brother

FACSIMILE EQUIPMENT
SERVICE MANUAL

MODEL: FAX1150P/1200P/1350M
FAX1700P/1450MC/
1550MC/1850MC/1950MC

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 adjustment—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 five chapters and appendices.

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

CHAPTER I.

GENERAL DESCRIPTION

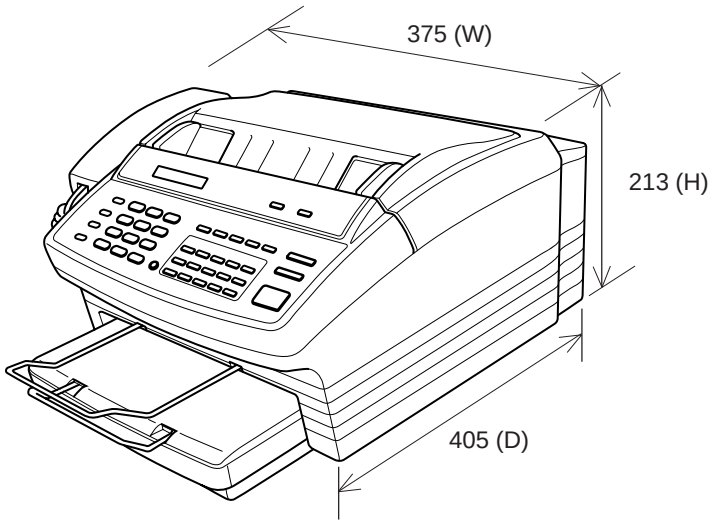
CONTENTS

1. EQUIPMENT OUTLINE

1.1 External Appearance

The figure below shows the equipment appearance and approximate dimensions.

(NOTE: The handset, curled cord, handset mount and related parts are not provided on the FAX1150P.)



(Unit: mm)

1.2 Components

The equipment has the following components:

- Facsimile Equipment
  - Electronic/ Electrical/ Section
    - Main PCB
    - NCU PCB
    - Control Panel PCB
    - Recording Head Unit
    - LED Array (for illuminating documents)
    - Charge Coupled Device (CCD) Unit
    - Sensors
    - Power Supply PCB
  - Mechanical Section
    - Drive Motor (for paper & document feed)
    - Drive Gears
    - Control Panel Unit
    - Covers
    - Automatic Document Feeder (ADF)
    - Handset (Not provided on the FAX1150P)
    - Frame and Miscellaneous Parts
  - Package
  - Accessories

2. SPECIFICATIONS

Model	IntelliFAX1350M	IntelliFAX1450MC	IntelliFAX1550MC	MFC1850MC	MFC1950MC
Color	BN4	BN2	BN4	1138	1138
Modem Speed	9600 bps	14400 bps	14400 bps	14400 bps	14400 bps
CCITT Group	G3	G3	G3	G3	G3
Coding Method	MH	MH	MH	MH	MH
Transmission Speed	15 sec.	10 sec.	10 sec.	10 sec.	10 sec.
Input/Output Width	8.5"/8.5"	8.5"/8.5"	8.5"/8.5"	8.5"/8.5"	8.5"/8.5"
ADF Capacity (pages)	20 or more	20 or more	20 or more	20 or more	20 or more
Handset	Yes	Yes	Yes	Yes	Yes
LCD Size	16 X 1	16 X 1	16 X 1	16 X 1	16 X 1
Super Fine	Yes	Yes	Yes	Yes	Yes
Gray Scale	64	64	64	64	64
Smoothing	Yes	Yes	Yes	Yes	Yes
One-touch Dial	15X2	15X2	15X2	15X2	15X2
Speed Dial	60	60	100	60	100
Telephone Index	Yes	Yes	Yes	Yes	Yes
Multi-resolution Transmission	Yes	Yes	Yes	Yes	Yes
FAX/TEL Switch	Yes	Yes	Yes	Yes	Yes
Distinctive Ringing	Yes	Yes	Yes	Yes	Yes
Next Fax-reservation	Yes	Yes	Yes	Yes	Yes
Help	Yes	Yes	Yes	Yes	Yes
TAD Interface	Yes	Yes	Yes	Yes	Yes
Coverpage	Yes, Super	Yes, Super	Yes, Super	Yes, Super	Yes, Super
Polling Type	Std/Sec/Del/Seq	Std/Sec/Del/Seq	Std/Sec/Del/Seq	Std/Sec/Del/Seq	Std/Sec/Del/Seq
Password Check	Yes	Yes	Yes	Yes	Yes
Delayed Transmission	Yes, 3 timings	Yes, 3 timings	Yes, 3 timings	Yes, 3 timings	Yes, 3 timings
Call Reservation	Yes	Yes	Yes	Yes	Yes
Call Back Message	Yes	Yes	Yes	Yes	Yes
Page Memory	Yes, 256 KB	Yes, 512 KB	Yes, 512 KB	Yes, 512 KB	Yes, 512 KB
Out-of-paper Reception	10 pages	20 pages	20 pages	20 pages	20 pages
Quick Scan	Yes	Yes	Yes	Yes	Yes
Super Quick Scan	Yes	Yes	Yes	Yes	Yes
Broadcasting	Yes	Yes	Yes	Yes	Yes
Relay Broadcasting	No	No	No	No	No
ECM	Yes	Yes	Yes	Yes	Yes
Multi Transmission	Yes	Yes	Yes	Yes	Yes
Multi Copy	Yes	Yes	Yes	Yes	Yes
Enlargement	Yes	Yes	Yes	Yes	Yes
Reduction	Yes	Yes	Yes	Yes	Yes
TAD Type	No	IC Digital	IC Digital	IC Digital	IC Digital
OGM	No	Yes	Yes	Yes	Yes
ICM Recording Time	No	8 min	8 min	8 min	8 min
FAX Forwarding	Yes	Yes	Yes	Yes	Yes
FAX Retrieval	Yes	Yes	Yes	Yes	Yes
PCI (Missing link)	Option	Option	Option	Yes	Yes
Message Center	No	Yes	Yes	Yes	Yes
Paging	Yes	Yes	Yes	Yes	Yes
Caller ID	Yes	Yes	Yes	Yes	Yes
Fax-on-demand	No	Yes	Yes	Yes	Yes
Voice-on-demand	No	Yes	Yes	Yes	Yes
Mail Box	No	Yes	Yes	Yes	Yes
Remote Control	No	Yes	Yes	Yes	Yes
Toll Saver	No	Yes	Yes	Yes	Yes
Memo/2-Way Recording	No	Yes	Yes	Yes	Yes
Auto Cutter	No	No	No	No	No
Anti-curl System	No	No	No	No	No
Paper Size	letter/legal/A4	letter/legal/A4	letter/legal/A4	letter/legal/A4	letter/legal/A4
Paper Cassette	200 sheets	200 sheets	200 sheets	200 sheets	200 sheets
Auto Reduction	Yes	Yes	Yes	Yes	Yes
Contrast	SuperL/Auto/SuperD	SuperL/Auto/SuperD	SuperL/Auto/SuperD	SuperL/Auto/SuperD	SuperL/Auto/SuperD
Confidential Mailbox	No	No	No	No	No
Optional Expansion Memory	No	Yes, 512 KB	Yes, 512 KB	Yes, 512 KB	Yes, 512 KB

NOTES • The TAD recording time depends on the sampling rate. • The MR and F/T OGM are optionally available.

Model	FAX1150P	FAX1200P	FAX1700P
Color	1138	1138	1138
Modem Speed	9600 bps	9600 bps	14400 bps
CCITT Group	G3	G3	G3
Coding Method	MH	MH	MH
Transmission Speed	15 sec.	15 sec.	10 sec.
Input/Output Width	A4/A4	A4/A4	A4/A4
ADF Capacity (pages)	20	20	20
Handset	No	Yes	Yes
LCD Size	16 X 1	16 X 1	16 X 1
Super Fine	Yes	Yes	Yes
Gray Scale	64	64	64
Smoothing	Yes	Yes	Yes
One-touch Dial	15X2	15X2	15X2
Speed Dial	40	40	100
Telephone Index	Yes	Yes	Yes
Multi-resolution Transmission	Yes	Yes	Yes
FAX/TEL Switch	Yes	Yes	Yes
Distinctive Ringing	No	No	No
Next Fax-reservation	Yes	Yes	Yes
Help	Yes	Yes	Yes
TAD Interface	Yes	Yes	Yes
Coverpage	Yes, Super	Yes, Super	Yes, Super
Polling Type	Std/Sec/Del/Seq	Std/Sec/Del/Seq	Std/Sec/Del/Seq
Password Check	Yes	Yes	Yes
Delayed Transmission	Yes, 3 timings	Yes, 3 timings	Yes, 3 timings
Call Reservation	Yes	Yes	Yes
Call Back Message	Yes	Yes	Yes
Page Memory	Yes, 256 KB	Yes, 256 KB	Yes, 1 MB
Out-of-paper Reception	10 pages	10 pages	50 pages
Quick Scan	Yes	Yes	Yes
Super Quick Scan	Yes	Yes	Yes
Broadcasting	Yes	Yes	Yes
Relay Broadcasting	No	No	No
ECM	Yes	Yes	Yes
Multi Transmission	Yes	Yes	Yes
Multi Copy	Yes	Yes	Yes
Enlargement	Yes	Yes	Yes
Reduction	Yes	Yes	Yes
TAD Type	No	No	Yes
OGM	No	No	Yes
ICM Recording Time	No	No	14 min
FAX Forwarding	Yes	Yes	Yes
FAX Retrieval	Yes	Yes	Yes
PCI (Missing link)	No	Yes	Yes
Message Center	No	No	Yes, 14 min
Paging	No	No	Yes
Caller ID	No	No	No
Fax-on-demand	No	No	Yes
Voice-on-demand	No	No	Yes
Mail Box	No	No	Yes
Remote Control	No	No	Yes
Toll Saver	No	No	Yes
Memo/2-Way Recording	No	No	Yes
Auto Cutter	No	No	No
Anti-curl System	No	No	No
Paper Size	letter/legal/A4	letter/legal/A4	letter/legal/A4
Paper Cassette	200 sheets	200 sheets	200 sheets
Auto Reduction	Yes	Yes	Yes
Contrast	SuperL/Auto/SuperD	SuperL/Auto/SuperD	SuperL/Auto/SuperD
Confidential Mailbox	No	No	No
Optional Expansion Memory	No	No	*

* Yes, 512KB: Only for the German, Austrian and Asian versions
No: For other versions

CHAPTER II.

INSTALLATION

CONTENTS

1. DEALER OPTION

A 512-kilobyte expansion memory board is optionally provided for the FAX1450MC/1550MC/1850MC/1950MC and the German, Austrian and Asian versions of the FAX1700P.

Installing the Optional Memory Board

(1) Disconnect the power cord.

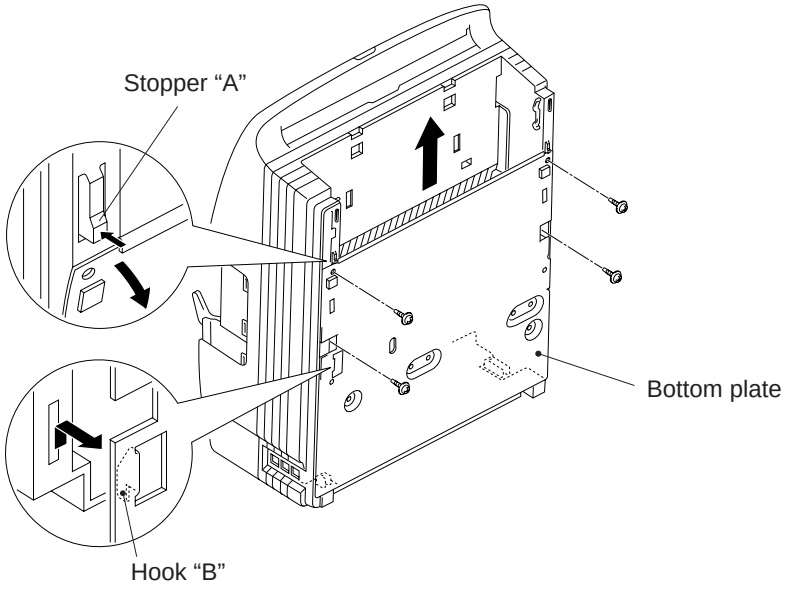
(2) Remove the bottom plate according to the steps below.

1) Place the machine upright as shown below.

2) Remove the four screws.

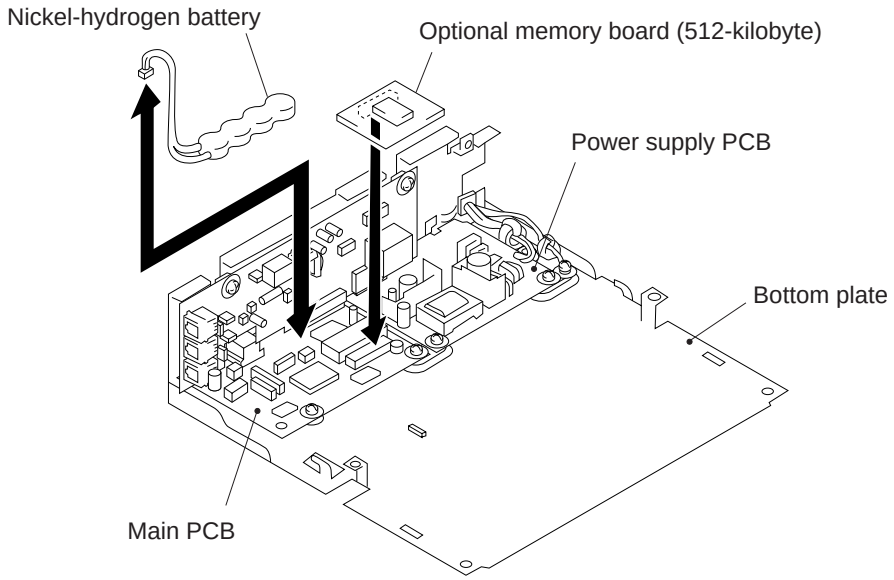
3) Slightly pull the top end of the bottom plate towards you to release it from stoppers "A."

4) Lift up the bottom plate to disengage its hooks "B" from the body cover.



(3) Disconnect the nickel-hydrogen battery from the main PCB.

(4) Directly plug the optional memory board into the connector on the main PCB.



(5) Replace the nickel-hydrogen battery.

(6) Install the bottom plate.

(7) Plug in the power cord.

(8) To check that the main PCB recognizes the optional memory board correctly, print out the memory status list as shown below by pressing the [Function], [3], and [8] keys and the [START] button.

At the bottom of the memory status list, the “OPTION MEMORY WAS INSTALLED” should be printed.

MEMORY STATUS LIST

TIME : 01/01/1996 00:30
NAME : AJGM
FAX : 123
TEL : 456

TAD

	DATE	TIME	
00 VOICE ON DEMAND			00%

VOICE ALARM

00 SCHEDULES	00%

STORED FAXES FOR RETRIEVAL

	DATE	TIME	RECEIVED FROM	# OF PAGES
				00%

MAIL BOX

	DATE	TIME	RECEIVED FROM	# OF PAGES
BOX01				
BOX02				
				00%

MEMORY USED FOR FAX FEATURES

		TIME	DESTINATION	# OF PAGES	
TIMER	1)	10:00	8242787	01	04%
ECM					05%
00 FAX ON DEMAND					00%
FAX FORWARD NUMBER	:		123		

MEMORY AVAILABLE

FREE	91%

OPTION MEMORY WAS INSTALLED

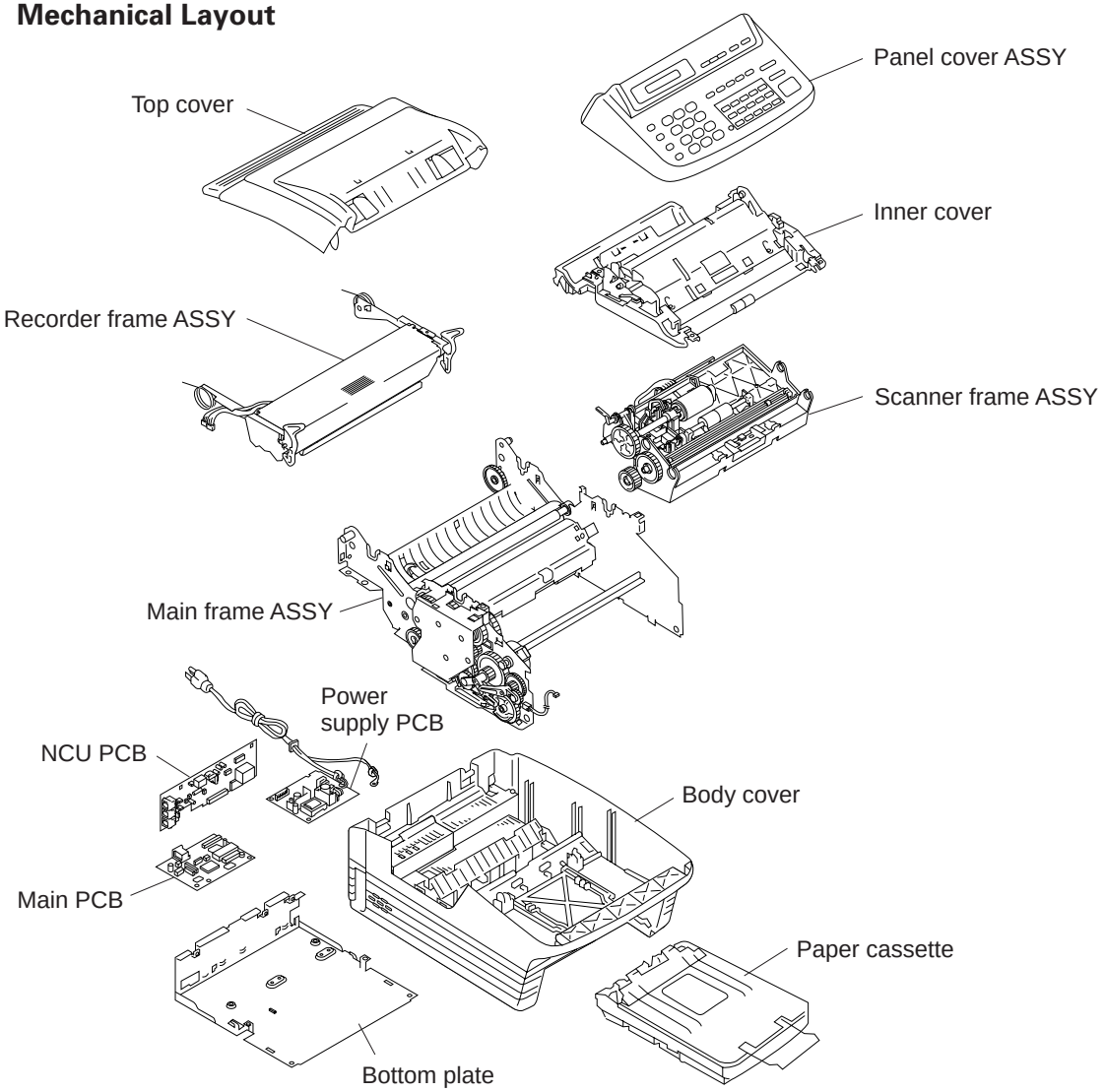
CHAPTER III.

THEORY OF OPERATION

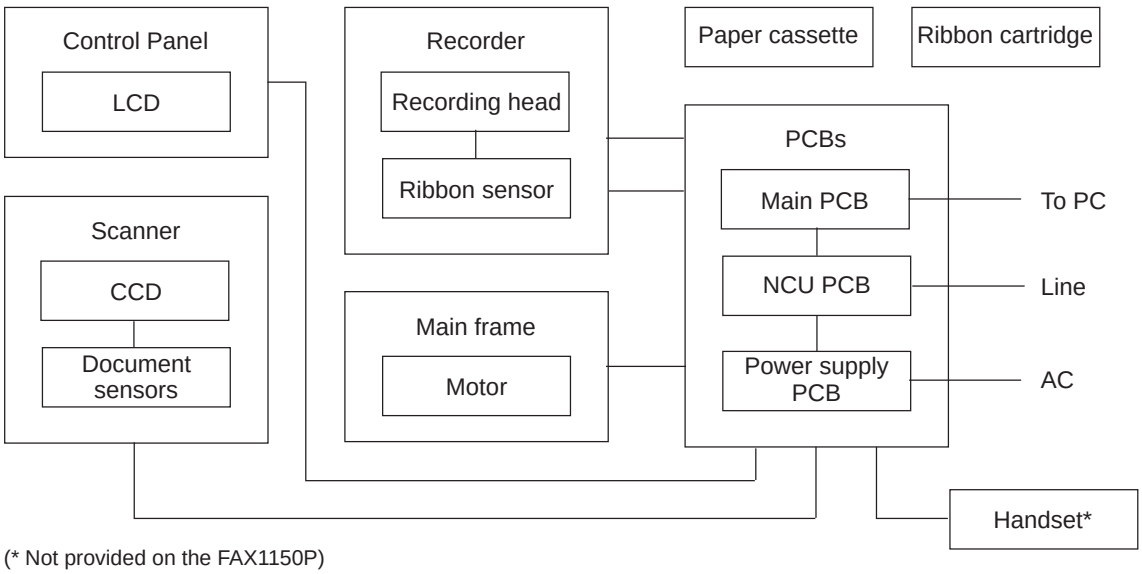
CONTENTS

1. OVERVIEW

1.1 Mechanical Layout



1.2 Functional Block Diagram



(* Not provided on the FAX1150P)

2. MECHANISMS

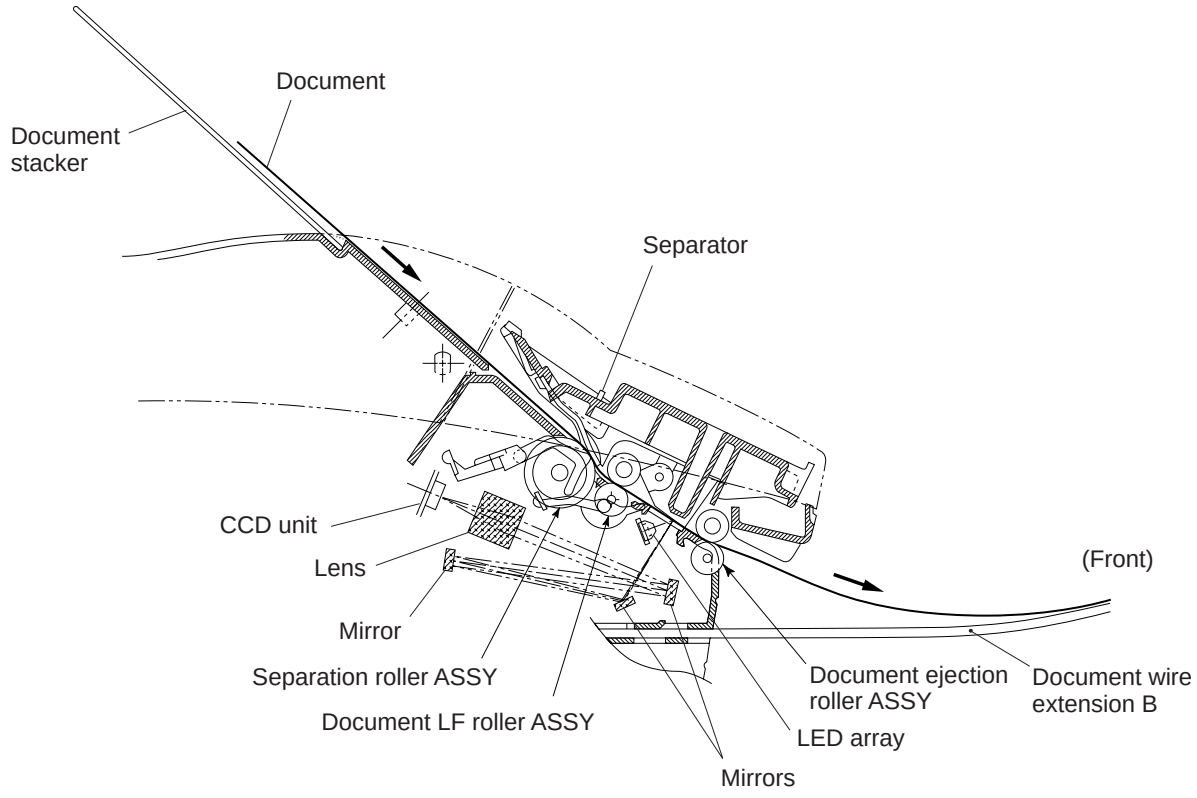
2.1 Transmitting Mechanism (Feeding and Scanning Documents)

The transmitting mechanism consists of the document stacker, automatic document feeder (ADF), document feeding related rollers, scanner, and document sensors. (For details about the sensors, refer to Section 2.3.)

If the operator sets documents on the stacker and starts the sending operation, the motor rotates counterclockwise so that the ADF feeds those documents into the equipment, page by page. Each document advances with the document LF roller to the scanner, and then it is fed out of the equipment with the document ejection roller.

After ejecting the last page, the motor rotates clockwise to return the switching cam to its home position.

For the power transmission shift by the switching cam and planetary gear train, refer to Section 2.4.



2.1.1 Automatic document feeder (ADF)

The ADF, which consists of the separation roller and separator, feeds documents set on the document stacker, starting from the bottom sheet to the top, page by page, due to the frictional difference among the separation roller, the documents, and the separator.

2.1.2 Scanner

The scanner uses a charge coupled device (CCD) image sensor.

As shown above, the LED array illuminates a document and the reflected light of the scanned image data is transmitted via the mirrors into the lens which reduces the scanned data so as to form the image on the CCD.

2.2 Receiving Mechanism (Feeding Paper & Recording Data)

The receiving mechanism consists of the paper cassette, paper feeding related rollers, platen, thermal recording head, and sensors (PE sensor, paper edge sensor, paper ejection sensor, ribbon sensor, and cam HP sensor). (For the details about the sensors, refer to Section 2.3.)

STEP 1: Shift from the scanning mode to the paper feeding mode

If the equipment receives data, the motor rotates clockwise to turn the switching cam 72 degrees from its home position (the scanning mode position) to the paper feeding mode position.

STEP 2: In the paper feeding mode

The motor rotates counterclockwise to drive the paper feed rollers, paper LF rollers, and the paper ejection rollers. This pulls out a sheet of recording paper from the paper cassette and feeds it until its leading edge reaches the point just before the printing position.

STEP 3: Shift from the paper feeding mode to the recording mode

The motor rotates clockwise to turn the cam to the recording mode position (144˚ from the home position).

STEP 4: In the recording mode

The motor rotates counterclockwise to drive the paper LF rollers, platen, and paper ejection rollers. This feeds the recording paper up to the printing position where the thermal printing head prints, as well as feeding the thermal ink ribbon. The paper advances further until its trailing edge passes through the ribbon separation point.

If there are data to be printed on the next page, the equipment goes to STEP 5A. If there are no more data to be printed, the equipment goes to STEP 5B.

STEP 5A: Shift from the recording mode to the paper feeding mode

The motor rotates clockwise to turn the cam to the paper feeding mode position (72˚ from the home position). The equipment goes back to STEP 2 where it feeds a new paper while ejecting the printed paper.

STEP 5B: Shift from the recording mode to the paper ejection mode

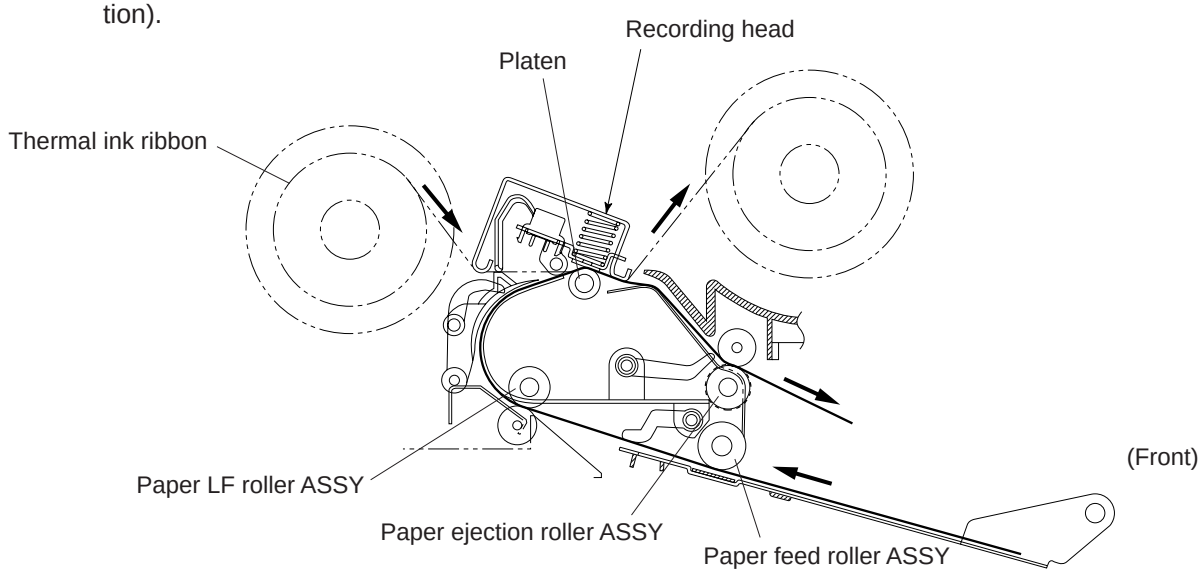
The motor rotates clockwise to turn the cam to the paper ejection mode position (288˚ from the home position).

STEP 6: In the paper ejection mode

The motor rotates counterclockwise to drive the paper LF rollers and paper ejection rollers. This ejects the recording paper.

STEP 7: Shift from the paper ejection mode back to the scanning mode

The motor rotates clockwise to return the cam to its home position (the scanning mode position).



2.3 Sensors

This equipment has two microswitches and seven (six*) photosensors as described below.

Microswitches

- Cam HP sensor which detects the home position of the switching cam.
- Ribbon sensor which detects when the thermal ink ribbon runs out.

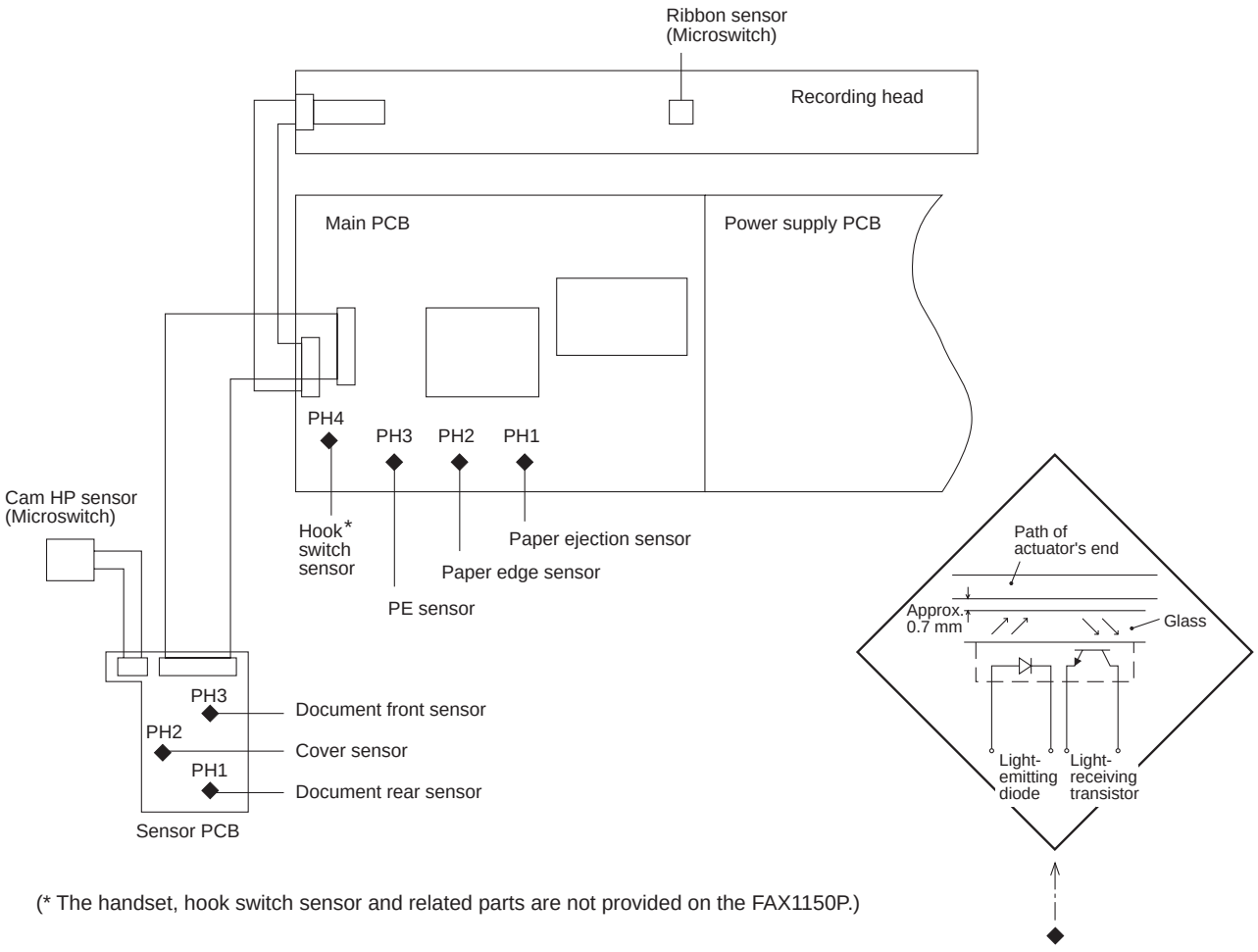
The cam HP sensor is located on the main frame and the ribbon sensor is on the recorder frame.

Photosensors

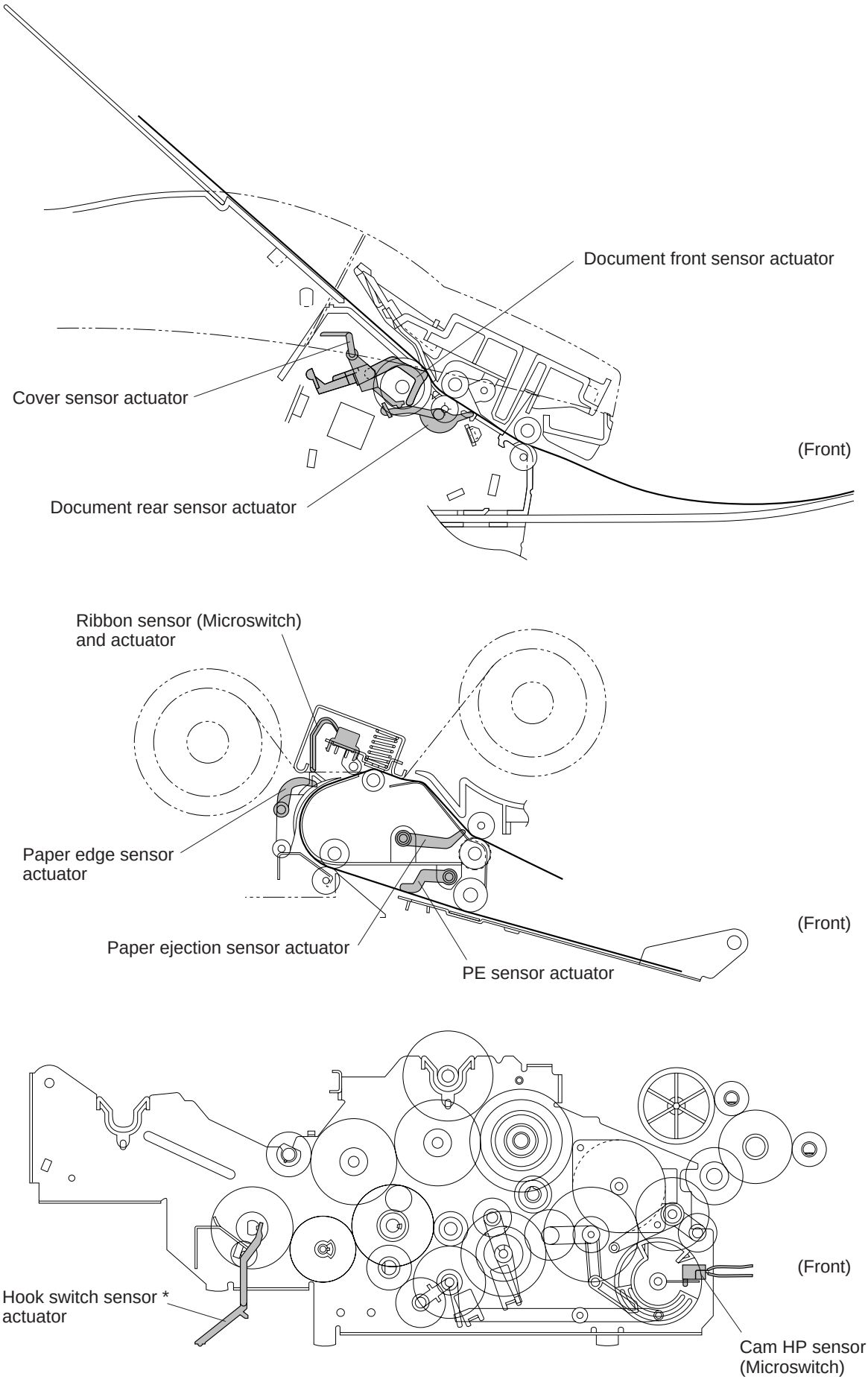
- Document front sensor which detects a presence of documents.
- Document rear sensor which detects the leading and trailing edges of pages to tell the control circuitry when the leading edge of a new page has reached the starting position and when the scan for that page is over.
- Cover sensor which detects whether the top cover is closed.
- PE (paper empty) sensor which detects that no recording paper is loaded.
- Paper edge sensor which detects the leading and trailing edges of recording paper.
- Paper ejection sensor which detects whether the recording paper goes out of the equipment.
- Hook switch sensor which detects whether the handset is placed on the handset mount.*

The former three of these photosensors are located on the sensor PCB and the latter four are on the main PCB, as shown below. These photosensors are of a reflection type consisting of a light-emitting diode and a light-receiving transistor. Each of them has an actuator separately arranged as shown on the next page.

If an actuator is activated, its white end will come to the path of light issued from the light-emitting diode and reflect that light. The moment the reflected light enters the light-receiving transistor, the sensor signals the detection.



(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)



Location of Photosensors' Actuators and Microswitches

(* The handset, hook switch sensor and related parts
are not provided on the FAX1150P.)

2.4 Power Transmission Shift by the Switching Cam and Planetary Gear Train

The equipment has a single drive motor whose power transmission route can be switched by the combination of the switching cam and the planetary gear train. The equipment mechanism can function in five operation modes (the scanning mode, paper feeding mode, recording mode, copy mode, and paper ejection mode).

The clockwise motor rotation drives the switching cam which controls the movement of the related planetary gear train to switch the power transmission route.

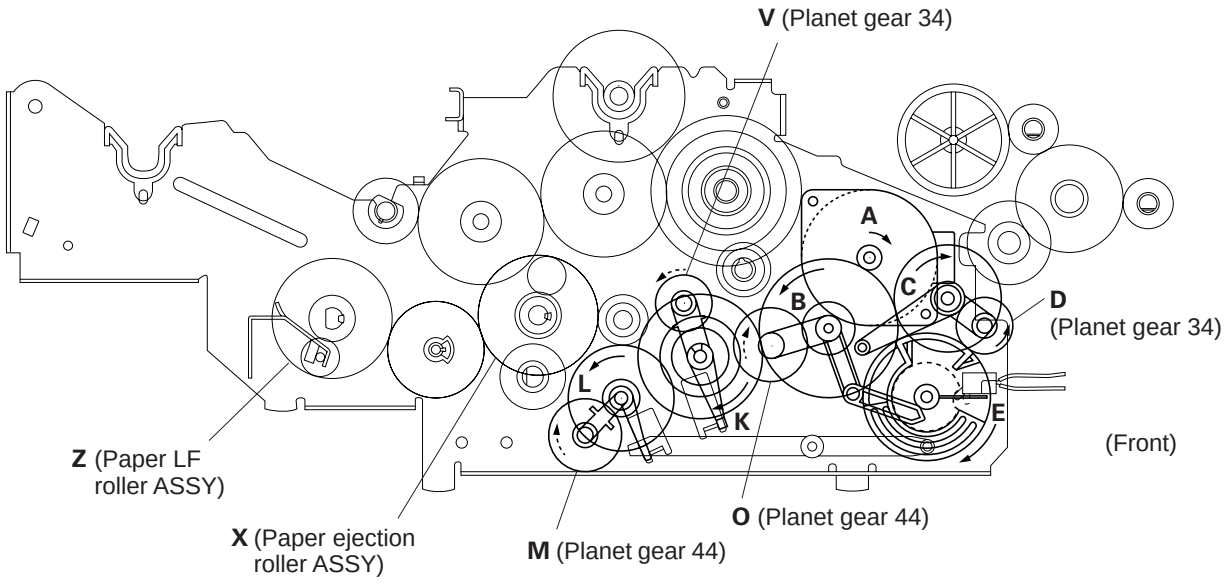
The counterclockwise motor rotation drives the gears activated in the current operation mode to rotate the related rollers.

2.4.1 Mode switching

The switching cam and the planetary gear train are usually in their home positions; that is, the switching cam is in the scanning mode position and planet gear “D” is engaged with switching cam (“E”) as shown below.

The mode switching controller is designed to turn and stop the switching cam at five stop angles specified for five operation modes. Depending upon the stop angle, the switching cam itself and linked arms restrict the movement of planet gears “D”, “O”, and “M” so that the power transmission route can be switched between the five operation modes. Planet gear “V” is independent of the switching cam and always rotates to drive paper ejection roller “X” and LF roller “Z” when the motor rotates counterclockwise.

The mode switching controller monitors the switching cam angle by signals sent from the cam HP sensor. If the controller receives long or short sensor-OFF signals, it recognizes that the cam is angled in the scanning mode or recording mode, respectively.



——> : Driving other gear(s)
- - -> : Idling

2.4.2 Rollers driven in each mode

If the motor rotates counterclockwise, the gears activated in the current mode rotate to drive the related rollers marked with "√ " in the table below.

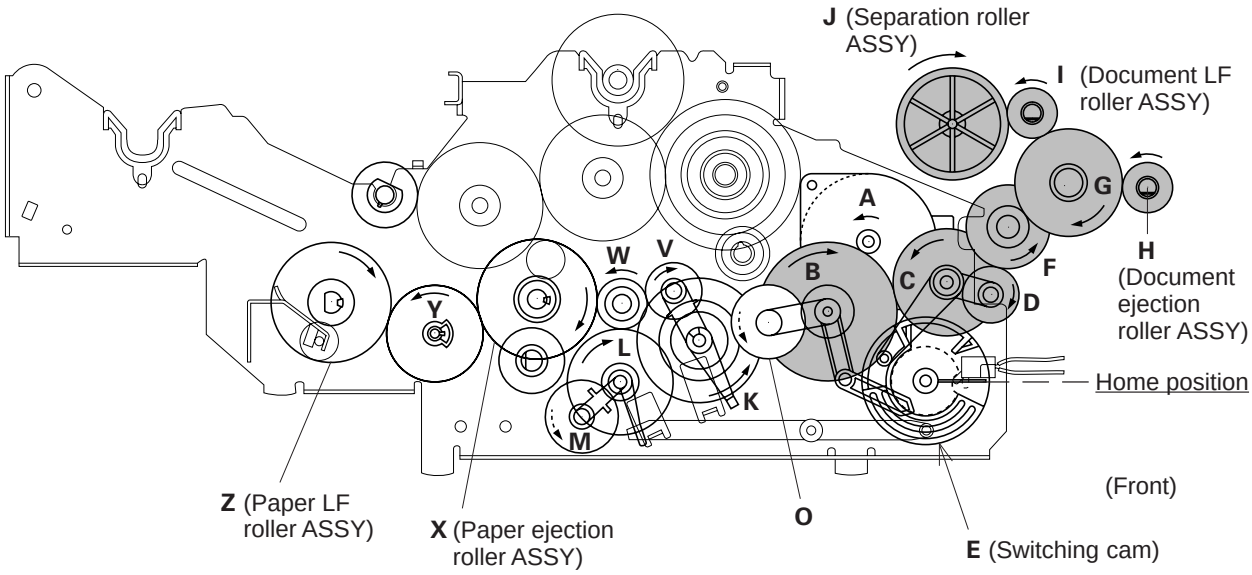
	Scanning-related rollers			Recording-related rollers			
	Separation roller	Document LF roller	Document ejection roller	Paper feed roller	Paper LF roller	Platen	Paper ejection roller
Scanning mode	√	√	√		√		√
Paper feeding mode				√	√		√
Recording mode					√	√	√
Copy mode	√	√	√		√	√	√
Paper ejection mode					√		√

2.4.3 Operation mode details

[1] Scanning mode

If the motor rotates counterclockwise when the switching cam ("E") is in the home position, the rotational force will be transmitted via planet gear “D” to the scanning-related gears.

Accordingly, the separation roller (gear “J”), document LF roller (gear “I”) and document ejection roller (gear “H”) rotate to feed, scan and eject documents. In this mode, the paper ejection roller (gear “X”) and paper LF roller (gear “Z”) also rotate.



——> : Driving other gears or rollers

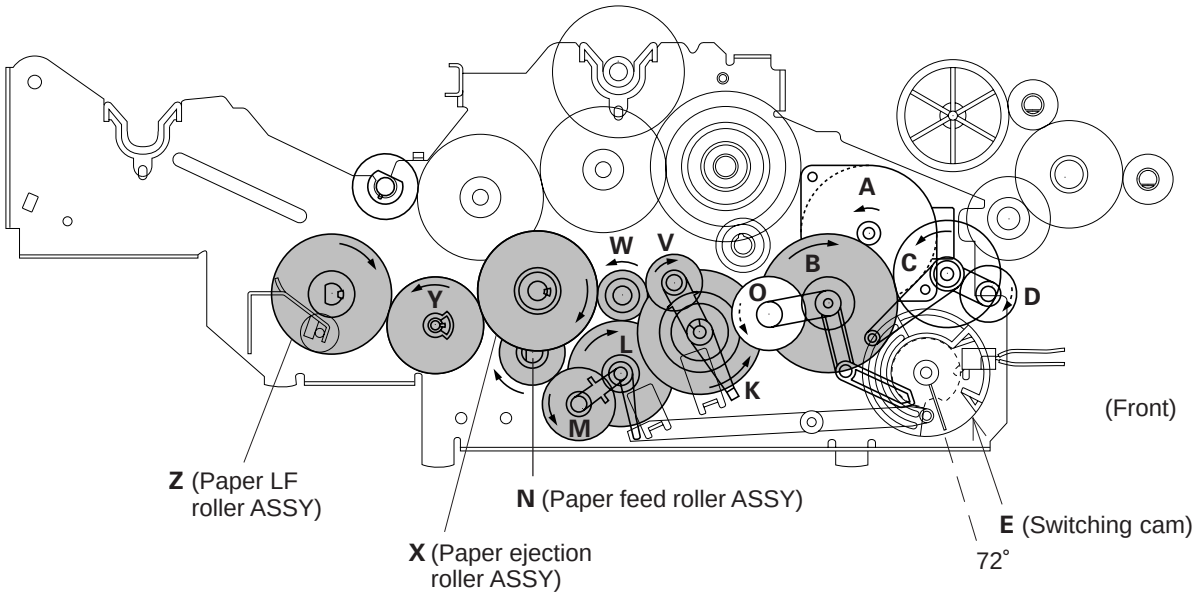
- - -> : Idling

: Necessarily functioning for the current mode

[2] Paper feeding mode

If the motor rotates counterclockwise when the switching cam ("E") is angled 72˚ from the home position, the rotational force will be transmitted via planet gears “V” and “M” to the feeding-related gears.

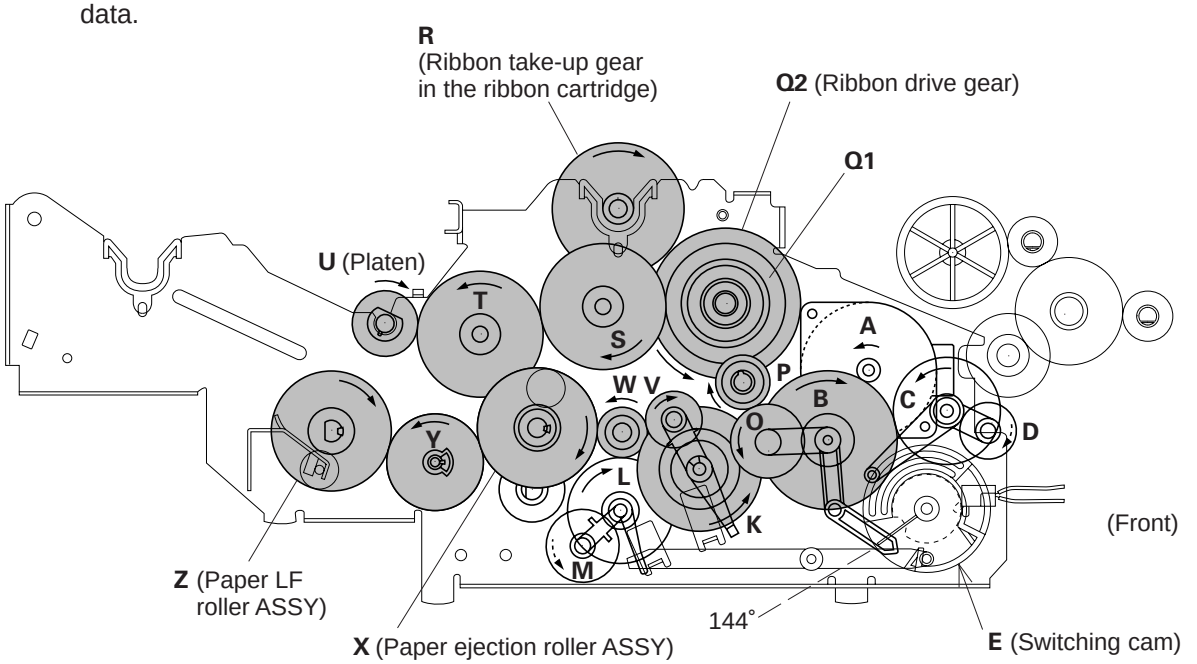
Accordingly, the paper feed roller (gear “N”), paper LF roller (gear “Z”) and paper ejection roller (gear “X”) rotate to take in recording paper as well as ejecting already loaded paper.



[3] Recording mode

If the motor rotates counterclockwise when the switching cam ("E") is angled 144˚ from the home position, the rotational force will be transmitted via planet gears “O” and “V” to the recording-related gears.

Accordingly, the paper LF roller (gear “Z”), platen (gear “U”), paper ejection roller (gear “X”) and ribbon take-up gear “R” rotate to feed recording paper and thermal ink ribbon for printing data.



——> : Driving other gears or rollers

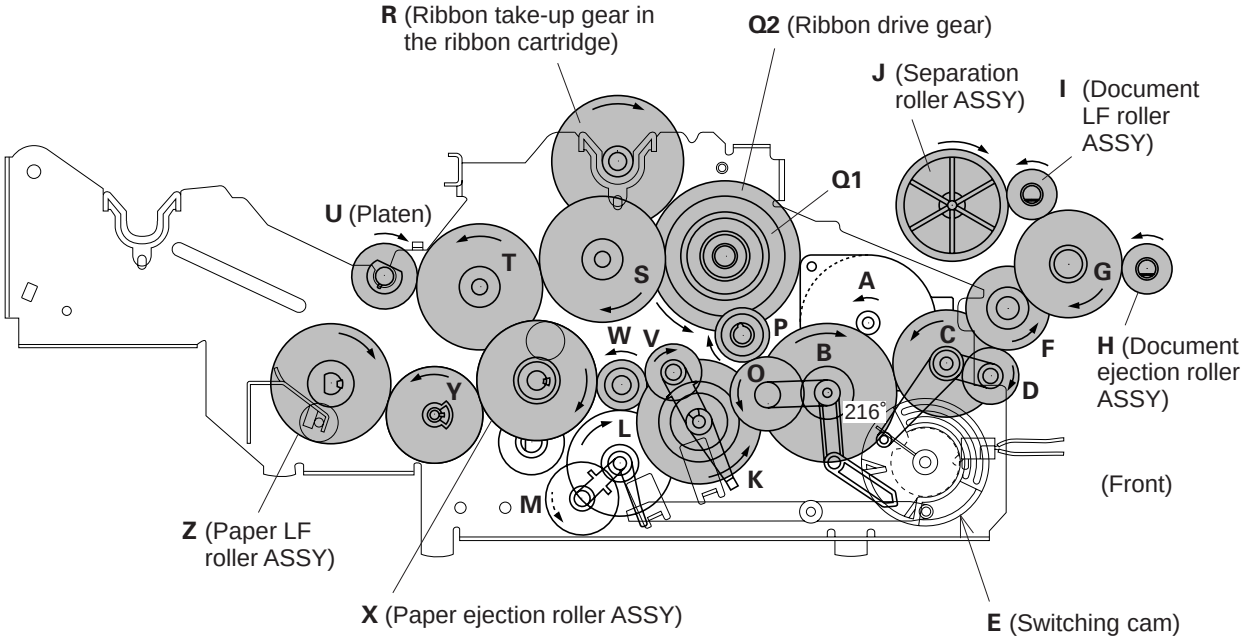
- - -> : Idling

: Necessarily functioning for the current mode

[4] Copy mode

If the motor rotates counterclockwise when the switching cam ("E") is angled 216˚ from the home position, the rotational force will be transmitted via planet gears “D”, “O” and “V” to almost all of the gears.

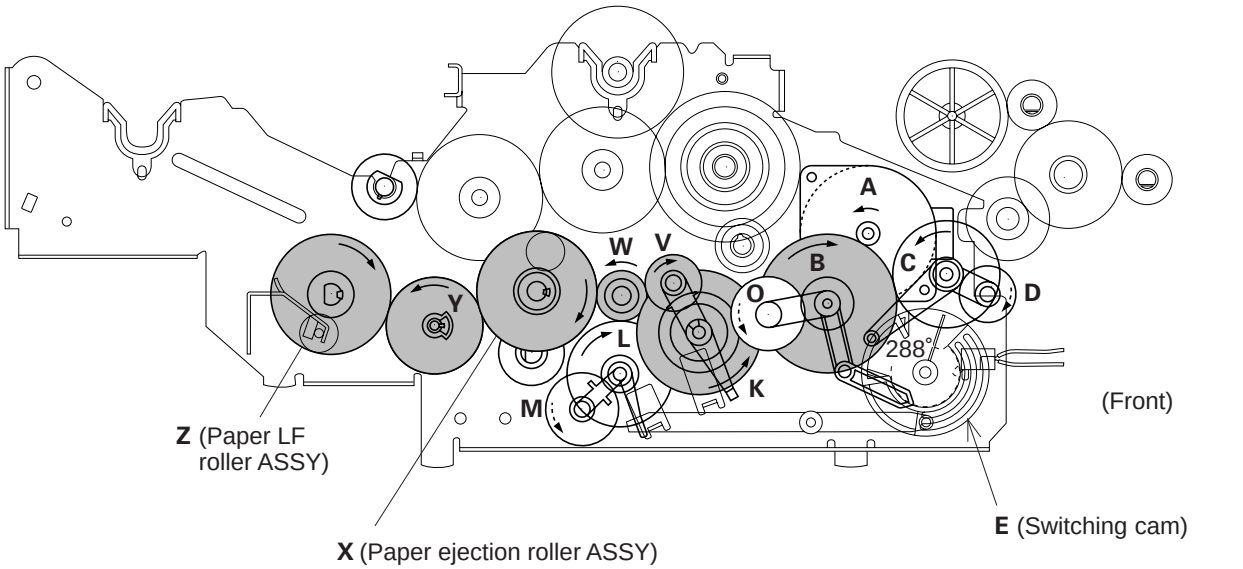
Accordingly, the separation roller (gear “J”), document LF roller (gear “I”), document ejection roller (gear “H”), paper LF roller (gear “Z”), platen (gear “U”), paper ejection roller (gear “X”) and ribbon take-up gear “R” rotate to copy data.



[5] Paper ejection mode

If the motor rotates counterclockwise when the switching cam ("E") is angled 288˚ from the home position, the rotational force will be transmitted via planet gear “V” to the ejection-related gears.

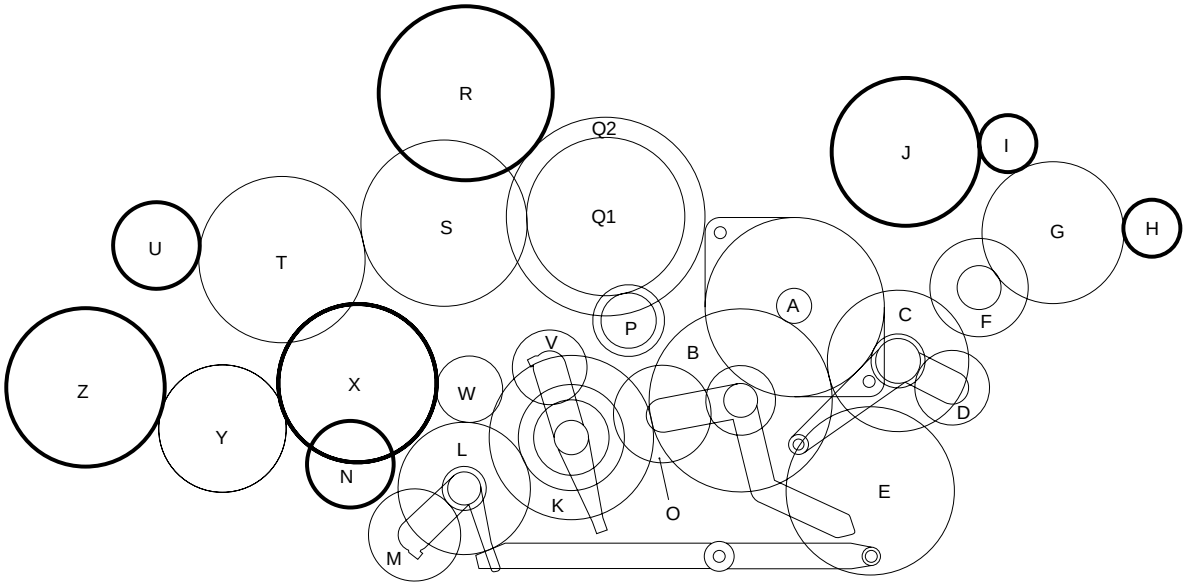
Accordingly, the paper LF roller (gear “Z”) and paper ejection roller (gear “X”) rotate to eject recording paper.



——> : Driving other gears or rollers
- - -> : Idling
⬭ : Necessarily functioning for the current mode

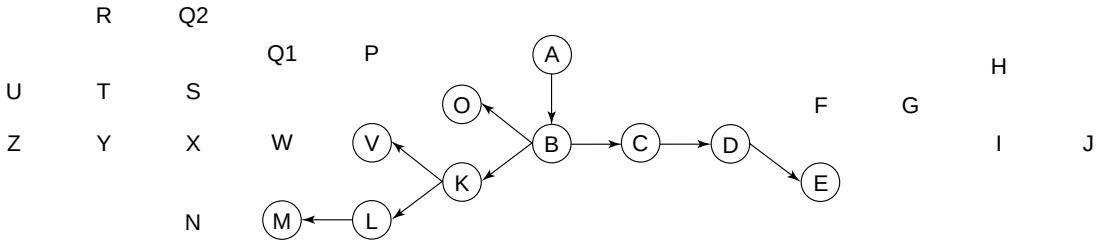
2.4.4 Power transmission route

Rotation of the motor gear is transmitted as shown below.

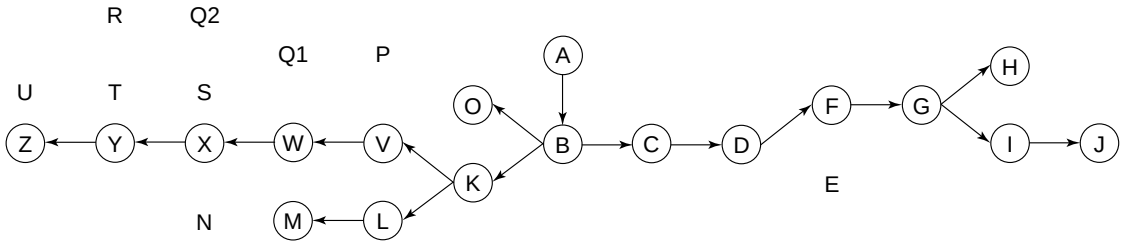


A: Motor gear
B: Gear 108/31
C: Gear 82/24
D: Planet gear 34
E: Switching cam
F: Gear 50/15
G: Gear 39
H: Document ejection roller gear
I: Document LF roller gear
J: Separation roller gear
K: Gear 96/48/34
L: Gear 63/21
M: Planet gear 44
N: Gear 40 (Paper feed roller)
O: Planet gear 44
P: Gear 34/18
Q1: Gear 46
Q2: Gear 58
R: Ribbon take-up gear in the ribbon cartridge
S: Idle gear 48
T: Idle gear 48
U: Gear 25 (Platen)
V: Planet gear 34
W: Idle gear 32
X: Gear 74 (Paper ejection roller)
Y: Idle gear 60
Z: Gear 74 (Paper LF roller)

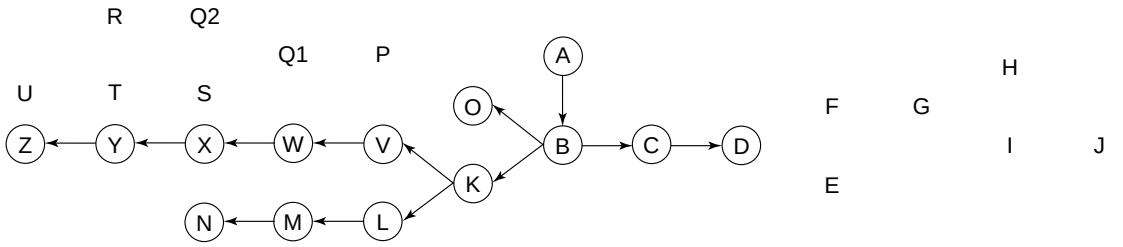
Mode switching



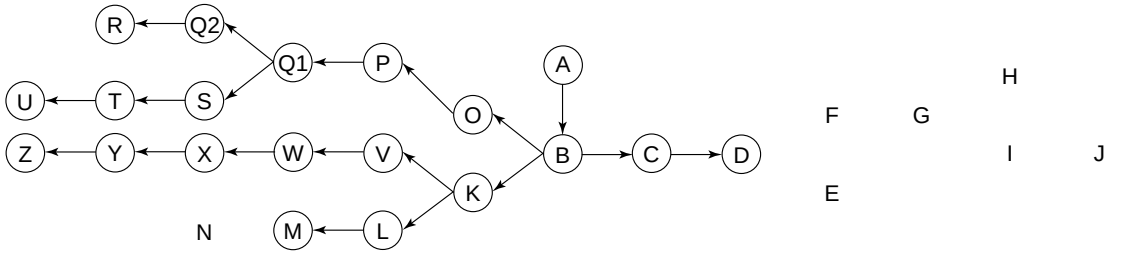
Scanning mode (Switching cam: Home position)



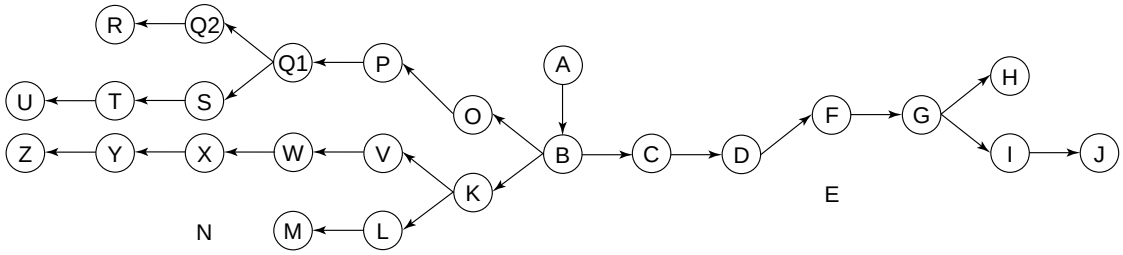
Paper feeding mode (Switching cam: 72˚)



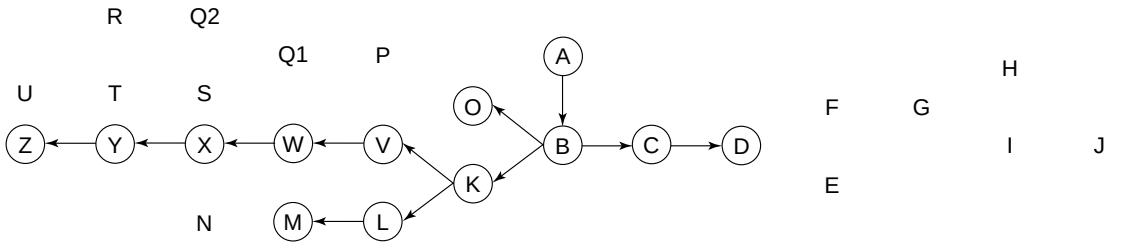
Recording mode (Switching cam: 144˚)



Copy mode (Switching cam: 216˚)



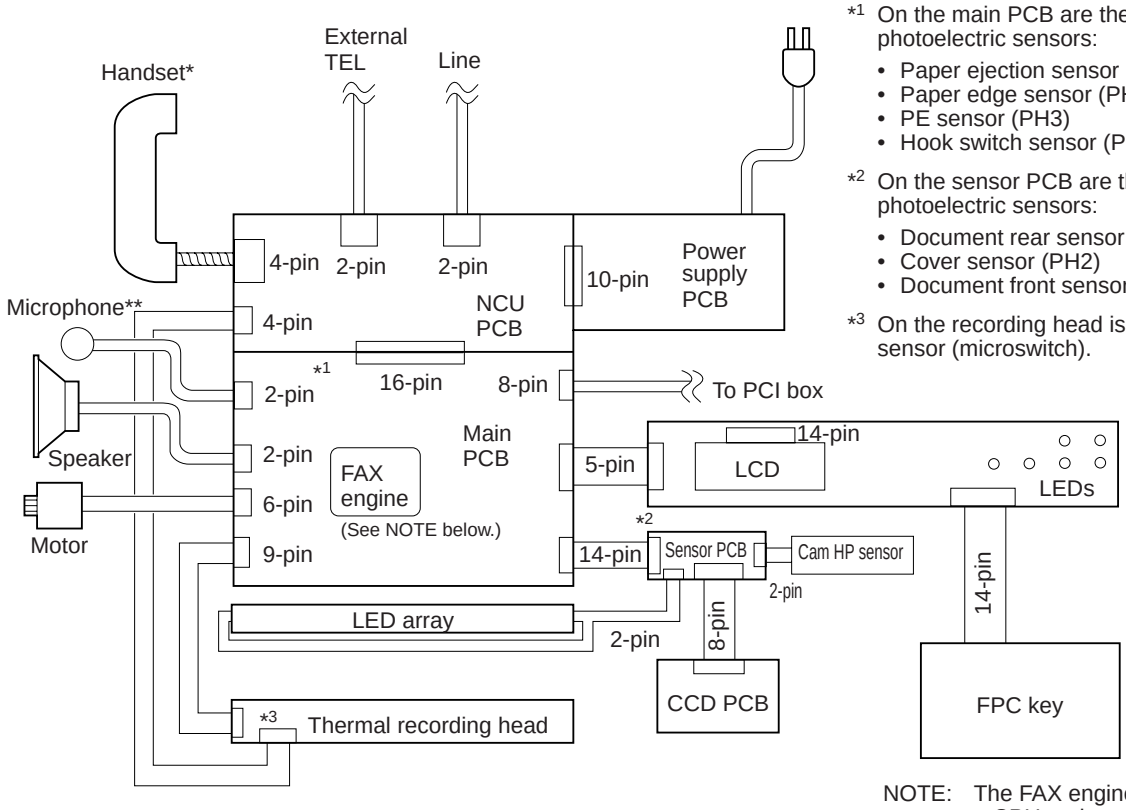
Paper ejection mode (Switching cam: 288˚)



3. CONTROL ELECTRONICS

3.1 Configuration

The hardware configuration of the facsimile equipment is shown below.



*1 On the main PCB are the following photoelectric sensors:
- Paper ejection sensor (PH1)
- Paper edge sensor (PH2)
- PE sensor (PH3)
- Hook switch sensor (PH4)*

*2 On the sensor PCB are the following photoelectric sensors:
- Document rear sensor (PH1)
- Cover sensor (PH2)
- Document front sensor (PH3)

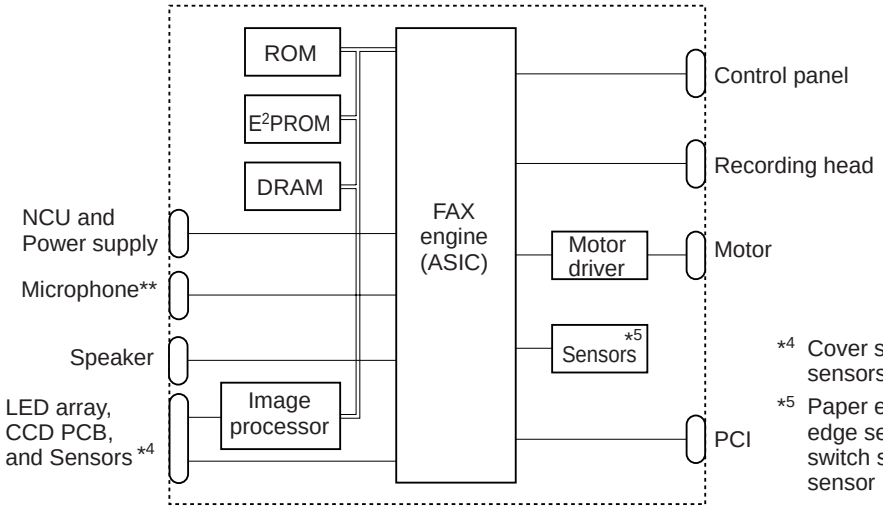
*3 On the recording head is the ribbon sensor (microswitch).

NOTE: The FAX engine includes a CPU and gate array. In the FAX1150P/1200P/1350M, it also includes a MODEM.

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, MODEM (except for FAX1150P/1200P/1350M), motor drive circuitry, sensor detection circuitry, and analog circuits for scanning, recording, and power transmission shifting.



*4 Cover sensor, document sensors, and cam HP sensor

5 Paper ejection sensor, paper edge sensor, PE sensor, hook switch sensor, and ribbon sensor

E2PROM: Electrically Erasable Programmable Read-only Memory
DRAM: Dynamic Random Access Memory

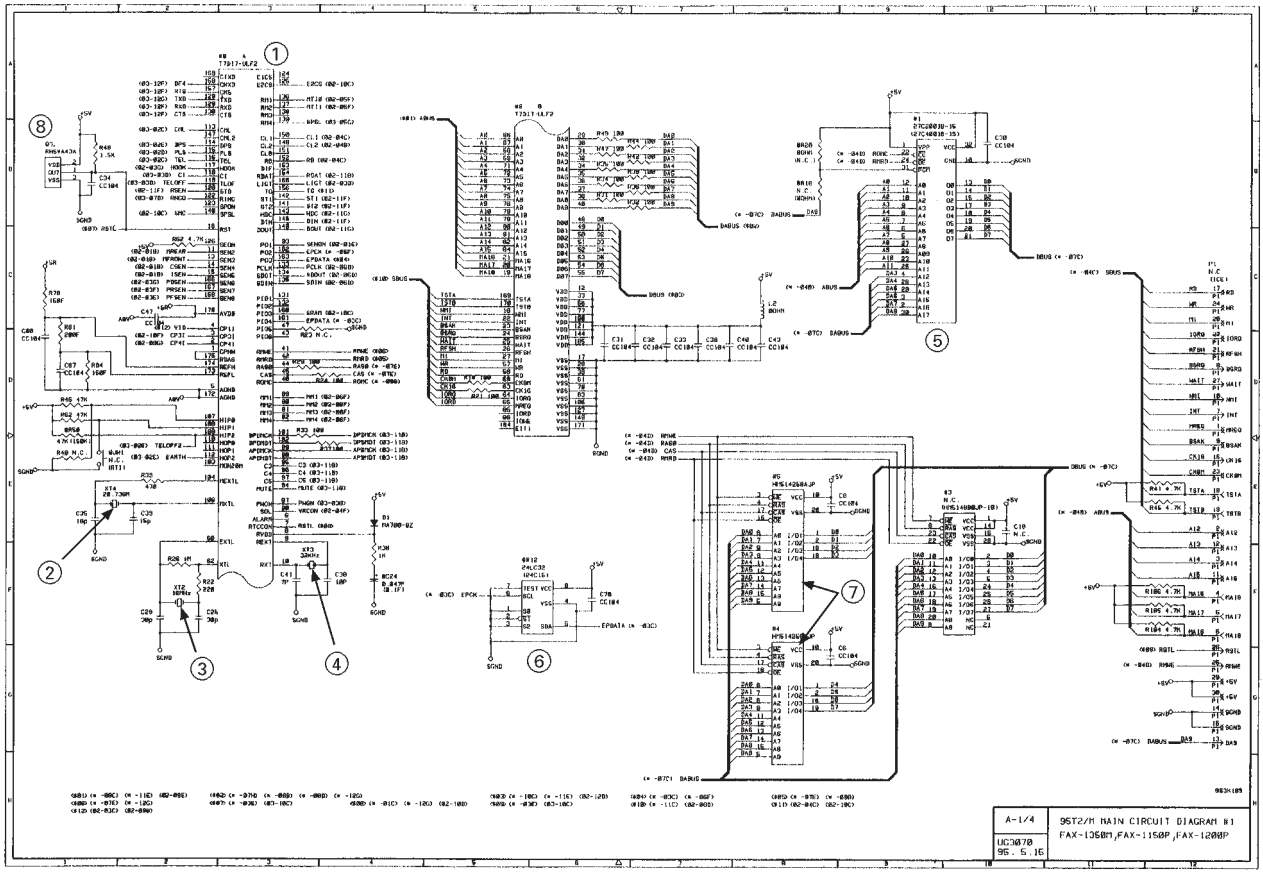
Block Diagram of Main PCB

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

(** Only for the Italian and UK versions)

3.2.1 FAX1150P/1200P/1350M

[1] Primary function group



Main PCB Circuit Diagram 1/3

① FAX engine (ASIC) which integrates a CPU, MODEM and gate array

② Clock for MODEM

③ Clock for CPU

④ Clock for calendar clock

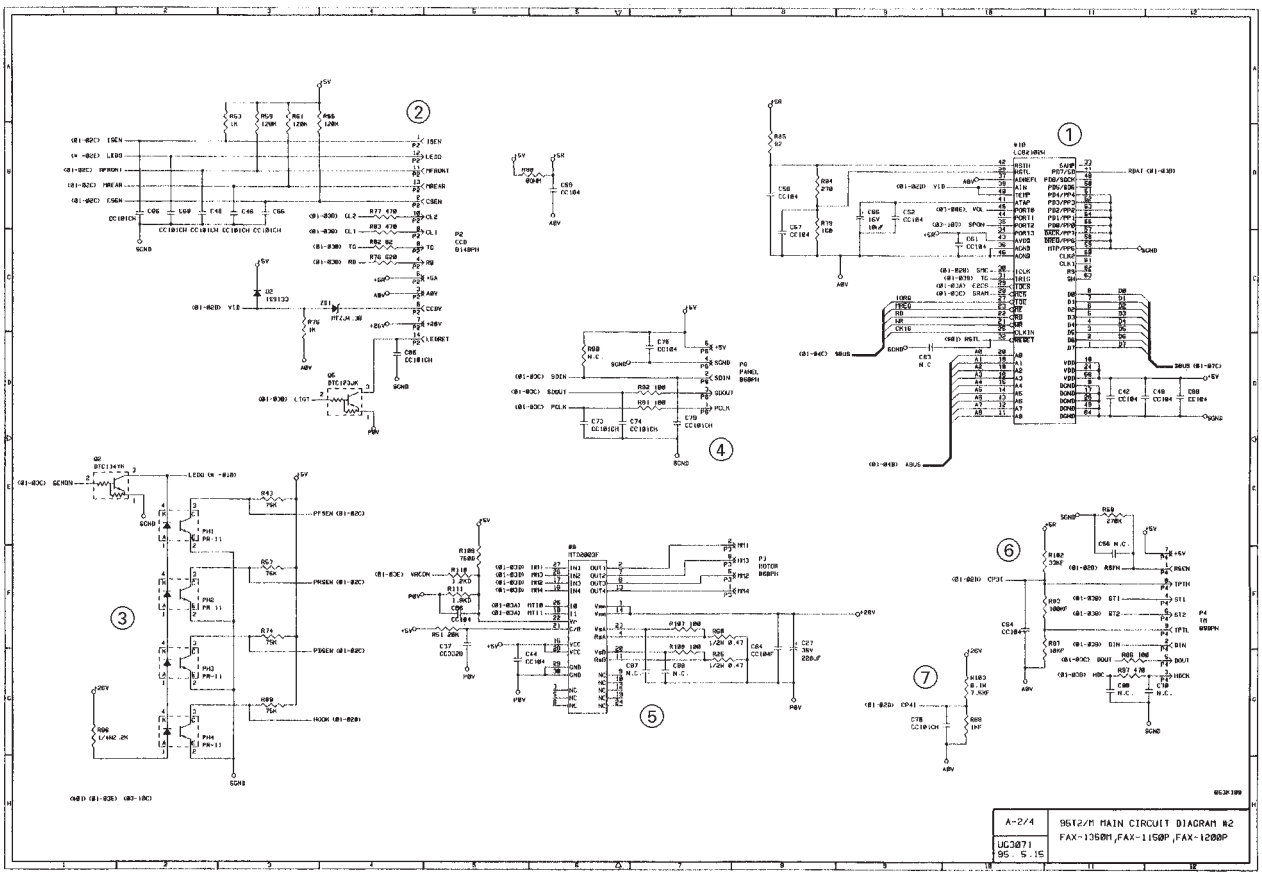
⑤ ROM (2-megabit. Note that the Belgian and Swiss versions and the sample machines for demonstration have a 4-megabit ROM.)

⑥ E^2PROM (32-kilobit)

⑦ DRAMs (256-kilobit)

⑧ Reset IC

[2] Image processing group



Main PCB Circuit Diagram 2/3

① Image processor (Image processing IC)

② Connector for the CCD PCB, LED array, and sensors

ISEN:	Cam HP sensor output signal
MFRONT:	Document front sensor output signal
MREAR:	Document rear sensor output signal
CSEN:	Cover sensor output signal
LEDRET:	LED array light intensity control signal
Others:	I/O signals to/from the CCD PCB

③ Sensors

PFSEN:	Paper edge sensor output signal
PRSEN:	Paper ejection sensor output signal
PDSEN:	PE sensor output signal
HOOK:	Hook switch sensor signal*

④ Control panel connector

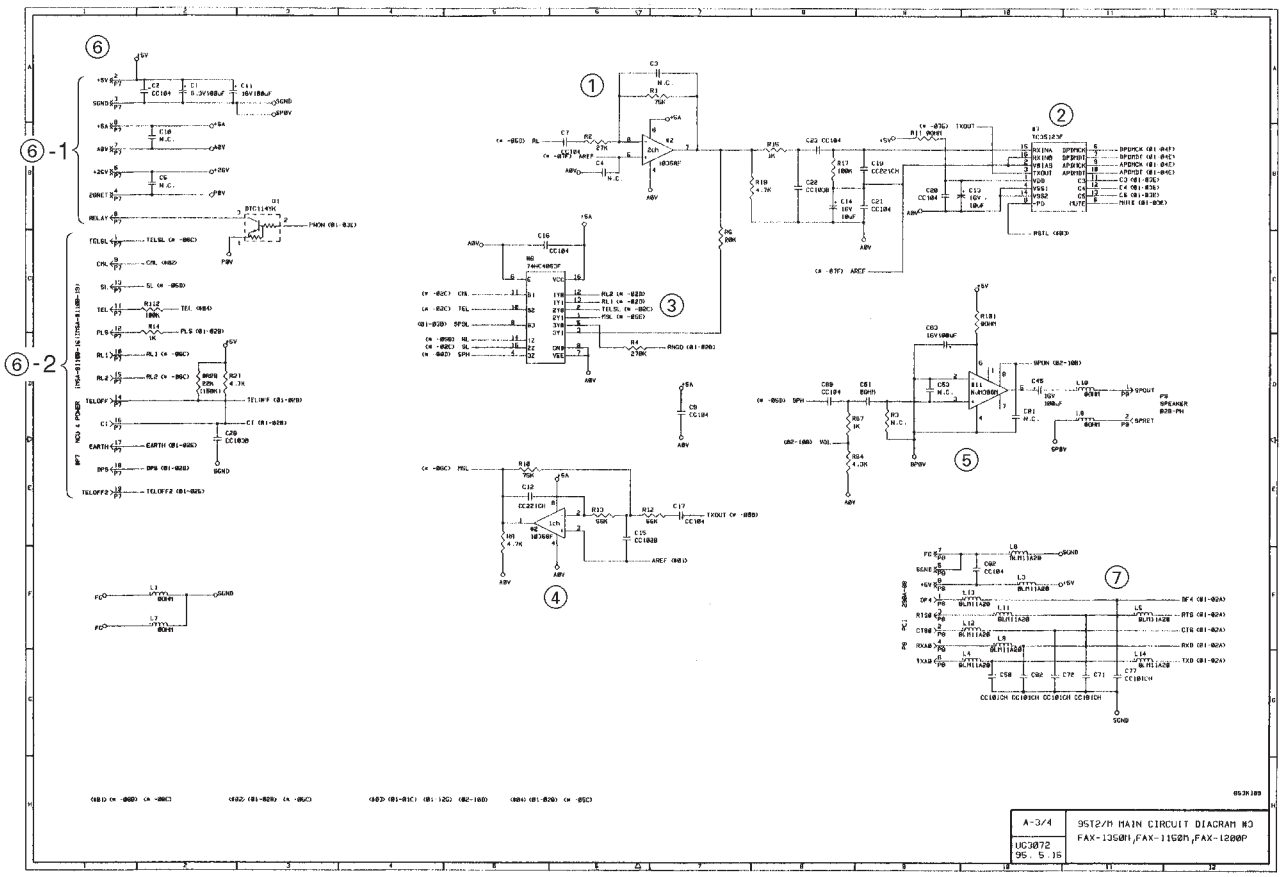
⑤ Motor driver and connector

⑥ Recording head temperature detector and head connector

⑦ Recording head drive voltage detector

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

[3] Analog signal processing group



Main PCB Circuit Diagram 3/3

① Amplifier & shaper circuit for signals inputted from the communications network

② Analog front end IC

Processes the analog I/O signals from/to the MODEM.

③ Analog signal selectors

1Y: Selects either RL1 or RL2 signals inputted from the communications network.

2Y: Selects either input signals from the handset* or those from the MODEM.

3Y: Selects either sound signals (e.g. alarm beeps, key clicks and ringer sounds) generated by the FAX engine or signals selected by 1Y.

④ Amplifier circuit for signals outputted from the MODEM

⑤ Speaker amplifier circuit

Amplifies sounds issued from the above analog signal selector (3Y1) and feeds them to the speaker.

⑥ Main-NCU connector

⑥-1: Feeds power from the power supply to the main PCB via the NCU PCB.

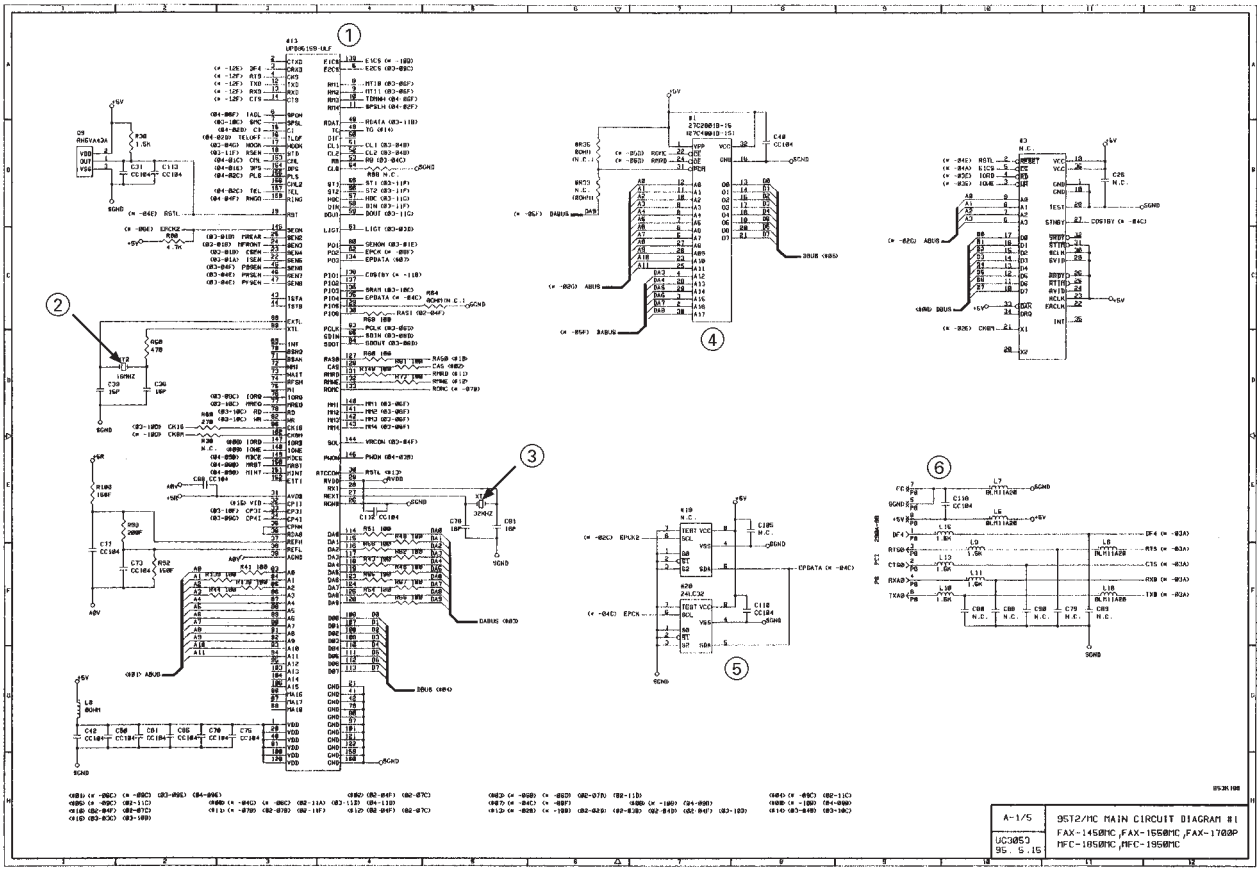
⑥-2: Exchanges I/O signals between the main PCB and NCU PCB.

⑦ PCI circuit and connector

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

3.2.2 FAX1700P/1450MC/1550MC/1850MC/1950MC

[1] Primary function group



Main PCB Circuit Diagram 1/4

① FAX engine (ASIC) which integrates a CPU and gate array.

② Clock for CPU

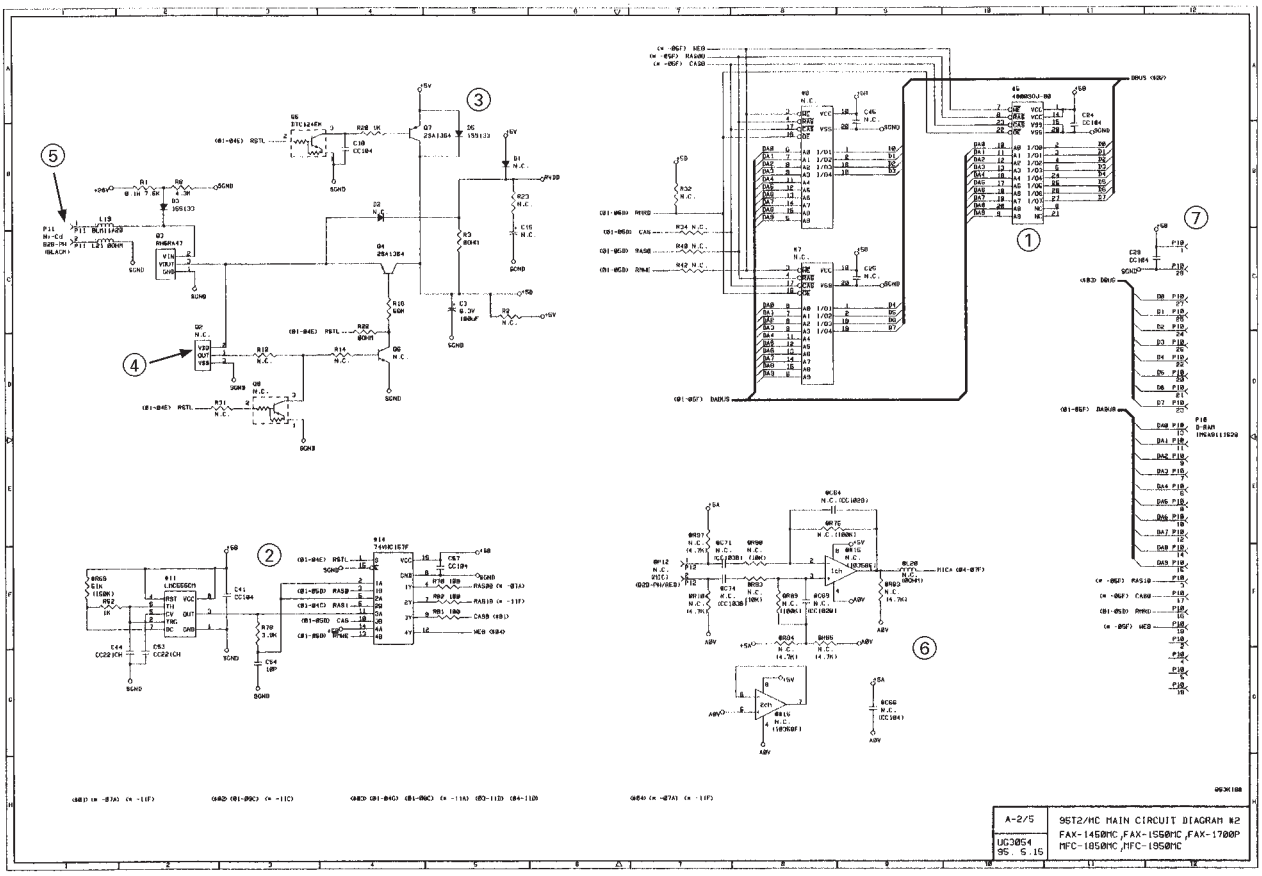
③ Clock for calendar clock

④ ROM (2-megabit. Note that the Belgian and Swiss versions and the sample machines for demonstration have a 4-megabit ROM.)

⑤ E2PROM (32-kilobit)

⑥ PCI circuit and connector

[2] DRAM group



Main PCB Circuit Diagram 2/4

① DRAM

512-kilobyte:	FAX1450MC/1550MC/1850MC/1950MC and German, Austrian and Asian versions of FAX1700P
1-megabyte:	Other models and versions

This is an 8-chip memory.

② DRAM refresh circuit

③ DRAM backup circuit

④ Reset IC

⑤ Connector for nickel-hydrogen battery

The nickel-hydrogen battery backs up the DRAM data.

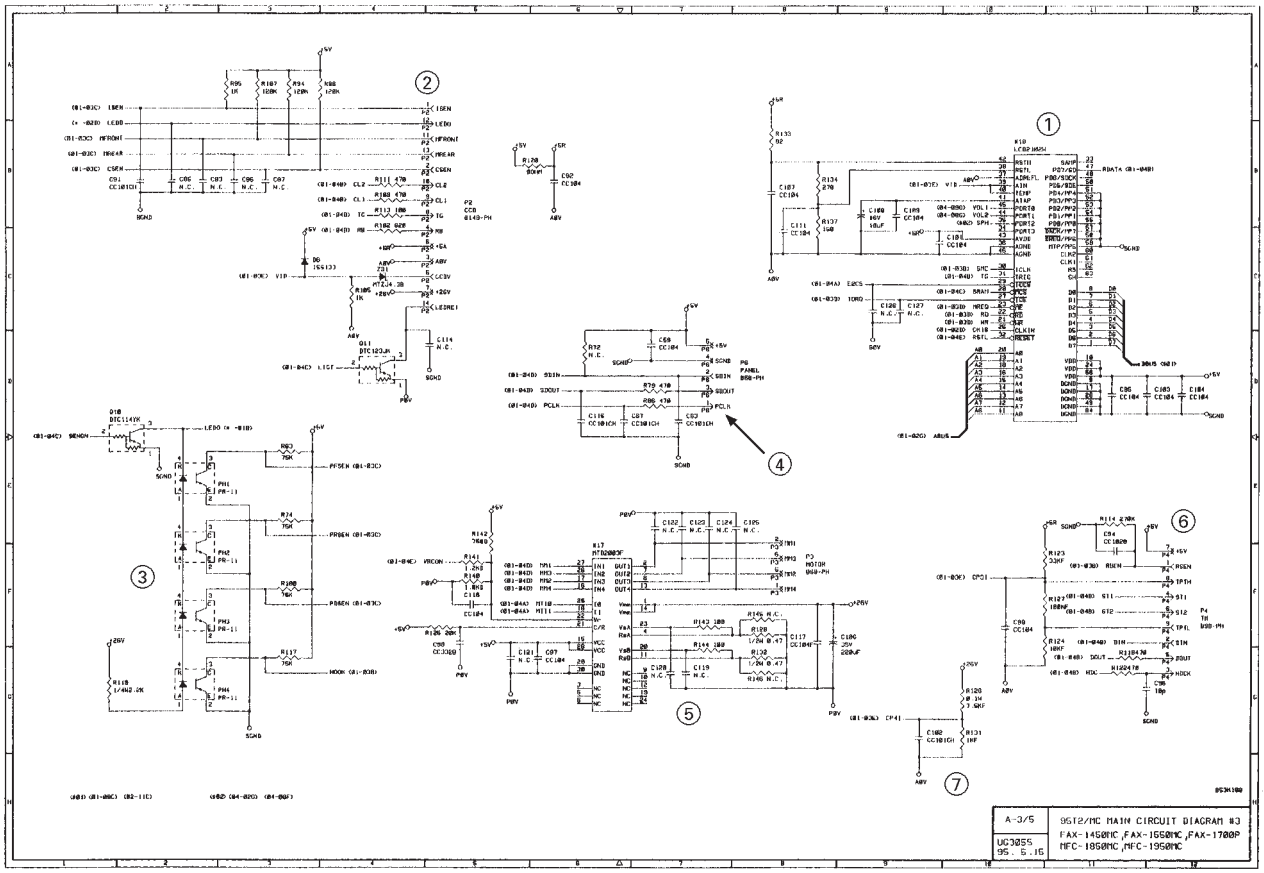
⑥ Microphone connector and voice signal amplifier circuit**

The voice signal amplifier circuit is applicable in those countries where telephones can be used to call even during power failures.

⑦ Additional RAM connector

(** Only for the Italian and UK versions)

[3] Image processing group



Main PCB Circuit Diagram 3/4

① Image processor (Image processing IC)

② Connector for the CCD PCB, LED array, and sensors

ISEN:	Cam HP sensor output signal
MFRONT:	Document front sensor output signal
MREAR:	Document rear sensor output signal
CSEN:	Cover sensor output signal
LEDRET:	LED array light intensity control signal
Others:	I/O signals to/from the CCD PCB

③ Sensors

PFSEN:	Paper edge sensor output signal
PRSEN:	Paper ejection sensor output signal
PDSEN:	PE sensor output signal
HOOK:	Hook switch sensor signal*

④ Control panel connector

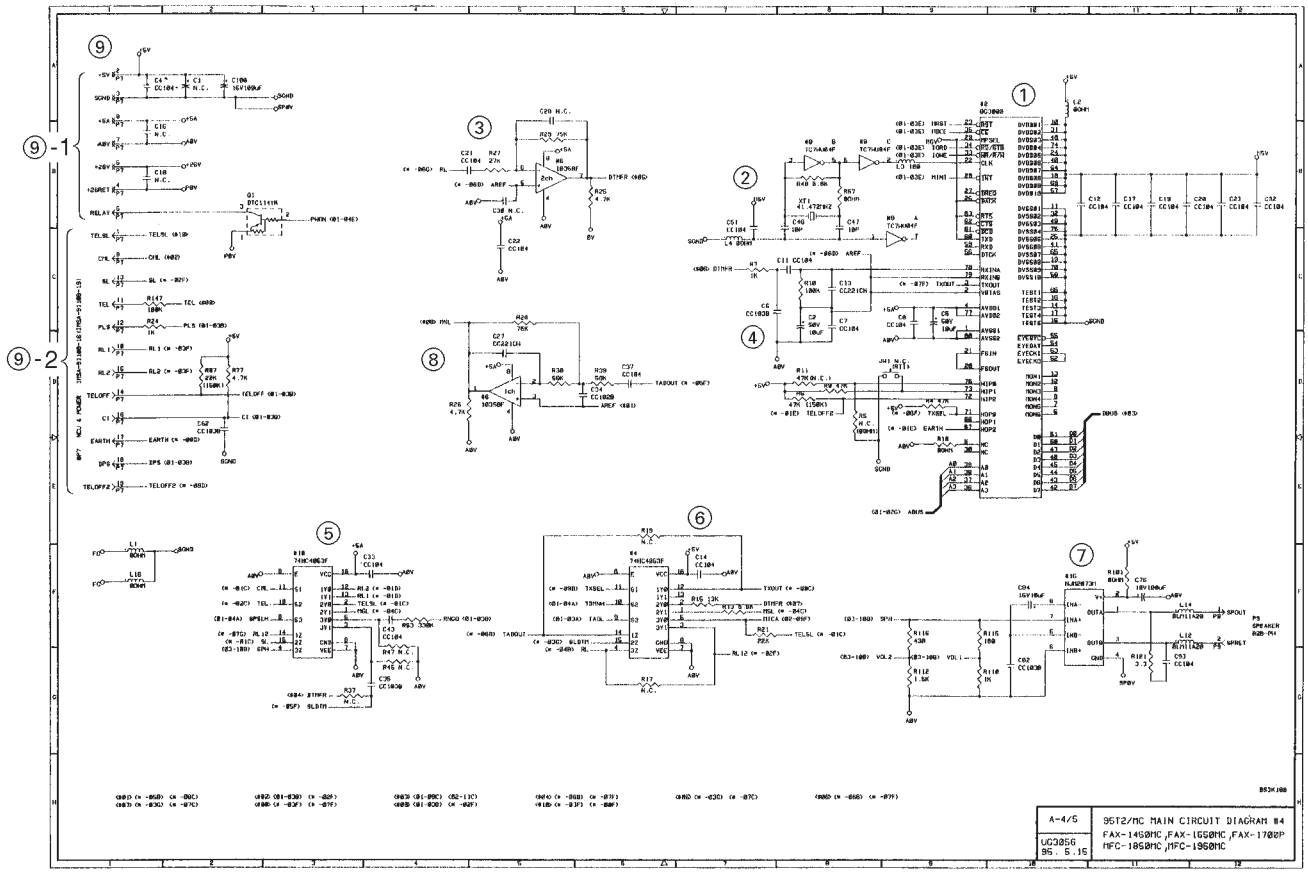
⑤ Motor driver and connector

⑥ Recording head temperature detector and head connector

⑦ Recording head drive voltage detector

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

[4] Analog signal processing group



Main PCB Circuit Diagram 4/4

① MODEM

② MODEM clock and clock shaper circuit

③ Amplifier circuit for signals inputted from the communications network

④ Shaper circuit for signals outputted from the amplifier circuit ③

⑤ Analog signal selectors

- 1Y: Selects either RL1 or RL2 signals inputted from the communications network.
- 2Y: Selects either input signals from the handset* or those from the MODEM.
- 3Y: Selects either sound signals (e.g. alarm beeps, key clicks and ringer sounds) generated by the FAX engine or signals outputted from the voice analog switch.

⑥ Voice switching analog selectors

- 1Y: Selects either TXOUT inputted from the MODEM or DA0. Note that the DA0 is not used.
- 2Y: Selects either input signals from the communications network or those from the MODEM, then feeds them to the speaker.
- 3Y: Selects either signals inputted from the communications network or recorded voice signals inputted from the microphone** or handset*, then feeds them to the MODEM.

⑦ Speaker output circuitry (speaker amplifier, speaker volume control, and ON/OFF switching circuits) and speaker connector

⑧ Amplifier & shaper circuit for signals inputted from the MODEM

⑨ Main-NCU connector

- ⑨-1: Feeds power from the power supply to the main PCB via the NCU PCB.
- ⑨-2: Exchanges I/O signals between the main PCB and NCU PCB.

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

(** Only for the Italian and UK versions.)

3.3 NCU PCB

The NCU PCB switches the communications line to telephone or built-in MODEM, under control of the main PCB. Also, it works as a power supply interface from the power supply unit to the main PCB and the recording head.

As shown in the circuit diagrams on the following two pages, the NCU PCB consists of the components listed below:

① Surge absorber
② Noise filter
③ Line relay (CML relay)
④ Line transformer
⑤ Circuit related to line transformer
⑥ High-impedance transformer circuit
⑦ Calling signal detector
⑧ Loop current detector
⑨ Dial pulse generator
⑩ Telephone circuit*
⑪ Recording head interface
⑫ Charge pulse filter
⑬ Earth function circuit
⑭ Internal telephone connector

* In the U.K. and Italian versions, (k) is packaged not on the NCU PCB but on the telephone unit.

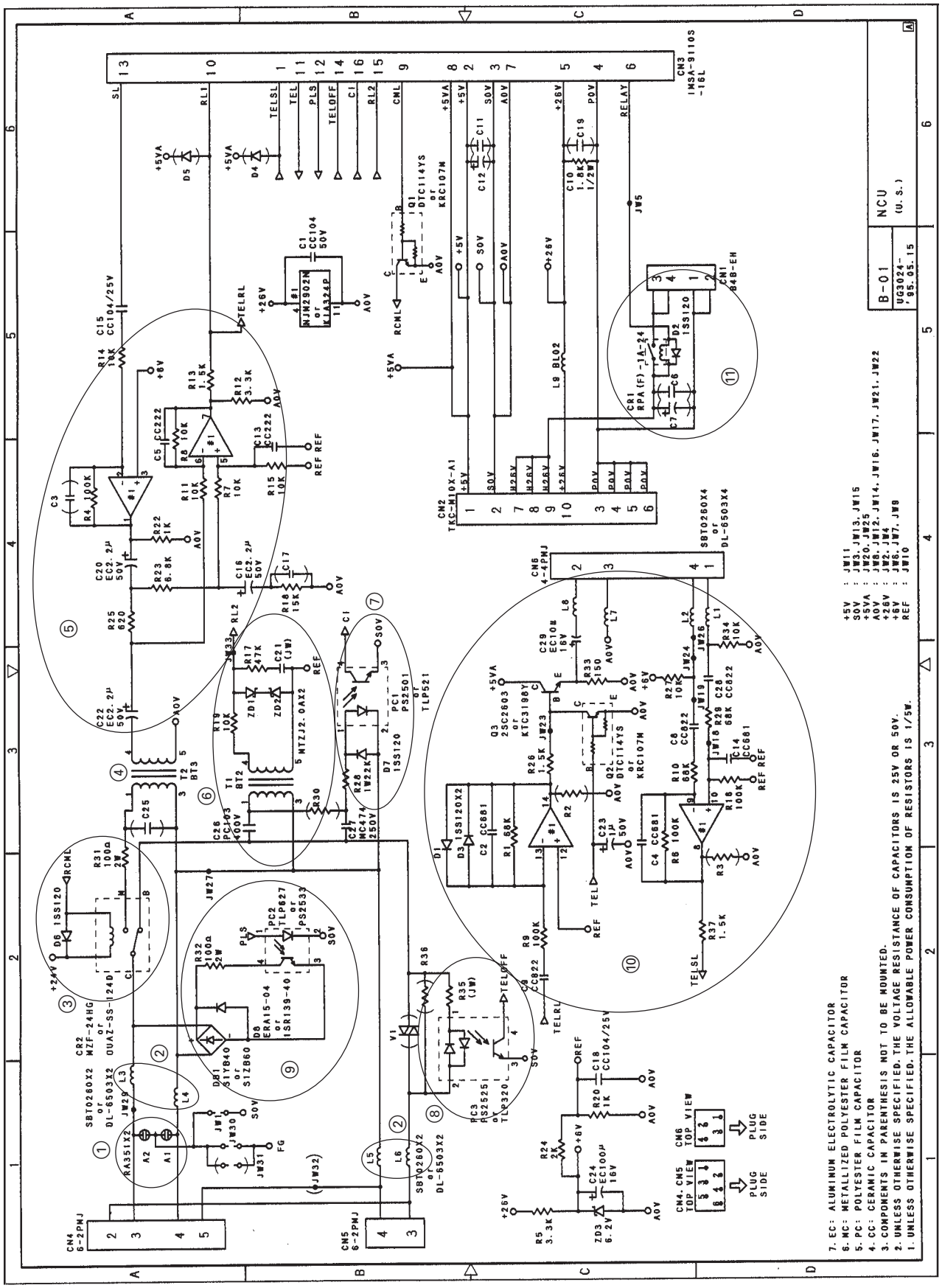
- The primary function of the NCU which is shared by facsimile and telephone units is to switch a line to the facsimile unit or to the telephone, which is carried out by the line relay.
- Since the direct connection of a facsimile equipment to the line is not allowed for protecting the line, it is essential to insert a line transformer between the line and the facsimile equipment to insulate them each other in direct current band.

The above two components, a line relay and a line transformer, are the minimum requirements for the NCU of the facsimile equipment.

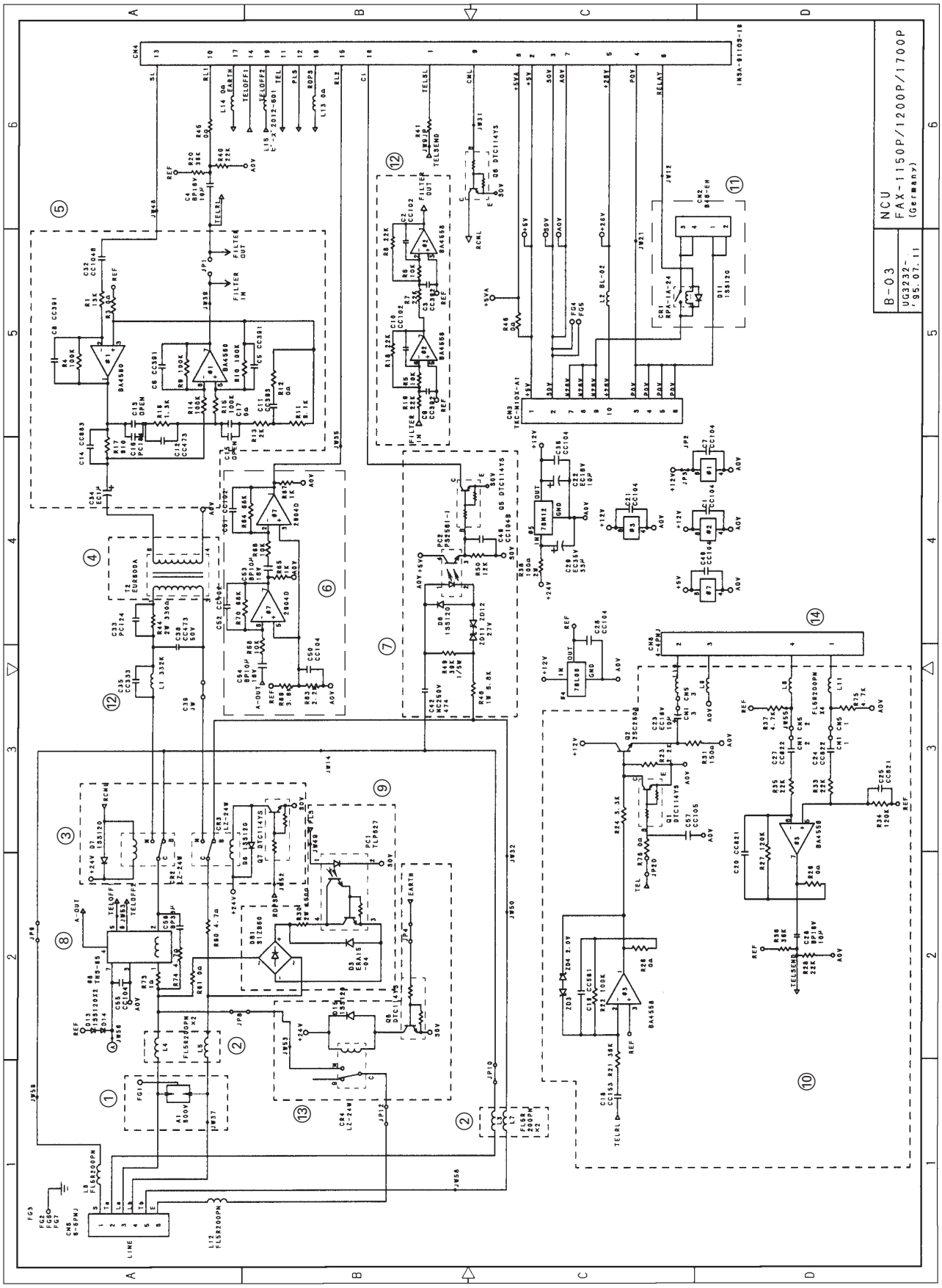
- If an external telephone is attached to the facsimile equipment, the NCU should have a loop current detector to identify the hook state by detecting loop current.
- If the facsimile equipment has an automatic answering facility, the NCU should be equipped with a calling signal detector which detects a calling signal and tells it to the CPU in the FAX engine.
- The circuit related to a line transformer allows the line transformer to be invariant by selecting the constants of the parts in this circuit so as to conform to the communications regulations or codes of each country.

In addition to the above basic components of the NCU, the following components are also required depending upon additional functions of the facsimile equipment:

- The dial pulse generator generates dial pulses within the facsimile equipment.
- The surge absorber is a protection circuit which absorbs lightning surge.
- The noise filter eliminates noise including radiation noise to prevent them from flowing out onto the communications line.
- The high-impedance transformer circuit detects the remote activation, F/T switching, and TAD interfacing signals (e.g., CNG and DTMF) sent from the line in ON-HOOK state without any interference to the line.
- The telephone circuit includes two amplifiers; one for amplifying the output signals of the handset microphone and the other for amplifying the receive signals from the communications lines to sound the handset receiver.



NCU Circuit Diagram (U.S.)



NCU Circuit Diagram (Germany)

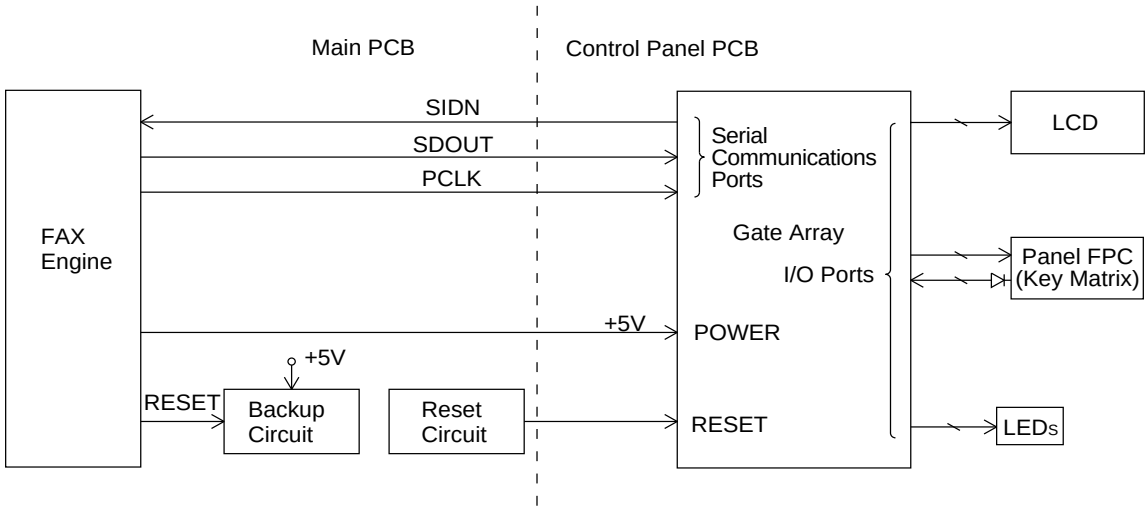
3.4 Control Panel PCB

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 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.



Control Panel PCB and its Related Circuit

3.5 Power Supply

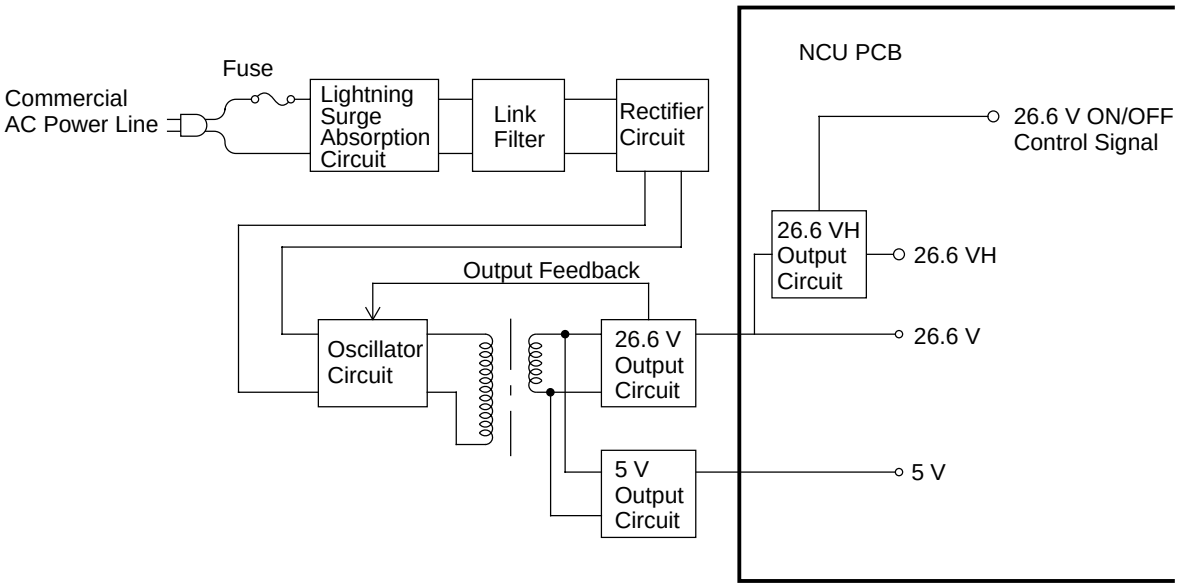
The power supply uses the switching regulation system to generate the required DC power (+5V and +26.6V) from the commercial AC power supply.

The 26.6V power source is fed to the NCU PCB where the +26.6VH source is generated.

The 26.6VH power source, which drives the recording head, outputs 26.6 VDC only when the 26.6V ON/OFF control signal sent from the main PCB turns High.

The 26.6V power source mainly drives the motor for feeding documents and recording paper.

Signals other than +26.6VH are connected to the main PCB through the NCU PCB and +26.6VH is fed to the recording head.



Power Supply Circuit

CHAPTER IV.

INDICATION AND INFORMATION PRINTOUT OF ERROR

CONTENTS

1. INDICATION AND PRINTOUT OF ERROR

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.

2. EQUIPMENT ERROR

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 Section 2.1. As one of the error messages, "MACHINE ERROR xx" includes an error code which indicates the detailed error causes listed in Section 2.2. To display an error code for other latest error message, make the equipment enter the maintenance mode and press [8] and [2] keys (for details, refer to Chapter V, Subsection 3.3.9).

2.1 Error Messages on the LCD

Messages on the LCD	Probable Cause
PRINTER JAM	(1) The paper ejection sensor stays OFF even after the paper edge sensor has come ON and the recording paper has been fed by the specified amount. (2) The paper ejection sensor stays ON even after the paper edge sensor has gone OFF and the recording paper has been fed by the specified amount. (3) After both the paper edge sensor and paper ejection sensor have gone OFF, the paper ejection sensor comes ON again halfway through the specified paper feeding.
CHANGE CARTRIDGE	The ribbon sensor detects that the thermal ink ribbon runs out.
COVER OPEN	The cover sensor detects that the top cover is not closed.
DOCUMENT JAM	■ Document jam (1) The document length exceeds the limitation (400 or 90 cm) registered by firmware switch WSW16. (Refer to Chapter V, Subsection 3.3.5.) (Both the document front and rear sensors stay ON after the document has been fed by the registered length.) (2) The document rear sensor detects no trailing edge of a document after the document has been fed by 400 cm. (The document rear sensor stays ON even after the document has been fed when the document front and rear sensors were OFF and ON, respectively.)

Messages on the LCD	Probable Cause
DOCUMENT JAM	■ Document loading error (1) The document rear sensor detects no leading edge of a document within 10 seconds from the start of document loading operation. (The document rear sensor stays OFF even after the document has been fed when the document front sensor was ON.) (2) The loaded document is too short. (Since the document is shorter than the distance between the document front and rear sensors, the document front sensor is turned OFF before the document rear sensor is turned ON.)
CLEAN UP SCANNER	In the scanning compensation data list printed by the maintenance-mode function No. 05, less than fifty percent of the white level data is faulty.
SCANNER ERROR	In the scanning compensation data list printed by the maintenance-mode function No. 05, fifty percent or more of the white level data is faulty.
PRINTER FAULT	The thermistor in the recording head caused a heat error.
MACHINE ERROR xx	"xx" indicates an error code. Refer to Section 2.2.

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.

2.2 Error Codes Shown in the "MACHINE ERROR xx" message

Error Code xx (Hex.)	Error factor
81	Cam home positioning error.
82	Recording paper feeding error.
(83	Recording paper jam. (The paper edge sensor remains ON.))
(84	Recording paper jam. (The paper ejection sensor remains ON.))
(85	Ribbon empty.)
87	Fails to complete the sequence of recording operation.
(88	Recording paper jam. Even after the paper edge sensor has come ON, the paper ejection sensor still stays OFF.)
8A	Wrong or weak contact of the recording head connectors.
(8B	Recording head overheat.)
(A1	Top cover opened.)
(A2	Document too long to scan.)
(A3	Document not detected by the document rear sensor.)
(A4	50% or more faulty of white level data.)

Error codes in parentheses do not appear in the "MACHINE ERROR xx", since those errors are displayed as messages described in Section 2.1. Those error codes appear in the communications error list if an equipment error occurs during communications. Refer to Section 3.1, (13).

Error Code xx (Hex.)	Error factor
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.
A9	Abnormal scanning reference voltage.
AB	Document feed-in amount measuring error.
AC	Less than 50% faulty of white level data.
B1	CODEC LSI error.
(B8	Amplifier gain error.)
(B9	Light emission intensity error of the LED array.)
(BA	Scanning error: The left-hand black reference line which is marked on the document pressure bar for scanning width setting is not detected.)
(BB	Scanning error: The right-hand black reference line which is marked on the document pressure bar for scanning width setting is not detected.)
(BC	Scanning error: Reduction miss)
(BD	Scanning error: Enlargement miss)
D1	The MODEM setup bit sticks to High.
D2	CTS stays OFF or ON if the MODEM RTS is turned ON or OFF, respectively.
D3	Bit B1A of the MODEM stays OFF.
D4	Bit RX of the MODEM stays OFF.
D5	The MODEM fails to complete the command transmission sequence.
D6	No MODEM interrupt for 60 seconds.
E1	Microprocessor (MPU) error on the control panel PCB.
(E4	Out of recording paper.)
(E5	Recording paper set error.)
E6	Write error in E^2PROM.
E8	Data scanning error during transmission.
(EA	Document removed at phase B.)
F3	Voice message recording or playing-back not started.
F5	EOL not found in page memory transmission mode.
FF	Interface error of page memory command.

Error codes in parentheses do not appear in the “MACHINE ERROR xx”, since those errors are displayed as messages described in Section 2.1. Those error codes appear in the communications list if an equipment error occurs during communications. Refer to Section 3.1, (13).

3. COMMUNICATIONS ERROR

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.

To print out the communications list containing the more detailed information (refer to Section 3.1) regardless of whether the equipment has been in sending or receiving operation, open and close the control panel unit to sound beeper and then press the [*] and [#] keys at one time during beeping.

```
                    TRANSMISSION VERIFICATION REPORT

                                              TIME : 05/15/1995 10:14
                                              NAME : A
                                              FAX  : 1
                                              TEL  : 2

      DATE,TIME                    05/15 10:13
      FAX NO./NAME                 5
      DURATION                     00:00:52
      PAGE(S)                      00
      RESULT                       NG
      MODE                         STANDARD
                                   ECM

      NG  : POOR LINE CONDITION
```

Transmission Verification Report Sample

```
                                              ERROR CODE : 00 00
*** COMMUNICATION LIST ***
                                              MODEL: 5X4-205/209
                                              TIME : 05/10/1995 16:08
                                              REV. : UG2217001  VER.A
                                              PCI  : 2.00
                                              SUM  : 215C

  TX/RX              : RX
  SPEED              : 9600 BPS  20 MSEC/LINE
  MODE               : MH
                       STANDARD
  LINE STATUS        : 000 (00000 LINE)
  FIF
     TX NSF          : 00 00 56 55 55 00 80 B0 80 12 00
     TX CSI          : 33 32 31 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 00
     TX DIS          : 00 6E B8 84 80 11
     RX TSI          : 33 32 38 37 33 35 38 32 35 30 20 20 20 20 20 20 20 20 20 20
     RX NSS          : 00 00 56 00 06 88 80 00 80 55 55 90 80 80 12 00
  COMMAND RECORD
       TX            : NSF  CSI  DIS                CFR            MCF
       RX            :                TSI  NSS  TCF      PIX  EOP       DCN
```

Communications List Sample

3.1 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 remote 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 answer back.
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 broadcasting 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 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 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: Five seconds or more for one-line transmission.
A0	16	RTC not found and carrier OFF signal detected for 6 seconds.
A0	17	RTC found and command detected for 60 seconds.
A8	01	RTN, PIN, or ERR received at the calling terminal. *
A9	01	RTN, PIN, or ERR received at the called terminal. *
AA	18	Receive buffer full during receiving into memory.

* Available in Germany and Austria only.

(11) General communications-related

Code 1	Code 2	Causes
B0	01	Polarity inversion detected.
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	xx	Equipment error (For xx, refer to Section 2.2.)

CHAPTER V.

MAINTENANCE

CONTENTS

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

(** Only for the Italian and UK versions)

1. DISASSEMBLY, REASSEMBLY, AND LUBRICATION

■ Safety Precautions

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

(1) Always turn off the power 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, or 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) Unless otherwise specified, tighten screws to the torque values listed below.

- Tapping screws
  - M2.6 : 3.5 kgf•cm
  - M3 x 8 : 5 kgf•cm
  - M3 x 10 : 7 kgf•cm
- Sems screws M3 (Screws with washer) : 7 kgf•cm
- Stepped screws : 7 kgf•cm

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

■ Preparation

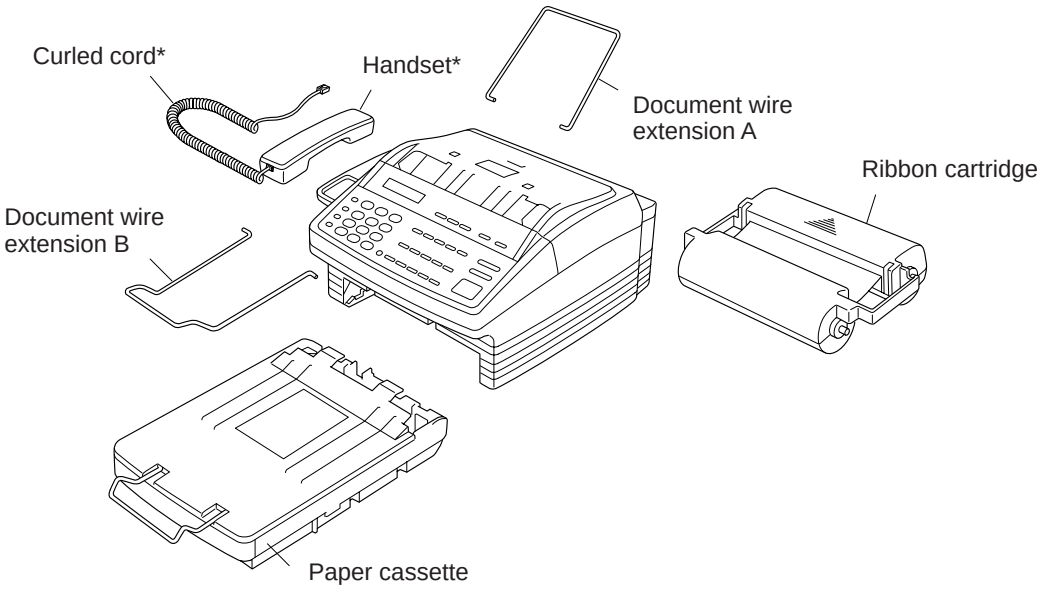
Prior to proceeding to the disassembly procedure,

(1) Unplug the modular jack of the telephone line.

(2) Unplug modular jacks of external telephone sets if mounted.

(3) Unplug the modular jack of the curled cord and remove the handset.* (See below.)

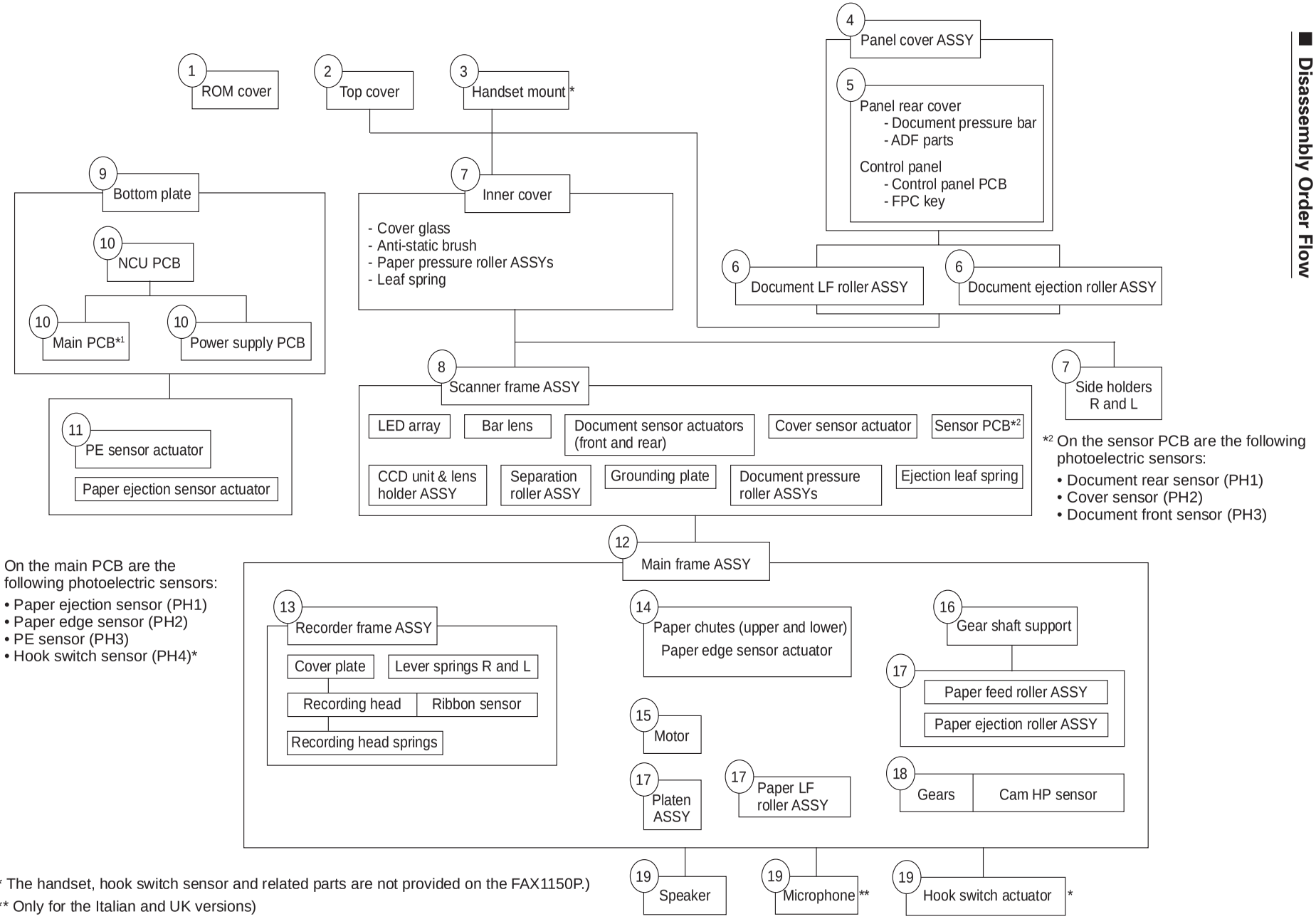
(4) Remove the paper cassette, document wire extensions, and ribbon cartridge. (See below.)



■ How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object component. To remove the recorder frame ASSY, for example, first find it on the flow and learn its number (⑬ in this case). You should remove parts numbered ③, ⑦, ⑧ and ⑫ so as to access the recorder frame ASSY.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)



*1 On the main PCB are the following photoelectric sensors:
- Paper ejection sensor (PH1)
- Paper edge sensor (PH2)
- PE sensor (PH3)
- Hook switch sensor (PH4)*

*2 On the sensor PCB are the following photoelectric sensors:
- Document rear sensor (PH1)
- Cover sensor (PH2)
- Document front sensor (PH3)

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)
(** Only for the Italian and UK versions)

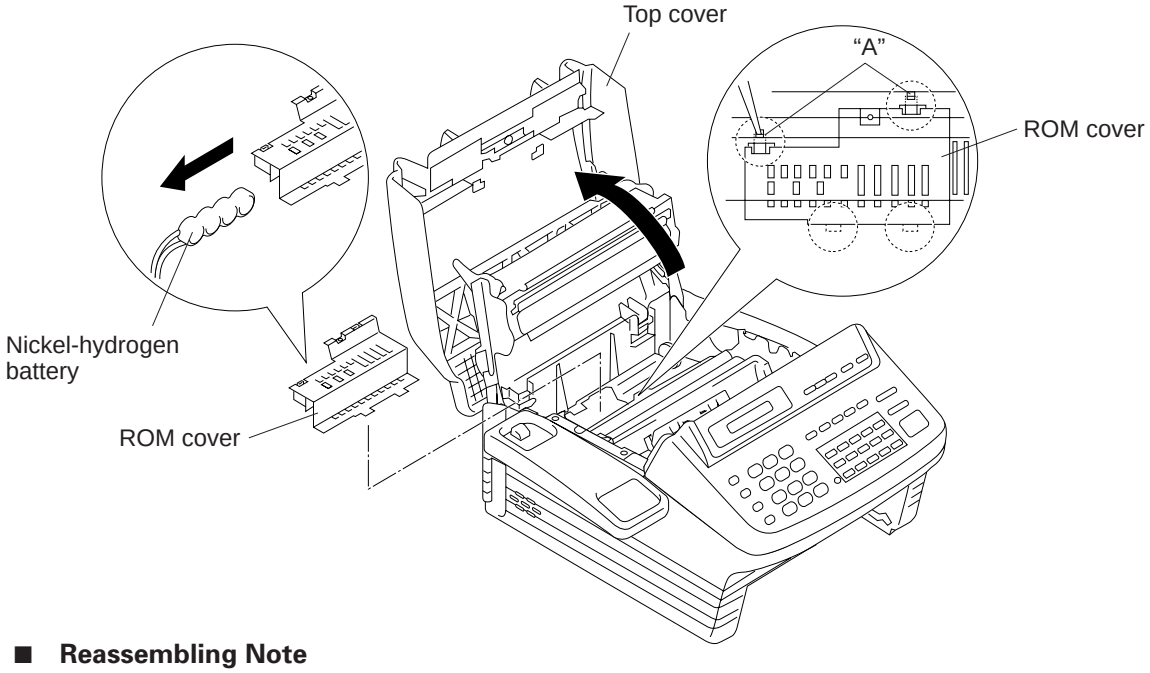
1.1 ROM Cover

(1) Open the top cover.

(2) Insert the tip of the spring hook into cutouts “A” and release two pawls of the ROM cover.

(3) Lift up the ROM cover while sliding it towards the rear.

The nickel-hydrogen battery will come off.



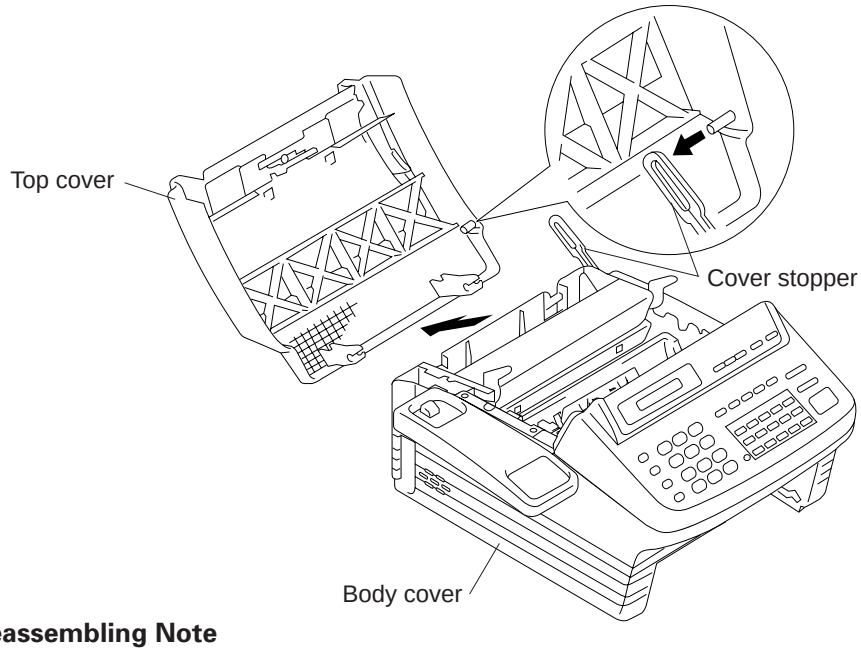
■ **Reassembling Note**

- When installing the ROM cover, set the nickel-hydrogen battery into the channel of the ROM cover.

1.2 Top Cover

(1) Pull the cover stopper off the top cover.

(2) Hold the top cover at an angle shown below and slide it to the rear.



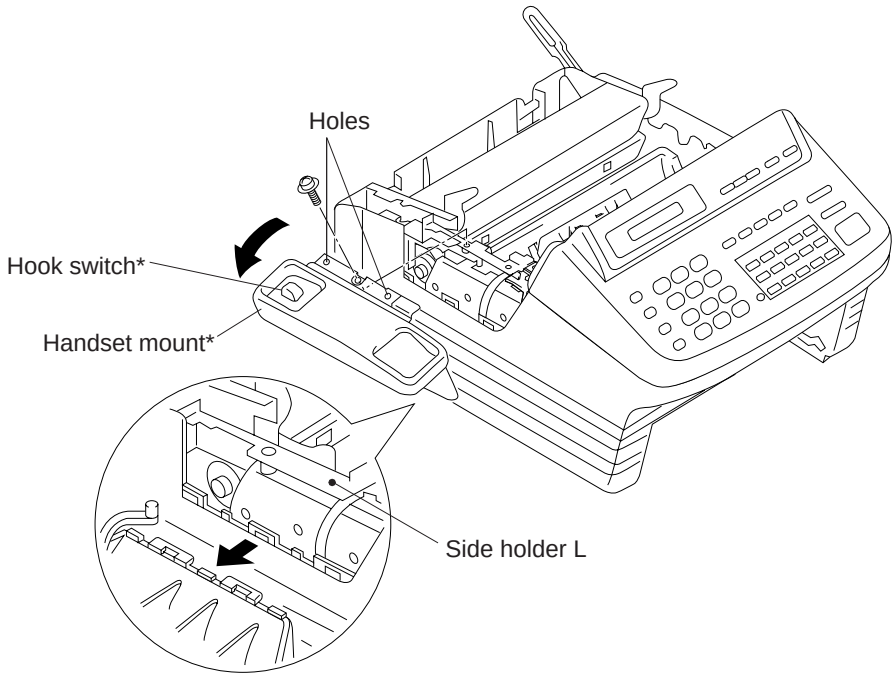
■ **Reassembling Note**

- If the cover stopper works out easily after reinstallation, replace it with a new one.

1.3 Handset Mount*

(1) Remove the screw from the handset mount.

(2) Turn the handset mount about its lower end so that its upper end works out of the bosses provided on the side holder L.



■ **Reassembling Note**

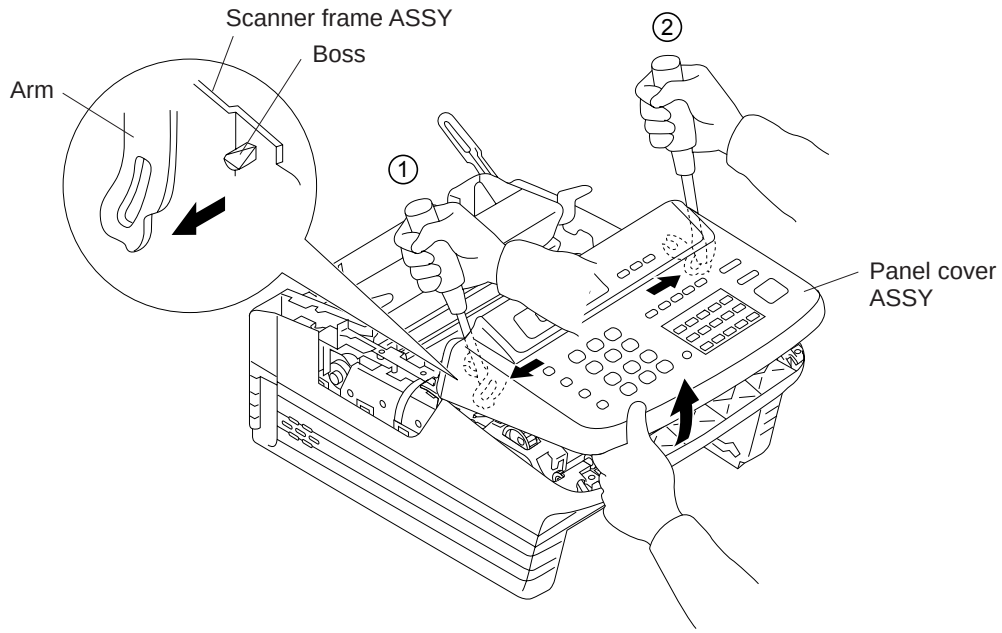
- When installing the handset mount, take care not to hold down the hook switch. Otherwise, the inner end of the hook switch will not mate correctly with the hook switch actuator positioned inside the body cover.

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

1.4 Panel Cover ASSY

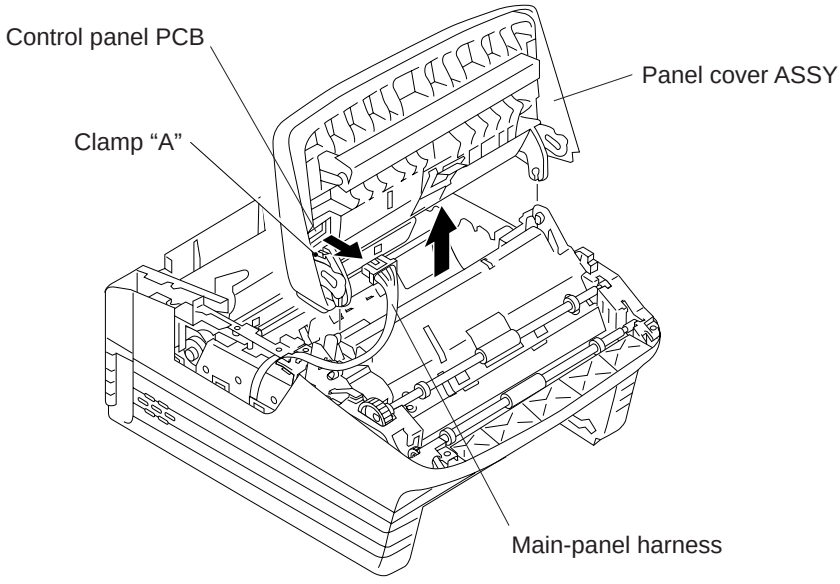
(1) Open the panel cover ASSY slightly as shown below.

(2) Push the right and left arms of the panel cover ASSY outwards with your thumb and a flat screwdriver as shown below to unhook them from the bosses on the scanner frame ASSY, then open the panel cover ASSY fully.



(3) Disconnect the main-panel harness from the control panel PCB.

(4) Lift up the panel cover ASSY.



■ **Reassembling Note**

- Route the main-panel harness through clamp “A” provided on the panel rear cover.

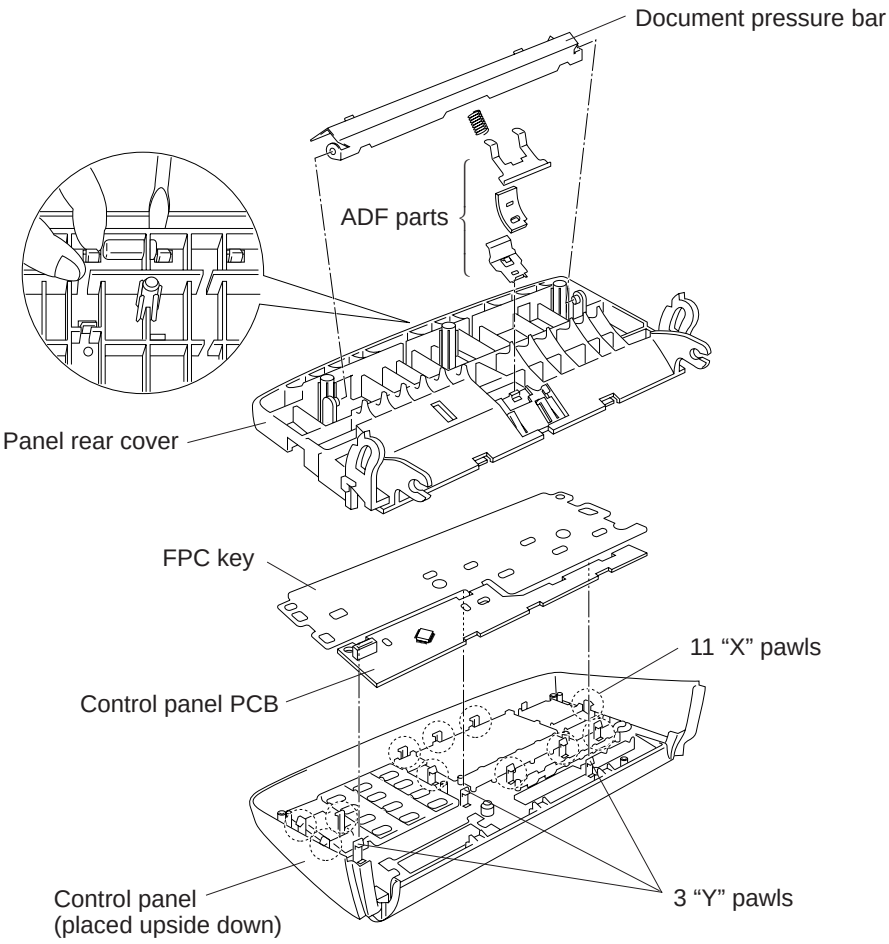
1.5 Panel Rear Cover and Control Panel

(1) Place the panel cover ASSY upside down.

(2) Remove the document pressure bar and the ADF parts from the panel rear cover.

(3) Insert the tip of a flat screwdriver between the panel rear cover and the control panel, then unhook the panel rear cover from the 11 “X” pawls provided on the control panel. Lift up the panel rear cover.

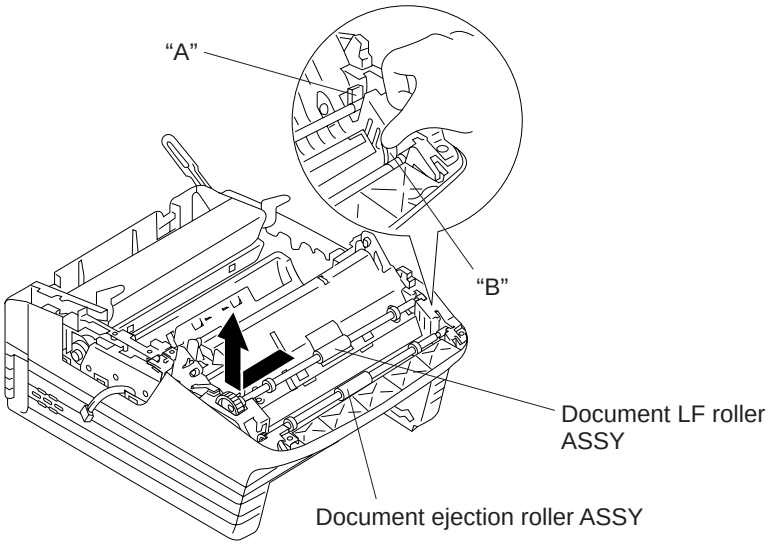
(4) Unhook the control panel PCB from the three “Y” pawls on the control panel and take it out together with the FPC key.



1.6 Document LF Roller ASSY and Ejection Roller ASSY

(1) Push arm rib “A” to the rear, then shift the document LF roller ASSY to the left and upwards.

(2) Push arm rib “B” to the rear, then shift the document ejection roller ASSY to the left and upwards.



1.7 Inner Cover

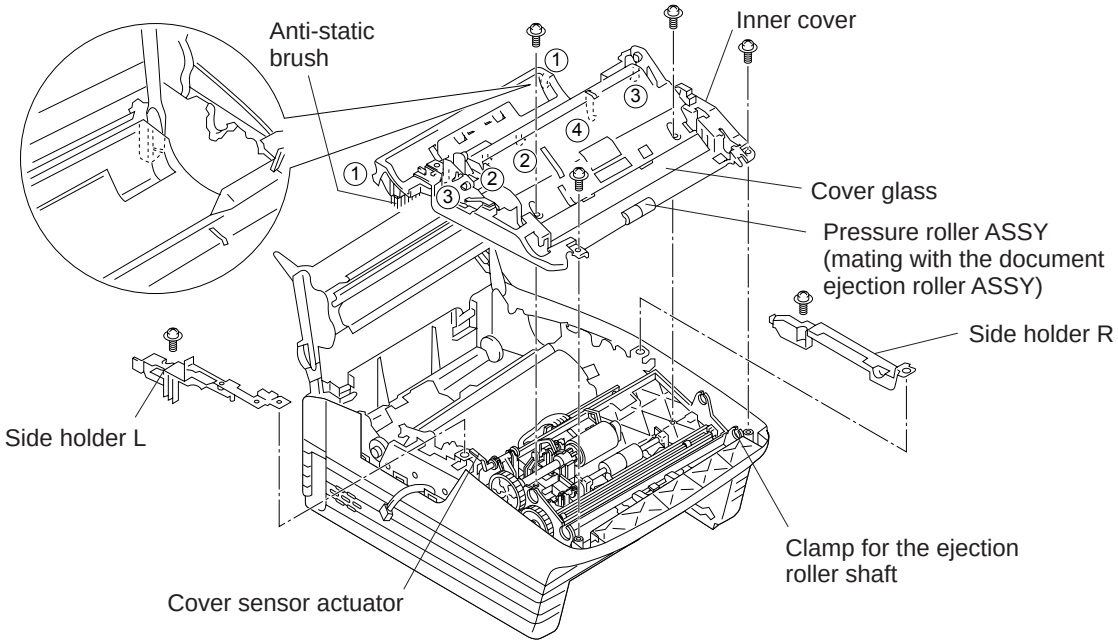
(1) Remove the four screws.

(2) Take off the main-panel harness from the inner cover.

(3) Unhook the seven pawls in the order of ① through ④ as shown below and lift up the inner cover.

To unhook pawls ①, insert the tip of a flat screwdriver from the rear side.

(4) Remove the two screws and take off the side holders R and L.



(5) You can remove the cover glass, anti-static brush, pressure roller ASSYs (for document and recording paper ejection), and leaf spring.

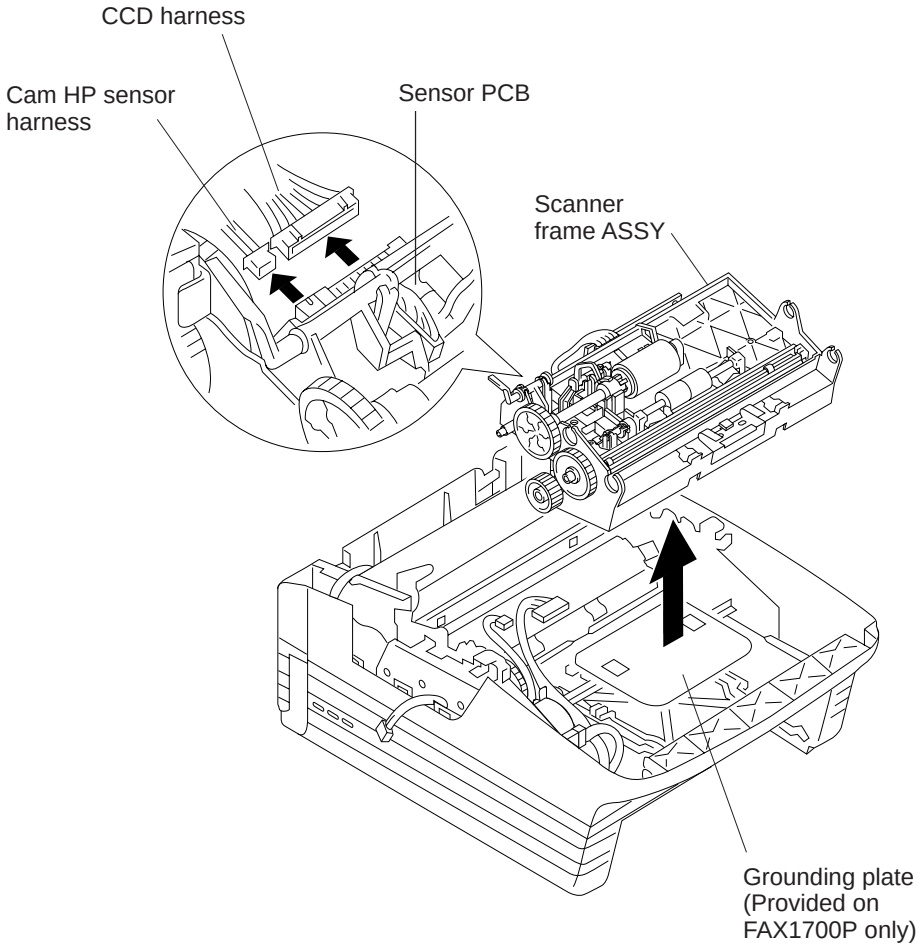
■ Reassembling Note

- Make sure you do not put on the inner cover in such a way that it accidentally pushes down the top end of the cover sensor actuator.
- Be careful not to break the clamp for the ejection roller shaft.

1.8 Scanner Frame ASSY

(1) Disconnect the cam home position (HP) sensor harness and CCD harness from the sensor PCB.

(2) Take out the scanner frame ASSY from the body cover.

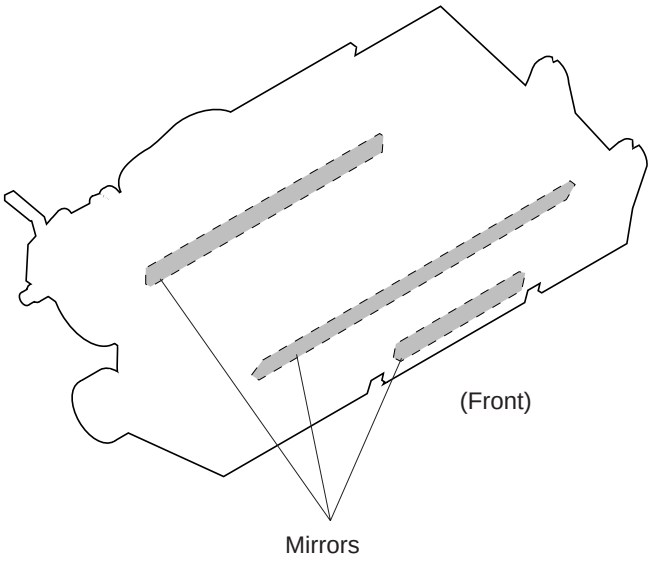


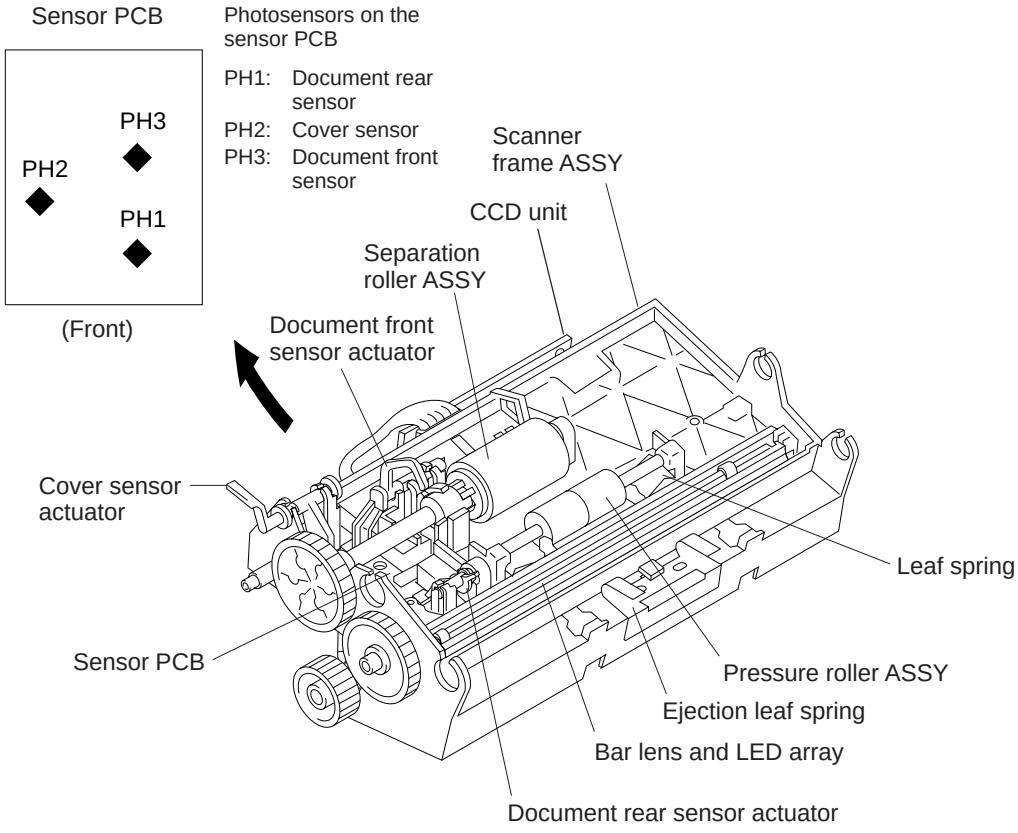
(3) Remove the grounding plate from the right side of the scanner frame ASSY.

(4) You can remove the LED array, bar lens, document sensor actuators, cover sensor actuator, sensor PCB, separation roller ASSY, rollers and their leaf spring, and ejection leaf spring.

NOTE: When accessing these components, take care not to scratch the mirrors, CCD lens, or bar lens.

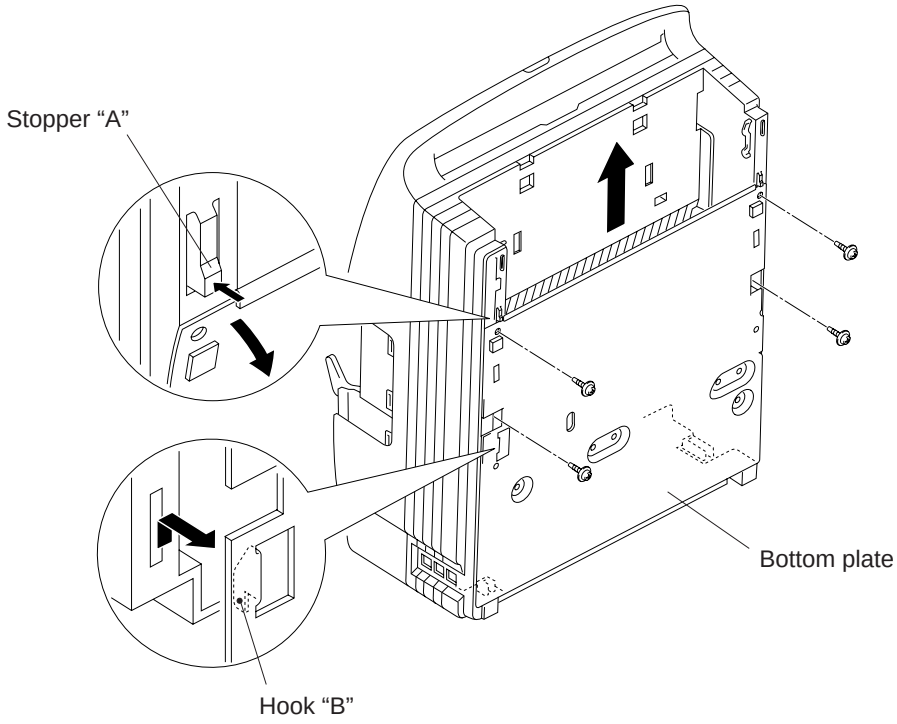
NOTE: NEVER remove or replace the CCD unit and mirrors. Their mounting positions have been adjusted in the factory.





1.9 Bottom Plate

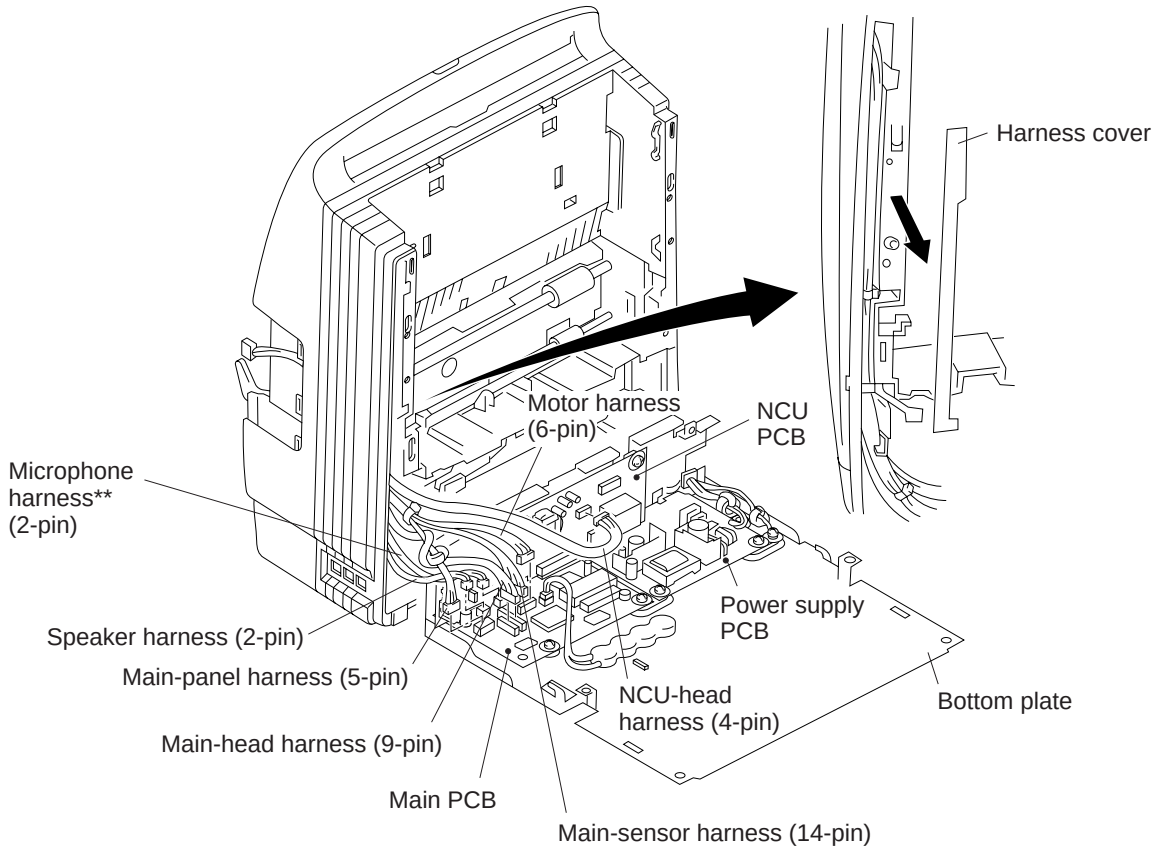
(1) Place the machine upright as shown below.
(2) Remove the four screws.
(3) Slightly pull the top end of the bottom plate towards you to release it from stoppers “A.”
(4) Lift up the bottom plate to disengage its hooks “B” from the body cover.



(5) Open the bottom plate. (See the next page.)
(6) Disconnect the following five (six**) harnesses from the main PCB:
- Main-head harness (9-pin)
- Main-panel harness (5-pin)
- Main-sensor harness (14-pin)
- Speaker harness (2-pin)
- Microphone harness** (2-pin)
- Motor harness (6-pin)

(** Only for the Italian and UK versions)

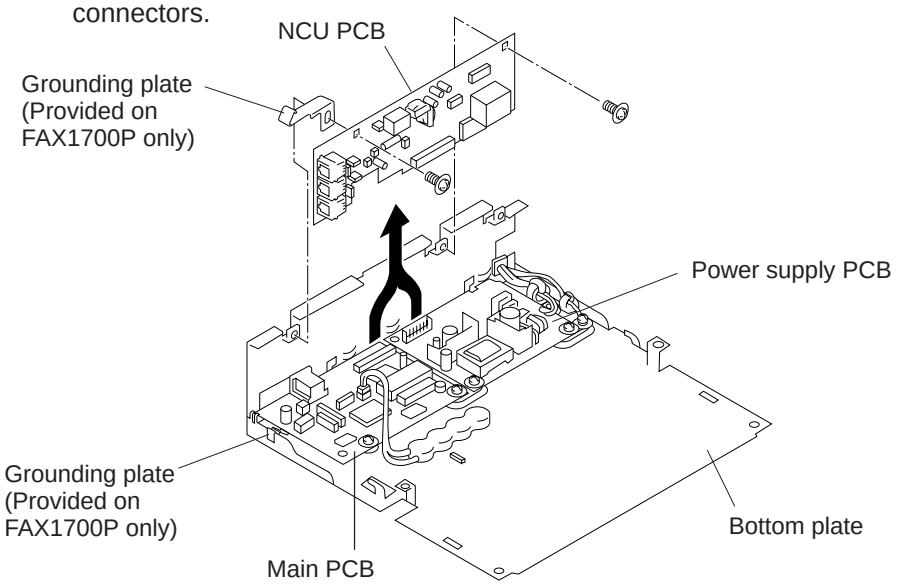
(7) Disconnect the NCU-head harness from the NCU PCB.



(** Only for the Italian and UK versions)

1.10 NCU PCB, Main PCB, and Power Supply PCB

(1) Remove the two screws from the NCU PCB and lift up the NCU PCB to disconnect the connectors.

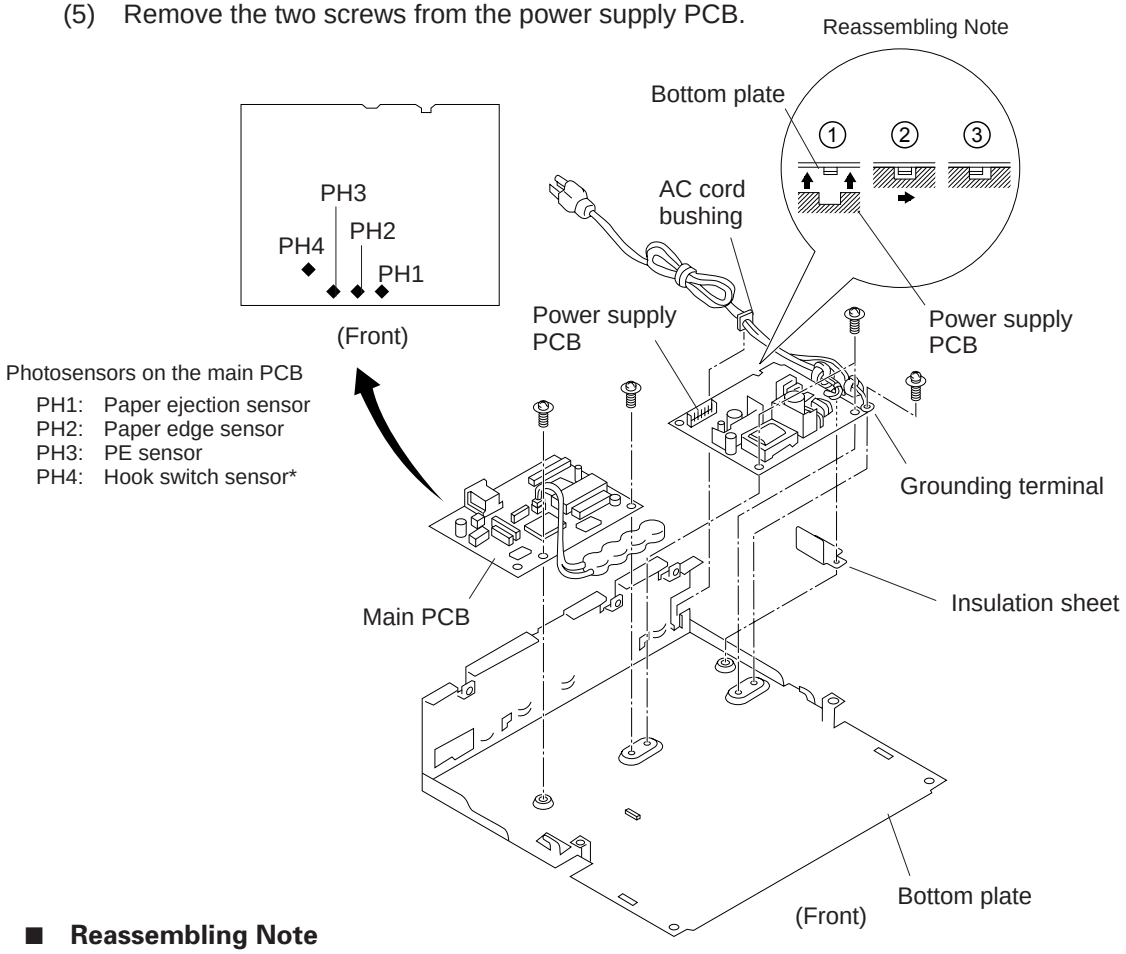


(2) Remove the two screws from the main PCB.

(3) Pull up the AC cord bushing.

(4) Remove the screw from the grounding terminal.

(5) Remove the two screws from the power supply PCB.



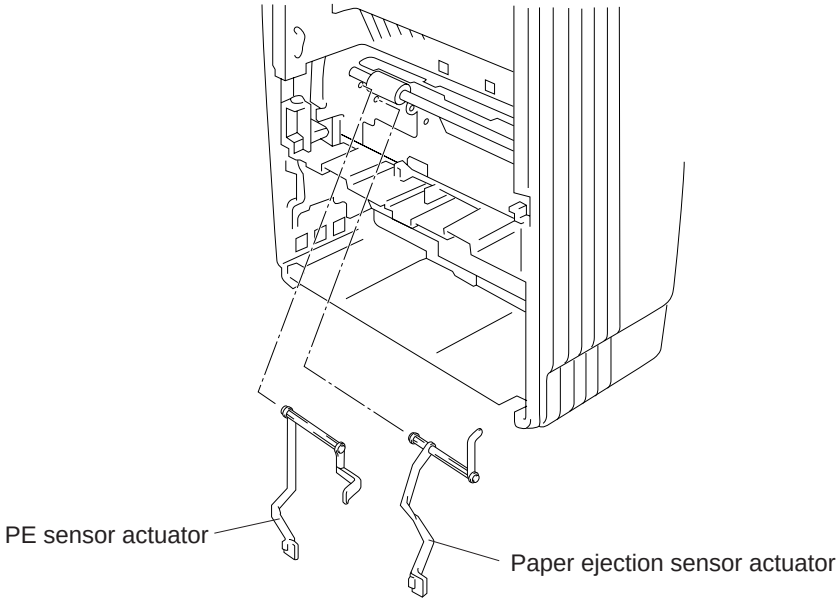
■ **Reassembling Note**

- Be sure to fit the rear end of the power supply PCB onto the bottom plate and then move the PCB to the right as shown above.

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

1.11 PE Sensor Actuator and Paper Ejection Sensor Actuator

(1) Remove the PE sensor actuator and paper ejection sensor actuator.

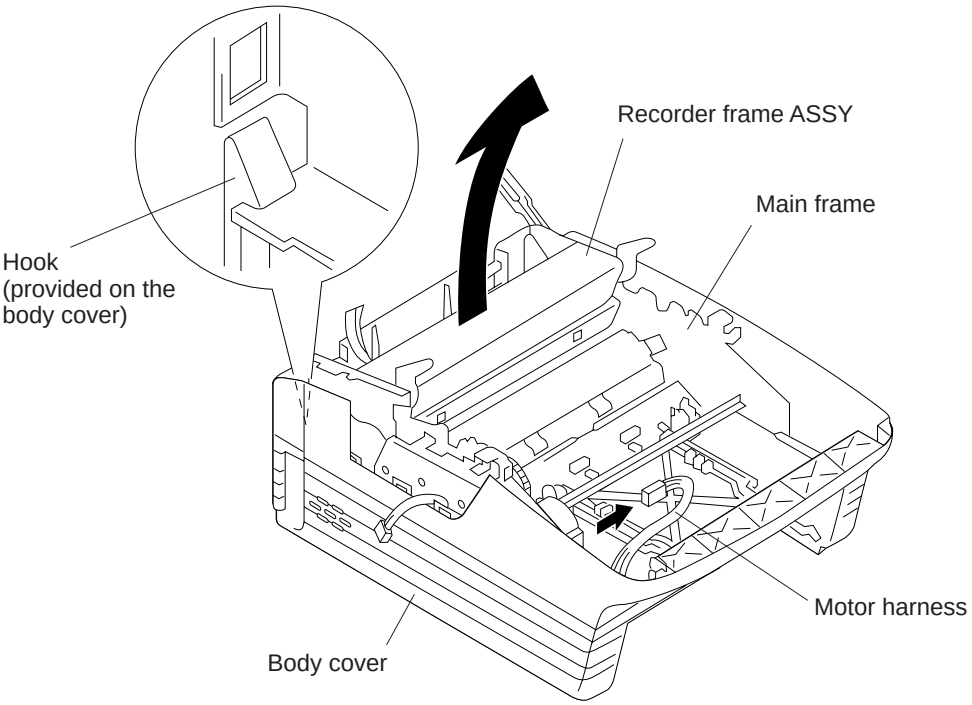


1.12 Main Frame ASSY

(1) Release the two hooks provided on the rear inside of the body cover with a flat screwdriver as shown below.

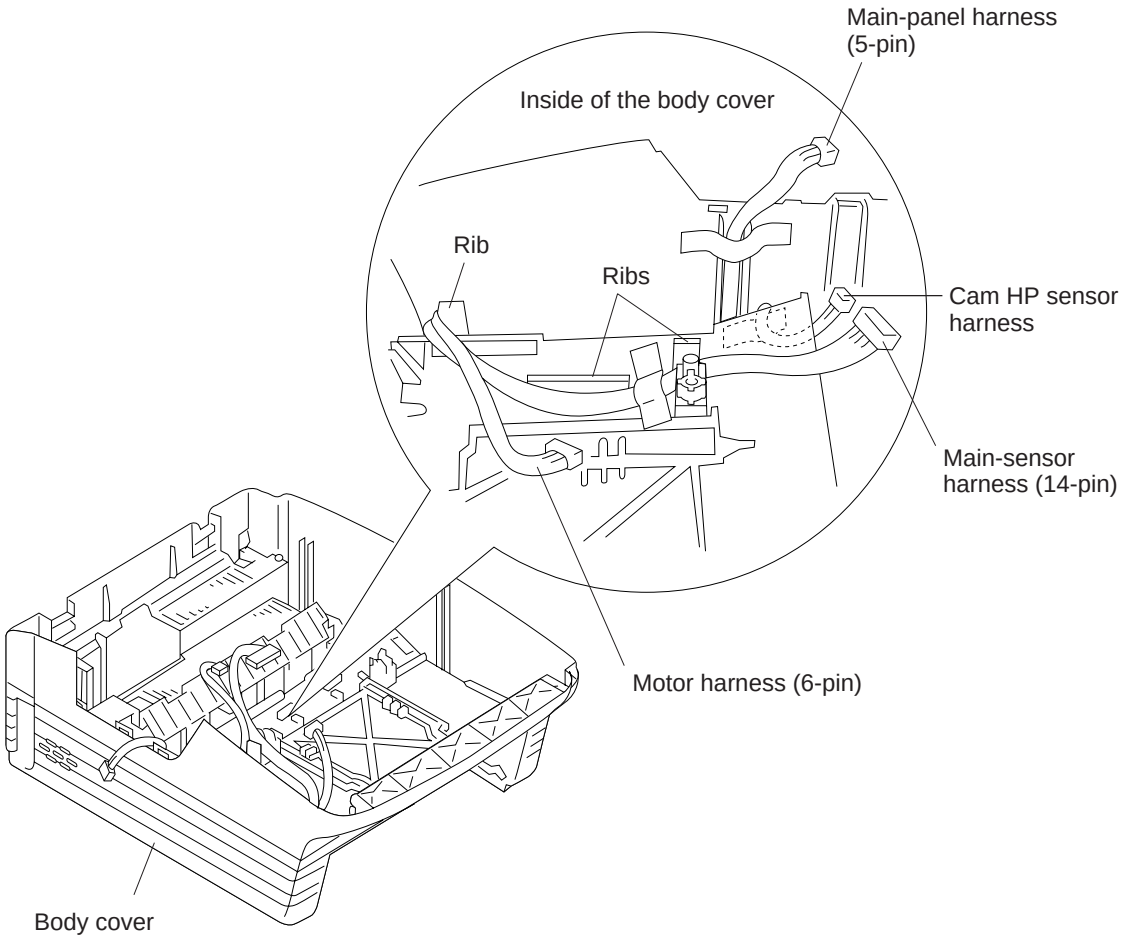
(2) Lift up the main frame ASSY while pulling up the main-head harness and NCU-head harness through the slot between the body cover and the main frame.

NOTE: When placing the removed main frame ASSY, be sure to keep the upper paper chute opened in order to prevent the paper edge sensor actuator (see page V-16) from getting broken.



■ Reassembling Notes

- When mounting the main frame ASSY onto the body cover, route the following four harnesses and secure them with tape as shown below.
  - Main-panel harness
  - Motor harness
  - Main-sensor harness
  - Cam HP sensor harness

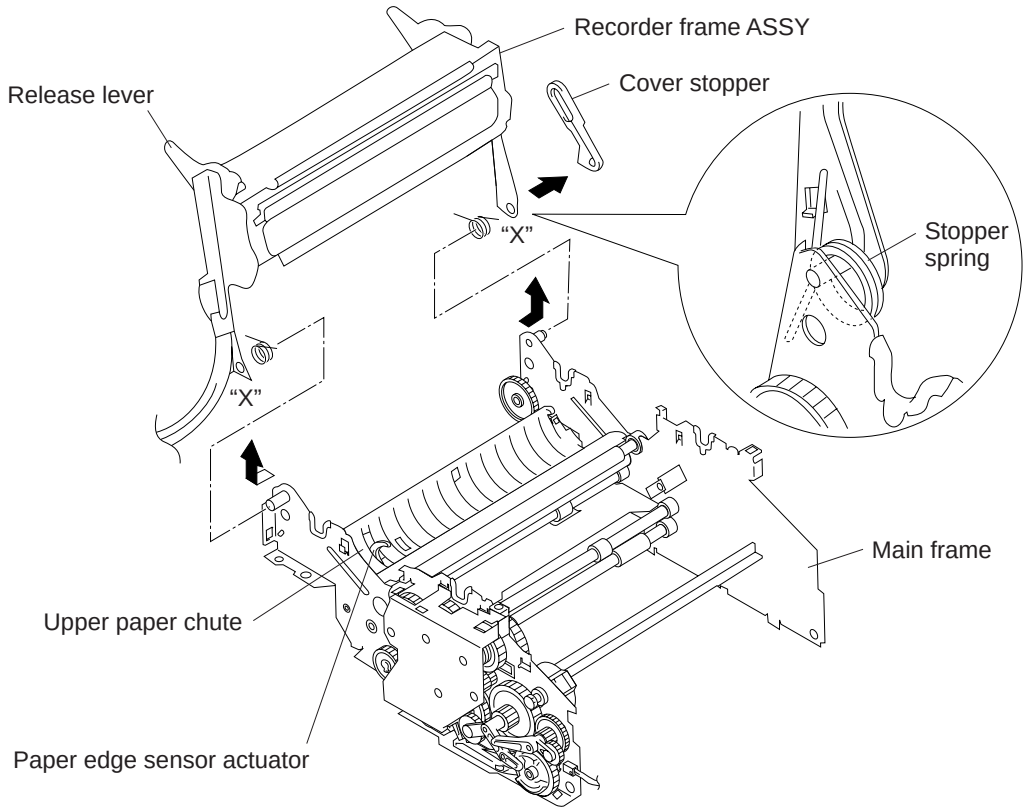


1.13 Recorder Frame ASSY

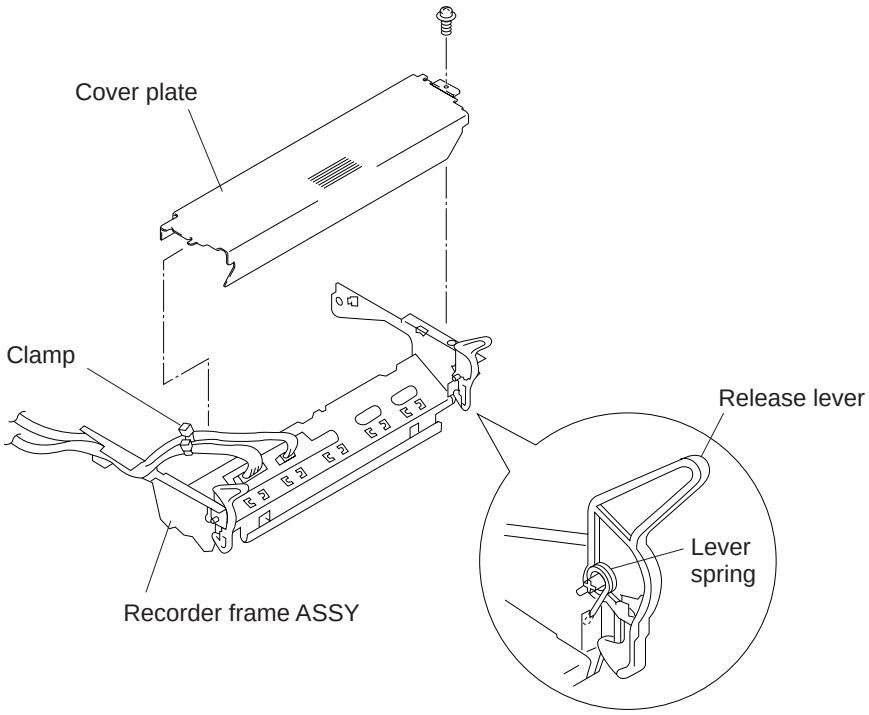
(1) Remove the cover stopper.

(2) Turn the release levers to the rear to open the recorder frame ASSY.

(3) Pull sections “X” outwards and take out the recorder frame ASSY from the main frame.

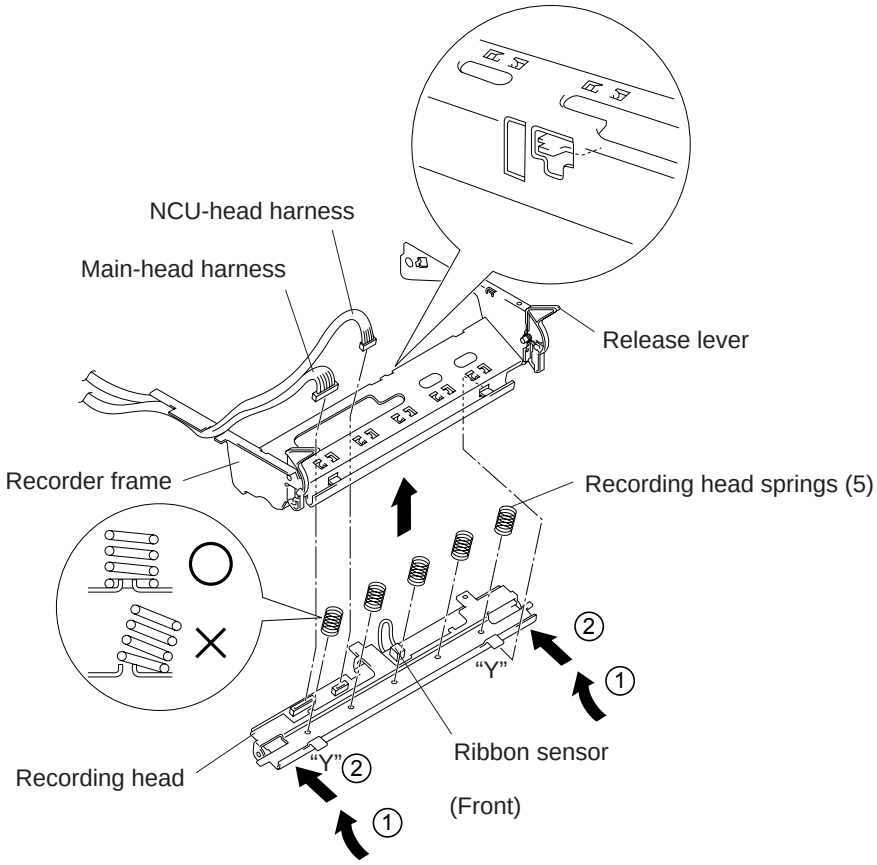


(4) Remove the screw and take off the cover plate.



(5) Disconnect the main-head harness and the NCU-head harness from the recording head.

(6) Push both ends of the recording head towards the recorder frame and shift them to the rear to unhook sections “Y” from the cutouts provided in the recorder frame as shown below.

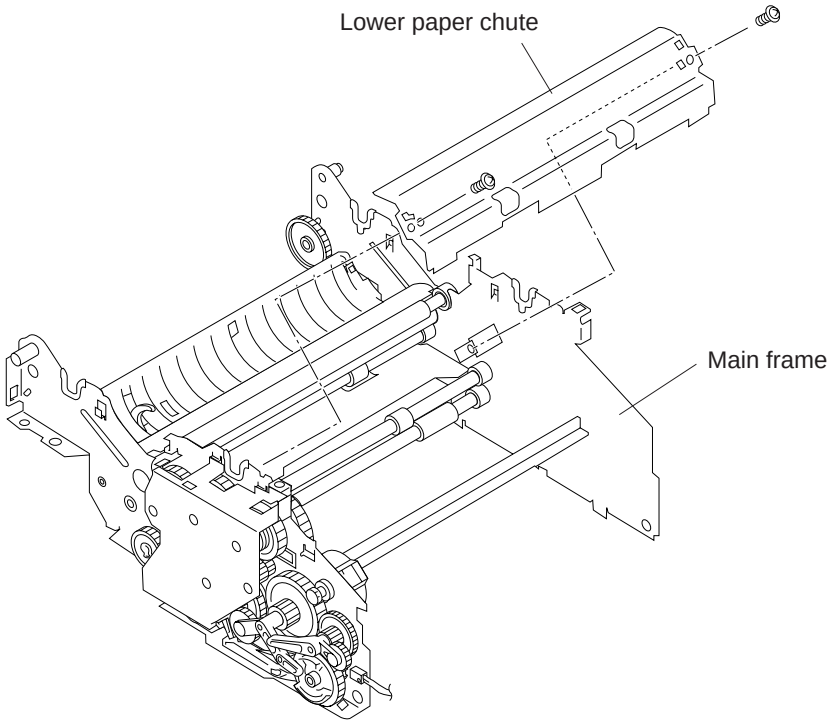


■ Reassembling Notes

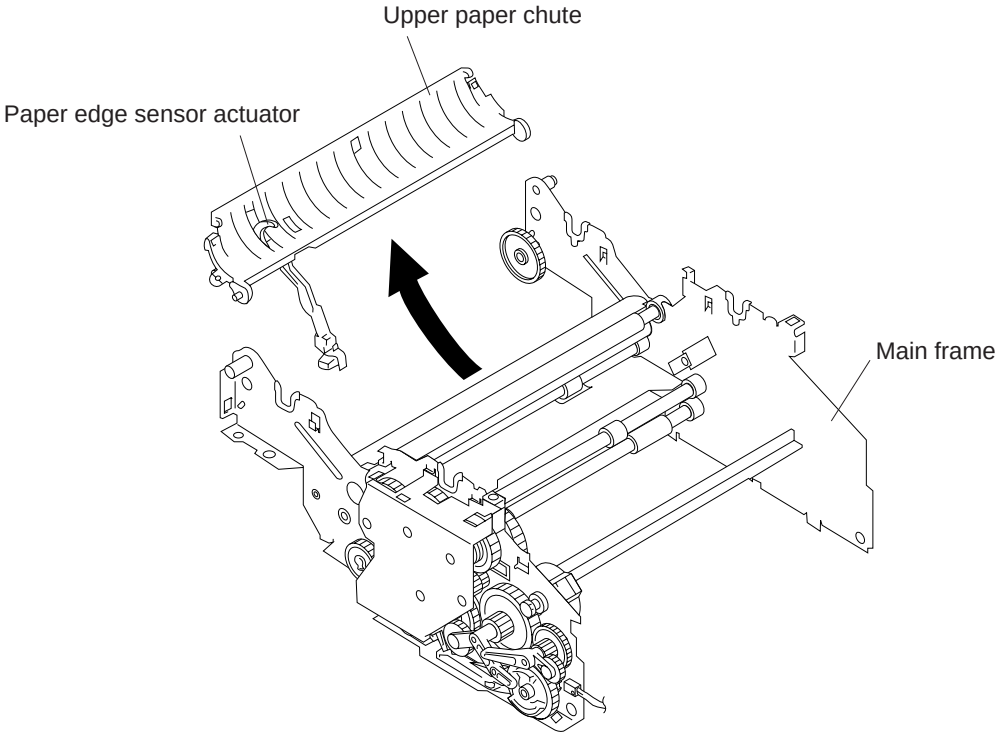
- If the cover stopper works out easily after reinstallation, replace it with a new one.
- When mounting the recorder frame ASSY, be careful with the hooking directions of the stopper springs. (See the previous page.)
- When installing the recording head, check that the recording head springs are set into place as shown above.

1.14 Paper Chutes

(1) Remove the two screws and take off the lower paper chute from the main frame.



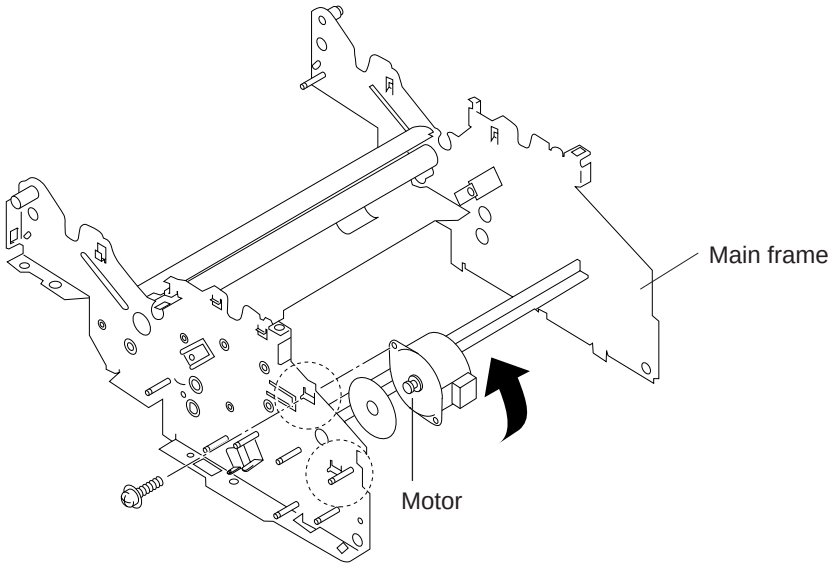
(2) Take out the upper paper chute, taking care not to damage the paper edge sensor actuator.



1.15 Motor

(1) Remove the screw.

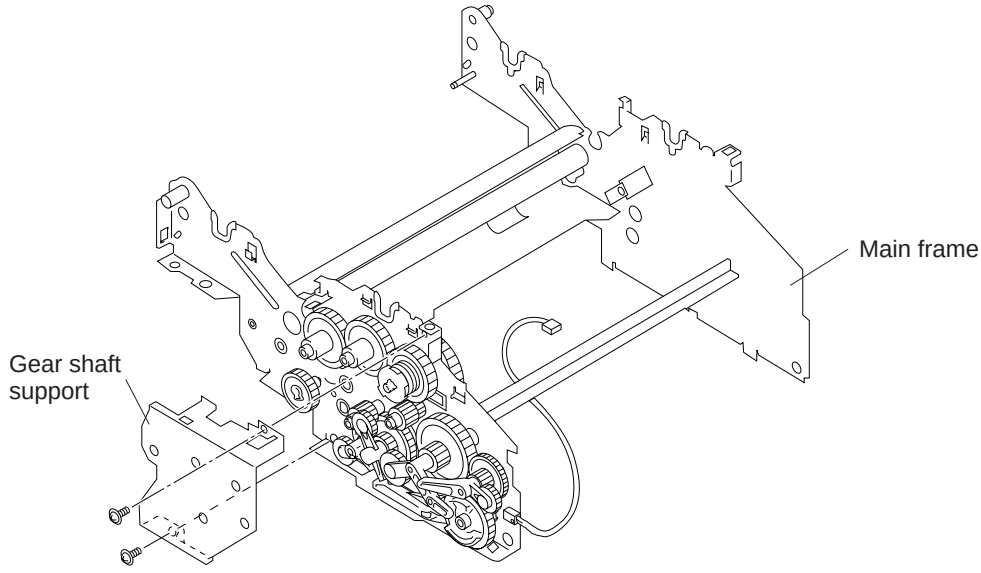
(2) Turn the motor in the direction of the arrow as shown below.



1.16 Gear Shaft Support

(1) Remove the two screws.

(2) Pulling down the gear shaft support, take it off the main frame.



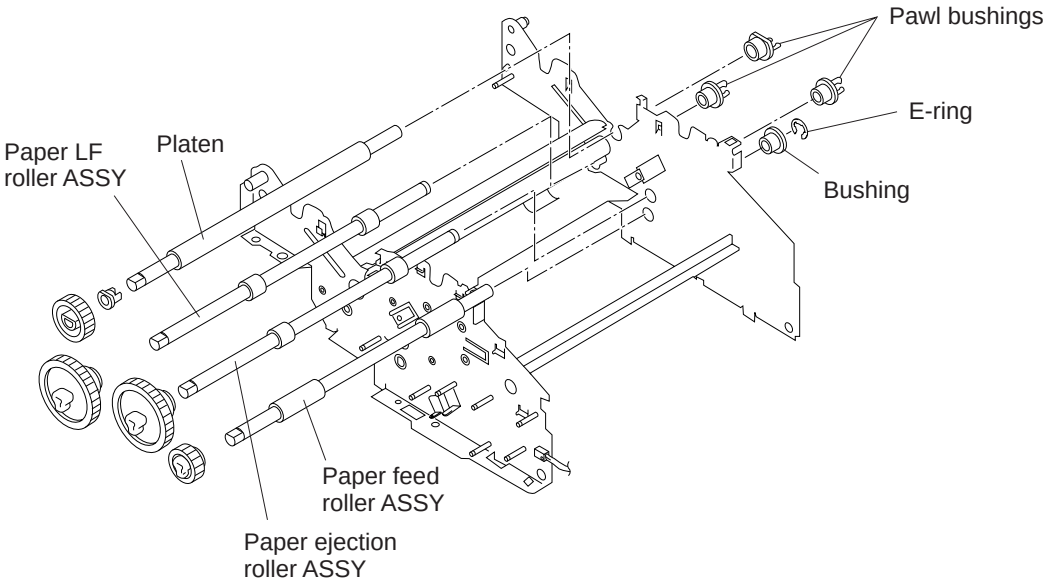
1.17 Platen ASSY, Paper LF Roller ASSY, Paper Feed Roller ASSY, and Ejection Roller ASSY

(1) To take out the platen ASSY, paper LF roller ASSY, and paper ejection roller ASSY, remove the pawl bushings from the right ends of those ASSYs by pulling their pawls outwards.

Next, at the left ends of those ASSYs, remove the gears by pulling their pawls outwards.

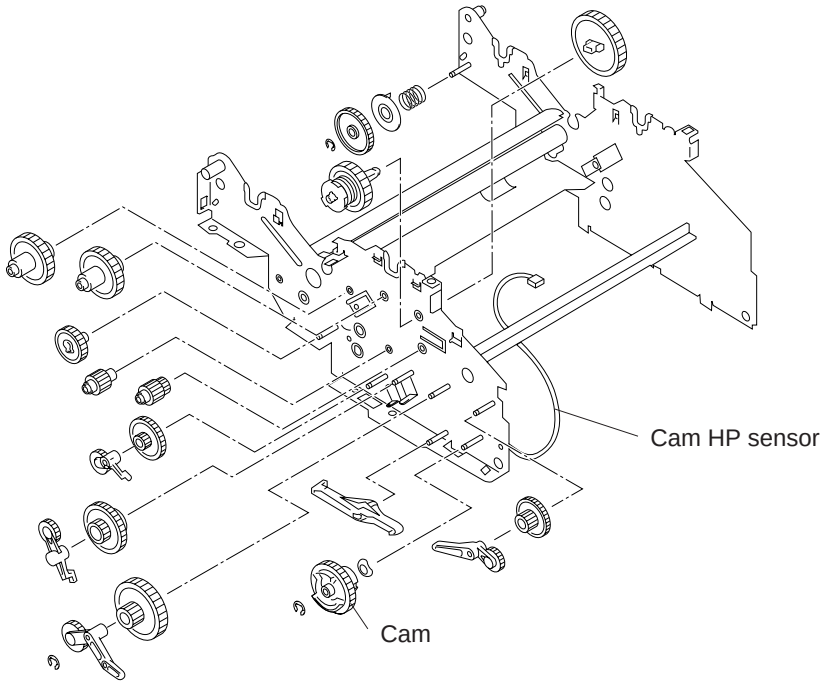
(2) To remove the paper feed roller ASSY, remove the E-ring and the bushing from the right end of the ASSY.

Next, at the left end, remove the gear by pulling its pawl outwards.



1.18 Gears

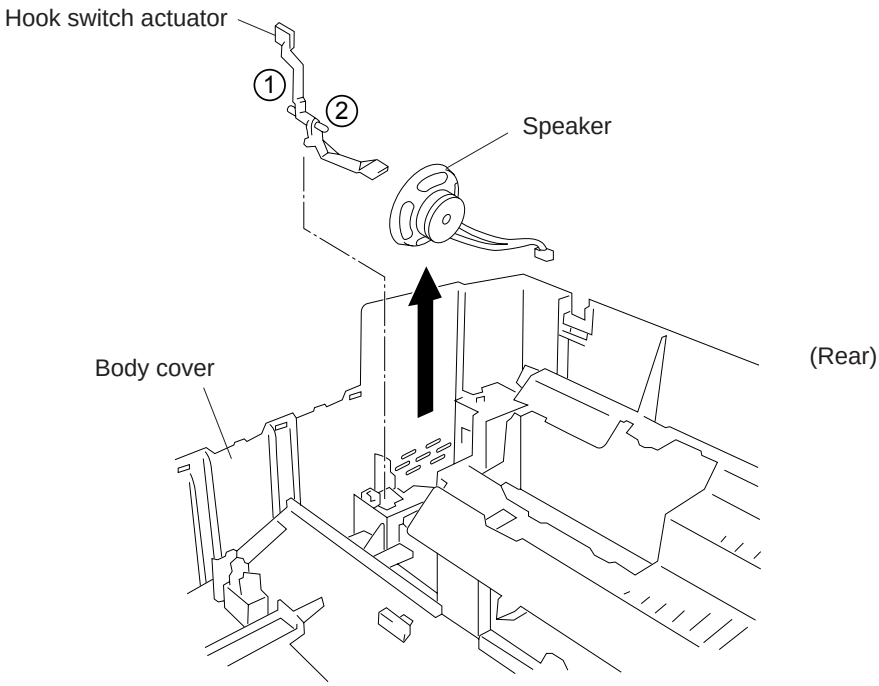
(1) Remove the gears from the main frame as shown below.

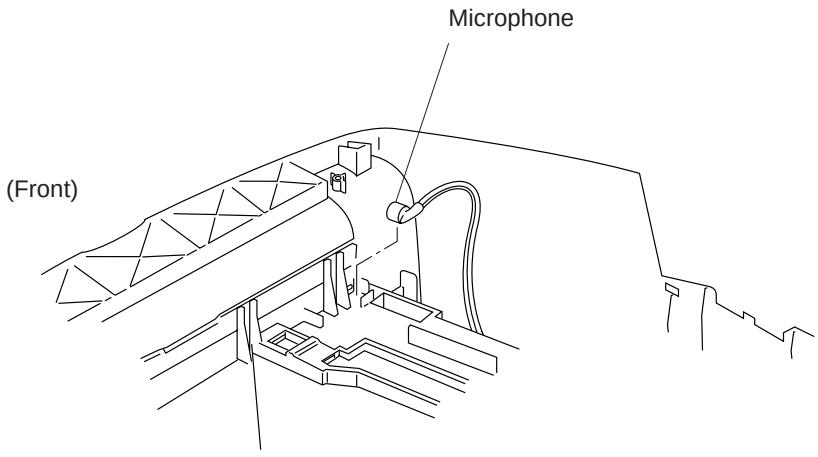


1.19 Speaker, Microphone**, and Hook Switch Actuator*

(1) Lift up the speaker.

(2) Remove the hook switch actuator.





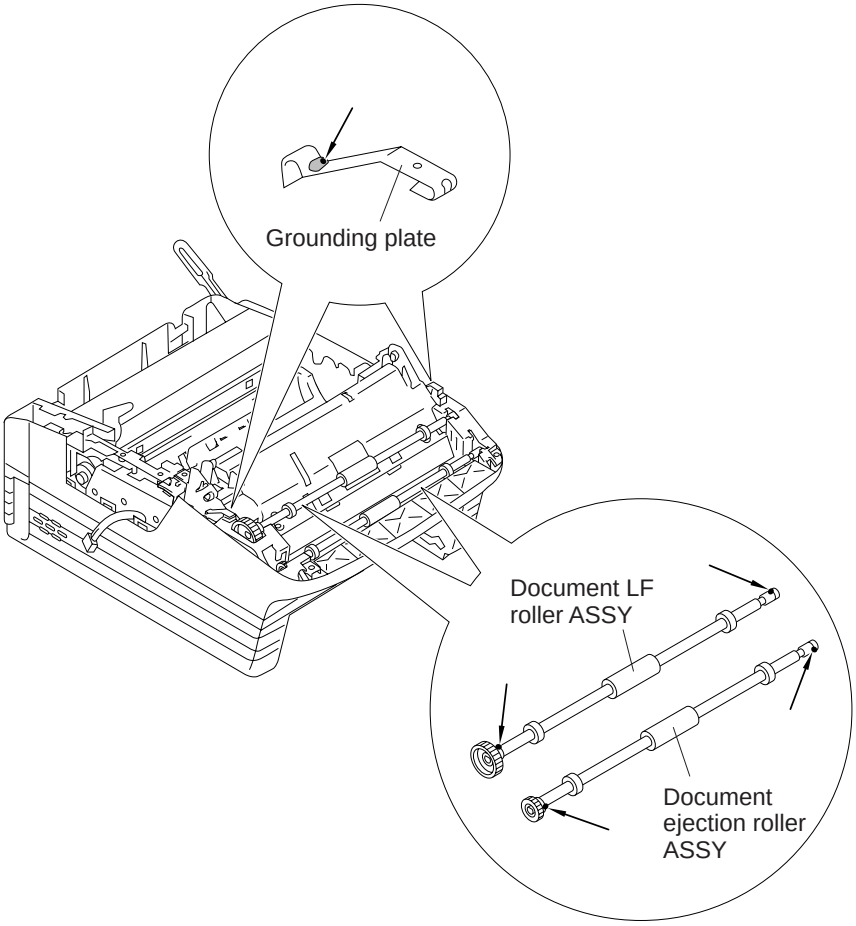
(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

(** Only for the Italian and UK versions)

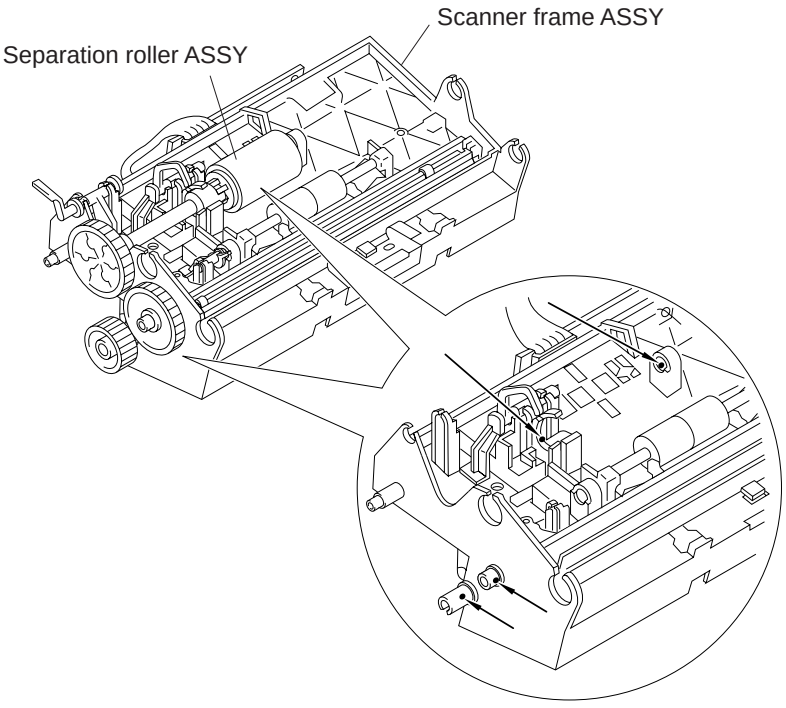
■ Lubrication

Apply two grains of grease (Molicoat EM-30) to each of the following lubrication points:

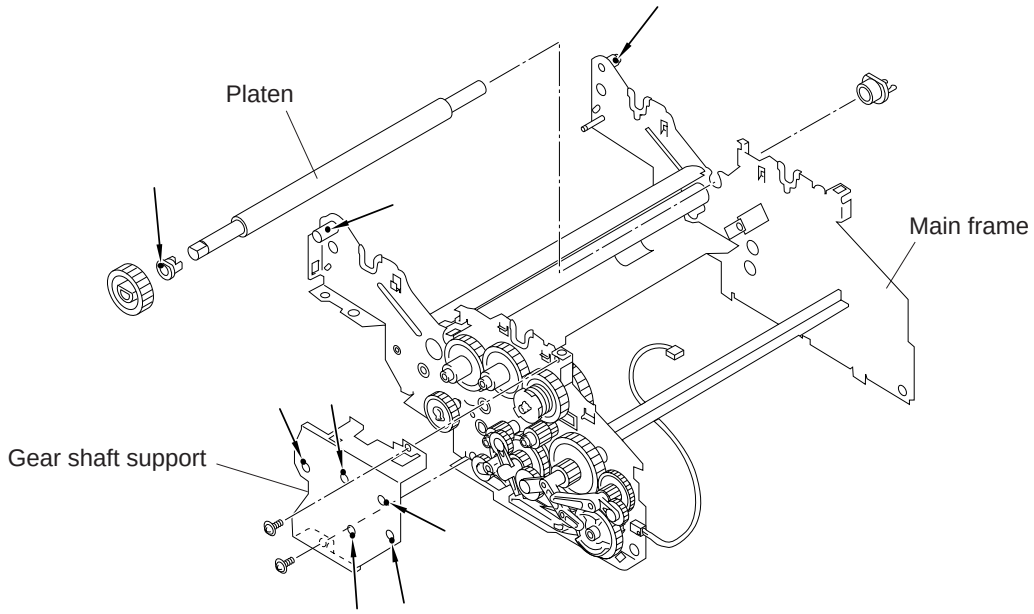
(1) Document LF roller ASSY, document ejection roller ASSY, and grounding plates



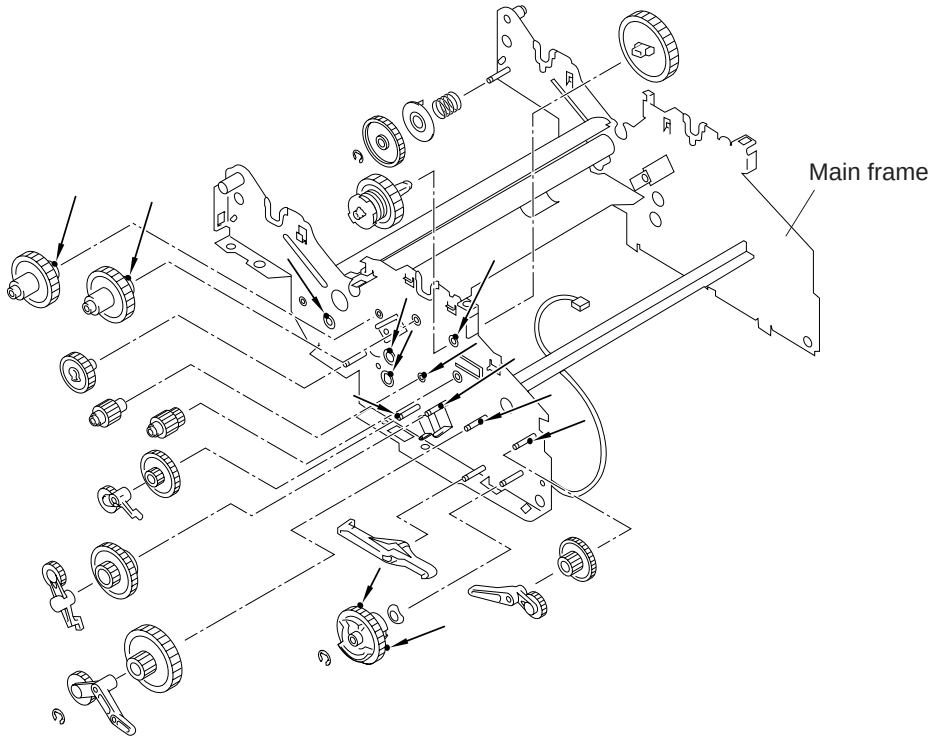
(2) Scanner frame ASSY



(3) Platen bushing, main frame, and gear shaft support



(4) Gears and shafts on the main frame



2. TROUBLESHOOTING

2.1 Introduction

This chapter 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 troubles which may occur in future and determine the troubleshooting procedures, so this chapter covers some sample troubles. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

Prior to proceeding to the troubleshooting, read CHAPTER IV, INDICATION AND INFORMATION PRINTOUT OF ERROR.

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.
- When removing the electronic devices with a soldering iron, do not leave solder chips or lead wires inside the machine.

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 flowcharts, 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.

■ Control panel related

Trouble	Action to be taken
(1) LCD shows nothing.	• Check the main-panel harness between the main PCB and the control panel. • Check the interfaces between the main PCB, NCU PCB, and power supply PCB. • Check the control panel PCB. • Check the power supply PCB. • Check the main PCB.
(2) Control panel inoperative.	• Check the main-panel harness between the main PCB and the control panel. • Check the interfaces between the main PCB, NCU PCB, and power supply PCB. • Check the control panel PCB. • Check the FPC key. • Check the main PCB.

■ Telephone related

Trouble	Action to be taken
(1) No phone call can be made.	• Check the FPC key. • Check the control panel PCB. - Use the maintenance-mode function No. 13. (Refer to Section 3.) If any defective keys are found, replace them. • Check the NCU PCB. • Check the main PCB.
(2) Speed dialing or one-touch dialing will not work.	• Check whether the ordinary dialing function (other than the speed and one-touch dialing) works correctly or not. - If yes, check the main PCB. - If not, refer to item (1) above.

Trouble	Action to be taken
(3) Speaker silent during on-hook dialing.	• Check whether the ordinary dialing function (other than the on-hook dialing with the hook key) works correctly or not. - If yes, proceed to the following checks: - If not, refer to item (1) above. • Check the speaker. • Check the NCU PCB. • Check the main PCB.
(4) Dial does not switch between tone and pulse.	• Check the main PCB.
(5) Telephone does not ring.	• Check the speaker. • Check the NCU PCB. • Check the main PCB.

■ Communications related

Trouble	Action to be taken
(1) No tone is transmitted.	• Check the main PCB. • Check the NCU PCB.

■ Image related

If the received or sent image has any trouble, first make a copy with the facsimile equipment.

If the copied image is normal, the remote terminal is defective. If it is abnormal, proceed to the troubleshooting list given below:

Trouble	Action to be taken
(1) All white images.	
[At scanning side]	• Check the harnesses between the main PCB, sensor PCB, and CCD & lens holder ASSY. • Check the sensor PCB. • Check the main PCB.
[At recording side]	• Check the main-head harness between the main PCB and the recording head. • Check the NCU-head harness between the NCU PCB and the recording head. • Check that the compression springs beneath the recording head are set in place. • Check the main PCB. • Check the recording head.
(2) Image has white vertical streaks.	
[At scanning side]	• Check the CCD & lens holder ASSY.
[At recording side]	• Check the recording head.
(3) All black images.	
[At scanning side]	• Check the interfaces between the main PCB, NCU PCB, and CCD & lens holder ASSY. • Check the LED array. • Check the main PCB.
[At recording side]	• Check the main PCB. • Check the recording head.
(4) Image has black vertical streaks.	
[At scanning side]	• Check the CCD & lens holder ASSY.
[At recording side]	• Check the recording head.

Trouble	Action to be taken
(5) Faint/dark image.	
[At scanning side]	• Check the LED array. • Check the main PCB.
[At recording side]	• Check that the compression springs beneath the recording head are set in place.
(6) Improper image alignment.	
[In communications]	• Check the displayed error code. (Refer to Chap. IV.) • Check the connection between the main PCB and the NCU PCB.
[At scanning side]	• Check the interfaces between the main PCB, NCU PCB, and CCD & lens holder ASSY. • Check the main PCB.
[At recording side]	• Check the main-head harness between the main PCB and the recording head. • Check the main PCB.
(7) Stretched-out image or compressed image.	
[In communications]	• Check the displayed error code. (Refer to Chap. IV.)
[At scanning side]	• Check the separator and its related section. • Check the document feed rollers and their related gears. • Check the drive motor and its harness.
[At recording side]	• Check that the compression springs beneath the recording head are set in place. • Check the platen and its gear. • Check the LF roller ASSY, paper ejection roller ASSY, and their related gears. • Check the drive motor and its harness.

■ Paper feeding related

Trouble	Action to be taken
(1) Neither “COPY: PRESS COPY” nor “FAX: NO. & START” message appears although documents are set.	• Check the document sensors according to the maintenance-mode function No. 32. (Refer to Section 3.)
(2) Document not fed.	• Check the drive motor and its harness. • Check the document feed rollers and their related gears. • Check the main PCB. • Check the drive motor and its harness.
(3) Recording paper not fed.	• Check the ADF and its related section. • Check the drive motor and its harness. • Check the recording paper feed rollers and their related gears. • Check the main PCB.

3. MAINTENANCE MODE

3.1 Entry into the Maintenance Mode

To make the facsimile equipment enter the maintenance mode, press the [FUNCTION], [*], [2], [8], [6], and [4] keys in this order.

⟵ Within 2 seconds ⟶

The equipment beeps for approx. 3 seconds and displays "MAINTENANCE" on the LCD, indicating that it is placed in the initial 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 the table below, 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 3.3.)

NOTES:
- Pressing the [9] key twice in the initial maintenance mode restores the equipment to the standby state.
- Pressing the [STOP] button after entering only one digit restores the equipment to the initial maintenance mode.
- If an invalid function code is entered, the equipment resumes the initial maintenance mode.

3.2 List of Maintenance-mode Functions

Maintenance-mode Functions (1)

Function Code	Function	Reference Subsection
01	E^2PROM Parameter Initialization	3.3.1
02	————	——
03	————	——
04	————	——
05	Printout of Scanning Compensation Data	3.3.2
06	————	——
07	————	——
08	ADF* Performance Test	3.3.3
09	Test Pattern 1	3.3.4
10	Firmware Switch Setting	3.3.5
11	Printout of Firmware Switch Data	
12	————	——
13	Operational Check of Control Panel PCB (Check of Keys and Buttons)	3.3.6
14	————	——
15	————	——
16	Operational Check of Control Panel PCB (Check of LEDs)	3.3.6

* ADF: Automatic document feeder

(Continued on the next page.)

Maintenance-mode Functions (2)

Function Code	Function	Reference Subsection
32	Sensor Operational Check	3.3.7
55	CCD Scanner Area Setting	3.3.8
82	Equipment Error Code Indication	3.3.9
91	E^2PROM Parameter Initialization (except the telephone number storage area)	3.3.1

IMPORTANT

Basically, the maintenance-mode functions listed above 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, 82, and 91) are shaded in the above table. Function code 10 accesses the firmware switches WSW01 to WSW34, 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 3.3.5.

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

(1) Press the [FUNCTION] key and the [MODE] key in this order.

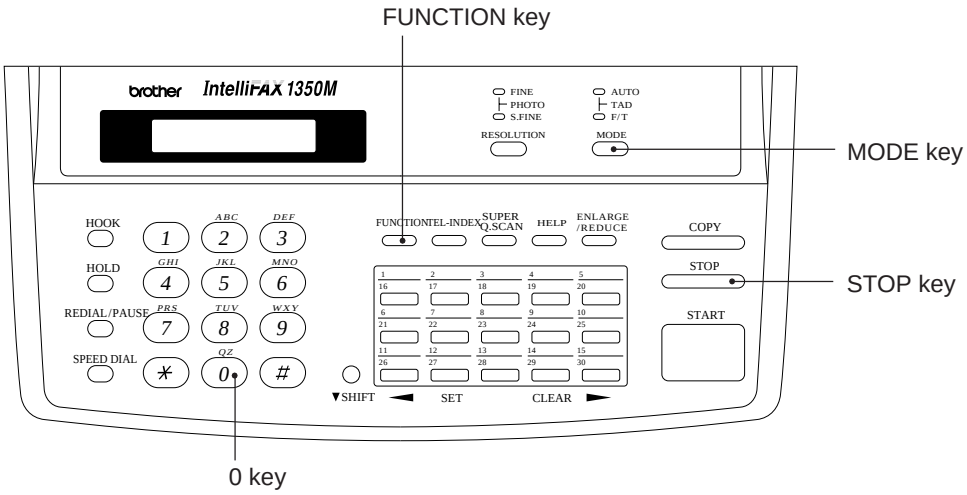
The LCD clears the current display.

NOTE: The [MODE] key is inoperable during standby for redialing, timer, paging, and forwarding.

(2) Press the [0] key.

(3) Enter the desired function code (10, 11, 82, or 91) with the numerical keys.

For function code 10, access the desired firmware switch according to the operating procedure described in Subsection 3.3.5.



(4) To make the equipment return to the standby state, press the [STOP] key.

- -

3.3 Detailed Description of Maintenance-mode Functions

3.3.1 E²PROM parameter initialization

■ Function

The equipment initializes the parameters, user switches, and firmware switches registered in the E²PROM, to the initial values. Entering the function code 01 initializes all of the E²PROM areas, but entering 91 does not initialize some areas, as listed below.

Data item \ Function code	01	91
Maintenance-mode functions User switches Firmware switches Remote activation code Calendar clock Activity report Distinctive ringing patterns registered (only for USA version) Page memory size	All of these will be initialized.	These will be initialized.
Station ID data Cover page comments Outside line number Telephone function registration One-touch dialing Speed dialing Group dialing		These will <u>not</u> be initialized.

■ 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 maintenance mode.

The "PARAMETER INIT" will appear on the LCD.

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

3.3.2 Printout of scanning compensation data

■ Function

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

■ Operating Procedure

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

(1) Press the [0] and [5] keys in this order in the initial 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) 2-value quantized white level data (208 bytes)
   b) 2-value quantized black level data (1 byte)
   c) Photo-mode white level data (208 bytes)
   d) Photo-mode black level data (1 byte)
   e) LED light intensity value, 2-value quantized LED light intensity value, and photo-mode LED light intensity
   f) 2-value quantized A/D reference value and photo-mode AD reference value

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

NOTE: If a certain data is abnormal, that code will be printed in inline style.

```
5F00 : DB DF E4 E7 EB EA ED EE  F0 F0 EF EE EC EC E9 E8
5F10 : E9 E7 E3 E2 E2 E1 E4 E6  EC F0 F3 F2 F1 F3 F1 F4
5F20 : F4 F6 F6 F9 F7 F5 F4 F4  F1 F1 ED E9 EA EB E8 E7
5F30 : E5 E4 E2 E3 E3 E2 EA E8  E7 E9 E6 E9 EC EE EF F2
5F40 : F3 F4 F4 F5 F3 F5 F0 EF  ED E9 E8 E9 E7 E9 E6 E4
5F50 : E5 E6 E5 E3 E5 E3 E3 E7  EA E6 E5 E7 E7 EA EA E7
5F60 : EB EB ED F0 F6 F5 F9 F5  FB F8 FA F9 F9 F3 EF EF
5F70 : EC EB EB EE F0 EE ED ED  EB EC EE F0 EF F1 F1 F2
5F80 : F1 F1 F5 FA F9 FA F7 F9  F8 F8 F6 F2 F4 F3 F2 F0
5F90 : EB EA E5 E7 E4 E4 E2 E0  DE DD DA DD DC DC DE DC
5FA0 : DD DD DD DE DE DE E1 E1  E3 E1 E1 E2 E2 E2 E3 E3
5FB0 : E2 E2 E3 E1 E1 E3 E2 E1  E6 E6 E9 EB E7 EB EE EF
5FC0 : F2 F1 F2 F5 F5 F6 F7 F3  F2 F1 EF EE EF EC EA EC

5F00 : 6F

5F00 : E0 E4 E6 E9 EC ED EF EF  F3 F3 F1 F0 EF EE ED EB
5F10 : EB EA EA E7 E5 E4 E7 E7  F1 F3 F4 F6 F0 F3 F3 F6
5F20 : F3 F5 F6 F6 FA F6 F8 F6  F3 F2 EF EB EE EC EC EA
5F30 : E8 E8 E8 E6 E7 E8 EC E8  EC EC EB EC EC EF F1 F1
5F40 : F4 F3 F4 F3 F3 F4 F0 F0  EF EC EB ED EC EB E9 E9
5F50 : E9 E9 E8 E7 EA E5 E7 E9  ED EA E9 EA E8 ED ED EC
5F60 : ED EC ED F2 F4 F7 F7 F7  FA F9 FA F8 FA F5 F2 ED
5F70 : EF EE ED EF F0 F1 EF EE  EC EE EF F3 F2 F1 F1 F2
5F80 : F3 F4 F6 FA F9 F9 F7 F9  F7 F7 F7 F5 F6 F4 F2 F1
5F90 : ED EA E9 E9 E9 E8 E5 E6  E3 E0 E1 E2 E1 E2 E3 E0
5FA0 : E2 E2 DF E3 E2 E3 E5 E7  E7 E5 E6 E7 E5 E7 E5 E6
5FB0 : E7 E6 E8 E7 E8 E8 E7 E7  E9 EC ED ED EC EE EE F1
5FC0 : F5 F2 F2 F6 F6 F5 F8 F5  F3 F6 F3 EF ED ED ED EC

5F00 : 6F

5F00 : 0E 0F 0F

5F00 : 2E 21
```

Scanning Compensation Data List

3.3.3 ADF performance test

■ Function

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

■ Operating Procedure

(1) Set documents. (Allowable up to the ADF capacity.)
The "DOC. READY" will appear on the LCD.

(2) Press the [0] and [8] keys in this order.
The equipment
i) copies the 1st document and displays "P.01" 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 "P.05" 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 "P.10" 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] button to return the equipment to the initial maintenance mode.

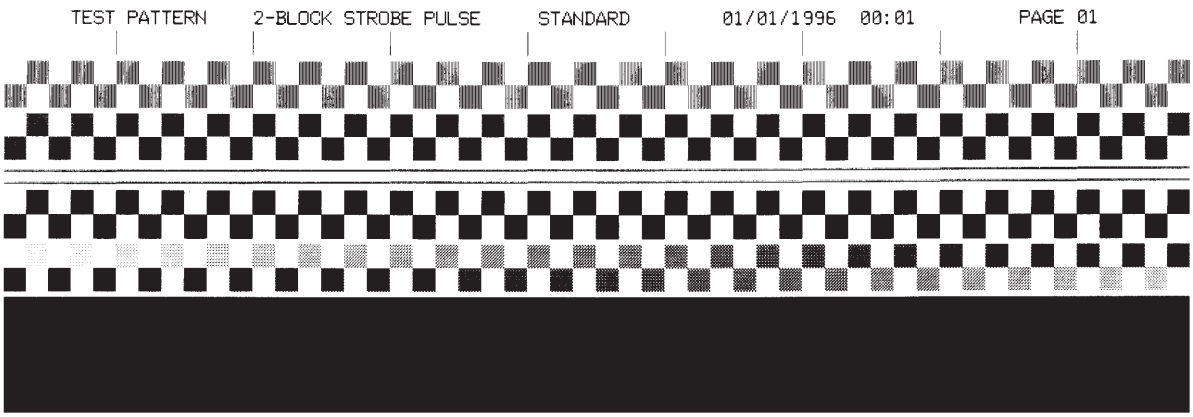
3.3.4 Test pattern 1

■ Function

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

■ Operating Procedure

Press the [0] and [9] keys in this order in the initial maintenance mode.
The figure below shows test pattern 1.



Test Pattern 1

3.3.5 Firmware switch setting and printout

[A] Firmware switch setting

■ Function

The facsimile equipment incorporates the following firmware switch functions (WSW01 through WSW34) 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 WSW34)

WSW No.	Function
WSW01	Dial pulse setting
WSW02	Tone signal setting
WSW03	PABX mode setting
WSW04	TRANSFER facility setting
WSW05	1st dial tone and busy tone detection
WSW06	PAUSE key setting and 2nd dial tone detection
WSW07	Dial tone setting 1
WSW08	Dial tone setting 2
WSW09	Protocol definition 1
WSW10	Protocol definition 2
WSW11	Busy tone setting
WSW12	Signal detection condition setting
WSW13	Modem setting
WSW14	AUTO ANS facility setting
WSW15	REDIAL facility setting
WSW16	Function setting 1
WSW17	Function setting 2
WSW18	Function setting 3
WSW19	Transmission speed setting
WSW20	Overseas communications mode setting
WSW21	TAD setting 1
WSW22	Copy resolution setting
WSW23	Communications setting
WSW24	TAD setting 2
WSW25	TAD setting 3
WSW26	Function setting 4
WSW27	Function setting 5
WSW28	Function setting 6
WSW29	Function setting 7
WSW30	Function setting 8
WSW31	Function setting 9
WSW32	Function setting 10
WSW33	Function setting 11
WSW34	Function setting 12

■ Operating Procedure

(1) Press the [1] and [0] keys in this order in the initial 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 34).

The following appears on the LCD:

WSWxx 0 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] or [1] key.

(5) Press the [SET] button. This operation saves the newly entered selector values onto the E^2PROM 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] button to return the equipment to the initial maintenance mode.

NOTES:
- To cancel this operation and return the equipment to the initial maintenance mode during the above procedure, press the [STOP] button.
- 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 maintenance mode.

■ Note

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

■ Detailed Description for the Firmware Switches

WSW01 (Dial pulse setting)

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

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

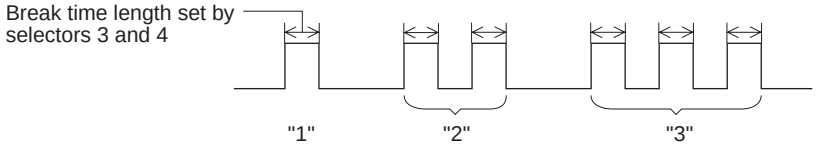
  These selectors set the number of pulses to be generated in pulse dialing.

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

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

  These selectors set the break time length in pulse dialing.

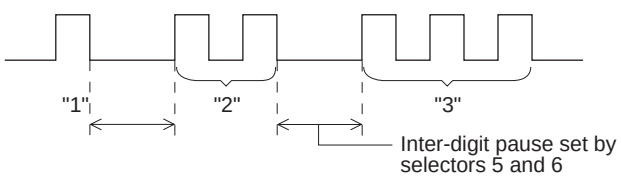
  (Example: If "1", "2", and "3" are dialled when N is set by selectors 1 and 2.)



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

  These selectors set the inter-digit pause in pulse dialing.

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



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

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

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

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

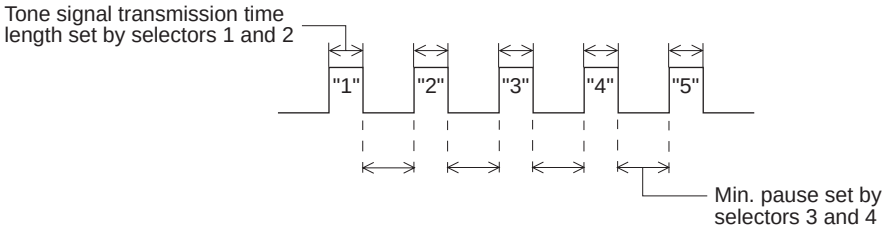
WSW02 (Tone signal setting)

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 the beep sound level	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

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

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

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



- **Selectors 5 through 8: Attenuator for the beep sound level**

  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	Not used.	
2 3 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	Not used.	
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: The WSW03 is not applicable in those countries where no PABX is supported, e.g. U.S.A.

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

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

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

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

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

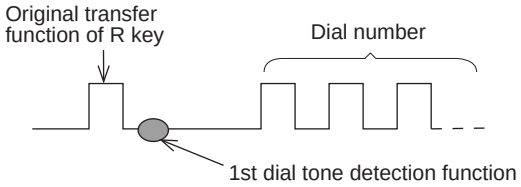
  Setting both of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected.

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

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

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

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



WSW04 (TRANSFER facility setting)

Selector No.	Function	Setting and Specifications
1	Earth function in transfer facility	0: Provided 1: Not provided
2 3	Dual tone detection frequency in ICM recording	No. 2 3 0 0 : 350 + 440 Hz (A) 0 1 : 440 + 480 Hz (B) 1 x : 480 + 620 Hz (C)
4	Tone detection level 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: The WSW04 is not applicable in those countries where no transfer facility is supported, e.g. 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 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 2 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

  This selector determines whether or not the equipment automatically disconnects 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 2 3	PAUSE key setting and 2nd dial tone detection	No. 1 2 3 0 0 0 : No pause 0 0 1 : 3.5 sec. WAIT 0 1 0 : 7 sec. WAIT 0 1 1 : 10.5 sec. WAIT 1 0 0 : 14 sec. WAIT 1 0 1 : 17.5 sec. WAIT 1 1 0 : 2nd dial tone detection only in pulse dialing (DP) system 1 1 1 : 2nd dial tone detection both in DP and push-button (PB) dialing systems
4 5 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 dial tone detection times	0: Once 1: Twice
8	2nd dial tone interrupt detecting time	0: 30 ms 1: 50 ms

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

Selectors
1 2 3

0 0 0	No WAIT is inserted even if the PAUSE key is pressed.
0 0 1 0 1 0 0 1 1 1 0 0 1 0 1	Pressing the PAUSE key inserts WAIT in pulse dialing, as defined in the above table. If the PAUSE key is pressed repeatedly, the equipment beeps a refusal sound and refuses the entry. In hook-up dialing, however, the equipment allows repeated pressing with an acceptance sound, but inserts WAIT only for the first pressing.
1 1 0 1 1 1	Each time the PAUSE key is pressed, the equipment detects a 2nd dial tone. If no 2nd dial tone is inputted within the specified time, the equipment disconnects the line in automatic dialing, or it starts transmitting the dial signal if given after depression of the PAUSE key in hook-up dialing. (In those countries where no dial tone detection function is supported, setting these selectors to "1, 1, 0" or "1, 1, 1" inserts a WAIT of 3.5 seconds.)

- **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, 1, 0 or 1, 1, 1).

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

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

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

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

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

WSW07 (Dial tone setting 1)

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

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

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

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

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

- **Selector 3: Line current detection**

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

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

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

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

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

WSW08 (Dial tone setting 2)

Selector No.	Function	Setting and Specifications
1 2 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 : 6 sec. 1 1 : 30 sec.
6 7 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

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

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

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

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

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

WSW09 (Protocol definition 1)

Selector No.	Function	Setting and Specifications
1	Frame length selection	0: 256 octets : 64 octets
2	Not used.	
3 | 4	No. of retries	No. 3 4 0 0 : 4 times 0 1 : 3 times 1 0 : 2 times 1 1 : 1 time
5	T5 timer	0: 300 sec. 1: 60 sec.
6	T1 timer	0: 35 sec. 1: 40 sec.
7 8	Elapsed time for time-out control for no response from the called station in automatic sending mode	No. 7 8 0 0 : 50 sec. 0 1 : 70 sec. 1 0 : 90 sec. 1 1 : 35 sec.

- **Selector 1: Frame length selection**

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

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

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

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

- **Selector 6: T1 time**

  This selector sets the time length for the T1 timer.

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

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

WSW10 (Protocol definition 2)

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

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

  Setting this selector to "1" switches DPS automatically following the CML ON/OFF operation. This function is provided to conform to the Swedish standard.

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

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

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

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

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

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

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

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

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: 100-642/100-660 ms

NOTE: The WSW11 is not applicable in those countries where no busy tone detection is supported, e.g. U.S.A.

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

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

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

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

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

WSW12 (Signal detection condition setting)

Selector No.	Function	Setting and Specifications
1 2	Min. OFF time length of calling signal (Ci)	No. 1 2 0 0 : 300 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	
8	Not used.	0: Yes 1: No

* 1000 ms in Chinese or Hong Kong 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 the time length which is above the value set by selectors 1 and 2 and less 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 acknowledgement 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 (Z = 600Ω)	No. 3 4 0 0 : -43 dBm 0 1 : -47 dBm 1 0 : -49 dBm 1 1 : -51 dBm
5 | 8	Modem attenuator	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

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

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

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

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

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

  These selectors set the optimum receive signal level.

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

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

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

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

WSW14 (AUTO ANS facility setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band selection (Lower limit)	No. 1 2 0 0 : 13 Hz 0 1 : 15 Hz 1 0 : 23 Hz 1 1 : 27 Hz
3 4	Frequency band selection (Upper limit)	No. 3 4 0 0 : 30 Hz 0 1 : 55 Hz 1 0 : 70 Hz 1 1 : 70 Hz
5 6 7 8	No. of rings in AUTO ANS mode	No. 5 6 7 8 0 0 0 0 : Fixed to once 0 0 0 1 : Fixed to 2 times 0 0 1 0 : Fixed to 3 times 0 0 1 1 : Fixed to 4 times 0 1 0 0 : 1 to 2 times 0 1 0 1 : 1 to 3 times 0 1 1 0 : 1 to 4 times 0 1 1 1 : 1 to 5 times 1 0 0 0 : 2 to 3 times 1 0 0 1 : 2 to 4 times 1 0 1 0 : 2 to 5 times 1 0 1 1 : 2 to 6 times 1 1 0 0 : 1 to 10 times 1 1 0 1 : 2 to 10 times 1 1 1 0 : 3 to 5 times 1 1 1 1 : 4 to 10 times

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

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

- **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 minutes 1 0 : 2 minutes 1 1 : 3 minutes
3 4 5 6	No. of redialings	No. 3 4 5 6 0 0 0 0 : 16 times 0 0 0 1 : 1 time 0 0 1 0 : 2 times 0 0 1 1 : 3 times | | 1 1 1 1 : 15 times
7	Redialing for no response sent from the called terminal	0: Redialing 1: No redialing
8	Not used.	

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

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

  This setting is effective only when selector 7 is set to "0."

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

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

  This selector is not applicable in the U.S.A. version.

WSW16 (Function setting 1)

Selector No.	Function	Setting and Specifications	
1	Not used.		
2	CCITT superfine recommendation	0: OFF	1: ON
3	Remote reception	0: Only from the connected external telephone	1: From all telephones connected
4	Not used.		
5	STOP key in automatic receiving mode	0: Inoperative	1: Operative
6	Exclusive line mode	0: OFF	1: ON
7	Max. document length limitation	0: 400 cm	1: 90 cm
8	Communications list output	0: No	1: Yes

- **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.

- **Selector 3: Remote reception**

  Setting this selector to "0" allows the facsimile equipment to receive data from the directly connected external telephone only. Setting it to "1" allows the equipment to receive data from all telephones connected in parallel as well as the directly connected external one.

  If any of the following troubles occurs frequently, set this selector to "0".

  - Dialing from any of the telephones connected in parallel to the outside line starts the facsimile equipment.
  - Picking up any handset of the telephones connected in parallel while the facsimile equipment is in receiving operation disarranges the received image due to the superimposed noise.

- **Selector 5: STOP key in automatic receiving mode**

  Setting this selector to "1" makes the STOP key operative during the time period from the start of receiving operation up to the reception of G3 command.

- **Selector 6: Exclusive line mode**

  Setting this selector to "1" connects the equipment to the exclusive line, which enables transmission just by pressing the START button without dialing operation at both the calling and called terminals.

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

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

- **Selector 8: Communications list output**

  Setting this selector to "1" prints a communications list for every transmission. This selector should be set to "1" for error analysis only and set to "0" during ordinary use by the end user.

WSW17 (Function setting 2)

Selector No.	Function	Setting and Specifications
1 2	Off-hook alarm	No. 1 2 0 0 : No alarm 0 1 : Always valid 1 X : Valid except when ‘ call reservation’ is selected.
3	Not used.	
4	Clock/prompt alternate indication on the LCD	0: OFF 1: ON
5	Calendar clock type	0: USA 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.	

- **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.

- **Selector 4: Clock/prompt alternate indication on the LCD**

  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" (European), the DD/MM/YY hh:mm format applies. Where, 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	CCD manufacturer setting	Fixed to 0.
2 | 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

- **Selector 1: CCD manufacturer setting**

  Reserved for future variation of CCD.

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

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

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

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

WSW19 (Transmission speed setting)

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

* 9,600 bps for the FAX1150P/1200P/1350M

- **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	Chattering elimination for CNG detection	No. 6 7 0 0 : During CNG ON and OFF 0 1 : During CNG OFF only 1 X : No elimination
8	Not used.	

* EP: Echo protection

- **Selector 1: EP tone prefix**

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

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

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

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

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

  Setting selector 3 to "1" allows the equipment to ignore a DIS signal sent from the called station once in sending operation. This operation suppresses echoes since the first DIS signal immediately follows a 2100 Hz CED (which disables the ES) so that it is likely to be affected by echoes in the disabled ES state. However, such a disabled ES state will be removed soon so that the second and the following DIS signals have little potential for data distortion due to echoes. Note that some called models may cause error by receiving a self-outputted DIS.

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 : A (for U.S.A.) 0 1 : B (for Europe) 1 0 : C (without beep) 1 1 : D (OFF)
8	Erasion of message stored in the memory after the message transfer	0: YES 1: NO

- **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.

  If the external TAD is connected to the equipment, the total length of the maximum waiting time specified by these selectors and the delay time specified by WSW25 (selectors 1 and 2) should not exceed 40 seconds.

- **Selectors 6 and 7: Two-way recording (For those models equipped with a built-in TAD)**

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

- **Selector 8: Erasion of message (For those models equipped with a built-in TAD)**

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

WSW22 (Copy resolution setting)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4	Copy resolution	0: Fine 1: Superfine
5 | 8	Not used.	

- **Selector 4: Copy resolution**

  This selector determines whether the resolution for multi-copy should be Fine or Superfine.

WSW23 (Communications setting)

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

- **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 after 100 ms from the head of a series of zeros detected.

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

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

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

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

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

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

  Setting this selector to "0" limits the attenuation level for the beeper and modem up 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 pseud 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

- **Selectors 1 and 2: Maximum OGM recording time (For those models equipped with a built-in TAD)**

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

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

  These selectors set the time length after CML becomes ON until the start of pseud ring backtone transmission.

  In those versions which have an OGM facility instead of pseud ring backtone, these selectors set the time length after CML becomes ON until the start of OGM transmission.

- **Selectors 5 through 8: Attenuator for playback of ICM/OGM to the line (For those models equipped with a built-in TAD)**

  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 seconds 0 0 1 : 4 seconds 0 1 0 : 0 1 1 : 1 0 0 : 1 0 1 : 1 1 0 : 1 1 1 : 16 seconds
8	Automatic shift to facsimile message receive mode in ICM recording mode	0: YES 1: NO

- **Selectors 5 and 7: Pause between paging number and PIN (For those models equipped with a built-in TAD)**

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

- **Selector 8: Automatic shift to facsimile message receive mode in ICM recording mode (For those models equipped with a built-in TAD)**

  If this selector is set to "0", the equipment automatically shifts to the facsimile message receive mode after recording an ICM. If it is set to "1", the equipment automatically disconnects the line after the waiting time has passed.

WSW26 (Function setting 4)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4 5	No. of CNG cycles to be detected (when the line is connected via the external telephone except in the external TAD mode)	No. 4 5 0 0 : No detection (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	Not used.	

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

  The equipment interprets CNG as an effective signal if it detects 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.

- **Selectors 6 and 7: No. of CNG cycles to be detected (For those models not equipped with a built-in TAD)**

  The equipment interprets CNG as an effective signal if it detects 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.

WSW27 (Function setting 5)

Selector No.	Function	Setting and Specifications
1	Not used.	
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: NO 1: YES
5	Automatic erasion of voice alarm	0: YES 1: NO
6	Recording quality level	0: Normal 1: High
7	Sampling rate when the recording quality level is set to High	0: Short 1: Long
8	Not used.	

- **Selector 2: Ringer OFF setting**

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

- **Selector 3: Automatic playback of OGM at the start time of OGM ON mode (For those models equipped with a built-in TAD)**

  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.

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

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

- **Selector 5: Automatic erasion of voice alarm**

  This selector determines whether or not the voice alarm should be erased from the memory after it is issued.

- **Selector 6: Recording quality level (For those models equipped with a built-in TAD)**

  This selector determines the recording quality level (this function can be accessed also by the user function 8-8). If it is set to “0” (Normal), the sampling rate specified by selector 4 of WSW30 takes effect; if it is set to “1” (High), the sampling rate by selector 7 of WSW27 takes effect.

- **Selector 7: Sampling rate when the recording quality level is set to Normal (For those models equipped with a built-in TAD)**

  This selector determines the sampling rate when selector 6 of WSW27 is set to “1” (High). If this selector is set to “0”, the sampling rate is 9.6 kbps; if it is set to “1”, the sampling rate is 8.8 kbps.

WSW28 (Function setting 6)

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

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

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

WSW29 (Function setting 7)

Selector No.	Function	Setting and Specifications
1 2 3	Compression threshold level for voice signals inputted via the network in the built-in TAD operation	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 5 6	Compression threshold level for voice signals inputted via the handset in the built-in TAD operation	No. 4 5 6 0 0 0 : -44.0 dBm (A) 0 0 1 : -45.0 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	Beep at the time of full activity report data	0: No 1: Yes

- **Selectors 1 through 6: Compression threshold level for signals inputted via the network/ handset in the built-in TAD operation (For those models equipped with a built-in TAD)**

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

- **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 button 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.)

- **Selector 8: Beep at the time of full activity report data (for FAX1150P/1200P/1700P)**

  If this selector is set to “1,” the equipment will beep at the time of full activity report data (as well as displaying a message on the LCD, prompting the output of the activity report).

WSW30 (Function setting 8)

Selector No.	Function	Setting and Specifications
1 2 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	Sampling rate when the recording quality level is set to Normal	0: Short 1: Long
5	Speaker output level	0: Higher 1: Lower
6 | 8	Not used.	

- **Selectors 1 through 3: Detection level of dial tone or busy tone for built-in TAD operation (For those models equipped with a built-in TAD)**

  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.

- **Selector 4: Sampling rate when the recording level is set to Normal (For those models equipped with a built-in TAD)**

  This selector determines the sampling rate when selector 6 of WSW27 is set to "0" (Normal). If this selector is set to "0", the sampling rate is 8.8 kbps; if it is set to "1", the sampling rate is 8.0 kbps.

- **Selector 5: Speaker output level (For those models equipped with a built-in TAD)**

  This selector determines the speaker output level when the speaker volume switch is set to HIGH or LOW, as listed below.

Selector 5 of WSW30 / Speaker Volume Switch Position	0 (Higher)	1 (Lower)
HIGH	High	Medium-High
LOW	Medium-Low	Low

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.	

- **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%).

- **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 0 : 0 1 : } Automatic 1 0 : Super light 1 1 : Super dark

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

  When the equipment is powered up or completes a transaction, the resolution returns to the default value specified by these selectors.

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

  When the equipment is powered up or completes a transaction, the contrast returns to the default value specified by these selectors.

WSW33 (Function setting 11)

Selector No.	Function	Setting and Specifications
1 2 3	Detection threshold level for voice signals inputted via the network 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	First communications speed choice for PCI	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)

The WSW33 is applicable to those models equipped with a built-in TAD.

- **Selectors 4 and 5: First communications speed choice for PCI**

  These selectors are used to set the first communications speed choice with which the equipment attempts to synchronize the data transmission via the PC interface. If the synchronization fails, the equipment automatically steps down to the next lowest speed.

- **Selector 6: Report output of polled transmission requests**

  This function does not apply in the U.S.A. version.

- **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 2 3	ICM recording time to be erased preceding the tone detection when the equipment automatically disconnects the line because no voice signal has been received	No. 1 2 3 0 0 0 : 0 second 0 0 1 : 1 second 0 1 0 : 2 seconds 0 1 1 : 3 seconds 1 0 0 : 4 seconds 1 0 1 : 5 seconds 1 1 0 : 6 seconds 1 1 1 : 7 seconds
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)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 7	Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation	No. 6 7 0 0 : 3 0 1 : 2 1 0 : 1 1 1 : OFF
8	Not used.	

- **Selectors 1 through 3: ICM recording time to be erased preceding the tone detection (For those models equipped with a built-in TAD)**
- **Selectors 4 and 5: No. of CNG cycles to be detected (For those models equipped with a built-in TAD)**

  The equipment interprets CNG as an effective signal if it detects 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.

- **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.

[B] Printout of firmware switch data

■ Function

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

■ Operating Procedure

(1) Press the [1] key twice in the initial maintenance mode.
The "CONFIG LIST" 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 maintenance mode.

CONFIGURATION LIST

```
MODEL: 5X4-205/209
TIME : 01/01/1996 00:02
REV. : UG2217001  VER.0
PCI  : 2.00
SUM  : 0386

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 = 11111010
  1-2. ON TIME                              : 100 MS
  3-4. OFF TIME                             : 140 MS
  5-8. LINE BEEP ATTENUATOR                 : 10 DB
WSW03 = 00000000
  1-8. NOT USED
WSW04 = 00010101
  1.   NOT USED
  2-3. DETECT DUAL TONE IN ICM              : A
  4.   DETECT TONE LEVEL IN ICM             : HIGH
  5-8. NOT USED
WSW05 = 00000010
  1-3. DIAL TONE DETECTION                  : 3.5 SEC WAITING
  4.   REMOTE ID DETECTION TIMEOUT          : 2 SEC
  5-8. NOT USED
WSW06 = 00101100
  1-3. PAUSE KEY                            : 3.5 SEC WAITING
  4-8. NOT USED
WSW07 = 01001100
  1-8. NOT USED
WSW08 = 011001100
  1-8. NOT USED
WSW09 = 00000000
  1.   ECM FRAME                            : 256 OCTET
  2.   NOT USED

WSW31 = 00000000
  1.   NOT USED
  2.   REDUCTION LIMIT                      : ON
  3-4. NOT USED
  5.   D/R CHATTERING                       : 130 MS
  6-8. NOT USED
WSW32 = 01010000
  1-4. NOT USED
  5-6. RESOLUTION HOME POSITION             : STD
  7-8. CONTRAST HOME POSITION               : AUTO
WSW33 = 10001110
  1-3. SOUND DETECT LEVEL (LINE)            : E
  4-6. SOUND DETECT LEVEL (H/S)             : D
  7-8. COMFORTABLE NOISE LEVEL              : B
WSW34 = 00010000
  1-3. CUT ADDRESS WHEN DETECT TONE         : 0 SEC
  4-5. INT. CNG DETECTION                   : C
  6-8. NOT USED
```

Configuration List

3.3.6 Operational check of control panel PCB

■ Function

This function checks the control panel PCB for normal operation. Two types of check modes are available: Key & button operation check mode and LED operation check mode.

■ Operating Procedure

[a] Key & button operation check mode

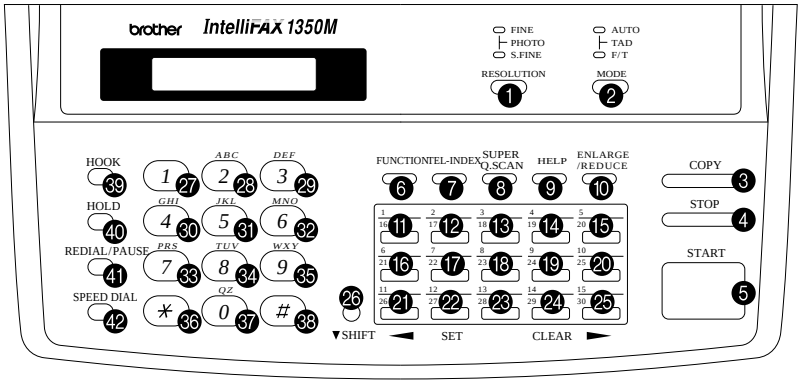
(1) Press the [1] and [3] keys in this order in the initial maintenance mode.
The "00 " will appear on the LCD.

(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] button.

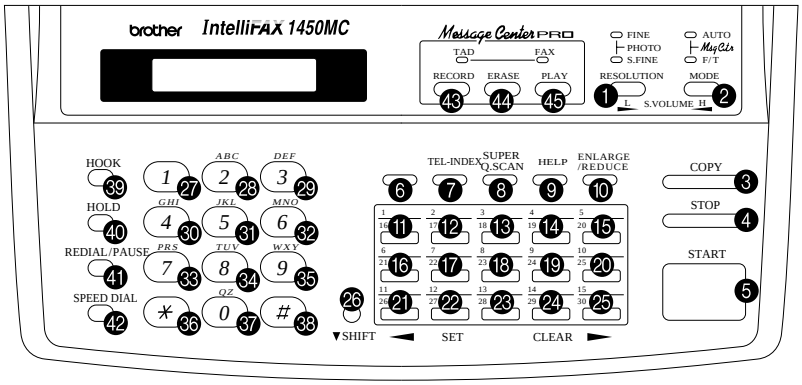
(3) After the last number key or button is pressed, the equipment beeps for 1 second.

(4) To terminate this operation, press the [STOP] button. The equipment returns to the initial maintenance mode.

FAX1150P/1200P/1350M



FAX1700P/1450MC/1550MC/1850MC/1950MC



Key & Button Entry Order

[b] LED operation check mode

(1) Press the [1] and [6] keys in this order in the initial maintenance mode.

All of the LEDs will come on and go off, then each LED will light for 0.5 second in the following order:

FINE → S.FINE → AUTO → F/T

(2) To terminate this operation, press the [STOP] button. The equipment returns to the initial maintenance mode.

3.3.7 Sensor operational check

■ Function

This function allows you to check whether the nine sensors (document front sensor, document rear sensor, cover sensor, paper ejection sensor, PE sensor, paper edge sensor, ribbon sensor, cam HP sensor, and hook switch sensor*) operate correctly.

The LCD shows the "FRE RC JM PE PH RX CH HK" when

- the document front and rear sensors detect no paper (FRE),
- the top cover is closed (RC),
- the paper ejection sensor detects no paper (JM),
- the PE sensor detects paper loaded (PE),
- the paper edge sensor detects paper (PH),
- the ribbon sensor detects the thermal ink ribbon (RX),
- the cam HP sensor detects that the cam is out of the home position (CH), and
- the hook switch sensor detects the on-hook state (HK).*

■ Operating Procedure

(1) Press the 3 and 2 keys in this order in the initial maintenance mode.

The LCD should show "FRE RC JM PE PH RX CH HK" if the detecting conditions of the nine sensors are as defined above.

(2) Change the detecting conditions (e.g. insert paper through the document sensors, open the top cover, jam the recording paper at the paper outlet, remove the paper cassette, jam the recording paper around the recording head, remove the ribbon cartridge, place the cam in the home position, and lift up the handset*), and then check that the indication on the LCD changes according to the sensor states.

(3) To stop this operation and return the equipment to the initial maintenance mode, press the STOP button.

3.3.8 CCD scanner area setting

■ Function

The equipment sets the CCD scanner area and stores it into the E^2PROM.

■ Operating Procedure

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

If any error is noted, the "SCANNER ERROR" will appear on the LCD. To return the equipment to the initial maintenance mode, press the STOP button.

(* The handset, hook switch sensor and related parts are not provided on the FAX1150P.)

3.3.9 Equipment error code indication

■ Function

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

■ Operating Procedure

(1) Press the [8] and [2] keys in this order in the initial maintenance mode.
The LCD shows "MACHINE ERROR xx."

(2) To stop this operation and return the equipment to the initial maintenance mode, press the [STOP] button.

FAX1150P/1200P/1350M
FAX1700P/1450MC/1550MC/1850MC/1950MC

APPENDICES

Circuit Diagrams

A. Main PCB
   FAX1150P/1200P/1350M
   FAX1700P/1450MC/1550MC/1850MC/1950MC
B. Network Control Unit (NCU) PCB
C. Control Panel PCB
D. Power Supply PCB

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5X4201 ①
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