Gestetner® LANIER RICOH® savin®

B044/B045/B046
SERVICE MANUAL

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RICOH GROUP COMPANIES

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WARNING

The Service Manual contains information regarding service techniques, procedures, processes and spare parts of office equipment distributed by Ricoh Corporation. Users of this manual should be either service trained or certified by successfully completing a Ricoh Technical Training Program.

Untrained and uncertified users utilizing information contained in this service manual to repair or modify Ricoh equipment risk personal injury, damage to property or loss of warranty protection.

Ricoh Corporation

LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	**LANIER**	**RICOH**	**SAVIN**
B044	1302	5613	Aficio 1013	2513
B045	–		Aficio 120	–
B046	1302f	5613F	Aficio 1013f	2513f

DOCUMENTATION HISTORY

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⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Be sure that the power cord is unplugged before disassembling or assembling parts of the copier or peripherals.

2. The wall outlet should be near the copier and easily accessible.

3. Note that electrical voltage is supplied to some components of the copier and the paper tray unit even while the main power switch is off.

4. If you start a job before the copier completes the warm-up or initializing period, keep hands away from the mechanical and electrical components until job execution has started. The copier will start making copies as soon as warm-up or initialization is finished.

5. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

Toner and developer are nontoxic, but getting either of these into your eyes may cause temporary eye discomfort. Try to remove with eye drops or flush with water. If material remains in eye or if discomfort continues, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those relevant models.

LITHIUM BATTERIES

Incorrect replacement of lithium battery(s) on the FCU may pose risk of explosion. Replace only with the same type or with an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

SAFE AND ECOLOGICAL DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly if exposed to an open flame.

2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are nontoxic supplies.)

3. Dispose of replaced parts in accordance with local regulations.

LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

⚠ **WARNING**

Use of controls not specified in this manual, or performance of adjustments or procedures not specified in this manual, may result in hazardous radiation exposure.

⚠ **WARNING FOR LASER UNIT**

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can cause serious damage to eyes.

CAUTION MARKING:

CAUTION
VORSICHT

⚠

>PS<

INVISIBLE LASER RADIATION WHEN OPEN.
AVOID EXPOSURE TO BEAM.
UNSICHTBARE LASERSTRAHLUNG
WENN ABDECKUNG GEÖFFNET.
NICHT DEM STRAHL AUSSETZEN.

Symbols and Abbreviations

This manual uses the symbols and abbreviations shown below.

Symbol	Meaning
☞	"See," "Refer to"
⌇	Clip ring
⬤	Screw
⬤	Connector
SEF	Short Edge Feed
LEF	Long Edge Feed
CT	Core Technology manual

INSTALLATION B044/B045/B046

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PREVENTIVE MAINTENANCE B044/B045/B046

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SPECIFICATIONS B044/B045/B046

INSTALLATION

1. INSTALLATION

> ⚠**CAUTION**
>
> **Before installing options, please do the following:**
>
> 1. **If there is a fax unit on the machine, print out all messages stored in the memory, all user-programmed items, and a system parameter list.**
> 2. **If there is a printer option on the machine, print out all data in the printer buffer.**
> 3. **Turn off the main switch and disconnect the power cord, the telephone line, and the network cable.**

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT

–Temperature and Humidity Chart–
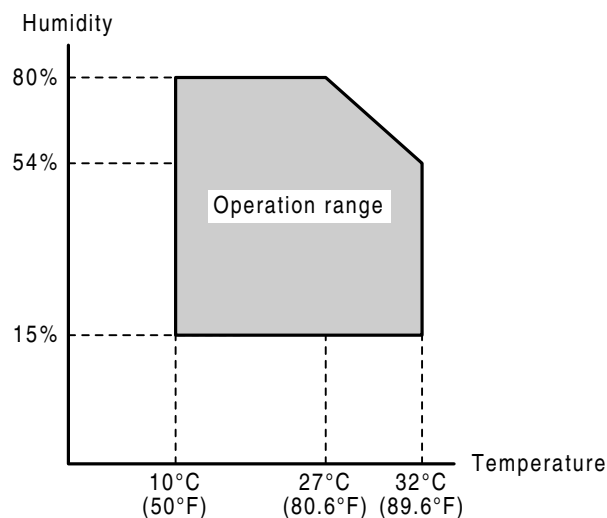
1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)

2. Humidity Range: 15% to 80% RH

3. Ambient Illumination: Less than 1,500 lux (Do not expose to direct sunlight.)

4. Ventilation: Room air should turn over at least 3 times/hr/person

5. Ambient Dust   Less than 0.1 mg/m^3

6. Do not install the machine where it will be exposed to direct sunlight or to direct airflow (from a fan, air conditioner, air cleaner, etc.).

7. Do not install the machine where it will be exposed to corrosive gas.

8. Place the machine on a firm and level base.

9. Do not install the machine where it may be subjected to strong vibration.

1.1.2 MACHINE LEVEL

Front to back: Within 5 mm (0.2") of level

Right to left: Within 5 mm (0.2") of level

1.1.3 MINIMUM OPERATIONAL SPACE REQUIREMENTS

Place the machine near the power source, providing clearance as shown.

A: Front > 750 mm (29.6")
B: Left   > 100 mm (3.9")
C: Rear > 105 mm (4.1")
D: Right > 230 mm (9.0")

450 mm (17.7")

468 mm (18.4")
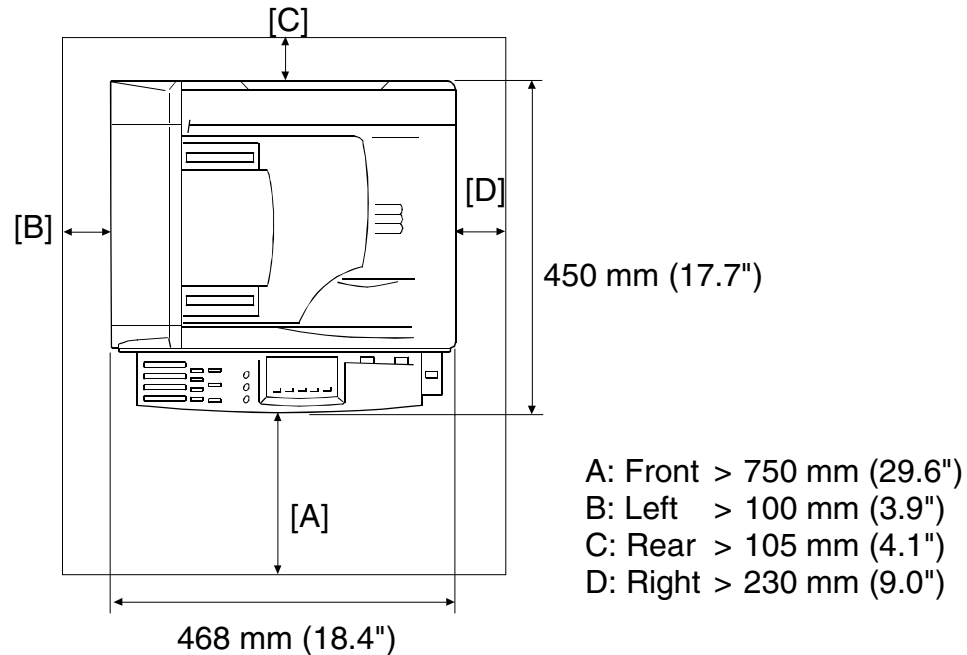
NOTE: 1) The 750-mm front space indicated above is sufficient to allow the paper tray to be pulled out. Additional space is required to allow an operator to stand at the front of the machine.

2) Actual minimum space requirement for left, rear, and right sides is 10mm (0.4") each, but note that this will not allow room for opening of the bypass tray, right door, platen cover, or ADF unit.

1.1.4 POWER REQUIREMENTS

⚠️CAUTION

1. **Make sure that the wall outlet is near the machine and easily accessible. After completing installation, make sure the plug fits firmly into the outlet.**
2. **Avoid multi-wiring.**
3. **Be sure to ground the machine.**

Input voltage:

North America: 110 – 120 V, 50/60 Hz, 10 A
Europe: 220 – 240 V, 50/60 Hz, 5 A

Image quality guaranteed at rated voltage ± 10%.
Operation guaranteed at rated voltage ± 15%.

1.2 COPIER

1.2.1 ACCESSORY CHECK

Check that you have the accessories indicated below. Note that accessories vary according to model and location.

No.	Description	Q'ty
1	Copier Operating Instructions (-17, -26, -29)	1
2	EU safety sheet (-22, -24, -26, -27)	1
3	NECR (-17, -27, -29)	1
4	Paper-size decals	1 set
5	Energy Star seal (-26)	1
6	Branding plaques (-22)	1 set
7	Brand decals	1 set
8	Handset bracket (B046)	1

1.2.2 INSTALLATION PROCEDURE

⚠CAUTION
Make sure that the copier remains unplugged during installation.

[A]   [B]
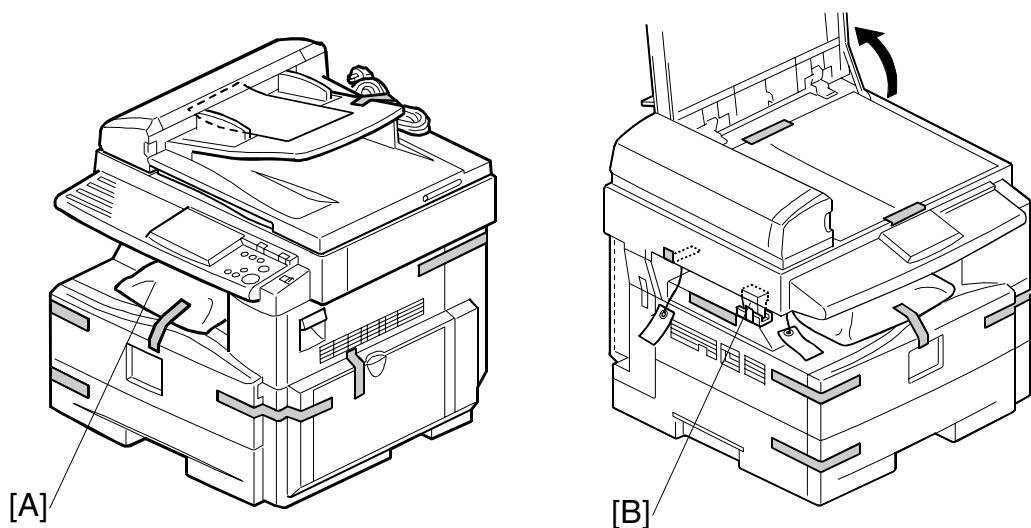
1. Remove the strips of tape.

2. Remove the bag [A] holding the included accessories.

3. Remove the spacing wedge [B].

4. Remove the 3 scanner lock pins. (A tag is hanging from each pin.) To remove: Grasp the base of the pin [A], turn 90 degrees, and pull down and out.
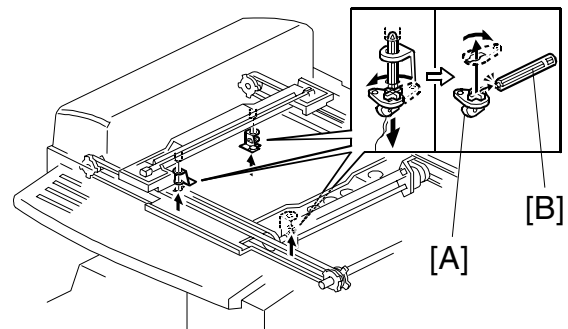
5. Remove the tags from the pins. Then break each pin off of its base [A], discard the pin part [B], and set each base [A] back into its original hole, turning it 90° to lock it into place. (Be sure to do this for all three pins.)

6. ***If installing a DF-equipped model (B046):*** Raise the DF upper guide [C] and remove the protective paper [D] at the feed unit. Then lower the guide.
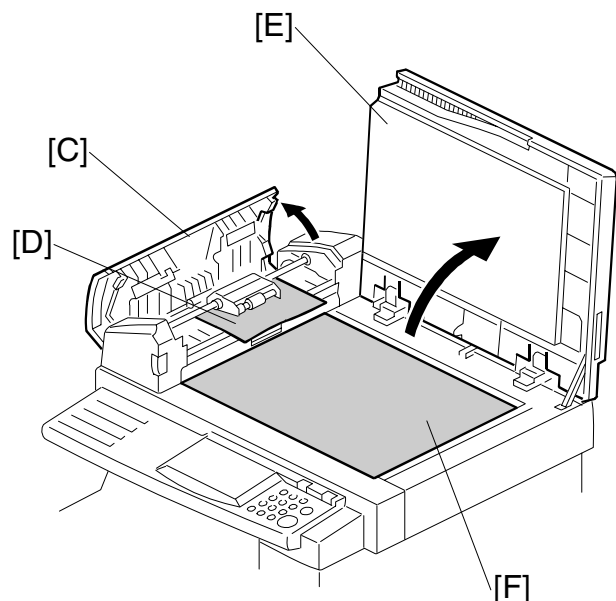
7. Open the platen cover [E] and remove the protective paper [F] covering the exposure glass. Then close the platen cover.

8. Open the front door [A].

9. ***If installing a toner-bottle model (B044 or B046):***
   - Lift lever [B], press in on latch [C] and pull the bottle holder [D] out. (It is not necessary to pull it completely out of the machine, however.)
   - Take a new bottle of toner, *shake it several times*, remove its outer cap [E], and load as shown. Then push the bottle holder back into the machine, and press the latch down to lock it.
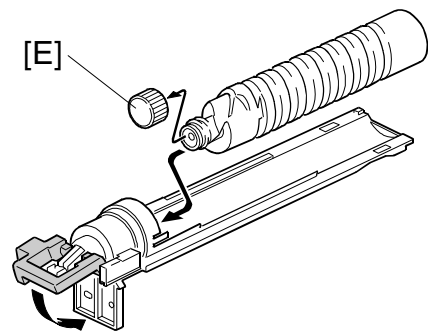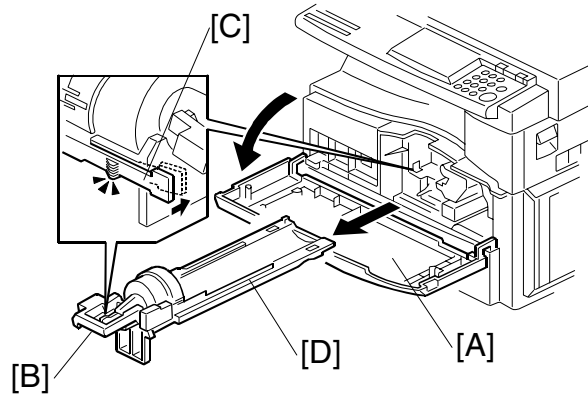
If installing a toner-hopper magazine (THM) model (B045):
   - *Shake the magazine several times*, then peel off the paper [F] from a new THM [G], and load the THM into the machine.
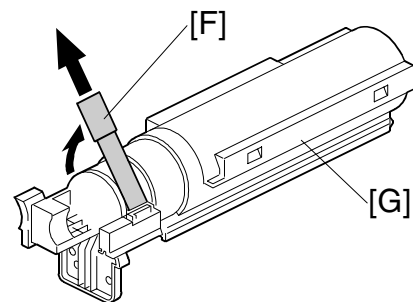
10. Remove the foam cushion [A] and pull the tabbed strips [B] all the way out of the PCU. Then close the front door.
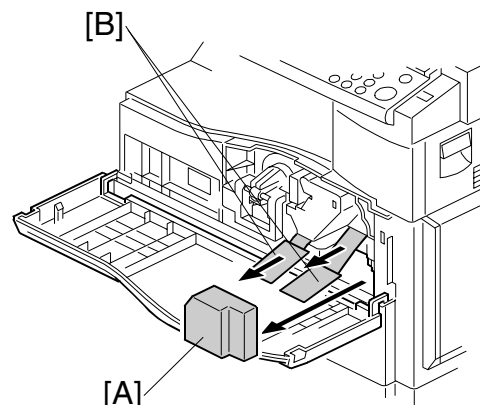
11. Pull open the paper tray, and remove the tape [C] securing the end fence in the compartment.

12. Push the bottom plate [D] down, load paper, and adjust the side fences. If loading paper shorter than A4, remove the end fence [E] from its compartment, set it into the tray, and adjust it to the correct length.
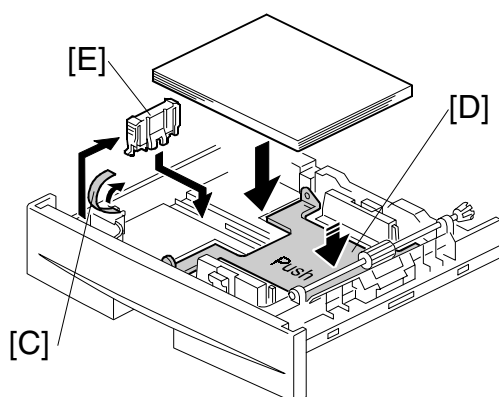
13. Push the tray back in.

14. Adhere the appropriate branding decal (not shown) to the center of the front door [F], and adhere the tray number decal and appropriate paper-size decal to the front of the paper tray (at [G]) as shown.
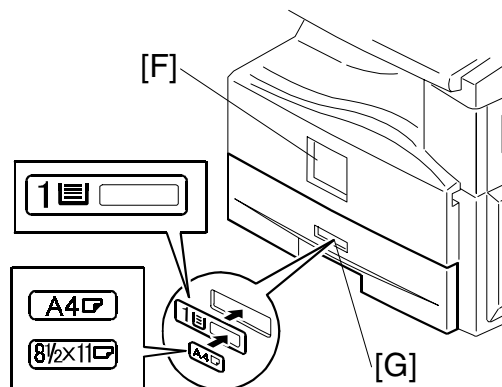
15. ***Hong Kong only:***
    If installing model B046 in Hong Kong, you must change the position of the TB1 jumper on the NCU. Turn to the fax service manual and carry out steps 4 to 8 of the installation procedure (fax service manual, section 1.2.2).

16. Plug in the machine and turn on the main switch located on the left side of the unit.

17. Enter SP mode (See 5.1 Accessing SP Mode), and run SP7-825 to initialize the electrical total counter to 0.

    NOTE: 1) After selecting SP7-825, enter "1" and then hold down the *Original Type* key and press the *OK* key to initialize the counter. If initialization is successful, the screen displays "Action completed."
    2) SP7-825 is effective only once, at time of machine installation.

18. **Model B046 only:** Access SP5-992 and select "2" to print out a full SMC report. Confirm that the report shows a "YES" for SP7-801-3.

19. **Modes B046 only:** After connecting the telephone line to the appropriate telephone wall jack and LINE press the On Hook key on the fax operation panel, and confirm that you hear a dial tone coming from the monitor speaker.

20. Program the required items, as indicated below.

Initial Programming: Faxless models (B044, B045)

Items to Program (Service Level – SP Mode)[1]	SP No.
Date and time	5-302
Language replacement (Firmware download)	5-827

*1: See Section 5 for SP-mode usage instructions.

Items to Program (User Level) [2]	User Tools
Display contrast	User Tools →
Energy saver level (low power mode)	System Settings
Reception mode	
Other items, as necessary	**[2]**

*2: Refer to the Operating Instructions for details.

Initial Programming: Fax-equipped models (B046)

Items to Program (Service Level – Service Functions)[3]	Function No.
Country code (System switch 0F)	01
Protocol requirements (G3 switch 0B) - EU only	01
PM call (System switch 01 – bit 0)	01
Country code (NCU parameter 00)	07
Service station's fax number	09

*3: See Section 5.1.1 of the fax service manual for information about using service functions.

Installation

Items to Program (Service Level – SP Mode)[4]	SP No.
Machine's serial number	5-811
Language replacement (Firmware download)	5-827
PSTN access code (RAM address 4000DB)	7-955
PSTN access method (RAM address 4000CD)	
Periodic service call (RAM addresses 40054F to 400553)	

*4: See Section 5 for SP-mode usage instructions.

Items to Program (User Administrator Level)[5]	User Tools
Monitor volume	Fax Features → Setup
Display contrast	
Date and Time	
Reception mode	
Fax Header/Own Name/Own No. (TTI/RTI/CSI)	
Reports on/off	Key Op. Tools
Country Code (except NA)	
Fusing power control during energy saver mode	System Settings
Language selection	Language
Other initial programming items	*5

*5: Refer to the Operating Instructions for details.

1.3 PAPER TRAY UNIT

1.3.1 ACCESSORY CHECK

Confirm that you have the accessories indicated below.

No.	Description	Q'ty
1	Paper-size decals	1 sheet
2	Installation Procedure (for service person)	1
3	Installation Procedure (for user)	1

1.3.2 INSTALLATION PROCEDURE

⚠CAUTION

Unplug the main machine's power cord before starting the following procedure.

1. Remove the tape at [A], and the tape and cardboard at [B].

2. Pull the paper tray part way out of the unit, remove the tape and cardboard at [C], and push the tray back in.
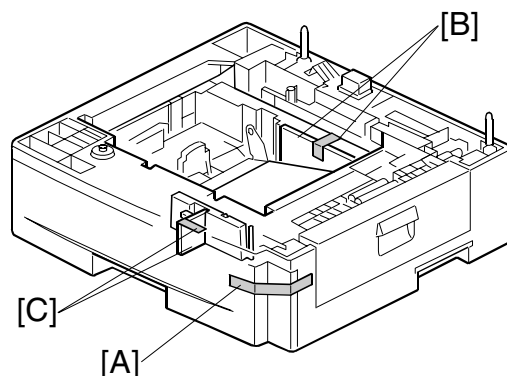
3. Set the machine onto the paper tray unit.
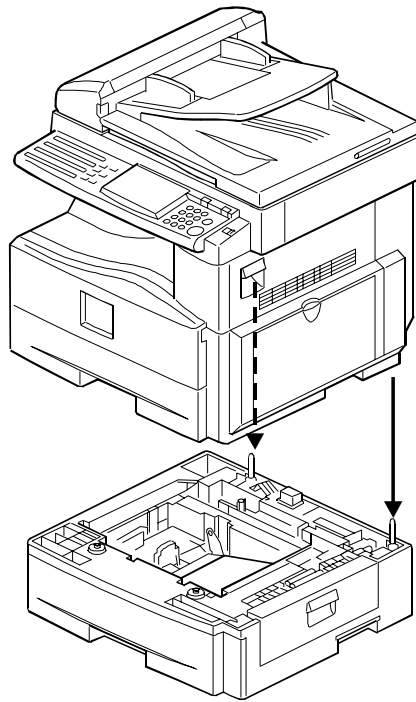
4. Remove the paper tray from the paper tray unit.

5. Load paper into the paper tray. Adjust the side and end fences as necessary. If loading 8$1/2$"x 14" paper, remove the end fence and set it into the special compartment.

6. Set the paper tray back into the paper tray unit.

7. Stick on the appropriate tray-number decal and paper-size decal, at the locations indicated in the illustration.
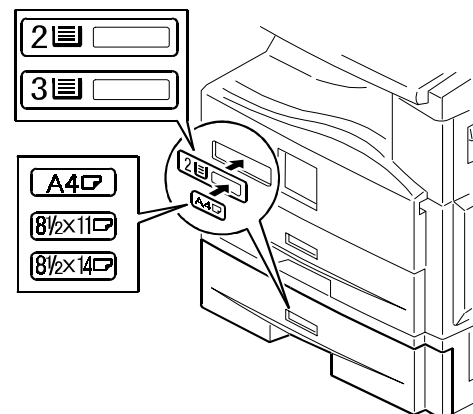
1.4 PAPER TRAY UNIT HEATER

1.4.1 ACCESSORY CHECK

Confirm that you have the accessories indicated below.

No.	Description	Q'ty
1	Grounding wire	1
2	Relay harness	1
3	Clamps	2
4	Ferrite core	1
5	Heater fastening screws	2
6	PTU fastening screws	3
7	Grounding screw	1
8	Decal for copier	1
9	Decal for paper unit	1
10	Tie wrap	1
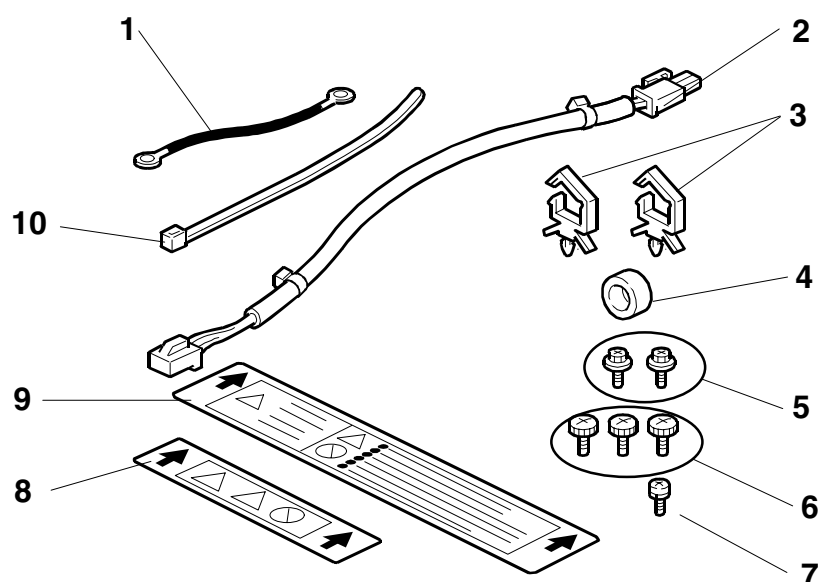
1.4.2 INSTALLATION PROCEDURE

⚠**CAUTION**

Unplug the main machine's power cord before starting the following procedure.

1. If the paper tray unit is already installed, uninstall it by lifting the copier off of it. (Refer to illustrations for Procedure 1.3.2, above.)

2. Remove both paper trays—the one from the copier, and the one from the paper tray unit.

3. Remove the ground screw [A] at the rear of the paper tray unit.

4. Fasten the heater [B] and the supplied ground wire [C] to the paper tray unit with 3 screws as shown. Note that [A] is the grounding screw you removed at Step 3 (returned to its original hole), and [D] and [E] are the two supplied heater fastening screws.

   NOTE: Be sure to position the ground wire [C] and heater harness [F] so that they will be out of the way of the copier when you set it onto the paper tray unit.
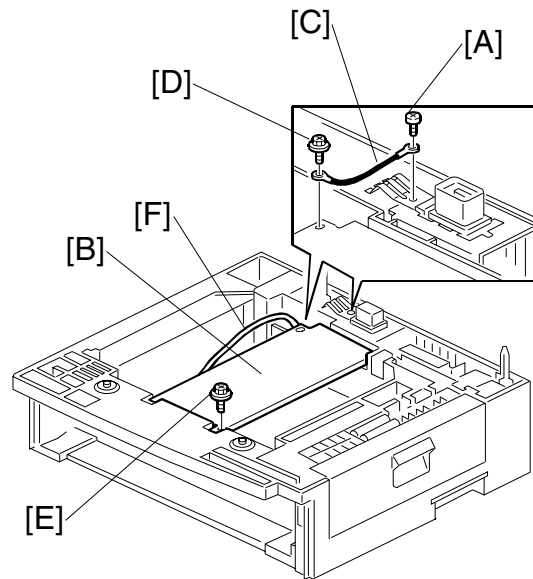
5. Set the copier onto the paper tray unit.

6. Screw the paper tray unit into place using three supplied PTU fastening screws.
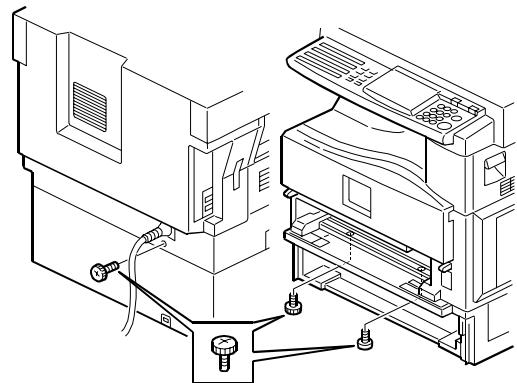
7. Open the front door [A] and remove the copy tray [B] ($\mathscr{P}\times1$). Then close the front door.
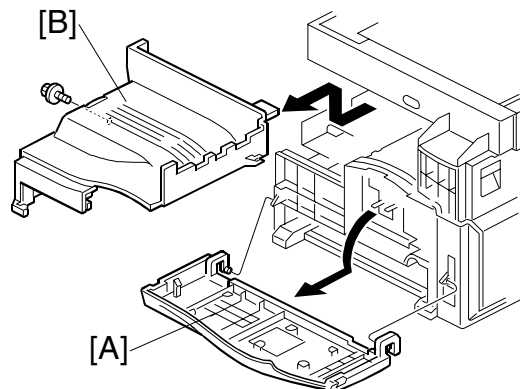
8. Remove the rear cover [C] ($\mathscr{P}$ x 5).
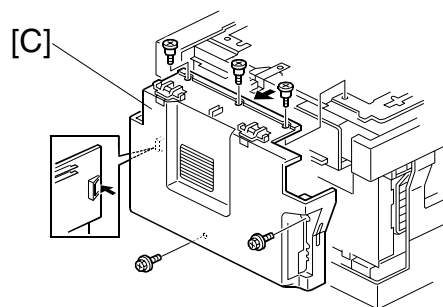
9. Remove the FCU cover plate [D] (7 screws on faxless machines, 8 screws on fax-equipped machines).
   NOTE: On fax-equipped machines, detach the NCU connector [E] first.
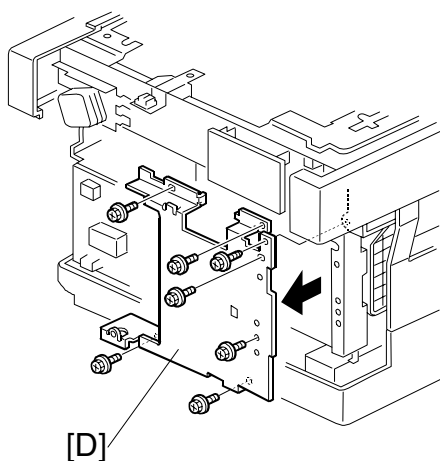
Faxless machines: *Fax-equipped machines:*
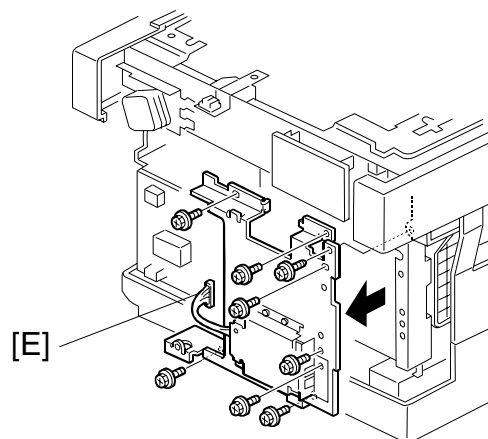
10. Pass the heater's harness through the hole [A] at the rear of the copier.

11. Pass relay harness [B] through the circular opening at [C] (at the rear of the PSU board bracket), and then through the hole at [A]. Then connect the relay harness to the heater's harness [D].
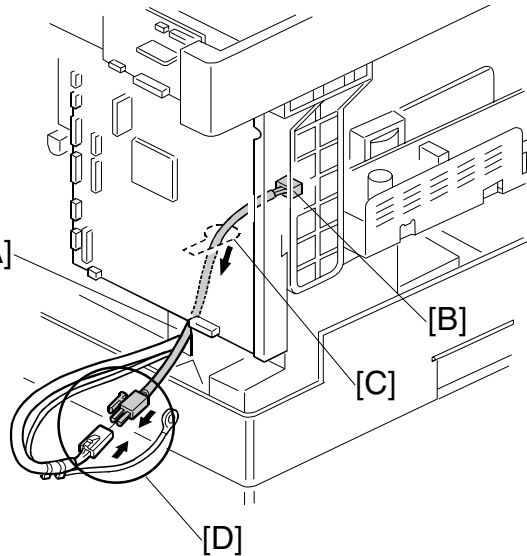
12. Pull the relay harness back into the copier. Then set the ferrite core [E] over the relay harness, and push it back so that it is over the heater's harness.

13. Wrap the heater's harness once around the core (see [F]). Adjust so that the core is located toward the rear of the copier (at position [E], behind the rear clamp). Secure the core into position using the supplied tie wrap [G].

14. Clip off the excess length of the tie wrap [H].
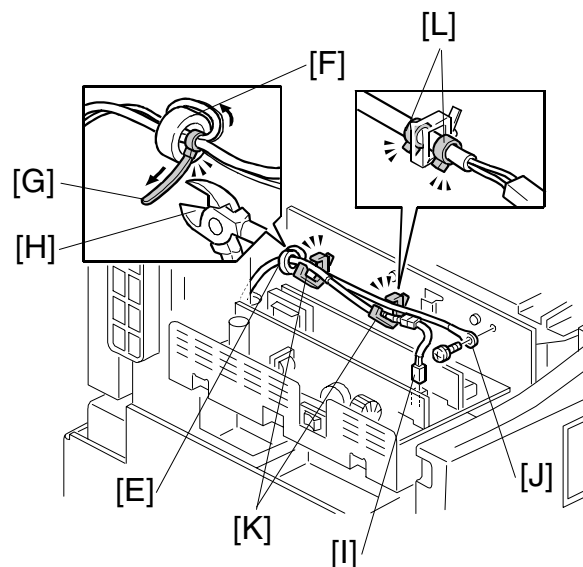
15. Connect the relay harness connector [I] to the large connector at the front center of the PSU board. Screw the ground wire [J] to the PSU board bracket, using the included grounding screw.

16. Attach the supplied clamps [K] to corresponding holes on the PSU board bracket, and set the heater harness though the clamps. Position the harness so that the front clamp is between the two bindings [L] on the harness. Then fasten the clamps.

17. Pull the excess length of the heater's harness out the hole at the rear [A].

NOTE: Be sure that the harness passes to the side of the grounding plate [B] at the bottom of the hole. (The front of the grounding plate must remain clear.)

[B]
[A]
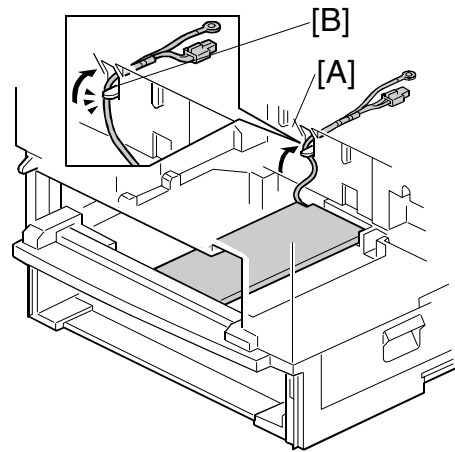
18. Arrange the excess harness length so that it sits beneath the FCU cover plate.

19. Attach the caution decals to the locations shown in the illustration.
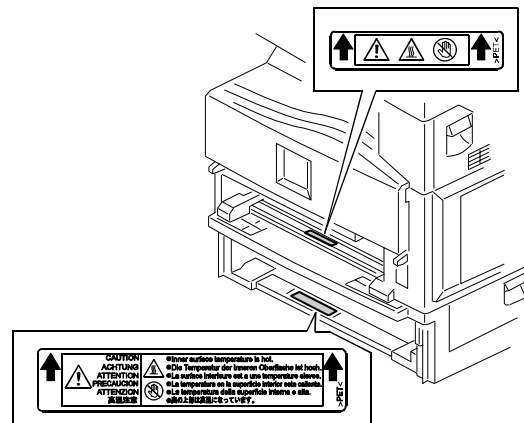
20. Reinsert the paper trays, and reattach the copy tray and the rear cover.

1.5 DOCUMENT FEEDER

1.5.1 ACCESSORY CHECK

Confirm that you have the components and accessories indicated below.

No.	Description	Q'ty
1	DF connection board	1
2	DF body	1
3	Hex wrench	1
4	Hex screws	4
5	DF original table	1
6	Wire harness	1
7	Phillips-head screws	5
8	Bracket	1
–	Installation Procedure	1
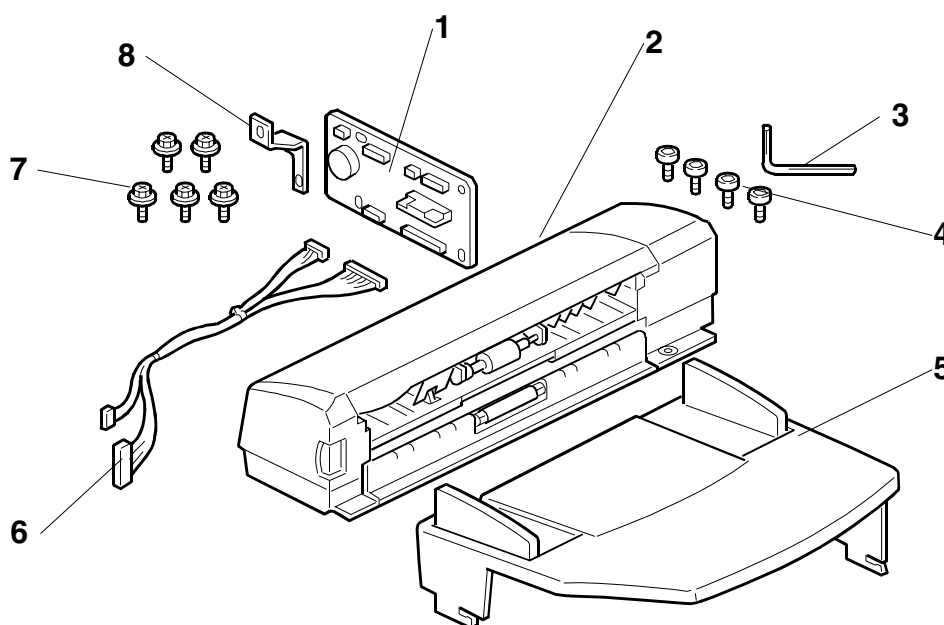
1.5.2 INSTALLATION PROCEDURE

⚠CAUTION

Unplug the main machine's power cord before starting the following procedure.

1. Unpack the ADF and remove the packing
    tape from the bottom of the ADF body.

2. Remove the platen cover [A]. To
    remove: Lift the cover, unlatch the
    two latches [B] (press down on
    the tabs [C] and push the latch
    back), and detach the cover from
    the hook [D].
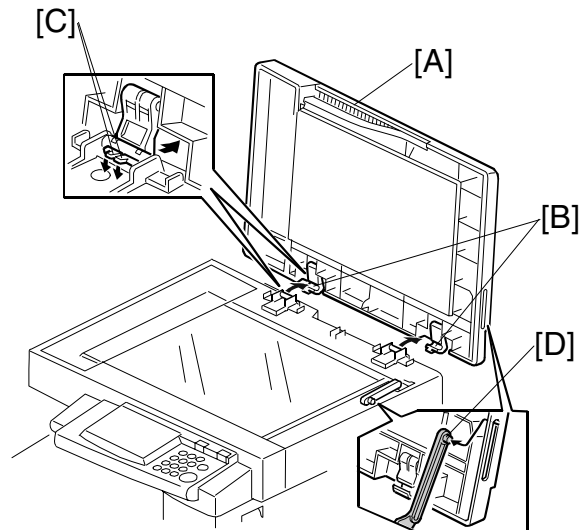
3. Remove the left piece [E] of the copier's
    platen cover by pushing the piece to the
    left and then pulling it up and off.
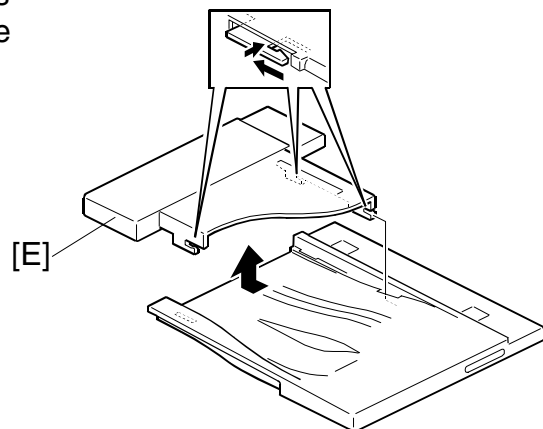
4. Place the DF original table [F] flat onto
    the platen cover, so that the 3 latches
    go all the way into the openings and so
    that the contact area [G] around each
    latch is flush against the cover. Then
    push so that latch [1] locks into place,
    then latch [2], and then latch [3] (at the
    rear left).
    NOTE: The latches may break if you
    try to push the table in at an
    angle.

5. Remove the rear cover [A] (✏ x 5).

[A]
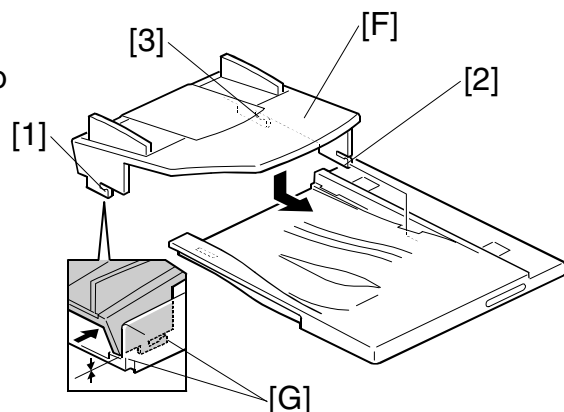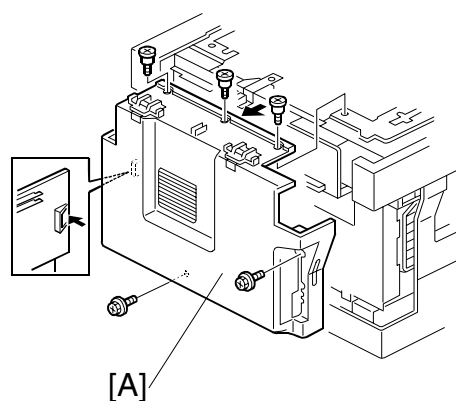
6. Remove the left scale plate [B] (✏ x 2).

[B]
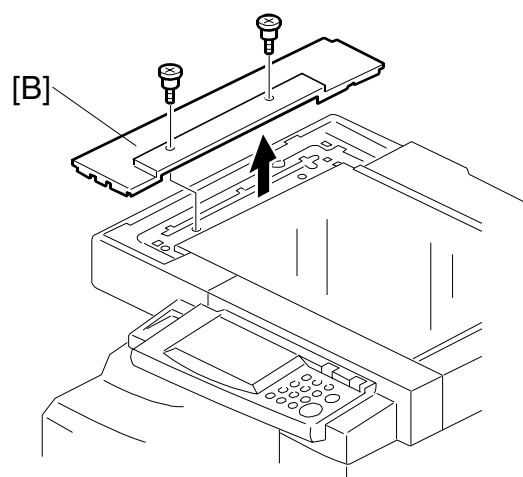
7. Set the DF body [C] onto the copier in its correct position. Press the latch [D] to raise the top half of the body, and fasten to the copier with the 4 hex screws (using the included hex wrench).

[D]

[C]
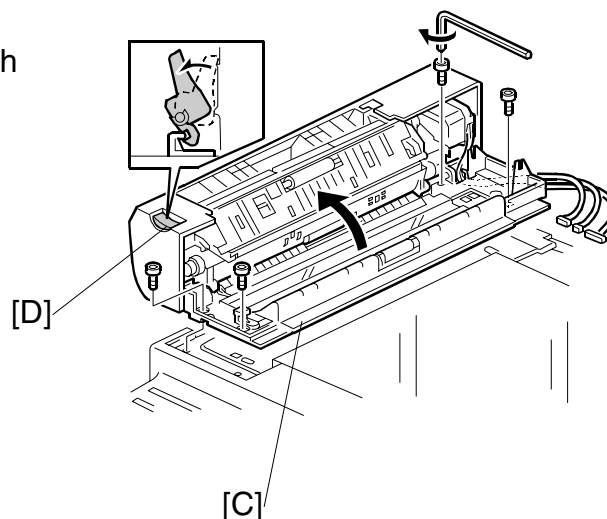
8. Install the DF connection board [A] and DF board bracket [B]. (🗝 x 5)
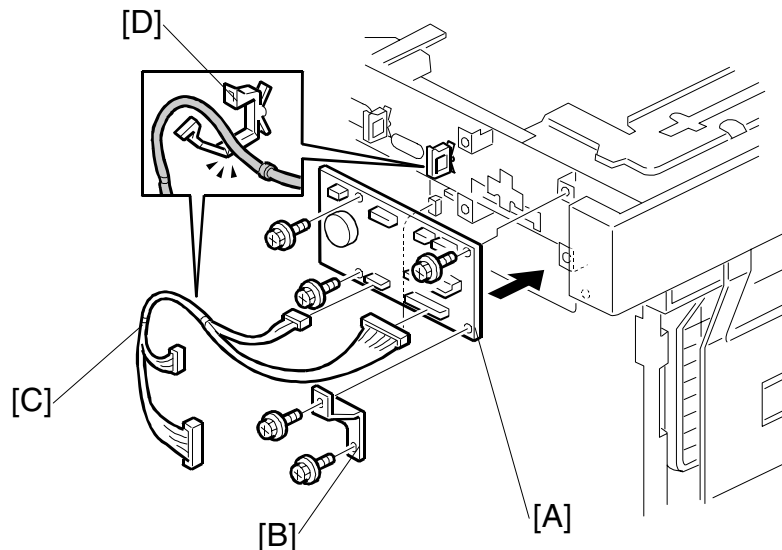
9. Connect the four wire sets from the DF body to CN103, CN105, CN106, and CN107 on the DF connection board. (Not shown in illustration.)

10. Connect one end of the supplied wire harness [C] to CN101 and CN102 on the DF connection board, and connect the other end to connectors CN9 and CN10 on the FCU. Secure the wire harness into the clamp [D] located to the side of the DF board.

11. Reattach the rear cover and the platen cover.

12. Plug in the power cord, and turn on the main switch.

13. Make a full-size copy from the first tray using the ADF, and check the side-to-side and leading edge registrations. If the registration is incorrect, adjust as necessary (☛ 3.13.3).

1.6 DIMM

1.6.1 INSTALLATION PROCEDURE

⚠**CAUTION**

Unplug the main machine's power cord before starting the following procedure.

1. Remove the rear cover [A] (🔩 x 5).

[A]
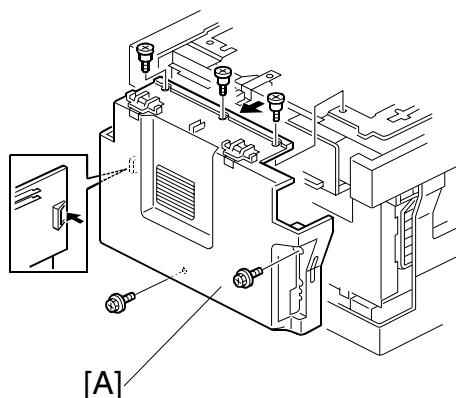
2. Remove the FCU cover plate [B] (7 screws on faxless machines, 8 screws on fax-equipped machines).
   NOTE: On fax-equipped machines, detach the NCU connector [C] first.

Faxless machines:　　　　　　　　*Fax-equipped machines:*

[C]

[B]
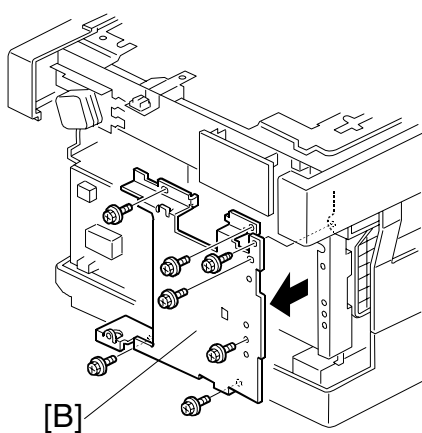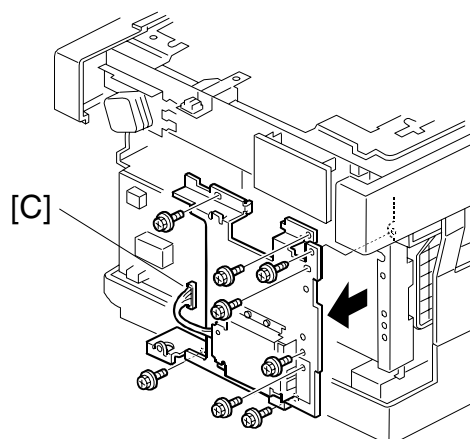
DIMM

3. Insert the DIMM [A] at an angle into slot CN2 on the FCU.

4. Press the free end of the DIMM toward the FCU, so that the DIMM snaps into place parallel to the FCU.

5. Reinstall the FCU cover plate and the rear cover.

[A]
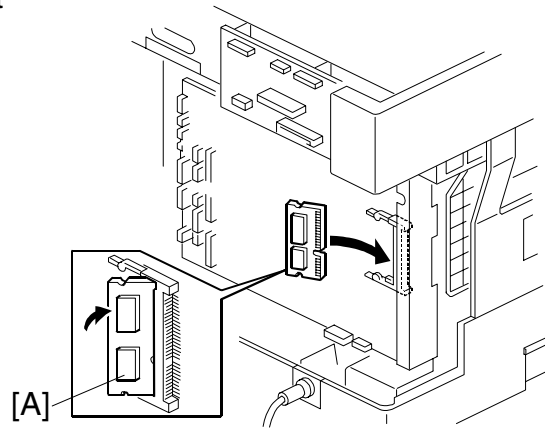
PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE SCHEDULES

2.1 PM TABLES

NOTE: 1) After carrying out PM, clear the PM counter (SP7-804).
      2) PM intervals (45k, 90k) indicate the number of prints.
      3) After performing the PM the copy adjustments should be checked and adjusted as necessary.

Key: AN: As necessary   C: Clean   R: Replace   I: Inspect

	Every 45k	Every 90k	AN	NOTE
OPTICS				
Reflector	C		C	Optics cloth
1st mirror	C		C	Optics cloth
2nd mirror	C		C	Optics cloth
3rd mirror	C		C	Optics cloth
Platen cover	C		C	Dry cloth
Exposure glass	C		C	Dry cloth
Toner shield glass	C		C	Dry cloth
DRUM AREA				
PCU	R			On B044 and B046: Also clean toner-bottle holder.
Transfer roller		R		
Discharge plate		R		
PAPER FEED				
Paper feed roller		R	C	Water or alcohol.
Friction pad		R	C	Dry cloth
Bottom-plate pad	C		C	Water or alcohol.
Registration roller	C		C	Water or alcohol.
FUSING UNIT				
Hot roller		R		
Pressure roller		R		
Hot roller bearings		R		
Pressure-roller bushings		I		
Inlet guide		C		
Outlet guide		C		
Hot roller stripper pawls		R		
Thermistor		C		

Preventive Maintenance

	Every 90k	AN	NOTE
DF			
Separation roller	R	C	Water or alcohol
Pick-up roller	R	C	Water or alcohol
White plate		C	Water or alcohol
DF exposure glass		C	Water
Rollers R0, R1, R2		C	Water or alcohol

	Every 120k	AN	NOTE
PAPER TRAY UNIT			
Paper feed roller	R		
Bottom-plate pad		C	Dry cloth
Friction pad	R		

2.2 HOW TO CLEAR THE PM COUNTER

After finishing PM, clear the PM counter as follows.

1. Access SP mode 7-804.

2. Hold down the *Original Type* key and press the *OK* key (or ⓡ/# key) to reset the counter. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!"

REPLACEMENT AND ADJUSTMENT

3. REPLACEMENT AND ADJUSTMENT

3.1 PRECAUTIONS

3.1.1 GENERAL

⚠CAUTION
Turn off the main power switch and unplug the machine before starting any of the replacement procedures described in this section.

Note that you should not turn off the main switch while mechanical parts are active, as this may cause parts to stop out of home position. Attempting to remove or install the PCU or other such units while parts are out of home position may result in damage. Wait for operation to stop before turning off the machine.

3.1.2 LITHIUM BATTERIES

⚠CAUTION: Lithium Batteries
Incorrect replacement of lithium battery(s) on the FCU poses risk of explosion. Replace only with the same type or with an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

3.1.3 PCU (PHOTOCONDUCTOR UNIT)

The PCU consists of the OPC (Organic Photo Conductor) drum, charge roller, development unit, and cleaning components. Observe the following precautions when handling the PCU.

1. Never touch the drum surface with bare hands. If the drum surface is dirty or if you have accidentally touched it, wipe it with a dry cloth, or clean it with wet cotton and then wipe it dry with a cloth.
2. Never use alcohol to clean the drum. Alcohol will dissolve the drum surface.
3. Store the PCU in a cool dry place.
4. Do not expose the drum to corrosive gases (ammonia, etc.).
5. Do not shake a used PCU, as this may cause toner and developer to spill out.
6. Dispose of used PCU components in accordance with local regulations.

3.1.4 TRANSFER ROLLER

1. Never touch the surface of the transfer roller with bare hands.
2. Be careful not to scratch the transfer roller, as the surface is easily damaged.

Replacement
and
Adjustment

3.1.5 SCANNER UNIT

1. Use alcohol or glass cleaner to clean the exposure and scanning glass. This will reduce the static charge on the glass.
2. Use a blower brush or a water-moistened cotton pad to clean the mirrors and lenses.
3. Take care not to bend or crease the exposure lamp's ribbon cable.
4. Do not disassemble the lens unit. Doing so will throw the lens and copy image out of focus.
5. Do not turn any of the CCD positioning screws. Doing so will cause the CCD to be misaligned.

3.1.6 LASER UNIT

1. Do not loosen or adjust the screws securing the LD drive board on the LD unit. Doing so will cause the LD unit to be out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as these are permanently adjusted at the factory. If replacement of the LD drive board is necessary, replace the entire LD unit.
3. Keep the polygon mirror and toroidal lens free of dust. Laser performance is very sensitive to dust on these components.
4. Do not touch the shield glass, the lenses, or the surface of the polygon mirror with bare hands.

3.1.7 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that the roller can rotate freely.
2. Be careful to avoid damage to the hot roller stripper pawls and their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

3.1.8 PAPER FEED

1. Do not touch the surface of paper feed rollers.
2. To avoid misfeeds, the side and end fences in each paper tray must be positioned correctly to align with the loaded paper size.

3.1.9 IMPORTANT

1. The machine will automatically start toner agitation when you install a new PCU. Be sure to wait for initialization to finish before reopening the front cover or turning off the main switch.

2. If the optional anti-condensation heater (for the optional paper tray unit) is installed, keep the copier's power cord plugged in even while the main switch is off, so that the heater remains energized.

3.2 SPECIAL TOOLS AND LUBRICANTS

Part Number	Description	Q'ty
A1849501	Optics Adjustment Tools (2 pcs/set)	1 set
A2929500	Test Chart – S5S (10 pcs/set)	1 set
A0299387	Digital Multimeter – Fluke 87	1
N8036701	Flash Memory Card (4MB)	1
N8031000	Case for Flash Memory Card	1
A2579300	Grease Barrierta – S552R	1
52039501	Silicone Grease G-501	1
G0219350	Loopback connector	1

Replacement and Adjustment

3.3 EXTERIOR COVER AND OPERATION PANEL

3.3.1 PLATEN COVER

1. Lift the platen cover [A].

2. Unlatch the two latches [B].
   NOTE: To unlatch, press down on the tabs [C] and then push the latch back.

3. Detach the cover from the hook [D].
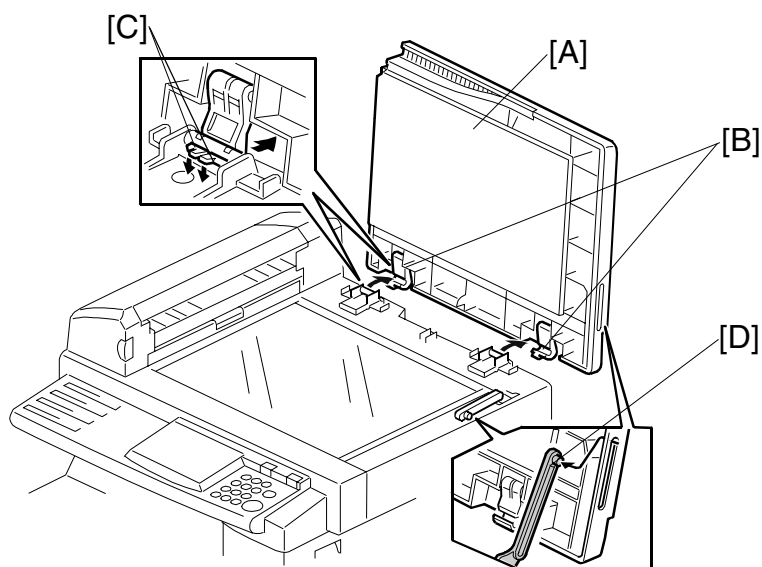
3.3.2 REAR COVER

1. Platen cover (☛ 3.3.1)

2. Rear cover [A] (🔩 x 5)
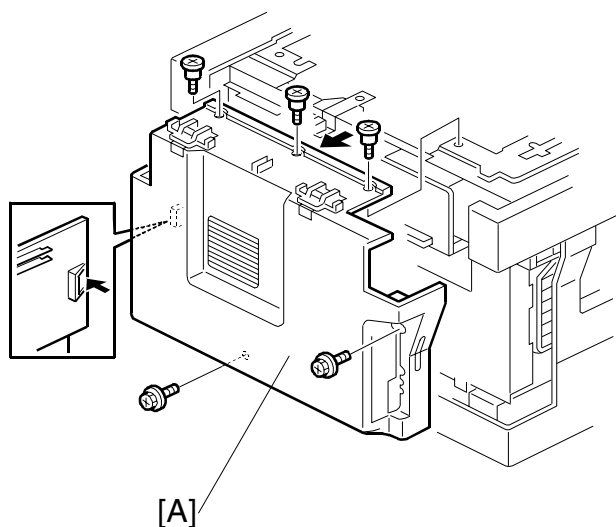
3.3.3 COPY TRAY

1. Open the front door [A].
2. Copy tray [B] ($\sqrt[p]{} $ x 1)
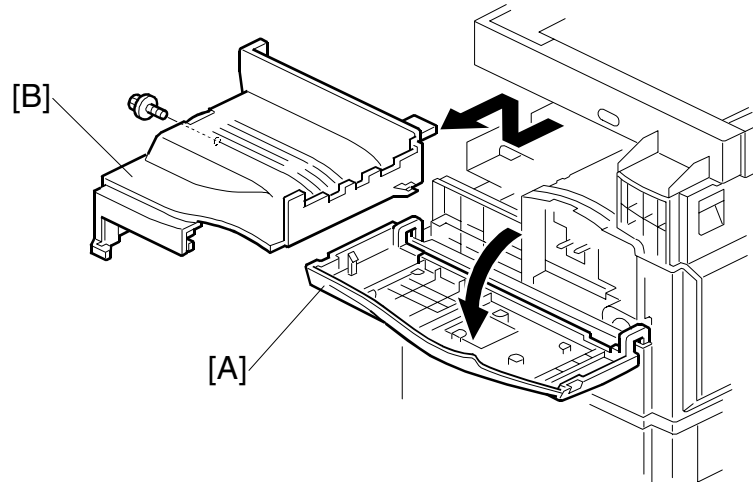
3.3.4 SCALE PLATE (B044 AND B045 ONLY)

1. Scale plate [A] ($\sqrt[p]{} \times 2$)
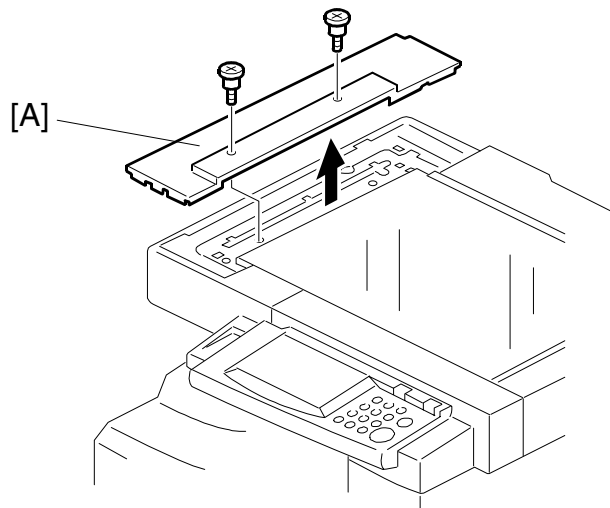
3.3.5 LEFT COVER

1. Rear cover (☛ 3.3.2)

2. Slide the left cover [A] toward the rear to remove it.
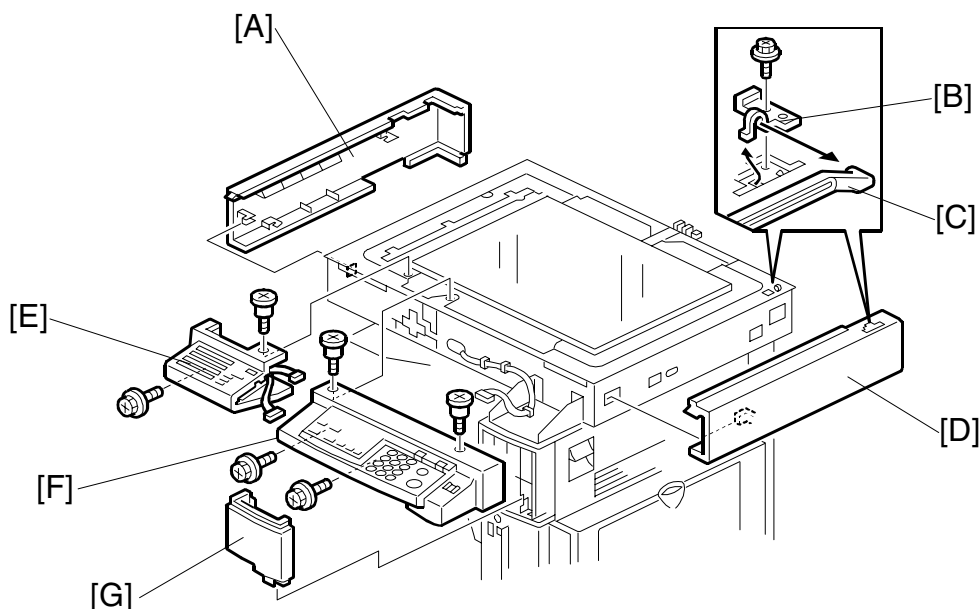
3.3.6 RIGHT COVER

1. Rear cover (☛ 3.3.2)

2. Remove the metal fitting [B], and the platen-cover arm [C].

3. Slide the right cover [D] toward the rear to remove it.

3.3.7 FRONT LEFT COVER AND OPERATION PANEL

1. Front left cover [E] (On B044/5: $\hat{\mathscr{F}} \times 2$) (On B046: $\hat{\mathscr{F}} \times 2$, ▤ $\times 2$)
   NOTE: The illustration shows B046.

2. Operation panel [F] ($\hat{\mathscr{F}} \times 4$, ▤ $\times 1$)

3.3.8 FRONT RIGHT COVER

1. Operation panel (☛ 3.3.7)

2. Open the right door.

3. Front right cover [G]

3.3.9 RIGHT DOOR

1. Open the right door [A].

2. Undo the strap [B].

3. Right door (⬚ × 1)
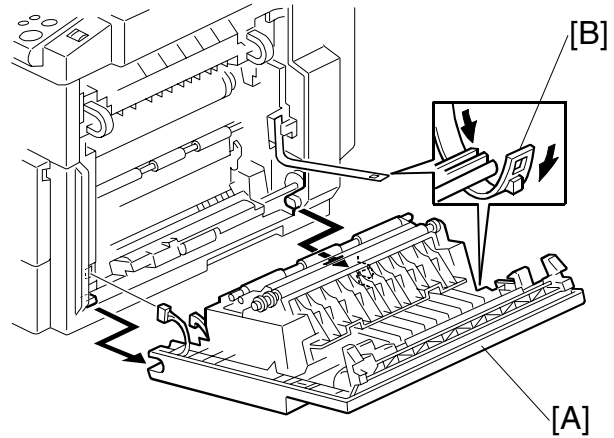
3.3.10 BYPASS TRAY (B044 AND B046 ONLY)

1. Press the stopper rails [A] inward and remove the bypass tray [B].
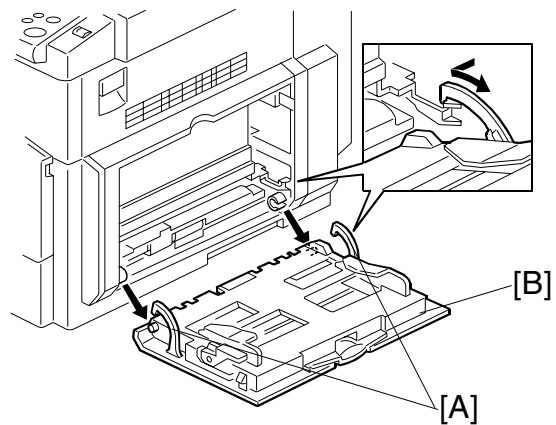
3.3.11 PLATEN COVER SENSOR

1. Rear cover (☛ 3.3.2)

2. Platen cover sensor [A] (⬚ × 1)
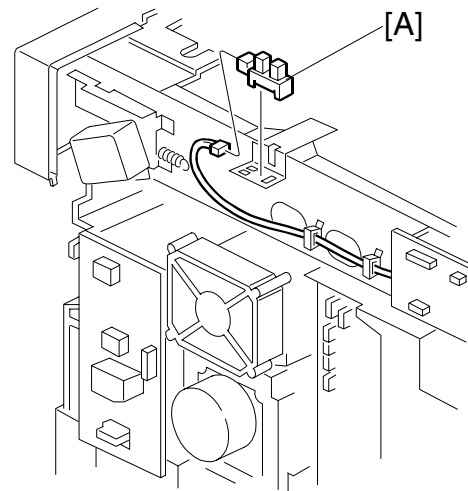
3.4 SCANNER SECTION

3.4.1 EXPOSURE GLASS
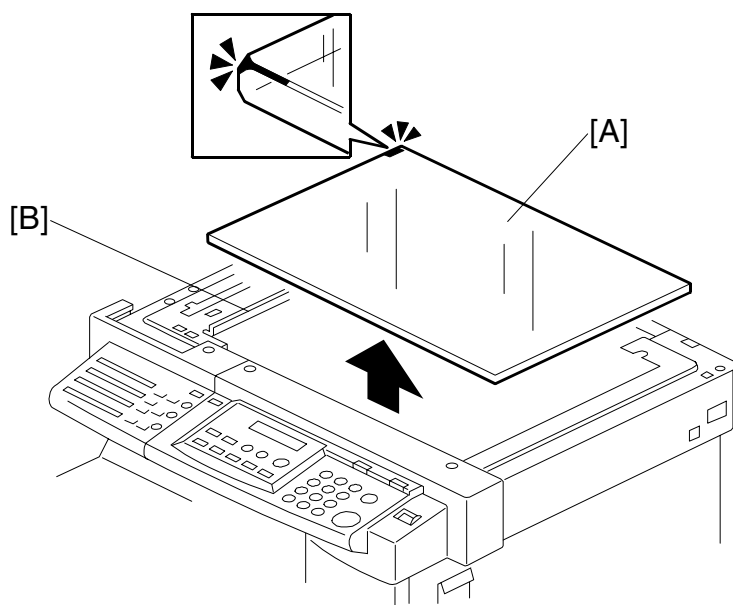
Replacement and Adjustment

Non-DF machines

1. Rear cover (☛ 3.3.2)
2. Scale plate (☛ 3.3.4)
3. Exposure glass [A]

DF-equipped machines

1. Rear cover (☛ 3.3.2)
2. Right cover (☛ 3.3.6)
3. Exposure glass [A]

NOTE: When reinstalling, be sure that the marking on the glass is at the rear left corner, and be sure the left edge of the glass is aligned flush against the support ridge [B] on the frame.

3.4.2 LENS BLOCK

1. Exposure glass (☛ 3.4.1)

2. Unclamp four clamps [A], and take the wire out of the clamps.

3. Lens block [B] ($\hat{\mathscr{J}} \times 4$, 1 flat cable)

NOTE: 1) Do not loosen the paint-locked screws holding the lens unit in place.

2) After installing a new lens block, carry out copy adjustments. (☛ 3.13)
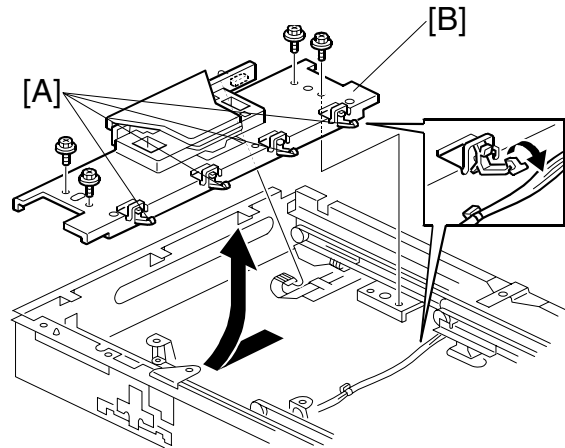
3.4.3 EXPOSURE LAMP, LAMP STABILIZER BOARD

1. Exposure glass (☛ 3.4.1)

2. Operation panel (☛ 3.3.7)

3. Slide the 1st scanner to a position where the lamp and scanner are clear of the metal lids.

4. Disconnect the lamp connector [A].

5. Remove either or both of the following:
   • Exposure lamp [B] (1 screw at [C])
   • Lamp stabilizer board [D] (2 screws at [E], 1 flat cable)
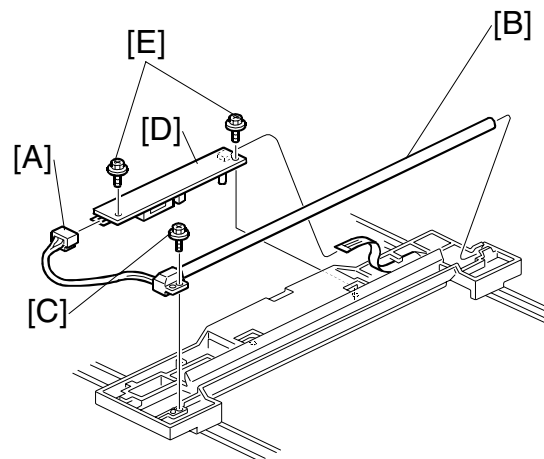
3.4.4 SCANNER MOTOR

1. Right cover (☛ 3.3.6)

2. Scanner motor [A] (🔩 × 4, 1 spring, 🔌 × 1)

NOTE: When reinstalling fasten the screws loosely, then set the spring in place, then tighten the screws.
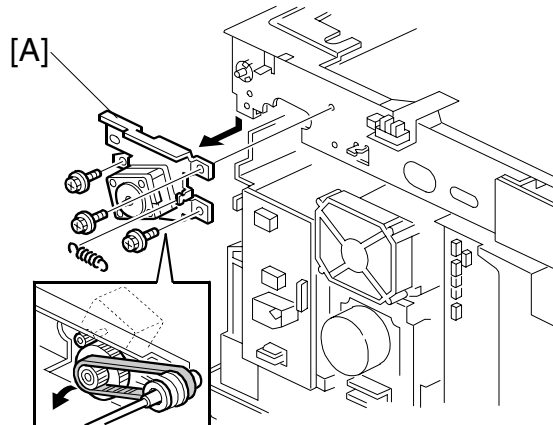
3.4.5 SCANNER HP SENSOR

1. Left cover (☛ 3.3.6)

2. *If non-DF machine:* Scale plate (☛ 3.3.4)

   If DF-equipped machine: Press on the DF latch and open the DF.

3. Scanner HP sensor [A] (🔌 × 1)
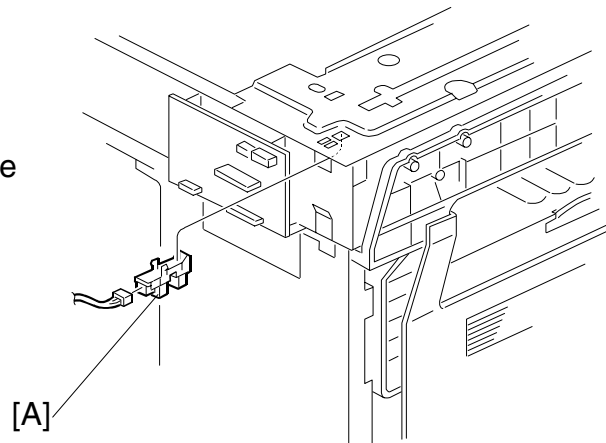
3.4.6 SCANNER ALIGNMENT ADJUSTMENT

1. Remove the rear cover (☛ 3.3.2), operation panel (☛ 3.3.7), and exposure glass (☛ 3.4.1).

2. Loosen the 2 screws holding the 1st and 2nd scanner belts in place.
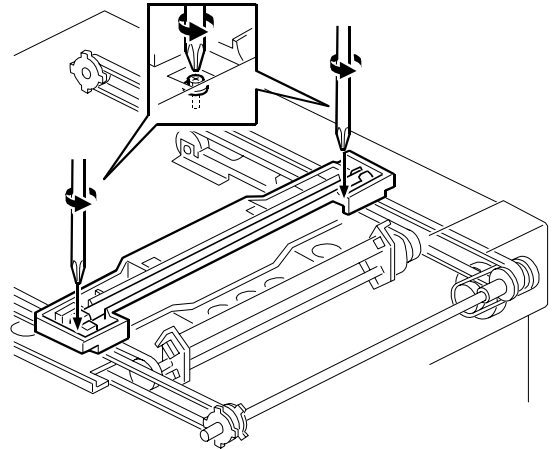
3. Slide the 1st and 2nd scanners so that all four of the following are roughly aligned on both the front and back sides:
    *   The hole on the copier's lid
    *   The hole on the 1st scanner
    *   The corner right hole on the 2nd scanner
    *   The hole at the base of the scanner

4. Insert the two optics adjustment tools [A], and adjust the scanners as necessary so that the tools go through all four holes.

5. Tighten the two screws that you loosened at step 2 above, so that the belts are firmly clamped into place.

6. Remove the adjustment tools.

[A]
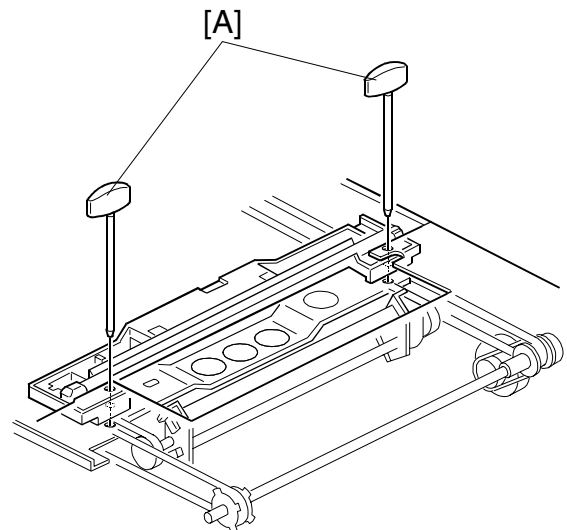
3.5 FUSING

3.5.1 FUSING UNIT

⚠**CAUTION**
The fusing unit can become very hot. Be sure that it has cooled down sufficiently before handling it.

1. Turn off the main switch, and unplug the machine.

2. Copy tray (☛ 3.3.3)

3. Fusing unit [A] (🔩 × 3, 🔌 × 3)
   NOTE: When reinstalling the unit replace the spacer [B] in the correct position, and remember to set the grounding wire [C] into place.
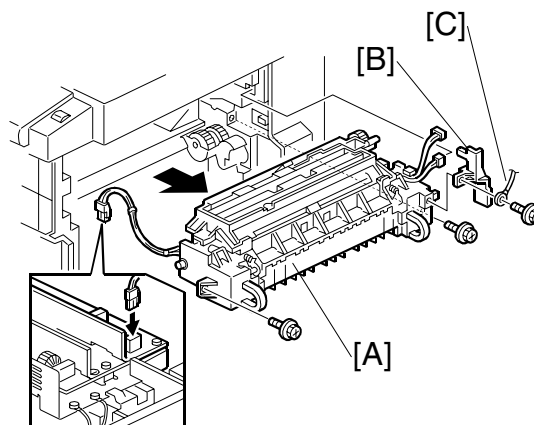
3.5.2 EXIT SENSOR

1. Fusing unit (☛ 3.5.1)

2. Exit sensor [A] (🔌 × 1)
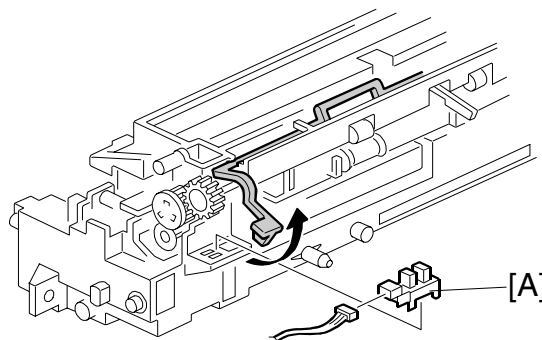
3.5.3 HOT ROLLER STRIPPER PAWLS
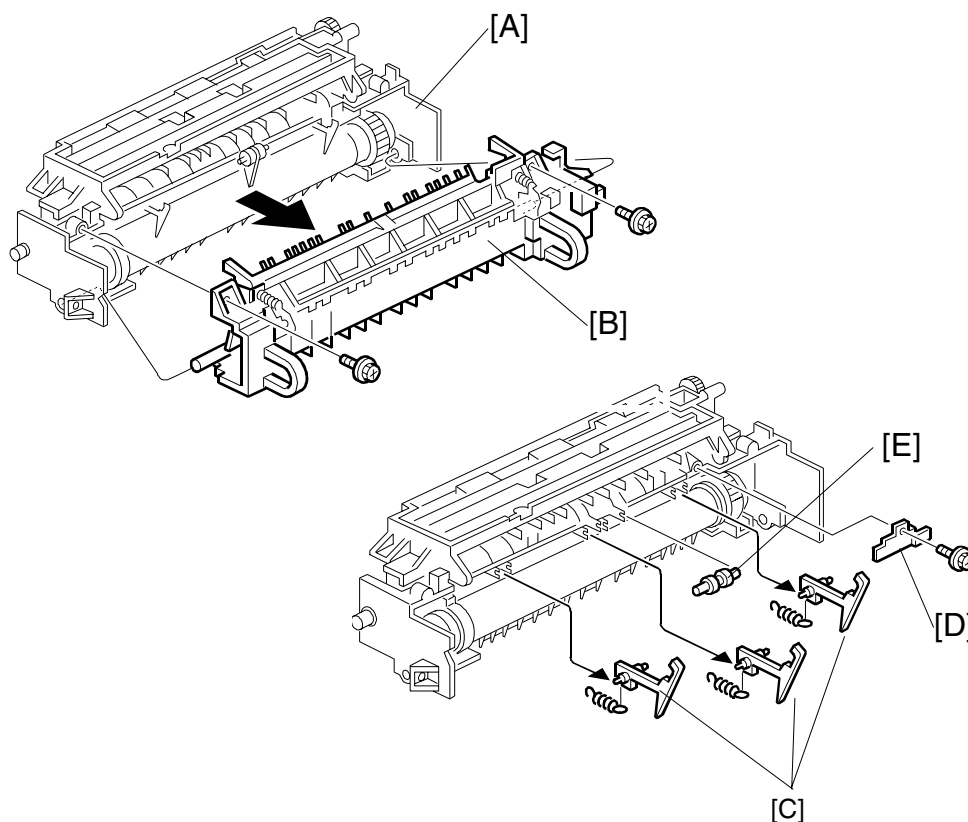
1. Fusing unit (☛ 3.5.1)

2. Separate the fusing unit into two sections: the hot roller section [A], and the pressure roller section [B]. (📎 × 2)
   NOTE: After removing the screws, lower the pressure roller section about halfway and then slide it toward the front side to detach it.

3. Hot roller stripper pawls [C] (1 spring for each pawl)
   NOTE: 1) To remove the right pawl, first remove the plastic spacer at [D] (📎 × 1).
   2) When reinstalling the center pawl, be sure to set roller [E] back into place.

3.5.4 HOT ROLLER & FUSING LAMP

1. Hot roller stripper pawls (☛ 3.5.3)

2. Hot roller assembly [A] ($\hat{\mathscr{F}} \times 2$)
   NOTE: 1) Each of the screws has a washer.
   2) After removing the screws, lift the hot roller assembly out from the rear side.

3. Fusing lamp [B]

4. Hot roller [C] (2 C-rings, 1 spacer, 1 gear, 2 bushings)
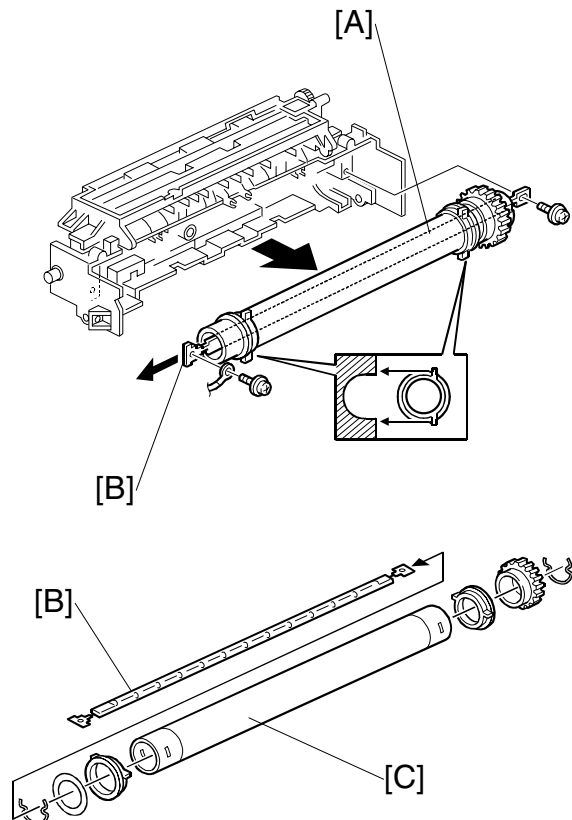
3.5.5 THERMOFUSE, THERMOSWITCH, AND THERMISTOR

1. Remove the hot roller assembly from the hot roller section. (☛ 3.5.3)

2. Thermofuse [A] ($\hat{\mathscr{F}} \times 2$).

3. Thermoswitch [B] ($\hat{\mathscr{F}} \times 2$)
   NOTE: You must remove the thermofuse first.

4. Thermistor [C] ($\hat{\mathscr{F}} \times 1$)

Replacement and Adjustment
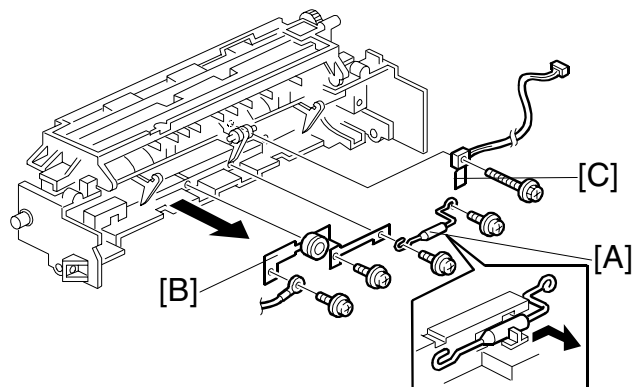
3.5.6 PRESSURE ROLLER

1. Fusing unit (☛ 3.5.1)

2. Separate the fusing unit into two sections: the hot roller section and the pressure roller section (☛ 3.5.3, Step 2). Carry out the remaining steps on the pressure roller section.

3. Fusing entrance guide [A]
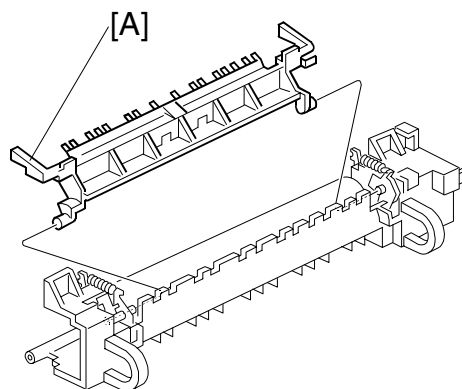
4. 2 springs ([B], [C])

5. 2 pressure arms ([D], [E])
   NOTE: Manipulate each arm so that it comes out through the slit in the casing.

6. 2 bushings ([F], [G])

7. Pressure roller [H]
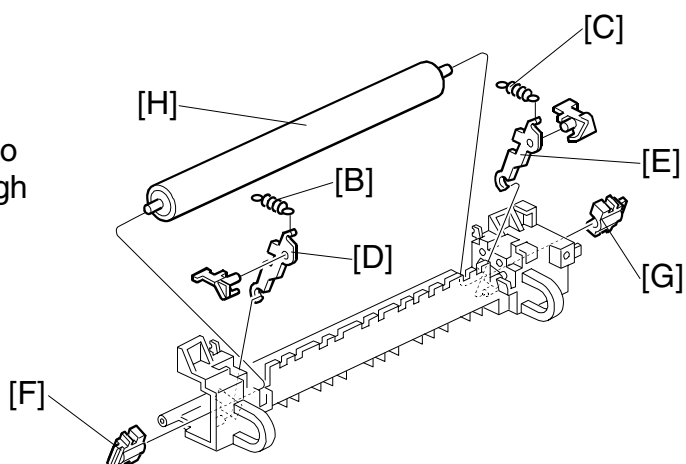
3.5.7 NIP BAND WIDTH ADJUSTMENT

NOTE: 1) The fusing unit must be at operating temperature when this adjustment is carried out.
2) Place an OHP sheet on the by-pass feed table before starting this procedure.
3) Use only A4/LT LEF. (Other OHP sheet sizes may cause a paper jam.)
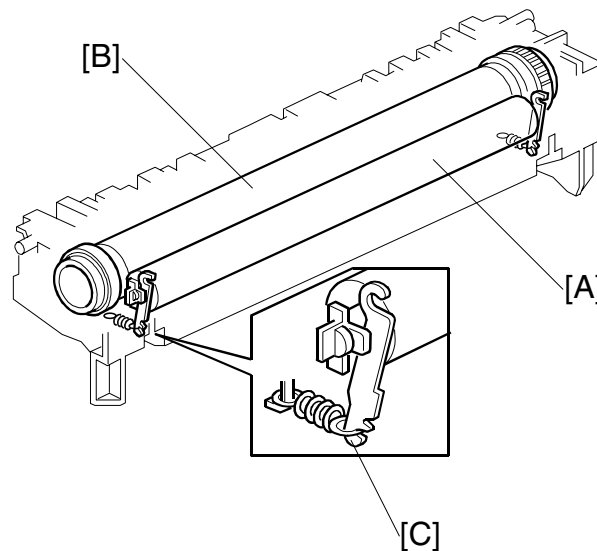
[A]: Pressure roller
[B]: Hot roller

1. Enter SP mode, and run SP1-109.

2. Press ⌾. The machine feeds the OHP sheet into the fusing section, stops it there for 20 seconds, then ejects it to the copy tray.

3. Check that the nip band (the opaque stripe) across the ejected OHP sheet is symmetrical, with both ends slightly thicker than the center.
   NOTE: There is no standard value for the nip band on this machine. Make the adjustment based on the band's appearance.

4. If the band is not as described above, change the position of the spring hooks [C] (one on each side), and then check the band again.
   NOTE: The higher hook position produces greater tension.

3.6 PCU
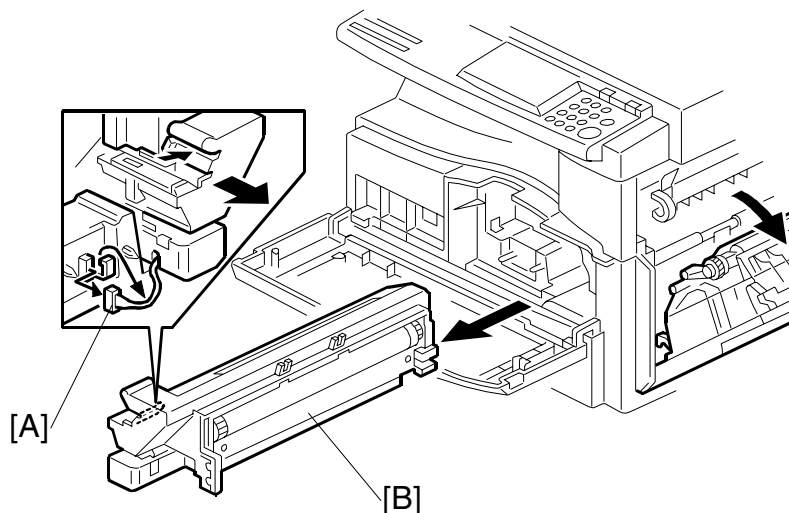
1. Open the right door.
   NOTE: *Do not forget to open the right door.* The PCU may become stuck if you try to remove it while the front door is closed.

2. Open the front door.

3. Remove the toner bottle holder or THM.
   NOTE: If working on a toner-bottle model, clean away all spilled toner from the toner bottle area and from the inside of the front door.

4. Detach the connector [A] and pull out the PCU [B].

NOTE: 1) After installing the new PCU, be sure to remove the Styrofoam piece and to pull off the two tags. (☛ 1.1.2, Step 10)
   2) The machine will automatically detect the new PCU and begin toner initialization. (☛ 6.10.4)

NOTE: If you accidentally touch the surface of the OPC with your fingers, clean with a dry cloth. Do not use alcohol, it will dissolve the drum surface.

3.7 TONER SUPPLY CLUTCH
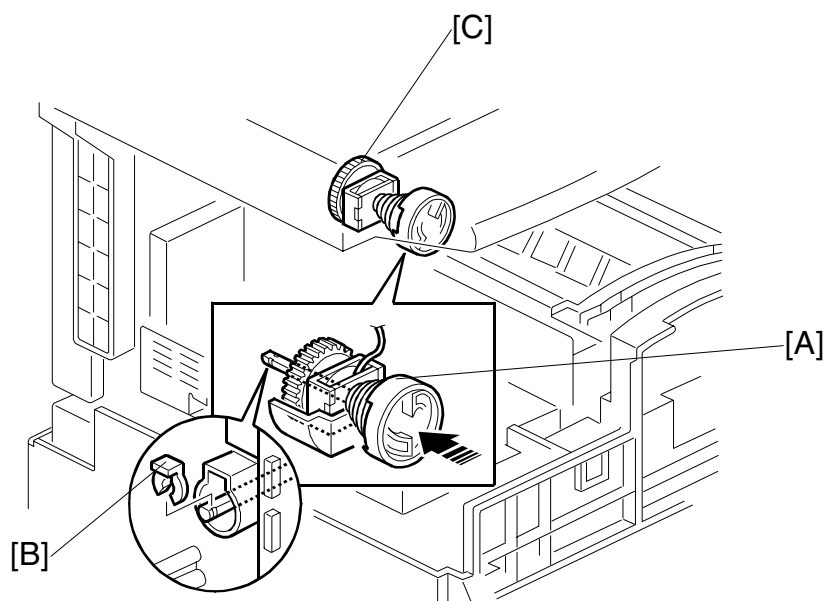
1. Remove the toner bottle or THM.

2. Copy tray (☛ 3.3.3)

3. Rear cover (☛ 3.3.2)

4. Disconnect the connector on C19 on the FCU.

5. Reach into the machine and push the clutch coupler [A] toward the rear, and at the same time reach around the back and remove the clip ring [B].

6. Remove the cone and spring, then lift the toner supply clutch mechanism [C] out of its housing and remove it.
   NOTE: When removing, note how the wire goes through the clamp, and also note where it passes through the rear of the machine.

3.8 PAPER FEED SECTION

3.8.1 PAPER FEED ROLLER AND FRICTION PAD

1. Take out the paper tray.

2. Clip ring [A]

3. Pull the shaft back, and lift it out.

4. Remove either or both of the following:
   - Paper feed roller [B]
   - Friction pad [C]
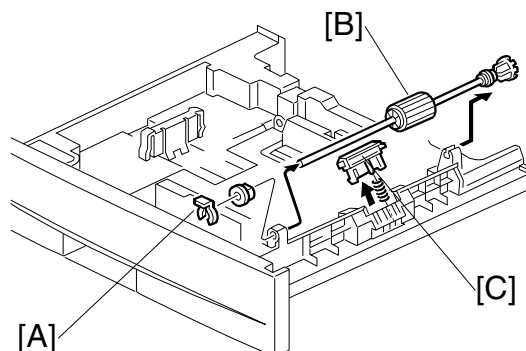
3.8.2 PAPER END SENSOR

1. Take out the paper tray.

2. Open the right door.

3. PCU (☛ 3.5)

4. Paper end sensor [A] (⬚ × 1)

NOTE: When installing the new sensor, reach your left hand in through the front and your right hand in through the right side, and view from the right side.
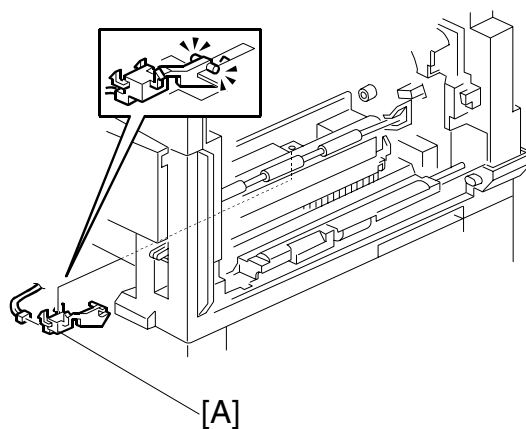
3.8.3 REGISTRATION SENSOR
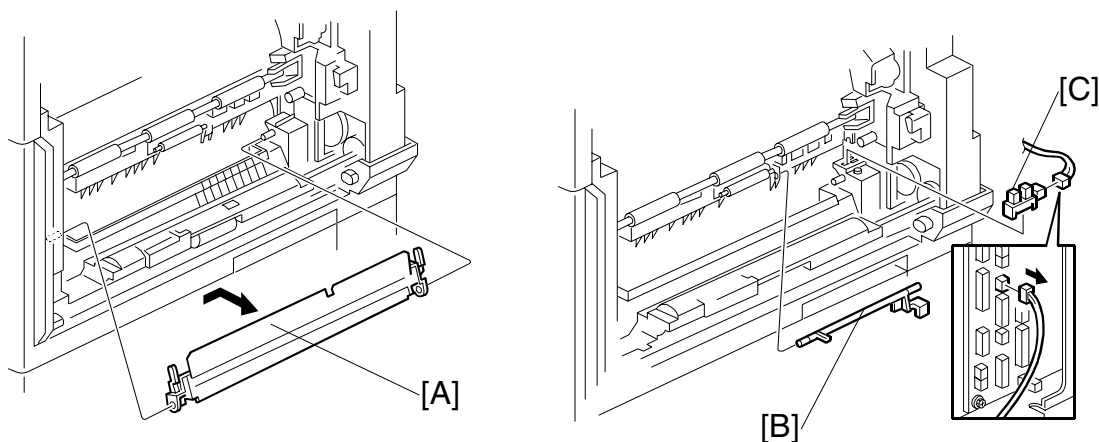
1. Take out the paper tray.
2. Open the right door.
3. Black guide piece [A]
4. Registration sensor feeler [B]
5. Registration sensor [C] (🖫 × 1)

3.8.4 BYPASS PAPER END SENSOR (B044 AND B046 ONLY)

1. Right door (☛ 3.3.9)
2. Detach the sensor compartment [A].
3. Bypass paper end sensor [B] (🖫 × 1)
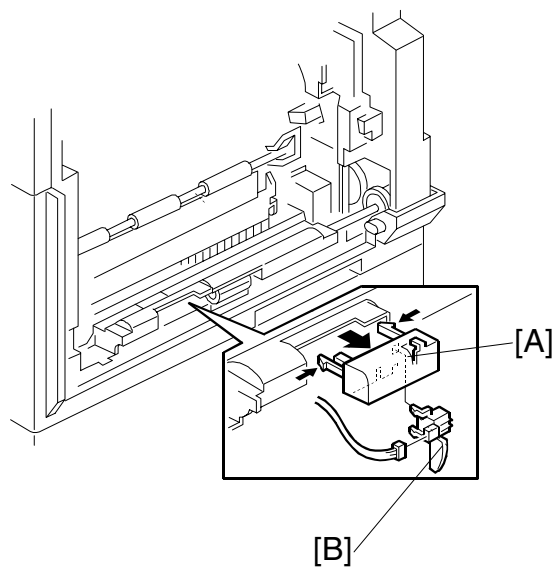
3.8.5 BYPASS FEED ROLLER (B044 AND B046 ONLY)
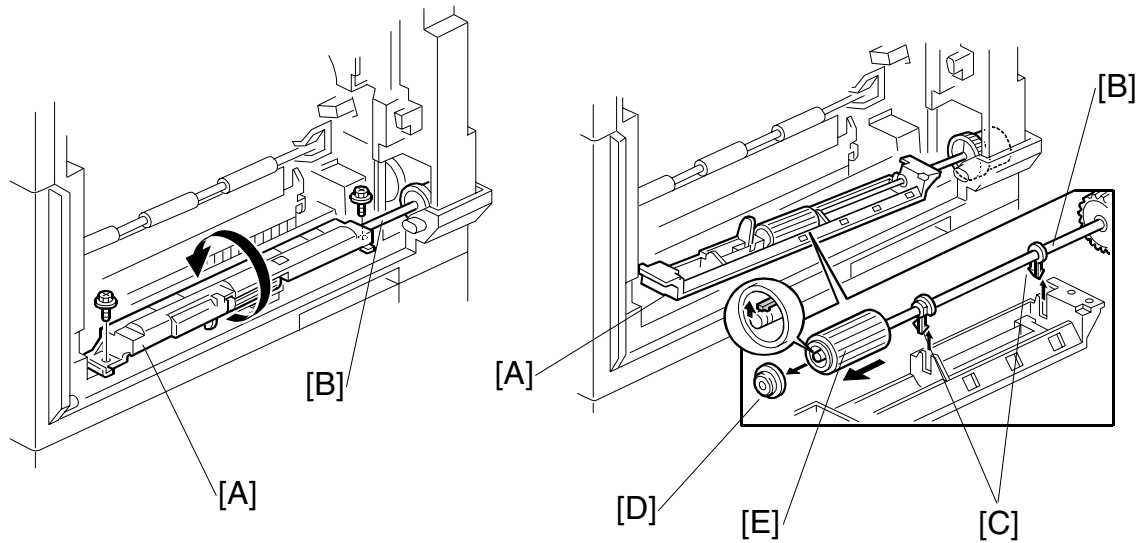
1. Right door (☛ 3.3.9)

2. Unscrew the feed roller frame [A] ($\mathbb{F} \times 2$) and rotate it about the feed roller shaft [B] so that it is upside down.

3. Detach the feed roller shaft [B] from the feed roller frame (unsnap the two snap pawls [C] and remove the spacer [D]).

4. Bypass feed roller [E]

3.8.6 BYPASS FEED CLUTCH (B044 AND B046 ONLY)

1. Rear cover (☛ 3.3.2)

2. Right door (☛ 3.3.9)

3. Detach the bypass feed clutch connector [A] from CN3 on the high-voltage power supply board.

4. Unscrew the bypass feed roller housing [B] ($\mathscr{F} \times 2$), and pull it out of the machine.
   NOTE: It is not necessary to remove or disconnect the bypass paper end sensor.

5. Bypass feed clutch [C] ($\mathbb{C} \times 1$)
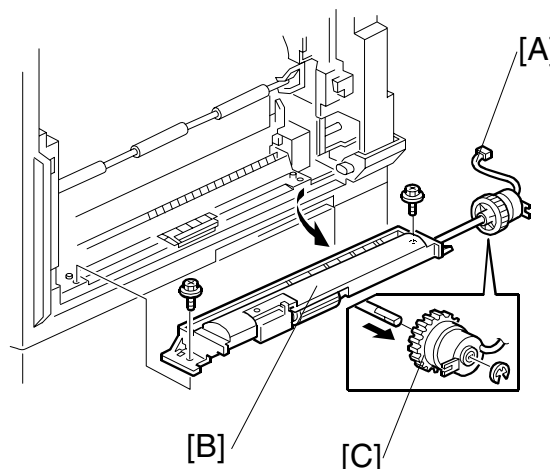
3.8.7 BYPASS FRICTION PAD (B044 AND B046 ONLY)

1. Right door (☛ 3.3.9)

2. Detach the roller housing [B] ($\mathscr{F} \times 2$), and move it out of the way.

3. Bypass friction pad [A]
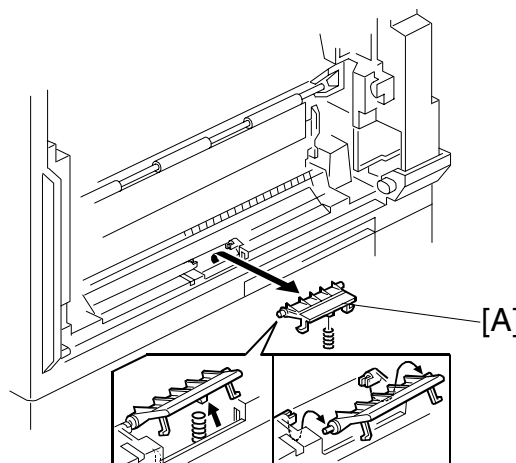
3.8.8 REGISTRATION CLUTCH

1. Rear cover (☛ 3.3.2)

2. High-voltage power supply board (☛ 3.12.2)

3. Ground plate [A] ($\mathscr{F}$)

4. Registration clutch [B] ($\overline{\mathbb{O}} \times 1$, $\mathbb{E}^{\mathbb{J}} \times 1$)
   NOTE: To free the clutch, pry clip [C] gently away from it using a screwdriver.
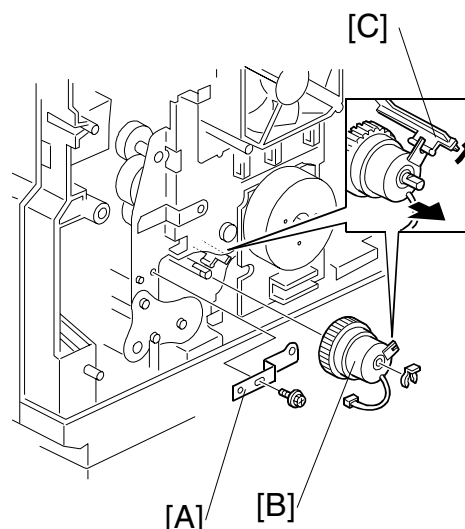
3.8.9 PAPER FEED CLUTCH
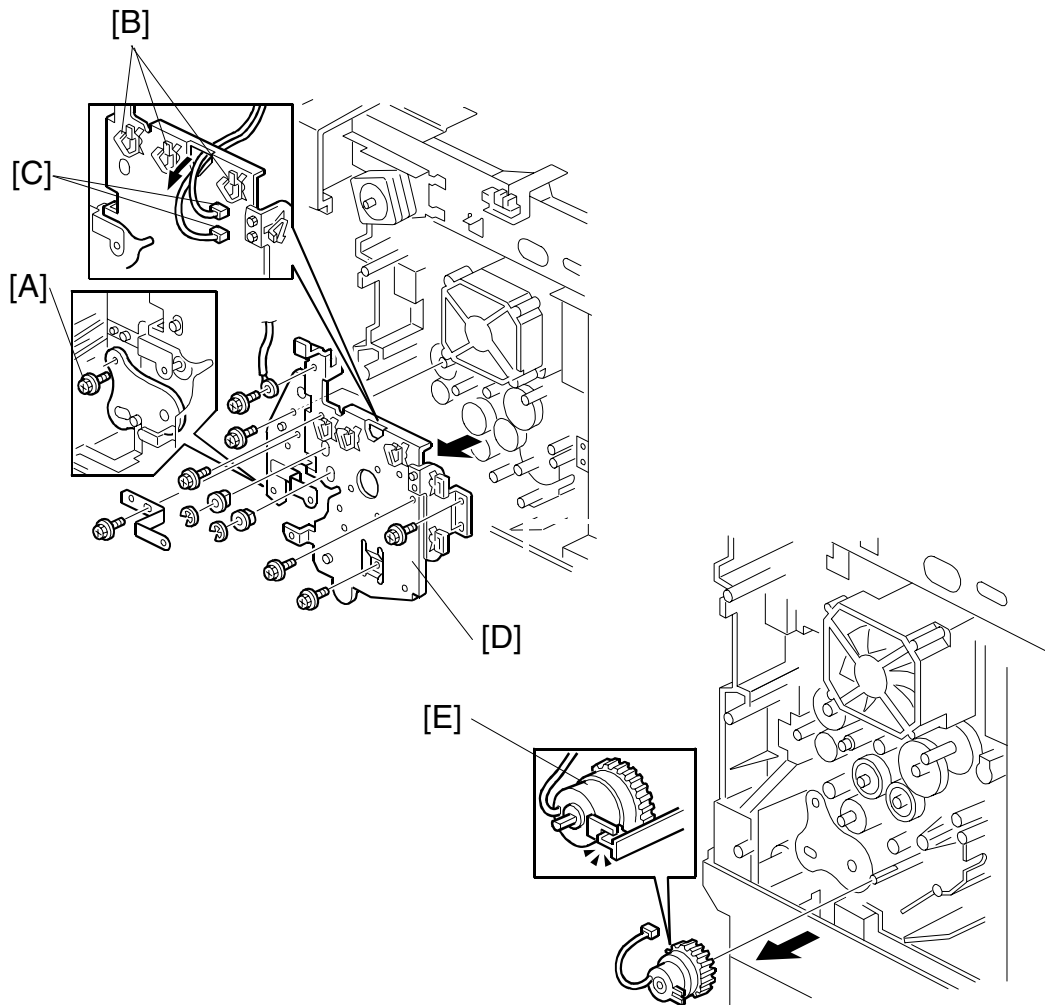
1. Pull the paper tray partially out of the unit.

2. High-voltage power supply board
   (☛ 3.12.2)

3. Main motor (☛ 3.12.4)

4. Remove 1 screw [A] from the small cover plate.

5. Open 3 clamps [B] on the large cover plate, and remove the wiring.

6. Detach two connectors [C] from the FCU.

7. Large cover plate [D] (𝄇 × 7, ℂ × 2, 2 bushings)

8. Paper feed clutch [E]

3.9 IMAGE TRANSFER

3.9.1 IMAGE TRANSFER ROLLER

1. Right door (☛ 3.3.9)

2. Raise the levers ([A], [B]) at the ends of the image transfer roller, and remove the roller [C].

   NOTE: 1) Note the position of the 2 springs [D] at each end. When reinstalling the roller, be sure that the pegs on the plastic end pieces fit into the springs.
   2) Do not touch the transfer roller surface with bare hands.
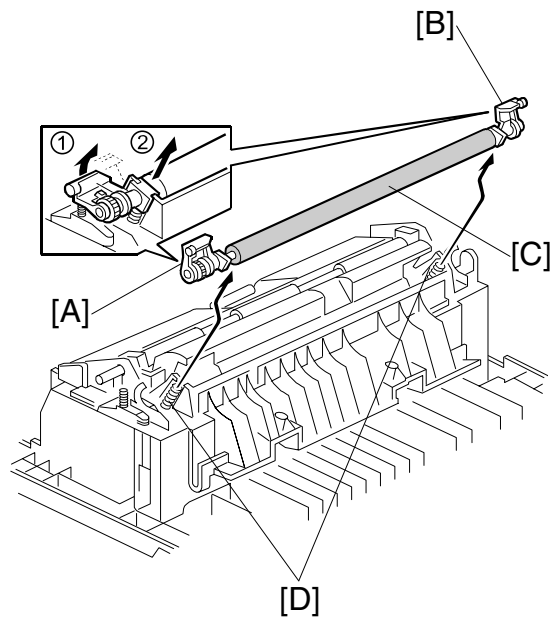
3.9.2 ID (IMAGE DENSITY) SENSOR
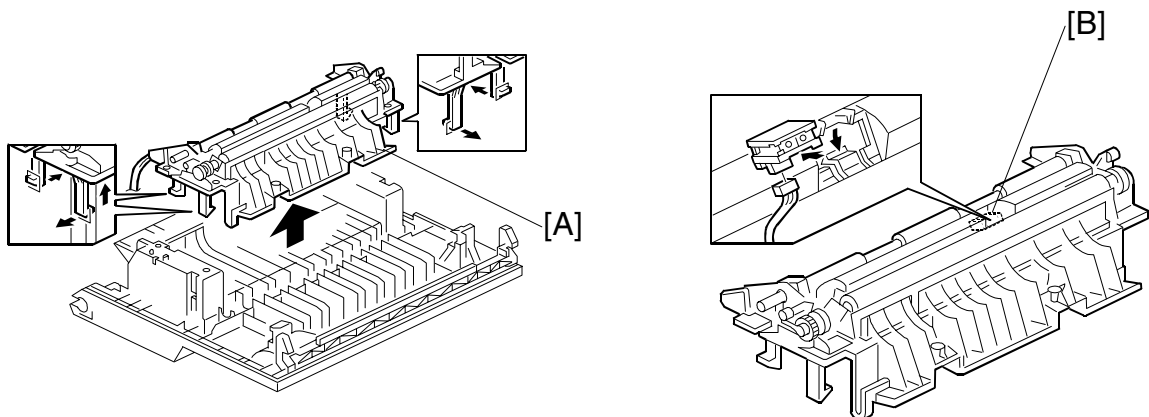
1. Right door (☛ 3.3.9)

2. Push in the latches as shown, and pry off the entire section [A].

3. ID sensor [B] (⬡ × 1)
   NOTE: This machine has no SC codes for ID sensor errors. If imaging problems occur, such as dirty background, use SP2-221. Use SP7-911 to check the number of ID sensor errors.

3.9.3 DISCHARGE PLATE

1. Right door (☛ 3.3.9)

2. Use a tweezers to remove the discharge plate [A].
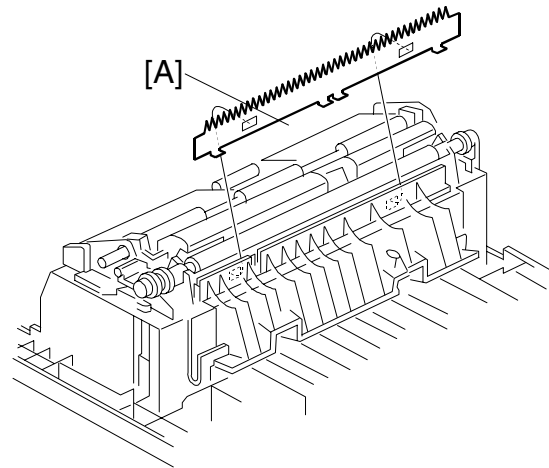
3.10 FUNCTION CONTROL UNIT (FCU)

NOTE: 1) Before starting replacement, use SP5-824 to save SRAM user data from the existing FCU into a flash memory card. After finishing the replacement, use SP5-825 to reload the data from the card into the SRAM on the new FCU. For instructions, see Section 5.1.8.
2) Replacement FCUs ship with the battery jumper switch set to the OFF position. Be sure to change the jumper switch to the ON position before installing the replacement FCU.

Faxless machine

Fax-equipped machine:

[B]

[A]

[D]

[C]
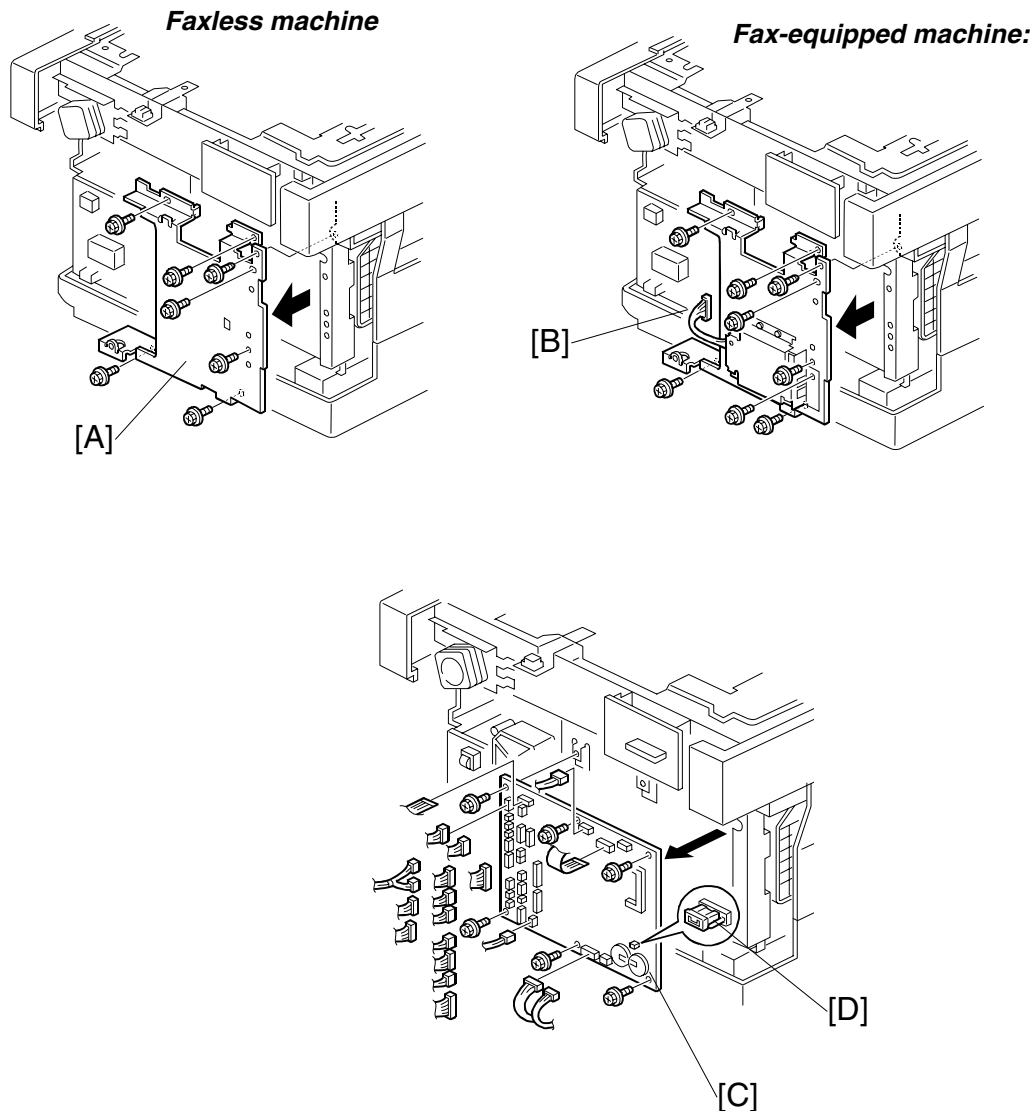
Replacement and Adjustment

1. Rear cover (☛ 3.3.2)

2. FCU cover plate [A] (7 screws on faxless machines, 8 on fax-equipped machines)

   NOTE: On fax-equipped machines, detach the NCU connector [B] first, then unscrew the cover plate and remove the cover plate together with the NCU.

3. FCU [C] (all connectors, 2 flat cables, 🖋 x 6)

   NOTE: If an optional DIMM is installed on the FCU, remove it and install it on the new FCU. (☛ 1.6)

4. Before installing the new board, set the new board's TB1 battery jumper switch [D] to the ON position.

3.11 LASER UNIT

> ⚠️**WARNING**
>
> **The laser beam can cause serious eye damage. Be sure that the main power switch is off and that the machine is unplugged before accessing the laser unit.**

3.11.1 LOCATION OF "CAUTION" DECAL

CAUTION
VORSICHT

INVISIBLE LASER RADIATION WHEN OPEN.
AVOID EXPOSURE TO BEAM
UNSICHTBARE LASERSTRAHLUNG
WENN ABDECKUNG GEÖFFNET.
NICHT DEM STRAHL AUSSETZEN.

>PS<
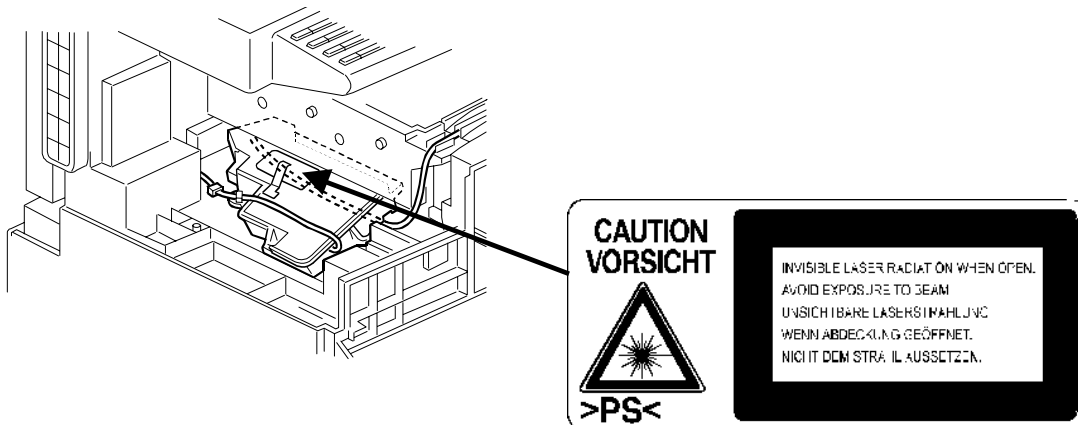
3.11.2 PSU BRACKET

1. FCU (☛ 3.10)
   NOTE: After removing the copy tray, leave the front door open.

2. Remove the 4 screws at [A].

[A]
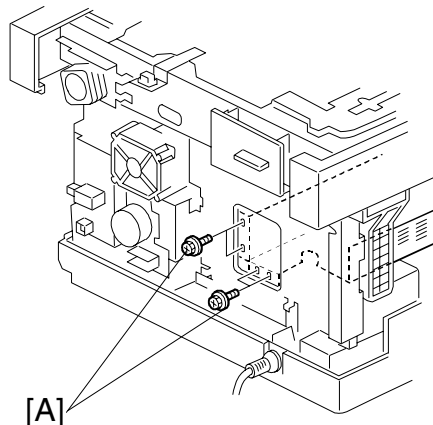
3. Unscrew the 6 screws securing the PSU bracket [B], and detach the 4 connectors.
   NOTE: Use a stubby screwdriver to remove the 2 screws at [C].

4. Hold the PSU bracket at the rear (viewing from the front of the machine), pull the rear end out to the left slightly, then lift the bracket upward at the rear so that it comes free of the hooks [D] at the front.

5. Pull the PSU bracket out.

[C]

[B]

[D]

Replacement and Adjustment
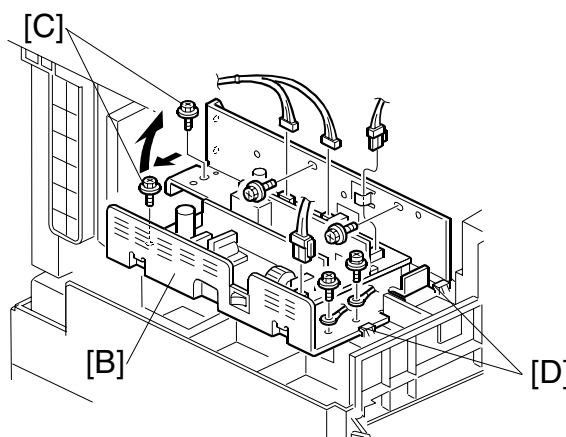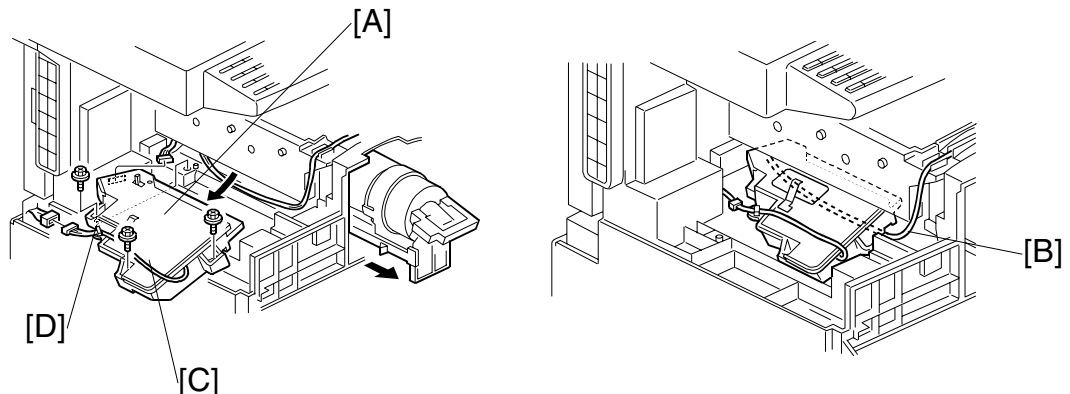
3.11.3 LASER UNIT

1. PSU bracket (☛ 3.11.2)
   NOTE: After removing the PSU bracket, leave the front door open.

2. Release the toner bottle holder (if model B044 or B046) or THM (if model B045), and pull it out slightly. (Illustration shows toner-bottle model.)

3. Laser unit [A] ($\mathscr{P}$ x 3, ▣ x 2)
   NOTE: When reinstalling the laser unit, be sure that the wire at [B] passes under the unit. In particular, be certain that the wire does not pass in front of the glass area on the unit.

3.11.4 LD UNIT

1. Laser unit (☛ 3.11.3)

2. Remove the harness ([C] in figure above) from the clamp [D].

3. Laser unit cover [E] ($\mathscr{P}$ x 2)

4. LD unit [F] ($\mathscr{P}$ x 2)
   NOTE: The LD drive board itself is not adjustable, and is not a replaceable part. You must replace the entire bracket.
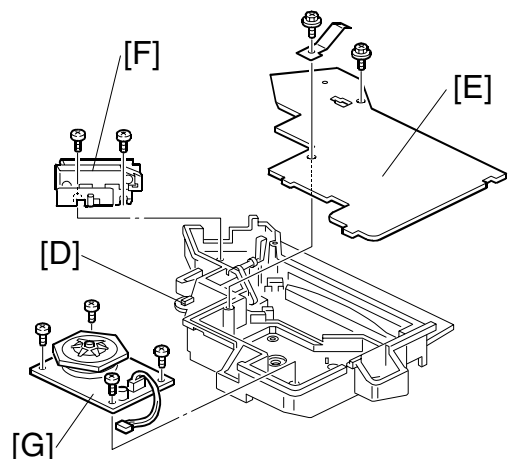
3.11.5 POLYGON MIRROR MOTOR

1. Laser unit (☛ 3.11.3)

2. Remove the harness ([C] in figure above) from the clamp [D].

3. Laser unit cover [E] ($\mathscr{P}$ x 2)

4. Polygon mirror motor [G] ($\mathscr{P}$ x 4)

3.12 OTHER REPLACEMENTS

3.12.1 QUENCHING LAMP

1. PCU (☛ 3.1.3)

2. Quenching lamp [A] (⬚ × 1)

[A]
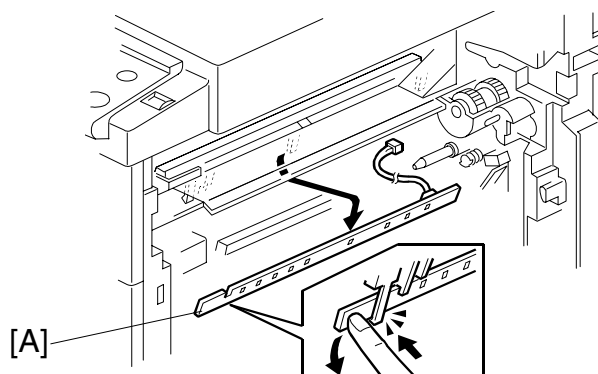
3.12.2 HIGH-VOLTAGE POWER SUPPLY BOARD

1. Rear cover (☛ 3.3.2)

2. High-voltage power supply
   board [A] (🔩 × 4, all connectors)

[A]
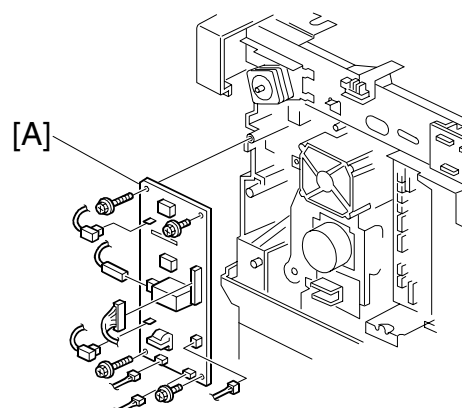
3.12.3 PSU

1. Copy tray

2. PSU [A] (🔩 × 6, all connectors)

[A]
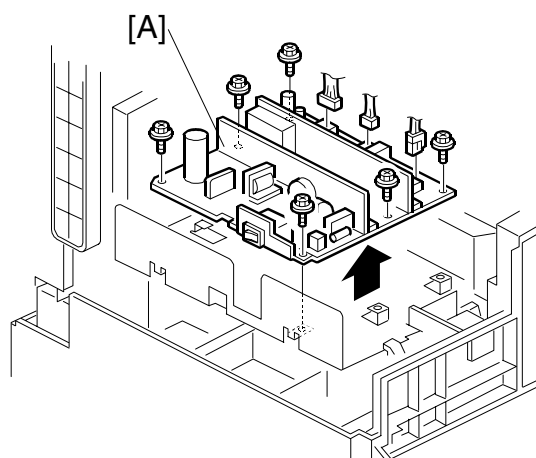
3.12.4 MAIN MOTOR

1. Rear cover (☛ 3.3.2)

2. Main motor [A] ($\mathscr{F} \times 4$, ▥ $\times 1$)

[A]
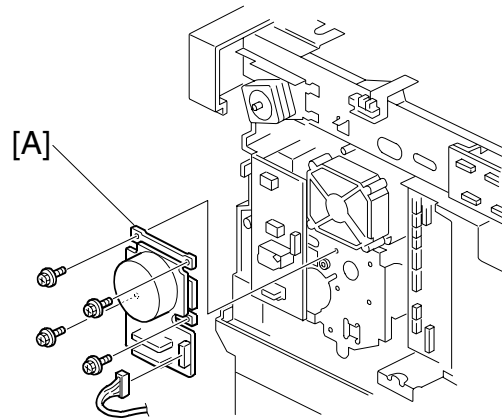
3.12.5 EXHAUST FAN

1. Rear cover (☛ 3.3.2)

2. Exhaust fan [A] ($\mathscr{F} \times 2$, ▥ $\times 1$)

[A]
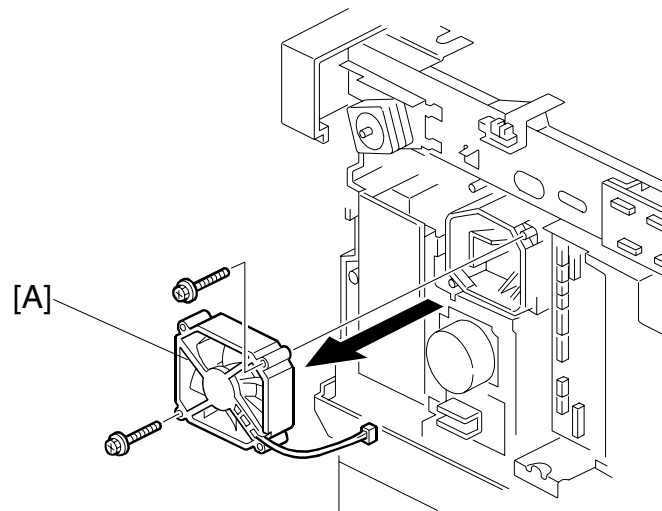
3.13 COPY IMAGE ADJUSTMENTS: PRINTING/SCANNING

NOTE: 1) You need to perform these adjustment after executing a Memory All Clear, and after replacing or adjusting any of the following parts.
- First or second scanner
- Lens Block
- Scanner Motor
- Polygon Mirror Motor
- Paper Tray

2) For detailed explanations about how to access and use SP mode, see Section 5.

3.13.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
2) Use the Trimming Area Pattern (SP5-902, No.10) to print the test pattern for the printing adjustments below.
3) Reset SP5-902 to 0 after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration [A] for each paper feed station, and adjust each of these registrations using SP1-001.

Tray	SP mode	Specification
Paper tray(s)	SP1-001-1	0 ± 2 mm
100-sheet bypass	SP1-001-2	0 ± 2 mm
1-sheet bypass		0 ± 4 mm

2. Check the side-to-side registration [B] for each paper feed station, and adjust these registrations using SP1-002. (Adjust the trays in order: the 1st tray first, then the 2nd tray [if installed], then the bypass).

Tray	SP mode	Specification
1st tray	SP1-002-1	0 ± 2 mm
2nd tray	SP1-002-2	
100-sheet bypass	SP1-002-5	0 ± 2 mm
1-sheet bypass		0 ± 4 mm
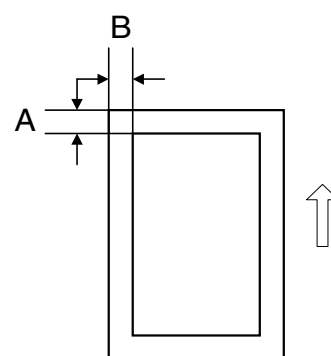
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge or side-to-side registration cannot be adjusted to within the specification, then adjust the leading-edge blank margin or the left-side blank margin.

1. Check the trailing edge and right side edge blank margins, and adjust them using the following SP modes.

	SP mode	Specification
Trailing edge (except for 1-sheet bypass)	SP2-101-4	3 ± 2 mm
Trailing edge for 1-sheet bypass	SP2-101-12	5 ± 3 mm
Right edge	SP2-101-6	2 +2.5/-1.5 mm
Leading edge (except for 1-sheet bypass)	SP2-101-1	3 ± 2 mm
Leading edge for 1-sheet bypass	SP2-101-11	5 ± 3 mm
Left edge	SP2-101-5	2 ± 1.5 mm
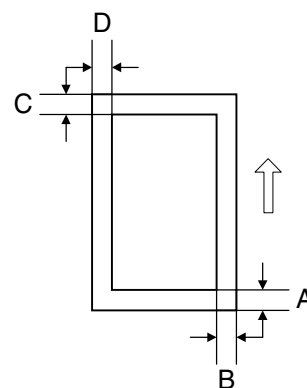
A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin

Main-Scan Magnification

1. Print the single-dot grid pattern (SP5-902-5).

2. Check the magnification (the grid size should be 2.7 x 2.7 mm), and if necessary use SP2-998 to adjust it. The specification is 100 ± 1% in both directions.

3.13.2 SCANNING

NOTE: 1) Before doing the following scanner adjustments, check and adjust the printing leading-edge and side-to-side registrations and the printing blank margins (as described above).

2) Use an A4 test chart to perform the following adjustments.

Registration: Platen Mode

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.

2. Check the leading edge registration [A], and adjust as necessary using SP4-010. (Specification is 0 ± 2mm.)
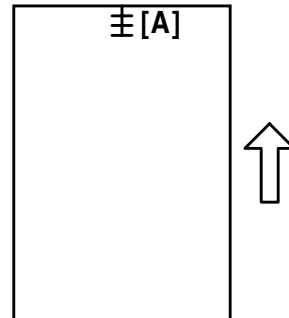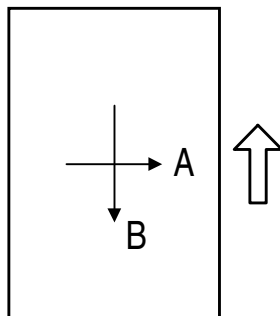
Magnification

A: Main scan magnification
B: Sub-scan magnification

Main Scan Magnification

1. Place the A4 test chart on the exposure glass and make a copy from one of the feed stations.

2. Check the magnification ratio. If necessary, adjust the magnification using the following SP mode.

	SP mode	Specification
Main Scan Magnification	SP4-008	± 1.0%

Sub-scan Magnification

1. Place the A4 test chart on the exposure glass and make a copy from one of the feed stations.

2. Check the magnification ratio. If necessary, adjust the magnification using the following SP mode.

	SP mode	Specification
Sub-scan magnification	SP4-101	± 1.0%

Standard White Density Adjustment

This procedure adjusts the standard white density level. Carry out this adjustment after doing any of the following:

- After replacing the standard white plate.
- After replacing the FCU.
- After replacing the lens block.
- After performing a memory all clear (SP5-801).

Procedure:

1. Place 10 sheets of new A4 paper on the exposure glass, and close the platen cover.

2. Access SP4-908, enter "1", and press *OK*. The machine automatically adjusts the standard white density.

3.13.3 DF IMAGE ADJUSTMENT

Registration and Blank Margin
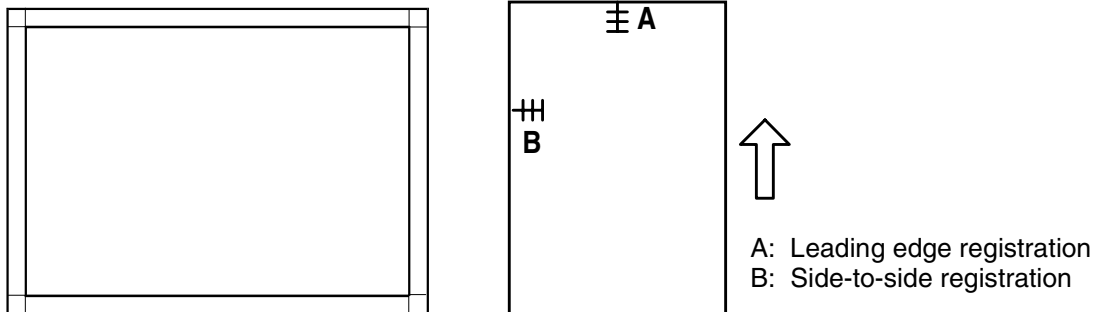
A: Leading edge registration
B: Side-to-side registration

NOTE: Make a temporary test chart as shown above, using A4 / 8$_{1/2}$"x11" paper.

1. Place the temporary test chart on the DF and make a copy from one of the feed stations.

2. Check the registrations, and adjust as necessary using SP mode, as follows.

	SP mode
Side-to-side registration	SP6-006-1
Leading edge registration	SP6-006-2
Blank margin for the trailing edge	SP6-006-3

Sub-scan Magnification
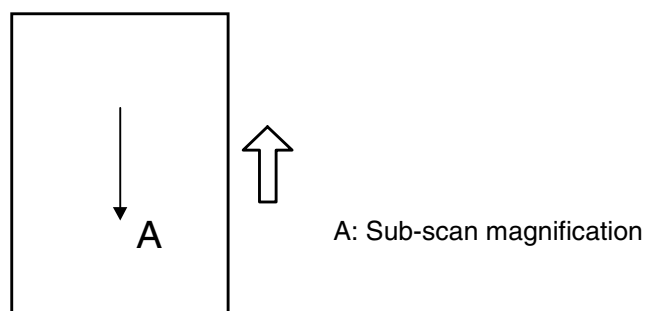
A: Sub-scan magnification

NOTE: Make a temporary test chart as shown above, using A4 / 8$_{1/2}$"x11" paper.

1. Place the temporary test chart on the DF and make a copy from one of the feed stations.

2. Check the registration, and if necessary adjust it using SP6-007. The specification is ±1.0%.

TROUBLESHOOTING

4. TROUBLESHOOTING

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are two service-call levels, as follows.

Level	Definition	Reset Procedure
A	To prevent possible damage to the machine, level-A service calls can be cleared only by a service representative The machine will not operate until the representative clears the call.	Enter SP 5-810 (SC code reset) and select "1". Then simultaneously press the *Original Type* key and the *OK* (or $^{(R/\#)}$) key. (There is no need to turn the main switch off and on.).
B	These SCs can be cleared by turning the main power switch off and on.	Turn the main power switch off and on.

NOTE: 1) *If a problem involves circuit boards:* Before deciding to replace a circuit board, first see if you can solve the problem by disconnecting and then reconnecting all connectors.
2) *If a problem involves a motor lock:* Check the mechanical load first, before deciding whether to replace motors or sensors.
3) If working on a fax-equipped machine, keep in mind that switching power off and back on may in some cases cause loss of data stored in SAF memory.

Trouble-
shooting

4.1.2 SC CODE DESCRIPTIONS

No. Definition			Symptom	Possible Cause
SC Code	Error Code	Level		
101	1-04	B	Exposure Lamp Error	
			Insufficient white level detected when scanning the white plate.	• Exposure lamp defective • SBU harness defective • Bad connection • Defect in optics system (dirty scanner mirror, mirror out of position, etc.) • Lamp stabilizer board (or connector) defective • Incorrect start position or length for white plate scanning (☛ SP4-015) • Scanner HP sensor out of position
120	9-93	B	Scanner home position error 1	
			Scanner home position sensor did not detect OFF condition during initialization or copying.	• Forgot to remove one or more of the scanner stoppers • Scanner motor defective • Scanner HP sensor (or connector) defective • FCU defective • Scanner belt loose or detached
121	9-92	B	Scanner home position error 2	
			Scanner home position sensor did not detect ON condition during initialization or copying.	• Forgot to remove one or more of the scanner stoppers • Scanner motor defective • Scanner HP sensor (or connector) defective • FCU defective • Scanner belt loose or detached
122	9-91	B	Scanner home position error 3	
			Scanner home position sensor did not detect OFF condition during book or ADF scan operation.	• Forgot to remove one or more of the scanner stoppers • Scanner motor defective • Scanner HP sensor (or connector) defective • FCU defective • Scanner belt loose or detached
123	9-90	B	Scanner home position error 4	
			Scanner home position sensor did not detect ON condition during book or ADF scan operation.	• Forgot to remove one or more of the scanner stoppers • Scanner motor defective • Scanner HP sensor (or connector) defective • FCU defective • Scanner belt loose or detached

No. Definition			Symptom	Possible Cause
SC Code	**Error Code**	**Level**		
192	1-05	B	SBU auto-adjustment error	
			During SBU auto-adjustment (☛ SP4-908), the detected white level was out of range.	• SBU auto adjustment was not done correctly (☛ 3.13) • Exposure lamp defective • SBU harness defective • Bad connection • Defect in optics system (dirty scanner mirror, mirror out of position. etc.) • Defective stabilizer board (or connector) • Incorrect start position or length for white plate scanning (☛ SP4-015) • Scanner HP sensor out of position
302	9-17	B	Charge roller current leak	
			Current leak at the charge roller was detected.	• Charge roller damaged • High voltage supply board defective • Poor connection of the PCU
320	9-23	B	Polygon mirror motor error	
			Did not detect lock signal from polygon mirror motor within 10 seconds after motor ON signal; or, lost lock signal for continuous 1.5 seconds after signal was detected.	• Polygon mirror motor (or harness) defective • FCU defective
322	9-20	B	Laser synchronization error	
			Detected LD error signal for continuous 1.5 seconds while polygon mirror motor was running at constant speed.	• Synchronization detection mirror defective • LD unit defective • FCU defective • LD harness damaged • THM not in place
390	9-73	B	TD sensor error	
			The TD sensor output less than 0.33 V or greater than 2.64 V ten times in succession.	• TD sensor defective • Bad connection
391	9-29	B	Development bias leak	
			Development bias leak signal was detected.	• Development roller defective • High voltage supply board defective
392	9-74	B	Developer initialization error	
			Error reading ID sensor pattern during developer initialization.	• Forgot to remove heat seal from replacement PCU • ID sensor defective • TD sensor defective • Drum is not turning • Development roller is not turning • Right door not closed firmly

Trouble-shooting

SERVICE CALL CONDITIONS

No. Definition			Symptom	Possible Cause
SC Code	Error Code	Level		
401	9-29	B	Transfer roller leak error 1 ("+" leak)	
			A current leak signal for the transfer roller was detected. (Current feedback signal was not detected for at least 200ms).	• Transfer roller damaged • High voltage supply board defective • Poor connection between transfer unit and machine • Transfer unit set incorrectly
402	9-29	B	Transfer roller leak error 2 ("-" leak)	
			A current leak signal for the transfer roller was detected. (Current feedback signal was not detected for at least 200ms).	• Transfer roller damaged • High voltage supply board defective • Poor connection between transfer unit and machine • Transfer unit set incorrectly
500	9-24	B	Main motor lock error	
			Failed to detect main motor lock signal for 7 checks in succession (total of 700ms) after main motor started to rotate, or after last lock signal was detected. (☛ 4.4)	• Main motor defective • Too much load on the drive mechanism • Motor driver damaged
541	9-22	A	Fusing thermistor open	
			Thermistor generated abnormal values immediately after 24V power on. (☛ 4.4)	• Fusing thermistor defective or disconnected • Fusing lamp defective • Fuse blown • PSU defective • Bad connection between fuser and machine
542	9-22	A	Fusing temperature warm-up error	
			During fusing warm-up, fusing temperature failed to reach target range within 22 seconds (when starting at least 25°C below the target temperature). (☛ 4.4)	• Fusing thermistor defective • Fusing lamp defective • Thermofuse blown • PSU defective • Bad connection between fuser and machine
543	9-22	A	Fusing overheat error	
			Detected fusing temperature remained above 230°C for 1 second. (☛ 4.4)	• Fusing thermistor defective • PSU defective
544	9-22	A	Fusing low temperature error	
			Detected fusing temperature remained abnormally low for 1 second during fusing operation (below 140°C) or during stand-by mode. (☛ 4.4)	• Fusing thermistor defective • PSU defective • Bad connection between fuser and machine

No. Definition			Symptom	Possible Cause
SC Code	Error Code	Level		
546	9-22	A	Unstable fusing temperature	
			Detected that fusing temperature changed more than ± 25°C/second two seconds in succession. (☛ 4.4)	• Fusing thermistor defective • PSU defective • Bad connection between fuser and machine
547	9-22	B	Zero-cross detection error	
			Detection error (detection overflow or busy) occurred 8 times in succession (at 20-ms intervals) while 24V power was on. (☛ 4.4)	• PSU defective • FCU defective
548	9-22	A	Fusing-temperature range violation (too high)	
			During paper transport, fusing temperature moved above limit (200°C for plain paper, 210°C for thick paper) and remained above limit for 10 seconds. (☛ 4.4)	• TRIAC short • Fan not running
549	9-22	A	Fusing-temperature range violation (too low)	
			During paper transport, fusing temperature fell below lower limit (155°C) and remained below limit for 6 seconds. (☛ 4.4)	• Fusing thermistor defective • PSU defective
550	9-22	A	Standby temperature error 1	
			Fusing temperature failed to drop to expected level within a given time (15 seconds, 15 minutes, or 25 minutes, depending on mode) after entering standby or low-power mode. (☛ 4.4)	• TRIAC short • Fan not running
551	9-22	A	Standby overheat	
			Temperature during standby or low-power mode remained too high for a specified interval (10 seconds or 25 seconds, depending on the mode). (☛ 4.4)	• TRIAC short
552	9-22	A	Standby low temperature error	
			After reaching expected temperature in low-power mode (level 1) or standby mode, temperature fell and remained below 155°C for 20 seconds. (☛ 4.4)	• Fusing thermistor defective • PSU defective

Trouble-shooting

SERVICE CALL CONDITIONS

No. Definition			Symptom	Possible Cause
SC Code	Error Code	Level		
692	9-49	B	Communication error between FCU and printer controller	
			Printer failed to acknowledge message from FCU within 1.2 seconds.	• Printer controller defective • FCU defective • Poor connection between FCU and printer controller
900	9-79	B	Electrical total counter error	
			The electrical total counter is not working properly.	• SRAM defective. *The only way to correct this error is to replace the FCU.*
901	9-78	B	Mechanical total counter	
			The mechanical total counter is not working properly.	• Mechanical total counter disconnected
2001	9-48	B	Printer controller self-diagnostic error	
			Printer controller's power-on self-diagnostic detected an error.	• Self-diagnostic error
2002	9-47	B	Printer controller: FGATE error	
			Printer application returned FGATE error notification to copier.	• FGATE error

4.2 ELECTRICAL COMPONENT DEFECTS

4.2.1 SENSOR/SWITCH OPEN ERRORS

Sensor or Switch	CN	Symptom
Registration Sensor	FCU 27-2	"A" or "Y" paper jam reported.
Paper End Sensor	FCU 29-2	Paper-end error when attempting to feed from main tray. Fax key blinks red.
Bypass Paper End Sensor *(B044 and B046 only)*	FCU 30-2	"Paper End" message when attempting to feed from bypass tray. .
Exit Sensor	FCU 28-2	"A" or "Y" paper jam reported.
Image Density (ID) Sensor	FCU 32-1	Toner control process changes.
Toner Density (TD) Sensor	FCU 23-3	"Reset PCU Correctly" message appears, and Caution indicator stays on.
Scanner HP Sensor	FCU 26-3	SC120 is displayed.
Platen Cover Sensor	FCU 26-5	Delays start of polygon motor by a few seconds. (Longer time for first copy.)
ADF Guide Open Sensor	DF 105-5	"Close ADF" message appears, and Caution indicator stays on.
ADF Original Set Sensor	DF 105-7	Fails to detect originals at ADF.
ADF Registration Sensor	DF 105 2	"P" paper jam reported.
Front/Right Door Switch	FCU 14	"Close Front/Right Cover" message appears, and the Caution indicator stays on.

4.3 BLOWN FUSE CONDITIONS

| Fuse | Rating | | At main switch ON |
	120 V	220 – 240 V	
Power Supply Board			
FU1	12 A/125 V	6.3 A/250 V	No response.
F2	1 A/250 V	1 A/250 V	Anti-condensation heater (option) does not turn on.
F3	4 A/250 V	2 A/250 V	No response.
F201	5 A/250 V	5 A/250 V	No response.

Trouble-
shooting

4.4 DUMPING THE FUSER TEMPERATURE LOG

The FCU monitors the fuser temperature and maintains a log of the most recent temperature values. If a heating-related SC error occurs (error code "9-22"; SCs 541 to 552), you may wish to print out a dump of the logged data before clearing the SC condition. The printout can then be submitted for analysis.

To dump the log, proceed as follows.

1. Before clearing the SC, use SP7-955 to write "02h" into address 40191C. This freezes the log data.

2. Clear the SC.

3. Use SP-992 setting "3" (☛ 5.1.5) to print out a dump of addresses 401900 to 410CFF.

4. Use SP7-955 to write "00h" into 40191C. This will restart temperature logging.

SERVICE TABLES

5. SERVICE TABLES

5.1 USING SERVICE PROGRAM MODE

Use the service program mode (SP mode) to check electrical data, change operating modes, and adjust values.

Accessing SP Mode

How to Enter SP Mode

1. Key in the following sequence.

   $\boxed{\circledast\ \ } \rightarrow \textcircled{1} \rightarrow \textcircled{0} \rightarrow \textcircled{7} \rightarrow \textcircled{C/\circledcirc}$

   - Hold the $\textcircled{C/\circledcirc}$ key down for longer than 3 seconds.

2. The LCD displays a menu.

   ```
   [Service P-Mode]  No._
   1 Copy 2 Fax 3 Printer
   ```

   NOTE: Installed applications appear on the menu as follows: "1.Copy", "2. Fax", "3. Printer". If an application is not installed, the corresponding item does not appear.

3. Press the number for the application mode you need. (For example, press "1" to select the copier application mode.) The selected SP mode display appears on the LCD, as shown.

   ```
   SP H5557200  E1 class1
   No.1 Feed
   ```

How to Exit SP Mode

Press $\boxed{\circledast\ \ }$ or the *Cancel* key one or more times to return to the standby-mode display.

Accessing Copy Mode from within SP Mode

1. Press the $\circledast$ key.

2. Select the appropriate copy mode and make trial copies.
   NOTE: The *User Tools* LED flashes while you are using copy mode from within SP mode.

3. To return to SP mode, press the $\boxed{\circledast\ \ }$ key.

Service
Tables

How to Select a Program Number

```
C1(1)Feed
C2 No.  1
```

Each SP number consists of two or three levels ("classes"). To select a program, you need to enter each class number in sequence.

1. Enter the first-class program number with the numeric keypad (or change the number using the *Right* or *Left* cursor key), and then press the ⓡ key or the *OK* key.

2. Enter the second-class program number with the numeric keypad (or *Right* or *Left* cursor key), and press ⓡ or *OK*.

3. To select a third-class program: select the second-class number and then use the *Right* or *Left* cursor key.

4. To return to the next higher class, press ▣▭.

NOTE: 1) If the screen is not large enough to display information about all of the available selections, the screen displays a solid semicircle mark as shown below. The mark means that you can press the *Darker* key to view the contents for each selection.
  2) An asterisk (*) to the right of mode name indicates that its value has been changed from the default.

```
SMC Printing
(1 - 5) ▶ 0
```

To Input a Value or Setting

1. Enter the required program mode as explained above.

2. Enter the required setting using the numeric keys, and then press ⓡ or the *OK* key.

NOTE: 1) If you forget to press ⓡ or *OK*, the previous value remains in effect.
  2) If necessary, use the ⊙ key to select "+" or "−" when entering the value.

5.1.1 SP MODE TABLES

NOTE: 1) An asterisk (*) after the SP number means that this SP's value is stored in the SRAM. If you do a RAM reset, all these SP settings will be returned to their factory defaults.

2) In the Function/[Setting] column:
- Comments are in *italics*.
- The setting range is enclosed in brackets, with the default setting written in **bold**.
- **DFU** stands for **D**esign/**F**actory **U**se only. Values marked **DFU** should not be changed.
- **IAJ** means that you should refer to Section 3.13 ("Replacement and Adjustment – Copy Image Adjustments") for more information. **IP** means that you should refer to Section 6.7, (Detailed Descriptions – Image Processing").

SP1-XXX (Feed)

1		Mode Number/Name	Function/[Setting]
001*		Leading Edge Registration	
	1	Paper tray (copy, fax)	Adjusts the plotter leading-edge registration from each paper feed station. Use the Trimming Area Pattern (SP5-902, No.10) to make the adjustment.) [–9.0 ~ 9.0 / **0.0** / 0.1 mm/step] **IAJ**
	2	Bypass (copy fax)	
	4	Paper tray (optional printer)	
	5	Bypass (optional printer)	• *Specification: 0 ± 2 mm* • *Use the ⟳ key to select "+" or "–" when entering the value.*
002*		Side-to-Side Registration	
	1	1st tray	Adjusts the printing side-to-side registration from each paper feed station. (Use Trimming Area Pattern (SP5-902, No.10) to make the adjustment.) The 2nd-tray adjustment is for the optional tray. [–9.0 ~ 9.0 / **0.0** / 0.1 mm/step] **IAJ**
	2	2nd tray	
	5	Bypass	• *Specification: 0 ± 2 mm* • *Use the ⟳ key to select "+" or "–" when entering the value.*
003*		Paper Feed Timing	
	1	1st tray	Adjusts the amount of buckle the paper feed clutch applies to the paper (by adjusting delay between triggering of the registration sensor and activation of registration clutch). A higher setting applies greater buckling. [0 ~ 10 / **5** / 1 mm/step]
	2	Other trays	
	3	Bypass	
106		Fusing Temperature Display	
	1		Displays the fusing temperature. *Press ▨ to exit the display.*

Service Tables

1		**Mode Number/Name**	**Function/[Setting]**
109		Fusing Nip Band Check	
	1		Checks the fusing nip band. [**1 = No** / 0= Yes] **DFU**
901		Auto-Restart Interval	
	1		Sets the time interval between completion of one copy and automatic start of next copy. [0 ~ 9999 / **0** / 1 s] **DFU**
902		AC Frequency Display	
	1		Displays the fusing lamp power control frequency (as detected by the zero cross signal generator), in Hz.

SP2-XXX *(Drum)*

2		**Mode Number/Name**	**Function/[Setting]**
001*		Charge Bias Adjustment	
	1	Image area	Adjusts the voltage applied to the charge roller when printing. [–1800 ~ –1500 / **–1650** / 1 V/step] *The actually applied voltage changes automatically as charge roller voltage correction is carried out. The value you set here becomes the base value on which this correction is carried out.*
	2	ID sensor pattern	Adjusts the voltage applied to the charge roller when generating the ID sensor pattern. [0 ~ 400 / **200** / 1 V/step] *The actual charge-roller voltage is obtained by adding this value to the value of SP2-001-1.*
	3	Manual	Use this feature to adjust the voltage to the image area when diagnosing a problem. [-1900 ~ 0 / **0** / 1 V/step] • *The value is applied as an offset to the value set by SP2-001-001.* • *This setting is lost at power-off.*
005		Charge Bias Correction	
	1	Vsdp min.	Sets lower limit for application of charge-bias correction. [0 ~ 100 / **90** / 1%/step] *Correction is applied if Vsdp/Vsg is less than this value.*
	2	Vsdp max.	Sets upper limit for application of charge-bias correction. [0 ~ 100 / **95** / 1%/step] *Correction is applied if Vsdp/Vsg is greater than this value.*
	3	Correction step	Sets the correction step (the amount of voltage added or subtracted for each correction). [0 ~ 200 / **50** / 1V/step]

2	Mode Number/Name		Function/[Setting]
101*	Erase Margin Adjustment		
	1	Leading edge	Adjusts the leading edge erase margin. [0.0 ~ 9.0 / **3.0** / 0.1 mm/step] **IAJ** *Does not apply to 1-sheet bypass feed.*
	4	Trailing	Adjusts the trailing edge erase margin. [0.0 ~ 9.0 / **4.0** / 0.1 mm/step] **IAJ** *Does not apply to 1-sheet bypass feed.*
	5	Left side	Adjusts the left edge erase margin. [0.0 ~ 9.0 / **2.0** / 0.1 mm/step] **IAJ**
	6	Right side	Adjusts the right edge erase margin. [0.0 ~ 9.0 / **2.0** / 0.1 mm/step] **IAJ**
	11	1-sheet bypass leading edge	Adjusts the leading edge erase margin for 1-sheet bypass. [0.0 ~ 9.0 / **4.5** / 0.1 mm/step] **IAJ**
	12	1-sheet bypass trailing	Adjusts the trailing edge erase margin for 1-sheet bypass. [0.0 ~ 9.0 / **4.5** / 0.1 mm/step] **IAJ**
201*	Development Bias Adjustment		
	1	Image area	Adjusts the voltage applied to the development roller when printing. [–800 ~ 0 / **–600** / 1 V/step] • *This can be adjusted as a temporary measure if faint copies are being produced due to an aging drum.*
	2	ID sensor pattern	Adjusts the voltage applied to the development roller when generating the ID sensor pattern. [**0 = N (200 V)** / 1 = H (240 V) / 3 = HH (280 V) / 4 = LL (120V)] *The actual voltage applied is this setting – 600V.*
213*	Copies after Toner Near End		
	1		Sets the number of copy/print/fax pages that can be made after toner near-end has been detected. [**0 = 50 pages** / 1 = 20 pages] *Reduce the number of pages if the user normally makes copies with a high image ratio.*
214	Initial Developer Running		
			Initializes the developer (by forced churning). [**0 = No** / 1 = Yes] • *To start forced developer initialization, you must turn the machine off and back on.* • *Since the machine automatically initializes the developer when a replacement PCU is installed, there is no need to carry out this SP when replacing the PCU.* • *If the machine has not been used for a long period of time, prints may have a dirty background. In this case, use this SP to mix the developer.*

Service Tables

2		**Mode Number/Name**	**Function/[Setting]**
220		TD Sensor Value Display	
	1		Displays: a) Current TD sensor output value (Vt) b) Target TD output value [Vts corrected by ID sensor output] • *The TD sensor output value changes every copy. If a > b, toner is supplied to the development unit.* • *Press ⃟ to exit the display.*
221		ID Sensor Display	
	1		Displays Vsg, Vsp, Vsdp, Vt, and the ID sensor's PWM output. Use these values to check the operational status of the ID sensor. [**0 = No** / 1 = Yes] • *This machine has no SC code for ID sensor errors. If imaging problems occur (such as dirty background), use this SP to determine whether the problem is with toner density control.* • *You can use SP7-911 to check the number of ID sensor errors that have occurred.* • *(☛ 5.1.11)*
301*		Transfer Current	
	1	Normal paper	Adjusts the current applied to the transfer roller when feeding from a paper tray. [0 = −2 μA / **1 = 0 μA** / 2 = +2 μA / 3 = +4 μA] • *Use a high setting if the user normally feeds relatively thick paper (within spec).* • *(☛ 6.14.2, , "Image Transfer Current Timing")*
	2	Thick/Thin paper	Adjusts the current applied to the transfer roller when feeding from the bypass tray. [0 = −2 μA / **−1 = 0 μA** / 2 = +2 μA / 3 = +4 μA] • *Use a high setting (a) if the user normally feeds relatively thick paper, or (b) if waste toner is re-attracted from the drum (which can occur when using transparencies).* • *(☛ 6.14.2, , "Image Transfer Current Timing")*
	4	Cleaning	Adjusts the current applied to the transfer roller for roller cleaning. [−10 ~ 0 / **−4** / 1 μA/step] • *Increase the current if toner remains on the roller after cleaning. (Remaining toner may cause dirty background on the rear side.)* • *(☛ 6.14.2, "Image Transfer Current Timing")*
	5	Manual (Temporary)	**DFU**

2	**Mode Number/Name**		**Function/[Setting]**
906*	Tailing Correction		
	1	Shift value	When printing multiple copies, the machine will shift the image writing position by the specified amount after every *n* copies, where *n* is given by SP2-906-2. [0.0 ~ 1.0 / **0.0** / 0.1 mm/step] *When making many copies of an original that contains vertical lines (such as in tables), the paper may not separate correctly. This can cause tailing images (ghosts of the vertical lines continuing past the bottom of the table). This SP corrects the problem by shifting the paper after every specified number of copies.*
	2	Interval	Changes the interval for the image shift specified by SP2-906-1. [1 ~ 10 / **1** / 1 page/step] *If the setting is* n*, the machine executes the shift after the first* n *copies, then shifts back to standard position after the next* n *copies, and so on.*
908	Forced Toner Supply		
	1		Forces the toner bottle (or toner hopper) to supply toner to the toner supply unit. Press "1" to start. [**0 = No** / 1 = Yes] *The machine supplies toner over a total of 15 seconds (1.5 second on, 1.5 second off, repeated 5 times).*
915*	Polygon Mirror Motor Idling Time		
	1		Selects the polygon mirror motor idling time. [0 = None / **1 = 15 s** / 2 = 25 s] *To increase the speed of the first copy, the mirror motor begins idling when the user sets an original, touches a key, or opens the platen cover or DF. If this setting is left at the default (25 s), the motor will stop if the user does nothing for 25 s. If the setting is "0", the motor will not switch off during standby. (Regardless of the setting, the motor will switch off when the machine enters low-power mode.)*
922*	Toner Supply Time		
	1		Adjusts the toner supply motor ON time. [0.1 ~ 5.0 / **0.6** / 0.1 s/step] • *Raising this value increases the toner supply motor ON time. Set to a high value if the user tends to make many copies having high proportions of solid black image areas.* • (☛ 6.12.4, "Toner Density Control")
926*	Standard Vt		
	1		Adjusts Vts (the reference voltage used for new developer). The TD sensor output is adjusted to this value during the TD sensor initial setting process. [0.00 ~ 3.3 / **1.25** / 0.01 V/step] **DFU**

Service Tables

2		**Mode Number/Name**	**Function/[Setting]**
927*		ID Sensor Control	
	1		Selects whether the ID sensor is or is not used for toner density control. [0 = No / **1 = Yes**] *This value should normally be left at "1". If the value is "0", dirty background may occur after long periods of non-use.*
928		Toner End Clear	
	1		Clears the toner end condition without adding new toner. Select "1" then press the ⓡ⁄# key to clear the condition. [**0 = No** / 1 = Yes] *Setting this to "1" will clear the following:* • *Toner end and near-end indicator* • *Toner near-end counter* • *Toner end counter (sheets)* • *Toner end counter (level)* *This function should generally not be used. If you clear the toner end condition without adding new toner, there is a risk that the drum may eventually begin to attract carrier after toner runs out. This attracted carrier may damage the drum.*
929*		Vref Limits	
	1	Upper	Adjust the upper Vref limit. [0.50 ~ 3.50 / **1.80** / 0.01V/step]
	2	Lower	Adjust the lower Vref limit. [0.00 ~ 3.50 / **0.45** / 0.01V/step]
995*		ID Detection Interval	
	1		Sets the interval after which ID detection will be carried out at start of printing (relative to previous ID detection). [0 ~ 999 / **480** / 1 minute/step] *Higher values increase the chance of dirty background. Lower values increase the frequency at which the machine makes ID sensor patterns, increasing the chance that the transfer roller (and rear side of paper) will become dirty.*
998*		Main Scan Magnification (Printing)	
	1		Adjusts the magnification along the main scan direction, for all print modes (copy, fax, printing). [–0.5 ~ +0.5 / **0.0** / 0.1%/step] **IAJ** • *Use the ⓒ⁄* key to select "+" or "–" when entering the value.*

SP4-XXX (Scanner)

4	Mode Number/Name		Function/[Setting]
008*	Main Scan Magnification (Scanner)		
	1		Adjusts the magnification along the main scan direction, for scanning. [–0.9 ~ +9.0 / **0.0** / 0.1%/step] **IAJ** • *Use the ⊙ key to select "+" or "–" when entering the value*
010*	Leading Edge Registration (Scanner)		
	1		Adjusts the leading edge registration for scanning in platen mode. [–2.0 ~ +5.0 / **0.0** / 0.1 mm/step] **IAJ** • *(–): The image moves toward the leading edge.* • *(+): The image moves toward the trailing edge.* • *Use the ⊙ key to select "+" or "–" when entering the value*
011*	Side-to-side Registration (Scanner)		
	1		Adjusts the side-to-side registration for scanning in platen mode. [–0.9 ~ 0.9 / **0.0** / 0.1 mm/step] **IAJ** • *Increasing the value shifts the image to the right* • *Use the ⊙ key to select "+" or "–" when entering the value*
013	Scanner Free Run		
			Performs a scanner free run with the exposure lamp on. [0 = No / 1 = Yes] • *For details about free runs:* ☞ *5.1.7.* • *After selecting "1", press OK or ⊕ twice to start the run. Press ⊙ to stop.*
015*	White Plate Scanning		
	1	Start position	Adjusts the scanning start position on the white plate for auto-shading. [–3.0 ~ +6.0 / **0.0** / 0.1 mm/step] • *Positive settings move the position away from HP.*
	2	Scanning area	Adjusts the end position of the white plate scan, in the main scan direction. The scan begins at the start position [as set by SP4-015-1] and extends for the specified length. [–3.0 ~ +6.0 / **0.0** / 0.1 mm/step] • *The total scanning length (as determined by SP2-015-1 and SP2-105-2) must be at least 2.0mm.*
101*	Sub-Scan Magnification (Scanning)		
	1		Adjusts the actual sub-scan scanning magnification. The higher the setting, the lower the scanner motor speed. [-0.9 ~ +0.9 / **0.0** / 0.1%/step]

Service Tables

4	**Mode Number/Name**	**Function/[Setting]**
902*	Exposure Lamp ON	
		Lets you turn the exposure lamp on and off.
		[0 = Lamp Off / 1 = Lamp On]
		• *To turn the exposure lamp on, press "1". To turn the lamp off, press "0". To exit, press ⌦ or Cancel to exit.*
		• *The scanner moves to the shading position and remains there until you exit the SP.*
		• *The display also shows the minimum and maximum white-plate values (updated every 0.5 sec.).*
908	SBU Auto-Adjustment	
	1	Performs auto scanner adjustment.
		[0 = No (normal operation) / 1 = Yes (start adjustment)]
		• *Use this SP after replacing the white plate, FCU, or lens block, and after executing a Memory All Clear (SP5-801).*
		• *(☞ IAJ, "Standard White Density Adjustment".)*
913*	DF Shading Interval Time	
	1	Adjusts the interval used for shading processing in DF mode.
		[0 ~ 255 / **30** / 1s/step]
		• *Setting this value to 255 will switch off auto-shading between pages of DF copy jobs.*
		• *Light and heat may affect scanner response. Reduce this setting if copy quality indicates that the white level is drifting during DF copy jobs.*
921*	Image Adjustment Selection	
	1	Use this to select the processing mode (pattern) that you wish to set adjustment parameters for. After selecting the mode, you can set the adjustment parameters for that mode using SPs 4-922 to 4-966. **IP**
		There are 11 modes ("Pattern 1" to "Pattern 11"), as follows.
		1 = Text 1 7 = Special 3
		2 = Text 2 8 = Fax Text 1 ("text sharp")
		3 = Photo 1 9 = Fax Photo 1 "(photo smooth)"
		4 = Photo 2 10 = Fax Photo 2 ("photo normal")
		5 = Special 1 11 = Fax Text 2 ("text dropout")
		6 = Special 2
		First use the right or left cursor key to select the mode ["Pattern 1" to "Pattern 11"], and then press "1" to enable adjustment for that mode. Then press *OK*, and then proceed to use SPs 4-922 to 4-966 to make adjustments.
		• *If you press "0" and then press OK, SPs 4-922 to 4-966 will not operate.*

4	**Mode Number/Name**	**Function/[Setting]**
922*	Scanning Density Adjustment	
		Selects the gamma table used for linear adjustment by the mode selected by SP4-921. [**0 = Linear** / 1 = 16-bit gray] **IP**
923*	Notch Selection	
		Selects the value of the center ID adjustment notch for the ID adjustment LEDs. Applies only to the mode selected by SP4-921. [−1 = Light / **0 = Normal** / +1 = Dark] *Normally the center notch is 3 (range 1–5). If −1 is selected, each notch shifts down (becomes lighter). If +1 is selected, each notch shifts up (becomes darker).*
925*	Sharpness Adjustment	
		Adjusts the image sharpness processing (MTF and smoothing coefficients) for the mode selected by SP4-921. [−2 ~ 2 / **0** / 1/step] **IP** *Higher values produce greater sharpness.*
926*	Texture Removal Threshold	
		Adjusts the texture removal threshold for the mode selected by SP4-921. **IP** [0 ~ 4 / **0**], where: 0: The mode's default value is used. 1: Fixed threshold. 2: Varying threshold (low variance) 3: Varying threshold (medium variance) 4: Varying threshold (photo error diffusion)
927*	Line Width Correction	
		Adjusts the line width correction algorithm for the mode selected by SP4-921. Positive settings produce thicker lines; negative settings produce thinner lines. [−2 ~ 2 / **0** / 1/step] **IP**
928*	Independent Dot Erase	
		Selects the dot erase level for the mode selected by SP4-921. Higher settings provide greater erasure. [−2 ~ 2 / **0** / 1/step] **IP**
930	Binary Data Select	
		Not effective on this machine. **DFU**
931*	Uneven Dot Adjustment	
		Selects the bad-dot correction method used by the mode selected by SP4-921. [**0 = selected mode's default** / 1 = off / 2 =1-dot correct / 3 = 2-dot correct / 4 = 3-dot correct / 5 = 4-dot correct] **DFU** (Not effective on this machine.)

Service Tables

4	Mode Number/Name	Function/[Setting]
932*	Auto Density Adjustment	
		[-2 ~ 2 / **0** / 1/step] **DFU** (Not effective on this machine.)
933*	Blank-Page Sensor Level Adjustment	
		[-2 ~ 2 / **0** / 1] **DFU** (Not effective on this machine.)
934*	Peak Setting	
		Sets adjustment the machine will use when setting white peak prior to start of scanning, for the mode selected by SP4-921. [–128 ~ 127 / **0** / 1/step] • *If AE tracking is enabled, the applied peak becomes: [(detected peak + this setting) x approx. 40%]* • *If AE tracking is disabled, the applied peak becomes: [(detected peak + this setting)*
935*	AE Tracking Speed	
		Adjusts the white-peak tracking speed for the mode selected by SP4-921. [–2 ~ 2 / **0** / 1/step] *Negative settings reduce the speed; positive settings increase it.*
936*	Peak Offset Select	
		Sets the peak correction offset for the mode selected by SP4-921. [–2 ~ 2 / **0** / 1/step] **IP** *Negative settings produce better reproduction of low-contrast originals. Positive settings provide better elimination of dirty background.*
961*	Plotter Mode Select	
		Selects the plotter mode used by the processing mode selected by SP4-921. **IP** [**0 = Selected processing mode's default /** 1 = Normal (no correction) / 2 = Toner save / 3 = FCI • *The default varies according to the processing mode selected by SP4-241*
962*	Marking Image Density Conversion	
		Selects the image density conversion for the processing mode selected by SP4-921. [–2 ~ 2 / **0** / 1/step] **IP** *A setting of "0" sets conversion OFF. Negative settings reduce the black marking size, while positive values magnify it.*
963*	Marking Image Density Setting	
		Sets the density adjustment type for the mode selected by SP4-921. **IP** [0 ~ 5 / **0** / 1/step], where: 0: The mode's default value is used. 1: Distortion prevention 2: Distortion prevention and edge correction 3: Normal 4: Light edge correction 5: Dense edge correction

4	**Mode Number/Name**	**Function/[Setting]**
964*	Spot Dot Enhancement Select	
		Selects emphasis used for lone dots, for the mode selected by SP4-921. **IP** [–2 ~ 2 / **0** / 1/step
965*	Toner Save Level	
		Sets the toner save level for the mode selected by SP4-921. [0 ~ 4 / **0** / 1/step], where: 0: The mode's default value is used. 1: Thin lines 2: Mask 1 (with edge detect) 3: Mask 2 (no edge detect) 4: Mask 3 (with edge detect)
966*	Smoothing Select	
		Selects whether smoothing is used for the mode selected by SP4-921. **IP** [0 ~ 4 / **0** / 1/step], where: 0: The mode's default value is used. 1: OFF 2: ON

SP5-XXX (Mode)

5	Mode Number/Name		Function/[Setting]
001	All Indicators On		
			Sets on all indicators on the operation panel, and causes the display to blink (empty for five second, all pixels black for five seconds). *After checking, press* 🖸 *or Cancel to exit.*
302*	Date/Time		
			Sets the date and time. • *For the year value, you can set the last two digits only. (The first two digits are fixed at "20".)* • *You cannot set the seconds value directly. Instead, the seconds value automatically resets to 0 when you enter the setting for the minutes value.* • *Use cursor keys (or OK) to move from field to field (the selected field flashes), and enter values with the numeric keys. Your new settings are saved only if you press OK while the minutes field is selected.*
501*	PM Alarm Mode		
	1	Interval	Sets the base PM interval. [1 ~ 255 / **45** / 1K copies/step] *This setting is meaningful only if SP5-501-2 is set to "1".*
	2	On/Off	Enables/disables the PM alarm for the total number of prints, copies, and faxes. [0 = Disable / **1 = Enable**]
801	Memory All Clear		
			Resets all SP/UP settings and values to their defaults, with the exception of plug-and-play settings (SP5-907), total print counters (SP7-003), and the serial number setting (SP5-811). (☞ *5.1.6*) [**0 = No** / 1 = Yes] • *Before clearing the SRAM, be sure to output an SMC printout of all current SRAM content. (☞ SP5-992).* • *This SP mode should generally not be used.*
802	Free Run		
			Starts a free run of both the scanner and the printer. [**0: = No** / 1 = Yes] • *For details about free runs:* ☞ *5.1.7.* • *After selecting "1", press the OK key (or the* ⊛ *key) twice to start the free run. Press* ⊚ *to stop the free run.*
803	Input Check		
			Displays the signals being received from a selected sensor or switch. (☞ *5.1.3*) *Press* 🖸 *to exit the program.*
804	Output Check		
			Turns on a selected electrical component for test purposes. (☞ *5.1.4*)

5	Mode Number/Name	Function/[Setting]
810	SC Code Reset	
		Resets all level-A service call conditions, such as fusing errors. [**0 = No** / 1 = Yes] • *After selecting "1", hold down the Original Type key and press the OK key (or the ⓡ/# key) to execute the reset. If the reset succeeds, the machine reboots. If it fails, the display shows "Error!!!".* • *(☛ 4.1, "Service Call Conditions")*
811*	Serial Number Input	
		Used to input the machine serial number (normally done at the factory). This is the serial number printed on SMC reports. (☛ 5.1.10)
812*	Service Telephone Number	
		Use this to input the telephone number of the service representative. (This number is displayed when a service call condition occurs.) • *To input a dash, press ⓒ/*.* • *Use ⓒ/© to delete the existing phone number or to delete the last digit that you entered.*
824	SRAM Data Upload	
		Uploads SP and UP settings from the machine's SRAM to a flash memory card. (☛ 5.1.9) [**0 = No** / 1 = Yes] • *This SP is effective only if a flash memory card has been plugged into the machine's card slot.*
825	SRAM Data Download	
		Downloads SP mode data from a flash memory card to the machine's SRAM. (☛ 5.1.9) [**0 = No** / 1 = Yes] • *This SP is effective only if a flash memory card has been plugged into the machine's card slot.*
826	Program Upload	
		Uploads the system program from the machine's SRAM into the flash memory card plugged into the machine's card slot. (☛ 5.1.8) [**0 = No** / 1 = Yes] • *This SP is effective only if a flash memory card has been plugged into the machine's card slot.*
827	Program Download	
		Downloads the system program from a flash memory card to the machine's SRAM. (☛ 5.1.8) [**0 = No** / 1 = Download first 2MB / 2= Download last 2MB] • *This SP is effective only if you have booted the machine from a flash memory card.*

Service Tables

5	Mode Number/Name		Function/[Setting]
837	Program Checksums		
			Displays checksums of the contents of the machine's SRAM.
			• *The screen shows three check sums: "SUM" (total checksum, "B" (boot sum), and "M" (main sum).*
			• *If you have used SP-827 to download new firmware, be sure to reboot the software before running this SP. (If you don't reboot, the screen will show checksums for the previous firmware.)*
901	Printer Free Run		
			Starts a printer free run.
			[**0 = No** / 1 = Yes]
			• *For details about free runs: ☛ 5.1.7.*
			• *After selecting "1", press the OK key (or the ⓡ/# key) twice to start the free run. Press ⓒ/ⓒ to stop the free run.*
902	Test Pattern Print		
	1		Prints a test pattern. (☛ 5.1.2)
906*	Exhaust-Fan Control Timer		
	1		Inputs the fan control time.
			[30 ~ 120 / **30** / 1 s/step]
			The fan maintains existing speed for the specified time before slowing or stopping (after occurrence of an SC or following entry into warm-up, standby, or low-power mode).
907*	Plug & Play Setting		
			Selects the brand name and production name for the Plug and Play function (for Windows 95 and up). These names are registered in the SRAM. If the SRAM becomes defective, these names should be re-registered.
			• *Use the Right or Left cursor key to scroll through the list of brand names. To select a brand name, press the Original Type key and the OK (or ⓡ/#) key at the same time. The LCD displays an asterisk (*) next to the number of the currently selected brand name.*
			• *After displaying any of the brand names, you can view the corresponding production name by holding down the Darker key. (If the production name is too long to fit on the screen, you can view the rest of the name by holding down both the Darker and Lighter keys).*
			• *To exit, press ▨▱ or the Cancel key.*
908*	C1a/C1b Select		
	1		Selects whether the machine identifies itself as a C1a (B045) or C1b (B044/B046) when reporting to firmware.
			[**0 = no setting** / 1 = C1a / 2 = C1b]
			• *You can visually identify the machine is C1a or C1b by its bypass. C1a machines have 1-sheet bypass; C1b machines have 100-sheet bypass.*
			• *If the setting is "0", the machine automatically checks its own bypass type to determine how to report itself.*

5		**Mode Number/Name**	**Function/[Setting]**
912*		PCU Alarm	
	1	Alarm Display On/Off	Selects whether or not the machine will display a "Replace PCU' warning when the PCU alarm counter reaches the interval set by SP912-2. [**0 = Display** / 1 = Do not display]
	2	Interval	Sets the PCU Alarm interval (count) at which a "Replace PCU' warning occurs. [1 ~ 255 / **45** / 1000 sheets/step]
913		UP Mode Data Reset	
	1		Resets the user tools settings (with the exception of the copy user codes and copy user code counters). [**0 = No** / 1 = Yes] • *This operation is equivalent to executing a System Reset with the User Tools.* • *After selecting "1", hold down the Original Type key and press the OK key (or ⊕ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!"*
956		Preset Small-Size Setting	
	1		Enables setting of small paper sizes. [**0 = No** / 1 = Yes] • *Setting this value to "1" enables setting of the following standard small sizes, for both paper tray and bypass tray: B5 SEF, Executive SEF.* If you change the setting from "1" to "0" when one of these sizes is set, the size setting changes to each tray's default.
991*		Debug Monitor Mode	
	1		[0 ~ 3 / **0** / 1/step] **DFU**
992		SMC Printing	
			Prints out machine data. (☛ 5.1.5) [**0 = No** / 1 = SP settings / 2 = All / 3 = Memory]

Service Tables

SP6-XXX (Peripherals)

6	**Mode Number/Name**		**Function/[Setting]**
006	ADF Registration		
	1	Side-to-Side	Adjusts the side-to-side registration for DF mode. [–9.0 ~ +9.0 / **0.0** / 0.1 mm/step] **IAJ** *Use the ⊙ key to select "+" or "–" when entering the value.*
	2	Leading Edge	Adjusts the leading edge registration for DF mode. [–5.0 ~ +5.0 / **0.0** / 0.1 mm/step] **IAJ** 0.1 mm/step *Use the ⊙ key to select "+" or "–" when entering the value.*
	3	Trailing Edge Erase	Adjusts the trailing edge erase margin for DF mode. [–3.0 ~ +3.0 / **–1.0** / 0.1 mm/step] **IAJ** *Use the ⊙ key to select "+" or "–" when entering the value.*
007	ADF Sub-scan Magnification		
	1		Adjusts the actual magnification ratio in the sub-scan direction, for DF mode. [–0.9 ~ +0.9 / **0.0** / 0.1%/step] **IAJ** *Use the ⊙ key to select "+" or "–" when entering the value.*
009	ADF Free Run		
			Performs a DF free run . [**0 = No** / 1 = Yes] • *For details about free runs:* ☛ *5.1.7.* • *After selecting "1", press OK or ⊞ twice to start the run. Press ⊙ to stop.*
910	ADF/Printer Free Run		
			Performs a free run of the DF and printer. [**0 = No** / 1 = Yes] • *For details about free runs:* ☛ *5.1.7.* • *After selecting "1", press OK or ⊞ twice to start the run. Press ⊙ to stop.*

SP7-XXX (Data Log)

7		Mode Number/Name	Function/[Setting]
002*		Total Original Counter	
	1	All Modes	Displays the total number of scanned originals (total).
	2	Copy	Displays total number of scanned originals (copy mode only).
	3	Fax	Displays total number of scanned originals (fax mode only).
003*		Total Print Counter	
	1	All Modes	Displays the total number of prints (total).
	2	Copy	Displays the total number of prints (copier mode).
	3	Fax	Displays the total number of prints (fax mode).
	4	Printer	Displays the total number of prints (printer mode).
101*		Copy Counter – Paper Size	
	1	A4	Displays the total number of copies by paper size.
	2	B5	
	3	LG	
	4	LT	
	5	HLT	
	6	Others	
201*		Total Scan Counter	
	1		Displays the total number of scanned originals.
204*		Copy Counter - Paper Tray	
	1	1st	Displays the total number of sheets fed from each paper feed station.
	2	2nd	
	3	Bypass	
205*		Total ADF Counter	
	1		Displays the total number of originals fed by the DF.
401*		Total SC Counter	
	1		Displays the total number of logged SC codes.
402*		SC Type Counter	
	1		Displays the total number of each type of logged SC code.
501*		Total Jam Counter	
	1		Displays the total number of jams (copy paper + original).
502*		Total Paper Jam Counter	
	1		Displays the total number of copy paper jams.
503*		Total Original Jam Counter	
	1		Displays the total number of original jams.
504*		Jam Counter – by Location	
	1	"A" jams	Displays the total number of copy paper jams by location.
	2	"B" jams	
	3	"C" jams	
	4	"Y" jams	
	5	1st Tray	
	6	2nd Tray	
	7	Bypass	

Service Tables

7		Mode Number/Name	Function/[Setting]
801		ROM Versions and Option Connections **Note: SP7-801 cannot be accessed at the screen.** *This information appears on SMC printouts only. (Go to SP5-992 and select "2" to print out all data. The SP-801 information will appear in the "LOG DATA" section on the second page of the printout. [☛ 5.1.5])*	
			Shows software versions and option connection statuses.
	1	Firmware Version	
	2	No meaning (Fixed at "VER. 1")	
	3	Fax Unit ["Yes" = installed, "No" = Not installed]	
	4	Printer Unit ["Yes" = installed, "No" = Not installed]	
	5	ADF ["Yes" = installed, "No" = Not installed]	
	6	Optional Memory ["No" (None installed), "32MB", "40MB", "64MB"]	
	7	Paper Tray Unit ["Yes" = installed, "No" = Not installed]	
	8	Bypass Type ["1" = 1 sheet / "100" = 100-sheet]	
803*		PM Counter Display	
	1		Displays the PM counter value (the count since the last PM).
804		PM Counter Reset	
	1		Resets the PM counter. [**0 = No** / 1 = Yes] *After selecting "1", hold down the Original Type key and press the OK key (or ⊕ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*
807		SC/Jam Counter Reset	
	1		Resets the SC counter and all jam counters. [**0 = No** / 1 = Yes] *After selecting "1", hold down the Original Type key and press the OK key (or ⊕ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*
808		Reset Counters	
	1		Resets all counters, except for the total counter (SP7-003). [**0 = No** / 1 = Yes] *After selecting "1", hold down the Original Type key and press the OK key (or ⊕ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*

7	**Mode Number/Name**	**Function/[Setting]**
825	Total Counter Reset	
	1	Resets the electronic total counter. [**0 = No** / 1 = Yes] • *This reset is generally performed at installation. This SP mode is effective only once, while the counter still has a negative value. This SP cannot be used once the counter takes a positive value.* • *After selecting "1", hold down the Original Type key and press the OK key (or ⒭⒣ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*
901	SC History Display	
	1	Displays the codes of the last fifty errors that have occurred. [0 = No / 1 = Yes] *On fax-equipped models, you can print out the last fifty error codes using fax service mode 04. For information, refer to the fax service manual.*
902	SC History Reset	
	1	Clears the SC history. [**0 = No** / 1 = Yes] • *Note that when executed on fax-equipped models, this operation will not clear the machine's service-report data.* • *After selecting "1", hold down the Original Type key and press the OK key (or ⒭⒣ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*
908	PCU Counter Display	
	1	*Displays the number of prints made since the PCU was last replaced.*
909	PCU Counter Reset	
	1	Resets the developer counter. [**0 = No** / 1 = Yes] *After selecting "1", press the Original Type key and the OK key (or ⒭⒣ key) at the same time to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*
911*	ID Sensor Error Counter Display	
	1	Displays the total number of logged ID sensor errors. *For information about how to analyze these errors, see Section 5.1.11.*
912	ID Sensor Error Counter Reset	
	1	Resets the ID sensor error counter. [**0 = No** / 1 = Yes] *After selecting "1", hold down the Original Type key and press the OK key (or ⒭⒣ key) to execute the reset. If the reset is successful, the display shows "Action completed." If the reset fails, the display shows "Error!!!".*

Service
Tables

7	**Mode Number/Name**	**Function/[Setting]**
955	Memory Read/Write (Byte Access)	
		Lets you read byte values from arbitrary RAM addresses, and write values into arbitrary addresses. (☛ 5.1.12)
956	Memory Read/Write (Word Access)	
		Same as SP7-955, except that access is in (2-byte) words. **DFU**
		This SP is not intended for use on models outside of Japan. Always use SP-955 to carry out memory reads and writes.

5.1.2 TEST PATTERN PRINTING (SP5-902)

1. Enter SP mode and select SP5-902.

2. Input the number for the test pattern you wish to print.

3. Press ⊚ to access the copy mode display.

4. Select the copy features (paper size, image density, magnification, etc.).

5. Press ⊚ again to print the test pattern.

6. After checking the test pattern, press ⊚▭ key to exit from copy mode.

7. To print other test patterns, repeat steps 2 to 6.

8. When finished, exit SP mode.

No.	Test Pattern
0	Blank
1	Horiz. lines (1-dot printed line, 1-dot blank line, alternating)
2	Horiz. lines (1-dot printed line, 2-dot blank line, alternating)
3	Horiz. Lines (2-dot printed line, 1-dot blank line, alternating)
4	Horiz. Lines (2-dot printed line, 2-dot blank line, alternating)
5	Grid (1-dot line thickness)
6	Grid (2-dot line thickness)
7	Alternating dots (1 horiz. line of repeating 1 dot printed, 2 dots blank; followed by 2 horizontal lines completely blank; repeating)
8	Solid Black
9	——
10	Trimming Area
11	Grayscale, 2 x 2–dot [Horizontal line of repeating 2 dots printed, 2 dots blank; printed every other line.]
12	Grayscale, 4 x 4–dot [Horizontal line of repeating 4 dots printed, 4 dots blank; printed every 4th line.]
13	——
14	——
15	——
16	——
17	——
18	——
19	——

No.	Test Pattern
20	——
21	Diagonal line pattern, ascending (1-dot width) [600dpi]
22	Diagonal line pattern, ascending (2-dot width) [600dpi]
23	Diagonal line pattern, descending (1-dot width) [600dpi]
24	Diagonal line pattern, descending (2-dot width) [600dpi]
25	Diagonal line pattern, ascending (1-dot width) [400dpi]
26	Diagonal line pattern, ascending (2-dot width) [400dpi]
27	Diagonal line pattern, descending (1-dot width) [400dpi]
28	Diagonal line pattern, descending (2-dot width) [400dpi]
	——
51	Vertical-line VPM (**DFU**)
52	Horiz.-line VPM (**DFU**)
53	Diagonal-line VPM (**DFU**)
54	Grayscale VPM (**DFU**)

Service Tables

5.1.3 INPUT CHECK (SP5-803)

```
Input Check
      Code:       0
```

1. Access SP5-803.

2. Select the number that will access the switch or sensor you wish to check (see the table below).

3. Check the status of the sensor or switch.

4. If you wish to check the signal during a copy cycle, select the required copy mode, then press ⊚.

5. The LCD panel will display "00H" or "01H", as shown below.

```
Input Check
          Code:       0
```

The following table shows the meaning of the value displayed for each switch and sensor.

Input Check Table

Number	Description	Reading	
		00H	01H
1	DF registration sensor	No paper	Paper detected
3	DF original set sensor	No paper	Paper detected
12	Scanner HP sensor	Not at home	At home
13	Platen cover sensor	Platen cover closed	Platen cover open
15	Registration sensor	No paper	Paper detected
16	Exit Sensor	No paper	Paper detected
17	Front door switch	Door closed	Door open
18	Right door switch	Door closed	Door open
23	Mechanical counter sensing	Counter not installed	Counter installed
35	Paper end sensor (standard tray)	Paper not detected.	Paper detected.
44	Paper end sensor (optional paper tray unit)	No paper	Paper detected
88	Bypass paper end sensor (100-sheet bypass)	No paper	Paper detected

5.1.4 OUTPUT CHECK (SP5-804)

```
Output Check
Code:       0  Data:   0
```

CAUTION: To avoid mechanical or electrical damage, do not leave electrical components on continuously for a prolonged period of time.

1. Access SP5-804.

2. Select the number that corresponds to the component you wish to check (see the table below), then press *OK* or Ⓡ/#.

3. Press "1", then press *OK* or the Ⓡ/# key to check that component.

4. To interrupt the test, re-enter SP 5-804 and enter a value of "0".

Input Check Table

Number	Description
1	Polygon mirror motor (400 x 400 dpi)
2	Polygon mirror motor (600 x 600 dpi)
3	Main motor
4	Fan motor (slow)
5	Fan motor (fast)

Service Tables

5.1.5 SMC PRINTING (SP5-992)

1. Access SP5-992.

2. Select the type of data you wish to print: "1" to print SP settings only, "2" to print all system parameters (including SP settings), or "3" to dump a selected memory range.

3. If you selected "3", press the *OK* key and then use the cursor and numeric keys to enter the address range to be dumped.

4. Press ⊘ to access the copy mode display.

5. Select the print conditions (paper size, print density, etc).

6. Press ⊘ again to print the list.

7. Press ⊠ to exit from copy mode.

8. Press ⊠ as necessary to exit this SP.
    NOTE: This report only requires the copier to print. it does not need the printer or fax option to generate the report.

5.1.6 MEMORY ALL CLEAR (SP5-801)

Executing a Memory All Clear will reset all SRAM-resident SP and UP settings and values to their defaults—with the exception of the serial number setting (SP5-811), the plug-and-play settings (SP5-907), and the total print counters (SP7-003). This procedure is not for normal use, but may be appropriate if the copier has malfunctioned as a result of a problem with its SRAM.

1. Before clearing the memory clear, you should do both of the following to save current SRAM data (if possible).
   - Print a complete SMC printout using SP5-992. Be sure to select all "2" ("All") for the printout type. (☛ 5.1.5)
   - Upload the data to a flash memory card using SP5-824. (☛ 5.1.9)

2. Access SP5-801.

3. Hold down the *Original Type* key and press the *OK* key (or $^{(R/\#)}$) key) to execute the clear. If the clear is successful, the display shows "Action completed". If it fails, the display shows "Error!!!".

4. Turn the main switch off and back on.

5. If you save SRAM data to a flash-memory card, try downloading the data back into the machine (☛ 5.1.9). If the download is successful, this completes the procedure.

If you did not save SRAM data to a flash memory card, or if you were unable to download the saved data, then continue as follows.

6. Carry out printer and scanner registration and magnification adjustments. (☛ 3.13)

7. Carry out auto-scanner (white-level) adjustment, using SP4-908.

8. Refer to the SMC printout, and re-enter any values that differ from the factory settings.

9. Check the copy quality, and carry out any necessary adjustments.

Service Tables

5.1.7 FREE RUNS

SP mode offers a variety of free-run operations, as indicated below. Please keep in mind that prolonged or unnecessary use of free runs can cause machine wear or other problems. Select the free run that drives only those parts that you specifically need to check.

Name	SP	Scanner / ADF			Plotter		Remark
		Book Motor	ADF feed	Exposure Lamp	Paper printout	Fusing Lamp	
Fusing Nip Band Check	SP1-109	Off	Off	Off	Runs	Runs	**Factory use only**
Scanner Free Run	SP4-013	Runs	Off	Runs	Off	Off	
Free Run	SP5-802	Runs	Off	Runs	Runs	Runs	These two free runs are identical.
Printer Free Run	SP5-901	Runs	Off	Runs	Runs	Runs	
ADF Free Run	SP6-009	Off *	Runs	Runs	Off	Off	
ADF/Printer Free Run	SP6-910	Off *	Runs	Runs	Runs	Runs	

*The motor comes on briefly to move the scanner to the scanning position.

5.1.8 PROGRAM UPLOAD/DOWNLOAD

The program (firmware) for this machine is upgraded using a 4MB flash memory card. The machine provides the following two SPs to support program porting and upgrade:

- SP5-826: Uploads the program from the machine's flash ROM to a flash memory card.
- SP5-827: Downloads the selected program from a flash memory card to the machine's flash ROM.

Since the program size is only 2MB, it is possible to carry two different program versions on a single card, and selectively download either one of these. If you wish to carry two different programs on the same card, write one of these programs into card address space 000000h to 1FFFFFh, and write the other one into address space 200000h to 3FFFFFh.

Program Download (SP5-827)

This SP is effective only if you boot the machine from the flash memory card as described below. If the download is unsuccessful, or if you decide that you do not wish to start the download, please turn the machine off and back on before resuming normal operation.

NOTE: Be sure to turn off the main switch before inserting or removing the flash memory card. Installing or removing a card while the main switch is on may damage the FCU.

1. Turn off the main switch.
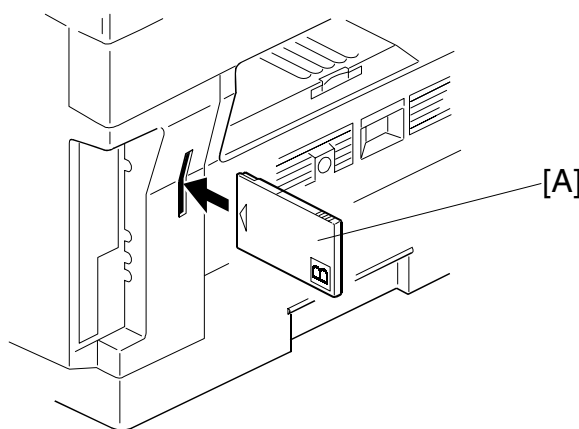
2. Insert the flash memory card [A] into the card slot, with the card's "B" side facing the rear of the machine.

3. Hold down the *Operation Switch* and turn on the main switch.
   NOTE: If the card does not contain a valid program, the machine will not start.

4. The machine boots from the card, automatically enters SP5-827, and displays the following.

```
Program Download
(1:1st 2:2nd)          0
```

5. If you wish to load the program stored in first half of the card (in card space 000000h to 1FFFFFh), enter "1". If you wish to load the program stored in second half of the card (space 200000h to 3FFFFFh), enter "2". Then press *OK* to start the download.
   NOTE: If you enter "0" (the default) instead of "1" or "2", the machine moves back to the top-level SP5-827 screen. If you enter "1" or "2" but the corresponding card space does not contain a valid program, the machine displays "Loading error!!!".

6. The machine erases the current firmware, then begins downloading the new firmware from the card. The "ON" lamp flashes, and the screen counts down the progress. The download takes about 3 minutes.
   NOTE: If downloading fails, the "Loading error!!!" message appears. If this occurs, try repeating the procedure.

7. After completing the download, turn off the main switch and remove the memory card.

8. Turn the switch back on, and run SP5-837 to check the checksums for the new firmware. Then run SP7-801-1 to confirm that it correctly displays the new firmware version.
   NOTE: Be sure to remove the card and turn the main switch off and back on before running the above SPs.

Display during download:

```
Program Download
1 :   2089024
```

[A]   [B]

[A]: "0" = erasing flash ROM
      "1" or "2" = writing to flash ROM
      ("1" if you selected "1st";
       "2" if you selected "2nd".)

[B]: Amount (bytes) remaining
      to be written

Program Upload (SP5-826)

NOTE: 1) Be sure to turn off the main switch before inserting or removing the flash memory card. Installing or removing a card while the main switch is on may damage the FCU.
              2) This operation will erase any data already stored in the flash memory card.

1. Turn off the main switch.

2. Insert the flash memory card into the card slot, with the card's "A" side facing the front of the machine "B" side facing the rear of the machine. (See illustration on page 5-29.)

3. Turn on the main switch.

4. Access SP 5-826.

5. Enter "1" at the keypad, and then press *OK.*

6. The machine erases the card, and then writes the program into it. The "ON" lamp flashes, and the screen counts down the progress. Uploading takes about 2 minutes. On successful completion, the screen displays "Loading completed."
   NOTE: If uploading fails, the "Loading error!!!" message appears. If this occurs, try repeating the procedure.

7. Turn off the main switch, then remove the memory card.

Display during upload:

    [A]:   "10" = erasing card
           "11" = writing to card
    [B]:   Amount (bytes) remaining
            to be written

```
Program Upload
11 :   2086914
```

[A]   [B]

Service Tables

5.1.9 SRAM DATA UPLOAD/DOWNLOAD

Before installing a new FCU, and before executing a "memory all clear," you should upload all current SRAM data into a flash memory card. You can then download the data back after completing the FCU replacement or memory clear.

- SP5-824: Upload from the machine's SRAM to a flash memory card.
- SP5-825: Download from a flash memory card to the machine's SRAM

SRAM Data Upload (SP5-824)

NOTE: 1) Be sure to turn off the main switch before inserting or removing the flash memory card. Installing or removing a card while the main switch is on may damage the FCU.

2) This operation will erase any data already stored in the flash memory card.

1. Turn off the main switch.

2. Insert the flash memory card [A] into the card slot, with the card's "B" side facing the rear of the machine.
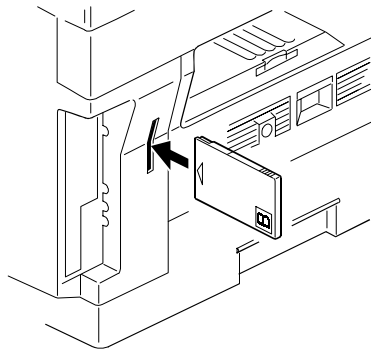
3. Turn on the main switch.

4. Access SP 5-824.

5. Enter "1" at the keypad, and then press *OK* or ⓡ⁄#

6. The machine erases the card, and then saves its SRAM data into it. The "ON" lamp flashes, and the screen counts down the progress. Uploading takes about 30 seconds. On successful completion, the screen displays "Loading completed."
NOTE: If uploading fails, the "Loading error!!!" message appears. If this occurs, try repeating the procedure.

7. Turn off the main switch, then remove the memory card.

Display during upload:

[A]: "10" = erasing card
"11" = saving to card
[B]: Amount (bytes) remaining

```
SRAM Data Upload
11  :   120834
```
    [A]   [B]

SRAM Data Download (SP5-825)

NOTE: 1) Be sure to turn off the main switch before inserting or removing the flash memory card. Installing or removing a card while the main switch is on may damage the FCU.

2) This operation will overwrite all of the machine's current SRAM data.

1. Turn off the main switch.

2. Insert the flash memory card [A] into the card slot, with the card's "B" side facing the rear of the machine. (See illustration on page 5-32.)

3. Turn on the main switch.

4. Access SP 5-825.

5. Enter "1" at the keypad, and then press *OK.*

6. The machine executes the download. This operation takes about 2 seconds. On successful completion, the screen displays "Loading completed."
   NOTE: If uploading fails, the "Loading error!!!" message appears. If this occurs, try repeating the procedure.

7. Turn off the main switch, then remove the memory card.

5.1.10 SERIAL NUMBER INPUT (SP5-811)

Use this SP to input the machine's 11-digit serial number. (This is normally done at the factory). Each key of the numeric keypad controls a different digit of the serial number: the first key controls the first digit, the second key controls the second digit, and so on. (The (R/#) key is not used.) Press each key as many time as necessary to set the corresponding digit. To set the second digit to "X", for example, press the 2 key as many times as necessary to bring up "X" on the screen.

Note that the first four digits of the serial number may be either letters or numbers. Digits 5 to 11 are always numbers.

①	②	③
1st digit	2nd digit	3rd digit
④	⑤	⑥
4th digit	5th digit	6th digit
⑦	⑧	⑨
7th digit	8th digit	9th digit
•/✳	⓪	(R/#)
10th digit	11th digit	Not used

5.1.11 ID SENSOR ERROR ANALYSIS (SP2-221)

```
Vg4.05,Vp0.56,PW59
Vg-Vp3.49,Vt2.16
```

A defective ID sensor does not generate an SC condition, but does cause the image quality to become worse (e.g., dirty background on the copy). If these conditions occur, check the ID sensor output using SP2-221. (☛ 6.11.15)

1. Vsg ("Vg" in the display)
   Error Condition: Vsg < 1.65

   Possible causes:
   - ID sensor defective
   - ID sensor dirty
   - Drum does not get charged

2. Vsp ("Vp" in the display)
   Error Condition: Vsp > 1.65

   Possible causes:
   - Toner density is very low
   - ID sensor pattern is not being generated

3. Power ("PW" in the display)

   This is the power for the light source of the ID sensor.
   Error Condition: Vsg < 2.31 at maximum power

   Possible causes:
   - ID sensor defective
   - ID sensor dirty
   - Drum does not get charged

4. Vsdp ("Vg-Vp" in the display)
   No Error Conditions

5. Vt
   Error Condition: Vt > 2.64 or Vt < 0.20

   Possible cause:
   - TD sensor defective

5.1.12 MEMORY READ/WRITE

You can use SP7-955 to read byte values from arbitrary RAM addresses, and to write values to arbitrary RAM addresses.

When you enter this SP, the screen looks likes this:

```
Mem R/W (1byte)
Adr=800000  Data=00
```

You can now operate the SP as follows.

- To manually enter an address or data value: Use the cursor keys to move to the desired column in the Adr field. Use numeric keys to input number values 1 to 9, and [*Original Type* + numeric keys "1" to "6"] to input number values A to F.
- After entering an address value, press OK (or $^{(R/#)}$) to set the value. The Data field will then display the current content of the entered address. The cursor will jump to the Data field.
- To increment or decrement the address, use the density keys (or Original Type + cursor keys). The Data value will change to show the content of the selected address.
- When the cursor is in the Data field, you can enter a new value to be stored into the selected address. Press OK (or $^{(R/#)}$) to write the new value into the address. The cursor will then return to the Address field.
- If you are in the Data field, pressing Cancel will move you to the address field. If you are in the address field, pressing Cancel will exit this SP.
- To cancel an entry in progress (and restore the previous value), press $^{(C/\oslash)}$. To exit the SP, press the *Clear Modes* key.

Service Tables

5.2 USER TOOLS

The User Tools are accessed by users and key operators and by sales and service staff. User Tools are used to input or change the copier's default settings, or to view counter values.

5.2.1 HOW TO ENTER AND EXIT USER TOOLS

Press the User Tools button, then select the User Tools program. When you have finished the User Tools program, press the User Tools button to exit.

5.2.2 USER TOOLS TABLE

System Settings Table

	1. Function Priority	
	2. Copy Count Display	
	3. System Reset	
	4. Energy Saver Timer	
	5. Energy Saver Level	
	6. Auto Off Timer	
	7. AOF (Keep It On.)	
2. System Settings	8. Tray Paper Size	1. Tray 1
		2. Tray 2
		3. Bypass
	9. Paper Tray Priority	
	10. Auto Tray Switch (B044/6 only)	
	11. Display Contrast	
	12. Measurement Unit	

NOTE: For information about the "AOF (Keep It On.)" setting, see System Settings in Section 6.

Copy Features Table

	1. Max. Copy Q'ty	
	2. Image Adjustment	1. Text
		2. Photo
	3. Set Ratios	
	4. Copy Reset Timer	
	5. Original Orientation	
	6. Bypass Paper Type	
2. Copy Features	7. Key Operator Tools	1. User Code Access
		2. Check Copy Counter
		3. Print Counter List
		4. Reset Counter
		5. Clear All User Codes
		6. Reset All Counters
		7. Program User Code
		8. Change User Code
		9. Delete User Code

DETAILED DESCRIPTIONS

6. DETAILED SECTION DESCRIPTIONS

6.1 OVERVIEW

6.1.1 COMPONENT LAYOUT
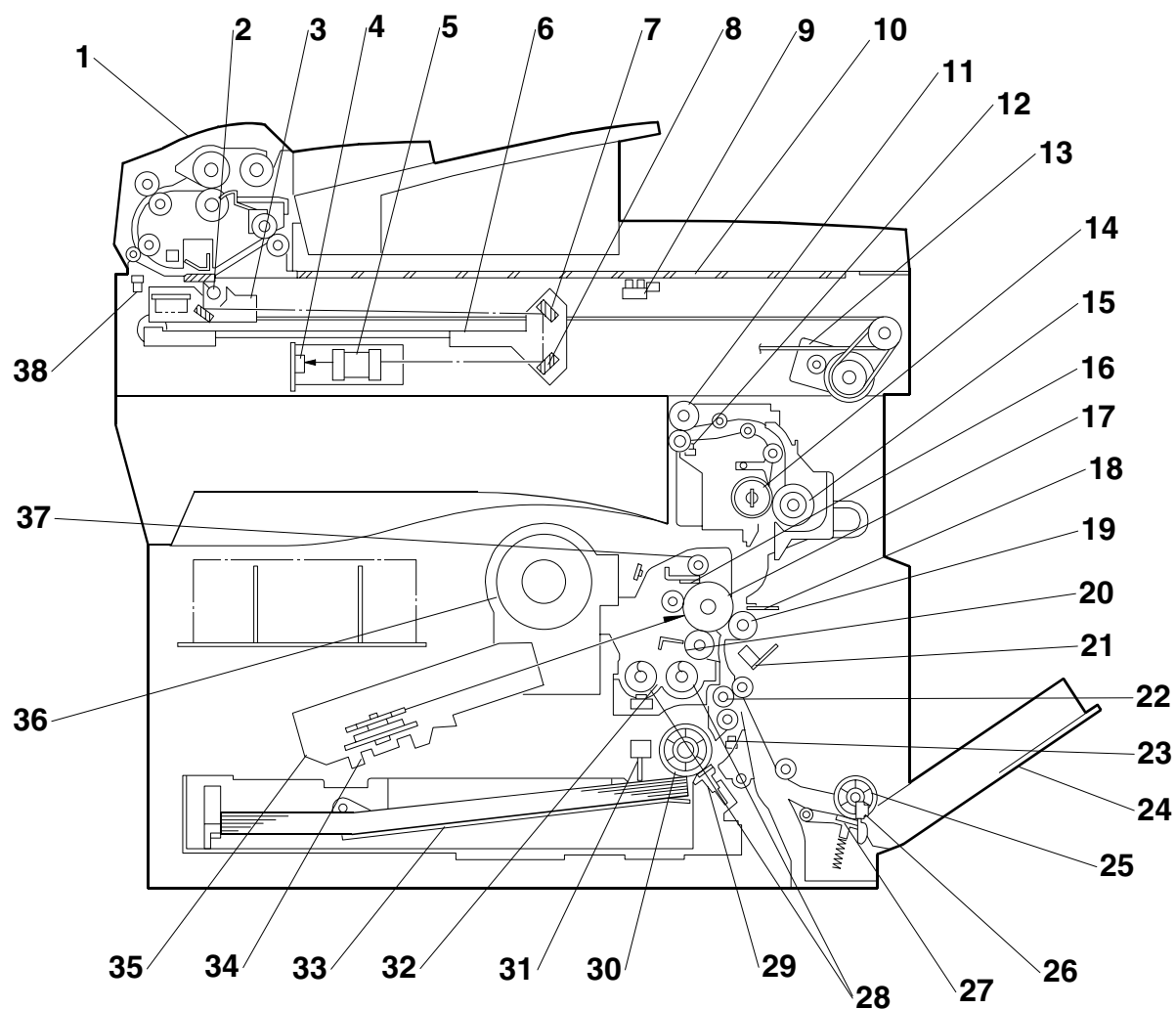
NOTE: The above illustration shows model B046. Model B045 has 1-sheet bypass only (no bypass paper feed roller and bypass friction pad). Models B044 and B045 do not include the ADF as standard.

Detailed Descriptions

OVERVIEW

1. ADF
2. Exposure Lamp
3. 1st Scanner
4. CCD (on SBU)
5. Lens Block
6. 2nd Scanner
7. 2nd Mirror
8. 3rd Mirror
9. Platen Cover Sensor
10. Exposure Glass
11. Exit Roller
12. Exit Sensor
13. Scanner Motor
14. Hot Roller
15. Pressure Roller
16. Cleaning Blade
17. OPC Drum
18. Discharge Plate
19. Transfer Roller
20. Development Roller
21. ID (Image Density) Sensor
22. Registration Roller
23. Registration Sensor
24. Bypass Tray
25. Bypass Paper Feed Roller
26. Bypass Paper End Sensor
27. Bypass Friction Pad
28. Mixing Augers
29. (Main) Friction Pad
30. Paper Feed Roller
31. Paper End Sensor
32. TD (Toner Density) Sensor
33. Bottom Plate
34. Polygon Mirror Motor
35. Laser Unit
36. Toner Supply Bottle (or THM)
37. Toner Collection Coil
38. Scanner HP Sensor
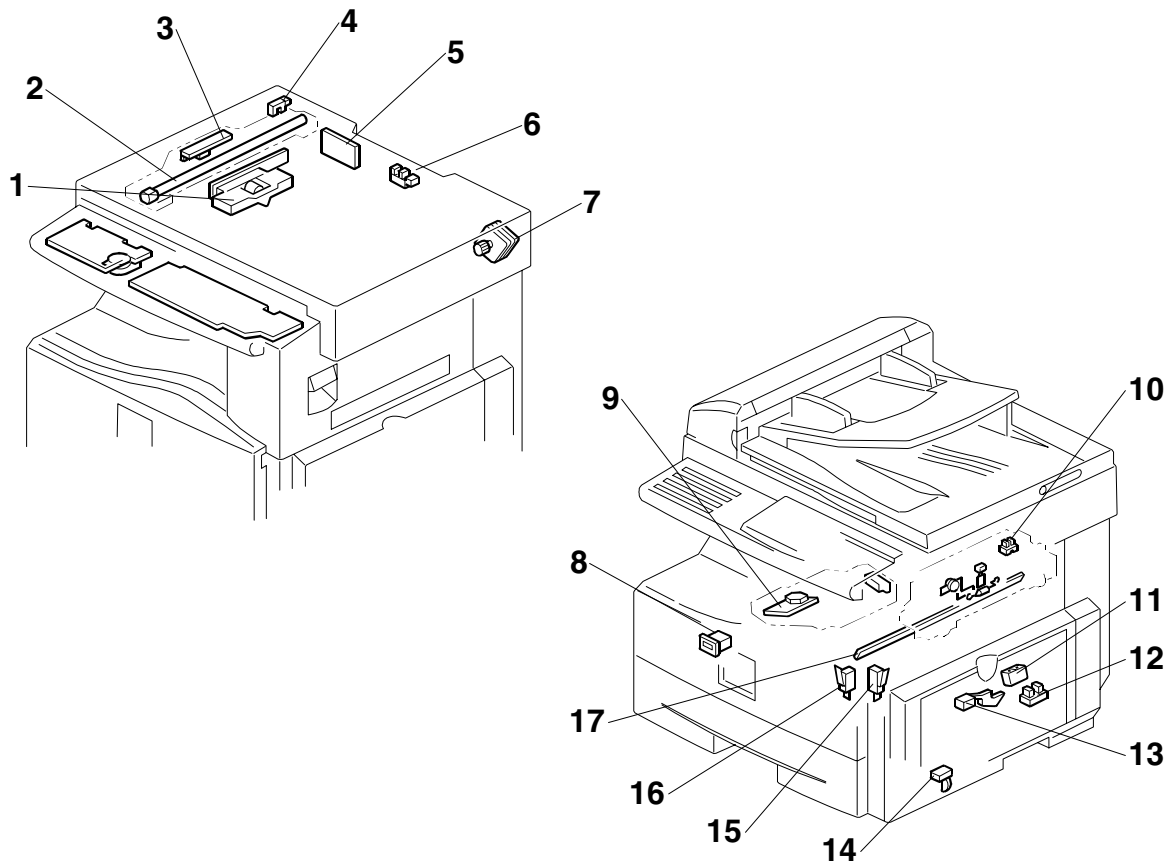
1. Lens Block
2. Exposure Lamp
3. Lamp Stabilizer Board
4. Scanner HP Sensor
5. DF Connection Board*¹
6. Platen Cover Sensor
7. Scanner Motor
8. Mechanical Counter*²
9. Polygon Mirror Motor

10. Exit Sensor
11. ID (Image Density) Sensor
12. Registration Sensor
13. Paper End Sensor
14. Bypass Paper End Sensor*³
15. Right Door Safety Switch
16. Front Door Safety Switch
17. Quenching Lamp

*1: DF connection board is standard on B046 only.

*2: Mechanical counter is standard on B044 and B046 only.

*3: Bypass paper end sensor is included on 100-sheet bypass models only (B044 and B046).

Detailed Descriptions
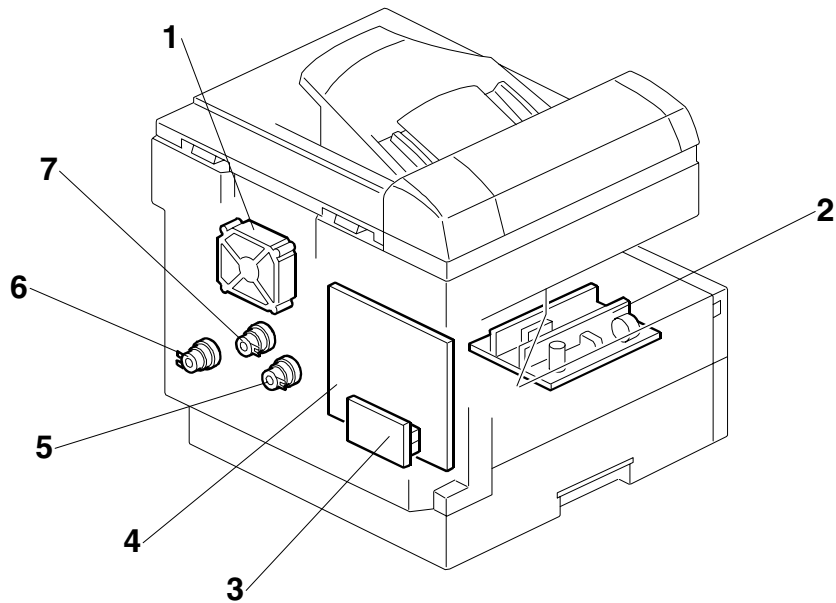
1. Exhaust Fan
2. PSU
3. NCU*1
4. FCU

5. Paper Feed Clutch
6. Bypass Feed Clutch*2
7. Registration Clutch

*1: NCU is standard on fax-equipped models only (B046).

*2: Bypass feed clutch is included on 100-sheet bypass models only (B044 and B046).

6.2   PAPER PATH
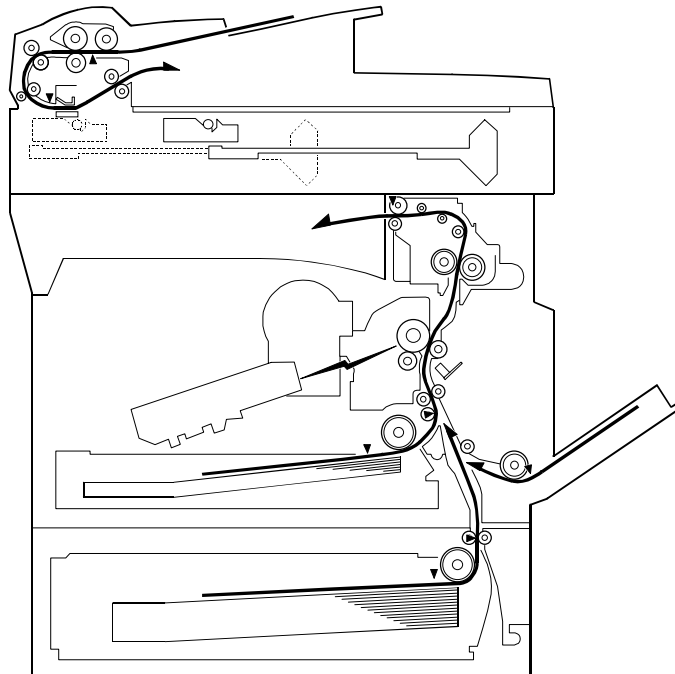
NOTE: The illustration shows model B046. Model B045 has 1-sheet bypass only (no bypass paper feed roller and no bypass friction pad). The paper tray unit shown above is an option for B044 and B046, and is not available on B045.

Detailed Descriptions

6.3 DRIVE LAYOUT
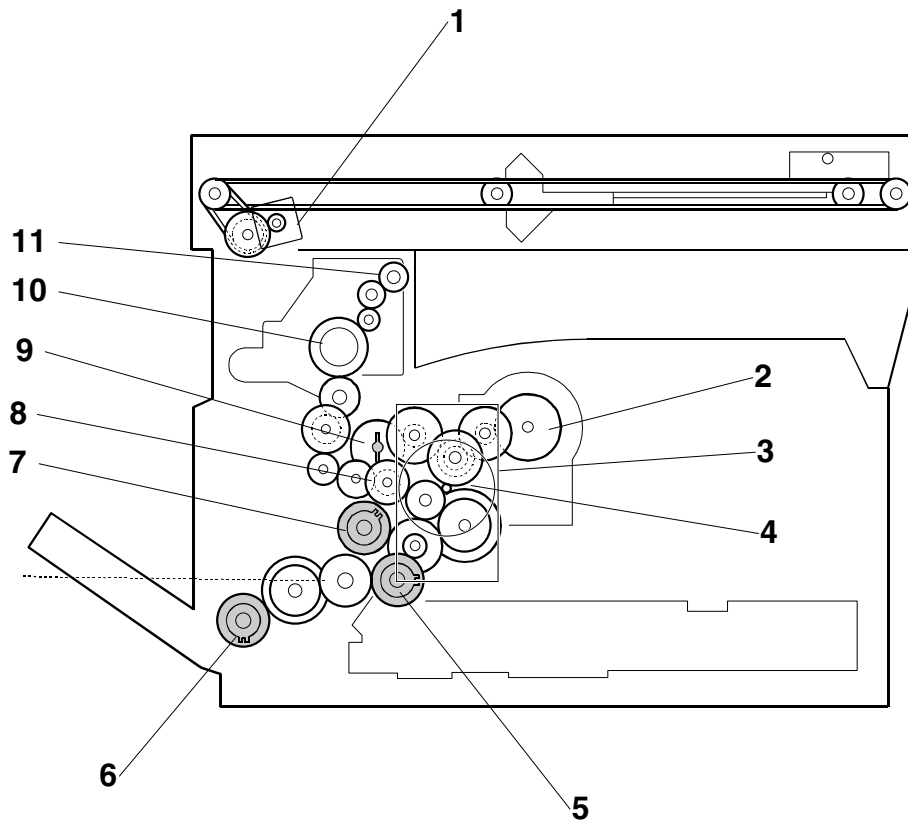
1. Scanner Motor
2. Toner Bottle (or THM) Clutch
3. Main Motor (board)
4. Main Motor (drive shaft)
5. Paper Feed Clutch
6. Bypass Feed Clutch*1
7. Registration Clutch
8. Developer Driver Gear
9. Drum Drive Gear
10. Fusing Drive Gear
11. Exit roller

*1: Bypass feed clutch is included on 100-sheet bypass models only (B044 and B046).

6.4 BLOCK DIAGRAM: PCBs AND COMPONENTS
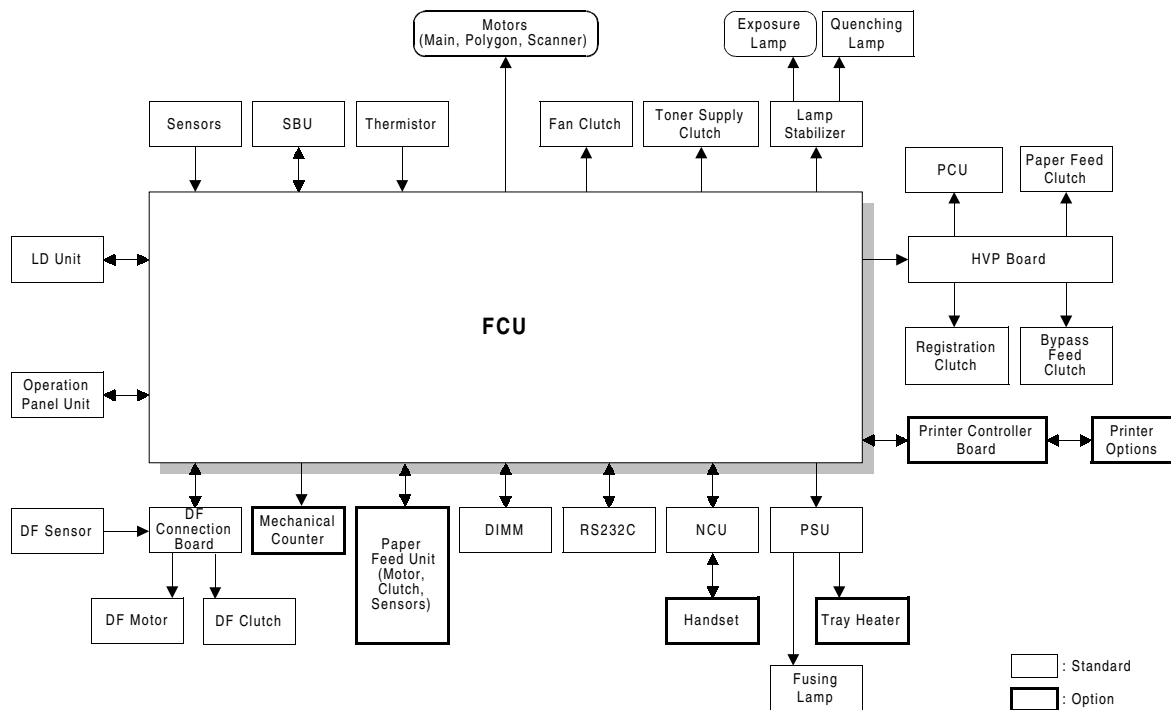
NOTE: The DF connection board, NCU, and speaker are standard on fax-equipped models (B046), and optional on B044 and B045.

6.5 MAIN PCBs

6.5.1 FCU (FUNCTION/FACSIMILE CONTROL UNIT)

The FCU is the machine's main controller. It controls scanning, printing, fax operations (B046 only), image processing, power-mode switching, and it interfaces with standard and optional peripherals and with the user. It holds the machine's FROM, SRAM, and DRAM, and provides the slot for the optional DIMM. Note that fax-related components are not included on FCUs that ship on models B044 and B045.

: Standard

: B046 only

: Option

Note: Mechanical counter is standard on B044 and B046.
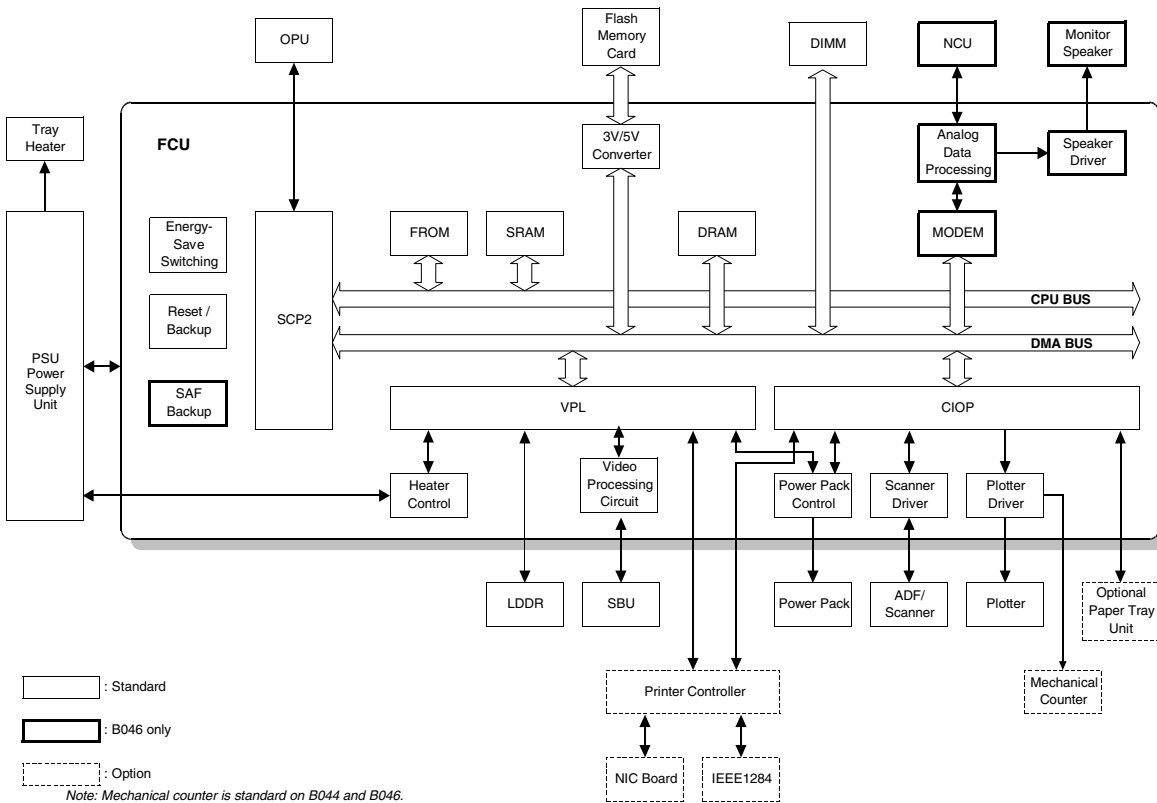
SPC2

The machine's CPU utilizes a dual bus structure (CPU bus and DMA bus), and includes DMA, DCR, JBIG, and energy-saver control circuits.

VPL (Video Processing LSI)

This chip implements video processing, utilizing the following internal blocks:
- VPM (Video Processing Module)
   Implements scanning control and image processing.
- LIF (Laser Interface)
   Implements printing control and image processing

CIOP (Communications and I/O Processing)

Implements communication and I/O control circuits. Runs at 9.83MHz (clock signal supplied by the SPC2).

FROM (Flash ROM) – 2MB

The machine's program memory. Packaged in a 48-pin TSOP; 75ns access time; runs at +2.7 to +3.6 V (+3VE). The memory content can be overwritten from a flash memory card.

DRAM – 8MB

The machine's standard operating RAM packaged in a 54-pin TSOP; 100MHz maximum clock speed; operates at +3.3V (+3VD). Allocated as follows: 6.0K for page memory and (if applicable) ring buffer; 1M for fax SAF; 576K working RAM; 256K line buffer, 128K ECM buffer, 128K OS, 64K text SAF. On B046 machines, the SAF backup circuit will maintain DRAM content for up to about 12 hours if power outage occurs while SAF data is being stored.

   NOTE: If optional DIMM is installed, the allocations for page memory, ring buffer, and fax SAF are different from the above, and 2.5 to 5.4K may be allocated for sort SAF.

SRAM – 128K

Stores users settings and usage data. Packaged in a 32-pin TSOP; 70ns access time; runs at +2.7 to +3.6 V (+3V BAT). On-board battery backup maintains memory content while power is off.

3V/5V Converter

Interface between the 3V output by the FCU and the 5V used by service flash card.

Energy-Saver Switching

Controls low-power mode switching

Detailed Descriptions

Reset/Backup Circuit

Monitors +5VE power, and issues system reset and RTC reset signals. When the main power is off, supplies power from the primary battery to SRAM and parts of the SPC2.

SAF Backup

Backs up DRAM for up to 12 hours if power outage occurs while SAF data is being held. (Included only on B046.)

Analog Processing Circuit

Implements modem filtering, 2/4-line switching, and RITONE switching. (Included only on B046.)

Modem

Implements a V34 modem and code. Includes a 24.6MHz modem clock. (Included only on B046.)

Speaker Driver

Drives the speaker for the buzzer and monitor sounds. (Included only on B046.)

Heater Control

Processes signals from the thermistor controlling the fusing heater.

Video Processing Circuit

Interface with the SBU.

Power Pack Control

Interface with the high-voltage power supply unit. (Implements PWM control and receives feedback.)

Scanner Driver

Drives the scanner and ADF motors and xenon lamp, interfaces with the HP sensor and the ADF.

Plotter Driver

- Drives the main and polygon motors; the feed, bypass, registration, and toner-supply clutches; the quenching lamp; and the fan.
- Interfaces with the exit, paper-end, registration, ID, and TD sensors.

6.5.2 SBU (SENSOR BOARD UNIT)
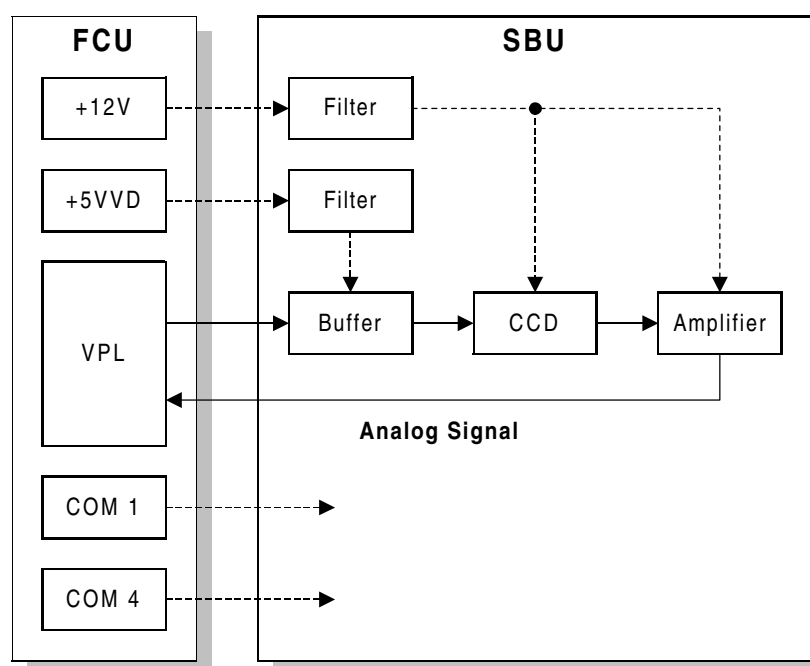
The SBU receives analog signals from the CCD and converts these into digital signals used for image processing.

Buffer

Used for driving the CCD. Includes a 3V/5V converter (converts the VPL's 3V drive signal to 5V).

CCD

Converts light reflected from the original into an electrical signal. This machine uses a Sony ILX553A (5150 pixel) CCD. Scan density is 600 dpi (for letter-size originals). Pixel size is 7 x 7 microns. Maximum pixel rate is 15Mhz.

Amplifier

Inverts and amplifies the electrical signal from the CCD.

Detailed Descriptions

6.5.3 NCU (NETWORK CONTROL UNIT)

The NCU implements the interface between the fax system and the telephone network. An NCU is standard on model B046, and is included as part of the fax option for B044 and B045.

North America version
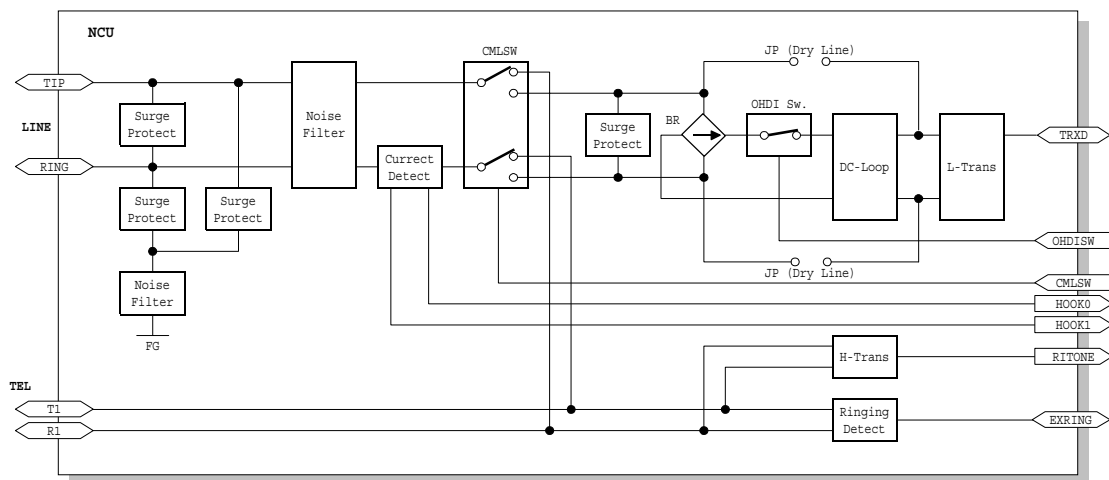
Europe/Asia version
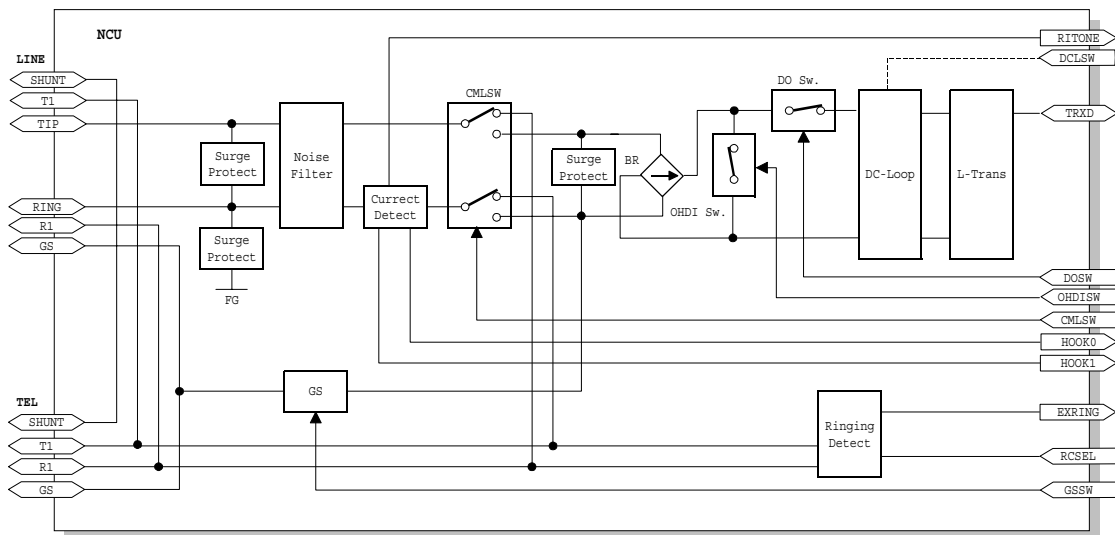
Jumper on Europe/Asia version

TB1	Jumper TB1 must be opened on machines installed in Hong Kong.

6.6 COPY PROCESS OVERVIEW
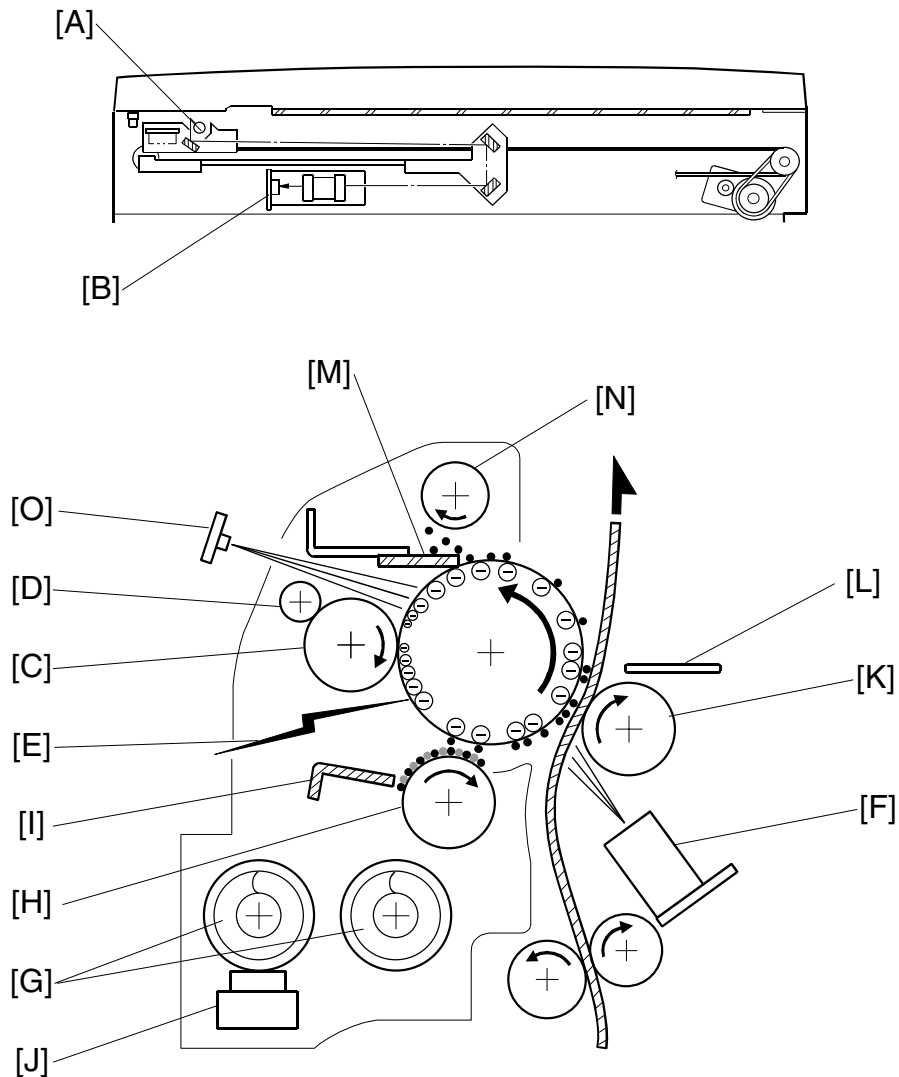
The following is a brief overview. For more detailed information about each process, refer to the *Core Technology* manual.

1. EXPOSURE

A xenon lamp [A] exposes the original –>the CCD [B] converts reflected light to analog data signal → the FCU converts analog signal into digital data, processes it, stores it in memory → the FCU retrieves the data from memory and uses it to drive the laser. (Each original is scanned once only.)

Detailed Descriptions

2. DRUM CHARGE

In the dark, the drum charge roller [C] imparts a negative charge to the OPC drum. (The roller is kept clean by cleaning roller [D].)

3. LASER EXPOSURE

The laser unit, controlled by the FCU, fires a beam [E] at the drum, drawing the latent electrostatic image on the drum surface. (Exposure by laser dissipates the local negative charge.)

4. ID (IMAGE DENSITY) SENSOR

The ID sensor [F] periodically measures (a) drum surface reflectivity, and (b) reflectivity of a test pattern image drawn on the drum. The FCU uses ID sensor data to adjust charge-roller voltage, and uses both ID sensor data and TD sensor [J] data to adjust the toner density.

5. DEVELOPMENT

Augers at [G] carry developer (carrier/toner mix) to the magnetic development roller [H]. The roller creates a developer "brush" that rubs against the drum, causing toner to adhere to the electrostatic image. (The doctor blade [I] restricts the height of the "brush." The TD (toner density) sensor [J] measures the ratio of toner in the developer.)

6. IMAGE TRANSFER

Paper moves between the drum and the transfer roller [K]. A positive charge applied to the transfer roller pulls toner off the drum and onto the paper, while also attracting the paper itself.

7. PAPER SEPARATION

Paper is separated from the drum as a result of (a) electrostatic attraction of paper toward transfer roller, and (b) a high AC voltage applied to the discharge plate [L].

8. CLEANING

The cleaning blade [M] scrapes remaining toner from the drum, and the toner collection coil [N] retrieves this toner.

9. QUENCHING

Light from the quenching lamp [O] neutralizes the charge on the drum surface.

6.7 SCANNING

6.7.1 OVERVIEW
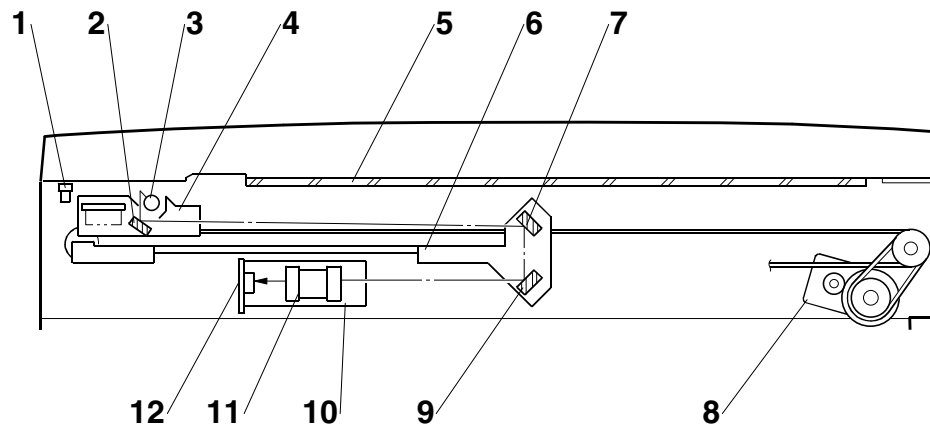
1. Scanner HP Sensor
2. 1st Mirror
3. Exposure Lamp
4. 1st Scanner
5. Exposure Glass
6. 2nd Scanner
7. 2nd Mirror
8. Scanner Motor
9. 3rd Mirror
10. Lens Block
11. Lens
12. CCD

The HP sensor [1] senses when the scanner is at home position, and indicates that the scanner is ready to begin a scan.

To copy: the original is illuminated by the xenon exposure lamp [2]. The 1st, 2nd, and 3rd mirrors direct the reflected light to the lens block, where the lens directs it to the CCD.

The 1st scanner includes a reflector (not shown) that helps reduce shadows on pasted originals.

Detailed Descriptions

6.7.2 SCANNER DRIVE
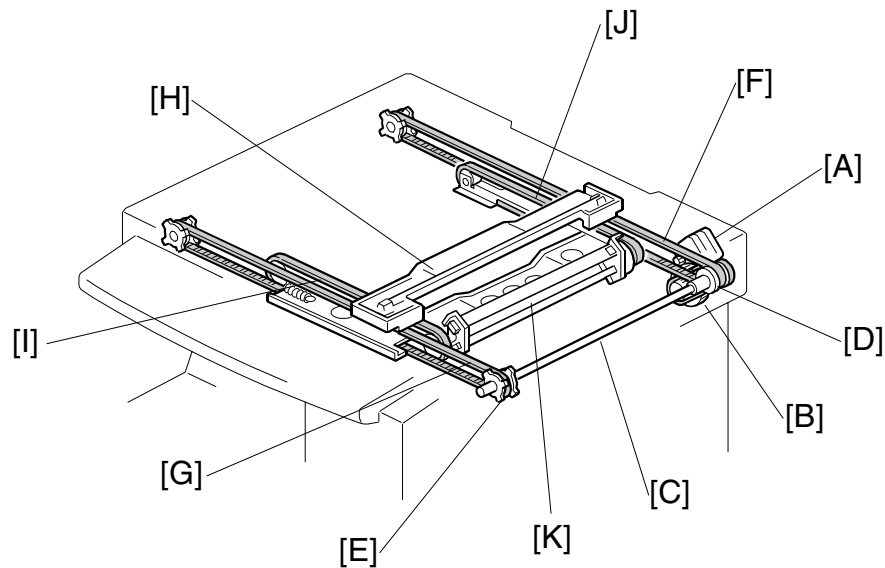
The scanner motor [A] (a stepper motor) drives a gear that turns a small drive belt [B], driving the scanner drive shaft [C]. Pulleys [D, E] on the ends of the shaft drive timing belts [F] and [G], driving the 1st scanner [H]. The first scanner is secured to timing belts [I] and [J], which drive the 2nd scanner [K] through the 2nd scanner's pulleys.

During scanning in book mode, the 2nd scanner moves at half the speed of the 1st scanner. Scanner speed increases for reduction printing, and drops for enlargement printing—generating reduction or enlargement in the sub-scan direction. (The FCU uses image processing to generate the corresponding reduction or enlargement in the main-scan direction.)

You can adjust magnification in the sub-scan direction using SP4-101 (which will adjust the motor speed). You can adjust in the main scan direction using SP4-008.

For information about scanning in DF mode, refer to the ADF manual.

6.8 IMAGE PROCESSING

6.8.1 OVERVIEW
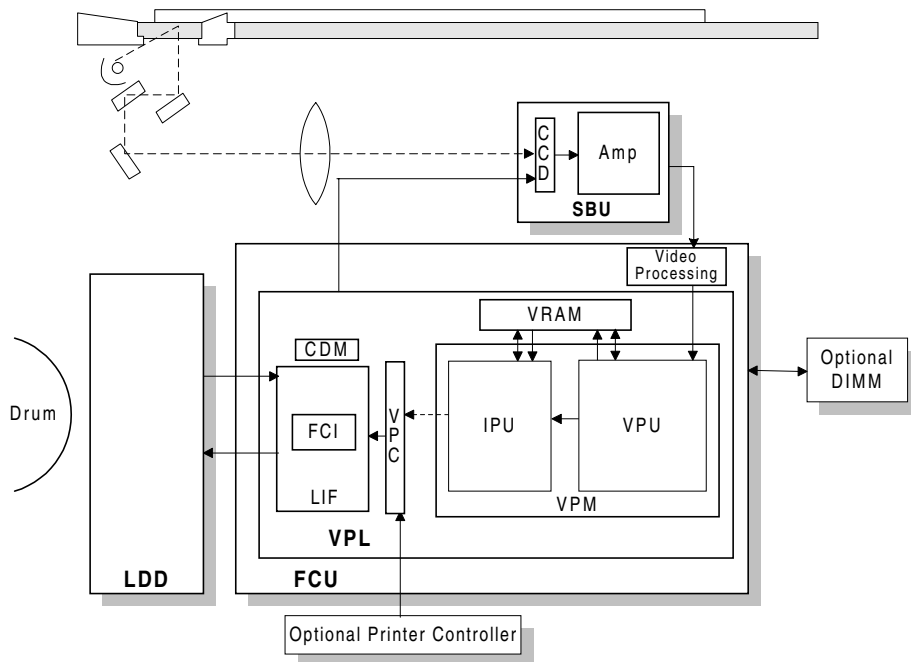
The scanned image is processed by the following modules.

In the SBU

- CCD: Converts the reflected light from the image into an analog signal. Driven by the CDM (CCD Drive Module) on the VPL.
- Amp: Amplifies the analog signal and sends it to the VPL on the FCU as a digital signal.

In the VPL chip on the FCU

- VPU: Video correction (black level, shading, peak tracking and correction), image correction (gamma correction), and reduction processing (in main-scan direction). (☛ 6.8.2)
- IPU: Magnification processing (in main scan direction), filtering, second gamma correction (for fax only), etc. (☛ 6.8.2))
- LIF Smoothing, edge correction, FCI (fine character adjustment) (☛ 6.8.2)

The data then moves to the LD drive board in accordance with timing controlled by the FCU.

Note the following:

- The VPU and IPU are submodules of a larger module, the VPM (Video Processing Module). The VPM includes interface components (not shown) that interface these submodules to the VRAM processing memory.
- The VPC (Video Path Control circuit) controls which signal is sent to the LIF.
- Abbreviations: SBU = Sensor Board Unit; LIF = Laser Interface; VPU = Video Processing Unit; IPU = Image Processing Unit.

6.8.2 IMAGE PROCESSING PATH

The diagram below shows the image processing steps. The steps that are actually performed depend on the selected original processing modes (☛ 6.8.3) and on adjustments made with the relevant SPs (☛ 6.8.5).

```
SBU ┌──────────────────────────────────────────────┐
    │         ┌──────────── ADS ───────────┐        │
    └─────────┴────────────────────────────┴────────┘

VPM ┌──────────────────────────────────────────────┐
    │ VPU ┌────────────────────────────────────────┐│
    │     │      ┌─────────────────────────┐       ││
    │     │      │   Black Level Correction │       ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌────────────┴────────────┐       ││
    │     │      │  Shading Line Correction │       ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌────────────┴────────────┐       ││
    │     │      │ Peak Tracking & Correction│      ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌────────────┴────────────┐       ││
    │     │      │     Gamma Correction     │       ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌────────────┴────────────┐       ││
    │     │      │    Main-Scan Reduction   │       ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌─ ─ ─ ─ ─ ─ ┴ ─ ─ ─ ─ ─ ─┐       ││
    │     │      │     Sub-Scan Reduction    │      ││
    │     │      └────────────┬────────────┘       ││
    │     │      ┌────────────┴────────────┐       ││
    │     │      │ Side-to-side registration, │     ││
    │     │      │ mirroring, white-dot replace│    ││
    │     │      └────────────┬────────────┘       ││
    │     └───────────────────┼────────────────────┘│
    │ IPU ┌───────────────────┼────────────────────┐│
    │     │      ┌────────────┴────────────┐       ││
    │     │      │     Main-Scan Magnify    │       ││
    │     │      └────────────┬────────────┘       ││
    │     │    ┌──────────────┴──────────────────┐ ││
    │     │    │ Filtering (MTF, smoothing, line  │ ││
    │     │    │    width correction, etc.)       │ ││
    │     │    └─┬──────────┬──────────────┬──────┘ ││
```

Side-to-side registration, mirroring, white-dot replace

VPU

Main-Scan Magnify

Filtering (MTF, smoothing, line width correction, etc.)

2nd Gamma Correction

Binarize

Picture/Text Separation

Error Diffusion/ Dithering

Independent Dot Corr.

Binary OR processing

Serial/Parallel Conversion

IPU

VPM

Optional Printer Controller → VPC (VIdeo Path Control)

Edge Correction

Distortion

FCI

Printer gamma correction

LIF

VPL

To LDD

⌐ ─ ─ ┐ : *Fax processing only*

6.8.3 ORIGINAL MODES

The machine offers seven "original" modes for copy operation. Fax-equipped machines (B046) also offer four original modes for fax operation.

Selection of Original Modes, for Copying

The user selects the mode using User Tools ("3: Copier Features" → "2. Adjust Original Mode"). The user can also assign any two of these modes to the two "mode indicators" on the panel, so that they can be accessed with a single button press. (Although the upper indicator is nominally for "Text" and the lower is for "Photo," in fact the user can assign any mode to either indicator.)

Selection of Original Modes, for Fax

Before scanning, the user selects Text or Photo at the operation panel.

- *If Text:* The machine uses Text 1 (Sharp), unless a serviceperson has changed the mode to Text 2 (Dropout).

- *If Photo:* The machine uses the photo mode selected by User Parameter switch 10 bit 7 (where "0" selects Photo Normal and "1" selects Photo Smooth).

If the user is having a problem with text-mode quality, please try to resolve the problem by adjusting the settings for Text Mode 1. Do *not* try to solve the problem by changing the mode to Text Mode 2. Text Mode 2 is designed for very specific uses only (for machines that are almost exclusively used to send preprinted forms with unneeded background color), and is rarely appropriate outside of Japan.

The text mode used by the machine is determined by the value of SRAM address 410D48h. To change the text mode, you must use SP7-955 (☛ 5-1-12) to manually change the value at this address. To change to Text Mode 2 (Dropout), write 0Ah into this address. To change back to Text Mode 1 (Sharp), write 07h into this address.

Detailed Descriptions

IMAGE PROCESSING

Original Modes: Copying

Original Type	Mode	Also Called	Intended For...
Text	Text Mode 1	*Text Normal*	Normal text originals
	Text Mode 2	*Text Sharp*	For newspapers or other originals through which text on the rear side is moderately visible.
Photo	Photo Mode 1	*Photo Priority*	For photos, and for text/photo images that are primarily photographic.
	Photo Mode 2	*Text / Photo*	For images with both text and photos
Special	Special 1	*Colored Text*	For originals with colored text and lines
	Special 2	*Pixel Photos*	For photo images with visible dots, such as newspaper photos. (This mode employs dithering.)
	Special 3	*Preserved Background*	This mode disables automatic density adjustment. It is intended for text originals, in cases where the user wishes to retain the background. (For example, if embedded white area is causing the copier to eliminate background that the user wishes to retain.)

Original Modes: Fax

Original Type	Mode	Also Called	Intended For...
Text	Fax Text 1	*Text Sharp*	For newspapers or other originals through which text on the rear side is moderately visible.
	Fax Text 2	*Dropout*	Stronger removal of dropout colors.
Photo	Fax Photo 1	*Photo Smooth*	Photos with visible pixels (newspaper photos, etc.)
	Fax Photo 2	*Photo Normal*	Normal photos

6.8.4 IMAGE PROCESSING STEPS FOR EACH MODE

		Copier							Fax				Adjust With..
		Text		Photo		Special			Text		Photo		
		Normal	Sharp	Photo Priority	Text / Photo	Colored Text	Pixel Photo	Preserved Background	Sharp	Dropout	Normal	Smooth	
SBU	ADS	ADS	ADS	No ADS	ADS	ADS	No ADS	No ADS	ADS	ADS	No ADS	No ADS	
Shading Correction	Shading Line Correction	On	On	On	On		On			On	On	On	
	1st Gamma Correction	Text Normal	Text Sharp	Photo Priority	Text / Photo	Text Normal	Pixel Photo	Text Normal					SP4-922
Magnification	Main Scan Mag.												
	Mirroring	On (DF only)	On		On		On		On	On	On	On	
	Side-To-Side Registration	On	On		On		On		On	On	On	On	
Filtering	MTF	Normal	Strong	Weak	Normal	Normal		Normal	Normal	Normal	Normal	Strong	SP4-925
	Smoothing						Normal					On	
	Line Width Correction	Off	Off	Off	Off	Thick	Off	Off					SP4-927
2nd Gamma Correction									Photo Normal				
Image Correction	Gradation	Error Diffusion	Binary	Error Diffusion	Error Diffusion	Error Diffusion	Dither	Error Diffusion	Binary (AutoThresh.)	Binary (FixedThresh.)	Error Diffus. + Binary	Dither + Binary	SP4-926 (Error diff. only)
	Independent Dot Erase		On							On			SP4-928
Video Path Control		On	On	On	On		On		On	On	On	On	
LIF	FCI	On (Edge corr. only)	On (Edge corr. only)						On (Edge Correct + Distortion Prevention)	On (Edge Correct + Distortion Prevention)	Off	Off	
	Printer Gamma Correction	On	On	On	On	On	On	On	On	On	On	On	

☐ : Not used.

ADS = Auto Image Density System removes original background such as colored paper from copied originals

Detailed Descriptions

6.8.5 MODE ADJUSTMENTS

As a service person, you can use SPs 4-922 to 4-966 to further customize each of these original modes to meet specific user requirements. If the user is experiencing a problem with copy or fax quality, however, SP-based adjustment should be the last step. Always proceed as follows:

1. First, try changing the density notch setting.

   If that doesn't resolve the problem, then...

2. Try selecting a different original mode.

   If that also doesn't resolve the problem, then...

3. Try customizing the relevant original mode with SPs.

To customize...

First use SP4-921 to select the original mode that you wish to customize. Then enter the relevant customizations using SP4-922 to SP4-966. Refer to Section 5 for general information about the adjustments you can make .

Note the following points:
- All SP settings are relative to the selected original mode. If you set the SP value to "0", the machine will use the default processing for that mode.
- If you enter an SP customization setting for an original mode that does not support that customization, the entry will have no meaning.

Default plotter customization settings for each mode...

The following table shows the default plotter customization settings for each original mode. For information about adjustments, refer to the SP explanations in Section 5.

Customization:		Plotter Mode	Marking-Image Density Correction	Marking-Image Density Setting	Spot (Lone) Dot Enhance	Toner Save Level	Smoothing
Adjust with:		SP4-961	SP4-962	SP4-963	SP4-964	SP4-965	SP4-966
Image Mode		Defaults					
Copy	Text Normal	No Correction	OFF	Normal	None[2]	Mask 1	OFF
	Text Sharp	FCI	OFF	Both[1]	None[2]	Mask 1	OFF
	Photo Priority	No Correction	OFF	Normal	None[2]	Mask 2	OFF
	Text/Photo	No Correction	OFF	Normal	None[2]	Mask 2	OFF
	Colored Text	No Correction	OFF	Normal	None[2]	Mask 1	OFF
	Pixel Photo	No Correction	OFF	Normal	None[2]	Mask 2	OFF
	Preserved Background	No Correction	OFF	Normal	None[2]	Mask 1	OFF
Fax	Text	FCI	OFF	Both[1]	Level 2[3]	Thin Lines	ON
	Photo	FCI	OFF	Light edge correction	Level 2[3]	Thin Lines	OFF
Printer	Text	FCI	OFF	Dense edge correction	Level 2[3]	Mask 3	ON
	Photo	FCI	OFF	Normal	Level 2[3]	Mask 3	OFF

[1]Both = Distortion prevention + edge correction
[2]For copy-mode patterns, SP4-964 adjustments operate as follows.

SP4-964 setting	Applied enhancement
-2	None
-1	None
0	None
+1	Level 1
+2	Level 2

[3]For printer and fax patterns, SP4-964 adjustments operate as follows.

SP4-964 setting	Applied enhancement
-2	None
-1	Level 1
0	Level 2
+1	Level 3
+2	Level 4

Detailed Descriptions

6.9 LASER EXPOSURE

6.9.1 OVERVIEW
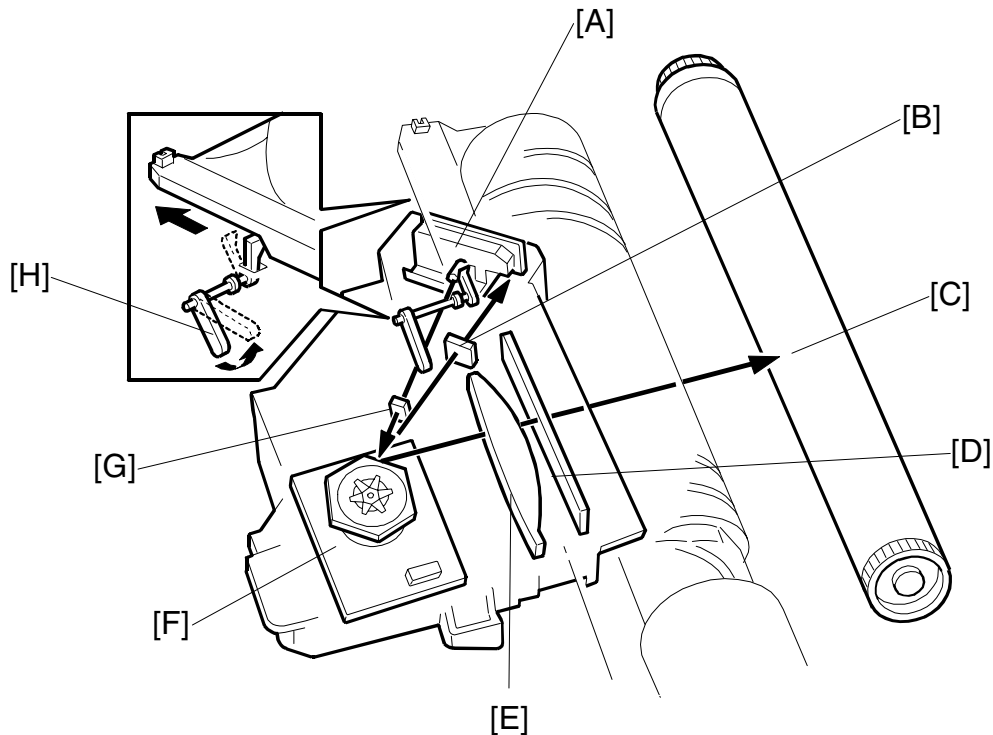
[A]: LD Unit
[B]: Synchronization Detector Lens
[C]: OPC Drum
[D]: Shield Glass

[E]: Toroidal Lens
[F]: Polygon Mirror Motor
[G]: Cylindrical Lens
[H]: LD Shutter

- The LD unit controls both the laser output and the laser synchronization mechanism.
- The machine cuts the power to the LD drive board when the front door or right door is opened.
- The LD shutter blocks the laser-beam path if the toner bottle holder or THM (toner hopper magazine) is unlatched.

6.9.2 LD SAFETY SWITCHES
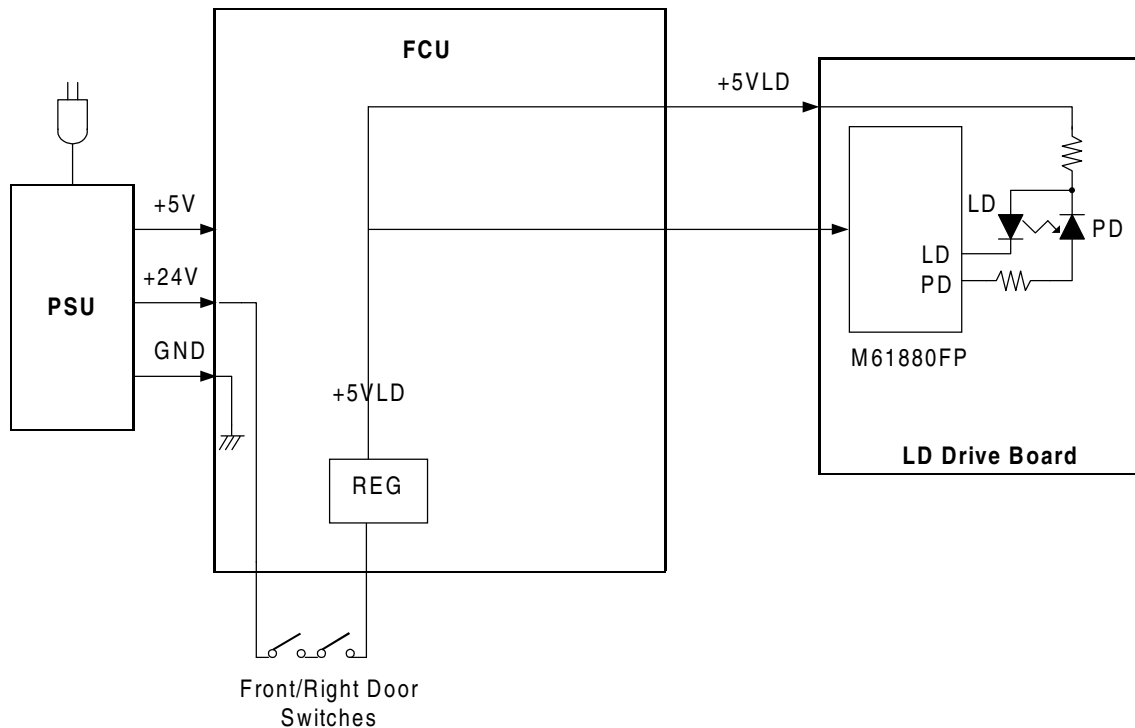
Safety switches are installed at the front and right doors to ensure technician and user safety and to prevent the laser beam from accidentally switching on during servicing. Opening of the front or right door opens the corresponding switch, cutting the power supply (+5VLD) to the laser diode.

The safety switches are installed on the +24V line coming from the power supply unit (PSU). The +24V supply must pass through these switches before converting into the +5VLD power that drives the laser.

6.10 PHOTOCONDUCTOR UNIT (PCU)

6.10.1 OVERVIEW
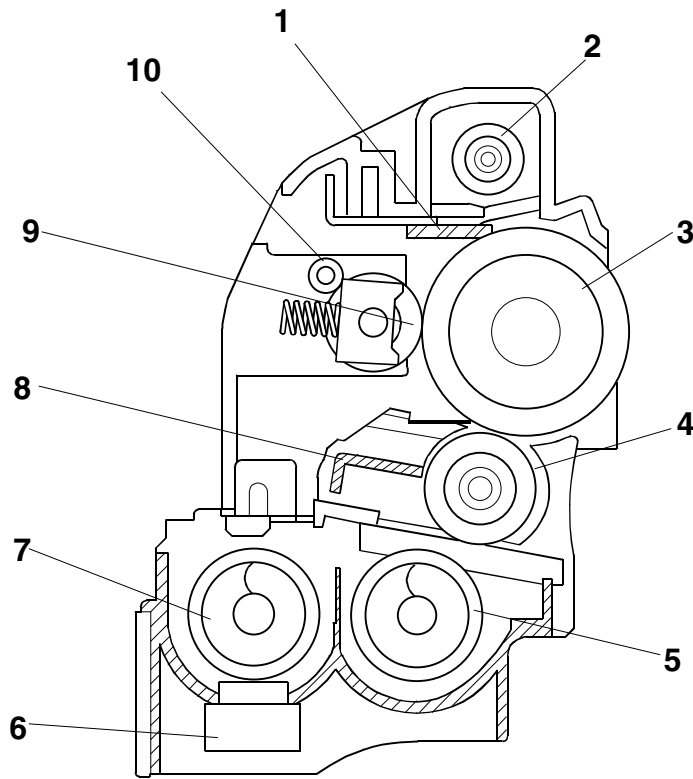
1. Cleaning Blade
2. Toner Collection Coil
3. OPC Drum
4. Development roller
5. Mixing Auger 2

6. TD (toner density) Sensor
7. Mixing Auger 1
8. Doctor Blade
9. Charge Roller
10. Cleaning Roller

6.10.2 DRUM DRIVE
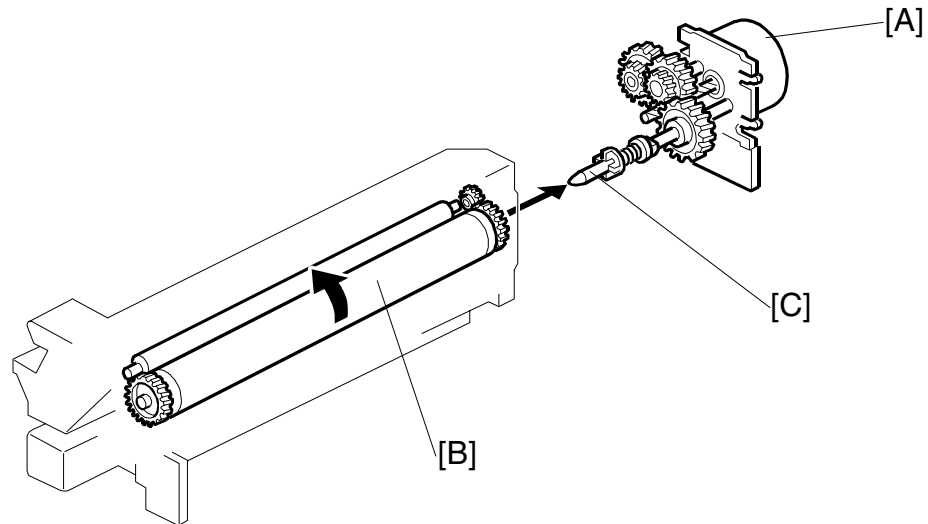
The main motor [A] drives the drum [B] through a series of gears and the drum drive shaft [C].

Detailed
Descriptions

6.11 DRUM CHARGE

6.11.1 OVERVIEW
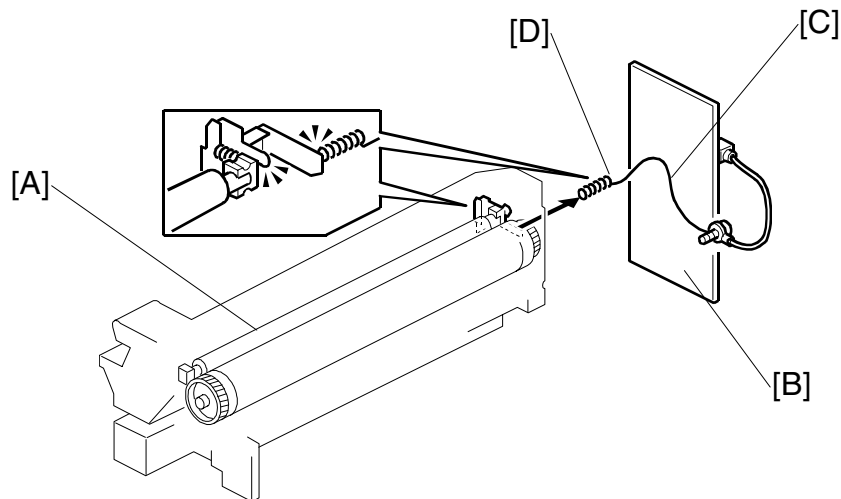
The drum charge roller [A] remains in contact with the drum, producing a charge of −900 V on the drum surface.

The high voltage supply board [B] supplies a negative charge to the charge roller via wire [C] and spring [D]. The default base (uncorrected) charge is −1650V. You can adjust this base charge using SP2-001-1. The actual charge is corrected in accordance with the ambient environment, as described in the next section.

6.11.2 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Ambient Environment
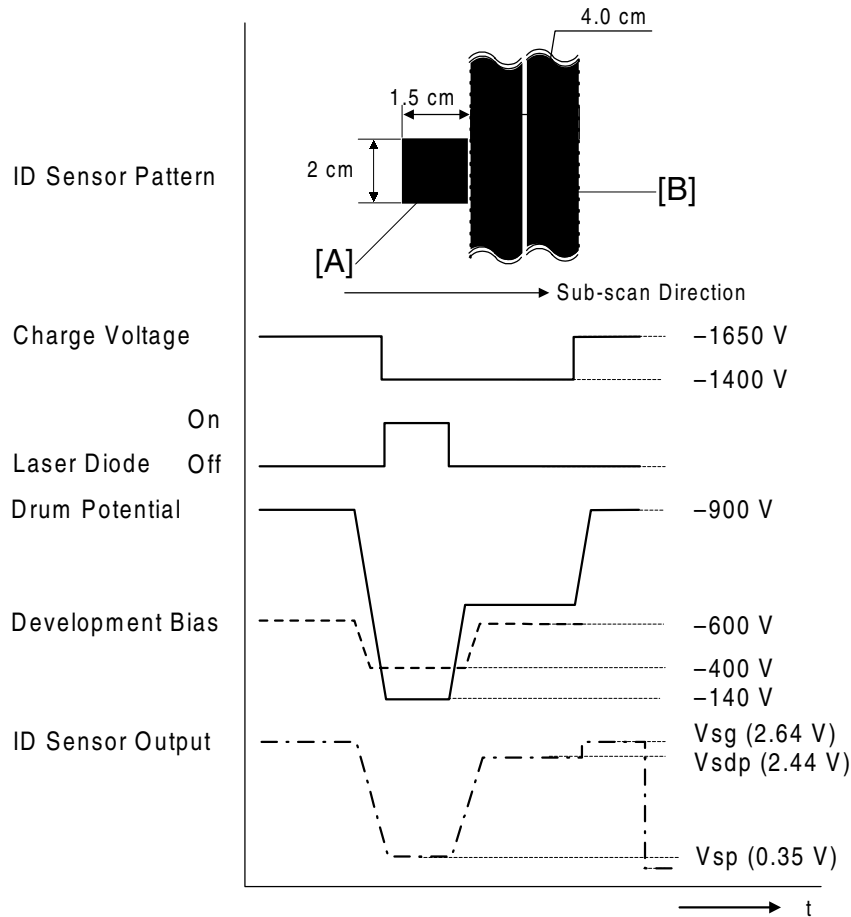
Efficiency of voltage transfer from the charge roller to the drum decreases as ambient temperature and humidity rise. Accordingly, the charge roller voltage must be made more negative at higher temperature and humidity.

When Correction is Made

- At initial warm-up (following power-on by main switch)
- During warm-up on exit from low-power or auto-off mode, if that mode has been in effect for at least 4 hours (Time set by SP2-995)

NOTE: Correction can be disabled with SP2-927.

How Correction is Made

Immediately after creating the ID sensor pattern [A] used for toner density control (☛ 6.12.4), the machine generates another pattern [B] for charge voltage correction by intensifying the development bias (☛ 6.12.2) to –600 V. The laser remains off, but a small amount of toner moves to the drum because of the slight charge difference between the drum and development roller. The ID measures the pattern's density (Vsdp) and the bare drum voltage (Vsg); the FCU compares the difference and adjusts the roller voltage accordingly.

- If Vsdp/Vsg > 0.95: Change charge roller voltage by +50 V (less negative).
- If Vsdp/Vsg < 0.90 = Change charge roller voltage by –50 V (more negative).

NOTE: The current ID sensor readings can be viewed using SP2-221.

6.11.3 CHARGE ROLLER CLEANING
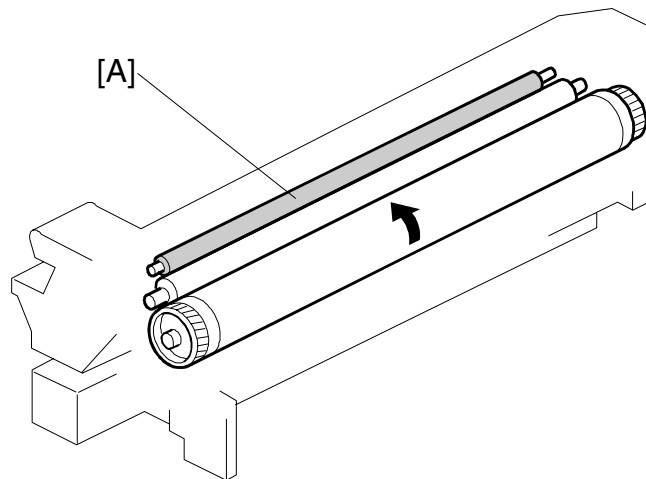
A cleaning roller [A] removes toner and debris that the roller picks up from the drum.

6.11.4 DETECTION OF A NEW PCU

Before starting to use a new PCU, the machine must (a) agitate the toner/developer mix, (b) initialize the TD sensor, and (c) initialize the PCU counter. This machine automatically detects the presence of a new PCU and carries out these operations.

At time of copier installation

The first time the machine is turned on following installation, a factory-set flag informs the machine that the PCU has not yet been initialized. The machine carries out the necessary initialization automatically.

When a replacement PCU is installed

Replacement PCUs have a special mechanism that trips when they first start, informing the machine that a new PCU has been installed. (Preinstalled PCUs do not include this mechanism, and have two empty pins in their connector.)

[A]   [B]   [C]

Detailed Descriptions
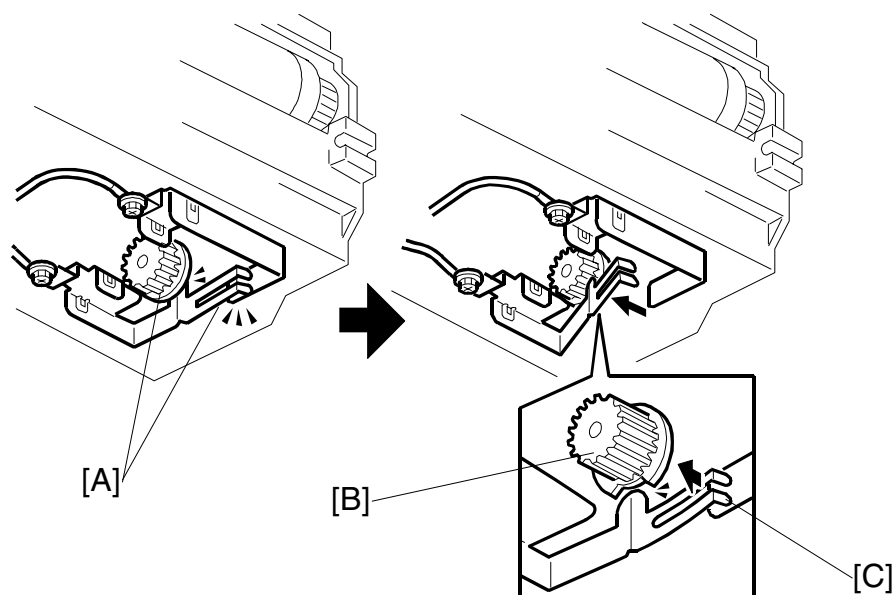
Replacement PCUs are shipped as shown in [A]. Slight rotation of PCU gear [B] at power-on releases plate [C], breaking the circuit and informing the FCU that the new PCU is a replacement unit.

6.12 DEVELOPMENT

6.12.1 OVERVIEW
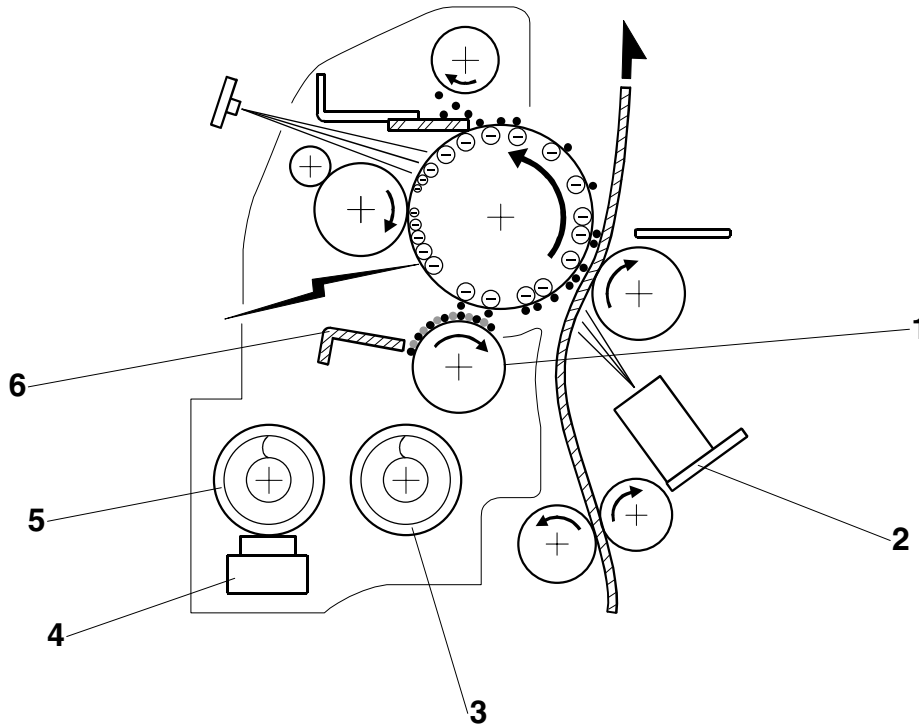
The development section consists of the following parts.

1. Development Roller
2. ID Sensor
3. Mixing Auger 2

4. TD Sensor
5. Mixing Auger 1
6. Doctor Blade

The two mixing augers mix the developer (carrier/toner mix). The TD (toner density) sensor and the ID (image density) sensor are used to control the copy image density.

6.12.2 DEVELOPMENT BIAS
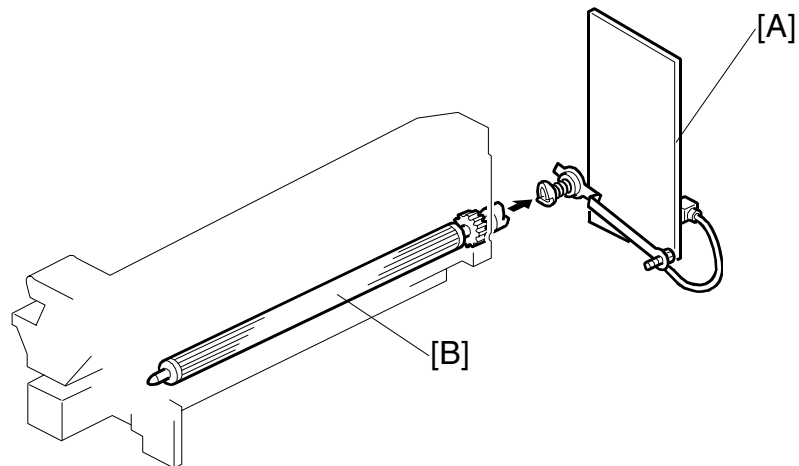
Black areas of the latent image on the drum are at low negative charge (about -140 ± 50 V), with white areas at high negative charge (about –900 V).

To attract negatively charged toner to black areas, the high voltage supply board [A] applies a (default) bias of –600 V to the development roller [B]. The bias voltage can be adjusted with SP2-201-1.

Detailed Descriptions

6.12.3 TONER SUPPLY

Toner-Bottle Models (B044 and B046)
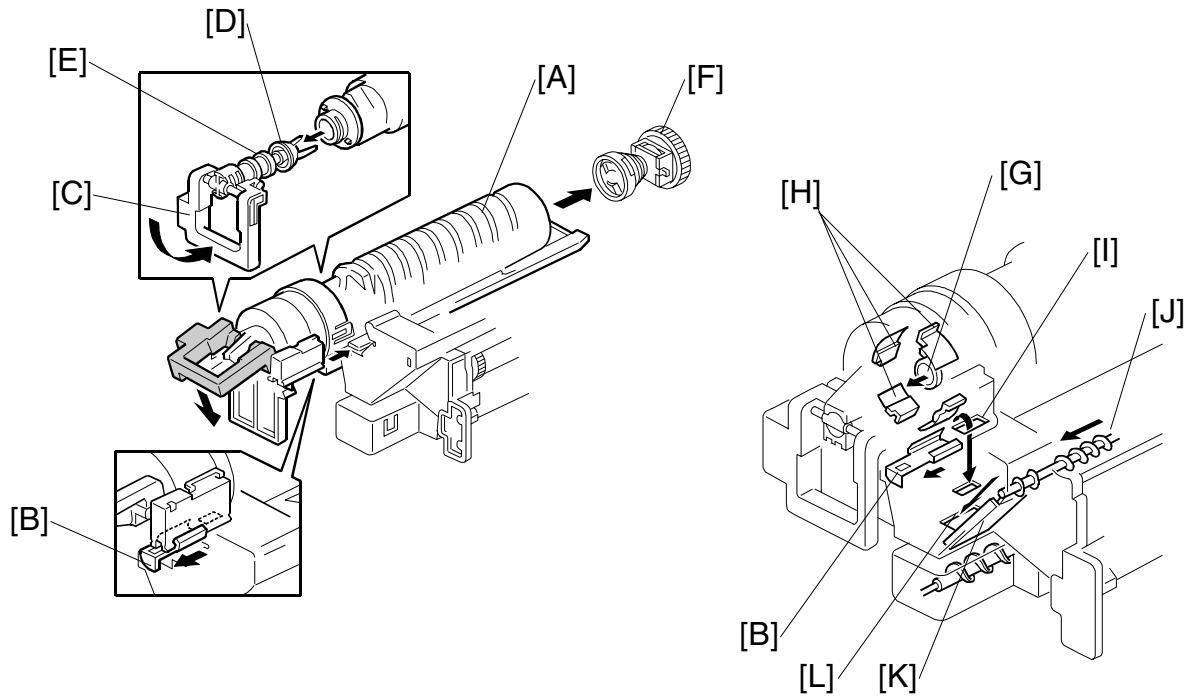
When toner bottle [A] is pushed in, shutter [B] is pushed open by the PCU body. Pressing in lever [C] pulls off toner bottle cap [D], which is held by chuck [E]. When clutch [F] turns the bottle, the spiral grooves push toner out at [G], and the turning Mylar blades [H] push this toner through slit [I] into the developing unit. Toner collection coil [J] simultaneously recycles toner retrieved from the OPC drum. The recycled toner slides down chute [K] and enters the developing unit through slit [L].

Toner Hopper Magazine (B045)

The magazine houses a grooved bottle similar to that shown on page 6-34 (except that it has no cap). The shuttering and rotation mechanisms are the same as on toner-bottle models (as seen on page 6-34).

Detailed Descriptions
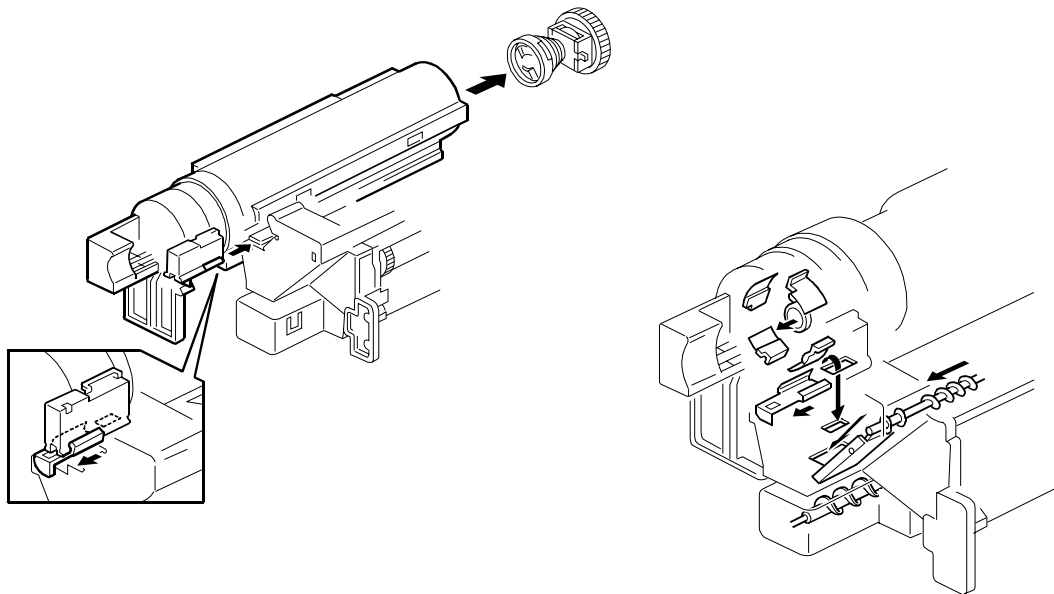
6.12.4 TONER DENSITY CONTROL

Overview

Toner concentration in the developer is controlled using the following values:

- Vts: TD sensor initial setting (1.25V). (Used as reference voltage when Vref is not available.)
- Vref: Toner supply reference voltage (calculated value; periodically updated)
- Vt: Actual output from TD sensor
- Vsg/Vsp: Values from ID sensor, where Vsp is the voltage of a test pattern (the "ID sensor pattern"), and Vsg is the voltage of the bare drum
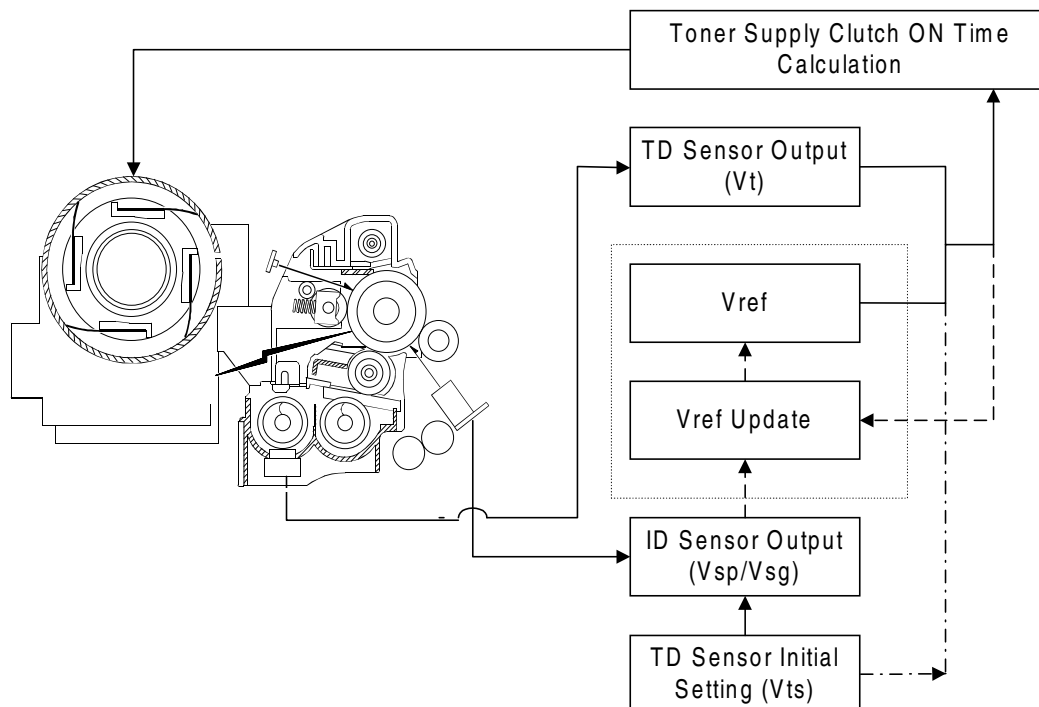
Toner is added to the development unit if Vt is higher than the reference voltage.

Reference Voltage

Vts is used as the reference if the PCU has just been installed (since Vref has not yet been calculated) or if ID sensor correction has been disabled with SP2-927. In all other cases, Vref is used as the reference.

Toner Density Sensor Initial Setting

The Vts for this machine is 1.25 V. During TD sensor initialization (after installation of new PCU), the machine adjusts the sensor so that it reads out 1.25V.

Toner Concentration Measurement

The machines checks concentration every copy cycle, by comparing Vt against the reference voltage.

Vsp/Vsg Detection

An ID sensor pattern is made on the drum by the charge roller and laser diode. The ID sensor detects the pattern density (Vsp) and the density of the bare drum (Vsg).

Detection is carried out at the same time as (and immediately before) charge-roller voltage detection (☛ 6.11.2).

NOTE: Use of ID sensor control can be disabled with SP2-927.

Calculation of Vref

Vref is calculated based on:

- ID sensor output (Vsp/Vsg)
- Existing reference voltage (Vref or Vts) – Vt

Toner Supply Determination

The machine supplies toner if Vt exceeds the reference voltage.

NOTE: Current Vt and reference voltage values can be viewed using SP2-220. Other ID sensor values can be viewed using SP2-221.

Toner Clutch ON Time

Calculation is based on:

- Vt
- Reference voltage RV (= Vref or Vts)
- S (TD sensor's sensivity coefficient)

Level	Decision	Motor On Time (seconds)
1	$RV < Vt \leq RV + S/16$	t
2	$RV + S/16 < Vt \leq RV + S/8$	$1.5t$
3	$RV + S/8 < Vt \leq RV + S/4$	$2t$
4	$RV + S/4 < Vt \leq RV + S/2$	$3t$
5	$RV + S/2 < Vt \leq RV + 4S/5$	$4t$
6	$RV + S > Vt \geq RV + 4S/5$	$5t$
7	$Vt \geq RV + S$	$6t$

NOTE: The default value for t is 0.6. The value can be changed using SP2-922.

6.12.5 TONER SUPPLY IF SENSOR READING IS ABNORMAL

ID Sensor

Any of the following is considered abnormal:
- $Vsg \leq 1.65$ (when Vsg is read)
- $Vsg < 2.31$ (at maximum power)
- $Vsp \geq 1.65$
- $Vt \geq 2.64$ or $Vt < 0.20$

Current readings can be viewed using SP2-221.

TD Sensor

The reading is considered abnormal if $TD < 0.20$ V or $TD > 2.64$ V. Abnormal readings 10 times in succession will generate SC 390. The current reading can be viewed using SP2-220.

6.12.6 DETECTION OF TONER NEAR END AND TONER END

Toner Near End detected when either of the following occurs...

- Vt is at level 6 (see above table) five times in succession
- $Vt > 1.85$ five times in succession

Toner End detected when any of the following occurs....

- (Vt is $\geq$level 6 *and* $Vt > 1.85$) *n* time in succession, where *n* is 50 by default but can be changed to 20 using SP2-213. (Note that *n* corresponds to the number of sheets that can be printed before Toner Near End changes to Toner End.)
- Vt is at level 7 three times in succession.
- $Vt > 2.00$ three times in succession

6.13 DRUM CLEANING AND TONER RECYCLING

- Cleaning blade [A] scrapes remaining toner from the drum after image transfer. Toner piles up on the blade.
- Toner collect coil [B] transports toner from pile and drops it onto chute [C], where it slides down into the development unit through a slit located at [D].
- At the end of each copy job, the drum turns about 3 mm in reverse to help clear toner and other debris from the edge of the cleaner blade.
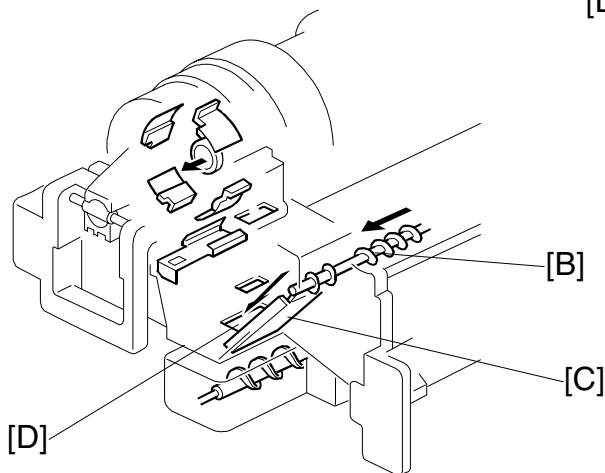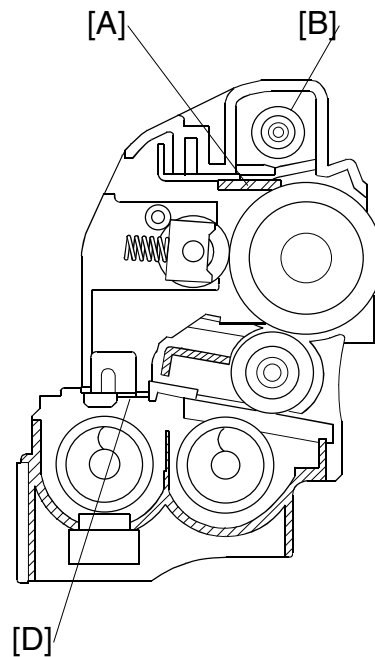
6.14 PAPER FEED

6.14.1 OVERVIEW

1. Exit Roller
2. Exit Sensor
3. Registration Sensor
4. Bypass Feed Roller*
5. Bypass Paper End Sensor*¹
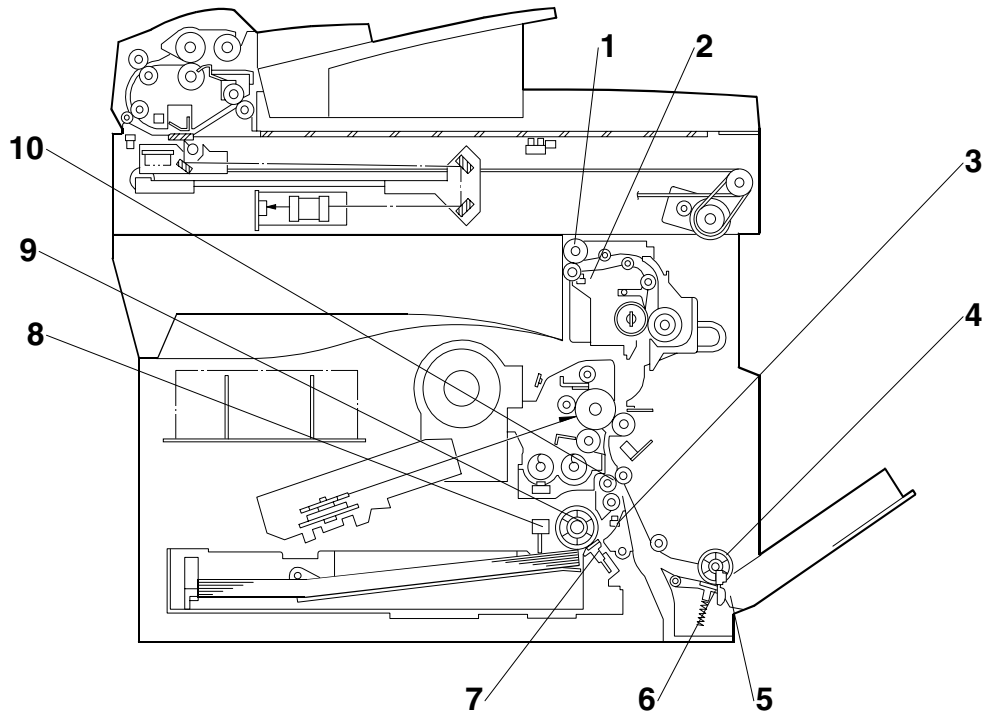
6. Bypass Friction Pad*¹
7. (Main) Friction Pad
8. (Main) Paper End Sensor
9. Paper Feed Roller
10. Registration Roller

*1: Only on 100-sheet bypass machines (B044, B046).

6.14.2 PAPER FEED DRIVE MECHANISM

From Paper Tray

Main motor [A] drives gears on the registration clutch [B] and the paper feed clutch [C]. These clutches transfer drive to the registration roller [D] and paper feed roller [E]. The FCU controls clutch timing based on input from the registration sensor.
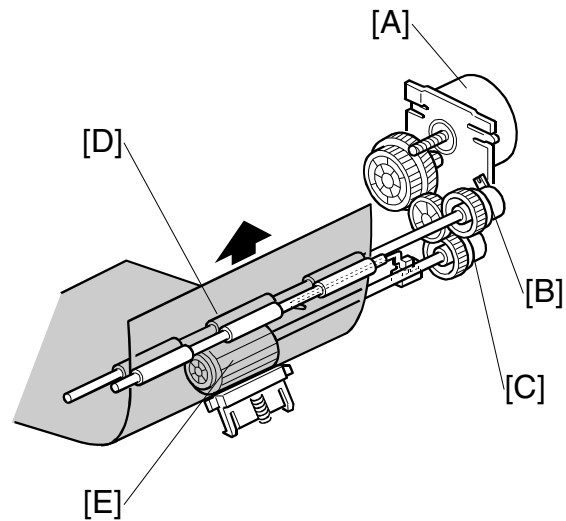
From 100-Sheet Bypass Tray (B044, B046)

Main motor [A] drives gear on registration clutch [B] and bypass feed clutch [F]. The bypass feed clutch drives the bypass feed roller [G]. Again, the FCU controls clutch timing based on input from the registration sensor.
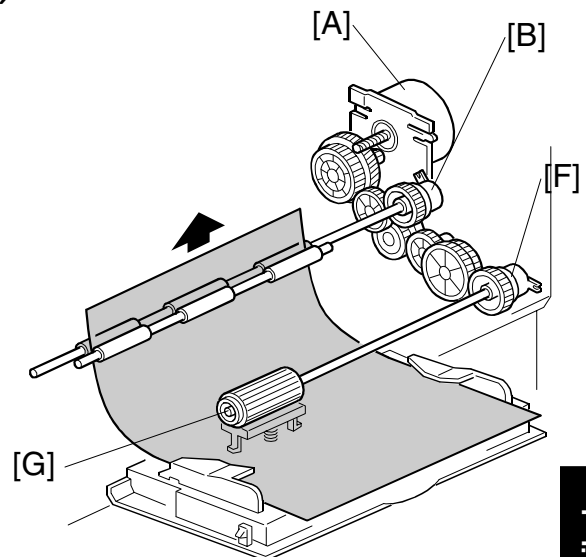
Detailed Descriptions

From 1-Sheet Bypass Tray (B045)

The user inserts the sheet directly up to the registration roller [D]. Main motor [A] drives the gear on registration clutch [B], causing the registration roller to turn and feed the sheet.

6.14.3 PAPER FEED AND SEPARATION

The machine uses a friction-pad feed system.

[A]: Friction pad (in paper tray)

NOTE: On 100-sheet bypass models (B044 and B046), friction-pad separation is also provided for the bypass feed.

[A]
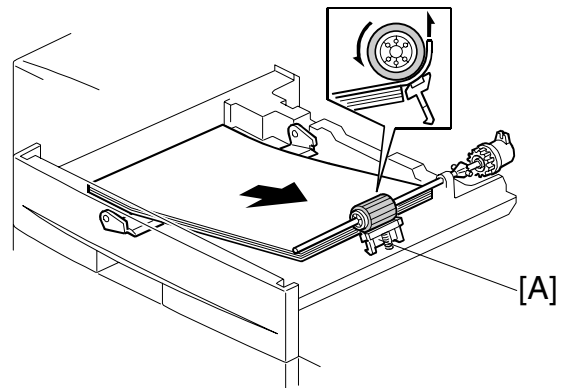
6.14.4 PAPER LIFT MECHANISM

When tray is pushed in: Projection [B] on frame pushes rounded slider [C] in against spring [D], retracting the latch [E]. Spring [F] pushes the plate up.

[B]

[E]

[C]

[D]

[F]
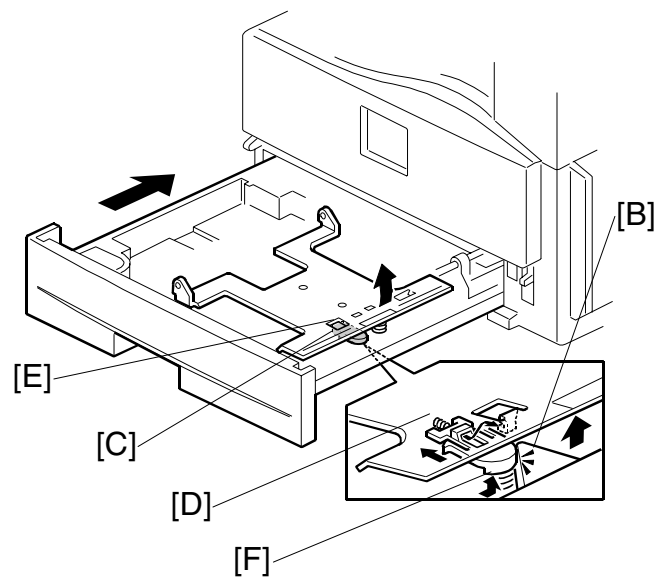
PAPER END DETECTION

Main Tray

When paper runs out, feeler [A] drops into cutout, activating paper end sensor [B].
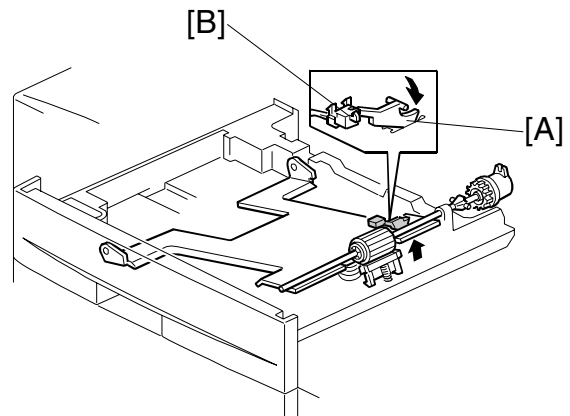
100-Sheet Bypass Tray (B044, B046)

When paper runs out, feeler [C] drops into cutout, activating the bypass paper end sensor [D].
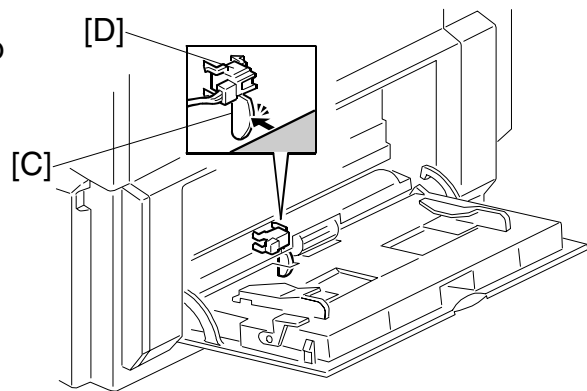
6.14.5 PAPER REGISTRATION

The FCU uses input from registration sensor [A] to control clutch timing and detect misfeeds. Registration clutch timing is controlled to eliminate skew (by stopping the paper briefly as it reaches the roller, so that it buckles). The amount of buckle can be adjusted with SP1-003.
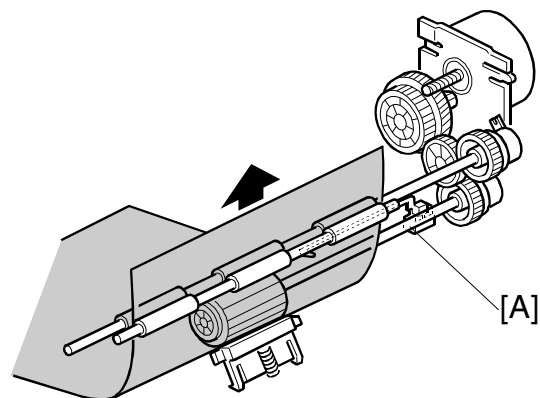
Detailed Descriptions

6.15 IMAGE TRANSFER AND PAPER SEPARATION

6.15.1 OVERVIEW
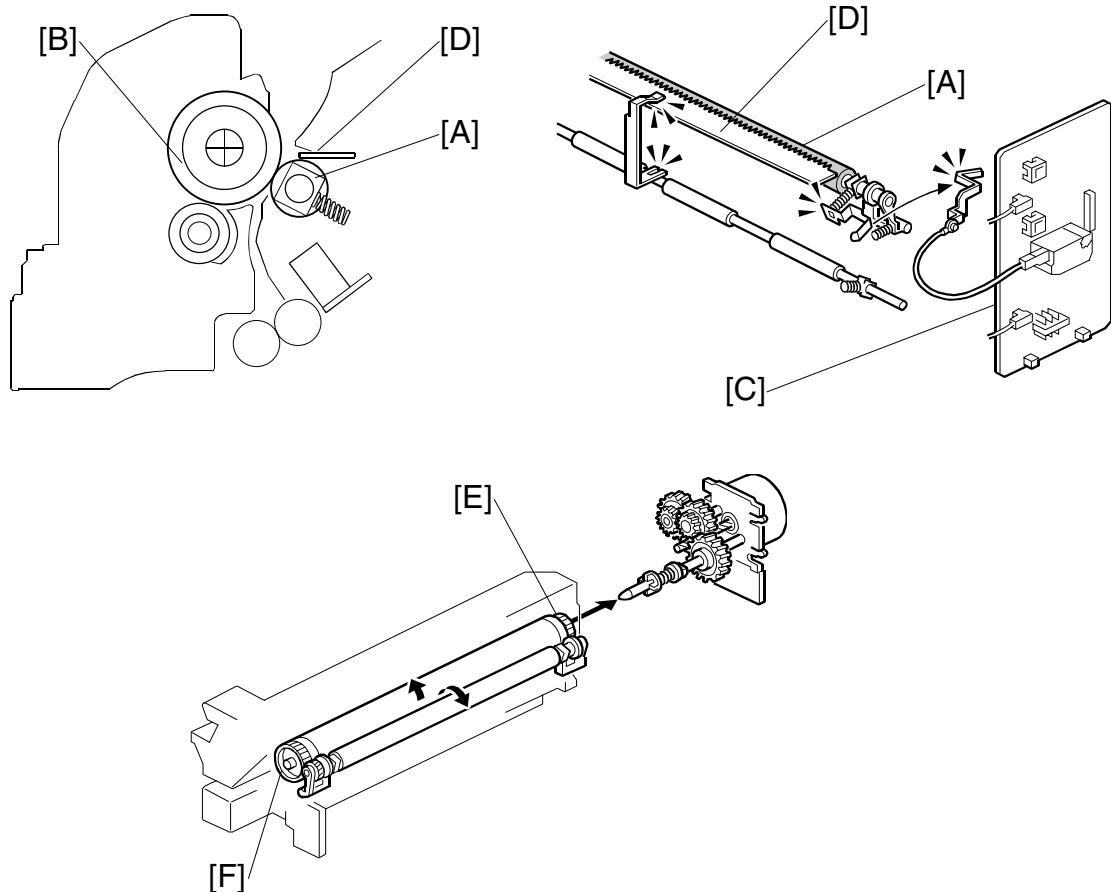
The transfer roller [A] is pressed against the OPC drum [B]. The high-voltage power supply board [C] supplies a positive current to the transfer roller, attracting the toner from the drum onto the paper. The current is set in accordance with the paper's type, size, and feed tray.

Separation of the paper from the drum is aided by the drum's own curvature and by a high AC voltage applied to the discharge plate [D].

The drum drives the transfer roller directly by gears [E], [F].

6.15.2 IMAGE TRANSFER CURRENT TIMING

There are two current levels used during the transfer sequence: low and high.

1. At time of write-start signal, the high voltage supply board generates low current (5 A) to the roller. This prevents positive toner on the drum from moving to the roller.

2. After a certain time the high voltage supply board generates high current to the roller, causing toner to move from drum to paper. (See table below.)

3. After the sheet has passed the roller, current goes off (if printing is finished) or returns to low (if multicopy job with nonstop feed).

The table below shows the default high current levels. You can adjust these levels with SP2-301. But please note that setting the current too high can cause a ghosting effect (where the image at the top of the sheet repeats as a ghost lower down on the page) and in the worst case may damage the drum.

"**High**" **Transfer Current** (μA)

Paper Size	Main Tray / Optional Tray	Bypass		
		Normal	Thick	Special (OHP)
A4, LT	6	6	8	8
B5	—	8	6	—
A5	—	10	6	—
A6	—	12	6	—

Detailed
Descriptions

6.15.3 TRANSFER ROLLER CLEANING

Toner may transfer to the roller surface following a paper jam or if the paper is smaller than the image. Periodic cleaning of the roller is required to prevent this toner from migrating back to the rear of new printouts.

The machine cleans the roller at the following times:

- After initial power on.
- After clearing of a copy jam
- At the end of a job, if at least 10 sheet have been printed since the last cleaning

The high voltage supply unit first supplies a negative cleaning current (about $-4\ \mu A$) to the transfer roller, causing negatively charged toner on the roller to move back to the drum. It then applies a positive cleaning current ($+5\ \mu A$) to the roller, causing any positively charged toner to migrate back to the drum.

The cleaning current can be adjusted using SP2-301-4.

6.16 IMAGE FUSING AND PAPER EXIT

6.16.1 OVERVIEW

The fusing unit and paper exit area consist of the following parts.

1. Exit sensor
2. Exit roller
3. Hot roller strippers
4. Pressure spring
5. Pressure roller
6. Fusing lamp
7. Hot roller
8. Thermofuse
9. Thermoswitch
10. Thermistor
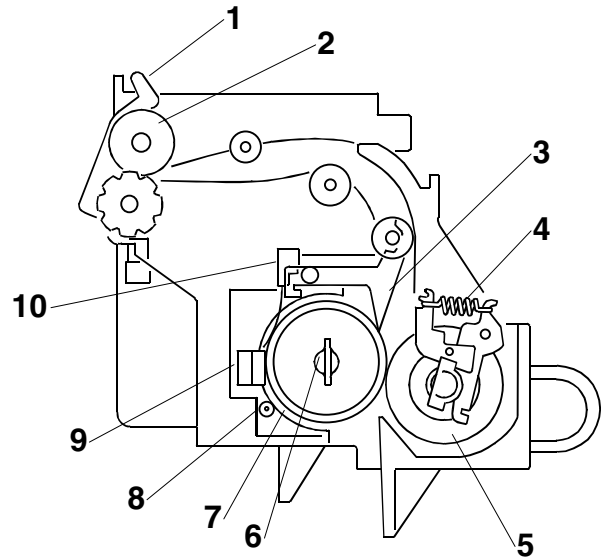
6.16.2 FUSING DRIVE AND RELEASE MECHANISM

The main motor [A] drives the hot roller [B], pressure roller [C], and exit roller [D] through a gear train.
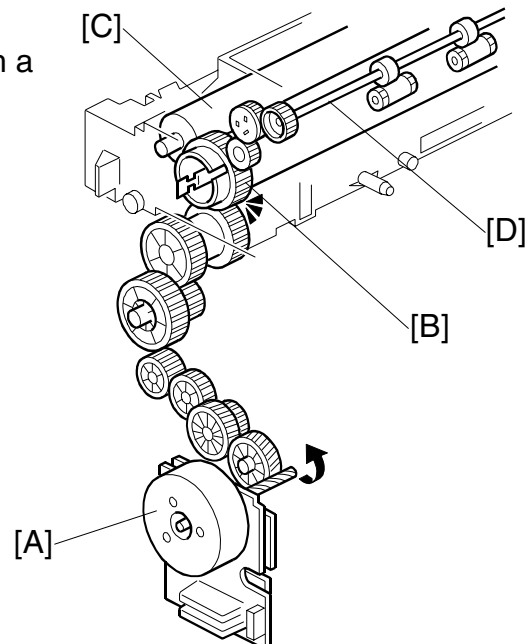
Detailed Descriptions

6.16.3 PRESSURE ROLLER

The pressure springs [A] constantly press the pressure roller [B] against the hot roller [C]. As the default, the springs are positioned at the end [D]. If necessary, pressure can be decreased by changing the springs to position [E].
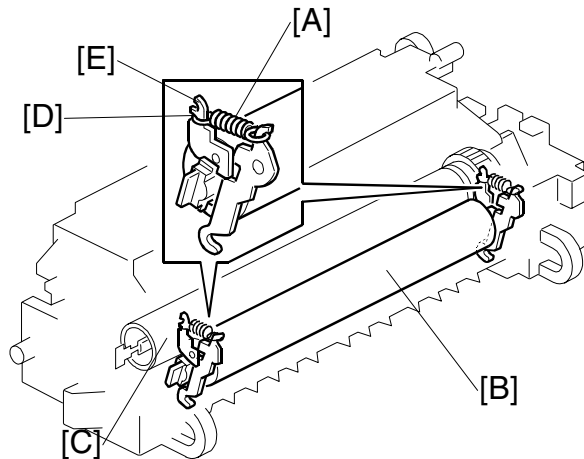
6.16.4 PRESSURE RELEASE

When right door opens, part [F] (on each side) pulls open catch [G] (on each side), releasing pressure on the pressure roller, so that it can turn freely to allow removal of jams. When right door closes, part [H] pushes catch [G] closed, restoring normal pressure.
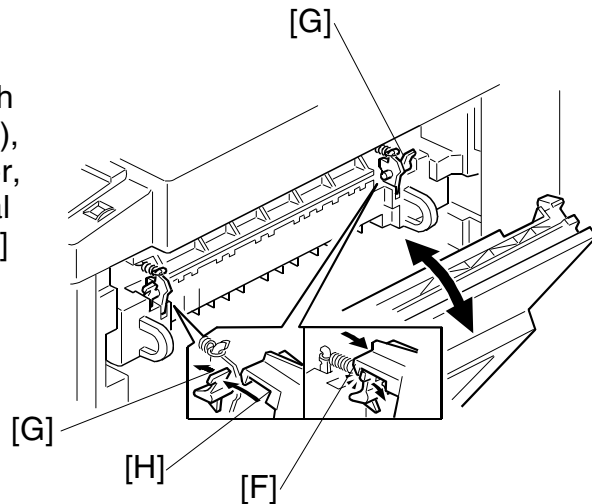
6.16.5 SEPARATION

The hot roller stripper pawls [I] prevent paper from sticking to the hot roller.
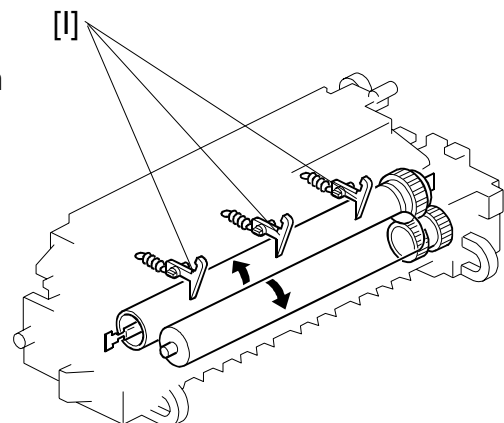
6.16.6 FUSING TEMPERATURE CONTROL

Overview

[A]: Thermistor
[B]: Thermoswitch
[C]: Thermofuse
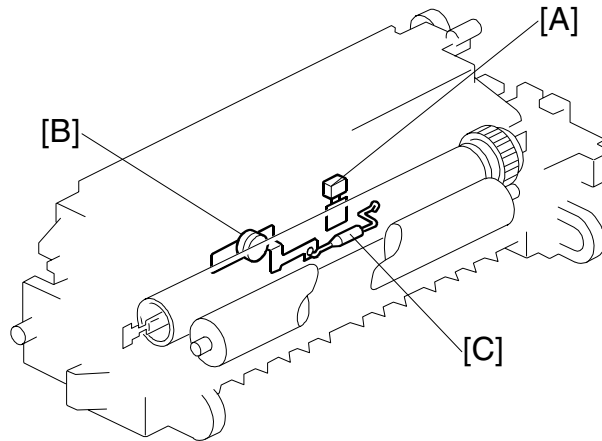
The CPU checks the thermistor
[A] output once per second, and calculates the power-on ratio for the next second based on (a) current temperature, (b) the temperature 1 second earlier, and (c) the target temperature.

The target fusing temperature drops somewhat over time, as the machine's overall state changes with continued use. For normal copying, the target starts at 180°C, then drops to 170°C after one minute.

Fusing Temperature Control for Thick Paper

Target temperature goes up 10°C if the user selects thick-paper mode.

6.16.7 OVERHEAT PROTECTION

Primary protection is provided by the thermistor and CPU, with backup by a thermoswitch and secondary backup by a thermofuse. (See illustration above.)

Protection 1: If the CPU determines from the thermistor that the hot roller has stayed above 230°C for more than 1 second, it cuts the power to the fusing lamp and issues SC543.

Protection 2: The thermoswitch (connected in series with the fusing lamp's common ground) opens if it reaches 190°C, cutting power to the lamp. If you restart the machine without correcting the problem, the machine will issue SC541.

Protection 3: The thermofuse (which is farther from the lamp than the thermoswitch) opens at 131°C, cutting power to the lamp.

Detailed
Descriptions

6.17 ENERGY SAVER MODES

6.17.1 MODE TRANSITIONS

When the machine is idle, the energy saver function reduces power consumption by lowering the fusing temperature. As shown below, the machine can be set to transition to two different reduced power states, in the following order:

1) Low power mode
2) Auto-off mode
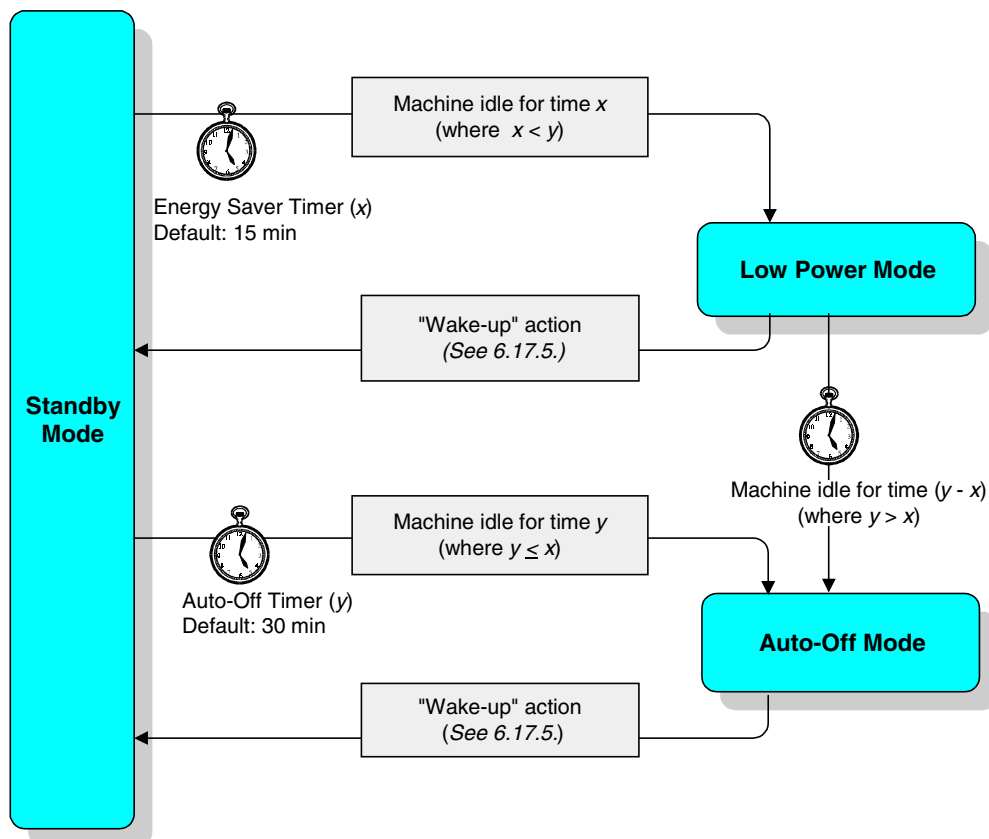
Above, if the Energy Saver Timer setting is x and the Auto Off Timer setting is y, then the following operation applies:

- If $x < y$: The machine moves into selected low-power mode if all sensors and components remain inactive for time x, then moves into auto-off mode if all sensors and components continue inactive for time y-x.

- If $x \geq y$: The machine skips low-power mode and moves directly into auto-off mode if all sensors and components remain inactive for time y.

Note that during countdown to x or y, the machine may automatically switch into the preferred application mode (copier/fax) in accordance with the User Tool's Function Priority and System Reset settings. This has no effect on the power-mode transition timing.

6.17.2 SYSTEM SETTINGS

The user sets up energy-saving operation using the following User Tool settings.

User Tool – System Setting	Operation
Energy Saver timer	Sets time at which machine moves from standby to the low-power mode. • The default is 15 minutes.
Energy Saver level	Selects the low-power mode that the system uses. The default is Level 2. (See below.)
Auto-Off Timer	Sets time at which machine transitions to auto-off mode. The default is 30 minutes.
AOF	Allows user to disable auto-off. The default setting is on (enabled). *See Note below.*

NOTE: If the customer requests that you disable auto-off, please inform the customer that disabling of this feature will void Energy Star conformance and is not recommended.

6.17.3 LOW POWER MODE LEVELS

The Energy Saver Level setting determines which power level is used when the machine enters Low Power mode.

Mode	Fusing Temp.	Approx. Recovery Time
Low Power—Level 1	165°C	5 s
Low Power—Level 2	90°C	10 s
Low Power—Level 3	Room Temp.	20 s

6.17.4 AUTO-OFF LEVEL

Identical to low power mode level 3.

6.17.5 TRANSITION OPERATION

On entry into low-power or auto-off:

- Main power LED stays ON, operation switch and all other indicators OFF.
- System +5V power remains on.

The machine returns to standby power mode when any of the following "wake-up" actions occurs:

- Pressing of operation switch
- Opening of platen cover
- Placing sheet in DF
- Wake-up signal from a PC
- Error or SC condition

Detailed
Descriptions

SPECIFICATIONS

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration: Desktop

Copy Process: Dry electrostatic transfer system

Originals: Sheet/Book

Original Size: Maximum
    A4 / 8$1/2$" x 11"
    A4 / 8$1/2$" x 14" (ADF)

Copy Paper Size: Maximum
    A4 SEF / 8$1/2$" x 11" SEF (Copier's paper tray)
    A4 SEF / 8$1/2$" x 14" SEF (Bypass)
    A4 SEF / 8$1/2$" x 14" SEF (Optional paper tray)

    Minimum
    A5 LEF / 8$1/2$" x 5$1/2$" LEF (Copier's paper tray)
    A6 SEF/ 8$1/2$" x 5$1/2$" (Bypass)
    A4 SEF / 8$1/2$" x 11" SEF (Optional paper tray unit)
    Custom sizes in the bypass tray:
        Width: 90 – 216 mm (3.5" – 8.5")
        Length: 140 – 356 mm (5.5" – 14.0")

Copy Paper Weight: Copier's paper tray; optional paper tray:
    60 – 90 g/m^2, 16 – 24 lb.
    Bypass:
    60 – 157 g/m^2, 16 – 42 lb.

Reproduction Ratios: 2 enlargement and 3 reduction

	A4 Version	LT Version
Enlargement	200%	155%
	141%	129%
Full Size	100%	100%
Reduction	93%	93%
	71%	78%
	50%	65%

Zoom: 50% to 200%, in 1% steps

Power Source: 110 – 120 V, 60 Hz
            or
    220 – 240 V, 50/60 Hz

SPECIFICATIONS

Power Consumption:
Maximum	Not above 1 kW
Standby (mainframe only)	Approx. 90 W
Standby (with ADF, PTU)	Approx. 100 W
When printing	Approx. 480 W
Low Power Level 1	Not above 50W
Low Power Level 2	Note above 12W
Auto-Off	Not above 2 W

Noise Emission

Sound Power Level

Standby (Mainframe / Full system):	Not above 40 dB(A)
Operating (Mainframe only, non-impulse):	Not above 62 dB(A)
Operating (Full System):	Not above 66 dB(A)

Sound Pressure Level

Standby (Mainframe / Full system):	Not above 27 dB(A)
Operating (Mainframe only, non-impulse):	Not above 54 dB(A)
Operating (Full System):	Not above 54 dB(A)

Dimensions (W x D x H)
    Without ADF: 468 x 450 x 371 mm (18.4" x 17.7" x 14.6")
    With ADF: 468 x 450 x 461 mm (18.4" x 17.7" x 18.2")

Weight
    Mainframe: Not above 20 kg (44.1 lb.)
    With ADF: Not above 22 kg (48.5 lb.)

Resolution: 600 dpi

Copying Speed in Multicopy Mode (copies/minute):

   B044, B046:   13
   B045:   12

   NOTE: Measurement Conditions:
            1) A4 / 8$_{1/2}$" x 11"
            2) 100% size

Warm-up Time: Less than 20 seconds (at 20°C [68°F])

First Copy Time: Not more than 8 seconds
                         NOTE: Measurement Conditions
                                  1) From the ready state, with the polygonal
                                     mirror motor spinning.
                                  2) A4/LT copying
                                  3) From copier's paper tray
                                  4) 100% size

Copy Number Input: Numeric keypad, 1 to 99 (increment, decrement)

Manual Image Density: 5 steps

Automatic Reset: Default is 60 seconds. Can be set from 10 to 999
                         seconds with user tools.

Auto-Off: Default is 30 minutes. Can be disabled or set from 1 to
                         240 minutes with user tools.

SPECIFICATIONS

Copy Paper Capacity: Paper Tray:
                             250 sheets
                         Optional Paper Tray Unit (B044/B046):
                             500 sheets x 1

                         Bypass Tray:
                             100 sheets (B044/B046)
                             1 sheet (B045)

Copy-Tray Capacity   250 sheets

Toner Replenishment:

- B045/B049:   THM (Toner Hopper Magazine) replacement (260 g/
                             magazine)
- B044/B046:   Cartridge replacement (230 g/cartridge)

Toner Yield

- B045/B049:   7k copies /THM (A4, 6% full black)
- B044/B046:   7k copies /toner bottle (A4, 6% full black)

Optional Equipment: • Auto document feeder
                         • Paper tray unit (available for B044, B046 only)
                         • Anti-condensation heater for paper tray unit

Memory Capacity   8MB standard; 32MB DIMM as option

2. MACHINE CONFIGURATION
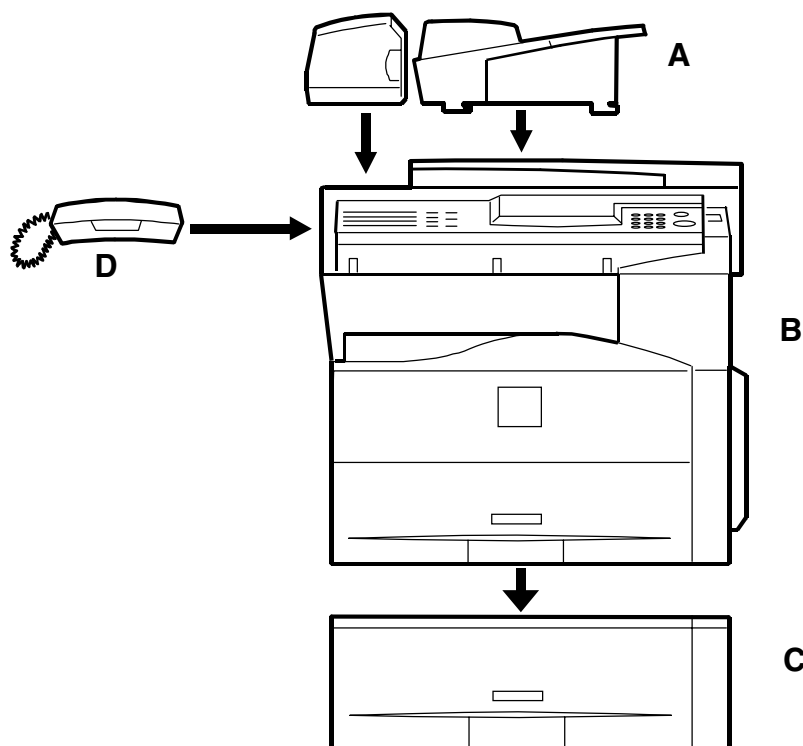
Version	Item	Machine Code	Letter
Copier	Copier (100-sheet bypass, no fax, no ADF)	B044	B
	Copier (1-sheet bypass, no fax, no ADF)	B045	B
	Copier (100-sheet bypass, fax, ADF)	B046	B
	ADF (option for B044/B045)	B444	A
	Paper Tray Unit (option for B044/B046)	B421	C
	32MB Memory (option)	G578	
	Anti-condensation heater for Paper Tray Unit	B421	
Fax Unit	Fax Controller (option for B044/B045)	B465	
	Handset (option)	B433	D
Printer	Printer Controller (option)	B441	
	NIB (option)	B430	
	32MB Memory (option)	G578	
	64MB Memory (option)	G579	
	128MB Memory (option)	G580	
	PS2 (option)	B431	

3. OPTIONAL EQUIPMENT

ADF

Original Size:	Standard sizes:
	    A4 to A5; 8$_{1/2}$" x 14" to 8$_{1/2}$" x 5$_{1/2}$"
	Non-standard sizes:
	    Max. width: 216 mm
	    Min. width: 140 mm
	    Max. length: 356 mm
	    Min. length: 140 mm

Original Weight:	52 – 105 g/m^2 (14 – 28 lb.)
Table Capacity:	30 sheets (80 g/m^2, 21 lb.)
Original Standard Position:	Center
Separation:	FRR
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	50 – 200%
Power Source:	24 and 5 Vdc from the copier
Power Consumption:	Not above 50 W when running Not above 1.2 W when standing by
Dimensions (W x D x H):	110 x 360 x 95 mm (4.3" x 14.2" x 3.7")
Weight:	2 kg (4.4 lb)

PAPER TRAY UNIT

Paper Sizes:	A4 SEF, 8$_{1/2}$" x 11" SEF, 8$_{1/2}$" x 13" SEF, 8$_{1/2}$" x 14" SEF
Paper Weight:	60 – 90 g/m^2, 16 – 24 lb.
Tray Capacity:	500 sheets (80 g/m^2, 21 lb.) x 1 tray
Paper Feed System:	Feed roller and friction pad
Power Source:	24 Vdc and 5 Vdc, from copier. If optional tray heater is installed, the copier also supplies Vac (120 Vac or 220 – 240 Vac).
Power Consumption:	Maximum: 15 W (excluding optional tray heater) Average: 14 W (excluding optional tray heater)
Weight:	Not above 6 kg (13.2. lb.)
Size (W x D x H):	430 x 414 x 140 mm (16.9" x 16.3" x 5.5")

DOCUMENT FEEDER
B444

B444
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1. OVERALL INFORMATION

1.1 MECHANICAL COMPONENT LAYOUT
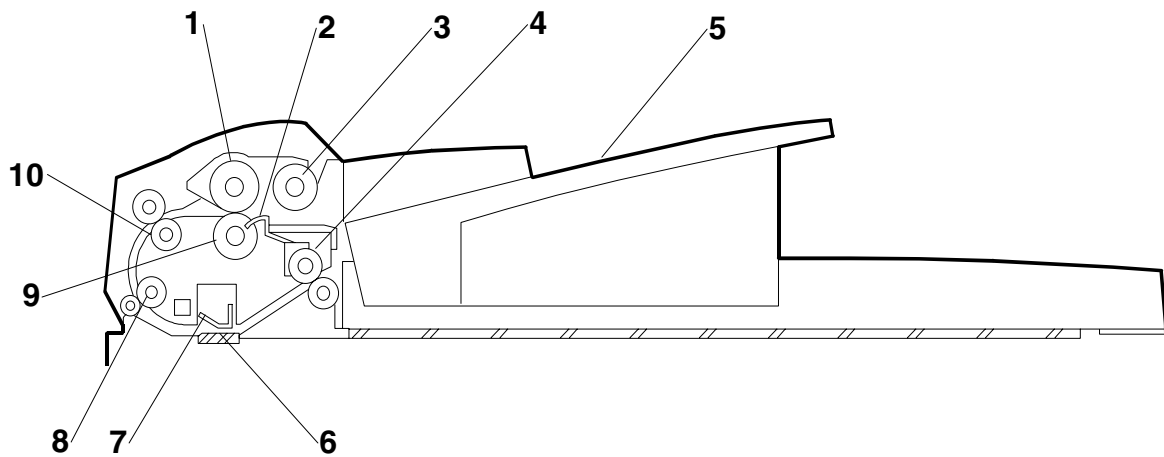
1. Feed roller	6. DF exposure glass
2. Original set sensor	7. White plate
3. Pickup roller	8. 2nd transport roller
4. Original exit roller	9. Separation roller
5. Original table	10. 1st transport roller

1.2 ELECTRICAL COMPONENT LAYOUT
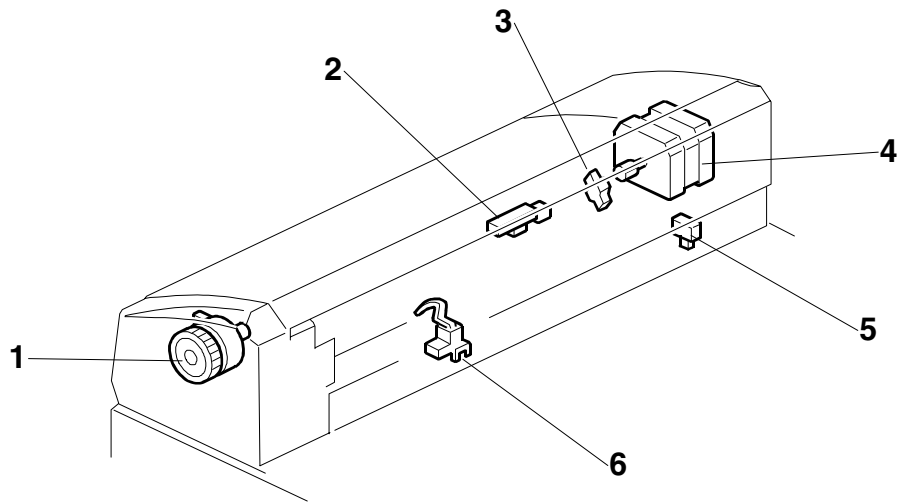
1. DF feed clutch
2. Original registration sensor
3. Guide open sensor
4. DF motor
5. Unit open switch
6. Original set sensor

1.3 DRIVE LAYOUT
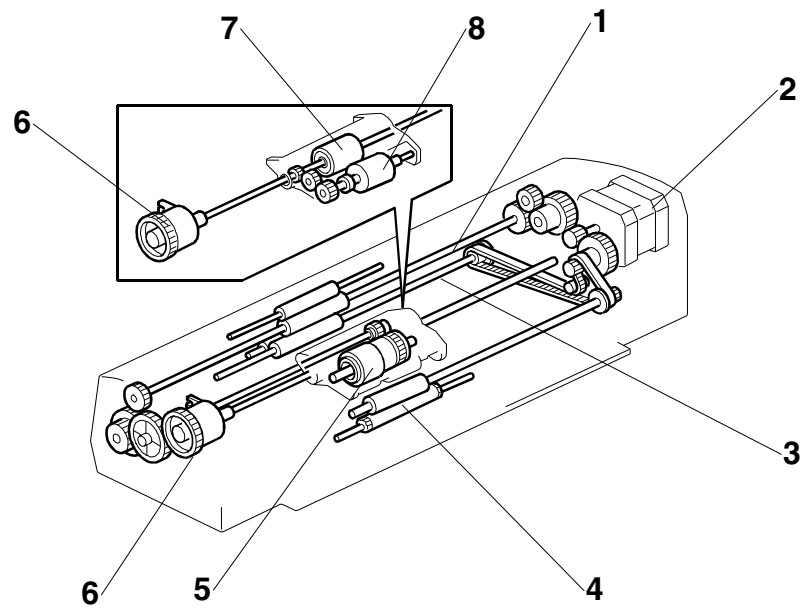
1. 1st transport roller
2. DF motor
3. 2nd transport roller
4. Exit roller
5. DF separation roller
6. DF feed clutch
7. DF feed roller
8. DF pickup roller

2. DETAILED SECTION DESCRIPTIONS

2.1 PICK-UP AND SEPARATION
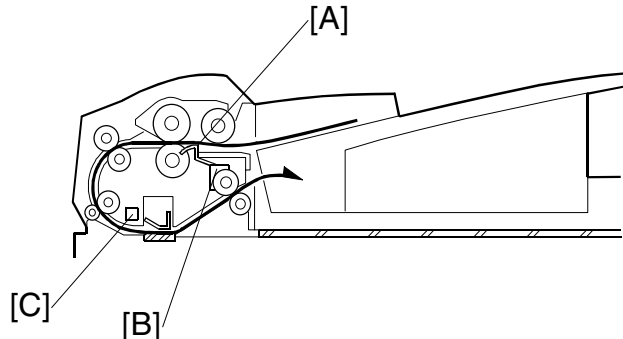
The ADF uses an FRR (Feed & Reverse Roller) system.

Setting paper lowers the feeler [A], causing the original set sensor [B] to inform the CPU that the ADF is ready to feed.

Press ⊚ → short time lag → DF feed clutch engages → DF motor starts.

The motor drives the DF pickup roller, DF feed roller, DF separation roller, and transport rollers. The pickup roller drives the top sheet(s) between the feed and separation roller, where the top sheet is separated and fed to the transport rollers.

2.2 CLUTCH OPERATION

The DF feed clutch is provided to stop feeding in the event of a jam. During jam-free operation the clutch remains activated for the entire feed cycle. In the event of a jam the clutch disengages (by torque limiter).

2.3 TRANSPORT AND EXIT

During pickup and feeding of the first sheet, the scanner moves to carry out white adjustment and then scanning correction.

A short time after the sheet reaches the original registration sensor [C], the DF motor stops briefly, the scanner moves to DF scan position, and the white peak is read. The DF motor then restarts and the sheet is scanned. The exit roller ejects the sheet.

Features of the transport mechanism:

• White peak is read for each sheet. If timing allows, the DF motor continues running while the peak is read between consecutive trailing and leading edges. If timing does not allow, the DF motor stops and then restarts.
• Shading correction is repeated every 10 sheets. The DF motor must stop and restart to carry out this correction.
• Following feeding of the last sheet, the DF motor reverses briefly, raising the pickup roller.

2.4   UNIT OPEN SWITCH AND GUIDE OPEN SENSOR

The guide open sensor is ON while the DF guide is open, and the unit open switch is ON when the DF unit itself is raised. The machine will not carry out scanning when either of these is ON, but will instead display a message instructing the user to close the DF.

2.5   OVERALL ELECTRICAL CIRCUIT
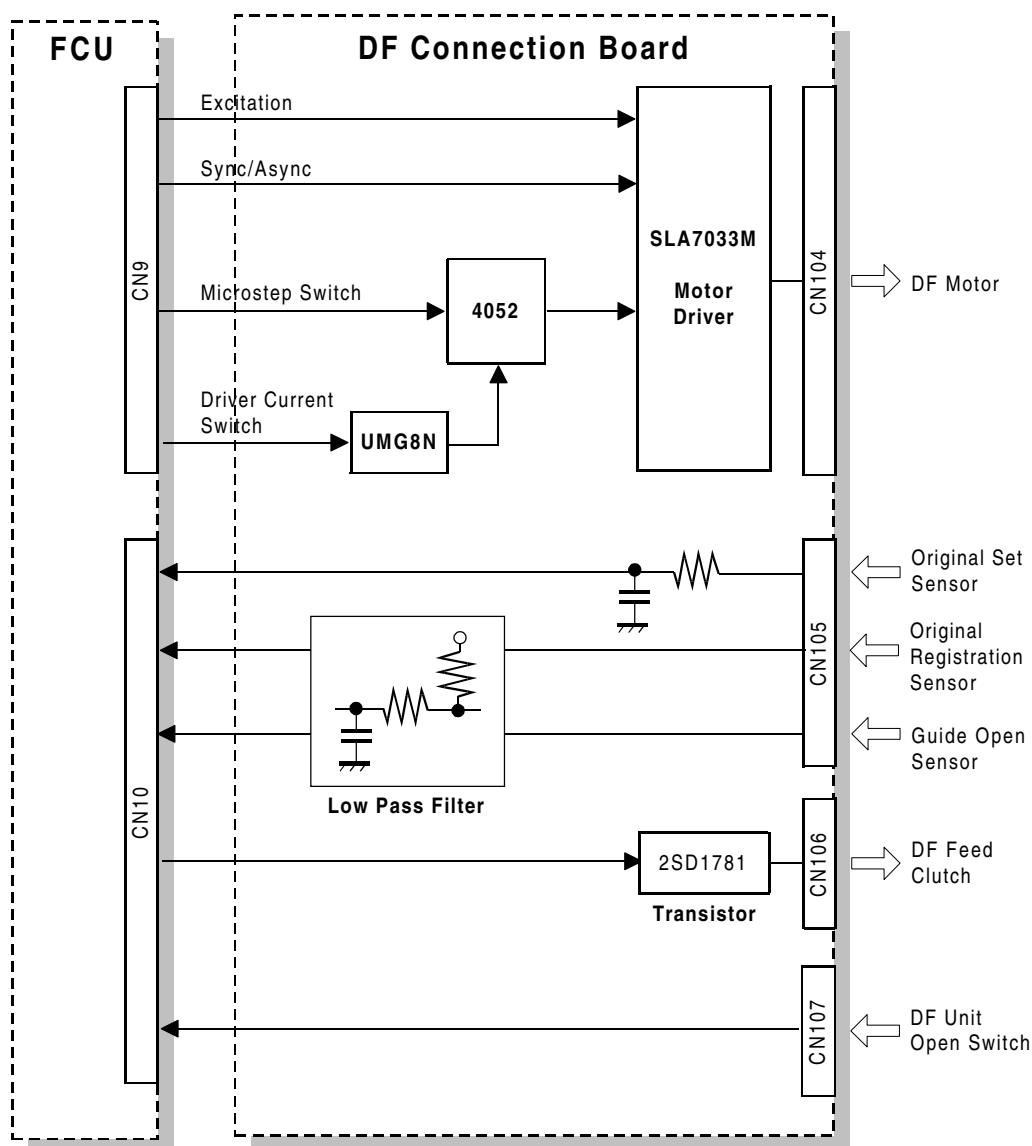
3. REPLACEMENT AND ADJUSTMENT

3.1 DF UPPER COVERS

1. Open the upper guide [A].

2. DF front upper cover [B] and/or DF rear upper cover [C] (1 screw each)
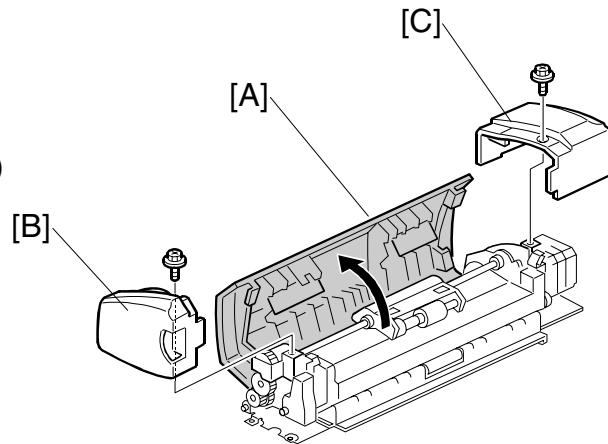
3.2 ORIGINAL TABLE

1. Push the original table [A] to the left so that the three latches come free of the platen cover [B], and lift off.
   NOTE: When reinstalling, first set the table flat onto the platen cover so that the latches go all the way in to the openings, and be sure that the contact area around each latch is flush against the cover. Then push so that latch [1] locks into place, then latch [2], and then latch [3].
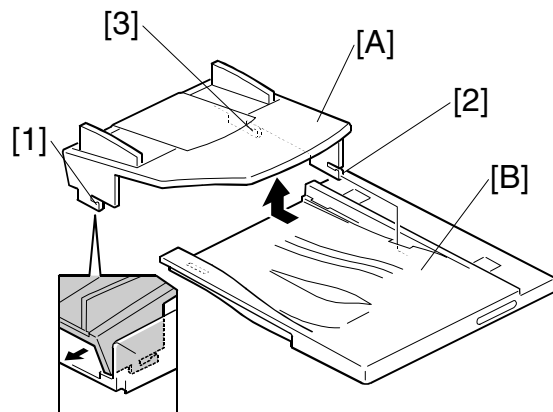
3.3 FEED UNIT

1. Raise the upper guide [A].

2. Feed unit [B] (⟨⟩ x 1).
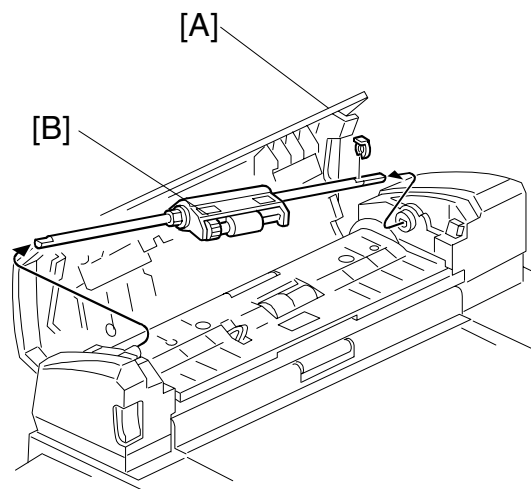
3.4 DF PICKUP ROLLER

1. Feed unit (☛ 3.3)

2. Remove E-ring [A].

3. DF pickup roller [B].

[A]

[B]
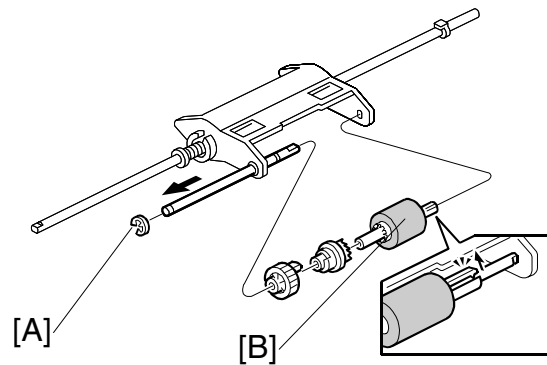
3.5 DF FEED ROLLER

1. Feed unit (☛ 3.3)

2. Remove E-ring [A].

3. Lift catch [B] and pull shaft in indicated direction.

4. DF feed roller [C]

[C]   [B]

[A]
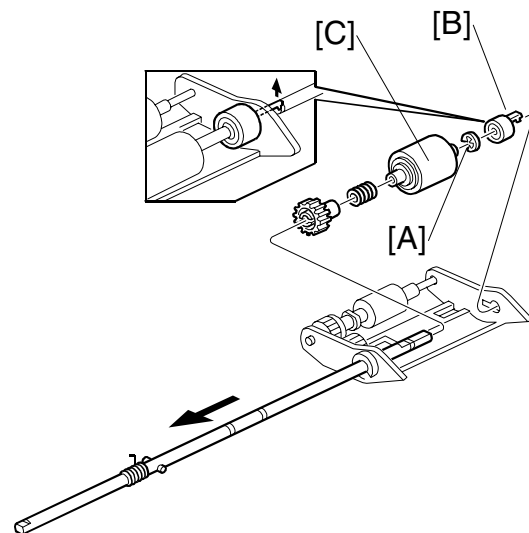
3.6 DF SEPARATION ROLLER

1. Feed unit (☛ 3.3)

2. Open the center lid [A]

3. Lift out the separation roller ass'y [B].

4. DF separation roller [C]
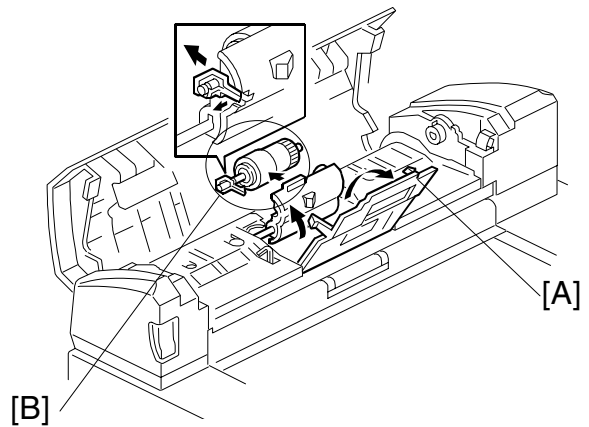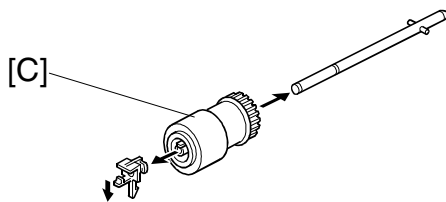
3.7 DF MOTOR

1. Copier rear cover (☛ Copier Service Manual, Section 3.3.2)

2. DF rear upper cover (☛ 3.1)

3. Unscrew and lift away the rear lower cover [A] (🔩 × 2).
    NOTE: It is not necessary to disconnect all connectors and remove the cover completely. When replacing, remember that the left screw [B] must also go through the ground line [C].
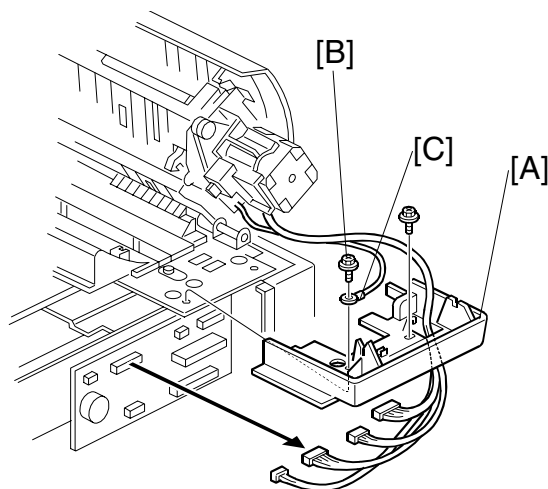
4. Motor bracket [D] (2 screws at [E]).
    NOTE: Before removing the bracket, open the three clamps (not shown) on the bracket and take the wiring out of the them.

5. Motor [F] (2 screws at [G], 🔌 × 1).
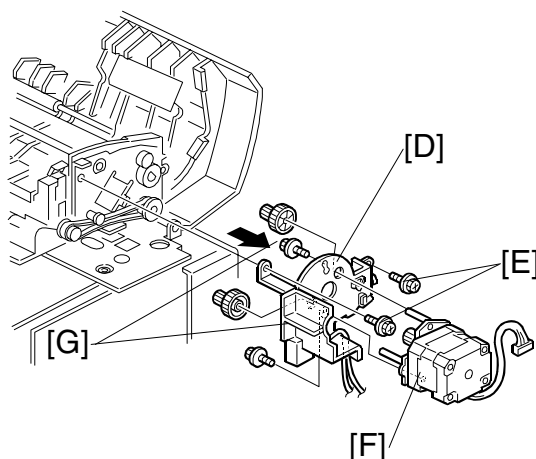
NOTE: When reinstalling, be sure that the belt [H] is arranged as shown in the illustration.
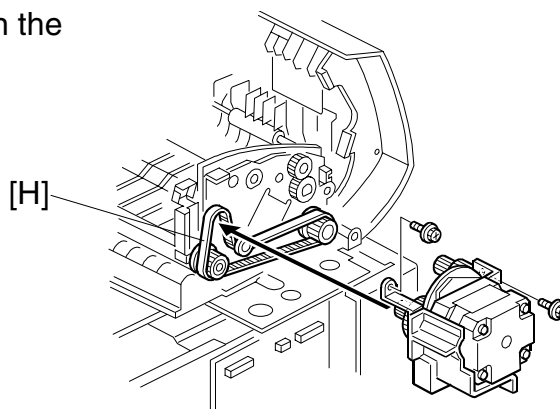
3.8 DF FEED CLUTCH

1. DF front upper cover (☛ 3.1)
2. Metal retainer [A]($\mathscr{F}$ × 2)
3. DF feed clutch [B] (▤ × 1)
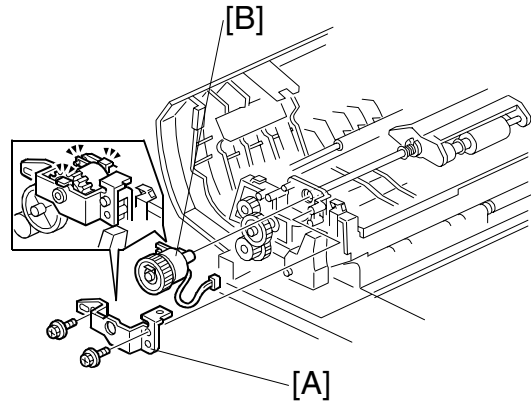
3.9 SENSORS
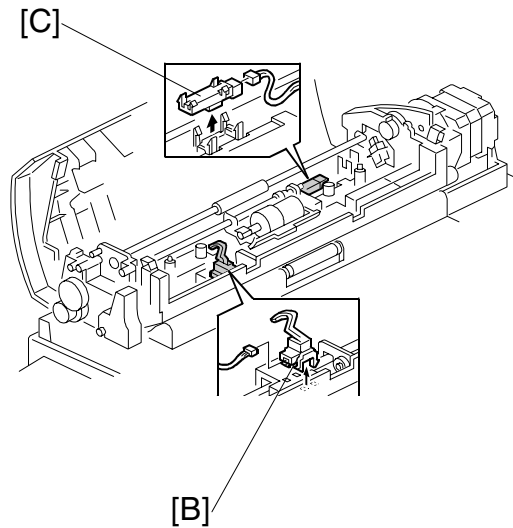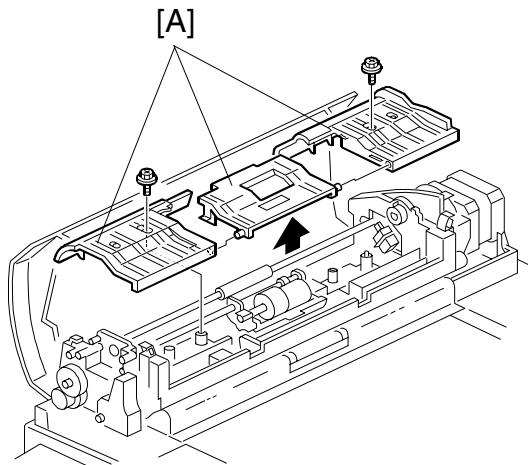
1. Feed unit (☛ 3.3)
2. Three lids [A] ($\mathscr{F}$ × 2)

[B]: Original set sensor (▤ × 1)

[C]: Original registration sensor (▤ × 1)

[D]: Guide open sensor (▤ × 1)
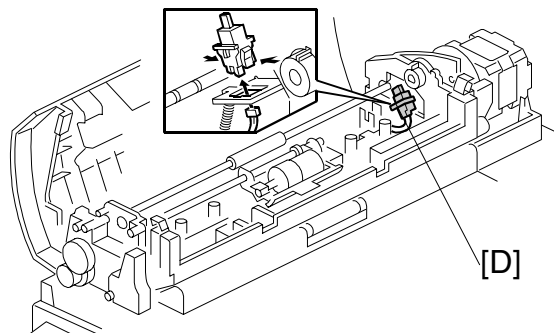
3.10 DF EXPOSURE GLASS

1. Press the DF latch and raise the DF body.

2. Original exit guide [A] ($\hat{\mathscr{F}} \times 3$)

3. DF exposure glass [B]
   NOTE: When reinstalling, set the glass so that its padded side is facing up.
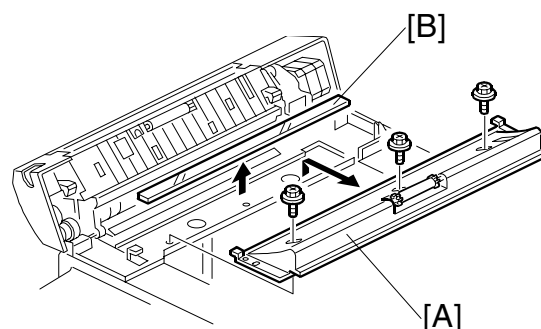
3.11 DF CONNECTION BOARD

1. Copier rear cover (☞ Copier Service Manual, Section 3.3.2)

2. DF connection board [A] ($\hat{\mathscr{F}} \times 5$, all connectors)
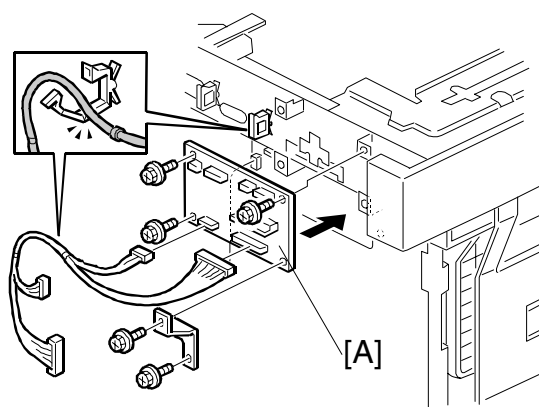
PAPER TRAY UNIT
B421

B421
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1. OVERALL MACHINE INFORMATION

1.1 MECHANICAL COMPONENT LAYOUT
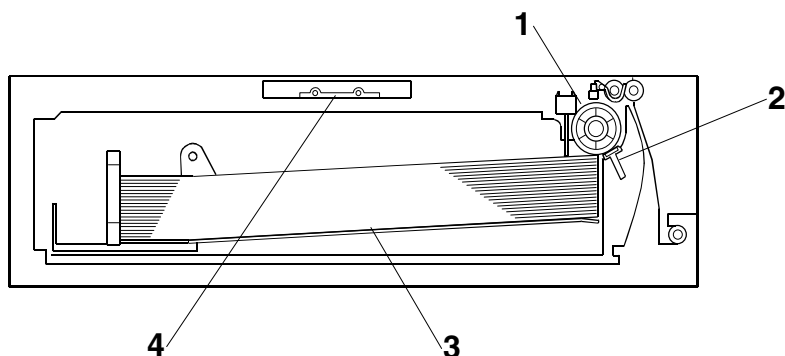
1. Feed Roller
2. Friction Pad
3. Bottom Plate
4. Optional Tray Heater

1.2 ELECTRICAL COMPONENT LAYOUT
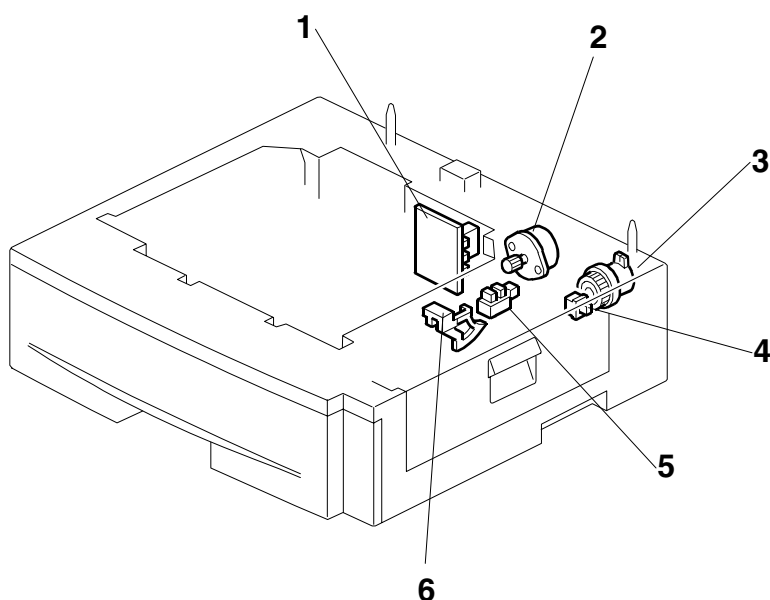
1. Tray Main Board
2. Paper Feed Motor
3. Paper Feed Clutch
4. Door Switch
5. Paper Feed Sensor
6. Paper End Sensor

1.3 DRIVE LAYOUT
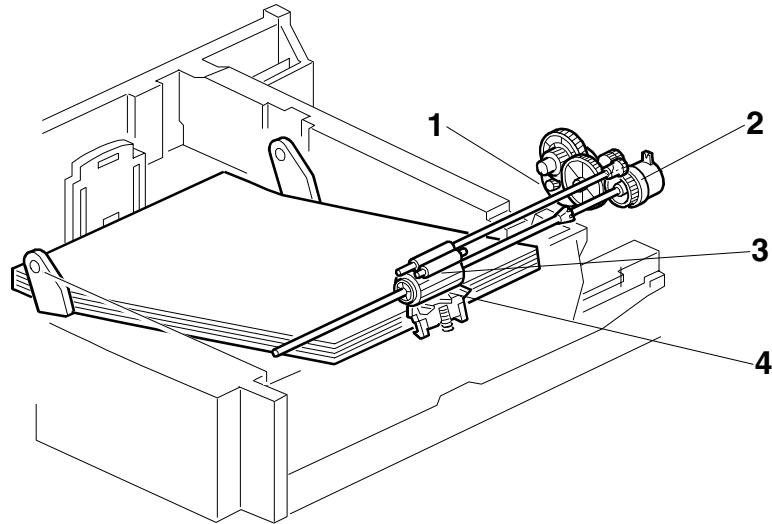
1. Paper Feed Motor
2. Paper Feed Clutch
3. Feed Roller
4. Friction Pad

1.4 OVERALL ELECTRICAL CIRCUIT
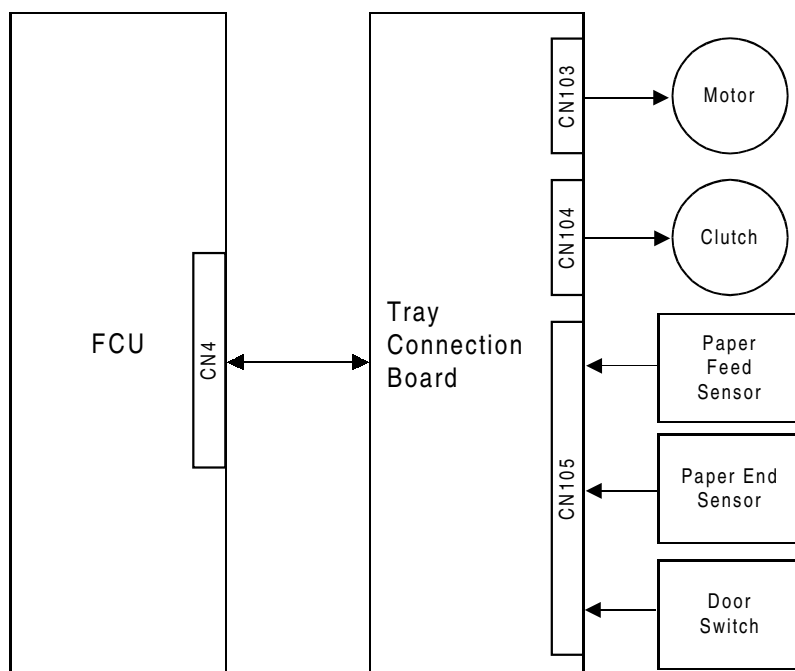
1.5   DETAILED DESCRIPTIONS

1.5.1 PAPER FEED AND SEPARATION
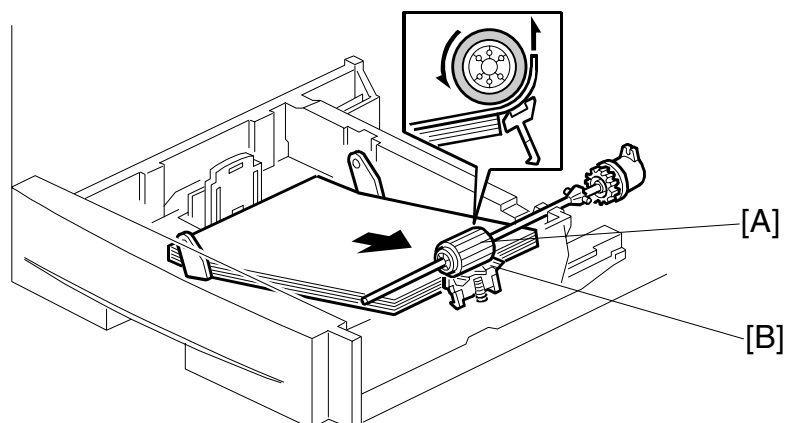
The paper tray holds 500 sheets. A friction-pad feed system is used.

[A]: Paper feed roller
[B]: Friction pad

1.6   PAPER LIFT MECHANISM
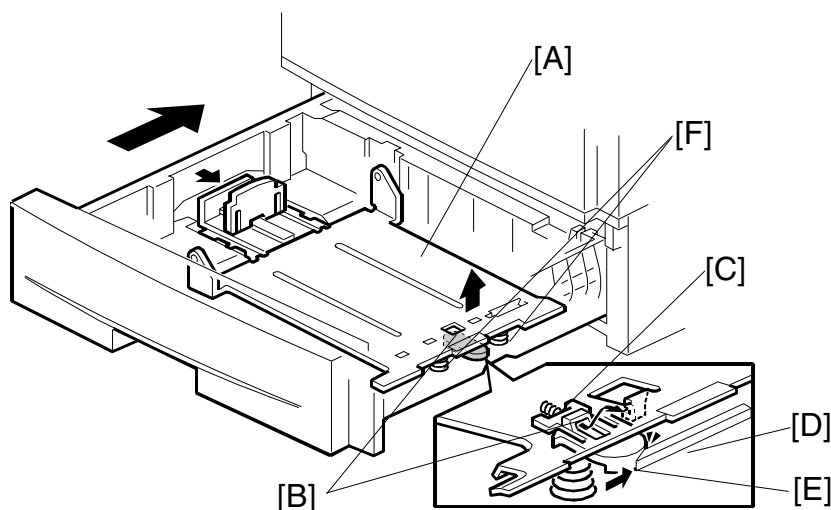
With tray partially or fully out of unit: Pushing down bottom plate [A] engages latch [B], locking the plate down. Latch [B] is held in place by spring [C].

When user pushes tray in: Runner [D] on frame pushes in rounded slider [E], retracting the latch. Springs [F] push the plate up. The latch remains retracted while the drawer is in the unit, so that the plate cannot be locked down.

1.7 PAPER END DETECTION
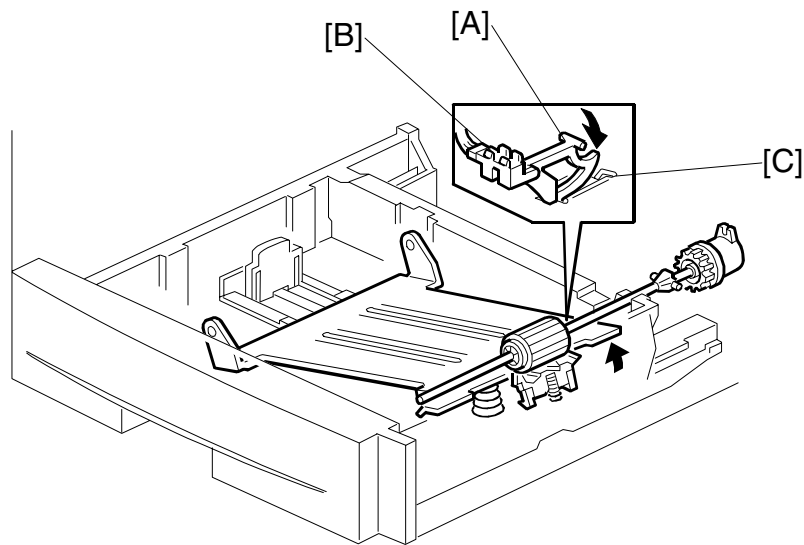
[A]: Paper End Feeler
[B]: Paper End Sensor
[C]: Cutout in Paper Tray

- If paper is present: feeler [A] pushed up, deactivating sensor [B].
- If no paper is present: feeler [A] drops into cutout [C], activating sensor [B].
- The feeler is rounded so that it lifts out of the way when the tray is inserted or pulled out.

1.8 SIDE AND END FENCES
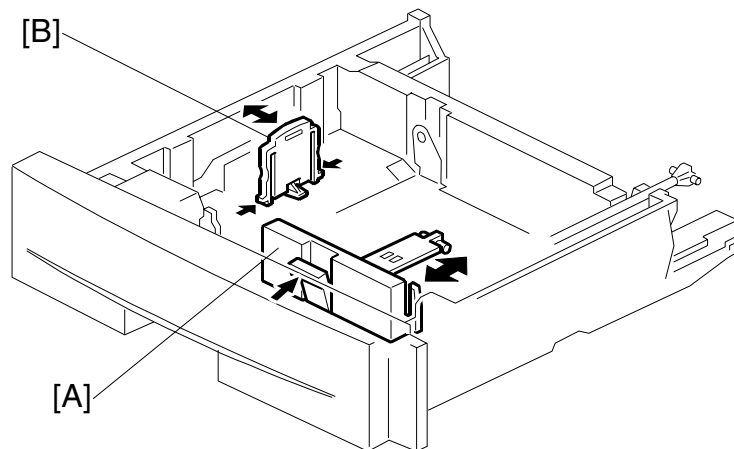
[A]: Side Fence
[B]: End Fence

- Side Fence: Set width to A4, 8$1/4$", or 8$1/2$".
- End fence: Set from 11" to 13", with standard settings at 11", A4, and 13". To feed 14" paper, the end fence can be removed and placed in internal compartment.
- Both fences can be secured with screws at standard positions.

2. REPLACEMENT AND ADJUSTMENT

2.1 FEED ROLLER AND FRICTION PAD

[C]

1. Take the tray out of the paper tray unit.

2. Clip ring [A]

3. Shaft assembly [B]

4. Feed roller [C] (◎ x 1)

5. Friction pad [D]

[A]

[B]

[D]
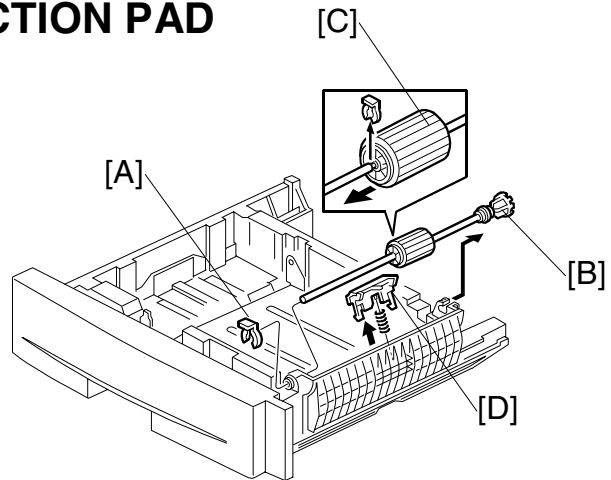
2.2 REMOVING THE PAPER TRAY UNIT FROM THE COPIER

If Optional Tray Heater Is Not Installed

1. Lift the copier off of the paper tray unit.

If Optional Tray Heater Is Installed

1. Refer to Section 1.4.2 of the B044/B045/B046 Service Manual, and carry out the following steps of that procedure in this order:
   • Step 2 (remove both paper trays)
   • Step 7 (remove copy tray)
   • Step 8 (remove rear cover)
   • Step 9 (remove FCU cover plate)

2. Refer to Section 1.4.2 of the B044/B045/B046 Service Manual, and do the following:
   • Unscrew the ground line.
   • Unclamp the heater harness clamps.
   • Disconnect the heater harness from the relay harness.
   • Unwrap and remove the core.

3. Pull the relay harness down and out through the hole in the PSU bracket, and then pull it all the way in through the hole at the rear of the (main) paper tray unit.

4. Remove the 3 screws fastening the paper tray unit to the copier (☛ 1.4.2 of the B044/B045/B046 Service Manual, Step 6).

5. Lift the copier off the paper tray unit.
   To reinstall, refer to the procedure in Section 1.4.2 of the B044/B045/B046 Service Manual. Carry out most of that procedure, starting from Step 5 and omitting unnecessary steps.

2.3 SENSORS

1. Remove the copier from the paper tray unit (☛ 2.2).

2. Open the PTU's right door [A].

[B]: Paper end sensor (⬚ × 1)
[C]: Paper feed sensor
    (1 feeler [D], ⬚ × 1)
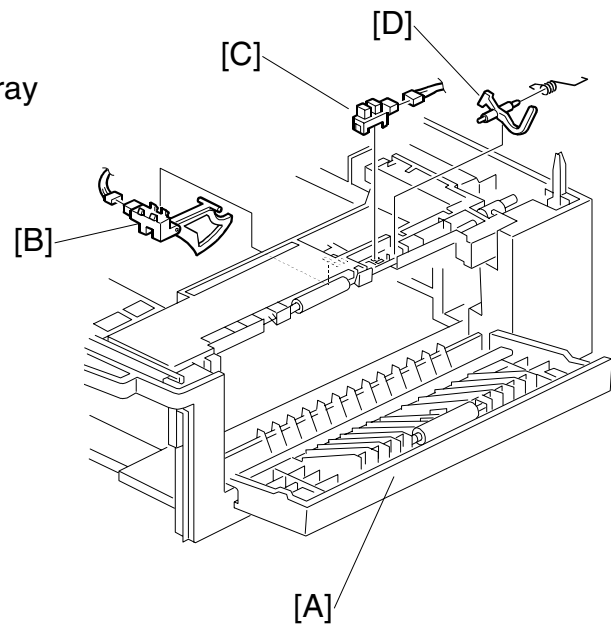
Paper Tray
Unit
B421

2.4 DRIVE SECTION

2.4.1 DRIVE BLOCK

1. Remove copier from paper tray unit (☛ 2.2).

2. Open the paper tray unit's right door [A].

3. Drive block [B] (🔩 × 4)
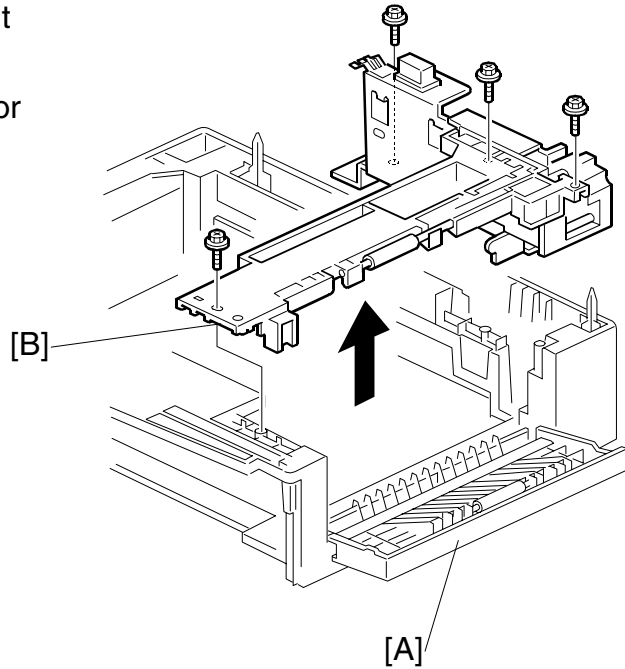
2.4.2 PAPER FEED MOTOR

1. Drive block (☛ 2.4.1)

2. Paper feed motor [A] (🔌 × 1)
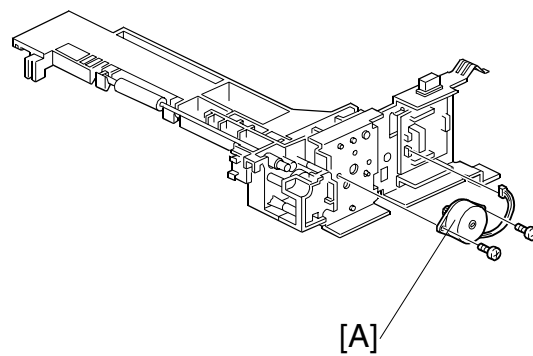
2.4.3 PAPER FEED CLUTCH

1. Drive block (☛ 2.4.1)

2. Detach the clutch cover [A]
   (🖰 x 1, 🔩 x 2).

3. Paper feed clutch [B] (🔌 × 1)
   Detach the connector from the board
   side, not the clutch side.
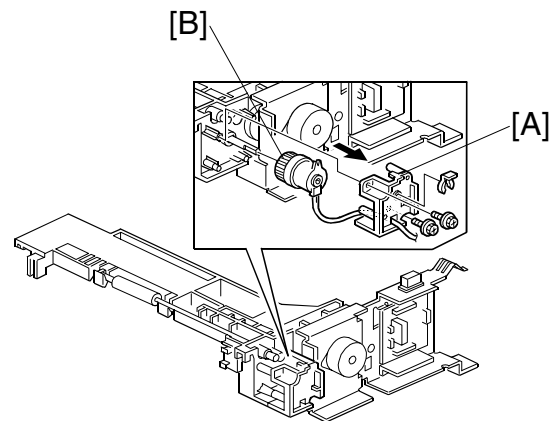
2.4.4 TRAY MAIN BOARD (☛ 2.4.1)

1. Tray main board [A]
   (🔩 × 2, all connectors)
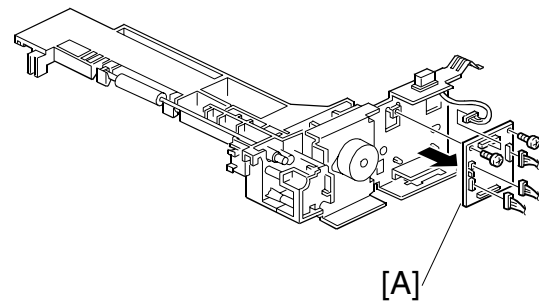
FAX UNIT
B465

This manual explains the Fax Unit, as well as the following.

❑ Handset (Machine Code: B433 - NA only)

Lithium Batteries

> ⚠**CAUTION**
>
> **The danger of explosion exists if battery on the FCU is incorrectly replaced.**
>
> **Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.**

B465
TABLE OF CONTENTS

INSTALLATION

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DETAILED DESCRIPTIONS

SPECIFICATIONS

INSTALLATION

1. INSTALLATION

NOTES: 1) Never install telephone wiring during a lightning storm.
2) Never install a telephone jack in a wet location, unless the jack is specifically designed for such a location.
3) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4) Use caution when installing and modifying telephone lines.
5) Avoid using telephones (other than cordless types) during an electrical storm, as there may be a remote risk of electric shock from lightning.
6) Do not use a telephone in the vicinity of a gas leak. If you need to report a leak, move to a different location before phoning.

⚠CAUTION

1. **Before installing the fax unit, switch off the main power and disconnect the power cord.**

2. **The fax unit includes lithium battery(s). There is risk of explosion of a battery of this type is replaced incorrectly. Replace only with the same type or with an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.**

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT

Refer to the service manual for the base copier.

1.1.2 MACHINE LEVEL

Refer to the service manual for the base copier.

1.1.3 MINIMUM SPACE REQUIREMENTS

Refer to the service manual for the base copier.

1.1.4 POWER REQUIREMENTS

Refer to the service manual for the base copier.

1.2 FAX UNIT

1.2.1 ACCESSORY CHECK

Confirm that you have the components and accessories indicated below.

No.	Description	Q'ty	NA
1	Fax operation panel	1	O
2	Monitor speaker	1	O
3	NCU (Network Control Unit) with bracket	1	O
4	Harness for NCU - FCU	1	O
5	FCU (Fax/Function Control Unit)	1	O
6	Copy Key Top	1	O
7	Screws	6	O
8	Super G3 decal	1	O
9	Handset bracket	1	O
10	Telephone cable	1	O
11	Label(s)	1	O
12	User function key decal	1	O
13	Operation panel sheet	1	#
14	Operators Instructions - Basic Features	1	O
15	Operators Instructions - Advanced Features	1	O
16	Installation Procedure	1	O

O: Included in package
#: Adhered on the operation panel

1.2.2 INSTALLING THE FAX OPTION

⚠**CAUTION**

1. **Before starting installation, be sure to save the SRAM data (user settings) from the existing FCU into an external memory card. After completing the installation, load the save data into the new FCU.**

2. **If there is a printer option installed in the machine, proceed as follows.**
    1) Print out all print data from the printer buffer.
    2) Remove the printer option from the machine.
    3) Install the fax option.
    4) Reinstall the printer option.

1. Turn the power off, and then insert a memory card [A] into the card slot [B].
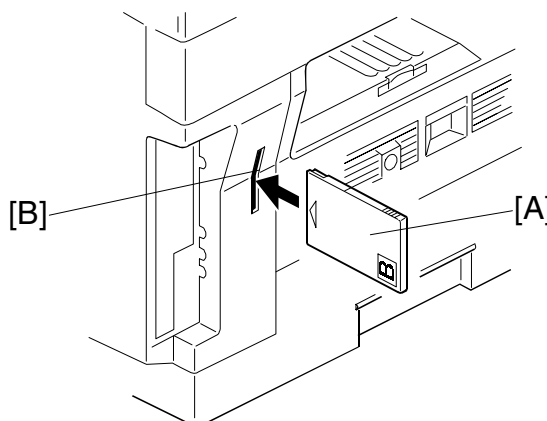
2. Turn the power on, and run SP5-824 to save (upload) the SRAM data from the current FCU into the memory card. (For instructions, see Section 5.1.8 of the base copier's service manual.)

3. Turn off the main switch, remove the memory card, and disconnect the power cord.

4. Remove the platen cover [C]. To remove: Lift the cover, unlatch the two latches [D] (press down on the tabs [E] and push the latch back), and detach the cover from the hook [F].
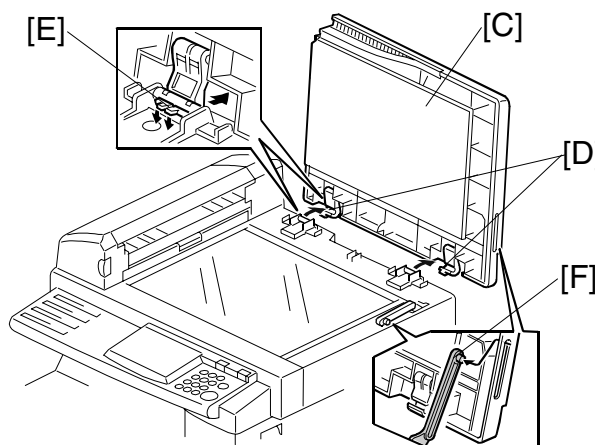
FAX UNIT

5. Remove the rear cover [A] (🔩 x 5).

[A]
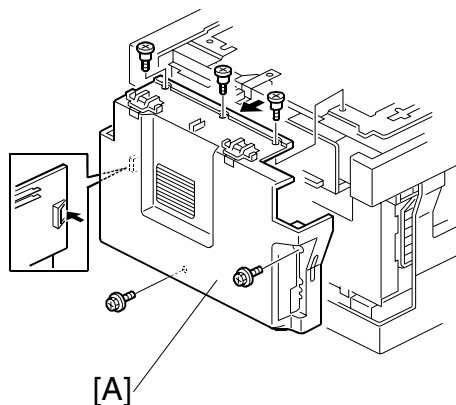
6. Cut out area [B] from the rear cover.

[B]
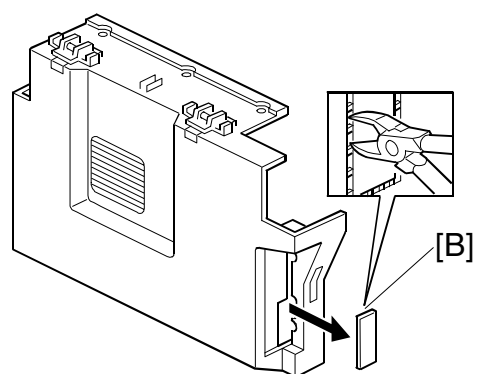
7. Connect the supplied harness [C] to the
    NCU [D].

[C]

[D]
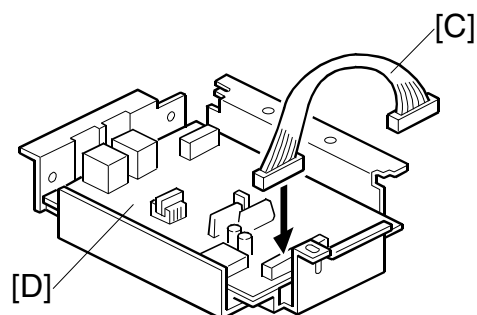
8. ***On Hong Kong models only***: On the NCU,
    change the position of the TB1 jumper
    connector [E] so that the jumper is open. On
    all other versions, make sure that the jumper
    TB1 is closed.

[E]

9. Remove the FCU cover plate [A] ($\hat{\mathscr{F}}$ x 7).

[A]
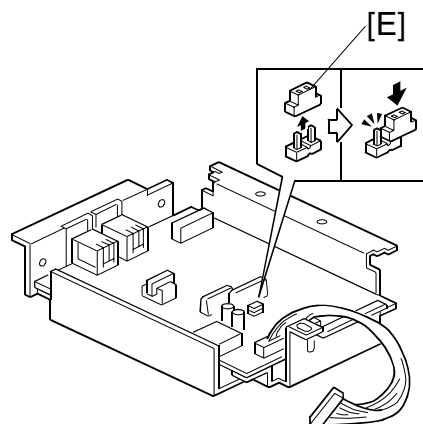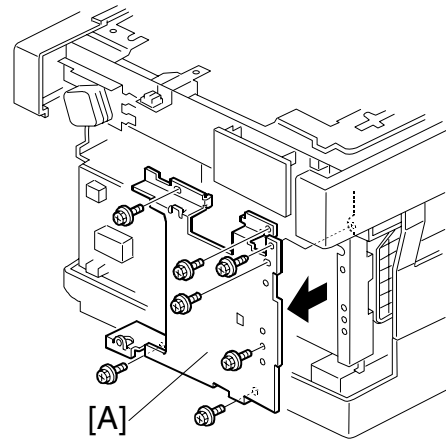
10. Remove the FCU [B] that is currently installed on the machine (all connectors, 2 flat cables, $\hat{\mathscr{F}}$ x 6).

[B]
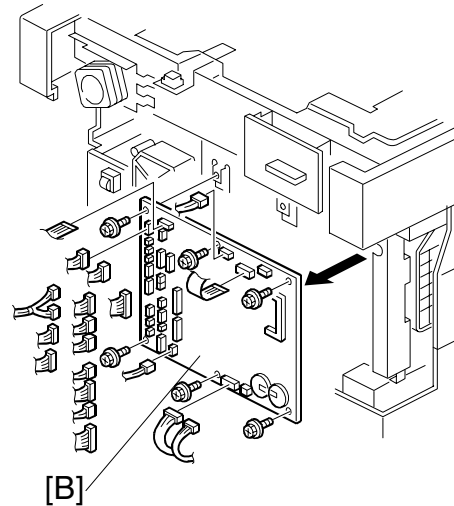
11. In place of the FCU that you just removed, install the FCU that came with the fax option ($\hat{\mathscr{F}}$ x 6, 2 flat cables, all connectors).
    NOTE: Make sure that the battery switch on the FCU is turned on.

12. Reinstall the FCU cover plate that you removed at Step 9.

13. Connect the supplied harness to CN1 on the NCU.

14. Attach the NCU-and-bracket [A] to the cover plate with 4 of the supplied screws. Connect the NCU cable [B] to CN33 on the FCU.

[B]

[A]
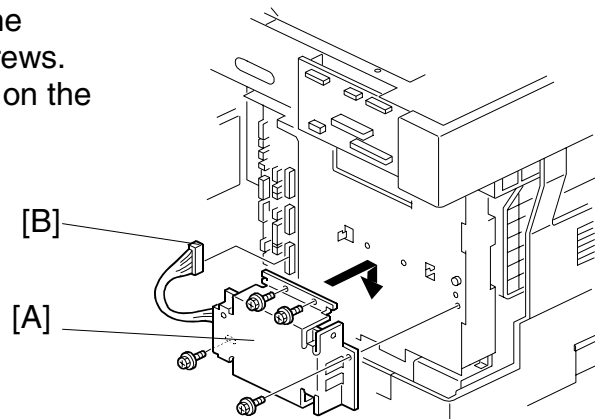
15. Reattach the rear cover.

16. Remove the front left cover [C] (𝄽 x 2).

[C]
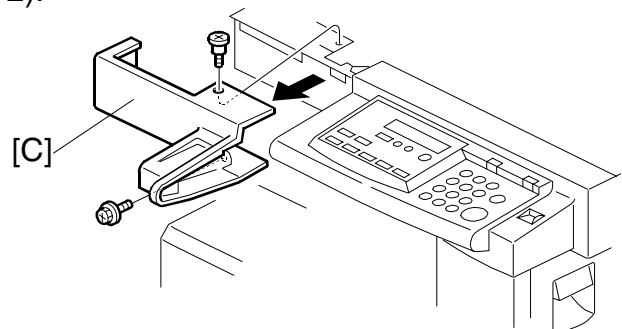
17. Set the monitor speaker [D] into the fax operation panel [E], with the speaker harness positioned as shown.

[E]

[D]
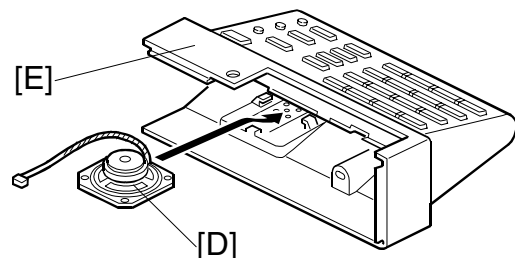
18. Connect the fax operation panel's connector [A] to the connector on the copier's operation panel.

[E]   [B]   [C]

[D]

[A]
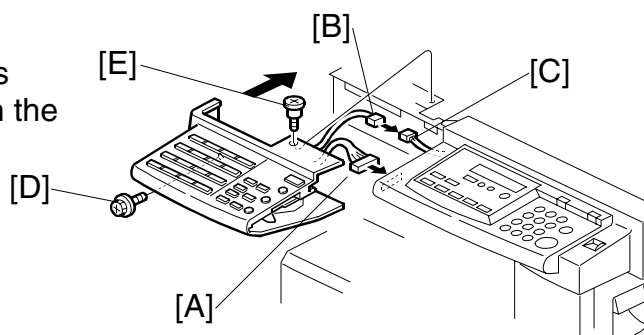
19. Connect the speaker's connector [B] to the connector [C] extending out from the copier's operation panel.

20. Attach the fax operation panel to the copier with the 2 screws ([D] and [E]) removed at Step 15. For the upper screw [E], be sure to use the shorter, headless screw.
    NOTE: If you mistakenly use the longer screw at [E], the screw will block the action of the scanner.

21. Remove the small cover [F], then attach the copy key top [G].

Copy

[G]

[F]
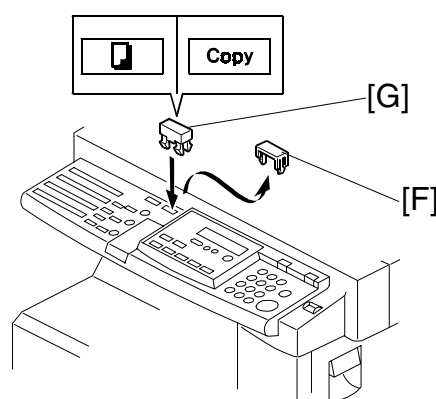
22. Reattach the platen cover.

23. Affix the packed decal(s)/label(s) on the front cover as shown.
    Example: Super G3 decal [H]

[H]

SUPER G3
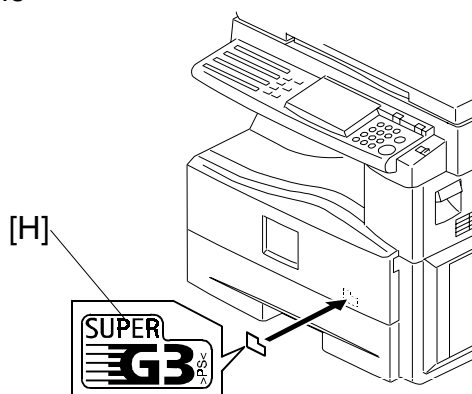
24. Insert the telephone cable into the socket labeled "LINE" at the rear of the machine.

25. Plug in the machine and turn the main power switch on.
    NOTE: Be sure to plug the machine in to a properly grounded outlet.

26. Do the following to confirm that the fax unit is correctly installed. If results are incorrect, go back and repeat the installation procedure.
    1) Access SP5-992 and select "2" to print out a full SMC report. Confirm that the report shows a "YES" for SP7-801-3.
    2) Press the On Hook key on the fax operation panel, and confirm that you hear a dial tone coming from the monitor speaker.

27. Turn the power off, and then insert the memory card that you used at Step 2 to save the old FCU's SRAM data.

28. Turn the power on, and run SP5-825 to download the saved data from the card into the new FCU. (For instructions, see Section 5.1.8 of the base copier's service manual.)

29. Turn the power off, remove the memory card, and turn the power back on.

30. Program the items required for fax communication, as indicated in section 1.2.3 Initial Programming.

1.2.3 INITIAL PROGRAMMING

Items to Program (Service Level – Service Functions[*1])	Function No.
Country code (System switch 0F)	01
Protocol requirements (G3 switch 0B) - EU only	01
PM call (System switch 01 – bit 0)	01
Country code (NCU parameter 00)	07
Service station's fax number	09

Items to Program (Service Level – SP Mode[*1])	SP No.
Machine's serial number	5-811
Language replacement (Firmware download)	5-827
PSTN access code (RAM address 4000DB)	7-955
PSTN access method (RAM address 4000CD)	
Periodic service call (RAM addresses 40054F to 400553)	

*1: See Section 5.1.1 for information about how to enter service functions.

Items to Program (User Administrator Level)	User Tools
Monitor volume	Fax Features -> Setup
Display contrast	
Date and Time	
Reception mode	
Fax Header/Own Name/Own No. (TTI/RTI/CSI)	
Reports on/off	Key Op. Tools
Country Code (except NA)	
Energy saver level	System Settings
Language selection	Language
Other initial programming items	*2

*2: Refer to the Operating Instructions for details.

1.3 HANDSET (OPTION FOR NA)

1.3.1 ACCESSORY CHECK

Check that you have the components and accessories indicated below.

No.	Description	Q'ty
1	Handset	1
2	Handset cradle	1
3	Screws	2
4	Handset manual	1

1.3.2 INSTALLATION PROCEDURE

1. Attach the handset bracket [A] included with the fax option, using 2 of the screws included with that option.
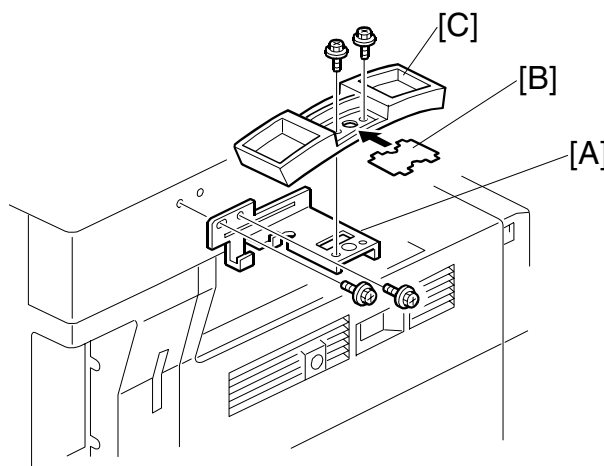
2. Remove the label [B] from the handset cradle [C]. Attach the cradle [C] to the bracket [A] using the two supplied screws. Then reattach the label.

3. Set the handset [D] on the cradle [C], and then connect the cable [E] to the TEL jack at the rear of the machine.
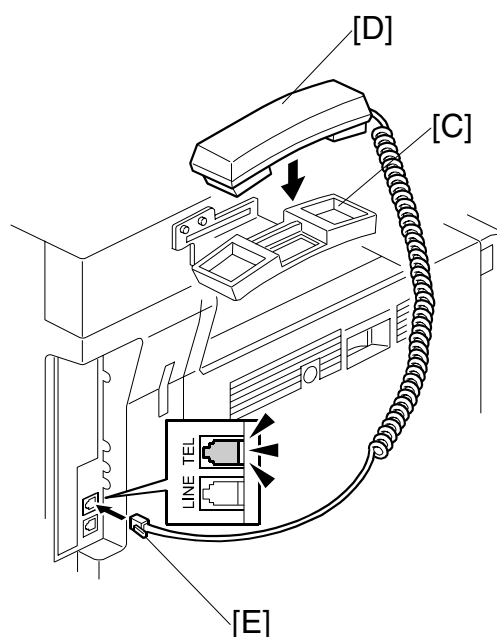
PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE

2.1 SPECIAL TOOLS AND LUBRICANTS

- Flash Memory Card – 4MB (P/N: N8036701)
- Card Case (P/N: N8031000)

2.2 PM TABLE

No PM necessary for the fax option.

REPLACEMENT AND ADJUSTMENT

3. REMOVAL AND REPLACEMENT

3.1 PRECAUTION

⚠CAUTION
Before starting disassembly, be sure to print all message files in the SAF memory. Then, turn off the main power switch and disconnect the power cord and telephone cable for safety.
Lithium Battery **The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same type or with an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.**

3.2 FCU

Refer to the service manual for the base copier.

3.3 NCU

1. Rear cover (Refer to service manual for the base copier.)

2. NCU bracket ($\hat{\mathscr{F}} \times 4$) [A]

3. Disconnect the harness [B] from the NCU.

4. NCU [C] ($\hat{\mathscr{F}} \times 4$)
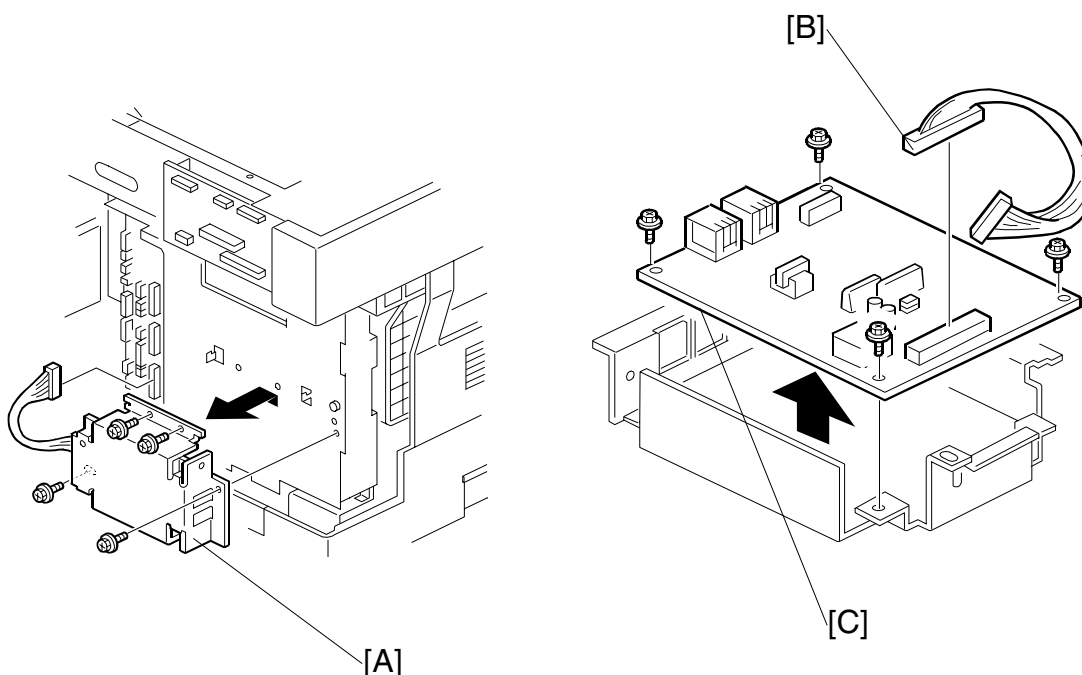
3.4 MONITOR SPEAKER

1. Fax operation panel [A] ($\mathscr{P} \times 2$, ▤ $\times 2$)

2. Speaker [B]
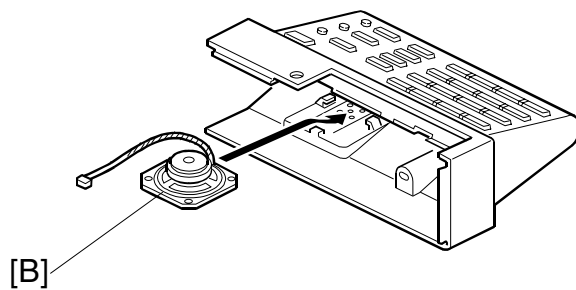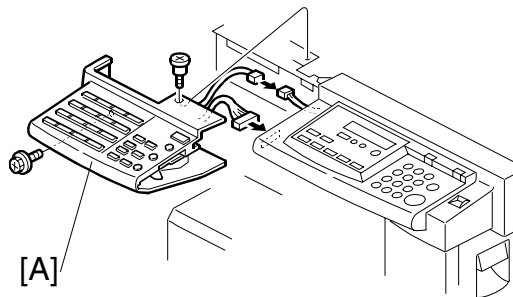
TROUBLESHOOTING

4. TROUBLESHOOTING

4.1 ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that some error codes appear only in the error code display and on the service report.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	• Check the line connection. • Check the NCU - FCU connectors. • The machine at the other end may be incompatible. • Replace the NCU or FCU. • Check for DIS/NSF with an oscilloscope. • If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	• The other party is out of paper or has a jammed printer. • The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	• The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	• Check the line connection. • Check the NCU - FCU connectors. • Try changing the tx level and/or cable equalizer settings. • Replace the FCU or NCU. • The other terminal may be faulty; try sending to another machine. • If the rx signal is weak or defective, there may be a bad line. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters
0-05	Unsuccessful after modem training at 2400 bps	• Check the line connection. • Check the NCU - FCU connectors. • Try adjusting the tx level and/or cable equalizer. • Replace the FCU or NCU. • Check for line problems. **Cross reference** • See error code 0-04.

Code	Meaning	Suggested Cause/Action
0-06	The other terminal did not reply to DCS	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. • The other end may be defective or incompatible; try sending to another machine. • Check for line problems. **Cross reference** • See error code 0-04.
0-07	No post-message response from the other end after a page was sent	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed or run out of paper. • The other end user may have disconnected the call. • Check for a bad line. • The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed, or run out of paper or memory space. • Try adjusting the tx level and/or cable equalizer settings. • The other end may have a defective modem/NCU/FCU; try sending to another machine. • Check for line problems and noise. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters
0-14	Non-standard post message response code received	• Check the FCU - NCU connectors. • Incompatible or defective remote terminal; try sending to another machine. • Noisy line: resend. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. **Cross reference** • See error code 0-08.

Code	Meaning	Suggested Cause/Action
0-15	The other terminal is not capable of specific functions.	The other terminal is not capable of accepting the following functions, or the other terminal's memory is full. • Confidential rx • Transfer function • SEP/SUB/PWD/SID
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel.
0-20	Facsimile data not received within 6 s of retraining	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Check for line problems. • Try calling another fax machine. • Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. **Cross reference** • Reconstruction time - G3 Switch 0A, bit 6 • Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	• Check the connections between the FCU, NCU, & line. • Check for line noise or other line problems. • Replace the NCU or FCU. • The remote machine may be defective or may have disconnected. **Cross reference** • Maximum interval between EOLs and between ECM frames - G3 Bit Switch 0A, bit 4
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 200 ms)	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try adjusting the acceptable modem carrier drop time. **Cross reference** • Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1

ERROR CODES

Code	Meaning	Suggested Cause/Action
0-23	Too many errors during reception	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try asking the other end to adjust their tx level. • Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN) • Rx error criteria - Communication Switch 02, bits 0 and 1
0-24	Printer failure occurred while the memory was full during non-ECM reception; negative response returned	There is no memory space available, or substitute reception is disabled. • Try asking the user to add optional extra memory.
0-29	Data block format failure in ECM reception	Check for line noise or other line problems. • Try receiving from another machine. Replace the FCU.
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • The other terminal may not be compatible. **Cross reference** • Dedicated tx parameters
0-32	The other terminal sent a DCS, which contained functions that the receiving machine cannot handle.	• Check the protocol dump list. • Ask the other party to contact the manufacturer.
0-33	DCR timer runs out without receiving certain amount of data.	• Check the connections between the FCU, NCU, & line. • Check for line noise or other line problems. • Replace the NCU or FCU. • The remote machine may be defective or may have disconnected.
0-52	Polarity changed during communication	• Check the line connection. Retry communication.
0-70	The communication mode specified in CM/JM was not available (V.8 calling and called terminal)	• The other terminal did not have a compatible communication mode (e.g., the other terminal was a V.34 data modem and not a fax modem.) • A polling tx file was not ready at the other terminal when polling rx was initiated from the calling terminal.

Code	Meaning	Suggested Cause/Action
0-74	The calling terminal fell back to T.30 mode, because it could not detect ANSam after sending CI.	• The calling terminal could not detect ANSam due to noise, etc. • ANSam was too short to detect. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.
0-75	The called terminal fell back to T.30 mode, because it could not detect a CM in response to ANSam (ANSam timeout).	• The terminal could not detect ANSam. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-76	The calling terminal fell back to T.30 mode, because it could not detect a JM in response to a CM (CM timeout).	• The called terminal could not detect a CM due to noise, etc. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.
0-77	The called terminal fell back to T.30 mode, because it could not detect a CJ in response to JM (JM timeout).	• The calling terminal could not detect a JM due to noise, etc. • A network that has narrow bandwidth cannot pass JM to the other end. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-79	The called terminal detected CI while waiting for a V.21 signal.	Check for line noise or other line problems. If this error occurs, the called terminal falls back to T.30 mode.
0-80	The line was disconnected due to a timeout in V.34 phase 2 – line probing.	• The guard timer expired while starting these phases. Serious noise, narrow bandwidth, or low signal level can cause these errors.
0-81	The line was disconnected due to a timeout in V.34 phase 3 – equalizer training.	If these errors happen at the transmitting terminal: • Try making a call at a later time. • Try using V.17 or a slower modem using dedicated tx parameters.
0-82	The line was disconnected due to a timeout in the V.34 phase 4 – control channel start-up.	• Try increasing the tx level. • Try adjusting the tx cable equalizer setting. If these errors happen at the receiving terminal:
0-83	The line was disconnected due to a timeout in the V.34 control channel restart sequence.	• Try adjusting the rx cable equalizer setting. • Try increasing the tx level. • Try using V.17 or a slower modem if the same error is frequent when receiving from multiple senders.
0-84	The line was disconnected due to abnormal signaling in V.34 phase 4 – control channel start-up.	• The signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.
0-85	The line was disconnected due to abnormal signaling in V.34 control channel restart.	• The signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.

ERROR CODES

Code	Meaning	Suggested Cause/Action
0-86	The line was disconnected because the other terminal requested a data rate using MPh that was not available in the currently selected symbol rate.	• The other terminal was incompatible. • Ask the other party to contact the manufacturer.
0-87	The control channel started after an unsuccessful primary channel.	• The receiving terminal restarted the control channel because data reception in the primary channel was not successful. • This does not result in an error communication.
0-88	The line was disconnected because PPR was transmitted/received 9 (default) times within the same ECM frame.	• Try using a lower data rate at the start. • Try adjusting the cable equalizer setting.
1-00	Document jam	• Incorrectly inserted document or unsuitable document type. Check the ADF drive components and sensors.
1-01	Document length exceeded the maximum	• Try changing the maximum acceptable document length. • Divide the document into smaller pieces. • Check the ADF drive components and sensors. **Cross reference** Max. document length - Scanner switch 00, bits 2 and 3
1-02	Shading error (Interval of original documents is too short)	• Check the ADF drive components and sensors.
1-08	Shading error (No Xenon lamp turns on)	• Check the xenon lamp connection • Replace the xenon lamp or FCU
1-10	Paper at the scan line when the power was turned on.	• Remove the paper. • Check the scan line sensor.
1-17	Document jam in the feed-out area	• Clear any debris from the sensor actuator. • Check the ADF drive components and sensors.
1-20	Paper did not reach the fusing exit at the end of printing	• Remove the paper. • Check the printer drive components and sensors.
1-21	Paper present at the fusing exit after printing	
1-30	Paper ran out during printing	• Add paper in the cassette.
1-34	Paper ran out after printing	
1-35	Paper lift mechanism error at the 1st optional paper tray	• Check the printer drive components and sensors of optional paper tray.
1-71	The cover was opened or the cassette was pulled out during printing	• Close the cover or put back the cassette.
2-10	The modem cannot enter tx mode	• Replace the FCU.
2-11	Only one V.21 connection flag was received	• Replace the FCU.

Code	Meaning	Suggested Cause/Action
2-12	Modem clock irregularity	• Replace the FCU.
2-13	Modem initialization error	• Turn off the machine, then turn it back on. • Update the modem ROM. • Replace the FCU.
2-20	Abnormal coding/decoding (CPU not ready)	• Replace the FCU.
2-23	JBIG compression/ reconstruction error	• Turn off the machine, then turn it back on. • Replace the FCU if the error occurs frequently.
2-24	JBIG ASIC error	
2-25	JBIG data reconstruction error (BIH) error	• JBIG data error. • Check the remote terminal's JBIG function. • Replace the FCU if the error occurs frequently.
2-26	JBIG data reconstruction error (Float marker error)	
2-27	JBIG data reconstruction error (End marker error)	
2-28	JBIG data reconstruction error (Timeout)	
2-50	The machine resets itself for a fatal FCU system error	• If this is frequent, update the ROM, or replace the FCU.
2-51	The machine resets itself because of a fatal communication error	• If this is frequent, update the ROM, or replace the FCU.
2-52	Memory resource releasing error after communication	Check the connection between FCU and NCU board.
3-30	Mismatched specifications (rx capability)	• Check the receive capabilities requested from the other terminal.
4-00	One page took longer than 8 minutes to transmit	Check for a bad line. Try the communication at a lower resolution, or without halftone. Change the FCU.
4-01	Line current was cut	• Check the line connector. • Check the connection between FCU and NCU. • Check for line problems. • Replace the FCU or the NCU.
4-02	The other end cut the received page as it was longer than the maximum limit.	• Split the page into smaller pieces, or ask the other end to change their maximum receive length setting, then re-send.
4-10	Communication failed because of an ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	• Get the ID Codes the same and/or the CSIs programmed correctly, then resend. • The machine at the other end may be defective.
5-00	Data construction not possible	• Replace the FCU.
5-01	Data reconstruction not possible	
5-10	DCR timer expired	

ERROR CODES

Code	Meaning	Suggested Cause/Action
5-20	Storage impossible because of a lack of memory	• Temporary memory shortage. • Test the SAF memory.
5-21	Memory overflow	• Replace the FCU board
5-22	Mode table overflow after the second page of a scanned document	• Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	• Test the SAF memory. • Ask the other end to resend the message. • Replace the FCU board.
5-24	Memory overflow after the second page of a scanned document	• Try using a lower resolution setting. • Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	• Replace the FCU board.
5-30	Mode table for the first page to be printed was not effective	• Replace the FCU or IC memory card.
6-00	G3 ECM - T1 time out during reception of facsimile data	• Try adjusting the rx cable equalizer. • Replace the FCU or NCU.
6-01	G3 ECM - no V.21 signal was received	
6-02	G3 ECM - EOR was received	
6-03	G3 ECM - non-standard V.21 code received	• The other terminal may be defective.
6-04	G3 ECM - RTC not detected	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU. • Try adjusting the rx cable equalizer **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN)
6-06	G3 ECM - coding/decoding error	• Defective FCU. • The other terminal may be defective.
6-08	G3 ECM - PIP/PIN received in reply to PPS.NULL	• The other end pressed Stop during communication. • The other terminal may be defective.
6-09	G3 ECM - ERR received	• Check for a noisy line. • Adjust the tx levels of the communicating machines. • See code 6-05.

Code	Meaning	Suggested Cause/Action
6-10	G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps	• Check for line noise. • Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). • Check the line connection. • Defective remote terminal.
6-11	G3 ECM - printing impossible because of a missing first line in the MMR coding	• Check for problems in the printer mechanism.
6-21	V.21 flag detected during high speed modem communication	• The other terminal may be defective or incompatible.
6-99	V.21 signal not stopped within 6 s	• Replace the FCU.
9-00	PIN code response because of printer SC error	• Fix and release the SC error
9-02	DMA receiving error (PLU)	• Replace the FCU.
9-03	Paper eject error at the last page (with image data)	• Check the printer drive components and sensors
9-04	Paper eject error at the last page (without image data)	
9-05	Paper eject error	
9-07	Paper non-feed or jam at the cassette entrance	• If the problem persists, replace the FCU.
9-08	Paper jam inside the development area	
9-09	Paper jam in the fusing exit area	
9-10	Toner end detected	• Replace the cartridge.
9-12	Cover open detected during printing	• Close the cover, or check the cover sensors.
9-13	LD interlock error	• Replace the polygon motor • Replace the LD unit
9-14	PSU overheat	• Check the machine's environment • Replace the PSU
9-17	Charge corona unit failure	• If the problem persists, replace the FCU.
9-20	Laser diode failure	• If the problem persists, replace the FCU.
9-22	Fusing lamp failure	
9-23	Hexagonal mirror motor failure	
9-24	Main motor failure	
9-29	Power pack error	• Check the connections • Replace the power pack or FCU
9-50	Paper non-feed or jam inside the upper paper feed unit	• Check if a recommended type of paper is used. • Check if the paper guides are aligned to the paper correctly. • Check the paper feed mechanism in the unit.

ERROR CODES

Code	Meaning	Suggested Cause/Action
9-51	Jam at the paper exit of the upper paper feed unit.	• Check for a blockage in the paper feed path. • Check the paper feed mechanisms inside the unit. • Check if the sensor is defective.
9-60	Printer error occurs during reception	If substitute reception is switched off and a paper jam or other printer error occurs, the machine will terminate the reception. • Check the printer mechanism.
9-61	Memory overflow occurs during reception	• Check the SAF.
9-80	Bypass feed - paper non-feed or jam at the entrance	• Check the registration roller and sensor.
9-81	Bypass feed - paper length exceeds the maximum limit (600 mm)	• Check the paper feed mechanism and sensors.
9-84	Paper non-feed or jam at the cassette entrance	• Same as 9-07
22-00	Original length exceeded the maximum scan length	• Divide the original into a few pages. • Check the resolution used for scanning. Lower the scan resolution if possible. • Add optional page memory.
22-01	Memory overflow while receiving	• Wait for the files in the queue to be sent. • Delete unnecessary files from memory. • Transfer the substitute reception files to an another fax machine, if the machine's printer is busy or out of order. • Expand SAF memory.
22-02	Tx or rx job stalled due to line disconnection at the other end	• The job started normally but did not finish normally; data may or may not have been received fully. • Restart the machine.
22-04	The machine cannot store received data in the SAF	• Update the ROM • Replace the FCU.
23-00	Data read timeout during construction	• Restart the machine. • Replace the FCU
25-00	The machine software resets itself after a fatal transmission error occurred	• Update the ROM • Replace the FCU.
F0-xx	V.34 modem error	• Replace the FCU.

4.2 FAX SC CODES

Same SC codes for fax communication as for the base copier are used.

Refer to section 4.1.2 in the service manual for the base copier.

SERVICE TABLES

5. SERVICE TABLES

5.1 SERVICE LEVEL FUNCTIONS

5.1.1 HOW TO ENTER AND EXIT SERVICE MODE

To Enter Fax Service Mode:

1. Ensure that the machine is in standby mode.

2. Press ⊛▭ ① ⓪ ⑦, then hold down ⓒ/◉ for more than 3 seconds.
   The SP mode main menu appears.

```
[Service P-Mode] No._
1 Copy 2 Fax 3 Printer
```

3. Press ② to enter the fax service mode.

```
SERVICE FUNCTION
■■ FUNCTION NO.
```

To Exit Fax Service Mode:

Press the 'CANCEL' key to exit the service mode.

5.1.2 FUNCTION NO.

(1) 01. BIT SW

1. Enter the fax service mode.

2. Press ⓪ ①, then 'OK'.
   ⓪ - System Switches
   ① - Scanner Switches
   ② - Plotter Switches
   ③ - Communication Switches
   ④ - G3 Switches

```
SERVICE FUNCTION
01.BIT SW
```

```
0.SYSTEM    1.SCANNER
2.PLOTTER   3.COMMUNI.
```

Example

1. Press ⓪

2. Scroll through the bit switches.
   To increment the bit switch number:
   Press '→'
   To decrement the bit switch number:
   Press '←'

```
 SYS DF  :0000 0000
 BITSW 00:0000 0000
```

3. Adjust the bit switch.
   Example: To change the value of bit 7, press ⑦.

4. To adjust more bit switches, go to step 2.
   To finish, press 'OK' then 'CANCEL'.

```
 SYS DF  :0000 0000
 BITSW 00:1000 0000
```

5. Exit the service mode.

(2) 02. PARAMETER LIST

1. Enter the fax service mode.

2. Press ⬚0⬚ ⬚2⬚.

```
SERVICE FUNCTION
02.PARAMETER LIST    ◀▶
```

3. Press 'OK'.

```
                    START
PARAMETER LIST
```

4. Press ⊚.

(3) 03. ERROR CODE

1. Enter the fax service mode.

2. Press ⬚0⬚ ⬚3⬚.

```
SERVICE FUNCTION
03.ERROR CODE        ◀▶
```

3. Press 'OK'.

4. Scroll through the error codes with the arrow keys

```
ERROR CODE           ◀▶
 00-00 JUN 04 22:07
```

(4) 04. SERVICE REPORT

1. Enter the fax service mode.

2. Press ⬚0⬚ ⬚4⬚.

```
SERVICE FUNCTION
04.SERVICE REPORT    ◀▶
```

3. Press 'OK'.

4. Press ⊚.

```
                    START
SERVICE REPORT
```

(5) 05. PROTOCOL DUMP

1. Enter the fax service mode.

2. Press ⎡0⎤ ⎡5⎤.

```
SERVICE FUNCTION
05.PROTOCOL DUMP      ◀▶
```

3. Press 'OK'.

4. Select '1–COMMUNICATION' or 'ALL–COMMUNICATIONS' with the arrow keys, then press 'OK'.

```
PROTOCOL DUMP
1-COMMUNICATION       ◀▶
```

```
PROTOCOL DUMP
ALL-COMMUNICATIONS    ◀▶
```

5. Press ⓦ.

```
                   START
PROTOCOL DUMP
```

(6) 06. COUNTER R/W

1. Enter the fax service mode.

2. Press ⎡0⎤ ⎡6⎤, then 'OK'.

```
SERVICE FUNCTION
06.COUNTER R/W        ◀▶
```

3. Either:
   Check the transmitted, received, scanned
   and printed page counters, and the

   printer and scanner jam counters - press ⎡0⎤.
   Check the PM counter - press ⎡1⎤.
   Check the Toner counter - press ⎡2⎤.
   Example: Press ⎡0⎤.

```
0.COUNTER        1.PM
2.TONER
```

```
0.TX        1.RX
2.SCAN      3.PRINT
```

4. To check the received counter, press ⎡1⎤.

```
RX COUNTER     :0000584
```

5. To change the contents of a counter, input the new value, then press 'OK'.

6. To finish, press 'CANCEL'.

(07) 07. NCU

1. Enter the fax service mode.

2. Press ⬚0⬚ ⬚7⬚ .

```
SERVICE FUNCTION
07.NCU              ◀▶
```

3. Press 'OK'.

4. Select an item from the menu, then press Ⓓ.

```
0.NCU      1.MODEM
2.DTMF     3.V8
```

   0. NCU:
     NCU parameters

```
4.V34      5.DP
```

   1. MODEM:
     MODEM test

   2. DTMF:
     DTMF test

   3. V8:
     V8 test

   4. V34:
     V34 test

   5. DP:
     Dial pulse test

   NOTE: NA models only:
     Before changing the NCU country code with "0. NCU", you must first set system switch 15 bit 2 to 1

(08) 08. WORDING

1. Enter the fax service mode.

2. Press ⬚0⬚ ⬚8⬚ .

```
SERVICE FUNCTION
08.WORDING          ◀▶
```

3. Press 'OK'.

4. Press Ⓓ to print out Wording List.

```
                 START
WORDING LIST
```

(09) 09. S.S. NUMBER

1. Enter the fax service mode.

2. Press [0] [9]

```
SERVICE FUNCTION
09.S.S.NO.          ◄►
```

3. Press 'OK'.

4. Enter the fax number of the service station that will receive Automatic Service Calls from the machine.

```
S.S.NO.          KPAD
■■■■■■■■■■■■■■■■
```

5. Press 'OK'.

(10) 10. WHITE ADJUST

This is the equivalent to SP4-908 (SBU Auto-Adjustment).
For details, refer to "Standard White Density Adjustment" in Section 3.13.2 of the base copier's service manual.

1. Enter the fax service mode.

2. Press [1] [0].

3. Press 'OK'.

```
SERVICE FUNCTION
10.WHITE ADJUST     ◄►
```

```
WHITE ADJUST    START
```

4. Place 10 sheets of new A4 paper on the exposure glass, and close the platen cover, then press Ⓞ.

```
WHITE ADJUSTING
```

5. The machine automatically adjusts the standard white density.
   If test is successful, the display shows "OK!!".

```
WHITE ADJUSTING
OK!!
```

   If test is unsuccessful, the display shows "NG!!".

```
WHITE ADJUSTING
NG!!
```

5.2   BIT SWITCHES

> ⚠**WARNING**
>
> **Do not adjust a bit switch or use a setting that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other countries, such as Japan.**

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

5.2.1 SYSTEM SWITCHES

System Switch 00		
No.	**FUNCTION**	**COMMENTS**

0, 1	**RAM Reset**
	
	Bit 1 0 Reset Level
	   0 0 No reset
	   0 1 Reset Level 2
	   1 0 Reset Level 3
	   1 1 Not used
		Reset Level 3: Erases all image data files stored in the SAF memory and communication files (e.g. substitute RX files). This is the recommended setting when the SAF requires clearing.
		
		Reset Level 2: This level erases the following items in addition to those erased by Reset Level 3: own telephone number, bit switches (excluding country code), RTI/TTI/CSI, report data, programmed telephone numbers (Quick/Speed/Groups, service station, etc.), NCU parameters, and personal codes. The NCU country code is also set to the same as the bit switch country code (System Bit Switch 0F).
		
		After erasing, the machine automatically changes these two bits back to 0.
		
		No reset: Normal operation
		
		Cross-reference
		RAM Reset Level 1 (Factory reset): Change the RAM address data from 400005(H) to FF(H), then turn the machine off and on. In addition to those items erased by Reset Level 2, the clock, country code (the default country code is Japan), scan margin settings and print registration settings are erased. To adjust the country code, you must first set system switch 15 bit 2 to 1.

Fax Unit
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System Switch 00		
No.	FUNCTION	COMMENTS
2	Technical data printout on Journal **0:** Disabled **1:** Enabled	**1:** Instead of a personal code, the Journal lists the following data for each analog G3 communication. E.g. 32 V34 288 M 01 00 03 02 **First number:** Symbol rate (V.34 only) Second number: Final modem type used **Third number:** Final date rate (for example, 288 means 28.8 KBPS) **Fourth number:** M means modem EQM./L means RX level. **Fifth and sixth number:** Line quality data. This is either a measurement of the error rate or the RX level, depending on the bit 3 setting below. (An M on the report indicates that it is error rate, and an L indicates RX level.) The left-hand figure is the high byte and the right-hand figure is the low byte (refer to the note after this table for how to read the RX level). If it measures the error rate, a larger number means more errors. **Seventh number (RX mode only):** Total number of error lines that occurred during non-ECM reception. **Eighth number (RX mode only):** Total number of burst error lines that occurred during non-ECM reception. The seventh and eighth numbers are fixed at 00 for transmission records and ECM reception records.
3	Line quality data output method **0:** Error rate measurement during image data transmission **1:** Rx level	This bit determines the data type printed in the Journal when bit 2 (above) enables a technical data printout.
4	Line error marks **0:** Disabled **1:** Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occurred in the data. A noisy line causes such errors, for example.
5	Communication parameter display **0:** Disabled **1:** Enabled	This is a faultfinding aid. The LCD shows the key parameters (see the next page). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output **0:** Disabled **1:** Enabled	This is used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after testing. The setting of system switch 09 bit 6 determines the types of communication that the list is printed after.

System Switch 00		
No.	FUNCTION	COMMENTS
7	Amount of protocol dump data in one protocol dump list print operation **0:** Up to the limit of the memory area for protocol dumping **1:** Last communication only	Change this bit to 1 if you want to have a protocol dump list of the last communication only.

How to calculate the RX level listed on the Journal (when bit 2 of system switch 00 is set to 1)

Example: 32 V34 288 **L 01 00** 00 00

The four-digit hexadecimal values (N) after L indicates the RX level.
The high byte is given first, followed by the low byte. Divide the decimal value of N by -16 to get the RX level.

In this above example, the decimal value of N (=0100[H]) is 256.
So, the actual RX level is 256/-16 = -16 dB.

Communication Parameters

Mode	DCS: ITU-T standard NSS: Non-standard G3
Modem rate	336: 33600 BPS 168: 16800 BPS 312: 31200 BPS 144: 14400 BPS 288: 28800 BPS 120: 12000 BPS 264: 26400 BPS 96: 9600 BPS 240: 24000 BPS 72: 7200 BPS 216: 21600 BPS 48: 4000 BPS 192: 19200 BPS 24: 2400 BPS
Resolution	F: Fine, transmitted at 8 x 15.4 dots per mm D: Detail, transmitted at 8 x 7.7 dots per mm S: Standard, transmitted at 8 x 3.85 dots per mm 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 24: Fine (200 x 400 dpi)
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression JBO: JBIG optional compression JBB: JBIG standard compression
Communication mode	ECM: With ECM NML: With no ECM
Width and reduction	A4: A4 (8.3"), no reduction
I/O rate	0: 0 ms/line 10: 10 ms/line 2/: 2.5 ms/line 20: 20 ms/line 5: 5 ms/line 40: 40 ms/line "40" is displayed while receiving a fax message using AI short protocol.

System Switch 01

No.	FUNCTION	COMMENTS
0	PM call **0:** Disabled **1:** Enabled	This bit switch determines whether the machine will send an Auto Service Call to the service station when it is time for PM.
1	Auto service call **0:** Disabled **1:** Enabled	This bit switch determines whether the machine will send an Auto Service Call to the service station when a fatal error occurs. This bit is changed to 0 (disabled) automatically when the machine called a not fax machine or a wrong fax machine. **Cross-reference** Communication Switch 02 bits 4 and 5 - Wrong connection prevention method (Service station)
2–7	Not used	Do not change these settings.

System Switch 02

No.	FUNCTION	COMMENTS
0	Memory file transfer **0:** Disabled **1:** Enabled	**1:** All messages in the memory (including confidential RX messages) are sent to the fax number that is stored as the service station. Always reset this bit to zero after transfer. **Cross-reference** Service station number: Function 09
1–3	Not used	Do not change these settings.
4	Automatic reset (during communication) **0:** Disabled **1:** Enabled	**1:** The machine automatically returns to standby mode when a page takes more than a certain time to send (the default setting is 60 minutes). This timer can be adjusted with RAM addresses 4004C0 and 4004C1. **Cross-reference** Service RAM Addresses, section 5.5.
5	Not used	Do not change the setting.

6, 7	Memory read/write by RDS
	Bit 7 6 Setting
	   0 0 Always disabled
	   0 1 User selectable
	   1 0 User selectable
	   1 1 Always enabled
		(0,0): All RDS systems are always locked out.
		(0,1), (1,0): Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired.
		(1,1): At any time, an RDS system can access the machine.

BIT SWITCHES

System Switch 03		
No.	**FUNCTION**	**COMMENTS**
0–7	Length of time that RDS is temporarily switched on when bits 6 and 7 of System Switch 02 are set to "User selectable"	00 - 99 hours (BCD). This data is only valid if bits 6 and 7 of System Switch 02 are set to "User selectable". The default setting is 24 hours.

System Switch 04		
No.	**FUNCTION**	**COMMENTS**
0–2	Not used	Do not change these settings.
3	Dedicated transmission parameter programming **0:** Disabled **1:** Enabled	Set this bit to 1 before changing any dedicated transmission parameters.
4	Not used	Do not change the setting.
5	Replacement level for the maintenance kits **0:** User **1:** Service	**0:** The machine asks the user to replace the parts in the ADF maintenance kit after 45,000 scans with the ADF. After the user replaces the parts, the machine asks the user if they have been replaced or not. After the user answers yes, the user has to reset the roller counter using the key operator tools. The replacement counter is programmed at the following addresses: ADF kit counter: 4002D0 to 4002D3(H) Refer to section 5.5 for more details. **1:** The machine will not ask the user to replace the maintenance kits.
6	CSI programming level **0:** User level **1:** Service level	**1:** Only a service function can program the CSI.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Only a service function can program the telephone line type selection.

System Switch 05		
No.	**FUNCTION**	**COMMENTS**
0–7	Not used	Do not change these settings.

System Switch 06

No.	FUNCTION	COMMENTS
0	Use of the Stop key during memory transmission **0:** Disabled **1:** Enabled	**1:** The Stop key can be used to halt memory transmissions. However, users might accidentally cancel another person's memory transmission in progress.
1–3	Not used	Do not change these settings.
4	Use of the Stop key during memory transmission **0:** Disabled **1:** Enabled	**1:** The Stop key can be used to halt memory transmissions. After pressing the Stop key, a message (STOP & CLR FILE?) appears on the LCD.
5–7	Not used	Do not change these settings.

System Switch 07 - Not used (do not change any of these settings)
System Switch 08 - Not used (do not change any of these settings)

System Switch 09

No.	FUNCTION	COMMENTS
0	Not used	Do not change the setting.
1	Inclusion of communications in the Journal when no image data was exchanged. **0:** Disabled **1:** Enabled	**0:** The Journal lists communications that reached phase C (message TX/RX) of the T.30 protocol. **1:** The Journal lists communications that reached phase A (call setup) of T.30 protocol. This includes telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports are not printed. **1:** Error reports will print automatically after all failed communications, excluding polling reception and immediate transmissions.
3	Print error code on error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the setting.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report automatically prints after the power is switched on if a fax message disappears from memory when the power was turned off last.
6	Conditions for printing the protocol dump list **0:** Print for all communications **1:** Print only when there is a communication error	This switch becomes effective only when system switch 00 bit 6 is set to 1. **1:** Set this bit to 1 when you wish to print a protocol dump list only for communications with errors.
7	Priority given to various types of remote terminal ID when printing reports **0:** RTI > CSI > Dial label > Tel. Number **1:** Dial label > Tel. number > RTI > CSI	This bit determines which set of priorities the machine uses when listing remote terminal names on reports. Dial Label: The name stored with the Quick/Speed Dial number by the user.

BIT SWITCHES

System Switch 0A		
No.	**FUNCTION**	**COMMENTS**
0–2	Not used	Do not change these settings
3	Continuous polling reception **0:** Disabled **1:** Enabled	This feature allows a series of stations to be polled in a continuous cycle.
4	Dialing on the ten-key pad when the handset is off-hook **0:** Disabled **1:** Enabled	**1:** The user can dial on the ten-key pad when the handset is off-hook.
5	On-hook dial **0:** Disabled **1:** Enabled	**0:** On-hook dial is disabled.
6, 7	Not used	Do not change these settings

System Switch 0B		
No.	**FUNCTION**	**COMMENTS**

0, 1	Automatic reset timer
	Bit 1 0 Timer setting
	  0 0 30 seconds
	  0 1 1 minutes
	  1 0 3 minutes
	  1 1 5 minutes
		The machine returns to standby mode when the timer expires after the last operation.

2–7	Not used	Do not change these settings.

System Switch 0C		
No.	**FUNCTION**	**COMMENTS**
0–2	Not used	Do not change these settings.
3	Paper size selection for ADF mode **0:** A4 **1:** Letter	This switch determines the original size in ADF mode, and fixes the maximum scanning width.
4–7	Not used	Do not change these settings.

System Switch 0D		
No.	**FUNCTION**	**COMMENTS**
0–2	Not used	Do not change these settings.
3	Paper size selection for book scan mode **0:** A4 **1:** Letter	This switch determines the original size in book scan mode, and fixes the maximum scanning width.
4–7	Not used	Do not change these settings.

System Switch 0E - Not used (do not change any of these settings)

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System Switch 0F

No.	FUNCTION	COMMENTS
0–7	Country code for functional settings (Hex) 00: France 11: USA 01: Germany 12: Asia 02: UK 13: Not used 03: Italy 14: Hong Kong 04: Austria 15: South Africa 05: Belgium 16: Australia 06: Denmark 17: New Zealand 07: Finland 18: Singapore 08: Ireland 19: Malaysia 09: Norway 1A: China 0A: Sweden 1B: Formosa 0B: Swiss. 1C: Korea 0C: Portugal 20: Turkey 0D: Holland 21: Greece 0E: Spain 22: Hungary 0F: Israel 23: Czech 10: Not used 24: Poland	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross-reference** NCU country code: Function 07, parameter CC. The bit switch country code will automatically be changed to the same country code with the NCU country code when you change the NCU country code and exit the service mode. **Note:** If RAM reset level 1 is done, this bit switch resets to UK (02) for EU/Asia models and USA (11) for NA model.

System Switch 10

No.	FUNCTION	COMMENTS
0–7	Threshold memory level for parallel memory transmission	Threshold mount = N x 64 Kbytes N can be between 00 - FF(H) Default setting: 04(H) = 256 Kbytes

System Switch 11

No.	FUNCTION	COMMENTS
0	TTI printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TTI overprints information that the customer considers important.
1–3	Not used	Do not change these settings.
4	Received-time printing position **0:** Superimposed on the page data **1:** Printed after the data trailing edge	Change this bit to 1 if the reception time overprints information that the customer considers important.
5	Preferred type of terminal identification to appear on reports **0:** Label programmed in the machine **1:** Dialed number	Change this bit to 1 If the customer wants reports to always show actually dialed numbers rather than programmed labels. (If the setting is 0, the report will show programmed label if one is registered, or dialed number otherwise).

BIT SWITCHES

System Switch 11

No.	FUNCTION	COMMENTS
6	Memory reception if no RTI or CSI received **0:** Reception disabled **1:** Reception enabled only when there is no problem with the printer mechanism	This switch setting is dependent on user parameter switch 05 bit 1. This Sw U.P.05 bit 1 -- 0 : Reception always enabled 0 1 : Reception disabled 1 1 : Reception enabled only there is no problem with the printer mechanism
7	Not used	Do not change the setting.

System Switch 12

No.	FUNCTION	COMMENTS
0–7	TTI printing position in the main scan direction	08 to 92 (BCD) mm. Only input even numbers. This setting determines the TTI print start position from the left edge of the paper. If the TTI is too far to the right, the file number, which is on the top right of the page, may obscure it.

System Switch 13 - Not used (do not change any of these settings)
System Switch 14 - Not used (do not change any of these settings)

System Switch 15

No.	FUNCTION	COMMENTS
0	Not used	Do not change this setting.
1	Programming with European characters **0:** Disabled **1:** Enabled	**1:** The user can program with European characters (e.g. "ä", "å") for the TTI, Quick Dial labels, etc.
2	Change NCU country code **0:** Disabled **1:** Enabled	**0:** The machine does not display "c.c." in the service mode 07: NCU, 0: NCU PARA menu.
3	Not used	Do not change the setting.
4	Daylight saving time automatic adjustment (NA only) **0:** Manual adjustment **1:** Automatic adjustment	**1:** The clock is adjusted automatically at start and end of daylight-saving time (in April and October).
5–7	Not used	Do not change these settings.

System Switch 16 - Not used (do not change any of these settings)

System Switch 17

No.	FUNCTION	COMMENTS
0–2	Not used	Do not change these settings.
3	Tonal signals key when the machine is in pulse dial setting. **0:** Disabled **1:** Enabled	**1:** The machine can dial out tone signals.
4, 5	Not used	Do not change these settings.
6	Notify user when the communication is complete **0:** Not notify **1:** Notify	**1:** The machine notifies the user with a beeper when the communication is complete.
7	Not used	Do not change the setting.

System Switch 18 - Not used (do not change any of these settings)
System Switch 19 - Not used (do not change any of these settings)
System Switch 1A - Not used (do not change any of these settings)
System Switch 1B - Not used (do not change any of these settings)
System Switch 1C - Not used (do not change any of these settings)
System Switch 1D - Not used (do not change any of these settings)
System Switch 1E - Not used (do not change any of these settings)
System Switch 1F - Not used (do not change any of these settings)

5.2.2 SCANNER SWITCHES

Scanner Switch 00

No.	FUNCTION	COMMENTS
0	MTF **0:** Disabled **1:** Enabled	
1	Text/Photo separation in halftone mode **0:** Disabled **1:** Enabled	Normally keep this bit at 1 to get a good halftone quality.
2, 3	Maximum transmittable document length **Bit 3 2 Setting** 0 0 600 mm 0 1 1200 mm 1 0 Not used 1 1 Not used	This is effective only in FAX mode.
4	OR processing in immediate TX and copying (Standard resolution) **0:** Disabled **1:** Enabled	**0:** The machine scans the document in 3.85 line/mm steps, then transmits or makes copies. **1:** The machine scans the document in 7.7 line/mm steps. Each pair of lines goes through OR processing before transmission or copy making. Toner may be used up earlier if OR processing is enabled.
5–7	Not used	Do not change these settings.

Scanner Switch 01 - Not used (do not change any of these settings)
Scanner Switch 02 - Not used (do not change any of these settings)
Scanner Switch 03 - Not used (do not change any of these settings)
Scanner Switch 04 - Not used (do not change any of these settings)
Scanner Switch 05 - Not used (do not change any of these settings)
Scanner Switch 06 - Not used (do not change any of these settings)
Scanner Switch 07 - Not used (do not change any of these settings)
Scanner Switch 08 - Not used (do not change any of these settings)
Scanner Switch 09 - Not used (do not change any of these settings)
Scanner Switch 0A - Not used (do not change any of these settings)
Scanner Switch 0B - Not used (do not change any of these settings)
Scanner Switch 0C - Not used (do not change any of these settings)
Scanner Switch 0D - Not used (do not change any of these settings)
Scanner Switch 0E - Not used (do not change any of these settings)
Scanner Switch 0F - Not used (do not change any of these settings)

5.2.3 PLOTTER SWITCHES

Plotter Switch 00		
No.	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks are printed. **1**: If a received page has to be printed out on two sheets, an asterisk inside square brackets is printed at the bottom right hand corner of the first sheet, and a "2" inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split.
1	Repetition of data when the received page is longer than the printer paper **0:** Disabled **1:** Enabled	**0:** The next page continues from where the previous page left off. **1:** The final 10 mm of the previous page are repeated at the top of the next page.
2–7	Not used	Do not change these settings.

Plotter Switch 01		
No.	**FUNCTION**	**COMMENTS**
0	Reset the fusing unit failure **0:** Off **1:** On (Clear)	When a fusing error occurs, set this bit to 1 after fixing the problem. The machine then resets the fusing error. Switch the machine off/on and this bit will reset itself to 0.
1–7	Not used	Do not change these settings.

Plotter Switch 02 - Not used (do not change any of these settings)

Plotter Switch 03		
No.	**FUNCTION**	**COMMENTS**
0	Length reduction of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. (Page separation threshold: Plotter Switch 03, bits 4 to 7) **1:** Incoming page length is reduced when printing. (Maximum reducible length: Plotter Switches 04, bits 0 to 4)
1–3	Not used	Do not change these settings.

BIT SWITCHES

Plotter Switch 03		
No.	**FUNCTION**	**COMMENTS**

4–7	Page separation threshold (with reduction disabled with switch 03-0 above)
	
	If the incoming page is up to x mm longer than the length of copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the length of copy paper, the excess portion will be printed on the next page.
	The value of x is determined by these four bits.
	
	Hex value of bits 4 to 7 x (mm)
	                  0 0
	                  1 1
	and so on until
	                  F 15
	
	Default setting: 6 mm
	
	Cross reference
	Length reduction On/Off: Plotter Switch 03, Bit 0	

Plotter Switch 04 and 05		
No.	**FUNCTION**	**COMMENTS**

0–7	Reduction ratios used for different paper sizes (with reduction enabled in switch 03-bit 0 above)
	If reduction is enabled, the data will be reduced in the lengthwise direction before printing.
	These switches determine the maximum reduction ratio for each paper size.
	
	Cross-reference
	Switch 04/05 Paper used
	Bit0 A5 sideways/HLT sideways
	Bit1 Not used
	Bit2 LT/B5
	Bit3 A4
	Bit4 F
	Bit5 LG
	Bit6 Not used
	Bit7 Not used
	
	SW04 SW05 Reduction Ratio
	    0 0 Disabled
	    1 0 4/3
	    0 1 8/7
	    1 0 12/11	

Plotter Switch 06 - Not used (do not change any of these settings)
Plotter Switch 07 - Not used (do not change any of these settings)
Plotter Switch 08 - Not used (do not change any of these settings)
Plotter Switch 09 - Not used (do not change any of these settings)
Plotter Switch 0A - Not used (do not change any of these settings)
Plotter Switch 0B - Not used (do not change any of these settings)
Plotter Switch 0C - Not used (do not change any of these settings)

Plotter Switch 0D - Not used (do not change any of these settings)	
Plotter Switch 0E - Not used (do not change any of these settings)	
Plotter Switch 0F - Not used (do not change any of these settings)	

5.2.4 COMMUNICATION SWITCHES

Communication Switch 00		
No.	**FUNCTION**	**COMMENTS**
0, 1	Compression modes available in receive mode **Bit 1 0 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2, 3	Compression modes available in transmit mode **Bit 3 2 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol.
4–7	Not used	Do not change these settings.

Communication Switch 01		
No.	**FUNCTION**	**COMMENTS**
0	ECM **0:** Off **1:** On	If this bit is set to 0, ECM is switched off for all communications.
1	Not used	Do not change the setting.
2, 3	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1)** - The machine will disconnect the line without sending a fax message if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. **(1,0)** - The same as above, except that only the last 4 digits are compared. **(1,1)** - The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. **(0,0)** - Nothing is checked; transmission will always go ahead. **Note:** This function does not work when dialing is done from the external telephone.
4	Operator call if no response is received in reply to NSF/DIS **0:** Disabled **1:** Enabled	Set this bit to 1 if the user expects to receive telephone calls at the same number that the machine is connected to. The machine will then alert the user if a phone call comes in.
5	Not used	Do not change the setting.
6, 7	Maximum printable page length available **Bit 7 6 Setting** 0 0 No limit 0 1 B4 (364 mm) 1 0 A4 (297 mm) 1 1 Not used	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		
No.	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution 100 dpi 200 dpi 400 dpi** **3.85 l/mm 7.7 l/mm 15.4 l/mm** Low settings 6 12 24 High settings 12 24 48 This bit is ignored if ECM is in use. This method is enabled only when the switch 02-bit 7 below is set to 1.
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end. This bit is ignored if ECM is in use.
2	Treatment of pages received with errors during G3 reception **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.
3	Hang-up decision when a negative code (RTN or PIN) is received during immediate transmission **0:** No hang-up **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.

4, 5	Wrong connection prevention method (Auto Service Call)
	Bit 3 Bit 2 Setting
	  0 0 None
	  0 1 8 digit CSI
	  1 0 4 digit CSI
	  1 1 CSI/RTI
		(0,1) - The machine will disconnect the line without sending a fax message if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed.
		(1,0) - The same as above, except that only the last 4 digits are compared.
		(1,1) - The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI.
		(0,0) - Nothing is checked; transmission will always go ahead.

6	Not used	Do not change the setting.
7	Burst error **0:** Disabled **1:** Enabled	If this switch is set to 0, burst error count method in switch 02-bit 0 above is disabled, and only total error line count method in switch 02-bit 1 above is used.

BIT SWITCHES

Communication Switch 03		
No.	**FUNCTION**	**COMMENTS**
0–7	Maximum number of page retransmissions in a memory transmission	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03(H)

Communication Switch 04 - Not used (do not change any of these settings)
Communication Switch 05 - Not used (do not change any of these settings)

Communication Switch 06		
No.	**FUNCTION**	**COMMENTS**
0–5	Not used	Do not change these settings.
6	Dialing requirements: USA **0:** Disabled **1:** Enabled	This function automatically sets these switches to the required settings for each country after selecting a country code (System switch 0F).
7	DTS requirements: Germany **0:** Disabled **1:** Enabled	

Communication Switch 07 - Not used (do not change any of these settings)
Communication Switch 08 - Not used (do not change any of these settings)
Communication Switch 09 - Not used (do not change any of these settings)

Communication Switch 0A		
No.	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page, using normal memory transmission.
1–6	Not used	Do not change these settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	Hong Kong only If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer.

Communication Switch 0B - Not used (do not change any of these settings)
Communication Switch 0C - Not used (do not change any of these settings)

Communication Switch 0D

No.	FUNCTION	COMMENTS
0–7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 2 KB (e.g. 0C(H) = 24 KB) One page is about 24 KB. The machine refers to this setting before each fax reception. If the remaining memory is below this threshold, the machine cannot receive fax messages. If this setting remains at 0, the machine will detect ringing signals and enter receive mode even if there is no available memory. This will result in communication failure.

Communication Switch 0E

No.	FUNCTION	COMMENTS
0–7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F - Not used (do not change any of these settings)

Communication Switch 10

No.	FUNCTION	COMMENTS
0–7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FE (Hex) = 1 - 254 times

Communication Switch 11 - Not used (do not change any of these settings)

Communication Switch 12

No.	FUNCTION	COMMENTS
0–7	Memory transmission: Interval between dialing attempts to the same destination	00 - FF (Hex) = 0 - 255 minutes

Communication Switch 13 - Not used (do not change any of these settings)

Communication Switch 14		
No.	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled (default) **1:** Enabled	**0:** Transmitting is always done in inch format. **1:** If the other end only has mm-based resolution for printing, the machine converts the scanned data to mm-format before transmission.
1	Inch/mm format informed to the other terminal during transmission **0:** Always in inch format **1:** Dependent on the other terminal (default)	**0:** The machine always informs the other terminal that the resolution is in inch format and transmits with the inch format. **1:** The machine informs the other terminal that the resolution is in mm format and transmits with the inch format if the other end only has mm-based resolution. This setting is informed to the receiving terminal in the pre-message protocol exchange (in the DCS/NSS frames).
2	Not used	Do not change the setting.
3	I/O rate for Detail reception **0:** Off (Normal) **1:** On (Double)	**1:** Shortens receiving time for non-ECM communication **Note:** In most cases this setting should be left at 0. Communication will fail if fusing warm-up time is longer than the time it takes to receive the image.
4	Positive response timing when substitute reception is disabled **0:** When the fusing exit sensor turns on **1:** When all image data are stored in the memory	This switch setting is effective when user parameter switch 05 bit 0 is set to 0 (Substitute reception is off). **0:** The data is not stored in the SAF memory. The machine sends the positive response to the other end when the leading edge of the paper turns on the fusing exit sensor. This informs the other end of successful reception after the received image data has already been printed. **1:** The incoming data is stored in the SAF memory. The machine sends the positive response to the other end when all received image data have been stored in the SAF memory. This sends the positive response earlier than when this bit switch is set to 0, but the page has not been printed yet. The data goes to SAF, like for substitute reception. However, it is different from substitute reception, as follows: • The machine rejects all incoming ringing signals when the printer is out of order. • The received image data are stored in the memory even if no RTI/CSI is received.

Communication Switch 14		
No.	FUNCTION	COMMENTS
5	Not used	Do not change the setting.
6, 7	Available unit of resolution in which fax messages are received **Bit 7**　**Bit 6**　**Unit** 　0　　　0　　mm 　0　　　1　　inch 　1　　　0　　mm and inch 　　　　　　　(default) 　1　　　1　　Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 15		
No.	FUNCTION	COMMENTS
0, 1	Available resolution for receiving fax messages **Bit 0 1:** 200 x 100/8 x 3.85 **Bit 1 1:** 200 x 200/8 x 7.7 Other bits: Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).
2–7	Not used	Do not change these settings.

Communication Switch 16 - Not used (do not change any of these settings)
Communication Switch 17 - Not used (do not change any of these settings)
Communication Switch 18 - Not used (do not change any of these settings)
Communication Switch 19 - Not used (do not change any of these settings)
Communication Switch 1A - Not used (do not change any of these settings)

Communication Switch 1B		
No.	FUNCTION	COMMENTS
0	Extension access code (0 to 7) to turn V.8 protocol On/Off **0:** On **1:** Off	If the PABX does not support V.8/V.34 protocol procedure, set one of these bits to "1" to disable V.8. **Example:** If "0" is the PSTN access code, set bit 0 to 1. When the machine detects "0" as the first dialed number, it automatically disables V.8 protocol. (Alternatively, if "3" is the PSTN access code, set bit 3 to 1.)
1		
2		
3		
4		
5		
6		
7		

BIT SWITCHES

Communication Switch 1C		
No.	**FUNCTION**	**COMMENTS**
0	Extension access code (8 and 9) to turn V.8 protocol On/Off **0:** On **1:** Off	Refer to communication switch 1B.
1		**Example:** If "8" is the PSTN access code, set bit 0 to 1. When the machine detects "8" as the first dialed number, it automatically disables V.8 protocol. (If "9" is the PSTN access code, use bit 1.)
2–7	Not used	Do not change these settings.

Communication Switch 1D - Not used (do not change any of these settings)
Communication Switch 1E - Not used (do not change any of these settings)
Communication Switch 1F - Not used (do not change any of these settings)

5.2.5 G3 SWITCHES

G3 Switch 00		
No.	**FUNCTION**	**COMMENTS**

0, 1	Monitor speaker during communication (tx and rx)
	Bit 1 Bit 0 Setting
	  0 0 Disabled
	  0 1 Up to Phase B
	  1 0 All the time
	  1 1 Not used
		(0, 0): The monitor speaker is disabled all through the communication.
		(0, 1): The monitor speaker is on up to phase B in the T.30 protocol.
		(1, 0): Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.

2	Monitor speaker during memory transmission **0:** Disabled **1:** Enabled	**1:** The monitor speaker is enabled during memory transmission.
3–7	Not used	Do not change the setting.

G3 Switch 01		
No.	**FUNCTION**	**COMMENTS**
0–3	Not used	Do not change these settings.
4	DIS frame length **0:** 10 bytes **1:** 4 bytes	**1:** The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED/ANSam transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission.
7	Not used	Do not change the setting.

G3 Switch 02		
No.	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. **1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1–4	Not used	Do not change these settings.
5	Use of modem rate history for transmission using Quick/Speed Dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed Dials always start from the highest modem rate. **1:** The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to the Core Technology Manual for details about AI Short Protocol.
7	Not used	Do not change the settings.

G3 Switch 03		
No.	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	Not used	Do not change the setting.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not set to 0 unless the line condition is always bad enough to slow down the data rate to 14.4 kbps or lower.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	Keep this bit at "0" in most cases.
4	CTC transmission conditions **0:** Ricoh mode (PPR x 1) **1:** ITU-T mode (PPR x 4)	When using ECM, the machine will choose a slower modem rate after receiving PPR once (Ricoh mode) or four times (ITU-T mode). This bit is ineffective in V.34 communications.
5	Modem rate for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The TX modem rate of the machine will fall back before sending the next page if it receives a negative code. This bit is ignored if ECM is in use.
6	Not used	Do not change the setting.
7	Polarity change after DIS/NSF detection **0:** Disabled **1:** Enabled	This bit should be set to "1" only to deal with communication problems caused by certain types of exchanger.

G3 Switch 04		
No.	**FUNCTION**	**COMMENTS**
0–3	Training error detection threshold	0 - F (Hex): 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that the training was successful.
4–7	Not used	Do not change these settings.

No.	FUNCTION	COMMENTS
G3 Switch 05		
0–3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 　　　0 0 0 1 2.4 k 　　　0 0 1 0 4.8 k 　　　0 0 1 1 7.2 k 　　　0 1 0 0 9.6 k 　　　0 1 0 1 12.0 k 　　　0 1 1 0 14.4 k 　　　0 1 1 1 16.8 k 　　　1 0 0 0 19.2 k 　　　1 0 0 1 21.6 k 　　　1 0 1 0 24.0 k 　　　1 0 1 1 26.4 k 　　　1 1 0 0 28.8 k 　　　1 1 0 1 31.2 k 　　　1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers. If a modem rate of 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit 2
4, 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 　0　　　　0　　　　V.29 　0　　　　1　　　　V.17 　1　　　　0　　　　V.34 　1　　　　1　　　　Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6, 7	Not used	Do not change these settings.

No.	FUNCTION	COMMENTS
G3 Switch 06		
0-3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 　　　0 0 0 1 2.4 k 　　　0 0 1 0 4.8 k 　　　0 0 1 1 7.2 k 　　　0 1 0 0 9.6 k 　　　0 1 0 1 12.0 k 　　　0 1 1 0 14.4 k 　　　0 1 1 1 16.8 k 　　　1 0 0 0 19.2 k 　　　1 0 0 1 21.6 k 　　　1 0 1 0 24.0 k 　　　1 0 1 1 26.4 k 　　　1 1 0 0 28.8 k 　　　1 1 0 1 31.2 k 　　　1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for reception. Use a lower setting if high speeds pose problems during reception. If a modem rate of 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit 2

BIT SWITCHES

G3 Switch 06		
No.	**Function**	**Comments**

4–7	Modem types available for reception
	Bit 7 6 5 4 Setting
	    0 0 0 1 V.27ter
	    0 0 1 0 V.27ter, V.29
	    0 0 1 1 Not used
	    0 1 0 0 V.27ter, V.29, V.17
	    0 1 0 1 V.27ter, V.29, V.17,V.34
	Other settings - Not used
		The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode.
		
		If V.34 is not selected, V.8 protocol must be disabled manually.
		
		Cross reference
		V.8 protocol on/off - G3 switch 03, bit 2

G3 Switch 07		
No.	**FUNCTION**	**COMMENTS**

0, 1	PSTN cable equalizer (tx mode: Internal)
	Bit 1 Bit 0 Setting
	  0 0 None
	  0 1 Low
	  1 0 Medium
	  1 1 High
		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange.
		Use the dedicated transmission parameters for specific receivers.
		
		Also, try using the cable equalizer if one or more of the following symptoms occurs.
		• Communication error
		• Modem rate fallback occurs frequently.
		
		Note: This setting is not effective in V.34 communications.

2, 3	PSTN cable equalizer (rx mode: Internal)
	Bit 3 Bit 2 Setting
	  0 0 None
	  0 1 Low
	  1 0 Medium
	  1 1 High
		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange.
		
		Also, try using the cable equalizer if one or more of the following symptoms occurs.
		• Communication error with error codes such as 0-20, 0-23, etc.
		• Modem rate fallback occurs frequently.
		
		Note: This setting is not effective in V.34 communications.

4	PSTN cable equalizer (V.27ter, V.29, V.33/V.17, V.8 rx mode: External) **0:** Disabled **1:** Enabled	Keep this bit at "1" in most cases.
5–7	Not used	Do not change these settings.

G3 Switch 08

No.	FUNCTION	COMMENTS
0, 1	PABX cable equalizer (tx mode: Internal) **Bit 1　Bit 0　Setting** 　0　　　0　　　None 　0　　　1　　　Low 　1　　　0　　　Medium 　1　　　1　　　High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
2, 3	PABX cable equalizer (rx mode: Internal) **Bit 3　Bit 2　Setting** 　0　　　0　　　None 　0　　　1　　　Low 　1　　　0　　　Medium 　1　　　1　　　High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
4	PABX cable equalizer (V.27ter, V.29, V.33/V.17, V.8 rx mode: External) **0:** Disabled **1:** Enabled	Set this bit to 0 when line quality is good. (e.g. for a digital PABX)
5–7	Not used	Do not change these settings.

G3 Switch 09 - Not used (do not change any of these settings)

G3 Switch 0A

No.	FUNCTION	COMMENTS
0, 1	Maximum allowable carrier drop during image data reception **Bit 1　Bit 0　Value (ms)** 　0　　　0　　　200 　0　　　1　　　400 　1　　　0　　　800 　1　　　1　　　Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2	Reception carrier drop operation. **0:** Continue reception **1:** Disconnect the line	This bit decides what the machine does when there is a carrier drop in the image data.
3	Not used	Do not change the setting.

BIT SWITCHES

G3 Switch 0A		
No.	**Function**	**Comments**
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum interval between EOL (end-of-line) signals from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 s of CFR.
7	Not used	Do not change the setting.

G3 Switch 0B (Europe only)		
No.	**FUNCTION**	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	Program these bit switches manually to match local requirements.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5–7	Not used	Do not change these settings.

G3 Switch 0C - Not used (do not change any of these settings)
G3 Switch 0D - Not used (do not change any of these settings)
G3 Switch 0E - Not used (do not change any of these settings)
G3 Switch 0F - Not used (do not change any of these settings)

5.3 NCU PARAMETERS

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (Function 06-0), but some can be changed using NCU Parameter programming (Function 07-0). If Function 07-0 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

Fax Unit
B465

Address	Function	Unit	Remarks
401400	Country code for NCU parameters	Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 07-0 (parameter C.C.). **Note:** NA model only. You will have to set system switch 15 bit 2 to 1 before trying to change the NCU country code.	

Country	Decimal	Hex
France	00	00
Germany	01	01
UK	02	02
Italy	03	03
Austria	04	04
Belgium	05	05
Denmark	06	06
Finland	07	07
Ireland	08	08
Norway	09	09
Sweden	10	0A
Switzerland	11	0B
Portugal	12	0C
Holland	13	0D
Spain	14	0E
Israel	15	0F
USA	17	11
Asia	18	12
Hong Kong	20	14
South Africa	21	15
Australia	22	16
New Zealand	23	17
Singapore	24	18
Malaysia	25	19
China	26	1A
Formosa	27	1B
Korea	28	1C
Turkey	32	20
Greece	33	21
Hungary	34	22
Czech	35	23
Poland	36	24

NCU PARAMETERS

Address	Function	Unit	Remarks
401401	Line current detection time	20 ms	Line current detection is disabled.
401402	Line current wait time		Line current is not detected if 401401 contains FF.
401403	Line current drop detect time		
401404	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled. See Note 7
401405	PSTN dial tone frequency upper limit (low byte)		
401406	PSTN dial tone frequency lower limit (high byte)		
401407	PSTN dial tone frequency lower limit (low byte)		
401408	PSTN dial tone detection time	20 ms	If 401408 contains FF(H), the machine pauses for the pause time (address 40140D / 40140E).
401409	PSTN dial tone reset time (LOW)		
40140A	PSTN dial tone reset time (HIGH)		
40140B	PSTN dial tone continuous tone time		
40140C	PSTN dial tone permissible drop time		Italy: See Note 2 and 7
40140D	PSTN wait interval (LOW)	20 ms	See Note 7
40140E	PSTN wait interval (HIGH)		
40140F	PSTN ring-back tone detection time	20 ms	Detection is disabled if this contains FF.
401410	PSTN ring-back tone off detection time	20 ms	
401411	PSTN detection time for silent period after ring-back tone detected (LOW)		
401412	PSTN detection time for silent period after ring-back tone detected (HIGH)		
401413	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401414	PSTN busy tone frequency upper limit (low byte)		
401415	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401416	PSTN busy tone frequency lower limit (low byte)		
401417	PABX dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401418	PABX dial tone frequency upper limit (low byte)		
401419	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
40141A	PABX dial tone frequency lower limit (low byte)		

Fax Unit
B465

Address	Function	Unit	Remarks
40141B	PABX dial tone detection time	20 ms	If 40141B contains FF, the machine pauses for the pause time (401420 / 401421).
40141C	PABX dial tone reset time (LOW)		
40141D	PABX dial tone reset time (HIGH)		
40141E	PABX dial tone continuous tone time		
40141F	PABX dial tone permissible drop time		
401420	PABX wait interval (LOW)		
401421	PABX wait interval (HIGH)		
401422	PABX ringback tone detection time	20 ms	If both addresses contain FF(H), tone detection is disabled.
401423	PABX ringback tone off detection time		
401424	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	If both addresses contain FF(H), tone detection is disabled.
401425	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	If both addresses contain FF(H), tone detection is disabled.
401426	PABX busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401427	PABX busy tone frequency upper limit (low byte)		
401428	PABX busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401429	PABX busy tone frequency lower limit (low byte)		
40142A	Busy tone ON time: range 1	20 ms	
40142B	Busy tone OFF time: range 1		
40142C	Busy tone ON time: range 2		
40142D	Busy tone OFF time: range 2		
40142E	Busy tone ON time: range 3		
40142F	Busy tone OFF time: range 3		
401430	Busy tone ON time: range 4		
401431	Busy tone OFF time: range 4		
401432	Busy tone continuous tone detection time		
401433	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance (±) Bit 1 0 0 0 75% Bits 2 and 3 must always 0 1 50% be kept at 0. 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4: number of cycles required for cadence detection		

NCU PARAMETERS

Address	Function	Unit	Remarks
401434	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401435	International dial tone frequency upper limit (low byte)		
401436	International dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401437	International dial tone frequency lower limit (low byte)		
401438	International dial tone detection time	20 ms	If 401438 contains FF, the machine pauses for the pause time (40143D / 40143E).

Belgium: See Note 2. |
401439	International dial tone reset time (LOW)		
40143A	International dial tone reset time (HIGH)		
40143B	International dial tone continuous tone time		
40143C	International dial tone permissible drop time		
40143D	International dial wait interval (LOW)		
40143E	International dial wait interval (HIGH)		
40143F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401440	Country dial tone upper frequency limit (LOW)		
401441	Country dial tone lower frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
401442	Country dial tone lower frequency limit (LOW)		
401443	Country dial tone detection time	20 ms	If 401443 contains FF, the machine pauses for the pause time (401448 / 401449).
401444	Country dial tone reset time (LOW)		
401445	Country dial tone reset time (HIGH)		
401446	Country dial tone continuous tone time		
401447	Country dial tone permissible drop time		
401448	Country dial wait interval (LOW)		
401449	Country dial wait interval (HIGH)		
40144A	Time between opening or closing the DO relay and opening the OHDI relay	1 ms	See Notes 3, 6 and 7. Function 07–0 (parameter 11).
40144B	Break time for pulse dialing	1 ms	See Notes 3 and 7. Function 07-0 (parameter 12).
40144C	Make time for pulse dialing	1 ms	See Notes 3 and 7. Function 07-0 (parameter 13).
40144D	Not used		Do not change the setting.

Address	Function	Unit	Remarks
40144E	Minimum pause between dialed digits (pulse dial mode)	20 ms	See Notes 3 and 7. Function 07-0 (parameter 15).
40144F	Time waited when a pause is entered at the operation panel		Function 07-0 (parameter 16). See Note 7
401450	DTMF tone on time	1 ms	Function 07-0 (parameter 17). See Note 7
401451	DTMF tone off time		Function 07-0 (parameter 18). See Note 7
401452	Tone attenuation level of DTMF signals while dialing	-dBm x 0.5	Function 07-0 (parameter 19). See Note 5 and 7.
401453	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-dBm x 0.5	Function 07-0 (parameter 20). The setting must be less than –5dBm, and should not exceed the setting at 401452h above. See Notes 5 and 7.
401454	PSTN: DTMF tone attenuation level after dialling	-dBm x 0.5	Function 07-0 (parameter 21). See Note 5.
401455	ISDN: DTMF tone attenuation level after dialling	-dBm x 0.5	See Note 5
401456	Not used	Do not change the setting.	
401457	Time between 40144Dh (NCU parameter 14) and 40144Eh (NCU parameter 15)	1 ms	
401458	Not used	Do not change the setting.	
401459	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
40145A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
40145B	International dial access code (High)	BCD	For a code of 100: 40145B - F1 40145C - 00
40145C	International dial access code (Low)		
40145D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. If this address contains FF[H], the pause time stored in address 40144F is used. In the UK: Do not set a number higher than 7.
40145E	Progress tone detection level, and cadence detection enable flags	Bits 7–3: Not used Bits 2–0: See Note 2.	
40145F to 401464	Not used	Do not change these settings.	

NCU PARAMETERS

Address	Function	Unit	Remarks
401465	Long distance call prefix (HIGH)	BCD	For a code of 0: 401465 - FF 401466 - F0
401466	Long distance call prefix (LOW)	BCD	
401467 to 401468	Not used	Do not change these settings.	
401469	Distinctive ring	Hex	00(H): OFF, 01(H): ON
40146A	Distinctive ring minimum off time	1 ms	
40146B	Distinctive ring maximum one cycle time	20 ms $\pm$ 20 ms	
40146C to 401471	Not used	Do not change these settings.	
401472	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz)	Function 07-0 (parameter 02). See Note 7.
401473	Acceptable ringing signal frequency: range 1, lower limit		Function 07-0 (parameter 03). See Note 7.
401474	Acceptable ringing signal frequency: range 2, upper limit	1000/ N (Hz)	Function 07-0 (parameter 04). See Note 7.
401475	Acceptable ringing signal frequency: range 2, lower limit		Function 07-0 (parameter 05). See Note 7.
401476	Number or rings until a call is detected	1	Function 07-0 (parameter 06). The setting must not be zero. See Note 7.
401477	Minimum required length of the first ring	20 ms	See Note 4 and 7. Function 07-0 (parameter 07).
401478	Minimum required length of the second and subsequent rings	20 ms	Function 07-0 (parameter 08). See Note 7.
401479	Ringing signal detection reset time (LOW)	20 ms	Function 07-0 (parameter 09). See Note 7.
40147A	Ringing signal detection reset time (HIGH)	20 ms	Function 07-0 (parameter 10). See Note 7.
40147B to 401480	Not used	Do not change the settings.	
401481	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms

Address	Function	Unit	Remarks

401482	Bits 0 and 1 - Handset off-hook detection time
	Bit 1 0 Setting
	   0 0 200 ms
	   0 1 800 ms
	   Other Not used
	
	Bits 2 and 3 - Handset on-hook detection time
	Bit 3 2 Setting
	   0 0 200 ms
	   0 1 800 ms
	   Other Not used
	
	Bits 4 to 7 - Not used		

401483 to 4014A4	Not used	Do not change these settings.	
4014A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
4014A6 to 4014AA	Not used	Do not change these settings.	
4014AB	CNG on time	20 ms	Factory setting: 500 ms
4014AC	CNG off time		Factory setting: 200 ms
4014AD	Number of CNG cycles required for detection		The data is coded in the same way as address 401433.
4014AE	Not used	Do not change the settings.	
4014AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
4014B0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		
4014B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
4014B2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		
4014B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
4014B4	PSTN: Tx level from the modem	- dBm	Function 07-0 (parameter 01). See Note 7.
4014B5 to 4014B6	Not used	Do not change these settings.	
4014B7	PABX: Tx level from the modem	- dBm	
4014B8 to 4014BC	Not used	Do not change these settings.	

NCU PARAMETERS

Address	Function	Unit	Remarks
4014BD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	
4014BE to 4014C6	Not used	Do not change these settings.	
4014C7	Bits 0 to 3 – Not used. Bit 4 – V.34 protocol dump **0:** Simple, **1:** Detailed (default) Bits 5 to 7 – Not used.		
4014C8 to 4014D9	Not used	Do not change the settings.	
4014DA	T.30 T1 timer	1 s	See Note 7.
4014DB to 4014DF	Not used	Do not change these settings.	
4014E0 bit 3	Maximum wait time for post message	**0:** 12 s **1:** 30 s	**1:** Maximum wait time for post message (EOP/EOM/MPS) can be changed to 30 s. Change this bit to "1" if communication errors occur frequently during V.17 reception.

NOTES

1. If a setting is not required, store FF in the address.

2. Italy and Belgium only

    RAM address 40145E: the lower four bits have the following meaning.
    Bit 2 - 1: International dial tone cadence detection enabled (Belgium)
    Bit 1 - Not used
    Bit 0 - 1: PSTN dial tone cadence detection enabled (Italy)

    If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
    401408 (if bit 0 = 1) or 401438 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 401433.
    40140B (if bit 0 = 1) or 40143B (if bit 2 = 1): on time, hex code (unit = 20 ms)
    40140C (if bit 0 = 1) or 40143C (if bit 2 = 1): off time, hex code (unit = 20 ms)

3. Pulse dial parameters (addresses 40144A to 40144F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.

4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.

5. The attenuation levels calculated from RAM data are:
    High frequency tone: - 0.5 x $N_{401452/401454}$ dBm
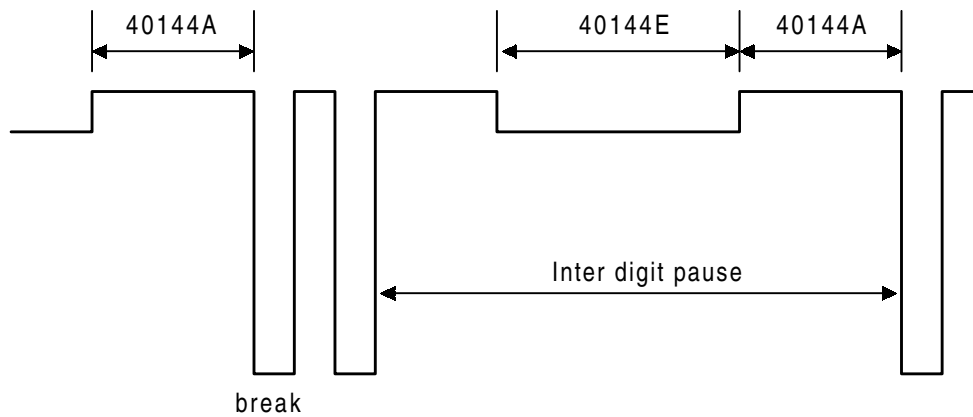
Low frequency tone: - 0.5 x ($N_{401452/401454}$ + N_{401453}) dBm
NOTE: N_{401452}, for example, means the value stored in address 401452(H)

6. The actual inter-digit pause (pulse dial mode) is the sum of the periods specified by RAM addresses 40144A and 40144E.

7. For European models, these parameters should not be changed in the field. The default values of these parameters have been approved by CTR21 and/or EG201121. Therefore, a change in any one of these values would constitute a violation of these requirements.

5.4 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has eight bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

The programming procedure will be explained first. Then, the eight bytes will be described.

5.4.1 PROGRAMMING PROCEDURE

1. Make sure the machine is in standby mode. Press 'User Tools' key then choose '4. Fax Features'.

2. Select the "1. Program/Delete", then press "OK" key.
    Select "1. Prog. Quick dial" or "3. Prog. Speed Dial" then press "OK" key
    Example: Change the Parameters in Quick Dial 01.

3. Press Quick Dial key 01 and "OK" key.
    NOTE: The selected Quick or Speed Dial must be programmed beforehand.

4. When the programmed dial number is displayed, press S - V - C using Quick Dial keys, then press 'Start'.

5. The settings for byte 0 are now displayed. Press a number from 0 to 7 corresponding to the bit that you wish to change.
    Example: Change bit 7 to 1: Press 7

6. To scroll through the parameter bytes, either:
    Select the next byte: press '→' Switch'
       or
    Select the previous byte: press '←' Switch' until the correct byte is displayed. Then go back to step 6.

7. After the setting is changed, press "OK" until "Programmed" displays.

8. To finish, press 'User Tools'.

5.4.2 PARAMETERS

The initial settings of the following parameters are all FF(H)—all the parameters are disabled.

Switch 00
FUNCTION AND COMMENTS
ITU-T T1 time (for PSTN G3 mode) If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. **Range:** 0 to 120 s (00h to 78h) FFh - The local NCU parameter factory setting is used. Do not program a value between 79h and FEh.

Switch 01		
No.	**FUNCTION**	**COMMENTS**
0–4	Tx level **Bit 4 3 2 1 0 Setting** 0 0 0 0 0 0 0 0 0 0 1 -1 0 0 0 1 0 -2 0 0 0 1 1 -3 0 0 1 0 0 -4 : : 0 1 1 1 1 -15 1 1 1 1 1 Disabled	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. If the setting is 'Disabled', the NCU parameter 01 setting is used. **Note:** Do not use settings other than listed on the left.
5–7	Cable equalizer **Bit 7 6 5 Setting** 0 0 0 None 0 0 1 Low 0 1 0 Medium 0 1 1 High 1 1 1 Disabled	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. If the setting is 'Disabled', the bit switch setting is used. **Note:** Do not use settings other than listed on the left.

DEDICATED TRANSMISSION PARAMETERS

Switch 02		
No.	**FUNCTION**	**COMMENTS**
0–3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 0 Not used 0 0 0 1 2,400 0 0 1 0 4,800 0 0 1 1 7,200 0 1 0 0 9,600 0 1 0 1 12,000 0 1 1 0 14,400 0 1 1 1 16,800 1 0 0 0 19,200 1 0 0 1 21,600 1 0 1 0 24,000 1 0 1 1 26,400 1 1 0 0 28,800 1 1 0 1 31,200 1 1 1 0 33,600 1 1 1 1 Disabled Other settings: Not used	If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. For the settings 14.4 or kbps slower, Switch 04 bit 4 must be changed to 0. If the setting is 'Disabled', the bit switch setting is used. **Note:** Do not use settings other than listed on the left.
4, 5	Not used	Do not change the settings.
6	AI short protocol **0:** Off **1:** Disabled	Refer to the Core Technology Manual for details about AI Short Protocol. If the setting is 'Disabled', the bit switch setting is used.
7	Not used	Do not change the setting.

Switch 03		
No.	**FUNCTION**	**COMMENTS**
0, 1	Inch-mm conversion before transmission **Bit 1 Bit 0 Setting** 0 0 Inch-mm conversion available 0 1 Inch only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. If "inch only" is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions. If the setting is 'Disabled', the bit switch setting is used.
2, 3	DIS/NSF detection method **Bit 3 Bit 2 Setting** 0 0 First DIS or NSF 0 1 Second DIS or NSF 1 0 Not used 1 1 Disabled	**(0, 1):** Use this setting if echoes on the line are interfering with the setup protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS. If the setting is 'Disabled', the bit switch setting is used.

Switch 03		
No.	**FUNCTION**	**COMMENTS**
4	V.8 protocol **0**: Off **1**: Disabled	If transmissions to a specific destination always end at a lower modem rate (14,400 bps or lower), disable V.8 protocol so as not to use V.34 protocol. **0:** V.34 communication will not be possible. If the setting is 'Disabled', the bit switch setting is used.
5	Compression modes available in transmit mode **0:** MH only **1**: Disabled	This bit determines the capabilities that are informed to the other terminal during transmission. If the setting is 'Disabled', the bit switch setting is used.

6
7
	ECM during transmission
	Bit 7 Bit 6 Setting
	  0 0 Off
	  0 1 On
	  1 0 Not used
	  1 1 Disabled
		For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting.
		Note that V.8/V.34 protocol and JBIG compression are automatically disabled if ECM is disabled.
		If the setting is 'Disabled', the bit switch setting is used.

Switch 04:	Not used (do not change any of these settings)
Switch 05:	Not used (do not change any of these settings)
Switch 06:	Not used (do not change any of these settings)
Switch 07:	Not used (do not change any of these settings)
Switch 08:	Not used (do not change any of these settings)
Switch 09:	Not used (do not change any of these settings)

5.5 SERVICE RAM ADDRESSES

┌───┐
│ ⚠CAUTION   │
│ **Do not change the settings which are marked as "Not used" or "Read** │
│ **only."**   │
└───┘

400001 to 400004(H) - ROM version (Read only)
   400001(H) - Revision number (BCD)
   400002(H) - Year (BCD)
   400003(H) - Month (BCD)
   400004(H) - Day (BCD)

400005(H) - **RAM Reset Level 1**
Change the data at this address to FF(H), then switch the machine off and on to reset all system settings (with the exception of the copier SP/UP settings, which are retained).
Caution: Before using this RAM, print the settings of all the system parameters (System Parameter List - Function02).

The country code will be reset to UK for EU/Asia models and USA for NA model when RAM reset level 1 is done.

400006(H) - Language Code (Hex)
   02(H) - English
   04(H) - French
   05(H) - Spanish
   06(H) - German
   07(H) - Italian
   08(H) - Swedish
   09H) - Norwegian
   0A(H) - Portuguese
   0B(H) - Dutch
   0C(H) - Polish
   0D(H) - Hungarian
   0E(H) - Czech
   0F(H) - Danish
   10(H) - Finnish

400008(H) - Program checksum: Total (low)
400009(H) - Program checksum: Total (high)
40000A(H) - Program checksum: Boot (low)
40000B(H) - Program checksum: Boot (high)
40000C(H) - Program checksum: Main (low)
40000D(H) - Program checksum: Main (high)
40000E(H) - RDS program update counter (Hex)

400010 to 40002F(H) - System bit switches
400030 to 40003F(H) - Scanner bit switches
400040 to 40004F(H) - Plotter bit switches

400050 to 40006F(H) - Communication bit switches
400070 to 40007F(H) - G3 bit switches

4000C0(H) - User parameter switch 00 (SWusr_00)
Bit 0: Not used
Bits 1 to 3: Scanning contrast home position

Bit	3	2	1	Setting
	0	0	0	Normal
	0	0	1	Lightest
	0	1	0	Darkest
	1	0	1	Lighter
	1	1	0	Darker

Bits 4 and 5: Scanning resolution home position

Bit	5	4	Setting
	0	0	Standard
	0	1	Detail
	1	0	Fine
	1	1	Not used

Bit 6: Transmission mode home position   0: Memory tx, 1: Immediate tx
Bit 7: Halftone home position   0: Disabled, 1: Enabled

4000C1(H) - User parameter switch 01 (SWusr_01)
Bits 0 to 6: Not
Bit 7: Settings return to home position after scanning   0: Disabled, 1: Enabled

4000C2(H) - User parameter switch 02 (SWusr_02)
Bit 0: Forwarding mark printing on forwarded messages   0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies   0: Disabled, 1: Enabled
Bit 2: Reception time printing   0: Disabled, 1: Enabled
Bit 3: TSI print on received messages   0: Disabled, 1: Enabled
Bit 4: Checkered mark printing   0: Disabled, 1: Enabled
Bits 5 and 7: Not used

4000C3(H) - User parameter switch 03 (SWusr_03: Automatic report printout)
Bit 0: Communication result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: File reserve report (memory transmission)   0: Off, 1: On
Bit 3: File reserve report (polling reception)   0: Off, 1: On
Bit 4: Communication result report (polling reception)   0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Not used
Bit 7: Journal   0: Off, 1: On

4000C4(H) - User parameter switch 04 (SWusr_04: Automatic report printout)
Bits 0 to 6: Not used
Bit 7: Inclusion of a sample image on reports   0: Off, 1: On

4000C5(H) - User parameter switch 05 (SWusr_05)
Bit 0: Substitute reception   0: Enabled, 1: Disabled
Bit 1: Memory reception if no RTI or CSI received   0: Possible, 1: Impossible
Bits 2 and 3: Not used

Bit 4: Restricted Access using personal codes   0: Off, 1: On
Bits 5 to 7: Not used

4000C6(H) - User parameter switch 06 (SWusr_06)
Bit 0: TT print   0: Off, 1: On
Bits 1 to 3: Not used
Bit 4: Batch transmission   0: Off, 1: On
Bits 5 to 7: Not used

4000C7(H) - User parameter switch 07 (SWusr_07)
Bits 0 and 1: Not used
Bit 2: Parallel memory transmission   0: Off, 1: On
Bit 3: Not used
Bit 4: Use of the ⊛ key for tonal signals   0: Off, 1: On
Bits 5 to 7: Not used

4000C8(H) - User parameter switch 08 (SWusr_08)
Bits 0 to 5: Not used.
Bits 6 and 7: Forwarding

Bit 7	6	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are forwarded.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are forwarded.

4000C9(H) - User parameter switch 09 (SWusr_09)
Bits 0 and 1: Memory lock

Bit 0	1	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are kept in the memory until a memory lock ID is entered.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are kept in the memory until a memory lock ID is entered.

Bits 2 to 5: Not used
Bit 6: Inclusion of the Yes key when Quick Dials are continuously selected for
     destinations   0: Not needed, 1: Needed
        1: The user must press the Yes key after each Quick Dial key. This is to
          prevent the user from selecting incorrect destinations.
Bit 7: Not used

4000CA(H) - User parameter switch 10 (SWusr_0A)
Bits 0 to 6: Not used
Bit 7: Halftone type   0: Error diffusion, 1: Dither

4000CB(H) - User parameter switch 11 (SWusr_0B)
Bits 0 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station
          0: Off, 1: On

Bit 7: Not used

4000CC(H) - User parameter switch 12 (SWusr_0C)

Bit 0: Not used

Bit 1: Distinctive Ring detection (NA only)   0: Off, 1: On

Bit 2: Toner saving mode   0: Disabled, 1: Enabled

Bits 3 to 7: Not used

4000CD(H) - User parameter switch 13 (SWusr_0D)

Bits 0 and 1: PSTN access method from behind a PABX

Bit	1	0	Setting
	0	0	PSTN
	0	1	Loop start (prefix)
	1	0	Ground start
	1	1	Flash start

Bits 2 to 7: Not used

4000CE(H) to 4000D8 - User parameter switch 14 to 24 (SWusr_0E to 18)

Bits 0 to 7: Not used

4000D9(H) - User parameter switch 25 (SWusr_19)

Bits 0 to 3: Not used

Bit 4: RDS operation   0: Not acceptable

1: Acceptable for the limit specified by system switch 03

Note: This bit is only effective when RDS operation can be selected by the user (system switch 02 bits 6 and 7).

Bits 5 and 6: Not used

Bit 7: Daylight saving time (User tools)   0: Disabled, 1: Enabled

4000DA(H) - User parameter switch 26 (SWusr_1A)

Bit 0 and 1: Dialing type

(This switch is not printed on the user parameter list.)

Bit	1	0	Setting
	0	0	Pulse dialing (10 pps)
	0	1	Pulse dialing (20 pps)
	1	0	Tone (DTMF) dialing

Bits 2 to 7: Not used

4000DB(H) - User parameter switch 27 (SWusr_1B)

PSTN access code from behind a PABX (Key operator tools)

(This switch is not printed on the user parameter list.)

Access number		Hex value to program (BCD)
0		F0
⇩	➡	⇩
9		F9
00		00
⇩	➡	⇩
99		99

4000DC(H) - User parameter switch 28 (SWusr_1C)
Number of rings in TEL mode (User tools)
(This switch is not printed on the user parameter list.)

Number of rings		Hex value to program (BCD)
00		00
⇩	➡	⇩
99		99

4000DD(H) to 4000EF - User parameter switch 29 to 47 (SWusr_1D to 2F)
Bits 0 to 7: Not used

400130 to 400143(H) - RTI (Max. 20 characters - ASCII) - See the following note.
400159 to 400178(H) - TTI 1 (Max. 32 characters - ASCII) - See the following note
400179 to 40018C(H) - CSI (Max. 20 digits - ASCII)
4001D5(H) - Number of CSI digits (Hex)
If the number of characters is less than the maximum (20 for RTI, 32 for TTI), add a stop code (FF[H]) after the last character.

4001D8 to 4001E6(H) - Service station's fax number (Max. 15 digits - ASCII)
[Service Function 09]

4001F6 to 400204(H) - Own fax number: PSTN (Max. 15 digits - ASCII)

400250(H) - ID code (low - BCD)
400251(H) - ID code (high - BCD)

400252(H) - Confidential ID (low - BCD)
400253(H) - Confidential ID (high - BCD)

400254(H) - Memory Lock ID (low - BCD)
400255(H) - Memory Lock ID (high - BCD)

400273 to 40027D(H) – Daylight-saving time (Summer time)
    Amount of time shift
        400273(H) – Amount of time shift
            1-0xFF(H) minutes,   00(H)= 60 minutes
    Start date/time:
        400274(H) - Month (BCD)
        400275(H) - Week (Hex)
        400276(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday
        400277(H) - Hour (BCD)
        400278(H) - Day (BCD)
    End date/time:
        400279(H) - Month (BCD)
        40027A(H) - Week (Hex)
        40027B(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday
        40027C(H) - 24-Hour (BCD)
        40027D(H) - Day (BCD)

40027E to 400285(H) - Last power off time (Read only)

    40027E(H) - Clock

                00(H) - 12-hour clock (AM)

                01(H) - 24-hour clock

                02(H) - 12-hour clock (PM)

    40027F(H) - Year (BCD)

    400280(H) - Month (BCD)

    400281(H) - Day (BCD)

    400282(H) - Hour

    400283(H) - Minute

    400284(H) - Second

    400285(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ..., 06: Sunday

400286 to 40028D(H) - Present time (Read only)

    400286(H) - Clock

                00(H) - 12-hour clock (AM)

                01(H) - 24-hour clock

                02(H) - 12-hour clock (PM)

    400287(H) - Year (BCD)

    400288(H) - Month (BCD)

    400289(H) - Day (BCD)

    40028A(H) - Hour

    40028B(H) - Minute

    40028C(H) - Second

    40028D(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ..., 06: Sunday

40028E to 400291(H) - Total seconds (hex value) since 00:00:00 1st January 1990
                  (Read only)

400292 to 400295(H) - Optional equipment (Read only)

    400292(H)

        Bit 1: Future expander 40M

        Bit 3: ADF

        Bit 4: !00 sheets by-pass tray unit

        Bit 7: Paper tray unit

        Other bits: Not used

    400293(H)

        Bit 4: Printer unit

        Other bits: Not used

    400294(H)

        Bit 2: JBIG

        Other bits: Not used

    400295(H)

        Bit 3: 1 sheet by-pass tray unit

        Bit 4: Modem

        Bit 5: DIMM

        Other bits: Not used

SERVICE RAM ADDRESSES

For the following counters, the wording in brackets indicates how these counters appear on the system parameter list.

4002AC to 4002AF(H) - TX counter (TRANSMISSION)

Address	High	Low
4002AC(H)	Tens digit	Unit digit
4002AD(H)	Thousands digit	Hundreds digit
4002AE(H)	Hundred thousands digit	Ten thousands digit
4002AF(H)	Ten millions digit	Millions digit

Note: The following counters have the same data format as above.

4002B0 to 4002B3(H) - RX counter (RECEPTION)

4002B4 to 4002B7(H) - Scan counter (SCAN)

4002B8 to 4002BB(H) - Print counter (PRINT)

4002C0 to 4002C3(H) - ADF counter (ADF)

4002C4 to 4002C7(H) - ADF PM counter

4002C8 to 4002CB(H) - ADF PM interval (Default: 45,000)

4002CC to 4002CF(H) - ADF roller counter

4002D0 to 4002D3(H) - ADF roller interval (Default: 45,000)

4002D8 to 4002DB(H) - Paper feed counter: standard cassette
(MAIN CASSETTE)

4002DC to 4002DF(H) - Paper feed counter: optional cassette (CASSETTE 2)

4002EC to 4002EF(H) - Paper feed counter: by-pass feeder (BY-PASS)

4002F4 to 4002F7(H) - Scanner total jam counter (DOC. JAM)

4002F8 to 4002FB(H) - Printer total jam counter (COPY JAM)

4002FC to 4002FF(H) - Paper jam counter: standard cassette (MAIN CST JAM)

400300 to 400303(H) - Paper jam counter: optional cassette (CST 2 JAM)

400310 to 400313(H) - Paper jam counter: by-pass feeder (BY-PASS JAM)

400318 to 40031B(H) - Fusing exit jam counter (EJECT JAM)

40031C to 40031F(H) - Registration jam counter (PAPER JAM)

400320 to 400323(H) - Printer PM counter (PM)

400324 to 400327(H) - Printer PM interval (PM DEFAULT: Default: 90,000)

400328 to 40032B(H) - Copy counter (COPY)

40032C to 40032F(H) - OPC counter (PCU)

400330 to 400333(H) - OPC PM interval (Default: 45,000)

400334 to 400337(H) - AIO counter (TONER)

400338 to 40033B(H) – Previous AIO counter, before replacing (TONER (PRE))

400340 to 40034F(H) - Excessive jam call parameters

Parameters	Address (H)		Initial Setting	Sys. Para. List
	ADF	Printer		
DEC (1 – 255; 0 = Disabled)	400340	400344	10 (H)	X
CALL (3 – 15; 0 = Disabled)	400341	400345	06(H)	Y
CLR (Low)	400342	400346	30(H)	-
(High)	400343	400347	00(H)	

Counters	Address (H)		Sys. Para. List
	ADF	Printer	
JAM: Jam counter used to place a service call	400348	40034C	Z
NO-JAM1: Counter used for JAM counter decrement	400349	40034D	-
NO-JAM2: Counter used for clearing the JAM counter	40034A (Low)	40034E (Low)	-
	40034B (High)	40034F (High)	

400350 to 400353(H) - PC tx counter (PC TX)
400354 to 400357(H) - PC rx counter (PC RX)
400358 to 40035B(H) - PC scan counter (PC SCN)
40035C to 40035F(H) - PC print counter (PC PRT)

4004B7(H) - ROM Suffix (BCD)
4004B8(H) - ROM Version (BCD)
4004B9 to 4004BB(H) - ROM Information
   4004B9(H) - Year (BCD)
   4004BA(H) - Month (BCD)
   4004BB(H) - Day (BCD)

4004BC to 4004BD(H) - Modem ROM version (BCD)

4004C0 to 4004C1(H)
   Timer adjustment for FCU automatic reset (system switch 02 bit 4)
   0000 to 04FF(H): 1 hour
   0500 to FFFF(H): N x 500 ms (10.7 minutes to 9.1 hours)

4004D8 to 400501(H) - Night timer period

4004D8 to 4004DA(H) - Setting #1 for Monday
4004DB to 4004DD(H) - Setting #2 for Monday
4004DE to 4004E0(H) - Setting #1 for Tuesday
4004E1 to 4004E3(H) - Setting #2 for Tuesday
4004E4 to 4004E6(H) - Setting #1 for Wednesday
4004E7 to 4004E9(H) - Setting #2 for Wednesday
4004EA to 4004EC(H) - Setting #1 for Thursday
4004ED to 4004EF(H) - Setting #2 for Thursday
4004F0 to 4004F2(H) - Setting #1 for Friday
4004F3 to 4004F5(H) - Setting #2 for Friday
4004F6 to 4004F8(H) - Setting #1 for Saturday
4004F9 to 4004FB(H) - Setting #2 for Saturday
4004FC to 4004FE(H) - Setting #1 for Sunday
4004FF to 400501(H) - Setting #2 for Sunday

Program format

First byte - Hour (BCD)
Second byte - Minute (BCD)
Third byte - 00(H): Timer start time, 01(H): Timer end time

40052E to 400531(H) - Time of last RDS execution (Read-only)

These 4 bytes store the time at which RDS was last carried out. (Time is given in total seconds counted from 00:00:00 January 1, 1990.)

400548(H) - Transmission monitor volume   00 – 07(H)
400549(H) - Reception monitor volume   00 – 07(H)
40054A(H) - On-hook monitor volume   00 – 07(H)
40054B(H) - Dialing monitor volume   00 – 07(H)
40054C(H) - Buzzer volume   00 – 07(H)
40054D(H) - Key acknowledgment tone volume   00 – 07(H)

40054E(H) - Country code (same data as System bit switch 0F)

40054F to 400553(H) - Periodic service call parameters

Parameters		Address (H)
Call interval	01 through 15 month(s) (BCD) 00: Periodic service call disabled	40054F
Next call	Year (Read only)	400550
	Month (Read only)	400551
	Day: 01 through 31 (BCD)	400552
	Hour: 01 through 24 (BCD)	400553

400559 to 40055B(H) - Effective term of automatic service calls

Parameters	Address (H)
Year: last two digits of the year (BCD)	400559
Month: 01 through 12 (BCD)	40055A
Day: 01 through 31 (BCD)	40055B

401400 to 4014E0(H) - NCU parameters (Refer to section 5.3 for details)

401D48(H) - Text mode selection for Fax mode   07(H): Text Sharp
0A(H): Dropout

40F1C8 to 40F3B1(H) - Dedicated tx parameters for Quick Dial 01 - 16.
There are 32 bytes for each Quick Dial. Only the 23rd to 32nd bytes are used.
40F1C8 to 40F1D1(H) - Dedicated tx parameters for Quick 01
40F1E8 to 40F1F1(H) - Dedicated tx parameters for Quick 02
40F208 to 40F211(H) - Dedicated tx parameters for Quick 03
⇩
40F3A8 to 40F3B1(H) - Dedicated tx parameters for Quick 16

40F3C8 to 40F9F1(H) - Dedicated tx parameters for Speed Dial #00 - #49.
There are 32 bytes for each Speed Dial. Only the 23rd to 32nd bytes are used.
40F3C8 to 40F3D1(H) - Dedicated tx parameters for Speed #00
40F3E8 to 40F3F1(H) - Dedicated tx parameters for Speed #01
40F402 to 40F411(H) - Dedicated tx parameters for Speed #02
⇩
40F9E8 to 40F9F1(H) - Dedicated tx parameters for Speed #49

4121DA to 4123D9(H) - Latest 64 error codes (Read only)
One error record consists of 8 bytes of data.
First error record start address - 4121DA(H)
Second error record start address - 4121E2(H)
Third error record start address - 4121F0(H)
    :
64th error record start address - 4123D2(H)

The format is as follows:
1st byte - Minute (BCD)
2nd byte - Hour (BCD)
3rd byte - Day (BCD)
4th byte - Month (BCD)
5th byte - Error code : low (BCD) [If the error code is 1-23, 23 is stored here.]
6th byte - Error code : high (BCD) [If the error code is 1-23, 01 is stored here.]
7th byte - Communication line (Hex)
        00(H): PSTN
        02(H): PABX
8th byte - Not used

413C22 to 414469(H) - Latest 20 error communication records (Read only)

One error communication record consists of 98 bytes. The format is as follows:

1st byte - Header
    Bit 0: Communication result   0: OK, 1: NG
    Bit 1: Document jam   1: Occurred
    Bit 2: Power down   1: Occurred
    Bit 3: Character type   0: ASCII, 1: Japanese characters
    Bit 4: Technical data printout instead of personal codes   0: No, 1: Yes
    Bit 5: Type of technical data   0: Rx level, 1: Measure of error rate

    Bit 6: Error report   0: Not printed, 1: Printed
    Bit 7: Data validity   0: Not valid, 1: Valid

2nd byte - Not used

3rd to 7th bytes - Date and time when the communication started
    3rd byte - Year (BCD)
    4th byte - Month (BCD)
    5th byte - Day (BCD)
    6th byte - Hour (BCD)
    7th byte - Minute (BCD)

8th and 9th bytes - Communication time
    8th byte - Minutes (BCD)
    9th byte - Seconds (BCD)

10th byte - Line detection status
    01(H): Ringing detection
    02(H): 1300Hz detection
    03(H): Remote detection
    04(H): CNG detection

11th and 12th bytes - Number of pages transmitted or received
    11th byte - Low byte (Hex)
    12th byte - High byte (Hex)

13th and 14th bytes - Personal code or number of total/burst error lines
    If bit 4 of the 1st byte is 0: 13th byte - Personal code (low - BCD)
                                   14th byte - Personal code (high - BCD)
    If bit 4 of the 1st byte is 1: 13th byte - Number of total error lines (Hex)
                                   14th byte - Number of burst error lines (Hex)

15th byte - File number (low - Hex)
16th byte - File number (high - Hex)

17th and 18th bytes – Destination File ID number (for system work area)

19th byte - Communication result
    00(H): OK
    80(H): NG
    FF(H): Unknown

20th byte - Type of image mode
    00(H): Text
    01(H): Gray scale
    02(H): Color
    03(H): Color/Text
    04(H): Color/Photo
    80(H): Photo

21st and 22nd bytes - Rx level or measure of error rate
    If bit 5 of the 1st byte is 0: 20th byte - Rx level (low - Hex)
                                   21st byte - Rx level (high - Hex)
    If bit 4 of the 1st byte is 1: 20th byte - Measure of error rate (low - Hex)
                                   21st byte - Measure of error rate (high - Hex)

23rd byte - Final modem rate
Bits 0 to 3: Final modem speed

Bit 3	2	1	0	Setting
0	0	0	1	2.4 k
0	0	1	0	4.8k
0	0	1	1	7.2k
0	1	0	0	9.6k
0	1	0	1	12.0k
0	1	1	0	14.4k
0	1	1	1	16.8k
1	0	0	0	19.2k
1	0	0	1	21.6k
1	0	1	0	24.0k
1	0	1	1	26.4k
1	1	0	0	28.8k
1	1	0	1	31.2k
1	1	1	0	33.6k

Other settings - Not used

Bits 4 to 7: Final modem type

Bit 7	6	5	4	Setting
0	0	0	1	V.27ter
0	0	1	0	V.27ter, V.29
0	0	1	1	V.33
0	1	0	0	V.27ter, V.29, V.17
0	1	0	1	V.27ter, V29, V.17, V.34

Other settings - Not used

24th to 26th bytes - Not used

27th to 50th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

51st byte - Communication mode #1
Bits 0 - 3: Resolution used

Bit 3	2	1	0	Setting
0	0	0	1	8 x 3.85 lines/mm
0	0	1	0	8 x 7.7 lines/mm
0	0	1	1	8 x 15.4 lines/mm
0	1	0	0	16 x 15.4 lines/mm
0	0	0	1	24 x 23.1 lines/mm

Bits 4 to 7: Communication mode used

Bit 7	6	5	4	Setting
0	0	0	0	Normal
0	0	1	0	Polling
0	1	0	0	Forwarding
0	1	0	1	Automatic Service Call

Other settings - Not used

52nd byte - Communication mode #2

Bit 0: Tx or Rx	0: Tx, 1: Rx
Bit 1: Reduction in Tx	0: Not reduced, 1: Reduced
Bit 2: Batch transmission	0: Not used, 1: Used

SERVICE RAM ADDRESSES

Bit 3: Send later transmission 0: Not used, 1: Used
Bit 4: Transmission from   0: ADF, 1: Memory
Bit 5: Not used
Bit 6: ECM   0: Off, 1: On
Bit 7: Not used

53rd to 56th bytes - Not used

57th byte - Number of errors during communication (Hex)

58th byte - Not used

59th to 62nd byte - 1st error code and page number where the error occurred
 59th byte - Page number where the error occurred (low - Hex)
 60th byte - Page number where the error occurred (high - Hex)
 61st byte - Error code (low - BCD)
 62nd byte - Error code (high - BCD)
63rd to 66th byte - 2nd error code and page number where the error occurred
67th to 70th byte - 3rd error code and page number where the error occurred
71st to 74th byte - 4th error code and page number where the error occurred
75th to 78th byte - 5th error code and page number where the error occurred
79th to 82nd byte - 6th error code and page number where the error occurred
83rd to 86th byte - 7th error code and page number where the error occurred
87th to 90th byte - 8th error code and page number where the error occurred
91st to 94th byte - 9th error code and page number where the error occurred
95th to 98th byte - 10th error code and page number where the error occurred

DETAILED DESCRIPTIONS

6. DETAILED SECTION DESCRIPTIONS

6.1 PCBS

6.1.1 FCU

The FCU (Facsimile Control Unit) for the fax unit contains some additional components other than the FCU (Function Control Unit) for the base copier, as shown below;

- V34 Modem
- Analog circuit for communication (Amplifier)
- Speaker driver
- SAF memory back-up circuit and a rechargeable lithium battery

For details about the FCU, refer to section 6.5.1 in the service manual for the base copier.

6.1.2 NCU

For details about the NCU, refer to section 6.5.3 in the service manual for the base copier.

SPECIFICATIONS

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX

Connection
Direct couple

Original Size (Book)
Maximum Length: 297 mm [11.7 in]
Maximum Width: 216 mm [8.5 in]

Original Size (ADF)
Length: 128 – 1260 mm [5.0 – 47.2 in]
Width: 105 – 216 mm [4.1 – 8.5 in]

Scanning Method
Flatbed, with CCD

Scan Width
210 mm [8.3 in] ± 1% (A4)
216 mm [8.5 in] ± 1% (8.5" x 11")

Resolutions
8 x 3.85 lines/mm
8 x 7.7 lines/mm
8 x 15.4 lines/mm
200 x 100 dpi
200 x 200 dpi
200 x 400 dpi

Memory Capacity

ECM: 128 KB

SAF:
Standard: 1 MB (80 pages)
Maximum: 4 MB (320 pages)

Measured using an ITU-T #1 test document
(Slerexe letter)

Compression
MH, MR, MMR
SAF storage for memory tx: MMR and/or
raw data

Protocol
Group 3 with ECM

Modulation
V.34, V.33, V.17 (TCM), V.29 (QAM),
V.27ter (PHM), V.8, V.21 (FM)

Data Rate (bps)
G3:
33600/31200/28800/26400/24000/21600/
19200/16800/14400/12000/9600/7200/4800
/2400, Automatic fallback

I/O Rate
With ECM: 0 ms/line
Without ECM: 2.5, 5, 10, 20, or 40 ms/line

Transmission Time
G3: 3 s at 28800 bps; Measured with G3
ECM using memory for an ITU-T #1 test
document (Slerexe letter) at 8 x 3.85 l/mm
resolution

2. FEATURES

2.1 FEATURES LIST

KEY:
O = Used   X = Not Used

Video Processing Features	
Automatic image density	O
Contrast	O
Halftone (Basic & Error Diffusion)	O
JBIG compression (copy mode)	O
MTF	O
Reduction before tx	X
Scanning Resolution – Standard	O
Scanning Resolution – Detail	O
Scanning Resolution – Fine	O
Scanning Resolution – Superfine	X
Smoothing to 400 x 400 dpi when printing (Rx only)	O

Communication Features – Automatic	
Automatic fallback	O
Automatic redialing (Memory tx only)	O
Dual Access	O
Length Reduction	O
Resolutions available for reception Detail	O
Fine	X
Superfine	X
Substitute reception	O
JBIG communication	X
V34 communication	O

Communication Features – User Selectable	
90° Image Rotation before tx	X
Action as a transfer broadcaster	X
AI Redial (last ten numbers)	O
Answering machine interface	X
Authorized Reception	X
Auto Document	X
Automatic dialing (pulse or DTMF)	O

Communication Features – User Selectable	
Automatic Voice Message	X
Batch Transmission	O
Book Original tx	O
Broadcasting	O
Chain Dialing	O
Communication Record Display	X
Confidential ID Override	X
Confidential Reception	X
Confidential Transmission	X
Direct Fax Number Entry	O
Economy Transmission	X
Fax on demand	X
Forwarding	O
Free Polling	O
Groups (Standard: 5 groups)	O
Hold	X
ID Transmission	X
Immediate Redialing	O
Immediate Transmission	O
ISDN	X
Keystroke Programs	X
Memory transmission	O
Multi-step Transfer	X
Non-standard original size transmission	O
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O
Page separation mark	O
Parallel memory transmission	O
Partial Image Area Scanning	X
Personal Codes	O
Personal Codes with Conf. ID	X
Polling Reception	O
Polling Transmission	X
Polling tx file lifetime in the SAF	X
Quick Dial (16 stations)	O
Reception modes (Fax, Tel)	O
Remote control features	X
Remote Transfer	X
Restricted Access	O
Send Later	O

Communication Features – User Selectable	
SEP/SUB/PWD/SID	O
Silent ringing detection	X
Specified Image area	X
Speed Dial (50 stations)	O
Stamp	X
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	X
Transmission Deadline (TRD)	X
Turnaround Polling	X
Two in one	X
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Cable Equalizer	O
Closed Network	X
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	X
Inch-mm conversion before tx	O
Length Reduction	O
Page retransmission times	O
Protection against wrong connection	O
Short Preamble	X

Other User Features	
Area code prefix	X
Center mark	O
Checkered mark	O
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	X
Counters	O
Daylight Saving Time	O
Destination Check	X
Energy Saver	O
File Retention Time	X

Other User Features	
File Retransmission	X
Function Programs (F1 – F3)	O
Hard Disk Filing System	X
ID Code	O
Label Insertion ("To xxx")	O
Language Selection	O
LCD contrast adjustment	O
Memory file printout (all files)	O
Memory Lock	O
Multi Sort Document Reception	X
Own telephone number	O
Print density control	X
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	O
Remaining memory indicator	O
Reverse Order Printing	X
RTI, TTI, CSI	O
Service Report Transmission	X
Speaker volume control	O
Specified Cassette Selection	X
Toner Saving Mode	O
TTI on/off	O
User Function Keys (3 keys)	O
User Parameters	O
Wild Cards	O

Fax Unit B465

SPECIFICATIONS

Reports – Automatic	
Charge Control Report	X
Communication Failure Report	O
Confidential File Report	X
Error Report	O
Fax On Demand Report	X
File Clear Report	X
File Reserve Report	O
Journal	O
Polling Result Report	O
Power Failure Report	O
Transfer Result Report	X
Transmission Result Report	O

Reports - User-initiated	
Authorized Reception List	X
Charge Control Report	X
File List	O
Forwarding List	O
Group List	O
Hard Disk File List	X
Journal	O
Personal Code List	O
Program List	X
Quick Dial Label	O
Quick Dial List	O
Specified Cassette Selection List	X
Speed Dial List	O
Transmission Status Report	X
User Function List	O
User Parameter List	O

Service Mode Features	
Back-to-back test	X
Bit switch programming	O
Cable equalizer	O
Comm. parameter display	O
Counter check	SP mode
Country code	O
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	O
Error code display	O
Excessive jam alarm	O
File Transfer (all files)	O

Service Mode Features	
Line error mark	O
Modem Software Download	X
Modem test (including V.34/V.8)	O
NCU parameters	O
Periodic service call	O
PM Call	O
Printing all communication records kept in memory	X
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
RAM test	X
RDS - RAM read/write - Dial data transfer (Quick/Speed Dial) - Software transfer	O O O
Ringer test	X
ROM version display (FCU)	SP mode
Serial number	SP mode
Service monitor report	O
Service station number	O
Software Download	SP mode
SRAM data backup/restore	SP mode
System parameter list	O
Technical data on the Journal	O

2.2 PROGRAMMABLE CAPACITY

The following table shows the maximum capacity for each programmable item.

Item	Capacity
Maximum number of memory files	140
Maximum number of destinations per file	133
Maximum number of pages overall	500
Number of Quick Dials	16
Number of Speed Dials	50
Number of Groups	5
Maximum number of destinations dialed from the ten-key pad overall	67
Maximum number of communication records for the Journal stored in the memory	10
Maximum number of user function keys	3
Maximum number of personal codes	10

3. OVERALL MACHINE CONTROL

3.1 SYSTEM CONTROL

The basic fax unit consists of two PCBs: the FCU and the NCU.

The FCU controls all fax communications and fax features. The NCU switches the analog line between the fax unit and the external telephone.

Refer to Section 6 of the base copier's service manual for details.

3.2 POWER DISTRIBUTION

The PSU (Power Supply Unit) generates +5V (+5VE) and +24V (+24VE) DC, and supplies these to the FCU.

The FCU includes regulators that generate +3V (specifically, +3.3V) and +12V for internal use, as indicated below.

Source	Voltage	Description
+24VE	+5VLD*	For the LDDR
	+12V	For the SBU.
	+24VES	For the lamp stabilizer and DF relay board.
	+24VM*	For the main motor, polygon motor, PSU, cooling fan, clutches, power pack, quenching lamp, mechanical counter, optional paper tray.
	+24VMM*	For the scanner motor and DF motor.
+5VE		For the Op-port, sensors, and optional printer unit
	+3V	For the SDRAM, VPL, CIOP, and modem.
	+3VA	For analog communication processing
	+3VBAT	Supplied from a long-term lithium battery; backs up the SRAM (programmed settings) on the FCU.
	+3VD	Supplied from a rechargeable lithium battery; backs up stored data DRAM and on optional IC card (both on the FCU) for 12 hours after power goes off.
	+3VE	For the SCP2, flash ROM, and optional DIMM.
	+3VV	For the thermistor
	+5V	For the power pack, sensors, DF relay board, and optional paper tray.
	+5VA	For analog communication processing
	+5VCD	For flash memory card
	+5VDS	For the NCU
	+5VHCT	For the card I/F
	+5VSPD	For the monitor speaker
	+5VVA	For video processing
	+5VVD	For the SBU.

*Supply is cut off if interlock switch is open.

3.3 MEMORY BACKUP

A non-rechargeable lithium battery provides long-term backup for the SRAM on the FCU, so that system parameters and programmed settings are maintained even when the base copier is unplugged or its main switch is turned off.

A rechargeable lithium battery backs up the SAF memory (SDRAM) on the FCU for about 12 hours in the event that power goes off.

**Fax Unit
B465**

4. VIDEO DATA PATH

4.1 TRANSMISSION

Memory Transmission and Parallel Memory Transmission

The base copier's scanner scans the original at the selected resolution in inch format, then the FCU compresses the data in MMR or raw format and stores it in the SAF memory.

At time of transmission, the FCU decompresses the stored data, then recompresses the data for transmission. The NCU transmits the data to the line through the modem.

Immediate Transmission

The base copier's scanner scans the original at the resolution agreed with the receiving terminal. Then the FCU stores the data in the memory, and compresses the data for transmission. The NCU transmits the data to the line through the modem.

4.2 RECEPTION

Data from an analog line passes to the modem through the NCU. After the modem demodulates the data, it is decompressed and transferred to the memory for printing.

B441 PRINTER CONTROLLER
TYPE 1013

B441
TABLE OF CONTENTS

INSTALLATION

TROUBLESHOOTING

SERVICE TABLES

DETAILED DESCRIPTIONS

SPECIFICATIONS

INSTALLATION

1. INSTALLATION

1.1 INSTALLATION REQUIREMENTS

Please refer to section 1 of the main unit service manual.

1.2 PRINTER INSTALLATION

Accessory Check

Check the accessories in the box against the following list:

No.	Description	Q'ty
1	CD ROM	1
2	Key Top – Printer	1
3	Key Top - Copy	1
4	Printer Key Cover	1
5	Harness - Controller/FCU	1
6	Screw - M3x6	8
7	Installation Procedure	1
8	Software License Agreement	1

Printer Unit B441

Printer Controller Installation

> ⚠**CAUTION**
> - **Unplug the main machine power cord before starting the following procedure.**
>
> **If you install the fax option at the same time, the fax option must be installed first. Otherwise you cannot install the fax option.**

[A]

[B]

[D]

[C]

[E]
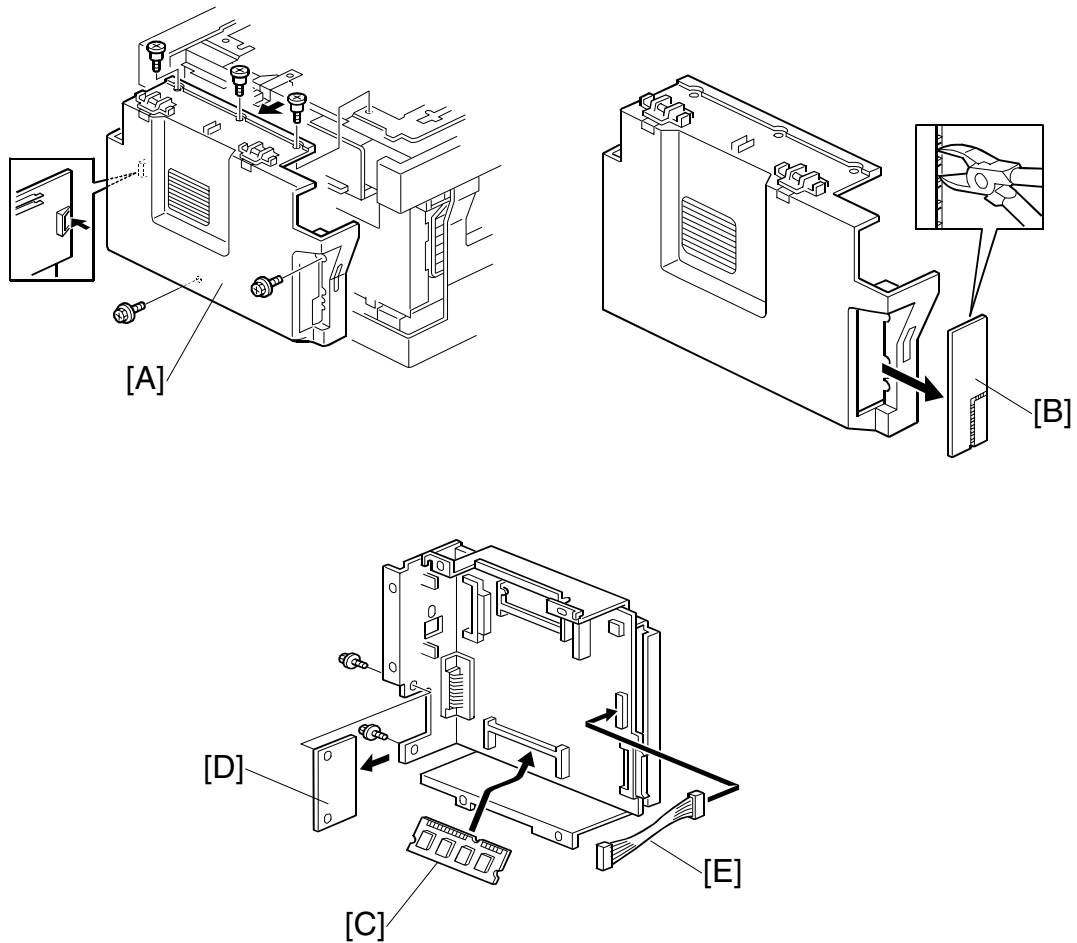
1. Remove the rear cover [A] (5 screws).

2. Remove the small cover [B] from the rear cover (cut it by the nipper).
   - When you install the printer memory at the same time, please connect the memory [C] to CN502 as shown.
   - When you install the fax option, please remove the small cover [D] as shown. Otherwise go to step 3.

3. Connect the harness [E] on CN507 as shown.
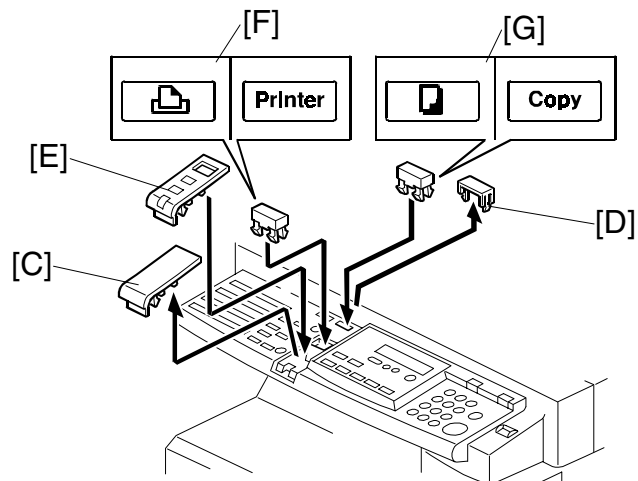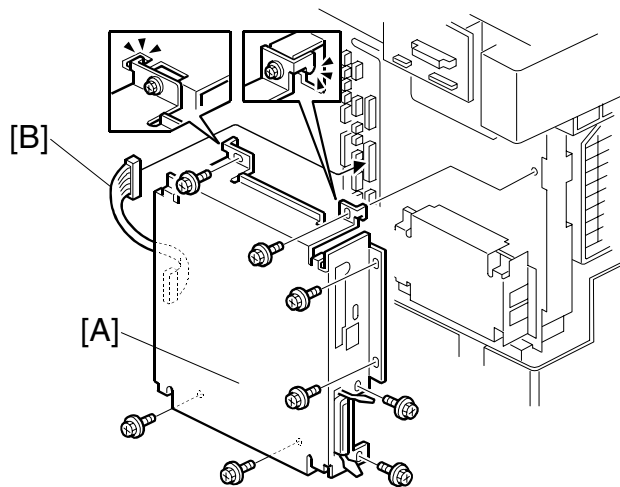
4. Install the controller [A] (1 connector and 8 screws) as shown.

5. Connect the harness [B] into CN3 on the FCU board.

6. Replace the rear cover.

7. Remove the covers [C] and [D] from the operation panel.

8. Install the printer key cover [E], the printer key top [F] and the copy key top [G].

1.3 PS 2 EMULATION BOARD (B431)

⚠️**CAUTION**

Unplug the main machine power cord before starting the following procedure.

NOTE: To install the Postscript option, the printer option (B441) must be installed also. Please refer to section 1.2 for the printer controller installation procedure.
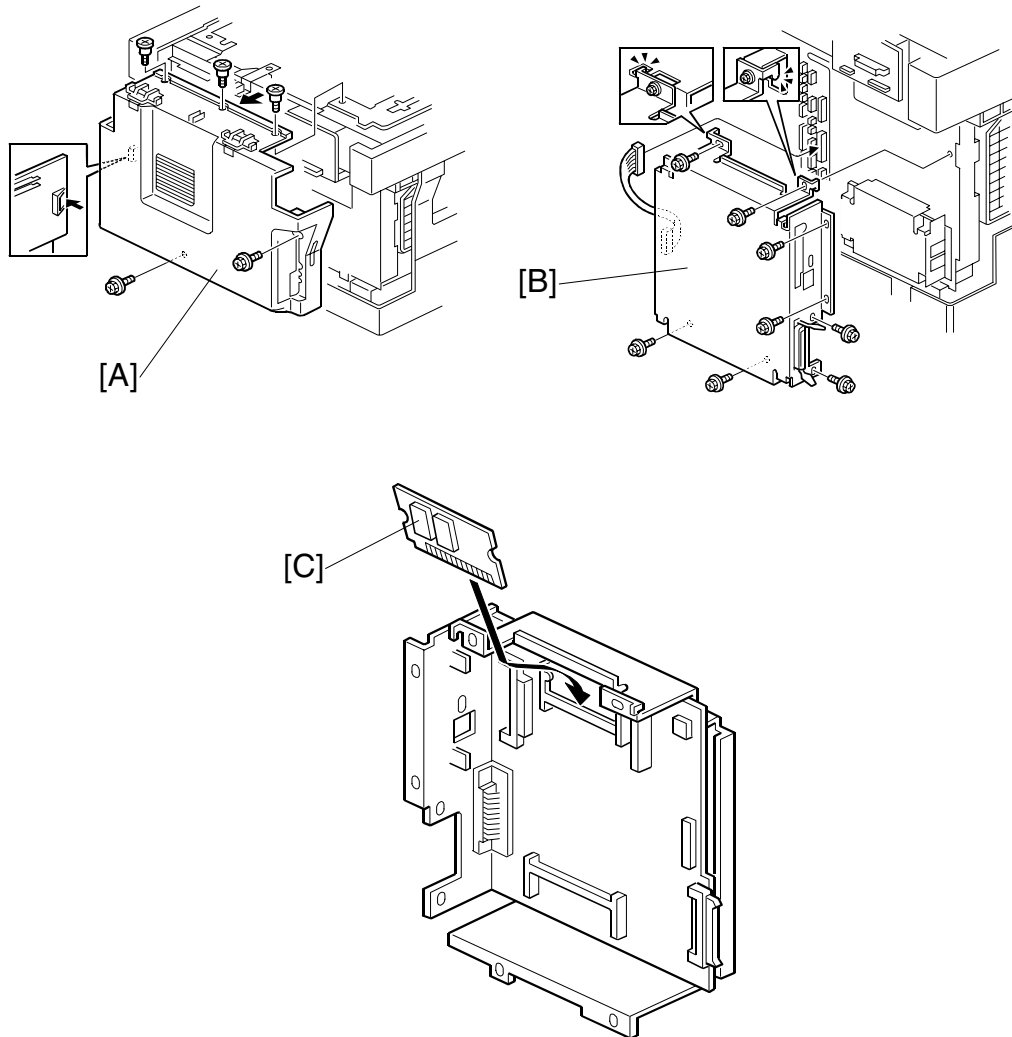
1. Remove the rear cover [A] (5 screws).

2. Remove the controller board [B] from the machine (1 harness and 8 screws or 6 screws if no fax option).

3. Connect the PS 2 emulation board [C] to CN505 on the controller board.

4. Replace the controller board assembly in the machine.

5. Replace the rear cover.

1.4 MEMORY BOARD (G578/G579/G580)

⚠**CAUTION**

Unplug the main machine power cord before starting the following procedure.

NOTE: To install the memory option, the printer option (B441) must be installed also. Please refer to section 1.2 for the printer controller installation procedure.

[A] [B] [C]
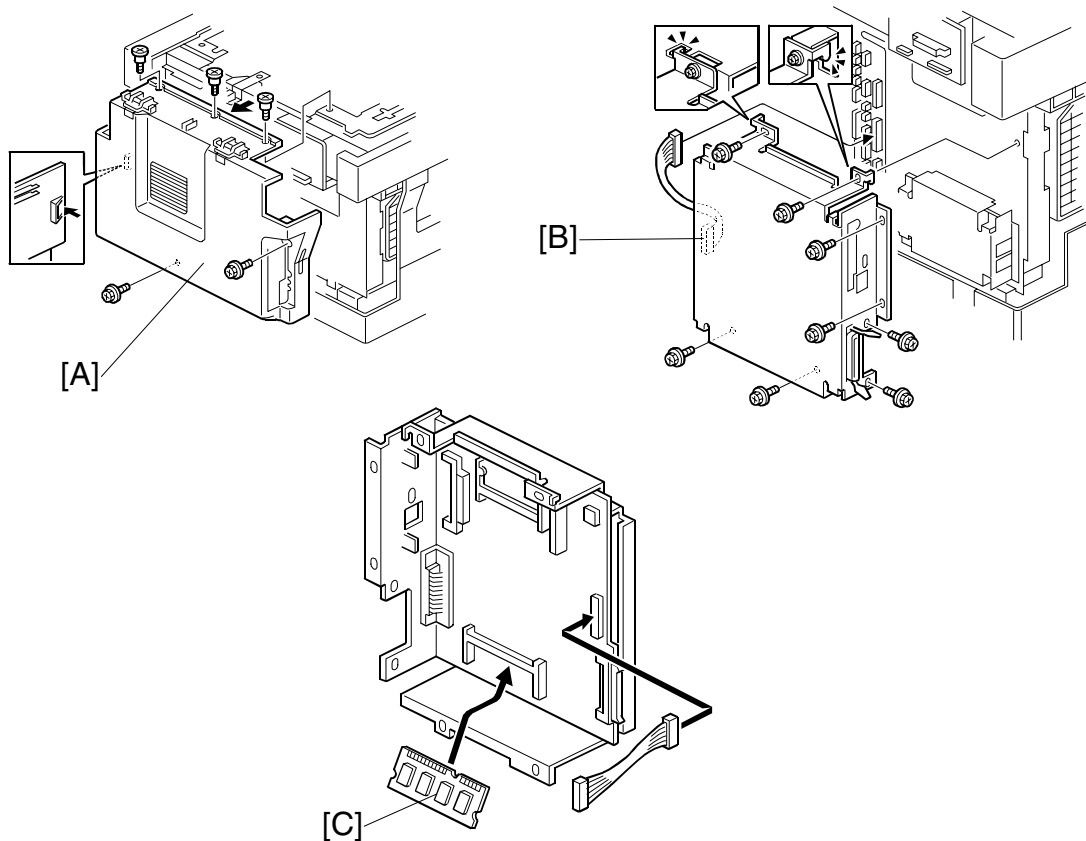
1. Remove the rear cover [A] (5 screws).

2. Remove the controller board [B] from the machine (1 harness and 8 screws or 6 screws if no fax option).

3. Connect the memory board [C] to CN502 on the controller board.

4. Replace the controller board assembly in the machine.

5. Replace the rear cover.

1.5 NIB (B430)

⚠️**CAUTION**

Unplug the main machine power cord before starting the following procedure.

NOTE: To install the NIB option, the printer option (B441) must be installed also. Please refer to section 1.2 for the printer controller installation procedure. The display takes a few minutes to initialize after installing the NIB.
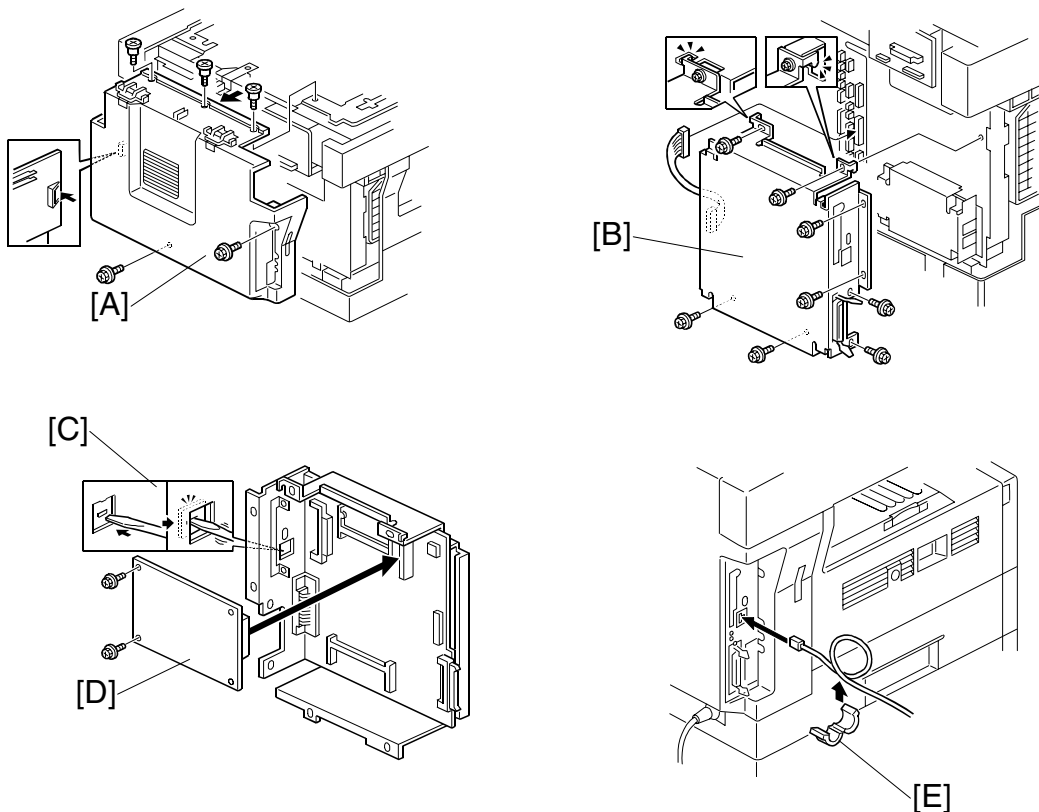
1. Remove the rear cover [A] (5screws)

2. Remove the controller board [B] from the machine (1 harness and 8 screws or 6 screws if no fax option).

3. Remove the small window [C] on the controller board bracket.

4. Connect the network interface board [D] to the controller board (2 screws) as shown.

5. Replace the controller board assembly in the machine.

6. Replace the rear cover.

7. Wrap the network cable around the core [E], close the core, then connect the cable to the machine.

TROUBLESHOOTING

2. TROUBLESHOOTING

2.1 ERROR CODES

The following table lists the controller error codes. If an error occurs, SC2001 and one of the following codes are displayed together at power-on, or after the power-on self-test.

Please refer to section 3.4 for details of the Power-On Self-Test.

Code	Description	Required Action
00xx	Exceptional operation error	• Replace the controller if the error is frequent.
0101	Code ROM error	• Replace the controller if the error is frequent.
0201	Resident RAM error	• Replace the controller if the error is frequent.
0301	Optional RAM error	• Replace the optional DIMM if the error is frequent.
06xx	CPU error	• Replace the controller if the error is frequent.
0Fxx	Engine interface and video data error	• Check the connection between the engine board and the controller
11xx	Centronics parallel interface error	• Replace the controller if the error is frequent.
1401	NVRAM error	• Replace the NVRAM if the error is frequent.
1601	Font ROM error	• Replace the controller if the error is frequent.
1Bxx	NIB interface error	• Replace the controller if the error is frequent.
1Cxx	Parallel interface error	• Replace the controller if the error is frequent.
25xx	PS2 error	• Replace the PS DIMM if the error is frequent.

2.2 LED DISPLAY

2.2.1 LOCATION

The controller uses two LEDs to display error status even while the LED message is not active.

To see these LEDs, remove the machine's rear cover.

```
┌─────────────────────────────────────────────────────┐
│  ┌──────┐      ┌──────────────┐                       │
│  │  NV  │      └──────────────┘          DIP SW2 ┌──┐ │
│  │ RAM  │      Engine I/F(CN507)                 └──┘ │
│  └──────┘                            ┌──────────┐     │
│                                      │Code/Font │     │
│   ┌──────────────┐                   │   ROM    │     │
│   └──────────────┘                   └──────────┘     │
│   Option NIB I/F                                      │
│     slot(CN506)                                       │
│                                              ┌────┐   │
│   ┌────┐       ┌──────────┐   Memory        │RAM │   │
│   │    │       │          │    DIMM          └────┘   │
│   │    │       │   MPU    │  slot(CN502)     ┌────┐   │
│ Program        │          │                  │RAM │   │
│  DIMM          └──────────┘                  └────┘   │
│ slot(CN505)                                           │
│   └────┘                                              │
│  ┌────────────────────┐  ● ●  ┌──────────────────┐    │
│  │ IC-Card I/F slot(CN511)│ LED2,1 │ IEEE 1284 I/F (CN501)│ │
│  └────────────────────┘       └──────────────────┘    │
└─────────────────────────────────────────────────────┘
```
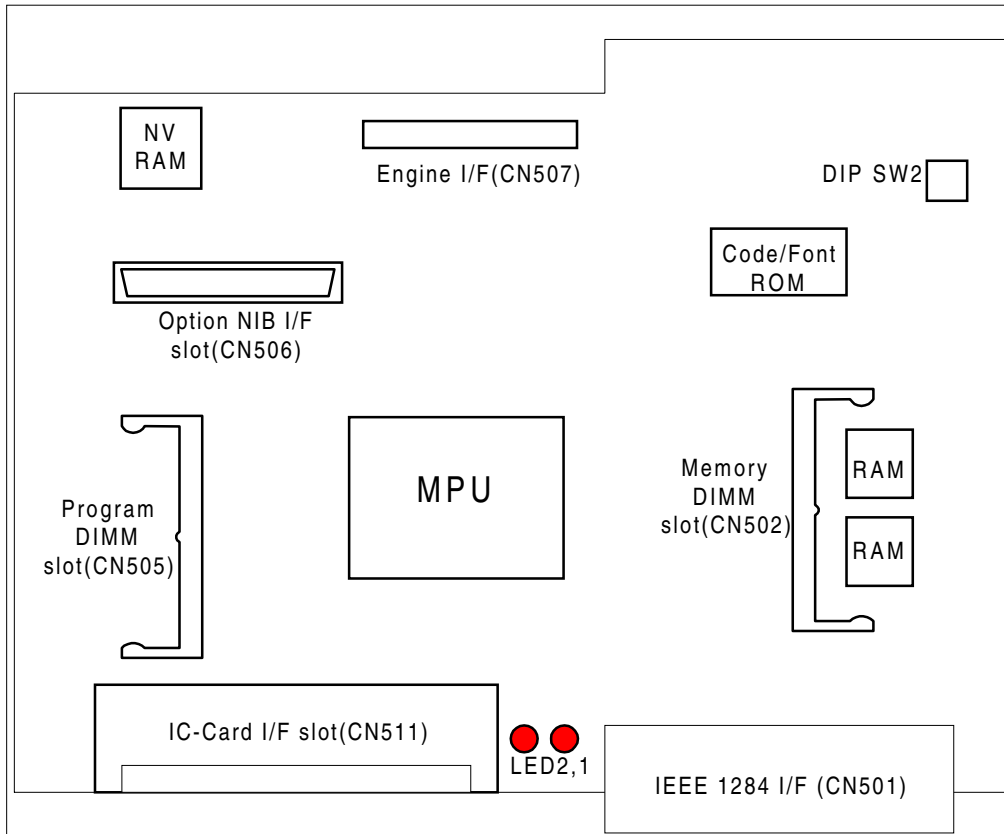
When the machine is operating normally, LED 1 blinks (on/off) and LED 2 remains always off. LED 2 only comes on if there is an error; see the next section of the manual.

2.2.2 FATAL ERROR

If the controller detected a fatal error during the Power-On Self-Test, it uses 2 LEDs to notify the cause of the error.

If one of the following fatal errors happens, the LED status changes as shown (read from the left of the diagram to the right).

Code ROM Error
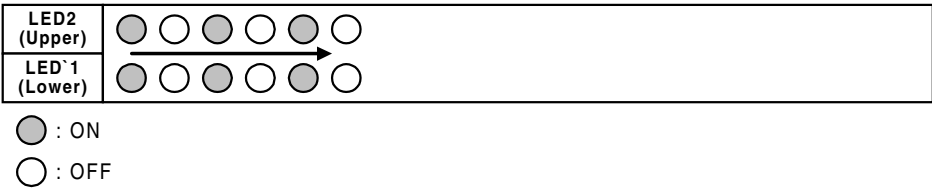
LED2 (Upper)	● ○ ● ○ ● ○
LED`1 (Lower)	● ○ ● ○ ● ○

○ : ON
○ : OFF

Turn off the machine and turn it back on. If the controller detects the same error, replace the controller.

Resident RAM Error
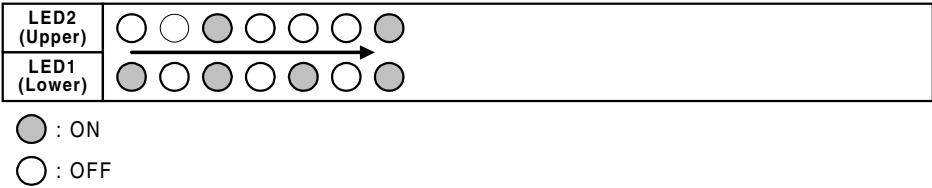
LED2 (Upper)	○ ○ ● ○ ○ ●
LED1 (Lower)	● ○ ● ○ ● ●

○ : ON
○ : OFF

Turn off the machine and turn it back on. If the controller detects the same error, replace the controller.

CPU Error
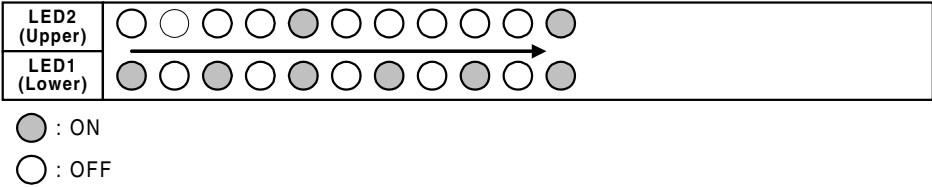
LED2 (Upper)	○ ○ ○ ○ ● ○ ○ ○ ○ ●
LED1 (Lower)	● ○ ● ○ ● ○ ● ○ ●

○ : ON
○ : OFF

Turn off the machine and turn it back on. If the controller detects the same error, replace the controller.

LED DISPLAY

Abnormal Termination

| LED2 (Upper) | ○ ○ ○ ○ ○ ○ ○ ○ ◉ ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ |
| LED1 (Lower) | ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ ○ ◉ |

◉ : ON

○ : OFF
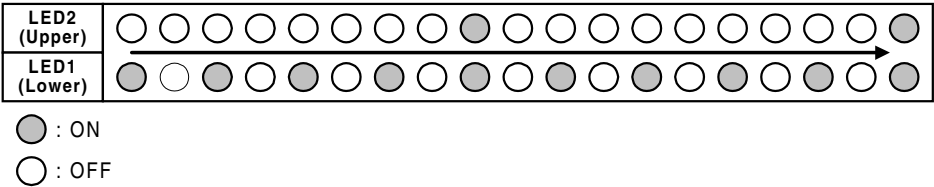
Turn off the machine, check the connection to the optional components, and turn on the machine. If the controller detects the same error, replace the controller or NIB.

SERVICE TABLES

3. SERVICE TABLES

3.1 SERVICE PROGRAM MODE OVERVIEW

> ⚠️**CAUTION**
>
> **Before accessing the service menu, do the following:**
>
> **Confirm that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).**
> **If there is some data in the buffer, wait until all data has been printed.**

3.1.1 HOW TO ENTER THE SP MODE

Entering the Service Mode

🔷⃞ → ① → ⓪ → ⑦ → © (Hold for more than 3 seconds until the SP mode menu is displayed.)

Select "3" to enter the printer SP mode.

Exiting the Service Mode

Select "2" to exit from the printer SP mode.

NOTE: To make the settings effective, turn the main switch off and on after exiting service mode.

3.1.2 SERVICE MENU TABLE

	Description	Function
A	BitSw#1 Set	Adjusts bit switch settings. **Note:** Currently the bit switches are not being used.
B	NVRAM Clear 1	Initializes the controller NV RAM except bit switches, NIB settings, and log data.
C	NVRAM Clear 2	Initializes the controller NV RAM except NIB settings.
D	NVRAM Clear 3	Initializes the NIB NV RAM (NIB settings).
E	Counter Clear	Initializes all counters to zero.
F	Diagnostic Error	Displays the most recent diagnostic error codes on the LCD.
G	Service Print	Prints the service summary sheet.

3.2 SERVICE MENU

3.2.1 BIT SWITCH SETTINGS

The bit switches are not used at the moment.

3.2.2 NV RAM CLEAR

> ⚠**CAUTION**
> **Print the service summary report, controller configuration page, and NIB configuration page before resetting the NV RAM(s).**

1. Enter the printer SP mode, and select "1. Service Menu".

2. Select the appropriate menu, and then press "OK".
   B: NV RAM Clear 1
   C: NV RAM Clear 2
   D: NV RAM Clear 3

3. Ensure that you have printed the appropriate configuration sheet, then press "OK".
   B: Service Summary Sheet
   C: Service Summary sheet and Controller Configuration Sheet
   D: NIB Configuration Sheet

4. Press "OK" to execute. Or press "Cancel" to exit.

3.2.3 COUNTER CLEAR

1. Enter the printer SP mode, and select "1. Service Menu".

2. Select "E. Counter Clear", then press "OK".

3. Press "OK" to execute. Or press "Cancel" to exit.

3.2.4 DIAGNOSTIC ERROR

This displays the latest 8 error codes that were found during the power-on self-test. Refer to section 2.1 for details of the error codes.

1. Enter the printer SP mode, and select "1. Service Menu".

2. Select "F. Diagnostic Error ", then press "OK".

3. Look through the error codes by using the right and left cursor keys.

4. Press "Cancel" to exit.

3.2.5 SERVICE PRINT

This prints the summary sheet, which contains the following items:

• Model Number/System Version/Unit Number
• Program List
• Bit Switch (These are not set at the moment.)
• Counters
• Exception Information
• System Logging 1/2
• Options

1. Enter the printer SP mode, and select "1. Service Menu".

2. Select "G. Service Print", then press "OK".

3. Press "Cancel" to exit.

3.3 FIRMWARE UPDATE PROCEDURE

3.3.1 CONTROLLER/PS2 FIRMWARE UPDATE

This procedure is for upgrading the firmware for the controller and PS2 DIMM module.

⚠CAUTION
Do not turn off the machine while downloading the firmware.
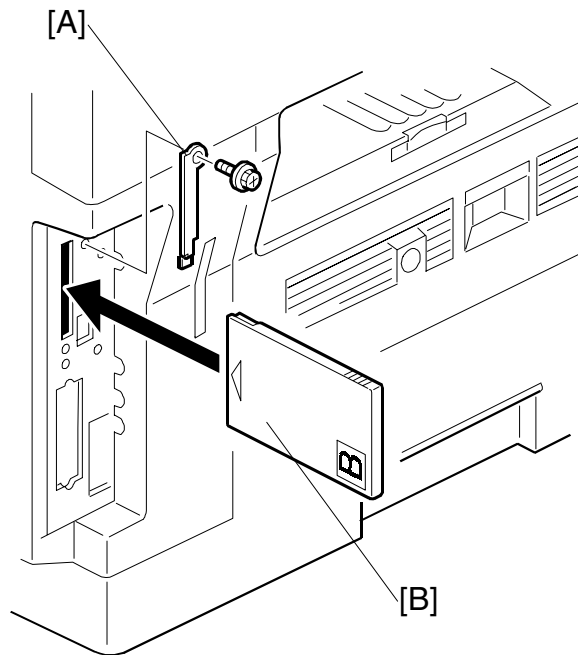
1. Prepare an IC card that contains the required firmware.

2. Turn off the machine and remove the cover [A] (1 screw).

3. Insert the card [B] into the IC card slot.
    NOTE: The "B" side of the card must face towards the rear of the machine.

4. Turn on the machine. Press the "Printer" key.

5. Start downloading the new firmware by pressing the "OK" key.

6. After the firmware download has finished, turn off the machine, and remove the card. Then, replace the cover.

7. Turn on the machine, and print the printer configuration sheet to confirm that the new firmware version has been installed.

Error Messages

Message	Description
Erasing failed ARD: xxxxxxxxx	Retry the download.
Writing Failed ARDS: xxxxxxxxx	
Melting Failed	The firmware file on the card may be damaged. Get a new firmware file and store it on the card. **NOTE:** 'Melting' means 'extraction of compressed data.'
DIMM installable program cannot find	Wrong type of firmware on the card.
CRC error. Please Retry install	The firmware file on the card may be damaged. Get a new firmware file and store it on the card.

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3.3.2 ERROR RECOVERY

CONTROLLER
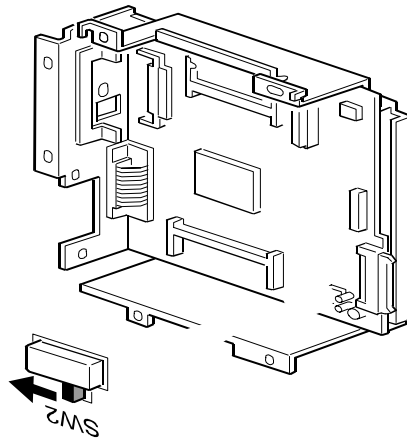
If the controller does not start up after a failed firmware download, use the following procedure. This procedure will force the controller to boot from the IC card.

1. Prepare an IC card with the required controller firmware version on it.

2. Turn off the machine and remove the controller.

3. Slide DIP SW 2 to the right (as viewed from the rear of the machine), as shown above.

4. Put back the controller and install the card in the IC card slot on the controller.
   NOTE: When you see the machine from the back, the "B" side of the card must face the rear of the machine.

5. Turn on the machine.

6. Wait until the LEDs between the IC card slot and the parallel interface are both lit.

7. Turn off the machine, remove the card, and reset DIP SW2. Then, put back the controller.

8. Turn on the machine, and print the configuration sheet.

PS2 DIMM

If a download attempt failed, try downloading the new firmware again.

3.4 POWER-ON SELF TEST

The controller tests the following devices at power-on. If an error is detected, an error code is stored in the NV RAM. Refer to section 3.2.4 for how to check the error codes, and section 2.1 for the details about error codes.

- CPU
- Flash ROM
- Font ROM
- Code ROM
- Resident and optional SDRAM
- Parallel interface
- NIB (If this board is installed)
- Centronics Interface (if a loop-back connector is present)
- NVRAM

3.5 SELF DIAGNOSTIC TEST

In addition to the power-on self-test, you can set the machine in a more detailed diagnostic mode to test other components and conditions.
It requires a loop-back connector (P/N: G0219350).

1. Turn off the machine and attach the loop-back connector to the parallel interface.

2. Turn on the machine while pressing the "On Line" key and "OK" key together.

3. The machine prints the diagnostic report automatically.
   - Refer to section 3.2.4 for how to check the error codes.
   - Refer to section 2.1 for the details about the error codes.

3.6 USER PROGRAM MODE

Press the "User Tools/Counter ◇/▥ ", then select "Printer Features" to change printer settings.

User Mode Table

Category	Function menu		
Job Control	Paper Input	Tray Priority / Default: Tray1	
		Tray Locking / Default:None	
		Bypass Paper Size	Standard Size
			Custom Size
	Print Quality	Edge Smoothing / Default: On	
		Resolution	PCL / Default: 600dpi
			PS / Default: 600dpi
		Toner Saving / Default:Off	
	System	I/O Time Out/ Default: 30sec.	
		I/O Buffer/ Default: 32KB	
		Prints PS Errors/ Default: Off	
		Page Protect/ Default: Auto	
		Auto Continue/ Default: Off	
		Sub Paper Size/ Default: Off	
	PCL menu	Orientation/ Default: Portrait	
		Form Lines/ Default: 64(Metric) 60(inch)	
		Font Source/ Default: Internal	
		Font Number/ Default: 0	
		Point Size/ Default: 12.00	
		Font Pitch/ Default: 10.00	
		Symbol Set/ Default: Roman-8	
Network Setup	IP Address/ Default: All zero		
	Subnet Mask/ Default: 255.000.000.000		
	Gateway Address/ Default: All zero		
Maintenance	Restart Printer		
	Menu Reset		
	Hex Dump/ Default: Off		
List Print	Configuration Page		
	Menu List		
	PCL Pont List		
	PS Font List		

DETAILED DESCRIPTIONS

4. DETAILED SECTION DESCRIPTIONS

4.1 BLOCK DIAGRAM
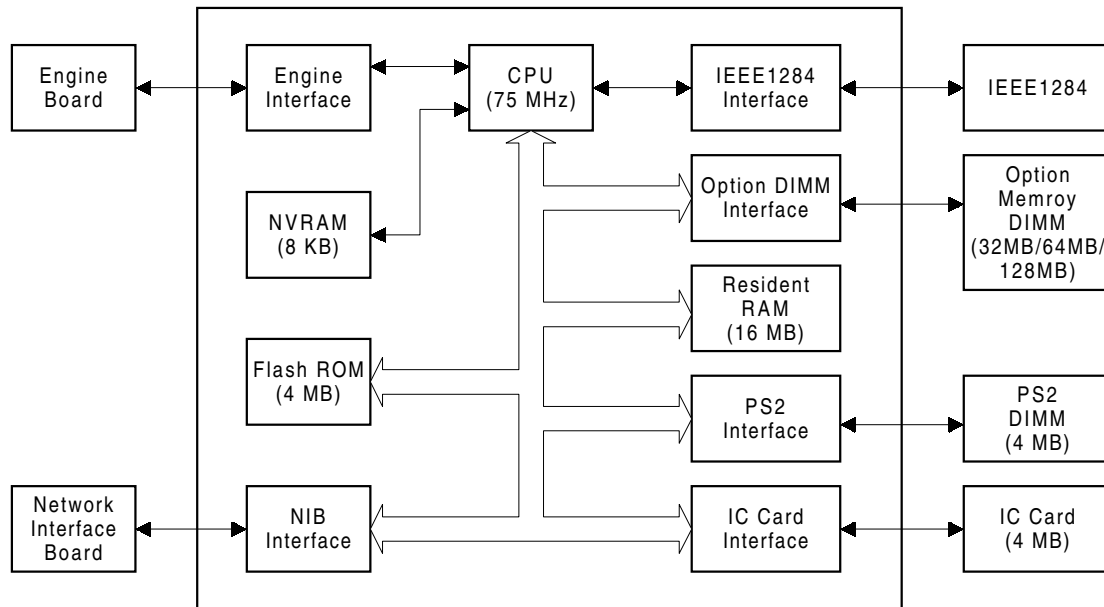
The CPU (Destiny D8401A, 75MHz) controls the resident RAM, engine interface, ROM interface, IEEE1284 parallel interface, NIB interface, and an IC card interface for upgrading firmware.

There is one optional memory socket that can have either a 32MB, 64MB, or a 128MB memory DIMM to increase RAM capacity and enable RAM collation. With the 128MB memory DIMM, the RAM capacity is increased to 144MB. There is another memory socket for the optional PS2 DIMM.

The NIB interface allows the user to install an Ethernet NIB. The IC card interface allows the interface for the controller and NIB to be updated.

4.2 CONTROLLER FUNCTIONS

4.2.1 PAPER SOURCE SELECTION

Tray Priority (Auto Tray Select)

Start of Tray Search ⟶ Tray 1 ⟶ Tray 2 ⟲
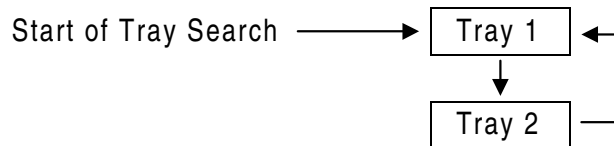
The controller searches for the specified paper size, starting from Tray 1, and uses the first tray that has the specified paper size. If the selected tray is pulled out or runs out of paper during printing, the controller searches for another tray with the specific paper size and if found, automatically switches to it. If the controller cannot find another paper tray with the specified paper size, printing stops and the LCD displays the message "Load Paper".

The Tray Priority setting can be specified with a user tool.
(User Tools/Printer features/Job Control/Paper Input/Tray Priority)

NOTE: The by-pass tray is not part of the tray search.

Manual Tray Select

Tray 1 ⟶ Tray 2 ⟲
Start of Tray Search ⟶ (Tray selected by the driver)
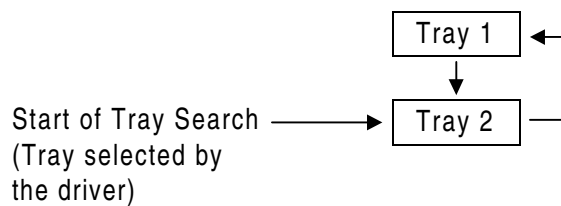
When the printer driver specifies a tray, the selected tray becomes the first tray checked at the start of the tray search. If the selected tray does not have the size of paper specified by the driver, the controller searches the other trays for the same paper size.

NOTE: Tray Priority in the Job Control menu does not specify the start of the tray search, but specifies the paper size in the selected tray as the default paper size.

Tray Lock

If Tray Lock is enabled for a tray, the controller does not use the "locked" tray in the tray search process. If a tray has, for example, colored A4 size paper for fax prints, enable tray lock for that tray so that the controller does not select the tray for printing.

If the user selects a "locked" tray with the printer driver, the controller uses the tray for printing only when the specified paper size matches the actual paper size in the tray.

The Tray Lock setting can be specified with a user tool.
(User Tools/Printer features/Job Control/Paper Input/Tray Locking)

NOTE: The by-pass tray cannot be locked.

By-pass Tray

To print from the by-pass tray, select the by-pass tray with the driver. The paper sizes that can only be fed from the by-pass tray (such as custom sizes), can be fed from the by-pass tray using "Auto Tray Select". But other paper sizes (LT, A4, etc), which can also be fed from the other paper trays, cannot be fed from the by-pass tray using "Auto Tray Select".

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4.2.2 COLLATION (SORTING)

This feature is available when the driver specifies it. Is not executed by the driver but by memory board on the controller.

4.2.3 AUTO CONTINUE

When this function is enabled, the machine continues printing automatically (after 10 seconds) even if one of the following errors occurs. However, the page where the error occurred may not be printed out correctly.

• Print Overrun
• Memory Overflow
• Memory Full

If Auto Continue is disabled and the one of the above errors occurs, the machine will stop printing and will display an error message on the operation panel.

NOTE: The default setting for Auto Continue is "Disabled."

4.2.4 PAGE PROTECT

When a Print Overrun error occurs and this function is set to "Auto", this error can be avoided by changing the setting to "On". However, printing may slow down.

NOTE: The default setting for Page Protect is "Auto".

SPECIFICATIONS

SPECIFICATIONS

1. SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

Printing Speed: B045:   Maximum 12 ppm (A4/LT SEF)
                    B044/B046: Maximum 13 ppm (A4/LT SEF)
                    H555:   Maximum 13 ppm (A4/LT SEF)

Printer Languages: PCL6/PCL5e
                    PostScript Level 2 Emulation (option)

Resolution: 600 dpi (PCL6/PCL5e/PS2)
                    300 dpi (PCL5e/PS2)

Resident Fonts: PCL:
                        35 Intellifonts
                        10 True Type fonts
                        1 PCL Bitmap
                    PS2 (Optional):
                        80 PS fonts

Host Interfaces: Bi-directional IEEE1284 parallel x 1 (standard)
                    Ethernet (100 Base-TX/10 Base-T) (option)

Network Protocols: TCP/IP, IPX/SPX, Apple Talk

Memory: Standard 16 MB
                    Options
                        48 MB (Standard 16 MB + 32 MB optional DIMM)
                        80 MB (Standard 16 MB + 64 MB optional DIMM)
                        144 MB (Standard 16 MB + 128 MB optional DIMM)

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1.2 SUPPORTED PAPER SIZES

Paper	Size (W x L)	Paper Trays Main Unit/Option		By-pass Tray
		US	Eur/Asia	
A4 SEF	210 x 297 mm	$Y^\#$/Y	Y/Y	Y
A5 SEF	148 x 210 mm	N/N	N/N	$Y^\#$
A5 LEF	210 x 148 mm	$Y^\#$/N	$Y^\#$/N	$Y^\#$
Legal SEF	8.5 x 14"	N/$Y^\#$	N/$Y^\#$	$Y^\#$
Letter SEF	8.5 x 11"	Y/N	$Y^\#$/N	$Y^\#$
Half Letter SEF	5.5 x 8.5"	N/$Y^\#$	N/$Y^\#$	$Y^\#$
Half Letter LEF	8.5 x 5.5"	Y/N	$Y^\#$/N	$Y^\#$
F	8 x 13"	N/N	N/N	$Y^\#$
Foolscap	8.5 x 13"	N/$Y^\#$	N/$Y^\#$	$Y^\#$
Folio	8.25 x 13"	N/$Y^\#$	N/$Y^\#$	$Y^\#$
Custom	Width: 90 - 216 mm Length: 140 - 356 mm	N	N	Y^C

Remarks:

Y	Supported. The paper size sensor detects the paper size.
$Y^\#$	Supported. The user has to select the correct paper size for the tray.
Y^C	Supported. The user has to enter the width and length of the paper.
N	Not supported.

2. SOFTWARE ACCESSORIES

The printer drivers and utility software are provided on one CD-ROM. An auto-run installer allows you to select which components to install.

PRINTER DRIVERS

Printer Language	Windows 3.1x	Windows 95/98/Me	Windows 2000/NT4.0	Macintosh 8.x/9.x
PCL 6	Yes	Yes	Yes	No
PCL 5e	Yes	Yes	Yes	No
PS2	No	Yes	Yes	Yes
PS PPD	No	Yes	Yes	Yes

NOTE: 1) The printer drivers for Windows NT 4.0 are only for the Intel x86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
2) The PCL drivers for Windows 3.1x are not included on the CD. Web release only.
3) There are mini-drivers on the web site also.
4) Macintosh OS 10 is not supported.

UTILITY SOFTWARE

Software	Description
Agfa Font Manager (Win 95/98/Me, NT4, 2000)	A font management utility with screen fonts for the printer.
SmartNetMonitor for Admin (Win 95/98/Me, NT4, 2000)	A printer management utility for network administrators. NIB setup utilities are also available.
SmartNetMonitor for Client (Win 95/98/Me, NT4, 2000)	A printer management utility for client users. Peer-to-peer printing utility and parallel/recovery printing functions are included.
Printer Utility for Mac	This software provides several convenient functions for printing from Macintosh clients.
Install Shell for Unix	This software allows the machine to be used with Unix. The supported OS are Solaris, HP-UX, and RedHat Linux. Sun OS and Unix Ware are not supported.

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3. MACHINE CONFIGURATION

3.1 SYSTEM COMPONENTS
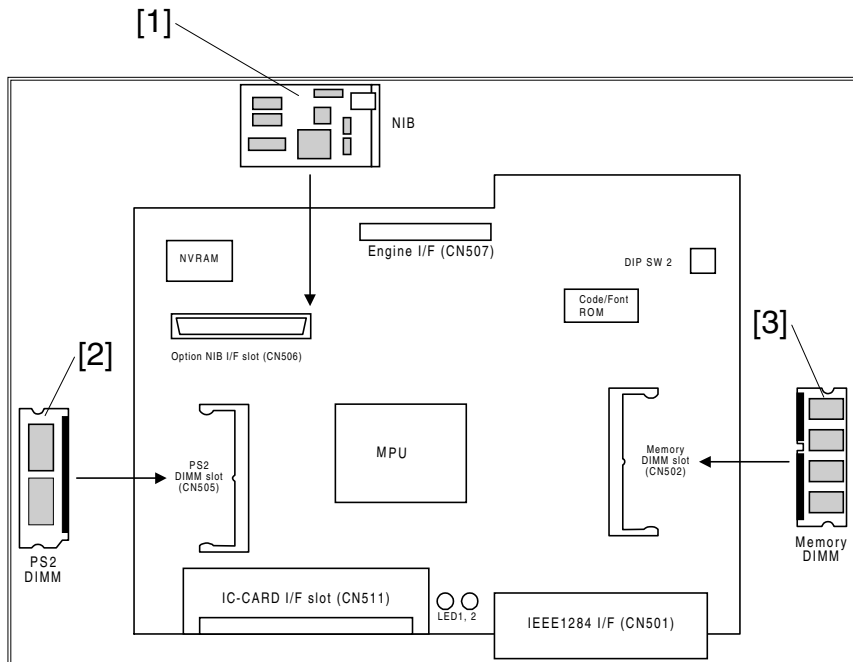
Item	Machine Code	No.	Remarks
NIB	B430	1	
PostScript Level 2 Emulation	B431	2	
Memory 32 MB	G578	3	Used in common with the models G056, A283, G060, etc.
Memory 64 MB	G579	3	Same as above
Memory 128 MB	G580	3	Same as above