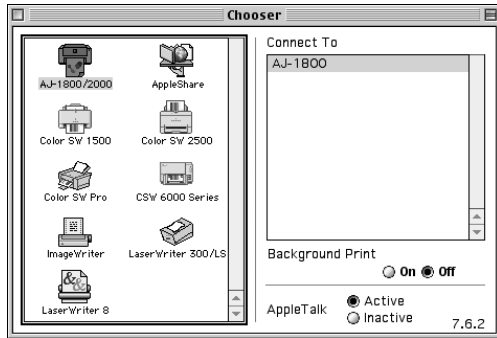
You have completed the installation of the printer driver.

Restart your system, and then specify your printer following the steps shown below.

Selecting the printer

1. Select "Chooser" from the Apple Menu located at the top-left of the desktop.

The following window will appear.



2. Click "AJ-1800/2000" icon and make sure that "AJ-1800" or "AJ-2000" appears in the right box.

The printer is ready for printing.

For the information on the installed printer driver, see the online manual.

Note: • Before printing align the print head by the procedure on next item.

B. ALIGNING THE PRINT HEAD

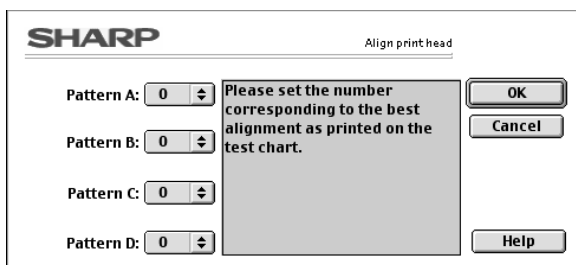
Before printing for the first time or after replacing the print head, make sure to align the print head position.

Follow the steps below to align the print head.

1. Make sure that A4 sized paper is set in the tray.
2. Select "Print" from the "File" menu of your application, and then click the "Maintenance" button.
3. Click the "Start" button of "Print alignment patterns".
4. Click the "Print" button.

The "Align print head" dialogue box will appear, and a test chart will be printed.

5. Check the test chart results, and change the preferences to the best setting for each pattern.



[4] COMPONENT IDENTIFICATION

1. EXTERNAL/INTERNAL VIEW

Front Side

Power button

Press to turn the printer power on or off.

Ink lamp

The light blinks when the ink is empty, or the ink tank is not inserted correctly.

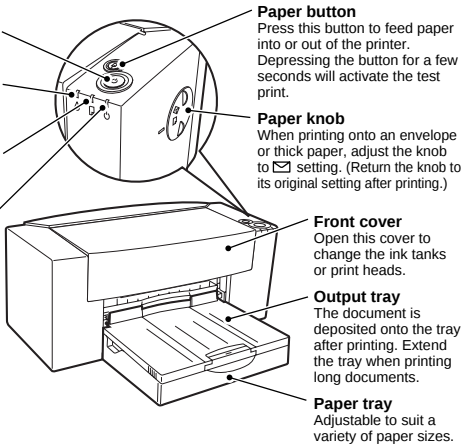
Paper lamp

The light blinks when the printer is out of paper, or a misfeed has occurred.

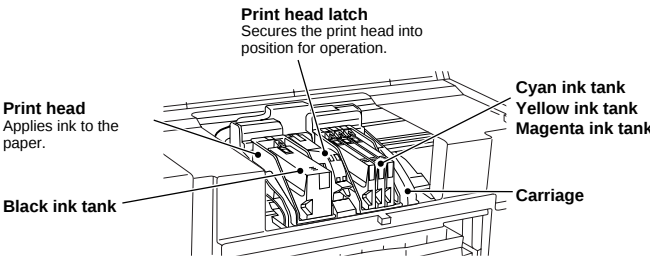
Power lamp

The indicator is lit when the printer is ready to print.

* If the printer has been kept idle for more than 20 minutes, the power will go off and so will the power lamp. The printer can be restarted when the power button is pressed, or any print job is sent from your computer.



Internal Part



Rear Side

USB interface connector

If you will be using a USB cable* to connect the printer to your computer. It is possible to insert the cable after the printer has been switched on.

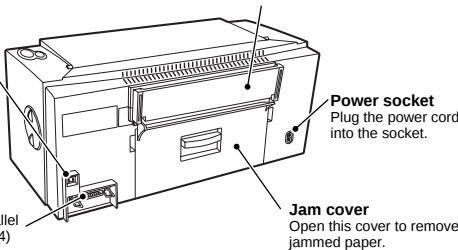
*B Type

Bypass tray

Use this tray to print on individual page. When printing large banners, make sure to use this tray. Insert a paper into the tray print side up. When printing onto thick paper, open the tray until it stops.

Parallel interface connector (36pin)

If you will be using a parallel interface cable (IEEE1284) to connect the printer to your computer.



2. INDICATOR LIGHT

When only the green power lamp is lit, the printer is working properly.

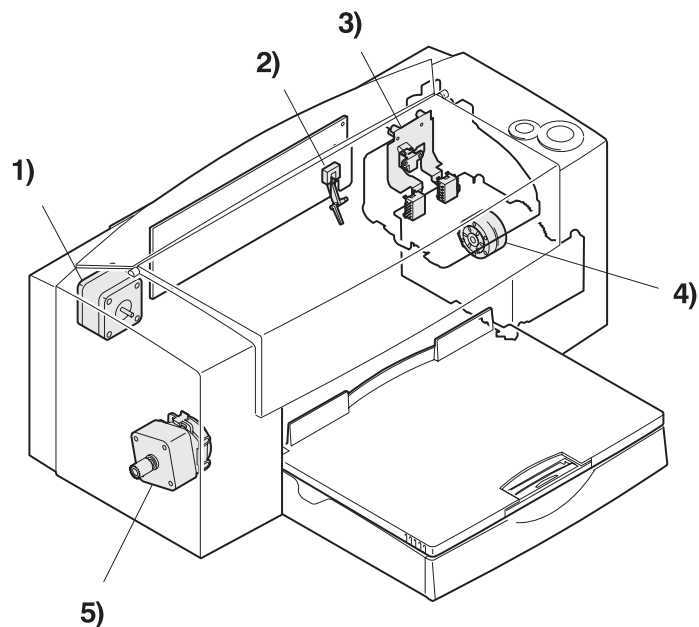
When a printer error occurs, a light will indicate what problem has occurred, as explained below.

....lit blinking fast blinking extinguished

Light condition			Problem and Solution
Ink	Paper	Power	
			Paper tray is empty, or a paper jam has occurred. Load more paper or remove the jammed paper and press the paper button.
			No ink, or a print head is not installed. Change the ink tank, or install a print head.
			Front cover is open. Close the front cover.
			The printer is warming up, or receiving data. Please wait.
			The carriage is not operating normally, or some errors may have occurred inside the printer.

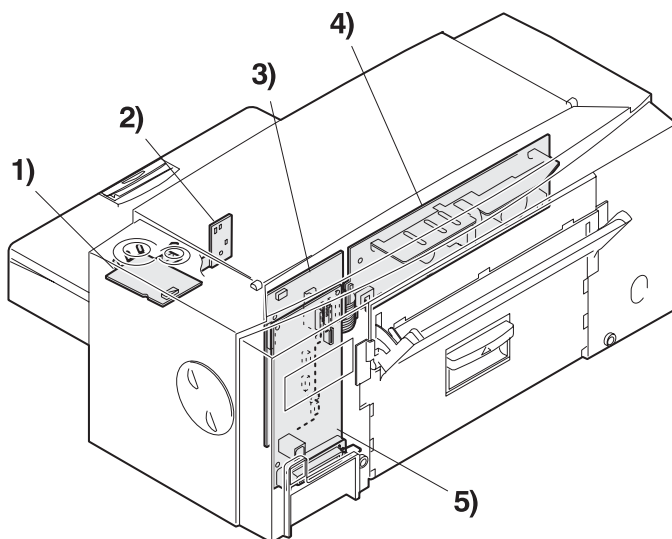
For more details on solving a problem, refer to the Troubleshooting section.

3. MOTOR, SENSOR



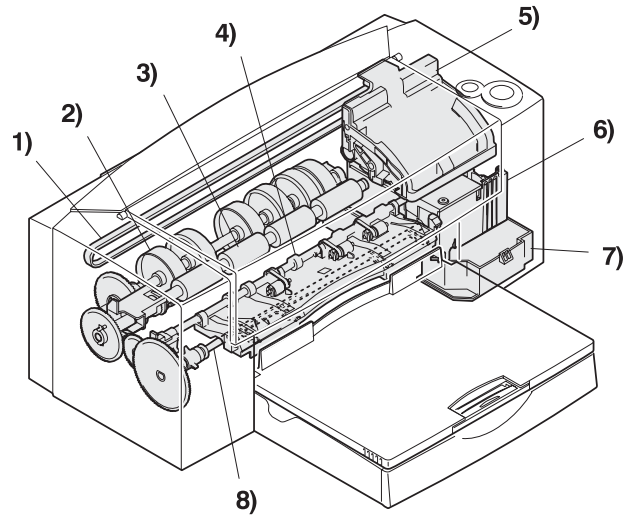
No.	Name	Function/Operation	Remark
1	X motor	Carriage drive	Pulse motor
2	Paper sensor	Paper presence/empty detection ("H" at paper empty)	Photo interrupter
3	Encoder sensor	Carriage position detection	Photo transmission
4	Maintenance motor	Maintenance station operation drive	Pulse motor
5	Y motor	Paper transport	Pulse motor

4. PWB



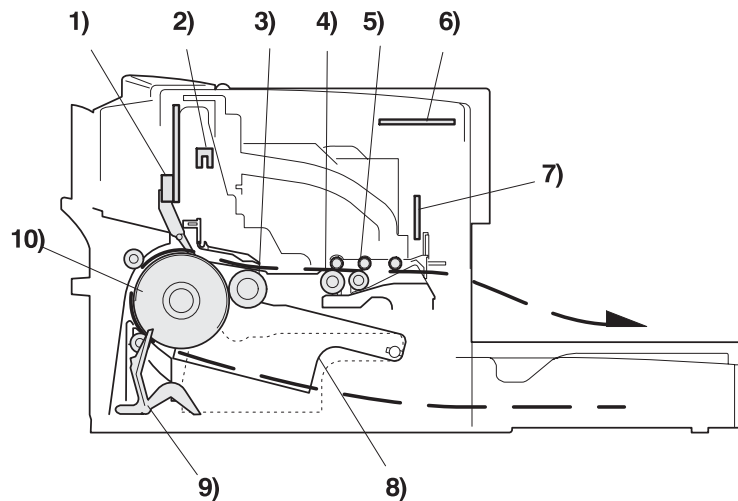
No.	Name	Function/Operation	Remark
1	Panel PWB	Operation input/display	
2	ILS PWB	Ink level detection, brand detection	
3	PUC PWB	Printer mechanism control	
4	Power PWB	Power supply	
5	IOT (Image Output Terminal) PWB	Data process, control of data transfer to the head	

5. ROLLER



No.	Name	Function/Operation	Remark
1	Carriage belt	Carriage transport	
2	U roller	Paper pickup/transport roller	
3	Feed roller	Main paper transport roller	
4	Eject roller	Paper eject roller	
5	Carriage	Change over between head holding and paper transport	
6	Maintenance station	Head cleaning and head protection	
7	Waste pad	Ink waste tank (pad)	
8	Paper eject arm	Paper eject	

6. CROSS SECTION



No.	Name	Function/Operation	Remark
1	Paper sensor	Paper presence/empty detection	
2	Encoder sensor	Carriage position detection	
3	Feed roller	Main paper transport roller	
4	Eject roller	Paper eject roller	
5	E guide roller	Transports paper to the paper eject position.	
6	Panel PWB	Operation input/display	
7	ILS PWB	Ink level detection, brand detection	
8	Rotary plate	Paper pickup support	
9	Return arm	Returns paper to the paper feed route. (Aligns paper.)	
10	U roller	Paper pickup and transport	

[5] CONSUMABLES

1. SUPPLY SYSTEM TABLE

No.	Product name	Content	Life	Remark
1	AJ-T20B	INK TANK [BLACK] x 1	Approx. 700 sheets *	
2	AJ-T20C	INK TANK [CYAN] x 1	Approx. 350 sheets *	
3	AJ-T20Y	INK TANK [YELLOW] x 1	Approx. 350 sheets *	
4	AJ-T20M	INK TANK [MAGENTA] x 1	Approx. 350 sheets *	
5	AJ-T20S	INK TANK [BK, C, Y, M 4pcs.] x 1	Approx. BK: 700/Color: 350 *	
6	AJ-H20B	PRINT HEAD [BLACK] x 1	Approx. 5000 sheets *	
7	AJ-H20C	PRINT HEAD [COLOR] x 1	Approx. 5000 sheets *	

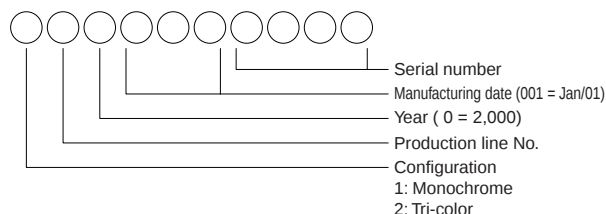
* : 5% print rate in 8" (203mm) x 10" (254mm) print area (Normal print mode)

AJ series ink jet paper (Japan/Asia)

No.	Name	Product name	Size	Package	
				Unit package	Collective package
1	High Grade Coated Paper	AJ-K4AC	A4	100 sheets	Unit x 10
2	Photo Glossy Paper	AJ-K4AG	A4	20 sheets	Unit x 50
3	Super Photo Glossy Paper	AJ-K4AP	A4	20 sheets	Unit x 20
4	Transparency film	AJ-K4AT	A4	20 sheets	Unit x 50

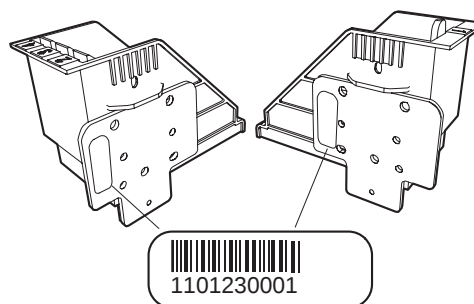
2. IDENTIFICATION OF PRODUCT SERIAL NUMBER (lot No.)

Print head (Composed in 10 digits)

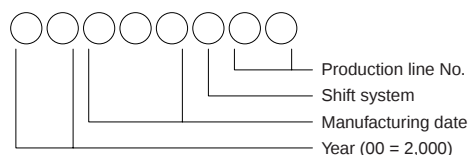


Example: 1101230001

First monochrome head manufactured in the first line on May 02, 2000.

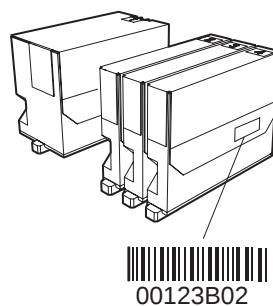


Ink cartridge (Composed in 8 digits)



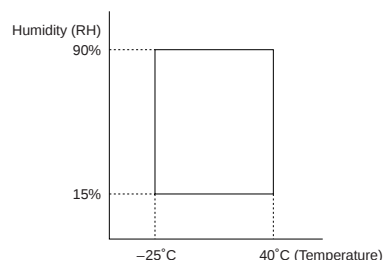
Example: 00123B02

Ink cartridge manufactured in B shift on the second line on May 02, 2,000.



3. STORAGE PERIOD AND CONDITIONS

Long term storage (24 months)

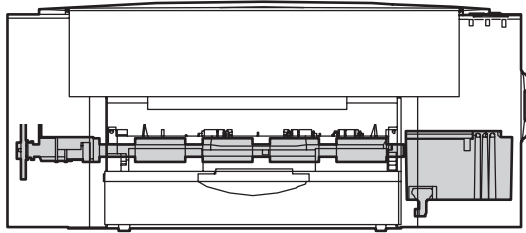


[6] OPERATIONAL DESCRIPTIONS

1. BASIC OPERATIONS

A. Power ON

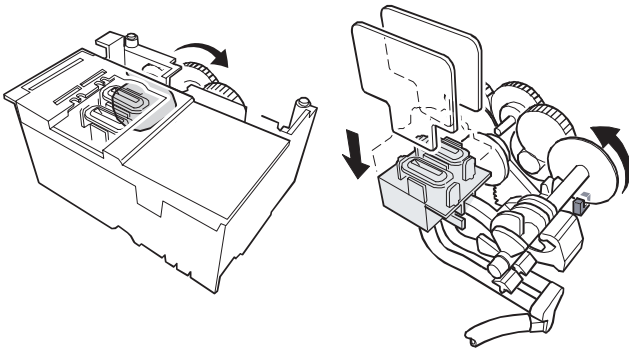
Note: • To simplify the descriptions, the carriage shift is described when viewed from the front. Therefore, the maintenance station is on the right side, and the pickup lever on the left side.



When the AC cable is connected or when the software is reset, the power ON initialization must be performed as follows:

1. Head cap removal

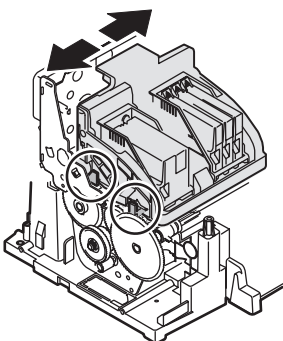
Rotate the maintenance motor to detect the cap sensor, and rotate it further to lower the cap, releasing it.



2. Shift the carriage by 8mm to the left, and by 8mm to the right. (This is to separate the carriage from the pickup lever.)

In the initial state, the carriage position is unknown. If the carriage is in contact with the pickup lever, paper is kept being picked up in the next paper exit operation. To prevent this, the carriage must be separated from the pickup lever first.)

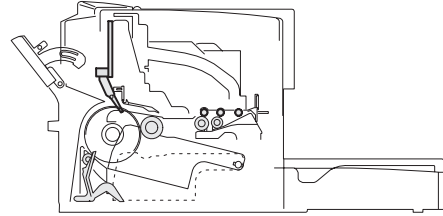
If the carriage is in contact with the pickup lever in the above operation, shift to the left side brings the carriage to the left end, and shift to the right brings the carriage apart from the pickup lever.



3. Paper exit operation

Paper feed is performed until the paper sensor detects paper empty.

If the paper sensor does not detect paper empty though a considerable quantity is fed out, a paper jam error occurs and power ON initialization fails.



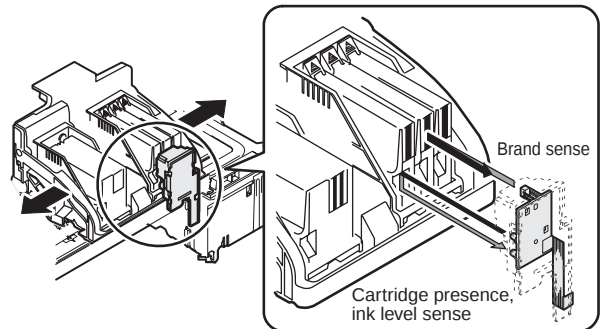
4. Carriage maintenance position detection

(Refer to "Maintenance position detection.")

5. Ink sense process

To sense the presence of an ink cartridge, the brand information, and the ink level, the carriage is reciprocated twice in front of the ink sensor.

(In the first reciprocation, the presence of an ink cartridge and the cartridge position are sensed. In the second reciprocation, the brand information and the ink level are sensed.)

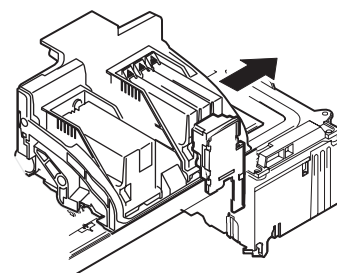


6. Cap entry process (The head is capped in the maintenance position.)

(Refer to 4-A. "Outline of process for maintenance.")

B. Power OFF

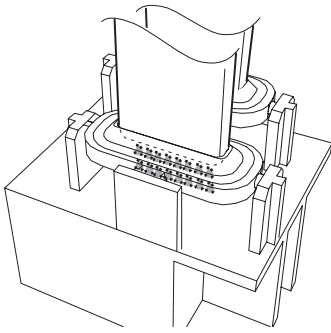
1. If the carriage is not in the maintenance position, return it to the maintenance position.
2. Perform the cap entry process to cap the head.
3. Cut off the power supply to the peripheral circuits. (The power to the CPU is kept ON.)



C. Power OFF

Ink is spit (discharged) every two hours with the cap sealed during the

power is OFF in order to prevent against drying.



D. Printing

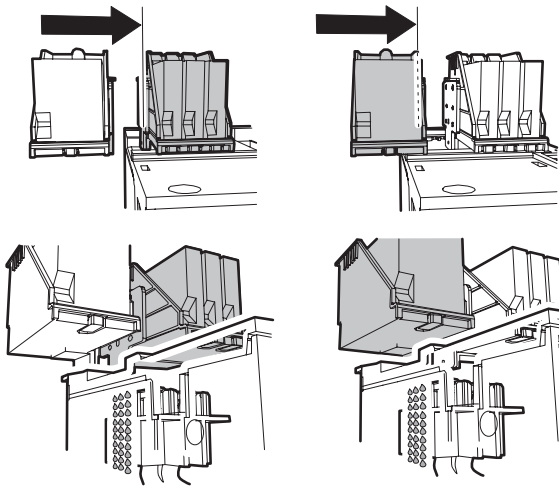
Spit operation during printing

Spitting is performed to discharge dry ink from the head nozzle.

The carriage is shifted to the specified position of the maintenance station (spit position) and ink is discharged to remove dry ink from the nozzle.

Spit operation during printing is performed in the following cases:

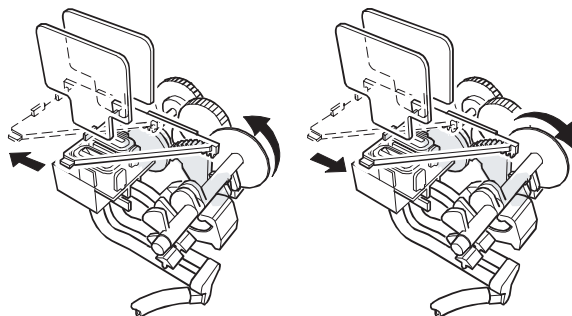
- When the carriage is shifted to the rescanning direction (maintenance position) in every specified time during printing.
- When paper is discharged after completion of printing.



Wiping in paper exit

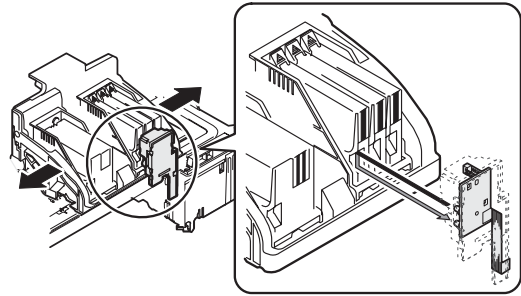
Wiping of the head is performed when discharging every 13th page. (Printing for a long time dirties the head.)

1. Shift the carriage to the maintenance position.
2. Rotate the maintenance motor and wipe the head with the wiper.
3. Discharge the color ink on the color cap.
4. Move the carriage to the spit position to spit black ink.



Ink level sense

The ink level is sensed every 5 pages in the draft mode, and every 3 pages in the other modes. At that time, only the ink level is sensed and the presence of an ink tank or the brand information is not sensed.



E. Standby

When the printer is held non-operated for a long time, note the following items:

- To prevent the head from drying, the head must be capped after a certain time.
- To comply with the EnergyStar standard, the printer must be brought into the standby state.

Therefore, the standby state is changed in the following steps when non-operating state continues.

1. When a certain time (20 sec) is passed with the printer non-operated, the carriage is returned to the maintenance position to execute the cap entry process.
2. When a certain time is further passed with the printer non-operated, the power supply mode is shifted to the low power consumption mode (where the power supply to the peripheral circuits is cut off).
3. After capping, ink is spit every two hours to prevent against drying.

When a request for operating the printer is generated by a print command from the PC or user operations (switch ON/OFF, cover close/open, or manual paper insertion), the above standby mode is canceled. At that time, if the state of (1) or later, the cap must be released.

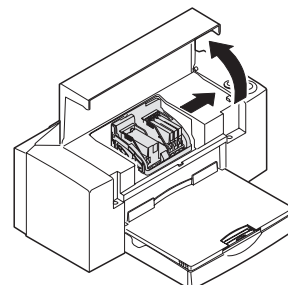
2. OPERATION FOR THE FRONT COVER OPEN

When the user opens the cover, perform the following procedure depending on the condition.

During power ON initializing (From the power switch ON to the completion of power ON initializing):

Interrupt power ON initializing, move the carriage to the maintenance position, and perform power OFF initializing.

When the cover is closed, perform power ON initializing.



During paper feed:

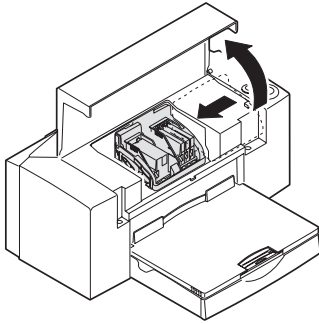
Continue paper feed operation. After completion of paper feed operation, perform the same procedure as those of cover open during printing.

During printing (From paper feed to paper exit):

Move the carriage to the maintenance position. If printing is being performed, after completion of one pass printing, move the carriage to the maintenance position. When the cover is closed, printing is resumed.

Non-printing (with no paper fed):

1. Move the carriage to the center (the ink cartridge replacement position).



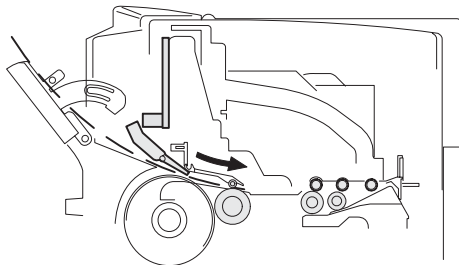
2. When the cover is closed with the print head installed, or when a certain time is passed with the cover opened, move the carriage to the maintenance position. (If the print head is not installed, the carriage is not returned to the maintenance position though the cover is closed.)
3. The presence of an Ink cartridge is sensed.
4. When the ink cartridge is replaced, prime operation after replacement of the ink cartridge is performed.

3. MANUAL PAPER FEED FROM THE BYPASS TRAY

The basic procedures of manual paper feed are as follows:

1. When the user inserts paper to the specified position of manual paper feed, the paper empty sensor (PE sensor) turns OFF.
2. Since paper is not fixed under that state, if the user let go of the paper, the paper will come off from the manual paper feed position.

Therefore, when the paper presence state is kept for a certain time (10 sec), paper is fed by 6mm to fix the paper. Then manual paper feed is allowed.



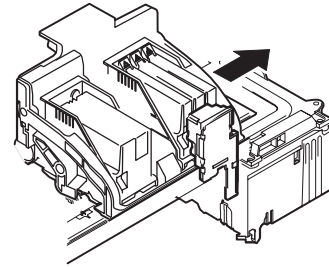
3. To start printing, feed paper from the manual paper feed position. The following operations are the same as normal printing.
4. If the user removes paper before paper feed, manual paper feed is canceled and the state returns to "1".

4. OUTLINE OF PROCESS FOR MAINTENANCE

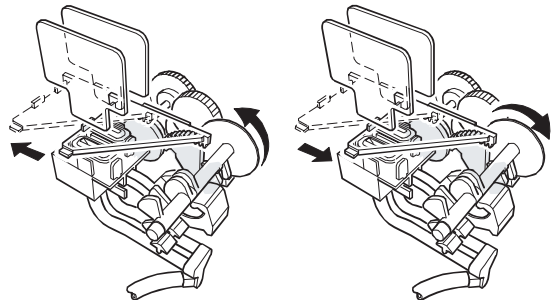
A. Cap entry process

Perform the following procedures to cap the head for standby.

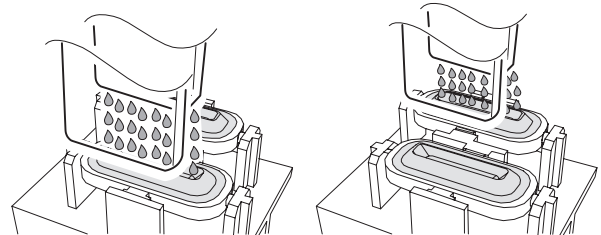
1. Move the carriage to the maintenance position.



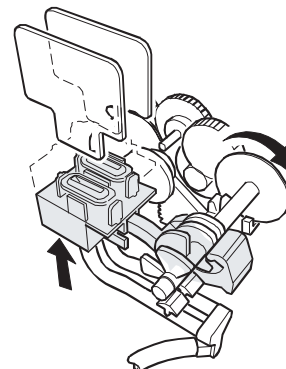
2. Rotate the maintenance motor, and wipe the head with the wiper.



3. Move the color cap to the black cap position, and spit ink (C, M) to dampen the head and prevent against drying.
4. Move the color head to the color cap position (maintenance position), and spit ink (C, M, Y) to dampen the head and prevent against drying.



5. Rotate the maintenance motor and lift the cap to cap the head.



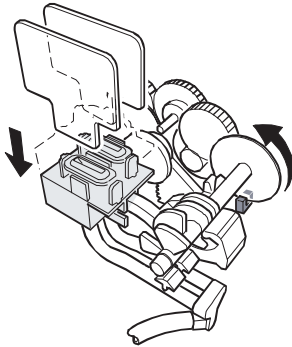
B. Cap release process

When canceling the cap standby state and remove the cap from the head, if capping has been kept for more than 360 hours, priming must

be performed as stated below.

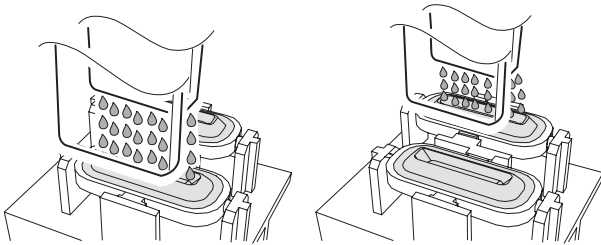
If not, perform the following procedures for releasing the cap.

1. Rotate the maintenance motor and remove the cap from the head.

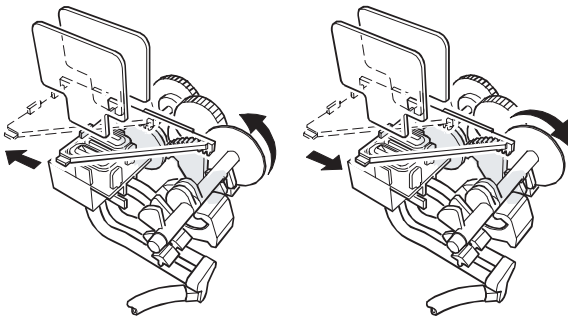


2. Spit color ink on the color cap.

3. Move the color head to the black cap position, and spit color ink on the black cap.



4. Rotate the maintenance motor, and wipe the head with the wiper.



5. Perform the above procedures 2 ~ 4 again.

6. Move the color head to the black cap position, and spit color ink on the black cap.

7. Return the color head to the maintenance position, and spit color ink on the color cap.

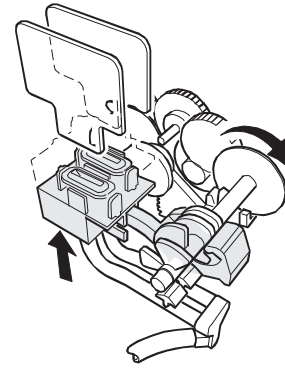
C. Priming

Priming is performed in the following cases:

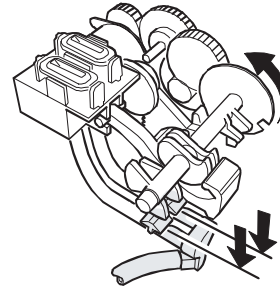
- When the user operates the button on the printer or operates the printer driver on the PC to deliver the priming command.
- When the ink tank or the print head is replaced.
- When the pixel count (the accumulated quantity of spit ink) reaches the specified level.

Rotate the suction pump to generate a vacuum to suck and remove residual ink and dried and fixed ink around the injection nozzle inside the head and on the cap and in the suction tube. The process is as follows:

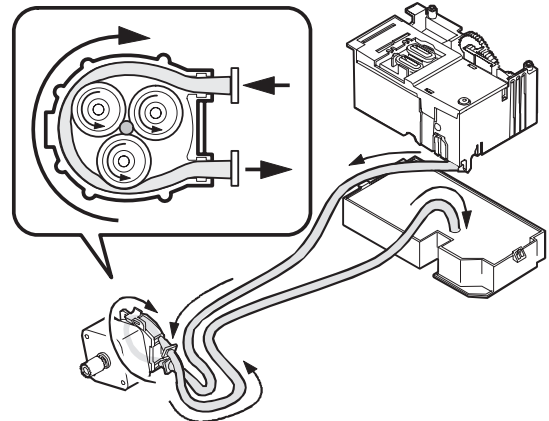
1. Perform the cap entry process to cap the head.



2. Rotate the maintenance motor to close the tube.

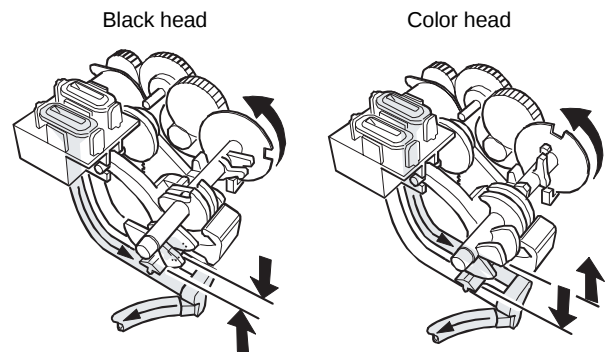


3. Rotate the Y motor to rotate the suction pump. (The suction pump is connected with the Y motor. When the Y motor is rotated with the tube closed, a vacuum is generated in the tube.)



4. Rotate the maintenance motor to open the tube, and the head will be sucked.

5. During the sucking time, ink is discharged from the head to clean the head nozzle.

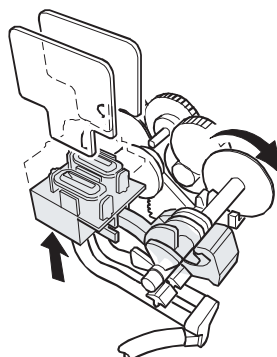


6. Rotate the maintenance motor and wipe the head with the wiper. (The head is capped at the same time.)

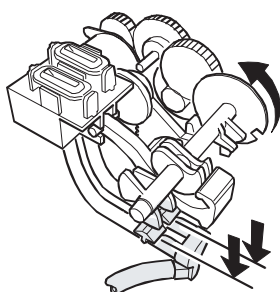
7. Move the black head and the color head to the spit position, and

spit ink.

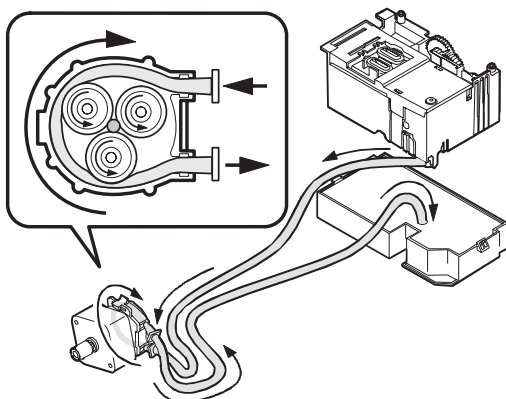
8. Move the carriage to the specified position so that the head is not in contact with the cap. (About 98mm away from the maintenance position in the scan direction.)



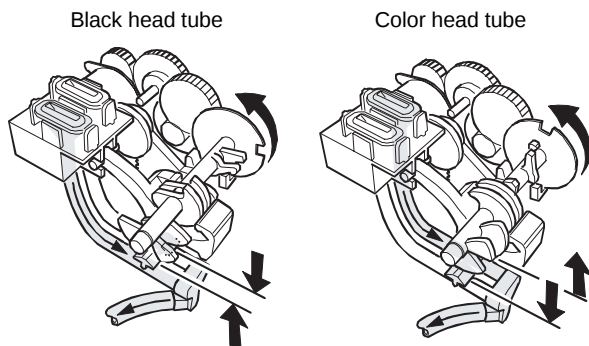
9. Rotate the maintenance motor again to close the tube.



10. Rotate the Y motor to generate a vacuum in the tube.



11. Rotate the maintenance motor to open the tube, and residual ink in the tube will be sucked and removed.



The above procedure primes only either of the black or the color head.

To prime both the black head and the color head, repeat the above procedure twice.

5. OUTLINE OF MAINTENANCE POSITION DETECTION

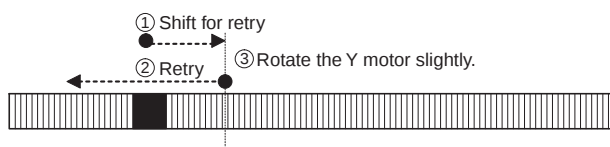
A. Detection with power ON

(1) Shift to the detection start position

The carriage shifted in the scan direction at a low speed to detect the encoder slit, and stops at a certain distance after detecting passage of the encoder slit.

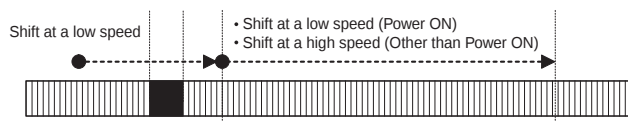


If the encoder slit is not detected before stopping, the carriage returns in the scan direction by a certain distance, and a retry is made. (Error after 10 times of retrying)



(2) Shift to the envelope mode detection start position

The carriage shifted in the rescan direction at a low speed to detect the encoder slit, then is shifted to the position at a certain distance.



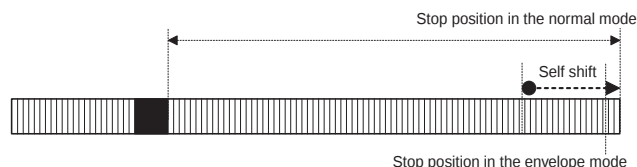
When one of the following phenomena is detected during detection of the encoder slit, stop the motor immediately and perform procedure (1) again. (Error after 10 times of retrying)

- When the difference between the expected value of the encoder coordinates for the shift distance and the actual encoder coordinates is greater than the specified level.
- When the encoder slit and its passage are not detected after moving in the specified distance.

(3) Envelope mode detection

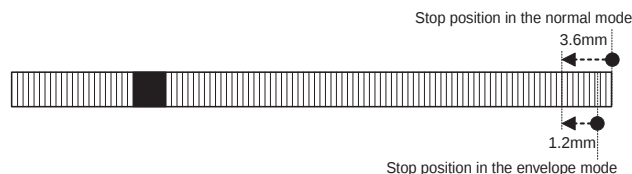
The carriage is moved in the rescan direction at a low speed.

When the encoder coordinates from the encoder slit at the time of stop after completion of shift exceeds the specified level, it is judged as the normal mode. If not, judged as the envelope mode.



(4) Shift to the home position (maintenance position)

In the normal mode, shift by 3.6mm in the scan direction reaches the home position. In the envelope mode, shift by 1.2mm reaches the home position.

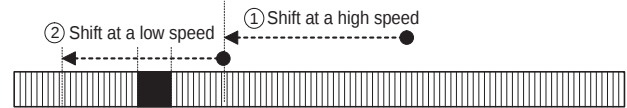


B. When paper feed pickup operation and when pushing the paper hit lever

(1) Shift to the detection start position

Obtain the distance from the start position to the select slice front position, and move the carriage by the distance in the scan direction at a high speed.

After that, the operations are same as A-(1). Shift after detection of the encoder slit in A-(2) is made not at a low speed, but at a high speed.



6. LED STATUS

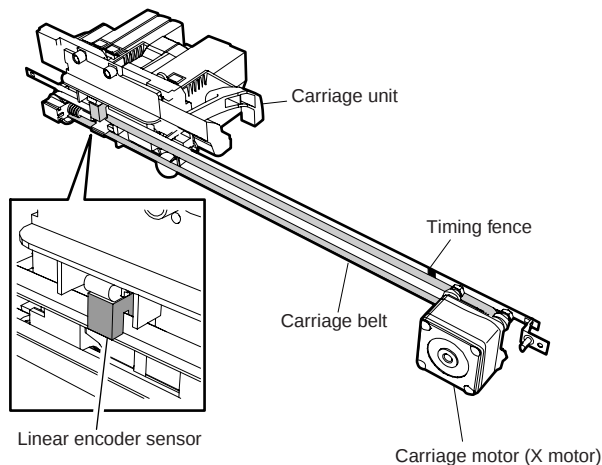
	Power LED (Indicates the power, self test, and system errors.)	Paper LED (Indicates paper errors.)	Ink LED (Indicates the ink level, ink brand, and print head errors.)
Printer power OFF	OFF	OFF	OFF
Printer warm-up	Slow blink	OFF	OFF
Ready when printer is not printing	ON	OFF	OFF
Data reception when printer is not printing	Slow blink	OFF	OFF
Printing	ON	OFF	OFF
Ink near empty	ON	OFF	OFF
Ink empty	ON	OFF	Fast blink
No ink tank			
No print head			
Improper ink brand			
Paper empty	ON	Fast blink	OFF
Jam			
Cover open without error	ON	OFF	Slow blink
Cover open with an error	Depends on the error state.	Depends on the error state.	Depends on the error state.
Carriage home position error	Fast blink	Fast blink	Fast blink
Maintenance station error	Fast blink	Fast blink	Fast blink
Self test execution	Fast blink	Fast blink	Fast blink
System error			
Print head priming/cleaning	Slow blink	—	—

7. MAJOR PARTS FUNCTIONS

The print section, the maintenance station, and the paper feed section are explained below.

A. Print section

The print section is composed of the following parts.



- Carriage unit

This unit is provided with the print head and an ink cartridge. Ink is supplied from the ink cartridge according to the print signals sent from IOT-ASIC, and spit from the head onto paper.

- Linear encoder sensor

This sensor is attached so that it covers over the timing fence. The linear encoder signal from the timing fence is sent to IOT-ASIC. In ASIC, 600LPI signals and the carriage direction signals are formed with the linear encoder signals.

The signal is the basic signal of the X coordinate.

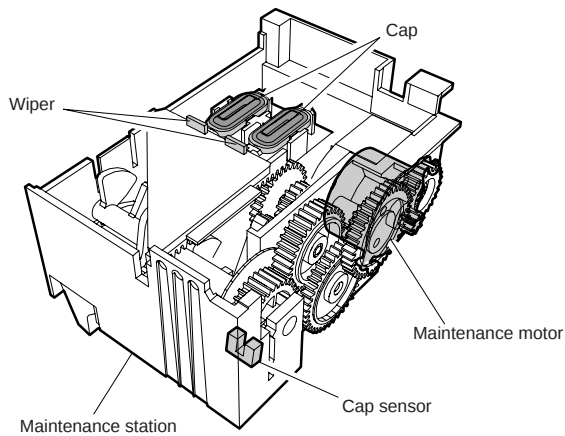
- Carriage motor (X motor)

This motor drives the carriage in the scan and the rescan directions through the carriage belt.

The motor drive speed is controlled by IOT-ASIC through the PM controller.

B. Maintenance station

The maintenance station is composed of the following parts, and it performs maintenance of the print head.



- Maintenance motor

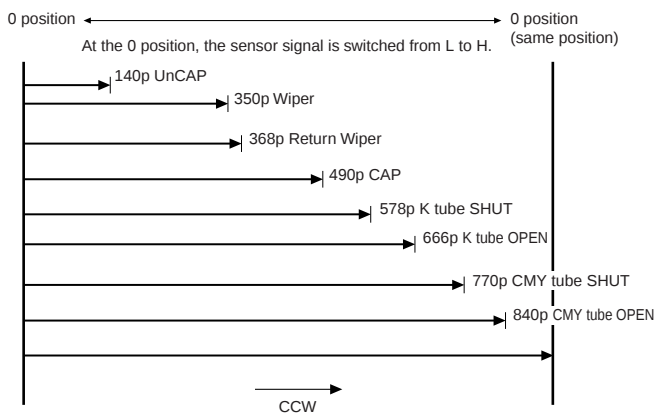
By rotation of the maintenance motor, the cap and the wiper are driven to perform capping and wiping (cleaning of the head surface) of the head.

In priming, the tube is opened and closed by rotation of the maintenance motor, and at the same time the Y motor is driven to clear the head.

- Cap sensor

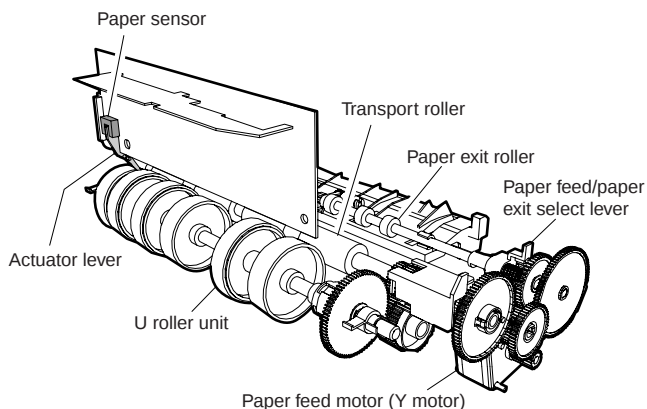
The disc slit integrated with the drive gear is detected by the cap sensor to notify the PM controller of capping state. The PM controller drives the maintenance motor with ON/FF.

Functions at each motor position



C. Paper feed section

The paper feed section is composed of the paper feed motor (Y motor), the U-roller unit, the transport roller, the paper exit roller, paper feed/paper exit select lever, and the paper sensor.



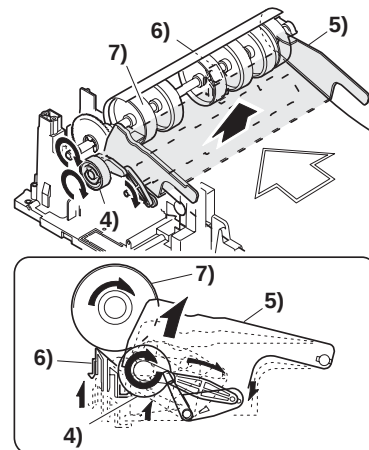
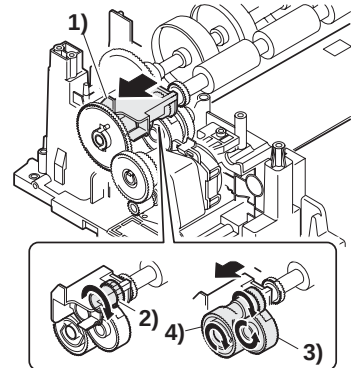
- Paper feed motor (Y motor)

The motor control command sent from IOT-ASIC is received by the PM controller, and the paper feed motor is rotated according to the command to drive each roller. (When priming, it drives the suction pump, too.)

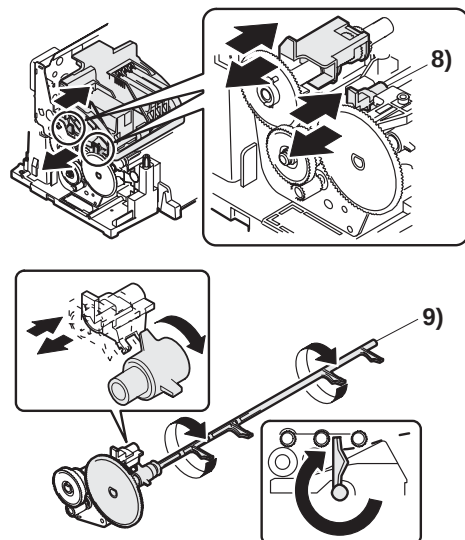
- Paper feed/transport/exit operations

Paper feed operation is started by the print start command sent from IOT-ASIC.

The change slider 1) is pushed by the head carriage to engage the change gear 2) and the U-W gear 3). The U cam gear 4) operates to lift the U rotary plate 5) and the U pickup 6), and paper is fed by the U roller 7) to the transport roller.



After completion of printing, the carriage pushes the E slider 8) to disengage the stopper of the E clutch roller to rotate the E arm 9), discharging paper.



When printing two or more pages, this paper exit operation is repeated.

8. PRINT HEAD

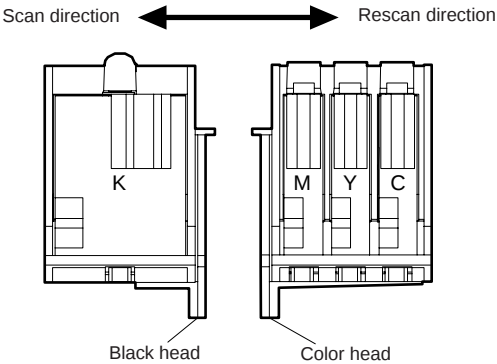
A. Print system

The print system of this machine is the thermal ink jet system. Ink is injected from the nozzle by heat to form images on paper.

When a voltage is applied to the heating element, bubbles are formed in ink by rapid heating. Those bubbles push ink out of the nozzle.

B. Head composition

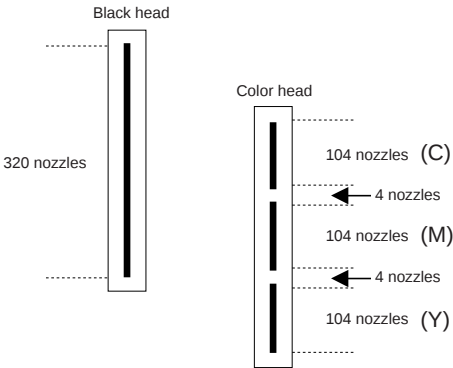
The positions of the head cartridge over the carriage and the ink cartridge are as shown below. The head and the ink can be replaced individually.



The black head is provided with 320 nozzles, each color head with 104 nozzles. In the color head, there are 4 reserved nozzles between Cyan and Magenta and 4 reserved nozzles between Magenta and Yellow.

The black head includes the thermistor. The head temperature information is sent to IOT-ASIC to control printing by the head temperature. (When the head is at a high temperature, the printing speed is reduced to lower the head temperature.)

Head composition



Shift between the black head and the color head is resulted from the following cause.

When the black head and the color head are at the same position, if printing both of black and color is tried with one carriage scan, black print and color print are overlapped.

K C
K M
K Y

If there is no shift as shown above, C/M/Y print and black print are overlapped.

K C
K M
K Y

If there is some shift as shown above, though K at the top and C/M/Y are printed simultaneously in one scan, there occurs no mixed color print.

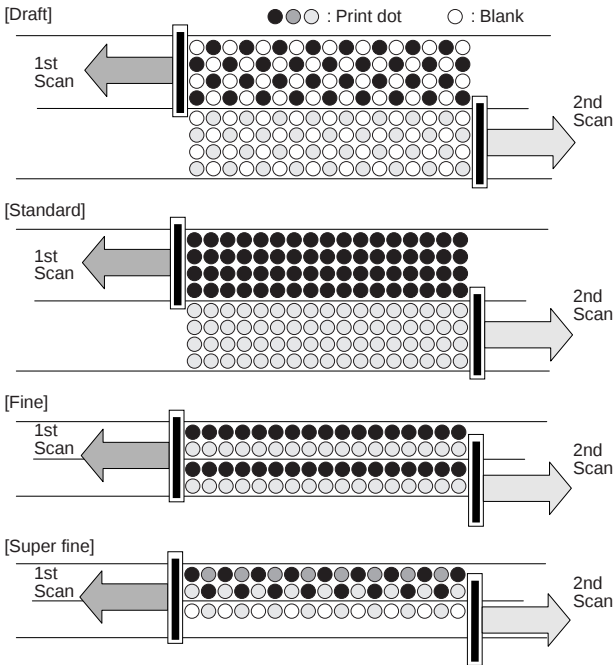
9. PRINT MODES

There are four print modes: the draft mode, the standard mode, the fine mode, and the super fine mode. The print direction, the carriage shifting speed, the coverage, and the paper feed quantity of each mode are as shown in the table below.

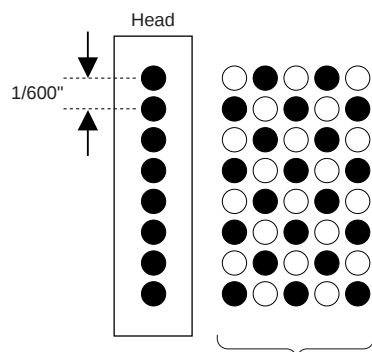
Print modes	Print direction	Carriage shift speed (Inch/sec)	Coverage (%) (Ratio of used nozzles)	Paper feed (Unit of 1/600")	
				Color	Mono chrome
Draft	Bi-direction	30	50	104	320
Sharp Special	Bi-direction	20	100	104	320
Normal	Bi-direction	20	50	52	160
Best	One direction	20	25	26	80

The operations of each print mode are as follows:

Print mode and operations (Image)



Draft



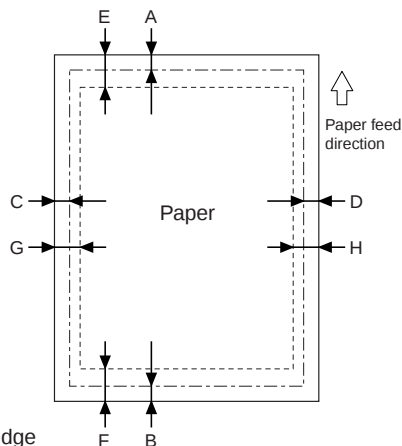
The print dots are of 300 dpi in the horizontal and vertical directions. However, if it is 300 x 300 dpi, the print ratio becomes 25%, which does not meet the above state. Therefore, the resolution is expressed as 600 x 300dpi because the head pitch is 600 dpi.

10. PRINT AREA

The print area is as shown below.

Void Area (Min)	
A	3 mm
B	3 mm
C	3 mm
D	3 mm

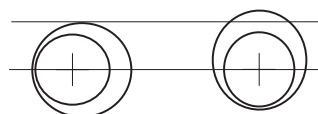
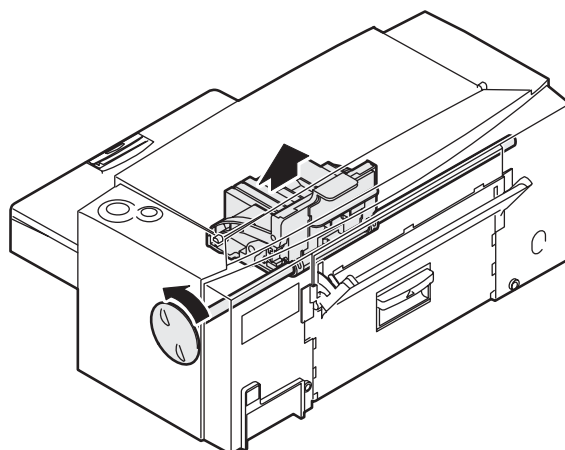
Void Area (recommendation)	
E	19 mm
F	19 mm
G	10 mm
H	10 mm



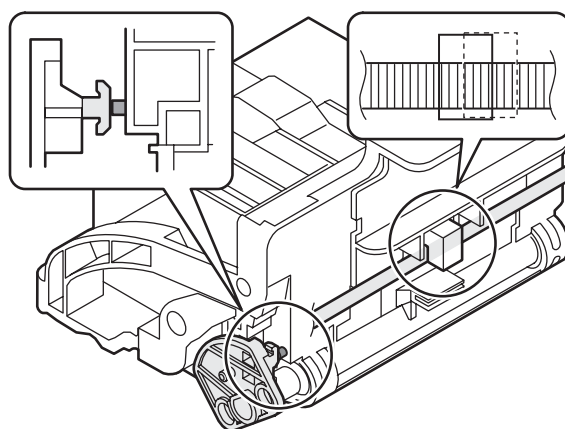
*: Paper orientation: Left edge

11. THICK PAPER/NORMAL PAPER SELECTION

When the thick paper/normal paper selection knob is set to the thick paper position, the slide shaft connected with the knob is rotated to lift the whole carriage, widening the clearance between the head and the platen.



The fulcrum of rotation of the shaft is shifted to perform eccentric operations.



At the same time, the projection of the selection cam moves to make contact with the projection of the carriage to change the carriage return distance.

The difference in the distances is detected by the linear encoder sensor to detect the thick paper mode or the normal paper mode.

[7] ADJUSTMENTS

1. Gap adjustment between the print head and paper

A. The adjustment is required in the following cases:

- When the main chassis or the carriage shaft is removed.
- When the adjustment lever is moved.

B. Necessary tools

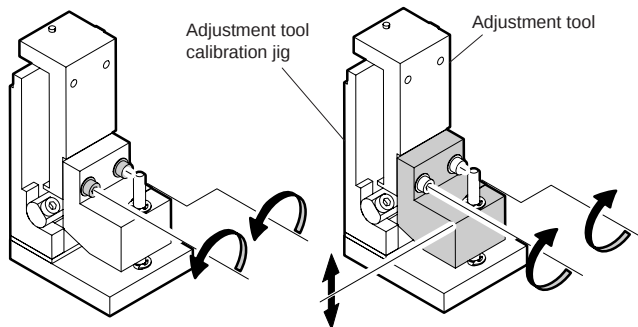
Tool	Parts code
Height adjustment jig	UKOG-0003ESZZ
Calibration jig	UKOG-0004ESZZ

C. Calibration of the adjustment tool

For example, when you drop the adjustment tool or in similar events, it is necessary for you to calibrate the tool. If you handle the tool carefully, it will not be necessary to calibrate the tool in normal use.

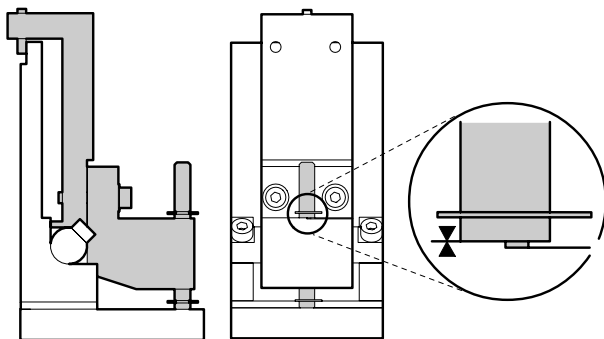
D. Adjustment tool calibration procedure

- 1) Set the adjustment tool as shown below.



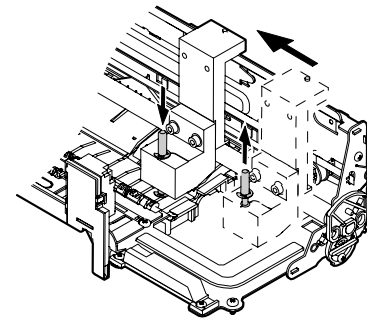
- 2) Loosen the screw and adjust so that the top of the block meets the edge on the measuring shaft groove. (Set at the upper limit.)

Note: Use a magnifying glass to check the gap.

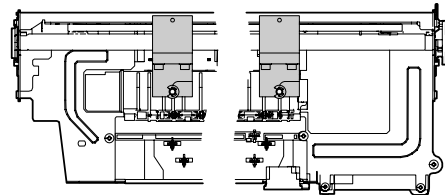


E. Gap adjustment procedure

- 1) Set the paper select lever to the position of normal paper.
- 2) Set the adjustment tool to the carriage slide section and the shaft as shown below.
- 3) With the measuring pin lifted up, slide the adjustment tool to the measuring position.



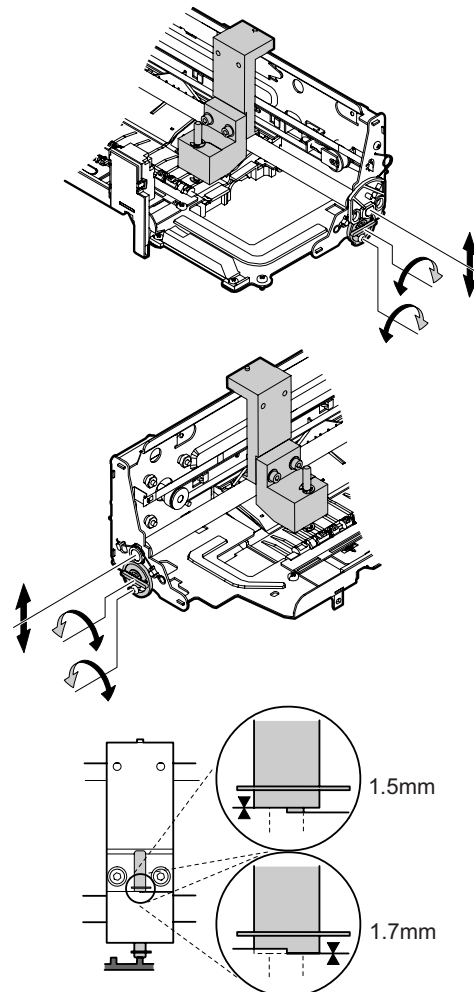
- 4) Fall the measuring pin to the target platen knob. (The fourth one from the left, and the first one from the right.)



Do not slide the adjustment tool with the measuring pin down.

- 5) Turn the adjustment lever to adjust so that the measuring pin is at the specified position in the block.

Note: Use a magnifying glass to check the gap.



If the top of the block is in the groove width of the measuring pin, the head gap is $1.6 \pm 0.1\text{mm}$.

[8] DIAGNOSTIC

Description	Process	Contents
Self print test	1. Turns on the machine power. 2. Depress the Paper key while 3 seconds. 3. The machine prints a test chart.	Print pattern • Jet pattern • Firmware version
Memory test	After P-on, the machine starts its test automatically.	If the machine found an error by the following test, all LED will blink. • RAM R/W test • ROM checksum
Mechanical test	The machine checks the following conditions. • Motor condition • sensor condition (problem) • Communication to the mechanical controller	If the machine found an error, all LED will blink (fast).
MS (maintenance) test	1. Turns off the machine power. 2. Depress the Power and Paper key together. 3. The machine starts MS test.	The machine starts the Priming (vacuum).
Sensor check	The PC displays the following error by the printer driver. • Paper empty • Ink empty • no ink tank • Cover open	Refer to [6]-6. LED STATUS
Head alignment and position adjustment	Select Head Alignment of the printer driver, check the obtained print patterns A ~ D, enter the most suitable value, and the adjustment will be performed.	For details, refer to [3]-11 ALIGNING THE PRINT HEAD.

[9] DISASSEMBLY, ASSEMBLY

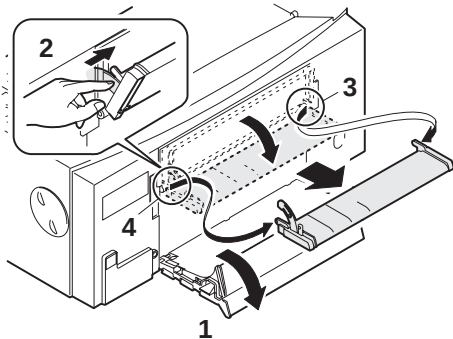
Applicable grease: G-484:GRE

Apply 0.05g of grease to every point.

(1) Cabinet

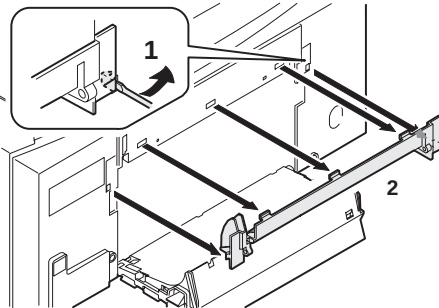
<1> Bypass tray

- 1) Open the U-turn paper guide.
- 2) Open the bypass tray and hold it. Press in the arrow direction as shown until the pawl is disengaged. Then open the tray again.
- 3) Remove the bypass tray hinge.
- 4) Remove the bypass tray from the tray hinge.
- 5) Slide in the arrow direction as shown and remove the bypass tray.



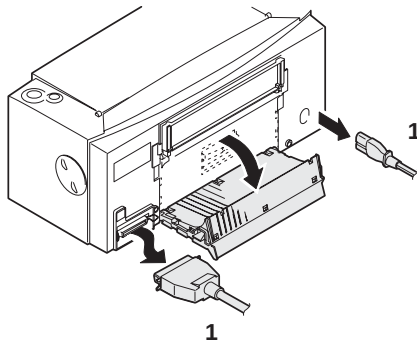
<2> Tray hinge

- 1) Remove the pawl in the arrow direction.
- 2) Remove four pawls and remove the tray hinge from the body cabinet.

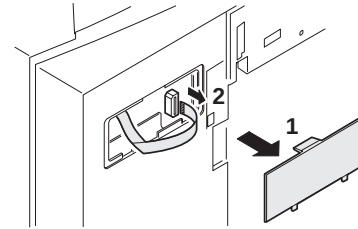


<3> Body cabinet

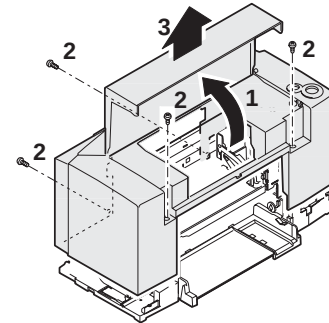
- 1) Remove the cables.



- 2) Remove the connector cover, and remove the operation panel FPC cable.

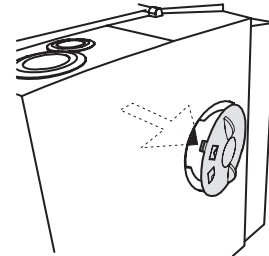


- 3) Remove the bypass tray.
- 4) Remove the tray hinge.
- 5) Remove the knob.
- 6) Open the front cover, and remove the screw.
- 7) Remove the body cabinet upward.



[Note for assembly]

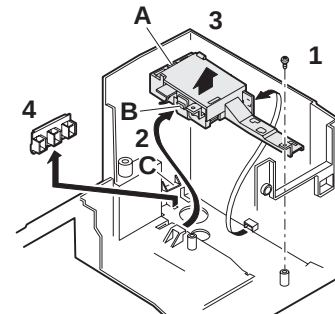
- 1) Push the paper select knob from the inside to remove.
- 2) Install the body cabinet.
- 3) Install the paper select knob.



(2) Operation panel

<1> Panel frame

- 1) Remove the cables.
- 2) Remove the body cabinet.
- 3) Remove the screw on the back of the body cabinet, remove the pawl and remove the panel frame.

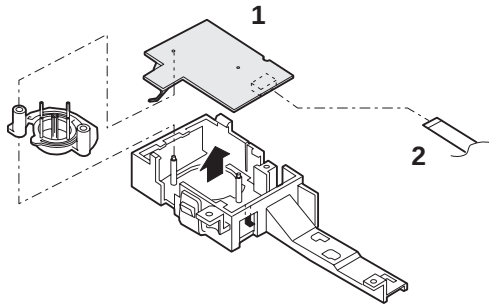


[Note for assembly]

- * Engage section B of the panel frame in groove C in the cabinet.
- * Check that the key top moves smoothly without inclination.

<2> Panel PWB

- 1) Remove the cables.
- 2) Remove the body cabinet.
- 3) Remove the panel frame.
- 4) Remove the LED lens.
- 5) Remove the panel PWB.
- 6) Remove the flat cable.



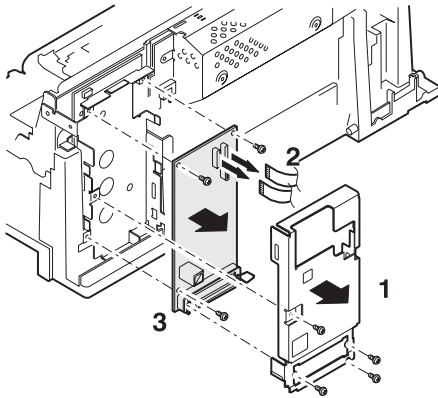
[Note for assembly]

- * Be careful of the front and back of the flat cable.
- * Store the flat cable inside the panel frame.

(3) PWB, power unit

<1> Control PWB

- 1) Remove the cabinet.
- 2) Remove the screw, and remove the shield box-R.
- 3) Remove the cables from the connectors.
- 4) Remove the screw and remove the control PWB.

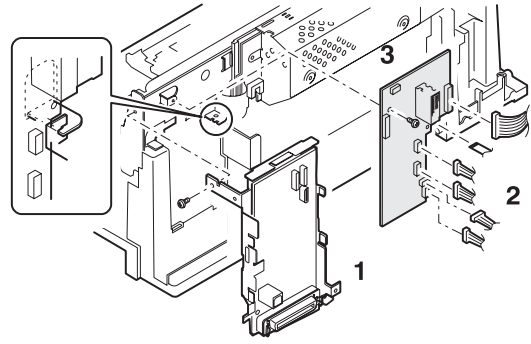


[Note for assembly]

- * Put the mounting fixture of the Centro connector out of the hole.

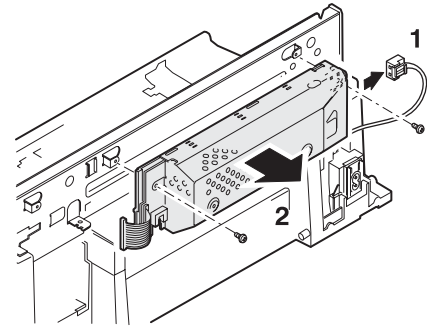
<2> Interface PWB

- 1) Remove the cabinet.
- 2) Remove the shield box-R.
- 3) Remove the cables from the connectors.
- 4) Remove the screw, and remove the shield box-F.
- 5) Remove the screw, and remove the interface PWB.



<3> Power source

- 1) Remove the cabinet.
- 2) Remove the AC inlet harness connector.
- 3) Remove the screw, and remove the power unit.

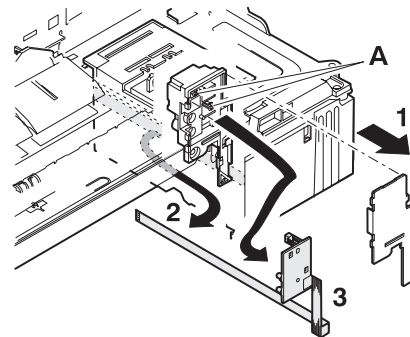


[Note for assembly]

- * When assembling the PS unit, be careful not to pinch the P sensor of the ITO mechanism.

<4> ILS PWB

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the ILS cover.
- 4) Remove the flat cable from the maintenance station.
- 5) Remove pawl A, and remove the ILS PWB.

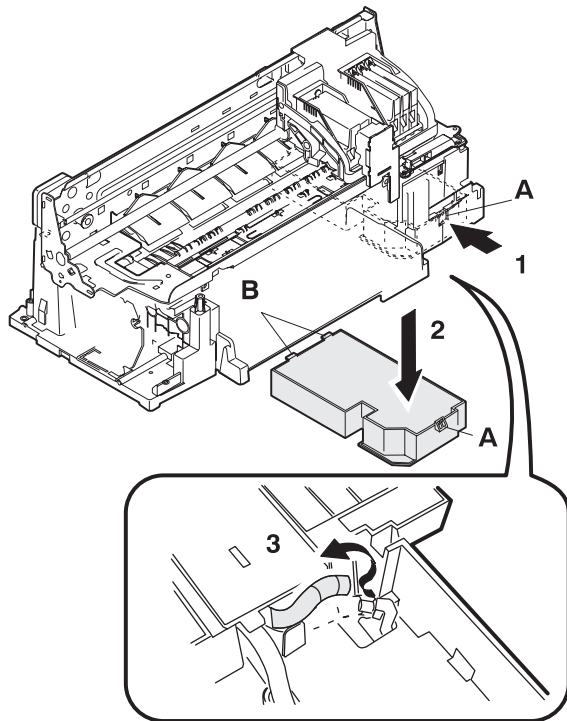


(4) Main chassis unit

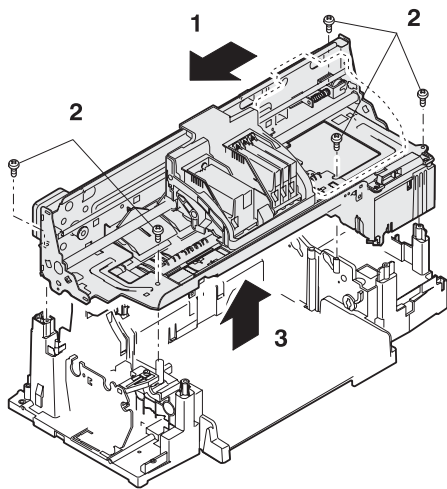
<1> Main chassis unit

- 1) Remove the cabinet.
- 2) Remove the shield box-R.
- 3) Remove the control PWB.
- 4) Remove pawl A, and remove the vat tray.

- 5) Remove the tube from the back of the U frame, the maintenance station, and the joint section.

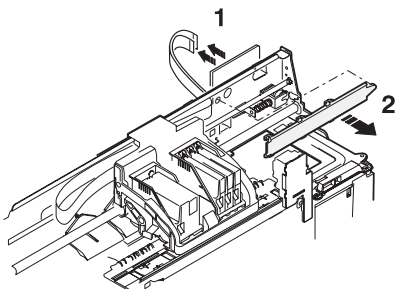


- 6) Slide the carriage to the left.
- 7) Remove the screw, and remove the main chassis unit.

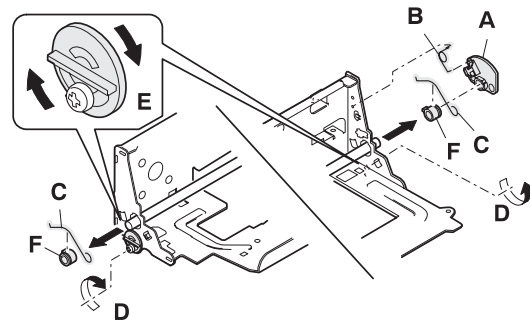


<2> Carriage unit

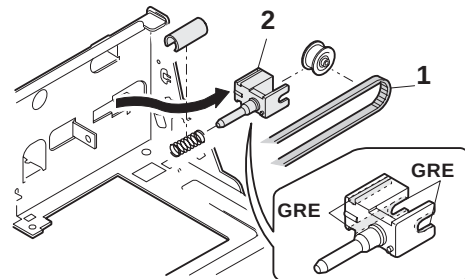
- 1) Remove the cabinet.
- 2) Remove the shield box-R.
- 3) Remove the flat cable.
- 4) Remove the FFC holder.



- 5) Remove the adjust lever (A), and remove the adjust lever spring (B).
- 6) Remove the adjust spring (C).
- 7) Loosen the adjust cam fixing screw (C), and rotate the adjust cam (E) to the right and lower the slide shaft bearing.
- 8) Fit the slide shift bearing (F) with the main chassis cutout, and remove it.



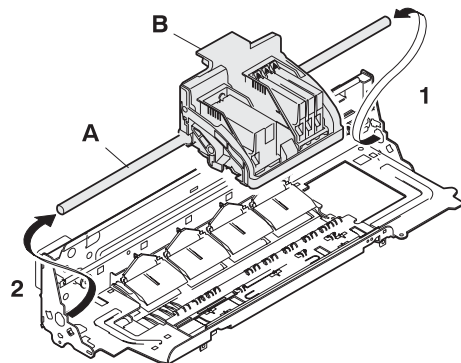
- 9) Push the belt lever (2) to the left, and remove the belt.
- 10) Remove the belt lever.



[Note for assembly]

* Apply grease to the GRE section.

- 11) Remove the slide shaft from the right side, and remove the carriage unit together with the slide shaft.
(Be careful that pawl B is engaged on the chassis.)

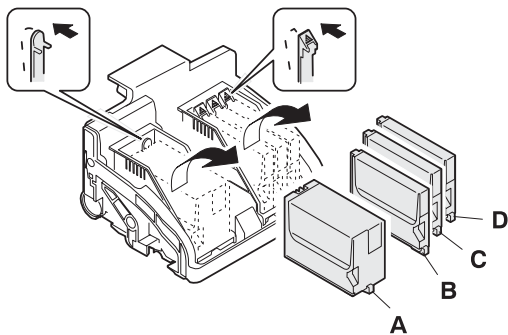


[Note for assembly]

* Do not use alcohol to clean the slide shaft.

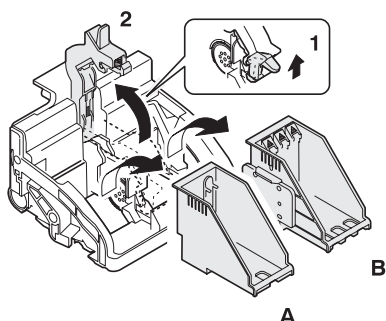
<3> Ink cartridge

- 1) Open the front cover.
- 2) Shift the carriage.
- 3) Press lever 1 and remove the black ink cartridge (A).
- 4) Press lever 2 and remove the magenta ink cartridge (B).
- 5) Press lever 2 and remove the yellow ink cartridge (C).
- 6) Press lever 3 and remove the cyan ink cartridge (D).



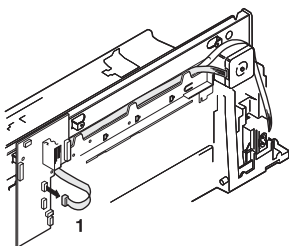
<4> Head unit (Black, Color)

- 1) Open the front cover.
- 2) Shift the carriage.
- 3) Remove the ink cartridges.
- 4) Pull the lock lever, and open the latch arm.
- 5) Remove the black head unit (A).
- 6) Remove the color head unit (B).

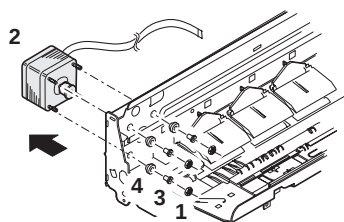


<5> X motor

- 1) Remove the cabinet.
- 2) Remove the shield box-F.
- 3) Remove the power unit.
- 4) Remove the X motor harness from the interface PWB.

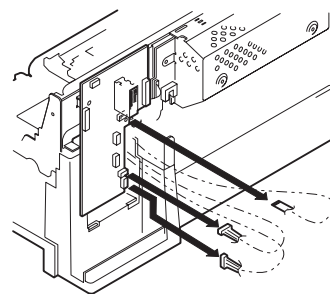


- 5) Remove the hex nut.
- 6) Remove the X motor.
- 7) Remove the anti-vibration rubber.

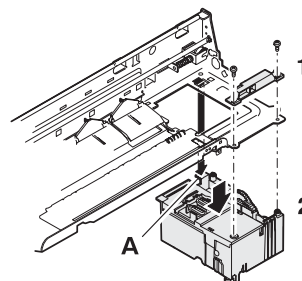


<6> Maintenance station

- 1) Remove the cabinet.
- 2) Remove the shield box-F.
- 3) Remove the harness.



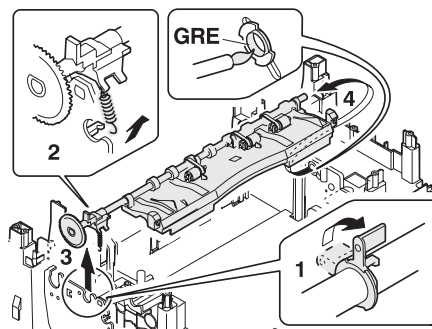
- 4) Remove the screw, and remove the MS guide.
- 5) Remove the maintenance station with a care not to scratch with the pawl in section A.



(5) U frame

<1> Eject roller unit

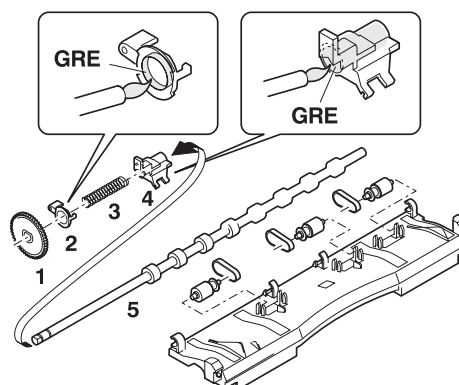
- 1) Remove the cabinet.
- 2) Remove the shield box-F.
- 3) Remove the lock of the left bearing.
- 4) Remove the spring.
- 5) Remove the eject roller.



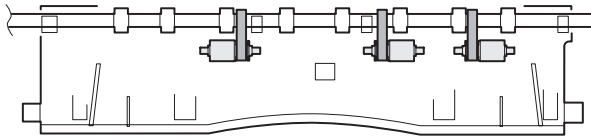
[Note for assembly]

* Apply grease to the GRE section.

- 6) Remove the eject guide roller.
- 7) Remove the eject roller unit.

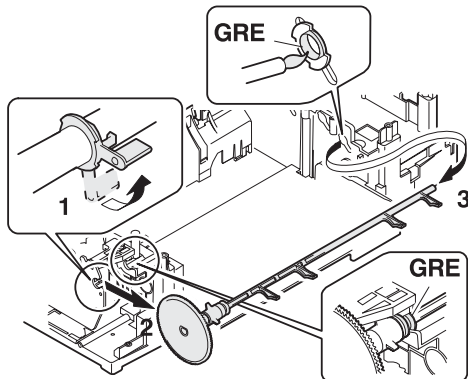


- 8) Install the eject guide roller belt to the position shown in the figure below.



<2> E clutch unit

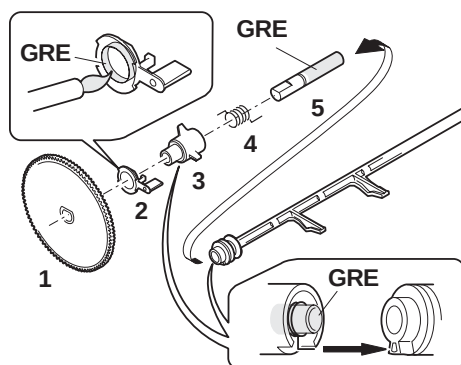
- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the eject roller unit.
- 4) Remove the lock of the left bearing.
- 5) Remove the E clutch unit.



[Note for assembly]

* Apply grease to the GRE section.

- 6) Remove the E clutch gear.
- 7) Remove the bearing.
- 8) Remove the E clutch roller.
- 9) Remove the E clutch spring.
- 10) Remove the E clutch shaft.

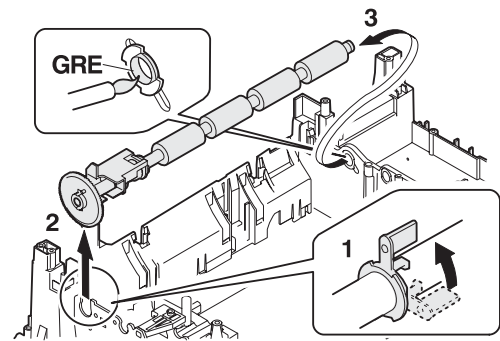


[Note for assembly]

- * Check that the end of the E clutch spring extends from the concave section of the E clutch roller.
- * Insert the E clutch spring into the square hole of the F arm.

<3> Feed roller unit

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the lock of the left bearing.
- 4) Remove the feed roller unit.

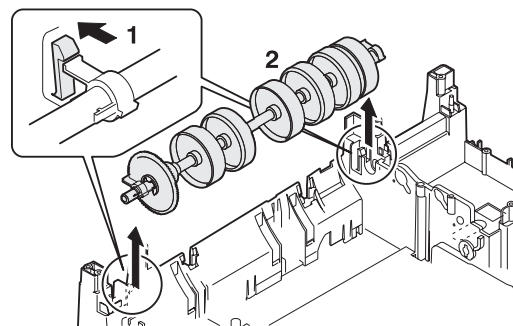


[Note for assembly]

* Apply grease to the GRE section.

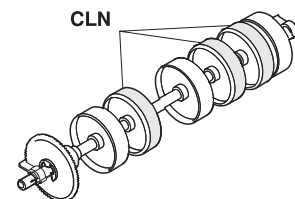
<4> U roller unit

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the locks of the right and left bearings.
- 4) Remove the U roller unit.



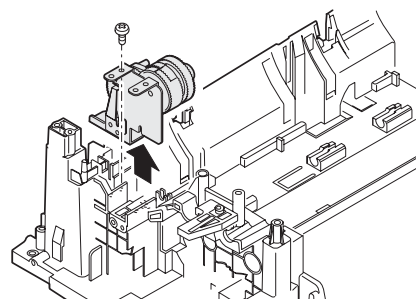
[Note for assembly]

* Clean the CLN section with absolute alcohol.



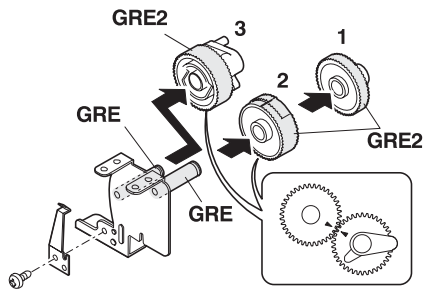
<5> U left plate unit

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the screw, and remove the U left plate unit.



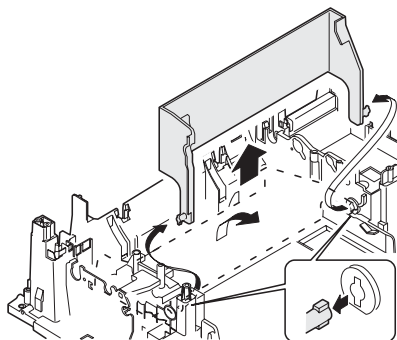
[Note for assembly]

* Apply grease to the GRE section.

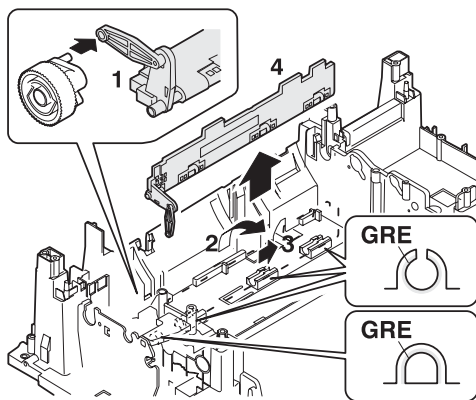


<6> U rotating plate arm

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the eject roller unit.
- 6) Remove the E clutch unit.
- 7) Remove the U rotating plate.



- 8) Remove the U cam crank from the U cam gear and the boss section.
- 9) Raise the U rotating plate arm 90 degrees toward you, and slide it to the right.



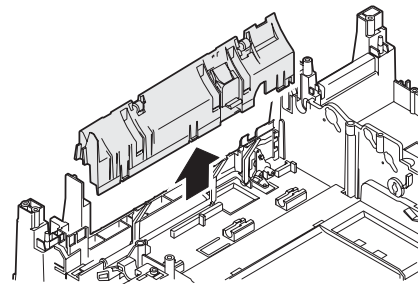
[Note for assembly]

* Apply grease to the GRE section.

<7> U separation guide

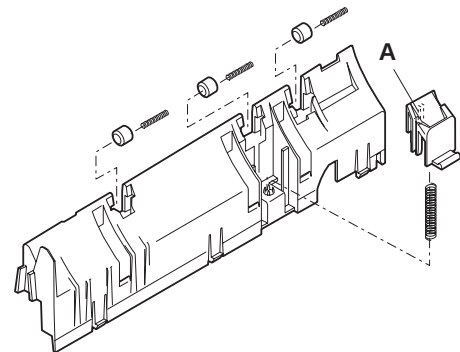
- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the eject roller unit.
- 6) Remove the E clutch unit.
- 7) Remove the U rotating plate.
- 8) Remove the U rotating plate arm.

- 9) Remove the U separation guide.



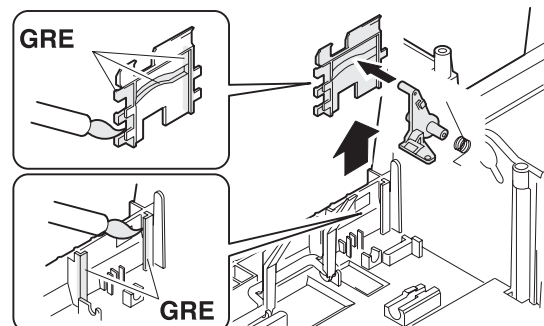
<8> U separation arm

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the eject roller unit.
- 6) Remove the E clutch unit.
- 7) Remove the U rotating plate.
- 8) Remove the U rotating plate arm.
- 9) Remove the U separation guide.
- 10) Remove pawl A, and remove the U separation arm.



<9> U stopper, U return arm

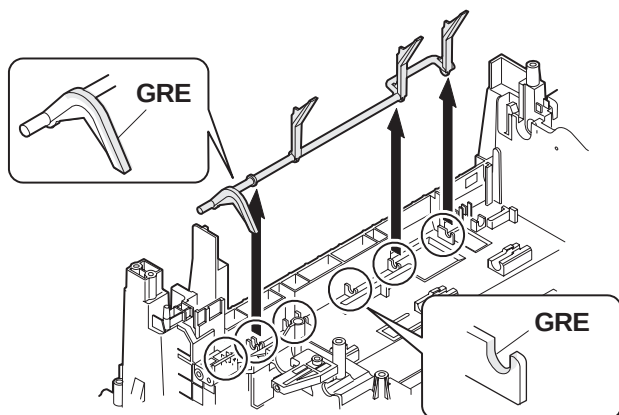
- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the eject roller unit.
- 6) Remove the E clutch unit.
- 7) Remove the U rotating plate.
- 8) Remove the U rotating plate arm.
- 9) Remove the U separation guide.
- 10) Remove the U stopper.



[Note for assembly]

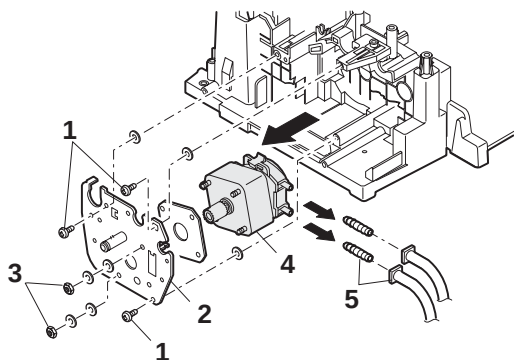
* Apply grease to the GRE section.

- 11) Remove the U return arm.



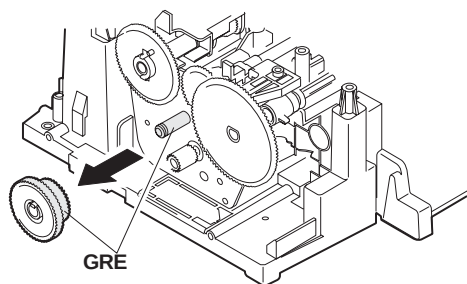
<10> Y motor pump

- 1) Remove the cabinet.
- 2) Remove the main chassis unit.
- 3) Remove the U roller unit.
- 4) Remove the feed roller unit.
- 5) Remove the eject roller unit.
- 6) Remove the E clutch unit.
- 7) Remove the screw.
- 8) Remove the Y plate.
- 9) Remove the nut.
- 10) Remove the tube.
- 11) Remove the Y motor pump.



<11> Y gear

- 1) Remove the cabinet.
- 2) Remove the Y gear.



[Note for assembly]

- * Apply grease to the GRE section.

[10] TROUBLE SHOOTING

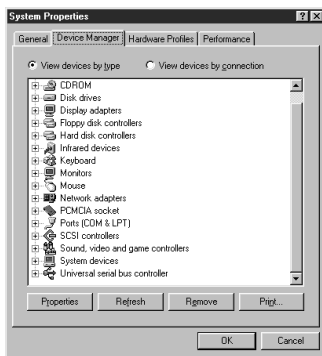
1. Failed to Install the USB Driver (Windows 98)

If the printer is connected to your computer by USB cable, you must install the USB driver.

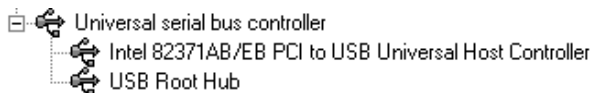
If the "Add New Hardware Wizard" window does not appear while the printer and your computer are connected each other and both powered on, confirm that the USB port is available following the steps below.

1. Click the "Start" button, select "Settings", and then click "Control Panel".
2. Double-click the "System" icon and click the "Device Manager" tab.

The last item listed in the Device Manager should be "Universal serial bus controller".



3. Click the ([+]) icon beside the "Universal serial bus controller".



Two items will display, your Controller chipset type and Root Hub. If these items appear, you can use USB port. If the "Universal serial bus controller" shows a yellow exclamation point or does not appear, you must check your computer manual for USB troubleshooting or contact your computer manufacture.

4. After the USB port becomes available, install USB driver referring to "INSTALLING THE USB DRIVER (Windows 98)" in the Setup Guide and Operation Manual.

2. Paper is not Fed into the Printer

If you encounter paper loading problems, refer to the check list below.

- CHECK1** Is there too much paper in the paper tray?
Paper tray can hold up to 150 sheets of 20 lbs. (75g/m²) plain paper. Be sure to keep total thickness of the loaded paper stack below 0.59" (15mm). The bypass tray can hold 1 sheet of paper only. If too much paper is loaded into the paper tray, paper supply problems will occur. Remove some of the paper from the paper tray.
- CHECK2** Is the top of the following paper fed into the printer?
If overlapping pieces of paper are supplied to the printer, paper supply problems will occur. Fan the paper before loading into the printer.

- CHECK3** Is the paper guide correctly adjusted to fit the paper?
If the width of the guide is set too narrow, a paper supply problem will occur. If the width of the guide is set too wide, printout will be skewed. Ensure that the guide is adjusted correctly to the paper.
- CHECK4** Is the bypass tray and the paper knob set to the appropriate position for thick paper?
When loading thick paper through the bypass tray, open the bypass tray until it stops, and turn the paper knob to (☒) direction.
- CHECK5** Is the loaded paper too thick or too thin?
Use only paper that meets SHARP specifications for weight as shown below.

Type	Specifications
Paper	16 lbs. to 110 lbs. index (60g/m ² to 200g/m ²)
Banner	20 lbs. (75g/m ²)
Envelope	20 lbs. to 24 lbs. (75g/m ² to 90g/m ²)
Card	110 lbs. index (110g/m ² to 200g/m ²) Max. thickness: 0.012" (0.3mm)

- CHECK6** Is the printer on a flat surface?
The printer will not operate correctly when placed on an uneven surface. Use the printer on a flat surface.
- CHECK7** Is the paper curled or folded?
Using curled or old paper may cause paper supply problems. The use of new paper is recommended.
- CHECK8** Did you fan the paper before placing into the paper tray?
Fan the paper, and tap the edge against a flat surface to even the stack before loading into the printer.
- CHECK9** Is the setting for printing cards or envelopes correct?
When printing onto a card or envelope, insert it vertically and make sure the correct side will be printed. When printing onto an envelope, be sure to turn the paper knob to (☒) direction to adjust the setting to fit the thickness.

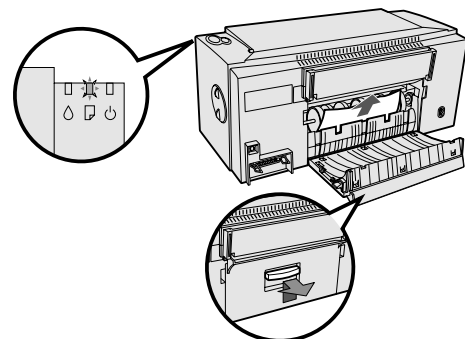
3. Paper Jam

If a paper jam occurs, refer to the steps below to remove the paper.

Note: • When paper is jammed, the paper lamp will blink fast.

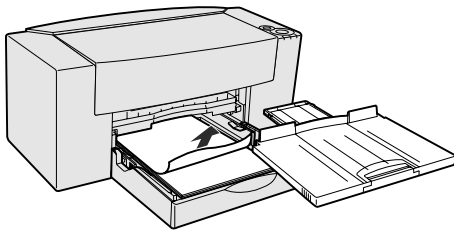
1. Open the jam cover located on the rear of the printer to remove the jammed paper.

Gently pull the jammed paper upward by holding both edges of the paper.



If you cannot remove the jammed paper from the jam cover, refer to the next step.

2. Take off the output tray to remove the jammed paper.



Caution: • After removing the jammed paper, be sure to align the paper guide to the paper in the paper tray.

3. Close the jam cover, insert the output tray and press the paper button.

Make sure the paper lamp is not blinking.

Caution: • If the jammed paper will not come out easily, try pulling in the opposite direction. Do not pull too hard as this may damage the printer mechanism. Do not re-use any sheets of paper that have jammed.

4. Printer Inoperative

If the power lamp of the printer does not light up after turned on, or the all the lamps keep blinking for a long, refer to the steps below.

CHECK1 Is the power cord connected?

Securely plug the power cord into the power connector of the printer and the electrical outlet. The power cord might not be inserted correctly. After firmly plugging in the printer, verify whether or not the power lamp has come on.

CHECK2 Is the printer plugged into a working electrical outlet?

Connect some other appliance to the electrical outlet to verify whether the power source is supplying power.

If all the lamps keep blinking

If all the lamps including the power lamp, the ink lamp, and the paper lamp are blinking, unplug the power cord from the printer, and then plug it again. If your printer still does not work, please call SHARP at 1-630-378-3590.

5. Nothing Prints

If nothing prints even when the power lamp is lit, please wait a few moments. The printer needs a longer time to process multicolored or intricate data. If the unit still does not print, refer to the check list below.

Check the connection between the printer and computer.

CHECK1 Are the interface cables compatible with the printer and computer?

Interface cables compatible with this printer are USB and parallel interface cables. If you are using any other type of interface cable, please change it to the recommended cable. Check if either type of interface is supported by your computer.

CHECK2 Is the interface cable connected securely?

Check if the interface cable is securely plugged into the connectors of the printer and computer. It is also advisable to ensure that the connector pins are not bent.

CHECK3 Are any other USB peripherals being connected along with the printer?

If other USB peripherals are connected through the same hub, turn them off any if they are not in use while printing.

Check your printer.

CHECK4 Is the front cover properly closed?

Check if the front cover of the printer is securely closed.

CHECK5 Are the ink tanks and the print heads installed properly?

Make sure the ink tanks and the print heads are installed properly.

CHECK6 Has a paper jam occurred?

Open the jam cover and remove the jammed paper.

CHECK7 Can you print a test page?

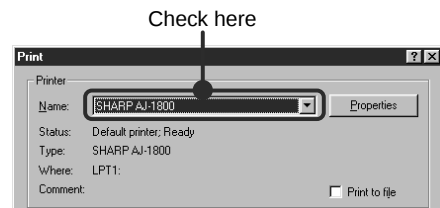
Depress the paper button on the printer for a few seconds to print a test page. If you can print a test page, there may be a problem not with the printer but with the computer or interface cable.

CHECK8 Is there enough computer memory or hard disk space?

To use this printer, you must have an adequate amount of hard disk space. If there is insufficient hard disk space, delete unnecessary files to increase the free space of the hard disk. If there is insufficient memory, close unnecessary applications to increase memory available for printing. If you are still unable to print, install more memory into your computer.

CHECK9 Is your printer selected correctly in the current application for the print job?

When choosing "Print" from the "File" menu located in applications, be sure you have selected the "SHARP AJ-1800" or "SHARP AJ-2000" displayed in the "Print" dialog box.



Note: • If your operating system is Windows 2000, make sure that either of "SHARP AJ-1800" or "SHARP AJ-2000" printer driver icon is selected as the current printer.

CHECK10 Has the printer driver been installed properly?

Check if the printer driver has been installed, following the steps listed below.

1. Click the "Start" button, select "Settings" and then click "Printers".
2. Check if the "SHARP AJ-1800" or "SHARP AJ-2000" printer driver icon is shown in the "Printers" window.



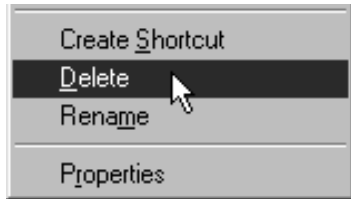
If you still cannot print after confirming the "SHARP AJ-1800" or "SHARP AJ-2000" printer driver icon, the printer driver may not have been installed correctly. In this case, you must uninstall the printer driver and install the printer driver again.

6. Uninstalling the Printer Driver

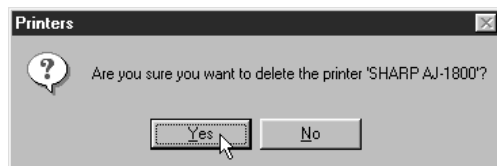
If you cannot print even after following the steps shown in Nothing Prints, you must uninstall the printer driver and install the printer driver again.

Caution: • Before uninstalling the printer driver, close all applications.

1. Click the "Start" button, select "Settings", and then click "Printers".
2. Right-click the "SHARP AJ-1800" or "SHARP AJ-2000" printer driver icon, and select "Delete" from the pop-up menu.



3. Click the "Yes" button in the confirmation dialog box.



You have successfully completed uninstalling the printer driver.

7. Faint, Uneven Print Output

If print quality is faint or uneven, refer to checks 1 to 3 below for possible remedies.

- CHECK1** Has the paper been inserted into the printer with the print side facing the right way?
Some types of paper have only one printable side. Print quality will suffer if paper is loaded in the tray with the print side facing the wrong way.
- CHECK2** Has the printer driver been specified to suit both paper and the print job?
Open the properties dialog box, and follow the steps listed below.
1. Is the paper specified in the properties dialog box the same as that loaded in the tray?
Click the "Advanced" tab, and check if the "Media Type" setting matches the paper inserted in the tray.
 2. Is the print quality setting in the properties dialog box set to "Draft"?
If the "Print Quality" setting in the "Advanced" tab is set to "Draft", you can print at higher speed but print quality may suffer as a result. Specify another setting, and then print again.
- CHECK3** Did you get a clear result for your test page?
Print a test page to check the print quality. To print a test page, click the "Start" button of "Test print head" on the "Maintenance" tab of the print status window.

8. Characters or Graphics are not Printed in Correct Position

If a document is printed skewed or partly off the paper, follow the steps listed below.

- CHECK1** Is the paper size loaded in the tray the same as that specified in the printer driver?
Click the "Paper" tab in the properties dialog box, and check if the "Paper Size" options suit the size of the paper loaded in the tray. If the "Fit To Page" setting is being activated, make sure that the paper size selected from the drop-down list of the "Print xxx on:" option is the same to the size of the loaded paper.

Example "Print Letter on:" Index card 5" x 8"

- CHECK2** Is the orientation of document setting correct?
Click the "Main" tab in the properties dialog box, and verify if the "Orientation" option is set to your requirements.
- CHECK3** Did you correctly select the desired value for "N-Up Printing"?
Confirm the selected value for "Original Size" when "2-Up" or "4-Up" has been selected for "N-Up Printing". If you have specified a paper size larger than the document size specified through your application, the image outside the printable area of the selected paper size may not be printed.
- CHECK4** Is the paper loaded correctly?
If a document is physically damaged as it is output or the image is skewed on the paper discard the jammed sheet, reinsert the paper supply and print again. Insert the paper so that there is no visible space between the paper and the paper guides.
- CHECK5** Did you correctly specify the margins for the application in use?
Check the layout of the document margins and the paper size settings for the application you are using.
Also check if the print settings are specified correctly to suit the paper size.

9. Printed Lines are not Straight, or Have Blank Spaces

When printed lines are not straight, or have blank spaces, follow the steps listed below.

1. Specify the print quality setting in the printer driver to except "Draft".
Click the "Advanced" tab located in the properties dialog box, and check if the "Print Quality" option is set to "Sharp Special", "Normal" or "Best".
If you change the setting from "Draft" to any other option and printed lines are still blurred, go to step 2.
2. Align the print head.
Click the "Maintenance" tab of the print status window and then click "Start" button of "Print alignment patterns" to align the print head.

10. Unit does not Print in Color

If you are unable to print a document in color, refer to the check list below.

- CHECK1** Is the printer driver set to the color print option?
Click the "Advanced" tab in the properties dialog box, and change the "Output Type" setting to "Color".
- CHECK2** Does the application you are using support color printing?
Some applications may not support color printing. Use an application that supports color printing.

For more information, see your application's manual or help file.

11. Printing is too Slow

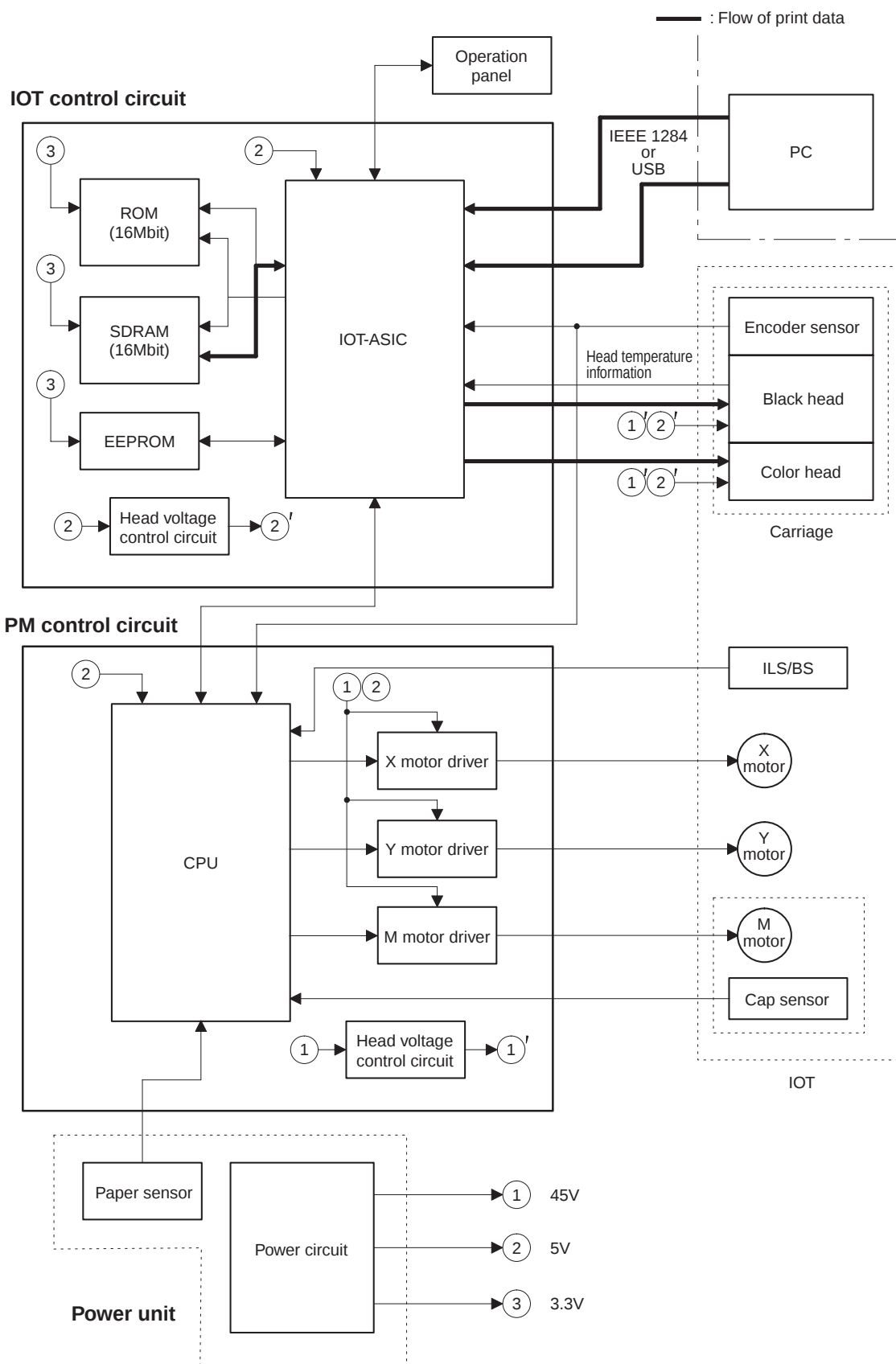
When execution time of a print job is slow, refer to the check list below.

- CHECK1** Does your computer have sufficient memory?
If you are using a number of applications, memory may not have enough space to process the print job. Try closing all other applications to increase the amount of memory available for printing. If printing is still excessively slow, you may have to add more memory into your computer.
- CHECK2** Is your hard disk fragmented?
When data is frequently stored/deleted, the hard disk may become fragmented causing a reduction in printing speed. In this case it is recommended to defragment your hard disk. You may use the Windows tools or a commercially available hard disk defragmenting tool.
- CHECK3** Is the size of the print job too large?
It is recommended to reduce the size of the file by lowering the resolution of the print data.

[11] ELECTRICAL SECTION

1. OVERALL BLOCK DIAGRAM

A. Block diagram



B. Descriptions of each block

1. IOT control PWB

IOT is an abbreviation of Input Output Terminal, and is composed of IOT-ASIC, ROM, SDRAM, EEPROM, and the head voltage (LG) control circuit.

The IOT control PWB analyzes commands sent from the PC and stores print data into the SDRAM.

The data are synchronized with the encoder signals, and print data are sent to the head.

Commands of paper feed, print start, end position, carriage return, paper exit, and maintenance are transferred to the PM control PWB by serial communication to perform carriage return, maintenance, etc.

The head voltage is turned off by the signal from IOT-ASIC in the standby state or when the cover is opened.

The EEPROM stores data of pixel count, head alignment, and head conduction pulses.

2. PM control PWB

PM is an abbreviation of Printer Mechanism. The PM control PWB is composed of the CPU, the X motor driver, the Y motor driver, the M motor driver, and the head voltage (HV) control circuit.

Its function is to drive the motors and process the inputs of sensors according to the command from IOT-ASIC.

The status of the printer mechanism is sent to IOT-ASIC by serial communication.

3. IOT (Printer engine section)

This is composed of the carriage, the maintenance station, motors, sensors, and the paper feed mechanism.

4. Power unit

This is the power circuit of AC voltage, and generates 45V, 5V, and 3.3V. (Refer to the power circuit descriptions.) It is provided with the paper sensor.

5. Operation panel

The operation panel is provided with two keys (power, paper) and three LED's (ink, paper, power). It is controlled by IOT-ASIC.

6. Maintenance station

The maintenance station performs maintenance of the head such as capping, priming, wiping, and spitting.

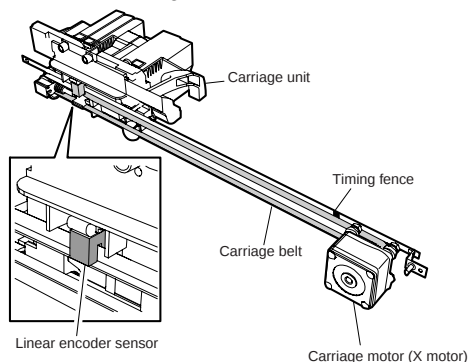
The cap sensor attached to the maintenance station senses the cap position.

For details, refer to the basic operation.

7. Encoder sensor

This sensor is installed so that it covers over the timing fence, and reads the linear encoder signal from the timing sensor and sends it to IOT-ASIC.

ASIC generates 600LPI signals and carriage direction signals from the linear encoder signals.



8. ILS/BS PWB

The ILS/BS PWB is attached about 35mm apart from the maintenance position in the scan direction as shown below. The BS (brand sensor) is provided on the upper side of the PWB, and the ILS/TP (ink level sensor and ink cartridge sensor) is provided on the lower side.

When the ink cartridge installed to the carriage passes in front of the sensors, the sensors detect the following items:

BS: Bar code on the upper side of the ink cartridge

ILS/TP: Detection area on the lower side of the ink cartridge

ILS detects no reflection light. →

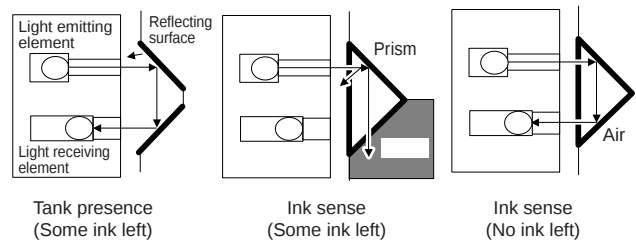
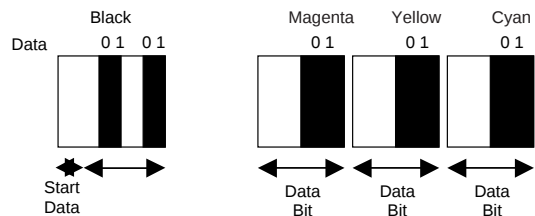
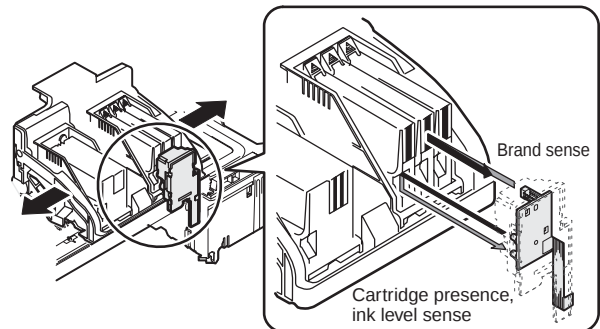
There is ink in the detection area.

ILS detects some reflection light. →

There is no ink in the detection area.

TP detects no reflection light. → There is no cartridge.

TP detects some reflection light. → There is a cartridge.



9. Head voltage control circuit

This circuit controls supply of the high voltage (45V) and the low voltage (5V) according to the signals sent from ASIC to the head.

10. Motors, motor drivers

The motors are pulse motors, and the drivers are bipolar chopper drive motor drivers.

The X motor (carriage motor) is driven by W1-2 phase excitement drive. The Y motor (paper feed motor) is driven by 2 phase and 1-2 phase excitement drive. The M motor (maintenance motor) is driven by 2 phase excitement drive. The drive currents (drive frequencies) are selected according to the speed and other conditions.

11. X motor

The X motor drives the carriage. The minimum feed is 125dpi

(0.2032mm). The speed and the drive frequency are shown in the table below.

Speed	Frequency
10ips	1250 x 4 pps
15ips	1875 x 4 pps
20ips	2500 x 4 pps
30ips	3750 x 4 pps

"ips" means inch per second. 10 ips is 254mm/sec.

"pps" means pulse per second.

12. Y motor

The Y motor is the paper feed motor, and drives suction pump when priming of the head. The speed is controlled by selecting the drive system and the drive frequency.

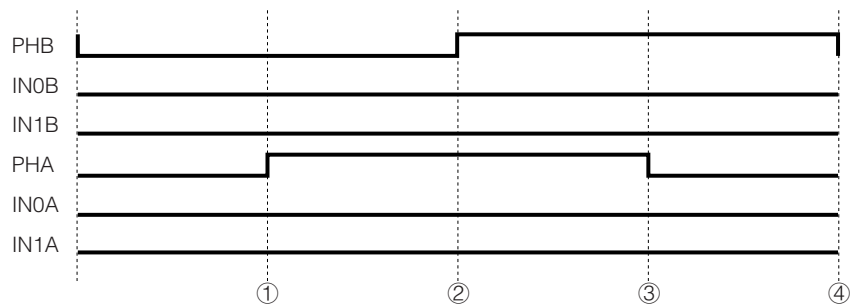
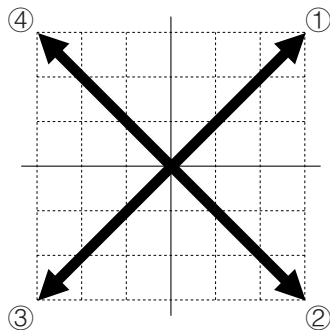
2-2 phase drive

Max. drive frequency during printing: 4500 pps

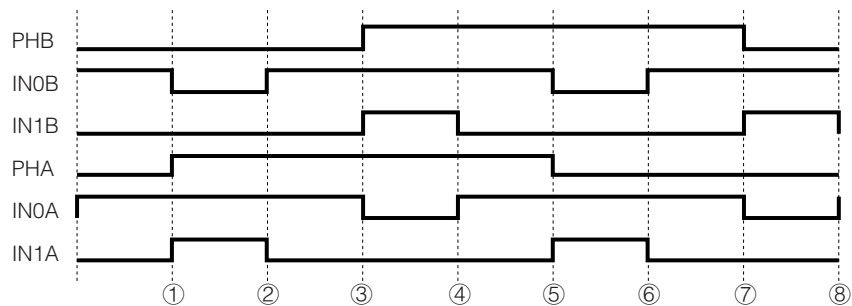
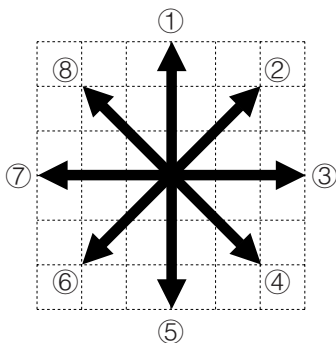
Max. drive frequency during paper feed/paper exit: 6000 pps

The minimum paper feed is 600 dpi or 1200 dpi by 1-2 phase drive system.

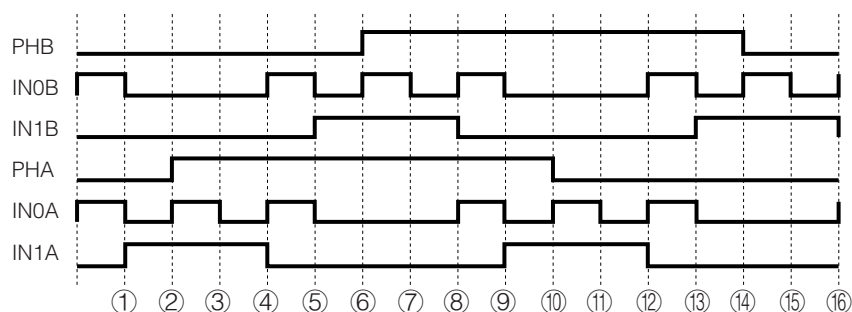
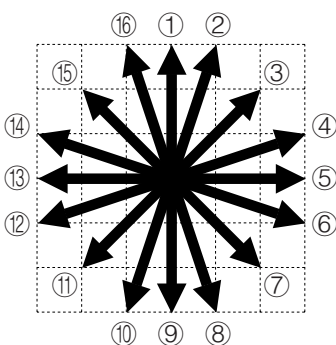
2-2 phase drive (M motor, Y motor)



1-2 phase drive (Y motor)



W1-2 phase drive (X motor)



13. M motor

The M motor is the maintenance station drive motor, and performs capping and wiping of the head.

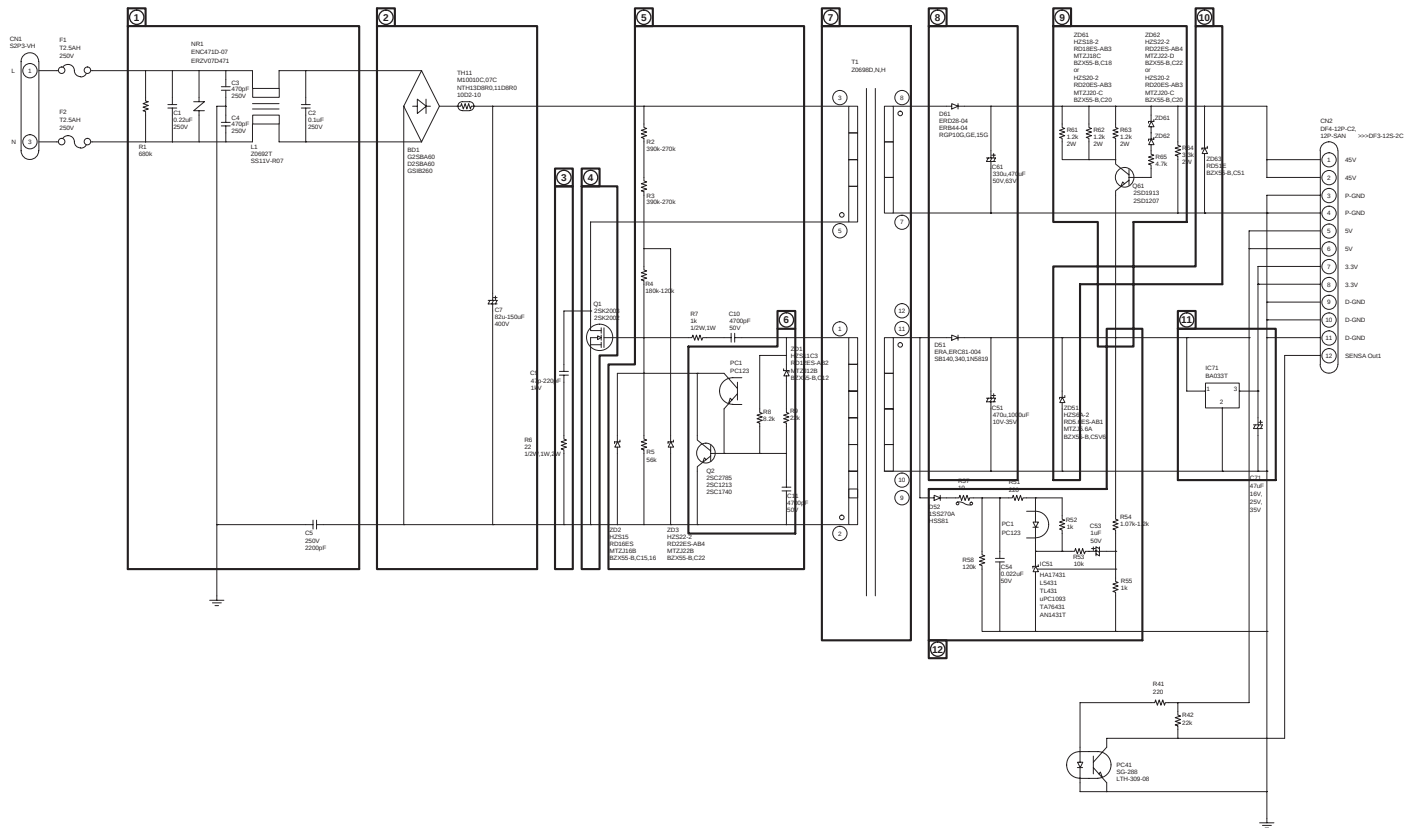
The drive frequency : 300/680 pps

14. Motor drive system

The motor control signal when the motor rotates one turn.

2. POWER CIRCUIT

A. Block diagram



B. Descriptions of each block

① Filter circuit

This circuit is provided mainly for EMI and EMC, and composed of C and L. R1 is the discharge resistor in the filter circuit.

② Commercial voltage rectifying/smoothing circuit

This circuit rectifies and smoothes input voltages of 50Hz or 60Hz.

③ Snapper circuit

This circuit serves as a filter circuit to reduce switching noises of the main switching element Q1.

④ Main switching element Q1

⑤ Switching control circuit

This circuit controls the switching element Q1 and the switching transformer T1 according to feed back information from the output voltage detection circuit on the secondary side.

This circuit also serves as the overcurrent protection circuit and the soft start circuit.

⑥ Overcurrent protection circuit

This circuit checks for any abnormality in the loads and the output overvoltage by observing the waveforms of transformer T1 and controls oscillation.

⑦ Switching transformer T1

⑧ Secondary side rectifying/smoothing circuit

This circuit rectifies the output of transformer T1 which performs high frequency switching.

⑨ Dummy load circuit

This circuit is provided to stable the outputs and suppress fluctuations of voltage due to fluctuations of load.

⑩ Overvoltage element

This elements detects an overvoltage of +45V output 'ZD63) and of +5V output (ZD51).

After detecting an abnormality, it feeds back the overvoltage to the primary side through transformer T1 as an overcurrent.

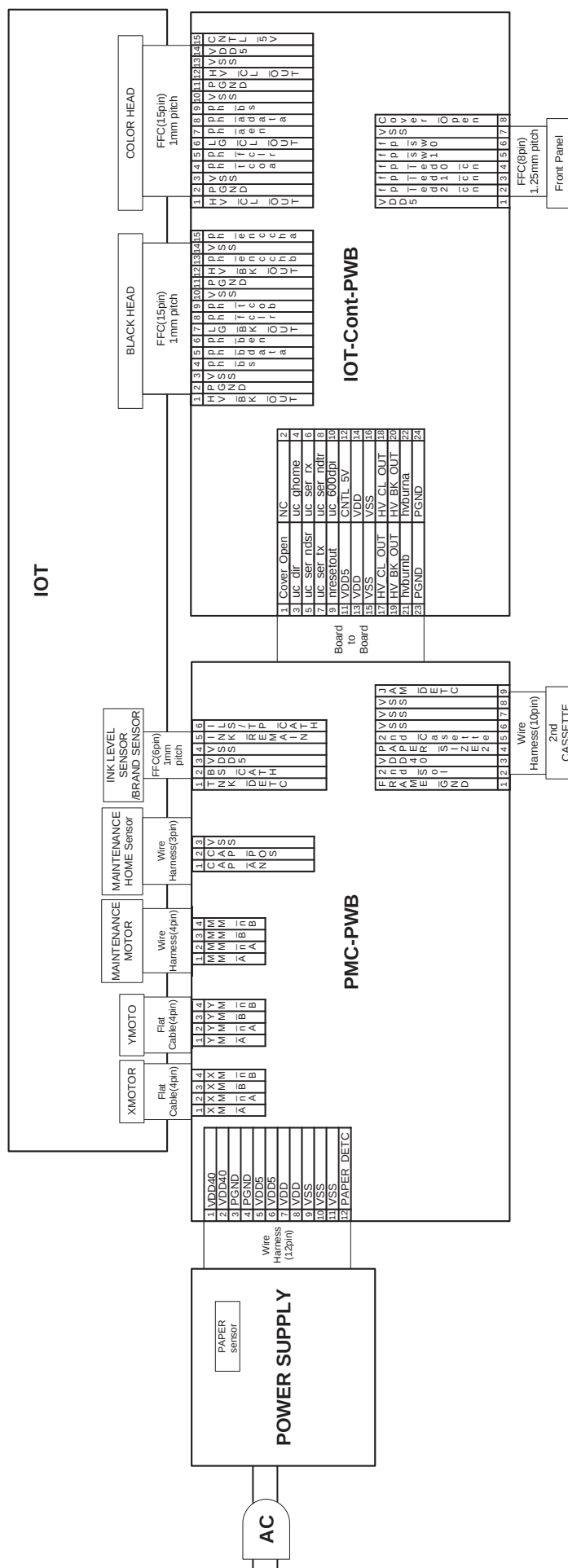
⑪ +3.3V output control circuit

This is the series dropper circuit from +5V by 3-terminal regulator IC71.

⑫ Secondary side output voltage detecting circuit

This circuit monitors +5V and feeds back to the primary side through the photo coupler PC1.

3. ACTUAL WIRING CHART



4. INTERFACE

A. PARALLEL INTERFACE

This printer uses a bi-directional parallel interface. Use the supplied interface cable.

Connector

36-pin DDK 57LE-40360-730B (D29) female connector or equivalent connector

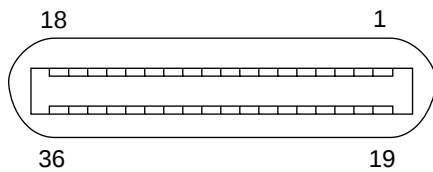
Cable

Shielded type bi-directional parallel interface

For best results, use a printer interface cable which is IEEE1284 compliant.

Pin configuration

The pin numbers and signal names are listed in the following table.



Pin No.	Signal name	Pin No.	Signal name
1	$\overline{\text{STB}}$	19	GND ($\overline{\text{STB}}$ RET)
2	DATA1	20	GND (DATA1 RET)
3	DATA2	21	GND (DATA2 RET)
4	DATA3	22	GND (DATA3 RET)
5	DATA4	23	GND (DATA4 RET)
6	DATA5	24	GND (DATA5 RET)
7	DATA6	25	GND (DATA6 RET)
8	DATA7	26	GND (DATA7 RET)
9	DATA8	27	GND (DATA8 RET)
10	$\overline{\text{ACKNLG}}$	28	GND ($\overline{\text{ACKNLG}}$ RET)
11	BUSY	29	GND (BUSY RET)
12	PE (Paper End)	30	GND (PE RET)
13	SLTC	31	INPRM
14	$\overline{\text{AUTO LF}}$	32	FAULT
15	(NC)	33	(NC)
16	GND (0 V)	34	(NC)
17	FG	35	+5 V
18	+5 V	36	$\overline{\text{SLTC IN}}$

B. USB INTERFACE

Connector

4-pin DDK DUSB-BRA42-T11
Type-B connector

Cable

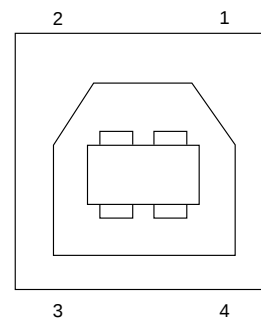
Shielded twisted pair cable

(2 m (6 feet) Max.: high-speed transmission equivalent)

Pin configuration

The pin numbers and signal names are listed in the following table.

Pin No.	Signal name
1	+5V
2	DATA
3	+DATA
4	GND



CAUTION FOR BATTERY REPLACEMENT

(Danish)

ADVARSEL !

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English)

Caution !

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the manufacturer.

"BATTERY DISPOSAL"

CONTAINS MANGANESE DIOXIDE LITHIUM BATTERY.
MUST BE DISPOSED OF PROPERLY.
REMOVE THE BATTERY FROM THE PRODUCT AND
CONTACT FEDERAL OR STATE ENVIRONMENTAL
AGENCIES FOR INFORMATION ON RECYCLING AND
DISPOSAL OPTIONS.

(Finnish)

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

(French)

ATTENTION

Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type équivalent recommandé par
le constructeur.
Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.

(Swedish)

VARNING

Explosionsfare vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

SHARP

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