Model A-C3
(Machine Code: B079/B082)

SERVICE MANUAL

⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier and easily accessible.
3. Note that some components of the copier and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
6. 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

1. Never operate the copier without the ozone filters installed.
2. Always replace the ozone filters with the specified ones at the specified intervals.
3. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.
2. The NVRAM on the system control board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.

1. **SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL**
   Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

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.

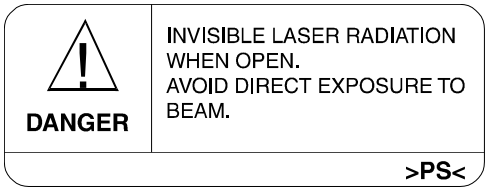
⚠WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠WARNING

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

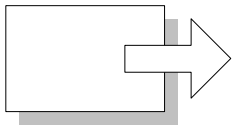
CAUTION MARKING:



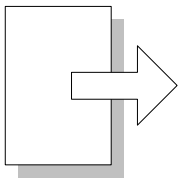
Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
☛	Refer to section number
CT	See Core Tech Manual for details
	Screw
	Connector
	E-ring
	Clip ring



Short Edge Feed (SEF)



Long Edge Feed (LEF)

TABLE OF CONTENTS

BOOKLET FINISHER (B546)

PRINTER OPTION (B548)

1. INSTALLATION PROCEDURE

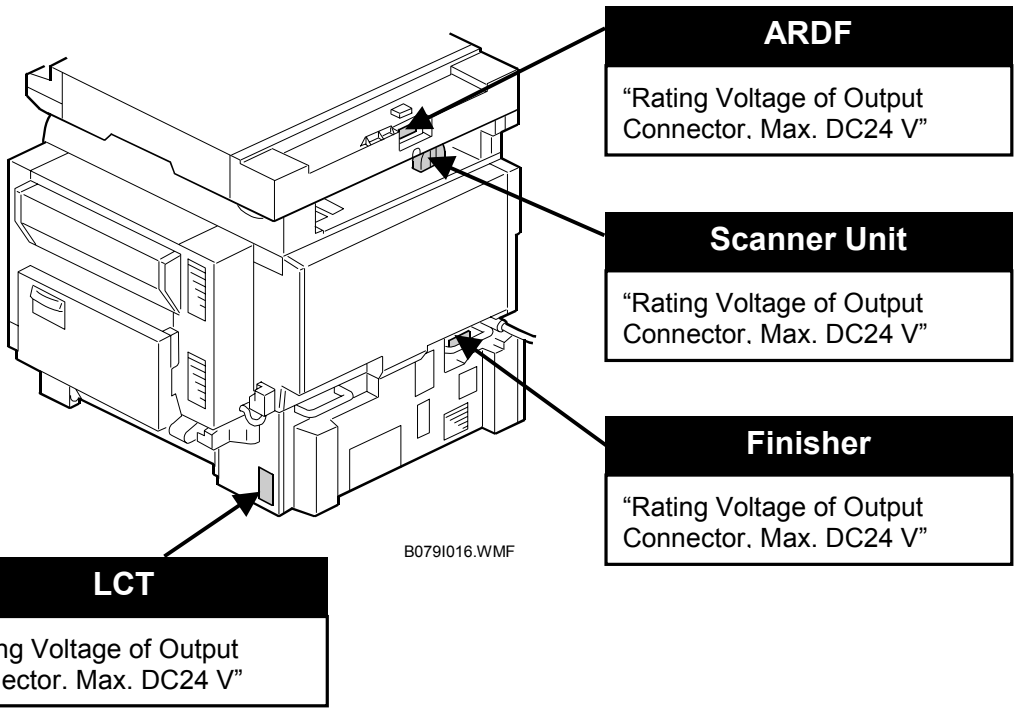
⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

1.1 INSTALLATION REQUIREMENTS

⚠CAUTION



1.1.1 ENVIRONMENT

1. Temperature Range: 10 °C to 32 °C (50 °F to 90 °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 30 m^3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10/6 oz/yd^3)
6. Avoid areas exposed to sudden temperature changes:
   1) Areas directly exposed to cool air from an air conditioner.
   2) Areas directly exposed to heat from a heater.
7. Do not place the machine where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the main machine on a strong and level base. Inclination on any side should be no more than 5 mm (0.2").
10. Do not place the machine where it may be subjected to strong vibrations.

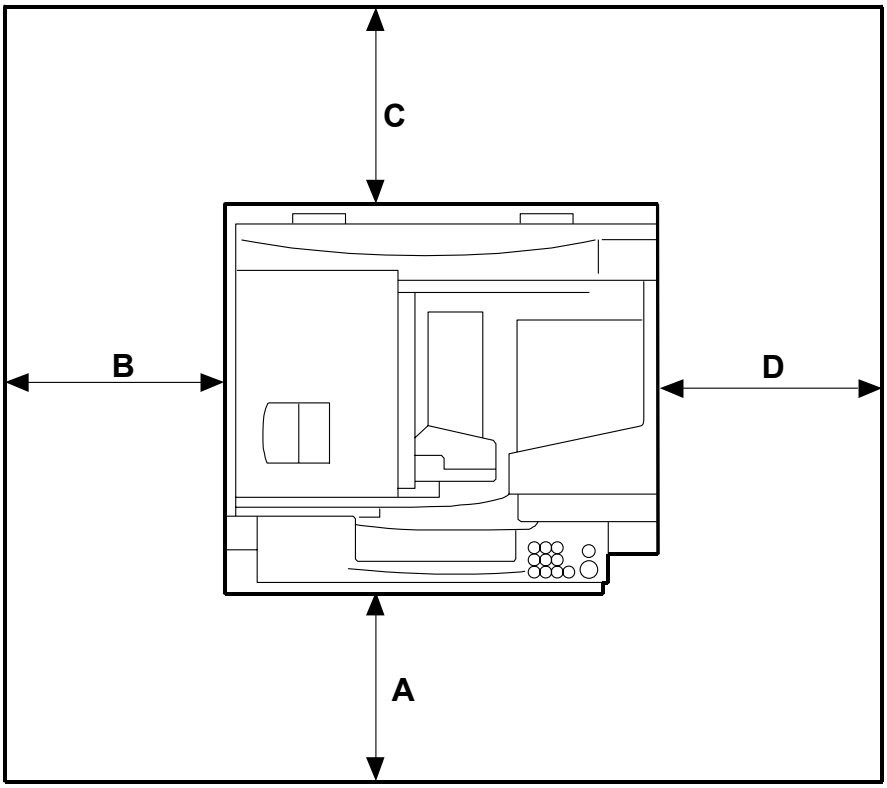
1.1.2 MACHINE LEVEL

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

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

1.1.3 MINIMUM SPACE REQUIREMENTS

Place the main machine near the power source, providing clearance as shown:



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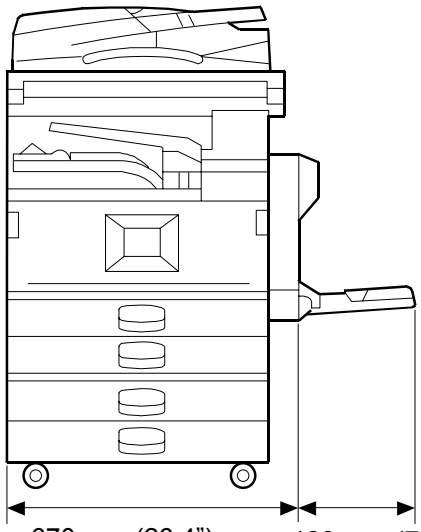
A: Front: >75 cm (29.6")
B: Left: > 10 cm (4")
C: Rear: > 10 cm (4")
D: Right > 10 cm (4")

NOTE: The 75 cm (29.5") recommended for the space at the front is for pulling out the paper tray only. If the operator stands at the front of the main machine, more space is required.



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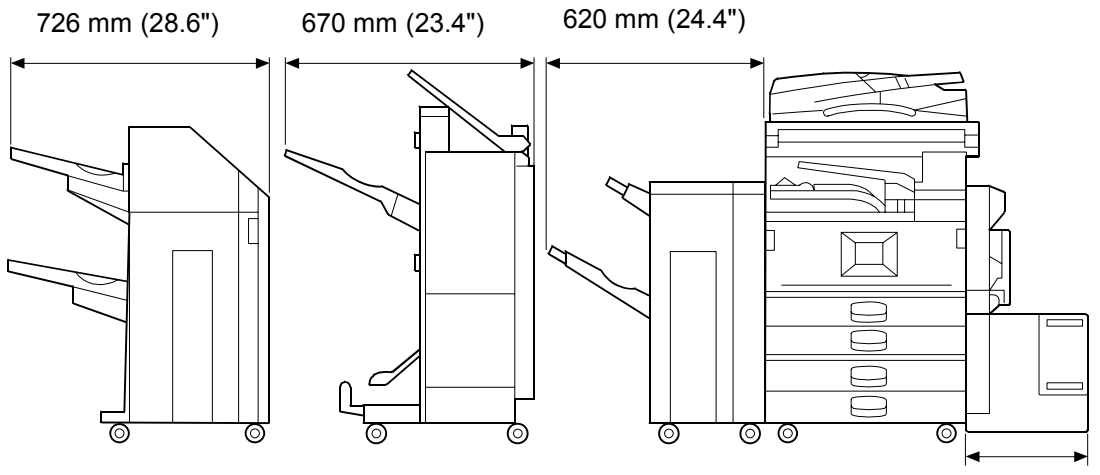

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1.1.4 POWER REQUIREMENTS

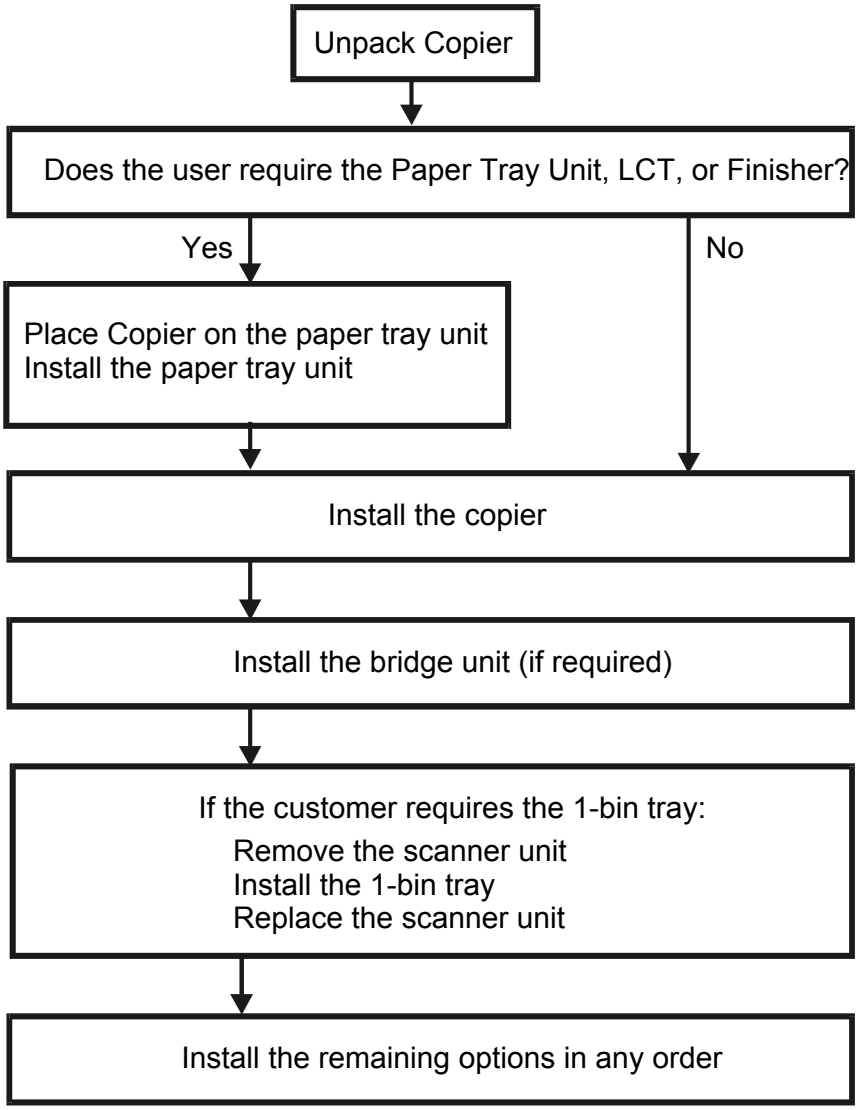
⚠CAUTION

1. Make sure that the wall outlet is near the main machine and easily accessible. Make sure the plug is firmly inserted in the outlet.
2. Avoid multi-wiring.
3. Be sure to ground the machine.

1. Input voltage level:
   North America 120 V, 60 Hz: More than 12.5 A
   Europe/Asia 220 V ~ 240V, 50 Hz/60 Hz: more than 6.8 A
2. Permissible voltage fluctuation: ±10 %
3. Never set anything on the power cord.

1.2 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.



Bridge Unit: Needed for the finishers and external output tray.

Paper Tray Unit: Needed for LCT and finishers.

Other requirements: See Overall Machine Information – Installation Option Table.

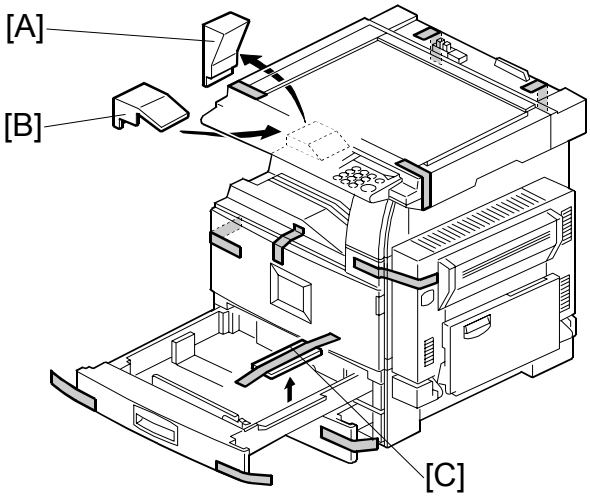
1.3 MAIN MACHINE INSTALLATION

1.3.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Operation Instructions – System Setting	1
2. Operation Instructions – Copy Reference	1
3. Exposure Glass Cleaner Holder	1
4. Exposure Glass Cleaner	1
5. Paper Size Decal	1
6. Middle Front Cover	1
7. NECR – English (-17, -57 Machines)	1
8. NECR – Multi-Language (-19, -21, -27, -28, -29, -67 Machines)	1
9. HDD Caution Decals (-17, -19, -21, -28, -29, -57 Machines)	1
10. Model Name Decal (-17, -29, -57 Machines)	1
11. Mode Name Decals – NRG (-22, -62 Machines)	1
12. Stamp (-17 Machine)	1
13. EU Safety Information (-22, -24, -26, -27, -62, -66, -67 Machines)	1
14. Blank Decals – NRG (-22, -62 Machines)	1
15. Operation Panel Indicator Decals (-22, -24, -26, -27, -62, -64, -66, -67 Machines)	1
16. Address Information Sheet – China (-21 Machine)	1
17. Paper Caution Sheet – China (-21 Machine)	1
18. Energy Start Sticker (-26, -66 Machines)	1

1.3.2 INSTALLATION PROCEDURE



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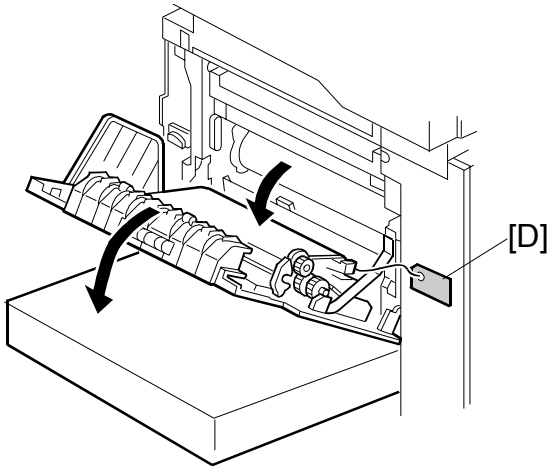

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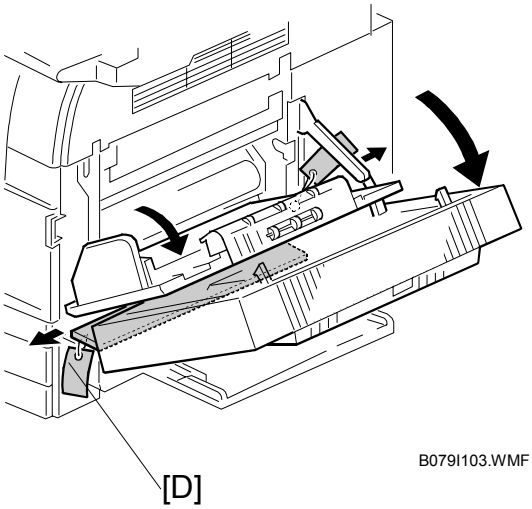

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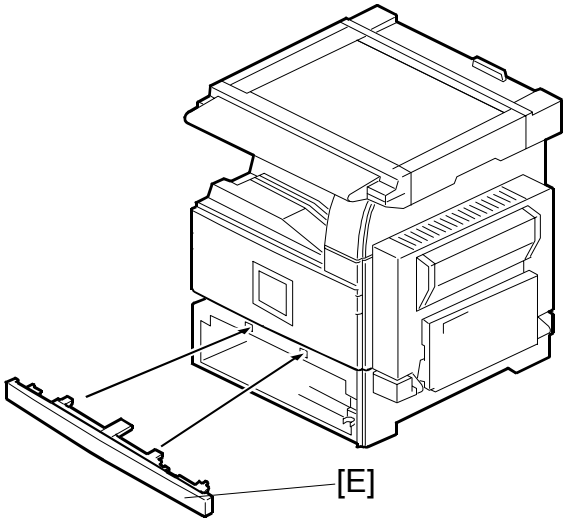

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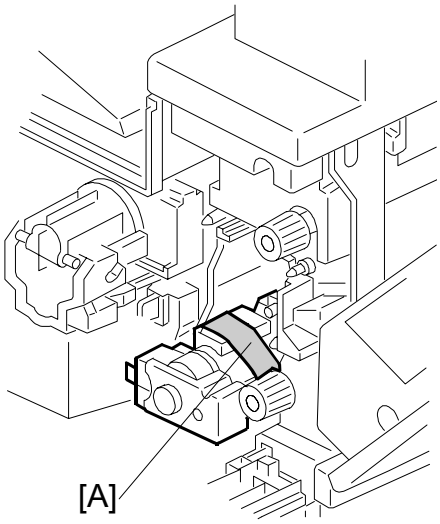
1. Remove the main machine from the box, and remove all shipping retainers and tapes.
   NOTE: Store all shipping retainers as you remove them. You will need them if the machine is moved to another location in the future.
2. Remove scanner cushion [A], and install the end fence [B].
3. Pull out the paper trays and remove all tape and bottom plate stoppers [C].
4. On the right side of the machine, open the by-pass tray, duplex unit, and transfer right cover, and then remove all the shipping retainers [D]
   NOTE: If the paper tray unit is to be installed, do this now. (☛1.4)
5. If the paper tray unit is not to be installed, install the middle front cover [E] (provided in the second paper tray).

Development Unit and PCU



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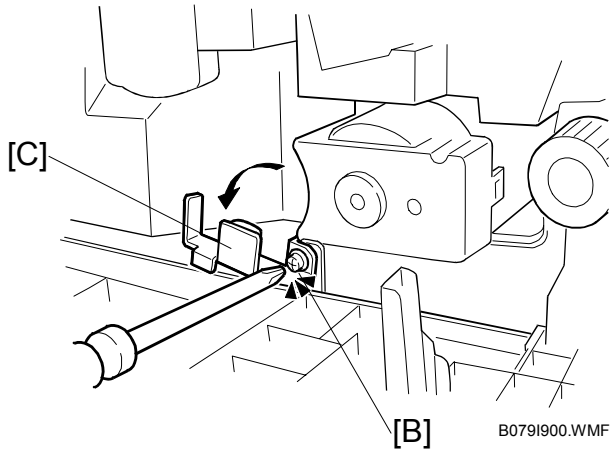

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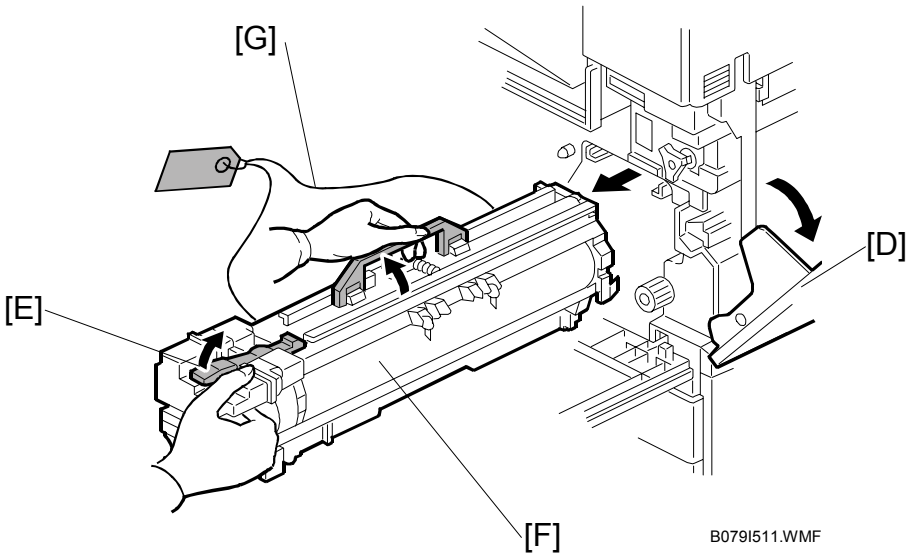

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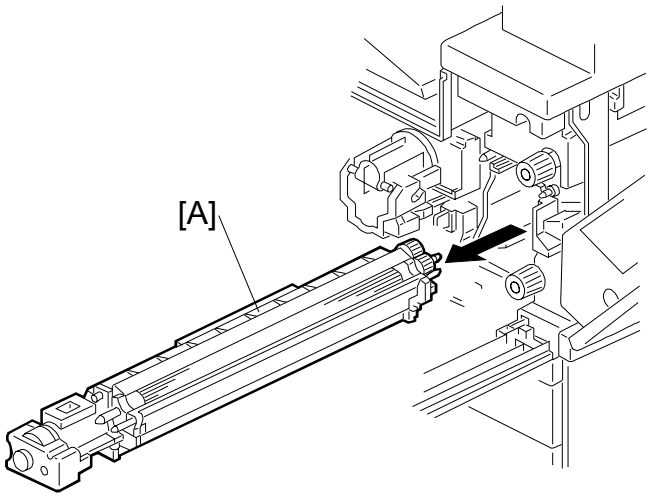
1. Open the front cover and remove the tape and retainers [A].
2. Loosen [B] (🔩 x 1) and rotate the bracket [C].
3. Open the right cover [D].
4. Raise the lever [E]
5. Holding the PCU [F] as shown slide it out and place it on a clean flat surface.
6. Remove clamps and wire [G].



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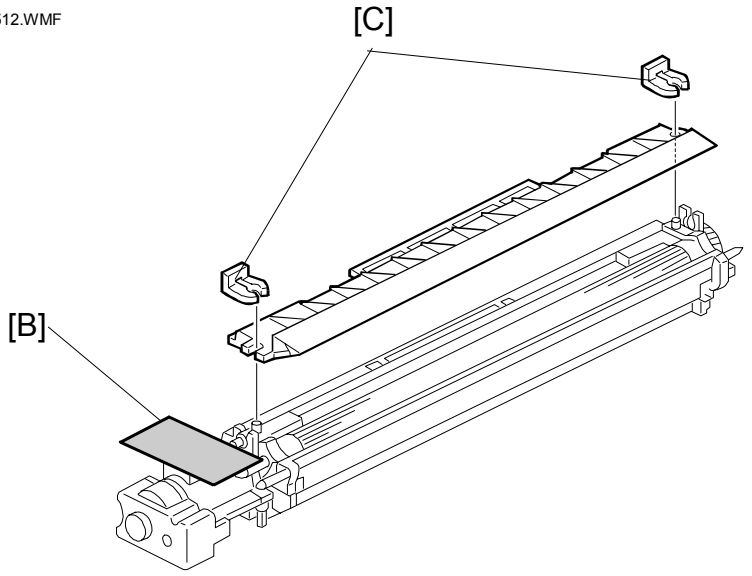

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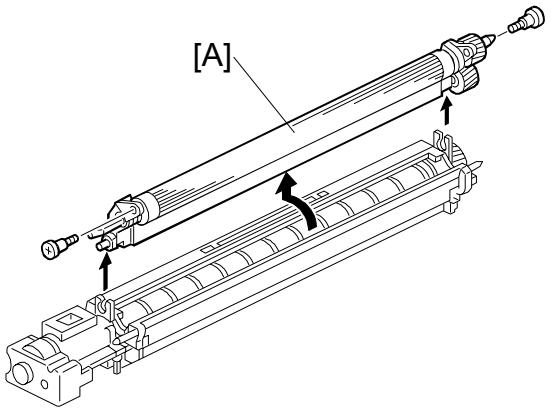
7. Spread a large piece of paper on a flat surface.
   NOTE: Make sure the area is free of pins, paper clips, staples, etc. to avoid attraction to the magnetic development roller.
8. Slide the development unit [A] out and place it on the paper.
9. Remove the tape and tag [B] from the development unit
10. Remove the entrance seal plate [C] (☆ x 2).



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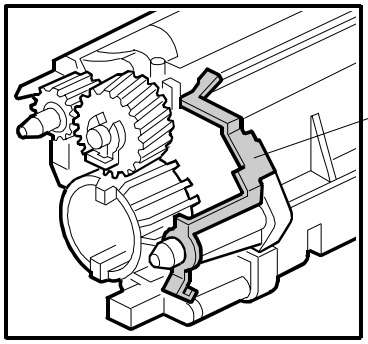

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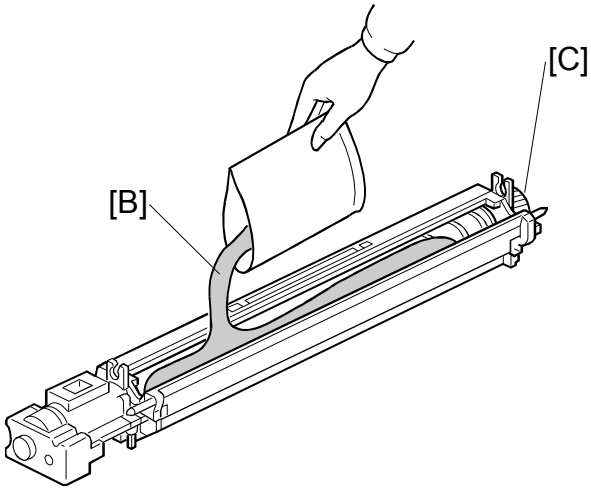

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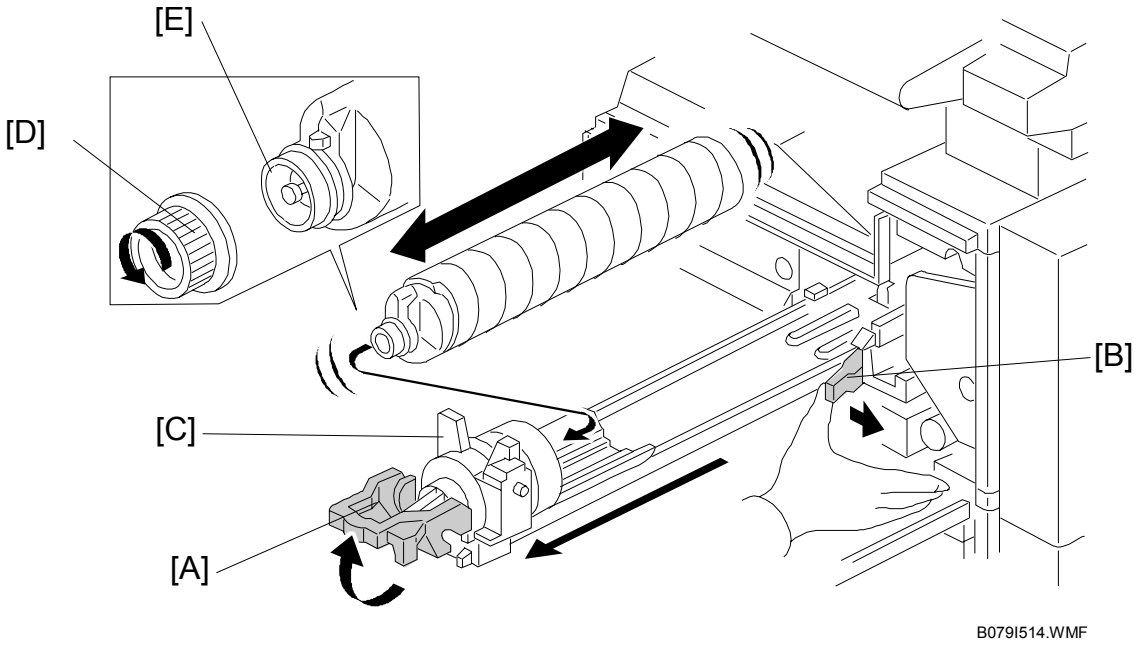
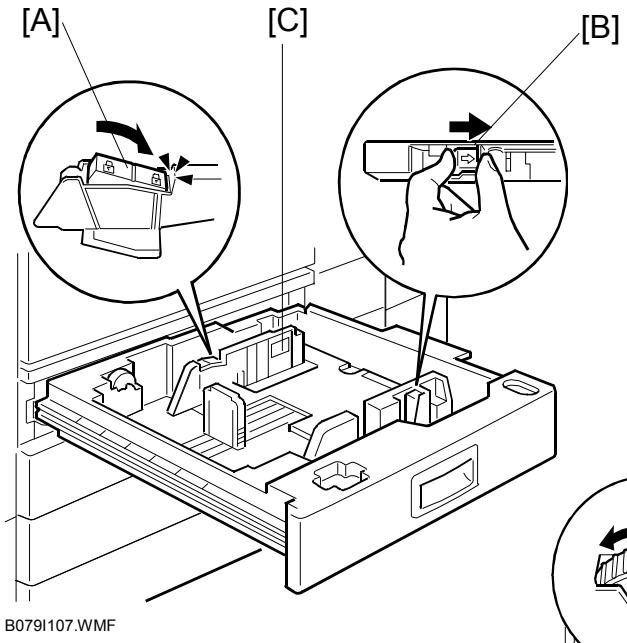
11. Remove the development roller unit [A], and set it on the paper.
12. Pour the developer [B] into the development unit.
    NOTE: The developer lot number is embossed on the end of the developer package. Do not discard the package until you have recorded the lot number. (☛1-15)
    1) Pour approximately 1/3 of the developer evenly along the length of the development unit.
    2) Rotate the drive gear [C] to work the developer into the unit.
    3) Repeat until all the developer is in the development unit.
    4) Continue to turn the drive gear until the developer is even with the top of the unit.
13. Reassemble the development unit.
    NOTE: Make sure that the earth plate [D] is positioned correctly.
14. Re-install the development unit and PCU.



Toner Bottle

1. Raise the toner bottle holder lever [A], push the lever [B] to the side, and then pull the toner bottle holder [C] out.
2. Shake the new toner bottle well.
   NOTE: Do not remove the toner bottle cap [D] until after shaking.
3. Unscrew the bottle cap and set the bottle in the holder.
   NOTE: Do not touch the inner bottle cap [E].
4. Push the toner bottle holder into the main machine until it locks in place, and then lower the holder lever to secure the toner bottle.
   NOTE: The holder lever cannot be lowered unless the toner bottle is installed.

Paper Trays



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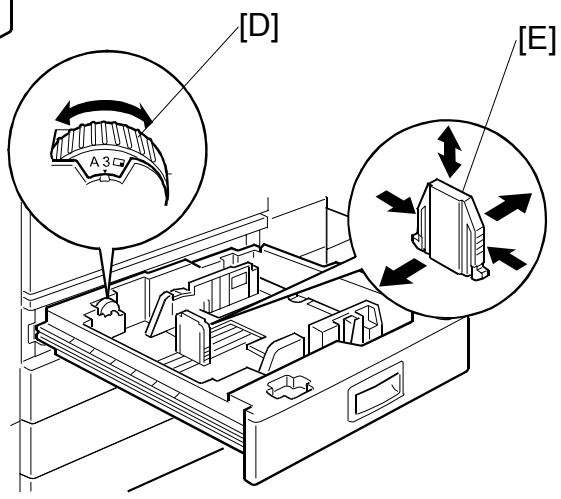

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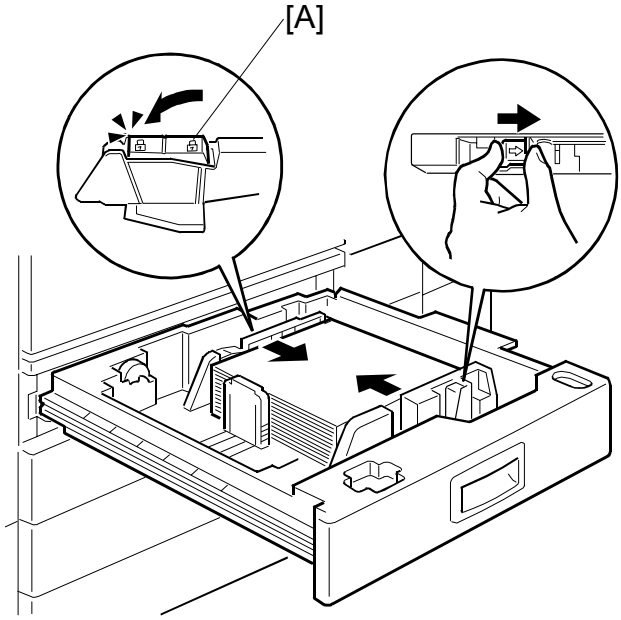
1. Open the 1st paper tray, and then press down on the right side of the lock [A] switch to unlock the side fences.
2. Press in on the sides of the fence release [B], and slide the side fences [C] to the appropriate mark for the paper size.
3. Turn the dial [D] to the correct setting for the paper size.
4. Pinch the sides of the bottom fence [E] and move it to the appropriate mark for the paper size, then load the paper.
5. Check the position of the stack.
   - Confirm that there is no gap between the stack and the side fences. If you see a gap, adjust the position of the side fences.
   - After loading the stack, confirm that the right side of the stack is not on top of both cushions.



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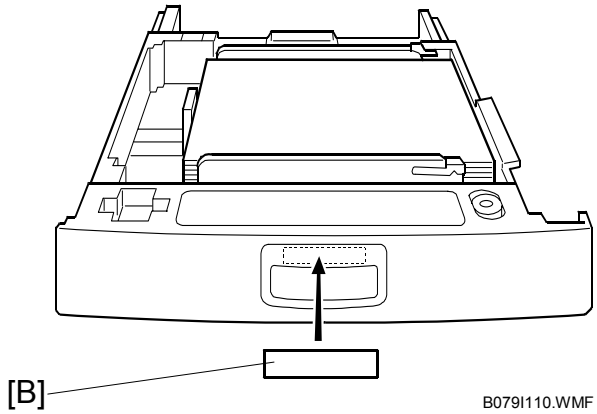

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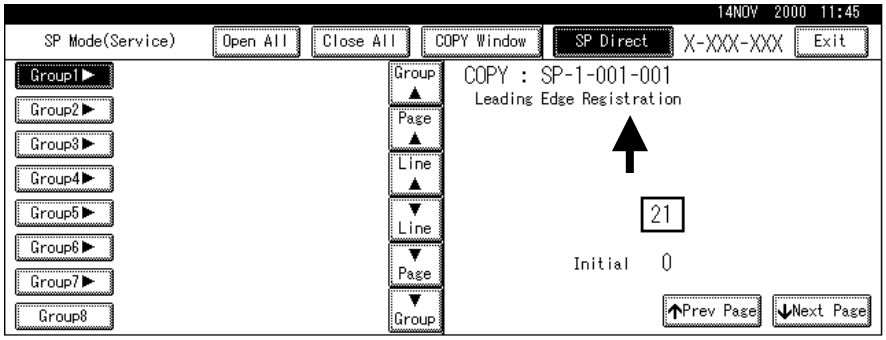
6. Press down the lock [A] to lock the side fences.
7. Attach the appropriate paper size decal [B] to the paper tray.
8. Paper size decals are also used for the optional paper tray unit. Keep any remaining decals for use with the paper tray unit.
9. Repeat this procedure to load paper in the 2nd paper tray.

Initialize TD Sensor and Developer

1. Connect the main machine to the power outlet, switch on the main machine, and wait for the fusing unit to warm up.
2. On the operation panel, press Clear Mode ⊡.
3. Use the number keys to enter 107.
4. Press and hold Clear/Stop Ⓒ/Ⓒ for three seconds.
5. On the touch-panel, press Copy SP.
6. Press SP Direct to highlight “SP Direct”, enter 2801, and then press Ⓗ.



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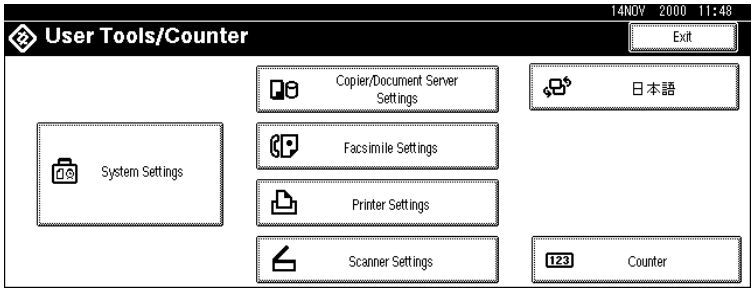
7. When the message prompts you to enter the lot number of the developer, enter the 7-digit lot number, press [Yes], and then press [Execute] on the touch-panel. This initializes the TD sensor.
   NOTE: The lot number is printed on the end of the developer package. Recording the lot number could help troubleshoot problems later. If the lot number is unavailable, enter any seven-digit number.
8. Press SP Direct to highlight “SP Direct” and enter 2805, press Ⓗ, and then press Execute on the touch-panel. This initializes the developer.
9. Press Exit twice to return to the copy window.

Set Paper Size for Paper Trays

1. Press User Tools/Counter .



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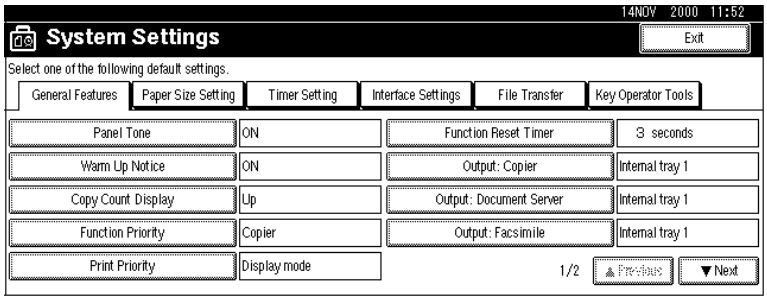
2. On the touch panel, press System Settings.



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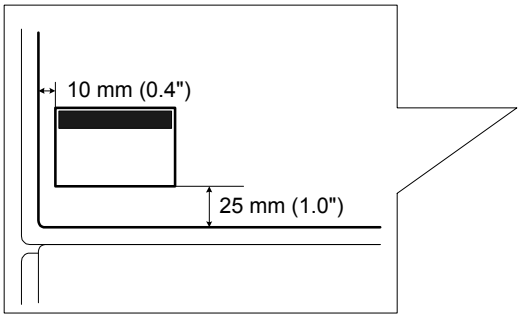
3. Press the Paper Size Setting tab.
4. Press the button for the tray to change.
5. Change the setting and press the [OK] button.
6. Repeat for each tray installed.
7. Press Exit twice to return to the main display
   - The 1st and 2nd paper trays are provided with paper size dial selectors. The dial settings on the paper trays have priority over the UP settings. However, if you select the asterisk (*) position on the paper size dial, you can select the paper size with the UP setting.
   - The 3rd and 4th paper trays of the paper output unit are not equipped with paper-size selection dials, so you must do the Paper Size UP settings for the 3rd and 4th trays.
8. Check the copy quality and machine operation.
   NOTE: The test pattern print procedure is slightly different for this machine. Use SP2-902 and select 2 for the IPU Test Print or 3 for the Print Test Patterns. (☛ Chapter 5, 5.1.3 Test Pattern Printing)

Electrical Total Counter

The electrical total counter no longer requires initialization. The new incrementing counter is set to “0” at the factory.

NOTE: SP7825 (Total Counter Reset) remains in the Service but executing this SP has no effect.

HDD Caution Decal



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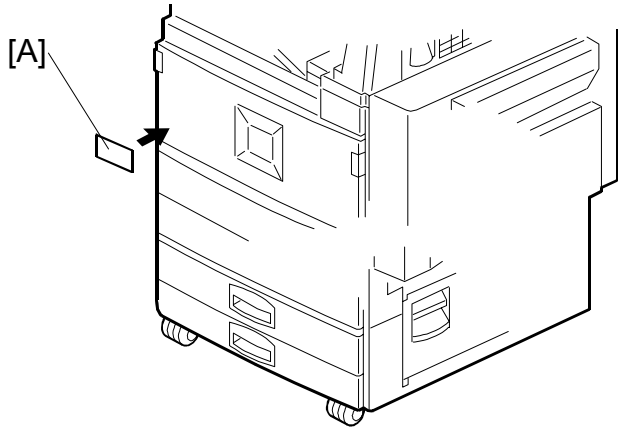

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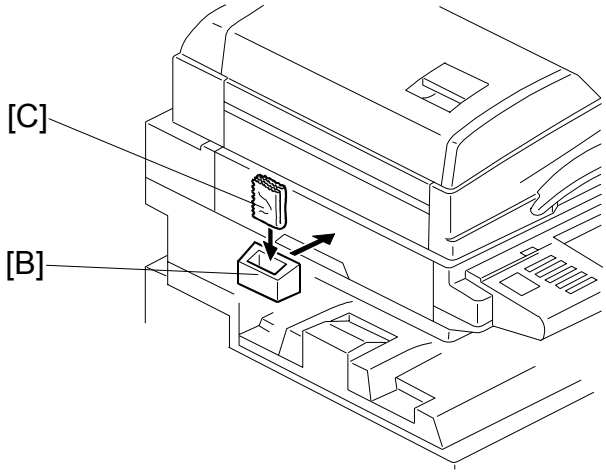
1. Attach the HDD Caution decal [A] to the front cover.

Exposure Glass Cleaner



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1. Attach the exposure glass cleaner holder [B] to the left side of the machine.
2. Place the exposure glass cleaner [C] inside the holder.
   NOTE: The exposure glass cleaner is used to clean the ARDF exposure glass, the glass strip to the left of the large exposure glass.

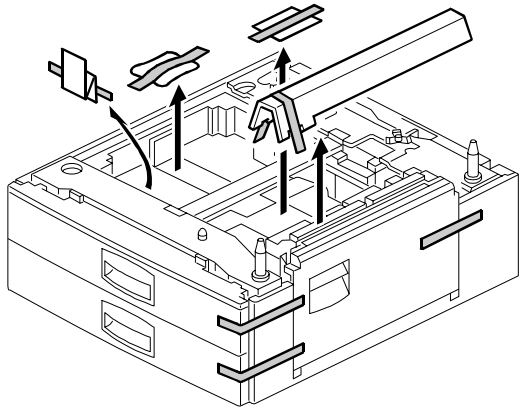
1.4 PAPER TRAY UNIT INSTALLATION (B542)

1.4.1 ACCESSORY CHECK

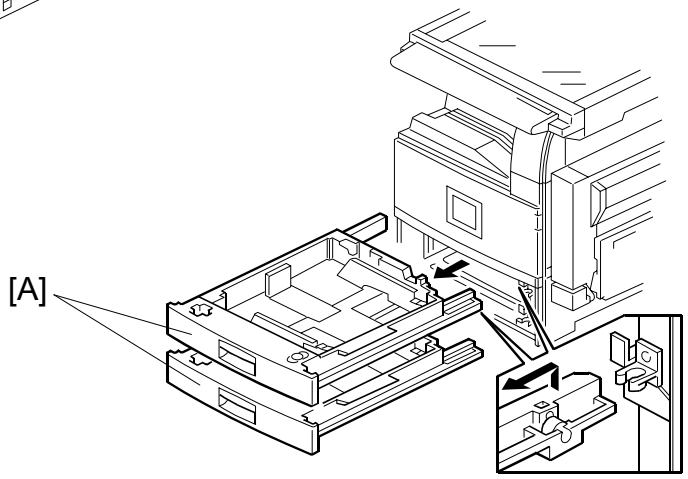
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Knob Screw – M3	1
2. Knob Screw – M4	1
3. Joint Bracket	1
4. Front Stand	1
5. Rear Stand	1
6. Stand Bracket	1
7. NECR	1
8. Installation Procedure	1

1.4.2 PAPER TRAY UNIT INSTALLATION PROCEDURE



B542I557.WMF

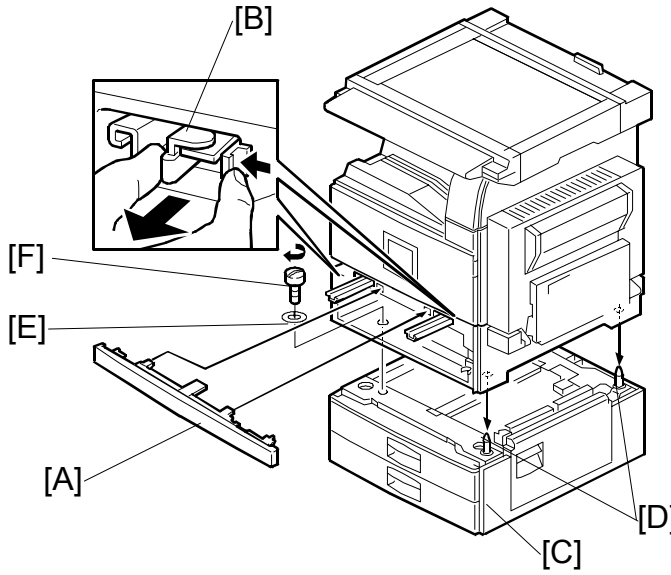


B542I112.WMF

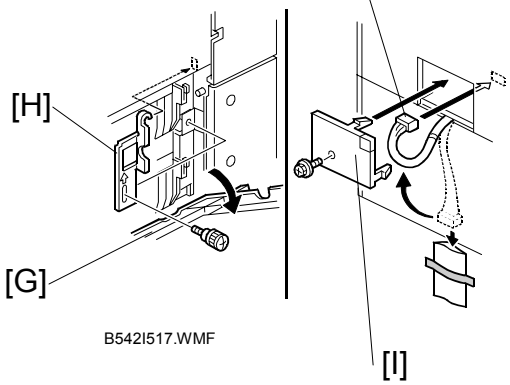
⚠CAUTION

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

1. Unpack the paper tray unit.
2. Remove all tape and shipping materials.
3. Remove the paper trays [A].

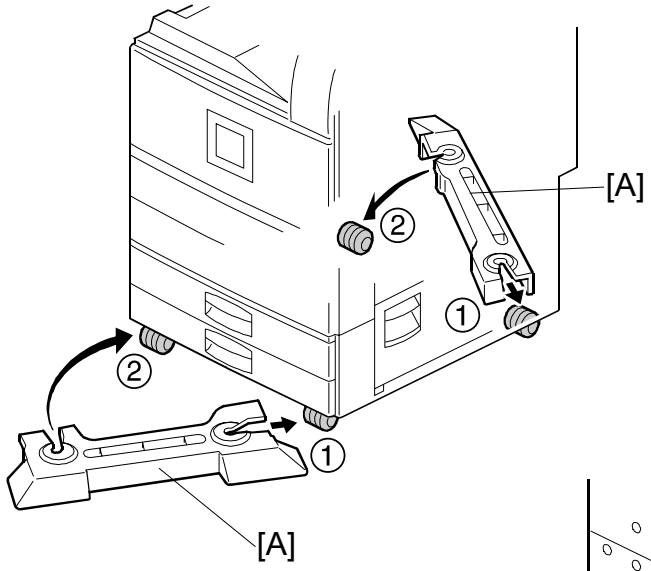


B542I113.WMF

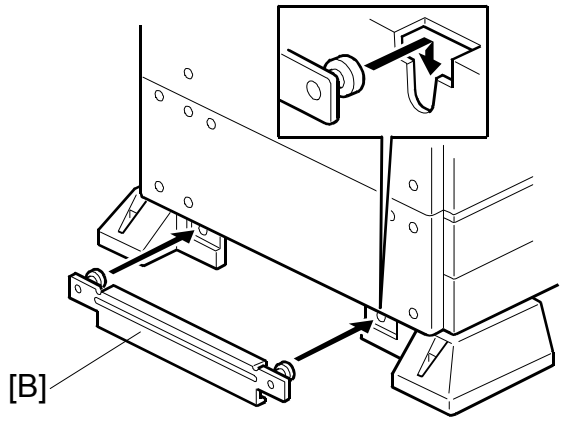


B542I517.WMF

4. Remove the middle front cover [A] and pull out the front handles [B].
5. Using the front handles and rear handles, lift the machine and hold it over the paper tray unit [C].
6. Slowly lower the machine onto the paper tray unit with the pegs [D] aligned with the peg holes on the bottom of the machine.
   NOTE: Do not hold the scanner unit.
7. Re-install the middle front cover [A].
8. Attach the spring washer [E] to the short knob screw [F]. Then, secure the paper tray unit.
9. Open the right cover of the paper tray unit [G].
10. Secure the joint bracket [H] (1 long knob screw).
11. Remove the connector cover [I] of the main machine (🔩 x 1).
12. Connect the paper tray unit harness [J] to the main machine and reinstall the connector cover.

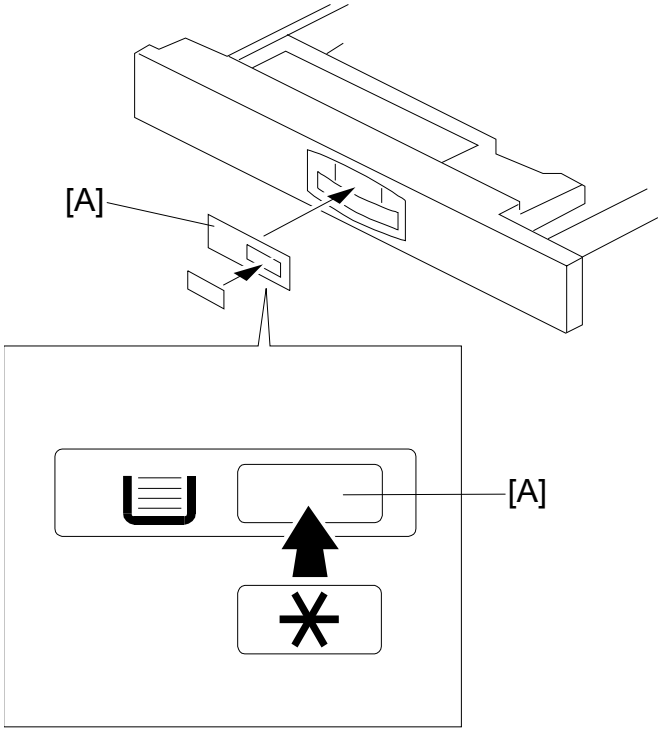


B542I118.WMF



B542I119.WMF

13. Install the front and rear stands [A] as shown above.
14. Install the stand bracket [B].



B542I500.WMF

15. Load paper into the paper tray and install the paper trays.
16. Attach the appropriate tray decals [A] which are included in the accessory box for the main machine.
17. Turn on the ac switch.
18. Turn the paper size dial to the correct setting for the paper size.
19. Check the machine's operation and copy quality.

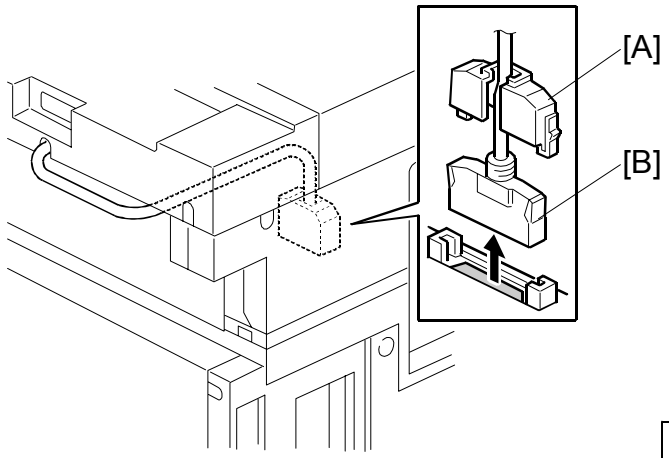
1.5 1-BIN TRAY UNIT INSTALLATION (B544)

1.5.1 ACCESSORY CHECK

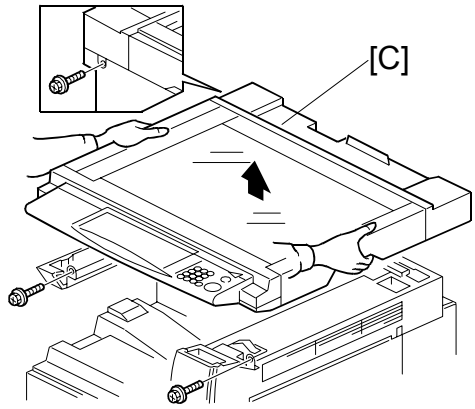
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Ground Bracket	1
2. Connector Cover	1
3. Base Cover	1
4. Arm Cover	1
5. Copy Tray	1
6. Mylar Strip	2
7. Stepped Screw – M3 x 8	5
8. Screw –M3 x 8	2
9. Screw – M4 x 7	1
10. Tapping Screw – M3 x 6	2
11. Tapping Screw – M3 x 14	1
12. Tapping Screw – M3 x 8	1
13. Installation Procedure	1

1.5.2 1-BIN TRAY INSTALLATION PROCEDURE



B544I113.WMF

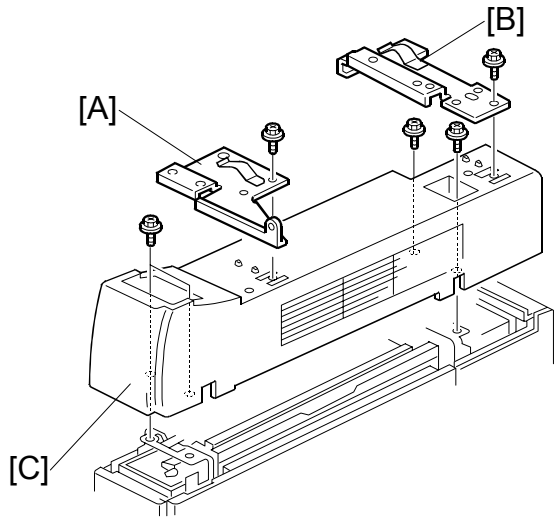


B544I114.WMFF

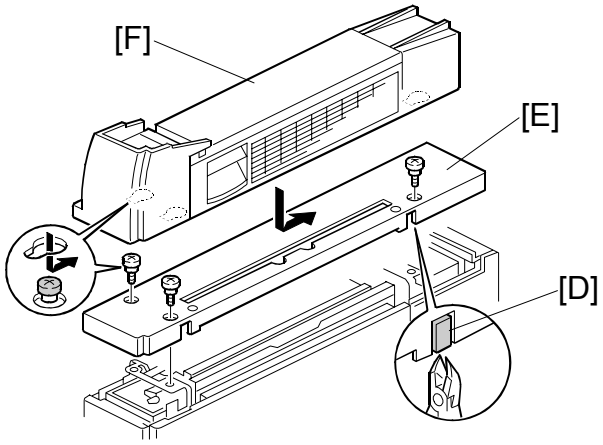
⚠CAUTION

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

1. Remove Scanner Unit
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the connector cover [A].
   2) Disconnect the scanner cable [B].
   3) Remove the scanner unit [C] (🖉 x 3).

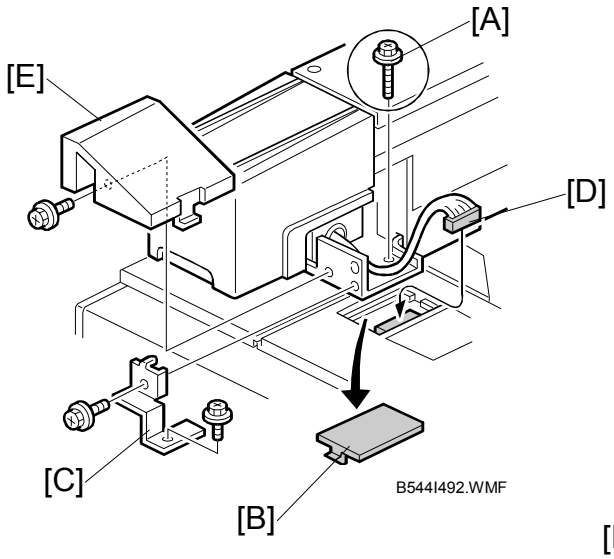


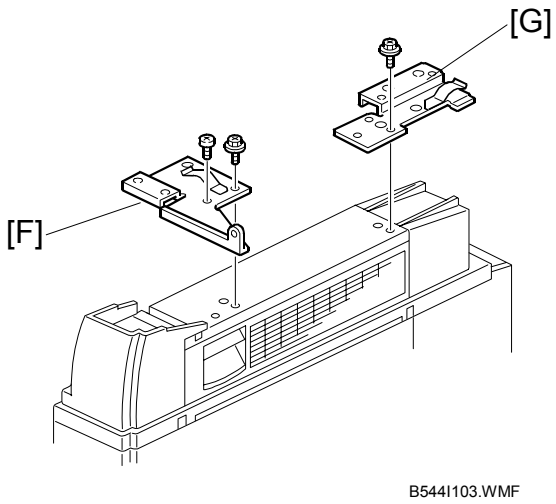
B544I201.WMF



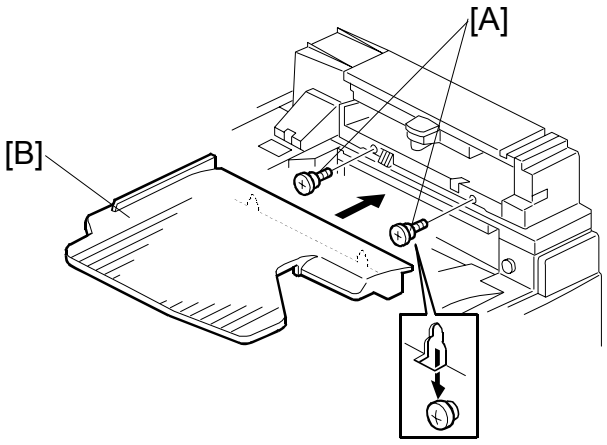
B544I102.WMF

2. Unpack the 1-bin tray unit and remove the tapes.
3. Remove the front bracket [A] (☞ x 1) and rear bracket [B] (☞ x 1) from the top of the paper exit cover [C].
4. Remove the paper exit cover [C] (☞ x 4).
5. Cut away two covers [D] from the base cover [E].
6. Trim the edges so they are smooth.
7. Install the base cover [E] (☞ x 3: stepped screw).
8. Set the 1-bin tray unit [F] on the base cover and slide onto the heads of the stepped screws.

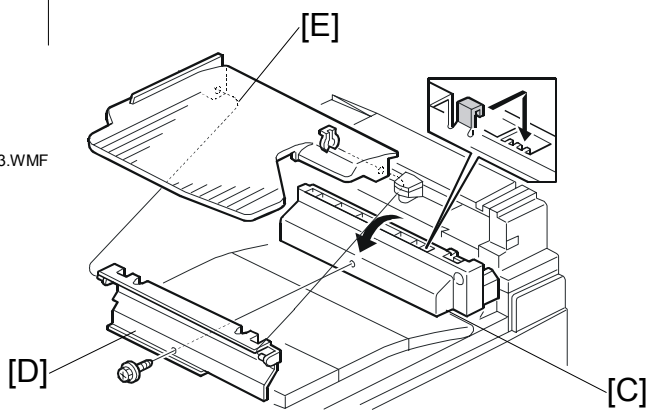




9. Secure the 1-bin tray unit [A] (☞ x 1 M3 x14).
10. Remove the cover [B].
11. Install the grounding bracket [C] (☞ x 2 M3 x 6).
12. Connect the harness [D].
13. Install the connector cover [E] (☞ x 1 M3 x 8)
14. Re-install the front bracket [F] (☞ x 2 M4 x 7, M4 x 10) and the rear bracket [G] (☞ x 1 M4 x 10).



B544I493.WMF



B544I501.WMF

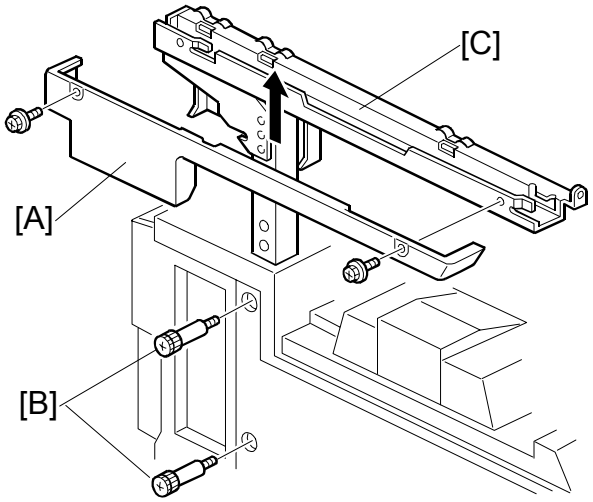
15. Attach the copy tray

Bridge Unit (B538) has not been installed:

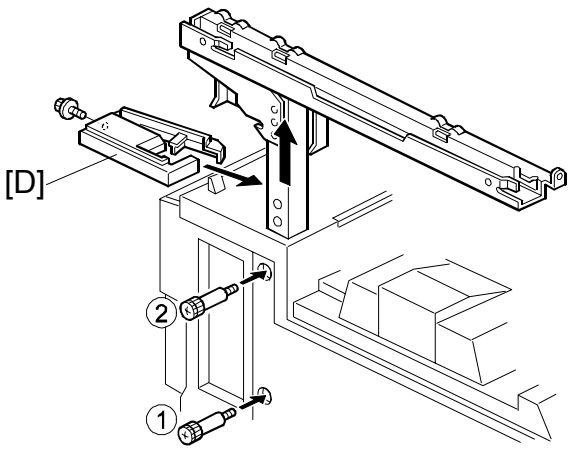
1) Secure [A] (stepped ☞ x 2) into the side of the 1-bin tray housing.
2) Attach the copy tray [B] to the stepped screws.

Bridge Unit (B538) has been installed

1) Open the cover of the bridge unit [C].
2) First, remove the copy tray bracket [D] (☜ x 1).
3) Install the copy tray bracket (☞ x 1: tapping screw).
4) Re-install the copy tray [E] (☜ x 1).

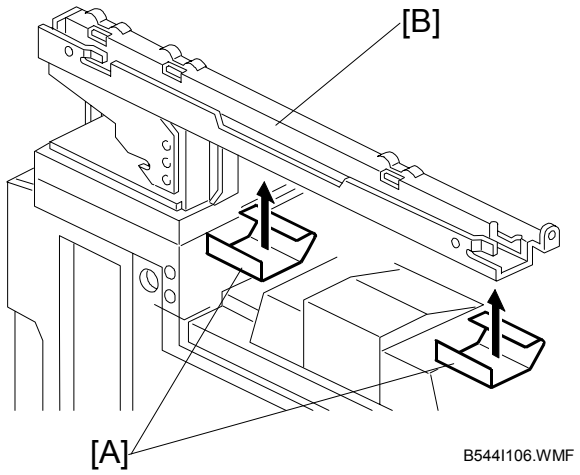


B544I104.WMF



B544I500.WMF

16. Remove the scanner stand cover [A] (☞ x 2).
17. To adjust the height of the scanner stand, first remove [B] (☞ x 2) to release the scanner stand [C].
18. Raise the scanner stand until the next set of screw holes in the main frame can be seen through the screw holes in the scanner stand.
19. Secure the stand (☞ x 2: ①, ②) and install the arm cover [D] (☞ x 1).



20. Attach two mylar strips [A] to the scanner stand [B].
21. Reinstall the scanner stand cover.
22. Reinstall the scanner unit.
23. Turn on the main switch and check the 1-bin tray unit operation.

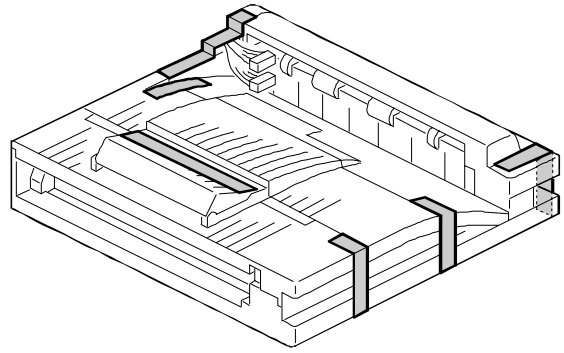
1.6 BRIDGE UNIT INSTALLATION (B538)

1.6.1 ACCESSORY CHECK

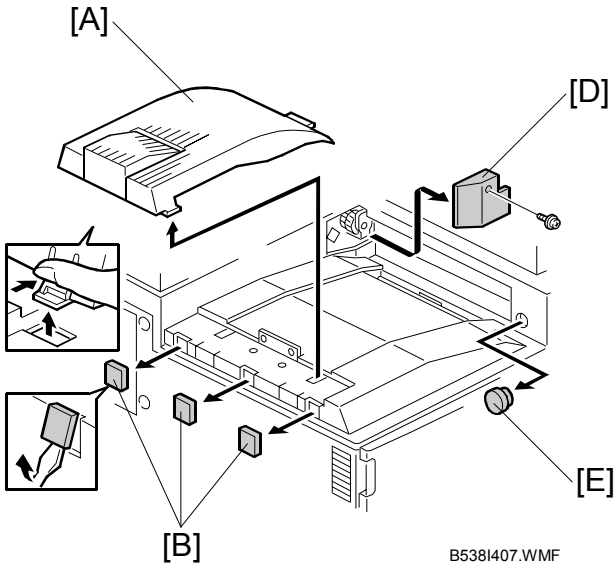
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Stepped Screw	2
2. Connector Cover	1
3. Exit Mylar	2
4. Installation Procedure	1

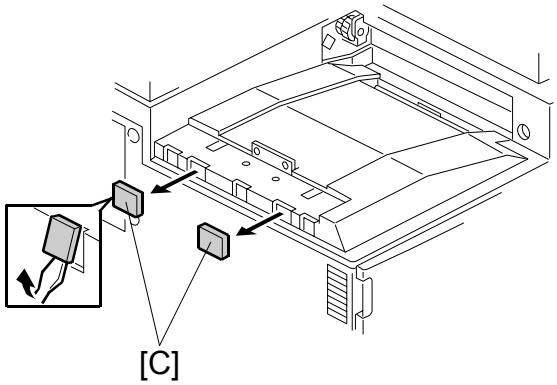
1.6.2 BRIDGE UNIT INSTALLATION PROCEDURE



B538I401.WMF



B538I407.WMF



B538I500.WMF

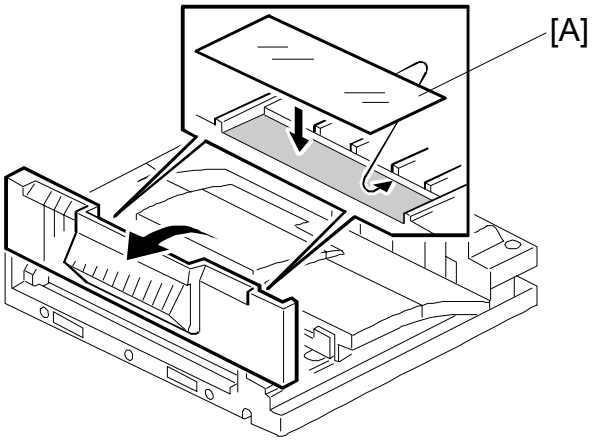
⚠CAUTION

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

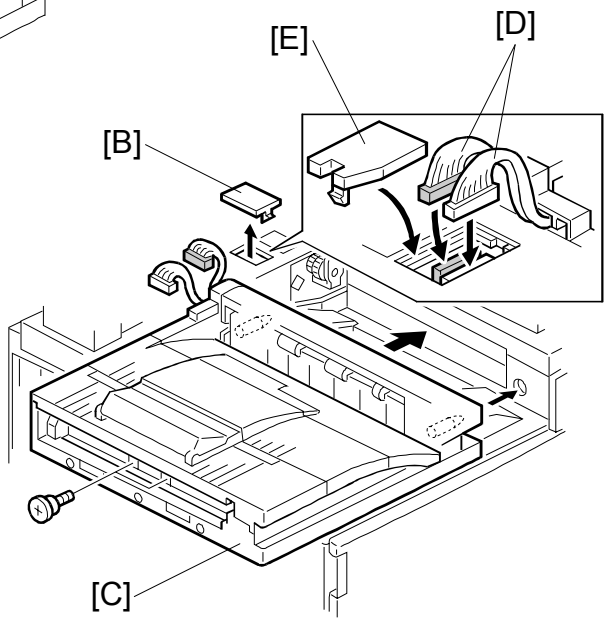
1. Unpack the bridge unit and remove all tapes shipping retainers.
2. Remove the inner tray [A].
3. On the side of the machine, remove the three small covers [B].

If the optional external output tray (A825) will be installed (instead of a finisher), do Step 4.

4. Remove the two small covers [C].
5. Remove the cover [D] (🖉 x 1).
6. Remove the cap [E].



B538I402.WMF



B538I404.WMF

7. If an optional finisher is to be installed, attach two mylars [A] to the bridge unit.
8. Remove the cover [B].
9. Install the bridge unit [C] (☞ x 2).
10. Connect the bridge unit I/F harnesses [D] (☞ x 2).
11. Install the connector cover [E].
12. Turn on the main switch and check the bridge unit operation (make sure that there are no paper jams).

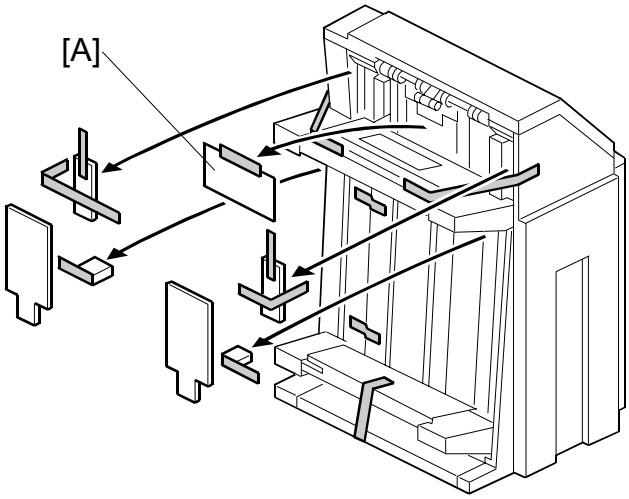
1.7 TWO-TRAY FINISHER INSTALLATION (B545)

1.7.1 ACCESSORY CHECK

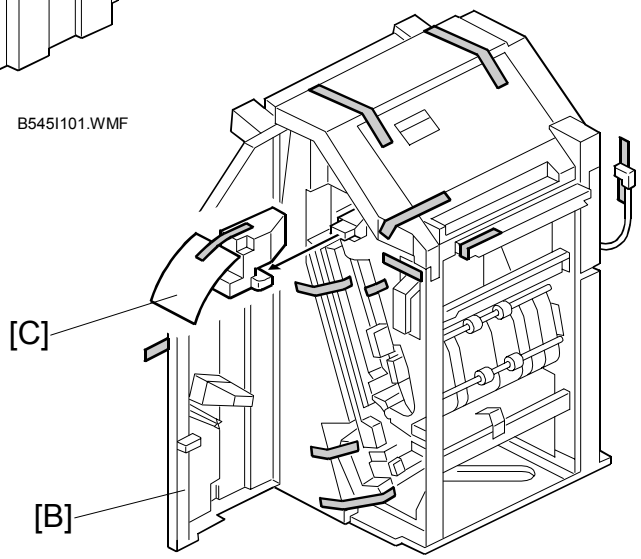
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Front Joint Bracket	1
2. Rear Joint Bracket	1
3. Shift Tray	2
4. Screw – M4 x 8	2
5. Screw – M4 x 12	5
6. Ground Plate	1
7. Installation Procedure	1

1.7.2 TWO-TRAY FINISHER INSTALLATION PROCEDURE



B545I101.WMF



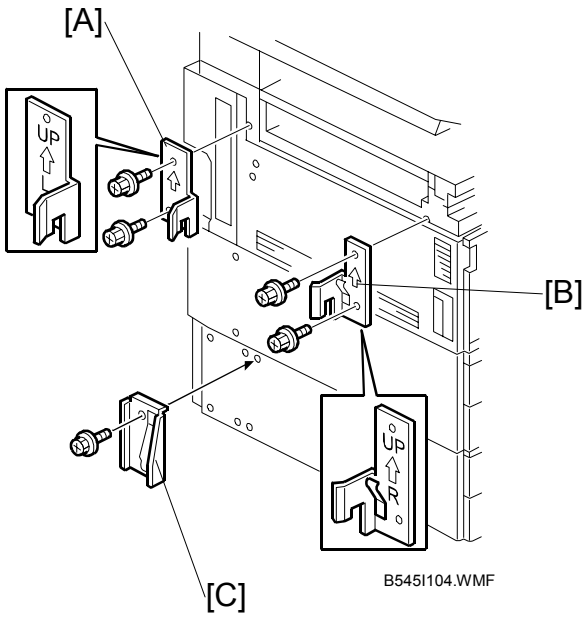
B545I107.WMF

⚠CAUTION

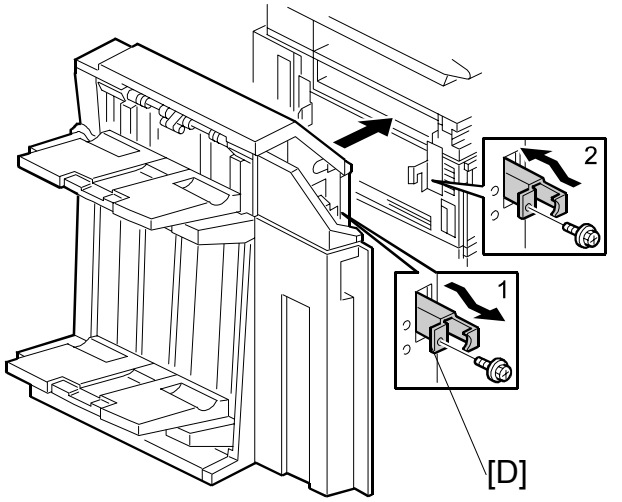
Unplug the main machine power cord before starting the following procedure.

NOTE: The bridge unit (B538) and paper tray unit (B542) must be installed before installing this finisher.

1. Unpack the finisher and remove all tapes and shipping retainers from outside the unit [A].
2. Open the front door [B] and remove all tapes and shipping materials from inside the finisher unit.
3. Save the retainer [C] and other shipping material.
   NOTE: The retainer [C] must be re-installed in the finisher before moving or shipping the finisher to another location.

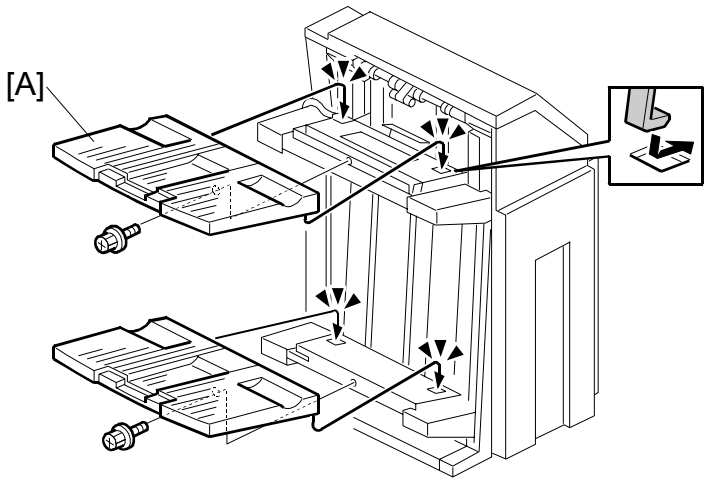


B545I104.WMF

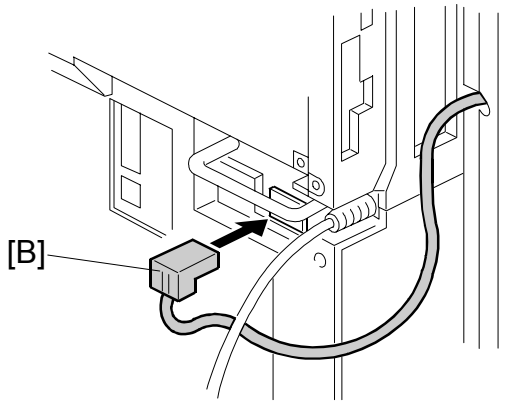


B545I105.WMF

4. Install the left joint bracket [A] (☞ x 2 M4 x 12) and right joint bracket [B] (☞ x 2 M4 x 12).
5. Attach the ground plate [C] (☞ x 1 M4 x 12) to the center of the paper tray unit as shown.
6. Open the front door of the finisher, and pull out the locking lever [D] (☞ x 1).
7. Push the finisher to the side of the machine with the holes in the finisher aligned with the joint brackets, and then dock the finisher against the machine.
8. Push in the locking lever and secure it (☞ x 1), then close the front door.



B545I103.WMFF



B545I106.WMF

9. Install two trays [A] (☞ x 1 each).
10. Connect the finisher cable [B] to the main machine below the right, rear handle.
11. Turn on the main switch and check the finisher operation.

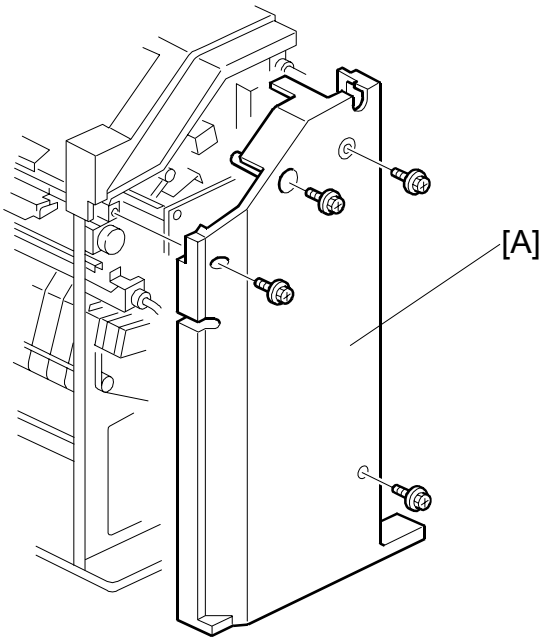
1.8 PUNCH UNIT INSTALLATION

1.8.1 ACCESSORY CHECK

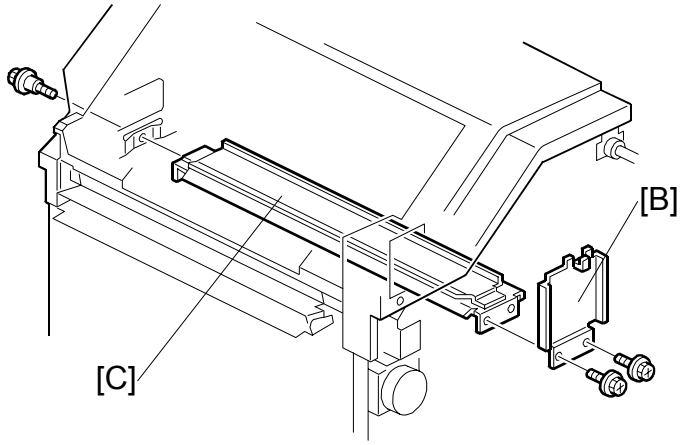
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Punch unit	1
2. Sensor arm	1
3. Hopper	1
4. Step screw	1
5. Spring	1
6. Spacer (2 mm)	1
7. Spacer (1 mm)	1
8. Tapping screw	1
9. Tapping screw	2

1.8.2 PUNCH UNIT INSTALLATION PROCEDURE



B377I102.WMF

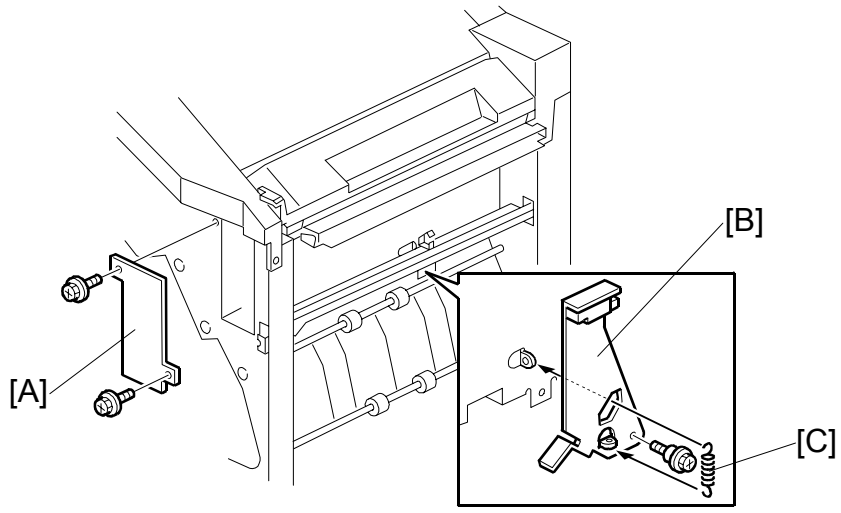


B377I103.WMF

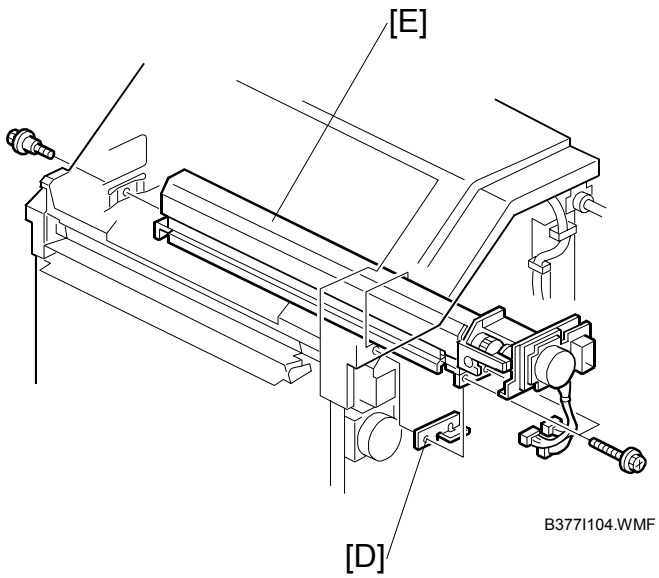
⚠CAUTION

Switch off the main machine and unplug its power cord. If the Two-Tray Finisher is installed, disconnect it and pull it away from the machine. (☛1.7)

1. Unpack the punch unit and remove all tapes and shipping retainers.
2. Open the front door and remove the rear cover [A] (🖉 x4).
3. Remove the bracket [B] (🖉 x2) and paper guide [C] (🖉 x 1).

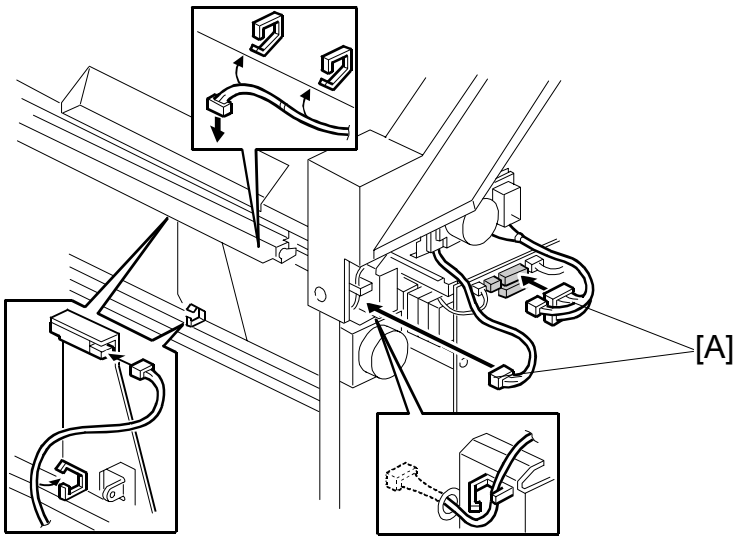


B377I101.WMF

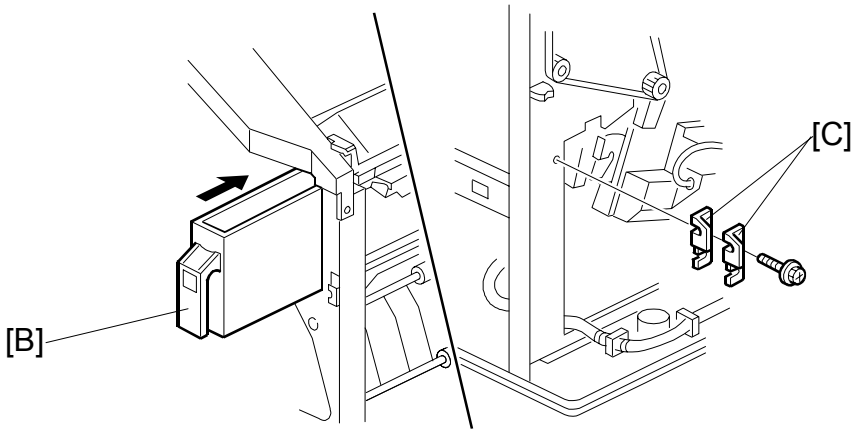


B377I104.WMF

4. Remove the hopper cover [A] (☞ x 2).
5. Install the sensor bracket [B] (stepped ☞ x 1).
6. Install the spring [C].
7. Install the 2 mm spacer [D].
8. Install the punch unit [E] (☞ x 2, stepped ☞ x 1)



B377I105.WMF



B377I106.WMF

9. Connect the harnesses [A] and clamp them as shown.
   NOTE: No special DIP switch settings are required for this punch unit. The punch unit sends an identification signal to the machine board so it knows what type of punch unit has been installed.
10. Slide the hopper [B] into the machine.
11. Fasten the two 1 mm spacers [C] to the rear frame for future adjustment.
    NOTE: The spacers are used to adjust the horizontal positioning of the holes.
12. Reassemble the finisher and check the punch operation.

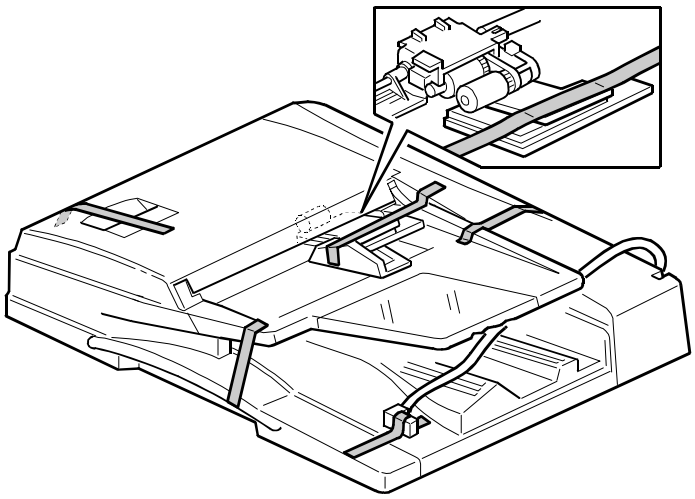
1.9 ARDF INSTALLATION (B541)

1.9.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Stepped Screw	2
2. Screw – M4 x 10	2
3. Attention Decal - Scanner	1
4. Attention Decal – Top Cover	1
5. Installation Procedure	1

1.9.2 ARDF INSTALLATION PROCEDURE

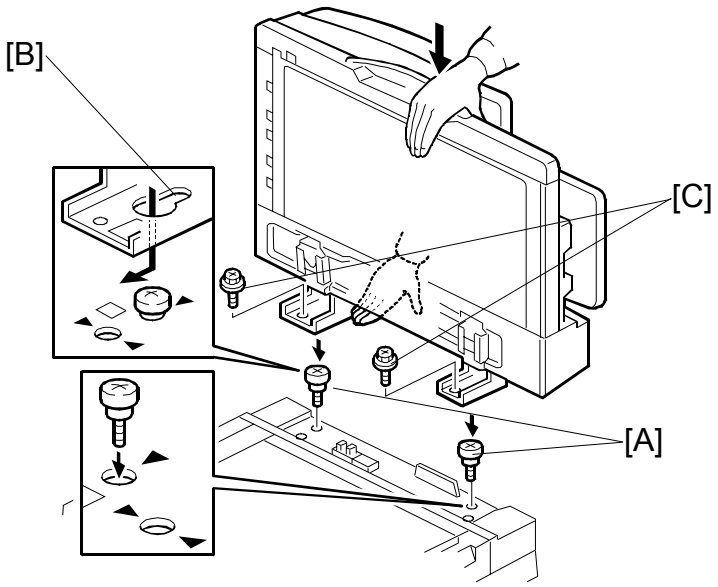


B541I904.WMF

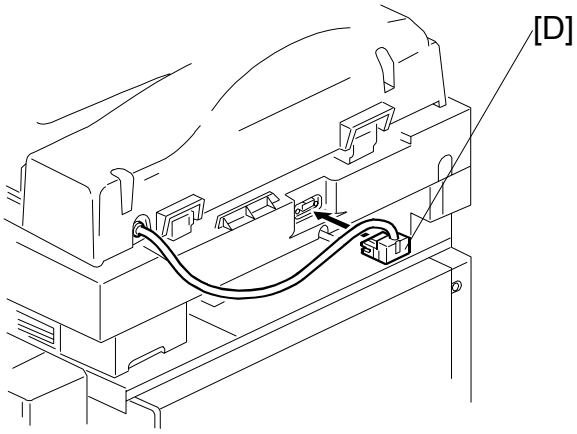
⚠CAUTION

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

1. Unpack the ARDF and remove all tapes and shipping retainers.

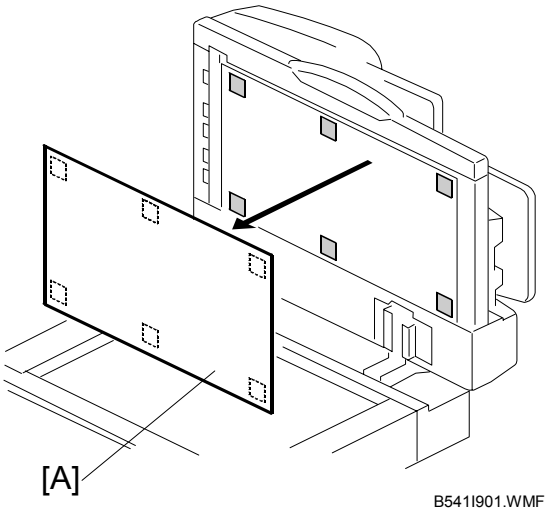


B541I905.WMF



B541I124.WMF

2. Attach and tighten [A] (☞ x 2 stud).
3. Mount the ARDF by aligning the screw keyholes [B] of the ARDF support plate over the stud screws, and slide the ARDF toward the front of the machine.
   NOTE: To avoid damaging the ARDF, hold it as shown in the illustration.
4. Secure the ARDF [C] (☞ x 2).
5. Connect the I/F cable [D] (☜ x 1) to the main machine.



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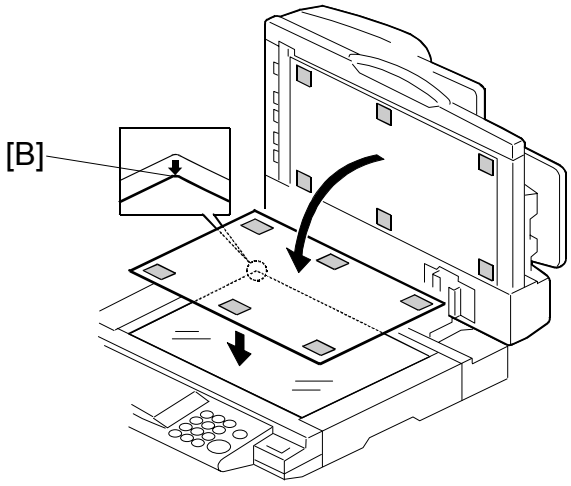
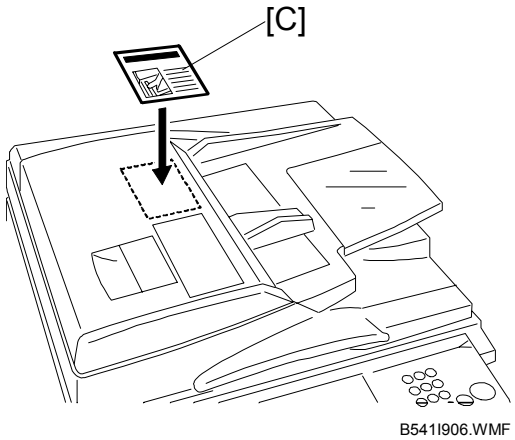
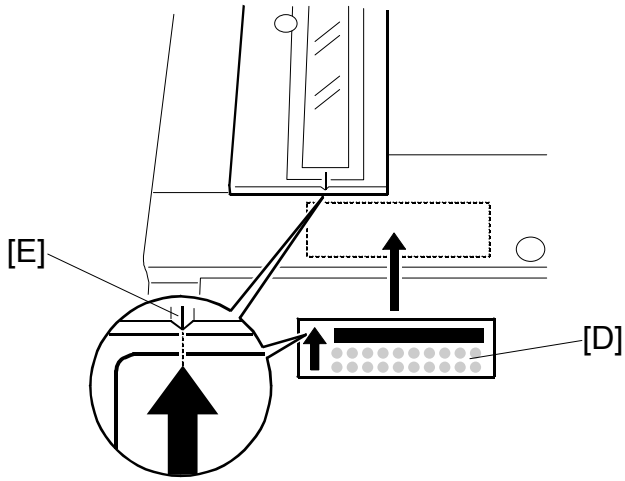


B541I902.WMF



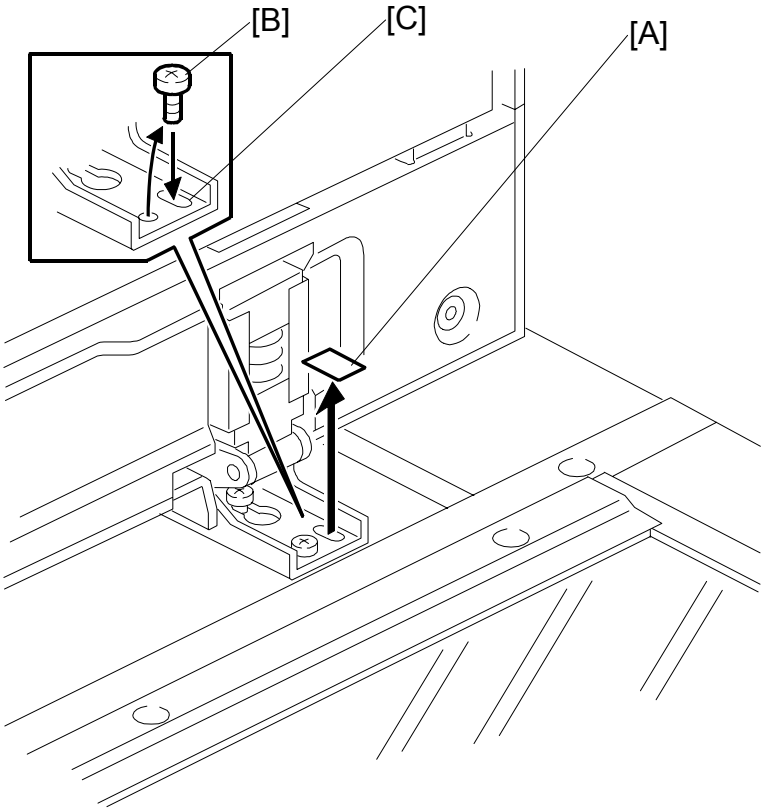
B541I906.WMF



B541I903.WMF

6. Peel off the platen sheet [A] and place it on the exposure glass.
7. Line up the rear left corner of the platen sheet flush against corner [B] on the exposure glass.
8. Close the ARDF.
9. Attach the decal [C] to the top cover as shown, choosing the language most suitable for the machine installed.
10. Attach the decal [D] to the cover so that the arrow on the decal lines up with the groove [E] of the left scale as shown. As with step 9, choose the language most suitable for the machine installed.
11. Turn on the main switch.
12. Check the ARDF operation and copy quality. Be sure to check and adjust the registration for the ARDF with the SP modes

1.9.3 ARDF SKEW ADJUSTMENT



B079R724.WMFF

1. Remove the tape [A] covering the elliptical hole.
2. Remove right screw [B] and install it into the elliptical hole [C].
3. Move the right side of the ARDF forward or back to adjust the position then tighten the screw.

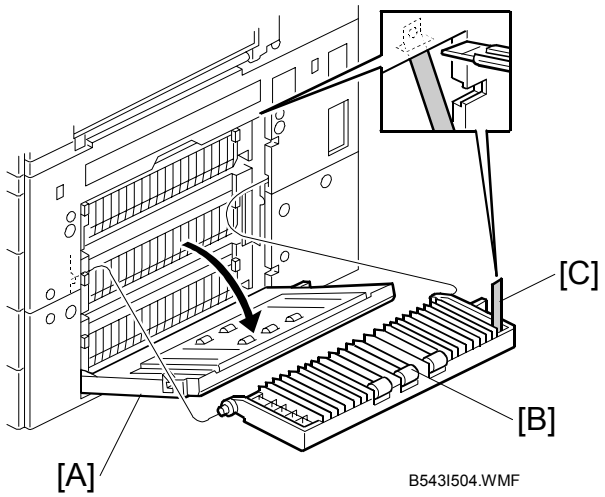
1.10 LCT INSTALLATION (B543)

1.10.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Joint Pin	2
2. Stepped Screw M3 x 18	4
3. Magnet Cover	1
4. NECR (-17, -27 machines)	1
5. Installation Procedure	1

1.10.2 LCT INSTALLATION PROCEDURE

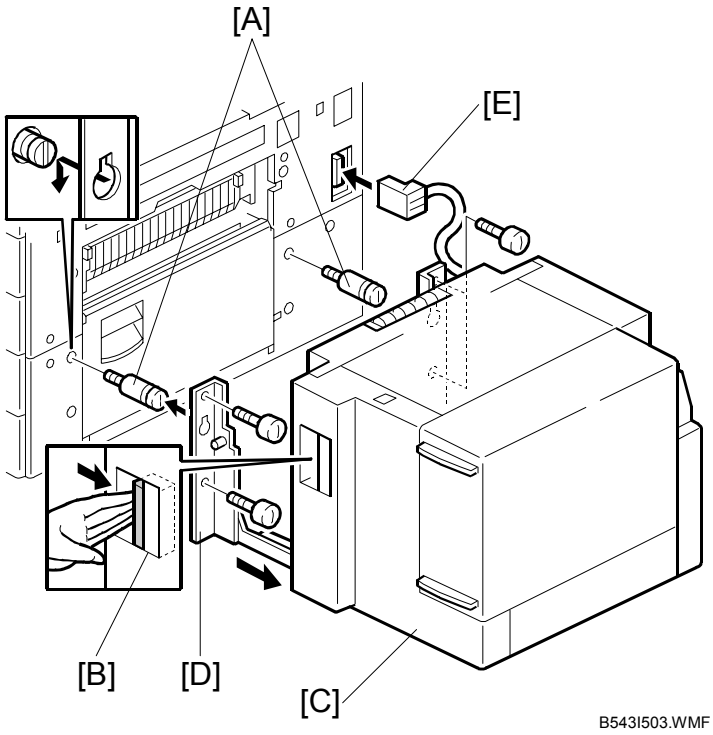


⚠CAUTION

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

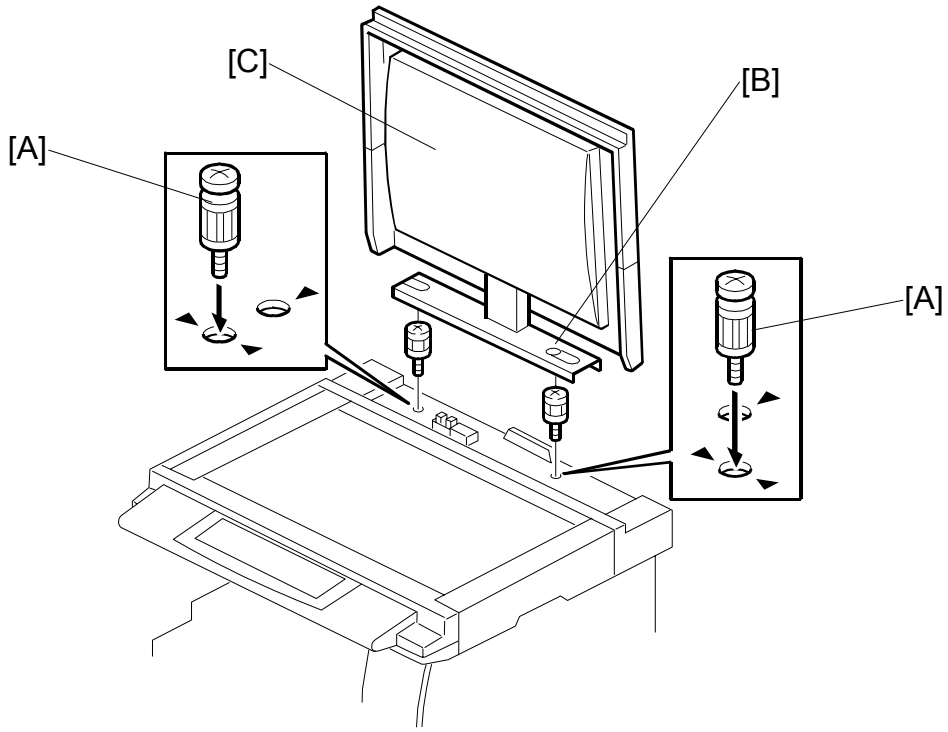
NOTE: The Paper Tray Unit (B542) must be installed before installing the LCT.

1. Unpack the LCT and remove the tapes.
2. Open the right cover of the paper tray unit [A].
3. Open the lower right cover [B] and cut the holding band [C].
   NOTE: When cutting the holding band, the upper part of the band should be cut as shown. Otherwise, paper jams may occur.
4. Remove the lower right cover.



6. Install the joint pins [A].
7. Push the release lever [B] and slide the LCT to the right (front view).
8. Hang the LCT [C] on the joint pins, then secure the brackets [D] (☞ x 4).
9. Return the LCT to the previous position and connect the LCT cable [E].
10. Open the LCT cover and load the paper.
11. Turn on the ac switch and check the LCT operation.

1.11 PLATEN COVER INSTALLATION (G329)

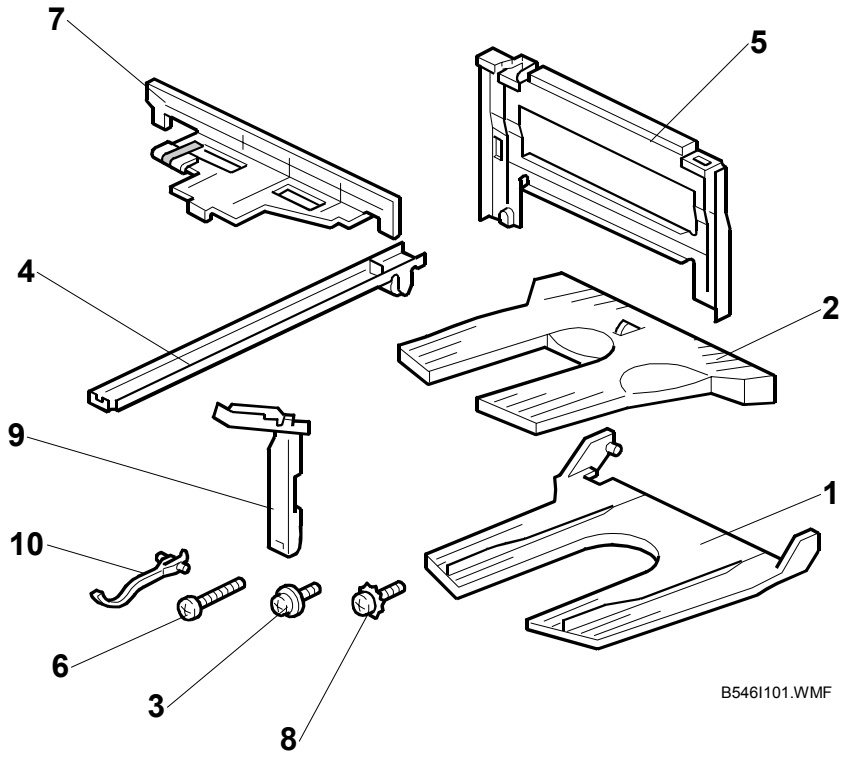


1. Install [A] (🔩 x 2) on the top cover as shown.
2. Position the platen cover bracket [B] on the heads of the stud screws and slide the platen cover [C] to the left.

1.12 BOOKLET FINISHER INSTALLATION (B546)

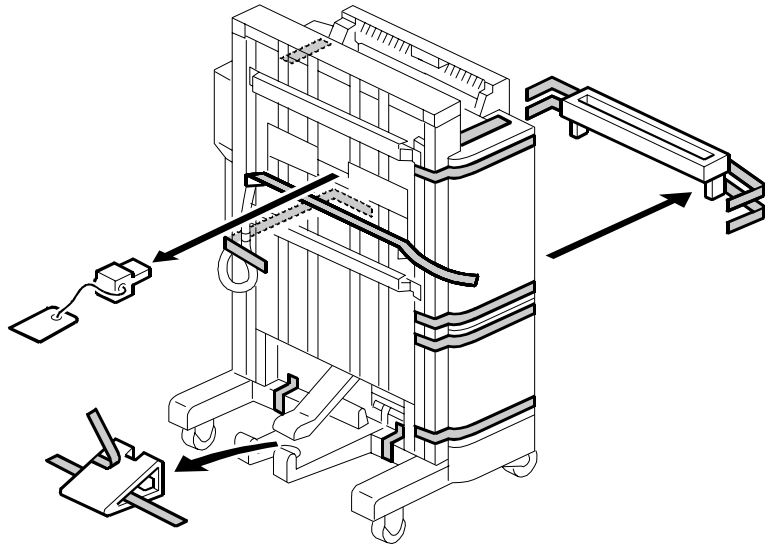
1.12.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list.

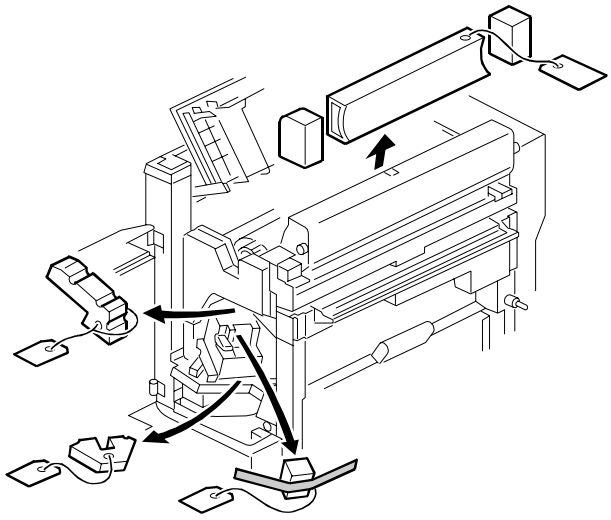


Description	Q'ty
1. Upper Tray	1
2. Shift Tray	1
3. Tapping Screw -M4 x 6	2
4. Rail Ass'y	1
5. Joint Bracket	1
6. Tapping Screw - M4 x 16	8
7. Rail Bracket	1
8. Tapping Screw - M4 x 6	1
9. Harness Cover	1
10. Sensor Feeler	1

1.12.2 BOOKLET FINISHER INSTALLATION PROCEDURE



B546I102.WMF

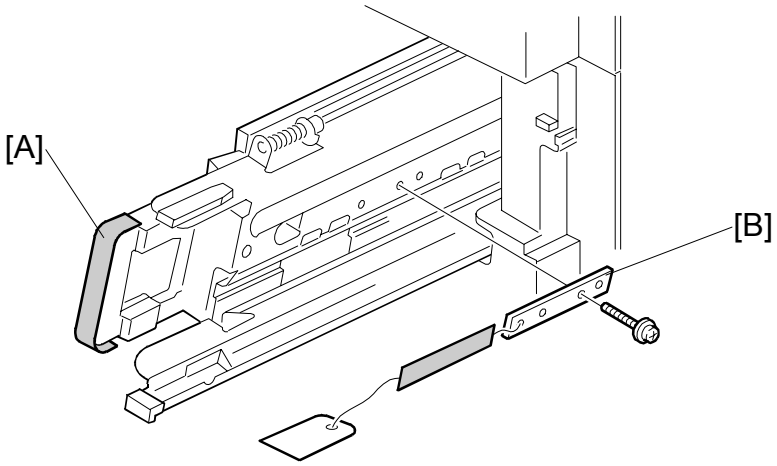


B546I104.WMF

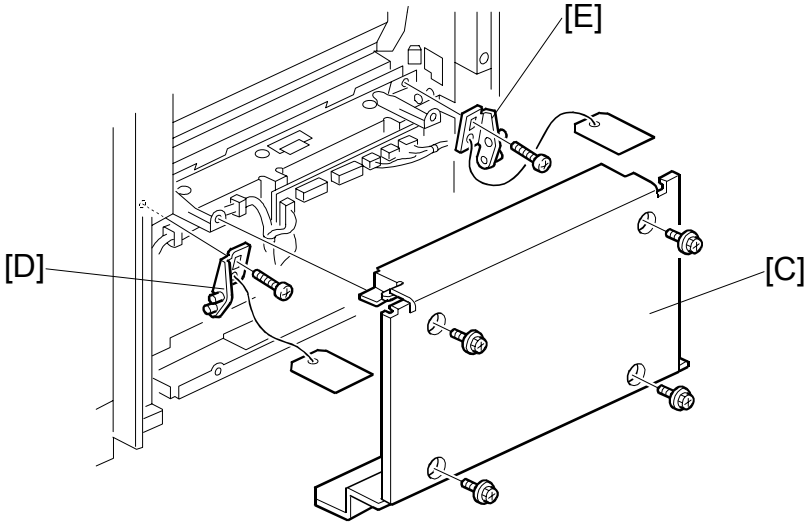
⚠CAUTION

Keep the power cord unplugged when starting the following procedure.

1. Unpack the finisher and remove the tapes and shipping retainers.

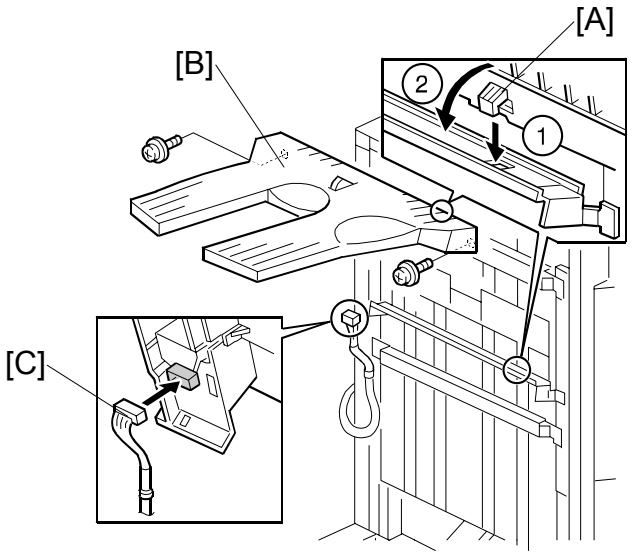


B546I105.WMF

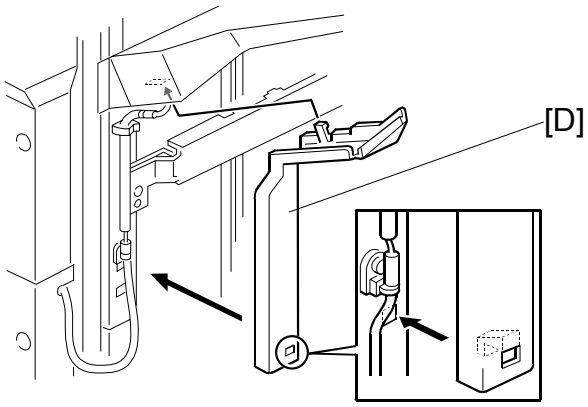


B546I103.WMF

2. Open the front under door and pull out the staple unit [A].
3. Remove the stapler unit lock plate [B] (☞ x 1).
4. Push in the stapler unit and shut the front lower door.
5. Remove the right lower cover [C] (☞ x 4).
6. Remove the front pressure release bracket [D] (☞ x 1).
7. Remove the rear pressure release bracket [E] (☞ x 1).
8. Reattach the cover [C].

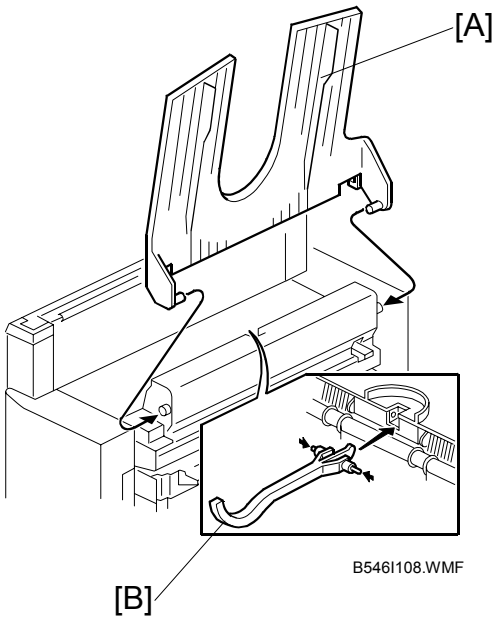


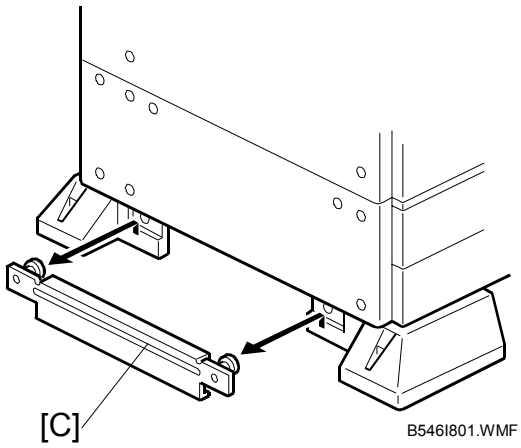
B546I106.WMF

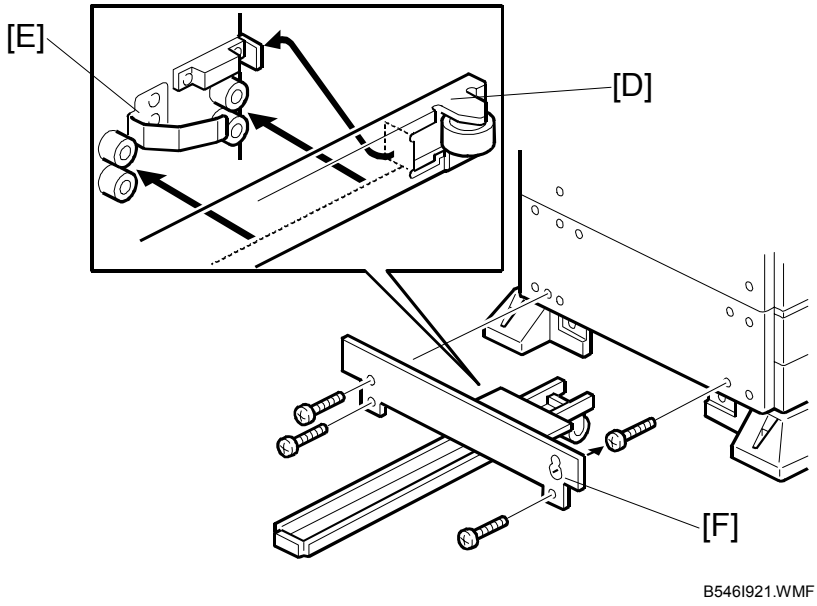


B546I107.WMF

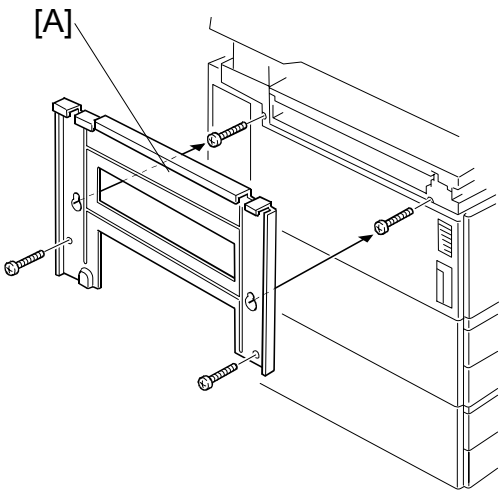
9. Set the hooks [A] of the shift tray [B] in the notches in the shift tray bracket, and secure the tray with two M4 x 6 screws.
10. Connect the shift tray sensor harness [C].
11. Install the harness cover [D] (2 hooks).



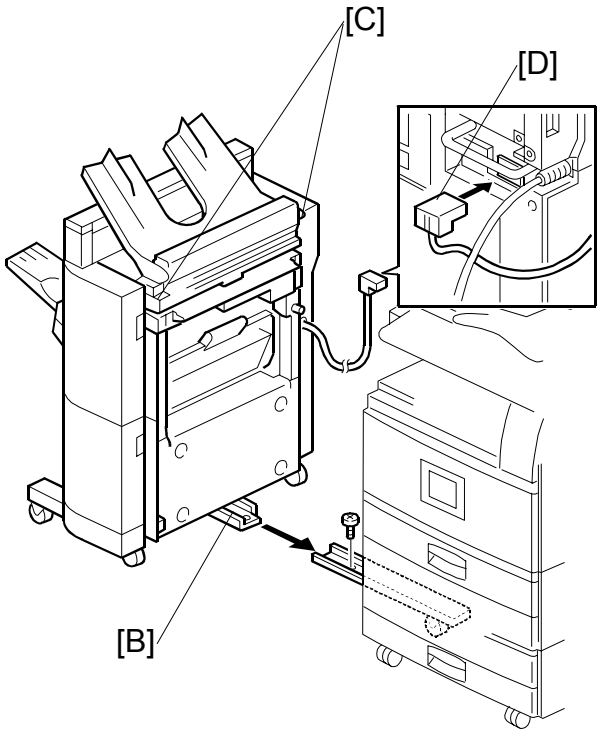




12. Install the upper tray [A] (2 pins).
13. Attach the sensor feeler [B] (2 pins).
14. Remove the stand bracket [C].
15. Attach the rail [D] to the rail bracket [E] as shown.
16. Install the rail bracket [F] on the left lower cover of the copier (☞ x 4).



B546I920.WMF



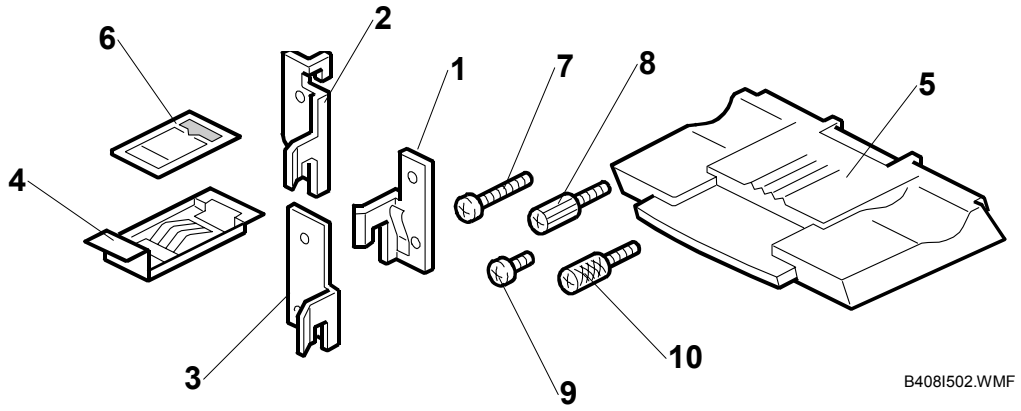
B546I111.WMF

17. Install the joint bracket [A] on the left side of the copier (🔩 x 4).
18. Secure the rail [B] to the booklet finisher with 1 M4 screw.
19. Align the finisher on the joint bracket and lock the 2 hooks [C] of the finisher on the joint bracket.
20. Connect the finisher cable [D] to the copier.
21. Turn on the main switch and check the finisher operation.

1.13 1000 SHEET FINISHER (B408)

1.13.1 ACCESSORY CHECK

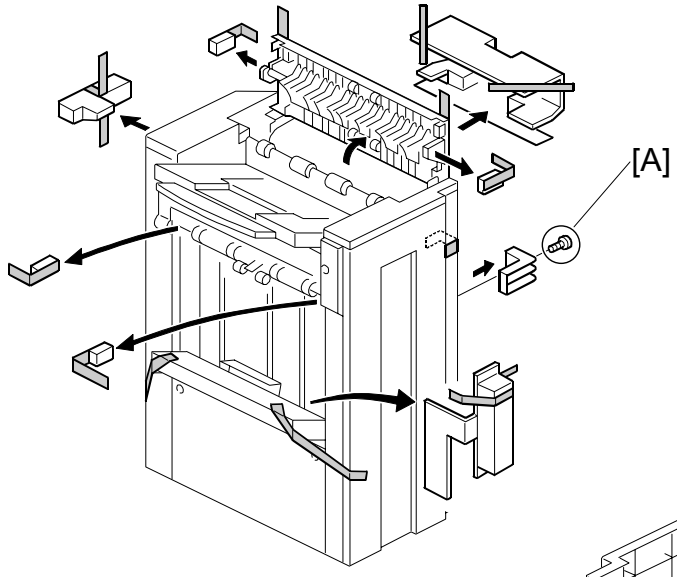
Check the quantity and condition of the accessories against the following list.



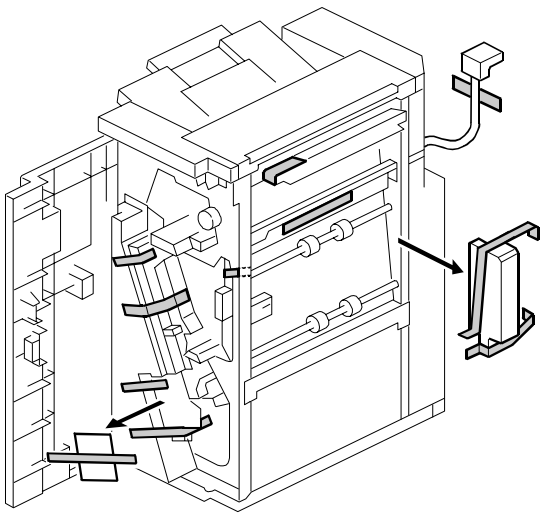
Description	Q'ty
1 Front Joint Bracket	1
2 Rear Joint Bracket *1	1
3 Rear Joint Bracket	1
4 Grounding Plate	1
5 Copy Tray	1
6 Staple Position Decal	1
7 Screw - M4 x 14	4
8 Knob Screw - M4 x 10	1
9 Screw - M3 x 8	1
10 Knob Screw - M3 x 8	1

*1: Rear joint bracket is not required for these models.

1.13.2 1000 SHEET FINISHER INSTALLATION PROCEDURE



B408I102.WMF

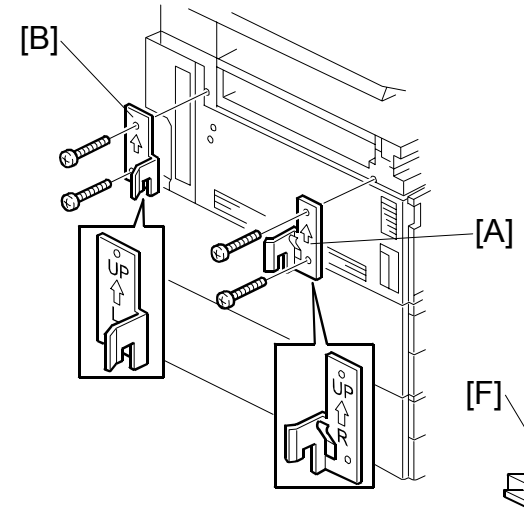


B408I103.WMF

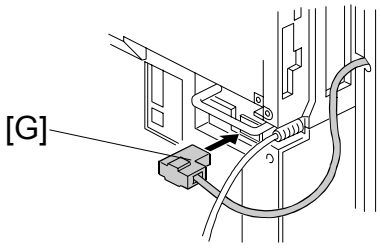
⚠CAUTION

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

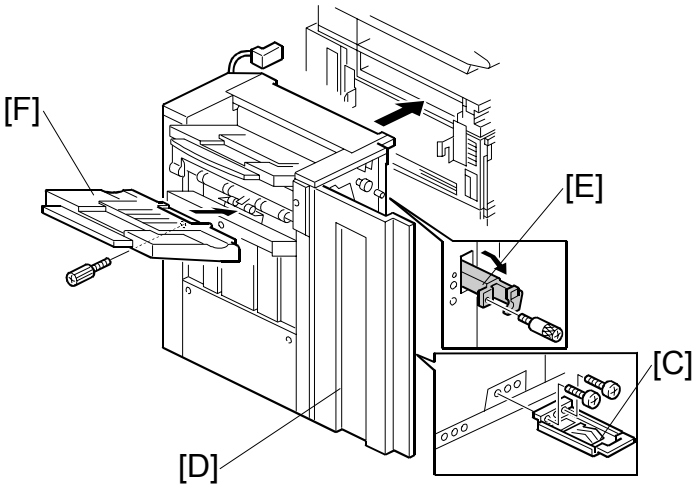
1. The following options must be installed before installing this finisher.
   - Bridge Unit (B538)
   - Paper Tray Unit (B542)
2. Unpack the finisher and remove the tapes.
   NOTE: Be sure to keep screw [A]. It will be needed to secure the grounding plate in Step 3.



B408I503.WMF

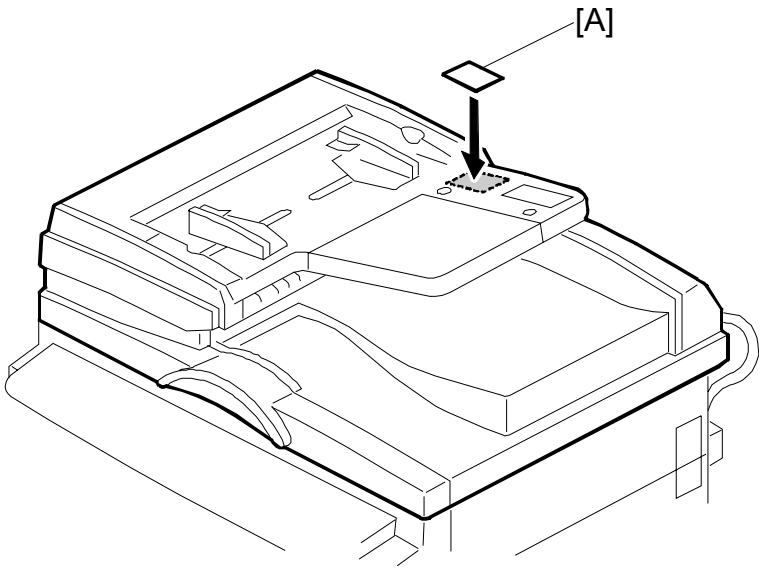


B408I504.WMF



B408I201.WMF

2. Install the front joint bracket [A] (2 screws - M4 x 14) and rear joint bracket [B] (☞ x2 M4 x 14).
3. Install the grounding plate [C] to the finisher (☞ x2 M3 x 8).
   NOTE: Use the screw removed in step 1 and the screw from the accessory box.
4. Open the front door [D] then pull the locking lever [E].
5. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
6. Secure the locking lever (☞ x 1 knob screw M3 x 8).
7. Close the front door.
8. Install the copy tray [F] (☞ x 1 knob screw M4 x 10).
9. Connect the finisher cable [G] to the main machine below the right rear handle.



B408I501.WMFF

10. Attach the staple position decal [A] to the ARDF as shown.
11. Turn on the main power switch and check the finisher operation.

1.13.3 CHECK ALL CONNECTIONS

1. Plug in the power cord and turn on the main switch.
2. Enter the printer user mode and print the configuration page.

   User Tools> Printer Settings> List Test Print> Config. Page

   NOTE: The same data can also be printed by executing SP1-004 – Print Summary. All installed options are listed in the “System Reference” column.

2. PREVENTIVE MAINTENANCE SCHEDULE

2.1 PM TABLE

NOTE: Amounts mentioned as the PM interval indicate the number of prints.

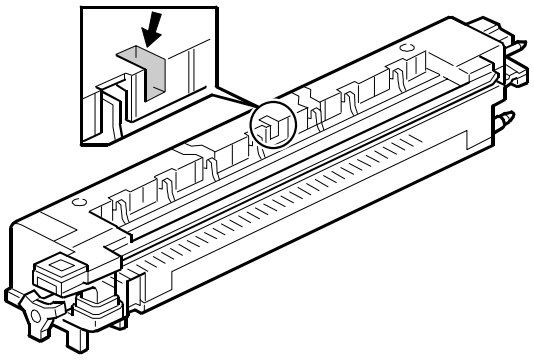
Symbol key: **C**: Clean, **R**: Replace, **L**: Lubricate, **I**: Inspect

B079/B082	EM	150K	300K	450K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		I	I	I	Do not use alcohol. Lubricate if necessary.
Platen Sheet Cover	C	I	I	I	Dry cloth or alcohol. Replace platen sheet if required.
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
Exposure Glass (Sheet through)		C	C	C	Dry cloth or alcohol
DRUM (OPC) AREA					
Charge Roller		R	R	R	
Charge Roller Cleaning Roller		R	R	R	
Drum Cleaning Blade 1		R	R	R	
Drum Cleaning Blade 2		R	R	R	
Quenching Lamp			C		Dry cloth
Pick-off Pawls		R	R	R	
Spurs		C	C	C	Dry cloth or alcohol
ID Sensor		C	C	C	Perform SP3-001-2 after blower brush cleaning.
Cleaning Entrance Seal		C	C	C	Blower brush. Replace if required.
Side Seal		I	I	I	

B003/B004B006/B007	EM	150K	300K	450K	NOTE
DEVELOPMENT UNIT					
Development Drive Gears		I	I	I	
Development Filter		R	R	R	
Developer		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	
Development Roller		C	C	C	Dry cloth
PAPER FEED					
Registration Roller	C	C	C	C	Water or alcohol.
Idle Roller Dust Blade		C	C	C	Detach and tap gently on flat surface to empty. Blower brush.
Registration Roller Dust Blade		C	R	C	Blower brush.
Paper Feed Roller	I	R	R	R	Check counter value for each (SP7-204). If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Separation Roller	I	R	R	R	
Pick-up Roller	I	R	R	R	
Paper Feed Roller (By-pass feed table)	I	R	R	R	
Separation Roller (By-pass feed table)	I	R	R	R	
Pick-up Roller (By-pass feed table)	I	R	R	R	
Paper Feed Guides		C	C	C	Water or alcohol.
Relay Rollers		C	C	C	Water or alcohol.
Bottom Plate Pad		C	C	C	Water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Water or alcohol.
Registration Sensor		C	C	C	Blower brush
Paper Feed Roller Gear		L	L	L	Silicone Grease G-501. See note below.*[1]
Upper Relay Sensor		C	C	C	Blower Brush
DUPLEX UNIT					
Upper Transport Roller		C	C	C	Water or alcohol.
Lower Transport Roller		C	C	C	Water or alcohol.
TRANSFER BELT UNIT					
Transfer Belt	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.

B079/B082	EM	150K	300K	450K	NOTE
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistors		R	R	R	
Cleaning Roller		R	R	R	
Cleaning Roller Bushings		L	L	L	Grease: Barrierta JFE 55/2
Hot Roller Strippers		C	R	C	Water or alcohol.
Paper Exit Guide Ribs		C	C	C	Water or alcohol. (See illustration below.)
Exit Sensor		C	C	C	Blower brush
DRIVE					
Drive Belts			I		Replace if necessary

Clean here.



B079P901.WMF

B541	EM	80K	160K	240K	NOTE
ARDF (for originals)					
Pick-up Roller	C	R	R	R	Belt cleaner
Feed Belt	C	R	R	R	Belt cleaner
Separation Roller	C	R	R	R	Dry or damp cloth
Sensors		C	C	C	Blower brush
Drive Gears		L	L	L	Grease, G501

B542	EM	150K	300K	450K	NOTE
PAPER TRAY UNIT					
Paper Feed Rollers		R	R	R	Check counter with SP7-204. If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Pick-up Rollers		R	R	R	
Separation Rollers		R	R	R	
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

B543	EM	150K	300K	450K	NOTE
LCT					
Paper Feed Roller		R	R	R	Check counter with SP7-204. If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Bottom Plate Pad		C	C	C	Dry or damp cloth

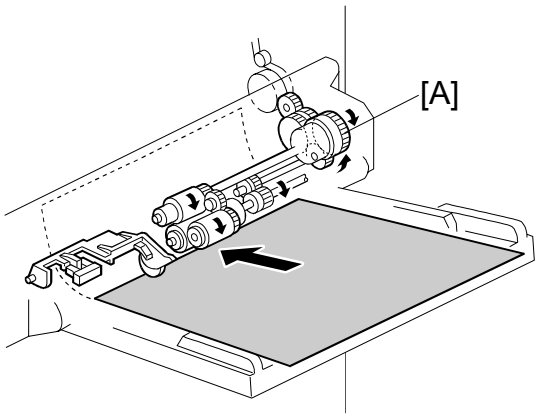
B408/B545	EM	150K	300K	450K	NOTE
1000-SHEET/TWO-TRAY FINISHER					
Rollers	C				Water or alcohol.
Brush Roller (A681 only)	I	I	I	I	Replace if required.
Discharge Brush	C	C	C	C	Dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if required.
Punch Waste Hopper*	I	I	I	I	Empty hopper.

*** Only for B545**

B546	EM	150K	300K	450K	NOTE
BOOKLET FINISHER					
Transport Belt		C	C	C	
Stapler Paddles		C	C	C	

B544	EM	150K	300K	450K	NOTE
1-BIN TRAY UNIT					
Rollers	C				Dry or damp cloth
Copy Tray	C				Dry or damp cloth
Sensors	C				Blower brush

*1 Lubricate the paper feed clutch gear [A] with Silicone Grease G501 every P.M.



B079P900.WMF

3. REPLACEMENT AND ADJUSTMENT

New design changes have been implemented in order to accommodate the new PxP (Polyester Polymerization) toner, which is of smaller particle size and allows lower fusing temperatures. This section describes some of these design changes and how they affect replacement and adjustment procedures.

PCU

- **New cleaning blade:** The PCU (Photoconductor Unit) must handle finer toner, so in addition to the stationary drum cleaning blade, a spring-loaded blade has been added for drum cleaning. The additional cleaning blade is required for the finer toner, and a new procedure for removal has been added. (☛ Drum Cleaning Blade)
- **Charge roller replacement:** The standard voltages for SP2001 1 have changed and must be checked after charge roller replacement.

Fusing Unit

The fusing unit can be operated at a lower temperature for the finer toner because it melts easily, so the following changes have been made in the fusing unit:

- **Cooling fans:** Two cooling fans have been added around the fusing unit, one on the right side of the machine and another on the right corner. Two new removal procedures have been added. (☛ 3.4.2, 3.4.3)
- **Hot roller knob:** The size of the knob on the end of the fusing unit is larger, making the roller easier to turn manually. (☛ 3.4.1)

Other Changes

While the following are not related to the new toner, they are nonetheless important changes:

- **Toner shield glass cover:** The shield glass is now equipped with a cover that locks the glass in place and prevents the shield glass from sliding out of the machine accidentally. (☛ 3.2.2)
- **Dust blades:** Two new paper dust blades have been added around the registration roller to clean paper dust from the paper feed path. Both blades can be easily removed and cleaned. (☛ 3.5.1, 3.5.2)
- **IOB:** The IOB (I/O Interface Board) has been moved from inside the machine to under the rear lower cover, making access much easier. (☛ 3.6.1)
- **Flash memory cards:** The number designations for the flash memory cards have changed. (☛3.1.1)

3.1 SPECIAL TOOLS AND LUBRICANTS

3.1.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
N8036701	Flash Memory Card – 4MB	1
N8031000	Case – Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
A2929500	Test Chart – S5S (10 pcs/Set)	1
G0219350	Parallel Loopback Connector	1

3.1.2 LUBRICANTS

Part Number	Description	Q'ty
A2579300	Grease Barrierta S552R	1
52039502	Silicone Grease G-501	1

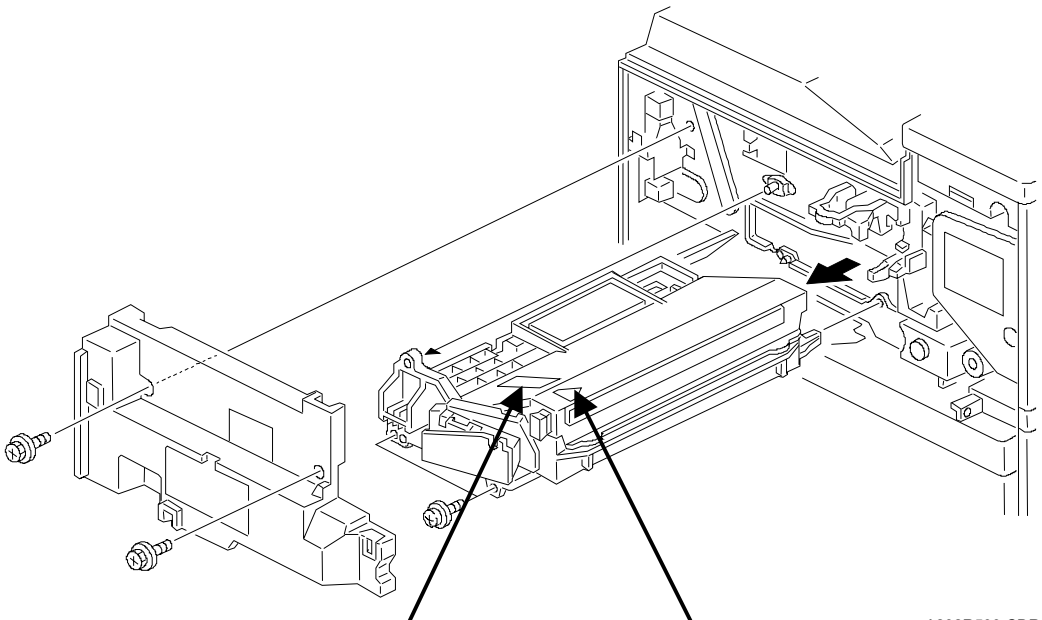
3.2 LASER UNIT

⚠WARNING

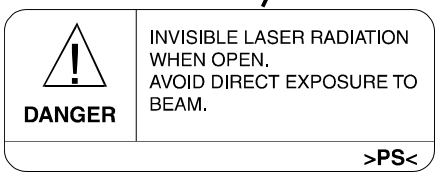
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

3.2.1 CAUTION DECAL LOCATIONS

Two caution decals are located in the laser section as shown below. (See the next page for removal instructions.)

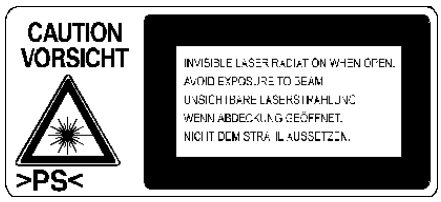


A232R500.CDR



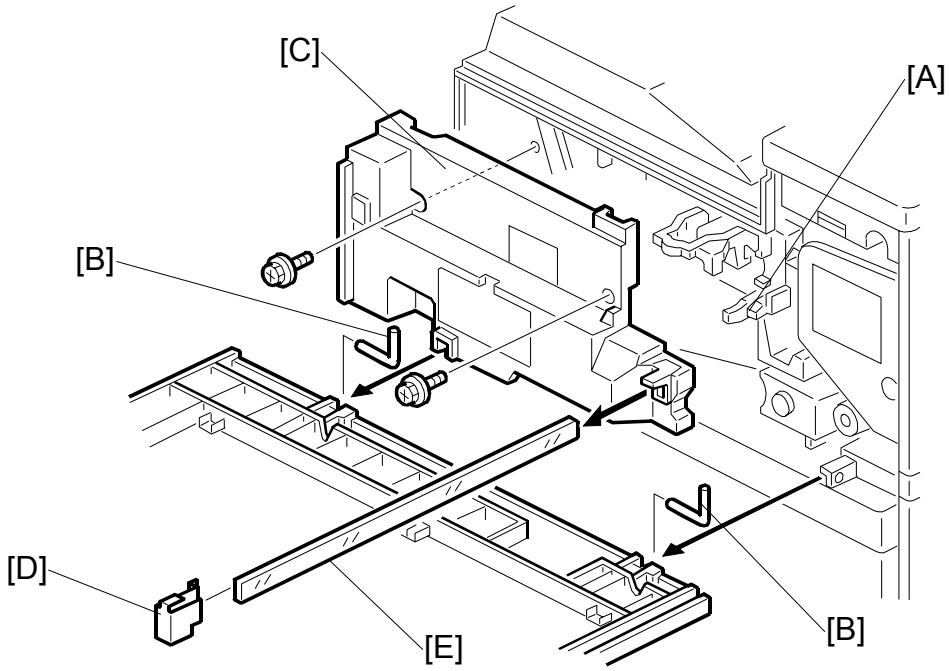
LASER-1.WMF

LASER-3.WMF



LASER-2.WMF

3.2.2 LASER UNIT



B079R211.WMF

⚠WARNING

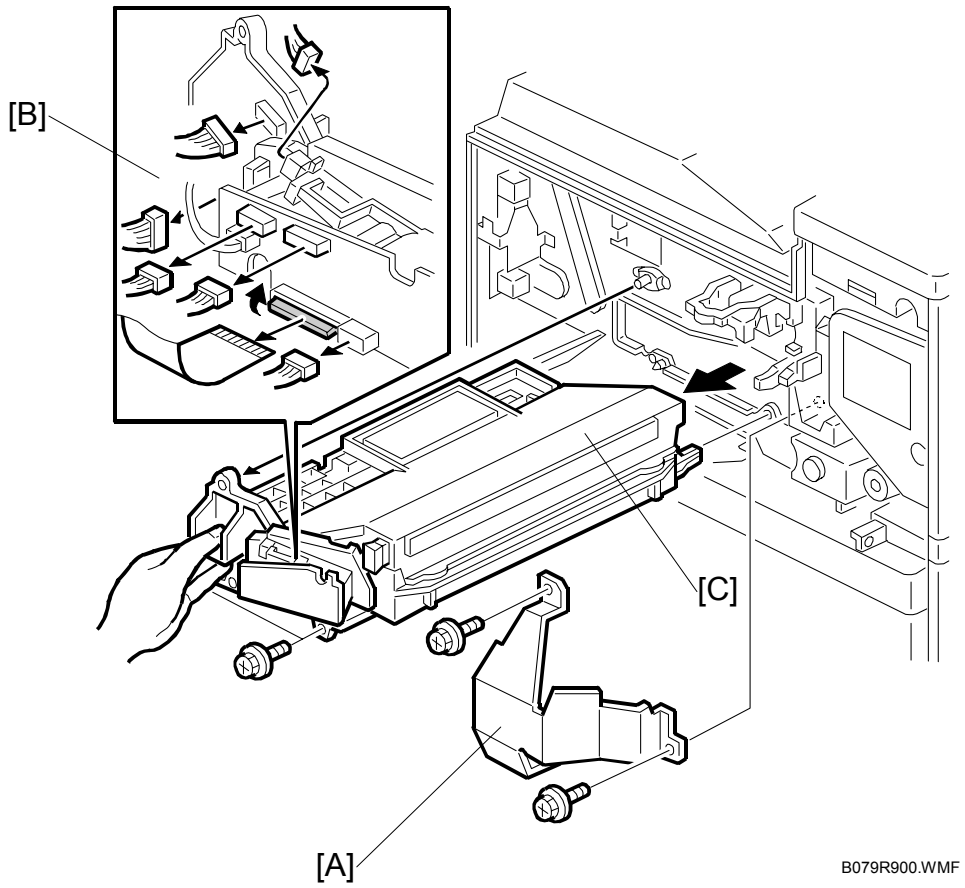
Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.

1. Open the front door and raise the toner bottle holder handle [A].
2. Front door (pins [B] x 2)
3. Inner cover [C] (🔩 x 2, ✋ x 1)
4. Shield glass cover [D].

   The shield glass cover holds the shield glass firmly in place and prevents it from accidental removal.

   To remove, on the left side press in the top leaf and pull off.

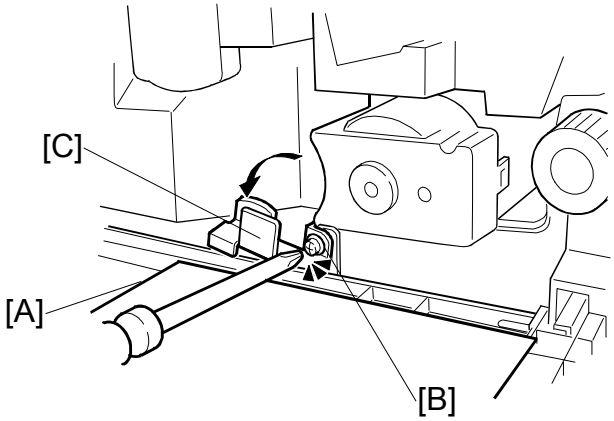
   When re-attaching the shield glass cover, note that the top leaf lies on top of the plastic form.
5. Shield glass [E]



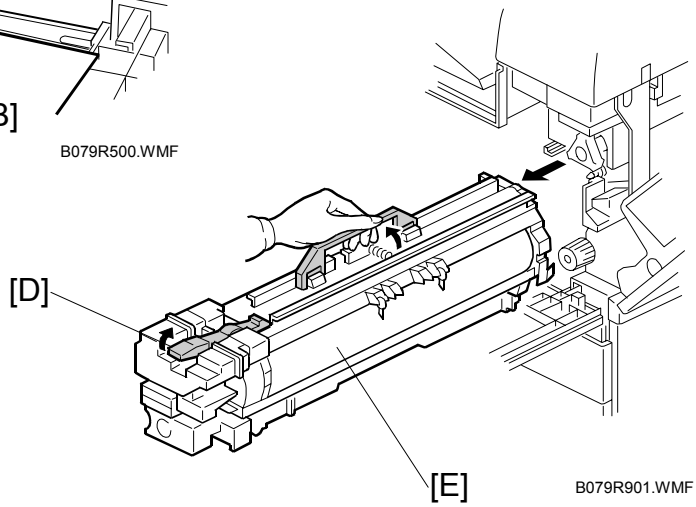
6. Shield plate [A] (☞ x 2)
7. Laser unit connectors [B] (☞ x 6, ☞ x1 flat cable)
   NOTE: Hold the LD board securely when disconnecting connectors.
8. Laser unit [C] (☞ x 2)
   NOTE: When sliding out the laser unit, do not hold the LD board. Hold the laser unit casing.

3.3 PHOTOCONDUCTOR UNIT (PCU)

3.3.1 PCU



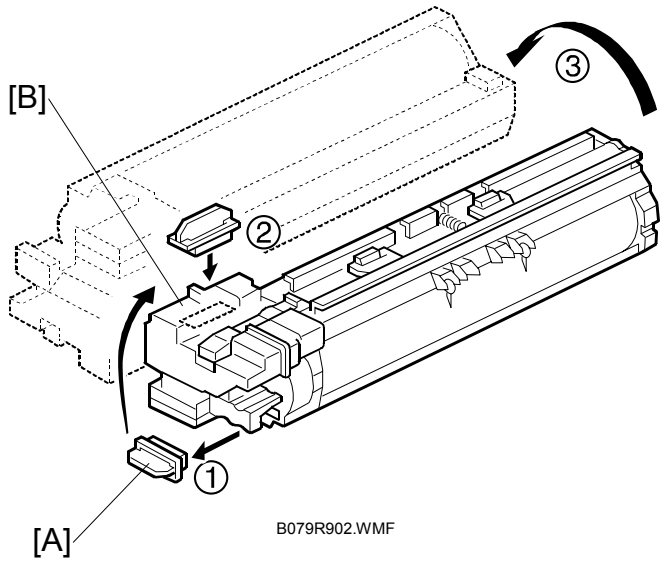
B079R500.WMF

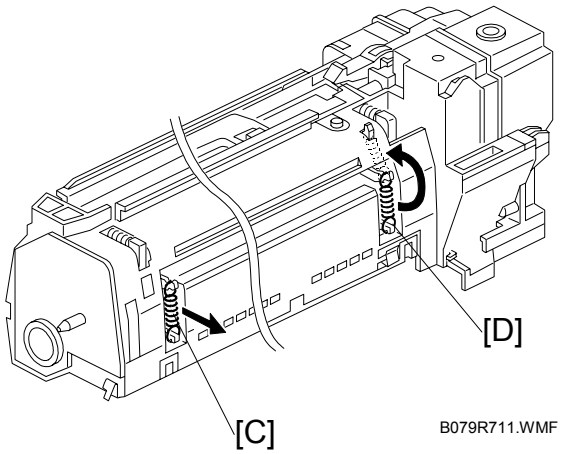


B079R901.WMF

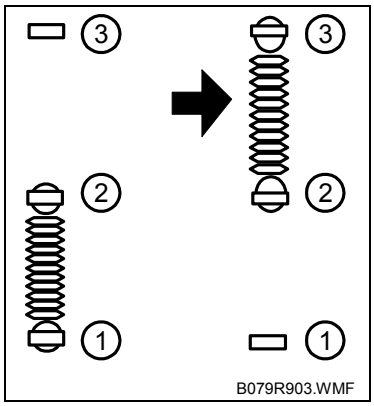
1. Open the front door.
2. Lower the by-pass tray, open the duplex unit, and open the transfer unit right cover.
3. Spread a sheet of A4 or LTR size paper [A] on top of the open front door.
   NOTE: This paper catches any loose toner that may fall from the PCU as it is removed.
4. Loosen [B] (🔩 x 1).
5. Rotate bracket [C] to the left.
6. Raise the release lever [D].
7. Hold the PCU [E] as shown and pull it out of the machine.
   NOTE: If the right cover is to be left open, cover the drum with paper, or remove the PCU and cover it with paper. Before you re-install the PCU, align the brackets on the PCU with the rails above and make sure they are engaged before you slowly push the PCU into the machine.

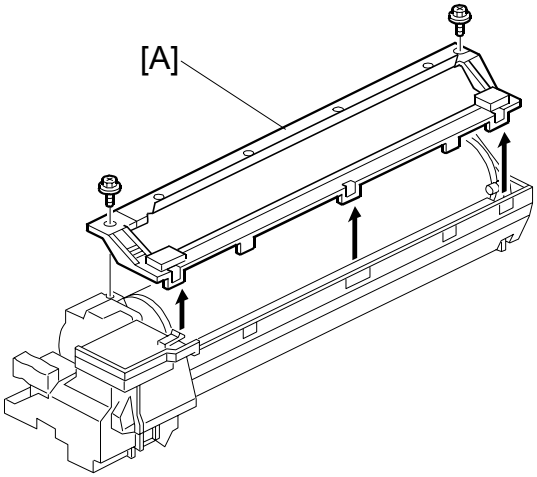
3.3.2 DRUM



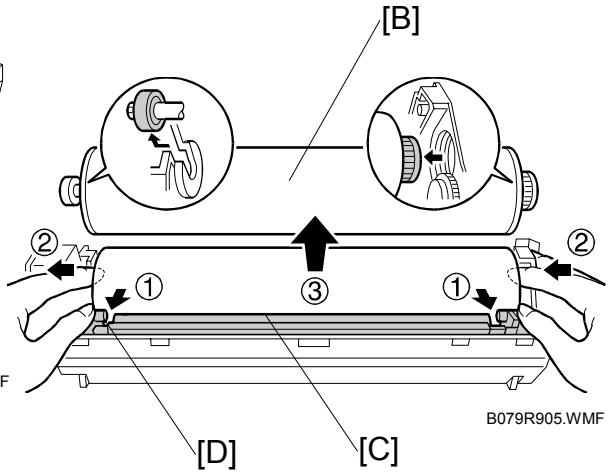


1. Remove the PCU (☛3.3.1)
2. Toner cap [A]
3. Insert cap [A] into the toner entrance hole [B].
   NOTE: Make sure that the cap is inserted completely into the hole.
4. On the left side of the PCU, disconnect the spring [C].
5. On the right side of the PCU disconnect the spring [D] and attach it to hooks as shown.
   - To prevent breaking the weaker hook ①, use a pair of needle-nose pliers to disconnect the spring at ②, then re-attach to ② and ③.
   - Moving this spring retracts the movable drum cleaning blade so it does not touch the surface of the drum when the drum is re-installed.





B079R904.WMF

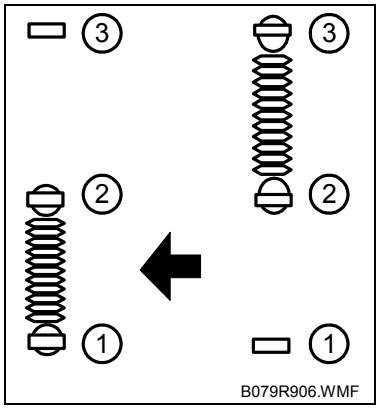


B079R905.WMF

6. Turn the PCU upside-down, and remove lower PCU cover [A] (🖉 x 2, 3 pawls).
7. Pull the drum [B] towards the front ② (the left side in the illustration) while releasing the charge roller [C] using the release lever ① [D], and then remove the drum ③.
   CAUTION: Never touch the drum surface with bare hands.
8. Replace the drum and re-attach the lower PCU cover.
9. Detach the spring from ②, ③and re-attach to ①, ②.

   CAUTION: You must return re-attach the spring to ①, ② in order for the cleaning blade to operate correctly.

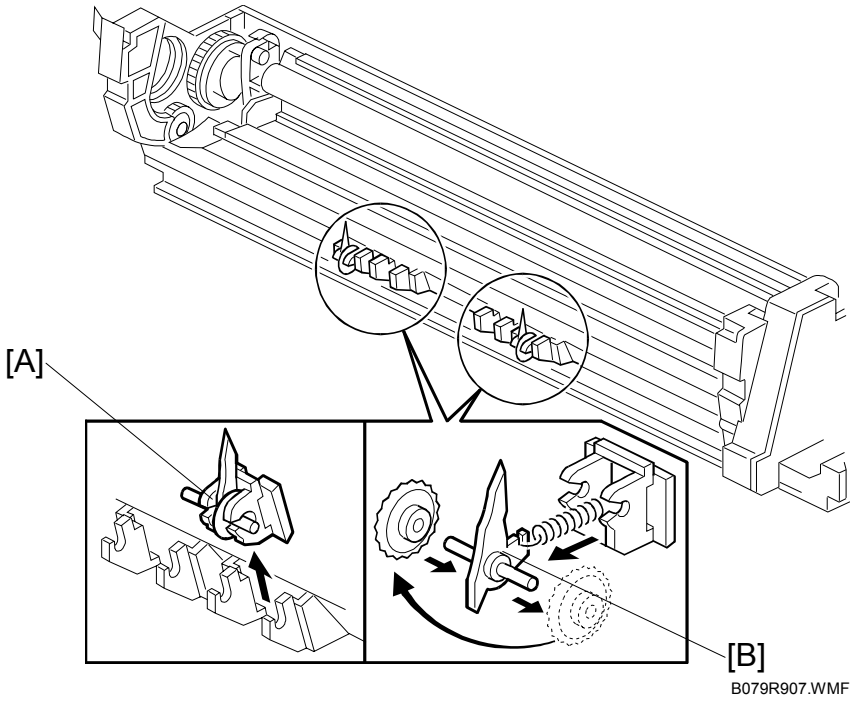
   If you fail to re-attach the spring to ①, ② the movable cleaning blade will not contact the drum for cleaning, but the machine will operate without generating an error. However, copies will gradually become dirty due to toner collecting on the drum.



B079R906.WMF

10. Re-attach the spring on the left side of the PCU.
11. After replacing the drum, perform the ID sensor initial setting using SP3001 002.
12. Do the process initial setting procedure (SP2805).

3.3.3 PICK-OFF PAWLS



1. Remove the drum. (☛ 3.3.2)
2. Pawl assembly [A]
3. Pick-off pawl [B] (spring x 1, spur x 1)

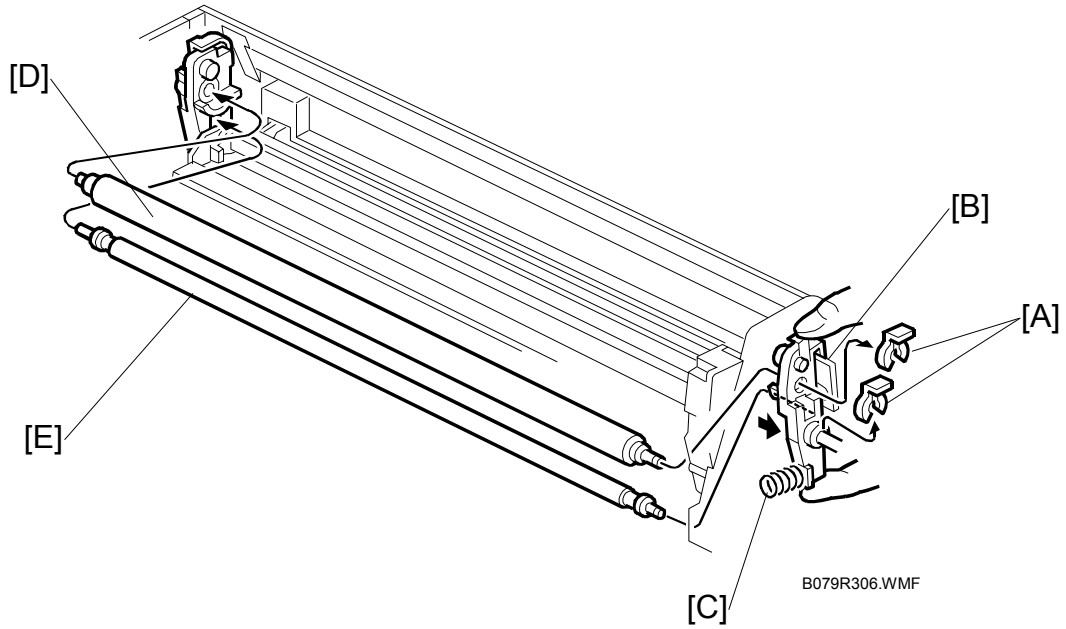
Pick-off pawl position adjustment

If the pick-off pawl has marked the drum with a line, the pick-off pawl position can be adjusted using either method:

- Changing the spur position.
- Changing the pick-off pawl assembly position

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.3.2)

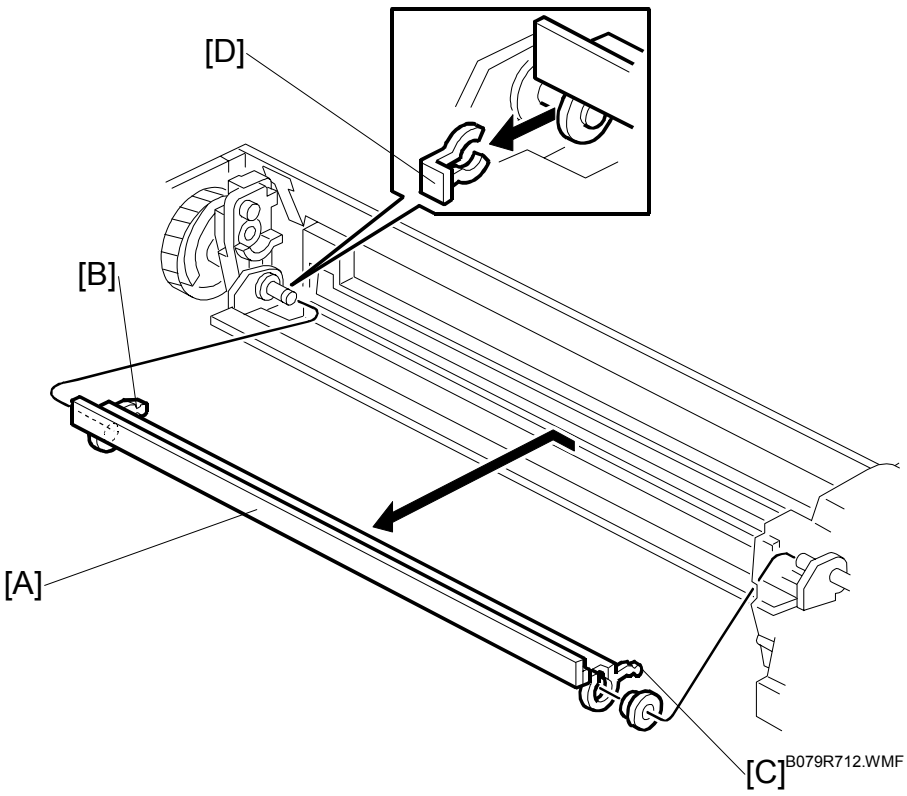
3.3.4 CHARGE ROLLER AND CLEANING ROLLER



1. Remove the drum. (☛ 3.3.2)
2. Two snap rings [A] (ⓢ x 2).
3. Push charge roller holder [B] toward the front of the PCU and remove the spring [C].
4. Charge roller [D].
   NOTE: Disengage the charge roller on the right side to remove. Try to avoid touching the charge roller.
5. Cleaning roller [E].
   NOTE: Disengage the cleaning roller on the left to remove.
6. After replacing the charge roller and cleaning roller, check the value of SP2001 001. If it is not at the standard value (1450 V), set SP2001 001 to –1450 V.
   NOTE: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.3.2)

3.3.5 DRUM CLEANING BLADE 2



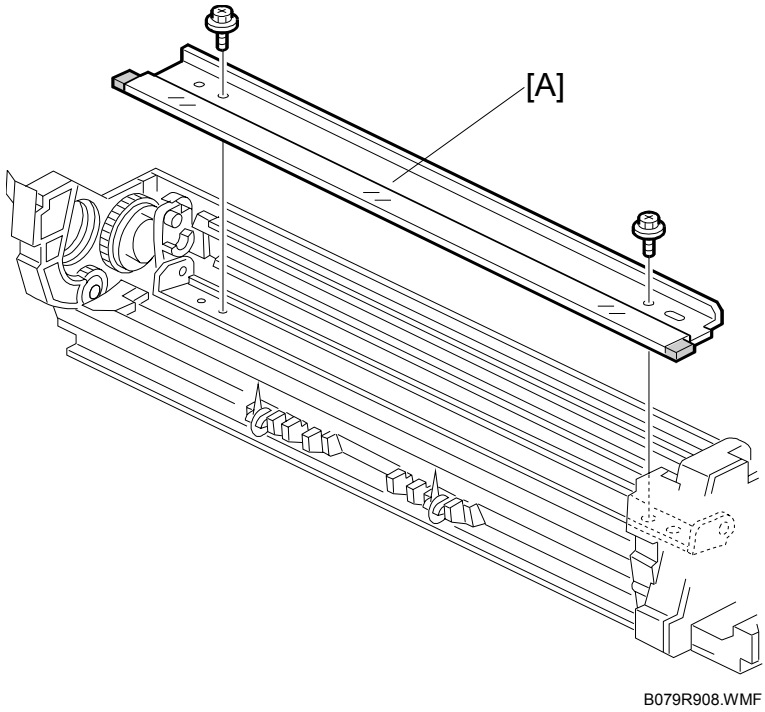
1. Remove the OPC drum. (☛ 3.3.2)
2. Remove the charge roller and cleaning roller. (☛ 3.3.4)
3. Remove the movable cleaning blade [A]. (⟲ x 1)

Re-installation

- Engage the left end of the cleaning blade first, then make sure that both arms [B] and [C] are through the holes on the left and right side.
- When you re-attach the snap-ring, make sure that the head of the snap ring [D] is below the blade.

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.3.2)

3.3.6 DRUM CLEANING BLADE 1



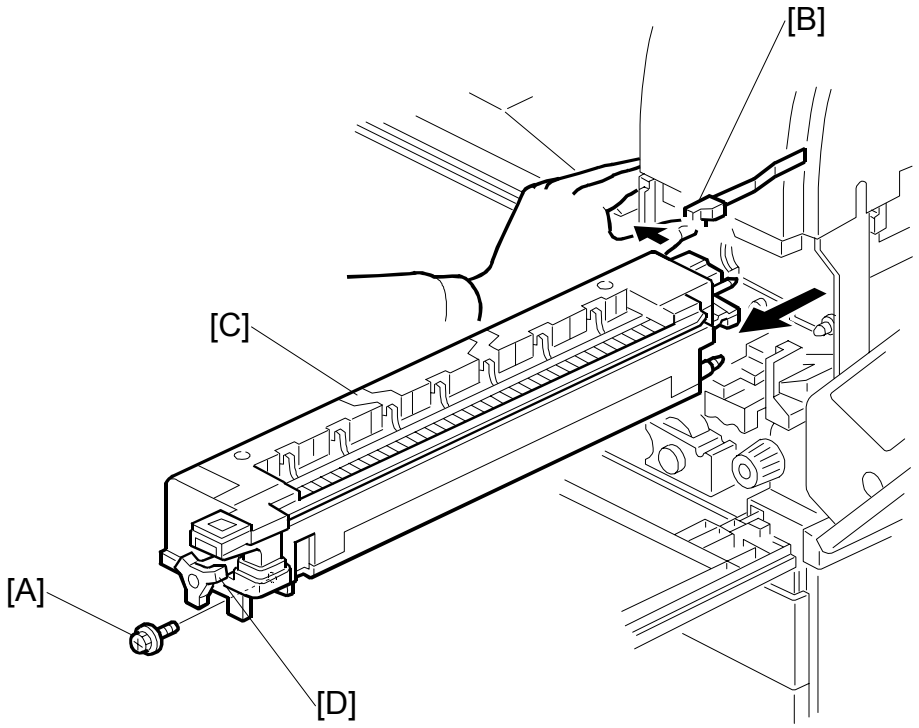
1. Remove the drum. (☛ 3.3.2)
2. Remove the charge roller and cleaning roller. (☛ 3.3.4)
3. Remove the movable cleaning blade. (☛ 3.3.5)
4. Remove the stationary drum cleaning blade [A] (🔩 x 2)

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.3.2)

3.4 FUSING UNIT

⚠CAUTION
Allow time for the unit to cool before doing the following procedure.

3.4.1 FUSING UNIT REMOVAL

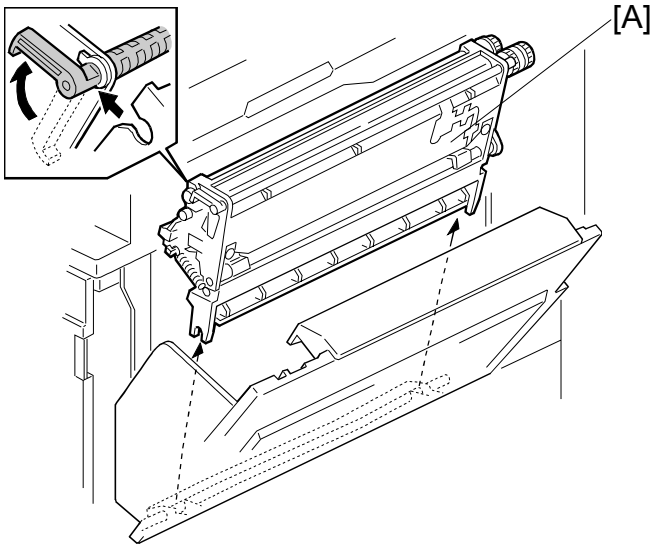


B079R611.WMF

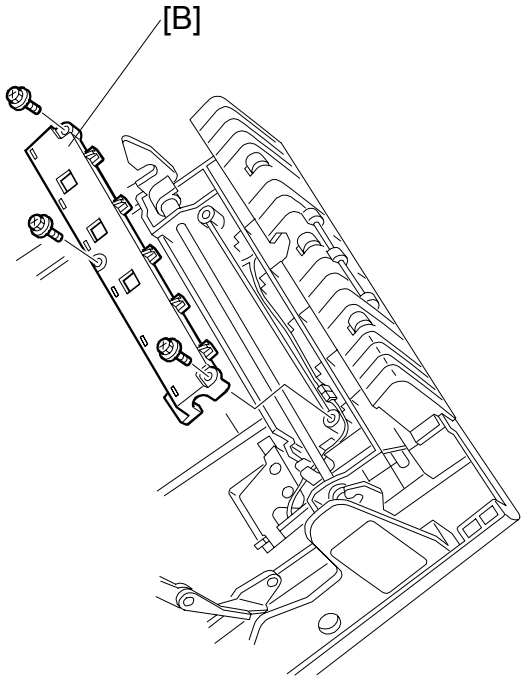
1. Open the front door, duplex unit, and right door.
2. Set screw [A] (🔩 x 1)
3. Fusing unit release lever [B]
4. Slide out the fusing unit [C]

NOTE: A larger knob [D] is provided to make turning the hot roller easier to free jams.

3.4.2 FUSING UNIT SIDE FAN

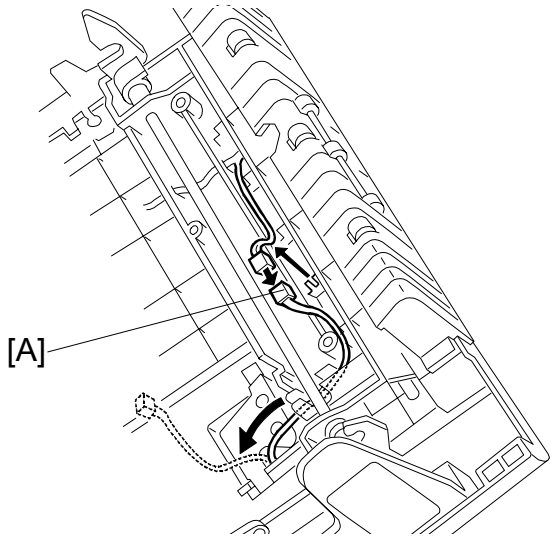


B079R909.WMF

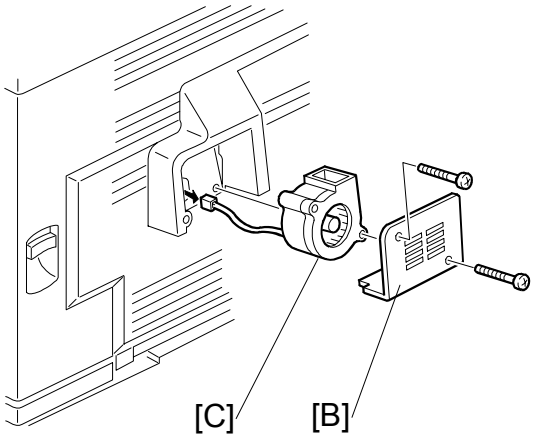


B079R713.WMF

1. Open the duplex unit and right door.
2. Release the transfer unit [A] and remove it.
3. Remove the shaft cover [B] (☞ x 3).



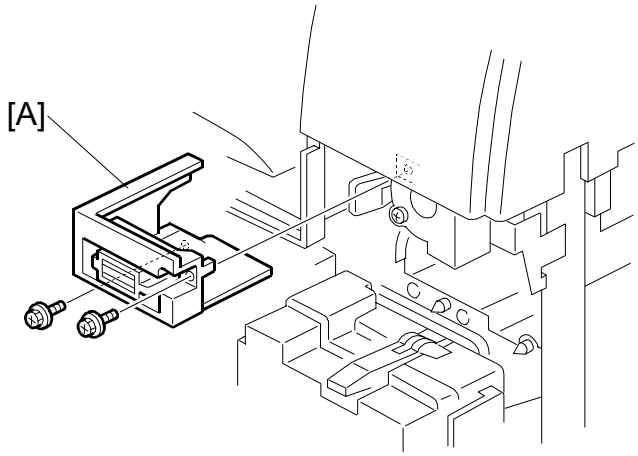
B079R714.WMF



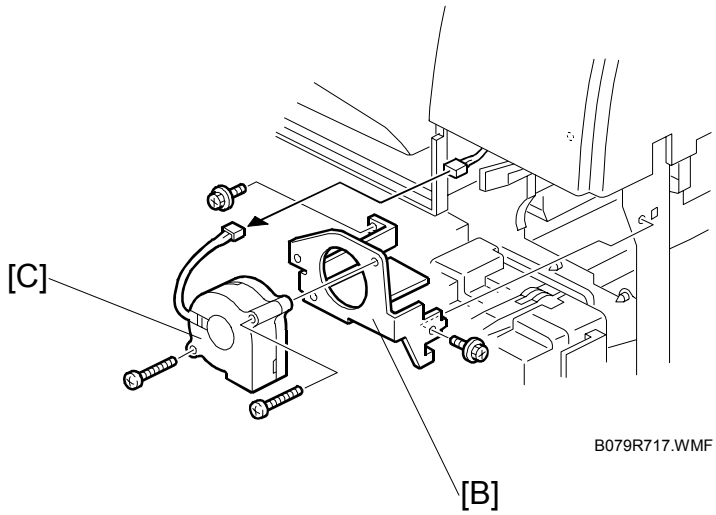
B079R715.WMF

4. Separate the fan connectors [A] (☞ x 1).
   NOTE: When re-connecting, be sure the thread the connector correctly between the gaps.
5. Close the right door.
6. Use a short screwdriver to remove the fan plate [B] (☞ x 2).
7. Pull the fan [C] out of the machine.

3.4.3 FUSING UNIT CORNER FAN



B079R716.WMF

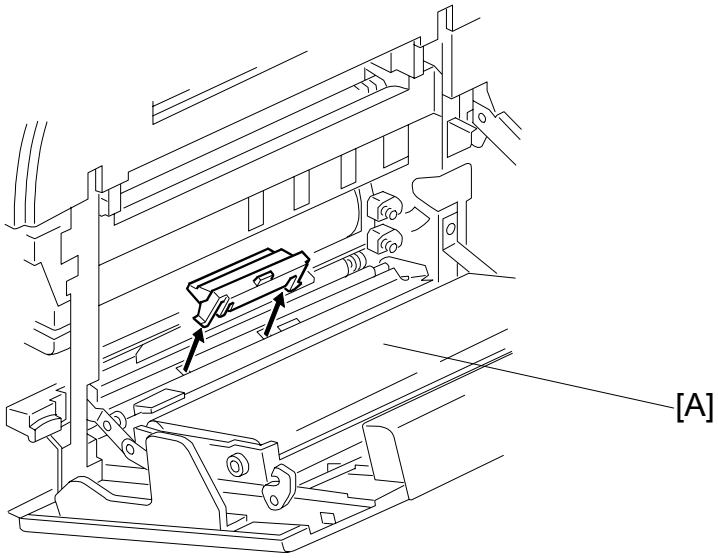


B079R717.WMF

1. Open the front door.
2. Open the duplex unit and right door.
3. Remove the fusing unit. (☛ 3.4.1)
4. Remove the magnet lock [A] of the front door (☞ x 2).
5. Remove the fan bracket [B] (☞ x 2).
6. Remove the fan [C] from the bracket (☞ x 2).

3.5 PAPER FEED

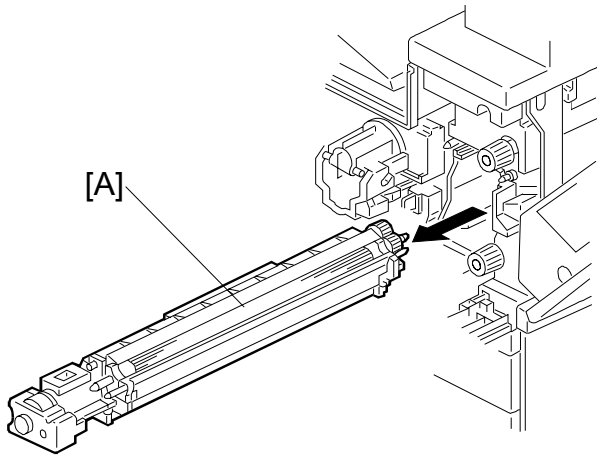
3.5.1 IDLE ROLLER DUST BLADE



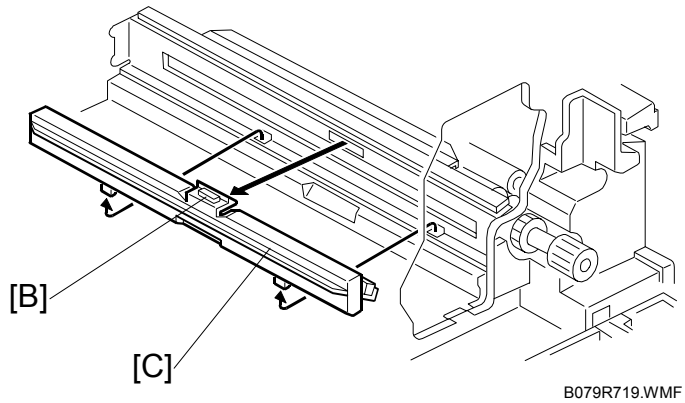
B079R718.WMF

1. Open the duplex unit and right door.
2. Detach the dust blade [A].
3. Spread some paper on a flat surface and tap the dust blade gently to remove paper dust collected in its dust box.

3.5.2 REGISTRATION ROLLER DUST BLADE



B079R910.WMF

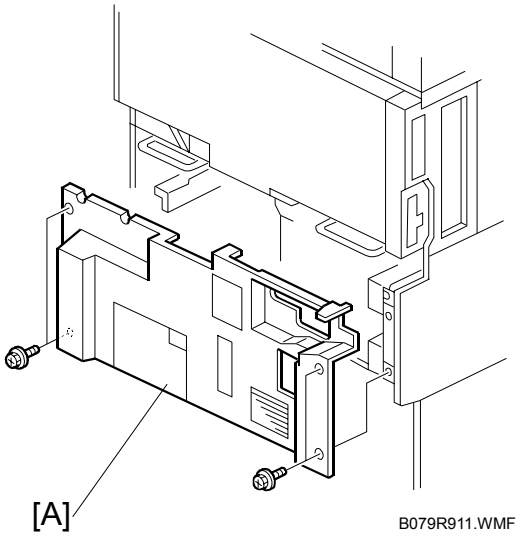


B079R719.WMF

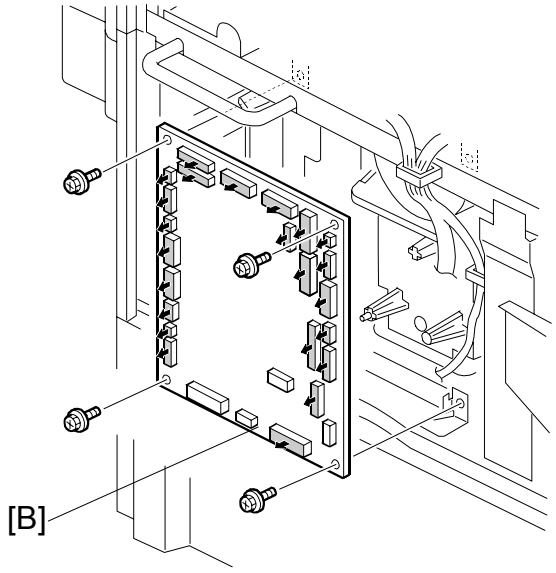
1. Open the duplex unit and open the right door.
2. Remove the PCU. (☛ 0)
3. Remove the development unit [A].
4. Press the top of the blade [B] to unlock it and open it to the left.
5. Remove the dust blade [C] from the machine.

3.6 PRINTED CIRCUIT BOARDS

3.6.1 IOB



B079R911.WMF



B079R720.WMF

1. Remove the rear lower cover [A] (x 4).
2. Remove the IOB [B] (All, x 4, Ribbon cable x 1).
3. The IOB is identical for the B079/B082. However, the DIP switches are set differently for each machine. Check the DIP switches then adjust settings as required. (See next page.)

IOB DIP Switch Settings (SW101)

1. The position of SW 1 determines the engine speed. This switch should be UP (ON) for the B079 (35 cpm) or DOWN (OFF) for the B082 (45 cpm)
   NOTE: Move a switch UP to ON or DOWN to OFF.

2. SW 2, 3, 4, and 5 should all be DOWN (OFF). Do not change these settings. This information is only for reference:

SW	If set to ON
2	Switches off jam detection.
3	Engine program recovery.
4	Print output for debugging.
5	Checking duplex function at the factory.

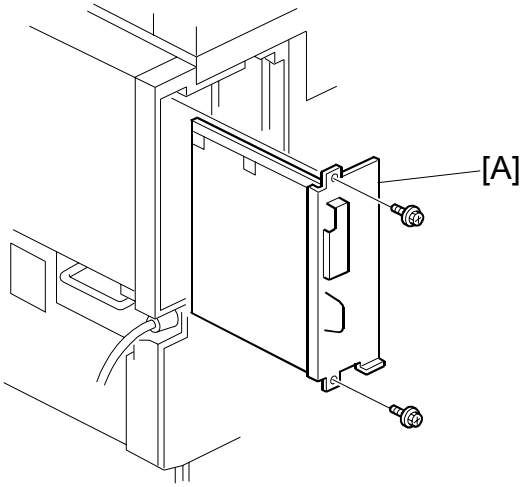
3. SW 6, 7, 8 should be set for the area where the machine is used and serviced.

6	7	8	Location
OFF	OFF	OFF	Japan
ON	OFF	OFF	North America
OFF	ON	OFF	Europe
OFF	OFF	ON	China
ON	OFF	ON	Taiwan
ON	ON	OFF	Asia
OFF	ON	ON	Korea
ON	ON	ON	Not used

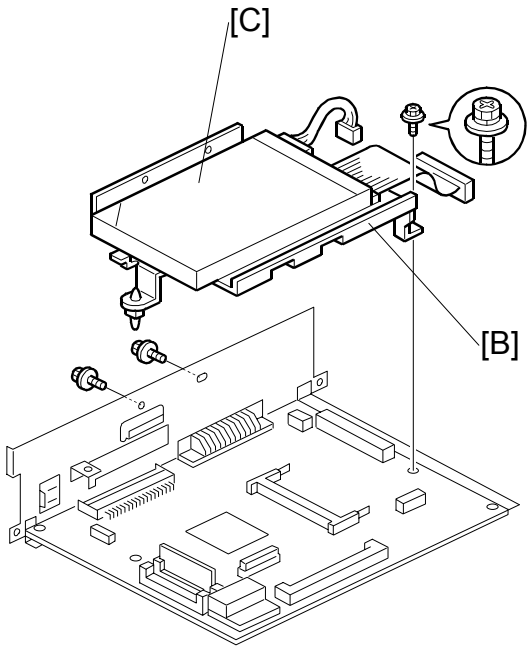
ON: Up
OFF: Down

3.7 HARD DISK, CONTROLLER BOARD

NOTE: The controller boards are machine specific, i.e. the controller board for the B079 (35 cpm) must be installed in the B079 copier, and the controller board for the B082 (45 cpm) must be installed in the B082 copier. These controller boards are not interchangeable.



B079R913.WMF



B079R914.WMF

1. Controller board [A] (x 2)
   NOTE: Use the wire handle to slide the HDD out of the expansion box.
2. HDD unit bracket [B] (x 3, x 2)
3. HDD unit [C] (x 4)
   NOTE: Work carefully to avoid dropping or hitting the HDD.

After replacing the HDD, execute SP 5853 to copy the stamp data from the firmware ROM to the new disk. No flash card is needed.

4. TROUBLESHOOTING

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED (☀①) lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent damage to the machine, the main machine cannot be operated until the SC has been reset by a service representative (see the note below).	Enter SP mode, and then turn the main power switch off and on.
B	If the SC was caused by incorrect sensor detection, the SC can be reset by turning the main power switch off and on.	Turn the operation switch and main power switch off and on.
C	The main machine can be operated as usual, excluding the unit related to the service call.	Turn the operation switch off and on.
D	The SC history is updated. The machine can be operated as usual.	The SC will not be displayed. Only the SC history is updated.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

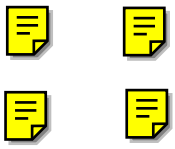
4.1.2 SC CODE DESCRIPTIONS

NOTE: This is a list of the new and revised SC codes for the B079 (35 cpm) and B082 (45 cpm) machines. For details about other SC codes please refer to Service Manual of the previous models.

Code No.		Symptom	Possible Cause
320 (Deleted)	**C**	Polygon motor error	
335 (New)	**C**	Polygonal Mirror Motor Error 1: ON Timeout The XSCRDY signal is not issued (LOW: Active) within 25 s after the polygonal mirror motor switches on.	• I/F harness of the polygonal mirror motor disconnected or defective. • Polygonal mirror motor or polygonal mirror motor driver defective. • Polygonal mirror motor drive pulse is not output incorrectly. • GABIC cannot monitor XSCRDY signal.
336 (New)	**C**	Polygonal Mirror Motor Error 2: OFF Timeout The XSCRDY signal is not issued (HIGH: Inactive) within 2 s after the polygonal mirror motor switches off.	• I/F harness of the polygonal mirror motor disconnected or defective. • Polygonal mirror motor or polygonal mirror motor driver defective. • Polygonal mirror motor drive pulse is not output incorrectly. • GABIC cannot monitor XSCRDY signal.
337 (New)	**C**	Polygonal Mirror Motor Error 3: XSCRDY Signal Error The XSCRDY is not issued (HIGH: Inactive) after the polygonal mirror motor has been rotating normally for 600 ms.	• I/F harness of the polygonal mirror motor disconnected or defective. • Polygonal mirror motor or polygonal mirror motor driver defective. • Polygonal mirror motor drive pulse is not output incorrectly. • GABIC cannot monitor XSCRDY signal.
338 (New)	**C**	Polygonal Mirror Motor Error 4: Unstable Timeout The XSCRDY signal is detected LOW) (Active) after the polygonal mirror motor switches on, but the signal is not detected LOW after 1 s has elapsed, and not detected after another 500 ms has elapsed.	• I/F harness of the polygonal mirror motor disconnected or defective. • Polygonal mirror motor or polygonal mirror motor driver defective. • Polygonal mirror motor drive pulse is not output incorrectly. • GABIC cannot monitor XSCRDY signal.
450 (New)	**C**	Feed Development Motor Error The PLL lock signal remains LOW for 2 s while the feed development motor is operating.	• Motor lock caused by overload. • Motor driver defective.
520 (New)	**C**	Fusing/Feed-Out Motor Error The PLL lock signal remains LOW for 2 s while the feed development motor is operating.	• Motor lock caused by overload. • Motor driver defective.

Code No.		Symptom	Possible Cause
818 (New)	**B**	Watch Dog Error	
		While the system program is running, a bus hold or interrupt program goes into an eternal loop, preventing any other programs from executing.	• System program defective • Controller board defective • Peripheral device malfunction
838 (Deleted)	**B**	Self-diagnostic Error: Clock Generator	
840 (New)	**C**	Self-Diagnostic Error 1: EEPROM Access Error	• EEPROM defective • EEPROM worn out
		During input/output with the EEPROM, one of the following errors occurred: • A read error occurred, then continued after 3 retries. • Write error occurred.	
841 (New)	**C**	Self-Diagnostic Error 2: EEPROM Read/Write Data Error	• The data is being written into the 3 designated errors differently
		The values of the data written and “mirrored” in 3 errors are all detected as not matching..	
853 (New)	**B**	Wireless LAN Error: Card Error 1	• Wireless LAN card not inserted into the wireless LAN board
		The wireless LAN board can be accessed, but the wireless LAN card (IEEE 802.11b or Bluetooth) cannot access the board.	
854 (New)	**B**	Wireless LAN Error Card Error 2	• Wireless LAN card has been removed
		The board that holds the wireless LAN card can be accessed, but the wireless LAN card (802.11b/Bluetooth) itself cannot be accessed while the machine is operating	
855 (New)	**B**	Wireless LAN Error 3: Card Error 3	• Wireless LAN card defective • Wireless card connection not tight
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
856 (New)		Wireless LAN Error 4: Board	• Wireless LAN card board defective • PCI connector loose
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
857 (New)	**B**	USB I/F Error	• The USB driver can generate three types of errors: RX, CRC, and STALL errors. Only the STALL error can generate this SC code.
		The USB driver is unstable and generated an error. The USB I/F cannot be used.	
870 (New)	**B**	Address Book Data Error	• Software defective • HDD defective
		Address book data stored on the hard disk was detected as abnormal when it was accessed from either the operation panel or the network.	

Code No.		Symptom	Possible Cause
871 (New)	**B**	FCU Flash ROM Error The address book written into the flash ROM mounted on the FCU is detected as defective.	• Flash ROM device defective • Replace flash ROM on the MBU
880 (New)	**B**	MLB Error A request for access to the MLB (Media Link Board) was not answered within the specified time.	• MLB defective
920 (New)	**B**	Printer Error 1 An internal application error was detected and operation cannot continue.	• Software defective • Insufficient memory
925 (New)	**B**	Network File Error NIA	• NIA
964 (Revised)	**C**	Scanner Start Error During scanned image processing, another command to start scanning was received.	• Software defective
992 (New)	**A**	Unexpected Software Error Software encountered an unexpected operation not defined under any SC code.	• Software defective • An error undetectable by any other SC code occurred
995 (New)	**A**	Machine Type Information Error After the machine is powered on, a mismatch is detected between the CPM information sent from the controller to the engine and the CPM information specified by the DIP SW settings.	The B079 (35 cpm) and B082 (45 cpm) use the same controller board, but the DIP SW settings must be set correctly for the machine speed. For details, see Section “3. Replace and Adjustment”.



4.2 ELECTRICAL COMPONENT DEFECTS

4.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home Position (S1)	504-5(SIB)	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
Platen Cover (S2)	504-8 (SIB)	Open	APS and ARE do not function properly.
		Shorted	No symptom.
Original Width (S3)	505-3, 4 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S4)	505-8,9 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S5)	505-13 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
LD Unit Home Position (S6)	204-B2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S7)	222-5 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-01 is displayed.
Paper Exit (S8)	202-B2 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration (S9)	224-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The The Paper Jam indicator will light whenever a copy is made.
Image Density (ID) (S10)	203-5 (IOB)	Open	SC350-03 is displayed after copying.
		Shorted	SC350-01 is displayed after copying.
Upper Paper Height (S11)	220-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-02 will be displayed.
		Shorted	SC501-01 is displayed.
Lower Paper Height (S12)	214-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-02 will be displayed.
		Shorted	SC502-01 is displayed.
Upper Paper End (S13)	220-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.

Component (Symbol)	CN	Condition	Symptom
Lower Paper End (S14)	214-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S15)	220-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay (S16)	214-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Transfer Belt Position (S19)	202-A10 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

4.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	216-4 (IOB)	Open	“Doors/Covers Open” is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU) 107-1	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	107-1 (PSU)	Open	“Doors/Covers Open” is displayed even if the front cover is closed.
		Shorted	“Doors/Covers” Open is not displayed even if the front cover is opened.

4.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom at power on
	115V	210 ~ 230V	
Power Supply Board			
FU1	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” is displayed
FU2	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” for the finisher is displayed
FU3	6.3A / 125V	6.3A / 250V	Paper end condition
FU5	6.3A / 125V	6.3A / 250V	SC302, or SC403, or SC405 displayed
FU6	3.15A/125V	3.15A/250V	
FU9	4A/125V	4A/250V	
FU101	15A / 125V	---	No response
FU102	10A / 125V	5A / 250V	No response
FU103	2A / 125V	1A / 250V	Normal operation (optional heaters do not work)

4.4 LEDS

BICU LED Sequences

	LED 101 (Green)	LED 102 (Red)	LED 103 (Orange)
Normal Operation	Flashes	Off	Flashes
System Startup	Flashes	On (1~2s) then Off	Flashes
Firmware Update: Normal Execution	Flashes	On	Flashes
Firmware Update: Error	Flashes	Flashes	Flashes
Firmware Update: Normal End	Flashes	Off	Flashes
Energy Save Mode	Off	Off	Off

Controller LED Sequences

	LED 1 (Red)	LED 2 (Red)
System Startup (including Self-Diagnostics)	On	Off
Self-Diagnostic Error	On	On
Normal Operation	Flashes	Off
Firmware Update: Normal Execution	Flashes	Flashes
Firmware Update: Error	Off	Off
Firmware Update: Normal End	On	On

NOTE: LED 1 monitors Data Bus Bit 14, LED 2 monitors Data Bus Bit 15.

4.5 TEST POINTS

Controller Board

Number	Monitored Signal
TP1	GND
TP3	GND
TP6	GND
TP8	DB0 RXD
TP9	DB0 TXD
TP10	GND
TP11	+5VE
TP12	GND
TP13	+5V
TP14	+5VE
TP15	GND
TP16	R_FGATE
TP17	W_FGATE

5. SERVICE TABLES

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

5.1 SERVICE PROGRAM MODE TABLES

Due to fundamental changes in image processing Group 4 and controller related additions in Group 5, all the SP codes for the B079 (35 cpm) and B082 (45 cpm) are included in the tables below.

5.1.1 SERVICE TABLE KEY

Notation	What it means
[range / **default** / step]	Example: [-9 ~ +9 / **+3.0** / 0.1 mm step]. The setting can be adjusted in the range ±9, value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
italics	Comments added for reference.
*	Value stored in NVRAM. After a RAM reset, this default value (factory setting) is restored.
1111	An SP number set in bold-italic denotes a "Special Service Program" mode setting that appears only after entering the SP mode by pressing # on the 10-key pad and "Copy SP" on the touch-screen together.
B079	Denotes the 35 cpm model.
B082	Denotes the 45 cpm model.
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan only	The feature or item is for Japan only. Do not change this value.
LEF	Long Edge Feed
SEF	Short Edge Feed
(☛6.2 Image Processing)	Refer to "6.2 Image Processing" in "6. Details". Due to fundamental changes in how image processing adjustment is done with Group 4 SP codes, more details are provided in Section 6.

Service Tables

5.1.2 SERVICE TABLES

SP1-xxx: Feed

SP1	Mode Number		Function and [Setting]
1001*	Leading Edge Registration		Adjusts the printing leading edge registration using the trimming area pattern (SP2-902-3, No.11). [+9 ~ –9 / **3.0** / 0.1 mm] Use # to toggle between ± before entering the value. Specification: 3 ±2 mm
1002*	Side-to-Side Registration		Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.11). Use the # key to toggle between + and – before entering the value. Specification: 2 ±1.5 mm
	1	Tray1	[–9 ~ +9/ **+3.0 mm** / 0.1 mm step]
	2	Tray2	
	3	Tray3	[–9~ +9/ **+2.0 mm** / 0.1 mm/step] *Tray3, Tray4 for Paper Feed Unit.*
	4	Tray4	
	5	Duplex Tray	[–9 ~ +9/ **+0.0 mm** / 0.1 mm/step]
	6	By-pass Tray	[–9 ~ +9/ **+3.0 mm** / 0.1 mm/step]
	7	LCT (if present)	[–9 ~ +9/ **+1.5 mm** / 0.1 mm/step]
1003*	Registration Buckle Adjustment		
	1	Paper Feed Trays/LCT	Adjusts the relay clutch timing at registration. Relay clutch timing determines the amount of paper buckle at registration. (A "+" setting causes more buckling.) [–9 ~+9/**0**/1 mm step]
	2	Duplex Tray	
	3	By-pass Tray	
	4	Tray1 Feed	
1007	By-pass Feed Paper Size Display		Displays the paper width sensor data for the by-pass feed table.
1012*	Exit Junction Solenoid Start Timing		Adjusts the timing of the solenoids at the entrance and exit of the paper exit section to accommodate the increased speed of the duplex unit. *This SP has been added to compensate for the increased operation speed of the duplex unit for this machine. Increase the value if the leading edges are jamming. Decrease the value if trailing edges are bending at the entrance.*
	1*	Exit Entrance Junction Solenoid	B079: [200 ~ 450 ms / **370 ms** / 10 ms]
	2*	Exit Last Junction Solenoid	B082: [200 ~ 450 ms / **300 ms** (ent.) **370 ms** (exit) /10 ms]
1103*	Fusing Idling		Switches fusing idling on/off. When on, printing will not start until enough time has elapsed so the hot roller can reach optimum temperature. This ensures even heat on the hot roller. *Switch on if fusing on the 1st and 2nd copies is incomplete (this may occur if the room is cold.)*

SP1	Mode Number		Function and [Setting]
1103*	1*	Enable Fusing Idling	**0 = Off**, 1 = On *In a cold environment, switch on and then set the idling time with SP1-103-2 to ensure the quality of the first copies.*
	2*	Fusing Idling Interval	[0 ~ 60 sec. / **30 sec.** / 1 sec.] *You must switch SP1-103-1 on before you can set the fusing idling interval.*
1104*		Fusing Temperature Control	Selects the fusing temperature control mode. [**0 = On/Off** / 1 phase
1105	Fusing Temperature Adjustment		Adjusts the fusing temperature at the center and both ends of the hot roller for paper fed from a tray. Use SP1105 001, SP1105 002 to adjust for any tray other than the by-pass tray. Use SP1105 003, SP1105 004 to adjust for by-pass tray. *Allows adjustment of the hot roller temperature at the center and ends of the roller for the quality or thickness of the paper. The hot roller in this machine has two fusing lamps: one heats the center of the roller, the other heats both ends. Each fusing lamp can be adjusted separately.*
	1	Center	35 cpm : [120 ~ 200/ **150** / 1 deg.] 45 cpm: : [120 ~ 200 / **170** / 1 deg.]
	2	Ends	35 cpm : [120 ~ 200 / **160** / 1 deg.] 45 cpm: : [120 ~ 200 / **175** / 1 deg.]
	3	Center – Bypass	35 cpm : [120 ~ 200 / **160** / 1 deg.] 45 cpm: : [120 ~ 200 / **170** / 1 deg.]
	4	End – Bypass	35 cpm : [120 ~ 200 / **160** / 1 deg.] 45 cpm: : [120 ~ 200 / **170** / 1 deg.]
	5	Re-load Temp. Minus: Roller Center	Adjusts the temperature for re-heating the hot roller. **Re-load Temp. = Fusing. Temp – SP Value** [0 ~ 60 / **30** / 1 step] *Note: The "re-load temperature" is the "print ready temperature.* *When the fusing temperature exceeds this setting, the machine can operate. Do not set up a re-load temperature (Spec. Temp – SP Value) that is higher than the SP1105 002 setting.*
	6	Re-load Temp. Minus: Roller Ends	
	7	Center – Thick Paper	35 cpm : [120 ~ 200 / **170** / 1 deg.]] 45 cpm: : [120 ~ 200 / **170** / 1 deg.]]
	8	Ends – Thick Paper	35 cpm : [120 ~ 200 / **170** / 1 deg.]] 45 cpm: : [120 ~ 200 / **170** / 1 deg.]]
	9*	Re-load Temp. Minus: Roller Center (Thick Paper)	Forces paper feed to wait until the fusing unit has reached the specified temperature. Feed temp. = Spec. temp. for thick paper – SP value *Feed begins when the hot roller reaches the specified temperature.* B079: [0 ~ 60 / **0°C**/ 5] B082: [0~ 60 / **0°C** /1]
	10*	Re-load Temp. Minus: Roller Ends (Thick Paper)	
1106	Fusing Temperature Display		Displays the fusing temperature for the center or ends of the hot roller. *This machine has two fusing lamps inside the hot roller: one lamp heats the center of the roller, the other lamp heats both ends.*
	1	Roller Center	

Service Tables

SP1	Mode Number		Function and [Setting]
1106	2	Roller Ends	
	3	I/O Board Temp. at Power On	Displays in degrees centigrade the internal temperature of the machine when it was powered on.
1109*	Fusing Nip Band Check		Checks the fusing nip band. [**0**=Off, 1=On]
1111*		Paper Reverse Timing (Duplex)	Adjusts the timing for stopping the rotation of the reverse roller after the trailing edge of the paper passes the duplex entrance sensor. [+5 ~ –5 / **0 mm** / 1 mm step] *Adjust the timing if paper frequently jams at the inverter gate in the duplex unit.*
1801	Motor Speed Adjustment		Adjusts the speeds of the main motor, feed/development motor, and fusing exit motor.
	1	Main Motor	[-4 ~ +4 / **0** / 0.15%] Each step decreases or increases motor speed in 0.15% increments
	2	Feed/Development Motor	
	3	Fusing/Exit Motor	

SP2-xxx: Drum

SP2	Mode Number		Function and [Setting]
2001*	Charge Roller Bias Adjustment		
	1*	Copying	Adjusts the voltage applied to the grid plate for copying. [–1000 ~ –2000 / **–1450V** / 10V step]
	2*	ID Sensor Pattern	Adjusts the voltage applied to the charge roller when making the VSDP ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2-001-1. [0 ~ 700 / **200V** / 10V step]
2005*	Charge Roller Bias Correction Adjustment		
	1*	Charge Roller Voltage Correction 1	Adjusts the lower threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage increases by 30 V (e.g., from –500 to –530).* [0.1 ~ 1.0 / **0.85** / 0.05 step]
	2*	Charge Roller Voltage Correction 2	Adjusts the upper threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage decreases by 30 V (absolute value).* [0.1 ~ 1.0 / **0.90** / 0.05 step]
	3*	Charge Roller Voltage Adjustment 1	Adjusts the lower limit value for charge roller voltage correction. [–1000 ~ **–**2000 / **1450V** / 10V step]
	4*	Charge Roller Voltage Adjustment 2	Adjusts the upper limit value for charge roller voltage correction. [–1000 ~ **–**2000 / **2000V** / 10V step]
	5*	Charge Roller Voltage Step	Adjusts the correction voltage adjustment step size. [0 ~ 100V / **30V** / 10V step]
2101*	Printing Erase Margin		Adjusts the leading edge (top), trailing edge (bottom), left, and right margins.
	1*	Leading Edge (Top)	[0.9 ~ 9.0 / **3** / 0.1 mm step] Specification: ±2 mm
	2*	Trailing Edge (Bottom)	
	3*	Left Edge	[0.9 ~ 9.0 / **2** / 0.1 mm step] Specification: ±1.5 mm
	4*	Right Edge	
	5*	Trailing Edge - Back side	Adjusts the trailing edge erase margin on the reverse side of duplex copies. [0.0 ~ 4.0 / **1.2** / 0.1 mm step] *Recommended: 2 ±1.5 mm*
	6*	Back Side - Right	Adjusts the right side erase margin in the reverse side of duplex copies. [0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommend: 2 ±1.5 mm*
	7*	Back Side - Left	Adjusts the left side erase margin in the reverse side of duplex copies. [0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommended: 2 +2.5/-1.5 mm*

SP2	Mode Number		Function and [Setting]
2103*	LD Power Adjustment		Adjusts the intensity of the laser for the copier, printer, and fax unit. The Copier and Printer/Fax settings can be adjusted separately. **DFU**
	1*	LD1 (Copier)	(–55 ~ +64 / **–20** /1 LSB step) *Approx. 50/128 = .4%*
	2*	LD2 (Copier)	
	3*	LD1 (Printer, FAX)	(–50 ~ –35 / **–5** /1 LSB step)
	4*	LD2 (Printer, FAX)	
	5*	LD1 Adjustment Start/End	
	6*	LD2 Adjustment Start/End	
2109*	LD Beam Pitch Adjustment		Adjusts the beam gap for the dual beam system. After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode to adjust the laser beam pitch. *This adjustment is performed by specifying the number of pulses to the stepper motor that will adjust the angle of rotation of the LD unit from the home position.*
	1*	400 dpi	Adjusts the laser beam pitch value for 400 dpi resolution. 400 dpi: [8 ~ 262 / **144** / 1 pulse step] *After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-3 to adjust the laser beam pitch.*
	2*	600 dpi	Adjusts the laser beam pitch value for 600 dpi resolution. 600 dpi: [30 ~ 284 / **168** / 1 pulse step] *After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-4 to adjust the laser beam pitch.*
	3*	400 dpi Initial Setting	Initializes the laser beam pitch for 400 dpi using the value for SP2-109-1. *After entering a value for SP2-109-1, this SP must be used.*
	4*	600 dpi Initial Setting	Initializes the laser beam pitch for 600 dpi using the value for SP2-109-2. *After entering a value for SP2-109-2, this SP must be used.*
	5*	Auto Pitch Adjustment Interval	Sets the interval for automatic laser beam pitch adjustment. [0 ~ 65535 / **1000** / 1 step] *When the number of times that the resolution has been changed reaches this value, the laser unit position is automatically corrected.*
	6	Current LD Unit Position	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.

SP2	Mode Number		Function and [Setting]		
2109*	7	Beam Pitch Change Counter	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) *When the laser beam pitch adjustment is done, this counter is reset to zero.*		
	8	Beam Pitch Data Reset	Resets the values of SP2-109-6 and SP2-109-7. *After replacing the LD unit, this SP mode must be performed. See the LD Unit Removal Procedure.*		
2110	Test Mode dpi		Sets the scanning resolution (dpi). **DFU** [See below / **8** / 0 ~ 18]		
			Range	0	400 x 400 dpi
				1	391 x 406 dpi
				2	406 x 391 dpi
				4	300 x 300 dpi
				8	**600 x 600 dpi**
				15	439 x 430 dpi
				16	476 x 476 dpi
				17	483 x 465 dpi
				18	465 x 483 dpi
2112	Polygon Motor Off Timer		Input the time that the polygon motor is to switch off after the printer has remained idle for the specified time and entered the standby mode. *If set to zero, the polygon motor never switches off in standby mode. However, if the machine enters the energy saver mode, the polygon motor will ignore the zero setting and switch itself off.* [0 ~ 60 s / **10 s** / 5 s step]		
2201*	Development Bias Adjustment				
	1*	Development Bias	Adjusts the development bias for copying. *Use as a temporary measure to correct faint copies from an aging drum.* [-200 ~ -700 / **-510V** / 10V step]		
	2*	ID Sensor Pattern	Adjusts the development bias for the ID sensor pattern for VSP [- 200 ~ -700 / **-380V** / 10V step]		
2207	Forced Toner Supply		Forces the toner bottle to supply toner at 1-second intervals for up to 30 seconds. To start, press #.		
2208*	1*	Toner Supply Mode	Selects the toner mode. **0**: Sensor control 1: Image pixel count. *If you select 1, SP2-209-002 should be set to its default value. Use image pixel count modes only as a temporary measure if the ID or TD sensor is defective.*		
2209*	Toner Supply Rate		Adjusts the toner supply rate.		
	1*	Toner Rate	Sets the amount of toner supplied every second by the toner supply motor. *Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.* [10 ~ 800 mg/s / **60 mg/s** / 5 mg/s step]		

SP2	Mode Number		Function and [Setting]
2209*	2*	Toner Supply Correction Data	Displays the toner supply correction coefficient (K). It can also be used to adjust K, but the value is changed again when VT is measured for the next copy. *The toner supply rate depends on the amount of toner in the toner bottle. This change is corrected using this coefficient. This SP can be used to check the toner supply condition. The lower the value of K, the lower the toner density.* [25 ~ 300 / **300** / 25 step]
2210*	ID Sensor Pattern Interval		Sets the interval between ID sensor pattern prints.
	*1	Job Page Count	Sets the interval between ID sensor pattern printing. For users that do not make many copies daily, set a smaller interval to compensate for the effects of seasonal and weather changes. [0 ~ 200 / **10** / 1]
	*2	Forced Page Count	Forces creation of the ID sensor pattern to prevent low density copies for customers who use the copier for long copy jobs. [2 ~ 999 / **200** / 1]
2213*	1*	Copies After Toner Near-End	Selects the number of copies that can be printed once the copier has detected toner near-end. Select 1 or 2 if the customer normally makes copies of high density. **0**: 90 copies 1: No copies 2: 10 copies
2220*	Vref Manual Setting		Adjusts the TD sensor reference voltage (Vref). [1.0 ~ 5.00 V / **4.00V** / 0.01V step]
		Change this value after replacing the development unit with another unit that contains toner. *1. Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to.* *2. Install the test development unit, and then input the VREF for this unit into SP2-220.* *3. After the test, put back the old development unit, and change SP2-220 back to the original value.*	
2223*	Vt Display		Displays the TD sensor output voltage for each copy.
	1*	Current	Displays the TD sensor output voltage for the immediately previous copy.
	2*	Average Previous 10 copies	Displays the average of the most recent TD sensor outputs (from the previous 10 copies).
	3*	Rate of Change	Displays the rate of change in the TD sensor output.
	4*	GAIN	Displays the GAIN value used to calculate the on time for the toner supply motor.
	5*	Image Pixel Count	Displays the image pixel count.

SP2	Mode Number		Function and [Setting]
2301	Transfer Current Adjustment		Adjusts the current applied to the transfer belt during copying the 5 phases listed below.
	1*	1st Side of Paper	Printing the first side of the paper (image area). *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.* B079: [20 ~ 100μA / **35** / 1μA step] B082: [20 ~ 100μA / **45**] / 1μA step]
	2*	2nd Side of Paper	Printing the second side of the paper (image area). B079: [20 ~ 100μA / **35** / 1μA step] B082: [20 ~ 100μA / **40**] / 1μA step]
	3*	Leading Edge	Copying at leading edge of the paper. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.* B079: [20 ~ 100μA / **35** / 1μA step] B082: [20 ~ 100μA / **45**] / 1μA step]
	4*	Bypass Feed	Copying from the by-pass tray (image area) for the B082 (45 cpm). *If the user normally feeds thicker paper from the bypass tray, use a higher setting.* B082: [20 ~ 100μA / **45** / 1μA step]
	5*	Leading Edge Bypass Feed	Copying at the leading edge of paper fed from the by-pass tray for the B082 (45 cpm). *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions*. B082: [20 ~ 100μA / **60 /** 1μA step]
	6*	Bypass Feed (35 cpm)	Copying from the by-pass tray (image area) for the B079 (35 cpm). B079: [20 ~ 100μA / **35** / 1μA step]
	7*	Leading Edge Bypass Feed (35 cpm)	Copying at the leading edge of paper fed from the by-pass tray for the B079 (35 cpm). B079: [20 ~ 100μA / **45** / 1μA step]
2309*	Transfer Current Correction		Corrects the transfer current for the items below.
	1*	Paper Lower Width (a)	Adjusts the lower paper width threshold for the transfer current, charge voltage, and development bias corrections. *Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2-309-3 (paper tray) or SP2-309-5 (by-pass).* [0 ~ 297 / **150** / 1 mm step]
	2*	Paper Upper Width (b)	Adjusts the upper paper width threshold for the transfer current, charge voltage, and development bias corrections. *As for SP2-309-1, but the factors are in SP2-309-4 (paper tray) and SP2-309-6 (by-pass).* [0 ~ 297 / **216** / 1 mm step]
	3*	Paper Tray (α)	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1. [1.0 ~ 3 / **1.2** / 0.1 mm step]

SP2	Mode Number		Function and [Setting]
2309*	***4****	Paper Tray (β)	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2. [1.0 ~ 3 / **1.2** / 0.1 mm step]
	5*	By-Pass Feed (γ)	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1. [1.0 ~ 3 / **1.5** / 0.1 mm step]
	6*	By-Pass Feed (δ)	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2. [1.0 ~ 3 / **1.5** / 0.1 mm step]
2801*	TD Sensor Initial Setting		Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press "Execute" to start. After finishing this, the TD sensor output voltage is displayed. *Use this mode only after installing the machine, changing the TD sensor, or adding new developer.*
2802*	TD Sensor Manual Setting		Allows you to adjust the TD sensor output manually for the following.
	1*	VTS	Adjusts the TD sensor output (VT). *Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes. To adjust VT, use a similar procedure as for SP2-220.* [1.00 ~ 5.00V / **4.78V** / 0.02V step]
	2*	VTMAX	Adjusts the maximum value for SP2-802-1. [1.00 ~ 5.00V / **4.78**V / 0.02V step]
	3*	VTMIN	Adjusts the minimum value for SP2-802-1. [1.00 ~ 5.00V / **1.00V** / 0.02V step]
2805	Developer Initialization		Performs the developer initialization. Press "Execute" to start. *This SP should be performed after doing SP2-801-1 at installation and after replacing the drum.*
2902	2	IPU Test Pattern	Prints the test patterns for the IPU chip. [0 ~ 15 / **0** / 1 step] *This SP mode is useful for finding whether the BICU or the SBU is defective. If the printout is not OK, the BICU is defective.*
	3	Printing Test Pattern	Prints the printer test patterns. Select the number of the test pattern that you want to print. [0 ~ 38 / **0** / 1 step] *This SP mode is useful for finding whether the LDDR or the BICU is defective. If the printout is not satisfactory, the LDDR is defective.* [0 ~ 38 / **0**]

SP2	Mode Number		Function and [Setting]
2909*	Main Scan Magnification		
	1*	Copier	Adjusts the magnification in the main scan direction for copy mode. Press # to toggle ±. [–2.0 ~ +2.0 / **0** / 0.1% step]
	2*	Printer	Adjusts the magnification in the main scan direction when printing from a personal computer. Press # to toggle ±. [–2.0 ~ +2.0 / **0** / 0.1% step]
2911	Transfer Current On/Off Timing		Adjusts the transfer current timing for the three items below.
	1	La (On Timing)	On timing at leading edge. [–30 ~ +30 / **0 mm** / 1 mm step]
	2	Lb (Switch Timing)	Transfer current switch timing. This determines when the leading edge stops and the image area current begins (see SP2-301). [0 ~ +30 / **10 mm** / 1 mm step]
	3	Lc (Off Timing)	Transfer current timing (e.g. –5 mm) is 5 mm after the trailing edge. [–30 ~ +30 / **– 5 mm** / 1 mm step]
2912	***1***	Drum Reverse Rotation Interval	**DFU**.
2913*	***1****	Print Density for Test Pattern	Sets the print density for the patterns printed with SP2-902-3. [0 ~ 15 / **15** / 1]
2914*	Process Control Setting – By-pass		Adjusts the charge roller voltage for the following items.
	1*	Cα	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray.* [0 ~ 400 / **150** / 10V step]
	2*	Cβ	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.* *[0 ~ 400 / **0** / 10V step]*
	3*	Bγ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.* *[0 ~ 300 / **200** / 10V step]*

SP2	Mode Number		Function and [Setting]
2914*	4*	Bδ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.* *[0 ~ 300 / **50** / 10V step]*
2920	LD Off Check		**DFU**
2960*	Toner Overflow Sensor		Selects whether the toner overflow sensor is activated or not. 0 = No, **1** = Yes
2964*	***1****	Transfer Cleaning Blade Forming	Applies a pattern of toner to the transfer belt at a defined interval between sheets on the transfer belt in order to reduce friction between the belt surface and the cleaning blade. [0 ~ 30/ **0** / 1 sheets] *Under conditions of high temperature and high humidity, the density control feature may reduce the amount of toner, which also reduces the amount of toner on the surface of the transfer belt. With less toner on the belt, the friction between the belt and the blade increases, and could cause the blade to bend or scour the surface of the belt.*
2969*	LD – PWM Selection		
	1*	Printer Output LD – PWM Selection	Changes the LD power PWM control for printed copies. A smaller value produces a lighter image. *Use this SP to adjust the image density for printing from a personal computer or printing a received fax message.* [1 ~ 5 / **1** / 1 step]
	2*	Fax Output LD – PWM Selection	Changes the LD power PWM control for printed fax messages. A smaller value produces a lighter image *Use this SP to adjust the image density for printing fax messages.* [1 ~ 5 / **1** / 1 step]
2971	Toner Full Sensor Count		**DFU**
2972*	Grayscale Limit		A new feature of this machine that controls the halftone density level to prevent deterioration of the OPC. The halftone density is detected by the ID sensor, and the machine adjusts the intensity of the LD beam according to the upper/lower limit setting.
	1*	Upper Limit	Defines the upper limit for grayscale. *A larger value allows a wider range of halftones at the pale end of the scale. If the image contains pale areas with fuzzy borders surrounded by dark areas, reduce this value to make the borders clearer.* [0 ~ 100 / **60** / 1 step]
	2*	Lower Limit	Defines the lower limit for grayscale. *A smaller value allows a wider range of halftones at the dark end of the scale.* [0 ~ 100 / **40** / 1 step]

SP2	Mode Number		Function and [Setting]
2973*	***1****	Grayscale Copy Interval Check	Sets the halftone operation interval in order to prevent deterioration of the OPC. If the number of copies exceeds this setting, at the end of the job, or if the door is opened and closed, charge correction is executed. [0 ~ 1000 / **100** / 10 step]
2974*	***1****	Image Density Adjustment	Adjusts image density. Changing this setting adjusts development bias and ID sensor output voltage that in turn raises or lowers image density. [1 ~ 5 / **3** / 1 step]
2975	1*	Toner End Time	Sets a time limit for issuing the toner near end warning on the operation panel. The time may need to be shorter for customers who run especially large print jobs (working at night, for example) to ensure earlier warning of the toner near end condition so toner out does not interrupt a long job. [0 ~ 2,000 / **0** / 10 s step] 0: Normal end detection (90 sheets after near-end detected (SP2213)
2976	1*	Toner Bottle On Count	Displays the total ON time of the toner supply motor, calculated from when the toner bottle was replaced. Use this to check that the toner end count (SP2975) is working properly. [0 ~ 2,000,000 / **0** / 1 ms step] *When SP2975 is set to any value other than "0", this value is displayed when it matches the setting of SP2975. When SP2975 is set to "0", SP2976 is disabled. SP2976 is automatically set to zero by toner end recovery.*
2980*	Charge Counter		Sets the number of pages to print after toner and carrier initialization before the charge input is increased to compensate for deterioration over time in the polarity of the carrier. [0 ~ 1000000 / **0** / 1 step] *The strength in the polarity of the carrier in the toner will eventually decrease and cause lower charge output. Setting the charge output to increase after a specified number of copies can compensate for this effect.*
2981	Polygon Mirror Revolution Switching		Switches the number revolutions per minute of the polygon mirror motor. **DFU** [0 ~ 2 / 0 / 1] 0: Rpm determined by engine 1: Rpm for B079 (35 cpm) 2: Rpm for B082 (45 cpm)

SP3-xxx: Process

SP3	Mode Number		Function and [Setting]
3001*	ID Sensor Initial Setting		
	1*	ID Sensor PWM Setting	Allows you to reset the PWM of the ID sensor LED to avoid a service call error after clearing NVRAM or replacing the NVRAM. [0 ~ 255 / **100** / 1 step] *The PWM data is stored by executing SP-3001-2.*
	2*	ID Sensor Initialization	Performs the ID sensor initial setting. ID sensor output for the bare drum (V_{SG}) is adjusted automatically to 4.0 ±0.2 V. *Press "Execute" to start. Perform this setting after replacing or cleaning the ID sensor, replacing the drum, or clearing NVRAM.*
3103*	ID Sensor Output Display		Displays the current V_{SG}, V_{SP}, V_{SDP}, and grayscale control.
	1*	Vsg (Drum Surface Output)	[0V ~ 5.00V] If the ID sensor does not detect the ID pattern, V_{SP} = 5.0 V/V_{SG} = 5.0 V is displayed and an SC code is generated. If the ID sensor does not detect the bare area of the drum, V_{SP} = 0.0 V/V_{SG} =0.0 V is displayed and an SC code is generated.
	2*	Vsp (Pattern Output)	
	3*	Vpdp (Immediate Post-Pattern Output).	
	4*	Vsm/Vsg (Immediate Grayscale Post-Pattern Output)	
3905*	Fuser Cleaning		Toner and carbon clinging to the hot roller strippers can cause poor print quality. To prevent this, toner and carbon are dislodged from the hot roller strippers in two ways: 1) jogging the fusing/feed-out motor 3 times after every print job. 2) freely rotating the hot roller for 12 s. For details, see Section "6.6.2 Hot Roller Stripper Cleaning". Also see SP 5959.
	1	Number of Rotations	Prescribes the number of times the fusing/exit motor is switched off/on in order to dislodge toner clinging to the hot roller strippers. [0 ~ 60 / **1** / 1] *Raising this setting can increase wear on the hot roller and cleaning roller and shorten the service life of the hot roller.*
	2	Number of Pages	Prescribes the number of pages to print before the fusing/feed-out motor is jogged (switched off and on rapidly) to dislodge toner and carbon from the hot roller strippers. [0 ~ 1000 / **15** / 1] *Normally the motor is jogged once (switched off and on rapidly) after every print job that exceeds 15 pages.*

SP4-xxx: Scanner

SP4	Mode Number		Function and [Setting]
4008*	Scanner Sub Scan Magnification		Adjusts the magnification of the sub scan direction during scanning. Changing this value changes the scanner motor speed. Press # to toggle ±. [–0.9 ~ 0.9 / **0.0** / 0.1% step]
4010*	Scanner Leading Edge Registration		Adjusts the leading edge registration for scanning. Press # to toggle ±. *As you enter a negative value, the image moves toward the leading edge.* [–0.9 ~ 0.9 / **0.0** / 0.1 mm step]
4011*	Scanner Side-to-Side Registration		Adjusts side-to-side registration for scanning. Press # to toggle ±. *As you enter negative values, the image will disappear at the left, and as you enter positive values, the image will appear at the left.* [–4.6 ~ +4.6 / **0.0** / 0.1 mm step]
4012*	Scanner Erase Margin		Adjusts scanning margins for the following items. Do not adjust unless the customer desires a scanner margin greater than the printer margin.
	1*	Leading Edge	Adjusts leading edge erase margin for sub scanning. Specification: 3 ± 2 mm [0 ~ 9 / **1.0** / 0.1 mm step]
	2*	Trailing Edge	Adjusts trailing edge erase margin for sub scanning. Specification: 2 ± 2 mm [0 ~ 9 / **0.5** / 0.1 mm step]
	3*	Right	Adjusts right margin for main scanning. Specification: +2.5 ~ -1.5 mm [0 ~ 9 / **0.5** / 0.1 mm step]
	4*	Left	Adjusts left margin for main scanning. Specification: 2 ± 1.5 mm [0 ~ 9 / **1.0** / 0.1 mm step]
4013	Scanner Free Run		Performs a scanner free run with the exposure lamp off.
4301	APS Sensor Output Display		Displays the time required to detect the size of the paper on the scanner exposure glass. Asterisks (*) are displayed if the size cannot be detected. *Dimensions are displayed in inches for North America and in mm for other areas.*
4303*	APS A5/LT Size Detection		Determines whether the original is A5/HLT size when the APS sensor does not detect the original size. **0**: not detected, 1: A5 length 5½ x 8½ *If 1 is selected, paper sizes that cannot be detected are regarded as A5 SEF. If 0 is selected, "Cannot detect original size" will be displayed.*

SP4	Mode Number		Function and [Setting]
4305*	8K/16K Detection		Selects whether or not the copier determines that the original is 8K/16K size when the APS sensor does not detect the original size. This SP is intended for use with 8K/16K Chinese paper sizes only. **For China/Taiwan area:** [0,1 /**0**/1] 0: 8k/16k not detected – Non-standard size 1: 8K, 16K paper size detect enabled **Other areas:** [0,1 /**0**/1] 0: 8k/16k not detected - Non-standard size 1: 8k/16k not detected - Non-standard size
4307*	APS Sensor Output Display		Determines whether or not the original size is detected while the exposure lamp lights during initialization. 0 ~ 1 /**1** / 1 step 0: Original size detection at power on disabled. 1: Original size detection at power on enabled.
4428	***1***	Flag Display	**DFU**
	2	Start	**DFU**
	3	Flag Reset	**DFU**
4901*	SBU Settings		**DFU**
	22*	A/D Standard Voltage in AE Mode	**DFU**
	23*	BK Adjustment	**DFU**
	24*	EO Adjustment	**DFU**
	26*	Range Adjustment	**DFU**
	27*	Gain Adjustment – Ech	**DFU**
	28*	Gain Adjustment – Och	**DFU**
	29*	Apli. Dummy Range Adjustment	**DFU**
	30*	Apli. Range Adjustment	**DFU**
	31*	Apli. Gain Adjustment – Ech	**DFU**
	32*	Apli. Gain Adjustment – Och	**DFU**
	33	Dummy Gain Adjustment – Ech	**DFU**
	34	Dummy Gain Adjustment – Och	**DFU**

SP4	Mode Number		Function and [Setting]
4903*	Filter Setting		
	5	Full Size Mode	Selects whether the copy is always full size, even if the magnification ratio has been changed. Set to 1 to check the main scan magnification. If the magnification is not 100%, the image processing circuits could be malfunctioning. [0~1 / **0** / 1 step] 0: No. Normal operation 1: Yes. Main scan magnification always full-size. *This SP is used to determine whether magnification is operating correctly. If this SP is set to 1 can make it easier to determine which part of the IPU is malfunctioning.*
	7	Image Shift in Magnification	Adjusts the amount of pixel shift in the main scan direction in the magnification mode. **DFU** [0~7199 / **0** / 1 step]
	8*	Fax 25%, 50% Reduction	Determines whether 25% and 50% reduction is available in the fax mode. **DFU** [0~3 / **0** / 1 step] 0: Off 1: Conducts fax mode OR processing for main scan for resolution below 100 dpi in only Text mode. 2: Conducts pre-filter processing for fax mode. 3: Conducts fax Text mode OR processing for main scan for resolution below 100 dpi. Pre-filter processing is done in every mode except Fax Text mode.
	10*	Pre-Filter: Text	Selects the filter processing setting for smoothing in order to reduce the incidence of moiré in images. Specifically, it sets 1) the compression rate for parallel lines in the main scan direction and for long lines in the sub scan direction, and 2) the strength of smoothing. See below. Enter the appropriate number with the10-key pad then press #. [0~9 / **0** / 1] *These settings attempt to smooth lines without making them standout. Increasing the strength of a setting can reduce the incidence of moiré but can also decrease sharpness.*
	12*	Pre-Filter: Photo Mode	Selects the Pre-Filter coefficient in the main scan direction for photo mode. (☛ Chap.6, "Image Processing". [0~9 / **0** / 1 step]
	13*	Pre-Filter: Text/Photo	Selects the Pre-Filter coefficient in the main scan direction for text/photo mode, and emphasizes lines parallel to the direction of feed. (☛ Chap.6, "Image Processing". [0~9 / **0** / 1 step] *Increasing this value strengthens smoothing but can also increase the occurrence of moiré and reduce sharpness.*

SP4	Mode Number		Function and [Setting]
4903*	***15****	Pre-Filter: Light	Selects the Pre-Filter coefficient in the main scan direction for low density mode and enhances lines parallel to the direction of feed to prevent moiré. (☛ Chap.6, "Image Processing". [0~9 / **0** / 1 step] *Increasing this value strengthens smoothing but can also increase the occurrence of moiré and reduce sharpness.*
	16*	Pre-Filter: Generation	Selects the Pre-Filter coefficient in the main scan direction for copied original mode to emphasize lines parallel to the direction of feed. (☛ Chap.6, "Image Processing". [0~9 / **0** / 1 step] *Increasing this value strengthens smoothing but can also increase the occurrence of moiré and reduce sharpness.*
	20*	Main Filter Level: Text 25%-64%	Selects the MTF filter coefficient for the text mode in the main scan direction. [0~15 / **9** / 1 step] *(☛6.2 Image Processing)*
	21*	Sub Filter Level: Text 25%-64%	Selects the MTF filter coefficient for the text mode in the sub scan direction. [0~13 / **13** / 1 step] *(☛6.2 Image Processing)*
	22*	Main Filter Strength: Text 25%-64%	Selects the MTF filter strength in the main scan direction for the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	23*	Sub Filter Strength: Text 25%-64%	Selects the MTF filter strength in the sub scan direction for the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	24*	Main Filter Level: Text 65%-154%	Selects the MTF filter coefficient for the main scan direction in the text mode. [0~15 / **12** / 1 step] *(☛6.2 Image Processing)*
	25*	Sub Filter Level: Text 65%-154%	Selects the MTF filter coefficient for the sub scan direction in the text mode. [0~13 / **13** / 1 step] *(☛6.2 Image Processing)*
	26*	Main Filter Strength: Text 65%-154%	Selects the MTF filter strength for the main scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	27*	Sub Filter Strength: Text 65%-154%	Selects the MTF filter strength for the sub scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	28*	Main Filter Level: Text 155%-256%	Selects the MTF filter coefficient for the main scan direction in the text mode. [0~15 / **14** / 1 step] *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	29*	Sub Filter Level: Text 155%-256%	Selects the MTF filter coefficient for the sub scan direction in the text mode. [0~13 / **13** / 1 step] *(☛6.2 Image Processing)*
	30*	Main Filter Strength: Text 155%-256%	Selects the MTF filter strength for the main scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	31*	Sub Filter Strength: Text 155%-256%	Selects the MTF filter strength for the sub scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	32*	Main Filter Level: Text 257%-400%	Selects the MTF filter coefficient for the sub scan direction in the text mode. [0~15 / **15** / 1 step] *(☛6.2 Image Processing)*
	33*	Sub Filter Level: Text 257%-400%	Selects the MTF filter coefficient for the sub scan direction in the text mode. [0~13 / **13** / 1 step] *(☛6.2 Image Processing)*
	34*	Main Filter Strength: Text 257%-400%	Selects the MTF filter strength for the main scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	35*	Sub Filter Strength: Text 257%-400%	Selects the MTF filter strength for the sub scan direction in the text mode. [0~7 / **2** / 1 step] *(☛6.2 Image Processing)*
	36*	Photo MTF (Edge)	Selects the MTF filter coefficient for edges in the photo mode. Use this setting to sharpen text and lines. However, selecting a strong (high) setting could cause moiré to appear in images created with dots. [0~7 / **0** / 1] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	37*	Smoothing Filter in Photo Mode	Selects the filter coefficient for smoothing in the photo mode. The higher the number you select, the greater the applied smoothing effect. [0~7 / **2** / 1] *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	38*	Photo MTF (All)	Selects the MTF filter coefficient sharpening an entire image in the Photo mode. The higher the number you select, the greater the effect on sharpening low contrast text and thin lines. However, high setting could cause background to drop or, or cause moiré to appear in photos shaded with dots. [0~7 / **0** / 1] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	39	Text/Photo (Edge) Coefficient 25-64%	Selects the filter coefficient that affects the clarity in reproduction of edges for images copied in the Text/Photo mode and enlarged in the range 25% to 64%. A higher setting increases effect of this adjustment and a lower setting decreases the effect. [0~7 / **1** / 1] *This adjustment can improve the appearance of text and lines, but selecting a higher setting can cause moiré in photographs created with dots (newspaper and magazine photos).*
	40	Text/Photo (All) Coefficient 25-64%	Selects the filter coefficient that affects the clarity in reproduction of an entire page copied in the Text/Photo mode and enlarged in the range 25% to 64%. A higher setting increases effect of this adjustment and a lower setting decreases the effect. [0~7 / 4 / 1] *This adjustment can improve the appearance of low density text, but selecting a higher setting can cause rough texture background to appear and also cause moiré in photographs created with dots (newspaper and magazine photos).*
	43*	Text/Photo (Edge) Coefficient 65-154%	Selects the MTF filter coefficient for text edges in the text/photo mode. Select a higher number to improve the clarity of text and lines. However, greatly increasing the value could increase the incidence of moiré. [0~7 / **1** / 1 step] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	44*	Text/Photo (All) Coefficient 65-154%	Selects the filter coefficient to improve the clarity of the entire image within 65%-154% in the Text/Photo mode. While this SP can improve the appearance of low contrast characters, an extremely large setting could cause background to fade or drop out completely or cause moiré to appear in images shaded with dots (newspapers, magazines, etc.) [0~7 / **4** / 1] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	47*	Text/Photo (Edge) Coefficient 155-256%	Selects the MTF filter applied to improve the clarity of edges within 155%-256% magnification in the Text/Photo mode. While this SP can improve the appearance of text and lines, it could increase the incidence of moiré in images shaded with dots (newspapers, magazines, etc.) [0~7 / **1** / 1 step] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	48*	Text/Photo (All) Coefficient 155-256%	Selects the MTF filter applied to improve the clarity of the entire image within 155%-256% magnification in the Text/Photo mode. While this SP can improve the appearance of low contrast text, it can also cause background to fade or drop out completely or increase the incidence of moiré. [0~7 / **4** / 1 step] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	51*	Text/Photo (Edge) Coefficient 257-400%	Selects the MTF filter applied to improve the clarity of edges within 257%-400% magnification in the Text/Photo mode. While this SP can improve the appearance of text and lines, it can also increase the incidence of moiré in images shaded with dots (newspapers, magazines, etc.) [0~7 / **1** / 1 step] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	52*	Text/Photo (All) Coefficient 257-400%	Selects the MTF filter applied to improve the clarity of the entire image within 257%-400% magnification in the Text/Photo mode. While this SP can improve the appearance of low contrast text, it can also cause background to fade or drop out completely or increase the incidence of moiré. [0~7 / **4** / 1 step] 0: Off 1: Softest 7: Sharpest *(☛6.2 Image Processing)*
	55*	Filter Level: Light Original	Selects the MTF filter coefficient for originals scanned in the Pale mode. While this SP can improve the appearance of low contrast originals, a very high setting can also increase the incidence of moiré. [0~6 / **6** /1] *(☛6.2 Image Processing)*
	56*	Filter Strength: Light Original	Selects the MTF filter strength to improve the contrast of originals scanned in the Pale mode. While selecting a larger number strengthens the effect of the filter to improve contrast, a very high setting can increase the incidence of moiré. [0~7 / **3** /1 step] 0: 1/32x 1: 1/16x 2: 1/8x 3: 1/4x 4: 1/2x 5: 1x 6: 2x 7: 4x *(☛6.2 Image Processing)*
	57*	Filter Level: Generation Copy	Selects the MTF filter coefficient to improve low contrast originals scanned in the Generation Copy mode. While selecting a higher number strengthens the effect of the filter to improve contrast, a very high setting can increase the incidence of moiré. [0~6 / **3** /1 step] *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	58*	Filter Strength: Generation Copy	Selects the MTF filter strength to improve the contrast of originals scanned in the Generation Copy mode. While selecting a larger number strengthens the effect of the filter to improve contrast, a very high setting can increase the incidence of moiré. [0~7 / **2** /1 step] 0: 1/32x 1: 1/16x 2: 1/8x 3: 1/4x 4: 1/2x 5: 1x 6: 2x 7: 4x *(☛6.2 Image Processing)*
	60*	Independent Dot Erase: Text Mode	Selects the independent dot erase level for originals scanned the Text mode. While selecting a higher setting erases more dots, setting a very high setting can cause very fine text or other detail to fade or drop out completely. [0~15 / **5** / 1 step] 0: Off 1: Weakest (fewest dots erased) 15:Strongest (most dots erased)
	62*	Independent Dot Erase: Text/Photo	Selects the independent dot erase level for originals scanned the Text/Photo mode. While selecting a higher setting erases more dots, setting a very high setting can cause very fine text or other detail to fade or drop out completely. [0~15 / **0** / 1 step] 0: Off 1: Weakest (fewest dots erased) 15:Strongest (most dots erased)
	63*	Independent Dot Erase: Light Original	Selects the independent dot erase level for originals scanned the Pale mode. While selecting a higher setting erases more dots, setting a very high setting can cause very fine text or other detail to fade or drop out completely. [0~15 / **0** / 1 step] 0: Off 1: Weakest (fewest dots erased) 15:Strongest (most dots erased)
	64	Independent Dot Erase: Generation Copy	Selects the independent dot erase level for originals scanned the Generation Copy mode. While selecting a higher setting erases more dots, setting a very high setting can cause very fine text or other detail to fade or drop out completely. [0~15 / **8** / 1 step] 0: Off 1: Weakest (fewest dots erased) 15:Strongest (most dots erased)

SP4	Mode Number		Function and [Setting]
4903*	65*	Background Erase Level: Text Mode	Adjusts the threshold for background erase in originals scanned in the Text mode. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. [0~255 / **0** / 1 step] 0: Off
	66*	Background Erase Level: Photo Mode	Adjusts the threshold for background erase in originals scanned in the Photo mode. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. [0~255 / **0** / 1 step] 0: Off
	67*	Background Erase Level: Text/Photo Mode	Adjusts the threshold for background erase in originals scanned in the Text/Photo mode. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. [0~255 / **0** / 1 step] 0: Off
	68*	Background Erase Level: Light Original	Adjusts the threshold for background erase in originals scanned in the Pale mode. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. [0~255 / **0** / 1 step] 0: Off
	69*	Background Erase Level: Generation Copy	Adjusts the threshold for background erase in originals scanned in the Generation Copy mode. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. [0~255 / **0** / 1 step] 0: Off
	75*	Line Width Correction: Generation Mode	Enter the appropriate number with the 10-key pad then press #. This SP determines whether line thickness is adjusted in the main and/or sub scan direction. [0~3 / **2** / 1] 0: None 1: Thin 2: Thin 3: Thick
			To adjust the level of adjustment in the main scan/sub scan direction, use SP4903 076/SP4903 077.
	76*	LWC Threshold (Main Scan): Generation Mode	Selects the threshold for line width detection in the main scan direction in originals copied in the Generation Copy mode. [0~5 / **1** / 1 step] Low: More difficult to thicken thin lines. High: Easier to thicken thin lines.

SP4	Mode Number		Function and [Setting]
4903*	77*	LWC Threshold (Sub Scan): Generation Mode	Selects the threshold for line width detection in the sub scan direction in copies copied in the Generation Copy mode. [0~5 / **1** / 1 step] Low: More difficult to thicken thin lines. High: Easier to thicken thin lines.
	79	Filter Strength: Text/Photo (Edge) 25-64%	Selects the strength of the MTF coefficient filter setting selected with SP4903 039 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 25% to 64%. A higher setting increases the strength of the effect, and a lower setting decreases the effect. While a higher setting can improve the clarity of text and thin lines, a very high setting can increase the incidence of moiré. [0~3 / **3** / 1] *(☛6.2 Image Processing)*
	80*	Filter Adj.: Text/Photo (Edge Det.) 25-64%	Selects the MTF filter coefficient of the edge detection level of the filter setting selected with SP4903 039 to adjust the clarity of edges in images copied in the Text/Photo mode and enlarged in the range 25% to 64%. A lower setting increases the number of edges detected, and a higher setting decreases the number of edges detected. • A higher setting affects the density of lines with a steep slope and to a lesser degree affects the density of gently sloping lines. • Areas other than sloping lines are not affected by this adjustment. • If edge detection is set high, then the range of edge detection is expanded to include any background. *(☛6.2 Image Processing)* [0~15 / **3** / 1] 0: Most edges detected. Settings near zero increase the range of the SP4903 039 setting. 15:Fewest edges detected. Settings near 15 decrease the range of the SP3903 039 setting.

SP4	Mode Number		Function and [Setting]
4903*	***81****	Filter Adj.: Text/Photo (Mag.%) 25-64%	Adjusts the of the filter coefficient magnification setting selected with SP4903 039 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 25% to 64%. • Specifically, this settings affects how edges are detected at sharp edges and at faint borders where no edges exist. A lower setting reproduces a noticeable difference in the appearance of sharp and faint borders, and a higher setting reduces this effect. • While selecting a lower setting makes it easier to distinguish the differences between sharp and faint borders, this can also cause moiré to appear in the image. A higher setting can weaken the clarity of edges. [0~15 / **12** / 1] *(☛6.2 Image Processing)*
	82*	Filter Strength: Text/Photo (Edge) 65-154%	Selects the strength of the MTF coefficient filter setting selected with SP4903 043 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 65% to 154%. A higher setting increases the strength of the effect, and a lower setting decreases the effect. While a higher setting can improve the clarity of text and thin lines, a very high setting can increase the incidence of moiré. [0~3 / **3** / 1] *(☛6.2 Image Processing)*
	83*	Filter Adj.: Text/Photo (Edge Det.) 65-154%	Selects the MTF filter coefficient of the edge detection level of the filter setting selected with SP4903 043 to adjust the clarity of edges in images copied in the Text/Photo mode and enlarged in the range 65% to 154%. A lower setting increases the number of edges detected, and a higher setting decreases the number of edges detected. • A higher setting affects the density of lines with a steep slope and to a lesser degree affects the density of gently sloping lines. • Areas other than sloping lines are not affected by this adjustment. • If edge detection is set high, then the range of edge detection is expanded to include any background. [0~15 / **3** / 1] 0: Most edges detected. Settings near zero increase the range of the SP4903 043 setting. 15: Fewest edges detected. Settings near 15 decrease the range of the SP3903 043 setting. (☛6.2 Image Processing)

SP4	Mode Number		Function and [Setting]
4903*	***84****	Filter Adj.: Text/Photo (Mag.%) 65-154%	Adjusts the of the filter coefficient magnification setting selected with SP4903 043 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 65% to 154%. • Specifically, this settings affects how edges are detected at sharp edges and at faint borders where no edges exist. A lower setting reproduces a noticeable difference in the appearance of sharp and faint borders, and a higher setting reduces this effect. • While selecting a lower setting makes it easier to distinguish the differences between sharp and faint borders, this can also cause moiré to appear in the image. A higher setting can weaken the clarity of edges. [0~15 / **12** / 1] *(☛6.2 Image Processing)*
	85*	Filter Strength: Text/Photo (Edge) 155-256%	Selects the strength of the MTF coefficient filter setting selected with SP4903 047 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 155% to 256%. A higher setting increases the strength of the effect, and a lower setting decreases the effect. While a higher setting can improve the clarity of text and thin lines, a very high setting can increase the incidence of moiré. [0~3 / **3** / 1] *(☛6.2 Image Processing)*
	86*	Filter Adj.: Text/Photo (Edge Det.) 155-256%	Selects the MTF filter coefficient of the edge detection level of the filter setting selected with SP4903 047 to adjust the clarity of edges in images copied in the Text/Photo mode and enlarged in the range 155% to 256%. A lower setting increases the number of edges detected, and a higher setting decreases the number of edges detected. • A higher setting affects the density of lines with a steep slope and to a lesser degree affects the density of gently sloping lines. • Areas other than sloping lines are not affected by this adjustment. • If edge detection is set high, then the range of edge detection is expanded to include any background. [0~15 / **3** / 1] 0: Fewest edges detected. Settings near zero increase the range of the SP4903 047 setting. 15: Most edges detected. Settings near 15 decrease the range of the SP3903 047 setting. *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	***87****	Filter Adj.: Text/Photo (Mag.%) 155-256%	Adjusts the of the filter coefficient magnification setting selected with SP4903 047 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 155% to 256%. • Specifically, this settings affects how edges are detected at sharp edges and at faint borders where no edges exist. A lower setting reproduces a noticeable difference in the appearance of sharp and faint borders, and a higher setting reduces this effect. • While selecting a lower setting makes it easier to distinguish the differences between sharp and faint borders, this can also cause moiré to appear in the image. A higher setting can weaken the clarity of edges. [0~15 / **12** / 1] *(☛6.2 Image Processing)*
	88*	Filter Strength: Text/Photo (Edge) 257-400%	Selects the strength of the MTF coefficient filter setting selected with SP4903 051 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 257% to 400%. A higher setting increases the strength of the effect, and a lower setting decreases the effect. While a higher setting can improve the clarity of text and thin lines, a very high setting can increase the incidence of moiré. [0~3 / **3** / 1] *(☛6.2 Image Processing)*
	89*	Filter Adj.: Text/Photo (Edge Det.) 257-400%	Selects the MTF filter coefficient of the edge detection level of the filter setting selected with SP4903 039 to adjust the clarity of edges in images copied in the Text/Photo mode and enlarged in the range 25% to 64%. A lower setting increases the number of edges detected, and a higher setting decreases the number of edges detected. • A higher setting affects the density of lines with a steep slope and to a lesser degree affects the density of gently sloping lines. • Areas other than sloping lines are not affected by this adjustment. • If edge detection is set high, then the range of edge detection is expanded to include any background. [0~15 / **3** / 1] 0: Fewest edges detected. Settings near zero increase the range of the SP4903 039 setting. 15: Most edges detected. Settings near 15 decrease the range of the SP3903 039 setting. *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4903*	***90****	Filter Adj.: Text/Photo (Mag.%) 257-400%	Adjusts the of the filter coefficient magnification setting selected with SP4903 051 to adjust the clarity of edges of images copied in the Text/Photo mode and enlarged in the range 257% to 400%. • Specifically, this settings affects how edges are detected at sharp edges and at faint borders where no edges exist. A lower setting reproduces a noticeable difference in the appearance of sharp and faint borders, and a higher setting reduces this effect. • While selecting a lower setting makes it *easier to distinguish the differences between sharp and faint borders, this can also cause moiré to appear in the image. A higher setting can weaken the clarity of edges. [0~15 / **12** / 1] *(☛6.2 Image Processing)*
	91*	Filter Strength: Photo (Edge)	Adjusts the strength of the MTF filter selected with SP4903 036 that adjusts the edge clarity of images scanned in the Photo mode. While selecting a higher setting can improve the clarity of text and lines, selecting a very high setting can increase the incidence of moiré. [0~3 / **2** / 1] 0: Weakest 3: Strongest *(☛6.2 Image Processing)*
	92*	Filter Adj.: Photo (Edge Det.)	Selects the MTF filter coefficient of the edge detection level of the filter setting selected with SP4903 036 to adjust the clarity of edges in images copied in the Photo mode. A lower setting increases the number of edges detected, and a higher setting decreases the number of edges detected. • A higher setting affects the density of lines with a steep slope and to a lesser degree affects the density of gently sloping lines. • Areas other than sloping lines are not affected by this adjustment. • If edge detection is set high, then the range of edge detection is expanded to include any background. [0~15 / **0** / 1] 0: Fewest edges detected. Settings near zero increase the range of the SP4903 036 setting. 15: Most edges detected. Settings near 15 decrease the range of the SP3903 036 setting. *(☛6.2 Image Processing)*

<table>
<tr><th>SP4</th><th colspan="2">Mode Number</th><th>Function and [Setting]</th></tr>
<tr><td>4903*</td><td>93*</td><td>Filter Adj.: Photo (Mag.%)</td><td>Adjusts the of the MTF filter coefficient magnification setting selected with SP4903 036 to adjust clarity of images copied in the Photo mode and enlarged in the range 257% to 400%.
• Specifically, this settings affects how edges are detected at sharp edges and at faint borders where no edges exist. A lower setting reproduces a noticeable difference in the appearance of sharp and faint borders, and a higher setting reduces this effect.
• While selecting a lower setting makes it easier to distinguish the differences between sharp and faint borders, this can also cause moiré to appear in the image. A higher setting can weaken the clarity of edges.
[0~15 / 15 / 1]
(☛6.2 Image Processing)</td></tr>
<tr><td>4904*</td><td colspan="2">IPU Setting</td><td></td></tr>
<tr><td></td><td>1</td><td>Grayscale Photo Mode</td><td>Selects the method of grayscale processing for the Photo Mode.
[0~1 / 0 / 1]
0: Dithering and smoothing. This setting is the same as the setting for “Print Photo” selected on the operation panel in Photo Mode. Dithering can be adjusted with SP4903 037.
1: Error diffusion and MTF filter processing. This setting is the same as the setting for “Normal” or “Glossy Photo” selected on the operation panel in Photo Mode. Error diffusion can be adjusted with SP4903 036 and 038.</td></tr>
<tr><td></td><td>2*</td><td>Quality Photo Mode</td><td>Selects the size of the dither matrix for the photo mode.
[0~3 / 1 / 1]
<table>
<tr><th>Value</th><th>Method</th><th>Lines</th><th>Effect</th></tr>
<tr><td>0</td><td>Dither 8 x 8</td><td>75</td><td>Screening</td></tr>
<tr><td>1</td><td>Dither 8 x 8</td><td>106</td><td>Best grayscale</td></tr>
<tr><td>2</td><td>Dither 6 x 6</td><td>142</td><td>Good grayscale</td></tr>
<tr><td>3</td><td>Dither 4 x 4</td><td>212</td><td>Good resolution</td></tr>
</table></td></tr>
<tr><td></td><td>3*</td><td>Density Setting for Low Density Original Mode</td><td>Selects the density γ factor for the low-density original mode.
[0~1 / 0 / 1]
0: Selects γ normal density.
1: Digitizes to near binary image.
Use to achieve better balance between text and images, correct shadows that appear around text in handwritten documents, to enhance documents written in pencil, or to achieve stark contrast when copying blueprints, building plans, etc.</td></tr>
<tr><td></td><td>4*</td><td>Density Setting for Copied Original Mode</td><td>Setting same as above.
[0~1 / 0 /1 step]</td></tr>
</table>

SP4	Mode Number		Function and [Setting]
4904*	5*	Special Text Density	Enter the appropriate number with the 10-key pad then press #. This SP code adjusts the density of the image to eliminate vertical black lines in originals that were caused by previous scanning with a dirty optics. While selecting a higher setting to erase more lines, selecting a very high setting can cause low contrast areas to become faint or cause them to drop out. [0~7 / **0** / 1] 0: Off 1: Weaker 7: Stronger *(☛6.2 Image Processing)*
	7*	Error Diffusion Pattern	Adjusts the threshold level for error diffusion processing in the Text/Photo mode. The effect of error diffusion can vary, depending on the image of the original. Adjust this setting if the results of the texture in copies is not what you expect, especially before starting a large copy job. [0~3 / 0 / 1 step] 0: Edge threshold pattern is used. 1: Texture Pattern (matrix) 0 is used 2: Texture Pattern (matrix) 1 used. 3: Texture Pattern 2 (matrix) used.
	8*	Gray Adj: Text/Photo (Edge Det.) 25-64%	Adjusts the degree of edge detection to improve image quality originals scanned in the Text/Photo Mode in a range of magnification of 25% to 64%. The method of error diffusion is determined how the edges are detected. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. [0~15 / **7** / 1] 0: Decreasing the setting (approaching "0") improves the appearance of photographs, but can cause text and thin lines to drop out. 15: Increasing the setting (approaching "15") sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.2 Image Processing)

SP4	Mode Number		Function and [Setting]
4904*	***9****	Gray Adj.: Text/Photo (Edge Det.) 65-154%	Adjusts the setting for edge detection during grayscale processing of originals scanned with the Custom Setting of the Text/Photo mode at 65%-154% magnification. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. 0: Decreasing the setting (approaching "0") improves the appearance of photographs, but can cause text and thin lines to drop out. 15: Increasing the setting (approaching "15") sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.2 Image Processing)
	10*	Gray Adj.: Text/Photo (Edge Det.) 155-256%	Adjusts the setting for edge detection during grayscale processing of originals scanned with the Custom Setting of the Text/Photo mode at 155%-256% magnification. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. [0~15 / **7** / 1] 0: Decreasing the setting (approaching "0") improves the appearance of photographs, but can cause text and thin lines to drop out. 15: Increasing the setting (approaching "15") sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.2 Image Processing)
	11*	Gray Adj.: Text/Photo (Edge Det.) 257-400%	Adjusts the setting for edge detection during grayscale processing of originals scanned with the Custom Setting of the Text/Photo mode at 257%-400% magnification. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. [0~15 / **7** / 1] 0: Decreasing the setting (approaching "0") improves the appearance of photographs, but can cause text and thin lines to drop out. 15: Increasing the setting (approaching "15") sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.2 Image Processing)

SP4	Mode Number		Function and [Setting]
4904*	***13****	Gray Adj.: Photo (Edge Det.)	Adjusts the setting for edge detection during grayscale processing of originals scanned with the Custom Setting of the Photo mode. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. [0~15 / **0** / 1] 0: Decreasing the setting (approaching "0") improves the appearance of photographs, but can cause text and thin lines to drop out. 15: Increasing the setting (approaching "15") sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.2 Image Processing)
	20*	Text (General) Quality 25-64%	Allows adjustment together with other SP codes to improve image quality of originals copied in Text Mode at magnification within 25%-64%. The selections are stepped to allow gradual adjustments from prioritizing reproduction of pictures shaded with dot patterns (newspapers, magazines, etc.) with less moiré to prioritizing low contrast fine lines and text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~13 / **0** / 1] 0: Off 1: Pictures highest priority 13: Text/thin lines highest priority (☛6.2 Image Processing)
	21	Text (General) Quality 65-154%	Allows adjustment together with other SP codes to improve image quality of originals copied in Text Mode at magnification within 65%-154%. The selections are stepped to allow gradual adjustments from prioritizing reproduction of pictures shaded with dot patterns (newspapers, magazines, etc.) with less moiré to prioritizing low contrast fine lines and text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~13 / **0** / 1] 0: Off 1: Pictures highest priority 13: Text/thin lines highest priority (☛6.2 Image Processing)

SP4	Mode Number		Function and [Setting]
4904*	22	Text (General) Quality 155-256%	Allows adjustment together with other SP codes to improve image quality of originals copied in Text Mode at magnification within 155%-256%. The selections are stepped to allow gradual adjustments from prioritizing reproduction of pictures shaded with dot patterns (newspapers, magazines, etc.) with less moiré to prioritizing low contrast fine lines and text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~13 / **0** / 1] 0: Off 1: Pictures highest priority 13: Text/thin lines highest priority (☛6.2 Image Processing)
	23	Text (General) Quality 25-64%	Allows adjustment together with other SP codes to improve image quality of originals copied in Text Mode at magnification within 255%-400%. The selections are stepped to allow gradual adjustments from prioritizing reproduction of pictures shaded with dot patterns (newspapers, magazines, etc.) with less moiré to prioritizing low contrast fine lines and text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text/thin lines highest priority (☛6.2 Image Processing)
	24	Photo (General) Quality	Allows overall adjustment of photo images in originals scanned in the Photo mode. These selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text highest priority *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4904*	25	Text/Photo (General) Quality 25-64%	Allows adjustment with other SP codes to improve quality of images scanned in the Text/Photo mode and magnified in the range 25%~64%. These selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text highest priority *(☛6.2 Image Processing)*
	26	Text/Photo (General) Quality 65-154%	Allows adjustment with other SP codes to improve quality of images scanned in the Text/Photo mode and magnified in the range 65%~154%. These selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text highest priority *(☛6.2 Image Processing)*
	27	**Text/Photo (General) Quality 155-256%**	Allows adjustment with other SP codes to improve quality of images scanned in the Text/Photo mode and magnified in the range 155%~256%. These selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text highest priority *(☛6.2 Image Processing)*

SP4	Mode Number		Function and [Setting]
4904*	28	Text/Photo (General) Quality 257-400%	Allows adjustment with other SP codes to improve quality of images scanned in the Text/Photo mode and magnified in the range 155%~256%. These selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. [0~10 / **0** / 1] 0: Off 1: Pictures highest priority 10: Text highest priority *(☛6.2 Image Processing)*
	29	Pale (General) Quality	Allows adjustment with other SP codes to improve the overall quality of images scanned in Pale Mode. The selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing fine lines and text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~13 / **0** / 1] 0: Off 1: Pictures highest priority 13: Text/thin lines highest priority (☛6.2 Image Processing)
	30	Generation (General) Quality	Allows adjustment with other SP codes to improve the overall quality of images in originals scanned in Generation Copy mode. The selections are stepped to allow adjustment in gradual stages from prioritizing reproduction of pictures with less moiré to prioritizing reproduction of fine lines and low density text. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. [0~13 / **0** / 1] 0: Off 1: Pictures highest priority 13: Text/thin lines highest priority *(☛6.2 Image Processing)*
4905	Image Data Path		
	1*	Filter Mag. Path Switch	Allows switching between filter and magnification processing of the image for testing. **DFU** [0~3 / **0** / 1] 0: Uses settings of each application and mode 1: Through filter 2: Through magnification 3: Through filter, magnification

SP4	Mode Number		Function and [Setting]
4905	***4****	Printout Type Selection	Allows switching of the printout for testing. **DFU** [0~1 / **0** / 1] 0: Uses settings of each application, mode 1: Reverses image logic (normally inverse black/white).
4909	Image Data Path		
	1*	Image Quality Through Processing	Selects the method for image quality through processing. **DFU** [0~3 / **0** / 1] 0: Normal operation 1: Grayscale through processing 2: Gamma correction through processing 3: Printer gamma, grayscale through processing
	20*	Image Data Path – Printer	Forces switching of the data output format between writing for the Ri10, CDIA for testing. **DFU** [0~3 / **0** / 1] 0: Normal operation 1: Sets output from the Ri10 to the CDICA for grayscale output (1 pixel/8 bits) 2: Sets output from the Ri10 to the write unit for grayscale output (4 pixles/8 bits) 3: Sets output from the Ri10 to the CDICA for grayscale output (1 pixel/8 bits), also sets output from the Ri10 to the write unit for grayscale output (4 pixels/8 bit)

SP5-xxx: Mode

SP5	Mode Number		Function and [Setting]
5024*	mm/inch Display Selection		Selects the unit of measurement. After selection, turn the main power switch off and on. 0: Europe/Asia 1: North America 0: mm, 1: inch
5044	Operation Panel Bit SW		**DFU**
5104*	A3/DLT Double Count		Specifies whether the counter is doubled for A3/DLT. **0: No** 1: Yes 2: Counts once for A4 SEF fed from bypass tray. *If ① is selected, the total counter and the current user code counter count up twice when A3 or DLT paper is used.*
5106*	6*	ADS Level Selection	Selects the image density level used in ADS mode. [1~7 / **4** / 1 notch per step] Example: If you set SP5-106-6 to "2": Pressing the Auto Image Density key toggles the display off and manual notch 2 is selected. *Adjust this SP if the customer cannot attain clean copies after performing automatic density adjustment.*
5112*	Non-Standard Paper Selection		Determines whether a non-standard paper size can be initialized for copying or not. 0: No, **1: Yes** If ① is selected, a non-standard size can be input using the UP mode.
5113*	Optional Counter Type		Selects the corresponding key for installed devices such as a coin lock. **Japan only** [0~5 / **0** / 1 step]
			0 None.
			1 Key card (RK3, RK4)
			2 Key card (subtraction count setting)
			3 Pre-paid card
			4 Coin lock
			5 MF key card (Peace) **Japan only**
			11 MF key card (Increment)
			12 MF key card (Decrement)
5118*	Disable Copying		**DFU**
5120*	Mode Clear Opt. Counter Removal		Clears all coin devices. **Japan only** [0~2 / 0 / 1 step] 0: Normal reset. 1: Resets only when job finished or before job begins. 2: Not normal reset.
5121*	Counter Up Timing		Determines whether the optional key counter counts up at paper feed or at paper exit. **0: Feed**, 1: Exit *The total counter is not affected by this SP mode.*

SP5	Mode Number		Function and [Setting]
5127*	APS Mode		Selects whether the APS function is enabled or disabled with the contact of a pre-paid card or coin lock. **0: Enabled**, 1: Disabled
5131*	Paper Size Type Selection		Selects the paper size (type) for both originals and copy paper. [0~2 / **DIP SW setting** / 1 step] 0: Japan 1: North America 2: Europe *After changing the setting, turn the copier off and on. If the paper size of the archive files stored on the HDD is different, abnormal copies could result.*
5150*	By-Pass Wide Paper Mode		Determines whether the transfer sheet from the by-pass tray is used or not. **0**: Off, 1: On *Normally the paper length for sub scanning paper from the by-pass tray is limited to 600 mm, but this can be extended with this SP to 1260 mm.*
5162	Application Switching Method		Determines whether the application screen is switched with a hardware switch or software switch. [0~1 / **0** / 1]
5212*	Page Stamp		
	3*	Duplex Printout Right/Left Position	Determines how horizontal printing is executed during duplex printing. Sets the upper right corner of the front side and the upper left corner of the backside so the starting points for horizontal printing are the same on both sides **DFU.** [–10~+10 / **0** / 1 mm step] –10: Extreme right +10: Extreme left
	4*	Duplex Printout High/Low Position	Determines how vertical printing is executed during duplex printing. Sets the upper right corner of the front side and the upper left corner of the backside so the starting points for vertical printing are the same on both sides. **DFU** [–10~+10 / **0** / 1 mm step] –10: Extreme top +10: Extreme bottom
5302*	2*	Set Time	Adjusts the RTC time setting for the local time zone. [–1440~+1440 / 1 min. step] *Example: For Japan (+9 GMT), enter 540 (9 hours x 60 min.)*
5501*	1*	PM Alarm Interval	Sets the PM alarm interval. [0~9999 / **0** / 1 step] **0**: Alarm off 1~9999: Alarm goes off when *Value (1~9999) ≥ PM counter*

SP5	Mode Number		Function and [Setting]
5501*	2*	Original Count Alarm	Sets the alarm to sound after the specified total number of originals goes through the ARDF. **0: Disabled**, 1: Enabled 0: No alarm sounds 1: Alarm sounds after the number of originals passing through the ARDF ≥ 10,000
5504*	Jam Alarm		Sets the alarm to sound for the specified jam level (document mis-feeds are not included). **DFU** [0~3 / **3** / 1 step] 0: Zero (Off) 1: Low (1.5K jams) 2: Medium (3K jams) 3: High (6K jams)
5505*	Error Alarm		Sets the error alarm level. **Japan only** [0~255 / **50** / 100 copies per step]
5507*	1*	Paper Supply Alarm	Switches the control call on/off for the paper supply. **DFU** **0: Off**, 1: On 0: No alarm. 1: Sets the alarm to sound for the specified number transfer sheets for each paper size (A3, A4, B4, B5, DLT, LG, LT, HLT)
	2*	Staple Supply Alarm	Switches the control call on/off for the stapler installed in the finisher. **Japan only** **0: Off**, 1: On 0: No alarm 1: Alarm goes off for every 1K of staples used.
	3*	Toner Supply Alarm	Switches the control call on/off for the toner end. **DFU** **0: Off**, 1: On If you select "1" the alarm will sound when the copier detects toner end.
	128*	Others	The "Paper Supply Call Level: nn" SPs specify the paper control call interval for the referenced paper sizes. **DFU** [00250 ~ 10000 / 1000 / 1 Step]
	132*	A3	
	133*	A4	
	134*	A5	
	141*	B4	
	142*	B5	
	160*	DLT	
	164*	LG	
	166*	LT	
	172*	HLT	
5508	CC Call		
	1*	Jam Remains	Enables/disables initiating a call for an unattended paper jam. [0~1/**1**/1] 0: Disable 1: Enable

SP5	Mode Number		Function and [Setting]
5508	2*	Continuous Jam Occurrence	Enables/disables initiating a call for consecutive paper jams. [0~1/**1**/1] 0: Disable 1: Enable
	3*	Continuous Door Open	Enables/disables initiating a call when the front door remains open. [0~1/**1**/1] 0: Disable 1: Enable
	4*	Low Call Mode	Enables/disables the new call specifications designed to reduce the number of calls. [0~1/**1**/1] 0: Normal mode 1: Reduced mode
	11*	Jam Detection: Time Length	Sets the length of time a jam must remain before it becomes an 'unattended paper jam'. [03~30/**10**/1] This setting is enabled only when SP5508 004 is enabled (set to 1).
	12*	Jam Detection: Continuous Count	Sets the number of consecutive paper jams required to initiate a call. [02~10/**5**/1] This setting is enabled only when SP5508 004 is enabled (set to 1).
	13*	Door Open: Time Length	Sets the length of time the door remains open before the machine initiates a call. [03~30/**10**/1] This setting is enabled only when SP5508 004 is enabled (set to 1).
	21*	Jam Operation: Time Length	Determines what happens when a paper jam is left unattended. [0~1/**1**/1] 0: Automatic Call 1: Audible Warning at Machine
	22*	Jam Operation: Continuous Count	Determines what happens when consecutive paper jams occur. [0~1/**1**/1] 0: Automatic Call 1: Audible Warning at Machine
	23*	Door Operation: Time Length	Determines what happens if the door remains open (15 min.). [0~1 / 1 / 1] 0: OFF 1: ON. Displays a warning. Pressing the call button will contact the service center. *This setting is available for setting only if SP5508 004 is set for 1.*

SP5	Mode Number		Function and [Setting]
5801*	Memory Clear		Resets all correction data for process control and all software counters, and returns all modes and adjustments to their default values. (☛ 5.1.8) *Use this SP only after replacing the NVRAM, or after the copier has malfunctioned due to a damaged NVRAM.*
5802*	Printer Free Run		Performs a free run. The scanner scans once and the printer prints for the number of copies requested. To perform the free run, after selecting "1", press the Copy Window to enter copy mode, input the number of copies, and then press the Start key. To stop the free run, press C/⊘. **0: Off**, 1: On
5803	Input Check		Displays the signals received from sensors and switches. (☛ 5.1.4)
5804	Output Check		Turns on the electrical components individually for test purposes. (☛ 5.1.5)
5807	Option Connection Check		Checks the connectors to the optional peripheral devices. Execution will return either a "1" or "0": 0: Device not connected correctly. 1: Device connected correctly.
	1	ARDF	
	2	Bank (Paper Tray Unit)	
	3	LCT	
	4	Finisher (1000-sheet, Two-Tray finisher)	
5811*	1*	Machine Serial Number	Use to input the machine serial number. This is normally done at the factory. *If you want to know the serial number, print the system parameter list. Press ✱ and then input "A".*
5812*	Service Tel. No. Setting		
	1*	Service Tel. Number	Use this to input the telephone number of the service representative. Enter the number and press #. This number is displayed when a service call condition occurs. *Press the ✱ key to input a pause. Press the "Clear modes" key to delete the telephone number.*
	2*	SMC Report Transfer Fax. No.	Use this to input the fax number of the service representative. Enter the number and press #. This number is printed on the Counter Report (UP: System No. 19) *Press the ✱ key to input a pause. Press the "Clear modes" key to delete the telephone number.*
	3*	Supply	Use this to input the telephone number of your supplier for consumables. Enter the number and press #. *Press the ✱ key to input a pause. Press the "Clear modes" key to delete the telephone number.*

SP5	Mode Number		Function and [Setting]
5812*	4*	Operation	Use this to input the service telephone. Enter the number and press #. *Press the ⊙* key to input a pause. Press the "Clear modes" key to delete the telephone number.*
5816*	1	CSS Function On/Off	**Japan Only** **0: Off**, 1: On.
	2	CE Call	**Japan Only** **0: Start**, 1: Finish
5821*	CSS PI Device Code		Selects the PI device code. **DFU** [0~4 / **0** / 1 step]
5824	NVRAM Data Upload		Uploads the UP and SP mode data (except for counters and the serial number) from NVRAM on the control board to a flash memory card. *While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.*
5825	NVRAM Data Download		Downloads the content of a flash memory card to the NVRAM on the control board.
5828*	Network Setting		
	12	Device Name	Displays the device name used by the network in the format RNPxxx… up to 48 characters.
	66	Job Spooling Clear: Start Time	This SP determines whether jobs spooled but not printed when the machine was switched off are printed the next time the machine is switched on. [0~1 /**1** /1] 0: Not printed at power on 1: Printed at power on *This SP is available only when job spooling is enabled.*
5828*	69	Job Spooling (Protocol)	Switches job spooling off and on and allows settings for job spooling protocols. [0~1 / **1** / 1] 0: Off 1: On (All Active) Protocols are enabled/disabled with bit switch settings (0 = Off, 0 = On). Bit0: LPR Bit1: FPT Bit2: IPP Bit3: SMB Bit4~Bit7: Reserved
	74*	Delete Password	Execute to delete network password.
	84*	Print NCS Parameters	Prints a list of all NCS related parameters.
	90*	Use Telnet	This setting determines whether Telnet is started or not. [0~1 / **1** / 1] *If not started, the Telnet port is closed.*
	91	Web Monitor Image	Determines whether Web Image Monitor is enabled or disabled. [0~1 / 1 / 1] 1: Enabled 0: Disabled

SP5	Mode Number		Function and [Setting]
5832	HDD		
	1	HDD Formatting (ALL)	Enter the SP number for the partition to initialize, then press #. When execution ends, cycle the machine off and on.
	2	HDD Formatting (IMH)	
	3	HDD Formatting (Thumbnail)	
	4	HDD Formatting (Job Log)	
	5	HDD Formatting (Printer Fonts)	
	6	HDD Formatting (Address Book)	
	7	HDD Formatting (Mail RX data)	
	8	HDD Formatting (Mail TX data)	
	9	HDD Formatting (Data for a Design)	
	11	HDD Formatting (Ridoc I/F)	
5833	Job Log Transfer On/Off Setting		Switches the job log transfer on/off for Poplar server. **0: Off (disable),** 1: On (enable)
5834	Enable Operation Panel Image Settings		Enables and disables the operation panel read (dump) feature. After powering on the machine, set this option to 1 to enable this feature. **0**: Off (disable), 1: On (enable) *To reset the machine to 0, the machine must be turned off and on again. Selecting 0 for this option without cycling the power off and on does not restore the default setting (0).*
5836	Capture Setting		
	1*	Capture Function (0:Off 1:On)	With this function disabled, the settings related to the capture feature cannot be initialized, displayed, or selected. [0~1/**0**/1] 0: Disable 1: Enable
	2*	Panel Setting	Determines whether each capture related setting can be selected or updated from the initial system screen. [0~1/0/1] 0: Disable 1: Enable The setting for SP5836 001 has priority.
	61*	File Send After Capture (0: NO 1:YES)	In order to reduce the load on the network, only the captured document is sent (0), or the network accurately maintains the captured document for re-sending. [0~1/**1**/1]

SP5	Mode Number		Function and [Setting]
5836	71*	Reduction for Copy Color	Sets the default reduction for stored copy color documents sent to the document management server via the MLB. [0~2 / **2** / 1] 0: 1-to-1 1: 1/2 2: 1/4 *Enabled only when optional MLB (Media Link Board) is installed.*
	72*	Reduction for Copy B&W Text	Sets the default reduction for stored black and white text documents sent the document management server via the MLB. [0~2 / **2** / 1] 0: 1-to-1 1: 1/2 2: 1/4 *Enabled only when optional MLB (Media Link Board) is installed.*
	73*	Reduction for Copy B&W Other	Sets the default reduction for stored documents other than black and white sent to the document management server via the MLB. [0~2 / **2** / 1] 0: 1-to-1 1: 1/2 2: 1/4 *Enabled only when optional MLB (Media Link Board) is installed.*
	74*	Reduction for Printer Color	Sets the default reduction for stored print color documents sent to the document management server via the MLB. [0~2 / **2** / 1] 0: 1-to-1 1: 1/2 2: 1/4 *Enabled only when optional MLB (Media Link Board) is installed.*
	75*	Reduction for Printer B&W	Sets the default reduction for stored printer black and white documents sent to the document management server via the MLB. [0~2 / **2** / 1] 0: 1-to-1 1: 1/2 2: 1/4 *Enabled only when optional MLB (Media Link Board) is installed.*

SP5	Mode Number		Function and [Setting]
5836	76*	Reduction for Printer B&W HQ	Sets the default reduction for stored printer black and white documents sent to the document management server via the MLB with higher quality given priority. [0~3 / **1** / 1] 0: 1-to-1 1: 1/2 2: 1/4 3: 1/8 *Enabled only when optional MLB (Media Link Board) is installed.*
	81*	Format for Copy Color	Sets the default format for stored copy color documents sent to the document management server via the MLB. [0~3 / **0** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only when* optional *MLB (Media Link Board) is installed.*
	82*	Format for Copy B&W Text	Sets the default format for stored copy black and white text documents sent to the document management server via the MLB. [0~3 / **1** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only when optional MLB (Media Link Board) is installed.*
	83*	Format Copy B&W Other	Sets the default format for stored other than black and white documents sent to the document management server via the MLB. [0~3 / **1** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only when optional MLB (Media Link Board) is* installed.
	84*	Format for Printer Color	Sets the default format for stored printer color documents sent to the document management server via the MLB. [0~3 / **0** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only when* optional *MLB (Media Link Board) is installed*

SP5	Mode Number		Function and [Setting]
5836	85*	Format for Printer B&W	Sets the default format for stored printer black and white documents sent to the document management server via the MLB. [0~3 / **1** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only* when *optional MLB (Media Link Board) is installed.*
	86*	Format for Printer B&W HQ	Sets the default format for stored copy black and white text documents sent to the document management server via the MLB with quality given higher priority. [0~3 / **0** / 1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR *Enabled only when optional MLB (Media Link Board) is installed.*
	91*	Default for JPEG	Sets the JPEG format default for documents sent to the document management server via the MLB with JPEG selected as the format. [5~95 / **50** / 1] *Enabled only when optional MLB (Media Link Board) is installed.*
5839	IEEE 1394		
	4	Host Name	Enter the name of the device used on the network. Example: RNP0000000000
	7*	Cycle Master	Enables or disables the cycle master function for the 1394 bus standard. [0~1/**1**/1] 0: Disable (Off) 1: Enable (On)
	8*	BCR mode	Determines how BCR (Broadcast Channel Register) operates on the 1394 standard bus when the independent node is in any mode other than IRM. (NVRAM: 2-bits) (Range: Binary settings 0~3) 00: Off. Writes from the IRM. 01: Copies BCR of the IRM after no data is written from the IRM after the prescribed time has elapsed. 10: Reserved. Not used. 11:BCR normally enabled.
	9*	IRM 1394a Check	Conducts a 1394a check of IRM when the independent node is in any mode other than IRM. 0: Checks whether IRM conforms to 1394a 1: After IRM is checked, if IRM does not conform then independent node switches to IRM.

SP5	Mode Number		Function and [Setting]
5839	10*	Unique ID	Lists the ID (Node_Unique_ID) assigned to the device by the system administrator. [0~1/**1**/1] 0: Does not list the Node_Unique_ID assigned by the system administrator. Instead, the Source_ID of the GASP header in the ARP is used. 1: The Node_Unique_ID assigned by the system administrator is used, and the Source_ID of the GASP header in the ARP is ignored. Also, when the serial bus is reset, extra bus transactions are opened for the enumeration.
	11*	Logout	Handles the login request of the login initiator for SBP-2. (1-bit) [0~1/**1**/1] 0: Disable (refuse login) Initiator retry during login Login refusal on arrival of login request (standard operation) 1: Enable (force logout) Initiator retry during login Login refusal on arrival of login request, and the initiator forces the login.
	12*	Login	Enables or disables the exclusive login feature (SBP-2 related). [0~1/1/1] 0: Disables. The exclusive login (LOGIN ORB exClusvie it) is ignored. 1: Enables. Exclusive login is in effect.
	13*	Login MAX	Sets the maximum number of logins from the initiator (6-bits) [0~63/**8**/1] 0: Reserved 63:Reserved
5840	IEEE 802.11b		
	4	SSID	Enters an unique ID (up to 32 characters long) to identify the device when it is operating in an area with another wireless LAN network.
	6	Channel MAX	Sets the maximum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the maximum end of the range for each area. Adjust the upper 4 bits to set the maximum number of channels. JA [1~14/ **14** / 1] NA [1~11 / **11** / 1 EU [1~13 / **13** / 1] China, Taiwan (Same as NA) *Displayed only when the option 802.11b for wireless LAN is installed.*

SP5	Mode Number		Function and [Setting]
5840	7	Channel MIN	[Sets the minimum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the minimum end of the range for each area. Adjust the lower 4 bits to set the minimum number of channels. JA [1~14 / **1** / 1] NA [1~11 / **1** / 1 EU [1~13 / **1** / 1] China, Taiwan (Same as NA) *Displayed only when the option 802.11b for wireless LAN is installed.*
	11	WEP Key Select	Selects the WEP key. [00~11 / 00 / 1 binary] 00: Key #1 01: Key #2 (Reserved) 10: Key #3 (Reserved) 11: Key #4 (Reserved)
	20	WEP Mode	Determines the operation mode of the WEP key. [0~1/**0**/1] 0: Max. 64-bit (10 characters) 1: Max. 128-bit (10, 26 characters) *Displayed only when the option 801.11b for wireless LAN is installed.*
5841	Supply Name Setting		Allows setting the following items with the Soft Keyboard after pressing the “Soft Keyboard” button displayed for this SP code. The items you enter are displayed after pressing “User Tools” and then pressing the “Inquiry” button on the touch-panel display.
	1	Toner Name Setting: Black	Enter the name of the toner in use.
	5	Staple Standard	Enter the name of the staples in use for normal stapling (not booklet stapling)
	6	Staple Bind	Enter the name of the staples in use for booklet stapling.
	7	Original Stamp	Enter the names of original stamps.
5842	1	Net File Analysis Mode Setting	Selects each debug output mode for NetFile processing [8 bits / **0011 1111** / Bit SW] *Bit 8 is reserved. Bit 7 is the debug output switch for each mode.* *Net files are jobs to be printed from the document server using a PC and the DeskTopBinder software*
5844	USB		
	1	Transfer Rate	Sets the speed for USB data transmission. [0x01~0x04 / **0x04** / 0] 0x01: Full Speed (12 Mbps fixed) 0x04: High Speed/Full Speed (480 Mbps/12 Mbps auto adjust)

SP5	Mode Number		Function and [Setting]
5844	2	Vendor ID	Sets the vendor ID: Initial Setting: 0x05A Ricoh Company. **DFU** [0x0000~0xFFFF/ 0x05CA /1]
	3	Product ID	Sets the product ID. **DFU** [0x0000~0xFFFF/0x0403/1]
	4	Device Release Number	Sets the device release number of the BCD (binary coded decimal) display. [0000~9999/0100/1] **DFU** *Enter as a decimal number. NCS converts the number to hexadecimal number recognized as the BCD.*
5845	Delivery Server Setting		Provides items for delivery server settings.
	1	FTP Port No.	Sets the FTP port number used when image files to the Scan Router Server. [0~65535 / **3670** / 1]
	2	IP Address	Use this SP to set the Scan Router Server address. The IP address under the transfer tab can be referenced by the initial system setting. [0~0xFFFFFFFF / **0x00**]
	3	Retry Interval	Determines the time interval between retries before the machine returns to standby after an error occurs during an image transfer with the delivery scanner or SMTP server. [60~900 / **300** / 1]
	4	Number oF Retries	Determines the number of retries before the machine returns to standby after an error occurs during an image transfer with the delivery or SMTP server. [0~99 / **3** / 1]
	5*	Capture Server IP Address	Sets the capture server IP address for the capture function. (eCabinet UC1). [0~0xFFFFFFFF / **0x00** /] MLB2 is required to use this feature.
	6*	Delivery Error Display Time Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software	Use this setting to determine the length of time the prompt message is displayed when a test error occurs during document transfer with the NetFile application and an external device. [0~999 / **300** / 1]
	7*	Delivery Options	Connects to the Scan Router server for delivery of scanned documents. [0~1 / **0** / 1] 0: No connection to Scan Router delivery server 1: Connected to Scan Router server for delivery of scanned documents.
5846	UCS Settings		
	1	Machine ID (For Delivery Server)	Displays the unique device ID in use by the delivery server directory. The value is only displayed and cannot be changed. This ID is created from the NIC MAC or IEEE 1394 EUI. The ID is displayed as either 6-byle or 8-byte binary.

SP5	Mode Number		Function and [Setting]
5846	2	Machine IC Clear (For Delivery Server)	Clears the unique ID of the device used as the name in the file transfer directory. Execute this SP if the connection of the device to the delivery server is unstable. After clearing the ID, the ID will be established again automatically by cycling the machine off and on.
	3	Maximum Entries	Changes the maximum number of entries that UCS can handle. [2000~50000/2000/1] If a value smaller than the present value is set, the UCS managed data is cleared, and the data (excluding user code information) is displayed.
	4	Delivery Server Model	Changes the model of the transfer server registered for the I/O device. [0~4/ **0** /1] 0: Not used 1: SG1 Provided 2: SG1 Package 3: SG2 Provided 4: SG2 Package
	5	Delivery Server Capability	Changes the capability of the server registered for the I/O device. Bit 7 = 1 Comment information Bit 6 = 1 Address direct entry possible Bit 5 = 1 Mail Rx confirmation possible Bit 4 = 1 Address book auto update Bit 3 = 1 Fax Rx function [0~255 / **0** / 2]
	6	Delivery Server Retry Timer	Sets the interval for retry attempts when the delivery server fails to acquire the delivery server address book. [0~255/ **0** /1]
	7	Delivery Server Retry Times	Sets the number of retry attempts when the delivery server fails to acquire the delivery server address book. [0~255/ **0** /1]
	8	Delivery Server Maximum Entries	Sets the maximum number account entries of the delivery server user information managed by UCS. [2000~50000 / **2000** / 1]
	50	Initialize All Directory Info.	Clears all directory information managed by UCS, including all user codes.
	51	All Directory Info. Upload	Uploads all directory information to the IC card.
	52	All Directory Info. Download	Downloads all directory information from the IC card.
	80	FCU Backup	Backs up all directory information on the HDD to the FCU ROM.
	99	Bit Switches	Sets UCS debug output. **DFU**
5847	Net File Mag. Rate		
	1	Copy: Color	Changes the default settings of image data transferred externally by the Net File page reference function. [0~2 / **2** / 1] 0: 1x
	2	Copy : B&W Text	
	3	Copy: Other Than B&W	
	4	Printer: Color	
	5	Printer: B&W Binary	

SP5	Mode Number		Function and [Setting]
5847	6	Printer: B&W Dither	1: ½x 2: ¼x *"Net files" are jobs to be printed from the document server using a PC and the DeskTopBinder software.*
	21	NetFile Default for JPEG	Sets the default for JPEG image quality of image files handled by NetFile. *Currently not used.* [5~95 / **50** / 1] *"Net files" are jobs to be printed from the document server using a PC and the DeskTopBinder software.*
5848	Web Service		
	1	Network Quality DeFault For JPEG	[5~95 / 50 / 1] *Currently not used.*
	2	Access Control: Repository (Lower 4 Bits)	Sets the 4-bit switch assignment for the access control setting. *Currently not used.* 0000: No access control 0001: Denies access to Desk Top Binder. Has no effect on access and delivery from Scan Router .
	3	Doc. Svr. Print (Lower 4 Bits)	Switches access control on and off. 0000: OFF
	4	User Directory (Lower 4 Bits)	Switches access control on and off. 0000: OFF
	5	Delivery Input (Lower 4 Bits)	Switches access control on and off. 0000: OFF
	6	Access Control: (Lower 4 Bits)	Switches access control on and off. 0000: OFF
	100	Repository: Max. Size of Download Image	Sets the maximum size allowed for downloaded images. The default is equal to 1 gigabyte. [1~1024 / **1024** / 1K]
5849	Installation Date		Sets the delivery date for the machine. **DFU**
	1	Indication	
	2	Switch to Print	
5852	SMTP		Simple Mail Transfer Protocol. The protocol for communication between Internet main MTAs (Message Transfer Agents).
	2	Port Number	Sets the port number [0~65535 / **25** / 1]
5853	Stamp Data Download		Use this SP to download the fixed stamp data stored in the firmware the ROM and copy it to the HDD. This SP can be executed as many times as required. This SP must be executed after replacing or formatting the hard disks. *This SP can be executed only with the hard disks installed.*
5857	Debug Log Save Function		
	1	On/Off (1:ON 0:OFF)	Switches the debug log feature on and off. The debug log cannot be captured until this feature is switched on. [0 ~ 1 / **0** / 1] 0: OFF 1: ON

SP5	Mode Number		Function and [Setting]
5857	2	Target (1:IC Card 2:HDD)	Select "1" (IC Card) if an HDD unit is not installed in the machine, or if the HDD unit is temporarily out of service. The IC card can store only 4 MB so use the HDD selection.
	3	Initialize IC Card	Initializes the IC card inserted into the controller slot. Initializing erases all data on the IC card. Use to initialize a new card. **DFU**
	4	Save to IC Card	Saves the debug log in memory to the IC card. **DFU**
	5	Save to HDD	Saves the debug log in memory to the HDD. **DFU** *A unique file name is generated to avoid overwriting existing file names on the SD Card. Up to 4MB can be copied to an SD Card. 4 MB segments can be copied one by one to each SD Card.*
	7	HDD to IC Card (Latest 4MB)	Copies the latest 4 MB of the debug log on the HDD to the IC card. This function erases all data from the IC card as it copies.
	8	HDD to IC Card (Latest 4MB Any Key)	Copies the latest 4 MB of the debug log on the HDD to the IC card, but only those portions of the log specified with a key specified with SP5859 (Debug Save Key No.) This function erases all data from the IC card as it copies. *To enable this SP, the machine must be cycled off and on.*
	11	Erase Debug Data From HDD	Erases all debug log data from the IC card. **DFU**.
5858	Debug Log Save Function		These SPs select the content of the debugging information to be saved to the destination selected by SP5857 002.
	1	Engine SC Error	Stores SC codes generated by copier engine errors.
	2	Controller SC Error	Stores SC codes generated by GW controller errors.
	3	Any SC Error	Stores one SC specified by number. [0~65535 / **0** / 1] Refer to Section 4 for a list of SC error codes.
	4	Jam	Stores jam errors.
5859	Debug Log Save Function		
	1	Key 1	These SPs allow you to set up to 10 keys for log files for functions that use common memory on the controller board. (☛5.3.1) [-9999999~9999999 / 0 / 1]
	2	Key 2	
	3	Key 3	
	4	Key 4	
	5	Key 5	
	6	Key 6	
	7	Key 7	
	8	Key 8	
	9	Key 9	
	10	Key 10	

SP5	Mode Number		Function and [Setting]
5907*	Plug & Play		Sets the brand name and the production name for Windows Plug & Play. This information is stored in NVRAM. If the NVRAM is defective or has been replaced, these names should be registered again. *To set the plug and play model name, enter the model number, and then press #.*
5914*	Application Counter Display		Selects whether or not the total printer counter is displayed in the UP mode. **0: Off**, 1: On
5915	Mechanical Counter Detection		Checks whether the mechanical counter inside the inner cover is connected or not. Display: 0: Not detected 1: Detected 2: Unknown
5918*	A3/DLT Counter Display		Sets the key press display for the counter key. [0, 1 / **1** / --] This setting has no relation to (SSP) SP5-104 A3/DLT Double Count.
5923*	Flame Elimination Area Change		Toggles between two settings that affect the appearance of the pages for border removal and printed facing pages: (1) Using the original area as the allotted area, or (2) Using only the copy paper as the allotted area. [0, 1/ **0** / --] 0: Original area used as base 1: Copy used as the base
5958	Feed Clutch Start Timing Adjustment		Adjusts the clutch timing to optimize the intervals between fed sheets to reduce jams in the feed unit. **DFU**
	1*	1st, 2nd Feed Clutches	[35 ~ 57.5 / **42.5** / 2.5mm]
	2*	3rd, 4th, LCT Feed Clutches	
	3*	Leading Edge Jam Detection Start Timing	[19~34 / **26.5** /2.5 mm]
5959	Image Timing Adj.		Sets the amount of time the machine waits to project the latent image onto the drum after the feed/development motor, main motor, and fusing/feed-out motor switch on. [0~60 / 0 / 1 s] *This setting allows the drum and hot roller to turn freely in order to allow more time for cleaning toner and carbon that has accumulated on the hot roller strippers. Changing this can improve image quality but can also slow down the first print time. Adjust only when necessary.* *Also see SP 3905.*
5961*	Large Capacity Exit Mode		Selects whether or not all stapled copies are sent to Shift Tray 1 when the Two-Tray finisher is installed. [0, 1 / **1**] 1: Enabled 0: Disabled

<table>
<tr><th>SP5</th><th>Mode Number</th><th>Function and [Setting]</th></tr>
<tr><td>5962</td><td>8K 16K Paper Mode</td><td>Switches on/off the use of 8-kai, and 16-kai China paper sizes.
[0~1 / 0 / 1]
0: Off. 8-kai, 16-kai paper sizes are not displayed after pressing the selection key.
1: On. 8-kai, 16-kai paper sizes displayed after pressing the selection key. For this setting to take effect, “2” must be selected for SP5131.
With “2” (Europe) selected for SP5131, the ADF can select 16-kai LEF. With SP5962 set for “0” (Off), the nearest size is detected as shown below.
<table>
<tr><th>Size Loaded</th><th>Size Detected</th></tr>
<tr><td>16-kai SEF</td><td>B5 SEF</td></tr>
<tr><td>16-kai LEF</td><td>B5 LEF</td></tr>
<tr><td>8-kai SEF</td><td>B4 LEF</td></tr>
</table></td></tr>
<tr><td>5970*</td><td>Debug Serial Output</td><td>DFU</td></tr>
<tr><td>5971</td><td>Operation Panel Coordinate Adj.</td><td>Determines whether the machine clears memory after calibrating the coordinates of the touch screen are calibrated.
[0~1 / 0 / 1]
0: Off. No memory clear.
1: On. Clears memory. The memory clear execution is the same as executing SP5801 1 (All).</td></tr>
<tr><td>5974*</td><td>Cherry Server Lite/ Switch to Full</td><td>Switches writing between the Scan Router lite application provided and the optional full version.
0: Lite, 1: Full</td></tr>
<tr><td>5990</td><td>SMC Printout
<table>
<tr><td>1</td><td>All (Data List)</td></tr>
<tr><td>2</td><td>SP (Mode Data List)</td></tr>
<tr><td>3</td><td>User Program</td></tr>
<tr><td>4</td><td>Logging Data</td></tr>
<tr><td>5</td><td>Diagnostic Report</td></tr>
<tr><td>7</td><td>NIB Summary</td></tr>
<tr><td>8</td><td>Print Net File Log</td></tr>
<tr><td>21</td><td>Copier User Program</td></tr>
<tr><td>22</td><td>Scanner SP</td></tr>
<tr><td>23</td><td>Scanner User Program</td></tr>
</table></td><td>Prints all of the system parameter lists for the item selected. (☛ 5.1.6) Input the number for the item that you want to print, and then press ①: “Execute” on the touch panel.</td></tr>
</table>

SP6-xxx: Peripherals

SP6	Mode Number		Function and [Setting]		
6006*	DF Registration Adjustment		Adjusts the side-to-side and leading edge registration for simplex and duplex original feeding in ARDF mode. Press # to toggle ±.		
	1*	Side-to-side	[–3 ~ +3 / **0.0** / 0.1 mm step]		
	2*	Leading Edge (Thin Original)	[–30 ~ +30 / **0.0** / 0.17 mm step]		
	3*	Leading Edge (Duplex Front)	[–42 ~ +42 / **0.0** / 0.12 mm step]		
	4*	Leading Edge (Duplex Rear)			
	5	Rear Edge Erase	Sets the maximum setting allowed for rear edge erase. [–20 ~ +20 / **0.0** / 0.5 mm step]		
6007		ADF Input Check	Displays the signals received from sensors and switches of the ARDF.(☛ 5.1.4)		
	1	Group 1			
	2	Group 2			
	3	Group 3			
6008	ADF Output Check		Switches on each electrical component (ARDF motor, solenoid, etc.) of the ARDF for testing. (☛ 5.1.5)		
6009	DF Free Run		Performs a free run with the ARDF for duplex and stamp testing. Input the number for the item you want to check, and then press 1 to start. 1: To Start, 0: To cancel This is a general free run controlled from the copier. For more detailed free run modes, see the ARDF manual.		
	1	Duplex Mode			
	2	Stamp Mode			
6010*	DF Stamp Position Adjustment		Adjusts the horizontal position of the stamp on the scanned originals. [–7~+7 / **0** / 0.5 mm steps]		
6016*	Original Size Decision Priority		Determines which original sizes are detected when an original is detected that is larger than the size assigned to the original size sensor. This provides an alternate selection for detection, other than that assigned with SP5131. [0~1 / **0** / 1]		
			Japan		
			Bit	**0**	**1**
			7	DLT SEF	11”x15”
			North America		
			Bit	**0**	**1**
			6	DLT SEF	11” x 15”
			5	LT LEF	US Exec LEF
			4	LT SEF	8”x10” SEF
			3	LG SEF	F4 SEF
			Europe		
			Bit	**0**	**1**
			2	DLT SEF	8-K SEF
			1	LT SEF	16-K SEF
			0	LT LEF	16-K LEF

SP6	Mode Number		Function and [Setting]
6017*	Sheet Through Magnification		Adjusts the magnification in the sub-scan direction for ADF mode. [–50.0 ~ +50.0 / **0.0** / 0.1%/step] Use the # key to toggle between + and - before entering the value
6105*	Staple Position Adjustment		Adjusts the staple position in the main scan direction when using the two-tray finisher. [–3.5~+3.5 / **0.0** / 0.5 mm step] *Press # to toggle ±. A larger value shifts the staple toward the edge of the paper.*
6113*	Punch Hole Adjustment		Adjusts the punch hole position. [–7~+7 / **0** / 0.5 mm steps] *Press # to toggle ±. A larger value shifts the holes toward the edge of the paper.*
	1*	2-Holes	2-hole punches for Japan, North America, Europe, and 4-hole punches for Northern Europe.
	2*	3-Holes	3-hole punches for North America, and 4-hole punches for Europe.
6902*	Fold Position Adjustment		Allows fine adjustment of the fold position on paper when the Booklet Finisher is connected and used.
	1*	A3/DLT	[-30~+30 / **0** / 0.5 mm]
	2*	B4	[-20~+20 / **0** / 0.5 mm]
	3*	A4/LT	[-15~+15 / **0** / 0.5 mm]

SP7-xxx: Data Log

SP7	Mode Number		Function and [Setting]
7001*	Main Motor Operation Time		The number of prints and drive time for drum revolutions can be obtained by counting the main motor revolution time. If the amount of time required for the drum to revolve to print 1 copy increases, this data combined with the number of copies can be used to analyze problems and could be useful for future product development. Display: 00000000~99999999 min.
7002*	Original Counter		Select a number to display the total original count (number of originals fed) for the selected item.
	1*	Total Counter	
	2*	Copier	
	3*	Fax	
	4*	Document Box	
	5*	Scanner	
	6*	Others	
7003*	Print Counter		Select a number to display the total print count for the selected item.
	1*	Total Counter	
	2*	Copier	
	3*	Fax	
	4*	Printer	
	5*	Others	
7006*	C/O, P/O Counter		Displays the number of copies per original when making more than 10 copies. *For example, if you make 15 copies of a 3 page original document, for a total of 45 sheets, then the counter would be 15 (5 copies counted from 11 to 15 x 3 originals). No count will be returned for 1~10 copies of an original.*
	1*	C/O (Copies/Original)	
	2*	P/O (Prints/Original)	
7007*	Other Counters		Displays the count total for the selected item.
	1*	Duplex Counter	
	2*	A3/DLT Counter	
	3*	Staple Counter	
	4*	Scan Counter	
7101*	Copy Counter: Paper Size		Displays the total number of prints by paper size.
	5*	A4 LEF	
	6*	A5 LEF	
	14*	B5 LEF	
	38*	LT LEF	
	44*	HLT LEF	
	132*	A3 SEF	
	133*	A4 SEF	
	134*	A5 SEF	
	141*	B4 SEF	
	142*	B5 SEF	
	160*	DLT SEF	
	164*	LG SEF	
	166*	LT SEF	
	172*	HLT SEF	

SP7	Mode Number		Function and [Setting]
7101*	255*	Others	
7105	P type Counter		Displays the count for each type of special paper, up to 99,999,999
	1	Normal	
	2	Recycled	
	3	Special	
	4	Colour	
	5	(Not used)	
	6	Letterhead	
	7	Label	
	8	Thick	
	9	OHP	
	10	Used	
	11	Index	
	255	Others	
7201*	Total Scan Counter		Displays the total number of originals scanned.
7204*	Copy Counter: Paper Tray		Displays the total number of sheets fed from each paper feed tray.
	1*	Paper Tray 1	Copier
	2*	Paper Tray 2	Copier
	3*	Paper Tray 3	Paper Tray Unit (Option)
	4*	Paper Tray 4	Paper Tray Unit (Option)
	5*	LCT	Large Capacity Tray (Option)
	6*	By-Pass	Copier
7205*	Total ADF Counter		Displays the total number of originals fed by the ARDF.
7206*	Staple Counter		Display the total number of staples fired.
	1*	Normal Staple	
	2*	Booklet Staple	
7209*	Punch		Displays the total times the punch has fired.
7301*	Copy Count: Magnification		Displays the total number of prints by magnification rate.
	1*	Reduce 25%-49%	
	2*	Reduce 50%~99%	
	3*	Full Size	
	4*	Enlarge 101%~200%	
	5*	Enlarge 201%~400%	
	6*	Direct Mag. 2	
	7*	Direct Size Mag. mm (inch)	
	8*	Auto Reduce/Enlarge	
7304*	Copy Counter: Copy Mode		Displays the total number of prints by copy operation mode.
	1*	Original Mode: Text	
	2*	Original Mode: Text/Photo	
	3*	Original Mode: Photo	
	4*	Original Mode: Generation	
	5*	Original Mode: Pale	
	6*	Punch	
	7*	Repeat	

SP7	Mode Number		Function and [Setting]
7304*	8*	Sort	Displays the total number of prints by copy operation mode.
	9*	Staple	
	10*	Series	
	11*	Erase	
	12*	Duplex	
	13*	ADF	
	14*	Double Copy	
	15*	Duplex Original	
	16*	Interrupt Copy	
	17*	Combine 1 Side	
	18*	Combine 2 Side	
	19*	Booklet	
	20*	Magazine	
	21*	Batch	
	22*	SADF	
	23*	Mixed Sizes	
	24*	Stamp	
	25*	Cover Page/Chapter Page	
	26*	Slip Sheet	
7305*	Copy Counter – Set Number		Displays the total number of prints for multiple copy jobs.
	1*	1 to 1	
	2*	1 to 2~5	
	3*	1 to 6~10	
	4*	1 to 11~20	
	5*	1 to 21~50	
	6*	1 to 51~100	
	7*	1 to 101~300	
	8*	1 to 301~ Over	
7306*	Job Counter – Copy Mode		Displays the total number of prints based on the job mode.
	1*	Sort	
	2*	Staple	
	3*	Punch	
	4*	Reserve Copy	
	5*	Check Copy	
7320*	Document Server: Scan Storage		Displays the original count stored on the document server.
	1*	Scanning Count	
7321*	Document Server: Each Size of Originals		Displays the number of originals by paper size scanned at the copy server.
	4*	A3	
	5*	A4	
	6*	A5	
	13*	B4	
	14*	B5	
	32*	DLT	
	36*	LG	
	38*	LT	
	44*	HLT	

SP7	Mode Number		Function and [Setting]
7321*	128*	Others	Displays the number of originals by paper size scanned at the copy server.
7323*	Document Server: Each Size of Printouts		Displays the number of prints by paper size.
	5*	A4 LEF	
	6*	A5 LEF	
	14*	B5 LEF	
	38*	LT LEF	
	44*	HLT LEF	
	128*	Other	
	132*	A3 SEF	
	133*	A4 SEF	
	134*	A5 SEF	
	141*	B4 SEF	
	142*	B5 SEF	
	160*	DLT SEF	
	164*	LG SEF	
	166*	LT SEF	
	172*	HLT SEF	
7324*	Document Server: Print Job Counter		Displays the number of jobs classed by job content.
	1*	Duplex	
	2*	Sort	
	3*	Staple	
	4*	Punch	
	5*	Check Copy	
	6*	Print 1st Page	
7325*	Document Server: Job Counter – Page Number		Displays the number of print jobs classed by size of the job.
	1*	1-page	
	2*	2-pages	
	3*	3~5 pages	
	4*	6~10 pages	
	5*	over 11 pages	
7326*	Document Server: Job Counter – File Number		Displays the number of print jobs classed by the number of files.
	1*	1 file	
	2*	2~5 files	
	3*	6~10 files	
	4*	over 11 files	
7327*	Document Server: Job Counter – Set Number		Displays the number of print jobs classed by the set sizes.
	1*	1 to 1	
	2*	1 to 2~5	
	3*	1 to 6~10	
	4*	1 to 11~20	
	5*	1 to 21~50	
	6*	1 to 51~100	

SP7	Mode Number		Function and [Setting]
7327*	7*	1 to 101~300	Displays the number of print jobs classed by the set sizes.
	8*	1 to 301~ over	
7328*	Document Server: Print Counter – Print Mode		Displays the number of prints by mode.
	6*	Punch	
	8*	Sort	
	9*	Staple	
	12*	Duplex	
	19*	Booklet	
	20*	Magazine	
	24*	Stamp	
	25*	Cover/Chapter Page	
	26*	Slip Sheet	
7401*	Total SC Counter		Displays the total number of service calls that have occurred. Display range: 0000~9999
7403*	SC History		Displays the most recent service calls successive groups of 10.
	1*	Latest	
	2*	Latest 1	
	3*	Latest 2	
	4*	Latest 3	
	5*	Latest 4	
	6*	Latest 5	
	7*	Latest 6	
	8*	Latest 7	
	9*	Latest 8	
	10*	Latest 9	
7502*	Total Paper Jam Counter		Displays the total number of copy jams. Display range: 0000~9999
7503*	Total Original Jam Counter		Displays the total number of original jams. Display range: 0000~9999
7504*	Paper Jam Counter by Jam Location		Displays the total number of copy jams by location. Display range: 0000~9999 *A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.*
	Paper Late Error No.	**Paper Lag Error No.**	**Error**
	1*		At Power On
	3*		1st Paper Feed Sensor
	4*		2nd Paper Feed Sensor
	5*		3rd Paper Feed Sensor
	6*		4th Paper Feed Sensor
	7*	57*	LCT Tray Relay Sensor
	8*	58*	Transport Sensor 1
	9*	59*	Transport Sensor 2
	10*	60*	Transport Sensor 3

SP7	Mode Number		Function and [Setting]
7504*		61*	Transport Sensor 4
	13*	63*	Registration Sensor
	14*	64*	Fusing Exit Sensor
	16*	66*	Exit Entrance Sensor
	17*	67*	Relay Sensor 1 (option)
	18*	68*	Relay Sensor 2 (option)
	19*	69*	Duplex Entrance Sensor
	23*	73*	Duplex Exit Sensor
	24*	74*	1-Bin Tray Sensor
	25*		Finisher Entrance
	26*		Finisher Proof Tray
	27*		Finisher Shift Tray
	28*		Finisher Staple Tray
	29*		Finisher Tray
	30*		Mailbox Entrance Sensor
	31*		Mailbox Proof Tray Exit Sensor
	32*		Mailbox Relay Sensor
	33*		Mailbox Exit Sensor
	35*		Booklet Finisher **(Japan Only)**
	36*		
	37*		
	38*		
	39*		
	40*		
	41*		
7505*	Total Original Jam by Location		Displays the total number of original jams by location. These jams occur when the original does not activate the sensors. A “Paper Late” error occurs when the paper fails to activate the sensor at the precise time. A “Paper Linger” paper jam occurs when the paper remains at the sensor for longer than the prescribed time.
	1*		At Power On
	Paper Late Error No.	**Paper Lag Error No.**	**Error Location**
	3	53	Skew Correction Sensor
	4	54	Interval Sensor
	5	55	Registration Sensor
	6	56	Relay Sensor
	7	57	Inverter Sensor
7506*	Jam Count by Copy Size		Displays the total number of copy jams by paper size.
	5*	A4 LEF	
	6*	A5 LEF	
	14*	B5 LEF	
	38*	LT LEF	
	44*	HLT LEF	
	132*	A3 SEF	
	133*	A4 SEF	

Service Tables

<table>
<tr><th>SP7</th><th colspan="2">Mode Number</th><th>Function and [Setting]</th></tr>
<tr><td rowspan="9">7506*</td><td>134*</td><td>A5 SEF</td><td rowspan="9">Displays the total number of copy jams by paper size.</td></tr>
<tr><td>141*</td><td>B4 SEF</td></tr>
<tr><td>142*</td><td>B5 SEF</td></tr>
<tr><td>160*</td><td>DLT SEF</td></tr>
<tr><td>164*</td><td>LG SEF</td></tr>
<tr><td>166*</td><td>LT SEF</td></tr>
<tr><td>172*</td><td>HLT SEF</td></tr>
<tr><td>255*</td><td>Others</td></tr>
<tr><td rowspan="12">7507*</td><td colspan="2">Copy Jam History (Transfer Sheet)</td><td rowspan="11">Displays the copy jam history of the transfer unit in groups of 10, starting with the most recent 10 jams.
Sample Display:
CODE: 007
SIZE: 05h
TOTAL: 0000334
DATE: Mon Mar 15 11:44:50 2000
where:
CODE is the SP7-505-*** number (see above.
SIZE is the paper size code in hex.
TOTAL is the total jam error count (SP7-003)
DATE is the date the previous jamLEF occurred.</td></tr>
<tr><td>1*</td><td>Last</td></tr>
<tr><td>2*</td><td>Last 1</td></tr>
<tr><td>3*</td><td>Last 2</td></tr>
<tr><td>4*</td><td>Last 3</td></tr>
<tr><td>5*</td><td>Last 4</td></tr>
<tr><td>6*</td><td>Last 5</td></tr>
<tr><td>7*</td><td>Last 6</td></tr>
<tr><td>8*</td><td>Last 7</td></tr>
<tr><td>9*</td><td>Last 8</td></tr>
<tr><td>10*</td><td>Last 9</td></tr>
<tr><td colspan="2" rowspan="16"></td><td>Paper Size</td><td>Code (hex)</td></tr>
<tr><td>A4 LEF</td><td>05</td></tr>
<tr><td>A5 LEF</td><td>06</td></tr>
<tr><td>B5 LEF</td><td>0E</td></tr>
<tr><td>LT LEF</td><td>26</td></tr>
<tr><td>HLT LEF</td><td>2C</td></tr>
<tr><td>A3 SEF</td><td>84</td></tr>
<tr><td>A4 SEF</td><td>85</td></tr>
<tr><td>A5 SEF</td><td>86</td></tr>
<tr><td>B4 SEF</td><td>8D</td></tr>
<tr><td>B5 SEF</td><td>8E</td></tr>
<tr><td>DLT SEF</td><td>A0</td></tr>
<tr><td>LG SEF</td><td>A4</td></tr>
<tr><td>LT SEF</td><td>A6</td></tr>
<tr><td>HLT SEF</td><td>AC</td></tr>
<tr><td>Others</td><td>FF</td></tr>
<tr><td rowspan="12">7508*</td><td colspan="2">Original Jam History</td><td rowspan="11">Displays the original jam history in groups of 10, starting with the most recent 10 jams.
Sample Display:
CODE: 007
SIZE: 05h
TOTAL: 0000334
DATE: Mon Mar 15 11:44:50 2000
where:
CODE is the SP7-505-*** number (see above.
SIZE is the paper size code in hex.
TOTAL is the total error count (SP7-003-001)
DATE is the date the previous jamLEF occurred.</td></tr>
<tr><td>1*</td><td>Last</td></tr>
<tr><td>2*</td><td>Last 1</td></tr>
<tr><td>3*</td><td>Last 2</td></tr>
<tr><td>4*</td><td>Last 3</td></tr>
<tr><td>5*</td><td>Last 4</td></tr>
<tr><td>6*</td><td>Last 5</td></tr>
<tr><td>7*</td><td>Last 6</td></tr>
<tr><td>8*</td><td>Last 7</td></tr>
<tr><td>9*</td><td>Last 8</td></tr>
<tr><td>10*</td><td>Last 9</td></tr>
</table>

SP7	Mode Number		Function and [Setting]
7801	ROM No./Firmware Version		Displays the ROM number and firmware version numbers.
7803*	PM Counter Display		Displays the PM counter since the last PM.
7804	PM Counter Reset		Resets the PM counter. To reset, press ①.
7807	SC/Jam Counter Reset		Resets the SC and jam counters. To reset, press ①. This SP does not reset the jam history counters: SP7-507, SP7-508.
7808	Counter Reset		Resets all counters except SP7-003-***, SP7-006-***. To reset, press ①.
7810	Access Code Clear		Use to clear the access code if the customer forgets the code. After clearing the code is reset for Null and the password entry display does not open. To clear, press ①.
7811	Original Count Clear		Clears the original total display, displayed with SP7-002-***. To clear, press ①.
7816		Print Counter Reset	Resets the total copy count by paper tray. To reset, press ①. Use these SP modes when replacing the pick-up, feed, and separation rollers.
	1	Tray1	
	2	Tray2	
	3	Tray3	
	4	Tray4	
	5	LCT	
	6	By-pass	
7822	Copy Counter Reset Magnification		Resets all counters of SP7-301 (Copy Count: Magnification).
7825	Total Counter Reset		No longer used. Executing this SP has no effect. *This SP is no longer required because the counter initialized (set to "0") at the factory.*
7826*	MF Device Error Count		This display is for the Japanese version only. **Japan Only**
7827	MF Device Error Count Clear		This SP is for the Japanese version only. (Clears SP7-826.) **Japan Only**
7832	Self-Diagnosis Result Display		Execute to open the "Self-Diagnose Result Display" to view details about errors. Use the keys on in the display on the touch-panel to scroll through all the information. If no errors have occurred, you will see the "No Error" notation.
7833	Pixel Coverage Ratio		This SP mode displays the coverage ratio of the output (the ratio of the total pixel area of the image data to the total printable area on the paper). Note that this value is not directly proportional to the amount of toner consumed, although of course it is one factor that affects this amount. The other major factors involved include: the type, total image area and image density of the original, toner concentration and developer potential.
	1	Last Pages	0% to 100%.
	2	Average Pages	0% to 100%.
	3	Toner Bottles In Use	0 to 65,535 copies

SP7	Mode Number		Function and [Setting]
7833	4	Copy Count: Previous Toner Bottle	0 to 999,999 copies
	5	Copy Count: Toner Bottle Before Previous	
7834	Clear Pixel Coverage Data		
	1	Last & Average	Clears counter for SP7833 001, 002
	2	Toner Bottles In Use	Clears counter for SP7833 003
	3	Page Counts (2 Prev. Toner Bottles)	Clears counter for SP7833 004, 005
7837	Copy Counter: Copy Mode Clear		Press Execute to clear counter SP7304 (Copy Num – Copies by Mode)
7838	Copy Counter - Set Number Clear		Press Execute to clear counter SP7305 (Copy: Display Jobs by Mode)
7839	Job Counter - Copy Mode Clear		Press Execute to clear counter SP7306 (Copy: Display Jobs by Mode).
7840	Doc. Svr - Scan Counter Clear		Press Execute to clear counter SP7320 (Doc. Svr. – Scan Count.
7841	Doc. Svr - Original Size Clear		Press Execute to clear counter SP7321 (Doc. Svr. – Original Size Display)
7842	Doc. Svr - Print Size Clear		Press Execute to clear counter SP7323 (Doc. Svr – Print Size Display).
7843	Doc. Svr - Print Job Counter Clear		Press Execute to clear counter SP7324 (Doc. Svr. – Print Job Counter).
7844	Doc. Svr - Job Count (Page No.) Clear		Press Execute to clear SP7325 (Doc. Svr. – Job Count (Page No.).
7845	Doc. Svr - Job Count (File No.) Clear		Press Execute to clear SP7326 (Doc. Svr – Job Count (File No.)
7846	Doc. Svr - Job Count (Set No.) Clear		Press Execute to clear SP7327 (Doc. Svr. – Job Count (Set No.
7847	Doc. Svr - Job Count (Prt Mode) Clear		Press Execute to clear SP7328 (Doc. Svr – Job Count (Print Mode).
7848	Copy Counter/Doc. Svr Clear		Press Execute to clear the following SP codes: SP7301, SP7304, SP7305, SP7306, SP7320, SP7321, SP7323, SP7324, SP7325, SP7326, SP7327, SP7328.
7901	Assert Info.		Used for debugging. **DFU**
	1	File Name	
	2	# oF Lines	
	3	Location	

5.1.3 TEST PATTERN PRINTING: SP2-902

NOTE: Always print a test pattern to confirm correct operation of the machine.

1. Enter the SP mode and select SP2-902.
2. Press ② or ③.
   - ② IPU Test Print
   - ③ Test Pattern
3. Enter the number for the test pattern that you want to print and press #. (See the tables below.)
4. When you are prompted to confirm your selection, press Yes. This selects the test pattern for printing.
5. Press Copy Window to open the copy window and then select the settings for the test print (paper size, etc.)
6. Press Start ◇ twice. (Ignore the "Place Original" messages) to start the test print.
7. Press SP Mode (highlighted) to return to the SP mode display.

Test Pattern Table (SP2-902-2: IPU Test Print)

No.	Test Pattern	No.	Test Pattern
0	None	8	Grayscale (Horizontal) (8)
1	Vertical Line (1-dot)	9	Grayscale (Vertical) (8)
2	Horizontal Line (1-dot)	10	Cross Pattern (8)
3	Vertical Line (2-dot)	11	Cross Shape
4	Horizontal Line (2-dot)	12	Argyle Pattern
5	Alternate Dot Pattern	13	Cross Pattern (256)
6	Grid Pattern (1-dot)	14	Cross Pattern (64)
7	Vertical Stripes	15	Not used

Test Pattern Table: SP2-902-3 Printing Test Patterns

No.	Test Pattern	No.	Test Pattern
0	None	20	Horizontal Line (1-dot) (Reversed LD1, LD2)
1	Vertical Line (1-dot)	21	Grid Pattern (1-dot) (Reversed LD1, LD2)
2	Horizontal Line (1-dot)	22	Grid Pattern (1-dot pair) (Reversed LD1, LD2)
3	Vertical Line (2-dot)	23	Independent Pattern (1-dot) (Reversed LD1, LD2)
4	Horizontal Line (2 dot)	24	3 Grayscale
5	Grid Pattern (1-dot)	25	Grayscale (Horizontal)
6	Grid Pattern (1-dot pair)	26	Grayscale (Vertical)
7	(not used)	27	Grayscale (Vertical/Horizontal)
8	(not used)	28	Grayscale (Grid)
9	Full Dot Pattern	29	Grayscale (Horizontal Extension)
10	Black band	30	Grayscale (Vertical Extension)
11	Trimming Area	31	Grayscale (Horizontal Margin)
12	Trimming Area (2-dot)	32	Grayscale (Vertical Margin)
13	Argyle Pattern	33	Grayscale (Vertical/Horizontal Margin)
14	Argyle Pattern (2-dot_)	34	Grayscale (Horizontal Extension Margin)
15	Hound's Tooth Check (2-dot Horizontal)	35	Grayscale (Vertical Extension Margin)
16	Checker Flag Pattern	36	White Pattern
17	Point Black Pattern	37	Grid (1-dot pair) (OR Outside Data 1)
18	Black Band (Vertical)		
19	Independent Pattern (4-dot)		

5.1.4 INPUT CHECK

Main Machine Input Check: SP5-803

1. Enter the SP mode and select SP5-803.
2. Enter the number (1 – 13) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's.
   The meaning of the display is as follows.

0 0 0 0 0 0 0 0
Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

Number	Bit	Description	Reading	
			0	1
1: Paper Feed 1 (Upper Tray)	7	Fusing Exit Sensor	Activated	Deactivated
	6	Near End Sensor 2	Activated	Deactivated
	5	Near End Sensor 1	Activated	Deactivated
	4	Not Used	---	---
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
2: Paper Feed 2 (Lower Tray)	7	Duplex Unit Set Sensor	Unit set	Unit not set
	6	Near End Sensor 2	Off	On
	5	Near End Sensor 1	Off	On
	4	Fusing/Paper Output Motor Lock	Not Locked	Locked
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
3: Registration and Others	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit HP Sensor	Not present	Present
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank not full	Tank full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected

Number	Bit	Description	Reading	
			0	1
4: By-pass Feed	7	Duplex reverse path door	Closed	Open
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4, By-pass	Activated	Deactivated
	3	Paper Size Sensor 3, By-pass	Activated	Deactivated
	2	Paper Size Sensor 2, By-pass	Activated	Deactivated
	1	Paper Size Sensor 1, By-pass	Activated	Deactivated
	0	Unit Set Signal	Yes	No
5: Relay Unit (Bridge Unit)	7	Not used	Yes	No
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor	Paper detected	Paper not detected
	4	Relay Sensor	Paper detected	Paper not detected
	3	Exit Sensor	Paper detected	Paper not detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Middle Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
6: Unit Set	7	Feed Motor Lock	No	Yes
	6	F-Gate Signal	Active	Not active
	5	Height Sensor	Feed height	Not feed height
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Key Card Present	Detected	Not detected
7: Paper End	7	Front cover/open closed	Open	Closed
	6	Vertical feed path	Clear	Not clear
	5	2nd Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected

Number	Bit	Description	Reading	
			0	1
8: DIP Switches	7	Dip Switch - 8	On	Off
	6	Dip Switch - 7	On	Off
	5	Dip Switch - 6	On	Off
	4	Dip Switch - 5	On	Off
	3	Dip Switch - 4	On	Off
	2	Dip Switch - 3	On	Off
	1	Dip Switch - 2	On	Off
	0	Dip Switch - 1	On	Off
9: Duplex Unit	7	Not used		
	6	Right cover open/closed	Closed	Open
	5	1-Bin Unit Set	Detected	Not detected
	4	LD, HP sensor	Positioned	Not positioned
	3	Exit Sensor (Jam)	Paper detected	Paper not detected
	2	Entrance Sensor (Jam)	Paper detected	Paper not detected
	1	Paper End Sensor	Paper detected	Paper not detected
	0	Duplex Unit Switch	Cover closed	Cover open
10: Remainder of Feed Tray 1	7	Tray 4: Bit 1		
	8	Tray 4: Bit 0	**Bit 1**	**Bit 0**	**Capacity**
	5	Tray 3: Bit 1	1	1	Full
	4	Tray 3: Bit 0	1	0	50% or more
	3	Tray 2: Bit 1	0	1	10% or more
	2	Tray 2: Bit 0	0	0	Out, or tray not set
	1	Tray 1: Bit 1			
	0	Tray 1: Bit 0			
11: Remainder of Feed Tray 2	7	By-pass Yes/No			
	6	Not Used			
	5	Not Used			
	4	Not Used			
	3	Not Used	**Bit 2**	**Bit 1**	**Bit 0**	**Capacity**
	2	LCT: Bit 2	1	1	1	Full
	1	LCT: Bit 1	1	0	0	80% or more
	0	LCT: Bit 0	0	1	1	50% or more
			0	1	0	30% or more
			0	0	0	10% or more

Service Tables

Number	Bit	Description	Reading	
			0	1
12: Full Exit Tray 1	7	Mailbox 9-bin	Not full or no tray	Full
	6	Mailbox 8-bin	Not full or no tray	Full
	5	Not used	-	-
	4	Finisher: Shift Tray 1	Not full or no tray	Full
	3	Finisher: Shift Tray 2	Not full or no tray	Full
	2	Not used	-	-
	1	1-Bin Exit	Not full or no tray	Full
	0	Machine Exit	Not full or no tray	Full
13: Full Exit Tray 2	7	Mailbox 7-bin	Not full or no tray	Full
	6	Mailbox 6-bin	Not full or no tray	Full
	5	Mailbox 5-bin	Not full or no tray	Full
	4	Mailbox 4-bin	Not full or no tray	Full
	3	Mailbox 3-bin	Not full or no tray	Full
	2	Mailbox 2-bin	Not full or no tray	Full
	1	Mailbox 1-bin	Not full or no tray	Full
	0	Mailbox Proof Tray	Not full or no tray	Full

Table 1: By-pass Feed Table Paper Size Data

Number.	Bit 4	Bit 3	Bit 2	Bit 1	Paper Width
4: By-pass	1	1	1	1	Post Card
	1	1	1	0	B6 SEF
	1	1	0	1	B5 SEF
	1	1	0	0	A5 SEF / 5.5"
	1	0	1	1	B4 SEF
	1	0	0	1	A4 SEF / 8.5" / 8"
	0	1	1	1	A3 SEF
	0	0	1	1	11" x 17"

ARDF Input Check: SP6-007

1. Enter the SP mode and select SP6-007.
2. Enter the number (1 – 13) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's.
   The meaning of the display is as follows.

0 0 0 0 0 0 0 0
Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

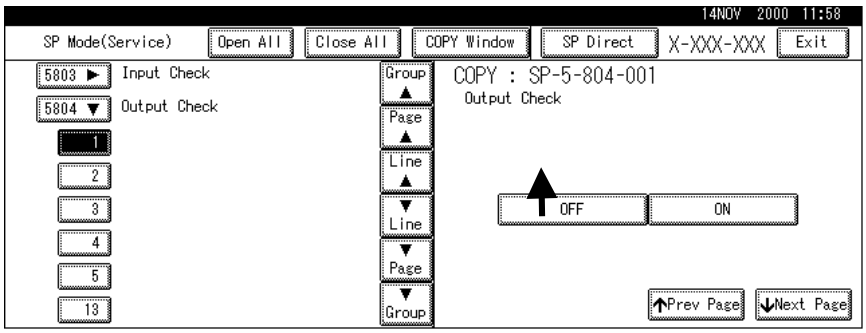
Group	Bit No.	Description	Reading	
			0	1
1	7	Original width sensor 4	Paper not detected	Paper detected
	6	Original width sensor 3	Paper not detected	Paper detected
	5	Original width sensor 2	Paper not detected	Paper detected
	4	Original width sensor 1	Paper not detected	Paper detected
	3	Skew correction sensor	Paper not detected	Paper detected
	2	Original set sensor	Paper not detected	Paper detected
	1	Original B5 sensor	Paper not detected	Paper detected
	0	Original LG sensor	Paper not detected	Paper detected
2	7	Original stopper HP sensor	Original stopper up	Original stopper down
	6	Pick-up HP sensor	Cover closed	Cover opened
	5	Top cover Sensor	Cover closed	Cover opened
	4	Lift sensor	Pick-up roller up	Pick-up roller down
	3	Inverter sensor	Paper not detected	Paper detected
	2	Exit sensor	Paper not detected	Paper detected
	1	Registration sensor	Paper not detected	Paper detected
	0	Interval Sensor	Paper not detected	Paper detected
3	0	Original A4 sensor		

5.1.5 OUTPUT CHECK

NOTE: Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

Main Machine Output Check: SP5-804

1. Open SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table on the next page.)
3. Press On then press Off to test the selected item.



B079S902.WMF

NOTE: You cannot exit and close this display until you press off to switch off the output check currently executing. Do not keep an electrical component switched on for a long time.

SP5-804 Output Check Table

No.	Description	No.	Description
1	1st Paper Feed CL	45	Duplex Junction Gate Solenoid ()
2	2nd Paper Feed CL	46	Not used
3	3rd Paper Feed CL (PTU)	47	Relay Junction Gate Solenoid
4	4th Paper Feed CL (PTU)	48~49	Not used
5	By-pass Paper Feed CL	50	Tray Junction Gate Solenoid
6	LCT Paper Feed CL	51	Stapler Junction Gate Solenoid
		52	Positioning Roller Solenoid (Finishers)
13	By-pass Pick-up Solenoid		
14	LCT Pick-up Solenoid	56	Toner Bottle Motor
		57	Transfer Belt Positioning Clutch
17	Transport Motor 1 (Finisher)		
18	Transport Motor 2 (Finisher)	62	Quenching Lamp
19	Exit Motor (Finisher)	63	Charge Bias
20	Staple Motor (Finisher)		
21	Punch Motor (Finisher)	67	Development Bias
		68	Not used
25	LCT Motor	69	Transfer Belt Voltage
26	Bank Motor (Paper Tray Unit)	70	ID Sensor LED
27	Fusing/Feed-Out Motor		
28	Main Motor	75	Exhaust Fan
29	Duplex Transport Motor	76	Elec. Equipment Cooling Fan (High Rev.)
30	Duplex Inverter Motor – Rev.	77	Elec. Equipment Cooling Fan (Low Rev.)
31	Duplex Inverter Motor – Fwd	78	Relay Unit Fan
32	Feed/Development Motor	79	Fusing Cooling Fan
		85	Total Counter
35	Bank Relay Clutch (Paper Tray Unit)		
36	Relay Clutch	90	LD (Laser Diode)
37	Not used	91	Not used
38	LCT Relay Clutch	92	Shift Tray Lift Motor (Finisher)
39	Registration Clutch	93	Jogger Motor (Finisher)
40	Not used	94	Stapler Unit Motor (Finisher)
41	Exit Junction Gate Solenoid (Upper Unit)	95	Stack Feed Out Motor (Finisher)
42	Duplex Junction Gate Solenoid (Lower Unit)	96	Shift Motor (Finisher)
		97	Stapler Rotation Motor (Two-Tray Finisher)

ARDF Output Check: SP6-008)

1. Open SP mode SP6-008.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Press On then press Off to test the selected item. You cannot exit and close this display until you click Off to switch off the output check currently executing.

No.	Description
1	Feed Motor (Forward)
2	Feed Motor (Reverse)
3	Drive Motor (Forward)
4	Inverter Motor (Forward)
5	Inverter Motor (Reverse)
6	Feed Clutch
7	Inverter Solenoid
8	Pick-up Motor (Forward)
9	Pick-up Motor (Reverse)

5.1.6 SMC PRINT OUT LISTS: SP5-990

1. Open SP mode 5-990 and select the number corresponding to the list that you wish to print.

SMC (System Parameter and Data Lists)	
1	All Data List
2	SP Mode Data List
3	UP Mode Data List
4	Logging Data List
5	Self-Diagnostics Results List
7	NIB Summary
8	NetFile Application Log
21	Copy UP Mode List
22	Scanner SP Mode List
23	Scanner UP Mode List

2. Press “Execute” on the touch panel.
3. Select “Single Face” or “Both Face”.
4. After printing the list, press “Close” to return to the SP mode display.
5. Press Exit twice to close the SP Mode screen and return to copy mode.

5.1.7 MEMORY CLEAR: SP5-801

Executing Memory All Clear resets all the settings stored in the NVRAM to their default settings except the following:

SP7-003-1:	Electrical total counter value
SP5-811-1:	Machine serial number
SP5-907:	Plug & Play Brand Name and Production Name Setting

1. Execute SP5-990 to print out all SMC Data Lists.
2. Open SP mode 5-801.
3. Press the number for the item that you want to initialize. The number you select determines which application is initialized. For example, press 1 if you want to initialize all modules or select the appropriate number from the table below.

No.	What It Initializes	Comments
1	All modules	Initializes items 2 ~ 12 below. *1
2	Engine	Initializes all registration settings for the engine and processing settings. *1
3	SCS (System Control Service)/SRM	Initializes default system settings, CSS settings, operation display coordinates, and ROM update information. *1
4	IMH (Image Memory Handler)	Initializes the registration setting for the image memory handler by deleting all image files on the HDD.
5	MCS (Memory Control Service)	Initializes the automatic delete time setting for stored documents.
6	Copier application	Initializes all copier application settings.
7	Fax application	Initializes the fax reset time, job login ID, all TX/RX settings, local storage file numbers, and off-hook timer.
8	Printer application	Initializes the printer defaults, programs registered, the printer SP Bit SW, and printer CSS counter.
9	Scanner application	Initializes the scanner defaults for the scanner and all the Scanner SP modes.
10	Network application	Deletes the NFA management files and thumbnails, and initializes the JOB login ID.
11	NCS (Network Control Service)	Initializes the system defaults and interface settings (IP addresses also), the SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
12	R-FAX	Initializes the Job login ID, SmartNetMonitor for Admin, Job History, and local storage file numbers.
14	DCS	Initialization
15	UCS	Initialization

*1: Resetting 1~3 resets the operation panel screen coordinates, so after executing 1, 2, or 3, you must re-calibrate the screen.

4. Press Execute, and then follow the prompts on the display to complete the procedure.

5. Make sure that you perform the following settings:
   - Do the laser beam pitch adjustment (SP2-109).
   - Do the printer and scanner registration and magnification adjustments (☛ 3.21 Replacement and Adjustment, “Copy Adjustments”).
   - Do the touch screen calibration (☛ 3.21.4 Replacement and Adjustment, “touch screen calibration”).
   - Referring to the SMC data lists, re-enter any values, which had been changed from their factory settings.
   - Do SP 3-001-2 (ID Sensor Initial Setting) and SP4-911-1 (HDD media check).

6. Check the copy quality and the paper path, and do any necessary adjustments.

5.2 DIP SWITCHES

Controller: DIP SW2

DIP SW No.	ON	OFF
1	IC Card Boot	System ROM Boot
2	Keep at “OFF”	
3		
4		

I/O Board: DIP SW101

DIP SW No.	Function	ON						OFF
1	Copy Speed	35 cpm (180 mm/s)						45 cpm (230 mm/s)
2	Jam Detection (see Note)	Off						On
3	Engine Program Recovery	On						Off
4	Print Output for Debugging	OFF (Do not change)						
5	Factory Duplex Function Check	OFF (Do not change)						
		JPN	**NA**	**EUR**	**China**	**Taiwan**	**Asia**	**Korea**
6	Destination	OFF	ON	OFF	OFF	ON	ON	OFF
7		OFF	OFF	ON	OFF	OFF	ON	ON
8		OFF	OFF	OFF	ON	ON	OFF	ON

NOTE: Disabling jam detection is effective only for the main machine (not for the options).

5.3 USING THE DEBUG LOG

This machine provides a Save Debug Log feature that allows saving and retrieving error information for later analysis. Every time an error occurs the debug information is recorded in volatile memory but is lost every time the machine is switched off and on. The Save Debug Log feature provides two new features:

- The customer or CE can save the debug log to HDD as soon as an error occurs. This is especially useful for recording information about errors that do not generate an SC code.
- The CE can copy the information to HDD and then to an IC card for later analysis.

When an error occurs while the machine is operating, a debugging log is generated in memory but this log is lost as soon as processing resumes or after the machine is cycled off and on.

5.3.1 CAPTURING DEBUGGING INFORMATION

The machine must be setup up correctly with SP codes in order for the debug log to be captured for later retrieval. Otherwise, the debugging log is lost.

The debug information cannot be saved the until the “Save Debug Log” function has been switched on and a target has been selected.

Switching On the Debug Log Feature

1. Enter the SP mode.
   - Press [#] then use the 10-key pad to enter 107.
   - Press and hold down [C/⊘] for more than 3 seconds.
   - Enter 5857 then press [#].
2. Under “5857 Save Debug Log”, press 1.

```
COPY : SP-5-857-001
 Save Debug Log
 On/Off (1:ON  0:OFF)

              1

    Initial 0
```

3. Press 1 then press [*].

4. Under “5857 Save Debug Log”, press ②.

```
COPY : SP-5-857-002
 Save Debug Log
 Target (1:IC Card 2:HDD)

                2

       Initial 0
```

5. Press ① to select the IC Card or press ② to select the HDD, then press ⊛.

   ① Saves the debug log directly to the IC card inserted in the controller slot. If the machine does not have an HDD unit, or if the HDD is temporarily disabled, be sure to use this setting.

   ② Saves the debug log to HDD.

   NOTE: This setting is normally set to “2” for writing the debug log to the HDD.

Setting the Timing for Debug Log Acquisition

You can specify that errors related to specific events be recorded in the debug log.

NOTE: More than one event can be selected for retrieval.

1. Enter ⑤⑧⑤⑧ then press #.

   SP5858 (Debug Save When) contains the following features:

1	Engine SC Error	Saves data when an engine-related SC code is generated.
2	Controller SC Error	Saves debug data when a controller-related SC Code is generated.
3	Any SC Error	Saves data only for the SC code that you specify by entering code number.
4	Jam	Saves data for jams.

2. To save data for items 1, 2, or 4, press the appropriate key. The example below shows the “Engine SC Error” selected after pressing ①.

```
COPY : SP-5-858-001
 Debug Save When
 Engine SC Error

          OFF   ON
```

   Press “ON” then press #.

To save data for item 3 (an SC code), press ③.

```
COPY : SP-5-858-001
 Debug Save When
 Any SC Error

              670
```

Enter the 3 digits for the SC error code then press #. For details about SC code numbers, please refer to the SC tables in Section "4. Troubleshooting".

Selecting a Module for Retrieval

Specific error information related to a particular module can be selected for retrieval.

NOTE: SP5859 (Debug Save Key No.) allows you to define up to 10 keys. More than one key can be set.

1. Enter ⑤⑧⑤⑨ then press #.
2. Under "5859" press the number of the key that you want to define. The example below shows the screen after "1" is pressed to define "Key 1".

```
COPY : SP-5-859-001
 Debug Save Key No.
 Key 1

```

3. Enter a number for the key.

```
COPY : SP-5-859-001
 Debug Save Key No.
 Key 1

             2222
```

4. Press # to save the key definition.

The following keys can be specified. The initials in parentheses indicate the names of the modules.

SP5859	COPY	FAX	PRINTER	SCANNER	WEB
001	2222 (SCS				
002	2223 (SRM)				
003	256 (IMH)				
004	1000 (ECS)				
005	1025 (MCS)				
006	4848 (COPY)	4846 (FAX)	4400 (GPS)	5375 (Scan)	5682 (NFA)
007	2224 (BCU)	1538 (FCS)	4500 (PDL)	5682 (NFA)	6600 (WebDB)
008		6016 (RFAX)	4500 (GPS-PM)	3000 (UCS)	3300 (PTS)
009		6017 (WEB)	2000 (NCS)	2000 (NCS)	6666 (WebSys)
010		2000 (NCS)	2224 (BCU)		2000 (NCS)

Key to Acronyms

ECS:	Engine Control Service
FCS:	Fax Control Service
GPS:	GW Print Service
GSP-PM:	GW Print Service – Print Module
IMH:	Image Memory Handler
MCS:	Memory Control Service
NCS:	Network Control Service
NFA:	Net File Application
PDL:	Printer Design Language
PTS:	Print Server
RFAX:	Remote Fax
SCS:	System Control Service
SRM:	System Resource Management
WebDB:	Web Document Box (Document Server)

Note the following restrictions on these settings:

- Only one of the 10 SP codes above can be selected for one key.
- You cannot mix settings for the groups for 005~010. For example, if you want to create a PRINTER debug log you must select all 9 available selections (001~009 in the PRINTER column of the Table above), and for a FAX debug log you must select all 10 selections (001~010 in the FAX column of the Table above.)

5.3.2 RETRIEVING THE DEBUG LOG

Recording Errors Manually

When the machine issues an SC code in response to an error, or when a jam occurs, the error information is recorded in the debug log depending on how the system is set up with the procedures described above. However, information about undefined errors (errors that do not generate SC codes) that occur during copier operation or when printing from memory are not recorded automatically.

Undefined errors not recorded automatically can be recorded on the HDD by following the simple manual procedure described below.

NOTE: In order to use this procedure, the Save Debug Log feature must be switched on and the HDD or IC card must be selected as the target.

1. Make sure that the Save Debug Log feature is switched on.
2. When the error occurs, on the operation panel, press ⎚ (Reset).
3. On the 10-key pad, press **01** then press and hold down C/⍉ until the machine beeps then release.
4. After completing Steps 1~3, to continue switch the machine off then on.

Copying the Debug Log to the IC Card

1. Insert the IC card into the copier.
2. Enter the SP mode and execute SP5857 007 (Copy HDD to IC Card (Latest 4 MB) to write the debugging data to the IC card.
3. The IC card can hold up to 4MB of data. If the debugging data is larger than 4MB, you can switch to another IC card.

Converting the Debug Log to Binary Data

1. Remove the IC card from the copier then insert it into the PC equipped with an IC card slot.
2. Start SwapBox.
3. Select Image> Read then click OK to start reading the data.
4. After confirming that the data has been read, select File> Save, then enter an appropriate file name and save the file.

   This completes converting the debugging log to binary data.

Analyzing the Debug Log Binary Data

The binary data created in the previous step must be sent to the Design Center for analysis. Since the amount of data can be fairly large (approximately 4 MB), compress the data with a standard compression program like ZIP or LZH and send it via email.

If a PC and the software for converting the IC card data to binary is not available, you can send or deliver the IC card.

A software application (GWLOG.EXE) is provided to convert the binary data file to a text file which can be read on screen or printed.

On the DOS command line, type:

`C:\GWLOG<Path>`

and press ENTER. The <Path> is the path to the directory (folder) where the converted binary file created in the previous was saved.

NOTE: 1) The program converts binary file to a text file in the same directory.
2) The target file name for the text file is generated automatically.
3) If the debug log was copied to an IC card of the wrong format, then an error is issued and the program halts.

6. DETAILED SECTIOIN DESCRIPTIONS

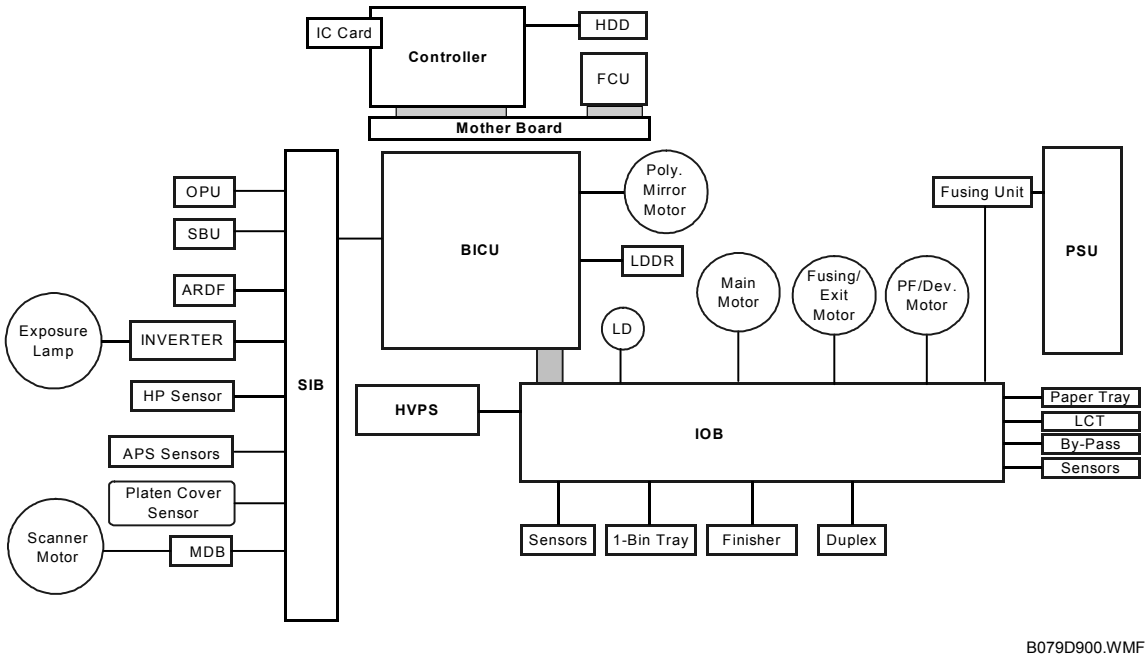
Here is a summary of some of the new features described in this section.

The section numbers preceded with the ☛ mark refer to the section number of this document where the new or amended feature is described.

- The physical location of the IOB has changed, making it much easier to remove. (☛6.1.1)
- There is no PFB in this machine. The function of the PFB has been built into the IOB. (☛6.1.1)
- The layout of the controller board has been modified. (☛6.1.2)
- Image processing for the B079 (35 cpm)/ B082 (45 cpm) has been revised. (☛6.2)
- A new cleaning blade has been added to the PCU in order to provide better cleaning of the OPC drum. (☛6.3.1, 6.3.2)
- The voltage adjustment for thicker paper, OHP sheets, etc. fed from the bypass tray has changed. (☛6.4.1, 6.4.2)
- Two new dust blades have been added for the registration roller and the registration idle roller. (☛6.5.1
- The cleaning roller inside the fusing unit has been re-designed to dissipate heat more efficiently (☛6.6.1)
- A new design feature jogs the fusing/paper exit motor at prescribed intervals in order to dislodge toner and paper dust collected on the hot roller strippers. (☛6.6.2)
- The line speed of the B082 (45 cpm) machine is adjusted down automatically to 35 cpm in order to print on thick paper. This adjustment was not provided in the previous models. (☛6.6.4
- Two new cooling fans have been added to the fusing unit to further ensure that the fusing unit runs cooler for the new toner which has a much lower melting temperature.(☛6.6.5)
- To reduce the incidence of toner scanner, the sponge strip has been replaced with a velvet strip that extends across the length of the fusing unit, new triangular seals are attached to each corner of the fusing unit. (☛6.6.6)

6.1 BOARD STRUCTURE

6.1.1 BLOCK DIAGRAM



B079D900.WMF

This machine uses the GW (Grand Workware) architecture, which allows the copier to be expanded as an MFP by installing simple modular components (ROM DIMMs) on the controller board. The BICU and FCU are connected to the controller via a PCI bus.

Controller (Main Board)
Takes charge of controlling memory and all peripheral devices.

BICU (Base Engine and Image Control Unit)
This is the engine control board. It controls the following functions.

- Engine sequence
- Timing control for peripherals
- Image processing, video control

IOB

The IOB (Input/Output Board) handles the following functions:

- Drive control for the sensors, motors, and solenoids of the main unit
- PWM control for the high voltage supply board
- Serial interface with peripherals
- Fusing control

NOTE: The IOB is now located directly behind the rear covers for easier access. The machine no longer contains the PFB (Paper Function Board). The functions of the PFB (paper feed control) have been taken over by the IOB. The same IOB is used for both the B079 and B082 but the DIP switches must be set correctly for each. See Section "3 Replacement and Adjustment" for details.

SIB (Scanner Interface Board): Controls the scanner, and serves as the signal I/F board for the SBU and the OPU. The SIB passes signals between the BICU and the scanner unit components, and transmits video signals from the SBU to the BICU.

OPU (Operation Panel Unit): Controls operation panel and display.

SBU (Sensor Board Unit): Receives analog signals from the CCD and converts them into digital signals.

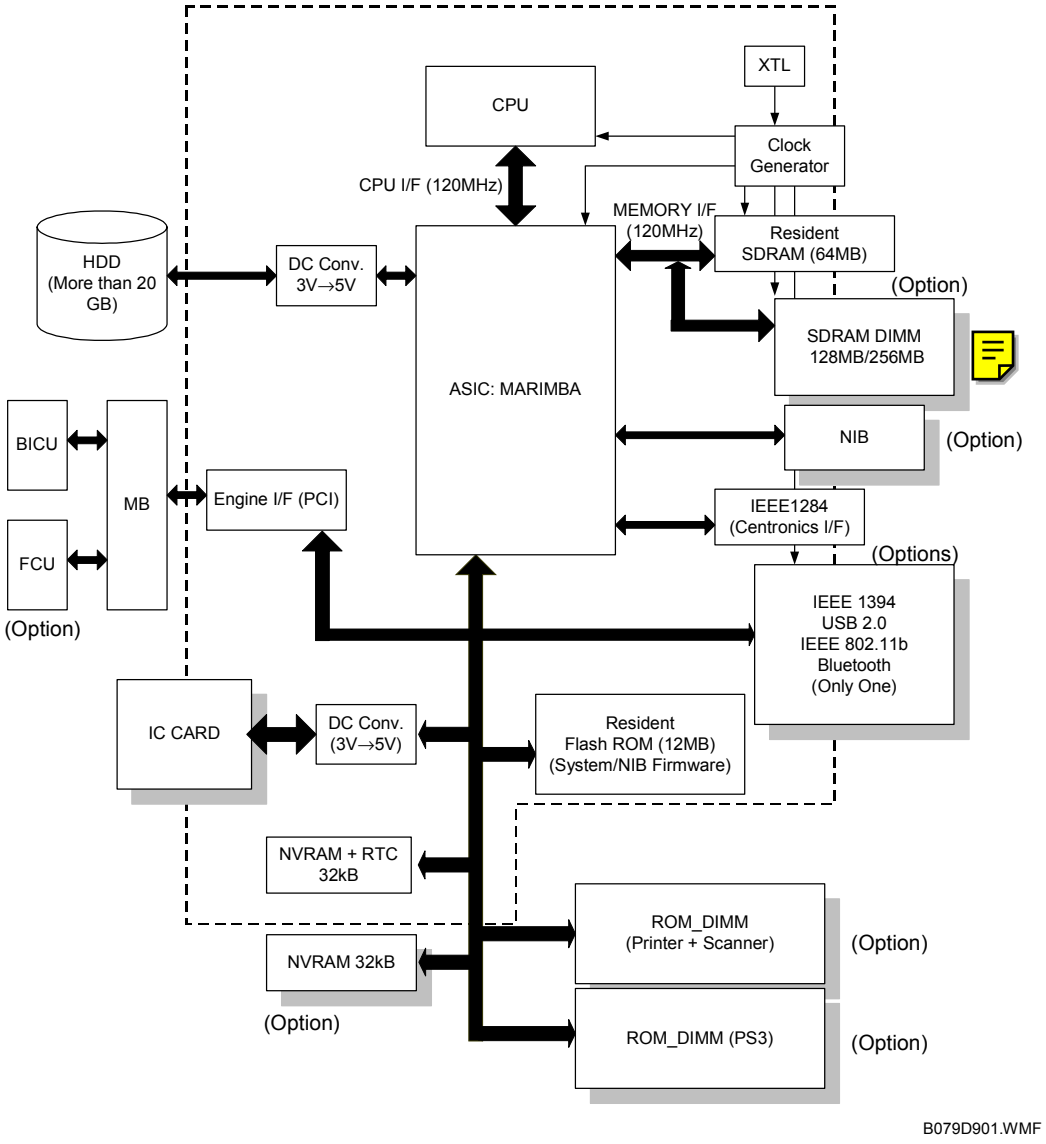
LDDR (Laser Diode Driver): The LD driver circuit board.

MDB (Motor Drive Board): Controls the scanner motor.

Mother Board: This board interfaces the controller and the BICU and FCU.

FCU (Facsimile Control Unit): Controls fax communications and fax features.

6.1.2 CONTROLLER



The controller controls all applications, including copier, printer, scanner, and fax applications. To add the optional printer, scanner, or fax applications, ROM DIMMs must be installed on the controller. The fax option, however, also requires FCU and NCU installation.

NOTE: The controller boards are machine specific and are not interchangeable. The controller board for the B079 (35 cpm) must be installed in the B079 and controller board for the B082 (45 cpm) must be installed in the B082.

The following firmware and application software can be downloaded from the Controller IC Card slot.

- Controller (System OS)
- Operation panel
- BICU (engine control)
- Printer
- Scanner
- Fax
- PostScript 3
- NIB
- FCU

CPU: Employs RM7065. Clock frequency: 300 MHz.

ASIC: Uses a dedicated chip developed for use with GW architecture. The CPU and memory I/F employ a 120 MHz bus (32 bit). These components perform CPU and I/F control and also control all of the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.

SDRAM: Comprises a 64 MB RAM chip, expandable with a 128 MB SDRAM.

System Flash ROM: Provided with an 12 MB Flash ROM for the system and NIB firmware.

Flash ROM DIMM Slots: Two slots are provided for two ROM DIMMs (8 MB or 16 MB). Expansion slots provided for the optional printer/scanner, and PostScript 3 applications.

NVRAM: 32 KB of NVRAM are provided for the system. NVRAM stores many settings, including OS system log information, copier calendar, current system settings, user accounts (max. 100) and all settings for the fax, printer, scanner, and network. The NVRAM also has the RTC (Real Time Clock) for time management.

NOTE: Optional NVRAM, which can store to 400 user accounts, can be installed on the controller.

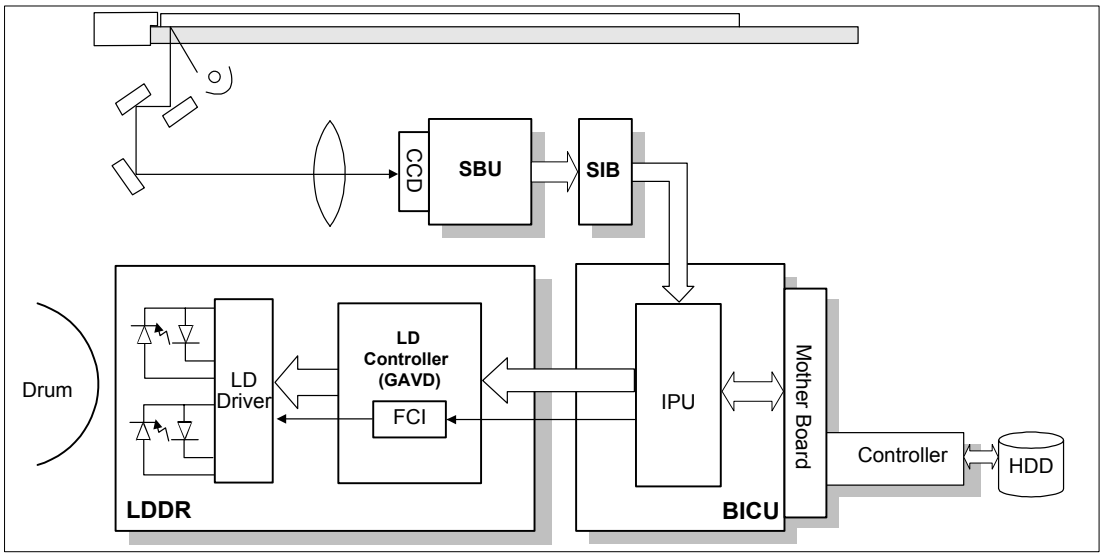
HDD: A 3.5" HDD (more than 20 GB) can be connected using an IDE I/F. The hard disk is partitioned as shown below.

Partition	Size	Function	Power OFF	Comment
File System 1	500 MB	Downloaded fonts, forms.	Remains	
File System 2	500 MB	Job spooling area.	Erased	
File System 3	2000 MB	Work data area	Remains	Used for document server application.
Image TMP	5200 MB	Collation, sample print, protected print.	Erased	Storage capacity (Max. *2): 2500 pp. (Copy) 9000 pp. (Print/ Fax/ Scanner)
Image LS*1	7800 MB	Document server, local storage archive	Remains	
Image Area Management	100MB	Stores image area information	Remains	
Job Log	20 MB	Job log.	Remains	
Others	3362 MB			
Total	**20 GB**		Remains	

*1: When an application uses an image page, first it uses the Image LS area. If this area is in use and not available, then it uses the Image TMP area.

*2: These areas are used for applications to store copy, print, fax, and scanned pages. The actual number of pages that can be stored differs depending on the content of the document and the scanning resolution.

6.2 IMAGE PROCESSING



B079D902.WMF

6.2.1 OVERVIEW

SBU: The SBU (Sensor Board Unit) converts the analog signal from the CCD to an 8-bit digital signal and sends it to the SIB.

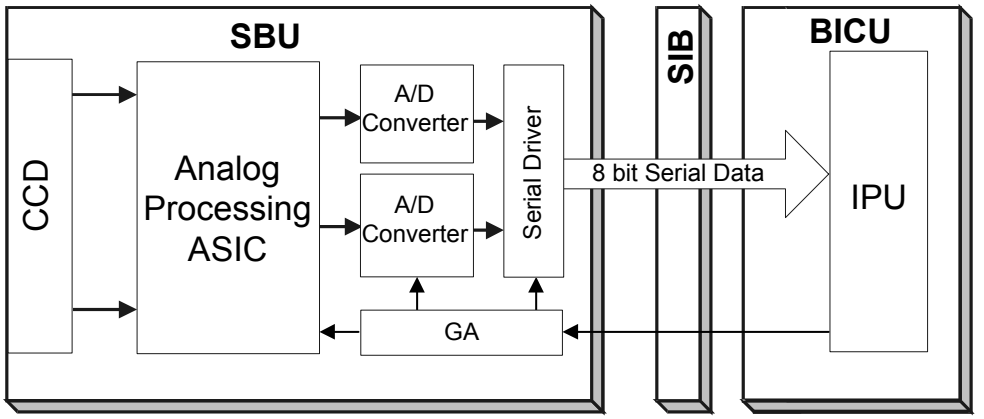
SIB: Relays image signals and controls the scanner.

BICU: The BICU (Base Engine Image Control Unit) performs timing control and command control. The IPU on the BICU processes auto shading, filtering, magnification, γ correction, and gradation. The memory controller performs image compression, decompression, and memory address control (for binary picture processing mode only)

LD Unit: Performs dual channel multi-beam exposure, multiple exposure, and synchronous detection.

Controller: Performs dual channel multi-beam exposure, multiple exposure, and synchronous detection.

6.2.2 SBU (SENSOR BOARD UNIT)



The CCD converts the light reflected from the original into an analog signal. The CCD line has 7200 pixels at a resolution of 600 dpi.

The CCD has two output lines to the analog processing ASIC, one for handling odd and one for handling even pixels. The analog processing ASIC performs the following operations on the signals received from the CCD:

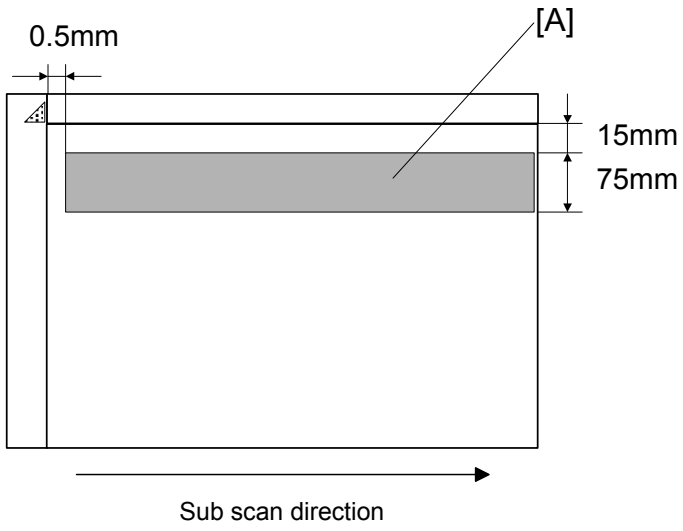
Z/C (Zero/Clamp): Adjusts the black level for even pixels to match the odd pixels.

Signal composition: Analog signals for odd and even pixels from the CCD are merged by a switching device.

Signal amplification: The analog signal is amplified by amplifiers in the AGC circuit. The maximum gains of the amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This gives a value for each pixel on a scale of 256 shades of gray. Then, this data goes to the BICU via the SIB.

6.2.3 AUTO IMAGE DENSITY (ADS)



B079D904.WMF

This mode prevents the background of an original from appearing on copies.

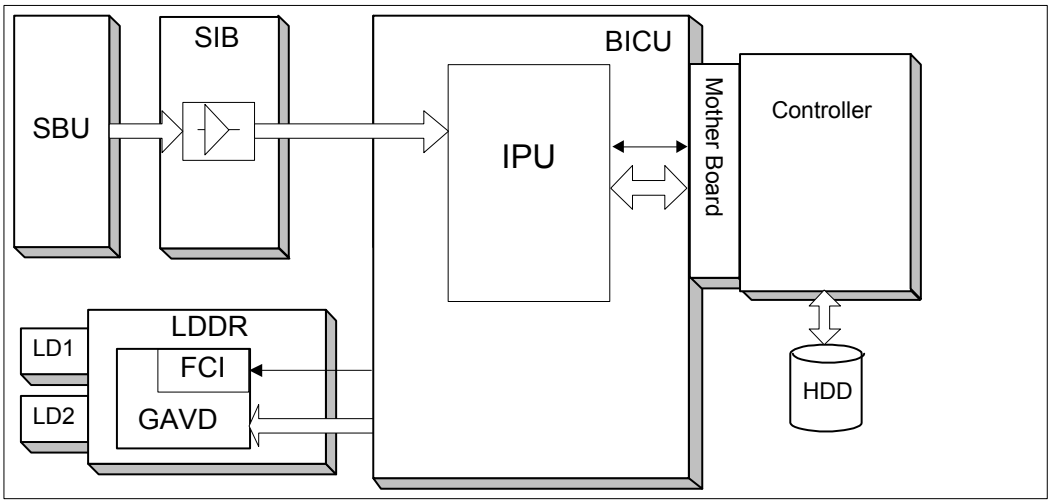
The copier scans the auto image density detection area [A]. This corresponds to a narrow strip at one end of the main scan line, as shown in the diagram. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line, within this narrow strip only. From this peak white level, the IPU determines the reference value for A/D conversion for the scan line. Then, the IPU sends the reference value to the A/D controller on the SBU.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode and the machine will use both settings when processing the original.

6.2.4 IPU (IMAGE PROCESSING UNIT)

Overview



B079D905.WMF

The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data:

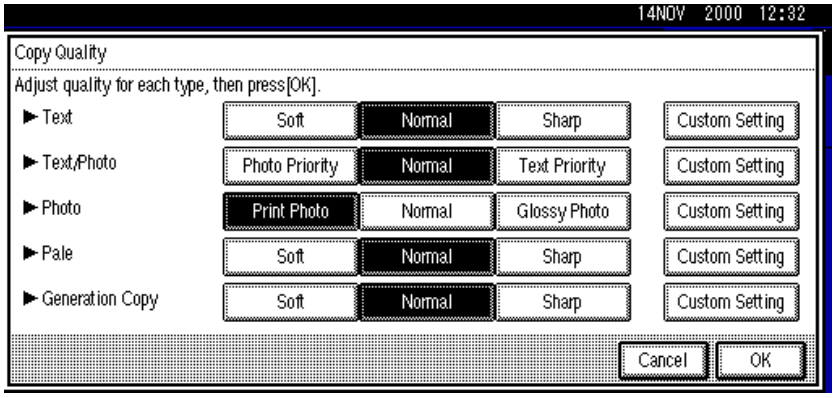
1. Auto shading
2. Filtering (MTF and smoothing)
3. Magnification
4. γ correction
5. Grayscale processing
6. Binary picture processing
7. Error diffusion
8. Dithering
9. Video path control
10. Test pattern generation

The image data then goes to the HDD.

6.2.5 IMAGE PROCESSING MODES

The user can select one of the following modes with the User Tools screen: Text, Text/Photo, Photo, Pale, Generation. Each of these modes has a range of different settings (e.g. Soft, Normal, Sharp, etc). For each mode, a Custom Setting options is also available. This Custom Setting holds the values selected with the SP modes, which can be adjusted to meet special requirements that cannot be covered by the standard settings.

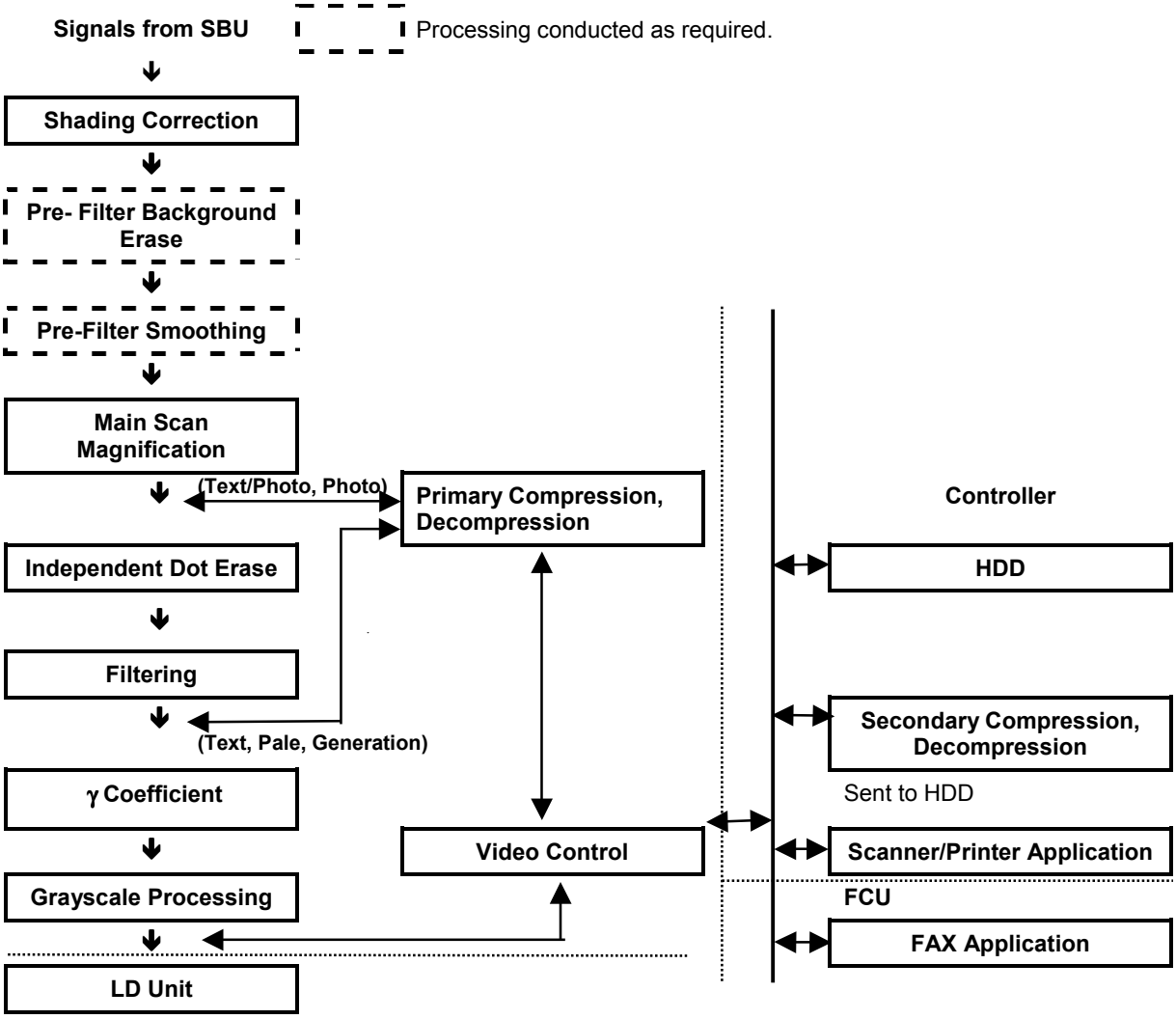
To display this screen, press User Tools/Counter> Copier/Document Server Settings> General Features> Copy Quality.



B079D906.WMF

Mode	Function
Text	Best reproduction of text and sharp lines. Ignores background texture. (☛ pg. 6-14)
Text/Photo	Good reproduction of mixed text and photographs with accurate grayscaling, better than that achieved in the Text mode. (☛ pg. 6-15)
Photo	Best possible reproduction of photographs. (☛ pg.6-16)
Pale	Reproduction similar to Text mode, but of lower contrast. Ideal for copying thin originals. (☛ pg.6-17)
Generation Copy	Attempts to achieve the best reproduction of copied originals, which have faded due to making copies of copies. (☛ pg.6-18)

General Image Processing Flow



6.2.6 SUMMARY OF IMAGE PROCESSING FUNCTIONS

Shading correction: Compensates for the possible differences in the amount of light at the edges and center of a scanned image caused by the scanner lens, or scatter among pixels of the CCD.

Pre-Filter Background erase: Attempts to eliminate the heavy background texture from copies (newspaper print or documents printed on coarse paper). Elements below the selected threshold level are eliminated.

Pre-Filter Smoothing: Reproduces halftones while reducing the incidence of moiré which can occur as a result of compressing and then decompressing the image.

Main scan magnification: Adjusts magnification to the desired level by processing adjusting multiple, adjacent pixels in the direction of main scanning. Adjustment of magnification in the sub scan direction is done by changing the scanning speed.

Independent dot erase: Attempts to recognize and eliminate scattered, independent dots in copies. Processes only pixels of high density and eliminates those of low density.

Filtering (MTF filter/smoothing): Performs mainly edge enhancement with the MTF filter. Performs smoothing only in the Photo mode. The matrix size of the filter is 9 pixels x 7 lines.

Gamma (γ) coefficient: Controls the image density for images processed with grayscaling. Copy density adjustment is achieved with special notch γ coefficient conversion. The best γ coefficient suited for the selected mode can be stored and adjusted as needed.

Grayscale processing: Performs reproduction of grayscales, using mainly error diffusion. (In the Photo mode, conducts processing with dithering.)

6.2.7 IMAGE PROCESSING STEPS AND RELATED SP MODES

Text Mode

The Text mode achieves quality reproduction of text and sharp lines and ignores background texture. Processing is conducted with a high resolution MTF filter; special processing with the γ coefficient prevents background reproduction and achieves the best reproduction of images with error diffusion. Because the Soft and Normal settings use a weak MTF filter, the quality of the image is improved with the elimination of moiré. The Sharp selection uses an MTF filter stronger than that of the Normal setting, thus increasing the sharpness of lines.

	Image Processing Flow	Related SP Modes
Scanner Image Correction	Shading Correction	
	↓	
Pre-Filter Processing	Background Erase	SP4903 65 (Background Erase Level: Text Mode)
	↓	
	Pre-Filter Smoothing	***SP4903 10 (Pre-Filter: Text)***
	↓	
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
	↓	
	Independent Dot Erase	SP4903 60 (Independent Dot Erase: Text Mode)
	↓	
Filter Processing	MTF Correction	SP4904 20~23 Text (General Quality) (☛6.2.12)
	↓	
Density Control	γ Coefficient	
	↓	
Grayscale Processing	Error Diffusion	

Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Text/Photo Mode

Text/Photo mode achieves high quality reproduction of pictures with accurate grayscaling. Processing is conducted with the special γ coefficient which reproduces a wide range of grayscale. Compared with the Text mode, text reproduced in the Text/Photo mode appears lighter and textured backgrounds could appear on copies, but the incidence of moiré is reduced with and edge detection filter. Because Photo Priority uses an MTF filter weaker than that of the Normal setting, the quality of the image is improved with the elimination of moiré. The Text Priority selection uses an MTF filter stronger than that of the Normal setting, thus increasing the sharpness of lines.

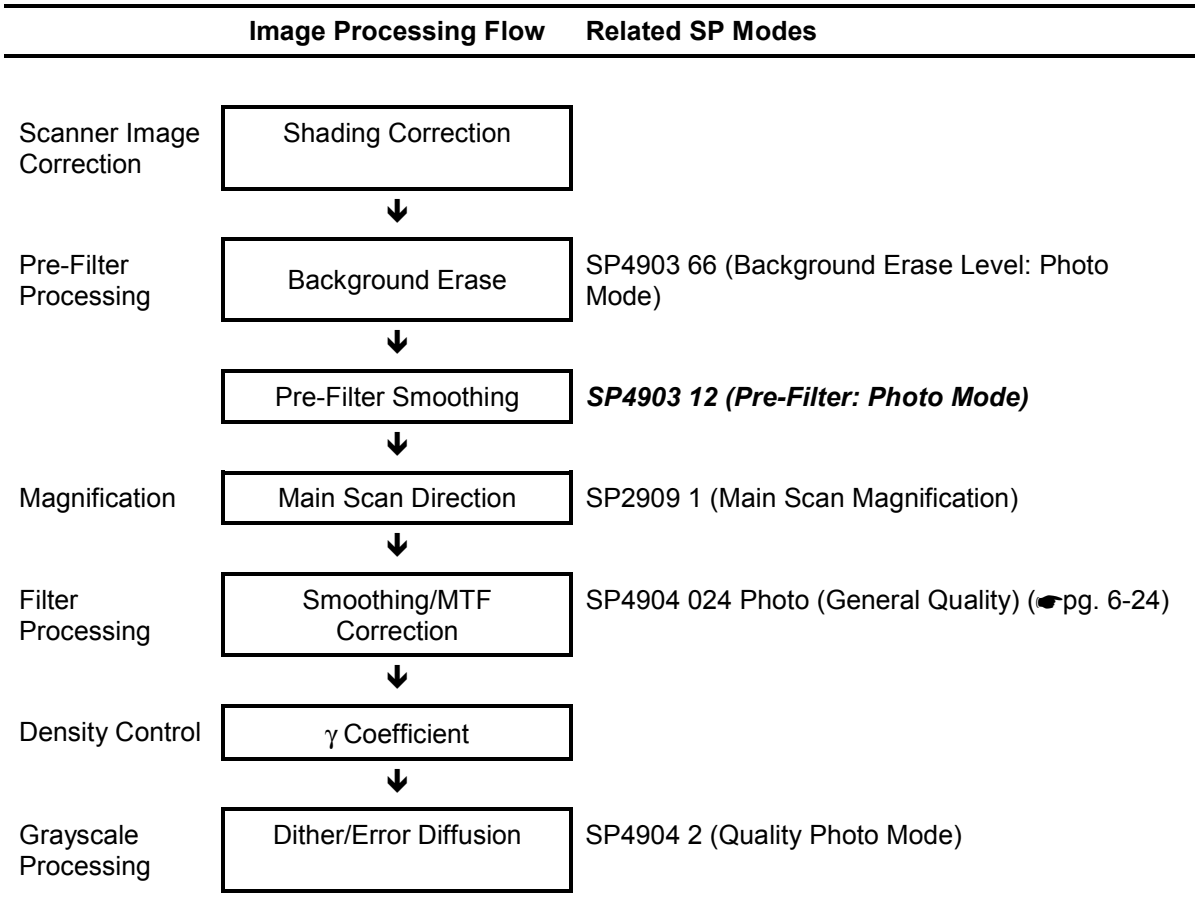
	Image Processing Flow	Related SP Modes
Scanner Image Correction	Shading Correction	
	↓	
Pre-Filter Processing	Background Erase	SP4903 67 (Background Erase Level: Text/Photo Mode)
	↓	
	Pre-Filter Smoothing	***SP4903 13 (Pre-Filter: Text/Photo)***
	↓	
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
	↓	
	Independent Dot Erase	SP4903 62 (Independent Dot Erase Level)
	↓	
Filter Processing	MTF Correction	SP4904 25~28 Text/Photo (General) Quality (☛"Text Photo Mode", pg.6-25)
	↓	
Density Control	γ Coefficient	
	↓	
Grayscale Processing	Error Diffusion	

Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Photo Mode

Photo mode emphasizes grayscale processing to achieve the best possible reproduction of photographs and eliminate moiré by using the highest density and γ coefficient in the reproduction of grayscales and dithering. Print Photo performs smoothing and dithering for photos copied from magazines, newspapers, etc. The Normal selection uses a higher resolution setting and employs error diffusion but does not use smoothing to improve the appearance of text in photographs. Glossy photo paper employs MTF filter processing and error diffusion to copy glossy or matte photographs and achieves a low incidence of moiré, thus reproducing copies of photographs of high resolution.

For photo mode, the features used depend on which type of greyscale processing has been selected for Photo mode (either 'dithering and smoothing' or 'error diffusion and MTF'); this depends on the setting of SP 4904 001. Details are explained later in this section.



Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Pale (Low-Density Mode)

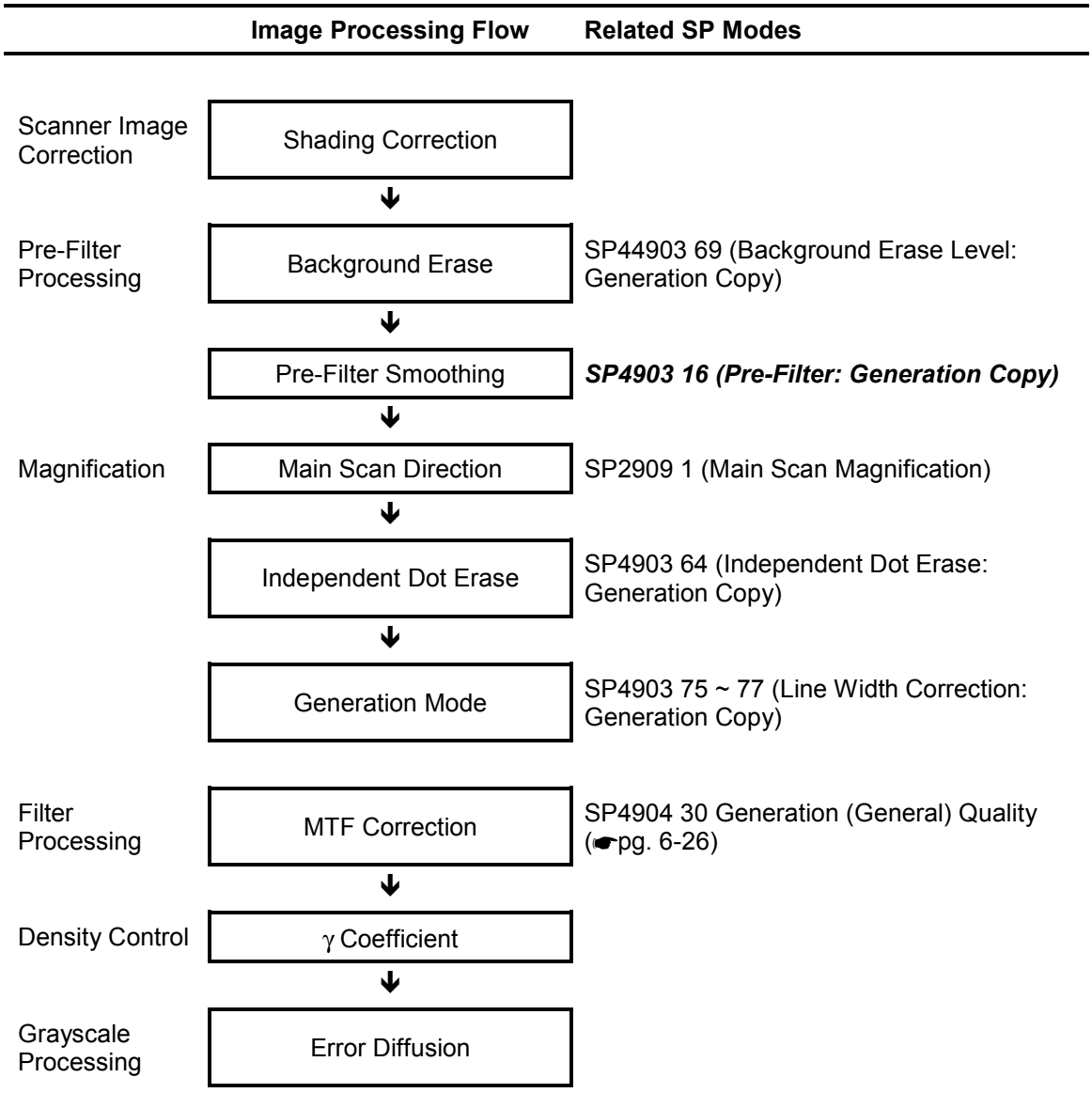
Pale achieves image quality comparable with Text mode, but of lower contrast. Pale employs an MTF filter stronger than that employed by the Text mode and uses a darker γ coefficient, thus increasing the incidence of copying textured backgrounds. Ideal for copying extremely thin originals. Soft employs an MTF filter weaker than Normal, thus achieving a softer image with less moiré. Sharp employs an MTF filter stronger than that of Normal, thus increasing the sharpness of lines.

Image Processing Flow		Related SP Modes
Scanner Image Correction	Shading Correction	
	↓	
Pre-Filter Processing	Background Erase	SP4903 68 (Background Erase Level: Light Original)
	↓	
	Pre-Filter Smoothing	***SP4903 15 (Pre-Filter: Light)***
	↓	
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
	↓	
	Independent Dot Erase	SP4903 63 (Independent Dot Erase: Light Original)
	↓	
Filter Processing	MTF Correction	SP4904 29 Pale (General) Quality (☛pg. 6-26)
	↓	
Density Control	γ Coefficient	
	↓	
Grayscale Processing	Error Diffusion	

Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Generation Copy Mode

Generation Copy, based mainly on Text mode, aims to achieve the best reproduction of copied originals (so called “generation copies” or copies of copies). This mode 1) employs an MTF filter weaker than that of the Text mode to eliminate spurious dots, 2) uses the γ coefficient to smooth the image, and 3) uses generation processing to thicken thin lines. Soft employs an MTF filter weaker than the Normal setting to achieve a softer image with less moiré. Sharp employs an MTF filter stronger than that for Normal to emphasize lines for better image quality.



Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then “Copy SP” on the touch-screen.

6.2.8 PRE-FILTERING

SP mode settings 4903 10 ~ 15 select pre-filters by changing the filter coefficient settings.

Original Mode	SP No.	Default	Setting	Mag.	Smoothing
Text	***SP4903 10***	0	0	25% ~ 400%	OFF
Photo	***SP4903 12***	0	1	25% ~ 50%	Weak
Text/Photo	***SP4903 13***	0	2	25% ~ 50%	Medium
Pale	***SP4903 15***	0	3	25% ~ 50%	Strong
Generation	***SP4903 16***	0	4	25% ~ 99%	Weak
↓			5	25% ~ 99%	Medium
Range	0 ~ 9		6	25% ~ 99%	Strong
			7	25% ~ 400%	Weak
			8	25% ~ 400%	Medium
			9	25% ~ 400%	Strong

Note: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

These SP mode settings are provided to reduce the incidence of moiré in the reproduction of images whose data signals have been compressed in the direction of the main scan. However, these SP adjustments can cause different effects in the reproduction of images depending on:

- Whether they contain areas shaded with dot screening (newspaper, magazine photos)
- Their reduction ratios.

These adjustments can also cause blurring in the reproduction of images that contain:

- Low density dots
- Low contrast text characters
- Fine lines

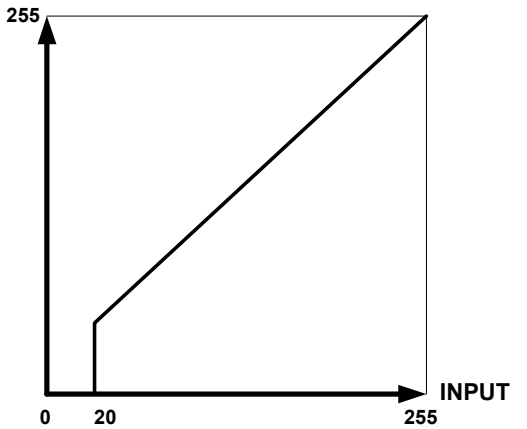
While filter processing is provided to reduce the incidence of moiré generated from digital signals, you must always pay attention to how these adjustments affect text characters and fine lines.

6.2.9 BACKGROUND ERASE

SP4903 65 ~ 69 cut the background from around images scanned from an original of rough texture such as a newspaper or parchment. The larger the setting done for this SP, the more background drops out from behind the image or text.

This SP mode setting for image processing executes separately from the ADS (Auto Image Density) function that is performed in the SBU to set the peak white level for scanning to eliminate background.

For example, if this SP is set for “20”, then the scanning data up to 20 is set to “0” and cut from the image. The range for this SP code adjustment is 0 ~ 255. The recommended range for a normal document is 0 ~ 60. An official document on rough texture paper would fall in the recommended range of 120 ~ 160. The correct setting for any original will vary with the texture and quality of the background, but remember that selecting a higher numbers for this setting will eventually lower the quality of the document or cause unexpected results.



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Mode	Background Erase Filter	Default	Range
Text	SP4903 65	0	0 ~ 255
Photo	SP4903 66	0	
Text/Photo	SP4903 67	0	
Pale	SP4903 68	0	
Generation Copy	SP4903 69	0	

NOTE: The “0” setting switches off the background erase filter.

6.2.10 INDEPENDENT DOT ERASE

Independent dot erase (set with the SP mode settings listed in the table below) remains in effect even when a “Custom Setting” is selected with the User Tools.

Independent dot erase targets for elimination random, irregular shaped black dots on the surface of the original that would otherwise appear in the copy after scanning and printing. The strength of the application of this feature can be adjusted for each mode.

The filter compares each pixel with the pixels around an area 7 pixels x 7 lines. If the sum of the pixels at the edges is smaller than the threshold value, the object pixel is changed to zero (white). depending on the strength of the SP mode setting. Setting a larger setting increases the number of dots erased, but if set too high, this SP can also remove small or fine text characters or even portions of large text characters.

Mode	Independent Dot Erase Filter	Default	Range
Text	SP4903 60	5	0 ~ 15
Text/Photo	SP4903 62	0	
Pale	SP4903 63	0	
Generation Copy	SP4903 64	8	

NOTE: The “0” setting switches off the filter.

6.2.11 LINE WIDTH CORRECTION

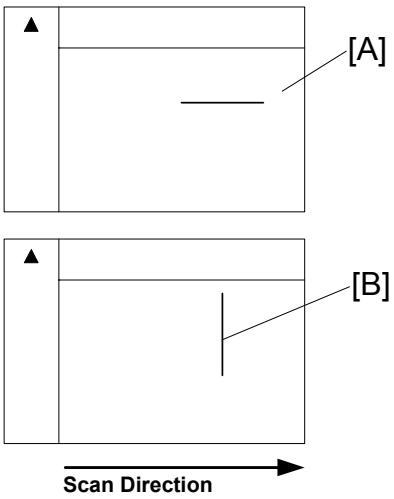
This section describes how to select a setting for line width correction (LWC) for the Generation Copy mode. LWC (Line Width Correction) can make lines thicker or thinner in generation copies.

SP4903 75 LWC: Generation Mode

Setting	Effect
0	No correction
1	Lighter lines
2	Darker lines (Default)
3	Thick lines

SP4903 75 adjusts the thickness of lines in faint generation copies. Specifically, this adjustment affects the lines targeted for adjustment by:

- SP4903 76 (LWC Threshold (Main Scan): Generation Mode). Targets main scan, lines parallel to the direction of feed [A].
- SP4903 77 LWC Threshold (Sub Scan): Generation Mode). Targets sub scan, lines at right angles to the direction of feed [B].



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For sharp thin lines, set SP4903 75 for a higher LWC setting, and for softer lines set a lower setting. For thick lines, select “3”.

- To thin (or thicken) lines in the main scan direction, select an SP4903 75 setting larger (or smaller) than the setting for SP4903 76
- To thin (or thicken) lines in the sub scan direction select an SP4903 75 setting larger (or smaller) than the setting for SP4903 77.

However, remember that too large a setting can cause unexpected results in copied images.

SP Mode	Default	Range
SP4903 76 LWC Threshold (Main Scan): Generation Mode	1	0 ~ 5
SP4903 77 LWC Threshold (Sub Scan): Generation Mode	1	

6.2.12 FILTERING

Interactive SP Codes

Overview

The tables in this section are for quick reference. For details about how each SP code operates and interacts with other SP settings, please refer to the sections that follow.

Many of the SP codes used for image processing adjustments are interactive in that they exist as master and slave SPs. Use the *master* SP codes for gross adjustment. If you need to fine adjust a master setting, set the master setting to "0" to access its *slave* SP codes.

NOTE: In the tables below, the master SP codes are set in **bold** type. The slave SP codes are indented and set in normal type.

Keep the following points in mind while you are using these SP codes:

- The slave SP codes cannot be accessed until the master SP is set to "0".
- For the slave SP code settings to take effect, the master SP code must remain set to "0".
- If the master SP code is reset to any value other than "0", then the slave SP codes are disabled and their adjustments have no effect on image processing.
- If a master SP code is provided with both a Strength and Level (coefficient) adjustment, adjust the Strength setting first to achieve the approximate effect that you want, then do the Level adjustment.

Text Mode

Adjust the image for the Text mode with the four master settings within their allowed ranges (for ranges see Section "5. Service Tables". To fine adjust a master setting set it to "0" then perform the adjustments listed below.

SP4904 020 = 0	Text (General) Quality 25-64%
SP4903 020	Main Scan Filter Level: Text 25%-64%
SP4903 021	Sub Scan Filter Level: Text 25%-64%
SP4903 022	Main Scan Filter Strength: Text 25%-64%
SP4903 023	Sub Scan Filter Strength: Text 25%-64%
SP4904 021 = 0	Text (General) Quality 65-154%
SP4903 024	Main Scan Filter Level: Text 65%-154%
SP4903 025	Sub Scan Filter Level: Text 65%-154%
SP4903 026	Main Scan Filter Strength: Text 65%-154%
SP4903 027	Sub Scan Filter Strength: Text 65%-154%
SP4904 022 = 0	Text (General) Quality 155-256%
SP4903 028	Main Scan Filter Level: Text 155%-256%
SP4903 029	Sub Scan Filter Level: Text 155%-256%
SP4903 030	Main Scan Filter Strength: Text 155%-256%
SP4903 031	Sub Scan Filter Strength: Text 155%-256%
SP4904 023 = 0	Text (General) Quality 257%-400%
SP4903 032	Main Scan Filter Level: Text 257%-400%
SP4903 033	Sub Scan Filter Level: Text 257%-400%
SP4903 034	Main Scan Filter Strength: Text 257%-400%
SP4903 035	Sub Scan Filter Strength: Text 257%-400%

Photo Mode

Dithering or Error Diffusion for Photo Mode?

Use SP4904 001 to select either dithering or error diffusion to process image fills and halftones.

0 Selects the dithering and smoothing filter.

1 Selects the error diffusion and MTF filter.

Photo Mode Dithering: SP4904 001 = 0

If you select "0" for SP4904 001 to enable dithering halftones, only one SP code is available for fine adjusting dithering.

SP4903 037	Smoothing Filter in Photo Mode

Photo Mode Error Diffusion: SP4904 001 = 1

If you select "1" for SP4904 001 to enable error diffusion, all the SP codes in the Mode tables below (Text Mode, Text/Photo Mode, etc.) are available for adjustment.

Use the *master* SP codes gross adjustment of the image processing mode after you have set SP4904 001 = 1 for error diffusion. If you need to fine adjust a master setting, set the master setting to "0" to access its slave SP codes.

Adjust the image for the Photo mode with the one master setting within its allowed range (for the range, see Section "5. Service Tables"). To fine adjust the master setting set it to "0" then perform the adjustments listed below.

SP4904 024 = 0	**Photo (General Quality)**
SP4903 036	Photo MTF (Edge)
SP4903 038	Photo MTF (All)
SP4903 091	***Filter Strength: Photo (Edge)***
SP4903 092	***Filter Adj.: Photo (Edge Det.)***
SP4903 093	***Filter Adj.: Photo (Mag.%)***
SP4904 013	***Halftone Adjustment: Edge Detection***

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Text/Photo Mode

Adjust the image for the Text/Photo mode with the four master settings within their allowed ranges (for ranges, see Section "5. Service Tables"). To fine adjust a master setting set it to "0" then perform the adjustments listed below.

SP4904 025 = 0	**Text/Photo (General) Quality 25%-64%**
SP4903 039	Text/Photo (Edge) Coefficient 25%-64%
SP4903 040	Text/Photo (All) Coefficient 25%-64%
SP4903 079	***Filter Strength: Text/Photo (Edge) 25%-64%***
SP4903 080	***Filter Adj.: Text/Photo (Edge Det.) 25%-64%***
SP4903 081	***Filter Adj.: Text/Photo (Mag.%) 25%-64%***
SP4904 008	***Gray Adj: Text/Photo (Edge Det.) 25-64%***
SP4904 026 = 0	**Text/Photo (General) Quality 65%-154%**
SP4903 043	Text/Photo (Edge) Coefficient 65%-154%
SP4903 044	Text/Photo (All) Coefficient 65%-154%
SP4903 082	***Filter Strength: Text/Photo (Edge) 65%-154%***
SP4903 083	***Filter Adj.: Text/Photo (Edge Det.) 65-154%***
SP4903 084	***Filter Adj. Text/Photo (Mag.%) 65%-154%***
SP4904 009	***Gray Adj.: Text/Photo (Edge Det.) 65-154%***
SP4904 027 = 0	**Text/Photo (General Quality) 155%-256%**
SP4903 047	Text/Photo (Edge) Coefficient 155%-256%
SP4903 048	Text/Photo (All) Coefficient 155%-256%
SP4903 085	***Filter Strength: Text/Photo (Edge) 155%-256%***
SP4903 086	***Filter Adj.: Text/Photo (Edge Det.) 155%-256%***
SP4903 087	***Filter Adj.; Text/Photo (Mag.%) 155%-256%***
SP4904 010	***Gray Adj.: Text/Photo (Edge Det.) 155-256%***
SP4904 028 = 0	**Text/Photo (General) Quality 257%-400%**
SP4903 051	Text/Photo (Edge) Coefficient 257%-400%
SP4903 052	Text/Photo (All) Coefficient 257%-400%
SP4903 088	***Filter Strength: Text/Photo (Edge) 257%-400%***
SP4903 089	***Filter Adj.: Text/Photo (Edge Det.) 257%-400%***
SP4903 090	***Filter Adj.: Text/Photo (Mag.%) 257%-400%***
SP4904 011	***Gray Adj.: Text/Photo (Edge Det.) 257-400%***

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down (#) on the 10-key pad then "Copy SP" on the touch-screen.

Also, SP4904 007 adjusts the error diffusion process that is used in text/photo mode.

Gray adjustment: At areas defined as edges, error diffusion is done on text to create sharp lines to better define text characters, but in other areas, grayscale processing for photographs is done. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. For details, refer to the SP table.

Pale Mode

Adjust the image for the Pale mode with the one master setting within its allowed range (for range see Section “5. Service Tables”. To fine adjust the master setting set it to “0” then perform the adjustments listed below.

SP4904 029 = 0	Pale (General) Quality
SP4903 055	Filter Level: Light Original
SP4903 056	Filter Strength: Light Original

Generation Copy Mode

Adjust the image for the Generation Copy mode with the one master setting within its allowed range (for range see Section “5. Service Tables”. To fine adjust the master setting set it to “0” then perform the adjustments listed below.

SP4904 030 = 0	Generation (General) Quality
SP4903 057	Filter Level: Generation Copy
SP4903 058	Filter Strength: Generation Copy

Text Mode MTF Filter

This section describes how to select the MTF filter coefficient and filter strength for the Text mode. You can use the SP mode settings listed in the table below to adjust these items for scanning in Text mode:

- MTF filter coefficient for the main scan and sub scan
- MTF filter strength for the main scan and sub scan

Text Mode (Mag.)	Coefficient		Strength	
	Main Scan .	Sub Scan .	Main Scan .	Sub Scan .
25% ~ 64%	SP4903 20	SP4903 21	SP4903 22	SP4903 23
65% ~ 154%	SP4903 24	SP4903 25	SP4903 26	SP4903 27
155% ~ 256%	SP4903 28	SP4903 29	SP4903 30	SP4903 31
257% ~ 400%	SP4903 32	SP4903 33	SP4903 34	SP4903 35
Ranges	0 ~ 15	0 ~ 13	0 ~ 7	0 ~ 7

Strengthening the MTF filter sharpens the edges of text characters and improves the appearance of low contrast text but can also cause moiré to appear in photos on the same original.

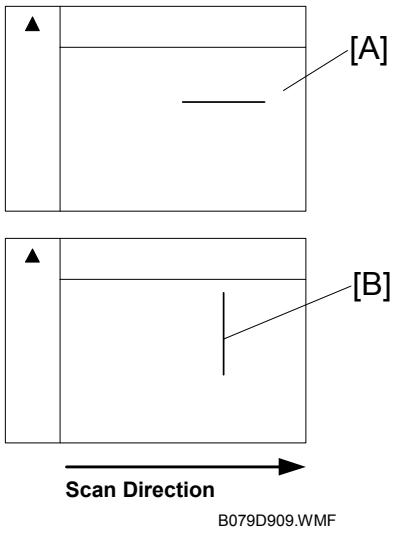
Conversely, weakening the MTF filter softens the edges of text characters and reduces the occurrence of moiré but low contrast characters may fade.

Strengthen or weaken the MTF filter for the Text mode only when necessary.

Adjustment of the MTF filter coefficient performs very fine level adjustment of the applied strength of the MTF filter. Adjustment of the MTF filter strength greatly affects the rate of the change applied to the image. Basically, you should first just the MTF filter strength in 1 step increments without adjusting the coefficient to achieve nearly the effect you want, and then use the coefficient settings for fine adjustment.

Coefficient and strength adjustments for main scan affect lines parallel to the direction of scanning [A].

Coefficient and strength adjustments for sub scan affect lines at right angles to the direction of scanning [B].



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Text/Photo, Photo Mode Filter

SP mode settings listed in Columns 2~4 below adjust the clarity of originals that contain text, thin lines, and photos; the SP codes of Columns 5~6 are intended to adjust the clarity of originals with text and thin lines or only photos. The photo mode settings are only valid if SP 4904 001 is set to 1.

Mode, Mag.	Filter Setting: Edge	Filter Setting: All	Filter Strength: Edge	Filter Adj.: Edge Det.	Filter Adj.: Mag.
Text/Photo 25 ~ 64%	SP4903 39	SP4903 40	***SP4903 79***	***SP4903 80***	***SP4903 81***
Text/Photo 65 ~ 154%	SP4903 43	SP4903 44	***SP4903 82***	***SP4903 83***	***SP4903 84***
Text/Photo 155 ~ 256%	SP4903 47	SP4903 48	***SP4903 85***	***SP4903 86***	***SP4903 87***
Text/Photo 257 ~ 400%	SP4903 51	SP4903 52	***SP4903 88***	***SP4903 89***	***SP4903 90***
Photo (Error Diffusion)	SP4903 36	SP4903 38	***SP4903 91***	***SP4903 92***	***SP4903 93***
Ranges	0~7	0~7	0~3	0~15	0~15

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Filter Setting: Edge (Column 2): Provides filter processing of edges to improve the clarity of originals that contain text and lines. Selecting a larger value sharpens the clarity. However, increasing the value also increases the possibility of producing moiré in the image.

Filter Setting: All (Column 3): Provides filter processing for the overall image, not to improve just text, lines, or photographs, but to improve the image as a whole. This filter coefficient reduces the incidence of moiré in images that contain shaded areas created with dots. Increasing the value improves reproduction of low contrast text and lines. However, increasing the value also increases the possibility of producing moiré in the image.

Filter Strength: Edge (Column 4): Aims to increase the *strength* of the "Filter Setting: Edge" effect that processes edges to improve the clarity of originals that contain text and lines. Increasing this setting not only increases the strength of the effect and creates thicker text characters and lines, but can also cause moiré to appear in the image. On the other hand, decreasing this setting lessens the effect, creating thinner characters and lines and also reduces the incidence of moiré.

Filter Adj.: Edge Detection (Column 5): Broadens the *range* of the effect of the "Filter Setting Edge" SP. Lowering this setting broadens the range for edge filter processing and increases clarity. Also, using this SP together with "Filter Adj. Mag." below can sharpen edges to an extent that an abnormal looking image is created.

Filter Adj.: Magnification (Column 6): Allows gradual adjustment of clarity in original images that contain varying degrees of clarity between text and lines, or between areas of the same image. Increasing these settings in large increments could easily cause moiré to appear in the images. These settings should always be changed in small increments.

Follow these general rules with these settings:

- Increasing the settings dramatically increases clarity but can also increase the incidence of moiré.
- Reducing the settings produces a smoother image, reduces the incidence of moiré, but also reduces the effect of the filters.
- Adjusting the "Filter Adj. Mag." SPs in combination with other settings can even produce abnormal images.

Also, SP4904 007 adjusts the error diffusion process that is used in text/photo mode.

Pale, Generation Mode Filter

The SP mode settings listed in the table below are used to adjust MTF filter coefficient and strength for the Pale mode and Generation Copy modes.

Mode	Coefficient	Strength
Pale Mode	SP4903 55	SP4903 56
Generation Copy	SP4903 57	SP4903 58
Ranges	0 ~ 6	0 ~ 7

Strengthening the MTF filter sharpens the edges of text characters and improves the appearance of low contrast text but can also cause moiré to appear in photos on the same original. Conversely, weakening the MTF filter softens the edges of text characters and reduces the occurrence of moiré but low contrast characters may fade.

Strengthen or weaken the MTF filter for the Text mode only when necessary.

Adjustment of the MTF filter coefficient performs very fine level adjustment of the applied strength of the MTF filter. Adjustment of the MTF filter strength greatly affects the rate of the change applied to the image. Basically, you should first just the MTF filter strength in 1 step increments without adjusting the coefficient to achieve the effect you want, and then use the coefficient settings for fine adjustment.

Photo Mode Smoothing for Dithering

Strengthening this SP4903 37 (Smoothing Filter in Photo Mode) makes images smoother and reduces the occurrence of moiré but can also cause fading. Strengthen this setting only when necessary. Only valid if SP 4901 001 is at 0.

Smoothing Coefficient	Range
SP4903 37 (Smoothing Filter in Photo Mode)	0 ~ 7

Photo Mode Grayscale

This SP mode adjustment sets how grayscales are processed when the user selects Photo mode on the operation panel.

SP4904 1 Grayscale Photo Mode

Setting	Description
0	Dithering and smoothing
1	Error diffusion, MTF filter correction for edges

If “0” is selected, the image grayscales are processed with dithering and filter processing, just as they are processed with the “Print Photo” selection on the operation panel. In this case the filter processing means smoothing only. The filter coefficient for smoothing can be adjusted with SP4904 37 (Smoothing Filter in Photo Mode).

If “1” is selected, then the image grayscales are processed with error diffusion processing, just as they are processed with the “Normal” and “Glossy Photo” settings on the operation panel. The MTF filter applied is the same as that applied for the “Normal” setting.

To achieve better photo image quality with slightly less clarity in lines and text, select “0” for dithering. You can also adjust SP4904 2 to achieve better reproduction of photographs.

On the other hand, to achieve better clarity in text and lines, with a slight sacrifice in the quality grayscale and smoothness in photographs, select “1” for error diffusion. To improve the clarity of fine lines and text, you can also increase the strength of the MTF filter. However, increasing the strength of the filter can also increase the incidence of moiré in areas of newspaper, magazine, or other photographs created with dot screening.

Photo Mode Image Quality

This section describes how to select a setting to improve image quality in the Photo mode with dithering in order to create an extremely smooth photo image.

Generally, a larger dithering matrix uses rougher dither pattern to reproduce a smoother gray image, but lowering the resolution can make text and lines more difficult to see. Conversely, a smaller dithering matrix uses a finer dithering pattern to reproduce a gray image of rougher texture, but raising the resolution can make text and lines easier to see.

SP4904 002 Quality Photo Mode

Setting	Dither Pattern	Picture Quality	Text Quality	Processing Priority
0	8 x 8 (75 lines)	High	Low	Dot screen areas
1	8 x 8 (106 lines)	Highest	Low	Filled areas (highest priority) Default
2	6 x 6 (142 lines)	Medium	Medium	Filled areas
3	4 x 4 (212 lines)	Low	High	Resolution

For these dither adjustments to take effect, SP4904 1 (Grayscale Photo Mode) must be set to “0” to enable dithering.

Here are some general rules:

- If your main concern is reproducing legible text, use the smaller matrixes, but a smaller matrix could cause spurious lines to appear in images.
- When using the smallest matrix with setting “3” (4 x 4), you should switch off the smoothing filter for the Photo mode by setting SP4903 37 to “0”.
- Use the largest dither matrix (setting “0”) for originals that contain dot screening such as newspaper and magazine photographs.

6.2.13 OTHERS

Vertical Black Line Correction

This section describes how to select a setting to correct vertical black lines. SP4904 5 (Special Text Density) adjusts the overall intensity of the image to eliminate vertical black lines in originals caused by documents scanned on a copy machine with dirty optics.

SP Mode	Default	Range
SP4904 5 Special Text Density	0	0 ~ 7

Normally, the default setting (0) leaves this feature switched off.

Select a higher setting to increase the effect or a lower setting to decrease the effect. High density vertical black lines may require a higher setting, but a higher setting could cause the overall density of the copy to lower, or could cause low density areas to drop out completely.

NOTE: Generally, this SP code corrects most low density vertical black lines but may not be able to correct extremely dark or wide black lines.

Density Settings

This section describes how to adjust the density settings for the Pale mode Generation Copy mode, and Text mode.

SP4904 3 is used to switch the density characteristics to binary digital processing for black and white originals to achieve better balance between text and images, correct shadows that appear around text in handwritten documents, to enhance documents written in pencil, or to achieve stark contrast when copying blueprints, building plans, etc.

SP4903 3 Density Setting for Low Density Original Mode

Settings	Density Characteristics
0	Selects γ normal density (Default).
1	Digitizes to near binary image.

SP4904 4 is used to switch between normal density and better reproduction of areas with graduated fill in originals copied in the Generation Copy mode. To improve the appearance of graduated fill areas of high density, set to “1” so the process can ignore black and more accurately reproduce areas with graduated fill. For example, the “1” setting is ideal for copying Generation Copy originals of medical charts that contain images of internal organs.

SP4904 4 Density Setting for Copied Original Mode

Settings	Density Characteristics
0	Selects normal density (Default) for Generation Copy originals.
1	Produces better gradation in fill areas of high density.

If “1” is selected for SP4904, the following SP mode settings may also need adjustment.

SP No.	Function	Recommended Setting
SP4903 57	Filter Level: Generation Copy	4 (or change as required)
SP4903 58	Filter Strength: Generation Copy	2 (or change as required)
SP4903 64	Independent Dot Erase: Generation Copy	0 (OFF)
SP4903 69	Background Erase Level: Generation Copy	0 OFF
SP4903 75	Line Width Correction: Generation Mode	0 (LWC OFF)

ADS Level

This section shows you how to adjust the center notch for the ADS (Automatic Density Setting) level. The notches are not displayed during ADS adjustment. Of 7 steps (notches) the center notch is 4. This is the value adjusted with this SP code.

SP5106 6 (ADS Level Selection) selects the image density used in ADS mode. For example, if you set SP5106 66 to “2”, pressing the Auto Image Density key toggles the display off and manual notch 2 is selected. This SP code is adjusted, if the customer cannot attain clean copies after performing automatic density adjustment.

This mode prevents the background of an original from appearing on copies.

The copier scans the auto image density detection area, a narrow strip at one end of the main scan line. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line in this narrow strip only. The IPU uses this peak white level as a reference value for analog-to-digital conversion of the scan line, then the IPU sends the reference value to the A/D controller on the SBU.

When an original with a gray background is scanned, for example, the density of the gray area becomes the peak white level density, so the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode and the machine will use both settings when processing the original.

6.2.14 PRACTICAL APPLICATION OF SP MODES

Solving Problems

This section describes some common problems that can be solved with SP code adjustments. This table lists the recommended settings; fine adjustments may be required for the actual type of originals that the customer is copying.

NOTE: To do the settings in the table below, first you must set the Master SP code to "0". (☛"FILTERING", 6-23~6-31)

Job	User Tool	Custom Setting Adjustment
Eliminate blue lines from graph paper, or erase shadows caused by originals that have been pasted up for layout.	• Lighten the image density for Text mode. • Select "Soft" for Text mode (User Tools).	• Increase the setting of SP4903 60 (Independent Dot Erase) to about 6 ~ 10. • Increase the setting of SP4903 65 (Background Erase) to about 20 ~ 60.
Eliminate orange or other color backgrounds from official documents.		• Increase the setting of SP4903 60 (Independent Dot Erase) to about 10 ~ 15. • Increase the setting of SP4903 65 (Background Erase) to about 120 ~ 160.
Reproduce blue lines of graph paper.	• Darken the image density for Text/Photo mode. • Select "Sharp" for the Text/Photo mode (User Tools).	
De-emphasize fine lines in jagged valleys and reduce the occurrence of moiré.	• Select "Soft" for Text mode (User Tools).	Weaken the MTF filters for Text mode: • SP4903 24, Main Scan: 9 • SP4903 25, Sub Scan: 13 • SP4903 26, Main Scan: 2 • SP4903 27, Sub Scan: 2
Reduce the occurrence of moiré when reducing the size of the original for copying.	• Select "Soft" for Text mode (User Tools).	Weaken the MTF filters for Text mode reduction: • SP4903 20, Main Scan: 14 • SP4903 21, Sub Scan: 13 • SP4903 22, Main Scan: 1 • SP4903 23, Sub Scan: 1
Reproduce areas of graduated fill in high density originals in Photo mode.	• Select "Glossy Photo" for Photo mode (User Tools).	
Sharpen text in Photo mode.	• Select "Normal" or "Glossy Photo" for Photo mode (User Tools).	Set SP4904 1 to "1" to enable error diffusion. Strengthen the settings for the Photo mode MTF filters coefficients: • SP4903 36: Select "3" • SP4903 38: Select "1"
Improve the appearance of originals handwritten with pencil, or make lighter copies of color originals (invoices and other commonly used business forms)	• Select "Sharp" for Pale mode (User Tools). • Select "Sharp" for Text mode (User Tools).	Strengthen the MTF filters for Pale mode: • SP4903 55: Select "3" • SP4903 56: Select "4" Strengthen the MTF filters for Text mode: • SP4903 24: Set to "9". • SP4903 25: Set to "13". • SP4903 26: Set to "3". • SP4903 27: Set to "3".

Recommended Settings for MTF Filters

Text Mode

Text Mode Filter Setting(25% ~ 64%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 20 Main Filter Level: Text	15	14	12	10	9	9	14	10	9
SP4903 21 Sub Filter Level: Text	13	13	12	12	13	10	13	13	10
SP4903 22 Main Filter Strength	2	2	2	2	2	2	1	1	1
SP4903 23 Sub Filter Strength: Text	2	2	2	2	2	2	1	1	1

Text Mode Filter Setting (65% ~ 154%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 24 Main Filter Level	9	9	15	14	12	10	9	14	11
SP4903 25 Sub Filter Level	13	11	13	13	13	13	13	13	13
SP4903 26 Main Filter Strength	3	3	2	2	2	2	2	1	1
SP4903 26 Sub Filter Strength	3	3	2	2	2	2	2	1	1

Text Mode (155% ~ 256%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 28 Main Filter Level	11	10	9	9	14	12	10	9	9
SP4903 29 Sub Filter Level	13	13	13	10	13	13	13	13	10
SP4903 30 Main Filter Strength	3	3	3	3	2	2	2	2	2
SP4903 31 Sub Filter Strength	3	3	3	3	2	2	2	2	2

Text Mode (257% ~ 400%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 32 Main Filter Level	12	11	10	9	15	14	12	10	9
SP4903 33 Sub Filter Level	13	13	13	13	13	13	13	13	13
SP4903 34 Main Filter Strength	3	3	3	3	2	2	2	2	2
SP4903 35 Sub Filter Strength	3	3	3	3	2	2	2	2	2

Pale Mode

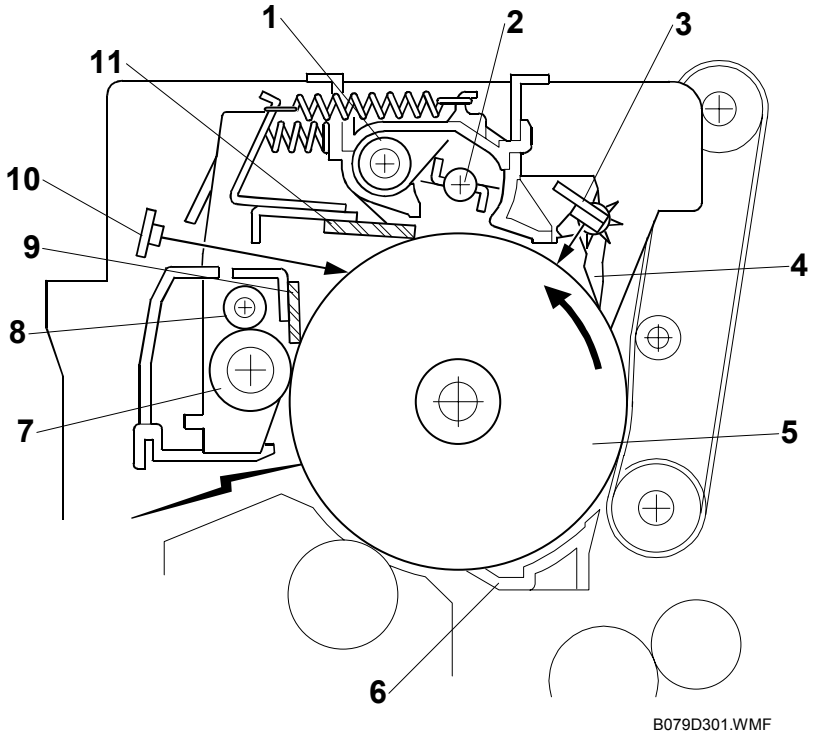
MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 55 Filter Level: Light Original	5	4	3	2	6	4	3	2	6
SP4903 56 Filter Strength: Light Original	4	4	4	4	3	3	3	3	2

Generation Copy Mode

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 55 Filter Level: Light Original	2	6	5	4	3	2	6	5	4
SP4903 56 Filter Strength: Light Original	2	2	2	2	2	2	1	1	1

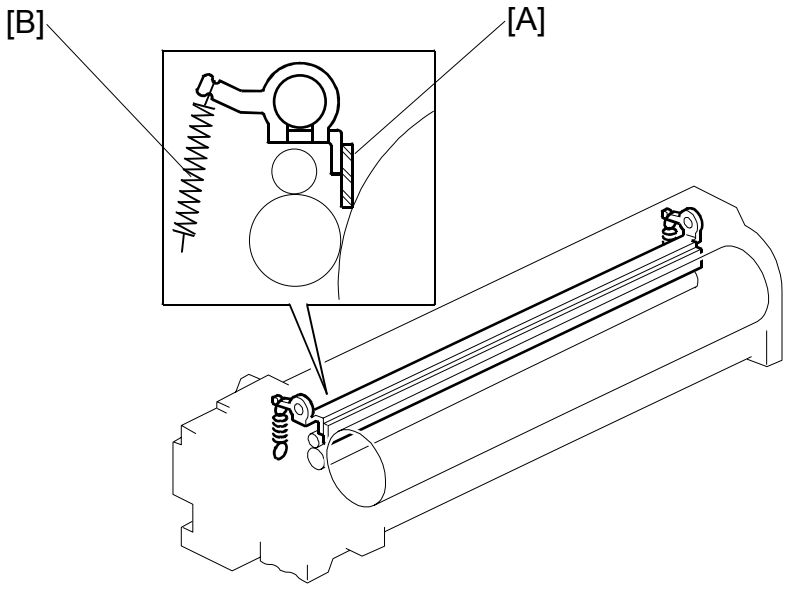
6.3 PHOTOCONDUCTOR UNIT (PCU)

6.3.1 OVERVIEW



1. Toner Collection Coil
2. Toner Collection Plate
3. Image Density Sensor
4. Pick off Pawl
5. OPC Drum (ϕ60 mm)
6. Transfer Entrance Guide
7. Charge Roller
8. Charge Roller Cleaning Roller
9. Drum Cleaning Blade 2
10. Quenching Lamp
11. Drum Cleaning Blade 1

6.3.2 DRUM CLEANING



B079D721.WMF

The PxP (Polyester Polymerization) toner of this machine is of much finer particle size so in addition to the stationary cleaning blade, mounted with two screws at the bottom of the PCU, an additional cleaning blade [A] has been added to increase the efficiency of drum cleaning.

The new cleaning blade is held in contact with the drum by two small springs [B] (one on each end) that keep the cleaning blade in contact with the drum. This cleaning blade is not a counter blade.

Every time the PCU is opened for replacement or cleaning, the spring closest to the front of the PCU must moved in order to retract the cleaning blade away from the OPC drum. After cleaning or replacement, the spring must be returned to its original position to keep the blade in contact with the OPC drum for normal operation. For details, see Section “3 Replacement and Adjustment”.

6.4 DRUM CHARGE

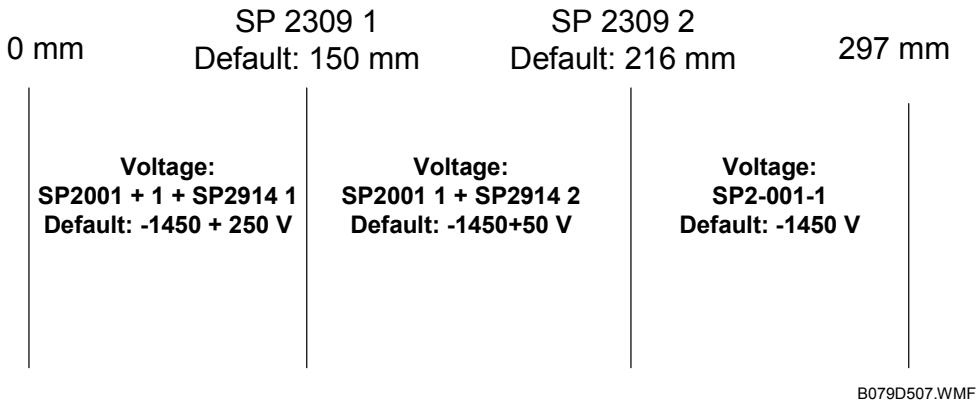
6.4.1 CORRECTION FOR PAPER WIDTH AND THICKNESS

NOTE: This correction is done for the bypass tray only.

The by-pass tray can be used for non-standard paper narrower than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and copy quality problems.

SP Mode	SP Name	
SP2001 1	Charge Roller Bias Adjustment	Width 216 - 297 mm (Default: -1630 V)
SP2309 1	Paper Lower Width [a]	Width limit (Default: 150 mm)
SP2309 2	Paper Upper Width [b]	Width limit (Default: 216 mm)
SP2914 1	Cα	Adjust 10V/step (Default: 250 V)
SP2914 2	Cβ	Adjust 10V/step (Default: 50 V)

The way that these SP modes are used is shown below.



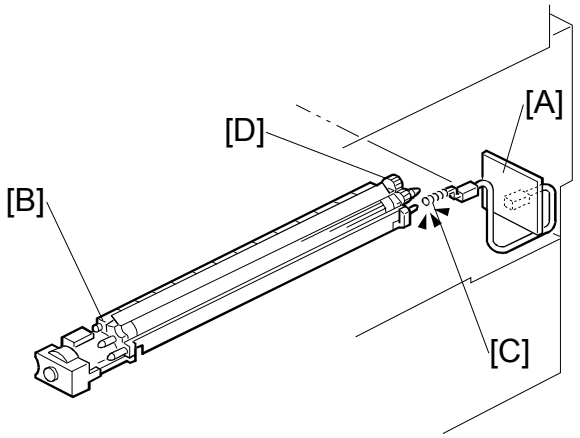
For example, with the default settings, if the paper width fed from the by-pass tray is 200 mm, the charge roller voltage will be –1450 + 50 V.

6.4.2 DEVELOPMENT BIAS

Mechanism

Black areas of the latent image are at a low negative charge (about –150 V) and white areas are at a high negative charge (about –950 V).

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of –510 volts to the development roller throughout the image development process. The bias is applied to the development roller shaft [B] through the bias terminal spring [C] and bias terminal [D].



B079D404.WMF

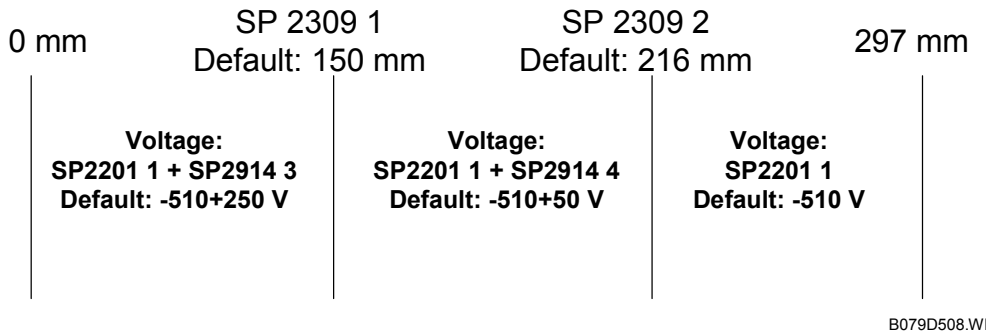
The development bias voltage (-510 V) can be adjusted with SP2-201 (Development Bias).

Correction for paper width and thickness (by-pass tray only)

The by-pass tray can be used for non-standard paper narrow than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and misfeeds.

SP Mode	SP Name	
SP2201 1	Development Bias	Width 216 - 297 mm (Default: -600V)
SP2309 1	Paper Lower Width [a]	Width limit (Default: 150 mm)
SP2309 2	Paper Upper Width [b]	Width limit (Default: 216 mm)
SP2914 3	Process Control Setting (Bγ)	Adjust 10V/step (Default: 250V)
SP2914 4	Process Control Setting (Bδ)	Adjust 10V/step (Default: 50V)

The way that these SP modes are used is shown below.

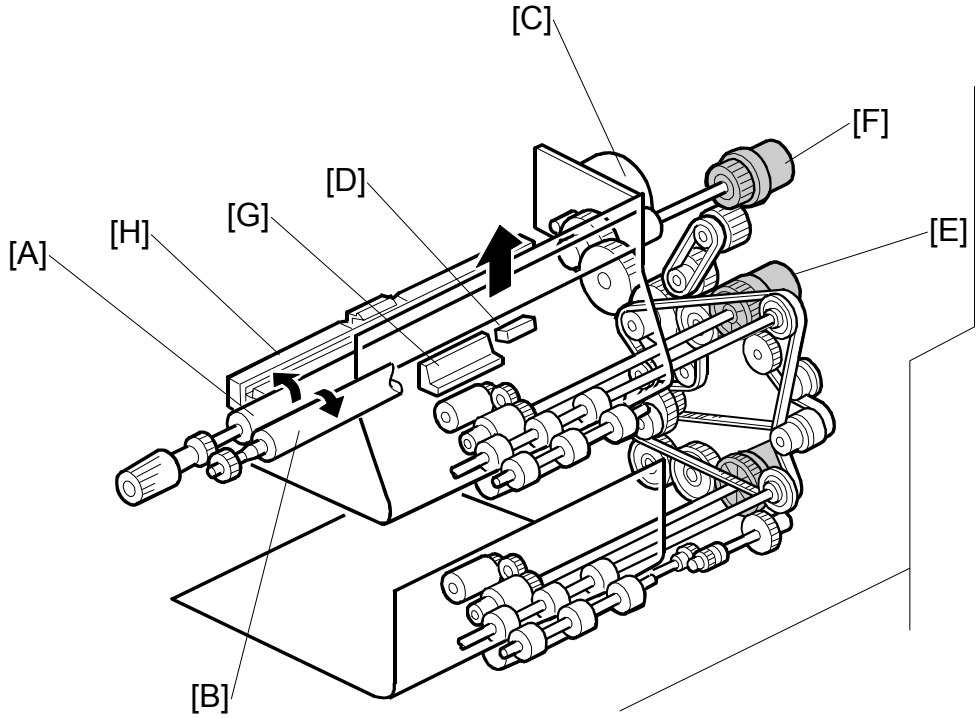


B079D508.WMF

For example, with the default settings, if the paper width fed from the by-pass tray is 200 mm, the development bias voltage will be –510 + 50 V.

6.5 PAPER FEED

6.5.1 PAPER REGISTRATION



The registration drive roller [A] and idle roller [B] correct the skew of the paper to ensure that the leading edge of the paper is positioned correctly at the drum. The paper feed/development motor [C] drives the registration mechanism.

The registration sensor [D] is positioned just before the registration rollers. When the leading edge activates the registration sensor, the registration clutch is switched off and the registration rollers stop turning. However, the relay clutch [E] remains on slightly longer. This delay allows more time for the paper to press against the registration rollers and buckle slightly to correct any skew. The registration sensor also detects misfeeds.

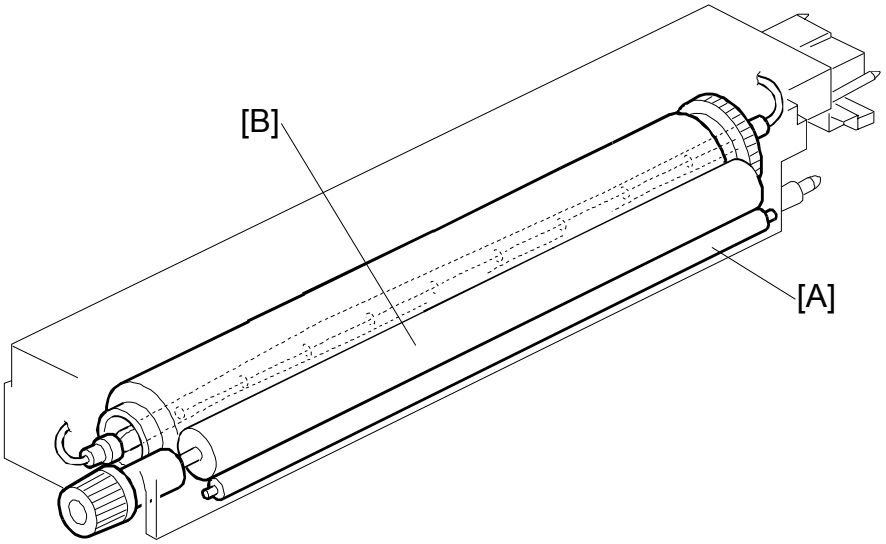
Next, the registration clutch [F] actuates and the relay clutch at the correct time to align the paper with the image on the drum. The registration rollers then feed the paper to the image transfer section.

Two new dust blades have been added around the registration roller. The idle roller dust blade [G] cleans the registration idle roller. This dust blade has a small dust box that collects paper dust that must be emptied periodically.

The registration roller dust blade [H] cleans the registration roller. For details about how to remove and clean these new parts, see Section “3 Replacement and Adjustment”.

6.6 IMAGE FUSING AND PAPER EXIT

6.6.1 CLEANING MECHANISM



B079D910.WMF

The cleaning roller [A], in constant contact with the pressure roller [B], collects toner and paper dust from the surface of the pressure roller.

Because the cleaning roller is metal, it can collect adhering matter better than the pressure roller, which is coated with Teflon.

Some new design features have been implemented in order to cope with the lower temperatures required for new toner which has a melting temperature much lower than the previous toner. The cleaning roller [A] is composed of an aluminum shell with an internal “heat pipe” suspended in the middle of the roller to dissipate heat more rapidly.

6.6.2 HOT ROLLER STRIPPER CLEANING

After a job of more than the specified number of pages ends, the fusing/exit motor switches off and on to rotate the hot roller in order to dislodge toner clinging to the hot roller strippers.

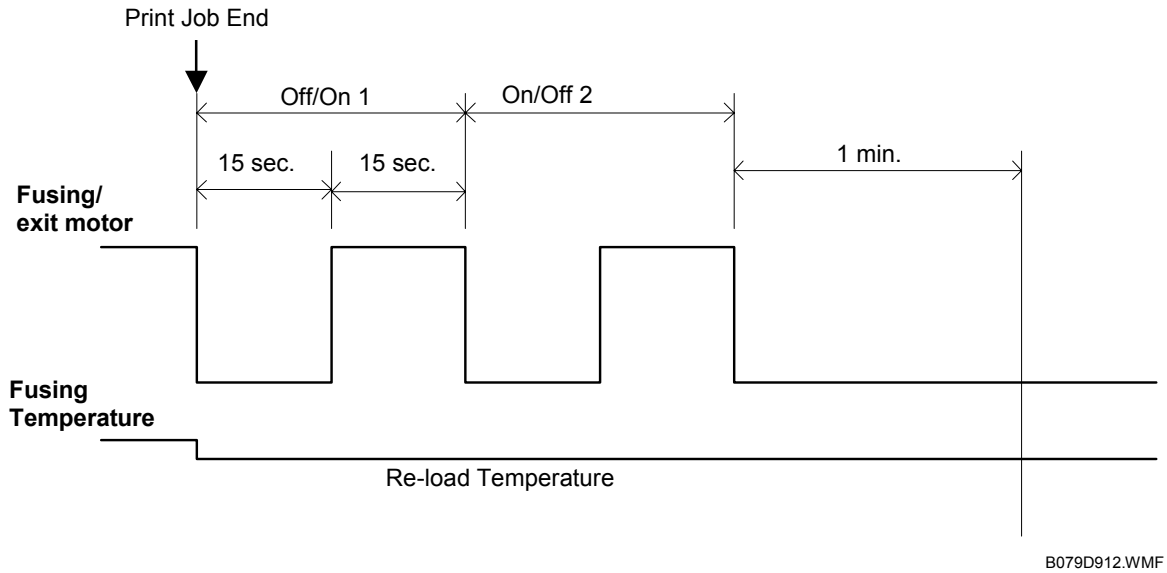
When printing ends, the fusing/exit motor switches off for 15 sec. then switches on for 15 sec. This on/off cycle is repeated for the number of times specified with SP3905 1 (Default: 1 off/on cycle). While the fusing/exit motor is switched off/on during the cleaning cycle, all fans remain on.

NOTE: The hot roller strippers are also be force cleaned by adjusting and raising the setting of SP5959 (Image Timing Adjustment) which allows the drum and hot roller to turn freely to allow more time for cleaning before printing. However, make sure that the customer understands that increasing this SP setting slows down the first print time.

These are the SP codes that control hot roller stripper cleaning. (For details, refer to Section “5. Service Tables”.

No.	Name	Function
SP3905 1	Number of Rotations	Prescribes the number of times the hot roller is rotated at the end of the print job if the print job exceeds the number of pages specified with SP3905 2. (Default: 1)
SP3905 2	Number of Pages	Prescribes the number of pages to print and trigger hot roller stripper cleaning. Cleaning executes only if the number of pages in the print job exceeds this number. (Default: 15 pp.)

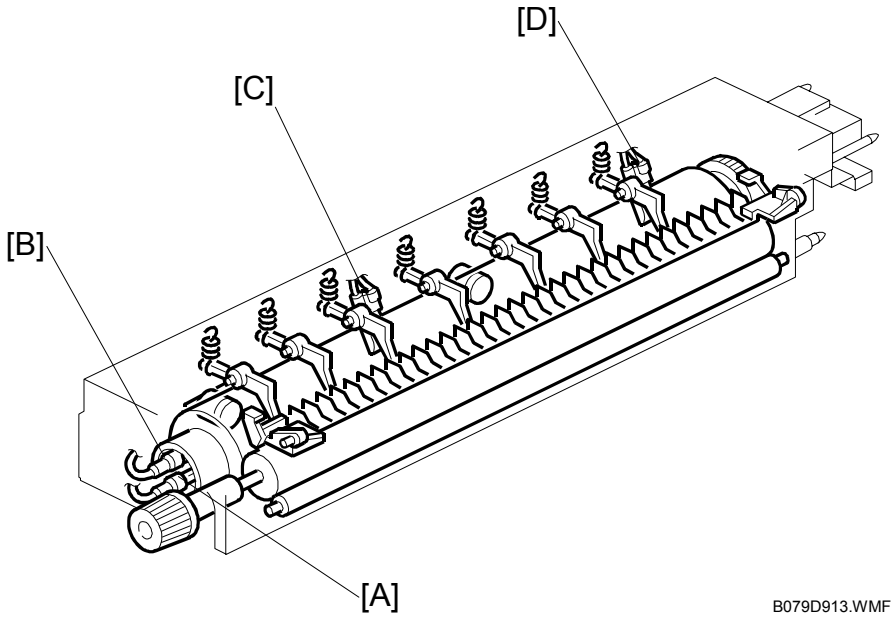
The timing chart below shows the fusing/exit motor switched off and on twice at the end of a print job.



Here are some important points to keep in mind about this new feature:

- If a request to start a print job is received during cleaning cycle in the timing chart above, cleaning stops and the new print job starts. During a normal print job, the fusing/exit motor switches on as soon as the paper reaches the registration roller, but in this case the fusing/exit motor remains on.
- If a request to enter the Off mode is received while hot roller stripper cleaning is in progress, the machine enters the Off mode and the cleaning cycle stops immediately.
- If the machine switches to any of the energy saver modes (low power mode, etc.) the cleaning cycle completes and does not halt.
- The cleaning cycle is not interrupted during free rotation of the hot roller when the machine is getting ready to print.
- Opening the front door, however, will stop the cleaning cycle.

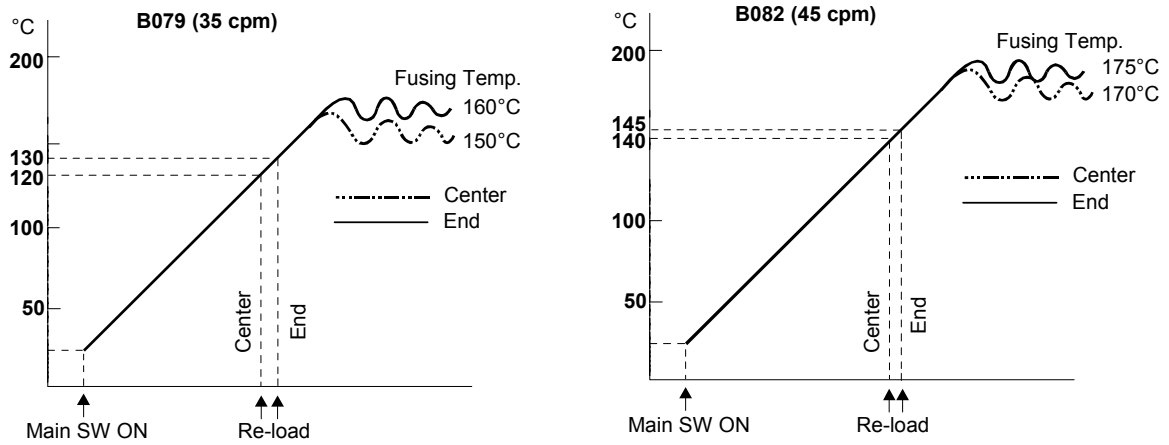
6.6.3 FUSING TEMPERATURE CONTROL



The fusing unit has two fusing lamps: the first fusing lamp (center: 650W) [A] heats the center of the fusing roller, and the second fusing lamp (ends: 550W) [B] heats both ends of the hot roller. This arrangement ensures even heat on all surfaces of the roller.

In order to control the temperature of the roller, two high response thermistors are attached to the unit, one near the center [C] and one at the end [D] of the hot roller.

Temperature Control



There are two types of temperature control:

- On/off control (Default)
- Phase control.

Either mode can be selected with SP1104 (Fusing Temperature Control).

After the machine is powered on, the CPU checks the ac frequency for 500 ms, in case phase control is selected later for the temperature control, and then switches on the fusing lamp.

As soon as both the center and end thermistors detect the print ready temperature (also known as the “re-load” temperature), the machine can operate. The “reload” temperature is 3 °C below the fusing temperature (this depends on the settings of SP1105 1~4, 7, 8). As soon as the thermistors detect the fusing temperature, the CPU switches the lamps off but frequently switches on/off again in order to maintain the fusing temperature.

The default temperatures of SP1105 for these models are set 10 ~ 30 degrees lower than the temperatures for the previous machines. Some new SP codes have been added and others removed. For details, see Section “5. Service Tables”.

Fusing Idling Temperature

If copies are not sufficiently fused soon after the main power switch is turned on, fusing idling should be enabled with SP1103 1.

When fusing idling is enabled, it is done when the temperature reaches the print ready ("re-load") temperature. The re-load temperature can be adjusted with SP1105 5,6.

In the opposite case, even if fusing idling is disabled, it is done when the temperature at power-up ≤ 15 °C

The fusing idling time is as follows.

Temperature at power-on	**Fusing Idling Mode**		
	0: Disabled	**1: Enabled**	SP1103 1
15 °C or less	30 s	30 s	SP1103 2
Higher than 15°C	Not done	30 s	

6.6.4 CPM DOWN FOR THICK PAPER

Because the fusing temperatures are set lower for the new toner which has a lower melting point, the results of printing on thick paper cannot be guaranteed at 45 cpm on the B082. Therefore, the 45 cpm line speed is adjusted down to 35 cpm as follows:

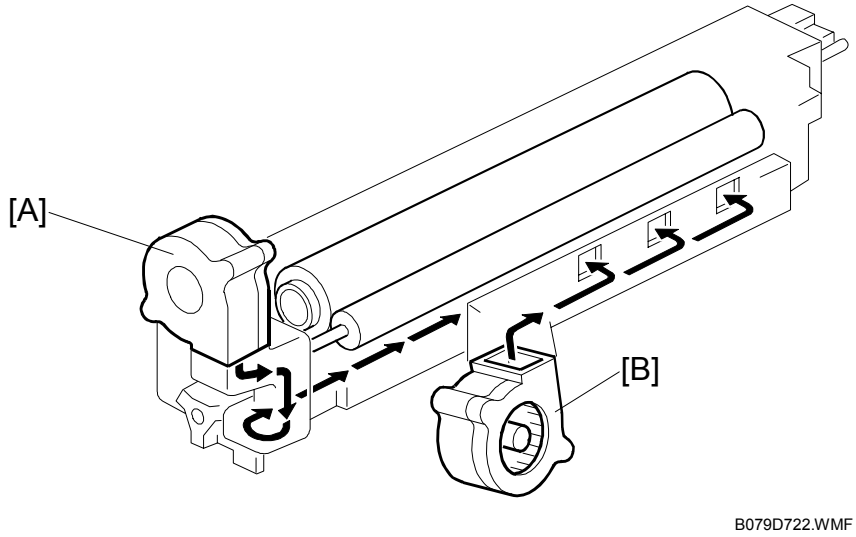
- After switching from Normal to Thick Paper for printing, the machine halts temporarily and re-starts for 35 cpm running.
- If the previous job included stapling or other finisher processing, these settings remain in effect for the next job on thick paper after the line speed is adjusted.
- If the print job on thick paper does not include an image on the page (a cover), then the speed is not adjusted down from 45 cpm to 35 cpm.

  NOTE: The previous machine automatically reduced line speed 30% (ppm down) for thick paper. In these models, however, the speed is reduced from 45 cpm to 35 cpm for the 45 cpm machine. This adjustment is performed automatically for the B082 (45 cpm) machine only.

Note these other important points regarding cpm down for thick paper on the 45 cpm machine:

- When the line speed switches from 45 cpm to 35 cpm for thick paper, the transfer current changes to the settings specified with SP2301 (Transfer Current Adjustment). (For details, see Section “5. Service Tables”.) Bias voltage, development and other settings are not affected.
- Fusing temperature adjustment switches on, but no operation can start until the machine reaches the temperature specified for the job.
- The ID sensor pattern is created and the line speed remains the same until the end of the job.
- The intensity of the LD unit is lowered evenly, 30 steps from its specified value.

6.6.5 COOLING AND OVERHEAT PROTECTION



B079D722.WMF

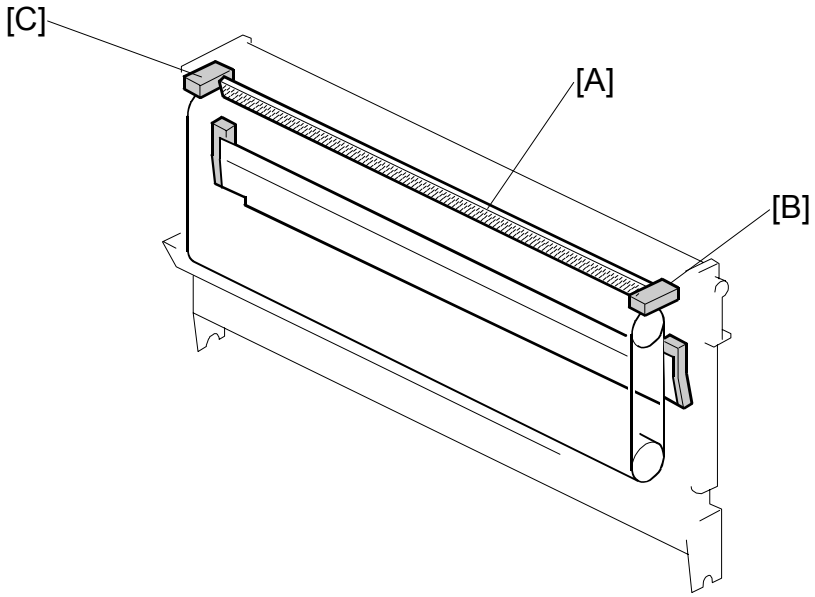
The fusing unit operates at temperatures lower than the previous model in order to accommodate the new toner which has a lower melting temperature. In order to further ensure cooler running temperatures for the fusing unit, two cooling fans have been added.

The side cooling fan [A] and corner cooling fan [B] switch on when the temperature of the fusing unit exceeds 150 °C and switch off when the main motor switches off.

If the hot roller temperature exceeds 230 °C for 5 seconds or more, the CPU cuts off the power to the fusing lamp, and SC543 (Fusing Overheat Error) will be displayed.

Even if the thermistor overheat protection fails, there is a thermostat in series with the common ground line of the fusing lamp. If the temperature of the thermostat reaches 210 °C, the thermostat opens, removing power from the fusing lamp. At the same time, the copier stops operating. At this time, SC542 (Fusing Temperature Warm-up Error) will be displayed.

6.6.6 TONER SCATTER PREVENTION



B079D723.WMF

To reduce the incidence of toner scanner, the sponge strip has been replaced with a velvet strip [A] that extends across the length of the fusing unit,

At each end of the strip [B] and [C] new seals have been added.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration	Desktop	
Copy Process	Dry electrostatic transfer system	
Original	Sheet/Book	
Original Size	Maximum A3/11" x 17"	
Copy Paper Size	Paper tray, Duplex:	A3/11" × 17" - A5 SEF
	By-pass tray:	A3/11" × 17" - A6 SEF
	Non-standard sizes:	Width: 100 - 297 mm (3.9" – 11.7") Length: 148 - 432 mm (5.8" – 17.0")
Copy Paper Weight	Paper Tray/ Duplex:	64 - 105 g/m^2 (20 - 28 lb.)
	By-pass:	52 - 163 g/m^2 (16 – 44 lb.)
Reproduction Ratios	7R5E:	Metric version (%): 400, 200, 141, 122, 115, 93, 82, 75, 71, 65, 50, 25 Inch version (%): 400, 200, 155, 129, 121, 93, 85, 78, 73, 65, 50, 25
	Zoom:	25 ~ 400% in 1% steps
Copying Speed	B079	35 cpm A4, 8 1/2" x 11" LEF, 1-to-1 (ADF)
	B082	45 cpm, A4, 8 1/2" x 11" LEF, 1-to-1 (ADF)
First Copy Time	B079	4.5 s, 1st Tray, A4/8 1/2" x 11" LEF
	B082	3.6 s, 1st Tray, A4/8 1/2" x 11" LEF
Warm-up Time	B079	Less than 18 s
	B082	Less than 20 s
Continuous Copy	1~999 (operation panel entry)	
Paper Capacity	1,050 sheets (500 sheets/tray x 2 with 50 sheets in by-pass tray)	
Paper Output	A4, 8 1/2" x 11" and smaller	500 sheets
	B4 and larger:	250 sheets
Power Source	North America:	120V/60 Hz, More than 12.5 A
	Europe/Asia:	220 – 240 V/50, 60 Hz, More than 6.8 A
Dimensions (W x D x H)	670 mm x 650 mm x 720 mm (26.3" x 25.6" x 28.3")	
Weight	Less than 79 kg (174 lb.)	
Resolution	600 dpi (Scanning and Printing)	
Gradation	256 levels (Scanning and Printing)	
Original Archive	More than 2,500 A4 pages for document server (ITU-T No. 4 Chart)	
Toner Replenishment	Cartridge exchange (550 g)	
Total Counter	Electric counter	

Power Consumption

Mainframe only

	B079	B082
Copying	Less than 1.2 kW	Less than 1.2 kW
Warm-up	Less than 1.25 kW	Less than 1.25 kW
Stand-by	Less than 139 W/h	Less than 170 W/h
Auto Off Mode	Ave. 4.5 W/h (NA) Ave. 5 W/h (EU, Asia)	Ave. 4.5 W/h (NA) Ave. 5 W/h (EU, Asia)
Maximum	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)

Full system (including options)

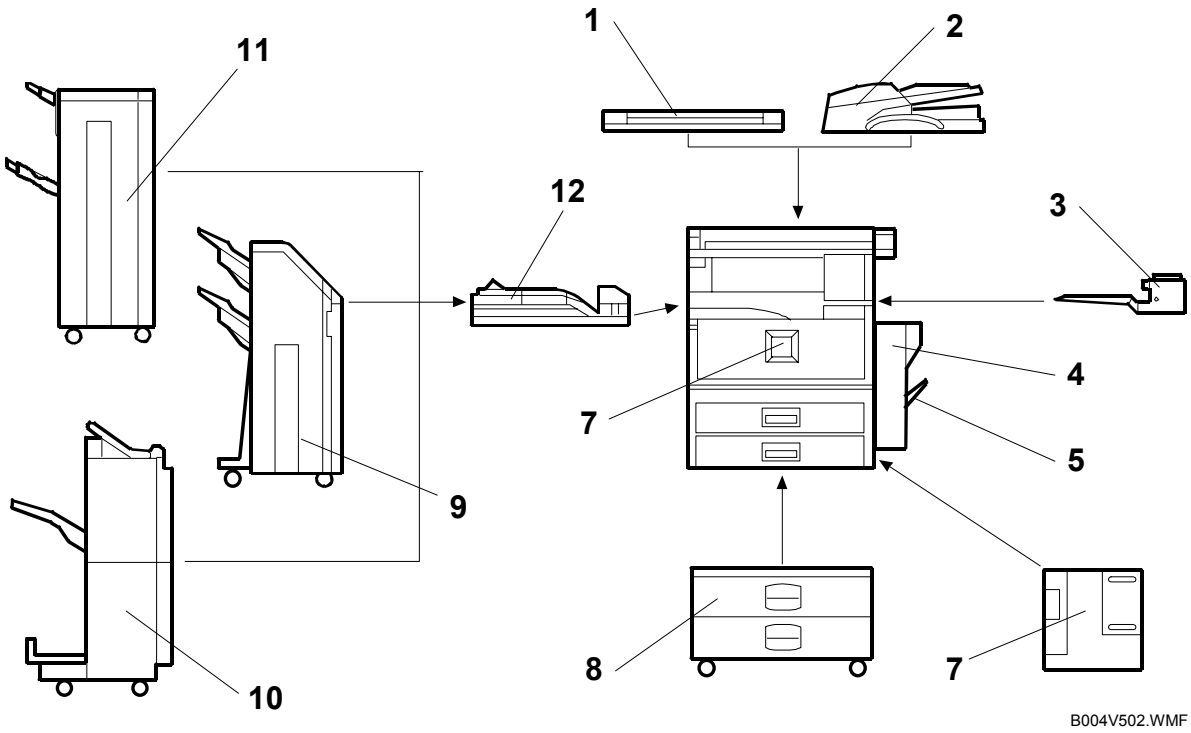
	B079	B082
Copying	Less than 1.4 kW	Less than 1.4 kW
Warm-up	Less than 1.3 kW	Less than 1.3 kW
Stand-by	Less than 170 W/h	Less than 195 W/h
Auto Off Mode	Ave. 8 W/h (NA) Ave. 9 W/h (EU, Asia)	Ave. 8 W/h Ave. 9 W/h (EU, Asia)
Maximum	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)

Noise Emission:

Mode	Model	Mainframe Only	Full System
Copying	B079 B082	69 dB(A) or less 70 dB(A) or less	73 dB(A) or less 74 dB(A) or less
Stand-by	B079 B082	42 dB(A) or less 42 dB(A) or less	

NOTE: The above measurements were made in accordance with ISO 7779.
Full system measurements include the ARDF, Finisher and LCT unit.
In the above stand-by condition, the polygonal mirror motor is not rotating.

2. MACHINE CONFIGURATION



1. Platen cover
2. ARDF
3. One-bin tray
4. Duplex unit
5. By-pass tray
6. LCT (Large Capacity Tray)
7. Copier
8. Paper tray unit
9. Two-tray finisher (2 shift trays)
10. Booklet Finisher
11. 1000 Sheet Finisher (1 shift tray)
12. Bridge Unit

NOTE: The Bridge Unit is required for the optional finishers.

Key: Symbol: **U**: Unique option, **C**: Option also used with other products

	Item	Key	Machine Code
Copier	B079		B079
	B082		B082
	ARDF (See **Note 1**.)	U	B541
	Platen Cover (See **Note 1**.)	C	G329
	Paper Tray Unit	U	B542
	LCT (Large Capacity Tray)	U	B543
	1-Bin Tray	U	B544
	Bridge Unit	U	B538
	1000-sheet Finisher (See **Note 2**.)	C	B408
	Two-tray Finisher (See **Note 2**.)	U	B545
	Booklet Finisher	C	B546
	Punch Unit (See **Note 3**.)	C	B377-17 (2/3-hole) US
	Punch Unit (See **Note 3**.)	C	B377-27 (2/4-hole) Metric
	Punch Unit (See **Note 3**.)	C	B377-31 (4-hole) Northern Europe/
	Key Counter Bracket	C	A674
	User Account Enhance Unit	C	B443
	CSS Kit A886	C	A886
Fax	Fax Option	U	B547
	G3 Interface Unit	U	B591
	JBIG	C	A892
	SAF Memory	C	G578
	Handset (USA model only)	C	A646
Printer/ Scanner	Printer/Scanner Unit	U	B548
	PostScript3 Unit	U	G354-17
	Network Interface Board	C	B525-03
	1394 Interface Unit	C	G336
	USB 2.0 Interface Board	C	B525-01
	IEEE 802.11b Wireless LAN	C	B515
	Bluetooth	C	G354-04
	Memory Unit 128 MB	C	G331

NOTE: 1) The ARDF and platen cover cannot be installed together.
2) The finishers require the paper tray unit and bridge unit.
3) The punch unit requires the two-tray finisher.

3. OPTIONAL EQUIPMENT

ARDF (B541)

Original Size:	Normal Original Mode: A3 to B6, DLT to HLT Duplex Original Mode: A3 to B5, DLT to HLT
Original Weight:	Normal Original Mode: 40 ~ 128 g/m^2 (11 ~ 34 lb.) Duplex Original Mode: 52 ~ 105 g/m^2 (14 ~ 28 lb.)
Table Capacity:	80 sheets (80 g/m^2, 20 lb.)
Original Standard Position:	Rear left corner
Separation:	Feed belt and separation roller
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	30 ~ 200% (Sub scan direction only)
Power Source:	DC 24V, 5V from the copier
Power Consumption:	Less than 60 W
Dimensions (W × D × H):	570 mm x 518 mm x 150 mm (22.4" x 20.4" x 5.9")
Weight:	12 kg

PAPER TRAY UNIT (B542)

Paper Size:	A5 SEF to A3 SEF 5 1/2" x 8 1/2" SEF to 11" x 17" SEF
Paper Weight:	64 g/m^2 ~ 105 g/m^2 (20 lb. ~ 28 lb.)
Tray Capacity:	500 sheets (80 g/m^2, 20 lb.)
Paper Feed System:	FRR
Paper Height Detection:	4 steps (100%, 70%, 30%, Near end)
Power Source:	24 Vdc, 5 Vdc (from the copier) 120 Vac: 115 V version (from the copier) 220 ~ 240 Vac: 224/240 V version (from the copier)
Power Consumption:	50 W
Weight:	Less than 25 kg (55.1 lb.)
Size (W x D x H):	540 mm x 600 mm x 270 mm (21.3" x 23.6" x 10.6")

ONE-BIN TRAY (B544)

Paper Size:	A5 SEF to A3 SEF 5 1/2"x8 1/2" SEF to 11"x17" SEF
Paper Weight:	60 g/m^2 ~ 105 g/m^2 (16 lb. ~ 28 lb.)
Tray Capacity:	125 sheets (80 g/m^2, 20 lb.)
Power Source:	5 Vdc, 24 Vdc (from copier)
Power Consumption:	15 W
Weight:	Less than 4 kg (8.8 lb.)
Size (W x D x H):	470 mm x 565 mm x 140 mm (18.5" x 22.2" x 5.5")

1000 Sheet Finisher (B408)

Upper Tray				
Paper Size	A3 to A6 11" x 17" to 5 1/2" x 8 1/2"			
Paper Weight	60 to 157 g/m2 (16 to 42 lb.)			
Paper Capacity	250 sheets, A4 LEF, 8 1/2" x 11" SEF or smaller, 80 g/m^2 (20 lb.)			
Lower Tray				
Paper Size	Staple Mode Off: A3 to B5, 11" x 17" to 5 1/2" x 8 1/2" Staple Mode On: A3, B4, A4, B5, 11" x 17" to 8 1/2" x 11"			
Paper Weight	Staple Mode Off: 60 to 157 g/m^2 (16 ~ 43 lb.)			
	Staple Mode On: 64 to 90 g/m^2 (17 ~ 24 lb.)			
Stapler Capacity	30 sheets (A3, B4, 11" x 17", 8 1/2" x 14" 50 sheets (A4, B5 LEF, 8 1/2" x 11"			
Paper Capacity	Staple Mode Off: 1,000 sheets, A4, 8 1/2" x 11" or smaller, 80 g/m^2 (20 lb.) 500 sheets, A3, B4, 11" x 17", 8 1/2" x 14", 80 g/m^2 (20 lb.)			
	Staple Mode On: 80 g/m2 (20 lb.) **Number of Sets**			
	Set Size	**2 to 9**	**10 to 50**	
	Size		10 to 30	31 to 50
	A4, 8 1/2"x14" LEF	100	100 to 20	100 to 20
	A4, 8 1/2"x11" SEF	100	50 to 10	50 to 10
	A3, B4, 11"x17", 8 1/2""x14"	50	50 to 10	---
Staple Positions	1 Staple: 2 positions (Front, Rear) 2 Staples: 2 positions (Upper, Left			
Staple Replenishment	Cartridge (5,000 staples/cartridge)			
Power Source	DC 24 V, 5V (from copier)			
Power Consumption	50 W			
Weight	25 kg (55.2 lb.)			
Dimensions	527 x 520 x 790 mm 20.8" x 20.5" x 31.1"			

TWO-TRAY FINISHER (B545)

NOTE: The punch unit is an option for this machine.

Paper Size	Normal/Shift Mode: A3 to A5/DLT to HLT (A6L in no shift mode and no staple mode) Staple Mode: A3 to B5/DLT to LT Punch Mode: 2 Holes: A3 to A5/DLT to HLT 3 Holes: A3 to B5/DLT to LT 4 Holes (Europe/Asia) : A3 to A5/ DLT to HLT 4 Holes (North Europe): A3 to B5/DLT to LT
Paper Weight	Normal/Shift Mode: 52 g/m^2 ~ 163 g/m^2 (14 ~ 43 lb.) Staple Mode: 64 g/m^2 ~ 90 g/m^2 (17 ~ 23 lb.) Punch mode (All types): 52 g/m^2 ~ 163 g/m^2 (14 ~ 43 lb.)
Tray Paper Capacity	Upper Tray: 500 sheets (A4S ~ A5S/LTS, 80 g/m^2, 20 lb.) 250 sheets (A3 ~ A4L/DLT ~ LTL, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.) Lower Tray (Multi-tray Staple Mode): 1500 sheets (A4S/LTS, 80 g/m^2, 20 lb.) 750 sheets (A3 ~ B5/DLT ~ LTL, 80 g/m^2, 20 lb.) 500 sheets (A5S, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.) Lower Tray (Normal Mode): 2000 sheets (A4S/LTS, 80 g/m^2, 20 lb.) 750 sheets (A3 ~ B5/DLT ~ LTL, 80 g/m^2, 20 lb.) 500 sheets (A5S, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.)
Stapler Tray Capacity	No Mixed Original Mode: 50 sheets (A4 ~ B5/LT, 80 g/m^2, 20 lb.) 30 sheets (A3 ~ B4/DLT ~ LG, 80 g/m^2, 20 lb.) Mixed Original Mode: 30 sheets (A4S/A3, B5S/B4, LTS/DLT, 80 g/m^2, 20 lb.)
Staple Position	4 positions 1 staple: 3 positions (Front, Rear, Rear-Slant) 2 staple: 1 position
Staple Replenishment	Cartridge (5,000 staples)
Power Source	24 Vdc (from copier)
Power Consumption	60 W
Weight	Less than 53 kg (116.8 lb.) (without punch unit) Less than 55 kg (121.3 lb.) (with punch unit)
Size (W x D x H)	680 mm x 620 mm x 1030 mm (26.8" x 24.4" x 40.6")

Booklet Finisher (B546)

Paper Size	**Tray**	**Modes**		**Sizes**
	Proof tray			A3 to A5, DLT to HLT
	Shift tray	No staple mode		A3 to A5, DLT to HLT
		Staple Mode	Rear	A4 SEF, LG SEF, LT SEF
			Front/Slant	A3 SEF, A4 LEF/SEF, B4 SEF, B5 LEF, DLT SEF, LG SEF, LT LEF/SEF
			Rear/Slant	A3 SEF, A4 LEF, B4 SEF, B5 LEF, DLT SEF, LT LEF
			2 Staple	A3 SEF, A4, LEF, B4 SEF, B5 LEF, DLT SEF, LT LEF
	Booklet tray	Staple Mode		A3 SEF, A4 SEF, B4 SEF, DLT SEF, LT SEF

Paper Weight	**Tray**	**Weight**
	Stack mode	52 g/m^2 to 163 g/m^2, 14 to 42 lb
	Staple mode	64 g/m^2 to 80 g/m^2, 17 to 21 lb
	Saddle stitch mode	64 g/m^2 to 80 g/m^2, 17 to 21 lb 64 g/m^2 to 128 g/m^2, 17 to 34 lb (Cover sheet only)

Paper Capacity*1	**Tray**	**Modes**	**Paper size**	**Capacity**
	Proof tray		A4 LEF, LT LEF or shorter	150 sheets
			A4 SEF, LT SEF or longer	75 sheets
	Shift tray	No staple	A4 LEF, LT LEF or shorter	1000 sheets
			A4 SEF, LT SEF or longer	500 sheet
		Staple	A4 LEF, LT LEF or shorter	750 sheets, or 30 sets *2
			A4 SEF, LT SEF or longer	500 sheets, or 30 sets *2
	Booklet tray		1-5 sheets	25 sets
			6-10 sheets	15 sets
			11-15 sheets	10 sets

*1 80 g/m^2, 20 lb
*2 Setting DIP SW 3 No. 5 to ON releases the 30 set limit.

Staple Capacity	**Modes**	**Paper size**	**Total capacity**
	Staple	A4 LEF, LT LEF or shorter	50 sheets
		A4 SEF, LT SEF or longer	30 sheets
	Saddle stitch		15 sheets
Staple Position	Staple mode: 4 positions 1 staple: 3 positions (Rear, Front/Slant, Rear/Slant) 2 staples: 1 position Saddle stitch mode: 2 positions, 2 staples (center), fixed position		
Staple Replenishment	Cartridge Staple: 5000 staples Saddle stitch: 2000 staples		
Power Source	24 Vdc (from copier)		
Power Consumption	Less than 170 W		
Dimensions (w x d x h)	689 x 603 x 1055 mm 27.1 x 23.7 x 41.5 in.		
Weight:	49 kg (107.8 lb.)		

*1 80 g/m^2, 20 lb

BRIDGE UNIT (B538)

Paper Size	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight	52 g/m^2 ~ 135 g/m^2, 16 lb. ~ 42 lb.

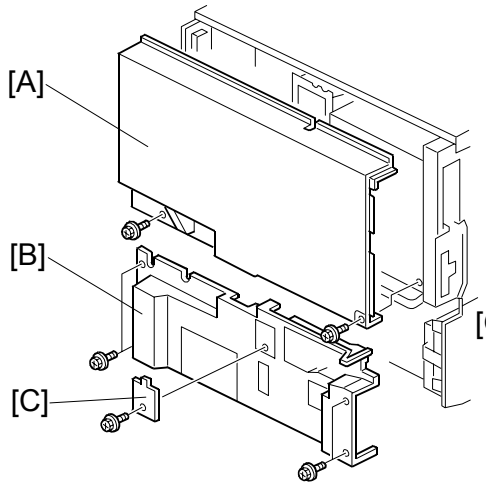
LCT (B543)

Paper Size	A4 (S)/LT (S)
Paper Weight	60 g/m^2 ~ 105 g/m^2, 16 lb. ~ 28 lb.
Tray Capacity	1500 sheets (80 g/m^2, 20lb.)
Remaining Paper Detection	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source	24 Vdc, 5 Vdc (from copier)
Power Consumption	40 W
Weight	Less than 17 kg (37.5 lb.)
Size (W x D x H)	390 mm x 500 mm x 390 mm (15.4" x 19.7" x 15.4")

APPENDIX 1 (FOR MODEL A-C3)

1. RSS (REMOTE SERVICE SYSTEM)

1.1 RSS SET UP



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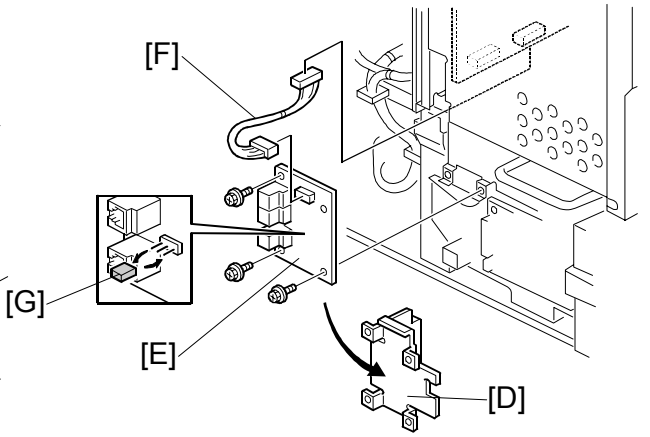

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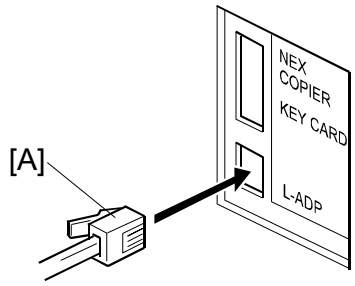
⚠CAUTION
Unplug the machine power cord before starting the following procedure.

NOTE: This manual uses the following symbols.
: Screw

1. Remove the rear upper cover [A] (x 2).
2. Remove the rear lower cover [B] (x 4).
3. Remove the CSS cover [C] (x 1).
4. Remove the bracket [D] (x 4).
5. Install the RSS board [E] (x 3).
6. Install the harness [F] between the RSS board and the Mother board.

When connecting only one machine to the line adapter, skips step 7.

7. Set the jumper switch [G] on the RSS board as shown (default setting is 1-2).



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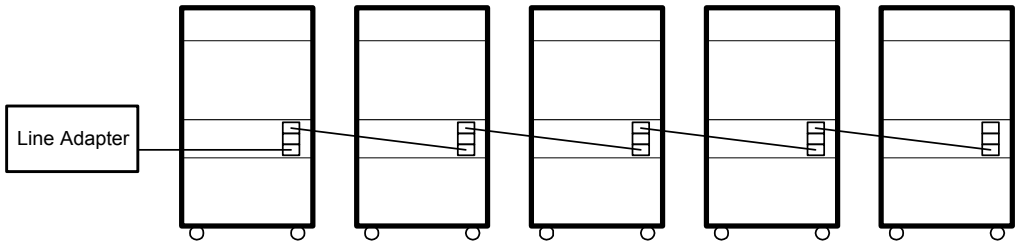

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Machine No.	1	2	3	4	5
Jumper Set	2-3	2-3	2-3	2-3	1-2
PI device code	0	1	2	3	4

8. Reassemble the machine.
9. Connect the modular cord [A] to the line adapter as shown.
10. Install the line adapter (refer to chapter 2-1 L-ADP Installation Procedure in the CSS Service Manual).
11. Turn on the machine.

When connecting only one machine to the line adapter, skips step 12.

12. Enter the Copier SP mode and set the PI device code with SP5-821 (default 0).
    NOTE: After changing the value, turn the main power switch off and on to enable the PI device code.

1.2 SP MODE SETTING

After installing the machine and line adapter, perform SP5-816-1 (CSS Function On/Off).

Check the value of the following SP modes. Ensure they are set correctly.

NOTE: SP5-507 is only for the Japanese version. Do not change.

- SP5-501-1 (PM Alarm Interval): 150k
- SP5-504 (Jam Alarm Setting): 3
- SP5-508-1 (CE Call - Jam Level 1): 1 (On)
- SP5-508-2 (CE Call - Jam Level 2): 1 (On)
- SP5-508-3 (CE Call - Cover Open): 1 (On)

1.3 CHECKING ITEMS USING RSS

1.3.1 READ ONLY ITEMS

Item	
Paper end	
Paper jam information	
Staple end	
Toner end	
Toner near end	
Door open	
Unit connection condition (Fusing and PCU)	
Paper size information	
System configuration	
Vsg, Vsp, Vsdp, Vt data	
Copy counter for user codes	
Fax information (Total No. of Tx, Total No. of Rx etc)	
The related SP modes are;	
SP - ＊	2223 - 001~002, 3103 - 001~003
SP7 - ＊	002 - 001~005, 003 - 003~004, 004 - 002, 206 - 001~002, 833 - 001~005
SP7 - ＊ - 001	001, 003, 101, 204~205, 301, 304~305, 320~328, 401, 402, 502~507, 801, 803
SP7 - 506 - ＊	005~006, 014, 038, 044, 132~133, 134, 141~142, 160, 164, 166, 172, 255
SP8 - ＊ - 001	001~007, 011~017, 021~027, 111, 121, 131, 141, 151, 161, 191~193, 195~196, 205, 211~213, 215~216, 251, 291, 381~384, 386~387, 391, 401~404, 411, 531, 633, 643, 651, 661, 671, 781, 831, 901, 911

1.3.2 AUTO CALL AND READ ITEMS

SC Calls

The SC calls are generated according to the SC level as follows. Please note that the SC level of this copier is defined differently from the other copiers.

SC Level	Definition	SC Auto Call Condition
A	Fuser unit SCs which cannot be reset by customer.	SC call is generated immediately
B	SCs caused by incorrect sensor detection which can be reset by turning main power switch off and on.	SC call is generated when SC occurs two times within 10 copies.
C	SCs that disable only the features which use the defective item.	SC call is generated when SC occurs two times within 10 copies.
D	SCs that are not shown on the operation panel.	SC call is not generated.

CC Calls

There are three types of CC calls as follows:

CC Code	Definition
CC 101	When paper jam is detected five times consecutively without completing any copy job, a CC101 is automatically generated.
CC 201	When a paper jam condition is not reset for 15 minutes, CC201 is automatically generated.
CC 202	When a cover open condition is not reset for 15 minutes, CC202 is automatically generated.

Alarm Calls

There are four types of Alarm Calls as follows:

Type	Definition
PM	When the PM counter reaches 80000, a PM Alarm Call is automatically reported to the Concorde system.
Original Count	Alarm call is generated after the specified total number of originals goes through the ARDF.
SC	When 3 SCs (Any level) occur during 1500 sheets copying, an SC Alarm Call is automatically reported to the Concorde system.
Jam	When paper jamming occurs 10 times during 1000 sheets copying, a Jam Alarm Call is automatically reported to the Concorde system.

1.3.3 READ AND WRITE ITEMS

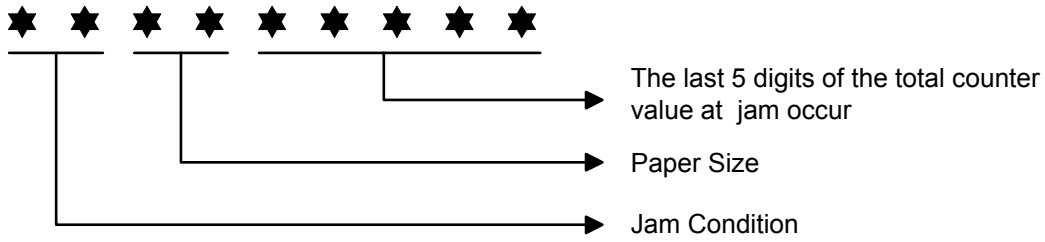
All data for SP modes and UP modes except few modes.

1.3.4 EXECUTE ITEMS

Item
PM Counter Reset
SC/Jam Counter Rest
Counters Reset (all except total counter)
Total ADF Counter
Print Counter – Paper Tray Bypass
Print Counter – Paper Tray 1
Print Counter – Paper Tray 2
Print Counter – Paper Tray 3
Print Counter – Paper Tray 4
Print Counter – Paper Tray LCT

1.4 JAM HISTORY

The jam history is read in this way.



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1.4.1 JAM CONDITION TABLE

Copier

Code	Meaning
01	Jams at power on.
03	Paper does not reach the 1st Paper Feed Sensor
04	Paper does not reach the 2nd Paper Feed Sensor
05	Paper does not reach the 3rd Paper Feed Sensor
06	Paper does not reach the 4th Paper Feed Sensor
07	Paper does not reach the LCT Tray Relay Sensor
08	Paper does not reach the Transport sensor 1
09	Paper does not reach the Transport sensor 2
10	Paper does not reach the Transport sensor 3
13	Paper does not reach the Registration Sensor
14	Paper does not reach the Fusing Exit Sensor
16	Paper does not reach the Exit Entrance Sensor
17	Paper does not reach the Relay Sensor 1 (option)
18	Paper does not reach the Relay Sensor 2 (option)
19	Paper does not reach the Duplex Entrance Sensor
23	Paper does not reach the Duplex Exit Sensor
24	Paper does not reach the 1-Bin Tray Sensor
25	Paper does not reach the Finisher Entrance
26	Paper does not reach the Finisher Proof Tray
27	Paper does not reach the Finisher Shift Tray
28	Paper does not reach the Finisher Staple Tray
29	Paper does not reach the Finisher Tray
30	Paper does not reach the Mailbox Entrance Sensor
31	Paper does not reach the Mailbox Proof Tray Exit Sensor
32	Paper does not reach the Mailbox Relay Sensor
33	Paper does not reach the Mailbox Exit Sensor
35	Paper does not reach the Booklet Finisher **(Japan Only)**
36	
37	
38	
39	
40	
41	
57	Paper caught at the LCT Tray Relay Sensor
58	Paper caught at the Transport sensor 1
59	Paper caught at the Transport sensor 2
60	Paper caught at the Transport sensor 3
61	Paper caught at the Transport sensor 4
63	Paper caught at the Registration Sensor
64	Paper caught at the Fusing Exit Sensor
66	Paper caught at the Exit Entrance Sensor
67	Paper caught at the Relay Sensor 1 (option)
68	Paper caught at the Relay Sensor 2 (option)
69	Paper caught at the Duplex Entrance Sensor
73	Paper caught at the Duplex Exit Sensor
74	Paper caught at the 1-Bin Tray Sensor

Document Feeder

Code	Meaning
03	Original does not reach the Skew Correction Sensor
04	Original does not reach the Interval Sensor
05	Original does not reach the Registration Sensor
06	Original does not reach the Relay Sensor
07	Original does not reach the Inverter Sensor
53	Original caught at the Skew Correction Sensor
54	Original caught at the Interval Sensor
55	Original caught at the Registration Sensor
56	Original caught at the Relay Sensor
57	Original caught at the Inverter Sensor

1.4.2 PAPER SIZE

Code	Paper Size	Code	Paper Size
05	A4 sideways	86	A5 lengthwise
06	A5 sideways	87	A6 lengthwise
07	A6 sideways	8D	B4
0E	B5 sideways	8E	B5 lengthwise
0F	B6 sideways	8F	B6 lengthwise
11	Return post card sideways	91	Return post card lengthwise
12	Post card sideways	92	Post card lengthwise
24	8.5" x 14" sideways	A0	11" x 17"
26	8.5" x 11" sideways	A4	8.5" x 14" lengthwise
2C	8.5" x 5.5" sideways	A6	8.5" x 11" lengthwise
84	A3	AC	8.5" x 5.5" lengthwise
85	A4 lengthwise		

1.5 OTHERS

1.5.1 SC630 [RDS COMMUNICATION ERROR]

Frequent occurrence of SC630 indicates a problem in the customer's communication line or line adapter. To maintain the communications environment in good working order, it is necessary to contact planned inspections periodically.

1.5.2 PM PROCEDURE OR OTHER MAINTENANCE

Before beginning PM or other maintenance procedures, SP5-816-2 should be set to "0". This will disable the RDS function. When maintenance is completed, SP5-816-2 should be set to "1". This will re-enable the RDS function.

NOTE: The RDS function will remain disabled for four hours. Therefore, if maintenance for longer than four hours is required, SP5-816-2 should be set to "0" again to disable RDS.