N1000/2000

SERVICE MANUAL

Canon

2002 MAY CANON INC.

Application

This manual has been issued for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual could include technical inaccuracies or typographical errors due to improvements or changes in the products. When changes occur in applicable products or in the content of this manual, Canon will release technical information as the need arises.

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All documents and page layouts were created with Microsoft®Word 2000.

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Part 1

PRODUCT SPECIFICATIONS

1. PRODUCT OVERVIEW

The N1000 series is the Network Color BJ Printer for Office Use.
This printer is targeted for internal work group users who need to output the large volume document in a short period, small business work group users who are difficult to introduce the color laser printer due to high cost, users who need to repurchase the printer from the middle range monochrome printers and add-on users.

1) High speed printing
   Monochrome text: 20 ppm
   Color DTP: 18 ppm
   Full color: 4 ppm (Reference)
2) Network support
   Supports standard printer MIB, Canon MIB and NetSpot (MIB: Management Information Base)
3) Printer with high durability and large capacity of ink tank that supports printing of large amount of documents
   Large capacity of ink tank: 2800 pages/Bk ink tank, 3400 pages/color ink tank
   Capability of stacking approx. 250 pages of plain paper on a standard cassette
4) Low power consumption

2. SPECIFICATIONS

2.1 Printer Specifications

2.1.1 Printer Specifications

Model name / Item	N1000	N2000
External dimension mm	465 (W) x 440 (D) x 207 (H)	587(W) x 626(D) x 209(H)
Unit weight kg	Approx. 12 kg (Including ink tanks, print head and cassette.)	Approx. 15 kg (Including ink tanks, print head and cassette.)
Paper Feeding Method	Cassette feed (U-turn pass) and Manual feed	
Paper delivery method	Front delivery (Print surface upward)	
Resolution	Bk: 600 x 1200 dpi__Color: 1200 x 2400 dpi	
Printing Direction	Uni-/Bi-directional	
Print size	Up to A4	Up to A3+
Throughput Media size: A4	HS / HQ Bk: 20 ppm Color: 18 ppm (DTP) / 4 ppm (Photo) Reference	
Interface Standard equipment	IEEE1284 Compatible / USB Rev 1.1	
Network support	10/100BASE-T,TX (with optional network interface board)	
Printer Driver	Canon specified. GARO (Graphic Arts Language with Raster Operations)	
Detection functions	Front cover-open, Carriage position, Presence of paper, Paper width, Presence of BJ print heads, BJ print head mis-installation, Ink remaining amount, Waste ink tank full and Paper feed roller rotating position	
Operating Noise	48dB (5.8 Bels) during printing	
Environmental requirements	During operation: ___Temperature 5 to 35˚C Humidity 10 to 90%RH (No condensation) During non-operation: _Temperature 0 to 35˚C Humidity _5 to 90%RH (No condensation)	
Power consumption	44Wh (during printing) 13Wh (standby)	
Safety standards	Radio wave interference: VCCI, FCC, Taiwan/Korea EMC, CE-Mark, C-tick and CCIB Electrical safety: Electrical appliance regulation, UL1950, cUL, CE-Marking, TUV, FIMKO, SASO, Energy Authority, PSB, CB/CCIB, GOST-R and Korean Electric Commerce	
Serial No. Location	Behind the printer and on the rating plate	

2.1.2 Printer life

Whichever comes first:

1) A total of 100, 000 sheets printed.
2) Five years of use.

2.1.3 Print head/ink tank life

1) Print head life
   Whichever comes first:
   For color printing: 50,000 pages (A4, 5% duty pattern)
   For monochrome printing: 50,000 pages (A4, 5% duty pattern)

2) Ink tank life (No. of printable pages per ink tank)
   Black: 2800 pages (A4, 5% duty pattern)
   Colors: 3400 pages (A4, 5% duty pattern)

2.2 Paper Specifications

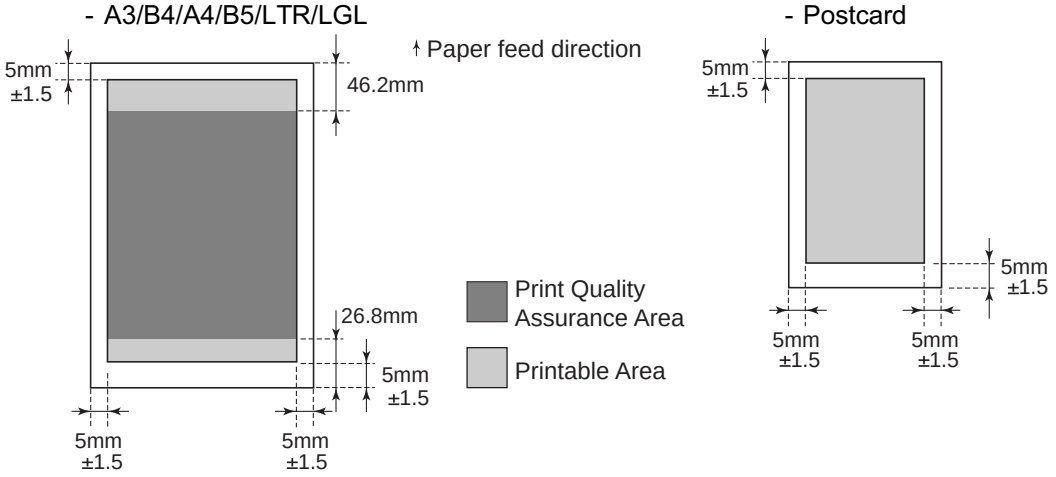
2.2.1 Paper sizes and weights

1) Paper size See the table below.
2) Weight For cassette feeding, the paper's weight should be 64 to 75 g/m_
3) Paper height on cassette 23 mm or less

2.2.2 Paper types

Type		Size	N1000		N2000	
			Paper feeding method		Paper feeding method	
			Cassette	Manual	Cassette	Manual
Plain paper	PB (SK/DK)	A4/B5 A3	Yes No	Yes No	Yes Yes	Yes Yes
	KANGAS	A4	Yes	Yes	Yes	Yes
	NEUDIEDLER	A4	Yes	Yes	Yes	Yes
	BOISE CASCADE	LTR LGL	Yes No	Yes No	Yes Yes	Yes Yes
	LC-301	B5/A4/LTR B4/A3/LGL	Yes No	Yes No	Yes Yes	Yes Yes
Special paper	HR-101	B5/A4/LTR B4/A3	Yes No	Yes No	Yes Yes	Yes Yes
	CF-102 (Transparency)	A4/LTR LGL	Yes No	Yes No	Yes Yes	Yes Yes
	GP-301N	A4/LTR A3	No No	No No	No No	No No
	Postcard (postal card)	100 x 148 mm (Min.)	Yes (with a post card support)	No	Yes (with a Post card Support)	No

2.2.3 Printing area



When media is fed from second/third cassettes, or by manual, both left and right edges will become 5.0 mm +/- 2.5.

2.3 BJ Cartidge Tank Specifications

2.3.1 Print head

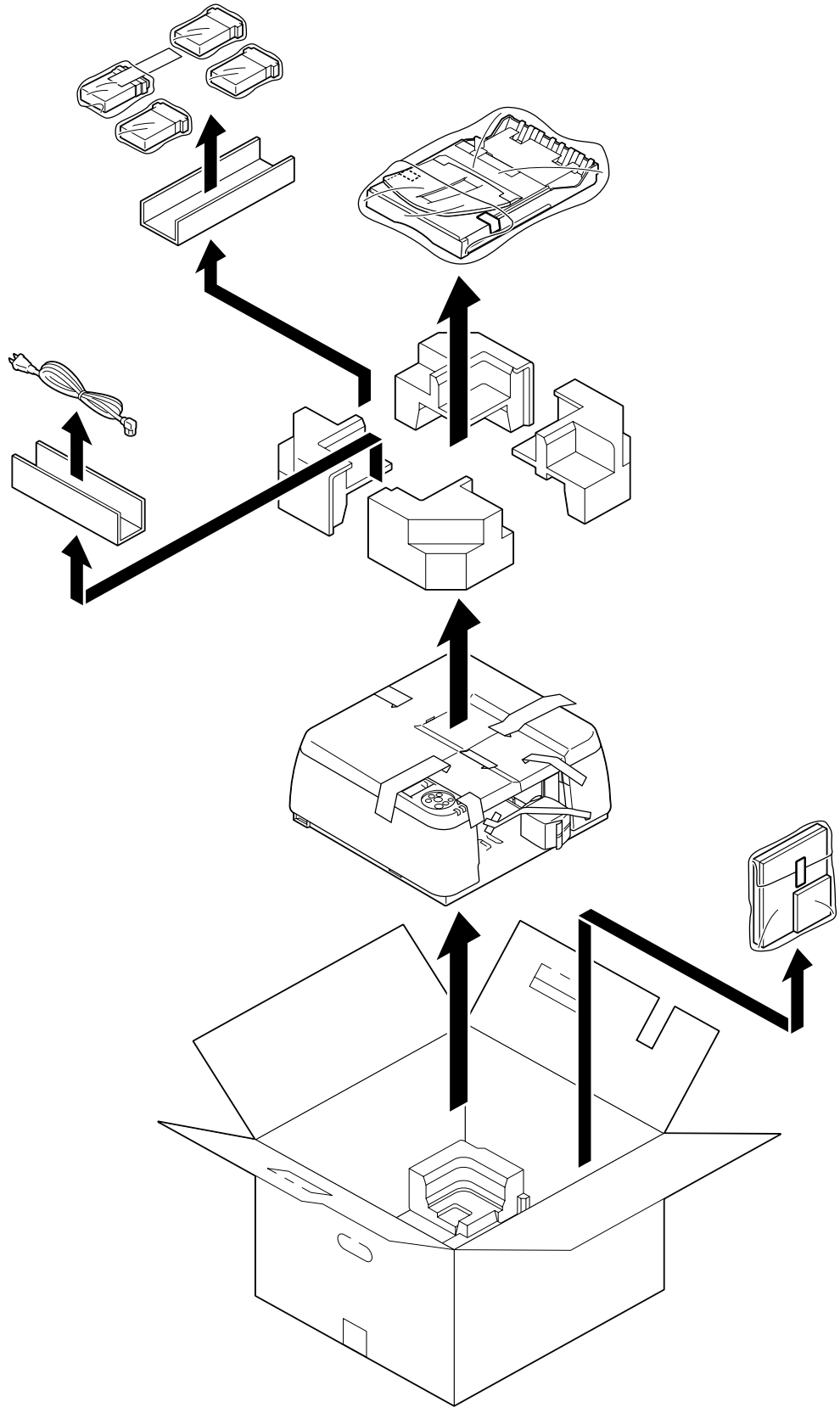
	Black	**Color (each)**
Nozzle density	600 dpi	1200 dpi
Number of nozzles	640 nozzles	1280 nozzles
Recording density	2400 dpi	2400 dpi

2.3.2 Ink tank

	Black	**Yellow**	**Magenta**	**Cyan**
Ink component	Pigment ink	Dye ink	Dye ink	Dye ink
Ink tank capacity	130 ml	80 ml	80 ml	80 ml

3. PACKAGING CONFIGURATION

After opening the box, make sure all the items below are included.
There is no storage box for storing the BJ cartridge. Keep the original box for transportation.



4. PARTS CODE LIST

Items	**Description**	**Code** No.	**Remarks**
Printer	N1000 JPN	Q51-1051	A4 printer
	N1000 LV/US	Q51-1052	A4 printer
	N1000 HV	Q51-1053	A4 printer
	N2000 JPN	Q51-1041	A3 printer
	N2000 LV/US	Q51-1042	A3 printer
	N2000 HV	Q51-1043	A3 printer
Print head		QY6-1000	Supplied as a service part
Ink tank	BCI-1201Bk	AG6-8438	
	BCI-1201Cyan	AG6-8439	
	BCI-1201Magenta	AG6-8440	
	BCI-1201Yellow	AG6-8441	

Options

Items	**Description**	**Code** No.	**Remarks**
N1000 Paper feed unit (Second unit)	Paper feed unit PFN-12	Q55-1020	For A4 media
N1000 Paper feed unit (Third unit)	Paper feed unit PFN-13	Q55-1080	For A4 media
N1000 Universal cassette (First cassette)	Universal cassette UCN-11	Q55-1100	For A4 media
N1000 Universal cassette (Second/third cassettes in common)	Universal cassette UCN-12	Q55-1110	For A4 media
N2000 Paper feed unit (Second unit)	Paper feed unit PFN-22	Q55-1010	For A3 media
N2000 Universal cassette (First cassette)	Universal cassette UCN-21	Q55-1120	For A3 media
N2000 Universal cassette (Second cassette)	Universal cassette UCN-22	Q55-1130	For A3 media
Network interface card	Network interface card NB-11FB	Q55-1030	For N1000/2000

Note: The network interface card is not originally installed in the printer. When the printer is used as a network printer, install the network interface card in which the LAN cable can be connected.

Part 2

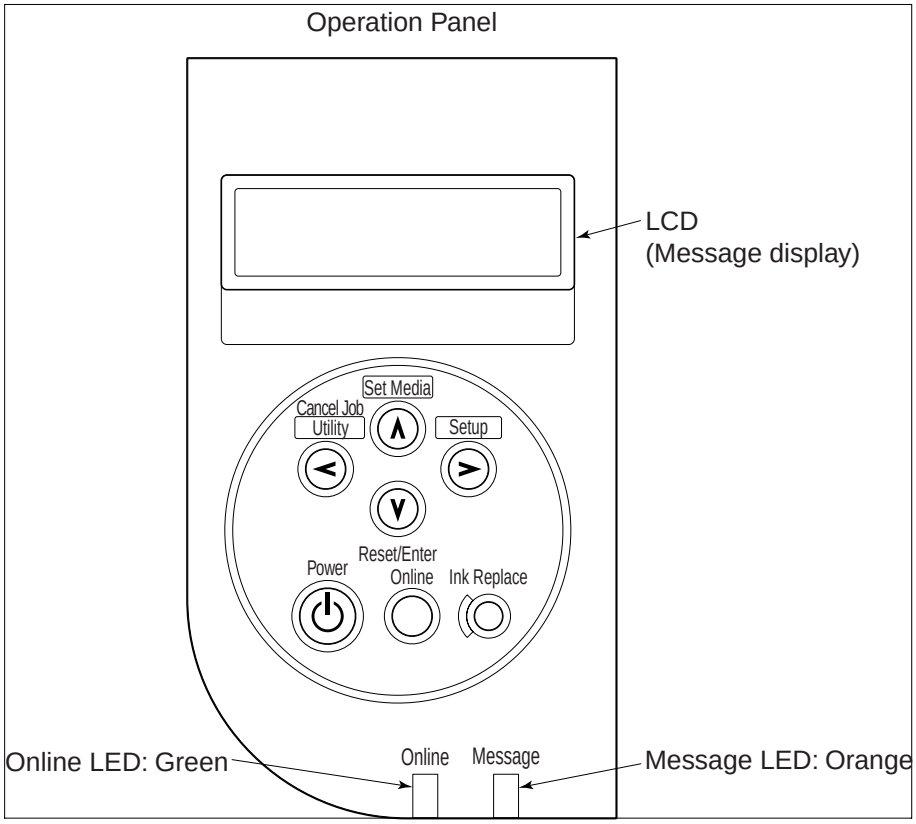
TROUBLESHOOTING

1. PRINTER OPERATION

The printer's operation procedures, which are necessary for the troubleshooting, are explained below.

1.1 Printer Operation Procedure

From the printer's operation panel, it is possible to make settings during printing or network settings, and cancel printing or an error.



1.2 Status Indicator

When the printer is operated, a message is shown on the LCD. When the printer operates properly, it indicates the operation status and the instruction what the user should operate. When an error occurs or the user has to perform some operation, the message that indicates the operation status and the error code are indicated.

Normal operation

LCD display	Online LED	Message LED	Operation status
Printable	Light	Light off	Power ON
*1	Blinks	Light off	Printing in progress

During error or service call

LCD display	Online LED	Message LED	Operation status
Each message	Light off	Blinks	Error/Service call
*2	Light off	Blinks	Offline
	Light off	Light	Warning display

*1: Refer to the status indication list.
*2: Refer to the error indication list.

1.3 Printer Panel Operation

Printer settings or maintenance can be performed by operating the printer panel. (Mode open to users.)

Depending on purposes, three types of menu are prepared for the panel operation.

1) Setup menu
   Menu to set each printer operation environment
2) Utility menu
   Menu to perform self-printing or maintenance function
3) Media set menu
   Menu to set the media size and media type of cassettes

Operation method

With the printer offline state, hold down the key decided by each menu, and you will be able to enter the menu.

Menu	**Key to enter menu / LCD display**	**Key to move within menu / function**	**Execution key**
Setup menu	***Setup*** key	_key	_key
Expansion function	Warning Display	Sets whether or not to display the warnings.	_key
	Wait Time	Sets the fixing wait time when it is not set from the computer.	_key
	Language	Sets the language on the display.	_key
Print adjustment	Adjust Printer	Prints the head adjustment pattern.	_key
	Adjust Printhead Print Pattern	Sets the registration adjustment values of the bi-directional and odd/even of the adjustment pattern. Use _key to change values.	_key
	Band Adjust	Sets the banding process value. Use _key to change values.	_key
Interface settings	Select Interface	Sets to select the interface, IEEE1284 or USB.	_key
	Set Centronics ECP / Nibble / None	Designates the mode of IEEE1284.	_key
	Ext. Network Initial Settings *1	Restores the network card settings to the factory shipment values.	_key
	Set TCP/IP	Sets the TCP/IP setting of the network card.	_key

Menu	Key to enter menu / LCD display	Key to move within menu / function	Execution key
Maintenance settings	Cleaning at ON	Sets whether or not to perform purging at powering on.	_key
	Initialize Panel *2	Restores the setup menu set values except for the extension network setting to the factory shipment values.	_key
Utility menu	***Utility*** key	_key	_key
	Nozzle Check	Prints nozzle check pattern.	_key
	Status Print	Prints status print.	_key
	Ext. I/F Print	Prints NIC board status.	_key
	Head Cleaning A	Performs cleaning operation.	_key
	Head Cleaning B	Performs cleaning with ink consumption amount higher than Cleaning A.	_key
	Head Cleaning C	Fills ink in the print head and tubes on arrival. (Ink consumption amount is higher than Cleaning B.)	_key
	Move Printer	Drains internal ink into the waste ink absorber when the printer is transported.	_key
	Replace Head	Performs head replacement.	_key
	Ink Remains Bk=xx% C=xx% M=xx% Y=xx%	Displays ink remaining amount. Displays black and cyan first, and then magenta and yellow when _key is pressed.	_key
Media set menu *3	***Set Media*** key	_key	_key
	Cassette 1	Sets the media size and media type of cassette 1.	_key
	Cassette 2	Sets the media size and media type of cassette 2.	_key
	Cassette 3 (N1000 only)	Sets the media size and media type of cassette 3.	_key

*1: Items to be initialized when “Ext. Network / Initial Settings“ is executed and their initial values are:
IP Address=192.168.0.215, Subnet Mask=0.0.0.0, Default G/W=0.0.0.0 and IP Setting= Manual

*2: Items to be initialized when “Initialize Panel“ is executed and their initial values are:
Warning Display=On, Wait Time=Standard, Cleaning at ON=Off, Media Size=A4, Media Type=Plain Paper, Adjust Printhead (Adj. Setting A to F)=0 and Band Adjust (Adj. Setting G)=0

*3 Media size and type which can be set by each cassette.
For the N2000, the supported media size can be detected by aligning the end guide in the cassette to the media size. As for the media size, which is supported but cannot be detected by the end guide, should be set from the operation panel. Those media sizes need to be set are B5 and postcard in Cassette 1, and B5 in Cassette 2.

	Destination	**JP (Japan)**	**US (Overseas)**
Cassette 1	Media size	A4 / B5 / Letter / Post Card	A4 / B5-JIS / Letter
	Media type	Plain Paper / Post Card / Coated Paper / IJ Post card / Transparency / Quick Dry Tran / Special 5	Plain Paper / Coated Paper / Transparency / Quick Dry Tran / Special 5
Cassette 2	Media size	A4 / B5 / Letter	A4 / B5-JIS / Letter
	Media type	Plain Paper / Coated Paper / Transparency / Quick Dry Tran / Special 5	Plain Paper / Coated Paper / Transparency / Quick Dry Tran / Special 5
Cassette 3	Media size	A4 / Letter	A4 / Letter
	Media type	Plain Paper / Coated Paper / Transparency / Quick Dry Tran / Special 5	Plain Paper / Coated Paper / Transparency / Quick Dry Tran / Special 5

2. SERVICING

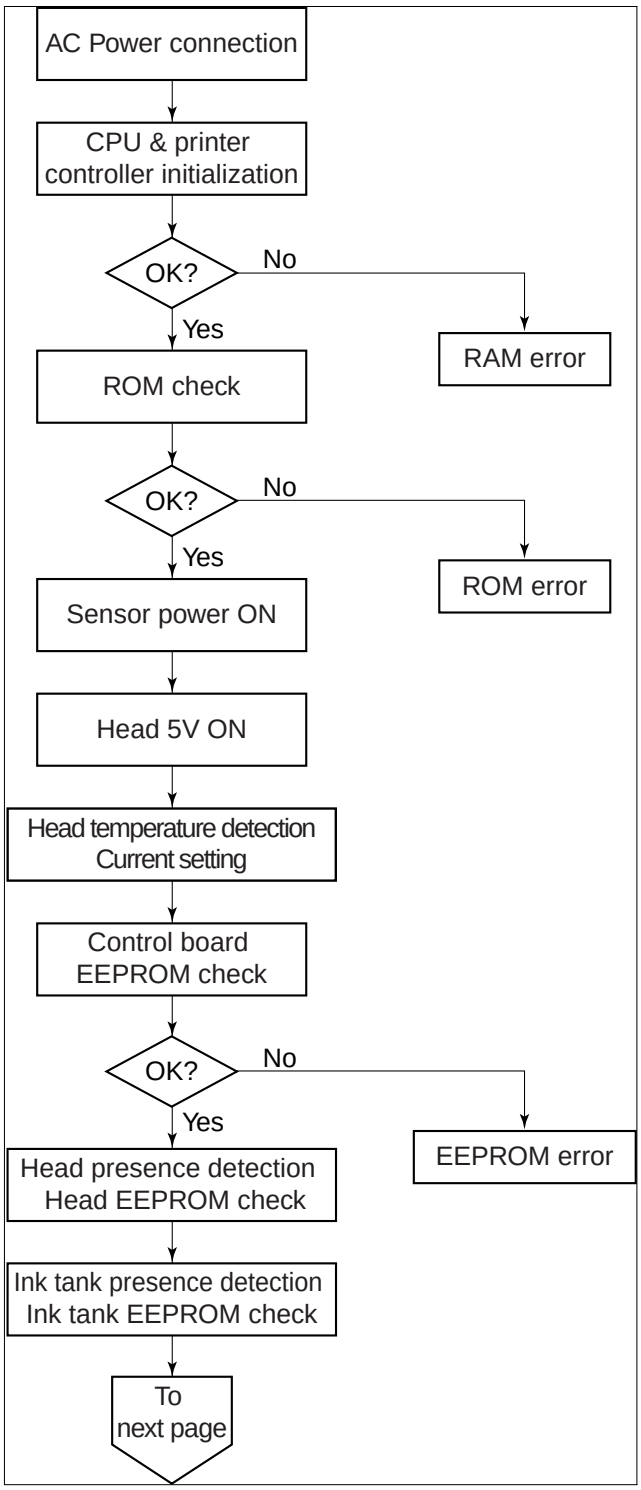
2.1 Before Troubleshooting

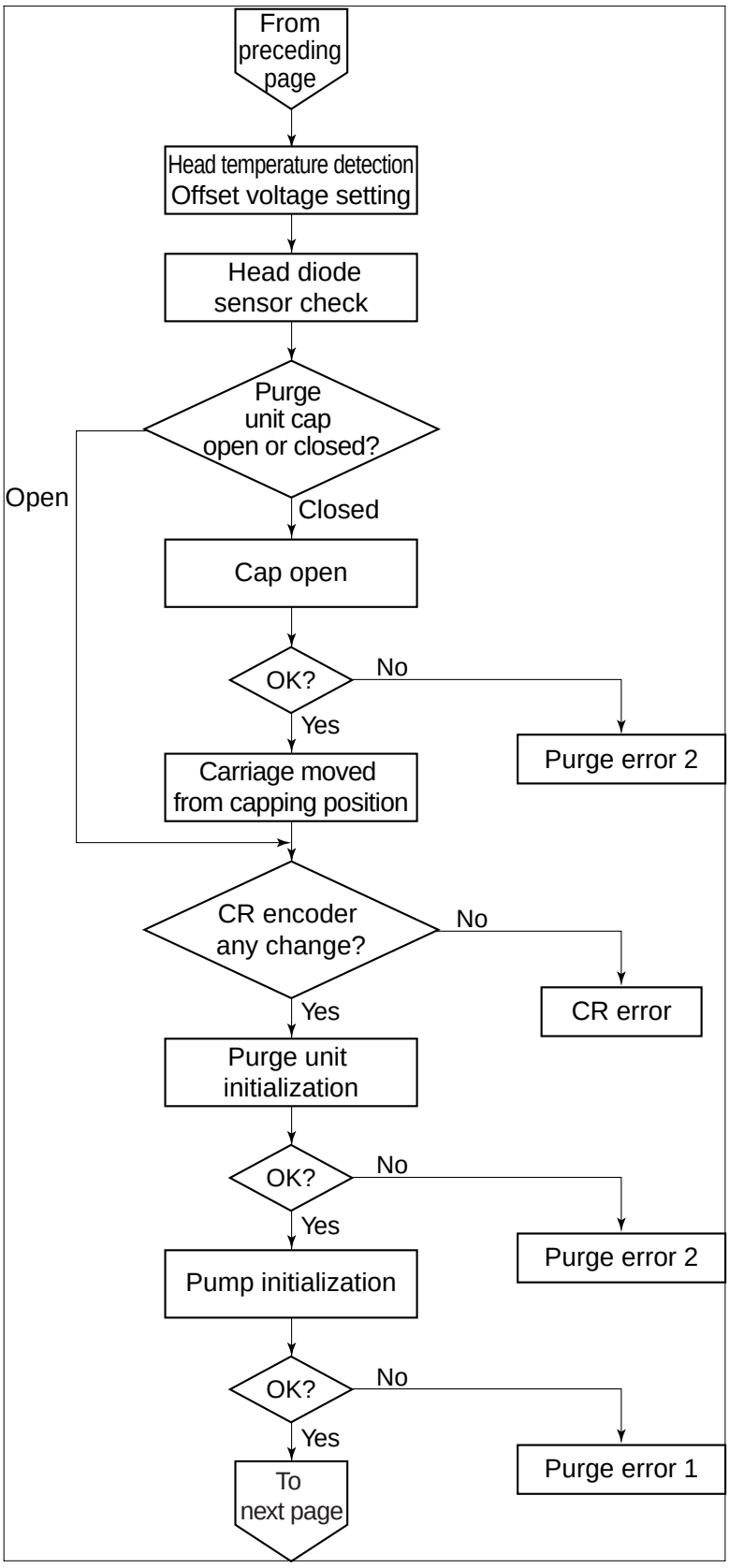
Before troubleshooting, check the following and see if any of the applicable problems can be fixed.

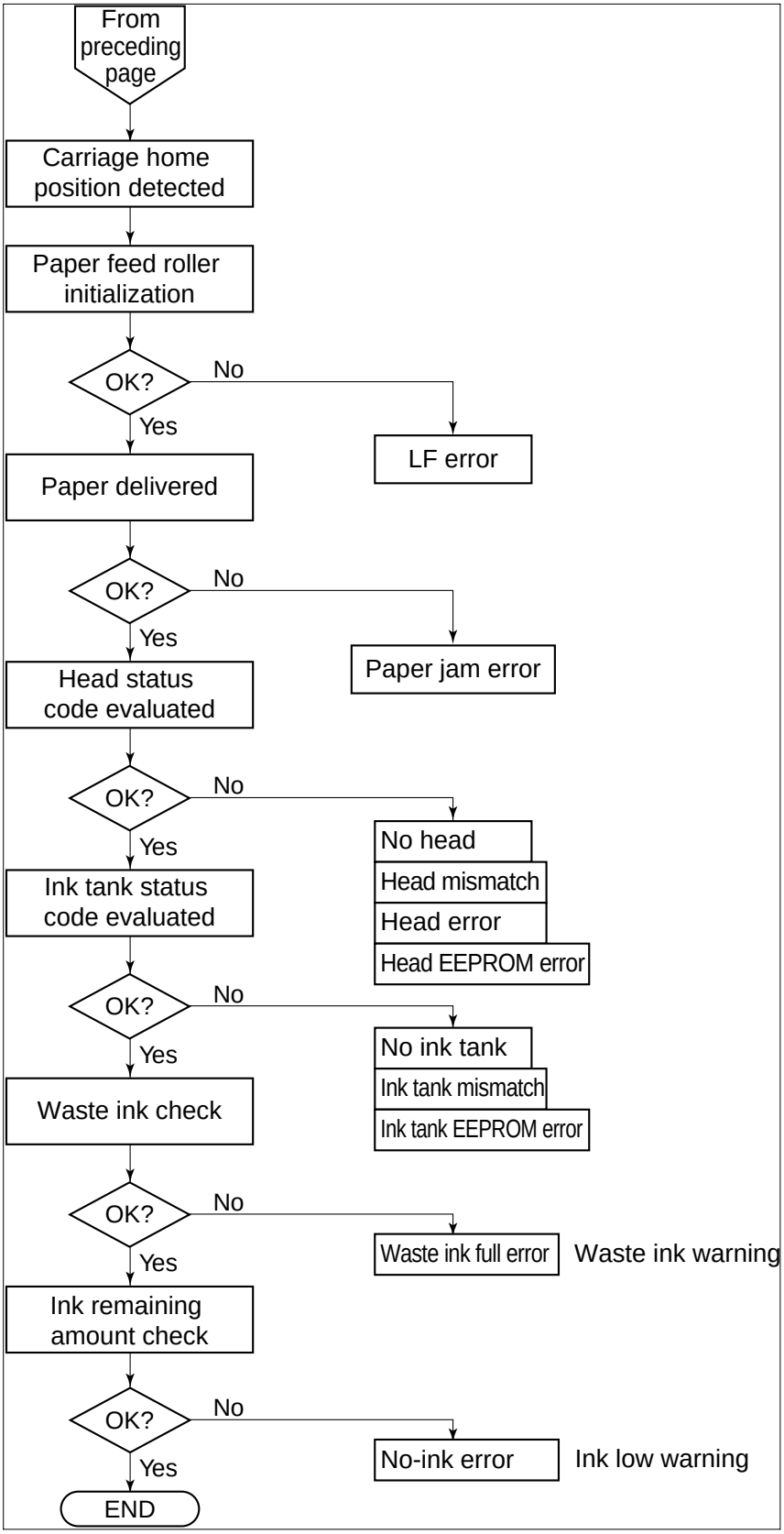
Problem	Confirmation item	Countermeasure
Printer does not operate at all.	Is the power cord properly connected? Is the I/F cable properly connected? Isn't the fuse of the power unit blown?	Check that the cables are connected properly.
Paper is not fed.	Check the paper type on the cassette. Isn't the paper jammed? Is the manual lever set properly?	Remove the jammed paper. Confirm the media height on the cassette. Lower the manual lever.
Printer does not print.	Does the ink remaining amount warning appear?	Replace the ink tank indicated on the warning display.
	Perform cleaning and check whether ink flows into the tube.	Perform cleaning operation.
	Can the test print be performed?	Confirm the carriage cable connection.
Vertical lines misalignment occurs.	Has the print head position adjustment performed?	Perform the print head position adjustment.
Image is mis-positioned.	Does the carriage move correctly?	Confirm the CR encoder contamination.

2.2 Detectable Problems When System Startup Completed

Some of the errors irresolvable by the user can be checked before the system startup is completed.




From preceding page
Head temperature detection
Offset voltage setting
Head diode sensor check
Purge unit cap open or closed?
Open
Closed
Cap open
OK?
No
Yes
Purge error 2
Carriage moved from capping position
CR encoder any change?
No
CR error
Yes
Purge unit initialization
OK?
No
Yes
Purge error 2
Pump initialization
OK?
No
Yes
Purge error 1
To next page


From preceding page
Carriage home position detected
Paper feed roller initialization
OK?
No
LF error
Yes
Paper delivered
OK?
No
Paper jam error
Yes
Head status code evaluated
OK?
No
No head
Head mismatch
Head error
Head EEPROM error
Yes
Ink tank status code evaluated
OK?
No
No ink tank
Ink tank mismatch
Ink tank EEPROM error
Yes
Waste ink check
OK?
No
Waste ink full error
Waste ink warning
Yes
Ink remaining amount check
OK?
No
No-ink error
Ink low warning
Yes
END

2.3 Troubleshooting by Phenomenon

Phenomenon	**Probable Cause / Check Items**	**Solution**
Power does not turn on. After powering ON, it immediately turns off.	1. Power supply unit 2. Control board 3. Panel board	Replace faulty parts.
Carriage does not move.	1. Carriage unit 2. Carriage encoder dirtied	Check any loose parts. (loosen carriage ribbon cable, etc.) Check for contamination. Replace faulty parts.
Printing stops midway.	1. Carriage unit 2. Control board	Replace faulty parts.
Abnormal noise	1. Foreign matter attached	Remove foreign matter.
Paper is not fed.	1. Pick-up roller is not lowered. 2. Faulty PE sensor	Lower the pick-up roller. Replace faulty parts.
Paper is picked up on the skew.	1. Confirmation of paper loading method 2. Faulty pick-up roller	 Replace the pick-up roller.
Multiple sheets are fed at a time.	1. Faulty separation sheet of the cassette	Replace the cassette.
Ink is not ejected	1. Ink tank 2. Purge unit 3. Print head 4. Carriage unit	Replace the empty ink tank. Replace the purge unit. Perform cleaning./ Replace the print head. Confirmation of the carriage ribbon cable.
A line which is not in the print data appears.	1. Whether paper jammed in the feeding system. 2. Carriage unit 3. Control board	Check any loose parts. Remove foreign matter. Replace faulty parts.
Paper is dirtied.	1. Pass through several sheets of paper.	Remove the platen dirt.
Spur marks appear.	1. Spur unit	Replace the spur unit.
Paper is not delivered.	1. Eject roller	Replace the eject roller.
Vertical lines misalignment occurs.	1. Carriage encoder 2. Print head	Replace the carriage encoder. Adjust the print position.

2.4 Printer Status Indication

The printer status is indicated on the LCD in order to show the operation status when the printer is operated correctly or to direct the user the printer operation.

LCD Indication	**Printer Status**
Ink Filling….	Filling ink during head installation / replacement and ink tank installation.
Rep. Ink Tank OK	Direct the user to replace the ink tank during ink tank replacement.
Ins. Ink Tank OK	Direct the user to install the ink tank during ink tank installation.
Ext. I/F Print	Printing extension I/F board status print
Open Cover Back Upper Cover	Direct the user to open the access cover during head installation / replacement.
Ink Draining…	Performing purging to drain ink inside the tubes during head replacement and processing for transportation.
Please Wait…	Displayed when the user is asked to wait during initialization, etc.
Job Cancel	Canceling jobs
Soft Reset	Resetting software
Remove Ink Tank	Direct the user to remove the ink tank during head replacement and processing for transportation.
Rep. P.Head OK	Able to replace the print head after entering the head replacement process.
Install P.Head	Direct the user to install the print head during head installation / replacement.
Load Media XX (ZZ)	Direct the user to load the media during manual feed. At the lower line, media size and type, which are directed from the host computer, are displayed alternately.
Remove Media	Direct the user to remove the remaining paper after the manual feeding is completed.

2.5 Troubleshooting by Error

1) Error indication when a user-recoverable error occurs

A warning message is indicated when an error occurs in which the user has to perform some operation, but does not have to interrupt the printing operation. When a number of warnings occur, a message for the last warning will be indicated.

Also, the printing operation is interrupted and the message to request for the user operation is indicated as an error message. When this message appears, the printer stops printing and moves on to the offline state. At this time, when users operate the printer as requested referring to the message, the operation can be continued after that.

LCD Indication	Cause	Solution
Y Ink Check	The amount of yellow ink becomes low.	Replace the yellow ink tank.
M Ink Check	The amount of magenta ink becomes low.	Replace the magenta ink tank.
C Ink Check	The amount of cyan ink becomes low.	Replace the cyan ink tank.
Bk Ink Check	The amount of black ink becomes low.	Replace the black ink tank.
Rep. Waste Ink	There is a possibility that the waste ink tank may become full.	Prepare for the waste ink absorber replacement that is to be done by service person.
GARO Error 0101	Due to lack of memories, data is missing.	Transmitting the next print job.
GARO Error 0201	With the image mode, the command, which is not supported by the printer, is transmitted.	Transmitting the next print job.
GARO Error 0202	No. of parameters in the image mode is incorrect.	Transmitting the next print job.
GARO Error 0203	With the image mode, the items, which cannot be omitted, are omitted.	Transmitting the next print job.
GARO Error 0204	Image mode data is out of range.	Transmitting the next print job.
GARO Error 0205	Other errors concerning the image mode.	Transmitting the next print job.
GARO Error 0301	With the set mode, the command, which is not supported by the printer, is transmitted.	Transmitting the next print job.
GARO Error 0302	No. of parameters in the set mode is incorrect.	Transmitting the next print job.
GARO Error 0303	With the set mode, the items, which cannot be omitted, are omitted.	Transmitting the next print job.
GARO Error 0304	Set mode data is out of range.	Transmitting the next print job.
GARO Error 0305	Other errors concerning the set mode.	Transmitting the next print job.
No Media YY (ZZ)	Loaded media size/type differs from what is specified. YY: Media size ZZ: Media type	Change the media to the specified one, and press the ***ONLINE*** key.
No Media: Cass.X YY (ZZ)	Media out X: Cassette no. YY: Media size ZZ: Media type	Replenish media and press the ***ONLINE*** key.
No Media: Manual YY (ZZ)	Media out Manual feed YY: Media size ZZ: Media type	Load media on the manual tray.
Cover Open Back Upper Cover	The upper cover is kept open.	Close the upper cover.
Cover Open Right Cover	The ink tank cover is kept open.	Close the ink tank cover.
Load Media YY (ZZ)	The printer is waiting for the media to be loaded on the manual tray. YY: Media size ZZ: Media type	Load the media on the manual tray and press the ***ONLINE*** key.
Remove Media	The printer is waiting for the media, placed at the manual tray, to be removed.	Remove the media placed at the manual tray, and press the ***ONLINE*** key.
Media Misfeed	Media cannot be picked up properly.	Reload the media and press the ***ONLINE*** key.
Media Jam	Media is jammed.	Remove the jammed media.
Replace Y Ink Tank	Yellow ink is out.	Replace the yellow ink tank.
Replace M Ink Tank	Magenta ink is out.	Replace the magenta ink tank.
Replace C Ink Tank	Cyan ink is out.	Replace the cyan ink tank.
Replace Bk Ink Tank	Blank ink is out.	Replace the black ink tank.

LCD Indication	Cause	Solution
No Y Ink Tank	Yellow ink tank is not installed.	Install the yellow ink tank.
No M Ink Tank	Magenta ink tank is not installed.	Install the magenta ink tank.
No C Ink Tank	Cyan ink tank is not installed.	Install the cyan ink tank.
No Bk Ink Tank	Black ink tank is not installed.	Install the black ink tank.
Y Ink Tank NG	The yellow ink tank that cannot be used in this printer is installed.	Install the yellow ink tank exclusive for the N1000/2000.
M Ink Tank NG	The magenta ink tank that cannot be used in this printer is installed.	Install the magenta ink tank exclusive for the N1000/2000.
C Ink Tank NG	The cyan ink tank that cannot be used in this printer is installed.	Install the cyan ink tank exclusive for the N1000/2000.
Bk Ink Tank NG	The black ink tank that cannot be used in this printer is installed.	Install the black ink tank exclusive for the N1000/2000.
Install P.Head Press Online Key	The print head is not installed.	Install the print head.
Printhead NG Press Online Key	The print head that cannot be used in this printer is installed, or the print head is broken.	Install the print head exclusive for the N1000/2000 or the new one.
Ext. I/F Error	The expansion I/F protocol error occurs.	Press the ***ONLINE*** key.

2) Error indication when an error not recoverable by the user occurs

A service call message is indicated when a serious problem which cannot be recovered occurs. On the upper line, the "Service Call" is displayed, and at the bottom line, the alphanumerical code is displayed.

Service Call Indication

LCD Indication	Error status	Probable cause
Service Call **E141-0022**	Purge error 2	Abnormalities in cam of purge unit
Service Call **E143-0021**	Purge error 1	Abnormalities in pump of purge unit
Service Call **E146-0050**	Waste ink absorber is filled with waste ink.	Waste ink absorber Control board
Service Call **E157-0201**	Yellow head part is broken.	Print head
Service Call **E157-0202**	Magenta head part is broken.	Print head
Service Call **E157-0203**	Cyan head part is broken.	Print head
Service Call **E157-0204**	Black head part is broken.	Print head
Service Call **E161-0101**	Head temperature of yellow ink rises abnormally.	Print head
Service Call **E161-0102**	Head temperature of magenta ink rises abnormally.	Print head
Service Call **E161-0103**	Head temperature of cyan ink rises abnormally.	Print head
Service Call **E161-0104**	Head temperature of black ink rises abnormally.	Print head
Service Call **E170-0000**	CR error	Carriage encoder Carriage motor
Service Call **E182-0010**	LF error	LF roller LF encoder
Service Call **E190-0600**	RAM error	Control board
Service Call **E196-0300**	Printer EEPROM error	Control board
Service Call **E196-0400**	Print head EEPROM error	Print head Control board
Service Call **E196-0501**	Yellow ink tank EEPROM error	Ink tank Control board
Service Call **E196-0502**	Magenta ink tank EEPROM error	Ink tank Control board
Service Call **E196-0503**	Cyan ink tank EEPROM error	Ink tank Control board
Service Call **E196-0504**	Black ink tank EEPROM error	Ink tank Control board
Service Call **E196-0700**	ROM error	Control board
Service Call **E739-0801**	Extension I/F error 1 Failure in extension I/F initial sequence	Confirmation of network Control board NIC board
Service Call **E741-0802**	Extension I/F error 2 Extension I/F hardware error	NIC board Control board
Service Call **E850-0030**	Ink tank cover does not open.	Coming off of unlock shaft Tank cover sensor
Service Call **E999-0900**	Other hardware errors	Control board CR encoder contamination

3. DISASSEMBLY AND REASSEMBLY

3.1 Cautions for Disassembly and Reassembly

3.1.1 Cautions for ink stains

When replacing the waste ink absorber located at the bottom case of the printer, do not place the upper printer unit directly on the desk or the floor. There is a possibility that ink comes out of the purge unit, resulting in the ink stain on the desk or the floor. Be sure to place a sheet on the desk or the floor before work. Also, some parts inside the printer may be stained by ink mist. (Around platen, purge unit and paper delivery cover)

3.1.2 Damage by static electricity

Dry air or rubbing of clothing may cause a build up of static electricity on the human body. Static electricity may destroy electrical components or alter the electrical characteristics of components. Take extra care when handling the control board.

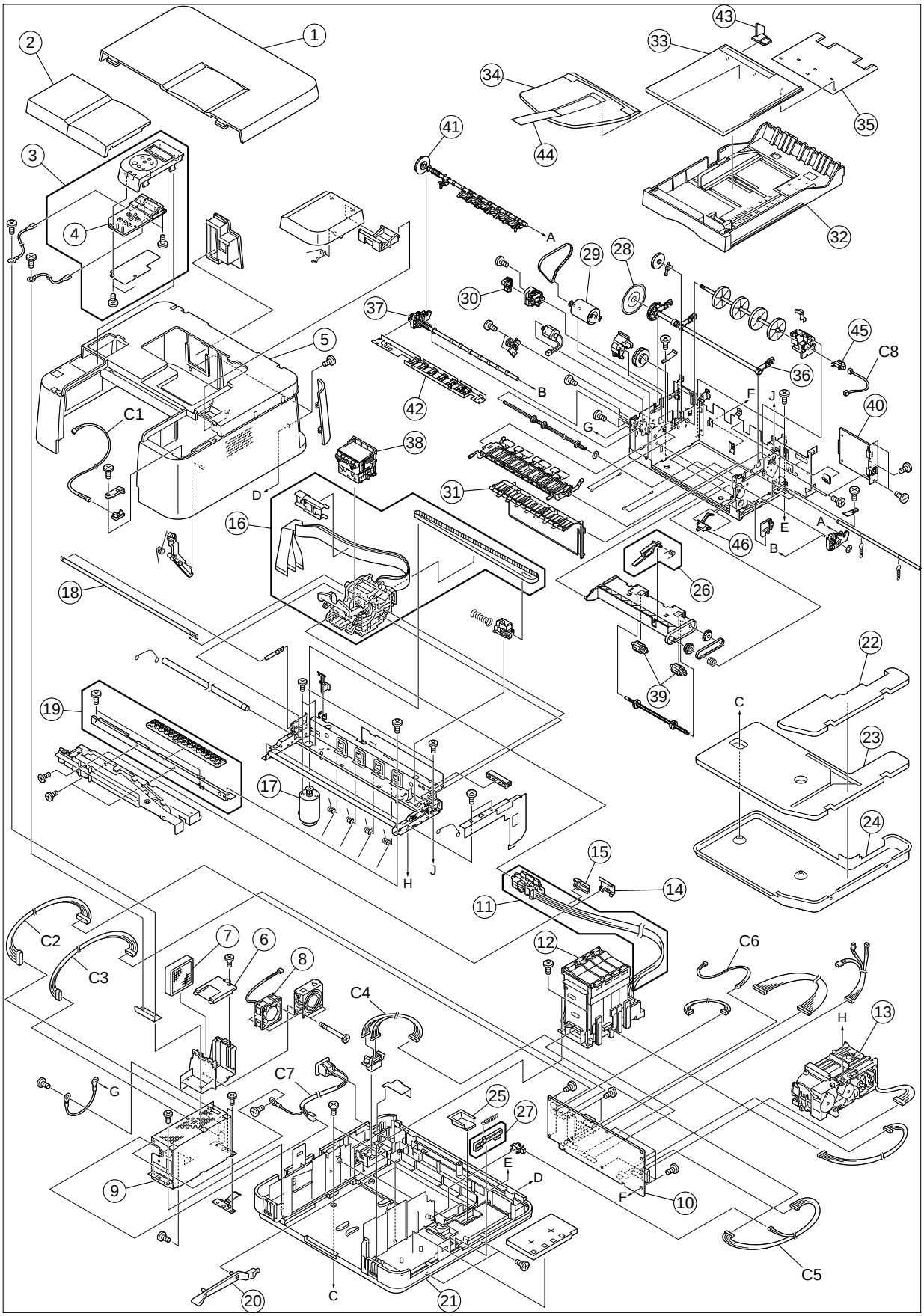
3.1.3 Deformation of spur tips

Be careful not to deform the spur tips. As for service parts, the spur unit is supplied with a metal support attached. When replacing the parts, don't forget to remove the metal support.

3.1.4 Ink drain

Ink must be drained before disassembling or transporting the printer.
Make the printer offline and press the ***setup*** key. From the utility menu, select "Move Printer" and perform ink drain according to the LCD display. Also, remove ink tanks.

3.2 Exploded View



N1000 Main parts list

KEY No.	PART No.	Q'ty	Description	Remarks
1	QM2-0052-000	1	ACCESS COVER UNIT(A4)	
2	QM2-0053-000	1	PAPER EJECT COVER UNIT	
3	QM2-0227-000	1	OP PANEL COVER UNIT(E)	
4	QM2-0008-000	1	PANEL UNIT	
5	QM2-0065-000	1	MAIN COVER UNIT(A4)	
6	QC1-0021-000	1	FAN COVER	
7	QC1-0840-000	1	FILTER	
8	QH4-4361-000	1	FAN MOTOR	
9	QH3-3482-000	1	POWER SUPPLY UNIT 120V	
	QH3-3483-000	1	POWER SUPPLY UNIT 230V	
10	QG2-3279-000	1	CONTROL BOARD UNIT	
11	QM2-0071-000	1	JOINT BASE UNIT(A4)	
12	QM2-0011-000	1	TANK BASE UNIT	
13	QM2-0025-000	1	PURGE UNIT	
14	QC1-0693-000	1	TUBE CRAMP	
15	QC1-0694-000	1	RUBBER, TUBE CRAMP	
16	QM2-0047-000	1	CARRIAGE UNIT(A4)	
17	QH4-4359-000	1	CR MOTOR	
18	QC1-0176-000	1	CR ENCODER FILM(A4)	
19	QM2-0060-000	1	SPUR UNIT	
20	QC1-0047-000	1	LEVER, MANUAL FEED	
21	QL2-0037-000	1	BOTTOM CASE ASS'Y	
22	QC1-0172-000	1	INK ABSORBER SHEET1(A4)	
23	QC1-0173-000	1	INK ABSORBER SHEET2(A4)	
24	QC1-0174-000	1	INK ABSORBER TRAY(A4)	
25	QC1-0332-000	1	TRAY, WASTE INK	
26	QC1-0350-000	1	LEVER, ROLL UP CHECK	
27	QC1-0052-000	1	SHAFT, UNLOCK	
28	QC1-0087-000	1	LF ENCODER FILM	
29	QH4-4360-000	1	LF MOTOR	
30	QG2-3265-000	1	LF ENCODER BOARD UNIT	
31	QM2-0063-000	1	PINCH ROLLER UNIT(A4)	
32	QM2-0051-000	1	CASSETTE CASE UNIT	
33	QL2-0043-000	1	COVER, CASSETTE(A4)	
34	QC1-0204-000	1	TRAY, PAPER EJECT1	
35	QC1-0027-000	1	SHEET, MANUAL FEED	
36	QL2-0035-000	1	LF ROLLER Ass'y	
37	QL2-0044-000	1	EJECT ROLLER B Ass'y(A4)	
38	QY6-1000-000	1	PRINT HEAD	
39	QM2-0024-000	2	PICK-UP ROLLER UNIT	
40	NPN	1	NIC BOARD UNIT	7029A008AA
41	QL2-0036-000	1	EJECT ROLLER Ass'y(A4)	
42	QM2-0075-000	1	SPUR B UNIT(A4)	
43	QC1-0349-000	1	GUIDE, MANUAL FEED	
44	QC1-0713-000	1	TRAY, PAPER EJECT2	
45	WG8-5362-000	1	PAPER SENSOR	
46	QC1-0121-000	1	LEVER, CASSETTE PE	
C1	QG2-3284-000	1	CABLES, TANK COVER SWITCH	
C2	QH2-2523-000	1	CABLE, POWER IN	
C3	QH2-2524-000	1	CABLE, POWER CONTROL	
C4	QH2-2526-000	1	CABLE, CASSETTE	
C5	QH2-2527-000	1	CABLE, PAPER SENSOR	
C6	QH2-2529-000	1	CABLE, LF MOTOR	
C7	QH2-2536-000	1	CABLE, POWER OUT	
C8	QH2-2565-000	1	CABLE, PE SENSOR	

N2000 Main parts list

KEY No.	PART No.	Q'ty	Description	Remarks
1	QM2-0004-000	1	ACCESS COVER UNIT	
2	QM2-0005-000	1	PAPER EJECT COVER UNIT(A3)	
3	QM2-0036-000	1	OP PANEL UNIT(E)	
4	QM2-0008-000	1	PANEL UNIT	
5	QM2-0003-000	1	MAIN COVER UNIT	A3
6	QC1-0021-000	1	FAN COVER	
7	QC1-0840-000	1	FILTER	
8	QH4-4361-000	1	FAN MOTOR	
9	QH3-3482-000	1	POWER SUPPLY UNIT 120V	
	QH3-3483-000	1	POWER SUPPLY UNIT 230V	
10	QG2-3263-000	1	CONTROL BOARD UNIT	
11	QM2-0012-000	1	JOINT BASE UNIT	
12	QM2-0011-000	1	TANK BASE UNIT	
13	QM2-0025-000	1	PURGE UNIT	
14	QC1-0693-000	1	TUBE, CRAMP	
15	QC1-0694-000	1	RUBBER, TUBE CRAMP	
16	QM2-0048-000	1	CARRIAGE UNIT(A3)	
17	QH4-4359-000	1	CR MOTOR	
18	QC1-0088-000	1	CR ENCODER FILM(A3)	
19	QM2-0018-000	1	SPUR UNIT(A3)	
20	QC1-0047-000	1	LEVER, MANUAL FEED	
21	QL2-0004-000	1	BOTTOM CASE ASS'Y(A3)	
22	QC1-0048-000	1	INK ABSORBER SHEET_	
23	QC1-0049-000	1	INK ABSORBER SHEET_	
	QC1-0050-000	1	INK ABSORBER SHEET3	
24	QC1-0051-000	1	INK ABSORBER TRAY(A3)	
25	QC1-0332-000	1	TRAY, WASTE INK	
26	QC1-0795-000	1	LEVER, ROLL UP CHECK2	
27	QC1-0052-000	1	SHAFT, UNLOCK	
28	QC1-0087-000	1	LF ENCODER FILM	
29	QH4-4360-000	1	LF MOTOR	
30	QG2-3265-000	1	LF ENCODER PWB UNIT	
31	QM2-0022-000	1	PINCH ROLLER UNIT(A3)	
32	QM2-0002-000	1	CASSETTE CASE UNIT(A3)	
33	QC1-0028-000	1	CASSETTE COVER(A3)	
34	QC1-0764-000	1	TRAY, PAPER EJECT(A3)	
35	QC1-0027-000	1	SHEET, MANUAL FEED	
36	QL2-0011-000	1	LF ROLLER ASS'Y(A3)	
37	QL2-0025-000	1	EJECT ROLLER B ASS'Y(A3)	
38	QY6-1000-000	1	PRINT HEAD	
39	QM2-0024-000	2	PICK-UP ROLLER UNIT	
40	NPN	1	NIC BOARD UNIT	7029A008AA
41	QL2-0024-000	1	EJECT ROLLER ASS'Y(A3)	
42	QM2-0038-000	1	SPUR UNIT B(A3)	
43	QC1-0349-000	1	GUIDE, MANUAL FEED	
44				
45	WG8-5362-000	1	PAPER SENSOR	
46	QC1-0121-000	1	LEVER, CASSETTE PE	
C1	QG2-3284-000	1	CABLES, TANK COVER SWITCH	
C2	QH2-2506-000	1	CABLE, POWER IN(A3)	
C3	QH2-2507-000	1	CABLE, POWER CONTROL(A3)	
C4	QH2-2510-000	1	CABLE UNIT, CASSETTE	
C5	QH2-2512-000	1	CABLE UNIT, SENSOR	
C6	QH2-2519-000	1	CABLE, LF MOTOR(A3)	
C7	QH2-2536-000	1	CABLE, POWER OUT	
C8	QH2-2565-000	1	CABLE, PE SENSOR	

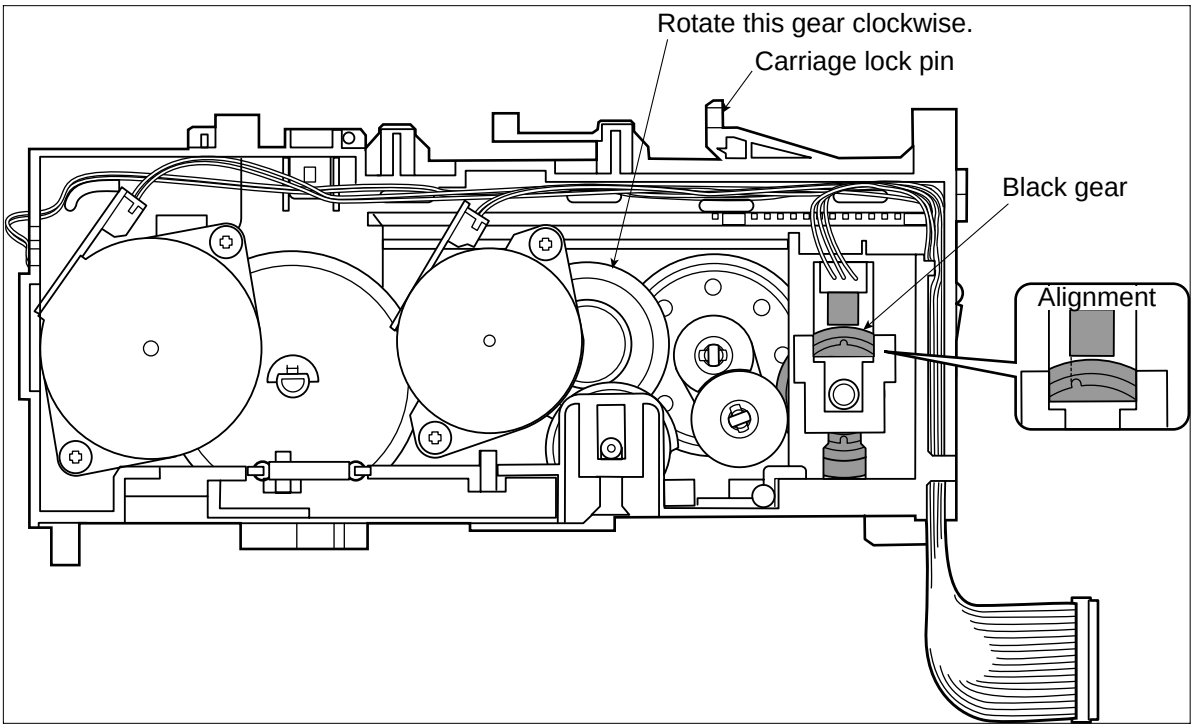
3.3 Disassembly and Reassembly

Supplemental information and cautions for disassembling and reassembling the printer are stated below.
As for the disassembly procedure, refer to the Parts Catalog.

3.3.1 Carriage lock release

Normally, as for the printer in which the power is turned off correctly with the head installed on the carriage, its carriage is locked at the home position.
When the power is turned on correctly, the carriage lock is normally released at power on. However, if the printer does not operate properly, release the carriage lock manually.

Method:
With the upper cover removed, when the purge unit gear is rotated clockwise manually from the right side, the locking pin goes down.



3.3.2 Installing and removing the purge unit

When removing the purge unit, rotate the gear inside the purge unit clockwise and lower the carriage lock pin. Align the phase of the black pump gear so that the cap part and pre-ejection opening will rise.
Unhook the lock spring of the ink tank replacing cover and return the lock to the front position. Disconnect the connector from the control board, and pull out the purge unit by pressing down the printer chassis claw placing at the front. When removing the purge unit, be careful for the ink stain as ink is attached around the tubes coming out from the bottom or at the bottom surface.

3.3.3 Removing and installing tap screws

This printer uses tap screws to fasten the external cover and printer unit. As the removed tap screws have residue from the mold in which the internal thread was made, the residue may crush the screw threads when screws are reused without cleaning. Therefore, clean off the residue from tap screws before reusing them, or use a new tap screw.

3.3.4 Installing and removing the carriage encoder film

The carriage encoder film is fixed in place by the leaf spring. When installing or removing the carriage encoder film, be careful not to distort the leaf spring.

3.3.5 Handling the encoder film

Be careful not to contaminate or get any grease on the encoder film (carriage/LF). If grease gets on the encoder film, the film's slit will not be read correctly, resulting in error. If grease gets on the film, use alcohol to wipe it off completely.
Also, do not fold or scratch the encoder film.

3.3.6 Installing and removing the carriage unit

When removing the carriage unit, remove 3 carriage ribbon cables and the carriage belt. The carriage belt is hung on the idle pulley and the carriage motor. If the idle pulley is pressed inward, the belt will come off. When installing the carriage belt, press the idle pulley inward and hang it to the motor and the pulley. It is not necessary to adjust the tension.

3.3.7 Removal of red screws prohibited

As it is quite difficult to adjust red screws of the print unit in the field, they must not be loosened or removed.

3.3.8 Installing and removing the ink supply unit

When removing the ink supply unit, ink tanks have to be removed first. Also, detach the ink supply tubes from the carriage joint part. As the ink absorber is placed underneath the ink supply tank and ink might be attached there, when it is put down, avoid contamination by placing sheet underneath.

3.3.9 Installing and removing the carriage motor

When replacing the carriage motor, remove the carriage belt and pull out the motor from the top by rotating it.

3.3.10 Installing and removing the print head

The print head has to be installed or removed at the certain position.
Replace the head at the position where the joint part of ink tubes can be pulled forward. When removing the head in use, ink drain must be performed first. It is necessary to drain ink inside the tubes and the head. Also, even if ink is drained, a little amount of ink may remain inside the head. Be careful for ink leakage when carrying the print head.

3.4 Adjustments and Settings After Disassembly and Reassembly

3.4.1 Adjustments and setting list

Positions for necessary adjustment or resetting have been described below after a service personnel disassembles or reassembles the printer parts.

Replacement parts	Adjustment / settings	Mode
Print head	Print adjustment	User mode
Control board	EEPROM initialization Waste ink absorber counter clear Destination setting	Service mode
NIC board	IP address settings	User mode
Waste ink absorber	EEPROM waste ink counter clear (Control board)	Service mode
Carriage unit	Print adjustment	User mode

3.4.2 Print Adjustment

1) When the printer is ON, make it offline and press the ***set up*** key.

2) When "Ext. Features" is displayed, press _ key to select "Adjust Printer", and then display "Adjust Printhead".

3) When "Adjust Printhead / Print Pattern →" is displayed, press _ key.

4) Print adjustment pattern.

5) After printing is completed, press _ key until "Adjust Printhead / Adj. Setting A →" appears on the display.

6) When the above appears, if _ key is pressed, the current adjustment value is displayed. From the printed adjustment pattern, select the optimal value and press _ key to execute.

7) As for other settings B, C and D, return to 5) and press _ key to select the setting and _ key to execute. Press _ key to select the optimal value and _ key to execute.

8) Next, adjust the band process which is used during one pass printing.

9) Display "Band Adjust / Print Pattern" and press _ key.

10) After band adjustment pattern printing is completed, display "Band Adjust / Adj. Setting G →" and press _ key. The current adjustment value will be displayed.

11) From the printed adjustment pattern, set the optimal value by pressing _ key, and press _ key to execute.

3.4.3 Control board's EEPROM initialization / destination settings

1) Press the ***power*** key while holding down the ***set up*** key and ***online*** key.

2) Select "EEPROM init." with _ key and execute with _ key.
   Reset the EEPROM information to factory shipment settings.
   However, the following items will not be initialized:
   - USB Serial no.
   - Destination setting
   - LF correction value

3) When changing the destination settings, select "Set Destination" with _ key and execute with _ key.
   As the setting is displayed, select "Japan" for Japan, "Overseas" for overseas and "Overseas US" for the US models. Press _ key to execute.

4) After initializing the EEPROM, press the ***power*** key to power off the printer.

3.4.4 Clear the control board's EEPROM waste ink counter

1) Press the ***power*** key while holding down the ***set up*** key and ***online*** key.
   This will enter the service mode.

2) Select "Init Waste Ink" with _ key and execute with _ key.

3) After clearing the waste ink counter, press the ***power*** key to power off the printer.

3.4.5 NIC board's IP address settings

1) Make the printer offline and press the ***set up*** key to enter the set up menu.
2) When "Setup Menu / Ext. Features" is displayed, select "Set Interface" with _ key and execute with _ key.
3) Select "Ext. Network" with _ key and execute with _ key.
4) Select "Set TCP/IP" with _ key and enter the menu that is to set the frame type, IP mode, protocol and address.
5) For "Frame Type", select "Disable" or "Ethernet II" with _ key and execute with _ key.
6) For "IP Mode", select "Automatic" or "Manual" with _ key and execute with _ key.
7) Only when "Automatic" is selected for "IP Mode", it is necessary to set "Protocol".
   7-1) Select "ON" or "OFF" for "DHCP" with _ key and execute with _ key.
   7-2) Select "ON" or "OFF" for "BOOTP" with _ key and execute with _ key.
   7-3) Select "ON" or "OFF" for "RARP" with _ key and execute with _ key.
8) When "Manual" is selected for "IP Mode", it is necessary to set each of IP address, subnet mask and gateway address.
   8-1) Select "IP Setting".
   As "IP Setting / IP Address _" will appear, execute with _ key.
   8-2) Current IP address setting values will appear.
   For example, IP Address
   =192.168.0.215
   8-3) When _ key is pressed, the under bar will move to the right, and when < key is pressed, it moves to the left.
   With _ key, determine which under bar part to input, and select the values with _ key or _ key. Confirm the selected value with _ key.
   8-4) Execute the remaining two settings similarly.
9) To register set values in the NIC board, press _ key when "Ext. Network / Regis. Settings _" appears.
10) When "Regis. Settings / Execute?" appears, press _ key and set values are registered in the NIC board.
11) When the printer receives setting registration completion notice from the NIC board, "Regis. Settings / Registered!" appears on the display.

4. OPERATION CHECK AFTER DISASSEMBLY AND REASSEMBLY

4.1 Check Procedure

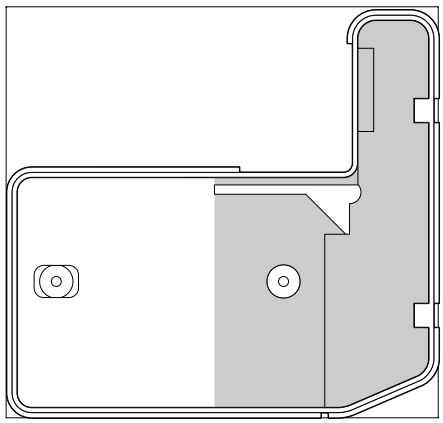
1) Check visually for any grease or foreign matter dirtying the internal parts. Especially, if there is any grease on the encoder film or foreign matter on the spurs, wipe them clean with alcohol.
2) Test print by the printer
   At service mode, shipment inspection print pattern and EEPROM information print can be printed. Check whether EEPROM setting values are correctly set and print adjustment values of the print head are set properly.

4.2 Cautions when Replacing the Control Board

It is necessary to confirm the following when replacing the control board.

Confirmation items	Method
EEPROM information before replacing the control board	Execute ”EEPROM PRINT” from the Service Mode.
Absorption amount of waste ink	Refer to the Waste Ink Accumulated amount of “EEPROM PRINT”. Visually check the absorption amount of waste ink. (Refer to the following figure.)

The waste ink absorber also has to be replaced when the total absorption amount of waste ink (black + color) becomes more than 700,000 (mg), or the ink is soaked up like the figure below when checked visually. At that time, it is necessary to perform the EEPROM initial setting with a new control board.



Waste ink absorber

5. TRANSPORTING THE PRINTER

5.1 Preparation before Transportation (place in the carton)

1) Drain ink inside the printer. (From the utility menu, execute “Move Printer”.)
2) Move the carriage to the home position. (Only ink tanks shall be removed while the print head remains on.)
3) Turn off the printer.

5.2 Moving the Printer

Move the printer after placing it levelly on the pallet. If inclined, there is a fear that ink may leak. Turn off the printer before moving it.

6. PARTS REPLACEMENT, PERIODIC INSPECTIONS & TOOL

6.1 Parts Replacement

Level	Periodic Replacement Parts
User	None
Serviceperson	None

6.2 Periodic Inspections

Level	Periodic Inspections
User	None
Service Person	None

6.3 Tool List

Ordinary Tools	Remarks
Phillips screwdriver	
Blade screwdriver	
Tweezers	
LF tension spring (QU1-2026)	Necessary when the belt is looped over the LF roller.
CR Holder (QZ4-0474)	Necessary for transportation
Plate, Pick-up Roller Holder (QZ4-0443)	Necessary for transportation

7. SERVICE MODE

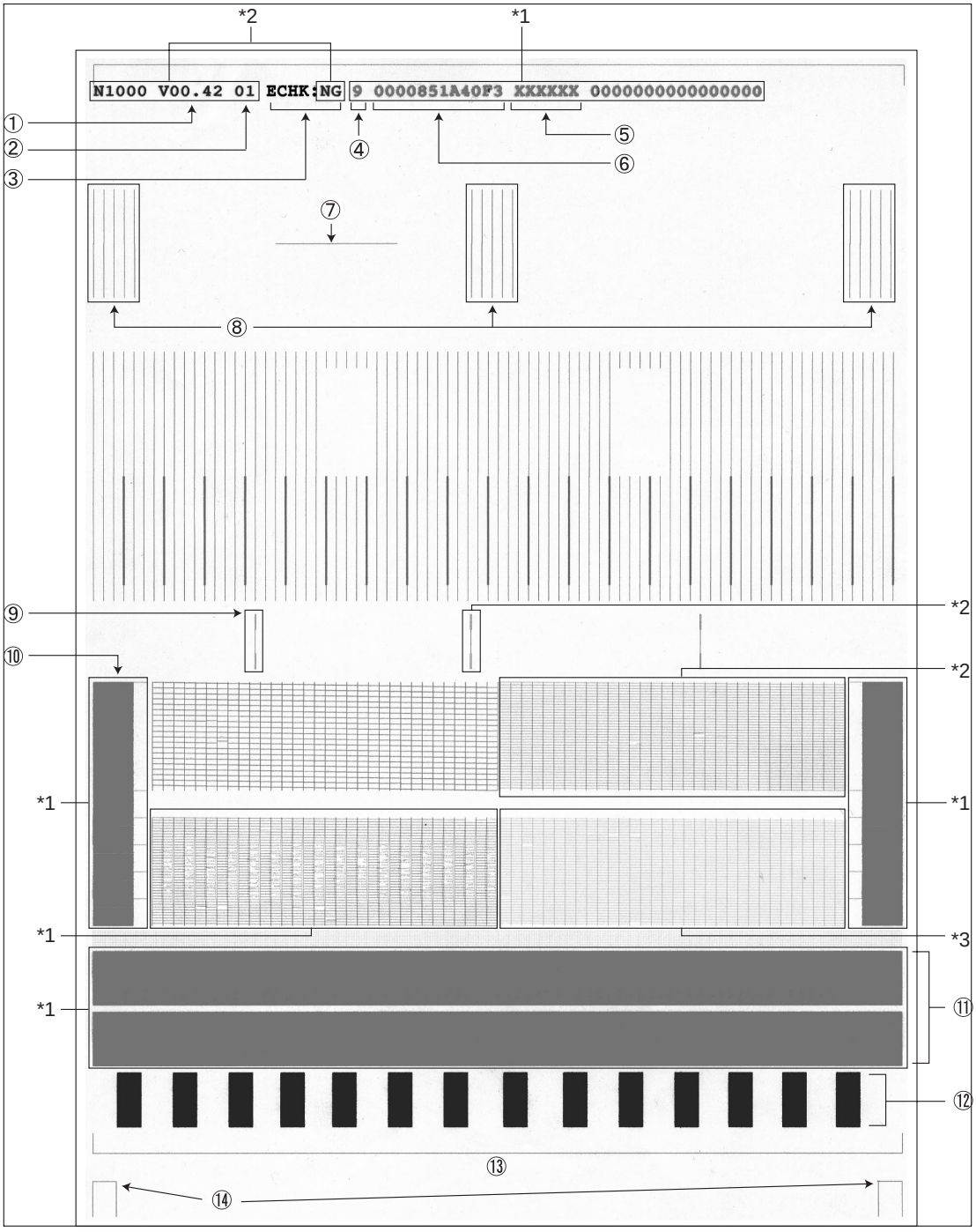
7.1 How to Enter the Service Mode

Press the ***power*** key while holding down the ***SET UP*** key and ***ONLINE*** key.

Service mode item list

Function	Operation method
Shipment pattern printing	***SET UP*** key + ***ONLINE*** key + ***POWER*** key When "Factory Test" is displayed, execute with ∨ key.
EEPROM information printing	With the Service Mode, select "EEPROM Print" with > key and execute with ∨ key.
Printer EEPROM initialization	With the Service Mode, select "EEPROM Init." with > key and execute with ∨ key.
Waste ink counter clear	With the Service Mode, select "Init Waste Ink" with > key and execute with ∨ key.
Destination settings	With the Service Mode, select "Set Destination" with > key and set value with > key, and execute with ∨ key.
Head replacement	With the Service Mode, select "Replace Head" with > key and execute with ∨ key.

7.2 Shipment Inspection Pattern



Note:
*1: Cyan *2: Magenta *3: Yellow Others with no mark: Black

1. ROM version 2. Destination 3. Electric check flag 4. LF roller correction data
5. USB Serial no. 6. Mac address 7. Printing of LF roller correction result
8. Confirmation of vertical line misalignment amount
9. Confirmation of registration adjustment 10. LF pattern 11. Uneven printing check
12. Spur mark check 13. Magnification/parallel accuracy checks 14. Trailing edge margin check

7.3 EEPROM Information Print Pattern

```
Canon   EEPROM Information Print   Office Color N1000


ROM Information
   Product Version :XX.XX


Main EEPROM Information
  *Destination Settings :1(JP) (Destination information)
   Pages Fed                                  Bi-direction (Bi-directional registration correction value)
      Cassette1 :504                              Bk    :0
      Cassette2 :27                               Color :0
      Cassette3 :7
   Even/Odd Registration (Even/odd registration  Ink Tank Installations (No. of replacements of
      Black        :0      set value by head)        Black        :38   each ink tank)*1
      Cyan         :0                                 Cyan         :37
      Magenta      :0                                 Magenta      :24
      Yellow       :0                                 Yellow       :29
   Horizontal Registration    :0   (Registration set value between black and colors)
   Alignment Correction       :-1  (Alignment correction value)
  *Line Feed Correction Value :4   (Line feed correction value)
   Print Head Replacements    :2   (No. of head replacements)*2
   Total Cleanings
      Cleaning A :10
      Cleaning B :1
      Cleaning C :13
   Waste Ink Accumulated(Units:mg)
      Bk    :47295
      Color :119038
   Wipings         :180                       Ink Suctions :142
   Factory Area    :00H  00H  00H


Head EEPROM Information
   Print Head Lot Number    :001B01A0
   Print Head Serial Number :876
   Pulse Number                               Print Head Correction Data
      Black        :7dH                           Black        :0
      Cyan         :2dH                           Cyan         :0
      Magenta      :2eH                           Magenta      :0
      Yellow       :2dH                           Yellow       :0
   Dot Count
      Black        :34597
      Cyan         :167718
      Magenta      :71847
      Yellow       :154675


                                                          (No. of ink tank placements currently
Ink Tank EEPROM Information                               installed)
   Manufacturer                               Installations
      Black        :CANON INC.                    Black        :11
      Cyan         :CANON INC.                    Cyan         :9
      Magenta      :CANON INC.                    Magenta      :9
      Yellow       :CANON INC.                    Yellow       :12
   Ink Initial Level(Units:mg) (Ink tank initial Dot Count(Units:mg)
      Black        :138500      weight)           Black        :27126
      Cyan         : 85000                        Cyan         :14816
      Magenta      : 86000                        Magenta      :26726
      Yellow       : 82000                        Yellow       :24139
```

These values don't become the guidelines of ink remaining amount.
It is used as a work area within the EEPROM.

The items with *mark above will not change even when EEPROM Init is executed.
(The above values are the sample values.)

*1: The number is counted up when the ink tank different from the previous one is installed.
*2: The number is counted up when the head different from the previous one is installed.

7.4 Firmware Updating Function

By downloading the firmware program from the IEEE1284 (Compatible mode), the FlashROM data can be updated.

7.4.1 How to update the Flash ROM

1) Set the printer interface setting to "Set Centronics". Select "ECP" or "Nibble" mode and power off the printer.
2) Connect the computer and the printer with a Centronics cable.
3) Press the Power key while holding down the ***Utility*** key + ***Setup*** key + ***Reset*** key. "Firmware Update" appears on the LCD. This is the standby status of the FlashROM rewrite mode.
4) With the MS-DOS mode of the computer, write the updating program file into the printer Flash ROM using the copy command.

   >COPY File name prn ↵
   Then, press the return key.
5) When writing is completed, "Flashed" is displayed on the LCD and the online LED lights up. Then power off the printer. When the printer is powered on again, printer starts to operate with the updated program.

7.4.2 Cautions during the update

When the power of the printer and the computer is turned off during the updating process, the correct completion of the updating process and the correct operation of the printer cannot be assured. Also, when an error occurs during the updating process due to some failure, the correct operation of the printer cannot be assured.

7.4.3 Errors during the download process

The following are the errors that occur only during the updating process. These are displayed on the printer LCD. If these errors occur, it can be assumed that the problem may lie in the Flash ROM or the computer.

Printer LCD display	Error contents	Action
Error D0	Unable to shift to the download mode.	Replace the control board.
Error D1 Time Up	Program transfer timeout error occurs.	Confirm the host computer or the Centronics cable.
Error D2 Erasing Error	Unable to erase the Flash ROM data.	Replace the control board.
Error D3 Erasing Error	Unable to write in the Flash ROM.	Replace the control board.
Error D4 Verifying Error	Flash ROM verifying error occurs. Written data and original data sent-in do not agree.	Replace the control board.
Error D5 Illegal Data	The format data that cannot be used in this printer exists.	Replace the control board.
Error D6 Wrong ID	The model information at the start of downloading is found to be different from the actual printer.	Confirm the updating program.
Error D7 F/M Mismatched	The device ID of the Flash ROM is invalid or becomes write inhibit.	Replace the control board.

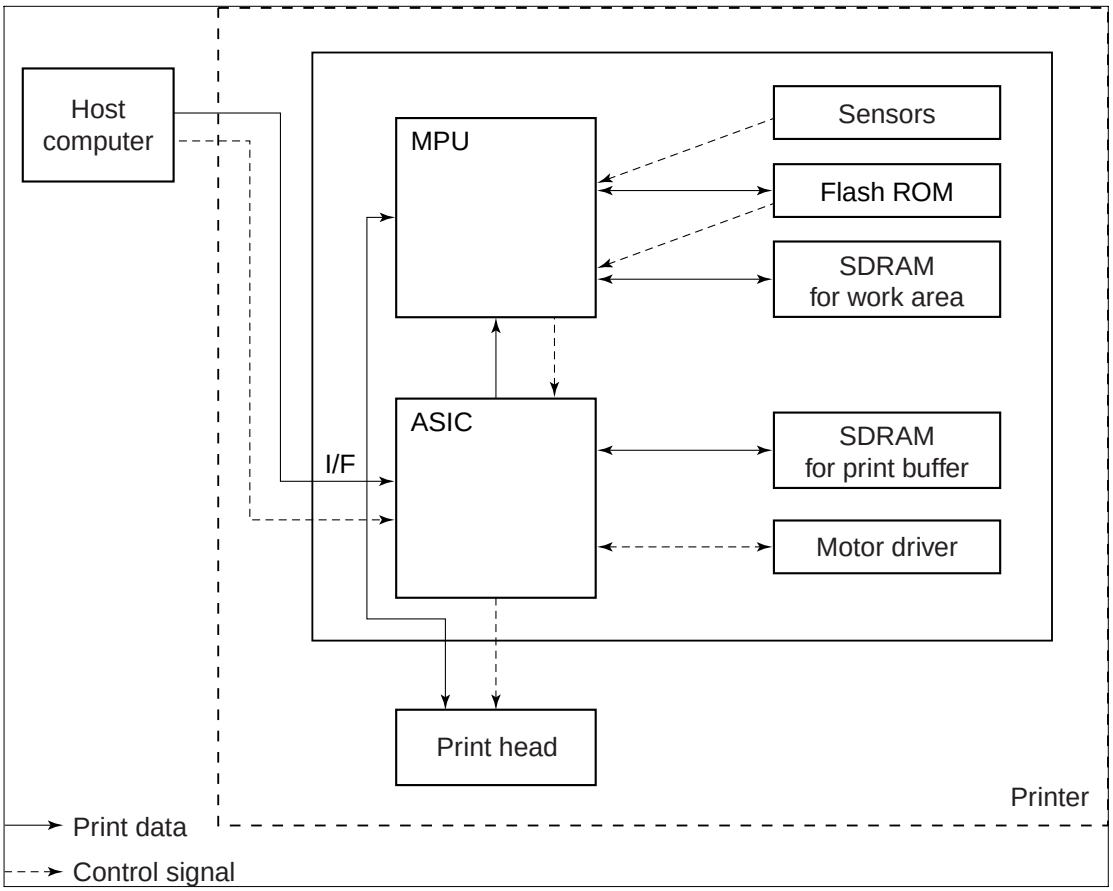
Printer LCD display	Error contents	Action
Firmware Update Check Sum Error	Checksum error occurs in the format record.	Confirm the updating program.
Firmware Update Error in Format	Abnormalities in the length of format record.	Confirm the updating program.
Firmware Update Illegal Data	Illegal record was received.	Confirm the updating program.
Firmware Update Handling Error	Failure in reading download data.	Confirm the updating program.

Part 3

TECHNICAL REFERENCE

1. PRINTER CONTROL SECTION

1.1 Printing Data and Control Signal Flow



Data on the computer which is created in the printer driver is divided into the control command and the print data in the printer ASIC. The control command is sent to printer control ROM and each sensor from ASIC through MPU. According to the program in the control ROM (Flash ROM), the signal which controls the motor or head is output from the ASIC.

1.2 Printing Drive Control

In this printer, the nozzles to be heated are divided into blocks, and dispersion driving is performed. The black part is divided into 12 blocks and color part into 24 blocks, and each block is divided into Odd/Even.
To perform dispersion driving, the order of the driving block is designated in the printer.
The heat pulse sets the pass, double or single, by PWM driving. According to the temperature parameter, the pulse width is modulated.
To control the ink ejection amount, the printer reads in the head characteristic data (such as head ID driving pulse no. and Di sensor correction value) written in the print head.
Ultimately, with the combination of the Heat Enable signal, whether to heat the nozzles or not is decided.

1.3 Control during printing

The print data received from the computer is expanded inside the printer, and is converted to data that matches the print mode. During data conversion, the dot in the received data is reduced to prevent the print speed from deteriorating even when the printing is performed using the print mode with large no. of passes.
There are several ways to reduce dots; every column, and random mask pattern or fixed mask pattern for each of black and colors. This processing is performed by selecting the print mode.
The print modes prepared at the printer driver side and the printer side are shown below.

Print mode List

Driver description / **Paper Type**	**Quality**		
	Draft	**Standard**	**High (quality)**
Plain paper	300 x 300_dpi_ 1-pass bi-directional	600 x 600 1- or 2-pass uni-directional	600 x 600 4-pass bi-directional
Postcard		600 x 600 4-pass uni-directional	600 x 600 8-pass bi-directional
High quality paper		600 x 600 4-pass uni-directional	600 x 600 8-pass bi-directional
Glossy paper		600 x 600 6-pass bi-directional	600 x 600 8-pass bi-directional
Transparency film		600 x 600 4-pass bi-directional	600 x 600 8-pass bi-directional
Postcard for ink jet		600 x 600 4-pass uni-directional	600 x 600 8-pass bi-directional

1.4 Detection Functions

1.4.1 Detection by sensors

The following sensors detect the printer's condition.

1) Tank cover sensor	Open/close of the ink tank cover
2) Cover sensor	Open/close of the upper cover
3) Paper-end sensor	Presence of paper
4) Carriage encoder	Carriage position
5) LF encoder	Rotation position of LF shaft
6) Head temperature sensor	Head temperature

1.4.2 Detection by others

The following items are detected other than by sensors.

1) Presence of head	It is detected by checking whether the EEPROM information on the head PCB can be read-out or not.
2) Presence of ink tank	It is detected by checking whether the EEPROM information on the ink tank can be read-out or not.
3) Waste ink amount	It is detected by storing the dot count value in the main EEPROM and checking whether the waste ink absorber capacity has exceeded or not.
4) Ink remaining amount	It is detected by checking whether the ink capacity has exceeded or not when counted by both Pin electrode method*1 and dot counter. If the ink amount become less and does not contact the pins, remaining ink amount will be detected only by the dot counter.

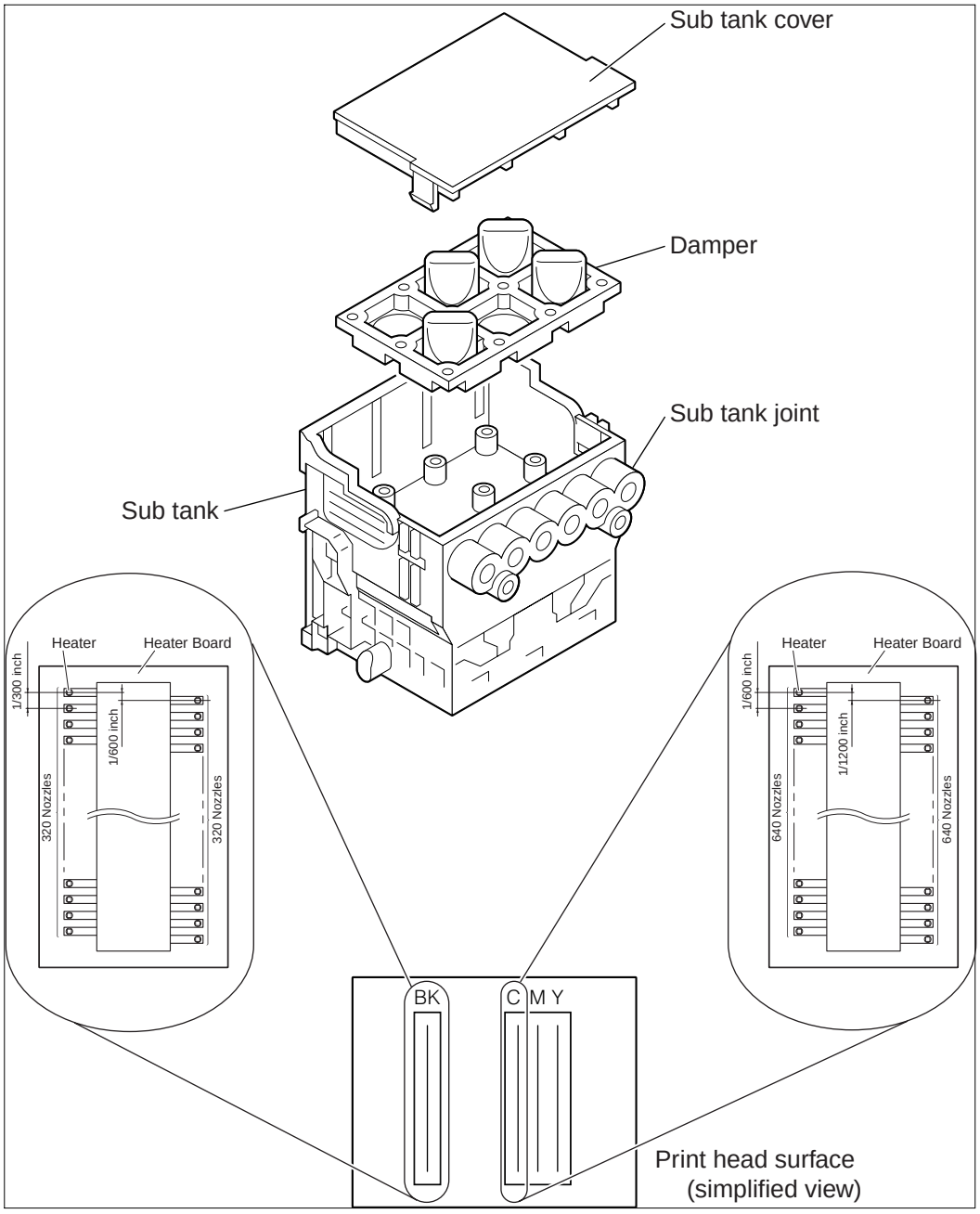
*1: Pin electrode method
By measuring the voltage that is necessary to pass the constant current to 2 pins inserted inside the ink tank, the presence of ink can be distinguished.

5) Media size	It is detected by aligning the end guide in the cassette to the applicable media position. Detectable media sizes are A4/A3/B4/Letter/Ledger/A3+. Note: Only N2000 has this function.

2. PRINT HEAD

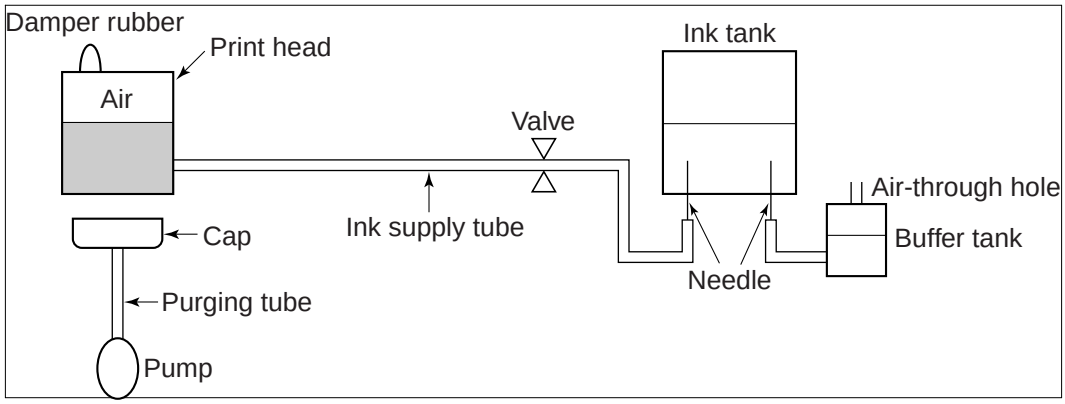
Each nozzle of Black, Cyan, Magenta and Yellow are divided to 2-nozzle array (odd/even). Nozzles of two lines are alternatively arranged and it is shifted by 600dpi for black and 1200dpi for color. Thus, if two lines of nozzles are printed with one pass, it realizes the resolution of 600dpi for black and 1200dpi for color. By making the nozzle length one inch, and extending the printing width for one pass, it is possible to accelerate the printing speed.

The structure of the head is illustrated below. Ink is put in the sub-ink tank, and the sub ink tank is divided into ink layer and air layer from the bottom. Then the air bubbles generated when ink is ejected will go out through the damper.



3. INK SUPPLY

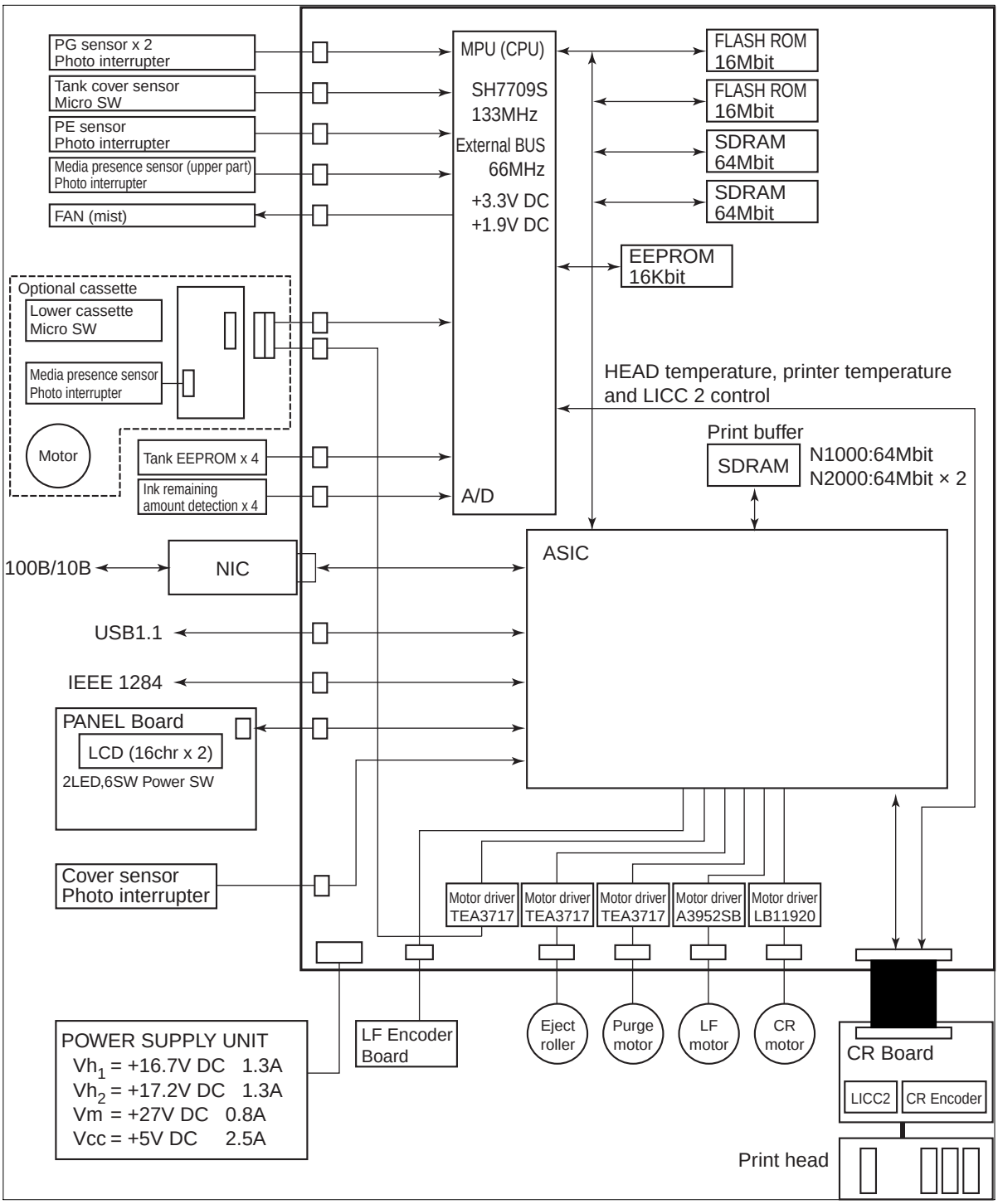
This printer supplies ink by tubes.



The valve located in the midway of the ink supply tube is closed when the printer is on standby status. It is open during printing or filling ink inside the print head.
The negative pressure is generated by the height difference between the ink surface inside the ink tank and inside the print head. The ink tank has an air-through hole on the side. This prevents the pressure inside the ink tank from fluctuating due to temperature change.

4. ELECTRICAL PARTS

4.1 Block Diagram



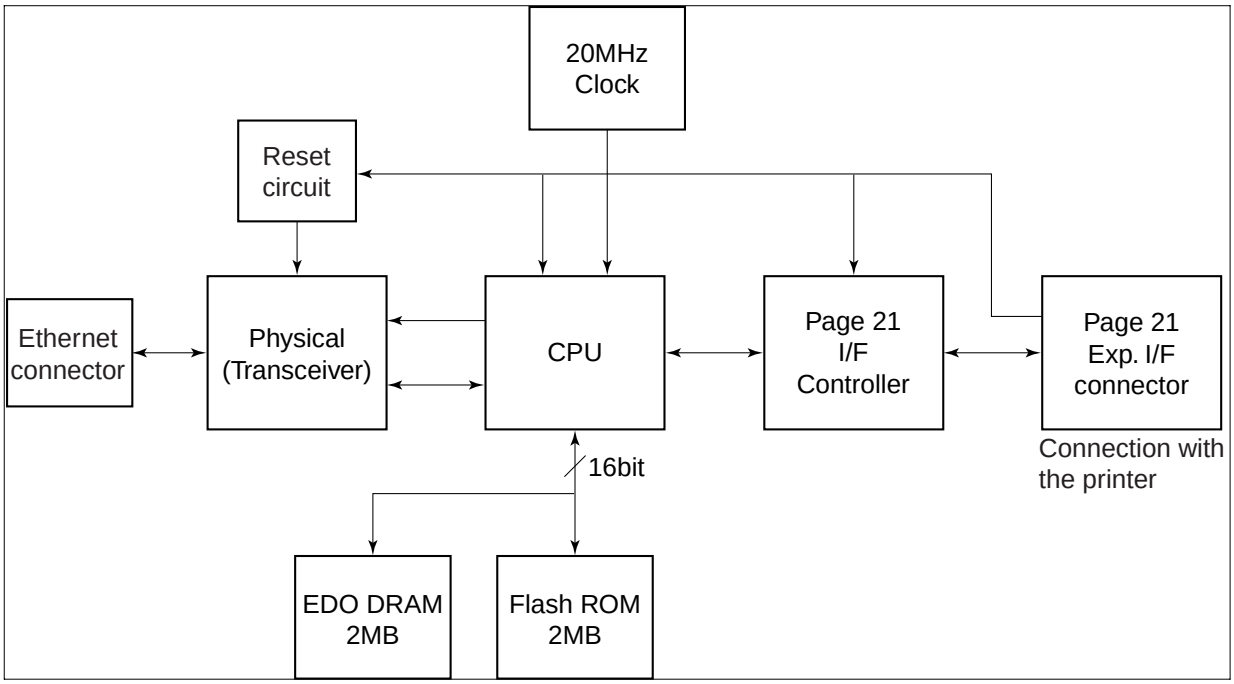
4.2 Electrical Part

At the electrical part, in order to supply driving voltage to motor, IC, printhead, etc., AC voltage which is input from AC power supply is converted to DC voltage.

The voltage input from AC power supply will be converted to 4 blocks, +27 V, +16.7 V, +17.2 V and +5 VDC.

5. NIC BOARD

For supporting the network, the NIC board is used by installing it to the Control Board. The print data sent from the computer is converted to data which can be expanded into the printer.



Block diagram

6. PRINTER'S MECHANICAL PARTS

6.1 Carriage Section

The carriage holds one print head in place. The carriage belt driven by the carriage motor moves the carriage horizontally back and forth across the media.

As for the carriage position control, the initial position is detected when the carriage hits the chassis of the purge unit. After that, the carriage position is detected by reading the pulse from the carriage encoder film.

6.2 Purge Section

There are two motors in the purge unit section. Each motor is controlled by the motor drive IC and performs pumping operation and capping. In the purge unit, the large motor moves the pump and small motor moves the cap and wiper. Due to differences in ink composition between black and colors, different caps are used; one for black and one for colors (3 colors).

6.3 Paper Feed Section

The pickup roller contacts the back of print media, and using the pickup roller, the leading edge of media is pulled up until it reaches the U-turn roller. When the leading edge of media is caught into the pinch roller, due to the rotation of the LF roller and the pinch roller, media is fed till the print starting position. The optical encoder film is attached on the LF roller. The LF roller is driven by the DC motor through the gear and the belt, and is controlled according to the signal read from the film. The minimum media feeding amount is 1/2400 inch.

7. CLEANING MODE AND INK SUCTION AMOUNT

This printer has the following cleaning modes.
The cleaning operation is selected depending on the respective condition.

Mode		Ink consumption amount (Approx. g)	Time required (Approx.)	Precondition
Cleaning A	Bk	0.5	1 min.	120 to 240 hrs. have passed since the previous cleaning.
		1.0	2 min.	240 to 360 hrs. have passed since the previous cleaning.
	Color	Each color: 1 Total: 3	2 min. 30 sec.	720 to 1440 hrs. have passed since the previous cleaning.
	All colors	3	2 min. 30 sec.	Manual cleaning by the user.
Cleaning B	Bk	8	1 min. 30 sec.	360 hrs. or more have passed since the previous cleaning A. 1440 hrs. or more have passed since the previous cleaning B.
	Color	Each color: 5.7 Total: 17	3 min. 10 sec.	1440 hrs. or more have passed since the previous cleaning B.
	All colors	25	3 min. 10 sec.	Performed after hard power on and at the initial soft power on. Manual cleaning by the user. 1440 hrs. or more have passed since the previous cleaning.
Cleaning C	Bk	17	4 min. 30 sec.	Performs automatically when the print head and ink tanks are installed at installation. Manual cleaning by the user. (When not recovered with B) Performed automatically when the print head is replaced.
	Color	Each color: 11 Total: 33		
	All colors	50		

Pre-ejection

Mode		Ink consumption amount (Approx. g)	Pre-ejection location	Pre-ejection timing
Pre-ejection Before printing	Bk	0.01	In the Bk cap	Ejected 24 to 120 hrs. before printing.
	Color (3 colors)	0.02	M in the Bk cap	
	Bk	0.02	In the Bk cap	Ejected 120 to 720 hrs. before printing.
	Color (3 colors)	0.08	M in the Bk cap	
Pre-ejection After suction	Bk	0.11	In the Bk cap	After cleaning and wiping is performed.
	Color (3 colors)	0.002	M in the Bk cap	After cleaning and wiping is performed.
Pre-ejection After suction	Bk	0.0013	In the Bk cap	After cleaning and wiping is performed.
	Cyan	0.8	In the Color cap	
	Magenta	0.07	In the Bk cap	
	Yellow	0.8	In the Color cap	

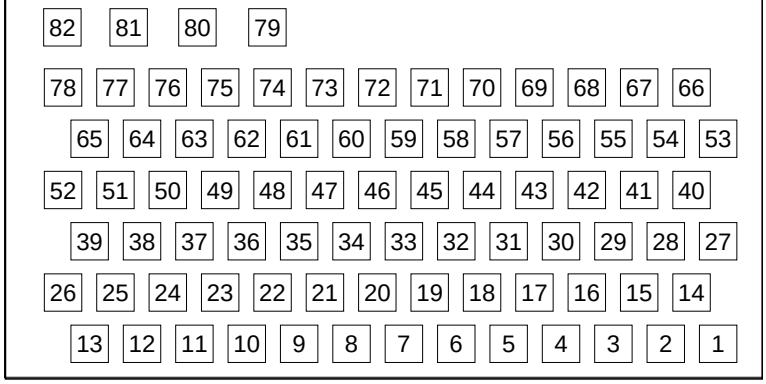
When the “Move Printer”, which is to perform when the printer is transported, is selected, ink inside the print head and tubes is flowed into the waste ink absorber. At this time, the waste ink amount is 10 g for black and 18.9 g for all three colors. These are the amount of ink remaining inside the print head and the tubes.

Part 4

APPENDIX

1. PRINT HEAD

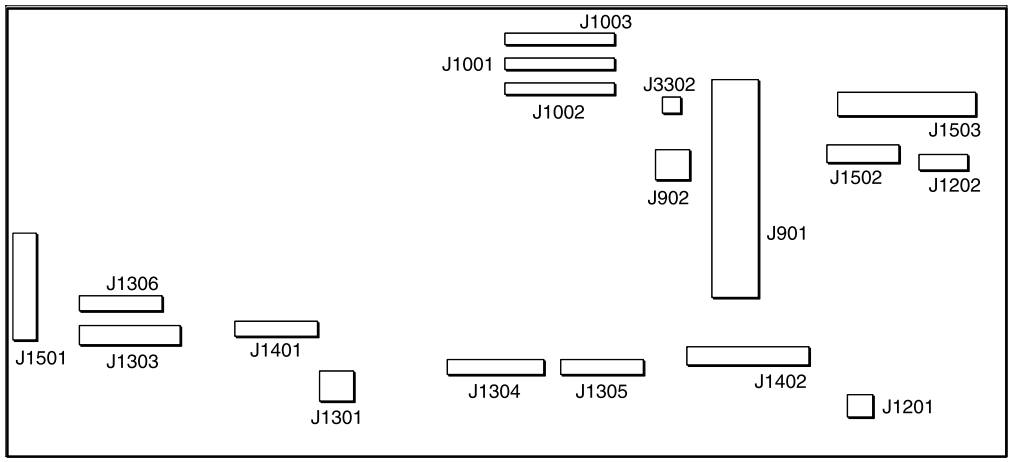
Head crimp pad arrangement



Pin No.	Signal	IN/OUT	Function	Carriage Board J4 Pin No.
1, 2	GNDH_Bk	_	Black heater ground	77, 78
3	HE_Bk	IN	Black heat enable signal	76
4	DATA_EVEN_M1	IN	Magenta even array nozzle data signal	75
5	DATA_EVEN_C1	IN	Cyan even array nozzle data signal	74
6	N.C.			73
7	DIK	OUT	Diode cathode terminal	72
8	VSS			71
9	DATA_ODD_M2	IN	Magenta odd array nozzle data signal	70
10, 11, 12, 13	GNDH	_	Heater ground	69 to 66
14, 15	GNDH_Bk	_	Black heater ground	65, 64
16	SH_Bk	IN	Black sub-heater terminal	63
17	DATA_ODD_C1	IN	Cyan odd array nozzle data signal	62
18	SH_C	IN	Cyan sub-heater terminal	61
19, 20	N.C.			60, 59
21	VSS		Logic GND	58
22 to 26	GND H		Heater ground	57 to 53
27	LT_Bk	IN	Black latch enable terminal	52
28	DIA_Bk1	OUT	Black diode anode terminal	51
29	CLK_Bk	IN	Black serial data clock	50
30	DATA_ODD_Bk2	IN	Black odd array nozzle data signal	49
31	HE_C	IN	Cyan heat enable signal	48
32	N.C.			47
33	LT_col	IN	Color latch enable terminal	46
34	SH_M	IN	Magenta sub-heater terminal	45
35	HE_Y	IN	Yellow heat enable signal	44
36	DATA_EVEN_Y2	IN	Yellow even array nozzle data signal	43
37	DATA_ODD_Y2	IN	Yellow odd array nozzle data signal	42
38	DIA_Y1	OUT	Yellow diode anode terminal	41

Pin No.	Signal	IN/OUT	Function	Carriage Board J4 Pin No.
39	DATA_EVEN_Y1	IN	Yellow even array nozzle data signal	40
40	DATA_ODD_Bk1	IN	Black odd array nozzle data signal	39
41	DATA_EVEN_Bk1	IN	Black even array nozzle data signal	38
42	DIA_Bk2	OUT	Black diode anode terminal	37
43	DATA_EVEN_C2	IN	Cyan even array nozzle data signal	36
44	N.C.			35
45	DIA_C2	OUT	Cyan diode terminal	34
46	DIA_M2	OUT	Magenta diode anode terminal	33
47	CLK_col	IN	Color serial data 1 clock	32
48	HE_M	IN	Magenta heat enable signal	31
49	DIA_Y2	OUT	Yellow diode anode signal	30
50	DATA_ODD_Y1	IN	Yellow odd array nozzle data signal	29
51	DATA_ODD_M1	IN	Magenta odd array nozzle data signal	28
52	DIA_M1	OUT	Magenta diode anode terminal	27
53, 54	VH_Bk	IN	Black heater power source	26, 25
55	DATA_EVEN_Bk2	IN	Black even array nozzle data signal	24
56	DIA_C1	OUT	Cyan diode anode terminal	23
57	DATA_ODD_C2	IN	Cyan odd array nozzle data signal	22
58	VDD	IN	Logic power source 5.0V	21
59	EEPROM_CE	IN	EEPROM chip enable signal	20
60	SH_Y	IN	Yellow sub-heater terminal	19
61	EEPROM_Do	OUT	EEPROM data out	18
62 to 65	VH	IN	Heater power source	17 to 14
66, 67	VH_Bk	IN	Black heater power source	13, 12
68	VHT_Bk	IN	Black heater driving voltage	11
69	N.C.			10
70	DATA_EVEN_M2	IN	Magenta even array nozzle data signal	9
71	VDD	IN	Logic power source	8
72	EEPROM_CLK	IN	EEPROM clock signal	7
73	EEPROM_Di	IN	EEPROM data in	6
74	VHT_col	IN	Color heater driving voltage	5
75 to 78	VH	IN	Heater power source	4 to 1
79	RANK_Bk		Black rank resistor	
80	RANK_C		Cyan rank resistor	
81	RANK_M		Magenta rank resistor	
82	RANK_Y		Yellow rank resistor	

2. CONTROL BOARD CONNECTOR



J1001 (Head Signal Connector To J3 Carriage Board)

Pin No.	Signal	IN/OUT	Function	Carriage Board J3 Pin No.
1	GND		GND	50
2	$\overline{\text{H5\_APTRG}}$	OUT	Head temperature, printer temperature acquisition trigger signal	49
3	H5_LICC2_CK	OUT	LICC2 control clock	48
4	H5_LICC2_DT	OUT	LICC2 control data	47
5	H5_LICC2_LT	OUT	LICC2 control latch	46
6	DSOUT2	IN	Head temperature, printer temperature data signal	45
7	GND		GND	44
8	DS OUT1	IN	Head temperature, printer temperature data signal	43
9	H5_E_DATA_Bk1	OUT	Even block black data 1	42
10	H5_E_DATA_Bk2	OUT	Even block black data 2	41
11	H5_O_DATA_Bk1	OUT	Odd block black data 1	40
12	H5_O_DATA_Bk2	OUT	Odd block black data 2	39
13	H5_E_DATA_C1	OUT	Even block cyan data 1	38
14	H5_E_DATA_C2	OUT	Even block cyan data 2	37
15	H5_O_DATA_C1	OUT	Odd block cyan data 1	36
16	H5_O_DATA_C2	OUT	Odd block cyan data 2	35
17	$\overline{\text{H5\_HE\_Bk}}$	OUT	Heat enable black signal	34
18	$\overline{\text{H5\_HE\_C}}$	OUT	Heat enable cyan signal	33
19	SUBH Bk	OUT	Black sub-heater driving signal	32
20	SUBH C	OUT	Cyan sub-heater driving signal	31
21	SUBH M	OUT	Magenta sub-heater driving signal	30
22	SUBH Y	OUT	Yellow sub-heater driving signal	29
23	N.C.			28
24	5V		+5VDC	27
25	5V		+5VDC	26
26	GND		GND	25
27	H5_HEAD_E2CS	OUT	Head's EEPROM chip select signal	24
28	V5_EEPROM_SK	OUT	Head's EEPROM clock signal	23
29	$\overline{\text{H5\_LATCH\_Bk}}$	OUT	Black head data latch	22
30	$\overline{\text{H5\_LATCH\_COL}}$	OUT	Color head data latch	21

Pin No.	Signal	IN/OUT	Function	Carriage Board J3 Pin No.
31	H5_SCLK_Bk	OUT	Black head data clock	20
32	H5_SCLK_COL	OUT	Color head data clock	19

33	V5_EEPROM_WD	OUT	EEPROM data writing	18
34	V5_EEPROM_RD	IN	EEPROM data reading	17
35	GND		GND	16
36	$\overline{\text{H5\_HE\_M}}$	OUT	Heat enable magenta signal	15
37	$\overline{\text{H5\_HE\_Y}}$	OUT	Heat enable yellow signal	14
38	H5_E_DATA_M1	OUT	Even block magenta data 1	13
39	H5_E_DATA_M2	OUT	EVEN block magenta data 2	12
40	H5_O_DATA_M1	OUT	Odd block magenta data 1	11
41	H5_O_DATA_M2	OUT	Odd block magenta data 2	10
42	H5_E_DATA_Y1	OUT	Even block yellow data 1	9
43	H5_E_DATA_Y2	OUT	Even block yellow data 2	8
44	H5_O_DATA_Y1	OUT	Odd block yellow data 1	7
45	H5_O_DATA_Y2	OUT	Odd block yellow data 2	6
46	H5V ON		+5V ON signal	5
47	GND		GND	4
48	MAIN5V/ V5_CRENCA	IN	CR encoder signal	3
49	MAIN5V/ V5_CRENCB	IN	CR encoder signal	2
50	GND		GND	1

J1002 (Head Power Source Connector To J2 Carriage Board)

Pin No.	Signal	IN/OUT	Function	Carriage Board J2 Pin No.
1	GND	IN	GND	24
2	GND	IN	GND	23
3	GND	IN	GND	22
4	GND	IN	GND	21
5	GND	IN	GND	20
6	GND	IN	GND	19
7	GND	IN	GND	18
8	VH1	IN	Black heater driving voltage (16.7V)	17
9	VH1	IN	Black heater driving voltage (16.7V)	16
10	VH1	IN	Black heater driving voltage (16.7V)	15
11	VH1	IN	Black heater driving voltage (16.7V)	14
12	VH1	IN	Black heater driving voltage (16.7V)	13
13	VH1	IN	Black heater driving voltage (16.7V)	12
14	VH1	IN	Black heater driving voltage (16.7V)	11
15	VH1	IN	Black heater driving voltage (16.7V)	10
16	VH1FBH	IN	Black heater driving voltage (16.7V)	9
17	VH1FBG	IN	GND for black heater driving voltage	8
18	GND	IN	GND	7
19	GND	IN	GND	6
20	GND	IN	GND	5
21	GND	IN	GND	4
22	GND	IN	GND	3
23	GND	IN	GND	2
24	GND	IN	GND	1

J1003 (Head Power Source Connector To J1 Carriage Board)

Pin No.	Signal	IN/OUT	Function	Carriage Board J1 Pin No.
1	GND	IN	GND	24
2	GND	IN	GND	23
3	GND	IN	GND	22
4	GND	IN	GND	21
5	GND	IN	GND	20
6	VH2	IN	Color heater driving voltage (17.2V)	19
7	VH2	IN	Color heater driving voltage (17.2V)	18
8	VH2	IN	Color heater driving voltage (17.2V)	17
9	VH2	IN	Color heater driving voltage (17.2V)	16
10	VH2	IN	Color heater driving voltage (17.2V)	15
11	VH2	IN	Color heater driving voltage (17.2V)	14
12	VH2	IN	Color heater driving voltage (17.2V)	13
13	VH2	IN	Color heater driving voltage (17.2V)	12
14	VH2	IN	Color heater driving voltage (17.2V)	11
15	VH2	IN	Color heater driving voltage (17.2V)	10
16	VH2	IN	Color heater driving voltage (17.2V)	9
17	VH2	IN	Color heater driving voltage (17.2V)	8
18	VH2	IN	Color heater driving voltage (17.2V)	7
19	VH2	IN	Color heater driving voltage (17.2V)	6
20	VH2FBH	IN	Color heater driving voltage (17.2V)	5
21	VH2FBG	IN	GND for color heater driving voltage	4
22	GND	IN	GND	3
23	GND	IN	GND	2
24	GND	IN	GND	1

J1202 (CR Motor Connector)

Pin No.	Signal	IN/OUT	Function	CR Motor Side Pin No.
1	CR HWP	OUT	CR motor phase W hall element plus side	1
2	CR HWM	OUT	CR motor phase W hall element minus side	2
3	CR W	OUT	CR motor phase W	3
4	CR HVM	OUT	CR motor phase V hall element minus side	4
5	CR U	OUT	CR motor phase U	5
6	GND	---	GND	6
7	CR V	OUT	CR motor phase V	7
8	+5V	IN	+5VDC	8
9	N.C.	---	CR motor common terminal	9
10	CR HVP	OUT	CR motor phase V hall element plus side	10
11	CR HUM	OUT	CR motor phase U hall element minus side	11
12	CR HUP	OUT	CR motor phase U hall element plus side	12

J1201 (LF Motor Connector)

Pin No.	Signal	IN/OUT	Function
1	OUT_A	OUT	Paper feed motor phase A
2	OUT_B	OUT	Paper feed motor phase B

J1502 (Power Source Control, Connector)

Pin No.	Signal	IN/OUT	Function
1	STDBY	IN	STDBY signal
2	START	IN	5V output ON signal
3	VHENB	IN	VHENB signal
4	VH1FB+	IN	16.8V output plus side
5	VH1FB–	IN	16.8V output minus side
6	VH2FB+	IN	17.2V output plus side
7	VH2FB–	IN	17.2V output minus side

J1503 (Power Source, Connector)

Pin No.	Signal	IN/OUT	Function
1	VCC		+5VDC
2	VCCGND		GND
3	VM1	IN	+27VDC
4	VMGND		GND
5	VH1GND		GND
6	VH1	IN	+16.7VDC
7	VH2GND		GND
8	VH2	IN	+17.2VDC

J1303 (Purge Unit, Connector)

Pin No.	Signal	IN/OUT	Function
1	MAIN 5V	OUT	+5VDC
2	GND		GND
3	CAM_SENSOR	IN	Cam sensor sense signal
4	MAIN 5V	OUT	+5V DC
5	GND		GND
6	PUMP_SENSOR	IN	Pump sensor sense signal
7	PGMOUT B*	OUT	Purge motor phase $\overline{B}$
8	PGMOUT B	OUT	Purge motor phase B
9	PGMOUT A*	OUT	Purge motor phase $\overline{A}$
10	PGMOUT A	OUT	Purge motor phase A
11	PGMOUT COM	OUT	Purge motor common terminal
12	ASFMOUT A	OUT	ASF motor phase A
13	ASFMOUT B	OUT	ASF motor phase B
14	ASFMOUT B*	OUT	ASF motor phase $\overline{B}$
15	ASFMOUT A*	OUT	ASF motor phase $\overline{A}$

J1302 (Tank Cover Switch, Connector)

Pin No.	Signal	IN/OUT	Function
1	TANK_COVER	IN	Tank cover sensor sense signal
2	GND		GND

J1304 (To Optional Cassette)

Pin No.	Signal	IN/OUT	Function	Cassette Board J1 Pin No.
1	OPT_CST1 PAPER NONE	IN	Optional cassette 1 Paper presence sense signal	1
2	OPT_CST2 PAPER NONE	IN	Optional cassette 2 Paper presence sense signal	2
3	OPT_CST2_VCC_ON		Optional cassette 2_VCC ON	3
4	OPT_CST2_VM_ ON	OUT	Optional cassette 2 Motor driving voltage ON	4
5	OPT_CSTM_CST2_ SEL	OUT	Optional cassette 2 Select number	5
6	$\overline{\text{CTM\_N0}}$	OUT	Cassette motor driving 0 signal	6
7	$\overline{\text{CTM\_N1}}$	OUT	Cassette motor driving 1 signal	7
8	CTM A	OUT	Cassette motor phase A driving signal	8
9	CTM B	OUT	Cassette motor phase B driving signal	9
10	OPT_CST1_NONE	IN	Optional cassette 1 Presence sense signal	10
11	OPT_CST2_NONE	IN	Optional cassette 2 Presence sense signal	11
12	GND		GND	12
13	VM1		+27VDC	13
14	OPT_CST1_VM_ ON	OUT	Optional cassette 1 Motor driving voltage ON	14
15, 16	GND		GND	15, 16
17	OPT_CST1_VCC_ON	OUT	Optional cassette 1 VCC ON	17
18	GND		GND	18

J1305 (To LF Encoder, Paper Lever and Fan Motor)

Pin No.	Signal	IN/OUT	Function	LF Encoder Board J2 Pin No.
1	GND		GND	4
2	LF ENCA	IN	LF encoder signal	3
3	MAIN 5V		+5VDC	2
4	LF ENC B	IN	LF encoder signal	1
5	GND		GND	
6	PAPER LEVER	IN	Manual feed lever signal	
7	FLAPM OUT A	OUT	Paper delivery roller motor phase A	
8	FLAPM OUT A*	OUT	Paper delivery roller motor phase $\overline{A}$	
9	GND		GND	
10	FAN ERROR	OUT	Mist fan stop signal	
11	FANM_OUT	OUT	Fan motor signal	

J1306 (Ink Tank EEPROM Connector)

Pin No.	Signal	IN/OUT	Function
1 (11)	GND		GND
2 (10)	MAIN 3V		+3V DC
3 (9)	GND		GND
4 (8)	EEPROM WD	OUT	EEPROM write signal
5 (7)	EEPROM RD	IN	EEPROM read signal
6 (6)	EEPROM SK	OUT	EEPROM serial data clock signal
7 (5)	TANK E2CS 3	OUT	Tank EEPROM 3 select signal
8 (4)	TANK E2CS 2	OUT	Tank EEPROM 2 select signal
9 (3)	TANK E2CS 1	OUT	Tank EEPROM 1 select signal
10 (2)	TANK E2CS 0	OUT	Tank EEPROM 0 select signal
11 (1)	GND		GND

J1401 (Ink Remaining Amount Detection, Paper Presence Check Sensor Connector)

Pin No.	Signal	IN/OUT	Function	Ink Sensor Board J1 Pin No.
1	+5V		+5VDC	9
2	LM INK		Not used in N1000	8
3	LC INK		Not used in N1000	7
4	Y INK	IN	Yellow ink remaining amount detection signal	6
5	M INK	IN	Magenta ink remaining amount detection signal	5
6	C INK	IN	Cyan ink remaining amount detection signal	4
7	Bk INK	IN	Black ink remaining amount detection signal	3
8	INK SENSER ON	OUT	Ink remaining amount detection sensor signal ON	2
9	GND		GND	1
10	PAPER 5V		Paper presence sensor +5VDC	
11	GND		GND	
12	STD_CST_PAPER_ NONE	OUT	Cassette (Upper), Paper presence sensor sense signal	

J1501 (To PAGE21 NIC Board Connector)

Pin No.	Signal	Function	PAGE21 Extension I/F J2 Pin No.
1, 2	+3.3V		A-1, B-1
3	$\overline{\text{PAGE CS}}$	PAGE21 chip select signal	A-2
4	$\overline{\text{PAGE DREQ}}$	PAGE21 data request signal	B-2
5, 6, 15, 18	GND	GND	A-3, 8, B-3, 9
7	PAGE D0	PAGE21 data signal	A-4
8	PAGE D1	PAGE21 data signal	B-4
9	PAGE D4	PAGE21 data signal	A-5
10	PAGE D5	PAGE21 data signal	B-5
11	PAGE D8	PAGE21 data signal	A-6
12	PAGE D9	PAGE21 data signal	B-6
13	PAGE D12	PAGE21 data signal	A-7
14	PAGE D13	PAGE21 data signal	B-7
16	PAGE AD4	PAGE21 address bus signal	D-8
17	N.C.	---	A-9
19	$\overline{\text{PAGE D ACK}}$	PAGE21 data ACK signal	A-10
20	$\overline{\text{PAGE RESET}}$	PAGE21 reset signal	B-10
21, 22	+3.3V		C-1, D-1
23	$\overline{\text{PAGE RD}}$	PAGE21 read data signal	C-2
24	$\overline{\text{IRQ4}}$	IRQ4 signal	D-2
25, 26	N.C.	---	C-3, C-9
27	PAGE D2	PAGE21 data signal	C-4
28	PAGE D3	PAGE21 data signal	D-4
29	PAGE D6	PAGE21 data signal	C-5
30	PAGE D7	PAGE21 data signal	D-5
31	PAGE D10	PAGE21 data signal	C-6
32	PAGE D11	PAGE21 data signal	D-6
33	PAGE D14	PAGE21 data signal	C-7
34	PAGE D15	PAGE21 data signal	D-7
35	PAGE AD3	PAGE21 address bus signal	C-8
36	PAGE AD2	PAGE21 address bus signal	B-8
37	N.C.	---	D-3
38, 39	GND	GND	C-10, D-9
40	$\overline{\text{PAGE WR}}$	PAGE21 write signal	D-10

J1402 (To Panel Board)

Pin No.	Signal	IN/OUT	Function
1	$\overline{\text{KEY 1}}$	IN	
2	$\overline{\text{KEY 2}}$	IN	
3	$\overline{\text{KEY 3}}$	IN	
4	$\overline{\text{KEY 4}}$	IN	
5	$\overline{\text{KEY 5}}$	IN	
6	LCD D0		
7	LCD D2		
8	LCD RS		
9	LCD RW		
10	LCD E		
11	LCD D1		
12	LCD D3		
13	GND		
14	+5V		
15	GND		
16	$\overline{\text{KEY 0}}$	IN	
17	PW-STDBY	OUT	Standby mode signal
18	PW-START	OUT	Power on signal
19	LED 0		Emitting diode
20	LED 1		Emitting diode

J3302 (To Tank Cover Sensor Board)

Pin No.	Signal	IN/OUT	Function
1	TANK_COVER		Tank cover on/off signal
2	GND		

J1301 (To PE Sensor)

Pin No.	Signal	IN/OUT	Function
1	MAIN 5V		
2	GND		
3	PE_SENSOR		Paper edge detection signal

J901 (Centronics Interface Connector)

Pin No.	Compatible Mode	Nibble Mode	ECP Mode
1	$\overline{\text{STROBE}}$	Host Clk	Host Clk
2	DATA 1	Data 1	Data 1
3	DATA 2	Data 2	Data 2
4	DATA 3	Data 3	Data 3
5	DATA 4	Data 4	Data 4
6	DATA 5	Data 5	Data 5
7	DATA 6	Data 6	Data 6
8	DATA 7	Data 7	Data 7
9	DATA 8	Data 8	Data 8
10	$\overline{\text{ACKNLG}}$	Prt Clk	Periph Clk
11	BUSY	Prt Busy	Periph Ack
12	P.E.	Ack Data Reg	Ack Reverse
13	SELECT	X flag	X flag
14	AUTO FEED XT	Host Busy	Host Ack
15	N.C.	Undefined	Undefined
16, 17	GND	Gnd	Gnd
18	+5.0V	Vcc	Vcc
19	STROBE-RET	Signal Gnd	Signal Gnd
20	DATA1-RET	Signal Gnd	Signal Gnd
21	DATA2-RET	Signal Gnd	Signal Gnd
22	DATA3-RET	Signal Gnd	Signal Gnd
23	DATA4-RET	Signal Gnd	Signal Gnd
24	DATA5-RET	Signal Gnd	Signal Gnd
25	DATA6-RET	Signal Gnd	Signal Gnd
26	DATA7-RET	Signal Gnd	Signal Gnd
27	DATA8-RET	Signal Gnd	Signal Gnd
28	ACKNLG-RET	Signal Gnd	Signal Gnd
29	BUSY-RET	Signal Gnd	Signal Gnd
30	P.E-RET	Signal Gnd	Signal Gnd
31	$\overline{\text{INIT}}$	INIT	Reverse Req
32	$\overline{\text{ERROR}}$	DATA Avail	Periph Req
33	GND	Undefined	Undefined
34	N.C.	Undefined	Undefined
35	+5.0V	Undefined	Undefined
36	$\overline{\text{SELECT IN}}$	1284 Active	1284 Active

J902 (USB)

Pin No.	Signal	IN/OUT	Function
1	US VCC	IN	Cable power source
2	DATA –		Data
3	DATA +		Data
4	USGNG		Cable GND