



**FACSIMILE EQUIPMENT  
SERVICE MANUAL**

**MODEL: FAX750/FAX770/FAX870MC  
FAX-910/FAX-920/FAX-921/FAX-930/FAX-931  
MFC-925/MFC970MC**

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Specifications are subject to change without notice.

## **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.

<b>CHAPTER I.</b>	<b>GENERAL DESCRIPTION</b>
<b>CHAPTER II.</b>	<b>INSTALLATION</b>
<b>CHAPTER III.</b>	<b>THEORY OF OPERATION</b>
<b>CHAPTER IV.</b>	<b>DISASSEMBLY/REASSEMBLY AND LUBRICATION</b>
<b>CHAPTER V.</b>	<b>MAINTENANCE MODE</b>
<b>CHAPTER VI.</b>	<b>ERROR INDICATION AND TROUBLESHOOTING</b>
<b>Appendix 1.</b>	<b>EEPROM Customizing Codes</b>
<b>Appendix 2.</b>	<b>Circuit Diagrams</b>

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

# **CHAPTER I.**

## **GENERAL DESCRIPTION**

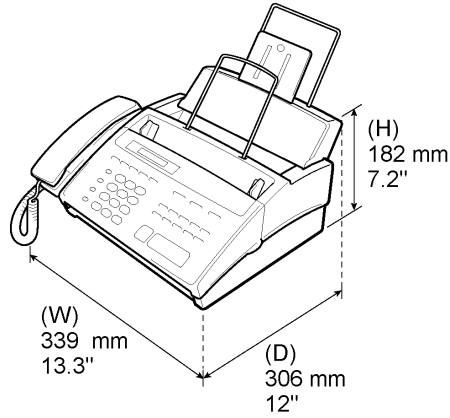
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# 1. EQUIPMENT OUTLINE

## 1.1 External Appearance and Weight

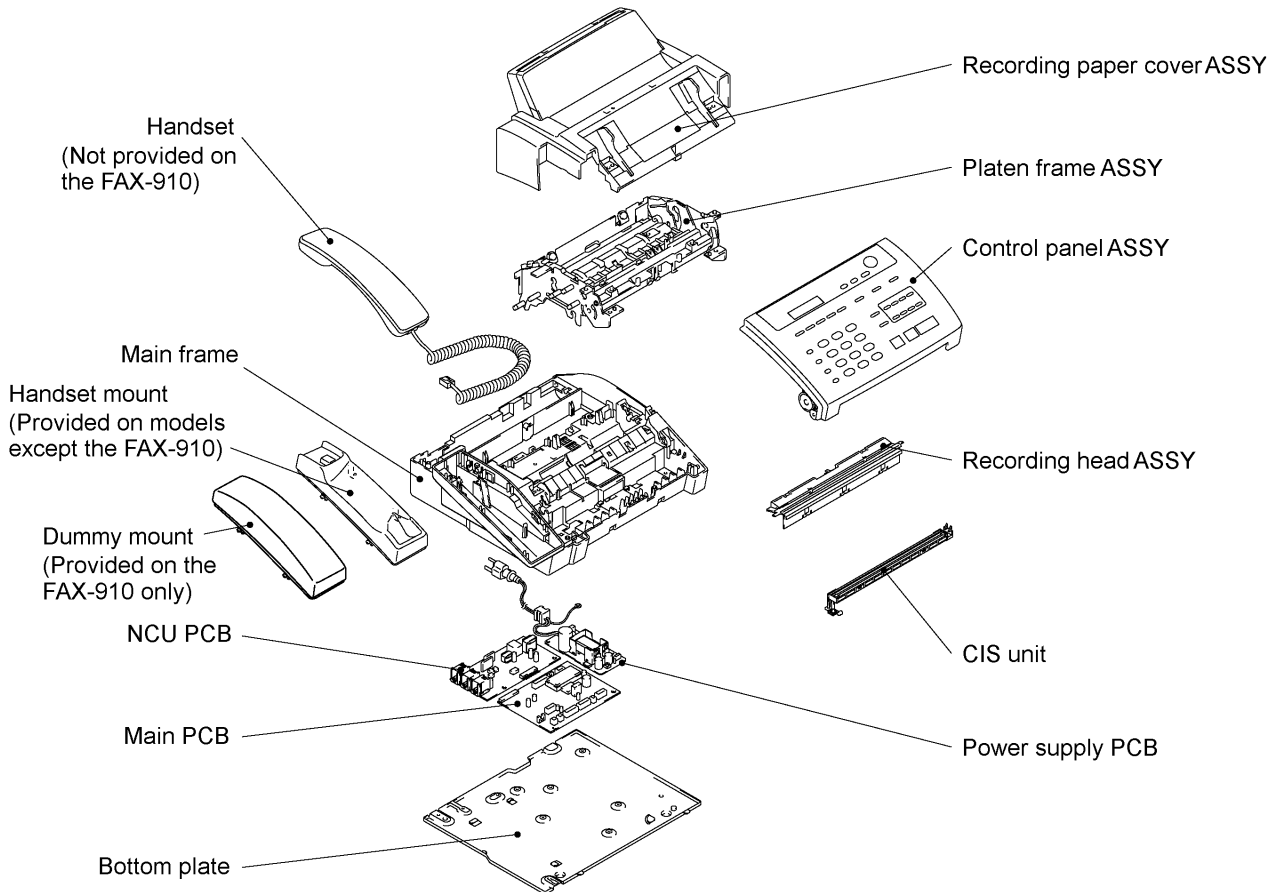
The figure below shows the equipment appearance and approximate dimensions.



Weight:	Machine proper (excluding a ribbon cartridge)	Approx. 4 kg (8.82 lbs.)
	In package	Approx. 6 kg (13.23 lbs.)

## 1.2 Components

The equipment consists of the following major components:



## 2. SPECIFICATIONS

Model Name	FAX750	FAX770
Engine	Thermal transfer	Thermal transfer
Color	Black (1395)	White (1397)
Transmission Speed (sec)	15	15
Modem Speed (bps)	9600	9600
Group Compatibility	G3	G3
Input/Output Width	8.5"/8.5"	8.5"/8.5"
ADF (pages)	10	10
Recording Paper Loadable	100 sheets	100 sheets
Ribbon Life (Letter-size print)	250 pages (77 m)	250 pages (77 m)
Starter Ribbon Life (Letter-size print)	100 pages (30 m)	100 pages (30 m)
LCD Size	16 x 1	16 x 1
On-Screen Programming	Yes	Yes
Super Fine	Yes	Yes
Smoothing	Yes	Yes
Gray Scale (levels)	64 by Dithered	64 by Dithered
One Touch	8	8
Speed Dial	40	40
Telephone Index	Yes	Yes
Speaker Phone	Monitor	Monitor
Handset	Yes	Yes
FAX/TEL Switch	Yes	Yes
Distinctive Ring Detection*	Yes	Yes
Caller ID*	Yes	Yes
Call Waiting Caller ID*	Yes	Yes
TAD Interface	Yes	Yes
Enhanced Remote Activation	Yes	Yes
Automatic Redial	Yes	Yes
Next-FAX Reservation	Yes	Yes
Multi-Resolution Transmission	Yes	Yes
Polling Type	Std/Seq	Std/Seq
Delayed Transmission	1-timer	1-timer
Call Reservation	Yes	Yes
Electronic Coverpage	Yes - Super	Yes - Super
Call Back Message	Yes	Yes
Activity Report	Yes	Yes
TX Verification Report	Yes	Yes
Memory Capacity (pages)	512 KB (20 pages)	512 KB (20 pages)
ECM	Yes	Yes
Broadcasting	Yes	Yes
Quick-Scan	Yes	Yes
Out-of-Paper Reception	Yes	Yes
Multi-Copying w/ Sorting	Yes	Yes
Enlargement/Reduction Ratio	Yes (50-150%)	Yes (50-150%)
Multi-Transmission	No	No
Confidential Mailbox	No	No
Auto Reduction	Yes	Yes
Message Center	No	No
TAD Recording Time	No	No
Fax Forwarding/Paging	No	Yes
Fax Retrieval	No	Yes
Fax-/Voice-on-demand	No	No
Fax & Voice Mailbox	No	No
Help List	Yes	Yes
Missing Link/Multifunction Link	Ready	Ready
Optional Memory	No	No
Voice Alarm	No	No
Others		

\* Check your local telephone company for availability of this service.

<b>Model Name</b>	<b>FAX870MC</b>	<b>MFC970MC</b>
Engine	Thermal transfer	Thermal transfer
Color	White (1397)	White (1138)
Transmission Speed (sec)	9	9
Modem Speed (bps)	14,400	14,400
Group Compatibility	G3	G3
Input/Output Width	8.5"/8.5"	8.5"/8.5"
ADF (pages)	10	10
Recording Paper Loadable	100 sheets	100 sheets
Ribbon Life (Letter-size print)	250 pages (77 m)	250 pages (77 m)
Starter Ribbon Life (Letter-size print)	100 pages (30 m)	100 pages (30 m)
LCD Size	16 x 1	16 x 1
On-Screen Programming	Yes	Yes
Super Fine	Yes	Yes
Smoothing	Yes	Yes
Gray Scale (levels)	64 by Dithered	64 by Dithered
One Touch	8	8
Speed Dial	40	40
Telephone Index	Yes	Yes
Speaker Phone	Full duplex (digital)	Full duplex (digital)
Handset	Yes	Yes
FAX/TEL Switch	Yes	Yes
Distinctive Ring Detection*	Yes	Yes
Caller ID*	Yes	Yes
Call Waiting Caller ID*	Yes	Yes
TAD Interface	Yes	Yes
Enhanced Remote Activation	Yes	Yes
Automatic Redial	Yes	Yes
Next-FAX Reservation	Yes	Yes
Multi-Resolution Transmission	Yes	Yes
Polling Type	Std/Seq	Std/Seq
Delayed Transmission	1-timer	1-timer
Call Reservation	Yes	Yes
Electronic Coverpage	Yes - Super	Yes - Super
Call Back Message	Yes	Yes
Activity Report	Yes	Yes
TX Verification Report	Yes	Yes
Memory Capacity (pages)	512 KB (20 pages)	512 KB (20 pages)
ECM	Yes	Yes
Broadcasting	Yes	Yes
Quick-Scan	Yes	Yes
Out-of-Paper Reception	Yes	Yes
Multi-Copying w/ Sorting	Yes	Yes
Enlargement/Reduction Ratio	Yes (50-150%)	Yes (50-150%)
Multi-Transmission	No	No
Confidential Mailbox	No	No
Auto Reduction	Yes	Yes
Message Center	Yes	Yes
TAD Recording Time	15 minutes	15 minutes
Fax Forwarding/Paging	Yes	Yes
Fax Retrieval	Yes	Yes
Fax-/Voice-on-demand	Voice-on-demand	Voice-on-demand
Fax & Voice Mailbox	Yes	Yes
Help List	Yes	Yes
Missing Link/Multifunction Link	Ready	Included
Optional Memory	No	No
Voice Alarm	No	No
Others		

\* Check your local telephone company for availability of this service.



<b>Model Name</b>	<b>FAX-910</b>	<b>FAX-920/921</b>
Engine	Thermal Transfer	Thermal Transfer
Color	Black(1395)	Black(1395)/White(1397/1138)
Transmission Speed (sec)	15	15
Modem Speed (bps)	9600	9600
Group Compatibility	G3	G3
Input/Output Width	8.5"/8.5"	8.5"/8.5"
ADF (pages)	10	10
Recording Paper Loadable	100 sheets	100 sheets
Ribbon Life (A4-size print)	235 pages	235 pages
Starter Ribbon Life (A4-size print)	90 pages (30 m)	90 pages (30 m)
LCD Size	16 X 1	16 X 1
On-Screen Programming	Yes	Yes
Super Fine	Yes	Yes
Smoothing	Yes	Yes
Gray Scale (levels)	64 by Dithered	64 by Dithered
One Touch	16 w/SHIFT KEY	16 w/SHIFT KEY
Speed Dial	32	32
Telephone Index	Yes	Yes
Speaker Phone	Monitor	Monitor
Handset	No	Yes
FAX/TEL Switch	Yes	Yes
Caller ID	Yes HOL/SWE/UK/FRA/NOR	Yes HOL/SWE/UK/FRA/NOR
Call Waiting Caller ID	No	No
Distinctive Ringing	No	No
TAD Interface	Yes	Yes
Enhanced Remote Activation	Yes	Yes
Automatic Redial	Yes	Yes
Next-FAX Reservation	Yes	Yes
Multi-Resolution Transmission	Yes	Yes
Polling Type	Sim/Sec/Del/Seq	Sim/Sec/Del/Seq
Delayed Transmission	3-timer	3-timer
Call Reservation	Yes	Yes
Electronic Coverpage	Yes - Super	Yes - Super
Call Back Message	Yes	Yes
Journal Report	Yes	Yes
TX Verification Report	Yes	Yes
Memory Capacity (pages)	512KB (20 pages)	512KB (20 pages)
ECM	Yes	Yes
Broadcasting	Yes	Yes
Quick-Scan	Yes	Yes
Out-of-Paper Reception	Yes	Yes
Multi-Copying w/Sorting	Yes	Yes
Enlargement/Reduction Ratio	Yes (50-150%)	Yes (50-150%)
Multi-Transmission	Yes	Yes
Confidential Mailbox	No	No
Auto Reduction	Yes	Yes
Message Manager	No	No
TAD Recording Time	No	No
Fax Forwarding/Paging	Yes - Only Fax forwarding	Yes - Only Fax forwarding
Fax Retrieval	Yes	Yes
Fax-/Voice-on-demand	No	No
Fax & Voice Mailbox	No	No
Help List	Yes	Yes
MFL PRO for Fax	Ready	Ready
Optional Memory	No	No
Memo Manager	No	No
Mute Key	No	Yes-music on hold; Green Sleeves
Backup for Clock	9 hours	9 hours
Output Tray	Option (CT70)	Option (CT70)
Backup for Page Memory	6 hours	6 hours

<b>Model Name</b>	<b>FAX-930/931</b>	<b>MFC-925</b>
Engine	Thermal Transfer	Thermal Transfer
Color	Black(1395)/White(1397/1138)	White(1138)
Transmission Speed (sec)	9	15
Modem Speed (bps)	14,400	9600
Group Compatibility	G3	G3
Input/Output Width	8.5"/8.5"	8.5"/8.5"
ADF (pages)	10	10
Recording Paper Loadable	100 sheets	100 sheets
Ribbon Life (A4-size print)	235 pages	235 pages
Starter Ribbon Life (A4-size print)	90 pages (30 m)	90 pages (30 m)
LCD Size	16X1	16X1
On-Screen Programming	Yes	Yes
Super Fine	Yes	Yes
Smoothing	Yes	Yes
Gray Scale (levels)	64 by Dithered	64 by Dithered
One Touch	16 w/SHIFT KEY	16 w/SHIFT KEY
Speed Dial	32	32
Telephone Index	Yes	Yes
Speaker Phone	Full duplex (digital)	Monitor
Handset	Yes	Yes
FAX/TEL Switch	Yes	Yes
Caller ID	Yes HOL/SWE/UK/FRA/NOR	Yes HOL/SWE/UK/FRA/NOR
Call Waiting Caller ID	No	No
Distinctive Ringing	No	No
TAD Interface	Yes	Yes
Enhanced Remote Activation	Yes	Yes
Automatic Redial	Yes	Yes
Next-FAX Reservation	Yes	Yes
Multi-Resolution Transmission	Yes	Yes
Polling Type	Sim/Sec/Del/Seq	Sim/Sec/Del/Seq
Delayed Transmission	3-timer	3-timer
Call Reservation	Yes	Yes
Electronic Coverpage	Yes - Super	Yes - Super
Call Back Message	Yes	Yes
Journal Report	Yes	Yes
TX Verification Report	Yes	Yes
Memory Capacity (pages)	512KB (20 pages)	512KB (20 pages)
ECM	Yes	Yes
Broadcasting	Yes	Yes
Quick-Scan	Yes	Yes
Out-of-Paper Reception	Yes	Yes
Multi-Copying w/Sorting	Yes	Yes
Enlargement/Reduction Ratio	Yes (50-150%)	Yes (50-150%)
Multi-Transmission	Yes	Yes
Confidential Mailbox	No	No
Auto Reduction	Yes	Yes
Message Manager	Yes	No
TAD Recording Time	15 minutes	No
Fax Forwarding/Paging	Yes - both	Yes - Only Fax forwarding
Fax Retrieval	Yes	Yes
Fax-/Voice-on-demand	Voice-on-demand	No
Fax & Voice Mailbox	Yes	No
Help List	Yes	Yes
MFL PRO for Fax	Ready	Included
Optional Memory	No	No
Memo Manager	No	No
Mute Key	Yes-music on hold; Green Sleeves	Yes-music on hold; Green Sleeves
Backup for Clock	15 hours	9 hours
Output Tray	Option (CT70)	Option (CT70)
Backup for Page Memory	6 hours	6 hours

# **CHAPTER II.**

## **INSTALLATION**

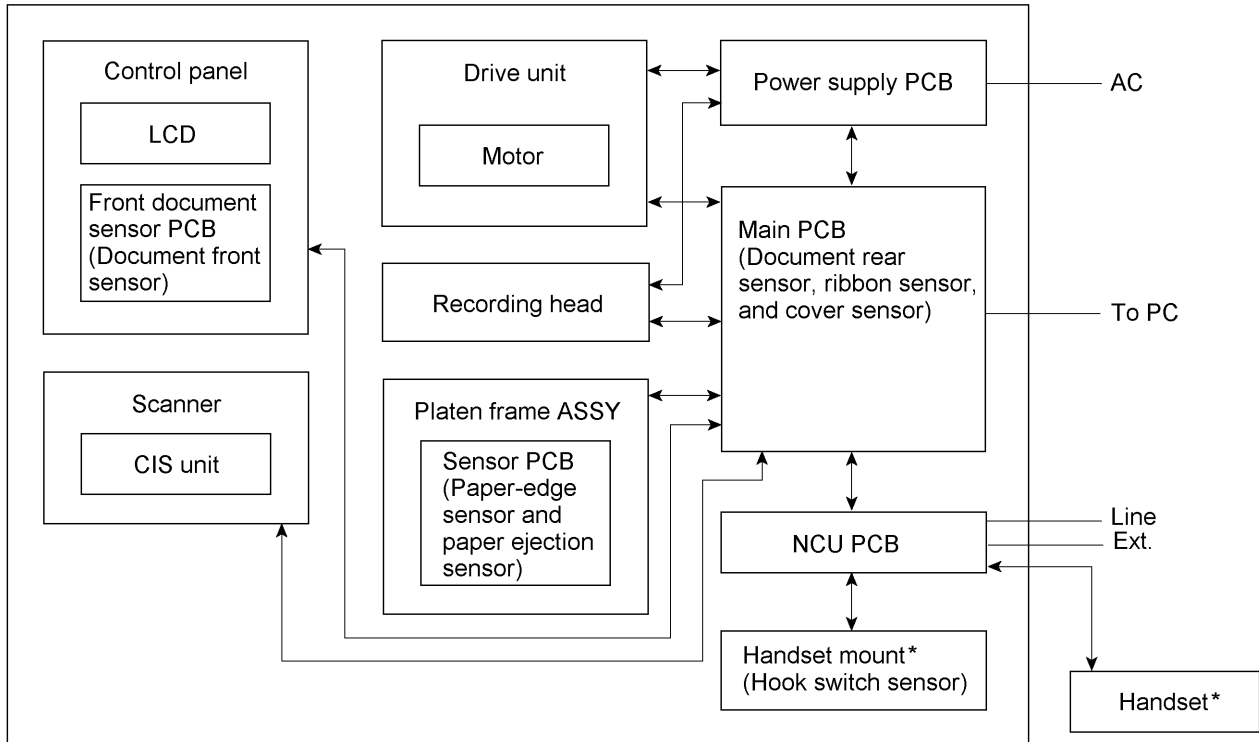
# **CHAPTER III.**

## **THEORY OF OPERATION**

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# 1. OVERVIEW



\*Not provided on the FAX-910.



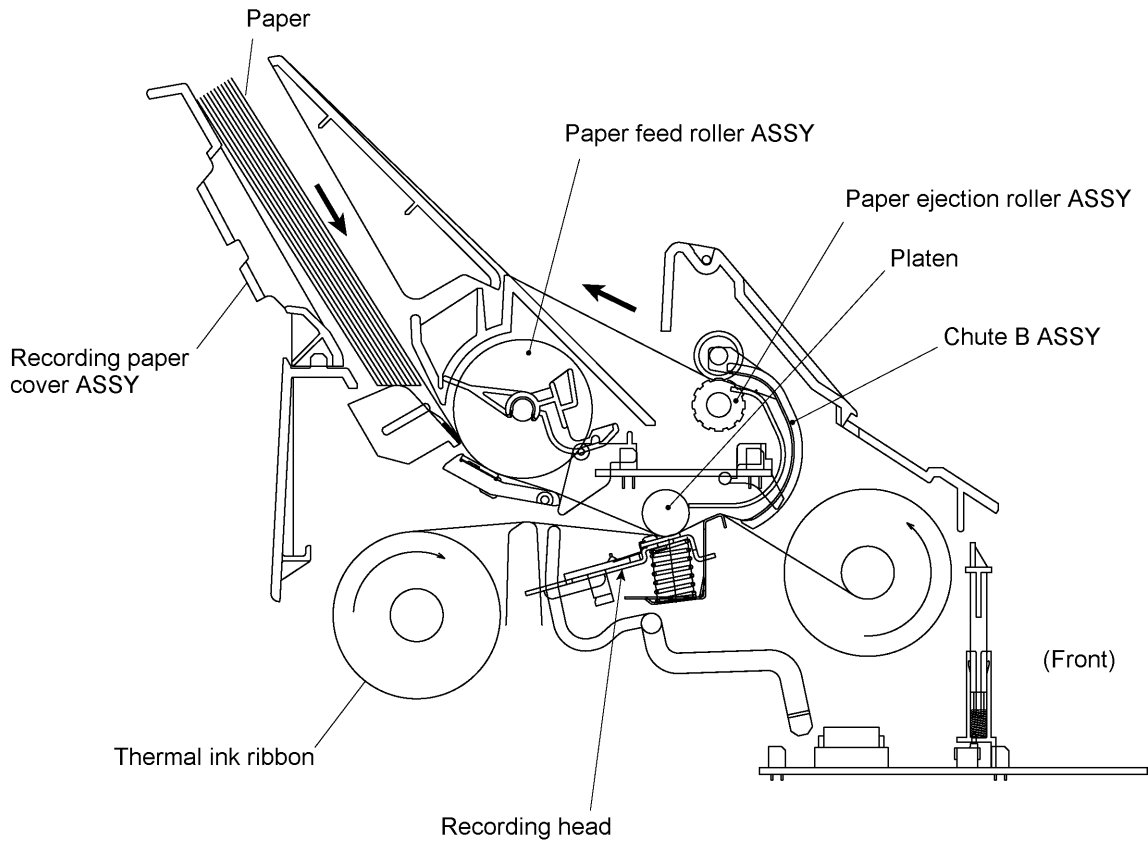
### **2.1.2 Scanner**

The scanner uses a contact image sensor (CIS) unit which consists of an LED array illuminating documents, a self-focus lens array collecting the reflected light, a CIS PCB carrying out photoelectric conversion to output picture element data, and a cover glass on which a document advances. When the document passes between the document pressure bar and the cover glass, it is scanned.



## 2.2 Receiving Mechanism (Feeding paper and printing data)

The receiving mechanism consists of the recording paper cover ASSY, paper feed roller ASSY, platen, thermal recording head, paper ejection roller, and sensors. (For details about the sensors, refer to Section 2.4.)



### STEP 1: In the paper feeding mode

If the equipment receives data, the control electronics activates the solenoid and rotates the motor counterclockwise to drive the paper feed roller (and paper ejection roller). This pulls in a sheet of paper and feeds it until its leading edge reaches the point just before the printing position.

### STEP 2: In the recording (platen drive & ribbon take-up) mode

The control electronics deactivates the solenoid and rotates the motor clockwise to drive the platen gear and the ribbon take-up gear as well as the paper ejection roller. This feeds the paper up to the printing position where the thermal recording head prints, as well as feeding the thermal ink ribbon.

### STEP 3: In the paper ejection mode

The same operation as for STEP 1 takes place so as to eject the paper.

## 2.3 Power Transmission Mechanism

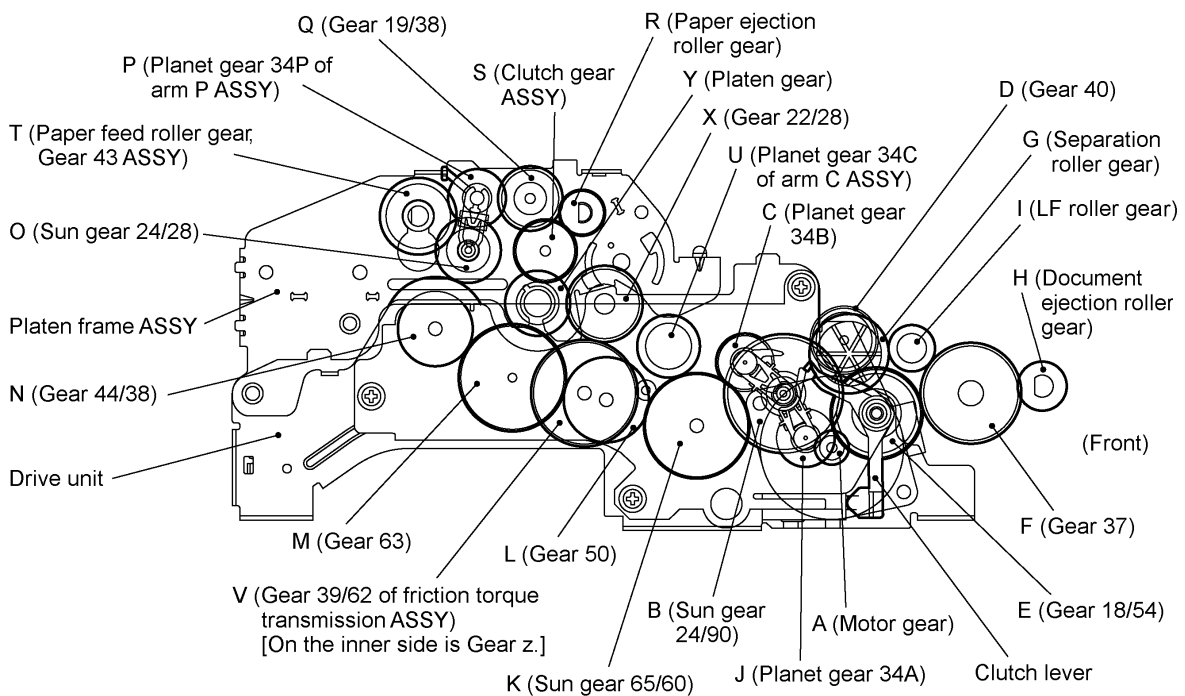
The equipment has a single drive motor whose power transmission route can be switched by the planetary gear systems and the solenoid. This switching allows the equipment to function in four operation modes (scanning, paper feeding/ejecting, recording, and copying modes). For the details about the planetary gear systems, refer to Subsection 2.3.2.

### 2.3.1 Structure of the gear train

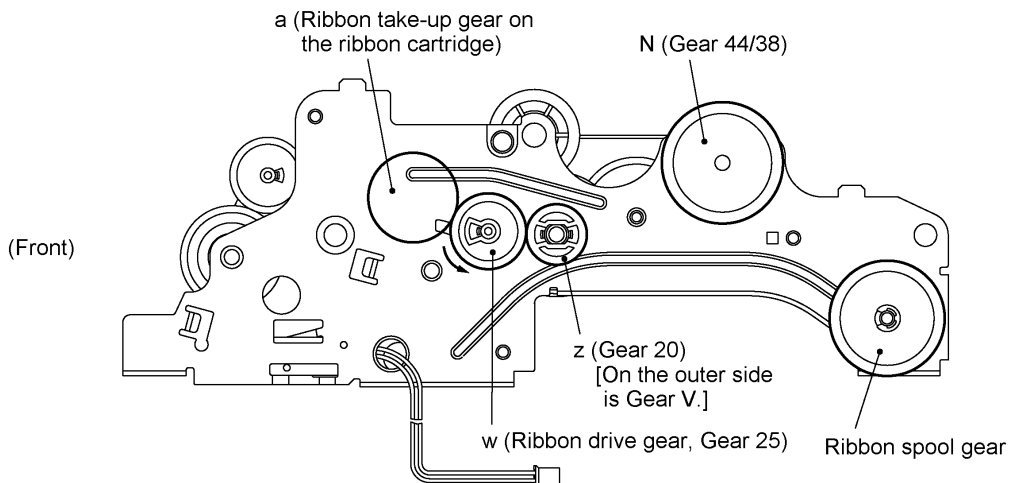
All of the motor and gears are located at the left side of the equipment. As illustrated in the figure below (On the outer side of the drive unit), the rotational torque of the motor on the drive unit is transmitted via the gears on the drive unit to the gears on the main frame, to those on the control panel ASSY, and to those on the platen frame.

If gear 39/62 of the friction torque transmission ASSY ("V" in the figure below) rotates, gear 20 ("z") on the inner side of the drive unit also rotates. The rotational torque is further transmitted to the ribbon drive gear ("w") which drives the ribbon take-up gear ("a") on the ribbon cartridge, as shown in the figure below (On the inner side of the drive unit).

On the outer side of the drive unit and on the left sides of the platen frame, main frame and control panel ASSY



On the inner side of the drive unit



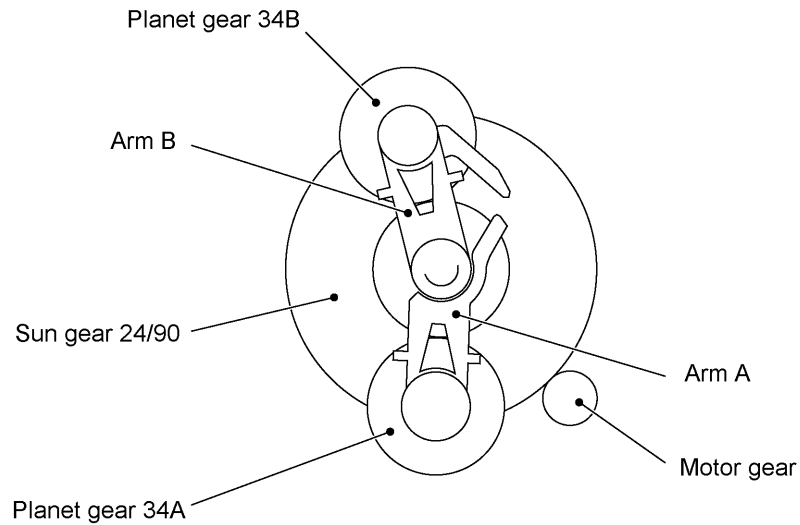
**Gear Train**

### 2.3.2 Description of planetary gear system

The equipment uses the following three planetary gear systems:

- Sun gear 24/90 ("B" in the figure given on the previous page) and its planet gears
- Sun gear 65/60 ("K") and its planet gear
- Sun gear 24/28 ("O") and its planet gear

This section describes the planetary gear system of sun gear 24/90 ("B"). It consists of sun gear 24/90, two planet gears 34, arm A, and arm B as shown below.



**Planetary Gear System**

If the motor rotates, sun gear 24/90 rotates so that the rotational torque is transmitted to the engagement between the sun gear and planet gears 34. Since the arms and planet gears are so designed that the moment of the arms is less than that of the planet gears, the arms turn around the center shaft in the same direction as sun gear 24/90.

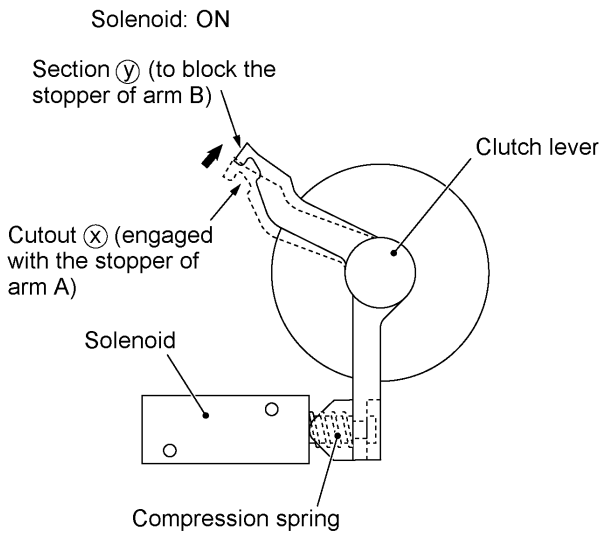
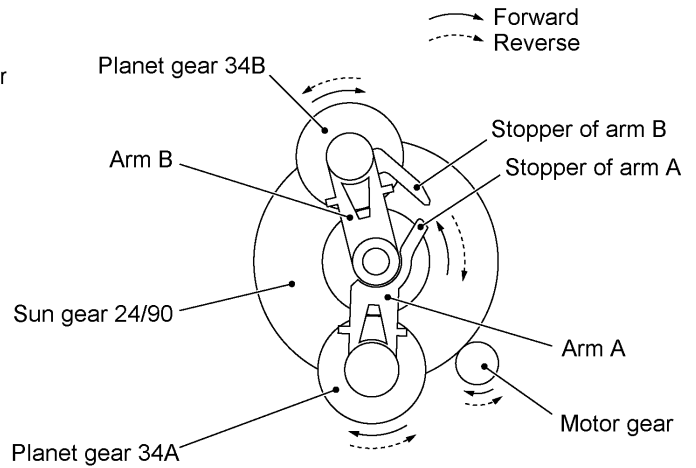
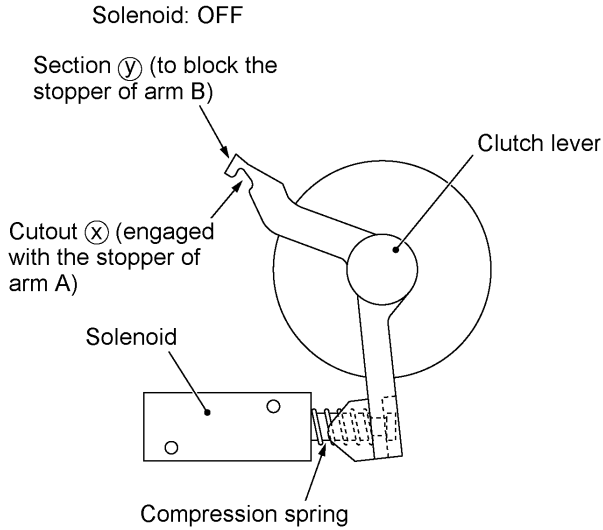
If the planet gear(s) becomes engaged with any other gear so that the arm cannot turn furthermore, the rotational torque of sun gear 24/90 is transmitted to that planet gear. Accordingly, the planet gear starts rotation in the opposite direction of sun gear 24/90.

### 2.3.3 Power transmission for four operation modes

Depending upon the solenoid ON/OFF state and the motor rotation direction, the planetary gear train switches the power transmission route for the four operation modes.

#### Solenoid ON/OFF state

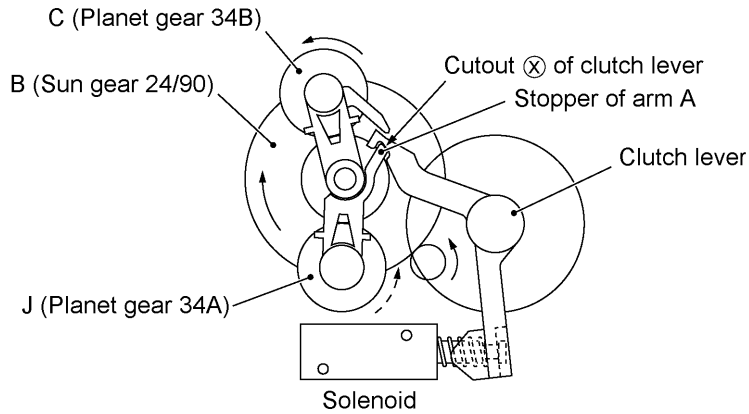
#### Motor rotation direction



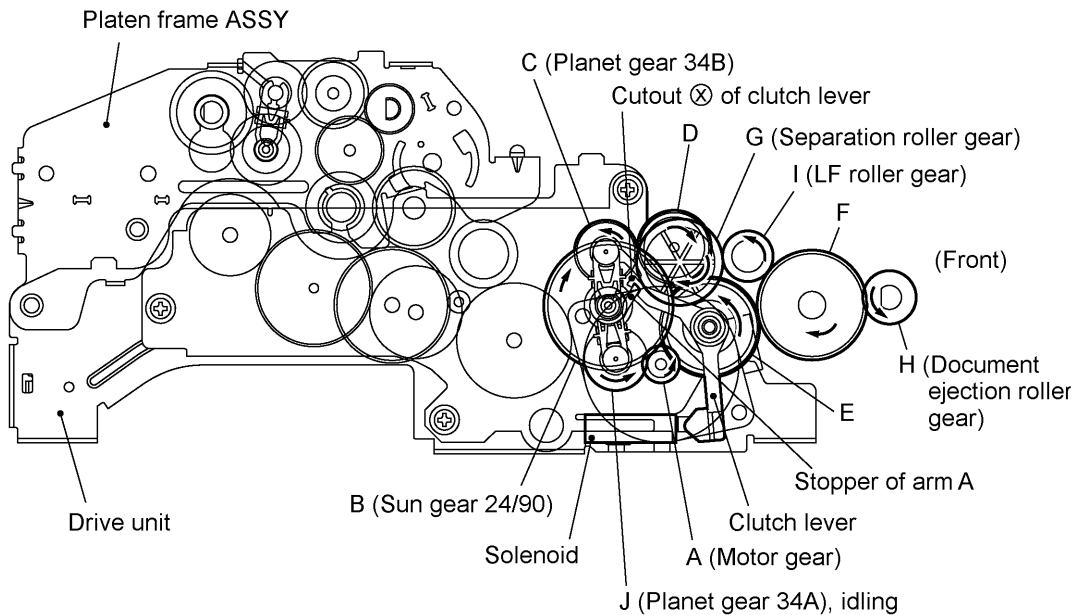
**[ 1 ] Scanning mode (Solenoid: OFF, Motor rotation: Reverse)**

In the scanning mode, the control electronics deactivates the solenoid. When the motor rotates in the reverse direction, the clutch lever turns counterclockwise with the compression spring so that its cutout (⊗) becomes engaged with the stopper of arm A. Once arm A is locked, planet gear 34A ("J") will not be engaged with any other gear but simply idle.

The motor's rotational torque turns sun gear 24/90 ("B") clockwise so that planet gear 34B ("C") transmits the torque via gear "D" to gear "E" which drives the separation roller gear ("G") and gear "F." As gear "F" rotates, the LF roller gear ("I") and document ejection roller gear ("H") also rotate.



**Arm A Locked by Cutout (⊗) of Clutch Lever**



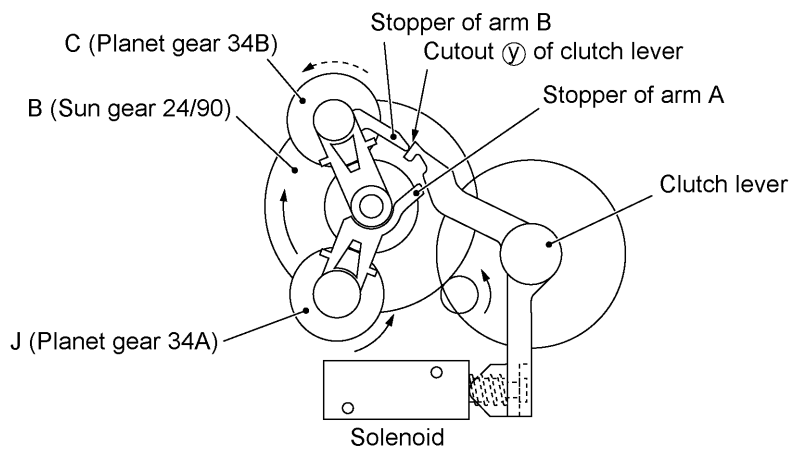
**Active Gears**

**[ 2 ] Paper feeding/ejecting mode (Solenoid: ON, Motor rotation: Reverse)**

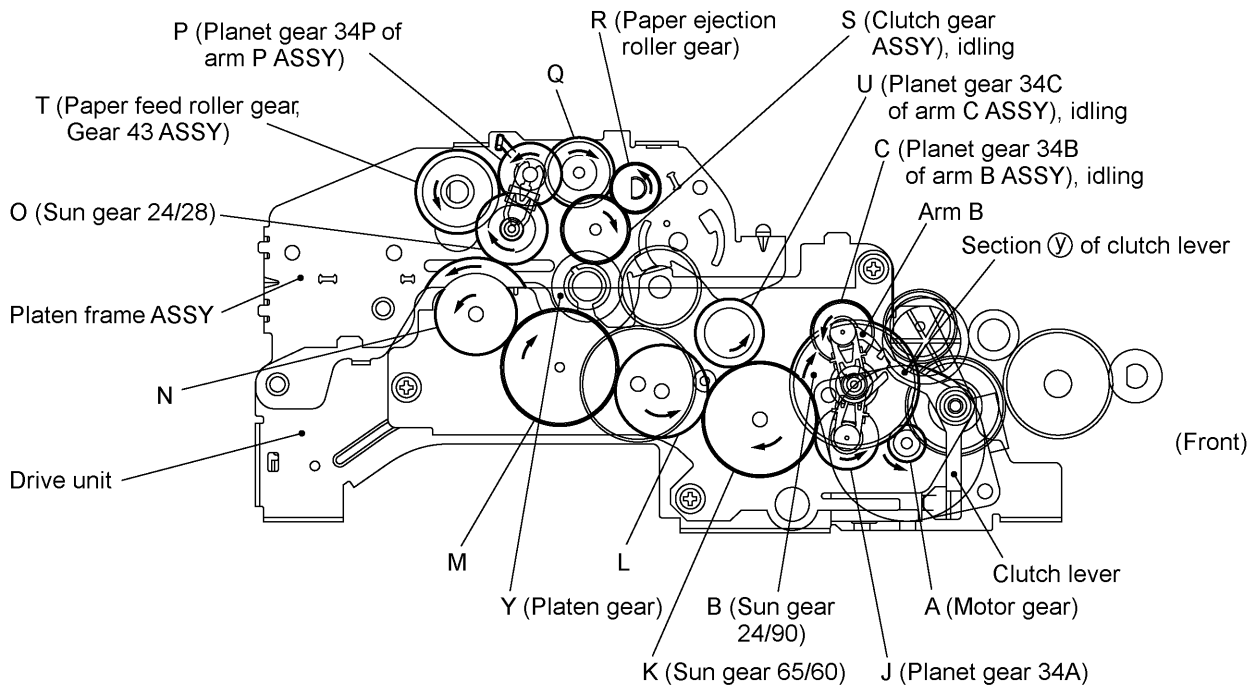
In the paper feeding/ejecting mode, the control electronics activates the solenoid to release the stopper of arm A. When the motor rotates in the reverse direction, sun gear 24/90 ("B") rotates clockwise so that planet gear 34A ("J") transmits the torque via sun gear 65/60 ("K") and other gears to the paper feed roller gear ("T") and paper ejection roller gear ("R").

Since the stopper of arm B is blocked by section ⑤ of the clutch lever, the planet gear 34B ("C") is merely idle without engaging with any other gear.

The rotational torque of the paper ejection roller gear ("R") is transmitted to the inner gear of the clutch gear ASSY ("S"). However, the outer gear does not rotate since it is engaged with the platen gear ("Y") that undergoes the heavy frictional torque of the platen. (This clutch gear ASSY works as a one-way clutch. If the outer gear is driven by the platen gear ("Y"), the inner gear also rotates. Refer to [ 3 ] Recording mode.)



**Arm B Blocked by Section ⑤ of Clutch Lever**



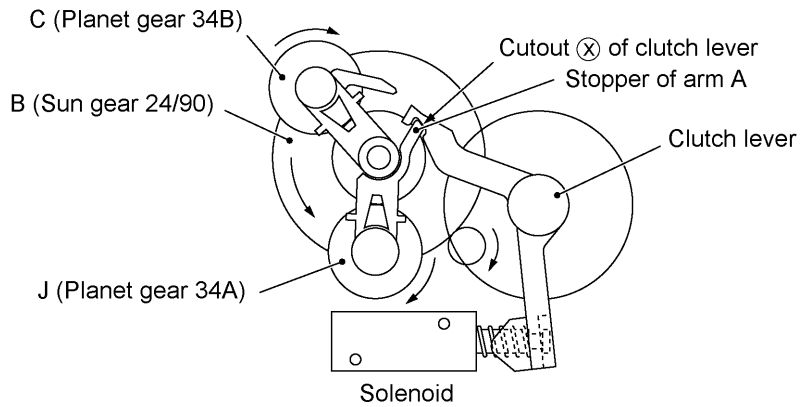
**Active Gears**

**[ 3 ] Recording mode (Solenoid: OFF, Motor rotation: Forward)**

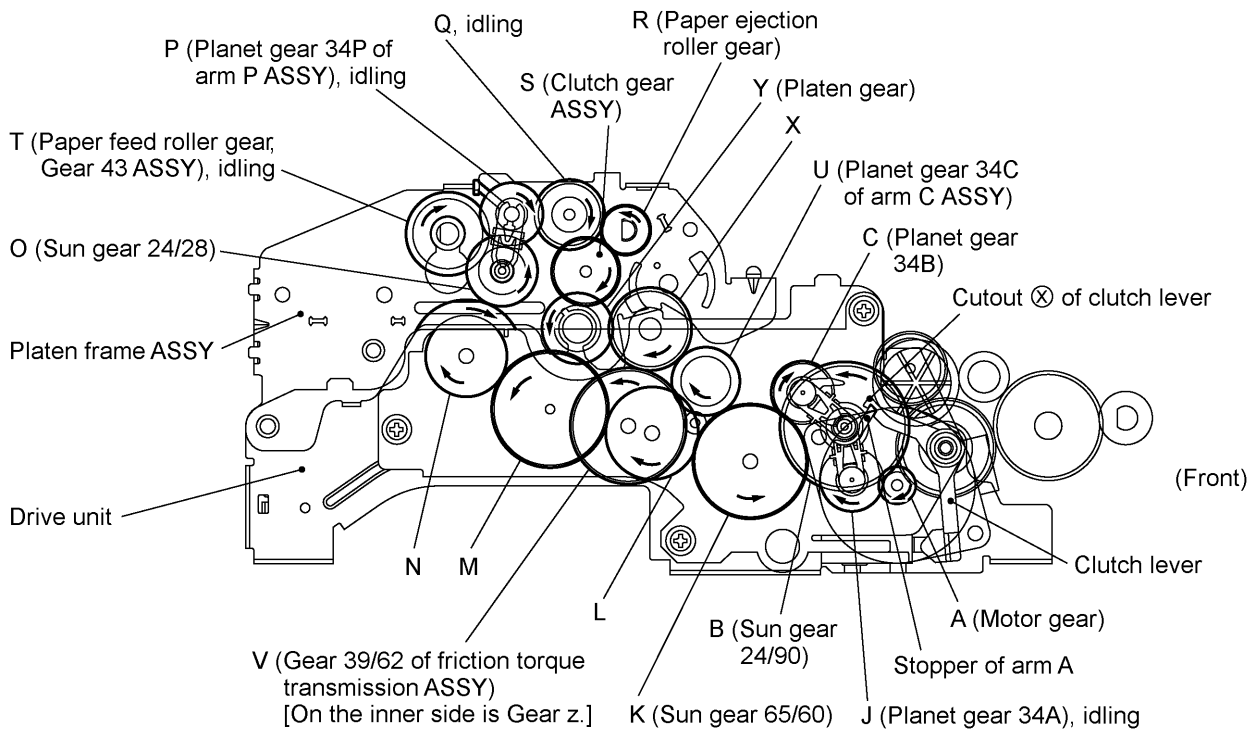
In the recording mode, the control electronics deactivates the solenoid. When the motor rotates in the forward direction, the clutch lever turns counterclockwise with the compression spring so that its cutout (⊗) becomes engaged with the stopper of arm A. Once arm A is locked, planet gear 34A ("J") will not be engaged with any other gear but simply idle.

The motor's rotational torque turns sun gear 24/90 ("B") counterclockwise so that planet gear 34B ("C") transmits the torque via sun gear 65/60 ("K") and other gears to the platen gear ("Y") and the paper ejection roller gear ("R").

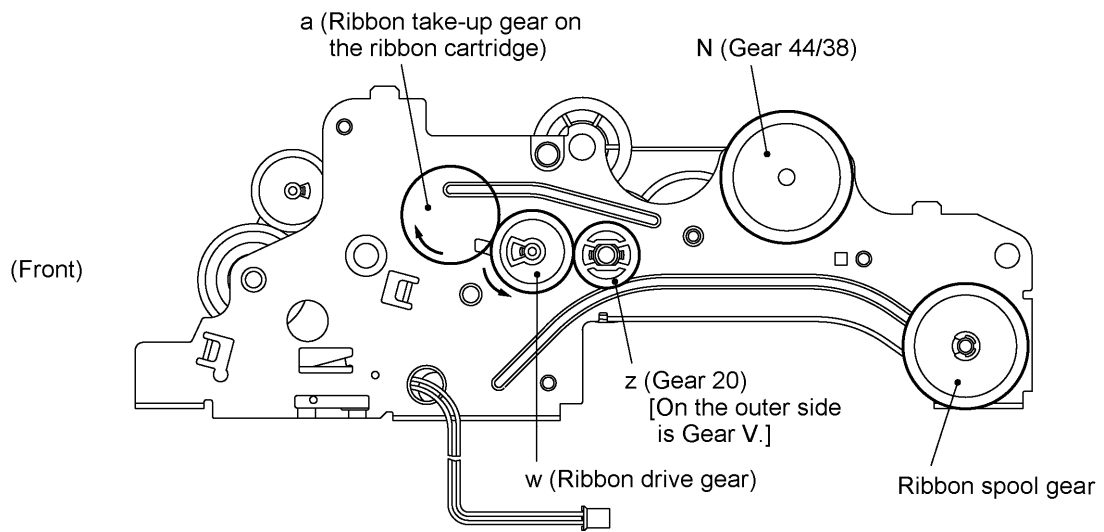
If gear 39/62 ("V") of the friction torque transmission ASSY rotates, gear 20 ("z") on the inner side of the drive unit also rotates so as to drive the ribbon drive gear ("w") that rotates the ribbon take-up gear ("a") on the ribbon cartridge, as shown on the next page.



**Arm A Locked by Cutout (⊗) of Clutch Lever**



**Active Gears on the Outer Side of the Drive Unit and Left Side of the Platen Frame**



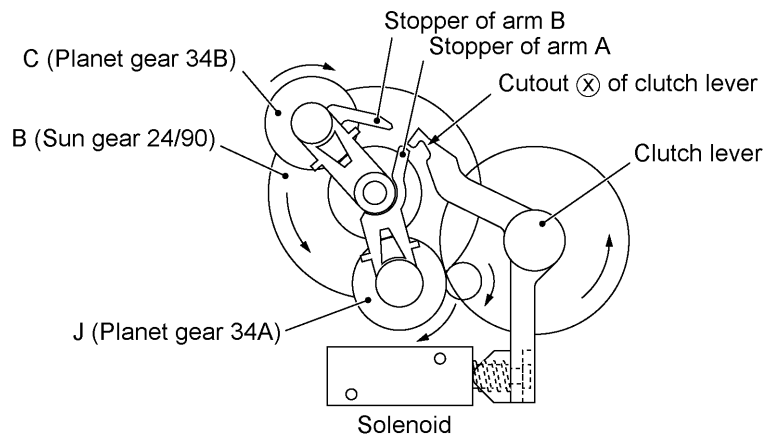
**Active Gears on the Inner Side of the Drive Unit**



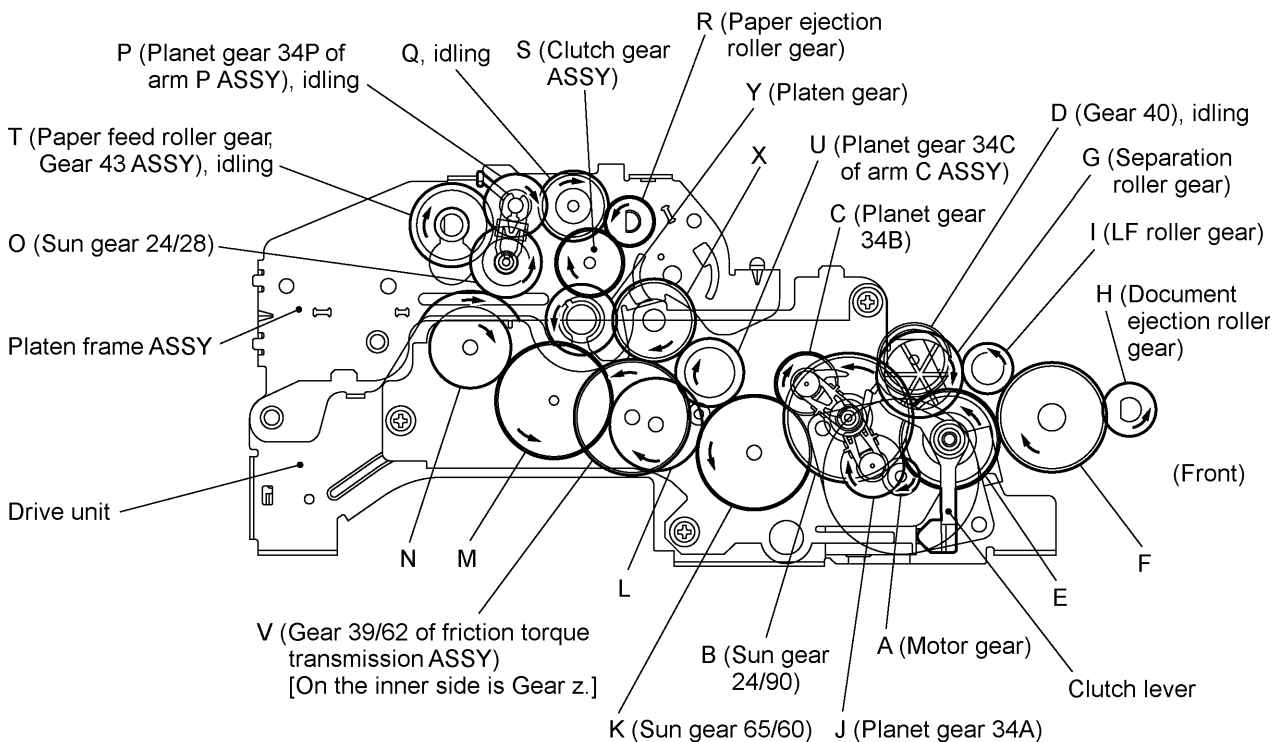
**[ 4 ] Copying mode (Solenoid: ON, Motor rotation: Forward)**

In the copying mode, the control electronics activates the solenoid to release the stopper of arm A from the clutch lever. When the motor rotates in the forward direction, sun gear 24/90 ("B") rotates counterclockwise so that planet gear 34A ("J") transmits the torque to the document scanner mechanism (e.g., the separation roller gear ("G"), LF roller gear ("I") and document ejection roller gear ("H")) and planet gear 34B ("C") transmits the torque to the recording mechanism (e.g., platen gear ("Y") and paper ejection roller gear ("R")).

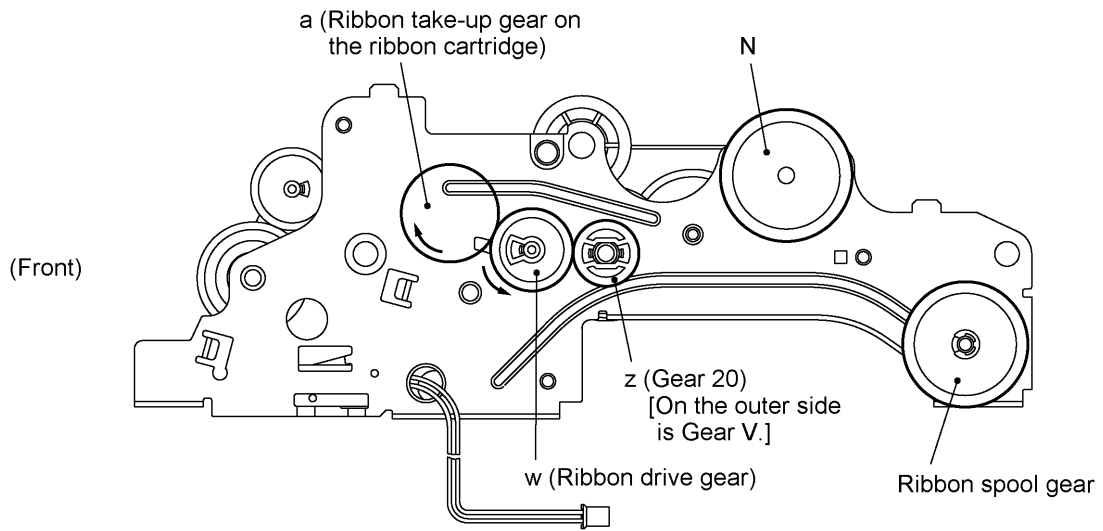
If gear 39/62 ("V") rotates, gear 20 ("z") on the inner side of the drive unit also rotates so as to drive the friction torque transmission ASSY and ribbon drive gear ("w") that rotates ribbon take-up gear ("a") on the ribbon cartridge, as shown on the next page.



**Arm A Released from Cutout (X) of Clutch Lever**



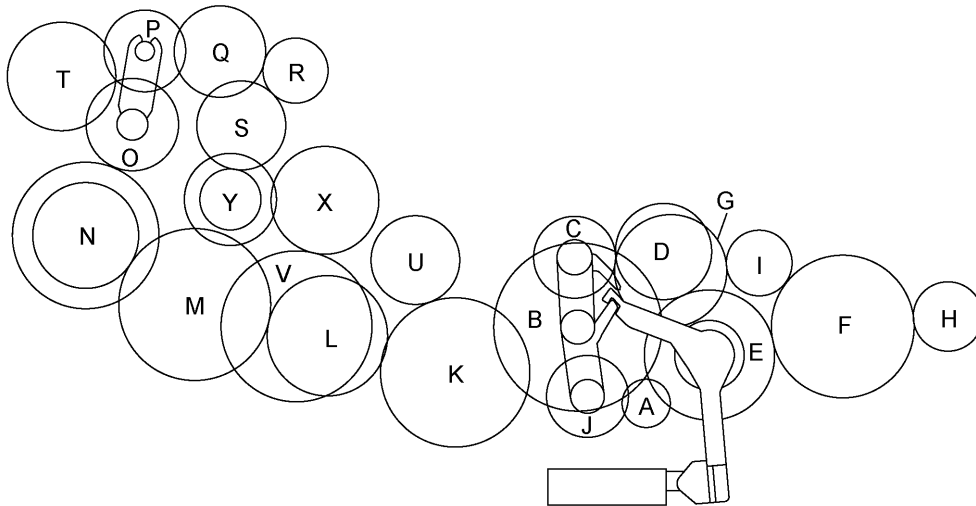
**Active Gears on the Outer Side of the Drive Unit and on the Left Sides of the Platen Frame, Main Frame and Control Panel ASSY**



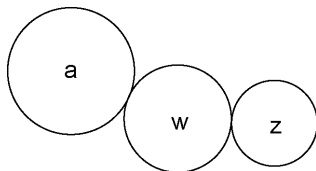
**Active Gears on the Inner Side of the Drive Unit**

### 2.3.4 Power transmission route

Rotation of the motor gear is transmitted as shown below.



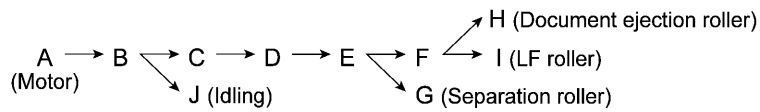
Gears on the outer side of the drive unit and on the left sides of the platen frame, main frame and control panel ASSY



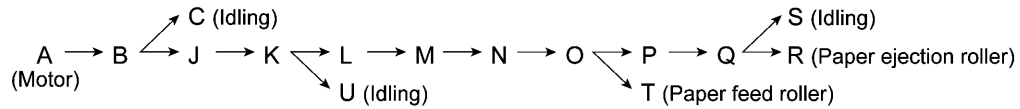
Gears on the inner side of the drive unit

- |                                  |   |
|----------------------------------|---|
| A: Motor gear                    | O: Sun gear 24/28                                 |
| B: Sun gear 24/90                | P: Planet gear 34P                                |
| C: Planet gear 34B               | Q: Gear 19/38                                     |
| D: Gear 40                       | R: Paper ejection roller gear                     |
| E: Gear 18/54                    | S: Clutch gear ASSY                               |
| F: Gear 37                       | T: Paper feed roller gear, Gear 43 ASSY           |
| G: Separation roller gear        | U: Planet gear 34C                                |
| H: Document ejection roller gear | V: Friction torque transmission ASSY (Gear 39/62) |
| I: LF roller gear                | w: Ribbon drive gear (Gear 25)                    |
| J: Planet gear 34A               | X: Gear 22/28                                     |
| K: Gear 65/60                    | Y: Platen gear (Gear 25/27)                       |
| L: Gear 50                       | z: Gear 20  |
| M: Gear 63                       | a: Ribbon take-up gear on the ribbon cartridge    |
| N: Gear 44/38                    |   |

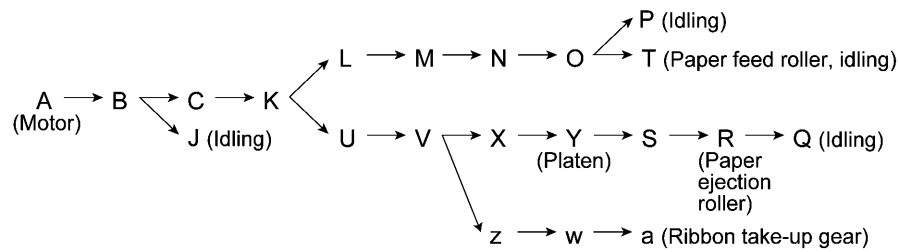
**[ 1 ] Scanning Mode (Solenoid: OFF, Motor rotation: reverse)**



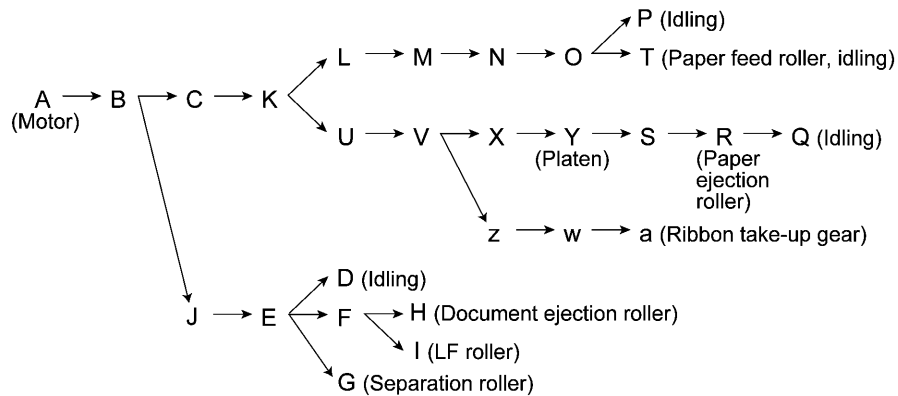
**[ 2 ] Paper Feeding/Ejecting Mode (Solenoid: ON, Motor rotation: reverse)**



**[ 3 ] Recording Mode (Solenoid: OFF, Motor rotation: forward)**



**[ 4 ] Copying Mode (Solenoid: ON, Motor rotation: forward)**



## 2.4 Sensors and Actuators

This equipment has five photosensors and two mechanical switches as described below.

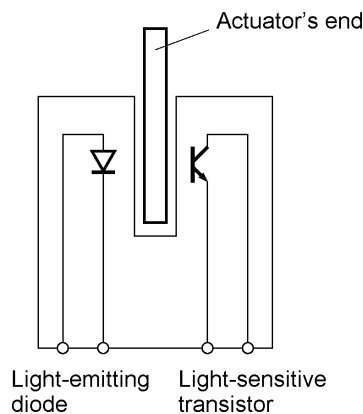
Sensor name	Type	Located on
Document front sensor	Photosensor	Control panel PCB ASSY
Document rear sensor	Photosensor (PI2)	Main PCB
Paper-edge sensor	Photosensor (PH1)	Sensor PCB
Paper ejection sensor	Photosensor (PH2)	Sensor PCB
Ribbon sensor	Photosensor (PI1)	Main PCB
Cover sensor	Mechanical switch (SW1)	Main PCB
Hook switch sensor*	Mechanical switch (SW1)	Hook switch PCB

- Document front sensor which detects the presence of documents.
- Document rear sensor which detects the leading and trailing edges of pages to tell the control circuitry when the leading edge of a new page has reached the starting position and when the scan for that page is over.
- Paper-edge sensor which detects the leading and trailing edges of paper and the presence of paper as well as detecting whether the paper front cover is closed.
- Paper ejection sensor which detects whether a paper jam has occurred.
- Ribbon sensor which detects whether the ink ribbon is loaded.

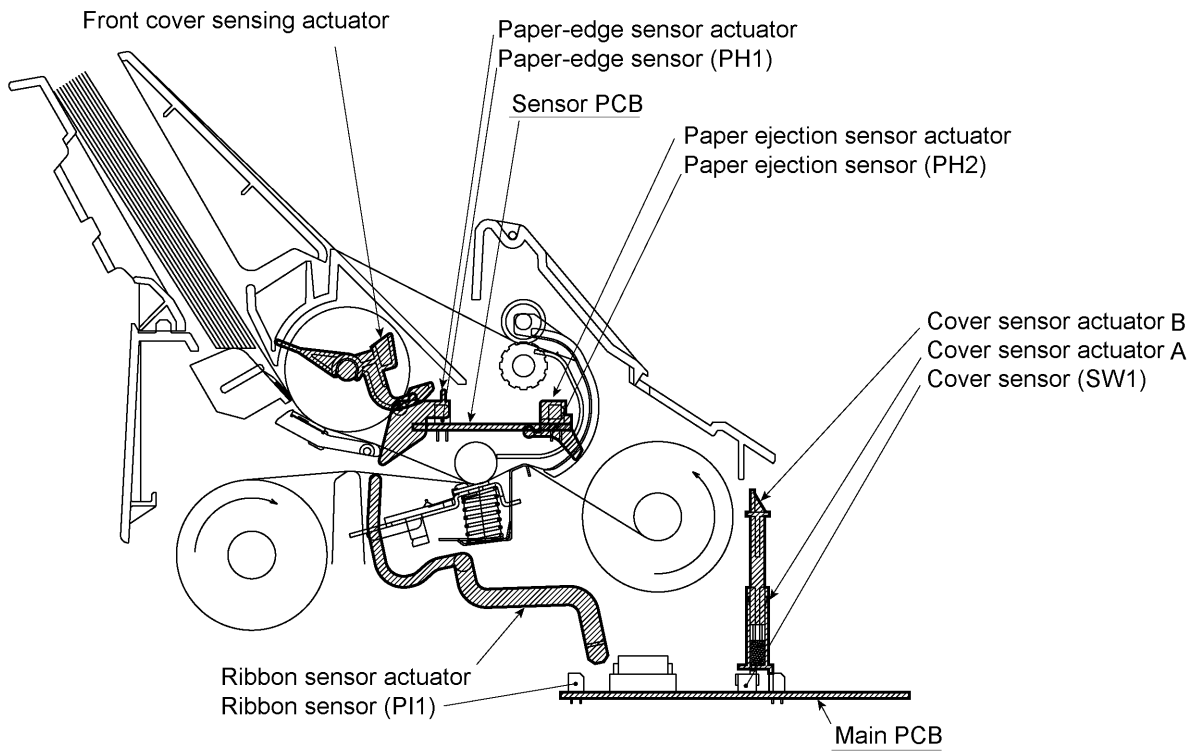
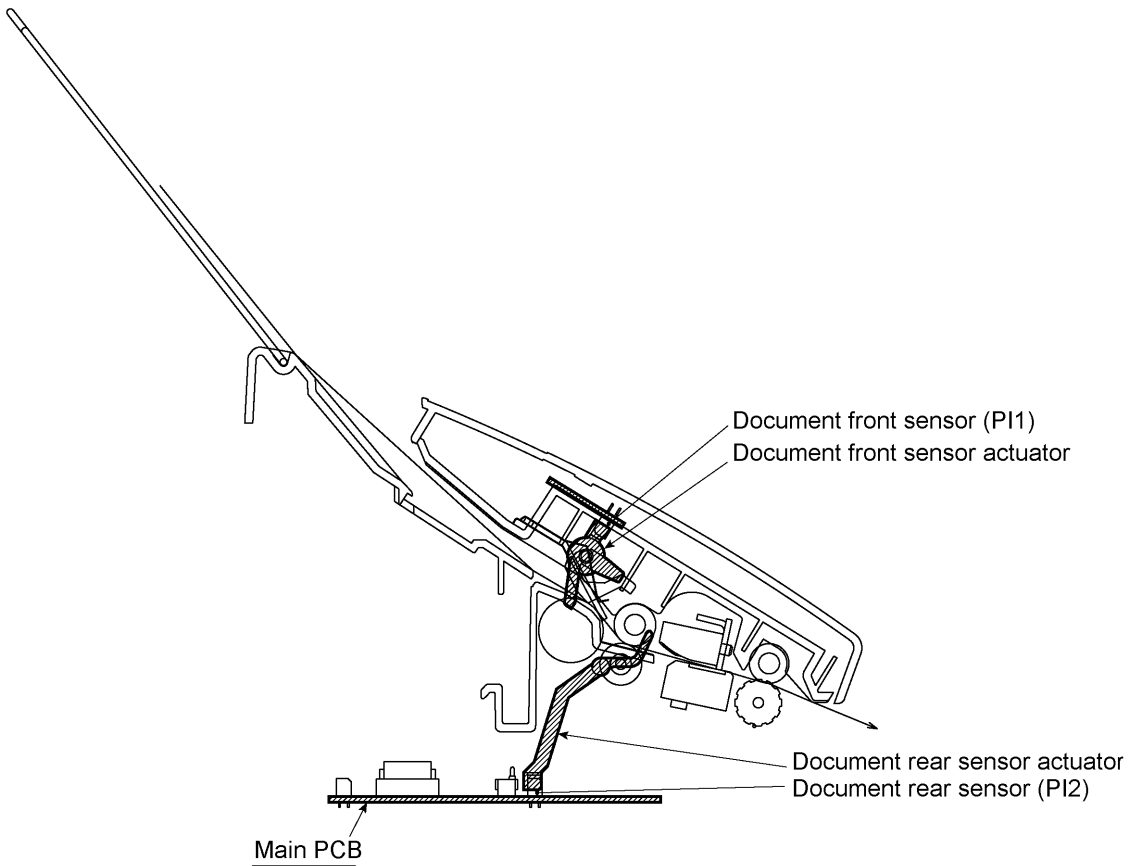
These photosensors are a photointerrupter consisting of a light-emitting diode and a light-sensitive transistor. Each of them has an actuator separately arranged (see the following pages) except that the paper-edge sensor has two actuators for sensing the paper and the paper front cover. When an actuator is not activated, its black end lies in the path of light issued from the light-emitting diode and interrupts its light so that the emitted light does not enter the light-sensitive transistor. If a document, paper, or ribbon comes in so as to activate the actuator, the actuator's black end goes out of the light path and the emitted light enters the light-sensitive transistor. This way, the sensor detects the presence of documents, paper, or ink ribbon.

- Cover sensor which detects whether the recording paper cover ASSY is closed.
- Hook switch sensor\* which detects whether the handset is placed on the handset mount.

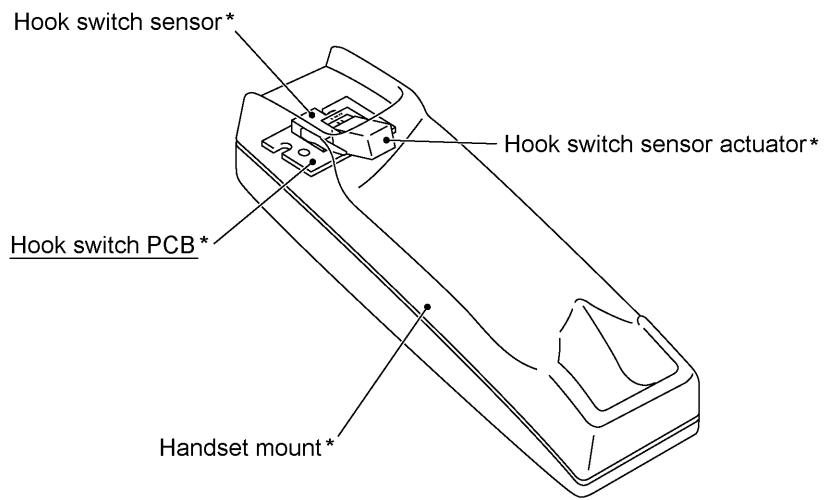
The cover sensor has an actuator ASSY (consisting of two actuators and a spring). If you open the recording paper cover ASSY, the actuator ASSY pops up to release the sensor.



\*Not provided on the FAX-910.



**Location of Sensors and Actuators (1)**



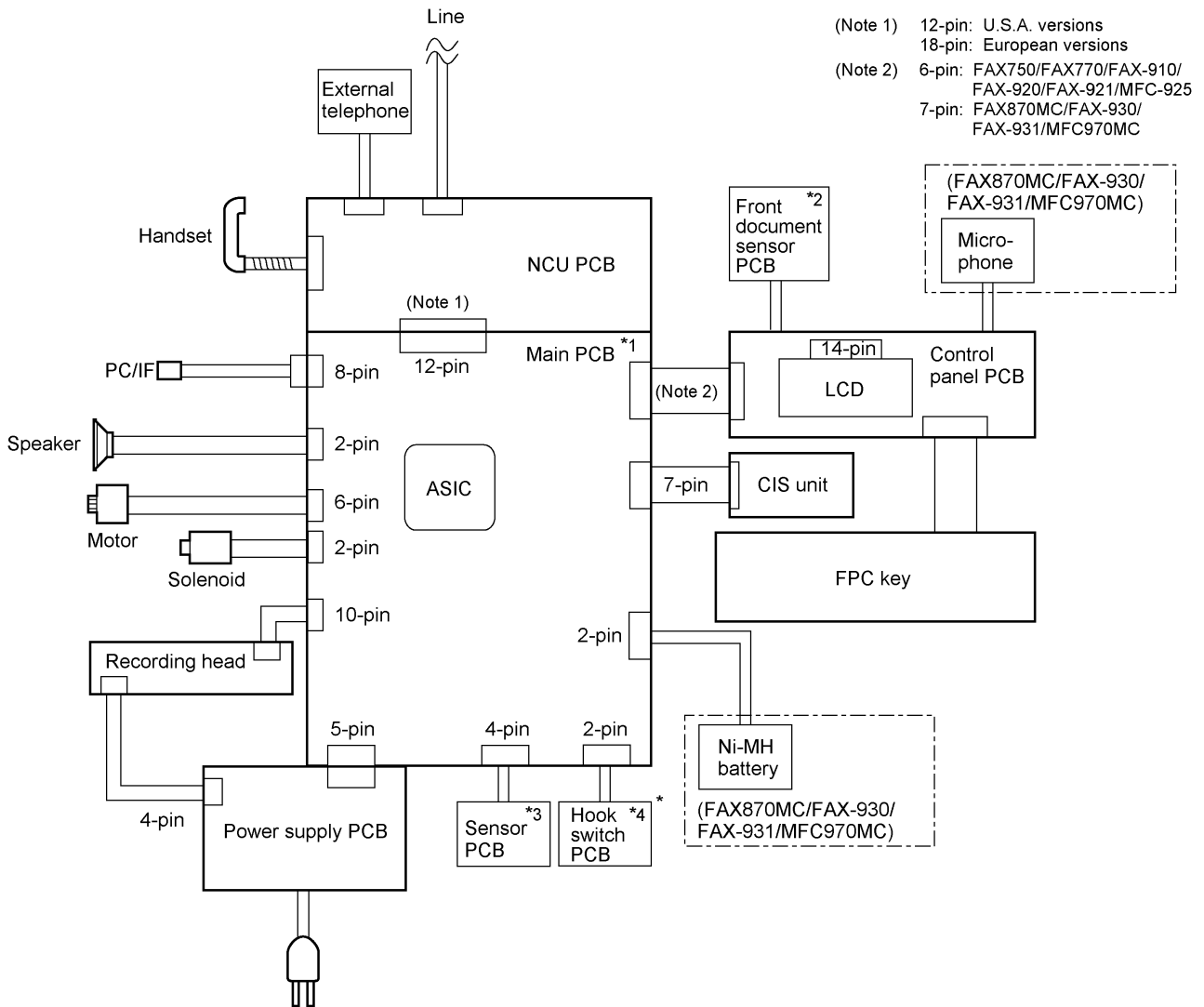
\*Not provided on the FAX-910.

**Location of Sensors and Actuators (2)**

# 3. CONTROL ELECTRONICS

## 3.1 Configuration

The hardware configuration of the facsimile equipment is shown below.



- \*1 On the main PCB are these sensors:
  - ┆ Ribbon sensor (PI1)
  - ┆ Document rear sensor (PI2)
  - ┆ Cover sensor (SW1)
- \*2 On the front document sensor PCB is the front document sensor.
- \*3 On the sensor PCB are these sensors:
  - ┆ Paper-edge sensor (PH1)
  - ┆ Paper ejection sensor (PH2)
- \*4 On the hook switch PCB\* is the hook switch sensor (SW1).

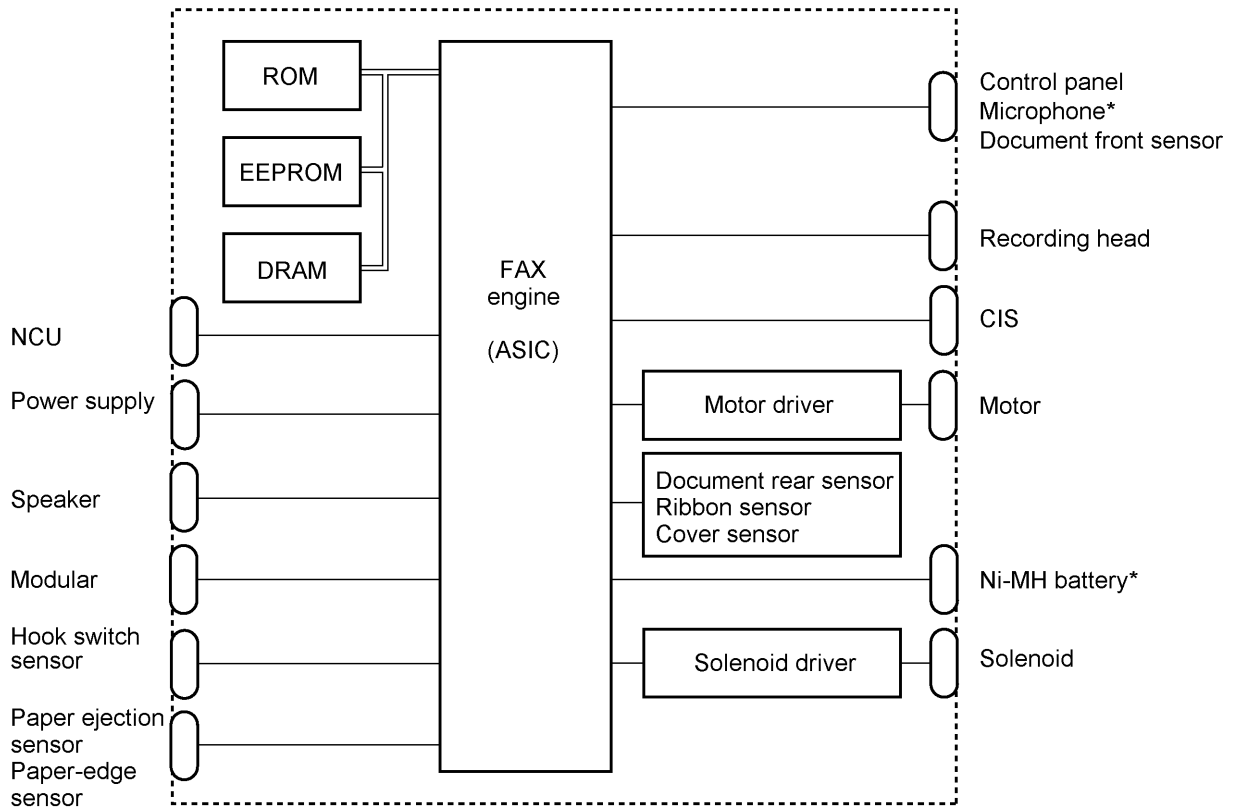
\*Not provided on the FAX-910.

### Configuration of Facsimile Equipment



### 3.2 Main PCB

The main PCB, which is the nucleus controlling the entire operation of the equipment, consists of a FAX engine (ASIC), memories, motor drive circuitry, sensor detection circuitry, and analog circuits for scanning, recording, and power transmission shifting.

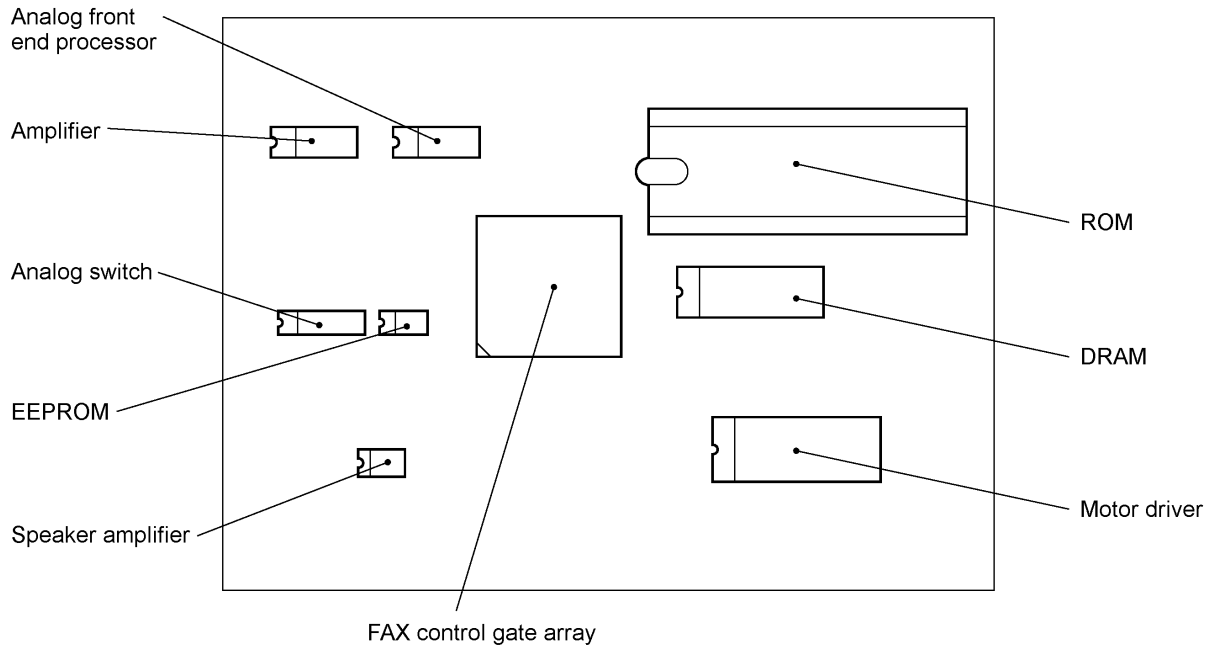


\*Provided on the FAX870MC/FAX-930/FAX-931/MFC970MC.

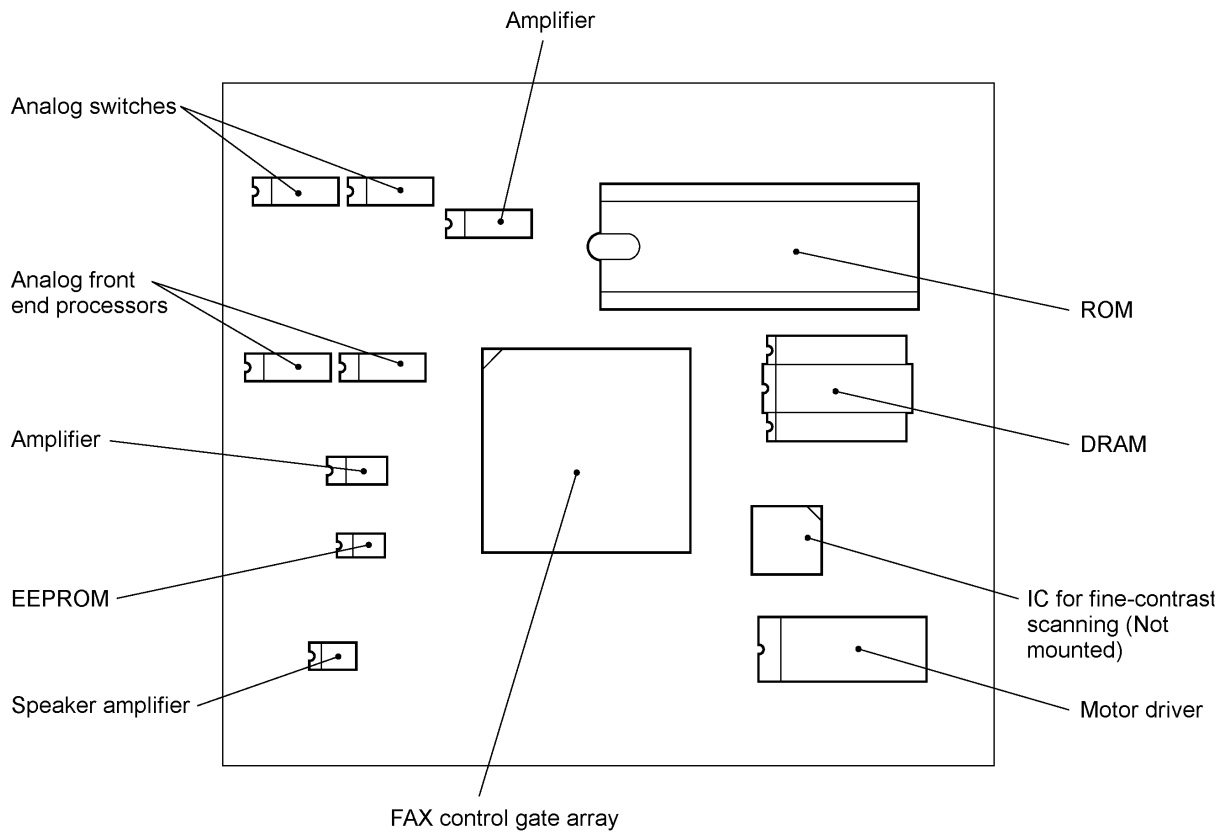
EEPROM: Electrically Erasable Programmable Read-only Memory  
 DRAM: Dynamic Random Access Memory

**Block Diagram of Main PCB**

FAX750/FAX770/FAX-910/FAX-920/FAX-921/MFC-925



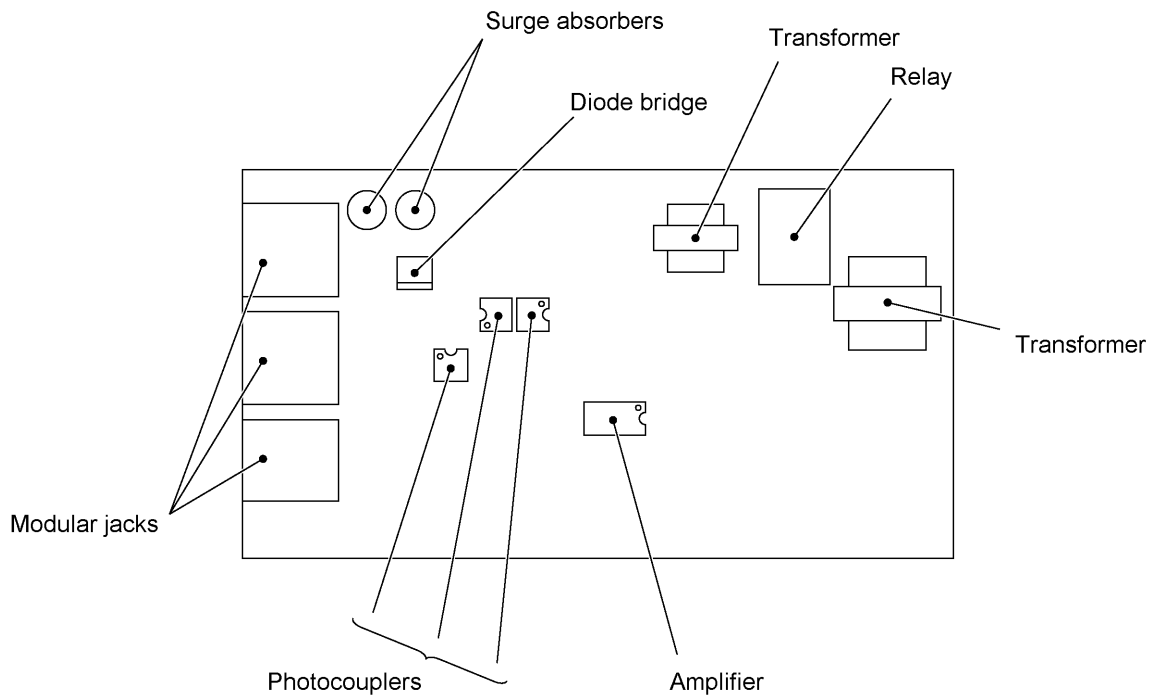
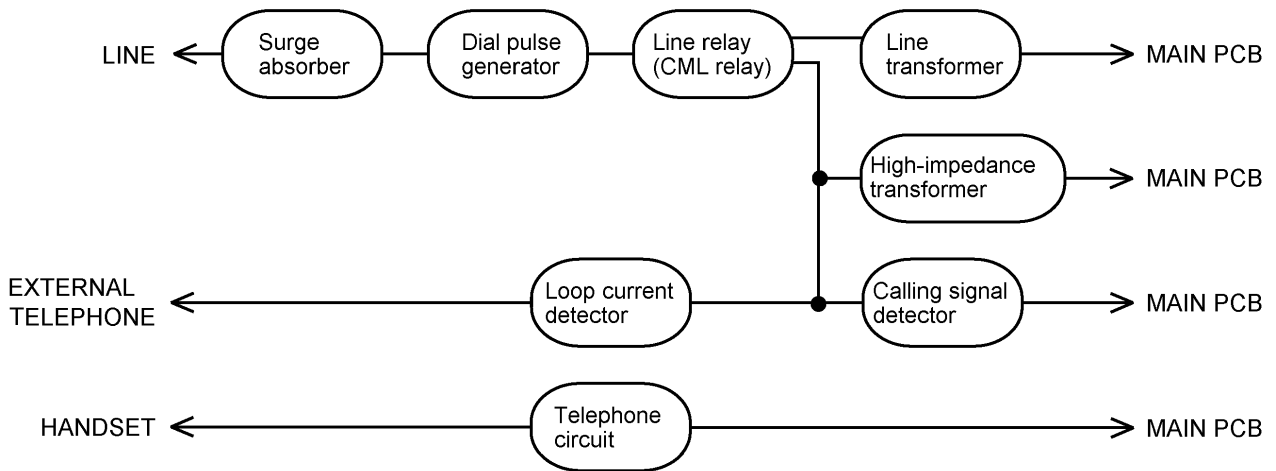
FAX870MC/FAX-930/FAX-931/MFC970MC



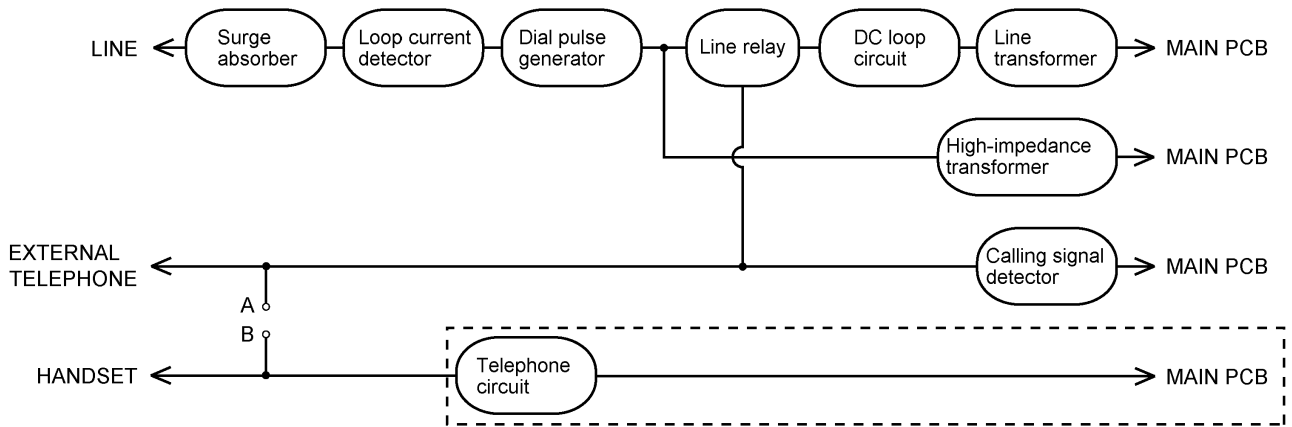
### 3.3 NCU PCB

The NCU PCB switches the communications line to telephone or built-in MODEM, under the control of the main PCB.

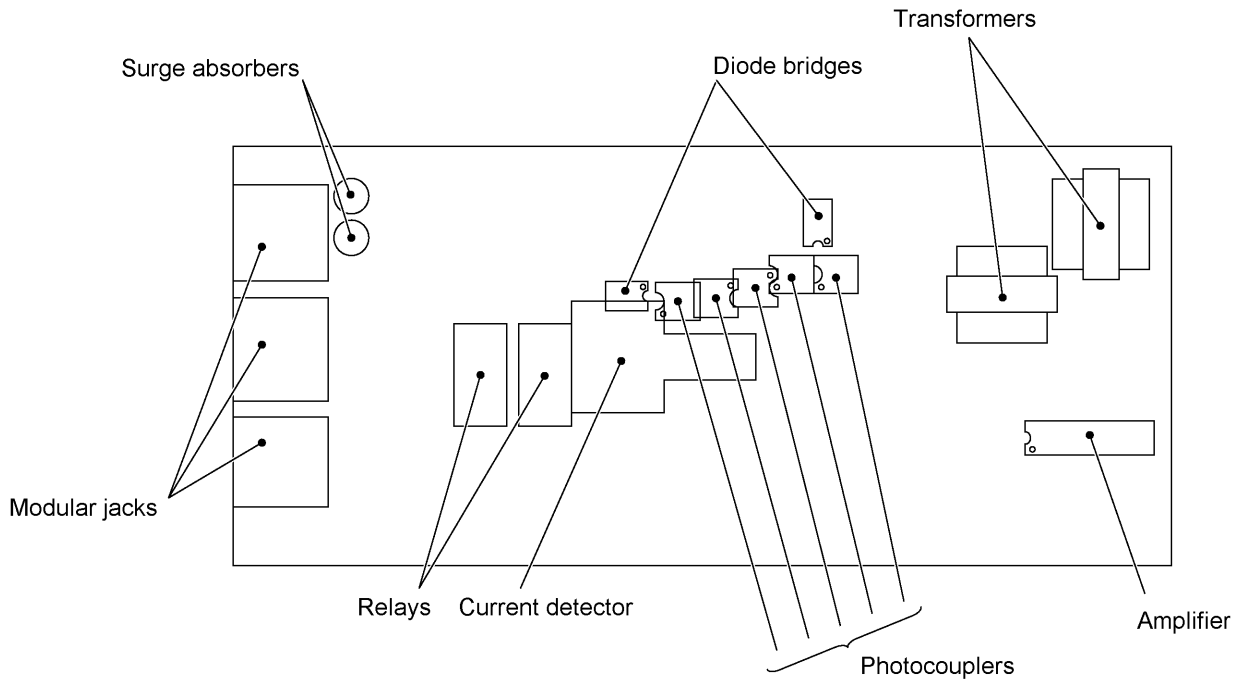
#### U.S.A. versions



European versions



NOTE: For models equipped with a power failure phone, the circuit enclosed in a dotted line does not apply and points A and B are short circuited together.



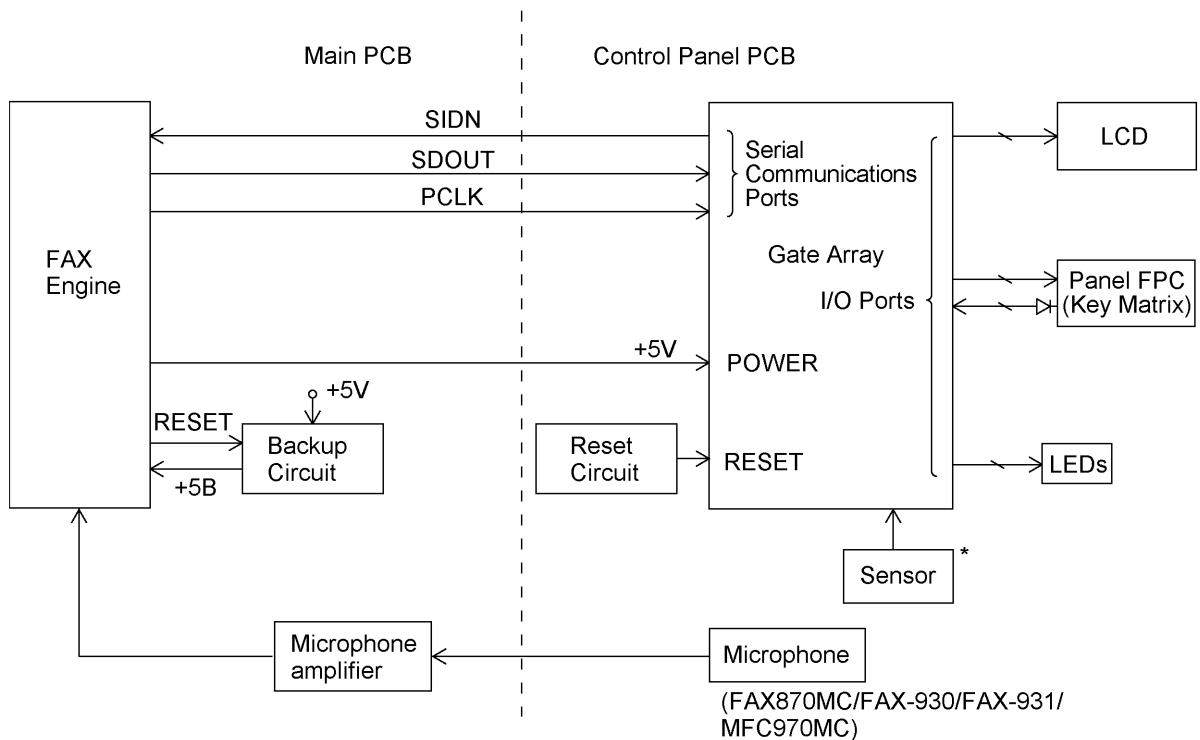
### 3.4 Control Panel PCB

The control panel PCB and the main PCB communicate with each other by serially transmitting commands and data.

The control panel unit consists of a gate array, an LCD and LEDs, which are controlled by the gate array according to commands issued from the FAX engine on the main PCB.

The calendar clock is backed up by the backup circuit on the main PCB.

The panel FPC is a flexible keyboard PCB which integrates the key matrix having rubber keytops.



\*Document front sensor

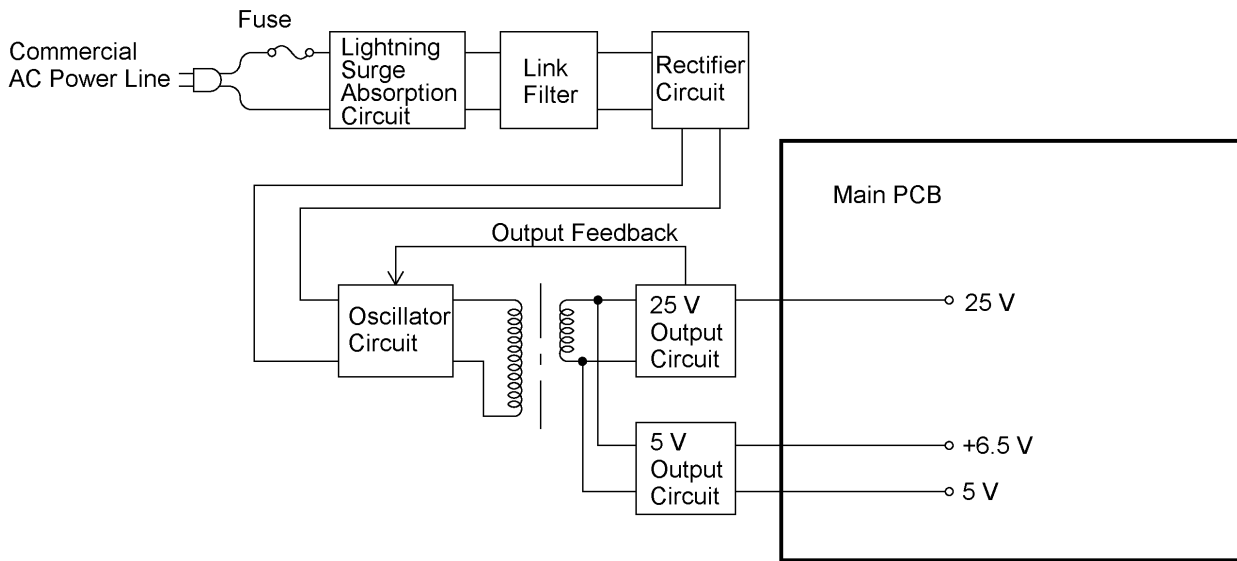
**Control Panel PCB and its Related Circuit**

### 3.5 Power Supply PCB

The power supply uses the switching regulator to generate DC power (+25V, +6.5V, and +5V) from a commercial AC power line.

The +25V source is stabilized and fed to the motor and solenoid (for feeding documents, recording paper, and ink ribbon), recording head, the main PCB, and the CIS LED array.

The +6.5V source is not stabilized and fed to the Ni-MH battery (on the FAX870MC/FAX-930/FAX-931/MFC970MC). The +5V source is fed to the logic on the main PCB, control panel, recording head, and sensors.



**Power Supply Circuit**

## **CHAPTER IV.**

### **DISASSEMBLY/REASSEMBLY, LUBRICATION AND ADJUSTMENT**

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<b>n How to Access the Object Component .....</b>	<b>IV-3</b>
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# 1. DISASSEMBLY/REASSEMBLY

## n 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 next page.
- (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.

## Tightening Torque List

Location	Screw type	Q'ty	Tightening torque (kg•cm)	Loosening torque (kg•cm)
ADF parts	Taptite, pan (washer) B M3x6	1	4 ±2	Min. 1
Panel rear cover	Taptite, cup B M3x8	2	4 ±2	Min. 1.5
Document front sensor PCB	Taptite, cup B M2.6x6	1	4 ±2	Min. 1
Control panel PCB*	Taptite, cup B M2.6x6	1	4 ±2	Min. 1
LF leaf spring	Taptite, bind B M3x8	1	5 ±2	Min. 2
CIS holders	Taptite, bind B M3x8	2	4 ±1	Min. 2
CIS unit	Taptite, pan B M3x8	1	5 ±2	Min. 2
Recorder frame	Taptite, cup B M3x8	2	5 ±2	Min. 2
Recording paper cover ASSY	Shoulder screw	2	7 ±2	Min. 3
Paper feed chute	Taptite, cup S M3x6	2	5 ±2	Min. 4
Cover stopper	Taptite, cup B M3x8	1	5 ±2	Min. 1.5
Bottom plate	Taptite, cup B M3x8	7	5 ±2	Min. 1.5
Grounding terminal	Screw, pan (washer) M4x6DB	1	7 ±2	Min. 4
Motor	Screw, pan (washer) M3x6DB	1	7 ±2	Min. 3.5

\* The control panel PCB of the FAX870MC/FAX-930/FAX-931/MFC970MC is secured with a screw.

## n Preparation

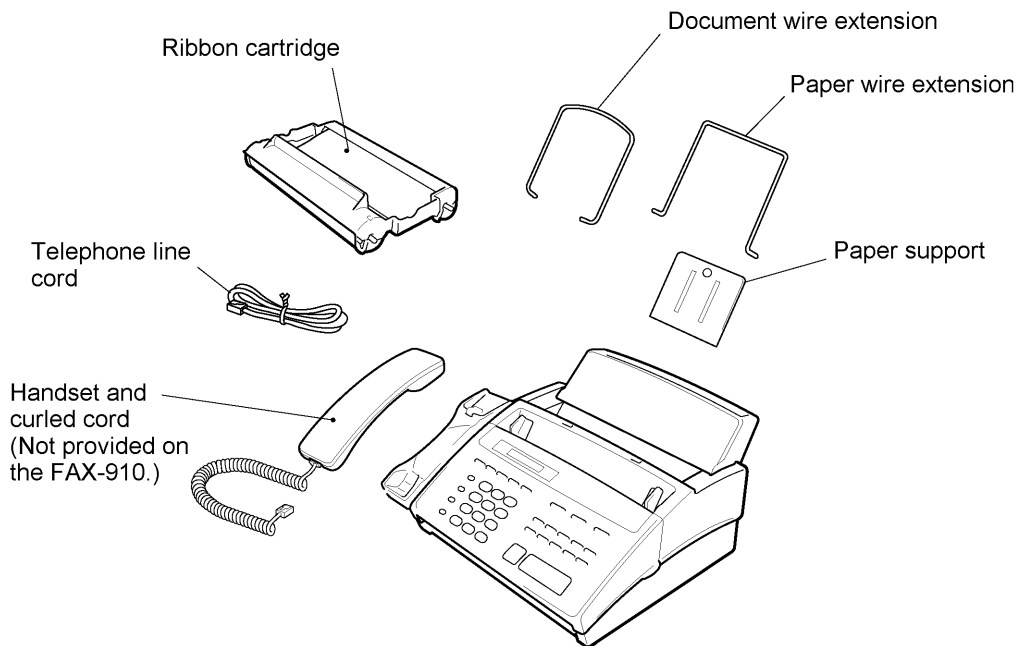
Prior to proceeding to the disassembly procedure,

(1) Unplug

- the modular jack of the telephone line,
- the modular jack of the curled cord (and remove the handset), and
- the modular jack of an external telephone set if connected. (Not shown below.)

(2) Remove

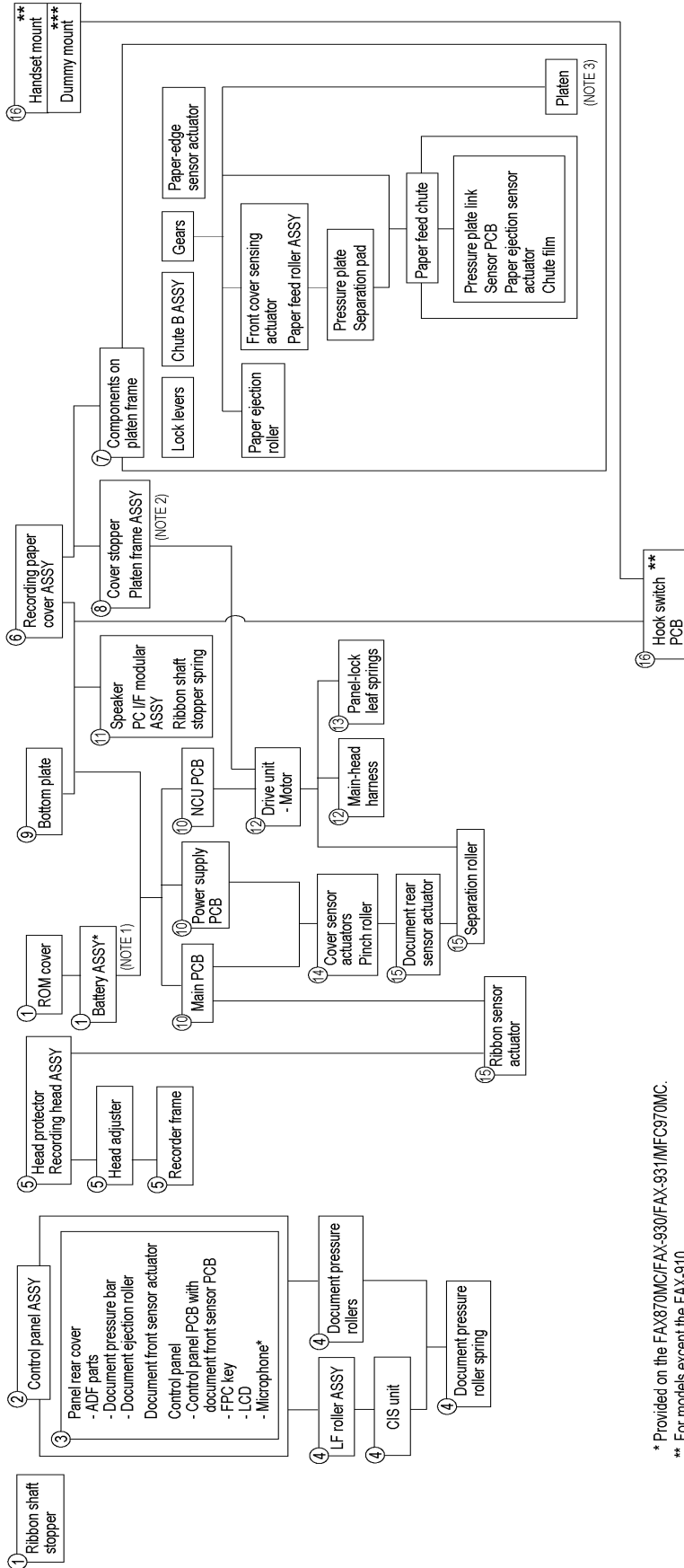
- the document wire extension,
- the paper wire extension,
- the paper support, and
- the ribbon cartridge.



## n 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 separation roller, for example, first find it on the flow and learn its number (15 in this case). You need to remove parts numbered 1, 6, 8, 9, 10, 12, and 14 so as to access the separation roller.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

# n Disassembly Order Flow



\* Provided on the FAX870MC/FAX-930/FAX-931/MFC970MC.

\*\* For models except the FAX-910

\*\*\* For the FAX-910

(NOTE 1) When accessing the main PCB, power supply PCB, or NCU PCB on the FAX870MC/FAX-930/FAX-931/MFC970MC, you need to remove the ROM cover and take out the battery ASSY from the main frame.

(NOTE 2) Only when you need to remove the platen frame ASSY, remove the cover stopper. In other cases, keep it in place for easier handling.

(NOTE 3) After removing the platen, NEVER close the platen frame ASSY when the recording head ASSY is set in place. Doing so will make the cutouts of the platen frame ASSY catch the right and left ends of the recording head ASSY. The platen frame ASSY and the recording head ASSY will be locked together.

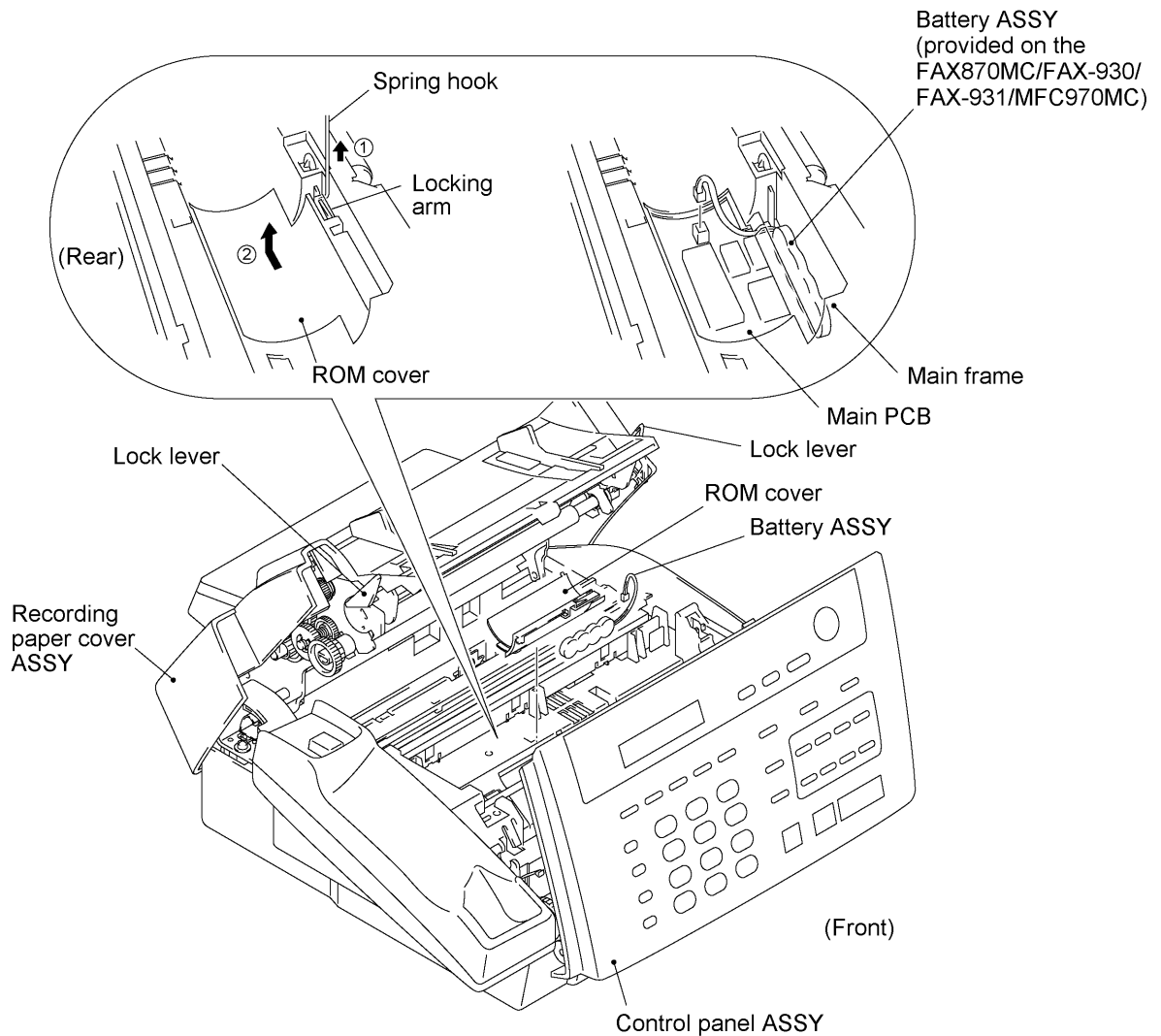
## 1.1 ROM Cover, Battery ASSY\* and Ribbon Shaft Stopper

(\*FAX870MC/FAX-930/FAX-931/MFC970MC)

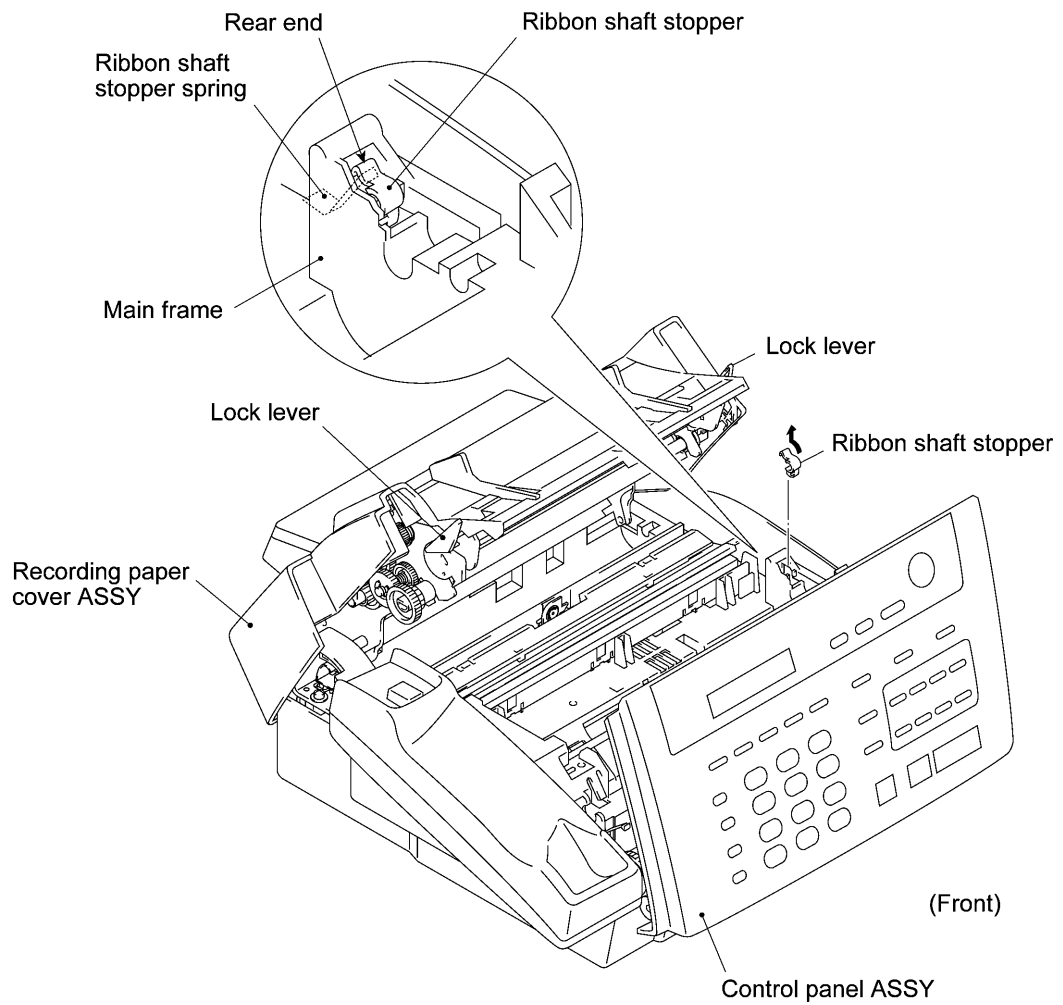
- (1) Open the control panel ASSY to the front.
- (2) Pull up the lock levers and open the recording paper cover ASSY to the rear.
- (3) As shown below, insert the tip of the spring hook at the center or right half of the locking arm (when viewed from the front), then lift up the hook to release and move the ROM cover to the right.
- (4) FAX870MC/FAX-930/FAX-931/MFC970MC: To replace the battery ASSY (Ni-MH battery), plug the power cord of the facsimile equipment into a wall socket, disconnect the battery harness from the main PCB, and take out the battery ASSY from the main frame. Set a new battery ASSY and unplug the power cord.

Disconnecting the battery harness with the power cord unplugged will lose the settings (e.g., calendar clock, voice messages, and received FAX data) stored in the RAM.

If you do not need to replace the battery ASSY, take out the battery ASSY from the main frame and put it on the main PCB with the battery harness being connected.



- (5) Remove the ribbon shaft stopper by pushing down the rear end of the stopper lightly with a screwdriver.

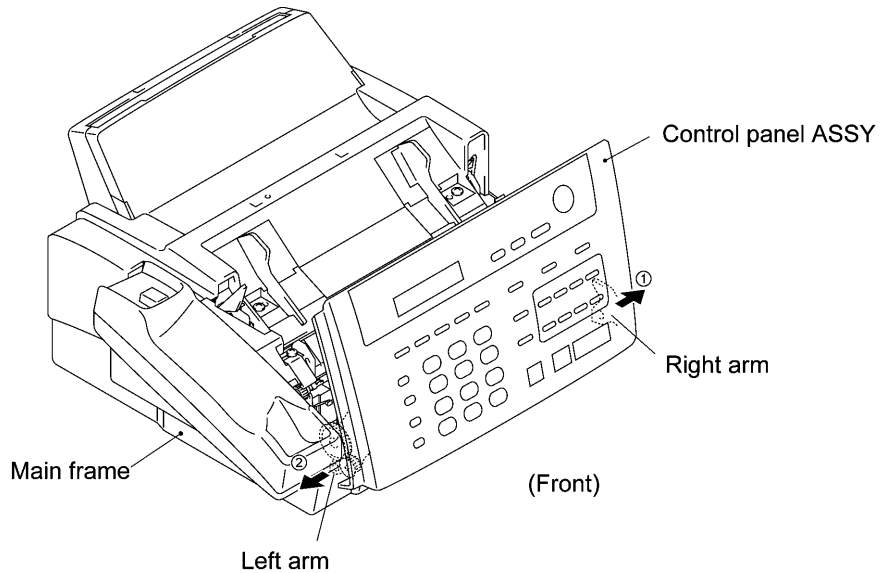


#### n Reassembling Notes

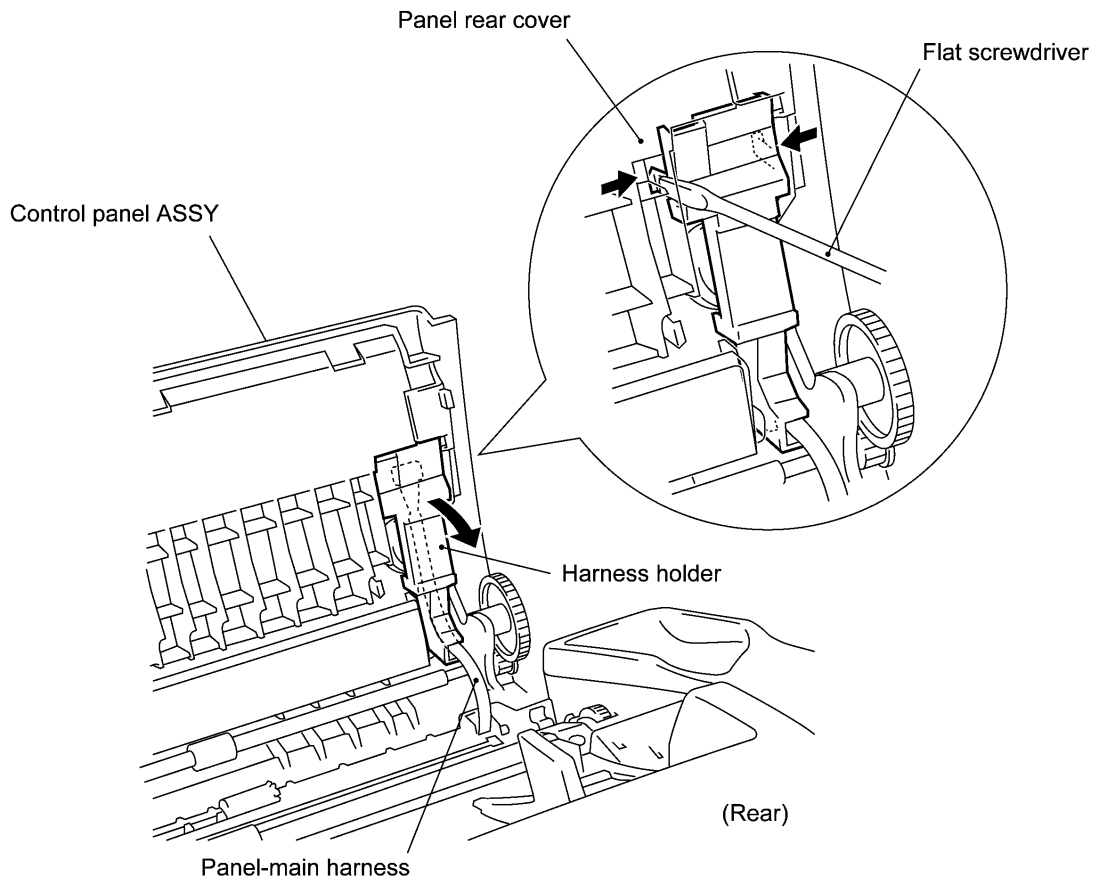
- When reinstalling the ribbon shaft stopper, lightly push down the ribbon shaft stopper spring with the rear end of the ribbon shaft stopper and then set the stopper.

## 1.2 Control Panel ASSY

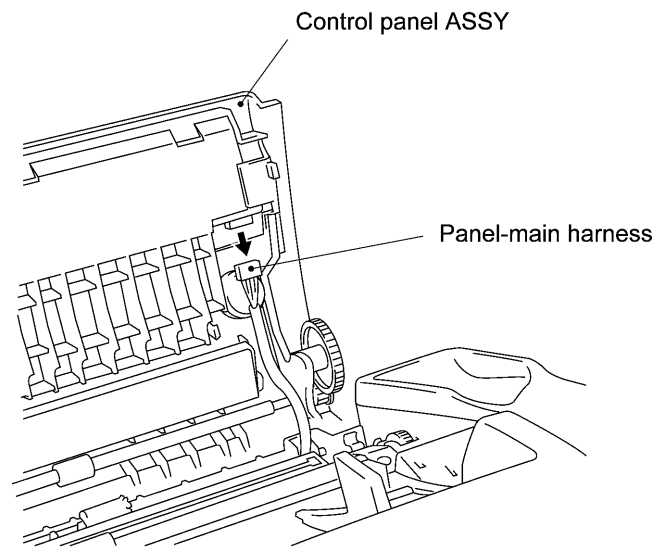
- (1) Open the control panel ASSY to the front.
- (2) Push the right arm of the panel rear cover outward (in the direction of arrow • ) to release it from the boss provided on the main frame, then move the control panel ASSY to the left and push the left arm outward (in the direction of arrow , ).



- (3) Remove the harness holder by unhooking its latches from the panel rear cover with a flat screwdriver as shown below.



(4) Disconnect the panel-main harness.



(Rear)

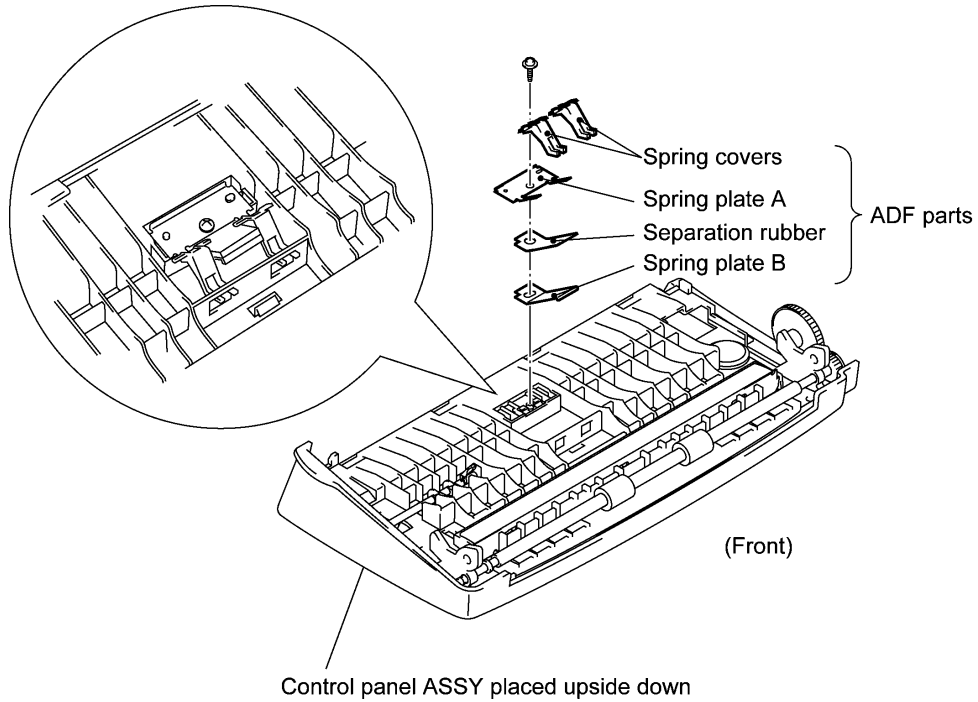


### 1.3 Panel Rear Cover and Control Panel

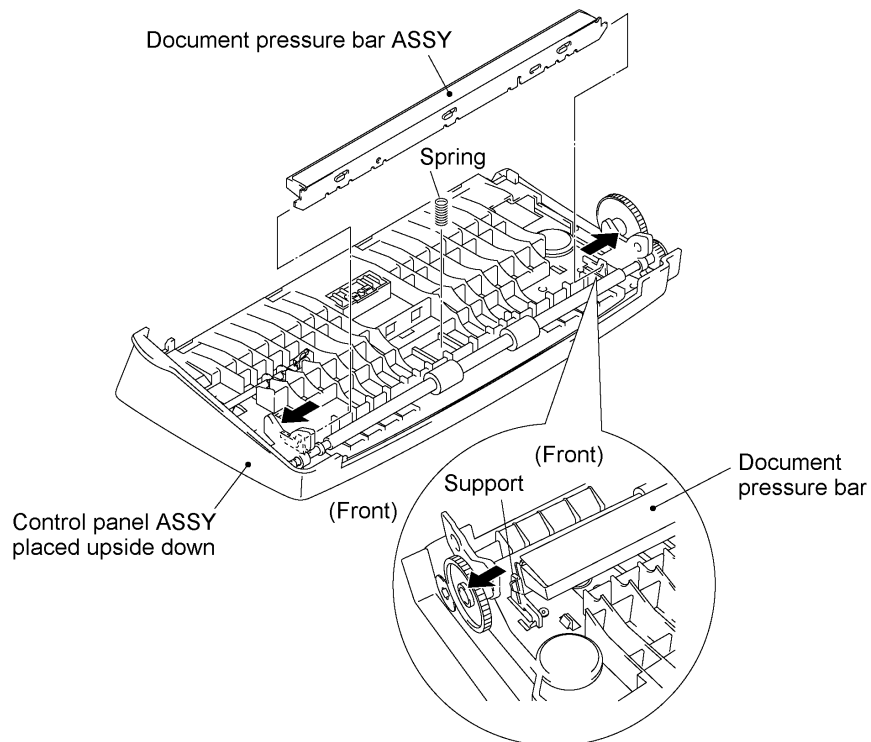
- (1) Place the control panel ASSY upside down.

If you do not need to remove the ADF parts, document pressure bar, or document ejection roller, skip to step (6).

- (2) To remove the ADF parts (spring covers, spring plates, and separation rubber), remove the screw.

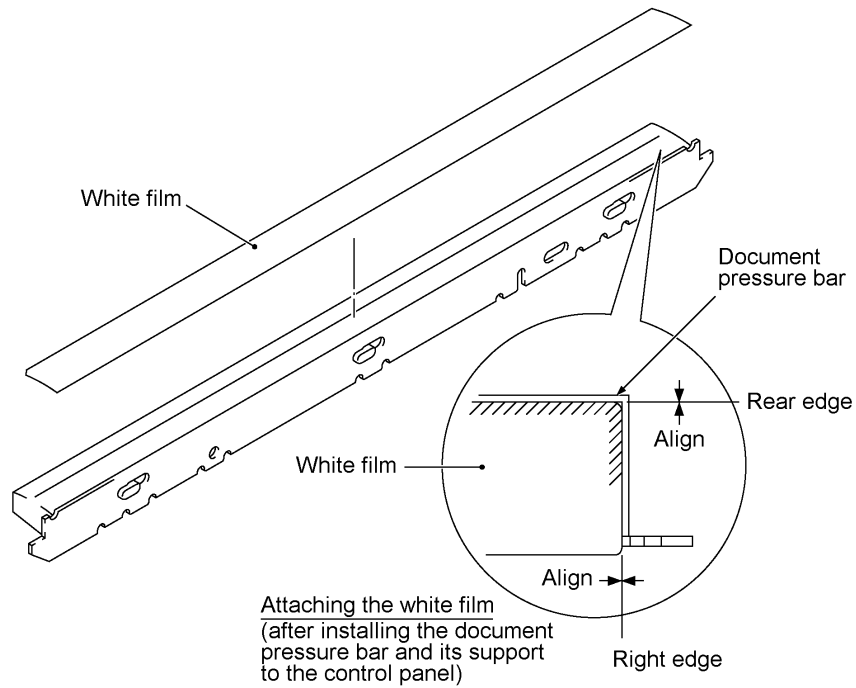


- (3) To remove the document pressure bar ASSY, pull either of the supports provided on the panel rear cover outwards and lift up the pressure bar. The spring also comes off.

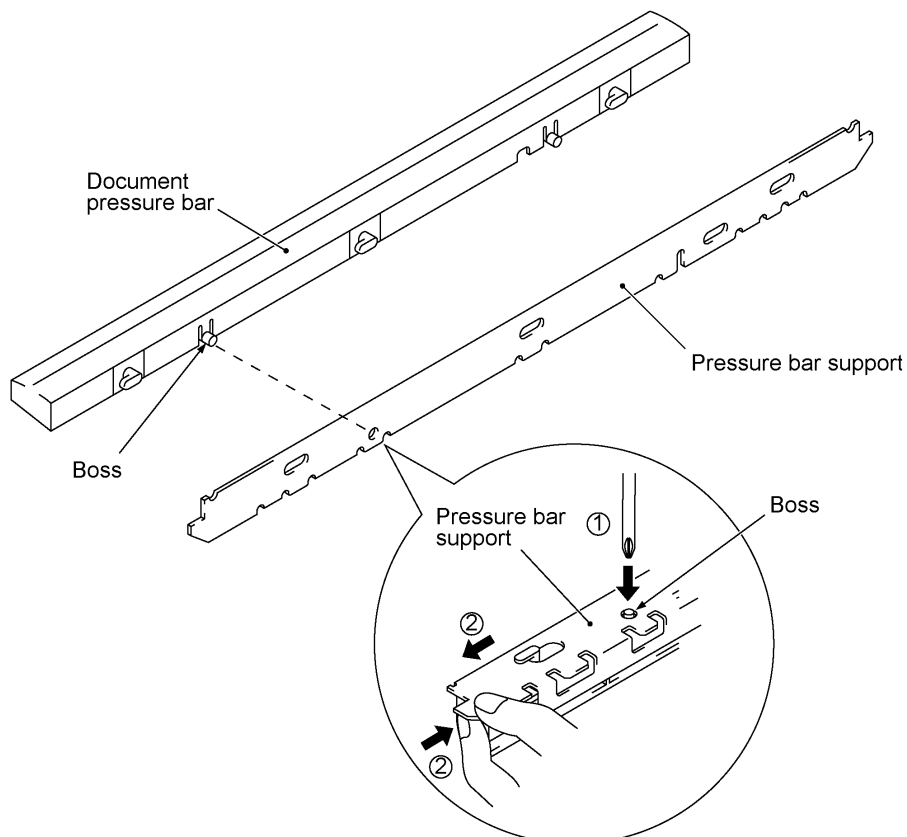


(4) To disassemble the document pressure bar ASSY, first remove the white film.

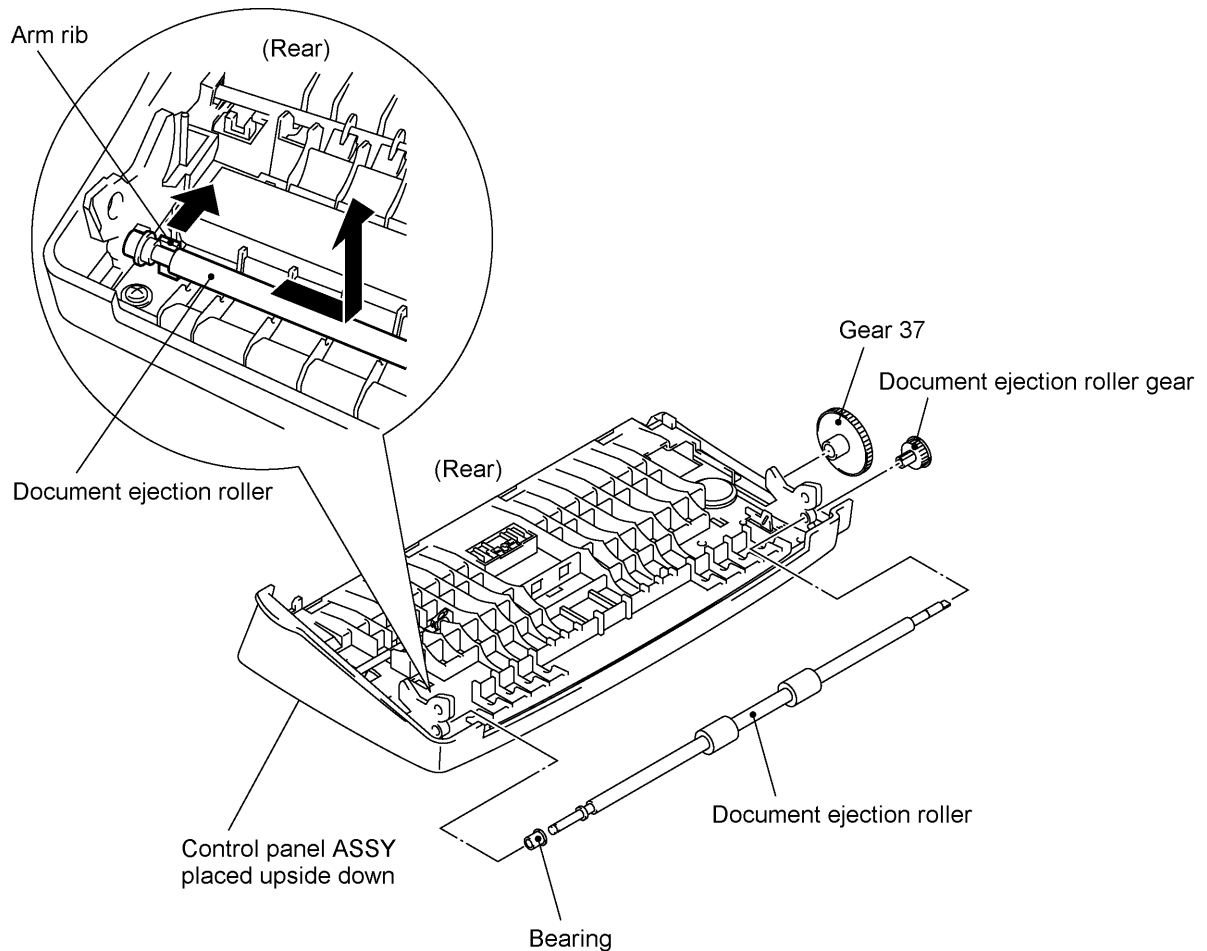
**NOTE:** Once removed, the white film will become unusable and a new one will have to be put back in.



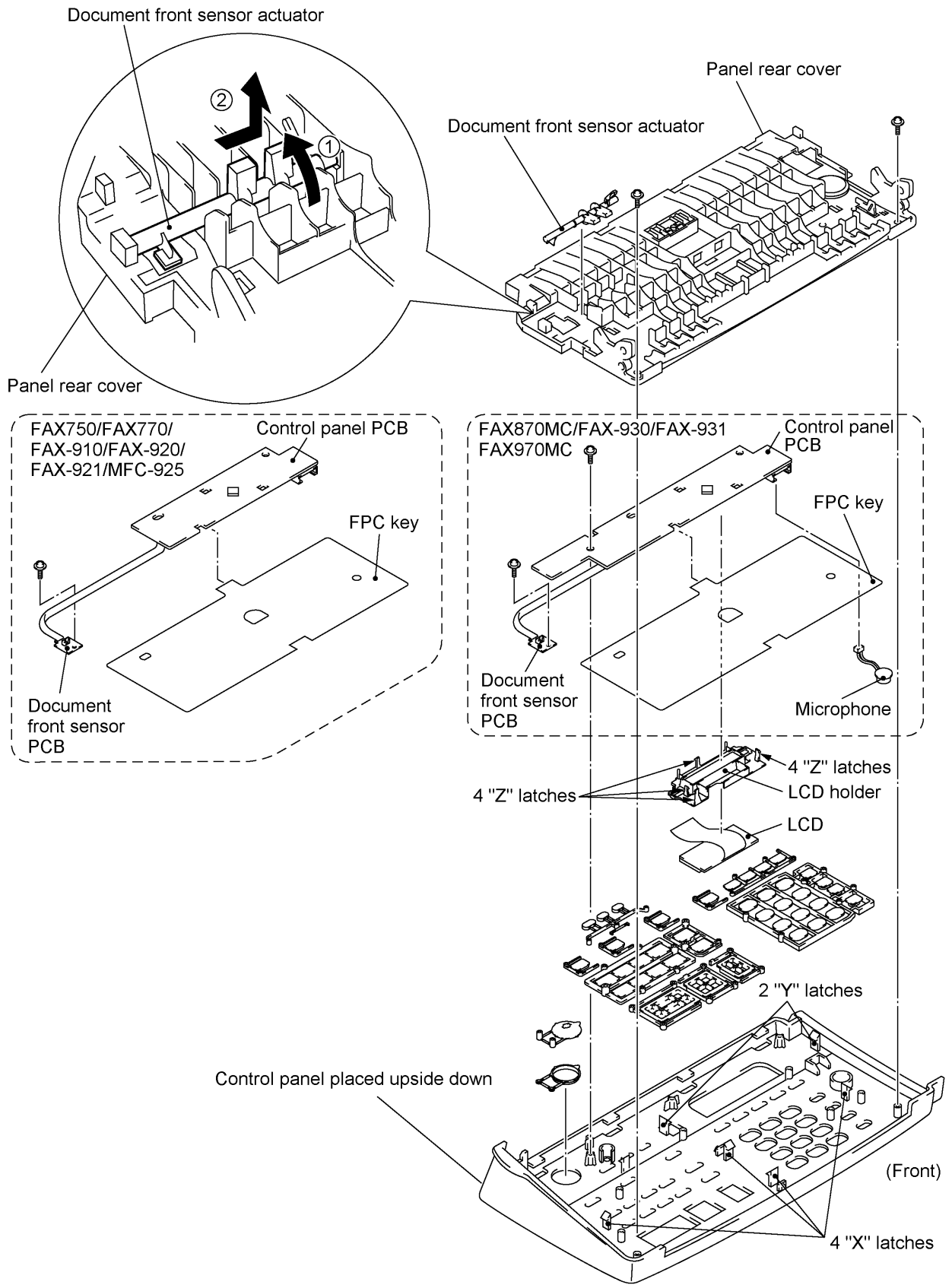
Next, place the document pressure bar ASSY with the pressure bar support facing up for easier disassembly. While pressing the boss of the document pressure bar with the tip of a Phillips screwdriver, shift the document pressure bar to the right to take it off from the pressure bar support.



- (5) To remove the document ejection roller, push the arm rib to the rear and shift the document ejection roller to the right.
- Pull out the document ejection roller gear and remove gear 37.
- Pull out the document ejection roller to the left.
- Remove the bearing.



- (6) Remove the two screws from the panel rear cover. (See the next page.)
- (7) Unhook the panel rear cover from the four "X" latches provided on the control panel and lift up the panel rear cover.
- (8) Remove the document front sensor actuator from the panel rear cover by turning it clockwise (in the direction of arrow •) and moving it in the direction of arrow , .
- (9) Remove the screw from the document front sensor PCB.
- (10) FAX750/FAX770/FAX-910/FAX-920/FAX-921/MFC-925: Unhook the control panel PCB from the two "Y" latches.
- FAX870MC/FAX-930/FAX-931/MFC970MC: Remove the screw from the control panel PCB and unhook the PCB from the two "Y" latches. Disconnect the microphone.



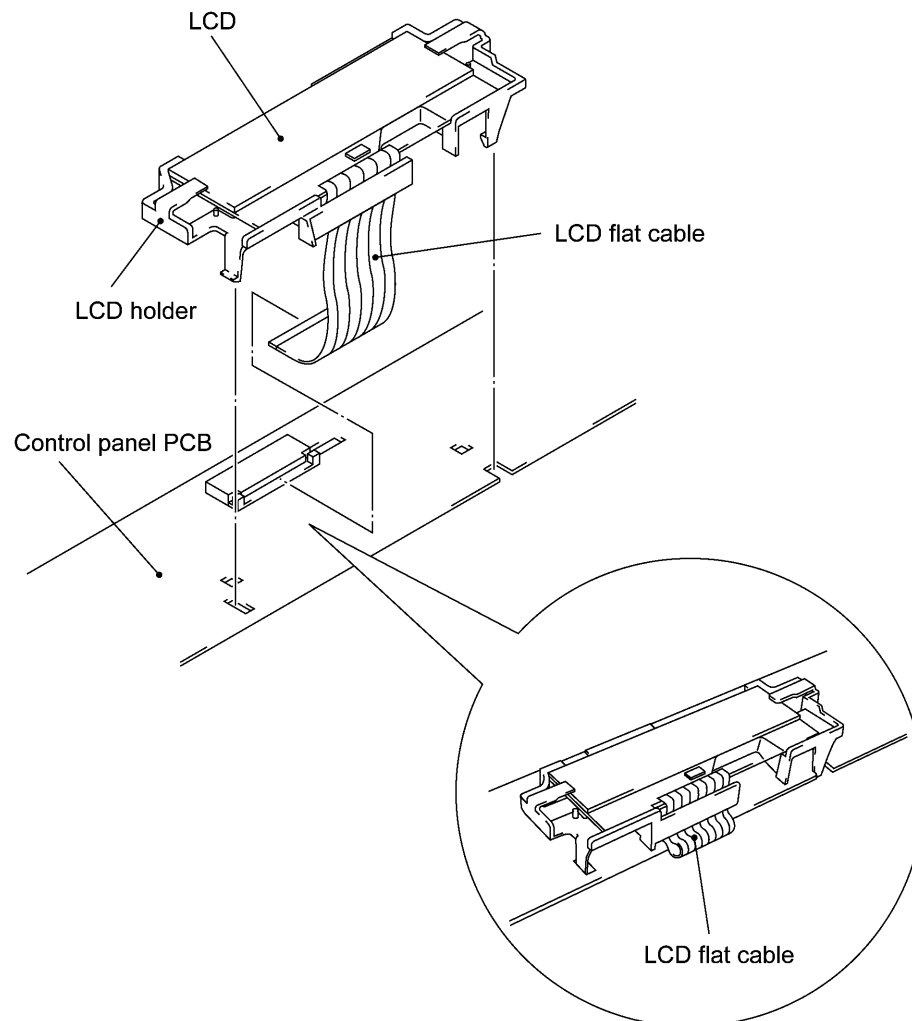
(11) To remove the LCD, unhook the four "Z" latches of the LCD holder from the control panel PCB. Unlock the LCD cable connector and disconnect the LCD flat cable. Slide the LCD to the cable side and remove it from the LCD holder.

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

(12) Unlock the FPC key connector and disconnect the FPC key.

## **n** Reassembling Notes

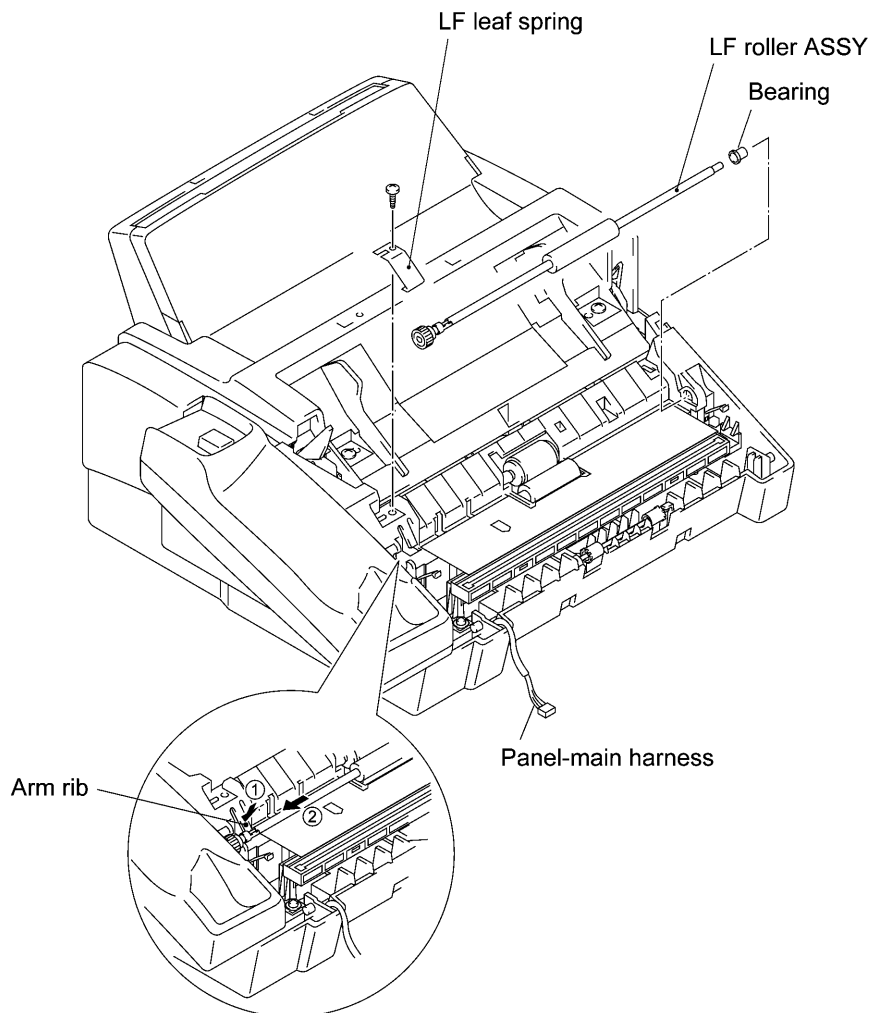
- A new LCD is covered with a protection sheet. Before installing it, remove the protection sheet.
- As shown below, route the LCD flat cable and set the LCD holder on the control panel PCB.



- Before reinstalling the control panel PCB to the control panel, wipe fingerprints off the LCD surface with a soft cloth.
- After assembling the document pressure bar and its support together, check that the boss of the document pressure bar is fitted in the hole provided in the support.
- After reinstalling the assembly of the document pressure bar and its support to the control panel ASSY, attach the white film, referring to the illustration given on page IV-10.

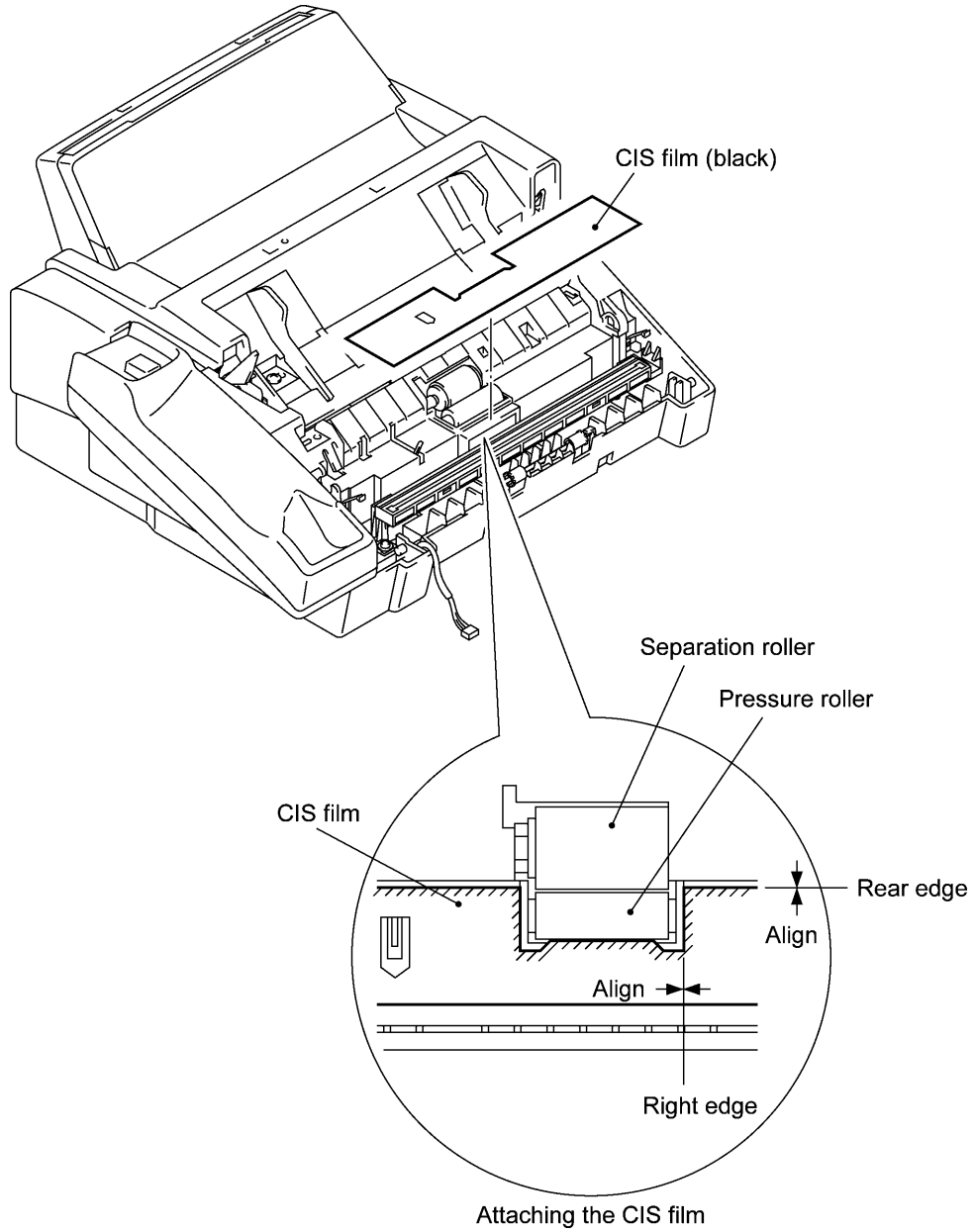
#### 1.4 LF Roller ASSY and CIS Unit

- (1) Take off the LF leaf spring by removing the screw.
- (2) Push the arm rib to the rear and shift the LF roller ASSY to the left. The bearing also comes off.

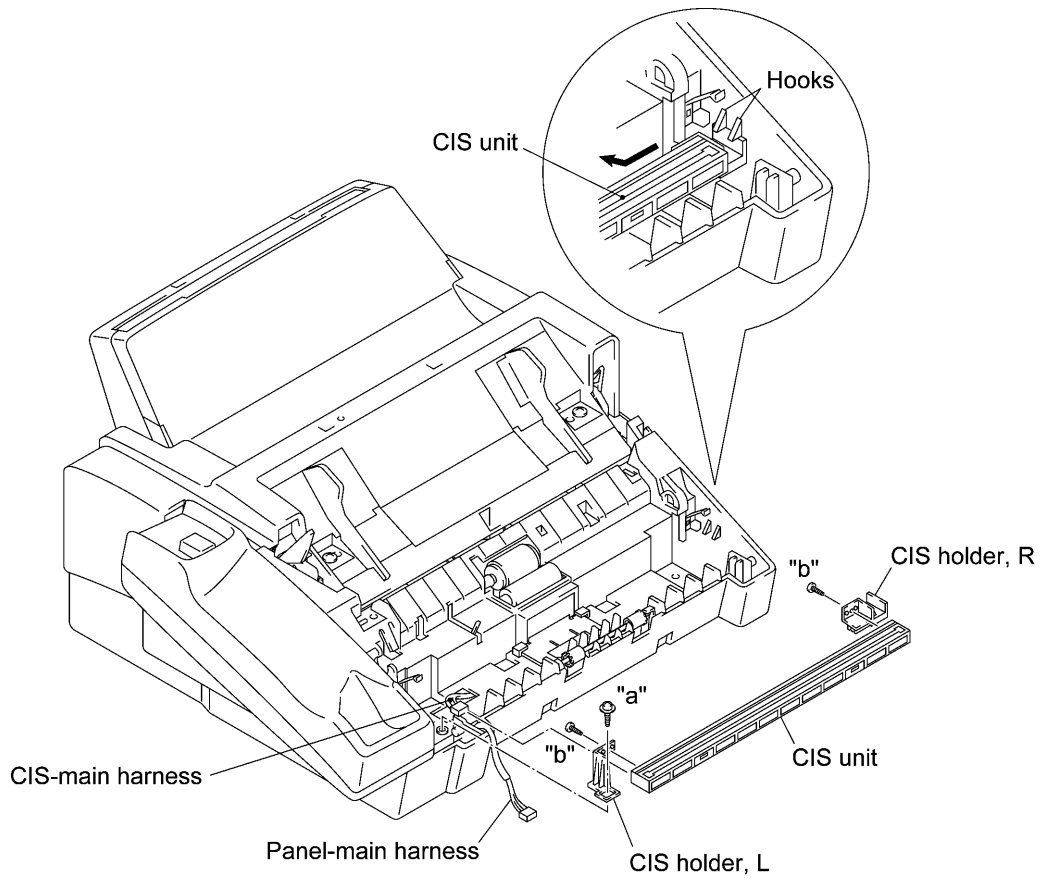


(3) Peel off the black CIS film.

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

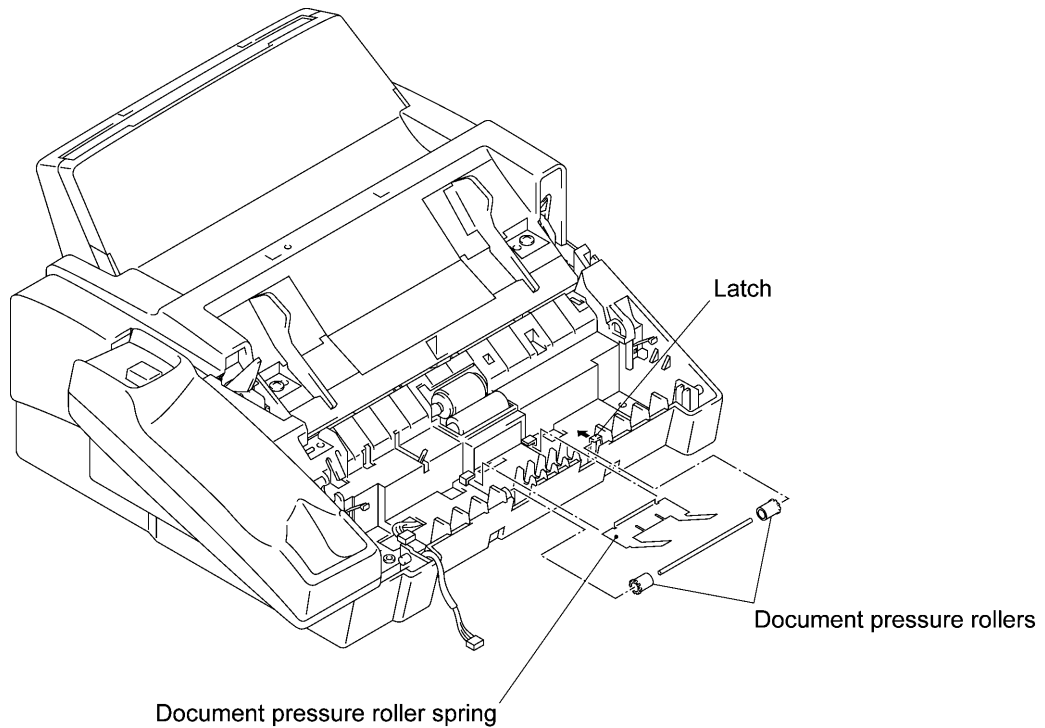


- (4) Remove screw "a" from the CIS holder L.
- (5) Lift up the left end of the CIS unit slightly and disengage the CIS holder R from the hooks provided of the main frame.
- (6) Disconnect the CIS-main harness.
- (7) Take off the CIS holders L and R by removing screws "b."





- (8) Push the latch to the rear and remove the document pressure rollers and their shaft.
- (9) Remove the document pressure roller spring.

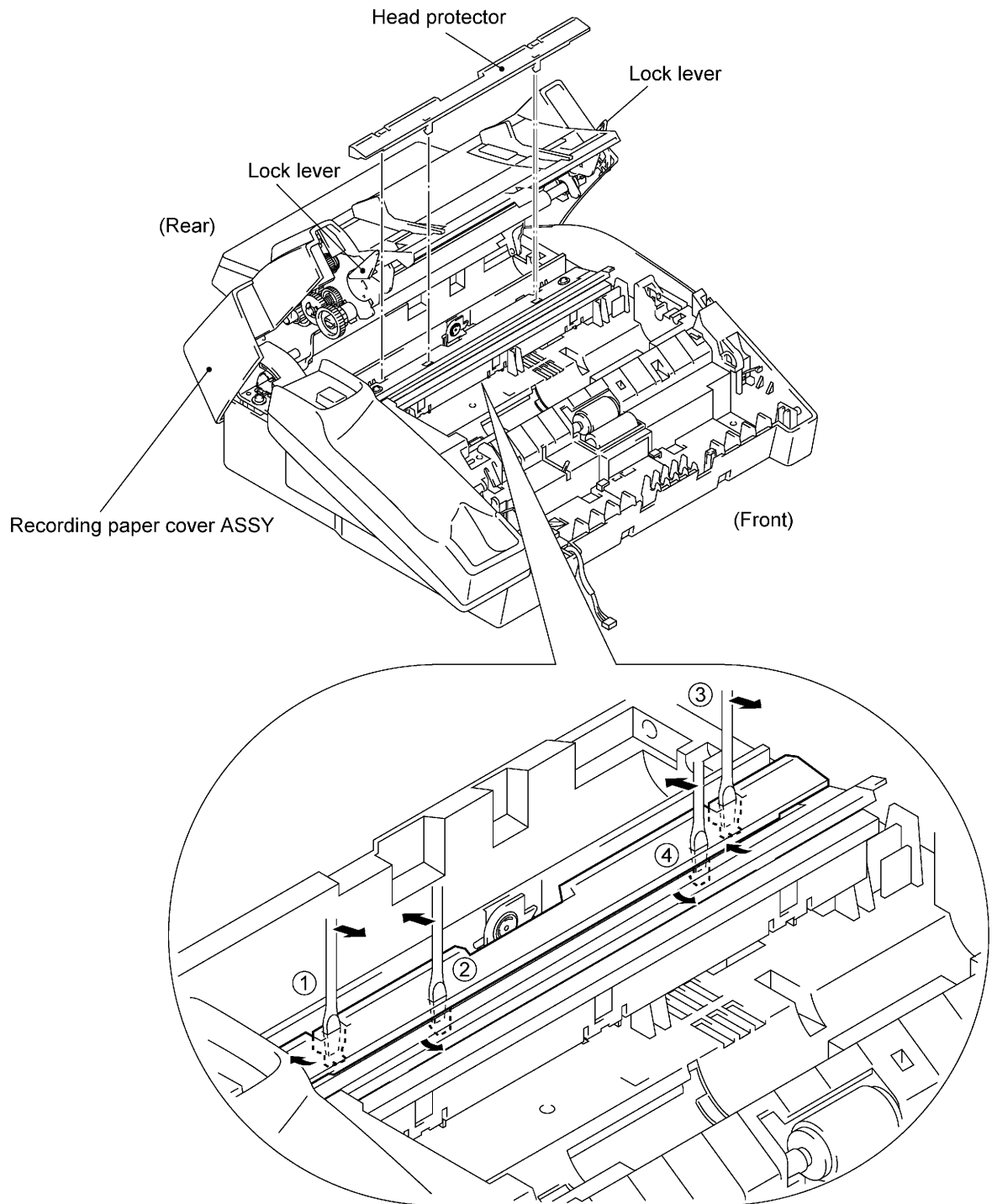


#### **n Reassembling Notes**

- When attaching the CIS film, align its right and rear edges with the cutout provided in the main frame, as illustrated on page IV-15.
- Before reinstalling the LF roller ASSY, apply grease to the left end of the ASSY. (Refer to Section 2, "LUBRICATION.")

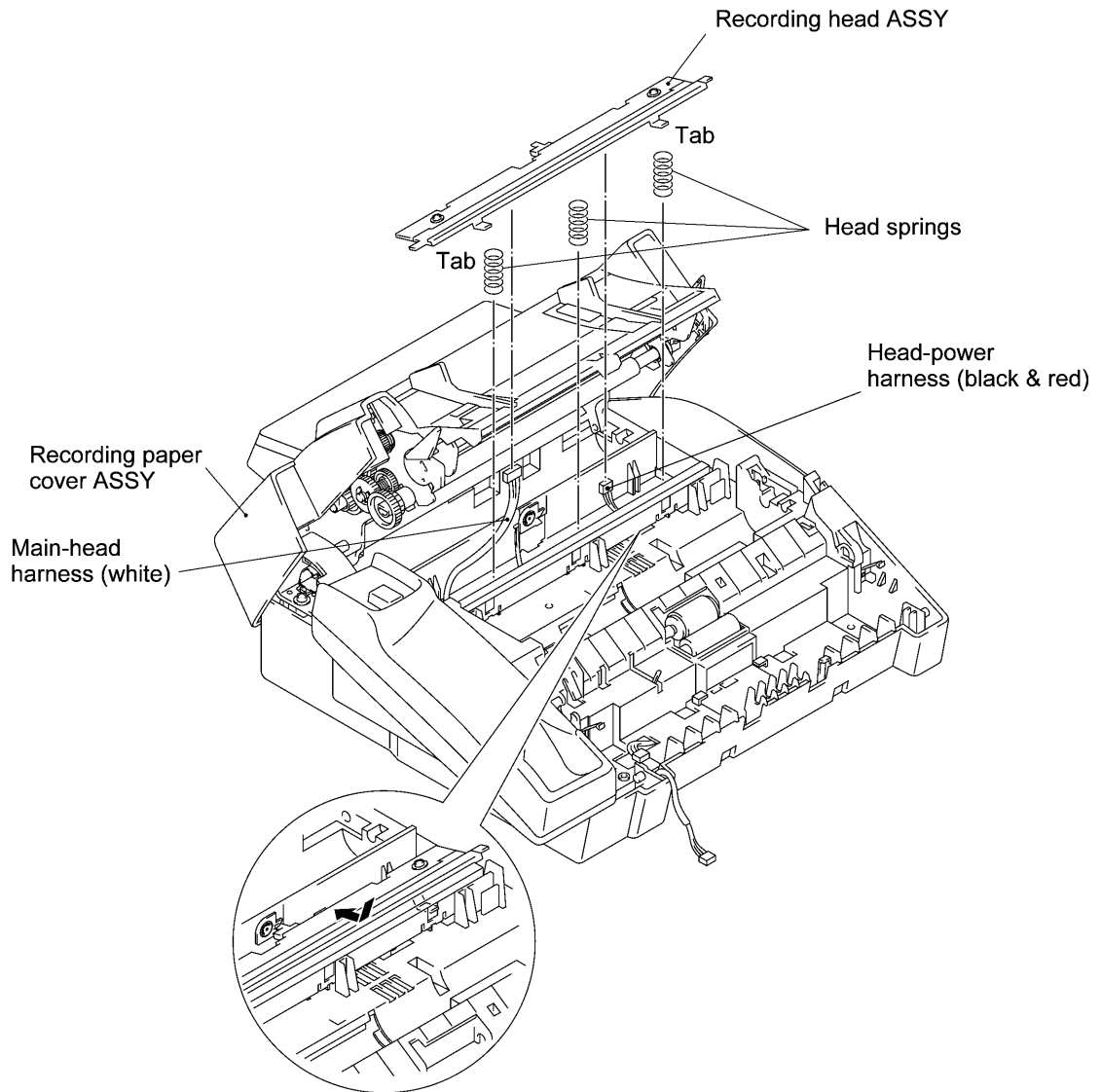
## 1.5 Head Protector, Recording Head ASSY, Head Adjuster, and Recorder Frame

- (1) Pull up the lock levers and open the recording paper cover ASSY to the rear.
- (2) While pulling up the left end of the head protector, unhook latches through „, in this order with a small flat screwdriver as illustrated below.



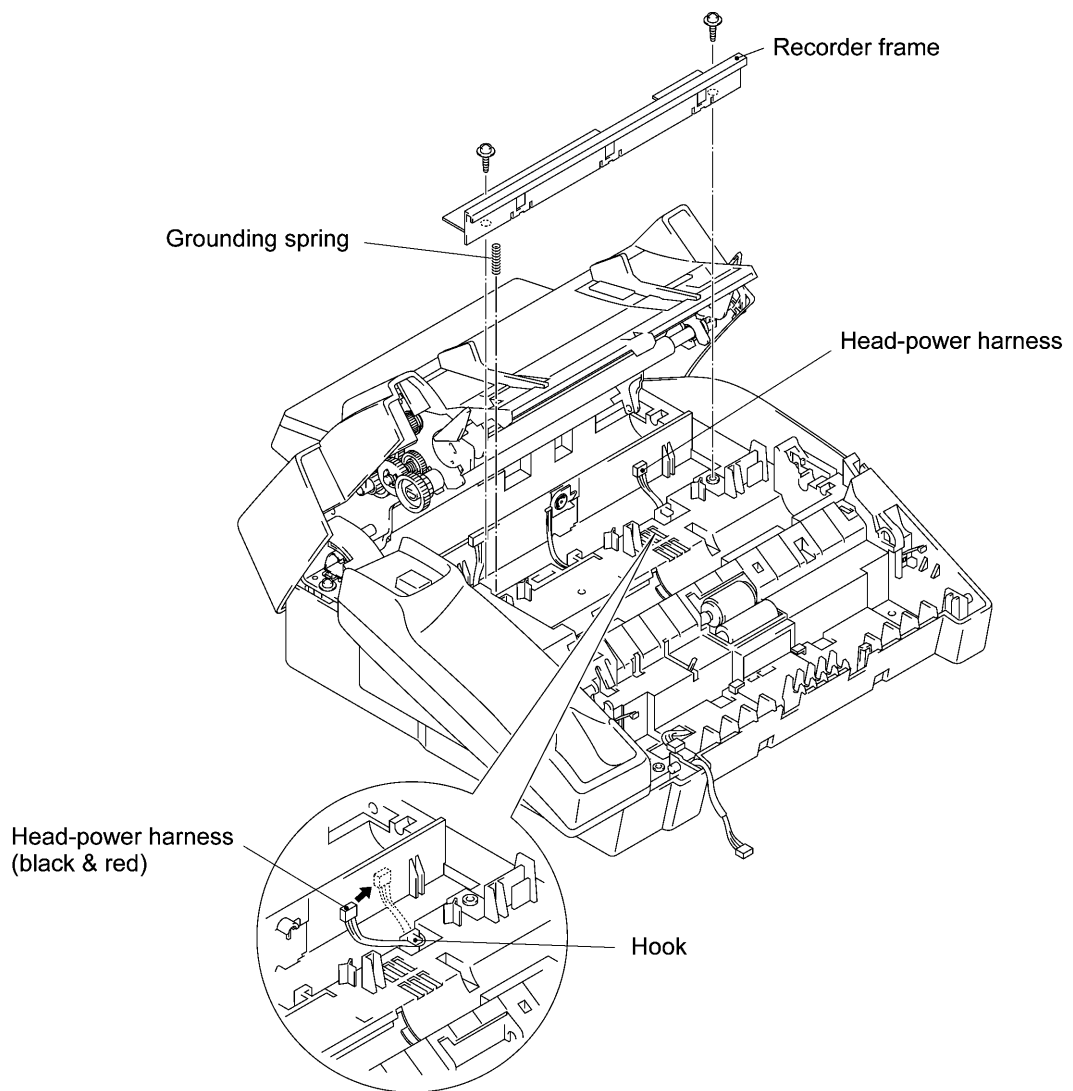
Unhooking the latches of the head protector

- (3) Push down both ends of the recording head ASSY and move it to the rear to release the tabs from the cutouts provided in the recorder frame.
- (4) Disconnect the two harnesses (main-head harness and head-power harness) from the recording head ASSY and then lift up the ASSY.
- (5) Remove the three head springs.



Installing the recording head ASSY

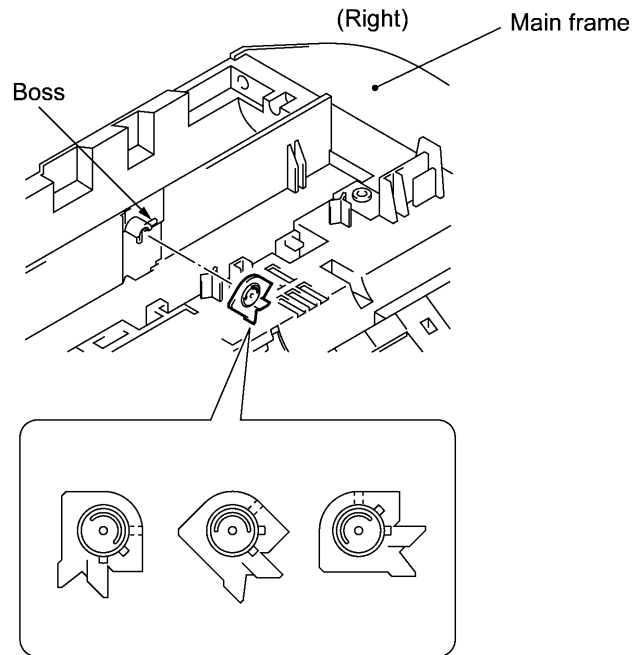
- (6) Take off the recorder frame by removing the two screws.
- (7) Remove the grounding spring.
- (8) Take out the head-power harness from the hook provided on the main frame.



- (9) To replace the main frame with a new one, first check to see which position the head adjuster is currently set in (see the three positions in the illustration below), and then remove the head adjuster with a flat screwdriver. Next set it to the new main frame in the same position.

If the printed image is abnormally light or dark, remove the head adjuster and set it back in any other position.

**NOTE:** Do not access the head adjuster unless necessary.



Three positions of head adjuster

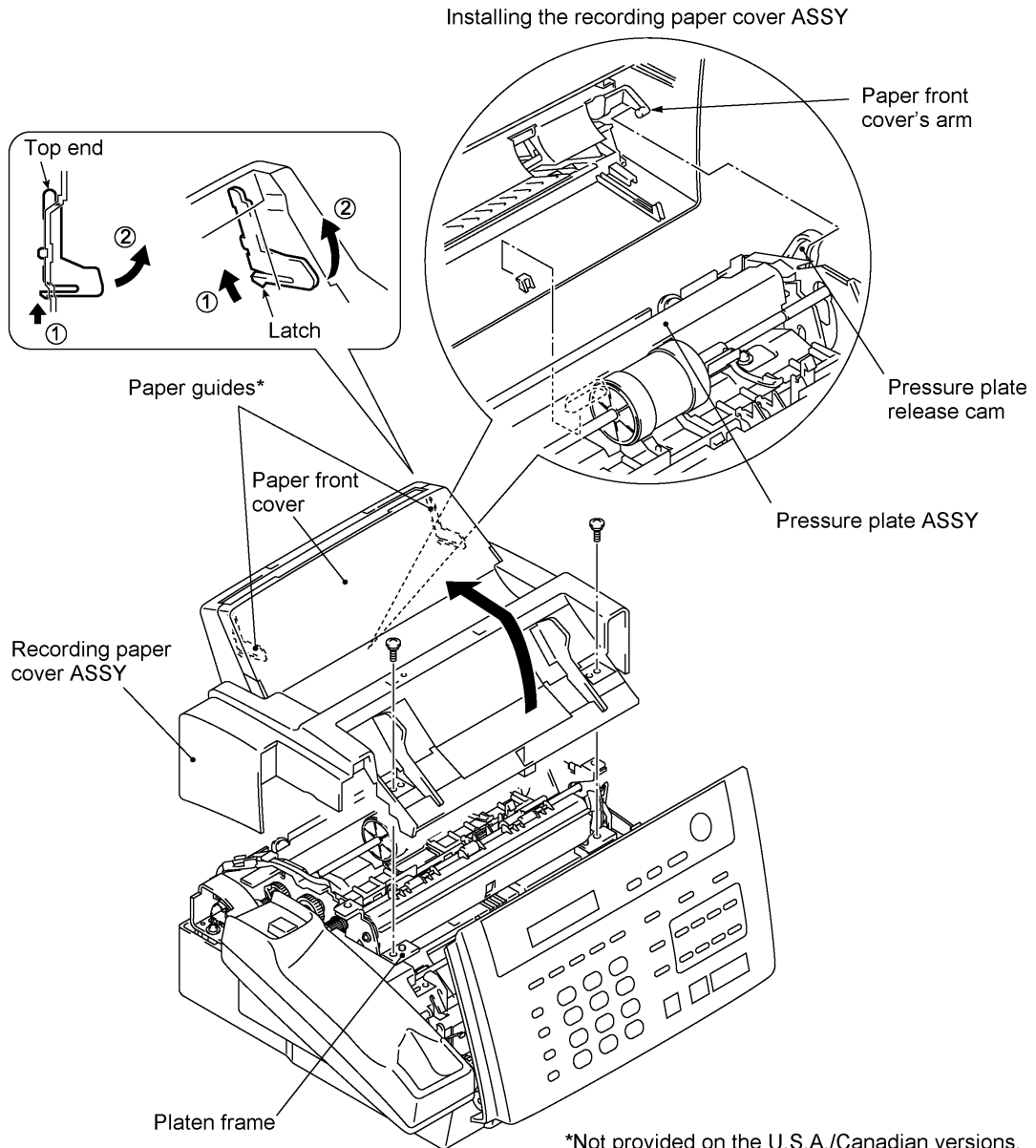
#### **n Reassembling Notes**

- Before reinstalling the recorder frame, check its top end (on which paper and ribbon pass) for scratches or burrs. Those on the top end will affect the printed image.
- When reinstalling the recording head ASSY, make sure that the three head springs are set into place.

## 1.6 Recording Paper Cover ASSY and Paper Guides\*

(\*Not provided on the U.S.A. and Canadian versions.)

- (1) To remove the paper guides\*, open the paper front cover towards you, then pull up the latch (in the direction of arrow • in the illustration below) and pull the paper guide in the direction of arrow , .
- (2) Remove the two screws.
- (3) Lift up the front of the recording paper cover ASSY and take it out to the rear.



\*Not provided on the U.S.A./Canadian versions.

### n Reassembling Notes

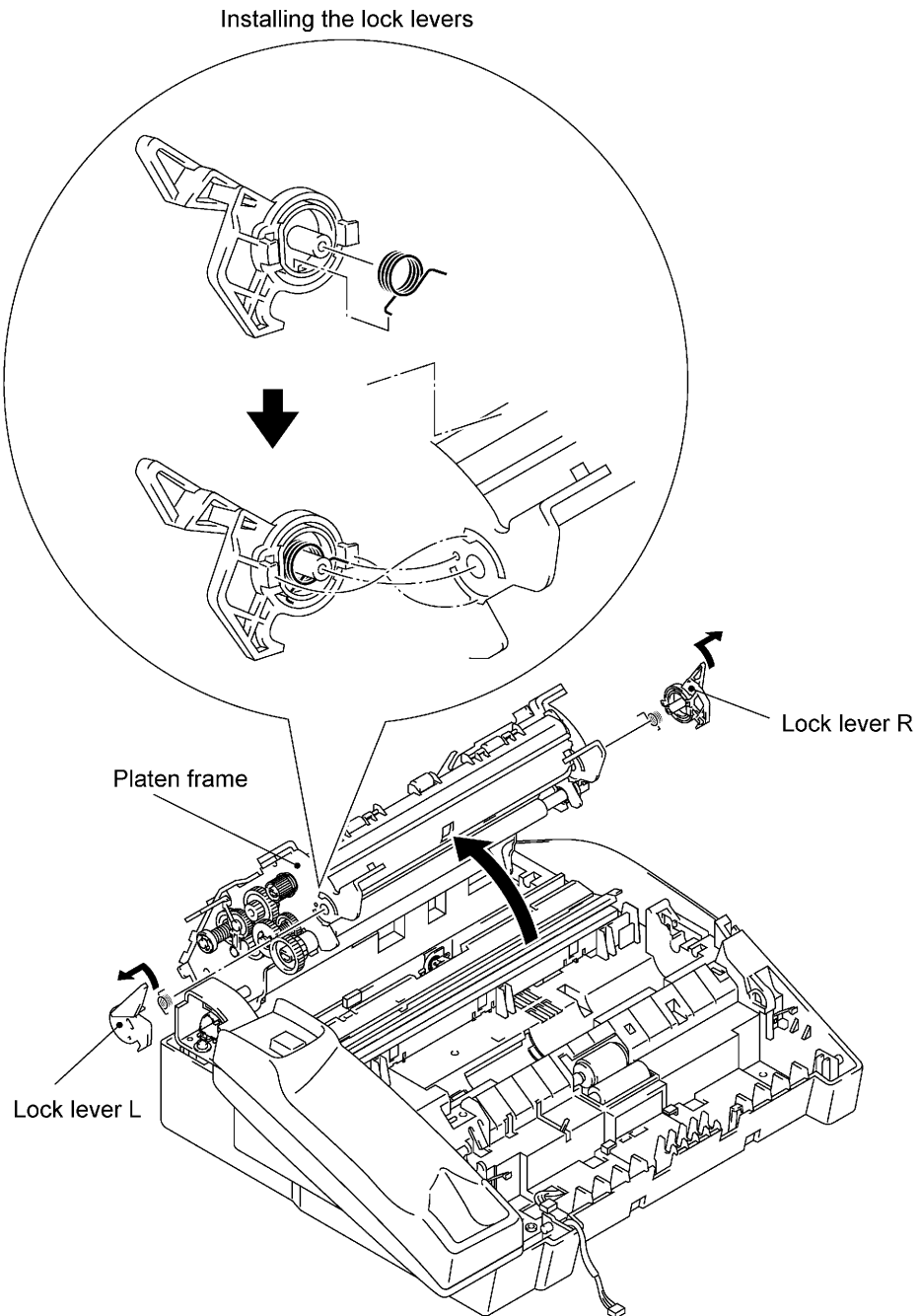
- To reinstall the paper guides\*, first insert its top end and then push the guide into place.
- When reinstalling the recording paper cover ASSY, slightly slant it to the right and hook the paper front cover's arm onto the pressure plate release cam as shown above while keeping the paper front cover closed, then put the ASSY onto the platen frame.

After installation, open and close the paper front cover to check that the paper front cover is interlocked with the pressure plate ASSY.

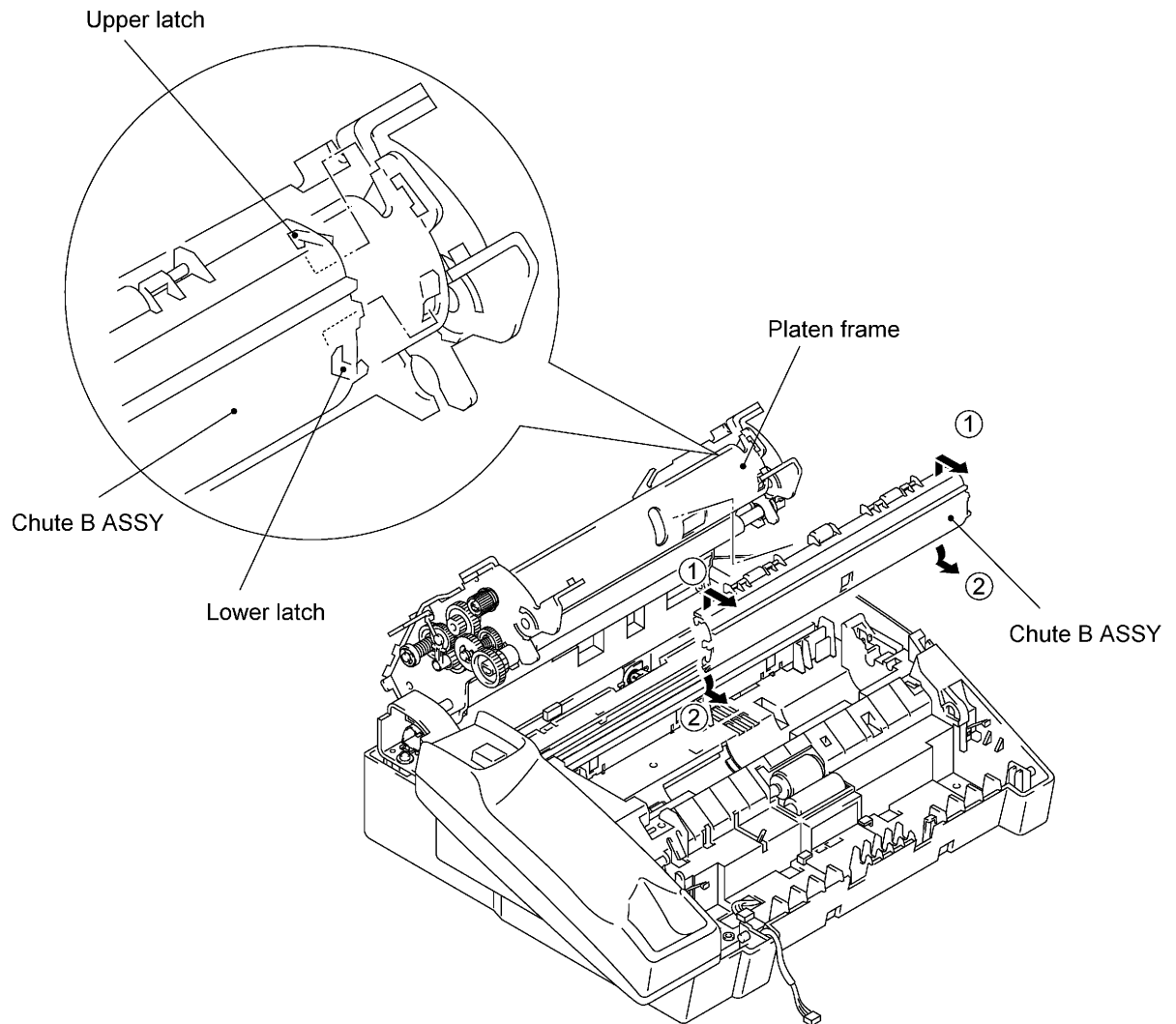
## 1.7 Lock Levers, Chute B ASSY, Gears, Paper Ejection Roller, Paper Feed Roller ASSY, Pressure Plate, Paper Feed Chute and Other Components on the Platen Frame

With the platen frame being secured to the main frame, you can remove and install the components given in this section. To remove the platen frame itself, see Section 1.8.

- (1) Open the platen frame ASSY.
- (2) Turn the lock levers R and L to the rear and pull them out.

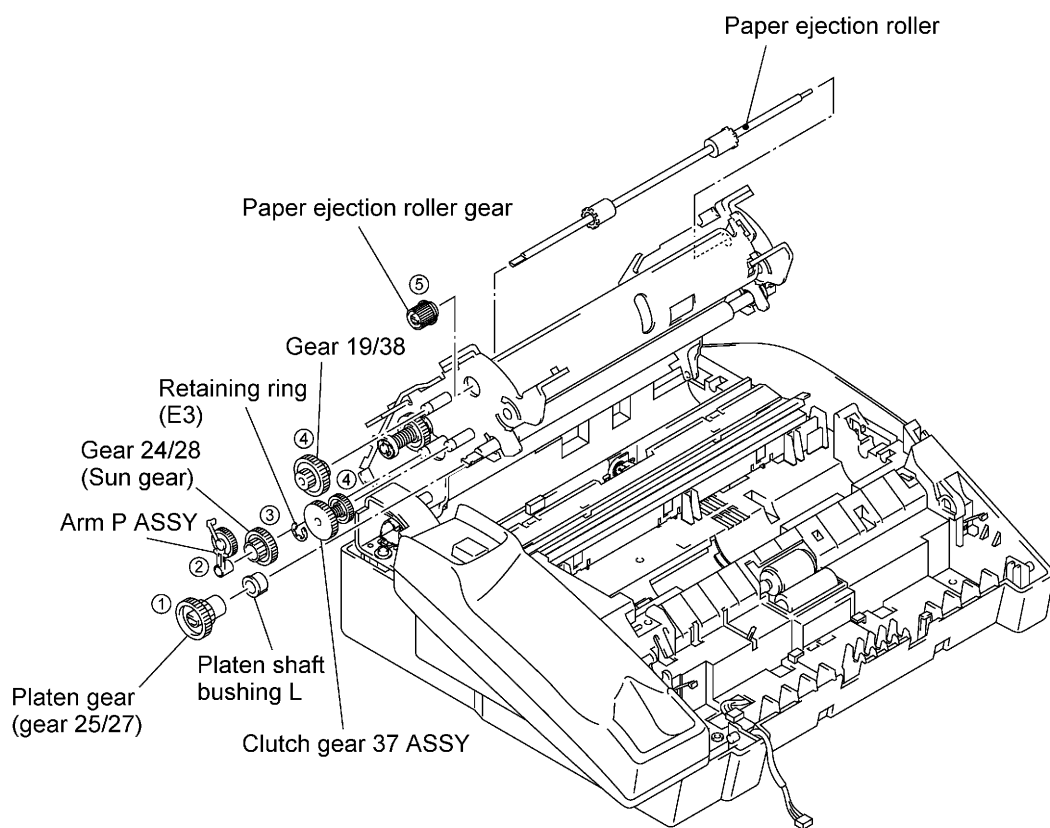


- (3) Pull the chute B ASSY up and towards you to unhook the upper latches from the platen frame, then pull the ASSY down and towards you to unhook the lower latches.



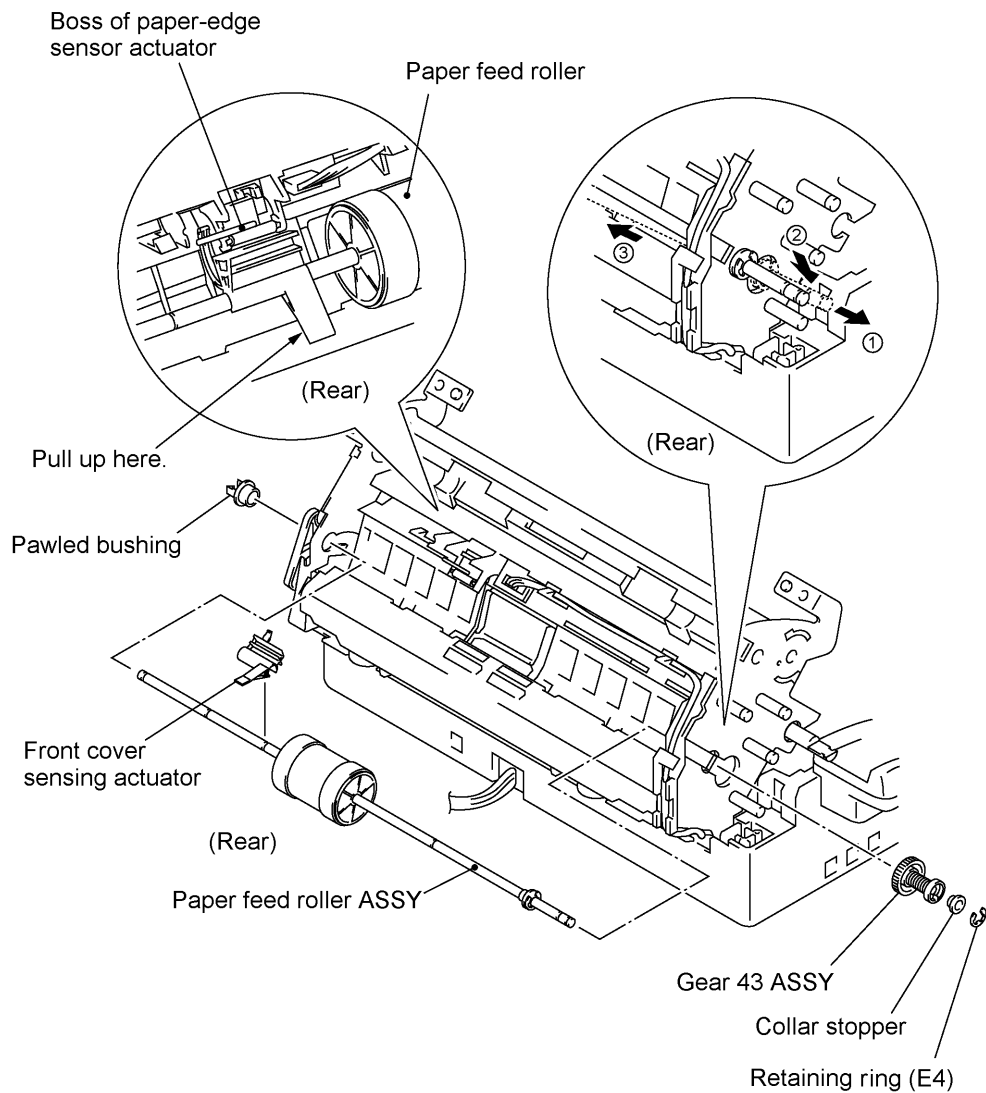


- (4) At the left end of the platen frame, remove the gears in the following order:
- Platen gear (gear 25/27) by pulling its pawl outwards. (Also remove the black platen shaft bushing L.)
  - Arm P ASSY by pulling its pawl outwards.
  - Gear 24/28 (sun gear)
  - Clutch gear 37 ASSY by removing the retaining ring, together with gear 19/38
  - Paper ejection roller gear
- NOTE:** The platen shaft bushing is greased for antistatic purpose. Take care not to stain other parts with the grease.
- (5) Remove the paper ejection roller.



- (6) Remove the front cover sensing actuator from the paper feed roller shaft by pulling up the actuator's rear edge as shown below.
- (7) At the right end of the paper feed roller ASSY (when viewed from the rear), remove the collar stopper and gear 43 ASSY by removing the retaining ring.
- (8) At the left end (when viewed from the rear), remove the pawled bushing by pulling its pawls outwards.

Next, pull the paper feed roller shaft to the right until the left end of the shaft comes out of the platen frame and then tilt the shaft to the right so that the bushing-fixed end can pass through the lower hole, and take it out to the left.

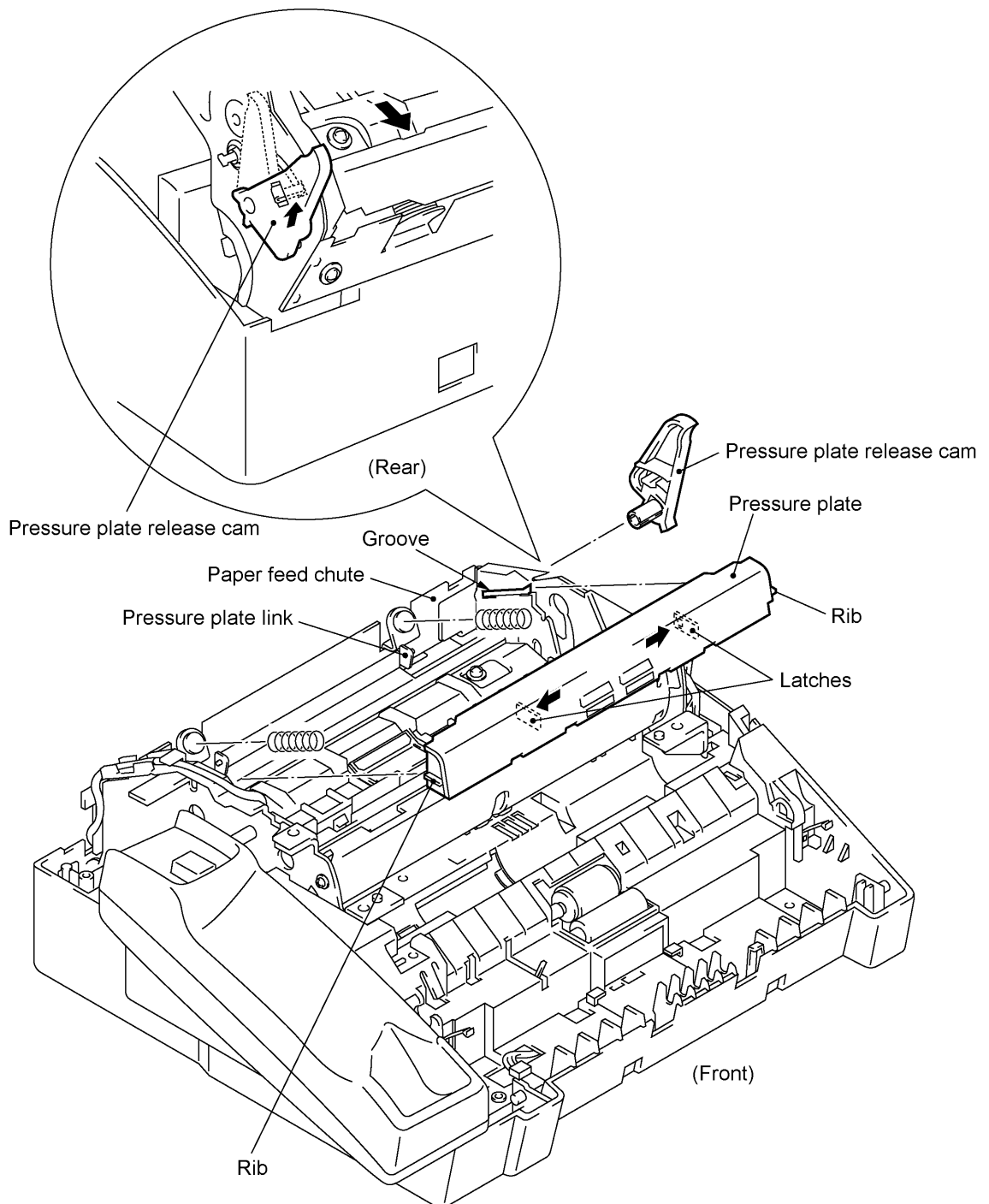


(9) Make sure that the platen is set in place, and then close the platen frame ASSY.

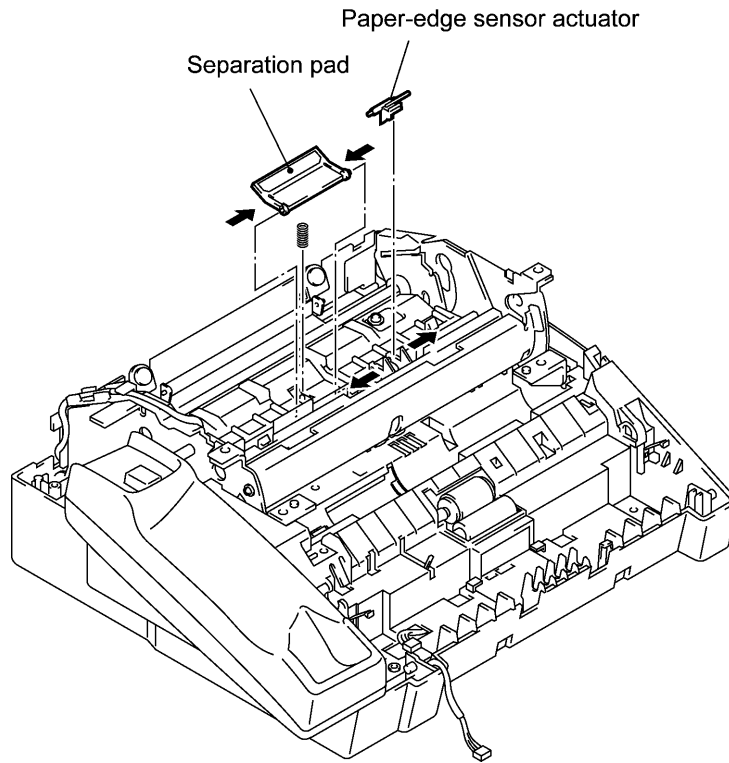
**NOTE:** If you close the platen frame ASSY when no platen is set and the recording head ASSY is installed, the platen frame ASSY and the recording head ASSY will be locked together.

(10) Fully turn the pressure plate release cam to the rear and pull it up and outwards to unhook from the platen frame.

(11) Pull the latches provided on the pressure plate outwards and lift it up. The two springs also come off.



- (12) Pull up the separation pad while squeezing it. The spring also comes off.
- (13) Remove the paper-edge sensor actuator by pulling the support outwards.

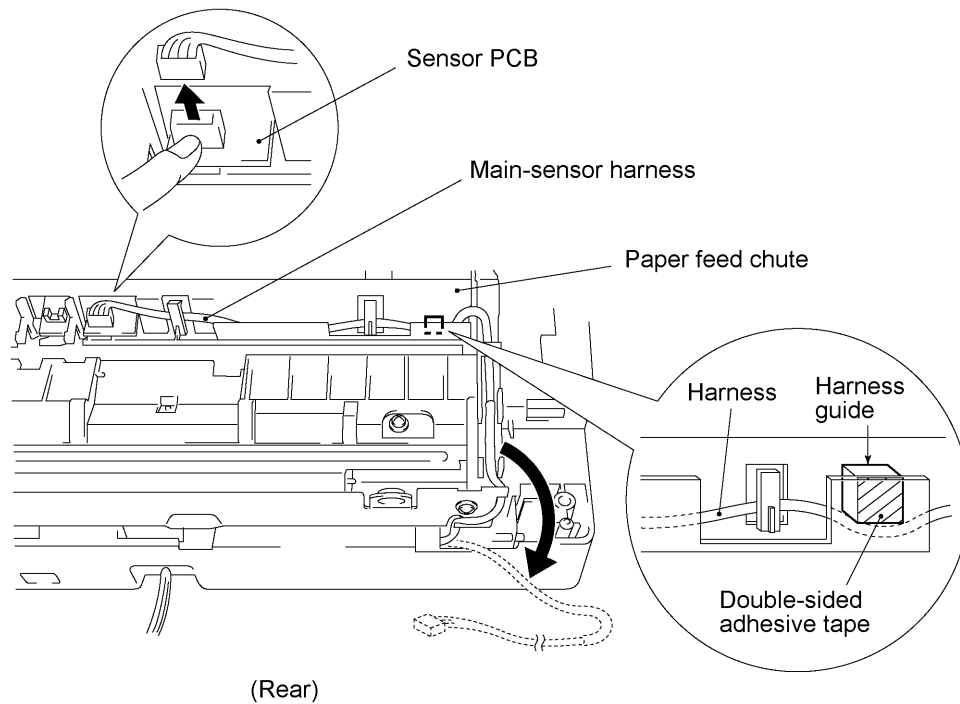


(14) To take the paper feed chute off the platen frame, do the following:

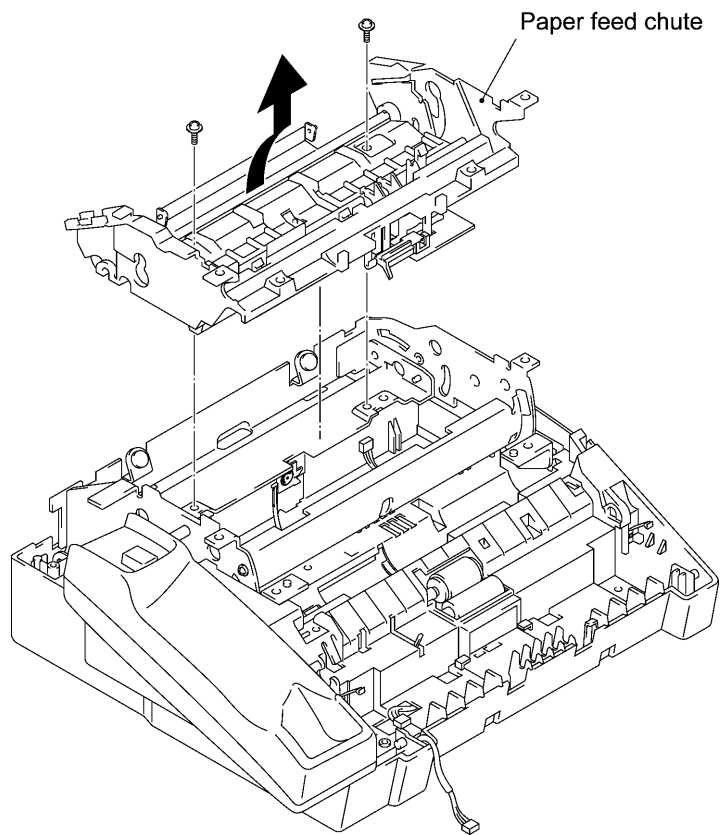
- Disconnect the main-sensor harness from the sensor PCB while pressing down the PCB with your finger, then remove the harness guide and take out the harness from the cable clamps.

**NOTE:** Pulling up the main-sensor harness without pressing down the sensor PCB will cause the PCB to work out of the paper feed chute.

**NOTE:** Once removed, the harness guide will become unusable and a new one will have to be put back in.

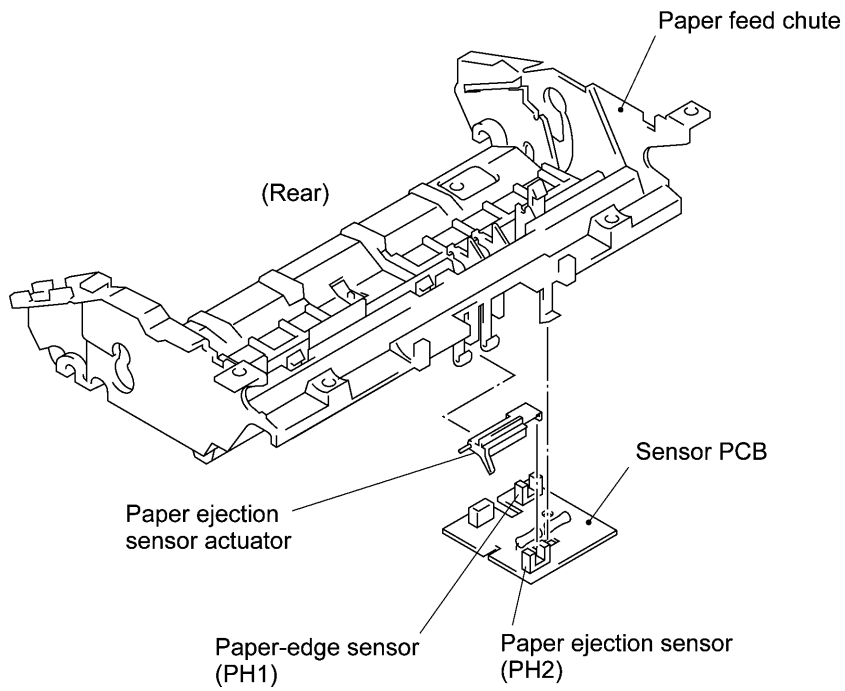
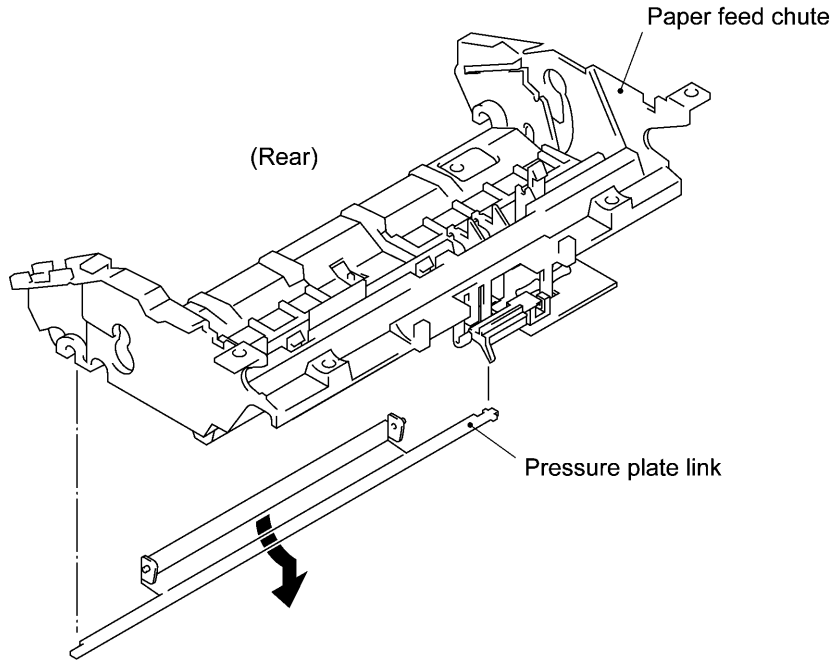


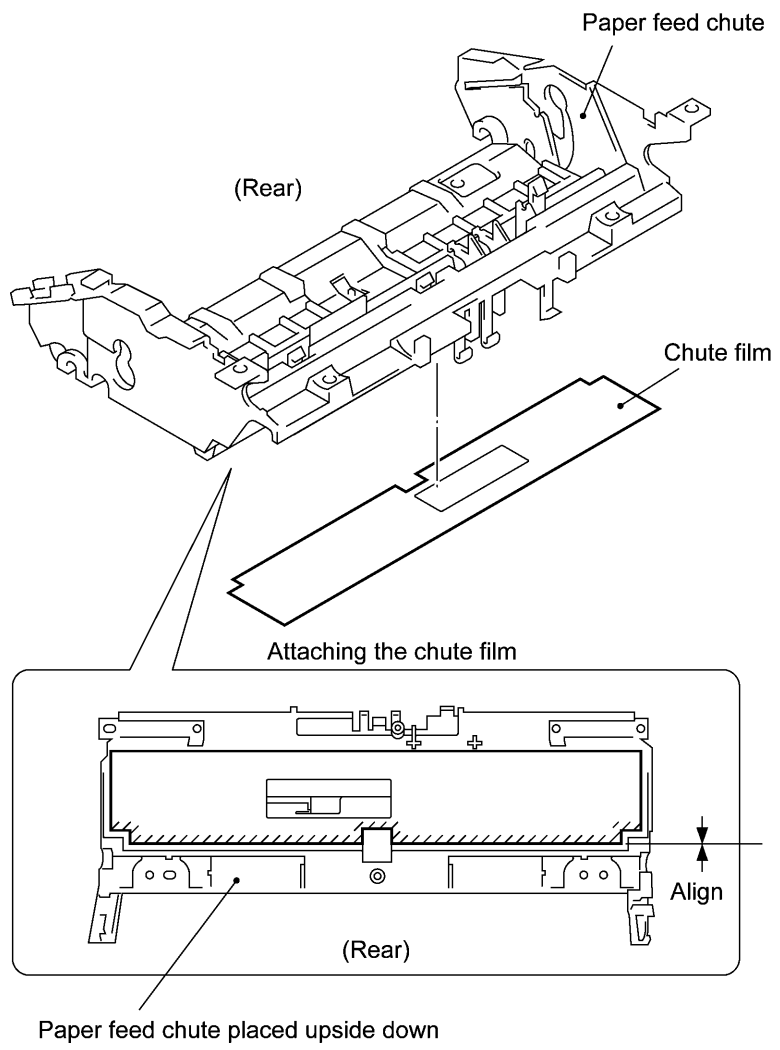
- Remove the two screws and lift up the paper feed chute.



(15) From the paper feed chute, remove the pressure plate link, paper ejection sensor actuator, sensor PCB, and chute film.

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







(16) Remove the platen as follows:

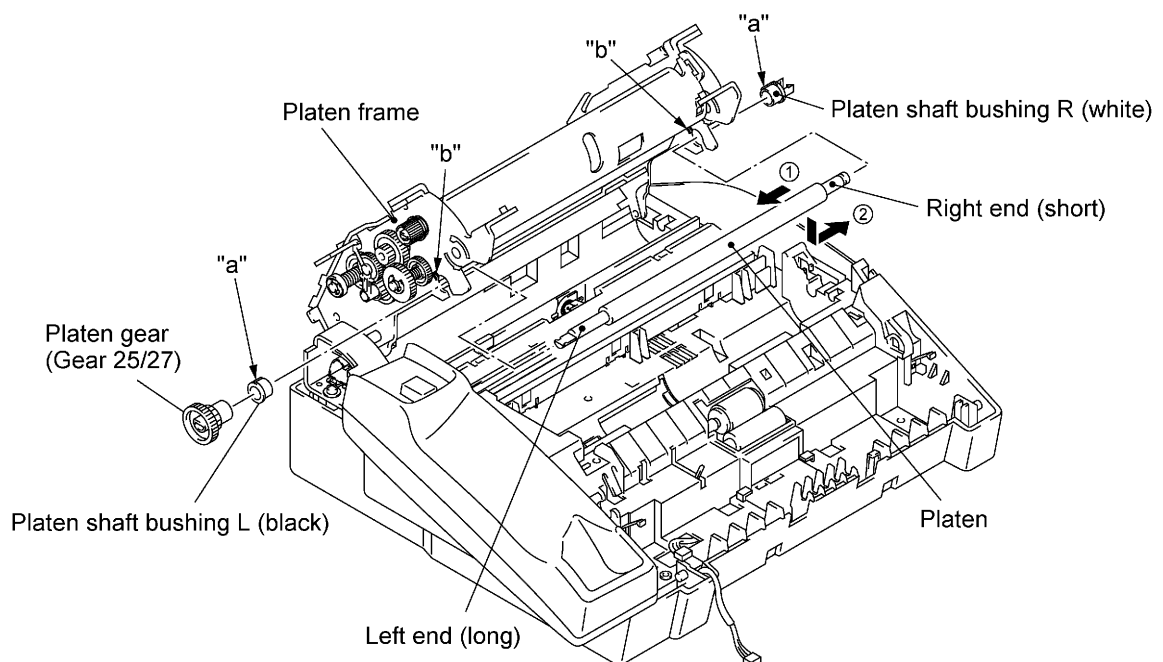
At the left end of the platen frame, remove the platen gear (gear 25/27) by pulling its pawl outwards and then remove the platen shaft bushing L.

At the right end, remove the platen shaft bushing R by pulling its pawls outwards.

Move the platen to the left to take out the right end from the platen frame and then take it out to the right.

**CAUTION:** After removing the platen, NEVER close the platen frame ASSY when the recording head ASSY is set in place. Doing so will make the cutouts of the platen frame ASSY catch the right and left ends of the recording head ASSY. The platen frame ASSY and the recording head ASSY will be locked together.

**NOTE:** The platen shaft bushings are greased for antistatic purpose. Take care not to stain other parts with the grease.



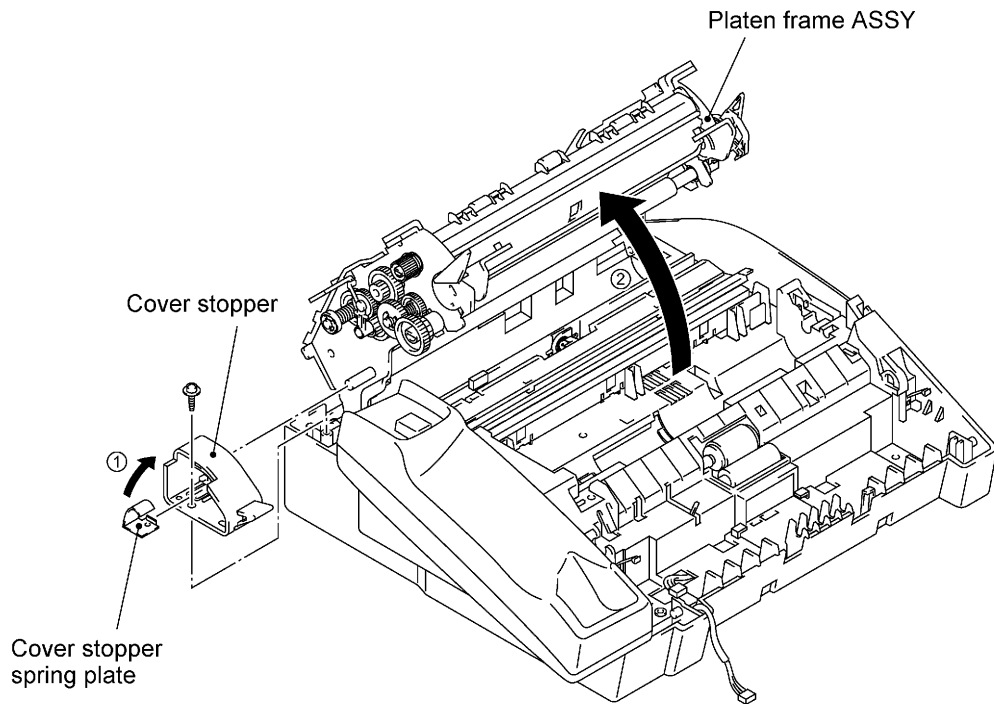
## n Reassembling Notes

- If you replace the platen shaft bushing(s) with new one(s), apply grease to it. (Refer to Section 2, "LUBRICATION.")
- When reinstalling the platen shaft bushings R and L, fit boss "a" of each bushing into cutout "b" provided in the platen frame. (See the above illustration.)
- When attaching the chute film, align its rear edge with the rib of the paper feed chute.
- When reinstalling the pressure plate, slide the ribs along the grooves of the paper feed chute until the latches of the pressure plate catch the pressure plate link.
- When setting the lock levers back into place, as shown on page IV-23, first fit the shorter end of the spring into the cutout provided in each lock lever, then fit the longer end of the spring and the lock lever's boss into the small and large holes provided in the platen frame, respectively. Fully turn the lever to the rear so that the lever's hooks catch the platen frame.

## 1.8 Cover Stopper and Platen Frame ASSY

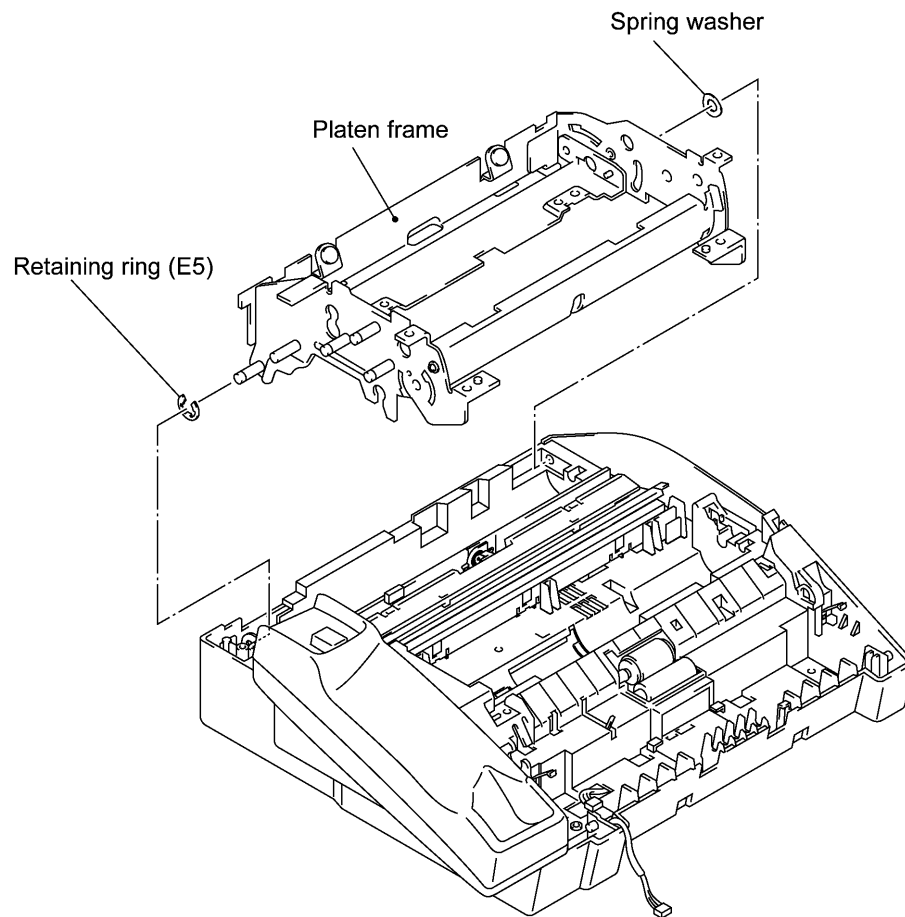
**TIP:** Only when you need to remove the platen frame from the main frame, remove the cover stopper. When accessing other components, keep the cover stopper in place for easier handling.

- (1) Remove the screw from the cover stopper.
- (2) Lift up the rear end of the cover stopper and open the platen frame ASSY to remove the cover stopper.
- (3) Take out the cover stopper spring plate.



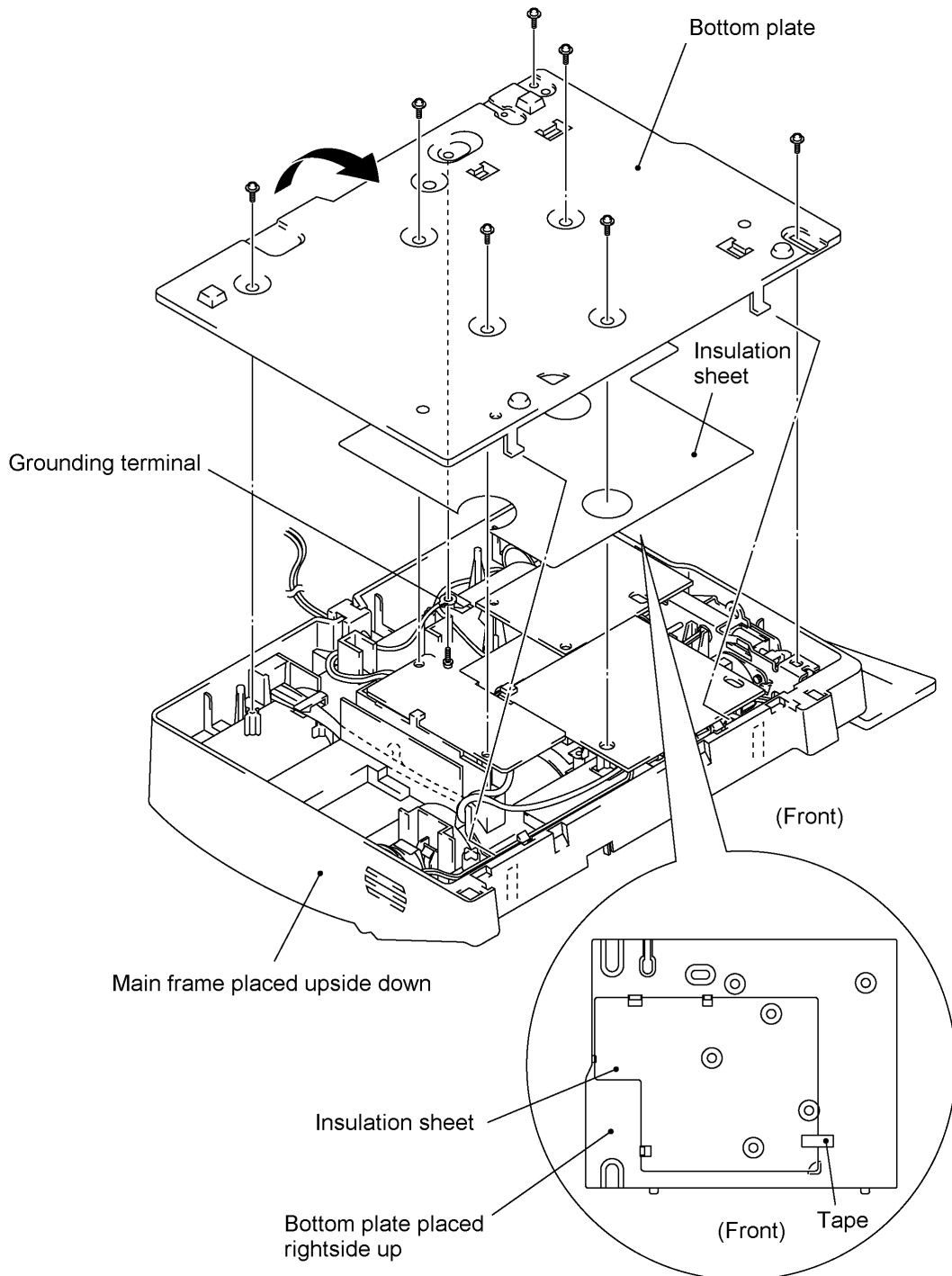
- (4) Remove the retaining ring (E5) from the left end of the platen frame and move the frame to the left. The spring washer also comes off.

**NOTE:** Take care not to drop the retaining ring inside the main frame. If you drop it, you need to remove the bottom plate to take it out.



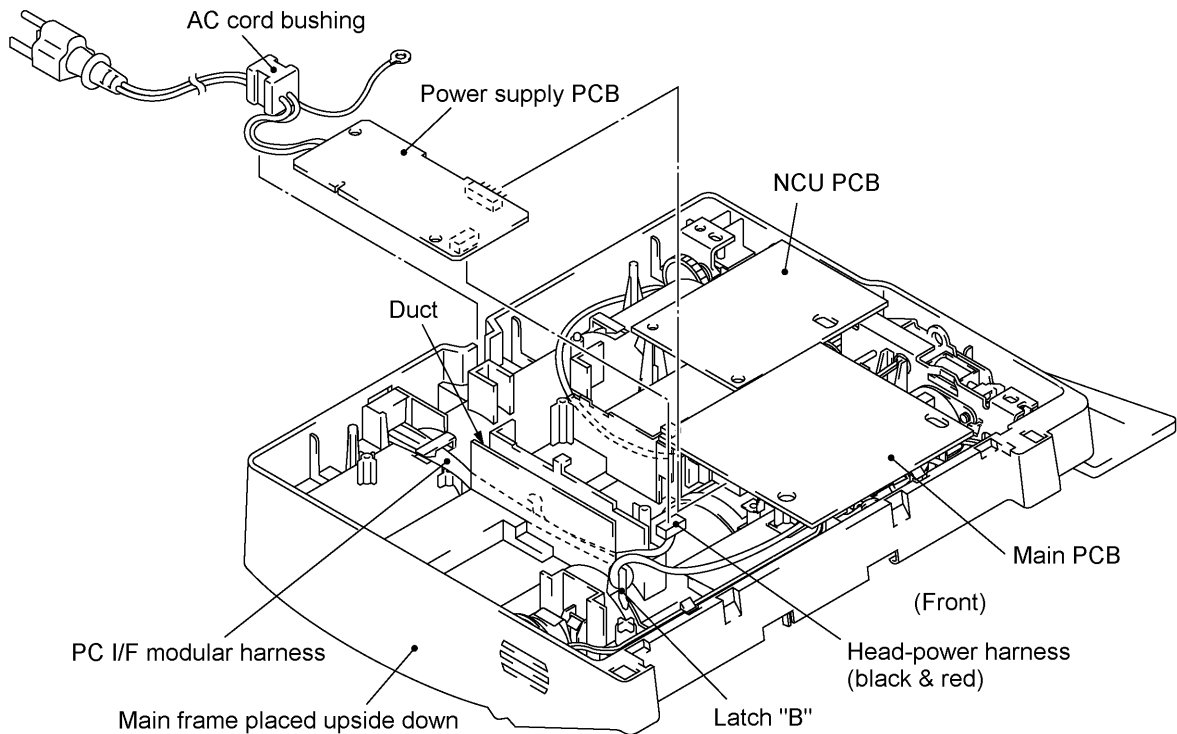
## 1.9 Bottom Plate

- (1) Place the machine upside down.
- (2) Remove the seven screws from the bottom plate.
- (3) Slightly lift up the bottom plate and disconnect the grounding terminal.
- (4) Remove the bottom plate together with the insulation sheet.



## 1.10 Power Supply PCB, Main PCB, and NCU PCB

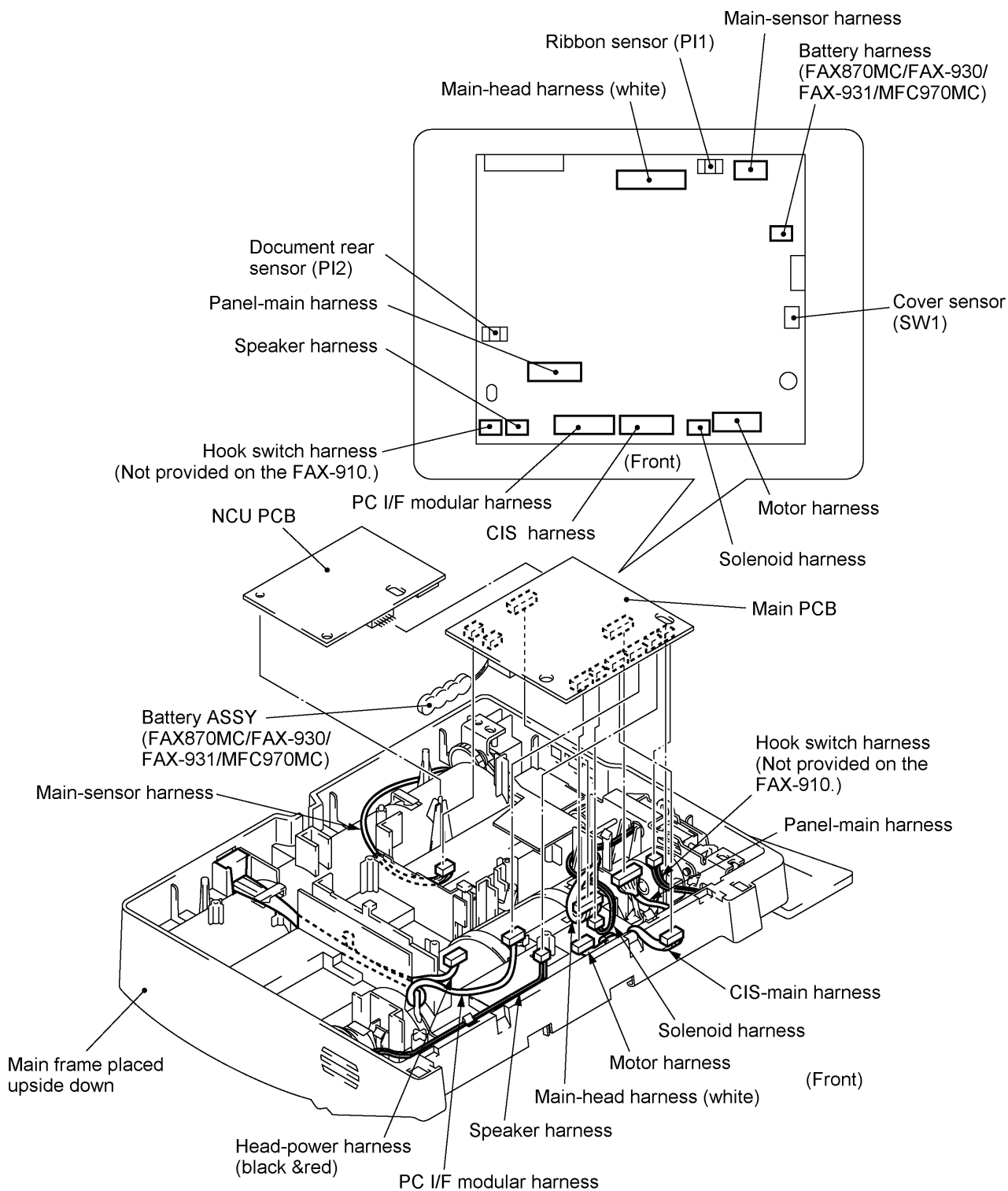
- (1) Unhook the head-power harness from latch "B" (together with the PC I/F modular harness since the head-power harness is routed under the PC I/F modular harness through the duct when viewed from the bottom).
- (2) Pull out the AC cord bushing from the main frame.
- (3) Disconnect the power supply PCB from the main PCB.
- (4) Slightly lift up the power supply PCB and disconnect the head-power harness.



- (5) Slightly lift up the main PCB and NCU PCB together, then disconnect the NCU PCB from the main PCB.
- (6) Disconnect the following nine harnesses from the main PCB:
  - Hook switch harness (Not provided on the FAX-910.)
  - Speaker harness
  - Panel-main harness
  - PC I/F modular harness
  - CIS harness
  - Solenoid harness
  - Motor harness
  - Main-head harness
  - Main-sensor harness

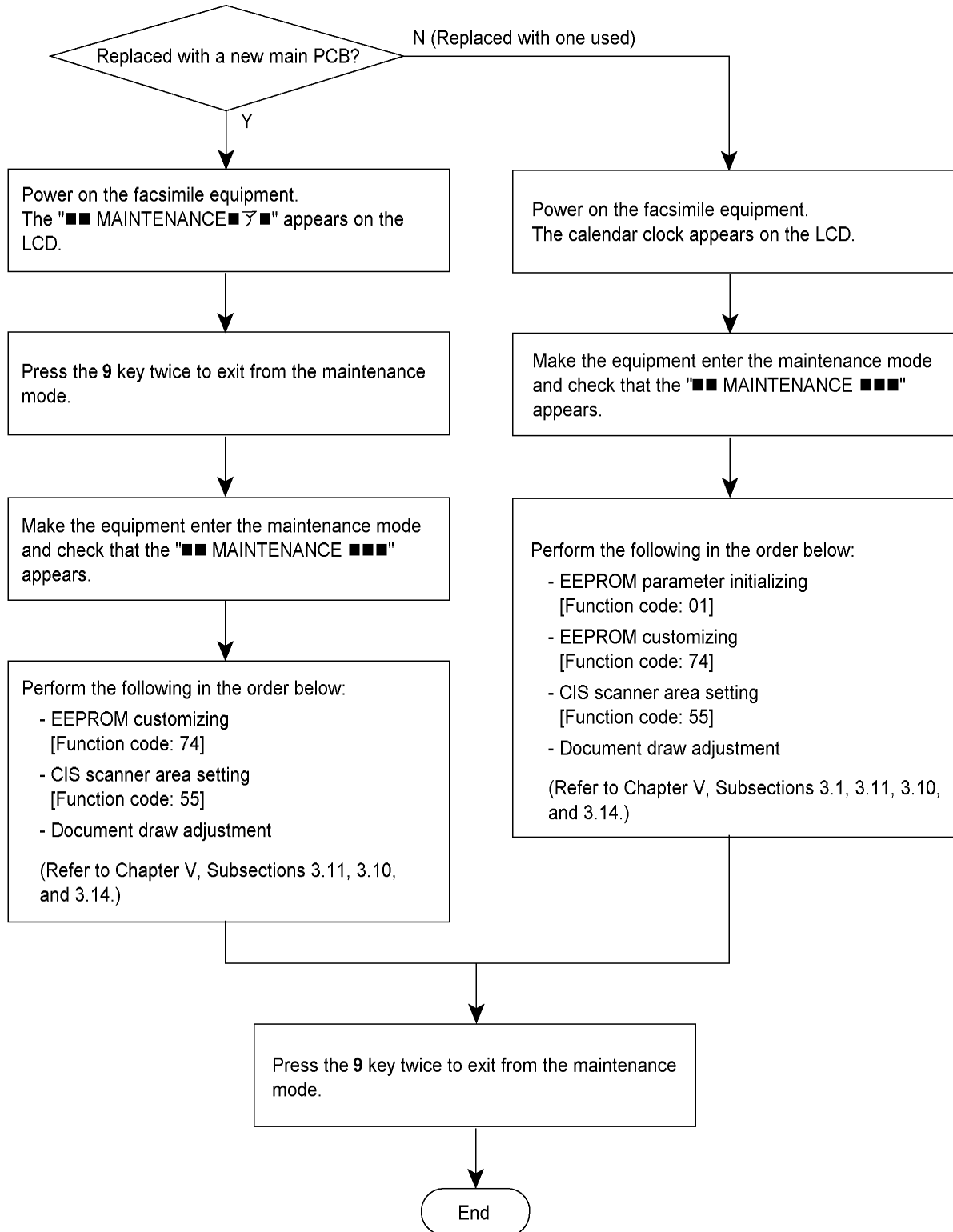
**NOTE:** The FAX870MC/FAX-930/FAX-931/MFC970MC has a Ni-MH battery ASSY. Only when you need to replace the main PCB, disconnect the battery harness. After installing a new main PCB, you may need to make settings to be stored in the RAM. If you need to replace the battery ASSY, do not disconnect the harness in this disassembly step. Doing so with the power cord unplugged will lose the settings stored in the RAM. Refer to Section 1.1.

- (7) You may take out the harnesses (except for the main-head harness that is routed under the drive unit) from the main frame.



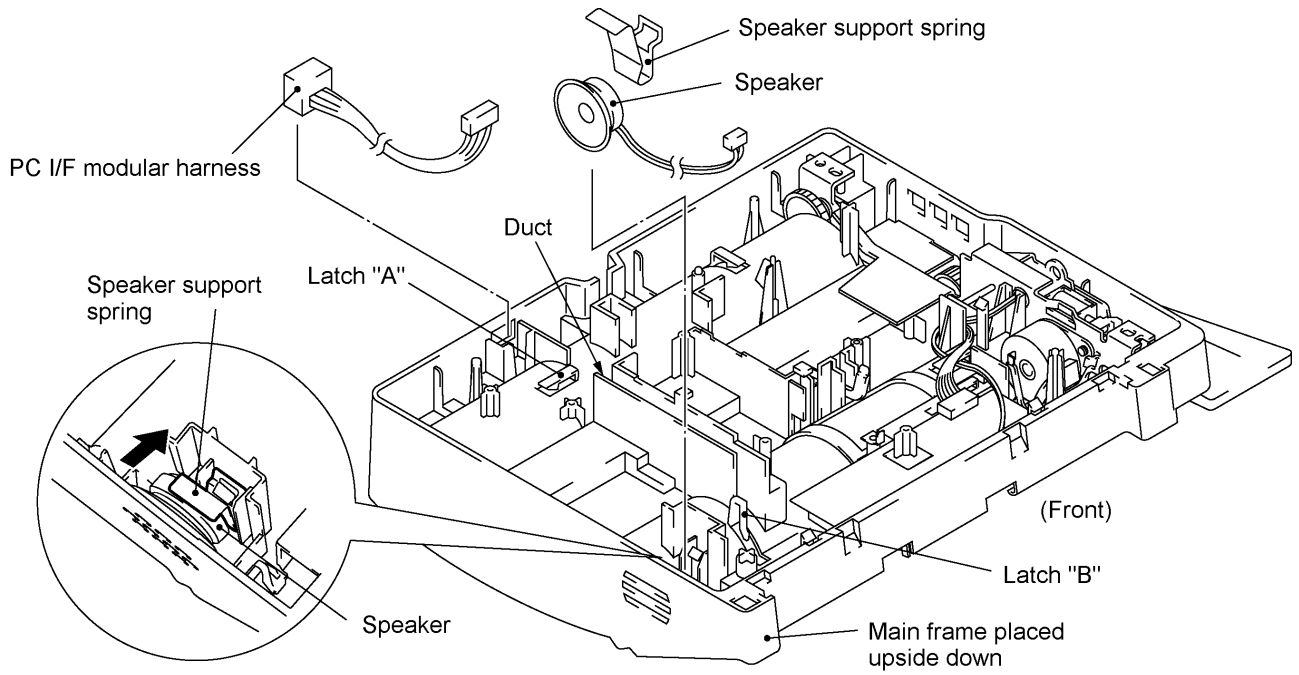
**n Reassembling Notes**

- When routing the harnesses, refer to Section 1.17.
- After you replace the main PCB, be sure to follow the flowchart given below.

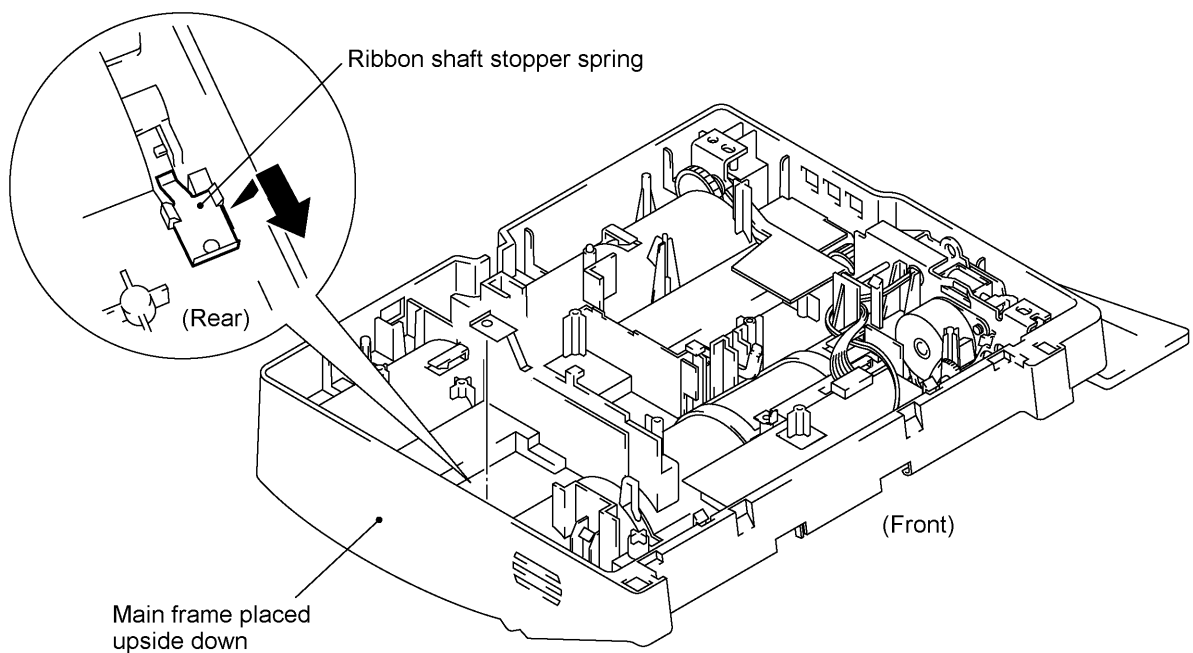


### 1.11 Speaker, PC I/F Modular ASSY, and Ribbon Shaft Stopper Spring

- (1) Pull the speaker support spring to the right and lift up the speaker. The spring also comes off.
- (2) Slightly lift up the main PCB (if mounted) and disconnect the speaker harness from the PCB.
- (3) Unhook the PC I/F modular harness (which is routed through the duct) from latches "B" and "A," and then take out the modular.
- (4) Slightly lift up the main PCB (if mounted) and disconnect the PC I/F modular harness from the PCB.



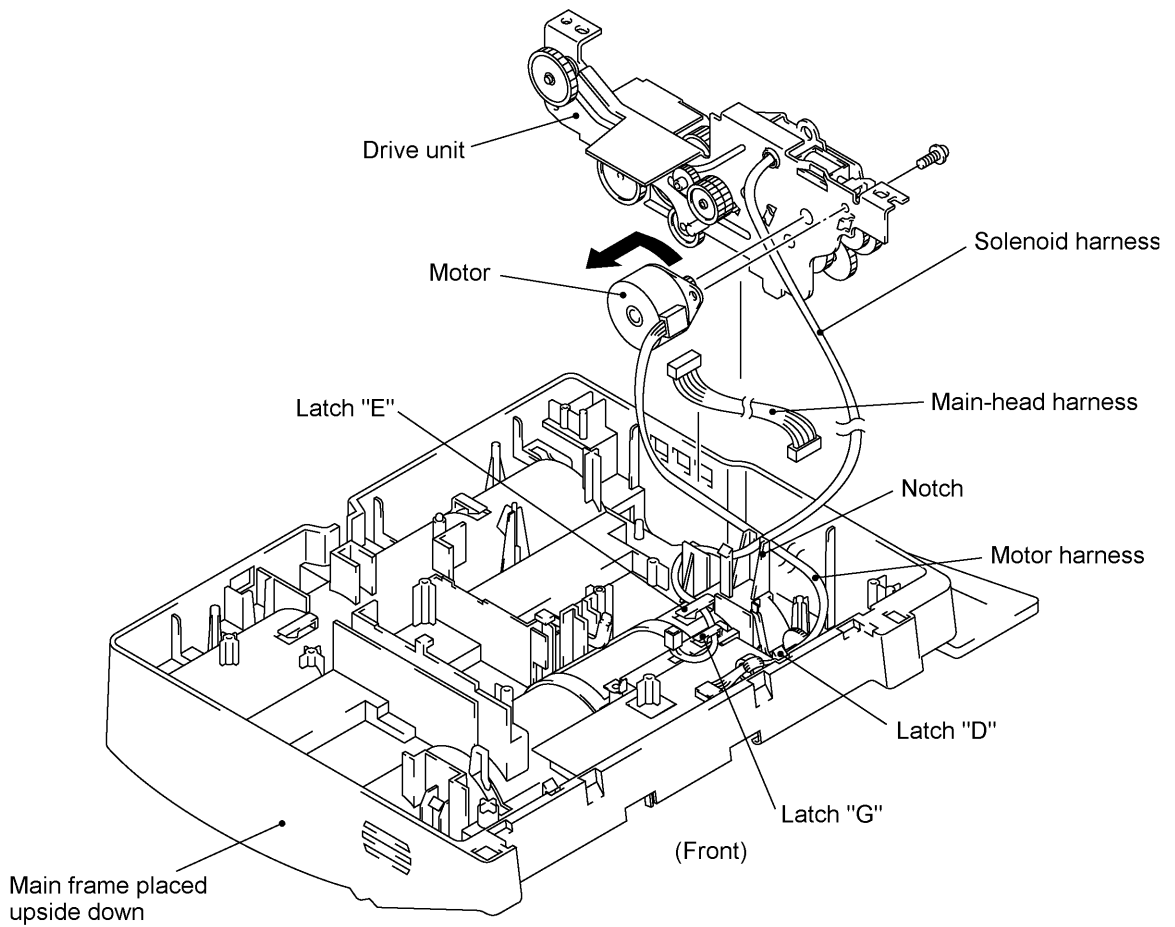
- (5) Slightly pull up the rear end of the ribbon shaft stopper spring and take it out to the rear.





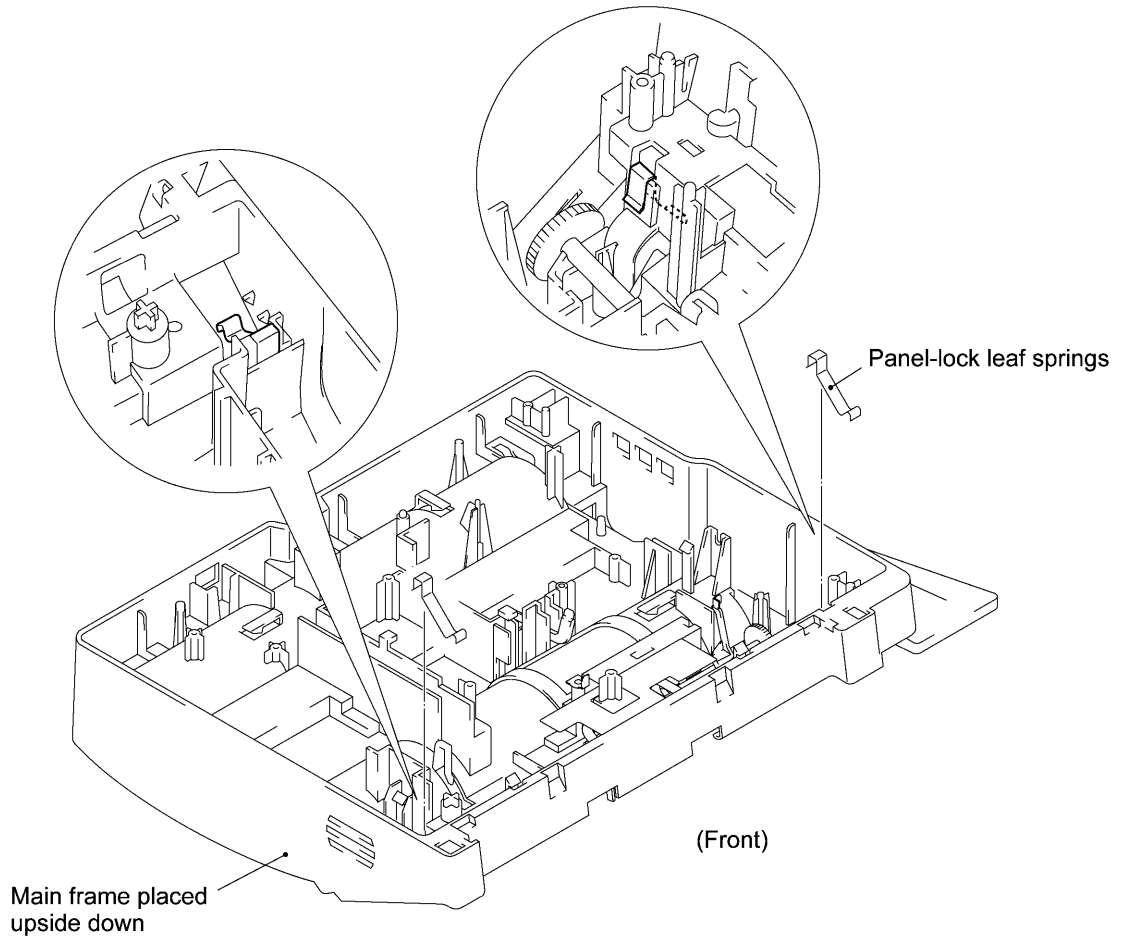
## 1.12 Drive Unit, Motor, and Main-Head Harness

- (1) Slightly lift up the main PCB (if mounted), unhook the motor harness from latch "D," and disconnect the harness from the PCB.
- (2) Slightly lift up the main PCB (if mounted), unhook the solenoid harness from latches "E" and "G" and the notch, then disconnect the harness from the PCB.
- (3) Lift up the drive unit.
- (4) Remove the motor from the drive unit by removing the screw.
- (5) Slightly lift up the main PCB (if mounted) and disconnect the main-head harness from the PCB.



### 1.13 Panel-lock Leaf Springs

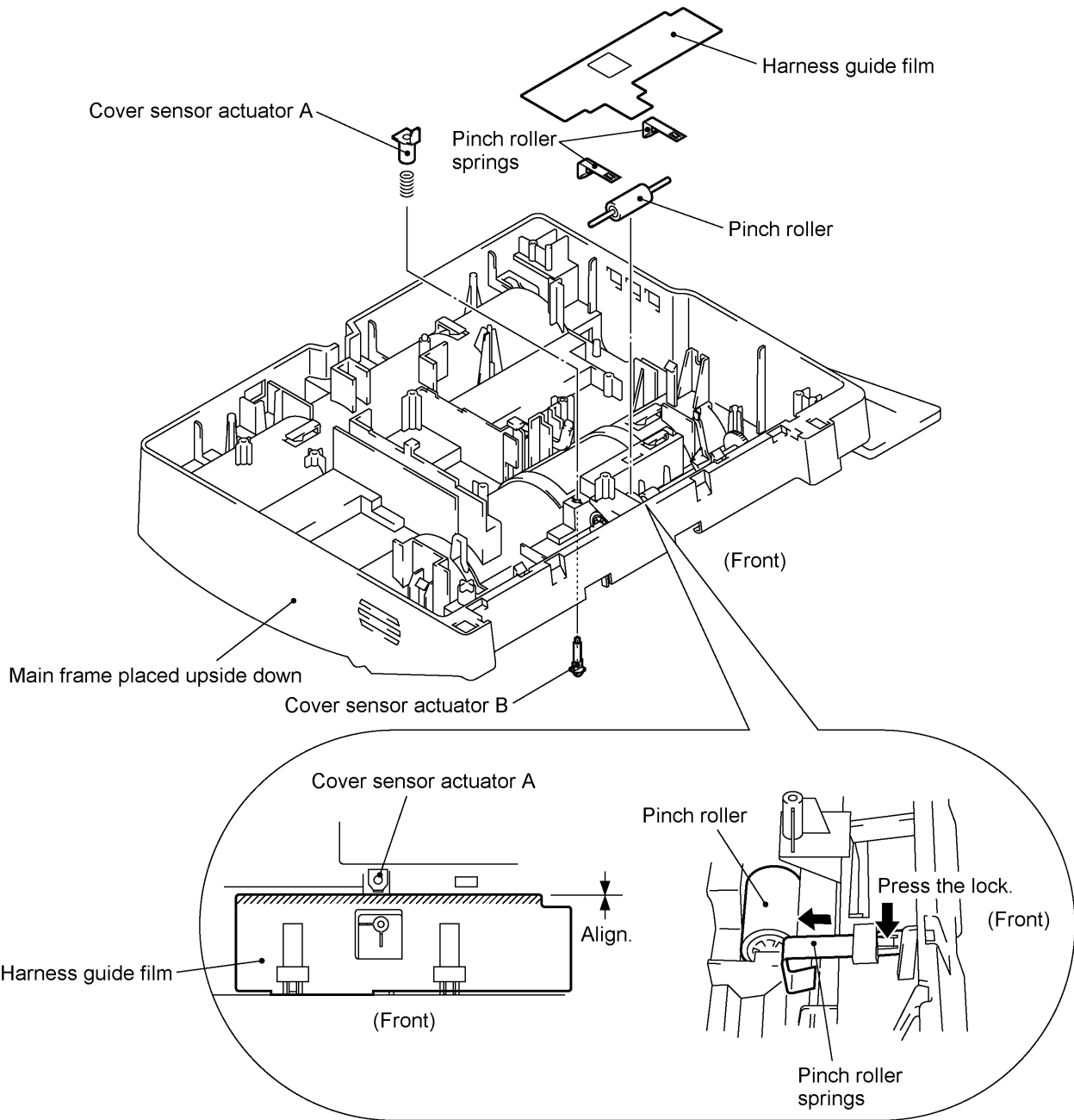
- (1) Remove the panel-lock leaf springs by pushing them up with your finger from the bottom.



### 1.14 Cover Sensor Actuators and Pinch Roller

- (1) Pull up the cover sensor actuator A and turn it to separate from the actuator B. The spring pops up and the actuator B drops.
- (2) Remove the harness guide film.
 

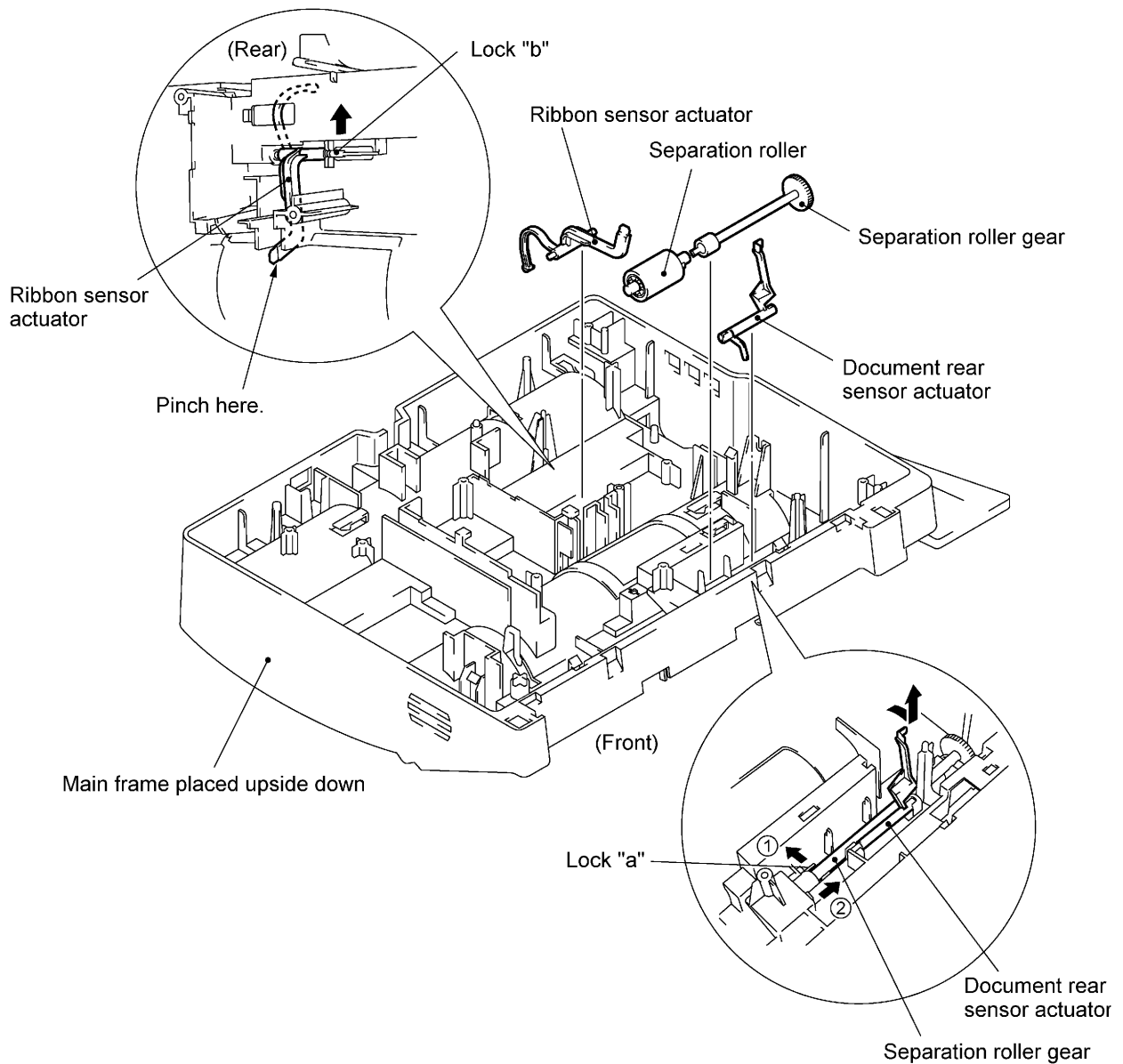
**NOTE:** This film is attached to the main frame with double-sided adhesive tape. This film can be usable again as long as it is adhesive.
- (3) Press the lock of each pinch roller spring and pull out the springs to the rear.
- (4) Lift up the pinch roller.



### 1.15 Document Rear Sensor Actuator, Separation Roller, and Ribbon Sensor Actuator

- (1) Turn up the document rear sensor actuator to the front and pull it up.
- (2) Push lock "a" (in the direction of arrow • ) and pull the separation roller gear to the right (in the direction of arrow , ). Then take out the separation roller and its gear.
- (3) To remove the ribbon sensor actuator, you need to disengage the recording head ASSY from the recorder frame. (Refer to Section 1.5, (1) to (3).)

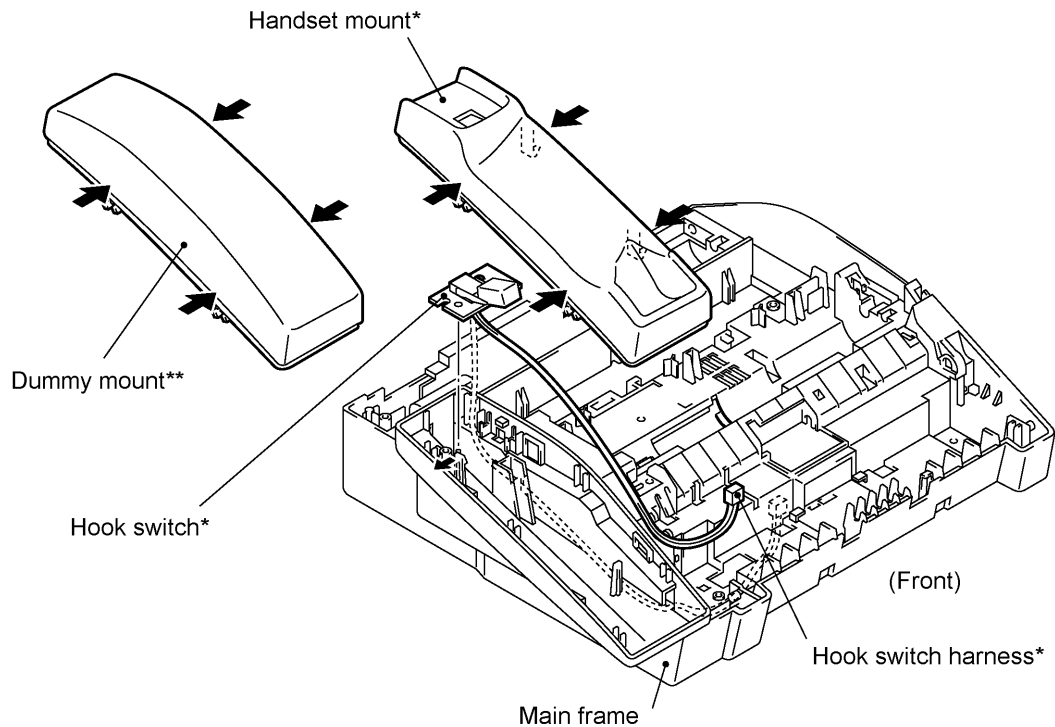
Push lock "b" to the rear, pinch the front end of the ribbon sensor actuator with your fingers, pull the right end up and rightwards, turn the actuator counterclockwise 180°, and then take it out of the main frame.



## 1.16 Handset Mount,\* Hook Switch PCB,\* and Dummy Mount\*\*

(\*For models except the FAX-910, \*\*For the FAX-910 only)

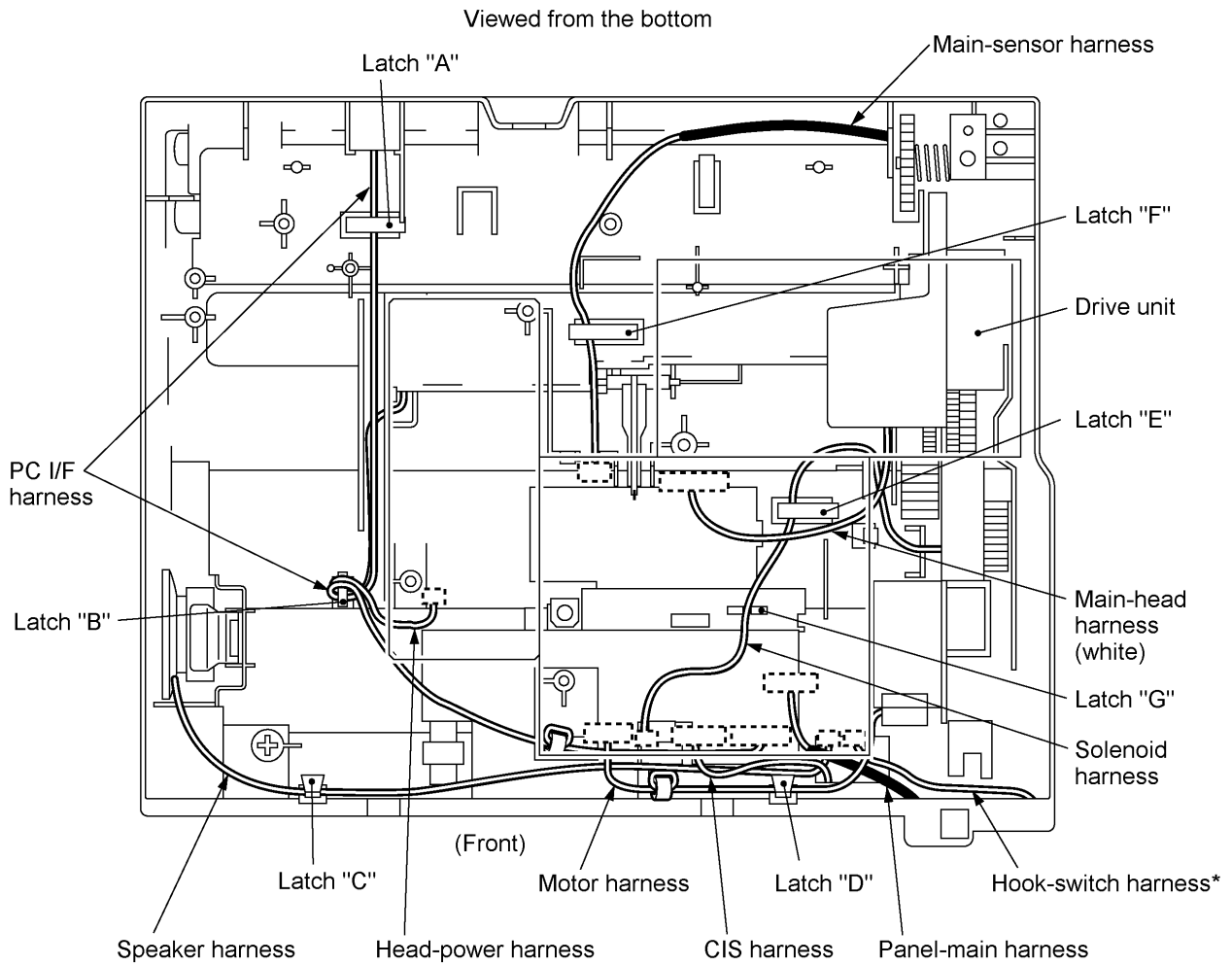
- (1) Insert the tip of a flat screwdriver into the slits of the handset mount\* (or the dummy mount\*\*) and unhook the mount from the main frame.
- (2) To replace the hook switch PCB\*, you need to disconnect the hook switch harness from the main PCB. (Refer to Section 1.10.)



### n Reassembling Notes

- When reinstalling the handset mount\* (or the dummy mount\*\*), first align the left edge with the main frame and then push down the right edge.

## 1.17 Harness Routing



\*Not provided on the FAX-910.

## 2. LUBRICATION

Apply the specified lubricants to the lubrication points as shown below.

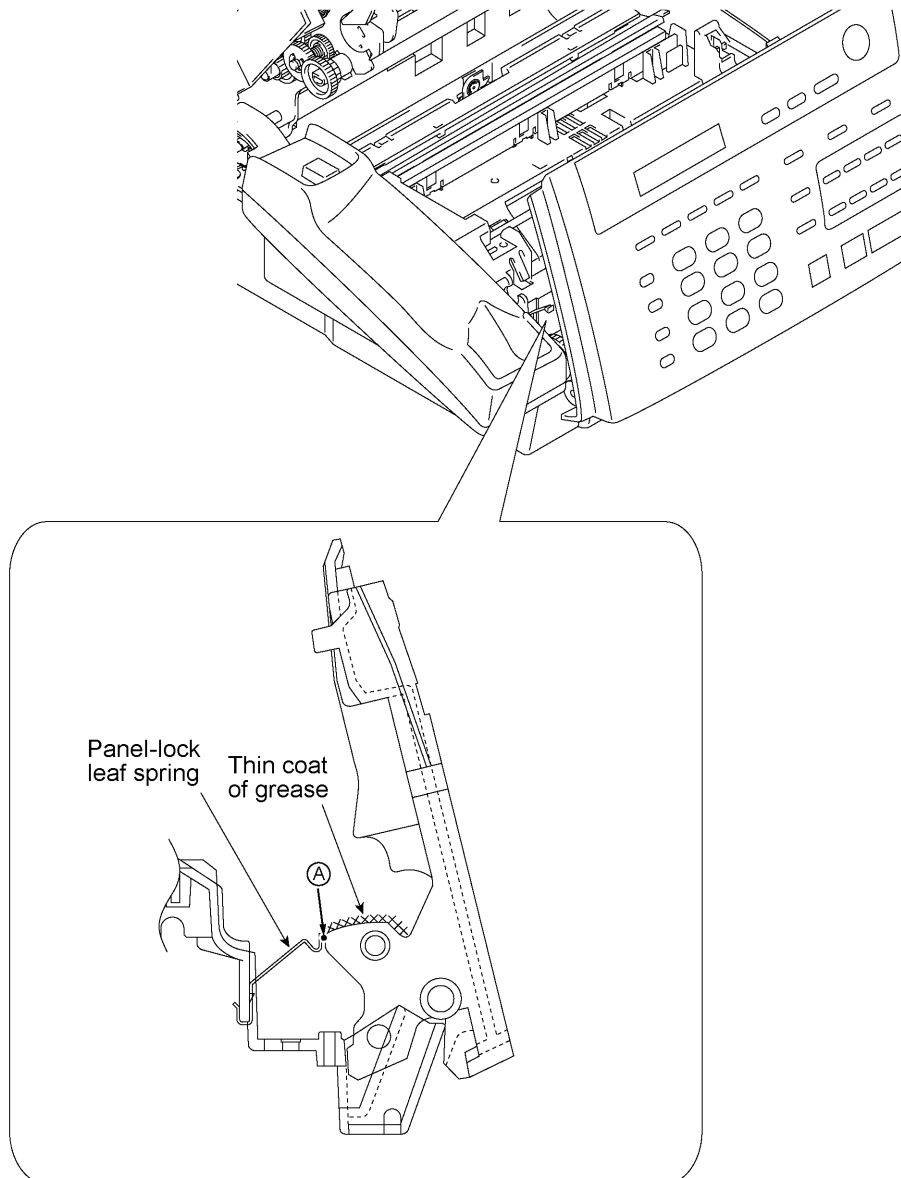
Molykote EM-30L or EM-30LG

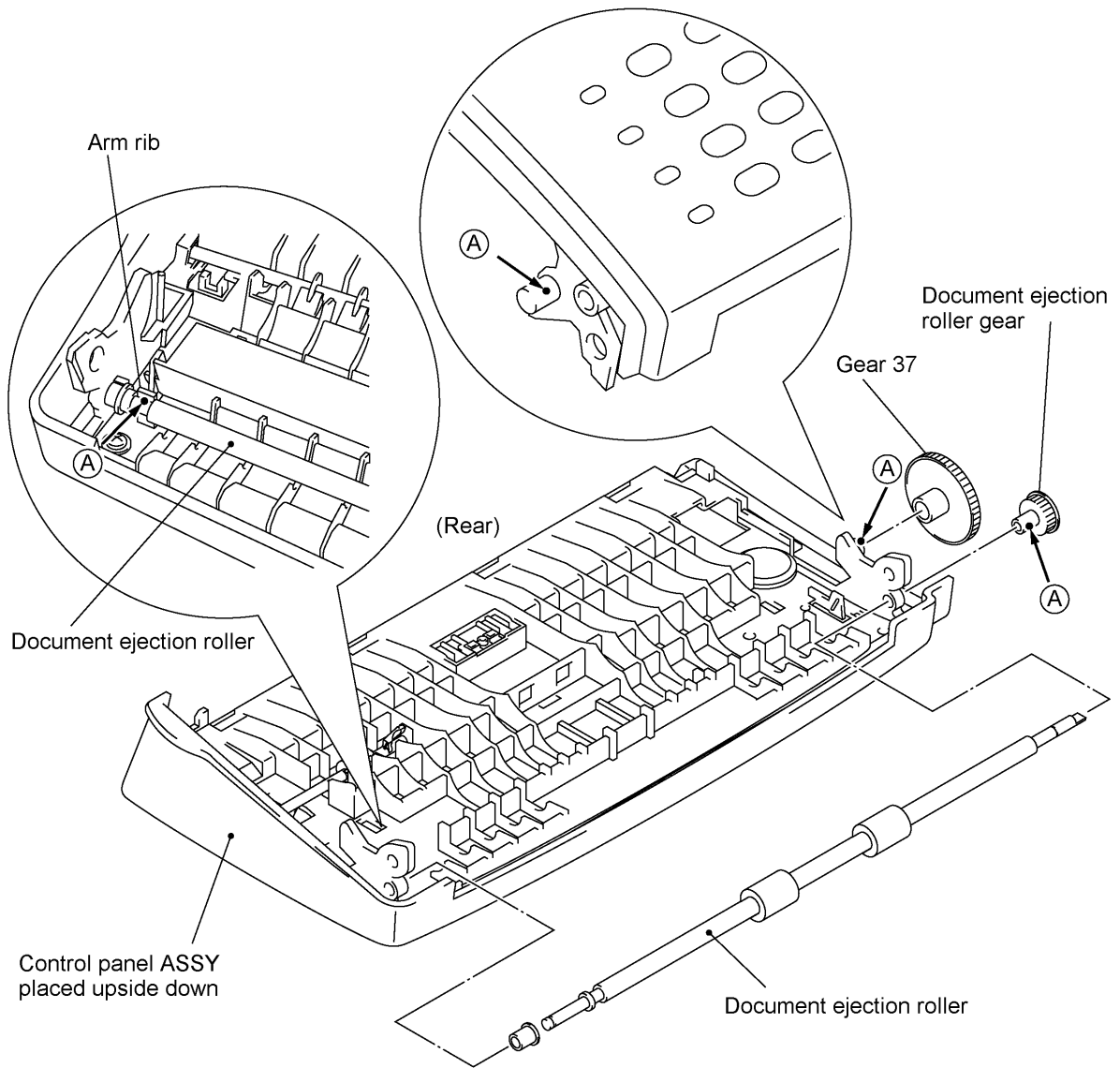
For points ①, apply a rice-sized pinch of grease (6 mm<sup>3</sup>).

Floil GE-334C

For points ②, apply half of a rice-sized pinch of grease (3 mm<sup>3</sup>).

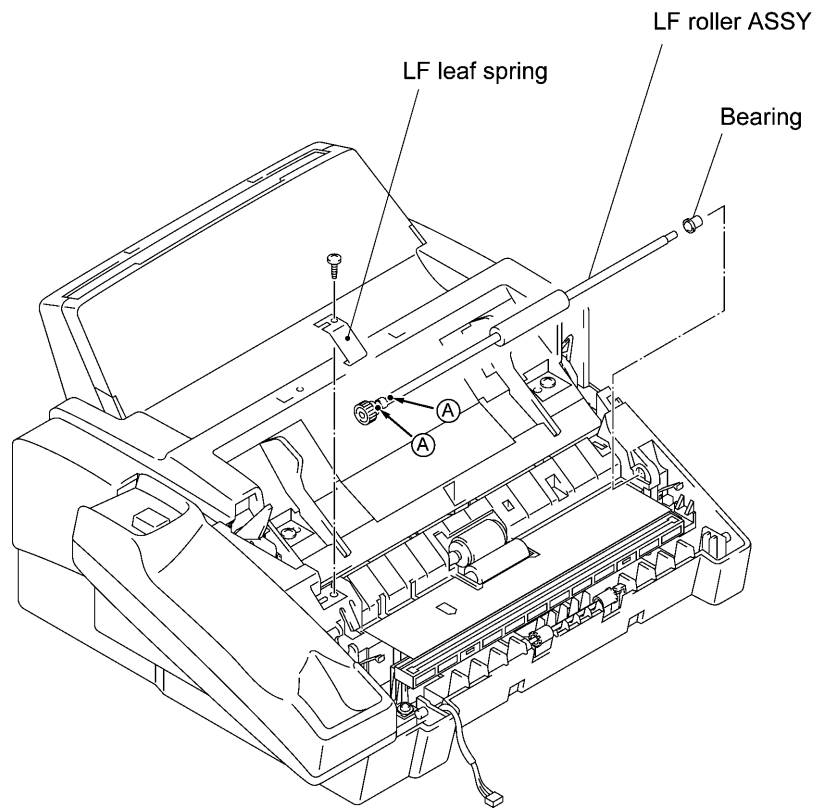
### [ 1 ] Control panel ASSY



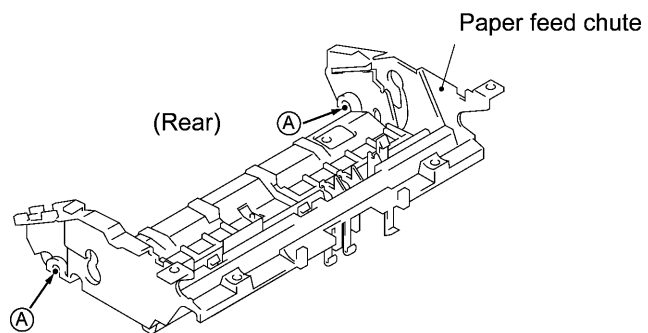


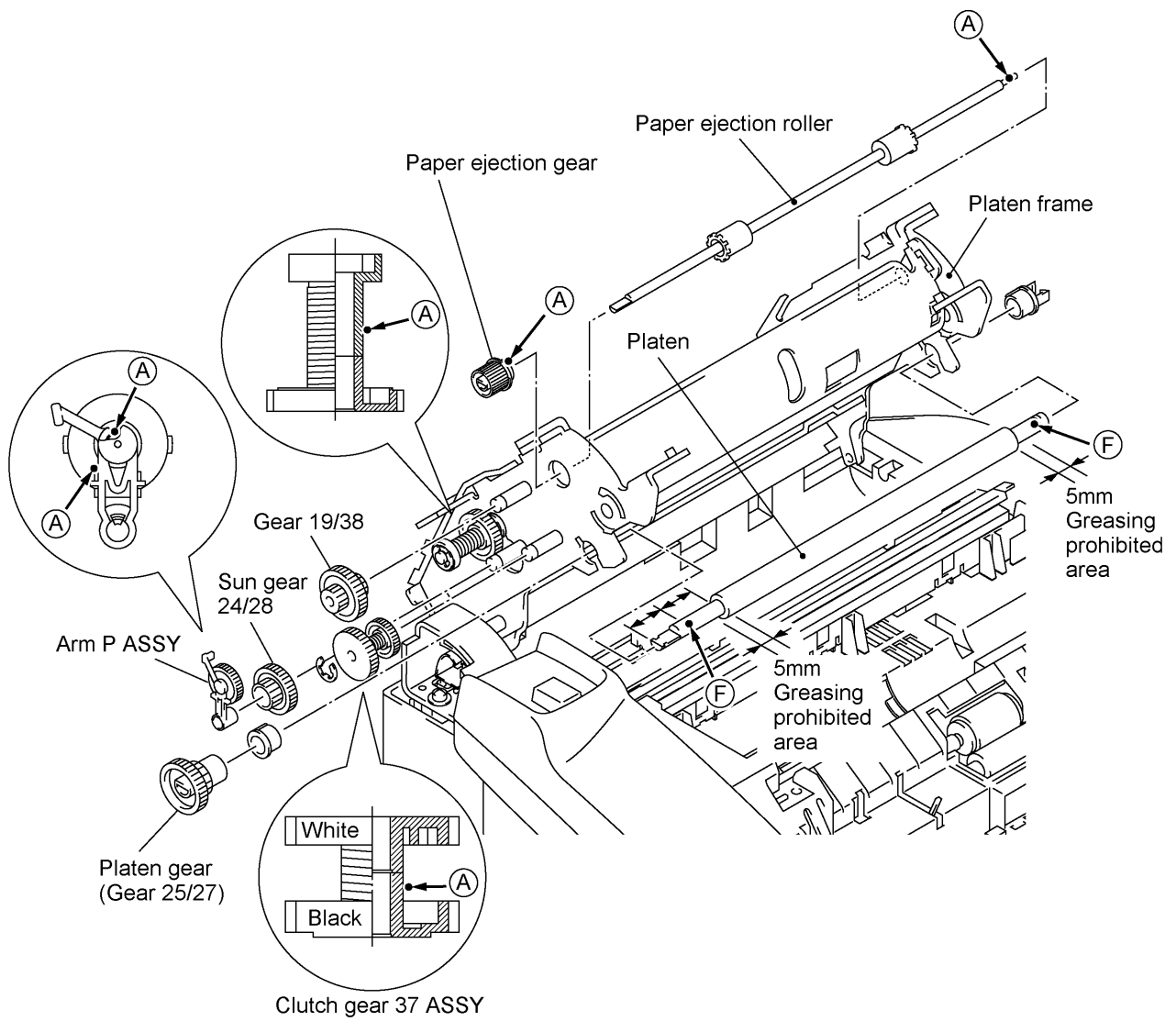


[ 2 ] LF roller ASSY

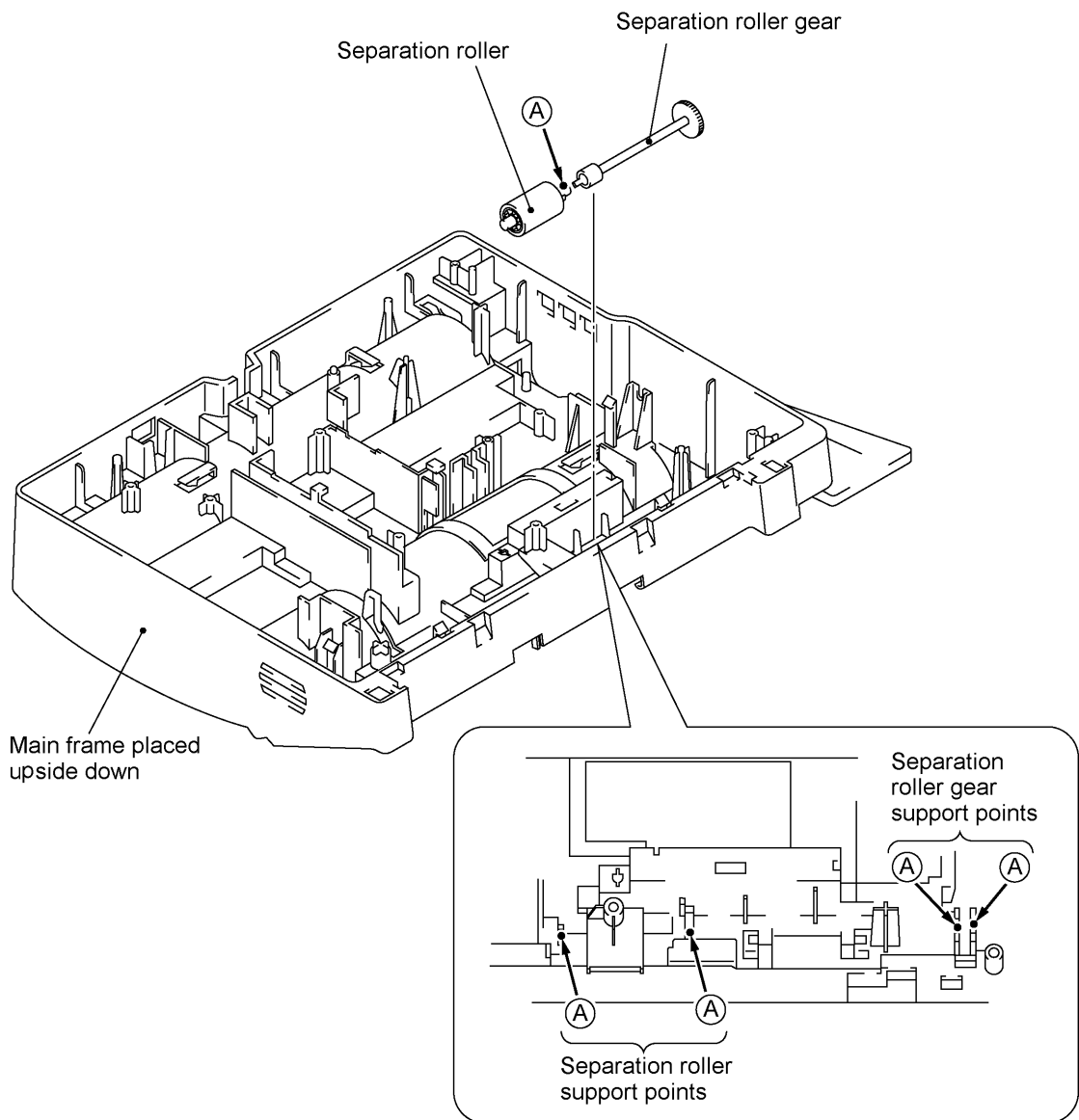


[ 3 ] Platen frame ASSY





[ 4 ] Separation roller and main frame



# **CHAPTER V.**

## **MAINTENANCE MODE**

# CONTENTS

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3.2	Printout of Scanning Compensation Data .....	V-5
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3.4	Test Pattern 1 .....	V-8
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# 1. ENTRY INTO THE MAINTENANCE MODE

FAX750/FAX770/FAX870MC/MFC970MC: To make the facsimile equipment enter the maintenance mode, press the **Function**, \*, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

FAX-910/FAX-920/FAX-921/FAX-930/FAX-931/MFC-925: To make the facsimile equipment enter the maintenance mode, press the **Menu**, \*, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

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** button 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.
  - The 98-year model displays "■■ MAINTENANCE ■■■"; the earlier models display "■■ MAINTENANCE ■了■."

## 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-49)
12	Operational Check of LCD	3.6 (V-50)
13	Operational Check of Control Panel PCB (Check of Keys and Buttons)	3.7 (V-50)
32	Sensor Operational Check	3.8 (V-52)
54	Fine Adjustment of Scanning Start/End Position	3.9 (V-53)
55	CIS Scanner Area Setting	3.10 (V-54)
74	EEPROM Customizing	3.11 (V-54)
82	Equipment Error Code Indication	3.12 (V-55)
87	Output of Transmission Log to the Telephone Line	3.13 (V-55)
91	EEPROM Parameter Initialization (except the telephone number storage area)	3.1 (V-4)
99	Exit from the Maintenance Mode	---- (V-1)
-----	Document Draw Adjustment	3.14 (V-56)

\* ADF: Automatic document feeder

----- **IMPORTANT** -----

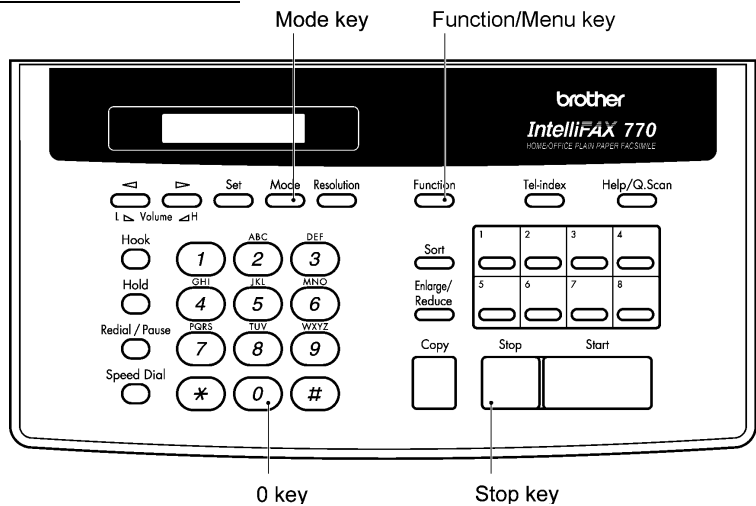
Basically, the maintenance-mode functions listed on the previous page should be accessed by service personnel only. However, you may allow end users to access some of these under the guidance of service personnel (e.g., by telephone).

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 WSW36, 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.

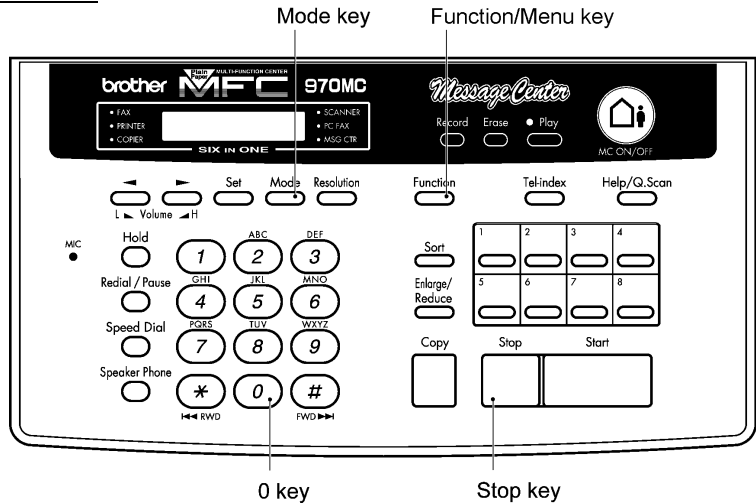
The service personnel should instruct end users to follow the procedure given below.

- (1) FAX750/FAX770/FAX870MC/MFC970MC: Press the **Function** and **Mode** keys in this order.  
 FAX-910/FAX-920/FAX-921/FAX-930/FAX-931/MFC-925: Press the **Menu** and **Mode** keys in this order.  
 The LCD clears the current display.  
**NOTE:** The **Mode** key is inoperable 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.

FAX750/FAX770/FAX-910/FAX-920/FAX-921/MFC-925



FAX870MC/FAX-930/FAX-931/MFC970MC





### 3. DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS

#### 3.1 EEPROM Parameter Initialization

##### n 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 all of the EEPROM areas, but entering 91 does not initialize some areas, as listed below.

Function code	01	91
Data item		
Maintenance-mode functions User switches Firmware switches Remote activation code Activity report Distinctive ringing patterns registered	All of these will be initialized	These will be initialized
Station ID data Outside line number Cover page custom comments Remote access code FAX forwarding/paging Personal mailbox password Telephone function registration One-touch dialing Speed dialing Group dialing		These will <u>not</u> be initialized
EEPROM customizing code (4-digit)	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.)	

**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 3.11).

##### n 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

#### n Function

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

#### n 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 (208 bytes)
  - b) Black level data (1 byte)
  - c) Initial clamp PWM value (1 byte)
  - d) Clamp PWM value (1 byte)
  - e) Compensation data for background color (1 byte)
  - f) Initial LED light intensity value (1 byte)
  - g) LED light intensity value (1 byte)
  - h) LED light intensity value on the white film of the document pressure bar ASSY and documents (2 bytes)
  - i) Document rear sensor adjustment value (1 byte)
- (3) Upon completion of recording of the compensation data list, the equipment returns to the initial stage of the maintenance mode.

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

```

5F00 : 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08
5F10 : 08 08 08 08 06 08 08 08 08 08 08 08 08 08 08 08
5F20 : 08 08 08 06 06 02 08 08 08 08 08 08 06 06 06 2E 32
5F30 : 36 38 36 36 3A 3A 3A 3A 38 38 36 34 36 2A 08 08
5F40 : 0A 36 36 36 36 34 36 34 34 34 32 32 32 34 34 08
5F50 : 06 0A 30 30 30 30 30 2E 08 08 06 06 06 08 30 32
5F60 : 34 34 34 2A 06 06 06 08 06 08 36 38 3A 3C 3E 3E
5F70 : 3E 3C 3E 3C 3C 3A 38 2E 06 06 06 2C 38 3A 3A 36
5F80 : 36 30 06 06 06 06 06 08 06 2C 34 34 34 34 08 08
5F90 : 08 08 08 08 08 08 08 08 08 08 08 06 06 08 08 08
5FA0 : 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08
5FB0 : 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08
5FC0 : 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08 08

```

5F00 : 00

5F00 : 99

5F00 : 99

5F00 : FF

5F00 : 91

5F00 : 8D

5F00 : 8E 8D

5F00 : B9

**Scanning Compensation Data List**

### 3.3 ADF Performance Test

#### n 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.

#### n Operating Procedure

- (1) Set documents (Allowable up to the ADF capacity) in the initial stage of the maintenance mode.  
The "DOC. READY" will appear on the LCD.
- (2) Press the **0** and **8** keys in this order.  
The equipment
  - i) copies the 1st document and displays "COPY P.01 STD" on the LCD.
  - ii) feeds in and out the 2nd through 4th documents while counting without copying them as the LCD shows the corresponding count,
  - iii) copies the 5th document and displays "COPY P.05 STD" on the LCD,
  - iv) feeds in and out the 6th through 9th documents while counting without copying them as the LCD shows the corresponding count, and
  - v) copies the 10th document and displays "COPY P.10 STD" on the LCD.
- (3) Upon completion of feeding in and out all of the documents, the final count appears on the LCD.
- (4) Press the **Stop** key to return the equipment to the initial maintenance mode.

### 3.4 Test Pattern 1

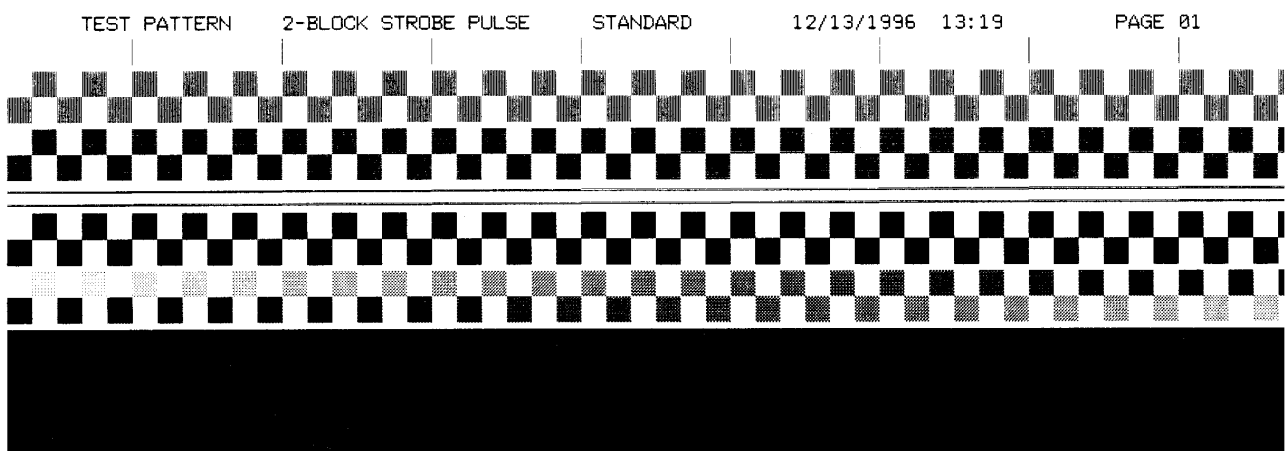
#### n Function

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.

#### n 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

##### n Function

The facsimile equipment incorporates the following firmware switch functions (WSW01 through WSW36) 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 WSW36)**

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
WSW10	Protocol definition 2	V-23
WSW11	Busy tone setting	V-24
WSW12	Signal detection condition setting	V-25
WSW13	Modem setting	V-26
WSW14	AUTO ANS facility setting	V-27
WSW15	REDIAL facility setting	V-28
WSW16	Function setting 1	V-29
WSW17	Function setting 2	V-30
WSW18	Function setting 3	V-31
WSW19	Transmission speed setting	V-32
WSW20	Overseas communications mode setting	V-33
WSW21	TAD setting 1	V-34
WSW22	ECM setting	V-35
WSW23	Communications setting	V-36
WSW24	TAD setting 2	V-37
WSW25	TAD setting 3	V-38
WSW26	Function setting 4	V-39
WSW27	Function setting 5	V-40
WSW28	Function setting 6	V-41
WSW29	Function setting 7	V-42
WSW30	Function setting 8	V-43
WSW31	Function setting 9	V-44
WSW32	Function setting 10	V-45
WSW33	Function setting 11	V-46
WSW34	Function setting 12	V-47
WSW35	Function setting 13	V-48
WSW36	Function setting 14	V-48

## n **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 36).  
The following appears on the LCD:  
WSWXX = 0 0 0 0 0 0 0
- (3) Use the ◀ and ▶ 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.

## n **Note**

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

n 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

**I 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.)

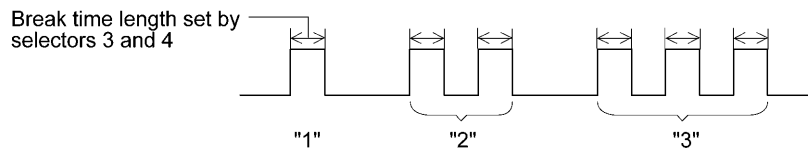
N + 1: Dialing "N" generates "N + 1" pulses.

10 - N: Dialing "N" generates "10 - N" pulses.

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

These selectors set the break time length in pulse dialing.

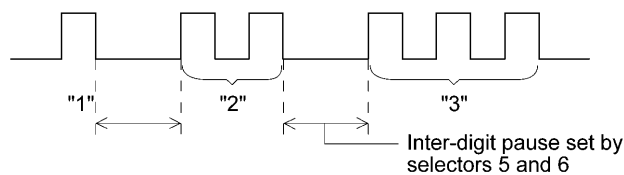
(Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



**I 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.)





l **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.

l **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.

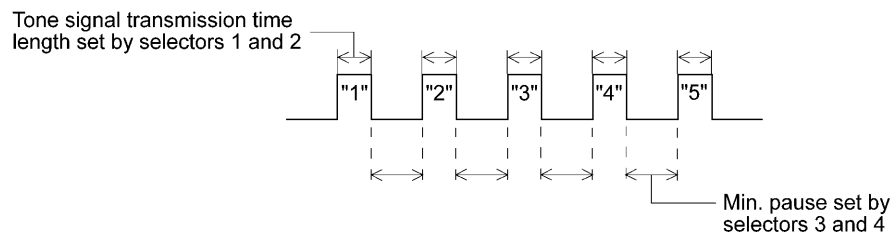
**WSW02 (Tone signal setting)**

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

l **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.)



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

**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 and 6 through 8 are not applicable where no PABX is installed.

**I 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 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

**I 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).

I **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.

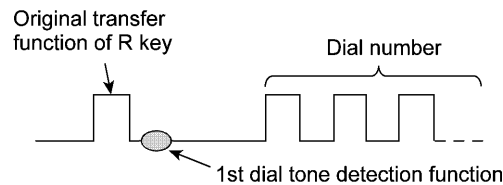
Setting both of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected.

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.

I **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 3	Dual tone detection frequency in ICM recording	No. 2 3 0 0 : 350 and 440 Hz (A) 0 1 : 440 and 480 Hz (B) 1 x : 480 and 620 Hz (C)
4	Tone detection sensitivity in ICM recording	0: OFF            1: High
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.

**NOTE:** Selectors 2 through 4 are applicable to those models equipped with a built-in TAD.

**NOTE:** Selectors 2 and 3 are applicable in the U.S.A.

┆ **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 2 and 3: Dual tone detection frequency in ICM recording**

If the equipment detects either of the frequencies set by these selectors in ICM recording, it will disconnect the line. For example, if these selectors are set to "0, 0," the equipment will disconnect the line upon detection of 350 Hz or 440 Hz.

┆ **Selectors 4: Tone detection sensitivity in ICM recording**

Setting this selector to "1" increases the tone detection sensitivity in ICM recording.

┆ **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, e.g., U.S.A.

#### I 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.

I **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.

I **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.

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

This selector determines whether or not the equipment automatically disconnects a 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	<b>Pause</b> 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 : } 2nd dial tone detection 1 1 1 : } 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.

I **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 <b>Pause</b> key is pressed.
0	0	1	If you press the <b>Pause</b> key during dialing, the facsimile equipment will insert WAIT as defined in the above table. If the <b>Pause</b> 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":
1	1	0	If you press the <b>Pause</b> key during dialing, the equipment will wait for the 2nd dial tone to be sent via the communications line.
1	1	1	When these selectors are set to "1, 1, 0" or "1, 1, 1": If you press the <b>Pause</b> key during dialing, the equipment will first wait for the 2nd dial tone to be sent via the communications line. After that, the equipment will insert a WAIT of 3.5 seconds. If no 2nd dial tone is received within the specified time length (set by WSW08), the equipment will disconnect the line if in automatic dialing or it will start transmitting the dial signal if given after depression of the <b>Pause</b> key in hook-up dialing. (In those countries where no dial tone detection function is supported, setting these selectors to "1, 1, 0," "1, 0, 1," or "1, 1, 1" inserts a WAIT of 3.5 seconds.)

I **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 1 0 1, 1 1 0, or 1 1 1).

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

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

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

I **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:** The WSW07 is not applicable in those countries where no dial tone or line current detection is supported, e.g., U.S.A.

l **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."

l **Selector 3: Line current detection**

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

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

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

l **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.

l **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."

l **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.



**WSW10 (Protocol definition 2)**

Selector No.	Function	Setting and Specifications
1	Switching of DPS, following the CML ON/OFF	0: No      1: Yes
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 8	Not used.	

l **Selector 1: Switching of DPS, following the CML ON/OFF**

Setting this selector to "1" automatically switches DPS following the CML ON/OFF operation.

l **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.

l **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.

l **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.

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

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

### 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: 700-800/700-800 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).

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

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

l **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	Delay	0: Yes      1: No
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.

┆ **Selector 7: Delay**

Setting this selector to "0" allows the equipment to insert a 900 ms WAIT after acknowledgment of the call until the equipment turns on the CML relay to start receiving operation.

### 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.

l **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.

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

These selectors set the optimum receive signal level.

l **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

**I 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.)

**I 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.	

l **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.

l **Selectors 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	CCITT superfine recommendation	0: OFF      1: ON
3   6	Not used.	
7	Max. document length limitation	0: 400 cm      1: 90 cm
8	<b>Stop</b> key pressed during reception	0: Not functional      1: Functional

l **Selector 2: CCITT superfine recommendation**

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

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

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

l **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	<table> <tr> <td>No. 1</td> <td>2</td> <td></td> </tr> <tr> <td>0</td> <td>0</td> <td>: No alarm</td> </tr> <tr> <td>0</td> <td>1</td> <td>: Always valid</td> </tr> <tr> <td>1</td> <td>X</td> <td>: Valid except when 'call reservation' is selected.</td> </tr> </table>	No. 1	2		0	0	: No alarm	0	1	: Always valid	1	X	: Valid except when 'call reservation' is selected.
No. 1	2													
0	0	: No alarm												
0	1	: Always valid												
1	X	: Valid except when 'call reservation' is selected.												
3	Power failure report output	0: ON                      1: OFF												
4	Calendar clock/prompt alternate display	0: NO                      1: YES												
5	Calendar clock type	0: U.S.A. type          1: European type												
6	Error indication in activity report	0: NO                      1: YES												
7	Non-ring reception	0: OFF                      1: ON												
8	Not used.													

**NOTE:** Selector 3 is not applicable to the U.S.A. versions.

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

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

┆ **Selector 3: Power failure report output**

This selector determines whether or not the equipment outputs a power failure report when the power comes back on.

┆ **Selector 4: Calendar clock/prompt alternate display**

If this selector is set to "1," the calendar clock and the prompt "INSERT DOCUMENT" appear alternately on the LCD while the equipment is on standby; if it is set to "0," only the calendar clock appears.

┆ **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 6: Error indication in activity report**

This selector determines whether or not a communications error code will be printed in the activity report.

┆ **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

l **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."

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

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

l **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 : } 14,400 bps * 1 1 0 : 1 1 1 :
4   6	Last transmission speed choice for fallback	
7	Not used.	
8	V. 17 mode	0: Permitted 1: Prohibited

- In those models with a maximum of 9600 bps capability, selection of 12,000 bps or 14,400 bps will still only produce a set speed automatically reduced to 9600 bps.

**NOTE:** Selector 8 is applicable only to those models that support 14,400 bps.

**I 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 synchronize the data transmission via the MODEM. If the synchronization fails, the equipment automatically steps down to the next lowest speed and attempts to synchronize the data transmission 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		No. 6 7 0 0 : A (During CNG ON and OFF) 0 1 : B (During CNG OFF only) 1 X : C (No elimination)	
8			0: OFF      1: ON

\* EP: Echo protection

#### I 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.

#### I 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.

#### I 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   5	Max. waiting time for voice signal	No. 1 2 3 4 5 0 0 0 0 0 : No detection 0 0 0 0 1 : 1 sec. 0 0 0 1 0 : 2 sec. 0 0 0 1 1 : 3 sec.   0 1 0 0 0 : 8 sec.   1 1 1 1 1 : 31 sec.
6  7	Two-way recording	No. 6 7 0 0 : For U.S.A. (A) 0 1 : Except for U.S.A. (B) 1 0 : Without beep (C) 1 1 : OFF (D)
8	Erasure of message stored in the memory after the message transfer	0: Yes                      1: No

**NOTE:** Selectors 1 through 8 are applicable to those models equipped with a built-in TAD.

l **Selectors 1 through 5: Max. waiting time for voice signal**

In the TAD mode, the equipment waits for voice signal for the time length specified by these selectors before it automatically shifts to the facsimile message receive mode or disconnects the line.

l **Selectors 6 and 7: Two-way recording**

These selectors select the specifications of the two-way recording feature.

l **Selector 8: Erasure of message**

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

**WSW22 (ECM and caller ID 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   8	Acceptable TCF bit error rate (%) (Only at 4800 bps)	0: 0%	1: 8%
		0: 0%	1: 4%
		0: 0%	1: 2%
		0: 0%	1: 1%

\* ECM: Error correction mode

**NOTE:** Selector 3 is applicable to the U.S.A. versions only.

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

**I 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.

**I 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		No. 4 5 0 0 : 16% 0 1 : 14% 1 0 : 10% 1 1 : 8%
6	Issue of RTN at the occurrence of a pagination error	0: YES      1: NO
7	Not used.	
8	Limitation of attenuation level	0: YES      1: NO

**NOTE:** Selector 8 is not applicable to the French and Chinese 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 6: Issue of RTN at the occurrence of a pagination error**

If this selector is set to "0," the facsimile equipment transmits an RTN when a pagination error occurs due to recording lag relative to receiving.

┆ **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	Maximum OGM recording time	No. 1 2 0 0 : 15 sec. 0 1 : 20 sec. 1 0 : 30 sec. 1 1 : 50 sec.
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	Attenuator for playback of ICM/OGM to the line (Selectable from 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

**NOTE:** Selectors 1 and 2 are applicable to those models equipped with a built-in TAD.

l **Selectors 1 and 2: Maximum OGM recording time**

These selectors set the allowable maximum recording time for an OGM.

l **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.

l **Selectors 5 through 8: Attenuator for playback of ICM/OGM to the line**

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

This setting will not be limited by selector 8 of WSW23.

**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 to the U.S.A. and Canadian versions of the FAX770/FAX870MC/MFC970MC.

**I 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	Application of DC wetting pulse	0: OFF      1: ON
2	Overvoltage limiter at the applying time of a wetting pulse	0: ON      1: OFF
3	Not used.	
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 7	No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode or via the facsimile equipment in F/T mode)	No. 6 7 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
8	FAX reception after the time-out of pseudo ring backtones in F/T mode	0: YES      1: NO

**NOTE:** Selectors 6 and 7 are not applicable to those models equipped with a built-in TAD.

**I Selectors 1 and 2: Application of DC wetting pulse and overvoltage limiter**

These selectors take effect only when the UK version of the facsimile equipment is set up for the British Telecom's caller ID service or its equivalent.

Selector 2 takes effect only when selector 1 is set to "1."

**I 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.

**I Selectors 6 and 7: 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 or via the facsimile equipment in F/T mode.

**I Selector 8: FAX reception after the time-out of pseudo ring backtones in F/T mode**

If this selector is set to "0," the equipment starts receiving FAX messages when it receives a CNG signal within 10-second no-tone period provided after the time-out of pseudo ring backtones. If no CNG is received within the period, the equipment disconnects the line.

If this selector is set to "1," the equipment disconnects the line after issuing pseudo ring backtones.

**WSW27 (Function setting 5)**

Selector No.	Function	Setting and Specifications
1	Definition of programmable key	0: TEL key    1: TEL/POLLING key
2	Ringer OFF setting	0: Yes        1: No
3	Automatic playback of OGM at the start time of OGM ON mode	0: No         1: Yes
4	Detection of distinctive ringing pattern	0: Yes        1: No
5   8	Not used.	

**NOTE:** Selector 1 is not applicable to the U.S.A. versions.

**NOTE:** Selector 3 is applicable to those models equipped with a built-in TAD.

l **Selector 1: Definition of programmable key**

This selector defines a programmable key as a TEL key or TEL/POLLING key.

Setting this selector to "1" allows the programmable key to function as either a TEL or POLLING key if pressed when the handset is off or on the hook, respectively.

This setting is effective only for those models having a programmable key.

l **Selector 2: Ringer OFF setting**

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

l **Selector 3: Automatic playback of OGM at the start time of OGM ON mode**

This selector determines whether or not the equipment automatically plays back an OGM the moment it switches to the OGM ON mode in the MC mode.

l **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.	

**I 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   3	Compression threshold level for voice signals inputted via the telephone line in the built-in TAD operation	<table> <tr><td>No.</td><td>1</td><td>2</td><td>3</td><td></td><td></td></tr> <tr><td></td><td>0</td><td>0</td><td>0</td><td>:</td><td>-47.0 dBm (A)</td></tr> <tr><td></td><td>0</td><td>0</td><td>1</td><td>:</td><td>-48.5 dBm (B)</td></tr> <tr><td></td><td>0</td><td>1</td><td>0</td><td>:</td><td>-50.0 dBm (C)</td></tr> <tr><td></td><td>0</td><td>1</td><td>1</td><td>:</td><td>-51.5 dBm (D)</td></tr> <tr><td></td><td>1</td><td>0</td><td>0</td><td>:</td><td>-53.0 dBm (E)</td></tr> <tr><td></td><td>1</td><td>0</td><td>1</td><td>:</td><td>-54.5 dBm (F)</td></tr> <tr><td></td><td>1</td><td>1</td><td>0</td><td>:</td><td>-56.0 dBm (G)</td></tr> <tr><td></td><td>1</td><td>1</td><td>1</td><td>:</td><td>OFF (H)</td></tr> </table>	No.	1	2	3				0	0	0	:	-47.0 dBm (A)		0	0	1	:	-48.5 dBm (B)		0	1	0	:	-50.0 dBm (C)		0	1	1	:	-51.5 dBm (D)		1	0	0	:	-53.0 dBm (E)		1	0	1	:	-54.5 dBm (F)		1	1	0	:	-56.0 dBm (G)		1	1	1	:	OFF (H)
No.	1	2	3																																																					
	0	0	0	:	-47.0 dBm (A)																																																			
	0	0	1	:	-48.5 dBm (B)																																																			
	0	1	0	:	-50.0 dBm (C)																																																			
	0	1	1	:	-51.5 dBm (D)																																																			
	1	0	0	:	-53.0 dBm (E)																																																			
	1	0	1	:	-54.5 dBm (F)																																																			
	1	1	0	:	-56.0 dBm (G)																																																			
	1	1	1	:	OFF (H)																																																			
4   6	Compression threshold level for voice signals inputted via the handset in the built-in TAD operation	<table> <tr><td>No.</td><td>4</td><td>5</td><td>6</td><td></td><td></td></tr> <tr><td></td><td>0</td><td>0</td><td>0</td><td>:</td><td>-44.0 dBm (A)</td></tr> <tr><td></td><td>0</td><td>0</td><td>1</td><td>:</td><td>-45.5 dBm (B)</td></tr> <tr><td></td><td>0</td><td>1</td><td>0</td><td>:</td><td>-47.0 dBm (C)</td></tr> <tr><td></td><td>0</td><td>1</td><td>1</td><td>:</td><td>-48.5 dBm (D)</td></tr> <tr><td></td><td>1</td><td>0</td><td>0</td><td>:</td><td>-50.0 dBm (E)</td></tr> <tr><td></td><td>1</td><td>0</td><td>1</td><td>:</td><td>-51.5 dBm (F)</td></tr> <tr><td></td><td>1</td><td>1</td><td>0</td><td>:</td><td>-53.0 dBm (G)</td></tr> <tr><td></td><td>1</td><td>1</td><td>1</td><td>:</td><td>OFF (H)</td></tr> </table>	No.	4	5	6				0	0	0	:	-44.0 dBm (A)		0	0	1	:	-45.5 dBm (B)		0	1	0	:	-47.0 dBm (C)		0	1	1	:	-48.5 dBm (D)		1	0	0	:	-50.0 dBm (E)		1	0	1	:	-51.5 dBm (F)		1	1	0	:	-53.0 dBm (G)		1	1	1	:	OFF (H)
No.	4	5	6																																																					
	0	0	0	:	-44.0 dBm (A)																																																			
	0	0	1	:	-45.5 dBm (B)																																																			
	0	1	0	:	-47.0 dBm (C)																																																			
	0	1	1	:	-48.5 dBm (D)																																																			
	1	0	0	:	-50.0 dBm (E)																																																			
	1	0	1	:	-51.5 dBm (F)																																																			
	1	1	0	:	-53.0 dBm (G)																																																			
	1	1	1	:	OFF (H)																																																			
7	Automatic dialing by caller IDs stored in the memory	0: Yes                      1: No																																																						
8	Prompt beep for activity report	0: No                        1: Yes																																																						

**NOTE:** Selectors 1 through 6 are applicable to those models equipped with a built-in TAD.

**NOTE:** Selector 8 is not applicable to the U.S.A. versions.

**I Selectors 1 through 6: Compression threshold level for voice signals inputted via the telephone line in the built-in TAD operation**

If voice signals inputted via the telephone line are below the level specified by these selectors, the TAD interprets those received voice signals as no signal, compressing the recording time.

**I Selector 7: Automatic dialing by caller IDs stored in the memory**

This selector determines whether or not the automatic dialing function by caller IDs stored in the memory (see the Note below) can be accessed.

If it is set to "0," caller IDs stored in the memory can be called up on the LCD by the user function 6-7 and then pressing the **Start** key when the desired caller ID is displayed dials the caller automatically.

(Note: The equipment can store a maximum of the latest 30 incoming caller IDs together with the reception date and time in the memory.)

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

This selector determines whether or not the equipment will beep if the activity report memory area becomes full with 30 records, for prompting you to print out the report. (Printing it out will clear the memory area.)

**WSW30 (Function setting 8)**

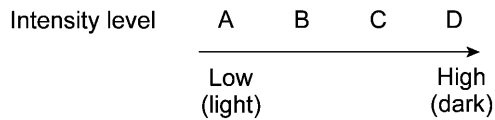
Selector No.	Function	Setting and Specifications
1   3	Detection level of dial tone or busy tone for the built-in TAD operation	No. 1 2 3 0 0 0 : -38.0 dBm (A) 0 0 1 : -39.5 dBm (B) 0 1 0 : -41.0 dBm (C) 0 1 1 : -42.5 dBm (D) 1 0 0 : -44.0 dBm (E) 1 0 1 : -45.5 dBm (F) 1 1 0 : -47.0 dBm (G) 1 1 1 : -48.5 dBm (H)
4   6	Not used.	
7 8	Recording intensity control	No. 7 8 0 0 : A 0 1 : B 1 0 : C 1 1 : D

**NOTE:** Selectors 1 through 3 are applicable to those models equipped with a built-in TAD.

**I Selectors 1 through 3: Detection level of dial tone or busy tone for built-in TAD operation**

If dial tone or busy tone inputted during ICM recording is below the level specified by these selectors, the TAD stops recording and disconnects the line.

**I Selectors 7 and 8 Recording intensity control**





**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: 50%
3 4	Not used.	
5	Minimum short-OFF duration in distinctive ringing	0: 130 ms    1: 90 ms
6   8	Not used.	

**NOTE:** Selector 5 is applicable in those areas where the distinctive ringing is supported.

l **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 half size (50%).

l **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

l **Selectors 5 and 6 Default resolution**

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

l **Selectors 7 and 8 Default contrast**

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

**WSW33 (Function setting 11)**

Selector No.	Function	Setting and Specifications
1   3	Detection threshold level for voice signals inputted via the telephone line in the built-in TAD operation	No. 1 2 3 0 0 0 : -42.5 dBm (A) 0 0 1 : -44.0 dBm (B) 0 1 0 : -45.5 dBm (C) 0 1 1 : -47.0 dBm (D) 1 0 0 : -48.5 dBm (E) 1 0 1 : -50.0 dBm (F) 1 1 0 : -51.5 dBm (G) 1 1 1 : -53.0 dBm (H)
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	Comfortable noise level	No. 7 8 0 0 : OFF 0 1 : Low (A) 1 0 : Medium (B) 1 1 : High (C)

**NOTE:** Selectors 1 through 3 and 6 through 8 are applicable to those models equipped with a built-in TAD.

**NOTE:** Selector 6 is not applicable to the U.S.A. versions.

**I Selectors 1 through 3: Detection threshold level for voice signals inputted via the telephone line in the built-in TAD operation**

If the equipment detects voice signals exceeding the threshold level set by these selectors, it will interpret them as effective voice.

**I 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.

**I Selectors 7 and 8: Comfortable noise level**

These selectors set the level of noise to be added during playing-back of voice signals recorded with no-signal compression.

If they are set to "0, 0," no noise will be added.

**WSW34 (Function setting 12)**

Selector No.	Function	Setting and Specifications																																													
1   3	Erasing time length of ICM tone recorded preceding the tone detection starting point in the case of automatic line disconnection due to no voice signal received	<table> <tr><td>No. 1</td><td>2</td><td>3</td><td></td><td></td></tr> <tr><td>0</td><td>0</td><td>0</td><td>:</td><td>0 sec.</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>:</td><td>1 sec.</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>:</td><td>2 sec.</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>:</td><td>3 sec.</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>:</td><td>4 sec.</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>:</td><td>5 sec.</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>:</td><td>6 sec.</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>:</td><td>7 sec.</td></tr> </table>	No. 1	2	3			0	0	0	:	0 sec.	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.
No. 1	2	3																																													
0	0	0	:	0 sec.																																											
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 5	No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode or via the facsimile equipment in F/T or TAD mode)	<table> <tr><td>No. 4</td><td>5</td><td></td><td></td><td></td></tr> <tr><td>0</td><td>0</td><td>:</td><td>0.5</td><td>(A)</td></tr> <tr><td>0</td><td>1</td><td>:</td><td>1</td><td>(B)</td></tr> <tr><td>1</td><td>0</td><td>:</td><td>1.5</td><td>(C)</td></tr> <tr><td>1</td><td>1</td><td>:</td><td>2</td><td>(D)</td></tr> </table>	No. 4	5				0	0	:	0.5	(A)	0	1	:	1	(B)	1	0	:	1.5	(C)	1	1	:	2	(D)																				
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	<table> <tr><td>No. 6</td><td>7</td><td></td><td></td><td></td></tr> <tr><td>0</td><td>0</td><td>:</td><td>3</td><td></td></tr> <tr><td>0</td><td>1</td><td>:</td><td>2</td><td></td></tr> <tr><td>1</td><td>0</td><td>:</td><td>1</td><td></td></tr> <tr><td>1</td><td>1</td><td>:</td><td>OFF</td><td></td></tr> </table>	No. 6	7				0	0	:	3		0	1	:	2		1	0	:	1		1	1	:	OFF																					
No. 6	7																																														
0	0	:	3																																												
0	1	:	2																																												
1	0	:	1																																												
1	1	:	OFF																																												
8	Not used.																																														

**NOTE:** Selectors 1 through 5 are applicable to those models equipped with a built-in TAD.

l **Selectors 1 through 3: Erasing time length of ICM tone recorded preceding the tone detection starting point in the case of automatic line disconnection due to no voice signal received**

If the equipment has disconnected the line after detection of disconnection tone in ICM recording, it erases tone recorded preceding the tone detection starting point for the time length set by these selectors.

l **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 in any of the following cases:

- when the line is connected via the external telephone in the external TAD mode.
- when the line is connected via the facsimile equipment in F/T or TAD mode.

l **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 (Function setting 13)**

Selector No.	Function	Setting and Specifications
1   4	Detection time length of the disconnection tone in ICM recording	No. 1 2 3 4 0 0 0 0 : No detection 0 0 0 1 : 1 sec. 0 0 1 0 : 2 sec. 0 1 0 0 : 4 sec.     1 1 1 1 : 15 sec.
5   8	Not used.	

**NOTE:** Selectors 1 through 4 are applicable to those models equipped with a built-in TAD.

**I Selectors 1 through 4: Detection time length of the disconnection tone in ICM recording**

If the equipment detects disconnection tone for the time length set by these selectors, it will disconnect the line.

**WSW36 (Function setting 14)**

Selector No.	Function	Setting and Specifications
1   5	Not used.	
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)

**I 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).

**[ B ] Printout of firmware switch data**

**n Function**

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

**n 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

MODEL: 5X4-401  
 TIME : 01/01/1999 02:09  
 REV. : UG2489001 VER.0  
 PCI : 2.00  
 SUM : 941E

:09  
R.0

<pre> WSW01 = 00000000 1-2. DIAL FORMAT           : NORMAL 3-4. BREAK TIME           : 60 MS 5-6. INTERDIGIT PAUSE     : 800 MS 7. DP/PB CHANGE IN USER SW : YES 8. DP/PB FIXING SELECTION : PB WSW02 = 1111010 1-2. ON TIME              : 100 MS 3-4. OFF TIME             : 140 MS 5-8. LINE BEEP ATTENUATOR : 10 DB WSW03 = 10000000 1. PARA. CNG DETECTION1   : B 2-4. NOT USED 5. PARA. CNG DETECTION2   : A 6-8. NOT USED WSW04 = 00010111 1-8. NOT USED WSW05 = 00000010 1-3. DIAL TONE DETECTION  : 3.5 SEC WAITING 4. REMOTE ID DETECTION TIMEOUT : 2 SEC 5-6. BUSY TONE DETECTION (CALLING) : NO 7. BUSY TONE DETECTION (CALLED) : OFF 8. NOT USED WSW06 = 00101100 1-3. PAUSE KEY           : 3.5 SEC WAITING 4-8. NOT USED WSW07 = 01001100 1-8. NOT USED WSW08 = 01100100 1-8. NOT USED WSW09 = 00000000 1. ECM FRAME             : 256 OCTET 2. NON STANDARD FACILITIES : ON 3-4. TIMES OF FALL BACK   : 4 5. T5 TIMER              : 300 SEC 6. T1 TIMER              : 35 SEC 7-8. CALLING TIMEOUT     : 50 SEC WSW10 = 00010100 1. DPS LINK WITH CML     : NO 2. TIMING OF LAST DIGIT-MODEM CHANGE : 100 MS 3. TIMING OF CML ON CNG TRANSMISSION : 2 SEC 4. TIMING OF CML ON CED TRANSMISSION : 2 SEC 5-6. TRAINING RETRIES    : 2 7-8. NOT USED WSW11 = 01011000 1-2. FREQUENCY RANGE     : INITIAL DATA 3. NOT USED 4-8. ON/OFF TIME         : 400 - 600 MS / 400 - 600 MS 175 - 440 MS / 175 - 440 MS WSW12 = 10011010 1-2. OFF DETECTION TIME  : 700 MS 3-4. AUTO ANS OFF DETECTION TIME : 7 SEC 5-6. ON DETECTION TIME   : 250 MS 7. DELAY                 : OFF 8. NOT USED                     </pre>	:10 R.0
<pre> 5. RTN ON UNSYNC. RECEIVE : NO 7. NOT USED 8. ATTENUATOR LIMIT       : ON WSW24 = 01001011 1-2. NOT USED 3-4. DELAY OF CML ON-OGM  : 4 SEC 5-8. NOT USED                     </pre>	
<pre> WSW36 = 00000000 1-5. NOT USED 6-8. IGNORE CI COUNT     : 0                     </pre>	

**Configuration List**

### 3.6 Operational Check of LCD

#### n Function

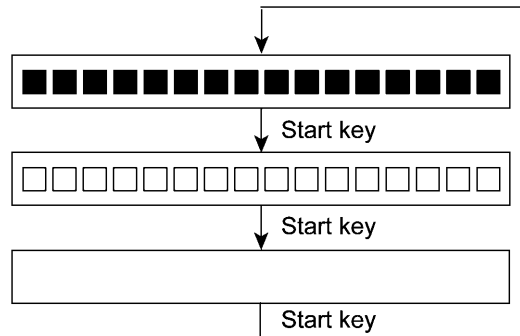
This function allows you to check whether the LCD on the control panel works normally.

#### n 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

#### n Function

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

#### n 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.

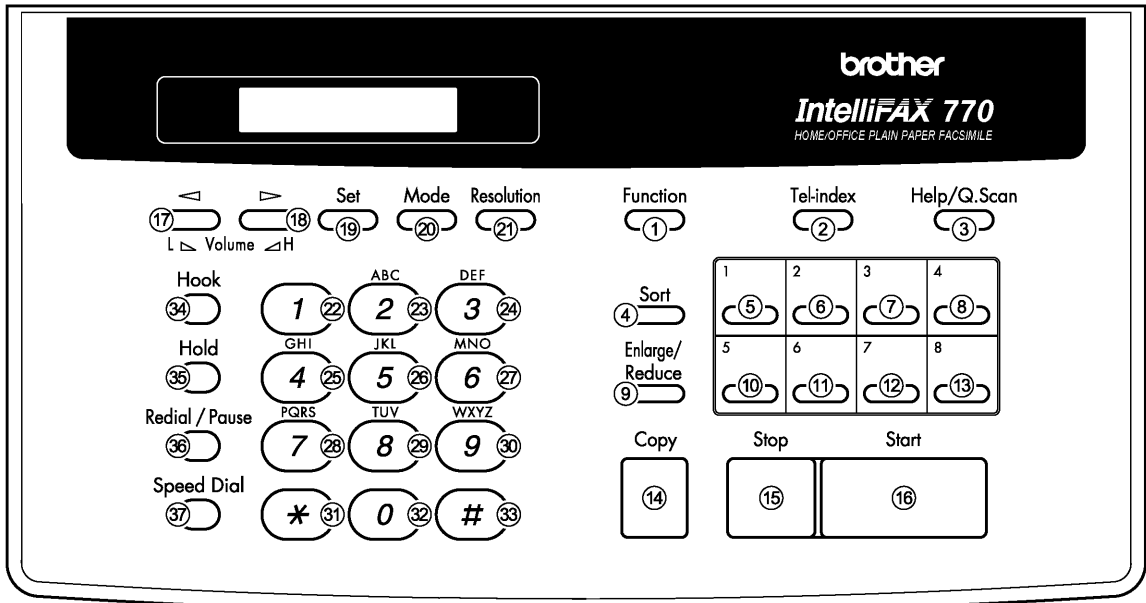
The LCD shows the corresponding number in decimal notation each time a key or button is pressed. Check that the displayed number is correct by referring to the illustration below.

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.

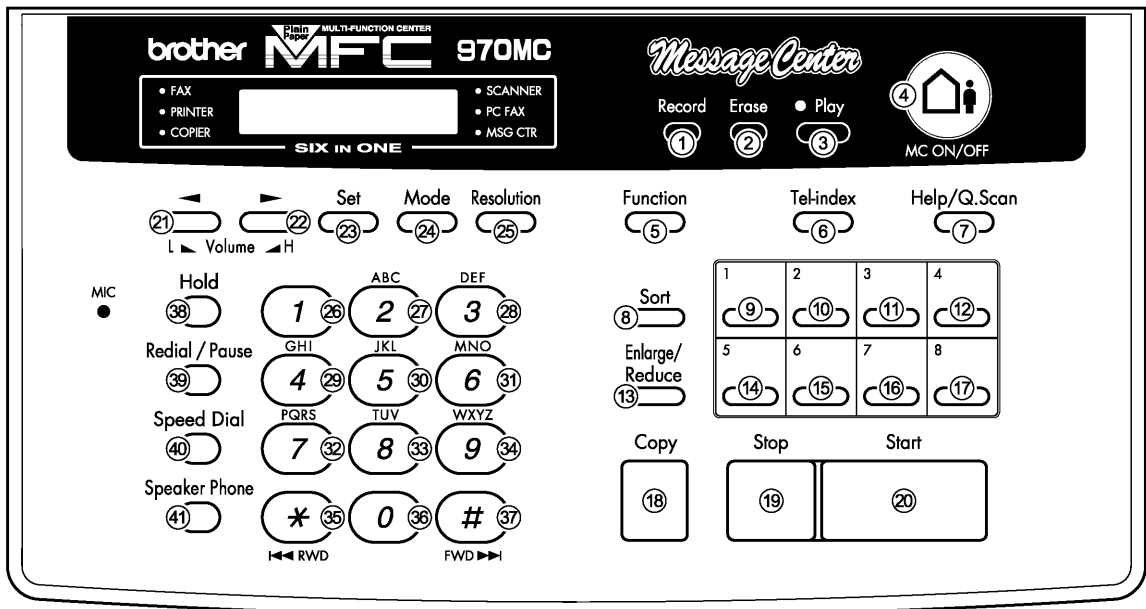
- (3) After the last number key or button is pressed, the equipment beeps and returns to the initial stage of the maintenance mode.

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

FAX750/FAX770/FAX-910/FAX-920/FAX-921/MFC-925



FAX870MC/FAX-930/FAX-931/MFC970MC



Key & Button Entry Order



### 3.8 Sensor Operational Check

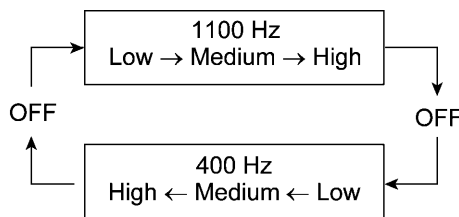
#### n Function

This function allows you to check that the seven sensors (document front sensor, document rear sensor, cover sensor, paper ejection sensor, paper-edge sensor, ribbon sensor, and hook switch sensor\*) operate correctly.

(\*In the FAX-910, the hook switch sensor serves no function.)

#### n 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.



If the sensing status are as listed below, the LCD will show the following:

"FRERCJMPHRX 1" on the FAX-910

"FRERCJMPHRXHK 1" on other models

In this area a numeral appears, indicating the number of communications records printed out at the factory for testing.

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

LCD	Sensors	Sensing status
FRE	Document front and rear sensors	No document detected.
RC	Cover sensor	Recording paper cover ASSY closed.
JM	Paper ejection sensor	No paper jam.
PH	Paper-edge sensor	Recording paper loaded or paper front cover opened.
RX	Ribbon sensor	Ribbon cartridge loaded.
HK	Hook switch sensor	On-hook state.

- (2) Change the detecting conditions and check that the displayed letters disappear. For example, insert a document through the document front (or rear) sensor and check that the "F" ( or "E") of the FRE disappears.
- (3) To stop this operation, press the **Stop** key. The equipment beeps for one second and returns to the initial stage of the maintenance mode.

### 3.9 Fine Adjustment of Scanning Start/End Position

#### n Function

This function allows you to adjust the scanning start/end position.

#### n Operating Procedure

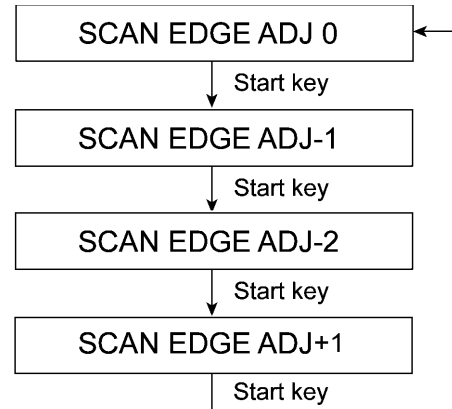
- (1) Press the **5** and **4** keys in this order in the initial stage of the maintenance mode.

The LCD shows the current scanning position correction value as shown at right.

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

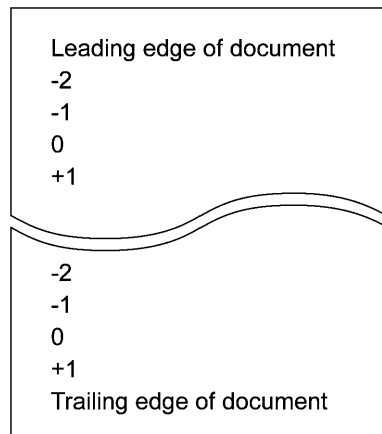
That is, pressing this key cycles through the correction values (mm) as shown below.

0 → -1 → -2 → +1



- (3) To stop this operation, press the **Stop** key. The equipment beeps for one second and returns to the initial stage of the maintenance mode.

**NOTE:** The relationship between the scanning start/end positions and their correction values is shown below.



### 3.10 CIS Scanner Area Setting

#### n Function

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

#### n Operating Procedure

- (1) Press the **5** key twice in the initial stage of the maintenance mode.  
The "SCANNER AREA SET" will appear on the LCD.  
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.

### 3.11 EEPROM Customizing

#### n 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.

#### n 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., 1101 in the case of FAX770 U.S.A. versions) appears.
- (2) Enter the desired customizing code (e.g., 0102 in the case of FAX770 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.

### 3.12 Equipment Error Code Indication

#### n Function

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

#### n 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 \_\_" (for 2-digit error code indication) or "MACHINE ERR \_ \_ \_ \_" (for 4-digit error code indication).
- (2) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

### 3.13 Output of Transmission Log to the Telephone Line

#### n 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.

#### n 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) For FAX750/FAX770/FAX870MC/MFC970MC: Press the **Function**, **Mode**, and **0** keys in this order.  
For FAX-910/FAX-920/FAX-921/FAX-930/FAX-931/MFC-925: Press the **Menu**, **Mode**, and **0** keys in this order.
  - 2) Press the **8** and **7** keys.  
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.

### 3.14 Document Draw Adjustment

After replacement of the main PCB or CIS, or if data stored in the EEPROM is damaged, you need to carry out this procedure by using the TC-027 chart.

#### n Function

This function adjusts how much the document is drawn in, starting at the point when the document rear sensor is turned on until the leading edge of the document reaches the scanning start position.

#### n Operating Procedure

(1) In the initial stage of the maintenance mode, set the TC-027 chart on the document stacker.  
The message "DOC. READY" appears on the LCD.

(2) For FAX750/FAX770/FAX870MC/MFC970MC: Press the **Function** key.

For FAX-910/FAX-920/FAX-921/FAX-930/FAX-931/MFC-925: Press the **Menu** key.

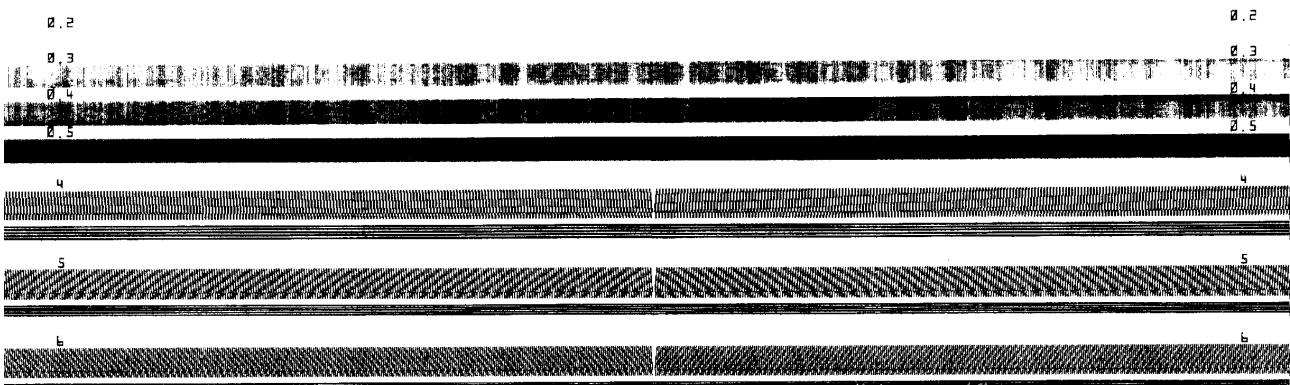
The equipment beeps and draws in the TC-027 chart to the scanning start position. While drawing it in, the equipment counts patterns on the chart to determine the amount of draw.

Upon completion of normal counting, the equipment shows the message "COPY P.01 SUP" on the LCD and begins copying the TC-027 chart. The message "REAR SENSOR IS ADJUSTED." and the copied image will be printed out on recording paper as shown below.

If any error occurs during counting, the message "MACHINE ERROR AB" appears on the LCD, with no copying of the TC-027 chart onto the recording paper. However, only the message "REAR SENSOR IS ADJUSTED." will be printed out.

TC-027

1997.1.14



REAR SENSOR IS ADJUSTED.

Printout after Normal Completion of Document Draw Adjustment

**CHAPTER VI.**  
**ERROR INDICATION AND**  
**TROUBLESHOOTING**

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# 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. As one of the error messages, "MACHINE ERROR \_ \_" includes an error code which indicates the detailed error causes listed in [ 2 ].

To display an error code for the other latest error message or detailed message, make the equipment enter the maintenance mode and press **8** and **2** keys (for details, refer to Chapter V, Section 3.12).

### [ 1 ] Error messages on the LCD

Messages on the LCD	Probable Cause
CHECK PAPER  (NOTE 1)	(1) The paper-edge sensor detects that no recording paper is present. (2) The paper ejection sensor detects that a paper jam has occurred .
TOP COVER OPEN	The cover sensor detects that the recording paper cover ASSY is not closed.
DOCUMENT JAM	n 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.)

**NOTE 1:** If a recording paper feeding or ejecting error occurs *in the maintenance mode*, this "CHECK PAPER" message will not appear on the LCD but some 4-digit error code listed on page VI-4 will appear instead.



Messages on the LCD	Probable Cause
DOCUMENT JAM	<p>n Document loading error</p> <p>(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.)</p> <p>(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.)</p>
CLEAN UP SCANNER	<p>In the scanning compensation data list printed by the maintenance-mode function code 05, less than fifty percent of the white level data is faulty. (This message may appear only in the maintenance mode.)</p>
SCANNER ERROR	<p>In the scanning compensation data list printed by the maintenance-mode function code 05, fifty percent or more of the white level data is faulty. (This message may appear only in the maintenance mode.)</p>
PRINTER FAULT	The thermistor in the recording head caused a heat error.
CHANGE CARTRIDGE	The ribbon sensor detects that no ink ribbon is loaded.
MACHINE ERROR __ or MACHINE ERR _ _ _ _	"_ _" indicates an error code. Refer to Section [ 2 ] on the following pages.
PC BUSY OR FAIL	After connected with the host computer, the equipment has received no response from the computer. (A communications error has occurred.)

If only an alarm beep is heard without any message on the LCD when the equipment is powered up, the ROM or RAM will be defective.

**[ 2 ] Error codes shown in the "MACHINE ERROR \_ \_" message**

Error Code (Hex.)	Error factor
( 85	Ink ribbon empty. )
( 87	Fails to complete the sequence of recording operation. )
8A	Wrong or weak contact of the recording head connectors.
( 8B	Recording head overheat. )
( A1	Recording paper cover opened. )
( A2	Document too long to scan. )
( A4	50% or more faulty of white level data. ) *
( A5	Faulty operation of DMA0 during scanning. )
( A6	Faulty operation of DMA1 during scanning. )
( A7	One-line feeding time-out error. )
( A8	One-line scanning time-out error. )
( AB	Document feed-in amount measuring error. ) *
( AC	Less than 50% faulty of white level data. ) *
( B9	Light emission intensity error of the LED array. )
( BE	Abnormal clamp PWM value )
( BF	Light emission intensity error of the LED array at the setting time of initial values. ) *
( D5	The MODEM fails to complete the command transmission sequence. )
( D6	No MODEM interrupt for 60 seconds. )
E6	Write error in EEPROM.
( E8	Data scanning error during transmission. )
F3	Voice message recording or playing-back not started.
( F5	EOL not found in page memory transmission mode. )
( F6	PC interface error. )

Error codes in parentheses do not appear in the "MACHINE ERROR \_ \_," since those errors are displayed as messages described in "[ 1 ] Error messages on the LCD." You can display those error codes in the maintenance mode (Function code 82). If an equipment error occurs during communications, they appear in the communications error lists.

\*These codes marked with an asterisk can appear only in the maintenance mode.

Error Code (Hex.)	Error factor
( 82xx	Although recording paper has been fed by 150 mm after the start of recording, the paper-edge sensor is still OFF. )
( 8303	Although recording paper has been fed by 360 mm after the start of recording, the paper-edge sensor is still ON. )
( 8406	Although the trailing edge of recording paper has passed out of the platen and further fed for 100 mm, the paper ejection sensor is still ON. )
( 8407	Within 10 mm of paper feeding from when the paper ejection sensor went OFF, the sensor has come ON again.
( 840C	The paper ejection sensor is ON when you turn the power on or after you open and close the recording paper cover. If the paper-edge sensor is also ON, error code 880B appears.
( 8809	Before the start of paper feeding, the paper-edge sensor is already ON. )
( 880A	Although recording paper has been fed by 50 mm after the start of recording, the paper ejection sensor is still OFF. )
( 880B	The paper-edge sensor is ON when you turn the power on or after you open and close the recording paper cover. If the paper ejection sensor is also ON, this error code appears. )
( A301	Even if a document is set, the document front sensor is OFF. )
( A302	Although a document has passed through the document front sensor, the document rear sensor is still OFF. )
( A303	When the document ejection operation has started, the document front sensor remains OFF. )
( A304	When the document ejection operation has started, the document rear sensor remains OFF. )
( A305	Although the CIS scanner area setting operation has been completed [Function code 55 in the maintenance mode], the document front sensor remains OFF. )
( A306	Although the CIS scanner area setting operation has been completed [Function code 55 in the maintenance mode], the document rear sensor remains OFF. )
( A307	In document scanning, the document rear sensor remains ON although the document has been fed by the specified amount after the document front sensor went OFF. )
( A308	In document ejecting caused by any of the following, the document rear sensor remains ON although the document has been fed by the specified amount after the document front sensor went OFF: <ul style="list-style-type: none"> <li>- Depression of the <b>STOP</b> key in midway of scanning.</li> <li>- Illegal copying (Copying a document longer than the recording paper or making an enlargement copy larger than the recording paper).</li> <li>- Recovery operation from the error state (e.g., "DOCUMENT JAM" and "CHECK PAPER" error.)</li> </ul>

**NOTE:** Four-digit error codes listed above are preceded by MACHINE ERR instead of MACHINE ERROR.

Error codes in parentheses do not appear in the "MACHINE ERR \_ \_ \_ \_," since those errors are displayed as messages described in "[ 1 ] Error messages on the LCD." You can display those error codes in the maintenance mode (Function code 82). If an equipment error occurs during communications, they appear in the communications error lists.

## 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.

**n 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 Germany and Austria 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.

**(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.

**(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.
A8	01	RTN, PIN, or ERR received at the calling terminal.*
A9	01	RTN, PIN, or ERR received at the called terminal.*

\* Available in Germany and Austria 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.
E0	03	Failed to detect any command from the RS-232C interface in burn-in operation.

**(13) Equipment error**

Code 1	Code 2	Causes
FF	<u>X</u> <u>X</u>	Equipment error (For <u>X</u> <u>X</u> , refer to Subsection 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, check that :

- (1) Each voltage level on AC input lines and DC lines is correct.
- (2) All cables and harnesses are firmly connected.
- (3) None of the fuses are blown.

## 2.4 Troubleshooting Procedures

### [ 1 ] Control panel related

Trouble	Check:
(1) LCD shows nothing.	<ul style="list-style-type: none"> <li>• Panel-main harness between the main PCB and the control PCB</li> <li>• Interfaces between the main PCB, NCU PCB and power supply PCB</li> <li>• LCD</li> <li>• Control panel PCB</li> <li>• Power supply PCB</li> <li>• Main PCB</li> </ul>
(2) Control panel inoperative.	<ul style="list-style-type: none"> <li>• Panel-main harness between the main PCB and the control PCB</li> <li>• Interfaces between the main PCB, NCU PCB and power supply PCB</li> <li>• Control panel PCB</li> <li>• FPC key</li> <li>• Main PCB</li> </ul>

### [ 2 ] Telephone related

Trouble	Check:
(1) No phone call can be made.	<ul style="list-style-type: none"> <li>• FPC key</li> <li>• Control panel PCB by using the maintenance-mode function code 13. If any defective keys are found, replace them. (Refer to Chapter V, Section 3.7, "Operational Check of Control Panel PCB.")</li> <li>• NCU PCB</li> <li>• Main PCB</li> </ul>
(2) Speed dialing or one-touch dialing will not work.	<ul style="list-style-type: none"> <li>• Ordinary dialing function (other than the speed and one-touch dialing)</li> </ul> <p>If it works normally, check the main PCB; if not, refer to item (1) above.</p>
(3) Speaker silent during on-hook dialing.	<ul style="list-style-type: none"> <li>• Ordinary dialing function (Pick up the handset and press the numerical keys.)</li> </ul> <p>If it works normally, proceed to the following checks; if not, refer to item (1) above.</p>
(4) Dial does not switch between tone and pulse.	<ul style="list-style-type: none"> <li>• Main PCB</li> </ul>
(5) Telephone does not ring.	<ul style="list-style-type: none"> <li>• Speaker</li> <li>• NCU PCB</li> <li>• Main PCB</li> </ul>

**[ 3 ] Communications related**

Trouble	Check:
(1) No tone is transmitted.	<ul style="list-style-type: none"> <li>• Main PCB</li> <li>• NCU PCB</li> </ul>

**[ 4 ] Paper/document feeding related**

Trouble	Check:
(1) Neither "COPY: PRESS COPY" nor "FAX: NO. & START" message appears although documents are set.	<ul style="list-style-type: none"> <li>• Sensors by using the maintenance-mode function code 32. (Refer to Chapter V, Section 3.8, "Sensor Operational Check".)</li> <li>• Document front sensor actuator and rear sensor actuator</li> <li>• Main PCB</li> </ul>
(2) Document not fed.	<ul style="list-style-type: none"> <li>• ADF and its related sections</li> <li>• Drive motor and its harness</li> <li>• LF roller and its related gears</li> <li>• Solenoid and the planetary gear train</li> <li>• Main PCB</li> </ul>
(3) Recording paper not fed.	<ul style="list-style-type: none"> <li>• Paper feed roller and its related sections</li> <li>• Drive motor and its harness</li> <li>• Platen and its related gears</li> <li>• Solenoid and the planetary gear train</li> <li>• Main PCB</li> </ul>
(4) Document double feeding	<ul style="list-style-type: none"> <li>• ADF parts</li> </ul>

**[ 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	Check:
(1) Completely blank <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• Main PCB</li> <li>• CIS unit</li> <li>• CIS harness</li> <li>• Main-head harness and head-power harness</li> <li>• Compression springs beneath the recording head</li> <li>• Recording head</li> <li>• Main PCB</li> </ul>
(2) White vertical streaks <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• CIS unit</li> <li>• Recording head</li> </ul>
(3) All black <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• CIS harness</li> <li>• CIS unit</li> <li>• Main PCB</li> <li>• Main-head harness and head-power harness</li> <li>• Recording head</li> <li>• Main PCB</li> </ul>
(4) Black vertical streaks <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• CIS unit</li> <li>• Recording head</li> </ul>
(5) Light or dark <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• CIS unit</li> <li>• Main PCB</li> <li>• Compression springs beneath the recording head</li> <li>• Position of the head adjuster</li> </ul>
(6) Faulty image registration <u>At the scanner</u>  <u>At the recorder</u>	<ul style="list-style-type: none"> <li>• CIS harness</li> <li>• CIS unit</li> <li>• Main PCB</li> <li>• Main-head harness and head-power harness</li> <li>• Main PCB</li> <li>• Recording head</li> </ul>



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