Mimaki

COLOR INKJET PLOTTER

JV2-130/90
PV90/130

MAINTENANCE MANUAL

FOREWORD

This maintenance manual covers items required to be remembered to conduct maintenance works for the JV2/PV series of color ink jet plotter in the field.

Maintenance works have to be carried out by servicemen who have learned disassembly, assembly and adjustment techniques with required tools and measuring apparatues.

This manual covers existing maintenance parts. For any failure other than those described in this manual, factory-repairs will be necessary.
Before reading this maintenance manual, read the following manual to learn basic operations of this device.

• **Instruction Manual for JV2/PV series**

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CHAPTER 6   ADJUSTMENT

CHAPTER 1

OVERVIEW OF MAINTENANCE

1-1. Cautions in maintenance

Following cautions have to be taken when conducting maintenance works.
★ Be sure to accurately grasp problems since misoperation can be the cause of the problem.
★ Be sure to secure a sufficient space for maintenance.
★ Be sure to turn off the power switch and disconnect the power plug from the receptacle.
★ In the case where it is necessary to conduct test with the electrical box cover opened, caution should be taken to avoid electric shock hazards in the electrical box.
★ In the case where it is necessary to conduct maintenance works with the power on, carefully observe the movement of the head. (Keep any part of your body away from the moving parts.)
★ Shift the paper (in the X-direction) and the head (in the Y-direction) using the jog keys. If it is necessary to shift the paper and the head by hand with the power turned off, exercise care to shift them slowly.
★ Be sure to fully understand precautions given in "For safe operation" in the Instruction Manual for the JV2/PV series.
★ Do not tilt the plotter with the ink cartridges filled with ink. Doing so can give rise to leakage of ink. (In particular, do not position the plotter in such a way, when ascending/descending the stairs, that the maintenance station is lower than the ink station.)
In principle, the following procedure should be taken in prior to the transportation.

1) Discharge ink from the tube in accordance with the description given under "Discharge cleaning" in the maintenance tests.
2) Detach the waste ink tank.
3) Fix the carriage with a metal fitting for the head.

★ The slider PCB cannot be adjusted in the field. (here is no adjustment potentiometer or module resistor.)
★ If the main unit is removed from the legs and placed directly on the floor, be careful of the following points.
  • Unplug the takeup unit power cord.
  • Remove the waste ink tank. (Plug the tube up with a cloth to prevent ink from spilling over.)
  • Remove the left and right tank guides and the waste ink tank guard.
★ When the front cover is open, Y-motor signal will be cut off resulting in no operation of Y-motor. If it is necessary to run the Y-motor with the front cover or the right-hand side cover removed, the drive line has to be short-circuited with a short-connector or the like. Caution should be taken not to short-circuit the drive line with the frame (FG) or any other component to avoid the main PCB breakage.

1-2. How to use this maintenance manual

Use the maintenance manual in the following manner.
- Check first a phenomenon that is arising to grasp the trouble.
- Secondly, grasp the outline of the trouble while referring to error messages given in Chapter 3.
- Refer to Chapter 6 for performance checking procedure and adjusting procedure.

1-3. Tools required for maintenance works

Tools and measuring apparatus required for maintenance works are given below.

Name	Q'ty	Remarks
Phillips screwdriver, type 1	1	For M2
Phillips screwdriver, type 2	1	For M3 to M5 (L=260 or more)
Phillips screwdriver, type 2	1	For M3 to M5
Slotted screwdriver	1	Log side 2.5 mm for drawing out E-rings
Hexagon wrench key	1	1.5 mm for M3 SSWP
	1	2.0 mm for M4 SSWP
	1	2.5 mm for M3 cap bolts
	1	6.0 mm for M8 cap bolts
Wrench	1	Opposite side 5 mm
	1	Opposite side 5.5 mm for M3 nuts
	1	Opposite side 7 mm for M4 nuts
Long-nose pliers	1	
Nippers	1	
Soldering iron	1	
Scale	1	
Bar-type tension gauge	1	For 500 g
Tester	1	If necessary
Magnifier	1	Magnification of approx. 50 to 60
Adhesive agent	1	LOCKTITE242 (for locking screws)
Gloves	1	In prevention of stains and safeguarding
Insulation lock	As required	L=150 or less (UL-approved product)
Nitroflon tape or acetate fabric tape	As required	UL-approved product
Solder	As required	

1-4. Specifications

1-4-1. JV2-90/130

Item		JV2-130	JV2-90
Head		1) On-demand piezo head 2) 360 dpi 3) 64 nozzle x 6 and 128 nozzle x 1 (Constitution of 7 head line)	
Effective plotting area		Width: 1320 mm (52 inch) Length: 50 m	Width: 914 mm (36 inch) Length: 50 m

Distance accuracy		1) Absolute accuracy:
		    the larger of ±0.3 mm or ±0.3% of the specified distance
		2) Reproducibility:
		    the larger of ±0.2 mm or ±0.1% of the specified distance	

Plotting resolution		1) 360 dpi x 360 dpi 2) 720 dpi x 720 dpi	
Plotting mode		2 pass: Uni-direction, bi-direction (in only 360 dpi) 4 pass: Uni-direction, bi-direction 8 pass: Uni-direction, bi-direction High speed scanning: Uni-direction, bi-direction	
Right angle accuracy		±0.5 mm/400 mm	
Paper feed method		Automatic feed by feed roller	
Media	Maximum width	1330 mm (52.4 inch)	930 mm (36.6 inch)
	Thickness Roll outside diameter Roll weight Paper core inside diameter Plotting surface	0.5 mm or less ø150 or less 15 kg or less 3 inch, 2 inch Outside of roll	

Paper width		INCH
		  9 (228 mm), 12 (305 mm),
		  18 (457 mm), 24 (609 mm),
		  36 (914 mm), 42 (1166 mm),
		  44 (1117 mm), 48 (1220 mm),
		  50 (1270 mm), 52 (1320 mm)
		ANSI
		  A (216 mm), B (279 mm),
		  C (432 mm), D (559 mm),
		  E (864 mm),
		  E width (1180 mm)
		JIS
		  A4 (210 mm), A3 (297 mm),
		  A2 (420 mm), A1 (594 mm),
		  A0 (841 mm),
		  A0 width (1189 mm)
		A media octavo (636 mm)
		A-series book version (625 mm)
			INCH
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			  18 (457 mm), 24 (609 mm),
			  36 (914 mm)
			
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			  A2 (420 mm), A1 (594 mm),
			  A0 (841 mm)
			
			A media octavo (636 mm)
			A-series book version (625 mm)

Plotting margins	Leaf	Left and right: 5 mm ± 0.5 mm Front and rear: 20 mm ± 2 mm Rear end: 35 mm ± 2 mm	
	Roll	Left and right: 5 mm ± 0.5 mm Front and rear: 20 mm ± 2 mm Rear end: 0 mm ± 0.5 mm	

Item	JV2-130	JV2-90
Usable media	PET, PVC, synthetic paper, illumination film, specialized canvas, specialized cloth (coated paper is impractical because cockling is produced)	
Head height adjustment	Adjustable to either of two steps, 1.2mm or 2.2mm above the platen surface (fixed with coin screw).	
Paper cutting	Cut in Y direction (width direction) with head cutter; cutting accuracy (difference between steps) within 0.5mm.	
Paper ejection	Roll wind-up unit standard (can switch between inner rolling and outer rolling)	
Waste ink tank	Bottle type (check replacement time visually); without tank full sensor	
Interface	Centronics (IEEE-1284 nibble mode, bite mode, ECP mode); external Ethernet adapter (optional)	
Commands	MRL-1 Rev. 1.2 ESC/P base original commands (YMCK + Or, Gr bit map format)	
Noise — On standby:	55 db or less (FAST A characteristics, front rear left right 1m)	
Noise during continuous action:	70 db or less (FAST A characteristics, front rear left right 1m)	
Noise during discontinuous action:	75 db or less (FAST A characteristics, front rear left right 1m)	
Safety standards	VCC1 Class A, FCC Class A UL 1950 (including CSA) CE marking (EMC, machine instructions, low voltage instructions)	
Input current	AC100V to 240V ±10% (automatic voltage)	
Power consumption	120VA or less	
Installation environment — Temperature in use:	15°C to 30°C	
Relative humidity:	35 to 65%Rh	
Temperature at which accuracy is guaranteed:	18°C to 25°C	
Rate of temperature change:	±10°C per hour or less	
Dust:	equivalent to regular office environment	
Weight	120 kg	100 kg
Outside dimensions (mm)	2150 (W) x 580 (D) x 1160 (H)	1750 (W) x 580 (D) x 1160 (H)

Plotting Time

Item	Specifications
Plotting time	360 x 360 2 passes in bi-direction: 11 minutes 8 passes in bi-direction: 40 minutes 2 passes in uni-direction: 13 minutes 8 passes in uni-direction: 53 minutes 4 passes in bi-direction: 20 minutes 4-pass high speed scanning in bi-direction: 13 minutes 4 passes in uni-direction: 27 minutes 4-pass high speed scanning in uni-direction: 19 minutes 720 x 720 4 passes in bi-direction: 24 minutes 8-pass high speed scanning in bi-direction: 33 minutes 4 passes in uni-direction: 27 minutes 8-pass high speed scanning in uni-direction: 39 minutes 8 passes in bi-direction: 49 minutes 8 passes in one direction: 53 minutes

Ink Specifications

Item	Specifications
Ink	6 basic colors can be selected from either (cyan, magenta, yellow, black, orange, green) or (cyan, magenta, yellow, black, light cyan, light magenta), and one additional color can be used. Inks are water - based pigmented inks, but the additional color can be water - based dye ink.
Ink supply	Tube supplied from ink cartridge. With ink end detection function (ink cartridge replacement system).
Ink capacity	220 cc ± 5 cc for each color
Amount of usable ink	Approximately 200c for each color

1-4-2. PV-90/130

Item		PV-130	PV-90
Head		1) On-demand piezo head 2) 360 dpi 3) 64 nozzle x 6 and 128 nozzle x 1 (Constitution of 7 head line)	
Effective plotting area		Width: 1320 mm (52 inch) Length: 50 m	Width: 914 mm (36 inch) Length: 50 m

Distance accuracy		1) Absolute accuracy:
		    the larger of ±0.3 mm or ±0.3% of the specified distance
		2) Reproducibility:
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Plotting resolution		1) 360 dpi x 360 dpi 2) 720 dpi x 720 dpi	
Plotting mode		2 pass: Uni-direction, bi-direction (in only 360 dpi) 4 pass: Uni-direction, bi-direction 8 pass: Uni-direction, bi-direction High speed scanning: Uni-direction, bi-direction	
Right angle accuracy		±0.5 mm/400 mm	
Paper feed method		Automatic feed by feed roller	
Media	Maximum width	1330 mm (52.4 inch)	930 mm (36.6 inch)
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Plotting margins	Leaf Roll	Left and right: 5 mm ± 0.5 mm Front and rear: 20 mm ± 2 mm Rear end: 35 mm ± 2 mm Left and right: 5 mm ± 0.5 mm Front and rear: 20 mm ± 2 mm Rear end: 0 mm ± 0.5 mm	
Usable media		PET, PVC, synthetic paper, illumination film, specialized canvas, specialized cloth (coated paper is impractical because cockling is produced)	

Item		JV2-130	JV2-90
Head height adjustment		Adjustable to either of two steps, 1.2mm or 2.2mm above the platen surface (fixed with coin screw).	
Paper cutting		Cut in Y direction (width direction) with head cutter; cutting accuracy (difference between steps) within 0.5mm.	
Paper ejection		Roll wind-up unit standard (can switch between inner rolling and outer rolling)	
Waste ink tank		Bottle type (check replacement time visually); without waste ink sensor	
Interface		Centronics (IEEE-1284 nibble mode, bite mode, ECP mode); external Ethernet adapter (optional)	
Commands		MRL-1 Rev. 1.2 ESC/P base original commands (YMCK + Lm, Lc bit map format)	
Noise	On standby:	55 db or less (FAST A characteristics, front rear left right 1m)	
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Safety standards		VCC1 Class A, FCC Class A UL 1950 (including CSA) CE marking (EMC, machine instructions, low voltage instructions)	
Input current		AC100V to 240V ±10% (automatic voltage)	
Power consumption		120VA or less	
Installation environment	Temperature in use:	15°C to 30°C	
	Relative humidity:	35 to 65%Rh	
	Temperature at which accuracy is guaranteed:	18°C to 25°C	
	Rate of temperature change:	±10°C per hour or less	
	Dust:	equivalent to regular office environment	
Weight		120 kg	100 kg
Outside dimensions (mm)		2150 (W) x 580 (D) x 1160 (H)	1750 (W) x 580 (D) x 1160 (H)

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Item	Specifications

Plotting time	360 x 360
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	720 x 720
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	  8 passes in bi-direction: 49 minutes
	  8 passes in one direction: 53 minutes

Ink Specifications

Item	Specifications
Ink	6 basic colors (cyan, magenta, yellow, black, light cyan, light magenta) and one additional color can be used. Inks are water - based pigmented inks, but the additional color can be water - based dye ink.
Ink supply	Tube supplied from ink cartridge. With ink end detection function (ink cartridge replacement system).
Ink capacity	220 cc ± 5 cc for each color
Usable ink amount	Approx. 200cc for each color

1-5. Names of parts

1-5-1. Front view
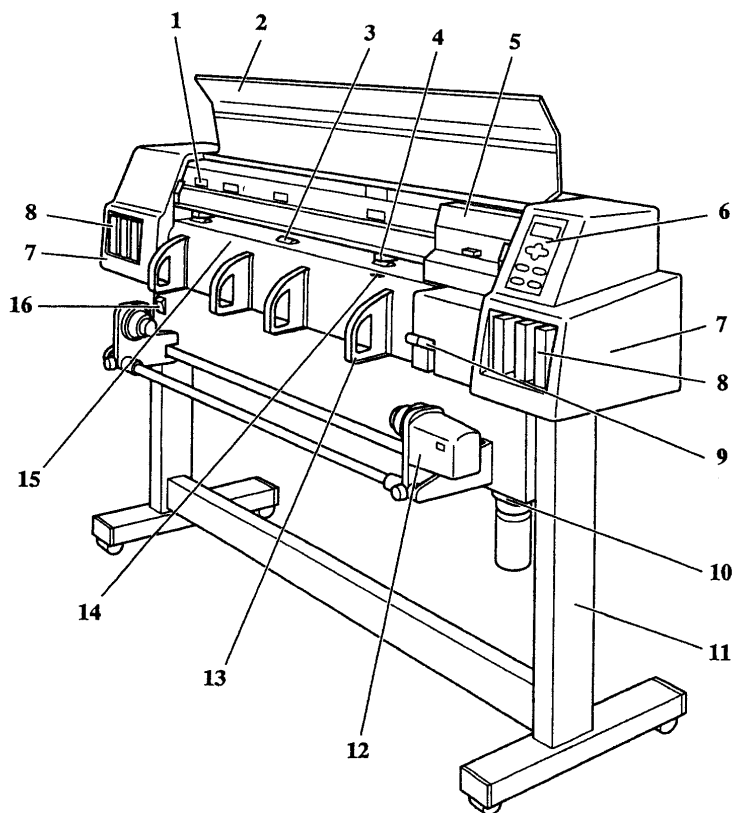
No.	Name	Function
1	Feed roller mark	Indicates the position of the feed roller. The pinch roller is set on the feed roller.
2	Front cover	Open this cover when setting papers or unjamming papers.
3	Feed roller	Forms a pair with the pinch roller to hold the media and move it forward and back.
4	Pinch roller	This roller can be shifted to the right and left in accordance with the media size.
5	Carriage	Contains the printing head and the cutter for cutting media.
6	Operation panel	Used to perform the necessary setting for this unit.
7	Ink station	Set ink cartridges of each color.
8	Ink cartridges	Contain ink of each color.
9	Clamp lever	Lifts/lowers the pinch roller to clamp/release the media.
10	Waste ink bracket	Mount waste ink tank.
11	Stand	Supports the main unit. The stand is provided with casters for moving the device.
12	Wind-up unit	Roll paper is automatically wound up after plotting is completed.
13	Paper support	Prevents comparatively solid media such as canvas from rising.
14	Media sensor	Detects the presence/absence of the media and the media length.
15	Platen	The media is output along the platen.
16	Power switch	Turns on/off the power to the device

1-5-2. Rear view
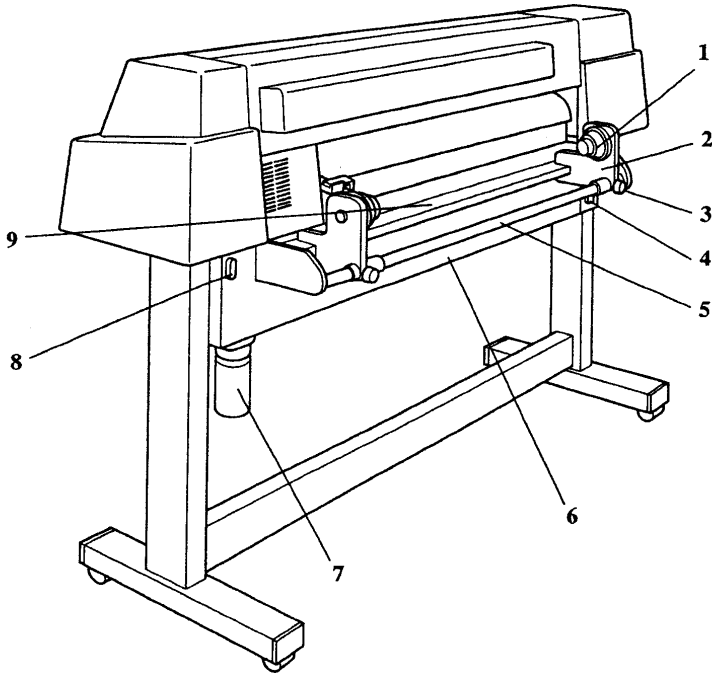
No.	Name	Function
1	Roll holder	Roll holders are put in the right and left ends of the cardboard core to hold the roll paper. They are adaptable to 2-inch and 3-inch cardboard cores.
2	Roll holder base	Boards to be used to shift the roll holders.
3	Holder base screw	Used to secure the roll holder base.
4	AC inlet	The power cable is connected to the AC inlet.
5	Shaft	The shaft is used as a guide along which the roll holders are shifted. Also, when the roll paper is inserted, it can be placed on the shaft.
6	Electrical box	Circuit boards are placed in the box. Since the electrical box can be dangerous, customers are not allowed to open/close it.
7	Waste ink tank	Waste ink accumulates in this tank.
8	Parallel connector	This is the bi-directional parallel interface connector. (Conforms to IEEE1284)
9	Guide rail	This rail is a guide to shift the roll holder.

CHAPTER 2

EXPLANATION OF OPERATION

2-1. Explanation of electrical components

2-1-1. Electrical component block diagram
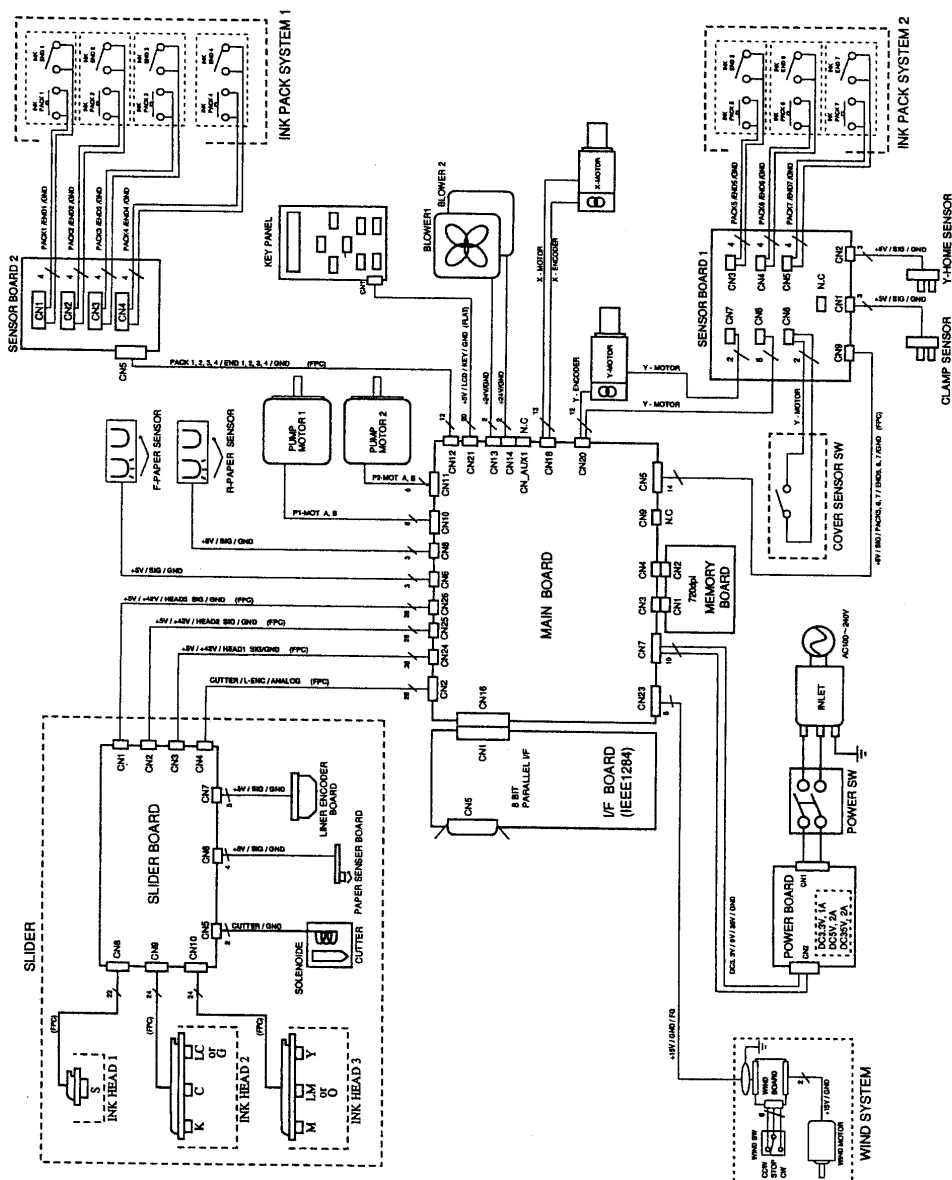
2-1-2. Power supply

Input/output of the power supply are as follows:

Input: 100 VAC to 240 VAC, 50/60 Hz

Output: +3.3 V, 1 A

+5 V, 2 A

+35 V, 2 A

Connector pins layout table and variable resistor numbers

Connector	Pin No.	Name of signal	Variable resistor
CN1	1	NC	
	2	NC	
	3	AC IN (L)	
	4	NC	
	5	AC IN (N)	
CN2	1	+35V	RV1 (CN2 proximity)
	2	+35V	
	3	0V	
	4	0V	
	5	+5V	RV2 (CN2 proximity)
	6	+5V	
	7	0V	
	8	0V	
	9	+3.3V	RV3 (CN2 proximity)
	10	+3.3V	

2-1-3. Main PCB

SH-3 (RISC, 60 MHz) (Hitachi) is used respectively for the main CPU and the head control CPU.

Main CPU and head CPU programs are written in the flash memory. These programs can easily be updated through Centronics interface in the field.

The head CPU program is downloaded to SRAM using the main CPU for execution.

When received data is written in FIFO memory from the Centronics interface PCB, the main CPU processes the data and writes it in the picture memory. The image memory consists of two blocks of 20 MB and shared between the main CPU and the head CPU.

The head CPU reads the received image memory to drive the heads.

Main PCB block diagram
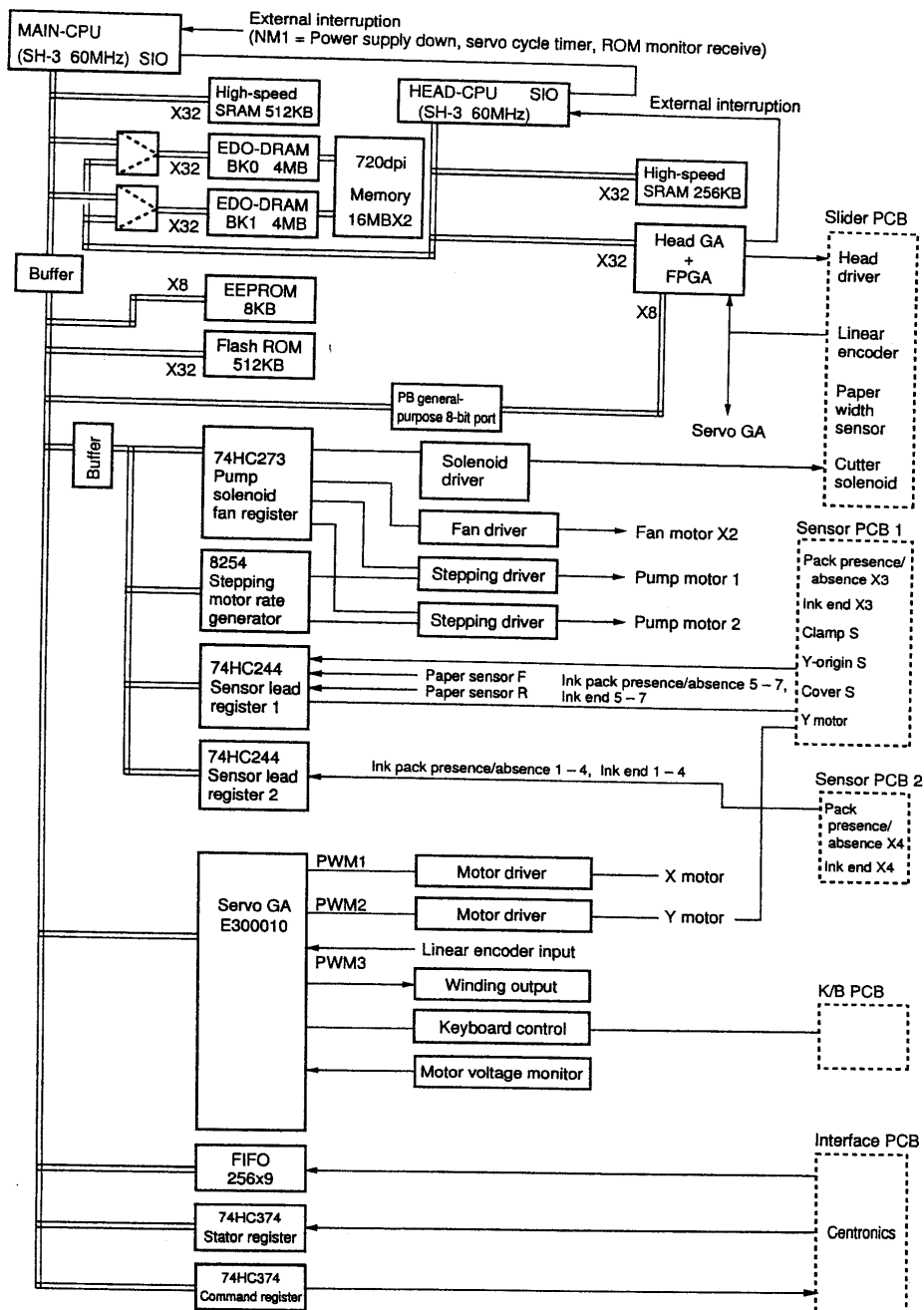
2-1-4. High speed I/F (IEEE 1284) PCB

SH2 (RISC 28MHz) (Hitachi) is used as the CPU for the high speed I/F (IEEE 1284) PCB. The program is written in the flash memory in the CPU. This means that the interface CPU is updated by downloading from the host computer. This PCB supports the bi-directional communication under the IEEE1284 nibble mode, byte mode and ECP mode. Furthermore, maximum of 128MB (when 64MB x 2 are used) can be expanded as a receiving buffer.

2-1-5. Slider PCB

• In the JV2/PV series, there are no adjustments required.

The slider PCB is on the inside of the head cover. Consists of 3 head drivers that create square waves that drive the piezo heads from the head control signal received from the main PCB; and a sensor circuit that switches between and detects the signals from the thermistor mounted on head 2 and the paper width sensor that detects the paper width.
The slider PCB is connected to the main PCB with four main FPC cables and connected to the heads with three head FPC cables. In addition, the slider PCB is connected respectively to the linear encoder that detects the ink discharging position with the linear scale, to the paper width sensor PCB and to the cutter solenoid.
The +42V current produced inside the main PCB is supplied only to the slider PCB for the purpose of driving the heads. In addition, there are 3 circuit protection fuses in the +42V line, in front of the respective head drivers.

2-1-6. Paper width sensor PCB

With a reflector type photoelectric sensor mounted on the underside of the cutter unit, the paper width sensor PCB detects reflected light of the platen groove and the sheet of paper at a cut line.

2-1-7. The K/B PCB

A 16 character x 1 line LCD, an LED that indicates +5V supply and 8 tact switches are mounted on the K/B PCB. It is connected to the main PCB via the K/B cable.

2-1-8. Sensor PCB 1

The sensor PCB 1 is mounted on the rear side of the station inside the right-hand side cover. It passes on signals among the clamp lever sensor (transmission type photoelectric sensor), Y-origin sensor (transmission type photoelectric sensor), ink cartridge presence/absence sensors for 3 color ink cartridges, ink end sensor and main PCB.
As for the cover sensor, the opening/closing of the covers is not monitored by the firmware but the Y-motor is stopped by hardware.

2-1-9. Sensor PCB 2

Sensor PCB 2 is on the side of the left side electrical equipment box reinforcing plate inside the electrical equipment box; it relays signals among the ink cartridge presence/absence sensors for 4 color ink cartridges, the ink end sensors and the main PCB.

2-1-10. Wind-up motor PCB

This is inside the wind-up unit. Power received from the main PCB is switched with a switch to drive the wind-up motor in either forward or reverse.

2-2. Ink system

2-2-1. Definitions

For the purpose of the maintenance manual, the following definitions apply:

Ink system

Ink system is the general term of a mechanism specific to ink-jet printing system for protecting a nozzle against troubles such as clogging and recovering it if it should be in trouble.

Clogged nozzle

In such an event that a specific nozzle fails to discharge any ink because the ink in the head has thickened or the nozzle itself has dried up, the nozzle called the "clogged nozzle."

Head capping

Head capping is a mechanism for automatically capping the nozzle so as to prevent it from drying. As long as the head is on the station in the right-hand side cover, it is capped.

Deflection

A finished state of a drawing on which lines are not plotted straight since a specific nozzle has failed to discharge ink straight on the paper because of the dust-accumulated or damaged nozzle surface.

Satellite

Satellite generally means a artificial body revolving round earth or other planet. For this maintenance manual, it means a state where ink is placed out of position on the paper since a drop of ink is separated into two or more drops of ink of different in size.

2-2-2. Brief explanation of the ink system

The ink system control mainly contains the following functions.
- Processing when turning the power on
- Processing when starting plotting
- Refreshing operation
- Standby operation
- Ink end monitoring
- Head cleaning operation
- Replacement of ink cartridge

Brief flow chart of the ink system control processing

| Power to the device is turned on | ..... Processing when turning the power on |

| The device waits for plotting data | ..... In capping |

| Press on the relevant key | ..... Cleaning operation |
| At predetermined intervals | ..... Ink end monitoring |

| Start plotting | ..... Processing when starting plotting |

| During plotting |

| At predetermined intervals | ..... Refreshing operation |
| At predetermined intervals | ..... Ink end monitoring |

| After a lapse of 3 seconds after the completion of scanning | ..... Standby operation |

| Power to the device is turned off | ..... Parameters are saved on EEPROM |

Processing when power is turned ON

If it is anticipated that the ink will have thickened while the power was OFF, and if there is expected to be danger that the uncapped nozzle will be dry when the power is turned ON, then cleaning action is executed to restore the ink ejection condition to what it was originally.

While the power is OFF, the timer incorporated into the CPU is backed up by a battery through a 2-layer electrical capacitor. After about 1.5 days this battery discharges to a voltage at which the timer can no longer operate. Accordingly, the maximum measurable time during which the power is OFF is 1.5 days.

Processing when plotting starts

Even if the nozzle has been capped, since the ink gradually thickens it is necessary to measure the time during which the unit is on standby with the nozzle capped. When plotting starts, either ink is ejected from all nozzles or all of the nozzles are cleaned, by an amount corresponding to the measured standby time, to avoid defective ink ejection on account of increased ink viscosity.

Refreshing operation

During plotting, only some of the nozzles discharge ink. To prevent nozzles that are at rest from drying and ink from thickening, the head is moved onto the cap inside of the station, at fixed intervals, and ink is ejected from all nozzles to maintain stable ink ejection. The "refresh interval" and the number of times that ink is ejected can be varied by varying the "refresh level" on a menu that is open to the user.

Standby state

To prevent the nozzle from drying, the head is automatically carried back to the station unless the next scanning starts after three seconds have passed after the completion of the last scanning.

Ink end monitoring

At fixed intervals a sensor monitors the ink level, and detects the following.
- Ink remains: Plotting is possible.
- Ink near end: Plotting is possible (ink cartridge replacement is recommended).
- Ink end: Plotting is not possible (plotting is suspended, and the system waits for ink cartridge replacement).
- No ink cartridge: Plotting is not possible.

Head cleaning operation

A function that works to remove thickened ink or dust accumulated on the nozzle faces to recover normal ink-discharge.

There are the following 3 methods.

Cleaning method	Cleaning time	Ink consumption	Cleaning effect	Remarks
Soft	Short	Small	Small	Can deal with minor problems such as failure of ink jet.
Normal	Normal	Normal	Normal	Action is taken to clear a clogged nozzle.
Strong	Long	Large	Large	Action is taken to deal with major trouble that cannot be taken care of by normal cleaning.

The menu that is open to the user only offers 2 options, soft and normal, but when normal is selected strong cleaning is automatically executed as required by conditions.

- When soft is selected .... Only soft cleaning is executed.
- When normal is selected .... Normal or strong cleaning is automatically selected and executed depending on the scan length after cleaning is executed and the number of times that cleaning has been done consecutively.

Ink cartridge replacement

When an error occurs because ink has run out or an ink cartridge has not been installed, the user should replace the ink cartridge, or if there is none, install one. In particular, when ink has not yet passed through the head at all (when the plotter is shipped from the factory), initial filling of ink is carried out so that ink will pass from the ink cartridge through the tube to the head.

Miscellaneous

a) The cap inside the station must be kept at the proper humidity to prevent the nozzle from drying out. For this reason, whenever the head is put into or taken out of the station, ink is ejected to keep the nozzle moist. Conversely, if so much ink has been ejected that the nozzle is too moist, ink is ejected from inside the cap to the waste ink tank with the pump mechanism to keep the humidity at its optimum level.

b) This unit has a paper width sensor mechanism and a cutter mechanism in the head; the paper width detection action and the paper cutting action make it necessary for the head to move in and out of the station. The actions described in a) are necessary in this case also.

2-2-3. Parameters related to the ink system

To control the ink system, the following two items of parameter groups are stored on the EEPROM.
- Ink parameters 1 → Any change of ink parameters 1 is prohibited since they are used to control the ink system.
- Ink parameters 2 → Any change of ink parameters 2 is prohibited since they are used for experiments and evaluations in MIMAKI Development Division.

Ink parameters 1

Parameters to be used to control the ink system such as the parameters for the humidity control inside the cap, etc. are saved on the EEPROM. Parameter values are updated and managed by the firmware. Some of them are saved when turning the power off.
If any of these parameter values should be changed, the ink system would be out of control. They must not be changed from the factory-designated initial settings.

Ink parameters 2

Control constants used for the ink system processing are saved on the EEPROM. They must not be changed since they are used by MIMAKI Development Division for experiments and evaluations.

⚠ CAUTION When the main PCB has been replaced (meaning that the EEPROM has been initialized), the following procedure must be followed to match ink parameters 1, which control the ink system, to the actual situation.

1) All heads are cleaned once (soft cleaning is sufficient) → the indication of ink amount inside the cap must be matched to the actual situation.
2) The number of times that wiping has taken place is set to the value before the replacement. → ink parameters 1 Nos. 13, 14
3) The running meter parameter is set to its value before the replacement. → ink parameters 1 Nos. 11, 12, 16 to 22

4-3-2. $HEAD WASH

[Function]

The ink that has been filled is ejected, and the tube, damper and head are cleaned with a washing fluid. This process is normally carried out prior to shipment from the factory or at the time of ink replacement. If ink must be ejected, for example in order to transport the plotter, then use the "DISCHARGING INK" item in the user menu. Also "DISCHARGING INK" must be carried out twice at the time of a installation.

At the time of ink replacement, "Head Cleaning Kit SPA-0188" to be separately prepared will be required.

[Operation]

1) ┌─────────────────────────┐
   │ # ADJUST   < ENT > │
   └─────────────────────────┘

   Select the **ADJUSTMENT.**
   Press the (ENTER) key.

2) ┌─────────────────────────┐
   │ $ HEAD WASH   │
   └─────────────────────────┘

   Press the (FUNCTION) key to select the "**$HEAD WASH.**"

3) ┌─────────────────────────┐
   │ WASH   : All   │
   └─────────────────────────┘

   Press the (ENTER) key.

4) ┌─────────────────────────┐
   │ WASH   : All   │
   └─────────────────────────┘

   ┌─────────────────────────┐
   │ WASH   : Color 1   │
   └─────────────────────────┘

   ┌─────────────────────────┐
   │ WASH   : Color 234   │
   └─────────────────────────┘

   ┌─────────────────────────┐
   │ WASH   : Color 567   │
   └─────────────────────────┘

   Select the target head using the [∧] or [∨] key.

5) ┌─────────────────────────┐
   │ WASH   : Color 567   │
   └─────────────────────────┘

   Specify the target head using the (ENTER) key.

6) ┌─────────────────────────┐
   │ REMOVE CARTRIDGE   │
   └─────────────────────────┘

   Detach the ink cartridge from the head selected.

7) ┌─────────────────────────┐
   │ DISCHARGING INK   │
   └─────────────────────────┘

   Press the (ENTER) key.
   The ink that has been filled is ejected to the waste ink tank.

8) ┌─────────────────────────┐
   │ SET CLEAN TOOL   │
   └─────────────────────────┘

   Set a washing cartridge in place.

4-4-5. &X SERVO

[Function]

Continuous outward/inward travel is executed in terms of the X-direction for the purpose of durability test.

This test can be executed without placing a media on the plotter.

⚠ CAUTION
- Execute the test with speed, acceleration and traveling amount set to the initial values. If they are excessively increased, the plotter can break.

[Operation]

1)
```
# TEST          < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& X SERVO
```
Select the "&X SERVO" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)
```
X :  S = 00▓  A = 0.10
```
Press the (ENTER) key twice without changing the set value.
Now, the screen changes over to permit the setting of a traveling amount in the X-direction.

4)
```
▓ = 140
```
Press the (ENTER) key without changing the set value.
The aging in the X-direction starts.

5)
```
& X SERVO
```
Press the (END) key to interrupt the operation.

No.	Indication	Description	Set value	Remarks
57	PAGE	Page length clip (in units of mm)	0~35	Indicates the action when the plot length exceeds the page length. 0: The page length command is activated, and clipping is done on the page. n: The page length command is inactivated, the plot is plotted and a margin is added at the rear end.
58	X SIZE	Initial value for X medium size (Unit: cm)	100~5000 ~ 10000	Maximum plot limit when roll paper is set
59	MECA	Mechanical size	0~1~3	0, 3: Reserved 1: 36 inch model 2: 52 inch model
60	RESERVE	Unused		
61	HASH	Hash check pass	0~1	1: forced startup
62	SUPPORT	Adjusting function extention	0~3	0, 1: Maintenance mode is closed. 2: Released 3: Released + English
63	INITIAL	Parameter initialization	0~1	1: All parameters are initialized.

CHAPTER 6

ADJUSTMENT

2-3. Brief explanation of media size detection control

Detection of the front and rear ends of a media → Detection by front/rear paper sensor
Detection of the right- and left-side edges of a media → Detection by paper width sensor

Brief flow chart of the media width detection processing

Edges of the media are detected through the use of the difference in lightness between the media and the platen (cutter slit), based on which the paper width is calculated.

```
        ( Start the detection. )
                  │
   ┌──────────────────────────────┐
   │ Turn on the paper width sensor. │
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ The sensor moves onto the media to │ ........ The sensor moves to the Y coordinate of the front/
   │ permit the reading of the sensor   │          rear paper sensor to ensure that the sensor reaches a
   │ value. → S on                      │          position on which the media is placed.
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ The sensor moves out of the media to │ ........ The sensor moves to the Y coordinate at the
   │ permit the reading of the sensor     │          rightmost end of the platen to ensure that the sensor
   │ value. → S off                       │          reaches a position on which the media is not placed.
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ Calculation of the edge detection │ ........ Calculation is made from "S on" and "S off."
   │ value                             │          (Standard value: 50%)
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ The rightmost edge of the media is │
   │ detected from the rightmost edge of │
   │ the device. → R edg                 │
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ The leftmost edge of the media is  │
   │ detected from the leftmost edge of the │
   │ media. → L edg                     │
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ Calculation of the paper width │ ........ Calculation is made from "R edg" and "L edg."
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ Turn off the paper width sensor. │
   └──────────────────────────────┘
                  │
   ┌──────────────────────────────┐
   │ The sensor travels to the Y coordinate │ ........ After the sensor travels to the Y coordinate, the
   │ of the origin for plotting.            │          device notifies the HEAD-CPU that the current
   └──────────────────────────────┘          position is the origin for plotting.
                  │
   ┌──────────────────────────────┐
   │        Head capping            │
   └──────────────────────────────┘
                  │
        ( Detection completes. )
```
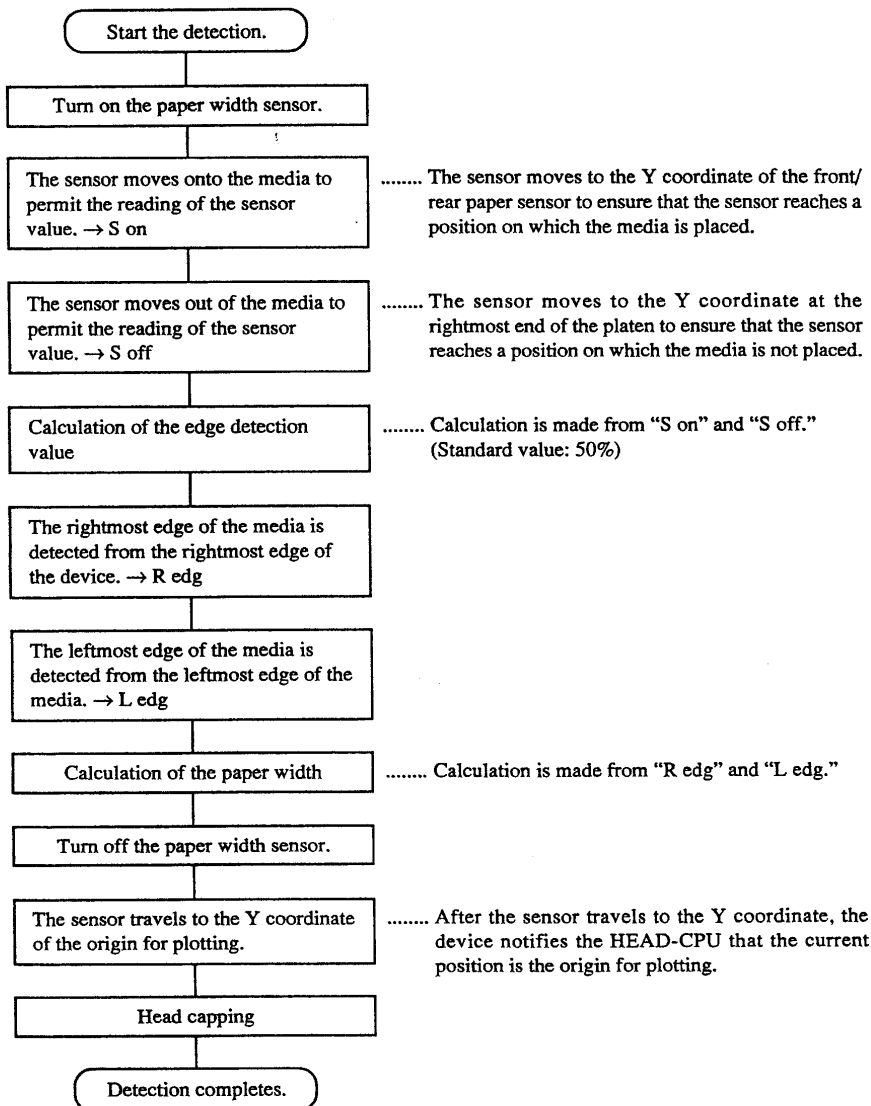
CHAPTER 3

RECOVERY PROCEDURES
FROM TROUBLES

It is necessary to isolate, to some extent, the function that is in trouble in prior to trouble-shooting.
Troubles can be roughly classified into the following two groups.

1) Troubles only relating to the device
   • The function in trouble can be determined through various tests.
2) Trouble relating to the connection with the host computer
   • Disconnection of failed contact of the cables in terms of hardware
   • In terms of software, the case where the user has changed computer parameters or has sent wrong data by mistake.

Recovering procedures for troubles in general that are likely to arise independently on the device will appear from the next page.

3-1. Troubles for which error messages are given on the LCD

General recovering procedures for troubles for which error messages are given on LCD are as follows:

1) **Segregation of causes of errors**

   Causes of errors are roughly classified into the following groups.
   1) Handling errors on the system side
   2) Defective conditions on the system side
   3) Defective conditions on the interface cable
   4) Plotter handling errors
   5) Mechanical malfunctions in the plotter
   6) Malfunctions in hardware of the plotter
   7) Malfunctions in firmware of the plotter

2) **Initial remedies**

   Track down the cause of a trouble to the system side or the plotter side referring to the error message shown on the LCD.
   1) Check whether you have changed connection conditions (plotter model settings, command, communication conditions, etc.).
   2) Check whether or not the trouble arises under specific circumstances.
   3) Check whether or not the trouble is reproducible.

3) **Failures on the plotter side**

   Take the following recovering procedure.
   1) Replace the faulty component (sensor, etc.) with a new one or properly adjust it.
   2) Update the firmware.
   3) Replace the main circuit board with a new one.

4) **If the error recurs even after correcting it in accordance with the specified recovering procedures, return the device to the factory for repairs.**

3-2. Error messages and corrective measures

3-2-1. Error messages for troubles for which error numbers are given on the LCD

Message	Description	Corrective measures and recovering procedures
ERR03 HEAD RAM	• The control RAM is in abnormal conditions.	1) Replace the main PCB with a new one.
ERR04 EEPROM	• EEPROM is in abnormal conditions.	
ERR05 CPUsci * * * *	• Communication between Main.CPU and Head.CPU inside the main PCCB has not been successfully carried out.	
ERR06 EDO–DRAM. M	• The standard EDO-DRAM is in abnormal conditions.	
ERR07 EDO–DRAM. S	• An error has occurred in the expansion EDO-DRAM. Run the system with only the standard EDO-DRAM.	1) Replace the EDO-DRAM PCB with a new one.
ERR08 POWER	• The supply voltage of the motor is in abnormal conditions.	1) Replace the main PCB with a new one.
ERR10 COMMAND	• Command code other than MRL-1 has been received.	1) Check the data received through HEX dump.
ERR11 PARAMETER	• Parameter that has not defined in MRL-1 has been received.	1) Check the data received through HEX dump.
ERR20 I / F BOARD	• The I/F board is in abnormal conditions.	1) Replace the I/F PCB with a new one. 2) Replace the main PCB with a new one.
ERR21 I / F NONE	• The I/F PCB has not been loaded on the machine.	1) Install the I/F PCB. 2) Replace the I/F PCB with a new one.
ERR22 SIMM SLs r	• A SIMM on the interface board could not be recognized or initialized. s = slot number (0 or 1) r = 4 (recognition impossible) r = 5 (initialization impossible): The system runs on only the SIMMs that have been recognized.	1) Check whether a SIMM outside of the specifications is being used. 2) Remove or replace the SIMM that was not recognized.

Message	Description	Corrective measures and recovering procedures
ERR23 HOST I / F	• A time limit exceeded error occurred in communication between the host computer and the interface board.	1) Is the cable loose? 2) Has an error occurred on the host computer? 3) Is the application being used running normally?
ERR30 OPERATION		1) Indicate the improper operation. 2) Replace a key board. 3) Replace a main PCB.
ERR31 NO DATA	• Copy function is activated even though the data is not received.	1) Copy function can be activated only when the data is stored in receiving buffer.
ERR32 DATA too BIG	• Copy function cannot be used because the received data size is larger than the receiving buffer size.	1) Exceeded size of data than existing memory size can not be copied.
ERR34 DATA active	• Operating condition is tried to be changed when data that has not yet been plotted remains.	1) This tells that any of the operating conditions cannot be changed if data that have not been plotted remains.
ERR40 MOTOR X	• The X-axis motor has been overloaded.	1) Replace X axis motor. 2) Replace a main PCB.
ERR41 MOTOR Y	• The Y-axis motor has been overloaded.	1) Clean the main guide axis. 2) Replace Y axis motor. 3) Replace a main PCB.
	• Front cover opens.	1) Close covers and press the ⬚ENTER⬚ key.
ERR42 X CURRENT	• Overcurrent error has arisen on the X-axis motor	1) Replace X axis motor. 2) Replace a main PCB.
ERR43 Y CURRENT	• Overcurrent error has arisen on the Y-axis motor	1) Replace Y axis motor. 2) Replace a main PCB.
	• Front cover opens.	1) Close covers and press the ⬚ENTER⬚ key.
ERR50 SUBSTRAT	• Media detection has not been successfully carried out.	1) Check if the media right edge is set at a position 15mm or more from the feed roller:R1 toward the station side or not. 2) Replace a paper width sensor. 3) Replace a slider PCB. 4) Replace a main PCB. 5) Replace a main FPC cable.
ERR51 Y ORIGIN	• Y-axis origin detection has not been successfully carried out.	1) Replace a Y axis motor. 2) Replace a Y origin sensor. 3) Replace a main PCB.

3-2-2. Ink-related components and other components

Message	Description	Corrective measures and recovering procedures
! CARTRIDGE ↕ (Appears alternately) [1 2 3 4 5 6 7]	• The number of absent ink cartridge is shown.	1) Install the ink cartridge. 2) If the error recurs after the ink cartridge has been installed. Conduct sensor tests to find out the cause of trouble. Possible causes of the troubles are as follows. a) The cartridge presence/absence sensor has failed. b) Defective contact or disconnection of relay cables. c) Main PCB has failed.
! INK near END ↕ (Appears alternately) [1 2 3 4 5 6 7]	• The number of the ink cartridge in which the ink has run short.	1) Replace the ink cartridge with a new one. 2) If the error recurs after the ink cartridge has been replaced, conduct sensor tests to find out a possible cause of the trouble. Possible causes of the troubles are as follows: a) The ink end sensor has failed. b) Defective contact or disconnection of relay cables. c) The main PCB has failed.
! INK END ↕ (Appears alternately) [1 2 3 4 5 6 7]	• Ink has run out	1) Replace the ink cartridge with a new one.
! FILLING UP ↕ (Appears alternately) [1 2 3 4 5 6 7]	• The number of head that has not been filled with ink.	1) Install the ink cartridge. The ink cartridge will be automatically filled with ink. 2) Normally, this message is given when the power to machine is turned on for the first time after the delivery from the factory. If this message appears at other instances, it may be the main PCB error or the user may have activated "Discharge ink" erroneously.

Message	Description	Corrective measures and recovering procedures
! REPLACE WIPER	• The number of times of use of the wiper has been exceeded.	1) Replace the wiper.
NO MEDIA	• The clamp lever has been lowered without media placed. • If roll paper is being used, it indicates that the media has run out.	1) Place media first, then lower the clamp lever. 2) If the error occurs with media loaded on the machine, conduct sensor tests to find out a possible cause of the trouble. Possible causes of the trouble are as follows: a) The front sheet sensor has failed. b) The rear sheet sensor has failed. c) The main PCB has failed.
∗ ∗ REMOTE ∗ ∗ (flashing display)	• If the entire LCD display flashes in REMOTE mode, it indicates that data have not been received for 30 seconds or more.	1) Confirm that the computer is sending data. 2) Replace the centronics I/F cable with a new one. 3) Replace the centronics I/F PCB with a new one. 4) Replace the main PCB with a new one.

3-3. Troubles for which error messages are not given on the LCD

3-3-1. The device will not be energized.

Problems	The POWER indicator lamp on the operation panel will not light up even if turning the power switch on.
Causes	1) The power cord has come off the receptacle. 2) The power unit has broken. 3) The main PCB has short-circuited to GND in +35V or +5V. 4) The slider PCB has short-circuited to GND in +35V or +5V. 5) The key panel has broken, or the K/B cable has disconnected. 6) An outlet is not available for the power supply.
Checking procedure	1) Check the voltage at the receptacle using a tester. 2) Remove the DC cable and check the output voltage of the power supply using a tester. 3) Check a resistance at +35V and +5V on the main PCB using a tester. 4) Remove the main FPC cable and turn the power on. 5) Check whether or not the LED on the main PCB is in the ON state.
Remedies	1) Securely insert the power cord into the receptacle. 2) Replace the power unit with a new one. 3) Replace the main PCB with a new one. 4) Replace the slider PCB with a new one. 5) Replace the key panel or the K/B cable with a new one.

3-3-2. The device fails to perform plotting

Problems	The head operates, but the device fails to perform printing.
Causes	1) Nozzles on the head are clogged. 2) The main FPC cable is in poor contact or has disconnected. 3) The head FPC cable is in poor contact or has disconnected. 4) The slider PCB has broken, or the head ID has not been properly specified. 5) The main PCB has broken. 6) The pump assembly has broken. 7) The linear encoder sensor has broken. 8) The head has broken.
Checking procedure	1) Conduct cleaning to check whether or not ink is fed from the vinyl tube. 2) Check the connector or replace the cable with a new one. 3) Check the connector. 4) Replace the slider PCB with a new one. 5) Replace the main PCB with a new one. 6) Check the pump assembly. 7) Replace the linear encoder sensor with a new one. 8) If the phenomenon recurs even after taking procedures (1) through (7), replace the head with a new one.
Remedies	1) Conduct cleaning of the head, and fill up the ink. 2) If the main FPC cable has disconnected, replace it with a new one. 3) If the head FPC cable is in poor contact, securely insert the cable into the connector. 4) Replace the slider PCB with a new one. Or properly specify the head ID. 5) Replace the main PCB with a new one. 6) Replace the pump assembly with a new one. 7) Replace the linear encoder sensor with a new one. 8) Replace the head with a new one.

9) ┌─────────────────────┐
　　　　│ ＊＊ WASHING ＊＊ │
　　　　└─────────────────────┘

Press the ⌈ ENTER ⌉ key.
Cleaning fluid is suctioned up.

10) ┌─────────────────────┐
　　　　│ REMOVE TOOL │
　　　　└─────────────────────┘

Remove the washing cartridge.

11) ┌─────────────────────┐
　　　　│ ＊＊ WASHING ＊＊ │
　　　　└─────────────────────┘

Press the ⌈ ENTER ⌉ key.
The washing fluid that has been suctioned up is
ejected to the waste ink tank.

12) ┌─────────────────────┐
　　　　│ $ HEAD WASH │
　　　　└─────────────────────┘

**When all steps have been completed, the
display shown at left returns.**

4-3-3. $SELECT CLEANING

[Function]
Specified cleaning is performed.

[Operation]

1)
```
# ADJUST          < ENT >
```
Select the ADJUSTMENT.
Press the (ENTER) key.

2)
```
$ SELECT  CLEANING
```
Press the (FUNCTION) key to select the
"$SELECT CLEANING."

3)
```
CLEANING  : All
```
Press the (ENTER) key.

4)
```
CLEANING  : All
```
Select the target head using the △ or ▽
key.
```
CLEANING  : Head 1
```
```
WASH     : Color234
```
```
WASH     : Color 567
```

5)
```
CLEANING : Standar
```
Specify the target head using (ENTER) key.

6)
```
CLEANING : Standar
```
Select the type of cleaning using the △ or
▽ key.
```
CLEANING : Soft
```
```
CLEANING : Strong
```

7)
```
** CLEANING **
```
Press the (ENTER) key.
Now, start the cleaning.

8)
```
$ SELECT  CLEANING
```
Upon completion of the cleaning, the indication
given in step of procedure 2) will be restored
on

4-3-4. $REPLACE COUNTER

[Function]

Number of ink cartridge replacements, number of scanning and number of sci retries are confirmed.

The number of times the ink cartridge has been replaced is incremented whenever the ink cartridge is removed and reinstalled when "INK END" or

[Operation]

1)
```
# ADJUST        < ENT >
```
Select the ADJUSTMENT.
Press the (ENTER) key.

2)
```
$ REPLACE  COUNTER
```
Select the "$REPLACE COUNTER" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)
```
color 1  : 6
```
```
color 2  : 5
```
```
            •
            •
```
```
color 7  : 10
```
```
SCAN    : 999
```
When the (ENTER) key is pressed, number of ink cartridge replacements, number of scanning and number of sci retries and displayed for each head.

Color 1: Special color
Color 2: Black
Color 3: Cyan
Color 4: Light cyan or green
Color 5: Magenta
Color 6: Light magenta or orange
Color 7: Yellow
Scan: Number of scans (in units of 10,000 times)

```
sci 0001  : 0
```
```
            •
            •
```
```
sci 0100  : 0
```
Number of retries made after error 05 CPU sci has taken place.
sci 0001:
sci 0002:
sci 0080:
sci 0100:

4)
Press the (END) key to exit from the function.

– 4.13 –

4-3-5. $DEFAULT SET

[Function]

Parameter settings are reset to initial values.

When the "Set parameter" is under execution, the following situation takes place.
- Setting of "DISPLAY" among the set items is not changed.
  The setting of the other items (the drawing method, the number of ink layers etc.) are reset to the initial values.
- "PRINTadjust" that is released to the users is reset to the initial value.
- System parameter No.62 Adjusting function extension =0 (Adjusting function: CLOSE)

[Operation]

1)
```
# ADJUST        < ENT >
```
Select the ADJUSTMENT.
Press the [ENTER] key.

2)
```
$ DEFAULT  SET
```
Select the "$DEFAULT SET" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)
```
SET : SETUP  PRM
```
```
SET : INK  PRM. 1
```
```
SET : INK  PRM. 2
```
```
SET : MENT  PRM.
```
```
SET : SERVO  PRM.
```
Select the parameter using the [∧] or [∨] key.

4)
Press the [ENTER] key, and the parameter settings are reset to the initial values.

4-3-6. $CAPPING

[Function]

Capping position is adjusted.

The adjustment value is stored under the system parameter No. 4.

[Operation]

1)
```
# ADJUST          < ENT >
```
Select the ADJUSTMENT.
Press the (ENTER) key.

2)
```
$ CAPPING
```
Select the "$CAPPING" pressing the
(FUNCTION) **key.**
Press the (ENTER) key.

3)
```
CAPPING   = 0.0
```
Move the head with the [<] or [>] key in
increments of 0.1 mm.

4)
```
CAPPING   = 0.2
```
Press the ENTER key, and the select value
will be entered and the capping is carried out.
Press the (END) key to exit from the func-
tion.

Continuous execution of capping. (Intended for durability test conducted in the factory)

1)
```
CAPPING   = 0.0
```
Press the (FUNCTION) **key, and the capping**
will be carried out in repetition.
The number of times of capping is shown on the
LCD.

2)
```
CNT  = 1
```
Press the (END) **key to exit from the**
function.

4-3-7. $WIPING

[Function]

Check the wiping and rubbing positions, then adjust the cap OFF position, which becomes the reference position. The adjusted value is stored under system parameter No. 5.

[Operation]

1)
```
# ADJUST      < ENT >
```
Select the ADJUSTMENT, and then press the ENTER key.

2)
```
$ WIPING
```
Select the "$WIPING" pressing the FUNCTION key, and then press the ENTER key.

3)
```
WIPING  : █.0
```
Move the head 3 to the wiping completed position.
Use the ◁ and ▷ keys to move in 0.1mm steps.
The wiper can be turned ON and OFF with the △ and ▽ keys.

4)
```
WIPING  : █1.0
```
Finalize the position with the ENTER key, then enter the setting under a system parameter.
Press the END key to exit from the function.

Checks during wiping and rubbing action

```
WIPING  : −1.0
```
Press the FUNCTION key to execute all head wiping and rubbing actions with the position being shown as the reference position.

4-3-8. $FLASHING

[Function]

Adjust the flashing position. When flashing is performed outside of the cap, not only will the capped section become soiled, but failure of jet and nozzle clogging can be caused. The adjustment value is stored under system parameter No. 8.

⚠ **CAUTION**
- The flashing position adjustment value that is stored under system parameter No. 8 becomes the value calculated with the following formula; it differs from the value indicated by this function.

Flashing position = capping position + value of system parameter No. 8

[Operation]

1)
```
# ADJUST        < ENT >
```
Select the ADJUSTMENT, and then press the [ENTER] key.

2)
```
$ FLASHING
```
Select the "$FLASHING" pressing the [FUNCTION] key, and then press the [ENTER] key.

3)
```
FLASHING  : 0.0
```
Move to the flashing position.
Use the ◁ and ▷ keys to move in units of 0.1mm.
Use the △ and ▽ keys to move the position to which the head is withdrawn, and the presently indicated position.

4)
```
FLASHING  : 0
```
Finalize the position with the [ENTER] key, then enter the setting under a system parameter.
Press the [END] key to exit from the function.

Check of flashing action in progress

```
* * FLASHING * *
```
Press the [FUNCTION] key to execute flashing at the presently indicated position (the number of times that flashing is done is fixed).

4-3-9. $HEAD ID

[Function]

Enter the ID numbers of heads 1 to 3. The input values are stored under system parameters Nos. 40 to 48.

ID numbers are indicated on each print head using a marker.

[Operation]

1)
```
# ADJUST          < ENT >
```
Select the ADJUSTMENT, and then press the **ENTER** key.

2)
```
$ HEAD  ID
```
Select the "$HEAD ID", and then press the **ENTER** key.

3)
```
▓EAD. 1 : 01101
```

```
HEAD. 1 : ▓1101
```
When the **ENTER** key is pressed, the cursor moves to the 5th digit, and the ID number can be entered.

Use the ◁ and ▷ keys to move left or right.

Use the △ and ▽ keys to enter the number.

Press the **ENTER** key to finalize the number. The cursor will return to "H".

When the **END** key is pressed, the value returns to what it was before the change.

4)
```
▓EAD. 2 : 01101
```
Use the △ or ▽ key to select head 2 or head 3, then enter the ID number by the procedure in step 3).

5)
```
▓EAD. 3 : 15114
```
After the ID numbers of heads 1 to 3 have been entered, press the **END** key.

The values that were input are stored under system parameters, and this operation ends.

⚠ CAUTION
- The input values are stored under the following items of system parameter.
  No.40 "H1.NORM" ← HEAD.1   5th and 4th digit
  No.41 "H1.MICR" ← HEAD.1   2nd and 1st digit
  No.42 "H1.FREQ" ← HEAD.1   3rd digit
  No.43 "H2.NORM" ← HEAD.2   5th and 4th digit
  No.44 "H2.MICR" ← HEAD.2   2nd and 1st digit
  No.45 "H2 FREQ" ← HEAD.2   3rd digit
  No.46 "H3.NORM" ← HEAD.3   5th and 4th digit
  No.47 "H3.MICR" ← HEAD.3   2nd and 1st digit
  No.48 "H3.FREQ" ← HEAD.3   3rd digit

⚠ CAUTION
- If an out-of-range value has been entered in step 3), the display shown at left appears, and the value returns to what it was before the change.
  $1 \leqq$ 5th and 4th digit $\leqq 35$ $1 \leqq$ 3rd digit $\leqq 3$ $1 \leqq$ 2nd and 1st digit $\leqq 35$
  Mark the new values on somewhere easy to see.

4-3-10. $WORM GEAR adjust

[Function]

This function is used to obtain the correction to be applied for worm gear eccentricity. Look for a value such that eccentricity does not have any effect; then high image quality can be maintained by always starting plots from that position. The adjustment value is stored under system parameter

[Operation]

1) `# ADJUST        < ENT >`

Select the ADJUSTMENT, and then press the `ENTER` key.

2) `$ WORM  GEAR adjust`

Select the "$WORM GEAR adjust" using the `FUNCTION` key, and then press the `ENTER` key.

3) `X = 20    Y = 100`

Select the plotting length in the X-direction using the $\wedge$ or $\vee$ key and press the `ENTER` key.
Initial value: 20 mm
Length setting: 10 mm to the sheet length
                       (in increments of 10 mm)

4) `X = 30    Y = 100`

Select the plotting width in the Y-direction using the $\wedge$ or $\vee$ key and press the `ENTER` key.
Initial value: 100 mm
Length setting: 10 mm to the sheet width
                       (in increments of 10 mm)   .

5) `color : K - - - - -`

Select the color used for plotting.
Shift the cursor using the $<$ or $>$ key to select the color to be used.
Press the $\wedge$ or $\vee$ key to allow the initial letter of the color to be used to appear on the display, and the pattern will be drawn using the color.

4-4-6. &Y SERVO

[Function]

    Continuous outward/inward travel is executed in terms of the Y-direction for the purpose of durability test.

    This test can be executed without placing a media on the plotter.

⚠   • Execute the test with speed, acceleration and traveling amount set to the initial values.
CAUTION   If they are excessively increased, the plotter can break.

[Operation]

1)   `# TEST          < ENT >`

Select the TEST.
Press the (ENTER) key.

2)   `& Y  SERVO`

Select the "&Y SERVO" pressing the
(FUNCTION) key.
Press the (ENTER) key.

3)   `X :  S = 15█  A = 1.00`

Press the (ENTER) key twice without changing the set value.
Now, the screen changes over to permit the setting of a traveling amount in the Y-direction.

4)   `█ = 1320`

Press the (ENTER) key without changing the set value.
The aging in the Y-direction starts.

5)   `& Y  SERVO`

Press the (END) key to interrupt the operation.

— 4.35 —

4-4-7. &XY SERVO

[Function]

Continuous outward/inward travel is executed in terms of the X- and Y-direction for the purpose of durability test.

This test can be executed without placing a media on the plotter.

⚠ CAUTION

- Execute the test with speed, acceleration and traveling amount set to the initial values. If they are excessively increased, the plotter can break.
- In this test, X-axis and Y-axis will not operate simultaneously. And, as for the X-axis, movement will be only in the paper feed direction rather than reciprocating.

[Operation]

1) `# TEST          < ENT >`

Select the TEST.
Press the (ENTER) key.

2) `& XY  SERVO`

Select the "&XY SERVO" pressing the (FUNCTION) key.
Press the (ENTER) key.

3) `X :  S = 00█  A = 0.10`

The screen changes over to permit the setting of speed and acceleration in the X-direction.
Press the (ENTER) key twice without changing the set value.

4) `Y :  S = 15█  A = 1.00`

The screen changes over to permit the setting of speed and acceleration in the Y-direction.
Press the (ENTER) key twice without changing the set value.

5) `█ = 140      Y = 1320`

The screen changes over to permit the setting of a traveling amount in the X-direction.
Press the (ENTER) key without changing the set value.

6) `X = 140      █ = 1320`

The screen changes over to permit the setting of a traveling amount in the Y-direction.
Press the (ENTER) key without changing the set value.
The aging in the X- and Y-direction starts.

7) `& XY  SERVO`

Press the (END) key to exit from the function.

4-4-8. &ACTION TEST

[Function]

Performance of the following units is checked.

- Rotation of fan motor (Low/Mid/High/L.L.)
- Up/down operation of Y-cutter
- Turning ON/OFF wiper
- Turning ON/OFF winding motor

When HASH = 1; and when the X and Y motors are OFF, as after a sensor test is started; the wiper

[Operation]

1) [# TEST   < ENT >]

Select the TEST.
Press the (ENTER) key.

2) [& ACTION TEST]

Select the "&ACTION TEST" pressing the
(FUNCTION) **key.**
Press the (ENTER) key.

3) [FAN MOTOR   : LOW]

[Y CUTTER   : UP]

[WIPER   : OFF]

[ROLL MOTOR : OFF]

Select the action item using the (ENTER)
key.

4) **Execute the action using the [∧] or [∨] key.**

5) **Press the (END) key to exit from the**
function.

- 4.37 -

4-4-9. &SENSOR TEST

[Function]

The state of the following sensors are checked.

- Medium setting lever sensor
- Front (F)/rear (R) paper presence/absence sensors
- Y-origin sensor
- Ink cartridge presence/absence sensor
- Ink end sensor

The motor is turned OFF during the tests. Upon completion of the tests, be sure to re-turn on the power to the motor.

[Operation]

1)

```
# TEST          < ENT >
```

Select the TEST.
Press the (ENTER) key.

2)

```
& SENSOR  TEST
```

Select the "&SENSOR TEST" pressing the
(FUNCTION) **key.**
Press the (ENTER) key.

3)

```
SET  LEVER  : DOWN
```

Press the (ENTER) key.
The state of the media setting lever is shown on the LCD.
DOWN: Lever is in its lower position.
UP: Lever is in its upper position.

4)

```
F = OFF      R = ON
```

The state of the front (F)/rear (R) sheet sensor is shown on the LCD.
ON: Medium is present.
OFF: Medium is absent.

5)

```
Y-ORIGIN    : OFF
```

Press the (ENTER) key.
The state of the Y-origin sensor is shown on the LCD.
ON: Origin has been detected.
OFF: Origin has not been detected.

6)

```
INK pack   1 – 4 = – 23 –
```

Press the (ENTER) key.
The present state of the ink cartridge presence/absence sensors 1 to 4 is shown on the LCD.
The numbers of the cartridges that are not set appear.

7)

INK pack　5 – 7 = 5 – –

Press the (ENTER) key.
The present state of the ink cartridge presence/
absence sensors 5 to 7 is shown on the LCD.
The numbers of the cartridges that are not set
appear.

8)

INK end　1 – 4 = – – – 4

Press the (ENTER) key.
Current status of ink end sensor 1 to 4 is displayed.
The numbers of the cartridges that have run out
of ink are appear.

9)

INK end　5 – 7 = – – –

Press the (ENTER) key.
Current status of ink end sensor 5 to 7 is displayed.
The numbers of the cartridges that have run out
of ink are appear.

10)

WORM GEAR　: OFF

Press the (ENTER) key.
The state of the worm gear origin sensor is
indicated as being ON or OFF.
When the origin is detected, the indication
changes from ON to OFF or from OFF to ON.

11)

& SENSOR TEST

**Press the (END) key to exit from the
function.**

4-4-10. &PAPER SENSOR

[Function]

Reading by the paper width sensor is given on the LCD.

This test can be executed without placing a media on the plotter.

[Operation]

1)

| # TEST   < ENT > |

Select the TEST.
Press the (ENTER) key.

2)

| & PAPER SENSOR |

Select the "&PAPER SENSOR" pressing the
(FUNCTION) key.
Press the (ENTER) key.
Reading by the paper sensor is given on the LCD.

3)

| SENSOR   =   316 |

| SENSOR   =   1680 |

Move the head to the position at which the paper is present and the position at which the paper is absent at the time of detecting the paper using the △ **and** ▽ **key.**
The head can be moved to a desired position using the ◁ or ▷ key.

- Regarding the use of the paper width sensor, refer to "2-3. Brief explanation of media size detection control."

4)

Press the (END) key to exit from the function.

4-4-11. &KEYBOARD TEST

[Function]

The key pressed is shown on the LCD.

[Operation]

1)
```
# TEST          < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& KEYBOARD  TEST
```
Select the "&KEYBOARD TEST" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)
```
Key - - >   NONE
```
```
Key - - > [ REMOTE ]
```
```
Key - - > [ FUNCTION ]
```
```
Key - - > [ UP ]
```
```
Key - - > [ LEFT ]
```
```
Key - - > [ RIGHT ]
```
```
Key - - > [ DOWN ]
```
```
Key - - > [ ENTER ]
```
Press the keys on the operation panel to check that the name of the key shown on the LCD matches the name of the key pressed.

4)
```
[ END ] - - > TEST  END
```
Press the (END) key to exit from the function.

4-4-12. &DISPLAY TEST

This is not used in the field.

4-4-13. &LCD TEST

[Function]

Indication shown on the LCD is changed over at predetermined intervals to allow the indications to be checked.

[Operation]

1)
```
# TEST          < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& LCD  TEST
```
Select the "&LCD TEST" pressing the (FUNCTION) **key.**

3)
```
!!!!!!!!!!!!!!!!!!
```
Press the (ENTER) **key.**
This causes the device to start to indicate test patterns on the LCD.

```
" " " " " " " " " " " " " " " "
```

4)
Press the (END) **key to exit from the function.**

4-4-14. &PUMP MOTOR

[Function]

    Performance of the pump motor is checked.

[Operation]

1)
```
# TEST            < ENT >
```
Select the TEST.
Press the (ENTER) .

2)
```
& PUMP  MOTOR
```
Select the "&PUMP MOTOR" pressing the
(FUNCTION) **key.**
Press the (ENTER) .

3)
```
HEAD. ALL  pumping
```
```
HEAD. 1  : pump 1
```
```
HEAD. 2  : pump 1
```
```
HEAD. 3  : pump 2
```
```
RESERVE : pump 2
```
Select the target head using the △ or ▽
key.
Press the (ENTER) key.

4)
```
STEP count : 9000
```
Select the number of drive steps using the △
or ▽ key.
Press the (ENTER) key.

5)
```
STEP. pps  : 350
```
⬇
```
PUMP  MOTOR  RUN !
```
⬇
```
HEAD. ALL  pumping
```
Select the driving speed using the △ or ▽
key.
Press the (ENTER) key.
The pump motor starts running.

After the pump motor performance is checked,
the head selection can be made.
Press the (END) key to exit from the func-
tion.

[Operation]

1)
| # PARAMETER   < ENT > |

Select the **PARAMETER.**
Press the (**ENTER**) key.

2)
| & SYSTEM PRM |

**Select the &SYSTEM PRM" pressing the
(FUNCTION) key.**
Press the (**ENTER**) key.

3)
| 0 = 0   COMP. X |

Select a parameter item using the △ or ▽ key.

| 62 = 0   SUPPORT |

⋮

4)
| 62 = 0   0 |

**Press the (ENTER) key to permit the value
to be changed.**

5)
| 62 = 0   2 |

Change the value using the △ or ▽ key.

6)
| 62 = 2   SUPPORT |

Press the (ENTER) key to store the value.

7)

**Press the (END) key to exit from the
function.**

4-5-2. &INK PARAMETER 1

This is not used in the field.
Never change the value.

4-5-3. &INK PARAMETER 2

This is not used in the field.
Never change the value.

4-5-4. $MENT PARAMETER

This is not used in the field.
Never change the value.

4-5-5. &SERVO PARAMETER

This is not used in the field.
Never change the value.

This device permits updating of the firmware through the parallel interface from the computer. Use a specialized F/W downloader. Also, if there is no utility, use IBM PC-AT compatible computer.

⚠️ **CAUTION**
- If an F/W downloader is used, refer to the F/W downloader operation manual.

4-6-1. The firmware in this unit

This unit consists of the following 2 firmware components; the versions of both can be updated through the parallel interface.

Mechanical side firmware .... This firmware controls the machine main unit. It is downloaded onto the main PCB.

Interface side firmware............ This firmware controls the interface with the host computer. It is downloaded onto the high speed I/F PCB.

4-6-2. Main unit side firmware version updating file

The F/W version updating floppy disc issued by Development Division of MIMAKI contains the following 2 files.

1. JV2.ROM .... This is the F/W version updating file.
2. FILECHK.EXE .... This program checks for copying mistakes when the F/W version updating file is copied to the floppy disc. Be sure to check every time the file is copied.

The F/W version updating file can be downloaded from MIMAKI's Internet home page (http://www.mimaki.co.jp).
The downloaded file (JV2_****.EXE) is a self-uncompressing compressed file. It uncompresses into the following 3 files.

1. JV2.ROM .... This is the F/W version updating file.
2. README.TXT .... The version updating instructions, in English.
3. READMEJ.TXT .... The version updating instructions, in Japanese.

4-6-3. Interface side firmware version updating file

The interface side F/W version updating froppy disc issued by Development Division of MIMAKI contains the following 2 files.

1. HPIF.ROM .... This is the F/W version updating file.
2. FILECHECK.EXE .... This program checks for copying mistakes when the F/W version updating file is copied to the floppy disc. Be sure to check every time the file is copied.

The F/W version upgrade file can be downloaded from our company's Internet home page (http://www.mimaki.co.jp).
The downloaded file (HPIF****.EXE) is a self-uncompressing compressed file. It uncompresses into the following 4 files.

1. HPIF.ROM .... This is the F/W version updating file.
2. README.TXT .... The version upgrading instructions, in English.
3. READMEJ.TXT .... The version upgrading instructions, in Japanese.

4-6-4. Checking the version updating file

Be sure to check the version updating file every time the file is copied.
If an F/W downloader is not used, proceed as described below. The procedure is the same on both the mechanical side and the interface side.

[Operation]

1) Actuate the check program at the MS-DOS prompt.

>A: (Return) .... "A" is the drive in which the floppy disk is loaded.
This differs with the computer.

>FILECHK (Return) .... The check program starts up.
F/W DOWNLOAD FILE CHECK Version 2.10

input file name —>*.ROM (Return) .... Enter the name of the version updating file to be checked.
On the mechanical side this is JV2.ROM; on the interface side it is HPIF.ROM.

*.ROM open as input file.
check start .... Checking is being executed.
(v2.00) .... Version of the updating file
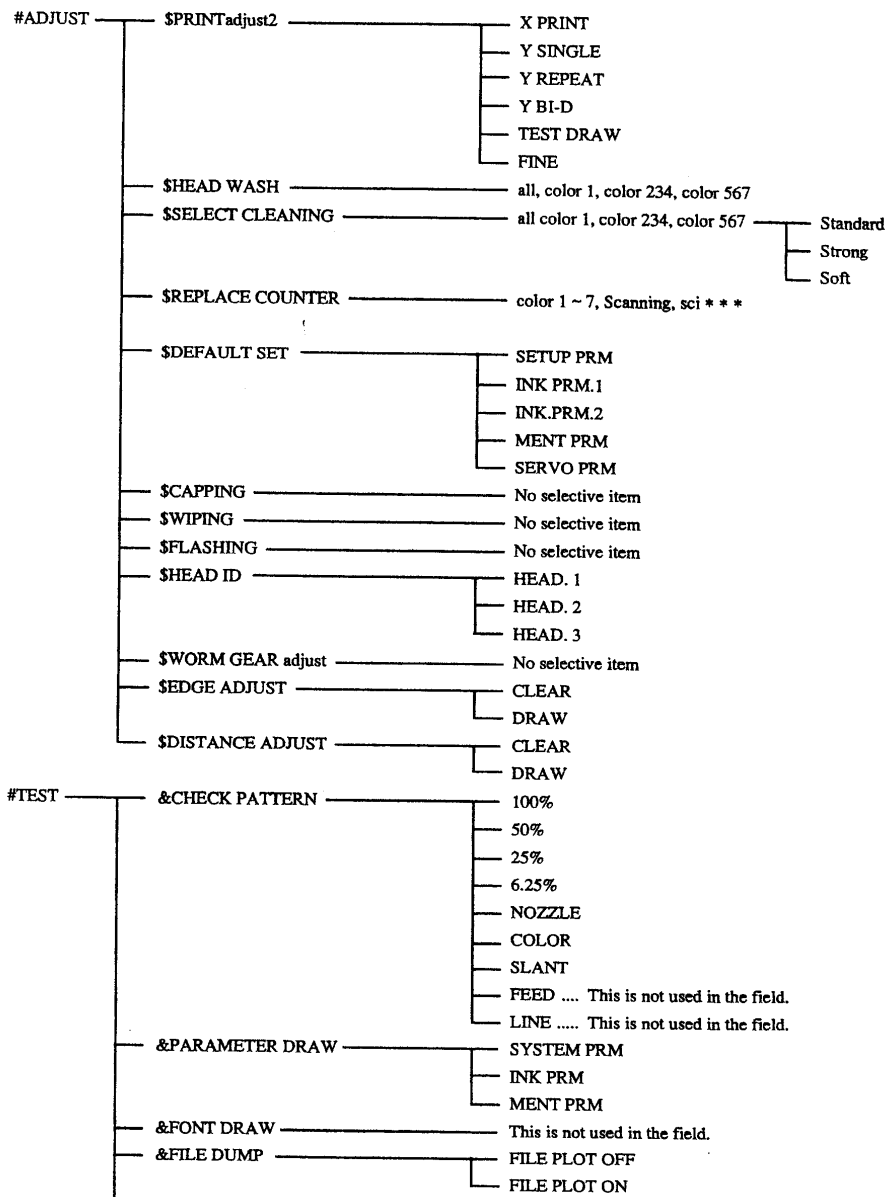check ok .... Checking is normally finished.

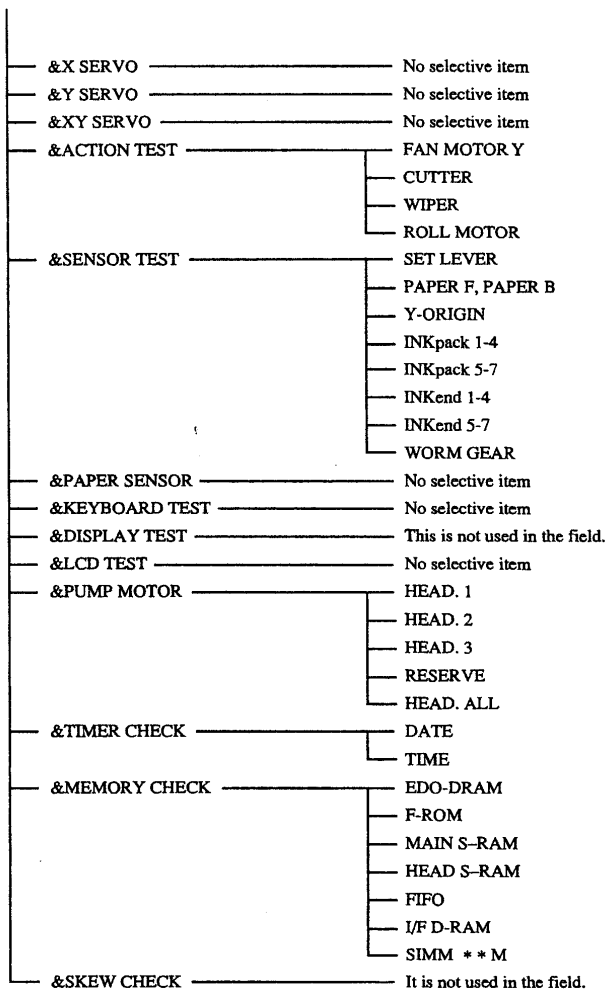If any abnormal conditions of the file are found, the following error message will be shown on the LCD.
In this case, be sure to conduct copying again.
ERROR!! (DATA)
ERROR!! (CHECK SUM)

```
#ADJUST ──┬── $PRINTadjust2 ──────────────────┬── X PRINT
          │                                    ├── Y SINGLE
          │                                    ├── Y REPEAT
          │                                    ├── Y BI-D
          │                                    ├── TEST DRAW
          │                                    └── FINE
          ├── $HEAD WASH ──────────────────── all, color 1, color 234, color 567
          ├── $SELECT CLEANING ────────────── all color 1, color 234, color 567 ──┬── Standard
          │                                                                        ├── Strong
          │                                                                        └── Soft
          ├── $REPLACE COUNTER ────────────── color 1 ~ 7, Scanning, sci * * *
          │
          ├── $DEFAULT SET ──────────────────┬── SETUP PRM
          │                                   ├── INK PRM.1
          │                                   ├── INK.PRM.2
          │                                   ├── MENT PRM
          │                                   └── SERVO PRM
          ├── $CAPPING ─────────────────────── No selective item
          ├── $WIPING ──────────────────────── No selective item
          ├── $FLASHING ────────────────────── No selective item
          ├── $HEAD ID ──────────────────────┬── HEAD. 1
          │                                   ├── HEAD. 2
          │                                   └── HEAD. 3
          ├── $WORM GEAR adjust ───────────── No selective item
          ├── $EDGE ADJUST ──────────────────┬── CLEAR
          │                                   └── DRAW
          └── $DISTANCE ADJUST ──────────────┬── CLEAR
                                              └── DRAW
#TEST ────┬── &CHECK PATTERN ────────────────┬── 100%
          │                                   ├── 50%
          │                                   ├── 25%
          │                                   ├── 6.25%
          │                                   ├── NOZZLE
          │                                   ├── COLOR
          │                                   ├── SLANT
          │                                   ├── FEED .... This is not used in the field.
          │                                   └── LINE ..... This is not used in the field.
          ├── &PARAMETER DRAW ───────────────┬── SYSTEM PRM
          │                                   ├── INK PRM
          │                                   └── MENT PRM
          ├── &FONT DRAW ──────────────────── This is not used in the field.
          └── &FILE DUMP ────────────────────┬── FILE PLOT OFF
                                              └── FILE PLOT ON
```

```
    ┌─ &X SERVO ──────────────────── No selective item
    ├─ &Y SERVO ──────────────────── No selective item
    ├─ &XY SERVO ─────────────────── No selective item
    ├─ &ACTION TEST ─────────────────┬─ FAN MOTOR Y
    │                                ├─ CUTTER
    │                                ├─ WIPER
    │                                └─ ROLL MOTOR
    ├─ &SENSOR TEST ─────────────────┬─ SET LEVER
    │                                ├─ PAPER F, PAPER B
    │                                ├─ Y-ORIGIN
    │                                ├─ INKpack 1-4
    │                                ├─ INKpack 5-7
    │                                ├─ INKend 1-4
    │                                ├─ INKend 5-7
    │                                └─ WORM GEAR
    ├─ &PAPER SENSOR ─────────────── No selective item
    ├─ &KEYBOARD TEST ───────────── No selective item
    ├─ &DISPLAY TEST ────────────── This is not used in the field.
    ├─ &LCD TEST ───────────────── No selective item
    ├─ &PUMP MOTOR ──────────────────┬─ HEAD. 1
    │                                ├─ HEAD. 2
    │                                ├─ HEAD. 3
    │                                ├─ RESERVE
    │                                └─ HEAD. ALL
    ├─ &TIMER CHECK ─────────────────┬─ DATE
    │                                └─ TIME
    ├─ &MEMORY CHECK ────────────────┬─ EDO-DRAM
    │                                ├─ F-ROM
    │                                ├─ MAIN S–RAM
    │                                ├─ HEAD S–RAM
    │                                ├─ FIFO
    │                                ├─ I/F D-RAM
    │                                └─ SIMM * * M
    └─ &SKEW CHECK ─────────────── It is not used in the field.


#PARAMETER ──┬─ &SYSTEM PRM        Total 64 items ............... Refer to "4-5-1. $SYSTEM PRM"
             ├─ &INK PARAMETER1    Total 32 items ............... This is not used in the field.
             ├─ &INK PARAMETER2    Total 100 items .............. This is not used in the field.
             ├─ &MENT PARAMETER    Total 64 items ............... This is not used in the field.
             └─ &SERVO PARAMETER   Total 40 items ............... This is not used in the field.
```

The procedure is the same on both the mechanical side and the interface side.

[Operation]

1)
```
[        v 1.00        ]
```
Turn on the power to the plotter.

2)
```
[ * TRANSMIT START * ]
```
Press the ⟦REMOTE/LOCAL⟧ key while the firmware version is being shown on the LCD.
This device will then be placed in the data waiting state.

3)
Transmit the version updating file from the computer to the plotter.

If an F/W downloader is not used, use an MS-DOS COPY command and output the version updating file from the parallel port.
Type in the following letters at the MS-DOS prompt.

A: (Return) .... "A" is the drive in which the floppy disk is loaded. This differs with the computer.

In case of DOS/V (IBM compatible computer):
copy *. ROM LPT1:   (Return) .... *. ROM is the name of the version updating file.

```
[ *** RECEIVE *** ]
```
The indication given on the left will appear on the LCD when the device received the data.
(In the case of the mechanical side version updating file, the *** at both ends flashes.)

4)
```
[ *** DOWNLOAD *** ]
```
When all the data are received, the data is written into the flash ROM.

In the case of the mechanical side version updating

5)
```
[ MECA LOAD [ v 2.00 ] ]
```
Upon completion of the writing, the version of the firmware written into the ROM will be shown on the LCD.

In the case of the interface side version updating

6)
```
[ I / F LOAD [ v 2.00 ] ]
```
Re-turn on the power to the plotter.

⚠ • Do not turn the power OFF while the data is written into the flash ROM.
CAUTION   There is a danger of damaging the PCB.

Error messages when updating the version on the mechanical side

Error message	Cause	Remedy
E80 ROM0 ERASE	Data stored in the ROM could not be erased.	Replace the main PCB with a new one.
E81 ROM1 ERASE	Data stored in the ROM could not be erased.	
E82 h'********	Data could not be written into the ROM.	
E83 h'********	Data could not be written into the ROM.	
E84 h'********	Data written into the ROM are wrong.	
E85 ROM HASH	Data written into the ROM has errors.	
E86 EDO–DRAM	Memory error has arisen.	

Error message when updating the version on the interface side

Error message	Cause	Remedy
E90 h'********	Data stored in the ROM can not be erased.	Replace the interface PCB with a new one.
E91 < Skipped No. >		
E92 h'********	Data cannot be written into the ROM.	Replace the interface PCB with a new one.
E93 < Skipped No. >		
E94 PLOT DATA	There are data that have not been plotted yet.	Repeat the version updating from the beginning.
E95 MODE	It is not possible to enter version updating mode.	Repeat the version updating from the beginning.
E96 DATA **	The data received data are not the program file.	Check the version updating file.
E97 < Skipped No. >		
E98 TRANSE **	The received data are not for the interface.	Check the version updating file.
E99 NOT VER. UP	The PCB is not compatible with the circuit updating.	Replace the PCB with an interface PCB that is compatible with the circuit updating.

Error messages that apply to both the mechanical side and the interface side

Error message	Cause	Remedy
E87 TRANSE DATA	Data received are not the program file.	Check the version updating file.
E88 I/F BOARD	Abnormal conditions have arisen on the interface board.	Replace the interface board or the main PCB with a new one.
E89 I/F NONE	The interface board has not been loaded on the device.	Load the interface board on the device.

CHAPTER 5

DISASSEMBLING /
ASSEMBLING PROCEDURE

6-1. Adjusting item list

	Adjusting item	Cutter height	Station height	Linear scale height	X-motor belt tension	Y-motor belt tension	Capping position	Wiping position	Flashing position	Head angle	Dot position	Right and left edges	Wind-up torque limiter	Worm gear	XY range accuracy
Part to be replaced	Cutter assy.	O													
	Cap slider assy.		O				O								
	X-axis motor assy. (When X driving belt is loosened)				O									O	O
	Y-axis motor assy.					O									O
	Origin sensor assy.							O							
	Print head									O	O				
	Paper width sensor PCB assy.											O			
Symptom	The media is not wound up.												O		
	Ink cannot be filled.		O				O								
	There are too many horizontal stripes.										O				
	When 8 passes are performed, there are too many horizontal stripes.													O	
	Within certain limits ink is not ejected.		O												

6-2. Adjusting item

6-2-1. Adjustment of the cutter height

[The case that needs adjustment]
* The case where the cutter blade has been replaced
* The case where the cutter assy. has been detached

[Tools to be used]
Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
Remove the front cover assy. and the head cover assy.

[Adjusting procedure]
1) Loosen the screw in the cutter.
2) Adjust so that the top end of the cutter is spaced 2.5 to 3 mm from the platen surface. Then, tighten the screw.

6-2-2. Adjustment of the station (bracket assy.) position

[The case that needs adjustment]
- Ink is not filled up.
- The wiper contacts the head too strongly, causing the nozzle to become clogged and the failure of jet to occur.

When the following parts are replaced:
1) Cap slider assy.
2) Pump 1 assy.
3) Pump bracket L assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5, length = 260 mm or longer when excluding the handle)

[Disassembling procedure]
1) Remove the front cover, Y cover and right cover. (Remove the cables CN10 and CN11 for the pump motor from the main PCB.)
2) Remove the cartridge base R assy. and relieve it.
3) Remove the station cover and the station cover R.
4) Remove the station bracket assy.
   Four screws P4 x 8SMW (Station bracket assy./Right shielding plate assy.)
   Two screws P3 x 6SMW (Station supporting plate S/Station supporting plate D)

[Adjusting procedure]
1) Set the head height to the upper position (for Media Type: thick).
2) Looking at the main unit from the right side, the head should come within the cap slider assembly guide. Also, The height should be such that the top end of the wiper is 0.5mm above the nozzle surface (the height at which the wiper will barely wipe rather than press down strongly).

Head height: upper
(for Media Type: thick)

The wiper should be 0.5mm above the nozzle surface.

The head PCB is in contact with the cap slider assy. guide section.
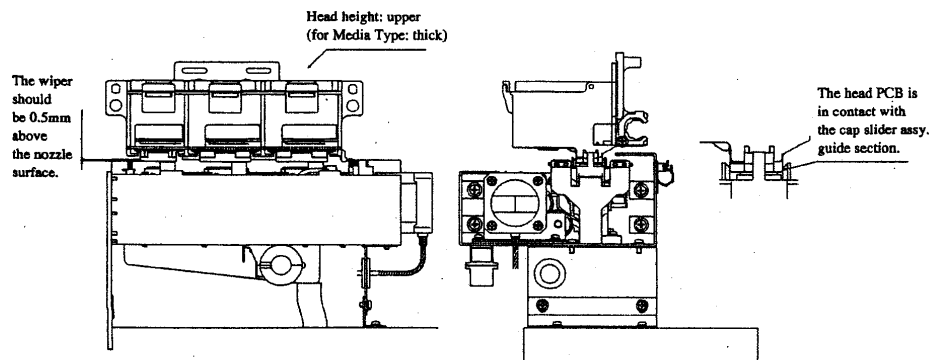
6-2-3. Important points in capping

The following important points should be observed in capping.

a) Cap position
b) Air-sucking position
c) Cap OFF position
d) Flashing position

1) Cap position
   • Cap: closed
   • Valve: closed
   Condition in which the supplied ink can be suctioned → capping position adjustment

Valve is closed   2 mm
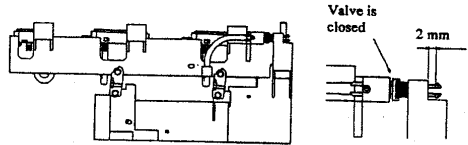
2) Air-sucking position
   • Cap: closed
   • Valve : opened
   The supplied ink cannot be suctioned.
   Suction the excess of ink inside the cap → fix in place 3mm from the cap position

Valve is opened   1 mm
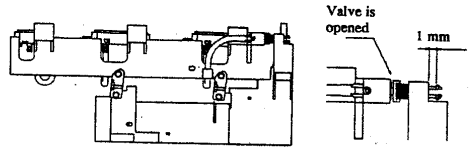
3) Cap OFF position
   • Cap: opened
   • Valve: opened
   Fully opened
   There is a relation to the wiping position → wiping position adjustment
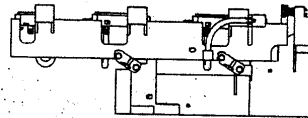
4) Flashing position
   • Cap: opened
   • Valve: opened
   Open, but the nozzle is directly above the cap → flashing position adjustment

0.5 mm
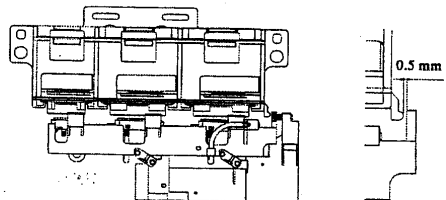
6-2-4. Adjustment of the capping position

[The case that needs adjustment]
- Even after cleaning, the nozzle is clogged and ink is not ejected to the correct position.
- When the following parts are replaced:
  a) Origin sensor assy.
  b) Cap slider assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
1) Remove the arm top.
   A screw B3 x 6 black (Arm top/Clamp lever assy.)
2) Remove the station cover F.
   Four screws B3 x 6 black (Station cover F/Station bracket and the electrical unit case)

[Adjusting procedure]
1) With the head height adjustment lever, fix the head height to the position for "Media Type: thin".
2) Adjust the capping position using the "$CAPPING" in the maintenance menu.

Standards
When capping, adjust to the position at which the slider and the valve are pushed in 2mm.
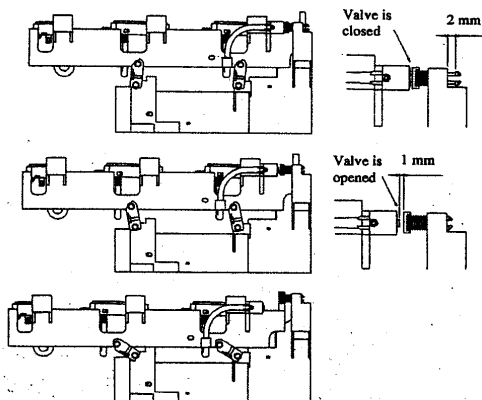
[Assembling procedure]
Assembly is the reverse of disassembly.
* After capping position adjustment, always perform the following adjustments.
- Adjustment of the wiping position
- Adjustment of the flashing position

6-2-5. Adjustment of the wiping position

The case that needs adjustment
- The capping position was adjusted.
- The wiper does not go in or does not come out.

Adjusting procedure
1) Set the head height to the lower position (Media Type: thin).
2) Execute "ADJUST → WIPING", then adjust the wiping position to the position indicated as OK in the diagram below and check with the [FUNCTION] key.
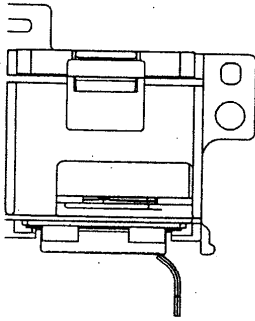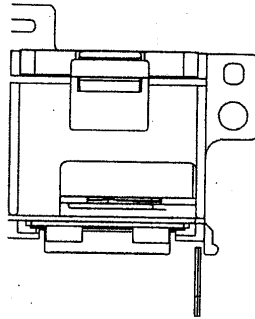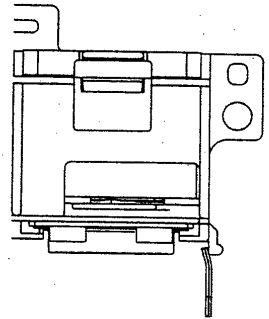
NG   OK   NG

3) If none of the heads catch on the wiper and wiping and rubbing can be done normally, then the position is OK. If it is NG, then repeat the adjustment in step 2).

6-2-6. Adjustment of the flashing position

- The capping position was adjusted.
- The flashing position is not correct.
  - a) When flashing is done during plotting, a grating sound is produced inside the station.
  - b) Flashing is done on the outside of the capping rubber section.
  - c) It is easy for nozzle to become clogged and the failure of jet to occur.

[Adjusting procedure]

1) Execute the "&ADJUST → FLASHING" in the maintenance menu, then adjust the flashing position.

0.5 mm
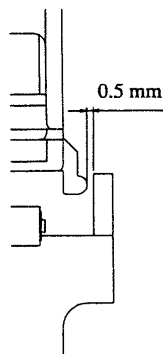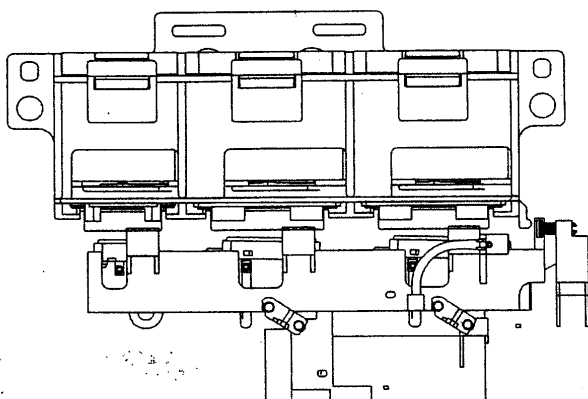
2) If OK (the gap is 0.5 to 1mm), the adjustment is completed.

6-2-7. Adjustment of the linear encoder scale height

[The case that needs adjustment]

- When ink of all colors is not ejected within just certain limits, within the scanning direction limits.

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]

1) Remove the front cover, Y cover and right and left cover.

[Adjusting procedure]

1) Loosen four screws (two of P3 x 14SMW on the right and two of P3 x 8SMW on the left) on the linear encoder scale assy.

2) Perform up/down adjustment so that the bottom surface of the linear encoder scale is level with the step in the main shaft stay over the full width.

3) Retighten the screws that were loosened in step (1).

4) Confirm that the gap between the linear encoder scale and the encoder sensor is open.

⚠ CAUTION
- As for serial #001 to #070 of JV2-130, make adjustment so that it will be 1mm below the level difference.

The bottom surface of the linear encoder scale must be level with the step in the main shaft stay over the full width.

Linear encoder scale

Main shaft
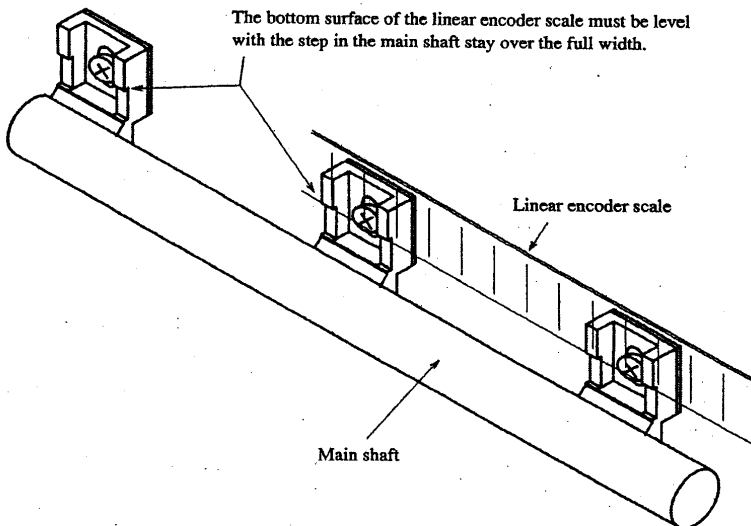
6-2-8. Adjustment of the X-motor belt tension

[The case that needs adjustment]
- In the case where the X-motor total assy. has been replaced

[Tools to be used]
- Tension gauge (Max. 300gf or more)
- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
1) Remove the front cover assy., Y cover assy. and left cover assy.
2) Temporarily fasten the cartridge base L assy. to the relieved tap.

[Adjusting procedure]
1) Loosen the screws (P3 x 8SMW) in the X-motor bracket.
2) Pull the X-motor total assy. downward so that it becomes parallel to the intermediate pulley.
3) Fix the X motor bracket in place so that when the middle of the belt span is pressed down with 200gf, it bends between 0.5mm and 0.7mm.

200 gf

Bending 0.5mm to 0.7 mm

3-3-3. Print is not sharp

Problems	A line has been omitted from the print. A stripe in the scanning direction is partially printed with widened. Characters printed by a specific nozzle are displaced.
Causes	1) Nozzles on the head have clogged. Failure of ink jet is generated. 2) The pump fails to turn. 3) The head ID is not set correctly.
Checking procedure	1) Print the nozzle check to check the printed result. 2) Perform cleaning to confirm that the pump is rotating and that ink is being ejected. 3) Check the head ID. In addition, check whether the ID offset value is negative.
Remedies	1) Clean the head. If cleaning is executed several times and the system still is not restored to correct operating condition, fill with ink for up to a maximum of 3 times. If the system is still not restored to correct operating condition, replace the head. 2) Replace or repair the pump motor and pump unit. 3) Set the head ID.

3-3-4. Plotting failure 1

Problems	Abnormal print is produced outside the paper.
Causes	1) The main FPC cable is in poor contact or has disconnected. 2) The head FPC cable is in poor contact or has disconnected. 3) Paper width sensor PCB assembly has broken. 4) The slider PCB has broken. 5) The main PCB has broken. 6) The head has broken.
Checking procedure	1) Check, through the paper sensor test, whether or not any abnormal value has been specified. 2) Check the connector or replace the cable with a new one. 3) Confirm the connector section. 4) Try to replace the paper width sensor PCB assembly with a new one. 5) Try to replace the slider PCB with a new one. 6) Try to replace the main PCB with a new one. 7) If the phenomenon recurs even after taking procedures (2) through (6), replace the head wtih a new one.
Remedies	1) If the main FPC cable has disconnected, replace it with a new one. 2) If the head FPC cable is in poor contact, securely insert the cable into the connector. 3) Replace the paper width sensor PCB assembly with a new one. 4) Replace the slider PCB with a new one. 5) Replace the main PCB with a new one. 6) Replace the head with a new one.

3-3-5. Plotting failure 2

Problems	Color of print is pale. Color of print differs from device to device.
Causes	1) The head ID has not been properly specified. 2) A media other than exclusive media is used.
Checking procedure	1) Check the head ID number inscribed on the head FPC against the ID number in the system parameters. 2) Check whether the offset value in the system parameter ID has become negative.
Remedies	1) If the head ID is not correct, correct it. 2) If the head ID has been changed, check the Y offset again. 3) Except for pure Y, M, C, K, LM, LC, O or G, some difference in colors between machines cannot be avoided.

3-3-6. Plotting failure 3

Problems	Ink-filling cannot be performed.
Causes	1) There are some gaps for capping. 2) Cap slider Assy is broken. (valve section, in particular) 3) The pump motor has broken. 4) The main PCB has broken.
Checking procedure	1) Visually confirm the ink-filling status. 2) Visually confirm the ink-filling status. 3) Check whether or not the pump motor is running. 4) Replace the main PCB with a new one.
Remedies	1) Height adjustment for the station and position adjustment for capping. 2) Replace the cap slider assembly with a new one. 3) Replace the pump motor with a new one. 4) Replace the main PCB with a new one.

3-3-7. Plotting failure 4

Problems	Plotted dots or lines are dirty.
Causes	1) Head (nozzle) failure. 2) Head/cap positional relations get shifted. 3) The media is not a dedicated paper.

Checking procedures	1) a. Isn't a satellite being generated?
	   b. Isn't a failure of jet being generated?
	   c. Aren't notches inside a single head being generated in the vertical line?
	2) Is the ink securely being drained out when executing the cleaning actuation?
	3) Aren't there any stains and whiskers due to the fibers of paper?

Remedies	1) Conduct the cleaning actuation.
	  • Clean the interior of capping station and the end face of wiper.
	  • Perform the intensive cleaning with the "Select cleaning" inside the maintenance.
	  • Perform the ink-filling with the "Select cleaning" inside the maintenance.
	2) Adjust the capping position.
	  Replace the head if the failure can not be restored with the said remedies.

3-3-8. Cutting failure

Problems	The cutter goes up during paper cutting.
Causes	1) The main FPC has disconnected.
Checking procedure	1) Check whether or not the phenomenon occurs at a specific position in terms of the Y-direction.
Remedies	1) Replace the main FPC cable with a new one.

3-3-9. Faulty cutter

Problems	The cutter remains in the lower position. The cutter will not come down.
Causes	1) The cutter fails to go up/come down smoothly. (The cutter moves jerkily.) 2) The cutter height is not correct. 3) There is a short in the cutter drive circuit.
Checking procedure	1) Remove the head cover and check whether or not the cutter can be smoothly lifted/lowered by hand. 2) Remove the head cover and fully lower the cutter by hand to check whether or not the cutter comes in contact with any other component. 3) Check whether or not the cutter goes up when turning the power off or detaching the connector from the slider PCB in the solenoid with the cutter held lowered (abnormal state).
Remedies	1) Replace the cutter unit with a new one. 2) Adjust the height of the cutter assy. 3) Replace the main FPC, main PCB, slider PCB and cutter assy. respectively with a new one in the written order.

3-3-10. Plotted drawing is out of position.

Problems	The plotted drawing is out of position.
Causes	1) Dust has gathered or scratches are made on the linear scale, causing the linear encoder to make a detecting error.
Checking procedures	1) Check the linear scale for dust, stains and scratches. 2) Check the linear encoder for dust, stains and scratches.
Remedies	1) Lightly wipe the surface of the linear scale (excepting the rear face) with a cloth dampened with alcohol. 2) Lightly wipe the linear encoder with a cotton swab dampened with alcohol. 3) Replace the linear scale with a new one. 4) Replace the linear encoder with a new one.

3-4. High speed interface LED display error analysis

The high speed I/F PCB has 8 LEDs that can be controlled to be ON or OFF by firmware. These LEDs are used mainly to indicate the present state of the high speed interface. In other words, they indicate what kind of condition the high speed interface is in at present. As a result, if an error occurs, they indicate in what condition the high speed interface has stopped. These LED are used during the initial action from turning power ON to completion of preparation to receive data after the high speed interface board hardware checks are completed, differently from thereafter.

3-4-1. During initialization action

During initialization action, first all LEDs are checked to make sure that they will light up, then they indicate the progress of the interface board hardware checks.


```
   D1      D2      D3      D4      D5      D6      D7      D8
 ┌──────┬──────┬──────┬──────┬──────┬──────┬──────┬──────┐
 │  ●   │  ●   │  ●   │  ●   │  ●   │  ●   │  ●   │  ●   │
 └──────┴──────┴──────┴──────┴──────┴──────┴──────┴──────┘
                                                        ▼ TE6137 initialization OK
                                                    ──► DRAM check OK
                                                ──► SIMM check OK
                                            ──► SIMM capacity judgment OK
                                        ──► SIMM specifications check OK
                                    ──► SIMM presence check OK
                          ──► IFC initialization OK
              ──► Data bus check OK
```
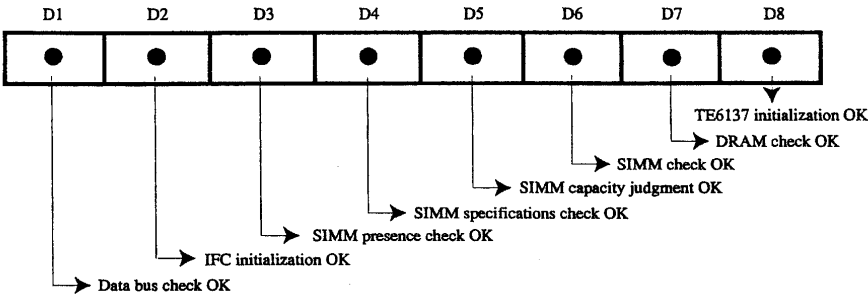
If the SIMM reception buffer has not been installed, then D3 through D6 will not light up. Then, when initialization processing is completed normally, D1, D2, D7 and LED8 will be lit.
If the SIMM reception buffer has been installed, then D3 through D6 are operated for one bank at a time, so the LEDs will light up repeatedly for the number of times corresponding to the number of banks that have been mounted. In other words, if the maximum number of banks have been mounted, D3 to D6 will light up 4 times.

3-4-2. During normal operation (after initialization action has been completed)

When initialization action is completed, the system waits for the plotter to recognize the main interface board; until it does, the LED remain in the same status that they were in when the initialization action was completed. When the plotter recognizes the main interface board, LED0, which acts as the pilot lamp, lights up.

During normal operation, the LEDs indicate the present state of the main interface board.

D1	D2	D3	D4	D5	D6	D7	D8
●	●	●	●	●	●	●	●

An undefined interrupt has occurred.
FIFO buffer full.
Transfer DMA action in progress.
There are data that have not been transferred to the plotter.
Reception DMA in operation.
Data reception in progress.
Operating in ECP mode.
High speed interface is in operation.
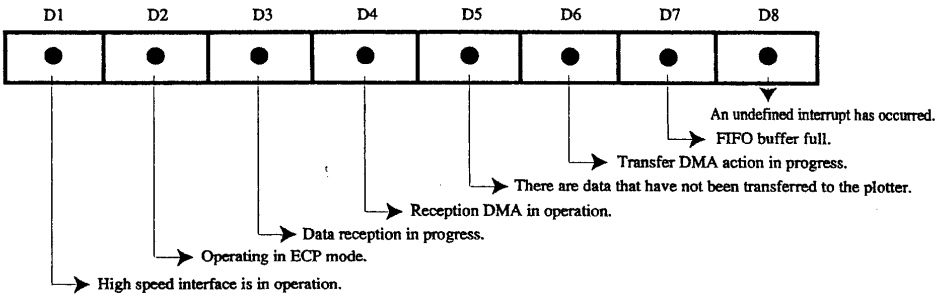
CHAPTER 4

MAINTENANCE MODE

4-1. Maintenance items

The maintenance mode has been prepared for the operations to be conducted for adjustment at the time of delivery of product and for adjustment in maintenance works. This mode is not released to general users.

Under the maintenance mode, "#Adjustment" items, "#Test" items and "#Parameter" items are included in functions.

#ADJUST

$PRINTadjust2 .... Adjusts displacement of heads
$HEAD WASH .... Head is cleaned.
$SELECT CLEANING .... Various cleanings are performed.
$REPLACE COUNTER .... The number of times of replacing ink cartridges is confirmed.
$DEFAULT SET .... Various parameters are reset to the value at the time of delivery from the factory.
$CAPPING .... Capping position is adjusted.
$WIPING .... The wiping reference position is adjusted.
$FLASHING .... The flashing position is adjusted.
$HEAD ID .... The ID for each head is entered.
$WORM GEAR adjust .... The eccentricity of the worm gear is corrected.
$EDGE ADJUST .... Right and left dead space sizes are adjusted.
$DISTANCE ADJUST .... Range accuracy is adjusted.

#TEST

&CHECK PATTERN .... Nozzle check/density pattern is plotted.
&PARAMETER DRAW .... Data stored on EEPROM is plotted.
&FONT DRAW .... Stored font is plotted.
&FILE DUMP .... Plots the setting states of commands sent from the computer.
&X SERVO .... X-motor aging is carried out.
&Y SERVO .... Y-motor aging is carried out.
&XY SERVO .... XY-motor aging is carried out.
&ACTION TEST .... Performance of the wiper, cutter and winding motor is checked.
&SENSOR TEST .... Performance of various sensors is checked.
&PAPER SENSOR .... Read-out value of the paper width sensor is checked.
&KEYBOARD TEST .... The state of the keyboard is checked.
&DISPLAY TEST .... It is not used in the field.
&LCD TEST .... Check the LCD display condition.
&PUMP MOTOR .... Performance of the pump motor is checked.
&TIMER CHECK .... Performance of the timer under the power-off state is checked.
&MEMORY CHECK .... Memory check is carried out.
&SKEW CHECK .... It is not used in the field.

#PARAMETER

&SYSTEM PRM .... Specifies a system parameter.
&INK PARAMETER1 .... This is not used in the field.
&INK PARAMETER2 .... This is not used in the field.
&MENT PARAMETER .... This is not used in the field.
&SERVO PARAMETER .... This is not used in the field.

4-2. Entering into the maintenance mode

The maintenance mode is entitled in two different methods.

4-2-1. Entering into the maintenance mode when actuating the plotter

This section explains how to enter into the maintenance mode when turning on the power to the plotter. The maintenance mode is closed by re-turning the power on.

< Method 1 >

1)
```
┌──────────────────────────────┐
│                      v 1.11  │
└──────────────────────────────┘
```
⬇
```
┌──────────────────────────────┐
│   RAM  CHECK  . . . . .       │
└──────────────────────────────┘
```
　　　When placing a sheet
　　　of paper on the plotter

2)
```
┌──────────────────────────────┐
│   ROLL <          > LEAF      │
└──────────────────────────────┘
```
⬍
```
┌──────────────────────────────┐
│      WIDTH : END              │
└──────────────────────────────┘
```

3)
```
┌──────────────────────────────┐
│        << LOCAL >>            │
└──────────────────────────────┘
```

4)
```
┌──────────────────────────────┐
│   CLEANING        < ENT >     │
└──────────────────────────────┘
```
```
┌──────────────────────────────┐
│   DATA  CLEAR     < ENT >     │
└──────────────────────────────┘
```
```
┌──────────────────────────────┐
│   SETUP           < ENT >     │
└──────────────────────────────┘
```
　　　　　·
　　　　　·
　　　　　·
```
┌──────────────────────────────┐
│   # ADJUST        < ENT >     │
└──────────────────────────────┘
```
```
┌──────────────────────────────┐
│   # TEST          < ENT >     │
└──────────────────────────────┘
```
```
┌──────────────────────────────┐
│   # PARAMETER    < ENT >      │
└──────────────────────────────┘
```

FUNCTION + REMOTE/LOCAL
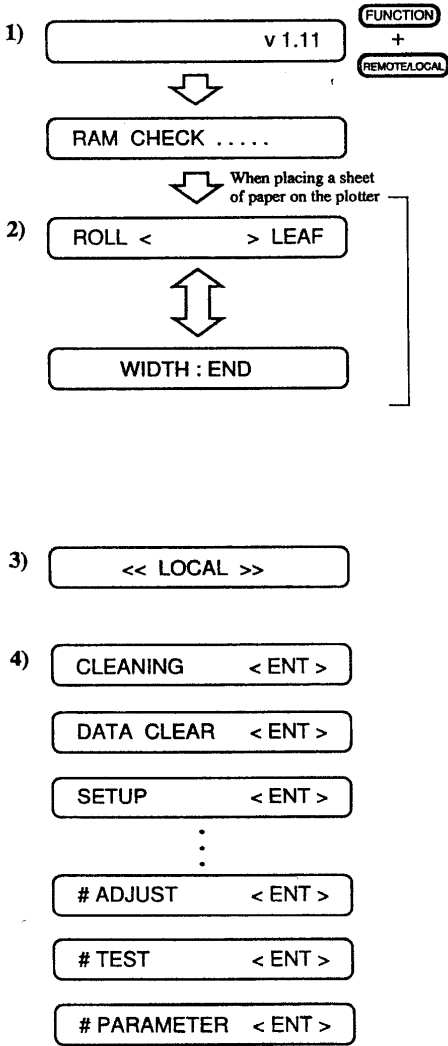
Turn the power on. When the firmware version number is shown on the LCD, press the REMOTE/LOCAL **key while pressing the** FUNCTION **key.**

⚠ CAUTION
- If simultaneously pressing the FUNCTION key and REMOTE/LOCAL key, the plotter may enter into the firmware updating mode (see "4-6. Updating the firmware").

Select the detection of media using the ◁ **key,** ▷ **key or** END **key.**

After the detection of media, the plotter will enter the LOCAL mode.

Press the FUNCTION **key in repetition, and the maintenance items will appear on the LCD. The item name attached with a number sign (#) are the maintenance items.**

4-2-2. Entering into the maintenance mode by system parameters

It is possible to keep the maintenance mode held released at all times by changing the value for the system parameter No. 62 (SUPPORT).

⚠ • Upon completion of maintenance works, set the value for the system parameter No.
CAUTION   62 (SUPPORT) to "0(zero)" or "1" to close the maintenance mode.

< Method 1 >

1)
```
                              v 1.11
```
⬇
```
RAM  CHECK . . . . .        !
```
⬇
```
0  = 0            COMP.  X
```

END
+
ENTER
or
◁ + ▷
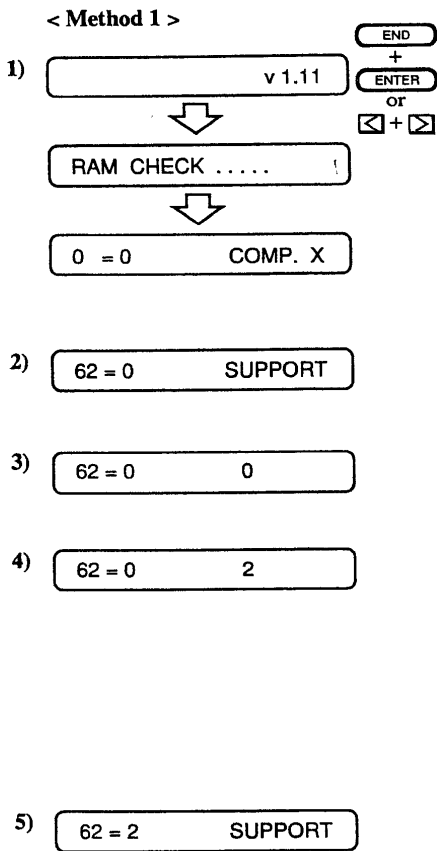
Turn the power on. When the firmware version number is shown on the LCD, simultaneously press the (END) key and the (ENTER) key.
Or, simultaneously press the ◁ key and ▷ key.

2)
```
62 = 0          SUPPORT
```

Press the △ key or ▽ key to call up "No. 62 SUPPORT" on the screen.

3)
```
62 = 0          0
```

Press the (ENTER) key to enter the input mode.

4)
```
62 = 0          2
```

Press the △ key or ▽ key to input "2" or "3".
0, 1: Maintenance mode is disabled.
2:     Maintenance mode is enabled.
3:     Maintenance mode is enabled and the indications on the LCD are all given in English.

5)
```
62 = 2          SUPPORT
```

Press the (ENTER) key to store the entered value.
After completion of the initial operation, this releases the maintenance mode.

4-2-3. Indication of ink type

When orange or green ink is used, "LM/LC" on the LCD display shall be interpreted as "LM → orange" and "LC → green".

4-3. Menu of #ADJUST

4-3-1. $PRINTadjust2

This function is used to adjust the relative dot positions between colors after the nozzle BKT has been replaced.

[Function]

Using color 2 (black) as a reference, correct the displacements between colors in the X direction and the Y direction. To adjust, first adjust the relative positions of the heads (colors 1 and 2, colors 2 and 5). Then correct the relative positions between colors within one head (colors 2 and 3, 2 and 4, 5 and 6, 5 and 7).

The adjustment pattern is plotted dot-by-dot; as indicated in the table below, there are some items that can be entered in 0.1 dot units.

		X PRINT	Y SINGLE	Y REPEAT	Y BI-D
between heads	colors 1 - 2	1 dot units	0.1 dot units	0.1 dot units	none
	colors 2 - 5	1 dot units	0.1 dot units	0.1 dot units	none
within heads	colors 2 - 3	1 dot units	1 dot units	1 dot units	none
	colors 2 - 4	1 dot units	1 dot units	1 dot units	none
	colors 5 - 6	1 dot units	1 dot units	1 dot units	none
	colors 5 - 7	1 dot units	1 dot units	1 dot units	none
	colors 2 - 2	none	none	none	0.1 dot units

When this operation is executed, the adjustment values of the "PRINTadjust" which is open to the user become the initial values. This is so that the adjustment values obtained with this function can be used as a base to which the user adjustment values can be added to obtain the actual dot position correction values.

The correction values are stored under the system parameters No. 10 to No. 28.

[Operation]

1) | # ADJUST   < ENT > |

Select the "ADJUSTMENT."
Press the (ENTER) key.

2) | $ PRINT adjust 2 |

Select the $PRINTadjust2" pressing the (FUNCTION) **key.**
Press the (ENTER) key.

3)

| ADJUST : X PRINT |

| ADJUST : X SINGLE |

| ADJUST : X REPEAT |

| ADJUST : X BI-D |

| ADJUST : TEST DRAW |

| ADJUST : FINE |

Select the item to be corrected using the ⟨∧⟩ or ⟨∨⟩ key.

Start plotting with the (ENTER) key.

To enter the correction value without performing plotting, press the ⟨▷⟩ key.

When the ⟨◁⟩ key is pressed, jogging can be performed using the ⟨◁⟩ , ⟨▷⟩ , ⟨◁⟩ and ⟨▷⟩ keys. Store the origin with the (ENTER) key and start plotting.

The reference points of the origin for plotting are:

X-direction = Center of the cutter slit

Y-direction = Position of the mark "ORIGIN ↓"

⚠ **CAUTION**
- "ADJUST:TEST DRAW" only plots the test pattern that is used to check the adjustments. There is no place to enter correction values.
- If "ADJSUT:FINE" is selected, refer to the section "If FINE has been selected" below.

4)

| color 1-2 = No 0.0 |

When plotting has been completed, correction value input mode is entered.

Input the values using the ⟨∧⟩ and ⟨∨⟩ keys. Then press (ENTER) key to enter the values. In the same way, enter the correction values for between colors 2 and 5, between colors 2 and 3, between colors 2 and 4, between colors 5 and 6, and between colors 5 and 7.

5)

| HEAD 1-2 = No 0.0 |

Then, enter the following correction items in the same manner.
- ADJUST: X PRINT
- ADJUST: Y SINGLE
- ADJUST: Y REPEAT
- ADJUST: Y BI-D

– 4.7 –

If "FINE" has been selected

"ADJUST:FINE" is used to check, or perform fine adjustment of, the X PRINT, Y SINGLE, Y REPEAT, and Y BI-D correction values. Accordingly, perform the "ADJUST:FINE" after the X PRINT, Y SINGLE, Y REPEAT, and Y BI-D corrections have been performed.

In-coming travel plot

Out-going travel plot

Y in-coming travel, X direction

Vertical line; Y going-and-coming travel

Y out-going travel X direction

Paper feed direction
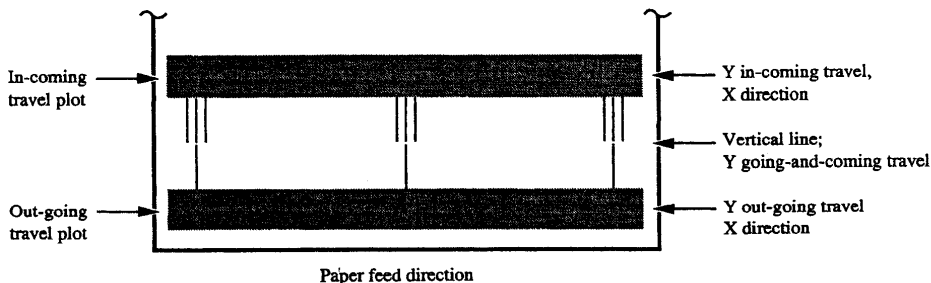
1)
```
ADJUST : ▊INE
```

Select the "ADJUST:FINE."
Press the (ENTER) key.
When the [>] key is pressed, the system goes into correction value input mode without plotting anything.
When the [<] key is pressed, jogging can be performed using the [∧], [∨], [<] and [>] keys.
The reference points of the origin for plotting are:
  X-direction = Center of the cutter slit
  Y-direction = Position of the mark "ORIGIN"
Press the (ENTER) key to store the origin.

2)
```
COLOR : SKC^Lc M^Lm Y
```

Press the [∧] or [∨] key to cause the screen to show colors for plotting. Select the color to be used using the [<] or [>] key.

3)
```
ADJUST : FINE
```

Plotting starts.
Press the (ENTER) key.
(Plot length: about 18mm; plot width: paper width)

4)
```
X PRINT 1-2 : ▊.0
```

When plotting has been completed, correction value input mode is entered.
Input the correction value for the X-direction using the [∧] or [∨] key.
Enter the correction value with the (ENTER) key.
Enter the correction values between colors 2 and 5, between colors 2 and 3, between colors 2 and 4, between colors 5 and 6, and between colors 5 and 7 following the same procedure.

5) `Y SINGLE 1-2 : 0.0`

Input the correction value for the Y out-going travel using the △ or ▽ key.
Enter the correction value with the (ENTER) key.
Enter the correction values between colors 2 and 5, between colors 2 and 3, between colors 2 and 4, between colors 5 and 6, and between colors 5 and 7 following the same procedure.

6) `Y REPEAT 1-2 : 0.0`

Input the correction value for the Y in-coming travel using the △ or ▽ key.
Enter the correction value with the (ENTER) key.
Enter the correction values between colors 2 and 5, between colors 2 and 3, between colors 2 and 4, between colors 5 and 6, and between colors 5 and 7 following the same procedure.

7) `Y BI-D 1-2  : 0.0`

`ADJUST : FINE`

Input the correction value for the Y going-and-coming travel using the △ or ▽ key.
Enter the correction value with the (ENTER) key.
Once the values for all correction items are entered, the screen will show as left.

6)

> PATTERN   : DRAW

Press the (ENTER) key.
At this standby state, press the (END) key
in repetition to return the layers of screens one by
one to permit the conditions to be changed.
The machine starts plotting when pressing
(ENTER) key again.
To shift the origin, press the ◁ key.
Move the origin with ◁ , ▷ , △ or ▽
key and finalize it with the (ENTER) key.

7)

The machine starts plotting when pressing the
(ENTER) key.
Plotting can be started by pressing the
(END) key.

8)

> WORM GEAR = No. ▊

When 100% saturated patterns No. 1 to No. 8
are plotted, the adjusted value input display
appears, so check the contents of the plot, then
enter the number that gives the least horizontal
stripes.

9)

> WORM GEAR = No. ▊

Press the (ENTER) key to enter the adjusted
value.

10)

> $WORM GEAR adjust

Press the (END) key to end this opera-
tion.

4-3-11. $EDGE ADJUST

[Function]

Size of the dead spaces on the left and right of the sheet is adjusted.

Adjust so that the adjustment pattern is drawn in such way that the left and right end of the pattern are respectively positioned at 5 mm from the left and right edges of the paper.

The adjustment value will be stored under system parameter Nos. 3 and 2. (Left edge of the paper = No.3, right edge of the paper = No.2

⚠ **CAUTION**
- Because the adjustment pattern plots the drawing while detecting the paper width, the paper of no plotting should be used during the adjustment. If the paper which has been plotted should be used, the correct adjustment becomes unavailable any longer.
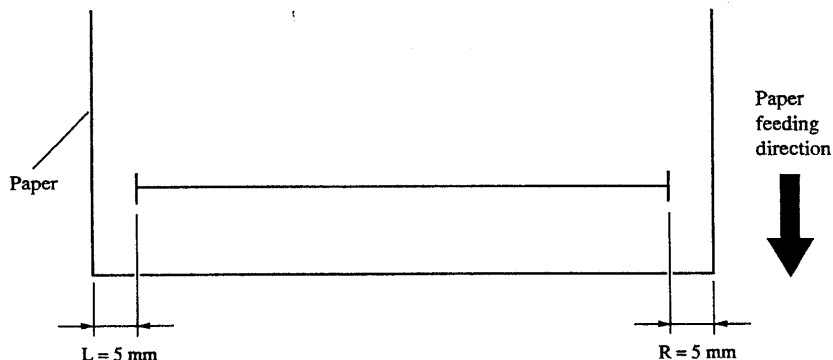
⚠ **CAUTION**
- In this adjustment, the actual measured value is entered, but the value found from the following formula is stored under the system parameter.

Adjustment value = 5mm - Actual measured value (mm) (stored in units of 0.1mm)

[Operation]

1)
```
# ADJUST        < ENT >
```
Select the ADJUSTMENT.
Press the (ENTER) key.

2)
```
$ EDGE  ADJUST
```
Select the "$EDGE ADJUST" pressing the
(FUNCTION) **key.**
Press the (ENTER) key.

3)
```
CLEAR <        > DRAW
```
Plot the adjusting pattern using the ▷ key.
Clear the adjustment value using the ◁ key.
Press the △ or ▽ key to enter a correction value without performing plotting.
After the completion of plotting, enter a correction value.

4)

```
L = 5.0      R = 5.0
```

Enter an actual measurement (L), using the ⟨∧⟩ or ⟨∨⟩ key, for the left-hand side dead space of the sheet in increments of 0.1 mm.
Press the ⟨ ENTER ⟩ key to store the entered value.

5)

```
L = 6.0      R = 5.0
```

Press the ⟨∧⟩ or ⟨∨⟩ key to enter an actual measurement (R) for the right-hand side dead space of the sheet.
Press the ⟨ ENTER ⟩ key to store the entered value.

6)

```
CLEAR <      > DRAW
```

The indication given in the step of procedure 3) will be restored on the LCD.
Press the ⟨ END ⟩ key to exit from the "$EDGE ADJUST."
To clear the adjustment value, press the ⟨<⟩ key.
To draw an adjusting pattern, press the ⟨>⟩ key.

4-3-12. $DISTANCE ADJUST

[Function]

Range accuracy is adjusted.

The adjustment value in the Y-direction shall be applied to the detected paper width.

The dimension of the Y-direction for the drawing itself will not be changed.

The adjustment values are stored under the system parameters Nos. 0 and 1. (X-direction = No. 0, Y-direction = No. 1)

⚠ **CAUTION**
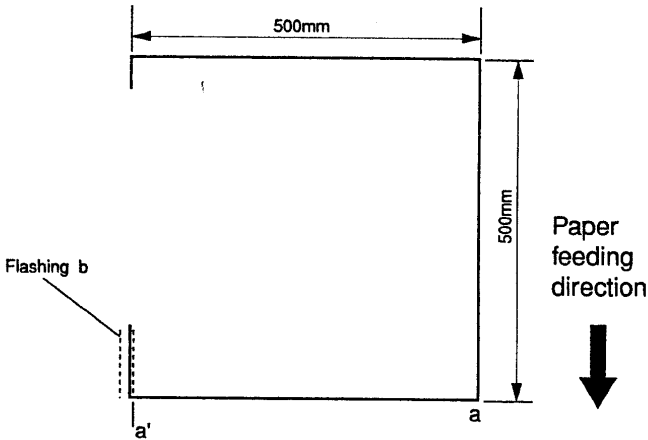
• The measured value in the Y direction becomes the b position when the distance a – a' in the above diagram is taken to be 500 mm.

• In this adjustment, the actual measurement is entered, but the value found from the following formula is stored under the system parameter.

Adjustment value = 500 mm – Actual measurement (mm) (stored in units of 0.1 mm)

[Operation]

1) `# ADJUST        < ENT >`

Select the ADJUSTMENT.
Press the (ENTER) key.

2) `$ DISTANCE  ADJUST`

Select the "$DISTANCE ADJUST" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)

```
CLEAR <        > DRAW
```

Plot the adjusting pattern using the ▷ key.
Clear the adjustment value using the ◁ key.
Press the △ or ▽ key to enter a correction
value without performing plotting.
After the completion of plotting, enter a correction
value.

4)

```
▓ = 500.0    Y = 500.0
```

**Enter an actual measurement in terms of the
X-direction in increments of 0.5 mm using the
△ or ▽ key.**
Press the (ENTER) key to store the entered
value.

5)

```
X = 500.0   ▓ = 500.0
```

**Enter an actual measurement in terms of the
Y-direction in increments of 0.1 mm using the
△ or ▽ key.**
Press the (ENTER) key to store the entered
value.

6)

```
CLEAR <        > DRAW
```

**The indication given in the step of procedure
3) will be restored on the LCD.**
Press the (END) key in repetition, and
the indication given in the step of procedure 2)
will be restored on the LCD to exit from the
"$DISTANCE ADJUST".
To clear the adjustment value, press the ◁ key.
To draw an adjusting pattern, press the ▷ key.

4-4. #TEST items

4-4-1. &CHECK PATTERN

[Function]

Plotting of a density pattern and adjusting pattern is executed.

The drawing way when printing "Check Pattern" can be set.

Density pattern .... Patterns are drawn for the density of 100%, 50%, 25%, and 6.25% (Colors can be selected.)

Nozzle check .... A nozzle checking pattern is drawn (Colors can be selected.)

Color chart .... Y, M, C, K, LM (or O) and LC (or G) color patterns are drawn (fixed color).

Slant .... Creates a head angle adjustment pattern (fixed color).

Feed .... Cannot be used in the field.

Nozzle line .... Cannot be used in the field.

[Operation]

1)
```
# TEST          < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& CHECK  PATTERN
```
Select the "$CHECK PATTERN" pressing the (FUNCTION) **key.**
Press the (ENTER) key.

3)
```
PATTERN : 100%
```
```
PATTERN : 50%
```
```
PATTERN : 25%
```
```
PATTERN : 6.25%
```
```
PATTERN : NOZZLE
```
```
PATTERN : COLOR
```
```
PATTERN : SLANT
```
```
PATTERN : FEED
```
```
PATTERN : LINE
```

Select a pattern using the △ and ▽ keys.

⚠ **CAUTION**

• If two or more colors are selected, a density pattern is drawn while mixing the selected colors. Note that, however, nozzle checking patterns are respectively plotted for the selected colors.

– 4.25 –

Plotting a density pattern

1)
| PATTERN : 100% |
| PATTERN : 50% |
| PATTERN : 25% |
| PATTERN : 6.25% |

Select the density pattern using the ⟨△⟩ or ⟨▽⟩ key and press the (ENTER) key.

2)
| DPI : 360X360 |
| DPI : 720X720 |
| DPI : 180X180 |

Select the resolution using the ⟨△⟩ or ⟨▽⟩ key and press the (ENTER) key.

3)
| PLOT : UNI–D 2 pass |
| PLOT : UNI–D 4 pass |
| PLOT : UNI–D 8 pass |
| PLOT : UNI–D HI spd |
| PLOT : BI–D 2 pass |
| PLOT : BI–D 4 pass |
| PLOT : BI–D 8 pass |
| PLOT : BI–D HI spd |

Select the drawing way using the ⟨△⟩ or ⟨▽⟩ key and press the (ENTER) key.

4)
| X = 40   Y = 1200 |

Select the plotting length in the X-direction using the ⟨△⟩ or ⟨▽⟩ key and press the (ENTER) key.
Length setting: 10 mm to the sheet length (in increments of 10 mm)

5)
| X = 40   Y = 1000 |

Select the plotting length in the Y-direction using the ⟨△⟩ or ⟨▽⟩ key and press the (ENTER) key.
Length setting: 10 mm to the sheet width (in increments of 10 mm)

6)

COLOR : – K – – – – –

COLOR : – KC – – – –

Select the color used for plotting.
Shift the cursor using the ◁ or ▷ key to select the color to be used.
Press the ∧ or ∨ key to allow the initial letter of the color to be used to appear on the display, and the pattern will be drawn using the color.

7)

PATTERN : PLOT

Press the (ENTER) key to the drawing.
The machine starts plotting when pressing (ENTER) key again.
To shift the origin, press the ◁ key.
Press the (ENTER) key to store the origin.
Plotting can be aborted by pressing the (END) key.

8)

PATTERN : PLOT

After the completion of the plotting, press the (END) key in repetition to return the layers of screens one by one to permit the conditions to be changed.

Plotting a nozzle checking pattern

1)

PATTERN : NOZZLE

Select "NOZZLE" using the ∧ or ∨ key and press the (ENTER) key.

2)

DPI : 360X360

DPI : 720X720

DPI : 180X180

Select the resolution using the ∧ or ∨ key and press the (ENTER) key.

3)

PLOT : UNI–D 2 pass

PLOT : UNI–D 4 pass

PLOT : UNI–D 8 pass

PLOT : UNI–D HI spd

PLOT : BI–D 2 pass

Select the print mode using the ∧ or ∨ key and press the (ENTER) key.

PLOT : BI-D 4 pass

PLOT : BI-D 8 pass

PLOT : BI-D HI spd

4) X = 40   Y = 1200

Select the plotting length in the X-direction using the △ or ▽ key and press the (ENTER) key.
Length setting: 10 mm to the sheet length (in increments of 10 mm)

5) X = 40   Y = 1000

Select the plotting length in the Y-direction using the △ or ▽ key and press the (ENTER) key.
Length setting: 60 mm to the sheet width (in increments of 60 mm)

6) COLOR : - K - - - - -

COLOR : - K0 - - - -

Select the color used for plotting.
Shift the cursor using the ◁ or ▷ key to select the color to be used.
Press the △ or ▽ key to allow the initial letter of the color to be used to appear on the display, and the pattern will be drawn using the color.

7) PATTERN : PLOT

Press the (ENTER) key to the drawing.
The machine starts plotting when pressing (ENTER) key again.
To shift the origin, press the ◁ key.
Press the (ENTER) key to store the origin.
Plotting can be aborted by pressing the (END) key.

8) PATTERN : PLOT

After the completion of the plotting, press the (END) key in repetition to return the layers of screens one by one to permit the conditions to be changed.

Plotting a color chart pattern

1) | PATTERN : COLOR |

Select color chart using the ⌃ or ⌄ key
and press the (ENTER) key.

2) | DPI : 360X360 |

| DPI : 720X720 |

| DPI : 180X180 |

Select the resolution using the ⌃ or ⌄ key
and press the (ENTER) key.

3) | PLOT : UNI–D 2 pass |

| PLOT : UNI–D 4 pass |

| PLOT : UNI–D 8 pass |

| PLOT : UNI–D HI spd |

| PLOT : BI–D 2 pass |

| PLOT : BI–D 4 pass |

| PLOT : BI–D 8 pass |

| PLOT : BI–D HI spd |

Select the print mode using the ⌃ or ⌄
key and press the (ENTER) key.

4) | DENSITY : All |

| DENSITY : 100% |

| DENSITY : 50% |

| DENSITY : 25% |

Select the density using the ⌃ or ⌄ key
and press the (ENTER) key.
At this time it is now ready for the drawing.

5) | PATTERN : PLOT |

Press the (ENTER) key to start drawing.

– 4.29 –

At this time, jogging operation can be conducted using the ◁ , ▷ , ⋀ and ⋁ keys.

Press the (END) key to return the head to the station.

Press the (ENTER) key to store the origin and to allow the machine to start plotting.

The reference point for the plotting origin is as follows:

X-direction: Center of the cutter slit
Y-direction: Position of the mark "ORIGIN ↓"

⚠ CAUTION
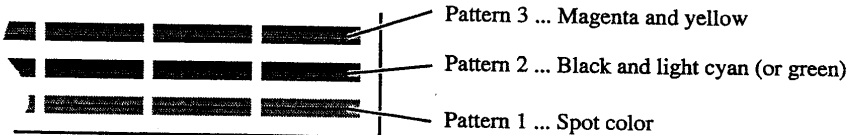• This pattern has fixed plot lengths in the X direction and the Y direction.

To abort the drawing, press the (END) key.

6)

After the completion of the plotting, press the (END) key in repetition to return the layers of screen one by one to permit the conditions to be changed.

Plotting a head angle adjustment pattern

In this pattern, the plotted color is determined as follows.

Pattern 3 ... Magenta and yellow

Pattern 2 ... Black and light cyan (or green)

Pattern 1 ... Spot color

1)

    PATTERN : SLANT

Select "SLANT" using the ⋀ or ⋁ key and press the (ENTER) key.

2)

    X = 30   Y = 200

Select the plotting length in the Y-direction using the ⋀ or ⋁ key and press the (ENTER) key.

Length setting: 50mm to the sheet width (in increments of 50 mm)

⚠ CAUTION
• Length setting in X-direction is fixed.

3)
```
┌─────────────────────────────┐
│  PATTERN    : PLOT          │
└─────────────────────────────┘
```

Press the (ENTER) key.

The machine starts plotting.

To shift the origin, press the ◁ key.

Press the (ENTER) key to store the origin.

Plotting can be aborted by pressing the (END) key.

4)

After the completion of the plotting, press the (END) key in repetition to return the layers of screens one by one to permit the conditions to be changed.
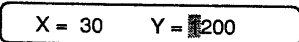
4-4-2. &PARAMETER DRAW

[Function]

Setting state of parameters is plotted.

Plotting is carried out in portrait orientation of A4-size paper.

[Operation]

1)
```
# TEST          < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& PARAMETER  DRAW
```
Select the "$PARAMETER DRAW" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)
```
DRAW : SYSTEM  PRM
```
```
DRAW : INK  PRM
```
```
DRAW : MENT  PRM
```
Select the plot parameter using the ⟨∧⟩ or ⟨∨⟩ key.
System parameter:
  Setup parameter and system parameter are plotted.
Ink parameter:
  Ink parameter 1 and ink parameter 2 are plotted.
Maintenance parameter:
  Maintenance parameter and servo parameter are plotted.

4)
Press the (ENTER) key to start plotting.

4-4-3. &FONT DRAW

This is not used in the field.

4-4-4. &FILE DUMP

[Function]

Setting states of commands from the computer are drawn.

```
FILE DUMP Ver1.00 I/F1.00 SIMM1: 32M SIMM2: 32M
DATA SIZE    = 61706 byte
DPI          = 360x360
PAGE WIDTH   = NONE
PAGE LENGTH  = 354
LINE COUNT   = 355
PRINT MODE   = PLOTTER NONE
DIST COMP    = +1.0mm
INK LAYERS   = PLOTTER
DRYING TIME  = PLOTTER PLOTTER
AUTO CUT     = PLOTTER
```

A file data size represents the data size that the plotter recognizes as a file. This means the data size can differ from the actual data size transmitted from the computer.

The indication "NONE" given in the plotting items means that the computer has specified nothing.

The indication "PLOTTER" given in the plotting items means that the computer has specified to operate according to the settings established on

[Operation]

1)
```
# TEST        < ENT >
```
Select the TEST.
Press the (ENTER) key.

2)
```
& FILE  DUMP
```
Select the "$FILE DUMP" pressing the (FUNCTION) key.

3)
```
FILE  DRAW  : ●FF
```
```
FILE  DRAW  : ●N
```
Select the operation mode using the △ or ▽ key.

OFF: Image data transmitted from the computer are not plotted. Only the setting states of commands are plotted.

ON: After image data have been plotted, the setting states of commands are plotted.

4)
```
* * FILE  DUMP  * *
```
Press the (ENTER) key.
The plotter will be placed in the remote mode and start the file dump.

5)
```
* * FILE  DUMP  * *
```
Data are transmitted from the computer.
Once the plotter starts to receive data, the asterisk "*" starts flickering. When the plotter detects the end of the file, it plots the setting states of com-mands.

4-4-15. &TIMER CHECK

[Function]

A period of time (including the number of days) during which the power to the device is turned off is checked.

This test is used for the evaluation of the build-in battery.

The battery for the timer built in the CPU is backed up by an electric double layer capacitor. This battery discharges electricity, in approximately 1.5 days, to the voltage with which the CPU timer cannot operate. So, the timer is not able to deliver the correct time. This capacitor is recharged by turning on the power to the device.

[Operation]

1) | # TEST   < ENT > |

Select the TEST.
Press the (ENTER) key.

2) | & TIMER CHECK |

Select the "&TIMER CHECK" pressing the (FUNCTION) **key.**

3) | DATE = 00. 00. 01 |

Press the (ENTER) key.
The period of time during which the power is in the off state is shown on the LCD.
In this case, the indication shows that the power to the device has been turned off for a day.

4) | TIME = 08 : 31 : 30 |

The period of time during which the power is in the off state is shown on the LCD using the △ **or** ▽ **key.**
In this case, the indication shows that the power to the device has been turned off for eight hours 31 minutes 30 seconds.

5)

Press the (END) key to exit from the function.

4-4-16. &MEMORY CHECK

[Function]

Checking of the following memories is executed.

a. EDO-DRAM read/write check

b. F-ROM hash check

c. MAIN S-RAM read/write check

d. HEAD S-RAM read/write check

e. FIFO read check (when I/F board is installed)

f. I/F board side D-RAM read/write check (when I/F board is installed)

g. I/F board side additional memory read/write check (when I/F board and SIMM are installed.)

⚠ CAUTION
 • If an error occurs during any of the memory checks, it becomes impossible for the memory check action to continue. Turn the power OFF and then back ON.

[Operation]

1)
```
# TEST          < ENT >
```

Select the TEST.
Press the (ENTER) key.

2)
```
& MEMORY  CHECK
```
⬇
```
CHECK : EDO  D–RAM
```

Select the "&MEMORY CHECK" pressing the (FUNCTION) key.
Press the (ENTER) key.

3)
```
CHECK : EDO  D–RAM
```
```
CHECK : F–ROM
```
```
CHECK : MAIN  S–RAM
```
```
CHECK : HEAD  S–RAM
```
```
CHECK : FIFO
```
```
CHECK : I / F  D–RAM
```
```
CHECK : SIMM  64MB
```

Select the item to be checked using the ☐ or ☐ key.
Press the (ENTER) key, and the check menu for memories will be invoked.

– 4.45 –

a. EDO-DRAM check

1)

```
CHECK : EDO  D-RAM
```

The indication "EDO-DRAM" is shown on the
LCD.

Press the (ENTER) key.

2)

```
BANK 0 : 20M   1 : 20M
```

The EDO-DRAM capacity is shown on the
LCD. After checking, press the (ENTER)
key.

The EDO-DRAM details are as follows:

    on the main PCB:

        BANK0 = 4MB; BANK1 = 4MB

    on the 720dpi additional memory PCB:

        BANK0 = 16MB

        BANK1 = 16MB

⚠ **CAUTION**

• If the capacities of BANK0 and BANK1 are
different when power is turned ON and it is
confirmed that the additional
EDO-DRAM has been installed, then the
following error is indicated, and operation
continues with just the capacity on the main
PCB.

```
ERR07   EDO-DRAM. S
```

In this case, the value of the bank that has the
larger capacity is checked in this checking.

3)

```
TYPE : 0 BK 0, 1 MH
```

```
TYPE : 1 BK 0      M
```

```
TYPE : 2 BK 1      M
```

```
TYPE : 3 BL 0, 1 MH
```

```
TYPE : 4 BK 0      H
```

```
TYPE : 5 BK 1      H
```

```
TYPE : 6 BK 0, 1 H
```

Select the object of the check with the [△] and
[▽] keys, then press (ENTER) key.

TYPE0: BANK0 and BANK1 are checked
         alternately on both the Main CPU side
         and the Head CPU side.

TYPE1: BANK0 only is checked only on the
         Main CPU side.

TYPE2: BANK1 only is checked only on the
         Main CPU side.

TYPE3: BANK0 and BANK1 are checked
         alternately on the Main CPU side only.

TYPE4: BANK0 only is checked only on the
         Head CPU side.

TYPE5: BANK1 only is checked only on the
         Head CPU side.

TYPE6: BANK0 and BANK1 are checked
         alternately on the Head CPU side only.

4)

> WAIT TIME   : 0 s

Use the � key ⟨△⟩ and ⟨▽⟩ keys to set the waiting time after data have been written in until the read-in check is performed (0 to 300 seconds).

5)

> CNT : 1   BANK 0

When the ⟨ ENTER ⟩ key is pressed, the check starts.

The number of checks and the BANK No. that is the object of checking are shown on the LCD.

> E h' ac400000 (M)

⇕

When an error arises, the error address and the CPU (M: Main or H: Head) at which the error was confirmed will appear on the LCD. At this time, if the ⟨△⟩ key or the ⟨▽⟩ key is pressed, read/write data and number of checks until error occurrence will be displayed.

> E   R : ∗∗ h   W : ∗∗ h

⇕

When the ⟨ END ⟩ key is pressed, the checking will be aborted when the BANK being checked is completed.

> COUNT = ∗ ∗ ∗ ∗

b. F-ROM check

1)

> CHECK : F–ROM

The indication "F-ROM" is shown on the LCD.

2)

> CNT 1   F–ROM

Press the ⟨ ENTER ⟩ key. The plotter starts checking.

The number of checks is shown on the LCD.

> ERROR ROM HASH

When an error arises, the error message will appear on the LCD and the checking will be aborted.

3)

Press the ⟨ END ⟩ key to terminate the F-ROM checking.

c. MAIN S-RAM check

1)

```
CHECK : MAIN S-RAM
```

The indication "MAIN S-RAM" is shown on the LCD.

2)

```
M SRAM CHECK : 0 0 h
```

⬇

```
M SRAM CHECK : f f h
```

Press the (ENTER) key. The plotter starts checking.
The write data is shown on the LCD.

This indication appears while the checking is being executed.

```
E h' 0 0 0 0 0 0 0 0 R 0 0
```

When an error arises, the error address and the read data will appear on the LCD and the checking will be aborted.

3)

To terminate the MAIN S-RAM checking, turn the power off.

d. HEAD S-RAM check

1)

```
CHECK : HEAD S-RAM
```

The indication "HAED S-RAM" is shown on the LCD.

2)

```
H SRAM CHECK : 0 0 h
```

⬇

```
H SRAM CHECK : f f h
```

Press the (ENTER) key. The plotter starts checking.
The write data is shown on the LCD.

This indication appears while the checking is being executed.

```
E h' 0 0 0 0 0 0 0 0 R 0 0
```

When an error arises, the error address and the read data will appear on the LCD and the checking will be aborted.

3)

To terminate the HEAD S-RAM checking, turn the power off.

e. FIFO check

1) CHECK : FIFO

The indication "FIFO" is shown on the LCD.

2) CNT 1   FIFO

Press the (ENTER) key. The plotter starts checking.

The number of checks is shown on the LCD.

E FIFO R : 01 W : 00

When an error arises, the read/write data will appear on the LCD and the checking will be aborted.

3)

Press the (END) key to terminate the FIFO checking.

f. I/F board side D-RAM check

1) CHECK I / F D–RAM

The indication "I/F D-RAM" is shown on the LCD.

2) CNT : 1   D–RAM

Press the (ENTER) key. The plotter starts checking.

The number of checks is shown on the LCD.

E h' 0 0 0 0 0 0 0 0

When an error arises, the error address will appear on the LCD and the checking will be aborted.
At this time, when the [△] key or [▽] key is pressed, the read/write data will appear on the LCD.

E R : ∗ ∗ h W : ∗ ∗ h

3)

Press the (END) key to terminate the checking.

g. SIMM check

1)

CHECK : SIMM   ✱ ✱ ✱ M

The indication **"CHECK: SIMM ✱ ✱ ✱ M"** is shown on the LCD.

(✱ ✱ ✱ indicates the capacity of the SIMM that has been recognized.)

Press the (ENTER) key.

2)

CHECK : SIMM   ✱ ✱ M
TYPE : 0
TYPE : 1
TYPE : 2
TYPE : ALL

Select the type to be checked using the △ or ▽ key.

TYPE:0 .... 55H/AAH read/write check

TYPE:1 .... 00H/FEH read/write check

TYPE:2 .... Wait time check

TYPE:ALL ... Types 0 to 2 are executed.

3)

CNT 1   SIMM

E h' 0 0 0 0 0 0 0 0   L / 1

E R : ✱ ✱ h   W : ✱ ✱ h

Press the (ENTER) key to start checking.

The number of checks is shown on the LCD.

When an error occurs, the following will appear on the LCD, and the checking will be aborted.

• The error address.

• The number of the slot at which the error occurred (L becomes 0 or 1 on the LCD display shown at left).

• The number of the side on which the error occurred (I becomes 0 or 1 on the LCD display shown at left.)

At this time, when the △ key or ▽ key is pressed, the read/write data will appear on the LCD.

4)

Press the (END) key to terminate the SIMM checking.

c. MAIN S-RAM check

1)
```
CHECK : MAIN S-RAM
```
The indication "MAIN S-RAM" is shown on the LCD.

2)
```
M SRAM CHECK : 0 0 h
```
⬇
```
M SRAM CHECK : f f h
```
Press the (ENTER) key. The plotter starts checking.
The write data is shown on the LCD.

This indication appears while the checking is being executed.

```
E h' 0 0 0 0 0 0 0 0 R 0 0
```
When an error arises, the error address and the read data will appear on the LCD and the checking will be aborted.

3)
To terminate the MAIN S-RAM checking, turn the power off.

d. HEAD S-RAM check

1)
```
CHECK : HEAD S-RAM
```
The indication "HAED S-RAM" is shown on the LCD.

2)
```
H SRAM CHECK : 0 0 h
```
⬇
```
H SRAM CHECK : f f h
```
Press the (ENTER) key. The plotter starts checking.
The write data is shown on the LCD.

This indication appears while the checking is being executed.

```
E h' 0 0 0 0 0 0 0 0 R 0 0
```
When an error arises, the error address and the read data will appear on the LCD and the checking will be aborted.

3)
To terminate the HEAD S-RAM checking, turn the power off.

4)

```
WAIT  TIME      : 0 s
```
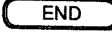
Use the ⌃ and ⌄ keys to set the waiting time after data have been written in until the read-in check is performed (0 to 300 seconds).

5)

```
CNT : 1           BANK 0
```

When the (ENTER) key is pressed, the check starts.
The number of checks and the BANK No. that is the object of checking are shown on the LCD.

```
E  h' ac400000  (M)
```

⇕

When an error arises, the error address and the CPU (M: Main or H: Head) at which the error was confirmed will appear on the LCD. At this time, if the ⌃ key or the ⌄ key is pressed, read/write data and number of checks until error occurrence will be displayed.

```
E    R : ∗∗ h    W : ∗∗ h
```

⇕

When the (END) key is pressed, the checking will be aborted when the BANK being checked is completed.

```
COUNT  =  ∗ ∗ ∗ ∗
```

b. F-ROM check

1)

```
CHECK : F–ROM
```

The indication "F-ROM" is shown on the LCD.

2)

```
CNT 1  .  F–ROM
```

Press the (ENTER) key. The plotter starts checking.
The number of checks is shown on the LCD.

```
ERROR  ROM  HASH
```

When an error arises, the error message will appear on the LCD and the checking will be aborted.

3)

Press the (END) key to terminate the F-ROM checking.

e. FIFO check

1) ┌─────────────────────────┐
    │ CHECK : FIFO   │
    └─────────────────────────┘

The indication "FIFO" is shown on the LCD.

2) ┌─────────────────────────┐
    │ CNT 1   FIFO   │
    └─────────────────────────┘

Press the (ENTER) key. The plotter starts checking.
The number of checks is shown on the LCD.

    ┌─────────────────────────┐
    │ E FIFO R : 01 W : 00 │
    └─────────────────────────┘

When an error arises, the read/write data will appear on the LCD and the checking will be aborted.

3) **Press the (END) key to terminate the FIFO checking.**

f. I/F board side D-RAM check

1) ┌─────────────────────────┐
    │ CHECK I / F D–RAM   │
    └─────────────────────────┘

The indication "I/F D-RAM" is shown on the LCD.

2) ┌─────────────────────────┐
    │ CNT : 1   D–RAM   │
    └─────────────────────────┘

Press the (ENTER) key. The plotter starts checking.
The number of checks is shown on the LCD.

    ┌─────────────────────────┐
    │ E h ' 0 0 0 0 0 0 0 0 │
    └─────────────────────────┘

         ⇕

    ┌─────────────────────────┐
    │ E R : ∗ ∗ h W : ∗ ∗ h │
    └─────────────────────────┘

When an error arises, the error address will appear on the LCD and the checking will be aborted.
At this time, when the [∧] key or [∨] key is pressed, the read/write data will appear on the LCD.

3) **Press the (END) key to terminate the checking.**

g. SIMM check

1)

```
CHECK : SIMM   * * * M
```

The indication "CHECK: SIMM ∗ ∗ ∗ M" is shown on the LCD.
(∗ ∗ ∗ indicates the capacity of the SIMM that has been recognized.)
Press the (ENTER) key.

2)

```
CHECK : SIMM   * * M
```
```
TYPE  : 0
```
```
TYPE  : 1
```
```
TYPE  : 2
```
```
TYPE  : ALL
```

Select the type to be checked using the ⟨∧⟩ or ⟨∨⟩ key.
TYPE:0 .... 55H/AAH read/write check
TYPE:1 .... 00H/FEH read/write check
TYPE:2 .... Wait time check
TYPE:ALL ... Types 0 to 2 are executed.

3)

```
CNT 1              SIMM
```

Press the (ENTER) key to start checking.
The number of checks is shown on the LCD.

When an error occurs, the following will appear on the LCD, and the checking will be aborted.
• The error address.
• The number of the slot at which the error occurred (L becomes 0 or 1 on the LCD display shown at left).

```
E  h' 0 0 0 0 0 0 0 0  L / 1
```

⇕

```
E   R : * * h   W : * * h
```

• The number of the side on which the error occurred (I becomes 0 or 1 on the LCD display shown at left.)
At this time, when the ⟨∧⟩ key or ⟨∨⟩ key is pressed, the read/write data will appear on the LCD.

4)

Press the (END) key to terminate the SIMM checking.

4-4-17. &SKEW CHECK

It is not used in the field.

4-5. #PARAMETER items

4-5-1. $SYSTEM PRM

[Function]

System parameter values are changed.

[System parameters list]

The underlined settings in the list are the initial values.

No.	Indication	Description	Set value	Remarks
0	COMP.X	Mechanical correction X (in increments of 0.1 mm 500 mm – actual measured value)	-100~0~100	Adjustment of range accuracy
1	COMP.Y	Mechanical correction Y (in increments of 0.1 mm 500 mm – actual measured value)	-75~44~75	If the system parameter value is incrased: Length of a pattern plotted will be increased.
2	R GRIP	Adjustment of dead space on the right-hand side of the paper (in increments of 0.1 mm 5mm - actual measured value)	-100~0~100	Adjustment value for edge adjustment
3	L GRIP	Adjustment of dead space on the left-hand side of the paper (in increments of 0.1 mm 5mm - actual measured value)	-100~0~100	If the system parameter value is increased: Dead space will be reduced.
4	CAPPING	Adjustment of capping position (in increments of 0.1 mm)	-100~20~100	Adjustment value for capping position
5	CAPOFF	Adjustment of cap released position (in increments of 0.1 mm)	-100~0~100	Adjustment value of cap OFF position → Wiping reference position
6	CUTposi	Adjustment X of the medium cutting position (in increments of 0.1 mm)	-100~0~100	Adjustment value in the X-direction when cutting If the system parameter value is increased: Remaining portion of the paper after cutting will become larger.
7	EDGE LV	Medium edge detection level (Unit: %)	0~50~100	Edge detection level when the medium width is detected
8	FLASHp	Adjustment of flashing position (in increments of 0.1 mm)	0~110~300	Offset of flashing position from capping position
9	COMPXsw	Mechanical correction x ineffective/effective switch at the time of 8 pass.	0~1	0: correction ineffective 1: correction effective
10	XHE.12	Adjustment of X dot position [between colors 1 and 2] (In increments of 1 dot)	-16~0~16	Adjustment value for the dot position correction 2
11	XHE.25	[between colors 2 and 5] (In increments of 1 dot)	-16~0~16	
12	XCO.23	[between colors 2 and 3] (In increments of 1 dot)	-16~0~16	
13	XCO.24	[between colors 2 and 4] (In increments of 1 dot)	-16~0~16	
14	XCO.56	[between colors 5 and 6] (In increments of 1 dot)	-16~0~16	
15	X60.14	[between colors 5 and 7] (In increments of 1 dot)	-16~0~16	

No.	Indication	Description			Set value	Remarks
16	YHE.12G	Adjustment of Y dot position Outward travel [between colors 1 and 2] (In increments of 0.1 dot)			-160~0~160	Adjustment value for the dot position correction 2
17	YHE.25G	[between colors 2 and 5] (In increments of 0.1 dot)			-160~0~160	
18	YCO.23G	[between colors 2 and 3] (In increments of 0.1 dot)			-160~0~160	
19	YCO.24G	[between colors 2 and 4] (In increments of 0.1 dot)			-160~0~160	
20	YCO.56G	[between colors 5 and 6] (In increments of 0.1 dot)			-160~0~160	
21	YCO.57G	[between colors 5 and 7] (In increments of 0.1 dot)			-160~0~160	
22	YHE.12R	Adjustment of Y dot position Inward travel [between colors 1 and 2] (In increments of 0.1 dot)			-160~0~160	
23	YHE.25R	[between colors 2 and 5] (In increments of 0.1 dot)			-160~0~160	
24	YCO.23R	[between colors 2 and 3] (In increments of 0.1 dot)			-160~0~160	
25	YCO.24R	[between colors 2 and 4] (In increments of 0.1 dot)			-160~0~160	
26	YCO.56R	[between colors 5 and 6] (In increments of 0.1 dot)			-160~0~160	
27	YCO.57R	[between colors 5 and 7] (In increments of 0.1 dot)			-160~0~160	
28	YAJ.BID	Adjustment of Y dot position Outward-inward travel [between colors 2 and 2] (In increments of 0.1 dot)			-160~0~160	
29 · · · · · 39	RESERVE	Unused				
41	H1.NORM	Head 1	Normal dot ID		1~35	Head ID of each head (5-digit numbers)
41	H1.MICR		Microscopic dot ID		1~35	
42	H1.FREQ		Frequency ID		1~3	
43	H2.NORM	Head2	Normal dot ID		1~35	
44	H2.MICR		Microscopic dot ID		1~35	
45	H2.FREQ		Frequency ID		1~3	
46	H3.NORM	Head 3	Normal dot ID		1~35	
47	H3.MICR		Microscopic dot ID		1~35	
48	H3.FREQ		Frequency ID		1~3	
49	H1.Nofs	Head 1	Normal dot ID	Offset value	-5~5	Head ID + this value = execution value
50	H1.Mofs		Microscopic dot ID	Offset value	-5~5	
51	H2.Nofs	Head 2	Normal dot ID	Offset value	-5~5	
52	H2.Mofs		Microscopic dot ID	Offset value	-5~5	
53	H3.Nofs	Head 3	Normal dot ID	Offset value	-5~5	
54	H3.Mofs		Microscopic dot ID	Offset value	-5~5	
55	WORMadj	Worm gear correction value			0~1~8	0: correction inactivated 1 to 8: the correction value
56	FEEDlow	Long direction feed rate (1mm/s)			1~10~60	Medium feed speed when total feed is 9mm or more

5-1. Disassembly and assembly

5-1-1. Front cover assy., Y cover, left cover assy., Station cover and rear cover
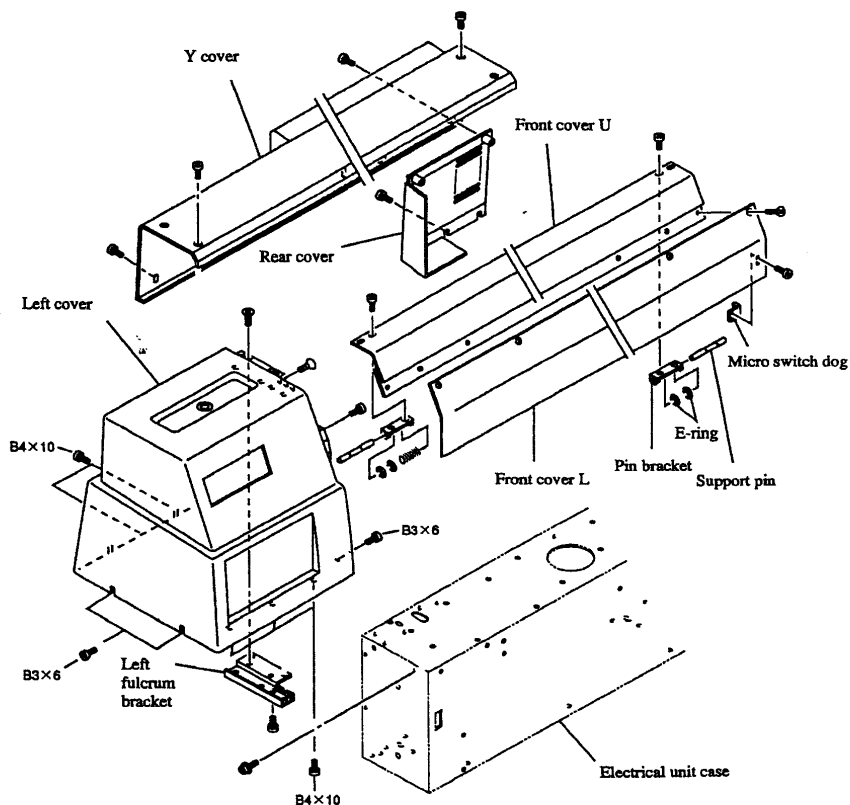
[Tools to be used]
- Phillips screwdriver (No. 2 for M3 to M5)

[Disassembling procedure]

Remove the covers as follows.

To disassemble, remove nine screws (B3 x 6), then remove the front cover assy., then remove the Y cover. Next, remove three screws (B3 x6) and six screws (B4 x10), then remove the left cover assy. Then the station cover and the rear cover can be removed individually.
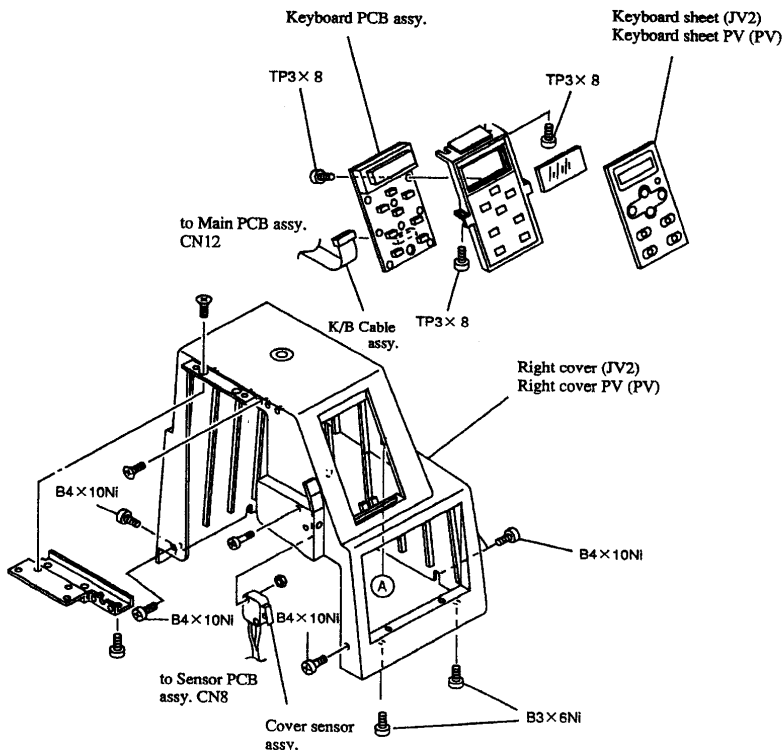
5-1-2. Right cover assy. and keyboard assy.

[Tools to be used]
- Phillips screwdriver (No. 2 for M3 to M5)

[Disassembling procedure]

1) Remove the front cover assy., Y cover, rear cover and station cover. Detach the front cover sensor connector (CN8) from the sensor PCB and the cover sensor assy. cable from the cable clamp.

2) Loosen four screws (B4 x 10Ni) in the rear and side faces of the right cover assy.

3) Remove two screws (B3 x 6Ni) from the under surface and front face of the right cover assy.

4) Remove two screws (B4 x 10Ni) from the inner side face of the right cover assy.

5) Slip the right cover assy. upward, then insert a hand through the ink fill port and remove the keyboard connector.

6) Remove the right cover assy. upward.

7) Turn the right cover assy. over, then remove five screws (TP3 x 8) from the keyboard assy.

8) Remove the keyboard assy., then remove five screws (TP3 x 8) from the keyboard PCB.

9) Remove the keyboard PCB.

Keyboard PCB assy.

Keyboard sheet (JV2)
Keyboard sheet PV (PV)

TP3 × 8

TP3 × 8

to Main PCB assy.
CN12

K/B Cable assy.　TP3 × 8

Right cover (JV2)
Right cover PV (PV)

B4×10Ni

B4×10Ni

B4×10Ni　B4×10Ni

to Sensor PCB assy. CN8

Cover sensor assy.

B3×6Ni

[Assembling procedure]

⚠️ CAUTION

- When installing the right-side cover, adjust so that the wire of K/B cable assy. does not come in contact with any of the moving parts of Y-drive pulley and belt. In addition, do not cut off the insulated lock located near the cover sensor.
  If the wire of K/B cable assy. comes in contact with any of the aforementioned moving parts, the vinyl cover of the cable can break to give rise to a short-circuit.
  1) Draw the wire downward.
  2) Clamp the drawn-out wire.
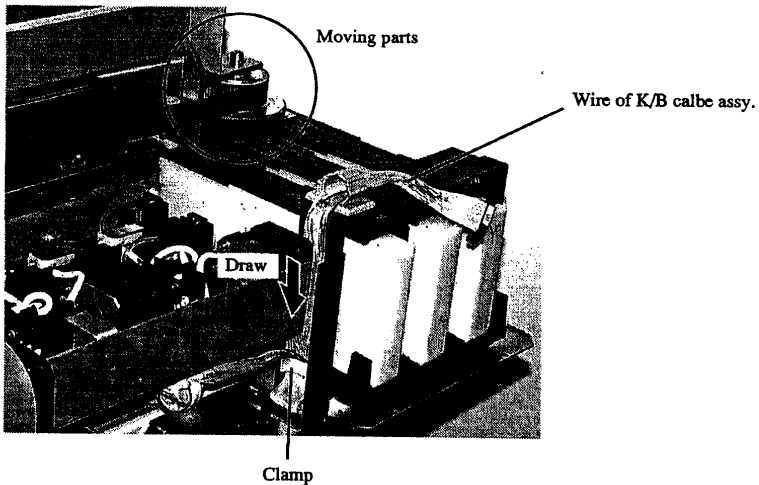
Assembly is the reverse of disassembly.

[Items to be checked]

After you have installed the right-side cover, visually check to be sure that neither the wire of K/B cable nor that of cover sensor come in contact with the moving parts of Y-drive pulley and belt.

5-1-3. Electrical equipment cover 1 assy. and high speed I/F (IEEE1284) PCB assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)

[Disassembling procedure]
1) Remove five screws (B3 x 6NI) from the front face of the electrical equipment cover 1 assy.
2) Loosen two screws (B3 x 6NI) in the under surface of the cover assy.
3) Draw the electrical equipment cover 1 assy.
4) Remove two screws (Centronics connector, M2) from the high speed I/F PCB.
5) Separate the electrical equipment cover 1 assy. from the I/F PCB.

[Assembling procedure]
Assembly is the reverse of disassembly.

5-1-4. Electrical equipment cover 2, 3, 4 assemblies

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
1) Remove five screws (two screws: B4 x 8Ni, three screws: B3 x 6Ni) from the front face of each assy.
2) Loosen the screws (B3 x 6Ni) in the top surface and under surface of each assy.
3) Shift each assy. backward until it comes off.

[Assembling procedure]
Assembly is the reverse of disassembly.

5-1-5. Y-motor assy. and timing belt

[Tools to be used]
- Phillips screwdriver (No. 2 for M3 to M5)
- Slotted screwdriver (Long side 2.5 mm)
- Box wrench (opposite side distance: 7 mm)

[Disassembling procedure]
1) Remove the front cover assy. and Y cover assy.
2) Remove the right cover assy.
3) Remove the electrical equipment cover 2 assy.
4) Detach Y-motor connector (CN20) from the main PCB and route the motor cable outside the electrical unit case.
5) Remove two screws (P4 x 12SMW) from the Y motor bracket, then pull the Y motor bracket assy. out.
6) Remove two screws (P4 x 8SMW) from the Y motor plate assy.
7) Remove the two studs (4SQ-30) that hold the Y motor to the bracket. (The belt pulley cannot be removed from the motor. Replace the motor together with the pulley.)

Follow the procedure given below to disassemble the timing belt.
8) Remove the left cover assy.
9) Loosen spring retaining screw on the tension pulley side to release the tension.
10) Remove E-ring (E-6) from the driving shaft on the driving bracket side using a slotted screwdriver.
11) Draw the driving shaft downward until it comes off.
12) Draw out the timing belt.
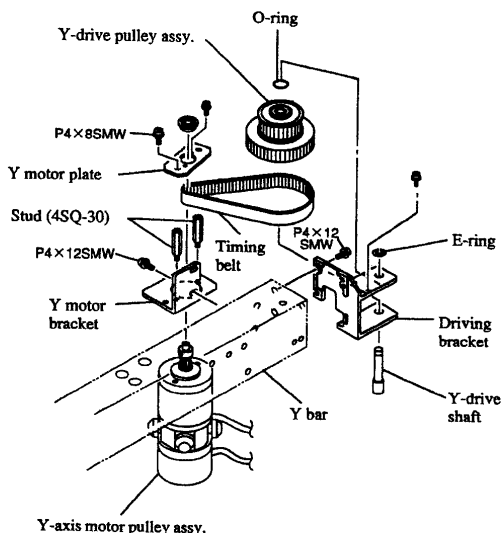
[Assembling procedure]

⚠️ CAUTION
- When installing the driving shaft, be sure to place an O-ring.
- At the time of installing Y motor, make sure that the motor is not inclined. (because the load to the motor will increase due to inclination)

Assembly is the reverse of disassembly.

[Items to be checked/adjusted]
Adjustment of the Y-motor belt tension

5-1-6. Head cover, slider PCB and linear encoder PCB assy./scale

⚠️ CAUTION
- Be sure to disassemble/assemble the linear encoder sensor after shifting the slide to the rightmost position (capping position). If the slider rests at any other position the linear encoder sensor can not be removed.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Box wrench (opposite side distance: 5.5 mm)
- Phillips screwdriver (No.1 for M2)

[Disassembling procedure]
1) Remove the front cover assy. and Y cover.
2) Remove three screws (B3 x 6 black) from the head cover.
3) Shift the head cover frontward until it comes off.

Follow the procedure given below to disassemble the slider PCB and linear encoder PCB assy.
4) Remove two screws (B3 x 6Ni) from the head up/down lever assy., then pull the assy. out.
5) Remove four screws (B3 x 6Ni) from the plate that guards the slider PCB.
6) Pull the plate, together with the plastic head cover bracket, in the sideways direction of the ink supply tube.
7) Detach all of the connector FPC from the slider PCB.
8) Remove four screws (P3 x 8SMW) from the slider PCB.
9) Pull the slider PCB in the sideways direction.

Follow the procedure given below to disassemble the linear encoder sensor.
10) Remove two screws (P3 x 6SMW) from the slider PCB.
11) Slide the slider PCB bracket upward, then remove two screws (P3 x 8SMW) from the linear encoder sensor assy.
12) Remove the linear encoder sensor assy.
13) Remove two screws (P2 x 16) from the linear encoder PCB assy.

Follow the procedure given below to disassemble the linear encoder scale.
14) Remove two screws (P3 x 14SMW) from the scale RD on the right side of the encoder scale.
15) Pull the right end of the encoder scale out from the rear of the slider.
16) Remove two screws (P3 x 8SMW) from the scale LD on the left side.
17) Remove two screws (TP3 x 8) from the encoder scale.
18) Remove the encoder scale.

[Assembling procedure]
Assembly is the reverse of disassembly.

[Items to be checked/adjusted]

- Linear encoder scale height adjustment

  Be careful of the following points when mounting the linear encoder PCB assy.

  * Interference between the linear encoder PCB assy. cable and slider stopper.
  * Visually check the gap between the linear encoder PCB assy. and the scale; it should be 0.3mm or more in each direction.

  Make sure that there is enough of a gap so that there is no interference when the head is moved a full stroke.

- Make sure to use P3 x 6 SMW screw for the slider PCB BKT fixing screws. If other screw is used, there is a possibility of motor alarm.
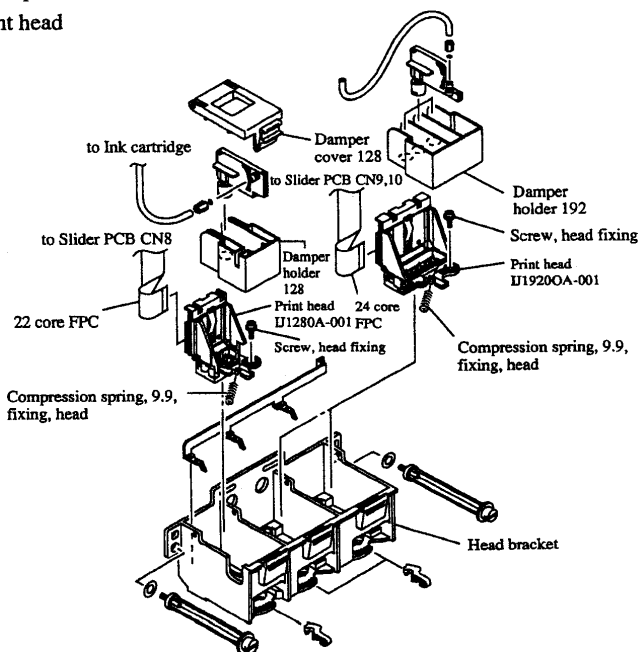
5-1-7. Print head 192/128 and head FPC

⚠️ CAUTION
• Disassemble the print head by moving the slider on the platen.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Long-nose plier
- Phillips screwdriver (No.1 for M2)

[Disassembling procedure]
1) Remove the front cover assy.
2) Remove the head cover.
3) Remove the head up/down lever assy.
4) Remove the head cover bracket (including the plate).
5) Grab the base of the damper cover of the print head to be disassembled with the fingers, then remove it from the head bracket.
6) Pull the FPC cable of the print head to be disassembled out from the slider PCB.
7) Pull the damper assy., together with the damper holder, out using long-nose pliers.
8) Remove the spring (compression spring 9.9) that holds the head in place with long-nose pliers.
9) Remove the screw that holds the head in place.
10) Pull the head out upward.
11) Separate the print head from the FPC.

to Ink cartridge

Damper cover 128

to Slider PCB CN9,10

Damper holder 192

to Slider PCB CN8

Screw, head fixing

Damper holder 128

Print head IJ1920OA-001

Print head IJ1280A-001 FPC

24 core

22 core FPC

Screw, head fixing

Compression spring, 9.9, fixing, head

Compression spring, 9.9, fixing, head

Head bracket

[Assembling procedure]

⚠ **CAUTION**
- Copy the 5-digit number on the print head to a location on the FPC where it will be visible after the assembly.
- Tighten the head fixing screw as far as it goes. Then turn the screw in the reverse direction by a 45-degree angle.
- When installing the spring that holds the head in place, confirm that the print head turns with a head tilt lever.
- Insert a damper into a damper holder in such a manner as to bring the damper below the top surface of the damper holder.
- Be careful not to touch the print head nozzle surface absolutely.

Assembly is the reverse of disassembly.

[Items to be checked/adjusted]
1) Head ID input
2) Ink filling
3) Head angle adjustment
4) Dot position correction

5-1-8. Main FPC cable assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)

Disassembling procedure
1) Remove the Y cover and the front cover assy.
2) Remove the rear cover.
3) Remove the head cover.
4) Remove the electrical equipment cover 2 assy.
5) Detach four main FPC cable connector from the main PCB and route the cable outside the electrical unit case.
6) Remove the main FPC cable connectors from the slider PCB and remove two screws (B3 x 6NI) from the FPC cover.
7) Loosen a screw (P3 x 8SMW) in the FPC holder.
8) Remove the cable clamp etc., and draw the main FPC cable upward until it comes off.

[Assembling procedure]
Assembly is the reverse of disassembly.

## 5-1-9. Cutter assy., cutter actuator assy. and paper width sensor PCB assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Nitoflon tape or acetate fabric tape

[Disassembling procedure]
1) Remove the head cover.
2) Detach the head cover bracket.
3) Remove the connectors (CN5)(CN6) from the slider PCB.
4) Remove two screws (B3 x 6NI) from the cutter bracket assy.
5) Remove the tape that holds the lead wire in place.
6) Remove two screws (B3 x 5 black) from the paper width sensor PCB assy.
7) Remove two screws (B3 x 5) from the cutter actuator assy., then remove the main body of the assy., leaving the iron core.

Cutter bracket assy.

B3 × 5

to Slider PCB CN6

Paper width sensor PCB assy.

B3x6Ni

B3 × 6 Ni

to Slider PCB CN5   Cutter actuator assy.
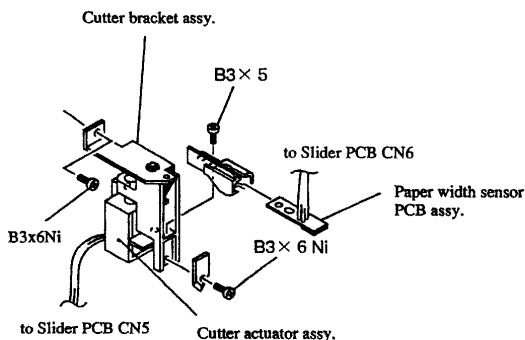
[Assembling procedure]

⚠ CAUTION
- When assembling, make sure that the cutter actuator assy. lead wire does not interfere with the cutter holder.
- Install the cutter actuator assy. in a position where it will move smoothly, without the iron core hitting the bottom.
- Secure the lead wires of the sheet width sensor assy. and cutter actuator assy. with tape.

Assembly is the reverse of disassembly.
- After assembly, make sure that the cutter edge at full width does not interfere with the platen or the platen cover F.

[Items to be checked/adjusted]
6-9. Correction of displacement of head for each color

5-1-10. PR and P holder assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Hexagon wrench (opposite side distance: 2 mm)
- Slotted screwdriver (Long side 2.5 mm)

[Disassembling procedure]
1) Remove the semi-elliptic E-ring (BETW-2.5) from the PR shaft B.
2) Draw out the PR shaft B and detach the P.R14 and slider washer.

Follow the procedure given below to disassemble the P-holder assy.
3) Remove the Y cover and front cover assy.
4) Remove the right cover assy.
5) Loosen the screws (SSWP4 x 4) in the stopper of the clamp shaft.
6) Remove the screws (P4 x 12TW) from the clamp shaft and the clamp arm.
7) Draw the clamp shaft to the right until it comes off.
8) Detach the P holder assy.

P holder

Semi-elliptic E-ring

Slider washer

P. R14

PR shaft B
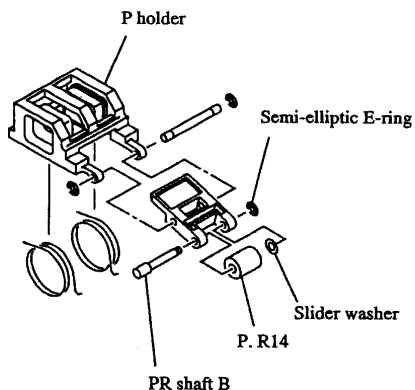
[Assembling procedure]
Assembly is the reverse of disassembly.

5-1-11. Platen covers, front and rear, front and rear paper sensor assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
1) Remove the Y cover and front cover assy.
2) Remove the left cover assy.
3) Remove five (four in case of 36 inch model) screws (B3 x 5NI) from the platen cover, front. Draw out the platen cover, front. (Follow the same procedure for the platen cover, rear.)

⚠ CAUTION
- When drawing out the platen cover, be careful that it is not caught on the sensor.

4) Remove the electrical equipment cover 2 assy.
5) Detach the front and rear paper sensor assy. connector (CN6: paper sensor F, CN8:paper sensor R) from the main PCB and route the cable outside the electrical unit case.
6) Remove a screw (P3 x 6SMW) from the paper sensor bracket.
7) Remove a screw (B3 x 10 black) from the paper sensor assy.

[Assembling procedure]

⚠ CAUTION
- Insert the platen cover between the fram and P-cover BKT.

Assembly is the reverse of disassembly.

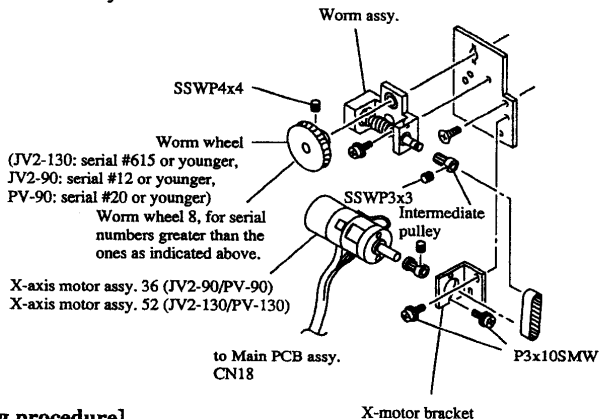## 5-1-12. X-motor total assy., worm assy. and worm wheel

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Hexagon wrench (opposite side distance: 2mm, 1.5 mm)

[Disassembling procedure]
1) Remove and Y cover assy. the front cover assy.
2) Remove the left cover assy.
3) Remove the electrical equipment covers 2 and 3 assemblies.
4) Detach the X-motor connector (CN18) from the main PCB and route the cable outside the electrical unit case.
5) Remove two screws (P3 x 10SMW) from the X-motor bracket and then remove the X-motor total assy.

Follow the procedure given below to disassemble the worm assy. and the worm wheel
6) Remove two screws (P4 x 12SMW) from the worm total assy.
7) Loosen two screws (SSWP4 x 4) on the worm wheel.
8) Pull the worm total assy. and the worm assy. out at the same time.
9) Loosen the screw (SSWP3 x 3) on the intermediate pulley, then separate the pulley from the worm assy.

Worm assy.

SSWP4x4

Worm wheel
(JV2-130: serial #615 or younger,
JV2-90: serial #12 or younger,
PV-90: serial #20 or younger)
Worm wheel 8, for serial
numbers greater than the
ones as indicated above.

X-axis motor assy. 36 (JV2-90/PV-90)
X-axis motor assy. 52 (JV2-130/PV-130)

SSWP3x3
Intermediate
pulley

to Main PCB assy.
CN18

P3x10SMW

X-motor bracket

[Assembling procedure]

⚠ CAUTION
- When loosening the X-motor belt tension, make sure to operate "$WORM GEAR adjust".

Assembly is the reverse of disassembly.

[Items to be adjusted]
- Adjustment of the X-motor belt tension.
- Worm gear adjustment.
- Distance adjustment.

5-1-13. Cap slider assy., pump motor 1, 2 assy. and pump 1,2 assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
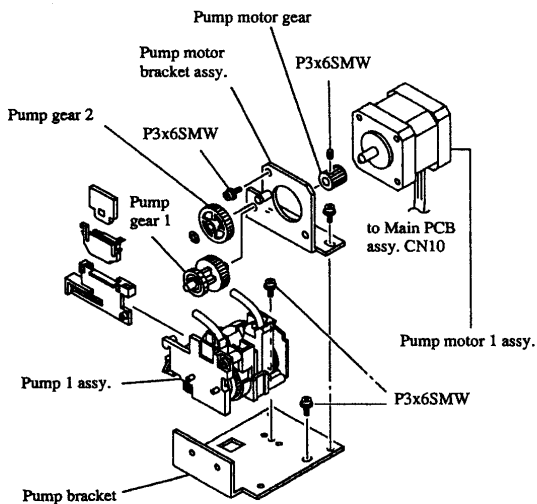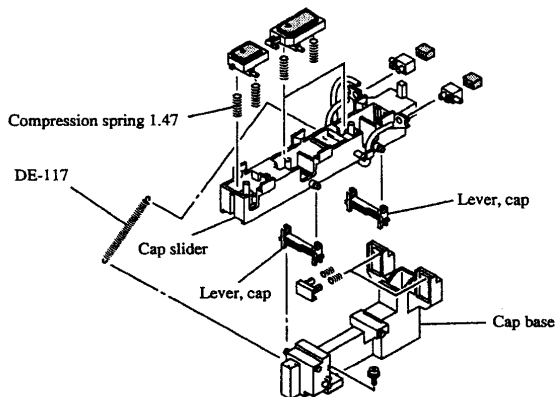- Long-nose pliers

[Disassembling procedure]
1) Remove the Y cover assy. and front cover assy.
2) Remove the right cover assy. and rear cover assy.
3) Remove the station cover and station cover R.
4) Detach three tubes that connect the pump assy. with the cap slider assy.
5) Remove the spring (DE-117) giving a tension between the cap slider assy. and the cap base.
6) Remove the cap slider assy. from the lever and cap.

Follow the procedure given below to disassembly the pump motor 1,2 assy. and pump 1,2 assy.
7) Remove the electrical equipment cover 2 assy.
8) Remove the pump motor connectors (CN10: pump motor 1 assy.; CN11: pump motor 2 assy.) from the main PCB, then route the cable outside the electrical unit case.
9) Remove two screws (P3 x 5SMW) from the pump motor bracket.
10) Remove, together with the pump motor bracket, by sliding to the right. Remove pump gear 1 at the same time.
11) Remove two screws (P3 x 6SMW) from the pump motor, then remove the pump motor from the bracket.
12) Loosen screws (SSWP3 x 3) on the pump gear, then remove the gear.

Follow the procedure given below to disassemble the pump 1, 2 assy.
13) Remove a screw (P3 x 6SMW) from the pump assy.
14) Remove the pump assy. by sliding it to the right.

Compression spring 1.47

DE-117

Cap slider

Lever, cap

Lever, cap

Cap base

Pump motor gear

Pump motor
bracket assy.

P3x6SMW

Pump gear 2

P3x6SMW

Pump
gear 1

to Main PCB
assy. CN10

Pump motor 1 assy.

Pump 1 assy.

P3x6SMW

Pump bracket

[Assembling procedure]

Assembly is the revese of disassembly.

[Items to be checked]

- When connecting the pump assy. and the cap slider assy. tube, insert the tube all the way in to the base.
- After assembly, move the cap slider assy. with the fingers, and confirm that it moves smoothly.

5-1-14. Main PCB assy. and power supply PCB assy.

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]

1) Plot the system parameters using "parameter plot".
2) Turn OFF the power supply switch.
3) Remove the electrical equipment cover 1 assy. and the electrical equipment cover 2 assy.
4) Remove all of the connectors from the main PCB assy. (or the power supply PCB assy.)
5) Remove six screws from the main PCB assy. or seven screws (P3 x 8SMW) from the power supply PCB assy.
6) Take out the main PCB assy. or the power supply PCB assy.

[Assembling procedure]

⚠ CAUTION

- After replacing the main PCB assy., enter the system parameters of the main PCB assy. that was replaced.
- When plugging the connector in, be careful to plug into the connector with the correct connector number.
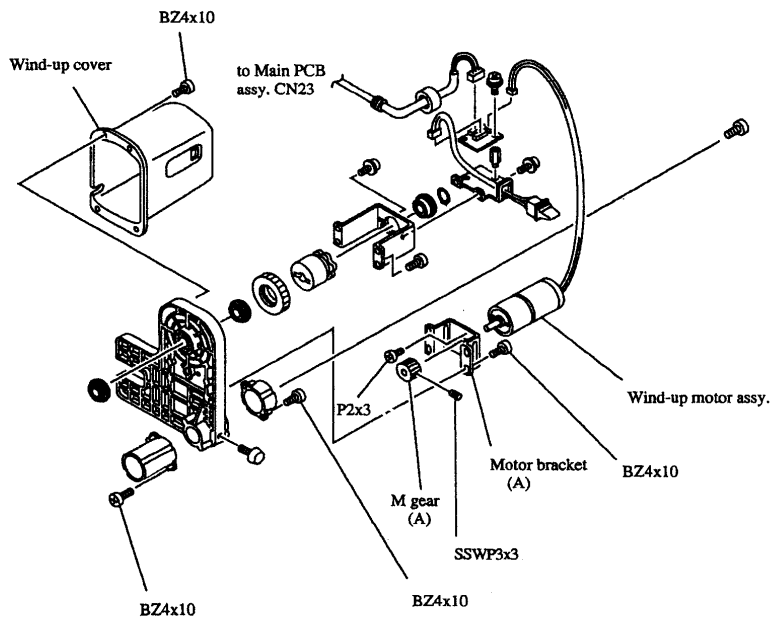
Assembly is the reverse of disassembly.

5-1-15. Wind-up motor assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 ro M2)
- Hexagon wrench (opposite side distance: 1.5 mm)
- Insulated lock (L=150 or less)

[Disassembling procedure]
1) Remove four screws (BZ4 x 10) from the wind-up cover, and then remove the wind-up cover.
2) Remove the wind-up motor connector from the wind-up motor PCB assy.
3) Remove four screws (BZ4 x 10) from the motor bracket (A).
4) Remove two screws (P2 x 3) holding the wind-up motor assy. and the motor bracket and separate them.
5) Remove a screw (SSWP3 x 3) from the M gear (A) mounted on the wind-up motor, and draw out the gear.

[Assembling procedure]

⚠ CAUTION
- When fixing the M gear (A) in place, match the screw and the motor shaft D cut.
- Replace the insulated lock that has been cut off with a new one.

Assembly is the reverse of disassembly.

5-1-16. Ink supply tube (inside diameter: ⌀2 mm)

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Insulating lock (L=150 or less)

[Disassembling procedure]

⚠️ **CAUTION**
- When removing the tube, be careful of the order of the colors and make a mark for reference.
- There are O-rings inside all of the screws that hold the tubes in place. Be careful not to lose them.

1) Remove the Y cover and the front cover.
2) Remove the left cover assy.
3) Remove the right cover assy.
4) Eject ink from all of the print heads using "DISCHARGING INK".
5) Remove the screws that hold all of the SUS pipes and tube joints in place.
6) Remove six screws that hold the joints of the tube of inner diameter 2mm and the tube of inner diameter 1.4 mm to the front surface of the head.
7) Remove the damper assy. from the print head 128.
8) Remove the screws that hold the damper assy. and the tube of inner diameter 2 mm in place.
9) Remove two screws (P3 x 8SMW) from the tube holder.
10) Twist and remove the connecting sections of the blocks at both ends of the tube bear, then remove the tube together with the cable bear.
11) Pull the tube to be replaced out, then pull it out of the protective tube.
12) Cut a new tube to the length of the tube that is to be replaced.

[Assembling procedure]

⚠️ **CAUTION**
- When connecting a tube, be careful that the order of the colors on the SUS pipe matches the order of the colors on the print head.
- Tighten the screw that holds the tube in place by hand, then tighten tightly until it will not turn any more.
- After connecting, perform "FILL UP INK."

Assembly is the reverse of disassembly.
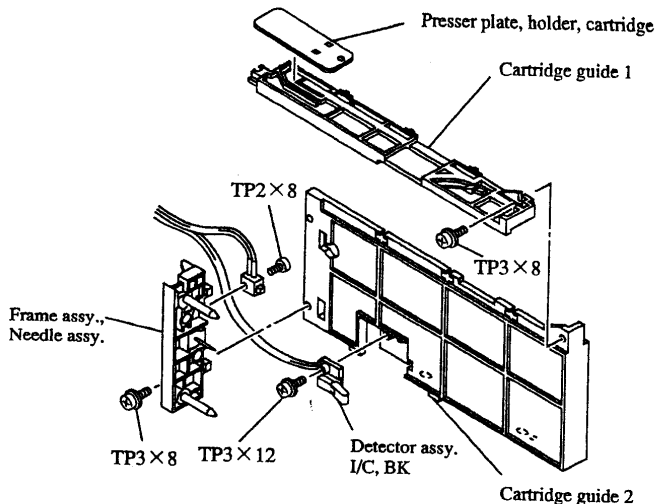
5-1-17. Detector assy. I/C and BK.

⚠️ CAUTION
- Be careful not to lose the O-rings inside the screws that hold the ink supply pipe, the frame assy. and the needle assy. in place.

[Tools to be used]
- Tools to be used
- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)
- Insulated lock (L=150 or less)
- Nipper
- Disassembling procedure

[Disassembling procedure]
1) Remove the Y cover and the front cover assy.
2) Remove the right and left cover assemblies.
3) Remove the head cover.
4) Eject the ink that is inside the tube by performing "DISCHARGING INK" for the head that corresponds to the detector assembly to be disassembled.
5) Remove the screws that hold the ink supply pipe, the frame assy. and the needle assy. in place.
6) Remove the electrical unit case 3 assy., then remove the connector from the detector assy. to be disassembled.
7) Remove two screws (P3 x 8SMW) from the left or right cartridge presser.
8) Remove two screws (TP3 x 8) from cartridge guide 2.
9) Pull up and out together with the assembly.
10) Remove a screw (TP2 x 8) from the side of the sensor that detects whether or not there is a detector assembly cartridge.
11) Remove a screw (TP3 x 12) from the side of the sensor that detects the amount of ink remaining in the detector assembly.
12) Remove the detector assembly I/C and BK.

Presser plate, holder, cartridge

Cartridge guide 1

TP2×8

TP3×8

Frame assy., Needle assy.

TP3×8   TP3×12

Detector assy. I/C, BK

Cartridge guide 2

[Assembling procedure]

⚠ **CAUTION**

- Tighten the screws that hold the ink supply pipe and the connecting section of the frame assembly and the needle assy. in place by hand, then tighten them tightly until they will not turn any more.
- After assembly, fill up ink.

Assembly is the reverse of disassembly.

6-2-9. Adjustment of the Y-motor belt tension

[The case that needs adjustment]
- In the case where the Y-motor total assy. is removed
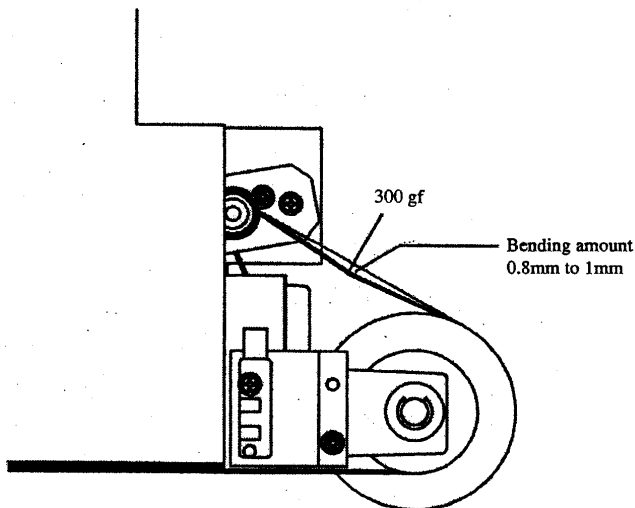
[Tools to be used]
- Tension wire
- Tension gauge (Max. 300gf or more)
- Phillips screwdriver (No.2 for M3 to M5)

[Disassembling procedure]
Remove the front cover assy., Y cover, right cover assy. and rear cover assy.

[Adjusting procedure]
1) Loosen the screw (P4 × 10SMW) in the Y-motor bracket.
2) Fix the Y-motor bracket in place so that when the Y-motor total assy. is pushed down with 300gf, it bends between 0.8mm and 1.0mm.

300 gf

Bending amount
0.8mm to 1mm

6-2-10. Adjustment of the head angle

[The case that needs adjustment]
- The dot position is displaced.
- When the following parts are replaced:
  a) Print head IJ1280A-001
  b) Print head IJ1920A-001
  c) Head bracket assy.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Magnifier (Magnification of approx. 50)

[Disassembling procedure]
1) Remove the head cover assy.
   Three screws B3 x 6 black (Head cover assy./Head cover bracket)

[Adjusting procedure]
1) Using the "&CHECK PATTERN → SLANT" function in the maintenance menu, print a
   pattern on the "PET gloss (part number SPC-0111)" media.
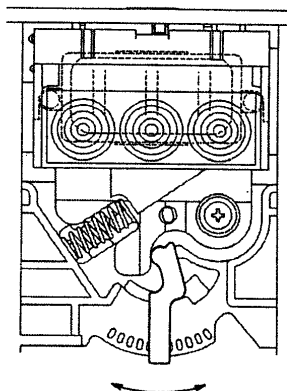

| NG | OK | NG |

2) Head 1 adjustment........ Check the head 1 pattern with a magnifier, then adjust so that the gaps between all of the lines are equal. If adjustment is necessary, press the JOG key to remove the head from capping, then move the adjustment lever.

3) Head 2 adjustment........ Check the head 2 pattern with a magnifier, then adjust so that the 2 colors are superimposed on the same line. If adjustment is necessary, press the JOG key to remove the head from capping, then move the adjustment lever.

4) Head 3 adjustment........ Similar to step 3) Head 2 adjustment.

5) When adjustment with the adjustment lever is completed, print the slant pattern and check with a magnifier. If OK, then the adjustment is completed; if NG, then repeat steps 2) [3), 4)], and 5).

[Assembling procedure]

Assembly is the reverse of disassembly.

* After head tilt adjustment is completed, always adjust the dot position.

If the tilt was adjusted but horizontal white lines appear

See the separate section "Head tilt fine adjustment".

6-2-11. Head angle fine adjustment

[The case that needs adjustment]
- The head tilt was adjusted, but intense horizontal white lines appear.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Magnifier (Magnification of approx. 50)

[Disassembling procedure]
The procedure is similar to that for head angle adjustment.

[Adjusting procedure]
1) Using the "&CHECK PATTERN → 100% → 360dpi → UNI-D 4 passes → K" function in the maintenance menu, print a pattern on the "PET gloss (part number SPC-0111)"media; stop the plotting during the 4th or a subsequent pass.
2) When the interrupted last pass becomes the 1st pass, pay attention to the 2nd pass and the 3rd pass. Check whether the dots are centered midway between the dots of the previous pass.
3) If OK, end the adjustment; if NG, then move the head angle adjustment lever and repeat the check in step (2).
   The amount by which the head angle adjustment lever is moved should be within 2 steps left or right from the position determined in the head angle adjustment.

[Assembling procedure]
Assembly is the reverse of disassembly.
- * After the head angle fine adjustment is completed, always adjust the dot position.
- * In dot position adjustment after this adjustment has been made, there are cases that adjustment must be made within the same head (between 2 and 3, between 2 and 4, between 5 and 6, between 5 and 7).
   (Make adjustment cautiously as the dot position adjustment within the same head is made in 1 dot increment.)
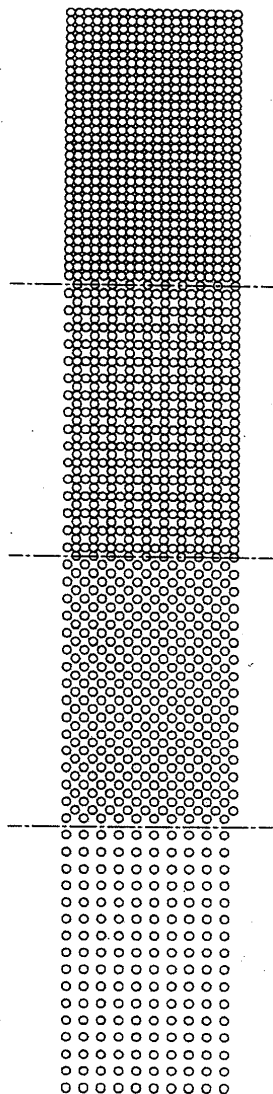
6-2-12. Adjustment of the dot position

[The case that needs adjustment]
- The dot position is displaced
- When the head angle was adjusted

[Tools to be used]
- Magnifier (Magnification of approx. 50)

[Adjusting procedure]
1) Using the "&PRINTadjust2" function in the maintenance menu, print the adjustment pattern on the "PET gloss (part number SPC-0111)" media. Then perform the adjustment of four items as below.
   - X PRINT
   - Y SINGLE
   - Y REPEAT
   - Y BI-D
2) Then perform fine adjustment.
   Using the "&PRINTadjust2 → FINE → all colors" function in the maintenance menu, print the adjustment pattern on the "PET gloss (part number SPC-0111)" media. Check for dot displacement with a magnifier.
3) Enter the corrected value. Perform the printing in step (2), and recheck for dot displacement. (4) If OK (the dot displacement is within 0.5 dot), then end the adjustment; if NG, repeat the work in step (3).

⚠ CAUTION
- Basically the adjustment is only performed between heads (between 1 and 2 and between 2 and 5); do not perform adjustments within the same head (between 2 and 3, between 2 and 4, between 5 and 6, between 5 and 7).

- Fix the head height at the position for "Media Type: thin".

6-2-13. Adjustment of the right and left edges

[The case that needs adjustment]

Adjust the edges in the case where the dead spaces on the right and left of the sheet exceeds the reference value after replacing the paper width sensor assy. or the like.

[Tools to be used]

- Roll paper
- Scale

[Adjusting procedure]

1) Perform the adjustment of edges using "&EDGE ADJUST" of the maintenance function.

6-2-14. Adjustment of torque limiter in wind-up unit

[The case that needs adjustment]
- When the wind-up torque is too small, so that the medium cannot be wound up.
- When the wind-up torque is too large, so that white lines appear, or the distance accuracy is incorrect.

[Tools to be used]
- Phillips screwdriver (No.2 for M3 to M5)
- Slotted screwdriver (Long side 2.5 mm)
- Tension gauge (for max. 500g)

[Adjusting procedure]
Torque adjustment value: 265gf ± 25gf

1) Turn the plotter power ON, then set the "TEST" > "ACTION TEST" > "ROLL MOTOR" function to ON.
2) Set the accessory paper core in the wind-up unit.
3) Remove four screws (BZ4 x 10) that attach the wind-up cover, then remove the wind-up cover.
4) Fasten paper (width 30mm, length about 200mm) to the middle of the paper core with tape.
5) Open a hole in the end of the paper, and hook a tension gauge through the hole.
6) Set the wind-up unit switch to "FORWARD", then measure the tension (torque) with the tension gauge.

Adjust the torque of the torque limiter
7) With the protrusion on the turn stopper clip fitted into the hub groove, slide it and remove it from the stop button (the protrusion).
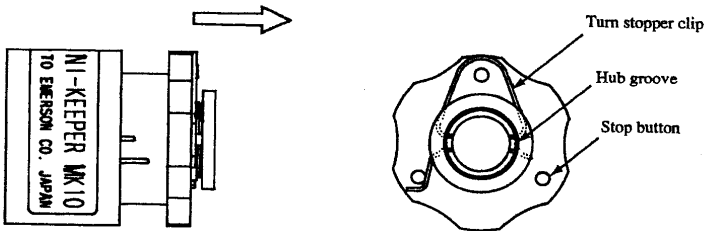

8) Turn the adjustment nut in units of at least 1/3 turn and adjust the torque needed so that the clip will hit the stop button (when the adjustment nut is turned in the direction of tightening, the torque increases).
9) Turn the roll holder several turns to smoothen the torque limiter, and then measure the tension.

10) Repeat steps 7) and 8) and adjust to within the prescribed limits.
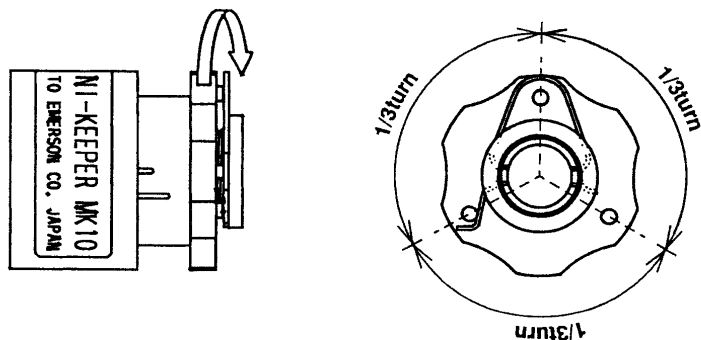
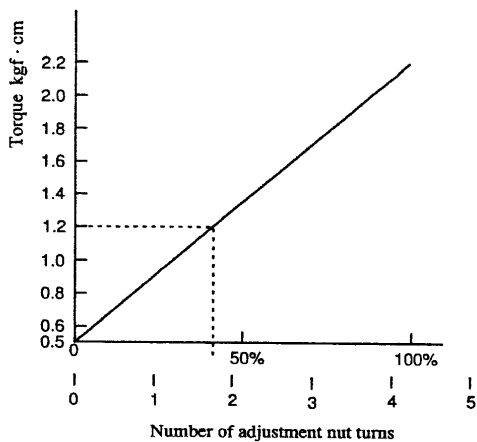11) After adjusting the torque, slide the turn stopper clip into place.
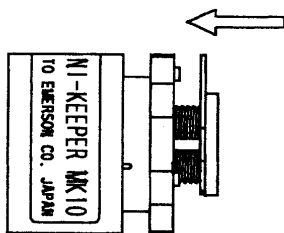
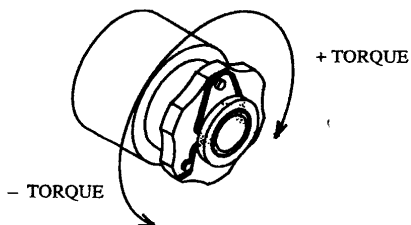
12) After the adjustment is completed, check the following points.
   a. The clip protrusions are in the hub groove (on both sides).
   b. The clip is in the position where it butts up against the adjustment nut stopper button (the protrusion).
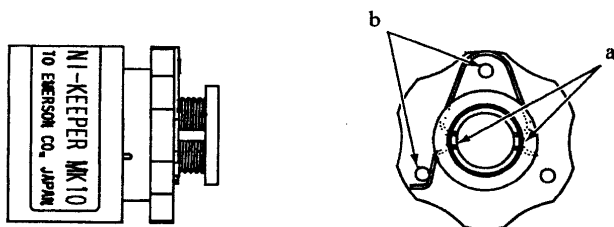
MK-10 Torque curve

Number of adjustment nut turns	Δ T (gf·cm)	Δ F (gf) ⌀80 hr.
1/3	133.2	33.3
1	399.7	99.9
	1200	300

+ TORQUE

− TORQUE

Torque kgf · cm

2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.5

0   50%   100%

0   1   2   3   4   5

Number of adjustment nut turns

This graph is for the case in which the torque limiter acts in isolation. It can change when it is attached to the actual machine.

変更来歴

日付	ヴァージョン	改定ページ	変更内容
'98.06.01	1.00		初版印刷
'99.02.24	1.10	P.1-2	Yモータの信号→文章変更
		P.1-4	プロッティングモード　2pass→(360dpiのみ)　追加
		P.1-5	コマンド→YMCKの後に+Or, Grを追加
		P.1-6	インク仕様→インク仕様可能量の項を追加
		P.1-7	プロッティングモード　2pass→(360dpiのみ)　追加
		P.1-8	コマンド→YMCKの後に+Or, Grを追加
			ノイズ, 動作連続音65db→70dbに変更
		P.2-3	メイン基板→文章変更
		P.2-5	高速I/F基板→文章変更
		P.2-6	2-1-11の項→削除
		P.2-10	表修正
		P.3-4	エラー31→内容を追加 エラー32→内容を追加 エラー41の対処方法→文章追加 エラー50の対処方法→文章追加
		P.3-5	表の最終項→文章変更
		P.3-6	3-3-6作図不良3の原因の項の(2)→文章変更 3-3-6作図不良3のチェック方法の項→文章追加 3-3-6作図不良3の処置の項→文章変更, 削除
		P.3-13	3-3-10作図位置がずれるの処置の項→文章変更
		P.4-13	機能の項→文章変更 操作の項→文章、LCD表示追加
		P.4-18	機能の項→文章追加
		P.4-19	操作の項のLCD表示→数値変更
		P.4-23	イラスト変更
		P.4-24	3)→文章削除
		P.4-30	注意書き→文章変更
		P.4-31	3)→数値変更
		P.4-35	4)→数値変更
		P.4-36	注意書き→文章追加 3)、5)、6)→数値変更
		P.4-47	5)→文章変更、LCD表示追加
		P.4-51	ページ追加→4-4-17　スキューチェック
		P.4-52	システムパラメータの表、No.9→全ての項変更
		P.4-54	No.57→設定値変更
		P.4-57	4-6-1のI/F側ファームウェア→説明文変更 4-6-2の項の文章変更
		P.4-58	4-6-3→文章削除
		P.4-59	操作6)→注意追加
		P.4-61	sci追加
		P.4-62	スキューチェック追加
		P.5-7	注意書き追加

変更来歴