Model B-C2 (Machine Code: B070) SERVICE MANUAL

\bigtriangleup IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY[Argot1]

- 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 cold 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 controller board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical type. However, the manufacturer recommends replacing the entire NVRAM, not just the battery. Never recharge or incinerate a used NVRAM battery. Dispose of a used NVRAM or NVRAM battery in accordance with local regulations.
- 3. The danger of explosion exists if the battery on the controller board is incorrectly replaced. Replace the battery only with the equivalent type recommended by the manufacturer. Discard the used controller board battery in accordance with the manufacturer's instructions and local regulations.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

- 1. 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.

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

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:



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

Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
	Refer to section number
CIT	See Core Tech Manual for details
Ĩ	Screw
E)-	Connector
C	E-ring
$\langle \overline{0} \rangle$	Clip ring
NA	North America
EUR/A	Europe/Asia





LEF (Long Edge Feed)

SEF (Short Edge Feed)

LEFSEF.WMF

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1. INSTALLATION PROCEDURES

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT

- 1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
- 2. Humidity Range: 15% to 80% RH



- 3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight or strong light)
- 4. Ventilation: Room air should turn over at least 3 times per hour
- 5. Ambient Dust: Less than 0.075 mg/m³
- 6. If the place of installation is air-conditioned or heated, do not place the machine where it will be:
 - 1) Subjected to sudden temperature changes
 - 2) Directly exposed to cool air from an air-conditioner
 - 3) 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 feet) above sea level.

INSTALLATION REQUIREMENTS

- 9. Place the copier on a strong and level base.
- 10. Do not place the machine where it may be subjected to strong vibrations.
- 11. Do not connect the machine to a power source shared with another electrical appliance.
- 12. The machine can generate an electrical field which could interfere with radio or television reception.

1.1.2 MACHINE LEVEL

- 1. Front to back: Within 5 mm (0.2") of level
- 2. Right to left: Within 5 mm (0.2") of level
- **NOTE:** The machine legs may be raised or lowered in order to level the machine. Set a carpenter's level on the exposure glass.

1.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown below. The same amount of clearance is necessary when optional equipment is installed.



Copier + Finisher + LCT + By-pass Tray

Copier + Finisher



NOTE: The controller box door on the back of the machine swings open and can be removed. (*•*1.2.3) Door removal is required only if the machine cannot pass through a narrow door.

1.1.4 DIMENSIONS

Side View



Top View



B070I412.WMF

1.1.5 POWER REQUIREMENTS

- 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.
- 4. Never set anything on the power cord.

Input voltage level:

North America: 208 to 240 V, 60 Hz: More than 20 A Europe/Asia: 220 ~240 V, 50/60 Hz: More than 16 A 10%

Permissible voltage fluctuation: 10

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.

The Main Power LED (O) lights or flashes at the following times:

- While the platen cover or ADF is open
- While the main machine is communicating with the network server
- While the machine is accessing the hard disk or memory when reading or writing data.

There are two power switches on the machine:

• Main Power Switch.

Located on the front left corner of the machine and covered by a plastic cover. This switch should always remain on unless the machine is being serviced.

• Operation Power Switch.

Located on the right side of the operation panel. This is the switch normally used by the customer to power the machine on and off. COPIER (B070/B071)

1.2 COPIER (B070/B071)

1.2.1 ACCESSORIES



B070I001.WMF

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

D	Description		
-	1.	Operation Panel	1
2	2.	Lower Cover - Operation Unit Holder	1
3	3.	Upper Cover - Operation Unit Holder	1
2	1.	Operating Instruction Holder	1
Ę	5.	Right Arm Cover	1
6	5.	Operation Unit Arm	1
7	7.	Leveling Shoes	4
8	3.	Optics Dust Filter	1
ę	9.	Dust Filter	1
-	10.	Operation Panel Unit Arm	1
-	11.	Paper Size Decals	1
-	12.	Metal Cable Clamp	1
-	13.	Tapping Screw - M4 x 12	2
-	14.	Philips Pan Head Screw - M4 x 6	1
-	15.	Tapping Screw - M4 x 8	25
-	16.	Nylon Harness Clamp	1
-	17.	ADF Exit Tray	1
-	18.	Paper Size Decals	1
-	19.	Paper Loading Decals	1
2	20.	Toner Hopper Drive Gear (White)	1
ſ	Mo	del Name Plate (-10, -15, -22 machines) – not shown	1
(Эр	erating Instructions – not shown	1

1.2.2 INSTALLATION



External Tape and Retainers

The installation procedure is not packed with the copier. Always bring this service manual with you.

CAUTION Before performing the following procedures, make sure that the machine is unplugged from the power source.



B070I006.WMF



B070I004.WMF

- 1. Remove all tape from the exterior [A].
- Remove the tape and retainers from the power cord and cables [B].
 NOTE: Keep the shipping retainers after installing the machine. They can be reused if the machine is moved to another location in the future.



- 3. Remove all tape and retainers from under the ADF [A].
- 4. Remove A3 paper [B].
- 5. Set the leveling shoes [C] (x 4) under the feet [D], then level the machine.

Internal Tape and Retainers



- Pull out the 2nd tray and remove the lock plate [C] (²/₈ x 1).
 NOTE: Be sure the re-attach the screw to the same hole. Do not discard the screw.
- Pull out the 3rd tray and remove the lock plate [D] (
 P x 1).
 NOTE: Be sure the re-attach the screw to the same hole. Do not discard the screw.

Installation



- 4. Open the front doors and remove all visible tape and retainers from inside the machine [A].
- 5. Press down lever D2 [B], pull out the fusing unit [C], and remove all tape and retainers from the fusing unit.

COPIER (B070/B071)

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Developer



- 1. Remove the inner cover [A] ($\mathscr{F} \times 3$).
- 2. Rotate the blade release pin [B] clockwise and remove it.
- 3. Remove the transfer belt lock plate [C] ($\mathscr{F} \times 1$).
- 4. Remove the development unit support plate [D].
- 5. Remove the drum plate [E] ($\mathscr{F} \times 1$, knob x 1).


- 6. Separate the upper connector [A] from the frame then disconnect it.
- 7. Separate the lower connector [B] from the frame then disconnect it.
- 8. Disconnect the suction hose [C] and set it on the hook [D] to prevent toner leakage.
- Pull out the development unit [E] (≅ x 2).
 NOTE: To prevent scratching the drum, push the development unit slightly to the right when pulling it out, and do not pull on the knob.
- 10. Place the development unit on a clean sheet of paper to prevent foreign matter from being attracted to the sleeve rollers.



- B0701004.000
- 11. Remove the toner hopper [A] ($\hat{\mathscr{F}} \times 2$).
- 12. Pour in one pack of developer while turning the knob [B]. Distribute the developer evenly along the length of the roller.
- 13. When re-installing the development unit, confirm that:
 - All connectors are re-connected.
 - The suction hose [C] is re-connected to the development unit.
 - The connector cables are re-attached at [D] and [E].

Operation Panel and Display



- 1. Remove the right upper cover [A] ($\hat{\mathscr{F}} \times 4$).
- 2. Pass the harness through the operation unit arm [B], and install the arm (x 2, 3×9).
- Pass the operation unit cable [C] through the support arm and connect it. (E^J x 2).



- Secure the harness clamp [A] on the operation unit (²/_ℓ x 1, M4 x 6 brass pan head).
- 5. Pass the harness [B] through the clamps.
- 6. Install the operation panel [C] on the arm (\mathbb{Z} x 2, \mathcal{F} x 4).
- 7. Set the nylon clamp [D].
- 8. Install the right arm cover [E] ($\hat{\mathscr{F}} \times 3$).
- 9. Install the arm upper cover [F] ($\mathscr{F} \times 2$).

Filters and Original Exit Tray



- 1. Install the upper cover [A] ($\hat{\mathscr{F}} \times 3$)
- 2. Install the lower cover [B] ($\hat{\mathscr{F}} \times 3$).
- 3. Set the dust filter [C].
- 4. Loosen the bottom knob, adjust the view angle of the operation panel, then tighten the knob.
- 5. Loosen the side knob, adjust the tilt of the operation panel, then tighten the knob.

COPIER (B070/B071)





- 6. Set the optics dust filter [A].
- 7. Loosen the two screws of the bracket [B].
- 8. Attach the original exit tray at [C] (\$\$\vec{\vec{P}}\$ x 2, M4 x 12) and [D] (\$\$\vec{\vec{P}}\$ x 1, M 4 x 8) NOTE: To prevent damage to moving parts inside the machine, never use these long screws (M4 x 12) to fasten any exterior cover.
- 9. Re-tighten the screws of the bracket [B] ($\hat{P} \times 1$).
- 10. Re-attach the right upper cover ($\hat{\beta} \times 4$).
- 11. Remove the tape from the operating instructions holder and attach it to one of the front doors.
- 12. At the back of the machine, connect the ADF to the copier body.
- 13. Plug in the power cord, turn the main switch on, then follow the instructions printed on the inside cover of the front door to install the toner bottles.

Initializing Developer Supply

- 1. When the machine is ready, enter SP mode:
 - 1) Press **c**/℗.
 - 2) Enter "107".
 - 3) Hold down Co for more than 3 seconds.
- 2. Press "Copy SP" on the LCD, and perform the TD initial setting:
 - 1) Select SP2801 (TD Sensor Initial Setting)
 - 2) Use the keys displayed on the screen and the numeric keys on the LCD to enter the developer Lot No., then press (#).

NOTE: The Lot No. is embossed on the top edge of the developer packet. 3) Press "Execute" on the LCD.

- **NOTE:** This executes the TD initial setting. After about 1 minute, "Completed" is displayed on the screen, and the execution stops automatically.
- 3. Start to supply toner from the toner bank to the toner hopper:
 - 1) Select SP2207 002 (Toner Bank Toner Setup).
 - 2) Press the "Start key" on the LCD.

This procedure supplies toner to the toner hopper and the toner transport path. It will stop automatically in about 7 minutes. If SP2207 002 fails after SP2801 is completed (an SC code is displayed), repeat only SP2207 002.

- 4. Execute SP2962 (Auto Process Control Execution).
 - **NOTE:** In step 1, if you enter SP mode immediately after switching the machine on, the system will not execute process control automatically. To ensure that process control calibrates its settings, use this SP to execute process control manually.

Replacing the Joint Gear



- 1. Switch the copier off and disconnect it from its power source.
- 2. Remove the development unit.
- 3. At the back of the toner hopper unit, remove red Joint Gear 15Z [A] and replace it with the white gear [B] provided in the accessory bag.
 - **NOTE:** The red gear is designed to supply toner to the toner hopper only (toner is not supplied to the development roller below). The white gear must be installed in order to supply toner to the development roller below for normal operation.

Save the red gear. If the toner hopper is removed at any time and must be refilled with toner again, you must swap the white gear for the red gear, execute SP2207 002, and then remove the red gear and re-install the white gear for normal operation. Ξ_

Completing the Installation

- 1. Set the required paper sizes for all paper trays.
 - Tray 1: Use SP5019 002 (Tray Paper Size Selection 1st Tray)
 - Trays 2 and 3: Use the paper size dial
 - LCT, top two trays, bypass tray, and cover interposer: Position the fences correctly
 - LCT, bottom tray: Use SP5019 007 (Tray Paper Size Selection 6th Tray)
- 2. Attach the appropriate paper size decal to each tray (decals are provided in the accessories bag).
- 3. Attach the face-up decal to the ADF.
- Check copy quality and machine operation.
 NOTE: The first time the ADF is used, dust on the ADF transport belt will transfer to the exposure glass. To remove this dust, perform SP6008-3 (DF Output Check) for 3 minutes, then check the exposure glass for dust and remove it.
- 5. Initialize the electrical total counter with SP7825 (Total Counter Clear).
- 6. Input the supply name with SP5841 (Supply Name Settings) 001 (Toner), 005 Staples), and 006 (Staple Bind (for booklet staples).
- 7. Install the stamp data (SP5853).(•5.10.5)

1.2.3 CONTROLLER BOX DOOR REMOVAL

NOTE: Do this procedure only if the machine is too large to pass through a narrow door or passageway.



B070R166.WMF

- 1. Remove the lock screw [A] ($\hat{\mathscr{F}} \times 1$) and swing the door open.
- 2. Remove the connector plate [B].
- 3. Remove the clamps [C] ($\hat{P} \times 2$).
- 4. Disconnect the upper connectors [D] (\mathbb{Z} x 7).
- 5. Disconnect the lower connectors [E] (\mathbb{E} x 2).
- 6. Remove the upper hinge cover [F] ($\mathscr{F} \times 1$).
- 7. Remove the lower hinge cover [G] ($\hat{\mathscr{F}} \times 1$).
- 8. Lift the door off the hinges and remove it.

1.2.4 TRANSPORTING THE COPIER

To prevent blockages in the toner supply path, always follow the procedure below before transporting the copier. If this procedure is not done, SC592 (Toner Bank Motor Error) or SC495 (Toner Bottle Unit Error) may be displayed, requiring replacement of the toner transport hose and screw.

To prevent damaging the toner supply coil inside the toner hose, never bend the toner hose. If the coil is bent, SC592 will be displayed and the hose must be replaced.

Before Moving the Copier



A294D207.WMF

1. To prevent cleaning blade deformation during transportation, lock the release lever [A] in the up position.



B070I901.WMF

- 2. Use SP5804 097 (Upper Bottle) and SP5804 098 (Lower Bottle) to close the toner caps, then remove the toner bottles from the bank.
- 3. Remove the rear upper and rear lower covers.
- 4. Remove the left upper cover, left lower cover, and right upper cover.
- 5. Remove the two screws [A] securing the toner supply cylinder.
- 6. Cover the end of the toner transport coil tube [B] with a plastic bag.
- Execute SP5804 070 (Output Check Toner Bank Motor) and SP5804 071 (Output Check – Toner Supply Coil Clutch) to actuate the toner bank motor and toner supply coil clutch for 2 minutes and remove all toner in the supply hose.
- 8. Re-install all removed parts except the toner bottles.
- 9. Make sure that three tubes are connected to the toner supply cylinder when putting it back.

After Moving the Copier

- 1. Load the toner bottles in the toner bank.
- 2. Remove the right upper cover.
- 3. Open the cylinder top cover, clean the inner surface of the cylinder with a cloth, then close the cover.
- 4. Execute SP5804 070 (Output Check Toner Bank Motor) to switch on the toner supply motor.
- Execute SP5804 068 (Output Check Upper Toner Bottle Motor) and SP5804 069 (Output Check – Lower Toner Bottle Motor) to switch on the bottle motors for about 5 to 6 seconds.

NOTE: To prevent toner overflow in the toner entrance tank, do not execute these SP commands for longer than 5 to 6 seconds.

- 6. Execute SP5804 071 (Output Check Toner Supply Coil Clutch) to switch on the toner supply coil clutch. 50 to 60 seconds later, toner is supplied to the toner supply cylinder. Make sure that toner is properly supplied to the cylinder.
- 7. Execute SP5804 071 and SP5804 070 to switch off the toner supply coil clutch and toner supply motor.
- 8. Re-install all removed parts.
- 9. Move the drum cleaning blade lever down away from the shipping position.

1.3 A3/DLT TRAY KIT (B331)

1.3.1 ACCESSORIES



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

1.3.2 INSTALLATION



▲ CAUTION Switch the machine off and unplug it from the power source before starting the following procedure.

- 1. Remove the shipping material [A] and metal retainer [B] ($\hat{\mathscr{F}} \times 1$).
- 2. Check the position of the front and back side fences and make sure that they are set for DLT or A3.
- 3. If you need to adjust the positions of the side fences for the paper to be loaded in the tray, remove the front panel [C] ($\hat{\mathscr{F}} \times 4$).



5. Open the front doors.

- 6. Pull out the tandem feed tray [A] completely.
- 7. Push the right tandem tray [B] into the machine.
- 8. Remove the left tandem tray [C] ($\hat{\mathscr{F}} \times 2$ left, $\hat{\mathscr{F}} \times 3$ right).



B3311002.WMF



- 9. From the left tandem tray, remove the front cover [A] ($\hat{\mathscr{F}} \times 2$).
- 10. Remove the safety switch holders [B] ($\hat{\mathscr{F}} \times 2$).
- 11. Pull out the right tandem tray [C] then remove it. ($\hat{\mathscr{F}} \ge 2$).



- 12. Insert the short connector [A] into the socket inside the machine [B]. **NOTE:** Hold the connector as shown in the illustration.
- 13. Using the screws removed in Steps 8 and 11, install the tray [C] on the right rail [D], center rail [E], left rail [F].
 - **NOTE:** You must use the short, silver screws on the left and right rails. If you use one of the longer screws, it will block the movement of the tray on the rails.



- 14. Re-install the safety switch holders [A] ($\hat{\mathscr{F}} \ge 2$) removed from the left tandem tray in Step 10.
- 15. Re-install the front cover [B] (x 2) removed from the left tandem tray in Step 9.
- 16. Use SP5019 002 to select the paper size for Tray 1 (A3 or DLT).
- 17. After selecting the paper size, switch the machine off and on to change the indicator on the operation panel.

1.4 LCT (B511)

1.4.1 ACCESSORIES

LCT (B511)



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

Description

Q'ty 4. Decal – Paper Size 1 6. Tab Paper End Fence 1 7. Philips Screw - M4 x 8..... 1 8. Installation Procedure – English (not shown) 1

NOTE: The tab paper end fence (6) is located in the LCT unit, mounted on hooks behind the front door.

1.4.2 INSTALLATION



CAUTION Unplug the power cord before starting the following procedure.

- 1. Remove the strips of tape on the covers (shown in the top illustration) and the packing material (shown in the bottom illustration).
- 2. Open the LCT door and remove the shipping retainers and strips of tape holding the levers.

LCT (B511)





- 3. Remove the covers [A] from the right upper side.
- 4. Remove the covers [B] from the right lower side.
- 5. Install the pins with the grooved rings [C] on the right upper cover.
- 6. Install the other pins [D] on the right lower cover.



- 7. Pull the connectors and ground wire [A] out of the LCT unit.
- 8. Remove the two screws that secure the ground plate [B].
- 9. Turn the ground plate over, reverse it, then fasten it to the same holes [C] $(\hat{\mathscr{F}} \times 2)$.
- 10. Open the front door and remove the lock screw [D] from the lock lever [E].

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- 11. Move the LCT to the side of the copier and connect the four connectors [A]
- 12. Fasten the ground wire screw [B] ($\hat{\mathscr{F}} \times 1$).
- 13. Align the LCT on the joint pins, and dock the LCT with the right side of the copier.
- 14. Tighten the lock screw to attach the LCT to the copier ([D] in step 10).NOTE: If the lock lever is not seated correctly, pull the spring loaded lock lever forward and release to lock it into the groove.
- 15. Insert the leveling shoes (x 3) under the leveling feet and level the LCT.
- 16. Attach the appropriate decals to the trays.

1.4.3 LCT TRAY HEATER (OPTION)

Installation

Before doing this procedure, turn off the main switch and unplug the copier
power cord.



B511I131.WMF

- 1. Remove the LCT unit from the main copier.
- 2. Remove the LCT right cover ($\hat{\mathscr{F}} \times 6$).
- 3. Attach the two condensation heaters [A] (²/₇ x 2 each)
- 4. Attach the heater cover [B] ($\hat{P} \times 2$)
- 5. Attach the two harness clamps [C].
- 6. Lead the heater harnesses [D] through the harness clamps.
- 7. Push the connectors [E] through the holes.
- 8. Connect the interface harness connectors [F] to the connectors pushed through the holes.

LCT (B511)





- 9. Replace the wire saddle [A] with the new one included in the optional tray heater kit.
- 10. Lead the connecting harness [B] as shown.

To comply with safety standards, make sure that the connecting harness [B] is not touching the interface harness [C].

11. Connect the connector [D] of the interface harness to the mainframe interface.



All anti-condensation heaters are disconnected from the AC drive board before shipping. Before plugging in the AC harness connector, make sure that the main switch of the copier is switched off and that the power cord is unplugged.

- 12. Connect the AC harness connector [A] to the AC drive board [B].
 - **NOTE:** The main switch must be switched off when the heater AC harness connector is connected to the AC drive board, in order for the transfer anti-condensation drum heater to switch on/off with other optional heaters.
- 13. Hang the harness on the clamp under the AC drive board.

1.5 BYPASS TRAY (B512)

1.5.1 ACCESSORIES

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



B512I001.WMF

Description

Q'ty

Bracket	1
Joint Pins	2
Tapping Screws	4
Harness Clamps	4
Cable Harness	1
End Fence	1
Tab Fence	1
Sponge Strip	1
	Bracket Joint Pins Tapping Screws Harness Clamps Cable Harness End Fence Tab Fence Sponge Strip

1.5.2 INSTALLATION

Switch the machine off and unplug the machine before starting the following procedure.



- 1. If the LCT is connected to the machine, disconnect it.
 - CAUTION: To avoid damaging the LCT connectors and ground wire, separate the LCT and copier about 20 cm (8"), and disconnect the connectors (I × 4) and ground wire (x 1) before pulling the LCT away from the machine.
- 2. Remove the tab fence from the left top cover [A].
- 3. Remove all tapes and shipping material from the bypass tray [B].
- 4. Remove the paper slot cover [C] ($\hat{F} \times 2$) and discard the screws.
- 5. Use the edge of a fine tip flathead screwdriver to remove the smaller three covers [D].



- 6. Screw in the guide pins [A] ($\hat{P} \times 2$).
- 7. Attach the bracket [B] provided in the accessories kit ($\hat{\mathscr{F}} \times 1$).
- 8. Grip the bypass tray unit handle [C] and place your hand under the corner [D] diagonal to the handle, lift the unit and set it on top of the LCT.
- 9. Align the embossed arrows on the top left cover [E] of the bypass tray with the arrows on the LCT top.
- 10. Fasten the bypass tray to the right bracket [F] ($\hat{\not}$ x 1).



- 11. Remove the handle [A] ($\hat{\beta}^{a} \times 2$). Save these screws.
- 12. Remove the bypass tray top left cover [B] ($\hat{\not}^2 \times 4$).
- 13. Use the screws removed above to attach the handle to the front frame [C].
- 14. Fasten the bypass tray rear frame [D] to the LCT ($\hat{\not}$ x 1).
- 15. Fasten the bypass tray front frame [E] to the LCT ($\hat{\mathscr{F}} \times 1$).
- 16. Re-attach the top left cover [B] ($\mathscr{F} \times 4$).
- 17. Remove the rear cover [F] ($\hat{F} \times 6$).



- 18. Attach the 4 clamps [A] to the holes in the frame.
- 19. Connect the cable harness connectors [B] to the bypass tray at the top (x = 0) x 4).
- 20. Connect the cable harness to the bypass tray main board [C] (I X 3). Working from bottom to top, match the shape of the connector to the slot, and connect to:
 - CN531
 - CN532
 - CN530

NOTE: Insert the connectors gently. If at first you cannot insert the connector, reverse it and try again.

- 21. Fasten the cable harness [D] to the frame with the 4 clamps attached above.
- 22. Open the 3 harness clamps [E] (2 above and 1 to the left) of the control board then secure the harness cable

CAUTION: Make sure that the cable harness is securely clamped at the 7 clamps. If the cable harness is loose, this could interfere with the moving parts inside the LCT.

23. Re-attach the rear cover.



- 24. Remove the tape from the sponge strip and attach the strip [A] to the top left cover of the bypass tray. Position the strip in the center above the three roller housings [B].
 - **NOTE:** The sponge strip prevents paper or other objects from accidentally falling between the output tray and the left cover.
- 25. Attach the end fence (follow the instructions on the decal attached to the top of the bypass tray).
- **NOTE:** Open the LCT front door and hang tab sheet fence on the hooks [C] on top of the LCT tab fence. When feeding tab sheets from the bypass tray, follow the decal instructions on the tab fence to install it.

1.6 3000-SHEET FINISHERS (B468/B469)

1.6.1 ACCESSORIES

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

Description

Q'ty

1.	Rear joint bracket	1
2.	Front joint bracket	1
3.	Upper output tray	1
4.	Lower output tray	1
5.	Tapping screws - M3 x 6	2
6.	Tapping screws - M4 x 8	2
7.	Tapping screws - M4 x 14	4
8.	Cushion (with double-sided tape)	1
9.	Ground (earth) plate	1
10.	Installation Instructions	1

1.6.2 INSTALLATION

This section describes the common installation instructions for two peripheral devices for three machines:

- **B468 Booklet Finisher**, capable of punching, shifting, stapling, and saddlestitching with staples. *This booklet finisher can be used with the B064/B065 or the B070 (90 cpm). It cannot be used with the B071 (105 cpm).*
- **B469 Finisher**, capable of punching, shifting, and stapling but with no saddlestitching unit. *The B469 Finisher can be used with the B064/B065. It cannot be used with the B070 or B071.*

NOTE: Differences in the installation procedure are noted as "B468" or "B469".

Removing Tapes and Retainers

B468 (B064/B065/B070)



B468I001.WMF

B469 (B064/B065)



B469I001.WMF



- 1. Unpack the machine and remove all the wrapping.
- 2. Remove all filament tape and shipping retainers from the front of the finisher.
- 3. Open the front door [A] and remove all the tape and shipping retainers from inside the finisher.
B468/B469 Installation

CAUTION Switch the machine off and unplug the machine before starting the following procedure.



- 1. Install the front [A] and rear [B] joint brackets ($\hat{\mathscr{F}} \times 2$ each, M4 x 14).
- 2. Install the ground plate [C] ($\mathscr{F} \times 2$, M3 x 6).



B468I004.WMF

- Attach the cushion [A] to the right side of the upper cover.
 NOTE: If you are installing the cover interposer tray, do not attach the cushion here. Attach it to the cover interposer tray. The cover interposer tray must be installed before you dock the finisher and tray to the main machine. For details, see the Cover Interposer Tray B470 installation instructions.
- 4. Remove the screw [B] to release the lock lever [C] ($\hat{\mathbb{F}} \times 1$).
- 5. Slowly and carefully, to avoid bending the entrance guide plates of the finisher, push the finisher against the side of the machine until the brackets enter the slots.
- 6. Using the screw [B] removed above, secure the lock lever [C] ($\hat{\not} x 1$).
- 7. Connect the plug [D] of the finisher power cord to the connector on the machine.

Always move the finisher slowly to avoid bending the entrance guide plates. Bent guide plates could interfere with paper transport from the finisher to the machine.



B468 (B064/B065/B070)

- Install the lower output tray [A] (Â x 2). Note that only the lower output tray has a movable support tray [B].
- 2. Install the upper output tray [C] ($\hat{\mathscr{F}} \times 2$).
- 3. Attach the staple position decal [D] to the ADF.

B469 (B064/B065)

- 1. Install the output tray [E] ($\hat{\beta} \times 2$).
- 2. Attach the staple position decal [F].

Selecting the Staple Supply Name

Enter the SP mode and execute the following information.

5841*	Supply Name Setting		These names appear when the user prints the Inquiry List (B070: Press the Counter key, then press 'Print Inquiry List', B064/B065: Press the Inquiry button in the initial User Tools screen).
	005*	Staple Std	Enter the name of the staples in use for normal stapling (not booklet stapling). This setting should be done for both the B468 and B469.
	006*	Staple Bind	Enter the name of the staples in use for booklet stapling (saddle-stitching). This setting is required only for the B468 for booklet finishing.

Enabling Booklet Binding

To enable booklet binding, you must select the center stapling position.

- 1. Press the User Tools key.
- 2. Touch "Copier/Document Server Features".
- 3. Touch the "Input/Output" tab.
- 4. Touch any "Stapling Position" button and touch the center (saddle-stitch) stapling symbol.
- 5. Exit the User Tools mode. Specify the number of copies, touch the center stapling symbol on the operation panel, then start the print job.

This SP adjustment is available but not required at installation. Use this SP to fine adjust the fold/staple position of they are not aligned correctly.

SP6902	Staple Position in Center Folding	Use this SP to fine adjust the fold and staple positions if they are not aligned correctly. See "5. Service Tables".
SP6120	Staple Jogger Adjustment	Allows fine adjustment of the staple unit jogger fences for different paper sizes, if required. For details, see "4. Service Tables".

1.7 3000 SHEET FINISHER (B478)

1.7.1 ACCESSORIES

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.	Entrance Guide Plate	1
4.	Shift Tray	1
5.	Grounding Plate	1
6.	Table Extension	1
7.	Cushion	1
8.	Tapping Screws - M4 x 8	2
9.	Tapping Screws - M3 x 6	4
10.	Tapping Screws - M3 x 8	4
11.	Phillips Screws w/washer - M4 x 14	4
12.	Leveling Shoes	4
13.	Installation Procedure	1

3000 SHEET FINISHER (B478)

1.7.2 INSTALLATION





B478I003.WMF





B478I019.WMF

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

- 1. Unpack the finisher and remove all tapes and shipping retainers.
- Open the front door and remove the shipping retainers. Remove brackets [A], [B], and [C] (²/₈ x 2 each).
- 4. Remove the connector cover [F].



B478I107.WMF

- Install the grounding plate [A] (x 2) (M3 x 6).
 NOTE: Set the grounding plate so that there is no gap between the grounding plate and the bottom frame of the finisher (as shown).
- Install the table extension [B] as shown (x 2) (M4 x 8).
 NOTE: The edge of the table extension should be aligned with the edge of the finisher (as shown).
- Attach the cushion [C] to the right side of the upper cover.
 NOTE: If you are installing the cover interposer tray, do not attach the cushion here. Attach it to the cover interposer tray. The cover interposer tray must be installed before you dock the finisher and tray with the main machine. For details, see the Cover Interposer Tray B470 installation instructions.
- 8. Install the entrance guide plate [D] ($\hat{\mathscr{F}} \times 2$) (M3 x 6).



- 9. Attach the shift tray [A] ($\hat{\mathscr{F}} \times 4$) (M3 x 8).
- 10. Open the front door of the finisher, and remove the screw from the polycking lever, then pull out the locking lever [B].
- 11. Align the finisher on the joint brackets, and lock it in place by pushing in the locking lever [B].

NOTE: Before securing the locking lever, make sure that the top edges of the finisher and the copier are parallel from front to rear as shown [C].

- 12. Set the leveling shoes [D] (x4) under the feet [E], then level the machine.
- 13. Secure the locking lever [B] ($\hat{\beta}^2 \times 1$) and close the front door.
- 14. Connect the finisher cable [F] to the copier.

1.8 PUNCH UNIT (B377)

1.8.1 ACCESSORIES

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 - M3 x 8	1
9.	Tapping screw - M3 x 10	2

1.8.2 INSTALLATION PROCEDURE



▲ CAUTION Switch off the main machine and unplug its power cord.

- 1. If the finisher is connected to the machine, disconnect it.
- 2. Unpack the punch unit and remove all tapes and shipping retainers.
- 3. Open the front door and remove the rear cover [A] ($\hat{\not}$ x 4).
- 4. Remove the bracket [B] ($\mathscr{F} \times 2$) and paper guide [C] ($\mathscr{F} \times 1$).
- 5. Remove the plastic knockout [D].
- 6. Install the sensor bracket arm [E] (Â² x 1).
 NOTE: Make sure that the sensor arm swings freely on the step screw.
- 7. Install the spring [F].



B377I106.WMF

- 8. Remove the shipping bracket [A] ($\hat{\mathscr{F}} \times 2$).
- 9. Position the 2 mm spacer [B] and secure the punch unit ($\mathscr{F} \times 2$).
- 10. Secure the punch unit at the front with the shoulder screw ($\mathscr{F} \times 1$ [C]).
- 11. Connect the harnesses [D] and clamp them as shown.
- 12. Slide the hopper [E] into the machine.
- 13. Fasten the two 1 mm spacers [F] to the rear frame. These may be used during future adjustments.NOTE: The spacers are used to adjust the horizontal positioning of the holes.
- 14. Reassemble the finisher and check the punch operation.

1.9 PUNCH UNIT (B531/A812)

1.9.1 ACCESSORIES

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



Description

Q'ty

1.	Punch unit	1
2.	Harness Connector Cable - PCB	1
3.	Harness Connector Cable - HP Sensor 2	1
4.	Harness Connector Cable - HP Sensor 1, Hopper Full	1
5.	Sensor Arm and Sensor	1
6.	Spacer (2 mm)	1
7.	Spacer (1 mm)	2
8.	Spring	1
9.	Step Screw (large) (M4 x 11)	1
10.	Tapping Screw (M4 x 10)	2
11.	Step Screw (small) (M3 x 4)	1
12.	Machine Screw, Washer (M4 x 6)	1
13.	Knob	1
14.	Punch Waste Hopper	1

1.9.2 INSTALLATION



Switch the machine off and unplug the machine before starting the following procedure.

- 1. If the finisher is connected to the machine, disconnect it.
- 2. Open the front door and remove the rear cover ($\hat{\mathscr{F}} \times 2$).
- 3. Unpack the punch unit and remove the motor protector plate [A] (𝔅 x 4) and the cam lock plate [B] (𝔅 x 1).
- 4. Remove the inner cover [C] ($\hat{\beta}^2 \times 3$).
- 5. Behind the inner cover at [D] and [E], press the lock tab to the right to release the inner cover from the frame.
- 6. Remove the plastic knockouts [F].



- 7. Remove the paper guide [A] ($\hat{\mathscr{F}} \times 4$).
- 8. Install the sensor arm [B] ($\hat{\beta}$ x 1, small step screw (M3 x 4). **NOTE:** Make sure that the sensor arm swings freely on the step screw.
- 9. Attach the spring [C].



- 10. At the front, secure the punch unit [A] with the large step screw ($\hat{\mathscr{F}} \times 1$, M4 x 10).
- 11. At the rear, position the 2 mm spacer [B] and attach the punch unit [C] ($\hat{\mathscr{F}}$ x 2, M4 x 10).
 - **NOTE:** At the hole just above the lock lever, use one of the screws from the paper guide removed above to fasten the remaining two spacers to the frame. These extra spacers are used to adjust the horizontal position of the punch holes.
- 12. At the front, fasten the punch unit knob [D] ($\hat{\mathscr{F}} \times 1$).

PUNCH UNIT (B531/A812)



- 13. Connect the PCB harness connector [A] to CN129 of the finisher PCB and to CN600 of the punch unit PCB.
- 14. Connect the HP Sensor 2 harness connector [B] to CN130 of the finisher PCB and to HP Sensor 2.
- 15. Connect the single end of the hopper full sensor connector cable [C] to the hopper full sensor on the arm (^[] x 1, clamp x 1), then connect the other two connectors to HP Sensor 1 [D] and CN620 [E] of the punch PCB.
 - **NOTE:** No special DIP switch settings are required for this punch unit. The punch unit sends an identification signal to the machine, so it knows what type of punch unit has been installed.
- 16. Slide the hopper [F] into the finisher.
- 17. Re-attach the inner cover and rear cover.
- 18. Close the front door and re-connect the finisher to the machine.

1.10 JOGGER UNIT (B513)

1.10.1 ACCESSORIES

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

Description

Q'ty

JOGGER UNIT (B513)

1.10.2 INSTALLATION



- 1. Turn the main machine switch off and disconnect the finisher from the main frame.
- 2. Use the flat head of a screw driver to remove the left upper cover [A] from the finisher and discard it.
- 3. Remove the cover plate [B] from the jogger unit ($\hat{\mathscr{F}} \times 2$). Save the screws.
- 4. With the jogger unit connector on the left side, hook the frame of the jogger unit [C] into the holes on the left and right side of the finisher frame.
- 5. On the left side, fasten the connector [D] to the socket (x = 1).
- 6. On the left and right side, attach the jogger unit frame to the side of the finisher with the screws [E] provided (^A x 2).
- 7. Re-attach the jogger unit cover to its frame with the screws removed in step 2 ($\hat{\mathscr{F}} \times 2$).

1.11 COVER INTERPOSER TRAY (B470)

1.11.1 ACCESSORIES

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



B470I006.WMF

Description

Q'ty

1.	Front door extension (top)	1
2.	Rear cover extension (bottom)	1
3.	Shoulder screws	3
4.	Tapping screws – M4 x 8	7
5.	Tapping screws – M3 x 8	2
6.	Tapping screws – M3 x 6	5
7.	Ground Plate	1
8.	Plate extension (bottom)	1
9.	Right rear cover plate (for B478 only)	2
10	. Right front corner plate (for B478 only)	2
11	. Spacer (B468/B469 only)	1
12	. Front door extension (bottom)	1

1.11.2 INSTALLATION

This procedure describes installation of the Cover Interposer Tray B470 on the Booklet Finisher B468, 3000 Sheet Finisher 469, and 3000 Sheet Finisher B478.

- The B468/B469 require installation of only the front spacer.
- The B478 requires installation of corner plates.

Removing Tapes and Retainers



- 1. If the finisher is connected to the machine, disconnect it.
- 2. Remove all tape and retainers from the cover interposer tray [A].
- 3. Remove the tape and cardboard [B] from the ground connector.
- 4. Remove the cover [C] of the relay connector.
- Loosen the screw of the bracket [D] (³/_ℓ x 1) then remove the bracket.
 NOTE: If you are installing the cover interposer tray with a previously installed finisher B468/B469/B478, remove the sponge strip [E] from the finisher and save it for re-attachment to the interposer tray.
- 6. Remove the guide plate [F].

Attaching the Extensions



Make sure that the finisher is disconnected from the main machine and that the copier is switched off and unplugged before starting the following procedure.

- 1. Attach the three shoulder screws [A] ($\hat{\mathscr{F}} \times 3$).
- 2. Remove the ground plate [B] from the finisher and save the screws
- 3. Attach the bottom plate [C] ($\hat{\beta}^2 \times 2$, M3 x 6) then re-attach the ground plate to the bottom plate ($\hat{\beta}^2 \times 2$) with the screws removed in Step 2.
- 4. Attach the bottom front cover extension [D] ($\hat{P} \times 2$, M4 x 8).
- 5. Attach the top front cover extension [E] ($\hat{\mathscr{F}} \times 2$, M4 x 8).
- 6. Attach the rear cover extension [F] ($\mathscr{F} \times 2$, M3 x 6).



B470I004.WMF

- If you are installing cover interposer tray on the B468/B469 finisher, insert the spacer [A] and snap it into position.
 NOTE: If you are installing the cover interposer tray on the B478, do not install this spacer. This spacer is for the B468/B469 installation only.
- 2. Pick up the cover interposer tray, align the keyholes [B] with the shoulder screws [C], then slide the cover interposer down onto the screws.
- 3. Secure the cover interposer with the screw [D] ($\hat{\mathscr{F}} \times 1$, M3 x 6).
- **NOTE:** 1) If you are installing the cover interposer tray on the B468, skip the next section and go directly to "Docking the Finisher with the Machine" on page 1-74.
 - 2) If you are installing the cover interposer tray on the B478, go to the next section, install the corner plates on the B478, then go to "Docking the Finisher with the Machine" on page 1-74.

Attaching the Corner Plates for the B478

CAUTION: The corner plates are installed on the B478 only. Attach the cover interposer tray to the finisher before attaching the corner plates.

Right Rear Corner Plate (B478 only)



- Temporarily attach the screws [A] (with about two turns) to the right end of the finisher extension table [B] (\$ x 2, tapping M4 x 8)
 NOTE: The holes are not visible because they are covered with tape. Just punch the screws through the holes.
- 2. Align the cutouts [C] of the right rear corner plate [D] with the screws and attach the plate.

NOTE: If there is a gap [E] between the plate and the tray extension attached to the side of the finisher, loosen the two screws below the table extension (not shown), align the table extension with the corner of the finisher and plate, then re-tighten the tray extension screws.

3. With a long screw driver inserted through the cutouts in the right rear corner plate [D], tighten the screws to fasten the right rear corner plate to the table extension [B].

Right Front Corner Plate (B478 only)



- Temporarily attach the screw [A] (M4 x 8) with about two turns to fasten to the panel at the right front corner.
 NOTE: The hole is not visible because it is covered with tape. Just punch the screw through the hole.
- 2. With the clamp [B] under the edge of the corner, align the cutout [C] in the right front corner plate with the screw, then snap it into position.
- 3. With a long screwdriver inserted into the plate cutout [C], tighten the screw to fasten the right front corner plate.

Docking the Finisher with the Machine



B4701005.WMF

- Attach the sponge strip [A] provided with the finisher.
 NOTE: If you are installing the cover interposer tray with a previously installed finisher, remove the strip from the finisher and attach it to the cover interposer tray.
- Attach the guide plate [B] (removed from the finisher) to the cover interposer (x 2).

NOTE: Be sure to use the two small tapping screws provided, not the machine screws removed from the finisher with the guide plate.

- 3. Release the lock lever [C] ($\hat{\mathscr{F}} \times 1$).
- 4. Lower the transport guide plate [D].
- 5. Slowly push the finisher against the side of the machine until the brackets [E] enter the slots.

Dock the finisher carefully to avoid bending the entrance guide plates. Bent guide plates could interfere with paper transport from the machine to the finisher.

- 6. Secure the lock lever [C] ($\hat{\beta}^{*} \times 1$).
- 7. Raise the transport guide plate [D] to close it.
- 8. Plug the connector [E] into the copier.
- Switch on the machine and execute SP5158 001 ~ 008 to select the default paper sizes for the cover interposer unit. For details, see the service manual "5. Service Tables".

1.12 INSTALLATION OF MFP CONTROLLER OPTIONS

1.12.1 OVERVIEW

To facilitate the installation of MFP options, 6 slots for boards and 3 slots for SD cards are provided on the side of the controller box. Each board or SC card must be inserted into its assigned slot. The slot assignment of each item is listed in the table below, and a decal with the same information is attached to the controller box cover.

Slot	Decal Name	Description
A1	External CTL	I/F board for an external controller such as EFI
A2	Tandem	Copier Connection Kit B328
B1	File Format Converter	MLB (Media Link Board) B609
B2	Parallel (1284)	IEEE 1284 Centronics Parallel Interface B580
В3	1394/802.11b/USB2.0	IEEE 1394 (FireWire) B581 IEEE 802.11b (Wireless LAN) B582 USB 2.0 B596
		Note : Only one of the cards can be inserted at a time.
B4	Ethernet	NIC Kit B580 (100Base TX/10BaseT) NIC Board B594 (100Base TX/10BaseT)
C1	Printer/Scanner	SD card for Printer/Scanner Kit B580
C2	Option PDL	SD card for PS3 B613
C3	Service	SD card for Machine Firmware update by the customer engineer.

MFP Option Slot Assignment

The large slots [A] are for boards (cards) and the small slots [B] are for the SD cards. Slot C3 [C] is on the other side of the controller box.



B580I101.WMF

1.12.2 PRINTER/SCANNER KIT (B580)

Accessories

Description

Q'ty

1.	NIC Board	1
2.	IEEE 1284 Centronics	1
3.	Caution Decal	1
4.	Printer/Scanner SD Card	1
5.	Printer Keytops (English/Symbol)	2
6.	Scanner Keytops (English/Symbol)	2
7.	Ferrite Core (RFC-10)	1
8.	EULA Sheet	1
9.	FCC Decal	1

NOTE: The optional 256 MB Memory Kit B585 is required for this installation and must be purchased separately. The memory kit is not provided with the Printer/Scanner Kit B580.

Installation



R5801102 W/MF

Installation

Before you begin this procedure, switch the machine off and disconnect the power plug from the power source.

- 1. Remove the controller box cover ($\hat{P} \times 9$).
- Hold the 256 MB memory DIMM [A] with the slot [B] in the edge connector on the left, then insert the DIMM into the slot [C] above the other memory DIMM.
 NOTE: To remove the memory DIMM, spread the spring-loaded clips on either end of the DIMM.
- 3. Re-attach the controller box cover.



- 4. Remove the cover [A] of Slot B4 ($\hat{\mathscr{F}}$ x 2).
- 5. Insert the NIC board [B] into Slot B4 and fasten it with the screws.
- 6. Remove the cover [C] of Slot B2 ($\hat{\beta}^2 \times 2$).
- 7. Insert the Centronics board [D] into Slot B2 and fasten it with the screws.
- 8. Hold the SD Card [E] with its label facing the as shown above, then insert it into Slot C1.

NOTE: Pushing in the SD Card releases it for removal. Make sure the SD Card is inserted and locked in place. If it is partially out of the slot, push it in gently until it locks in place.

Installation



- 9. Wind the cable [A] one full turn around the ferrite core [B], then clamp the core to lock it.
- 10. Connect the cable [C] to the NIC board.



- 11. On the operation panel, remove the slot covers [A] and discard them.
- 12. Install the "Printer" keytop [B] then the "Scanner" keytop [C]. Select either the English set or Symbol set for installation. The correct order is:
 - Printer (upper)
 - Scanner (lower)
- 13. Attach the decal [D] to the main machine.
- 14. Follow the instructions in the Operation Instructions to complete the installation for the printer/scanner option.

Q'ty

1.12.3 PS3 (B613)

Accessories

Description

- 1. PostScript3 Emulation SD Card 1

Installation



B580I110.WMF

- 1. Switch the machine off.
- Insert the PS3 SD Card into Slot C2 [A].
 NOTE: Pushing in the SD Card releases it for removal. Make sure the SD Card is inserted and locked in place. If it is partially out of the slot, push it in gently until it locks in place.
- 3. Switch the machine on.

Q'ty

1.12.4 USB 2.0 (B596)

Accessories

Description

1. USB 2.0 Board 1

Installation

Only one PCI slot (B3) is available for one of these options:

- USB 2.0
- IEEE 801.11b (Wireless LAN)
- IEEE 1394 (FireWire)

If another card is installed in B3, you must remove it before installing USB 2.0 B596.



- 1. Switch the machine off.
- 2. Remove the cover [A] of Slot B3 (\hat{P} x 2).
- 3. Insert the USB 2.0 board [B] into Slot B3 and fasten it with the screws.
- 4. Print a configuration page to confirm that the machine recognizes the installed board for USB2.0:

User Tools > Printer Features > List Test Print > Configuration Page

1.12.5 IEEE 1394 KIT (B581)

Accessories

Description

- Q'ty

Installation

Only one PCI slot (B3) is available for one of these options:

- USB 2.0
- IEEE 801.11b (Wireless LAN)
- IEEE 1394 (FireWire)

If another card is installed in B3, you must remove it before installing IEEE 1394 B581.



- 1. Switch the machine off.
- 2. Remove the cover [A] of Slot B3 ($\hat{\mathscr{F}} \times 2$)
- 3. Insert the IEEE 1394 board [B] into Slot B3 and fasten it with the screws.
- 4. Switch the machine on and print a configuration page to confirm that the machine recognizes the installed board for IEEE 1394 (FireWire): User Tools> Printer Features> List Test Print> Configuration Page

1.12.6 IEEE 802.11B (B582)

Accessories

Description

Q'ty

 1. IEEE 801.11b Board
 1

 2. PCI Card
 1

 3. Antennas
 2

 4. Velcro pads
 2

Installation

Only one PCI slot (B3) is available for one of these options:

- USB 2.0
- IEEE 801.11b (Wireless LAN)
- IEEE 1394 (FireWire)

If another card is installed in B3, you must remove it before installing IEEE 802.11b B582.



- 1. Switch the machine off.
- 2. Remove the cover [A] of Slot B3 ($\hat{\mathscr{F}} \times 2$).
- 3. Detach the plastic protector [B] from the PCI card.
- 4. Insert the PCI card [C] into the wireless LAN board.
- 5. Insert the wireless LAN board [D] into Slot B3 and fasten it with the screws.



- 6. Remove the tape from the back of the Velcro patch, attach the patch to the right corner [A] of the controller box, then attach the antenna [B] to the patch.
- 7. Remove the tape from the back of the Velcro patch, attach the patch to the left corner [C] of the controller box, then attach the antenna [D] to the patch.
- 8. Pass the connectors through the cover [E].
- 9. Connect each antenna to a terminal [F] and attach the cover.
 - **NOTE:** 1) Attach the antennas as described above. However, if you change the location of either antenna, please remember that the antennas should be separated by at least 40~60 mm (1.5~2.5").
 - 2) Set up the antennas in an area that is free of interference from electrical equipment that generates a strong electromagnetic field.
 - 3) Always detach the antennas from the corners of the machine and disconnect them before moving the machine.
 - 4) If reception is poor, move the machine and antennas closer to the access point.
- 10. Switch the machine on and print a configuration page to confirm that the machine recognizes the installed board for IEEE 802.11b (Wireless LAN):User Tools> Printer Features> List Test Print> Configuration Page
1.12.7 COPIER CONNECTION KIT (B328)

Accessories

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



1.	Interface Cable 1394	3
2.	Repeater Hub 1394	2
	Connection PCB	2
	Power Repeater Cable	2
3.	"Other Function" Keytops (NA, EU 1 ea.)	2
4.	"Printer/Other Function" Keytops (NA, EU 1 ea.)	2
5.	SDRAM DIMM 64 MB	2

Preparation

Before you begin the installation procedure, you must first:

- Determine the distance between the machines to be connected.
- Determine whether the printer/scanner option is installed on the machines.

Measure the distance between the machines, then decide how many cables and repeater hubs are required.

DISTANCE	POWER REPEATER HUBS	INTERFACE CABLES
Up to 4.5 m (14.8 ft.)	None	1
4.5 ~ 9.0 m (14.8 ~ 29.5 ft)	1	2
9.0 ~ 13.5 m (29.5 ~ 112.5 ft.	2	3

Two sets of keytops (2 per set, 1 for NA, 1 for EU) are provided for each machine, but you need to install only one keytop on each machine.

- Install the key labeled "Printer/Other Function" (or its equivalent symbol keytop for EU) on a machine with the printer/scanner option installed
- Install the key labeled "Other Function" (or its equivalent symbol keytop for EU) on a machine without the printer/scanner option.

Installation Procedure

CAUTION Switch the machine off and unplug the machine before starting the following procedure.



- 1. Switch the main power switch off.
- 2. Remove the controller box cover. ($\hat{\beta}^2 x7$)
- 3. Remove the cover [A] from slot A2.
- Align the PCB with the bottom groove, and push the connection PCB [B] into the slot.
 NOTE: Make sure that the edge of the PCB is in the groove before you push the card into the machine.
- 5. Fasten the PCB with the attached screws [C].



- 6. Connect the power repeater cable [A] to the mother board at CN149.
- 7. Connect the other end of the power repeater cable the connection PCB [B].
- 8. Insert the 64 MB SDRAM DIMM [C] into the slot on the mother board.
 - Set the edge connector at a 45 degree angle with the slot on the edge connector [D] aligned with the post below.
 - Press down slightly then push the DIMM toward the mother board until it snaps into place.
 - Make sure that the notches on both sides of the DIMM [E] [F] engage the pawls of the spring loaded arms so the DIMM is perpendicular.
- 9. Re-attach the controller box cover.
- 10. Repeat Steps 1 to 9 to install the connection PCB and 64 MB DIMM on the slave machine.



- 11. Insert one end of the interface cable [A] to the connection PCB inserted in slot A2.
- 12. If additional interface cables are required, connect the cables [B] with the repeater hubs [C].
- 13. On the operation panel of the both machines, remove the second cover (or Printer key) from the bottom [D].
- 14. Install an appropriate key for each machine:

Attach the "Printer/Other Function" key [E] (or its equivalent symbol keytop for EU) if the printer/scanner option is installed in the machine.

-or-

Attach the "Other Function" key [E] (or its equivalent symbol keytop for EU) if the printer/scanner is not installed in the machine.

15. Attach the other end of the connection cable to the connection PCB installed in the other machine.

1.12.8 EFI (G353)



- 1. Switch the machine off.
- 2. Remove the cover [A] of Slot A1 ($\hat{\mathscr{F}} \times 2$).
- 3. Insert the EFI Board G353 [B] into Slot A1 and fasten it with the screws.



1.12.9 MLB (B609)

Accessories

Description

- Q'ty
- 1. MLB Board
 1

 2. Instructions
 1

Installation



- 1. Switch the machine off.
- 2. Remove the cover [A] of Slot B1 ($\hat{\mathscr{F}} \times 2$).
- 3. Insert the MLB board [B] into Slot B1 and fasten it with the screws.
- 4. Switch the machine on.

1.13 KEY CARD COUNTER

1.13.1 ACCESSORIES

Description

1.	Key Counter Cover	1
2.	Key Counter Plates	2
3.	Key Counter Bracket	1
4.	Machine screw M3 x 6	1
5.	Shoulder Screw M3 x 4	1
6.	Tapping Screws M4 x 8	3
7.	Machine Screws M3 x 20	2
8.	External Screw M3 x 20	1
9.	Machine Screw (Flathead) M4 x 16	1
10.	Extension Cable (for LCT Installation)	1
11.	Extension Cable Clamps (for LCT Installation)	6

1.13.2 INSTALLATION

Assembling the Key Counter



- 1. While holding the key counter plates [A] inside the key counter bracket [B], insert the key counter holder [C]
- 2. Fasten the key counter holder [C] through the bracket plate to the counter plates [A] (²/₆ x 2).
- 3. Fasten the cover [D] to the key counter bracket [B] ($\hat{\mathscr{F}} \times 2$).

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Attaching the Key Counter to the Copier

Attach the key counter to the copier if the LCT is not installed.



- 1. On the right side of the copier, remove the small cover [A].
- 2. Remove the jumper connector [B].
- 3. Fasten the shoulder screw [C] to the side of the machine.
- 4. Connect the key count assembly [D].
- 5. Fit the keyhole of the key counter bracket [E] over the head of the shoulder screw, then slide it back.
- 6. Fasten the key counter assembly [F] to the copier ($\hat{\mathscr{F}} \times 1$).
- 7. Do the User Tool and SP mode settings described at the end of this section.

Attaching the Key Counter to the LCT



- 1. On the LCT right cover, remove the cover [A] ($\hat{\not}^2 \times 2$).
- 2. Remove the LCT right cover [B] ($\hat{\mathscr{F}} \times 6$).
- 3. Remove the LCT rear cover [C] ($\hat{\mathscr{F}} \times 3$).
- 4. On the right side of the LCT, attach 2 clamps [D].
- 5. Attach the extension cable [E] to the 2 clamps.

KEY CARD COUNTER



- 6. On the rear side of the LCT, attach 2 clamps [A].
- 7. Route the cable [B] as shown.
- 8. On the left side of the LCT, attach 2 clamps [C].
- 9. Route the cable [D] as shown.
- 10. If the cable from the right cover is too long, loop it [E] to make it shorter.



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- 11. Re-attach the right LCT cover.
- 12. Fasten the shoulder screw [A] to the side of the LCT.
- 13. Connect the key count assembly [B].
- 14. Fit the keyhole of the key counter bracket [C] over the head of the shoulder screw, then slide it back.
- 15. Fasten the key counter assembly [D] to the LCT ($\hat{\mathscr{F}} \times 1$).
- 16. On the right side of the copier, remove the small cover [E].
- 17. Remove the jumper connector [F].

KEY CARD COUNTER



- 18. Connect the extension cable [A] from the LCT to the copier.
- 19. Dock the LCT to the copier.

User Tool and SP Mode Settings

- Instruct the key operator to enable the key counter with the User Tools setting: User Tools> System Settings> Key Counter Management> then click the ON button for the items you want to enable for the counter (Copier, Document Server, Printer, Scanner).
- Enter the SP mode and set SP5113 (Optional Counter Type) to 002 (Key Card (Countdown Type)) or 005 (MF Key Card).
 NOTE: If the counter is a countdown type, you must select 002.
- 3. Enter the SP mode and set SP5121 to "0" (Paper Feed Count) or "1" (Paper Exit Count) to determine whether the counter counts at paper feed-in or a paper exit.

2. PREVENTIVE MAINTENANCE

2.1 PM PARTS

The amounts mentioned (K=1,000) as the PM interval indicate the number of prints or copies unless stated otherwise. These numbers are based on the PM counter.

Symbol Key for PM Tables

- I: Inspect. Clean, replace, or lubricate as needed.
- **C:** Cleaning required.
- **R:** Replacement required.
- L: Lubrication required.

Turn off the main power switch and unplug the machine before performing any procedure in this section. Laser beams can seriously damage the eyes.

2.1.1 MAIN MACHINE

Main Unit PM Parts

	350K	700K	1000K	Expected	Note				
OPTICS									
Exposure Glass	I	I	R		Dry cloth.				
1st~3rd Mirrors	l	I	I		Optical cloth.				
APS Sensor	I	I	I		Dry cloth.				
Scanner Rail	l	I			Dry cloth				
Scanner Filter		С			Blower brush.				
Toner Shield Glass	С	С	С		Optical cloth.				

	350K	400K	700K	800K	1050K	Expected	Note
DEVELOPMENT							
Side Seals (x2)	С		С		С		Blower brush,
Development Unit	I		I		I	9300K	dry cloth
Development Roller	С		С		С		Dry cloth. * ¹
Development Doctor Blade	С		С		С		Insert the paper dust cleaner behind the blade to rub away the paper dust. * ¹
Entrance Seal	С		С		С		Blower brush or
Toner Hopper (Outside)	Ι				I		dry cloth
Gears (All)			I		I		Blower brush
Toner Filter (Center)		R		R		820K	
Toner Filter (front)		R		R		820K	
Developer	R		R		R		SP2801 (TD Sensor Initial Setting). Before execution, be sure to enter the Lot No. for the new developer.
Waste Toner Collection bottle							
Suction Toner Collection Bottle	At 2500K replacement is required. * ²						
Development Suction Motor Assy	At 2500	K replac	ement is	required	. * ²		

*1: Cleaning required when developer is replaced.
*2: K count assumes copying and printing on A4 LEF.

NOTE: If toner sticks to the development roller, the bias voltage will increase in that area. This may in turn cause dirty background on copies. Therefore, the development rollers should be cleaned whenever the developer is replaced.

laintenance

	350K	500K	700K	1000K	1050K	Note
AROUND THE DRUM	•		•		•	
Side Seals	I		I		I	Blower brush, dry cloth
Ground Plate Screw	I		I		I	Conductivity check. Alcohol or water
Drum Filter	С		С		С	Blower brush
Cleaning Unit	I		I		I	Blower brush, dry cloth
Cleaning Brush Seal	I		I		I	
Cleaning Entrance Seal	С		С		С	
ID Sensor	С		С		С	
Transfer Unit Entrance Stay	С		С		С	Ě
Corona Wire Casing	С		С		С	Dry cloth
Drum Potential Sensor	С		С		С	Blower brush
Quenching Lamp	С		С		С	Blower brush, dry cloth
Cleaning Brush	R		R		R	
Toner Filter Assy	R		R		R	(Note 2)
Transfer Belt Cleaning Blade	С	R	С	R		Dry Cloth (Note 3)
Cleaning Blade	R		R		R	(Note 1)
Grid Plate	R		R		R	(Note 4)
Charge Corona Wire	R		R		R	
Wire Cleaner	R		R		R	
Wire Cushion	R		R		R	
Pick-Off Pawls	R		R		R	(Note 5)
Transfer Belt		R		R		(Note 3)
Transfer Belt Cleaning Bias Roller	С	С	С	С		Alcohol
Transfer Belt Bias Brush		С		С		Blower brush
Rear Casing Guide		С		С		Dry cloth
Exit Bias Plate		С		С		Blower brush when transfer belt is replaced.
Belt Drive Roller		С		С		Alcohol, when transfer belt
Belt Roller		С		С		is replaced.
Cleaning Bias Roller ø6		С		С		Alcohol, when transfer belt is replaced. Apply conductive grease to electrical contacts.
Carrier Catcher						

NOTE:1) Improper cleaning can cause vertical white or black lines.

- 2) Failure to change the filter could cause complete clogging in the flow of the toner.
- 3) Failure to replace the cleaning blade could cause toner to cling to the transfer belt, dirty back sides of copies, poor paper separation, or pawl marks on paper.
- 4) Failure to replace this item could cause the machine to return SC300, SC301, SC303, or SC304 due to a corona housing leak.
- 5) Failure to replace worn pawls could cause them to wear and sharpen, thus increasing the chance of scouring the drum surface.

	350K	500K	600K	Expected	Note					
FUSING UNIT	FUSING UNIT									
Pressure Roller,					Inspect only (Note 1)					
Cleaning Roller	I									
Eusing Lamps (x3)	1				Inspect only					
Pressure Roller					Dry cloth (water or alcohol can					
Cleaning Roller	С				also be used if necessary)					
Fusing Entrance	C				Water or alcohol					
Guide Plate	<u> </u>									
Oil Supply &			D		After replacement, reset					
Assembly (Note 8)			K (US)		Control Web Consumption)					
			(03)		to 0.					
Hot Roller			R	750K						
Hot Roller Strippers	С		R		Dry cloth					
	Note 6		Note 2							
Pressure Roller	I				Dry cloth					
Strippers					Moton clockel					
Fusing Exit Roller	I				When replacing lubricate with					
Pressure Roller		R		600K	Barrierta 55L or S552R.					
Web Cleaning Roller			R	700K	(Note 3)					
Hot Roller Ball					Inspect only					
Bearings			Note 4							
Pressure Roller Ball		Noto 5								
Hot Roller Bushings		NOLE J			When replacing bot roller					
The Roller Dushings					lubricate with Barrierta 55L or					
			NOTE 4		S552R.					
Pressure Roller		I	I		Inspect only					
Bushings		Note 5	1							
Hot Roller Gears	L				Lubricate (Barrierta 55L or SS552R)					
Fusing Exit Guide					Dry cloth wrapped around a					
Plates (Upper,	I				metal scale					
Lower)										
Cooling Entrance	I									
Fusing Web Brake					Dry cloth (Note 7)					
Pad			R	700K						

NOTE: 1) Clean when servicing pressure roller or cleaning roller.

2) Replace when hot roller is replaced.

3) Replace with when oil supply & cleaning web is replaced, or after cleaning web end.

4) Inspect when hot roller is replaced.

5) Inspect when pressure roller is replaced.

6) Clean when replacing cleaning web.

7) Use dry cloth to clean oil from stopper when replacing cleaning web.
8) Europe: Near-end = 350K, US: Near-end = 600K

	350K	700K	1000K	Expected	Note				
PAPER FEED									
Grip Rollers	С	С	С		Damp cloth				
Relays Rollers	С	С	С						
Paper Feed Guide Plate	I	I	I						
Upper and Lower Registration Rollers	С	С	С						
Registration Sensor	С	С	С		Blower brush				
Relay Sensor	С	С	С		Remove paper dust.				
Paper Dust Remover	С	С	С						
Paper Feed Sensor	С	С	С		Blower brush				
Paper Feed Rollers			R						
Pick-Up Rollers			R		Replace together.				
Separation Rollers			R						

	350K	700K	1050K	Expected	Note
DUPLEX UNIT					
Transport Rollers	С	С	С		Damp cloth
Feed Rollers	С	С	С		
Reverse Transport Roller	С	С	С		
Reverse Feed Roller	С	С	С		
Inverter Feed Rollers	С	С	С		
Inverter Transport Rollers	С	С	С		
Entrance Sensor	С	С	С		Blower brush
Anti-Static Brush	I	I	I		
Duplex Inverter Sensor	С	С	С		Blower brush, inspect feeler movement.
Duplex Transport Sensor	С	С	С		Blower brush
Horizontal Transport Feed Roller (Resin Roller)	С	С	С		Damp cloth
	•	•	•	•	

GW CONTROLLER				
Controller Filter	С	С	С	Blower brush

NOTE: Paper dust on the duplex transport sensors and the duplex inverter sensor can cause paper jams. Therefore, these sensors should be cleaned with a blower brush at every PM visit.

2.1.2 ADF

	80K	160K	240K	Note					
The PM interval is for the number of sheets that have been fed.									
Transport belt	R	R	R						
Feed belt	R	R	R						
Separation roller	R	R	R						
Pick-up roller	R	R	R						
Sensors	I	I	I						
Drive gears	I	Ι							

2.1.3 3000 SHEET BOOKLET FINISHER B468

	EM	300K	450K	600K	Note
Driver Rollers		С	С	С	Dry cloth
Idle Rollers		С	С	С	
Discharge Brush		С	С	С	
Bushings	L				Lubricate with silicone oil if noisy.
Sensors		С	С	С	Blower brush.
Jogger Fences			I	I	Make sure screws are tight.

2.1.4 COVER INTERPOSER TRAY B470

	EM	60K	120K	180K	Note				
The PM interval is for the number of sheets that have been fed.									
Feed Belt		R	R	R	Replace as a set.				
Pick-up Roller		R	R	R					
Separation Roller		R	R	R					
Driver Rollers		С	С	С	Damp clean cloth.				
Idle Rollers		С	С	С					
Discharge Brush		С	С	С					
Bushings	L				Lubricate with silicone oil if noisy.				
Sensors		С	С	С	Blower brush.				

2.1.5 3000-SHEET FINISHER B478

	350K	700K	1050K	Note
Driver rollers	I	I		Alcohol
Idle rollers	I	I		
Discharge brush	I	Ι		
Bushings	I	I		Lubricate with silicone oil if noisy.
Sensors	I	Ι		Blow brush.
Jogger fences	I	Ι		Make sure screws are tight.
Staple waste hopper	С	С	С	Empty staple waste.

2.1.6 LCT B511, BYPASS TRAY B512

	1000K	2000K	3000K	Expected	Note
Paper feed roller	R	R	R		
Pick-up roller	R	R	R		
Separation roller	R	R	R		
Transport guide plate	Increated alogn at every 250K				
Grip roller	Inspect at clean at every 350K.				

2.1.7 PUNCH UNIT B377, B531, A812

	EM	300K	450K	600K	Note
Punch Waste Hopper		-	-	-	Remove and empty as required.

Preventive Maintenance

Main Lubrication

Types of Grease

а	Grease 501	d	Heat Resisting Grease MT-78
b	Grease Barrierta – JFE 5 5/2	е	Launa Oil 40
С	Grease – KS660 – SHIN-ETSU		

Toner Bank

No.	Lubrication Point	Type of Grease	Note/Remarks
3	Shaft holes of driving case	а	Only when the toner bank is disassembled for servicing.
4	Drive gears for toner chuck	а	
5	Vibrating plate link bracket	d	Only when the toner bank is disassembled for servicing.



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Transfer

No.	Lubrication Point	Type of Grease
5	Spring plate surface of the transfer unit	d
6	Both edges of the transport driven roller. Shaft of the drive roller.	С
7	Upper part of the bias roller terminal	С



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PCU

No.	Lubrication Point	Type of Grease
9	Shaft of the Cleaning Blade Bracket	е



ainter

Fusing

No.	Lubrication Point	Type of Grease
10	Outer, inner surface of bushings, gears	b
11	Inner surface of pressure roller where contacts the ball bearing	b
12	Web drive gears	b
13	Fusing unit drive gears	b
14	Between shaft, web bracket	b



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PM PARTS

Duplex

No.	Lubrication Point	Type of Grease
14	Shaft of Entrance Guide	а
15	Shaft of Duplex Junction Gate	а
16	Jogger Guide Rod & Inverter Exit Guide Screw	d
17	Lock Arm and Release Bracket	



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Paper Feed

No.	Lubrication Point	Type of Grease
17	Registration roller bushings	d
18	Paper feed drive gears	а
19	Paper feed/transport drive gears	а





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Adjustment

3. REPLACEMENT AND ADJUSTMENT

3.1 GENERAL CAUTIONS

Do not turn off either of the power switches while any of the electrical components are active. Doing so might cause damage to units such as the transfer belt, drum, and development unit when they are pulled out of or put back into the copier.

3.1.1 DRUM

An organic photoconductor (OPC) drum is more sensitive to light and ammonia gas than a selenium drum. Follow the cautions below when handling an OPC drum.

- 1. Never expose the drum to direct sunlight.
- 2. Never expose the drum to direct light of more than 1,000 Lux for more than a minute.
- 3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
- 4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
- 5. Store the drum in a cool, dry place away from heat.
- 6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
- 7. Never expose the drum to corrosive gases such as ammonia gas.
- 8. Always keep the drum in the protective sheet when keeping the drum unit, or the drum itself, out of the copier. Doing so avoids exposing it to bright light or direct sunlight, and will protect it from light fatigue.
- 9. Dispose of used drums in accordance with local regulations.
- 10. When installing a new drum, execute SP2962 (Auto Process Control Execution).

3.1.2 DRUM UNIT

- 1. Before pulling out the drum unit, place a sheet of paper under the drum unit to catch any spilt toner.
- 2. Make sure that the drum unit is set in position and the drum stay is secured with a screw before the main switch is turned on. If the drum unit is loose, poor contact of the drum connectors may cause electrical noise, resulting in unexpected malfunctions (RAM data change is the worst case).
- 3. To prevent drum scratches, remove the development unit before removing the drum unit.

3.1.3 TRANSFER BELT UNIT

- 1. Never touch the transfer belt surface with bare hands.
- 2. Take care not to scratch the transfer belt, as the surface is easily damaged.
- 3. Before installing the new transfer belt, clean all the rollers and the inner part of the transfer belt with a dry cloth to prevent the belt from slipping.

3.1.4 SCANNER UNIT

- 1. When installing the exposure glass, make sure that the white paint is at the rear left corner.
- 2. Clean the exposure glass with alcohol or glass cleaner to reduce the amount of static electricity on the glass surface.
- 3. Use a cotton pad or optical cloth to clean the mirrors and lens.
- 4. Do not bend or crease the exposure lamp flat cable.
- 5. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
- 6. Do not turn any of the CCD positioning screws. Doing so will throw the CCD out of position.

3.1.5 LASER UNIT

- 1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so would throw the LD unit out of adjustment.
- 2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
- 3. The polygon mirror and F-theta lenses are very sensitive to dust. Do not open the optical housing unit.
- 4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.
- 5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

3.1.6 CHARGE CORONA

- 1. Clean the corona wires with a dry cloth. Do not use sandpaper or solvent.
- 2. Clean the charge corona casing with water first to remove NOx based compounds. Then clean it with alcohol if any toner still remains on the casing.
- 3. Clean the end block with a blower brush first to remove toner and paper dust. Then clean with alcohol if any toner still remains.
- 4. Do not touch the corona wires with bare hands. Oil stains from fingers may cause uneven image density on copies.
- 5. Make sure that the wires are correctly between the cleaner pads and that there is no foreign material (iron filings, etc.) on the casing.
- 6. When installing new corona wires, do not bend or scratch the wire surface. Doing so may cause uneven charge. Also be sure that the corona wires are correctly positioned in the end blocks.
- 7. Clean the grid plate with a blower brush (not with a dry cloth).
- 8. Do not touch the charge grid plate with bare hands. Also, do not bend the charge grid plate or make any dent in it. Doing so may cause uneven charge.

3.1.7 DEVELOPMENT

- 1. Be careful not to nick or scratch the development roller.
- 2. Place the development unit on a sheet of paper after removing it from the copier.
- 3. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller.
- 4. Clean the drive gears after removing used developer.
- 5. Dispose of used developer in accordance with local regulations.
- 6. Never load types of developer and toner into the development unit other than specified for this model. Doing so will cause poor copy quality and toner scattering.
- 7. Immediately after installing new developer, the TD sensor initial setting procedure should be performed with SP2801 (TD Sensor Initialization) to avoid damage to the copier. Do not perform the TD sensor initial setting with used developer. Do not make any copies before doing the TD sensor initial setting.
- 8. When using a vacuum cleaner to clean the development unit casing, always ground the casing with your fingers to avoid damaging the toner density sensor with static electricity.
- 9. When replacing the TD sensor, replace the developer, then execute SP2801 (TD Sensor Initialization) and SP2962 (Auto Process Control Execution).

Replacemen Adjustment

3.1.8 CLEANING

- 1. When servicing the cleaning section, be careful not to damage the edge of the cleaning blade.
- 2. Do not touch the cleaning blade with bare hands.
- 3. Before disassembling the cleaning section, place a sheet of paper under it to catch any toner falling from it.

3.1.9 FUSING UNIT

- 1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it is movable.
- 2. Be careful not to damage the edges of the hot roller strippers or their tension springs.
- 3. Do not touch the fusing lamp and rollers with bare hands.
- 4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

3.1.10 PAPER FEED

- 1. Do not touch the surface of the pick-up, feed, and separation rollers.
- 2. To avoid paper misfeeds, the side fences and end fence of the paper tray must be positioned correctly to align with the actual paper size.

3.1.11 USED TONER

- 1. We recommend checking the amount of used toner at every EM.
- 2. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

3.2 SPECIAL TOOLS AND LUBRICANTS

3.2.1 SPECIAL TOOLS

Part No.	Description
A0069104	Scanner Positioning Pin (4 pcs./set)
A2929500	Test Chart – S5S (10 pcs./set)
A0299387	Digital Multimeter – FLUKE 87
B6455010	SD (Secure Digital) Card – 64 MB
G0219350	Loop Back Connector

3.2.2 LUBRICANTS

Part No.	Description
A2579300	Grease Barrierta – JFE 5 5/2
52039502	Silicon Grease G-501



Turn off the main power switch and unplug the machine before attempting any procedure in this section.

3.3 DOORS AND COVERS

3.3.1 FRONT DOORS



B070R945.WMF

- 1. Open the left door [A].
- 2. Bracket [B] (🖗 x 1).
- 3. Lift up the left door and remove it.
- 4. Open the right door [C].
- 5. Bracket [D] (²/_ℓx 1).
- 6. Lift up the right door and remove it.

3.3.2 RIGHT COVERS



B070R946.WMF

- 1. Right upper cover [A] ($\beta x 4$).
- 2. Right lower cover [B] ($\hat{\mathscr{F}} \times 4$).

3.3.3 LEFT COVERS



- 1. Disconnect the optional finisher, if it is installed.
- 2. Remove the front and rear joint brackets [A] (* x 2 each), if the optional finisher was installed.
- 3. Left upper cover [B] ($\hat{\mathscr{F}} \times 4$)
- 4. Left lower cover [C] ($\mathscr{F} \times 4$).

3.3.4 REAR COVERS AND CONTROLLER BOX DOOR



Replacemen Adjustment

B070R911.WMF

Rear Covers

- 1. Disconnect the ADF connector [A].
- 2. Rear upper cover [B] (²/₈ x 4).
- 3. Rear lower cover [C] ($\hat{\mathscr{F}} \times 4$).

Opening the Controller Box

- 1. Remove the screws on the left [D] ($\hat{\not}$ x 3).
- 2. Swing open the controller box.
 - **NOTE:** To close the controller box door, fasten the top screw first to ensure that the holes for the other two screws are aligned correctly with the holes of the machine frame, then fasten the other two screws.
3.4 DOCUMENT FEEDER

3.4.1 ADF COVERS



- 1. Front cover [A] (²/_ℓ x 2).
- 2. Rear cover [B] (🕅 x 2).
- 3. Left cover [C] (ℰ x 2, ≅ x 2).
- 4. Original exit tray. (•3.5.5)
- 6. Upper exit cover [E] (🖗 x 1).

3.4.2 ADF ORIGINAL TRAY





B070R856.WMF

Original Tray

- 1. Remove the front and rear covers.
- 2. Original tray [A] (🖗 x 4).

Original Table Cover

- 1. Remove the ADF front and rear covers. (#3.4.1)
- 2. Remove the original tray [A].
- 3. Original table cover [B] ($\hat{\beta}$ x 2).

Bottom Plate

- 1. Remove the ADF front and rear covers. (•3.4.1)
- 2. Remove the original tray [A].
- 3. Bottom plate [C] (⑦ x 1, 🗊 x 1).

3.4.3 FEED UNIT AND SEPARATION ROLLER



B070R857.WMF

- 1. Open the left cover.
- 2. Clip [A].
- 3. Remove the feed unit [B]. Pull the feed unit to the front, release the shaft at the rear, and release the front bushing.
- 4. Separation roller cover [C].
- 5. Torque limiter [D] and separation roller [E] (O x 1).

3.4.4 FEED BELT



- 1. Feed unit. (•3.4.3)
- 2. Pick-up roller unit [A].
- 3. Feed belt holder [B]. **NOTE:** The springs [C] come off the feed belt cover easily.
- 4. Feed belt [D].

NOTE: When reinstalling the pick-up roller unit, make sure that levers [E] and [F] on the front and rear original guides are resting on the pick-up roller unit cover.

3.4.5 PICK-UP ROLLER



- 1. Open the left cover.
- 2. Feed unit (•3.4.3)
- 3. Snap rings [A] (🕅 x 2).
- 4. Two bushings [B].
- 5. Pick-up roller [C].NOTE: When reinstalling the pick-up roller, make sure that the one-way clutch [D] is not on the gear side.

3.4.6 ADF SENSORS

Entrance Sensor and Length Sensor



Replacement Adjustment

B070R861.WMF

- 1. Left cover.
- 2. Guide plate [A] (²/_ℓ x 5).
- 3. Entrance sensor [B] (⊑^{IJ} x 1).
- 4. Length sensor bracket [C] ($\hat{\mathscr{F}}$ x 2).
- 5. Length sensor [D] (⊑^{IJ} x 1).

Registration Sensor



B070R950.WMF



- 1. ADF front cover. (-3.4.1)
- 2. ADF left cover. (•3.4.1)
- 3. Release entrance guide [A] ($\hat{\mathscr{F}} \times 2$).
- 4. Release transport belt unit [B] ($\hat{\mathscr{F}} \times 3$).
- 5. Sensor bracket [C] (3 x 1).
- 6. Registration sensor [D] (x 1, x 1).

Width Sensors



Replacement Adjustment

- 1. ADF front cover. (•3.4.1)
- 2. Feed unit. (•3.4.3)
- 3. Stopper screw [A].
- 4. Guide plate [B] (²/_ℓ x 2).
- 5. Release the front end of the upper transport roller [C] (bushing x 1, \mathbb{C} x 1).
- 6. Sensor bracket [D] (x 1).
- 7. Width sensors [E] (⊑^{IJ} x 1 each).

DOCUMENT FEEDER

Exit Sensor, Inverter Sensor



B070R954.WMF

- 1. Front and rear covers. (•3.4.1)
- 2. Original paper tray. (•3.5.5)
- 3. Exit guide unit [A] (ℱ x 5, ℡ x 1).
- 4. Exit sensor [B] (≅ x 1).
 NOTE: When reinstalling the exit guide unit, make sure that the guide plate [C] on the exit unit is over the exit gate [D].
- 5. Right cover [E]. (•3.4.1)
- 6. Guide plate [F] (🖗 x 3).
- 7. Inverter sensor [G] (1 x 1).

3.4.7 TRANSPORT BELT



B070R958.WMF

- 1. Front cover. (•3.4.1)
- 2. Release entrance guide [A] ($\hat{P} \times 2$).
- 3. Release transport belt unit [B] (x 3).
- 4. Fold the transport belt assembly extension [C].
- Transport belt [D] and replace it.
 NOTE: When installing the transport belt, make sure that the belt passes under the upper and lower belt guide spacers [E].
- 6. Execute SP6009 (DF Free Run) to do an ADF free run for 3 minutes. After the free run is finished, clean off any dust on the exposure glass.

3.4.8 ADF MOTORS



B070R959.WMF



B070R960.WMF

Bottom Plate Motor, Pick-up Motor

- 1. Rear cover. (•3.4.1)
- 3. Pick-up motor [B] (ℰ x 2, ⊑ x 1).



B070R962.WMF

Feed-in, Transport, Feed-out Motors

- 1. Rear cover. (•3.4.1)
- 2. Transport motor [B] (ℱ x 4, ≅ × 2).
- 2. Grounding wire [C] ($\hat{\beta}^{2} \times 1$).
- 3. Feed-out motor assembly [D] (²/_ℓ x 2, ⊑¹/_ℓ x 2).
- 4. Feed-out motor [E] ($\hat{\beta}^2 \times 2$).

3.4.9 FEED-IN CLUTCH



- 1. Rear cover. (•3.4.1)
- 2. Remove a screw from the band [A].
- 3. Timing belt [B].
- 4. Pulley [C] and bearing [D] from the feed-in drive shaft ((x 1, pin x 1)).
- 5. Pulley [E] and bushing [F] from the pick-up roller cam shaft ($\mathbb{C} \times 1$, pin x 1)
- 6. Bearings [G] from the feed belt drive shaft ($\mathbb{C} \times 1$).
- 7. Feed-in clutch assembly [H] ($\hat{\mathscr{F}} \times 5$, $\mathbb{E} \times 1$).



- 8. Two bearings [A] from the feed-in clutch shaft ($\mathbb{C} \times 1$ each).
- 9. Pulley [B] (\mathbb{C} x 1), pin and timing belt [C].
- 10. Feed-in clutch [D].
 - **NOTE:** When re-installing the feed-in clutch, put the stopper screw [E] in the clutch hook.

3.5 SCANNER UNIT

3.5.1 EXPOSURE GLASS



B070R001.WMF

- 1. Left scale [A] (🕅 x 3).
- 2. Rear scale [B] ($\hat{\mathscr{F}}$ x 2). Slide in the direction of the arrow to remove.
- Exposure glass [C].
 NOTE: When positioning the exposure glass for re-installation, make sure that the white dot [D] is at the rear left corner.

3.5.2 ORIGINAL SIZE SENSORS



B070R052.WMF

▲ CAUTION Turn off the main switch and unplug the machine before performing this procedure. Laser beams can seriously damage the eyes.

- 1. Exposure glass (•3.5.1).
- 2. Lens cover [A] (🖗 x 6).
- 3. Lens block [B] (ℰ x 4, ⊑ x 3).
- 5. Original length sensors [D] (x 1 each,
 x 1 each).
- 6. After re-assembly, do the scanner and printer copy adjustment. (#3.15)

3.5.3 EXPOSURE LAMP



B070R050.WMF

- 1. Exposure glass. (•3.5.1).
- Open the front door, then remove the front upper cover (²/₂ x 7, ² x 1).
 (-3.5.7)
- 3. Lamp regulator cover [A] ($\hat{\mathscr{F}} \times 2$).
- 4. Exposure lamp [B] (x 2, 1).
 NOTE: When reinstalling the exposure lamp, pass the cable through the opening [C] in the bracket.

3.5.4 LAMP REGULATOR



B070R007.WMF

- 1. Exposure glass. (•3.5.1)
- 2. Lamp regulator cover [A] ($\hat{F} \times 2$).
- 3. Slide the holder [B] in the direction of the arrow. Then disconnect the flat cable [C].
- 4. Lamp regulator [D] (ℰ x 2, ⊑ x 1).

3.5.5 OPTICS DUST FILTER



B070R006.WMF

- 1. Original exit tray [A] ($\hat{\beta} \times 3$).
- 2. Optics dust filter [B].

3.5.6 SCANNER H.P. SENSOR





B070R017.WMF

- 1. Front upper cover. (•3.5.7)
- 2. Upper right, inner cover [A] ($\hat{\mathscr{F}} \times 4$).
- 3. Upper left inner cover [B] (2 x 3).
- 4. Scanner HP sensor bracket [C] ($\hat{\mathscr{F}} \times 1$).
- 5. Scanner HP sensor [D] (I 𝒴 x 1).

3.5.7 SCANNER MOTOR



B070R016.WMF

- 1. Exposure glass. (•3.5.1).
- 2. Left upper cover. (•3.3.3).
- 3. Front upper cover [A] (ℰ x 7, ≅ x 1).
- 4. Scanner motor assembly [B] (◻型 x 2, ⅔ x 3).
- 5. Scanner motor from the bracket [C] ($\hat{\not}^2 \times 3$).
- 6. After reassembly, do the copy image adjustments. (
 3.15)

3.5.8 SCANNER DRIVE WIRES

Preparation



- 1. Remove the ADF.
- 2. Original exit tray [A] ($\hat{\beta}^2 \times 3$).
- 3. Scanner front cover [B] (ℱ x 7, ≅ x 1).
- 4. Rear upper cover [C] (ℰ x 6).
- 5. Scanner right cover [D] ($\hat{\beta}^2 \times 4$).
- 6. Bracket [E] (🕅 x 4).
- 7. Scanner frame [F] (²/_ℓ x 10).

Front, Rear Scanner Drive Wires



- 1. Wire tension bracket [A] ($\hat{\beta}$ x 1).
- 2. Front scanner wire bracket [B].
- 3. Front scanner wire.

Reinstallation

- 1. Scanner wire pulley [C] ($\hat{\beta} \times 1$).
- 2. While making sure of the direction, place the beads on the middle of the wire on the pulley openings. Then wind the wire (ball side) 3 times and the other side (ring side) once as shown ①. Secure the pulley with tape to keep this condition.
- 3. Install the pulley on the scanner drive shaft ($\hat{\mathscr{F}} \times 1$).
- 4. Wind the end of the wire with the ball as shown (2,3,4).
- 5. Wind the end of the wire with the ring as shown $(5, 6, \overline{O})$.
- 6. Install the tension spring on the tension bracket, and slightly tighten the tension bracket ($\hat{\beta}^{x} \times 1$).



- 7. Install the 1st scanner and adjust the position with the positioning tools [A].
- 8. Secure the 1st scanner with the scanner wire bracket [B] ($\hat{\mathscr{F}} \times 1$).
- 9. Tighten the tension bracket [C] and remove the tape.
- 10. Remove the positioning tools. After sliding the scanner to the right and left several times, set the positioning tools to check the scanner wire bracket and the tension bracket again.
- 11. Reassemble the scanner and do the scanner and copy adjustments (•3.15)

3.6 LASER UNIT

- Direct exposure to the eyes can seriously damage the eyes and cause permanent blindness. Always turn off the main power switch and unplug the machine before attempting any of the procedures described below.
- Allow enough time for the machine to cool and for the polygon motor to stop rotating. The polygon motor continues to rotate for about one to three minutes after the machine is switched off.
- Never power on the machine with any of these components removed: 1) LD unit, 2) polygon motor cover, 3) synchronization detector.

3.6.1 CAUTION DECALS

Two caution decals are provided for the laser section.



3.6.2 LENS BLOCK



Replacemer Adjustmeni

B070R003.WMF

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

- 1. Exposure glass (•3.5.1).
- 2. Lens cover [A] (🖗 x 6).
- 3. Lens block [B] (ℱ x 4, ℡ x 3).
- 4. After reassembly, do the scanner and printer copy adjustment. (•3.15)

NOTE: There are no field adjustments for the lens block.

3.6.3 LD UNIT



B070R102.WMF

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

- **NOTE:** To avoid damaging the board with static electricity, never touch the printed circuit board.
- 1. Exposure glass (•3.5.1)
- 2. LD cover [A] (ℰ x 4, ⊑ x 1).
- 3. LD unit [B] (곍 x 2, ⊑ x 5).
 - Before removal, note how the LD unit is inserted into the 4 seams of the optical housing (the thickness is different according to color). This positioning is used for fine adjustment of the LD unit position. Make sure that you install the LD at the same position.
 - Be sure to remove the mylar from the underside of the old LD unit and attach it to the new one.

- 4. After installing the LD unit, execute SP2115 001~006 to input the pitch settings for the main scan beams.
 - NOTE: The correct settings for these SP codes are printed on a decal attached to the mounting bracket [C] of the LD unit.

<LD Unit Lot No.> SP2115 001/SP2115 002/SP2115 003 PS2115 004/SP2115 005/SP2115 006

B070R967 WMF

The 6 numbers printed on the label correspond to the correct settings of the SP codes shown in the diagram above.

Here is an example:

-10/-2/+10 -100/+0/+100

SP2115 006

To enter these numbers, you would execute:

- SP2115 001 (*)10(#) (*)(2)(#) SP2115 002 (1)(0)(#)SP2115 003 ()SP2115 004 SP2115 005 **(**)(#) (1)(0)(0)(#)
 - Press $\stackrel{(\mbox{\sc to})}{\longrightarrow}$ to enter the minus sign.
 - Press (#) after each entry.
 - A key press is not required for the plus sign.
- **CAUTION:** This example is for instructional purposes only. When you do this adjustment, you must enter the numbers printed on the label attached to the LD unit.
- 5. Do SP2962 (Auto Process Control Execution).
- 6. Make some test copies and check that the magnification is correct. If not correct, please do the printer copy adjustment. (•3.15)

3.6.4 POLYGON MIRROR MOTOR



B070R101.WMF

- **NOTE:** To avoid damaging the polygon motor, switch the machine off and wait 3 minutes to allow the motor to stop rotating before removing it.
- 1. Turn off the main power switch and unplug the machine.
- 2. Exposure glass (•3.5.1)
- Lens block cover and lens block. (
 3.6.2)

 NOTE: You do not need to remove the lens block completely. Lift it gently and move it to the right.
- 4. LD cover [A] (斧 x 4, ≅ 1).
- 5. Polygon mirror motor [B] (*🖗* x 3, 🖼 x 1).
 - **NOTE:** 1) When reinstalling, make sure that the polygon mirror opening faces the right.
 - 2) Never touch the glass surface of the polygon mirror motor with bare hands.
- 7. After reassembly, do the scanner and printer copy adjustments. (•3.15)

3.6.5 LASER SYNCHRONIZATION DETECTOR



- 1. Turn off the main power switch and unplug the machine.
- 2. Exposure glass (•3.5.1)
- Lens block cover and lens block. (#3.6.2)
 NOTE: You do no need to remove the lens block completely. Lift it gently and move it to the right.
- 4. Detector cover [A] ($\hat{\mathscr{F}} \times 2$).
- 5. Laser synchronization detector [B] (²/_ℓ x 1, ⊑^{II}/_ℓ x 1).

3.7 DRUM UNIT

3.7.1 DRUM UNIT

Drum Removal



1. Remove the development unit. ($rac{3.8.1}$)

- 2. Lower the transfer belt unit lever
- Grip the drum unit by the handle [A] then remove it.
 NOTE: 1) Keep the drum unit covered with a sheet of paper while it is out of the machine.
 - 2) Never touch the drum surface with bare hands.
 - 3) If it is difficult to re-insert the drum into the machine because the gear is disengaged, push in the drum unit while holding down the cleaning blade release lever [E].
- 4. Disconnect the drum potential sensor connector [B] ($\mathbb{E}^{||} \times 1$).
- 5. Open the upper drum unit [C] ($\hat{P} \ge 2$).

3.7.2 QUENCHING LAMP



Replacement Adjustment

B070R202.WMF

- Remove the drum. (-3.7.1)
 NOTE: Wrap a protective sheet or a few sheets of paper around the drum to protect it from light.
- Pull up the quenching lamp connector cable [A] slightly, then release the hook [B] at the center of the quenching lamp.
 NOTE: Do not pull the wire too strongly.
- 3. Disconnect [C].

3.7.3 GRID PLATE, CHARGE CORONA WIRE, WIRE CLEANER



- 2. Grid plate [B] ($\hat{\mathscr{F}} \times 1$, hooks x 4).
 - When installing the grid plate, do not over tighten the plastic screw [C].
 - Never touch the corona wire and grid plate with bare hands.



- 3. Remove the front grid terminal [A], then the front block cover [B].
- 4. Plate [C].
- 5. Terminal spring [D].
- 6. Slide the rear grid terminal [E] to the rear and remove it, then remove the rear end block cover [F].
- 7. Charge corona wire [G].



B070R553.WMF

- 8. Wire cleaner [A] (\bigcirc x 1).
- 9. Install the wire cleaner and the charge corona wire. **NOTE:** Put the joint part [B] of the wire in the rear end block.
- 10. After installing new wires, reset SP codes SP2001 001 to 2001 006 (Corona Voltage and Current) to their defaults.
- 11. Execute SP2962 (Auto Process Control Execution).

3.7.4 DRUM POTENTIAL SENSOR



Replacement Adjustment

- Remove the drum unit. (•3.7.1)
 NOTE: Before removing the drum potential sensor, put a few sheets of paper between the sensor and the drum to protect the drum surface.
- 2. Drum potential sensor [B] and the grounding plate [C] ($\mathscr{F} \times 2$, $\mathfrak{P} \times 1$).
- Execute SP2962 (Auto Process Control Execution).
 NOTE: After replacing the drum potential sensor, you must always execute SP 2962.
3.7.5 DRUM CLEANING BLADE, ID SENSOR



B070R558.WMF

- 1. Remove the drum unit. (-3.7.1)
- 2. Cleaning blade [A] ($\hat{\mathscr{F}} \times 2$).
- 3. Clean the side seals [B] and cleaning brush [C]. (See 'Vacuum Cleaning' on the next page.)



- 4. Install the new cleaning blade.
- **NOTE:** 1) To avoid damaging the edge of the blade and causing black lines on copies, never clean the blade with a cloth.
 - 2) Never touch the edge of a new cleaning blade.
 - 3) If setting powder or toner on the blade edge is removed at any point, reapply toner or setting powder at that point. When installing the cleaning blade, do not pinch the side seals.

Vacuum Cleaning

To protect the electrical parts from static electricity, disconnect the connector on the charge power pack and remove the ID sensor.

- 1. Disconnect the 12-pin connector [A].
- 2. Separate the upper and lower drum units.
- 3. Remove the spur bracket [B] and pick-off pawl bracket [C] (x 2).
- 4. Disconnect the connector [D].
- 5. Slide the pick-off pawl bracket to the rear, while turning it counterclockwise (as seen from the front). The ID sensor is on this bracket.
- After installing a new ID sensor, do SP3001 002 (ID Sensor Settings ID Sensor Initialization).

Replace Adjust

3.7.6 CLEANING BRUSH



B070R204.WMF

- 1. Cleaning blade. (•3.7.5)
- 2. Coupling gear [A] ($\hat{\mathscr{F}} \times 1$).
- 3. Bushing [B] (𝔅 x 1).
- Pull the cleaning brush shaft to the rear to release the cleaning brush [C], then remove the cleaning brush.
 NOTE: Never touch the cleaning brush with bare hands.
- 5. After replacement, clean the ID sensor surface.
- 6. Execute SP3001 002 (ID Sensor Initial Settings ID Sensor Initialization) to initialize the sensor.

3.7.7 PICK-OFF PAWLS



- 1. Remove the drum unit. ($rac{-}3.7.1$)
- 2. Spur bracket [A] and pick-off pawl bracket [B] ($\hat{F} \times 2$).
- 3. Bushing [C] (ℰ x 1, ℂ x 1).
- 4. While pulling the shaft [D] to the rear, turn the pick-off pawl shaft about 45 degrees clockwise (viewed from the front) to move up the pick-off pawl.
- 5. Pick-off pawl [E].

Replacement

- 1. Do not forget to hook the tension spring [F].
- 2. After replacement, make sure the pick-off pawl moves smoothly.
- 3. Never touch the edge of the pick-off pawl.

3.7.8 DRUM FILTER



B070R205.WMF

- 1. Open the front doors.
- 2. Right inner cover [A] ($\hat{\beta}^2 \times 3$).
- 3. Drum filter [B].

3.8 DEVELOPMENT AND TONER SUPPLY

3.8.1 DEVELOPMENT UNIT REMOVAL



- 1. Turn off the main switch.
- 2. Open the right door.
- 3. Right inner cover [A] ($\hat{P} \times 3$).
- 4. Development support plate [B] ($\mathscr{F} \times 1$).
- 5. Drum stay [C] (🖗 x 1, knob x 1)



- 6. Disconnect the connectors [A].
- 7. Disconnect the toner suction hose [B] and set it on the hook provided to keep the hose elevated so it does not leak toner.
- 8. Grasp the knob [C] of the development unit and pull it out of the machine.
 - **NOTE:** 1) To prevent scratches on the drum, press the development unit to the right while pulling it out.
 - 2) After installing the development unit, be sure to re-connect the connectors (x2) and suction hose.
 - 3) When cleaning the unit with a vacuum cleaner, keep the development unit connector as far as possible away from the development unit.



3.8.2 DEVELOPER REPLACEMENT



- 1. Take out the development unit. (•3.8.1)
- 2. Place the development unit on a sheet of paper.
- 3. Toner hopper [A] (𝔅 x 2).
- Turn over the development unit. Then turn the paddle roller knob [B] counterclockwise to empty the remaining developer onto the sheet
 NOTE: Dispose of used developer in accordance with local regulations. Make sure that no developer remains on the development rollers or in the development unit.



- 5. Remove the entrance seal [A] ($\hat{P} \times 2$).
- 6. Clean the side seals [B].
- 7. Clean the development sleeve [C].
- 8. Cover the sleeve rollers [D] with a sheet of paper to prevent the new developer from being attracted to the sleeve rollers.
- 9. If you are installing a new development unit, go to the next step. -or-

If you are only replacing the developer, clean the doctor blade before you pour in the developer: (\bullet 3-55)

10. Pour in one pack of developer [E] evenly across the width of the development unit, while turning the knob [F].

- 11. Re-install the toner hopper, then re-assemble the machine.
- 12. Tilt the toner hopper so that there is toner near the toner hopper sensor.
- 13. Be sure to connect the connectors after installing the development unit in the machine.
- 14. Turn on the main switch, then execute SP2801 (TD Sensor Initial Setting).
 - Use the keys on the screen to enter the Developer Lot No, then press (#). (The Lot No. is embossed on the top edge of the developer packet.)
 - Press "Execute" on the LCD.

This executes the TD initial setting. After about 1 minute, "Completed" is displayed on the screen, and the execution stops automatically.

NOTE: Do not make copies with new developer until after executing SP2801; otherwise, toner density control will be abnormal.

15. If the developer initial setting did not complete correctly, you cannot exit the SP mode by pressing the "Quit" key. If this problem occurs, turn the main switch off and on, then perform the initial setting again. If the result is the same, see "SC342" (TD Sensor Error 3) (• "4.Troubleshooting").

3.8.3 DOCTOR BLADE CLEANING

The doctor blade must be cleaned:

- At every PM visit.
- When replacing developer.

This procedure may need to be done more often if the customer is using paper that contains a large amount of paper dust. The dust tends to collect at the front and on the back side of the blade, causing the doctor gap to become narrower. Cleaning is required when:

- There is toner scatter from both ends of the development unit.
- White lines appear on copies.
- Faint reproduction of the image around the edges of the paper.

To do this procedure, you need a special tool.

Part Number	Description
A2949560	Paper Dust Cleaner - 5pcs/set

NOTE: The tool is made of flexible plastic and can be re-used. However, before you use it, make sure that it is perfectly flat.

Replacemer Adjustmen



- 1. Remove the development unit from the machine.
- 2. Pour out the developer.
- 3. Remove the entrance seal [A] ($\hat{P} \times 2$).
- 4. Flatten the paper dust cleaner [B] before you insert it.
- 5. Insert the tool into the gap [C] until you cannot see the leaf cutout.
- Pull the tool back gently so that the leaf [D] hooks on the back of the blade.
 NOTE: To avoid bending the leaf, making it difficult to remove, do not pull it toward you with too much force.
- 7. While maintaining a steady, even pressure, slide the tool [E] all the way to the left and right ends of the gap several times.
- 8. Turn the tool about 45 degrees to either side then remove it.
- Rotate the development roller about 10 mm (about ½") toward you, then vacuum away any paper dust or developer that falls away from the roller.
 NOTE: Be sure to collect all the dust and developer, and do not allow it to touch the development roller surface again.
- 10. Repeat steps 4 to 8 about 5 times.
- 11. Hold the development unit upside-down, gently shake the unit to remove any remaining paper dust, then vacuum clean the work area.
- 12. To complete the procedure, return to Step 10 on page 3-58. **NOTE:** Be sure to clean the development sleeve before you proceed.

3.8.4 DEVELOPMENT UNIT FILTERS



Replacement Adjustment

B070R301.WMF

- 1. Development unit. (•3.8.1)
- 2. Dust filter cover [A] (hooks x 4).
- 3. Center development filter [B].
- 4. Spread the base of the front dust filter cover [C] and remove it.
- 5. Front dust filter [D].
- **NOTE:** Make sure that the beveled corner of each dust filter fits into the beveled corner of the holder below.

3.8.5 DEVELOPMENT UNIT TONER SUCTION PUMP



- 1. Right upper cover (🖗 x 4).
- 2. Toner suction pump assembly [A] (ℰ x 2, hoses x 2, ⊑ x 2)

3.8.6 DEVELOPMENT UNIT WASTE TONER BOTTLE



Replacemen[.] Adjustment

- 1. Open the front right door.
- 2. Tap the hose [A] to clear toner from the opening of the hose.
- 3. Bracket [B] (𝔅 x 1).
- 4. Waste toner bottle [C] (hose x 1).
- **NOTE:** During transport and disposal of the used bottle, make sure that toner does not spill from top opening [D].

3.8.7 DEVELOPMENT ENTRANCE, FRONT, AND REAR SIDE SEALS



- 1. Remove the developer and save it.
- 2. Replace the developer entrance seal [A] ($\hat{P} \times 2$, hooks x 2).
- Replace the front and rear side seals [B].
 NOTE: When re-assembling the development unit, align the edges of the new side seals [C] with the edges [D].

B070R547.WMF

3.8.8 TONER DENSITY SENSOR



Replacement Adjustment

- 2. Remove the TD sensor [A] ($\hat{\mathscr{F}} \times 2$).
- 3. Thoroughly clean the development unit, so no carrier particles remain in the gap between the TD sensor and the development unit casing.
- 4. Install the new TD sensor
- 5. Install new developer and reassemble the development unit. (
 3.8.2)
- 6. Execute SP2801 (TD Sensor Initial Setting). (•3.8.2)
- 7. Execute SP2962 (Auto Process Control Execution).

NOTE: Do not make any copies until you have executed SP2801 (TD Sensor Initial Setting).

3.8.9 TONER HOPPER



- 1. Take out the development unit. (-3.8.1)
- Replace the toner hopper (x 2).
 NOTE: The new toner hopper has a red gear. This red gear is used for Step 3 only.
- Execute SP2207 002 (Toner Bank Toner Setup).
 NOTE: Occasionally, SP2207 002 finishes within a few seconds. If this occurs, execute SP2207 002 again. This operation normally continues for about 5 minutes.
- 4. Remove the white gear [A] from the old toner hopper.
- Remove the red gear [B] from the new hopper and replace it with the white gear from the old toner hopper.
 NOTE: The white gear is used for machine operation.

3.8.10 TONER HOPPER SENSOR



B070R303.WMF

- 1. Take out the toner hopper. (•3.8.2)
- 2. Toner hopper sensor [A] ($\hat{\mathscr{F}} \times 2$).

3.8.11 DEVELOPMENT MOTOR



B070R919.WMF

- 1. Turn off the main switch.
- 2. Rear upper cover (ℰ x 4). (☞3.3.4)
- 3. Flywheel (∦ x 3).
- 4. Development motor unit [A] ($\hat{\beta} \times 4$, $\exists \forall x 2$, hooks x 1).

3.8.12 DEVELOPMENT ROLLER SHAFT CLEANING



B070R405.WMF

- 1. Remove the development unit. (-3.8.1)
- 2. Use Teflon tape to remove toner and developer from the development roller shafts.

3-65

3.9 TRANSFER BELT UNIT

3.9.1 TRANSFER BELT UNIT REMOVAL



- 1. Turn off the main switch.
- 3. Remove the transfer belt unit holder [A] ($\hat{P} \times 1$).
- 4. Connector [B] (⊑^{IJ} x 1).
- 5. While turning the lever [C] counterclockwise, take out the transfer belt unit.
- NOTE: 1) Never touch the transfer belt with bare hands.2) Work carefully to avoid scratching the drum with the transfer belt unit.

Reassembly:

- 1. Rotate the lever [C] fully counterclockwise, then install the transfer belt unit.
- 2. Insert the gear [D] into the opening [E] in the rear frame.
- 3. Place the slot [F] in the transfer belt unit on the rail.
- 4. Connect the connector [B] (x 1).



B070R404.WMF

- 5. Attach the transfer belt unit holder [A] ($\hat{\beta}$ x 1). **NOTE:** Align the three holes [B] with the three projections [C].
- 6. After installation, check the following points:
 - The transfer belt unit must move up and down smoothly.
 - Part [D] of the transfer belt unit must be behind the drum stay.
 - Part [D] of the transfer belt unit must be set in the indent [E] in the drum unit casing.

3.9.2 TRANSFER BELT



- 1. Remove the transfer belt unit. (•3.9.1)
- 2. Raise knob [A], then disconnect the connectors [B] (x 2).
- 3. Turn the transfer belt upper unit [C] 90 degrees counterclockwise, then raise and remove it.
- 4. Remove the screws [D] ($\hat{\mathscr{F}} \times 2$).



- 5. Turn the belt drive roller holder [A] clockwise (front view) and remove the transfer belt [B].
- 6. Clean both sides of the transfer belt with a dry cloth. **CAUTION: Do not use alcohol**.

Before Installing or Replacing the Transfer Belt

Clean the following items with alcohol:

- Belt drive roller [C]
- Belt roller [D]
- Bias roller [E]

Installing the Transfer Belt

- 1. Position the transfer belt at the center of the belt roller [D] so both marks [F] are visible.
- 2. Position the transfer belt under the bias terminals [G] (see the previous page).

3.9.3 TRANSFER BELT CLEANING BLADE



B070R108.WMF

- 1. Remove the transfer belt unit. (-3.9.1)
- 2. Transfer belt cleaning blade [A] ($\hat{\mathscr{F}} \times 2$).
- Clean the cleaning bias roller [B].
 NOTE: Before vacuuming, remove the power pack connectors [C] to protect the transfer power pack from static electricity.
- 4. Install the new cleaning blade.
 - **NOTE:** Never touch the edge of the cleaning blade. If the setting powder on the blade edge is accidentally removed at some point, apply setting powder or toner at that point before installation.

3.9.4 TRANSFER BELT BIAS BRUSH



B070R455.WMF

- 1. Transfer belt. (•3.9.2)
- 2. Transfer belt bias brush holder [A] ($\mathscr{F} \times 1$).
- 3. Transfer belt bias brush [B].

3.10 PAPER FEED

3.10.1 PAPER TRAYS

Tandem Tray



B070R708.WMF

- 1. Open the front doors.
- 2. Open the tandem feed tray [A] so the right tandem tray [B] fully separates from the left tray.
- 3. Push in the right tandem tray.
- 4. Left tandem tray [C] ($\hat{\beta}^{2} \times 5$).



- 5. Right tandem tray [A] ($\hat{\beta}$ x 2).
- **NOTE:** 1) When re-installing the right tandem tray, make sure that the wheels [B] ride on the slide rail [C].
 - 2) When re-installing the right tandem tray, make sure that the tandem tray stopper [D] is set behind the stopper [E] on the copier frame.
 - 3) Use M4 x 4 screws [F] to secure the right tandem tray. Screws longer than 4 mm will prevent the right tandem tray from sliding out and in smoothly.

Universal Tray



B070R711.WMF

- 1. Pull open tray 2 or tray 3 [A].
- 2. Lift the tray [B] out of the drawer.

3.10.2 PAPER FEED ROLLERS



Replacement Adjustment

- 1. Turn off the main switch.
- 3. Pick-up roller [A] (\bigcirc x 1).
- 4. Feed roller [B] (🖾 x 1).
- 5. Remove separation roller [C] from the torque limiter [D] (\bigcirc x 1).
- **NOTE:** 1) The feed rollers of the main machine and the LCT are not interchangeable because they turn in different directions. After replacing a feed roller in the main machine, always make sure that it turns counterclockwise in the direction of paper feed.
 - 2) Do not touch the surface of the rollers with your bare hands.
- 6. Reset the appropriate counter after installing the new rollers. 4. Service Tables SP7816 (Print Counter Reset Paper Trays).

3.10.3 PAPER FEED AND VERTICAL TRANSPORT CLUTCHES, TRAY LIFT AND PAPER FEED SENSORS



- **NOTE:** This procedure uses the 1st feed unit as an example. The procedures for the 2nd and 3rd trays are almost identical.
- 1. Turn off the main switch.
- 2. Right front door. (•3.1.1)
- Right lower cover. (-3.1.2)
 NOTE: If the LCT is installed, disconnect it.
- 4. Toner collection bottle ((*3.6.5)
- 5. Lift the vertical transport guide [A] and remove it.
- 6. Screw [B] and knob [C].
- 7. Pull out the 1st tray (tandem tray), then remove the paper tray unit inner cover [D] ($\hat{\beta}^2 \times 2$).



B070R704.WMF

- 8. Inner vertical transport guide [A] (x 2, 1 ≥ x 1).
 NOTE: When re-installing the inner vertical transport guide, set the pin [B] of the inner vertical transport guide into the slot [C] on the main body.
- 9. Disconnect [D] (⊑^{IJ} x 2).
- 10. Paper feed unit [E] (🖗 x 2).

NOTE: Before removing any paper feed unit, remove the inner vertical transport guide [A]. Otherwise, the paper feed unit may be damaged.



- 11. Paper feed clutch [A] (≝^J x 1).
- 12. Vertical transport clutch [B] (12. X 1).
- 13. When re-installing the clutches, put the stopper [C] of each clutch on the correct hook on the bracket.
- 14. Paper lift sensor [D] (ℰ x 1, 🕬 x 1).
- 15. Paper feed sensor [E] (ℱ x 1, ≅ × 1).

3.10.4 REAR FENCE RETURN SENSOR



Replacement Adjustment

B070R525.WMF

- 1. Turn off the main switch.
- 2. Pull out the left tandem tray.
- 3. Rear bottom plate [A] (🖗 x 1).
- 4. Rear fence return sensor [B] (ﷺ x 1).

3.10.5 REAR FENCE HP SENSOR



B070R002.WMF

- 1. Turn off the main switch.
- 2. Pull out the left tandem tray.
- 3. Rear bottom plate [A] ($\hat{\beta} \times 1$).
- 4. Rear fence transport gear [B] ($\hat{\mathscr{F}} \times 1$).
- 5. Move the rear fence [C] to the right.
- 6. Rear fence HP sensor [D] ([™] x 1).

3.10.6 1ST TRAY RIGHT PAPER SENSOR



1. Turn off the main switch.

- 2. Right tandem tray. (•3.10.1)
- 3. Inner cover [A] (⅔ x 2).
- 4. Side fences [B] (x 1 each).
 NOTE: When re-installing the side fences, make sure that the position of the side fences is correct.
 A4: Outer, LT: Inner
- 5. Bottom plate [C] ($\hat{\beta}^2 \times 4$).
3.10.7 BOTTOM PLATE LIFT WIRE

NOTE: Before replacing the rear bottom plate lift wire, remove the front bottom plate lift wire. The procedure for the two wires is the same.



- 1. Right tandem tray. (•3.10.1)
- 2. Inner cover (⅔ x 2). (☞3.10.6)
- 3. Sensor bracket [A] (🖗 x 3).
- 4. Slightly lift the front bottom plate and unhook the wire stoppers [B], remove stopper [C] and actuator [D].
- 5. Wire covers [E] (C x 1 each).
- 7. Gear [G].
- 8. Bottom plate lift wire [I].



B070R061.WMF

Re-installation

When re-installing the bottom plate lift wire:

- 1. Set the positioning pin [A] in the hole [B].
- 2. Set the projection [C] in the hole [D].
- 3. Position the wire as shown [E]. **NOTE:** Do not cross the wires.

3.10.8 PAPER DUST TRAY, REGISTRATION SENSOR CLEANING



B070R369.WMF

Paper Dust Tray Cleaning

- 1. Development unit. (•3.6.1)
- 2. Disconnect [A] (🗐 x 1).
- 3. Release clamp [B].
- 4. Guide plate [C] (🖗 x 2)
- 5. Use a clean dry cloth to remove the paper dust in the tray [D].

Registration Sensor Cleaning

Use a blower brush to clean the registration sensor [E] on the guide plate.

3.10.9 2ND AND 3RD TRAY SIZE SWITCHES



- 1. Rear lower cover. (•3.1.4)
- 2. Open the controller box ($\hat{\mathscr{F}} \times 2$)
- 3. PSU-E (∦ x 4, ≝ x all). (☞3.14.4)
- 4. 2nd tray size switch bracket [A] ($\hat{P} \times 2$)
- 5. 2nd tray size switch [B] (⊑^{IJ} x 1, ∦ x 1)
- 6. 3rd tray size switch bracket [C] ($\hat{\mathscr{F}} \times 2$)
- 7. 3rd tray size switch [D] (^[] x 1, *[∂]* x 1).

3.10.10 ST TRAY LIFT MOTOR



B070R926.WMF

- 1. Rear lower cover. (•3.1.6)
- 2. PSU-E. (•3.14.4)
- 3. IOB board and bracket. (ℰ x 4) (**●**3.14.3)
- 4. Tension spring [A].
- 5. Upper timing belt [B].
- 6. Connector [C] (≝ x 1)
- 7. 1st tray lift motor [D] (🖗 x 3).

3.10.11 2ND, 3RD TRAY LIFT MOTORS, LOWER TIMING BELT



B070R931.WMF



Replacement Adjustment

2nd, 3rd Tray Lift Motors

- 1. Turn off the main switch.
- 2. Lower rear cover. ((-(3.1.4)
- 3. Open the control box door. (•3.1.4)
- 4. IOB with bracket. (•3.14.3)
- 5. PSU-E. (•3.14.4)
- 6. 2nd tray lift motor [A] (ﷺ x 1, ⅔ x 2).
- 7. 3rd tray lift motor [B] (≝^J x 1, ∦ x 2).

Lower Timing Belt

- 1. Upper timing belt. (-3.10.10)
- 2. Tension spring [C].
- 3. Lower timing belt [D].

3.10.12 PAPER FEED MOTOR





B070R934.WMF

- 1. Upper and lower timing belts. (•3.10.10, 3.10.11)
- 2. Unfasten the paper feed motor [A] ($\mathscr{F} \times 4$, $\mathfrak{V} \times 2$).
- 3. Slide the motor [B] to the left ① then turn it ②.
- 4. Slide the motor [C] to the front ③ to remove it.

3.10.13 RELAY MOTOR, UPPER RELAY CLUTCH, LCT RELAY CLUTCH





B070R916.WMF



B070R917.WMF

- 1. Rear upper cover. (•3.1.4)
- 2. Flywheel [A] (🖗 x 3).
- 3. Relay motor [B] (ℰ x 2, ≅^{IJ} x 2).
- 4. Upper relay clutch [C] (ℂ x 1, 🖽 x 1).



B070R917.WMF

5. LCT relay clutch [A] (ℂ x 1, 🗊 x 1).

Re-assembly

- 1. To re-install the LCT relay clutch [A], insert the pin of the clutch stopper into the cutout of the clutch.
- 2. To re-install the relay clutch [B], insert the pin [C] of the of the clutch stopper [D] into the cutout [E] of the clutch.

3.10.14 REGISTRATION MOTOR



Replacemer Adjustmen

- 1. Rear upper cover. (•3.1.4)
- 2. Flywheel (🖗 x 3).
- 3. Timing belt [A].
- 5. Registration motor [C] ($\mathscr{F} \times 3$, timing belt x 1, spring x 1).

3.10.15 DEVELOPMENT FAN MOTORS, COPIER FEED UNIT



B070R939.WMF

- 1. Right upper inner cover. (•3.1.2)
- 2. Two fan motors [A] (ℰ x 1, ⊑ x 1 each).



B070R940.WMF

- 3. LCT guide plate [A] (B5 knob). (🖏 x 1)
- 4. Draw out the duplex unit about 10 cm.
- 5. Relay motor. (•3.10.13)
- 6. LCT guide plate solenoid [B]. (ℰ x 1, ⊑ x 1)
- 7. Right upper cover. (•3.1.2)
- 8. Toner suction pump assembly. (**•**3.6.4) **NOTE:** When re-installing, make sure that the hose is not pinched.
- 9. Copier feed unit [C] (²/_ℓ x 5, ⊑¹/_ℓ x 2).

3.10.16 LCT RELAY SENSOR AND RELAY SENSOR



B070R935.WMF



B070R938.WMF

- 1. Right upper cover (🖗 x 4).
- 2. LCT relay sensor bracket [A] (ℰ x 1, ≅ x 1).
- 3. LCT relay sensor [B].
- 4. Relay sensor bracket [C] ([∂] x 1, ⊑^{IJ} x 1).
- 5. Relay sensor [D].

3.10.17 TANDEM FEED TRAY PAPER SIZE CHANGE

NOTE: At the factory, this tray is set up for A4 or LT LEF. Only A4 or LT LEF paper can be used for tandem feed.



- 1. Open the front cover.
- 2. Pull out the tandem feed tray [A] and remove the left and right tandem trays. ((-3.10.1)

Setting the Paper Size for the Right Tandem Tray

- 1. Right tandem inner cover [C]. (x 2)
- Re-position the side fences [D] (²/_ℓ x 1 each).
 NOTE: Outer: A4, Inner: LT.
- 3. Re-install the right tandem inner cover [C].



B070R523.WMF

Setting the Paper Size for the Left Tandem Tray

- 1. Tray cover [A] (ℰ x 2).
- 2. Motor cover [B] (🖗 x 5).
- Re-position the side fences [C] (²/_ℓ x 4 each).
 NOTE: Outer: A4, Inner: LT.
- 4. Re-install the motor cover and the tray cover.



- 5. Rear bottom plate [A] ($\hat{\beta}^{2} \times 1$).
- Re-position the return position sensor bracket [B] (x 1). To use the paper tray for A4 size, put the screw in the left hole.
 NOTE: For LT size, the screw should be placed on the right.
- 7. Re-install the rear bottom plate.
- 8. Change the paper size for the 1st Tray (Tandem Tray) with SP5019 002.

3.10.18 TANDEM TRAY SIDE REGISTRATION



Normally the side registration of the image can be adjusted in the SP mode.

If the punch hole positions are not aligned from a particular feed station, however, you can manually adjust the side registration by changing the tray cover position for that tray, and then adjust the side registration of the image with SP1002 001 Side-to-side Registration - 1st Tray (Copier Tandem Tray).

- 1. Pull out the tray and remove the right inner cover [A].
- 2. Loosen the screws and adjust the position of the plate [B]. Adjustment range: 0 ± 2.0 mm adjustment step: 1.0 mm/step

3.11 FUSING UNIT

3.11.1 OIL SUPPLY AND CLEANING WEB UNIT REMOVAL



1. Turn off the machine and wait for the oil supply and web cleaning unit to cool.

▲ CAUTION To avoid minor burns, allow sufficient time for fusing unit to cool.

- 2. Open the front doors and pull out the fusing and exit unit [A].
- 3. Fusing unit inner cover [B] ($\hat{\beta}$ x 2).
- 4. Oil supply and cleaning web unit [C] (*≱* x 1). **NOTE:** After re-installing the oil supply and cleaning web unit, confirm that the

web take-up roller gear is engaged with the gears of the fusing unit.

SP1902 001 (Web Motor Control – Web Consumption) should be set to "0" every time the oil supply/cleaning web is replaced. This setting will not take effect until the machine is cycled off/on.

3.11.2 FUSING UNIT THERMOSTATS AND THERMISTOR



- 1. Switch off the machine and wait for the fusing unit to cool.
- 2. Open both front doors and pull out the fusing unit.

▲ CAUTION To avoid minor burns, allow sufficient time for the fusing unit to cool.

- 3. Fusing unit inner cover. (•3.9.1)
- 4. Fusing unit top cover ($\hat{P} \times 1$). (\bullet 3.9.1)
- 5. Thermostat cover [A] (x 1).
- 6. Thermostat leads [B] ($\hat{\beta}^2 \times 2$).
- 7. Thermostats [C] (*x* 1).
- 8. Thermistor [D] (ℰ x 1, 🗊 x 1, clamps x 3).

3.11.3 HOT ROLLER UNIT, PRESSURE ROLLER



- 1. Remove the oil supply and cleaning web unit. (-3.11.1)
- Top cover [A] of the fusing unit (X 1).
 NOTE: When re-installing this cover, align the cutouts [B] and projections [C] and slide the cover to the right. Make sure that the cover does not pinch the thermistor and thermostat cables against the stay.
- 3. Fusing unit inner cover [D] ($\hat{\mathscr{F}} \times 2$).
- 4. Turn the upper exit guide plate assembly [E] clockwise about 160° and slide the pivot shaft out of the cutout [F].
- 5. Release the fusing pressure by turning the pressure lever [G] 1/4 of a turn counterclockwise with a screwdriver.
 - **CAUTION:** Be sure to lock the pressure roller lever [G] before re-attaching inner cover [D]. The inner cover cannot be re-attached if the pressure roller lever is not locked.



B070R503.WMF

- On both sides remove the outer pairs of M5 pan head screws [A]. (x 4)
 NOTE: On both sides of the fusing unit, do not remove the inner pair of M4 bind screws [B].
- 7. Hot Roller unit [C].
 - **NOTE:** When re-installing, secure the screws [A] in the following order: rear-left, front-right, rear-right, front-left.
- 8. Lower exit guide plate assembly [D] (*P̂* x 2, *■* x 1, clamp x 1). **NOTE:** Avoid touching the surface of the pressure roller.
- 9. Pressure roller assembly [E].



- 6. Shaft [A] (C-ring x 1)
- 7. Replace the pressure roller, bearings, and bushings [B]. **NOTE:** Handle the pressure roller carefully to avoid damaging it.
- 8. Lubricate the inner surface of the new pressure roller [C] and the outer surfaces of the bearings [D] with BARRIERTA L55/2 grease.

3.11.4 HOT ROLLER



- 1. Hot roller unit. (•3.11.3 Steps 1 to 6)
- 2. Fusing entrance guide plate [A] ($\hat{P} \times 2$).
- 3. Two screws [B] securing the harness terminal bracket, and unhook the bracket. **NOTE:** Unhook the thermistor cable [C] and thermostat cable [D] to avoid damaging them.
- 4. Disconnect the fusing lamp cables [E] from the terminals at the rear (x = 0).



- 6. Front lamp holder [A] ($\hat{\beta} \times 1$).
- 7. Rear lamp holder [B] (²/_R x 1).
- 8. Three fusing lamps [C] one-by-one.

When re-installing the three fusing lamps, check the following points:

- While aligning the three lamps with the cutouts in the front lamp holder, reinstall the front and rear lamp holders.
- The fusing lamp connectors at the front can be connected in any order. However, in order to ensure correct fusing temperature control, the connectors at the back [D] must be connected correctly by matching the color of the connectors of the fusing unit with the colors of the connection points on each lamp.

NA	EUR/A	Connection
800 W	730 W	Red $\leftarrow \rightarrow$ Red
560 W	540 W	Blue ←→ Blue
530 W	530 W	Green ←→ Green

- Route the thermistor cable and thermostat cable correctly. (•3.11.4)
- Make sure that the cables are not pinched and do not contact the gears.



9. Hot roller [A] (gear x 1, \bigcirc x 2, bushings x 2, bearings x 2).

CAUTION: Handle the hot roller carefully to avoid damaging its soft surface.

10. Lubricate the inner and outer surfaces of the bushings [B] with BARRIERTA L55/2 grease before re-installing the hot roller.

Re-assembly

- Before re-installing the hot roller, make sure that the end with long part of the shaft [C] is at the rear on the gear side.
- When re-installing bearings and bushings, make sure that the flanges for the bearings and bushings are placed on the outside.

3.11.5 WEB ROLLER AND FILTER



- 1. Remove the oil supply and cleaning web unit. (#3.11.1)
- 2. Place the unit on a flat surface as shown.
- 3. Cover [A] (🕅 x 2).
- 4. Note the positions of the blue shaft bushings at the rear and front.
 - No e-rings or clips are used to hold these bushings in place.
 - The rear side of the cover holds the two rear bushings in place.
 - The bushings at the front are held in place by two tabs at the front.
- 5. Filter [B].
- 6. Bushing of the web supply roller shaft [C].
- 7. Oil supply and cleaning web shaft [D] (gear x 1, bushing x 1). **NOTE:** Raise the small tab on the gear to release it.



- 8. Web take-up roller gear [A]
- 9. Bushings [B]
- 10. Web take-up roller [C]



- 11. Make sure that the feeler [A] for the web end sensor is below the bracket. Otherwise, after turning on the main switch, SC550 (Web End) will be displayed.
- 12. Make sure the bracket [B] is on top of the web of the take-up roller.
- 13. If the web is buckled between the web supply roll and web collecting roll, turn the web take-up roller gear [C] clockwise to remove the buckle.
- 14. Reassemble the fusing unit.NOTE: After re-attaching the oil supply and cleaning web unit, make sure that the web take-up roller gear engages the gears on the fusing unit exit unit.
- 15. If a new web is installed, execute SP1902 001 (Web Motor Control Web Consumption), and set the value to 0. Switch the machine off/on after changing the setting.

3.11.6 WEB CLEANING ROLLER



B070R519.WMFF

- 1. Remove the oil supply and cleaning web.
- Replace the web cleaning roller [A] (gear x 1, bracket x 1, bushings x 2, springs x 2).
- **NOTE:** When re-installing the gear [B], the D-shaped opening in this gear should face the roller shaft side. The circular-shaped opening [C] in the gear should face the bracket side [D].

3.11.7 HOT ROLLER STRIPPERS



Replacemer Adjustmen

- Raise the upper exit guide plate assembly and rotate it clockwise 160 degrees, disconnect the pegs from the cut outs on both sides, then remove the unit.
 (-3.11.3)
- 3. Upper exit guide plate [A] ($\hat{\beta}^2 \times 2$).
- 4. Spring [B].
- 5. Springs [C], [D] hooked to the sides of the stripper.
- 6. Shaft [E].

3.11.8 PRESSURE ROLLER STRIPPER, FUSING EXIT SENSOR



B070R518.WMF

- 1. Lower exit guide plate assembly. (•3.11.3)
- 2. Lower exit guide plate [A] ($\hat{\beta}$ x 2).
- 3. Pressure roller stripper [B] (spring x 1).
- 4. Fusing exit sensor [C].

3.11.9 PRESSURE ROLLER CLEANING ROLLER



- 1. Open both front doors and pull out the fusing unit.
- 2. Screw [A].
- 3. Pull out the pressure roller cleaning roller assembly [B] to dislodge it from the pins [C].
- 4. Two spring plates [D] ($\hat{\mathscr{F}} \times 1$ each).
- 5. Replace the pressure roller cleaning roller [E] and shaft [F] (bearings x 1, spacer x 1).

Re-assembly

- Fit the holes [G] (rear then front) of the pressure roller cleaning roller unit bracket onto the pins [C].
- While turning the pressure roller cleaning roller assembly counterclockwise, push the pressure roller cleaning roller assembly to the rear until it locks in place, then secure it with the screw [A].

3.11.10 FUSING AND EXIT UNIT



The fusing and exit unit is heavy. Handle it carefully to avoid dropping the fusing and exit unit when removing and installing it.

- 1. Fusing unit inner cover [A] ($\hat{F} \times 2$).
- 2. Fusing and exit unit [B] (x 4).

Re-assembly

Hook the cutouts [C] onto the projections [D] of the right and left slide rails.

3.11.11 FUSING PRESSURE ADJUSTMENT



- **NOTE:** The nip width 11.5 ± 0.5 mm (the difference between front and rear measurements should be less than 0.5 mm).
- 1. Execute SP1109 (Fusing Nip Band Check) to enter the fusing nip band check mode.
- Make a copy using an A4/LT OHP sheet. Copying will start. It will stop in the fusing unit for 30 seconds and then will exit.
 NOTE: If an OHP sheet is not available, use a solid black copy on plain paper (make the copy with the ADF open the copy will be all black).
- 3. Measure the nip band width (the shiny band) at both ends.
- It the nip band width is not within specifications at both ends, release the fusing pressure and adjust it using the adjustment screw [A] (clockwise increases the pressure, counterclockwise decreases the pressure).
 NOTE: Loosen the lock nuts [B] before turning the pressure adjustment screw. Re-tighten the nuts after adjusting.
- 5. Repeat steps 1 to 4 to check the nip band width.

3.11.12 EXIT SENSOR



- 1. Pull out the fusing and exit unit.
- 2. Sensor bracket [A] with the sensor ($\mathscr{F} \times 1$, $\mathfrak{W} \times 1$, clamps x 2).
- 3. Exit sensor [B].
- **NOTE:** When re-installing the sensor bracket, run the cable through the cutout [C] to slacken the cable.

3.12 DUPLEX UNIT

3.12.1 DUPLEX UNIT



- 1. Open the left and right front doors and pull out the duplex unit [A].
- 2. Remove the shoulder screws [B] ($\hat{P} \times 2$).
- 3. Lift up the duplex unit.
- **NOTE:** When re-installing the duplex unit, align the cutouts [C] with the slide rail projections [D].
3.12.2 DUPLEX UNIT INNER COVER



B070R802.WMF

- 1. Open both front doors.
- 2. Pull out the duplex unit.
- 3. Duplex unit inner cover [A] ($\mathscr{F} \times 3$, knob x 1).

3.12.3 JOGGER MOTOR



B070R803.WMF

- 1. Duplex inner cover. (•3.12.2)
- 2. Duplex grip [A] (🖗 x 2).
- 3. E-ring [B] and slide the duplex grip shaft [C] to the left.

Re-assembly

- 1. Re-install the duplex grip shaft and E-ring first.
- 2. Next, tighten the screws for the jogger motor assembly.

3.12.4 DUPLEX TRANSPORT MOTORS



- 1. Open both doors and pull out the duplex unit.
- 2. Duplex unit inner cover ((-3.12.2)
- 4. Transport motor 1 [B] ($\hat{\beta}$ x 2)
- 6. Transport motor 2 [D] ($\hat{\beta}^2 \times 2$).

3.12.5 DUPLEX ENTRANCE SENSOR



Replacement Adjustment

B070R805.WMF

- 1. Pull out the duplex unit.
- 2. Entrance sensor bracket [A] ($\hat{\mathscr{F}} \times 2$).
- 3. Duplex entrance sensor [B] (⊑^{IJ} x 1).





- 1. Open both front doors and pull out the duplex unit.
- Remove the upper duplex cover screws [A] (X 2) then slide the cover to the right.

NOTE: The front screw is a shoulder screw.

- 3. Slide the jogger fences to the center, then remove both jogger fences [B] ($\not\!\!\!\! \stackrel{\circ}{\otimes} x\ 2$ each).
- 4. Right upper duplex cover [C] (x 1).
- 5. Duplex transport sensor 2 [D] ($\mathscr{F} \times 1$, $\mathfrak{P} \times 1$).
- 6. Duplex transport sensor bracket [E] ($\hat{\not}^2 \times 2$).
- 7. Duplex transport sensor 3 [F] (x 1,
 x 1).

3.12.7 DUPLEX TRANSPORT SENSOR 1/DUPLEX INVERTER SENSOR



B070R809.WMFF

- 1. Open both front doors and pull out the duplex unit.
- 2. Both jogger fences ($\hat{\beta}^2 \times 2$). (\bullet 3.12.6)
- 3. Right upper duplex cover (•3.12.6).
- 4. Reverse roller solenoid [A] (²/₂ x 1, ¹/₂ x 1, link x 1, spring x 1).
- 5. Reverse trigger roller assembly [B] (\mathbb{C} x 1, bushings x 2, \mathbb{O} x 1, links x 1).
- 7. Duplex inverter sensor [D] (⊑^{IJ} x 1)
- 8. Transport sensor 1 [E] (ℰ x 1, 🗊 x 1).

Re-assembly

Make sure that the cutouts [F] catch the duplex side plate projections and the hooks are below the bracket plate.

3.13 TONER BANK

3.13.1 WASTE TONER BOTTLE





B070R902.WMF

- 1. Toner bank door [A] (pins x 2).
- 2. Waste toner bottle cover [B] ($\hat{\mathscr{F}} \times 1$).
- 3. Waste toner bottle [C].

3.13.2 TONER BANK UNIT



Replacemer Adjustmen

NOTE: Work carefully to avoid spilling toner during removal.

- 1. Execute SP5804 097 (upper bottle) and 098 (lower bottle) to close the caps, then remove the toner bottles from the bank.
- 2. Upper rear and lower rear covers (-3.1.4).
- 3. Open the controller box door ($\hat{P} \times 3$) ($rac{-}3.1.4$)
- 4. Left lower cover, right upper cover (-3.1.2, 3.1.3).
- Two screws [A] of the toner supply cylinder. (x 2, tubes x 3)
 NOTE: Work carefully to avoid spilling toner.
- Cover the end of the toner transport coil tube [B] with a plastic bag.
 NOTE: Do not to bend the toner transport coil tube [B]. If it is bent, this can cause the coil inside to be overloaded, locked, or damaged. SC592 will be displayed, and the coil (screw) inside should be replaced.
- 7. Switch on the machine and execute SP2226 to discharge toner from the toner bank.
- 8. Turn off the main switch and unplug the power cord.
- 9. Toner waste bottle. (•3.13.1)



Make sure that the power cord is unplugged before removing the noise filter in the next step.

- 10. Harness clamp bracket [A] ($\hat{\beta}$ x 1, clamps x 2).
- 11. Remove the noise filter [B] ($\hat{\mathscr{F}} \ge 2$, $\mathbb{E} \xrightarrow{\mathbb{P}} \ge 4$). **NOTE:** The top connectors are white, and the bottom connectors are yellow.
- 13. Connectors [D] (🗊 x 3).



B070R906.WMF

- 14. Toner transport coil casing [A] ($\mathscr{F} \times 2$).
- 15. Snap ring [B]
- 16. Slide coupling [C] to the left.



- 17. Toner bank door [A] (pins x 2).
- 18. Toner bank inner covers [B] (& x 3).
- 19. Screw on the left [C] (I x 1) and screws on the front [D] (I x 3) securing the toner bank unit.



- 20. Screw [A] securing the toner recycling and collection casing [B].
- 21. Lift the toner recycling and collection casing [B], pull out the pin [C] from the hole under the case, then pull out the toner bank unit.
 - **NOTE:** When pulling out the toner bank unit, toner may leak out of the junction between the tube and toner bank. Place a cloth on the machine bottom plate so that the plate does not become dirty.

After Re-installing the Toner Bank Unit

- 1. Remove the plastic bag from the toner transport coil tube. Re-connect the toner supply cylinder to the toner transport coil tube ($\hat{\mathscr{F}} \times 2$, tubes x 3).
- 2. Load the toner bottles into the toner bank.
- 3. Open the cylinder top cover and clean the inner surface of the cylinder with a cloth, then close the cylinder top cover.
- 4. Execute SP5804 070 to energize the toner bank motor.
- 5. Execute SP5804 068, 069 to energize the toner bottle motors for 5 to 6 seconds.
- 6. Execute SP5804 071 to energize the toner supply coil clutch.
- 7. About 50 to 60 seconds later, toner is supplied to the toner supply cylinder. Make sure that toner is properly supplied to the cylinder.
- 8. Turn off the toner supply coil clutch and then the toner bank motor.
- **NOTE:** To prevent overflow at the toner entrance tank, do not energize the toner bottle motors for a long time.

3.13.3 TONER SUPPLY PUMP MOTOR, TONER SUPPLY MOTOR SENSOR



B070R912.WMF

- 1. Right upper cover (ℰ x 4) (**●**3.1.2).
- 2. Bracket [A] with the toner supply pump motor ($\mathscr{F} \times 2$, $\mathfrak{W} \times 2$, tubes x 2).
- 3. Toner supply pump motor sensor [B].
- 4. Toner supply pump motor [C] ($\overset{\circ}{P}$ x 2).
- **NOTE:** When re-installing the parts, make sure that the hoses are connected at the correct positions, as shown.

3.13.4 ACCESS TO INSIDE THE TONER BANK



B070R948.WMF

- **NOTE:** The toner bottle sensors and toner collection bottle sensor are inside the toner bank.
- 1. Toner bank. (•3.13.2)
- 2. Toner release link bracket [A] ($\mathscr{F} \times 2$).
- Left side plate [B] (X 9, 2 links [C]).
 NOTE: When re-attaching the links [C], place the front pin [D] under the lock plate [E].
- 4. Toner bottle bottom plates [F] (x 3 each).

3.14 MAIN BOARDS

3.14.1 LCDC (LCD CONTROLLER)



- 1. Original exit tray [A] ($\hat{\beta}^2 \times 3$).
- 2. Scanner right cover [B] (🖗 x 4).
- 3. Optics dust filter [C].
- 4. Cover [D] (∦ x 4).
- 5. LCDC cover bracket [E] ($\hat{\beta}^2 \times 3$).
- 6. LCDC board [F] (²/_ℓ x 5, ⊑¹/_ℓ x 9, ribbon connectors x 3).

3.14.2 BCU BOARD



- 2. Open the controller box. (-3.1.4)
- BCU board [A] (x 6, I × 19).
 NOTE: If the 4 screws shown in the diagram are removed, the BCU board [B] swings down. If all 6 screws are removed, the BCU comes off.

3.14.3 IOB



B070R925.WMF

- 1. Rear lower cover (ℰ x 4) (**●**3.1.4).
- 2. PSU cover (🖗 x 2).
- 3. IOB [A] (⊑^{IJ} x 19, ∦ x 6).

3.14.4 PSU-E (POWER SUPPLY UNIT-ENGINE)



Replacemen Adjustment

B070R927.WMF

- 1. Remove the rear lower cover ($\hat{\mathscr{F}} \times 4$). (\clubsuit 3.1.4)
- 2. Open the controller box door. (\bullet 3.1.4)
- 3. PSU cover [A] (🕅 x 2).
- 4. PSU-E [B] (ℰ x 4, ≅ x 11).

3.14.5 CBG POWER PACK



B070R915.WMF

- 1. Remove the rear upper cover ($\hat{\mathscr{F}} \times 4$). (\clubsuit 3.1.4)
- 3. When re-installing, be sure to connect the connectors at the correct points:
 - CN753: Orange
 - CN755: Green
 - CN754: Blue

3.14.6 AC DRIVE BOARD



Derender mit

- 1. Open the controller box door. (•3.1.4)
- 2. AC drive board [A] ($\mathscr{F} \times 2$, Standoffs x 2)

3.15 CONTROLLER BOARDS, HDD

3.15.1 CONTROLLER BOX COVER



- 1. Side screws [A] (🖗 x 2).
- 2. Rear panel screws [B] ($\hat{\beta}^{2} \times 6$).
- 3. Bottom and left side screws [C] ($\hat{P} \times 2$)
- Top lock screw [D] (*P* x 1)
 NOTE: When you re-install the control box cover, fasten screw [D] first to ensure that the bottom and left side screw holes align correctly with their holes.

3.15.2 CONTROLLER BOARD, NVRAM



- 1. Controller box cover. (•3.15.1)
- 2. Left bracket [A] (²/₇ x 12)
- Slot cover bracket [B] (x 4)
 NOTE: When re-installing, make sure that board is between the ground plates.
- 4. Bottom slot covers [C] (x 4)
- 5. Controller board [D] (\$x2)
- 6. NVRAM [E].

NOTE: When installing a new controller board, be sure to remove the NVRAM from the old board and attach it to the new board.

3.15.3 INTERFACE BOARD



- 1. Controller box cover. (•3.15.1)
- 2. Slot cover bracket. (•3.15.2)
- 3. Interface board ($\hat{\beta} \times 3$)

3.15.4 IPU (IMAGE PROCESSING UNIT)



- 1. Controller box cover. ((3.15.1)
- 2. Controller board. (
 . 3.15.2)
- 3. Interface board. (•3.15.3)
- 4. Connector cover [A] ($\hat{\beta}$ x 2).
- 5. Behind the IPU board, disconnect the connectors [B] (\mathbb{Z} x 6).
- 6. Vertical bracket [C] ($\hat{\mathscr{F}} \times 2$).
- 7. IPU [D] (🖗 x 7).

3.15.5 CSS UNIT



- 1. Remove the controller box cover. (•3.15.1)
- 2. CSS unit (∦ x 2, 🖽 x 2).

[B]

3.15.6 MB (MOTHER BOARD)



Replacement Adjustment

- 1. Controller box cover. ((-3.15.1)
- 3. Interface board. (•3.15.3)
- 4. IPU (•3.15.4)
- 5. SD card slot board (@3.15.5)
- Box [A] (x 2)
 NOTE: Slide to the right to remove. When re-installing, make sure that the hooks are seated correctly in the grooves. If they are not, you will not be able to close the controller box and re-attach the screws.

B070R158.WMF

7. Mother board [B] (ℰ x 7, ≅ x 9).

3.15.7 HARD DISKS



NOTE: The controller recognizes both disks as one disk unit; therefore, both disks must always be replaced together, or there will be errors.

- 1. Remove the controller box cover. (•3.15.1)
- 2. HDD bracket [A] (ℱ x 5, 🖽 x 4).
- 3. Hard disks [B] (𝔅² x 8).
- 4. If you intend to re-install the same disks in the machine, confirm the correct connections before disconnecting. After the disks have been formatted, they are not identical, and each disk must be connected to the correct connector.

NOTE: The external terminal connections of HDD_A and HDD_B are, respectively, IDE1 and IDE2. In the Point-to-Point diagram, CN135 is the connection point for IDE1 and CN136 is the connection point for IDE2.

- Install the new disks.
 NOTE: If the disks are new and unformatted, they are both identical, and can be connected in either position.
- 6. Turn the main switch on and execute 5832 001 (HDD Formatting All) to format the new disks.
- 7. Install the stamp data using SP5853. (
 "Stamp Data Installation", 5. Service Tables.)

3.15.8 PSU-C (POWER SUPPLY UNIT-CONTROLLER)



B070R161.WMF

- 1. Controller box cover. (•3.15.1)
- 2. PSU-C bracket (x 5).
- 3. PSU-C (곍 x 6, ☞ x 5).
 - **NOTE:** Please note that the screw that fastens the ground wire is different. Use the same screw to re-fasten the ground wire.

3.16 MOTORS

3.16.1 FUSING/EXIT MOTOR REPLACEMENT



B070R921.WMF

- 1. Upper rear cover. (-3.1.4)
- 2. Open the controller box. (-3.1.4)
- 4. Loosen screw [A] to release the belt tension.
- 5. Timing belt [B].
- Fusing/exit motor [C] (x 5, x 2, clamps x 2)
 NOTE: Disengage the hooks (x 2) [D] to remove.
- **NOTE:** When re-installing the parts, hook up the tension spring (this automatically gives the belt the correct tension), then tighten screw [A].

3.16.2 DRUM MOTOR



B070R924.WMF

- 1. Rear upper cover. (•3.1.4)
- 2. Open the controller box. (•3.1.4)
- 3. Flywheel (∦ x 3).
- 4. Swing down the BCU board. (•3.14.2)
- 5. Loosen the screws [A] to loosen the belts, and remove the three timing belts [B].

Re-assembly

To place tension on the belt before tightening the screws [A], attach the tension spring.

3.17 COPY IMAGE ADJUSTMENT: PRINTING/SCANNING

- **NOTE:** 1) You need to perform these adjustment(s) after replacing any of the following parts:
 - Scanner Wires
 - Lens Block
 - Scanner Motor
 - Polygon Mirror Motor
 - Paper Side Fences
 - Memory All Clear
 - 2) For more details about accessing SP modes, refer to section 4.

3.17.1 PRINTING

- **NOTE:** 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
 - 2) Use the Trimming Area Pattern (SP2902 003, No. 27) to print the test pattern for the following procedures.
 - 3) Set SP2902 003 to 0 again after completing these printing adjustments.

Registration – Leading Edge

1. Check the leading edge registration using the Trimming Area Pattern, and adjust it using SP1001 if necessary. The specification is: 4 ± 2 mm.

Registration – Side-to-Side

Do the parallel image adjustment after the side-to-side registration adjustment.

Using SP Mode

1. Check the side-to-side registration for each paper feed station using the Trimming Area Pattern, and adjust them using the following SP modes if necessary.

	SP mode	Specification
1st paper feed	SP1002 1	
2nd paper feed	SP1002 2	
3rd paper feed (Optional PFU tray 1)	SP1002 3	
4th paper feed (LCT)	SP1002 4	2 ± 1.5 mm
5th paper feed (LCT)	SP1002 5	
6th paper feed (LCT)	SP1002 6	
7th Tray (Bypass)	SP1002 7	
Duplex	SP1002 8	



A: Leading Edge Registration B: Side-to-side Registration B070R633.WMF

Blank Margin

- **NOTE:** If the leading edge/side-to-side registration cannot be adjusted within the specifications, adjust the leading/left side edge blank margin.
- 1. Check the trailing edge and right side edge blank margins using the Trimming Area Pattern, and adjust them using the following SP modes if necessary.

	SP mode	Specification
Trailing edge	SP2101 2	3 ± 2 mm
Right edge	SP2101 4	More than 0.5 mm
Leading edge	SP2101 1	4 ± 2 mm
Left edge	SP2101 3	2 ± 1.5 mm

- A: Trailing Edge Blank Margin
- B: Right Edge Blank Margin
- C: Leading Edge Blank Margin

D: Left Edge Blank Margin



B070R634.WMF

Magnification Adjustment



B070R999.WMF

- 1. Enter SP mode and access SP2902 003.
- 2. Select pattern 4 (Alternating Dot pattern 2048 dots) and make a print using A3 (DLT) paper.
- 3. Check the length between the edges of the black squares. The length should be 130 mm in the sub scan direction.
 - 1) If the magnification in the main scan direction is not within 100 \pm 0.5%, adjust using SP2910.
 - After sub scan adjustment, use SP2909 (Main Scan Magnification) 001 (Copy), 002 (Printer) to adjust main scan magnification for the copy and print images.
 - 3) Next, use SP4008 (Scanner Sub Scan Magnification) to adjust magnification in the sub scan direction.
 - 4) If the magnification in the main scan direction is not within 100 \pm 0.5%, adjust using SP2910.
- **NOTE:** Check the magnification after the paper cools.

3.17.2 PARALLELOGRAM IMAGE ADJUSTMENT

If a parallelogram type image is printed while using a trimming area pattern, do the following to adjust the printing registration or the printing margin.

- **NOTE:** 1) The following procedure should be done after adjusting the side-to-side registration for each paper tray.
 - 2) This adjustment is only effective for a parallelogram image caused by the printer. It should not be applied if the skew is caused by the scanner.



- 1. Check whether a parallelogram image appears as shown on the next page when printing a trimming area pattern (SP2902 003, No. 27). If it appears, do the following.
- 2. Remove the exposure glass (see Replacement and Adjustment Exposure Glass Removal).
- 3. Remove the original exit tray and the scanner right cover. (See Replacement and Adjustment Scanner Drive Wires)
- 4. Peel away the mylar [A] covering the opening in the frame.
- 5. Loosen the three screws [B] that hold the laser unit.



- 6. Make a note of the position of the laser unit using the scale [A].
- 7. Adjust the laser unit position using a flat screwdriver [B] as shown. If the right side of the trimming area pattern is down by about 1 mm as shown [C], the laser unit should be rotated about one graduation in the direction of the black arrow. If the opposite side is down, adjust in the opposite direction.
- 8. Tighten the three screws to secure the laser unit.
- 9. Print the trimming area pattern to check the image. If it is still the same, repeat steps 2 to 7.

3.17.3 SCANNING

- **NOTE:** 1) Before doing the following scanner adjustments, check the printing registration/side-to-side adjustment and the blank margin adjustment.
 - 2) Use an OS-A3 test chart to perform the following adjustments.

Registration: Platen Mode

- 1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
- 2. Check the leading edge and side-to-side registration, and adjust them using the following SP modes if necessary.

	SP mode
Leading Edge	SP4010
Side-to-side	SP4011



A: Leading Edge Registration B: Side-to-side Registration

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Magnification

NOTE: Use an OS-A3 test chart to perform the following adjustment.

Scanner Sub Scan Magnification

- 1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
- 2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is within $\pm 1\%$.





A: Sub Scan Magnification


3.17.4 ADF IMAGE ADJUSTMENT

Registration

NOTE: Make a temporary test chart as shown below left, using A3/DLT paper.

- 1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
- 2. Check the registration, and adjust using the following SP modes if necessary.

	SP mode
Side-to-side Registration	SP6006 1
Leading Edge Registration (Thin original mode)	SP6006 2
Leading Edge Registration (Single-sided/Duplex: front)	SP6006 3
Leading Edge Registration (Duplex: rear)	SP6006 4





B070R637.WMF

A: Leading Edge Registration B: Side-to-side Registration

B070R692.WMF

3.17.5 ADJUSTING THE LD UNIT CHANNELS

Small pitch banding could occur with this machine due to:

- Characteristics of the drum
- Variations that occur over time in the amount of light emitted by each channel

The quantity of light emitted from each channel of the LD unit is adjusted at the factory. However, SP codes are provided so you can test and adjust the quantity of light emitted from each channel. Patterns No.4~8 generated with SP2902 002 (Test Pattern – IPU Printing Test Pattern) allow you to visually compare channel output, and SP2105 003~010 (LD Power Correction) allows you to do the adjustments.

Test Patterns and Adjustment

Print the test pattern with SP2902 002, No.5.

The test pattern is a "caterpillar" pattern printed for every channel on one sheet for A3 paper. The sample on the next page shows a test. Pattern 8 is a pattern for each of the eight channels (0~7). Patterns 1~7 compare each pattern with Ch0.

In the sample pattern on the next page, note the darker appearance of Ch4 in both Pattern 4 and Pattern 8, compared with the uniform appearance in the patterns for the other channel. This indicates that Ch4 requires adjustment.

Light Quantity Adjustment

Adjust with SP2105 (LD Power Correction) 003 ~ 010. Then print the test pattern again to check the effects of the new settings.

If a pattern is darker or lighter than the others, the quantity of light on that channel should be reduced or increased.

While visually checking, Pattern 8 in the sample is sufficient to detect a difference in the density of the patterns; the other patterns (1~7) allow more detailed comparison with Ch0.

To perform adjustment for the channels, use SP2105 (LD Power Correction) 003 \sim 010.

In the case of the sample print on the next page, we can see that Ch4 requires correction because it is too dark; therefore, the value of SP2105 007 (the SP code for Ch4 adjustment) must be lowered.

Generally, the amount of adjustment required can be determined by increasing or decreasing the SP setting (in this case, reducing the setting for SP2105 007) and then printing the text pattern again to confirm the results of the adjustment. The adjustment should be done until the dark (or light) pattern matches the other patterns.

Replacemen Adjustment

Sample: SP2902 002 Test Pattern – IPU Printing Test Pattern, Pattern 5

The numbers in the vertical blocks of the caterpillar patterns indicate the number of the channels compared.



3.18 TOUCH SCREEN CALIBRATION

When the touch panel detection mechanism is not working properly, calibrate the touch screen as follows:

1. Press the following keys in sequence to enter operation panel self diagnostic mode.



	Self	Diagnostic	Menu]
[1] Touch	Screen Adjust			
[2] LED Te	est			
[3] Print	Screen			
[4] Record	d Monitor			
			,	
				E#3 E 'I

	ţ	
<u> </u>	1	
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œ		

- 2. Select "[1] Touch Screen Adjust".
 - **NOTE:** [2] tests the LEDs on the operation unit, not the machine's main operation panel. Keys [3] [4] [5] [6] [7] are for factory use only. Do not use unless directed by senior technical staff.



B070R117.WMF

TOUCH SCREEN CALIBRATION

- 3. The "Touch Screen Adjustment" calibration screen will appear. Touch the center of the circle in the upper left corner then the lower right corner of the panel using a pointer (but not sharp!) tool.
- Touch a few spots on the LED touch panel, and confirm that the marker appears on the screen at exactly the same location as where it is touched. If it does not, touch "Re-input" (or press the ● key) and repeat the calibration procedure.
- 5. Touch "OK" on the adjustment screen.`
- 6. Touch "Exit" to exit the self diagnostic mode.

4. TROUBLESHOOTING

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
А	Fusing SCs displayed on the operation panel. The machine is disabled. The user cannot reset the SC.	Enter SP mode, then turn the main power switch off/on.
В	SCs that disable only the features that use the defective item. Although these SCs are not shown to the user under normal conditions, they are displayed on the operation panel only when the defective feature is selected.	Turn power off/on.
С	SCs that are not shown on the operation panel. They are internally logged.	Logging only.
D	Turning the operation switch or main power switch off then on resets SCs. Displayed on the operation panel. These are re-displayed if the error occurs again.	Turn the operation switch or main power switch off and on.

- **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.
 - 3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.

Troubleshooting

4.1.2 SC CODE DESCRIPTIONS

SC101: Exposure Lamp Error

Definition [B]

The standard white level was not detected properly when scanning the white plate.

Possible Causes

- Exposure lamp defective
- Lamp stabilizer defective
- Exposure lamp connector defective
- Scanner motor control unit (MCU board) defective
- SBU board defective
- Dirty standard white plate
- Dirty scanner mirror or scanner mirror or lens block out of position

SC120: Scanner Home Position Error 1

Definition [B]

The scanner home position sensor does not detect the on condition during initialization or copying.

Possible Causes

- Scanner home position sensor defective
- Poor connection between HP sensor and MCU board
- Scanner motor control unit (MCU board) defective
- Scanner wire, timing belt, pulleys, or carriage out of position
- Scanner motor defective
- Poor connection or defective harness between MCU board and scanner motor

SC121: Scanner Home Position Error 2

Definition [B]

Scanner home position sensor OFF not detected.

- Scanner home position sensor defective
- Poor connection between MCU board and scanner home position sensor
- Harness between MCU board and sensor defective
- MCU board defective
- Scanner wire, timing belt, pulleys, or carriage out of position
- Scanner drive motor defective
- Harness between MCU board and scanner motor disconnected

SC124: Encoder Signal Error

Definition [B]

The scanner motor encoder connector is not set correctly, or the encoder signal was not input. When the scanner motor encoder connector is not set correctly, or occasionally even if set correctly, this error is detected if there is no input 4 ms after scanning begins.

Possible Causes

- Scanner motor encoder connector disconnected
- Scanner motor lead connector disconnected
- Scanner motor defective
- MCU board defective (scanner motor control unit)
- Scanner wire, timing belt, pulleys, or carriage installation incorrect
- Power supply connector disconnected (+38V ±12V)
- Power supply unit (PSU-E board) defective

SC125: Scanner Motor Error 2

Definition [B]

Scanner motor stopped before feedback from scanner HP sensor detected, or motor speed too slow when detected at scanner HP sensor.

Possible Causes

- Scanner motor defective (high torque)
- Overload on scanner drive mechanism
- MCU board defective (scanner motor unit control)

SC126: Scanner Motor Error 3

Definition [B]

The scanner motor does not stop within 15 mm after the scanner home position sensor turns on when the scanner returns.

- Scanner motor defective (low torque)
- Overload on scanner drive mechanism
- MCU board defective (scanner motor control unit)

SC127: Scanner Motor Error 4

Definition [B]

The scanner motor rotates in the opposite direction to the signal from the MCU board.

Possible Causes

- Scanner motor defective (motor lead connected incorrectly)
- MCU board defective (scanner motor control unit)

SC128: Scanner Motor Error 5

Definition [B]

The scanner motor speed does not reach the target speed by the time the scanning start point is reached.

Possible Causes

- Scanner motor defective
- Overload on scanner mechanism\
- PSU-E board defective
- MCU board defective (scanner motor control unit)

SC129: Scanner Motor Error 6

Definition [B]

The scanner motor speed is abnormal.

NOTE: The machine will not stop scanning even after the machine detects that motor speed is abnormal.

- Scanner motor defective
- Scanner drive mechanism defective
- PSU-E board defective
- MCU board defective (scanner motor control unit)

SC143: SBU (Sensor Board Unit) Error 1

Definition [B]

At power on, the SBU white level adjustment, black level check, and final SBU white level check did not execute.

Possible Causes

- SBU defective
- IPU defective
- BCU defective
- Harness between the SBU and IPU defective
- Standard white plate not installed correctly, or is dirty
- Scanner mirrors and/or lenses are dirty or installed incorrectly

SC144: SBU (Sensor Board Unit) Error 2

Definition [B]

At power on, the specified SBU ID (GASBUP and LM98513) could not be read after 3 tries

Possible Causes

- SBU defective
- IPU defective
- BCU defective
- Harness between SBU and IPU defective

SC300: Charge Corona Output Error 1 (Charge Leakage)

Definition [B]

A high feedback voltage for the charge corona (more than 4.5 V) was detected from the CBG (charge, bias, grid) power pack 9 times within 60 ms.

Possible Causes

- CBG power pack defective
- Poor charge corona unit connection
- Charge corona unit connector defective

Troubleshooting

SC301: Charge Corona Output Error 2 (Circuit Open)

Definition [B]

A low feedback voltage for the charge corona (less than 1.5 V) was detected from the CBG power pack 9 times for 60 ms.

Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection
- Charge corona unit connector defective

SC303: Charge Grid Output Error 1 (Grid Leakage)

Definition [B]

A high feedback voltage for the grid (more than 4.5 V) was detected from the CBG power pack 9 times consecutively for 60 ms.

Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection
- Charge corona unit connector defective

SC304: Charge Grid Output Error 2 (Grip Open)

Definition [B]

A low feedback voltage for the grid (less than 1.0 V) was detected from the CBG power pack 9 times for 60 ms.

Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection
- Charge corona unit connector defective

SC305: Charge Corona Wire Cleaner Error 1

Definition [D]

The charge corona wire cleaner does not return to its home position, and there is no stop signal 30 s after cleaning starts.

- Charge corona wire cleaner lock defective
- Charge corona wire cleaner motor defective
- BCU defective

SC310: Drum Potential Sensor Error 1

Definition [D]

During drum potential sensor calibration, the output voltages from the drum potential sensor are not within specifications while –200V then –700V are applied to the drum.

NOTE: After this SC is issued, the grid voltage changes to the value set with SP2001-001 (Charge Corona Bias Adjustment) and LD power changes to the value set with SP2103 (LD Power Adjustment).

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- Drum potential sensor defective
- IOB defective
- Poor drum ground connection
- CBG power pack defective

SC311: Drum Potential Sensor Error 2

Definition [D]

When calibrating the drum potential sensor during process control initialization, the rate of change of drum potential sensor output with voltage on the drum is out of specification.

NOTE: After this SC is issued, the grid voltage changes to the value set with SP2001-001 (Charge Corona Bias Adjustment) and LD power changes to the value set with SP2103 (LD Power Adjustment).

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- Drum potential sensor defective
- IOB defective
- Poor drum ground connection
- CBG power pack defective



SC312: Drum Potential Sensor Error 3 (Vd Abnormal)

Definition- [D]

When Vd on the surface of the unexposed drum is adjusted during process control initialization, -900 V is applied to the charge grid but Vd is more than -900.

NOTE: After this SC is issued, the grid voltage changes to the value set with SP2001-001 (Charge Corona Bias Adjustment) and LD power changes to the value set with SP2103 (LD Power Adjustment).

Possible Causes

- Drum potential sensor defective
- Poor drum potential sensor harness connection
- Drum potential sensor connector defective
- IOB defective
- Poor drum ground connection
- Drum disconnected
- Quenching lamp defective
- CBG power pack defective
- Charge corona wire dirty or defective

SC313: Drum Potential Sensor Error 4 (Vd > Vg)

Definition [D]

When adjusting the drum potential (Vd) during process control initialization, the drum potential sensor detects that Vd is more than Vg (grid voltage).

NOTE: After this SC is issued, the grid voltage changes to the value set with SP2001-001 (Charge Corona Bias Adjustment) and LD power changes to the value set with SP2103 (LD Power Adjustment).

- Drum potential sensor defective
- Drum potential sensor harness defective
- Drum potential sensor connector defective
- IOB defective
- Poor contact at the drum connection
- CBG power pack defective
- Charge corona wire dirty or defective

SC314: Drum Potential Sensor Error 5 (Vh Abnormal)

Definition [D]

When adjusting the drum potential (Vh) for LD power adjustment during process control initial setting, the first time the Vh pattern is made, the drum potential sensor detects that Vh is more than 600 V.

NOTE: After this SC is issued, the grid voltage changes to the value set with SP2001-001 (Charge Corona Bias Adjustment) and LD power changes to the value set with SP2103 (LD Power Adjustment).

Possible Causes

- Drum worn
- Drum potential sensor defective
- Poor drum potential sensor connection
- Drum potential sensor connector defective
- LD unit requires cleaning
- IOB defective
- Drum unit connector defective
- LDB board defective

SC315: Drum Potential Sensor Error 6 (Vd Abnormal)

Definition [D]

When adjusting Vd for the unexposed drum during process control initialization, Vd does not reach the voltage set for SP2001 007 \pm 20 V even if Vg has been adjusted 5 times.

SP2001 007 (Charge Corona Bias Adjustment – Vd) adjusts the target Vd voltage for process control. Range/Default/Step: [700~1000 / 800 / 5 V].

NOTE: If the Vd adjustment fails, the machine uses the charge grid voltage Vg for the previous adjustment. In this condition, normal ID sensor pattern detection is done.

- Drum potential sensor defective
- Drum potential sensor harness defective
- Drum potential sensor connector defective
- IOB defective
- Drum unit connector defective
- CBG power pack defective

SC316: Drum Potential Sensor Error 7 (Vh abnormal

Definition [D]

One of the following occurred:

- When adjusting the drum potential (Vh) for the process control initial setting, the drum potential sensor detects Vh is not within the range $-260 + \Delta VIref \pm 20V$. In this case, the auto process control value is used.
- During retries for LD power modulation to adjust the amount of light, the adjustment was out of range (-70 to +185). In this case, the value of the setting is used.

Possible Causes

- Drum potential sensor defective
- IOB defective
- Drum unit connector defective
- LDB board defective
- Poor drum ground connection
- Drum worn
- Laser optics need cleaning

SC317: Drum Potential Sensor Error 8

Definition [B]

At auto process control initialization, the VL detected after creation of the ID sensor pattern is greater than 300.

- Drum worn
- LD unit dirty
- Poor drum ground connection

SC322: Laser Synchronization Error

Definition [B]

The laser synchronization signal (DETP) cannot be detected by the synchronization detector even if the laser diodes are activated and the polygon mirror motor is rotating normally.

Possible Causes

- Laser synchronization detector harness disconnected or defective
- Laser synchronization detector is installed incorrectly out of position
- LDB board, Polygonal mirror motor control PCB defective. After the CPU issues the LD ON command, the LD OFF signal remains HIGH and the laser diodes do not fire
- LDB board, Polygonal mirror motor control PCB defective. After the CPU issues the LD ON command, the LD OFF signal goes low, but the laser diodes still do not fire

SC323: Excessive LD Drive Current

Definition [B]

The value of the LD driver offset current is over the allowed current (about 90 mA).

- Poor LDB board harness connection
- LDB defective
- LD unit defective



SC335: Polygonal Mirror Motor Error 1

Definition [B]

The polygonal mirror motor does not reach its operating speed within 20 s after the polygonal mirror motor turns on, or the polygonal mirror motor speed is changed. (The XSCRDY signal does not go LOW for active.)

Possible Causes

- Poor connection between polygonal mirror motor and I/F harness
- Polygonal mirror motor, LDB, or polygon mirror motor control PCB defective
- IPU defective



Polygon mirror motor driver: Polygon mirror motor control PCB

XPMON:	Command that switches polygon mirror motor on/off. BCU \rightarrow IPU \rightarrow LDB \rightarrow Polygon mirror motor control PCB
PMCLK:	Polygon mirror motor drive clock. BCU \rightarrow IPU \rightarrow LDB \rightarrow Polygon mirror motor control PCB
XSCRDY:	Polygon mirror motor ready signal. Polygon mirror motor control $PCB \rightarrow LDB \rightarrow IPU \rightarrow BCU$

SC336: Polygonal Mirror Motor Error 2

Definition [B]

The XSCRDY signal (polygon mirror motor ready signal) does not go HIGH (inactive) within 20 s after the polygonal mirror motor switches off.

NOTE: For details, see the illustration for SC335.

Possible Causes

- Poor connection between the polygon mirror motor control PCB and I/F harness
- Polygonal mirror motor, polygon mirror motor control PCB, or LDB board defective
- IPU defective

SC337: Polygonal Mirror Motor Error 3 (SCRDY Signal Error)

Definition [B]

While the polygonal mirror motor is rotating normally, the lock signal (XSCRDY or polygon mirror motor ready signal) is detected HIGH (inactive) even though the motor has not been switched off nor has the motor rotation been changed.

NOTE: For details, see the illustration for SC335.

Possible Causes

- Electrical noise interfering with the lock signal (XSCRDY)
- Poor connection between polygonal mirror motor control PCB and I/F harness
- Polygonal mirror motor or LDB defective

SC338: Polygonal Mirror Motor Error 4

Definition [B]

The XSCRDY signal (polygon mirror motor ready signal) does not stabilize within 20 s when:

- The motor is switched ON or OFF
- After the rotation of the motor has been changed

NOTE: For details, see the illustration for SC335.

- Poor connection between the polygonal mirror motor control PCB and the I/F harness
- Polygonal mirror motor or LDB defective

SC340: TD Sensor Error 1 (Vt Measurement Error)

Definition [B]

The TD sensor output voltage is detected less than 0.5 V or more than 4.0 V for 10 continuous copies.

Possible Causes

- TD sensor defective
- TD sensor harness defective
- TD sensor connector defective
- IOB defective
- Toner supply defective; check the toner supply path from the toner bank through to the hopper
- BCU defective

SC341: TD Sensor Error 2 (TD Sensor Control Voltage Abnormal)

Definition [B]

One of the following TD sensor output voltages is detected during TD sensor initial setting.

- Less than 2.5 V when the maximum PWM (255) is applied to the TD sensor.
- 2.5 V or more when minimum PWM (0) is applied to the TD sensor.
- **NOTE:** When an abnormal condition is detected, "0" is displayed for SP2906 (Vcont Manual Setting).

- TD sensor defective
- TD sensor harness defective
- TD sensor connector defective
- IOB defective
- Toner supply defective; check the toner supply path from the toner bank through to the hopper
- BCU defective

SC342: TD Sensor Error 3 (TD Sensor Adjustment Error)

Definition [B]

The TD sensor output voltage is not adjusted to 2.5 \pm 0.1 V within 20 s during automatic TD sensor initial setting.

NOTE: When an abnormal condition is detected, "0" is displayed for SP2906 (Vcont Manual Setting).

Possible Causes

- TD sensor defective
- TD sensor harness defective
- TD sensor connector defective
- IOB defective
- Toner supply defective; check the toner supply path from the toner bank through to the hopper
- BCU defective

SC345: Development Bias Leak

Definition [B]

Maximum PWM for the development bias signal was applied 10 times for 60 ms.

- CBG power pack defective
- Defective or disconnected harness between CBG power pack and development unit
- Defective harness connector



SC350: ID Sensor Error 1

Definition [D]

One of the following ID sensor output voltages was detected when checking the ID sensor pattern.

- Vsp ≥ 2.5 V
- Vsp = 0 V
- **NOTE:** 1) Vsp is the ID sensor output after checking the ID sensor pattern image.
 - 2) The SC code is not displayed; only the logging data is incremented.
 - Regarding toner supply, if an abnormal condition is detected, then only the toner density sensor output is used, without an updated Vref setting.
 - 4) After an abnormal condition is detected, SP3103 (ID Sensor Output Display) shows Vsp = Vsg (or 5.0V).

- ID sensor defective
- ID sensor harness defective
- ID sensor connector defective
- IOB board defective
- LD unit defective
- BCU defective
- CBG power pack defective
- Dirty ID sensor

SC351: ID Sensor Error 2

Definition [D]

One of the following conditions were detected when checking the ID sensor pattern:

- 1) Vsg ≤ 2.5 V
- 2) Vsg= 0 V
- 3) The ID sensor output voltage = 5.0 V and PWM signal input to ID sensor = 0

Vsg is the ID sensor output after checking the erased drum surface

- **NOTE:** 1) Vsp is the ID sensor output after checking the ID sensor pattern image.
 - 2) The SC code is not displayed; only the logging data is incremented.
 - 5) Regarding toner supply, if an abnormal condition is detected, then only the toner density sensor output is used, without an updated Vref setting.
 - 6) After an abnormal condition is detected, SP3103 (ID Sensor Output Display) shows Vsp = Vsg (or 5.0V).

- ID sensor defective
- ID sensor harness defective
- ID sensor connector defective
- IOB defective
- LD unit defective
- BCU defective
- CBG power pack defective
- Dirty ID sensor



SC352: ID Sensor Error 3

Definition [D]

At the ID sensor pattern check, the ID sensor pattern edge voltage is not detected at 2.5 V for 1.5 seconds.

- **NOTE:** 1) Vsp is the ID sensor output after checking the ID sensor pattern image.
 - 2) The SC code is not displayed; only the logging data is incremented.
 - Regarding toner supply, if an abnormal condition is detected, then only the toner density sensor output is used, without an updated Vref setting.
 - 4) After an abnormal condition is detected, SP3103 (ID Sensor Output Display) shows Vsp = Vsg (or 5.0V).

Possible Causes

- ID sensor defective
- ID sensor harness defective
- ID sensor connector defective
- IOB defective
- LD unit defective
- BCU defective
- CBG power pack defective
- Dirty ID sensor

SC353: ID Sensor Error 4 (Adjustment Error)

Definition [D]

One of the following ID sensor output voltages is detected at ID sensor initialization.

- VSG < 4.0 V when the maximum PWM input (255) is applied to the ID sensor.
- VSG \geq 4.0 V when the minimum PWM input (0) is applied to the ID sensor.
- **NOTE:** 1) The most recent PWM value is used for control.
 - 2) The values displayed with SP3103 (ID Sensor Output Display) are the actual values.

- ID sensor defective
- ID sensor harness defective
- ID sensor connector defective
- IOB defective
- LD unit defective
- BCU defective
- CBG power pack defective
- Dirty ID sensor

SC354: ID Sensor Error 5

Definition [D]

Vsg is not adjusted to target $(4.0 \pm 0.2 \text{ V})$ within 20 s during VsG checking.

- **NOTE:** 1) The most recent PWM value is used for control.
 - 2) The values displayed with SP3103 (ID Sensor Output Display) are the actual values.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- IOB defective
- LD unit defective
- BCU defective
- CBG power pack defective
- Dirty ID sensor

SC355: ID Sensor Voltage Error

Definition [B] The ID sensor voltage (Vp) exceeds 800 V for 10 continuous counts.

Possible Causes

- Drum potential sensor defective
- IOB defective
- Poor drum unit connection or connectors defective
- Poor drum ground connection
- LD defective
- Poor drum cleaning ground connection
- Drum worn
- Dirty laser optics

SC400: Transfer Bias Roller Leak

Definition [B]

After the transfer current begins, the value of the transfer current set with SP2301 (Transfer Current Adjustment) exceeds the specified setting, and feedback voltage lower than 0.75V is detected for 16 counts (about 100 ms).

- CBG power pack defective
- Poor connection between the transfer current terminal and the transfer power pack.

SC401: Transfer roller open error

Definition [B]

When transfer bias is applied to the bias roller while the main motor is operating, after bias output has started, one of the following conditions exists:

- Input connector is defective
- Output connector is defective

Possible Causes

- Transfer power pack defective
- Poor connection between the transfer current terminal and the transfer power pack.

SC430: Quenching Lamp Error

Definition [D]

When finishing the process control initial setting at the end of a job and the drum motor has stopped, the drum potential detected by the drum potential sensor is beyond the normal range.

Possible Causes

- Quenching lamp defective
- Quenching lamp connector defective
- Poor connection between quenching lamp and CBG power pack

SC440: Drum Motor Lock

Definition [B]

The drum motor lock signal is longer than 2 s while the drum motor is on.

Possible Causes

- Motor lock due to overload
- BCU defective

SC441: Development Motor Lock

Definition [B]

While the motor is operating, the motor lock signal remains LOW for 2 s.

- Motor lock due to overload
- BCU defective

SC491: Polygonal Mirror Motor Cooling Fan Motor Lock

Definition [B]

The polygonal mirror motor cooling fan motor lock signal remains HIGH for 5s while the polygonal mirror motor cooling fan motor is on.

Possible Causes

- Drive mechanism overload
- Obstruction has stopped the fan
- Fan connector loose

SC492: Development Unit Suction Motor

Definition [B]

While the development unit toner suction motor is operating, the lock sensor output does not change for 1 s.

Possible Causes

- Motor lock due to overload
- BCU defective

SC495: Toner Bottle Unit Error

Definition [B]

The toner hopper sensor cannot detect toner even after the toner supply coil clutch turns on 10 times within 2 s during toner supply during copying.

Possible Causes

- Toner supply pump motor defective
- Toner supply pump motor connector loose
- Toner supply coil clutch defective
- Toner supply coil clutch connector defective
- Toner near-end sensor (in the toner bank) defective
- Toner near-end sensor (in the toner bank) spring defective
- Toner blockage in the toner supply pump or toner supply path
- Toner hopper sensor defective

Troubleshooting

SC496: Toner Collection Bottle Error

Definition [B]

The toner collection bottle sensor or development unit toner suction bottle set sensor remains off for 3 s.

Possible Causes

- Used toner collection bottle or development unit waste toner suction collection bottle is incorrectly set
- Used toner collection bottle or development unit waste toner suction collection bottle connector is loose or sensor defective

SC497: Development Unit Toner Suction Bottle Error

Definition [B]

During machine operation, the development unit toner suction bottle set sensor goes off for 3 s.

Possible Causes

- Bottle is not installed
- Toner suction bottle set sensor connector is loose

SC501: 1st Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 1st tray (tandem tray) of the main machine:

- The 1st tray lift sensor is not activated for 10 s after the 1st tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The 1st tray lift sensor is already activated when the 1st tray is placed in the machine.

- Poor 1st tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- 1st pick-up solenoid connector is loose
- 1st pick-up solenoid is blocked by an obstruction

SC502: 2nd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 2nd tray of the main machine:

- The 2nd tray lift sensor is not activated for 10 s after the 2nd tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The 2nd tray lift sensor is already activated when the 2nd tray is placed in the machine.

Possible Causes

- Poor 2nd tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- 2nd pick-up solenoid connector is loose
- 2nd pick-up solenoid is blocked by an obstruction

SC503: 3rd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 3rd tray of the main machine:

- The 3rd tray lift sensor is not activated for 10 s after the 3rd tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The 3rd tray lift sensor is already activated when the 3rd tray is placed in the machine.

Possible Causes

- Poor 3rd tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- 3rd pick-up solenoid connector is loose
- 3rd pick-up solenoid is blocked by an obstruction

SC504: 4th Tray (LCT 1st Tray) Lift Malfunction

Definition [C]

One of the following conditions is detected in the 4th tray:

- The LCT 1st lift sensor is not activated for 10 s after the LCT 1st tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The LCT 1st lift sensor is already activated when the LCT 1st tray is placed in the machine.

Possible Causes

- Poor LCT 1st tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- LCT 1st pick-up solenoid connector is loose
- LCT 1st pick-up solenoid is blocked by an obstruction

SC505: 5th Tray (LCT 2nd Tray) Lift Malfunction

Definition [C]

One of the following conditions is detected in the 5th tray:

- The LCT 2nd lift sensor is not activated for 10 s after the LCT 2nd tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The LCT 2nd lift sensor is already activated when the LCT 2nd tray is placed in the machine.

Possible Causes

- Poor LCT 2nd tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- LCT 2nd pick-up solenoid connector is loose
- LCT 2nd pick-up solenoid is blocked by an obstruction

SC506: 6th Tray (LCT 3rd Tray) Lift Malfunction

Definition [C]

One of the following conditions is detected in the 6th tray.

- The LCT 3rd lift sensor is not activated for 20 s after the LCT 3rd tray lift motor turned on.
- Upper limit is not detected within 20 s while the paper tray is lifting during paper feed.
- The LCT 3rd lift sensor is already activated when the LCT 3rd tray is placed in the machine.

- Poor LCT 3rd tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- LCT 3rd pick-up solenoid connector is loose
- LCT 3rd pick-up solenoid is blocked by an obstruction

SC507: 7th Tray (Bypass Tray) Lift Mechanism

Definition [C]

One of the following conditions is detected in the optional bypass tray.

- The bypass tray lift sensor is not activated for 10 s after the tray lift motor turned on.
- Upper limit is not detected within 10 s while the paper tray is lifting during paper feed.
- The bypass tray lift sensor is already activated paper is placed in the 7th tray.

Possible Causes

- Poor bypass tray lift motor connection
- Remaining paper or another obstruction has stopped the tray and motor
- Bypass tray pick-up solenoid connector is loose
- Bypass tray pick-up solenoid is blocked by an obstruction

SC510: Paper Feed Motor Lock

Definition [B]

An abnormal signal is sent from the paper feed motor.

Possible Causes

- Paper feed motor defective
- Poor paper feed motor connector connection
- Too much load on the drive mechanism

SC511: LCT Motor Error 1

Definition [B]

The motor overload lock signal for the LCT motor is detected HIGH for more than 500 ms during rotation.

Possible Causes

- LCT motor defective
- Too much load on the drive mechanism

SC512: Bypass Tray Error 1

Definition [B]

The motor overload lock signal for the optional bypass tray motor is detected HIGH for more than 400 ms during rotation.

- Bypass tray motor defective
- Too much load on the drive mechanism

SC520: Duplex Jogger Motor Error 1

Definition [C]

When the jogger fence moves to the home position, the duplex jogger HP sensor does not turn on even if the jogger motor has moved the jogger fence more than 153.5 mm.

Possible Causes

- Remaining paper or another obstruction is blocking the side fence
- Jogger motor connection is loose

SC521: Duplex Jogger Motor Error 2

Definition [C]

When the jogger fence moves from the home position, the duplex jogger fence HP sensor does not turn off even if the jogger motor has moved the jogger fence more than 153.5 mm.

Possible Causes

- Remaining paper or another obstruction is blocking the side fence
- Jogger motor connection is loose

SC531: Fusing/Exit Motor Lock

Definition [B]

A fusing/exit motor lock signal is detected for more than 2 s during operation.

Possible Causes

- Motor lock due to overload
- Motor driver board defective

SC532: Paper Feed Motor Lock

Definition [C]

Paper feed motor lock signal is detected for more than 2 s during operation.

- Motor lock due to overload
- Motor driver board defective

SC541: Fusing Thermistor Open

Definition [A]

The fusing temperature detected by the thermistor was below 7°C for 15 s.

Possible Causes

- Fusing thermistor defective or out of position
- Poor thermistor terminal connection

SC542: Fusing Temperature Warm-up Error

Definition [A]

One of the following occurred:

- Hot roller did not reach target operation temperature within 6 minutes after the machine was powered or 6 minutes after the doors were closed.
- Fusing temperature rose only 5°C toward the fusing temperature within 20 s after the machine was powered on, or after the doors were closed.
- Fusing temperature rose only 5°C toward the fusing temperature within 25 s of the start of hot roller rotation.

Possible Causes

- Fusing lamp(s) disconnected
- Thermistor out of position

SC543: Fusing Overheat Error 1: Software

Definition [A]

A fusing temperature of over 210°C is detected for 5 s by the fusing thermistor. This prevents the fusing lamps from switching on without a fusing lamp trigger signal.

Possible Causes

- AC drive board defective
- BCU defective
- Reload the BCU firmware

SC544: Fusing Overheat Error 2: Hardware

Definition [A]

The fusing temperature monitoring circuit detects abnormal fusing temperature.

- AC drive board defective
- BCU defective
- Reload the BCU firmware

SC545: Fusing Overheat Error 3: Continuous Lamp On

Definition [A]

After warm-up and while the hot roller is not rotating, the fusing lamps remain on at full power for 90 s.

Possible Causes

- Fusing thermistor out of position
- One or more fusing lamp is disconnected

SC546: Fusing Temperature Unstable

Definition [A]

The fusing temperature continues to fluctuate rapidly.

Possible Causes

- Poor thermistor connector connection
- Poor fusing unit connection

SC547: Zero Cross Signal Malfunction

Definition [A]

The applied bandwidth is detected above 66 Hz or below 45 Hz, and no zero-cross signal detected for 5 s with the power relay ON.

Possible Causes

• Noise on the ac power line

SC550: Oil Supply/Cleaning Web End

Definition [A]

The oil supply/cleaning web end sensor stays on longer than the specified time after the web motor remains ON for 40 s.

- Oil supply/cleaning web end (web on supply roller used up)
- Oil supply/cleaning web motor defective
- **NOTE:** SP1902 001 (Web Motor Control Web Consumption) should be set to "0" every time the oil supply/cleaning web is replaced. This setting will not take effect until the machine is cycled off/on.

SC591: Toner Supply Pump Motor Error

Definition [B]

The toner supply pump motor lock signal did not change within 1 s while the motor is operating.

Possible Causes

- Motor lock due to overload
- BCU defective

SC592: Toner Bank Motor Error

Definition [B]

An abnormal signal was received from the toner bank motor.

Possible Causes

- Toner bank motor defective
- Bank motor connector loose
- Too much load on the drive mechanism

SC593: Toner Suction Motor Replace

Definition [B]

The operation time of the motor is over 600 hours.

Possible Cause

- Service life of the toner suction motor is finished.
- **NOTE:** A near-end message is displayed in the LCD when the operation time exceeds 570 hours.

SC601: Communication Error Between BCU and MCU

Definition [B]

One or more of the following occurred:

- The BCU cannot communicate with the MCU within 0.8 s after power on.
- A BREAK signal was detected after connection between the BCU and MCU.

• After a communication error, three tries to communicate with the MCU failed.

- Poor connection between BCU and MCU
- BCU defective
- MCU defective

SC620: Communication Error between BCU and ADF 1

Definition [B']

The TXD and RXD signals between BCU and ADF main board do not stabilize.

Possible Causes

- Poor connection between the BCU board and the ADF main board
- Noise on interface cable

SC621: Communication Error between BCU and ADF 2

Definition [B']

The TXD and RXD signals between BCU and ADF main board do not stabilize.

Possible Causes

- Poor connection between the BCU board and the ADF main board
- ADF main board defective
- BCU board defective

SC622: Communication Error between BCU and ADF 3

Definition- [B']

Software error after abnormal user operation.

Possible Causes

• Software error; switch the machine off/on

SC625, 626: Communication Error between BCU and Finisher

Definition [B]

The BCU cannot communicate with the finisher properly.

Possible Causes

- Poor connection between the BCU board and the finisher main board
- Finisher main board defective
- BCU board defective
- Noise on the interface cable

SC630: CSS (RSS) Communication

Definition [B] Japan only

SC632: Charge Unit Device Error 1

Definition [B] Japan Only

SC633: Charge Unit Device Error 2

Definition [B] Japan Only



SC670: Engine Startup Error

Definition [B]

Several possible causes for this error:

At power on or after the machine leaves the energy conservation mode:

- /ENGRDY signal does not assert
- IPURDY signal does not assert

After power on and the prescribed time has elapsed:

- No EC response from the engine
- No PC response from the engine
- No SC response from the engine

During machine operation mode:

- Write to Rapi drive failure (could not locate destination on the PCI)
- After the /ENGRDY signal asserts with no effect.

Possible Causes

- BCU ←→ Controller Board disconnected
- BCU board defective
- Controller board defective
- Mother board defective
- Software error; switch off/on, if that fails, change the engine firmware
- PSU-E or PSU-C defective

SC672: Controller Startup Error

Definition [B]

The line between the controller board and the operation panel does not open correctly when the machine is powered on, or after the machine was powered on communication between the controller and operation panel is suspended.

The controller board and operation panel could not exchange the handshake (FDH) and acknowledge (FEH) signals within 15 s of the operation panel reset after power on, or after 2 retries there was no response to the transmission line confirmation command issued every 30 s from the operation panel to the controller board.

- Controller board defective
- Controller board installed incorrectly
- Operation panel harness connection loose or incorrect
SC701: ADF Pick-up Roller Release Malfunction

Definition [B]

The pick-up roller HP sensor does not activate or de-activate when the pick-up motor turns on.

Possible Causes

- Pick-up roller HP sensor defective
- Pick-up motor defective
- ADF main control board defective

SC702: ADF Feed-in Motor Error

Definition [B]

While the feed motor is operating, the encoder pulse signal is not received within the specified time, or the paper size length encoder signal cannot be detected within the specified time (the encoder is built into the feed-in motor).

Possible Causes

- Feed-in motor defective
- Paper length sensor
- ADF main control board defective
- Poor connection between the feed-in motor and ADF main board

SC703: ADF Transport Belt Motor Error

Definition [B]

While the motor is operating, the encoder pulse signal is not received within the specified time and the transport belt motor does not turn properly.

Possible Causes

- Transport belt motor defective
- Poor connection between the transport motor and ADF main board
- ADF main board defective

SC704: ADF Feed-out Motor Error

Definition [B]

While the feed-out motor is operating, the encoder pulse signal is not received within the specified time, and the feed-out motor does not turn properly

- Feed-out motor defective
- Poor connection between the feed-out motor and ADF main board
- ADF main control board defective

SC705: ADF Original Table Lift Malfunction

Definition [B]

One of the following conditions was detected.

- The bottom plate position sensor does not activate when the bottom plate motor lifts the original table.
- The bottom plate HP sensor does not activate when the bottom plate motor lowers the original table.

Possible Causes

- Bottom plate position sensor defective
- Bottom plate HP sensor defective
- Bottom plate motor defective
- ADF main control board defective

SC720: Finisher Lower Transport Motor Error

Definition [B]

The encoder pulse signal of the lower transport motor (B478) or stapler transport motor (B468) does not change within the specified time, and the lower transport motor does not turn properly

Possible Causes

- Lower transport motor/stapler transport motor defective
- Poor connection between the lower transport motor (or stapler transport motor) and finisher main board
- Finisher main control board defective
- Motor overload

SC722: Finisher Jogger Motor Error

Definition [D]

The jogger fences move out of the home position but the HP sensor output does not change within the specified number of pulses.

- Jogger HP sensor (B478)/ jogger fence HP sensor (B468) defective
- Overload on the jogger mechanism
- Jogger motor (B478)/jogger fence motor (B468) defective (not rotating)
- Finisher main control board defective
- Poor connection between the jogger motor and finisher main board

SC724: Finisher Staple Hammer Motor Error

Definition [B]

Stapling does not finish within the specified time (450 ms) after the staple hammer motor turned on.

Possible Causes

- Staple jam
- Overload because number of sheets exceeds the limit
- Staple hammer motor (B478)/stapler motor (B468) defective
- Poor motor cable connection

SC725: Finisher Stack Feed-out Motor Error

Definition [D]

The stack feed-out belt HP sensor does not activate within the specified time after the stack feed-out belt motor turned on.

Possible Causes

- Stack feed-out HP sensor defective
- Poor stack feed-out belt motor cable connection
- Stack feed-out belt motor defective
- Finisher main control board
- Motor overload

SC726: Finisher Shift Motor Error (B478 only)

Definition [D]

The shift tray half-turn sensor status does not change within 1 second after the shift motor turns on.

- Shift tray half-turn sensor defective
- Poor shift tray half-turn sensor connection or defective harness
- Shift motor defective
- Finisher main control board defective
- Motor overload

SC727: Finisher Stapler Rotation Motor Error

Definition [D]

The stapler does not return to its home position within the specified time after stapling finished.

Possible Causes

- Staple rotation HP sensor defective
- Poor stapler rotation motor connection
- Stapler rotation motor defective
- Finisher main board defective
- Motor overload

SC729: Finisher Punch Motor Error

Definition [B]

The punch HP sensor is not activated within the specified time after the punch motor turned on.

Possible Causes

- Punch HP sensor defective
- Poor punch motor connection
- Punch motor defective
- Finisher main board defective
- Motor overload

SC730: Finisher Stapler Motor Error

Definition [D]

The stapler HP sensor is not activated within the specified time after the stapler motor turned on.

- Stapler HP sensor defective
- Poor stapler motor (B478)/stapler movement motor (B468) connection
- Stapler motor (B478)/stapler movement motor (B468) defective
- Finisher main board defective
- Motor overload



SC731: Finisher Positioning Roller Error (B478 only)

Definition [B]

The positioning roller HP sensor in the finisher is not activated within the prescribed length of time (340 pulses) for two counts.

Possible Causes

If powering the machine off/on does not solve the problem:

- Positioning roller HP sensor defective or disconnected
- Stapler transport motor or positioning roller solenoid defective
- Finisher main control board defective
- Finisher control board defective
- Jam
- NOTE: 1) If the motor operates, then check the positioning roller HP sensor.
 - 2) If the motor does not operate, then check the motor and the finisher control board.
 - 3) If the harness connections are secure, the motor may be defective.

SC732: Finisher Jogger Motor Error

Definition [B]

The jogger HP sensor is not activated within the prescribed length of time.

- Jogger HP sensor (B478)/jogger fence HP sensor (B468)/shift jogger HP sensor (optional jogger unit) disconnected or defective
- Jogger motor (B478)/jogger fence motor (B468)/shift jogger motor (optional jogger unit) disconnected or defective
- Finisher main control board defective
- Overload
- **NOTE:** 1) If cycling the machine off/on does not solve the problem, then the HP sensor may be defective.
 - 2) Be sure to check all harness connections.
 - 3) If the motor operates, then the HP sensor is defective.
 - 4) If the motor does not operate, then the motor or the finisher main control board is defective.
 - 5) Make sure that the jogger unit is not overloaded.

SC735: Finisher Paper Stack Plate Motor Error (B478)

Definition [D]

One of the stack plate HP sensors (front, center, or rear) does not turn on within the prescribed time after the stack plate motor turned on.

Possible Causes

- One of the stack plate HP sensors is defective
- Poor stack plate motor connection
- One of the stack plate motors is defective
- Finisher main control board defective
- Motor overload

SC736: Finisher Exit Guide Motor Error (B478 only)

Definition [D]

The exit guide open sensor does not change within the specified time after the exit guide motor is energized.

Possible Causes

- Exit guide open sensor defective
- Poor exit guide motor connection
- Exit guide motor defective
- Finisher main control board defective
- Motor overload

SC737: Full Finisher Staple Waste Hopper (B478)

Definition [D]

The staple waste hopper is full.

Possible Causes

• Staple waste hopper is full (remove hopper and empty it)

SC738: Finisher Shift Tray Lift Motor Error (B478)

Definition [B]

The staple mode HP or shift mode HP sensor does not activate within the specified time after the tray lift motor turned on.

- Staple mode HP or shift mode HP sensor defective
- Staple mode HP or shift mode HP sensor connection loose or broken
- Tray lift motor defective
- Finisher main control board defective
- Motor overload

SC740: Finisher Upper Tray Lift Motor Error (B468)

Definition [D]

The upper tray paper height sensor does not change its status with the specified time after the tray raises or lowers.

Possible Causes

- Upper tray paper height sensor defective
- Upper tray paper height sensor connection loose or broken
- Tray lift motor defective
- Finisher main control board defective
- Motor overload

SC741: Finisher Lower Tray Lift Motor Error (B468)

Definition [D]

The lower tray paper height sensor does not change its status with the specified time after the tray raises or lowers.

Possible Causes

- Lower tray paper height sensor defective
- Lower tray paper height sensor connection loose or broken
- Tray lift motor defective
- Finisher main control board defective
- Motor overload

SC742: Finisher Shift Motor Error (B468)

Definition [D]

Shift motor not detected at the home position within the specified time.

- Shift roller HP sensor defective
- Shift roller HP sensor connection loose or broken
- Shift motor defective
- Finisher main control board defective
- Motor overload

SC743: Finisher Pressure Plate Motor Error (B468)

Definition [D]

Pressure plate motor operating but the plate is not detected at the home position within the specified time.

Possible Causes

- Pressure plate HP sensor defective
- Pressure plate HP sensor connection loose or broken
- Pressure plate motor defective
- Finisher main control board defective
- Motor overload

SC744: Finisher Exit Guide Motor Error (B468)

Definition [B]

After moving away from the guide plate position sensor, the exit guide is not detected at the home position within the specified time (800 ms)

Possible Causes

- Guide plate motor overload
- Motor defective
- Motor harness defective
- Motor connector loose

SC745: Finisher Folder Plate Motor Error (B468)

Definition [D]

The folder plate moves but is not detected at the home position within the specified time.

- Folder plate HP sensor defective
- Folder plate HP sensor harness broken or poor connection
- Folder plate motor defective
- Finisher main control board defective
- Motor overload



SC746: Stapler Unit Saddle Stitch Motor Error 1

Definition [D]

The front stapler unit saddle-stitch motor does not start operation within the specified time (450 ms).

Possible Causes

- Motor harness defective or connection loose
- Motor defective
- Finisher main controller board defective
- Motor overload

SC747: Stapler Unit Saddle Stitch Motor Error 2

Definition [D]

The rear stapler unit saddle-stitch motor does not start operation within the specified time (450 ms).

Possible Causes

- Motor harness defective or connection loose
- Motor defective
- Finisher main controller board defective
- Motor overload

SC750: Cover Interposer Tray Bottom Plate Motor Error

Definition [D]

One of the following events occurred:

- After the motor starts to raise the bottom plate, the bottom plate position sensor does not detect the plate at the specified time (3 s).
- After the motor starts to lower the bottom plate, the bottom plate HP sensor does not detect the bottom plate.

- Bottom plate position sensor defective
- Bottom plate HP sensor defective
- Bottom plate lift motor defective
- Cover interposer tray main board defective
- Motor connectors loose or harness defective

SC800: Video Output Transmission End Error

Definition [B]

A video signal is sent to the engine but no command is received within the prescribed time from the engine to signal the end of transfer – output all black.

Possible Causes

• Controller defective

SC804: Video Input End Error

Definition [B]

Video transfer is requested from the scanner, but no command is received within the prescribed time from the scanner to signal a response, and output is all black.

Possible Causes

• Controller board defective

SC817 Monitor Error

Definition [B]

This is a file detection and electronic file signature check error when the boot loader attempts to read the self-diagnostic module, system kernel, or root system files from the OS Flash ROM, or the items on the SD card in the controller slot are false or corrupted.

Error (Codes
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Code	Meaning	
0x0000 0000	BIOS boot error	
0x0000 0001	Primary boot start load error	
0x0000 0002	Secondary boot load error (Boot3.Elf)	
0x0000 0003	Self-diagnostic module error (Diag.Elf	
0x0000 0004	Kernel start error (Netbsd)	
0x0000 0005	Root file system file read error (Rootfs)	
Oxffff ffff	Other error	

Possible Causes

- OS Flash ROM data defective; change the controller firmware
- SD card data defective; use another SD card
 - For example:

Data in the self-diagnostic module, system kernel, or root system files are corrupted or do not exist in OS flash ROM or on the SD card Files in the self-diagnostic module, kernel, or root file system on the SD card have been falsified or altered

- **NOTE:** 1) Before discarding the SD card, try to update the data on the card. If the error occurs again, the card may be defective.
 - 2) Be sure to use an SD card that contains the correct electronic signature.



SC818 Watch Dog Error

Definition [B]

While the system program is running, a bus hold or interrupt program goes into an endless loop, preventing any other programs from executing.

Possible Causes

- System program defective; switch off/on, or change the controller firmware if the problem cannot be solved
- Controller board defective
- Controller option malfunction



SC819 Fatal kernel error

Definition [B]

RAM overflow occurs during system processing. One of the following messages is displayed on the operation panel.

NOTE: For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

SMC Report Error Code: 0x696e

init died

SMC Report Error Code: 0x766d

vm_pageout: VM is full

- Controller board defective
- Software defective; change the controller firmware

SC821: Self-Diagnostic Error 1: ASIC Not Detected

NOTE: For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

SMC Report Error Code: 0B00

Definition [B]

Error code 0xffff ffff is returned when the register Write & Verify check is executed on the ASIC mounted on the controller board. The ASIC controls the ROM and buses for other devices.

Possible Causes

ASIC (Bassoon) defective

NOTE: Replace the controller board.

SMC Report Error Code: 0B06

Definition [B]

ASIC not detected.

Possible Causes

- ASIC (Bassoon) defective
- Poor connection between North Bridge and PCI I/F

NOTE: Replace the controller board.

SMC Report Error Code: 0B10

Definition [B]

Failed to initialize or could not read connection bus. Data in SHM register incorrect.

Possible Causes

- Connection bus defective
- SHM defective
- **NOTE:** Replace the controller board.

SC822: Self-Diagnostic Error 2: HDD

NOTE: For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

SMC Report Error Code: 3004

Definition [B]

No response to the self-diagnostic command from the ASIC to the HDDs.

Possible Causes

• One or both HDDs defective

SMC Report Error Code: 3013

Definition [B]

Mandolin does not respond, the HDD device remains BUSY for more than 31 s, or the BUSY signal does not drop within 6 s after the diagnostic command is issued to the HDDs.

Possible Causes

- One or both HDDs defective
- HDD connector loose or defective
- Controller defective

SMC Report Error Code: 3014

Definition [B]

Error returned from HDD in response to the self-diagnostic command, Mandolin could not be located due to a read/write error at the HDD register.

Possible Causes

• One or both HDDs defective

SMC Report Error Code: 3023

Definition [B]

Mandolin does not respond, the HDD device remains BUSY for more than 31 s, or the BUSY signal does not drop within 6 s after the diagnostic command is issued to the HDDs.

Possible Causes

- One or both HDDs defective
- HDD connector loose or defective
- Controller defective

SMC Report Error Code: 3024

Definition [B]

Error returned from HDD in response to the self-diagnostic command, Mandolin could not be located due to a read/write error at the HDD register.

Possible Causes

• One or both HDDs defective

SC824 Self-Diagnostic Error 3: NVRAM

Definition [B]

The NVRAM is not installed or is damaged.

Possible Causes

- NVRAM not installed
- NVRAM defective
- Controller board defective
- Backup battery has discharged

SC826: Self-Diagnostic Error 4: RTC Backup Battery Error

Definition [B]

The RTC backup battery has discharged or the voltage of the installed battery is not within the specified range.

Possible Causes

- NVRAM installed incorrectly
- RTC backup battery defective
- Controller board defective
- NVRAM defective

SC828 Self-Diagnostic Error 5: ROM Error

Definition [B]

Measuring the CRC for the boot monitor and operating system program results in an error. This check is not executed when booting the machine from an SD card.

Possible Causes

- SD card defective
- Controller board defective

SC829 Self-Diagnostic Error 6: Optional RAM

Definition [B]

A check of the optional RAM installed in Slot 0 on the controller board returned an error.

- RAM DIMM installed incorrectly
- RAM DIMM defective
- RAM DIMM slot damaged or defective; replace the controller board

SC833: Self-Diagnostic Error 7: Engine I/F ASIC

NOTE: For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

SMC Report Error Code: 0F30, 0F31

Definition [B]

ASIC (Mandolin) for system control could not be detected. After the PCI is configured, the device ID for the ASIC could not be confirmed.

Possible Causes

- The ASIC (Mandolin) for system control is defective
- I/F between North Bridge and AGPI is defective

NOTE: Replace the Mother Board.

SMC Report Error Code: 0F41

Definition [B]

The read/write check conducted for resident RAM mounted on the Mother Board failed.

Possible Causes

Memory device defective

NOTE: Replace the Mother Board.

SMC Report Error Code: 50B1

Definition [B]

Failed to initialize or read the bus connection.

Possible Causes

- Bus connection defective or loose
- SSCG defective

NOTE: Replace the Mother Board.

SMC Report Error Code: 50B2

Definition [B]

Value of the SSCG register is incorrect.

- Bus connection defective or loose
- SSCG defective
- Replace the Mother Board.

SC834: Self-Diagnostic Error 8: Optional Memory RAM DIMM

Definition [B]

The write/verify check for the optional RAM chip on the engine I/F board (mother board) returned an error

Possible Causes

- Controller board defective
- Mother board defective

SC838 Self-Diagnostic Error 9: Clock Generator

Definition [B]

Setup data is read from the clock generator via the I2C bus but differs from the prescribed value due to defects in the clock generator, in the I2C bus, or the I2C bus port for the PCU.

Possible Causes

• Controller board defective

SC850: Network I/F Error

Definition [D]

One of the following conditions exists:

- Duplicate IP addresses
- Illegal IP address
- Driver unstable and cannot be used on the network.

Possible Causes

- IP address setting incorrect
- NIB (PHY) defective
- Controller board defective

SC851: IEEE 1394 I/F Error

Definition [D]

Driver setting incorrect and cannot be used by the 1394 I/F.

- NIB (PHY), LINK module defective; change the Interface Board
- Controller board defective

SC853: Wireless LAN Error 1

Definition [D]

The board that holds the wireless LAN card can be accessed, but the wireless LAN card (802.11b/Bluetooth) itself could not be accessed while the machine was starting up.

Possible Causes

• Wireless LAN card has been removed

SC854: Wireless LAN Error 2

Definition [D]

The board that holds the wireless LAN card can be accessed, but the wireless LAN card (802.11b/Bluetooth) itself cannot be could not be accessed while the machine was operating.

Possible Causes

• Wireless LAN card has been removed

SC855: Wireless LAN Error 3

Definition [D]

An error is detected for the wireless LAN card (802.11b or Bluetooth).

Possible Causes

- Wireless LAN card defective
- Wireless card connection not tight

SC856: Wireless LAN Error 4

Definition [D]

An error is detected for the wireless LAN board (802.11b or Bluetooth).

Possible Causes

- Wireless LAN card board defective
- PCI connector loose (External controller interface board)

SC857: USB I/F Error 1

Definition [D]

The USB driver is unstable and generated an error. The USB I/F cannot be used.

Possible Causes

• USB board or controller board defective

SC860: HDD Error 1

Definition [D]

One of the following occurred:

• The HDD is connected, but the driver detected one of the following errors:

SS_NOT_READY	One or both HDDs are not ready.
SS_BAD_LABEL	Partition types are different
SS_READ_ERROR	Error returned during label read or label check
SS_WRITE_ERROR	Error returned during label write or label check
SS_FS_ERROR	File system repair failed
SS_MOUNT_ERROR	File system mount failed
SS_COMMAND_ERROR	Drive does not answer the command
SS_KERNEL_ERROR	Kernel internal error
SS_SIZE_ERROR	Driver size is too small
SS_NO_PARTITION	Specified partition does not exist
SS_NO_FILE	Device files do not exist

• The driver could not acquire the status of the hard disks within 30 s.

Possible Causes

- Hard disks are not formatted
- Hard disk corrupted; reformat the disks with SP mode

SC861: HDD Error 2: HDD Startup

Definition [B]

The hard disks were detected at power on, but the disks were not detected within 30 s after recovery from the energy conservation mode.

- Cable between the hard disks and controller board disconnected or loose
- Hard disk power connector loose
- One of the hard disks is defective
- Controller or mother board defective



SC862 HDD Error 3: Bad Sectors

Definition [A]

The number of bad sectors on the HDD in the area for storing images exceeds 101.

Possible Causes

- Too many bad sectors accumulated on the HDDs.
- **NOTE:** 1) Execute SP5832 002 (HDD Formatting IMH) to format the HDD and replace the bad sectors; copy the stamp data after doing this (use SP 5853).
 - 2) HDD replacement is recommended because an HDD unit that generates bad sectors is probably of poor quality and performs poorly.

SC863: HDD Error 4: HDD Read Error

Definition [B]

The system cannot read the data written on the hard disks.

Possible Causes

• Sectors on the disks have become corrupted during operation; replace the hard disks

SC864: HDD Error 5: Data CRC Error

Definition [B]

During HDD operation, the HDD could not respond to a CRC error query.

Possible Causes

• Mother board defective

SC865: HDD Error 6: Access Error

Definition [B]

HDD responded to an error during operation for a condition other than those for SC863, 864.

Possible Causes

HDD defective

SC866: SD Card Error 1: Confirmation

Definition [B]

The machine detects an electronic license error in the application on the SD card inserted in the controller slot when the machine is powered on.

The program stored on the SD card contains electronic confirmation license data. If the program does not contain this license data, or if the result of the check reveals the license data in the program on the SD card is incorrect, then the checked program cannot execute and this SC code is displayed.

Possible Causes

Required program missing or incorrect

NOTE: Download the correct program for this machine onto the SD card.

SC867 SD Card Error 2: SD Card Removed

Definition [B]

The SD card inserted in the boot slot when the machine was powered on was removed while the machine was still switched on.

- SD card removed from boot slot on the controller
- Cycle the machine off/on



SC868 SD Card Error 3: SD Card Access

Definition [B]

An error is returned during an operation using an SD card. Debug console acquires more detailed information about the error.

Possible Causes

- SD card not inserted completely
- SD card defective
- Controller board defective
- **NOTE:** If this SC code is displayed again after cycling the machine off and on, use another SD card. If this does not solve the problem, replace the controller board.

SC870: Address Book Data Error

Definition [B]

Address book data stored on the hard disk was detected as abnormal when it was accessed from either the operation panel or the network.

The address book data cannot be read from the HDD or SD card where it is stored, or the data read from the media is defective.

Possible Causes

- Software defective; switch off/on, and change the controller firmware if the problem is not solved
- HDD defective

Recovery

- Execute SP5846 050 (UCS Settings Initialize all Directory Info.) to initialize all address book data.
- Initialize the user information with SP5832 006 (HDD Formatting– User Information 1) and SP5832 007 (HDD Formatting – User Information 2).
- Replace the HDDs.
- Boot the machine from the SD card.

SC880: Media Link Board Error

Definition [B]

A request for access to the Media Link Board was not answered within the specified time.

Possible Causes

• Media Link Board defective

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SC900: Electrical Total Counter Error

Definition [A]

The total counter contains data that is not a number.

Possible Causes

- NVRAM disturbed unexpectedly
- NVRAM defective
- NVRAM data corrupted

SC901: Mechanical Total Counter Error

Definition [B] The mechanical total counter is disconnected.

Possible Causes

- User removed the counter while it was operating
- Poor connection
- Mechanical total counter defective

SC910: External Controller Error 1

Definition [D] Not used.

SC911: External Controller Error 2

Definition [D] Not used.

SC912: External Controller Error 3

Definition [D] Not used.

SC913: External Controller Error 4

Definition [D] Not used.



SC914: External Controller Error 5

Definition [D] Not used.

SC919: External Controller Error 6

Definition [B]

While EAC (External Application Converter), the conversion module, was operating normally, the receipt of a power line interrupt signal from the FLUTE serial driver was detected, or BREAK signal from the other station was detected.

Possible Causes

- Power outage at the EFI controller
- EFI controller was rebooted
- Connection to EFI controller loose

SC920: Printer Error 1

Definition [D]

An internal application error was detected and operation cannot continue.

Possible Causes

- Software defective; switch off/on, or change the controller firmware if the problem is not solved
- Insufficient memory

SC921: Printer Error 2

Definition [D]

When the printer application started, the font to use could not be found on the SD card.

Possible Causes

• The font is not on the SD card

SC925 NetFile Function Error

Definition [B]

The NetFile file management on the HDD cannot be used, or a NetFile management file is corrupted and operation cannot continue.

The HDDs are defective and they cannot be debugged or partitioned, so the Scan Router functions (delivery of received faxes, document capture, etc.), Web services, and other network functions cannot be used.

Display	Meaning	
(-1)	HDD not connected	
(-2)	HDD not ready	
(-3)	No level	
(-4)	Partition type incorrect	
(-5)	Error returned during level read or check	
(-6)	Error returned during level read or check	
(-7)	"filesystem" repair failed	
(-8)	"filesystem" mount failed	
(-9)	Drive does not answer command	
(-10)	Internal kernel error	
(-11)	Size of drive is too small	
(-12)	Specified partition does not exist	
(-13)	Device file does not exist	

HDD status codes displayed on the debug console:

Possible Causes

- HDD defective
- Power supply to machine cut occurred while writing data to HDD
- Software error

Recovery

Procedure 1

If the machine returns SC codes for HDD errors (SC860 ~ SC865), please follow the recovery procedures described for these SC codes.

Procedure 2

If the machine does not return one of the five HDD errors (SC860 ~ SC865), cycle the machine off and on. If this does not solve the problem, then initialize the NetFile partition on the HDD with SP5832 011 (HDD Formatting – Ridoc I/F).

NetFiles: Jobs printed from the document server using a PC and DeskTopBinder

- Before initializing the NetFile partition on the HDD please inform the client that:
 - Received faxes on the delivery server will be lost
 - All captured documents will be lost
 - DeskTopBinder/Print Job Manager/Desk Top Editor job history will be cleared

Troubleshooting

- Documents stored on the document server, included scanned documents, will not be lost.
- The first time the network accesses the machine, the management information must be reconfigured (this will require a significant amount of time).

Before initializing the Netfile partition with SP5823 011, do the following:

- 1. Enter the User Tools mode and execute "Delivery Settings" to print all received fax documents scheduled for delivery and delete them.
- 2. In the User Tools mode, execute Document Management> Batch Delete Transfer Documents.
- 3. Execute SP5832 011 then cycle the machine off and on.

Procedure 3

If "Procedure 2" does not solve the problem, execute SP5832 001 (HDD Formatting – All), then cycle the machine off and on.

Executing SP5832 001 erases all document and address book data stored on the hard disks. Be sure to consult with the customer before executing this SP code.

Procedure 4

If "Procedure 4" fails to correct the problem, replace the HDDs.

SC951: F-GATE Signal Error

Definition [B]

When the IPU has already received the F-GATE signal (laser writing start trigger signal), the IPU receives another F-GATE signal.

Possible Causes

- Software defective; switch off/on, or change the BCU firmware if this does not solve the problem
- BCU defective

SC953: Scanner Image Setting Error

Definition [B]

The settings required for image processing using the scanner are not sent from the IPU.

- Check the connections between the MCU and LCDC and BCU
- Replace the MCU, BCU, or IPU
- Change the BCU or MCU firmware

SC954: Printer Image Setting Error

Definition [B]

The settings that are required for image processing using the printer controller are not sent from the IPU.

Possible Causes

- Check the connections between the IPU and the LDB, and from the LDB to the polygon mirror motor control PCB.
- Change the IPU or LDB
- Change the polygon mirror motor or the polygon mirror motor control PCB
- Change the BCU firmware



SC955: Memory Setting Error

Definition [B]

The settings that are required for image processing using the memory are not sent from the IPU.

Possible Causes

- Format the hard disks
- Change the hard disks
- Controller defective
- Change the mother board or IPU
- Change the controller firmware or the BCU firmware

SC964: Scanner Start Error

Definition [B]

During scanned image processing, another command to start scanning was received.

Possible Causes

• Change the BCU firmware

SC965: Print Start Error

Definition [B]

During print processing, another command to start printing was received.

Possible Causes

• Change the BCU firmware

SC966: Polygon Mirror Motor Ready Error

Definition [B]

The polygon mirror motor does not reach ready status within 15 s after the copy paper is detected by the registration sensor. (15 s after the write request was issued for the IPU, the F-GATE signal remained LOW.)

Possible Causes:

- Polygon mirror motor defective
- Poor connection between polygon mirror motor drive board and BCU
- Polygon mirror motor drive board defective
- BCU defective

SC970: Scanner Ready Error

Definition [B]

The scan ready signal is not generated by the MCU for more than 10 s after the read start signal is sent to the MCU.

Possible Causes

- Serial data transfer between MCU and BCU (through the LCDC)
- Change the MCU firmware

SC990: Software Performance Error 1

Definition [B]

An unexpected operation was encountered by the software.

Possible Causes

• Software crash; reboot the machine

Procedure 1

If the HDDs have just been replaced, be sure to download the stamp data (SP 5853).

Procedure 2

With SP5990 004 (SMC Report – Logging Data), print the most recent information for SC990. The SC990 information displays the file name, line number, and value. Report this information to your technical supervisor. For example:

Function.c LINE: 123 VAL:0

SC991: Software Error 2

Definition [D]

Software attempted to execute an unexpected operation. However, unlike SC990, operation can be recovered.

Possible Causes

• Software crash; reboot the machine

Recovery

After SC991 has been issued, the machine cannot be used until it is cycled off an on.

Procedure 1

Cycle the machine off and on.

Procedure 2

Enter the SP mode and execute SP5990 to print an SMC report, or execute SP7403 to review the "SC History".

-or-

With SP5990 004 (SMC Report – Logging Data), print the most recent information for SC9901. The SC991 information displays the file name, line number, and value. Report this information to your technical supervisor. For example:

Function.c LINE: 123 VAL:0

SC992: Software Error 4: Undefined Error

Definition [B]

Software encountered an unexpected operation. This error is issued if the error cannot be covered by SC990.

Possible Causes

- Software defective
- An error undetectable by any other SC code occurred

Recovery

• The machine cannot be used until this error is cleared. Cycle the machine off and on.

shooting

SC997: Application Selection Error

Definition [D]

An application did not start after pressing the appropriate key on the operation panel.

- Software bug; change the firmware for the application that failed
- A RAM or DIMM option required by the application is not installed or not installed correctly.



SC998: Application Start Error

Definition [B]

Register processing does not execute for any application within 60 s after the machine is powered on. No application starts correctly, and all end abnormally.

Possible Causes

- Software defective; change the firmware for the application that failed
- A RAM or DIMM option required by the application is not installed or not installed correctly.

SC999: Program Download Error

Definition [B]

The program download from the SD card does not execute normally. This SC is not logged.

- Card installed incorrectly
- BCU defective
- SD card defective
- Controller board defective
- Power down during program downloading
- Wrong type of card inserted (see Section 5 "Service Tables" for downloading procedures)

5. SERVICE TABLES

5.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

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.

To Enter and Exit the SP Mode

- 1. Press Clear Modes key 🔊.
- 2. On the operation panel keypad, press (10).
- Hold down Clear key ^{Clear} more than 3 seconds. The Copy SP or PM Counter items are displayed. If the printer or scanner/printer option is installed, the Printer SP and Scanner SP items are also available.
- 4. Press Copy SP.
- 5. To exit the SP mode, just press Exit in the upper right corner of the SP mode screen.

To Switch to the Copy Window for Test Printing

- 1. In the SP mode display, press Copy Window to switch to the copy operation screen when you need to select paper for a test print.
- 2. Use the copy window (copier mode) to select the appropriate settings (paper size, etc.) for the test print.
- 3. Press Start key (*) to execute the test print.
- 4. Press SP Mode (highlighted) to return to the SP mode screen and repeat from step 1.

Using the SP Mode

SP command numbers can be entered directly (if you know the entire number) or the command can be selected from the menus.

Direct Entry

If you know all seven digits of the SP code, enter the seven numbers and press Enter key (#).

However, if you do not know all the numbers, enter only the first four numbers of the seven-digit SP and press Enter key (#). The display goes immediately to the first SP of that group. Then you can use the buttons to browse to the desired selection.

Button Selection Entry

- 1. Refer to the SP Mode Tables at the end of this section to find the SP that you want to adjust.
- 2. Press the Group number on the left side SP Mode window that contains the SP that you want to adjust.
- 3. Use the scrolling buttons in the center of the SP mode window to display the SP number that you want to open, then, press that number to expand the list.
- 4. Use the center touch-panel buttons to scroll to the number and title of the item that you want to set, and press Enter key ^(#). The small entry box on the right is activated and displays the default or the current setting below.
- 5. To enter a setting
 - Press (*) key to enter a minus sign. Then use the keypad to enter the appropriate number. The number you enter will write over the previous setting.
 - Press (#) to enter the setting. (If you enter a number that is out of range, the key press is ignored.)
 - Press Clear key $\overset{\text{liear}}{\square}$ to cancel the data.
- 6. If you need to perform a test print, press Copy Window to open the copy window and select the settings for the test print. Press Start ^(®) key.
- 7. Press SP Mode (highlighted) in the copy window to return to the SP mode display.
- 8. When you are finished, press Exit twice to return to the copy window.

SP Mode Button Summary

Here is a short summary of the touch-panel buttons.



B064S500.WMF

Tables

(1)	Open All . Opens all SP groups and sublevels.	
(2)	Close All. Closes all open groups and sublevels and restores the initial SP mode display.	
(3)	Copy Window . Opens the copy window (copy mode) so you can make test copies. To return to the SP mode screen, press SP Mode (highlighted) in the copy window.	vice
(4)	SP Direct . Enter the SP code directly with the number keys if you know the SP number, then press Enter key (#). (SP Direct must be highlighted before you can enter the number. Just press SP Direct if it is not highlighted.)	Ser
(5)	Exit . Press twice to leave the SP mode and return to the copy window to resume normal operation.	
(6)	SPnxxx . Press any group number to open a list of SP codes and titles for that group. For example, to open the SP code list for SP1-nnn, press SP1XXX. If an SP has sublevels, it is marked with a right pointing triangle.	
(7)	Group . Press to scroll the display to the previous or next group.	
(8)	Page . Press to scroll to the previous or next display in segments the size of the screen display (page).	
(9)	Line. Press to scroll the display to the previous or next line, line by line.	
(10)	Prev Page or Next Page . Press to move the highlight on the left to the previous or next selection in the list.	

5.2 SERVICE PROGRAM MODE TABLES

NOTE: The Service Program Mode is for use only by customer engineers so that they can properly maintain product quality. If this mode is used by anyone other than a customer engineer for any reason, data might be deleted or settings might be changed. In such a case image quality can no longer be guaranteed.

Service Table Key

Notation	What it means	
[range / default /	[–9~+9 / +3.0 / 0.1 mm]	
step]	The default setting +3.0 can be adjusted in 0.1mm steps in the	
	range ±9.	
Italics	Comments added for reference.	
*	An asterisk marks the SP's that are reset to their factory default	
	settings after an NVRAM reset.	
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.	
SEF	Short Edge Feed	
LEF	Long Edge Feed	

5.2.1 COPIER SERVICE PROGRAM MODE TABLES

SP1-nnn Feed

SP		Number/Name	Function/[Setting]
1001	Leading Edge Registration		Adjusts the printing leading edge registration for feeding from the trays and duplex tray using the trimming area pattern (SP2-902-3, No.15).] Use the "•/ *key to enter the minus (–) before entering the value. The specification is $4 \pm 2 \text{ mm.}$ ($raccenterererererererererererererererererere$
	001	Copier/LCT Paper Tray	B070: [-9.0~+9.0 / -2.6 / 0.1 mm] B071: [-9.0~+9.0 / -4.0 / 0.1 mm]
	002	Duplex Tray	B070: [-9.0~+9.0 / -0.3 / 0.1 mm] B071: [-9.0~+9.0 / -0.4 / 0.1 mm])
	003	Copier//LCT Paper Tray (Low Speed)	B070: [-9.0~+9.0 / -3.0 / 0.1 mm] B071: [-9.0~+9.0 / -2.0 / 0.1 mm]
	004	Duplex Tray (Low Speed)	[-9.0~+9.0 / 0 / 0.1 mm]
1002	Side-to-side Registration		Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-902-3, No.15). Use the "•/ *key to enter the minus (–) before entering the value. Specification: 0 ± 2.0 mm. ($-3-17$)
	001	1st Tray (Copier Tandem Tray)	[-9.0~+9.0 / -0.1 / 0.1 mm]
	002	2nd Tray (Copier)	[-9.0~+9.0 / -0.6 / 0.1 mm]
	003	3rd Tray (Copier)	[-9.0~+9.0 / -0.3 / 0.1 mm]
	004	4th Tray (LCT Tray 1)	[-9.0~+9.0 / -0.8 / 0.1 mm]

SP		Number/Name	Function/[Setting]
1002	005	5th Tray (LCT Tray 2)	[-9.0~+9.0 / -0.8 / 0.1 mm]
	006	6th Tray (LCT Tray 3)	[-9.0~+9.0 / +0.3 / 0.1 mm]
	007	7th Tray (Bypass Tray)	[-9.0~+9.0 / -0.3 / 0.1 mm]
	008	Duplex Tray (Copier)	[-9.0~+9.0 / 0 / 0.1 mm]
1003	Paper E	Buckle Adjustment (Registration)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A plus or minus setting increases or decreases the amount of buckle.)
	001	Copier Paper Tray	[-9~+9 / + 4 / 1 mm]
	002	LCT	[-9~+9 / + 4 / 1 mm]
	003	Duplex Tray	[-9~+9 / + 4 / 1 mm]
1008		Duplex Fence Adjustment	Adjusts the distance between the front and rear duplex fences. [-2.0~+2.0 / 0 / 0.5 mm]
1103		Fusing Idling After Low Power Mode	Selects whether fusing idling is done or not when recovering from the low power mode [0~1 / 0 / 1] 0: Not Done 1: Done
1105	Fusing	Temperature Adjustment	
	001	Fusing Temperature in Waiting Condition	Adjusts the fusing temperature for stand- by. B070: [168~178/ 168 / 1 deg] B071: [168~178 / 173 / 1 deg]
	002	Fusing Temperature Lower Limit	Adjusts the fusing temperature lower limit. When the fusing unit falls below this temperature, the machine stops copying. Copying automatically restarts when the fusing temperature recovers. DFU B070: [148~158 / 148 / 1 deg] B071: [148~158 / 153 / 1 deg]
	003	Fusing Temperature Correction (< A4 / LT)	Specifies the amount to raise the fusing temperature from standby mode to print on paper smaller than A4/LT LEF. B070: [0~10 / 7 / 1 deg] B071: [0~10 / 10 / 1 deg]
	004	Fusing Temperature Correction (>A4 / LT)	Specifies the amount to raise the fusing temperature from standby mode to print on paper of A4/LT width LEF or wider. B070: [0~10 / 2 / 1 deg] (B070) B071: [0~10 / 5 / 1 deg] (B071) Note : The threshold paper width used for SP1105 003 and 004 depends on SP1105 010.
	005	Fusing Temperature Correction (Transparencies)	Specifies the amount to raise or lower fusing temperature from standby mode to print on OHP Transparencies. B070: [-10~+5 / +2 / 1 deg] (B070) B071: [-10~+5 / +5 / 1 deg] (B071)

Service Tables

SP		Number/Name	Function/[Setting]	
1105	006	Fusing Temperature Correction (Translucent Sheets)	Specifies the amount to raise or lower fusing temperature from standby mode to print on Translucent Sheets (tracing paper). B070: [-10~+5 / +2 / 1 deg] B071: [-10~+5 / +5 / 1 deg]	
	007	Fusing Lamp Switching at Warm- up	Specifies the fusing temperature when switching from 3 fusing lamps on to 2 fusing lamps on to stabilize the fusing temperature from warm-up. (The fusing lamp that heats the center of the hot roller is turned off.) [20~140 / 40 / 1°C]	
	008	Fusing Temperature Adjustment in Lower Power Mode	Sets the target temperature for the hot roller when the machine enters low power mode. B070: [101~178/ 143 / 1°C] B071: [101~178/ 150 / 1°C]	
	009	Fusing Idling Start Temperature	Sets the start temperature for fusing idling. [100~160 / 150 / 1°C]	
	010	Paper Size Selection for Temperature Correction	Determines which threshold paper width is used for SP1105 003 and SP1105 004. [0~1 / 0 / 1] 0: LT/A4 LEF 1: 257 mm wide (B5 SEF).	
	011	Fusing Lamp Switching after Low Power Mode	Specifies the fusing temperature to switch from 3 fusing lamps on to 2 fusing lamps on when the machine returns from low power mode: SP1105-1 – SP1105 011 = Actual Temp. [5~20 / 10 / 1°C] The third lamp is not switched on to prevent overshooting the target temperature.	
1106		Fusing Temperature Display	Displays the fusing temperature.	
1107		Fusing Idling Time Setting	Sets the fusing idling time. [0~60 / 10 / 1 s]	
1108	Fusing Adjustment before Ready Condition			

SP		Number/Name	Function/[Setting]	
	001	Waiting Condition Time Setting	Specifies the length of time to elapse after the target temperature has been reached in order to apply even heat across the length of the hot roller. Only applies when fusing idling is used. [0~180 / 80 / 1s] This SP attempts to reduce the amount of paper wrinkling, especially if the first job is on A3 paper after the machine is started up at the beginning of the workday.	
1108	002	Temperature Correction	Corrects the fusing temperature before reaching standby temperature in order to prevent overshooting standby temperature. DFU [-10~-5 / -8 / 1°C]	
1109	Fusing Nip Band Check		Use OHP to execute this SP and feed 1 sheet between the hot roller and pressure roller where it remains for 30 s and is then fed out so you can measure the nip band width. [OFF , ON]	
1902	Web Motor Control			
	001	Web Consumption	Displays how much of the web has been used, expressed as a percentage of the roll consumed. Switch the machine off/on after changing this setting. [0~107 / 0 / 1%] When you install a partially used roll from another machine, read this SP before removal, then input that value with this SP on the next machine. Otherwise, the machine has no way of knowing how much of the partially used roll has been consumed.	
	002	Web Motor Drive Interval	Determines how often the web motor turns on. B070 EUR/A: [3~130 / 12.6 / 0.1 sec] NA: [3~130 / 20.7 / 0.1 sec] B071 EUR/A: [3~130 / 10.4 / 0.1 sec] NA: [3~130 / 17.0 / 0.1 sec]	
	003	Web Motor Drive Time	Changes the time that the web motor is driven. [0.3~3.5 / 2.8 / 0.1 s]	
	004	Web Near End Setting	Changes the web consumption ratio at which web near end is displayed. EUR/A: [0~100 / 86 / 1%] NA: [0~100 / 90 / 1%]	
Ĩ	SP		Number/Name	Function/[Setting]
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		005	Web Motor Drive Interval (Low	Determines how often the web motor
			Speed)	turns on in Low Speed mode.
				EUR/A: [3~130 / 15.4 / 0.1 s]
				NA: [3~130 / 25.3 / 0.1 s]
	1903	Web Dr	ive Time	
		001	Web Total Time Display (x 200ms)	Displays the total amount of time (seconds) elapsed during web roll feed.
		002	Web Actual Time Display (x 100ms)	Displays the total amount of web roll motor operation time (seconds) for feeding the current web roll.
	1906	001	Duplex Stop Position - Right	Changes the paper stop position in the duplex unit after passing duplex transport sensor 2. DFU [-10~+10 / 0 / 2 mm]
I	1907	Paper F	eed Timing Adjustment	Specifies when to stop the feed clutch once a sheet of paper reaches the feed sensor and switches it on. [0~1000 / 0 / 100 ms] <i>This SP mode is used as a multi-feed</i> <i>countermeasure. However, copy (print)</i> <i>speed is slightly reduced.</i>
		001	Tray 1	
		002	Tray 2	
		003	Tray 3	
		004	Tray 4 (LCT Tray 1)	
		005	Tray 5 (LCT Tray 2)	
		006	Tray 6 (LCT Tray 3)	
		007	Tray 7 (Bypass Tray)	
		008	Translucent Sheets	

SP2-nnn Drum

SP	Number/Name		Function/[Setting]
2001	Charge	Corona Bias Adjustment	
	001	Grid Voltage in Imaging Area (Auto Process Control OFF)	Adjusts the voltage applied to the grid plate during copying when auto process control is off . [-600~-1300 / - 900 / 10 V] <i>Normally, there is no need to adjust this.</i> <i>However, if there is an ID or TD sensor</i> <i>problem, the machine goes into fixed</i> <i>toner supply mode. After replacing the</i> <i>drum or charge corona wire, reset this</i> <i>value to the default</i>
	002	Grid Voltage in ID Sensor Pattern(Auto Process Control OFF)	Adjusts the voltage applied to the grid plate when making the ID sensor pattern, when auto process control is switched off . [-600~-1300 / -770 / 10 V] <i>Normally, there is no need to adjust this.</i> <i>If the user wants high-density copies, the</i> <i>sensor pattern must be lighter, so this</i> <i>voltage must be a higher negative</i> <i>voltage.</i>
	003	Grid Voltage in Imaging Area (Auto Process Control ON)	Adjusts the voltage applied to the grid plate during copying when auto process control is switched on . [-600~-1300 / - 1000 / 10 V] <i>This voltage changes every time auto</i> <i>process control starts up (every time the</i> <i>machine is switched on)</i>
	004	Grid Voltage for Transparencies	Adjusts the voltage applied to the grid plate when Transparency mode is selected. [-600~-1300 / - 770 / 10 V] Use this if there is a copy quality problem when making copies on Transparencies. Normally there is no need to adjust this SP.
	005	Total Corona Current	Adjusts the current applied to the charge corona wire except in Photo mode. [-1000~-2800 / - 1400 / 10 uA]
	006	Total Corona Current (Photo Mode)	Adjusts the current applied to the charge corona wire for Photo mode. [-1000~-2800 / - 1600 / 10 uA]
	007	Vd (Auto Process Control)	Adjusts the target VD voltage for Process Control Initial Setting. [-700~-1000 / - 800 / 5 V]
	008	Grid Voltage in Imaging Area (Auto Process Control off/Low Speed)	Adjusts the voltage applied to the grid plate during copying when auto process control is switched off and the machine is in the low speed mode. [-600~-1300 / - 850 / 10 V]

SP		Number/Name	Function/[Setting]
2001	009	Grid Voltage in ID Sensor Pattern (Auto Process Control off/Low Speed)	Adjusts the voltage applied to the grid plate when making the ID sensor pattern, when auto process control is switched off and the machine is in the low speed mode. [-600~-1300 / - 710 / 10 V]
	010	Grid Voltage Correction in Auto Process Control (Low Speed)	Adjusts the voltage applied to the grid plate when auto process control is on and the machine is in the low speed mode. [0~300 / 110 / 10 V] (B070) [0~300 / 160 / 10 V] (B071) In low speed mode, this value is subtracted from the setting of <i>SP2001</i> 003. For example, if <i>SP2001</i> 003 is set at 1000 and this <i>SP</i> is set at 90, then the value is set at 910 (1000 – 90 = 910).
	011	Grid Voltage for Transparencies (Low Speed)	Adjusts the voltage applied to the grid plate when Transparency mode is selected and the machine is in the low speed mode. [-600~-1300 / - 710 / 10 V]
	012	Total Corona Current (Low Speed)	Adjusts the current applied to the charge corona wire when the machine is in the low speed mode (but not the Photo Mode). [-1000~-2800 / - 1400 / 10 uA]
	013	Total Corona Current for Photo Mode (Low Speed)	Adjusts the current applied to the charge corona wire for Photo mode and low speed mode. [-1000~-2800 / - 1600 / 10 uA]
2101	Printing	Erase Margin	(• 3-17)
	001	Leading Edge	Adjusts the leading edge erase margin. [0~9.0/ 3.5 / 0.1 mm]
	002	Trailing Edge	Adjusts the trailing edge erase margin. [0~9.0/ 2.5 / 0.1 mm]
	003	Left edge	Adjusts the left side erase margin. [0~9.0/ 2.0 / 0.1 mm]
	004	Right edge	Adjusts the right side erase margin. [0~9.0/ 2.0 / 0.1 mm]
2104	LD Pov Pattern	ver Adjustment (for ID Sensor ،)	Selects the LD power for making the ID pattern when auto process control is switched on.
	001	Normal Speed	DFU [0~15 / 4 / 1]
	002	Low Speed	DFU [0~15 / 3 / 1]
2105	LD Pov	ver Correction	This SP mode corrects the banding caused by: 1) changes in drum characteristics over time, and 2) LD power fluctuations. (-3-17)

SP		Number/Name	Function/[Setting]
2105	001	Correction in Printer Mode	If switched ON, this allows each channel to be adjusted for 1200 dpi print output with the SP settings below (LD0 ~ LD7). [0~1 / 1 / 1] 0: OFF, 1: ON
	002	Correction in Copy Mode	If switched ON, this allows each channel to be adjusted for copy output with the SP settings below (LD0 ~ LD7). [0~1 / 0 / 1] 0: OFF, 1: ON
	003	LD0 Power Correction	Correct the power of LD0 after either SP2105-001 or -002 is switched on. [-40~+40 / -2 /1]
	004	LD1 Power Correction	Corrects the power of LD1 after either SP2105-001 or -002 is switched on. [-40~+40 / -2 /1]
	005	LD2 Power Correction	Corrects the power of LD2 after either SP2105-001 or -002 is switched on. [-40~+40 / + 2 /1]
	006	LD3 Power Correction	Corrects the power of LD3 after either SP2105-001 or -002 is switched on. $[-40 \sim +40 / +2 /1]$
	007	LD4 Power Correction	Corrects the power of LD4 after either SP2105-001 or -002 is switched on. $[-40 \sim +40 / +2 /1]$
	008	LD5 Power Correction	Corrects the power of LD5 after either SP2105-001 or -002 is switched on. [-40~+40 / + 2 /1]
	009	LD6 Power Correction	Corrects the power of LD6 after either SP2105-001 or -002 is switched on. [-40~+40 / -2 /1]
	010	LD7 Power Correction	Corrects the power of LD7 after either SP2105-001 or -002 is switched on. [-40~+40 / - 2 /1]
2111	FCI Sh	ade Detection	Allows shading detection if FCI (Fine Character Adjustment) smoothing is on. With this SP switched on, photos and painted areas are detected, and FCI is not applied in these areas. FCI is used for printer mode output only.
	001	Matrix Size (600 dpi)	[0~128 / 18 / 1] 0: OFF
	002	Threshold Value (600 dpi)	[0~128 / 4 / 1] 0: OFF
	003	Matrix Size (400 dpi)	[0~128 / 18 / 1] 0: OFF
	004	Threshold Value (400 dpi)	[0~128 / 4 / 1] 0: OFF

SP	Number/Name		Function/[Setting]
2114	Printer Dot Edge Parameter Setting		Allows setting a parameter for binary edge processing for the printer application with FCI switched off. This SP allows adjustment of image quality if the desired effect cannot be achieved with the default settings for edge processing.
			In general, increasing the values produces thicker lines and decreasing them produces thinner lines. However, some settings could cause defective images on white paper
	001	Leading Dot Level Setting (1200 dpi)	[2~8 / 5 / 1]
	002	Trailing Dot Level Setting (1200 dpi)	[2~8 / 5 / 1]
	003	Multiple Dot Level Setting (1200 dpi)	[2~8 / 8 / 1]
	004	Independent Dot Level Setting (1200 dpi)	[2~8 / 6 / 1]
	005	Leading Dot Level Setting (600 dpi)	[2~16 / 12 / 1]
	006	Trailing Dot Level Setting (600 dpi)	[2~16 / 12 / 1]
	007	Multiple Dot Level Setting (600 dpi)	[2~16 / 16 / 1]
	008	Independent Dot Level Setting (600 dpi)	[2~16 / 12 / 1]
2115	Main Scan Beam Pitch Adjustment		A label attached to the LD unit service part lists the correct settings.
	001	Pitch Adjustment Between LD0 and LD2 (LD0)	[-100~100 / 0 / 1 μm]
	002	Pitch Adjustment Between LD0 and LD4 (LD0)	[-100~100 / 0 / 1 μm]
	003	Pitch Adjustment Between LD0 and LD6 (LD0)	[-100~100 / 0 / 1 μm]
	004	Pitch Adjustment Between LD1 and LD3 (LD1)	[-100~100 / 0 / 1 μm]
	005	Pitch Adjustment Between LD1 and LD5 (LD1)	[-100~100 / 0 / 1 μm]
	006	Pitch Adjustment Between LD1 and LD7 (LD1)	[-100~100 / 0 / 1 μm]
2201	Development Bias Adjustment		
	001	Image Area	Adjusts the development bias for copying. [-200~-800 / - 550 / 10 V] This can be adjusted as a temporary measure if faint copies appear due to an aging drum.
	002	ID Sensor Pattern (Auto Process Control OFF)	Adjusts the development bias for making the ID sensor pattern for VSP measurement when the auto process control is set to off. [-200~-800 / - 400 / 10 V] This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply.

SP		Number/Name	Function/[Setting]
2201	003	Transparencies	Adjusts the development bias for copying
			on Transparencies.
	004		[-200~-800 / -400 / 10 V]
	004	ID Sensor Development Potential	Adjusts the development potential for making the ID sensor pattern for VSP
			measurement when the auto process
			control is set on.
			[140~380 / 240 / 10 V]
	005	Image Area (Low Speed)	Adjusts the development bias for copying
			in low speed mode.
			B070: [-200~800 / - 480 / 10 V]
			B071: [-200~800 / - 450 / 10 V]
	006	ID Sensor Pattern (Auto Process	Adjusts the development bias for making
		Control OFF/Low Speed)	the ID sensor pattern for VSP
			measurement when the auto process
			low speed mode
			B070: [-200~800 / -370 / 10 V]
			B071: [-200~800 / -350 / 10 V]
	007	Transparencies (Low Speed)	Adjusts the development bias for copying
			onto Transparencies in low speed mode.
			B070: [-200~800 / -370 / 10 V]
			B071: [-200~800 / -350 / 10 V]
	008	ID Sensor Development Potential	Adjusts the development potential for
		(Low Speed)	making the ID sensor pattern for VSP
			control is set on and the machine is in the
			low speed mode
			B070: [0~200 / 30 / 10 V]
			B071: [0~200 / 50 / 10 V]
			This value is subtracted from the setting
			of SP2201 004. For example, if 004 is set
			at 240 and 008 set at 60, then the value
0007			is adjusted to 180 (240 – 60 = 180).
2207	Toner		
	001	Forced Toner Supply	Forces toner supply for 10 seconds from
			the toner bank through the toner hopper
			force toner supply
			This mode finishes automatically after the
			toner supplied 10 times. Use to determine
			if toner supply is operating correctly. If
			forcing toner supply with this SP does not
			darken the image, then toner supply is
			not operating correctly.

SP		Number/Name	Function/[Setting]
2207	002	Toner Bank Toner Setup	Turns on the drum motor, development motor, development bias, toner supply motor and charge corona. Then turns on the toner supply coil clutch to supply toner to the toner hopper, but not to the development unit. Requires about 7 minutes. Remove the white gear from the toner hopper and install the red gear. Press Start. Install the white gear again after finishing with this SP mode. Use this SP to fill the toner transport path with toner after cleaning the toner supply unit, or at installation.
2208	Toner \$	Supply Mode	 Selects the toner supply mode: Sensor Control or Image Pixel Count. [0~1 / 0 / 1] 0: Sensor Control 1: Pixel Count Select Image Pixel Count only if the TD sensor has failed and cannot be replaced immediately, so that the customer can use the machine. Return the setting to Sensor Control after replacing the sensor.
2209	Toner S	Supply Rate	
	001	Normal Speed	Adjust the toner supply amount from the hopper for the normal operation. B070: [100~2000 / 850 / 10 mg/s] B071: [100~2000 / 1000 / 10 mg/s] Increasing this value reduces the toner supply roller clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.
	002	Low Speed	Allows adjustment of the toner supply amount from the hopper for low speed mode. B070: [100~2000 / 850 / 10 mg/s] B071: [100~2000 / 1000 / 10 mg/s]
2210	ID Sen	sor Pattern Interval	Changes the interval for making the ID sensor pattern (VSP/VSG detection). [1~500 / 10 / 1 copy] If the user normally makes copies with a high proportion of black, reduce the interval.

SP	Number/Name		Function/[Setting]
SP 2220 2223	Vref Manual Setting		Function/[Setting] Adjusts the TD sensor reference voltage (Vref) manually. [0~5.0 / 2.5 / 0.01 V] Change this value after replacing the development unit with another one that already contains toner. To use a development unit from another machine for test purposes: 1) Check the value of SP2220 and SP2906 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, then input the VREF for this unit into SP2200 and the Vcont for this unit into SP2906. 3) After the test, put back the old development unit, and change SP2220 and SP2906 back to the original value. Displays the current TD sensor output
2225			voltage. [0~5.0 / 2.5 / 0.01 V]
2226	Toner I	3ank Toner Discharge	This SP removes toner from the toner bank and sends it to the toner hopper. After turning the toner supply motor and the toner bank motor on, the toner supply coil clutch turns on and off at 2 second intervals. The motors and clutch stop when the toner near-end sensor (in the toner bank unit) detects no toner. Even if the sensor continues to detect toner, this operation stops when the clutch has been turned on and off 10 times, so this SP may have to be repeated to clean out the system completely.
2227	Toner Supply Mode Display		 Displays the toner supply mode used for the last copy. 1: ID Sensor and TD Sensor (from the 11th copy, using VT – VREF) 2: ID Sensor and TD Sensor (using VSP/VSG) – before the 10th copy of a job 3: TD Sensor – temporary mode when ID sensor output is abnormal 4: Image Pixel Count
2301	Transfer Current Adjustment		Adjusts the current applied to the transfer belt during copying, depending on the side, media type, and operation mode (normal or low speed).
	001	1st Copy Side	B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]
	002	Thick Paper	B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]

SP		Number/Name	Function/[Setting]
2301	003	Transparencies	[10~200 / 140 / 1 μA]
	004	Translucent Sheets	B070: [10~200 / 110 / 1 μA]
			B071: [10~200 / 120 / 1 μA]
	005	2nd Copy Side	B070: [10~200 / 110 / 1 μA]
			B071: [10~200 / 120 / 1 μA]
	006	Between Papers	[10~200 / 20 / 1 μA]
	007	1st Copy Side (Low Speed)	[10~200 / 80 / 1 μA]
	008	Thick Paper (Low Speed)	[10~200 / 80 / 1 μA]
	009	Transparencies (Low Speed)	[10~200 / 90 / 1 μA]
	010	Translucent Sheets (Low Speed)	[10~200 / 80 / 1 μA]
	011	2nd Copy Side (Low Speed)	[10~200 / 80 / 1 μA]
	012	Between Papers (Low Speed)	[10~200 / 20 / 1 μA]
2506	Cleanir	ng Interval-Multiple Copy	
	001	On / Off	Selects whether multiple jobs are stopped
			the drum to clean the cleaning blade
			edge, or 2) create an ID sensor pattern to
			correct toner density control. This SP
			switches this feature on and off. SP2506
			102 sets the interval. 10~1 / 1/11
			0: OFF. 1: ON
			Use if the drum gets dirty or images get
			too pale or too dark during long copy
			jobs.
	002	Interval	Selects the interval at which multi copy
			JODS are stopped for blade cleaning. $[1 \sim 100 / 30 / 1 min]$
			Reduce the value if a large amount of
			paper dust is causing black lines on the
			сору.
2801	TD Ser	isor Initial Setting	Performs the TD sensor initial setting.
			This SP mode controls the voltage
			sensor output about 2.5 V. After finishing
			this, the TD sensor output voltage is
			displayed. Press Start to execute.
			You must enter the developer lot number.
			(I he lot number is stenciled on the top
			Use this mode only after changing the TD
			sensor or the developer.
2803	Charge	Corona Cleaner On	Turns on the corona wire cleaner
			manually. Press Start to execute.
			When copy density across the paper is
			uneven, clean the wire with this SP.

SP		Number/Name	Function/[Setting]
2804	Charge	Corona Cleaner Setting	
	001	Corona Wire Cleaner Operation Setting	Selects when automatic corona wire cleaning is done. [0~2 / 2 / 1] 0: OFF 1: With process control and at intervals selected with SP2804 002
	002	Corona Wire Cleaner Interval	2: At Intervals selected with SF 2004 002. Selects the interval for automatic corona
	002		wire cleaning. [100~10000 / 5000 / 100 copies]
2902	Test Pa	attern	
	001	IPU Scanning Test Pattern	Prints the scan test patterns for the IPU chip. [0~17 / 0 / 1]
	002	IPU Printing Test Pattern	Prints the print test pattern for the IPU chip. [0~8 / 0 / 1]
2902	003	Printing Test Pattern	Prints the printer test patterns. [0~38 / 0 / 1]
2906	001	Vcont Manual Setting	Adjusts the TD sensor control voltage (Vcont) manually. [4.0~24.0 / 9.7 / 0.1 V] 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.(See SP2220.)
2909	Main S	can Magnification	
	001	Сору	Adjusts the magnification in the main scan direction for copy mode. (-3-17) [-2.0~+2.0 / 0 / 0.1%] Use the "• / *key to enter the minus (-) before entering the value.
	002	Printer	Adjusts the magnification in the main scan direction for printing mode. (•3-17) [-2.0~+2.0 / 0 / 0.1%] Use the "•/*key to enter the minus (-) before entering the value.
2910	Writing Sub Scan Magnification		Adjusts the magnification in the sub scan direction. (•3-17) [-1.0~+1.0 / 0 / 0.1%] Use the "• / *key to enter the minus (–) before entering the value.
2911	Transfe	er Current On / Off Timing	
	001	La (ON)	Adjusts the transfer current on timing at the leading edge. [-30~+30 / 0 / 1 mm]
	002	Lb (Switch)	Adjusts the transfer current on/off exchange timing. [0~60 / 45 / 1 mm]

SP	Number/Name		Function/[Setting]
2911	003	Lc (OFF)	Adjusts the transfer current off timing (for example: –5 mm is 5 mm after the trailing edge). [-30~+30 / 0 / 1 mm]
2912	Drum I	Reverse Rotation Interval	
	001	1st Reverse Rotation	Sets the length of time the drum is reversed to clean the drum cleaning blade. [0~7 / 2 / 20 ms]
	002	Forward Rotation After 1st Reverse Rotation	Sets the length of time the drum is rotated forward after the 1st reverse rotation. [0~7 / 0 / 20 ms]
	003	2nd Reverse Rotation	Sets the length of time the drum is reversed for the 2nd reverse rotation to clean the drum cleaning blade again. [0~7 / 0 / 20 ms]
2915	Drum I	Heater Adjustment	SP 2915 is currently not being used. Do not change the settings.
	001	ON Time at Power On (<100°C)	[0~10 / 0 / 1 min.] DFU
2915	002	ON Time at Power On ($<$ 140°C)	[0~10 / 0 / 1 min.] DFU
	003	Drum Temperature	DFU
	004	Sensor Output Value (Direct)	DFU
	005	Sensor Output Value (Atmosphere)	DFU
	006	Forced Heater ON	DFU
2920	LD Off	Check	Checks whether the LD turns off or on when the front door is opened. DFU [0~1 / 0 / 0] 0: ON 1: OFF
2940	Leadin	g Edge Transfer Current	Adjusts the leading edge transfer current for each paper feed station at normal and low speed.
	001	Tray 1	Tandem Tray – Copier, Normal Speed B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]
	002	Tray 2	Universal Tray – Copier, Normal Speed B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]
	003	Tray 3	Universal Tray – Copier, Normal Speed B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]
	004	Tray 4	LCT 1st Tray, Normal Speed B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]
	005	Tray 5	LCT 2nd Tray, Normal Speed B070: [10~200 / 110 / 1 μA] B071: [10~200 / 120 / 1 μA]

SP		Number/Name	Function/[Setting]
2940	006	Tray 6	LCT 3rd Tray, Normal Speed
			B070: [10~200 / 110 / 1 μA]
			B071: [10~200 / 120 / 1 μA]
	007	Tray 7 (Bypass Tray)	Bypass Tray, Normal Speed
			B070: [10~200 / 110 / 1 μA]
			B071: [10~200 / 120 / 1 μA]
	008	Duplex Tray	Duplex Tray – Copier, Normal Speed
			B070: [10~200 / 110 / 1 μA]
			B071: [10~200 / 120 / 1 μA]
	009	Tray 1 (Low Speed)	Tandem Tray – Copier, Low Speed
			[10~200 / 80 / 1 μA]
	010	Tray 2 (Low Speed)	Universal Tray – Copier, Low Speed
			[10~200 / 80 / 1 μA]
	011	Tray 3 (Low Speed)	Universal Tray – Copier, Low Speed
			[10~200 / 80 / 1 μA]
	012	Tray 4 (Low Speed)	LCT 1st Tray, Low Speed
			[10~200 / 80 / 1 μA]
	013	Tray 5 (Low Speed)	LCT 2nd Tray, Low Speed
			[10~200 / 80 / 1 μA]
	014	Tray 6 (Low Speed)	LCT 3rd Tray, Low Speed
			[10~200 / 80 / 1 μA]
2940	015	Tray 7 (Low Speed)	Bypass Tray, Low Speed
			[10~200 / 80 / 1 μA]
	016	Duplex Tray (Low Speed)	Duplex Tray –Copier, Low Speed
			[10~200 / 80 / 1 μA]
2941	Recycled Paper Transfer Control		Determines whether recycled paper is
			handled as plain paper or thick paper.
			$[0 \sim 1 / 0 / 1]$
			0: Plain paper
			1. Thick paper Sotting this mode to 1 is offective when
			the image at the leading edge is not
			good.
			To use this SP, "Recycled Paper" should
			be selected in the Tray Paper Settings
			screen.
			Selecting "Thick paper" in the Tray paper
			Settings screen has the same effect as
			this SP, but the Thick Paper selection
2961	Devel	oper Initialization (Factory)	DELL
2001	Deven		2. 0

E

SP	Number/Name	Function/[Setting]
2962	Auto Process Control Execution	 Press Start to execute and automatically adjust the following: 1. Drum potential sensor 2. ID sensor 3. Charge grid voltage Vg (by changing Vd) 4. LD power (by changing Vh) 5. VL detection. Before using this SP, auto process control should be on (SP3-901). After changing the drum, ID sensor, drum potential sensor, LD unit, charge corona wires, or toner density sensor, this SP should be executed.
2966	Periodical Auto Process Control	Selects whether auto process control is done after 24 hours have elapsed after the last copy job. [0~1 / 0 / 1] 0: OFF 1: ON <i>This setting is required for a customer</i> <i>who keeps the main switch on all day.</i>
2967	Auto Image Density Adjustment	Selects whether auto image density adjustment is done during machine warm up. This mode is to counter dirty background that occurs when a machine is used in an area that contains ammonia. [0~1 / 0 / 1] 0: OFF 1: ON <i>If Periodical Auto Process Control (SP2-</i> 966) is used, this adjustment is done also after the auto process control is finished.
2968	Toner Density Correction	To prevent the image density dropping during continuous copying after a long interval (this is caused by a sudden increase of Q/M), VREF is changed by – 0.06 V every (100 X [SP2-974 value + 1]) prints. This correction is applied from when the auto process control is done, until "(the number of prints set in this SP mode) X (SP2-974 value +1)" has been made. [0~20 / 0 / 1K copies]
2969	ID Sensor Pattern Interval-Multiple Copy	Twenty ID patterns are made in an interval of about 1 minute during a continuous copy process just after process control is completed. Image density will be stabilized. However, printing productivity will be reduced. [0~1 / 0 / 1] 0: OFF 1: ON

SP		Number/Name	Function/[Setting]
2972	Toner S Time	uction Collection Bottle Operation	Displays the total operation time of the development unit toner collection bottle. [0~600 / 0 / 1 hour] Need to replace soon: 580 hours
			Need to replace now: 600 hours After the bottle is replaced, reset the value to 0 (zero) by pressing 0 and # (Enter) keys.
2973	Toner Suction Motor Operation Time		Displays the total operation time of the development toner suction motor. [0~600 / 0 / 1 hour] Need to replace soon: 570 hours Need to replace now: 600 hours <i>After the motor is replaced, reset the</i> <i>value to 0 (zero) by pressing 0 and #.</i>
2974	Toner Supply Interval		Adjusts how often toner is supplied [0~3 / 0 / 1] 0: 1/1 (every print) 1: 1/2 (every 2 prints) 2: 1/3 (every 3 prints) 3: 1/4 (every 4 prints) The operation of SP2968 now depends on this SP mode setting. In this machine, the Vref update interval has been changed from "every 100 prints" to "every [100X(SP2-974 value +1)] prints". For example, if set to 1, toner is supplied every 2 prints, and SP 2-974 value + 1 = 3.
2975	Toner Recycle Cut Counter		
	001	ON Counter	Determines how often all recycled toner is discarded. The purpose of this feature is to periodically remove all recycled toner contaminated with paper dust. [0~999 / 200 / 1 K copies] This setting determines when the toner separation solenoid closes the shutter and shunts all toner to the waste toner collection bottle. For details, see "Toner Recycling" in Section 6.
	002	OFF Counter	This setting determines how long all toner is shunted to the waste toner collection bottle (no recycling). [0~255 / 25 / 1 K copies] <i>This setting determines when the toner</i> <i>separation solenoid opens the shutter</i> <i>and toner recycling starts.</i>
2980	Toner Consumption Pattern Interval		Use this SP to improve drum cleaning if required. It determines how long the drum turns after the ID sensor pattern is created before the toner consumption pattern is created. [0~30 / 0 / 1 minutes] DFU 0: No toner consumption pattern created.

SP3-nnn Processing

SP		Number/Name	Function/[Setting]
3001	ID Sens	sor Initial Setting	
	001	ID Sensor PWM Setting	This SP mode recovers the machine when an SC condition occurs because ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. Reset this SP to the factory setting in this case. [0~255 / 62 / 1] The PWM data is stored when ID Sensor Initial Setting is done.
	002	ID Sensor Initialization	Performs the ID sensor initial setting. The ID sensor output for the bare drum (VSG) is adjusted to 4.0 ± 0.2 V. This SP mode should be performed: 1) After replacing or cleaning the ID sensor, 2) After replacing the NVRAM or doing an NVRAM clear.
3103	ID Sens	sor Output Display	
	001	Vsg	Displays the current value of the ID sensor output after checking the bare drum surface.
	002	Vsg Initial	Displays Vsg when the Vsp adjustment is done.
	003	Vsp	Displays the current value of the ID sensor output after checking the ID sensor pattern image.
	004	Vsdp	Displays the value of the ID sensor output immediately after Vsp is output when the charge potential drops. This reading is used to test and determine characteristics for design. DFU
3901	Auto Pr	ocess Control Setting	
	001	Auto Process Control Setting	Determines whether machine checks and corrects drum potential (Vd) and LD power when the fusing temperature is lower than 100°C at power-on. [0~1 / 1/ 1] 0: OFF 1: ON This setting attempts to change the Vd setting consistent with the OPC, the charge corona unit, and environment to improve the reliability of the system.
	002	VL Correction Control Setting	Determines whether VL detection and correction are performed during process control every 1K copies. [0~1 / 0/ 1] DFU 0: OFF 1: ON Even with this SP switched ON, VL detection and correction will not be performed if SP3901 001 is OFF.

SERVICE PROGRAM MODE TABLES

SP		Number/Name	Function/[Setting]
3902	Proces	s Control Data Display	
	001	Auto Process Control	Displays whether auto process control is switched on or off [0:Off, 1: On]
			When auto process control is on and the potential sensor is calibrated correctly, "ON" appears on the operation panel.
			Auto process control is not executed when this SP is switched off.
			After RAM is cleared, this SP setting goes off.
	002	VD	Displays the drum potential.
	003	VH	Displays the standard halftone drum potential, used for laser power adjustment.
	004	VG	Displays the charge grid voltage resulting from the latest Vd adjustment.
	005	LD Power (Correction)	Displays the LD power correction value as a result of the latest Vh adjustment.
	006	VID	Displays the latest drum surface voltage measured on the ID sensor pattern.
	007	V M200	Displays the acquired value when the potential sensor is calibrated after application of -200V to the drum.
	008	V M700	Displays the acquired value when the potential sensor is calibrated after application of -700V.
	009	VD Correction	Shows whether VD correction is being done or not0: Not being done; process control is using the value of SP2001 007 only
			1: Being done; process control is using the value of SP2001 007 + 50V
	010	VL (Auto Process Control)	Displays the value of VL at auto process control initialization.
	011	VL Correction (Auto Process Control)	Displays the amount of correction (Δ VLref) according to results of the VL detection at auto process control.
	012	VL	Displays the latest value of VL.
	013	VL Correction	Displays the amount of correction (Δ VLref) according to the latest VL detection results.
	014	VB	Displays the value of the current image development bias output, determined by the results of VL detection.
3903	VD Cor	rection Counter	Adjusts the starting point for the VD Correction. Displays whether the VD correction is being performed. The target value is "the value of SP2-001-7 + 50". [0~999 / 200 / 1 K copies] Reduce the setting if dirty background occurs. The counter is automatically reset to 0 (zero) when SP2-801 is performed.

SERVICE PROGRAM MODE TABLES

SP4-nnn Scanner

SP		Number/Name	Function/[Setting]	
4008	Scanner Sub Scan Magnification		Adjusts the magnification in the sub scan direction for scanning. If this value is changed, the scanner motor speed is changed. (-3-17) [-0.9~+0.9 / 0 / 0.1 percent]	
			before entering the value. Setting a lower value reduces the motor	
			speed and lengthens the image in the sub scan direction (paper direction). Setting a larger value increases the motor speed and shortens the image in the sub scan direction.	
4010	Scanne	er Leading Edge Registration	Adjusts the leading edge registration for scanning. (-3-17) [-9.0~+9.0 / 0 / 0.1 mm]	
			Use the "•/*key to enter the minus (-) before entering the value. A minus setting moves in the direction of the leading edge. A larger value shifts the image away from the leading edge, and a smaller value shifts the image toward the leading edge.	
4011	Scanner Side-to-Side Registration		Adjusts the side-to-side registration for scanning. (-3-17) [-3.0~+3.0 / 0 / 0.1 mm]	
			 (-): The image disappears at the left side. (+): The image appears at the left side. Use the "•/ *key to enter the minus (-) before entering the value. 	
4012	Scanner Erase Margin		Adjusts the erase margin for scanning. The leading, trailing, right and left margins can be set independently. Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.	
	001	Leading Edge	[0~9.0 / 0.5 / 0.1 mm]	
	002	Trailing Edge		
	003	Right	-	
4012	004			
4013	Scanne	Sooppor Free Run: Lamp ON	Allows seensor free running with the	
	001	Scanner Flee Run. Lamp ON	exposure lamp on.	
	002	Scanner Free Run: Lamp OFF	Allows scanner free running with exposure lamp off.	

SP		Number/Name	Function/[Setting]
4015	Scanne	er Speed Adjustment	Displays the value of the scanner speed
			Interacijustinent. $120 \sim \pm 20$ / 0 / 11
			[-20 ⁻³⁺ 207 0 7 1] Scanner sneed fine adjustment is
			automatically done when the main switch
			is turned on, and the current setting is
			overwritten.
4301	APS Se	ensor Output Display	Displays the APS sensor output signals
			when an original is placed on the
			exposure glass.
4303	APS A	5 / HLT Size Detection	Selects whether or not the machine
			determines that the original is A5/HLT size
			when the APS sensor does not detect the
			[0~1/U/1]
			U. NOT detected $4 \cdot \Delta 5 \text{ longth}/51/0^{\circ} \times 81/0^{\circ}$
			I. AS lengui/S1/2 X 01/2
			determined as Δ5 length/51/2" X 81/2"
			even if the paper size is too small to be
			detected on the exposure glass.
4600	Read S	BU ASIC ID	Displays the SBU ID code confirmed by
			reading the SBU after the SBU adjusts
			automatically at power on. DFU
			[0~FFFF / B550 / 0]
4601	SBU PLL Adjustment		Adjusts the PLL bandwidth. DFU
	Cooppor Adjustment		[9322~9326 / 9324 / 1]
4605	Scanne	er Adjustment	
	001	Flag Display	Displays a flag to indicate whether
			with the standard white hoard for the
			CCD DFU
			10 - 1 / 0 / 11
			0: Not executed.
			1: Executed
	002	Start	Starts the density adjustment for the
			CCD using the standard white board.
			Place 10 sheets of A3 plain paper on the
			exposure glass, then press Execute. A
			message is displayed to indicate the
4610	001	Standard White Level	DFU
	001	Adjustment	
4613	001	Standard White Level	DFU
		Adjustment Normally	
4616	001	Standard White Level	DFU
		Adjustment at Factory	
4624	Read C	Offset Data	
	001	FE ch	DFU
	002	FO ch	DFU

SP		Number/Name	Function/[Setting]
4624	003	LE ch	DFU
	004	LO ch	DFU
4632	Gain A	djustment	
	001	FE ch	DFU
	002	FO ch	DFU
	003	LE ch	DFU
	004	LO ch	DFU
4641	001	White Adjust Loop	DFU
4646	001	SBU Adjustment Error Flag	DFU
4647	001	SBU Hard Error Flag	DFU
4662	Gain A	djustment Normally	
	001	FE CN	DFU
	002	FO ch	DFU
	003		DFU
4004	004	LO cn	DFU
4681	Gain A		DEU
	001	FE CN	DFU
	002	FUCN	
	003		DFU
4601	Dood S	LO CN	DFU
4091	Reau 3		DEU
	001	FE CN	
	002		
	003		
4604	004	Offset Adjustment	
4034	001	E side	DEIL
	001		
4901	Scan C		
4301	001	Shading Correction: AEREE	Changes the AEREE (Automatic
	001	Setting	Exposure Reference) value used in
			scanned from the front side (SBU). DFU
			10~63 / 0 / 11
	002	Shading Correction: Shading	Changes the AEREF (Automatic
		Data Output	Exposure Reference) value used in
			digital A/E processing. DFU
			[0~1 / 0 / 1]
			0: Normal
			1: Output
	003	Digital AE: AEREF Setting	Changes the AEREF (Automatic
			digital A/F processing for the image
			data. DFU
			[-63~+63 / -12 / 1]

SP		Number/Name	Function/[Setting]
4901	004	Digital AE: Low Limit	Sets the low limit at 120 for the value used in digital A/E processing for the image data. DFU [0~1 / 1 / 1] 0 : No low limit 1: Low limit set
	020	Background Erase: Blue Original (Lighter)	Sets the strength of background blue erase when orange original mode is selected. [168~255 / 180 / 1] A higher setting erases more background and a lower setting less.
	021	Background Erase: Blue Original (Normal)	Sets the strength of background blue erase when the green original mode is selected. [131~167 / 155 / 1] A higher setting erases more background and a lower setting less.
	022	Background Erase: Blue Original (Darker)	Sets the strength of background blue erase when blue original mode is selected [25~130 / 105 / 1] A higher setting erases more background and a lower setting less.
4903	Image	Quality Adjustment	
	001	Text Mode (25.0-55.0%)	Adjusts the sharpness and texture of
	002	Text Mode (55.5-75.0%)	images processed in Text mode.
	003	Text Mode (75.5-160.0%)	[0~10 / 5 / 1]
	004 005 006	Text Mode (160.5-400.0%) Photo Mode Dithering (25.0- 55.0%) Photo Mode Dithering (55.5- 75.0%)	 0: Softest 1: Soft Mode 2: ↑ 3: ↑ 4: ↑ 5: Normal (Default) 6: ↓ 7: ↓ 8: ↓ 9: Sharp Mode 10: Sharpest Adjusts the sharpness and texture of images processed in Photo mode with dithering [0~6 / 3 / 1]
	007	Photo Mode Dithering (75.5- 160.0%)	0: Softest 1: ↑
	008	Photo Mode Dithering (160.5- 400.0%)	 2: ↑ 3: Print Original Mode (Default) 4: ↓ 5: ↓ 6: Sharpest
	009	Photo Mode Error Diffusion (25.0-55.0%)	Adjusts the sharpness and texture of images processed in Photo mode with

SP		Number/Name	Function/[Setting]
4903	010	Photo Mode Error Diffusion	error diffusion.
		(55.5-75.0%)	[0~6 / 1 / 1]
	011	Photo Mode Error Diffusion	0 Softest
	010	(75.5-160.0%)	1: Normal (Default)
	012	Photo Mode Error Diffusion	2: ↑
		(160.5-400.0%)	3: ↑
			4: ↑
			5: Print Original Mode
	0.1.0		6: Sharpest
	013	Text / Photo Mode (25.0-55.0%)	Adjusts the snarpness and texture of
	014	Text / Photo Mode (55.5-75.0%)	$10 \times 10 / F / 11$
	015	Text / Photo Mode (75.5-	$[0 \sim 10 / 3 / 1]$
	0.1.0	160.0%)	1: Dhoto Briority
	016	1 ext / Photo Mode (160.5-	
		400.0%)	∠. 3: ↑
			$\Delta \uparrow$
			5 Normal (Default)
			7
			8
			9 Text Priority
			10 Sharpest
	017	Pale Mode (25.0-55.0%)	Adjusts the sharpness and texture of
	018	Pale Mode (55.5-75.0%)	images processed in Pale mode.
	019	Pale Mode (75.5-160.0%)	[0~10 / 5 / 1]
	020	Pale Mode (160 5-400 0%)	1: Softest
	020		2: Soft Mode↑
			3: ↑
			4: ↑
			5: Normal (Default)
			6: ↓
			7: ↓
			8: ↓
			9: Sharp
	001		10: Sharpest
	021	Generation Mode (25.0-55.0%)	Adjusts the snarpness and texture of
	022	Generation Mode (55.5-75.0%)	10×10^{10} f (11)
	023	Generation Mode (75.5-	[0~10/ 3 /1] 0: Softest
	004	160.0%)	1: Soft
	024		2. ↑
		400.078)	3. ↓
			4: ↑
			5: Normal (Default)
			6: L
			7: 1
			8: 1
			9: Sharp
			10: Sharpest

SP		Number/Name	Function/[Setting]
4903	060	Independent Dot Erase: Text Mode	Sets the level for independent dot erasure. [0~14 / 8 / 1] 0: Off
			The higher the setting, the stronger the effect.
	061	Independent Dot Erase: Photo Mode	[0~14 / 0 / 1] 0: Off
	062	Independent Dot Erase: Text / Photo Mode	
	063	Independent Dot Erase: Pale Mode	
	064	Independent Dot Erase: Generation Mode	[0~14 / 8 / 1] 0: Off
	070	Background Erase: Text Mode	Sets the level for background erase.
	071	Background Erase: Photo Mode	[0~255 / 0 / 1]
	072	Background Erase: Text / Photo Mode	I he higher the setting, the stronger the effect.
	073	Background Erase: Pale Mode	
	074	Background Erase: Generation Mode	
	080	Line Width Correction: Text Mode Select	Selects the level of line width correction for Text mode. [0~8 / 2 / 1] The higher the setting, the thicker the line.
	081	Line Width Correction: Text Mode (Main Scan)	Switches on line width correction in the main scan direction in text mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	082	Line Width Correction: Text Mode (Sub Scan)	Switches on line width correction in the sub scan direction in text mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	083	Line Width Correction: Photo Mode Select	Selects the level of line width correction for photo mode. [0~8 / 4 / 1] The higher the setting, the thicker the line.
	084	Line Width Correction: Photo Mode (Main Scan)	Switches on line width processing for the main scan direction in photo mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON

SP		Number/Name	Function/[Setting]
4903	085	Line Width Correction: Photo Mode (Sub Scan)	Switches on line width correction in the sub scan direction in Photo mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	086	Line Width Correction: Text / Photo Mode Select	Selects the level of line width processing for text/photo mode. [0~8 / 4 / 1] The higher the setting, the thicker the line.
	087	Line Width Correction: Text / Photo Mode (Main Scan)	Switches on line width processing for the main scan direction in text/photo mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	088	Line Width Correction: Text / Photo Mode (Sub Scan)	Switches on line width processing for the the sub scan direction in text/photo mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	089	Line Width Correction: Pale Mode Select	Selects the level of line width processing for pale mode. [0~8 / 4 / 1] The higher the setting, the thicker the line.
	090	Line Width Correction: Pale Mode (Main Scan)	Switches on line width processing for the main scan direction in pale mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	091	Line Width Correction: Pale Mode (Sub Scan)	Switches on line width processing for the sub scan direction in pale mode [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON
	092	Line Width Correction: Generation Mode Select	Selects the level of line width processing for generation mode. [0~8 / 1 / 1] The higher the setting, the thicker the line.
	093	Line Width Correction: Generation Mode (Main Scan)	Switches on line width processing for the main scan direction in generation mode. [0~1 / 1 / 1] 0: Line width correction OFF 1: Line width correction ON

SP		Number/Name	Function/[Setting]
4903	094	Line Width Correction:	Switches on line width processing for
		Generation Mode (Sub Scan)	the sub scan direction in generation
			mode.
			0: Line width correction OFF
			1: Line width correction ON
4904	Image	Quality / Exposure Thin Line	
	002	Image Process Setting: Photo	Selects the image processing mode for
		Mode	PHOLO MODE.
			$\begin{bmatrix} 0^{-3} & 3 & 7 \end{bmatrix}$
			1: 141 line dither processing
			2: 212 line dither processing
			3: Error diffusion processing
	020	Text Mode	Selects the line width correction level for
	020		Text mode
			$[0 \sim 2 / 0 / 1]$
			0: No processing
			1: Low (thin)
			2: High (thick)
	021	Photo Mode	Selects the line width correction level for
			Photo mode.
			[0~2 / 0 / 1]
			0: No processing
			1: Low (thin)
			2: High (thick)
	022	Text / Photo Mode	Selects the line width correction level for
			Text/Photo mode.
			[0~2 / 0 / 1]
			U: No processing
			1: LOW (TNIN)
	000	Dala Mada	2. Fligh (thick)
	023		Pale mode
			$10 \sim 2 / 0 / 11$
			0: No processing
			1 [°] Low (thin)
			2: High (thick)
	024	Generation Mode	Selects the line width correction level for
			Generation mode.
			[0~2 / 0 / 1]
			0: No processing
			1: Low (thin)
			2: High (thick)
4909	Image	Processing Through	
	001	IPU Scan Image Module	DFU
			[0~15 / 0 / 1]
	002	IPU Plotter Image Module	DFU
			[0~127 / 0 / 1]

SP5-nnn Mode

	SP		Number/Name	Function/[Setting]
	5019	Tray Pape	r Size Selection	
		002	1st Tray	Selects the paper size for the 1st tray.
				[LT LEF: USA version
				A4 LEF: Other versions}
		007	6th Tray	Selects the paper size for the 6th tray.
				[LI LEF: USA version
	5024	mm / inch	Diaplay Solaction	A4 LEF: Other versions}
	5024		Display Selection	Selects the unit of measurement. $[0 \sim 1 / 0 \text{ or } 1/1]$
				0: mm (Default for other versions)
				1: inch (Default for USA version)
				After selection, turn the main power switch
				off and on
	5040	Custom Si	ze: Vertical	
		002	Custom Size: Vertical	Adjusts the vertical dimension of custom
				size paper for Tray 1. 'Custom size' must
				be selected with SP 5019-2.
_	50.14			[210.0~305.0 / 297.0 / 0.1 mm]
Ę	5041	Custom Si		
		002	Custom Size: Horizontai	Adjusts the norizontal dimension of custom
				be selected with SP 5019-2
				$[210.0 \sim 439.0 / 210.0 / 0.1 \text{ mm}]$
	5047	Reverse P	aper Display	Determines whether the tray loaded with
				paper printed on one side is displayed.
				[0~1/ 0 /1]
				0: Not displayed
				1: Displayed
	5104	A3 / DLT E	Double Count	Specifies whether the counter is doubled
				for A3/11"x17" paper.
				[0~1/0/1] 0: No
				1: Yes
				If "1" is selected, the total counter and the
				current user code counter count up twice
				when A3/11"x17" paper is used.
	5106	ID level Se	etting	
		006	Auto Density Level	Selects the image density levels that are
				used in ADS mode by assigning a value to
	5110	Non Stone	lard Dapar Salaction	[1~9 / 5 / 1]
	5112	NUII-Stant	and Paper Selection	size can be input for the universal cassette
				travs (Trav 2, Trav 3)
				[0~1/ 0 /1]
				0 : No
				1: Yes.
				If "1" is selected, the customer will be able
				to input a non-standard paper size using
				the UP mode.

SP	Number/Name	Function/[Setting]
5113	Optional Counter Type	Selects the type of key counter:
		[0~12 / 0 / 1]
		0: None
		1: Key card (Japan only)
		2: Key card (countdown type)
		3: Pre-paid card
		4: Not used
		5: MF key card
		6: Not used
		7: Not used
		8: Not used
		9: Not used
		10: Not used
		11: Overseas Keycard
		(Increment)
		12 Overseas Keycard
5440	Disable Oscillar	
5118	Disable Copying	lengen Only
		$\int \frac{d^2}{d^2} dr = \frac{d^2}{d^2} \int \frac{d^2}{dr} dr = \frac{d^2}{dr} \int \frac{d^2}{dr} \int \frac{d^2}{dr} dr = \frac{d^2}{dr} \int \frac{d^2}{dr} \int \frac{d^2}{dr} dr = \frac{d^2}{dr} \int \frac{d^2}{dr} $
		0: Poloase for normal operation
		1: Prohibit access to machine
5120	Mode Clear Opt, Counter Removal	Do not change Japan Only
5120		$10 \sim 2/0/11$
		0: Normal reset
		1: Resets before job start/after completion
		2. Normally no reset
5121	Counter Up Timing	Determines whether the optional key
0121		counter counts up at paper feed-in or at
		paper exit.
		[0~1/ 0 /1]
		0: Paper Feed Count
		1: Paper Exit Count
		This setting does not affect timing of the
		copier total counter.
5127	APS OFF Mode	This SP can be used to switch APS (Auto
		Paper Select) off. This SP only works
		when a coin lock or pre-paid key card
5131	Paper Size Type Selection	Selects the namer size type (for originals
5151		and copy paper) (The default setting
		depends on the setting of DIP SW 1 and 2
		on BCU.)
		[0~3/1 or 2 or 3/1]
		0: Japan
		1: North America
		2: Europe
		3. China
		After changing the value, turn the main
		power switch off and on.

SP		Number/Name	Function/[Setting]
5158	Cover F	eeder Size Change	Determines the paper size for the cover
			interposer tray. Select the desired paper
	004		size and press #.
	001	For all versions	$[0 \sim 1 / 0 / 1]$
			U: A3
	000	For Europe and China	1: 12 X 18
	002	For Europe and China	$[0^{2}/0^{7}]$
			0. 0 /2 X IS 1. 9" v 12"
			$2^{\circ} 8^{1}/ \times 13^{\circ}$
	003	For USA	$10 \sim 1/0/1$
	000		0: 8 ½" x 14"
			1:8 ½ x 13"
	004	For USA	[0~1 / 0 / 1]
			0: LT LEF
			1: 10 ½" x 7 ¼"
	005	For USA	[0~1 / 0 / 1]
			0: LT SEF
			1: 8" x 10"
	006	For Europe and China	[0~1 / 0 / 1]
			0: 8-Kai (Taiwan)
			1: Double Letter
	007	For Europe and China	[0~1 / 0 / 1]
			0: 16-Kai (Taiwan)
			1: LT SEF
	800	For Europe and China	
5400	Analiaa	tion Coroon Change	1: LI LEF
5162	Applica	uon Screen Change	betermines whether the application
			(key top) or a soft switch on the LCD
			$[0 \sim 1 / 0 / 1]$
			0: Soft switch
			1: Hard switch
5212	Page N	umbering	
	003	Duplex Printout Right / Left	Horizontally positions the page numbers
		Position	printed on both sides during duplexing.
			[-10~+10 / 0 / 1 mm]
			0: Center
			-: Left
			+: Right
	004	Duplex Printout High / Low	Vertically positions the page numbers
		Position	printed on both sides during duplexing.
			[–10~+10/ 0 /1 mm]
			0 is center, minus is down, + is up.
5302	Set Tim	ie	
	002	Time Difference	Sets the time clock for the local time.
			[–1440~+1440/ +540 /1 min.]
5404	User Co	ode Count Clear	Clears all user code counters.
			Press # to execute.

SP	Number/Name		Function/[Setting]	
5501	PM Alarm Interval		Sets the count level for the PM alarm. [0~9999 / 0 / 1] 0: Alarm disabled The PM alarm goes off when the print count reaches this value multiplied by 1,000.	
5504	Jam Alarm Interval		RDS function Japan Only	
5505	Error Alarm		RDS function Japan Only	
5507	Supply Alarm			
	001	Paper Supply Alarm	Enables or disables the paper supply call function. Japan Only [0~1/ 0 /1] 0: No call 1: Call If this SP is enabled, use the settings below to set the supply level to initiate a call for each paper size	
	002	Staple Supply Alarm	Enables or disables the staple supply call function. Japan Only [0~1/0/1] 0: No call 1: Call A staple supply call is issued for every 1,000 staples consumed.	
	003 Toner Supply Alarm		Enables or disables the toner supply call function. Japan Only [0~1/ 0 /1] 0: No call 1: Call	
	128	Interval: Others	Sets the level to initiate a paper supply call for each paper size, if SP 5507 001	
	132	Interval: A3	is enabled. Japan Only [00250~10,000/ 1,000 /1]	
	133	Interval: A4		
	134	Interval: A5		
	141	Interval: B4		
	142	Interval: B5		
	160 Interval: DLT			
	164	Interval: LG		
	166	Interval: LT		
	172	Interval: HLT		

SP		Number/Name	Function/[Setting]
5508	CC Ca	all	Japan Only
	001	Jam Remains	Enables/disables initiating a call for an unattended paper jam. [0~1/1/1] 0: Disable 1: Enable
	002	Continuous Jam Occurrence	Enables/disables initiating a call for continuous paper jam. [0~1/1/1] 0: Disable 1: Enable
	003	Continuous Door Open	Enables/disables initiating a call when the front door remains open. [0~1/1/1] 0: Disable 1: Enable
	004	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
	011	Jam Detection: Time Length	Sets the length of time a jam must remain before it becomes an 'unattended paper jam'. [03~30/ 10 /1] <i>This setting is enabled only when</i> <i>SP5508 004 is enabled (set to 1).</i>
	012	Jam Detection: Continuous Count	Sets the number of continuous paper jams required to initiate a call. [02~10/ 5 /1] <i>This setting is enabled only when</i> <i>SP5508 004 is enabled (set to 1).</i>
	013	Door Open: Time Length	Sets the length of time the door remains open before the machine initiates a call. [03~30/ 10 /1] <i>This setting is enabled only when</i> <i>SP5508 004 is enabled (set to 1).</i>
	021	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 <i>This setting is enabled only when</i> <i>SP5508 004 is enabled (set to 1).</i>

SP		Number/Name	Function/[Setting]
5508	022	Jam Operation: Continuous	Determines what happens when
		Count	continuous paper jams occur.
			[0~1/ 1 /1]
			0: Automatic Call
			1: Audible Warning at Machine
			I his setting is enabled only when
	023	Door Operation: Time Length	Determines what happens if the door
	020	Bool operation. Time Length	remains open.
			[0~1 / 1 / 1]
			0: OFF
			1: ON. Displays a warning. Pressing the
			call button will contact the service
			center.
			SP5508 004 is enabled (set to 1)
5513	Parts /	Alarm Level Count	Japan Only
	001	Normal	Sets the parts replacement alarm
			counter to sound for the number of
			copies.
			[1~9999 / 350 / 1]
	002	DF	Sets the parts replacement alarm
			counter to sound for the number of
			[1~9999 / 350 / 1]
5514	Parts /	Alarm Level	Japan Only
	001	Normal	[0~1 / 1 / 1]
	002	DF	[0~1 / 0 / 1]
5801	Memo	ry Clear	Clears data from NVRAM, either
			selectively (002~015), or entirely (001).
			Before executing this SP, print an SMC Report (-See 5.6)
			After executing this SP turn the main
			switch off and on.
	001	All Clear	Initializes items 002~015.
	002	Engine Clear	For details, see 5.7.
	003	SCS (System Control	
	004	Service)/SRM	
	004	IMH MCS(Mamony Control Sonvice)	
	005	Conjer application	
	000	Printer application	
	009	Scanner application	
	010	Network application	
	011	NCS (Network Control Service)	
	014	DCS (Delivery & Receive	
		Control Server)	
	015	UCS (User Directory Controller	
		Server)	

SP		Number/Name	Function/[Setting]
5802	Printer	Free Run	Makes a base engine free run
			[0~1/ 0 /1]
			0: Release free run mode
			1: Enable free run mode
			Return this setting to off (0) after testing is completed.
			Finisher connectors should be
			disconnected and duplex mode should be off.
5803	Input C	Check	Displays signals received from sensors and switches. (•5.4.1)
5804	Output	t Check	Turns on the electrical components individually for testing. (#5.5.1)
5811	Machir	ne No. Setting	
	001	Code Set	Enters the machine serial number. DFU
5812	Servic	e Tel. No. Setting	
	001	Service	Use this to input the telephone number of the CE (displayed when a service call condition occurs.)
			Press "•" to input a pause. Press "Clear modes" to delete the telephone number.
	002	Fax	Use this to input the fax number of the CE printed on the SMC print.
	003	Supply	Displayed on the initial SP screen.
	004	Operation	Allows the service center contact telephone number to be displayed on the initial screen.
5816	CSS Function		Switches the CSS function on/off. Do not change. Japan Only . [0~1/ 0 /1]
5821	CSS-PI Device Code		Do not change. Japan Only . [0~4/ 0 /1]
5824	NV-RA	M Data Upload	Uploads the NVRAM data to a SD card. (
5825	NV-RA	M Data Download	Downloads data from the SD card to the NVRAM in the machine. When downloading this SP mode data, the front door must be open. After downloading is completed, remove the card and cycle the machine off and on. (•5.10.6)
5828	Netwo	rk Setting	
	074	Delete Password	Execute to delete network password.
	084	NCS Prints	Prints a list of all NCS related parameters.
	090	TELNET	This setting determines whether Telnet D is started or not. [0~1 / 1 / 1] If not started, the Telnet port is closed

5828 091 WEB Determines whether Web is enabled disabled. [0~1 / 1 / 1] 0: Disabled 1: Enabled	or
disabled. [0~1 / 1 / 1] 0: Disabled 1: Enabled	
[0~1 / 1 / 1] 0: Disabled 1: Enabled	
1: Enabled	ŀ
	ļ
	ļ
5832 HDD Formatting	
001 HDD Formatting (ALL) Enter the SP number for the partition	0
002 HDD Formatting (IMH) initialize, then press #. When execution	n
003 HDD Formatting (Thumbnail) ends, cycle the machine oπ and on.	
004 HDD Formatting (Job Log)	
005 HDD Formatting (Printer Fonts)	ļ
006 HDD Formatting (User Info1)	
007 HDD Formatting (User Info2)	
008 HDD Formatting (Scanner Mail)	
009 HDD Formatting (Data for a	
5226 Conture Setting	
001 Capture Sunction With this function disabled, the setting	
related to the capture feature cannot	ง 18
initialized, displayed, or selected. DFI	j I
[0~1/ 0 /1]	
0: Disable	
1: Enable	
002 Panel Setting Determines whether each capture	_
related setting can be selected or	
	•
The setting for SP5836 001 has prior	iy.
003 Print Back-up Function Determines whether the print back-up	<u> </u>
function setting can be changed.	
[0~1/ 0 /1]	
1. Enable	
Conversion for Color ratio when a Color image document is	:
sent to the Document Server via the	
MLB (Media Link Board).	
[0~2/ 0 /1]	
0: 1 x	
2: ¼ x	
2: ¼ x	
2: ¼ x	

SP		Number/Name	Function/[Setting]
5836	072	Capture Setting: Resolution Conversion for Copy Text	Determines the resolution conversion ratio when a Copy Text image document is sent to the Document Server via the MLB (Media Link Board). [0~2/ 0 /1] 0: 1 x 1: ¹ / ₂ x 2: ¹ / ₄ x
	073	Capture Setting: Resolution Conversion for Copy (Others)	Determines the resolution conversion ratio when a Copy image document other than Text mode is sent to the Document Server via the MLB (Media Link Board). [0~2/ 0 /1] 0: 1 x 1: ½ x 2: ¼ x
	074		
	075	Capture Setting: Resolution Conversion for Binary Print	Determines the resolution conversion ratio when a binary print image document is sent to the Document Server via the MLB (Media Link Board). [0~2/ 0 /1] 0: 1 x 1: ½ x 2: ¼ x
	076	Capture Setting: Resolution Conversion for Dither Print (1200 dpi)	Determines the resolution conversion ratio when the Dither print image document is sent to the Document Server via the MLB (Media Link Board) [1~3/1/1] 1: ¹ / ₂ x 2: ¹ / ₄ x 3: 1/8 x
	081		
	082	Capture Setting: Format for Copy Text	Determines the image format for Copy Text images sent to the Document Server via the MLB (Media Link Board). [0~3/1/1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR

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SP		Number/Name	Function/[Setting]
5836	083	Capture Setting: Format for Copy (Others)	Determines the image format for Copy (other than text) images sent to the Document Server via the MLB (Media Link Board). [0~3/1/1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR
	085	Capture Setting: Format for Binary Print	Determines the image format for Binary Print images sent to the Document Server via the MLB (Media Link Board). [0~3/1/1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR
	086	Capture Setting: Format for Dither Print (1200dpi)	Determines the image format for Dither Print images sent to the Document Server via the MLB (Media Link Board). [0~3/1/1] 0: JFIF/JPEG 1: TIFF/MMR 2: TIFF/MH 3: TIFF/MR
	091	Capture Setting: Page Quality for JPEG	Determines the quality level of JPEG images sent to the Document Server via the MLB (Media Link Board). [5~95/ 50 /1]
	092	Capture Setting: Page Quality for JPEG (High Quality)	Determines the quality level of JPEG images for high quality sent to the Document Server via the MLB (Media Link Board). [5~95/ 60 /1]
	093	Capture Setting: Page Quality for JPEG (Low Quality)	Determines the quality level of JPEG images for low quality sent to the Document Server via the MLB (Media Link Board). [5~95/ 40 /1]
5839	IEEE 1	1394	This SP is displayed only when an IEEE 1394 card is installed.
	004	Device Name	Enter the name of the device used on the network. Example: RNP000000000
	007	Cycle Master	Enables or disables the cycle master function for the 1394 bus standard. [0~1/ 1 /1] 0: Disable (Off) 1: Enable (On)

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SP		Number/Name	Function/[Setting]
5839	008	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.
	009	IRM 1394a Check	 Conducts a 1394a check of IRM when the independent node is in any mode other than IRM. [0~1/0/1] O: Checks whether IRM conforms to 1394a 1: After IRM is checked, if IRM does not conform then independent node switches to IRM.
	010	Unique ID	 Lists the ID (Node_Unique_ID) assigned to the device by the system administrator. [0~1/1/1] O: 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.
	011	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.

SP		Number/Name	Function/[Setting]
5839	012	Login	Enables or disables the exclusive login feature (SBP-2 related). [0~1/ 0 /1]
			 0: Disables. The exclusive login (LOGIN ORB exclusive it) is ignored. 1: Enables. Exclusive login is in offect
	013		Sets the maximum number of logins from
	010		the initiator (6-bits)
			[0~03/0/1] 0: Reserved
			63: Reserved
5840	IEEE 8	02.11b	
	004		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.
	006	Channel MAX	Sets the maximum range of the bandwidth for the wireless LAN. This bandwidth setting varies for different countries. NA: [1~11/11/1] EUR/A: [1~13/13/1]
	007	Channel MIN	Sets the minimum range of the bandwidth for the wireless LAN. This bandwidth setting varies for different countries. NA: [1~11/1/1] EUR/A: [1~13/1/1]
	011	WEP Key Select	Selects the WEP key.
			[00~11/ 00 /1binary] 00: Key #1
			01: Key #2 (Reserved)
			10: Key #3 (Reserved
			11: Key #4 (Reserved
5841	Supply	Name Setting	These names appear on the Inquiry list (the user can print this by pressing the Counter key on the operation panel, then touching 'Print Inquiry List' on the screen).
	001	Toner Name Setting: Black	Enter the name of the toner in use.
	005	Staple Standard	Enter the name of the staples in use for normal stapling (not booklet stapling)
	006	Staple Bind	Enter the name of the staples in use for booklet stapling.
SP		Number/Name	Function/[Setting]
------	----------	------------------------	---
5842	Net File	Analysis Mode Setting	Selects each debut output mode for
			NetFile processing
			NetFiles: Jobs printed from the
			document server using a PC and
			DesklopBinder
			[8 bits / 0011 1111 / Bit SW]
			Bit 8 is reserved. Bit / is the debug
5044			output switch for each mode.
5844	USB		
	001	I ransmission Rate	Sets the speed for USB data
			$[0x01 \sim 0x04 / 0x04 / 0]$
			0x01: Full Speed (Fixed)
			(Automatic change)
	002	Vandar ID	(Automatic change)
	002		
			[UXUUUU~UXFFFF/UXUSCA/1]
	002	Droduct ID	Sete the product ID DELL
	003	Product ID	
	004	Devrice Delegas Number	[UXUUU0~UXFFFF/UXU4U3/1]
	004	Device Release Number	BCD (bipary coded decimal) display
			Enter as a decimal number NCS
			converts the number to hexadecimal
			number recognized as the BCD
5845	Deliverv	Server Setting	Provides items for delivery server
	_ = = ;		settings.
	001	FTP Port No.	Sets the FTP port number used when
			image files to the Scan Router Server.
			[0~65535 / 3670 / 1]
	002	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.
			[0~0xFFFFFFF / 0x00]
	003	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]
	004	Number of Retries	Determines the number of retries before
			the machine returns to standby after an
			with the delivery or SMTP conver
			with the delivery of SiMTP server. $[0_{2},00]/2/11$

SP		Number/Name	Function/[Setting]
5845	005	Capture Server IP Address	Sets the capture server IP address for the capture function. [0~0xFFFFFFFF / 0x00 /] MLB2 is required to use this feature.
	006	Delivery Error Display Time	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]
	007	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 Set	ting	
	001	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 EUR/AI. The ID is displayed as either 6-byle or 8- byte binary. 6-byte: %02X.%02X.%02X.%02X.%02X.%02X.%02X.%02X.
	002	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.
	003	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.
	004	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

SP		Number/Name	Function/[Setting]
5846	005	Delivery Server Cap a bility	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 [0~255 / 0 / 1]
	006	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]
	007	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]
	008	Delivery Server Maximum Entries	Sets the maximum number account entries of the delivery server user information managed by UCS. [0~50000 / 2000 / 1]
	050	Initialize All Directory Info.	Clears all directory information managed by UCS, including all user codes.
5847	Net File	Mag. Rate	
	002	Copy : Text	Changes the default settings of image
	003	Copy: Others	data transferred externally by the
	005	Print: Binary	DeskTopBinder page reference function via the MLB (Media Link Board). [0~2 / 0 / 1] 0: 1x 1: ¹ / ₂ x 2: ¹ / ₄ x
	006	Print: Dither(1200 dpi)	Sets the default for dithered image size sent to the Document Server via the MLB (Media Link Board). [1~3/ 1 / 1] 1: ½ x 2: ¼ x 3: 1/8 x
	021	Netfile Page Quality Default for JPEG	Sets the default for JPEG image quality of image files handled by DeskTopBinder sent via the MLB (Media Link Board). [5~95 / 50 / 1]
5848	Web Ser	vice	Sets the 4-bit switch assignment for the access control setting. 0000: No access control 0001: Denies access to Desk Top Binder. Has no effect on access and delivery from Scan Router. <i>The lower 4 bits are used.</i>

	SP		Number/Name	Function/[Setting]	
	5848	001	Access Control: Net file	Net File: Job printed from the document	
		002	Access Control: Repository	server from a PC using DeskTopBinder.	
		003	DocBox Print	DocBox: Document Server	
		004	User Directory	Repository: Document intenagement	
		005	Delivery Input (Lower 4 Bits)		
		100	Repository: Max. Size of	Sets the maximum size allowed for	
			Download intage	to 1 gigabyte.	
				[1~1024 / 1024 / 1K]	
E	5849	Counter	Clear Day Setting	Sets the delivery date for the machine. DFU	
		001	Indication	Display the date.	
		002	Print out	Print out the date.	
				[0~1/ 1 / 1]	
				0: No print	
	5050	Adroop	Deals Eurotion	1: Print	
	5850	Address		Selects the module for managing user	
		001		information. DFU	
				[0~1/ 1 /1]	
				0: SCS	
				1: UCS	
	5852	SMTP		Simple Mail Transfer Protocol. The	
				protocol for communication between	
				Agents)	
		002	Port Number	Sets the port number	
				[1~65535 / 25 / 1]	
		003	Authorization	Validates the SMTP function. SMTP	
				(Simple Mail Transfer Protocol) is the	
				Internet main MTAs (Message Transfer	
				Agents).	
				[ON/OFF]	
				ON : Enables SMTP	
				OFF : Disables SMTP	
		004	User Name	Sets the SMTP user name.	
		005	Password	Sets the SMTP password.	
		006	SMTP Auth. Encryption	Sets encryption method for the transfer	
				password in SMTP validation.	
				0° Auto Allows three methods for	
				encryption in SMTP validation:	
				LOGIN, PLAIN, or CRAM-MD5.	
				1: Off. Allows two methods for SMTP	
				validation: LOGIN, PLAIN.	
				2: On. Allows only one memod for SMTP validation: CRAM-MD5	

SP		Number/Name	Function/[Setting]	
5852	007	POP before SMTP	A flag that determines whether the POP server is connected before connecting to the SMTP server.	
			POP	
			0: OFF	
			1: On Post Office Protocol (POP)servers are	
			computers that receive mail using SMTP. The mail includes a setting to ensure that it is directed to the POP server. POP servers are used when the user is not permanently	
	008	POP Server Name	Sets the POP server name	
	009	POP Port Number	Sets the POP port number	
	000		[1~65535/ 110 /1]	
	010	POP User Name	Set the POP user name.	
	011	POP Password	Set the POP password.	
	012	POP Auth. Encryption	Sets the encryption method for the password when 5852 POP Before SMTP is in use.	
			 O: Auto. Allows two methods for encryption: APOP and normal encryption to match the settings of the POP server. Off. Allows only normal encryption. 	
	012	Time out Setting for DOD	2: On. Allows only APOP encryption.	
	013	Time out Setting for POP	until the SMTP mail is sent. [0~10000/ 300 /1 ms]	
5853	Stamp Da	ata Download	Use this SP to download the fixed stamp data stored in the controller firmware and save it on the HDD. This SP can be executed as many times as required. This SP must be executed after replacing or formatting the hard disks.	
			hard disks installed. (<i>e</i> 5.10.5)	
5856	002	Remote Program Update: Local port	When set to "1" allows reception of firmware data via the local port (IEEE 1284) during a remote ROM update. [0~1 / 0 / 1] 0: Not allowed 1: Allowed This setting is reset to zero after the machine is cycled off and on	

SP		Number/Name	Function/[Setting]
5857	Save Deb	ug Log	
	001	On/Off (1:ON 0:OFF	Switches on the debug log feature. The debug log cannot be captured until this feature is switched on. [0 ~ 1 / 0 / 1] 0: OFF 1: ON
	002	Target (2: HDD 3: SD Card)	Selects the destination where the debugging information generated by the event selected by SP5858 will be stored if an error is generated $[2 \sim 3 / 2 / 1]$ 2: HDD 3: SD Card
	005	Save to HDD	Specifies the decimal key number of the log to be written to the hard disk. (•5.16)
	006	Save to SD Card	Specifies the decimal key number of the log to be written to the SD Card. (#5.16)
	009	HDD to SD Card (Latest 4 MB)	Takes the most recent 4 MB of the log written to the hard disk and copies them to the SD Card. (•5.16) 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.
	010	HDD to SD Card Latest 4 MB Any Key)	Takes the log of the specified key from the log on the hard disk and copies it to the SD Card. (r 5.16) A unique file name is generated to avoid overwriting existing file names on the SD Card. Up to 4 MB can be copied to an SD Card. 4 MB segments can be copied one by one to each SD Card. This SP does not execute if there is no log on the HDD with no key specified.
	011	Erase Debug Data From HDD	Erases all debug logs on the HDD
	012	Erase Debug Data From SD Card	Erases all debug logs on the SD Card. If the card contains only debugging files generated by an event specified by SP5858, the files are erased when SP5857 010 or 011 is executed. To enable this SP, the machine must be cycled off and on.

SP		Number/Name	Function/[Setting]	
5857	013	SD Card Space Available	Displays the amount of space available	
			on the SD card.	
5858	Debug Sa	ave When	These SPs select the content of the	
			debugging information to be saved to the	
	001		destination selected by Smool UUZ	
	001	Engine SC Error	engine errors	
	002	Controller SC Error	Stores SC codes generated by GW	
			controller errors	
	003	Any SC Error	Stores one SC specified by number.	
			[0~65535 / 0 / 1]	
			Refer to Section 4 for a list of SC error	
		l .	codes.	
	004	Jam	Stores jam errors	
5859	Debug Sa	ave Key No.	These SPs allow you to set up to 10	
	001	Key 1	keys for log files for functions that use	
	002	Key 2	common memory on the controller	
	003	Key 3		
	004	Key 4	[-99999999-+9999999 / 0 / 1]	
	005	Key 5	1	
	006	Key 6	1	
	007	Key 7]	
	008	Key 8]	
	009	Key 9]	
	010	Key 10		
5907	Plug & Pl	ay Maker/Model Name	Selects the brand name and the	
			production name for Windows Plug &	
			NVRAM If the NVRAM is defective	
			these names should be registered again.	
			After selecting, press the "Original Type"	
			key and "#" key at the same time. When	
			the setting is completed, the beeper	
			sounds five times.	
5913	002	Switchover Permission Time	Sets the amount of time to elapse while	
			the machine is in standby mode (and the	
			used) before another application can	
			gain control of the display.	
			[3~30 / 3 / 1 s]	
5915	Mechanic	cal Counter Detection	Displays whether the mechanical counter	
			is installed in the machine.	
			[0~2]	
			0: Not detected	
			1: Detected	
			2: Unknown	

SP		Number/Name	Function/[Setting]
5917	GPC Cou	unter Display	Displays the GPC counter.
			[0~1/ 0 /1] Japan Only
			0: No display
			1: Display
5918	A3 / DLT	Counter Display	Determines whether pressing the
			counter key displays count confirmation. $[0 \sim 1/0/1]$
			0. OFF
			1: ON
			This SP affects the display only, and has
			no effect on SP5104 (A3/DLT Double
			Count).
5923	Border R	emoval Area Switching	Selects the standard for edge erase.
			[0~1/0/1]
			0: The margin is erased from the original
			¹ The margin is erased from the data
			sent to the laser diode.
			The output resulting from each of the
			settings will be different when
			reduction/enlargement is used.
5967	Copy Server: Disable Function		Enables and disables the copier server.
			[0~1/0/1]
			1. Disables
			Turn the main switch off and on after
			changing this setting.
5974	Cherry S	erver	Do not change. Japan Only
5990	SMC Prir	nt	In the SP mode, press Copy mode to
			move to the copy screen, select the
			paper size, then press Start. Select
			information prints. Return to the SP
			mode, select the desired print, and press
			Execute.
	001	All Data	
	002	SP Mode Data List	
	003	User Program	
	004	Logging Data	
	005	Self-Diagnosis Report	
	007	NIB Summary	
	800		
	021	Copier User Program	
	022	Scanner SP	
	023	Scanner User Program	

SP6-nnn Peripherals

SP		Number/Name	Function/[Setting]
6006	DF Re	gistration Adjustment	
	001	Side-to-Side	Adjusts the printing side-to-side registration in the ADF mode. [-3~+3 / 0 / 0.1 mm] Use the "•/*" key to toggle between + and
	002	Leading Edge (Thin Original)	Adjusts the original stop position. [-10~+10 / 0 / 0.13mm] Use the "•/*" key to toggle between + and
	003	Leading Edge (Duplex 1st)	Adjusts the original stop position against the original left scale in one-sided original mode, and the first side of duplex originals. [-29~+29 / 0 / 0.13mm] Use the "•" key to toggle between + and
	004	Leading Edge (Duplex-2nd)	Adjusts the original stop position against the original left scale for the second side of duplex originals. [-29~+29 / 0 / 0.13mm] Use the "•" key to toggle between + and –.
6007	ADF II	nput Check	
	001	Group 1	Displays the signals received from sensors and switches of the ADF. ((\$\milder\$5.4.2))
	002	Group 2	Displays the signals received from sensors and switches of the ADF. (•5.4.2)
	003	Group 3	Displays the signals received from sensors and switches of the ADF. (•5.4.2)
6008	ADF C	Dutput Check	Turns on the ADF electrical components individually for testing. (+5.5.2)
6009	DF Free Run		Performs an ADF free run in two-sided original mode. Press "1" to start. <i>This is a general free run controlled from</i> <i>the copier</i>
6016	ADF N	lotor Speed Auto Adjustment	After pressing the Start key, the machine automatically adjusts the speeds of the ADF motors in the following order: Feed-in motor \rightarrow Transport Motor \rightarrow Feed-out Motor (High) \rightarrow Feed-out Motor (Low)

SP		Number/Name	Function/[Setting]
6105	Staple	e Position Adjustment	Adjusts the stapling position in the main
			scan direction
			[-3.5~+3.5 / 0 / 0.5 mm]
			Use the "•" key to toggle between + and
			A larger value causes the stapling
6107	Finieł	ar Frag Dup	position to shift outward.
0107	001	Stanle Mode	The finisher simulates a finisher free run
			for stanling A4 LEF.
			IO~1 / 0 / 11
			0: Stop
			1: Start
	002	Shift Mode	The finisher simulates a free run for
			stapling and tray shifting.
			[0~1 / 0 / 1]
			0: Stop
		De la la lla vez Deciliar	1: Start
	003	Back to the Home Position	Sets the machine in standby mode for
			Shipping. IO~1 / 0 / 11
			$\begin{bmatrix} 0^{-1} & \mathbf{i} \\ \mathbf{i} \end{bmatrix}$
			1 [·] Start
	004	With Joaaer Unit	The finisher simulates a shift mode free
	•-		run with the optional jogger unit.
			[0~1 / 0 / 1]
			0: Stop
			1: Start
6113	Punch	h Hole Position Adjustment	Adjusts the punch hole position in the
	001	2 Holes	sub-scan direction for the punch unit.
	002	3 Holes	[-7.5 - +7.5 / U / U.5 mm]
			Use the "•/*" key to toggle between + and
			A larger value shifts the nunch holes
			away from the edge of the paper, a
			smaller value toward the edge.
6116	Sheef	t Conversion (Thick Paper)	Divide the normal limit for stapling by this
			number to determine the staple limit
			number for thick paper mode.
0117			$\frac{\left[1^{3}/3\right]}{2}$
6117	FINIS		Displays the signals received from
	001		= ($=$ 5 4 3)
	002		
	003		_
	004		_
	005		_
0110	UUb		The second description of the
6110	FINISI	ier Оцтрит Спеск	I UM ON THE Electrical components of the finisher individually for test purposes
			(~ 5.5.3)

SP		Number/Name	Function/[Setting]
6119	Punch Function Enabled (Thick Paper)		Determines whether punch mode is enabled in thick paper mode. [0~1 / 0 / 1] 0: Disabled 1: Enabled
6120	Stapl	e Jogger Adjustment	
	001	A3	Adjusts the staple jogger positions for
	002	B4	each paper size. The higher the setting,
	003	A4 SEF	the narrower the jogger span.
	004	A4 LEF	[-1.5~+1.57 0 70.5 mm]
	005	B5 SEF	
	006	B5 LEF	
	007	DLT	
	800	LG	
	009	LT SEF	
	010	LTLEF	
	011	Others	
6121	Staple Jogging Repeat Setting		Determines whether jogging is executed once or twice for each sheet. [1~2 / 1 / 1] 1: Once 2: Twice This SP applies to the B478 finisher only.
6902	Staples Position in Center Folding		Use the 10-key pad to adjust the staple position in center folding. [-3.5~+3.5 / 0 / 0.5 mm] Use the "•/*" key to toggle between + and A larger value decreases the length of trailing edges, a smaller value increases the length of trailing edges.

SP7-nnn Data Logs

SP		Number/Name	Function/[Setting]
7001	Main Mo	tor Operation Time	Displays the total drum rotation time in minutes.
7002	Original Counter		Displays the total number of fed originals for each operation mode
	001	Total	
	002	Сору	
	004	Document Server	
	005	Scanner	
	006	Others	
7003	Print Cou	unter	Displays the total number of prints for
	001	Total	each operation mode.
	002	Сору	
	004	Printer	
	005	Others	
7006	GPC Co	unter	Japan Only
	001	GPC Total	
	002	GPC Copy	-
	003	GPC Printer	-
7007	Other Co	bunter	
	001	Duplex Counter	Displays the count total for the selected
	002	A3 / DLT Counter	item.
	003	Staple Counter	-
	004	Scan Counter	-
7009	Rental G	PC Counter	Japan Only
	001 GPC	C Total	
	002 GPC	Сору	
	003 GPC	Printer	
7101	Print Cou	unt - Paper Size	
	005	A4 LEF	Displays the number of copies by paper
	006	A5 LEF	size.
	014	B5 LEF	Display range: 0~9999999
	038	LTLEF	
	044	HLT LEF	
	132	A3	
	133	A4 SEF	
	134	A5 SEF	
	141	B4	
	142	B5 SEF	
	160	DLT	
	164	LG	
	166	LT SEF	
	172	HLT SEF	
	255	Others	

SP		Number/Name	Function/[Setting]
7105	Paper	Type Counter	Displays the total number of prints by
	001	Normal	paper type. A single-sided print counts as
	002	Recycled	1 and a two-sided print counts as 2.
	003	Special	1
	004	Colour1	1
	005	Colour2	1
	006	Letterhead	1
	008	Thick	1
	009	OHP	1
	010	Used]
	011	Index]
	012	Tracing]
	020	Yellow]
	021	Green	
	022	Blue	
	023	Purple	
	024	lvory	
	025	Orange	
	026	Pink	4
	027	Red	4
	028	Gray	4
	255	Others	
7201	Total Scan Counter		Displays the total number of scanned originals.
7204	Print C	ounter - Paper Tray	Displays the total number of sheets fed from each paper tray.
	002	Tray 1	
	003	Tray 2	1
	004	Tray 3	1
	005	Tray 4	1
	006	Tray 5]
	007	Tray 6]
	008	Tray 7]
	009	Inserter	
7205	Total A	DF Counter	Displays the total number of originals fed by the ADF.
7206	Staple	Counter	Displays the total number of staples used.
7301	Numbe	r of Pages by Magnification	Displays the total number of prints for
	Mode		each reproduction ratio range.
	001	Reduce 25%<>49%	SP7848 clears these counters.
	002	Reduce 50%<>99%	4
	003	Full Size	
	004	Enlarge 101%<>200%	
	005	Enlarge 201%<>400%	4
	006	Free Mag.%	4
	007	Free Size Mag. mm (in.)	
	800	Auto Reduce / Enlarge	

SP		Number/Name	Function/[Setting]
7304	Copy: N	Number of Copies by Mode	Displays the total number of copies by
			original type. SP7837 or SP7848 clears
	001	Tout	this counter.
	001	Text / Photo	+
	002	Deato	
	003	Concention Conv	+
	00-	Pale	+
	006	Punching	
	007	Reneat	++
	008	Sort	++
	009	Staple	
	010	Series	
	011	Erase	1
	012	Duplex	1
	013	ADF	
	014	Double Copy	1
	015	Duplex Original	
	016	Divided Copy	
	017	Combine 1 Side	
	018	Combine 2 Sides	
	019	Booklet Gathering	
	020	Pamphlet Saddle-Stitching	
	021	Batch	
	022	SADF	
	023	Mixed Sizes	
	024	Stamp	
	025	Cover/Chapter Sheet Switching	
	026	Chapter Page	
7305	Сору: Г	Display Jobs by Continuous	
	Output	T	
	001	1to1	Displays the total number of multiple print
	002	1 to 2<>5	JODS DY THE SIZE OF THE SETS. SP 1030 OF
	003	1 to 6<>10	
	004	1 to 11<>20	4
	005	1 to 21<>50	4
	006	1 to 51<>100	4
		1 to 101<>300	4
7206			
/ 300			Displays the total number of convicts by
	001	Stoplo	Displays the total number of copy jobs by operation mode (stapling punching etc.)
	002	Staple	SP7839 or SP7848 clears this counter.
	003	Punching Resona Conv	-
	004	Chack Copy	4
	005	спеск сору	

SP		Number/Name	Function/[Setting]
7320	Doc. Sv	r - Scan Counter	Displays the total number of pages stored in the document server. SP7840 or SP7848 clears this counter.
7321	Doc. Sv	/r - Original Size Display	
	004	A3	Displays by paper size the total number of
	005	A4	Originals stored in the document server.
	006	A5	
	013	B4 D2	4
	014		-
	032		-
	038		-
	044		-
	128	Others	-
7323	Doc. Sv	vr - Print Size Display	
	005	A4 LEF	Displays by paper size the total number of
	006	A5 LEF	prints stored in the document server.
	014	B5 LEF	SP7842 or SP7848 clears this counter.
	038	LTLEF	-
	044	HLTLEF	
	128	Others	
	132	A3	_
	133	A4 SEF	
	134	A5 SEF	4
	141		4
	142		4
	164		-
	166		-
	172	HLTSEF	-
7324	Doc. Sv	vr - Print Job Counter	
	001	Duplex	Displays the total number of jobs executed
	002	Sort	from the document server. SP7843 or
	003	Staple	SP7848 clears this counter.
	004	Punch	1
	005	Check Copy	-
	006	Print 1st Page	-
7325	Doc. Sv	/r - Job Count (Page No)	
	001	1 Page	Displays the number of pages in jobs
	002	2 Pages	SP7844 or SP7848 clears this counter
	003	3 <-> 5 Pages	
	004	6 <-> 10 Pages	-
	005	Over 11 Pages	

SP		Number/Name	Function/[Setting]
7326	Doc. Sv	rr - Job Count (File No)	
	001	1 File	Displays the number of files in jobs
	002	2 <-> 5 Files	executed from the document server.
	003	6 <-> 10 Files	SP7845 or SP7848 clears this counter.
	004	Over 11 Files	
7327	Doc. Sv	rr - Job Count (Set No)	
	001	1 to 1	Displays the number of sets of multiple
	002	1 to 2<>5	page print jobs executed from the
	003	1 to 6<>10	document server. SP7846 or SP7848
	004	1 to 11<>20	
	005	1 to 21<>50	
	006	1 to 51<>100	
	007	1 to 101<>300	
	008	1 to 301<>over	
7328	Doc. Sv	rr - Job Count (Print Mode)	
	006	Punch	Displays the total number of prints in print
	008	Sort	mode executed from the document server.
	009	Staple	SF7047 OF SF7040 Clears this counter.
	012	Duplex	
	019	Booklet	
	020	Magazine	
	024	Stamp	
	025	Cover / Chapter Sheet	
	000	Switching	-
7000	026	Slip Sheet	Displays the symples of ishe successed by
7330	Connec	t Copy – Job Count	Displays the number of jobs processed by
			connected.
7331	Connec	t Copy – Print Count	Displays the number of copies when two
			copiers are connected. Counts the total for
	_		both the master and slave machines.
7334	Connec	t Copy – Doc. Svr. Print Count	Displays the number of copies printed with
			the document server when two copiers are
			master and slave machines
7401	Total S	C Counter	Displays the total number of SCs logged.
			Display Range: 0~9999
7403	SC Hist	ory	Displays the latest 10 service call codes
	001	Latest	
	002	Latest 1	
	003	Latest 2	
	004	Latest 3	
	005	Latest 4	
	006	Latest 5	
	007	Latest 6	
	008	Latest 7	
	009	Latest 8	
	010	Latest 9	

SP		Number/Name	Function/[Setting]
7502	Total F	Paper Jam Counter	Displays the total number of copy jams.
			Display Range: 0~9999
7503	Total C	Driginal Jam Counter	Displays the total number of original jams.
		0	Display Range: 0~9999
7504	Paper	Jam Counter by Jam Location	Displays the list of possible locations
			where a jam could have occurred. These
			Jams are caused by the failure of a sensor
	003	1st Paper Trav	These are jams when the paper does not
	003	2nd Paper Tray	activate the sensor.
	004	3rd Paper Tray	
	005	Ath Paper Tray	
	000	5th Paper Tray	
	007	6th Paper Tray	
	000	7th Paper Tray	
	009	LCT Polov Sonsor	
	010		
	011	Polov Sonsor	
	012	Relay Selisor	
	015	Eucing Exit Sonsor	
	015	Fusing Exit Sensor	
	010	Duploy Entrance Sensor	
	019	Duplex Entrance Sensor	
	020	Duplex Transport Sensor 1	
	021	Duplex Transport Sensor 2	
	022	Inverter Tray Deper Sensor 3	
	023	Entropos Songer Fin	
	025	Linear Tray Exit Sonsor Fin.	
	020	Shift Tray Exit Sensor Fin.	
	027	Stanler Trey Entrence Sensor	
	020	Fin.	
	029	Stapler Tray Paper Sensor -	
		Fin.	
	030	Entrance Sensor - FIN Staple	
		Tray	
	031	Stapler Tray Paper Sensor - S.S. Fin	
	032	Saddle Stitch Stapler Sensors - S.S. Fin	
	033	Pressure Plate Sensors - S.S. Fin	
	034	Stapler Entrance Sensors - S.S Fin	
	035	Shift Tray Sensors - S.S. Fin	
	036	Jogger Fence HP Sensor -	
		S.Š. Fin	
	037	Shift Roller HP Sensor - S.S	
		Fin	

SP		Number/Name	Function/[Setting]
7504	038	Stapler HP Sensors - S.S. Fin	These are jams when the paper does not
	039	Stapler Unit Sensor - S.S. Fin	activate the sensor.
	040	Folder Plate HP Sensor - S.S.	
		Fin	
	041	Feed-out Belt HP Sensor - S.S	
	042	FIN	
	042	Punch HP Sensor - 5.5 Fin	
	043	Abnormal Signal - 5.5 Fin	
	044	Internoser	
	045	Transport Sensor - Cover	
	• • •	Interposer	
	046	Bottom Plate Position Sensor -	
		Cover Interposer	
	053	1st Paper Tray	
	054	2nd Paper Tray	
	055	3rd Paper Tray	
	056	4th Paper Tray	
	057	5th Paper Tray	
	058	6th Paper Tray	
	059	LCT Relay Sensor	
	060	LCT Exit Sensor	
	061	Relay Sensor	
	062	Registration Sensor	
	063	Fusing Exit Sensor	
	065	Exit Sensor	
	069	Duplex Entrance Sensor	
	070	Duplex Transport Sensor 1	
	071	Duplex Transport Sensor 2	
	072	Duplex Transport Sensor 3	
	073	Inverter Tray Paper Sensor	
7505	Origina	al Jam Counter by Jam Location	Displays the list of possible locations where an original jam could have occurred. These jams are caused by the failure of a sensor to activate.
	003	ADF Feed-in Sensor	
	004	ADF Feed-out Sensor	
7506	Jam C	ounter by Copy Size	Displays the total number of original jams by paper size.
	005	A4 LEF	
	006	A5 LEF	
	014	B5 LEF	
	038	LTLEF	
	044	HLT LEF	
	132	A3	
	133	A4 SEF	
	134	A5 SEF	
	141	B4	

SP		Number/Name	Function/[Setting]
7506	142	B5 SEF	
	160	DLT	
	164	LG	
	166	LT SEF	
	172	HLT SEF	
	255	Others	
7507	Plotter	Jam History	Displays the following items for the last 10
			copy paper jams:
			1) Jam code
			2) Paper size
			4) Date of iam
	001	Latest	
	001	Latest	
	002	Latest 1	
	003	Latest 2	
	004	Latest 4	
	005	Latest 5	
	007	Latest 6	
	008	Latest 7	
	009	Latest 8	
	010	Latest 9	
7508	Origina	al Jam History	Displays the following items for the Latest
	eng		10 original jams:
			1) Jam code,
			2) Original size,
			3) Total count when jam occurred,
			4) Date of jam.
	001	Latest	
	002	Latest 1	
	003	Latest 2	
	004	Latest 3	
	005	Latest 4	
	006	Latest 5	
	007	Latest 6	
	800	Latest 7	
	009	Latest 8	
7047	010 Dente I	Latest 9	
1017		- W Counter Display	lanan Only
	001	Original Paper Standard	Japan Only
7619	Dorte I	M Counter Reset	Japan Only
1010	- aits i	Conv Paper Standard	Clears the counter of SP7617_001
	001	oopy Faper Stanuaru	Janan Only
	002	Copy Paper Standard	Clears the counter of SP7617-002
	002		Japan Only

SP		Number/Name	Function/[Setting]
7801	ROM	Version	
	001	System/Copy	Displays the ROM versions for these
	002	Engine	items.
	003	LCDC	
	004	PI	
	005	ADF	
	007	Finisher	
	015	Scanner	
	018	NIB	
	020	Cover Interposer	
	022	BIOS	
	100	Language-1	
	101	Language-2	
	150	RPCS	
	151	PS	
	152	RPDL	
	153	R98	
	154	R16	
	155	RPGL	
	156	R55	
	157	RTIFF	
	158	PCL	
	159	PCLXL	
	160	MSIS	
	161	MSIS (Option)	
	180	FONT	
	181	FONT1	
	182	FONT2	
	183	FONT3	
	201	Copy Application	
	202	NetFile Application	
	204	Printer Application	
	205	Scanner Application	
	211	Web System	
	212	WebDocBox	
7803	PM Co	ounter Display	Displays the PM counter since the last PM.
7804	PM Co	ounter Reset	Resets the PM counter.
7807	SC/J	am Counter Reset	Resets the SC and jam counters.

SP		Number/Name	Function/[Setting]
7808	Counte	er Reset	Press # to reset all counters, with the
			exception of the following counts:
			Total electronic count
			Copy count
			Print count
			Duplex count
			Staple count
			• A3/DLT count
			• P/O count
7810	Access	Code Clear	Press # to clear the key operator code if
7010	7.00033		the customer key operator forgets the
			code and the machine cannot be used.
7811	Origina	I Counter Clear	Clears the original total display, displayed
	Ŭ		with SP7-002-***.and SP7205-001
7816	Print C	ounter Reset by Paper Tray	
	002	Tray 1	Resets the total copy counter by paper
	003	Tray 2	tray. These SP modes can be used after
	004	Tray 3	replacing the pick-up, feed, and
	005	Tray 4	stations
	006	Tray 5	
	007	Tray 6	
	008	Tray 7	
	009	Inserter	
7822	Copy C Rate	Clear: Pages by Magnification	Resets all counters of SP7-301.
7825	Total C	Counter Reset	Resets the electrical total counter.
			Usually, this SP mode is done at
			installation. This SP mode works only
7000	N/E E		once when the counter value is negative.
7826	MF Err		
	001		Japan Only
7007	002	Error Staple	Japan Only
7827	MF Err	or Counter Clear	Japan Only
7829	Rental	GPC Counter Reset	Japan Only
7832	Self-Dia	agnose Result Display	Nothing is displayed if no errors have
7833	Pival C	overage Ratio	
1000	001		Displays the toper coverage ratio (%) for
	001		the previous page just output.
			Example: All black solid: 100%
	002	Average Pages	Displays the average toner coverage ratio
			(%) for the previous pages just output.
	003	Toner Bottle in Use	Displays the number of toner ends. (Total
			number of times the toner bottle has been
			used)

SP		Number/Name	Function/[Setting]
7833	004	Copy Count: Previous Toner Bottle	Display the number of output pages for the last toner bottle. (Toner yield for the last toner bottle)
	005	Copy Count: Toner Bottle Before Previous	Display the number of output pages for the toner bottle before last. (Toner yield for the toner bottle before last)
7834	Clear F	Pixel Coverage Data	
	001	Last & Average pages	Clears the counters SP7833-001 and -002
	002	Toner Bottle in Use	Clears the counters SP7833-003.
	003	Page Counts (2 Prev. Toner Bottles)	Clears the counters SP7833-004 and - 005.
7836	Total M	lemory Size	Press # to display the contents of the memory on the controller system.
7837	Copy C	Clear: Pages by Mode	Press execute to clear counters SP7301 (Number of Pages by Magnification Mode) and SP7304 (Copy: Number of Copies by Mode) . If the machine has connect copy function, SP7330 (Connect Copy – Job Count)is also cleared .
7838	Copy Clear: Jobs by Continuous Output		Press Execute to clear counter SP7305 (Copy: Display Jobs by Continuous Output.)
7839	Сору С	Clear: Jobs by Mode	Press Execute to clear counter SP7306.(Copy: Display Jobs by Mode). If the machine has the connect copy function, SP7331 (Connect Copy – Print Count) is also cleared
7840	LS Cle	ar: Stored Image Logins	Press Execute to clear counter SP7320 (Doc. Svr. – Scan Count).
7841	LS Cle	ar: Originals by Size	Press Execute to clear counter SP7321 (Doc. Svr. – Original Size Display)
7842	LS Cle	ar: Prints by Size	Press Execute to clear counter SP7323 (Doc. Svr – Print Size Display).
7843	LS Cle	ar: Print Job Logins	Press Execute to clear counter SP7324 (Doc. Svr. – Print Job Counter).
7844	LS Cle	ar: Print Job Page Distribution	Press Execute to clear SP7325 (Doc. Svr. – Job Count (Page No.).
7845	LS Cle	ar: Print Job File Distribution	Press Execute to clear SP7326 (Doc. Svr – Job Count (File No.)
7846	LS Cle	ar: Print Job Copies Distribution	Press Execute to clear SP7327 (Doc. Svr. – Job Count (Set No.
7847	LS Cle	ar: Number oF Pages by Mode	Press Execute to clear SP7328 (Doc. Svr – Job Count (Print Mode). If the machine has the connect copy function, SP7334 (Connect Copy – Doc. Svr. Print Cou) is also cleared.
7848	Copy: /	All Clear	Press Execute to clear the following SP codes: SP7301, SP7304, SP7305, SP7306, SP7320, SP7321, SP7323, SP7324, SP7325, SP7326, SP7327, SP7328.

SP	Number/Name	Function/[Setting]
7901	Status of SC990	Displays the following information of SC990.
		1) Source file name
		2) Line no.
		3) Location
		DFU

1004

1005

Print Summary

Display Version.

- 1	
	_

5.2.2 PRINTER SERVICE TABLE SP Number/Bit SW Initial 1001 Bit Switch 001 Bit SW 1 00H Adjusts the bit switch settings. 002 00H Note: These bit switches are Bit SW 2 currently not being used 003 Bit SW 3 00H 004 Bit SW 4 00H 005 Bit SW 5 00H 006 Bit SW 6 00H Bit SW 7 007 00H 008 Bit SW 8 00H 1003 Clear setting 001 Initialize Printer System Initializes the settings in the printer feature settings of UP mode. 002 Clear CSS Counter DFU 003 **Delete Program** DFU

Prints the printer summary sheet.

firmware.

Displays the version of the controller

5.2.3 SCANNER SERVICE TABLE

SP	Number/Name		Function/[Setting]	
1001	Syste	m		
	001	Model Name	Displays the model name.	
	002	Scanner Firmware Version	Displays the scanner firmware version.	
	003	Scanner Firmware Number	Displays the firmware's part number.	
	004	Detail Model Name	Displays the detail model name.	
1002	Error Log Display		Displays the error log data.	
1004	Comp	ression Type	Selects the compression type for binary	
			picture processing.	
			[1-3/1/1]	
	_		1: MH, 2: MR, 3: MMR	
1005	Erase	Margin	Creates an erase margin for all edges of the	
			scanned image.	
			If the machine has scanned the edge of the	
			[0 - 5/0/1 mm]	
1006	Auto	Reset Timer	Adjusts the auto reset timer for the scanner	
1000	7 (010)		function.	
			If this is "0", the auto reset function is	
			disabled.	
	[[0, 10 – 99/ 60 /1s]	
1007	7 Store Priority		Selects the default setting of the store	
			priority when the main switch is turned on.	
			[1 – 3/1/1]	
			1: Send only	
			2: Store only	
			3: Send + Store	
2002	Text Mode Setting			
	001	MIF Filter Coefficient	Selects the MTF filter coefficient in the main	
		(Main Scan)	Scient a higher number for a stronger filter	
			Select a migher number for a stronger miler.	
			$10 \sim 13/7/11$	
	002	MTE Filter Coefficient	Selects the MTE filter coefficient in the sub	
	002	(Sub scan)	scan direction for Text mode.	
		()	Select a higher number for a stronger filter.	
			If this is "0", the MTF filter is not applied	
			[0~13/ 7 /1]	
	003	MTF Filter Strength	Selects the MTF filter strength in the main	
		(Main scan)	scan direction for Text mode.	
			Select a higher number for a stronger filter.	
			[0~7/2/1]	
	004	MTF Filter Strength	Selects the MTF filter strength in the sub	
		(Sub scan)	scan direction for Text mode.	
			Select a higher number for a stronger filter. $[0 \sim 7/2/1]$	

SP		Number/Name	Function/[Setting]
2002	005	Smoothing Filter	Selects the smoothing pattern for Text
			mode.
			A larger value is smoother. A smaller value
			could cause moiré to appear in the image.
	006	Seener Commo	[0~7/0/1]
	006	Scanner Gamma	mode
			[0~7 11/ 4 /1]
			0:Normal, 1:Smooth, 2:Distinct, 3:Sharp,
			4:Text, 6:Text/Photo, 7: Photo, 11:
			Grayscale
			4~7 is used for delivery scanner mode.
	007	Notch 7(Lighter): Brightness	The following SPs adjust the image density
	800	Notch 7(Lighter): Contrast	(brightness, contrast, and thresholds) for
	009	Notch 7(Lighter): Threshold	Text mode The settings are reflected in the
	010	Notch 6: Brightness	gamma table.
	011	Notch 6: Contrast	[1~255/ 128 /1]
	012	Notch 5: Prightness	
	013	Notch 5: Contrast	-
	015	Notch 5: Threshold	-
	016	Notch 4(Middle): Brightness	
	017	Notch 4 (Middle): Contrast	
	018	Notch 4 (Middle): Threshold	
	019	Notch 3: Brightness	
	020	Notch 3: Contrast	
	021	Notch 3: Threshold	-
	022	Notch 2: Brightness	
	023	Notch 2: Contrast	
	024	Notch 2: Threshold	-
	025	Notch 1(Darker): Brightness	-
	026	Notch 1 (Darker): Contrast	-
	027	Notch 1(Darker): Threshold	
	028	Independent Dot Erase	Select the independent dot erase type for
			A larger value is stronger erase
			[0~7/ 0 /1]
	029	Unevenness Correction	Selects the unevenness correction.
			[0~1/ 0 /1]
			0: OFF
			1: ON
2003	Tovt/	 Photo Mode Setting	
2003	001	MTF Filter Coefficient	Selects the MTF filter coefficient in the main
		(Main scan)	scan direction for Text/Photo mode.
			Select a higher number for a stronger filter.
			If this is "0", the MTF filter is not applied.
			[0~13/ 6 /1]

SP	Number/Name		Function/[Setting]	
2003	002	MTF Filter Coefficient (Sub scan)	Selects the MTF filter coefficient in the sub scan direction for Text/Photo mode. Select a higher number for a stronger filter. If this is "0", the MTF filter is not applied [0~13/ 6 /1]	
0	003	MTF Filter Strength (Main scan)	Selects the MTF filter strength in the main scan direction for Text/Photo mode. Select a higher number for a stronger filter. [0~7/ 2 /1]	
	004	MTF Filter Strength (Sub scan)	Selects the MTF filter strength in the sub scan direction for Text/Photo mode. Select a higher number for a stronger filter. [0~7/ 2 /1]	
	005	Smoothing Level	Selects the smoothing pattern for Text/Photo mode. A larger value is smoother. A smaller value could cause moiré to appear in the image. [0~7/ 0 /1]	
	006	Gamma Setting	Selects the scanner gamma type for Text/Photo mode. [0~7,11/ 6 /1] 0:Normal, 1:Smooth, 2:Distinct, 3:Sharp, 4:Text, 6:Text/Photo, 7: Photo, 11: Grayscale <i>4~7 is used for delivery scanner mode</i> .	
	007	Notch 7(Lighter): Brightness	The following SPs adjust the image density	
	008	Notch 7(Lighter): Contrast	(brightness, contrast, and thresholds) for	
	009	Notch 7(Lighter): Threshold	each image density level (from 7 to 1) for	
	010	Notch 6: Brightness	in the gamma table	
	011	Notch 6: Contrast	11 the gamma table. [1~255/ 128 /1]	
	012	Notch 6: Threshold		
	013	Notch 5: Brightness		
	014	Notch 5: Contrast		
	015	Notch 5: Threshold		
	016	Notch 4(Middle): Brightness		
	017	Notch 4 (Middle): Contrast		
	018	NOTCH 4 (IVIIODIE): I hreshold		
	019	Notch 2: Contract		
	020	Notch 2: Throshold		
	021	Notch 2: Brightness		
	022	Notch 2: Contrast		
	020	Notch 2: Threshold		
	025	Notch 1(Darker): Brightness		
	026	Notch 1 (Darker): Contrast		
	027	Notch 1 (Darker): Threshold		

SP	Number/Name		Function/[Setting]		
2004	Photo	Mode Setting			
	001	MTF Filter Coefficient (Main scan)	Selects the MTF filter coefficient in the main scan direction for Photo mode. Select a higher number for a stronger filter. If this is "0", the MTF filter is not applied. [0~13/ 0 /1]		
	002	MTF Filter Coefficient (Sub scan)	Selects the MTF filter coefficient in the sub scan direction for Photo mode. Select a higher number for a stronger filter. If this is "0", the MTF filter is not applied [0~13/ 0 /1]		
	003	MTF Filter Strength (Main scan)	Selects the MTF filter strength in the main scan direction for Photo mode. Select a higher number for a stronger filter. [0~7/ 0 /1]		
	004	MTF Filter Strength (Sub scan)	Selects the MTF filter strength in the sub scan direction for Photo mode. Select a higher number for a stronger filter. [0~7/ 0 /1]		
	005	Smoothing Level	Selects the smoothing pattern for Photo mode. A larger value is smoother. A smaller value could cause moiré to appear in the image. [0~7/ 7 /1]		
	006	Gamma Setting	Selects the scanner gamma type for Text/Photo mode. [0~7,11/ 7 /1] 0:Normal, 1:Smooth, 2:Distinct, 3:Sharp, 4:Text, 6:Text/Photo, 7: Photo, 11: Grayscale 4~7 is used for delivery scanner mode.		
	007	Dither Pattern	Selects the dither pattern. [1~11/5/1] 1: 8 x 4 45° 2: 6 x 6 90° 3: 4 x 4 spiral 4: 8 x 8 90°, 5: 70 line 6: 95 line 7: 140 line 8: 180 line 9: 16 x 16 90° 10: 8x8 spiral 11: 106 line		
	008	Notch 7(Lighter): Brightness	The following SPs adjust the image density		
	009	Notch 7(Lighter): Contrast	(brightness, contrast, and thresholds) for		
	010	Notch 7(Lighter): Threshold	each image density level (from 7 to 1) for		
	011	Notch 6: Brightness	Photo mode. The settings are reflected in		
	012	Notch 6: Contrast	11~255/ 128 /1]		
	013	Notch 6: Threshold			

SP		Number/Name	Function/[Setting]
2004	014	Notch 5: Brightness	
	015	Notch 5: Contrast	
	016	Notch 5: Threshold	
	017	Notch 4(Middle): Brightness	
	018	Notch 4 (Middle): Contrast	
	019	Notch 4 (Middle): Threshold	
	020	Notch 3: Brightness	
	021	Notch 3: Contrast	
	022	Notch 3: Threshold	
	023	Notch 2: Brightness	
	024	Notch 2: Contrast	
	025	Notch 2: Threshold	
	026	Notch 1(Darker): Brightness	
	027	Notch 1 (Darker): Contrast	
	028	Notch 1 (Darker): Threshold	
2005	Grays	cale Mode Setting	
	001	MTF Filter Coefficient	Selects the MTF filter coefficient in the main
		(Main scan)	scan direction for Grayscale mode.
			Select a higher number for a stronger filter.
			If this is "0", the MTF filter is not applied.
			[0~13/ 0 /1]
	002	MTF Filter Coefficient	Selects the MTF filter coefficient in the sub
		(Sub scan)	scan direction for Grayscale mode.
			Select a higher number for a stronger filter.
			If this is "0", the MIF filter is not applied
	000		$[0^{13}, 0^{1}]$
	003	(Main scan)	scan direction for Gravecale mode
			Select a higher number for a stronger filter
			$[0 \sim 7/0/1]$
	004	MTE Filter Strength	Selects the MTE filter strength in the sub
		(Sub scan)	scan direction for Grayscale mode.
		,	Select a higher number for a stronger filter.
			[0~7/ 0 /1]
	005	Smoothing Level	Selects the smoothing pattern for Grayscale
			mode.
			A larger value is smoother. A smaller value
			could cause moiré to appear in the image.
			[0~7/ 0 /1]
	006	Gamma Setting	Selects the scanner gamma type for
			[0~7,17]
			U.Nommal, T.Smooth, Z.Distinct, S.Sharp, 4:Text, 6:Text/Photo, 7: Photo, 11:
			Gravscale
			$4 \sim 7$ is used for delivery scanner mode

SP	Number/Name		Function/[Setting]	
2005	007	Notch 7(Lighter): Brightness	The following SPs adjust the image density	
	008	Notch 7(Lighter): Contrast	(brightness, contrast, and thresholds) for	
	009	Notch 7(Lighter): Threshold	each image density level (from 7 to 1) for	
	010	Notch 6: Brightness	grayscale mode. The settings are reflected	
	011	Notch 6: Contrast	In the gamma table.	
	012	Notch 6: Threshold	[1~255/126/1]	
	013	Notch 5: Brightness		
	014	Notch 5: Contrast		
	015	Notch 5: Threshold		
	016	Notch 4(Middle): Brightness		
	017	Notch 4 (Middle): Contrast		
	018	Notch 4 (Middle): Threshold		
	019	Notch 3: Brightness		
	020	Notch 3: Contrast		
	021	Notch 3: Threshold		
	022	Notch 2: Brightness		
	023	Notch 2: Contrast		
	024	Notch 2: Threshold		
	025	Notch 1(Darker): Brightness		
	026	Notch 1 (Darker): Contrast		
	027	Notch 1 (Darker): Threshold		
2006	Grays	cale Compression		
	001	Standard	Sets the rate of compression when	
			Standard is selected for handling JPEG	
			files.	
			[5~95/ 50 /1]	
			95: Low compression (larger file)	
	000	Llinh Quality	5: High compression (smaller file)	
	002	High Quality	Sets the rate of compression when High is	
			95: Low compression (larger file)	
			5. High compression (smaller file)	
	003	Low Quality	Sets the rate of compression when Low is	
	000	Low Quanty	selected for handling JPEG files.	
			[5~95/ 40 /1]	
			95: Low compression (larger file)	
			5: High compression (smaller file)	

5.3 PRINTING TEST PATTERNS

- **NOTE:** Do not operate the machine until the test pattern is printed out completely. Otherwise, an SC may occur.
- 1. Access the SP mode which contains the test pattern you need.
- 2. Touch the "Copy Window" key on the operation panel to access the copy mode display.
- 3. Select the paper size.
- 4. Press the "Start" key to print the test pattern.
- 5. After checking the test pattern, exit copy mode by touching the "SP Mode" key.
- 6. Exit the SP mode.

5.3.1 IPU SCANNING TEST PATTERN (SP2-902-001)

No.	Test Pattern
0	OFF
1	Vertical 1-dot Line
2	Vertical 2-dot Line
3	Horizontal 1-dot Line
4	Horizontal 2-dot Line
5	Independent 1-dot
6	Cross Stripes 1-dot Lines
7	Vertical Stripes
8	Horizontal Grayscale
9	Vertical Grayscale
10	16-step Grayscale
11	Cross
12	Slant Cross Stripes
13	256-Color Density Pattern
14	64-Color Density Pattern
15	Trimming Region
16	Vertical Frequency Spec.
17	Horizontal Frequency Spec.

5.3.2 IPU PRINTING TEST PATTERN (SP2-902-002)

No.	Test Pattern		
0	OFF		
1	1200 Date Image 1		
2	1200 Date Image 2		
3	Vertical Grayscale		
4	Caterpillar		
5	LD Channel Adjust 1		
6	LD Channel Adjust 2		
7	LD Channel Adjust 3		
8	LD Channel Adjust 4		

5.3.3 PRINTING TEST PATTERN (SP2-902-003)

No.	Test Pattern		
0	None		
1	1-dot Independent Pattern		
2	2-dot Independent Pattern		
3	4-dot Independent Pattern		
4	2048-dot Independent Pattern		
5	Grid 1-dot Line (0ch)		
6	Grid 1-dot Line (1ch)		
7	Grid 1-dot Line (2ch)		
8	Grid 1-dot Line (3ch)		
9	Grid 1-dot Line (4ch)		
10	Grid 1-dot Line (5ch)		
11	Grid 1-dot Line (6ch)		
12	Grid 1-dot Line (7ch)		
13	Vertical 1-dot Line		
14	Vertical 2-dot Line		
15	Horizontal 1-dot Line		
16	Horizontal 2-dot Llne		
17	17 Grid 1-dot Parallel Lines		
18	Checker Flag		
19 Slanted Grid 1-dot Line			
20 Slanted Grid 2-dot Line			
21 Argyle 670			
22 Argyle 012			
23 All Black			
24 Grid 2-dot Line			
25	Vertical Belt Pattern		
26	Horizontal Belt Pattern		
27	Trim 1-dot Line		
28	Trim 2-dot Line		
29	Stair Pattern		
30	Grayscale Horizontal (20 mm Wide)		
31	Grayscale Horizontal (40 mm Wide)		
32	Grayscale Vertical (20 mm Wide)		
33	Grayscale Vertical (40 mm Wide)		
34	Grayscale Horizontal (20 mm Wide		
	Without Loop)		
35	White Paper (Test: No Output)		
36 Grid 1-dot Line (0ch) OR External			
3/ Irim 1-dot Line OR External			
38 Slanted Grid Pattern OR External			

5.4 INPUT CHECK

5.4.1 MAIN MACHINE INPUT CHECK: SP5803

This procedure allows you to test sensors and other components of the machine. After you select one of the categories below by number, you will see a small 8-bit table with the number of the bit and its current setting (0 or 1). The bits are numbered 0 to 7, reading right to left.

- 1. Enter the SP mode and select SP5803.
- 2. Enter the class 3 number 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.

Bit	76543210
Setting	11001010

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

Class 3	Bit	Description	Reading	
No.	No.	Description	0 (LOW)	1 (HIGH)
	7	Not Used		
	6	By-pass Tray Paper End Sensor(7th tray)	Not paper end	Paper end
	5	LCT 3rd Paper End Sensor (6th tray)	Not paper end	Paper end
1	4	LCT 2nd Paper End Sensor (5th tray)	Not paper end	Paper end
	3	LCT 1st Paper End Sensor (4th tray)	Not paper end	Paper end
	2	3rd Paper End Sensor	Not paper end	Paper end
	1	2nd Paper End Sensor	Not paper end	Paper end
	0	1st Paper End Sensor	Not paper end	Paper end
	7	Not Used		
	6	By-pass Tray Paper Feed Sensor(7th tray)	Paper detected	No paper
	5	LCT 3rd Paper Feed Sensor (6th tray)	Paper detected	No paper
	4	LCT 2nd Paper Feed Sensor (5th tray)	Paper detected	No paper
2	3	LCT 1st Paper Feed Sensor (4th tray)	Paper detected	No paper
	2	3rd Paper Feed Sensor	Paper detected	No paper
	1	2nd Paper Feed Sensor	Paper detected	No paper
		1st Paper feed Sensor		No paper
	0		Paper detected	

Class 3	Bit No.	Description	Reading	
No.			0 (LOW)	1 (HIGH)
	7	Key Card Set	Set	Not set
	6	Duplex Entrance Sensor	Paper detected	No paper
	5	Duplex Jogger H.P.	Not detected	Detected
	4	Duplex Transport 3 Sensor	Paper detected	No paper
3	3	Duplex Transport 2 Sensor	Paper detected	No paper
	2	Duplex Transport 1 Sensor	Paper detected	No paper
	1	Duplex Inverter Sensor	Paper detected	No paper
	0	Duplex Connection	Connected	Not connected
	7	Not Used		
	6	By-pass Tray Lift Sensor (7th tray)	Lifted	No paper
	5	LCT 3rd Lift Sensor (6th tray)	Lifted	No paper
4	4	LCT 2nd Lift Sensor (5th tray)	Lifted	No paper
	3	LCT 1st Lift Sensor (4th tray)	Lifted	No paper
	2	3rd Lift Sensor	Lifted	No paper
	1	2nd Lift Sensor	Lifted	No paper
	0	1st Lift Sensor	Lifted	No paper
	7	Not Used		
	6	Not Used		
	5	Not Used		
5	4	Not Used		
Ŭ	3	Drum Unit set	Set	Not set
	2	Polygon Motor Cooling Fan Lock	No lock	Lock
	1	Toner Hopper Sensor	Toner end	Not toner end
	0	Key Counter Set	Set	Not set
	7	Drum Motor Lock	Lock	Not lock
	6	Fusing/Exit Motor Lock	Lock	Not lock
	5	Not Used		
	4	Not Used		
6	3	Development Motor Lock	Lock	Not lock
	2	Ioner Suction Motor Rotation Sensor	Not interrupted	Interrupted
	1	Not Used		
	0	Toner Supply Pump Motor Sensor	Not interrupted	Interrupted
	7	Left Front Door Safety Switch	Door closed	Door open
	6	Right Front Door Safety Switch	Door closed	Door open
	5	Relay Motor Lock	Lock	Not lock
	4	Guide Plate Position Sensor	In position	Out of position
	3	LCT Relay Sensor	Paper detected	No paper
-	2	Relay Sensor	Paper detected	No paper
/	1	Not Used		
		Registration Sensor		No paper
	0		Paper detected	

Class 3 No.	Bit No.	Description	Reading	
			0 (LOW)	1 (HIGH)
	7	Not Used		
	6	Not Used		
8	5	Not Used		
	4	Not Used		
	3	Not Used		
	2	Not Used		
	1	Not Used		
	0	Not Used		
9	7	Total Counter Set	Not set	Set
	6	Fusing Abnormal Signal	Normal	Abnormal
	5	Not Used		
	4	Exit Unit Set	Set	Not set
	3	Web End Sensor	Not end	End
	2	Exit Sensor	Paper detected	No paper
	1	Fusing Exit Sensor	No paper	Paper detected
	0	Fusing Unit Set	Set	Not set
	7	Dip SW 8	ON	OFF
	6	Dip SW 7	ON	OFF
	5	Dip SW 6	ON	OFF
10	4	Dip SW 5	ON	OFF
	3	Dip SW 4	ON	OFF
	2	Dip SW 3	ON	OFF
	1	Dip SW 2	ON	OFF
	0	Dip SW 1	ON	OFF
	7	Not used		
	6	Not used		
	5	Not used		
11	4	2nd Tray Paper Size 5		
	3	2nd Tray Paper Size 4	See Table 1	
	2	2nd Tray Paper Size 3		
	1	2nd Tray Paper Size 2		
	0	2nd Tray Paper Size 1		
	7	Not used		
	6	Not used		
	5	Not used		
12	4	3rd Tray Paper Size 5		
12	3	3rd Tray Paper Size 4	See Table 1	
	2	3rd Tray Paper Size 3		
	1	3rd Tray Paper Size 2		
	0	3rd Tray Paper Size 1		
13	7	Not used		
	6	Not used		
	5	Not used		
	4	Rear Fence Return Sensor	Not detected	Return Position
	3	Front Side Fence Closed Sensor	Open	Closed
	2	Front Side Fence Open Sensor	Open	Closed
	1	Rear Side Fence Closed Sensor	Open	Closed

Class 3 No.	Bit No.	Description	Reading			
			0 (LOW)	1 (HIGH)		
	0	Rear Side Fence Open Sensor	Open	Closed		
	7	Not used				
	6	Not used				
	5	Not Used				
14	4	Rear Fence HP Sensor	Not detected	Home position		
14	3	Left Tandem Tray Set	Set	Not set		
	2	Right Tandem Tray Set	Set	Not set		
	1	Left 1st Tray Paper Sensor	Paper detected	No Paper		
	0	Right 1st Tray Paper Sensor	No Paper	Paper detected		
	7	Not Used				
15	6	Not Used				
	5	Not Used				
	4	Lower Limit Sensor	Not detected	Detected		
	3	1st Tray Paper Height 4	See Table 2			
	2	1st Tray Paper Height 3				
	1	1st Tray Paper Height 2				
	0	1st Tray Paper Height 1				
	7	Not Used				
	6	Not Used				
	5	Not Used				
16	4	Paper Feed Motor Lock	Lock	Not lock		
10	3	Not Used				
	2	Toner Suction Bottle Set Sensor	Set	Not set		
	1	2nd Tray Paper Height Sensor 2	See Table 3			
	0	2nd Tray Paper Height Sensor 1				
17	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Toner Near End Sensor	Toner End	Not toner end		
	3	Toner Collection Bottle Sensor	Set	Not set		
	2	Toner Bank Motor Lock	Lock	Not lock		
	1	3rd Tray Paper Height 2	See Table 3			
	0	3rd Tray Paper Height 1				
18	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Toner Overflow Sensor	Stays high/low: Toner Overflow Change status: Not overflow			
	3	Lower Bottle Inner Cap Sensor	Cap closed	Cap opened		
	2	Upper Bottle Inner Cap Sensor	Cap closed	Cap opened		
	1	Lower Toner Bottle Sensor	Bottle set	Bottle not set		
		Upper Toner Bottle Sensor		Bottle not set		
	0		Bottle set			
Class 3	Bit	Description	Reading			
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No.	No.	Description	0 (LOW)	1 (HIGH)		
	7	Not Used				
19	6	Not Used				
	5	Not Used				
	4	By-pass Tray Paper Height				
	-	Sensor 2 (7th Tray)	See T	able 4		
	3	By-pass Tray Paper Height				
		Sensor I (/th Tray)				
	2	2 (4th tray)				
		I CT 1st Tray Paper Size Switch				
	1	2 (4th tray)	See T	able 5		
		LCT 1st Tray Paper Size Switch				
	0	1 (4th tray)				
	7	Not Used				
	6	Not Used				
	5	Not Used				
	Δ	By-pass Tray Paper Length	See T	able 6		
	-	Sensor (7th Tray)				
20	3	By-pass Tray Lower Limit	Not detected	Detected		
20	_	Sensor Paper (7th Tray)				
	2	3 (5th tray)				
		I CT 2nd Tray Paper Size Switch				
	1	2 (5th trav)	See T	able 5		
	•	LCT 2nd Tray Paper Size Switch				
	0	1 (5th tray)				
	7	Not Used				
	6	Not Used				
	5	Not Used				
21	4	By-pass Tray Motor Lock	Not lock	Lock		
21	3	LCT Motor Lock	Not lock	Lock		
	2	Not Used				
	1	Not Used	•			
	0	LCT 3rd Tray Set (6th Tray)	Set	Not set		
	1	Not Used				
	6	Not Used				
	5	Not Used	Cat	Netest		
	4	By pass Tray Set	Set	NOT SET		
	ა ე	LCT Door Open SW	Deer closed			
	2 1	LCT Exit Sensor	Duoi ciuseu Papar datactad	No paper		
22	-		raper delected	Not connected		
	0		Connected			

Class 3	Bit	Description	Reading			
No.	No.	Description	0 (LOW)	1 (HIGH)		
	7	Not Used				
23	6	Not Used				
	5	Not Used				
	4	By-pass Tray Open	Tray closed	Tray open		
	3	LCT 1st Tray Paper Height sensor 4 (4th tray)				
	2	LCT 1st Tray Paper Height				
	1	LCT 1st Tray Paper Height sensor 2 (4th tray)	See Table 2			
	0	LCT 1st Tray Paper Height sensor 1 (4th tray)				
	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Not Used				
24	3	LCT 2nd Tray Paper Height sensor 4 (5th tray)				
24		LCT 2nd Tray Paper Height	See Table 2			
	2	sensor 3 (5th tray)				
	1	LCT 2nd Tray Paper Height sensor 2 (5th tray)				
	0	LCT 2nd Tray Paper Height sensor 1 (5th tray)				
	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Not Used				
25	3	LCT 3rd Tray Paper Height sensor 4 (6th tray)				
25	2	LCT 3rd Tray Paper Height				
	1	LCT 3rd Tray Paper Height sensor 2 (6th tray) See Table 2				
	0	LCT 3rd Tray Paper Height sensor 1 (6th tray)				
	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Not Used				
26	3	By-pass Tray Paper Size SW 4 (7th tray)				
20	2	By-pass Tray Paper Size SW 3 (7th tray)	See Table 6			
	1	By-pass Tray Paper Size SW 2 (7th tray)				
	0	By-pass Tray Paper Size SW 1 (7th tray)				

Class 3	Bit	Bit	Bit	Bit	Bit	Paper Width	
No.	4	3	2	1	0	Metric version	Inch version
	1	1	1	1	0	A3	DLT
	1	1	1	0	0	81/4" x 13"	81/2" x 14"
	1	1	0	0	1	A4 SEF	LT SEF
	1	0	0	1	0	A4 LEF	LT LEF
11 12	0	0	1	0	0	81/2" x 13"	HLT SEF
11, 12	0	1	0	0	0	A5 SEF	HLT LEF
	1	0	0	0	0	A5 LEF	8"X101/2"
	0	0	0	0	1	71/4"X101/2"	71/4"X101/2"
	0	0	0	1	1	-	8" x 13"
	0	0	0	0	1	*	*

Table 1: 2nd and 3rd Tray Paper Size Switch Combination (0:Low, 1:High)

Table 2: 1st, LCT 1st(4th Tray), 2nd(5th Tray) and 3rd (6th Tray) Paper HeightSensor Combination

Class 3 No.	Bit 3	Bit 2	Bit 1	Bit 0	Paper Height
	0	0	0	0	76%~100%
15 22 24	1	0	0	0	51%~75%
25		1	0	0	26%~50%
			1	0	1%~25%
				1	Near End

Table 3: 2nd and 3rd Tray Paper Height Sensor Combination

Class 3 No.	Upper Bit	Lower Bit	Paper Height
	1	1	71 ~ 100%
16 17	1	0	31 ~ 70%
10, 17	0	0	11 ~ 30%
	0	1	0 ~ 10%

Table 4: By-pass Tray (7th tray) Paper Height Sensor Combination

Class 3 No.	Upper Bit	Lower Bit	Paper Height
	0	0	91 ~ 100%
10	0	1	51 ~ 90%
19	1	1	11 ~ 50%
	1	0	0 ~ 10%

(1):Low,	1:High	ı)	
Class 3 No.	Bit 2	Bit 1	Bit 0	Paper Size
	1	1	0	A4 LEF
	1	0	1	B5 LEF
	0	1	0	A5 LEF
19, 20	1	0	0	A5 SEF
	0	0	0	LT LEF
	0	0	1	HLT LEF
	0	1	1	HLT SEF

Table 6: By-pass Tray (7th Tray) Paper Size Switch Combination (0:Low, 1:High)

Class 3	Bit	Bit	Bit	Bit	Paper	Рар	er Width
No. 4 3	2	1	Length Sensor	Metric version	Inch version		
	0	1	1	1	0	A3	A3
	0	1	1	1	1	A4 LEF	A4LEF
	0	0	1	1	0	DLT	DLT
	0	0	1	1	1	LT LEF	LT LEF
	1	0	1	1	0	B4	B4
20,26	1	0	1	1	1	B5 LEF	B5 LEF
	1	0	0	1	0	A4 SEF	Lt SEF
	1	0	0	1	1	A5 LEF	HLT LEF
	1	1	0	1	0	8" x 13"	8" x 13"
	1	1	0	0	1	A5 SEF	A5 SEF
	1	1	1	0	1	HLT SEF	HLT SEF

5.4.2 ADF INPUT CHECK: SP6007

Class 3	Bit	Description	Rea	ding	
No.	No.	Description	0	1	
1	7	Inverter Sensor	No original	Original detected	
	6	Exit Sensor	No original	Original detected	
	5	Registration Sensor	No original	Original detected	
	4	Entrance Sensor	No original	Original detected	
	3	Original Width Sensor 3	No original	Original detected	
	2	Original Width Sensor 2	No original	Original detected	
	1	Original Width Sensor 1	No original	Original detected	
	0	Original Set Sensor	No original	Original detected	
	7	ADF Feed-in Motor Encoder Pulse	Change the "0" and "1" during rotation		
	6	Pick-up Roller HP Sensor	At home position	Not home position	
	5	Bottom Plate Position Sensor	Detected	Not detected	
2	4	Bottom Plate HP Sensor	At home position	Not home position	
-	3	Exit Cover Sensor	Close	Open	
	2	Feed Cover Sensor	Close	Open	
	1	APS Start Sensor	Start	Off	
	0	DF Position Sensor	Down	Up	
	7	Not Used			
	6	Not Used			
	5	Not Used			
	4	Not Used			
3	3	Not Used			
Ũ	2	Original Length Sensor	No original	Original detected	
	1	ADF Feed-out Motor Encoder Pulse	Change the "0" and "1" during rotat		
	0	ADF Transport Motor Encoder Pulse	Change the "0" and "1" during rotation		

5.4.3 FINISHER INPUT CHECK: SP6117 (B478 ONLY)

Class 3 Bit		Description	Reading		
No.	No.	Description	0	1	
	7	Stack Feed-out Belt HP Sensor	Home position	Not home position	
1	6	Not Used			
	5	Shift Tray Lower Limit 2 Sensor	Not detected	Detected	
	4	Shift Tray Lower Limit 3 Sensor	Not detected	Detected	
	3	Stapler Tray Exit Sensor	Paper not detected	Paper detected	
	2	Shift Tray Exit Sensor	Paper detected	Paper not detected	
	1	Upper Tray Exit Sensor	Paper detected	Paper not detected	
	0	Entrance Sensor	Paper not detected	Paper detected	
	7	Not used			
	6	Front Door Safety Switch	Door closed	Door open	
	5	Stapler Tray Paper Sensor	Paper not detected	Paper detected	
<u> </u>	4	Staple End Sensor	Not end	End	
2	3	Staple Hammer HP Sensor	Home position	Not home position	
	2	Stapler HP Sensor	Not home position	Home position	
	1	Shift Tray Half-turn Sensor	Home position	Not home position	
	0	Jogger HP Sensor	Not home position	Home position	
	7	Not Used	·	·	
	6	Staple Cartridge Set Sensor	Set	Not set	
0	5	Staple Mode HP Sensor 2	Not detected	Detected	
	4	Staple Mode HP Sensor 1	Not detected	Detected	
3	3	Not Used			
	2	Punch Waste Hopper Sensor	Not full	Full	
	1	Punch HP1 Sensor	Home position	Not home position	
	0	Punch Unit Connection	Connected	Not connected	
	7	Stapler Ready	Ready	Not ready	
	6	Stapler Return Sensor	Not detected	Detected	
	5	Exit Guide Open Sensor	Home position	Not home position	
4	4	Stack Plate – Center HP Sensor	Not home position	Home position	
4	3	Pre-stack Tray Paper Sensor	Paper not detected	Paper detected	
	2	Staple Waste Hopper Sensor	Not full	Full	
	1	Stapler Rotation HP Sensor	Not home position	Home position	
	0	Upper Tray Limit Sensor	Not full	Full	
	7	Punch HP 2 Sensor	Home position	Not home position	
	6	Not Used			
	5	Shift Lower Limit - Large Paper Sensor	Not detected	Detected	
	4	Shift Mode HP Sensor	Not detected	Detected	
F	3	Stacking Roller HP Sensor	Home position	Not home position	
Э	2	Positioning Roller HP Sensor	Not home position	Home position	
	1	Stack Plate – Rear HP Sensor	Not home position	Home position	
		Stack Plate – Front HP Sensor	· · ·	Home position	
	0		Not home position		

Class 3	Bit	Description	Reading		
No.	No.	Description	0	1	
	7	Not Used			
6	6	Not Used			
	5	Not Used			
	4	Not Used			
	3	Emergency Stop Switch	Not press	Press	
6	2	Shift Jogger Lift HP Sensor (Optional Jogger Unit)	Home position	Not home position	
	1	Shift Jogger HP Sensor (Optional Jogger Unit)	Not home position	Home position	
	0	Optional Jogger Unit Connection	Connection	Not connection	

5.5 OUTPUT CHECK

5.5.1 MAIN MACHINE OUTPUT CHECK: SP5804

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.

No.	Description	No.	Description
001	1st Paper Feed Clutch	027	LCT 3rd Grip Clutch
002	2nd Paper Feed Clutch	028	Bypass Grip Clutch
003	3rd Paper Feed Clutch	029	Relay Clutch
004	LCT 1st Paper Feed Clutch	030	LCT Relay Clutch
005	LCT 2nd Paper Feed Clutch	031	Lower Relay Clutch
006	LCT 3rd Paper Feed Clutch	032	LCT Transport Clutch 1
007	Bypass Paper Feed Clutch	033	LCT Transport Clutch 2 (By-pass)
008	1st Pick-up Solenoid	034	LCT Guide Plate Solenoid
009	2nd Pick-up Solenoid	035	1st Tray Lift Motor
010	3rd Pick-up Solenoid	036	2nd Tray Lift Motor
011	LCT 1st Pick-up Solenoid	037	3rd Tray Lift Motor
012	LCT 2nd Pick-up Solenoid	038	LCT 1st Tray Lift Motor
013	LCT 3rd Pick-up Solenoid	039	LCT 2nd Tray Lift Motor
014	Bypass Pick-up Solenoid	040	LCT 3rd Tray Lift Motor
015	1st Separation Roller Solenoid	041	Bypass Tray Lift Motor
016	2nd Separation Roller Solenoid	042	Rear Fence Drive Motor
017	3rd Separation Roller Solenoid	043	Tandem Tray Connect Solenoid
018	LCT 1st Separation Roller Solenoid	044	Front Side Fence Solenoid
019	LCT 2nd Separation Roller Solenoid	045	Rear Side Fence Solenoid
020	LCT 3rd Separation Roller Solenoid	046	Left 1st Tray Lock Solenoid
021	Bypass Separation Roller Solenoid	047	Relay Motor
022	1st Vertical Transport Clutch	048	Paper Feed Motor
023	2nd Vertical Transport Clutch	049	LCT Motor
024	3rd Vertical Transport Clutch	050	Bypass Tray Motor
025	LCT 1st Grip Clutch	051	Drum Motor
026	LCT 2nd Grip Clutch	052	Fusing/Exit Motor

No.	Description	No.	Description
053	Registration Motor	076	Quenching Lamp
054	Web Motor	077	Charge Corona
055	Guide Plate Solenoid	078	Grid Plate
056	Inverter Gate Solenoid	079	Development Bias
057	Duplex Transport Motor1	080	Transfer Belt Bias
058	Duplex Transport Motor2	081	Polygonal Motor Mirror Cooling Fan
059	Inverter Exit Roller Clutch	082	Exhaust Fan (Low)
060	Duplex Inverter Gate Solenoid	083	Exhaust Fan (High)
061	Reverse Roller Solenoid	084	Drum Cooling Fan (Low)
062	Inverter Guide Plate Solenoid	085	Drum Cooling Fan (High)
063	Toner Recycling Shutter Solenoid	086	Paper Cooling Pipe Fan1
064	Jogger Motor	087	Steam Removal Fan (Low)
065	Toner Supply Roller Clutch	088	Steam Removal Fan (High)
066	Development Motor	089	Development Unit Cooling Fan1
067	Toner Supply Pump Motor	090	Laser Diode
068	Upper Toner Bottle Motor	091	Development Unit Cooling Fan2
069	Lower Toner Bottle Motor	092	Duplex Entrance Cooling Fan
070	Toner Bank Motor	093	Paper Cooling Pipe Fan2
071	Toner Supply Coil Clutch	094	Duplex Cooling Fan
072	Exposure Lamp	095	Toner Suction Motor
073	Optics Cooling Fan	096	Total Counter
074	ID Sensor LED	097	Upper Bottle Cap Motor
075	Transfer Belt Lift Solenoid	098	Lower Bottle Cap Motor

5.5.2 ADF OUTPUT CHECK: SP6008

No.	Description	0	1
1	Feed-in Motor (High)	OFF	ON
2	Feed-in Motor (Low)	OFF	ON
3	Transport Motor (Forward)	OFF	ON
4	Transport Motor (Reverse)	OFF	ON
5	Feed-out Motor	OFF	ON
6	Exit Gate Solenoid	OFF	ON
7	Inverter Solenoid	OFF	ON
8	LEDs (Operation Panel)	OFF	ON
9	Pick-up Motor	OFF	ON
10	Bottom Plate Motor	OFF	ON
11	Feed-in Clutch	OFF	ON

5.5.3 FINISHER OUTPUT CHECK: SP6118

No.	Description	
1	Upper Transport Motor	
2	Shift Tray Exit Motor	
3	Upper Tray Junction Gate Solenoid	
4	Shift Tray Lift Motor	
5	Jogger Motor	
6	Stapler Motor	
7	Staple Hammer Motor (Stapler Unit)	
8	Punch Motor	
9	Stapler Junction Gate Solenoid	
10	Positioning Roller Solenoid	
11	Stack Feed-out Belt Motor	
12	Shift Motor	
13	Stapler Rotation Motor	
14	Lower Transport Motor	
15	Exit Guide Motor	
16	Stack Plate-Center Motor	
17	Pre-stack Junction Gate Solenoid	
18	Pre-stack Paper Stopper Solenoid	
19	Stapler Return Solenoid	
20	Stack Plate- Front Motor	
21	Stack Plate – Rear Motor	
22	Stacking Roller Drag Motor	
23	Stacking Roller Motor	
24	Shift Jogger Motor (Optional Jogger Unit)	
25	Shift Jogger Lift Motor (Optional Jogger Unit)	

5.6 SMC LISTS (SYSTEM PARAMETERS AND REPORT DATA)

- 1. Access the SP mode corresponding to the list that you wish to print.
 - SP5-990-1: All system parameter list
 - SP5-990-2: SP mode data list
 - SP5-990-3: UP mode data list
 - SP5-990-4: Machine logging data list
 - SP5-990-5: Self-diagnosis report list
 - SP5-990-7: NIB summary
 - SP5-990-8: Net file log
 - SP5-990-21: Copier user program list
 - SP5-990-22: Scanner SP list
 - SP5-990-23: Scanner user program list
- 2. Touch the "Copy Window" key to access the copy mode display.
- 3. Select the paper size and press the "SP Mode" key to retune the SP mode.
- 4. Press the "Execute" key to print the list.
- 5. Exit SP mode.

5.7 MEMORY ALL CLEAR: SP5801

As a rule, you should always print an SMC Report before initializing or adjusting the SP settings. The SMC Report provides a concise list of all the SP commands and their current settings. The report can be used for reference if the service manual is not available.

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 SP5990 to print out all SMC Data Lists.
- 2. Open SP5801.
- 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.

No.	What It Initializes	Comments	
1	All modules	Initializes items 2 ~ 15 below.	
2	Engine	Initializes all registration settings for the engine and copy	
-		process settings.	
	SCS (System	Initializes default system settings, CSS settings, operation	
3	Control Service) /SRM	display coordinates.	
4	IMH	Initializes the image file system.	
5	MCS (Memory	Initializes the automatic delete time setting for stored	
5	Control Service)	documents.	
6	Copier application	Initializes all copier application settings.	
8	Printer application	Initializes the printer defaults, programs registered, the printer	
0		SP bit switches, and the printer CSS counter.	
9	Scanner application	Initializes the defaults for the scanner and all the scanner SP modes.	
	Network application	Initializes all service-mode settings about access to the	
10		document server from the DeskTopBinder software on a PC.	
10		For example, initializes the resolution of images the PC gets	
		using the image converter board option.	
	NCS (Network	Initializes the system defaults and interface settings (IP	
11	Control Service)	addresses also), the SmartNetMonitor for Admin settings,	
		WebStatusMonitor settings, and the TELNET settings.	
14	DCS	Initializes the DCS (Delivery & Receive Control Server) settings.	
15	UCS	Initializes the UCS (User Directory Control Server) settings.	

- 4. Press Execute, then follow the prompts on the display to complete the procedure.
- 5. Make sure that you perform the following settings:
 - Do the printer and scanner registration and magnification adjustments.
 (- 3-17).
 - Execute SP2115 Main Scan Beam Pitch Adjustment
 - Do the touch screen calibration (Section 3 "Touch Screen Calibration").
 - Referring to the SMC data lists, re-enter any values, which had been changed from their factory settings.
 - Execute SP 3001 002 ID Sensor Initial Setting
 - Switch SP 3901 001 (Auto Process Control Setting) to 1 (On), if you wish auto process control to be used.
- 6. Check the copy quality and the paper path, and do any necessary adjustments.



5.8 SOFTWARE AND COPY SETTING RESET (UP MODE)

5.8.1 SOFTWARE RESET

The software can be rebooted when the machine hangs up. Use the following procedure.

Turn the main power switch off and on.

-or-

Press and hold down (*) (#) together for over 10 seconds. When the machine beeps once, release both buttons. After "Now loading. Please wait" is displayed for a few seconds, the copy window will open. The machine is ready for normal operation.

5.8.2 RESETTING THE SYSTEM

The system settings in the UP mode can be reset to their defaults using the following procedure.

- 1. Make sure that the machine is in the copier standby mode.
- 2. Press the User Tools key.
- 3. Hold down the "#" key and touch the "System Setting" key.
- 4. A confirmation message will be displayed, then press "Yes".

5.8.3 RESETTING COPY/DOCUMENT SERVER FEATURES ONLY

The copy/document server settings in the UP mode can be reset to their defaults using the following procedure.

- 1. Make sure that the machine is in the copier standby mode.
- 2. Press the User Tools key.
- 3. Hold down the "#" key and touch "Copy/Document Server Features" key.
- 4. A confirmation message will be displayed, then press "Yes".

5.8.4 RESETTING SCANNER FEATURES ONLY

The scanner settings in the UP mode can be reset to their defaults using the following procedure

- 1. Make sure that the machine is in the copier standby mode.
- 2. Press the User Tools key.
- 3. Hold down the "#" key and touch "Scanner Features" key.
- 4. A confirmation message will be displayed, then press "Yes

5.9 PM COUNTER

5.9.1 ACCESSING THE PM COUNTERS

Each PM part has a counter which counts up at the appropriate time. (For example, the counter for the hot roller counts up every copy, and the counter for a feed roller counts up when paper is fed from the corresponding tray.) These counters should be used as references for part replacement timing.

1) Press the following keys in sequence.



The SP mode menu is displayed.

SP mode	Exit
Сору SP	
PM Counter	
SICU Soft Version 5,23 / BCU Soft Version 5,23	

A29FGH4M001.PCX

- 2) Press [PM Counter] on the display.
- 3) The following menu appears on the display.

SP Mode (Parts replacement)	Prev. Menu Exit
Select Item	
All PM parts list	Counterlist print out
Parts list for PM yield indicator	CSS Calling Setting
Parts exceeding target yield	
Counter clear for parts exceeding target yield	
Clear all PM settings	
,	

A294M013.PCX

Service Tables

All PM Parts List

Displays all the counters for PM parts.

	SP Mode (Parts replacement)				rev. Menu	Exit
AII PM (parts list					
No	Description	PM yield	Current	Target		
001	Developer	Yes	0000236	0000K	Clear	
002	Oil Supply & Cleaning Web	Yes	0000236	0300K	Clear	
003	Web Cleaning Roller	Yes	0000236	0300K	Clear	
004	Hot Roller	Yes	0000236	0450K	Clear	
005	Pressure Roller	Yes	0000236	0450K	Clear	
006	Pressure Roller Cleaning Roller	Yes	0000236	0300K	Clear	
007	Hot Roller Strippers	Yes	0000236	0300K	Clear	
008	Development Filter	Yes	0000236	0300K	Clear	
009	Toner Hopper Filter - Center	Yes	0000236	0300K	Clear	
010	Toner Hopper Filter - Front	Yes	0000236	0300K	Clear	
011	Feed Roller - Tray 1	Yes	0000228	0300K	Clear	
012	Pick-up Roller - Tray 1	Yes	0000228	0300K	Clear	
013	Separation Roller - Tray 1	Yes	0000228	0300K	Clear	
014	Feed Roller - Tray 2	Yes	0000000	0300K	Clear	01/03
015	Pick-up Roller - Tray 2	Yes	0000000	0300K	Clear	
016	Separation Roller - Tray 2	Yes	0000000	0300K	Clear	Previous page
017	Feed Roller - Tray 3	Yes	0000000	0300K	Clear	
018	Pick-up Roller - Tray 3	Yes	0000000	0300K	Clear	INEXT page

A294M014.PCX

On this screen, the current counter and the target yield of each PM part can be checked.

Additionally, the PM yield indicator setting can be changed. To change the setting press [Yes/No] key in the "PM yield" column.

When "Parts list for PM yield" is selected in the parts replacement menu, only the parts with [Yes] in the "PM yield" are listed.

To clear a counter, press [Clear] on the display. The following appears.



A294M016.PCX

Then press [Yes] to clear the counter.

If one of the keys in the "No" column is pressed, the following appears on the display.

	SP Mode (Parts repla		Prev. Menu Exit	
AI PM p	parts list			
No	Description	PM yield	Current	Target
001	Developer	Ves	0000236	0000K Clear
002	Oil Supply & Cleaning Web	Yes	0000236	0300K Clear
003	Web Cleaning Roller	Yes	0000236	0300K Clear
004	Hot Roller	Yes	0000236	0450K Clear
005	Pressure Roller	Yes	0000236	0450K Clear
006	Pressure Roller Cleaning Roller	Yes	0000236	0300K Clear
007	Hot Roller Strippers	001: Developer		
008	Development Filter	001. Developer		
009	Toner Hopper Filter - Center	Current counter	0000336	Clear ourrest counter
010	Toner Hopper Filter - Front	Carrent counter	0000200	
011	Feed Roller - Tray 1	Target vield	0000K	Change target yield
012	Pick-up Roller - Tray 1			· · · · · · · · · · · · · · · · · · ·
013	Separation Roller - Tray 1	Latest 1	0000000	PM yield indicator settings
014	Feed Roller - Tray 2	Latest 2	0000000	
015	Pick-up Roller - Tray 2	Latest 3	0000000	No Yes
016	Separation Roller - Tray 2			
017	Feed Roller - Tray 3	Close		Prev. Next
018	Pick-up Roller - Tray 3	Ves	0000000	USUUN Clear

A294M017.PCX

On this screen, the records of the last three part replacements are displayed. When 'Clear current counter' is pressed, the current counter is cleared, the current counter is overwritten to "Latest 1", the Latest 1 counter is overwritten to "Latest 2", and the Latest 2 counter is overwritten to "Latest 3".

Additionally, the target yield can be changed on this screen. To change the target yield setting, do the following:

- 1) Press [Change target yield] on the screen.
- 2) Input the target yield using the ten-key pad.
- 3) Press the # key.

	SP Mode (Parts replaceme	nt)		P	rev. Menu	Exit
Parts lis	st for PM yield indicator					
No	Description	Exceed	Current	Target		
001	Developer		0000236	0000K	Clear	
002	Oil Supply & Cleaning Web		0000236	0300K	Clear	
003	Web Cleaning Roller		0000236	0300K	Clear	
004	Hot Roller		0000236	0450K	Clear	
005	Pressure Roller		0000236	0450K	Clear	
006	Pressure Roller Cleaning Roller		0000236	0300K	Clear	
007	Hot Roller Strippers		0000236	0300K	Clear	
008	Development Filter		0000236	0300K	Clear	
009	Toner Hopper Filter - Center		0000236	0300K	Clear	
010	Toner Hopper Filter - Front		0000236	0300K	Clear	
011	Feed Roller - Tray 1		0000228	0300K	Clear	
012	Pick-up Roller - Tray 1		0000228	0300K	Clear	
013	Separation Roller - Tray 1		0000228	0300K	Clear	
014	Feed Roller - Tray 2		0000000	0300K	Clear	01/01
015	Pick-up Roller - Tray 2		0000000	0300K	Clear	
016	Separation Roller - Tray 2		0000000	0300K	Clear	Previous page
017	Feed Roller - Tray 3		0000000	0300K	Clear	
018	Pick-up Roller - Tray 3		0000000	0300K	Clear	Next page

Parts List for PM Yield Indicator



On this screen, only the parts selected in the "All PM parts list" screen are displayed. Normally, the PM parts counters should be checked on this screen.

If the current counter exceeds the target yield, there is a * mark in the "Exceed" column.

Each counter can also be cleared on this screen. To clear all counters on this screen at once, see 'Counter Clear for Parts Exceeding Target Yield' on the next page.

Parts Exceeding Target Yield

Only the parts whose counters are exceeding the target yield are displayed. If none of the PM counters is exceeding the target yield, this item cannot be selected from the parts replacement menu.

Counter Clear for Parts Exceeding Target Yield

Clears all the counters which are exceeding the target yield. When this item is selected, the following appears on the display.



A294M018.PCX

Press [Yes] to clear the counters.

Clear All PM Settings

Clears all the PM counters and returns all the settings (PM parts list and target yield) to the defaults. When this item is selected, the following appears.



A294M019.PCX

Press [Yes] to clear the settings.

Counter List Print Out

Prints a list of all the PM part counters. When this item is selected, the following appears on the display.



A294M010.PCX

Press [Print] to print out the counter list.

CSS Calling Setting (RSS Function)

This function is for Japanese machines only.

5.10 FIRMWARE UPDATE

To update the firmware for this machine, you must have the new version of the firmware downloaded onto an SD (Secure Digital) Card. The SD Card is inserted into the C3 slot on the right side of the controller box, viewed from the back of the machine.

5.10.1 BEFORE YOU BEGIN...

An SD card is a precision device, so always observe the following precautions when handling SD cards:

- Always switch the machine off before inserting an SD card. Never insert the SD card into the slot with the power on.
- After the power has been switched on, never remove the SD card from the service slot.
- Never switch the machine off while the firmware is downloading from the SD card.
- Store SD cards in a safe location where they are not exposed high temperature, high humidity, or exposure to direct sunlight.
- Always handle SD cards with care to avoid bending or scratching them. Never drop an SD card or expose it to other shock or vibration.

Keep the following points in mind while you are using the firmware update software:

- "Upload" means to send data from the machine to the SD card, and "download" means to send data from the SD card to the machine.
- To select an item on the LCD, touch the appropriate button on the soft touchscreen of the LCD, or press the appropriate number key on the 10-key pad of the operation panel. For example, "Exit (0)" displayed on the screen means you can touch the Exit button on the screen, or press the ⁽¹⁾ button on the operation panel of the copier.
- Before starting the firmware update procedure, always make sure that the machine is disconnected from the network to prevent a print job for arriving while the firmware update is in progress.

5.10.2 UPDATING FIRMWARE

- 1. On the machine, switch off the main power switch.
- 2. With the label on the SD card [A] facing as shown in the diagram, insert the SD card into service slot C3 [B] on the right side of the controller box [C]. Slowly push the SD card once into the slot so it locks in place.
- 3. Make sure the SD card is locked in place.

NOTE: To remove the SD, push it in to unlock the spring lock and then release it so it pops out of the slot.



- 4. If the machine is connected to a network, disconnect the network cable from the copier.
- 5. Switch the main power switch on. After about 10 seconds, the initial version update screen appears on the LCD in English.

Update Menu	
Firmware (1) Language Data(2)	
	Exit(0)

SCR01.WMF

KEY	WHAT IT DOES
Firmware (1)	Press this button on the touch-screen (or $^{(1)}$ on the 10-key pad) to open the firmware update screen.
Language Data (2)	Press this button on the touch-screen (or $^{(2)}$ on the 10-key pad) to open the language update screen.
Exit (0)	Press this key on the touch-screen (or ⁽¹⁾) on the 10-key pad) to quit the update procedure and return to normal machine operation.

- **NOTE:** The firmware update and language update cannot be performed during the same session. If you need to do both, do the firmware update, switch the machine off and on to confirm the successful update of the firmware, then do the language update.
- 6. Touch "Firmware (1)" to open the firmware update screen.



SCR02.WMF

ROM/NEW	WHAT IT MEANS
ROM:	Tells you the number of the module and name of the version presently installed. The first line is the module number, the second line the version name.
NEW:	Tells you the number of the module and name version on the SD card. The first line is the module number, the second line the version name.

7. On the screen, touch the button or press the corresponding number key on the operation panel to select the item in the menu that you want to update.

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8. After pressing the module button, or entering the appropriate number with the 10-key pad to select the module, the "Verify" and "Update" keys appear at the bottom of the screen.

NOTE: The screen below shows only the "Printer" option selected for update.

PCcard -> ROM Page01		
Printer (1)	ROM: G0000000 ROM: 0.01 ROM: B0705254	NEW: G0000000 NEW: 0.0X NEW: B0705254
OpePanel.DOM (3)	ROM: 2.10:10 ROM: B0705370 ROM: 1.22	NEW: 2.10:10 NEW: B0705370 NEW: 2.00
Verify(/*) Exit(0)	UpDate(#)
	,	

SCR03.WMF

KEY	WHAT IT DOES
Verify (./*)	Press this button (or $$) to verify the selected module.
Update(#)	Press this button (or (\textcircled{P})) to upgrade the selected module.
Exit(0)	Press this button (or \textcircled{O}) to return to the previous screen.

9. To start the update, touch "UpDate (#)" (or (#)).

DCasual	> POM
PCcara	-> ROM
1	Loading
	Printer
[****

After selecting "Update", three lines are displayed on the screen:

SCR05.WMF

The first line tells you what is happening, the second line is the name of the module, and the third line tells you about the progress of the operation. As the update progresses, the underscores (_) in the progress bar are replaced by asterisks.

The update is finished after all 10 underscores are replaced by asterisks.

NOTE: The progress bar (*****_____) is not displayed for the operation panel firmware after you touch "OpePanel". While the LCDC firmware is updating, the power on key flashes on and off at 0.5 s intervals. When the update is finished, the power key flashes on and off slower at 3 s intervals.

When the update is finished, you will see a screen like the one below:

PCcard -> ROM	
Update done.	
Printer Card No.: 1/1	



The first line prompts you that the update is finished, and the second line tells you the name of the module that has just been updated.

NOTE: If you have selected more than one module for updating, only the screen for the last module updated will be displayed.

- 10. When you see the "Update Done" message, switch the copier main power switch off.
- 11. Press in the SD card to release it, then remove it from the slot.
- 12. Switch the copier on for normal operation.

Error Messages

If an error occurs during the download, an error message will be displayed in the first line.

PCcard -> ROM	
No Valid Data E24	1
]
Exit(0)	

SCR13.WMF

The error code consists of the letter "E" and a number. The example above shows error "E24" displayed. For details, refer to the Error Message Table. ($rac{5.10.8}$)

Firmware Update Error

If a firmware update error occurs, this means the update was cancelled during the update because the module selected for update was not on the SD card.

PCcard -> ROM	
Reboot after card insert. E82	
BLC2 eplot Card No.:1/1	
	_

SCR14.WMF

Recovery After Power Loss

If the ROM update is interrupted as a result of accidental loss of power while the firmware is updating, then the correct operation of the machine cannot be guaranteed after the machine is switched on again. If the ROM update does not complete successfully for any reason, then in order to ensure the correct operation of the machine, the ROM update error will continue to be displayed until the ROM is updated successfully.

In this case, just insert the card once again and switch on the machine to continue the firmware download automatically from the card without the menu display.

5.10.3 VERIFYING A SUCCESSFUL UPDATE

Follow this procedure to verify that a module has been updated successfully.

- 1. Switch off the main power switch.
- 2. If the SD card is not in the machine, insert it into service slot C3.
- 3. Switch the main power switch on. After about 10 seconds, the initial screen appears on the LCD in English.

Update Menu	
Firmware (1)	
Language Data(2)	
	Exit(0)

SCR01.WMF

4. Press "Firmware (1)" to open the firmware update screen.

PCcard -> ROM Page01		
Printer(1)Engine(2)OpePanel.DOM(3)	ROM: G0000000 ROM: 0.01 ROM: B0705254 ROM: 2.16:16 ROM: B0705370 ROM: 1.22	NEW: G0000000 NEW: 0.0X NEW: B0705254 NEW: 2.16:16 NEW: B0705370 NEW: 2.00
		Exit(0)

SCR02.WMF

- 5. On the touch-screen, touch the button or press the corresponding number key on the operation panel to select the item in the menu that you want to verify
- 6. After pressing the key, the items selected for verification are displayed in reverse and the "Verify" and "Update" keys appear at the bottom of the screen.
- To start the verification, touch "Verify (./*" (or press ^(™)).
 After selecting "Verify", two lines are displayed on the screen:

PCcard -> ROM	
Verify done.	
Printer Card No.: 1/1	



The first line tells you the status of the verification for the item selected from the menu, and the second name tells you the name of the item verified.

NOTE: If you selected more than one item for verification, the "Verify Done" message is displayed only once for the last module verified.

- 9. When you see the "Verify Done" message, switch the copier main power switch off.
- 10. Press in the SD card to release it, then remove it from the slot.
- 11. Switch the copier on for normal operation.

Error During Verification

If anything abnormal is detected during verification, an error message is displayed:

PCcard	-> ROM	
	Verifv Error	
	Printer Card No.: 1/1	

SCR08.WMF

The second line tells you the name of the module where the error was detected.

If an error occurs during verification, switch the printer off and download the firmware from the SD card again.

5.10.4 UPDATING THE LCDC FOR THE OPERATION PANEL

Follow this procedure to update the LCDC (LCD Control Board).

- 1. Turn the copier main switch off.
- 2. Insert the SD card into service slot C3.
- 3. Switch the copier main switch on.
- 4. After about 10 seconds the initial screen opens in English.
- 5. Touch "OpePanel".

PCcard -> ROM Page01				
Printer (1)	ROM: ROM:	G0000000 0.01	NEW: NEW:	G0000000 0.0X
Engine (2)	ROM: ROM:	B0705254 2.16:16	NEW: NEW:	B0705254 2.16:16
OpePanel.DOM (3)	ROM: ROM:	B0705370 1.22	NEW: NEW:	B0705370 2.00
Verify(.	/*)	Exit(0)] [L	JpDate(#)
L				

SCR03_OPE.WMF

6. Touch "UpDate(#) (or ^(#)) to start the update. After about 9 seconds, the downloading starts.

While the data is downloading, the operation panel goes off and the main power on key flashes at 0.5 s intervals. When the update is finished, the same key starts flashing slower at 3 s intervals.

7. Switch the copier main power switch off, remove the SD card, then switch the copier on again.



5.10.5 DOWNLOADING STAMP DATA

The stamp data should be downloaded from the controller firmware to the hard disks:

- When the machine is installed.
- After the hard disks have been replaced.

The print data contains the controller software, so execute SP5853 to download the fixed stamp data required by the hard disks.

- 1. Enter the SP mode.
- 2. Select SP5853 then press "Execute". The following screen opens while the stamp data is downloading.

PCcard -> ROM	
Loading	
Stamp Data	
**	

Service Tables

SCR_STAMP.WMF

The download is finished with the message prompts you to close.



SCR_FIN.WMF

3. Press the "Close" button then cycle the copier off and on again.

5.10.6 NVRAM DATA UPLOAD/DOWNLOAD

Uploading Content of NVRAM to an SD card

Follow this procedure to upload SP code settings from NVRAM to an SD card.

NOTE: This data should always be uploaded to an SD card before the NVRAM is replaced.

- 1. Before switching the machine off, execute SP5990 001 (SMC Print). You will need a record of the NVRAM settings if the upload fails.
- 2. Switch the copier main power switch off.
- 3. Insert the SD card into service slot C3, then switch the copier on.
- 4. Execute SP5824 001 (NVRAM Data Upload) then press the "Execute" key When uploading is finished, the following files are coped to an NVRAM folder on the SD card. The fileis saved to the path and filename:

NVRAM\<serial number>.NV

Here is an example with Serial Number "B0700017":

NVRAM B0700017.NV

5. In order to prevent an error during the download, be sure to mark the SD card that holds the uploaded data with the number of the machine from which the data was uploaded.

NOTE: NVRAM data from more than one machine can be uploaded to the same SD card.

Downloading an SD Card to NVRAM

Follow this procedure to download SP data from an SD card to the NVRAM in the machine.

- If the SD card with the NVRAM data is damaged, or if the connection between the controller and BCU is defective, the NVRAM data down load may fail.
- If the download fails, repeat the download procedure.
- If the second attempt fails, enter the NVRAM data manually using the SMC print you created before uploading the NVRAM data. (#5.10.6)
- 1. Switch the copier main power switch off.
- 2. Insert the SD card with the NVRAM data into service slot C3.
- 3. Switch the copier main power switch on.
- Execute SP5825 001 (NVRAM Data Download) and press the "Execute" key.
 NOTE: In order for the NVRAM data to download successfully, the serial number of the file on the SD card must match the serial number of the machine. If the serial numbers do not match, the download will fail.

This procedure downloads the following data to the NVRAM:

- Total Count
- C/O, P/O Count
5.10.7 INSTALLING ANOTHER LANGUAGE

Many languages are available for selection, but only two can be selected for switching. Follow this procedure to select the two languages, either of which can be selected for the user interface on the operation panel.

- 1. Switch the copier main power switch off.
- 2. Insert the SD card with the language data into service slot C3.
- 3. Switch the copier main power switch on. The initial screen opens after about 10 seconds.
- 4. Touch the "Language (2)" on the screen (or press 2).

Download Lang	Jage LCDC ROM	B 0705370 Lang. C ard	-
LANG. 1(1)	Now Lang. Japanese 2.87 English - UK 2.87 	Select Lang.	

SCR09.WMF

5. Touch "LANG. 1(1)" or "LANG 2(2)

Key	What it does
LANG. 1(1)	Touch this button on the screen (or press ① on the 10-key pad) to open the next screen so you can select the 1st language.
LANG. 1(2)	Touch this button on the screen (or press ② on the 10-key pad) to open the next screen so you can select the 2nd language.
Exit(0)	Touch this key on the screen (or press ()) on the 10-key pad) to quit the update procedure and return to normal screen.

6. To select the 1st Language, touch "LANG 1(1)". -or-

To select the 2nd Language, touch "LANG(2)".

PCcard	-> ROM Pa	ge02		
1 (7)	Italian	(1)		
	Spanish	(2)		
	Dutch	(3)		
	Norwegian	(4)		
	D an ish	(6)		
₩(9)				
			Exit(0)	
L			 	
				SCR10.WM

7. Touch the appropriate button on the screen (or press the number on the 10keypad) to select a language as the 1st (or 2nd) Language.

If a language is already selected, it will be displayed in reverse.

Touching "Exit(0)" also returns the previous screen.

If you do not see the language that you want to select, touch "↑(7)" or "↓(9)" on the screen (or press ⑦ or ⁽⁹⁾) to display more choices.

Service Tables After you select a language, the Download Screen opens.

The 1st or 2nd language selected for updating is displayed.

To the right of the selection, the first column displays the language currently selected and the 2nd column displays the language selected to replace that language.

The example below shows that the download will replace "Japanese" with "Italian" as the 1st language.



SCR11.WMF

 Touch "Update(#)" on the screen (or press (#)) to start the download. Another screen with a progress bar is not displayed while the language is downloading.

While the language is downloading:

- The operation panel switches off.
- The LED on the power on key flashes rapidly.
- 10. After the Start LED begins to flash slowly, switch the copier main power switch off, then remove the SD card from the slot.
- 11. Switch the copier main power switch on to resume normal operation.

5.10.8 HANDLING FIRMWARE UPDATE ERRORS

If an error occurs during a download, an error message will be displayed in the first line. The error code consists of the letter "E" and a number ("E20", for example).

CODE	MEANING	SOLUTION
20	Cannot map logical address	Make sure SD card inserted correctly, or use another SD card.
21	Cannot access memory	HDD connection incorrect or replace hard disks.
22	Cannot decompress compressed data	Incorrect ROM data on the SD card, or data is corrupted.
23	Error occurred when ROM update program started	Controller program abnormal. If the second attempt fails, replace controller board.
24	SD card access error	Make sure SD card inserted correctly, or use another SD card.
30	No HDD available for stamp data download	HDD connection incorrect or replace hard disks.
31	Data incorrect for continuous download	Insert the SD card with the remaining data required for the download, the re-start the procedure.
32	Data incorrect after download interrupted	Execute the recovery procedure for the intended module download, then repeat the installation procedure.
33	Incorrect SD card version	Incorrect ROM data on the SD card, or data is corrupted.
34	Module mismatch - Correct module is not on the SD card)	SD update data is incorrect. Acquire the correct data (Japan, Overseas, OEM, etc.) then install again.
35	Module mismatch – Module on SD card is not for this machine	SD update data is incorrect. The data on the SD card is for another machine. Acquire correct update data then install again.
36	Cannot write module – Cause other than E34, E35	SD update data is incorrect. The data on the SD card is for another machine. Acquire correct update data then install again.
40	Engine module download failed	Replace the update data for the module on the SD card and try again, or replace the BCU board.
42	Operation panel module download failed	Replace the update data for the module on the SD card and try again, or replace the LCDC.
43	Stamp data module download failed	Replace the update data for the module on the SD card and try again, or replace the hard disks.
44	Controller module download failed	Replace the update data for the module on the SD card and tray again, or replace controller board.
50	Electronic confirmation check failed	SD update data is incorrect. The data on the SD card is for another machine. Acquire correct update data then install again.

Error Message Table



5.11 USER PROGRAM MODE

5.11.1 ENTERING AND EXITING USER PROGRAM MODE

The user program (UP) mode is accessed by users, and by sales and service staff. UP mode is used to input the copier's default settings.

Press the User Tools/Counter button, then select the UP mode program. After finishing the UP mode program, touch "Exit" key to exit UP mode.

5.12 BOARD LEDS

BCU

Number Monitored Signal	
LED101 (Green)	Not Used. Normally remains off.
LED102 (Red)	Flashes while BCU operating to monitor operation of BCU.

PSU-E

Number	Monitored Signal		
LED2	On: Normal Off: Energy saver mode		
LED3	On: Normal Off: Energy saver mode		

LCDC

Number	Monitored Signal		
	Normally OFF.		
LED101 (Red)	Blinks Slowly: During data download from SD card.		
	Blinks Rapidly: When data download from SD card fails.		
LED102 (Green)	Normally blinks Green.		
	Blinks Slowly: During data download from SD card.		

IPU

Number	Monitored Signal		
	Monitors Printer		
LED 801 (Green)	Flashes: ICs operating normally for image processing.		
	Off: Operation failure.		
	Monitors Printer		
LED 802 (Green)	Flashes: ICs operating normally for image processing.		
	Off: Operation failure.		
	Monitors Scanner		
LED 803 (Red)	Flashes: ICs operating normally for image processing.		
	Off: Operation failure.		

I/O Board

Number	Monitored Signal		
LED201	Turns on when motor/solenoid drive signal is sent from the BCU to IOB (Normally on).		

Controller Board

This table refers to the appearance of the array LEDs to the left of center on the controller board during the firmware upgrade, viewed from the back of the machine with the controller box cover removed.

LED	Color	Comments			
Power	Green	Flashes during normal operation.			
8	Red				
7	Red				
6	Red	While upgrading the firmware from the SD card inserted in the controller slot, each LED lights red as the download progresses			
5	Red				
4	Red	All LEDs light and remain on after the download is completed.			
3	Red				
2	Red				
1	Red				

ADF Main Board LEDs

O: ON ☆: Blinking

LED100	LED101	LED102	
О	—	—	Entrance Sensor Jam
—	О	—	Registration Sensor Jam
О	Ο		Exit Sensor Jam
	_	Ο	Inverter Sensor Jam
\cap		\circ	Jammed paper not removed:
Ŭ		J	Between entrance sensor + registration sensor
О	О	О	Jammed paper not removed: On the exposure glass
☆	—	—	Feed-in Motor Abnormal
—	☆	—	Transport Motor Abnormal
—	—	☆	Feed-out Motor Abnormal
े दे	☆	—	Pick-up Motor Abnormal
—	☆	☆	Bottom Plate Motor Abnormal
\$ ♪	☆	☆	DF Position (Open)
☆	—	公	APS Sensor ON
\$ ♪			Normal

5.13 DIP SW LEDS AND TEST POINT LEDS

5.13.1 DIP SWITCHES

BCU

NO.	NA	EUR/A	COMMENTS
1	ON	OFF	NA: Only SW1 Set to ON, Others OFF.
2	OFF	ON	EUR/A: Only SW2 set to ON, Others OFF
3	OFF	OFF	
4	OFF	OFF	Do not chongo those pottings
5	OFF	OFF	
6	OFF	OFF	Do not change these settings.
7	OFF	OFF	
8	OFF	OFF	

ADF Main Board

DPS100				Description	
4	3	2	1	Description	
0	0	0	0	Normal operating mode	
0	0	0	1	Motor Test: Transport motor – Forward	
0	0	1	0	Motor Test: Transport motor – Reverse	
0	0	1	1	Motor Speed Adjustment (Automatic)	
0	1	0	0	Original stop position adjustment – Single-sided original mode (No original skew correction)	
0	1	0	1	Original stop position adjustment – Double sided original mode	
1	0	0	0	Free Run: Single-sided original mode with skew correction	
1	0	1	0	Free Run: Single-sided original mode without skew correction	
0	1	1	0	Free Run: Double-sided original mode	
Others			Do not select		

"SADF" LED turns on when one of DIP switch turns on.

IEEE 802.11b (Wireless LAN) (Option)

NO.	NA	EUR/A	COMMENTS		
1			Not used with this machine.		

IEEE 1394 (FireWire) (Option)

NO.	NA	EUR/A	COMMENTS
1			Not used with this machine.

MCU

DIP SW No.1 must be ON, and all others (No.2 ~ No.4) OFF.

Controller Board

DIP SW No.5

NO.		COMMENTS
1	OFF	Boot ROM Bank Switching
2	OFF	Design Use Only

DIP SW No.4

NO.		COMMENTS		
1	OFF	Never change this setting.		
		ON	Monitor display and BIOS memory check.	
2	ON	OFF	Monitor display but no BIOS memory check.	
			Never change this setting.	
3	OFF	Design use only.		
4	OFF	Never change this setting.		
5	OFF	Production use (Jig boot selection 1)		
6	OFF	Production use (Jig boot selection 2)		
7	OFF	Production use (Jig boot selection 3)		
8	OFF	Not used.		

5.13.2 TEST POINTS

ADF Main Board

Number	Label	Monitored Signal
TP100	TXD	TXD to the copier
TP101	RXD	RXD from the copier
TP102	GND	Ground
TP103	12 V	+12 V
TP104	5 V	+5 V

5.14 FUSES

ADF Main Board

Number		Description
FU100	Protects the 38 V line	
FU101	Protects the 24 V line	

PSU-E

Number	Description	
Fuse101	Protects AC input line.	

PSU-C

Number	Description	
Fuse 1	Protects AC input line	

LCDC

Number	Description
Fuse 101	12V fuse for the FFC cable that connects the SBU.

Controller

Number	Description
Fuse 101	Monitors 5V line between the mother board and controller.

Mother Board

Number	Description
Fuse 3	
Fuse 4	Breakers. Do not require replacement.
Fuse 5	

Centronics (Option)

Number	Description		
Fuse 1	Monitors 3.3V power supply line from controller.		
Fuse 2	Monitors 5V power supply line from controller.		

NIC (Option)

Number	Description		
Fuse 1	Monitors 3.3V power supply linen from controller.		

IEEE 802.11b (Wireless LAN) (Option)

Number	Description		
Fuse 2	Monitors 3.3V power supply line from controller.		
Fuse 3	Monitors 5V power supply line from controller.		
Fuse 4	Monitors 3.3V power supply line from controller.		

USB 2.0 (Option)

Number	Description		
Fuse 1	Monitors 3.3V power supply line from controller.		

EFI (Option)

Number	Description		
Fuse 1	Monitors 3.3V power supply line from controller.		

IEEE 1394 (FireWire) (Option)

Number	Description		
Fuse 1	Breakers. Do not require replacement.		
Fuse 2			
Fuse 3	Monitors 5V power supply line from controller.		

5.15 VARIABLE RESISTORS

ADF Main Board

Number	Function			
VR100	Adjusts the original stop position for the single-sided original at no skew correction mode.			
VR101	Adjusts the original stop position for the double-sided original.			

CBG Power Pack

Number	Function		
VR16	For the charge corona PWM. Do not change the setting in the field.		
VR101	For grid PWM. Do not change the setting in the field.		

Transfer Bias Power Pack

Number	Function	
VR101	For monitoring transfer voltage.	

5.16 USING THE DEBUG LOG

This machine provides a Save Debug Log feature that allows the Customer Engineer to save and retrieve error information for analysis.

Every time an error occurs, debug information is recorded in volatile memory but this information is lost when the machine is switched off and on.

The Save Debug Log feature provides two main features:

- Switching on the debug feature so error information is saved directly to the HDD for later retrieval.
- Copying the error information from the HDD to an SD card.

When a user is experiencing problems with the machine, follow the procedure below to set up the machine so the error information is saved automatically to the HDD.

5.16.1 SWITCHING ON AND SETTING UP SAVE DEBUG LOG

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

- 1. Enter the SP mode and switch the Save Debug Log feature on.
 - Press I then use the 10-key pad to enter ① ◎ ⑦.
 - Press and hold down C/O for more than 3 seconds.
 - Touch "Copy SP".
 - On the LCD panel, open SP5857.
- 2. Under "5857 Save Debug Log", touch "1 On/Off".



3. On the control panel keypad, press "1" then press [⊕]. This switches the Save Debug Log feature on.

NOTE: The default setting is "0" (OFF). This feature must be switched on in order for the debug information to be saved.

 Next, select the target destination where the debug information will be saved. Under "5857 Save Debug Log", touch "2 Target", enter "2" with the operation panel key to select the hard disk as the target destination, then press ([#]).



NOTE: Select "3 SD Card" to save the debug information directly to the SD card if it is inserted in the service slot.

5. Now touch "5858" and specify the events that you want to record in the debug log. SP5858 (Debug Save When) provides the following items for selection.

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.

NOTE: More than one event can be selected.

Example 1: To Select Items 1, 2, 4

Touch the appropriate items(s). Press "ON" for each selection. This example shows "Engine SC Error" selected.



Example 2: To Specify an SC Code

Touch "3 Any SC Error", enter the 3-digit SC code number with the control panel number keys, then press (#). This example shows an entry for SC670.



NOTE: For details about SC code numbers, please refer to the SC tables in Section "4. Troubleshooting".

Service Tables 6. Next, select the one or more memory modules for reading and recording debug information. Touch "5859".

Under "5859" press the appropriate key item for the module that you want to record.

Enter the appropriate 4-digit number, then press (#).

NOTE: Refer to the two tables below for the 4-digit numbers to enter for each key.

The example below shows "Key 1" with "2222" entered.

SP-5-859-001
Save Key No.
2222

The following keys can be set with the corresponding numbers. (The initials in parentheses indicate the names of the modules.)

4-Digit Entries for Keys 1 to 10

KEY NO.	COPY	PRINTER	SCANNER	WEB	
1		2222 (SCS)			
2		2223 (SRM)			
3	256 (IMH)				
4	1000 (ECS)				
5		1025 (MCS)			
6	4848 (COPY)	4400 (GPS)	5375 (Scan)	5682 (NFA)	
7	2224 (BCU)	4500 (PDL)	5682 (NFA)	6600 (WebDB)	
8		4600 (GPS-PM)	3000 (NCS)	3300 (PTS)	
9		2000 (NCS)	2000 (NCS)	6666 (WebSys)	
10		2224 (BCU)		2000 (NCS)	

NOTE: The default settings for Keys 1 to 10 are all zero ("0").

Key to Acronyms

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

The machine is now set to record the debugging information automatically on the HDD (the target selected with SP5-857-002) for the events that you selected SP5-858 and the memory modules selected with SP5-859.

Please keep the following important points in mind when you are doing this setting:

- Note that the number entries for Keys 1 to 5 are the same for the Copy, Printer, Scanner, and Web memory modules.
- The initial settings are all zero.
- These settings remain in effect until you change them. Be sure to check all the settings, especially the settings for Keys 6 to 10. To switch off a key setting, enter a zero for that key.
- You can select any number of keys from 1 to 10 (or all) by entering the corresponding 4-digit numbers from the table.
- You cannot mix settings for the groups (COPY, PRINTER, etc.) for 006~010. For example, if you want to create a PRINTER debug log you must select the settings from the 9 available selections for the "PRINTER" column only.
- One area of the disk is reserved to store the debug log. The size of this area is limited to 4 MB.

5.16.2 RETRIEVING THE DEBUG LOG FROM THE HDD

Retrieve the debug log by copying it from the hard disk to an SD card.

- 1. Insert the SD card into the service slot of the copier.
- 2. Enter the SP mode and execute SP5857 009 (Copy HDD to SD Card (Latest 4 MB)) to write the debugging data to the SD card.
- 3. After you return to the service center, use a card reader to copy the file and send it for analysis to Ricoh by email, or just send the SD card by mail.

Service Tables

5.16.3 RECORDING ERRORS MANUALLY

Since only SC errors and jams are recorded to the debug log automatically, for any other errors that occur while the customer engineer is not on site, please instruct customers to perform the following immediately after occurrence to save the debug data. Such problems would include a controller or panel freeze.

- **NOTE:** In order to use this feature, the customer engineer must have previously switched on the Save Debug Feature (SP5857-001) and selected the hard disk as the save destination (SP5857-002).
- 1. When the error occurs, on the operation panel, press 3 (Clear Modes).
- 2. On the control panel, enter "01" then hold down C/☉ for at least 3 sec. until the machine beeps then release. This saves the debug log to the hard disk for later retrieval with an SD card by the service representatives.
- 3. Switch the machine off and on to resume operation.

The debug information for the error is saved on the hard disk so the service representatives can retrieve it on their next visit by copying it from the HDD to an SD card.

DETAILED DESCRIPTION 6.

6.1 COMPONENT LAYOUT

6.1.1 COPIER ENGINE



- 13. LCT Relay Roller
- 14. Transfer Belt Unit
- 15. Relay Roller
- 16. Pick-up Roller
- 17. Vertical Transport Rollers
- 31. Motor Control Unit 32. Oil Supply & Cleaning Web
- 33. Drum Unit

6.2 PAPER PATH



B070D871.WMF

- 1. ADF
- 2. Bypass Tray
- 3. Optional LCT
- 4. Tray 3
- 5. Tray 2
- 6. Tray 1

- 7. Duplex Unit
- 8. Optional Finisher
- 9. Inverter Unit
- 10. Shift Tray
- 11. Upper Tray
- 12. Cover Interposer

6.3 COPY PROCESS



B070D872.WMF



1. EXPOSURE

A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the hard disk.

2. DRUM CHARGE

An OPC (organic photoconductor) drum is used in this machine. In the dark, the charge corona unit gives a negative charge to the drum. The grid plate ensures that corona charge is applied uniformly. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

3. LASER EXPOSURE

The processed data from the scanned original is retrieved from the hard disk and transferred to the drum by four laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the laser diode board (LDB).

4. DRUM POTENTIAL SENSOR

The drum potential sensor detects the electric potential on the drum to correct various process control elements.

5. DEVELOPMENT

The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

6. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer belt at the proper time to align the copy paper and the developed image on the drum. Then, the transfer bias roller and brush apply a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum to the paper. At the same time, the paper is electrically attracted to the transfer belt.

7. PAPER SEPARATION

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. The pick-off pawls also help separate the paper from the drum.

8. ID SENSOR

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control.

9. CLEANING

The cleaning brush removes toner remaining on the drum after image transfer and the cleaning blade scrapes off all remaining toner.

10. QUENCHING

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

6.4 DRIVE LAYOUT

6.4.1 COPIER ENGINE



B070D874.WMF

- 1. Drum Motor
- 2. Scanner Motor
- 3. Fusing/Duplex Motor
- 4. Paper Feed Motor
- 5. Registration Motor
- 6. Relay Motor
- 7. Development Motor

6.5 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components using the symbols and index numbers.

6.5.1 COPIER ENGINE

Number	Name	Description
Lamps		
L01	Exposure Lamp	Applies high intensity light to the original for exposure.
L02	Fusing Lamp 1	Provides heat to the hot roller.
L03	Fusing Lamp 2	Provides heat to the hot roller.
L04	Fusing Lamp 3	Provides heat to the hot roller.
L05	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.
Magnetic (Clutches	
MC01	Toner Supply Coil Clutch	Transfers drive from the toner bank motor to the toner transport coil to transport toner towards the hopper.
MC02	Toner Supply Roller Clutch	Turns the toner supply roller to supply toner from the toner hopper to the development unit.
MC03	1st Paper Feed Clutch	Starts paper feed from tray 1.
MC04	2nd Paper Feed Clutch	Starts paper feed from tray 2.
MC05	3rd Paper Feed Clutch	Starts paper feed from tray 3.
MC06	Inverter Exit Roller Clutch	Releases the drive from the inverter exit roller in the duplex unit.
MC07	1st Vertical Transport Clutch	Drives the 1st vertical transport rollers.
MC08	2nd Vertical Transport Clutch	Drives the 2nd vertical transport rollers.
MC09	3rd Vertical Transport Clutch	Drives the 3rd vertical transport rollers.
MC10	Upper Relay Clutch	Drives the upper relay rollers (between tray 1 and the registration rollers)
MC11	LCT Relay Clutch	Drives the relay rollers for paper feed into the machine from the LCT.
MC12	Lower Relay Clutch	Drives the lower relay rollers (between paper trays 1 and 2.
Motors		
M01	Scanner Motor	Drives the 1st and 2nd scanners.
M02	Polygon Mirror Motor	Drives the polygon mirror in the laser optics unit
M03	Drum Motor	Drives the drum, cleaning unit, and transfer belt unit.
M04	Development Motor	Drives the development unit.
M05	Toner Supply Pump Motor	Mounted between the toner hopper and the toner supply cylinder, this pumps the toner that the supply cylinder has received from the toner bank into the toner hopper.
M06	Toner Bank Motor	Drives the toner transport coil, which feeds fresh toner from the toner bank to the toner supply cylinder.

Number	Name	Description
M07	Upper Toner Bottle Motor	Rotates the upper toner bottle to supply
		toner to the toner entrance tank.
M08	Upper Bottle Cap Motor	Opens and closes the inner cap of the upper toner bottle.
М09	Lower Toner Bottle Motor	Rotates the lower toner bottle to supply
		toner to the toner entrance tank.
M10	Lower Bottle Cap Motor	Opens and closes the inner cap of the lower toner bottle.
M11	Charge Corona Wire Cleaner	Drives the charge corona wire cleaner.
M12	Fusing/Exit Motor	Drives the fusing unit, inverter unit, reverse trigger roller, and paper exit rollers.
M13	Paper Feed Motor	Drives the paper feed, separation, pick-up, lower relay, and vertical transport rollers in the three trays.
M14	Relay	Drives the upper relay roller and the LCT relay roller.
M15	1st Tray Lift Motor	Raises and lowers the bottom plate in the 1st paper tray.
M16	2nd Tray Lift Motor	Raises and lowers the bottom plate in the 2nd paper tray.
M17	3rd Tray Lift Motor	Raises and lowers the bottom plate in the 3rd paper tray.
M18	Registration Motor	Drives the registration rollers.
M19	Web Motor	Drives the oil supply/cleaning web.
M20	Rear Fence Drive Motor	Moves the paper stack in the left tandem tray to the right tandem tray.
M21	Jogger Motor	Drives the jogger fences to square the paper stack in the duplex unit.
M22	Duplex Transport Motor 1	Drives the duplex transport rollers (transport).
M23	Duplex Transport Motor 2	Drives the duplex transport rollers (transport 2).
M24	Toner Suction Motor	Drives the air pump that creates the vacuum to draw loose toner from the development unit to the development unit waste toner collection bottle.
M25	Optics Cooling Fan	Removes heat from the scanner optics unit.
M26	Polygon Mirror Motor Cooling Fan	Removes heat from around the polygon mirror motor.
M27	LDB Cooling Fan	Removes heat from around the LDB.
M28	SBU Cooling Fan	Removes heat from around the SBU.
M29	Drum Cooling Fan	Removes heat from the drum.
M30	Development Unit Cooling Fan 1	Removes heat from the development unit.
M31	Development Unit Cooling Fan 2	Removes heat from the development unit.
M32	Paper Cooling Pipe Fan 1	Removes heat from the paper cooling pipe.
M33	Paper Cooling Pipe Fan 2	Removes heat from the paper cooling pipe.
M34	Duplex Cooling Fan	Removes heat from the horizontal paper path of the duplex/inverter unit.
M35	Exhaust Fan	Removes heat from around the fusing unit.
M36	Steam Removal Fan	Removes water vapor from around the fusing unit.
M37	Duplex Entrance Cooling Fan 1	Removes heat from around the entrance to the duplex/inverter unit.

ELECTRICAL COMPONENT DESCRIPTIONS

F

Number	Name	Description
M38	Duplex Entrance Cooling Fan 2	Removes heat from around the entrance to the duplex/inverter unit.
M39	Controller Board Fan Motor	Removes heat from around the controller board.
M40	Mother Board Fan Motor 1	Removes heat from around the mother board.
M41	Mother Board Fan Motor 2	Removes heat from around the mother board.
PCBs	·	
PCB01	BCU	BCU (Base-Engine Control Unit): Main control board, controls the engine sequence, timing for peripherals, image processing, and the video data path
PCB02	PSU-E	PSU-E (Power Supply Unit-Engine): Supplies DC power for the machine, and controls the anti-condensation heaters.
PCB03	PSU-C	PSU-C (Power Supply Unit-Controller): Supplies DC power for the controller.
PCB04	IOB	IOB (Input/Output Board): Performs three functions (1) Continues conversion done in the BCU of the sensor input from the main unit paper trays, toner supply unit, and LCT, (2) Converts serial data from the BCU to parallel data for control of the man unit paper trays, toner supply unit, and LCT components (motors, solenoids, clutches), (3) Routes the power supply from the PSU in the BCU to the LCT, and routes power interlock power supply to all the motors.
PCB05	SBU	SBU (Sensor Board Unit): Contains the CCD. Converts the CCD output to digital before sensing it to the IPU (Image Processing Unit).
PCB06	MCU	MCU (Main Control Unit) Controls the scanner motor with the commands from the BCU. Also controls fusing lamp on/off timing, APS detection, the fan motors, generation of gate signals, and transmission of serial data.
PCB07	Lamp Regulator	bed scanner
PCB08	Polygon Mirror Motor Control Board	Controls the polygon motor.
PCB09	LDB	LDB (Laser Diode Board) controls the laser diodes. It also contains the laser diodes.
PCB10	AC Drive	Drives the ac components (fusing lamps, anti-condensation heaters).
PCB11	Operation Panel	Controls the operation panel and LCD display panel.
PCB12	Operation Switch Board	Switches main power to the machine on/off.
PCB13	Mother Board	MB (Mother Board): Interfaces the controller and the IPU.

Number	Name	Description
PCB14	Controller	Controls the memory and all peripheral devices. GW architecture allows the board to control all applications, i.e. copying, printing, and scanning. In order to add an option (printer, scanner), the appropriate ROM DIMM must be installed on the controller.
PCB15	LCDC	LCDC (LCD Controller): Controls the operation panel and connects the scanner to the IPU
PCB16	IPU	IPU (Image Processing Unit): Contains large-scale integrated circuits that perform image processing with the digital data sent from the SBU, then sends the processed data to the controller and to the exposure ASIC which sends it to the LD unit. Also relays data transmissions between the controller and LCDC.
PCB17	SD Card Board	Allows SD cards to be connected to the controller.
PCB18	DC Supply Board	Converts the DC current supplied from the PSU to the correct DC voltage for the operation of the Controller.
PCB19	External Controller Interface Board	Interfaces the controller with the IEEE1394 card and other options
PCB20	Laser Synchronization Detector Board	Detects when the laser is about to start another main scan line across the OPC
Power Pac	ks	
PP01	CGB (Charge, Grid, Bias) Power Pack	Provides high voltage for the charge corona wires, grid plate, and the development roller.
PP02	Transfer Power Pack	Supplies high voltages to the transfer unit.
Sensors		
S01	Scanner HP Sensor	Informs the CPU when the 1st and 2nd scanners are at home position.
S02	Original Width Sensors 1~3	Detect the width of the original.
S03	Original Length 1	Detects the original length.
S04	Original Length 2	Detects the original length.
S05	Drum Potential Sensor	Detects the drum surface potential.
S06	Toner Density Sensor	Measures the concentration of toner in the toner-developer mixture.
S07	Image Density (ID) Sensor	Detects the density of the ID sensor pattern on the drum.
S08	Toner Hopper Sensor	Monitors the level of toner in the toner supply unit.
S09	Toner Supply Pump Motor Sensor	Detects whether the toner supply pump motor is rotating.
S10	Upper Toner Bottle Sensor	Detects when the upper toner bottle is set.
S11	Lower Toner Bottle	Detects when the lower toner bottle is set.
S12	Upper Bottle Inner Cap Sensor	Detects when the inner cap of the upper toner bottle is opened.
S13	Lower Bottle Inner Cap Motor	Detects when the inner cap of the lower toner bottle is opened.
S14	Toner Collection Bottle Sensor	Detects when the waste toner collection bottle is set.

Number	Name	Description
S15	Toner Overflow Sensor	Detects when the waste toner collection bottle is full.
S16	Toner Near End Sensor	Detects toner near end in the toner bank unit.
S17	1st Paper Feed Sensor	Controls the 1st paper feed clutch on/off timing and the 1st pick-up solenoid off timing.
S18	2nd Paper Feed Sensor	Controls the 2nd paper feed clutch on/off timing and the 1st pick-up solenoid off timing.
S19	3rd Paper End	Informs the CPU when tray 3 runs out of paper.
S20	1st Tray Lift Sensor	Detects the correct paper height for feeding in the 1st tray.
S21	2nd Tray Lift Sensor	Detects the correct paper height for feeding in the 2nd tray.
S22	3rd Tray Lift Sensor	Detects the correct paper height for feeding in the 3rd tray.
S23	1st Paper End Sensor	Informs the CPU when tray 1 runs out of paper.
S24	2nd Paper End Sensor	Informs the CPU when tray 2 runs out of paper.
S25	3rd Paper Feed	Controls the 3rd paper feed clutch on/off timing and the 3rd pick-up solenoid off timing.
S26	Rear Fence HP Sensor	Informs the CPU when the tandem tray rear fence is in the home position.
S27	Rear Fence Return Sensor	Informs the CPU when the tandem tray rear fence is in the return position.
S28	Front Side Fence Open Sensor	Detects whether the tandem tray front side fence is opened.
S29	Front Side Fence Closed Sensor	Detects whether the tandem tray front side fence is closed.
S30	Rear Side Fence Open Sensor	Detects whether the tandem tray rear side fence is opened.
S31	Rear Side Fence Closed Sensor	Detects whether the tandem tray rear side fence is closed.
S32	Lower Limit Sensor	After the tandem tray is empty, the tray lowers until this sensor detects the tray.
S33	1st Tray Paper Height 1	Detects the paper height in the 1st tray (tandem tray), stage 1.
S34	1st Tray Paper Height 2	Detects the paper height in the 1st tray (tandem tray), stage 2.
S35	1st Tray Paper Height 3	Detects the paper height in the 1st tray (tandem tray), stage 3.
S36	1st Tray Paper Height 4	Detects the paper height in the 1st tray (tandem tray), stage 4.
S37	Left 1st Tray Paper Sensor	Detects whether there is paper in the left side of the 1st tray.
S38	Right 1st Tray Paper Sensor	Detects whether there is paper in the right side of the 1st tray, allowing the tray to lift if paper is present.

Number	Name	Description
S39	Duplex Inverter Sensor	Detects when to turn the inverter gate and exit gate solenoids off and checks for misfeeds.
S40	Duplex Entrance Sensor	Detects the leading and trailing edges of the paper to determine the reverse roller solenoid on or off timing.
S41	Duplex Transport Sensor 1	Detects the position of paper in the duplex unit.
S42	Duplex Transport Sensor 2	Detects the position of paper in the duplex unit.
S43	Duplex Transport Sensor 3	Detects the position of paper in the duplex unit.
S44	Duplex Jogger HP Sensor	Detects whether the duplex jogger fences are at the home position.
S45	LCT Relay Sensor	Detects misfeeds.
S46	Relay Sensor	Detects misfeeds.
S47	Registration Sensor	Detects misfeeds and controls registration motor on/off timing.
S48	Guide Plate Position Sensor	Detects whether the registration guide plate is open or closed.
S49	Web End Sensor	Detects when the oil supply/cleaning web has been used up.
S50	Fusing Exit Sensor	Detects misfeeds.
S51	Exit Sensor	Detects misfeeds.
S52	Toner Suction Motor Rotation Sensor	Detects whether the development unit toner suction motor is rotating.
S53	Toner Suction Bottle Set Sensor	Detects whether the development unit waste toner bottle is set.
Solenoids		
SOL01	Transfer Belt Lift	Controls the up-down movement of the transfer belt unit.
SOL02	1st Pick-up Solenoid	Controls the up-down movement of the pick- up roller in tray 1.
SOL03	1st Pick-up Solenoid	Controls the up-down movement of the pick- up roller in tray 2.
SOL04	3rd Pick-up Solenoid	Controls the up-down movement of the pick- up roller in tray 3.
SOL05	1st Separation Roller Solenoid	Controls the up-down movement of the separation roller in tray 1.
SOL06	2nd Separation Roller Solenoid	Controls the up-down movement of the separation roller in tray 2.
SOL07	3rd Separation Roller Solenoid	Controls the up-down movement of the separation roller in tray 3.
SOL08	Front Side Fence	Opens and closes the front side fence in the tandem tray.
SOL09	Rear Side Fence	Opens and closes the rear side fence in the tandem tray.
SOL10	Tandem Tray Connect	Connects/disconnects the two halves of the tandem tray.
SOL11	Left 1st Tray Lock	Locks the left tandem tray while paper is being transported from left tray to right tray.
SOL12	Duplex Inverter Gate Solenoid	Moves the junction gate to direct copies to

Detailed Descriptions

ELECTRICAL COMPONENT DESCRIPTIONS

Number	Name	Description
		the duplex tray or to the paper exit.
SOL13	Reverse Roller	Controls the up-down movement of the reverse roller in the duplex unit.
SOL14	Inverter Guide Plate Solenoid	Controls the up-down movement of the inverter feed guide plate in the duplex unit.
SOL15	Guide Plate Solenoid	Opens the guide plate when a paper misfeed occurs around this area.
SOL16	Inverter Gate Solenoid	Directs paper either straight out or down to the inverter.
SOL17	Toner Recycling Shutter Solenoid	Controls the shutter mechanism in the toner recycling system.
SOL18	LCT Guide Plate SOL	Opens and closes the LCT guide plate between the LCT and the bypass tray.
Switches	•	· · · · · · · · · · · · · · · · · · ·
SW01	Main Power	Provides power to the machine. If this is off, there is no power supplied to the machine.
SW02	Right Front Door Safety Switch 1	Cuts the 24V dc power from the PSU-E to the fusing/exit motor when the door is opened.
SW03	Right Front Door Safety Switch 2	Cuts the 24V power from the PSU-E to the IOB when the front right door is opened.
SW04	Right Front Door Safety Switch 3	Cuts the +5 LD dc power to disable the LD unit when the right door is open.
SW05	Right Front Door Safety Switch 4	Cuts the +5 LD dc power to disable the LD unit when the right door is open.
SW06	Left Front Door Safety Switch 1	Cuts the 24V dc power from the PSU-E to the fusing/exit motor when the door is opened.
SW07	Left Front Door Safety Switch 2	Cuts the 24V power from the PSU-E to the IOB when the front left door is opened.
SW08	Left Front Door Safety Switch 3	Cuts the +5 LD dc power to disable the LD unit when the left door is open.
SW09	Left Front Door Safety Switch 4	Cuts the +5 LD dc power to disable the LD unit when the left door is open.
SW10	2nd Tray Paper Size	Determines the size of paper in tray 2. Also detects when the tray has been placed in the machine.
SW11	3rd Tray Paper Size	Determines the size of paper in tray 3. Also detects when the tray has been placed in the machine.
Other	1	
CB01	Circuit Breaker	Provides back-up high current protection for the electrical components.
CS01	Ext. Control Slot	Factory use only.
EN01	Encoder	Generates pulses for the scanner motor (this motor is a dc motor, not a stepper motor)
H0.1		Ensures that the drum operates at a suitable
		copies.
H02	Optics Anti-condensation Heater (option)	Turns on when the main switch is off to keep the scanner unit drv.
H03	Drum Anti-condensation Heater	Turns on when the main switch is off to

Ī	Number Name		Description
		(option)	prevent moisture from forming around the drum.
	H04	Tray Anti-Condensation Heater 1 (option)	Turns on when the main switch is off to keep paper dry in the paper trays.
	H05	Tray Anti-Condensation Heater 2 (option)	Turns on when the main switch is off to keep paper dry in the paper trays.
	H06	LCT Anti-Condensation Heater	Turns on when the main switch is off to keep paper dry in the LCT paper trays. Contains two heaters.
	HDD1	HDD 1	Scanned image data is compressed and held here temporarily.
	HDD2	HDD 2	Scanned image data is compressed and held here temporarily.
	NF1	Noise Filter	Removes noise from the power line.
	TC1	Total Counter	Counts the total number of copies.
	TH1	Fusing Thermistor	In direct contact with the drum, detects the temperature of the not roller.
	TS01	Thermostat 1	One of a pair of wafer thermostats mounted directly above the center of the hot roller to monitor the temperature of the hot roller and signal the CPU to switch it off if it overheats.
	TS02	Thermostat 2	One of a pair of wafer thermostats mounted directly above the center of the hot roller to monitor the temperature of the hot roller and signal the CPU to switch it off if it overheats.
	TS3	Drum mermostat	Prevents the drum heater from overheating

Detailed Descriptions

6.5.2 ADF

Symbol	Name	Function
Motors		
M1	Pick-up	Moves the pick-up roller up and down.
M2	Eard in	Drives the feed belt, and the separation, pick-up, and
IVIZ		transport rollers.
M3	Transport Belt	Drives the transport belt.
M4	Feed-out	Drives the exit and inverter rollers.
M5	Bottom Plate	Moves the bottom plate up and down.
Sensors		
		Informs the CPU when the DF is opened and closed (for
S1	APS Start	platen mode) so that the original size sensors in the
		copier can check the original size.
S2	DF Position	Detects whether the DF is lifted or not.
S3	Original Set	Detects whether an original is on the table.
S4	Bottom Plate HP	Detects whether the bottom plate is in the down position or not.
S5	Bottom Plate Position	Detects when the original is at the correct position for feeding.
S6	Pick-up Roller HP	Detects whether the pick-up roller is up or not.
		Detects when to restart the pick-up motor to lift up the
		pick-up roller, detects when to change the feed motor
S7	Entrance	direction, detects the trailing edge of the original to
		finish checking the original length, and checks for
		Misteeds.
<u>co</u>	Desistration	Detects the leading edge of the original to check the
30	Registration	original length, detects when to stop the original on the
59	Original Width 1	Detects the original width
<u>S10</u>	Original Width 2	Detects the original width
S11	Original Width 3	Detects the original width
S12	Original Length	Detects the original length
012		Detects when to stop the transport helt motor and
S13	Exit	checks for misfeeds
		Detects when to turn the inverter gate and exit gate
S14	Inverter	solenoids off and checks for misfeeds.
S15	Feed Cover	Detects whether the feed cover is open or not.
S16	Exit Cover	Detects whether the exit cover is open or not.
Solenoid	S	
SOL1	Exit Gate	Opens and closes the exit gate.
SOL2	Inverter Gate	Opens and closes the inverter gate.
Magnetic	Clutches	<u></u>
MC1	Feed-in	Drives the feed belt, separation roller, and pick-up roller.
PCBs		· · · · · · · · · · · · · · · · · · ·
		Controls the DF and communicates with the main copier
PUDI		boards.
		Indicates whether an original has been placed in the
PCB2	DF Indicator	feeder, and indicates whether SADF mode has been selected.

6.6 ADF

6.6.1 OVERVIEW



- 1. Entrance Sensor
- 2. Separation Roller
- 3. Feed Belt
- 4. Pick-up Roller
- 5. Original Tray
- 6. Inverter Junction Gate
- 7. Inverter Guide Roller
- 8. Inverter Sensor

- 9. Feed-out Roller
- 10. Exit Junction Gate
- 11. Inverter Roller
- 12. Exit Sensor
- 13. Transport Belt
- 14. Registration Sensor
- 15. Width Sensors (x3)

Detailed Descriptions

6.6.2 PICK-UP ROLLER RELEASE



B070D916.WMF

When the original set sensor is off (no original on the original tray), the pick-up roller stays in the up position.

When the original set sensor turns on (or when the trailing edge of a page passes the entrance sensor while pages remain on the original tray), the pick-up motor [A] turns on. The cam [B] rotates away from the pick-up roller release lever [C]. The lever then rises and the pick-up roller [D] drops onto the original.

When the original reaches the entrance sensor, the pick-up motor turns on again. The cam pushes the lever down, and the pick-up roller rises until the pick-up roller HP sensor [E] detects the actuator [F].

6.6.3 BOTTOM PLATE LIFT



B070D917.WMF

When an original is placed on the original tray, the original set sensor [A] turns on, the pick-up roller [B] drops on to the original, and the bottom plate position sensor [C] turns off. Then the bottom plate motor [D] turns on and lifts the bottom plate [E] by raising the lift lever [F] until the bottom plate position sensor turns on.

The level of the pick-up roller drops as the stack of originals becomes smaller, and eventually, the bottom plate position sensor [C] turns off. Then, the bottom plate motor turns on and lifts the bottom plate until the bottom plate position sensor turns on. This keeps the original at the correct height for feeding.

Detailed Descriptions

6.6.4 PICK-UP AND SEPARATION



The original separation system is a Feed and Reverse Roller (FRR) system. The pick-up roller [A], feed belt [B], and separation roller [C] are driven by the feed-in motor [D].

To drive this mechanism, the feed-in motor [D] and feed-in clutch [E] turn on.

(CM Handling Paper> Handling Originals> Document Feed> FRR with Feed Belt)

6.6.5 ORIGINAL FEED



When the leading edge of the original turns the entrance sensor [A] on, the feed-in clutch [B] turns off and the drive for the feed belt is released. The original is fed by the transport rollers [C].

At the same time, the pick-up motor starts again and the pick-up roller [D] is lifted up. When the pick-up roller HP sensor turns on, the pick-up motor stops (see Pickup Roller Release).
6.6.6 ORIGINAL SIZE DETECTION



The ADF detects the original size by combining the readings of original length sensor [A], and original width sensors-1 [B], -2 [C], and -3 [D].

Original Length

The original length sensor and the disk [E] (connected to the transport roller) generate a pulse signal. The CPU counts pulses, starting when the leading edge of the original turns on the registration sensor [F], until the trailing edge of the original turns off the entrance sensor [G].

Original Width

The CPU detects original width using three original width sensors -1, -2, -3 as shown above. Three small circles on the diagram indicate the positions of the sensors.

Original Width Sensor Location



B070D922.WMF

Detectable Paper Sizes

Please refer to the "1.2 ADF" table in "Specifications".

6.6.7 ORIGINAL TRANSPORT



B070D923.WMF



B070D924.WMF

The transport belt [A] is driven by the transport belt motor [B]. The transport belt motor starts when the copier sends an original feed-in signal.

The pressure rollers inside the transport belt maintain the correct pressure between belt and original. The pressure roller [C] closest to the left original scale is made of rubber for the stronger pressure needed for thick originals. The other rollers are sponge rollers.

Normally, originals are manually placed at the left rear corner, so an original [D] fed from the ADF must also be at this position. But if the original touches the rear scale [E] as it feeds, original skew, jam, or wrinkling may occur.

To prevent such problems, the original transfer position is set to 3.5 mm away from the rear scale as shown. The 3.5 mm gap is compensated for by changing the starting position of the main scan for when the image is exposed on the drum.

(+)+ (+)+ (+) $^+$ (+) (+) (+ [A] 7 mm $^+$ (+) (+)(+) + B070D925 WMF [B]

6.6.8 ORIGINAL SKEW CORRECTION

The transport belt motor remains energized to carry the original to the right about 7 mm past the left scale [A]. Then the motor stops and reverses to feed the original 12 mm to the left against the left scale to correct skew. This forces the original to hit the left scale, which aligns the trailing edge to minimize original skew on the exposure glass.

If thin original mode is selected, the original is not forced back against the left scale. This is to prevent damage to the original.

After a two-sided original has been inverted to copy the 2nd side, it is fed in from the inverter against the left scale [B] without skew correction.

NOTE: The bottom drawing applies to duplex scanning; the top two drawings do not apply in this mode.

The amount of reverse feed against the left scale can be adjusted as follows:

- One-sided originals, and side 1 of two-sided originals: SP6006-3 (DF Registration Adjustment – Leading Edge Duplex 1st)
- Side 2 of two-sided originals: SP6006-4 (DF Registration Adjustment Leading Edge Duplex 2nd).

6.6.9 ORIGINAL INVERSION AND FEED-OUT

General Operation



When the scanner reaches the return position, the copier CPU sends the feed-out signal to the ADF. When the ADF receives the feed-out signal, the transport belt motor and feed-out motor [A] turn on. The original is then fed out to the exit tray or fed back to the exposure glass after reversing in the inverter section.

This ADF has two exit trays. For single-sided original mode, the original is fed out straight out to the right exit tray, but for double-sided original mode, the original is fed out to the upper exit tray.

This causes the originals to be fed out in the correct order on the exit trays and allows the maximum one-to-one copy speed for each mode.

Detailed Descriptions

Original Inversion



B070D927.WMF

When the ADF receives the original invert signal from the copier, the transport belt motor, feed-out motor, exit gate solenoid [A], and inverter gate solenoid [B] turn on and the original is fed back to the exposure glass through the inverter roller [C], exit gate [D], inverter guide roller [E], inverter gate [F], and inverter roller.

The transport belt motor reverses shortly after the leading edge of the original turns on the inverter sensor [G], and feeds the original to the left scale.

Original Exit (Single-Sided Original Mode)



The exit gate solenoid [A] remains off, the exit gate [B] remains closed, and the original is fed out to the right exit tray.

The speed of the motor is reduced about 30 mm from the trailing edge of the original to ensure the originals stack neatly on the exit tray. This timing is determined by the length of the original, and the time since the exit sensor [C] detected the leading edge.

The transport belt motor turns off after the exit sensor [C] turns off.

Detailed Descriptions



Original Exit (Double-Sided Original Mode)

The exit gate solenoid [A] turns on and the exit gate [B] opens.

The inverter gate solenoid [C] remains off, and the original is fed out to the upper tray. The transport belt motor turns off when the trailing edge of the original passes the exit sensor [D].

To stack the originals neatly on the upper tray, the feed-out motor speed is reduced shortly after the trailing edge of the original turns off the inverter sensor [E].

6.6.10 ADF JAM CONDITIONS



Feed-in

- 1. The entrance sensor [A] is still off 500 ms after the feed-in motor turned on.
- 2. The registration sensor [B] is still not off 300 ms after the feed-in motor speed increased.
- 3. The entrance sensor is still on when the feed-in and transport motors have fed the original 442 mm after the registration sensor turned on.

Feed-out

- 4. The registration sensor is still on when the feed-in and transport motors have fed the original 751 mm after the registration sensor turned on.
- 5. The exit sensor [C] is still off when the transport and feed-out motors have fed the original 129 mm after the feed-out motor turned on.
- 6. The exit sensor is still on when feed-out motor has fed the original X mm (X = original length x 1.3) after the exit sensor turned on.

Inversion

- 7. The exit sensor is still off when the transport and exit motors have fed the original 198 mm after the transport motor turned on to feed the original to the inverter section.
- 8. The exit sensor is still on when the feed-out motor has fed the original X mm (X = original length x 1.3) after the exit sensor turned on.
- 9. The inverter sensor [D] is still off when the transport and feed-out motors have fed the original 96 mm after the exit sensor turned on.
- 10. The inverter sensor is still off when the transport and feed-out motors have fed the original 96 mm to the exposure glass after the exit sensor turned off.

6.7 SCANNING

6.7.1 OVERVIEW



- 1. Scanner Motor
- 2. White Plate (on exposure glass)
- 3. 2nd Mirror
- 4. Exposure Lamp (Xenon)
- 5. Exposure Glass
- 6. 1st Mirror
- 7. Lamp Regulator
- 8. SBU Cooling Fan
- 9. Optics Cooling Fan

- 10. LCDC (LCD Control Board)
- 11. CCD (Charge Coupled Device)
- 12. Original Length Sensor (APS)
- 13. Scanner Lens
- 14. 3rd Mirror
- 15. Original Width Sensors 1, 2, 3 (APS)
- 16. Scanner HP Sensor
- 17. Optics Anti-condensation Heater (option)

One xenon lamp (23W) as the exposure lamp [4] illuminates the original. The image is reflected onto the CCD [11] (600 dpi resolution) via the 1st, 2nd, and 3rd mirrors, and through the lens [13].

The lens, CCD, and SBU are in a single unit, the lens block. The optical axis, focus, and MTF are pre-adjusted, so this lens block requires no adjustment in the field. The 1st scanner consists of the exposure lamp [4], the lamp regulator [7] and the 1st mirror.

Two fans, the optics cooling fan [9] and the SBU cooling fan [8], draw cool air into the scanning unit. The optics cooling fan turns on when the scanner motor starts and turns off 10 seconds after the scanner motor turns off. The SBU cooling fan operates while the operation switch is on. The optional optics anti-condensation heater [17] (if installed as an option) turns on while the main switch is off, to prevent moisture from forming on the optics.

6.7.2 SCANNER DRIVE



The scanner motor is a dc servo motor. The 1st and 2nd scanners [A, B] are driven by the scanner motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

The MCU (Motor Control Unit) board controls the scanner motor. The exposure lamp scans a sheet with 100% magnification at 515 mm/s and returns to the scan position for the next scan at 2500 mm/s.

Magnification and Reduction

Magnification and reduction in the main scan direction are done in the IPU board.

Magnification and reduction in the sub scan direction, however, are done by controlling the speed of the scanner motor in sync with the main scan processing done in the IPU.

- Magnification above 101% is done in the IPU. For example, at 200% magnification, the IPU doubles magnification while the scanner motor speed remains at 100%.
- Reduction in the range 51% to 100% is done by the scanner motor.
- Reduction in the range 25% to 50% is done by the scanner motor, assisted by IPU processing. For example, at 40% reduction, the scanner motor speed is 80% and the IPU reduces the image by 1/2.
- Reduction below 25% is done by the scanner motor, assisted by IPU processing. For example, at 24% reduction the scanner motor speed is 96% and the IPU reduces the image by 1/4.
- **NOTE:** Magnification in the sub scan direction can be adjusted by changing the scanner motor speed with SP4008 (Scanner Sub Scan Magnification).

Detailed Description

6.7.3 ORIGINAL SIZE DETECTION



There are three reflective sensors at three locations in the optics cavity for original size detection.

The original width sensor [A] detects the original width, and the original length sensor 1 [B] and original length sensor 2 [C] detect the original length. These are the APS (Auto Paper Select) sensors.

Inside each APS sensor, there is an LED [D] and either three photoelectric devices [E] (for the width sensor) or one photoelectric device (for each length sensor). In the width sensor, the light generated by the LED is separated into three beams and each beam scans a different point of the exposure glass (in each length sensor, there is only one beam). If the original or ADF cover is present over the scanning point, the beam is reflected and each reflected beam exposes a photoelectric device and activates it.

While the main switch is on, these sensors are active and the original size data is always sent to the main CPU. However, the main CPU checks the data only when the ADF is being closed.

The ADF functions as the platen. The DF position sensor [F] (attached to the ADF) detects whether the ADF is open or closed.

The APS start sensor [G] triggers auto paper size detection.

Original Size		Length Sensor		Width Sensor			SP4301 Display	
A4/A3 Version	LT/DLT Version	2	1	1	2	3	Display	
A3	11" x 17"	Н	Н	Н	Н	Н	00011111	
B4	10" x 14"	Н	Н	Н	Н	L	00011110	
F4	81/2" x 14" (8" x 13")	Н	Н	Н	L	L	00011100	
A4 SEF	81/2" x 11"	L	Н	Н	L	L	00001100	
B5 SEF	—	L	Н	L	L	L	00001000	
A5 SEF	51/2" x 81/2"	L	L	L	L	L	00000000	
A4 LEF	11" x 81/2"	L	L	Н	Н	Н	00000111	
B5 LEF	—	L	L	Н	Н	L	00000110	
A5 LEF	81/2" x 51/2"	L	L	Н	L	L	00000100	

NOTE: The Europe/Asia model has one length sensor (L1), but the North American model has two length sensors (L1, L2)

H:High (Paper Present) L: Low

The original size data is taken by the main CPU when the DF position sensor is activated. This is when the ADF is positioned about 12 cm above the exposure glass. At this time, only the sensor(s) underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU recognizes the original size from the on/off signals from the five sensors.

If the copy is made with the ADF open, the main CPU decides the original size from the sensor outputs when the Start key is pressed.

The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine productivity.





6.7.4 AUTO IMAGE DENSITY (ADS)

The area that the CCD uses as a reference for ADS is shown in the following diagram.



(CD Digital Processes> Image Processing> Black and White CCD Systems> Analog Signal Processing> Automatic Image Density)

6.8 BOARD STRUCTURE

6.8.1 BLOCK DIAGRAM



B070D864.WMF

ailed

6.8.2 COMPONENT DESCRIPTIONS

This machine employs Ricoh GW (Grand Work) architecture that allows the copier to be expanded as an MFP (Multi-Function Product) by installation of simple modular components (ROM DIMMs) on the controller board.

Here is a summary of the main parts of the board structure.

NOTE: The DIP switch settings and the board should not be changed. For details, please refer to the "Specifications", the last section of this manual.

BCU (Base Engine Control Unit): This is the main control board that controls the engine sequence, timing for peripherals. The BCU also controls:

- High voltage
- Duplexing
- Paper feed
- Paper registration
- Fusing
- Peripheral interfaces
- Drive
- Toner supply

Controller Board: The controller board controls all devices for memory DIMMs, HDD, copying, printing, and scanning. The controller board also provides all the connection points for easy installation of the options (printer, scanner, FireWire, wireless LAN, and so on). The controller board also controls:

- Printer/scanner
- Document server
- Image rotation
- Conversion of all image formats
- Image compression and decompression

Mother Board: Interfaces the controller and the IPU, and installed options.

IPU (Image Processing Unit): Contains large-scale integrated circuits that perform image processing on the digital data sent from the SBU, then sends the processed data to the controller and then to the LD unit. Also relays data transmissions between the controller and LCDC.

SBU (Sensor Board Unit): The SBU receives analog signals from the CCD and converts them into the digital signals that are used for image processing. A/D conversion divides the range between black and white into 256 levels and digitizes the analog signal based on these levels. The 256 levels are called grayscales.

IOB (Input/Output Board): Performs three functions:

- Converts sensor output from the paper bank, toner bank unit, and LCT then sends it to the BCU.
- Converts serial data from the BCU to parallel data for control of the paper bank, toner bank unit, and LCT components (motors, solenoids, clutches).
- Supplies the 24V power supply from the PSU to the BCU, LCT, and interlock system for the development motor, drum motor, and paper feed motor.

LCDC (LCD Control): The LCDC controls the operation panel and relays the internal signals of the optical system (SBU, MCU $\leftarrow \rightarrow$ IPU, BCU)

LDB (LD Board): The LDB controls the laser diodes. It also contains the laser diodes.

AC Drive Board: The AC drive board controls AC power for the fusing lamps and the anti-condensation heaters.

MCU (Motor Control Unit): Controls the scanner motor with the commands from the BCU. Also controls Xenon lamp on/off timing, APS detection, the fan motors, generation of gate signals, and transmission of serial data.

Lamp Regulator: Controls the Xenon exposure lamp in the flat bed scanner

Operation Panel: Controls the operation panel and LCD display panel.

Operation Switch Board: Switches main power to the machine on/off.

Polygon Mirror Motor Control Board: Controls the polygon motor.

PSU-C (Power Supply Unit-Controller): Supplies DC power for the controller.

PSU-E (Power Supply Unit-Engine): Supplies DC power for the machine.

HDD (Hard Disk Drive)

The combined capacity of the HDD's is 80 GB (40 GB x2) for image storage. They can store up to approximately 3,000 copy images, based on the ITU-T No. 4 Chart.

The ASIC on the controller handles data by dividing each 32-bit word into 16-bit units and writes the high-end bits to one hard disk and the low-end bits to the other hard disk. This effectively reduces the write speed by 50% because each half of each 32-bit word is saved simultaneously. Because the data is divided between the two hard disks, replacing only one of the hard disks will cause errors. Therefore, both disks must always be replaced together.

Area	Power Off	Capacity	Control		Comment
Local image storage	Store	49325 MB	15,000 Copies		Doc. server storage
		6750 MB	Copies	3000	Electronic sort,
Tomporony		1350 MB	Allocated Copies	100	test printing,
images	Delete	2100 MB	Printer	3000	confidential
inageo		2100 MB	Sample	3000	printing
		3375 MB	Scanner	3000	
FileSystem1	Store	500 MB			Print font download, form registration
FileSystem2	Delete	500 MB	150 jobs		Job spool area, RTIFF spool area (both cannot be used at same time)
FileSystem3	Store	2000 MB			Desk Top Binder thumbnails, work data area
FileSystem4~7	Store	1600 MB			Email address storage area
Debug Log	Store	100 MB			Debug log
Job Log	Store	10 MB			
Debug	Store	256 MB			Object area
Swap	Store	256 MB			Swap area

Note the following important points regarding HDD replacement:

- Both HDD's must always be replaced together as one set.
- Replacing the HDD loses all document server documents, and user stamps.
- When the HDD is replaced, the default user stamps must be re-installed, so use SP5853 to copy these files from the controller firmware onto the hard disk.
- The "Scan to Email" addresses are also lost by HDD replacement. However, addresses can be backed up with Smart Net Monitor.
- Print fonts must also be re-entered after HDD replacement.

6.9 IMAGE PROCESSING

6.9.1 IMAGE PROCESSING STEPS AND RELATED SP MODES

The following tables describe the image processing path and the related SP modes used for each image processing mode.

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The user can adjust many of the image processing parameters with a UP mode (Copy/Document Server Features> General Features> Original Mode Quality Level), using fixed settings such as Sharp, Normal, and Soft. Each of these fixed settings have different parameters, but user changes do not affect the relevant SP mode settings.

If the user is not satisfied with any of the available settings for this UP mode, the technician can adjust the SP modes. However, the SP mode settings are not used unless the user selects 'Service Mode' with the UP Mode.



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6.9.2 IMAGE PROCESSING OVERVIEW



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- **SBU:** Photoelectric conversion, Odd/even allocation, Amplification, A/D Conversion (analog to digital), Light intensity detection (scanning)
- **BCU:** Engine control, Scanner control, SBU settings, IPU settings, LDB settings
- IPU: Shading correction, Image Processing, Main/Sub scan magnification, Video path switching, Image Compression/ Decompression. The GAVD on this board performs density conversion processing, FCI processing, and edge processing, and also generates the test patterns.
- **Controller:** System control, software application control, image storage control, file compression/decompression
- LDB: 8-beam laser exposure, binary-to-grayscale conversion, synchronization detection

6.9.3 IMAGE PROCESSING FLOW

Image processing is done by the IPU (Image Processing Unit), following the steps shown below.

Overall image processing for this machine is designed to:

- Target edges with filters to improve the angles of text characters and reduce the occurrence of moiré filled areas.
- Improve the evenness of granular areas in images



6.9.4 IMAGE PROCESSING MODES

The user can select one of the following five modes with the User Tools screen: Text, Text/Photo, Photo, Pale, Generation.

Each mode has four different settings (described below). Each mode has a Custom Setting that can be customized with SP modes to meet special requirements that cannot be covered by the standard settings.

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NOTE: To see these settings in the User Tools mode, press the User Tools key, press "Copier/Document Server Functions", then press "Copy Quality".

Mode	Setting	Function				
	Soft	Rough texture background drops out.				
	Normal	Used for black-and-white printed material and documents that contain mainly text. Easily reads lines as well as text.				
Text	Sharp	Use for newspapers, time schedules, or any type of printed material with fine print. Emphasizes black over white.				
	Custom Setting	Stores SP command settings.				
	Photo Priority	Used for documents that contain text and color or black-				
	Normal	and-white photos, such as catalogs, magazines, maps,				
Tex/Photo	Text Priority	etc. Provides more faithful reproduction than the Text mode.				
	Custom Setting	Stores SP command settings.				
	Print Photo	Used for magazines, graphics, for smooth reproduction. Employs dithering.				
Photo	Normal	Used for copying photographs, graphics, for sharp reproduction. Employs error diffusion.				
Photo	Glossy Photo	Used for best results in copying glossy photographs for sharp reproduction. Employs error diffusion.				
	Custom Settings	Stores SP command settings. Employs either error diffusion or dithering, depending on an SP setting.				
	Soft	Used for low density documents with text handwritten in				
Palo	Normal	black or color pencil (or carbon copies) such as receipts,				
1 die	Sharp	invoices, etc.				
	Custom Setting	Stores SP command settings.				
	Soft	Used to achieve an image smoother than Normal.				
Generation	Normal	Used to achieved best reproduction of "copies of copies" by smoothing the image.				
Сору	Sharp	Used to emphasize lines and text stronger than Normal for better image quality.				
	Custom Setting	Stores SP command settings.				
	Strong	Drops out the blue background color of tab sheets or other paper.				
Background Dropout	Medium	Drops out the green background color of tab sheets or other paper.				
	Weak	Drops out the orange background color of tab sheets or other paper.				

6.9.5 IMAGE QUALITY SP ADJUSTMENTS

Adjustments are easier with this machine, because the parameters have been grouped and no longer have to be adjusted one by one.

In this section, we will cover the custom settings for each of the 5 original modes: These custom settings are:

- Image Quality
- Line Width Correction

Settings adjustable for each original mode will also be covered (these do not just affect the custom settings; they also affect all sub original modes, such as sharp text).

- Independent Dot Erase
- Background Erase

Custom Settings for Each Mode: Image Quality

Custom Setting: Text Mode Image Quality

ltem		Range	Default	SP No.
	25~55%	0~10		SP4903 001
Text	55.5~75%		5 Normal	SP4903 002
	75.5~160%		5 Normai	SP4903 003
	160.5~400%			SP4903 004

If the value is increased, the outlines of lines become sharper but this could cause moiré to appear in dot patterns. If the value is decreased, image patterns become smoother, the occurrence of moiré decreases, but the corners of characters and intersections of lines at acute angles may not be as sharp.

There are two sets of custom settings for photo mode. One is for dithering, and one is for error diffusion. The set of custom settings that will be used depends on the setting of SP4904 002. The possible settings are:

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0	Dither (106 line)
1	Dither (141 line)
2	Dither (212 line)
3	Error Diffusion

-		•		-
ltem		Range	Default	SP No.
	25~55%		2 Drint Dhoto	SP4903 005
Photo	55.5~75%	0~6		SP4903 006
	75.5~160%			SP4903 007
	160.5~400%			SP4903 008

Custom Setting: Photo Mode (Dithering) Image Quality

Used for coarse, dithered tone photographs such as newsprint.

If the value is increased, the photo becomes sharper, but blurring could occur in the sub scan direction. If the value is decreased, blurring in the sub scan direction is less obvious but outlines become fuzzy.

Custom Setting: Photo Mode (Error Diffusion) Image Quality

Item		Range	Default	SP No.
	25~55%	0~6	1 Normal	SP4903 009
Photo	55.5~75%			SP4903 010
	75.5~160%		TNOITIAI	SP4903 011
	160.5~400%			SP4903 012

Used for printed materials (magazines, etc.) with photographs to sharp patterns in copies.

If the photos have dithered tones, the image becomes sharper if the value is increased, but blurring could occur in the sub scan direction. If the value is decreased, blurring in the sub scan direction is less obvious but outlines become fuzzy.

Custom Setting: Text/Photo Mode Image Quality

Item		Range	Default	SP No.
25~55% Text/Photo 55.5~75% 75.5~160% 160.5~400%			SP4903 013	
	55.5~75%	0~10	5 Normal	SP4903 014
	75.5~160%		JINOITTAI	SP4903 015
	160.5~400%			SP4903 016

See the remarks for 'Custom Setting: Text Mode Image Quality' above.

Custom Setting: Pale Mode Image Quality

Item		Range	Default	SP No.
	25~55%	0~10		SP4903 017
Pale	55.5~75%		5 Normal	SP4903 018
	75.5~160%		0.410	5 Normai
	160.5~400%			SP4903 020

If the value is increased, low density areas become sharper, but the background could become dirtier. If the value is decreased, the background disappears but the density of low density areas becomes low.

Custom Setting: Generation Mode Image Quality

Item		Range	Default	SP No.
	25~55%		E Normal	SP4903 021
Generation	55.5~75%	0~10		SP4903 022
	75.5~160%		5 Normai	SP4903 023
	160.5~400%			SP4903 024

See the remarks for 'Custom Setting: Pale Mode Image Quality' above.



Custom Settings for Each Mode: Line Width Correction

Se	election	Range	Default	Content	SP No.
Itom	Line Width Correction	0~8	2	0 (Thin) - 4 (Off) - 8 (Thick)	SP4903 080
nem	Main Scan	0~1	1	0:OFF 1:ON	SP4903 081
	Sub Scan	0~1	1	0:OFF 1:ON	SP4903 082

Custom Setting: Text Mode Line Width Correction

If the value is made smaller, the line width correction becomes thinner, and if the value is made larger, the line width correction becomes thicker. To switch this feature off, select "4".

If the above settings do not make the lines thin enough, use SP4904 020 (Image Quality Exposure: Thin Line - Text Mode). Normally, SP4904 020 is set to 0 (OFF). As the setting is increased (1~3), the line width correction effect becomes stronger, and lines become thinner. All settings of SP4903 080 will be affected by the same amount.

Custom Setting: Photo Mode Line Width Correction

Se	lection	Range	Default	Content	SP No.
ltom	Line Width Correction	0~8	4	0 (Thin) - 4 (Off) - 8 (Thick)	SP4903 083
nem	Main Scan	0~1	1	0:OFF 1:ON	SP4903 084
	Sub Scan	0~1	1	0:OFF 1:ON	SP4903 085

See the remarks for 'Custom Setting: Text Mode Line Width Correction' above.

If the above settings do not make the lines thin enough, use SP4904 021 (Image Quality Exposure: Thin Line – Photo Mode). Normally, SP4904 021 is set to 0 (OFF). As the setting is increased (1~3) the line width correction effect becomes stronger, and lines become thinner. All settings of SP4903 083 will be affected by the same amount.

Se	election	Range	Default	Content	SP No.
Itom	Line Width Correction	0~8	4	0 (Thin) - 4 (Off) - 8 (Thick)	SP4903 086
item	Main Scan	0~1	1	0:OFF 1:ON	SP4903 087
	Sub Scan	0~1	1	0:OFF 1:ON	SP4903 088

Custom Setting: Text/Photo Mode Line Width Correction

See the remarks for 'Custom Setting: Text Mode Line Width Correction' above.

If the above settings do not make the lines thin enough, use SP4904 022 (Image Quality Exposure: Thin Line – Text/Photo Mode). Normally, SP4904 022 is set to 0 (OFF). As the setting is increased (1~3) the line width correction effect becomes stronger, and lines become thinner. All settings of SP4903 086 will be affected by the same amount.

Se	election	Range	Default	Content	SP No.
Itom	Line Width Correction	0~8	4	0 (Thin) - 4 (Off) - 8 (Thick)	SP4903 089
item	Main Scan	0~1	1	0:OFF 1:ON	SP4903 090
	Sub Scan	0~1	1	0:OFF 1:ON	SP4903 091

Custom Setting: Pale Mode Line Correction

See the remarks for 'Custom Setting: Text Mode Line Width Correction' above.

If the above settings do not make the lines thin enough, use SP4904 023 (Image Quality Exposure: Thin Line – Pale Mode). Normally, SP4904 023 is set to 0 (OFF). As the setting is increased (1~3) the line width correction effect becomes stronger, and lines become thinner. All settings of SP4903 089 will be affected by the same amount.

Custom Setting: Generation Copy Line Width Correction

S	election	Range	Default	Content	SP No.
Itom	Line Width Correction	0~8	1	0 (Thin) - 4 (Off) - 8 (Thick)	SP4903 092
nem	Main Scan	0~1	1	0:OFF 1:ON	SP4903 093
	Sub Scan	0~1	1	0:OFF 1:ON	SP4903 094

See the remarks for 'Custom Setting: Text Mode Line Width Correction' above.

If the above settings do not make the lines thin enough, use SP4904 024 (Image Quality Exposure: Thin Line – Generation Mode). Normally, SP4904 024 is set to 0 (OFF). As the setting is increased (1~3) the line width correction effect becomes stronger, and lines become thinner. All settings of SP4903 092 will be affected by the same amount.



Settings Adjustable for Each Original Mode

Independent Dot Erase

ltem	Range	Default	SP No.
Text		8	SP4903 060
Photo		0	SP4903 061
Text/Photo	0~14	0	SP4903 062
Pale		0	SP4903 063
Generation Copy		8	SP4903 064

Independent dot erase removes isolated black pixels. As this setting is increased, the greater the number of eliminated isolated pixels. Setting to zero switches this function off.

Background Erase

ltem	Range	Default	SP No.
Text			SP4903 070
Photo			SP4903 071
Text/Photo	0~255	0 (Off)	SP4903 072
Pale			SP4903 073
Generation Copy			SP4903 074

Background erase attempts to eliminate the heavy background texture from copies of newspaper print or documents printed on coarse paper. Pixels of density below the selected threshold level are eliminated. Setting this feature to zero switches it off. Increasing this setting increases the effect of background erase.

6.9.6 RELATION BETWEEN THE SP AND UP SETTINGS

The tables below illustrate the relationship between the UP and SP settings for each of the 5 original modes. The scale across the top of the table is the range of settings for the SP modes.

The settings in the gray areas indicate the UP settings overlaid on the SP scale of the table. Words that are not shaded within the tables, such as 'softer', indicate how the image changes if you change the SP setting is a certain direction. The related UP mode is User Tools> Copier Features> General Features> Copy Quality.

Text Mode

Setting	0	1	2	3	4	5	6	7	8	9	10	SP No.
25% ~55%												SP4903 001
55.5 ~ 75%		ft				mal				arp		SP4903 002
75.5 ~ 160%		Sc				Nor				She		SP4903 003
160.5 ~ 400%												SP4903 004

Photo Mode (Dithering)

Setting	0	1	2	3	4	5	6	SP No.
25% ~55%				0				SP4903 005
55.5 ~ 75%	ter			phot			rper	SP4903 006
75.5 ~ 160%	Sof			rint			Sha	SP4903 007
160.5 ~ 400%				₫.				SP4903 008

Photo Mode (Error Diffusion)

Setting	0	1	2	3	4	5	6	SP No.
25% ~55%						to		SP4903 009
55.5 ~ 75%	ter	mal				Pho	rper	SP4903 010
75.5 ~ 160%	Sof	Nor				Sssy	Shai	SP4903 011
160.5 ~ 400%						Ğ		SP4903 012

Text/Photo Mode

Setting	0	1	2	3	4	5	6	7	8	9	10	SP No.
25% ~55%		ity								ţ		SP4903 013
55.5 ~ 75%		rior				mal				riorit		SP4903 014
75.5 ~ 160%		oto F				Nor				ext P		SP4903 015
160.5 ~ 400%		ЧЧ								Τ¢		SP4903 016

Pale Mode

Setting	0	1	2	3	4	5	6	7	8	9	10	SP No.
25% ~55%												SP4903 017
55.5 ~ 75%		ft				mal				arp		SP4903 018
75.5 ~ 160%		So				Nori				She		SP4903 019
160.5 ~ 400%												SP4903 020

Generation Copy

Setting	0	1	2	3	4	5	6	7	8	9	10	SP No.
25% ~55%												SP4903 021
55.5 ~ 75%		ft				mal				arp		SP4903 022
75.5 ~ 160%		So				Nor				Sha		SP4903 023
160.5 ~ 400%												SP4903 024

Background Color Dropout

SP NO.	MODE NAME	TARGETTED COLOR	VALUES
4901 020	Background Dropout – Weak	Orange	165 ~ 255 (Default: 180)
4901 021	Background Dropout – Medium	Green	115 ~164 (Default: 155)
4901 022	Background Dropout - Strong	Blue	15 ~ 144 (Default: 105)

6.10 LASER EXPOSURE

6.10.1 OVERVIEW



- 1. LD Unit
- 2. Polygon Mirror Motor Control Board
- 3. Polygon Mirror Motor
- 4. F-Theta Lens 1
- 5. F-Theta Lens 2
- 6. BTL Lens

- 7. 2nd Mirror
- 8. Drum
- 9. Toner Shield Glass
- 10. 1st Mirror
- 11. Laser Synchronization Detector
- 12. Cylindrical Lens

Detailed Descriptions

6.10.2 LASER EXPOSURE MECHANISM



The LD unit consists of two 4-channel LDA's (Laser Diode Arrays) and two collimating lenses.

Each LDA produces 4 beams [A]. Each collimating lens [B] is a fixed lens, seated in a V-groove and held in place by a spring and a screw.

Four beams from each LDA [C] pass through the collimating lenses, though the apertures [D], then strike the polygonal mirror. Due to this multi-beam writing, the polygonal mirror motor speed can be reduced, thus the noise generated by the polygon mirror motor and the wear on the motor can be reduced.

Auto Power Control (APC)

A built-in photo diode detects the light emitted from the LD unit. When the photo diode detects this light, it generates a signal and the feedback of this signal to the LD control board is used to adjust the strength and amount of light in the laser beams.

NOTE: The laser diode array is assembled and adjusted in the factory, and does not require physical position adjustment in the field.

LD drivers control the power output from the laser diodes.

(Digital Processes > Printing > Laser Printing > Laser Diode Power Control)

NOTE: The reference levels are adjusted on the production line. Never touch the variable resistors on the LD unit.

6.10.3 LD SAFETY SWITCHES



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To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, there are four safety switches inside the front cover (these are the 4th front left and 4th front right door safety switches).

When one of the front covers is open, the 5 V line connecting to the LD drivers (LDD) is disconnected.

6.10.4 MULTI-BEAM LINE EXPOSURE



The LD unit contains two laser diode arrays (LDA) [A], each with one 4-channel array, allowing the LD unit to produce a total of eight beams. This multi-beam exposure mechanism has the following advantages:

- Reduces the number of rotations required of the polygon mirror motor.
- Reduces the amount of noise generated by the polygon mirror motor because it is rotating at lower speed.
- Reduces the need for LD unit replacement.
- Allows production of a more precision beam on a stable platform.

The laser synchronization detector detects only Channel 0 and Channel 1, the uppermost beams of each parallel array.

The main scan pitch of Channels 2 to 7 is determined by setting SP2115 001~006 (Main Scan Beam Pitch Adjustment) at the factory. For this reason, when the LD unit is replaced, these SP codes must be input for the new unit. The correct SP settings are printed on a label attached to the LD unit.

An SC code is issued for a laser synchronization detector error if the LD unit malfunctions and does not emit the laser beams.

6.10.5 POLYGON MIRROR MOTOR

The polygon mirror reflects the laser beam onto the OPC drum to expose the image line by line in the main scan direction. The polygon mirror motor rotates at a constant speed, even while the copier is in standby mode, but shuts off when the copier enters the energy conservation mode.

The polygon mirror motor has no brake mechanism, so it requires about 3 minutes to stop rotating. Before moving the machine or before servicing the motor or the area around the polygon mirror motor, you should switch off the copier main power switch, disconnect the machine, and wait at least three minutes for the motor to stop rotating.

NOTE: The polygon mirror motor requires about 10 seconds to reach full speed after the machine awakes from the energy conservation mode, or after the machine is switched from the normal mode to low speed mode for printing on thick paper. The machine cannot print during this 10 second interval until it reaches full rotation speed.



6.10.6 1200-DPI RESOLUTION



The original is scanned at 600 dpi, then the 600 dpi output is boosted to 1200 dpi 1-bit data during image processing in the IPU.

This machine can produce an image at 1200 dpi by writing each dot twice, possibly with two different values, depending on the results of image processing. This is achieved with the LD unit, which has two laser diode arrays, each with 4 channels which together produce 8 beams. As shown in the illustration above, the beams from each laser diode are emitted in two parallel lines.

For copying, 1200 dpi is used. For printing, the default is 600 dpi, but 1200 dpi can be selected.

The diagram shows how the two sets of four beams are interlaced to produce a sub scan resolution of 1200 dpi.

There are two parallel rows of four beams, separated by 22.3 mm in the main scan direction. In each of these rows, the beams are spaced at 42.3 micrometer intervals (this is the same as 600 dpi).

The rows are also offset in the sub scan direction by 21.2 micrometers.

The net result is that we have dots at 21.2 micrometer intervals, which is the same as 1200 dpi

6.10.7 OPTICAL PATH



The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs eight laser beams to the polygonal mirror [B] (six mirror surfaces) through the cylindrical lens [C] and the 1st mirror [D].

Each surface of the polygon mirror reflects eight full main scan lines. The laser beams go to the F-theta lens 1 [E], F-theta lens 2 [F], BTL (barrel toroidal lens) [G], and mirror [H]. Then these laser beams go to the drum through the toner shield glass [I].

The laser synchronizing detector [J] determines the main scan starting position. This sensor sends a synchronization signal when the laser synchronization detector mirror [K] reflects the laser beam to the detector as the laser beam starts its sweep across the drum.

The laser synchronization detector detects only the beams emitted from Channels 1 and 0, the uppermost beams of each parallel array.

Detailed Descriptions
6.11 DRUM UNIT

6.11.1 OVERVIEW



The drum unit consists of the components shown in the above illustration. An organic photoconductor drum (diameter: 100 mm) is used for this model.

- 1. OPC Drum
- 2. Drum Potential Sensor
- 3. Pick-off Pawl
- 4. Image Density Sensor
- 5. Toner Collection Coil

- 6. Cleaning Brush
- 7. Cleaning Blade
- 8. Quenching Lamp
- 9. Charge Corona Unit

6.11.2 DRUM DRIVE



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The drive from the drum motor [A] is transmitted to the drum and the cleaning unit through timing belts, gears, the drum drive shaft [B], and the cleaning unit coupling [C].

The drum motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range. The drum speed for the B070 (90 cpm) is 450 mm/s and for the B071 (105 cpm) 500 mm/s.

The flywheel [D] on the end of the drum drive shaft stabilizes the rotation speed.

6.11.3 DRUM CHARGE

Overview



B070D203.WMF

This copier uses a double corona wire Scorotron system to charge the drum. Because of the high speed of this copier, two corona wires are needed to give a sufficient, uniform negative charge to the drum surface. The stainless steel grid plate makes the corona charge uniform and controls the amount of negative charge on the drum surface by applying a negative voltage to the grid.

The CBG (Charge, Bias, Grid) power pack [A] supplies a constant corona current to the corona wires, $-1600 \ \mu$ A for Photo mode and $-1400 \ \mu$ A for all other modes (Text, Text/Photo, Pale, Generation Copy).

The voltage to the grid plate is automatically controlled to maintain the correct image density in response to changes in drum potential caused by dirt on the grid plate and charge corona casing. (-6.11.8)

Charge Corona Wire Cleaning



Air flowing around the charge corona wire may deposit toner particles on the corona wires. These particles may interfere with charging and cause low density bands on copies.

The wire cleaner pads [A] automatically clean the wires to prevent such a problem.

The wire cleaner is driven by a dc motor [B]. Normally the wire cleaner [C] is at the front end (the home position). Just after the main switch is turned on, the wire cleaner motor turns on to bring the wire cleaner to the rear and then back to the home position. When the wire cleaner [D] moves from the rear to the home position, the wire cleaner pads swivel, bringing the pads into contact with the wires, and clean the wires as it moves forward.

Cleaning is executed when:

- The machine is switched on and the fusing temperature is less than 100°C while auto process control executes.
- Every 24 hours.
- After every 5,000 copies. This can be adjusted with SP2804 002 (Charge Corona Cleaner Setting Corona Wire Cleaning Interval).

6.11.4 DRUM CLEANING

Overview



This copier uses a counter blade system to clean the drum. In a counter blade system, the drum cleaning blade [A] is angled against drum rotation. The counter blade system has the following advantages:

- Less wearing of the cleaning blade edge
- High cleaning efficiency

Due to the high efficiency of this cleaning system, the pre-cleaning corona and cleaning bias are not used for this copier.

The cleaning brush [B] helps the cleaning blade. The brush removes toner from the drum surface and any remaining toner is scraped off by the cleaning blade. Toner on the cleaning brush is scraped off by the mylar [C] and falls onto the toner collection coil [D]. The coil transports the toner to back to the toner entrance tank in the toner bank unit for recycling.

To remove any accumulated toner at the edge of the cleaning blade, the drum turns in reverse for about 40 ms [E] at the end of every copy job. This is also during long copy jobs every 30 min. For details, refer to SP2506 002 (Cleaning Interval – Multiple Copy - Inteval) in Section "5. Service Tables".

The accumulated toner is deposited on the drum and is removed by the cleaning brush.

Cleaning Unit Drive



Drive from the drum motor is transmitted to the cleaning unit drive gear via the timing belt [A] and the cleaning unit coupling [B]. This coupling drives the cleaning brush [C] directly. The cleaning brush then transmits the drive to the gear at the front, which drives the toner collection coil gear [D].

Detailed Descriptions



Cleaning Blade Pressure and Side-to-Side Movement

The spring [A] always pushes the cleaning blade against the drum. The cleaning blade pressure can be manually released by pushing up the release lever [B]. To prevent cleaning blade deformation during transportation, the release lever must be locked in the pressure release (upper) position.

The guide roller [C] at the rear end of the cleaning blade holder touches the cam gear [D], which moves the blade from side to side. This movement helps to disperse accumulated toner to prevent early blade edge wear.

6.11.5 AIR FLOW AROUND THE DRUM



The drum cooling fan [A] draws cool air through the filter [B] and sends it to the center of the drum [C], then over the charge corona unit [D].

Holes in the flanges on both ends of the drum allow air to pass through the drum to cool it. After the air has passed through the center of the drum, the exhaust fan [E] draws the air out of the interior of the machine, through the toner filter [F] to remove free floating toner, through the ozone filter [G] to remove ozone, then finally out of the machine.

To keep the temperature inside the machine constant, the drum cooling fan turns slowly during standby, but turns faster during copying.

NOTE: This ozone filter does not require replacement.

6.11.6 DRUM PICK-OFF PAWLS



If the paper does not separate from the drum after image transfer, the drum pick-off pawls strip the paper from the drum.

Pressure from small springs [A] press the pick-off pawls [B] against the surface of the drum.

The shaft [C] and the cam [D] move the pick-off pawls from side to side to ensure that they never remain at the same location (this prevents wear on the drum).

6.11.7 DRUM QUENCHING



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In preparation for the next copy cycle, light from the quenching lamp [A] neutralizes any charge remaining on the drum.

The quenching lamp consists of an array of 16 red LEDs extending across the full width of the drum.





6.11.8 PROCESS CONTROL

Drum potential gradually changes for the following reasons:

- Dirty optics, exposure glass
- Dirty charge corona casing, grid plate
- Deterioration of drum sensitivity

What Happens at Power On

Here is a description of what happens while the fusing temperature is below 100°C immediately after the main power switch is switched on (process control must also be enabled with SP3901 001, or this will not happen).

At any time, this process can also be executed manually by using SP2962. However, process control must be enabled with SP3901 001 and the fusing temperature must be below 100°C, or this will not work.

- 1. Drum potential sensor is calibrated.
- 2. Drum starts first rotation after fusing temperature reaches 100°C.
- 3. ID sensor is calibrated (Vsg).
- 4. Readout from the drum potential sensor is used to adjust:
 - Grid voltage (Vg)

Ξ

• Laser diode (LD) power.

NOTE: This step occurs only if process control is enabled with SP3901 001 (Auto Process Control On/Off Setting). If this SP is disabled, then:

- Development bias is set to the value stored in SP2201 1
 - Grid voltage is set to the value stored in SP2001 1
 - Laser power is set to the values stored in SP2103
- 5. TD sensor is calibrated (Vref).

Any SC codes that are generated during auto process control are logged in the memory and do not appear. The machine will continue to operate.

Drum Potential Sensor Calibration

The drum potential sensor output is affected by the distance of the sensor from the OPC, paper dust or other matter on the surface of the sensor, and environmental conditions. For these reasons, the potential sensor is calibrated often, as described below.

1. 100 samples are taken at -200V and at -700V, and the readings are averaged.



2. If the readings are within the normal range, then these readings are used to calibrate the drum potential sensor.

If the variations in the readings exceed the specified range, then an SC is logged (Sensor Calibration Error, SC310 to SC312) and automatic process control halts. The charge grid voltage Vg, development bias, and LD power are set as follows.

- Development bias is set to the value stored in SP2201 1
 - Grid voltage is set to the value stored in SP2001 1
 - Laser power is set to the values stored in SP2103

Detailed Descriptions

Grid Voltage (Vg) Adjustment

Then, the machine determines the corona grid voltage (Vg) that will be used during copying. This is done as follows:

- 1. A Vd pattern is unexposed on the drum and the bias for the unexposed area is adjusted.
- 2. The drum potential sensor reads the Vd potential.
- 3. Vd should be $-800 \pm 20V$. If it is within this range, the current value of Vg will be used for copying. If it is not within this range, (Vd + 800)V is added to Vg, and the process starts again from Step 1.
 - **NOTE:** VD Correction As the development sleeve accumulates toner over time, the gap between VD and VB decreases, which makes it easier for dirty background to occur. To compensate for this, the machine increases the target VD value to -850±20V when the number of copies exceeds the value set with SP3903: VD Correction Counter (default: 200K). As a result, VD increases and the VD-VB gap is maintained.
- 4. If Vd cannot be adjusted to this standard within 5 attempts, Vg is set to the value of SP2001-001 (default: –900V) and SC315 (Potential Sensor Calibration Error 3) is logged.

LD Power Adjustment

Finally, the machine determines the laser diode power that will be used during copying. This is done as follows.

- 1. The laser power is changed to the value needed to write a halftone pattern to the drum.
- 2. The drum potential sensor reads the potential, Vh, from this pattern. Vh: Standard halftone drum potential
- 3. Vh should be $-260 \pm 20V$. If it is within this range, the current value of the laser power will be used for copying.
 - If it is not, the laser power changes by 5 units, and the process starts again from step 1.
 - The laser power cannot be adjusted within the range –70 to +185.
- 4. If Vh cannot be adjusted to this standard within 45 attempts, LD power is set to the most recent value and SC316 (Potential Sensor Error 7) is logged.

ID Sensor Calibration (Vsg)

After power-on, Vsg (the ID sensor output from reading the bare drum) is set to $4.00\pm0.2V$ by changing the intensity of the light from the sensor shining on the drum. This can also be done at any time with SP3001 002 (ID Initial Setting – Vsg).

NOTE: If the ID sensor output cannot be adjusted to the standard, then after 20 seconds SC353 or SC354 is issued. Toner supply during copying will then be controlled using the TD sensor only, until the machine is repaired.

TD Sensor Calibration (Vref)

Next, Vref (TD sensor reference voltage) is updated using the latest calibration values from the ID sensor.

Vref is updated to stabilize the concentration of toner in the development unit. By shifting the value of Vref, the density of the ID sensor pattern image is controlled. Toner supply control is covered in the Development and Toner Supply section.

Vref is determined from a table in the machine software, using the following values:

- Vsp/Vsg
 Vsp: ID sensor output when checking the ID sensor pattern.
 Vsg: ID sensor output when checking the bare drum.
- Vref-Vt: Vref is the TD sensor reference voltage Vt is the current output voltage of the TD sensor.
- **NOTE:** If the ID sensor could not be calibrated during the latest process control (when measuring Vsg), then the previous ID sensor value is used. If the ID sensor output is abnormal when measuring Vsp, SC350, 351, or 352 is issued, and Vref is not updated (the machine uses the previous value).



6.12 DEVELOPMENT

6.12.1 OVERVIEW



- 1. Hopper Filter
- 2. Hopper Center Filter
- 3. Toner Hopper Sensor
- 4. Agitator
- 5. Toner Supply Roller
- 6. Upper Development Roller
- 7. Doctor Blade

- 8. Separator
- 9. Toner Transport Coil
- 10. Development Agitator
- 11. TD Sensor
- 12. Paddle Roller
- 13. Lower Development Roller

This copier uses a double roller development system and a dual component development process with toner particles 6.8 μ m and developer particles 50 μ m. To improve image quality, the width of the magnetic area on the lower development roller has been reduced.

This system differs from single roller development systems in that:

- It develops the image in a narrower area
- It develops the image twice
- The relative speed of each development roller against the drum is reduced.

This machine contains a toner recycling system. Toner recycled from the drum cleaning unit is transferred to the toner hopper with fresh toner, where they are mixed by the toner agitator. (-6.13)

6.12.2 DEVELOPMENT MECHANISM



Toner and developer are mixed in the toner agitator by the cross-mixing roller [A]. The paddle roller [B] picks up the developer and sends it to the upper development roller [C]. Internal permanent magnets in the development rollers attract the developer to the development roller sleeve. Developer from the upper development roller sleeve is also attracted to the lower development roller [D].

The upper development roller carries the developer past the doctor blade [E] which trims the developer to the desired thickness. Backspill (excess toner) spills over the separator [F] to the toner transport coil [G] which sends the developer from back to front to the cross-mixing roller.

In this machine, 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 -800 V).

The development roller is given a negative bias to attract negatively charged toner to the black areas of the latent image on the drum.

The development rollers continue to turn, carrying the developer to the drum [H]. When the developer brush contacts the drum surface, the low-negatively charged areas of the drum surface attract and hold the negatively charged toner. In this way, the latent image is developed.

Detailed Descriptions

6.12.3 DRIVE



The gears in the development unit are driven by the development drive gear [A] when the development motor [B] (a dc servomotor) turns.

The gears in the toner hopper are driven by the toner supply roller drive gear [C] when the toner supply roller clutch [D] activates.

A one-way clutch on the paddle roller knob [F] prevents counter-clockwise rotation of the paddle roller.

6.12.4 CROSSMIXING



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This copier uses a standard cross-mixing mechanism to keep the toner and developer evenly mixed. It also helps agitate the developer to prevent developer clumps from forming and helps create the triboelectric charge.

The developer on the turning development rollers [A] is split into two parts by the doctor blade [B]. The part that stays on the development rollers forms the magnetic brush and develops the latent image on the drum. The part that is trimmed off by the doctor blade goes to the backspill plate [C].

As the developer slides down the backspill plate to the agitator [D], the mixing vanes [E] move it slightly toward the rear of the unit. Part of the developer falls into the auger inlet and is transported to the front of the unit by the auger [F].

Detailed escriptions

6.12.5 DEVELOPMENT BIAS



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The CBG (Charge Bias Grid) power pack [A] applies the negative development bias (-550V) to both the lower sleeve roller and upper sleeve roller through the receptacles [B] and the sleeve roller shafts [C].

The development bias prevents toner from being attracted to the non-image areas on the drum where there is residual voltage. In addition, the development bias changes with the image density setting chosen for the copy job by the user.

The development rollers [D] employ fixed shafts that do not rotate. This eliminates friction on the shafts so they never require lubrication.

6.12.6 DEVELOPMENT UNIT TONER SUCTION



To ensure that the fine-grained toner does not scatter and blacken the interior of the development unit, a toner suction assembly reduces the pressure inside the development unit.

Below the development unit [A] the toner suction pump [B], driven by the toner suction motor [C], draws air out of the development unit along with any airborne toner. The toner is sent to the development unit waste toner bottle [D] on the right side of the machine.

Detailed Descriptions

The toner suction motor switches on and off with the development motor.

The toner suction motor and the waste toner bottle both have near-end and end.

When an end alert is issued for either the development unit waste toner bottle or the toner suction motor, a message is displayed on the copier LCD panel. (See the next page.)

	Near End	End
Toner Waste Collection Bottle ^{*1}	No Alert	Displays message on screen: Used toner bottle is full. Please call service.
Development Unit Toner Waste Collection Bottle	Displays an alert on bottom line of the LCD: Sucked Toner Collection Bottle is almost full. Call service.	Displays message on screen: Sucked Toner Collection Bottle is full. Please call service.
Development Unit Toner Suction Motor	Displays an alert on bottom line of the LCD: Toner suction motor replacement is now necessary. Call service.	SC593

^{*1}: The toner waste collection bottle on the left side of the machine.

6.12.7 TONER HOPPER

Toner Supply



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The toner supply pump motor pumps toner from the toner bottle into the hopper. ((-6.13.3)

When the toner supply roller clutch [A], inside the development motor unit [B], turns on, the agitator [C] mixes the toner transported by the air tube [G] from the toner bank (the toner from the toner bank is new toner mixed with recycled toner). Then it moves the toner from front to rear and sends it to the toner supply roller.

Toner is caught in the grooves in the toner supply roller [F]. Then, as the grooves turn past the opening, the toner falls into the development unit.

The toner supply roller clutch [A] transfers drive from the development motor to the toner supply roller gear [D], which drives the agitator gear [E].

Toner supply is controlled by the ID sensor and the toner density sensor. (€6.12.8)

Toner Hopper Empty Detection



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The toner hopper sensor [A] detects whether there is enough toner in the toner hopper.

The toner hopper sensor checks for toner once when the toner supply roller clutch turns on. When there is only a small amount of toner inside the toner hopper and pressure on the toner hopper sensor becomes low, the toner hopper sensor outputs a pulse signal for each copy. Then the toner bank mechanism supplies more toner to the toner hopper, as explained in previous sections.

6.12.8 TONER DENSITY CONTROL

Overview

There are two modes for controlling toner supply: sensor control mode and image pixel count control mode. The mode can be selected with SP2208. The factory setting is sensor control mode. Image pixel count mode should only be used if the TD or ID sensor is defective and cannot be replaced immediately.



Toner Supply Timing

After the trailing edge of the image leaves the development area, the machine calculates how long the toner supply clutch should be switched on (based on the TD sensor reading). Then, the toner supply clutch switches on for the time prescribed by the calculation. Until the toner supply clutch switches off, the development motor, main motor, charge, and development bias all remain on.

Regardless of whether the machine is in the sensor control or pixel count toner supply mode, toner is supplied based on the setting for the toner supply interval entered with SP2974 (Toner Supply Interval); the default is every print.

- If the TD sensor malfunctions, then toner is supplied for each copy and the setting for SP2974 is ignored.
- The SP2974 setting has no effect on the ID sensor pattern interval; the ID sensor pattern interval is set with SP2210 (ID Sensor Pattern Interval)

Sensor Control Mode

In sensor control mode, the machine varies toner supply for each copy to maintain the correct proportion of toner in the developer and to account for changes in drum reflectivity over time. The adjustment depends on two factors.

- Amount of toner needed to print the page (based on the black pixel amount for the page).
- Readings from the TD sensor and ID sensor.

Sensor control mode has two phases, called 'ID sensor control' and 'TD sensor control'. In ID sensor control, VSP/VSG from the most recent ID sensor pattern check determines the GAIN factor in the toner supply calculation (see later in this section). In TD sensor control mode, GAIN depends on the current TD sensor output also (VT – VREF is used).

The phase that is used depends on the number of copies since the start of the job. See the table below for details.

Number of copies in the job	Copy no.	Control method
10 or fewer	1 to 10	ID Sensor Control
More than 10	From 11	TD Sensor Control

Vref Decision

When new developer is installed, TD sensor initial setting must be done using SP2801. This sets the sensor output to $2.5 \pm 0.1V$. This value is used as the TD sensor reference voltage (VREF). Thereafter, a new reference value for the TD sensor is calculated from the ID sensor output (every time the ID sensor pattern is read) and the current TD sensor reading (Vt).

If the sensor output cannot be adjusted to within the standard, SC341 or SC342 is logged and the toner density control is set to the pixel count control.

VSP and VSG Detection

The ID sensor detects the following voltages.

- VSG: The ID sensor output when checking the drum surface
- VSP: The ID sensor output when checking the ID sensor pattern

In this way, the reflectivity of both the drum and the pattern on the drum are checked.

The ID sensor pattern is made on the drum with the charge corona and laser diode.

VREF Update

To update VREF (the TD sensor reference voltage), VSP/VSG is detected at the end of the copy job, if 10 or more copies have been made since the last VREF update. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface. The 10-copy interval can be changed using SP2210.

VREF is also updated during process control initial setting.

If the reading of the ID sensor becomes abnormal while checking the ID sensor pattern, SC350, SC351, or SC352 is logged and the toner density control is done using TD sensor only.

VT Detection

The toner density in the developer is detected once every copy cycle, after the trailing edge of the image passes the development roller.

If the reading from the TD sensor, done for every page in the copy job, becomes abnormal (Vt ≤ 0.5 V or Vt ≥ 4.0 V), then the machine holds the GAIN factor constant to allow toner supply to vary with only the pixel count for the rest of the copy job. Then at the end of the job, SC340 is generated and the machine must be repaired.

If the TD sensor needs to be replaced and none is available, the toner supply mode can be set to image pixel count mode using SP2208.

Image Pixel Count

For each copy, the CPU adds up the value of each pixel and converts the sum to a value between 0 and 255. (The value would be 255 if the page was all black.)

Detailed Descriptions

Gain Determination

GAIN is another factor in the toner supply roller clutch on time calculation. Its value can be 0, 1, 1.5, 2, 3, or 4. It is calculated either using VSP/VSG if ID sensor control is being used, or every copy using "VT – VREF" if TD sensor control is being used (see Sensor Control Mode – Overview for more on TD and ID sensor control).

ID Sensor Control		
VSP/VSG	GAIN	
≤ 3/40	0	
≤ 9/100	0	
≤ 21/200	1	
≤ 1/8	1	
≤ 4/25	2	
≤ 41/200	3	
≤ 1/2	4	
> 1/2	1	

TD Sensor Control		
a = VT – VREF	GAIN	
a < 0.00	0	
$0.00 \le a < 0.06$	1	
0.06 ≤ a < 0.10	2	
$0.10 \le a < 0.20$	3	
0.20 ≤ a	4	

Toner Supply Roller Clutch On Time Calculation

The toner supply roller clutch on time for each copy is decided using the following formula: (GAIN x Image pixel count x 0.7mg/cm²/Toner Supply Rate) + 50 ms

When GAIN is "0", the above 50 ms is set to "0".

The toner supply rate can be changed using SP2209.

Image Pixel Count Control

This mode should only be use as a temporary countermeasure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply using the same formula for the toner supply roller clutch on time. However, the GAIN value is fixed at 0.7.

6.13 TONER SUPPLY AND RECYCLING

6.13.1 OVERVIEW



Toner is supplied from a toner bank [A] on the left side of the machine and separated from the development unit. The toner bank holds two bottles, but only one bottle operates at a time.

A toner bottle motor turns the bottle [B], causing toner to leave the bottle and drop into the toner entrance tank [C].

The toner transport coil in the toner transport tube [D] transports toner to the toner supply cylinder [E]. Due to the length of the toner supply path, a toner supply pump [F] is needed to draw the toner into the toner hopper [G].

Here are some important points to remember about the toner bank:

- The toner bank holds two toner bottles. This doubles the toner supply capacity for the machine and allows replacement of an empty toner bottle while the machine is operating.
- The machine works even if there is only one bottle installed.
- Toner can be supplied from either the upper or lower toner bottle, but not from both at the same time. When toner runs out in one bottle, toner supply from the other bottle starts automatically.
- After the toner near-end message is displayed for both toner bottles, the toner bottle still has enough toner for about 200 copies.
- Load the lower toner bottle first, then the upper toner bottle. If the upper toner bottle is loaded first, a message will be displayed on the operation panel to request loading the lower toner bottle.
- Handle the toner bottles carefully to avoid shaking them.

Detailed Description

6.13.2 TONER BANK

Toner Bottle Switching Mechanism



When the upper toner bottle [A] is supplying toner, the upper bottle cap motor [B] pulls out the toner bottle cap. The upper bottle cap sensor [C] detects the actuator [D] of the toner bottle opening rod, then the motor shuts off to close the cap again.

Toner is supplied from the toner bottle to the toner entrance tank where a toner near end sensor (see the next page) checks for the presence of toner in the toner entrance tank.

When the toner near-end sensor (not shown) can no longer detect any toner, it signals the machine that it is time to switch bottles. The upper bottle cap motor switches on and closes the cap of the top bottle, while the lower bottle cap motor [E] switches on and opens the cap of the lower bottle so it can start supplying toner.



Toner Near-end, Toner End, Bottle Replacement

Each toner bottle [A] has an independent toner bottle motor [B]. An empty toner bottle can be replaced during printing.

The toner near-end sensor detects toner as it falls from the toner bottle into the toner entrance tank [C]. If the toner near end sensor [D] detects that no toner has come out of the toner bottle, the toner bottle enters the toner near-end condition.

The toner bottle motor then rotates the toner bottle up to 20 times to try to supply toner to the toner entrance tank. If the sensor detects toner more than 5 times, the near-end condition is cleared. However, if the toner near end sensor fails to detect toner 5 consecutive times, 200 more copies can be made from that bottle, then the machine declares it to be empty.

When the bottle is empty, the machine switches to the second toner bottle. The first toner bottle cap motor closes the bottle cap and the second toner bottle cap motor pulls out the second bottle cap. The motors operate until the first bottle inner cap sensor does not detect the actuator and the second bottle inner cap sensor does detect the actuator.

The second toner bottle is then rotated up to 15 times. If the near-end sensor detects toner after 5 times, the machine can print from that bottle.

TONER SUPPLY AND RECYCLING

Meanwhile, the machine indicates that the first bottle is empty. When the user takes out the old bottle, and puts in a new one, this is detected by the toner bottle sensor. (
Toner Bottle Sensors", 6-87) However, this bottle is not tested until the second bottle is empty.

NOTE: If an empty bottle is not replaced, and the other bottle becomes empty (no toner detected 10 consecutive times, as described above), 200 more copies can be made. Then the machine enters the system toner end condition (both bottles are empty), and this is indicated in the operation panel display.

When the second bottle is empty, the machine switches back to the first bottle.

The first bottle is tested now, by rotating it 15 times as usual. If this bottle is also found to be empty, the machine enters the system toner end condition. This time, the machine cannot print until one of the toner bottle sensors detects that a new toner bottle has been inserted (the machine does not allow the 200 extra copies).

When both bottles are empty and a new toner bottle is placed in the toner bank, the new toner bottle is rotated 15 times to supply toner to the toner entrance tank. If the toner near end sensor then detects toner in the toner entrance tank, the system toner end condition is cleared. If the toner near end sensor detects there is still no toner in the toner entrance tank, the bottle cap motor closes the toner bottle cap. The system toner end condition continues and printing is not possible.

Toner Bottle Sensors



When placing a toner bottle in the toner bank, the toner bottle pushes the lock arm [A] downwards. Then the lock arm catches the toner bottle and also pushes down lever [B]. This causes toner bottle sensor [C] to detect that a bottle has been installed (the actuator leaves the toner bottle sensor while the bottle is being inserted in the holder).

When replacing a toner bottle, push the toner bottle release lever [D] to release the lock mechanism. While a toner bottle is supplying toner, the toner bottle opening rod is pulled to the rear and the lock plate [E] is lowered by the link [F] so that the toner bottle release lever cannot be pushed. Therefore, the toner bottle that is supplying toner is always locked in place, and the user cannot pull out the bottle until it is empty.

6.13.3 SUPPLYING TONER TO THE DEVELOPMENT UNIT



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The toner bottle motor turns the toner bottle [A], causing toner to leave the bottle and drop into the toner entrance tank [B].

NOTE: Recycled toner in the tube from the drum cleaning unit also enters the toner entrance tank, and is mixed with fresh toner from the toner bottle.

The toner transport coil [C] in the toner transport tube transports toner to the toner supply cylinder [D]. The toner bank motor [E] drives the toner transport coil via the toner supply coil clutch [F].

The toner supply pump motor [G] creates the suction needed to draw the toner from the toner supply and send it to the toner hopper [H].

The toner hopper has two air pressure release filters and an air return tube [I] connected to the toner supply cylinder. Air returns to the toner supply cylinder from the toner hopper through the air return tube.

If the toner hopper sensor (-6.12.7) detects an insufficient amount of toner in the hopper, the toner bank mechanism is started up.

If there is sufficient toner in the toner entrance tank (detected by the toner near end sensor in the toner bank), the toner supply coil clutch turns on for 2 seconds. The toner supply pump motor turns on for 7 seconds at the same time as the toner supply coil clutch.

Next, if the toner hopper sensor still does not detect toner, the toner supply coil clutch turns on for 2 seconds again until the toner hopper sensor detects toner (this is done a maximum of 10 times). When the toner hopper sensor detects toner, the toner supply pump motor turns off 1 second after the toner supply coil clutch turns off.

If the toner hopper sensor does not detect toner in the toner hopper after the toner supply coil clutch has turned on 10 times, the operation panel returns SC495 (Toner Bank Error).

The toner supply pump motor sensor (mounted on the toner supply pump motor) monitors the operation of the pump motor. If the sensor detects that the motor does not rotate during the toner supply process, the operation panel returns SC591 (Toner Supply Motor Lock) and the job halts.



6.13.4 TONER RECYCLING AND WASTE TONER COLLECTION

Overview



To recycle used toner for re-use, the toner recycling coil in the tube [A] transports the toner collected by the drum cleaning to the toner entrance tank for recycling.

To collect waste toner that will no longer be used, the toner collection coil in the tube [B] transports the toner collected by the transfer belt unit to the waste toner collection bottle.

The drum motor [C] drives the toner recycling coil [A] via timing belts and gears, whose rotation in return drives the toner collection coil [B] via gears.

Toner Recycling



The toner recycling coil in the tube [A] transports the toner collected by the drum cleaning unit to the toner entrance tank [B] for recycling. This toner is dropped into the toner entrance tank and mixed with fresh toner from the toner bottle. The toner bank motor [C] drives the toner transport coil via the toner supply coil clutch [D].

The new toner separation shutter mechanism (toner recycling shutter solenoid [E] and shutter [F]) reduces the amount of paper dust in the toner. During recycling, paper dust gradually collects in the toner, which can cause black dots to appear on copies. At the prescribed interval, the toner separation mechanism purges all toner from the toner supply system and replaces it with new toner, as described below.

Normally during toner recycling, the toner recycling shutter solenoid remains on and the shutter remains open, but when the number of copies exceeds 200K, the toner recycling shutter solenoid switches off and the shutter closes.

After the solenoid switches off, no toner recycling is done for the next 25K copies, and all used toner is sent to the waste toner collection bottle without recycling. Toner from the toner hopper takes about 20K copies to pass through the recycling path cleaning and collection tubes, so during the 25K copies after the solenoid switches off, all the toner in the toner supply path is purged from the system and replaced with fresh toner.

NOTE: The timing of this operation can be adjusted with SP2975 001, 002 (Toner Recycle Cut Counter – ON Counter/OFF Counter). SP2975 001 determines how often the toner is purged (default: 200k), and SP2975 002 determines how long the purge is done for (default: 25k copies)

Detailed Descriptior
Waste Toner Collection



B070D908.WMF

The toner collection coil in the tube [A] transports the toner collected by the transfer belt unit to the waste toner collection bottle. This toner contains paper dust and cannot be recycled.

The waste toner coil [B] transports the waste toner dropped from the toner collection coil tube to the waste toner collection bottle [C]. The waste toner coil tube has five holes [D] and the end [E] of the tube is open. The waste toner drops from these holes.



B070D910.WMF

When the waste toner collection bottle fills up, the pressure in the bottle increases and the waste toner coil becomes harder to turn. When this occurs, the actuator plate [A] does not rotate because the waste toner coil drive gear [B] has a torque limiter, and the output of the toner overflow sensor [C] becomes constant. In this condition, the operation panel LCD indicates "Waste Toner Full" and printing is stops.

The bottle contains 1,300 g to 1,500 g of waste toner. About 2,400K copies can be made before the waste toner bottle becomes full.

If the waste toner bottle is not properly installed inside the toner bank, the toner collection bottle sensor [D] detects this condition and the operation panel LCD displays SC496 (Toner Collection Bottle Error).

Detailed Descriptions

6.14 PAPER FEED

6.14.1 OVERVIEW



- 1. Duplex Tray 2. Relay Roller
- 3. Upper Registration Roller 8. 3rd Tray (Universal)
- 4. Grip Roller
- 5. Pick-up Roller

- 6. Feed Roller
- 7. Separation Roller
- 9. 2nd Tray (Universal)
- 10. 1st Tray (Tandem)

This model has three paper tray feed stations. The 1st tray (10), the tandem feed tray, holds 2,000 sheets of paper (1,000 sheets x 2 stacks). The tandem tray also be can be converted to a 1,000-sheet tray for larger paper sizes with the optional A3/DLT Feed Kit B331.

The 2nd tray (9) and 3rd trays (8) are universal trays and each can hold 500 sheets of paper. To allow easy removal, the paper cassettes are not fastened to the trays with screws.

All feed stations use an FRR feed system. Rotation of the pick-up roller (5) drives the top sheet of paper to the feed (6) and separation (7) rollers. These rollers then take over the paper drive. If the pick-up roller feeds more than one sheet, the separation rollers rotate in the opposite direction and prevent all but the top sheet from passing through to the registration rollers. The large grip rollers (4) feed paper from the trays in the vertical paper path.

6.14.2 DRIVE



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1. Paper Feed Motor	6. U
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- 2. Paper Feed Clutches 1 to 3
- 3. Vertical Transport Clutches 1 to 3
- 4. Lower Relay Clutch
- 5. Relay Motor

- 6. Upper Relay Clutch
- 7. LCT Relay Clutch
- 8. One-way Gear
- 9. Knob

Descriptio

The paper feed motor (1) drives feed, pick-up, and separation rollers in trays 1, 2, and 3 via timing belts, clutches (2), and gears. The paper feed motor also drives the vertical transport rollers and the lower relay roller. Drive is transferred to each of the three vertical transport rollers by a vertical transport clutch (3), and to the lower relay roller by the lower relay clutch (4).

The relay motor (5) drives the upper relay roller and LCT relay roller via gears and clutches (6) and (7).

The 2nd vertical transport clutch has a one-way-gear (8). This prevents the clutch from slipping when the knob (9) is turned to remove jammed paper in the paper feed tray and vertical transport area.

6.14.3 PAPER LIFT – TRAYS 2 & 3



The machine detects when a tray has been placed in the machine by a signal from the paper size switch. When this is detected, the tray lift motor [A] turns on. The coupling gear [B] on the tray lift motor engages the pin [C] on the lift arm shaft [D], then it turns the tray lift arm [E] to lift the tray bottom plate [F].

For tray 1, an electrical signal from the tray connector automatically informs the cpu when the tray has been placed in the machine.



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When a stack of paper is loaded in the tray, the paper end sensor below the stack (not shown) activates and switches on the pick-up solenoid [A] to lower the pick-up roller [B]. At the same time, the tray lift motor [C] switches on and lifts the bottom plate [D]. This plate pushes the top of the stack up against the pick-up roller until the actuator [E] descends and leaves the tray lift sensor [F] slot. This de-activates the tray lift sensor; the tray is now at the correct feed position so the machine switches off the tray lift motor.

The pick-up roller descends gradually with each sheet fed, so the tray lift sensor actuator ascends until it activates the tray lift sensor. This signals the machine to switch on the tray lift motor to raise the stack to the correct feed height. The tray lift sensor again deactivates to switch off the tray lift motor. This process is repeated to position the top of the stack at the correct feed height.

When the tray is drawn out of the feed unit, the lift motor coupling gear [G] disengages the pin [H] of the lift arm shaft, then the tray bottom plate drops under its own weight.

6.14.4 PICK-UP AND FEED – TRAYS 1, 2, 3

Overview



B070D598.WMF

Drive from the paper feed motor is transmitted to the gear [A] in the paper feed unit via the timing belt [B].

Then the gear [A] transmits this drive to the pick-up [C], paper feed [D] and separation [E] rollers via gears and the paper feed clutch [F].

The gear [A] also transmits this drive to the vertical transport roller [G] via gears and the vertical transport clutch [H].

Pick-up and Feed



If a paper feed station is not selected, its separation roller solenoid [A] de-activates and the separation roller [B] can turn freely in the opposite direction to paper feed.

When the paper feed station is selected and the start key is pressed, the feed clutch [C], separation roller solenoid [A], and the pick-up solenoid [D] all turn on.

When the feed clutch [C] activates to transfer drive to the feed roller [E], the pick-up roller [F] also turns because it is linked to the feed roller by an idle gear [G].

When the separation roller solenoid [A] turns on, the separation roller [B] contacts the paper feed roller [E] and turns with the feed roller in spite of the torque limiter in the separation roller, which forces it in the opposite direction.

When the pick-up solenoid [D] activates, the pick-up roller [F] lowers to contact the top sheet of the paper stack and send it to the paper feed and separation rollers.

When the paper feed sensor [H] detects the leading edge of the paper, the pick-up solenoid de-energizes to lift the pick-up roller [F], and the vertical transport clutch [I] energizes to feed the paper to the vertical paper feed section.

Detailed Descriptions

Separation Roller Release



B070D602.WMF

The separation roller [A] is normally away from the feed roller [B]. When the paper feed station is selected, the separation roller solenoid [C] contacts the separation roller with the feed roller as explained on the previous two pages.

This contact/release mechanism has the following three advantages:

- 1. When the paper feed motor turns on, all the separation rollers in the three feed stations rotate. If the separation roller is away from the feed roller, it reduces the load on the paper feed motor and drive mechanism, and it also reduces wear to the rubber surface of the separation roller caused by friction between the separation roller and the feed roller.
- 2. After paper feed is completed, paper sometimes remains between the feed and separation rollers. If the feed tray is pulled out in this condition, this paper might be torn. When the separation roller is away from the feed roller, the remaining paper can be removed from between the rollers.
- 3. When paper misfeeds occur around this area, the user can easily pull out the jammed paper between the feed and the separation rollers if the separation roller is away from the feed roller.

After paper feed and the paper feed clutch turns off, the paper feed motor still turns the separation roller [A] in reverse. The separation roller, still contacting the feed roller, turns the feed roller in reverse for 100 ms. Then, the separation solenoid turns off.

6.14.5 REMAINING PAPER/PAPER END DETECTION (TRAY 2, 3)



B070D608.WMF

Remaining Paper Detection

The tray lift motor [A] rotates when the tray is pushed in. The CPU detects the remaining paper by monitoring the lift motor rotation angle (4 levels).

End Detection

The paper end sensor [B] is a photo-reflective sensor. While there is paper in the tray, light is reflected back to the sensor, but after the last sheet feeds, the sensor deactivates and signals paper out.

6.14.6 PAPER SIZE DETECTION – TRAY 2, 3



B070D712.WMF

North America

Paper Size	Paper Size Switch
11" x 17" SEF	01111
81⁄2"x14" SEF	00111
81⁄2"x11" SEF	10011
11" x81⁄2" LEF	01001
51/2"x81/2" SEF	00100
81⁄2" x51⁄2" LEF	00010
8"x101/2" SEF	00001
7¼"x10½" SEF	10000
8"x13" SEF	11000
*	11110

1: HIGH 0: LOW

Europe/Asia

Paper Size	Paper Size Switch
A3 SEF	01111
8¼"x 13" SEF	00111
A4 SEF	10011
A4 LEF	01001
8 ½"x13" SEF	00100
A5 SEF	00010
A5 LEF	00001
7¼"x10½" SEF	10000
*	11110

1: HIGH 0: LOW

For the 1st feed tray, the paper size has to be stored with SP5019 002.

For the 2nd and 3rd feed tray (universal trays), the paper size switch [A] detects the paper size. The paper size switch contains five microswitches. The paper size switch is actuated by an actuator plate [B] at the rear of the tray. Each paper size has its own unique combination as shown in the table and the CPU determines the paper size by the combination.

Using the asterisk setting (*), a wider range of sizes can be used for custom paper sizes entered by the user (press the Tray Paper Settings key on the operation panel). SP5112 must be set to 1 (Yes).

	Metric version	Inch version
Main Scan Direction	139.7 mm ~ 305 mm	5.5" ~ 12"
Sub Scan Direction	139.7 mm ~ 458 mm	5.5" ~ 18.0"

6.14.7 TRAY LOCK - TRAY 2, 3



B070D618.WMF

When the tray is placed in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the support bracket to lock the tray in the proper position.

6.14.8 TANDEM FEED - TRAY 1

Overview



1,000 sheets of paper can be set in the left tray [A] and right tray [B] of tray 1, the tandem paper tray. Paper is fed from the right tray. When the paper in the right tray runs out, the paper stack in the left tray automatically is pushed to the right tray. After the stack is moved from the left tray to the right tray, paper feeding resumes.

Normally both the right and the left trays are joined. However, during copying, if there is no paper in the left tray, the left tray can be pulled out to load paper while the right tray stays in the machine so paper feed can continue.

NOTE: After moving the adjustable side fences for a different paper size, be sure to execute SP5019 002 (Tray Paper Size Selection – 1st Tray) to select the correct setting for the paper size loaded in the tandem tray. (The tandem tray cannot detect the paper size automatically.)

Connecting the Left and Right Sides of the Tray



B070D703.WMF

B070D704.WMF



B070D654.WMF

Normally the left tray lock lever [A] catches the pin [B] in the right tandem tray. During copying, if there is no paper in the left tray, the tandem tray connect solenoid [C] turns on to release the tray lock lever so the left tray separates from the right tray. Therefore, the left tray can be pulled out to load paper while paper is still being fed into the machine from the right tray.

When the tandem tray is drawn out fully, the projection [D] pushes up the left tray lock lever [A] so that both trays separate for easier paper loading.

Paper Lift/Remaining Paper Detection: Tray 1

The machine detects when the 1st tray has been placed in the machine by monitoring the tray set signal through the connector.



When the machine detects the 1st paper tray, the right 1st tray paper sensor [N] (under the tray) checks whether there is paper in the right tandem tray. When paper is detected, the tray lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] of the lift shaft [D].

The tray wires [E] are fixed in the slots [F] at the ends of the tray support rods [G, H]. When the tray lift motor rotates clockwise, the tray support rods and the tray bottom plate [I] rise. The tray rises until stack pushes up the pick-up roller until the tray lift sensor de-activates and switches off the tray lift motor.

As the actuator [K] on the right support rod [G] rises, it de-activates each of the 4 paper height sensors [J] to trigger 5 levels of paper remaining alerts on the operation panel.

Paper Height Sensor	Remaining Paper	Comment
None	100%	Bottom position, no sensors de-activated.
1	75%	
2	50%	Fach consor do activatos as the actuator risos
3	25%	
4	Near End	
	Paper Out	Detected by the paper sensor [N] below the stack when the last sheet feeds.

When the tray is removed, the coupling gear [B] separates from pin [C], so the tray bottom plate descends. The tray descends until the actuator activates the lower limit sensor [L]. The damper [M] provides resistance so the tray bottom plate descends slowly.

Feed and Lift: Tray 1



B070D098.WMF

When the tray lift motor turns on, the pick-up solenoid [A] actuates and lowers the pick-up roller [B]. When the top of the stack reaches the correct height for paper feed, it pushes up the pick-up roller and lowers the actuator [C]. This actuator deactivates the tray lift sensor [D] when it leaves the sensor slot, and this stops the tray lift motor.

After several paper feeds, the pick-up roller descends and the actuator rises and enters the tray lift sensor and activates it. This switches on the tray lift motor again, which raises the stack once again to the correct paper height.

When the tray is pulled out of the feed unit, the lift motor coupling gear [E] disengages the pin [F] on the lift shaft [G], then the tray bottom plate [H] drops. The damper provides resistance so the tray descends slowly.

There is also a paper end sensor for the 1st tray, which works in the same way as the sensor in the 2nd and 3rd trays.

Side Fence Drive: Tray 1



The side fences [A] of the right tray are normally closed. They open only when paper in the left tray is moving to the right tray.

The side fence solenoids [B] drive the side fences. When the paper loaded in the left tray transfers to the right tray, the side fence solenoids turn on to open the side fences until the side fence open sensors [C] activate.

When the rear fence in the left tray has pushed the stack of paper into the right tray, the side fence solenoids turn off to close the side fences. Then, when the side fence closed sensors [D] activate, the LCD displays a message advising the user to load some paper into the left side of the tandem tray.

Rear Fence Drive



B070D705.WMF

When the left 1st tray paper sensor [A] detects paper but the right 1st tray paper sensor does not, the rear fence drive motor [B] (a DC motor) in the left tray turns counter-clockwise causing the rear fence [C] to push the paper stack into the right tray.

When the actuator on the rear fence activates the rear fence return sensor [D], the rear fence drive motor turns clockwise until the actuator activates the rear fence HP sensor [E].

While the rear fence is moving, the left 1st tray lock solenoid [F] turns on and the lock lever [G] locks the left tray.

Tray Positioning



B070D612.WMF

Tray Lock

When the feed tray is set in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the Accuride support bracket to lock the tray in the proper position.

Side-to-side Positioning

When the feed tray is set in the paper feed unit, the side-to-side positioning plate [C] presses the feed tray against the stopper [D]. By moving the positioning plate, the tray position can be changed to adjust the side-to-side registration.

6.14.9 VERTICAL TRANSPORT



B070D617.WMFF

The vertical transport rollers [A] in each feed unit are all driven by the paper feed motor. The vertical transport rollers and the vertical transport idle rollers [B], on the inner and outer vertical guide plates, transport the paper up from each feed unit towards the relay and registration rollers.

The vertical transport guides [C] can be opened to remove jammed paper in the vertical transport area.

Detailed Descriptions

6.14.10 LCT GUIDE PLATE



When the machine detects a jam at the LCT exit, paper feed stops, and the LCT guide plate solenoid [A] releases the guide plate (labeled 'B5') [B] so that the user can easily remove the jammed paper. After removing the jam, the user must return the B5 lever to its normal position.

Overview



B070D702.WMF

The registration sensor [A] is positioned just before the registration rollers [B].

When the paper leading edge activates the registration sensor, the registration motor is off and the registration rollers are not turning. However, the upper relay roller (or LCT relay roller for feed from the LCT) [C] stays on for a bit longer.

This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Next, the registration motor energizes and the upper relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection, and the LCT relay sensor [E] detects jams at the LCT roller.

Detailed)escriptions

Registration Drive



The registration motor [A] drives the lower registration roller [B] through a timing belt [C] and some gears. Drive is transmitted to the upper registration roller [D] via two gears [E] at the front.

The paper dust remover [F] extends across the length of the paper registration roller [D], where most paper dust is generated.

NOTE: Clean the dust remover every PM visit.

Jam Removal at Paper Registration



If a sheet misfeeds between the vertical transport rollers and the registration rollers, the next sheet is already on its way up from the paper tray, and must be stopped, or there will be a pile-up of jammed paper.

To prevent this, when the registration sensor is not activated at a certain jam check timing, the lower paper guide plate [A] automatically opens.

Guide plate solenoid [B] turns on \rightarrow Lever [C] raises \rightarrow Lock lever [D] (on the guide plate) releases from pin [E] (on the rear side frame) \rightarrow Guide plate [A] falls open \rightarrow Paper coming along the feed path is diverted to the duplex tray.

Actuator [F] on the guide plate activates the guide plate position sensor [G] when the guide plate opens.

The user must remove jammed paper in the feed path, the sheet in the duplex tray, and manually close the guide plate.

To prevent the guide plate from being left open, if the guide plate position sensor is activated, copying is disabled and a caution is displayed on the LCD panel.

6.14.12 JAM DETECTION



When a jam occurs, a graphic illustration of the main machine, finisher, LCT, and bypass tray appears on the operation panel screen.

The location where the jammed paper remains lights (does not flash) in the graphic illustration.

A jam code is displayed on the operation panel to indicate the cause and location of the jam. For more details, please refer to the tables on the following pages.

Jam Location Display Tables

A Trays 1 ~ 3

Related Sensors	Knob/Lever
Between paper feed sensor and relay sensor (Tray 1, 2, 3), excluding relay sensor A1 A2	A1
	A2

B Before Registration Roller/Sensor

Related Sensors	Knob/Lever
 Between duplex transport sensor 3 and relay sensor (excluding duplex transport sensor). B1, B2 Between relays sensor and registration sensor. B1, B2 Between LCT relay sensor and registration sensor (excluding registration sensor). B3, B4 	B1
	B2
	B3
	B4
	B5

C Transfer Unit

Related Sensors	Knob/Lever
Between registration sensor and fusing exit sensor (excluding fusing exit sensor) C1, C2	C1
	C2

D Fusing Exit/Paper Output

	Related Sensors	Knob/Lever
•	Between fusing exit sensor and duplex entrance sensor (excluding duplex entrance senor) D1 D2	D1
•	Between fusing exit sensor and exit sensor (excluding exit sensor). D1 , D2	D2
•	 Between inverter sensor and exit sensor (excluding inverter sensor) D1, D2 Between registration sensor and fusing exit sensor (excluding fusing exit sensors) D1, D2 	D3
•		D4
		D5
		D6

Detailed

Z Duplex Unit

Related Sensors	Knob/Lever
Between duplex entrance sensor and inverter sensor. Z1 , Z2	Z1
sensor) Z1 , Z5	Z2
	Z3
	Z4
	Z5

U LCT (B511)

Related Sensors	Knob/Lever
Between LCT feed sensor 1 and LCT exit sensor. U1, U2 Between LCT feed sensor 2 and LCT exit sensor. U2, U2	U1
 Between LCT feed sensor 2 and LCT exit sensor. U3, U4 Between LCT feed sensor 3 and LCT exit sensor. U3, U5 	U2
Between LCT exit sensor and LCT relay sensor (excluding LCT relay sensor.	U3
	U4
	U5
	U6
	U7

V Bypass Tray (B512)

	Related Sensors	Knob/Lever
•	Between bypass tray feed sensor and LCT exit sensor (excluding LCT exit sensor)	V

Ξ.

Jam Error Code Table

C	ode	
	3	1st Tray Feed (Tandem Tray – Main Machine) – no feed
	53	1st paper tray feed sensor check-out error.
	4	2nd Tray Feed (Universal Cassette – Main Machine) – no feed
	54	2nd tray paper feed sensor check-out error.
	5	3rd Tray Feed (Universal Cassette – Main machine) – no feed
	55	3rd tray paper feed sensor check-out error
	6	4th Tray (LCT – Top Tray) no feed
	56	4th tray paper feed sensor check-out error
	7	5th Tray (LCT – Middle Tray) no feed
	57	5th Tray paper feed sensor check-out error
	8	6th Tray (LCT – Bottom Tray) no feed
	58	6th Tray paper feed sensor check-out error
	9	Bypass no feed
	59	Bypass feed paper feed sensor check-out error
	10	LCT relay sensor check-in error
	60	LCT relay sensor check-out error
	11	LCT exit sensor check-in error
	61	LCT exit sensor check-out error
	12	Relay sensor check-in error
	62	Relay sensor check-out error
	13	Registration sensor check-in error
	63	Registration sensor check-out error
	15	Fusing exit sensor check-in error
	65	Fusing exit sensor check-out error
	16	Exit sensor check-in error
	66	Exit sensor check-out error
	19	Duplex entrance sensor check-in error
	69	Duplex entrance sensor check-out error
	20	Duplex transport sensor 1 check-in error
	70	Duplex transport sensor 1 check-out error
	21	Duplex transport sensor 2 check-in error
	71	Duplex transport sensor 2 check-out error
	22	Duplex transport sensor 3 check-in error
	72	Duplex transport sensor 3 check-out error
	23	Duplex inverter sensor check-in error
	73	Duplex inverter sensor check-out error

Detailed Descriptions

Check-out error: Paper fails to leave after prescribed time has elapsed. Check-in error: Paper fails to arrive after prescribed time has elapsed.

6.14.13 ANTI-CONDENSATION HEATERS (OPTIONS)



Two optional anti-condensation heaters can be installed below the 1st tray [A] and below the 3rd tray [B].

The anti-condensation heaters switch on when the main switch or operation switch are switched off. The anti-condensation trays prevent moisture from collecting in and around the paper trays when the machine is not in use.

NOTE: The anti-condensation heater connectors are not pre-set at the factory and must be connected correctly before use. For details, see "1. Installation" in the main service manual.

6.15 IMAGE TRANSFER AND PAPER SEPARATION

6.15.1 OVERVIEW



The transfer belt unit consists of the following parts:

[A]: Transfer belt

A belt (length: 321 mm) with high electrical resistance which holds a high positive electrical potential to attract toner from the drum to the paper. Also, the electrical potential attracts the paper itself and helps the paper to separate from the drum.

- [B]: Transfer bias roller and transfer belt bias brush Applies transfer voltage to the transfer belt.
- [C]: Transfer belt lift lever (driven by a solenoid) Lifts the transfer belt into contact with the drum.
- [D]: Transfer power pack Generates a constant transfer current.
- [E]: Cleaning roller and cleaning roller cleaning blade Removes toner remaining on the transfer belt to prevent the rear side of the paper from getting dirty.
- [F]: Transfer belt cleaning blade Removes toner from the transfer belt. Any toner that is not removed by this blade is removed by the cleaning roller [E].

6.15.2 IMAGE TRANSFER AND PAPER SEPARATION

The registration rollers [A] feed the paper [B] to the gap between the drum [C] and the transfer belt [D].



B070D507.WMF

As soon as the leading edge of the first sheet reaches the gap between the transfer belt and the drum, the transfer belt lift lever [E] raises the transfer belt into contact with the drum. The lift lever is driven by a solenoid.



B070D508.WMF

Then a positive charge is applied to the transfer bias roller [F] and transfer belt bias brush to attract the negatively charged toner [G] from the drum. It also attracts the paper and separates it from the drum.



B070D648 WMF

After the image transfer is completed, the charge on the transfer belt holds the paper to the transfer belt. After separating the paper from the transfer belt, the transfer belt is discharged by the transfer belt drive roller [A].

The transfer power pack [B] inside the transfer belt unit monitors the current (I_1 and I_2) fed back from the drive rollers at each end of the transfer belt to adjust the transfer current.

The power pack then adjusts "It" to keep the current through the drum (I3) constant, even if the paper, environmental conditions, or transfer belt surface resistance change.

The varistor [C] keeps the voltage at the cleaning bias roller [D] constant.

To apply a higher current to the transfer belt without a higher voltage, the bias brush [E] has been incorporated near the nip between drum and belt. This ensures that enough transfer current is applied for this machine, which has a higher copy volume.





B070D503.WMF

Detailed Descriptions

6.15.3 TRANSFER BELT UNIT LIFT



The transfer belt lift solenoid [A] inside the transfer belt unit turns on to raise the transfer belt into contact with the drum. The front lever [B] and the rear lever [C] are connected to the solenoid by links [D], and they push up the stays [E] when the solenoid turns on.

The support spring [F] helps the solenoid to raise the transfer belt.

The solenoid turns off after the copy job is finished.

The transfer belt must be released from the drum for the following reasons:

- 1. To prevent the ID sensor pattern on the drum from being rubbed off by the transfer belt, because the transfer belt is located between the development unit and the ID sensor.
- 2. To decrease the load on the bias roller cleaning blade, it is better to prevent toner on non-image areas (for example VD, VH, ID sensor patterns developed during process control data initial setting) from being transferred onto the transfer belt.
- 3. To prevent drum characteristics from being changed by remaining in contact with the rubber belt.

6.15.4 PAPER TRANSPORTATION AND BELT DRIVE



The drum motor [A] drives the transfer belt through belts and gears. Since the transfer belt electrically attracts the paper [B], a transport fan is not required.

At the turn in the transfer belt, the transfer belt drive roller [C] discharges the belt to reduce paper attraction, and the paper separates from the belt as a result of its own stiffness.

The tapered parts [D] at both ends of the roller [E] help keep the transfer belt [F] in the center, so that it does not run off the rollers.



6.15.5 TRANSFER BELT CLEANING



Some toner may adhere to the transfer belt when paper jams occur. The adhered toner must be removed to prevent the rear side of the copy paper from getting dirty.

The cleaning blade [A] scrapes off any toner remaining on the transfer belt. This is a counter blade system.

Even if the toner is not completely removed due to paper dust stuck on the transfer belt cleaning blade [A], the positively charged cleaning bias roller [B] attracts the remaining toner. The bias roller cleaning blade [C] scrapes toner off the cleaning bias roller.

The surface of the transfer belt is coated to make it smooth and prevent the transfer belt from flipping the cleaning blade.

The toner collection coil [D] transports toner cleaned off the transfer belt to the waste toner collection bottle (see Toner Supply and Recycling for more on this).

6.15.6 TONER COLLECTION



B070D505.WMF

Transfer belt drive is transmitted to the toner collection coil [A] through idle gears [B]. The toner collection coil [C] transports the collected toner to the toner recycling unit [D] and from there it goes to the waste toner collection bottle.

See Toner Supply and Recycling for details.

6.15.7 DRUM ANTI-CONDENSATION HEATER



Detailed Descriptions

B070D048.WMF

The drum anti-condensation heater [A] is located under the transfer belt unit. It turns on when the main switch is off to prevent moisture from forming on the transfer belt.

The heater is included in the machine at the factory, but the connector is not connected.
6.16 FUSING

6.16.1 OVERVIEW



After transferring the image, the copy paper enters the fusing unit. A heat and pressure process using a hot roller [A] and a pressure roller [B] fuses the image to the copy paper. There are three fusing lamps of different wattage [C] inside the hot roller. They are turned on and off to maintain the target fusing temperature. (re 6.16.4)

The CPU monitors the hot roller surface temperature through a thermistor [D], which is in contact with the hot roller's surface. A thermostat [E] protects the fusing unit from overheating.

The fusing exit sensor [F] monitors the progress of the copy paper through the fusing unit and acts as a mis-feed detector while the exit rollers drive the copy paper to the inverter section.

The oil supply roller and cleaning web [G] applies a light coat of silicone oil to the hot roller. It also removes the paper dust on the hot roller.

The hot roller and pressure roller have stripper pawls [H] to prevent wrap-around jams.

The pressure roller is cleaned by a steel cleaning roller [I]. Toner adheres to steel more readily than to silicone rubber.

6.16.2 FUSING ENTRANCE GUIDE



B070D009.WMF

The entrance guide [A] for this machine is adjustable for thick or thin paper by changing the screw position from the upper to the lower.

With thin paper, set the entrance guide in the upper position. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit.

With thick paper, set the entrance guide in the lower position. This is because thick paper does not bend as easily, and is therefore less prone to creasing. In addition, the lower setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy.

In this model, the transfer belt improves paper transport and stabilizes the paper path to the fusing entrance. This reduces the chance of paper creasing due to paper skews in the fusing unit.

Use the screws to adjust the guide plate position. Since there are very few reasons to change the guide plate position, there is no guide plate position adjustment lever for customer use.

Detailed Descriptions

6.16.3 FUSING UNIT DRIVE



The fusing drive gear [A] transmits drive from the fusing/exit motor [B] to the gear [C], which drives the hot roller gear [D]. Rotation passes from the gear [C] through an idle gear to the exit roller drive section. The pressure roller is driven by the friction between the hot and pressure rollers.

6.16.4 FUSING LAMP AND FUSING TEMPERATURE CONTROL

Overview

This machine controls the fusing temperature of the hot roller by switching the fusing lamps on and off. Three fusing lamps (each of different Wattage) are mounted inside the hot roller.

NAME	WAT	ΓAGE	FUNCTION
	NA	EUR/A	I GNOTION
Fusing Lamp A	800 W	730 W	Heats center of the hot roller.
Fusing Lamp B	530 W	530 W	Heats length of the hot roller.
Fusing Lamp C	560 W	540 W	Heats ends of the hot roller.

The table below shows how the fusing temperature control method depends on the mode.

DEFAULT VALUES	B070	B071	SP	No.
Standby Temp.	168°C	173°C	SP1105 001	168 ~ 178°C
Fusing Lower Limit	148°C	153°C	SP1105 002	148 ~ 158°C
Correction for Small Paper Size	7°C	10°C	SP1105 003	0 to 10°C
Correction for Normal Paper Size	2°C	5°C	SP1105 004	0 to 10°C
Correction for OHP	2°C	5°C	SP1105 005	-10 to +5°C
Correction for Tracing Paper	2°C	5°C	SP1105 006	-10 to +5°C

During long jobs some images may not fuse correctly, depending on variables such as paper and image type, and room temperature. In such circumstances, a lower limit is set to prevent paper feed and copying while a "Please Wait" message is displayed to allow time for fusing temperature control to achieve the correct temperature, then the job is re-started.

In most cases, the three fusing lamps never switch on together or in pairs. Usually, the lamps are switched on and off one-by-one at 1 sec. intervals. When a small paper size (smaller than A4/LT) is selected for a job, two lamps are switched on and off at 4 sec. intervals during the job.

Warm-up

Here is a summary of how the machine operates differently during warmup, depending on the temperature of the hot roller.

- **Power On at Less Than 100°C**. If the fusing unit is less than 100°C when the machine is switched on, and auto process control executes.
- **Power On at 100°C or Higher.** If the fusing unit is 100°C or higher when the machine is switched on, and auto process control does not execute.
- Door Opened Then Closed at Less Than 100°C. If one of the front doors is opened to remove a jam or perform another procedure, if the fusing unit is less than 100°C when the door is closed, and auto process control does not execute.

• Door Opened Then Closed at Less Than 140°C. If the fusing unit is lower than 140°C when the machine is switched on, or when the front doors are closed, the machine enters the fusing idle warm-up mode. The 3 fusing lamps light until the fusing temperature reaches 40°C, then the center fusing lamp switches off, leaving two fusing lamps on (the 40°C target temperature can be adjusted with

__ SP1107 007).

After the fusing unit reaches 150°C (adjustable with SP1105 009), the hot roller rotates for 10 sec. (adjustable with SP1107).

 Door Opened and Closed at Higher Than 140°C. If the fusing unit is higher than 140°C when the machine is switched on, or after the front doors are closed, the machine does not enter the fusing idle mode. It warms up in the same way as returning to normal operation from the low power mode (the machine switches off the center lamp when the fusing unit reaches the temperature set with SP1105 001 [168C°/173°C for the B070/B071] minus 10°C set with SP1105 011).

Start of Copying

When the fusing unit warms up without idling (higher than 140°C), the machine can start copying once it reaches a temperature 5 degrees lower than the pre-target stand-by temperature.

When the fusing unit warms up in the idling mode (less than 140°C), the machine can start copying 80 sec. after it reaches the temperature 8 degrees lower than the target stand-by temperature.

- The pre-stand-by temperature is 168°C/173°C for the B070/B071 (adjustable with SP1105 001) plus the value with SP2208 002 (Default: 160°C, for the B070 and 165°C for the B071)
- The 80 sec. default wait time can be adjusted with SP1108 001.

Temperature Control for Different Paper

The machine automatically adjusts fusing temperature control for the size and type of paper or other print media. This is not done to maintain the target fusing temperature, but to account for differences in the type of paper and power supply fluctuation.

- Temperature Control for A4/LT sideways or wider: Three lamps are switched on when copying with A4/LT size paper. In this case, the target fusing temperature, 168°C for the B070 or 173°C for the B071, is raised by adding the setting of SP1105 004 (2°C [B070] or 5°C [B071]).
- Temperature Control for paper less wide than A4/LT sideways: Immediately after a copy job starts with small size paper, three fusing lamps are used, then lamp C is switched off. In this case, the target fusing temperature, 168°C for the B070 (90 cpm) or 173°C for the B071 (105 cpm), is raised by adding the setting of SP1105 003 (7C [B070] or 10°C [B071]).
- **Temperature Control for OHP:** When copying with OHP transparencies or tracing paper, three lamps are used and no lamp is switched off.

Temperature Control: General Comments

The fusing lamps switch on to raise the temperature of the hot roller to the target fusing temperature and switch off when the hot roller is 2°C higher than the target temperature.

If more than one fusing lamp ceases to function during a copy job, the fusing temperature drops, the machine enters the stand-by mode and issues SC542 (Fusing Temperature Warm-up Error).

Fusing temperature control is not affected when:

- The machine operates in the low speed mode.
- When thick paper is selected for copying.
- When thick paper is selected for copying in the low speed mode.

The table below describes the sequence for switching the lamps on and off to control the fusing temperature.

Fusing Lamp A (Center)

-WWWWWWWWWW-Fusing Lamp B (Length)

-www--

Fusing Lamp C (Ends)

NAME	WATTAGE		EUNCTION
	NA	EUR/A	I ONOTION
Fusing Lamp A	800 W	730 W	Heats center of the hot roller.
Fusing Lamp B	530 W	530 W	Heats length of the hot roller.
Fusing Lamp C	560 W	540 W	Heats ends of the hot roller.

CONDITION	LAMPS USED	CON	TROL SEQUENCE
Warm up, Re-load (See Note 1) (before the hot roller temperature reaches the hot roller idle rotation start temperature of 140°C)	3	ON:	$A \rightarrow B \rightarrow C$ (See Note 2)
Warm up, Re-load (after the hot holler reaches temperature higher than the hot roller idle rotation start temperature of 140°C)	2	ON:	B→C
Standby	1	ON	B, C Alternates
Normal Size Paper Copying	3	ON	$A \rightarrow B \rightarrow C$
(ON/OFF timing fixed at 1 sec. intervals)	5	OFF	$C \rightarrow B \rightarrow A$
Small Size Paper	2	ON	$A \rightarrow B$
(ON/OFF timing fixed at 4 sec. intervals)	2	OFF	$B \rightarrow A$

Note 1 Re-load temperature is the temperature while the machine is idling.

Note 2 When a small paper size (smaller than A4/LTR) is selected for the job, all three lamps remain on until the fusing unit reaches the target temperature, then Lamp C switches off to prevent the ends of the hot roller from over heating.

6.16.5 LOW SPEED MODE (CPM DOWN TO 70 PPM)

The User Tools has a selection that allows the customer to improve the fusing of images and text to thick paper and tracing paper by slowing down the machine (System Settings> General Features> Optimum for Thick Paper: Set to 'On'). For example, the speed is reduced to 70 cpm (350 mm/s) using A4 LEF. With this setting switched on, the machine speed is not only lowered but this setting affects process control as well.

In the low speed mode, the speed of the polygon mirror motor is reduced to about 20,000 rpm, and the initial setting for the speed of the web motor on interval is reduced to 25.3 second (NA) or 15.4 sec. (Europe/Asia).

Speed Reduction

	•
Size	Speed
A3	30 cpm
B4	40 cpm
A4 SEF	40 cpm
A4 LEF	70 cpm
B5 SEF	50 cpm
B5 LEF	70 cpm
A5 SEF	70 cpm
A5 LEF	70 cpm

Paper Size and Variable Speeds

Process Control

In low speed mode, the following items are adjusted as described below.

1. Development Line Speed. Does not change.

2. Toner Supply Rate. Uses the settings of SP2209 002 (Toner Supply Rate – Low Speed).

3. Transfer Conditions. Uses the settings of SP2301 007~012 (Transfer Current Adjustment) and SP2940 009~016 (Leading Edge Transfer Current)

4. LD Intensity

With process control ON, the amount of light emitted by the laser is reduced by:

LD Adjustment by Process Control x Line Speed Rate

With process control OFF, the amount of LD adjustment is set to "0" and the line speed rate/s and quantity of light are reduced.

5 Charge Conditions

These depend on whether auto process control is switched off or on.

Process Control Off

Depends on the settings of the following SP codes:

SP2001 008	Adjusts the voltage applied to the grid plate during copying.
SP2001 009	Adjusts the voltage applied to the grid plate for making the ID sensor pattern.

Process Control On

Depends on the voltage setting of SP2001 010.

The current grid voltage as a result of process control can be checked SP3902 004 (Process Control Display - VG). From this value for VG (SP3902 004 – SP2001 010), the value of the minus VL correction (SP3902 013) and the value of SP2001 010 (the value for the bias grid is determined for line speed of 350 mm/s) and VL is adjusted for 350 mm/s (low speed mode).

6 Development Bias Conditions

The development potential for low speed mode is determined by subtracting the value of SP2201 008 from the value for SP2201 004.

8 ID Pattern Interval and LD Exposure Level

Uses the settings of SP2104 002 (LD Power Adjustment for ID Sensor Pattern – Low Speed).

Others

- Leading edge registration: SP1001 003 and 004
- Fusing unit web motor (how often it turns on): SP1902 005

6.16.6 OIL SUPPLY AND CLEANING



The oil supply and cleaning web [A] feeds the web felt soaked with silicone oil. Springs [B] hold a roller under the web [C] against the hot roller [D].

This intermediate roller applies a light coat of silicone oil to the hot roller and removes paper dust and toner from the hot roller.

A spring clutch inside the mechanism pulls the web to take up the slack, to prevent it getting pulled in between the fusing rollers.

At prescribed intervals (see below), the web motor [E] switches on for 2.8 sec. to move the oil supply and cleaning web felt.

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Web Motor Run Time Intervals

	B070 (90 cpm)	B071 (105 cpm)
NA	20.7 s	17.0 s
EUR/A	12.6 s	10.4 s

The interval starts when the first copy reaches the fusing exit sensor, and ends 2 sec. after the last copy has passed this sensor. SP1902 002, 003 (Web Motor Control – Web Motor Drive Interval, Web Motor Drive Time) can be used to adjust the motor rotation time and rotation interval. SP1902 004 (Web Motor Control - Web Near End Setting) is used to adjust the near end timing for the web (Default: 90% for NA, 86% for EUR/A).

The web is 20 m long and lasts for about 600K copies for NA, or 350K copies for EUR/A.



SP1902 001 displays the web consumption. When the web consumption exceeds the value set with SP1-902-4 (Web Near End), the machine indicates web nearend on the operation display.

The machine still operates while the actuator [A] remains above the web end sensor [B] undetected. The actuator arm of the actuator remains in contact with the supply roller [C] and gradually lowers as the amount of web on the supply roller grows smaller as it is fed to the take-up roller [D] above.

When the web runs out, the actuator drops into the web end sensor at [E] and the sensor signal to the CPU displays SC550 on the operation panel display. In this condition, a technician must install a new oil supply and cleaning web, and then reset SP1902 001 to 0 to clear SC550.

SP1902 004 (Web Near End) can be adjusted to change the near-end period. The defaults for and amount of web that remains for copying are different for NA and EUR/A.

Near-End

Area	Near-End	Web Remaining
NA	90%	600K
EUR/A	86%	350K

The table below, provided for your reference, shows approximately how adjustment of SP1902 002 affects the near-end and end displays on the B070 (90 cpm) or B071 (105 cpm).

Note that adjustment of SP1902 002 also affects SP1902 005 (Web Motor Control – Web Motor Drive Interval (Low Speed)).

	SP1902 002	*1		Near-End		
B070	B071	Low Speed Mode ^{*2}	SP1902 004 ^{*3}	Display (Sheets) *4	End Display (Sheets)	Comments
20.7 s	17.0 s	25.3 s	90%	600K	670K	NA Default
15.6 s	12.8 s	19.0 s	90%	450K	500K	
12.1 s	10.0 s	14.8 s	90%	350K	385K	
10.4 s	8.5 s	12.7 s	90%	300K	330K	
6.9 s	5.7 s	8.5 s	90%	200K	220K	
12.6 s	10.4 s	15.4 s	86%	350K	410K	EUR/A Default
10.8 s	9.0 s	13.2 s	86%	300K	350K	
7.2 s	6.0 s	8.8 s	86%	200K	230K	

^{*1}: SP1902 002 (Web Motor Control – Web Motor Drive Interval)

*2: SP1902 005 (Web Motor Control – Web Motor Drive Interval (Low Speed))

*³: SP1902 004 (Web Motor Control – Web Near End Setting)

^{*4}: Calculated based on A4 LEF at 100% magnification.

NOTE: SP1902 003 (Web Motor Control – Web Near End Setting) not adjusted.

Detailed Descriptions

6.16.7 PAPER COOLING



The paper cooling pipe [A] cools the copy paper [B] after it has gone through the fusing unit. This prevents the temperature around the drum from increasing in duplex mode.

The paper cooling pipe has a hollow metal tube inside. Water capillary tubes run along the inside of the paper cooling pipe, and these transfer heat within the pipe.

The hot paper leaving the fusing unit heats the parts of the cooling pipe that it touches at [C] (black arrows), causing the water in the pipe to vaporize. This creates a high-speed flow of steam to the ends of the pipe, which are cooler, especially to the rear, which is well away from the paper feed path, and has the cooling fins [D] attached to it. When the steam reaches this area, it cools and condenses. Capillary action returns the condensation to the heated part of the pipe.

This heat transfer cycle (vaporization \rightarrow steam transfer \rightarrow condensation) repeats continuously. Paper cooling pipe fan 1 [E] in the duct at the machine rear side cools the fins and paper cooling fan 2 [F] pulls the air around the fins out of the fusing unit.

6.16.8 FUSING PRESSURE



Fusing pressure is constantly applied between the hot roller [A] and pressure roller [B] by the upper pressure lever [C] and lower pressure lever [D], which are lifted by the fusing unit release lever [E] via the pressure cam [F]. The pressure can be adjusted by using the pressure adjustment screw [G].

Detailed)escriptions

The fusing pressure is released by turning the fusing unit release lever counterclockwise.

6.16.9 HOT ROLLER STRIPPER RELEASE



For easier jam removal, when the hot roller stripper unit [A] is opened, the stripper pawls [B] turn clockwise to expand the jam removal area.

6.17 PAPER EXIT/DUPLEX

6.17.1 OVERVIEW



The printed page from the fusing unit goes either straight through to the output tray or finisher, or downward through to the inverter or duplex unit, depending on the position of the junction gate [A].

If the page is fed out directly, it arrives on the tray face-up. If the user selected face-down output, the page goes to the inverter [B] before being fed out.

If the user selects duplex mode, the page is directed to the duplex tray [C] after inverting, and back to the machine for printing the second side.

Detailed Descriptions

6.17.2 PAPER EXIT MECHANISM



Drive from the fusing/exit motor is transmitted to the paper exit roller [A] and transport rollers [B].

To feed the printed page from the fusing unit straight through to the output tray or finisher, the inverter gate solenoid [C] energizes to open the junction gate [D]. To feed the page to the inverter and duplex unit, the solenoid stays off.

6.17.3 DUPLEX DRIVE MECHANISM



The duplex drive coupling gear [A] transmits drive from the fusing/exit motor [B] to the duplex unit. This motor drives the inverter and the reverse roller.

The inverter exit roller clutch [C] transmits drive from this motor to the duplex inverter exit section. The inverter exit roller clutch engages the drive (i.e., the roller turns) while the clutch is not energized. This clutch disengages the drive when the clutch is turned on. This prevents the clutch from being energized for a long time.

Duplex transport motors 1 [D] and 2 [E] drive the paper feed rollers in the horizontal paper path of the duplex unit and feed out the paper from the duplex unit.

Detailed Descriptions

6.17.4 INVERTER

Feed-in and Jogging



B070D803.WMF

The inverter feed roller [A] feeds paper to the jogger section. After the trailing edge of the paper passes through the inverter feed roller, the jogger fences [B] move to square the paper. This happens every page.

The jogger motor (a stepper motor) [C] moves the jogger fences [B] inward or outward.

When the main switch is turned on, the jogger motor places the jogger fences at the home position, which is determined by monitoring the signal from the jogger home position sensor [D].

When the start key is pressed, the jogger motor positions the jogger fences 15 mm away from the selected paper size to wait for the paper.

When the paper is delivered to the jogger fences, the jogger fences move inward to square the paper. After this, the jogger fences move back to the previous position (15 mm away from the paper).

Feed-out



B070D805.WMF

After jogging, the reverse roller solenoid [A] energizes to push down the reverse trigger roller [B]. The reverse roller [C] turns counterclockwise continuously, so the paper starts to reverse when the reverse trigger roller is down and catches the paper between the rollers. The inverter guide plate solenoid [D] energizes to lower the inverter guide plate [E], so that the paper is guided by the inverter guide plate. The next sheet waits at the inverter guide plate.

The paper is fed from the reverse roller to the inverter exit roller [F]. After the paper starts to be fed by the inverter exit roller, the reverse trigger roller and inverter guide plate move back up.

Detailed Description

6.17.5 DUPLEX TRAY FEED MECHANISM



In duplex mode, after the paper leaves the inverter, the duplex inverter gate solenoid [A] switches the junction gate [B] to direct the paper to the duplex tray. The paper is fed through the duplex tray by duplex transport rollers 1 [C], 2 [D], 3 [E], and the duplex feed roller [F].

If duplex mode is not selected, the solenoid does not switch the junction gate, and the paper goes to the output tray or finisher face down.

6.17.6 BASIC DUPLEX FEED OPERATION

To improve the productivity of duplex copying, a non-stacking style duplex mechanism is adopted. This type of mechanism allows more than one page to be processed at once, in a process called 'interleaving'. Examples of this are given below.

For paper lengths up to A4/Letter LEF, the top duplex speed is possible, with the duplex unit processing four sheets of copy paper at the same time.

For paper longer than this, the duplex tray can process two sheets of copy paper at once.

For a single-set duplex copy job, the duplex unit stores only one sheet of copy paper. For a multi-set duplex job, the job is stored first, then the first set is made using interleaving.

Length up to A4/Letter LEF

The duplex unit can process four sheets of copy paper

Example: A 14-page copy. The large numbers in the illustration show the order of pages. The small numbers in circles show the order of sheets of copy paper (if shaded, this indicates the second side).



B070D550.WMF

- 1. The first 4 sheets are fed and printed.
 - 1) 1st sheet printed (1st page)
 - 2) 2nd sheet printed (3rd page)
 - 3) 3rd sheet printed (5th page)
 - 4) 4th sheet printed (7th page)



PAPER EXIT/DUPLEX

- 2. The back of the 1st sheet is printed (2nd page).
- 3. The 2nd, 3rd, 4th sheets (3rd, 5th, and 7th pages) go into the duplex unit.
- 4. The 5th sheet (9th page) is fed in.

- 5. The 5th sheet is printed (9th page).
- 6. The 1st sheet is fed out (1st and 2nd pages printed).

- 7. The 5th sheet (9th page) is directed to the duplex unit.
- 8. The 6th sheet (11th page) is fed.
- 9. The back of the 2nd sheet is printed (4th page).





B070D809.WMF



B070D810.WMF

- 10. The 2nd sheet is fed out (3rd and 4th pages printed).
- 11. The 6th sheet is printed (11th page) and directed to the duplex unit.
- 12. The back of the 3rd sheet (6th page) is printed.
- 13. The 7th sheet is fed and printed (13th page).
- 14. The back of the 4th sheet is printed (8th page) and fed out (7th and 8th page).
- 15. The back of the 5th sheet is printed (10th page) and fed out (9th and 10th pages).
- 16. The back of the 6th sheet is printed (12th page) and fed out (11th and 12th pages).
- 17. The back of the 7th sheet is printed and fed out (13th and 14th pages).

Longer than A4/Letter LEF

The duplex unit can process two sheets of copy paper

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



The first 2 sheets are fed and printed.
 1) 1st sheet printed (1st page)
 2) 2nd sheet printed (3rd page)





PAPER EXIT/DUPLEX

printed.

2. The first 2 sheets go into the duplex unit.



B070D858.WMF

The back of the 1st sheet (2nd page) is printed.
 The 3rd sheet (5th page) is fed and

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- 5. The 1st sheet (1st and 2nd pages) is fed out.
- 6. The back of the 2nd sheet (4th page) is printed.
- 7. The 4th sheet (7th page) is fed and printed.
- 8. The 2nd sheet (3rd and 4th pages) is fed out.
- 9. The back of the 3rd sheet (6th page) is printed.



B070D861.WMF

- 10. The 3rd sheet (5th and 6th pages printed) is fed out.
- 11. The back of the 4th sheet (8th page) is printed.
- 12. The 4th sheet (7th and 8th pages) is fed out.

6.18 ENERGY CONSERVATION MODES

6.18.1 OVERVIEW



When the machine is not used, the energy saver function reduces power consumption by lowering the fusing temperature.

This machine has four types of energy saver mode as follows.

- 1) Energy saver mode (called 'panel off mode' in the operation manual)
- 2) Low power mode (called 'energy saver mode' in the operation manual)
- 3) Auto off mode (copier configuration only)
- 4) Night mode (copier/printer/scanner configuration only)

These modes are controlled by the following User Tools:

- Panel off timer
- Energy saver timer
- Auto off timer
- Auto off disabling

The way that the machine operates depends on the combination of installed equipment (copier only, or whether a printer/scanner is installed).

6.18.2 ENERGY SAVER MODE

Entering the energy saver mode

The machine enters energy saver mode when one of the following is done.

- The Energy Saver Key is held down for a second.
- The panel off timer runs out after the last job (User Tools System Settings Timer Setting Panel Off Timer: default setting is 60 s).

What happens in energy saver mode

When the machine enters energy saver mode, the fusing lamp drops to a certain temperature and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the CPU receives the image print out command from an application (e. g. to print data from a PC), the fusing temperature rises to print the data. However, the operation indicators stay off.

Return to stand-by mode

If one of the following is done, the machine returns to stand-by mode:

- The Energy Saver Mode key is pressed
- An original is placed in the ADF
- The ADF is lifted
- A sheet of paper is placed in the by-pass feed table

Operation Switch	Energy Saver LED	Fusing Temp.	Approx. Recovery Time	System +5V
On	On	168°C (B070/90 cpm) 173°C (B071/105 cpm)	3 s	On

6.18.3 LOW POWER MODE

Entering the low power mode

The machine enters low power mode when:

The energy saver timer runs out after the last job.

(User Tools - System Settings - Timer Setting - Energy Saver Timer: default setting is 15 min)

What happens in low power mode

The fusing lamp drops to the prescribed temperature, as shown in the table below (the temperature drops more than that in energy saver mode). The other conditions are the same as for the energy saver mode.

Return to stand-by mode

The machine returns to standby mode in the same way as from the energy saver mode.

Operation Switch	Energy Saver LED	Fusing Temp.	Approx. Recovery Time	System +5V
On	On	143 °C (B070/90 cpm) 150°C (B071/105 cpm)	40 s	On

6.18.4 AUTO OFF MODE

Auto off mode is used only if no optional printer/scanner unit is installed.

Entering auto off mode

The machine enters auto off mode when one of the following is done.

- The auto off timer runs out after the last job (User Tools System Settings Timer Setting Auto Off Timer: default setting is 90 min)
- The operation switch is pressed to turn the power off

What happens in auto off mode

When the machine enters auto off mode, the fusing lamps and all dc supplies except +5VE/12VE (+5V/12V for energy saver mode) turn off.

Returning to stand-by mode

The machine returns to stand-by mode when the main operation switch is pressed.

Operation Switch	Energy Saver LED	Fusing Temp.	Approx. Recovery Time	System +5V	Note
Off	Off	Room Temp. (Fusing lamp off)	360 s	Off	Only +5VE/+12VE is supplied to the Controller, MB, HDD.

Disabling auto off mode

If the user wishes to disable auto off mode, use the following user tool: User Tools – System Settings – AOF (change the setting to 'OFF').

6.18.5 NIGHT MODE

This is used instead of auto off mode when an optional scanner/printer unit is installed.

There are two types of night mode: Night Stand-by Mode and Night Mode. The difference between night stand-by mode and night mode is the machine's condition when the machine enters auto off mode.

Entering night stand-by and night modes

The machine enters the night stand-by mode and night modes when one of the following is done.

- The operation switch is pressed to turn the power off
- The auto off timer runs out (the operation switch is then turned off, but the main power switch stays on)

If the machine is in one or more of the following conditions, the machine enters night stand-by mode. If not, the machine enters night mode.

- Error or SC condition
- Image data is stored in the memory
- An original is in the ADF
- The ADF is open
- Paper is left in the duplex unit or staple tray

What happens in night stand-by and night modes

When the machine enters either of these modes, the fusing lamp and operation switch turn off, and only the main power LED is lit.

Night stand-by mode

The system +5V and +24 V are supplied to all components.

Night mode

The system +5V supply is also turned off. However, +5VE (+5V for energy saver mode) is still activated. When the machine detects a signal from the PC, the machine goes back to night stand-by mode and the system +5V and +24V supplies are activated. Then the machine receives the incoming message and prints it.



Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V	Note
Night stand- by mode	Off	Off	Room Temp. (Fusing lamp off)	On	
Night mode	Off	Off	Room Temp. (Fusing lamp off)	Off	Only +5VE/+12VE is supplied to the controller, MB, HDD.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

1.1 COPIER ENGINE

Configuration:	Console						
Copy Process:	Dry electrostatic tr	ansfer system					
Originals:	Sheet/Book/Objec	t					
Original Size:	Max.: A3/11" x 1	7"					
0	Min.: A5, 51/2" x	81/2" (with ADF)					
Original Alignment:	Rear left corner (for platen mode, ADF mode)						
Paper Weight	Trav 1~3	52 to 163 a/m^2					
· • • • • • • • • • • • • • • • • • • •	Tray 6 (I CT)	Bond: 16 to 40 lb.					
		Cover: 50 to 60 lb.					
		Index: 90 lb.					
	Trav 4~5 (I CT) [.]	52 to 216 a/m^2					
	Tray 7 (Bypass): Bond: 16 to 40 lb						
		Cover: 50 to 60 lb.					
		Index: 90 to 110 lb.					
	Duplex Trav	$64 \text{ to } 163 \text{ g/m}^2$					
	(Possible	Bond: 20 to 40 lb.					
	Weight):	Cover: 50 to 60 lb.					
	0,	Index: 90 lb.					
Paper Size:	Tray 1 (Tandem):	81/2" x 11" LEF, A4	81/2" x 11" LEF, A4 LEF				
	Tray 2, Tray 3:	51/2" x 81/2" to 11" x	x 17", 12" x 18"				
	j	A5 to A3					
	Duplex Tray	A5 to A3, 51/2" x 81/2	2" to 11" x 17",				
	(Possible Sizes):	12" x 18"	,				
Reproduction Ratios:	7 reduction and 5	enlargement					
		Metric Version	Inch Version				
	Enlargement	400%	400%				
		200%	200%				
		141%	155%				
		122%	129%				
	Full Size	100%	100%				
		03%	03%				
		82%	85%				
		75%	78%				
	Reduction	71%	73%				
		65%	65%				
		50%	50%				
		25%	25%				

Spec.

	Zoom:	25 ~ 400% (allows manual adjustment in 1% steps vertically, horizontally)					
	Copy Speed:	B070		9() ppm	Copying v	vith image stored in
		B071		10	5 ppm	memory v from the s	vith A4/LT LEF feeding ame tray.
		B070/B07	'1	7	5 ppm	When usi LEF magi same tray	ng ADF 1-to-1 with A4/LT nification feeding from the
	Resolution	Scanning Printing		600 120) dpi)0 dpi		
	Gradation:	256 levels	6	Scanning (8 bits/pixel) Printing (1 bit/pixel, 9 values):			
	Warm-up Time: First Copy Time	Less than 360 s from Off mode at 23 [°] C (73.4 [°] F) Copy Tray 1, A4/81/2 [°] x 11 [°] LEF				23°C (73.4°F)	
					B070 (90	cpm)	B071 (105 cpm)
		Face-up		Les	s than 3.	5 s	Less than 3.2 s
		Face-down		Les	s than 5.	0 s	Less than 4.2 s
	Copy Number Input:	1 to 9999					
	Copy Paper Capacity (Sheets):	Copier	3,0	00	Tray 1: Tray 2: Tray 3:	(Tandem) [·] 500 500	1000 x 2
		LCT	4,5	50	Tray 4:	1,000 , Tra	y 5: 1,000, Tray 6: 2,550
		Bypass	50	0	Tray 7,	500 (Optio	nal Bypass Tray B512)
		Total	8,0	50			
F	Memory Capacity:	RAM; 22 25 0 HDD: 80	56 N 56 N ptior) GE	1B(1B((1) 3(4(128 x 2) Optional) GB x2	<u>Standard</u> I, Require), approxil	d for Scanner/Printer
	Toner Replenishment:	Cartridge	e ex	chai	nge (1,4	50 g/cartr	idge)
	Toner Yield:	55 K copies, (A4 LEF, 6% chart, B070 (90 cpm) 1 to 25 Repeat Copying), (B071 (105 cpm), 1 to 50 Repeat				070 (90 cpm) 1 to 25), 1 to 50 Repeat	
	Power Source:	North Am Europe/As	erica sia;	a;	208 to 220 to	240 V, 60 240 V, 50) Hz, 20 A)/60 Hz, 16 A
	Dimensions (W x D x H)	Copier;	·	87(32.	0 x 858. 3 [°] x 33.	5 x 1476 ı 8 [°] x 58.1 [°]	mm
		Full Syste	em;	22′ 87.	18 x 858 3 [°] x 33.8	35 x 1476 8 [°] x 58.1 [°]	mm
	Weight:	Less than	275	5 kg	(605 lb.) including	g ADF, and no options

Space Requirements:

Copier (w x d) 1202 x 858.5 mm (47.3[°] x 33.8[°])

Full System ^{*1} (w x d)	Max.	2528 x 858.5 mm 99 [°] x 33.7 [°]	Finisher + Bypass with bypass tray extended for A3 SEF
	Min.	2804 x 858.5 mm 110.4 [°] x 33.7 [°]	Finisher + Bypass with bypass tray extended for A4 LEF.

Full System: Mainframe + ADF + Finisher B478 + LCT B511 + Cover Interposer Tray B470 + Bypass Tray B512

Power Consumption: North America Version (Unit: W)

	Mainfra	me Only	Full System*		
B070 B071		B071	B070	B071	
Warm-up	2.20 K	2.20 K	2.30 K	2.30 K	
Stand-by	0.65 K	0.65 K	0.70 K	0.70 K	
Copying	2.70 K	2.80 K	2.80 K	2.90 K	
Maximum	2.80 K	2.90 K	2.90 K	3.00 K	

*Full System: Mainframe + ADF + LCT + Bypass Tray + Cover Interposer + Finisher¹ ¹ Finisher: B478 + Punch Unit with B071 (105 cpm), B468 + Punch Unit with B070 (90 cpm)

Power Consumption: Europe Version (Unit: W)

	Mainfra	me Only	Full System*		
	B070	B071	B070	B071	
Warm-up	2.10 K	2.10 K	2.20 K	2.20 K	
Stand-by	0.65 K	0.65 K	0.70 K	0.70 K	
Copying	2.50 K	2.60 K	2.60 K	2.70 K	
Maximum	2.60 K	2.70 K	2.70 K	2.80 K	

*Full System: Mainframe + ADF + LCT + Bypass Tray + Cover Interposer + Finisher¹ ¹ Finisher: B478 + Punch Unit with B071 (105 cpm), B468 + Punch Unit with B070 (90 cpm)

Energy Star

	North America				Eu	rope			
	B071 (105 cpm)		B070 (B070 (90 cpm)		B071 (105 cpm)		B070 (90 cpm)	
	Basic	MFP	Basic	MFP	Basic	MFP	Basic	MFP	
Low Power Mode									
Power Consumption (W)	350	355	340	345	350	355	340	345	
Default Interval (Min.)	15	15	15	15	15	15	15	15	
Recovery Time (Sec.)	40	40	40	40	40	40	40	40	
Off Mode									
Power Consumption (W)	6		6		6		6		
Default Interval (Min.)	120		90		120		90		
Recovery Time (Sec.)	Less than 360		Less than 360		Less than 360		Less than 360		
Sleep Mode									
Power Consumption (W)		50		50		50		50	
Default Interval (Min.)		120		90		120		60	
Recovery Time (Sec.)		Less than 360		Less than 360		Less than 360		Less than 360	

Noise Emission

B070 (90	cpm)	Sound Power Level db (A)	Sound Pressure Level dB (A)
Mainframe	Stand-by	60	45
Mainmanne	Copying	74	60
Full System	Stand-by	59	46
i uli System	Copying	78	68
B070 (105	5 cpm)	Sound Power Level dB (A)	Sound Pressure Level dB (A)
Mainframe	Stand-by	60	45
Mainmanne	Copying	76	61
Full System	Stand-by	59	46
r un Oystein	Copying	79	68

1.2 ADF

Original Size:	Normal Original Mode:	A3 to B5, 11 [°] x 17 [°] to 51/2 [°] x 81/2 [°]			
	Thin Original Mode	A3 to B5, 11 [°] x 17 [°] to 51/2 [°] x 81/2 [°]			
	Duplex Original Mode:	A3 to B5, 11 x 17 to 51/2 x 81/2			
Original Weight:	Normal Original Mode:	52~128 g/m ² (Note 1)			
	Thin Original Mode	40~128 g/m ² (Note 1)			
	Duplex Original Mode:	52~105 g/m ² (Note 2)			
Table Capacity:	100 sheets (80 g/m ² , 20 lb)				
Original Feeding Speed:	75 cpm (A4/81/2 x 11 LEF, 1 to 1)				
Original Standard Position:	Rear left corner (Face-up)				
Separation:	FRR				
Original Transport:	One flat belt				
Original Feed Order:	From the top original				
Power Source:	DC 24 V and DC 38 V fro	om the copier			
Power Consumption:	Less than 130 W				
Dimensions (W x D x H):	680 x 560 x 150 mm (26.8 [°] x 22 [°] x 5.9 [°])				
Weight	Less than 17.5 kg (38.5 ll	Less than 17.5 kg (38.5 lb.)			

Note 1:156 g/m² possible, but not guaranteed. **Note 2**:128 g/m² possible, but not guaranteed.

1.3 PAPER SIZES BY FEED STATION

The tables on the next three pages describe how paper size detection operates, depending on the geographical area, namely, North American, Europe/Asia, and China.

Here are important notes and the key for reading these tables.

General Notes

Symbol	Meaning
1	Tandem Tray
0	A3/DLT Kit B331 Installed
2	Main Machine Universal Trave
3	
4	
5	LCT B511
6	
7	Bypass Tray B512 (Installed on LCT B511)

Key

Trays (1), (6) are fixed trays and do not support automatic paper size detection. Use this key for columns (1), (6).

Symbol	Meaning
0	Paper size must be selected with an SP code.
	A Custom Size must be selected with an SP code.

Trays ②, ③, ④, ⑤ are universal paper cassettes. ②, ③: Paper size can be selected by manually setting the dial on the tray. ④, ⑤: Paper size depends on the position of the actuator plates. Use this key for columns ②, ③, ④, ⑤.

Symbol	Meaning
	Paper size is detected automatically by paper size detection sensors.
0	Set dial setting to * , move the fences to the correct positions for the paper size, then select paper size with the Tray Paper Settings button.
	Setting the dial to * and moving the size fences does not detect the paper size. Select paper size with the Tray Paper Settings button.

Tray \bigcirc is the optional Bypass Tray B512. Use this key for column \bigcirc .

Symbol	Meaning
•	Paper size is detected automatically by the position of the side fence and one paper length sensor.
О	Paper size can be detected after the operator selects the bypass tray as the feed source, pushes (#) on the operation panel, then select the paper size with the Tray Paper Settings button.

NOTE: The side fences and end fence can be adjusted freely to accept any paper size. However, only a limited number of standard paper sizes can be detected automatically. For details, refer to Column 8 (⑦) and the Bypass Tray B512 manual ("Paper Size Detection").
North America

			1	0	2	3	4	5	6	\bigcirc
A3	SEF	297 x 420 mm		0	0	0				Ο
A3	LEF	420 x 297 mm	ſ							
B4	SEF	257 x 364 mm		0						Ο
B4	LEF	364 x 257 mm								
A4	SEF	210 x 297 mm		0	0	Ο				Ο
A4	LEF	297 x 210 mm	0	0	0	Ο			О	Ο
B5	SEF	182 x 257 mm	ſ							Ο
B5	LEF	257 x 182 mm	ſ						О	0
A5	SEF	148 x 210 mm			Ο	Ο			О	Ο
A5	LEF	210 x 148 mm	ſ		Ο	Ο			О	Ο
DLT	SEF	11" x 17"	ſ	Ο						
DLT	LEF	17" x 11"								
LG	SEF	81/2" x 14"	ſ	Ο						0
LG	LEF	14" x 81/2"								
LT	SEF	81/2" x 11"	ſ	Ο						
LT	LEF	11" x 81/2 "	Ο	0					О	
HLT	SEF	51/2 " x 81/2"							0	
HLT	LEF	81/2" x 51/2"							0	
Executive	SEF	71/4" x 101/2"								0
Executive	LEF	101/2" x 71/4"		「 <u> </u>				「 <u> </u>		0
F	SEF	8" x 13"	「 <u> </u>	「 <u> </u>				「 <u> </u>		
F	LEF	13" x 8"								
Foolscap	SEF	81/2" x 13"			0	O				0
Foolscap	LEF	13" x 81/2"		「 <u> </u>				「 <u> </u>		
Folio	SEF	81/4" x 13"			O	O				0
	LEF	13" x 81/4"								
	SEF	11" x 14"								
	SEF	11" x 15"			Ō	Ō				0
Folio	SEF	10" x 14"			0	Ο				0
	SEF	81/4" x 14"								
	SEF	8" x 101/2"								
	SEF	8" x 10"								0
	SEF	12" x 18"								0
Custom	Width	139 ~ 305 mm								
Size	Length	139 ~ 458 mm	<u> </u>							
Custom	Width	210 ~ 305 mm								
Size	Length	210 ~ 439 mm								

Spec.

SPECIFICATIONS

Europe/Asia

			1	0	2	3	4	5	6	0
A3	SEF	297 x 420 mm		0						
A3	LEF	420 x 297 mm								
B4	SEF	257 x 364 mm		Ο	О	О				0
B4	LEF	364 x 257								
A4	SEF	210 x 297 mm		Ο						
A4	LEF	297 x 210 mm	О	0					0	
B5	SEF	182 x 257 mm			0	О				О
B5	LEF	257 x 182 mm			0	Ο			0	О
A5	SEF	148 x 210 mm							0	
A5	LEF	210 x 148 mm							0	
DLT	SEF	11" x 17"		О	0	О				О
DLT	LEF	17" x 11"								
LG	SEF	81/2 " x 14"		О	О	Ο				О
LG	LEF	14 x 81/2 "								
LT	SEF	81/2" x 11"		О	Ο	Ο				О
LT	LEF	11" x 81/2 "	О	О	О	Ο			Ο	О
HLT	SEF	51/2" x 81/2 "			0	О			Ο	0
HLT	LEF	81/2" x 51/2"			0	Ο			Ο	0
Executive	SEF	71/4" x 101/2"								0
Executive	LEF	101/2" x 71/4"								0
F	SEF	8" x 13"			0	0				0
F	LEF	13" x 8"								
Foolscap	SEF	81/2" x 13"								0
Foolscap	LEF	13" x 81/2"								
Folio	SEF	81/4" x 13"			\bullet					0
	LEF	13" x 81/4"								
	SEF	11" x 14"								
	SEF	11" x 15"			0	Ο				0
Folio	SEF	10" x 14"								0
1 0110	SEF	81/4" x 14"								
	SEF	8" x 101/2"			0	Ο				0
	SEF	8" x 10"								0
	SEF	12" x 18"								0
Custom	Width	139 ~ 305 mm								\circ
Size	Length	139 ~ 458 mm								
Custom	Width	210 ~ 305 mm								
Size	Length	210 ~ 439 mm								

China

			1	0	2	3	4	5	6	\bigcirc
A3	SEF	297 x 420 mm		О						
A3	LEF	420 x 297 mm								
B4	SEF	257 x 364 mm		Ο	О	Ο				Ο
B4	LEF	364 x 257								
A4	SEF	210 x 297 mm		О						
A4	LEF	297 x 210 mm	0	О					Ο	
B5	SEF	182 x 257 mm			О	Ο				О
B5	LEF	257 x 182 mm			О	О			0	О
A5	SEF	148 x 210 mm							0	
A5	LEF	210 x 148 mm							0	
DLT	SEF	11" x 17"		О	О	О				О
DLT	LEF	17" x 11"								
LG	SEF	81/2" x 14"		О	О	Ο				О
LG	LEF	14" x 81/2"								
LT	SEF	81/2" x 11"		Ο	Ο	Ο				О
LT	LEF	11" x 81/2"	0	Ο	0	0			0	0
HLT	SEF	51/2" x 81/2 "			Ο	Ο			Ο	Ο
HLT	LEF	81/2" x 51/2"			Ο	Ο			Ο	Ο
Executive	SEF	71/4" x 101/2"								Ο
Executive	LEF	101/2" x 71/4"								Ο
F	SEF	8" x 13"			Ο	Ο				Ο
F	LEF	13" x 8"								
Foolscap	SEF	81/2" x 13"								О
Foolscap	LEF	13" x 81/2"								
Folio	SEF	81/4" x 13"								О
	LEF	13" x 81/4"								
	SEF	11" x 14"								
	SEF	11" x 15"			О	Ο				Ο
	SEF	10" x 14"								О
FOIIO	SEF	81/4" x 14"								
	SEF	8" x 101/2"			Ο	0				0
	SEF	8" x 10"								О
	SEF	12" x 18"								Ο
8-K	SEF	390 x 267 mm								0
16-K	SEF	267 x 195 mm								Ο
16-K	LEF	195 x 267 mm								Ο
Custom	Width	139 ~ 305 mm								0
Size	Length	139 ~ 458 mm	1							0
Custom	Width	210 ~ 305 mm		•		•				
Size	Length	210 ~ 439 mm	1							

Spec.

1.4 A3/DLT TRAY KIT (B331)

Paper Size	A3 SEF, B4 SEF, 11"x17" SEF, 81/2"x14" SEF, A4 SEF, A4 LEF, 81/2"x11" SEF, 11"x81/2" LEF, 305 mm x 439 mm
Paper Weight	52 ~ 163 g/m ²
Tray Capacity	1,000 sheets
Remaining Paper Detection	5-Step: 100%, 75%, 50%, 25%, End

1.5 LCT (B511)

Paper Weight	Tray 4, 5	52 to 216 g/m ²			
	Tray 6	52 to 216 g/m ²			
Paper Size	Tray 4,5,6	A4 LEF, B5 LEF, 81/2"x11" LEF, A5, 51/2"x81/2"			
Tray Capacity:	Tray 4, 5	1,000 sheets (Thick Paper 0.11 mm)			
	Tray 6	2,550 sheets (Thick Paper 0.11 mm)			
Tab Sheet:	Feed possible from Tray 4 or Tray 5. Requires installation of tab sheet fence. Note: Only A4 LEF. 81/2" x 11" LEF tab sheets can be fully a sheet of the sheet				
Paper Feed System:	FRR				
Remaining Paper Detection:	5-Step including	g Near-End for Trays 4, 5, 6			
Power Source:	24 Vdc, 5 Vdc (from copier)			
Power Consumption:	55 W				
Weight:	Less than 82 kg (180.4 lb.)				
Size (W x D x H):	540 mm x 730 mm x 980 mm (21.3" x 28.7" x 38.6")				

1.6 BYPASS TRAY (B512)

NOTE: The Bypass Tray is attached to the top of the LCT B511.

Paper Feed System	FRR
Tray Capacity	500 sheets (Thick Paper 0.11 mm)
Remaining Paper Detection	4-Step: Including Near-End
Paper Size	A5 to A3, 51/2" x 81/2" to 12" x 18"
Tab Sheets	A4 LEF, 81/2" x 11" LEF (requires attachment of tab
	fence)
Paper Weight	52 to 216 g/m ²
Weight	Less than 18 kg (39.6 lb.)
Power Source	24 Vdc, 5 Vdc (from copier)
Power Consumption	50 W
Dimensions (W x D x H)	680 x 561 x 181 mm
	(26.7 x 21.1 x 7.1 in.)

1.7 3000 SHEET BOOKLET FINISHER (B468)

NOTE: The 3000 Sheet Booklet Finisher B468 is used with the B070 (90 ppm) only.

Upper Tray

Tray	Unstapled	500 sheets (A4, A5 LEF, B5, 81/2"x11")						
Capacity		250 sheets (A3 SEF, B4 SEF, 11"x17" SEF, 81/2"x11",						
(80 g/m ²)			12"x18"					
		100 sheets (100 sheets (A5 SEF, A6 SEF, B6 SEF, 51/2"x81/2")					
	Stapled	Max docs.	Size					
		50 docs.500 sheets25 docs.250 sheets		A4 LEF, 81/2"x11" LEF				
				A3, A4 SEF, B4, B5, 12"x18",				
				11"x17", 81/2"x11"				
	Stapled			A3 LEF, A4 LEF, B4 LEF, B5				
	(Mixed	(Mixed 16 docs	30 sheets	LEF, 11"x17" LEF, 81/2"x11"				
	Sizes)	LEF						
Paper Size		A3 ~ A5, A6 SEF, B6 SEF, 12"x18", 11"x17" ~ 51/2"x81/2"						
Paper Weigh	t	$52 \text{ g/m}^2 \sim 216 \text{ g/m}^2$						

Lower Tray

Documents selected for booklet finishing (saddle-stitching) are folded, stapled, and output only to the lower tray.

Tray Capacity	Unstapled	2,500 Sheets	A4 LEF, 81/2"x11" LEF			
(80 g/m²)		1 250 Shaata	A3 SEF, A4 SEF, B4 SEF, B5, 11"x17" SEF,			
		1,250 Sheets	81/2"x14", 81/2"x1	1" SEF, 12"x18"		
		500 Sheets	A5 LEF			
		100 Sheets	A5 SEF, B6 SEF, 51/2"x81/2"			
	Stapled	Max docs.	Total sheets	Size		
		50 docs.	2,500 sheets	A4 LEF, 81/2"x11" LEF		
		50 docs.	1,250 sheets	A4 SEF, B5, 81/2"x11" SEF		
		30 docs.	1,250 sheets	A3, B4, 12"x18", 11"x17"		
	Stapled			A3 LEF, A4 LEF, B4 LEF,		
	(Mixed	50 docs.	30 sheets	B5 LEF, 11"x17" LEF,		
	Sizes)			81/2"x11" LEF.		
Paper Size		A3 ~ A5, A6 SEF, B6 SEF, 12"x18", 11"x17" ~ 51/2"x81/2" LEF				
Paper Weight		$52 \text{ g/m}^2 \sim 216 \text{ g/m}^2$				

Proof Tray

Tray Capacity	250 sheets (A4, 81/2"x11" or smaller) 50 sheets (B4, 81/2"x14" or larger)	
Paper Weight	$52 \text{ g/m}^2 \sim 216 \text{ g/m}^2$	

Staple Specifications

Binding Capacity (80 g/m ²)	Same Size	50 sheets (A4, 81/2" x 11" or smaller) 30 sheets (B4, 81/2" x 14" or larger)		
	Mixed Sizes	30 sheets (A3 and A4 LEF, B4 and B5 LEF, 11" x 17"and 81/2" x 11" LEF		
Paper Size	A3 to B5, 11" x 17" to 81/2" x 11"			
Paper Weight	64 g/m ² to 90 g/m ²			
Stapling Position	Front (1), Back (1), Back (1: diagonal), 2 positions			
Stapling Capacity	5,000 staples/cartridge			

Booklet Staple Specifications

Binding Capacity (80 g/m ²)	15 Sheets					
Paper Size	A3 SEF, B4 SEF, A	A3 SEF, B4 SEF, A4 SEF, 11" x 17" SEF, 81/2" x 11" SEF				
Paper Weight	64 g/m ² ~ 90 g/m ²					
Stapling Position	Center, 2 Locations					
Stapling Capacity	2,000 Staples/Cartridge					
Fold Position	Center, Half-Folding					
Saddle-Stitch Capacity	Max. Docs.	Total Sheets	Size			
	25	2~5				
	15	6~10	81/2" x 11" SEF			
	10	11~15				
	30	2~5	A3 SEF,			
	20	6~10	B4 SEF,			
	10	11~15	11" x 17" SEF			

1.8 PUNCH UNIT (B377)

The Punch Unit B377 is installed in the 3000 Sheet Booklet Finisher B468 connected to the B070 (90 ppm).

Punch Position	North America (NA)	2/3 holes	B377-17		
	Europe (E)		2/4 holes	B377-27		
	Northern Europe (NE)		4 holes	B377-31		
Punching Allowed	All modes	. ,	•			
Allowed Paper Sizes	Holes	Feed	Paper Size			
	2-hole	SEF A3 ~ A5, 11" x 17" ~ 51/2" x 81/2				
	(EUR/A)	LEF	A4 ~ A5, 8	1/2" x 11", 51/2" x 81/2"		
	2-hole (NA)	SEF	A3 ~ A5, 1	1" x 17" ~ 51/2" x 81/2"		
		LEF	A4 ~ A5, 8	1/2" x 11", 51/2" x 81/2"		
	3-hole (NA)	SEF	A3, B4, 11	" x 17"		
		LEF	A4, B5, 81/	′2" x 11"		
	4-holes	SEF	A3, B4, 11	x17"		
	(EUR/A)	LEF	A4, B5, 81/	′2" x 11"		
	4-holes (North	SEF	A3 ~ A5, 1	1" x 17" ~ 51/2" x 81/2"		
	Europe)	LEF	EF A3 ~ A5, 81/2" x 11", 51/2" x 8 [.]			
Allowed Paper Weight	Holes		Veight			
	2-hole					
	3-hole	52 ~ 163	2 ~ 163 g/m ² 14 ~ 43 lb)			
	4-hole (E)	$(14 \sim 43)$				
	4-hole (NE)	יסד דין	0.)			
	2-hole (NA)					
Hopper Capacity	NA (2/3-hole)	More t	han 6 K prin	nts		
	EUR/A (4-hole)) More t	than 8 K prints			
	EUR/A (2-hole)) More t	han 10 K pr	ints		
Rated Voltage of Output Connector	Max. DC 24 V					
Dimensions (W x D x H)	700 x 620 x 960) mm (27.6	" x 24.4" x 3	57.8")		
Weight	Approx. 65 kg (143 lb.) (W	(ith Finisher)			
Power Consumption	72 W (3 A/24 V)				
Power Supply	DC 24 V (From Copier to Finisher)					

1.9 3000 SHEET FINISHER (B478)

UPPER TRAY	UPPER TRAY				
Paper Capacity (80 g/m ²)	500 sheets (A4, 81/2" x 11" and smaller)				
	250 sheets ((B4, 81/2" x 14	" and larger)		
Paper Size	A3 to A6 SEF, 11" x 17" to 51/2" x 81/2", 12" x 18"				
Paper Weight	52 to 216 g/r	m ²			
Upper Tray Full Detection	Provided				
SHIFT TRAY	L				
Paper Capacity (80 g/m ²)	3000 sheets	(A4 LEF, B5	LEF, 81/2" x 11" LEF)		
• • • • • • •	1500 sheets	(A3, A4 SEF,	B4 and B5 SEF, 11" x 17",		
	81/2" x 14", 8	31/2" x <u>11" SEF</u>	[–] , 12" x 18")		
	500 sheets ((A5 LEF, 51/2"	x 81/2" LEF)		
	100 sheets ((A5 SEF, 51/2"	x 81/2" SEF)		
Paper Size	A3 to A5, 11	" x 17" to 51/2	" x 81/2", 12" x 18" (including		
	tab paper)				
Paper Weight	52 to 216 g/r	m ²			
Shift Tray Full Detection	Provided				
STAPLER	. <u> </u>				
Stapling Stack Size	A4, B5, 81/2"	' x 11" (Max. 1	00 Sheets)		
	A3, B4, 11" >	x 17", 81/2" x 1	4" (Max. 50 sheets)		
Stapling Paper Size	A3 to B5				
	11" x 1/" to a	<u>81/2" x 11"</u>			
Stapling Paper Weight	64 to 80 g/m ⁻				
Staple Position	4 Modes				
	1 Staple:	Front, Rear, F	Rear-Oblique		
	2 Stapes:	2 locations			
	5000 staples	3/cartriage	- 1		
	Cartridge or	Staple Replac			
Stapled Stack Size	Sheets	Sets			
	10 ~ 100	200 ~ 30	A4 SEF, B5 SEF, 81/2" X 11"		
	2~0	150	SEF AAIEE BSIEE 81/2" v 11"		
	2~9	150	IFF		
	10 ~ 50	150 ~ 30			
	2~9	150	A3, B4, 11" x 17", 81/2" x 14"		
Trim Waste Staple Capacity	30.000 or m	ore	<u> </u>		
Waste Staple Hopper Full	Provided				
Detection	1 1011222				
Power Consumption	Less than 100 W				
Power Source	DC 24 V (From Mainframe)				
Size (W x D x H)	800 x 730 x 980 mm				
, ,	31.5 x 28.7 >	x 38.6 in.			
Weight	Less than 65 kg (143 lb.)				
Compatible Machines	B070 (90 cpm), B071 (105 cpm), B064 (60 cpm), B065				
	(75 cpm)				

1.10PUNCH UNIT (B531)

The Punch Unit B531 is installed in the 3000 Sheet Finisher B478.

Punch Hole Positions	2/3-hole (North America)
	2/4-hole (Europe)
Punch Paper Size	
2-Hole (NA)	A5 ~ A3 SEF, 11" x 17"~5 1/2" x 81/2" SEF
	A5 ~ A4 LEF, 8 1/2" x 11" LEF, 51/2" x 81/2" LEF
3-Hole (NA)	A3 SEF, B4 SEF, 11" x 17" SEF
	A4 LEF, B5 LEF, 81/2" x11" LEF
4-Hole (EUR/A)	A3 SEF, 11" x 17" SEF
	A4 LEF, 81/2" x 11" LEF
Paper Weight	
2-Hole (NA)	52 g/m ² ~ 163 g/m ²
3-Hole (NA)	52 g/m ² ~ 163 g/m ²
4-Hole (EUR/A)	52 g/m ² ~ 128 g/m ²
Punch Waste Hopper Capacity	
2-Hole (NA)	10K
3-Hole (NA)	15K
4-Hole (EUR/A)	15K
Operation Modes	All (Shift, Proof, Staple)

DIP SW Settings

The correct DIP SW settings of the Punch Unit 531 are provided in the table below for your reference only. The DIP switches of these punch units do not need to be changed at installation, or adjusted for operation.

Punch Unit	Linit No	DIP SW Settings			
	Onic NO.	1	2	3	4
2/3-Hole (NA)	B531-17	1	0	1	0
2/4-Hole (EUR/A)	B531-27	1	0	0	1

0: OFF

1: ON

1.11 PUNCH UNIT (A812)

The Punch Unit A812 is installed in the 3000 Sheet Finisher B478.

Punch Hole Positions	2-hole, 3-hole (NA)
	4-hole (EUR/A)
	4-hole (North Éurope)
Punch Paper Size	
2-Hole	A5 ~ A3 SEF, 11" x 17" ~ 81/2" x 11" SEF
	A5 ~ A4 LEF, 81/2" x 11" LEF
3-Hole (NA)	A3 SEF, B4 SEF, 11" x 17" SEF
	A4 LEF, B5 LEF, 81/2" x 11" LEF
4-Hole (EUR/A)	A3 SEF, 11" x 17" SEF
	A4 LEF, 11" x 17" LEF
4-Hole (North Europe)	B5 ~ A3 SEF, 81/2" x 11" ~ 11" x 17" SEF
	A5 ~ A4 LEF, 81/2" x 11" LEF, 51/2" x 81/2" LEF
Paper Weight	
2-Hole, 3-Hole (NA)	52 g/m ² ~ 163 g/m ²
4-Hole (Europe/North Europe)	52 g/m ² ~ 128 g/m ²
Punch Waste Hopper Capacity	
2-Hole	40K
3-Hole (NA)	15K
4-Hole (EUR/A)	15K
4-Hole (North Europe)	15K
Power Supply	DC 24 V (From Finisher)
Power Consumption	60 W
Weight	Less than 2.4 K (5.3 lb.)
Operation Modes	All (Shift, Proof, Staple)

DIP SW Settings

The correct DIP SW settings of the Punch Unit A812 are provided in the table below for your reference only. The DIP switches of these punch units do not need to be changed at installation, or adjusted for operation.

Punch Unit	Linit No	DIP SW Settings			
	onic No.	1	2	3	4
2-Hole (EUR/A)	A812-40/A812-67	0	0	0	0
3-Hole (NA)	A812-57	1	0	0	0
4-Hole (EUR/A)	A812-30	0	1	0	0
4-Hole (North Europe)	A812-31	0	0	1	0
2-Hole (NA)	A812-32	0	0	0	1

0: OFF

1: ON

1.12 JOGGER UNIT B513

The Jogger Unit B513 is installed above the shift tray of the 3000 Sheet Finisher B478.

Paper Size	A3 SEF, B4 SEF, 11" x 17" SEF
	A4 LEF, B5 LEF, 81/2" x 11" LEF
Paper Weight	52 g/m² ~ 216 g/m²
Weight	Less than 1.7 kg (3.7 lb.)
Dimensions (W x D x H)	125 mm x 450 mm x 100 mm
	5" x 17.7" x 4"
Power Supply	DC 24 V, DC 5V (From Finisher)
Power Consumption	24 W

1.13COVER INTERPOSER TRAY B470

Paper Separation	FRR System with Feed Belt
Paper Sizes	A3 ~ A5, 11" x 17" ~ 51/2" x 81/2"
Paper Weight	64 ~ 216 g/m ²
Capacity	200 sheets (80 g/m ²)
Power Supply	24 V ±10%, 5 V ±5% (From Finisher)
(from main machine)	
Power Consumption	Less than 48 W
Dimensions (W x D x H)	500 x 620 x 200 mm
	19.7" x 24.4" x 7.9"
Weight	Less than 12 kg (26.4 lb.)

2. MACHINE CONFIGURATION



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No.	ltem	Machine Code	Comments
1	Mainframe	B070/B071	B070 (95 cpm), B071 (105 cpm).
2	Bypass Tray	B512	
3	LCT	B511	
4	A3/DLT Tray Kit* ¹	B331	Replace Tray 1 (tandem tray) inside.
5	3000 Sheet Finisher	B478	
6	3000 Sheet Booklet Finisher	B468	Attached to B070 only for booklet binding.
7	Punch Unit	B377	Inside Finisher B468
8	Output Jogger Unit	B513	Attached to Finisher B478
9	Cover Interposer Tray	B470	Attached to B468 or B478 Finisher.
10	Punch Unit	B531, A812	Inside Finisher B478
	Copier Connection Kit	B328	Not shown.

*1: Replaces Tandem Tray in main unit.



APPENDIX 1

1.1 INSTALLATION

Unplug the machine power cord before starting the following procedure.

1.1.1 SETTING TERMINAL RESISTANCE FOR EACH RSS UNIT



- 1. Switch the copier off and disconnect the copier power cord from the power supply.
- 2. Remove the controller box cover. ($\hat{\mathscr{F}} \times 11$)
- 3. Remove the PI board [A]. (*ŷ* x 2, *⊑* x 2)
- 4. Do the terminal resistance setting for each machine in the RSS connection by changing the position of the jumper [B].
 - Up to 5 RSS machines can be connected for 1 LADP.
 - The terminal resistance jumper setting is different, depending on whether or not the machine is the last machine connected.

Terminal Resistance Settings

Machine	Jumper	Comment
Last machine	1-2	This is the factory setting done before the machine is shipped.
Other machines in RSS connection	2-3	This setting must be done for all machines in the RSS connection (not last machine).

5. Do Steps 1 to 4 for each machine in the connection.

1.1.2 SETTING DEVICE CODES FOR EACH MACHINE

After the terminal resistance is set for the machines, a device code must be set for each machine in the RSS connection. Do the procedure below for each machine.

- 1. Connect the power cord and switch the machine on.
- 2. Execute SP5821 (RSS-PI Device Code) and select the appropriate setting for each machine and press Enter to set the PI device code for each machine.

Machine	Setting
1st Machine	0 (Default)
2nd Machine	1
3rd Machine	2
4th Machine	3
5th Machine	4

3. After selecting the setting, a message will remind you that you must reboot the machine. Be sure to switch the machine off and on to enable the new setting.

1.1.3 CONNECTION



- Connect the modular cord [A] to the left modular connector [B].
 NOTE: Make sure that the harness end with the ferrite core [B] is connected to the terminal.
- 2. Follow the instructions in the RSS LADP Service Manual (Chapter 2) to install the line adapter [C].



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1.2 ADDITIONAL SP MODE SETTINGS

- 1. After installing the machine and line adapter, perform SP5816 001 (RSS Function) and set to "1" (ON).
- Check the settings of the following SP codes with the values in the table below.
 NOTE: Full descriptions of these SP codes are not provided in the Section "4. Service Tables" of the Service Manual and they are marked "Japan Only". For details, see the table below.

SP		Number/Name	Function/[Setting]
5504	Jam A	larm	
	001	Jam Alarm	Sets the level of the alarm to sound when a jam
			initiates an alarm call.
			[0~3 / 3 / 1 step]
			0: Z. No alarm issued.
			1: L. Low (1/4 H level)
			2: M. Medium (1/2 H level)
			3 : H. Issues the alarm at 6K intervals.
	002	Jam Alarm Interval	Switches the jam alarm interval off and on.
			[0~1 / 1 / 1 step]
			0: No alarm
			1: Alarm
			When set to "1" (On), the jam alarm call is issued if the jam condition exists for longer than 15 min.
5505	001	Error Alarm	Sets the error alarm level to issue an error alarm
			call.
			[0~255 / 50 /1 step]]
5508	CC Ca	all	
	001	Jam Remains	Enables/disables initiating a call for an unattended
			paper jam.
			[0~1/1/1]
			0: Disable
			1: Enable
			This setting is enabled only when SP5508 004 is
			enabled (set to 1).
	002	Continuous Jam	Enables/disables initiating a call for continuous
		Occurrence	paper jam.
			[0~1/1/1]
			0: Disable
			1: Enable
			This setting is enabled only when SP5508 004 is
	000	Ocationa Deca	enabled (set to 1).
	003	Continuous Door	Enables/disables initiating a call when the front door
		Open	
			0. Disable
			I. Elidule This setting is enabled only when SDEEOS 004 is
			nnis setting is enabled only when SP5506 004 IS enabled (set to 1)

SP		Number/Name	Function/[Setting]
5508	004	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
	011	Jam Detection: Time Length	Sets the length of time a jam must remain before it becomes an 'unattended paper jam'. [03~30/ 10 /1] <i>This setting is enabled only when SP5508 004 is</i> <i>enabled (set to 1).</i>
	012	Jam Detection: Continuous Count	Sets the number of continuous paper jams required to initiate a call. [02~10/ 5 /1] <i>This setting is enabled only when SP5508 004 is</i> <i>enabled (set to 1).</i>
	013	Door Open: Time Length	Sets the length of time the door remains open before the machine initiates a call. [03~30/ 10 /1] <i>This setting is enabled only when SP5508 004 is</i> <i>enabled (set to 1).</i>
	021	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 <i>This setting is enabled only when SP5508 004 is</i> <i>enabled (set to 1).</i>
	022	Jam Operation: Continuous Count	Determines what happens when continuous paper jams occur. [0~1/ 1 /1] 0: Automatic Call 1: Audible Warning at Machine <i>This setting is enabled only when SP5508 004 is</i> <i>enabled (set to 1).</i>
	023	Door Operation: Time Length	 Determines what happens if the door remains open. [0~1 / 1 / 1] 0: OFF 1: ON. Displays a warning. Pressing the call button will contact the service center. This setting is enabled only when SP5508 004 is enabled (set to 1).
5513	Parts	Alarm Level Count	
	001	Normal	Sets the parts replacement alarm counter to sound for the number of copies. [1~9999 / 350 / 1]
	002	DF	Sets the parts replacement alarm counter to sound for the number of scanned originals. [1~9999 / 80 / 1]

SP		Number/Name	Function/[Setting]
5514	Parts /	Alarm Level	
	001	Normal	Switches the parts alarm level off (0) and on (1) for copying. [0~1 / 1 / 1]
	002	DF	Switches the parts alarm level off (0) and on (1) for the DF (document feeder). $[0~1 / 0 / 1]$
5811	Machi	ne No. Setting	
	001	Code Set	Confirm. Do not change. DFU
5812	Service Tel. No. Setting		
	001	Service	Use this to input the telephone number of the CE (displayed when a service call condition occurs.)
			Press " • " to input a pause. Press "Clear modes" to delete the telephone number.
	002	Fax	Use this to input the fax number of the CE printed on the SMC print.
	003	Supply	Displayed on the initial SP screen.
	004	Operation	Allows the service center contact telephone number to be displayed on the initial screen.

1.3 SC630

If SC630 (RSS Communication Error) is issued frequently, this could mean there is a problem with the customer's communication line or line adapter. To maintain the communication environment, regular planned inspections are required.

1.4 JAM HISTORY

The jam history consists of a 9-digit code. The code is read as described in the tables below.



- [A] Jam Location
- [B] Paper Size
- [C] Total Count at Jam

See "Table 1 Jam Location" below. See "Table 2 Paper Size" below. Count total (last 5-digit number)

1.4.1 TABLE 1 JAM LOCATION/COPIER

Class	Code	Condition
Standby	01	Initial jam
	03	Tray 1 (Tandem Tray – Copier)
	04	Tray 2 (Universal Tray – Copier)
	05	Tray 3 (Universal Tray – Copier)
	06	Tray 4 (LCT Tray 1)
	07	Tray 5 (LCT Tray 2)
	08	Tray 6 (LCT Tray 3)
	09	Tray 7 (Bypass Tray on LCT)
Chook in Error	10	LCT relay sensor
(Paper Doos not	11	LCT exit sensor
Arrive at Sensor)	12	Relay sensor
	13	Registration
	15	Fusing exit
	16	Exit
	19	Duplex entrance
	20	Duplex transport 1
	21	Duplex transport 2
	22	Duplex transport 3
	23	Duplex inverter
Finishing	25	Finisher entrance
(After Copying)	26	Finisher proof tray
	27	Finisher shift tray
	28	Finisher stapler
	29	Finisher feed-out
	30	Finisher staple entrance
	31	Stapler jam
	32	Saddle-stitch staple jam (B468)
	33	Folder plate jam (B468)
	34	Stacking roller (B478)

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Class	Code	Condition
	35	Shift tray lift motor (B478)
	36	Jogger motor (B478)
	37	Shift motor (B478)
	38	Stapler move motor (B478)
	39	Stapler motor (B478)
Finiching	40	Fold roller motor (B468)
(After Copying)	41	Release motor (B468)
(Anter copying)	42	Punch motor (B468)
	43	Insufficient data jam (main machine)
	44	Cover feeder jam (B470)
	45	Transport (B470)
	46	Bottom plate motor (B470)
	53	Tray 1 (Tandem Tray – Copier)
	54	Tray 2 (Universal Tray – Copier)
	55	Tray 3 (Universal Tray – Copier)
	56	Tray 4 (LCT Tray 1)
	57	Tray 5 (LCT Tray 2)
	58	Tray 6 (LCT Tray 3)
	59	Tray 7 (Bypass Tray on LCT)
Chook out Error	60	LCT relay sensor
(Paper Does Not	61	LCT exit sensor
Leave Sensor)	62	Relay sensor
,	63	Registration
	65	Fusing exit
	66	Exit
	69	Duplex entrance
	70	Duplex transport 1
	71	Duplex transport 2
	72	Duplex transport 3
	73	Duplex inverter

1.4.2 JAM LOCATION/DOCUMENT FEEDER

Class	Code	Condition
	03	Feed-in area
	04	Feed-out area

1.4.3 TABLE 2 PAPER SIZE

Code	Paper Size	Measurements
05	A4 LEF	297 x 210 mm
06	A5 LEF	210 x 148 mm
07	A6 LEF	148 x 105 mm
0E	B5 LEF	257 x 182 mm
0F	B6 LEF	176 x 125 mm
11	Return post card LEF	
12	Govt. post card LEF	
24	LG LEF	14" x 81/2"
26	LTLEF	11" x 8.5"
2C	HLT LEF	81/2" x 51/2"
84	A3	297 x 420 mm
85	A4 SEF	210 x 297 mm
86	A5 SEF	148 x 210 mm
87	A6 SEF	105 x 148 mm
8D	B4	250 x 353 mm
8E	B5 SEF	182 x 257 mm
8F	B6 SEF	125 x 176 mm
91	Return post card SEF	
92	Post card SEF	
A0	DLT	11" x 17"
A4	LG SEF	8.5" x 14"
A6	LT SEF	81/2" x 11"
AC	HLT SEF	81/2" x 51/2"

1.5 RSS CHECK ITEMS

These are the items reported to the RSS Center when a problem occurs with the copier. These items can also be reported on the copier operation panel. Just like the "Read Only" items, the "Auto Call and Read" items are used to read the status of the copier at the RSS Center.

1.5.1 AUTO CALL AND READ ITEMS

Item	Content	Comments
Continuous jam auto call	Paper scraps remain in the machine, notification says the machine cannot copy even 1 sheet.	CC101
Simultaneous tendency to jam	Call issued for 5 consecutive jams.	CC201
Continuous door open auto call	Door remains open longer than 15 min during paper jam.	CC202
Fusing cleaning web near end call	Call issued when fusing cleaning web reaches near end.	Alarm Call
Development unit suction bottle near full	Call issued when the suction bottle attached to the development unit is nearly full.	Alarm Call
Development unit suction motor near end of service life	Call issued when the suction motor that drives the suction pump attached to the development unit is near the end of its service life.	Alarm Call
Jam alarm	Issued for abnormally high frequency of jams.	Jam Alarm Call
Error alarm	Issued for abnormally high frequency of SC errors.	Error Alarm Call
SC auto call:	Issued when consecutive SC errors occurs.	SC Call
Staple supply auto call	Issue when stapler is out of staples.	Cannot be used
Toner supply auto call	Issued when toner is near end.	Cannot be used
Paper size (by size) auto call	Issues paper out (by size) warning.	Cannot be used
PM Alarm	Issues PM time alert.	PM Alarm Call

1.5.2 READ ONLY ITEMS

These items inform the RSS center about the status and history of the machine (jams, SC occurrences, total copies, etc.) The RSS center can only read the information and cannot adjust the problem from the remote location.

	ltem	Reports:	
1	Paper end	End of paper supply.	
2	Toner end	Toner supply completely exhausted.	
3	Staple end	Staple supply exhausted.	
4	Toner near-end	Toner supply is nearly exhausted.	
5	Door open	One or more covers open (for each location).	
6	Jammed paper position	The location where paper remains.	
7	Unit not ready status	Unit (fusing, duplex) not set correctly.	
8	Machine condition	Operating status (standby, copying etc.)	
9	SC information details	More information about issued SC code.	
10	Tray paper size	Size of paper in each paper tray.	
11	System configuration	Description of system.	
12	Total jam count	Total for paper jams during copying/printing.	
13	Original jam count	Total for original jams during copying.	
14	Copy paper jam total by cause	Paper jams by cause/location of jam.	
15	Original jam count by cause	Original jams by cause/location of jam.	
16	Copy paper jam count by size	Paper jams by paper size.	
17	Latest 10 paper jams history	History of 10 most recent paper jams.	
18	Latest 10 original jams history	History of 10 most recent original jams.	
19	Total electronic count	Total count and print count.	
20	Original total	Number of original sheets fed.	
21	Copy total by paper size	Total copies by paper size.	
22	Copy total by paper type	Total copies by paper type.	
23	Copy total by paper tray	Total copies by feed source.	
24	DF original total	Total of sheets fed from DF.	
25	Staple total	Total number of staples used.	
26	Copy total by magnification rates	Copies by rates of enlargement/reduction.	
27	Copy total by mode	Copies by mode (Text, Text/Photo, etc.)	
28	Continuous output copy jobs	Total copies for continuous print jobs.	
29	PM alarm level (paper)	Total copies for PM cycles.	
30	PM replace level by parts	PM levels part by part.	
31	Total copier operation time	Total hours copier has been in operation.	
32	Total SC count	Total number of SC codes issued.	
33	SC count by type: Scanning	SC code total generated by scanning.	
34	SC count by type: Exposure	SC code total generated by exposure.	
35	SC count by type: Drum	SC code total generated by drum unit.	
36	SC count by type: Paper Feed	SC code total generated by paper feed.	
37	SC count by type: Communication	SC code total generated by communication.	
38	SC count by type: Peripherals	SC code total generated by peripheral devices.	
39	SC count by type: Controller	SC code total generated by controller unit.	
40	SC count by type: Others	SC code total generated in areas other than the above.	
41	ROM version	Version of the current ROM installed in the machine.	

The counter level for each PM part is expressed as a code.

The code indicates the current value of the part counter, compared with the alarm level for the part.

The diagram below shows the relationship between the code and the counter level. A part which is not selected for the PM list ("No" is selected in the All PM Parts List) is shown as "Z".

Part Counter Level (%)		Part Condition Code	;
200% 190% 180% 170% 160% 150% 140% 130% 120%		K J I G F E D C	
110%		<u>-</u> A	
100%		9	Alarm Level
90%		8	
80%		7	
70%		6	
60%		5	
50%		4	
40%		3	
30%		2	
20%			
10%		0	
0%	L		

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1.5.3 READ AND WRITE ITEMS

These items can not only be read at the RSS center but also adjusted remotely by overwriting settings with new settings.

	ltem		
1	Printer sub scan registration adjustment		
2	Printer main scan registration adjustment		
3	Fusing temperature setting		
4	Fusing web usage amount display/setting		
5	Bias grid voltage setting		
6	Exposure white margin setting		
7	Development bias output confirmation		
8	Toner supply mode		
9	Toner supply capacity setting		
10	Toner supply standard Vref value setting		
11	Copy bias output confirmation		
12	TD sensor initial value manual setting		
13	ID sensor initial setting value reading		
14	Scanner sub scan speed adjustment		
15	Priority feed setting		
16	Auto paper select priority setting		
17	Operation panel buzzer sound setting		
18	Priority magnification setting		
19	Copy number control setting		
20	Priority application setting		
21	Copy and auto clear time setting		
22	Shift to low power mode time setting		
23	Limitless feed setting		
24	Date and time setting (yy:mm:dd:hh:mm)		
25	Weekly timer setting (hh:mm)		
26	Weekly timer code setting		
27	Auto off function release setting		
28	Auto off time setting		
29	PM alarm: Level setting (1 K sheets)		
30	Jam alarm level setting (H, M, L, Z)		
31	Error alarm level setting		
32	Supply management call on/off setting		
33	Supply management call level setting		
34	CC call on/off setting		
35	PM call (by parts) report alarm level setting		
36	PM call (by parts) report alarm level on/off setting		
37	Machine number setting		
38	Service telephone number setting		
39	SADF auto reset time setting		
40	Staple position adjustment		

1.5.4 EXECUTE ITEMS

The following settings (counter, log clearing, etc.) can be done for the machine from the CSS center.

	Item	Comment
1	SC code reset	Release of SC codes can be executed remotely, but only for SC codes other than "Level A" SC codes.
2	PM counter clear	PM counters can be cleared remotely.
3	Each type of counter clear	Each counter can be individually cleared remotely.

1.6 PM PROCEDURE OR OTHER MAINTENANCE

Before beginning PM or any other maintenance procedure:

- 1. Set SP5816-002 to "**0**" to disable the RSS function.
- 2. When maintenance is completed, set SP5816-002 to "1" to enable the RSS function.
 - **NOTE:** The RSS function will remain disabled for four hours. Therefore, if maintenance for longer than four hours is required, SP5816-002 should be set to "**0**" again to disable RSS.