brother

FACSIMILE EQUIPMENT

SERVICE MANUAL

MODEL: MFC9200C/MFC860

PREFACE

This publication is a Service Manual covering the specifications, construction, theory of operation, and maintenance of the Brother facsimile equipment. It includes information required for field troubleshooting and repair--disassembly, reassembly, and lubrication--so that service personnel will be able to understand equipment function, to rapidly repair the equipment and order any necessary spare parts.

To perform appropriate maintenance so that the facsimile equipment is always in best condition for the customer, the service personnel must adequately understand and apply this manual.

This manual is made up of six chapters and appendices.

This manual describes the model and its versions to be destined for major countries. The specifications and functions are subject to change depending upon each destination.

CHAPTER I.

GENERAL DESCRIPTION

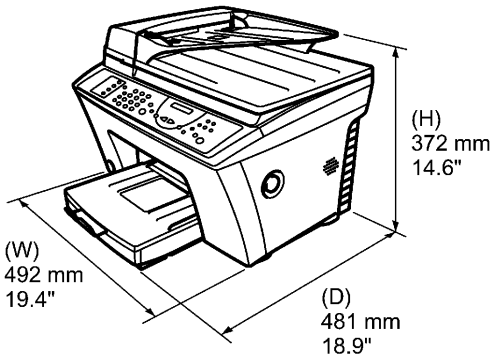
CHAPTER I. GENERAL DESCRIPTION

CONTENTS

1. EQUIPMENT OUTLINE

1.1 External Appearance and Weight

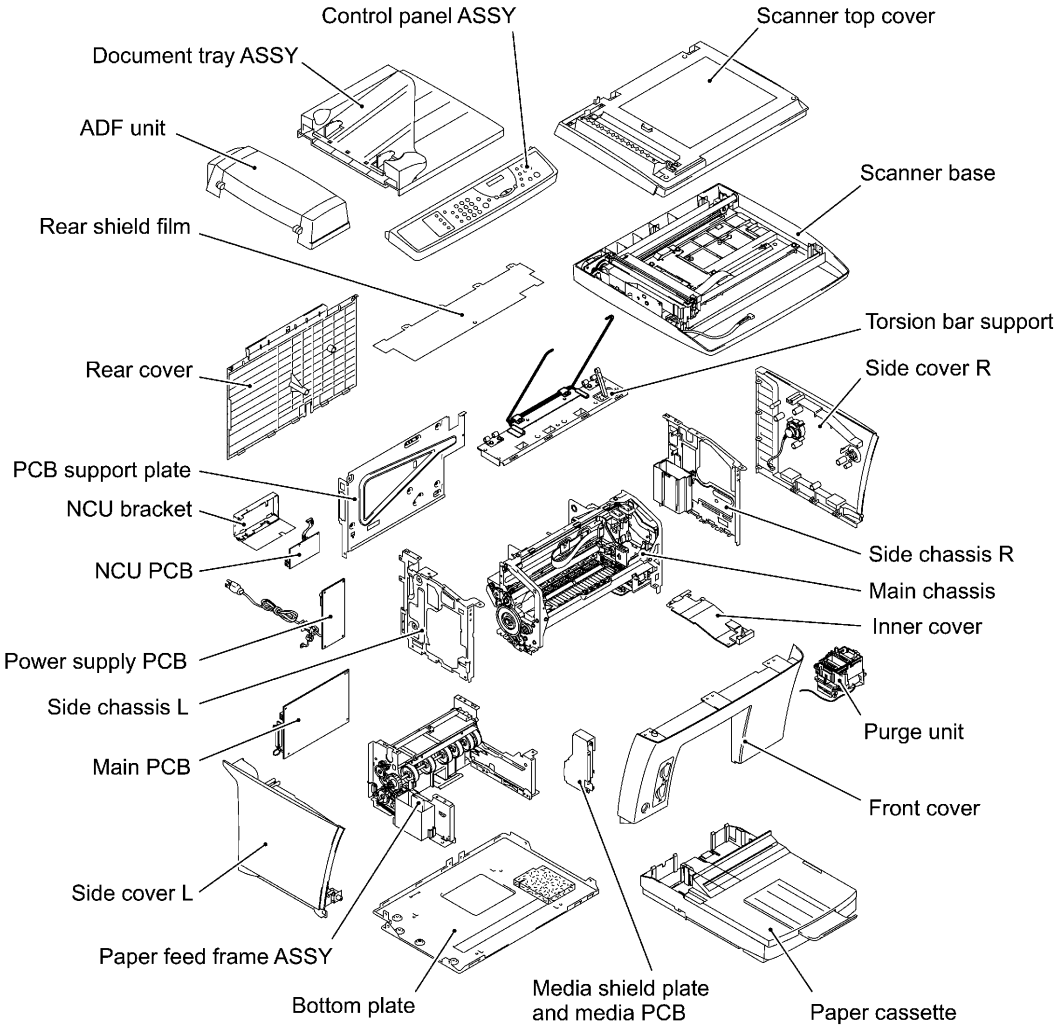
The figure below shows the equipment appearance and approximate dimensions.



Weight:	Machine proper	Approx. 17 kg
	In package	Approx. 21 kg

1.2 Components

The equipment consists of the following major components:



2. SPECIFICATIONS

Model Name	**MFC9200C (Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860 (Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
GENERAL		
Print Engine	Ink Jet (BY4)	Ink Jet (BY4)
Modem Speed (bps)	14,400 (Fax)	14,400 (Fax)
Transmission Speed (sec.)	5 (Brother#1, JBIG)	5 (Brother#1, JBIG)
ITU-T Group	G3	G3
Coding System	MH/MR/MMR/JBIG/JPEG	MH/MR/MMR/JBIG/JPEG
Input/Output Width	5.8" to 8.5"/3.7" to 8.5"	148 to 216 mm/95.3 to 216 mm
Input/Output Length	4.7" to 14"/6.7" to 14"	120 x 356 mm/171 x 356 mm
ADF (pages)	Up to 50	Up to 50
LCD Size	16 chars x 1 line	16 chars x 1 line
LCD Backlight	No	No
On-Screen Programming	Yes	Yes
Backup Clock	Yes (1 hour)	Yes (1 hour)
Memory Capacity (physical)	8 MB (RAM)	8 MB (RAM)
Optional Memory	No	No
Dimensions w/ Carton (W x D x H)	22.9" x 22.4" x 18.1"	582 mm x 569 mm x 460 mm
Dimensions w/o Carton (W x D x H)	19.4" x 18.9" x 14.6"	492 mm x 481 mm x 372 mm
Weight w/o Carton	38 lb	17 kg
Weight w/ Carton	46 lb	21 kg
Color	Gray 1495	Gray 1495
Standby Mode	No	No
PC-Fax Protocol Compliance	Class 1, 2	N/A
Simultaneous Operation	Yes (Print/Fax, Print/Copy, Print/Scan)	Yes (Print/Fax, Print/Copy, Print/Scan)
Energy Star Compliant	Yes	Yes
Operating Environment Temperature Humidity	5 to 35ºC 60% ±25%	5 to 35ºC 60% ±25%
Power Source	120 VAC, 50/60Hz	220 VAC, 50/60Hz
Power Consumption (Idle/Peak)	Under 13W/50W	Under 13W/50W
On/Off Switch	No	No

Model Name	**MFC9200C (Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860 (Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
TELEPHONE		
Automatic Redial	Yes	Yes
Handset	No	No
One-Touch Dial	8 (4 x 2)	8 (4 x 2)
Speed Dial	100	100
Figures of One-Touch & Speed Dial	20 digits	20 digits
Registerable Number of Characters	15 chars	15 chars
Telephone Index	Yes (Normal)	Yes (Normal)
Speaker Phone	No	No
Chain Dialing	Yes	Yes
Caller ID	No	No
Call Waiting Caller ID	No	No
Distinctive Ringing	No	Yes
Hold/Mute Key	No	No
Power Failure Dialing	No	No
Speaker Volume	Yes (3 levels + OFF)	Yes (3 levels + OFF)
Ringer Volume	Yes (3 levels + OFF)	Yes (3 levels + OFF)
Receiver Volume	No	No
PBX Feature	No	Yes
Transfer Method	No	Flash
FAX		
Internet FAX	No	No
Data Modem	No	No
Easy Receive/Fax Detect	Yes	Yes
Fax/Tel Switch	No	No
Super Fine	Yes (TX & RX)	Yes (TX & RX)
300dpi Transmission	No	No
Gray Scale	256	256
Contrast	Yes (Auto/S.Light/S.Dark)	Yes (Auto/Light/Dark)
Smoothing	No	No
Call Reservation Over Auto TX	No	No
Password Check	No	No
Enhanced Remote Activation	Yes	Yes
Multi Resolution Transmission	Yes	Yes
Multi Transmission	No	No

Model Name	**MFC9200C** **(Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860** **(Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
FAX		
Next-Fax Reservation	Yes (Dual Access)	Yes (Dual Access)
Delayed Timer	Yes (50 timers/50 jobs)	Yes (50 timers/50 jobs)
Polling	Yes (Std/Seq)	Yes (Std/Seq/Sec/Timer)
Quick-Scan key	(Memory TX w/o key)	(Memory TX w/o key)
Scan Speed (A4: Standard)	Approx. 3 sec./page (A4: standard)	Approx. 3 sec./page (A4: standard)
Memory Transmission (Brother#1 Chart)	Yes (550: JBIG)	Yes (550: JBIG)
Memory Transmission (ITU-T#1)	Yes (500: JBIG)	Yes (500: JBIG)
Broadcasting	Yes (158 locations)	Yes (158 locations)
Batch Transmission	Yes	Yes
Auto Reduction	Yes	Yes
Out-of-Paper Reception (Brother #1 Chart)	550 (JBIG)	550 (JBIG)
Out-of-Paper Reception (ITU-T Chart)	500 (JBIG)	500 (JBIG)
Dual Access	Yes	Yes
ECM (Error Correction Mode)	Yes	Yes
ITU SUB Addressing	No	Yes (Wordcraft s/w)
Group Dial	Yes (6)	Yes (6)
Error Re-Transmission	No	No
Station ID	1 (20 digits/20 chars)	1 (20 digits/20 chars)
Off-Hook Alarm	No	No
Remote Maintenance	Yes	Yes
Call Reservation Over Manual TX	No	No
RX Mode Indication	LCD	LCD
Resolution Indication	LED	LED
Memory Security	No	Yes
Color FAX (Document Send/Receive)	Yes/Yes	Yes/Yes
Color FAX (Memory Send/Receive)	No/Yes (within memory capacity)	No/Yes
Manual Broadcasting	Yes	Yes
E-MAIL FAX (Service)	No	No
Call Manage	No	No

Model Name	**MFC9200C** **(Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860** **(Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
LIST/REPORT		
Activity Report/Journal Report	Yes (up to 50)	Yes (up to 50)
Transmission Verification Report	Yes	Yes
Coverpage	Yes (Super)	Yes (Super)
Help List	Yes (Function Menu)	Yes
Callback Message	No	No
Caller ID List	No	No
Auto Dial List	Yes	Yes
Tel Index List	Yes	Yes
Order Form	Yes	Yes
INTERFACE		
External TAD Interface	Yes	Yes
Missing Link/PC Interface	No	No
Host Interface (Serial)	No	No
Host Interface (IEEE1284)	Yes	Yes
Host Interface (USB)	Yes	Yes
LAN Interface	No	No
Acceptable Media Card Slot	SmartMedia/Compact Flash	SmartMedia/Compact Flash
Analog Video Port	Yes	Yes
PRINTER		
Color/Mono	Color/Mono	Color/Mono
Engine Type	Piezo Ink Jet (BY4)	Piezo Ink Jet (BY4)
Resolution (dpi)	1200 x 1200	1200 x 1200
Speed (ppm)	12/14 (Color/Mono)	12/14 (Color/Mono)
Paper Capacity (sheets)	250	250
Additional Paper Capacity (sheets)	No	No
Output Paper Capacity (sheets)	100	100
Standard Print Language	Windows GDI	Windows GDI
Emulation	No	No
Resident Fonts	No	No
Fonts Disk Based	Yes	Yes
Paper Handling Size	LTR, LGL, A4, A5, EXE	LTR, LGL, A4, A5, EXE
Manual Feed Slot	3.75" x 6.75" to 8.5" x 14" (Post card available)	95.3 x 171mm to 216 x 356 mm (Post card available)

Model Name	**MFC9200C (Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860 (Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
PRINTER		
Other Paper Type	OHP, Envelopes, Organizer	OHP, Envelopes, Organizer
Sheet Weight (Paper Cassette) (Manual Slot)	64 to 120 g/m^2 (17 to 32 lb) 64 to 120 g/m^2 (17 to 32 lb)	64 to 120 g/m^2 (17 to 32 lb) 64 to 120 g/m^2 (17 to 32 lb)
Printer Driver	Windows95/98/98SE/2000 Professional/NT4.0/ME/ Mac OS 8.5/8.5.1/8.6/9.0	Windows95/98/98SE/2000 Professional/NT4.0/ME/ Mac OS 8.5/8.5.1/8.6/9.0
Utility Software	Yes (Maintenance software)	Yes (Maintenance software)
Bundled Cable	No	No
Network	No (No option)	No (No option)
Variable Dot Print	Yes (3 size, Min. 8 pl)	Yes (3 size, Min. 8 pl)
Shingling Print	No	No
Image Enhancement	Yes	Yes
COPY		
Color/Mono	Color/Mono	Color/Mono
Speed (ppm)	3.1/2.9 (Full Scan)	4/7 (color/mono)
Multi Copy (Stack)	Up to 99	Up to 99
Multi Copy (Sort)	Yes	Yes
Reduction/Enlargement (%)	25% to 400 % in 1% increments	25% to 400% in 1% increments
Resolution (dpi)	1200 x 1200	1200 x 1200
N in 1	2 in 1, 4 in 1 (300 dpi)	2 in 1, 4 in 1 (300 dpi)
Poster	1 in 3 x 3 (FB scan only, 300 dpi)	1 in 3 x 3 (FB scan only: 300 dpi)
Image Enhancement	No	No
SCANNER		
Color/Mono	Color/Mono	Color/Mono
Resolution (dpi) (Physical)	600 x 2400 (Opt.)	600 x 2400 (Opt.)
Resolution (dpi) (Logical)	9600 (Int.)	9600 (Int.)
Speed	3 sec.	Min. 3 sec. (100 x 100 dpi)
Gray Scale	256	256
TWAIN Compliant & Operating System	Windows95/98/98SE/2000 Professional/NT4.0/ME/Mac OS 8.6/9.0	Windows95/98/98SE/2000 Professional/NT4.0/ME/Mac OS 8.6/9.0
PCI Scanner (Parallel/Serial)	Parallel/USB	Parallel/USB
E-MAIL Scan Key	Yes	Yes
OCR Scan key	Yes	Yes
Scan Key	Yes	Yes
Color Depth	36-bit color	36-bit color

Model Name	MFC9200C (Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)	MFC860 (Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)
MESSAGE CENTER/MESSAGE MANAGER		
ICM Recording Time	N/A	N/A
Page Memory	N/A	N/A
OGM (MC;MC Pro;Paging;F/T)	N/A	N/A
TAD Type	N/A	N/A
Memo/Recording Conversation	N/A	N/A
Fax Forwarding	Yes (B&W only)	Yes (B&W only)
Fax Retrieval	Yes (B&W only)	Yes (B&W only)
Paging	Yes	No
Remote Access	Yes	Yes
Toll Saver	N/A	N/A
MESSAGE CENTER Pro/MESSAGE MANAGER Pro		
Fax/Voice Mail Box	N/A	N/A
Fax-/Voice-on-Demand	N/A	N/A
MESSAGE CENTER (PC MC)		
Fax Forwarding	N/A	N/A
Paging	N/A	N/A
ICM Recording Time	N/A	N/A
OGM MC;MC Pro;Paging	N/A	N/A
Fax/Voice Mail Box	N/A	N/A
Fax/Voice on Demand	N/A	N/A
VIDEO CAPTURE		
Video Capture	Yes	Yes
Video Print	Yes	Yes
Video Format	Yes (NTSC)	Yes (PAL)
Video Fax	No	No

Model Name	**MFC9200C (Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860 (Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
PHOTOCAPTURE CENTER		
Acceptable Media	SmartMedia/Compact Flash	SmartMedia/Compact Flash
Print	Yes (Color)	Yes (Color)
Media Format	DPOF	DPOF
Image Format	JPEG	JPEG
Image Enhancement	Yes	Yes
Media Drive	Yes (USB except i-Mac/ Windows NT4.0)	Yes (USB except i-Mac/ Windows NT4.0)
BUNDLED SOFTWARE (For Windows)		
Printer Driver	Brother	Brother
TWAIN	Brother	Brother
Viewer	ScanSoft	ScanSoft
PC Fax	SMSI	N/A
Others	Auto E-mail Printing	No
Formats (Import)	TIFF/BMP/PCX/DCX/BTF/ BTX/MAX/PDF	TIFF/BMP/PCX/DCX/BTF/ BTX/MAX/PDF
Formats (Export)	TIFF/BMP/MAX/PDF	TIFF/BM/MAX/PDF
OCR	Yes (ScanSoft TextBridge)	Yes (ScanSoft TextBridge)
Pop-Up Menu	Yes	Yes
PC Diagnostics	Yes	No
Remote Setup	Yes	Yes
BUNDLED SOFTWARE (For i-MAC)		
Printer Driver	Brother	Brother
TWAIN	Brother	Brother
Viewer	ScanSoft	No
PC Fax	No	No
Others	No	No
Formats (Import)	-	-
Formats (Export)	-	-
OCR	Mac OS 8.6/9.0	No
Pop-Up Menu	No	No
PC Diagnostics	No	No
Remote Setup	No	No

Model Name	**MFC9200C** **(Fax/Copy/Print/Scan/PC-FAX/ PhotoCapture Center/Video Capture)**	**MFC860** **(Fax/Copy/Print/Scan/ PhotoCapture Centre/Video Capture)**
ACCESSORY		
Life of Ink Cartridges	4 colors (each separate tank)	4 colors (each separate tank)
	Black: 850 pages, Color: 410 pages	Black: 850 pages, Color: 410 pages

CHAPTER II.

INSTALLATION

CHAPTER II. INSTALLATION

CONTENTS

1. INSTALLING THE UPDATE DATA TO THE FACSIMILE EQUIPMENT

If the program version is updated or the main PCB is replaced, install the update program onto the flash ROM of the main PCB.

The program installation requires a PC/AT-compatible computer (which is capable of running MS-DOS or its compatible OS).

Connecting the facsimile equipment to your computer

(1) Make sure that your computer is turned off.

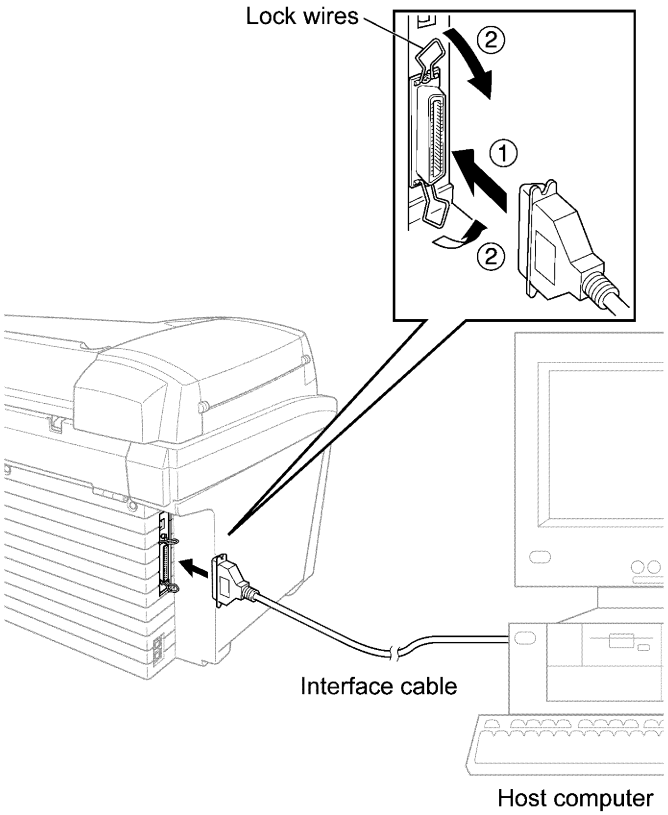
(2) Make sure that the equipment's power cord is unplugged from a wall socket.

(3) Connect the interface cable to the parallel interface port on the back of the equipment and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your computer and secure it with the two screws.

(5) Plug the equipment's power cord into a wall socket

(6) Turn on your computer.



Installing the update data onto the flash ROM of the facsimile equipment

NOTE: The following is an installation procedure example on a PC that is running Windows 95/98.

(1) Copy the update data and transfer utility onto the desired directory of the hard disk.
e.g., C:\UPDATE

(2) Click the Start button, point to Programs, and then click MS-DOS Prompt to open an MS-DOS window.

(3) Type the drive letter where the update data and transfer utility are located. In the above example, type C:\ from the command line and press the **ENTER** key.

Then type CD UPDATE and press the **ENTER** key.

(4) Check that your computer is connected with the facsimile equipment correctly.

(5) To start the transfer utility transmitting the update data to the flash ROM of the facsimile equipment, type the following:

`ICEN` *`filename`* `/b`

Then press the **ENTER** key.

During downloading, the equipment beeps *intermittently*.

Upon completion of the downloading, the equipment beeps *continuously*.

NOTE: If the facsimile equipment cannot return to the standby state after completion of downloading, turn the equipment off and on.

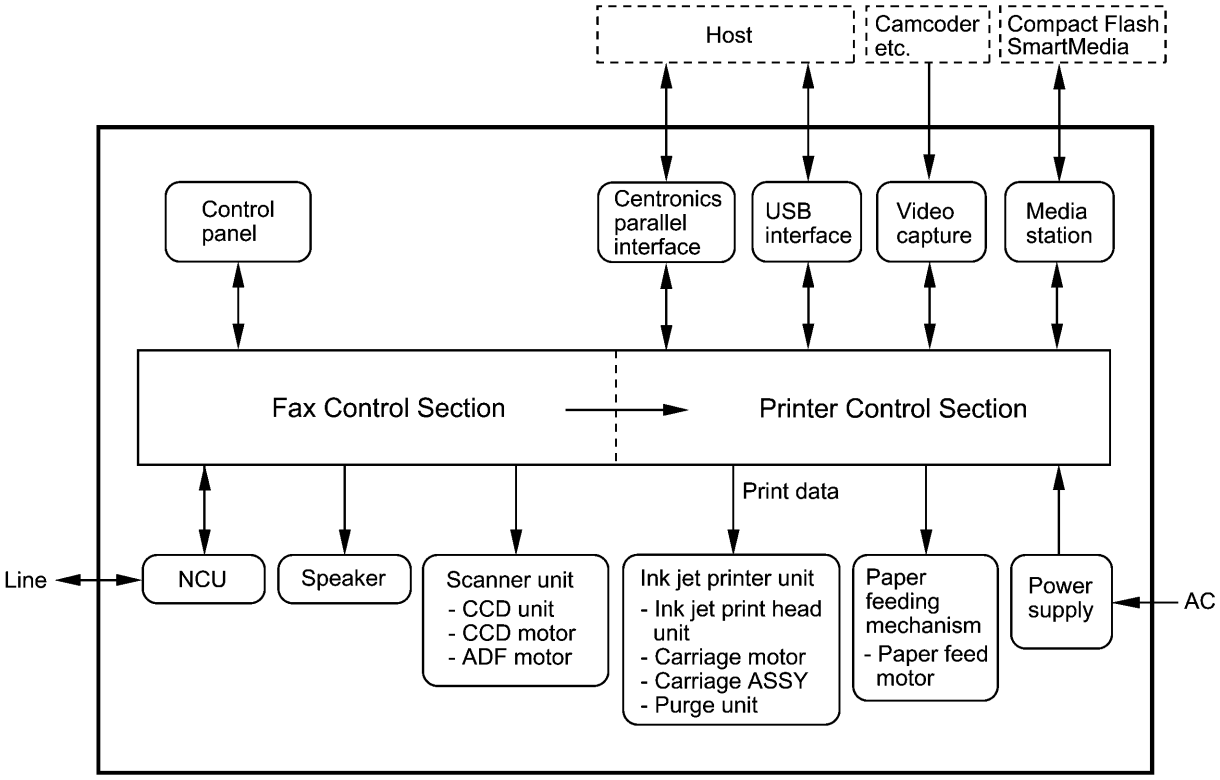
CHAPTER III.

THEORY OF OPERATION

CHAPTER III. THEORY OF OPERATION

CONTENTS

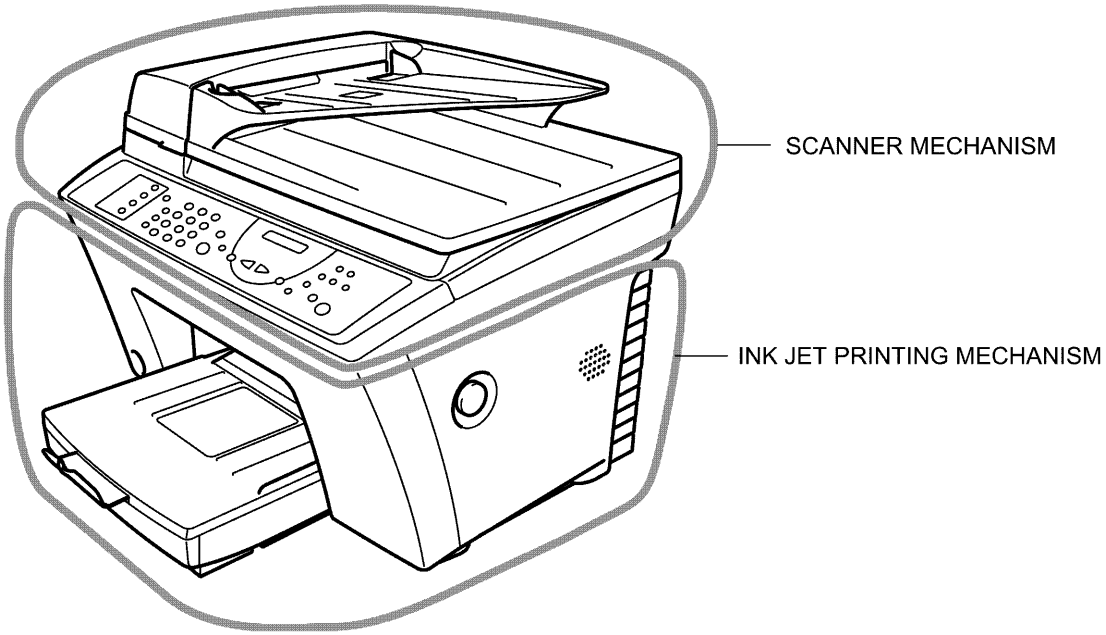
1. OVERVIEW


Host
Camcoder etc.
Compact Flash SmartMedia
Control panel
Centronics parallel interface
USB interface
Video capture
Media station
Fax Control Section
Printer Control Section
Print data
Line
NCU
Speaker
Scanner unit
- CCD unit
- CCD motor
- ADF motor
Ink jet printer unit
- Ink jet print head unit
- Carriage motor
- Carriage ASSY
- Purge unit
Paper feeding mechanism
- Paper feed motor
Power supply
AC

2. MECHANISMS

The equipment is classified into the following mechanisms:

- SCANNER MECHANISM
  - ADF mechanism
  - Document scanning mechanism
- INK JET PRINTING MECHANISM
  - Paper pick-up, registration, feeding, and ejecting mechanisms
  - Ink jet printing and head capping mechanisms
  - Purging mechanism
  - Carriage drive mechanism
- SENSORS AND ACTUATORS

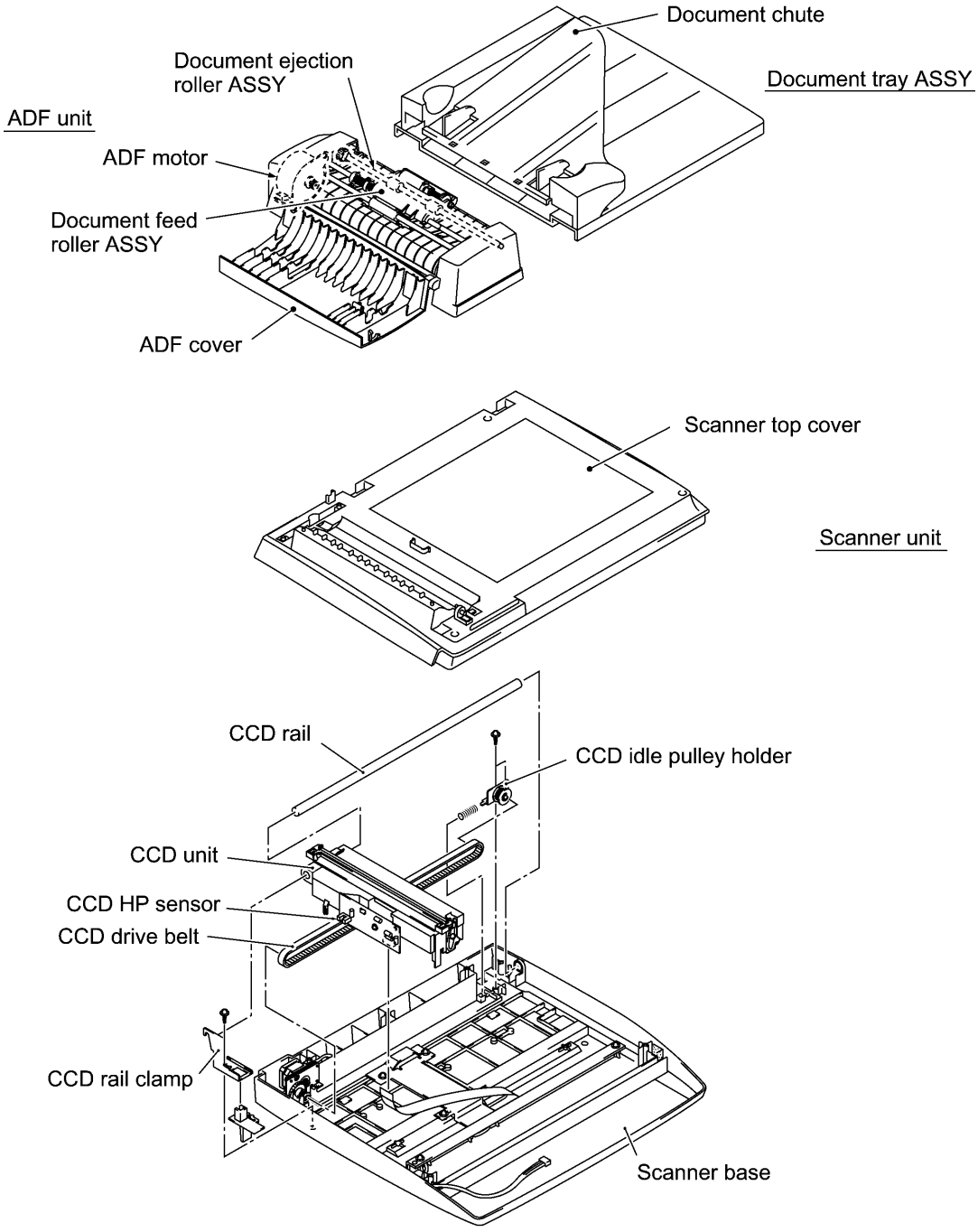


2.1 Scanner Mechanism

This mechanism consists of the following:

- document tray ASSY which consists of a document chute and document tray,
- automatic document feeder (ADF) unit which consists of a document feed roller ASSY, document ejection roller ASSY, ADF motor, and document front and rear sensors, and
- scanner unit which consists of a scanner top cover, CCD unit, CCD drive mechanism, CCD HP sensor, and scanner base.

For details about the sensors, refer to Section 2.3.



This scanner mechanism supports a dual scanning system.

(1) If you set documents with their faces up on the document chute and start the scanning operation, the ADF motor rotates so that the document feed roller ASSY feeds those documents into the ADF unit, starting from the top sheet to the bottom, page by page. Each document curves downwards and turns to the right so as to advance above the CCD unit, and then it is fed out to the document tray with the document ejection roller ASSY.

    This way, documents move above the CCD unit being kept in a stationary position.

(2) If you open the scanner unit, put a sheet of document (or put a bound book opened) on the glass of the scanner top cover, close the scanner unit, and start the scanning operation, then the CCD drive mechanism will be driven. That is, the CCD motor rotates and its rotation will be transmitted via the gear train to the CCD drive belt.

    The CCD unit, which is supported and guided by the CCD rail, is secured to the CCD drive belt. Clockwise and counterclockwise rotations of the CCD motor move the CCD unit to the right and left, respectively.

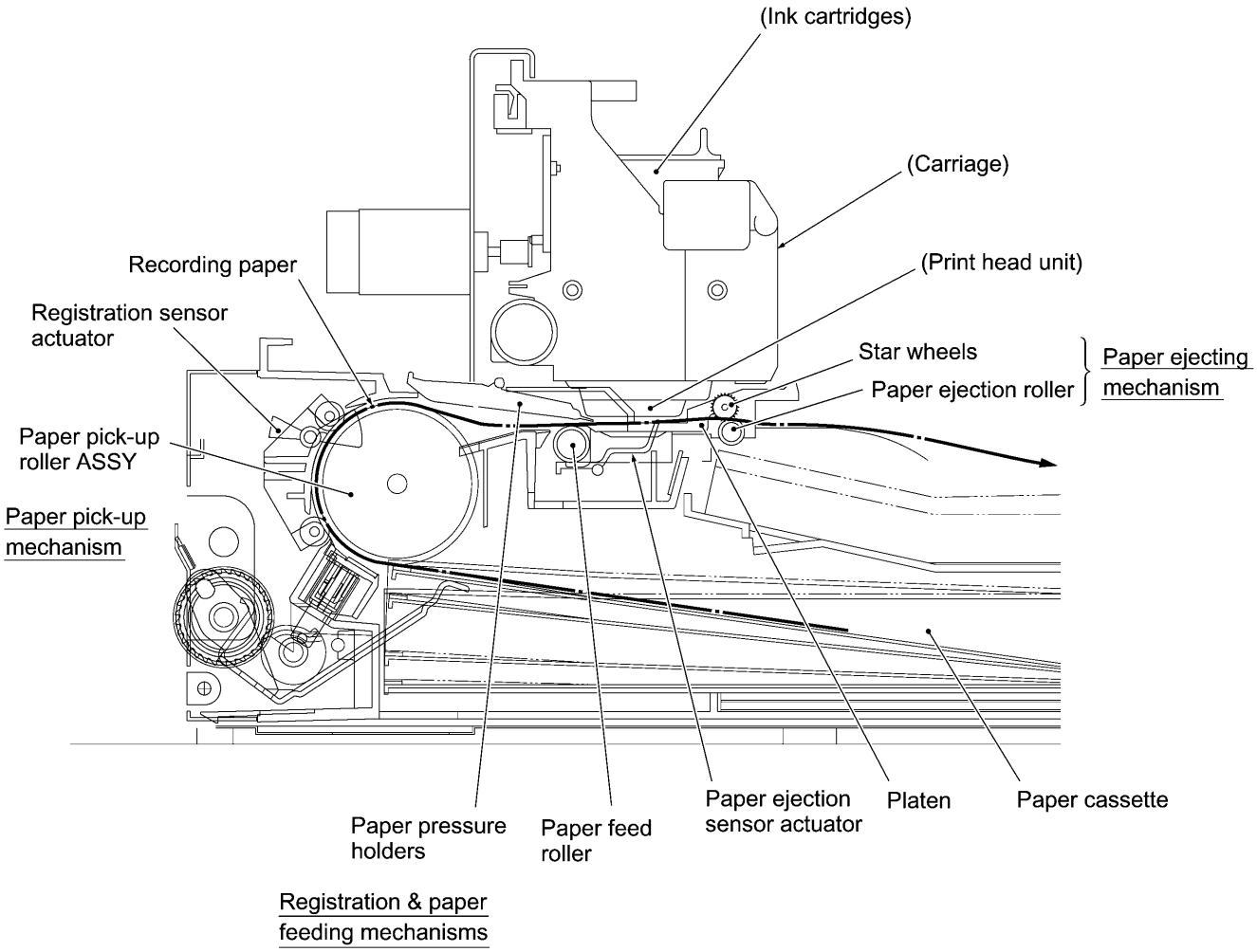
    In this scanning system, the CCD unit moves horizontally beneath a document being kept in stationary position.

The CCD unit contains a charge coupled device (CCD) image sensor. The cold-cathode fluorescent lamp illuminates a document and the reflected light of the scanned image data is transmitted via the mirrors into the lens which reduces the scanned data so as to form the image on the CCD.

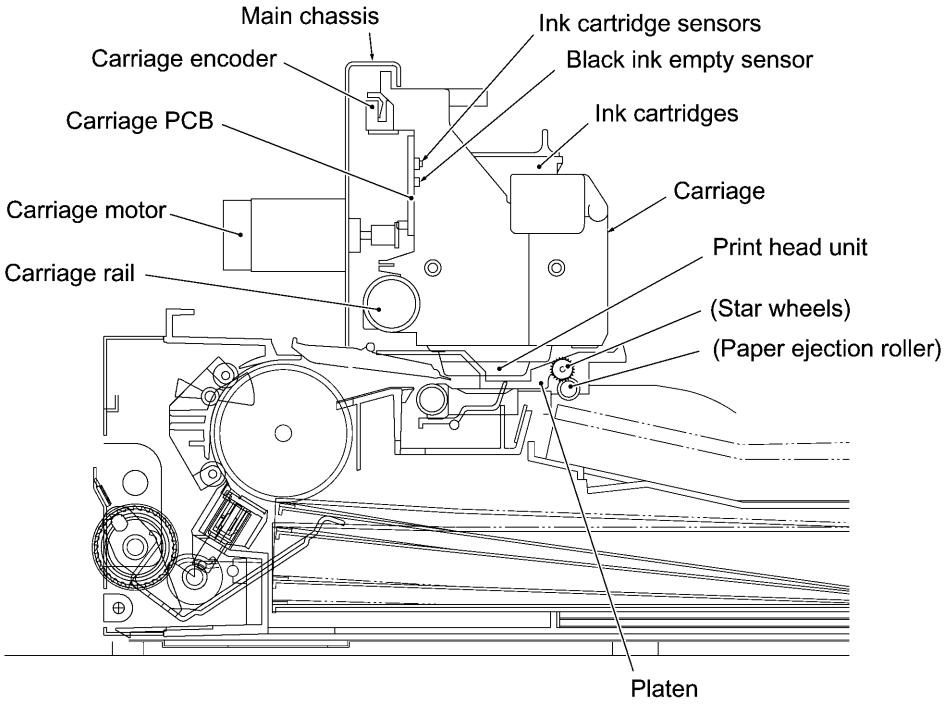
2.2 Ink Jet Printing Mechanism

2.2.1 Paper pick-up, registration, feeding, and ejecting mechanisms

The paper pick-up, registration, feeding, and ejecting mechanisms are driven by a single paper feed motor (stepping motor) via the two PF timing belts and gear train.



2.2.2 Ink jet printing and capping mechanisms



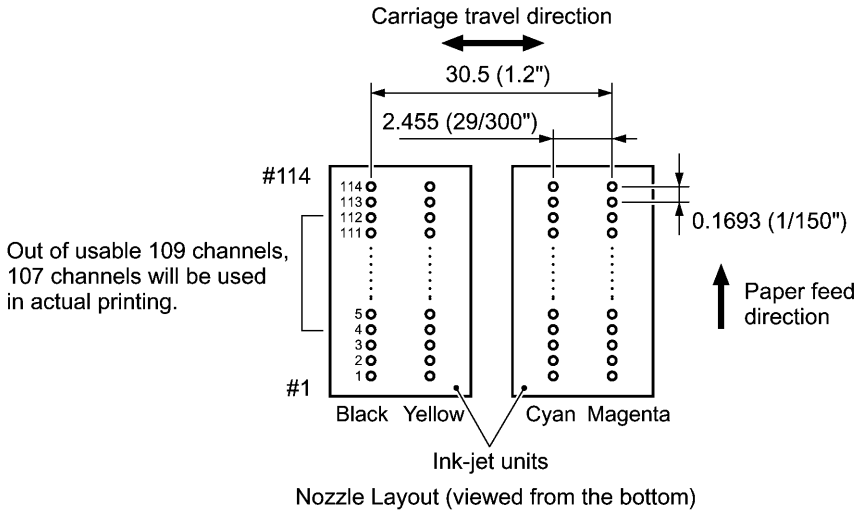
(1) Print head

This equipment uses drop-on-demand ink jet printing. Each of the right and left print heads has an ink-jet unit that has a pair of nozzle arrays for two color inks. A nozzle array consists of 114 nozzles, 114 channels sandwiched by a pair of piezoelectric ceramic actuators (PZT), manifold, and filter. As illustrated below, 109 channels from #4 to #112 are usable, but 107 channels out of them will be used in actual printing. Two channels are prepared for covering a vertical alignment error between the right and left print heads.

If a drive voltage* is applied to the electrodes formed on the surface of the piezoelectric actuators, those actuators will be distorted as shown with broken lines on the next page so that the ink in the manifold will be vacuumed out to the channel.

(*The controller switches the drive voltage between 36 levels within 8.5V to 24V depending upon the ambient temperature detected by the head thermistor.)

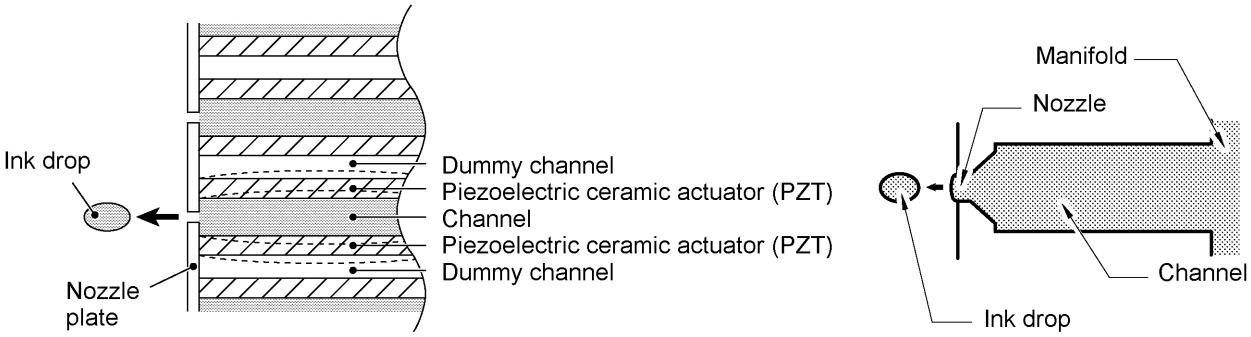
If deenergized, the piezoelectric actuators return to the previous form so as to apply pressure to the ink in the channel, causing the ink to jet out through the nozzle. The jetted-out ink drop will be splashed and produce a dot on paper held by the platen.



Nozzle Layout (viewed from the bottom)

As the carriage holding the print heads travels at the printing speed, the controller sends print command pulses to the circuits driving the piezoelectric actuators embedded in the print heads.

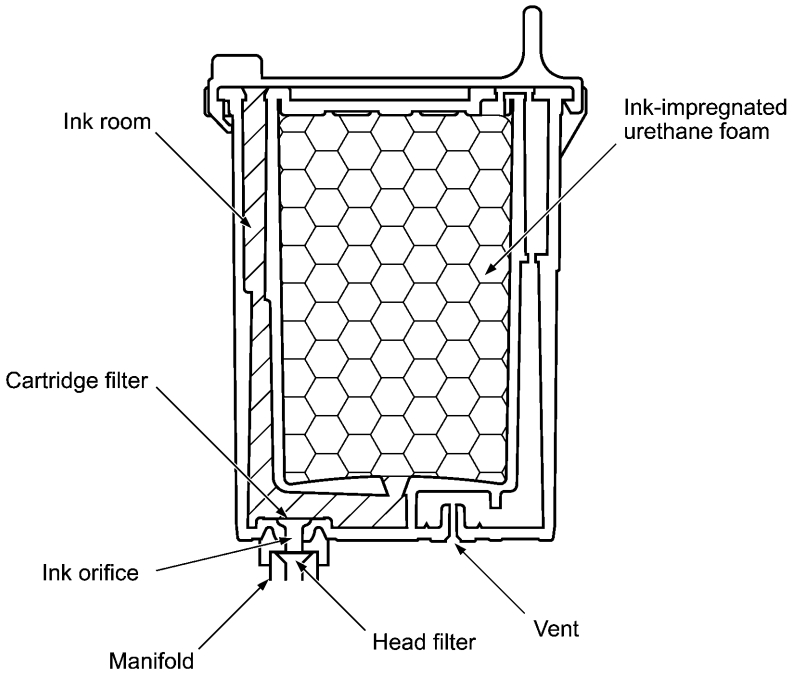
For the head thermistor and the head property EEPROMs, refer to Section 2.3.



(2) Ink cartridge

The equipment uses four ink cartridges (black, yellow, cyan, and magenta) of disposable type to supply ink to the print head. As shown below, an ink cartridge contains an ink-impregnated urethane foam. If ink-jet print operation or purging operation takes place, ink comes out of the urethane foam and is supplied to the print head through the ink room, filters, and manifold.

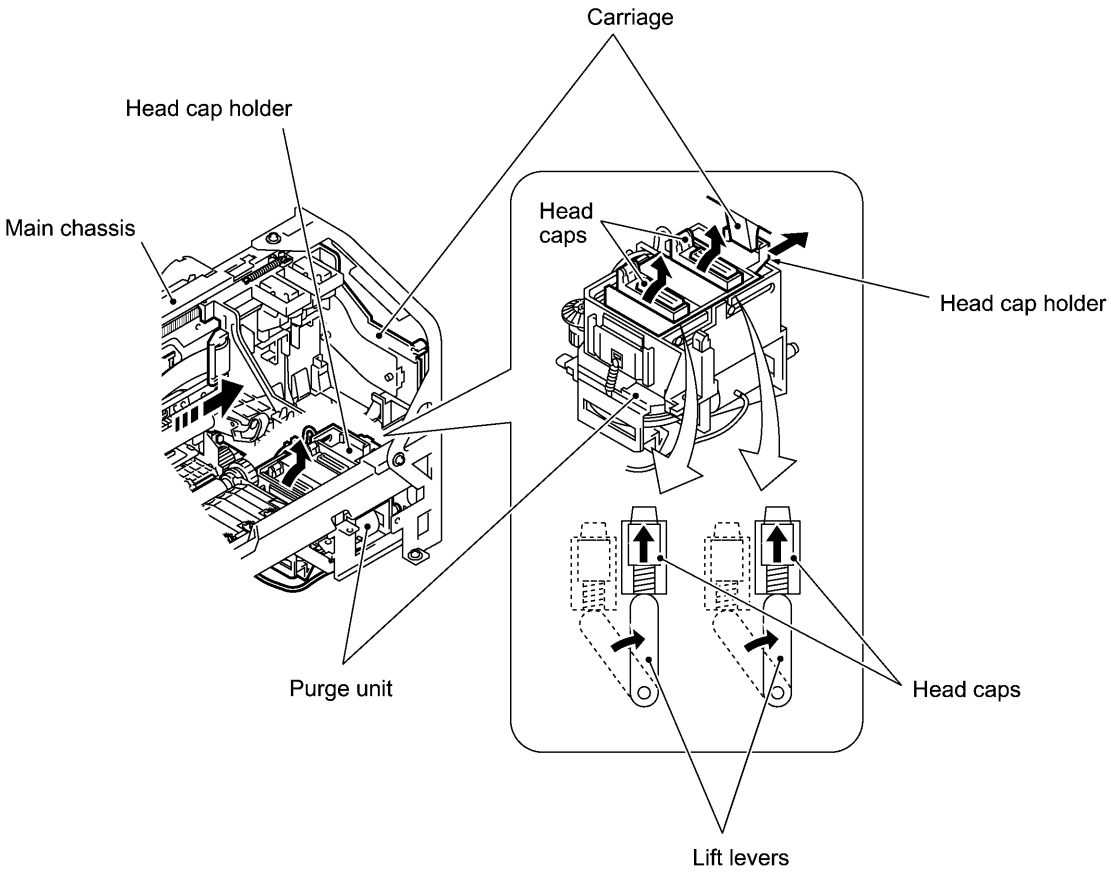
For the ink cartridge sensors on the carriage PCB, refer to Section 2.3.



(3) Head cap

Shown below is a head cap mechanism that prevents the nozzles of the print heads from drying up when they are not in use.

Upon completion of printing, the carriage travels to the right and moves the head cap holder provided on the purge unit to the right together. In the head cap holder are two head caps, each of which is supported with a lift lever. The rightward movement of the head cap holder turns the lift levers and pushes up the head caps to the position where the head caps come into tight contact with the print heads. This way, the nozzles will be capped.



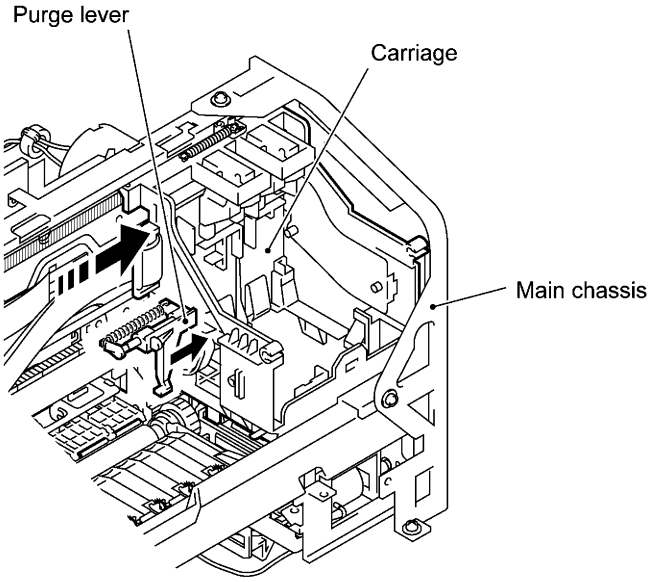
2.2.3 Purging mechanism

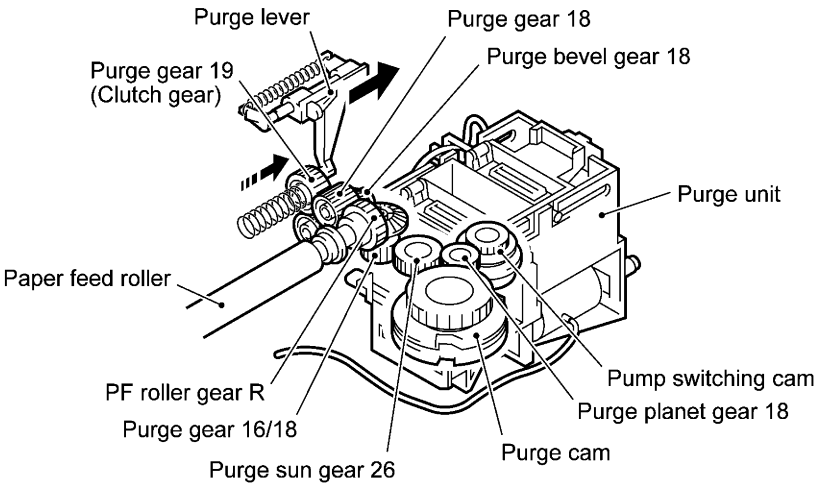
The purging mechanism is driven by the paper feed motor located at the left side of the main chassis. The rotation of the paper feed motor is transmitted via the PF timing belt L to the paper feed roller. At the right end of the paper feed roller is the PF roller gear R which is always engaged with the purge gear 18. Engaged with the purge gear 18, the purge gear 19 works as a clutch gear which engages with or disengages from the purge bevel gear 18 as illustrated on the next page.

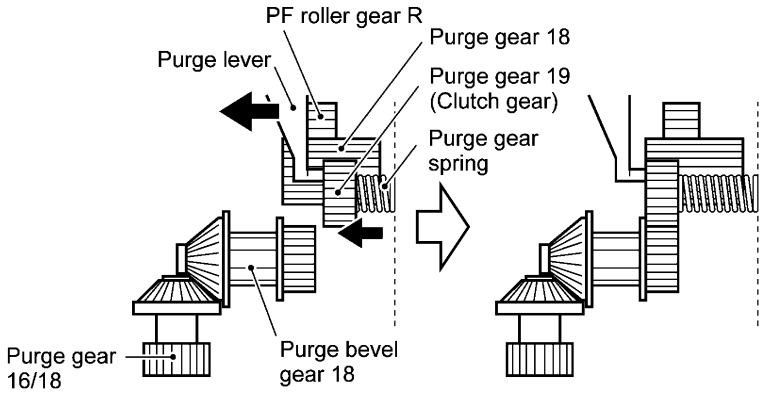
When the carriage travels from the left to right to reach the purge position, the tab provided on the back of the carriage pushes the purge lever on the main chassis to the right (see the illustration below). Accordingly, the purge gear 19 (which was shifted to the left by the purge lever) will move to the right by the spring so as to be engaged with the purge bevel gear 18. This engagement will transmit the motor rotation to the purge unit.

On the contrary, if the carriage travels from the purge position to the left, the tab on the back of the carriage releases the purge lever which will be pulled back to the left. The purge gear 19 will be disengaged from the purge bevel gear 18, where the purge gear 19 will simply idle and no rotation will be transmitted to the purge unit.

That is, when the carriage is in printing operation, no rotation of the paper feed motor is transmitted to the purge unit; when the carriage is in the purge position, the motor rotation is transmitted to the purge unit.



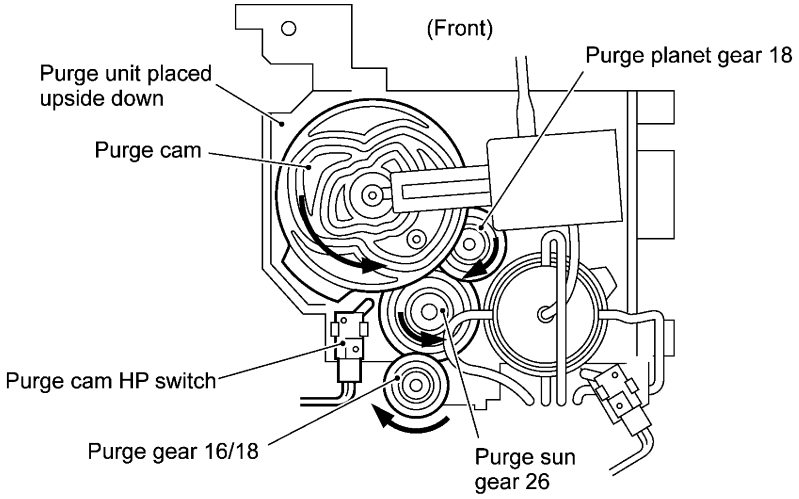




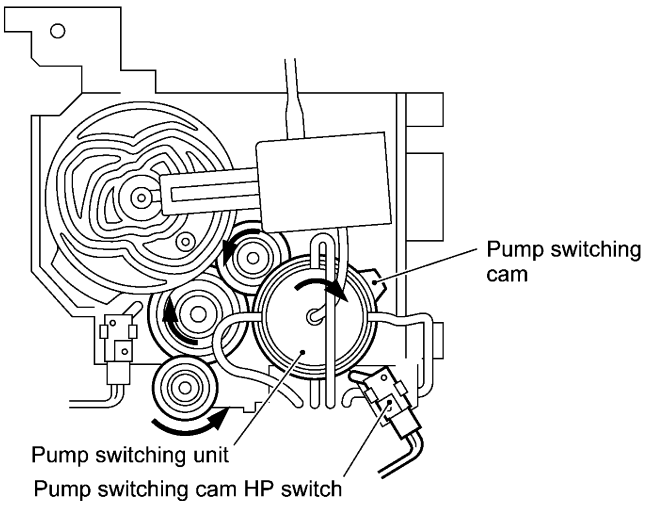
During printing: The purge gear 19 is simply idle.

During purging: The purge gear 19 is engaged with the purge bevel gear 18.

If the paper feed motor rotates in the forward direction when the motor rotation is transmitted to the purge unit, the purge cam will be driven; if in the backward direction, the pump switching unit will be driven.



When the paper feed motor rotates in the forward direction



When the paper feed motor rotates in the backward direction

The purge cam is so designed that:

- the carriage lock pops out to lock the carriage before purging and pops in before cleaning with the head wiper (see the illustration below),
- the pump works to draw out ink from each of the four head nozzles and drain it to the ink absorber felts, and
- the head wiper comes out to clean the nozzle surface (see the illustration below).

The pump switching cam is so designed that:

- the pump switching unit switches application of the pump's negative pressure between the four head nozzles in the order of black, yellow, cyan, and magenta nozzles. When the pump switching cam is in the home position, normal atmospheric pressure will be restored.

The home position of the purge cam and pump switching cam are detected by their HP switches. For those switches, refer to Section 2.3.

(1) Carriage lock

If the purge cam is driven, the carriage lock of the purge unit pops out and locks the carriage to align ink-jet units with the mating purge caps during purging operation. After purging but before cleaning with the head wiper, it pops in to release the carriage. When the power is off, the carriage lock keeps the print heads pressed against the head caps.

(2) Purging

If activated, the pump draws out ink to purge air bubbles or dust from the inside of the head nozzles and channels. As the purge cam rotates by one turn, the piston of the pump reciprocates two strokes. To complete purging of all four nozzles and channels, the purge cam rotates by two turns and the piston reciprocates four strokes.

(3) Draining

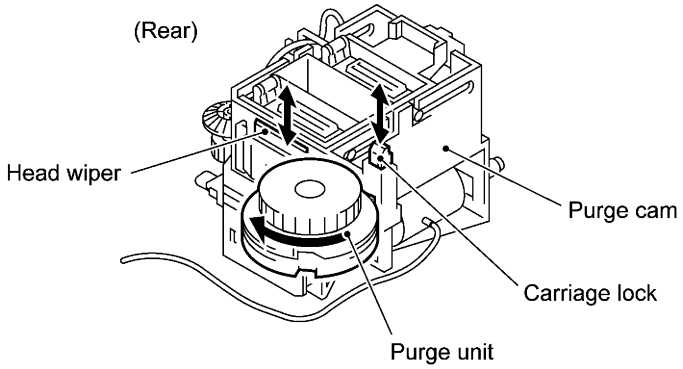
The pump drains drawn ink into the ink absorber felts.

(4) Cleaning with the head wiper

After purging operation, the head wiper comes out and the carriage moves from the right to left so as to clean ink remaining on the heads' surface.

(5) Restoring the pump's pressure to normal atmospheric pressure

When the pump switching cam is in the home position, the controller stops to produce negative pressure and restore the pump's pressure to normal atmospheric pressure.

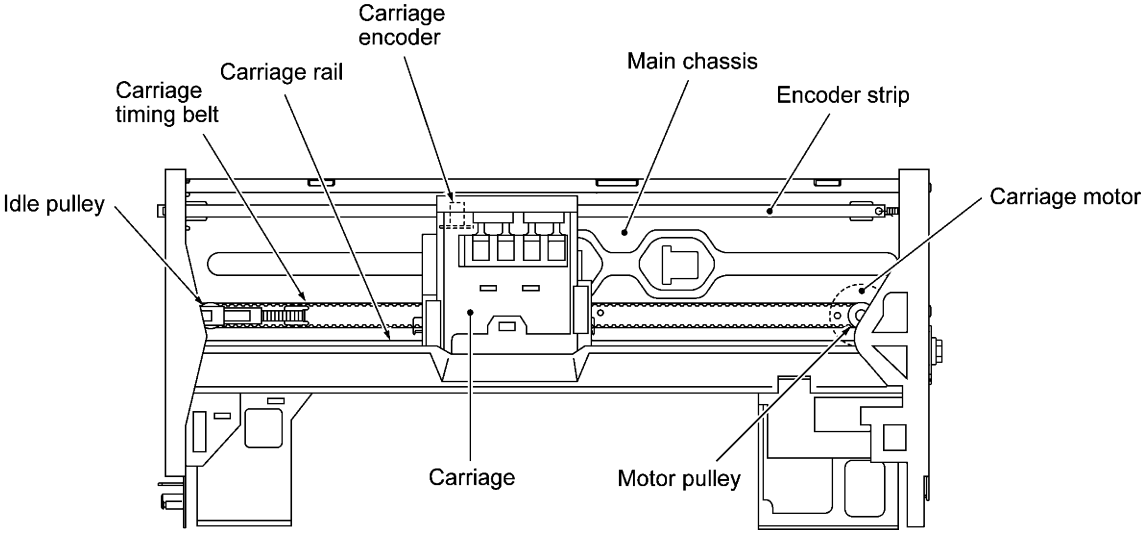


2.2.4 Carriage drive mechanism

The carriage motor controls horizontal motion. The motor rotation is transmitted via the motor pulley to the carriage timing belt.

The carriage, which is supported and guided by the carriage rail, is secured to the carriage timing belt. Clockwise and counterclockwise rotations of the carriage motor move the carriage to the right and left, respectively.

On the back of the carriage is the carriage encoder which tells the control circuitry the current carriage position counted based on the carriage home position by using the encoder strip attached to the main chassis.



2.3 Sensors and Actuators

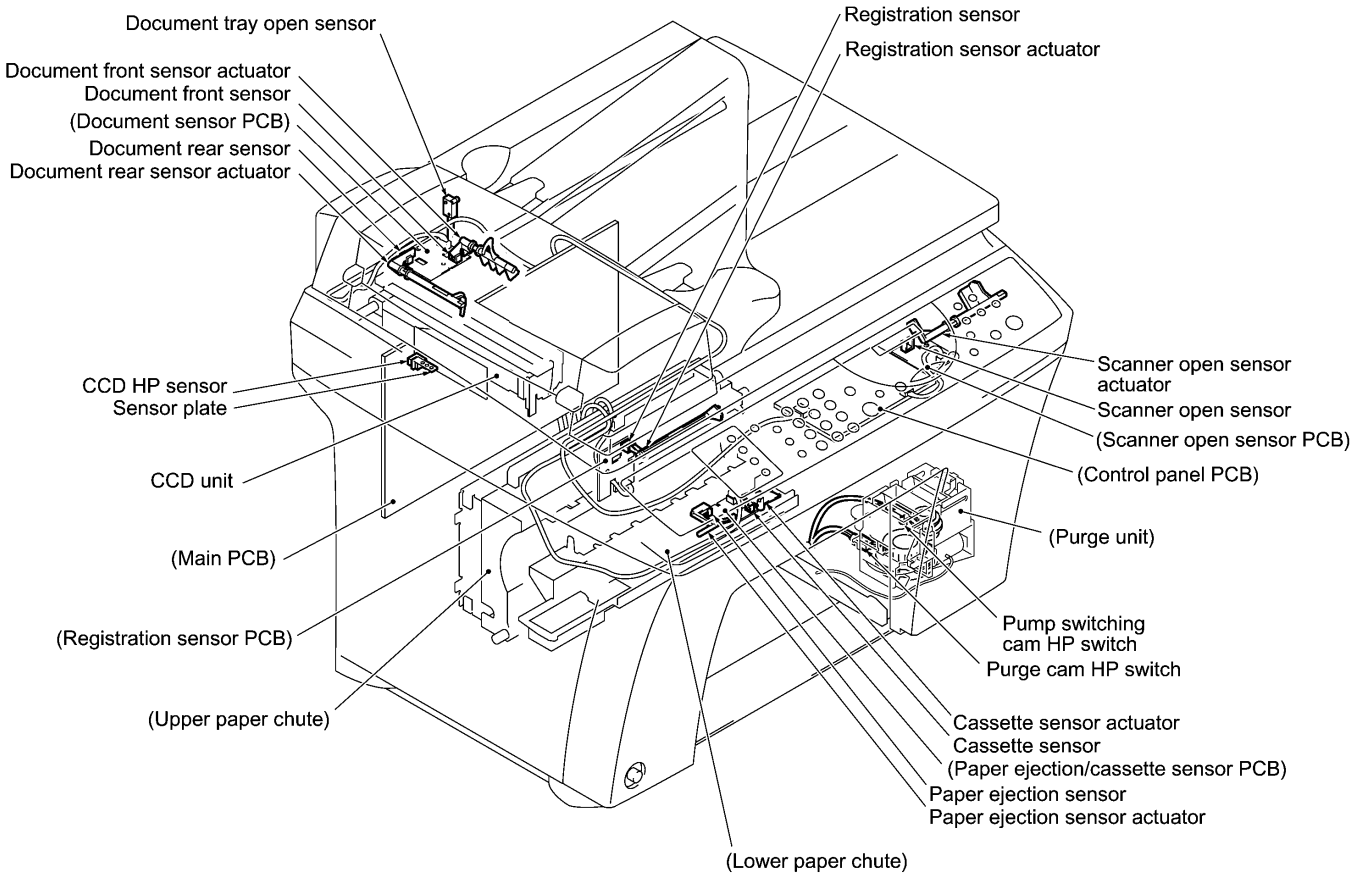
This equipment has the following sensors and thermistor.

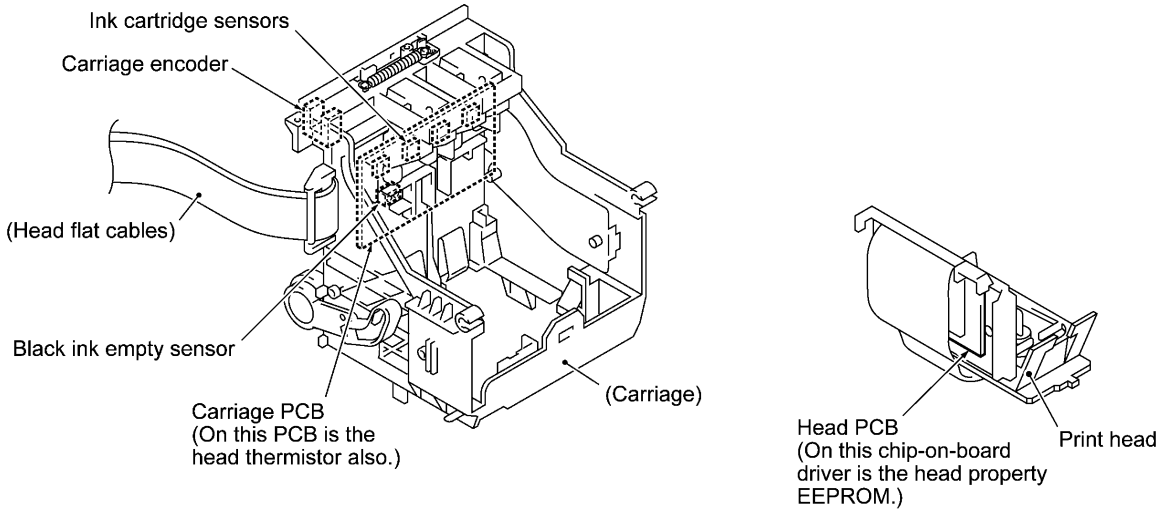
Sensor name	Type	Located on
Document front sensor	Photosensor	Document sensor PCB
Document rear sensor	Photosensor	Document sensor PCB
Document tray open sensor	Mechanical switch	Harness support
Scanner open sensor	Photosensor	Scanner open sensor PCB on the scanner base
CCD HP sensor	Photosensor	CCD unit
Registration sensor	Photosensor	Registration sensor PCB on the upper paper chute
Paper ejection sensor	Photosensor	Paper ejection/cassette sensor PCB on the lower paper chute
Cassette sensor	Photosensor	
Ink cartridge sensors	Mechanical switches	Carriage PCB
Black ink empty sensor	Photosensor	Carriage PCB
Carriage encoder	Photosensor	Carriage PCB
Head thermistor	Thermistor	Carriage PCB
Head property EEPROM on each head	—	Head PCB on each of the right and left print heads
Purge cam HP switch	Mechanical switch	Purge unit
Pump switching cam HP switch	Mechanical switch	Purge unit

- Document front sensor which detects the presence of documents.
- Document rear sensor which detects the leading and trailing edges of documents to tell the control circuitry when the leading edge of a new document has reached the starting position and when the scan for that page is over.
- Document tray open sensor which detects whether the document tray ASSY is closed.
- Scanner open sensor which detects whether the scanner unit is closed.
- CCD HP sensor which detects whether the CCD unit is in the home position.
- Registration sensor which detects the leading and trailing edges of paper, which allows the controller to determine the registration timing.
- Paper ejection sensor which detects whether the paper goes out of the equipment.
- Cassette sensor which detects whether the paper cassette is loaded.
- Ink cartridge sensors, each of which detects whether an ink cartridge is loaded.
- Black ink empty sensor which detects whether the black ink cartridge is empty.

- Carriage encoder which detects the current carriage position and carriage travel speed. If the carriage travel speed varies abnormally, the controller regards it as a paper jam.
- Head thermistor which allows the controller to control the temperature of the print heads. According to the change of the thermistor's internal resistance monitored, the control circuitry regulates the drive voltage applied to the piezoelectric ceramic actuators on each print head since the viscosity of the ink varies depending upon the temperature.
- Head property EEPROM which stores the head property information on each print head, as well as including a jetted-out ink drops counter and correction values of the black ink empty sensor. If you set the right or left print head on the carriage, the control circuitry on the main PCB reads the information and regulates the drive voltage applied to the head's piezoelectric ceramic actuators.
- Purge cam HP switch which detects whether the purge cam is in the home position.
- Pump switching cam HP switch which detects whether the pump switching cam is in the home position.

The above photosensors are a photointerrupter consisting of a light-emitting diode and a light-sensitive transistor. Each of them has an actuator separately arranged as shown on the next page.



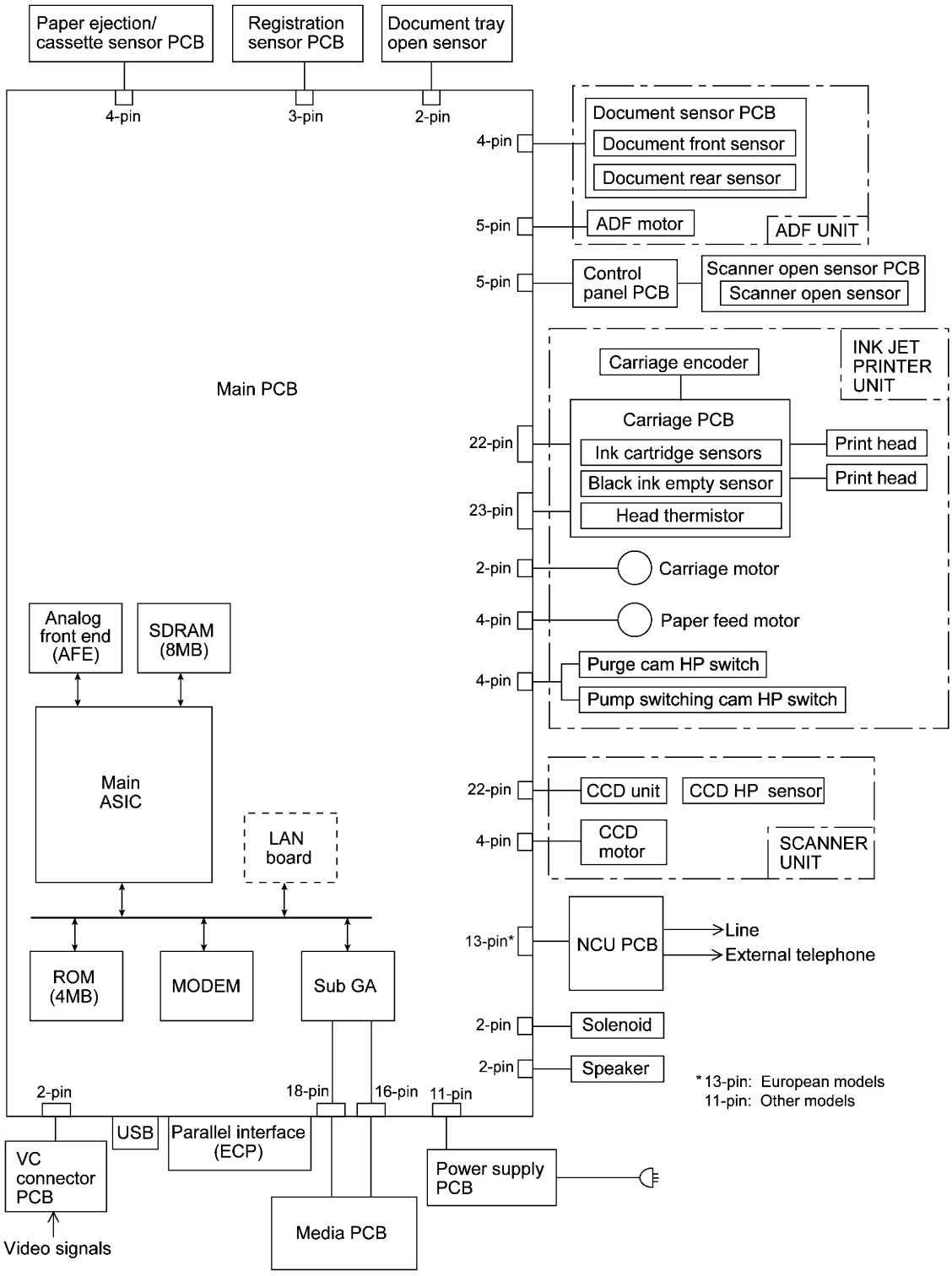


Location of Sensors and Actuators

3. CONTROL ELECTRONICS

3.1 Configuration

The hardware configuration of the facsimile equipment is shown below.



Configuration of Facsimile Equipment

CHAPTER IV.

DISASSEMBLY/REASSEMBLY AND LUBRICATION

CHAPTER IV. DISASSEMBLY/REASSEMBLY AND LUBRICATION

CONTENTS

1. DISASSEMBLY/REASSEMBLY

■ Safety Precautions

To prevent the creation of secondary problems by mishandling, observe the following precautions during maintenance work.

(1) Unplug the power cord from the power outlet before replacing parts or units. When having access to the power supply, be sure to unplug the power cord from the power outlet.

(2) Be careful not to lose screws, washers, or other parts removed for parts replacement.

(3) When using soldering irons and other heat-generating tools, take care not to damage the resin parts such as wires, PCBs, and covers.

(4) Before handling the PCBs, touch a metal portion of the equipment to discharge static electricity; otherwise, the electronic parts may be damaged due to the electricity charged in your body.

(5) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.

(6) Be sure to reinsert self-tapping screws correctly, if removed.

(7) Tighten screws to the torque values listed on the following pages.

(8) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, always slide the connector lock to unlock it.

(9) Before reassembly, apply the specified lubricant to the specified points. (Refer to Section 2 in this chapter.)

(10) After repairs, check not only the repaired portion but also that the connectors and other related portions function properly before operation checks.

(11) Once the print head prints, it will start head locking operation after five seconds from the end of printing. The head locking operation will take 5 to 10 seconds. NEVER unplug the power cord before the equipment completes the head locking operation; doing so will make the print head unusable and require replacement with a new print head.

When you receive the equipment from the user or when you pack it for sending it back to the user, check the head locking state.

Tightening Torque List

Location	Screw type	Q'ty	Tightening torque N•m (kgf•cm)	Loosening torque N•m (kgf•cm)
Hinges on the document tray ASSY	Taptite, cup B M3x10	6	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Document tray ASSY	Taptite, cup S M3x8	1	0.69 ±0.10 (7 ±1)	Min. 0.29 (3.0)
Rear cover	Taptite, cup S M3x10	3	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Harness support	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Grounding wire	Taptite, cup S M3x6	1	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Document tray open sensor	Taptite, pan P 1.6x8	1	0.15 ±0.03 (1.5 ±0.3)	Min. 0.10 (1.0)
ADF supports	Taptite, cup B M3x8	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
ADF side covers F and R	Taptite, cup S M3x8	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
ADF motor	Screw, pan (s/p washer) M3x6DA	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
ADF parts	Taptite, pan B M3x6	1	0.39 ±0.10 (4 ±1)	Min. 0.20 (2.0)
Upper ADF chute	Taptite, cup B M3x8	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
ADF motor bracket	Taptite, cup S M3x6	3	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Control panel ASSY	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Scanner open sensor PCB	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Control panel PCB	Taptite, cup B M2.6x8	2	0.39 ±0.10 (4 ±1)	Min. 0.20 (2.0)
Key support plate	Taptite, cup B M3x6	7	0.49 ±0.10 (5 ±1)	Min. 0.20 (2.0)
Torsion bar support	Taptite, cup S M3x6	2	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Hinges on the scanner unit	Taptite, bind B M4x12	4	0.98 ±0.10 (10 ±1)	Min. 0.29 (3.0)
Scanner top cover	Taptite, cup B M4x12	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
CCD rail clamp	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
CCD idle pulley holder	Taptite, pan B M3x10	2	0.39 ±0.10 (4 ±1)	Min. 0.20 (2.0)
CCD motor bracket	Taptite, cup B M3x8	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
CCD motor	Screw, pan (washer) M3x6DA	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Flat cable clamp	Taptite, cup B M3x8	4	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Guide plate	Taptite, cup B M3x8	4	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Inner cover	Taptite, cup S M3x10	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Front cover	Taptite, cup S M3x6	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Media shield plate	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
	Taptite, cup B M3x8	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Media PCB	Taptite, cup S M3x6	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Lens	Taptite, cup B M3x8	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Side cover L	Taptite, cup S M3x6	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
VC grounding bracket	Taptite, cup B M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
VC connector PCB	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Side cover R	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Speaker	Taptite, cup B M4x10	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)

Location	Screw type	Q'ty	Tightening torque N•m (kgf•cm)	Loosening torque N•m (kgf•cm)
Cover sheet	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Rear frame	Taptite, cup S M3x6	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Hinges on the rear frame	Taptite, cup S M3x6	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
NCU bracket	Taptite, cup S M3x6	2	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
NCU PCB	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Power supply shield	Taptite, cup S M3x6	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Power supply PCB	Taptite, cup S M3x6	4	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
AC cord grounding wire	Screw, pan (washer) M4x8DB	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Interface connector	Machine screw, pan M3x6	2	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Main PCB	Taptite, cup S M3x6	4	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
PCB support plate (Insulator films)	Taptite, cup S M3x6	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Front lock frame	Taptite, cup S M3x6	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Main chassis	Taptite, cup S M3x5	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Side chassis R	Taptite, cup S M3x6	3	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Ink absorber box	Taptite, cup S M3x6	1	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Side chassis L	Taptite, cup S M3x6	3	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Gear frame	Taptite, cup S M3x5	3	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Purge unit	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
	Taptite, cup S M3x10	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Platen	Taptite, cup S M3x5	3	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Lower paper chute	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Idle pulley stopper	Screw, pan (washer) M3x6DB	1	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)	Min. 0.20 (2.0)
Carriage motor	Screw, pan (s/p washer) M3x6DB	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Eccentric bushings R and L	Screw, pan (s/p washer) M3x6DB	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Tension plate	Screw, pan (s/p washer) M3x6DB	1	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Paper feed motor	Screw, pan (s/p washer) M3x6DA	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
Bottom plate	Taptite, cup S M3x6	4	0.98 ±0.10 (10 ±1)	Min. 0.20 (2.0)
Paper pick-up sector gear	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
PF side frame L	Taptite, cup S M3x6	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
PF side frame R	Taptite, cup S M3x6	2	0.69 ±0.10 (7 ±1)	Min. 0.20 (2.0)
	Taptite, cup B M3x10	2	0.59 ±0.10 (6 ±1)	Min. 0.20 (2.0)
Registration sensor PCB	Taptite, cup B M2.6x8	1	0.39 ±0.10 (4 ±1)	Min. 0.20 (2.0)

■ Preparation

Prior to proceeding to the disassembly procedure,

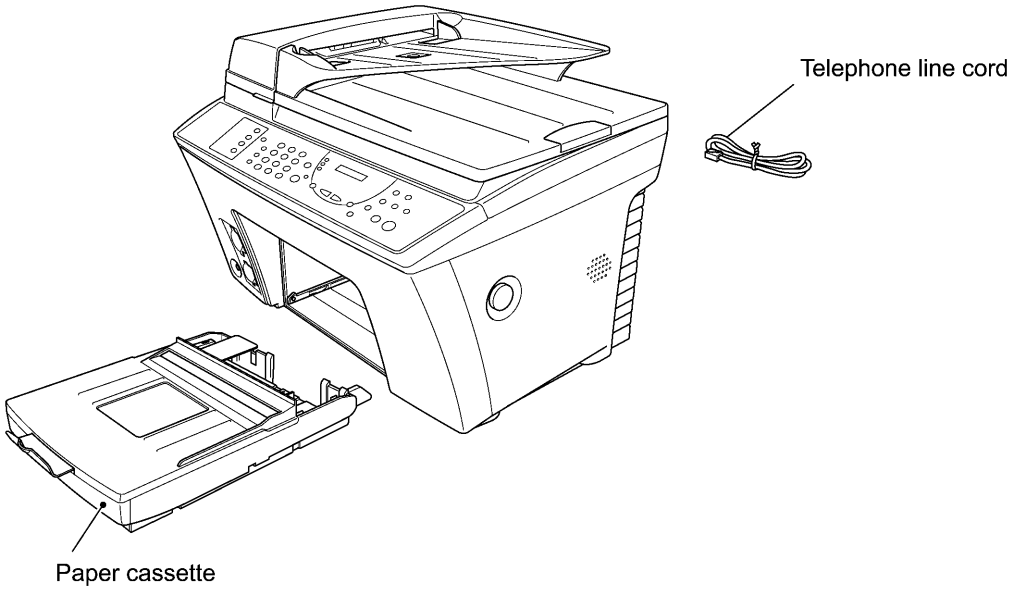
(1) Unplug

- the modular jack of the telephone line,
- the PC interface cable (not shown below), and
- the modular jack of an external telephone set if connected (not shown below).

(2) Remove

- the paper cassette (by lifting up its front end slightly and pulling it out).

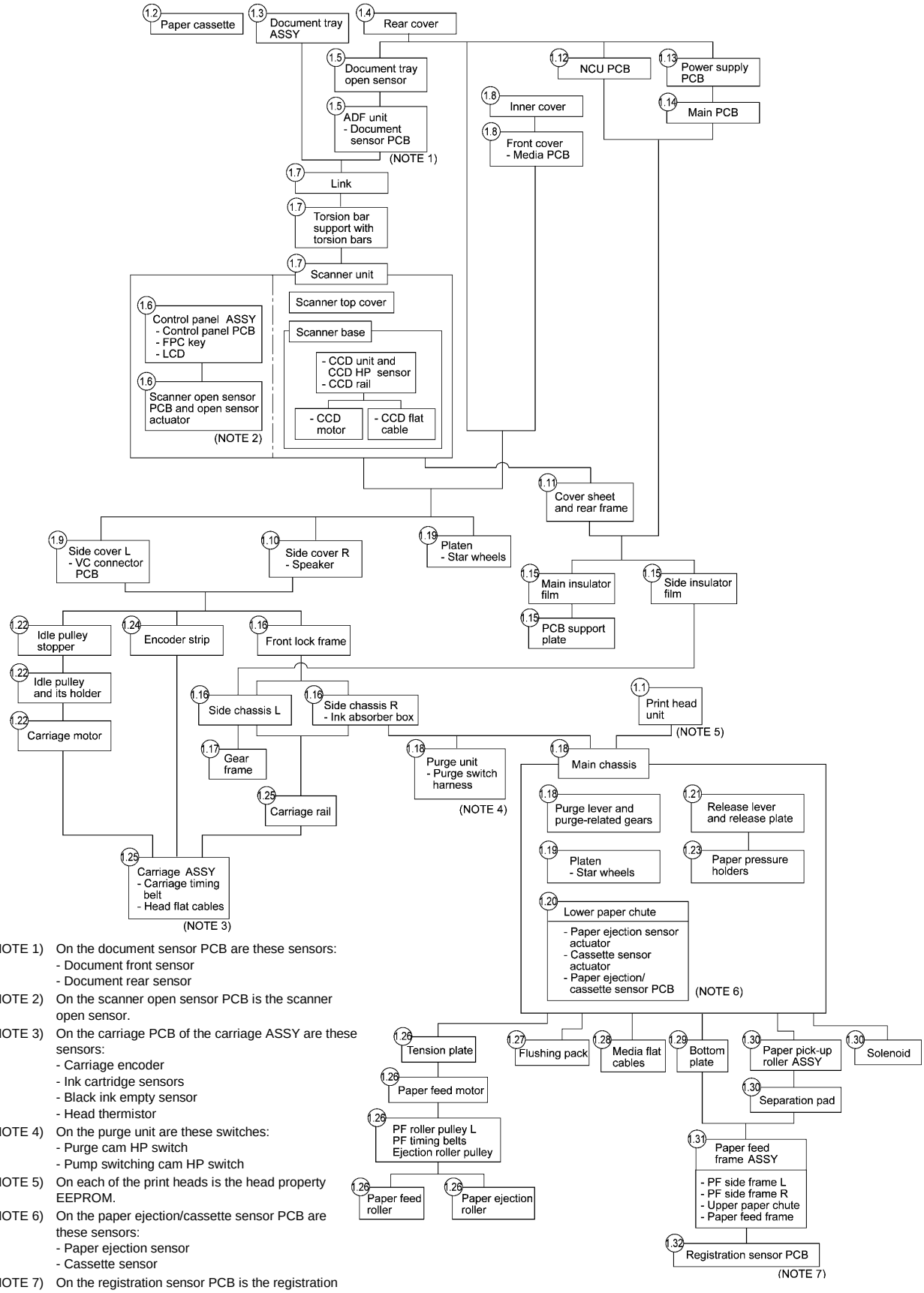
NOTE: Do not remove the ink cartridges when disassembling the equipment except when removing the print heads.



■ How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object components. To remove the platen, for example, first find it on the flow and learn its number (1.19 in this case). You need to remove parts numbered 1.3, 1.4, 1.5, 1.7, and 1.8 so as to access the platen.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

■ Disassembly Order Flow



(NOTE 1) On the document sensor PCB are these sensors:
- Document front sensor
- Document rear sensor

(NOTE 2) On the scanner open sensor PCB is the scanner open sensor.

(NOTE 3) On the carriage PCB of the carriage ASSY are these sensors:
- Carriage encoder
- Ink cartridge sensors
- Black ink empty sensor
- Head thermistor

(NOTE 4) On the purge unit are these switches:
- Purge cam HP switch
- Pump switching cam HP switch

(NOTE 5) On each of the print heads is the head property EEPROM.

(NOTE 6) On the paper ejection/cassette sensor PCB are these sensors:
- Paper ejection sensor
- Cassette sensor

(NOTE 7) On the registration sensor PCB is the registration sensor.

1.1 Print Head Unit

<u>During disassembly jobs (except when removing the carriage rail or carriage ASSY), the print head unit and all the four ink cartridges should be kept in place.</u>

NOTE: The print head unit is a pair of the right and left print heads. If either one of them is defective, replace the pair with a new one.

NOTE: To replace the print head unit with a new one, you need to move the carriage to the ink replacement position by placing the machine in the ink replacement mode. Do not move the carriage by hand when the power is off. If the print head is replaced with a new one not in the ink replacement mode, you need to adjust the sensing reference level of the black ink empty sensor (see Chapter V, Section 3.10).

NOTE: If you replace both the print head unit and main PCB with new ones at the same time, you need to adjust the sensing reference level of the black ink empty sensor (see Chapter V, Section 3.10).

NOTE: If you replace the print head unit with a new one, replace also the ink absorber box and ink cartridges with new ones.

(1) Plug the power cord into a wall socket.

(2) Press the **Ink Management** key to place the machine in the ink replacement mode.

(3) Press ◁ or ▷ key to choose "2. REPLACE INK," then press **Set** key.

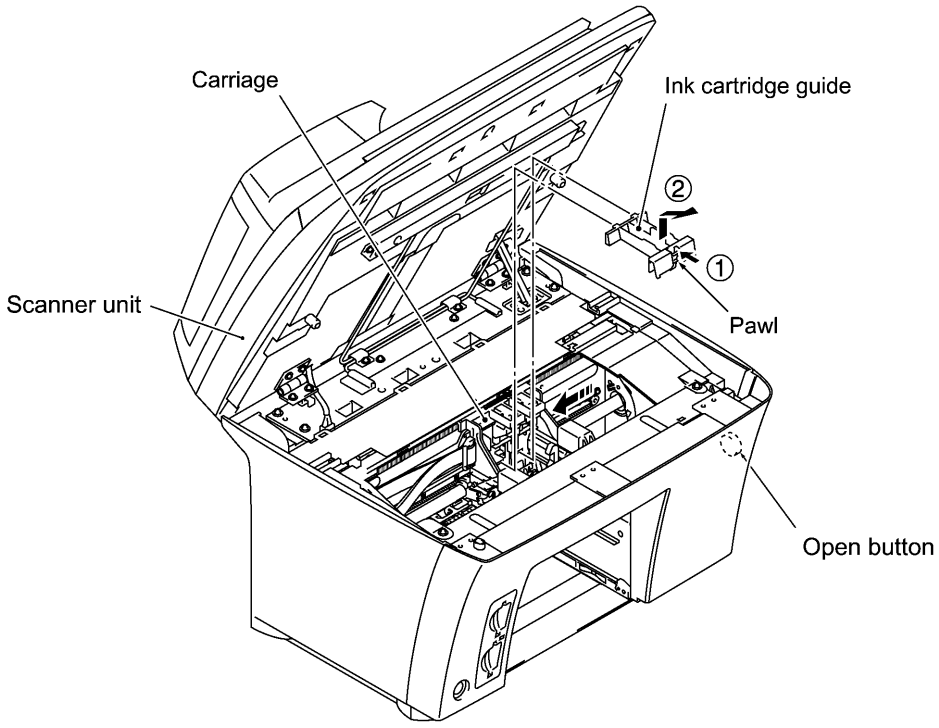
The carriage automatically moves to the ink replacement position.

(4) Press the open button to open the scanner unit.

(5) Remove all ink cartridges, one at a time. (Refer to the OWNER'S MANUAL.) Or, remove the yellow shipping cover.

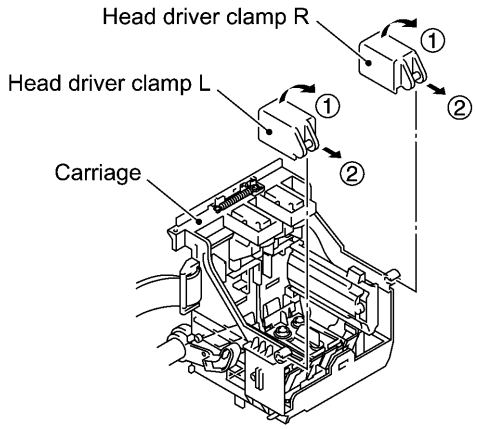
(6) Unplug the power cord from the wall socket.

(7) Push the pawl and pull up the ink cartridge guide in the direction of the arrows ① and ②.

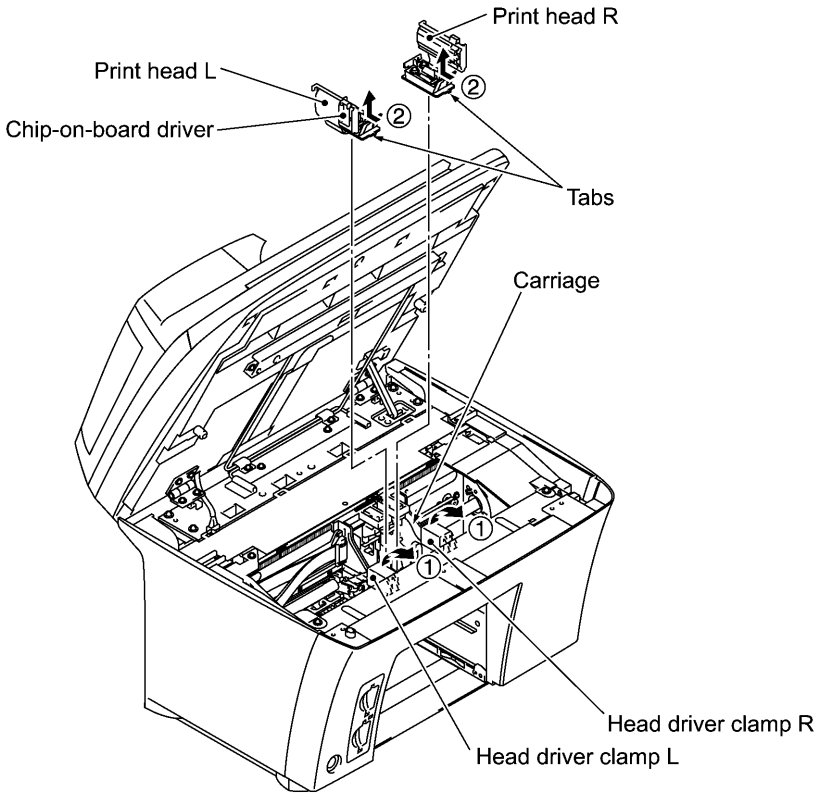


(8) Remove the head driver clamps R and L in the direction of arrows ① and ②.

NOTE: When you pull the clamps towards you, they may interfere with the scanner frame. Put each of the clamps within the cutout provided in the scanner frame by moving the carriage each time.



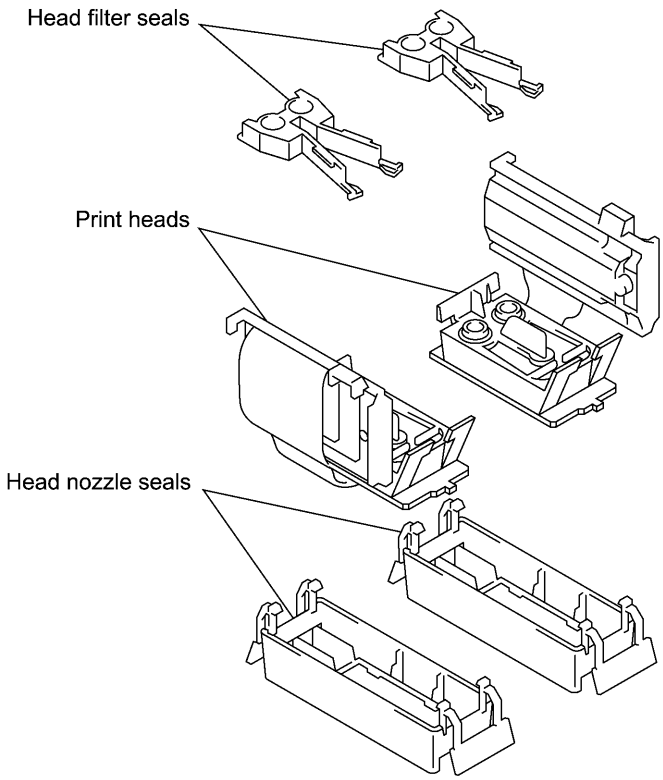
(9) Press each of the print heads R and L to the rear (against the leaf spring) to release the front tab from the carriage, then lift it up and out of the carriage.



NOTE: Do not touch the printing ends (nozzles) of the print heads; doing so will stain your hands with ink.

NOTE: Be sure to put a head nozzle seal and filter seal on each of the print heads as shown on the next page. Leaving the print heads without those seals will dry up their printing ends and filters, resulting in damaged heads.

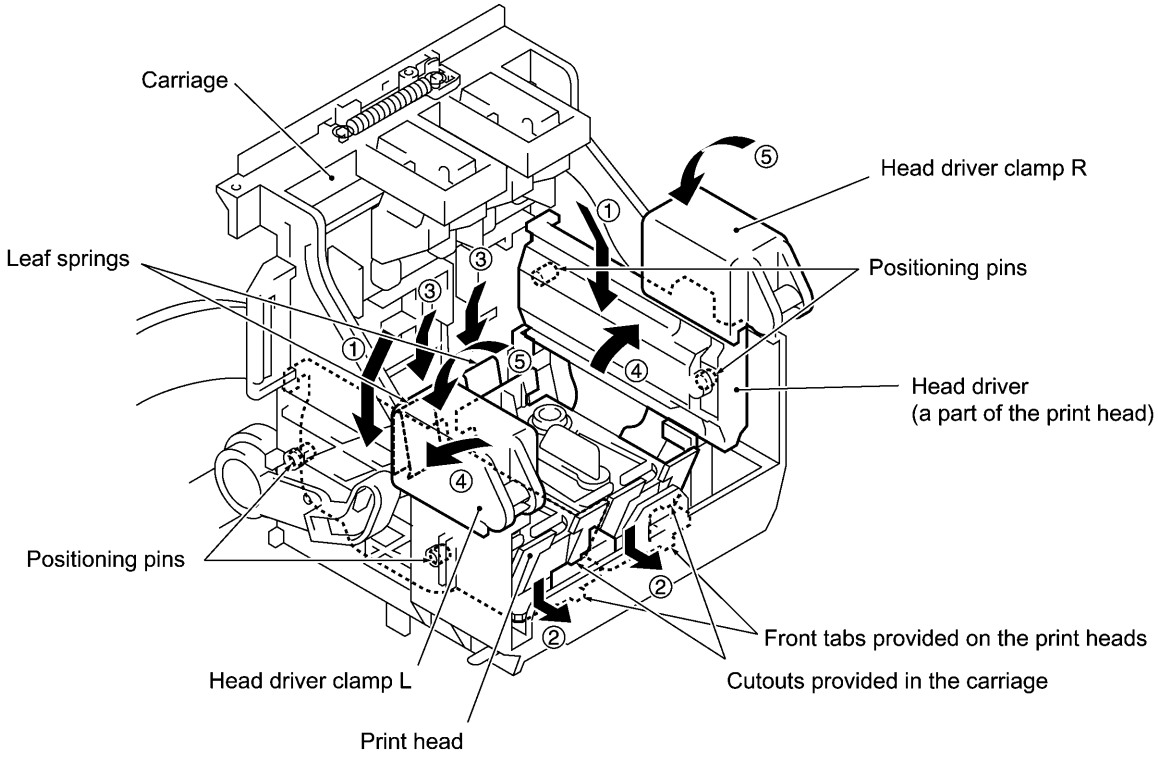
NOTE: Do not touch the chip-on-board (COB) driver of each print head.



(10) If the head caps have collected ink, clean them with a head cleaner. If the surrounding parts are stained with ink, wipe them off with a clean cloth.

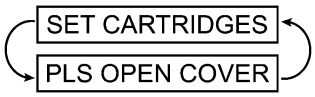
(11) To install a new (or removed) print head unit, take off the head nozzle seals and then set each print head according to the following steps as shown on the next page:

1) Put the print head into the carriage in the direction of arrow ①.
2) Insert the front tab of the print head into the cutout provided in the carriage in the direction of arrow ②.
3) Push down the rear end of the print head into place along the leaf spring in the direction of arrow ③.
4) Fit the head driver of the print head over the two positioning pins of the carriage in the direction of arrow ④.
5) Lock the head driver with the head driver clamp in the direction of arrow ⑤.
6) Remove the head filter seals.

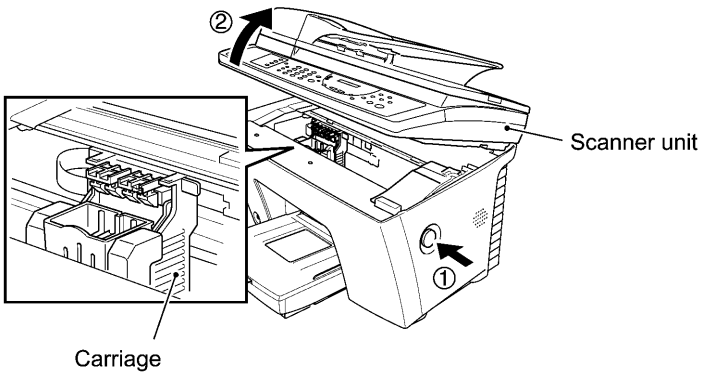


(12) Close the scanner unit, then plug the power cord into a wall socket.

The following messages will appear alternately on the LCD.

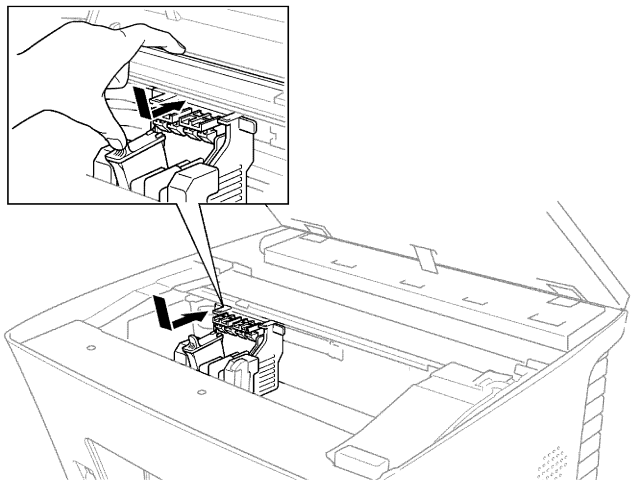


(13) Open the scanner unit. After a few seconds, the carriage will move left to the ink replacement position.



(14) Set new ink cartridges from left to right in the order of black, yellow, cyan, and magenta, as shown on the next page.

NOTE: Each color has its own correct position. Match the markings of the color indicators on the cartridge holder as a guide.



(15) Close the scanner unit.

(16) Follow the instructions shown on the LCD.

NOTE: Make sure that paper is loaded in the paper cassette.

NOTE: The machine enters a "head cleaning" cycle that takes approx. 6 minutes.

(17) If the machine prints no Test Sheet, press the **Function** (or **Menu**) key, select "2. PRINTER", press the **Set** key, select "1: TEST PRINT," and press the **Start** key.

This procedure will print a Test Sheet.

(18) Check the print quality of the Test Sheet. If it is not good, clean the print head again by pressing the **2** key. The screen will ask you if the print quality is OK for each color.

(19) Adjust the alignment of vertical print lines, referring to Chapter V, Subsection 3.12.

1.2 Paper Cassette

You may remove the parts from the paper cassette as follows:

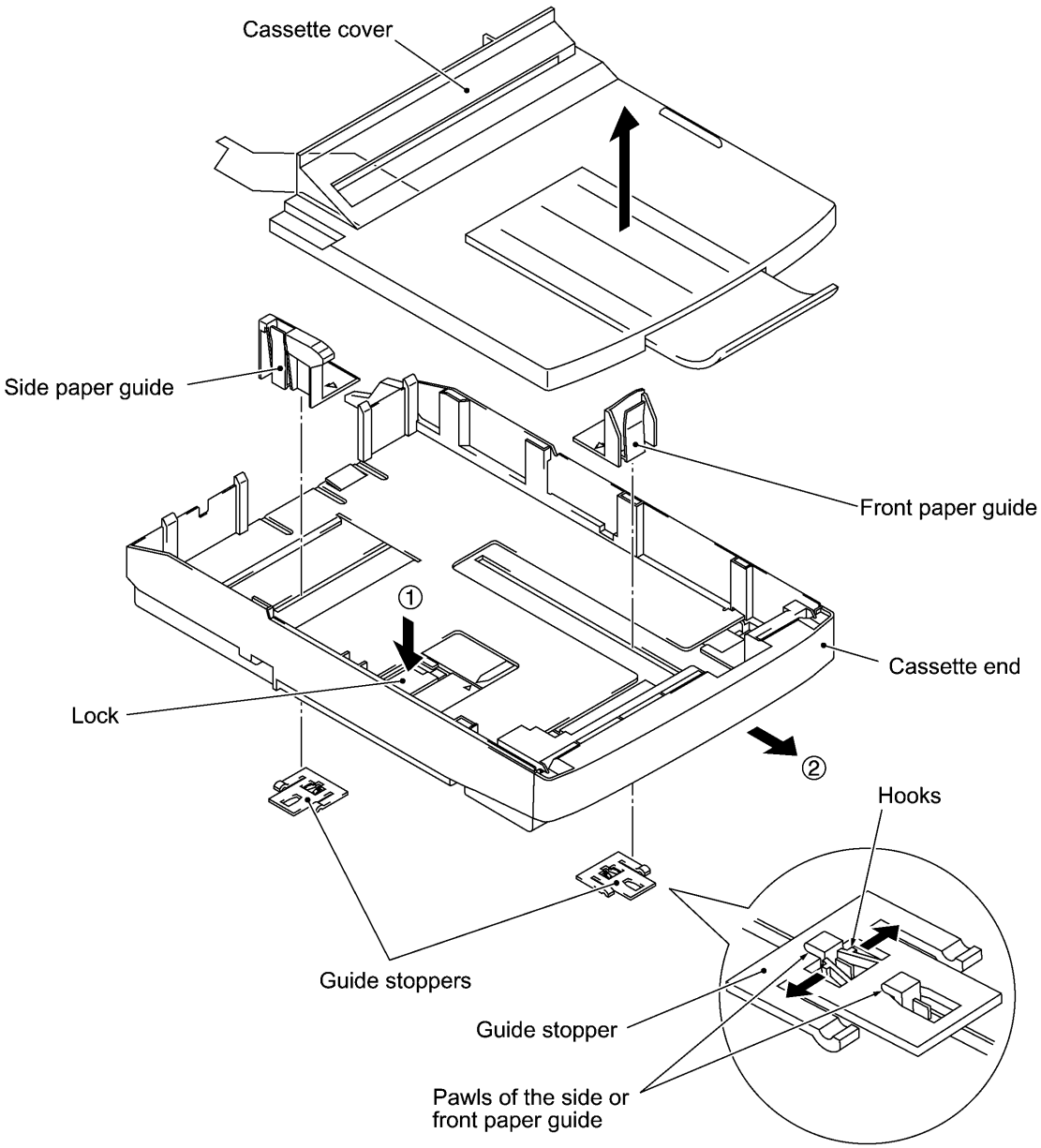
(1) Remove the cassette cover.

(2) To remove the front paper guide, lightly press the lock in the direction of arrow ① and pull out the cassette end in the direction of arrow ② until it stops.

Turn the paper cassette upside down.

Then pull the hooks of the guide stopper outwards and release the guide stopper from the pawls of the front paper guide.

(3) To remove the side paper guide, pull the hooks of the guide stopper outwards and release the guide stopper from the pawls of the side paper guide.



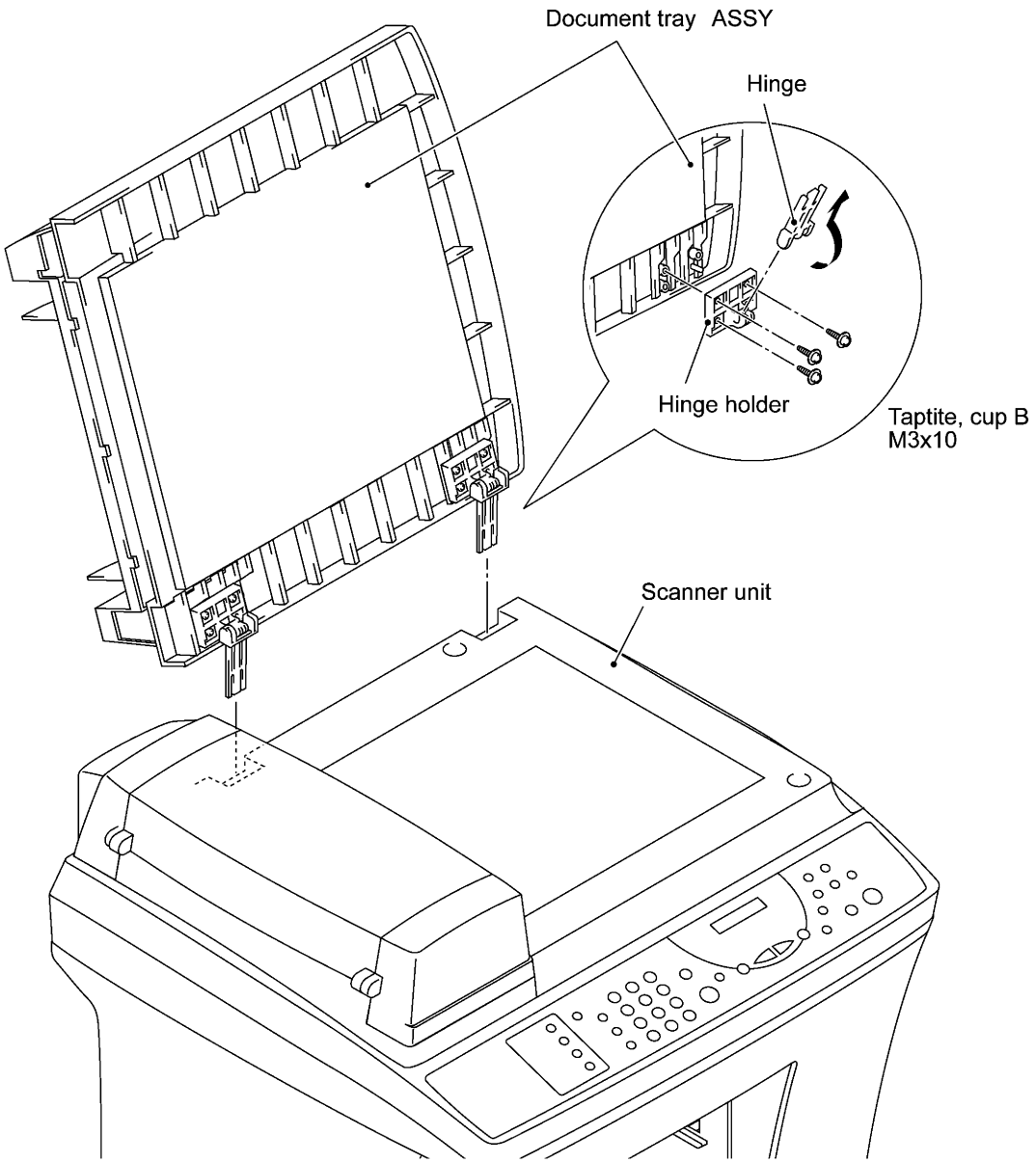
1.3 Document Tray ASSY

(1) Fully open the document tray ASSY.

(2) Lift up the document tray ASSY straight and take the hinges out of the scanner unit.

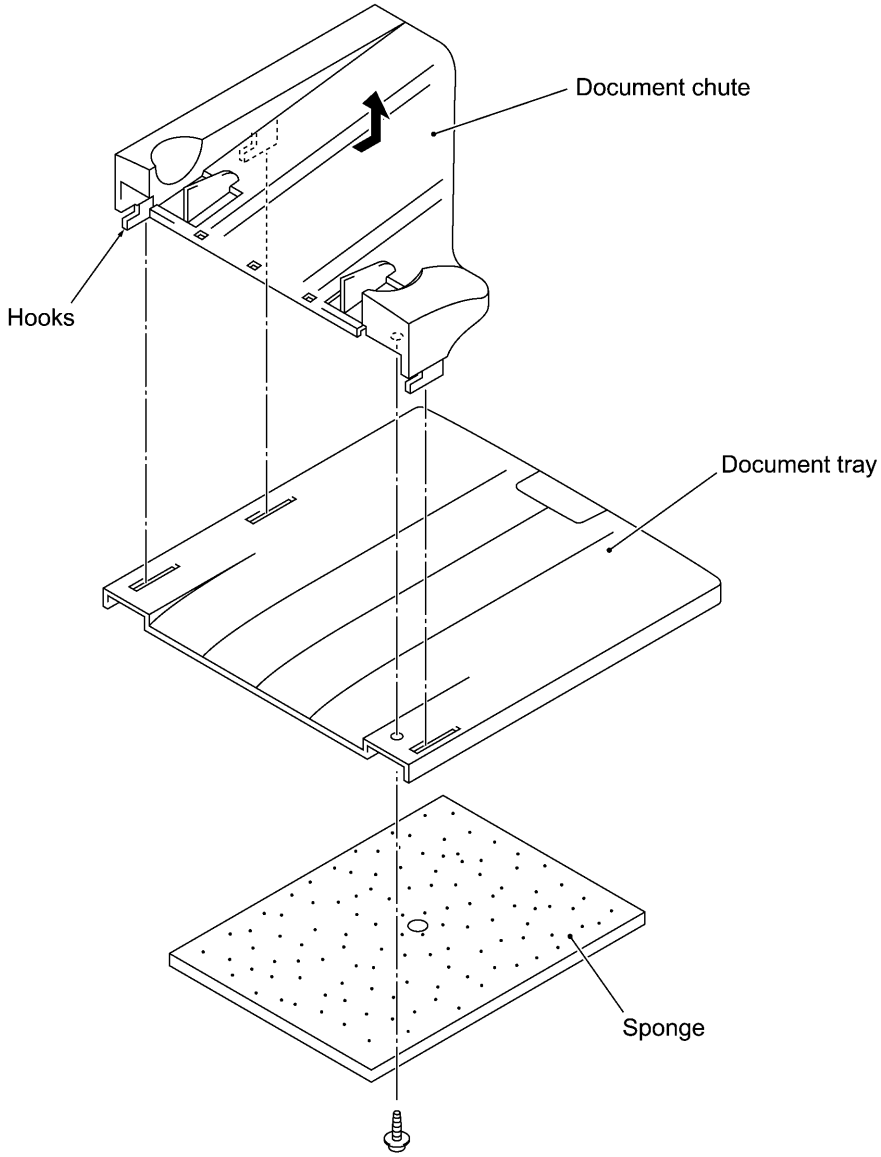
(3) As illustrated below, turn each of the hinges and pull it out.

(4) Remove the three screws from each of the hinge holders.



(5) Remove the screw, then lightly tap the left end of the document chute to release the three hooks from the document tray.

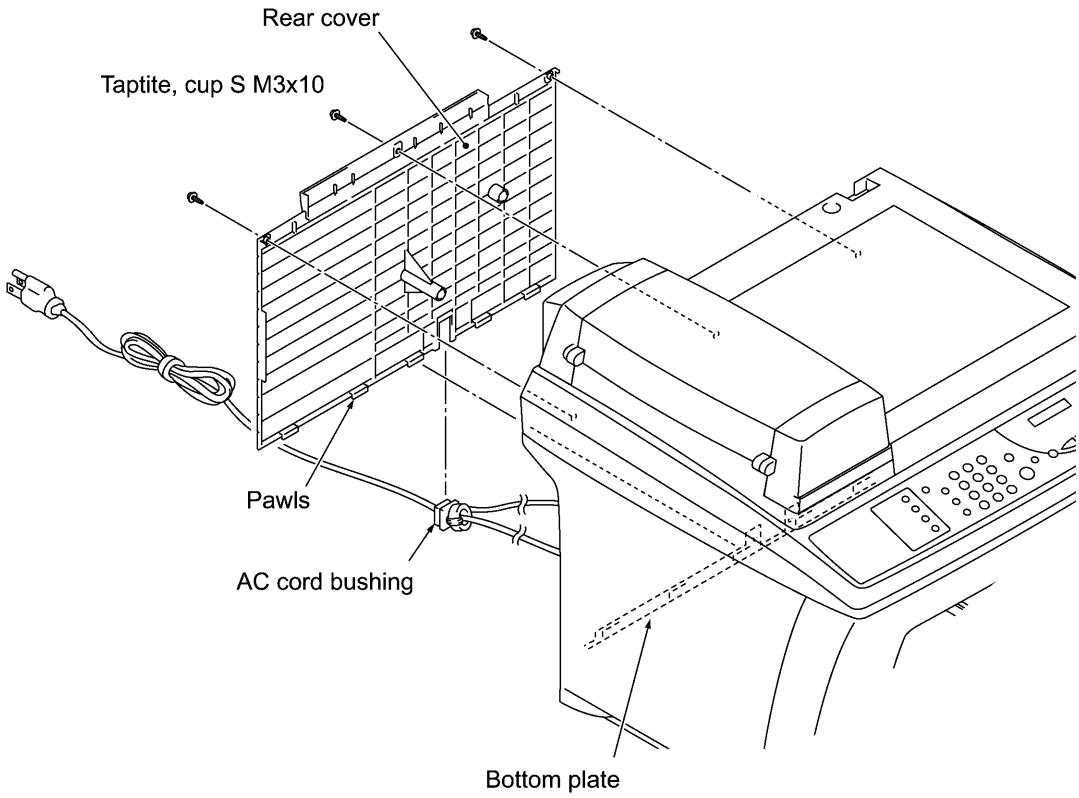
(6) Remove the sponge.



1.4 Rear Cover

(1) Remove the three screws and unhook the five pawls from the bottom plate.

(2) Remove the AC cord bushing from the rear cover.



1.5 Document Tray Open Sensor and ADF Unit

(1) Open the ADF unit.

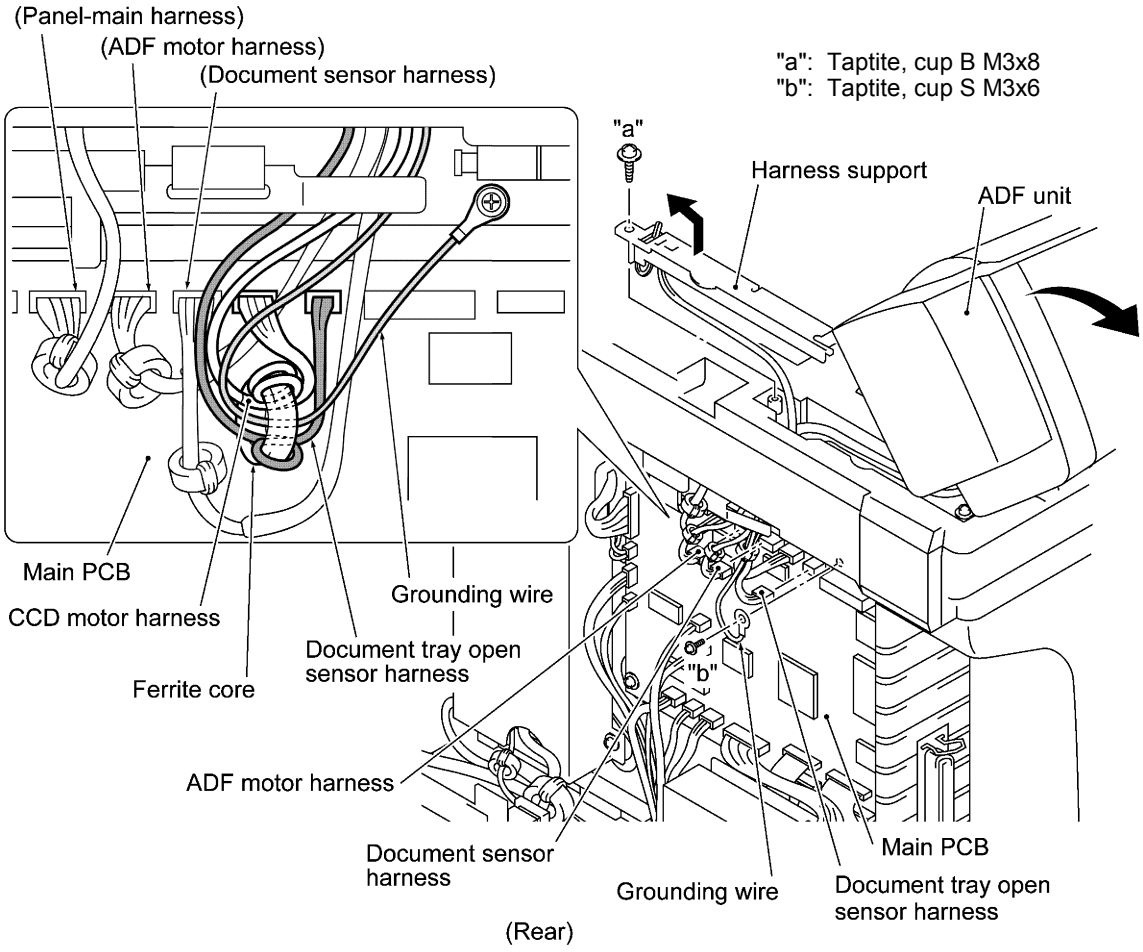
(2) Remove screw "a" from the harness support (which holds the document tray open sensor).

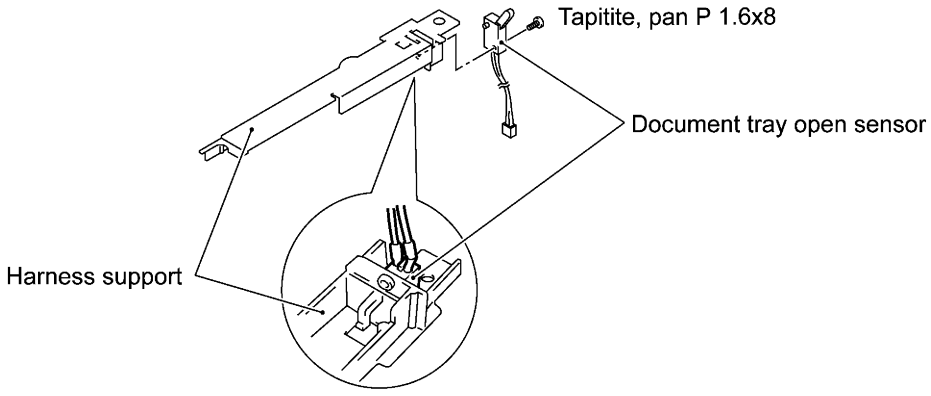
(3) Disconnect the document tray open sensor harness from the main PCB and remove the harness support together with the document tray open sensor.

Remove the screw from the document tray open sensor.

(4) Remove screw "b" to release the grounding wire.

(5) Disconnect the ADF motor harness and document sensor harness from the main PCB.



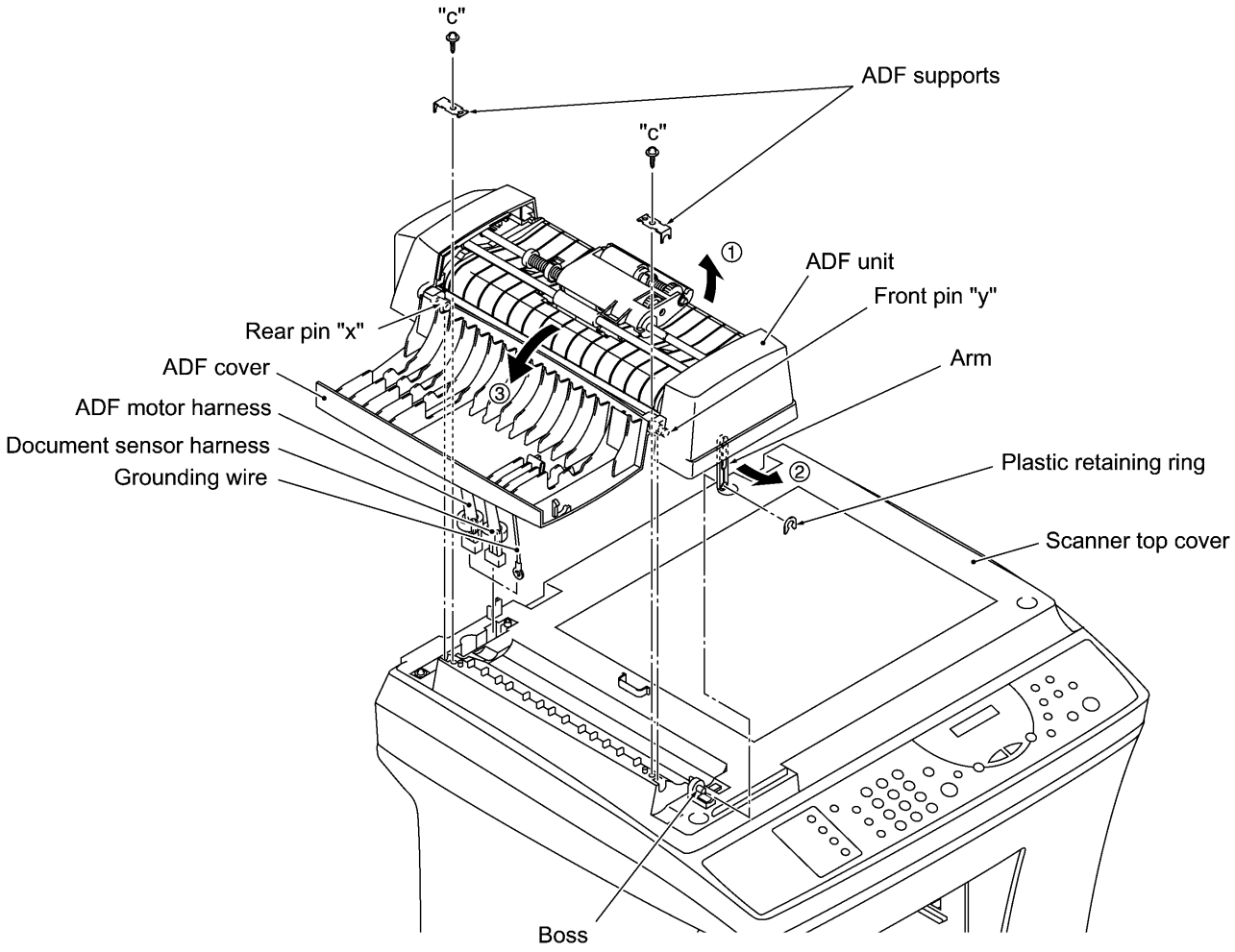


(6) Turn the ADF unit in the direction of arrow ①, remove the plastic retaining ring, and release the arm (arrow ②) from the boss provided on the scanner top cover. Turn the ADF unit back into place.

(7) Open the ADF cover (arrow ③) and remove two screws "c."

(8) Lift up the ADF unit while pulling out the ADF motor harness, document sensor harness, and grounding wire. The ADF supports also come off.

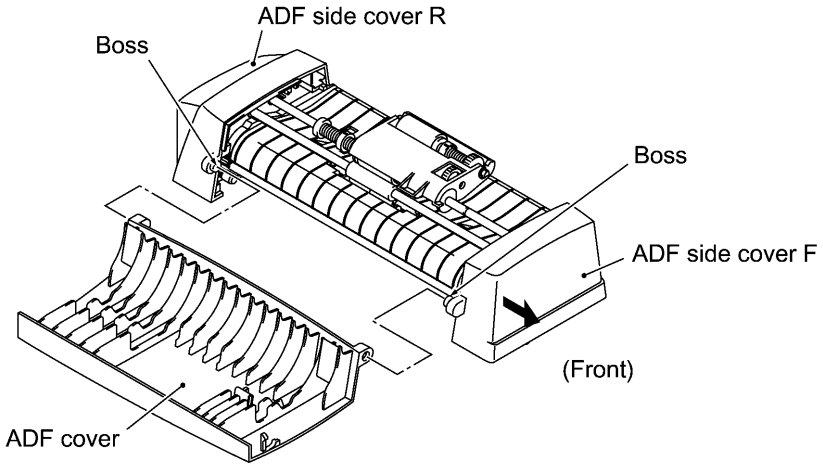
(9) Lift up the ADF unit. The ADF supports also come off.



"c": Taptite, cup B M3x8

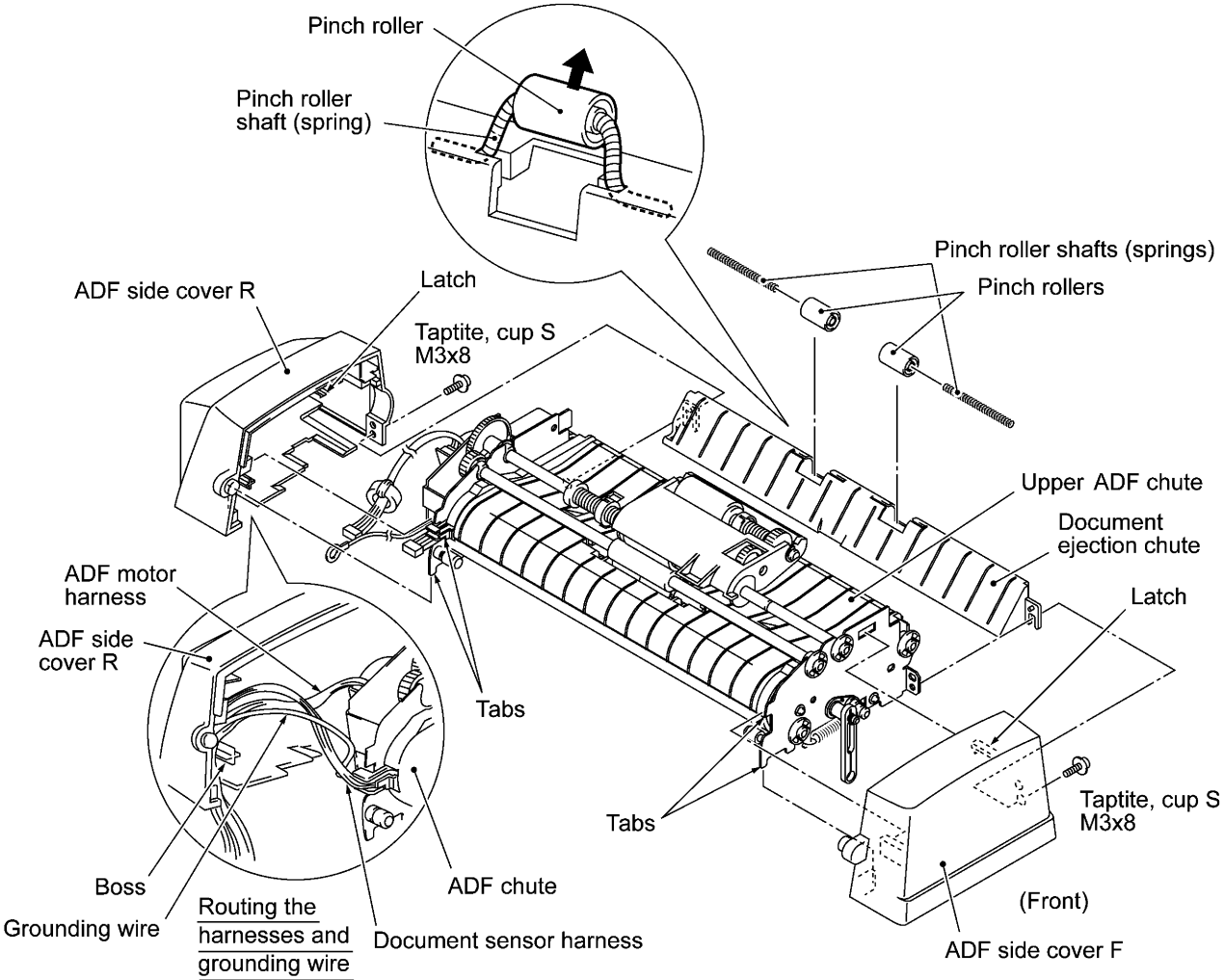
[Disassembling the ADF unit]

1) Open the ADF cover. Pull the ADF side cover outwards and release the ADF cover from the bosses provided on the ADF side covers.



2) At each of the ADF side covers F and R, remove the screw, pull the unscrewed corner outwards to release it from the document ejection chute, and unhook the latch.

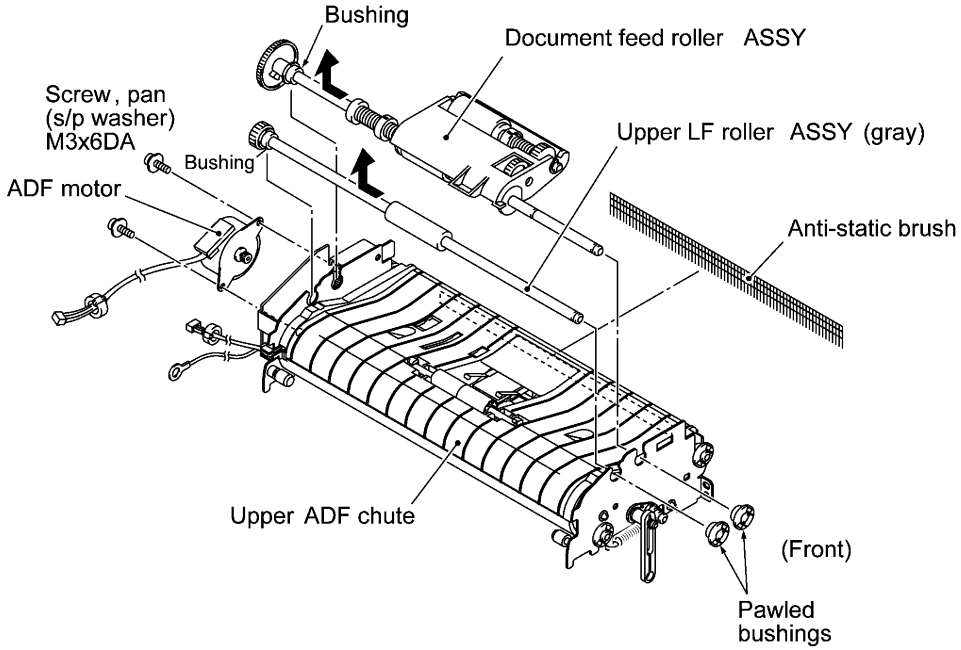
3) Remove the document ejection chute (which has been secured with the screws removed in step 2) above).



4) At the front end of the document feed roller shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the document feed roller ASSY.

5) At the front end of the upper LF roller (gray) shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the upper LF roller ASSY.

6) Remove the two screws and take off the ADF motor.



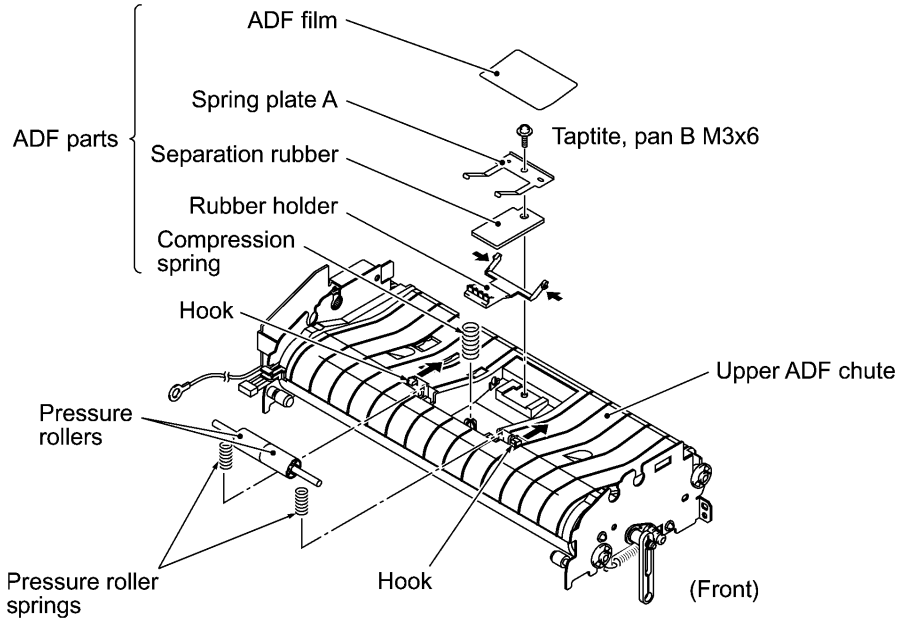
If you do not need to remove the ADF parts, skip to step 10).

7) Peel off the ADF film.

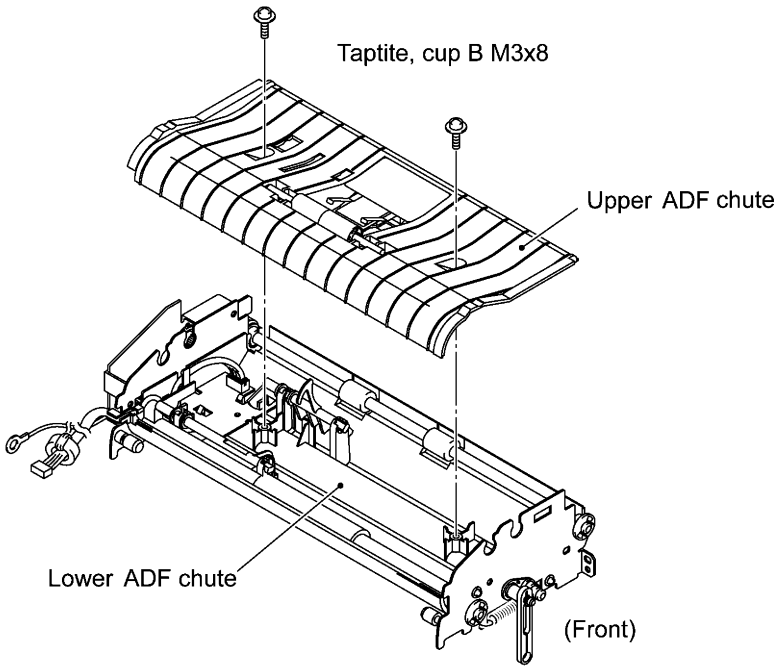
NOTE: Once removed, the ADF film will become unusable and a new part will have to be put back in.

8) Remove the screw and take off the spring plate A, separation rubber, rubber holder, and compression spring.

9) Push the hooks provided on the upper ADF chute and remove the pressure rollers and their springs.



10) Remove the two screws and lift up the upper ADF chute.

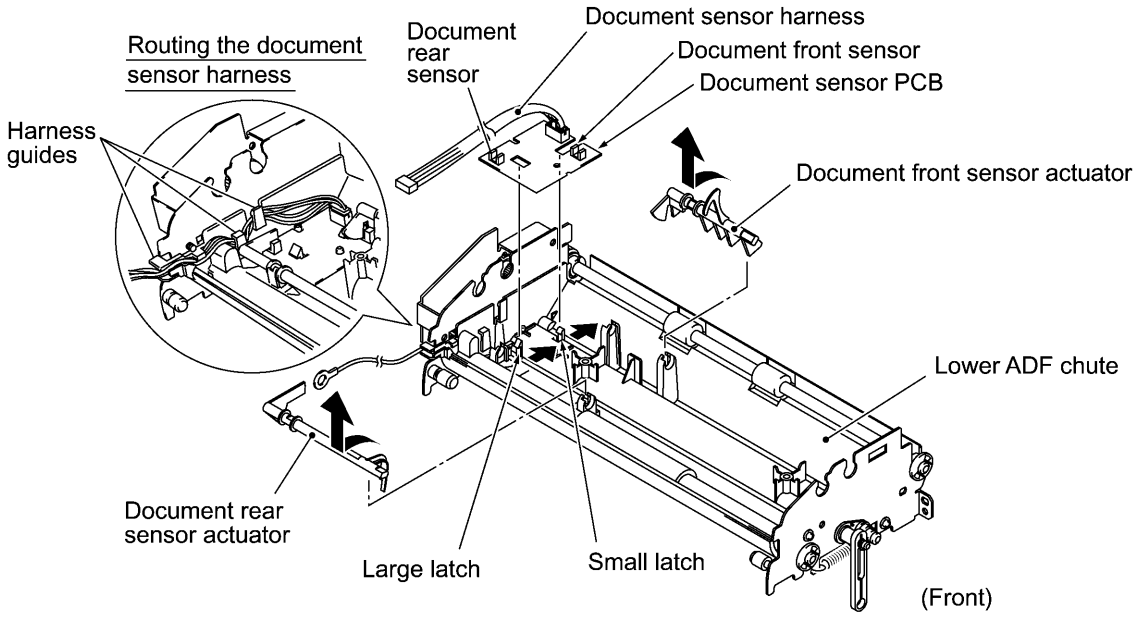


11) Turn the document front sensor actuator as shown below and lift it up.

12) Turn the document rear sensor actuator as shown below and lift it up.

13) Disconnect the document sensor harness from the document sensor PCB and take out its harness from the harness guides.

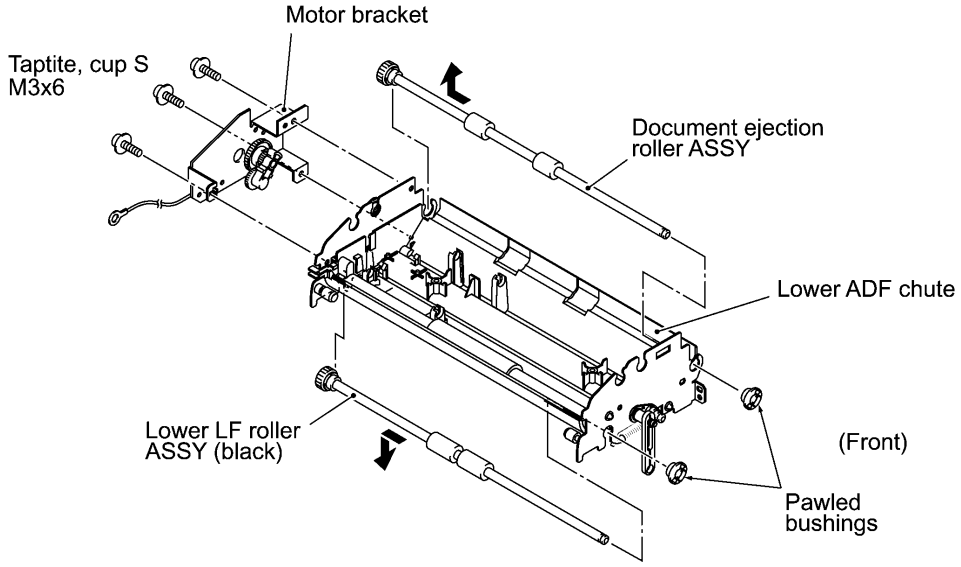
14) Unhook the two latches (large and small latches in this order) from the document sensor PCB and lift it up.



15) At the front end of the document ejection roller shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the document ejection roller ASSY.

16) Remove the three screws and take off the motor bracket.

17) At the front end of the lower LF roller (black) shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and remove the lower LF roller ASSY.



18) Turn the lower ADF chute upside down.

19) Pull the arm outwards and take it off.

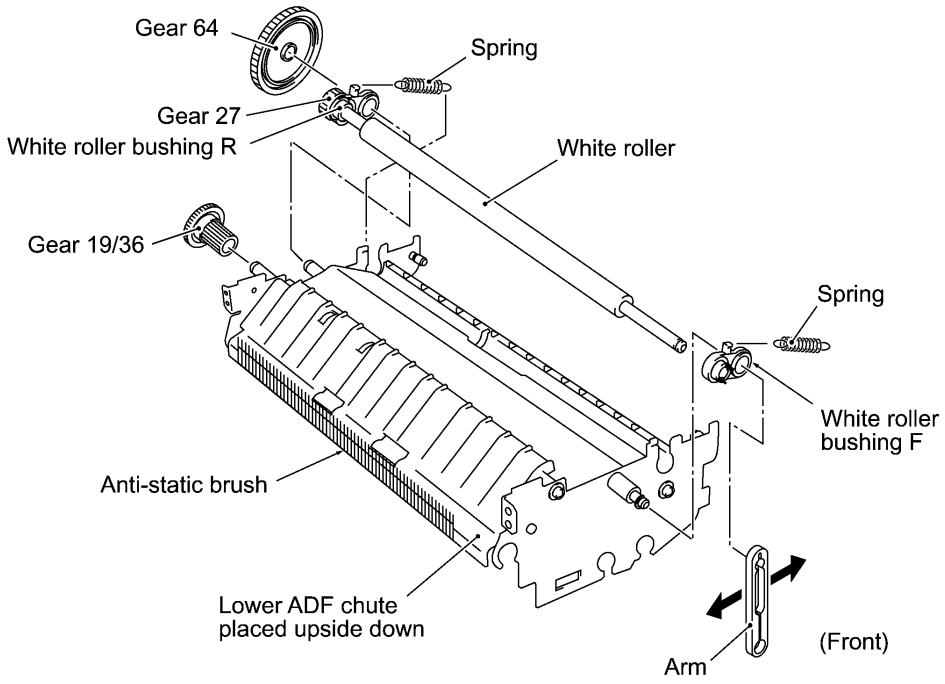
20) At the rear side of the lower ADF chute, remove the gear 19/36 by pulling its pawl outwards.

21) Remove the gear 64 by pulling its pawl outwards.

22) Unhook the two springs.

23) Pull out the white roller bushing F by pulling its pawls outwards.

24) Remove the white roller together with the white roller bushing R and gear 27.



■ Reassembling Notes

- Take care not to mistake the upper LF roller ASSY (gray) for the lower LF roller ASSY (black).
- When setting the document sensor PCB back into place, do not push it down straight, but first fit the PCB in the large latch and then fit it in the small latch (see the illustration given on page IV-19).
- Be sure to route the document sensor harness through the three harness guides so that it will not interfere with the document rear sensor actuator. (See the illustration given on page IV-19.)
- Reinstall the ADF motor with its connector side facing up. (See the illustration given on page IV-18.)
- Reinstall the ADF side covers so that the tabs of the ADF side plates become fitted inside the ribs provided on the ADF side covers. (See the illustration given on page IV-17.)
- When reinstalling the ADF side cover R, be sure to route the document sensor harness, ADF motor harness, and grounding wire between the boss and the ADF side cover R. (See the illustration given on page IV-17.)
- When reinstalling the ADF unit, first set the ADF support onto rear pin "x" of the ADF unit, set the ADF unit back into place, set the other ADF support onto front pin "y," then secure those ADF supports with two screws "c." (See the illustration given on page IV-16.)
- Before securing the grounding wire to the main chassis with screw "b," pass it through the ferrite core of the CCD motor harness. (See the illustration given on page IV-15.)
- Before connecting the document tray open sensor harness to the main PCB, wind it around the ferrite core of the CCD motor harness by one turn. (See the illustration given on page IV-15.)

1.6 Control Panel ASSY, Scanner Open Sensor PCB, and Open Sensor Actuator

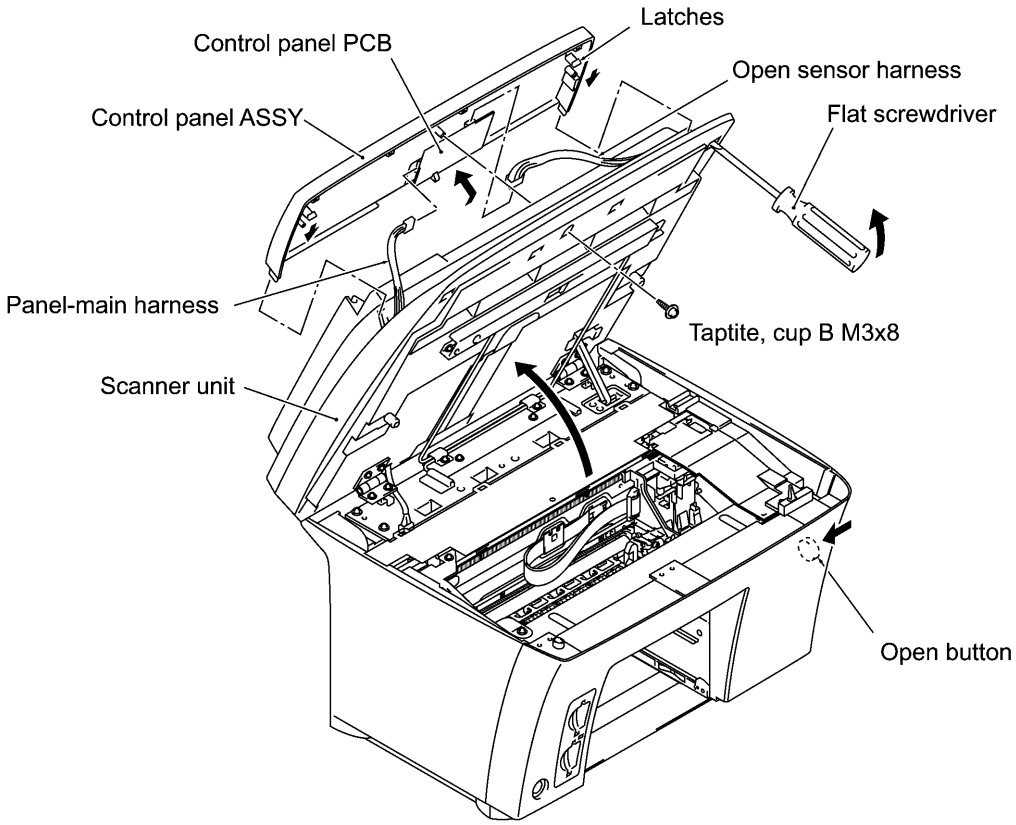
(1) Push the open button to open the scanner unit.

(2) Remove the screw from the scanner unit.

(3) Insert the tip of a flat screwdriver into each of the two holes provided in the bottom of the scanner unit and unhook the two latches while lifting up the control panel ASSY.

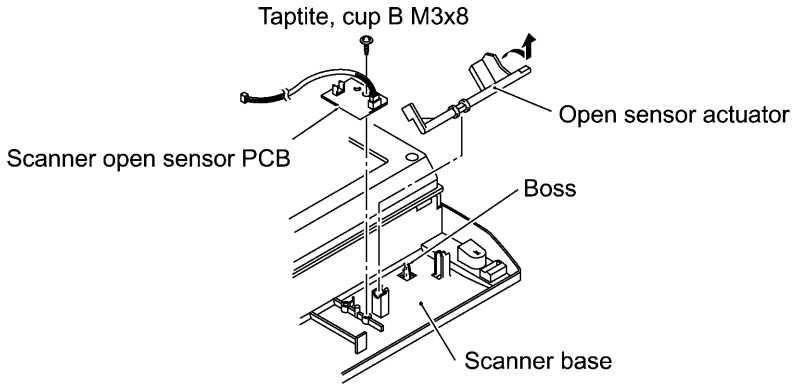
(4) Slightly slide the control panel ASSY towards you to separate it from the scanner unit.

(5) Disconnect the open sensor harness and panel-main harness from the control panel PCB.



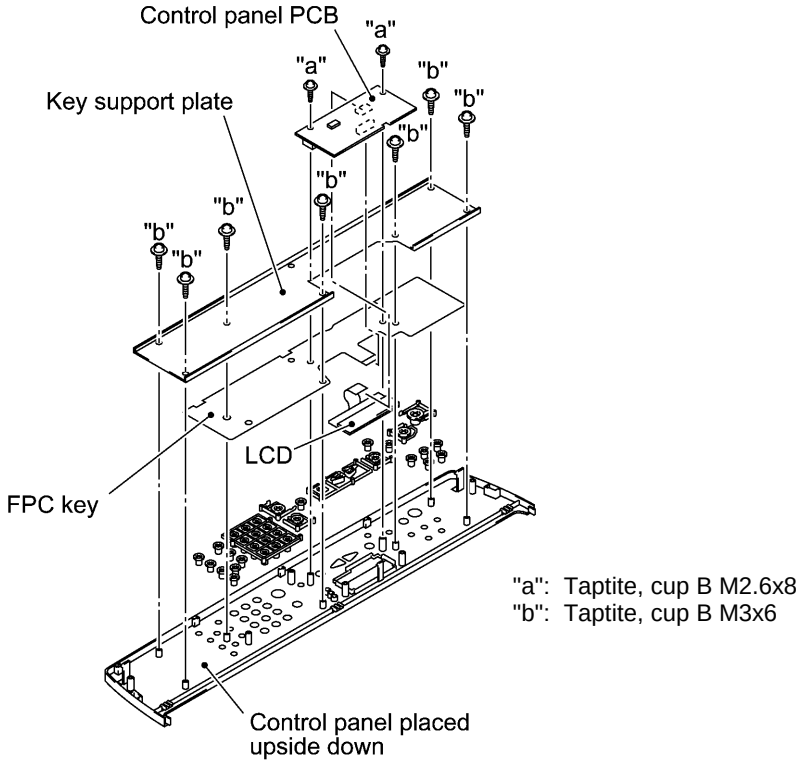
(6) Turn the open sensor actuator as shown below and lift it up.

(7) Remove the screw and take off the scanner open sensor PCB.



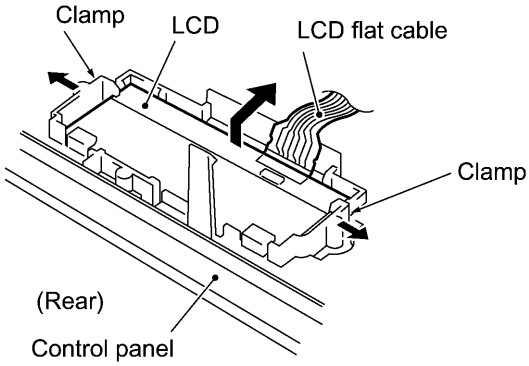
[Disassembling the Control Panel ASSY]

1) Turn the control panel ASSY upside down.
2) Remove two screws "a."
3) Slightly lift up the control panel PCB, then unlock the FPC key connector and disconnect the FPC key. Next, unlock the LCD cable connector and disconnect the LCD flat cable.
4) Remove seven screws "b."
5) Remove the key support plate and FPC key.



6) As shown below, slightly pull the clamps outwards and take out the LCD while pulling the LCD flat cable gently.

   NOTE: Do not take out the LCD except when the LCD is defective and requires replacement.



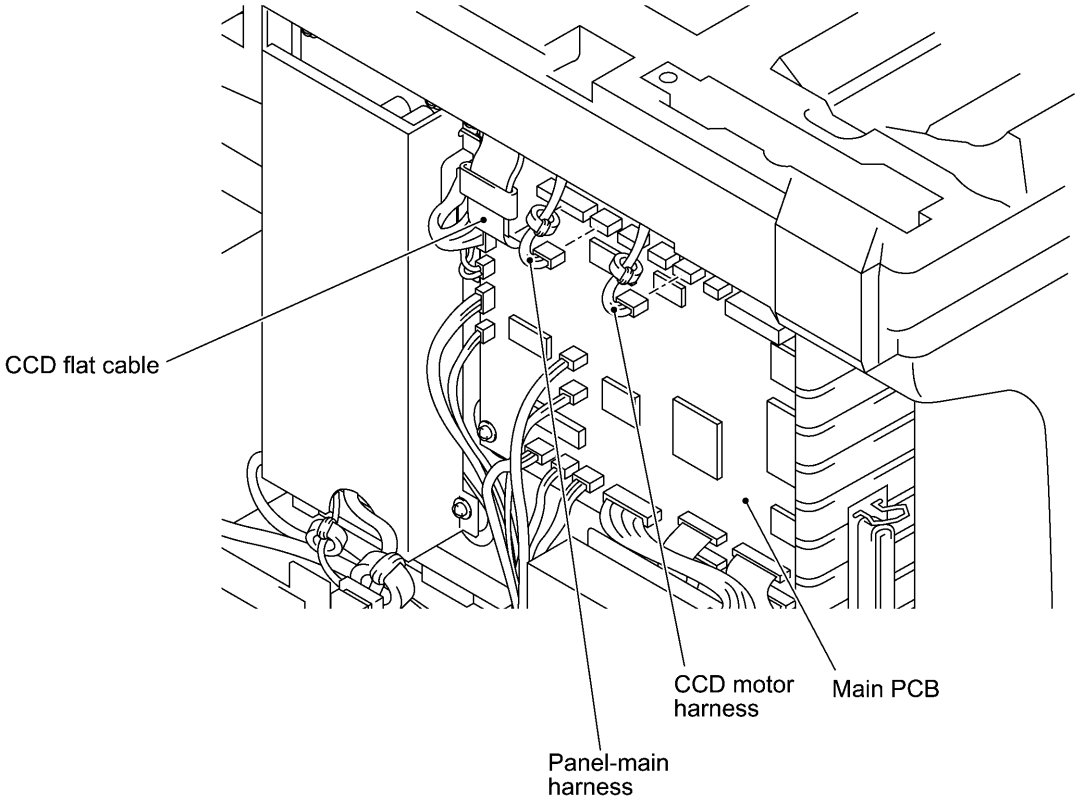
■ **Reassembling Notes**

- Before reinstalling the LCD to the control panel, wipe fingerprints or dust off the LCD surface and control panel window with a soft cloth.
- A new LCD is covered with a protection sheet. Before installing it, remove the protection sheet.

1.7 Scanner Unit

(1) Disconnect the following flat cable and harnesses from the main PCB:

- CCD flat cable
- Panel-main harness
- CCD motor harness



(2) Open the scanner unit.

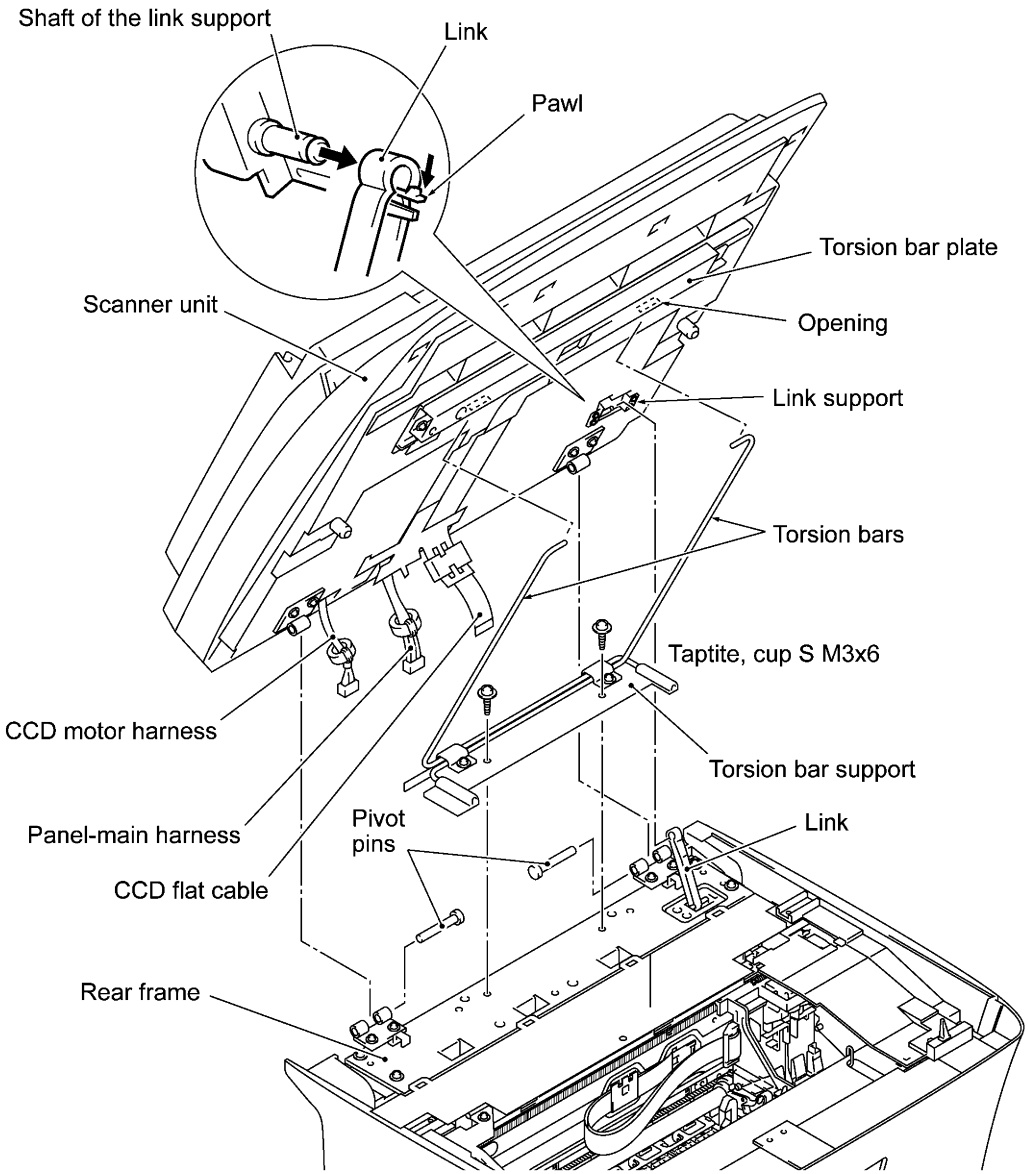
(3) Press the pawl of the link, move the link to the right, and release it from the shaft of the link support secured to the bottom of the scanner unit.

NOTE: Be careful with the scanner unit that will spring open further.

(4) Remove the two screws from the torsion bar support to release it from the rear frame.

(5) While holding the scanner unit by one hand, warp the top ends of the torsion bars to release them from the openings provided in the torsion bar plate. Then remove the torsion bar support together with the torsion bars from the machine.

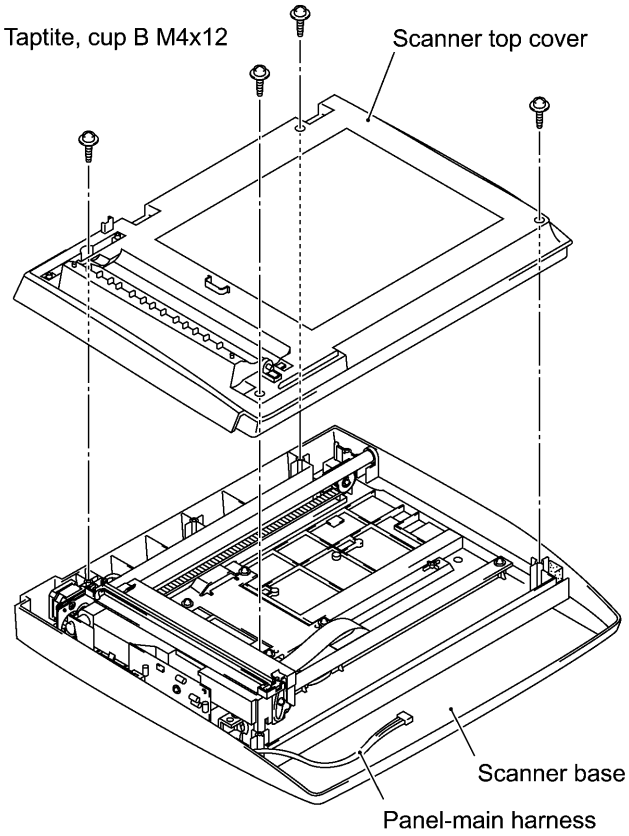
(6) Close the scanner unit and pull out the pivot pins inwards. The scanner unit may be separated.



[Disassembling the Scanner Unit]

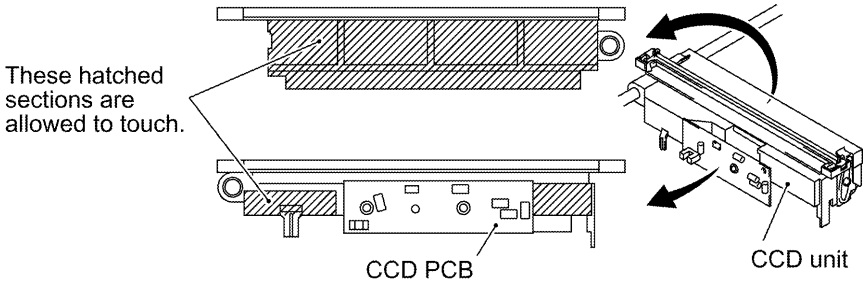
The disassembling job of the scanner unit should be done in a clean room to prevent dust or dirt from getting into the scanner unit.

1) Remove the four screws from the scanner top cover.
2) Separate the scanner top cover from the scanner base.



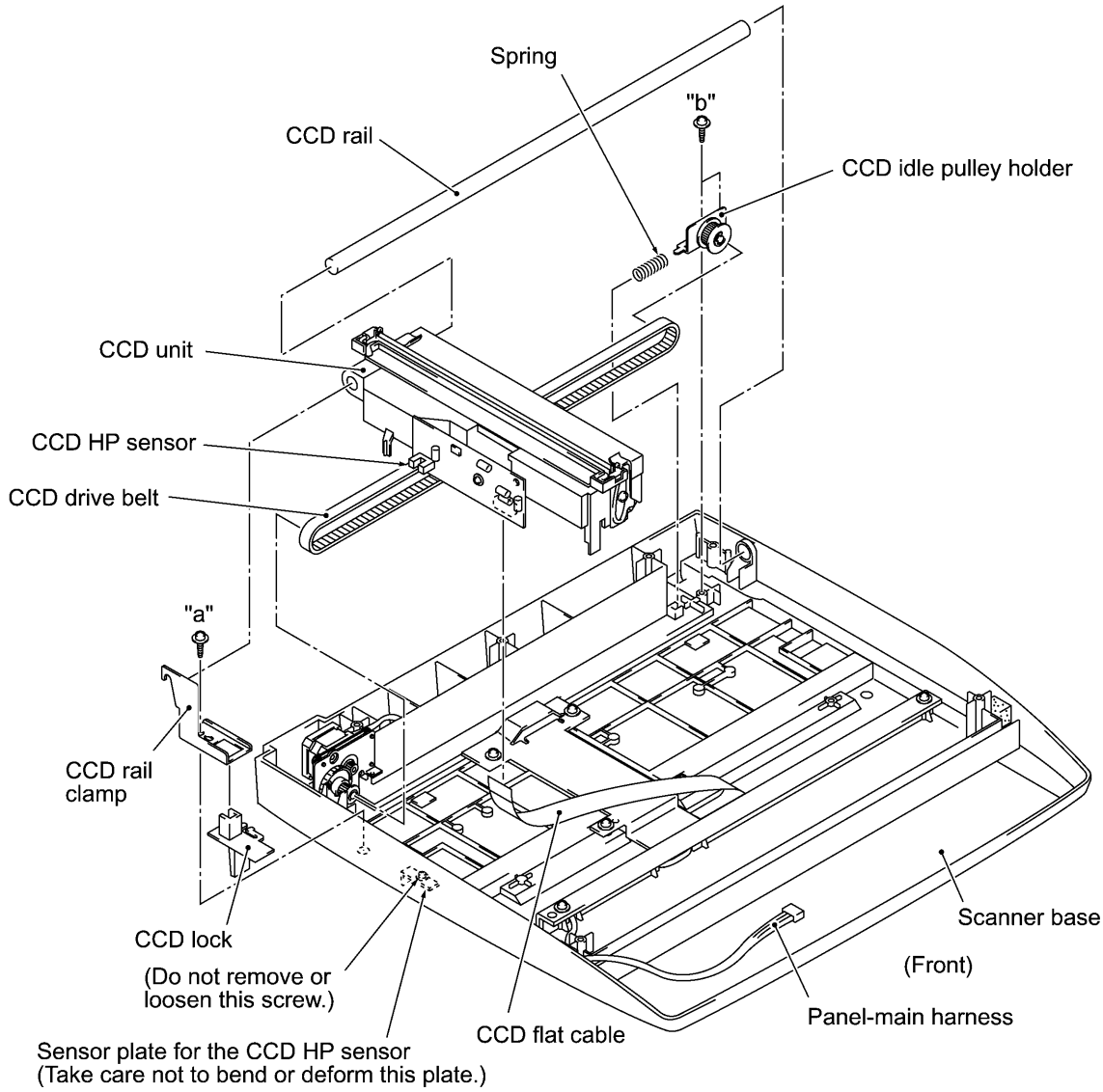
3) Move the CCD unit to the right by hand to make the following job easier.
4) Remove screw "a" and take out the CCD rail clamp. (See the illustration given on the next page.)
5) Remove two screws "b" from the CCD idle pulley holder, then remove the CCD drive belt from the idle pulley.
6) Lift up the CCD rail together with the CCD unit and CCD drive belt, and then disconnect the CCD flat cable.

NOTE: When handling the CCD unit, do not touch the CCD PCB or glasses but hold the hatched sections as shown below.



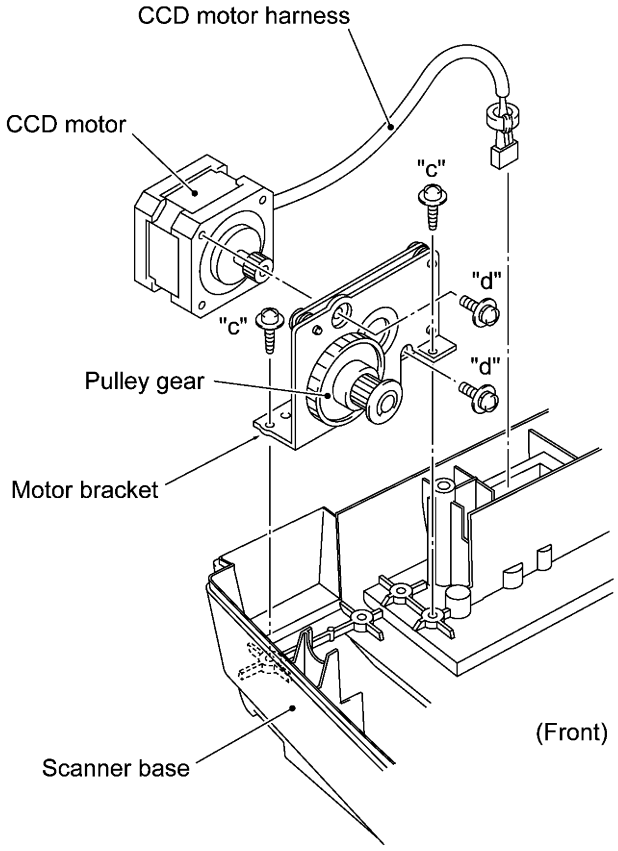
7) Pull out the CCD rail from the CCD unit.

8) Remove the CCD lock.



"a": Taptite, cup B M3x8
"b": Taptite, pan B M3x10

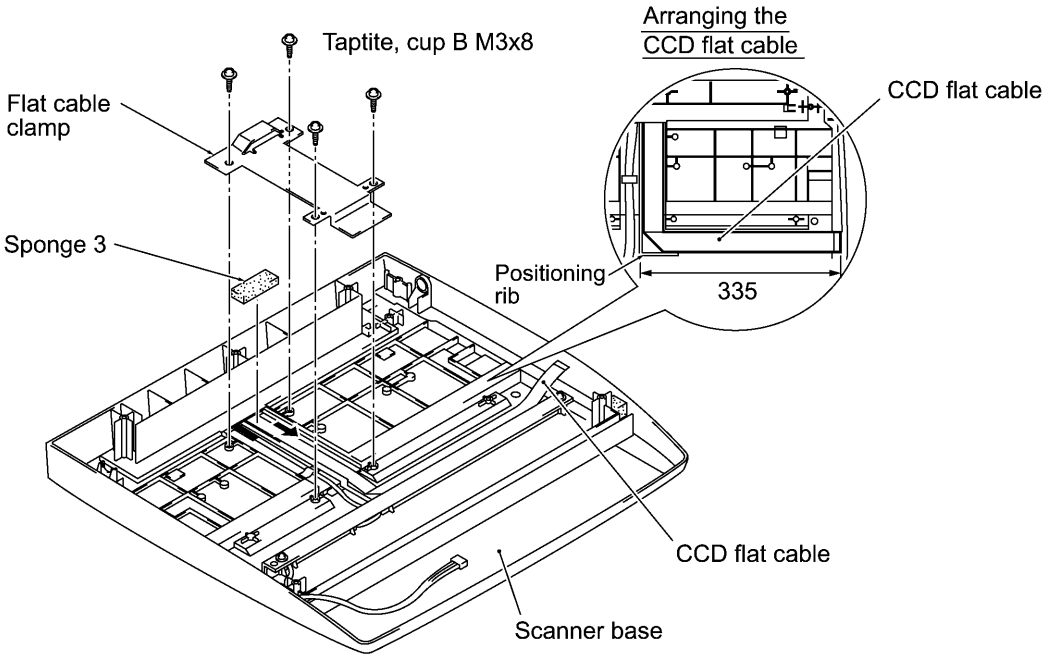
9) Pull up the CCD motor harness.
10) Remove two screws "c" from the motor bracket.
11) Lift up the motor bracket.
12) Remove two screws "d" to release the CCD motor.



"c": Taptite, cup B M3x8
"d": Screw, pan (washer) M3x6DA

13) Remove the four screws and take off the flat cable clamp. Remove sponge 3 attached with adhesive tape.

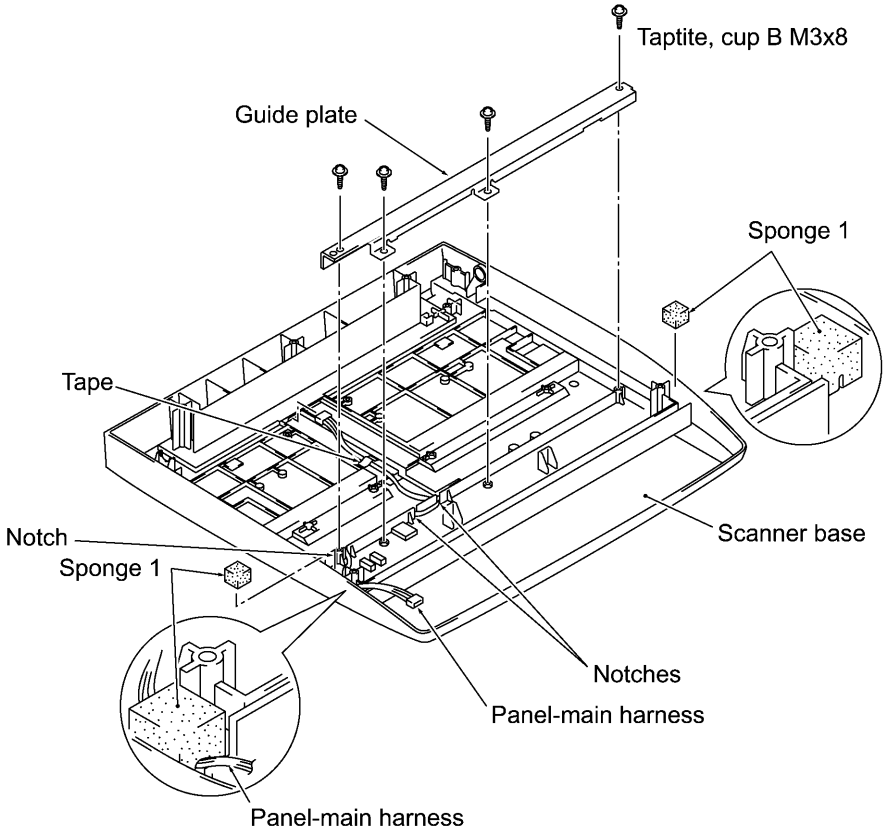
14) Remove the CCD flat cable (which is attached with adhesive tape).



15) Remove the four screws and take off the guide plate.

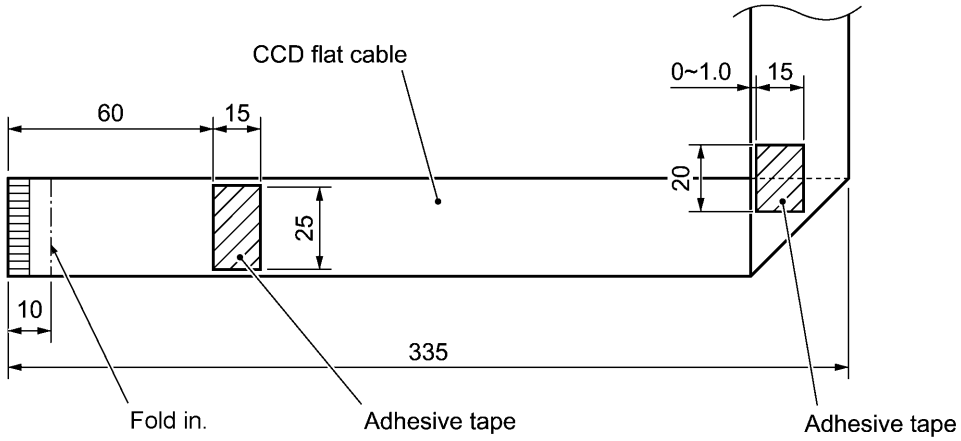
16) Remove tape and sponges 1, then take out the panel-main harness.

NOTE: Once removed, sponges 1 will become unusable and new ones will have to be put back in.

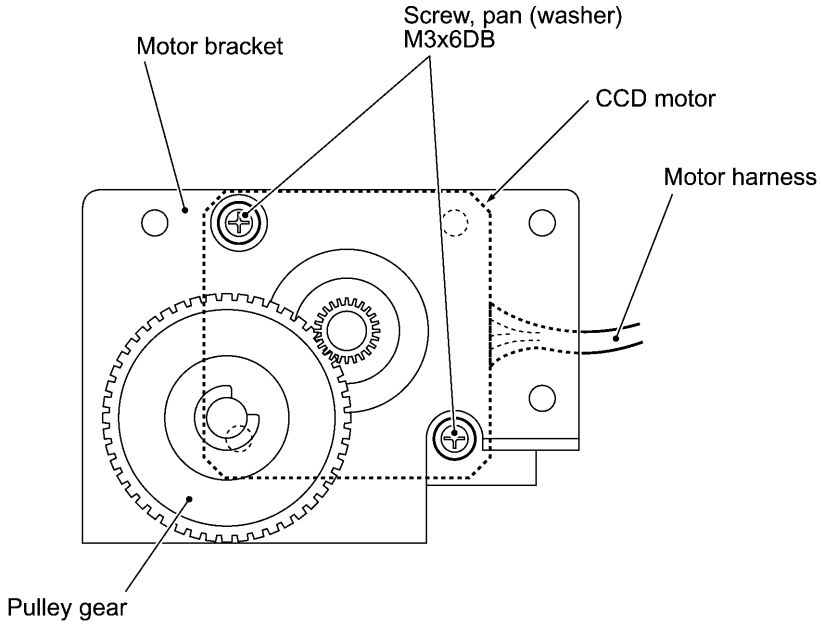


■ Reassembling Notes

- Route the panel-main harness through the three notches, then tape them as illustrated on the previous page.
- When replacing the CCD flat cable with a new one, be sure to arrange the new cable as illustrated below, then route it along the positioning rib as shown on the previous page.



- Set the CCD motor to the motor bracket with its harness coming as shown below.



- Set the CCD lock in the release (forward) position. If the CCD lock is placed in the lock position, the CCD home positioning will fail in the next powering-up sequence. If this happens, turn the CCD lock to the release position.

1.8 Inner Cover, Front Cover, and Media PCB

(1) If the scanner unit has not been removed, push the open button to open the scanner unit.

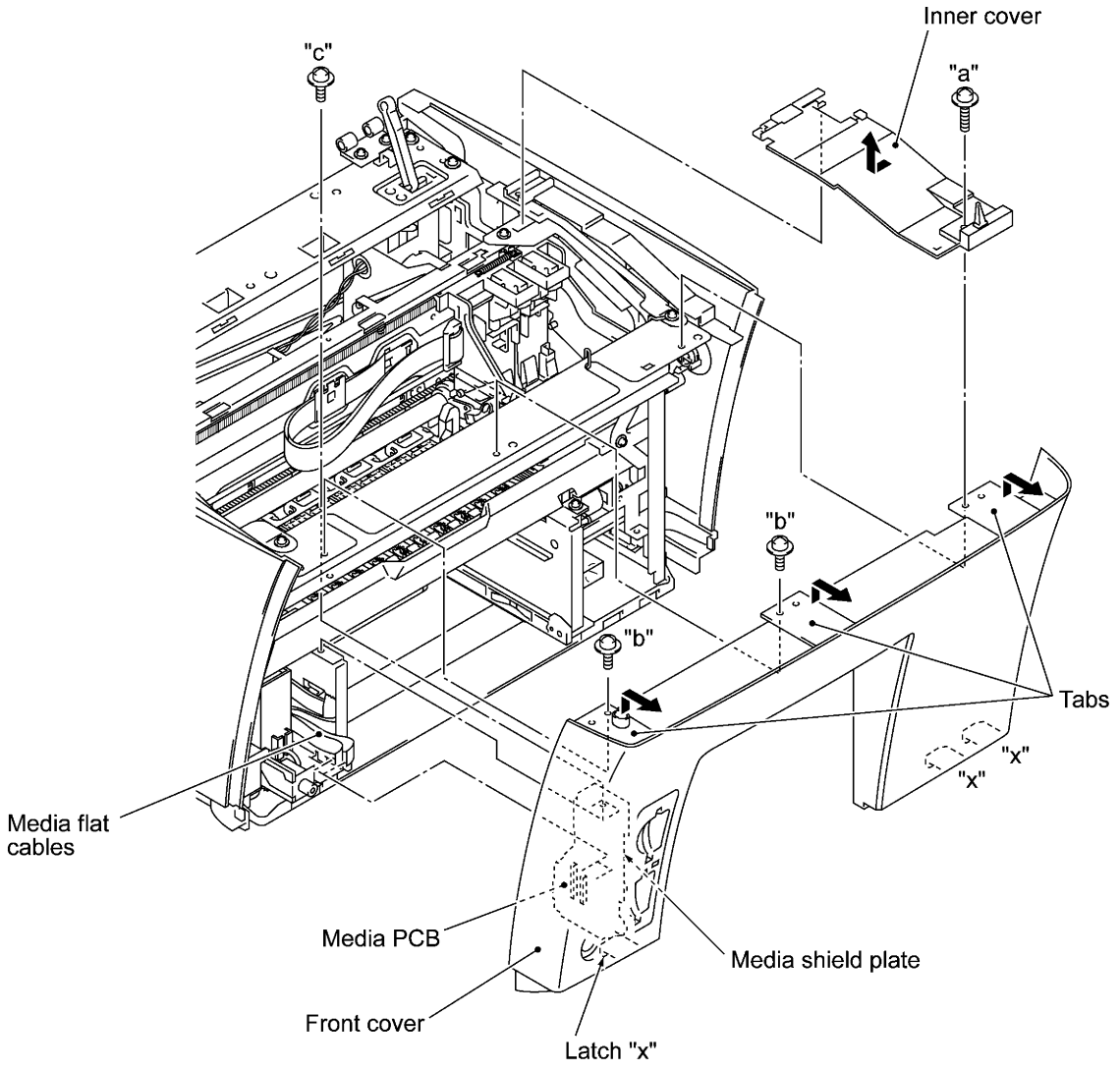
(2) Remove screw "a" from the inner cover and shift it to the left and up.

(3) Remove two screws "b" from the front cover.

(4) Remove screw "c" from the media shield plate.

(5) Slightly pull up three tabs of the front cover to release them from bosses and then remove the front cover to the front.

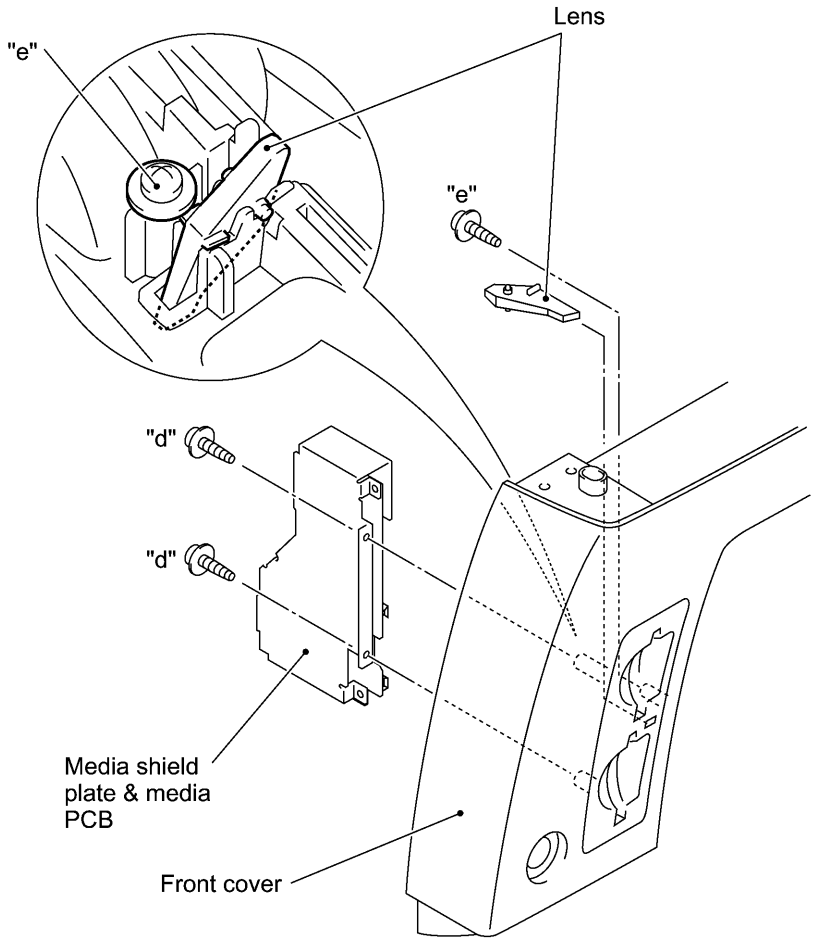
(6) Disconnect the media flat cables from the media PCB.



"a": Taptite, cup S M3x10
"b" and "c": Taptite, cup S M3x6

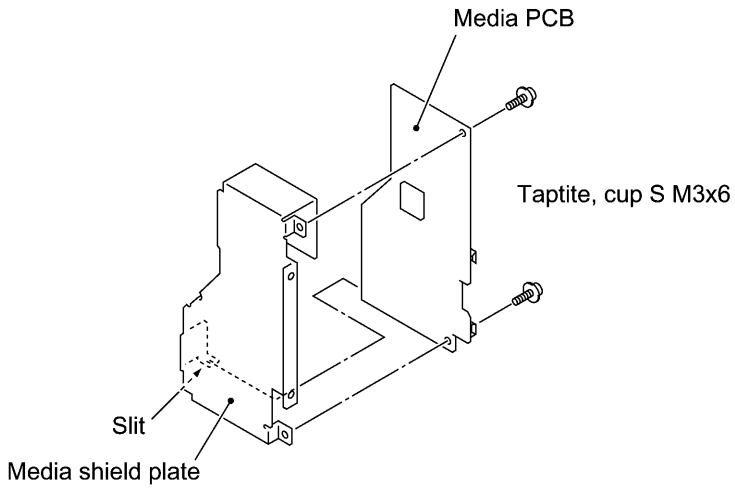
(7) Remove two screws "d" from the media shield plate, then take out the media shield plate together with the media PCB.

(8) Remove screw "e" to release the lens.



"d" and "e": Taptite, cup B M3x8

(9) Remove the two screws to release the media PCB.

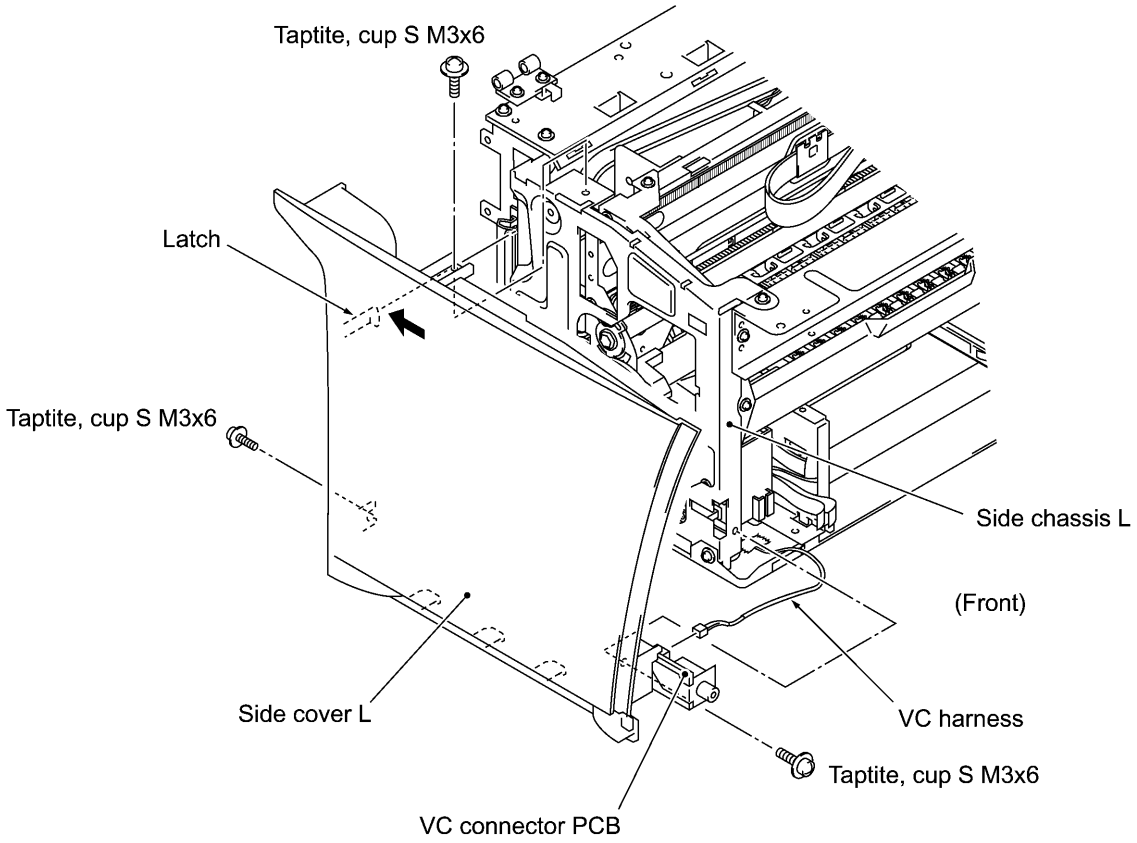


1.9 Side Cover L and VC Connector PCB

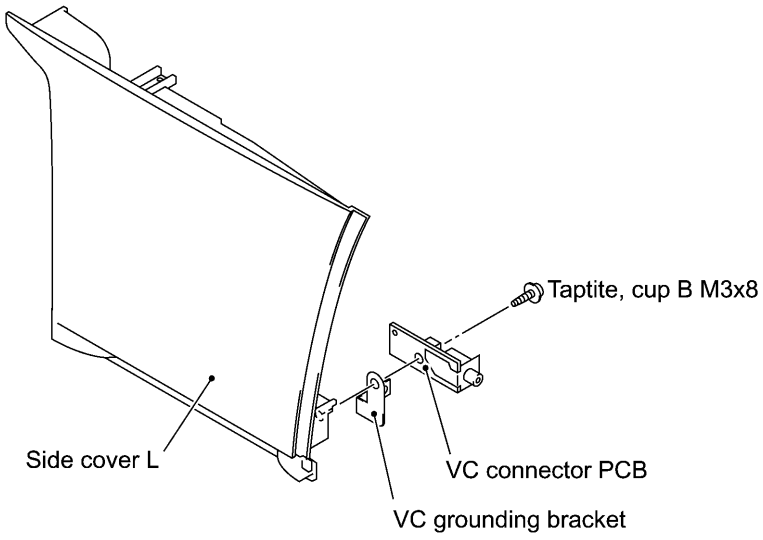
(1) Remove the three screws.

(2) Disconnect the VC harness from the VC connector PCB.

(3) Unhook the latch from the side chassis L and remove the side cover L together with the VC connector PCB.



(4) Remove the screw and take off the VC connector PCB and VC grounding bracket.



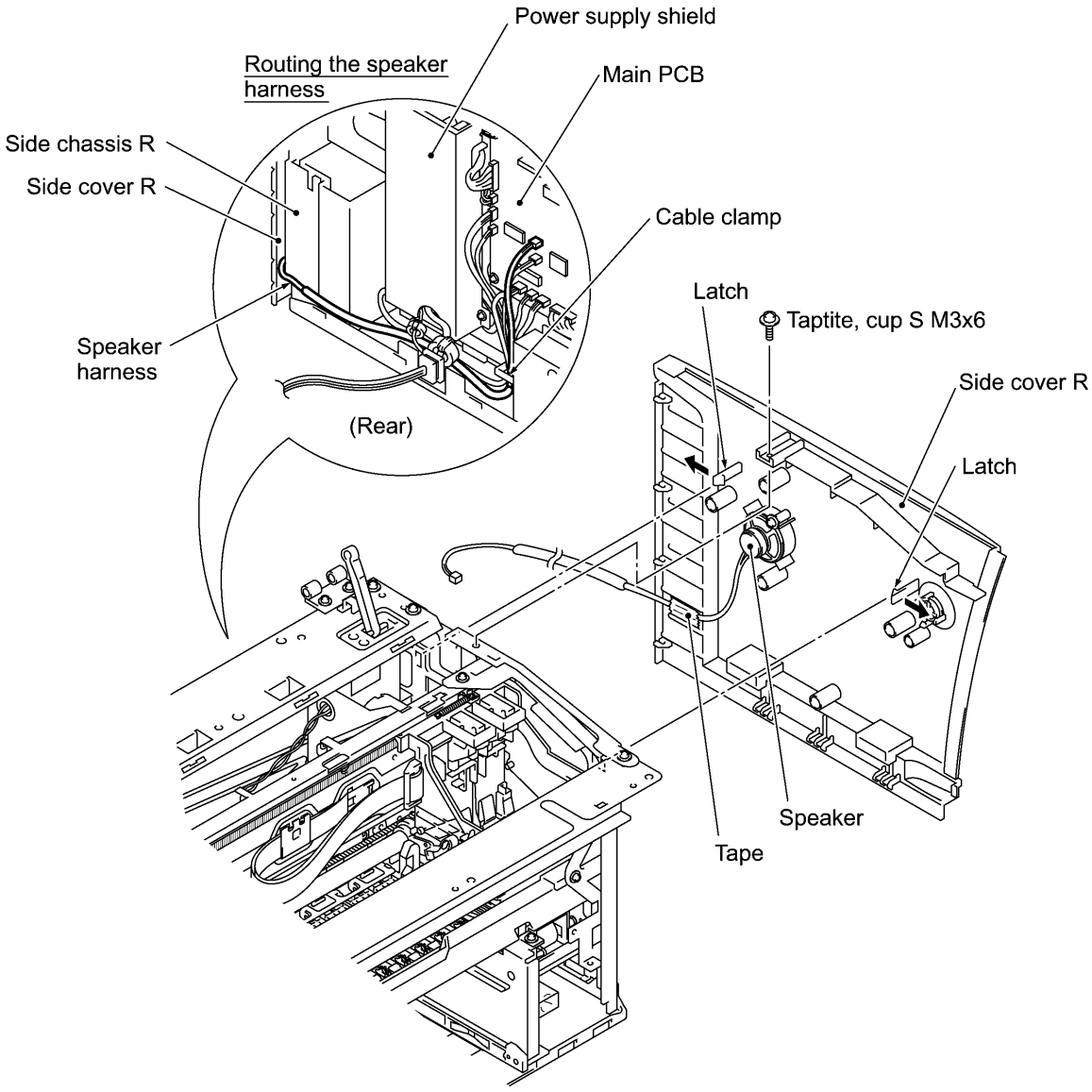
1.10 Side Cover R and Speaker

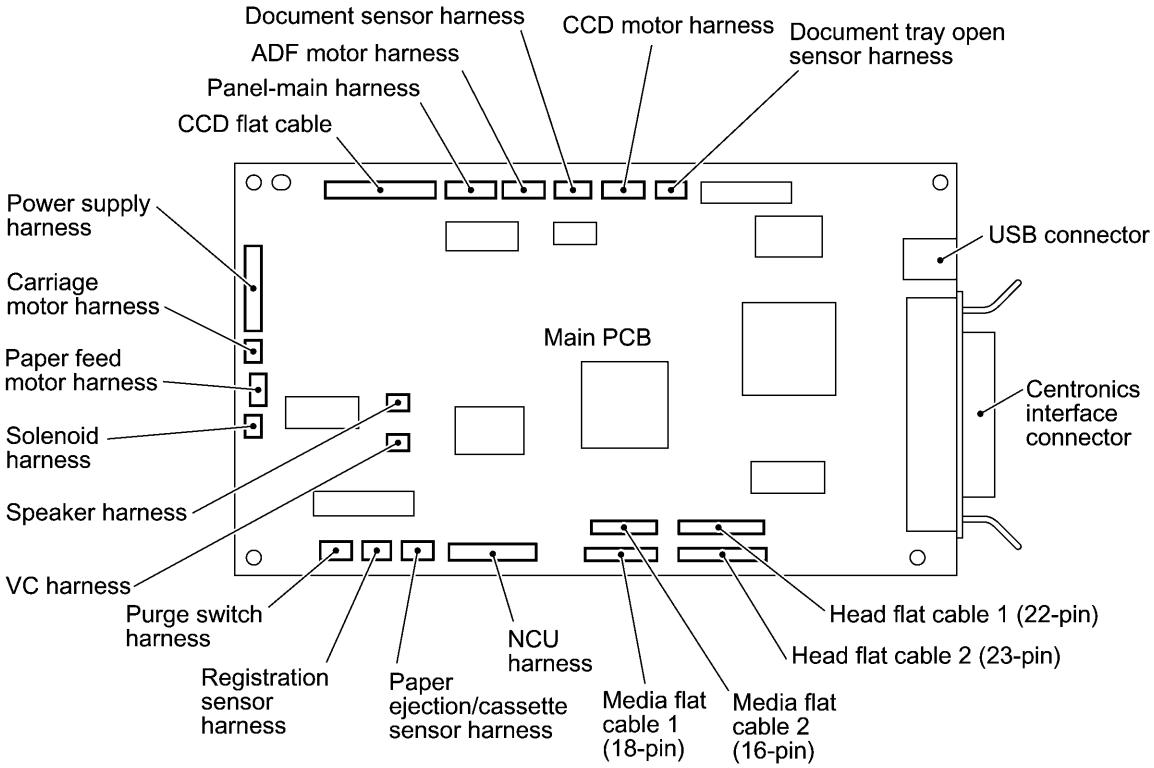
(1) Open the cable clamp and release the speaker harness.

(2) Disconnect the speaker harness from the main PCB.

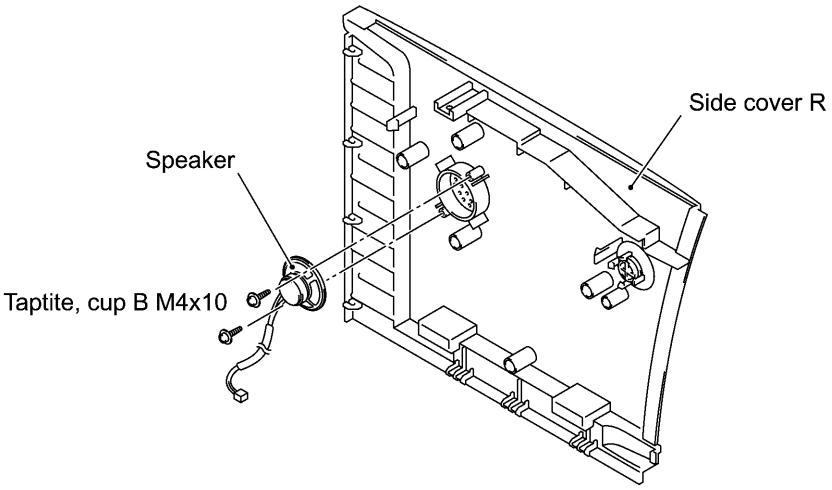
(3) Remove the screw from the top of the side cover R.

(4) Unhook the two latches from the side chassis R and remove the side cover R together with the speaker.



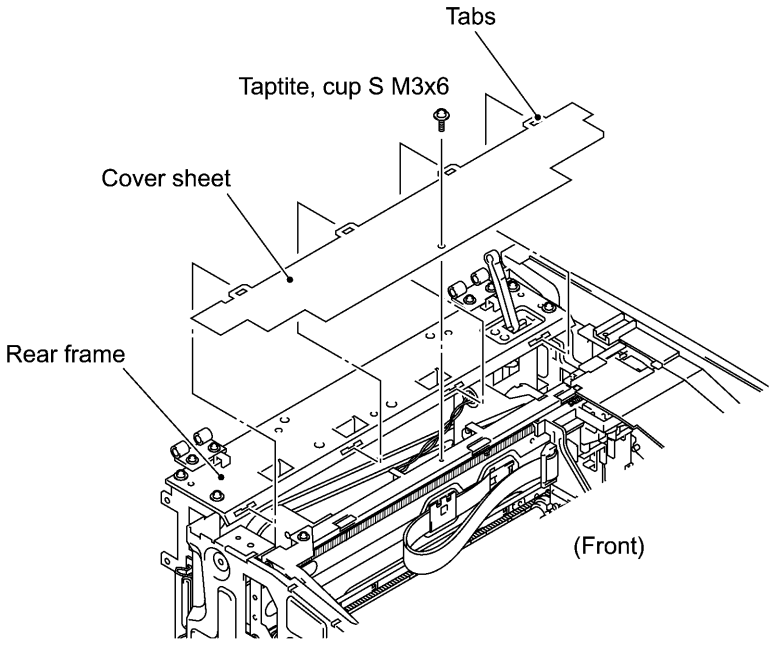


(5) Remove the two screws and take out the speaker.

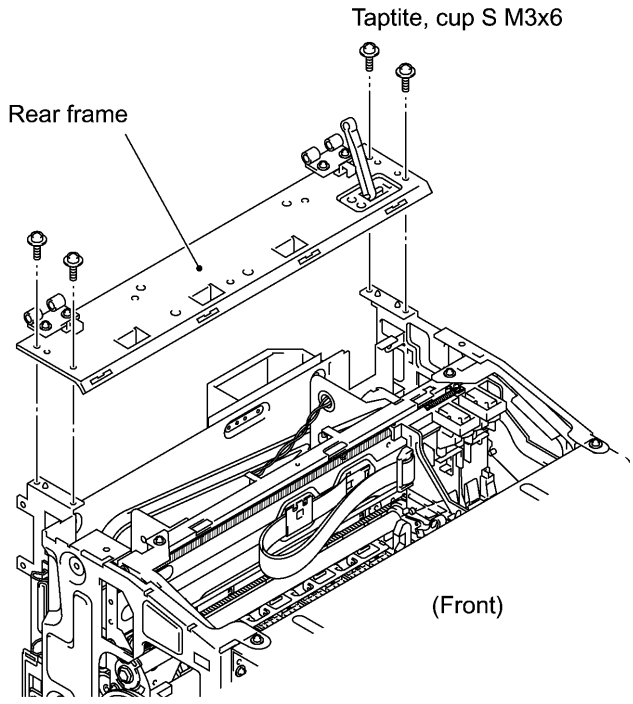


1.11 Cover Sheet and Rear Frame

(1) Remove the screw and take off the cover sheet.



(2) Remove the four screws and take off the rear frame.

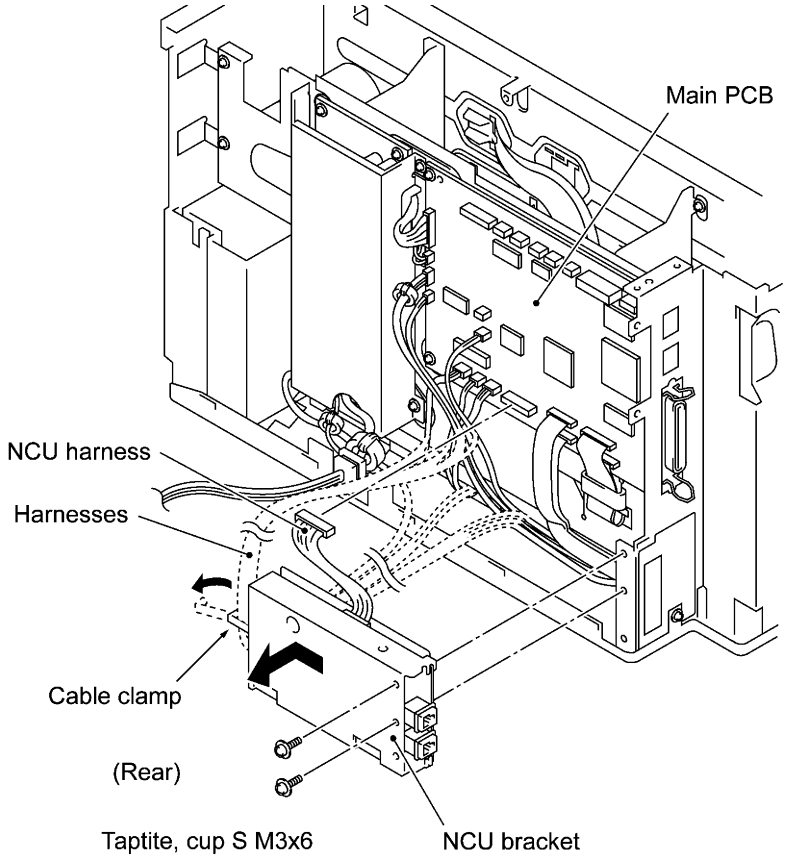


■ **Reassembling Notes**

- When setting the cover sheet back into place, fit its tabs into the cutouts provided in the rear frame as shown above.

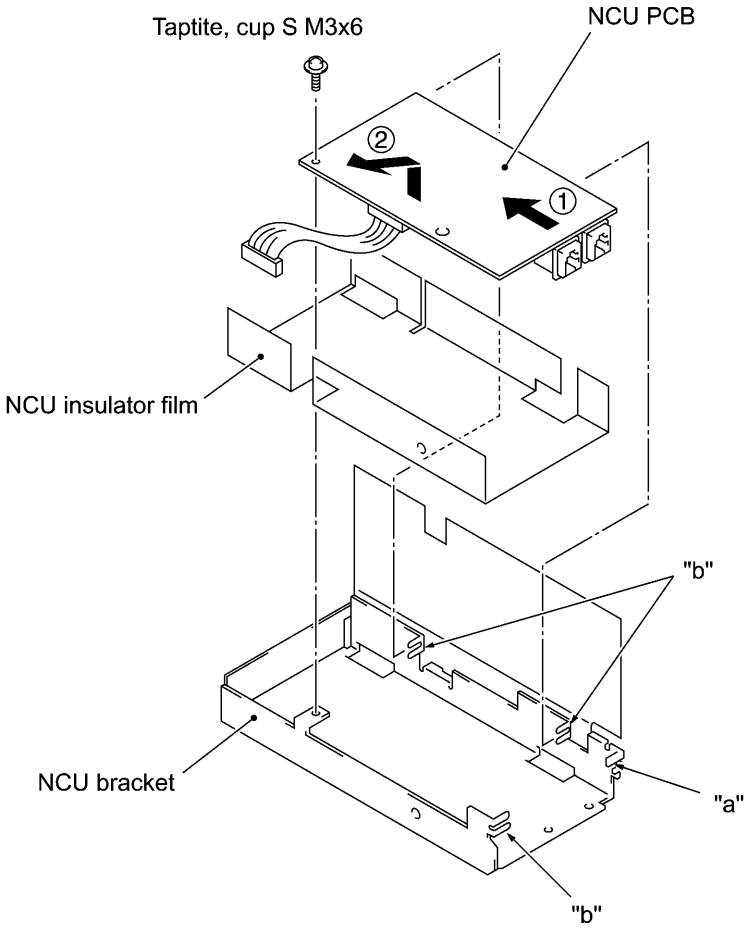
1.12 NCU PCB

(1) Disconnect the NCU harness from the main PCB.
(2) Remove the two screws (three screws if the side cover L has not been removed).
(3) Open the cable clamp and release the harnesses.
(4) Slide the NCU bracket to the left (when viewed from the rear) and to the rear.



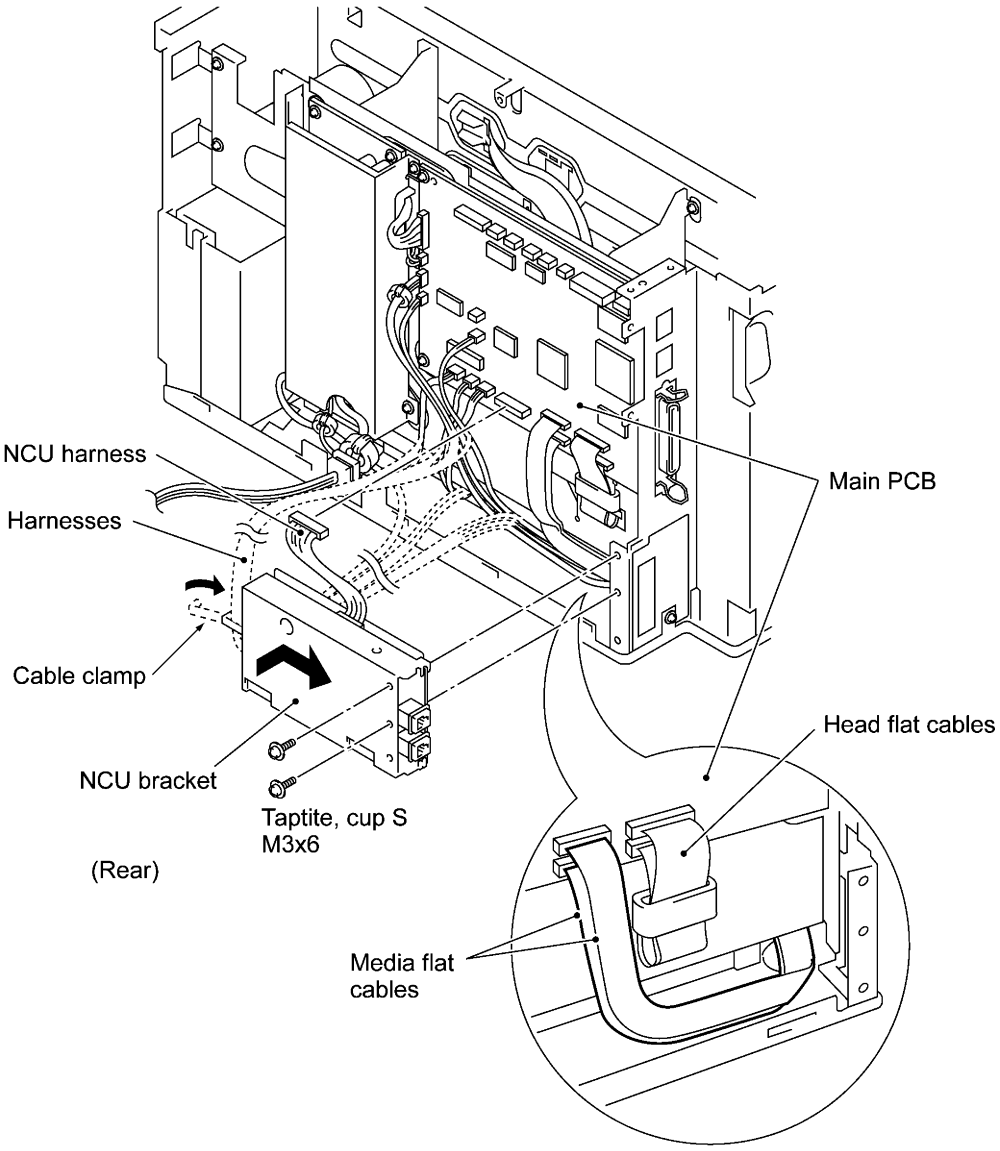
(5) Remove the screw.

(6) Take out the NCU PCB in the direction of arrows ① and ②.



■ Reassembling Notes

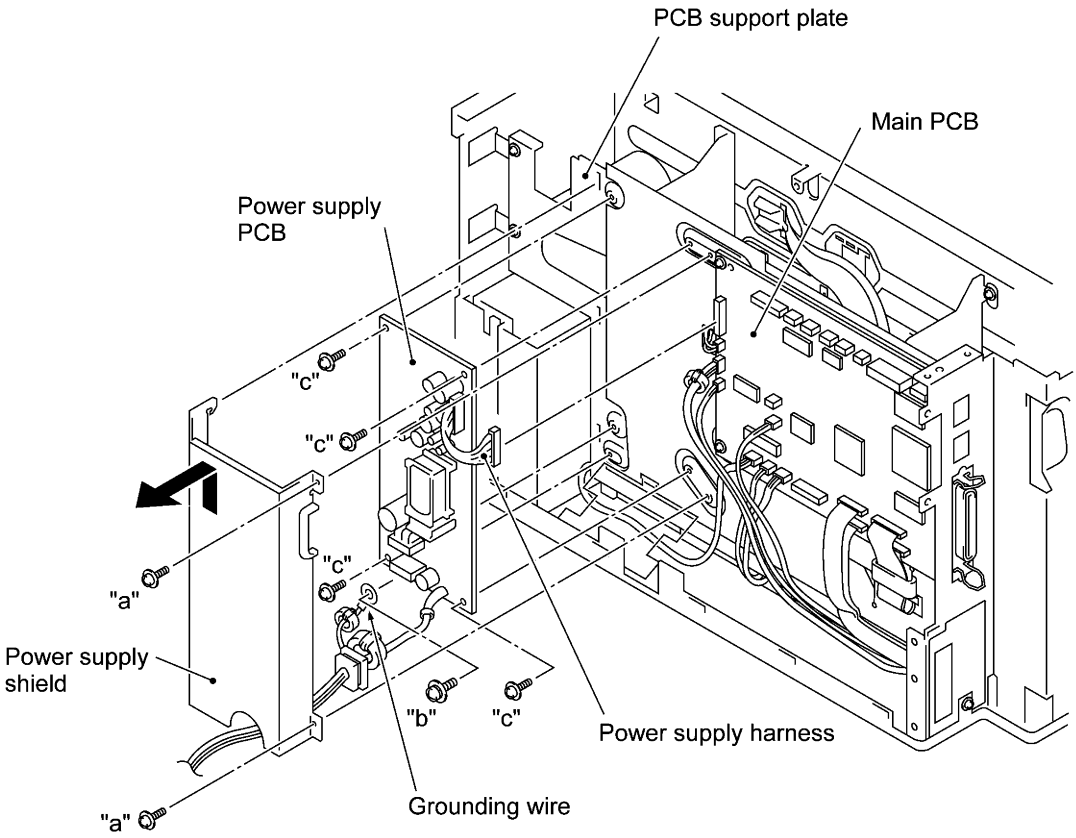
- When setting the NCU PCB back into its bracket, fit its edges onto "a" and into "b" as shown above.
- When setting the NCU bracket back into place, make sure that the media flat cables are routed as shown on the next page and IV-70.



Routing the media flat cables

1.13 Power Supply PCB

(1) Remove two screws "a" from the power supply shield.
(2) Slightly lift up the power supply shield and take it off to the rear.
(3) Disconnect the power supply harness from the main PCB.
(4) Remove screw "b" from the grounding wire.
(5) Remove four screws "c" from the power supply PCB



"a" and "c": Taptite, cup S M3x6
"b": Screw, pan (washer) M4x8DB

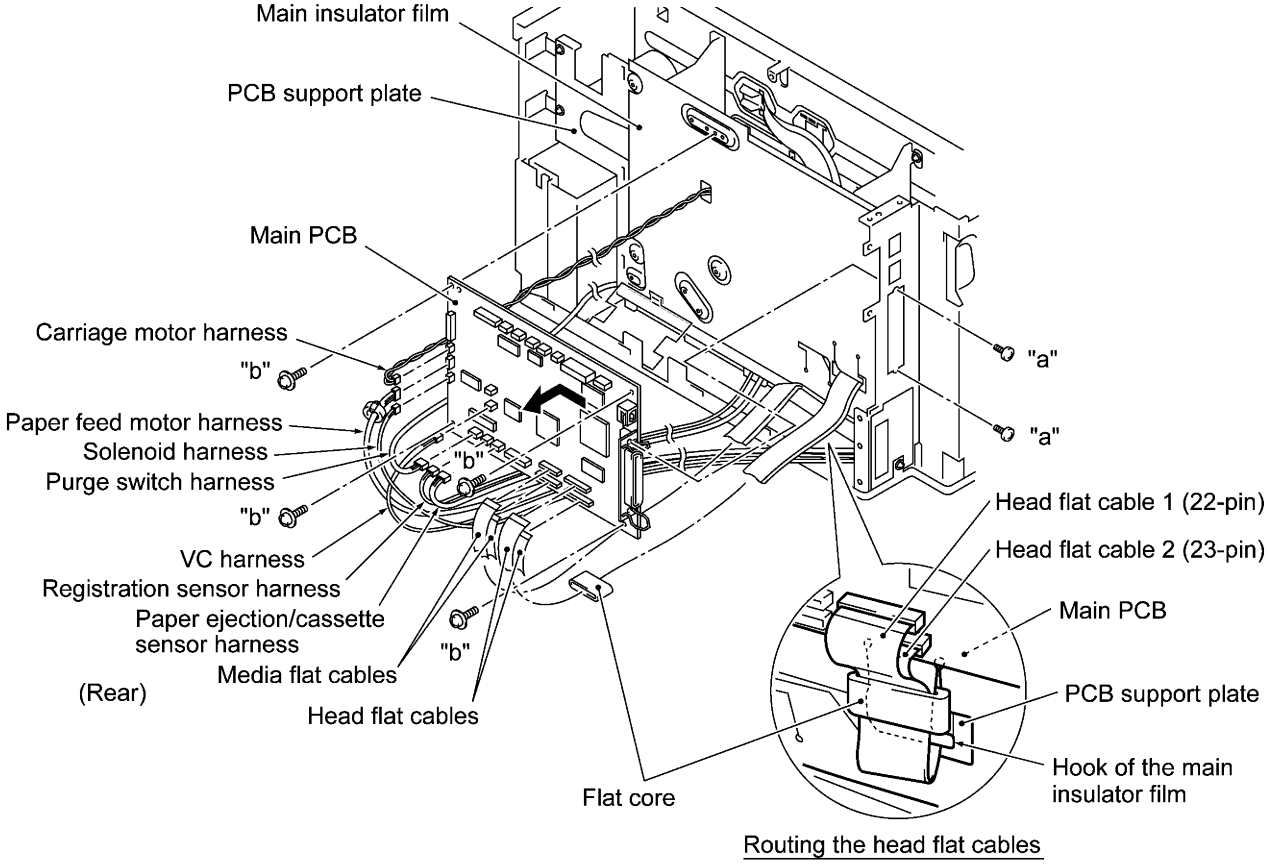
1.14 Main PCB

(1) Disconnect the following harnesses and flat cables from the main PCB:

- Carriage motor harness
- Paper feed motor harness
- Solenoid harness
- Speaker harness (if the speaker has not been removed)
- NCU harness (if the NCU PCB has not been removed)
- CCD flat cable
- Panel-main harness (if the scanner unit has not been removed)
- CCD motor harness
- ADF motor harness (if the ADF unit has not been removed)
- Document sensor harness
- VC harness
- Purge switch harness
- Registration sensor harness
- Paper ejection/cassette sensor harness
- Media flat cables
- Head flat cables

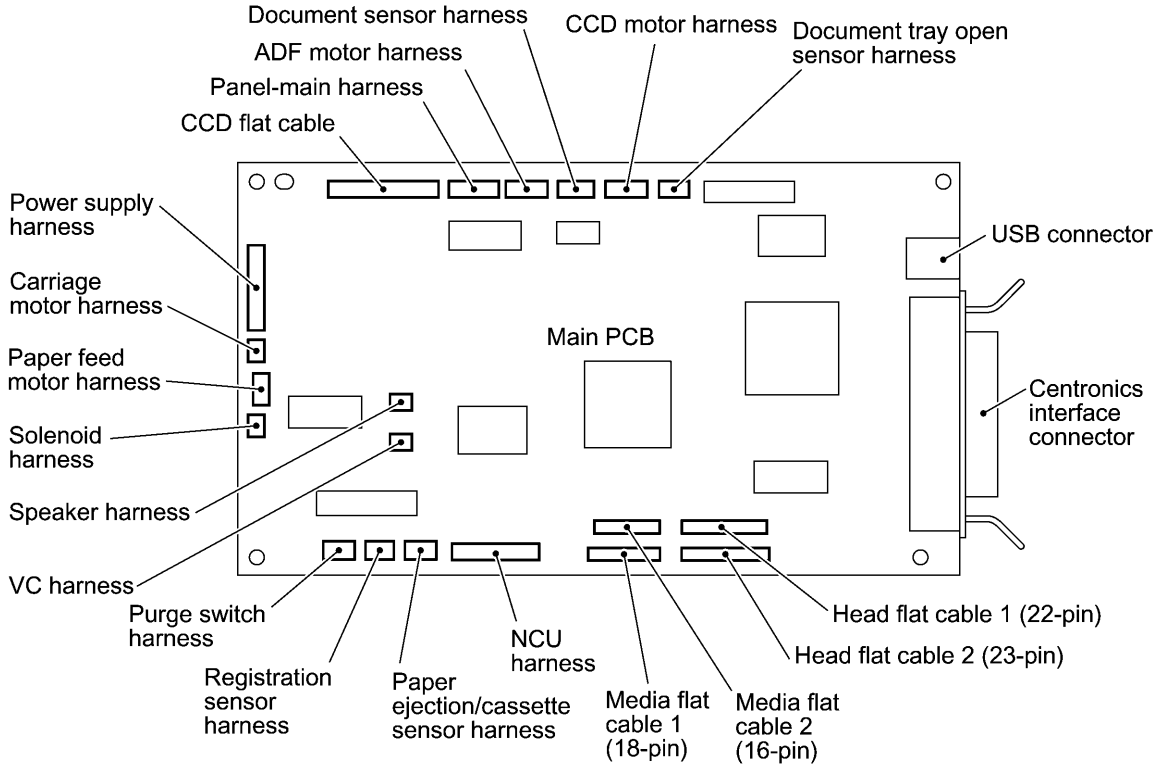
(2) Remove two screws "a" from the interface connector.

(3) Remove four screws "b" from the main PCB.



Routing the head flat cables

"a": Machine screw, pan M3x6
"b": Taptite, cup S M3x6



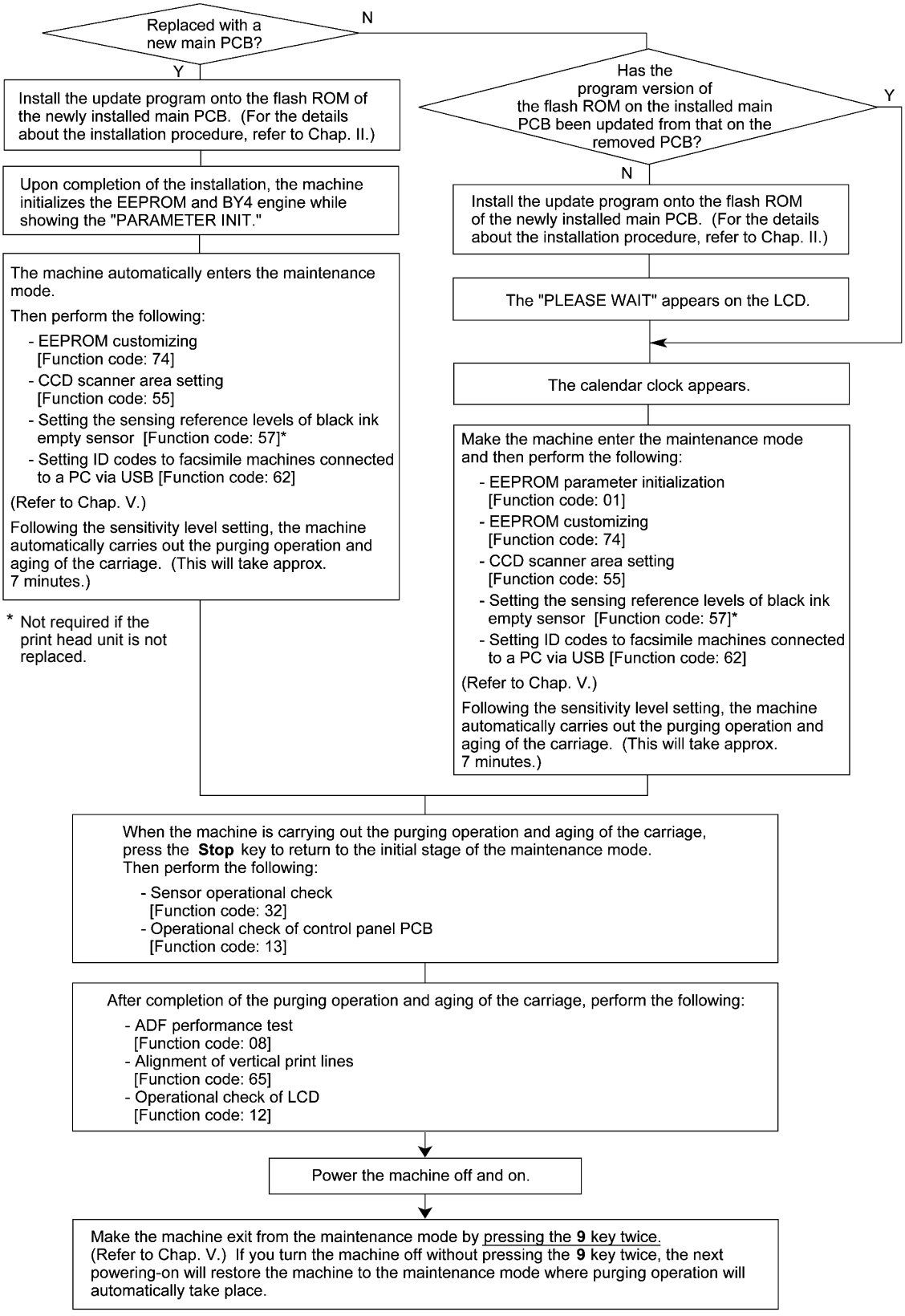
■ Reassembling Notes

- After you replace the main PCB, be sure to follow the flowchart given on the next page.

Setting up the main PCB after replacement

- **Important** -

NOTE: Before starting the following procedure, make sure that the print head unit is installed.

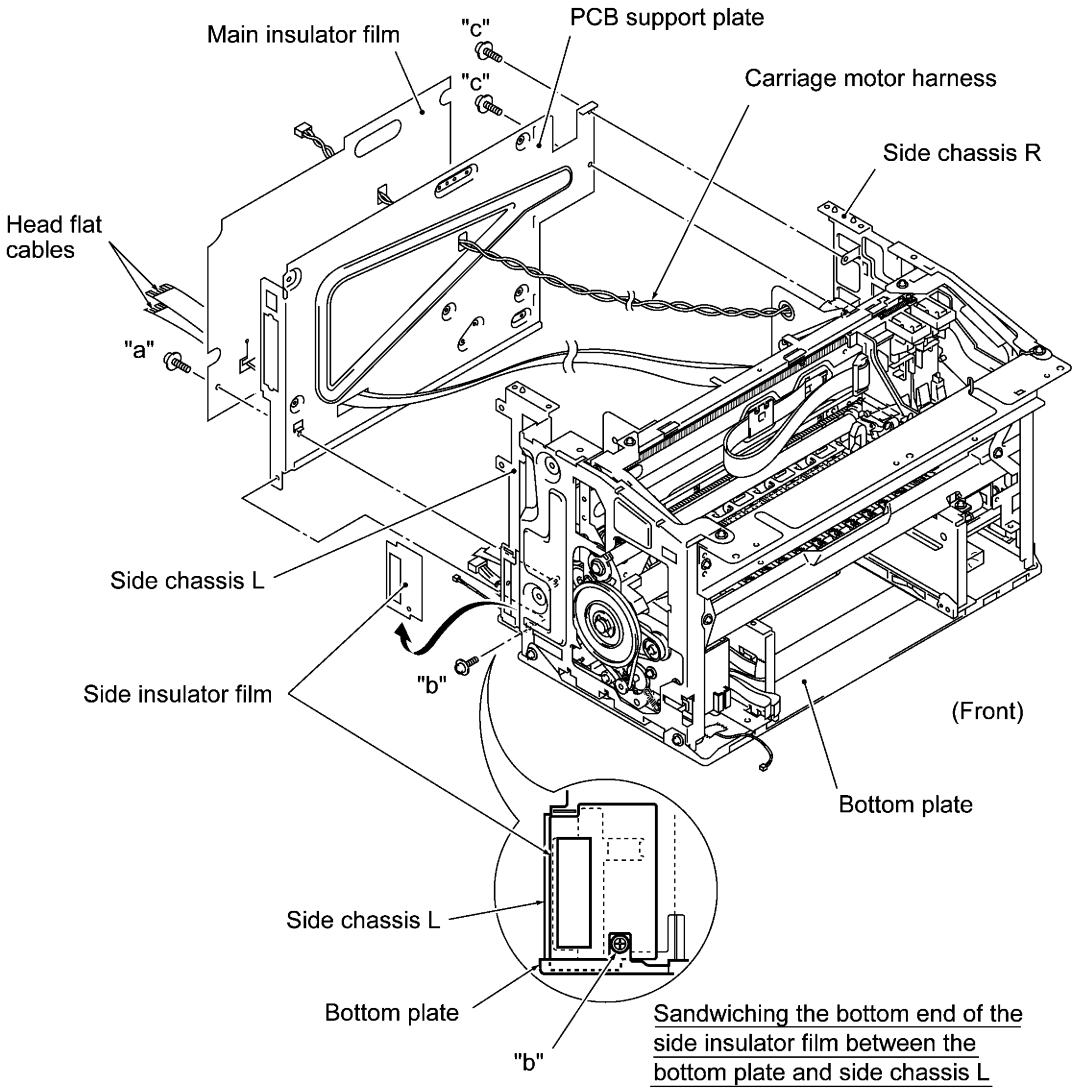


1.15 Insulator Films and PCB Support Plate

(1) Remove screw "a" (that secures the main insulator film and PCB support plate to the side chassis L) to release the main insulator film.

(2) Remove screw "b" (that secures the side insulator film and PCB support plate to the side chassis L) to release the side insulator film.

(3) Remove two screws "c" to release the PCB support plate.



"a," "b," and "c": Taptite, cup S M3x6

■ **Reassembling Notes**

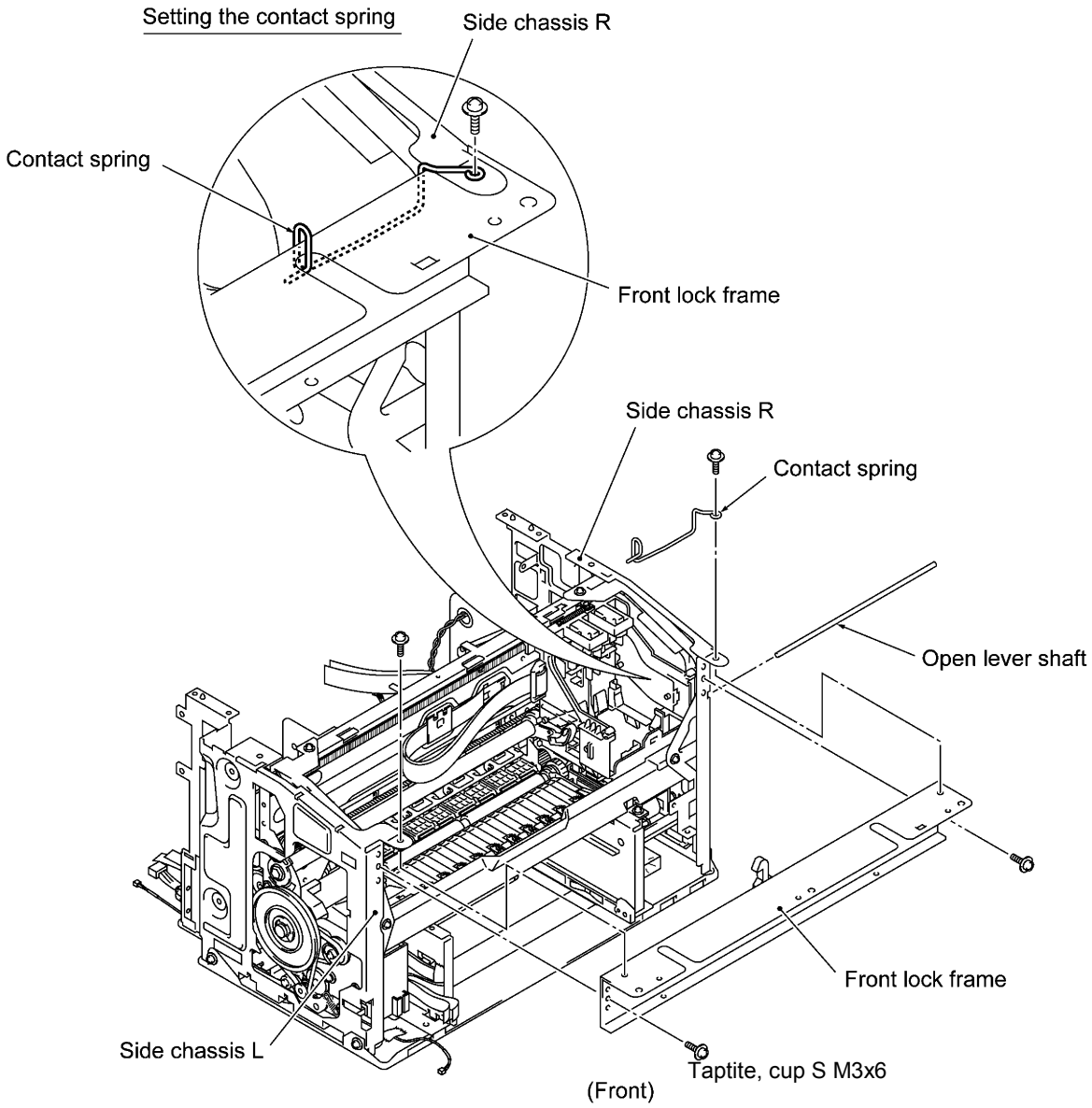
- When setting the PCB support plate back into place, take care not to pinch the media flat cables between the plate and the main chassis.
- When tightening screw "b," keep the bottom plate fitted on the workbench without any gap.

1.16 Front Lock Frame, Side Chassis R & L, and Ink Absorber Box

(1) Pull out the open lever shaft.

(2) Remove the four screws to release the front lock frame.

(3) Remove the contact spring.



(4) Remove four screws "a" (which secures the main chassis to the bottom plate). See the illustration given on the next page.

CAUTION: When handling side chassis R or L, put on working gloves to protect your hands.

Removing side chassis R:

(5) Remove two screws "Rb" and screw "Rc." (See the illustration given on the next page.)

(6) Slightly lift up side chassis R (arrow ①) together with the main chassis, then separate it from the support rubber of the main chassis (arrow ②).

NOTE: Do not pull side chassis R away from the main chassis in order to keep the end of the drain tube in the ink absorber box.

(7) Remove screw "d" to release the ink absorber box from side chassis R.

NOTE: Keep the ink absorber box near the purge unit. When replacing the ink absorber box, take care not to spill ink from the drain tube.

Removing side chassis L:

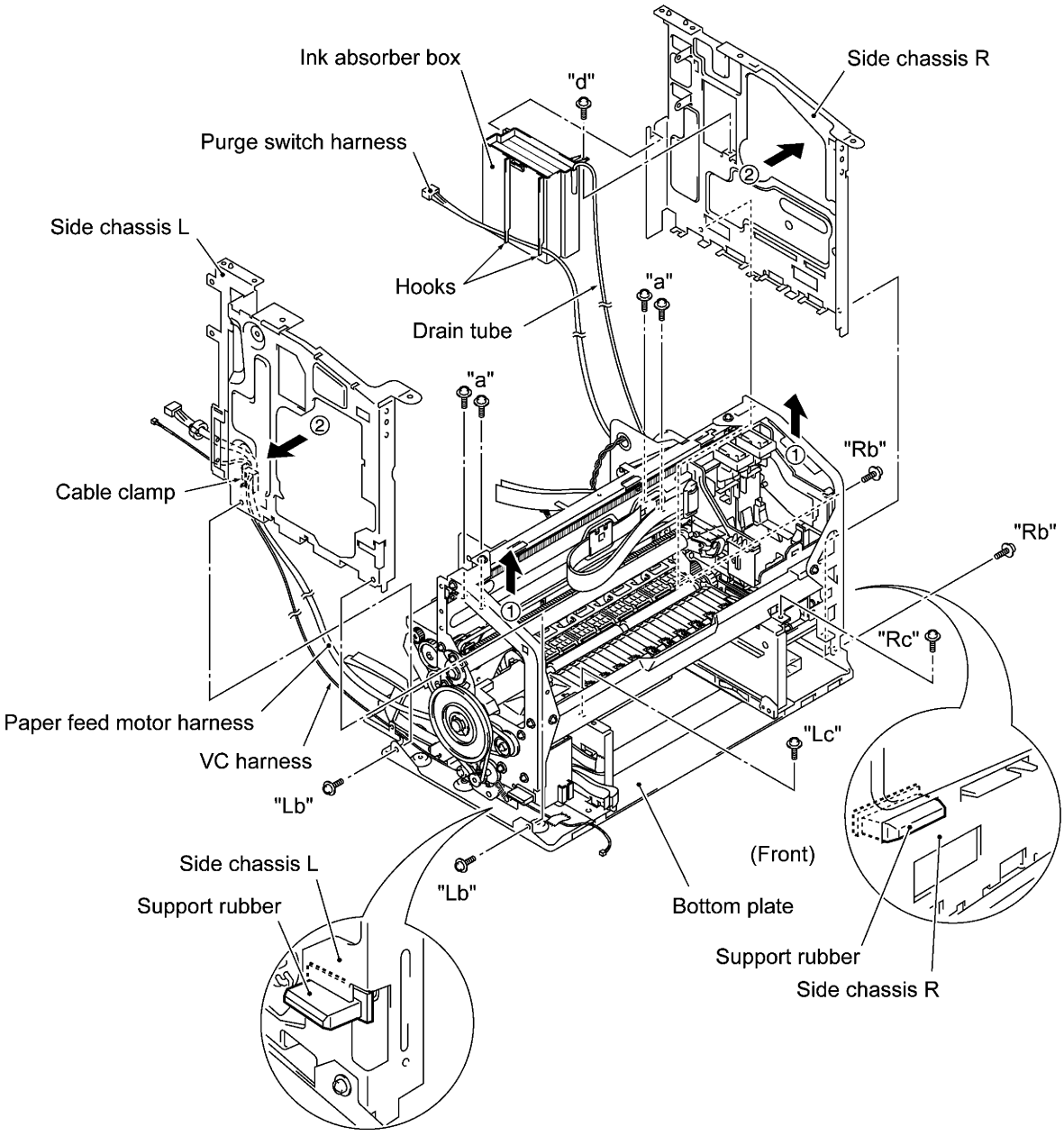
(8) Remove two screws "Lb" and screw "Lc."

(9) Slightly lift up side chassis L (arrow ①) together with the main chassis, then separate it from the support rubber of the main chassis (arrow ②).

(10) Open the cable clamp provided on side chassis L to release the paper feed motor harness and VC harness.

■ Reassembling Notes

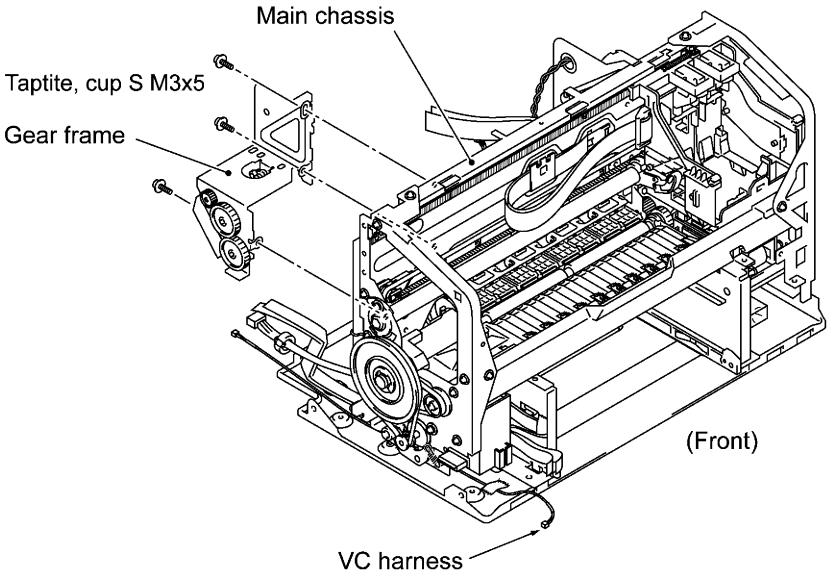
- When securing the front lock frame to side chassis R with two screws, be sure to secure the contact spring together according to the steps below.
  1) As illustrated on the previous page, first hook the left end of the contact spring to the front lock frame.
  2) Secure the right end of the contact spring to side chassis R with one of the screws together with the front lock frame.
  3) Check that the protruded left end of the contact spring moves up and down lightly.



"a": Taptite, cup S M3x5
"Rb," "Rc," "Lb," "Lc" and "d": Taptite, cup S M3x6

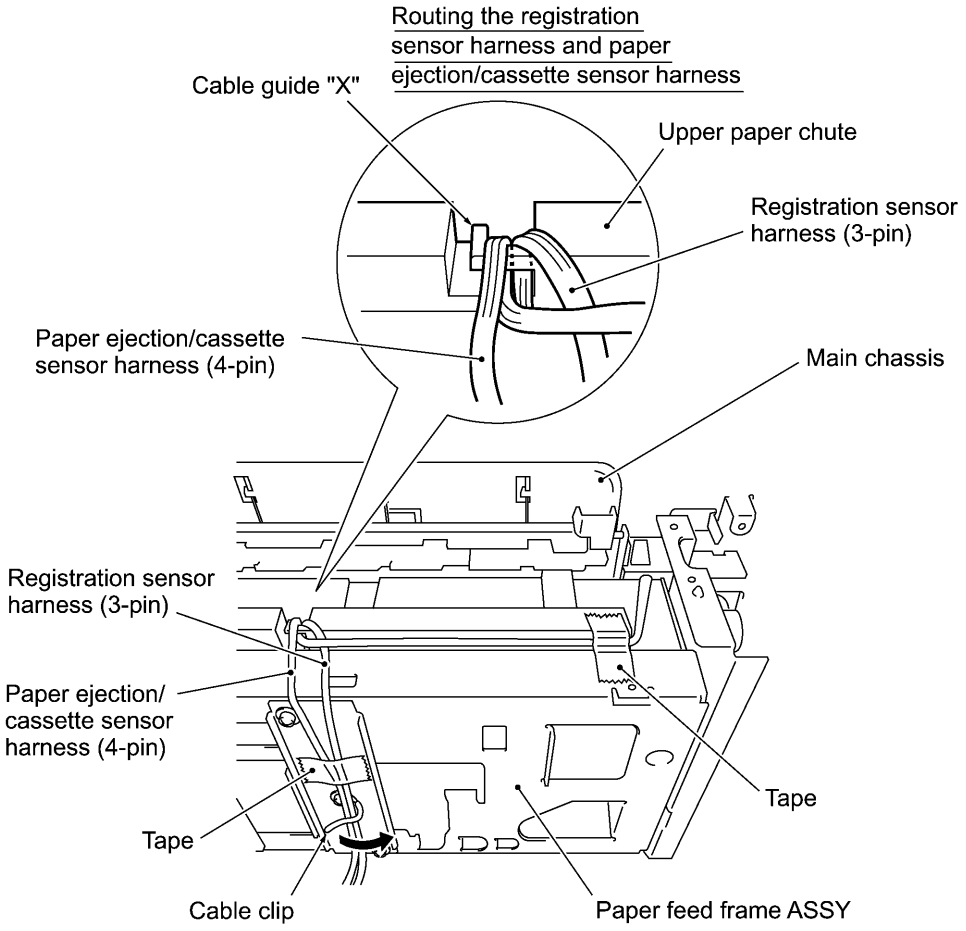
1.17 Gear Frame and Main Chassis

(1) Remove the three screws to release the gear frame from the main chassis.

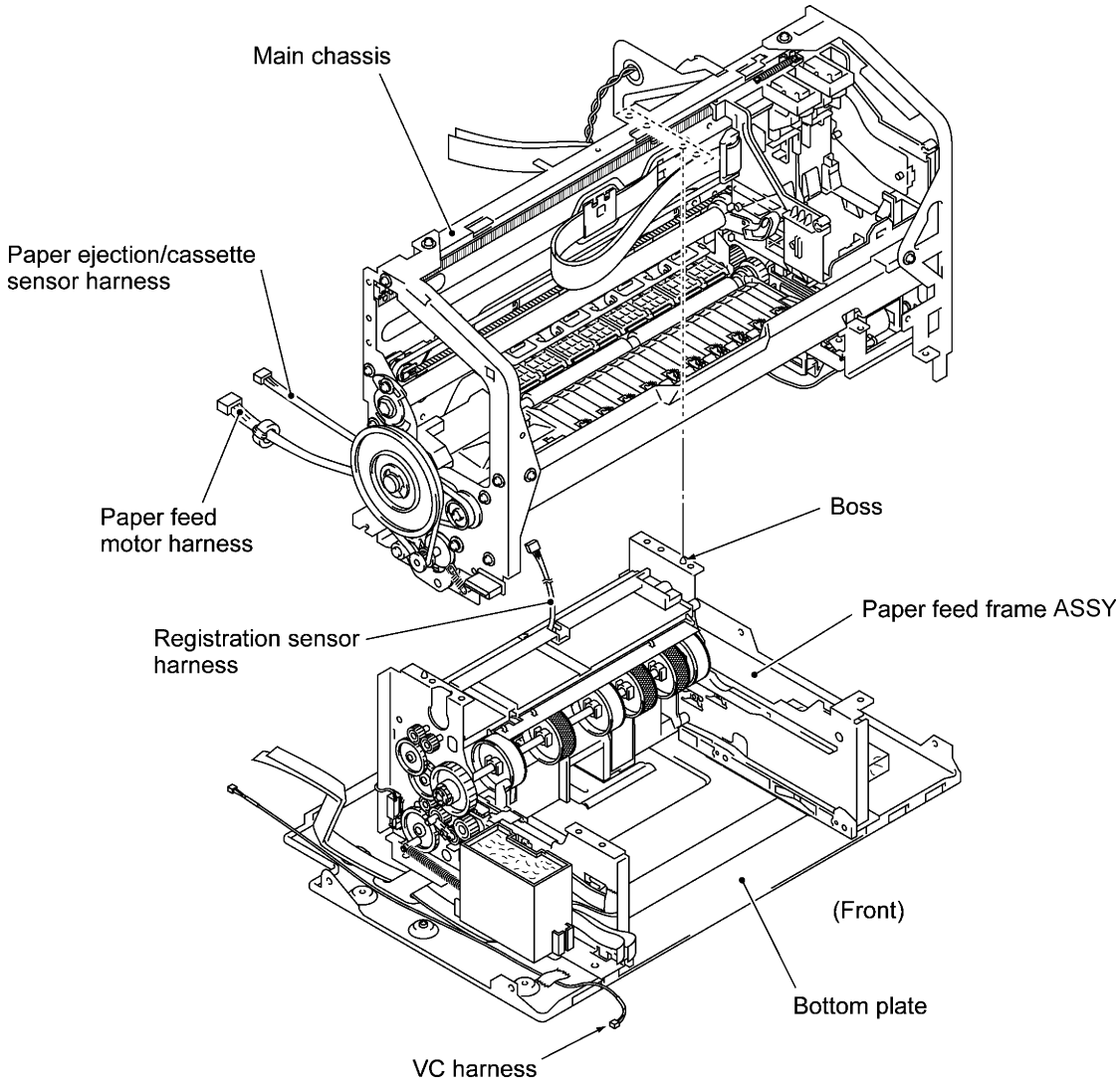


(2) Pull the cable clip to release the registration sensor harness and paper ejection/cassette sensor harness.

(3) Remove adhesive tape from two locations.



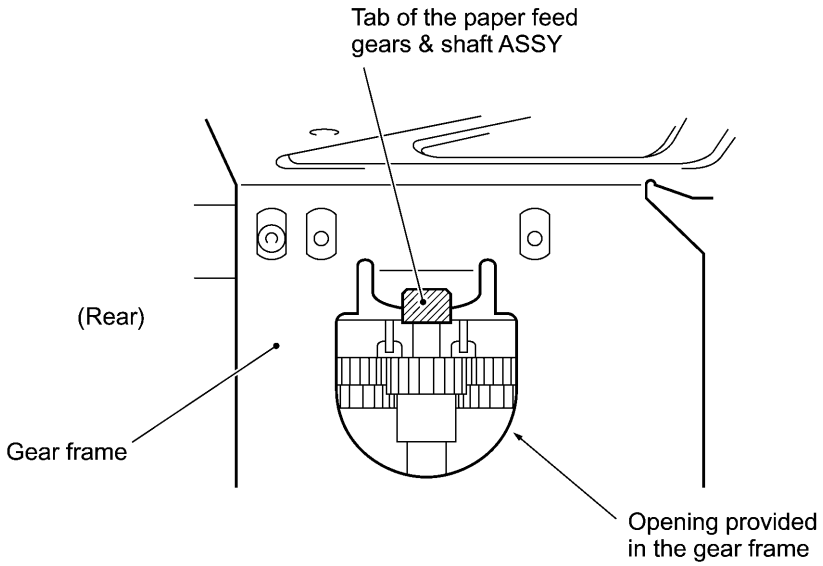
(4) Lift up the main chassis.



■ Reassembling Notes

- When reinstalling the main chassis onto the paper feed frame, make sure that:
  - the paper ejection/cassette sensor harness is routed through cable guide "Y" provided on the lower paper chute (see page IV-56),
  - the paper feed motor harness is routed through opening "Z" provided in the main chassis (see page IV-67), and
  - the VC harness is routed as shown on the previous page.
- After reinstalling the main chassis onto the paper feed frame, be sure to:
  - route the registration sensor harness and paper ejection/cassette sensor harness through cable guide "X" provided on the upper paper chute and then tape those harnesses as shown on the previous page and
  - route the paper feed motor harness and VC harness through the cable clamp (page IV-37) attached to the NCU bracket.

- When setting the gear frame back to the main chassis, face the tab of the paper feed gears & shaft ASSY upwards as shown below.



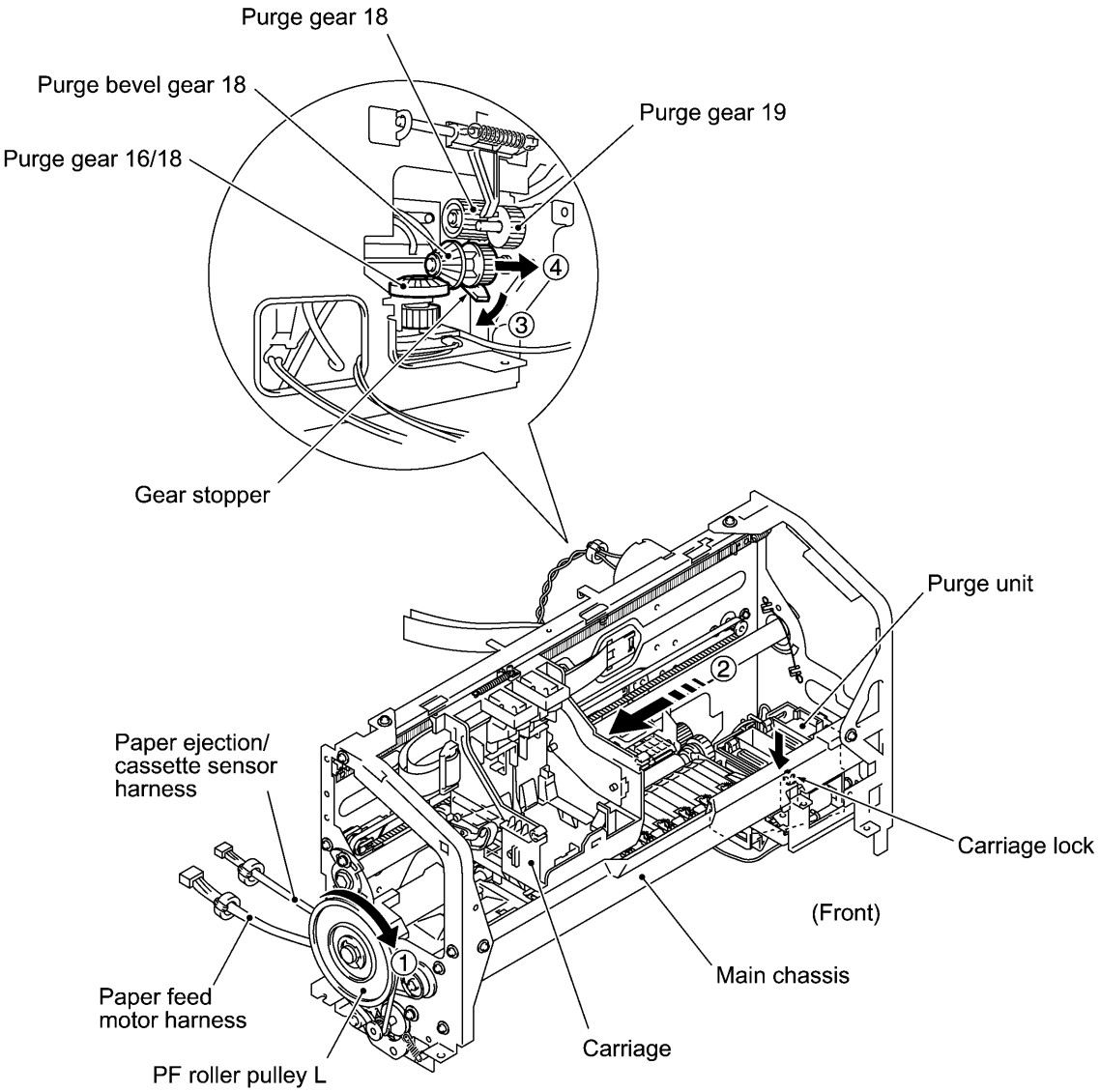
Top View

1.18 Purge Unit, Purge Switch Harness (Purge-related Switches), and Gears

(1) Move the carriage to the left and out of the home position.

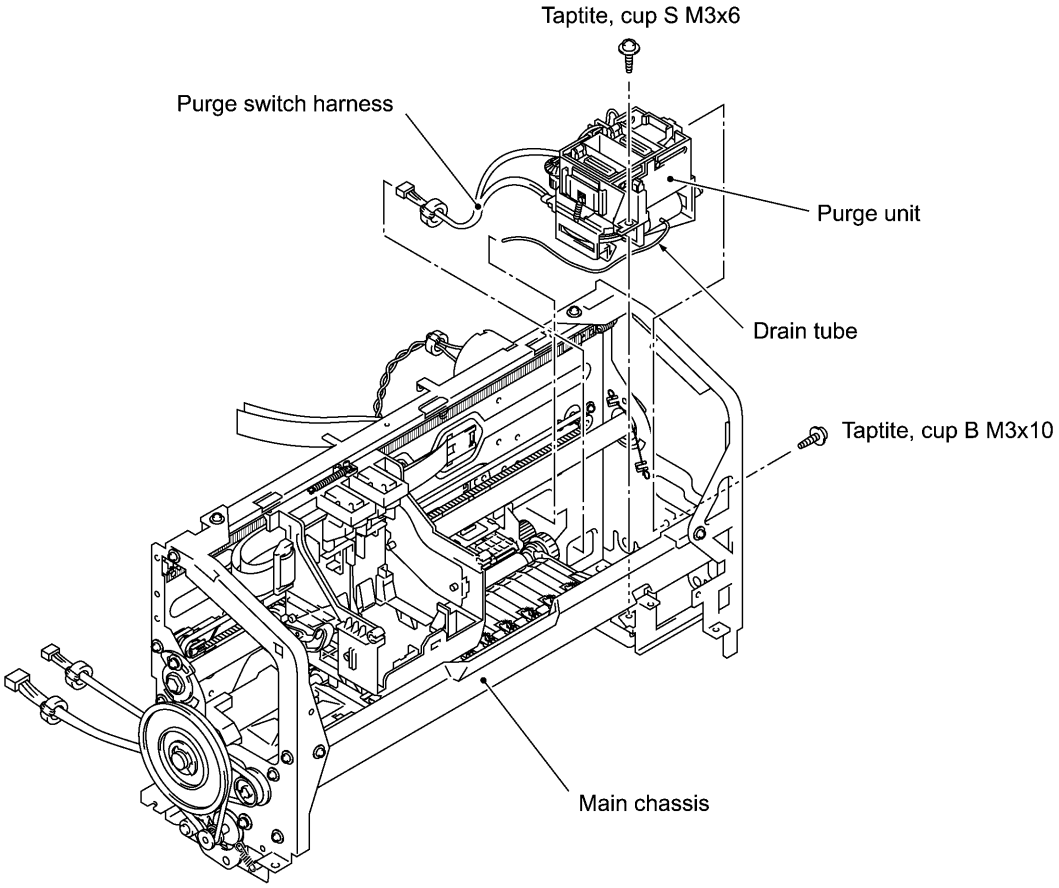
NOTE: If the carriage is locked in the home position, you need to turn the PF roller pulley L in the direction of arrow ① to retract the carriage lock and then move the carriage to the left (arrow ②).

(2) Turn the gear stopper in the direction of arrow ③ and move the purge bevel gear 18 in the direction of arrow ④ to release the purge gear 16/18.

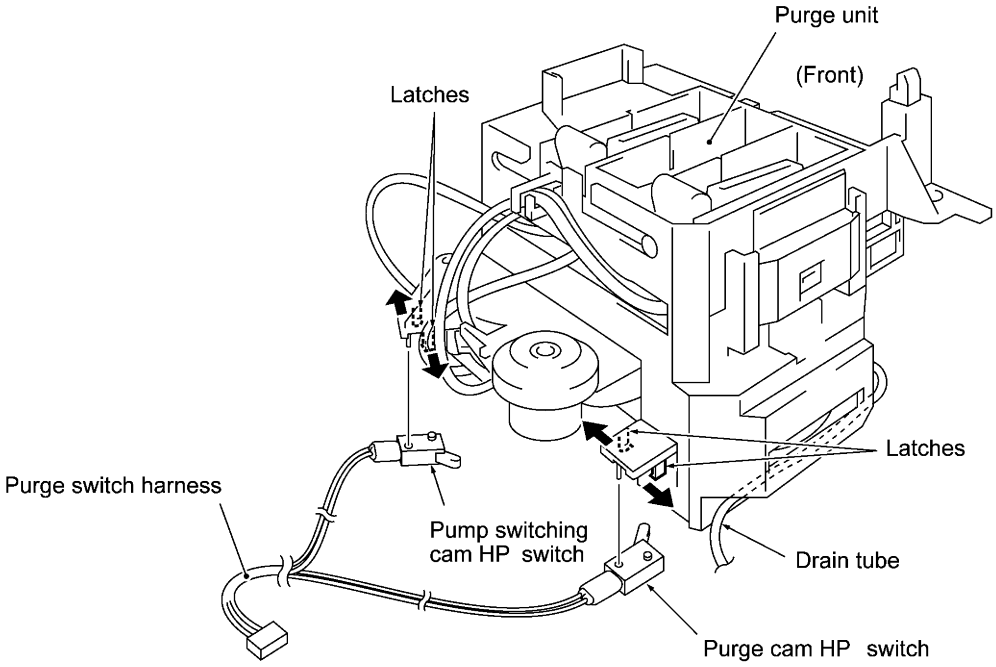


(3) Remove the two screws from the top of the purge unit and from the right side of the main chassis.

(4) Take the purge unit up and out of the main chassis.



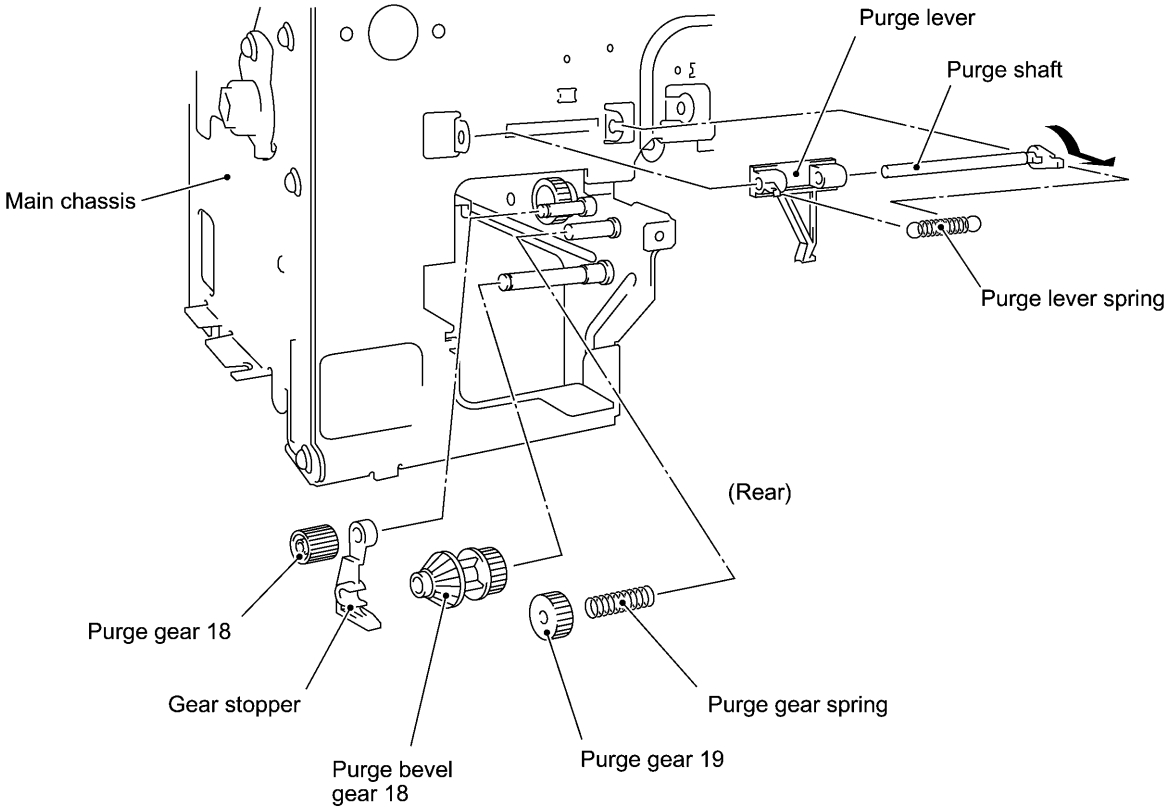
(5) Take off the purge cam HP switch and pump switching cam HP switch from the purge unit by pulling the latches outwards, respectively.



(6) From the rear left of the main chassis, remove the purge bevel gear 18.

(7) Unhook the purge lever spring and remove the purge lever and its shaft. The purge gear 19 and its spring also come off.

(8) Remove the purge gear 18 by pulling its pawl outwards. Also remove the gear stopper.



■ Reassembling Notes

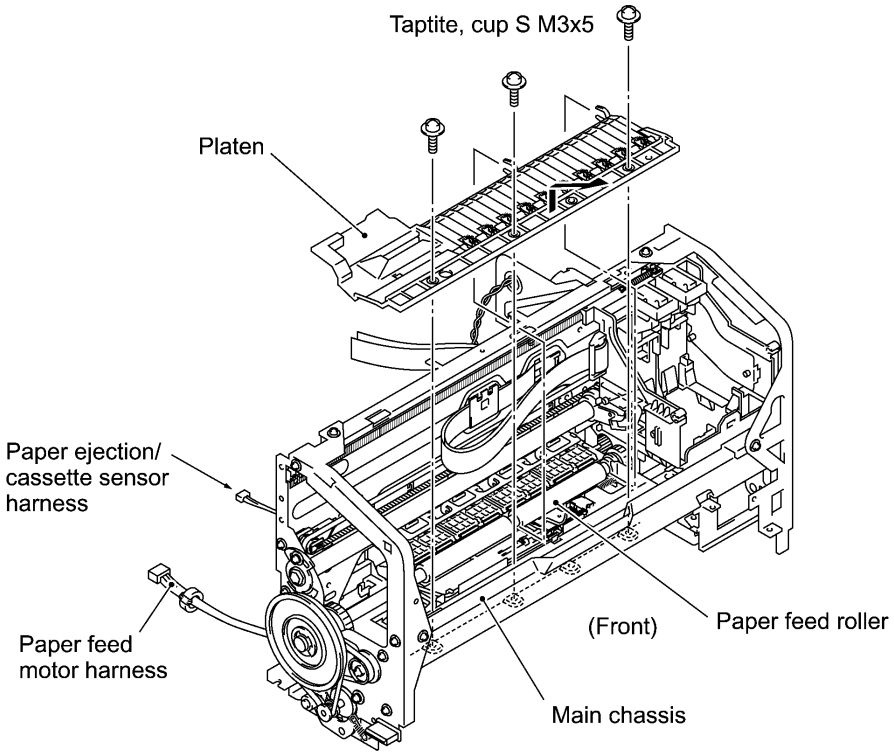
- After installing the purge unit, move the carriage to the right and left ends by hand to check that it travels smoothly.

1.19 Platen and Star Wheels

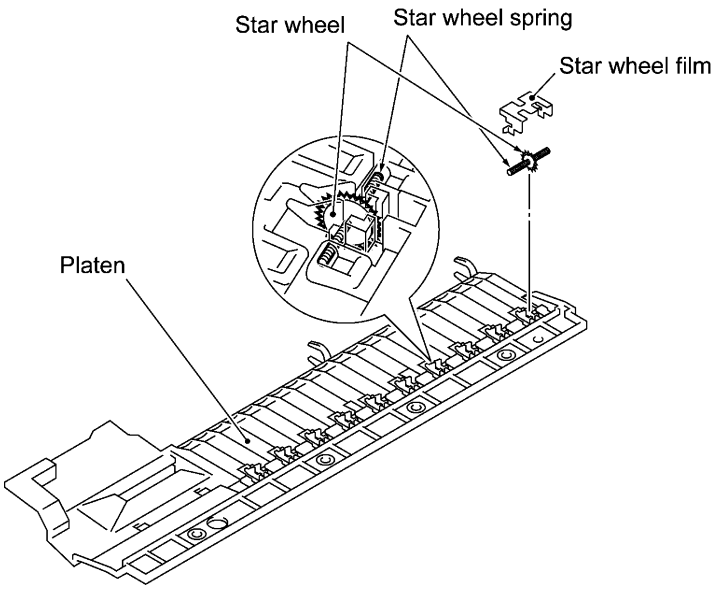
(1) Move the carriage to the right end of its travel.

(2) Remove the three screws from the platen.

(3) Take the platen up and out of the main chassis.



(4) Unhook the star wheel films and then pull out the star wheels and their springs.



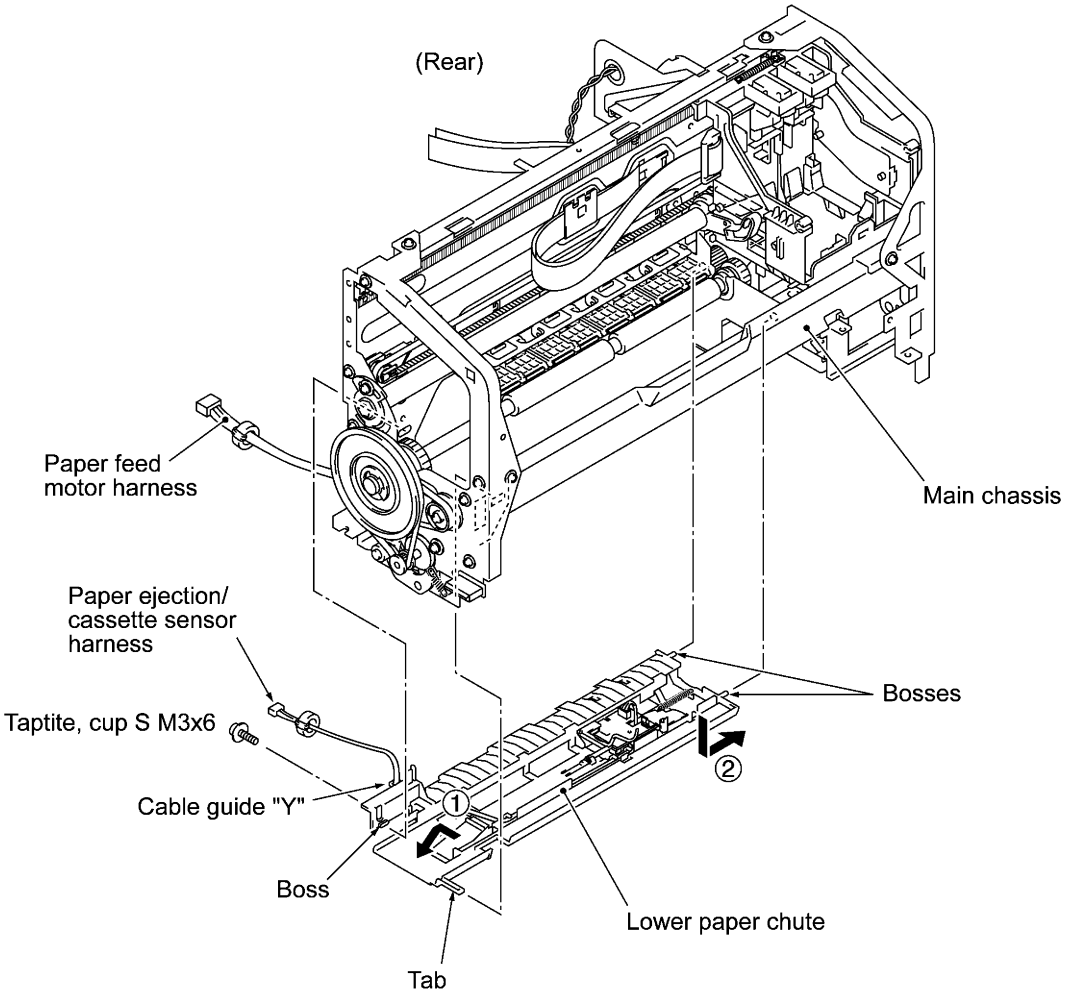
■ Reassembling Notes

- Be sure to hook the latch of each star wheel film to the platen.
- When securing the platen, be sure to use three M3x5 screws. Do not use longer ones.

1.20 Lower Paper Chute, Paper Ejection/Cassette Sensor PCB, and Sensor Actuators

(1) Remove the screw from the lower paper chute.

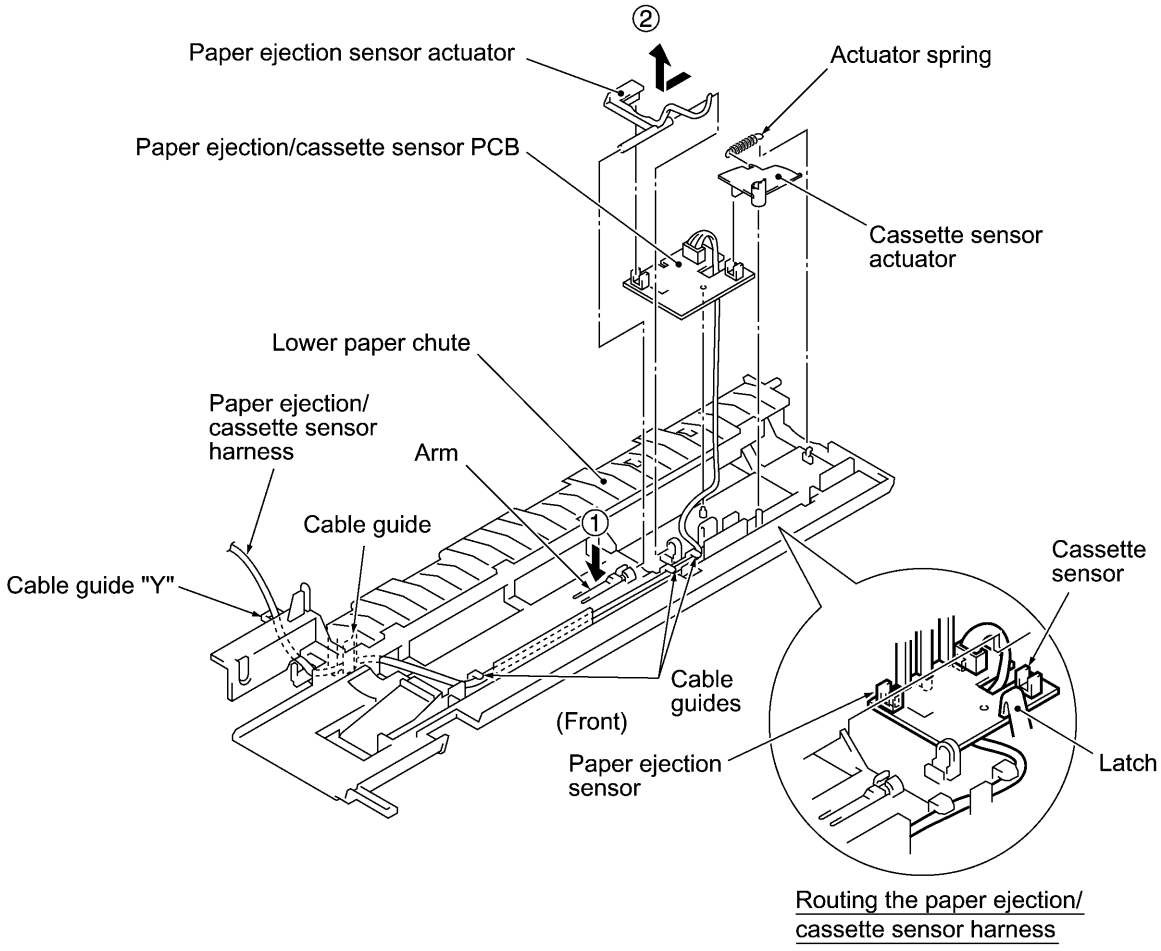
(2) Remove the lower paper chute by releasing its bosses and tab from the holes provided in the main chassis.



(3) As shown with arrows ① and ②, press the arm and take out the paper ejection sensor actuator.

(4) Unhook the actuator spring and remove the cassette sensor actuator.

(5) Pull the latch and take out the paper ejection/cassette sensor PCB.

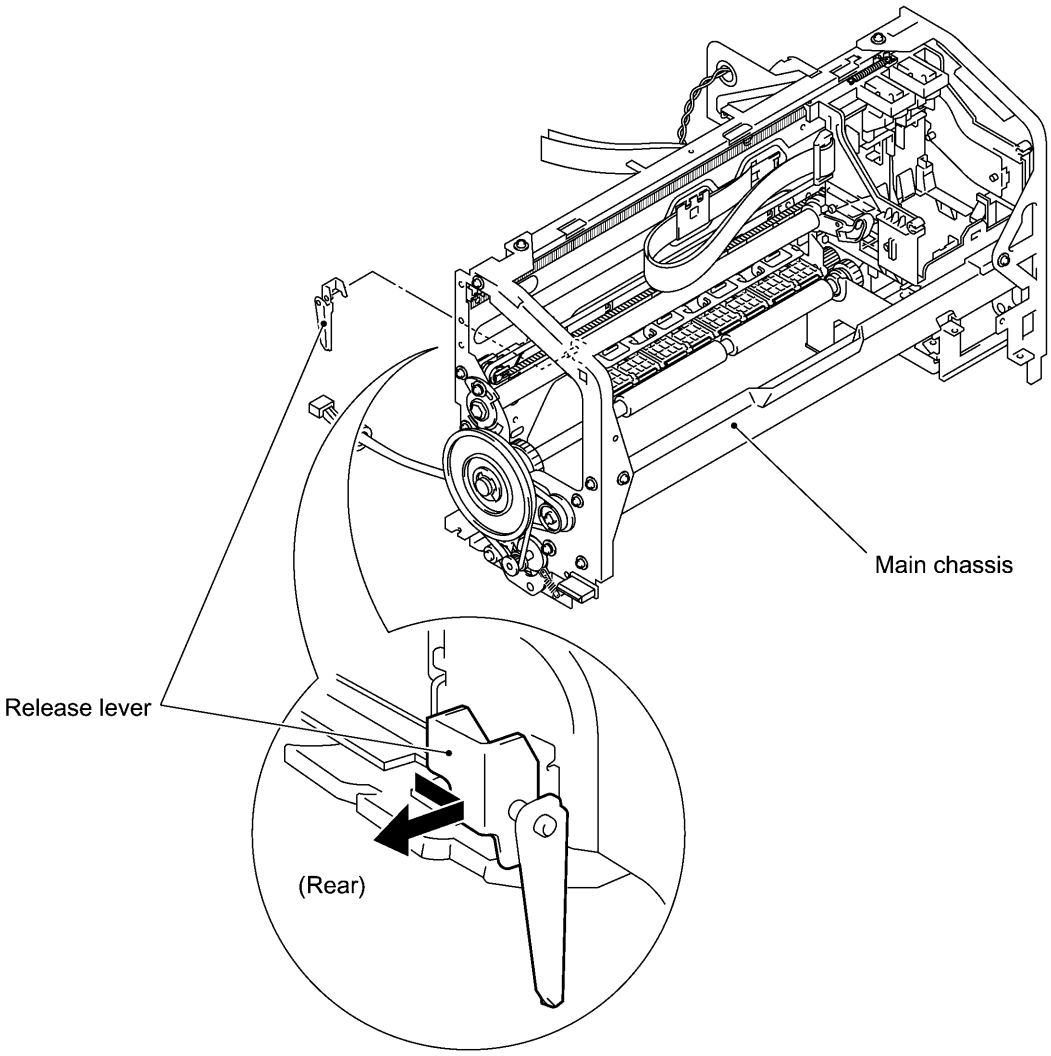


■ Reassembling Notes

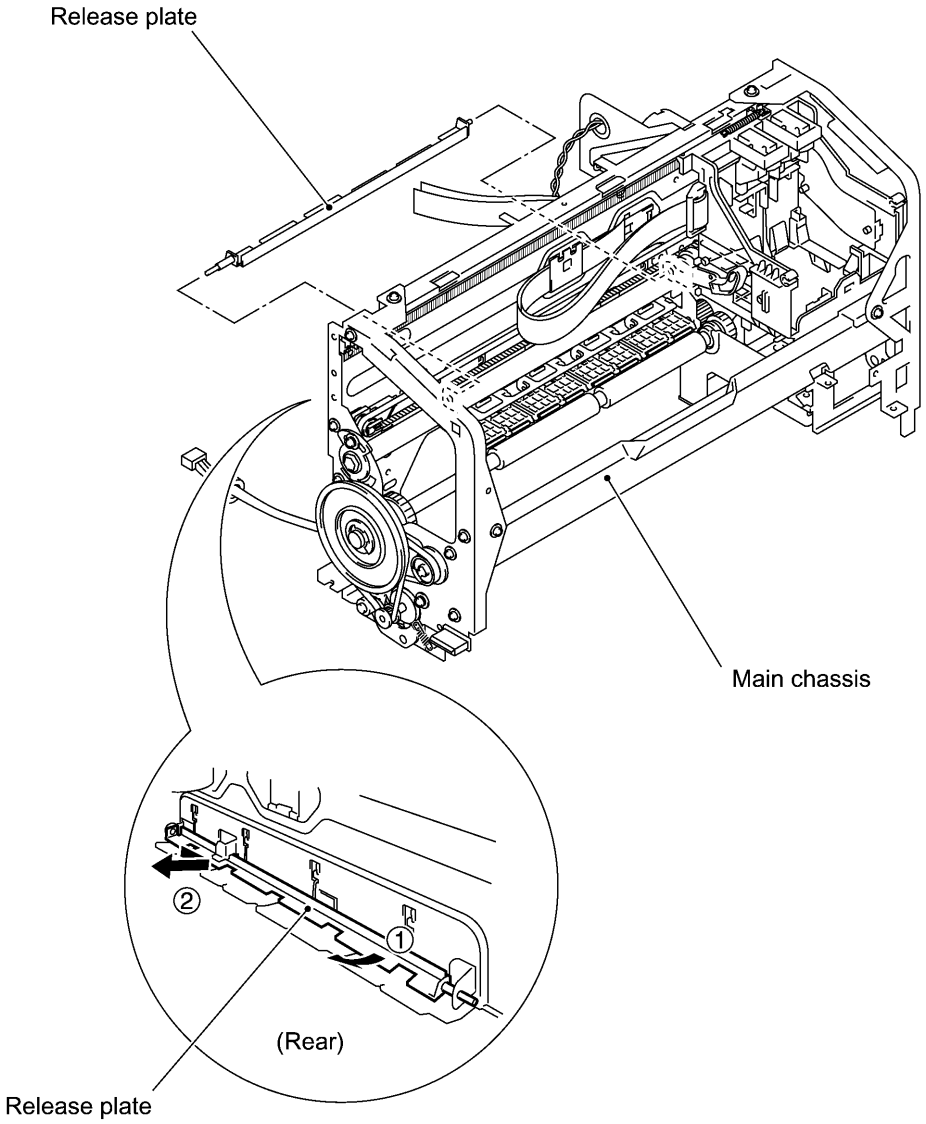
- Be sure to route the paper ejection/cassette sensor harness as illustrated above.

1.21 Release Lever and Release Plate

(1) Shift the release lever to the right (when viewed from the rear) and remove it to the rear.



(2) Turn the release plate in the direction of arrow ① and remove it in the direction of arrow ②.



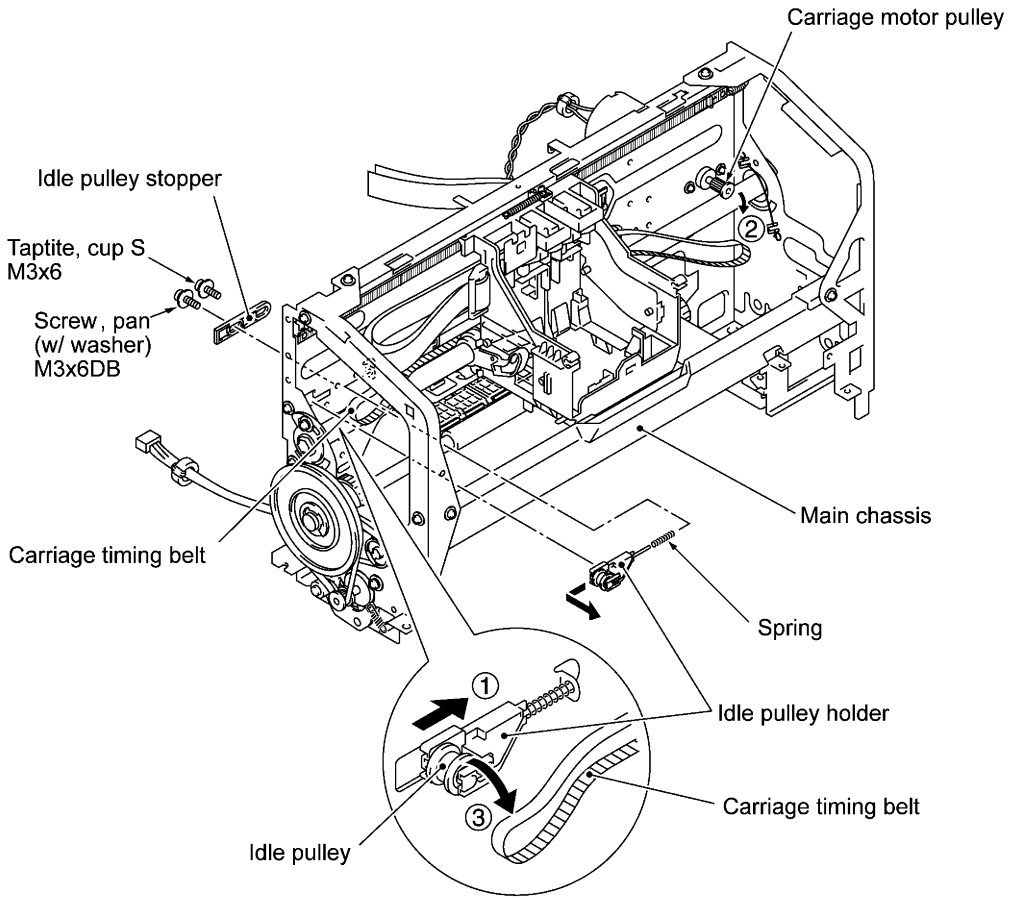
1.22 Idle Pulley Related Parts and Carriage Motor

(1) From the rear right of the main chassis (when viewed from the rear), remove the two screws to release the idle pulley stopper.

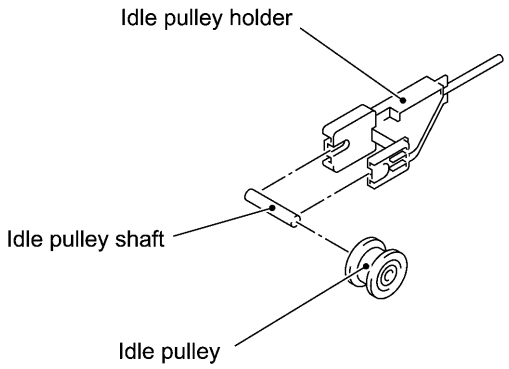
(2) Move the carriage to the center of its travel.

(3) While pushing the idle pulley holder in the direction of arrow ①, remove the carriage timing belt from the carriage motor pulley (arrow ②). Then remove the carriage timing belt from the idle pulley (arrow ③).

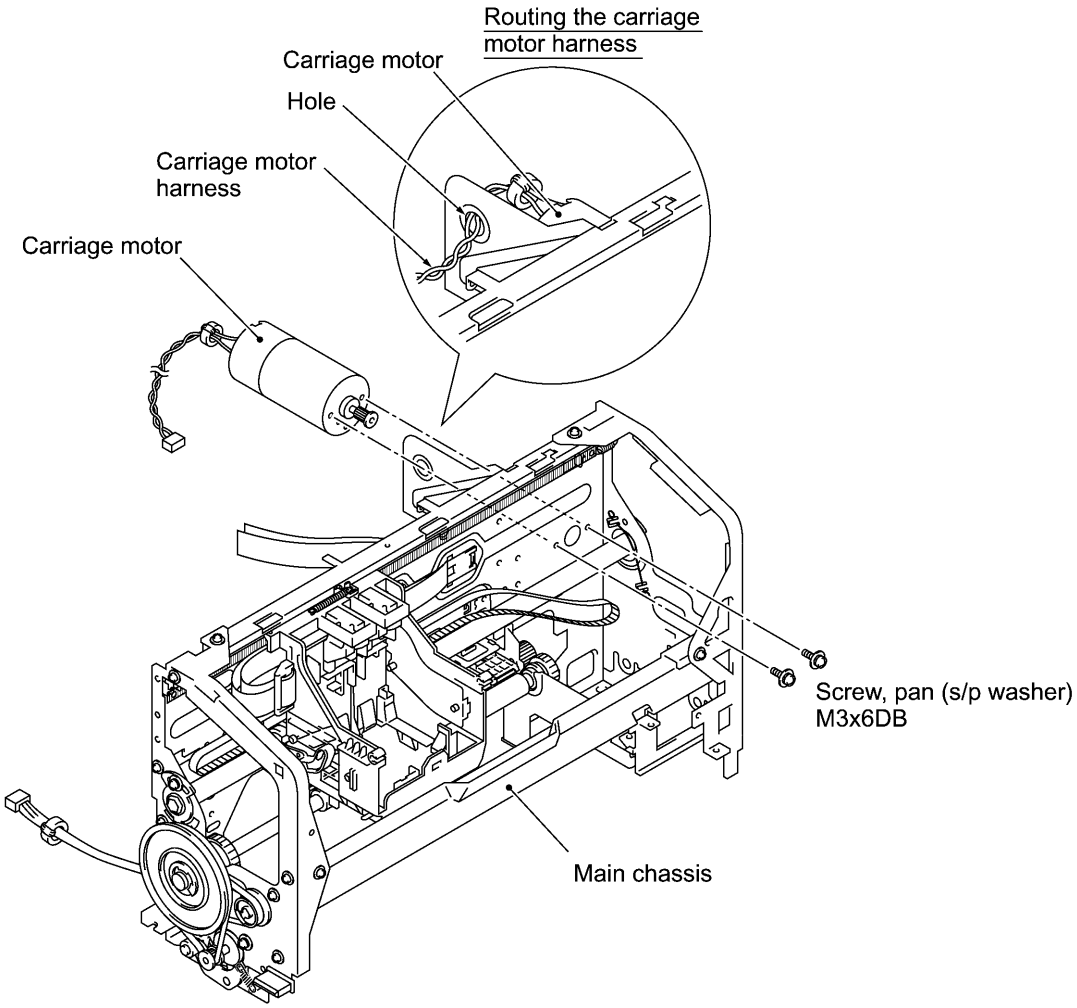
(4) Remove the idle pulley holder and its spring.



(5) Remove the idle pulley and its shaft from the idle pulley holder



(6) Remove the two screws and take the carriage motor off the main chassis.

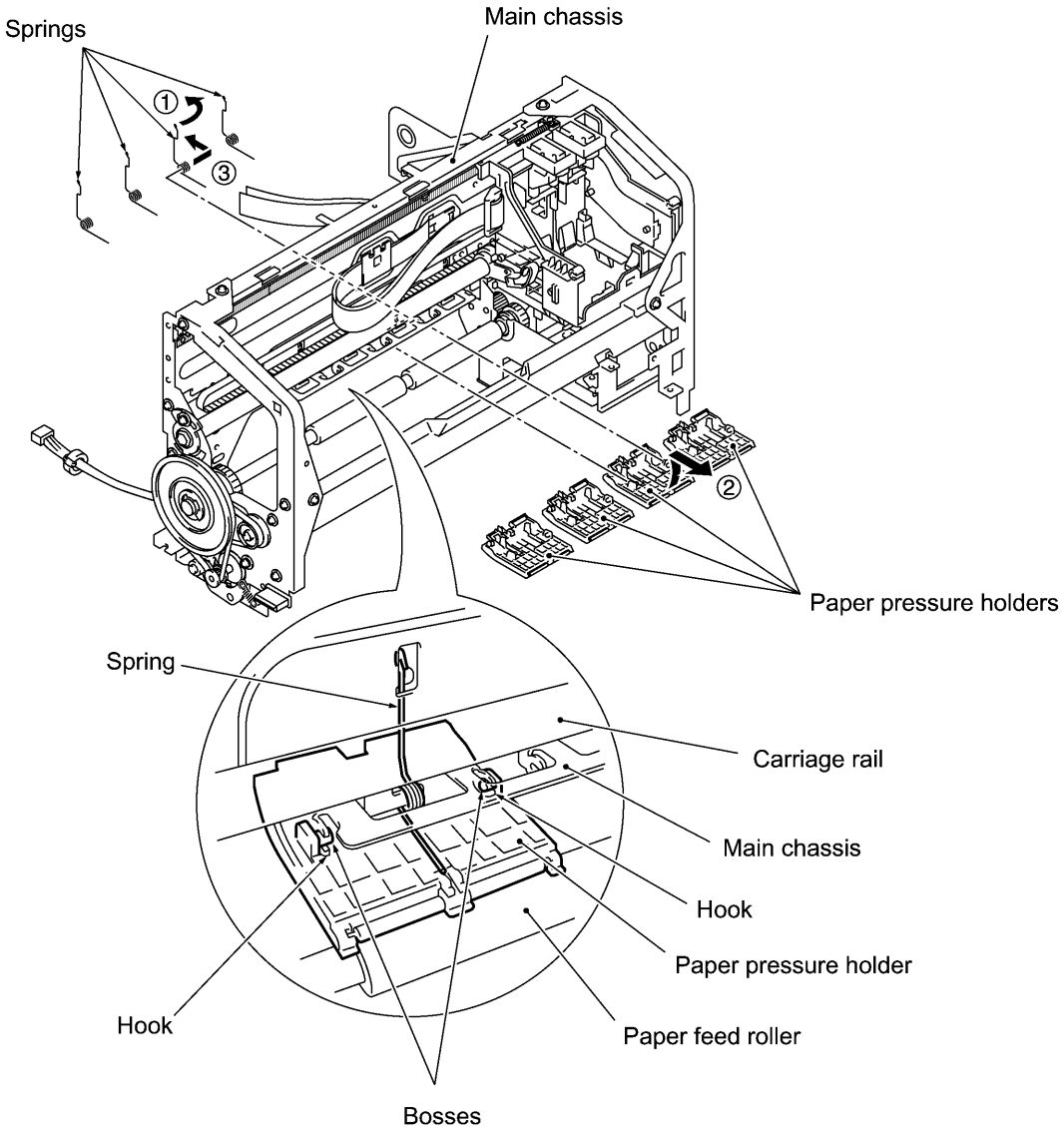


1.23 Paper Pressure Holders

(1) At each of the paper pressure holders, unhook the top end of the spring from the main chassis in the direction of arrow ①.

(2) Turn up the front end of the paper pressure holder and take it out to the front (arrow ②) to release the bosses from the hooks provided on the main chassis.

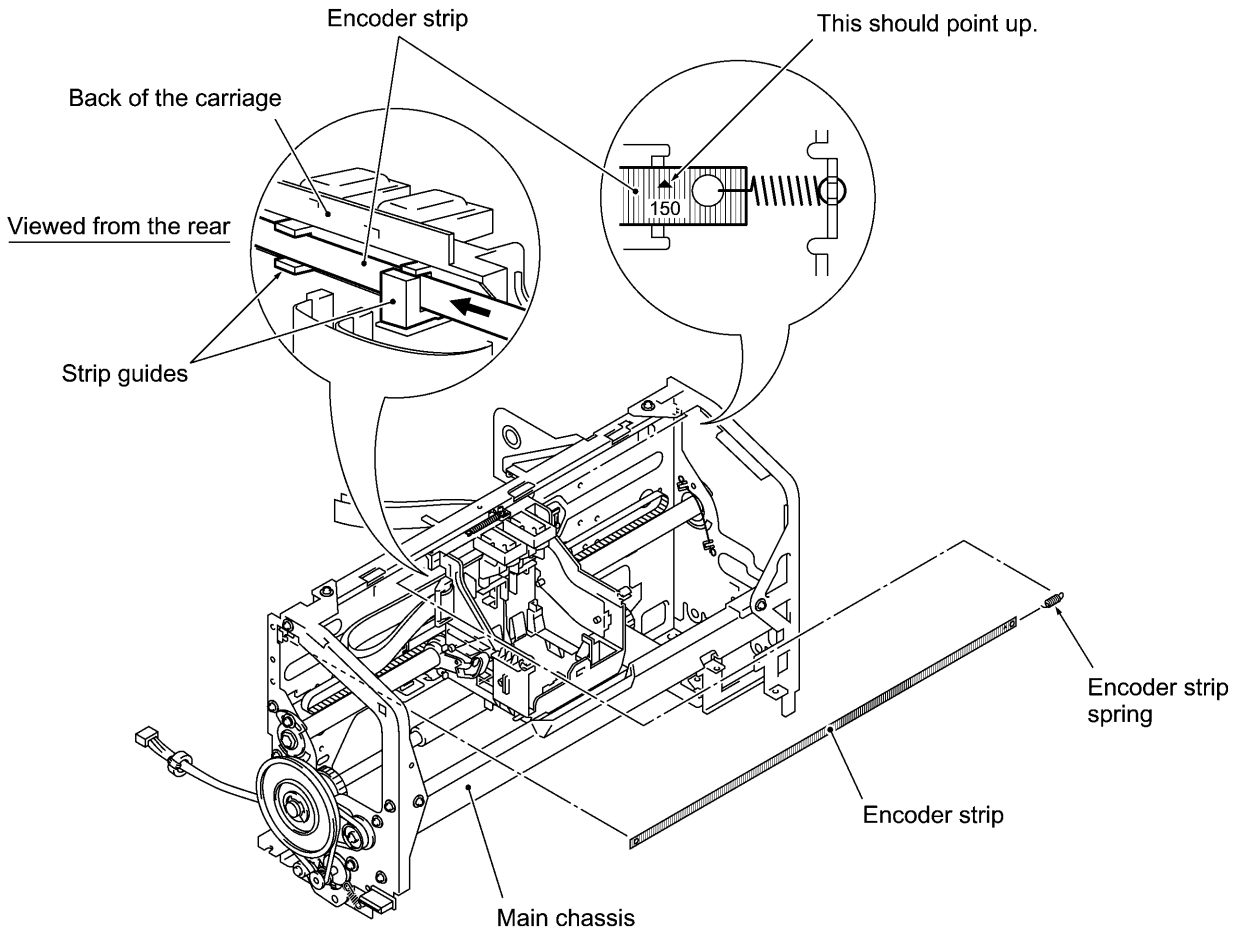
(3) Remove the springs from the main chassis (arrow ③).



1.24 Encoder Strip

(1) At the right end of the encoder strip, unhook the spring from the main chassis.

NOTE: Take care not to scratch or damage the encoder strip.



■ Reassembling Notes

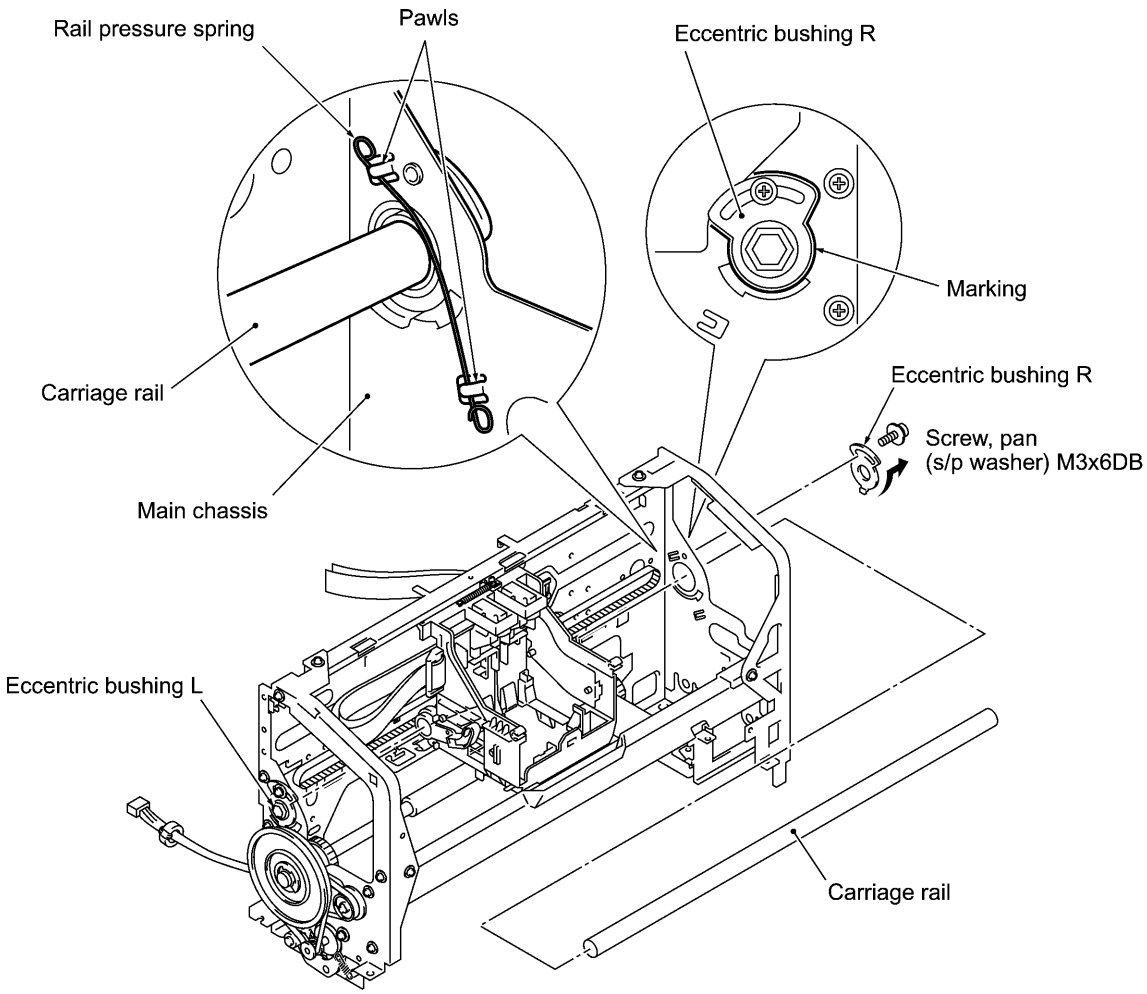
- Pass the encoder strip through the strip guides provided on the back of the carriage (from left to right) so that the strip will route as illustrated above and the ▲-marked end comes to the right. Then hook the ▲-marked end on the spring of the main chassis so that the ▲ mark points up.

1.25 Carriage Rail and Carriage ASSY

(1) At the right end of the carriage rail inside the main chassis, remove the rail pressure spring from the pawls of the main chassis.

(2) Remove the screw from the eccentric bushing R, then turn the eccentric bushing R clockwise (when viewed from the right) and take it off.

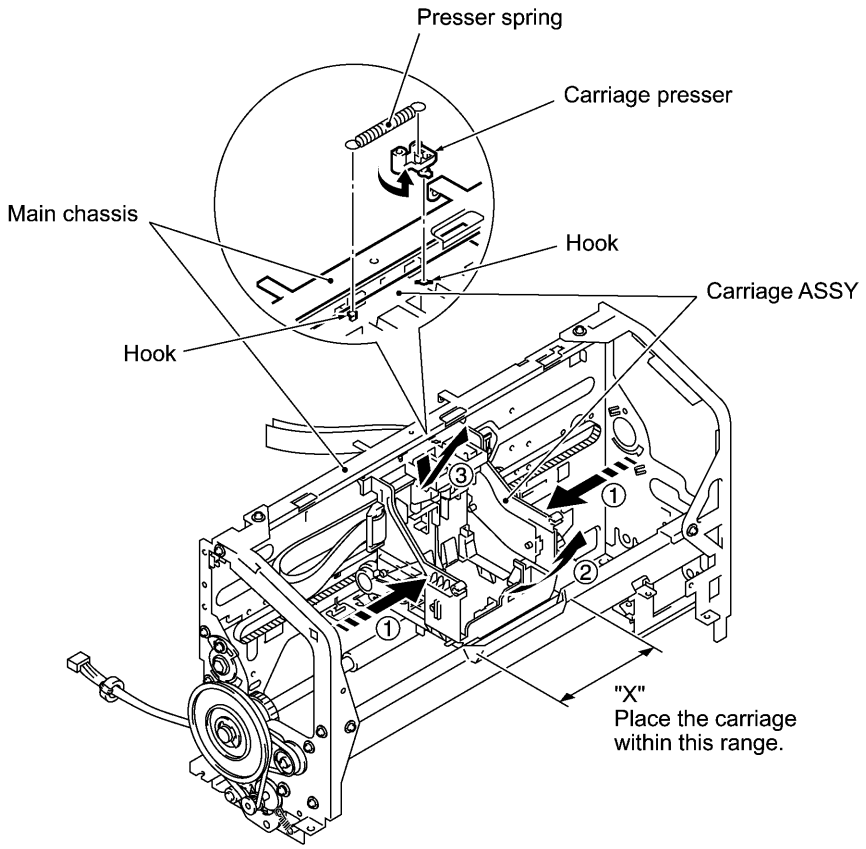
(3) Pull out the carriage rail to the right. (At the left side of the main chassis, remove the screw from the eccentric bushing L, if necessary, as shown on page IV-67.)



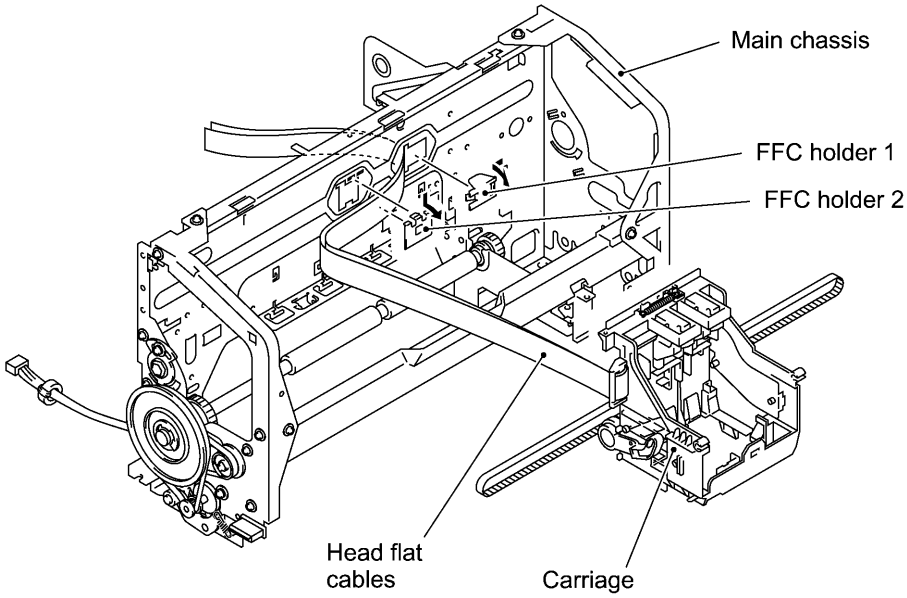
(4) Unhook the presser spring, turn the carriage presser counterclockwise (when viewed from the top), and lift it up.

(5) Bring the carriage to the center of the travel (within "X" range shown below) in the direction of arrow ①.

(6) Lift up the front end of the carriage (arrow ②) and take it out of the main chassis (arrow ③).

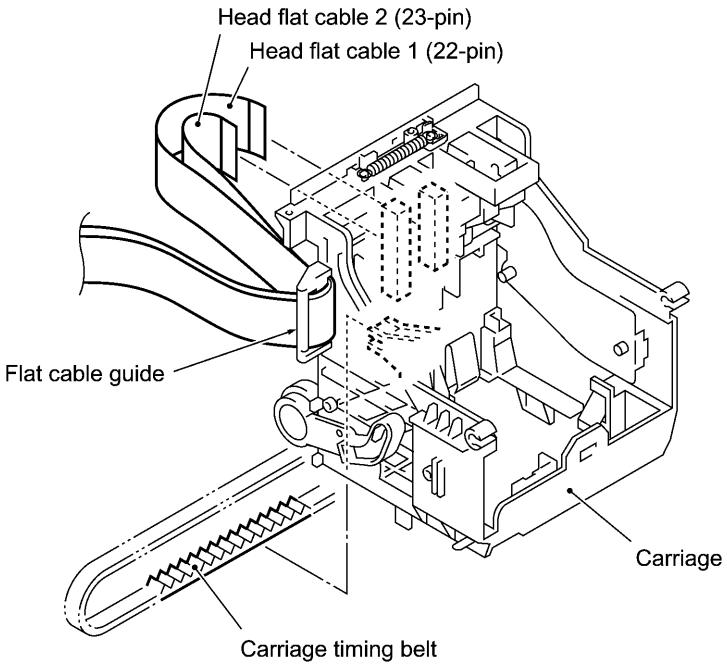


(7) Unlatch the FFC holders 1 and 2 and remove them to the front to release the head flat cables. The carriage is now completely separated from the main chassis.



(8) Remove the timing belt from the back of the carriage.

(9) Remove the head flat cables from the flat cable guide of the carriage.



■ Reassembling Notes

- To reinstall the carriage rail, temporarily set the eccentric bushing L to the left side of the main chassis with the screw, align the bushing L with marking made on the main chassis (as shown on page IV-63), and then tighten the screw firmly.

  Pass the carriage rail through the opening in the right side of the main chassis and through the carriage, then fit it into the eccentric bushing L.

  Next, fit the eccentric bushing R over the right end of the carriage rail, temporarily set the bushing R to the right side of the main chassis with the screw, align the bushing R with marking made on the main chassis, and then tighten the screw firmly.

  This alignment with markings is required for keeping the head-platen gap properly.

- If you replace the carriage PCB ASSY, be sure to set the sensing reference levels of the black ink empty sensor (function code: 57). (Refer to Chapter V, Subsection 3.10.)

1.26 Paper Feed Motor, PF Roller Pulley L, PF Timing Belts, Paper Feed Roller, and Paper Ejection Roller

(1) Unhook the tension spring and remove screw "a" from the tension plate to release the plate.

(2) Take off the paper feed motor by removing two screws "b." This releases the PF timing belt L from the motor pulley.

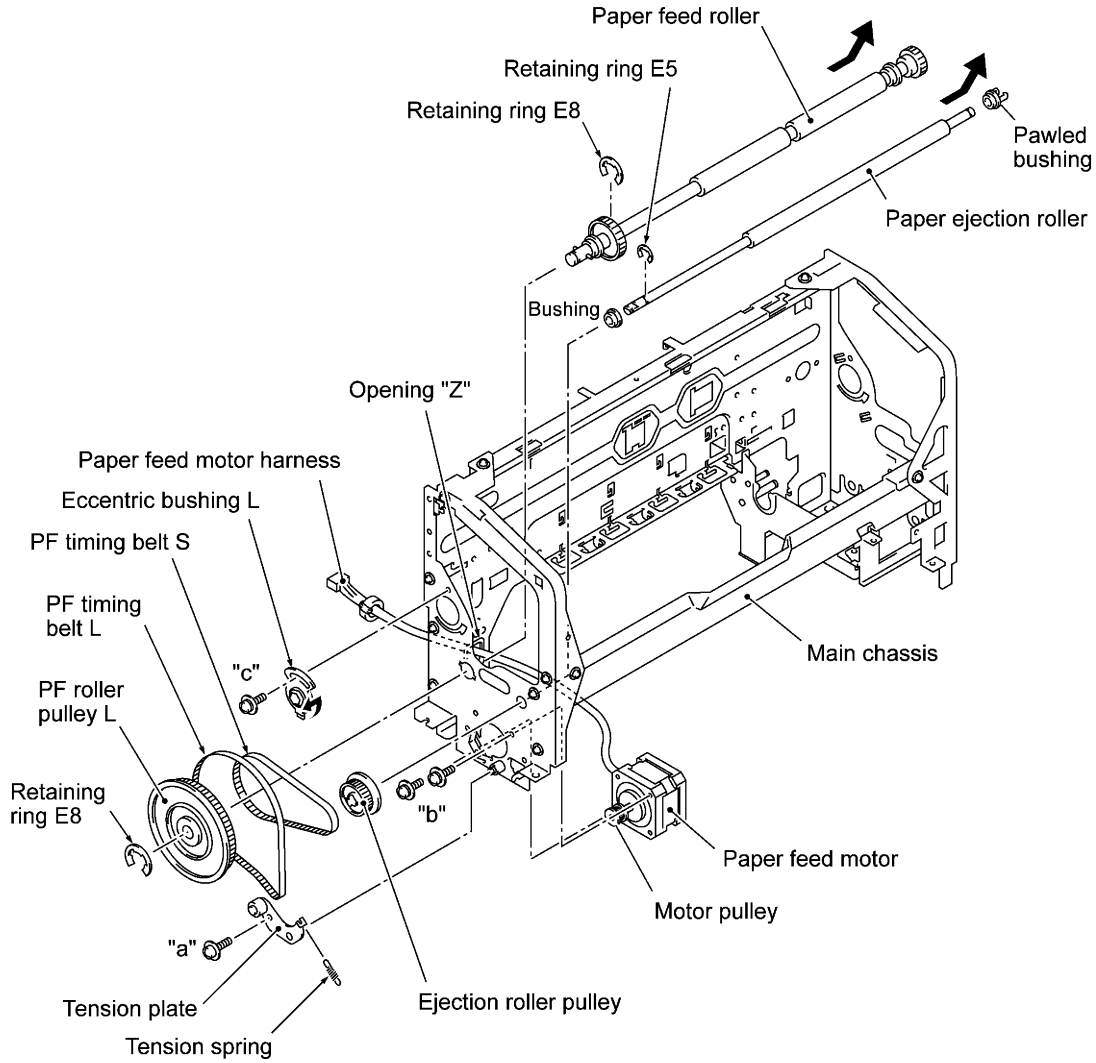
(3) Remove the PF timing belt L from the outer wheel of the PF roller pulley L.

(4) Remove the PF timing belt S from the ejection roller pulley.

(5) Remove the retaining ring E8 from the left end of the paper feed roller shaft and pull out the PF roller pulley L. The PF timing belt S also comes off.

(6) Remove the retaining ring E8 from the paper feed roller shaft inside the main chassis, then slide the paper feed roller to the right and lift it up.

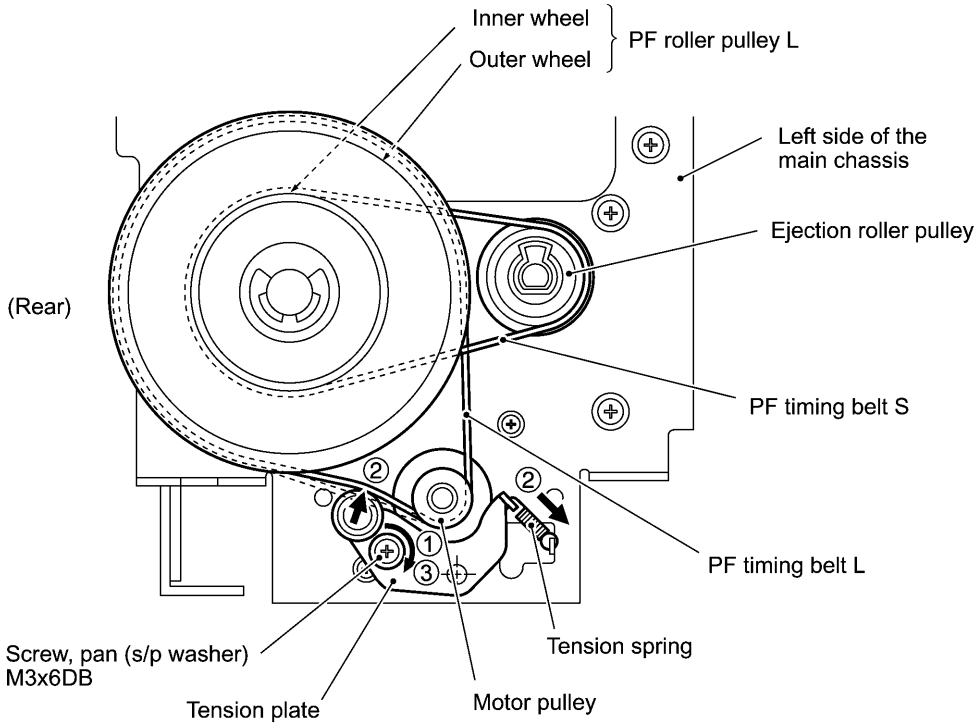
(7) Remove the ejection roller pulley by pulling its pawl outwards, then slide the paper ejection roller to the right and lift it up.



"a" and "c": Screw, pan (s/p washer) M3x6DB
"b": Screw, pan (s/p washer) M3x6DA

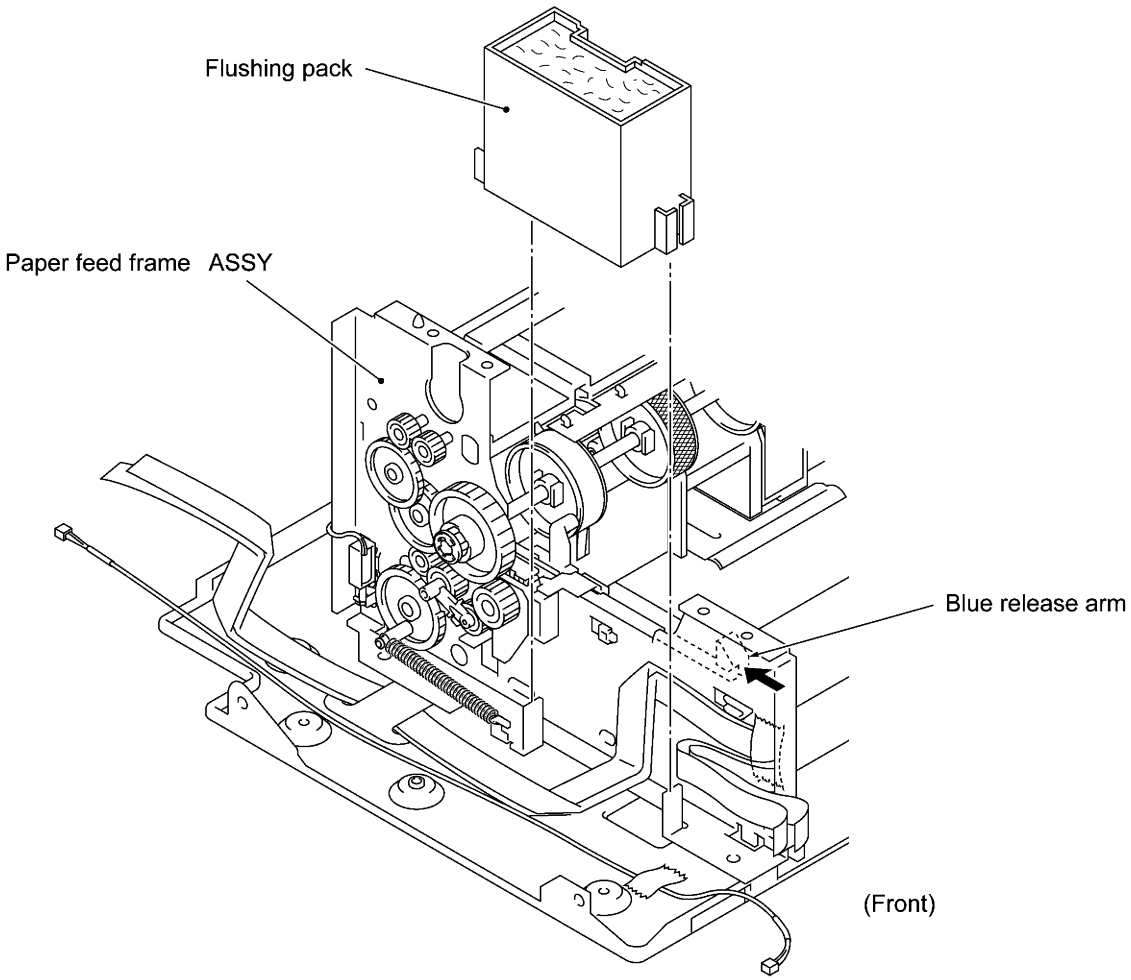
■ Reassembling Notes

- To reassemble the paper feed related parts, follow the steps below.
  1) Set the paper ejection roller to the main chassis and snap the ejection roller pulley onto the left end of the roller.
  2) Set the paper feed roller to the main chassis and set the retaining ring E8 to its roller shaft inside the main chassis.
  3) Put the PF timing belt S around the inner wheel of the PF roller pulley L, then secure the pulley to the left end of the paper feed roller shaft with the retaining ring E8.
  4) Put the PF timing belt S around the ejection roller pulley.
  5) Put the PF timing belt L around the outer wheel of the PF roller pulley L.
  6) Putting the PF timing belt L around the motor pulley, secure the paper feed motor to the main chassis with two screws.
  7) Set the tension plate to the main chassis and temporarily tighten the screw (arrow ①).
  8) Hook the tension spring onto the tension plate and main chassis to apply tension to the PF timing belt L (arrow ②), and then tighten the screw firmly (arrow ③).



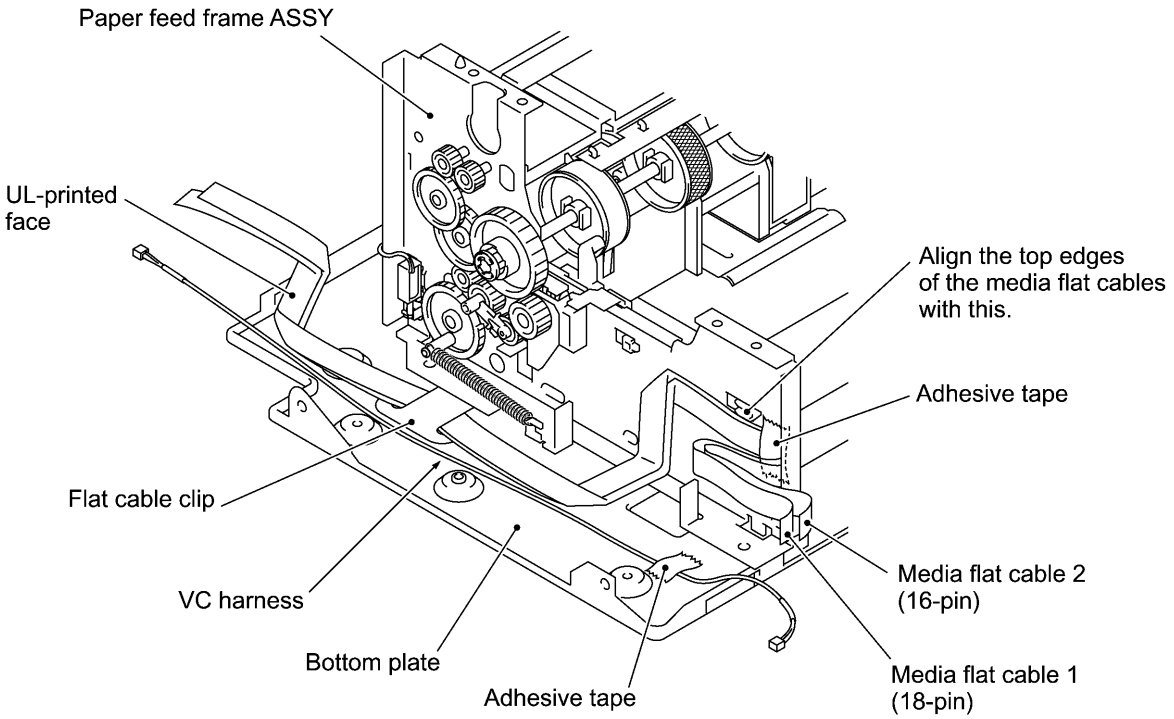
1.27 Flushing Pack

(1) Push the blue release arm and pull up the flushing pack.



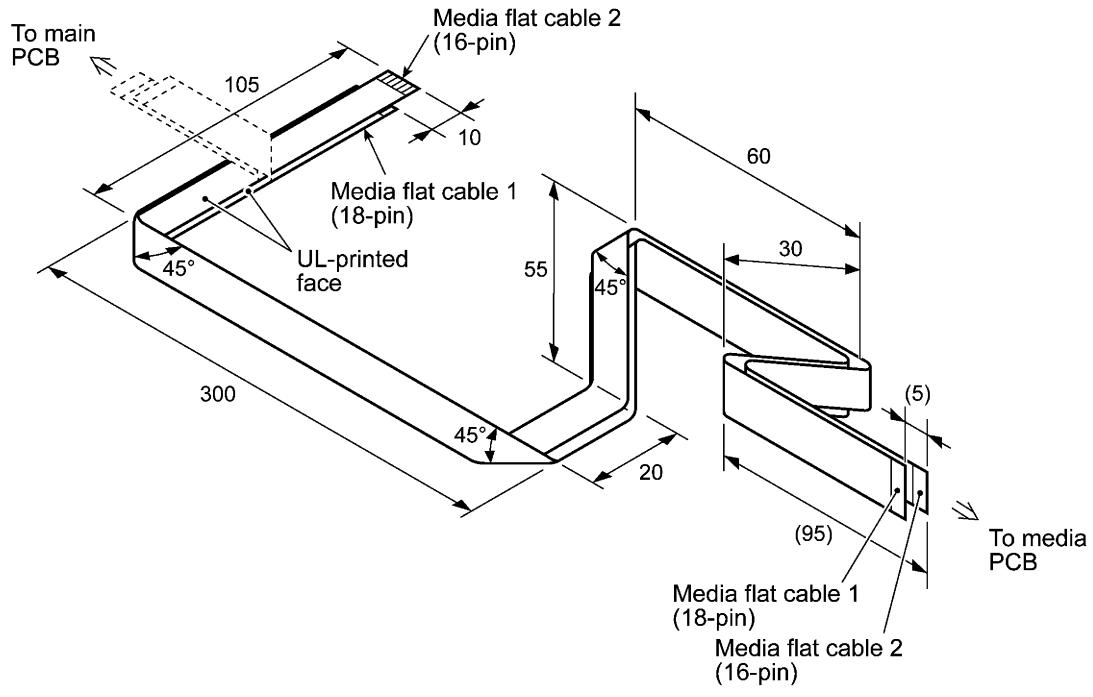
1.28 Media Flat Cables

(1) Remove adhesive tape to release the media flat cables.



■ **Reassembling Notes**

- When using new media flat cables, fold them as specified below.

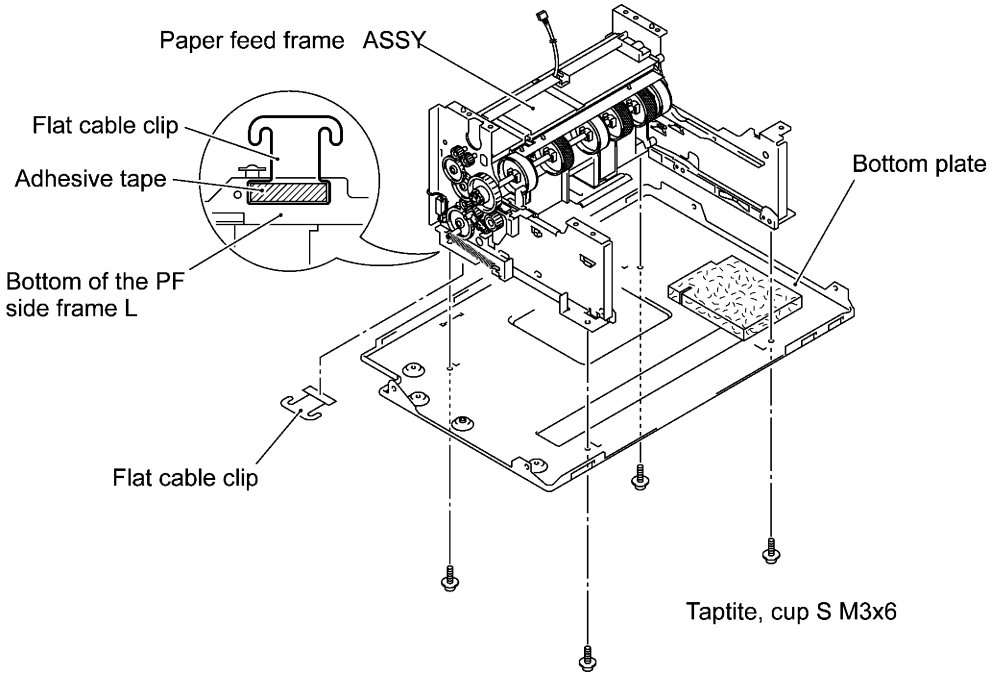


1.29 Bottom Plate

(1) Remove four screws and lift up the paper feed frame ASSY.

(2) Remove the flat cable clip.

NOTE: Once removed, the flat cable clip will become unusable and a new part will have to be put back in.



1.30 Paper Pick-up Roller ASSY, Separation Pad, and Solenoid

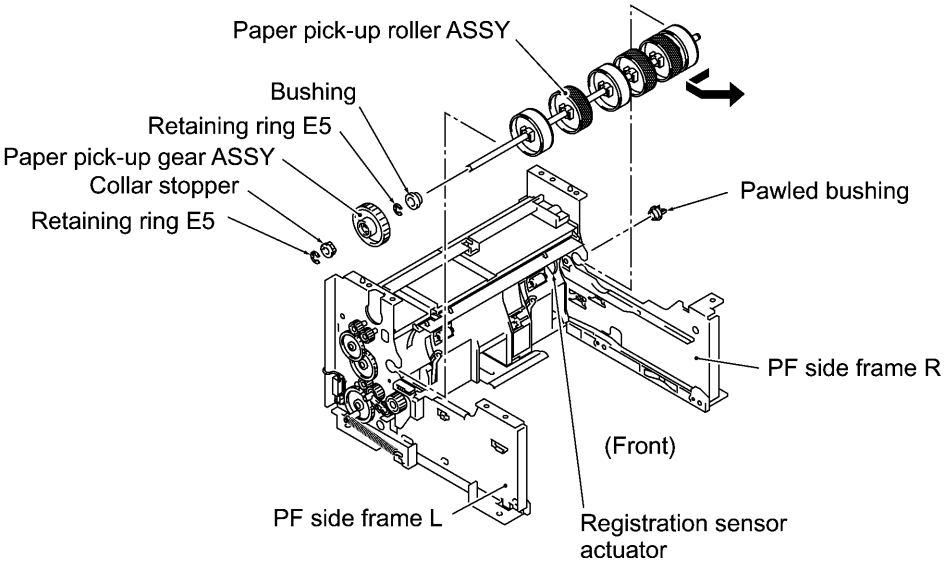
(1) Remove the retaining ring E5 from the left end of the paper pick-up roller shaft, then pull out the collar stopper and paper pick-up gear ASSY.

(2) Remove the retaining ring E5 and pull out the bushing.

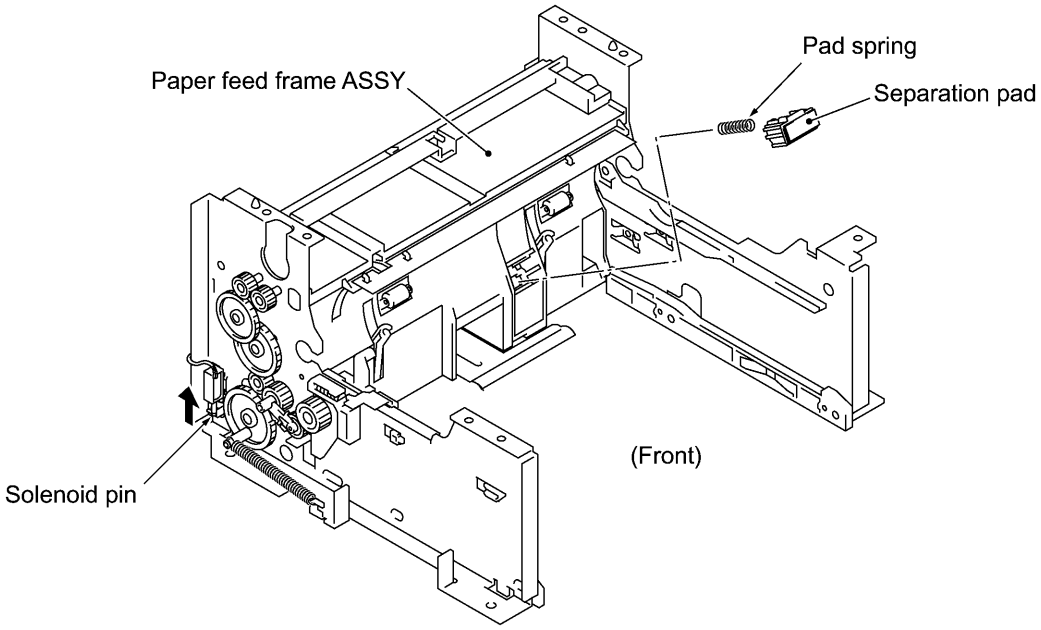
(3) Remove the pawled bushing from the right end of the paper pick-up roller shaft by pulling its pawls outwards.

(4) Remove the paper pick-up roller ASSY in the direction of the arrow, taking care not to break the registration sensor actuator.

NOTE: Keep the paper pick-up rollers away from grease.

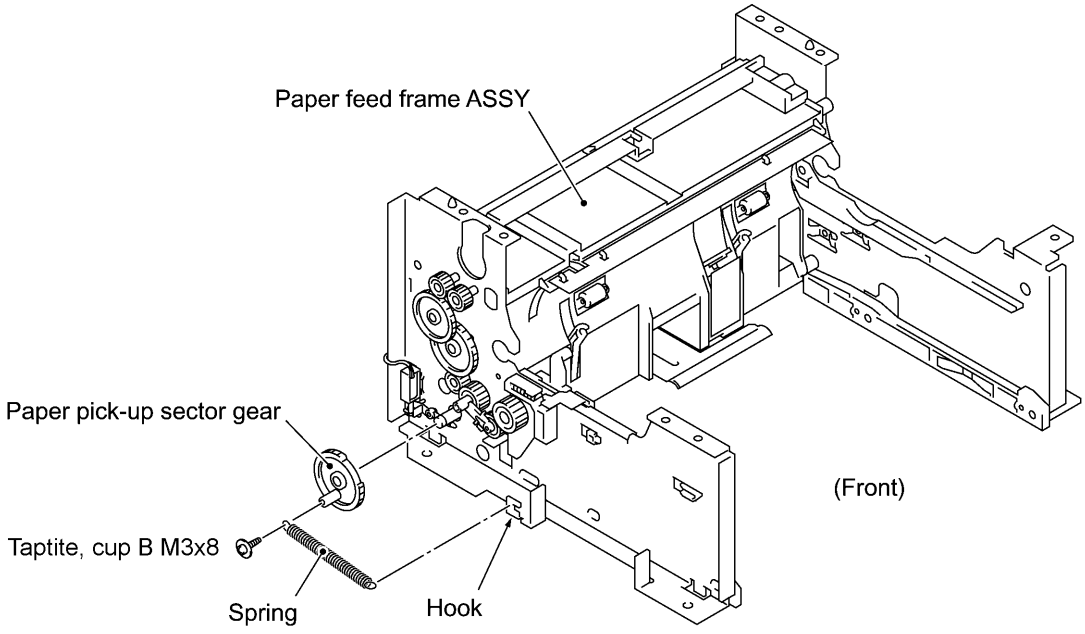


(5) Push up the solenoid pin, and the separation pad comes off with its spring.

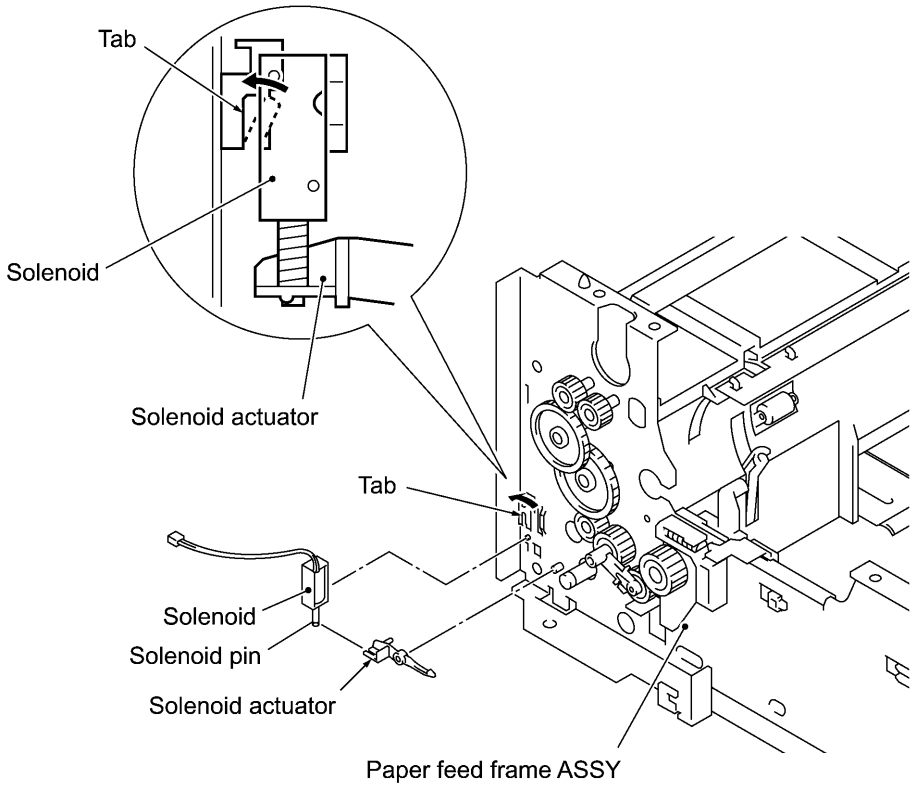


(6) Unhook the spring.

(7) Remove the paper pick-up sector gear by pulling its pawl outwards.

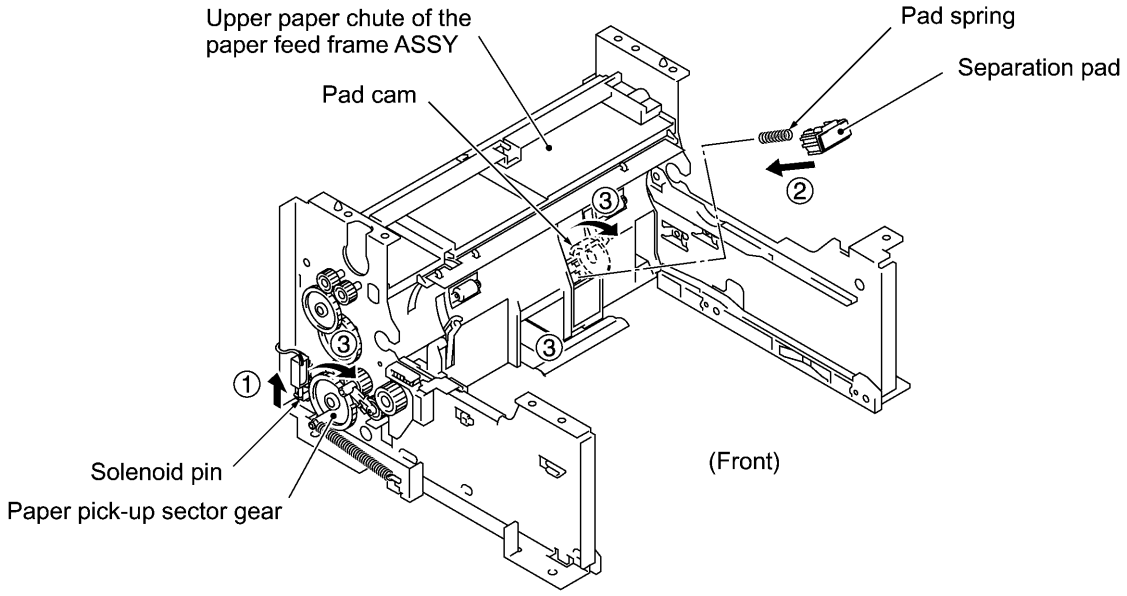


(8) Pull the tab provided on the paper feed frame ASSY outwards and remove the solenoid. The solenoid actuator, spring, and pin also come off.



■ Reassembling Notes

- When setting the separation pad back into place, push up the solenoid pin (in the direction of arrow ①), put the separation pad and its spring into the cutout provided in the upper paper chute of the paper feed frame ASSY (arrow ②), and turn the paper pick-up sector gear clockwise (arrow ③).



1.31 Disassembly of Paper Feed Frame ASSY

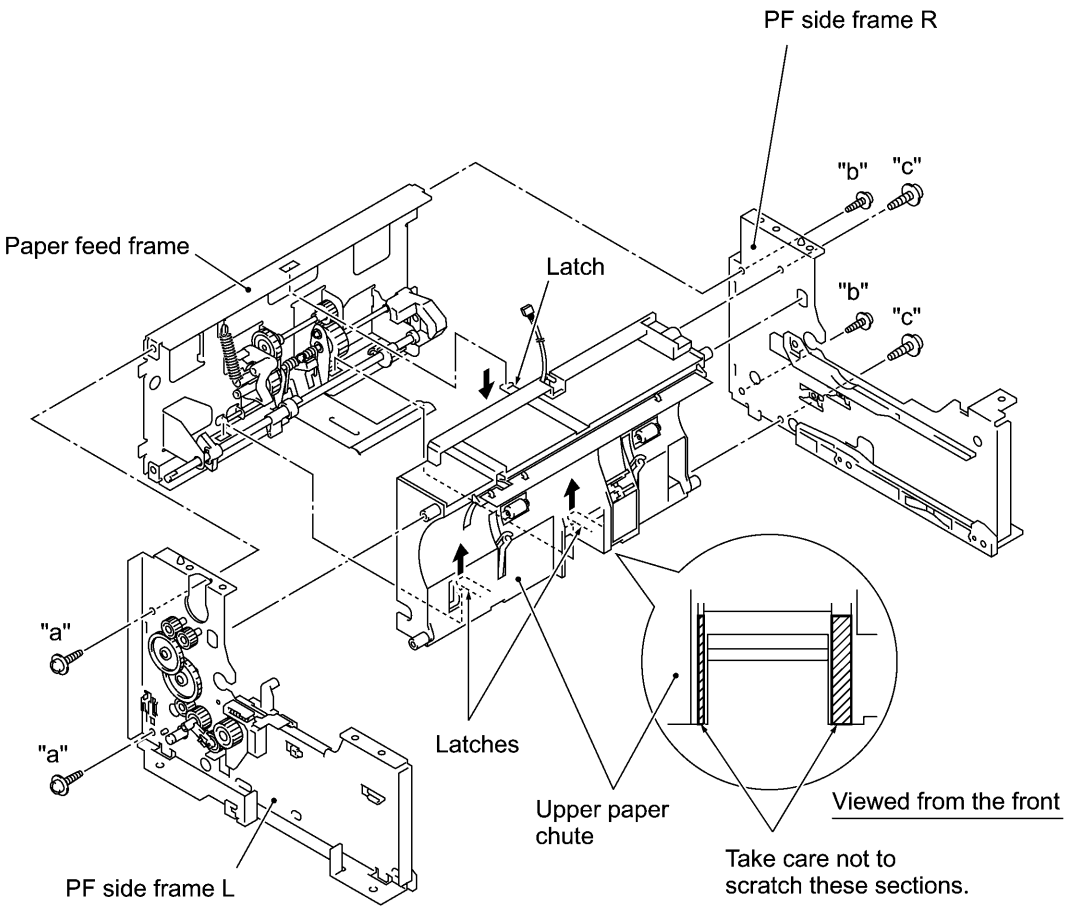
(1) Remove two screws "a" and take off the PF side frame L.

CAUTION: Do not place the paper feed frame ASSY with the PF side frame R facing down. Doing so will deform the purge unit supports.

(2) Remove four screws (two "b" and two "c") and take off the PF side frame R.

(3) Unhook the three latches and separate the upper paper chute from the paper feed frame.

CAUTION: When separating the upper paper chute, take care not to scratch hatched sections shown below which are used as the positioning face of the paper leading edge.



"a" and "b": Taptite, cup S M3x6
"c": Taptite, cup B M3x10

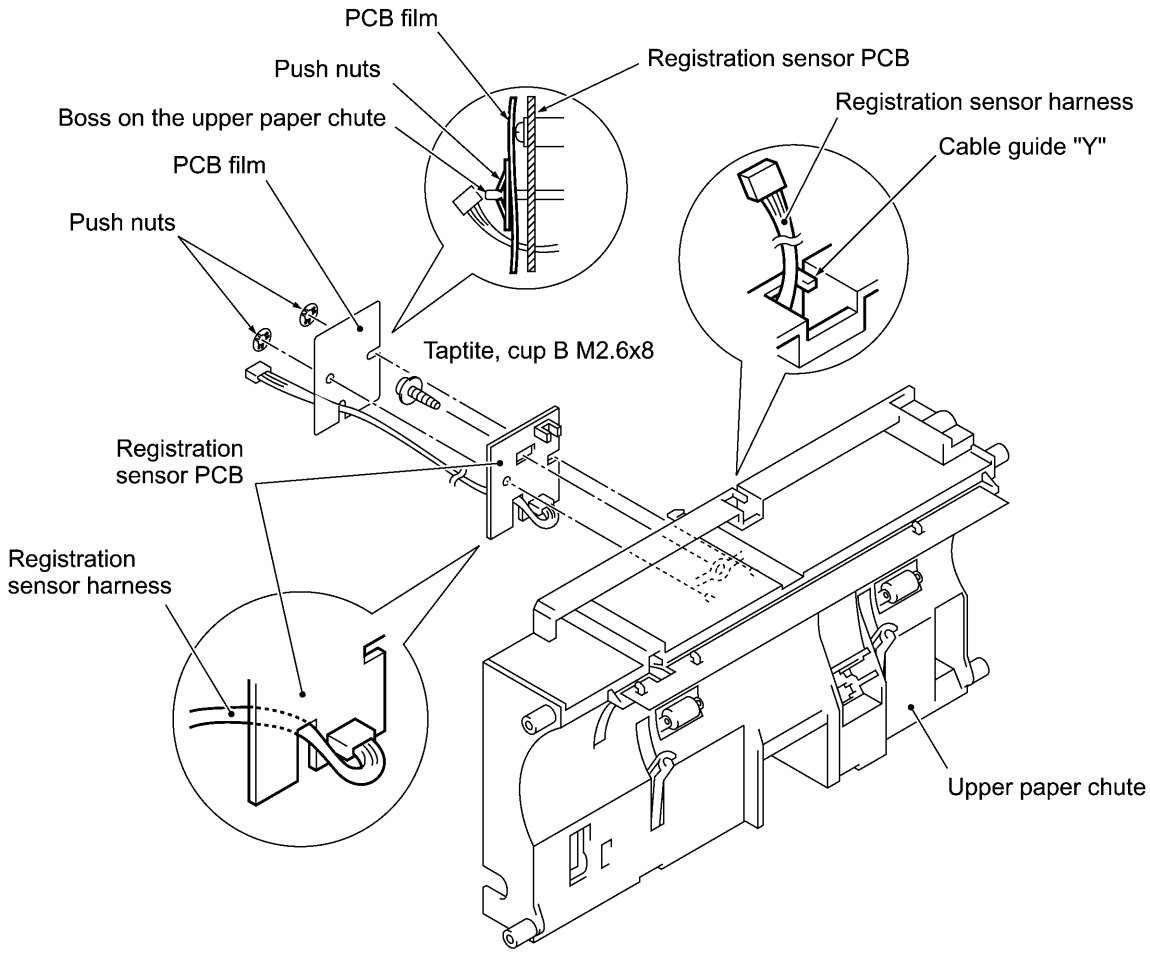
■ Reassembling Notes

- Take care not to contaminate the upper paper chute, separation pad, and rollers with grease applied to the paper feed frame.

1.32 Registration Sensor PCB

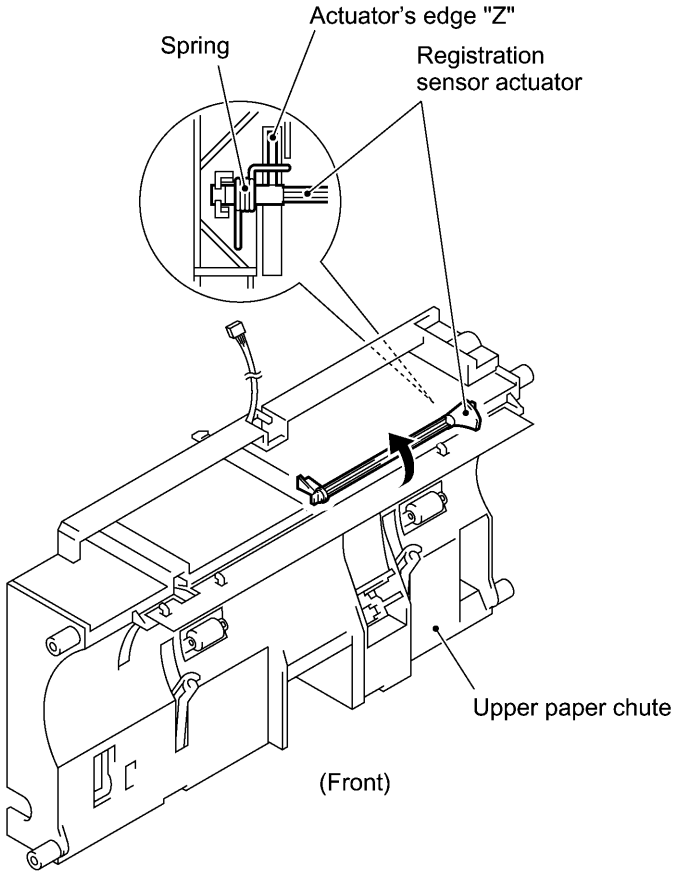
(1) Remove two push nuts and take off the PCB film.

(2) Remove the screw and take off the registration sensor PCB from the upper paper chute.



■ Reassembling Notes

- After putting the registration sensor actuator back into place, turn it so that the spring will be hooked on actuator's edge "Z" as shown below, and then set the registration sensor PCB.
- When setting the registration sensor PCB, route the harness as shown on the previous page.
- After securing the registration sensor PCB, check that the sensor actuators move smoothly.

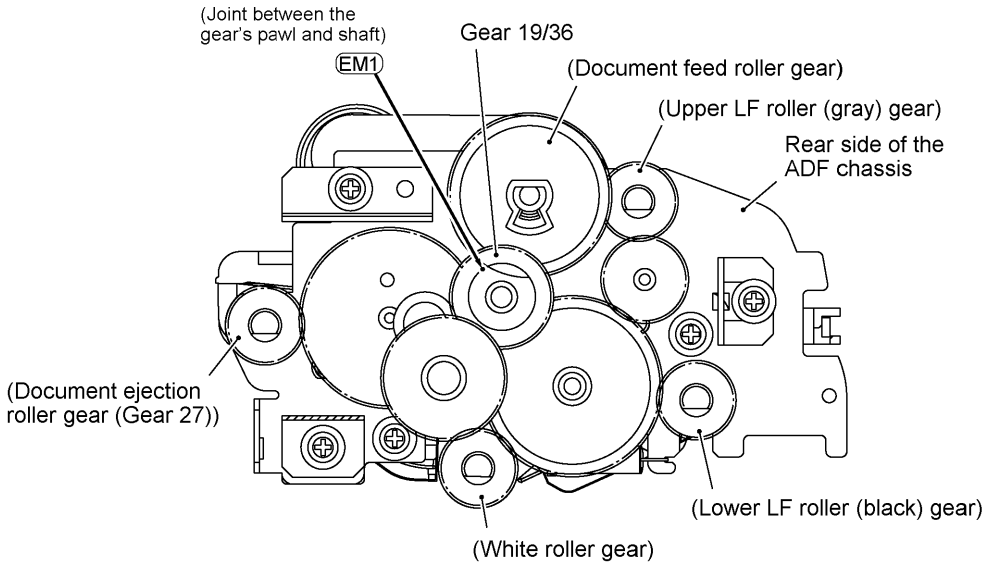


2. LUBRICATION

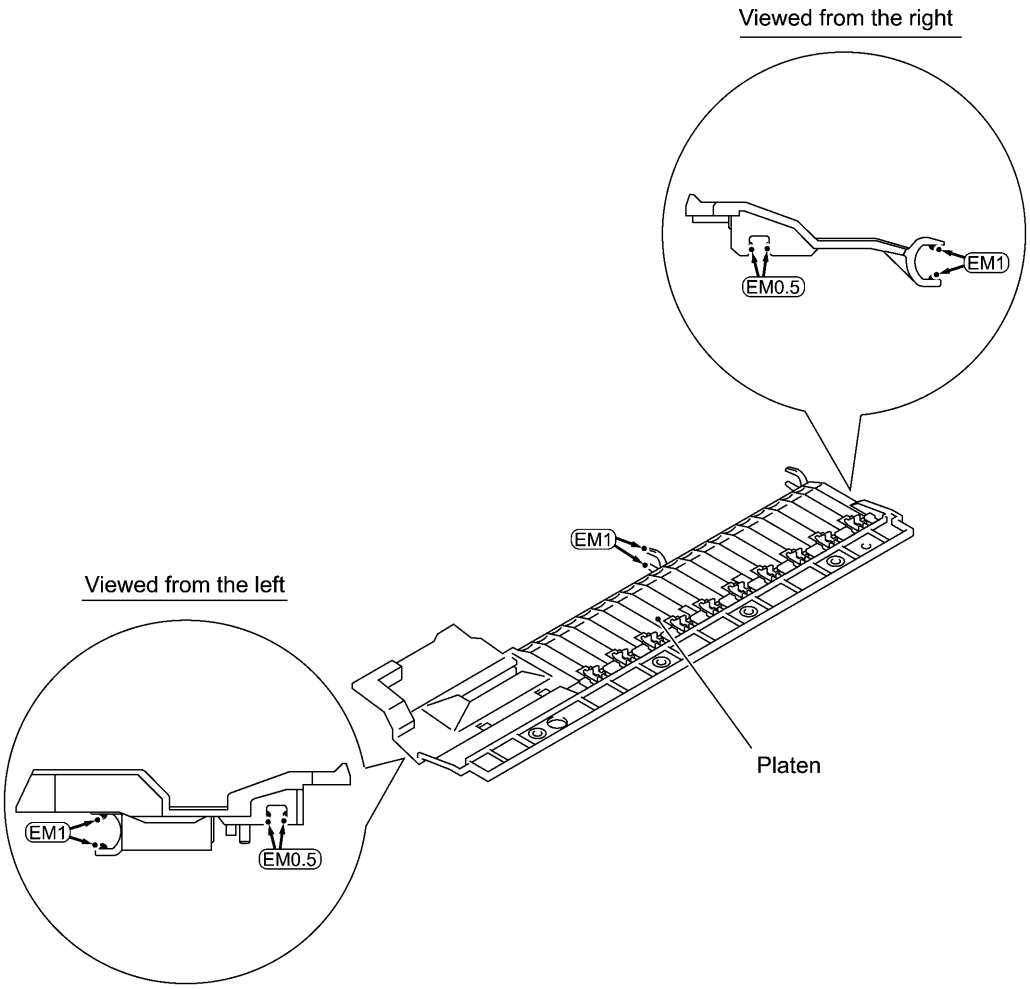
Apply the following lubricants to the lubrication points as illustrated below.

Lubricant type (Manufacturer)	Lubricant amount		
	0.02cc	Volume of 2 mm dia. ball	Volume of 4 mm dia. ball
Molykote EM-30LG or -30L (Dow Corning)	———	(EM0.5)	(EM1)
Silicone grease G501 (Shin-etsu Silicone)	———	———	(G1)
FLOIL 951P-32 (Kanto Kasei Co., Ltd.)	(GE0.02)	———	———

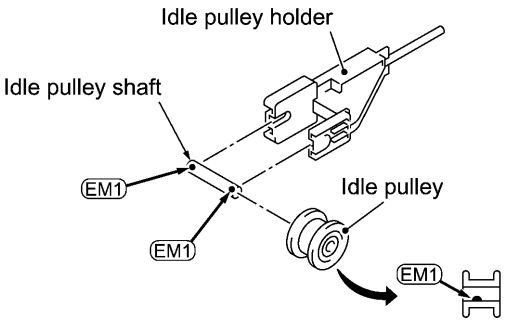
[1] ADF unit



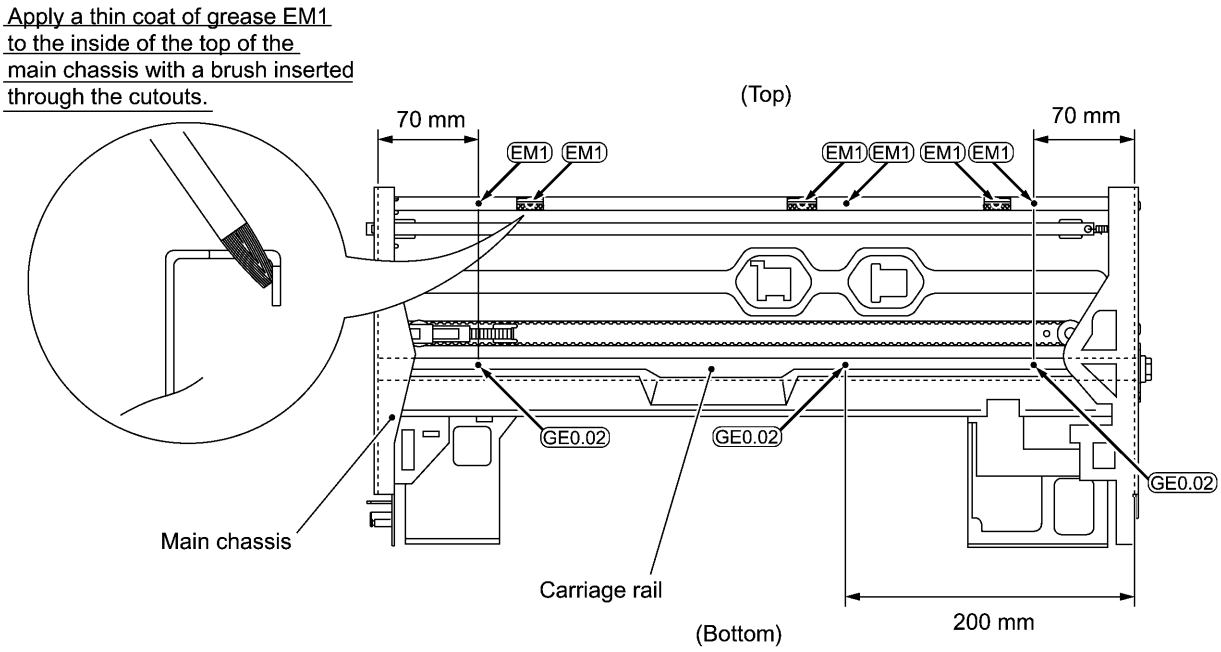
[2] Platen



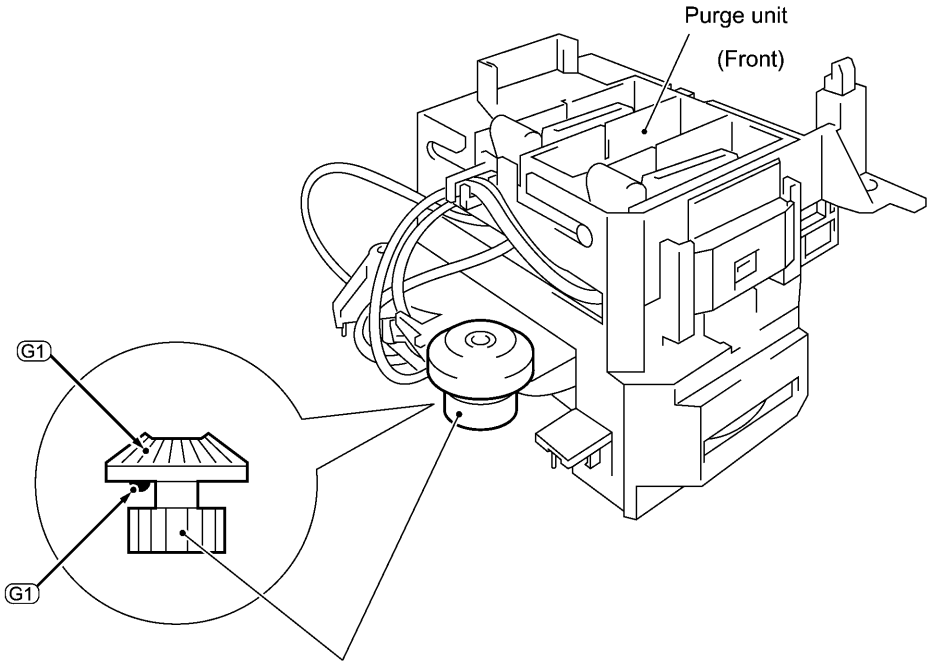
[3] Idle pulley shaft



[4] Main chassis and carriage rail

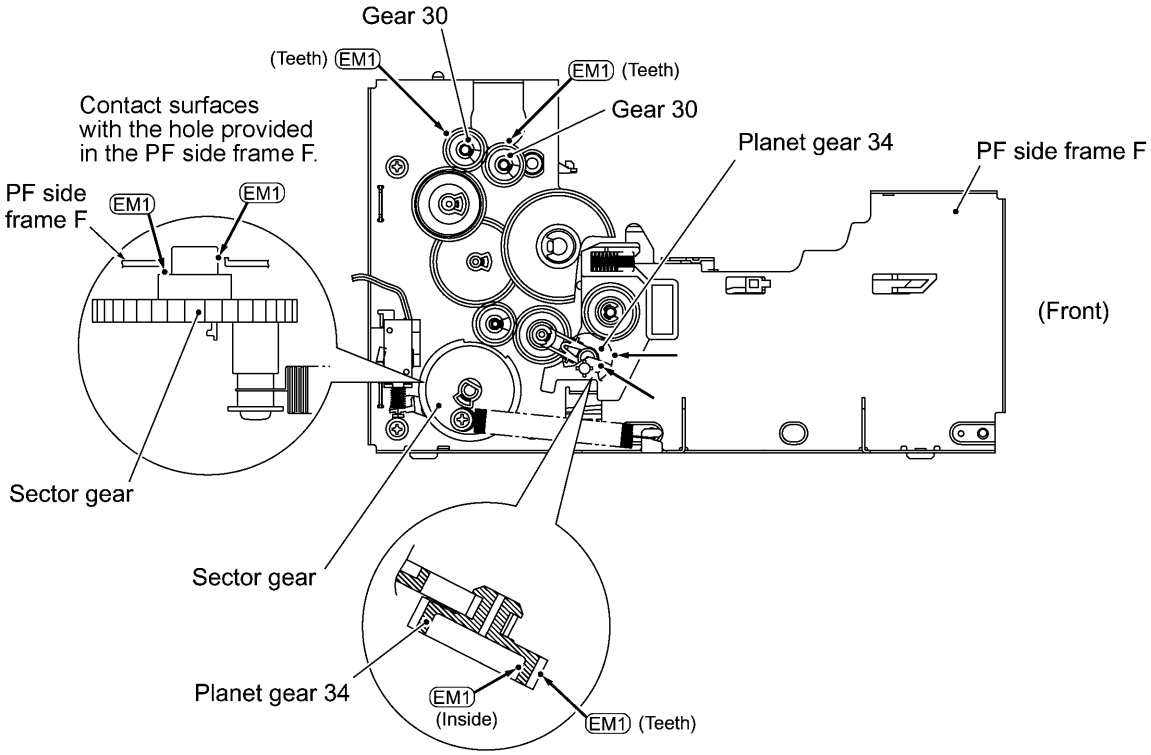


[5] Purge gear 16/18 on the purge unit



Purge gear 16/18

[6] Paper feed frame ASSY



CHAPTER V.

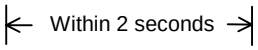
MAINTENANCE MODE

CHAPTER V. MAINTENANCE MODE

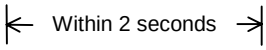
CONTENTS

1. ENTRY INTO THE MAINTENANCE MODE

American models: To make the facsimile equipment enter the maintenance mode, press the **Function**, *****, **2**, **8**, **6**, and **4** keys in this order.



European models: To make the facsimile equipment enter the maintenance mode, press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order.



The equipment beeps for approx. one second and displays " ▮▮ MAINTENANCE ▮▮▮ " on the LCD, indicating that it is placed in the initial stage of the maintenance mode, a mode in which the equipment is ready to accept entry from the keys.

To select one of the maintenance-mode functions listed in Section 2, enter the corresponding 2-digit function code with the numerical keys on the control panel. (The details of each maintenance-mode function are described in Section 3.)

NOTES:
- Pressing the **9** key twice in the initial stage of the maintenance mode makes the equipment exit from the maintenance mode, restoring it to the standby state.
- Pressing the **Stop** key after entering only one digit restores the equipment to the initial stage of the maintenance mode.
- If an invalid function code is entered, the equipment resumes the initial stage of the maintenance mode.

2. LIST OF MAINTENANCE-MODE FUNCTIONS

Maintenance-mode Functions

Function Code	Function	Reference Subsection (Page)
01	EEPROM Parameter Initialization	3.1 (V-4)
02	————	————
03	————	————
04	————	————
05	Printout of Scanning Compensation Data	3.2 (V-5)
06	————	————
07	————	————
08	ADF* Performance Test	3.3 (V-7)
09	Test Pattern 1	3.4 (V-8)
10	Firmware Switch Setting	3.5 (V-9)
11	Printout of Firmware Switch Data	3.5 (V-52)
12	Operational Check of LCD	3.6 (V-53)
13	Operational Check of Control Panel PCB (Check of Keys and Buttons)	3.7 (V-54)
32	Sensor Operational Check	3.8 (V-55)
55	CCD Scanner Area Setting	3.9 (V-56)
57	Setting the Sensing Reference Level of Black Ink Empty Sensor	3.10 (V-57)
62	Setting ID Codes of Facsimile Machines Connected to a PC via USB	3.11 (V-59)
65	Alignment of Vertical Print Lines	3.12 (V-60)
69	Initial Adjustment of PWM Value (Aging of the carriage)	3.13 (V-65)
74	EEPROM Customizing	3.14 (V-65)
82	Equipment Error Code Indication	3.15 (V-66)
87	Output of Transmission Log to the Telephone Line	3.16 (V-66)
91	EEPROM Parameter Initialization (except the telephone number storage area)	3.1 (V-4)
99	Exit from the Maintenance Mode	--- (V-1)
---	Cancellation of the Pin TX Lock Mode (Not applicable to American models)	3.17 (V-67)

* ADF: Automatic document feeder

- **IMPORTANT** -

Basically, the maintenance-mode functions listed on the previous page should be accessed by service personnel only. However, you may allow end users to access some of these under the guidance of service personnel (e.g., by telephone).

The user-accessible functions (codes 10, 11, 12, 82, 87 and 91) are shaded in the table given on the previous page. Function code 10 accesses the firmware switches WSW01 to WSW45, each of which has eight selectors. You should not allow end users to access all of those selectors, but you may allow them to access user-accessible selectors which are shaded in the firmware switch tables in Subsection 3.5.

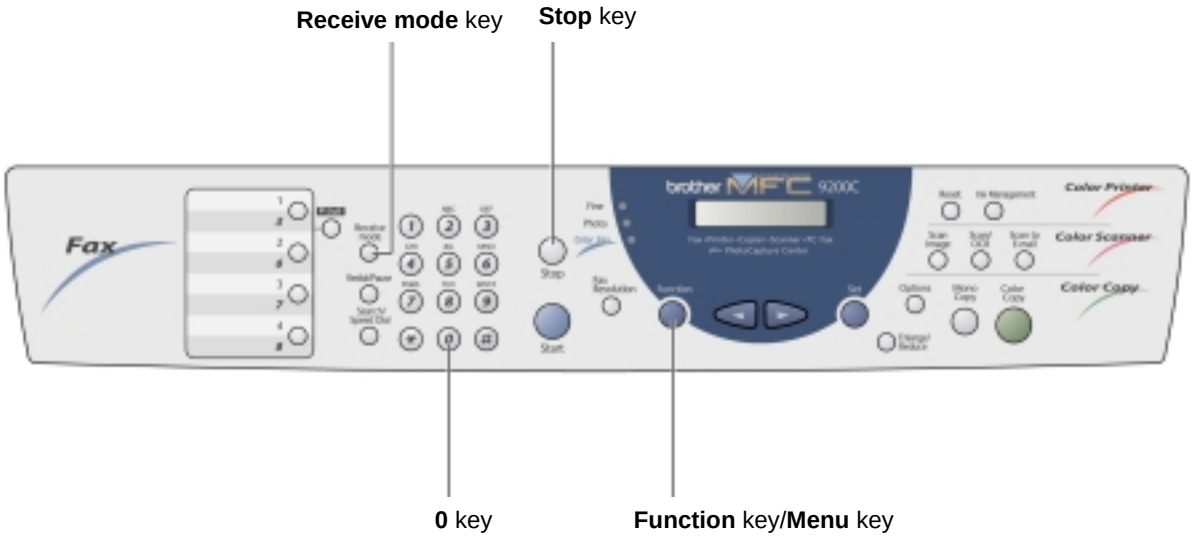
The service personnel should instruct end users to follow the procedure given below.

(1) American models: Press the **Function** and **Receive mode** keys in this order.
European models: Press the **Menu** and **Receive mode** keys in this order.
The LCD clears the current display.
NOTE: The **Receive mode** key is disabled during standby for redialing and timer.

(2) Press the **0** key.

(3) Enter the desired function code (10, 11, 12, 82, 87, or 91) with the numerical keys.
For function code 10, access the desired firmware switch according to the operating procedure described in Subsection 3.5.

(4) To make the equipment return to the standby state, press the **Stop** key.



3. DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS

3.1 EEPROM Parameter Initialization

■ Function

The equipment initializes the parameters, user switches, and firmware switches registered in the EEPROM, to the initial values. Entering the function code 01 initializes almost all of the EEPROM areas, but entering 91 does not initialize some areas, as listed below.

<table>
<tr><th>Data item \ Function code</th><th>01</th><th>91</th></tr>
<tr><td>Maintenance-mode functions
User switches
Firmware switches
Remote activation code
Activity report</td><td rowspan="2">All of these will be Initialized.</td><td>These will be initialized</td></tr>
<tr><td>Station ID data
Outside line number
Base year of real-time clock
Telephone function registration
One-touch dialing
Speed dialing
Group dialing</td><td>These will <u>not</u> be initialized</td></tr>
<tr><td>EEPROM customizing code (4-digit)</td><td colspan="2">This will <u>not</u> be initialized.
(Note that the first digit of the 4-digit code will be initialized to "0." If the code is <u>1</u>001, for example, it will be initialized to <u>0</u>001.)</td></tr>
</table>

NOTE: If you replace the main PCB with one used for other facsimile equipment, carry out this procedure and then customize the EEPROM (maintenance-mode function code 74 in Section 3.14).

■ Operating Procedure

(1) Press the **0** and **1** keys (or the **9** and **1** keys according to your need) in this order in the initial stage of the maintenance mode.

The "PARAMETER INIT" will appear on the LCD.

(2) Upon completion of parameter initialization, the equipment returns to the initial stage of the maintenance mode.

3.2 Printout of Scanning Compensation Data

■ Function

The equipment prints out the white and black level data for scanning compensation.

■ Operating Procedure

Do not start this function merely after powering on the equipment but start it after carrying out a sequence of scanning operation. Unless the equipment has carried out any scanning operation, this function cannot print out correct scanning compensation data. This is because at the start of scanning operation, the equipment initializes white and black level data and takes in the scanning compensation reference data.

(1) Press the **0** and **5** keys in this order in the initial stage of the maintenance mode.

The "WHITE LEVEL 1" will appear on the LCD.

(2) The equipment prints out the scanning compensation data list containing the following:

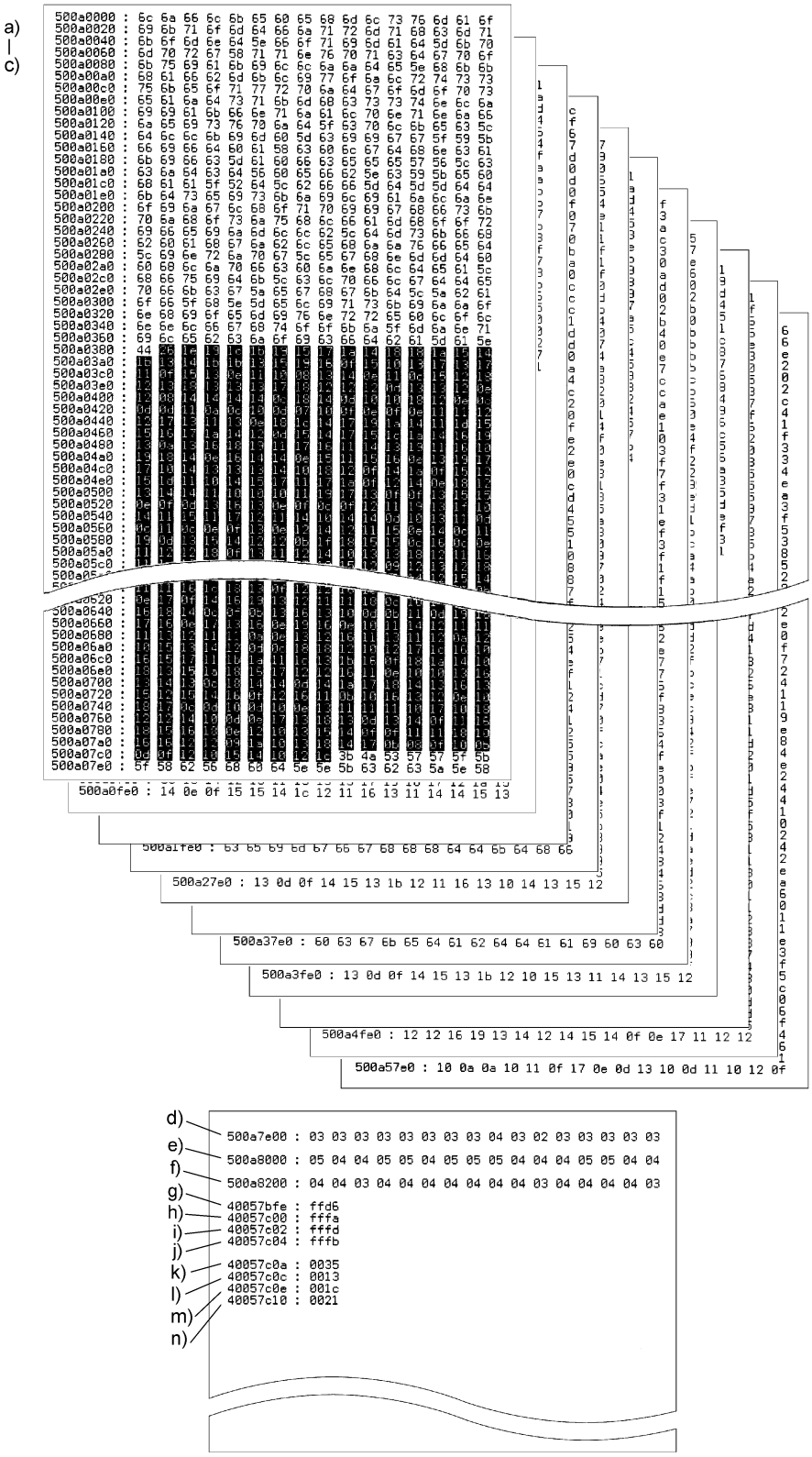
a) White level data for green image (4896 bytes)
b) White level data for blue image (4896 bytes)
c) White level data for red image (4896 bytes)
d) Black level data for green image (16 bytes)
e) Black level data for blue image (16 bytes)
f) Black level data for red image (16 bytes)
g) AFE offset data (black) (2 bytes)
h) AFE offset data (green) (2 bytes)
i) AFE offset data (blue) (2 bytes)
j) AFE offset data (red) (2 bytes)
k) AFE gain data (black) (2 bytes)
l) AFE gain data (green) (2 bytes)
m) AFE gain data (blue) (2 bytes)
n) AFE gain data (red) (2 bytes)

(AFE: Analog Front End)

(3) Upon completion of recording of the compensation data list, the equipment returns to the initial stage of the maintenance mode.

NOTE: When the equipment prints monochrome images after monochrome scanning, only the green data is valid.

NOTE: If any data is abnormal, its code will be printed in inline style, as shown on the next page.



Scanning Compensation Data List

3.3 ADF Performance Test

■ Function

The equipment counts the documents fed by the automatic document feeder (ADF) and displays the count on the LCD for checking the ADF performance.

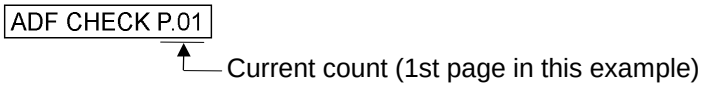
■ Operating Procedure

(1) Set documents. (Allowable up to the ADF capacity.)

The "DOC. READY" will appear on the LCD.

(2) Press the **0** and **8** keys in this order.

While counting the documents, the equipment feeds them in and out, displaying the current count on the LCD as shown below.



(3) After showing the final count, the equipment beeps for one second. To return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

3.4 Test Pattern 1

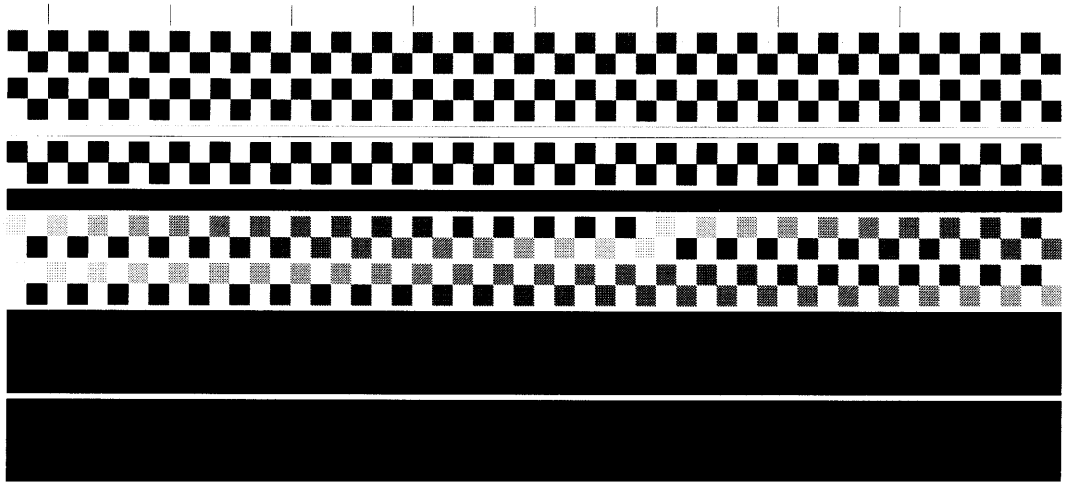
■ Function

This function, much like the copying function, prints out test pattern 1 to allow the service personnel to check for record data missing or print quality.

■ Operating Procedure

Press the **0** and **9** keys in this order in the initial stage of the maintenance mode.

The figure below shows test pattern 1.



Test Pattern 1

3.5 Firmware Switch Setting and Printout

[A] Firmware switch setting

■ Function

The facsimile equipment incorporates the following firmware switch functions (WSW01 through WSW45) which may be activated with the procedures using the control panel keys and buttons.
The firmware switches have been set at the factory in conformity to the communications standards and codes of each country. Do not disturb them unless necessary. Some firmware switches may not be applicable in some versions. The firmware switch data list indicates "Not used." for those inapplicable switches.

Firmware Switches (WSW01 through WSW45)

WSW No.	Function	Reference Page
WSW01	Dial pulse setting	V-11
WSW02	Tone signal setting	V-12
WSW03	PABX mode setting	V-13
WSW04	TRANSFER facility setting	V-15
WSW05	1st dial tone and busy tone detection	V-16
WSW06	**Pause** key setting and 2nd dial tone detection	V-18
WSW07	Dial tone setting 1	V-20
WSW08	Dial tone setting 2	V-21
WSW09	Protocol definition 1	V-22
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WSW34	Function setting 12	V-46
WSW35	Not used.	V-46
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Firmware Switches (WSW01 through WSW45) *Continued*

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WSW37	Function setting 15	V-48
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WSW41	Setting the CCD fluorescent lamp	V-49
WSW42	Function setting 20	V-49
WSW43	Function setting 21	V-50
WSW44	Speeding up scanning-1	V-50
WSW45	Speeding up scanning-2	V-51

■ Operating Procedure

(1) Press the **1** and **0** keys in this order in the initial stage of the maintenance mode.

The equipment displays the "WSW00" on the LCD and becomes ready to accept a firmware switch number.

(2) Enter the desired number from the firmware switch numbers (01 through 45).

The following appears on the LCD:

WSWXX = 0 0 0 0 0 0 0 0
↑ ↑
Selector No. 1 Selector No. 8

(3) Use the ◁ or ▷ keys to move the cursor to the selector position to be modified.

(4) Enter the desired number using the **0** and **1** keys.

(5) Press the **Set** key. This operation saves the newly entered selector values onto the EEPROM and readies the equipment for accepting a firmware switch number.

(6) Repeat steps (2) through (5) until the modification for the desired firmware switches is completed.

(7) Press the **Set** or **Stop** key to return the equipment to the initial stage of the maintenance mode.

NOTES:
- To cancel this operation and return the equipment to the initial stage of the maintenance mode during the above procedure, press the **Stop** key.
- If there is a pause of more than one minute after a single-digit number is entered for double-digit firmware switch numbers, the equipment will automatically return to the initial stage of the maintenance mode.

■ Note

The user-accessible selectors of the firmware switches are shaded in the tables given on the following pages.

■ Detailed Description for the Firmware Switches

WSW01 (Dial pulse setting)

Selector No.	Function	Setting and Specifications
1 2	Dial pulse generation mode	No. 1 2 0 0 : N 0 1 : N+1 1 0 : 10-N 1 1 : N
3 4	Break time length in pulse dialing	No. 3 4 0 0 : 60 ms 0 1 : 67 ms 1 0 : 40 ms (for 16 PPS) 1 1 : 64 ms (at 106-ms intervals)
5 6	Inter-digit pause	No. 5 6 0 0 : 800 ms 0 1 : 850 ms 1 0 : 950 ms 1 1 : 600 ms
7	Switching between pulse (DP) and tone (PB) dialing, by the function switch	0: Yes 1: No
8	Default dialing mode, pulse (DP) or tone (PB) dialing	0: PB 1: DP

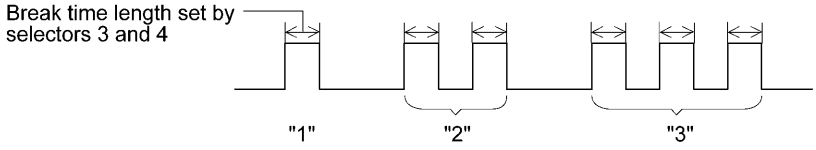
- **Selectors 1 and 2: Dial pulse generation mode**

  These selectors set the number of pulses to be generated in pulse dialing.

  N: Dialing "N" generates "N" pulses. (Dialing "0" generates 10 pulses.)
  N + 1: Dialing "N" generates "N + 1" pulses.
  10 - N: Dialing "N" generates "10 - N" pulses.

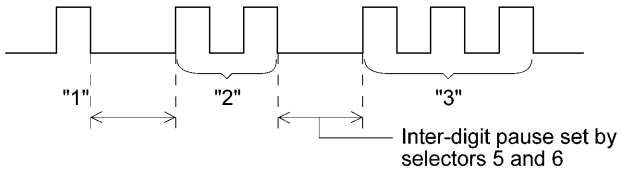
- **Selectors 3 and 4: Break time length in pulse dialing**

  These selectors set the break time length in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selectors 5 and 6: Inter-digit pause**

  These selectors set the inter-digit pause in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selector 7: Switching between pulse (DP) and tone (PB) dialing, by the function switch**

  This selector determines whether or not the dialing mode may be switched between the pulse (DP) and tone (PB) dialing by using the function switch.

- **Selector 8: Default dialing mode, pulse (DP) or tone (PB) dialing**

  This selector sets the default dialing mode (pulse dialing or tone dialing) which may be changed by the function switch. If the user switches it with the function switch when selector 7 is set to "0," the setting specified by this selector will also be switched automatically.

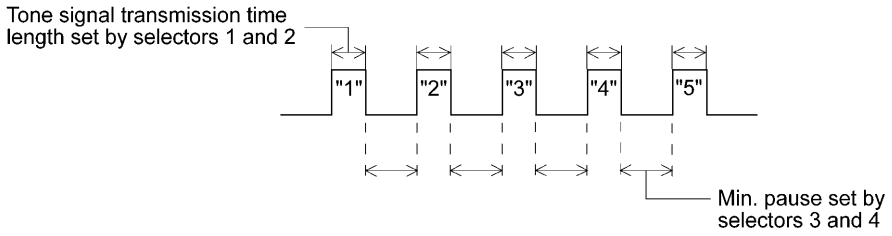
WSW02 (Tone signal setting)

Selector No.	Function	Setting and Specifications
1 2	Tone signal transmission time length	No. 1 2 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 100 ms
3 4	Min. pause in tone dialing	No. 3 4 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 140 ms
5 | 8	Attenuator for pseudo ring backtone to the line (selectable in the range of 0-15 dB)	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

- **Selectors 1 through 4: Tone signal transmission time length and Min. pause in tone dialing**

  These selectors set the tone signal transmission time length and minimum pause in tone dialing.

  (Example: If "1," "2," "3," "4," and "5" are dialed.)



- **Selectors 5 through 8: Attenuator for pseudo ring backtone to the line**

  These selectors are used to adjust the sound level of beep generated as a ring backtone in the F/T mode or as a signal during remote control operation or at the start of ICM recording.

  Setting two or more selectors to “1” produces addition of attenuation assigned to each selector.

WSW03 (PABX* mode setting)

Selector No.	Function	Setting and Specifications
1	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
2 | 4	Min. detection time length of PABX* dial tone, required for starting dialing	No. 2 3 4 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
5	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
6 7	Dial tone detection in PABX*	No. 6 7 0 0 : No detection (3.5 sec. WAIT) 0 1 : No detection (5 sec. WAIT) 1 0 : No detection (7 sec. WAIT) 1 1 : Detection (Frequency only)
8	"R" key function	0: 1st dial tone detection add 1: No 1st dial tone detection

* PABX: Private automatic branch exchange

NOTE: Selectors 2 through 4, 6 and 7 are not applicable where no PABX is installed.

- **Selectors 1 and 5: CNG detection when sharing a modular wall socket with a telephone**

  These selectors determine whether or not the equipment detects a CNG signal when a line is connected to a telephone sharing a modular wall socket with the equipment. Upon detection of CNG signals by the number of cycles specified by these selectors, the equipment interprets CNG as an effective signal and then starts FAX reception.

Selector No. 1	Selector No. 5	Cycle
0 (A)	0 (A)	0.5 cycle
0 (A)	1 (B)	1.0 cycle
1 (B)	0 (A)	1.5 cycles
1 (B)	1 (B)	2.0 cycles

- **Selectors 2 through 4: Min. detection time length of PABX dial tone, required for starting dialing**

  Upon detection of the PABX dial tone for the time length set by these selectors, the equipment starts dialing.

  These selectors are effective only when both selectors 6 and 7 are set to "1" (Detection).

- **Selectors 6 and 7: Dial tone detection in PABX**

  These selectors activate or deactivate the dial tone detection function which detects a dial tone when a line is connected to the PABX.

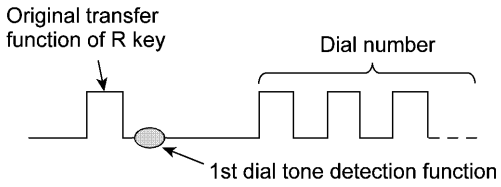
  Setting both of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected.

  Other setting combinations deactivate the dial tone detection function so that the equipment starts dialing after the specified WAIT (3.5, 5.0, or 7.0 sec.) without detection of a dial tone when a line is connected.

- **Selector 8: "R" key function**

  This selector determines whether or not the 1st dial tone detection function (specified by selectors 1 through 3 of WSW05) is added to the R key.

  If this selector is set to "0," pressing the R key automatically activates the 1st dial tone detection function when the PABX and the automatic calling are selected by using the function switch. If you press the R key and a dial number in succession, the equipment will automatically carry out the 1st dial tone detection function following the original transfer function as shown below.



WSW04 (TRANSFER facility setting)

Selector No.	Function	Setting and Specifications
1	Earth function in transfer facility	0: Provided 1: Not provided
2 | 4	Not used.	
5 6	Earth time length for earth function	No. 5 6 0 0 : 200 ms 0 1 : 300 ms 1 0 : 500 ms 1 1 : 700 ms
7 8	Break time length for flash function	No. 7 8 0 0 : 80 ms 0 1 : 110 ms 1 0 : 250 ms 1 1 : 500 ms

NOTE: Selectors 1 and 5 through 8 are not applicable in those countries where no transfer facility is supported.

- **Selector 1: Earth function in transfer facility**

  This selector determines whether or not the earth function is added to the transfer setting menu to be accessed by the function switch.

- **Selectors 5 and 6: Earth time length for earth function**

  These selectors set the short-circuiting time length of the telephone line (La or Lb) to ground.

  This setting is effective only when the earth function is selected for the R key by using the function switch.

- **Selectors 7 and 8: Break time length for flash function**

  These selectors set the break time length.

  This setting is effective only when the flash function is selected for the R key by using the function switch.

WSW05 (1st dial tone and busy tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection	No. 1 2 3 0 0 0 : 3.5 sec. WAIT 0 0 1 : 7.0 sec. WAIT 0 1 0 : 10.5 sec. WAIT 0 1 1 : 14.0 sec. WAIT 1 0 0 : 17.5 sec. WAIT 1 0 1 : 21.0 sec. WAIT 1 1 0 : 24.5 sec. WAIT 1 1 1 : Detection (Without WAIT)
4	Max. pause time allowable for remote ID code detection	0 : 2 seconds 1: 1 second
5 6	Busy tone detection in automatic sending mode	No. 5 6 0 0 : No detection 0 1 : Detection only after dialing 1 0 : No detection 1 1 : Detection before and after dialing
7	Busy tone detection in automatic receiving mode	0 : Yes 1: No
8	Not used.	

NOTE: Selectors 5 through 7 are not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 3: 1st dial tone detection**

  These selectors activate or deactivate the 1st dial tone detection function which detects the 1st dial tone issued from the PSTN when a line is connected to the PSTN.

  Setting all of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected. (However, in those countries which support no dial tone detection function, e.g., in the U.S.A., setting these selectors to "1" makes the equipment start dialing after a WAIT of 3.5 seconds.) For the detecting conditions of the 1st dial tone, refer to WSW07 and WSW08.

  Other setting combinations deactivate the dial tone detection function so that the equipment starts dialing after the specified WAIT (3.5, 7.0, 10.5, 14.0, 17.5, 21.0, or 24.5 seconds) without detection of a dial tone when a line is connected to the PSTN.

- **Selector 4: Max. pause time allowable for remote ID code detection**

  This selector sets the maximum pause time allowable for detecting the second digit of a remote ID code after detection of the first digit in remote reception.

  If selector 4 is set to "0" (2 seconds), for instance, only a remote ID code whose second digit is detected within 2 seconds after detection of the first digit will become effective so as to activate the remote function.

- **Selectors 5 and 6: Busy tone detection in automatic sending mode**

  These selectors determine whether or not the equipment automatically disconnects a line upon detection of a busy tone in automatic sending mode.

  Setting selector 6 to "0" ignores a busy tone so that the equipment does not disconnect the line.

  Setting selectors 5 and 6 to "0" and "1," respectively, makes the equipment detect a busy tone only after dialing and disconnect the line.

  Setting both of selectors 5 and 6 to "1" makes the equipment detect a busy tone before and after dialing and then disconnect the line.

- **Selector 7: Busy tone detection in automatic receiving mode**

  This selector determines whether or not the equipment automatically disconnects the line upon detection of a busy tone in automatic receiving mode.

WSW06 (Pause key setting and 2nd dial tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	**Pause** key setting and 2nd dial tone detection	No. 1 2 3 0 0 0 : No pause 0 0 1 : 3.5 sec. WAIT 0 1 0 : 7 sec. WAIT 0 1 1 : 10.5 sec. WAIT 1 0 0 : 14 sec. WAIT 1 1 0 : 2nd dial tone detection only in pulse dialing (DP) system 1 0 1 : 1 1 1 : 2nd dial tone detection both in DP and push-button (PB) dialing system
4 | 6	Detection of international tone	No. 4 5 6 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
7	No. of 2nd dial tone detection times	0: Once 1: Twice
8	2nd dial tone interrupt detecting time	0: 30 ms 1: 50 ms

NOTE: Selectors 4 through 8 are not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: Pause key setting and 2nd dial tone detection**

Selectors 1	2	3	
0	0	0	No WAIT is inserted even if the **Pause** key is pressed.
0	0	1	If you press the **Pause** key during dialing, the facsimile equipment will insert WAIT as defined in the above table. If the **Pause** key is pressed repeatedly, the equipment inserts the specified WAIT multiplied by the number of depressions. It applies also in hook-up dialing.
0	1	0	
0	1	1	
1	0	0	
1	0	1	When these selectors are set to "1, 0, 1": Each time you press the **Pause** key in dialing, the equipment will wait for the 2nd dial tone to be sent via the communications line regardless of pulse dialing or tone dialing. When these selectors are set to "1, 1, 0": If you press the **Pause** key in pulse dialing, the equipment will first wait for the 2nd dial tone to be sent via the communications line. After that, pressing the **Pause** key will cause the equipment to insert a WAIT of 3.5 seconds. In tone dialing, the equipment will insert a WAIT of 3.5 seconds. When these selectors are set to "1, 1, 1": If you press the **Pause** key, the equipment will first wait for the 2nd dial tone to be sent via the communications line regardless of pulse dialing or tone dialing. After that, pressing the **Pause** key will cause the equipment to insert a WAIT of 3.5 seconds. (In those countries where no dial tone detection function is supported, setting these selectors to "1, 0, 1," "1, 1, 0," or "1, 1, 1" inserts a WAIT of 3.5 seconds.)
1	1	0	
1	1	1	

- **Selectors 4 through 6: Detection of international tone**

  Upon detection of the 2nd dial tone for the time length specified by these selectors, the equipment starts dialing.

  This setting is effective only when the 2nd dial tone detection function is activated by selectors 1 through 3 (Setting 101, 110, or 111).

  This function does not apply in those countries where no dial tone detection function is supported.

- **Selector 7: No. of 2nd dial tone detection times**

  This selector sets the number of dial tone detection times required for starting dialing.

- **Selector 8: 2nd dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 2nd tone dialing.

WSW07 (Dial tone setting 1)

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 X : Widens by 10 Hz
3	Line current detection	0: No 1: Yes
4 | 6	2nd dial tone detection level (Z = 600 Ω)	No. 4 5 6 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm
7	1st dial tone interrupt detecting time	0: 30 ms 1: 50 ms
8	Not used.	

NOTE: Selectors 1, 2, 4 through 7 are not applicable in those countries where no dial tone or line current detection is supported, e.g., U.S.A.

NOTE: Selector 3 is not applicable to those models having no loop current detection function.

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for the 1st dial tone and the busy tone (before dialing) to be detected.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selector 3: Line current detection**

  This selector determines whether or not the equipment should detect a line current before starting dialing.

- **Selectors 4 through 6: 2nd dial tone detection level**

  These selectors set the detection level of the 2nd dial tone.

- **Selector 7: 1st dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 1st dial tone dialing.

WSW08 (Dial tone setting 2)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection time length	No. 1 2 3 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
4 5	Time-out length for 1st and 2nd dial tone detection	No. 4 5 0 0 : 10 sec. 0 1 : 20 sec. 1 0 : 15 sec. 1 1 : 30 sec.
6 | 8	Detection level of 1st dial tone and busy tone before dialing	No. 6 7 8 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm

NOTE: The WSW08 is not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: 1st dial tone detection time length**

  Upon detection of the 1st dial tone for the time length set by these selectors, the equipment starts dialing.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selectors 4 and 5: Time-out length for 1st and 2nd dial tone detection**

  These selectors set the time-out length for the 1st and 2nd dial tone detection so that the equipment waits dial tone input for the specified time length and disconnects itself from the line when no dial tone is inputted.

WSW09 (Protocol definition 1)

Selector No.	Function	Setting and Specifications
1	Frame length selection	0: 256 octets 1: 64 octets
2	Use of non-standard commands	0: Allowed 1: Prohibited
3 4	No. of retries	No. 3 4 0 0 : 4 times 0 1 : 3 times 1 0 : 2 times 1 1 : 1 time
5	T5 timer	0: 300 sec. 1: 60 sec.
6	T1 timer	0: 35 sec. 1: 40 sec.
7 8	Elapsed time for time-out control for no response from the called station in automatic sending mode	No. 7 8 0 0 : 55 sec. (in U.S.A. and Canadian versions) 60 sec. (in other versions) 0 1 : 140 sec. 1 0 : 90 sec. 1 1 : 35 sec.

NOTE: Selectors 1 through 5 are not applicable in those models which do not support ECM.

- **Selector 1: Frame length selection**

  Usually a single frame consists of 256 octets (1 octet = 8 bits). For communications lines with higher bit error rate, however, set selector 1 to "1" so that the facsimile equipment can divide a message into 64-octet frames.

  Remarks: The error correction mode (ECM) is a facsimile transmission manner in which the equipment divides a message into frames for transmission so that if any data error occurs on the transmission line, the equipment retransmits only those frames containing the error data.

- **Selector 2: Use of non-standard commands**

  If this selector is set to "0," the equipment may use non-standard commands (the machine's native-mode commands, e.g., NSF, NSC, and NSS) for communications. If it is set to "1," the equipment will use standard commands only.

- **Selectors 3 and 4: No. of retries**

  These selectors set the number of retries in each specified modem transmission speed.

- **Selector 5: T5 timer**

  This selector sets the time length for the T5 timer.

- **Selector 6: T1 timer**

  This selector sets the time length for the T1 timer.

- **Selectors 7 and 8: Elapsed time for time-out control**

  If the equipment receives no response (no G3 command) from the called terminal in automatic sending during the time set by these selectors, it disconnects the line.

WSW10 (Protocol definition 2)

Selector No.	Function		Setting and Specifications
1	Not used.		
2	Time length from transmission of the last dial digit to CML ON		0: 100 ms 1: 50 ms
3	Time length from CML ON to CNG transmission		0: 2 sec. 1: 4 sec.
4	Time length from CML ON to CED transmission (except for facsimile-to-telephone switching)		0: 0.5 sec. 1: 2 sec.
5 6	No. of training retries		No. 5 6 0 0 : 1 time 0 1 : 2 times 1 0 : 3 times 1 1 : 4 times
7	Encoding system (Compression)	MR	0: Allowed 1: Not allowed
8		MMR	0: Allowed 1: Not allowed

- **Selector 2: Time length from transmission of the last dial digit to CML ON**

  This selector sets the time length from when the equipment transmits the last dial digit until the CML relay comes on.

- **Selector 3: Time length from CML ON to CNG transmission**

  This selector sets the time length until the equipment transmits a CNG after it turns on the CML relay.

- **Selector 4: Time length from CML ON to CED transmission**

  This selector sets the time length until the equipment transmits a CED after it turns on the CML relay. This setting does not apply to switching between facsimile and telephone.

- **Selectors 5 and 6: No. of training retries**

  These selectors set the number of training retries to be repeated before automatic fallback.

- **Selectors 7 and 8: Encoding system (Compression)**

  This selector determines whether or not use of the MR/MMR coding system will be allowed.

WSW11 (Busy tone setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 x : Widens by 10 Hz
3	Not used.	
4	ON/OFF time length ranges (More than one setting allowed)	1: 400-600/400-600 ms
5		1: 175-440/175-440 ms
6		1: 100-1000 ms/17-660 ms
7		1: 110-410/320-550 ms
8		1: 100-660/100-660 ms

NOTE: WSW11 is not applicable in those countries where no busy tone detection is supported.

NOTE: The setting of WSW11 is effective only when selectors 5 and 6 of WSW05 are set to "0, 1" or "1, 1" (Busy tone detection).

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for busy tone to be detected.

- **Selectors 4 through 8: ON/OFF time length ranges**

  These selectors set the ON and OFF time length ranges for busy tone to be detected. If more than one selector is set to "1," the ranges become wider. For example, if selectors 4 and 5 are set to "1," the ON and OFF time length ranges are from 175 to 600 ms.

WSW12 (Signal detection condition setting)

Selector No.	Function	Setting and Specifications
1 2	Min. OFF time length of calling signal (Ci)	No. 1 2 0 0 : 1500 ms 0 1 : 500 ms 1 0 : 700 ms 1 1 : 900 ms
3 4	Max. OFF time length of calling signal (Ci)	No. 3 4 0 0 : 6 sec. 0 1 : 7 sec. 1 0 : 9 sec. 1 1 : 11 sec.
5 6	Detecting time setting	No. 5 6 0 0 : 800 ms (1000 ms*) 0 1 : 200 ms 1 0 : 250 ms 1 1 : 150 ms
7 8	Not used.	

*1000 ms in Chinese versions.

- **Selectors 1 through 4: Min. and max. OFF time length of calling signal (Ci)**

  If the equipment detects the OFF state of calling signal (Ci) for a time length which is greater than the value set by selectors 1 and 2 and less than the value set by selectors 3 and 4, it interprets the Ci signal as OFF.

- **Selectors 5 and 6: Detecting time setting**

  These selectors set the time length required to make the equipment acknowledge itself to be called. That is, if the equipment continuously detects calling signals with the frequency set by selectors 1 through 4 of WSW14 during the time length set by these selectors 5 and 6, it acknowledges the call.

WSW13 (Modem setting)

Selector No.	Function	Setting and Specifications
1 2	Cable equalizer	No. 1 2 0 0 : 0 km 0 1 : 1.8 km 1 0 : 3.6 km 1 1 : 5.6 km
3 4	Reception level	No. 3 4 0 0 : -43 dBm 0 1 : -47 dBm 1 0 : -49 dBm 1 1 : -51 dBm
5 | 8	Modem attenuator	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

The modem should be adjusted according to the user's line conditions.

- **Selectors 1 and 2: Cable equalizer**

  These selectors are used to improve the pass-band characteristics of analogue signals on a line. (Attenuation in the high-band frequency is greater than in the low-band frequency.)

  Set these selectors according to the distance from the telephone switchboard to the facsimile equipment.

- **Selectors 3 and 4: Reception level**

  These selectors set the optimum receive signal level.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies for G3 protocol signals.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

  This setting will be limited if selector 8 of WSW23 is set to "0."

WSW14 (AUTO ANS facility setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band selection (Lower limit)	No. 1 2 0 0 : 13 Hz 0 1 : 15 Hz 1 0 : 23 Hz 1 1 : 20 Hz
3 4	Frequency band selection (Upper limit)	No. 3 4 0 0 : 30 Hz 0 1 : 55 Hz 1 X : 70 Hz
5 | 8	No. of rings in AUTO ANS mode	No. 5 6 7 8 0 0 0 0 : Fixed to once 0 0 0 1 : Fixed to 2 times 0 0 1 0 : Fixed to 3 times 0 0 1 1 : Fixed to 4 times 0 1 0 0 : 1 to 2 times 0 1 0 1 : 1 to 3 times 0 1 1 0 : 1 to 4 times 0 1 1 1 : 1 to 5 times 1 0 0 0 : 2 to 3 times 1 0 0 1 : 2 to 4 times 1 0 1 0 : 2 to 5 times 1 0 1 1 : 2 to 6 times 1 1 0 0 : 1 to 10 times 1 1 0 1 : 2 to 10 times 1 1 1 0 : 3 to 5 times 1 1 1 1 : 4 to 10 times

- **Selectors 1 through 4: Frequency band selection**

  These selectors are used to select the frequency band of calling signals for activating the AUTO ANS facility.

  In the French versions, if the user sets the PBX to OFF from the control panel, the setting made by selectors 1 and 2 will take no effect and the frequency's lower limit will be fixed to 32 Hz. (Even if the setting made by these selectors does not apply, it will be printed on the configuration list.)

- **Selectors 5 through 8: No. of rings in AUTO ANS mode**

  These selectors set the number of rings to initiate the AUTO ANS facility.

WSW15 (REDIAL facility setting)

Selector No.	Function	Setting and Specifications
1 2	Selection of redial interval	No. 1 2 0 0 : 5 minutes 0 1 : 1 minute 1 0 : 2 minutes 1 1 : 3 minutes
3 | 6	No. of redialings	No. 3 4 5 6 0 0 0 0 : 16 times 0 0 0 1 : 1 times 0 0 1 0 : 2 times 0 0 1 1 : 3 times | | 1 1 1 1 : 15 times
7	Redialing for no response sent from the called terminal	0: Redialing 1: No redialing
8	Not used.	

- **Selectors 1 through 6: Selection of redial interval and No. of redialings**

  The equipment redials by the number of times set by selectors 3 through 6 at intervals set by selectors 1 and 2.

- **Selector 7: Redialing for no response sent from the called terminal**

  This selector determines whether or not the equipment redials if no G3 command response comes from the called station after dialing within the time length set by selectors 7 and 8 of WSW09.

WSW16 (Function setting 1)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	ITU-T (CCITT) superfine recommendation	0: OFF 1: ON
3 | 6	Not used.	
7	Max. document length limitation	0: 400 cm 1: 90 cm
8	**Stop** key pressed during reception	0: Not functional 1: Functional

- **Selector 2: ITU-T (CCITT) superfine recommendation**

  If this selector is set to "1," the equipment communicates in ITU-T (CCITT) recommended superfine mode (15.4 lines/mm). If it is set to "0," it communicates in native superfine mode.

- **Selector 7: Max. document length limitation**

  This selector is used to select the maximum length of a document to be sent.

- **Selector 8: Stop key pressed during reception**

  If this selector is set to "1," pressing the **Stop** key can stop the current receiving operation. The received data will be lost.

WSW17 (Function setting 2)

Selector No.	Function	Setting and Specifications
1 2	Off-hook alarm	No. 1 2 0 0 : No alarm 0 1 : Always valid 1 X : Valid except when 'call reservation' is selected.
3 4	Not used.	
5	Calendar clock type	0: U.S.A. type 1: European type
6	Not used.	
7	Non-ring reception	0: OFF 1: ON
8	Not used.	

NOTE: Selector 4 is not applicable to those models having a 2-row LCD.

- **Selectors 1 and 2: Off-hook alarm**

  These selectors activate or deactivate the alarm function which sounds an alarm when the handset is off the hook after the communication is completed.

  The off-hook alarm works also for an external telephone connected to the EXT modular socket.

- **Selector 5: Calendar clock type**

  If this selector is set to "0" (USA), the MM/DD/YY hh:mm format applies; if it is set to "1" (Europe), the DD/MM/YY hh:mm format applies: DD is the day, MM is the month, YY is the last two digits of the year, hh is the hour, and mm is the minute.

- **Selector 7: Non-ring reception**

  Setting this selector to "1" makes the equipment receive calls without ringer sound if the ring delay is set to 0.

WSW18 (Function setting 3)

Selector No.	Function	Setting and Specifications
1	Not used.	
2 3	Detection enabled time for CNG and no tone	No. 2 3 0 0 : 40 sec. 0 1 : 0 sec. (No detection) 1 0 : 5 sec. 1 1 : 80 sec.
4 5	Not used.	
6	Registration of station ID	0: Permitted 1: Prohibited
7 8	Tone sound monitoring	No. 7 8 0 X : No monitoring 1 0 : Up to phase B at the calling station only 1 1 : All transmission phases both at the calling and called stations

- **Selectors 2 and 3: Detection enabled time for CNG and no tone**

  After the line is connected via the external telephone or by picking up the handset of the facsimile equipment, the equipment can detect a CNG signal or no tone for the time length specified by these selectors. The setting specified by these selectors becomes effective only when selector 8 of WSW20 is set to "1."

- **Selector 6: Registration of station ID**

  Setting this selector to "0" permits the registration of station ID for Austrian and Czech versions.

- **Selectors 7 and 8: Tone sound monitoring**

  These selectors set monitoring specifications of the tone sound inputted from the line.

WSW19 (Transmission speed setting)

Selector No.	Function	Setting and Specifications
1 | 3	First transmission speed choice for fallback	No. 1 2 3 No. 4 5 6 0 0 0 : 2,400 bps 0 0 1 : 4,800 bps 0 1 0 : 7,200 bps 0 1 1 : 9,600 bps 1 0 0 : 12,000 bps 1 0 1 : 1 1 0 : 14,400 bps 1 1 1 :
4 | 6	Last transmission speed choice for fallback	
7	Not used.	
8	V. 17 mode	0: Permitted 1: Prohibited

- **Selectors 1 through 6: First and last choices of transmission speed for fallback**

  These selectors are used to set the MODEM speed range. With the first transmission speed choice specified by selectors 1 through 3, the equipment attempts to establish the transmission link via the MODEM. If the establishment fails, the equipment automatically steps down to the next lowest speed and attempts to establish the transmission link again. The equipment repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 4 through 6.

  If the MODEM always falls back to a low transmission speed (e.g., 4,800 bps), set the first transmission speed choice to the lower one (e.g., modify it from 12,000 bps to 7,200 bps) in order to deactivate the high-speed MODEM function and reduce the training time for shorter transmission time.

  Generally, to save the transmission time, set the last transmission speed choice to a higher one.

WSW20 (Overseas communications mode setting)

Selector No.	Function	Setting and Specifications
1	EP* tone prefix	0: OFF 1: ON
2	Overseas communications mode (Reception)	0: 2100 Hz 1: 1100 Hz
3	Overseas communications mode (Transmission)	0: OFF 1: Ignores DIS once.
4 5	Min. time length from reception of CFR to start of transmission of video signals	No. 4 5 0 0 : 100 ms 0 1 : 200 ms 1 0 : 300 ms 1 1 : 400 ms
6 7	Not used.	
8	CNG detection on/off	0: OFF 1: ON

* EP: Echo protection

- **Selector 1: EP tone prefix**

  Setting this selector to "1" makes the equipment transmit a 1700 Hz echo protection (EP) tone immediately preceding training in V.29 modulation system to prevent omission of training signals.

  Prefixing an EP tone is effective when the equipment fails to transmit at the V.29 modem speed and always has to fall back to 4800 bps transmission.

- **Selectors 2 and 3: Overseas communications mode**

  These selectors should be used if the facsimile equipment malfunctions in overseas communications. According to the communications error state, select the signal specifications.

  Setting selector 2 to "1" allows the equipment to use 1100 Hz CED signal instead of 2100 Hz in receiving operation. This prevents malfunctions resulting from echoes, since the 1100 Hz signal does not disable the echo suppressor (ES) while the 2100 Hz signal does.

  Setting selector 3 to "1" allows the equipment to ignore a DIS signal sent from the called station once in sending operation. This operation suppresses echoes since the first DIS signal immediately follows a 2100 Hz CED (which disables the ES) so that it is likely to be affected by echoes in the disabled ES state. However, such a disabled ES state will be removed soon so that the second and the following DIS signals are not susceptible to data distortion due to echoes. Note that some models when called may cause error by receiving a self-outputted DIS.

- **Selectors 8: CNG detection on/off**

  If this selector is set to "1," the equipment detects a CNG signal according to the condition preset by selectors 2 and 3 of WSW18 after a line is connected. If it is set to "0," the equipment detects a CNG signal as long as the line is connected.

WSW21 (TAD setting 1)

Selector No.	Function	Setting and Specifications
1 | 7	Not used.	
8	Erasure of message stored in the memory after the message transfer	0: Yes 1: No

- **Selector 8: Erasure of message stored in the memory after the message transfer**

  Setting this selector to "0" will erase the message recorded in the memory after the document retrieval feature transfers the message.

WSW22 (ECM and copy resolution setting)

Selector No.	Function	Setting and Specifications
1	ECM* in sending	0: ON 1: OFF
2	ECM* in receiving	0: ON 1: OFF
3	Call Waiting Caller ID	0: ON 1: OFF
4	Not used.	
5	Acceptable TCF bit error rate (%) (Only at 4800 bps)	0: 0% 1: 8%
6		0: 0% 1: 4%
7		0: 0% 1: 2%
8		0: 0% 1: 1%

* ECM: Error correction mode

NOTE: Selector 3 is applicable to the American versions only.

NOTE: Selectors 5 through 8 are applicable to the Chinese, Taiwanese and Asian versions only.

- **Selector 3: Call Waiting Caller ID**

  Setting this selector to "0" allows the user to decide whether or not to interrupt the current call when a new call comes in. If Call Waiting Caller ID service is available in the area and the user subscribes to it, he/she can see information about his/her incoming call on the LCD.

- **Selectors 5 through 8: Acceptable TCF bit error rate (%)**

  Setting two or more selectors to "1" produces addition of percent assigned to each selector. If you set selectors 7 and 8 to "1," the acceptable TCF bit error rate will be 3%.

WSW23 (Communications setting)

Selector No.	Function	Setting and Specifications
1	Starting point of training check (TCF)	0: From the head of a series of zeros 1: From any arbitrary point
2 3	Allowable training error rate	No. 2 3 0 0 : 0% 0 1 : 0.5% 1 0 : 1% 1 1 : 2%
4 5	Decoding error rate for transmission of RTN	No. 4 5 0 0 : 16% 0 1 : 14% 1 0 : 10% 1 1 : 8%
6 7	Not used.	
8	Limitation of attenuation level	0: Yes 1: No

NOTE: Selector 8 is not applicable to the French versions.

- **Selector 1: Starting point of training check (TCF)**

  At the training phase of receiving operation, the called station detects for 1.0 second a training check (TCF) command, a series of zeros which is sent from the calling station for 1.5 seconds to verify training and give the first indication of the acceptability of the line.

  This selector sets the starting point from which the called station should start counting those zeros. If this selector is set to "0," the called station starts counting zeros 100 ms after the head of a series of zeros is detected.

  If it is set to "1," the called station starts counting zeros upon detection of 10-ms successive zeros 50 ms after the head of a series of zeros is detected. In this case, if the detection of 10-ms successive zeros is too late, the data counting period will become less than 1.0 second, making the called station judge the line condition unacceptable.

- **Selectors 2 and 3: Allowable training error rate**

  The called station checks a series of zeros gathered in training (as described in Selector 1) according to the allowable training error rate set by these selectors. If the called station judges the line condition to be accepted, it responds with CFR; if not, it responds with FTT.

- **Selectors 4 and 5: Decoding error rate for transmission of RTN**

  The facsimile equipment checks the actual decoding errors and then transmits an RTN according to the decoding error rate (Number of lines containing an error per page ÷ Total number of lines per page) set by these selectors.

- **Selector 8: Limitation of attenuation level**

  Setting this selector to "0" limits the transmitting level of the modem to 10 dB.

  This setting has priority over the settings selected by WSW02 (selectors 5 through 8) and WSW13 (selectors 5 through 8).

WSW24 (TAD setting 2)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3 4	Time length from CML ON to start of pseudo ring backtone transmission	No. 3 4 0 0 : 4 sec. 0 1 : 3 sec. 1 0 : 2 sec. 1 1 : 1 sec.
5 | 8	Not used.	

- **Selectors 3 and 4: Time length from CML ON to start of pseudo ring backtone transmission**

  These selectors set the length of time from CML-ON up to the start of pseudo ring backtone transmission.

  In those versions which have an OGM facility, the settings made by these selectors also apply to the length of time from CML-ON up to the start of OGM transmission.

WSW25 (TAD setting 3)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 | 7	Pause between paging number and PIN	No. 5 6 7 0 0 0 : 2 sec. 0 0 1 : 4 sec. 0 1 0 : 6 sec. 0 1 1 : 8 sec. 1 0 0 : 10 sec. 1 0 1 : 12 sec. 1 1 0 : 14 sec. 1 1 1 : 16 sec.
8	Not used.	

NOTE: Selectors 5 through 7 are applicable only to the U.S.A. versions.

- **Selectors 5 through 7: Pause between paging number and PIN**

  These selectors set the pause time between a telephone number being paged and PIN (private identification number) for the paging feature.

WSW26 (Function setting 4)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3	Dialing during document reading into the temporary memory in in-memory message transmission	0: Disabled 1: Enabled
4 5	No. of CNG cycles to be detected (when the line is connected via the external telephone except in the external TAD mode)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 | 8	Not used.	

- **Selector 3: Dialing during document reading into the temporary memory in in-memory message transmission**

  If this selector is set to "0," the facsimile equipment waits for document reading into the memory to complete and then starts dialing. This enables the equipment to list the total number of pages in the header of the facsimile message.

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The equipment interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone except in the external TAD mode.

WSW27 (Function setting 5)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Ringer OFF setting	0: Yes 1: No
3	Not used.	
4	Detection of distinctive ringing pattern	0: Yes 1: No
5 | 8	Not used.	

NOTE: Selector 4 is applicable only to the U.S.A. versions.

- **Selector 2: Ringer OFF setting**

  This selector determines whether or not the ringer can be set to OFF.

- **Selector 4: Detection of distinctive ringing pattern**

  If this selector is set to "1," the equipment detects only the number of rings; if it is set to "0," the equipment detects the number of rings and the ringing time length to compare the detected ringing pattern with the registered distinctive one.

WSW28 (Function setting 6)

Selector No.	Function	Setting and Specifications
1 | 3	Transmission level of DTMF high-band frequency signal	No. 1 2 3 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
4 | 6	Transmission level of DTMF low-band frequency signal	No. 4 5 6 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
7 8	Not used.	

- **Selectors 1 through 6: Transmission level of DTMF high-/low-band frequency signal**

  These selectors are intended for the manufacturer who tests the equipment for the Standard. Never access them.

WSW29 (Function setting 7)

Selector No.	Function	Setting and Specifications
1 | 6	Not used.	
7	Impedance switching control in pulse dialing	0: OFF 1: ON
8	Prompt beep when the memory area for the activity report becomes full	0: No 1: Yes

NOTE: Selectors 7 and 8 are applicable only to the European versions.

- **Selector 8: Prompt beep for activity report**

  This selector determines whether or not the equipment will beep if the memory area for the activity report becomes full, for prompting you to print out the report. (Printing it out will clear the memory area.)

WSW30

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW31 (Function setting 9)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Default reduction rate for failure of automatic reduction during recording	0: 100% 1: 70%
3	Not used.	
4	Black ink empty sensor	0: Yes 1: No
5	Minimum short-OFF duration in distinctive ringing	0: 130 ms 1: 90 ms
6 | 8	Not used.	

NOTE: Selector 5 is applicable only to the U.S.A. versions.

- **Selector 2: Default reduction rate for failure of automatic reduction during recording**

  This selector sets the default reduction rate to be applied if the automatic reduction function fails to record one-page data sent from the calling station in a single page of the current recording paper.

  If it is set to "0," the equipment records one-page data at full size (100%) without reduction; if it is set to "1," the equipment records it at 70% size.

- **Selector 5 Minimum short-OFF duration in distinctive ringing**

  The ringer pattern consists of short and long rings, e.g., short-short-long rings. This selector sets the minimum OFF duration following a short ring in order to avoid missing ringer tones in distinctive ringing.

  If this selector is set to "1," when the short-OFF duration is a minimum of 90 ms long, then the equipment will interpret the short-OFF as OFF.

WSW32 (Function setting 10)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 6	Default resolution	No. 5 6 0 0 : Standard 0 1 : Fine 1 0 : Super fine 1 1 : Photo
7 8	Default contrast	No. 7 8 0 X : Automatic 1 0 : Super light 1 1 : Super dark

- **Selectors 5 and 6: Default resolution**

  These selectors set the default resolution which applies when the equipment is turned on or completes a transaction.

- **Selectors 7 and 8: Default contrast**

  These selectors set the default contrast which applies when the equipment is turned on or completes a transaction.

WSW33 (Function setting 11)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4 5	FAX receiving speed to be kept within the transmission speed limit to the PC	No. 4 5 0 0 : 14,400 bps 0 1 : 12,000 bps 1 0 : 9,600 bps 1 1 : 7,200 bps
6	Report output of polled transmission requests	0: Yes 1: No
7 8	Not used.	

- **Selectors 4 and 5: FAX receiving speed to be kept within the transmission speed limit to the PC**

  To transmit FAX data being received from other facsimile equipment to the connected PC, you may need to keep the FAX receiving speed within the transmission speed limit to the PC. In an initial negotiation sequence for transmission, the equipment responds to the calling station with the allowable FAX receiving speed specified by these selectors.

WSW34 (Function setting 12)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4 5	No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 7	Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation	No. 6 7 0 0 : 3 0 1 : 2 1 0 : 1 1 1 : OFF
8	Not used.	

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The equipment interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone in the external TAD mode.

- **Selectors 6 and 7: Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation**

  If the equipment receives this specified number of DTMF tone signals during external TAD operation, it will not detect CNG afterwards.

  If these selectors are set to "1, 1," the CNG detection will not be inhibited.

WSW35

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW36 (Function setting 14)

Selector No.	Function	Setting and Specifications
1	ECP mode*	0: ON 1: OFF
2	Recovery from Inactive PC Interface	0: Disabled 1: Enabled
3	PC Power-off Recognition Time	0: Normal 1: Long
4	Not used.	
5	Escape from phase C	0: Yes 1: No
6 | 8	Lower limit of frequency to be ignored after detection of calling signals (Ci)	No. 6 7 8 0 0 0 : 0 (Not ignored) 0 0 1 : 4 (448 Hz) 0 1 0 : 8 (244 Hz) 0 1 1 : 12 (162 Hz) 1 0 0 : 16 (122 Hz) 1 0 1 : 20 (97 Hz) 1 1 0 : 24 (81 Hz) 1 1 1 : 28 (69 Hz)

*ECP (Enhanced Capabilities Port)

- **Selector 1: ECP mode**

  The ECP mode enhances the normal bidirectional communications between the facsimile equipment and the connected PC for higher transmission speed.

- **Selector 2: Recovery from Inactive PC Interface**

  If the facsimile equipment recognizes via the STB signal line that the connected PC is powered off, it will turn the PC interface outputs Low to protect the PC from hazards that could be caused by weak electric current accidentally flown from the equipment.

  This selector determines whether the equipment should recover from the inactive PC interface to normal interfacing state upon receipt of data from the PC.

- **Selector 3: PC Power-off Recognition Time**

  This selector sets the time length from when the equipment detects the PC powered off until it recognizes the detected state as power-off.

  If selector 2 is set to "0," it is recommended that selector 3 be set to "1"; otherwise, the equipment may mistakenly detect PC powered off.

- **Selector 5: Escape from phase C**

  This selector determines whether or not the equipment will escape from phase C when it detects an RTC (Return to Control) in non-ECM mode or an RCP (Return to Control Partial page) in ECM mode.

- **Selectors 6 through 8: Lower limit of frequency to be ignored after detection of calling signals (Ci)**

  At the start of reception, if the equipment detects the frequency of calling signals (Ci) specified by selectors 1 through 4 of WSW14, it will start the ringer sounding. When doing so, the equipment may fail to detect the calling signals normally due to noises superimposed at the time of reception. To prevent it, use selectors 6 through 8 of WSW36.

  If the equipment detects higher frequencies than the lower limit specified by these selectors, it will regard them as noise and interpret that detecting state as being normal, allowing the ringer to keep sounding (until the equipment starts automatic reception of FAX data if in the FAX mode or enters the TAD mode if set in the TEL mode, according to the preset number of ringers).

WSW37 (Function setting 15)

Selector No.	Function	Setting and Specifications
1	Printout of the stored image data of an unsent document onto an error report	0: No 1: Yes
2	Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission	0: No 1: Yes
3 | 8	Not used.	

- **Selector 1: Printout of the stored image data of an unsent document onto an error report**

  This selector determines whether or not the 1st-page image data of a document will be printed out onto the error report if the document image data stored in the temporary memory cannot be transmitted normally.

- **Selector 2: Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission**

  If in-memory message transmission fails repeatedly when selector 1 is set to "1," the temporary memory will be occupied with image data. Setting selector 2 to "1" will automatically erase the stored 1st-page image data of an unsent document at the time of the subsequent in-memory message transmission only when recording paper or toner runs out.

WSW38 to WSW40

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW41 (Setting the CCD fluorescent lamp)

Selector No.	Function	Setting and Specifications
1 | 3	ON-duration of the fluorescent lamp built in the CCD unit	No. 1 2 3 0 0 0 : 16 hours 0 0 1 : 24 hours 0 1 0 : 12 hours 0 1 1 : 8 hours 1 0 0 : 4 hours 1 0 1 : 2 hours 1 1 0 : 10 minutes 1 1 1 : 0 minute
4 | 8	Not used.	

- **Selectors 1 through 3: ON-duration of the fluorescent lamp built in the CCD unit**

  If the scanning operation is started when the fluorescent lamp is off, the lamp will come on and stay on for the time length specified by these selectors.

  If these selectors are set to "1, 1, 1," the fluorescent lamp will go off after the scanning sequence.

WSW42 (Function setting 20)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4	JBIG coding	0: Disabled 1: Enabled
5 | 8	Not used.	

WSW43 (Function setting 21)

Selector No.	Function	Setting and Specifications
1	Not used.	
2 3	Wait time for PC-Fax reception (Class 2) and FPTS command transmission	No. 2 3 0 0 : 50 ms 0 1 : 100 ms 1 0 : 150 ms 1 1 : 0 ms
4 | 6	Not used.	
7	Automatic start of remote maintenance	0: No 1: Yes
8	JPEG coding	0: Disabled 1: Enabled

- **Selector 8: JPEG coding**

  Setting this selector to "0" disables the equipment from sending/receiving JPEG color images and from receiving JPEG monochrome images.

WSW44 (Speeding up scanning-1)

Selector No.	Function	Setting and Specifications
1 | 5	Not used.	
6 | 8	Effective time length of the white level compensation data obtained beforehand	No. 6 7 8 0 0 0 : Obtained compensation data ineffective 0 0 1 : 1 min. 0 1 0 : 3 min. 0 1 1 : 5 min. 1 0 0 : 10 min. 1 0 1 : 15 min. 1 1 0 : 20 min. 1 1 1 : 30 min.

- **Selectors 6 through 8: Effective time length of the white level compensation data obtained beforehand**

  If you set documents in the ADF and the document front sensor detects them or if you open the document tray ASSY and the document tray open sensor detects the open state, then the controller will make correction of the reference voltage to be applied to white level compensation for document scanning before the Copy button is pressed.

  These selectors determine how long compensation data obtained beforehand will keep effective.

WSW45 (Speeding up scanning-2)

Selector No.	Function	Setting and Specifications
1 | 3	Delay time from when documents are set until the ADF starts drawing them in	No. 1 2 3 0 0 0 : No automatic drawing-in 0 0 1 : 1 sec. 0 1 0 : 2 sec. 0 1 1 : 3 sec. 1 0 0 : 4 sec. 1 0 1 : 5 sec. 1 1 0 : 6 sec. 1 1 1 : 7 sec.
4 | 6	Periodical correction intervals of the reference voltage to be applied to white level compensation for document scanning, during standby	No. 4 5 6 0 0 0 : No correction of reference voltage during standby 0 0 1 : 10 sec. 0 1 0 : 30 sec. 0 1 1 : 1 min. 1 0 0 : 3 min. 1 0 1 : 5 min. 1 1 0 : 10 min. 1 1 1 : 30 min.
7	Home position of the CCD unit	0: CCD lock position 1: Location of the white-level reference film
8	Not used.	

- **Selectors 1 through 3: Delay time from when documents are set until the ADF starts drawing them in**

  These selectors determine how long the ADF will delay automatic drawing-in of documents (to the scanning standby position) after you set them in the ADF, as well as determining whether or not the ADF automatically draws in documents.

- **Selectors 4 through 6: Periodical correction intervals of the reference voltage applied to white level compensation for document scanning, during standby**

  These selectors set the correction intervals (in seconds) of the reference voltage to be applied to white level compensation for document scanning during standby, as well as determining whether or not the controller makes the reference voltage correction during standby. (Conventionally, the correction has been made immediately before the start of actual scanning)

  This function takes effect in copying. Making the correction during standby may shorten the preparation time for copying.

  NOTE: Do not access these selectors.

- **Selector 7: Home position of the CCD unit**

  This selector determines whether the home position of the CCD unit should be the CCD lock position or the location of the white-level reference film (attached to the inside of the scanner top cover). If the location of the reference film is selected, the CCD unit will not return to the lock position so as to shorten the travel time, decreasing the preparation time for copying.

[B] Printout of firmware switch data

■ Function

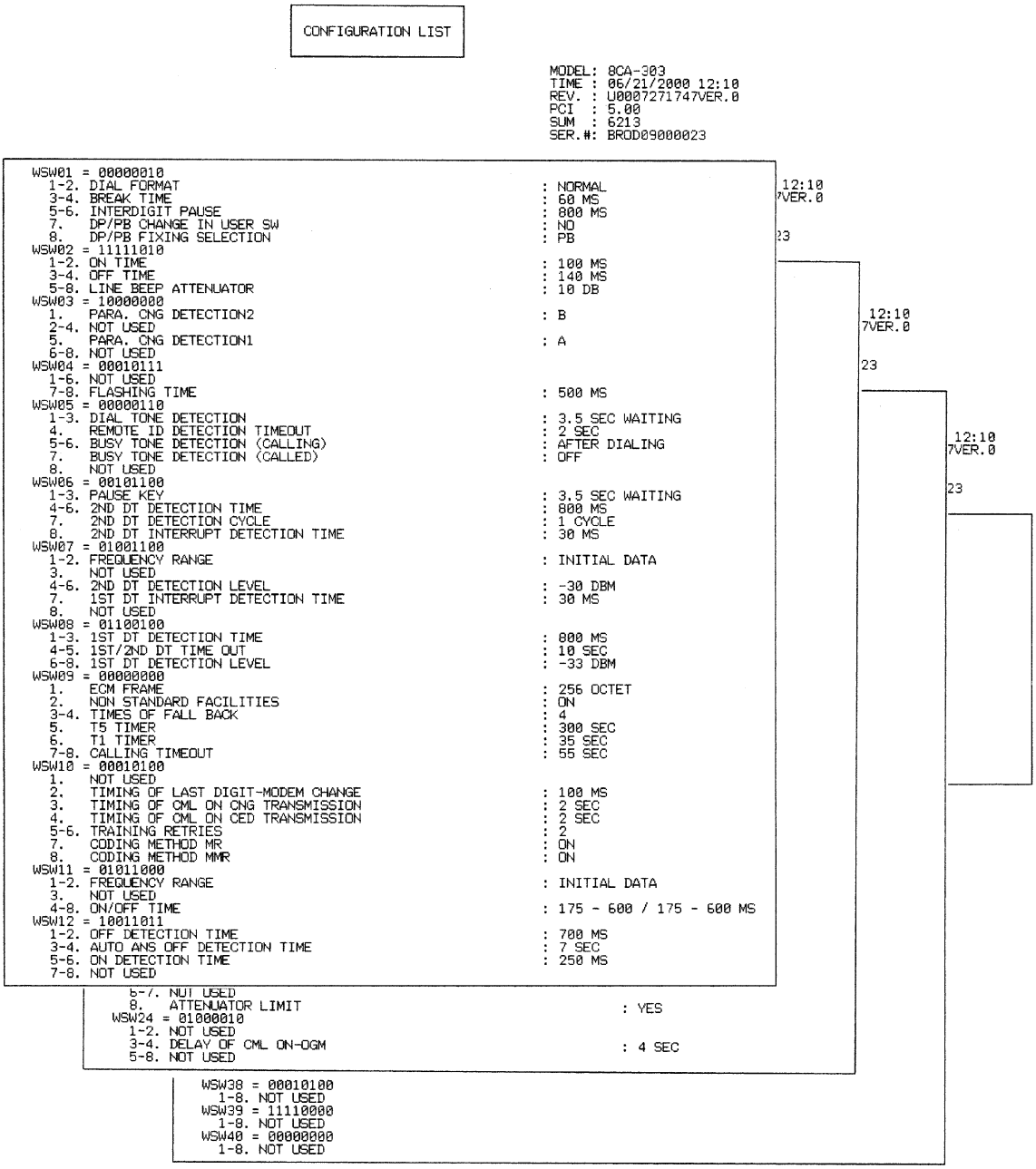
The equipment prints out the setting items and contents specified by the firmware switches.

■ Operating Procedure

(1) Press the **1** key twice in the initial stage of the maintenance mode.
The "PRINTING" will appear on the LCD.

(2) The equipment prints out the configuration list as shown in the figure below.

(3) Upon completion of printing, the equipment returns to the initial stage of the maintenance mode.



Configuration List

3.6 Operational Check of LCD

■ Function

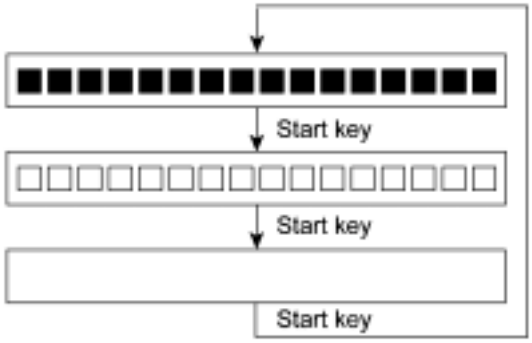
This function allows you to check whether the LCD on the control panel works normally.

■ Operating Procedure

(1) Press the **1** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows

(2) Press the **Start** key. Each time you press the **Start** key, the LCD cycles through the displays shown at right.



(3) Press the **Stop** key in any process of the above display cycle. The equipment beeps for one second and returns to the initial stage of the maintenance mode.

3.7 Operational Check of Control Panel PCB

■ Function

This function allows you to check the control panel PCB for normal operation.

■ Operating Procedure

(1) Press the **1** and **3** keys in this order in the initial stage of the maintenance mode.

The "00 " will appear on the LCD.

(2) Press the keys and buttons in the order designated in the illustration shown below.

The LCD shows the corresponding number in decimal notation each time a key or button is pressed. Check that the displayed number is correct by referring to the illustration below.

If a key or button is pressed out of order, the equipment beeps and displays the "INVALID OPERATE" on the LCD. To return to the status ready to accept key & button entry for operational check, press the **Stop** key.

(3) After the last number key or button is pressed, the equipment beeps and returns to the initial stage of the maintenance mode.

To terminate this operation, press the **Stop** key. The equipment returns to the initial stage of the maintenance mode.

Key & Button Entry Order

3.8 Sensor Operational Check

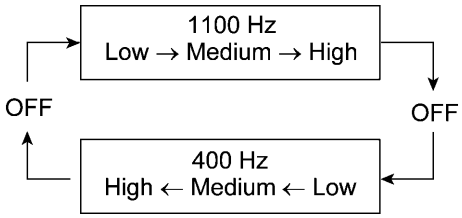
■ Function

This function allows you to check that the following sensors, switches, and EEPROMs operate correctly.

- Document front sensor
- Document rear sensor
- Document tray open sensor
- CCD HP sensor
- Cassette sensor
- Scanner open sensor
- Registration sensor
- Paper ejection sensor
- Purge cam HP switch
- Pump switching cam HP switch
- Head property EEPROMs
- Black ink cartridge sensor
- Yellow ink cartridge sensor
- Cyan ink cartridge sensor
- Magenta ink cartridge sensor

■ Operating Procedure

(1) Press the **3** and **2** keys in this order in the initial stage of the maintenance mode. The equipment sounds 1100 Hz and 400 Hz tones cyclically through the following volumes for testing the speaker:



NOTE: To stop beeping, press the **Function** key (American models) or **Menu** key (European models).

If the sensing status are as listed below, the LCD will show "DFDRDCFHCSCVRSPO" and "P1P2HDIKIYICIM," which can be switched by pressing the **Start** key.

Given below is the relationship between the LCD indication, sensor name and sensor status.

LCD	Sensors	Sensor signal ON
DF	Document front sensor	No document detected.
DR	Document rear sensor	No document detected.
DC	Document tray sensor	Document tray ASSY closed.
FH	CCD HP sensor	CCD unit in the home position.
CS	Cassette sensor	Paper cassette loaded.
CV	Scanner open sensor	Scanner unit closed.
RS	Registration sensor	No recording paper detected.
PO	Paper ejection sensor	No recording paper detected.
P1	Purge cam HP switch	Purge cam placed in the home position.
P2	Pump switching cam HP switch	Pump switching cam placed in the home position.
HD	Head property EEPROMs	Head (rank) detected.
IK	Black ink cartridge sensor	Black ink cartridge loaded.
IY	Yellow ink cartridge sensor	Yellow ink cartridge loaded.
IC	Cyan ink cartridge sensor	Cyan ink cartridge loaded.
IM	Magenta ink cartridge sensor	Magenta ink cartridge loaded.

(2) Change the detecting conditions and check that the displayed letters disappear. For example, insert a document through the document front sensor and check that the "DF" disappears.

(3) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

3.9 CCD Scanner Area Setting

■ Function

The equipment sets the CCD scanner area and stores it into the EEPROM.

■ Operating Procedure

(1) Press the **5** key twice in the initial stage of the maintenance mode.

The "SCANNER AREA SET," "BLACK LEVEL INIT," and "WHITE LEVEL INIT" will appear on the LCD in this order.

The equipment checks and sets the area to be scanned.

If no error is noted, the equipment returns to the initial stage of the maintenance mode.

If any error is noted, the "SCANNER ERROR" will appear on the LCD. To return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

3.10 Setting the Sensing Reference Level of Black Ink Empty Sensor

■ Function

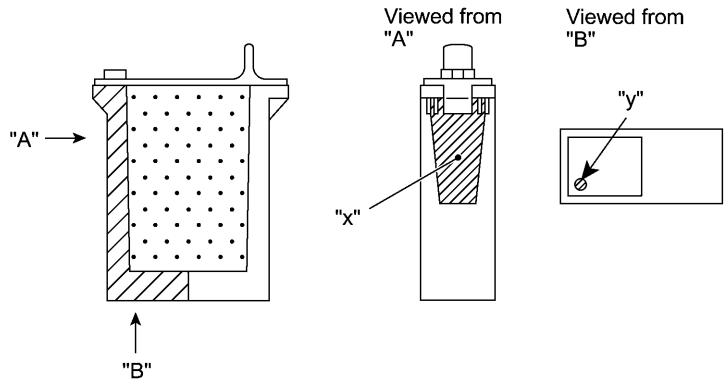
This function allows you to set the sensing reference level of the black ink empty sensor which apply when the controller judges whether there is ink in the black ink cartridge. The setting procedure requires a foam-empty cartridge as a reference cartridge.

NOTE: If you replace the carriage PCB or both the main PCB and the print head unit at the same time, carry out this procedure.

■ Operating Procedure

Handling notes for the reference cartridge: Shown below is a foam-empty cartridge to be used for setting the sensing reference level of the black ink empty sensor. Do not touch section "x" or "y."

If any dust or dirt is found on "x" or "y," wipe it off with a soft cloth. If "x" is scratched, replace the cartridge with a new one. Using such a scratched cartridge will fail to set correct reference level. After completion of the setting procedure, store the cartridge in the container.



Foam-empty cartridge

(1) Press the **5** and **7** keys in this order in the initial stage of the maintenance mode.
The LCD shows the "BKEMP TEST START" and "REMOVE ALL CART!" alternately.

(2) Press the open button to open the scanner unit.
The carriage automatically moves left to the ink replacement position.

(3) Remove all ink cartridges, one at a time.

(4) Close the scanner unit.

(5) Press the **Stop** key to return to the initial stage of the maintenance mode.

(6) Press the **5** and **7** keys in this order again.
The LCD shows the "BKEMP TEST START" and "SET F.EMP CART!" alternately.

(7) Press the open button to open the scanner unit.
The carriage automatically moves left to the ink replacement position.

(8) Set the foam-empty cartridge into the black ink cartridge position.

(9) Close the scanner unit.

The equipment shows the "-BKEMP CHECK-" and starts setting the sensing level for the foam-empty cartridge.

If the equipment completes setting normally, it beeps and displays the "BKEMP TEST OK!" Two seconds later, the "SET ALL NEW CART" appears. If it fails, the "BKEMP F.EMP:NG!" appears, so press the **Stop** key and go back to step (1).

(10) Press the open button to open the scanner unit, then remove the foam-empty cartridge.

(11) Load all ink cartridges removed in step (3) back into place.

(12) Close the scanner unit.

The equipment shows the "PURGE TYPE 12345?" on the LCD.

1: Ordinary purging
2: Double purging
3: Triple purging
4: Quadruple purging
5: Ink priming

(13) Choose the desired type of purging operation by using any of the **1** through **5** keys. (Usually choose "5: Ink priming.")

The equipment automatically carries out purging for all colors of ink and then aging of the carriage (to obtain the initial value of the PWM). This will take approx. 7 minutes if you choose "5: Ink priming."

(14) Press the **Stop** key to return to the initial stage of the maintenance mode.

3.11 Setting ID Codes to Facsimile Machines Connected to a PC via USB

■ Function

If more than one facsimile machine of the same model is connected to a PC via USB, you may assign ID codes (character strings) to those machines according to the procedure given here so that the PC can correctly identify them. For models covered by this manual, set serial numbers given to individual machines as ID codes.

■ Connecting each of facsimile machines to your PC

(1) Make sure that your PC is turned off.

(2) Make sure that the machine's power cord is unplugged from a wall socket.

(3) Connect the interface cable to the parallel interface port on the back of the facsimile machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your PC and secure it with the two screws.

(5) Plug the machine's power cord into a wall socket.

(6) Turn on your PC.

■ Operating Procedure

(1) Press the **6** and **2** keys in this order in the initial stage of the maintenance mode.

The machine stands by to accept an ID code.

(2) On your PC, run the ID setting utility. Follow the instructions shown on the PC's screen to enter the 9-digit serial number (e.g., G01012345) printed on the nameplate attached to the back of the facsimile machine as an ID code. Then press the Enter key.

The ID setting utility will transmit the ID code data from your PC to the facsimile machine and then it will terminate.

The facsimile machine will automatically return to the initial stage of the maintenance mode.

(3) To check that the entered character string (ID code) is correct, press the **1** key twice.

The facsimile machine will print out a Configuration List. At the right top of the list, "SER.#: BROXXXXXXXXX" is printed.

(4) Check that the character string entered in step (2) is printed in "XXXXXXXXX."

If it is OK, press the **9** key twice to exit from the maintenance mode.

If something other than that is printed in XXXXXXXXX, check the connection between the PC and facsimile machine and go back to step (1).

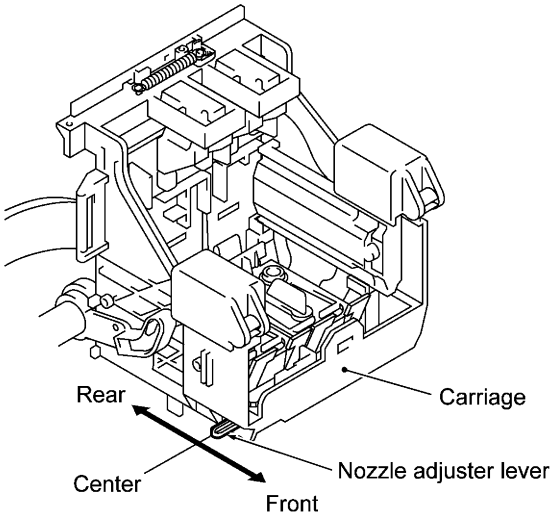
3.12 Alignment of Vertical Print Lines

■ Function

This function allows you to align not only vertical lines printed in the forward and backward direction of the carriage but also vertical/horizontal lines printed by the right and left print heads.

■ Operating Procedure

(1) Set the nozzle adjuster lever to the center position.



Nozzle Adjuster Lever

(2) Press the **6** and **5** keys in this order in the initial stage of the maintenance mode.

The equipment prints out a set of vertical alignment check patterns which consist of No. 1 to No. 9 lines for each of the 300 dpi (fast), 300 dpi, 600 dpi, and 1200 dpi.

If the vertical alignment is ON, No. 5 line (each in the 300 dpi (fast), 300 dpi, 600 dpi, and 1200 dpi printouts) shows vertically aligned lines as shown on pages V-62 and V-63.

The LCD shows the "300 FAST NO.(1-9)."

(3) Check the printed vertical alignment check patterns for the 300 dpi (fast) and find which number line shows full alignment. If the line is other than No. 5, enter that line number by using the numerical keys. In the example given on the next page, No. 5 line is not aligned and No. 9 line is fully aligned, so press the **9** key.

The LCD shows the "300 DPI NO.(1-9)."

(4) For the 300 dpi, perform the same operation as in step (3).

The LCD shows the "600 DPI NO.(1-9)."

(5) For the 600 dpi, perform the same operation as in step (3).

The LCD shows the "1200DPI NO.(1-9)."

(6) For the 1200 dpi, perform the same operation as in step (3).

The LCD shows the "NOZZLE NO.(1-3)."

(7) Check the nozzle test pattern and find which number block (from 1 through 3) shows the aligned height between the black block and magenta block. This is to correct a positioning error between the right and left print heads.

In the example given on page V-64, No. 3 block of the FRONT row shows the aligned height, so set the nozzle adjuster lever to the front position and press the **3** key.

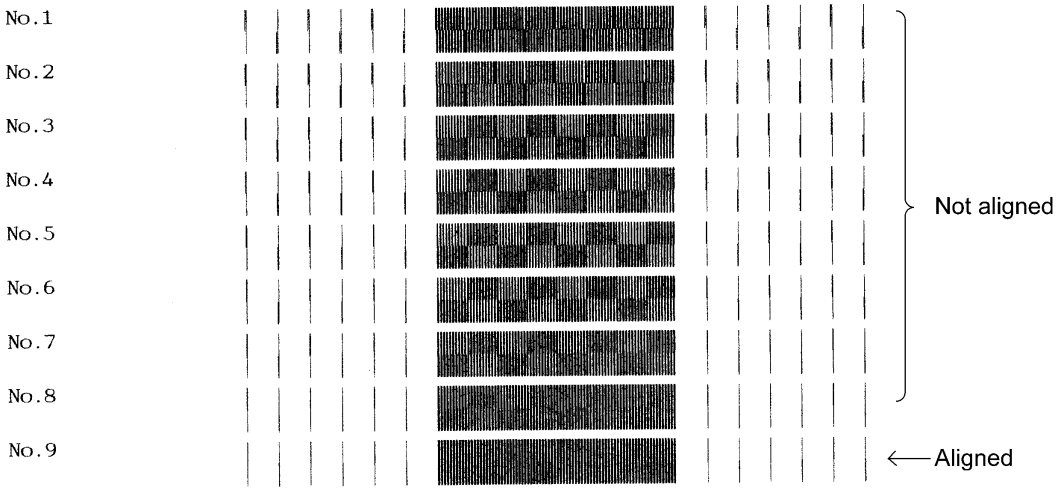
The LCD shows the "COLOR NO.(1-9)."

(8) Check the color position test pattern and find which number line (from 1 through 9) shows the vertical alignment of black vertical line with magenta one. This is to correct an ink jet speed error between the right and left print heads.

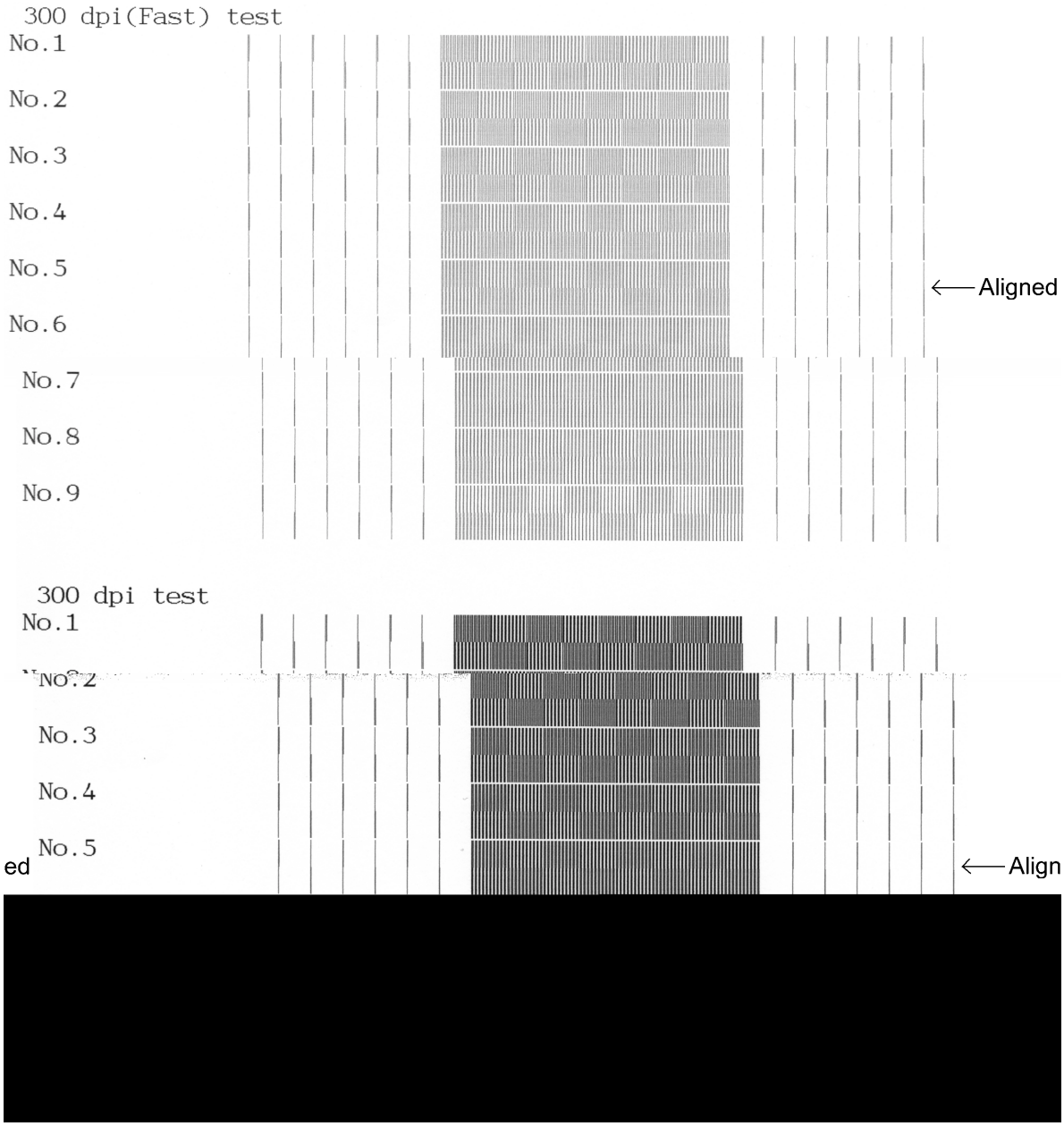
In the example given on page V-64, No 5 line shows the vertical alignment, so press the **5** key.

The equipment automatically returns to the initial stage of the maintenance mode.

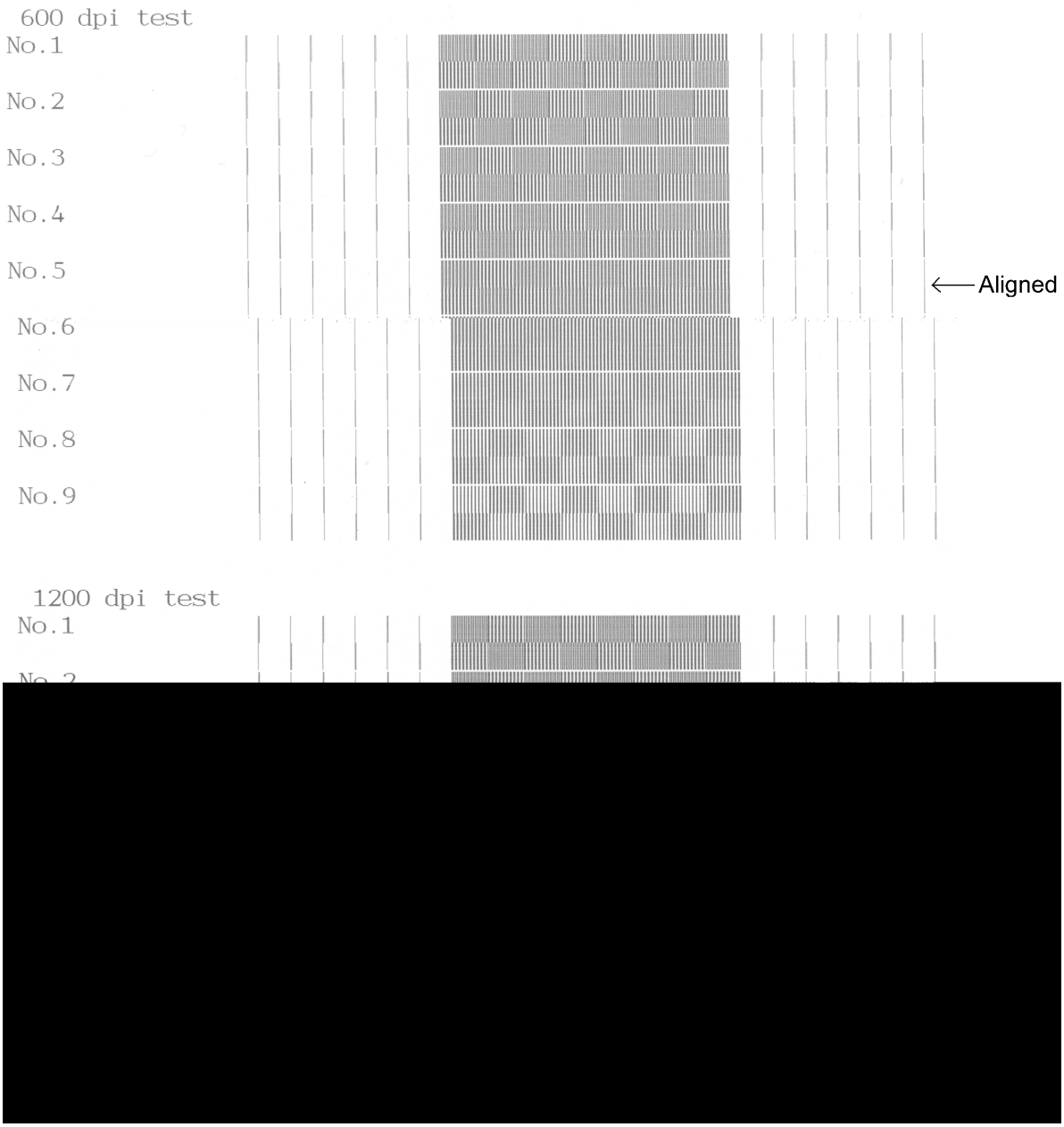
NOTE: If No. 1 line or No. 9 line is fully aligned so that you press the **1** or **9** key in the above procedure, go back to step (1) to confirm that No. 5 line becomes aligned.



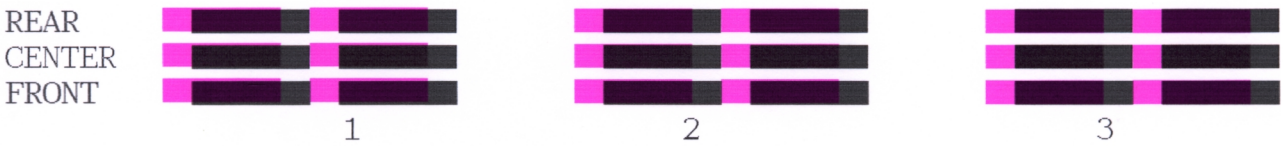
Vertical Alignment Check Pattern—Alignment OFF



Vertical Alignment Check Pattern—Alignment ON



Vertical Alignment Check Pattern—Alignment ON



Nozzle Test Pattern

Color Position Test Pattern

3.13 Initial Adjustment of PWM Value (Aging of the Carriage)

■ Function

This function obtains the initial value of the PWM by aging the carriage and writes it onto the EEPROM, as well as checking the head drive voltage level.

This aging procedure should be performed if you replace the print head, carriage ASSY, carriage motor, or encoder strip or if you loosen the timing belt.

NOTE: Opening the scanner unit during the aging procedure will result in an error. If you perform this aging procedure with the scanner unit opened, the equipment will slowly age the carriage resulting in an error after completion of the aging.

■ Operating Procedure

(1) Press the **6** and **9** keys in this order in the initial stage of the maintenance mode.

The equipment starts aging the carriage, showing the "CR AGING" on the LCD.

After writing the initial value of the PWM onto the EEPROM and checking the head drive voltage level, the equipment automatically returns to the initial stage of the maintenance mode.

If any error occurs, the equipment beeps and shows "CR AGING :ERROR" on the LCD. To return to the initial stage of the maintenance mode, press the **Stop** key.

3.14 EEPROM Customizing

■ Function

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings. The customizing codes list is given in Appendix 1.

NOTE: If you replace the main PCB, be sure to carry out this procedure.

■ Operating Procedure

(1) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC9200C U.S.A. versions) appears.

(2) Enter the desired customizing code (e.g., 0002 in the case of MFC9200C Canadian versions).

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the equipment will malfunction.*

(3) Press the **Start** key.

The equipment saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the equipment stops the procedure and returns to the initial stage of the maintenance mode.

3.15 Equipment Error Code Indication

■ Function

This function displays an error code of the last error on the LCD.

■ Operating Procedure

(1) Press the **8** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the "MACHINE ERROR X X."

(2) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

3.16 Output of Transmission Log to the Telephone Line

■ Function

This function outputs the transmission log (that the equipment has stored about the latest transmission) to the telephone line. It allows the service personnel to receive the transmission log of the user's equipment at a remote location and use it for analyzing problems arising in the user's equipment.

■ Operating Procedure

(1) If the user's equipment has a transmission-related problem, call the user's equipment at a remote location from your equipment.

(2) If the line is connected, have the user perform the following:

1) American models: Press the **Function**, **Receive mode**, and **0** keys in this order.

European models: Press the **Menu**, **Receive mode**, and **0** keys in this order.

2) Press the **8** and **7** keys in this order.

The above operation makes the user's equipment send CNG to your equipment for sending the transmission log.

(3) If you hear the CNG sent from the user's equipment, press the **Start** key of your equipment.

Your equipment will start to receive the transmission log from the user's equipment.

3.17 Cancellation of the Pin TX Lock Mode (Not applicable to American models)

■ Function

This procedure can cancel the Pin TX lock mode. Use this procedure if the user forgets his/her password entered when setting the Pin TX lock mode so as not to exit from the mode.

NOTE: Carrying out this procedure will lose passwords previously entered but retain FAX messages received in the Pin TX lock mode.

■ Operating Procedure

(1) When the PIN TX LOCK is displayed on the LCD, hold down the **Menu** key and press the **#** key. Within two seconds, start to press the **2**, **7**, **9**, **0**, and **0** keys.

The Pin TX lock mode will be canceled and the equipment returns to the calendar clock screen.

CHAPTER VI.

ERROR INDICATION AND TROUBLESHOOTING

CHAPTER VI. ERROR INDICATION AND TROUBLESHOOTING

CONTENTS

1. ERROR INDICATION

To help the user or the service personnel promptly locate the cause of a problem (if any), the facsimile equipment incorporates the self-diagnostic functions which display error messages for equipment errors and communications errors.

For the communications errors, the equipment also prints out the transmission verification report and the communications list.

1.1 Equipment Errors

If an equipment error occurs, the facsimile equipment emits an audible alarm (continuous beeping) for approximately 4 seconds and shows the error message on the LCD. For the error messages, see [1] below.

To display detailed error information, use the maintenance-mode function code 82 described in Chapter V, Section 3.15 (that is, make the equipment enter the maintenance mode and then press the **8** and **2** keys). Following the MACHINE ERROR, one of the error codes listed in [2] will appear on the LCD.

[1] Error messages on the LCD

Messages on the LCD	Probable Cause
CHECK PAPER	The registration sensor detects no recording paper loaded in the auto sheet feeder (ASF).
PRINTER JAM	The paper ejection sensor detects that a paper jam has occurred.
COVER OPEN	The scanner open sensor detects that the scanner unit is not closed.
CHECK CASSETTE	The cassette sensor detects that the paper cassette is not loaded properly.
CHECK SCAN LOCK	The output of the CCD HP sensor does not change because: 1) The CCD lock is placed in the lock (backward) position, 2) The CCD HP sensor is defective, or 3) The CCD motor is defective.
DOCUMENT JAM	■ Document jam (1) The document length exceeds the limitation (400 or 90 cm) registered by firmware switch WSW16. (Refer to Chapter V, Section 3.5.) (Both the document front and rear sensors stay ON even after the document has been fed by the registered length.) (2) The document rear sensor detects no trailing edge of a document after the document has been fed by 400 cm. (The document rear sensor stays ON even after the document has been fed when the document front and rear sensors were OFF and ON, respectively.)

Messages on the LCD	Probable Cause
DOCUMENT JAM	■ Document loading error (1) The document rear sensor detects no leading edge of a document within 10 seconds from the start of document loading operation. (The document rear sensor stays OFF even after the document has been fed when the document front sensor was ON.) (2) The loaded document is too short. (Since the document is shorter than the distance between the document front and rear sensors, the document front sensor is turned OFF before the document rear sensor is turned ON.)
CLEAN UP SCANNER	In the scanning compensation data list printed by the maintenance-mode function code 05 (refer to Chap. V, Section 3.2), less than fifty percent of the white level data is faulty. (This message may appear only in the maintenance mode)
SCANNER ERROR	In the scanning compensation data list printed by the maintenance-mode function code 05 (refer to Chap. V, Section 3.2), fifty percent or more of the white level data is faulty. (This message may appear only in the maintenance mode)
NEAR EMPTY CYAN NEAR EMPTY MGENT	The ink dot counter (for cyan or magenta) in the EEPROM on the right print head has counted up the specified number of dots, meaning near empty of ink. Even if either of these messages is displayed, color printing is still possible.
NEAR EMPTY YELLW NEAR EMPTY BLACK	The ink dot counter (for yellow or black) in the EEPROM on the left print head has counted up the specified number of dots, meaning near empty of ink. Even if either of these messages is displayed, color printing is still possible.
INK EMPTY CYAN INK EMPTY MAGENT	The ink dot counter (for cyan or magenta) in the EEPROM on the right print head has counted up the specified number of dots, meaning that the ink has run out. Once either of these messages is displayed, color printing is no longer possible. (If black ink remains, printing of the received data record or monochrome copying is possible.)
INK EMPTY YELLOW INK EMPTY BLACK	The ink dot counter (for yellow or black) in the EEPROM on the left print head has counted up the specified number of dots, meaning that the ink has run out. Once either of these messages is displayed, color printing is no longer possible. (If black ink remains, printing of the received data record or monochrome copying is possible.) **NOTE:** For checking how much the black ink remains accurately, the controller compensates the ink dot count with the black ink empty sensor.

Messages on the LCD	Probable Cause
SET CARTRIDGES	Any one of the four ink cartridge sensors detects no ink cartridge loaded.
WARMING UP	The temperature inside the equipment has dropped to 5.5°C or below after two hours of powering-on state, or it has dropped to 3.5°C or below within two hours of powering-on state.
COOLING DOWN	The temperature inside the equipment has exceeded 48°C.
PLS OPEN COVER	To display the relating detailed error code, use maintenance-mode function code 82. (Refer to Chapter V, Section 3.15.) If this message appears, open and close the scanner unit. The message may disappear if opening/closing scanner unit removes the error. If the error persists, the "MACHINE ERROR X X" will appear instead of this message.
PC BUSY OR FAIL	After connected with the host computer, the equipment has received no response from the computer. (A communications error has occurred.)
MEDIA ERROR	• The inserted media is broken or not formatted. • The equipment cannot access the designated file since no media is inserted or the inserted media is removed during access.
NO FILE	The designated image file is damaged, or the file is not an image file even if its extension is .JPG.

If only an alarm beep is heard without any message on the LCD when the equipment is turned on, the ROM or RAM will be defective.

[2] Error codes shown in the "MACHINE ERROR X X " message

If the LCD shows the "PLS OPEN COVER" message, you can display the detailed error code following the MACHINE ERROR, by using the maintenance-mode function code 82 described in Chapter V, Section 3.15.

NOTE: When checking a PCB as instructed in the "Check:" column, check its harness also.

NOTE: To check sensors, use the maintenance-mode function code 32 described in Chapter V, Section 3.8 (that is, press the **3** and **2** keys in the maintenance mode).

Error Code (Hex)	Error factor	Check:
23	Printer engine timeout.	• Main PCB
25	Ink cartridges had already been loaded when the power was first applied.	Reload ink cartridges, referring to the Owner's Manual.
30	The carriage cannot travel to the right or left.	• Carriage ASSY • Encoder strip (Any stains or scratches? Hooked correctly?) • Carriage motor • Main PCB • Power supply PCB • Purge unit • Main chassis
31	After driven by the specified number of pulses, the carriage does not stop (since it cannot detect the left end of the travel).	
32	The carriage movement parameter exceeded the travel range during printing.	
33	The carriage cannot move in midway of travel.	
34	The carriage stops during the short travel.	
35	The carriage stops during low-speed travel.	
36	The carriage stop position is out of the travel range.	
37	The carriage speed has exceeded the upper limit.	
38	The carriage speed has dropped below the lower limit during constant-speed travel.	
39	The carriage has overridden the travel range.	
3B	Printing area error.	
3C	Sudden carriage stop during printing.	
41	The head drive voltage has not been turned from Low to High within the specified time.	• Carriage ASSY • Main PCB • Print head unit • Power supply PCB
42	The head drive voltage has not been turned from High to Low within the specified time.	

Error Code (Hex)	Error factor	Check:
43	Head thermistor broken.	• Print head unit • Carriage ASSY • Main PCB
44	Head thermistor short-circuited.	
45	Flushing operation abnormally ended. (The head temperature has arisen abnormally.)	• Print head unit
46	The number of performed purge sequences has reached the limit.	• Ink absorber box • Main PCB
47	Head parameter stored in the EEPROM on either of the two print heads is invalid. (This code may appear only in the maintenance mode.)	• Print head unit • Main PCB • Power supply PCB
4B	Abnormal carriage travel speed detected when the power was applied.	• Encoder strip (Any stains or scratches? Hooked correctly?) • Purge unit • Main chassis • Carriage ASSY • Main PCB
4D	Error of the reference voltage in the video capture circuit.	• Main PCB
4E	Out of the allowable range of the head drive voltage designed for individual print head properties.	• Main PCB • Print head unit
50	The purge cam HP switch does not come ON even after the purge cam has been driven by the specified number of pulses.	• Purge unit • Purge-related gears on the main chassis (Purge gears 18 and 19, gear stopper, and purge bevel gear 18) • Main chassis • Paper feed motor • Main PCB
51	The purge cam HP switch does not go OFF even after the purge cam has been driven by the specified number of pulses.	
52	The pump switching cam HP switch does not come ON even after the switching cam has been driven by the specified number of pulses.	
53	The pump switching cam HP switch does not go OFF even after the switching cam has been driven by the specified number of pulses.	
73	Any of the four ink cartridges is not set into place.	• Ink cartridges • Carriage PCB • Head flat cables • Main PCB

Error Code (Hex)	Error factor	Check:
82	Recording paper feeding error.	• ASF • Registration sensor actuator • Main PCB
83	Recording paper jam. (The registration sensor sticks to OFF, indicating that paper has jammed.)	• Registration sensor actuator • Main PCB
84	Recording paper jam. (The paper ejection sensor has detected a paper jam.)	• Paper ejection sensor actuator • Registration sensor actuator • Main PCB
88	Recording paper jam. (Even after the registration sensor has come ON, the paper ejection sensor does not detect paper.)	
A1	Scanner unit opened.	• Scanner open sensor PCB and open sensor actuator • Main PCB • Document tray ASSY and scanner unit
A2	Document too long to scan.	• Document front sensor actuator • Document rear sensor actuator • Control panel PCB • Document sensor PCB • Document feed roller • ADF motor • Main PCB
A3	Document not detected by the document rear sensor.	
A4	50% or more faulty of white level data.	• CCD unit • Main PCB
A7	One-line feeding timeout.	
A8	One-line scanning timeout.	
AC	Less than 50% faulty of white level data.	• CCD unit • Main PCB
(AE	The CCD HP sensor sticks to OFF, indicating that the CCD unit has not returned to the home position.)	• CCD unit • Main PCB • CCD motor • CCD drive belt
(AF	The CCD HP sensor sticks to ON, indicating that the CCD unit has stayed in the home position.)	

Error Code (Hex)	Error factor	Check:
(B1	Dark level offset data error.)	• CCD unit • Main PCB
(B2	Gain control data error.)	
(B3	Scan area left edge detection error.)	
(B4	Scan area right edge detection error.)	
B5	Scan magnification (checked with the black marks printed on the white-level reference film) less than the specified value.	
B6	Scan magnification (checked with the black marks printed on the white-level reference film) greater than the specified value.	
(BE	Detection error of the black marks printed on the white-level reference film.)	
(BF	Detection error of ADF scanning position.)	
D5	The MODEM has failed to complete the command transmission sequence.	
E4	Out of recording paper.	• ASF • Registration sensor actuator • Document feed roller • Main PCB
E6	Write error in EEPROM.	• Main PCB
E8	Data scanning error during transmission.	• CCD unit • Main PCB
EA	Document removed at phase B.	
F6	PC interface error.	• Interface cable • Main PCB

1.2 Communications Errors

If a communications error occurs, the facsimile equipment

① emits an audible alarm (intermittent beeping) for approximately 4 seconds,

② displays the corresponding error message, and

③ prints out the transmission verification report if the equipment is in sending operation.

■ Definition of Error Codes on the Communications List

(1) Calling

Code 1	Code 2	Causes
10	08	Wrong number called.
11	01	No dial tone detected before start of dialing.
11	02	Busy tone detected before dialing.
11	03	2nd dial tone not detected.
11	05	No loop current detected.*
11	06	Busy tone detected after dialing or called.
11	07	No response from the remote station in sending.
11	10	No tone detected after dialing.
17	07	No response from the calling station in receiving.

*Available in German versions only.

(2) Command reception

Code 1	Code 2	Causes
20	01	Unable to detect a flag field.
20	02	Carrier was OFF for 200 ms or longer.
20	03	Abort detected ("1" in succession for 7 bits or more).
20	04	Overrun detected.
20	05	A frame for 3 seconds or more received.
20	06	CRC error in answerback.
20	07	Undefined command received.
20	08	Invalid command received.
20	09	Command ignored once for document setting or for dumping-out at turn-around transmission.
20	0A	T5 time-out error
20	0B	CRP received.
20	0C	EOR and NULL received.

(3) Compatibility [checking the NSF and DIS]

Code 1	Code 2	Causes
32	01	Remote terminal only with V.29 capability in 2400 or 4800 bps transmission.
32	02	Remote terminal not ready for polling.
32	10	Remote terminal not equipped with password function or its password switch OFF.
32	11	Remote terminal not equipped with or not ready for confidential mail box function.
32	12	Remote terminal not equipped with or not ready for relay broadcasting function.
32	13	No confidential mail in the remote terminal.
32	14	The available memory space of the remote terminal is less than that required for reception of the confidential or relay broad-casting instruction.
32	18	Remote terminal not equipped with color function.

(4) Instructions received from the remote terminal [checking the NSC, DTC, NSS, and DCS]

Code 1	Code 2	Causes
40	02	Illegal coding system requested.
40	03	Illegal recording width requested.
40	05	ECM requested although not allowed.
40	06	Polled while not ready.
40	07	No document to send when polled.
40	10	Nation code or manufacturer code not coincident.
40	11	Unregistered group code entered for relay broadcasting function, or the specified number of broadcasting subscribers exceeding the limit.
40	12	Retrieval attempted when not ready for retrieval.
40	13	Polled by any other manufacturers' terminal while waiting for secure polling.
40	17	Invalid resolution selected.
40	20	Invalid full-color mode requested.

(5) Command reception [checking the NSF and DIS after transmission of NSS and DCS]

Code 1	Code 2	Causes
50	01	Vertical resolution capability changed after compensation of background color.

(6) ID checking

Code 1	Code 2	Causes
63	01	Password plus "lower 4 digits of telephone number" not coincident.
63	02	Password not coincident.
63	03	Polling ID not coincident.
63	04	Entered confidential mail box ID uncoincident with the mail box ID.
63	05	Relay broadcasting ID not coincident.
63	06	Entered retrieval ID uncoincident with that of the mail box ID.

(7) DCN reception

Code 1	Code 2	Causes
74		DCN received.

(8) TCF transmission/reception

Code 1	Code 2	Causes
80	01	Fallback impossible.

(9) Signal isolation

Code 1	Code 2	Causes
90	01	Unable to detect video signals and commands within 6 seconds after CFR is transmitted.
90	02	Received PPS containing invalid page count or block count.

(10) Video signal reception

Code 1	Code 2	Causes
A0	03	Error correction sequence not terminated even at the final transmission speed for fallback.
A0	11	Receive buffer empty. (5-second time-out)
A0	12	Receive buffer full during operation except receiving into memory.
A0	13	Decoding error continued on 500 lines.
A0	14	Decoding error continued for 10 seconds.
A0	15	Time-out: 5 seconds or more for one-line transmission.
A0	16	RTC not found and carrier OFF signal detected for 6 seconds.
A0	17	RTC found but no command detected for 60 seconds.
A0	18	Receive buffer full during receiving into memory.
A0	19	No video data to be sent
A0	20	Unable to continue to receive color FAX (Remaining ink insufficient)
A8	01	RTN, PIN, or ERR received at the calling terminal.*
A9	01	RTN, PIN, or ERR received at the called terminal.*

* Available in German versions only

(11) General communications-related

Code 1	Code 2	Causes
B0	02	Unable to receive the next-page data.
B0	03	Unable to receive polling even during turn-around transmission due to call reservation.
B0	04	PC interface error.

(12) Maintenance mode

Code 1	Code 2	Causes
E0	01	Failed to detect 1300 Hz signal in burn-in operation.
E0	02	Failed to detect PB signals in burn-in operation.

(13) Equipment error

Code 1	Code 2	Causes
FF	X X	Equipment error (For X X, refer to Section 1.1 [2].)

2. TROUBLESHOOTING

2.1 Introduction

This section gives the service personnel some of the troubleshooting procedures to be followed if an error or malfunction occurs with the facsimile equipment. It is impossible to anticipate all of the possible problems which may occur in future and determine the troubleshooting procedures, so this section covers some sample problems. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

2.2 Precautions

Be sure to observe the following to prevent the secondary troubles from happening:

(1) Always unplug the AC power cord from the outlet when removing the covers and PCBs, adjusting the mechanisms, or conducting continuity testing with a circuit tester.

(2) When disconnecting the connectors, do not pull the lead wires but hold the connector housings.

(3)
- Before handling the PCBs, touch a metal portion of the machine to discharge static electricity charged in your body.
- When repairing the PCBs, handle them with extra care.

After repairing the defective section, be sure to check again if the repaired section works correctly. Also record the troubleshooting procedure so that it would be of use for future trouble occurrence.

2.3 Checking prior to Troubleshooting

Prior to proceeding to the troubleshooting procedures given in Subsection 2.4, make the following initial checks:

Environmental conditions

Check that:

(1) The machine is placed on a flat, firm surface.

(2) The machine is used in a clean environment at or near normal room temperature (10°C to 35°C) with normal relative humidity (20 to 80%).

(3) The machine is not exposed to direct sunlight or harmful gases.

Power requirements

Check that:

(1) The power supply specified on the rating plate located on the bottom of the machine is used. The supply voltage stays within the rating ±10%.

(2) Each voltage level on AC input lines and DC lines is correct.

(3) All cables and harnesses are firmly connected.

(4) None of the fuses are blown.

Recording paper

Check that:

(1) A recommended type of recording paper is used.

(2) The recording paper is not dampened.

Ink cartridges

(1) Check that all of four ink cartridges are loaded.

Print head

(1) Check that both the right and left print heads are installed on the carriage correctly. (Check the dimple contact between the print head PCB and the carriage PCB.)

(2) Repeat the head purging operation several times.

2.4 Troubleshooting Procedures

[1] Control panel related

Trouble	Check:
(1) LCD shows nothing.	• Panel-main harness • Control panel PCB • Power supply PCB • Main PCB
(2) Control panel inoperative.	• Panel-main harness • Control panel PCB • FPC key • Main PCB

[2] Telephone related

Trouble	Check:
(1) No phone call can be made.	• FPC key • Control panel PCB • NCU PCB • Main PCB
(2) Speed dialing or one-touch dialing will not work.	• Ordinary dialing function (other than the speed and one-touch dialing) If it works normally, check the main PCB; if not, refer to item (1) above.
(3) Dial does not switch between tone and pulse.	• Main PCB
(4) Telephone does not ring.	• Speaker • NCU PCB • Main PCB

[3] Communications related

Trouble	Check:
(1) No tone is transmitted.	• Main PCB • NCU PCB

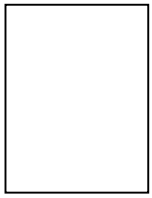
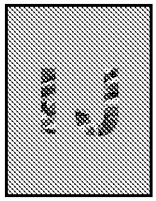
[4] Paper/document feeding related

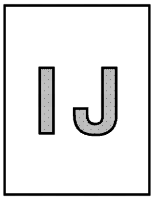
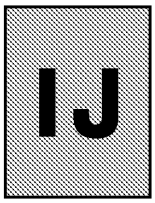
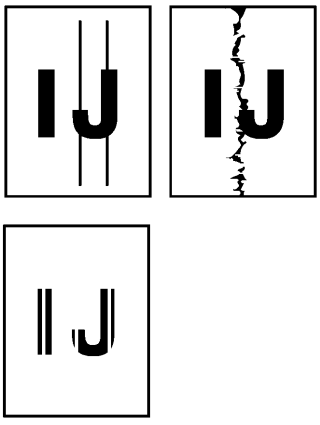
Trouble	Check:
(1) Neither "COPY: PRESS COPY" nor "FAX: NO. & START" message appears although documents are set.	• Sensors by using the maintenance-mode function code 32. (Refer to Chapter V, Section 3.8.) • Document front sensor actuator and document rear sensor actuator • Main PCB
(2) Document not fed.	• ADF and its related sections • ADF motor and its harness • Document feed rollers and their related gears • Main PCB
(3) Document double feeding	• ADF parts
(4) Document jam	• ADF motor
(5) Recording paper not fed.	• Paper feeding mechanism (PF timing belts and tension plate) • Main PCB
(6) Recording paper jam	• Paper feeding mechanism (PF timing belts and tension plate) • Eccentric bushing R and L (Alignment with markings made on the main chassis)

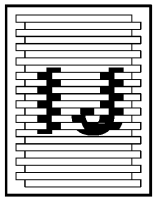
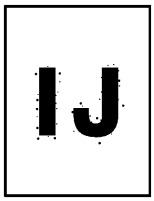
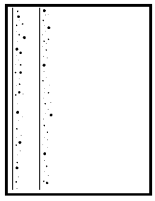
[5] Print-image related

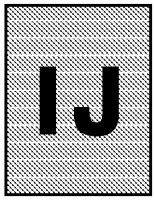
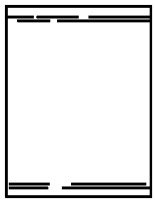
If the received or sent image has any problem, first make a copy with the facsimile equipment.

If the copied image is normal, the problem may be due to the remote terminal; if it is abnormal, proceed to the following checks:

Trouble	Action to be taken
(1) Completely blank 	<u>At the scanner</u> Check the following components: - CCD flat cable - Main PCB - CCD unit
(2) Random color 	<u>At the printer</u> • Check the ink cartridges. If any cartridges have run out of ink, replace them. • Check the dimple contact between each of the print head PCBs and the mating carriage FPC. Clean it if contaminated. (If the problem persists, replace the carriage ASSY.) • Check the connection of the head flat cables on the main PCB. (If either of those cables is broken or damaged, replace it.) • Replace the main PCB.
(3) All black 	<u>At the scanner</u> Check the following components: - CCD flat cable - CCD unit - Main PCB <u>At the printer</u> Check the following components: - Print head unit - Main PCB - Carriage ASSY

Trouble	Action to be taken
(4) Light 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer</u> Check the following components: - Ink cartridges - Print head unit - Main PCB - Power supply PCB
(5) Dark 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer</u> • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. If the problem persists, replace the print head unit. • Check the paper feed-related rollers. • Replace the main PCB and power supply PCB.
(6) Black or blurred vertical stripes 	<u>At the scanner</u> Check the following components: - CCD unit <u>At the printer</u> • Check whether paper is in abnormal contact with any other components during ejecting. • Check the encoder strip for stains or scratches. (If the encoder strip is not hooked properly, correct it.)

Trouble	Action to be taken
(7) Print edges not aligned 	At the printer • Check the alignment of vertical print lines by using the maintenance-mode function code 65. (Refer to Chapter V, Section 3.12.) • Check the print head unit. • Check the encoder strip for stains or scratches. (If the encoder strip is not hooked properly, correct it.)
(8) Ink splash  	At the printer • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Check the ink cartridges. Any of them has run out of ink or the ink viscosity has been increased, so replace it. • Replace the print head unit. • Replace the main PCB. • Replace the power supply PCB. • Check that the eccentric bushings R and L are aligned with markings made on the main chassis to adjust the head-platen gap.
(9) Random missing dots 	At the printer • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Check the ink cartridges. If any cartridges have run out of ink, replace them. • Check the dimple contact between each of the print head PCBs and the mating carriage FPC. Clean it if contaminated. • Replace the print head unit (a set of the right and left print heads). (If the problem persists, replace the carriage ASSY.) • Check the connection of the head flat cables on the main PCB. (If either of those cables is broken or damaged, replace it.) • Replace the main PCB. • Clean the purge cap of the purge unit with the head cleaner. If the wiper or the pump of the purge unit is defective, replace the purge unit.)

Trouble	Action to be taken
(10) White horizontal streaks 	• For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Replace the print head unit. • Check the paper feed-related rollers.
(11) Stained leading edge of recording paper 	<u>At the printer</u> • Clean the nozzle ends of the ink-jet units. • Check that the eccentric bushings R and L are aligned with markings made on the main chassis to adjust the head-platen gap.

[6] PC-driven or video capture-driven printing

Trouble	Check:
(1) PC-driven printing is impossible.	• Interface with the host computer • PC interface cable • Main PCB • Centronics interface • USB interface
(2) Video capture-driven printing is impossible	• VC connector PCB • Main PCB • Centronics interface • USB interface
(3) Video printing is impossible.	• VC connector PCB • Main PCB

[7] SmartMedia-driven or Compact Flash-driven printing

Trouble	Check:
(1) No image data can be read.	• SmartMedia - Inserted with its face up? • SmartMedia or Compact Flash - Formatted? - Any data in the media? - Images stored in the media are in EXIF2.0-compliant JPEG file format (having extension .JPG)? • Media PCB • Media flat cables • Main PCB
(2) No SmartMedia can be recognized.	• Check whether Compact Flash card is already inserted. If not, refer to item (1) above.
(3) Media printing is impossible.	• Check whether video signals are inputted to the VC terminal. • Check whether a document is set on the ADF. (If yes, remove it.) • Check whether the memory is full.

MFC9200C/MFC860

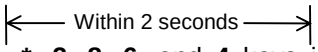
Appendix 1. EEPROM Customizing Codes

EEPROM Customizing Codes

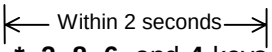
This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings.

■ Operating Procedure

(1) American models: Press the **Function**, *****, **2**, **8**, **6**, and **4** keys in this order to make the facsimile equipment enter the maintenance mode.



European models: Press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order to make the facsimile equipment enter the maintenance mode.



The equipment beeps for approx. one second and displays "▮▮ MAINTENANCE ▮▮▮" on the LCD.

(2) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC9200C U.S.A. versions) appears.

(3) Enter the desired customizing code (e.g., 0002 in the case of MFC9200C Canadian versions).

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the equipment will malfunction.*

(4) Press the **Start** key.

The equipment saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the equipment stops the procedure and returns to the initial stage of the maintenance mode.

■ EEPROM Customizing Codes List

(1) MFC9200C

Versions	Model
	MFC9200C
U.S.A.	9001
Canada	0002
Australia	0006
Asia	0040
New Zealand	0027

(2) MFC860

Versions	Model
	MFC860
Germany	0003
U.K.	0004
France	0005
Norway	0007
Belgium	0008
Netherlands	0009
Switzerland	0010
Ireland	0004
Denmark	0013
Austria	0003
Spain	0015
Italy	0016
Sweden	0026

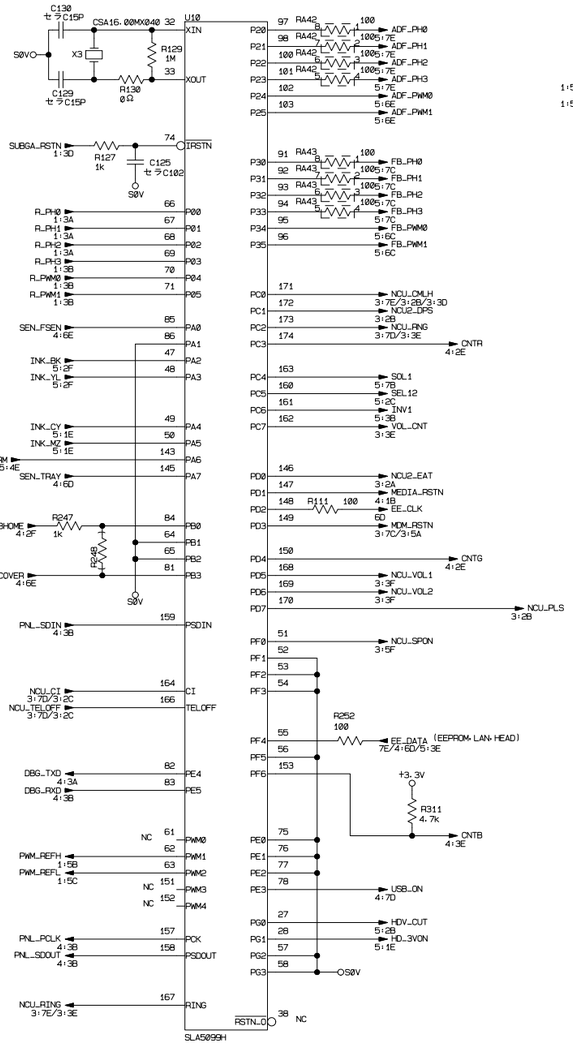
MFC9200C/MFC860

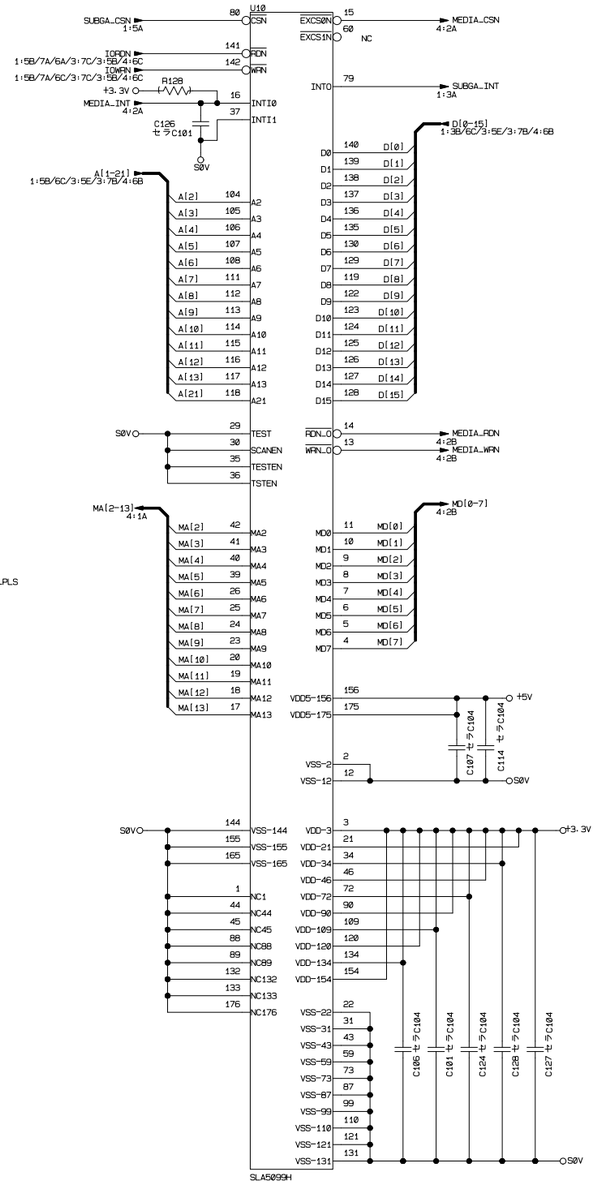
Appendix 2. Circuit Diagrams

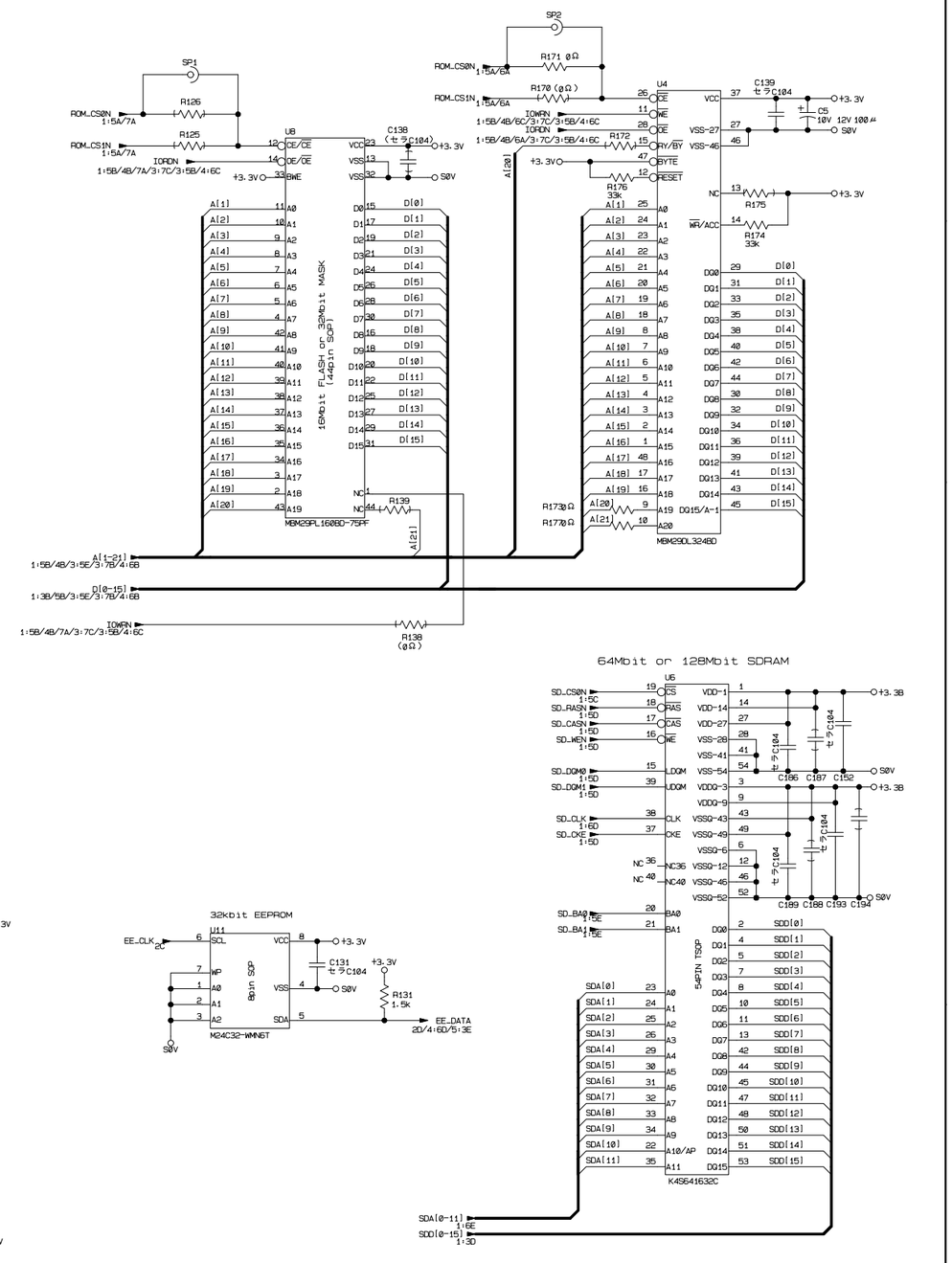
1.指示の無いチップ抵抗、コンデンサのサイズは1608(1/16W)。 UNLESS OTHERWISE SPECIFIED, THE SIZE OF CHIP RESISTORS OR CAPACITORS IS 1608 (1/16W).

セラC: Ceramic capacitor

A	Main PCB 1/5	

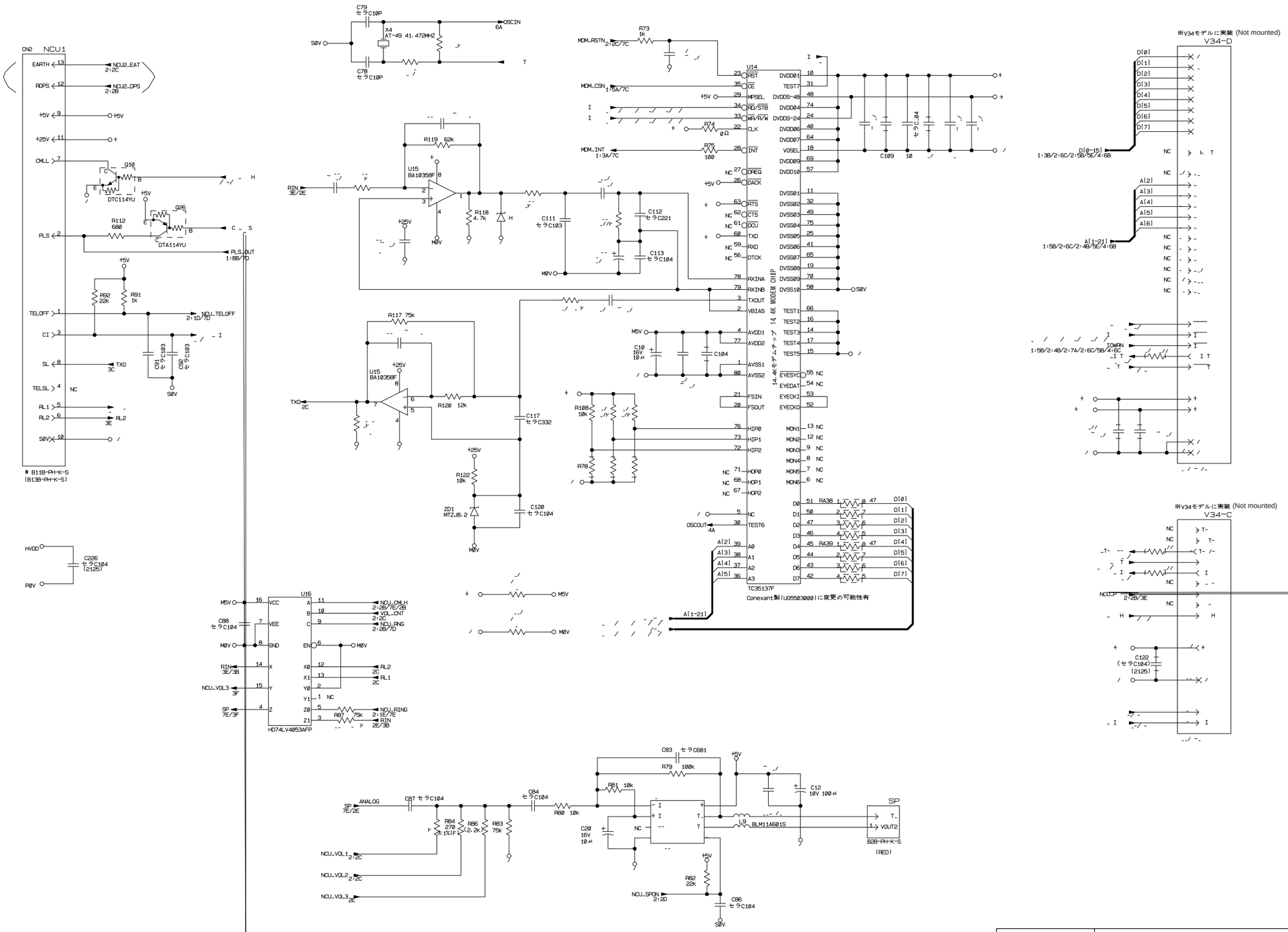






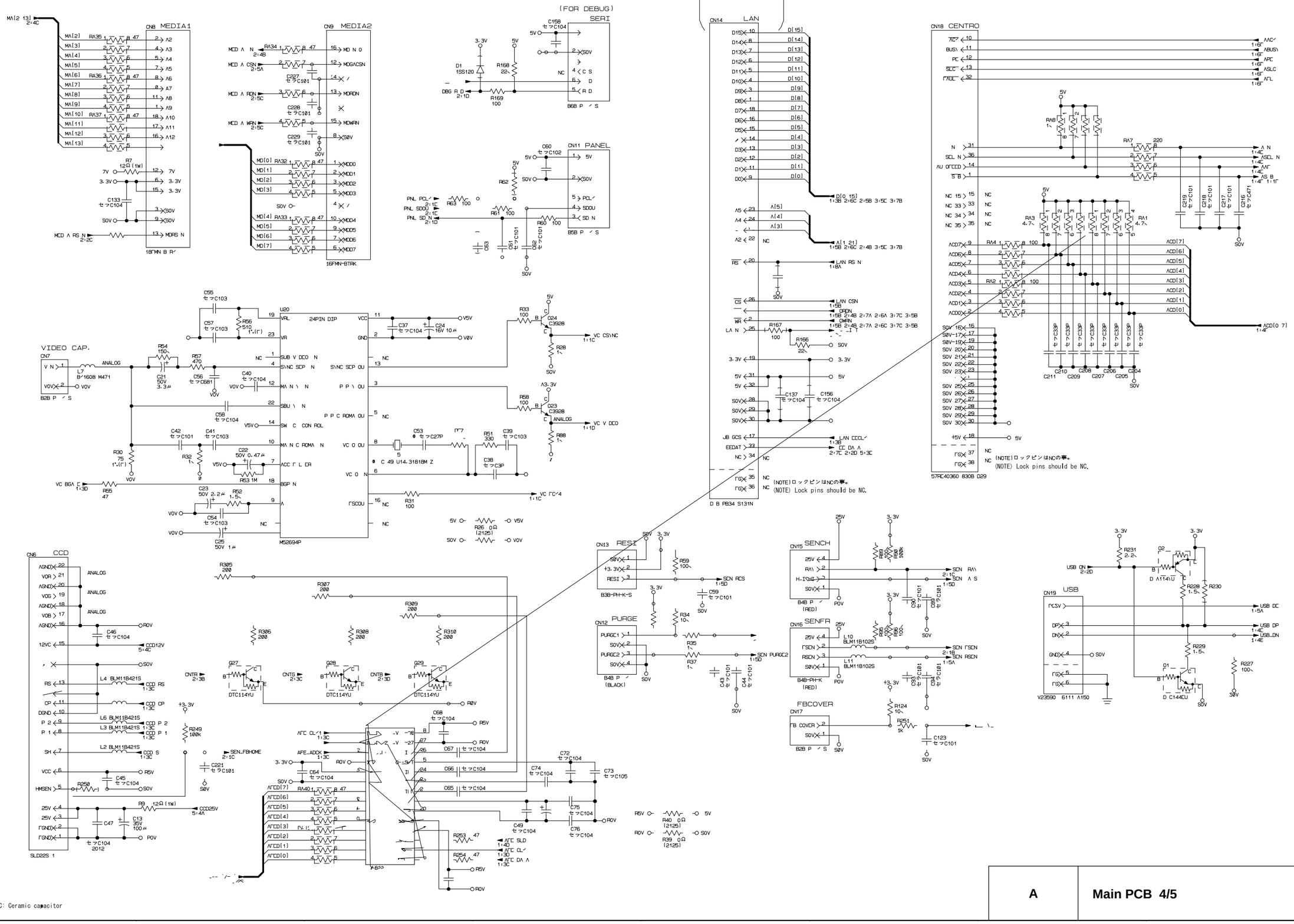
セラC: Ceramic capacitor

A	Main PCB 2/5

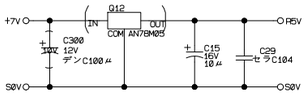


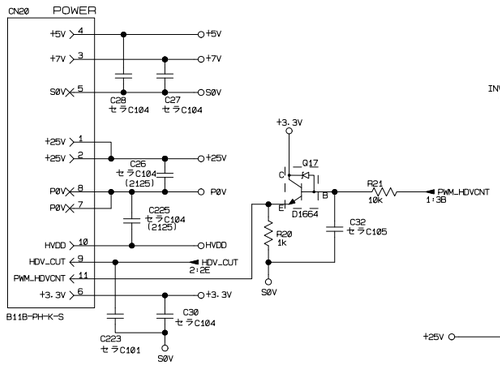
セラC: Ceramic capacitor

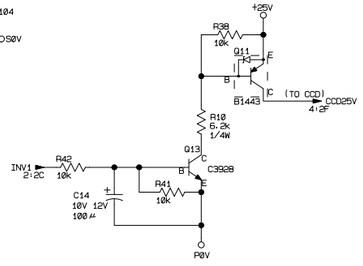
A	Main PCB 3/5

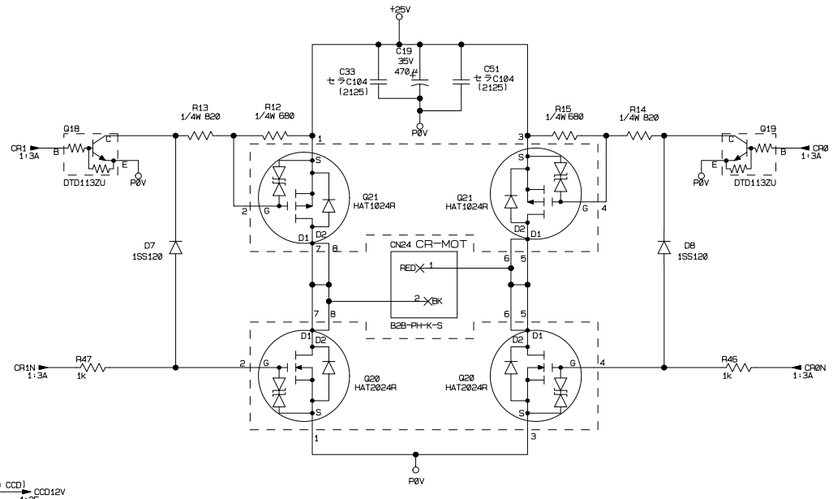

CN8 MEDIA1
18PMN B R/
CN9 MEDIA2
16PMN-BTRK
(FOR DEBUG)
SERI
B6B P ヾ S
CN11 PANEL
B5B P ヾ S
CN14 LAN
D B PB34 S131N
CN18 CENTRO
57RC40360 B30B D29
(NOTE)ロックピンはNCの事。
(NOTE) Lock pins should be NC.
VIDEO CAP.
B2B P ヾ S
M52694P
CN5 CCD
SLD22S 1
CN13 RESI
B3B-PH-K-S
CN12 PURGE
B4B P ヾ
(BLACK)
CN15 SENCH
CN16 SENFR
B4B-PH-K
(RED)
FBCOVER
CN17
B2B P ヾ S
CN19 USB
V23590 6111 A150
セラC: Ceramic capacitor

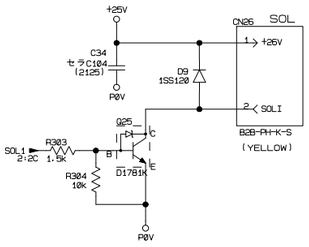
A	Main PCB 4/5

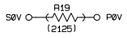


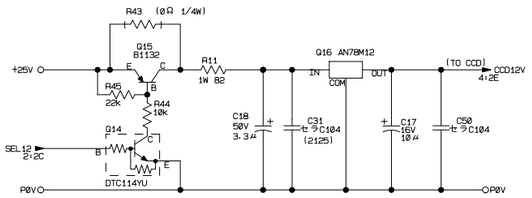


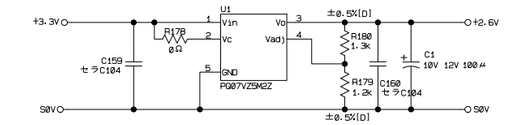


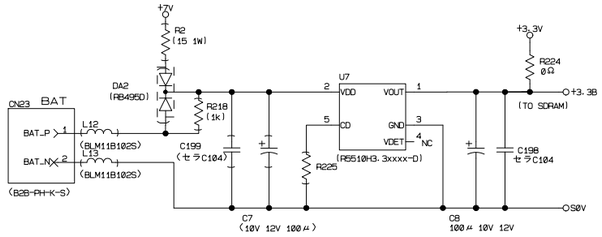


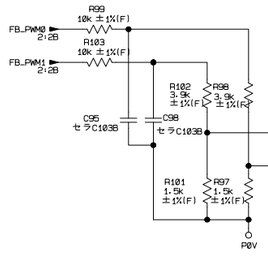


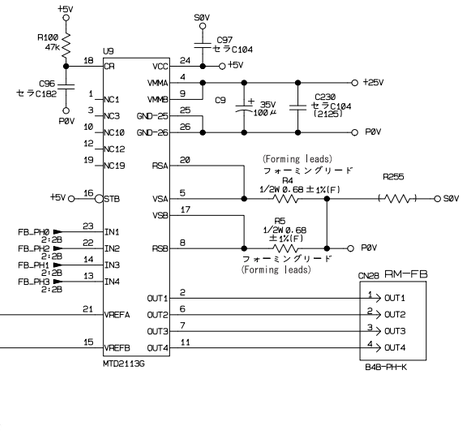


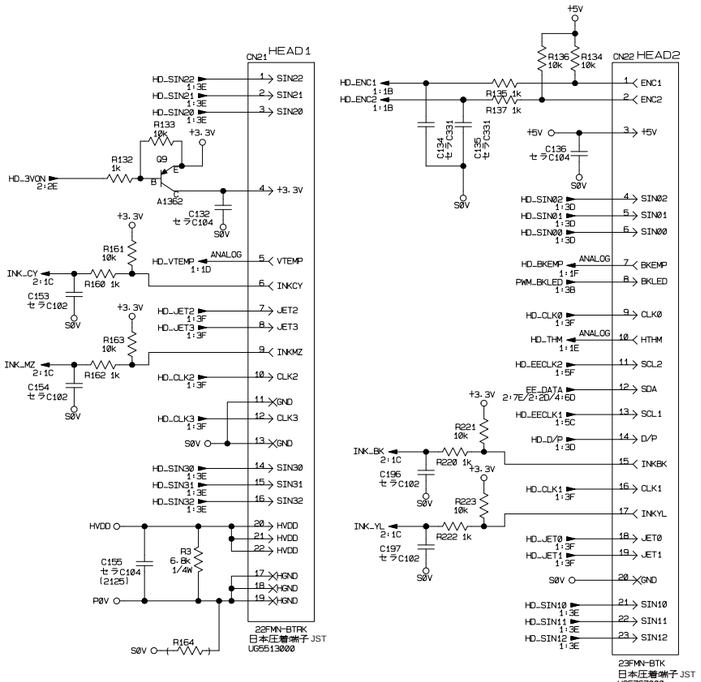


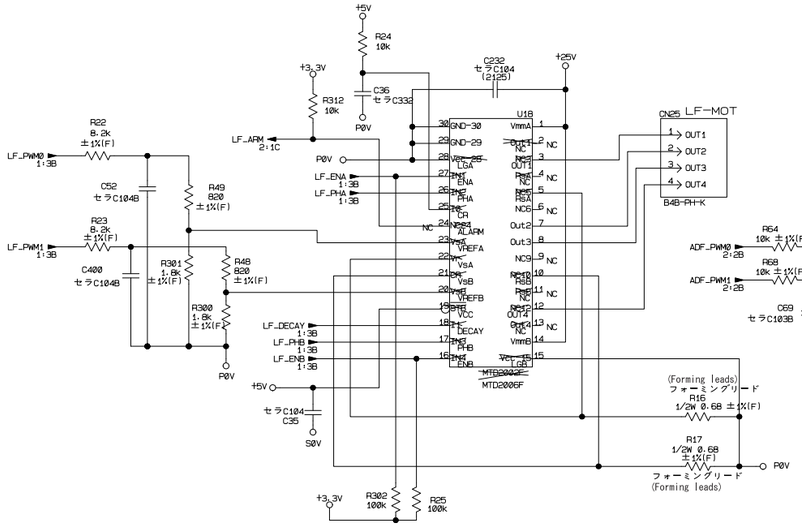


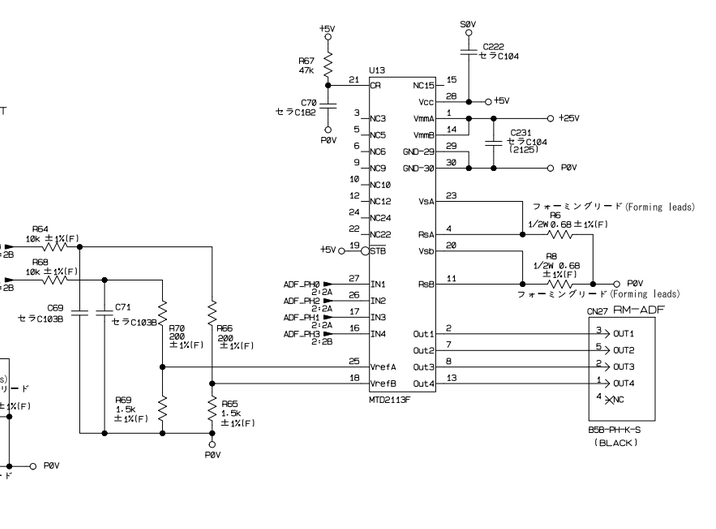










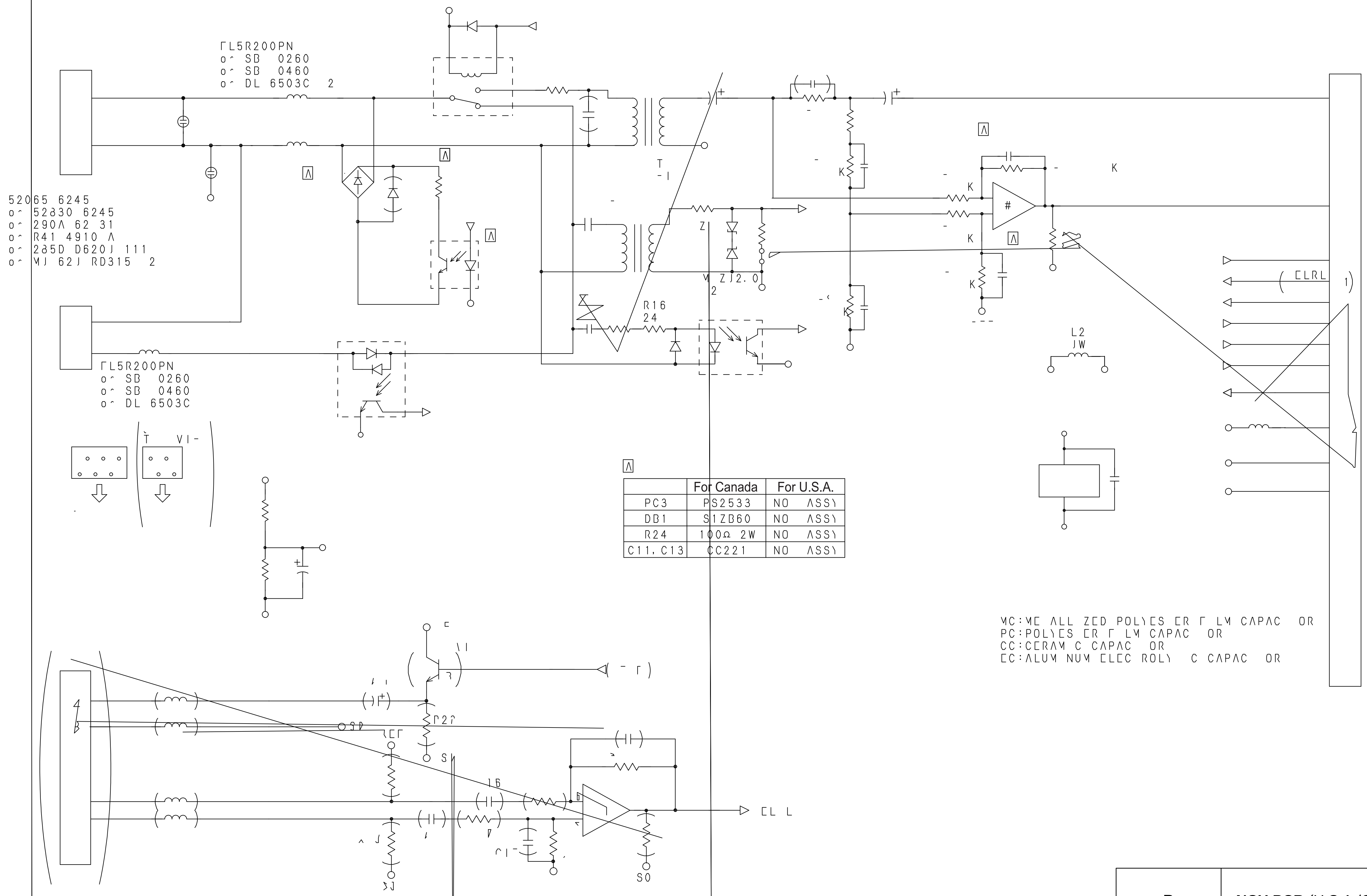


セラC: Ceramic capacitor
デンC: Electrolytic capacitor

A	Main PCB 5/5

2. UNLESS O ERW SE SPEC F ED, E OL ACE RES S ANCE OF CAPAC ORS S 25 OR 50 .

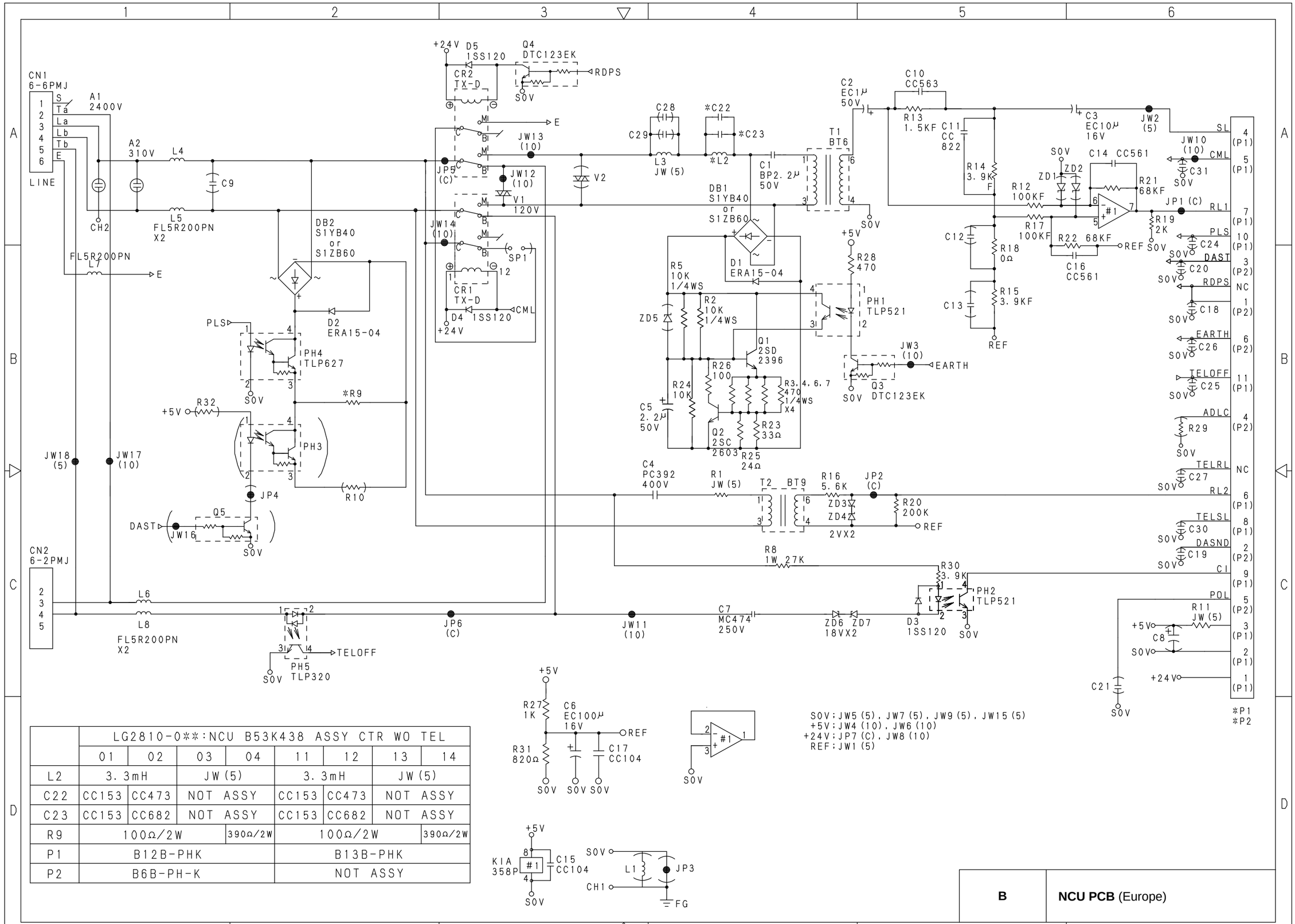
3. COMPONEN S N PAREN ES S NO O BE MOUN ED.



	For Canada	For U.S.A.
PC3	PS2533	NO ASSY
DB1	S1ZB60	NO ASSY
R24	100Ω 2W	NO ASSY
C11, C13	CC221	NO ASSY

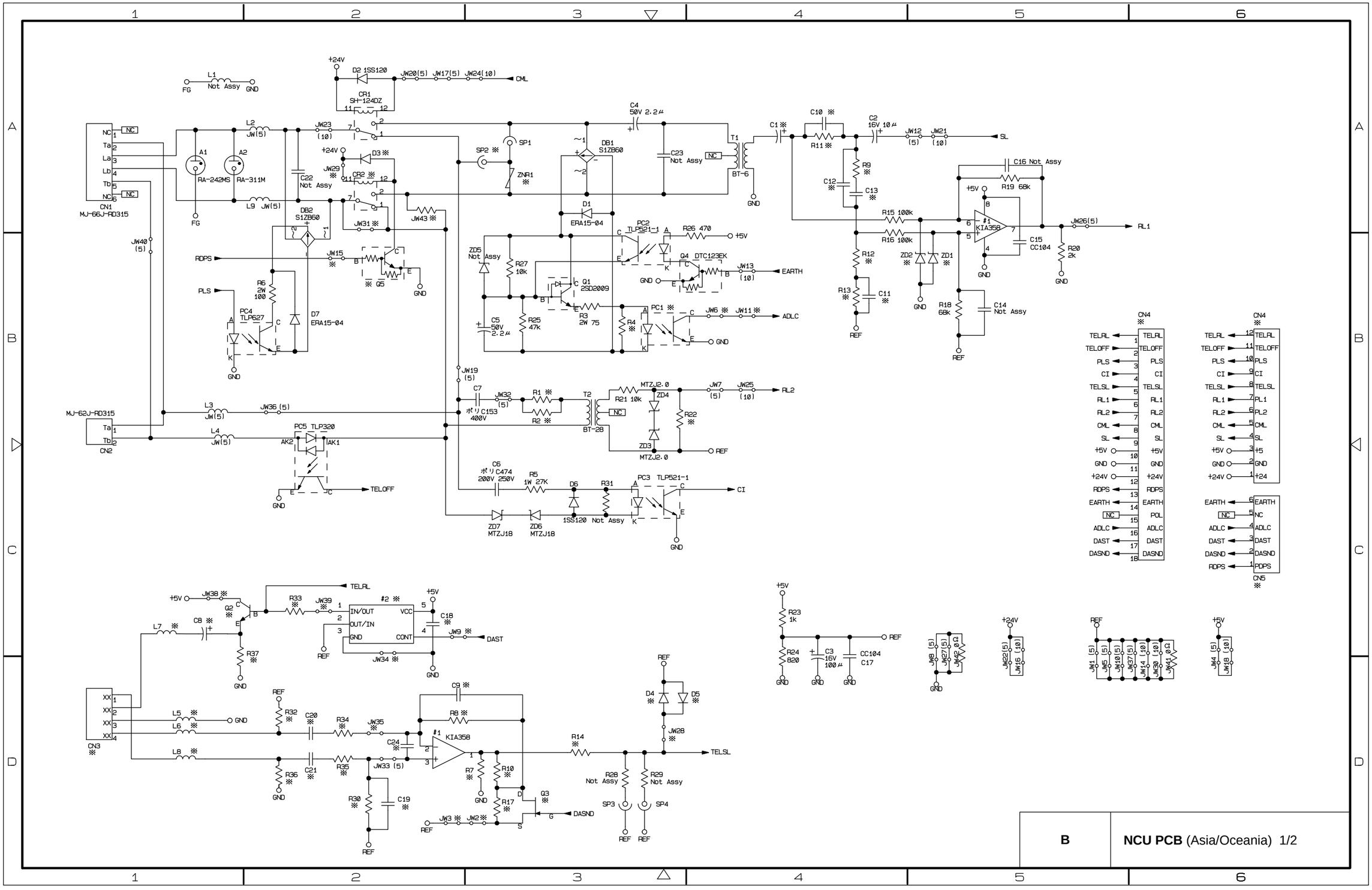
MC:ME ALL ZED POLYES ER F LM CAPAC OR
PC:POLYES ER F LM CAPAC OR
CC:CERAM C CAPAC OR
EC:ALUM NUM ELEC ROLY C CAPAC OR

B	**NCU PCB** (U.S.A./Canada)



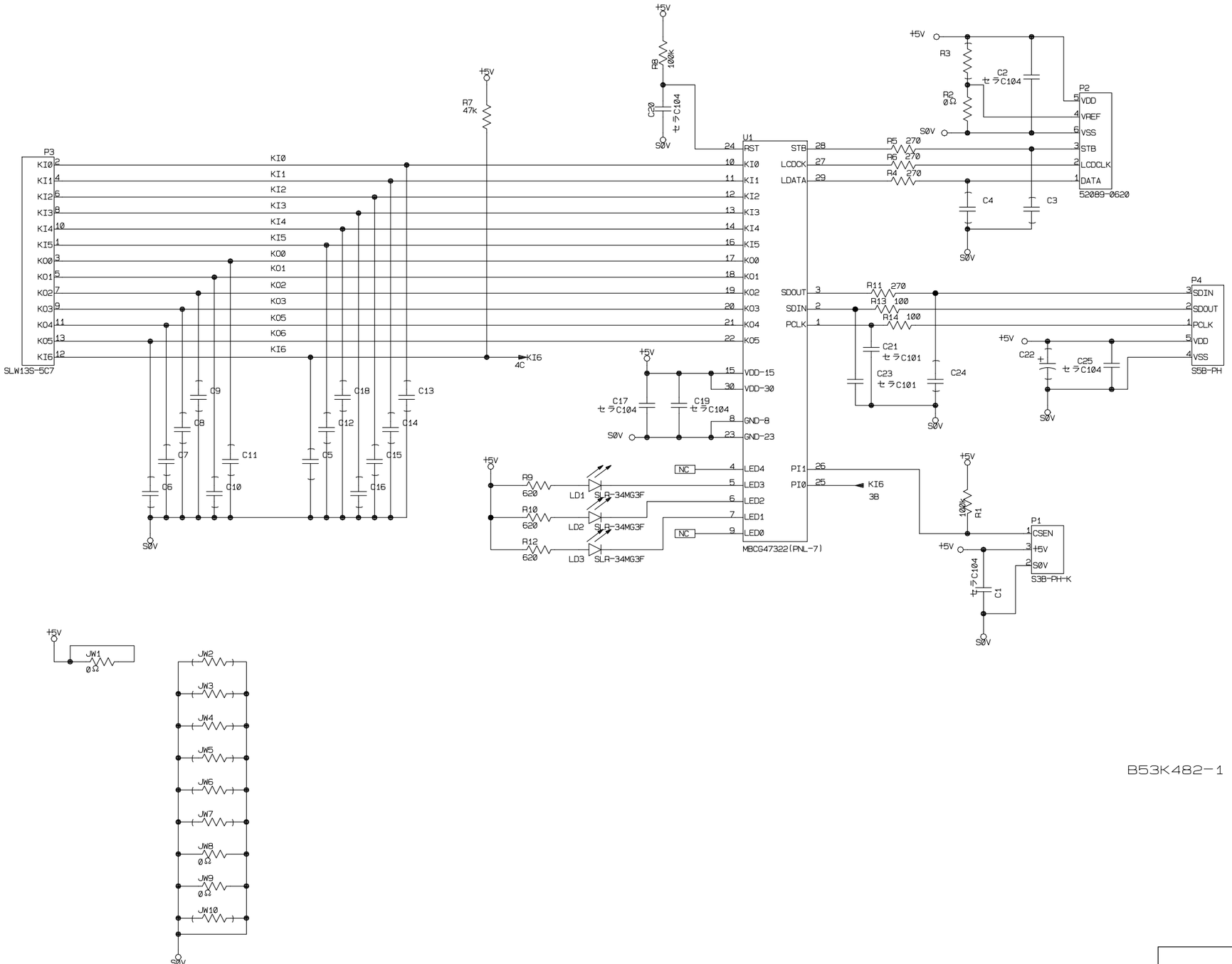
	LG2810-0**:NCU B53K438 ASSY CTR WO TEL							
	01	02	03	04	11	12	13	14
L2	3.3mH		JW(5)		3.3mH		JW(5)	
C22	CC153	CC473	NOT ASSY		CC153	CC473	NOT ASSY	
C23	CC153	CC682	NOT ASSY		CC153	CC682	NOT ASSY	
R9	100Ω/2W			390Ω/2W	100Ω/2W			390Ω/2W
P1	B12B-PHK				B13B-PHK			
P2	B6B-PH-K				NOT ASSY			

B	**NCU PCB** (Europe)



B	**NCU PCB** (Asia/Oceania) 1/2

ASSY	NCU B53K479 ASSY ASIA W/O TEL	NCU B53K479 ASSY OCEANIA W/O TEL
ADRS.	NAME	NAME
ZNR1	Not Assy	ENC121D07A
SP2	Not Assy	1/16W 0
CR2	Not Assy	SH-124DZ
Q5	Not Assy	DTC123EK
D3	Not Assy	1SS120
JW15	Not Assy	JW(10)
JW29	Not Assy	JW (5)
JW31	JW (5)	Not Assy
JW43	1/16W 0	Not Assy
PC1	Not Assy	Not Assy
R4	JW (5)	JW (5)
JW6;JW11	Not Assy	Not Assy
ZD1;ZD2	Not Assy	Not Assy
R1	1/4W 22K	Not Assy
R2	1/4W 22K	JW (5)
R9	1/16W 1% 4.7K	1/16W 1% 2.7K
R11	1/16W 1% 910	1/16W 1% 1.10K
R12	1/16W 1% 2K	CERAMIC 16C224B
R13	1/16W 1% 9.1K	1/16W 1% 3.9K
R22	Not Assy	1/16W 20K
C1	ALUM-ELEC 16B100	ALUM-ELEC 50B10-1
C10	Not Assy	CERAMIC 50C563B
C11	CERAMIC 50C103B	Not Assy
C12	Not Assy	CERAMIC 50C562B
C13	CERAMIC 16C224B	RESISTOR 0
CN3	Not Assy	Not Assy
CN5	Not Assy	Not Assy
CN4	B13B-PH	B13B-PH
Q2	Not Assy	Not Assy
R7	Not Assy	Not Assy
R8;R30	1/16W 0	1/16W 0
R14	Not Assy	Not Assy
R32;R36	Not Assy	Not Assy
R34;R35	Not Assy	Not Assy
R37	Not Assy	Not Assy
C8	Not Assy	Not Assy
C9;C19	Not Assy	Not Assy
C20;C21	Not Assy	Not Assy
C24	Not Assy	Not Assy
JW35;JW38;L5;L6;L7;L8	Not Assy	Not Assy
D4;D5	Not Assy	Not Assy
JW28	Not Assy	Not Assy
#2	Not Assy	Not Assy
R33	Not Assy	Not Assy
C18	Not Assy	Not Assy
JW9;JW34;JW39	Not Assy	Not Assy
Q3	Not Assy	Not Assy
R10	1/16W 0	1/16W 0
R17	Not Assy	Not Assy
JW2;JW3	Not Assy	Not Assy



C	Control Panel PCB 1/2

BY4FB PANEL KEY MATRIX REFERENCE TABLE 1

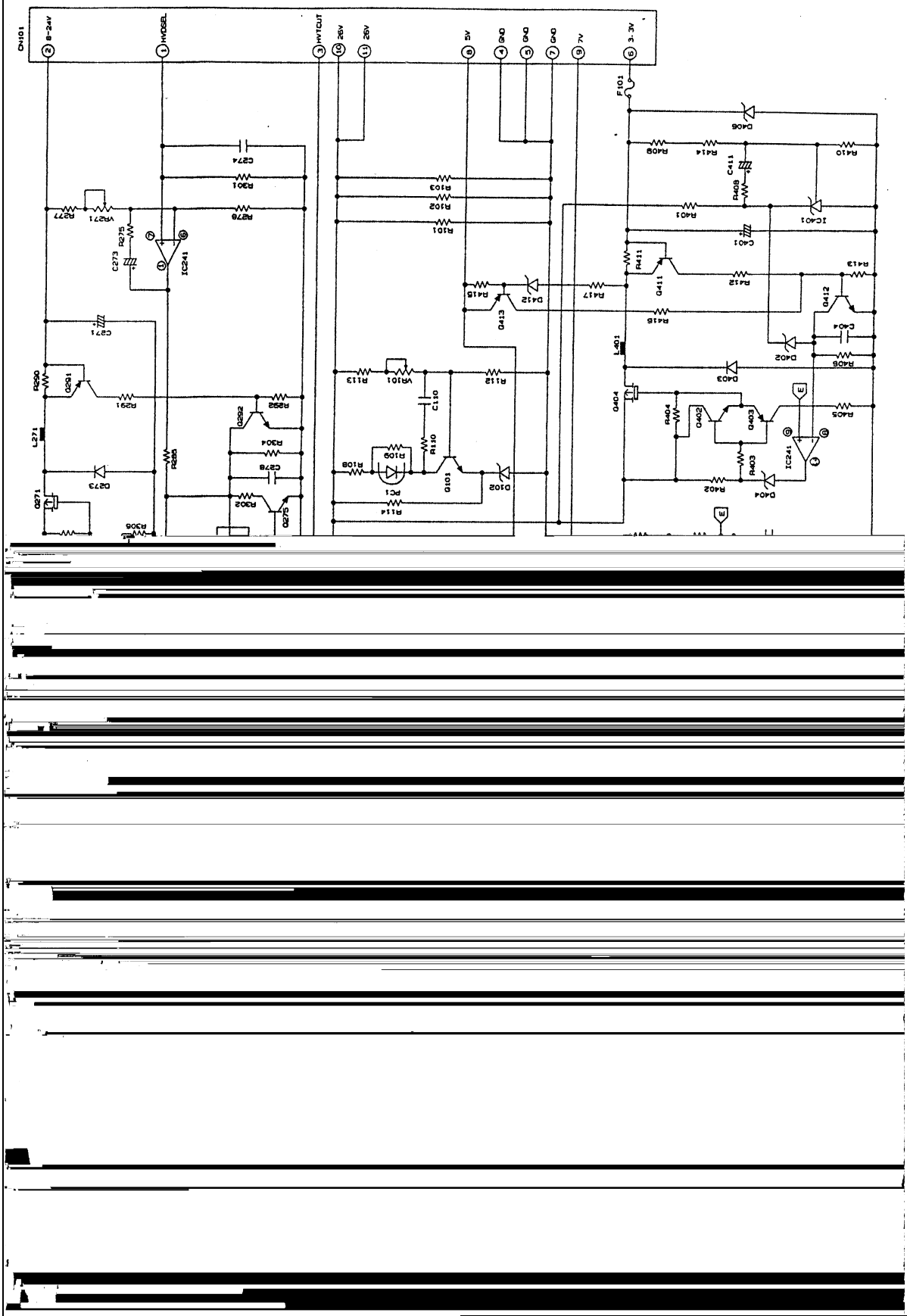
KEY NO.	KEY NAME	KEY CODE
1	1TOUCH- 1/5	2E
2	Shift	1E
3	1TOUCH- 2/6	29
4	Receive mode	19
5	1TOUCH- 3/7	2A
6		02
7	Redial/Pause	1A
8	1TOUCH- 4/8	2B
9	Search/Speed Dial	1B
10	10KEY-1	16
11	10KEY-2	0E
12	10KEY-3	26
13	10KEY-4	11
14	10KEY-5	09
15	10KEY-6	21
16	10KEY-7	12
17	10KEY-8	0A
18	10KEY-9	22
19	10KEY-*	13
20	10KEY-0	0B
21	10KEY-#	23
22	Stop	01
23	Start	24
24	Fax Resolution	0C
25	Function	14
26	←	2C
27	→	1C

KEY NO.	KEY NAME	KEY CODE
28	Set	15
29	Enlarge/Reduce	25
30	Options	0D
31	Reset	2F
32	Ink Management	1F
33	Scan Image	17
34	Scan/OCR	0F
35	Scan to E-Mail	27
36	Mono Copy	2D
37	Color Copy	1D

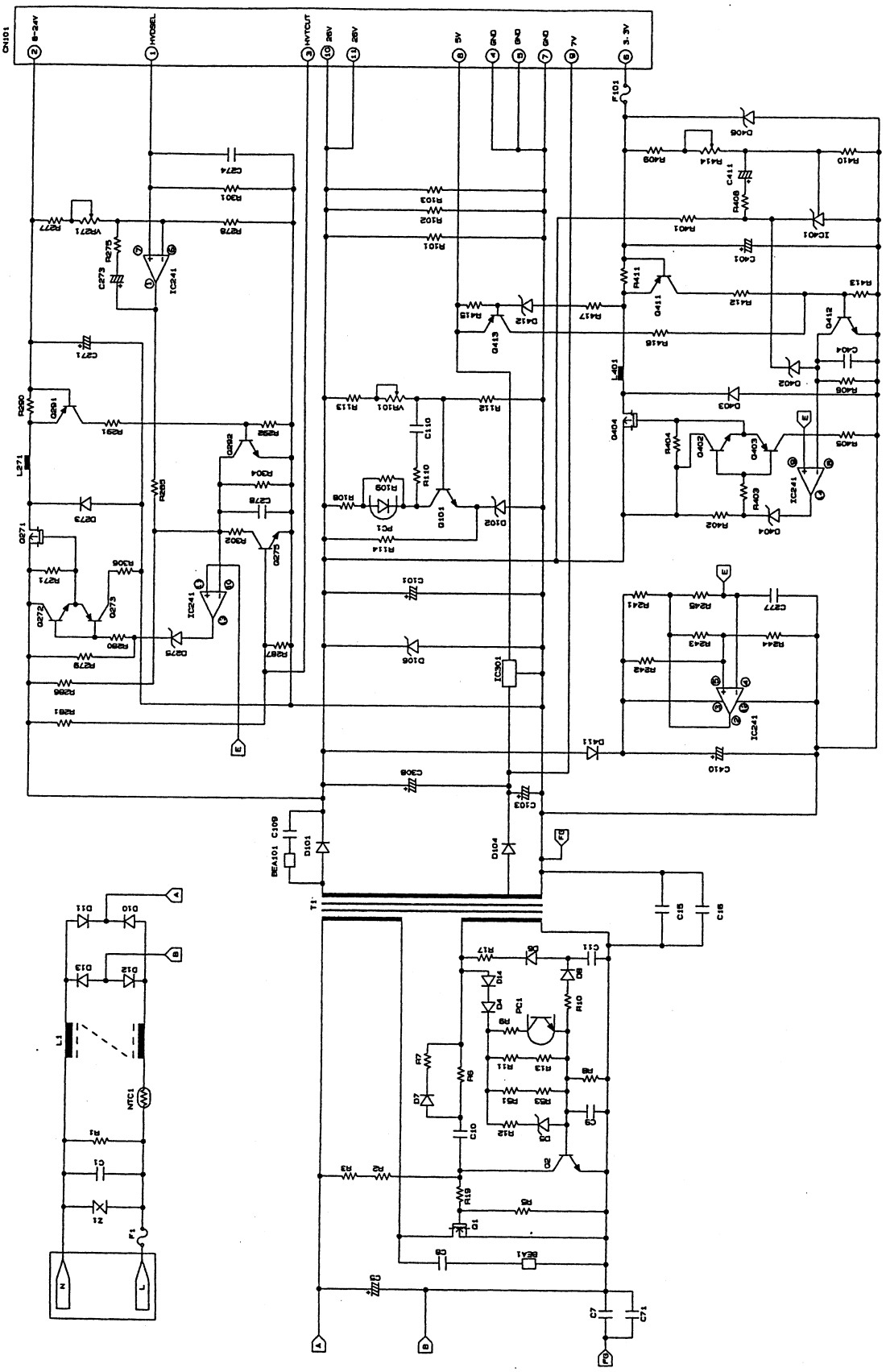
BY4FB PANEL KEY MATRIX REFERENCE TABLE 2

	KO0 P3-3P	KO1 P3-5P	KO2 P3-7P	KO3 P3-9P	KO4 P3-11P	KO5 P3-13P
KI0 P3-2P	22	14	13	4	15	3
KI1 P3-4P	6	17	16	7	18	5
KI2 P3-6P		20	19	9	21	8
KI3 P3-8P		24	25	27	23	26
KI4 P3-10P		30	28	37	29	36
KI5 P3-1P		11	10	2	12	1
KI6 P3-12P		34	33	32	35	31

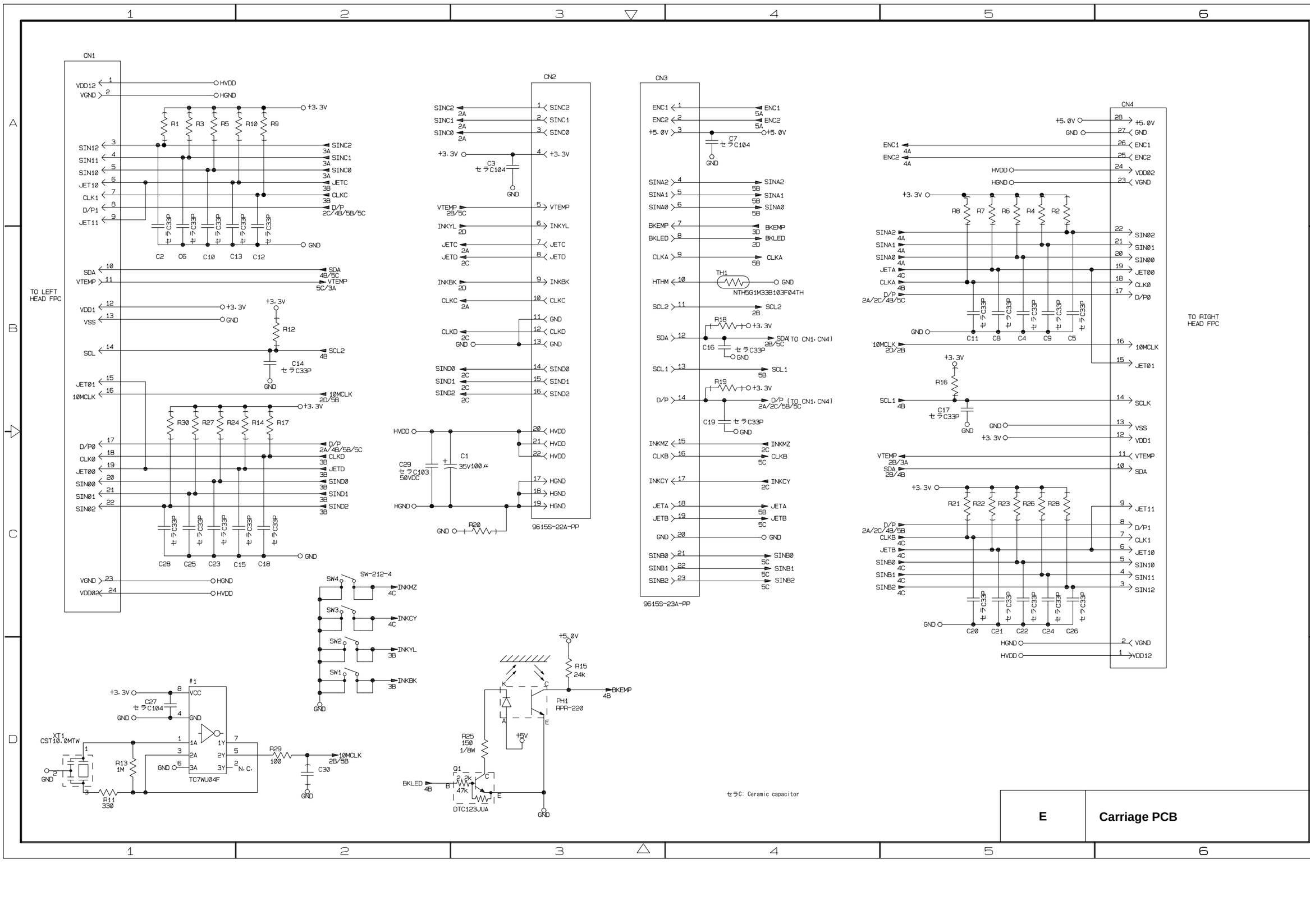
C	**Control Panel PCB 2/2**

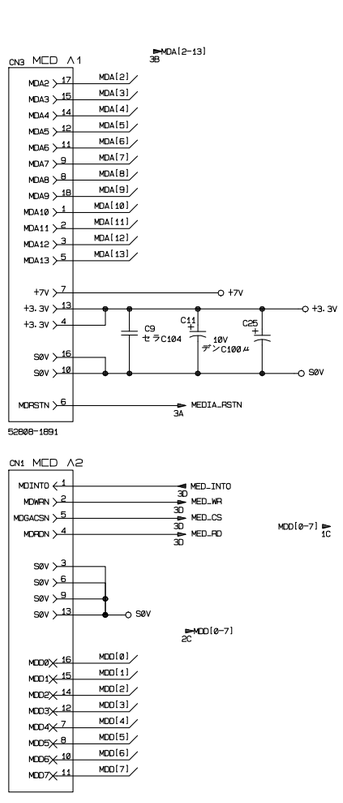


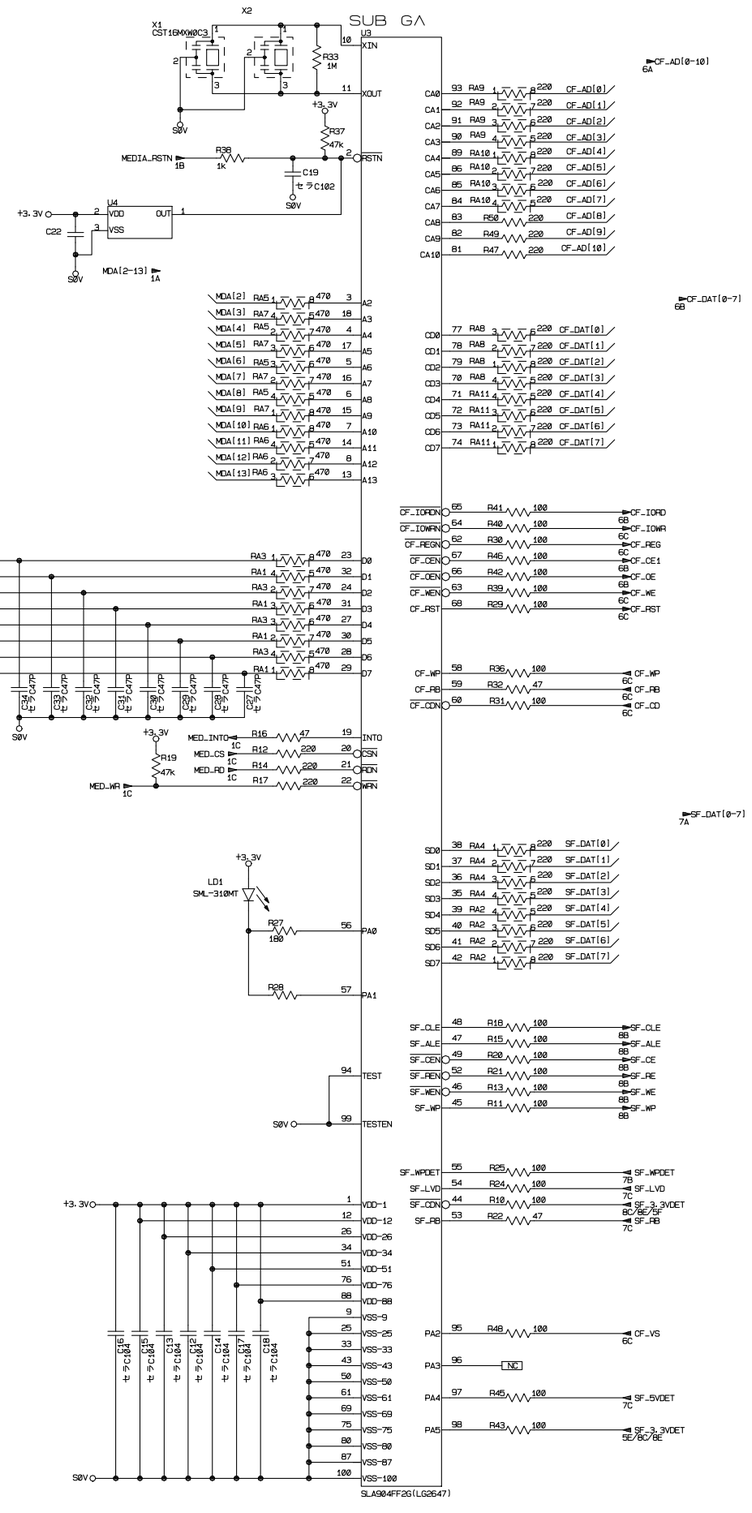
	D	Power supply PCB (100V series)

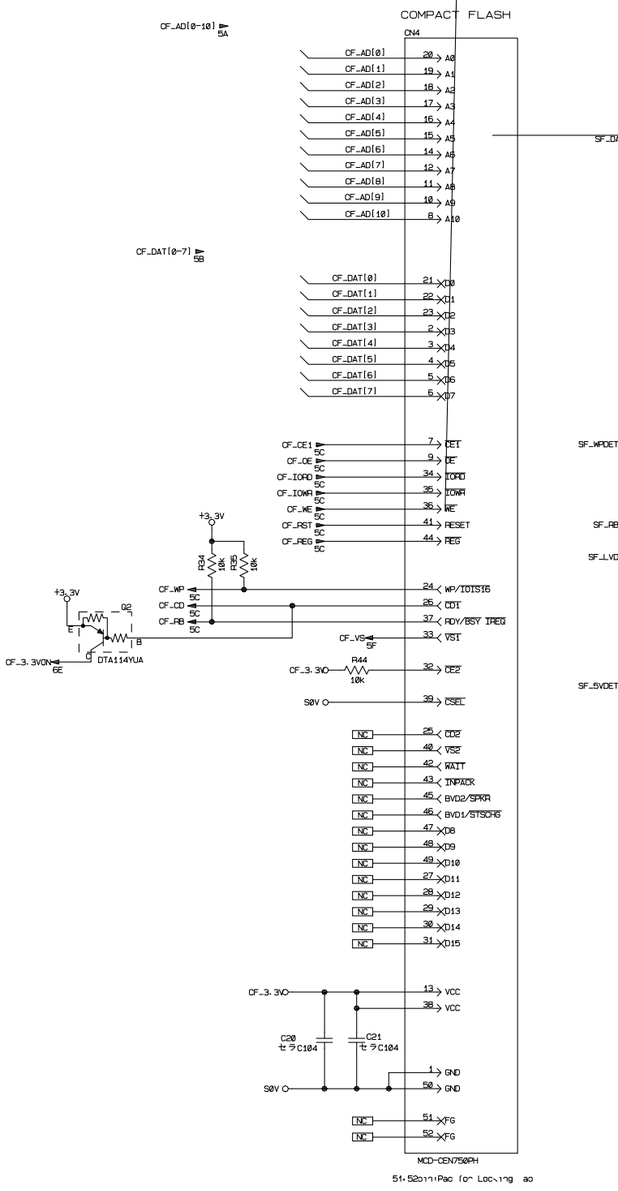


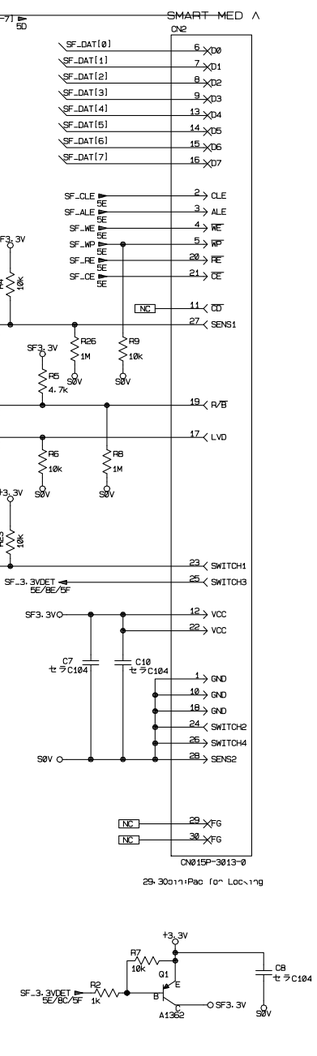
D	Power supply PCB (200V series)

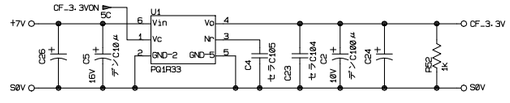

CN1
VDD12 1
VGND 2
HVDD
HGND
+3.3V
R1 R3 R5 R10 R9
SIN12 3
SIN11 4
SIN10 5
JET10 6
CLK1 7
D/P1 8
JET11 9
SINC2 3A
SINC1 3A
SINC0 3A
JETC 3B
CLKC 3B
D/P 2C/4B/5B/5C
C33P
C2 C6 C10 C13 C12
GND
SDA 10
VTEMP 11
SDA 4B/5C
VTEMP 5C/3A
TO LEFT HEAD FPC
VDD1 12
VSS 13
+3.3V
GND
R12
SCL 14
SCL2 4B
C14
JET01 15
10MCLK 16
10MCLK 2D/5B
R30 R27 R24 R14 R17
D/P0 17
CLK0 18
JET00 19
SIN00 20
SIN01 21
SIN02 22
D/P 2A/4B/5B/5C
CLKD 3B
JETD 3B
SIND0 3B
SIND1 3B
SIND2 3B
C28 C25 C23 C15 C18
VGND 23
VDD02 24
HGND
HVDD
CN2
SINC2 2A
SINC1 2A
SINC0 2A
+3.3V
C3
VTEMP 2B/5C
INKYL 2D
JETC 2A
JETD 2C
INKBK 2D
CLKC 2A
CLKD 2C
GND
SIND0 2C
SIND1 2C
SIND2 2C
HVDD
C29
C1
35V100μ
HGND
R20
9615S-22A-PP
CN3
ENC1 1
ENC2 2
+5.0V 3
ENC1 5A
ENC2 5A
+5.0V
C7
SINA2 4
SINA1 5
SINA0 6
SINA2 5B
SINA1 5B
SINA0 5B
BKEMP 7
BKLED 8
BKEMP 3D
BKLED 2D
CLKA 9
CLKA 5B
HTHM 10
TH1
NTH5G1M33B103F04TH
SCL2 11
SCL2 2B
R18
SDA 12
C16
SDA(TO CN1.CN4) 2B/5C
SCL1 13
SCL1 5B
R19
D/P 14
D/P (TO CN1.CN4) 2A/2C/5B/5C
C19
INKMZ 15
CLKB 16
INKMZ 2C
CLKB 5C
INKCY 17
INKCY 2C
JETA 18
JETB 19
JETA 5B
JETB 5C
SINB0 21
SINB1 22
SINB2 23
SINB0 5C
SINB1 5C
SINB2 5C
9615S-23A-PP
CN4
+5.0V 28
GND 27
ENC1 26
ENC2 25
HVDD 24
HGND 23
ENC1 4A
ENC2 4A
+3.3V
R8 R7 R6 R4 R2
SINA2 4A
SINA1 4A
SINA0 4A
JETA 4C
CLKA 4B
D/P 2A/2C/4B/5C
SIN02 22
SIN01 21
SIN00 20
JET00 19
CLK0 18
D/P0 17
C11 C8 C4 C9 C5
10MCLK 2D/2B
10MCLK 16
JET01 15
+3.3V
R16
SCL1 4B
SCLK 14
C17
GND
VSS 13
+3.3V
VDD1 12
VTEMP 2B/3A
SDA 2B/4B
VTEMP 11
SDA 10
+3.3V
R21 R22 R23 R25 R28
D/P 2A/2C/4B/5B
CLKB 4C
JETB 4C
SINB0 4C
SINB1 4C
SINB2 4C
JET11 9
D/P1 8
CLK1 7
JET10 6
SIN10 5
SIN11 4
SIN12 3
C20 C21 C22 C24 C26
HGND
HVDD
VGND 2
VDD12 1
TO RIGHT HEAD FPC
SW4 SW-212-4
SW3
SW2
SW1
INKMZ 4C
INKCY 4C
INKYL 3B
INKBK 3B
GND
+3.3V
#1
VCC 8
GND 4
C27
XT1
CST10.0MTW
1 2 3
GND
R13
1M
1A 1
2A 3
3A GND 6
1Y 7
2Y 5
3Y 2
N.C.
TC7WU04F
R11
330
R29
100
10MCLK 2B/5B
C30
GND
+5.0V
R15
24k
BKEMP 4B
PH1
APA-220
K C A E
+5V
R25
150
1/8W
Q1
2.2k
47k
BKLED 4B
B C E
DTC123JUA
GND
セラC: Ceramic capacitor
E
Carriage PCB


CN3 MED A1
MDA[2-13]
3B
MDA2
MDA3
MDA4
MDA5
MDA6
MDA7
MDA8
MDA9
MDA10
MDA11
MDA12
MDA13
+7V
+3.3V
S0V
MDRSTN
MEDIA_RSTN
3A
C9 セラC104
C11 10V デンC100μ
C25
52808-1891
CN1 MED A2
MDINT0
MDWRN
MDGACSN
MDRDN
MED_INT0
MED_WR
MED_CS
MED_RD
3D
MDD[0-7]
1C
2C
MDD0
MDD1
MDD2
MDD3
MDD4
MDD5
MDD6
MDD7
R1 0Ω
R51
FG1
FG2


SUB GA
X1 CST16MXW0C3
X2
U3
XIN
XOUT
R33 1M
R37 47k
MEDIA_RSTN
1B
R38 1K
RSTN
C19 セラC102
U4
VDD
VSS
OUT
C22
MDA[2-13]
1A
CA0
CA1
CA2
CA3
CA4
CA5
CA6
CA7
CA8
CA9
CA10
CF_AD[0-10]
6A
CD0
CD1
CD2
CD3
CD4
CD5
CD6
CD7
CF_DAT[0-7]
6B
CF_IORDN
CF_IOWRN
CF_REGN
CF_CEN
CF_OEN
CF_WEN
CF_RST
CF_WP
CF_RB
CF_CDN
MDD[0-7]
1C
2C
SD0
SD1
SD2
SD3
SD4
SD5
SD6
SD7
SF_DAT[0-7]
7A
LD1 SML-310MT
R27 180
R28
PA0
PA1
TEST
TESTEN
SF_CLE
SF_ALE
SF_CEN
SF_REN
SF_WEN
SF_WP
SF_WPDET
SF_LVD
SF_CDN
SF_RB
SF_3.3VDET
SF_5VDET
SF_VS
SLA904FF2G(LG2647)


COMPACT FLASH
CN4
CF_AD[0-10]
5A
CF_DAT[0-7]
5B
CF_CE1
CF_OE
CF_IORD
CF_IOWR
CF_WE
CF_RST
CF_REG
CF_WP
CF_CD
CF_RB
CF_VS
CF_3.3V
S0V
NC
CD1
CD2
VS1
IREQ
VS2
RESET
WAIT
WP/IOIS16
INPACK
RDY/BSY
SPKR
STSCHG
CSEL
VCC
GND
CF_3.3VON
6E
Q2 DTA114YUA
R24 10K
R25 10K
R44 10K
MCD-CEN750PH
51.52ｐｉｎPad for Locating ap


SF_DAT[0-7]
5D
SMART MED A
CN2
SF_CLE
SF_ALE
SF_WE
SF_WP
SF_RE
SF_CE
SF_WPDET
SF_RB
SF_LVD
SF_5VDET
SF_3.3VDET
5E/6C/7F
SF3.3V
R4 10K
R26 1M
R9 10K
R5 4.7K
R6 10K
R8 1M
R23 10K
C7 セラC104
C10 セラC104
SWITCH1
SWITCH3
SWITCH2
SWITCH4
SENS1
SENS2
CN015P-3013-0
29.30ｐｉｎPad for Locating
R7 10K
Q1
R2 1K
A1362
C8 セラC104


CF_3.3VON
5C
U1
Vin
Vc
GND-1
GND-2
PQ1R33
C25
C5 16V デンC10μ
C4 セラC105
C23 セラC104
C2 10V デンC100μ
C24
R30 1K
+7V
CF_3.3V
S0V

September 2000
SM8CA303①
Printed in Japan