Mimaki

JV4 Series

COLOR INKJET PLOTTER

MAINTENANCE MANUAL

Ver. 1.00

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D500175

FOREWORD

This maintenance manual covers items required to be remembered to conduct maintenance works for the JV4 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 JV4 Series (D200571).**

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CHAPTER 1

OVERVIEW OF MAINTENANCE

1-1. Cautions in maintenance

Following cautions have to be taken when conducting maintenance works.

- Be sure to fully understand precautions given in “For safe operation” in the Instruction Manual for the JV4 series.
- 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.
- 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 head with the head stopper.
- 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.)

CAUTION

- Danger of explosion if battery is incorrectly replaced.
  Replace only with the same or equivalent type recommended by the manufacture.
  Dispose of used batteries according to the manufacturer's instructions.
- Do not get ink drops on the FPC or connectors when connecting or disconnecting the damper. Doing so may cause short-circuit or inferior contact resulting in abnormal ink discharge. Be careful when handling ink.
- Properly and carefully connect the FPC cable of the slider PCB from the HDC PCB according to the connector number. Failure to do so may cause short-circuit of the power supply.
- Do not turn the power off during firmware upgrading. Doing so may disable restarting.

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.

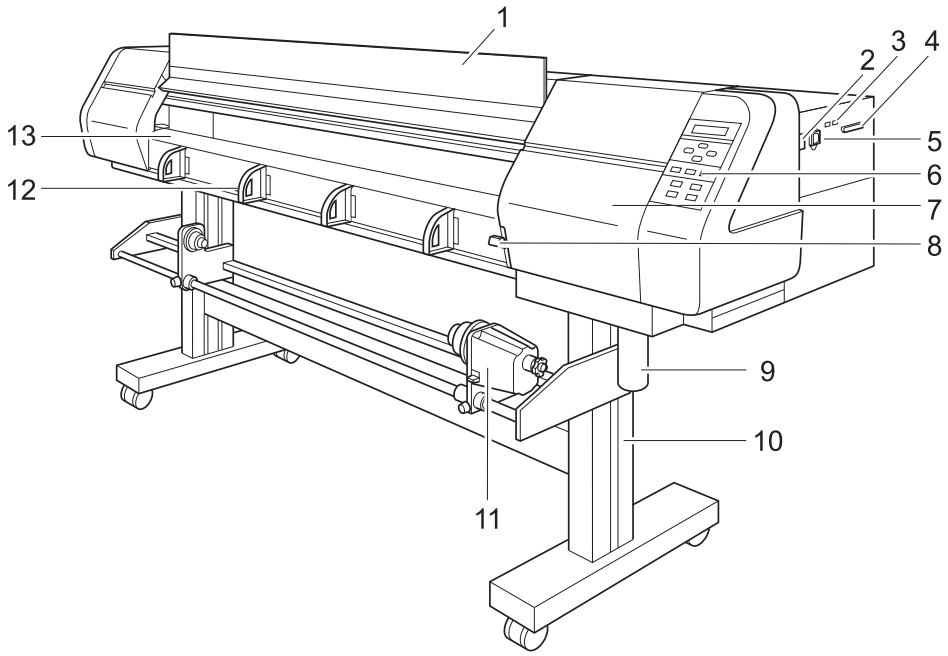
1-3. Tools required for maintenance works

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	5.5 mm for hexagon stud
	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
Tweezers	1	To prevent the cable from being pulled when disconnecting the connector
Long-nose pliers	1	
Nippers	1	
Soldering iron	1	
Scale	1	500 mm, 150 mm
Bar-type tension gauge	1	For 500 gf
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	

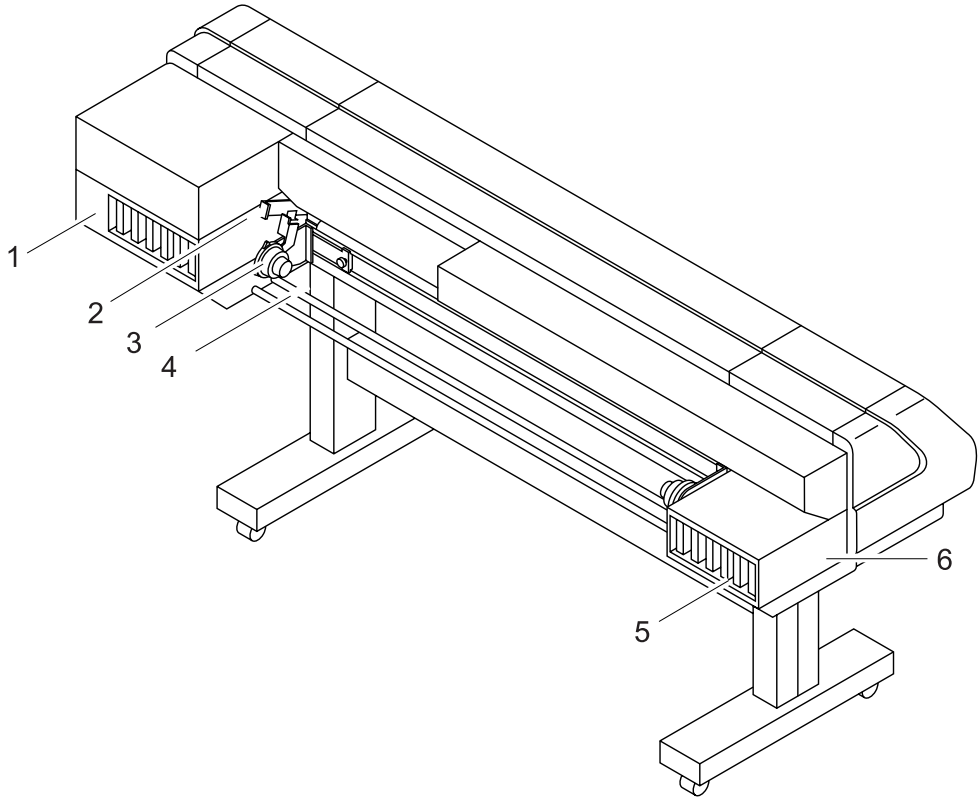
1-4. Names of parts

1-4-1. Front face



	Name	Function
1	Front cover	It is opened when setting medium or taking a corrective measure against a medium jam.
2	Power switch	It turns on/off the power to the device.
3	IEEE-1394 connector	A 400M bps interface connector compatible with IEEE-1394.
4	Parallel connector	Bi-directional parallel interface connector (complies with IEEE1284)
5	AC inlet	The power cable is connected to the AC inlet.
6	Operation panel	This panel has the operation keys required for operating the device and the LCD for displaying set items, etc.
7	Maintenance cover	This is the carriage cover. During maintenance of the station, open it by loosening the screws.
8	Clamp lever	It is made to go up-down the pinch roller for holding medium.
9	Waste ink tank	Waste ink gathers in this tank. One waste ink tank is provided on each side of the device.
10	Stand	It supports the main unit. It is provided with casters that are used to move the device.
11	Take-up device	It supports to wind up the roll medium printed, and have the operation named FORWARD / OFF / REVERSE.
12	Medium support	It supports to send the medium smoothly. It has merit for preventing rises of hard medium such as canvas.
13	Platen	It puts out the medium as it is plotted on.

1-4-2. Rear face



	Name	Function
1	F ink station	This station houses up to six ink cartridges.
2	Clamp lever	It is made to go up-down the pinch roller for holding medium.
3	Roll holder	Roll holder is inserted in the right and left core of roll medium to hold the roll medium. The roll holder is applicable to diameter of medium cores with 2 and 3 inches.
4	Paper roll setting bar	This bar facilitates a paper roll to be set in position.
5	Ink cartridge	Each cartridge contains ink of a specific color.
6	R ink station	This station houses up to six ink cartridges.

1-5. Specifications

Item		JV4-130	JV4-160	JV4-180
Printing head	Method	Piezo-electric drop-on demand		
	Specification	Six-heads (3 x 2 lines)		
	Nozzle	High speed plotting : 360 nozzles for each color		
	Printing speed	Two independent plotting : 180 nozzles for each color		
Resolution		360, 540, 720, 1440 dpi		
Drawing mode	Resolution Pass Printing direction	360 x 360 dpi : 2 / 4 passes, Unidirection / bidirection 360 x 540 dpi : 3 / 6 passes, Unidirection / bidirection 360 x 720 dpi :4 / 8 passes, Unidirection / bidirection 720 x 720 dpi : 4 / 8 / 16 passes, Unidirection / bidirection 1440 x 720 dpi : 8 / 16 passes, Unidirection / bidirection 1440 x 1440 dpi : 16 / 32 passes, Unidirection / bidirection		
Ink type Color	Water-soluble pigment ink	6 Color (Black, Cyan, Magenta, Yellow) + (Light Cyan, Light Magenta) or (Orange, Green)		
	Water-soluble dye ink	6 Color (Black, Cyan, Magenta, Yellow, Light Cyan, Light Magenta)		
	Disperse dye ink	6 Color (Black, Cyan, Magenta, Yellow, Light Cyan, Light Magenta)		
Delivery system of ink		Proprietary system with low ink detection sensor		
Capacity of ink cartrige		220 cc ± 5 cc per cartrige		
Medium type	Glossy medium	Grossy white PET, Photo paper, Glossy PVC		
	Matte medium	Mat-PVC, Tarpaulin, Back-lit film		
	Cloth	Nonflamable cloth		
	Other	Artwork film, Canvas, Tarpaulin, Waterproof olefin film, Board		
Max. Printing width		Width 1371 mm	Width 1600 mm	Width 1870 mm
Medium size (Leaf medium)	Maximum	1381 mm	1620 mm	1910 mm
	Minimum	210 mm		
Medium size (Roll medium)	Thickness	1.0 mm or less		
	Roll outside diameter	Ø 150 mm or less		
	Roll weight	20 Kg or less		
	Roll inside diameter	2 Inch, 3 Inch		
	Plotting surface	Faces OUT		
	Roll end treatment	Light-adhesive tape is used to allow the paper to be removed from the core with ease.		
Medium size (Board)	Thickness	7.0 mm or less		
	Deflection	1.0 mm or less		
Margin (Leaf medium)	Front	85 mm ± 2 mm		
	Rear	85 mm ± 2 mm		
	Left end	5 mm ± 0.5 mm		
	Right end	5 mm ± 0.5 mm		
Margin (Roll medium)	Front	50 mm ± 2 mm		
	Rear	0 mm ± 0.5 mm		
	Left end	5 mm ± 0.5 mm		
	Right end	5 mm ± 0.5 mm		
Distance accuracy	Absolute accuracy	Whichever the larger one of ± 0.3 mm or ±0.3 % of the designated		
	Reoroducibility	Whichever the larger one of ± 0.2 mm or ±0.1 % of the designated		
Perpendecularity		± 0.5 mm / 1000 mm		
Medium skew		5 mm or less / 10 m variable		
Head height adjustment		1.2 mm to 10 mm variable from the platen surface		
Cutting of medium		Cutting of Y direction by the head cutter,Cutting accuracy(steps) 0.5mmor less. Automatic lateral cutting (can be set to ON/OFF), Manual lateral cutting		

Item		JV4-130	JV4-160	JV4-180
Medium delivery		Take-up device as standerd (inside winding / outside winding selectable)		
Waste ink tank		Bottle type (1,000 cc).Replacement timing is judged visually.		
Interface		IEEE1394 (Max.transmission rate 400 M bps)		
		Bidirectional parallel interface (IEEE1284 compliant), ECP support		
Command		MRL-II (ESC/PV.2 base)		
Noise during standby		Less than 56 dB		
Noise during continuous printing		Less than 66 dB		
Noise during discontinuous printing		Less than 70 dB		
Safety Standard		FCC ClassA		
Power		AC 100 — 240 V 120 W or less		
Power consumption		400 W or less		
Recomended Enviroment	Temperature	15 °C to 30 °C		
	Humidity	35 to 65 % Rh (No condensation)		
	Temperature change	± 10 °C / h or less		
	Dust	Equivalent to normal office level		
Outside dimensions (mm) (W) x (D) x (H)		2406 x 730 x 1220	2740 x 730 x 1220	3025 x 730 x 1220
Weight	Main unit	114 kg	125 kg	126 kg
	Packing box	Less than 140 kg	Less than 153 kg	Less than 158 kg

Plotting speed (Measurement after nozzle disabling)

Bi-directional printing
(Measurement on 1m2: 1371 x 730mm printing)

Resolution	Drawing mode		Plotting time	
Y x X dpi	Setting	pass	High speed plotting	Two independent plotting
360 x 360	Speed	2	2 minutes 00 second	3 minutes 17 seconds
	Standard	4	2 minutes 29 seconds	4 minutes 31 seconds
	Fine	8	7 minutes 07 seconds	13 minutes 06 seconds
360 x 540	Speed	3	2 minutes 58 seconds	5 minutes 13 seconds
	Standard	6	2 minutes 38 seconds	6 minutes 56 seconds
	Fine	12	10 minutes 54 seconds	20 minutes 28 seconds
360 x 720 (Extended)	Speed	4	3 minutes 55 seconds	7 minutes 14 seconds
	Standard	8	4 minutes 26 seconds	8 minutes 09 seconds
	Fine	16	15 minutes 05 seconds	29 minutes 45 seconds
720 x 720 <Variable>	Speed	4	5 minutes 24 seconds	10 minutes 51 seconds
	Standard	8	6 minutes 06 seconds	12 minutes 08 seconds
	Fine	16	21 minutes 37 seconds	38 minutes 47 seconds
1440 x 720 <Variable>	Speed	4	5 minutes 38 seconds	10 minutes 40 seconds
	Standard	8	6 minutes 06 seconds	12 minutes 08 seconds
	Fine	16	21 minutes 37 seconds	38 minutes 42 seconds
1440 x 1440[*1]	Speed	16	22 minutes 35 seconds	42 minutes 43 seconds
	Standard	16	22 minutes 35 seconds	42 minutes 43 seconds
	Fine	32	44 minutes 25 seconds	89 minutes 03 seconds

[*1] Plain color layout paper

JV4 series specified ink

No.	Ink Type	The number of color
1	Water-soluble pigment ink (SPC-0180∗)	8
2	Water-soluble dye ink (SPC-0258∗)	6
3	Disperse dye ink (SPC-0256∗)	6

(∗ is indicates color code.)

JV4 series image quality standard media

Glossy white PET specified by MIMAKI(SPC-0111 or SPC-0260) is used as a image quality standard media to perform shipment inspection, maintenance, and adjustment.

Print Resolution of JV4 series and Notes on specified media.

Resolution	Recommended Media	Notes / Limitations
360 x 360	• Mat media	• Since the dot size of JV4 is smaller than that of JV2 for the 360 dpi mode, panting is more distinctive. The use of 360 x 540dpi mode is recommended. • Since the 2 pass mode is subject to panting by media feed accuracy variation or stripes or uneven plotting by curved nozzle fly, the use of media with a dot size of 120μm or more is recommended. • If the dot size is small, make plotting in the 4 pass mode or higher mode to make panting less distinctive. These modes need less amount of feed, improving the accuracy. Panting can also be reduced through software processing. • Glossy and film media are not suitable for JV4 because they may cause insufficient concentration, white stripes, and uneven plotting since the necessary dot size cannot be obtained.
360 x 540	• Mat media	• The use for applications allowing sufficient concentration with general mat media or for high- speed output applications is recommended. • Since the 3 pass mode is subject to panting by media feed accuracy variation or stripes or uneven plotting by curved nozzle fly, the use of media with a dot size of 90μm or more is recommended. • If the dot size is small, make plotting in the 6 pass mode or higher mode to make panting less distinctive. These modes need less amount of feed, improving the accuracy. Panting can also be reduced through software processing.
360 x 720	• Tarpaulin media, etc	• Use media with high ink absorption factor.
720 x 720	• Glossy media	• Since the 4 pass mode is subject to panting by media feed accuracy variation or stripes or uneven plotting by curved nozzle fly, the use of media with a dot size of 70μm or more is recommended. • If the dot size is small, make plotting in the 8 pass mode or higher mode to make panting less distinctive. These modes need less amount of feed, improving the accuracy. Panting can also be reduced through software processing. • With high image quality applications, the use with the bottom head psition is reccomended for stable dot shot.
Variable	• Glossy media allowing the same dot condition as MIMAKI-brand Glossy White PET. • Mat media	Variable data involves smaller dots, requring more strict margin for the dot size and media feed accuracy. • Plotting with 720 dpi in the 8 pass more or higher is recommended. • If stripes or uneven plotting occures, check the rank of the dischareged dot (Large, Middle, of Small) and then determine whether the resolution and profile are suitable for the media.

CHAPTER 2

EXPLANATION OF OPERATION

2-1. Explanation of electrical components

2-1-1. Operations

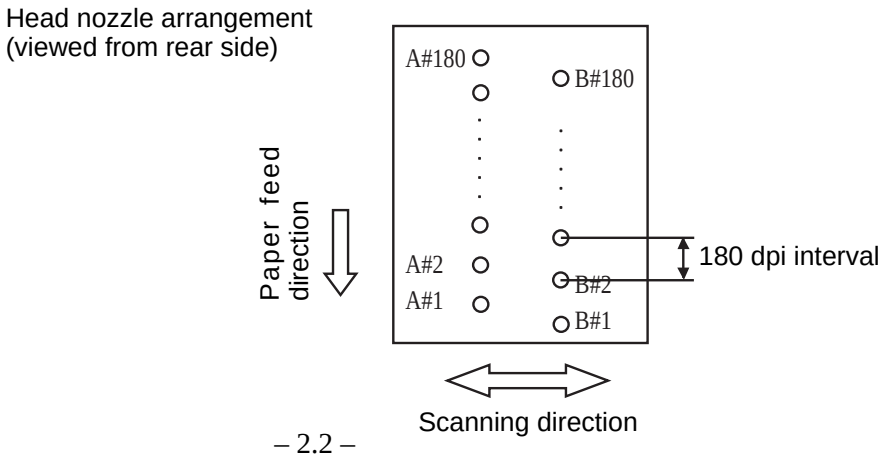
* The slider of the JV4 is provided with six heads with stagger arrangement, with 180 nozzles (at 180dpi intervals) x 2 rows (2 colors) for each head.

* The ink in the ink chamber is discharged by vibrating the piezo-electric element of the head. The JV4 uses four different vibration waveform modes: the V1 (Variable1) mode which enables four gradations (without L, M, and S) with 360 dpi resolution, the V2 (Variable2) mode which enables four gradations with smaller dots with 720 dpi resolution, the N1 (Normal1) mode which enables high-speed two gradations (1.0) with 360 dpi resolution, and the N2 (Normal2) mode which enables high-speed two gradations with 720 dpi resolution.
  However, note that the Normal waveform modes are not used when normal data is received from the host PC. (Some Variable waveforms are represented in two gradations.)
  Since the driving frequency (or the scanning speed of the head) depends on each waveform, Y-directional position adjustment is required for each waveform.

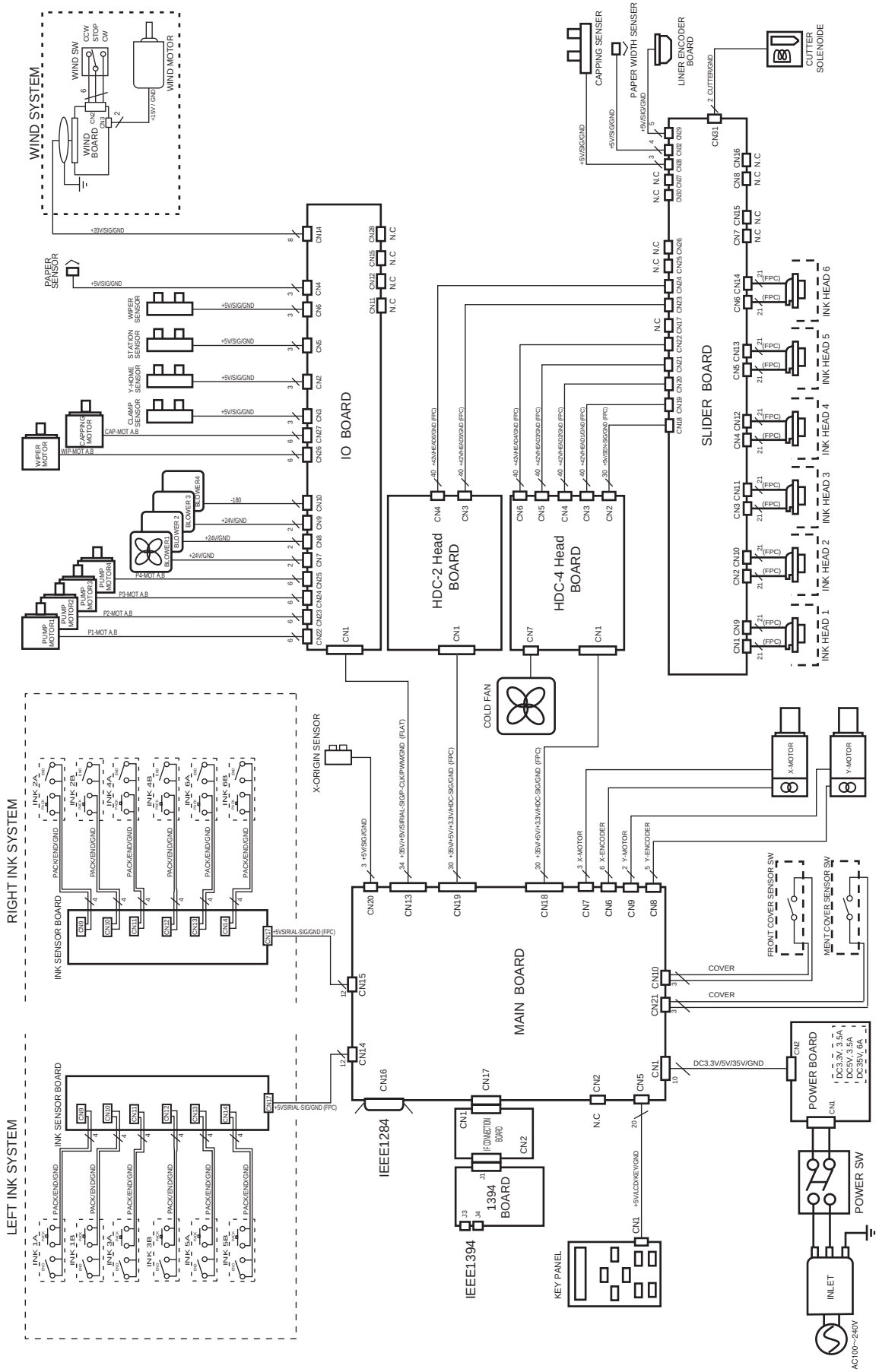
* The HDC-4Head PCB is provided with two FPGAs (HDCs) which generate the driving signal (COM waveform) to be applied to the piezo-electric element of one nozzle row for two heads, and the HDC-2Head PCB is provided with one FPGA (HDC). The COM waveform is applied in synchronization with the scale interval of each linear scale and, at the same time, the nozzle data is transferred to the head. Y-directional position adjustment can be made in units of one dot or less by adjusting the timing of the COM waveform for each nozzle row.
  Since the ink discharge performance depends on each head, the COM waveform is corrected automatically based on the head ID registered and the ambient temperature detected. (If the head ID is not registered correctly, no ink may be discharged.)

* The main PCB is provided with the FPGA (PDC) in charge of image processing to which the 256MB DSRAM picture memory (PRAM) is connected. As for the data output from the host PC, the command is analyzed by the CPU and the image is transferred to the memory through high-speed DMA. Since the PRAM has the ring memory configuration, head scanning is started when data for each scanning has been stored. Since only an image with 180 dpi resolution can be formed into the X direction in each scanning, the image with the target resolution is completed while making required amount of paper feed.

* Stepping motors, sensors, and many other IO devices are connected to the JV4. Therefore, if all of them are connected directly to the main PCB, it becomes difficult to handle wires and replace the PCB. To avoid this, the number of signals has been reduced through serial signal transmission with the main PCB using IO PCBs and ink sensor PCBs. This signal processing is performed by the FPGA (IOC) mounted on the main PCB.



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, 3.5 A

+5 V, 3.5 A

+35 V, 6 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	GND	
	4	GND	
	5	+5V	RV2 (CN2 proximity)
	6	+5V	
	7	GND	
	8	GND	
	9	+3.3V	RV3 (CN2 proximity)
	10	+3.3V	

2-1-3. Main PCB

The SH-3 (RISC, 133MHz) from Hitachi is used as the CPU.

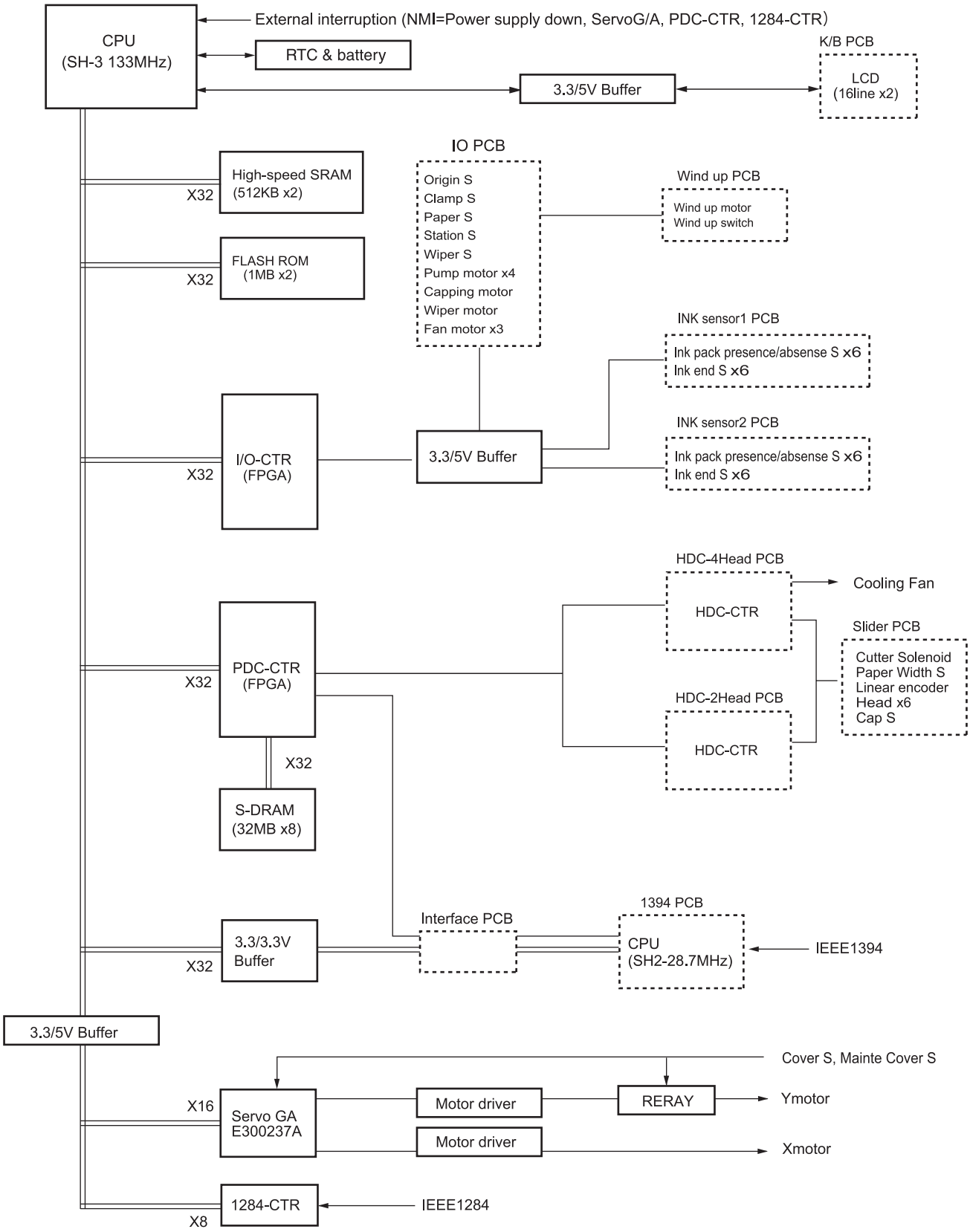
The program of the CPU is stored in the flash memory. This program can easily be upgraded on site through the interface.

During upgrading, the program is downloaded to the PRAM by the CPU and then stored in the flash memory of the CPU.

When the receive data is read from the interface, the CPU loads the data in the picture memory through the PDC-CTR. The picture memory consists of a 256MB DSRAM.

The PDC-CTR performs necessary mask processing, performs X-Y conversion, then transfers it to the head controller (on the HDC PCB) with 8-bit width.

Main PCB block diagram



Main PCB connector signals

Connector	Pin No.	Signal Name	Remarks
CN5	1	+5V	
	2	GND	
	3	LCD-E	
	4	RS1	
	5	LCD-RW	
	6	LCD-D0	
	7	LCD-D1	
	8	LCD-D2	
	9	LCD-D3	
	10	/KEY-E	
	11	RS2	
	12	K-LED	Not used
CN6	1	+5V	
	2	X-ENCA	
	3	X-ENCB	
	4	N.C	
	5	GND	
	6	GND	
CN7	1	+X-MV	
	2	N.C	
	3	-X-MV	
CN8	1	+5V	
	2	Y-ENCA	
	3	Y-ENCB	
	4	GND	
	5	GND	
CN9	1	+Y-MV	
	2	-Y-MV	
CN10	1	+COVER	
	2	N.C	
	3	-COVER	
CN13	1	+35V	
	2	+35V	
	3	GND	
	4	GND	
	5	+5V	
	6	GND	
	7	N.C	
	8	X-SEN	Not used
	9	SPCK-I1	
	10	SPLD-I1	
	11	SPDA-I1	
	12	SPCK-O1	
	13	SPLD-O1	
	14	SPDA-O1	
	15	SPCK-O2	
	16	SPLD-O2	
	17	SPDA-O2	
	18	P-CK1	
	19	P-CK2	
	20	P-CK3	
	21	P-CK4	
	22	P-CK5	
	23	P-CK6	
	24	P-CK7	Not used
	25	N.C	
	26	PWM1	
	27	GATE	
	28	RESET	
	29	H-ST	Not used
	30	H-ON	Not used
	31	H-PR	Not used
	32	W-ENC	Not used
	33	IO-V0	
	34	IO-V1	

Connector	Pin No.	Signal Name	Remarks
CN14 / (CN15)	1	+5V	
	2	GND	
	3	SPCK-I2(3)	
	4	SPLD-I2(3)	
	5	SPDA-I2(3)	
	6	SPCK-O3(4)	
	7	SPLD-O3(4)	
	8	SPDA-O3(4)	
	9	ID-IN	Not used
	10	ID-OUT	Not used
	11	GATE	
	12	N.C	
CN17	A1	+35V	
	A2	+35V	
	A3	+35V	
	A4	N.C	
	A5	N.C	
	A6	IFRESET	
	A7	IF-RDnWR	
	A8	PWDWN	Not used
	A9	WUPRQ	Not used
	A10	IF-nPREQ	
	A11	IF-DRQ0	
	A12	IF-DRQ1	
	A13	INNDREQ3	Not used
	A14	INNDREQ4	Not used
	A15	IFA0	
	A16	IFA1	
	A17	IF-RWCLK	
	A18	IF-CKIO	
	A19	IF-IDOUT	
	A20	IFD0	
	A21	IFD2	
	A22	IFD3	
	A23	IFD5	
	A24	IFD6	
	A25	IFD8	
	A26	IFD9	
	A27	IFD11	
	A28	IFD12	
	A29	IFD14	
	A30	IFD15	
	A31	IFD17	
	A32	IFD18	
	A33	IFD20	
	A34	IFD21	
	A35	IFD23	
	A36	IFD24	
	A37	IFD26	
	A38	IFD27	
	A39	IFD29	
	A40	IFD30	
	B1	+5V	
	B2	+5V	
	B3	+5V	
	B4	+3.3V	
	B5	+3.3V	
	B6	+3.3V	
	B7	SEQREQ	Not used
	B8	PWACK	Not used
	B9	GND	
	B10	GND	
	B11	IF-DRQ2	
	B12	GND	
	B13	INNDREQ5	Not used
	B14	GND	
	B15	IF-CS	

Connector	Pin No.	Signal Name	Remarks
CN17	B16	GND	
	B17	GND	
	B18	GND	
	B19	IFD1	
	B20	GND	
	B21	IFD4	
	B22	GND	
	B23	IFD7	
	B24	GND	
	B25	IFD10	
	B26	GND	
	B27	IFD13	
	B28	GND	
	B29	IFD16	
	B30	GND	
	B31	IFD19	
	B32	GND	
	B33	IFD22	
	B34	GND	
	B35	IFD25	
	B36	GND	
	B37	IFD28	
	B38	GND	
	B39	IFD31	
	B40	GND	
CN18 / (CN19)	1	GND	
	2	SCK	
	3	GND	
	4	SNLD1(2)	
	5	D0	
	6	D1	
	7	D2	
	8	D3	
	9	D4	
	10	D5	
	11	D6	
	12	D7	
	13	GND	
	14	SDI1(2)	
	15	SDRQ1(2)	
	16	HNINTR1(2)	
	17	REJ1(3)	
	18	REJ2(4)	
	19	SUB1(3)	
	20	SUB2(4)	
	21	LE1(2)A	
	22	LE1(2)B	
	23	LE1(2)A-R	
	24	LE1(2)B-R	
	25	GND	
	26	40MSCK+	
	27	40MSCK-	
	28	GND	
	29	+3.3V	
	30	+3.3V	
	31	GND	
	32	GND	
	33	+5V	
	34	+5V	
	35	GND	
	36	+35V	
	37	+35V	
	38	+35V	
	39	+35V	
	40	+35V	

Connector	Pin No.	Signal Name	Remarks
CN21	1	+5V	
	2	UDINO	
	3	UDINI	Not used
	4	GND	
CN21	1	+COVER	
	2	N.C	
	3	-COVER	

2-1-4. 1394 PCB

The 1394 (IEEE1394) PCB uses the SH2 (RISC, 28.7MHz) from Hitachi as the CPU and the program stored in the flash memory in the CPU. Therefore, the 1394 CPU is upgraded by downloading the program from the host computer. This PCB supports bi-directional printing.

2-1-5. I/F Connection PCB

This board connects the signals of the main PCB and 1394 PCB.

2-1-6. HDC-4Head PCB

This board is provided in the electrical equipment case. It receives signals from the main PCB, generates the COM signal for driving heads 1 to 4, generates nozzle data, and transfers each data to the slider PCB through the FPC cable. In addition, it is provided with the driver circuit for the cooling fan and cutter and the read-out circuit for the paper-width sensor and temperature sensor.

HDC PCB Connector signals

Connector	Pin No.	Signal Name	Remarks
CN1	1	GND	
	2	SCK	
	3	GND	
	4	SNLD1(2)	
	5	D0	
	6	D1	
	7	D2	
	8	D3	
	9	D4	
	10	D5	
	11	D6	
	12	D7	
	13	GND	
	14	SDI1(2)	
	15	SDRQ1(2)	
	16	HNINTR1(2)	
	17	REJ1(3)	
	18	REJ2(4)	
	19	SUB1(3)	
	20	SUB2(4)	
	21	LE1(2)A	
	22	LE1(2)B	
	23	LE1(2)A-R	
	24	LE1(2)B-R	
	25	GND	
	26	40MSCK+	
	27	40MSCK-	
	28	GND	
	29	+3.3V	
	30	+3.3V	
	31	GND	
	32	GND	
	33	+5V	
	34	+5V	
	35	GND	
	36	+35V	
	37	+35V	
	38	+35V	
	39	+35V	
	40	+35V	

Connector	Pin No.	Signal Name	Remarks
CN2	1	GND	
	2	SOLCOM	
	3	PAPER-CUT	
	4	GND	
	5	MARK2	Reserved (Tx)
	6	MARK1	Reserved (Tx)
	7	T-LEDON	
	8	GND	
	9	LENCB1	
	10	LENCA1	
	11	KP-SEN	
	12	P-WID-SEN	
	13	GND	
	14	SLOP	
	15	ADI	
	16	GND	
	17	A4INH3	
	18	A4INH2	
	19	A4INH1	
	20	A4C	
	21	A4B	
	22	A4A	
	23	ASCK	
	24	ACS	
	25	GND	
	26	GND	
	27	+5V	
	28	+5V	
	29	+5V	
	30	GND	

Connector	Pin No.	Signal Name	Remarks
CN3 / CN5	1	GND	
	2	GND	
	3	OUTA-	
	4	OUTA+	
	5	GND	
	6	OUTB-	
	7	OUTB+	
	8	GND	
	9	HxNCHGB	
	10	GND	
	11	HxLATB	
	12	GND	
	13	HxCHB	
	14	GND	
	15	HxNCHGA	
	16	GND	
	17	HxLATA	
	18	GND	
	19	HxCHA	
	20	GND	
	21	OUTC+	
	22	OUTC-	
	23	GND	
	24	OUTD+	
	25	OUTD-	
	26	GND	
	27	+5V	
	28	+5V	
	29	GND	
	30	GND	
	31	+42V	
	32	GND	
	33	HxCOMB	
	34	HxCOMB	
	35	HxCOMB	
	36	GND	
	37	GND	
	38	HxCOMA	
	39	HxCOMA	
	40	HxCOMA	
CN4 / CN6	1	GND	
	2	OUTA-	
	3	OUTA+	
	4	GND	
	5	OUTB-	
	6	OUTB+	
	7	GND	
	8	HxCHGB	
	9	GND	
	10	HxLATB	
	11	GND	
	12	HxCHB	
	13	GND	
	14	HxNCHGA	
	15	GND	
	16	HxLATA	
	17	GND	
	18	HxCHA	
	19	GND	
	20	OUTC+	
	21	OUTC-	
	22	GND	
	23	OUTD+	
	24	OUTD-	
	25	GND	
	26	+5V	
	27	+5V	

Connector	Pin No.	Signal Name	Remarks
CN4 / CN6	28	GND	
	29	GND	
	30	+42V	
	31	GND	
	32	HxCOMB	
	33	HxCOMB	
	34	HxCOMB	
	35	GND	
	36	GND	
	37	HxCOMA	
	38	HxCOMA	
	39	HxCOMA	
	40	GND	
CN7	1	+24V	
	2	-	
	3	FAN-ON	
CN8	1	H. S-1	
	2	GND	
CN9	1	H. S-2	
	2	GND	

2-1-7. HDC-2Head PCB

This board is located under the HDC-4Head PCB in the electrical equipment case. It receives signals from the main PCB, generates the COM signal for driving heads 5 and 6, generates nozzle data, and transfers each data to the slider PCB through the FPC cable.

2-1-8. IO PCB

This board is located on the back of the right frame. It receives the signal of each sensor, transfers each data to the main PCB, and controls various stepping motors and take-up motors.

IO PCB Connector signals

Connector	Pin No.	Signal Name	Remarks
CN2	1	+5V	
	2	D0	Origins
	3	GND	
CN3	1	+5V	
	2	D1	Lever sensor
	3	GND	
CN4	1	+5V	
	2	D2	Paper sensor
	3	GND	
CN5	1	+5V	
	2	D3	Station sensor
	3	N.C.	
	4	GND	
CN6	1	+5V	
	2	D4	Wiper sensor
	3	N.C.	
	4	GND	
CN7 / 8/ 9/ 10	1	POWER-F	
	2	POWER-F	
CN11 / 12/ 15/ 28	1	POWER	Not used
	2	/POWER	
CN14	1	POWER-M	Take-up motor
	2	POWER-M	Take-up motor
	3	+5V	
	4	W-ENC	Not used
	5	W-SEN	Not used
	6	GND	
	7	GND	
	8	W-UNIT	Not used
	9	GND	
CN17	1	POWER-L	
	2	GND	
	3	LAMP	Not used
CN22	1	MA-P1	Pump motor 1
	2	N.C.	
	3	/MA-P1	
	4	MB-P1	
	5	N.C.	
	6	/MB-P1	
CN23	1	MA-P2	Pump motor 2
	2	N.C.	
	3	/MA-P2	
	4	MB-P2	
	5	N.C.	
	6	/MB-P2	

Connector	Pin No.	Signal Name	Remarks
CN24	1	MA-P3	Pumop motor 3
	2	N.C.	
	3	/MA-P3	
	4	MB-P3	
	5	N.C.	
	6	MB-P3	
CN25	1	MA-P4	Pumop motor 4
	2	N.C.	
	3	/MA-P4	
	4	MB-P4	
	5	N.C.	
	6	/MB-P4	
CN26	1	MA-WP	Wiper motor
	2	N.C.	
	3	/MA-WP	
	4	MB-WP	
	5	N.C.	
	6	/MB-WP	
CN27	1	MA-CP	Capping motor
	2	N.C.	
	3	/MA-CP	
	4	MB-CP	
	5	N.C.	
	6	/MB-CP	

2-1-9. Slider PCB

The slider PCB is located on the inner side of the head cover. It relays the head control signal and head driving signal from the HDC PCB to the print heads. It contains the sensor circuit which detects the signal from the thermistor on each head and the signal from the paper-width sensor.

The slider PCB is connected to the HDC PCB with 7 main FPC cables and connected to the heads with 12 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.

Slider PCB Connector signals

Connector	Pin No.	Signal Name	Remarks
CN1 ~ CN8	1	SIO02A	
	2	SIO01A	
	3	SCK02A	
	4	SCK01A	
	5	H1anodeA	
	6	H1CHA	
	7	GND	
	8	H1LATA	
	9	GND	
	10	H1NCHGA	
	11	GND	
	12	+5V	
	13	H1-TH	
	14	GND	
	15	GND	
	16	H1COMA	
	17	GND	
	18	H1COMA	
	19	GND	
	20	H1COMA	
	21	GND	
CN9 ~ CN16	1	SI001B	
	2	SI002B	
	3	SCK01B	
	4	SCK02B	
	5	H1anodeA	
	6	GND	
	7	H1CHB	
	8	GND	
	9	H1LATB	
	10	GND	
	11	H1NCHGB	
	12	+5V	
	13	GND	
	14	GND	
	15	H1COMB	
	16	GND	
	17	H1COMB	
	18	GND	
	19	H1COMB	
	20	GND	
	21	+42V	

Connector	Pin No.	Signal Name	Remarks
CN17 / CN18	1	GND	
	2	SOLCOM	
	3	PAPER-CUT	
	4	GND	
	5	MARK2	Reserved (Tx)
	6	MARK1	Reserved (Tx)
	7	T-LEDON	
	8	GND	
	9	LENCB1	
	10	LENCA1	
	11	KP-SEN	
	12	P-WID-SEN	
	13	GND	
	14	SLOP	
	15	ADI	
	16	GND	
	17	A4INH3	
	18	A4INH2	
	19	A4INH1	
	20	A4C	
	21	A4B	
	22	A4A	
	23	ASCK	
	24	ACS	
	25	GND	
	26	GND	
	27	+5V	
	28	+5V	
	29	+5V	
	30	GND	

Connector	Pin No.	Signal Name	Remarks
CN19 / CN21 / CN23 / CN25	1	GND	
	2	GND	
	3	OUTA-	
	4	OUTA+	
	5	GND	
	6	OUTB-	
	7	OUTB+	
	8	GND	
	9	HxNCHGB	
	10	GND	
	11	HxLATB	
	12	GND	
	13	HxCHB	
	14	GND	
	15	HxNCHGA	
	16	GND	
	17	HxLATA	
	18	GND	
	19	HxCHA	
	20	GND	
	21	OUTC+	
	22	OUTC-	
	23	GND	
	24	OUTD+	
	25	OUTD-	
	26	GND	
	27	+5V	
	28	+5V	
	29	GND	
	30	GND	
	31	+42V	
	32	GND	
	33	HxCOMB	
	34	HxCOMB	
	35	HxCOMB	
	36	GND	
	37	GND	
	38	HxCOMA	
	39	HxCOMA	
	40	HxCOMA	
CN20 / CN22 / CN24 / CN26	1	GND	
	2	OUTA-	
	3	OUTA+	
	4	GND	
	5	OUTB-	
	6	OUTB+	
	7	GND	
	8	HxCHGB	
	9	GND	
	10	HxLATB	
	11	GND	
	12	HxCHB	
	13	GND	
	14	HxNCHGA	
	15	GND	
	16	HxLATA	
	17	GND	
	18	HxCHA	
	19	GND	
	20	OUTC+	
	21	OUTC-	
	22	GND	
	23	OUTD+	
	24	OUTD-	
	25	GND	
	26	+5V	
	27	+5V	

Connector	Pin No.	Signal Name	Remarks
CN20 / CN22 / CN24 / CN26	28	GND	
	29	GND	
	30	+42V	
	31	GND	
	32	HxCOMB	
	33	HxCOMB	
	34	HxCOMB	
	35	GND	
	36	GND	
	37	HxCOMA	
	38	HxCOMA	
	39	HxCOMA	
	40	GND	
CN27	1	+5V	
	2	P-WID-SEN	
	3	GND	
CN28	1	+5V	
	2	KP-SEN	
	3	GND	
CN29	1	GND	
	2	-	
	3	LENCA1	
	4	+5V	
	5	LENCB1	
CN30	1	+24V	
	2	MARK1	
	3	GND	
	4	MARK2	
	5	GND	
	6	-	
CN31	1	+24V	
	2	PAPER-CUT	

2-1-10. Linear encoder PCB

This board, located on the back of the slider, reads the linear scale.

2-1-11. The KeyBoard PCB

A 16 character x 2 line LCD, an LED that indicates +5V supply and 11 tact switches are mounted on the K/B PCB. It is connected to the main PCB via the K/B cable.

2-1-12. Ink Sensor PCB 1

The ink sensor PCB 1 is mounted on the Y-motor inside the right cover. It passes on signals among the ink cartridge presence/absence sensors for ink cartridges, ink end sensor and main PCB.

2-1-13. Ink Sensor PCB 2

Sensor PCB 2 is on the left-hand side plate ; it relays signals among the ink cartridge presence/ absence sensors for ink cartridges, the ink end sensors and the main PCB.

2-1-14. Take-up motor PCB

This board, located in the take-up device, drivers the motor by receiving the power from the IO PCB. The forward or reverse rotation of the take-up motor can be selected using a switch.

2-2. Ink system

2-2-1. Definitions

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.

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.

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.”

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

Discharged ink is shot as main drops or satellite drops.
If satellite drops are contained in main drops, the ink shot may shift.

Head cleaning

Recovers normal ink discharge by removing bubbles in the head and foreign objects on the head surface.

Wiping

Wipes the nozzle surface with wiper rubber surface to fix the condition of nozzle holes in order to remove foreign objects or ink leakage on the nozzle surface.

Rubbing

Wipes the nozzle surface with wiper felt surface to remove foreign objects or solidified ink on the nozzle surface.

Flashing

Make idling discharges of ink which may thicken at the point of the nozzle, for refreshment.

Ink suction

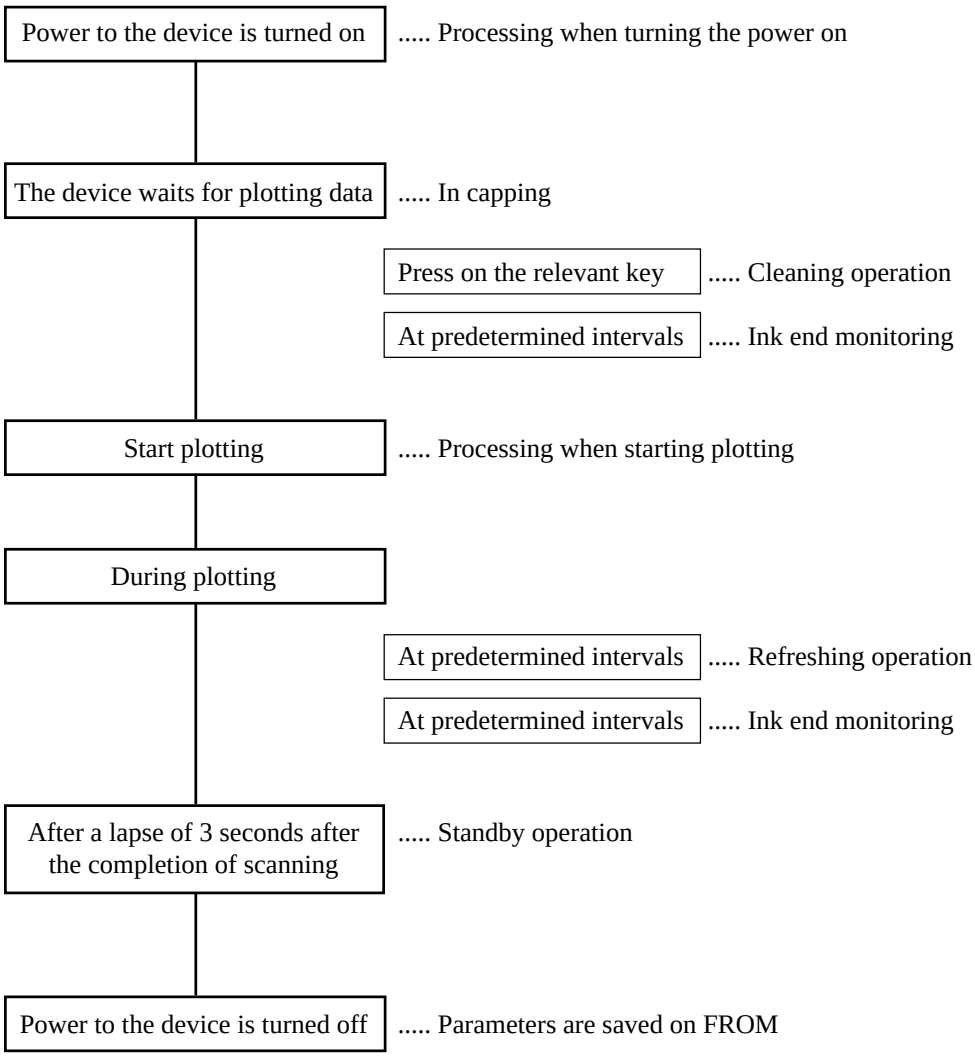
Absorbs ink from the nozzle using an ink absorption pump to discarge bubbles.

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



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 main unit is backed up by a battery. After about 7 years 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 7 years.

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 offers 2 options, soft and normal.

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 Flash memory.

- 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 . Parameter values are updated and managed by the firmware. They 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. They must not be changed since they are used by MIMAKI Development Division for experiments and evaluations.

- **When the main PCB has been replaced (meaning that the Flash memory 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 No. 13, 14
3. The running meter parameter is set to its value before the replacement. → ink parameters 1 No. 11, 12, 16 to 22

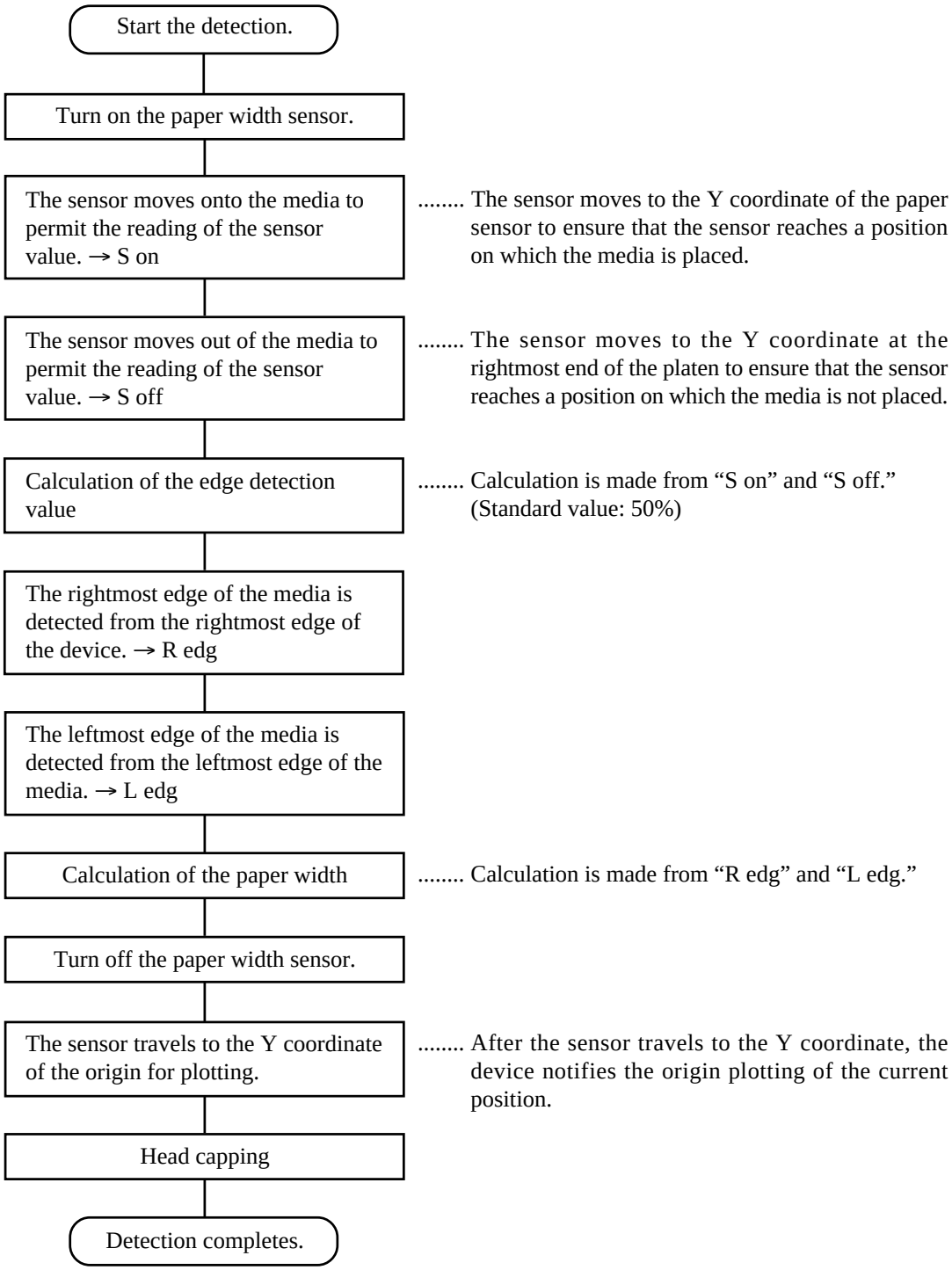
- **The ink system is controlled so that MIMAKI-brand ink be discharged in stable condition. Operation with non-MIMAKI brand ink is not guaranteed.**

2-3. Brief explanation of media size detection control

Detection of the front ends of a media → Detection by the paper width 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.



CHAPTER 3
TROUBLESHOOTING

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 (time-out setting on the host PC, 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 PCBs.

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
ERROR01 MAIN ROM	• The control ROM is in abnormal conditions.	1) Replace the main PCB with a new one.
ERROR02 MAIN RAM	• The control RAM is in abnormal conditions.	
ERROR03 POWER +35V	• The +35V voltage is in abnormal conditions.	1) Replace the the main PCB with a new one.
ERROR04 FLASH ROM	• The Flash memory is in abnormal conditions.	1) Replace the main PCB with a new one.
ERROR06 D-RAM	• An error has occurred in the D-RAM.	
ERROR07 TEMP n	• Abnormal temperature is detected.	1) Has ink in the camper run out? 2) Replace the HDC PCB with a new one. 3) Replace the head with a new one.
ERROR08 Linear Encoder n	• The Linear encoder is in abnormal conditions.	1) Replace the Linear encoder with a new one. 2) Replace the main PCB with a new one.
ERROR09 HDC	• Configuration of PDC/IOC has not been successfully carried out. • Configuration of HDC has not been successfully carried out.	1) Replace the main PCB with a new one. 2) Replace the HDC PCB with a new one.
ERROR10 COMMAND	• Command code other than MRL has been received.	1) Check the data received through HEX dump. 2) If error occurs at 1394 a. Check Time out of the transfer tool (RIP). b. Replace the I/F connection board with [E102154A] or later. c. Replace the 1394 board with a new one. d. Replace the main PCB with a new one.
ERROR11 PARAMETER	• Parameter that has not defined in MRL has been received.	
ERROR12 Ment Command	• A command error for manufacture of has occurred .	1) It is not used in the field.

Message	Description	Corrective measures and recovering procedures
ERROR20 I/F BOARD	• A error occurred in communication between the main PCB and the interface board.	1) Replace the I/F PCB with a new one. 2) Replace the main PCB with a new one. 3) Replace the I/F connection board with a new one.
ERROR21 I/F NONE	• The I/F board could not be recognized.	1) Is the I/F board mounted correctly ?
ERROR23 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?
ERROR24 I/F INITIAL	• The I/F board is in abnormal conditions.	1) Replace the I/F PCBwith a new one. 2) Replace the main PCB with a new one. 3) Replace the main PCB with a new one.
ERROR30 OPERATION	• Improper operation has been performed.	1) Indicate the improper operation. 2) Replace a key board. 3) Replace a main PCB.
ERROR34 DATA REMAIN	• 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.
ERROR40 MOTOR X	• The X-axis motor has been overloaded.	1) Replace X axis motor. 2) Replace a main PCB.
ERROR41 MOTOR Y	• The Y-axis motor has been overloaded. • The brush of motor is in abnormal conditions.	1) Clean the main guide axis. 2) Replace Y axis motor. 3) Replace a main PCB.
ERROR42 X CURRENT	• Overcurrent error has arisen on the X-axis motor	1) Replace X axis motor. 2) Replace a main PCB.
ERROR43 Y CURRENT	• Overcurrent error has arisen on the Y-axis motor	1) Replace Y axis motor. 2) Replace a main PCB.
ERROR45 CAPPING	• The capping-control is in abnormal conditions.	1) Turn on the power. 2) Replace a slider PCB. 3) Replace a cap sensor. 4) Replace a IO PCB. 5) Replace a station sensor. 6) Replace a station motor.
ERROR46 WIPER	• The wiper-control is in abnormal conditions.	1) Turn on the power. 2) Replace a wiper assy. 3) Replace IO PCB. 4) Replace a wiper sensor. 5) Replace a wiper motor.

Error message	Cause	Corrective measure
ERROR50 MEDIA SENSE	• Media detection has not been successfully carried out.	1) Make sure that there is no gap between platen F (aluminum) and the edge of the P cover F rubber. If there is a gap, stick the rubber appressed against the platen. The gap may be detected in mistake. 2) Make sure that platen cover F is fixed securely using the platen cover F mounting screws (attached on auxiliary side plates R and L to prevent the cover from protruding). 3) Check if the media right edge is set at a position 15mm or more from the rightmost edge of the rightmost feed roller:R1 toward the station side or not. 4) Cleaning or replace a paper width sensor. 5) Replace a main FPC cable. 6) Replace a slider PCB. 7) Replace a HDC-4Head PCB. 8) Replace a main PCB.
ERROR51 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 IO PCB. 4) Replace a main PCB.

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

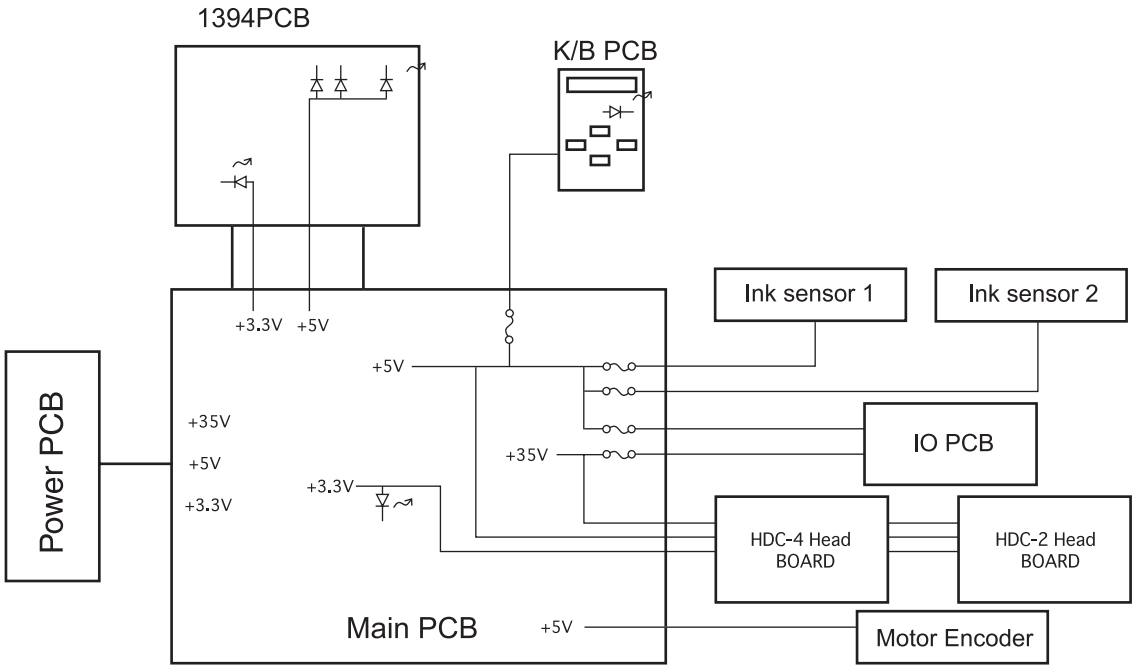
Message	Description	Corrective measures and recovering procedures
<LOCAL> CARTRIDGE – – – – – – K – – – – –	• The number of absent ink cartridge is shown.	1) Install the ink cartridge. 2) If the error recurs after the ink cartridge has been installed. Conduct sensor tests to find out the cause of trouble. 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) Ink sensor PCB has failed. d) Main PCB has failed.
<LOCAL> INK near END – – – – – – K – – – – –	• 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) Ink sensor PCB has failed. d) The main PCB has failed.
<LOCAL> INK END KC – – – – – – Y – –	• Ink has run out	1) Replace the ink cartridge with a new one.
<<LOCAL>> REPLACE WIPER	• The number of times of use of the wiper has been exceeded.	1) Replace the wiper.
<<LOCAL>> HEAD ID ?	• The ID numbers of heads have not been inputed.	1) Input the ID numbers of heads.
<<LOCAL>> 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 sheet sensor has failed. b) The IO PCB has failed. c) The main PCB has failed.

Message	Description	Corrective measures and recovering procedures
* * 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 I/F cable with a new one. 3) Replace the 1394 PCB. 4) Replace the main PCB.
* * BATTERY * *	• If indicates that the battery has run out.	1) Replace the battery with a same type.

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. An outlet is not available for the power supply. 2) The power unit has broken. 3) The main PCB has short-circuited to GND in +35V or +5V. 4) The HDC PCB has short-circuited to GND in +35V or +5V. 5) The key panel has broken, or the K/B cable has disconnected.
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 all the cables to be connected to the main PCB and then turn on the power. (See below.) 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 HDC PCB or 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. The HDC FPC cable is in poor contact or has disconnected. The head FPC cable is in poor contact or has disconnected. 3) The HDC PCB has broken. 4) The slider PCB has broken. 5) The main PCB has broken, or the head ID has not been properly specified. 6) Ink have not been filled up. 7) The pump assembly has broken. 8) The linear encoder sensor has broken. 9) 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) Replace the HDC PCB with a new one. 4) Replace the slider PCB with a new one. 5) Replace the main PCB with a new one. 6) Refer to [3-3-9. Ink-filling cannot be performed] 7) Check the pump assembly. 8) Perform the encoder check test. 9) 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 FPC cable has disconnected, replace it with a new one. If the FPC cable is in poor contact, securely insert the cable into the connector. 3) Replace the HDC PCB with a new one. 4) Replace the slider PCB with a new one. 5) Replace the main PCB with a new one, or properly specify the head ID. 6) Refer to [3-3-9. Ink-filling cannot be performed] 7) Replace the pump assembly with a new one. 8) Replace the linear encoder sensor with a new one. or adjust the sensor position. 9) Replace the head with a new one.

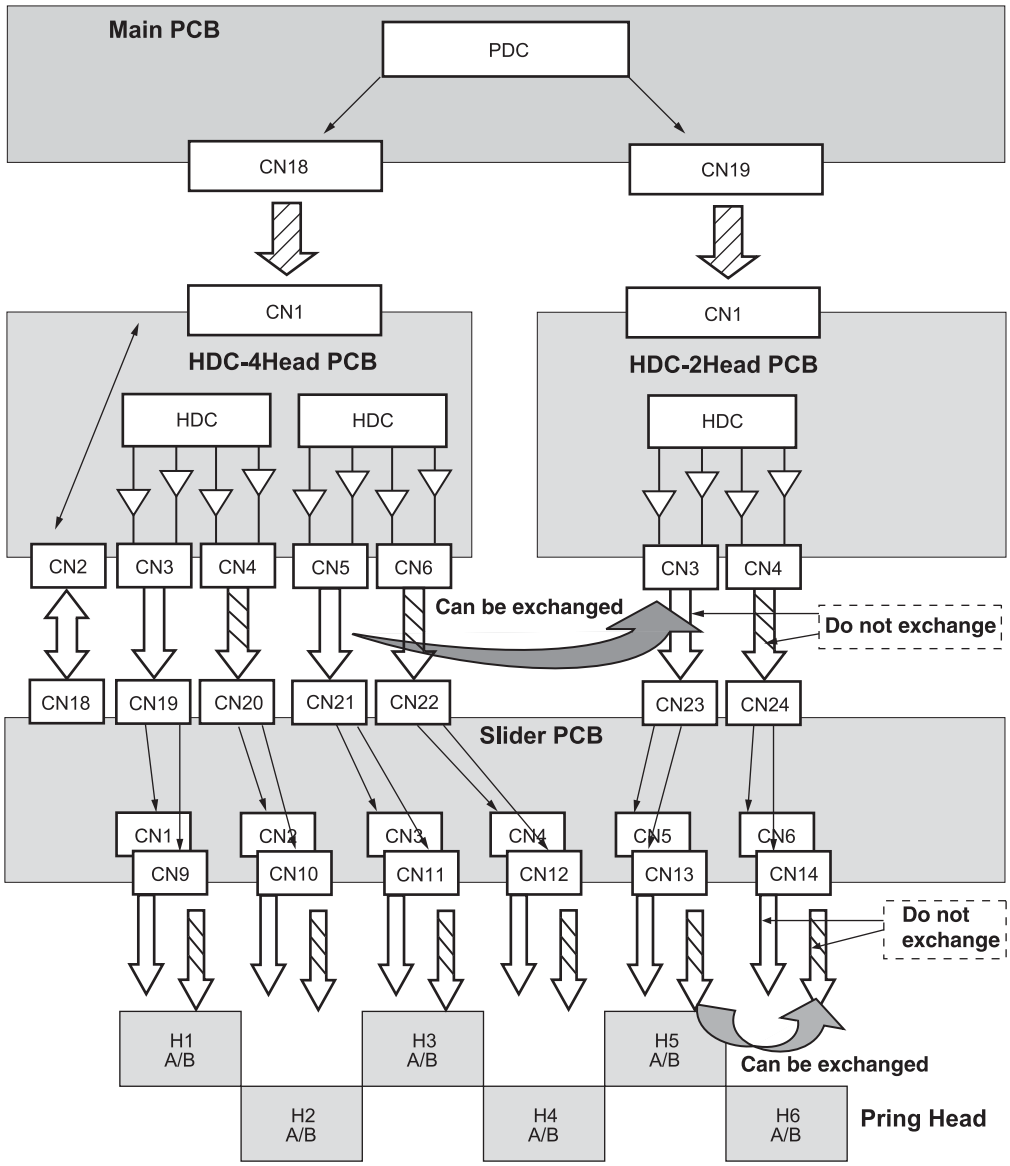
If none of the heads or nozzle rows discharges ink, check the following:

1. Check that the head ID is entered correctly.
2. If either nozzle row of the same head does not discharge ink, check the defective section by exchanging the 21-wire FPC (connected to the head) within the same nozzle row (for example, between CN9 and CN10).

   CAUTION • **Do not exchange the FPC between rows A and B because of power short-circuit.**

3. If neither row A nor row B within the same head discharges ink, check the defective section by shifting the 40-wire FPC (to be mounted on the slider PCB) pairwise (for example, shift the cable of CN21 and CN22 to CN23 and CN24).

   CAUTION • **Do not shift only one FPC because of power short-circuit.**



3-3-3. Cutting failure

Problems	The cutter goes up during paper cutting.
Causes	1) HDC 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 HDC FPC cable with a new one.

3-3-4. 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 HDC FPC, the HDC-4Head PCB, the main FPC, main PCB, the slider PCB and cutter assy with a new one.

3-3-5. Fan motor

Problems	The fan motor fails to turn. The fan motor cannot be stopped running.
Causes	1) The fan motor assy. has disconnected. 2) Clip the fan motor assy cable in the platen cover to short-circuit the fan motor.
Checking procedures	1-2) Visually comfirm the fam motor status. ([ACTION TEST - FAN MOTOR])
Remedies	1) Replace the fan motor assy. with a new one.

3-3-6. Abnormal nozzle discharge

Problems	When checking the nozzle, the nozzle at the enter of the head does not discharge. The head on the R side does not discharge. The edge of the nozzle does not discharge.
Causes	1) The amount of wiper contact is large/small. 2) The wiper on the R side does not contact. 3) The capping position with respect to the head is not normal.
Checking procedure	1-2) Make visual check of the amount of wiper contact. 3) Perform the check test / the capping position. (Refer to [6-6-2. Adjustment of the station position.])
Remedies	1) Adjust the amount of wiper contact. 2) Upglade the F/W. (A failure may occur with F/W1.30 or earlier.) If the wiper position on the F side is normal, the head on the R side does not contact, and the wiper BKT is slanted, bend the wiper BKT so that the amount of wiper contact be the same for wipers on the F and R sides. 3) Perform the adjustment of the station position.

3-3-7. Board medium feeding failure

Problems	Skew occurs. The printing surface of the board makes contact with the head.
Causes	1) The amount of warp of the board is more than 1mm. The board have an irregular sarface on the back. 2) The head height is not correct.
Checking procedure	1-2) Visually confirm the media and the head status.
Remedies	1) Use the board not having warp. 2) Adjust the height of the head. For media with irregular surface, increase the head height. When using a board with a length of 300mm or longer or a nonelastic board, use a bench before or after the machine. (Refer to JV4 series operation manual)

3-3-8. Abnormal ink discharge

Problems	Vertical lines during plotting, square spots, or ink discharged out of range
Causes	1) The head FPC cable is in poor contact. 2) The connector of head has bloken. (Metal corrosion)
Checking procedure	1) Disconnect the FPC cable and then check the contact surface visually.
Remedies	1) Replace the head FPC cable with a new one. 2) Replace the head with a new one.

3-3-9. Ink-filling cannot be performed

Problems	Ink-filling cannot be performed. Abnormal ink cleaning.
Causes	1) There are some gaps for capping. 2) The pump motor has broken. 3) The IO PCB has broken. 4) The main PCB has broken.
Checking procedure	1) Visually confirm the ink-filling status. 2)-4) Check whether or not the pump motor is running.
Remedies	1) Height adjustment for the station and position adjustment for capping. 2) Replace the pump motor with a new one. 3) Replace the IO PCB with a new one. 4) Replace the main PCB with a new one.

3-3-10. Abnormal wiper operation

Problems	The wiper does not work.(Neither the F nor R side works.)
Causes	1) Loose screw. (turning screw)
Checking procedure	1) Visually confirm the wiper status.
Remedies	1) Fasten the screw.

3-4. Plotting failure

3-4-1. Print is not sharp

Problems	A line has been omitted from the print. (specified color) 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. 4) The wiper is not cleaned. The amount of wiper contact is large/small. 5) The cap position is not set correctly. 6) Paper fragment or other dust is present on the head path above the curl stopper.
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. 4-6) Visually confirm the wiper.
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 the pump motor and pump unit, or adjust capping 3) Set the head ID. 4) Adjust the wiper. 5) Adjust the capping position. 6) Remove the dust.

3-4-2. Abnormal print

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

3-4-3. Color of print is pale.

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. 3) The temperature sensor is not read correctly.
Checking procedure **Remedies**	1) Check the head ID stuck on the head and the ID within #ADJUSTMENT. 2) Use the dedicated media and ink. 3) In temperature check for #TEST, check that the Ta1 to Ta6 display (**) can be read out with stabilized room temperature.
Remedies	1) If the head ID is not correct, enter a correct value. If the head ID has been changed, check the Y offset again. 2) Except for pure Y, M, C, K, Lm, Lc, O or G, some difference in colors between machines cannot be avoided. 3) Replace the slider PCB or the HDC PCB with a new one.

3-4-4. 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. Is the linear encoder mounted on the correct position ? Perform encoder check for #TEST.
Remedies	1) Lightly wipe the surface of the linear scale (excepting the rear face) with a cloth dampened with alcohol. Wipe the linear encoder with a cotton dampened with alcohol. Replace the linear scale with a new one. Adjust the linear encoder PCB assy position, or replace the linear encoder PCB assy with a new one.

3-4-5. Plotted dots or lines are dirty.

Problems	Plotted dots or lines are dirty.
Causes	1) The head height is not adjusted correctly. 2) The head ID is not set correctly. 3) Head/cap positional relations get shifted. 4) Wiper is not cleaned. 5) The media is not a dedicated paper. / The ink is not a dedicated ink. 6) Head (nozzle) failure.
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) Check the head ID stuck on the head and the ID within #ADJUSTMENT. 3) Is the ink securely being drained out when executing the cleaning actuation? 4) Visually confirm the ink-filling status. 5) Aren't there any stains and whiskers due to the fibers of paper?
Remedies	1) Adjust the height of the head. 2) Enter the correct head ID. 3) Adjust the capping. 4) Clean the interior of capping station and the end face of wiper. 5) Use the dedicated media and ink. 6) Conduct the cleaning actuation. • Perform the intensive cleaning with the "Select cleaning" inside the adjust. • Perform the ink-filling with the "Select cleaning" inside the maintenance. Replace the head if the failure can not be restored with the said remedies.

3-4-6. Stripes are always drawn at the time of scanning

Problems	Black or white stripes are always drawn at the time of scanning.
Causes	1) The value of [MEDIA COMP.] is not correct. When the media is changed, perform SETUP and [MEDIA COMP.] to set values which suit the media. 2) A medium that is heavier than the specification is placed. (For the case where black stripes appear) 3) Thickker media is used. However, the settings for light-weight medium remain. 4) The value of MEDIA CORRECTION is not correct. When the media is changed, perform [SETUP - MEDIA COMP] to set values which suit the media.
Checking procedures	1) Perform SETUP and [MEDIA COMP.] to check that the value of [MEDIA COMP.] is correct. 2) Medium weight measurement (medium of which weight is 10kg or less is recommended) 3) Check whether or not the distance compensation matches the medium used.
Remedies	1) Same as 1) [3-4-6. Medium feeding failure.] 2) Use a medium of which weight is 10kg or less. 3) Set the correction value.

Priority setting	**Media correction value used**
Panel	Media correction value set by the user at the time of media correction.
Host	Correction value specified by command.

3-4-7. Black and White Stripes on Reverse Sides

Problems	Black and white stripes on reverse sides. Different amount of paper feed between sides. Distinctive gradation or other panting along the scan direction.
Causes	1) Inbalance media setting. 2) Media set with slacks. 3) Plotting on glossy media with 360dpi, 2pass.
Checking procedures	1) Visually confirm the medium setting 2) Check wheter the difference between the left and right sides varies when using the roll paper. 3) Check the medium used and the setting to plot.
Remedies	1) Reset the medium. 2) Set the media using the roll stopper to take up the slack. 3) Change the output condition which suits the media. Check media correction to set a correct values.

3-4-8. Dark and Light Images Occur at Each Scan

Problems	Dark and light images occur at each scan.
Causes	1) Slanted head. 2) Gap between heads on the R and F sides or overlapped heads. 3) Check wheter the ink shot size is obtained according to the resolution.
Checking procedures	1) Adjust the dot slant with [SLANT ADJUST] to 10μm or less for each color. 2) Adjust the dot position with [R/F HEAD ADJUST] to 140μm+-10μm or less for each color. 3) In case of plotting with 720 dpi, perform test using MIMAKI-brand media, Glossy White PET(SPC-0111), and MIMAKI-brand colorant ink. Check that the dot size is 70 to 80μm for the V2 type.
Remedies	1-2) Adjust the head. 3) If panting is canceled, the accuracy of the device is assumed to be normal. Change the plot mode to [STANDARD] or [FINE].With 360 x 360dpi, change the 2pass mode to the 4pass mode; with 360 x 540dpi, change the 3pass mode to the 6pass mode.

3-4-9. Stripes occur

Problems	Stripes (wind repples) occur at each scan.
Causes	1) The head is too high. (The gap is too large.)
Checking procedures	1) Lower the head and then make plotting.
Remedies	1) If panting is canceled, the accuracy of the device is assumed to be normal. Change the plot mode to [STANDARD] or [FINE].With 360 x 360dpi, change the 2pass mode to the 4pass mode; with 360 x 540dpi, change the 3pass mode to the 6pass mode.

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	Corrects the dot shot timing of each head.
HEAD ADJUST	Adjusts the position displacement mechanically for each 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.
INK SETUP	Changes the ink type mounted.
CAPPING	Capping position is adjusted.
HEAD ID	The ID for each head is entered.
ADJUST EDGE	Right and left dead space sizes are adjusted.
500mm SQUARE	Range accuracy is adjuted.
SET QUALITY	Sets the operation mode for plot quality.
MEDIA COMP2	Corrects the amount of media feed.

#TEST

CHECK PATTERN	Nozzle check/density pattern is plotted.
PARAMETER DRAW	Plots the contents of the flash memory.
ALL PATTERN	Collectively plots the adjustment condition check pattern for head or dot position.
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	The state of the keyboard is checked.
DISPLAY TEST	Displays various display items in succession.
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	Check the amount of paper shift.
TEMP CHECK	Check the temperature around the head.
ENCODER CHECK	Check the Linear Scale and Linear Sensor if they perform correctly.

#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.
ADJUST PARAMETER	This is not used in the field.
INFO PARAMETER	This is not used in the field.

4-2. Entering into the maintenance mode

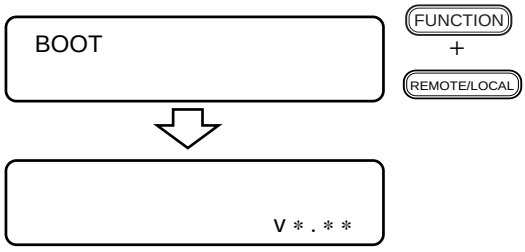
The maintenance mode is entitled in two different methods.

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)



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").

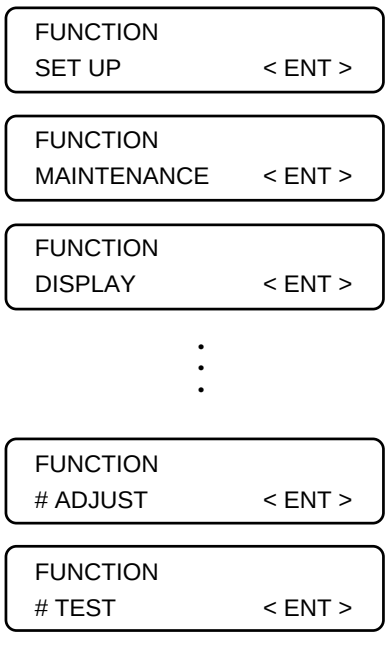
2)

Select the detection of media using the < key, > key or END key.

3)

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

4)



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

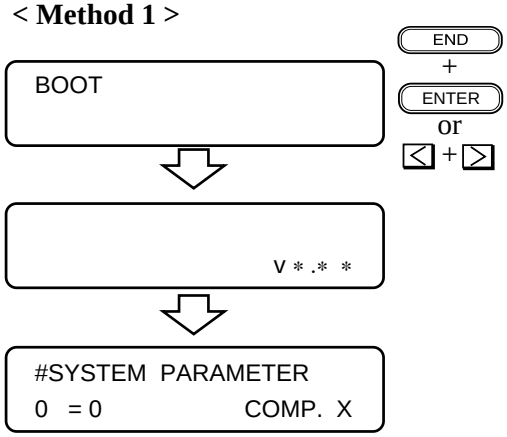
It is possible to keep the maintenance mode held released at all times by changing the value for the system parameter No. 62 (SUPPORT).

CAUTION

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

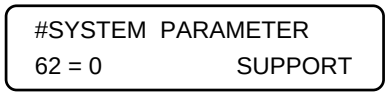
< Method 1 >

1)



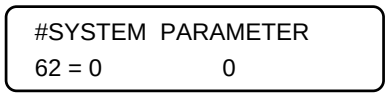
Turn the power on. When the firmware version number is shown on the LCD, simultaneously press the END key and the ENTER key.
Or, simultaneously press the ◁ key and ▷ key.

2)



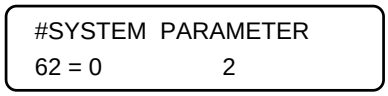
Press the △ key or ▽ key to call up "No. 62 SUPPORT" on the screen.

3)



Press the ENTER key to enter the input mode.

4)



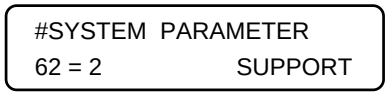
Press the △ key or ▽ key to input "2" or "3".

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)



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

4-3. Menu of #ADJUST

4-3-1. PRINTadjust2

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

[Function]

Corrects the dot shot timing between heads into the X and Y directions based on black of the REAR row.

Correction items and units entered are shown below.

		X PRINT	Y SINGLE	Y REPEAT	Y BI-D
between heads	colors 1 - 2		0.1 dot units	0.1 dot units	none
	colors 1 - 3	1 dot units	0.1 dot units	0.1 dot units	none
	colors 1 - 4		0.1 dot units	0.1 dot units	none
	colors 1 - 5	1 dot units	0.1 dot units	0.1 dot units	none
	colors 1 - 6		0.1 dot units	0.1 dot units	none
	colors 1 - 1	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 correction values can be added to obtain the actual dot position correction values.
The correction values are stored under the adijut parameters.

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the "ADJUSTMENT."
Press the [ENTER] key.

2)

```
#ADJUST
PRN. adjust 2     < ENT >
```

Select the "PRN.adjust2" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
#PRN. adjust2
SEL. :    Variable-1
```

```
#PRN. adjust2
SEL. :    Variable-2
```

```
#PRN. adjust2
SEL. :    Normal-1
```

```
#PRN. adjust2
SEL. :    Noramal-2
```

```
#PRN. adjust2
SEL. :    X DIRECTION
```

```
#PRN. adjust2
SEL. :    BASIS SET
```

Select the item to be corrected using the [△] or [▽] key.
Press the [ENTER] key.

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 "ADJUST: FINE" is selected, refer to the section "If FINE has been selected" below.

4)

```
#PRN. adjust2
Adjust :        Y  Si.
```

```
#PRN. adjust2
Adjust :        Y  Re.
```

```
#PRN. adjust2
Adjust :        Y  Bi.
```

```
#PRN. adjust2
Adjust :        TSTprint.
```

```
#PRN. adjust2
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.

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 "ADJUST: FINE" is selected, refer to the section "If FINE has been selected" below.
- Enter such a value tha the right and left protrusions of the plotted pattern agree with each otehr.

5)

```
#ADJUST
Y Si.  1 - 2 :          0 . 0
```

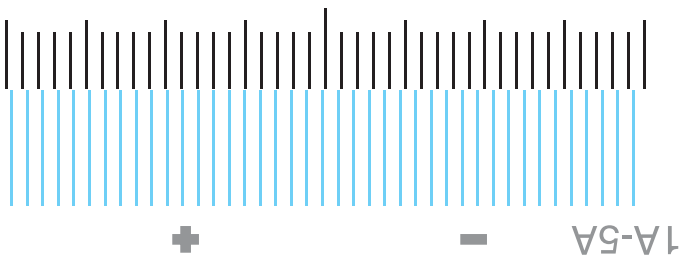
When plotting has been completed, correction value input mode is entered.
Input the values using the [△] and [▽] keys. Then press [ENTER] key to enter the values.
In the follow way, enter the correction values for between heads 1 and 2, between heads 1 and 3, between heads 1 and 4, between heads 1 and 5, and between heads 1 and 6.

6)

```
#ADJUST
Y Si.  1 - 2 :          0 . 0
```

Then, enter the following correction items in the same manner.

- Y SINGLE
- Y REPEAT
- Y BI-D



If "X DIRECTION" has been selected)

CAUTION

- Be sure to perform this item upon completion of media correction.

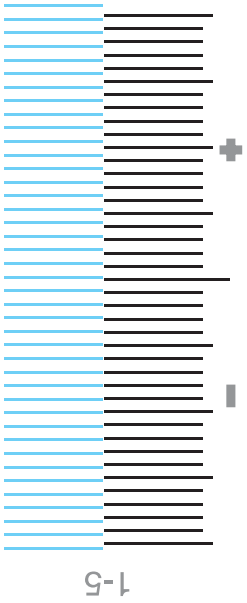
1)

```
#PRN. adjust2
SEL. :      X DIRECTION
```

Press the [ENTER] key to start plotting.
To enter the correction value without performing plotting, press the [>] key.

2)

```
#PRN. adjust2
X  DIR :    0-0
```



When plotting has been completed, correction value input mode is entered.
Input the correction value using the [^] or [v] key.
Enter the correction value with the [ENTER] key.
In the same way, enter the correction values for between heads 1 and 3 and between heads 1 and 5.

CAUTION

- Enter such a value tha the right and left protrusions of the plotted pattern agree with each otehr, 4 or less.

If "BASIS SET" has been selected)

BASIS SET is a function which sets correction values for Variable-1, Normal-1, and Normal-2 based on the correction value for Variable-2.

CAUTION

- Prior to BASIS SET, it is necessary to match correction values Y Si, Y Re, and Y Bi for Variable-2.
- After BASIS SET, the correction values for Variable-1, Normal-1, and Normal-2 can be fine-adjusted using FINE.

1)

```
#PRN. adjust2
SEL. :      BASIS  SET
```

Select the "BASIS SET".

2)

```
#PRN. adjust2
BASIS SET  :              ent
```

Press the [ENTER] key to make automatic internal setup of correction values for other waveforms.

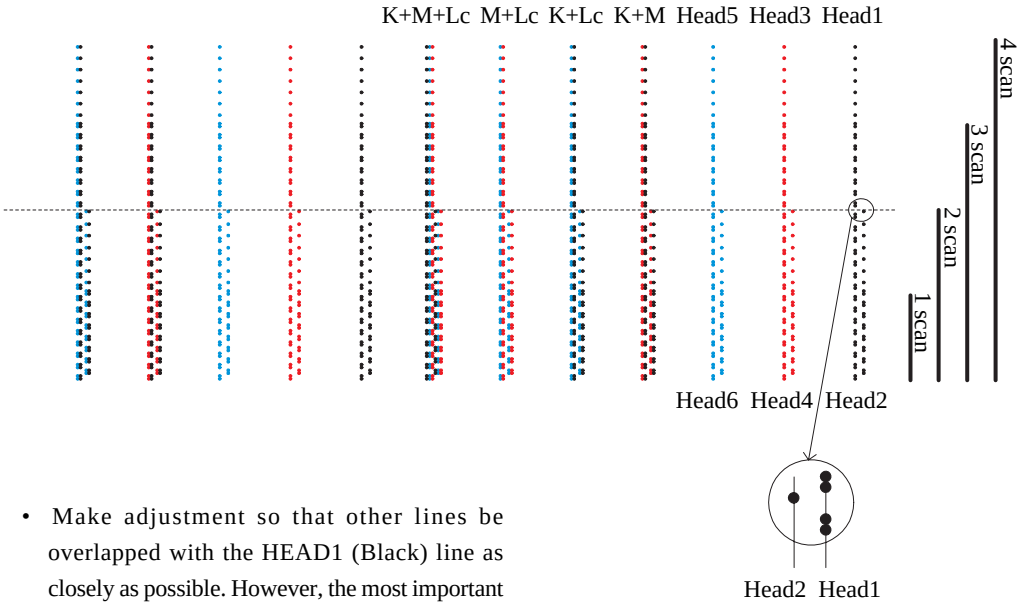
If “FINE” has been selected)

”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 “FINE” after the X PRINT, Y SINGLE, Y REPEAT, and Y BI-D corrections have been performed.

CAUTION

- [FINE] is used for dot position fine adjustment and [FINE: FINAL] is used for dot position check. [FINE: FINAL] cannot be used for adjustment.
- Adjust the shot so that the pattern (Y SINGLE, Y REPEAT) for dot position correction [FINE] totally be as uniform as possible.

[Example of Y SINGLE, Y REPEAT, and Y BI-D adjustment]



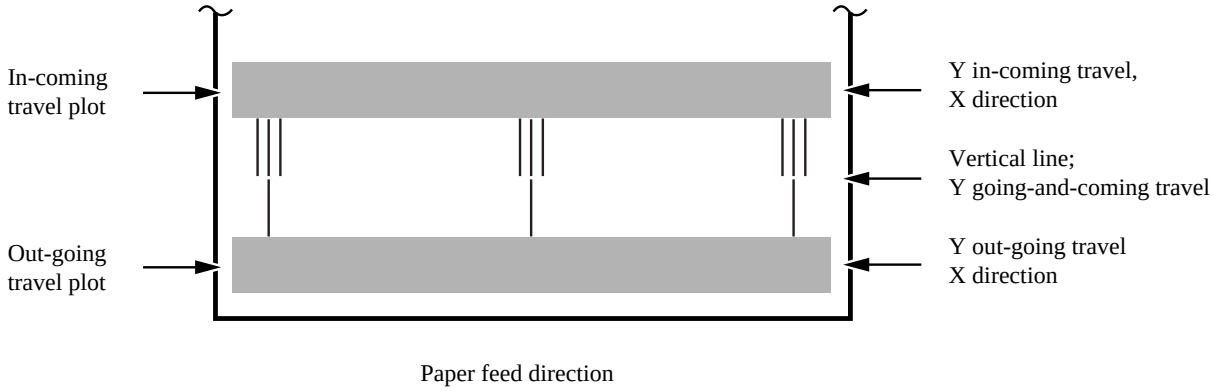
- Make adjustment so that other lines be overlapped with the HEAD1 (Black) line as closely as possible. However, the most important is overlapping of HEAD1 and HEAD2, HEAD3 and HEAD4, and HEAD5 and HEAD6.
- Adjust the correction value so that dot shift at left, right, and center positionsa totally be as uniform as possible. (Do not adjust it by noticing only one point.)

When the dot position viewed from the scope is as shown above, enter a positive value as the correction value for HEAD1 and HEAD2.

For V2 and N2, change of the correction value of 1.0 results in a shift of about 35μm. For V1 and N1, it results in a shift of about 70μm. When using a scope, note that vertical and horizontal inversions occur.

With Y BI-DIRECTIONAL / FINE, the above pattern is plotted only in black.

Sample plotting of [FINE: FINAL]



1)

```
#PRN. adjust2
Adjust          : FINE
```

Select the "Adjust : FINE".
Press the ENTER key.

2)

```
#PRN. adjust2
FINE            : Y Si.
```

```
#PRN. adjust2
FINE            : Y Re.
```

```
#PRN. adjust2
FINE            : Y Bi.
```

```
#PRN. adjust2
FINE            : FINAL
```

Select the adjustment item using the ∧ or ∨ key.
Press the ENTER key.

3)

```
#PRN. adjust2
COLOR           : KMC
```

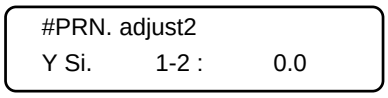
Select the color to plot.
Move the cursor using the < or > key and then select the plot color.
Select whether the selected color is plotted or not using the ∧ or ∨ key.

4)

```
#PRN. adjust2
FINE            : Y Si.
```

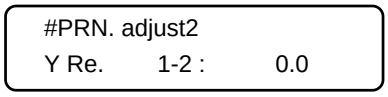
Start plotting with the ENTER key.
(Plot length: about 50mm; plot width; paper width)

If "Y Single" has been selected)



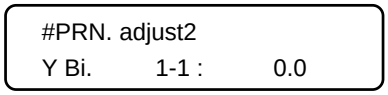
Input the correction value for the Y out-going travel using the ∧ or ∨ key.
Enter the correction values between heads 1 and 2, between heads 1 and 3, between heads 1 and 4, between heads 1 and 5, and between colors 1 and 6.

If "Y Repeat" has been selected)



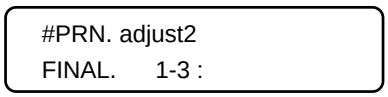
Input the correction value for the Y in-coming travel using the ∧ or ∨ key.
Enter the correction values between heads 1 and 2, between heads 1 and 3, between heads 1 and 4, between heads 1 and 5, and between colors 1 and 6.

If "Y Bi-D" has been selected)



Input the correction value for the Y going-and-coming travel using the ∧ or ∨ key.
Enter the correction value between heads 1 and 1.

If "FINAL" has been selected)



Enter the correction value with the ENTER key.

X PRINT : Heads 1-3, 1-5
Y SINGLE : Heads 1-2, 1-3, 1-4, 1-5, 1-6
Y REPEAT : Heads 1-2, 1-3, 1-4, 1-5, 1-6
Y BI-D : Heads 1-1

Usually, processing is completed by plotting a pattern for checking adjustment result for each item.

When you press the ENTER key, enter the correction value of above items.
Press the END key to exit from the function.

4-3-2. HEAD ADJUST

[Function]

Plots a pattern for mechanical adjustment of position shift of each head.
(Refer to [6-2-6. Adjustment of the head] P.6-12)

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.
Press the ENTER key.

2)

```
# ADJUST
HEAD ADJUST       < ent >
```

Press the FUNCTION key to select the "HEAD ADJUST"
Press the ENTER key.

3)

```
#HEAD ADJUST
SLANT adjust      < ent >
```

```
#HEAD ADJUST
R/F HEAD adj      < ent >
```

```
#HEAD ADJUST
HEAD U/D adj      < ent >
```

Select the adjustment item using the ∧ or ∨ key.

If "SLANT adjust" has been selected)

1)

```
#HEAD ADJUST
SELECT            : REAR
```

Select the head (REAR / FRONT) using the ∧ or ∨ key.
Press the ENTER key.

2)

```
#HEAD ADJUST
TYPE              : 720  4pass
```

Select the print-type (720, 4pass / 360, 2pass) using the ∧ or ∨ key.
Press the ∧ or ∨ key to change the position (only X position) to plot.

3)

```
#HEAD ADJUST
PRINT START       : ent
```

Press the ENTER key to start drawing.

If "R/F HEAD adjust" has been selected)

```
#HEAD ADJUST
SELECT          : KMc
```

Move the cursor using the ◁ or ▷ key to select the color.
Display the selected color using the △ or ▽ key.
Press the ENTER key.

Press the △ or ▽ key to change the position (only X position) to plot.

```
#HEAD ADJUST
PRINT START     : ent
```

Press the ENTER key to start drawing.

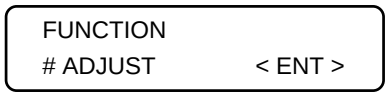
4-3-3. HEAD WASH

[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

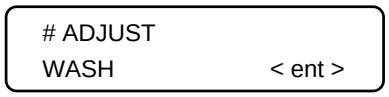
[Operation]

1)



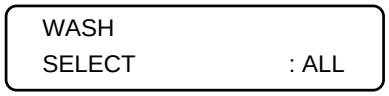
Select the ADJUSTMENT.
Press the ENTER key.

2)



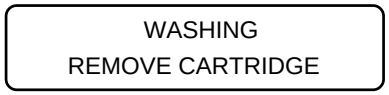
Press the FUNCTION key to select the " WASH."
Press the ENTER key.

3)



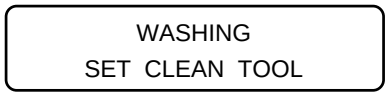
Select the target head using the ∧ or ∨ key.
Specify the target head using the ENTER key.

4)



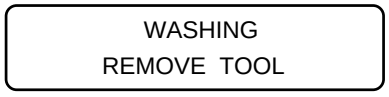
Detach the ink cartridge from the head selected.
The ink that has been filled is ejected to the waste ink tank.

5)



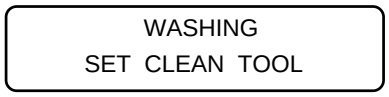
When the display shown at left appears, set the cleaning tool.
Cleaning fluid is suctioned up.

6)



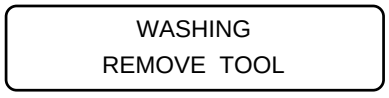
When the display shown at left appears, remove the cleaning tool.
Suck in air.

7)



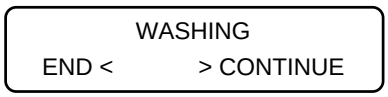
When the display shown at left appears, set the cleaning tool.
Cleaning fluid is suctioned up.

8)



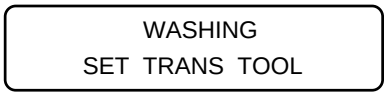
When the display shown at left appears, remove the cleaning tool.
The waste ink tank discharges the cleaning fluid sucked.

9)



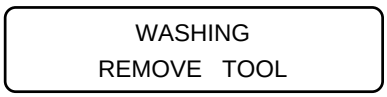
Select whether cleaning is to be continued.
To end cleaning, press the < key.

10)



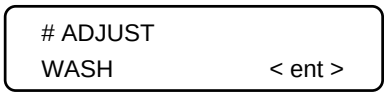
When the display shown at left appears, set the cleaning tool.
Suck in the transportation fluid.

11)



When the display shown at left appears, remove the cleaning tool.
The waste ink tank discharges the transportation fluid sucked.

12)



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

4-3-4. SELECT CLEANING

[Function]

Specified cleaning is performed.

Overview of cleaning operation

Cleaning operation	Cleaning mode		
	soft	normal	strong
Rubbing	X	X	O
Main suction	X	O	O
Micro-suction	O	O	O
Idle suction	O	O	O

* Micro-suction and idle suction include the wiping operation.

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.
Press the [ENTER] key.

2)

```
# ADJUST
SELcleaning       < ent >
```

Press the [FUNCTION] key to select the "SELECT CLEANING."
Press the [ENTER] key.

3)

```
# SELCleaning
SELECT        : ALL
```

```
# SELCleaning
SELECT        : REAR
```

```
# SELCleaning
SELECT        : FRONT
```

Select the target head using the [△] or [▽] key.
Specify the target head using [ENTER] key.

4)

```
# SELCleaning
TYPE          : normal
```

```
# SELCleaning
TYPE          : strong
```

```
# SELCleaning
TYPE          : soft
```

Select the cleaning type using the ∧ or ∨ key.

5)

```
CLEANING   ACTIVE
* * * * * *
```

Press the ENTER key.
Now, start the cleaning.

6)

```
# ADJUST
SELcleaning          < ent >
```

Upon completion of the cleaning, the indication given in step of procedure 2) will be restored on.

4-3-5. REPLACE COUNTER

[Function]

Number of ink cartridge replacements, number of scanning, draw area and using time are confirmed.

The number of times the ink cartridge has been replaced is incremented whenever the ink cartridge is removed.

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.
Press the [ENTER] key.

2)

```
# ADJUST
REPLACE CNT       < ent >
```

Select the "REPLACE COUNTER" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# REPLACE CNT
CARTRIDGE         < ent >
```

```
# REPLACE CNT
SCAN COUNT        < ent >
```

```
# REPLACE CNT
DRAW AREA         < ent >
```

```
# REPLACE CNT
USE TIME          < ent >
```

If "CARTRIDGE" has been selected)

```
# REPLACE CNT
color 1                : *
```

When you press the [△] or [▽] key, the number of replacements is displayed for each ink cartridge.
Press the [ENTER] key to exit from the function.

If "SCAN COUNT" has been selected)

```
# REPLACE CNT
Pig                    : *
```

When you press the [△] or [▽] key, the number of scans is displayed for each ink cartridge.
Press the [ENTER] key to exit from the function.

If "DRAW AREA" has been selected)

```
# REPLACE CNT
Pig              : * m2
```

When you press the [△] or [▽] key, the plotting area is displayed for each ink cartridge.
Press the [ENTER] key to exit from the function.

If "USE TIME" has been selected)

```
# REPLACE CNT
TIME             : * h
```

Display the operating time.
Press the [ENTER] key to exit from the function..

CAUTION

• The display value is the value accumulated since the power is turned on for the first time. Select [INK PARAMETER] in [4-3-6. Default set] to perform initialization.

4-3-6. DEFAULT SET

[Function]

Parameter settings are reset to initial values.

When the “Set parameter” is under execution, the following situation takes place.

- The setting items (the drawing method, the number of ink layers etc.) are reset to the initial values.
- “PRINTadjust2” that is released to the users is reset to the initial value.
- System parameter No.62 Adjusting function extension =0 (Adjusting function: CLOSE)
- DISPLAY

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.
Press the [ENTER] key.

2)

```
# ADJUST
DEFAULT SET       < ent >
```

Select the “DEFAULT SET” pressing the [FUNCTION] key.
Press the [ENTER] key.

3) **Select the parameter using the [△] or [▽] key.**

```
# DEFAULT SET
SET : SETUP PRM
```

```
# DEFAULT SET
SET : INK PRM. 1
```

```
# DEFAULT SET
SET : INK PRM. 2
```

```
# DEFAULT SET
SET : MAINTE PRM
```

```
# DEFAULT SET
SET : SERVO PRM
```

```
# DEFAULT SET
SET : ADJUST PRM
```

```
# DEFAULT SET
SET : INFO PRM
```

4)

```
# DEFAULT SET
SET : SETUP PRM
```

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

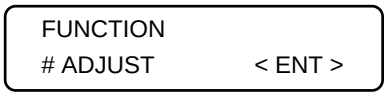
4-3-7. CAPPING

[Function]

Capping position is adjusted. (Refer to [6-2-2. Adjustment of the station position] P.6-4)
The adjustment value is stored under the system parameter No. 4 to No.8.

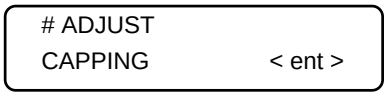
[Operation]

1)



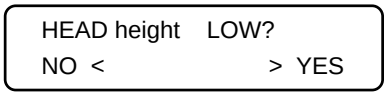
Select the ADJUSTMENT.
Press the ENTER key.

2)



Select the "CAPPING" pressing the FUNCTION key.
Press the ENTER key.

3)

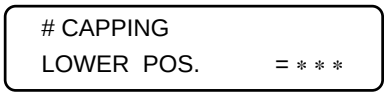


Check the head height.
If it is low, select YES; otherwise, select NO.

CAUTION

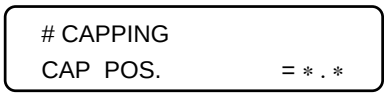
- Do not select YES if the head height is not high. Doing so may disable correct value display when checking the head height.

4)



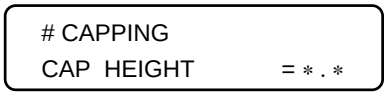
Adjust the bottom position using the ∧ or ∨ key.
Press the ENTER key.

5)



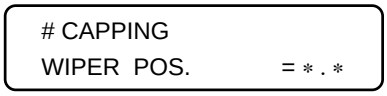
Adjust the Cap position using the ∧ or ∨ key.
Press the ENTER key.

6)



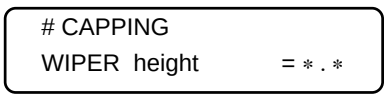
Adjust the Cap height using the ∧ or ∨ key.
Press the ENTER key.

7)



Adjust the Wiper position using the ∧ or ∨ key.
Press the ENTER key.

8)



Adjust the Wiper height using the ∧ or ∨ key.
When you press the ENTER key, the setting is registered and Capping executed.

9)

Press the END key to exit from the function.

4-3-8. INK SETUP

[Function]
Changes the ink type mounted.

CAUTION

- Use this function only when the selected ink type is different from the mounted ink type, for example, after PCB replacement. Note that selecting a different ink type from the mounted ink type may cause failed plotting.

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.
Press the [ENTER] key.

2)

```
# ADJUST
INK  SETUP        < ent >
```

Select the "INK SETUP" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# INK  SETUP
P :  Pigcm        F : Pigcm
```

```
# INK  SETUP
P :  PigOG        F : Pigcm
```

```
# INK  SETUP
P :  Dye          F : Pigcm
```

```
# INK  SETUP
P :  Sub          F : Pigcm
```

```
# INK  SETUP
P :  Pigcm        F : PigOG
```

```
# INK  SETUP
P :  Pigcm          F : Dye
```

```
# INK  SETUP
P :  Pigcm          F : Sub
```

Adjust the ink type using the [△] or [▽] key.
Adjust the Rear / Front using the [◁] or [▷] key.

4)

```
# ADJUST
INK  SETUP        < ent >
```

Upon completion of Rear/Front Ink type setting, press the [ENTER] key.

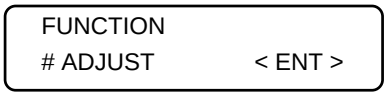
4-3-9. HEAD ID

[Function]

The setting value is issued in the maintenance list at the time of maintenance release.
Enter the ID numbers of heads 1 to 6. The input values are stored under system parameters No. 1 to 6.
The ID numbers are sealed and stuck on each print head.

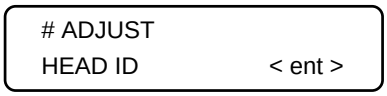
[Operation]

1)



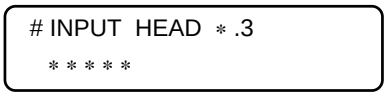
Select the ADJUSTMENT, and then press the ENTER key.

2)



Select the "HEAD ID", and then press the ENTER key.

3)



Press the ENTER key again, and thenthe 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.

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

4)

After the ID numbers of heads 1 to 6 have been entered, press the END key.
The values that were input are stored under system parameters, and this operation ends.

CAUTION

- Incorrect entry in step 3) results in an error when the ENTER key is pressed. Since the entry remains intact, modify the number and then normally terminate the entry.

4-3-10. ADJUST EDGE

[Function]

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

Adjustment should be done to be printed on each right and left position from the both edge of the Media.

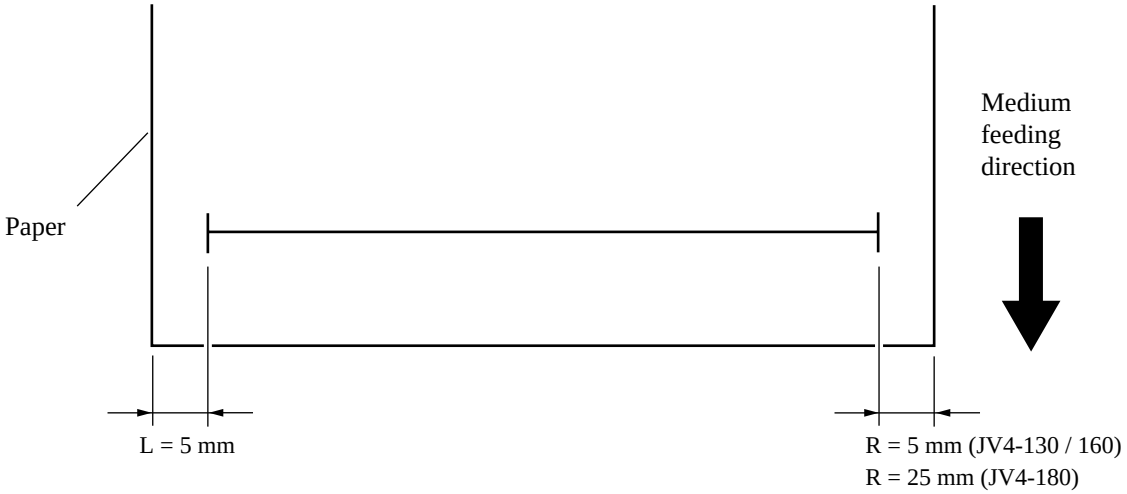
JV4-130/160 : Left edge 5mm, Right edge 5mm

JV4-180 : Left edge 5mm, Right edge 25mm

The adjustment value will be stored under system parameter No. 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 medium width, the medium of no plotting should be used during the adjustment. If the medium 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 of the left end = 5mm - Actual measured value (mm)
  (stored in increments of 0.1mm)

  Adjustment value of the right end = 5mm - Actual measured value (mm)
  (stored in increments of 0.1mm) : JV4-130/160

  Adjustment value of the right end = 25mm - Actual measured value (mm)
  (stored in increments of 0.1mm) : JV4-180

[Operation]

1)

```
FUNCTION
# ADJUST          < ENT >
```

Select the ADJUSTMENT.

Press the [ENTER] key.

2)

```
# ADJUST
ADJUST  EDGE      < ent >
```

Select the "ADJUST EDGE " pressing the [FUNCTION] key.

Press the [ENTER] key.

3)

Plot the adjusting pattern using the [>] key.
Clear the adjustment value using the [<] key.
Press the [^] or [v] key to enter a correction value without performing plotting.
After the completion of plotting, enter a correction value.

4)

Enter the measured value of the dead space in units of 0.1 mm, using the [^] or [v] key.

Press the (ENTER) key to store the entered value.

5)

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.

4-3-11. 500mmSQUARE

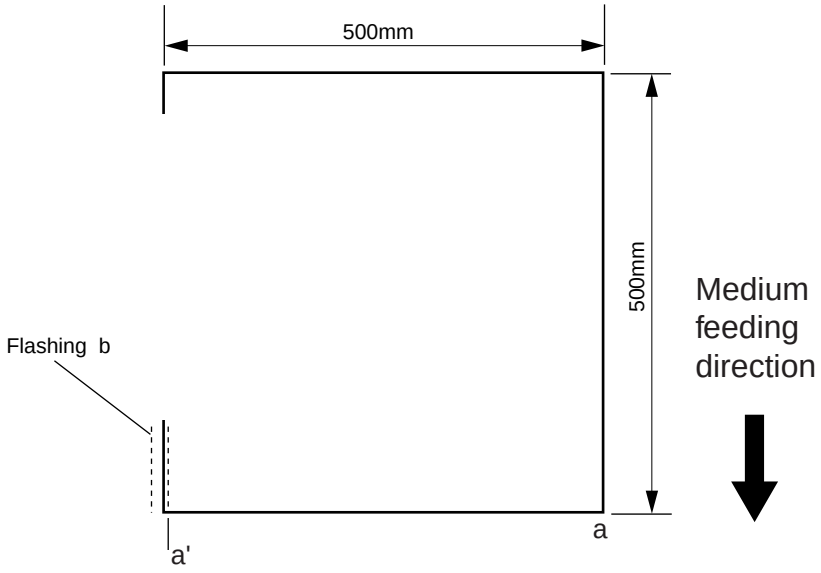
[Function]

Range accuracy is adjusted.

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

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

The adjustment values are stored under the system parameters No. 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)

FUNCTION	
# ADJUST	< ENT >

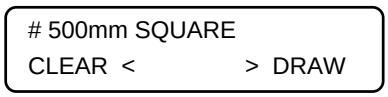
Select the ADJUSTMENT.
Press the [ENTER] key.

2)

# ADJUST	
500mmSQUARE	< ent >

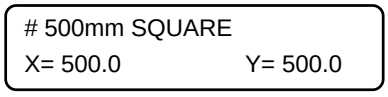
Select the "500mmSQUARE" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)



Plot the adjusting pattern using the [>] key.
Clear the adjustment value using the [<] key.
Press the [^] or [v] key to enter a correction value without performing plotting.
After the completion of plotting, enter a correction value.

4)



Enter the measured value for the X and Y directions using the [^] or [v] key.

Press the ENTER key to store the entered value.

5)

The indication given in the step of procedure 3) will be restored on the LCD.
Press the END key to exit from the "500mm SQUARE."
To clear the adjustment value, press the [<] key.
To draw an adjusting pattern, press the [>] key.

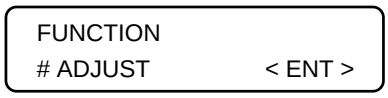
4-3-12. SET QUALITY

[Function]

Sets the operation mode of the user-defined PRINT MODE-QUALITY.The setting values are stored under the maintenance parameters No. 74 and 79.
The settting value is issued in the maintenance list at the time of maintenance release.

[Operation]

1)

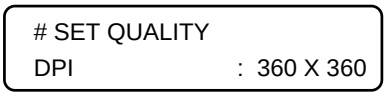


Select the ADJUSTMENT..
Press the ENTER key.

2)

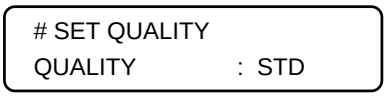
Select the "SET QUALITY" pressing the FUNCTION key.
Press the ENTER key.

3)



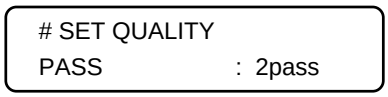
Select the resolution using the ∧ or ∨ key, and then press the ENTER key.
DPI: 360 x 360, 360 x 540, 360 x 720, 720 x 720, 1440 x 720, 1440 x 1440

4)



Select the quality using the ∧ or ∨ key, and then press the ENTER key.
QUALITY: Standard, Fine, Highspeed

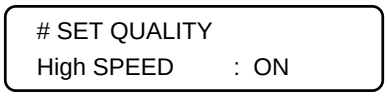
5)



Select the number of divisions using the ∧ or ∨ key, and then press the ENTER key.
PASS: 2pass, 3pass, 4pass, 6pass, 8pass, 12pass, 16pass, 32pass

CAUTION
- Some items cannot be selected depending on the resolution.

6)



Select the high-speed scan (on/off) using the ∧ or ∨ key, and then press the ENTER key.

CAUTION
- Some items cannot be selected depending on the resolution and the number of divisions.

7)

Press the ENTER key to exit from the function.

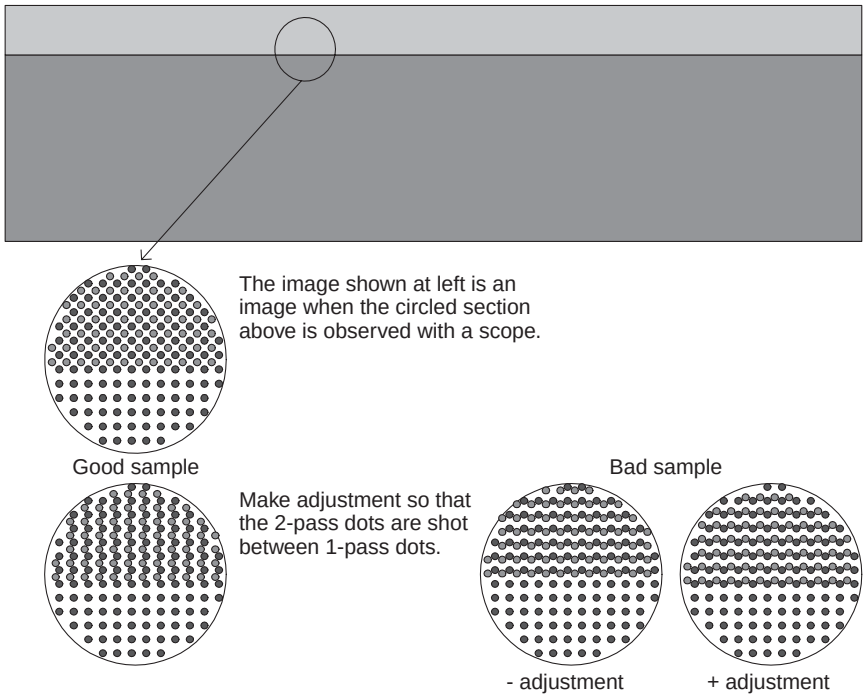
4-3-13. MEDIA COMP2

[Function]

Corrects the amount of media feed at the time of plotting.
The correcting values are stored under the system parameters No. 20.

CAUTION

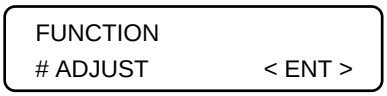
- Make this adjustment only if a problem occurs when the media is normally set and the folowing pattern is plotted using a combination of MIMAKI-brand Grossy White PET(SPC-0111)and MIMAKI-brand colorant ink.
  Reason : This adjustment changes the reference value for media correction. With this change, the four types of [SET UP - MEDIA COMP.] for the user are all changed and therefore the user needs re-adjustment.



* Since only the feed direction (X direction) is adjusted, the hatched dot pattern may not result.

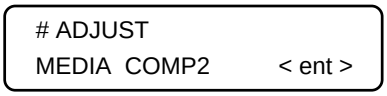
[Operation]

1)



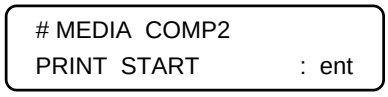
Select the ADJUSTMENT.
Press the ENTER key.

2)



Select the "MEDIA COMP2" pressing the FUNCTION key.
Press the ENTER key.
Press the > key to enter correction value without performing plotting.

3)



Press the ENTER key to start plotting.
Press the END key to interrupt the operation.Select the DPI using the ^ or v key.

4)

Input the correction value the ^ or v key.
Press the ENTER key to store the entered value.

4-4. #TEST items

4-4-1. CHECK PATTERN

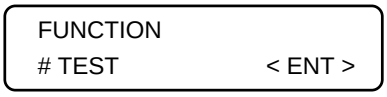
[Function]

Plots the following patterns with the selected plotting mode to check the machine status.

a. Density pattern..... Patterns are drawn for the density of 100%, 50%, 25%, and 6.25% (Colors can be selected.)
b. Nozzle check ..... A nozzle checking pattern is drawn (Colors can be selected.)
c. Color chart ..... K, C, M, Y, Lm (or O) and Lc (or G) color patterns are drawn (fixed color).
d. Feed ..... Checks the amount of feed with 1-head 1-nozzle configuration. (Colors can be selected.)

[Operation]

1)

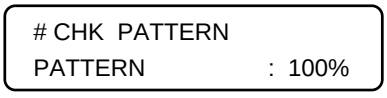


Select the "TEST."
Press the ENTER key.

2)

Select the "CHECK PATTERN" pressing the FUNCTION key.
Press the ENTER key.

3)



Select a pattern using the ∧ and ∨ keys.

Pattern : 100%
50%
25%
6.25%
NOZZLE
COLOR
FEED

- 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.
- When necessary items have been specified for each pattern and the device is ready for plotting, you can set the plot position, the head to be used, and the number of scans before pressing the ENTER key.

a. Plotting a density pattern

1)

```
# CHK PATTERN
PATTERN : 100%
```

Select the density pattern using the [△] or [▽] key and press the [ENTER] key.
Pattern : 100%, 50%, 25%, 6.25%

2)

```
# CHK PATTERN
DPI      : 360X360-N1
```

Select the resolution using the [△] or [▽] key and press the [ENTER] key.
Resolution : 360 x 360- N1, 360 x 360- V1
360 x 540- N1, 360 x 540- V1
720 x 720- N2, 720 x 720- V2
1440 x 1440 -V2, 180 x 180- N1

3)

```
# CHK PATTERN
PLOT : UNI–D 2 pass
```

Select the drawing way using the [△] or [▽] key and press the [ENTER] key.
Drawing way : BI-D 1,2,3,4,6,8,12,16,32 pass
UNI-D 1,2,3,4,6,8,12,16,32 pass

- Some items cannot be selected depending on the resolution.

4)

```
# CHK PATTERN
X = 10      Y = * * * * *
```

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

5)

```
# CHK PATTERN
INK TYPE              : Pigcm
```
(Select several)

Select the ink type used for plotting using the [◁] or [▷] key and press the [ENTER] key.

6)

```
# CHK PATTERN
COLOR          : KCMY  –  –
```

Select the color used for plotting.
Shift the cursor using the [<] or [>] key to select the color to be used.
Press the [^] or [v] key to select wheter the color is drawned or not.

Press the (ENTER) key to finalize the number.

7)

```
# CHK PATTERN
PATTERN        : PLOT
```

At this time it is now ready for the drawing.
Press the (ENTER) key to start drawing.
When the device is ready for plotting, the followings can be setted.

[<] : shift the origin.
(REMOTE/LOCAL) : select the head used and the high-speed scan.

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

8)

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.

b. Plotting a nozzle checking pattern

1)

```
# CHK PATTERN
PATTERN :  NOZZLE
```

Select "NOZZLE" using the [^] or [v] key and press the (ENTER) key.

2)

```
# CHK PATTERN
DPI        : 360X360-N1
```

Select the resolution using the [^] or [v] key and press the (ENTER) key.
Resolution : 360 x 360- N1, 360 x 360- V1
360 x 520- N1, 360 x 520- V1
720 x 720- N2, 720 x 720- V2
1440 x 1440 -V2, 180 x 180- N1

3)

```
# CHK  PATTERN
PLOT :  UNI–D  2 pass
```

Select the print mode using the [△] or [▽] key and press the (ENTER) key.

Drawing way : BI-D 1,2,3,4,6,8,12,16,32 pass
UNI-D 1,2,3,4,6,8,12,16,32 pas

CAUTION

- Some items cannot be selected depending on the resolution.

4)

```
# CHK  PATTERN
X =  10      Y = * * * * *
```

Select the plotting length in the XandY-direction using the [△] or [▽] key and press the (ENTER) key.

Length setting in X-direction
: 10 mm to the sheet length (in increments of 10 mm)
Length setting in Y-direction
: 40 mm to the sheet length (in increments of 40 mm)

5)

```
# CHK  PATTERN
COLOR              : KCMY   cm
```

```
# CHK  PATTERN
INK TYPE           : Pigcm
```

(Select several)

Select the color used for plotting.

Shift the cursor using the [◁] or [▷] key to select the color to be used.
Press the [△] or [▽] key tto select wheter the color is drawned or not.

Press the (ENTER) key to finalize the number.

6)

```
# CHK  PATTERN
PATTERN        : PLOT
```

At this time it is now ready for the drawing.
Press the (ENTER) key to start drawing.

When the device is ready for plotting, the followings can be setted.

[◁] : shift the origin.
(REMOTE/LOCAL) : select the head used and the high-speed scan.

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

7)

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.

c. Plotting a color chart pattern

1)

```
# CHK  PATTERN
PATTERN :  COLOR
```

Select color chart using the [△] or [▽] key and press the (ENTER) key.

2)

```
# CHK  PATTERN
DPI        : 360X360-N1
```

Select the resolution using the [△] or [▽] key and press the (ENTER) key.

Resolution : 360 x 360- N1, 360 x 360- V1
360 x 540- N1, 360 x 540- V1
720 x 720- N2, 720 x 720- V2
1440 x 1440 -V2, 180 x 180- N1

3)

```
# CHK  PATTERN
PLOT :  BI–D  1 pass
```

Select the print mode using the [△] or [▽] key and press the (ENTER) key.

Drawing way : BI-D 1,2,3,4,6,8,12,16,32 pass
UNI-D 1,2,3,4,6,8,12,16,32 pass

CAUTION

- Some items cannot be selected depending on the resolution.

4)

```
# CHK  PATTERN
DENSITY :  100%
```

Select the density using the [△] or [▽] key and press the (ENTER) key.

Density : ALL, 100%, 50%, 25%

At this time it is now ready for the drawing.

5)

```
# CHK  PATTERN
PATTERN        : PLOT
```

At this time it is now ready for the drawing.Press the (ENTER) key to start drawing.

When the device is ready for plotting, the followings can be setted.

[◁] : shift the origin.

(REMOTE/LOCAL) : select the head used and the high-speed scan.

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

6) **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.**

d. Plotting a feed pattern

1)

```
# CHK  PATTERN
PATTERN :  FEED
```

Select "FEED" using the ∧ or ∨ key and press the ENTER key.

2)

```
# CHK  PATTERN
DPI        : 360X360-N1
```

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

Resolution : 360 x 360- N1, 360 x 360- V1
360 x 540-N1, 360 x 540-V1
720 x 720- N2, 720 x 720- V2
1440 x 1440 -V2, 180 x 180- N1

3)

```
# CHK  PATTERN
PLOT :  UNI–D  1 pass
```

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

Drawing way : BI-D 1,2,3,4,6,8,12,16,32 pass
UNI-D 1,2,3,4,6,8,12,16,32 pass

CAUTION

- Some items cannot be selected depending on the resolution.

4)

```
# CHK  PATTERN
BETWEEN :          ∗ ∗ ∗ dot
```

Select the interval in the Y-direction using the ∧ or ∨ key and press the ENTER key.

Length setting: 16 dot to 512 dot

5)

```
# CHK  PATTERN
X = 10              Y = * * * *
```

Select the plotting length in the X and Y-direction using the [∧] or [∨] key and press the [ENTER] key.

Length setting: 10mm to the sheet width
(in increments of 10mm steps)

6)

```
# CHK  PATTERN
COLOR          : KCMY  cm
```

```
# CHK  PATTERN
INK TYPE            : Pigcm
```

(Select several)

Select the color to plot.
Shift the cursor using the [<] or [>] key to select the color to be used.
Press the [∧] or [∨] key ttto select wheter the color is drawned or not.

7)

```
# CHK  PATTERN
PATTERN      : PLOT
```

At this time it is now ready for the drawing.Press the [ENTER] key to start drawing.
When the device is ready for plotting, the followings can be setted.

[<] : shift the origin.
[REMOTE/LOCAL] : select the head used and the high-speed scan.

Plotting can be aborted by pressing the [END] key.

8)

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.

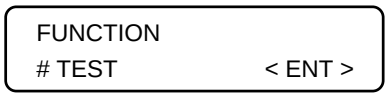
4-4-2. PARAMETER DRAW

[Function]

Setting state of parameters is plotted.

[Operation]

1)

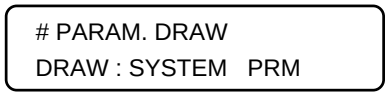


Select the TEST.
Press the ENTER key.

2)

Select the "PARAMETER DRAW" pressing the FUNCTION key.
Press the ENTER key.

3)



Select the plot parameter using the ∧ or ∨ key.
System parameter
Ink parameter 1
Ink parameter 2
Maintenance parameter
Servo parameter
Adjustment parameter
Information parameter

4)

Press the ENTER key to start plotting.

HEAD ID is issued in the maintenance list at the time of maintenance release.

4-4-3. ALL PATTERN

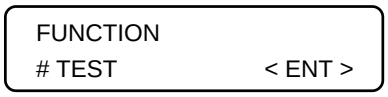
[Function]

Collectively plots the following adjustment result.

- HEAD ADJUST , SLANT adjust , R/F HEADadjust , HEAD U/ Dadjsut
- PARAMETERadjust2 , FAIN , FAINAL , TEST DRAW

[Operation]

1)



Select the TEST.
Press the ENTER key.

2)

Select the "ALL PATTERN" pressing the FUNCTION key.
Press the ENTER key.

3)

Press the ENTER key to start plotting.

4-4-4. 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.
- Note that executing this function with ink filled may cause ink leakage from the head.

[Operation]

1)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the ENTER key.

2)

```
# TEST
X  SERVO              < ent >
```

Select the "X SERVO" pressing the FUNCTION key.
Press the ENTER key.

3)

```
# X  SERVO
X :   S = * * *       A = * .* *
```

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)

```
# X  SERVO
          X = * * *
```

Press the ENTER key without changing the set value.
The aging in the X-direction starts.

5)

```
# TEST
X  SERVO              < ent >
```

Press the END key to interrupt the operation.

4-4-5. 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.

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)

```
FUNCTION
# TEST                    < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
Y  SERVO                  < ent >
```

Select the "Y SERVO" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# Y  SERVO
Y :   S = * * *      A = * . * *
```

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)

```
# Y  SERVO
          Y = * * * *
```

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

5)

```
# TEST
Y  SERVO                  < ent >
```

Press the [END] key to interrupt the operation.

4-4-6. 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)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
XY SERVO              < ent >
```

Select the "XY SERVO" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# XY SERVO
X :  S = :＊＊＊  A = ＊. ＊＊
```

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)

```
# XY SERVO
Y :  S = ＊＊＊  A = ＊.＊＊
```

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)

```
# XY SERVO
X = ＊＊＊      Y = ＊＊＊＊
```

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.
The aging in the X- and Y-direction starts.

6) **Press the [END] key to exit from the function.**

4-4-7. ACTION TEST

[Function]

Performance of the following units is checked.

- Rotation of fan motor (LOW/MID/HIGH/L.L./Poff)
- Up/down operation of Y-cutter (UP/DOWN)
- Turning ON/OFF roll motor.
- Turning ON/OFF cooling fan.

[Operation]

1)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
ACTION TEST           < ent >
```

Select the "ACTION TEST" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# ACTION TEST
FAN MOTOR             : LOW
```

```
# ACTION TEST
Y CUTTER              : DOWN
```

```
# ACTION TEST
COOLING FAN           : OFF
```

```
# ACTION TEST
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.**

4-4-8. SENSOR TEST

[Function]

The state of the following sensors are checked.

- Medium setting lever sensor
- Y-origin sensor
- Station sensor
- Front cover sensorrear
- Ink pack sensor
- Rear paper presence/absence sensor
- Capping sensor
- Wiper sensor
- X-origin sensor
- Ink end sensor

[Operation]

1)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
SENSOR  TEST        < ent >
```

Select the "SENSOR TEST" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# SENSOR TEST
SET  LEVER          : OFF
```

The state of the media setting lever is shown on the LCD.
ON: Lever is in its lower position.
OFF: Lever is in its upper position.

4)

```
# SENSOR  TEST
REAR  PAPER         : OFF
```

Press the [△] key.
The state of the rear paper sensor is shown on the LCD.
ON: Medium is present.
OFF: Medium is absent.

5)

```
# SENSOR TEST
Y-ORIGIN            : OFF
```

Press the [△] 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)

```
# SENSOR TEST
CAPPING             : OFF
```

Press the [△] key.
The state of the capping sensor is shown on the LCD.
ON: The capping has been opened.
OFF: The capping has not been closed.

7)

```
# SENSOR TEST
STATION          : OFF
```

Press the [△] key.
The state of the station cover sensor is shown on the LCD.
ON: The station cover has been opened.
OFF: The station cover has not been closed.

8)

```
# SENSOR TEST
WIPER            : OFF
```

Press the [△] key.
The state of the wiping sensor is shown on the LCD.
ON: Wiper FAR
OFF: Wiper NEAR

9)

```
# SENSOR TEST
FRONT COVER      : OFF
```

Press the [△] key.
The state of the front cover sensor is shown on the LCD.
ON: The front cover has been opened.
OFF: The front cover has not been closed.

10)

```
# SENSOR TEST
X-ORIGIN         : OFF
```

Press the [△] key.
The state of the X-origin sensor is shown on the LCD.
ON: Origin has been detected.
OFF: Origin has not been detected.

11)

```
# INK  PACK  TEST
– – – – – –    – – – – – –
```

Press the [△] key.
Current status of ink pack sensor is displayed.
The color codes of the cartridges that have run out of ink are appear.

12)

```
# INK  END  TEST
– – – – – –    – – – – – –
```

Press the [△] key.
Current status of ink end sensor is displayed.
The color codes of the cartridges that have run out of ink are appear.

Press the [▽] key in repetition to return the layers of screens one by one.

13)

Press the [END] key to exit from the function.
Press the [ENTER] key to start the initial operation.

4-4-9. 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)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the ENTER key.

2)

```
#TEST
PAPER  sensor         < ent >
```

Select the "PAPER SENSOR" pressing the FUNCTION key.
Press the ENTER key.

3)

```
# PAPER  sensor
***  (   ***, ***  )
```

Reading by the paper sensor is given on the LCD.

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

The head can be moved to a desired position using the < or > key.
The number at the left end indicates the readout value of the sensor.

- No media : About -600
- Clear film : About -400
- White media : 0 to 100

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

4-4-10. KEYBOARD TEST

[Function]

The key pressed is shown on the LCD.

[Operation]

1)

```
FUNCTION
# TEST                    < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
KEYBOARD                  < ent >
```

Select the "KEYBOARD" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# KEYBOARD  TEST
Key – – >   NONE
```

```
# KEYBOARD  TEST
Key – – >  [ REMOTE ]
```

```
# KEYBOARD  TEST
Key – – >  [ FUNCTION ]
```

```
# KEYBOARD  TEST
Key – – >  [ TESTDRAW ]
```

```
# KEYBOARD  TEST
Key – – >  [ CLEANING ]
```

```
# KEYBOARD  TEST
Key – – >  [ ENTER ]
```

```
# KEYBOARD  TEST
Key – – >  [ CLEAR ]
```

```
# KEYBOARD  TEST
Key – – >  [ LEFT ]
```

```
# KEYBOARD  TEST
Key – – >  [ RIGHT ]
```

```
# KEYBOARD  TEST
Key – – >  [ UP ]
```

```
# KEYBOARD  TEST
Key – – >  [ DOWN ]
```

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)

```
# TEST
[ END ] – – > TEST  END
```

Press the [END] key to exit from the function.

4-4-11. DISPLAY TEST

[Function]

Displays various display items in succession.

[Operation]

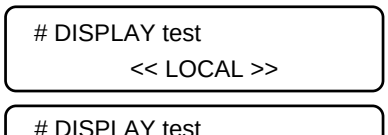
1)

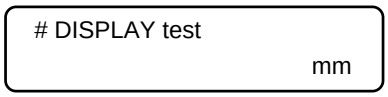
Select the TEST.
Press the ENTER key.

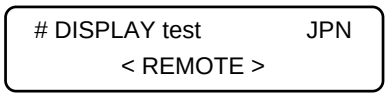
2)

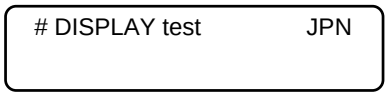
Select the "DISPLAY TEST" pressing the FUNCTION key.

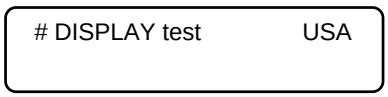
3)

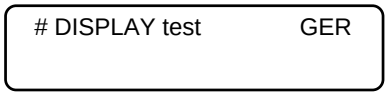


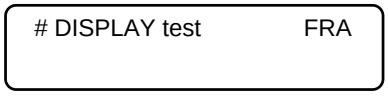


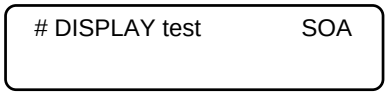


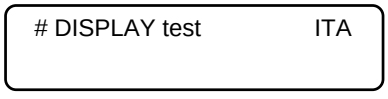


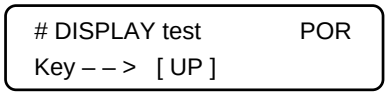












Press the ENTER key.
Display test is started.
Press the ∧ or ∨ key to change the display item.
Press the < or > key to change the display language.

4)

Press the END key to exit from the function.

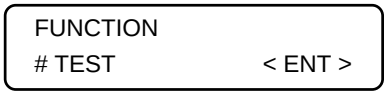
4-4-12. LCD TEST

[Function]

Indication shown on the LCD is changed over at predetermined intervals

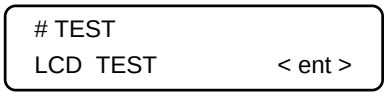
[Operation]

1)



Select the TEST.
Press the ENTER key.

2)



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.
Displays items at specific intervals.

4)

Press the END key to exit from the function.

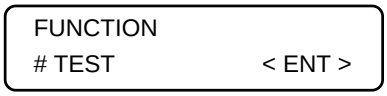
4-4-13. PUMP MOTOR

[Function]

Performance of the pump motor is checked.

[Operation]

1)

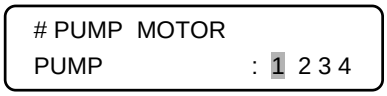


Select the TEST.
Press the ENTER key.

2)

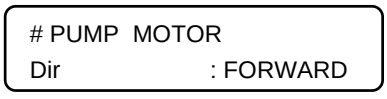
Select the "PUMP MOTOR" pressing the FUNCTION key.
Press the ENTER key.

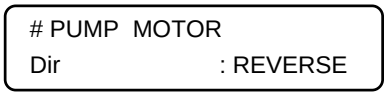
3)



Move the cursor using the ∧ or ∨ key, select the target pump
Press the ∧ or ∨ key to set the selected pump to ON or OFF.
Press the ENTER key.

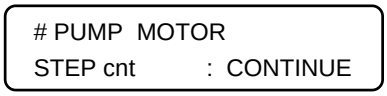
4)





Select the direction of drive steps using the ∧ or ∨ key.
Press the ENTER key.

5)



Select the number of drive steps (500-16300, CONTINUE) using the ∧ or ∨ key.
Press the ENTER key.

6)

Select the driving speed using the ∧ or ∨ key.
Press the ENTER key.

7)

The pump motor starts running.

After the pump motor performance is checked, the head selection can be made.
If you select the "CONTINUE", press the ENTER key to exit from the function.

4-4-14. TIMER CHECK

[Function]

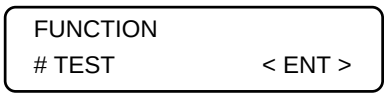
Checks the present date and time.

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

The built-in timer is backed up by a lithium battery. This battery discharges to a voltage level which cannot maintain normal timer operation in about 7 years.

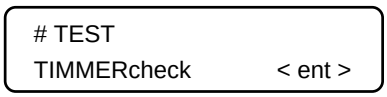
[Operation]

1)



Select the TEST.
Press the ENTER key.

2)



Select the "TIMER CHECK" pressing the FUNCTION key.

3)

Press the ENTER key.
Displays the present date and time.
Press the ENTER key to shift to the date setup mode.

4)

The present date and time is shown on the LCD using the ∧ or ∨ key.

5)

Press the END key to exit from the function.

4-4-15. MEMORY CHECK

[Function]

Checking of the following memories is executed.

a. SDRAM read/write check
b. F-ROM hash check
c. S-RAM read/write chec
d. I/F board S-RAM read/write check

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)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
MEMORY check          < ent >
```

Select the "MEMORY CHECK" pressing the [FUNCTION] key.
Press the [ENTER] key.

3)

```
# MEMORY check
CHECK :  SDRAM
```

```
# MEMORY check
CHECK :  F–ROM
```

```
# MEMORY check
CHECK :  S–RAM
```

```
# MEMORY check
CHECK :  I/F S–RAM
```

Select the item to be checked using the [△] or [▽] key.
Press the [ENTER] key, and the check menu for memories will be invoked.

a. SDRAM check

1)

```
# MEMORY check
CHECK :  SDRAM
```

The indication "SDRAM" is shown on the LCD.
Press the [ENTER] key.

2)

```
# MEMORY check
WAIT  TIME            : OFF
```

Use the [△] and [▽] keys to set the waiting time after data have been written in until the read-in check is performed .
OFF : With WAIT time
ON : Without WAIT time

3)

```
# MEMORY check
CNT : 1                SDRAM
```

When the [ENTER] key is pressed, the check starts.

```
# MEMORY check
E     h'  ac  400000     (M)
```

The number of checks are shown on the LCD.
(Single check takes about 10 minutes.)

```
# MEMORY check
E     R : ∗∗h     W :  ∗∗h
```

When an error arises, the error address 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.

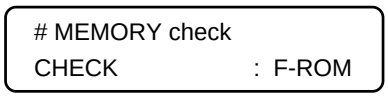
4)

```
# MEMORY check
COUNT          =          ∗∗∗
```

Press the [END] key to terminate the SDRAM checking.

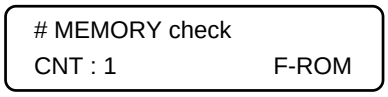
b. F-ROM check

1)



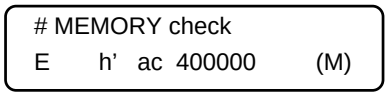
The indication "F-ROM" is shown on the LCD.

2)



Press the ENTER key. The plotter starts checking.

The number of checks is shown on the LCD.



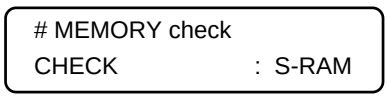
When an error arises, the error message will appear on the LCD and the checking will be aborted.

3)

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

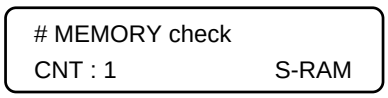
c. S-RAM check

1)



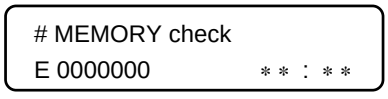
The indication "S-RAM" is shown on the LCD.

2)



Press the ENTER key. The plotter starts checking.

The number of checks is shown on the LCD.



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

3)

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

d. I/F S-RAM check

1)

```
# MEMORY check
CHECK          : I/ F S-RAM
```

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

2)

```
# MEMORY check
CNT : 1                I FRAM
```

Press the ENTER key. The plotter starts checking.
(Single check takes about 2 minutes.)

```
# MEMORY check
E 0 0 0 0 0 0 0 0      * * : * *
```

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

3)

Press the END key to terminate the I/F S-RAM checking.

4-4-16. SKEW CHECK

[Function]

Checks the amount of paper shift caused by paper feed.

[Operation]

1)

```
FUNCTION
# TEST                    < ENT >
```

Select the TEST.
Press the [ENTER] key.

2)

```
# TEST
SKEW  CHECK             < ent >
```

Select the "SKEW CHECK" pressing the [FUNCTION] key.
Press the [ENTER] key

3)

```
# SKEW  CHECK
FEED                    : * . * * m
```

Enter the value to feed the paper using the [△] or [▽] key.

4)

```
# SKEW  CHECK
* *  FEED        * . * * m * *
```

Press the [ENTER] key.
Press the [END] key to exit from the function.

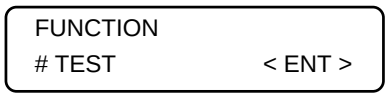
4-4-17. TEMP CHECK

[Function]

Displays the temperature around the head.

[Operation]

1)



Select the TEST.

Press the ENTER key.

2)

Select the "TEMP CHECK" pressing the FUNCTION key.

Press the ENTER key

3)

•
•
•

•
•
•

Displays the temerature around the head.

Select the head using the ∧ or ∨ key to display the temperature around each head.

- Temperature around the head and the entered value to change AD.
  Ta1 to Ta6 : H1, H2, ...,H6
- Temperature of the nozzle and forward voltage drop of diodes.
  Tj1A, Tj1B to Tj6B : H1A, H2B, ...,H6B

4)

Press the END key to exit from the function.

4-4-18. ENCODER CHECK

[Function]

Check linear sensor or linear encoder scale.

Based on capping position, indicate value of linear encoder and Y motor encoder when it's moved an optional position that was specified.

[Operation]

1)

```
FUNCTION
# TEST                < ENT >
```

Select the TEST.

Press the [ENTER] key.

2)

```
# TEST
ENCODER               < ent >
```

Select the "ENCODER CHECK" pressing the [FUNCTION] key.

Press the [ENTER] key.

3)

```
#ENCODER
DIST .          : * * * * *. * mm
```

Indicate the max movement distance that carriage is moved.

4)

```
#ENCODER
DIST .          : * * * * *. * mm
```

Input the movement distance of carriage using [△] or [▽] key.

The value that is able to set up is decided 100mm to max movement distance (100mm step)

5)

```
#ENCODER
M * * * * *. *          E * * * * *. *
```

Press the [ENTER] key

With F/W 1.60 or later, the carriage shuttles the set distance 3 times and the linear encoder value and Y motor encoder value are read.

If the difference between the values before and after movement to the linear encoder exceeds ±3, an error results and check is completed.

Indicate the following values when carriage was returned to capping position.

[value that is moved a specified distance]
– [value of capping position before movement]

M : value of Y motor encoder (μm)

E : value of linear encoder (mm)

Return to Process No. 3 when press the END key.

It is normal if value of Y motor encoder and value of linear encoder is indicated approximate.

There are appearance of dispersion of linear scale and 2mm to 3mm gaps by stretching, though it isn't unusual.

If [500mm SQUARE] is not adjusted, patteern shift becomes larger.

6)

```
# TEST
Mc  0 .0          Ec  0 .0
```

Press the > key. Indicate the calculation as follows.

[value of capping position after movement]

– [value of capping position before movement]

Mc : value of Y motor encoder (mm)

Ec : value of linear encoder (mm)

It is normal if a difference of capping position before and after that is moved is zero.

```
#ENCODER
Ms＊＊＊＊.＊      Es＊＊＊＊.＊
```

```
#ENCODER
Mm＊＊＊＊.＊      Em＊＊＊＊.＊
```

```
#ENCODER
Mr＊＊＊＊.＊      Er＊＊＊＊.＊
```

Press the FUNCTION key to display the following values:

- Capping position value before movement (resolution)
  Ms : value of Y motor encoder (5μm)
  Es : value of linear encoder (720dpi)
- Capping position value after movement over the specified distance (resolution)
  Mn : value of Y motor encoder (5μm)
  En : value of linear encoder (720dpi)
- Capping position value after movement (resolution)
  Mr : value of Y motor encoder (5μm)
  Er : value of linear encoder (720dpi)

Return to process 5) when press the < key.

Return to process 3) when press the END key.

When press the END key after the above operation, this test has ended.

4-5. #PARAMATER items

4-5-1. SYSTEM PARAMETER

[Function]

System parameter values are changed.

[System parameters list]

No.	Indication	Set value	Description	Remarks
0	COMP.X	0	Mechanical correction X (in increments of 0.1 mm 500 mm – actual measured value)	Adjustment of range accuracy If the system parameter value is incrased: Length of a pattern plotted will be increased.
1	COMP.Y	44	Mechanical correction Y (in increments of 0.1 mm 500 mm – actual measured value)	
2	R GRIP	0	Adjustment of dead space on the right-hand side of the paper (in increments of 0.1 mm 25mm - actual measured value)	Adjustment value for edge adjustment If the system parameter value is increased: Dead space will be reduced.
3	L GRIP	0	Adjustment of dead space on the left-hand side of the paper (in increments of 0.1 mm 5mm - actual measured value)	
4	CAPpodY	20	Adjustment of capping Y position (in increments of 0.1 mm)	Adjustment value for capping position
5	CAPposZ	0	Adjustment of capping Z position (in increments of 0.1 mm)	
6	WIPposY	0	Adjustment of wiping Y position (in increments of 0.1 mm)	Adjustment value for wiping position
7	WIPposZ	35	Adjustment of wiping Z position (in increments of 0.1 mm)	
8	STlower	0	(in increments of 1 step)	
9	CUTposi	0	Adjustment X of the medium cutting position (in increments of 0.1 mm)	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.
10	EDGE LV	50	Medium edge detection level (Unit: %)	Edge detection level when the medium width is detected
11	H12dist	252	Distance between head 1/nozzle row A and head 2/nozzle row A	
12	H13dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
13	H35dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
14	H57dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
15	H24dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
16	H46dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
17	H68dist	640	Distance between head 1/nozzle row A and head 2/nozzle row A	
18	PULLpos	25	Idle suction position (in increments of 0.1 mm)	
19	Hdhight	0	Reference head height	

No.	Indication	Set value	Description	Remarks
20	FEEDadj	25	X feed pulse correction (in increments of 1 dot)	
21	V1BiADJ	0	Correction base value for V1 waveform Y direction shuttle movement (in increments of 1 dot)	
22	V2BiADJ	0	Correction base value for V2 waveform Y direction shuttle movement (in increments of 1 dot)	
23	N1BiADJ	0	Correction base value for N1 waveform Y direction shuttle movement (in increments of 1 dot)	
24	N2BiADJ	0	Correction base value for N2 waveform Y direction shuttle movement (in increments of 1 dot)	
25	V1HBiAJ	6	Correction value for V1 waveform doubled shuttle movement (in increments of 1 dot)	
26	V2HBiAJ	4	Correction base value for V2 waveform doubled shuttle movement (in increments of 1 dot)	
27	RESERVE	0	RESERVE	
• • •	• • •	• • •		
54	RESERVE	0	RESERVE	
55	Ext.CND	0	Command extension	0: Disabled 1: Enabled
56	FEEDlow	30	Long direction feed rate (1mm/s)	Medium feed speed when total feed is 9 mm or more
57	PAGE	0	Page length clip 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.	Indicates the action when the plot length exceeds the page length.
58	X SIZE	5000	Initial value for X medium size (Unit: cm)	Maximum plot limit when roll paper is set
59	MD1284	0	Selects the IEEE1284 receive speed.	0: High speed 1: Low speed
60	MECAsiz	0	Mechanical size	0: 54 inch 1: 63 inch 2: 74 inch
61	HASH	0	Hash check pass	0: check pass (forced startup) 1: check pass & survo motor OFF
62	SUPPORT	0	Adjusting function extention	2: Released 3: Released + English
63	INITIAL	0	Initialization	1: All parameters are initialized. 2: Only system parameter 3: All parameters are secret.

CAUTION

- When [1.All parameters are initialized] is selected for NO.63 INITIAL, note that the values of the Adjustment parameter and Head parameter are also cleared.

REMOTE/LOCAL + FUNCTION --> Adjusting function extension

ENTER + END or ◁ + ▷ --> Enter the system parameter

REMOTE/LOCAL --> Varsion up mode

[Operation]

1)

```
FUNCTION
# PARAMETER      < ENT >
```

Select the PARAMETER.
Press the ENTER key.

2)

```
# PARAMETER
SYSTEN  PRM        < ent >
```

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

3)

```
# SYSTEM  PARAMETER
0 = 0              COMP.  X
```

```
# SYSTEM  PARAMETER
62 = 0             SUPPORT
```

Select a parameter item using the ∧ or ∨ key.

⋮

4)

```
# SYSTEM  PARAMETER
62 = 0                     0
```

Press the ENTER key to permit the value to be changed.

5)

```
# SYSTEM  PARAMETER
62 = 0                     2
```

Change the value using the ∧ or ∨ key.

6)

```
# SYSTEM  PARAMETER
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. MAINTENANCE 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.

4-5-6. ADJUSTMENT PARAMETER

Parameters are present for each waveform plot. The value of each parameter canbe changed and stored automatically through adjustment.

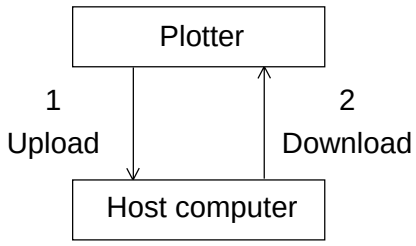
4-5-7. INFORMATION PARAMETER

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

4-6. Uploading and Downloading Parameters

This host computer and the plotter can be connected through the IEEE1284 or IEEE1394 interface to allow parameter loading the plotter to the host computer and parameter registration from the host computer to the plotter.

1. The function to load parameters from the plotter to the host computer (referred to as Upload hereafter)
2. The function to transfer parameters from the host computer to the plotter (referred to as Download hereafter)



4-6-1. UPLOAD (Plotter >>> Computer)

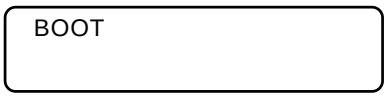
CAUTION

- To realize this function, the following item is required.
  OS : Windows2000
  Cable: IEEE1394 interface cable
  Tool: F/W Update Tool software

[Operation]

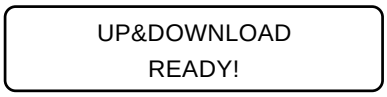
1) **Connect the plotter and the host computer through the IEEE1394 interface cable.**

2)



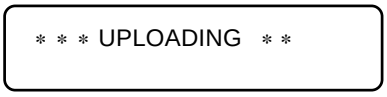
Turn ON the power while holding down the [△] and [▽] key.

3)



Upload is ready.

4)



Perform Upload using the F/W Update Tool software.
Transfer parameters to the host computer.
To cancel the operation, press the [END] key.

5)

If the operation is successfully completed, the message shown at left appears.

6) **Turn OFF the power of the plotter.**

4-6-2. DOWNLOAD (Computer >>> Plotter)

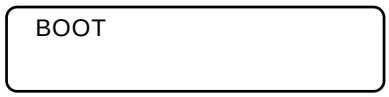
CAUTION

- To realize this function, the following item is required.
  OS : Windows2000, WindowsNT
  Cable: IEEE1394 interface cable, Pararel interface cable
  Tool: F/W Update Tool software

[Operation]

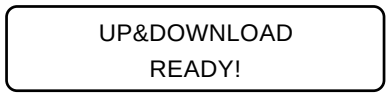
1) **Connect the plotter and the host computer through the IEEE1394 interface cable or the pararel interface cable.**

2)



Turn ON the power while holding down the [∧] and [∨] key.

3)

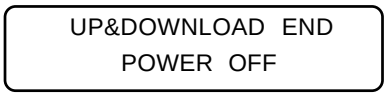


Download is ready.

4)

Perform Download using the F/W Update Tool software.
Receive data from the host computer.
To cancel the operation, press the [END] key.

5)



If the operation is successfully completed, the message shown at left appears.

6) **Turn OFF the power of the plotter.**

Error messages

If an error occurs, quit F/W Update Tool software and then turn OFF the poser of the plotter.

Error message	Cause	Remedy
ERROR COMMAND POWER OFF	Command error	Check wheter interface connection is normal. Turn OFF the power and then turn it back ON.
ERROR PARAMETER POWER OFF	Parameter error	Check wheter the file selected on the host computeer is for JV4. Turn OFF the power and then turn it back ON.
ERROR DATA POWER OFF	Data error	Check wheter the contents of the file selected on the host computer are normal and not defective. Turn OFF the power and then turn it back ON.

4-7. Updating the firmware

This device permits updating of the firmware through the IEEE1394 interface or the IEEE1284 interface from the computer. Use a specialized F/W downloader.

CAUTION

- You may download F/W downloader from our Web site on the Internet. (URL: http://www.mimaki.co.jp/)

4-7-1. The firmware in this unit

This unit consists of the following 2 firmware components; the versions of both can be updated through the 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 IEEE1394.

4-7-2. 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. JV4.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.

You may download F/W version-up file through our Web site on the Internet (URL: http://www.mimaki.co.jp/). Download one of the following according to your use environment. The " *** " in the file name indicates the version number of F/W.

1. JV4_***L.EXE ..... Japanese version for WINDOWS
2. JV4_***Z.EXE ..... English version for WINDOWS
3. JV4_***.sea .hqx ..... Japanese/English shared version for MAC

Every file is a self-unarchiving compressed file. When unarchived, the file is extracted to the following five files.

1. JV4.ROM ..... This is the F/W version updating file.
2. README.TXT ..... This is the version-updating manual in English.
3. READMEJ.TXT ..... This is the version-updating manual in Japanese.

4-7-3. Interface side firmware version updating file

The IEEE1394 -interface side F/W version updating froppy disc issued by Development Division of MIMAKI contains the following 2 files.

1. FWIF∗∗∗.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.

You may download F/W version-up file through our Web site on the Internet (URL: http://www.mimaki.co.jp/). Download one of the following according to your use environment. The " ∗∗∗ " in the file name indicates the version number of F/W.

1. FWIF∗∗∗L.EXE ..... Japanese version for WINDOWS
2. FWIF∗∗∗Z.EXE ..... English version for WINDOWS
3. FWIF∗∗∗.sea.hqx ..... Japanese/English shared version for MAC

Every file is a self-unarchiving compressed file. When unarchived, the file is extracted to the following three files.

1. FWIF.ROM ..... This is the F/W version updating file.
2. README.TXT ..... This is the version-updating manual in English.
3. READMEJ.TXT ..... This is the version-updating manual in Japanese.

4-7-4. Checking the version updating file

When the version-updated file is copied, check the version-updated file for faults using the file checking function provided by the F/W downloader. Refer to the instruction manual for the F/W downloader for operating procedures.

4-7-5. Updating procedure

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

[Operation]

1)

```
BOOT
```

Turn on the power to the plotter.

2)

```
F / W          UPDATING
  * TRANSMIT START *
```

Press the (REMOTE/LOCAL) key while the firm-ware version is being shown on the LCD.
This device will then be placed in the data waiting state.

3)

```
F / W      UPDATING
 * * *  RECEIVE * * *
```

Send the version-updating file from the PC using the transmitting function of the F/W downloader.
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)

```
F / W          UPDATING
  *  DOWNLOADING *
```

When all the data are received, the data is written into the flash ROM.

5) In the case of the mechanical side version updating

```
F / W          UPDATING
MECA LOAD      [ v 2. 0 0 ]
```

Upon completion of the writing, the version of the firmware written into the ROM will be shown on the LCD.

6) In the case of the interface side version updating

```
F / W          UPDATING
I / F LOAD     [ v 2. 0 0 ]
```

Re-turn on the power to the plotter.

CAUTION

- Do not turn the power OFF while the data is written into the flash ROM. 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.	

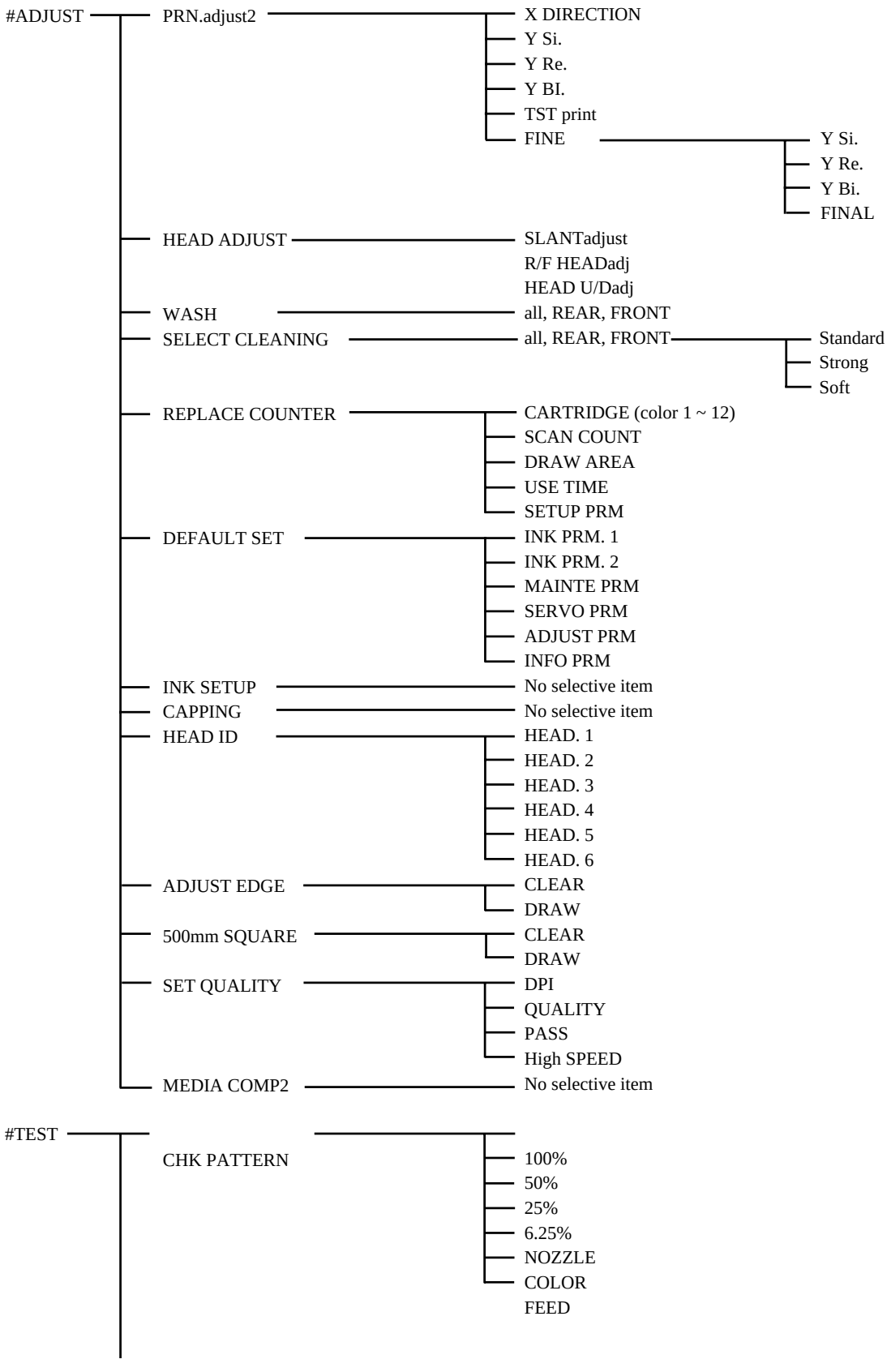
Error message when updating the version on the interface side

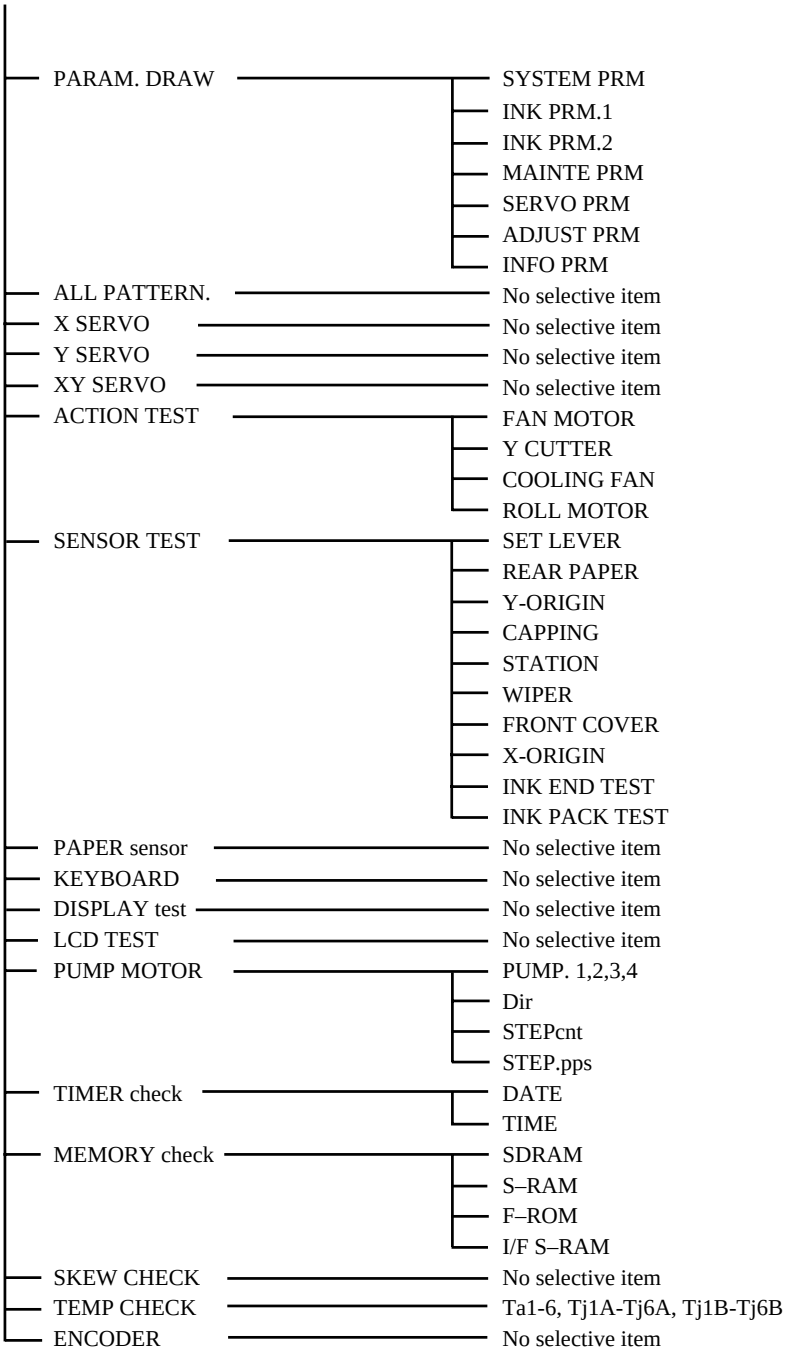
Error message	Cause	Remedy
E90 h'＊＊＊＊＊＊＊＊	Data stored in the ROM can not be erased.	Replace the interface PCB with a new one.
E91 < Skipped No. >		
E92 h'＊＊＊＊＊＊＊＊	Data cannot be written into the ROM.	Replace the interface PCB with a new one.
E93 < Skipped No. >		
E95 MODE	It is not possible to enter version updating mode.	Repeat the version updating from the beginning.
E97 < Skipped No. >		
E98 TRANSE＊＊	The received data are not for the interface.	Check the version updating file.

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

Error message	Cause	Remedy
E70 FPGA	Data received are not the program file.	Replace the main PCB with a new one.
E71 SD-RAM	Abnormal conditions have arisen on the D-RAM.	
E73 < Skipped No. >		
E74 TRANS DATA	Data received are not the program file.	Check the version updating file.
E75 I/F NONE	The interface board has not been loaded on the device.	Load the interface board on the device.
E76 I/F INITIAL	Abnormal conditions have arisen on the interface board.	Replace the interface board with a new one.
E77 I/F BOARD	A error occured in communication between the main PCB and the interface board.	
E78 HOST I/F	A time limit exceeded erro occured in communication between the host computer and the interface board.	Check the cable and the host computer.

4-8. Maintenance menu tree





#PARAMETER	SYSTEM PRM	Total 64 items	Refer to “4-5-1. SYSTEM PRM”
	INK PARAMETER1	Total 80 items	This is not used in the field.
	INK PARAMETER2	Total 100 items	This is not used in the field.
	MENT PARAMETER	Total 96 items	This is not used in the field.
	SERVO PARAMETER	Total 64 items	This is not used in the field.
	ADJ PARAMETER	Total 25 items	This is not used in the field.
	INFO PARAMETER	Total 96 items	This is not used in the field.

CHAPTER 5
DISASSEMBLING / ASSEMBLING PROCEDURE

5-1. Disassembly and assembly

5-1-1. Front cover assy., Y cover, SR cover, YR cover and Right cover

[Tools to be used]

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

[Disassembling procedure]

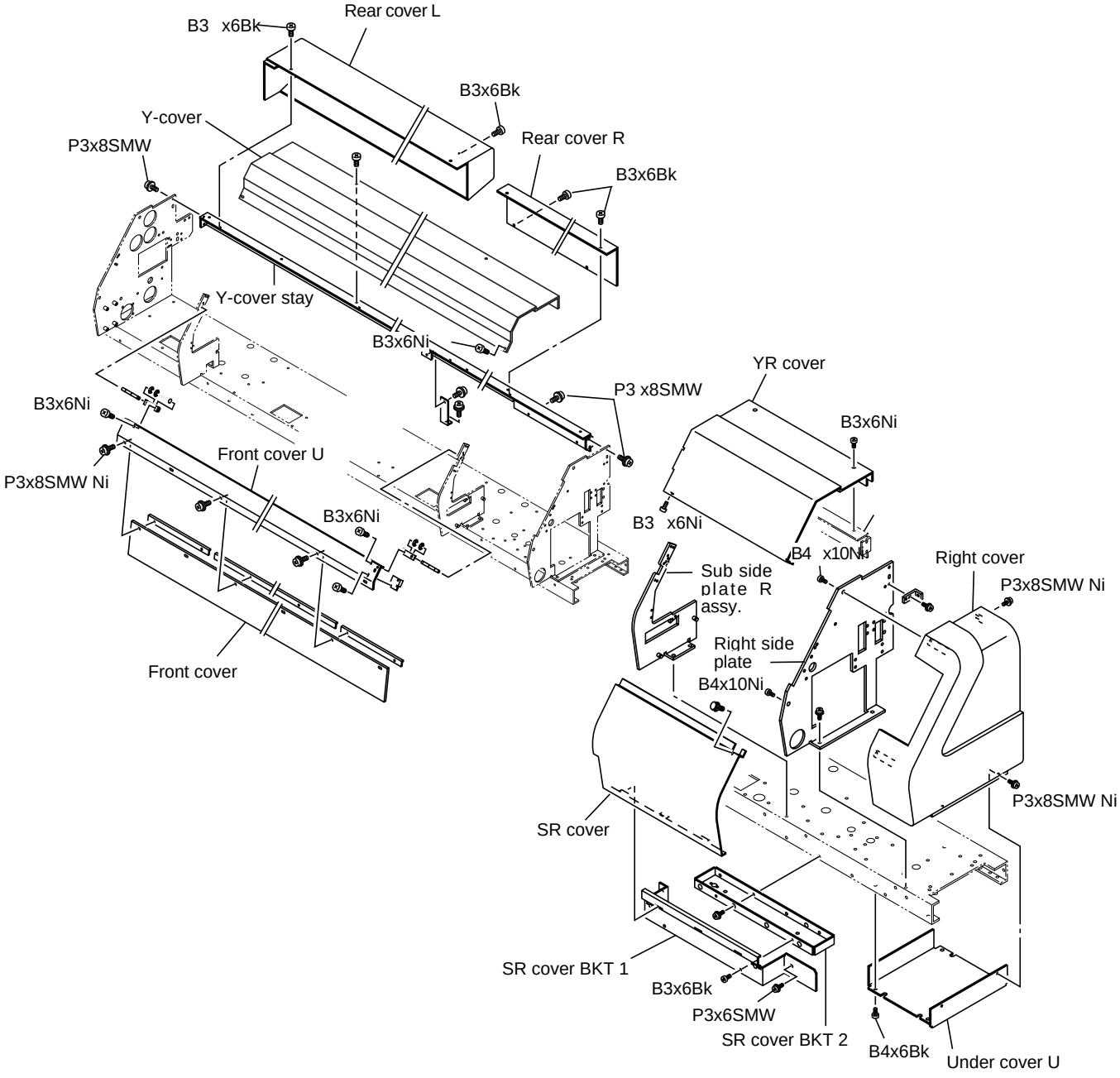
1) Move the left front cover pin and then pull out the front cover.
2) Remove the screw (B3 x 6Ni), then remove the Y cover.
3) Remove the SR cover.
4) Remove the screw (B3 x 6Ni), then remove the YR cover.

- Before removing the YR cover, be sure to remove the cable because the cable of the front cover sensor assembly is clamped on the back of the YR cover.

5) Remove the screw (B4 x 10Ni), then remove the right cover.

[Assembling procedure]

- Assembly is reverse of disassembly.


Rear cover L
B3 x6Bk
B3x6Bk
Y-cover
P3x8SMW
Rear cover R
B3x6Bk
Y-cover stay
B3x6Ni
P3 x8SMW
YR cover
B3x6Ni
B3x6Ni
Front cover U
P3x8SMW Ni
B3 x6Ni
B4 x10Ni
Sub side plate R assy.
Right cover
P3x8SMW Ni
Right side plate
B4x10Ni
B3x6Ni
Front cover
P3x8SMW Ni
SR cover
SR cover BKT 1
B3x6Bk
P3x6SMW
SR cover BKT 2
B4x6Bk
Under cover U

5-1-2. Keyboard assy. and IO PCB assy.

[Tools to be used]

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

[Disassembling procedure]

<Keyboard PCB>

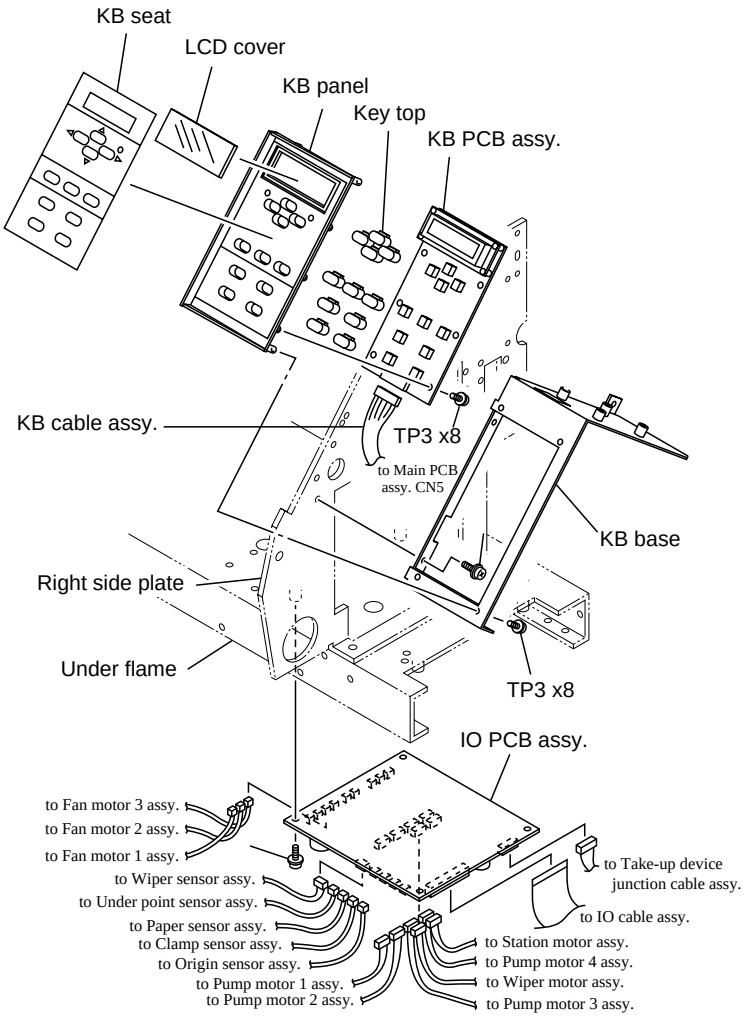
1) Remove the right cover.
2) Remove the keyboard cable assy.
3) Remove the screw (P4 x 6SMW), then remove the keyboard base from right side plate.
4) Remove the screw (TP3 x 8), then remove the keyboard PCB assy. from keyboard base.
5) Remove the keyboard PCB from keyboard panel.

<IO PCB>

1) Remove the screw (B4 x 10Bk), then remove the IO cover.
2) Remove the cables of the sensor and motor connected to the IO PCB assembly.
3) Remove the screw (P3 x 8SMW), then remove the IO PCB assy. from under flame.

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-3. Platen cover F/R, Fan motor assy., and Paper sensor R assy.

[Tools to be used]

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

[Disassembling procedure]

1) Remove the screw (B3 x 6Ni), then remove the platen cover F. (B3 x 6Ni)
2) Remove the screw (B3 x 6SMW), then remove the fan motor BKT from under flame.
3) Remove the screw (F3 x 8Bk), then remove the fan motor assy. from fan motor BKT.

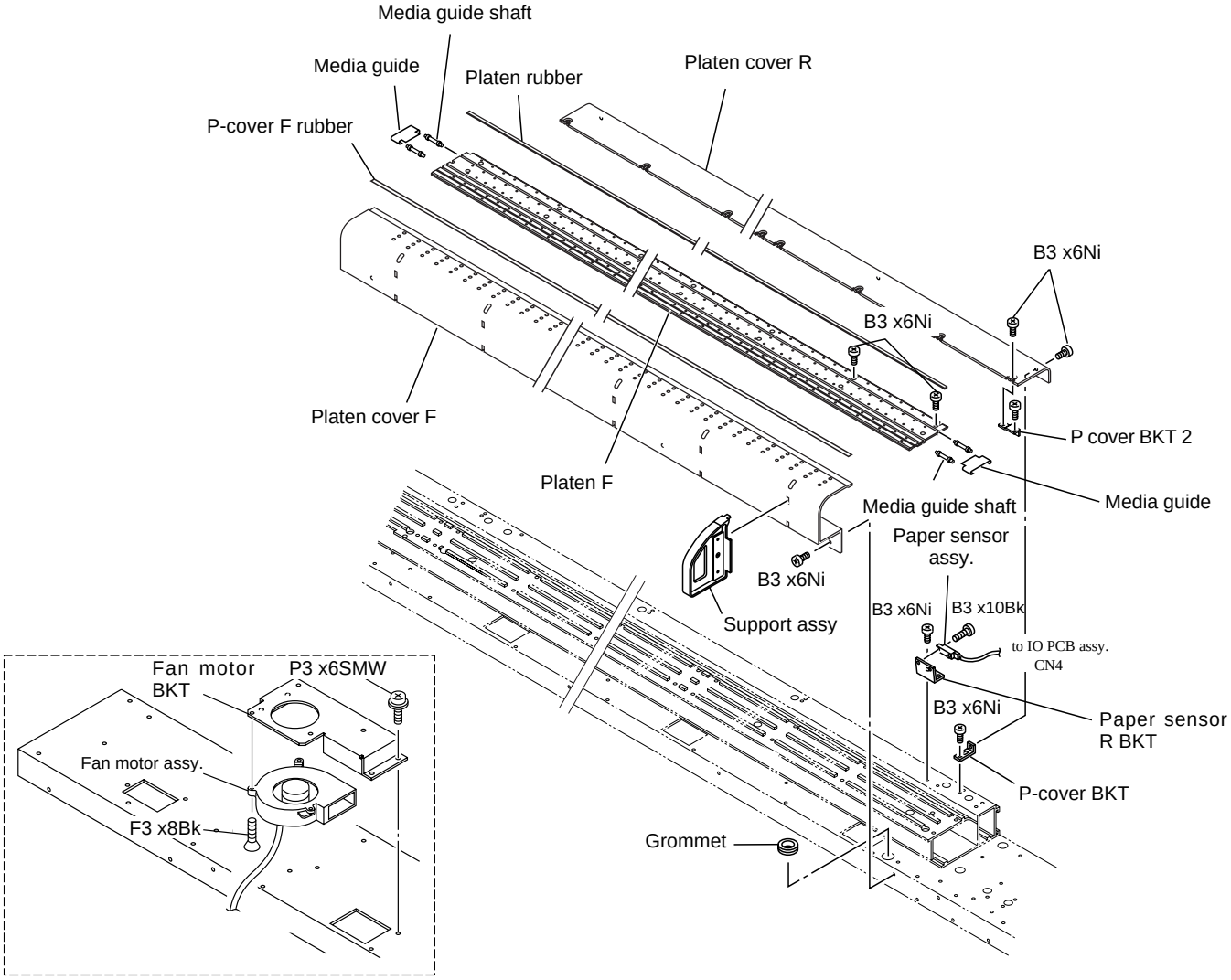
CAUTION

- Note that cables with different lengths are used for the three fan motors (four fan motors with the JV4-180) depending on the mounting position.

4) Remove the screw (B3 x 6Ni), then remove the platen cover R.
5) Remove the screw (P3 x 6Ni), then remove the paper sensor R BKT from under flame.
6) Remove the screw (B3 x 10Bk), then remove the paper sensor R assy. from the paper sensor R BKT

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-4. X-motor assy.

[Tools to be used]

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

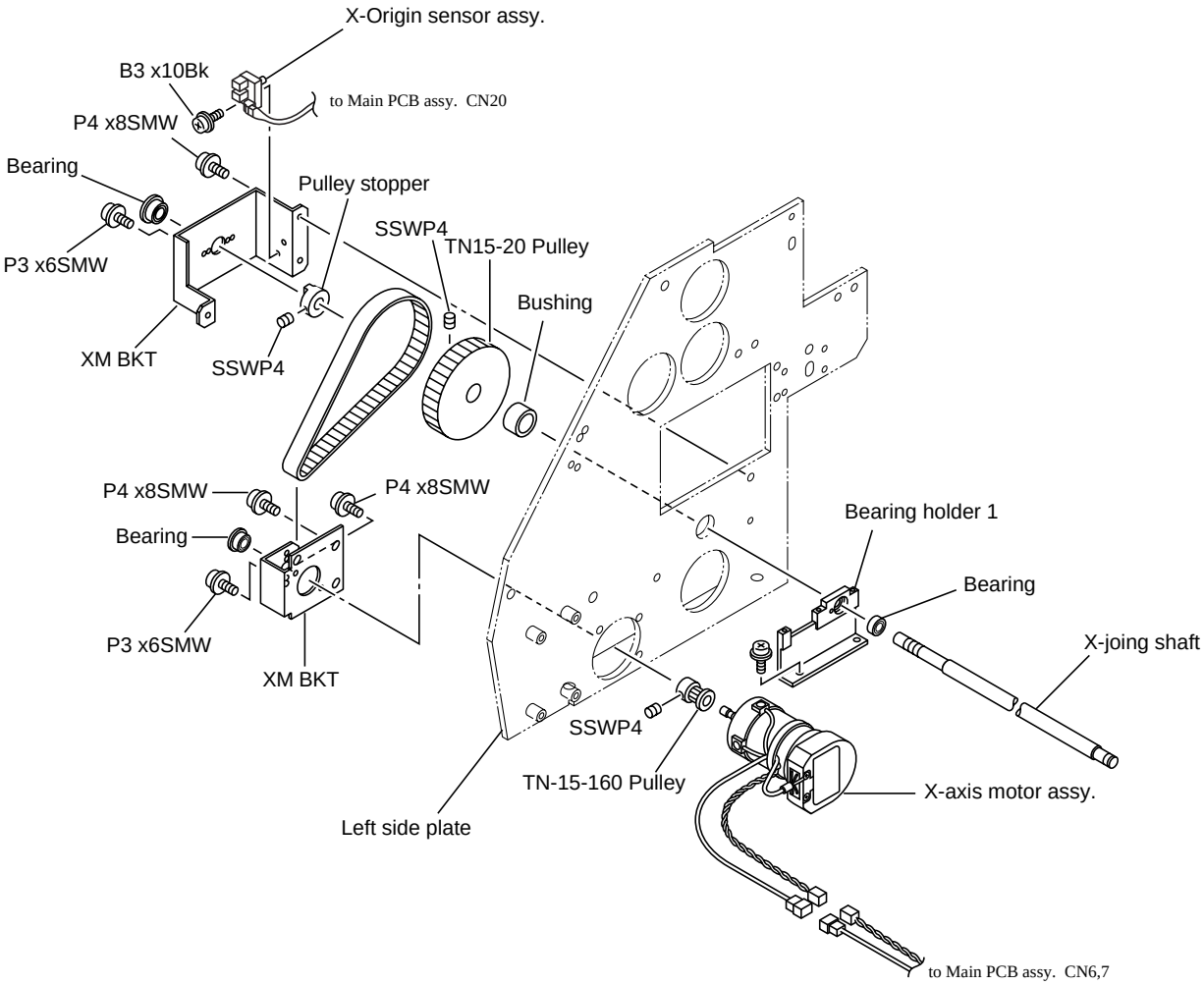
[Disassembling procedure]

1) Remove the screw (B3 x 6Ni), then remove the SL cover.
2) Remove the screw (B3 x 6Ni), then remove the YL cover.
3) Remove the left cover.
4) Loosen the screw (P4 x 8SMW) in the X-motor BKT from the left side plate.
5) Remove the screw (P3 x 6SMW) from the X-motor BKT, then remove the X-motor assy.

* Adjust Y-timing belt : Refer to [6-2-5. Adjustment of the X-motor belt tension] P.6-11

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-5. X-pulley and paper feed roller (Do not disassemble)

CAUTION

- Do not remove the X-pulley because it is positioned precisely. Do not loosen the set screws (SSWP4 X 4).
- Do not loosen the set screws (SSWP3 X 3) because the two protruded rollers are positioned precisely.

5-1-6. Y-motor assy., Y-timing long belt and Y-timing belt

[Tools to be used]

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

[Disassembling procedure]

1) Remove the front cover , Y cover, SR cover, YR cover and the right cover.
2) Remove the screw (B3 x 6Ni), then remove the SL cover.
3) Remove the screw (B3 x 6Ni), then remove the YL cover.
4) Remove the left cover.
5) Remove the screw (P4 x 10SMW) , then remove the YM-top plate assy.
6) Remove the electrical unit cover and then remove the harness
7) Remove the screw (P4 x 10SMW) , then remove the screw from the Y-motor assy.
8) Remove two YM-spacers and replace the Y-motor assy.

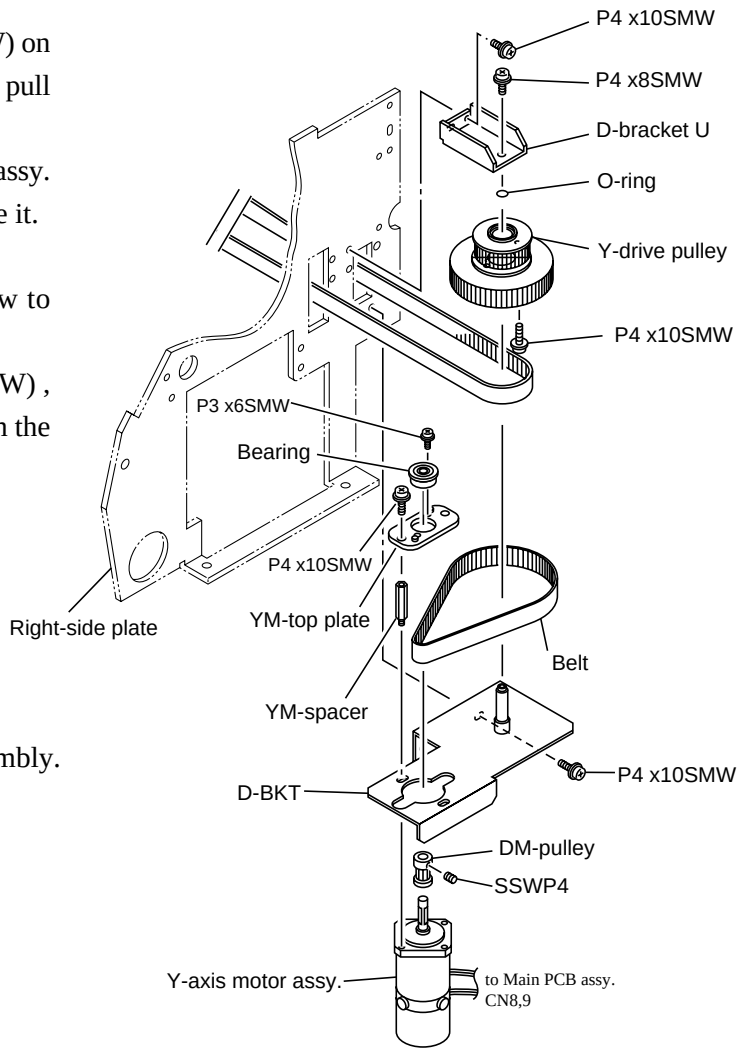
Follow the procedure given below to replace the Y-timing belt and the Y-timing long belt.

1) Remove the screw (B3 x 6Bk,P4 x 8SMW), then remove the head cover assy.and the head UD BKT assy.
2) Remove the left cover, loosen the tension screw until there is no tension, then remove the Y-tension pulley assy.
3) Remove the screw (P4 x 2SMW) on the slider from belt holder, then pull the belt holder assy.
4) Remove the Y-timing long belt assy. from the Y bar and then replace it.

Follow the procedure given below to replace the Y-timing belt.

1) Remove the screw (P4 x 10SMW) , then remove the D BKT U from the right-side plate.
2) Replace the Y-timing belt.

* Adjust Y-timing belt :
Refer to [6-2-4. Adjustment of the Y-motor belt tension] P.6-10



[Assembling procedure]

- Assembly is reverse of disassembly.

5-1-7. Head cover, Slider PCB and Linear encoder PCB assy. / scale

[Tools to be used]

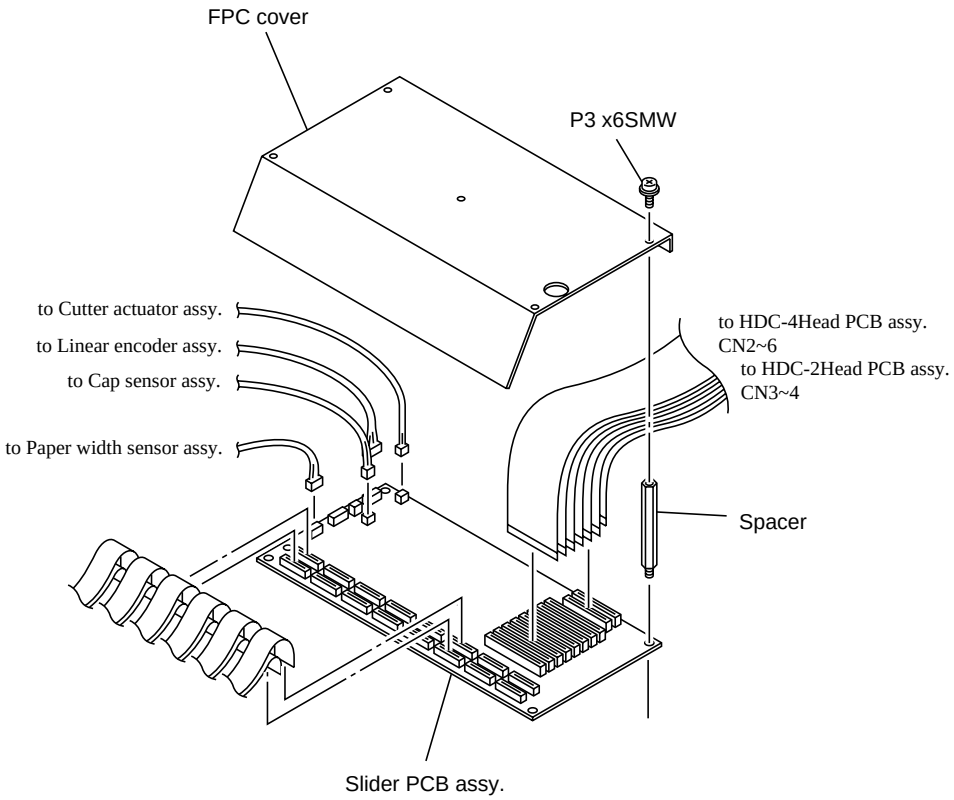
- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)
- Box wrench (opposite side distance: 5.5 mm)
- Phillips screwdriver (for removing SP)

[Disassembling procedure]

1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the front cover and the Y cover.
3) Remove the screw (B3 x 6Bk), then remove the head cover.
4) Remove the screw (P3 x 6SMW), then remove the FPC cover.
5) Remove all of the harnesses on the slider PCB.
6) Remove all of the spacers (SQ-25) that hold the slider PCB.
7) Replace the slider PCB.

[Assembling procedure]

- Assembly is reverse of disassembly.



Follow the procedure given below to replace the linear encoder PCB assy.

CAUTION

- After replacing the linear encoder PCB assy, be careful not to contact the linear encoder PCB scale. (Refer to the adjustment items.)

1) Remove the harness of the linear encoder PCB assy from the slider PCB.
2) Remove the screw (P3 x 8SMW) on the slider from the L-sensor BKT assy.
3) Remove the screw (P2 x 12), then remove the linear encoder PCB from the L-sensor BKT assy., then replace it.
4) Pull the Y-timing long belt assy. from the Y bar and replace it.

Follow the procedure given below to replace the linear encoder PCB scale.

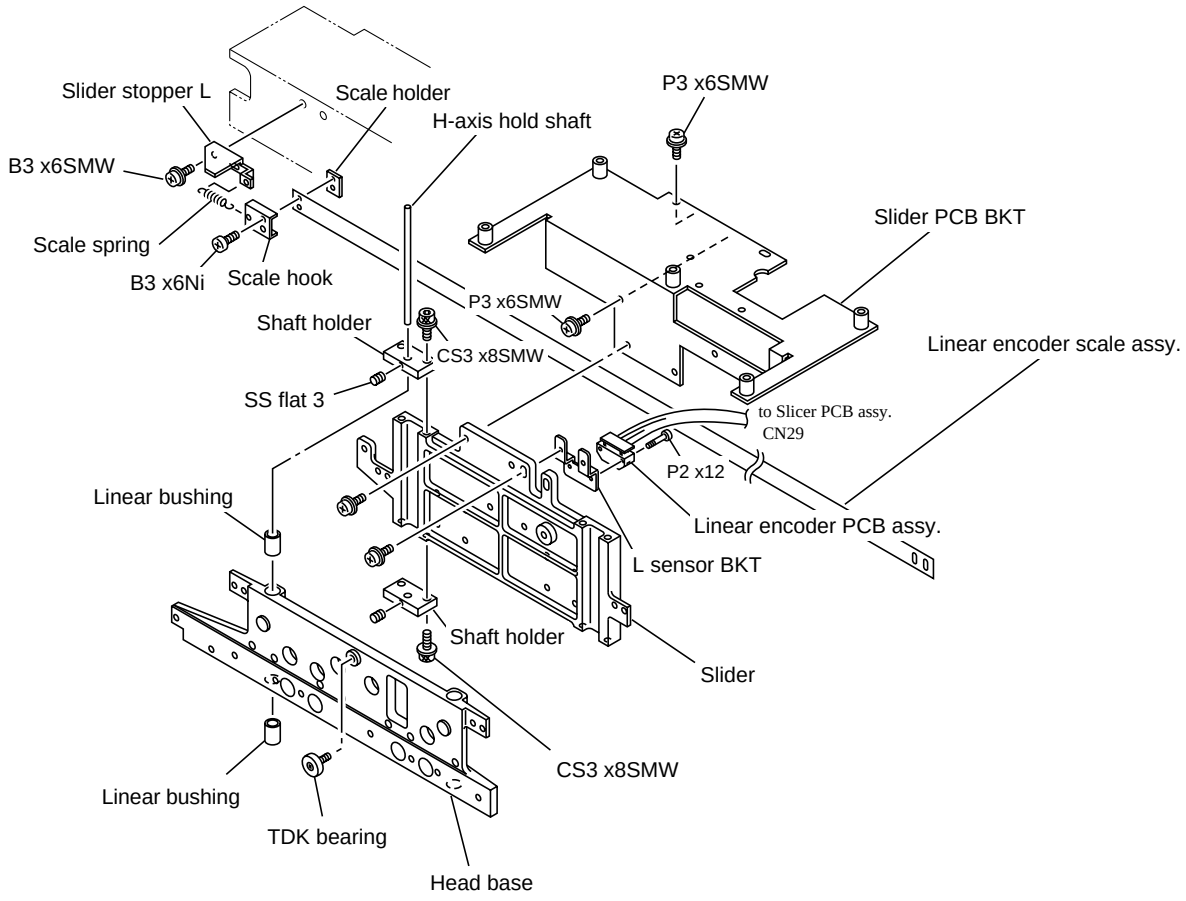
CAUTION

- After replacing the linear encoder PCB scale, be careful not to contact the linear encoder PCB scale. (Refer to the adjustment items.)

1) Remove the YR cover and the YL cover.
2) Remove the screw (B3 x 6Ni), then remove the scale spring on on the left side of the Y bar.
3) Remove the screw (B3 x 6Ni), then remove the linear encoder scale from the main unit, then remove the scale hook and the scale holder L.
4) Replace the linear encoder scale.

[Assembling procedure]

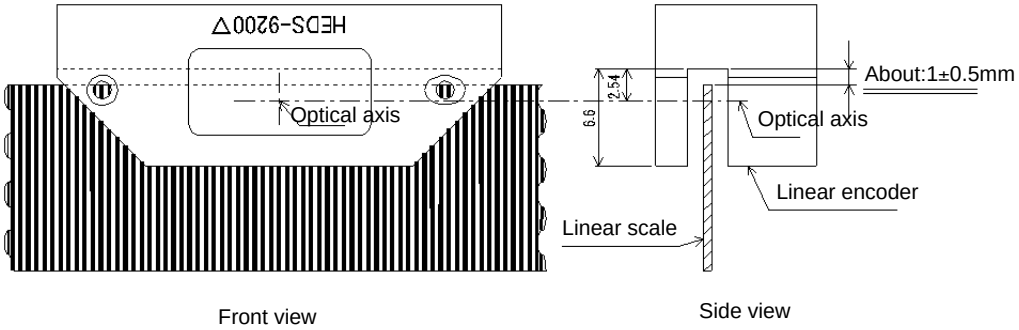
- Assembly is reverse of disassembly.



Mounting position of the linear encoder PCB

Attach the linear encoder PCB assy so that the mounting position (overlapping condition to the linear scale) satisfies the following rough standard over the entire scale. Also check 1) and 2) below.

1) The following overlapping condition is met at the right, center, and left of the device.
2) The linear scale is positioned approximately at the center of the sensor's recessed section but does not contact the wall.



5-1-8. Print head

[Tools to be used]

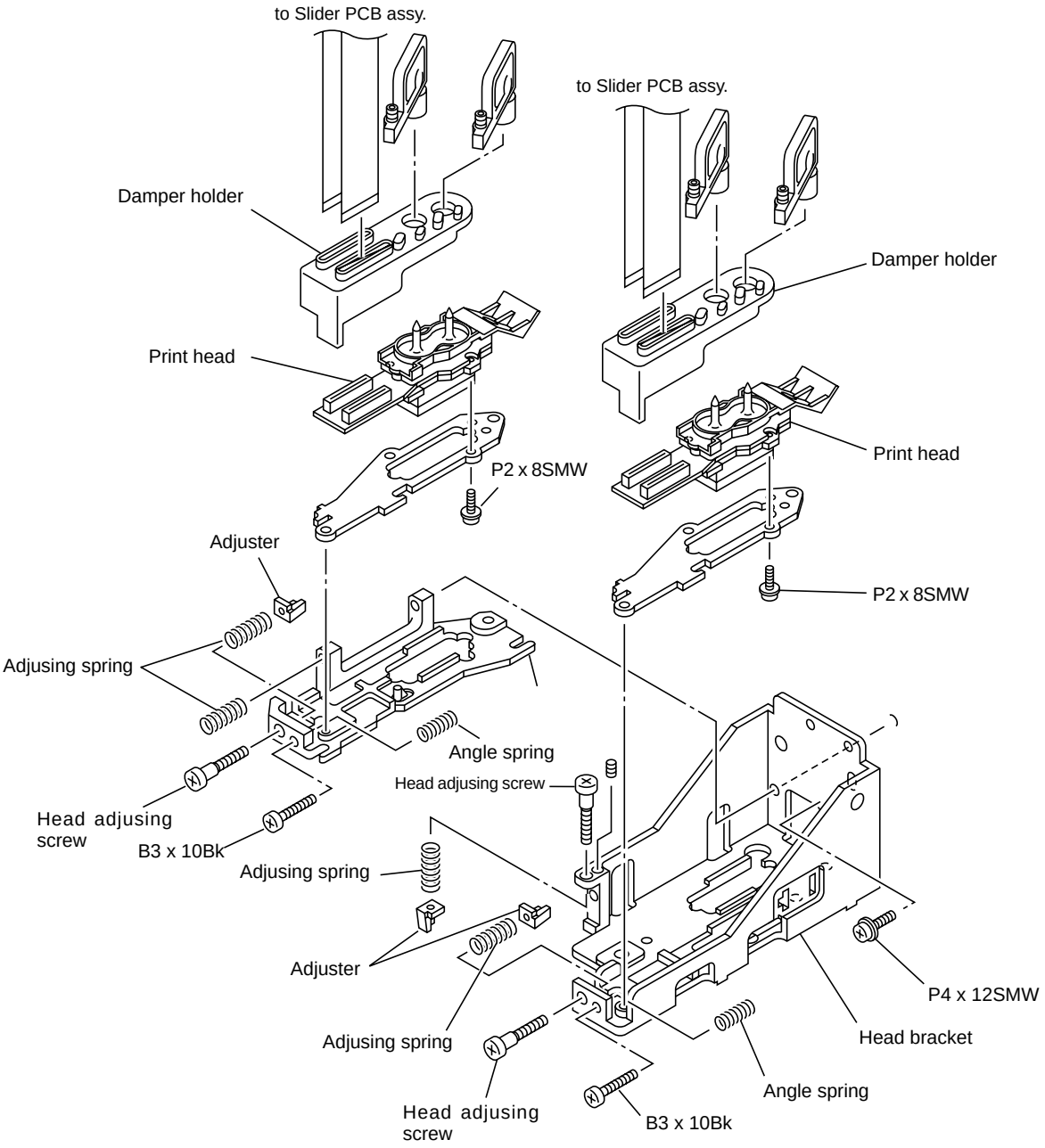
- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)
- Nippers (for removing SP)
- Box wrench (Bondhus type, opposite side distance: 2.5 mm, polarized)
- Small Phillips screwdriver (for removing Damper)

[Disassembling procedure]

1) Turn ON the power of the device and then enter the ID of the head to be replaced in advance.
2) Fill up the ink to the head replaced.
3) Move the slider to the center of the platen using the JOG key.
4) Turn OFF the power supply switch, remove the front cover, the Y cover and the head cover.
5) Remove the screw (P3 x 6SMW) and then remove the head cover BKT.
6) Remove the screw (P3 x 6SMW) and then remove the damper holder.
7) Remove the damper assy. of the print head to replace.
8) Remove the screw (P2 x 8SMW) from the print head assy. to replace.
9) Remove the screw (B3x 10Bk) from the angle spring and remove it.
9) Pull out the print head assy together with the damper holder to remove the FPC.
10) Replace the print head.
11) Fill up the ink.
12) Adjust the head position. (Refer to [6-6-2. Adjustment of the head] P.6-12)

[Assembling procedure]

- Assembly is reverse of disassembly.


to Slider PCB assy.
to Slider PCB assy.
Damper holder
Damper holder
Print head
Print head
P2 x 8SMW
P2 x 8SMW
Adjuster
Adjusing spring
Angle spring
Head adjusing screw
Head adjusing screw
B3 x 10Bk
Adjusing spring
Adjuster
P4 x 12SMW
Adjusing spring
Head bracket
Angle spring
Head adjusing screw
B3 x 10Bk

5-1-9. Main FPC cable assy.

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)

[Disassembling procedure]

1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the front cover, the Y cover.
3) Remove the screw (P3 x 6Bk) and then remove the head cover.
4) Remove the screw (P3 x 6SMW) and then remove the FPC cover. Pull out it from the slider PCB.
5) Remove the electrical unit cover and then pull out the main FPC cable from HDC PCB. (HDC : upside 5 , downside 2)
6) Remove the screw (P3 x 6SMW) and then remove the FPC ground board and the FPC holder.
7) Remove the screw (P3 x 6SMW) to remove the FPC guide plate from the slider PCB BKT and then remove the cable clamp.
8) Remove the main FPC cable assy. from the cable bearing.
9) Replace the main FPC cable assy.

[Assembling procedure]

- Assembly is reverse of disassembly.

5-1-10. Cutter solenoid assy. and the paper width sensor PCB assy.

[Tools to be used]

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

[Disassembling procedure]

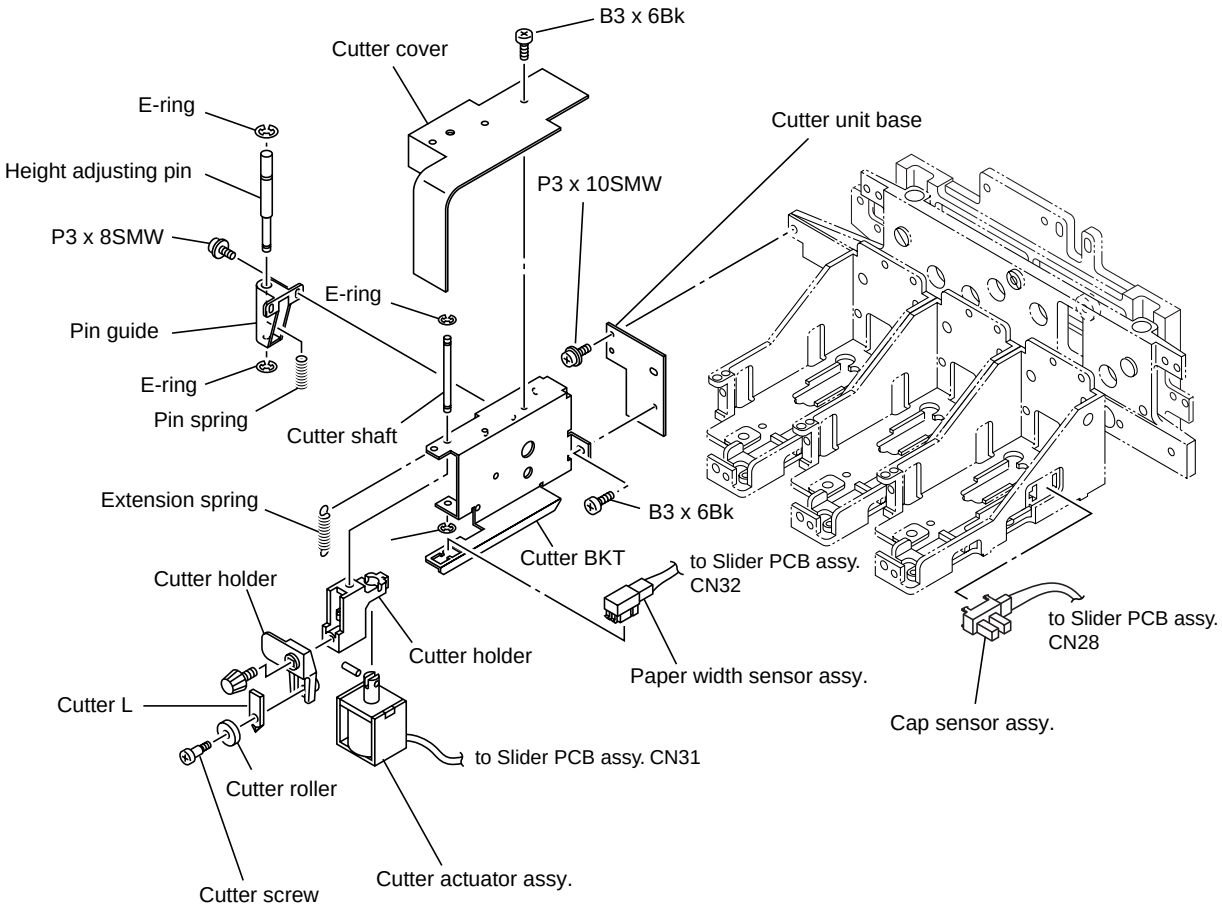
1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the front cover, the Y cover.
3) Remove the screw (P3 x 6SMW) and then remove the FPC cover, the cutter solenoid harness and the paper width sensor harness.
4) Remove the screw (B3 x 6Bk) and then remove the cutter cover.
5) Remove the screw (B3 x 8SMW) and then remove the cutter assy.
6) Remove the screw (B3 x 6Bk) for mountaing the cutter solenoid assy.
7) Pull down the cutter solenoid assy and replace it.

Follow the procedure given below to replace the paper width sensor PCB assy.

1) Remove the the paper width sensor assy. from the cutter BKT.
   (Only the one fixed by the notch of sensor.)

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-11. Cap assy.

CAUTION
- Do not make mistake on the orientation of the Cap assy.
- Do not attach the Cap assy. with the Cap SP removed.

[Tools to be used]

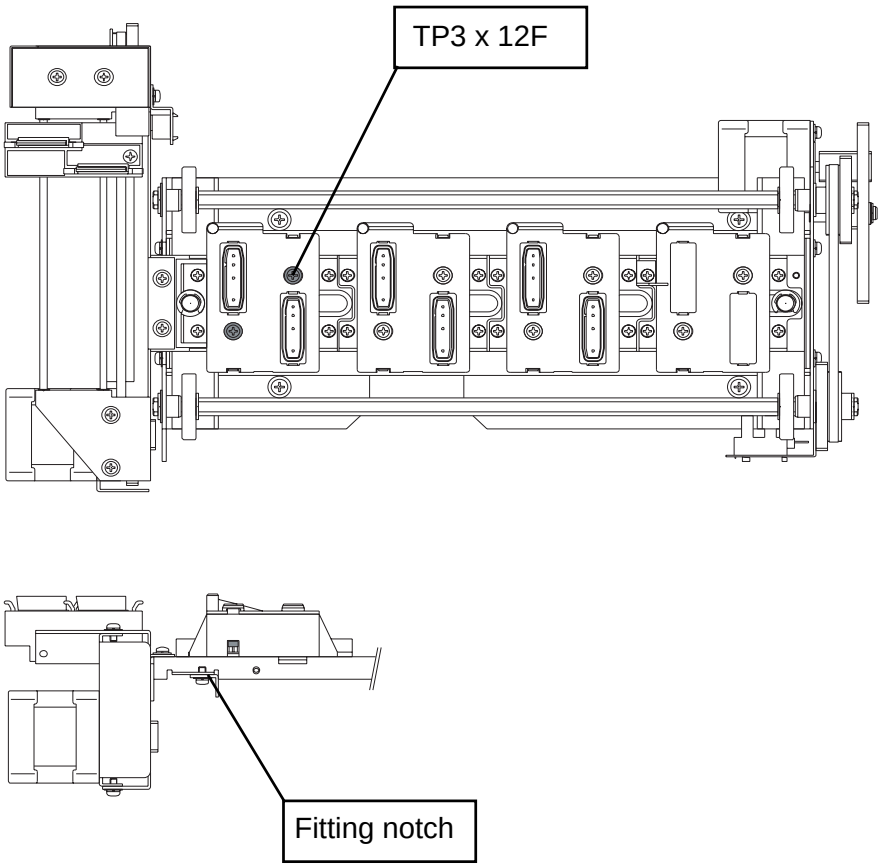
- Phillips screwdriver (No.2 for M3 to M5)
- Small slotted screwdriver (for removing the cap housing U)

[Disassembling procedure]

1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the SR cover, the YR cover.
3) Remove the screw (TP3 x 12F) and then remove the cap housing U.
   After removing the screw, you can remove cap housing U by pressing the fitting notch using a slotted screwdriver.
4) Disconnect the tube (black) and pump tube (white) of the Cap assy. removed.
5) Remove the cap assy. and replace it.

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-12. Station sensor assy., Capping sensor assy. and Wipersensor assy.

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5, L=260 more)
- Small slotted screwdriver (for removing the sensor)

[Disassembling procedure]

<Station sensor assy.>

1) Turn OFF the power supply switch, remove the SR cover, the YR cover and the right cover.
2) Remove the cable connected to the station sensor assy.
3) Remove the screw (P3 x 6SMW) and the D-point sensor BKT together with sensor.
4) Remove the station sensor from the D-point sensor BKT and replace it.

<Capping sensor assy.>

- When attaching the capping sensor assy., press it until the notch fits into place.

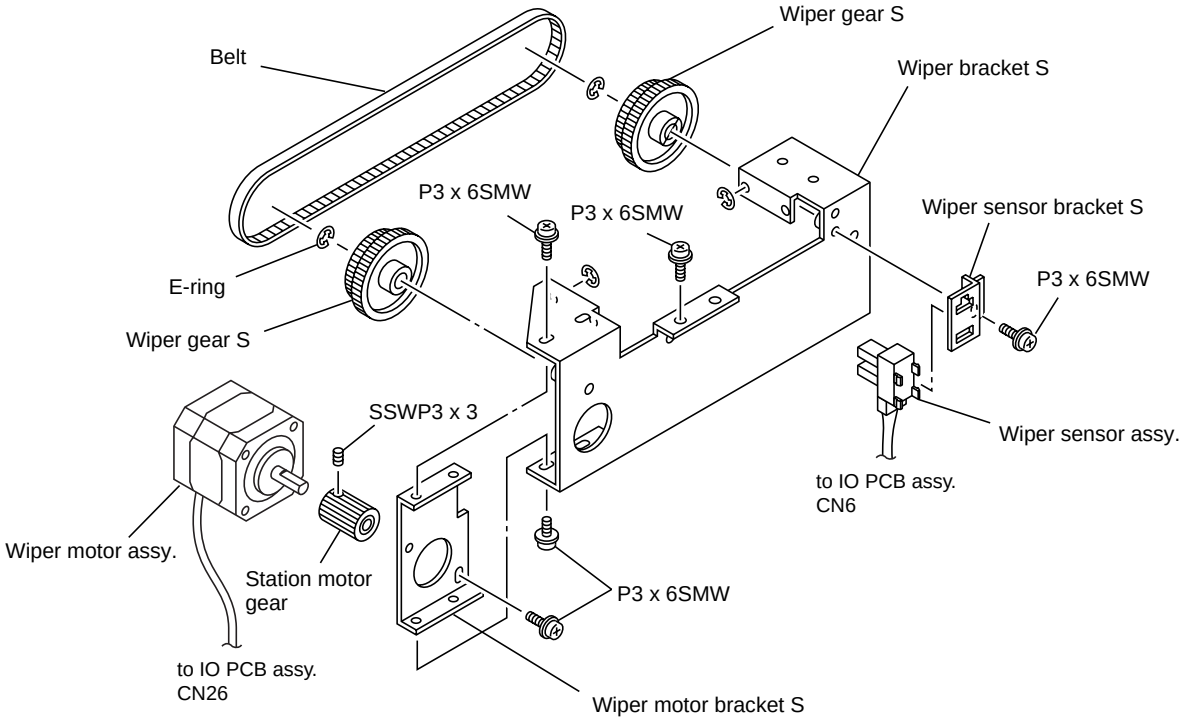
1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the head cover.
3) Remove the cable connected to the capping sensor assy.
4) Remove the capping sensor assy. by twisting it.

<Wiper sensor assy.>

1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the SR cover, the YR cover and the right cover.
3) Remove the cable connected to the wiper sensor assy.
4) Remove the screw (P3 x 6SMW) and the wiper sensor BKT together with sensor.
5) Remove the wiper sensor from the wiper sensor BKT and replace it.

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-13. IEEE1394 PCB, Main PCB, HDC-4 Head PCB assy., HDC-2 Head PCB assy. and Power PCB

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)
- Box wrench (opposite side distance: 5.5 mm)

[Disassembling procedure]

<IEEE1394 PCB>

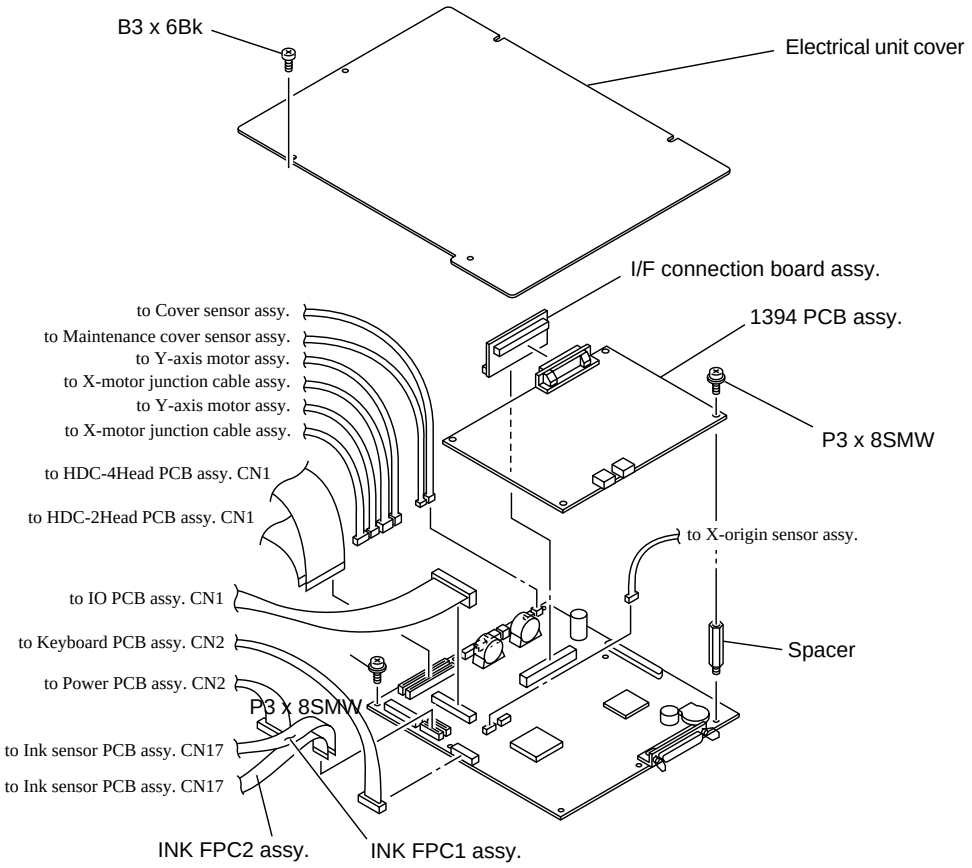
1) Turn OFF the power supply switch, remove the electrical unit cover.
2) Remove the screw (B3 x 6Bk) and remove the IEEE1394 PCB together with connection board.

Follow the procedure given below to replace **the main PCB**.

1) Remove all of the cables connected to the main PCB.
2) Remove the screw (P3 x 8SMW, SQ-30, the screw for the pararell connector) and remove the main PCB.

Follow the procedure given below to replace **the power PCB**.

1) Remove the screw (B3 x 6Bk, P3 x 6SMW) and remove the main PCB BKT.
2) Remove all of the cables connected to the power PCB.
3) Remove the screw (P3 x 8SMW) and remove the poser PCB.



<HDC-4 Head PCB assy.>

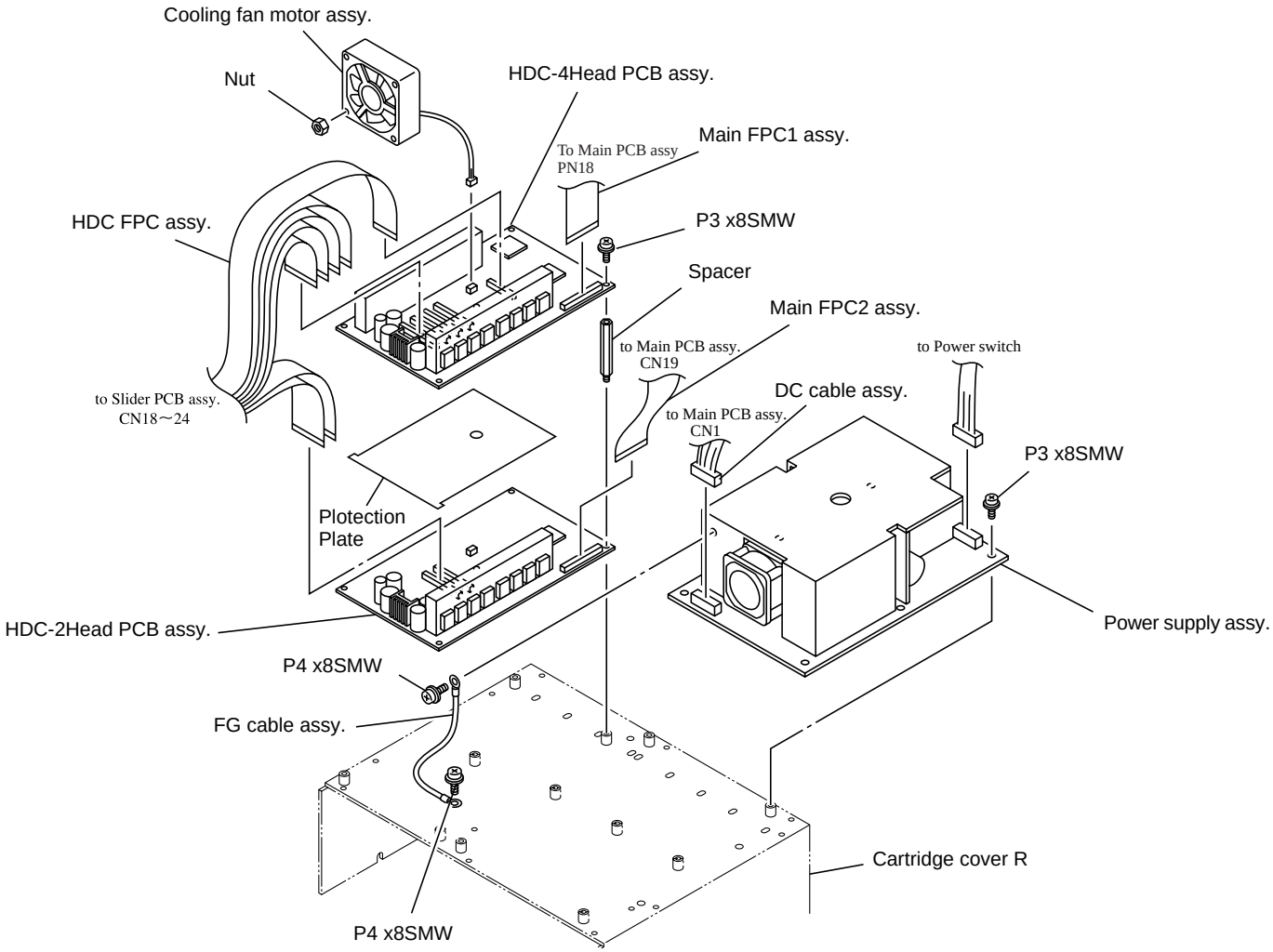
1) Turn OFF the power supply switch, remove the electrical unit cover.
2) Remove all of the cables connected to the HDC-4 Head PCB assy.
3) Remove the screw (P3 x 8SMW) and remove the HDC-4 Head PCB assy.

Follow the procedure given below to replace **the HDC-2 Head PCB assy**.

1) Remove the Protection plate.
2) Remove all of the cables connected to the HDC-2 Head PCB assy.
3) Remove the screw (SQ-60) and remove the HDC-2 Head PCB assy.

[Assembling procedure]

- Assembly is reverse of disassembly.



5-1-14. Ink supply tube (inside diameter: ø2mm)

[Tools to be used]

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

[Disassembling procedure]

1) Turn ON the power of the device and then move the slider to the center of the platen using the JOG key.
2) Turn OFF the power supply switch, remove the front cover, the Y cover and the head cover.
3) Pull the ink damper for replaced tube from the head.
4) Loosen the screw and then send back the ink inside the tube to the cartridge.
5) Remove the screw (B3 x 6Bk) and then remove the bear cover L/R and remove the screw for the ink supply tube (ø2,ø3).
6) Pull the ink supply tube to replace from the cable bear and replace it.

[Assembling procedure]

- Assembly is reverse of disassembly.

CHAPTER 6

ADJUSTMENT

6-1. Adjusting item list

* Perform all items

Adjusting item		Cutter height	Station position adjustment*					Linear sensor PCB assy height	Y-motor belt tension	X-motor belt tension	Head ID	Head position adjustment*				Right and left edges
			Bottom position of Cap	Forward and backward position of Cap	Capping Y position	Capping height	Wipint Y, height					Head angle	Head stagger adjustment	Dot position 2	X-Dot position	
Part to be replaced	Cutter assy	○														○
	Station sensor		○	○	○	○	○									
	Caping sensor		○	○	○	○	○									
	Linear sensor PCB assy							○								
	Paper width sensor PCB assy	○														○
	Y-origin sensor assy		○	○	○	○	○									
	Y-axis motor assy								○							
	X-axis motor assy									○						
	Cap assy		○	○	○	○	○									
	Print head										○	○	○	○	○	

6-2. Adjusting item

6-2-1. Adjustment of the cutter height

[The case that needs adjustment]

- The case where the cutter assy has been detached

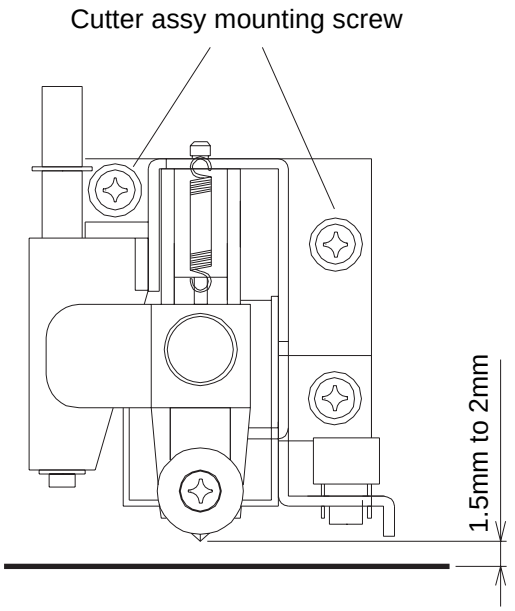
[Tools to be used]

Phillips screwdriver (No.2 for M3 to M5)

[Adjusting procedure]

1) Loosen a screw on the cutter assy for the slider.
2) Move the Cutter assy up and down so that the gap between the cutting edge and platen becomes 1.5 to 2mm.
3) Loosen a screw on the cutter assy.

* After cutter height adjustment, alwais perform the adjustment of the edge.



6-2-2. Adjustment of the station position

(Forward and backward position of Cap/ Bottom position of Cap/ Capping height/ Wiping Y/ Wiping height)

[The case that needs adjustment]

- In the case where the station assy is removed from
- In the case of ink filling or cleaning is not performed normally
- In the case where the capping sensor of the station sensor has been replaced

[Tools to be used]

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

[Adjusting procedure]

Adjustment of the station position Follow the steps below to perform adjustment of station position.

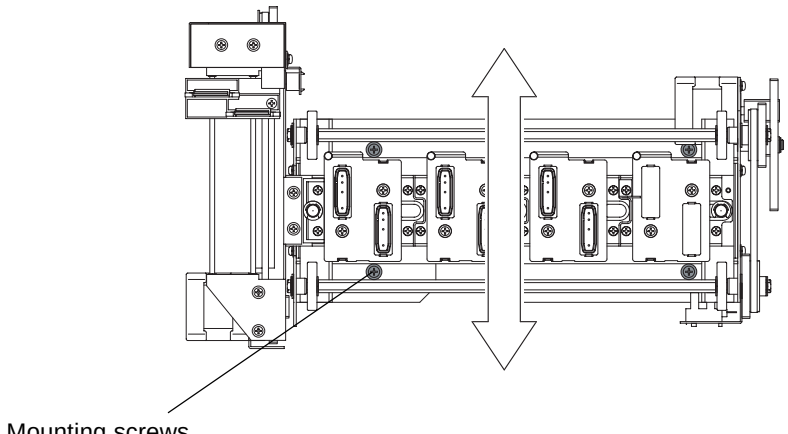
1) Assembling adjustment (Forward and backward position of Capping)
2) Operation adjustment (Adjustment operation (Forward and backward position of Cap, Bottom position of Cap, Capping height, Wiping Y,Wiping height)
3) Adjustment of the station position

CAUTION

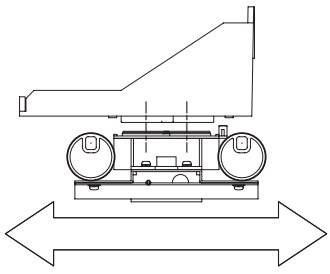
- Although the operation adjustment is serialized, correct adjustment values are written to parameters only if the operation adjustment is performed through to the end. Therefore, be sure to make adjustment through to the end.
- In operation adjustment, set the head height to the bottom position.

1. Assembling adjustment (forward and backward position of Capping)

1) Turn OFF the power of the device and then rotate the station gear to lower the Cap.
2) Observing from the right side of the device, make sure that the center of the Cap agrees with the center of the head.
3) If NG results, move the head on the platen, loosen the mounting screws of the station assy, then move the entire assy back and forth to adjust the position.



Forward and backward position of Cap (top view)



Forward and backward position of Cap (right side view)

2. Operation adjustment

The Capping position adjustment operation is serialized as follows:

```
# ADJUST
CAPPING              < ent >
```

```
HEAD height
LOW ?<               >  YES
```

Make sure that the head is at the bottom position and then select [>Yes].

```
# ADJUST
LOWER  POS.          = * * *
```

1. Bottom position of Cap
(adjustment value = 250 to 380)
If the Cap is removed, check the station sensor and station belt (cam phase).

```
# ADJUST
CAP  POS.            = * . *
```

2. Cap Y

```
# ADJUST
CAP  HEIGHT          = * . *
```

3. Capping height
(adjustment value = 1.0 to 2.2)
If the Cap is removed, check the station sensor and station belt.

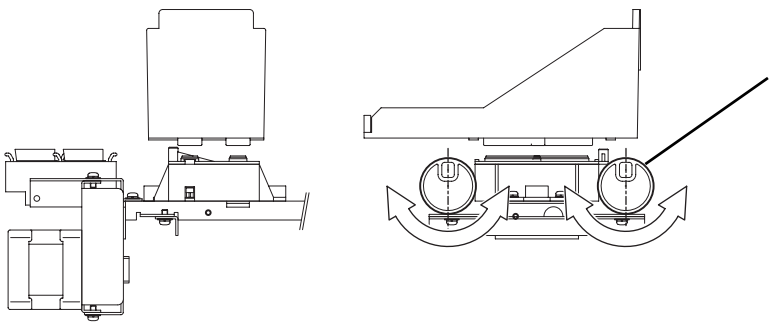
```
# ADJUST
WIPER  POS.          = * . *
```

4. Wiping Y

```
# ADJUST
WIPER  height        = * . *
```

5. Wiping height (adjustment value = 3.2 to 4.2)

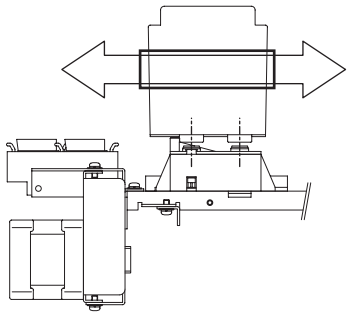
1. Bottom point of Cap
   Adjust the bottom position of Cap, using the [△] or [▽] key.



When the cam is oriented to the bottom, the Cap is at the bottom position.

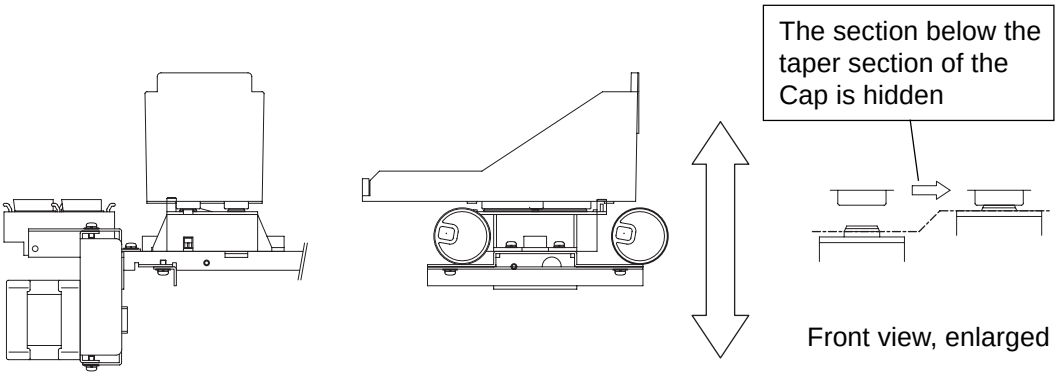
2. Cap Y

Adjust Cap Y so that the center of the Cap agrees with the center of the head, using the [<] or [>] key.



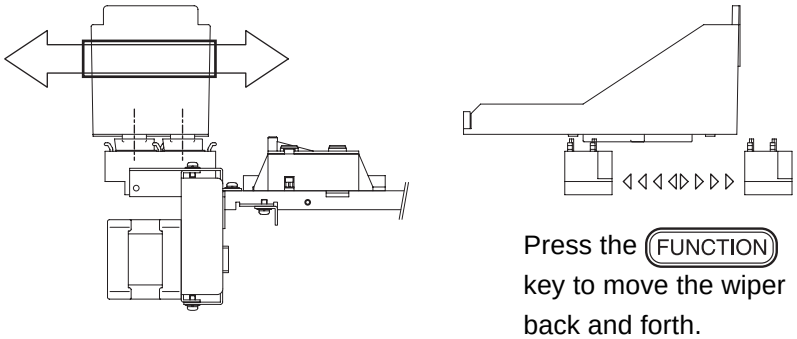
3. Cap height

Adjust the Cap height at which the Cap contacts the head, using the [^] or [v] key.



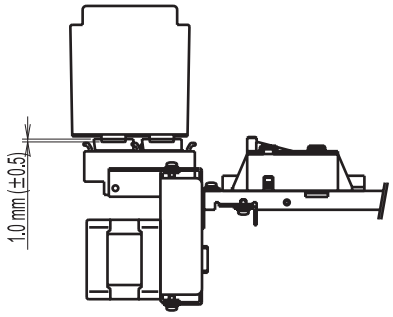
4. Wiping Y

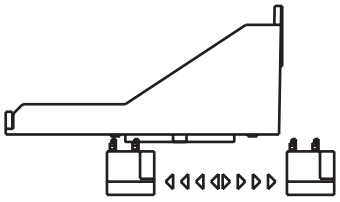
Adjust Wiping Y so that the center of the wiper agrees with the center of the head, using the [<] or [>] key.



5. Wiping height

Adjust the Wiping height so that the top 1mm (±0.5mm) of the wiper contacts the head, using the [△] or [▽] key.

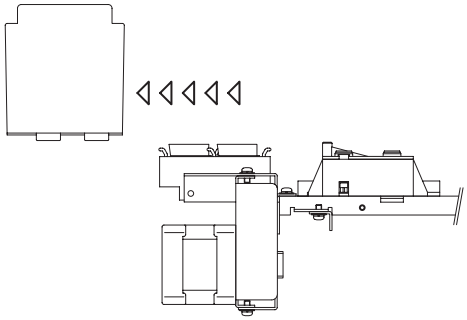




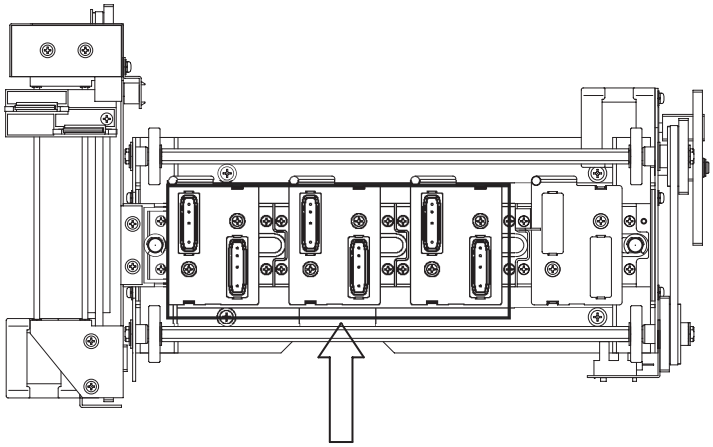
Press the [FUNCTION] key to move the wiper back and forth.

3. Station position check

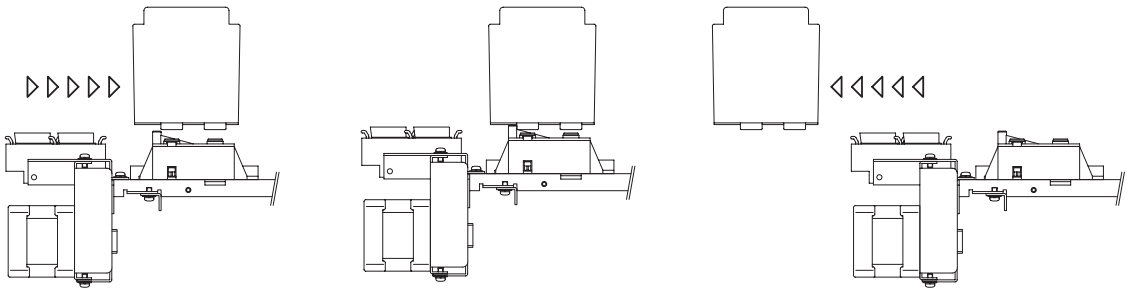
1) With the power of the device turned ON, set an appropriate media and then move the head on the platen using the JOG key.



2) Place plain paper (180x70mm) on the Cap assy.



3) Press the TEST key to enter the flashing mode.
Set Shot to 5000000 (maximum value) and then press the ENTER key. Flashing operation is performed on the Cap automatically.

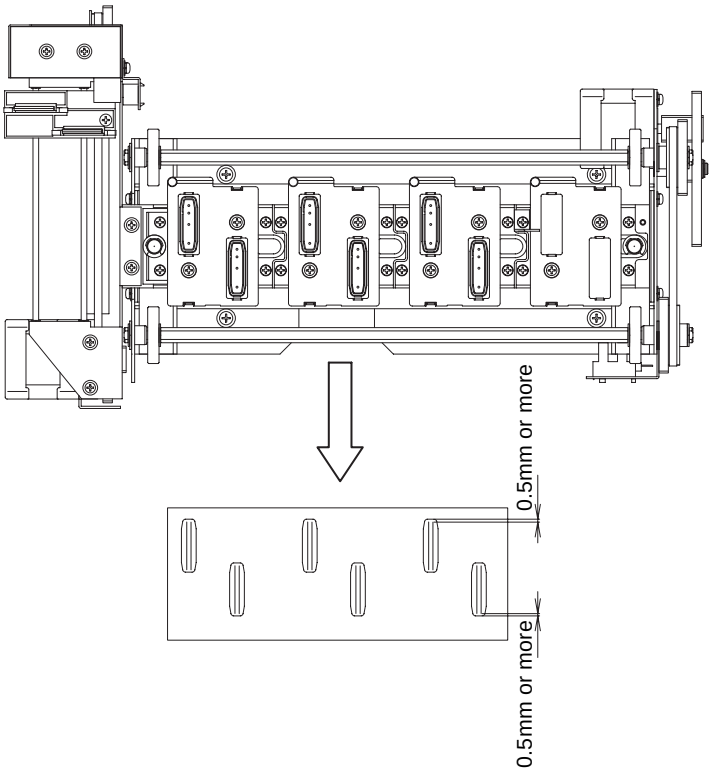


1. Return the head to on cap.

2. Flashing

3. Move the head on platen.

4) Press the plain paper with your hand to make a mark of the Cap and then remove it.
If the gap between the Cap and flashing is 0.5mm or more, the result is OK; otherwise, re-adjust the forward and backward position of the Cap.



6-2-3. Adjustment of the Linear sensor PCB assy height

[The case that needs adjustment]

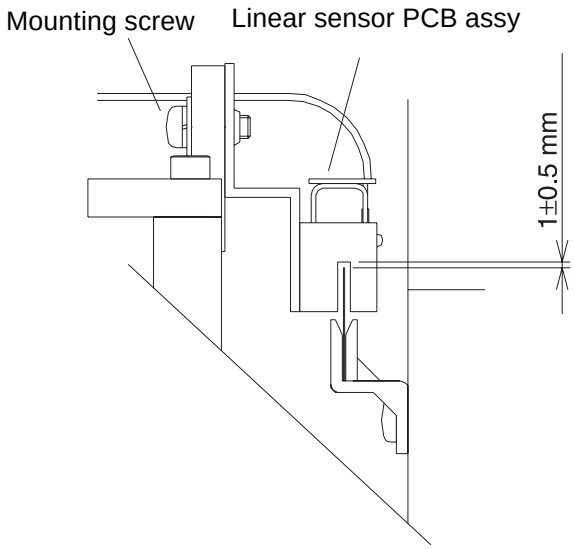
- In the case where the Linear sensor PCB assy has been replaced
- In the case where the Linear encoder scale has been replaced

[Tools to be used]

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

[Adjusting procedure]

1) Loosen the screws in the X-motor bracket.
2) Within the movable range of the slider, move the assy up and down so that the gap between the linear encoder scale and linear sensor PCB is about 1mm±0.5mm.



6-2-4. Adjustment of the Y-motor belt tension

[The case that needs adjustment]

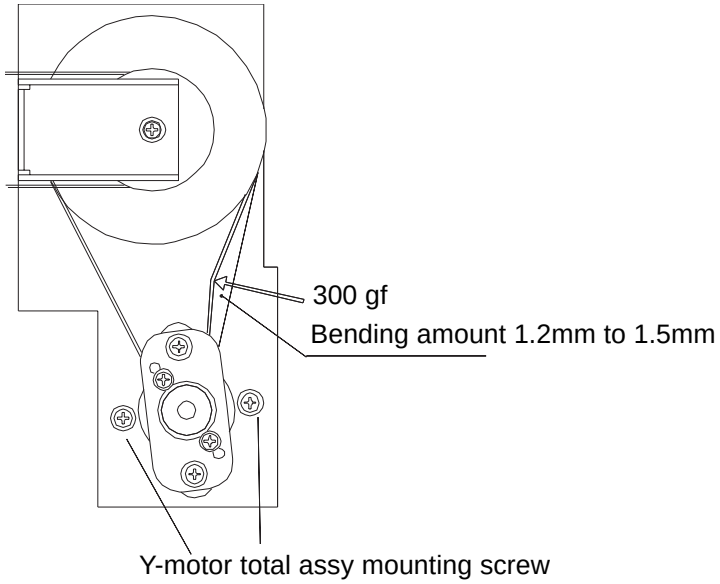
- In the case where the Y-motor total assy is removed

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)
- Tension gauge (Max. 300gf or more)
- Scale (L=150)

[Adjusting procedure]

1) Loosen the screw in the Y-motor total assy.
2) Adjust the Y motor total assy position so that when the middle of the timing belt is pressed down with 300gf, it bends between 1.2mm and 1.5mm, then fix in the place.



6-2-5. Adjustment of the X-motor belt tension

[The case that needs adjustment]

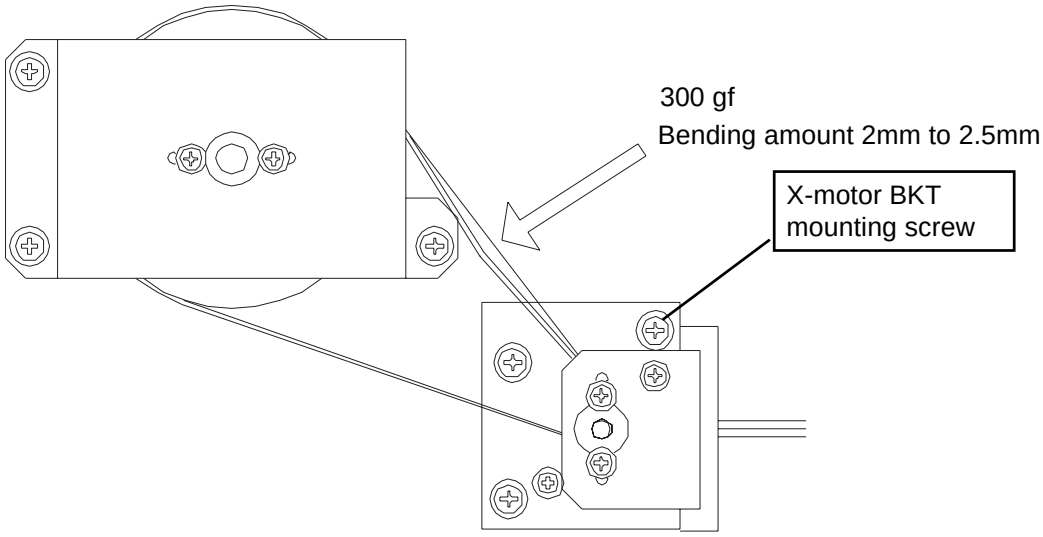
- In the case where the X-motor total assy is replaced.

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)
- Tension gauge (Max. 300gf or more)
- Scale (L=150)

[Adjusting procedure]

1) Loosen the screw in the X-motor total assy.
2) Adjust the Y motor total assy position so that when the middle of the timing belt is pressed down with 300gf, it bends between 1.2mm and 1.5mm, then fix in the place.



6-2-6. Adjustment of the head (head angle / head stagger)

[The case that needs adjustment]

- In the case where the head is replaced

[Tools to be used]

- Phillips screwdriver (No.2 for M3 to M5)
- Phillips screwdriver (No.1 for M2)
- Small Slotted screwdriver
- Hexagon wrench (opposite side distance: 2.5mm, Bondhus type polarized)
- Magnifier (Magnification of approx. 50)

[Adjusting procedure]

CAUTION

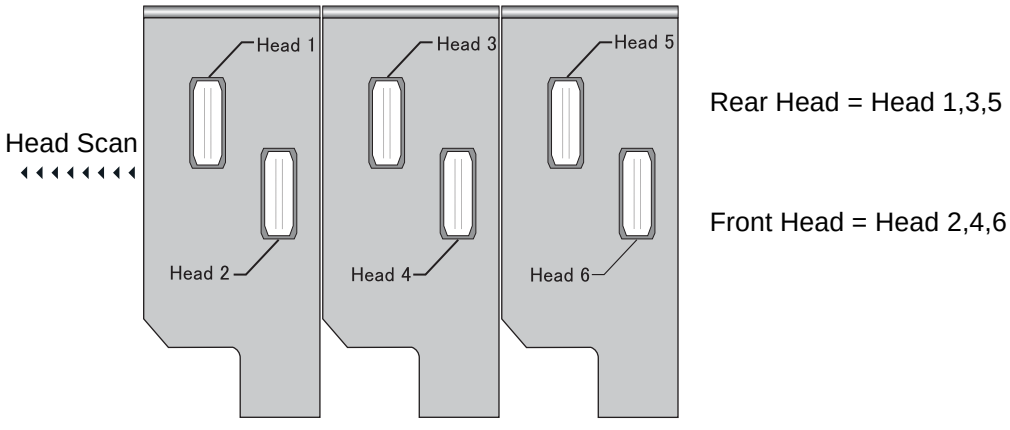
- Make adjustment in the following order with the head lowered to the bottom position.

Follow the steps below.

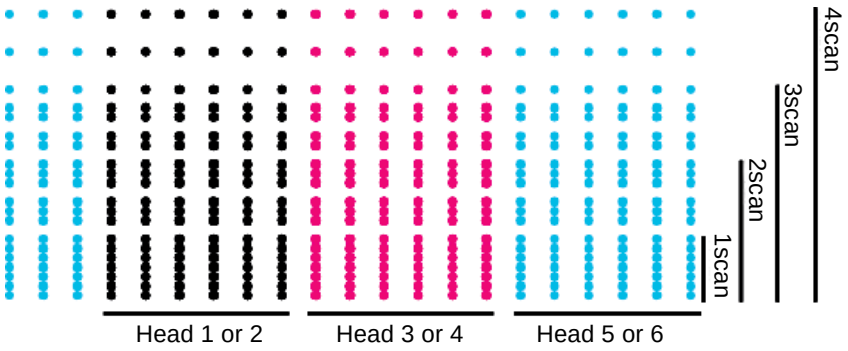
1. Adjustment of the head angle / [SLANT adjust]. (for each head, six positions)
2. Adjustment of the head angle / [REAR/FRONT adjust]. (for each head, three positions)

(3. Adjustment of the dot position / [PRINT adjust2], operation adjustment)

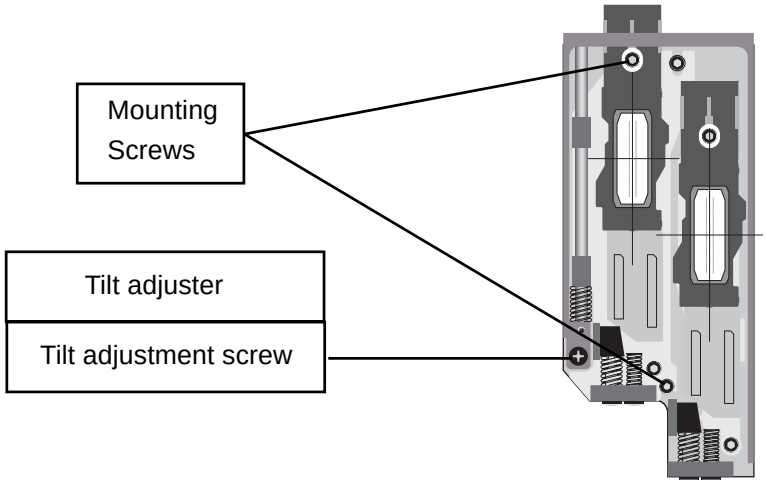
1. Adjustment of the head angle



(1) Select [#ADJUSTMENT - HEAD ADJUST - FRONT or REAR] and then print the adjustment pattern to glossy media. (Select the side including the replaced head.)

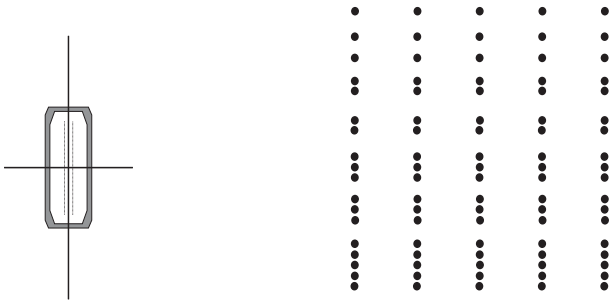


(2) Check the head tilt with a magnifying glass and then turn the tilt adjustment screw according to the tilt direction. As a rough standard, the head tilts 50μm for each screw rotation.

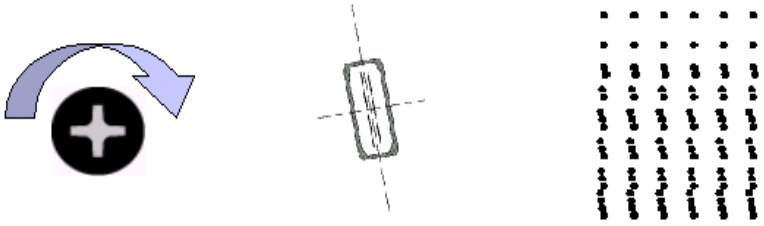


* Care is required when using a magnifying glass because of horizontal and vertical inversion.

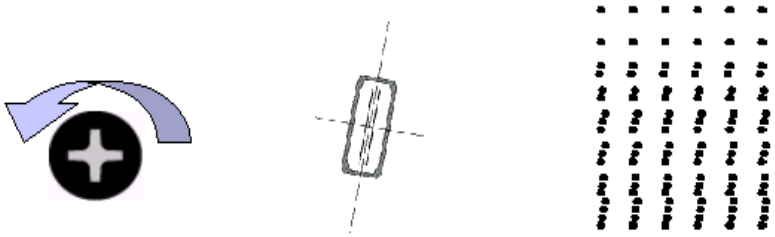
1) Good condition



2) Bad condition (Turn the screw clockwise.)

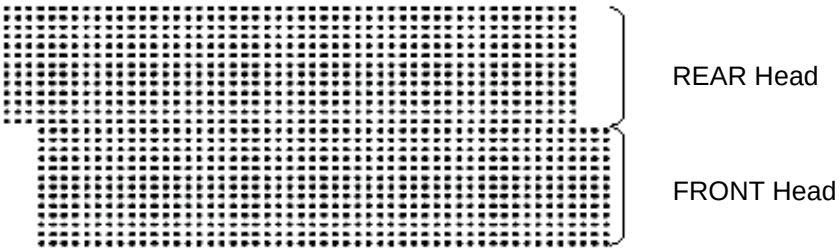


3) Bad condition (Turn the screw counterclockwise.)

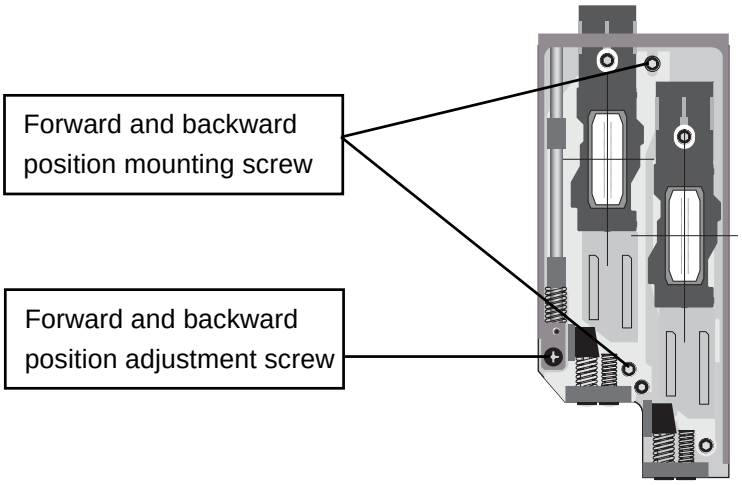


2. Stagger adjustment

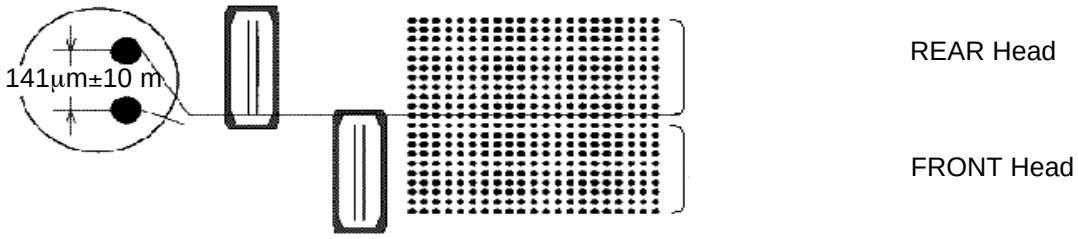
(1) Select [#ADJUSTMENT - HEAD ADJUST - FRONT or REAR (K_M_c)] and then print the adjustment pattern to glossy media. (Print the block including the replaced head.)



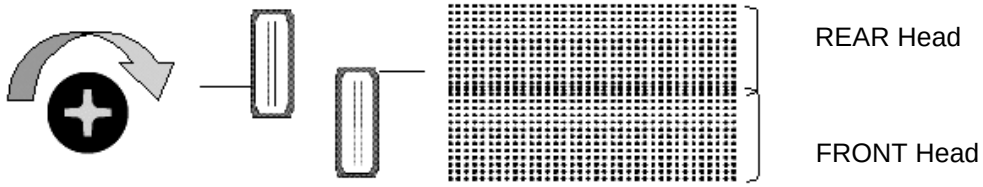
(2) Turn the forward and backward position adjustment screw according to the overlapping condition of the FRONT and REAR heads. (Move the REAR side to match the FRONT side or fixed side.) As a rough standard, the head moves 50μm for each screw rotation.



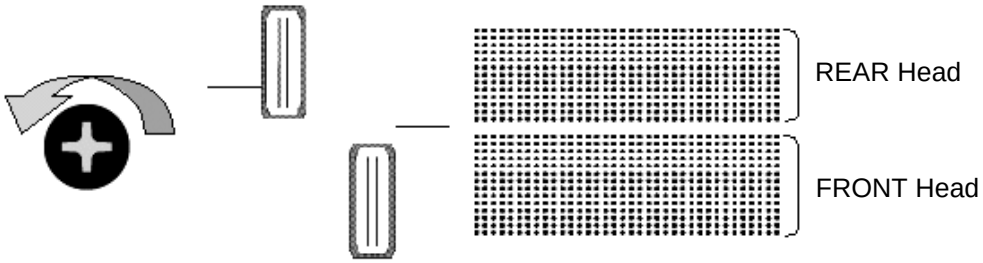
1) Good condition



2) Bad condition (Turn the screw clockwise.)



3) Bad condition (Turn the screw counterclockwise.)



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