Gestetner® RICOH® savin®

A283/A284

SUPPLEMENTAL SERVICE MANUAL

(To be used in conjunction with A232 Service Manual)

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SERVICE MANUAL

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Ricoh Corporation

LEGEND

PRODUCT CODE	COMPANY		
	GESTETNER	RICOH	SAVIN
A283	3235e	Aficio 350e	9935DPE
A284	3245e	Aficio 450e	9945DPE

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
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⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

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

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.

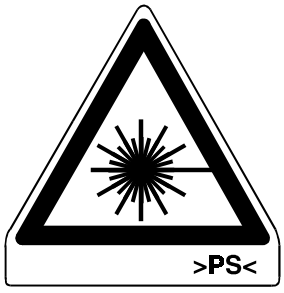
⚠WARNING

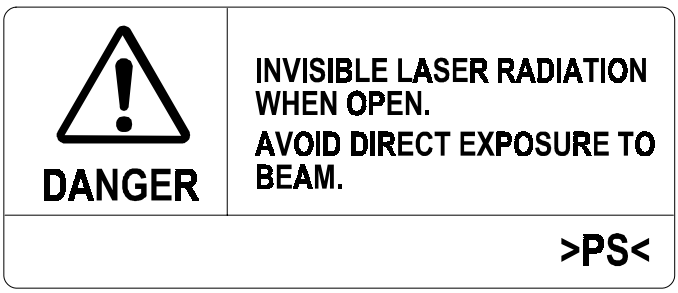
Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠WARNING

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

CAUTION MARKING:





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OVERALL INFORMATION

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

The "*" mark indicates differences between these machines and the A230/A231/A232 machines.

	A283 (35 cpm)	A284 (45 cpm)	Note
Configuration:	Desktop		
Copy Process:	Dry electrostatic transfer system		
Original:	Sheet/Book		
Original Size	Maximum A3/11" x 17"		
Copy Paper Size:	Maximum: A3/11" x 17" Minimum: A5/5.5" x 8.5" lengthwise (Paper tray / Duplex) A6/5.5" x 8.5" lengthwise (By-pass)		
Copy Paper Weight:	Paper Tray/Duplex: 64 - 105 g/m^2, 20 – 28 lb By-pass: 52 - 157 g/m^2, 16 – 42 lb		
Reproduction Ratios:	7R5E Metric version (%): 400, 200, 141, 122, 115, 100, 93, 87, 82, 71, 65, 50, 25 Inch version (%): 400, 200, 155, 129, 121, 100, 93, 85, 78, 73, 65, 50, 25	7R5E Metric version (%): 400, 200, 141, 122, 115, 100, 93, 87, 82, 71, 65, 50, 35 Inch version (%): 400, 200, 155, 129, 121, 100, 93, 85, 78, 73, 65, 50, 32	
Zoom:	Both versions: 25% to 400% in 1% steps	Metric version: 35% to 400% in 1% steps Inch version: 32% to 400% in 1% steps	
Copying Speed	35 cpm (A4/11" x 8.5" sideways) 19 cpm (A3/11" x 17")	45 cpm (A4/11" x 8.5" sideways) 22 cpm (A3/11" x 17")	Full size Repeat copy mode
Resolution*:	Scanning and Printing: 600 dpi		
Gradation:	Scanning and Printing: 256 levels		
Warm-up Time:	Less than 85 s	Less than 100 s	23°C, 73°F
First Copy Time (1st Tray):	Less than 3.9 s	Less than 3.2 s	A4/11" x 8.5" sideways (1st paper tray)
Copy Number Input:	Ten-key pad, 1 to 999		Count up or count down

	A283 (35 cpm)	A284 (45 cpm)	Note
Manual Image Density Selection:	5 steps		
Automatic Reset:	60 s is the standard setting; it can be changed with the UP mode.		
Auto Shut Off:	60 min. is the standard setting; it can be changed with the UP mode.		
Copy Paper Capacity:	Paper Tray: 500 sheets (stack thickness up to 56 mm, 2.2") x 2 By-pass Feed: 50 sheets (stack thickness up to 5.5 mm, 0.2")		
Copy Tray Capacity:	A4/11" x 8.5": 500 sheets A3/B4/8.5" x 14"/11" x 17": 250 sheets		Standard copy tray
Toner Replenishment:	Cartridge exchange (700 g/cartridge)		
Toner Yield:	27k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)		
Power Source:	North America 120V/60Hz, More than 12 A		
Dimensions (W x D x H)	670 x 640 x 720 mm (26.4" x 25.2" x 28.3")		Without options
Weight:	75 kg (166 lb)		

Power Consumption:

Mainframe only

	A283	A284	Note
Maximum	Less than 1.44 kW	Less than 1.44 kW	
Copying	Less than 1.05 kW	Less than 1.05 kW	
Warm-up	Less than 1.00 kW	Less than 1.05 kW	
Stand-by	Less than 200 Wh	Less than 220 Wh	

System

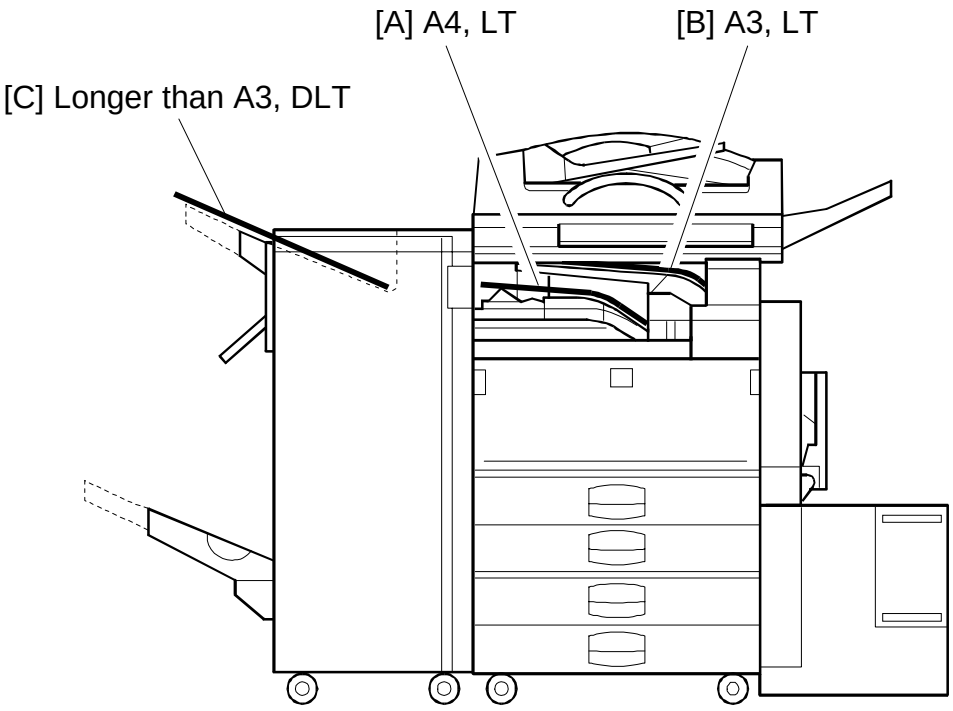
	A283	A284	Note
Maximum	Less than 1.44 kW	Less than 1.44 kW	Without the optional heaters, fax unit, and printer controller.
Copying	Less than 1.15 kW	Less than 1.15 kW	
Warm-up	Less than 1.00 kW	Less than 1.05 kW	
Stand-by	Less than 200 Wh	Less than 230 Wh	

Noise Emission:

	Mainframe Only	Full System
Copying		
A283	52 dB(A) or less	60 dB(A) or less
A284	56 dB(A) or less	62 dB(A) or less
Stand-by		
A283	27 dB(A) or less	28 dB(A) or less
A284	27 dB(A) or less	28 dB(A) or less

NOTE: 1) The above measurements were made in accordance with ISO 7779.
2) Full system measurements do not include the optional fax unit and the printer controller.
3) In the above stand-by condition, the polygon motor is not rotating.

1.2 PAPER EXIT TRAY SELECTION

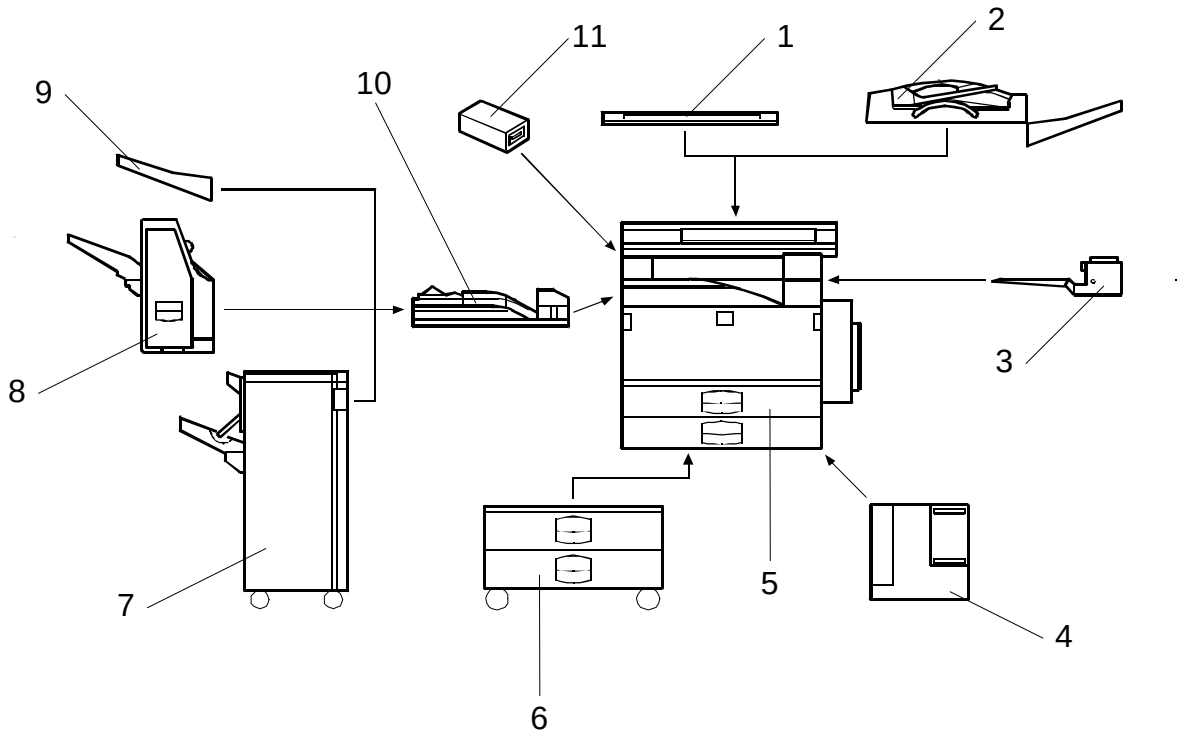


The machine allows selection between the paper tray exit trays: Int. Tray [A] (standard output tray), Int. Tray 2 [B] (optional one-bin tray), and Ext. Tray [C] (finisher or optional external output tray). If the sub-scan length is more than 330 mm, the exit tray is as shown below, if the relevant options have been installed.

Installed options	Exit tray for paper longer than 330 mm
Bridge unit & Finisher (1,000-sheet)	Int. Tray [A]
Bridge unit & Finisher (3,000-sheet)	Ext. Tray [C]: The finisher upper tray
Bridge unit & optional ext. output tray	Ext. Tray [C]: Ext. output tray

1.3 MACHINE CONFIGURATION

1.3.1 SYSTEM COMPONENTS



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

Version	Item	Machine Code	No.	Note
Copy	Copier (A283)	A283	5	
	Copier (A284)	A284	5	
	ARDF (Option)	A680	2	C
	Platen Cover (Option)	A381	1	C
	Paper Tray Unit (Option)	A682	6	C
	LCT (Option)	A683	4	C
	1-bin Tray (Option)	A684	3	C
	Bridge Unit (Option)	A688	10	C
	1000-sheet Finisher (Option)	A681	8	C
	3000-sheet Finisher (Option – A284 only)	A697	7	C
	Punch Unit (Option for 3000-sheet Finisher)	A812-17 (3 holes) A812-27 (2 holes)	---	C
	External Output Tray (Option)	A825	9	C
	Key Counter Bracket (Option)	A674	11	C
	Expansion Box (Option)	A872	---	U
Fax	Fax Unit (Option)	A874	---	U
	ISDN Unit (Option)	A816	---	C
	RAM SIMM (Option)	---	---	
	400-dpi High Resolution (Option)	A892	---	D
	PC-Fax Expander	B368	---	U
	Handset (Option)	A646	---	C
	Stamp Unit (Option)	A813	---	C
Printer	Printer Controller	B358	---	U
	PostScript Kit	A854	---	C
	Hard Disk	A853	---	C
	Network Interface Board	A855	---	C
	Mailbox	G909	---	C
	Mailbox Bridge Unit	G912	---	C
	RAM SIMM	---	---	
Scanner	Scanner Kit	B359	---	U
	RAM SIMM	---	---	

Symbol: U: Unique options C: Option also used with A230/A231/A232

D: Option also used with A265/A267

1.3.2 INSTALLABLE OPTION TABLE

Copier options

O = Available, Δ = Requires another option, **X** = Not available

Option	A283	A284	Note
ARDF	O	O	
Platen Cover	O	O	
Paper Tray Unit	O	O	
LCT	Δ	Δ	Requires the paper tray unit.
1-bin Tray	O	O	
Bridge Unit	O	O	
1,000-sheet Finisher	Δ	Δ	Requires the paper tray unit and bridge unit.
3,000-sheet Finisher	X	Δ	Requires the paper tray unit and bridge unit.
Punch Unit	X	Δ	Requires the 3000-sheet finisher.
External Output Tray	Δ	Δ	Requires the bridge unit.
Key Counter Bracket	O	O	
Expansion Box	O	O	It is required only when the fax option and/or printer option is installed.

Printer options

O = Available, Δ = Requires another option

Option	A283	A284	Note
PostScript Kit	O	O	
Hard Disk	O	O	
Network Interface Board	O	O	
Mailbox	Δ	Δ	Requires the paper tray unit.
Mailbox Bridge Unit	Δ	Δ	Requires the mailbox.
RAM SIMM	O	O	

Fax options and scanner kits

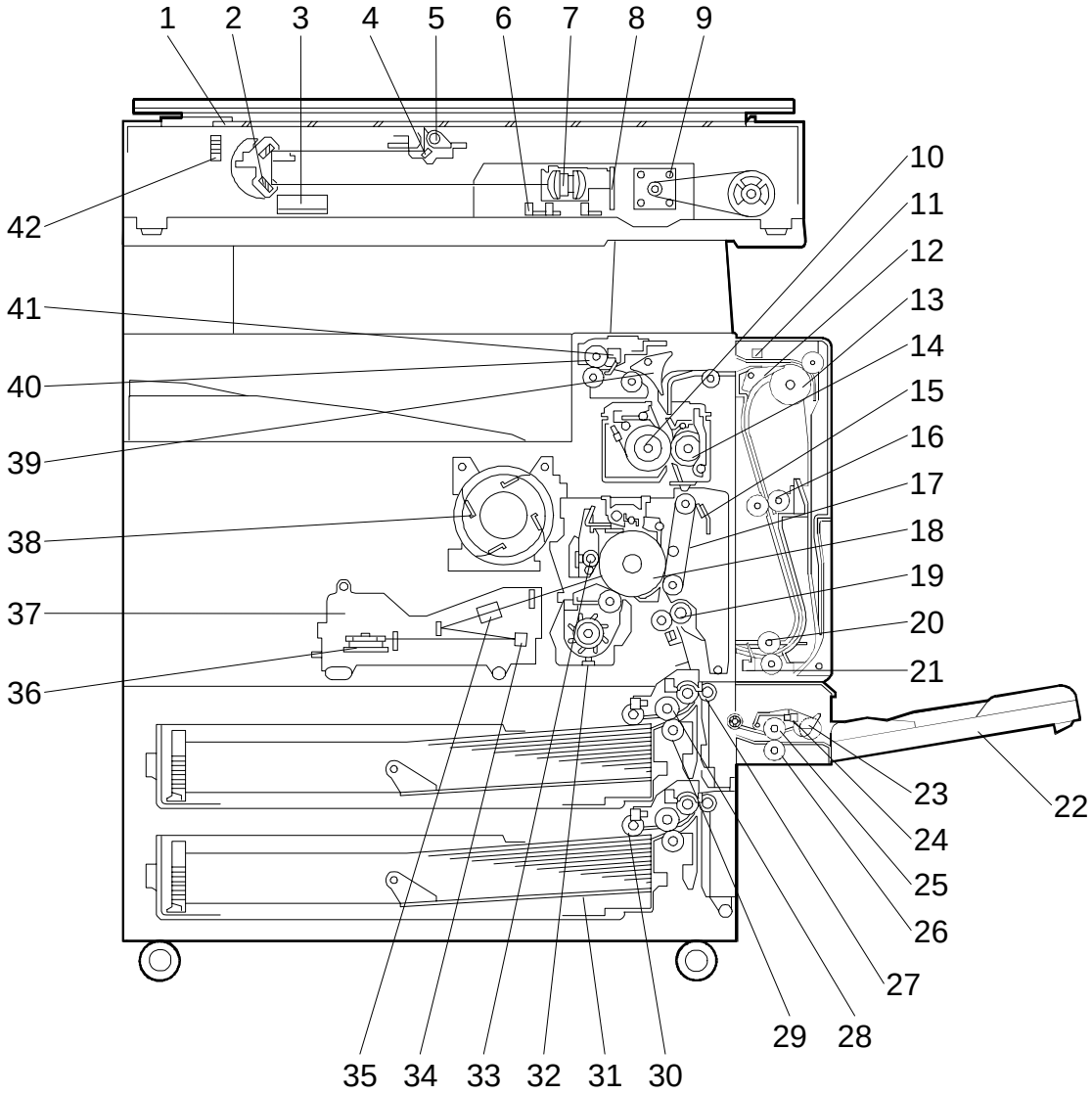
All options for the fax unit are available when the fax unit has been installed.

Relationship between main machine, mailbox, and finisher

O = Available, **X** = Not available

Model	Mailbox	1000-sheet Finisher	3000-sheet Finisher
A283	Installed	X	X
	Not Installed	O	X
A284	Installed	X	O
	Not Installed	O	O

1.4 MECHANICAL COMPONENT LAYOUT



1. Exposure Glass
2. 2nd Mirror
3. Original Width Sensors
4. 1st Mirror
5. Exposure Lamp
6. Original Length Sensors
7. Lens
8. SBU
9. Scanner Motor
10. Hot Roller
11. Entrance Sensor
12. Inverter Gate
13. Inverter Roller
14. Pressure Roller
15. Transfer Belt Cleaning Blade
16. Upper Transport Roller
17. Transfer Belt
18. OPC Drum
19. Registration Roller
20. Lower Transport Roller
21. Exit Sensor
22. By-pass Tray
23. Pick-up Roller
24. Paper End Sensor
25. Paper Feed Roller
26. Separation Roller
27. Upper Relay Roller
28. Feed Roller
29. Separation Roller
30. Pick-up Roller
31. Bottom Plate
32. Development Unit
33. Charge Roller
34. Fθ Mirror
35. Barrel Toroidal Lens (BTL)
36. Polygonal Mirror Motor
37. Laser Unit
38. Toner Supply Bottle Holder
39. Exit Junction Gate
40. Exit Roller
41. Paper Exit Sensor
42. 3rd Mirror

1.5 PAPER PATH

The paper path is the same as for A230/A231/A232 machines.

1.6 DRIVE LAYOUT

The drive layout is the same as for A230/A231/A232 machines.

1.7 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout and the point-to-point diagram on the waterproof paper in the pocket for the locations of these components.

Symbol	Index No.	Description	Note
Printed Circuit Boards			
PCB1	58	BICU (Base Engine & Image Control Unit)	Controls all copier functions both directly and through other control boards.
PCB2	55	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp and optional heaters.
PCB3	61	IOB (Input/Output Board)	Controls the mechanical parts of the printer (excluding the paper feed section), and the fusing lamp power.
PCB4	62	Paper Feed Control (PFB)	Controls the mechanical parts of all paper feed sections.
PCB5	63	High Voltage Supply	Supplies high voltage to the drum charge roller, development roller, and transfer belt.
PCB6	9	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the BICU board.
PCB7	7	SIB (Scanner Interface Board)	Controls the scanner carriages and passes signals from the scanner unit to the BICU board.
PCB8	11	Operation Panel	Controls the LCD and LED matrix and monitors the key matrix.
PCB9	4	Lamp Stabilizer	Provides dc power to the exposure lamp.
PCB10	19	LDDR (Laser Diode Driver)	Controls the laser diode.
PCB11	54	SIFB (Scanner Interface Board)	Passes signals between the SBU and BICU boards.
PCB12	65	Main (Duplex)	Controls the duplex unit and communicates with the copier.
Motors			
M1	35	Main	Drives the main body components.
M2	8	Scanner Drive	Drives the 1st and 2nd scanners.
M3	45	Tray Lift	Raises the bottom plate in the paper tray.
M4	22	Polygonal Mirror	Turns the polygonal mirror.
M5	20	LD Positioning	Rotates the LD unit to adjust the LD beam pitch when a different resolution is selected.
M6	36	Cooling Fan	Removes heat from the main PCBs.
M7	37	Exhaust Fan	Removes heat from around the fusing unit.
M8	34	Toner Supply	Rotates the toner bottle to supply toner to the development unit.
M9	56	PSU Cooling Fan	Removes heat from the PSU.
M10	64	Inverter (Duplex)	Drives the duplex inverter roller.
M11	66	Transport (Duplex)	Drives the duplex upper and lower transport rollers.

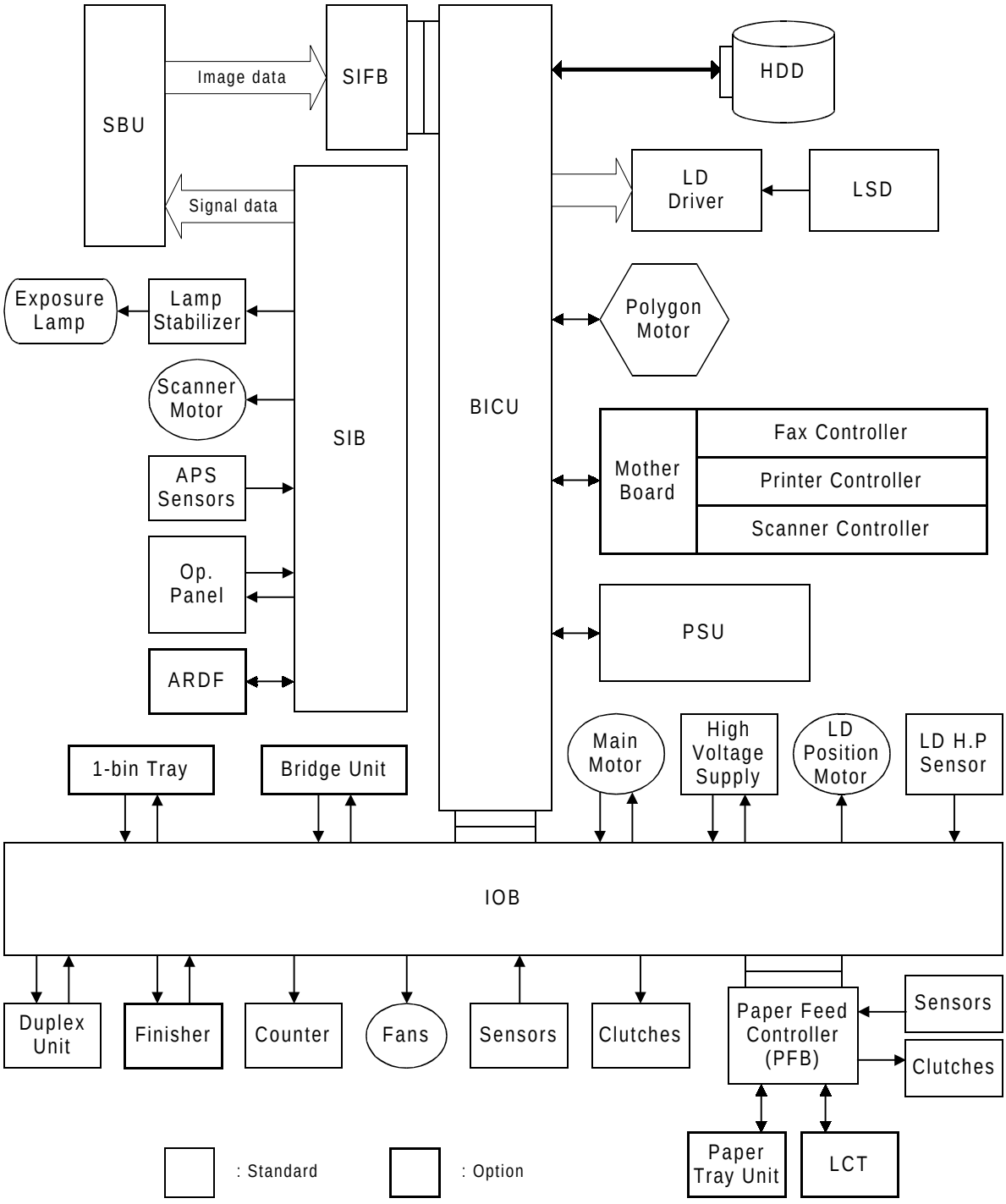
Symbol	Index No.	Description	Note
Sensors			
S1	2	Scanner Home Position	Informs the CPU when the 1st and 2nd scanners are at the home position.
S2	3	Platen Cover	Informs the CPU whether the platen cover is up or down (related to APS/ARE functions). ARE: Auto Reduce and Enlarge
S3	12	Original Width	Detects the width of the original. This is one of the APS (Auto Paper Select) sensors.
S4	5	Original Length-1	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S5	6	Original Length-2	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S6	21	LD Unit Home Position	Informs the CPU when the LD unit is at the home positon.
S7	17	Toner Density (TD)	Detects the amount of toner inside the development unit.
S8	24	Paper Exit	Detects misfeeds.
S9	27	Registration	Detects the leading edge of the copy paper to determine the stop timing of the paper feed clutch, and detects misfeeds.
S10	26	Image Density (ID)	Detects the density of various patterns and the reflectivity of the drum for process control.
S11	28	Upper Paper Height	Detects when the paper in the upper paper tray is at the feed height.
S12	30	Lower Paper Height	Detects when the paper in the lower paper tray is at the feed height.
S13	29	Upper Paper End	Informs the CPU when the upper paper tray runs out of paper.
S14	31	Lower Paper End	Informs the CPU when the lower paper tray runs out of paper.
S15	33	Upper Relay	Detects misfeeds.
S16	32	Lower Relay	Detects misfeeds.
S17	48	Upper Tray	Informs the CPU whether the upper paper tray is set into the machine or not.
S18	46	Lower Tray	Informs the CPU whether the lower paper tray is set into the machine or not.
S19	38	Transfer Belt Position	Informs the CPU of the current position of the transfer belt unit.
S20	18	Toner Overflow	Detects toner overflow in the toner collection tank.
S21	61	Duplex Entrance	Detects the trailing edge of the copy paper to turn on the inverter gate solenoid and turn on the inverter motor in reverse. Checks for misfeeds.
S22	67	Exit (Duplex)	Checks for misfeeds.
S23	68	Cover Guide (Duplex)	Detects whether the cover guide is opened or not.

Symbol	Index No.	Description	Note
S24	69	Paper End (By-pass)	Informs the copier when the by-pass tray runs out of paper.
S25	72	Paper Size Sensor Board (By-pass)	Detects the paper width for the by-pass tray unit.
Switches			
SW1	43	Right Lower Cover	Detects whether the right lower cover is open or closed.
SW2	49	Right Upper Cover	Cut the +5VLD and +24V dc power line and detects when the right upper cover is open.
SW3	51	Main Power Switch	Supplies power to the copier. If this is off, there is no power supplied to the copier.
SW4	52	Front Cover Safety	Cuts the +5VLD and +24V dc power line and detects when the front cover is open.
SW5	10	Operation Switch	Provides power for machine operation. The machine still has power if this switch is off.
SW6	62	Duplex Unit	Detects whether the duplex unit is opened or not.
Magnetic Clutches			
CL1	39	Transfer Belt	Controls the touch and release movement of the transfer belt unit.
CL2	40	Registration	Drives the registration rollers.
CL3	44	Relay	Drives the relay rollers.
CL4	41	Upper Paper Feed	Starts paper feed from the upper paper tray.
CL5	42	Lower Paper Feed	Starts paper feed from the lower paper tray.
CL6	71	Paper Feed (By-pass)	Starts paper feed from the by-pass tray unit.
Solenoids			
SOL1	63	Inverter Gate (Duplex)	Controls the duplex inverter gate.
SOL2	70	Pick-up (By-pass)	Moves the pick-up roller for the by-pass feed tray to contact the paper.
SOL3	73	Exit Junction Gate (Interchange unit)	Controls the exit junction gate.
SOL4	74	Duplex Junction Gate (Interchange unit)	Controls the duplex junction gate.
Lamps			
L1	13	Exposure	Applies high intensity light to the original for exposure.
L2	16	Fusing	Provides heat to the hot roller.
L3	25	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.
Heaters			

Symbol	Index No.	Description	Note
H1	1	Optics Anti-condensation (option)	Turns on when the main power switch is off to prevent moisture from forming on the optics.
H2	47	Tray (option)	Turns on when the main power switch is off to keep paper dry in the paper tray.
Thermistors			
TH1	14	Fusing	Monitors the temperature at the central area of the hot roller.
Thermofuses			
TF1	15	Fusing	Provides back up overheat protection in the fusing unit.
Counters			
CO1	50	Total	Keeps track of the total number of prints made.
CO2	N/A	Key (option)	Used for control of authorized use. If this feature is enabled for copying, copying will be impossible until it is installed. It can also be enabled for fax and printer modes separately.
Others			
LSD	23	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.

1.8 BOARD STRUCTURE

1.8.1 BLOCK DIAGRAM



1.8.2 DESCRIPTIONS

1. BICU (Base Engine and Image Control Unit)

This is the main board. It controls the following functions.

- Engine sequence
- Timing control for peripherals
- Image processing, video control
- Operation control
- Application boards (fax, printer, scanner)

2. IOB (Input/Output Board)

The IOB handles the following functions.

- Drive control for the sensors, motors, and solenoids in the printer engine
- PWM control for the high voltage supply board
- Serial interface with peripherals
- Fusing control

3. SBU (Sensor Board Unit)

The SBU receives analog signals from the CCD and converts them into digital signals.

4. SIB (Scanner Interface Board)

This board controls the scanner motor and passes signals between the BICU board and the component parts of the scanner unit.

5. SIFB (Scanner Interface Board)

This board interfaces the SBU with the BICU.

6. Mother Board (Option)

This board interfaces the BICU with the fax controller, printer controller and/or the scanner kit. The mother board is part of the expansion box option.

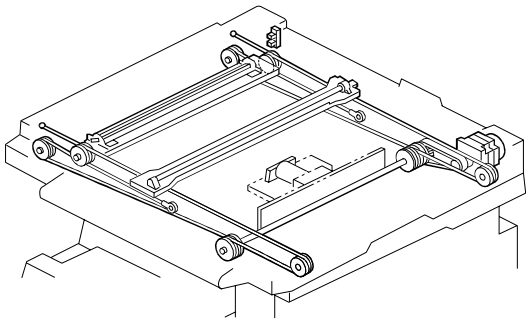
DETAILED DESCRIPTIONS

2. DETAILED DESCRIPTIONS

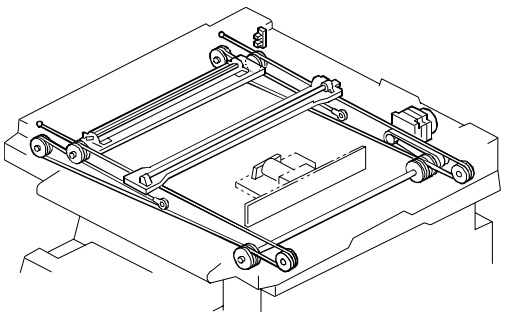
2.1 SCANNING

2.1.1 OVERVIEW

For A230/A231/A232



For A283/A284

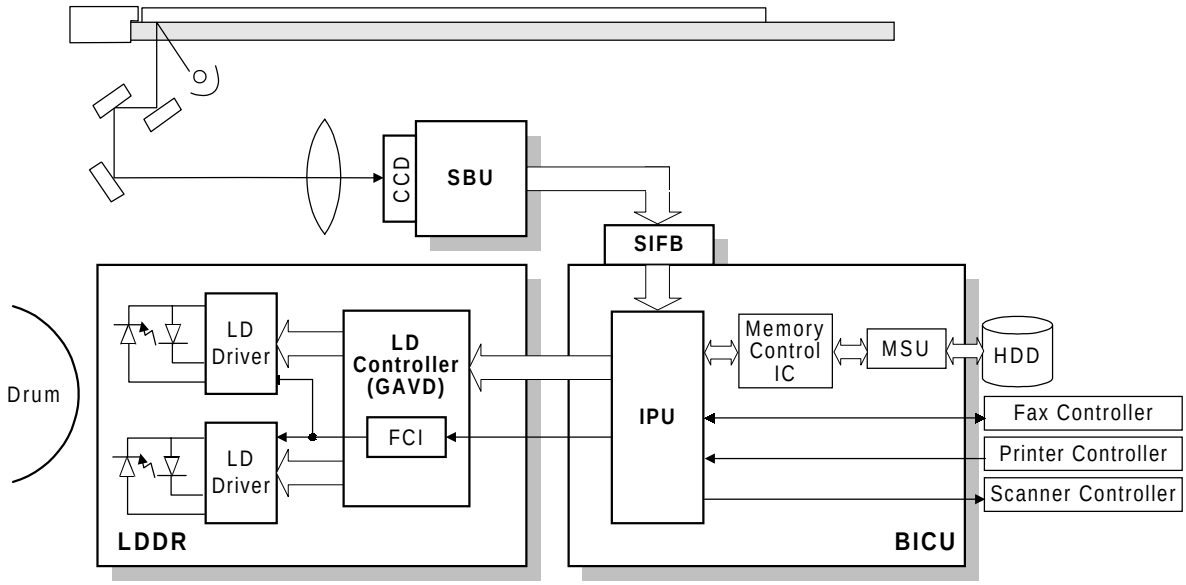


The mechanical components of the scanner unit are the same as for the A230/A231/A232. However, the following items have been changed because this machine scans at 600 dpi.

- The lens is larger
- Because the lens size has been changed, the drive layout has been changed as shown in the above illustration. Note the position of the scanner drive motor.
- Image processing is slightly different
- To reduce the electrical noise generated by the high frequency image data signal, a shield plate has been added to the lens block unit.

2.2 IMAGE PROCESSING

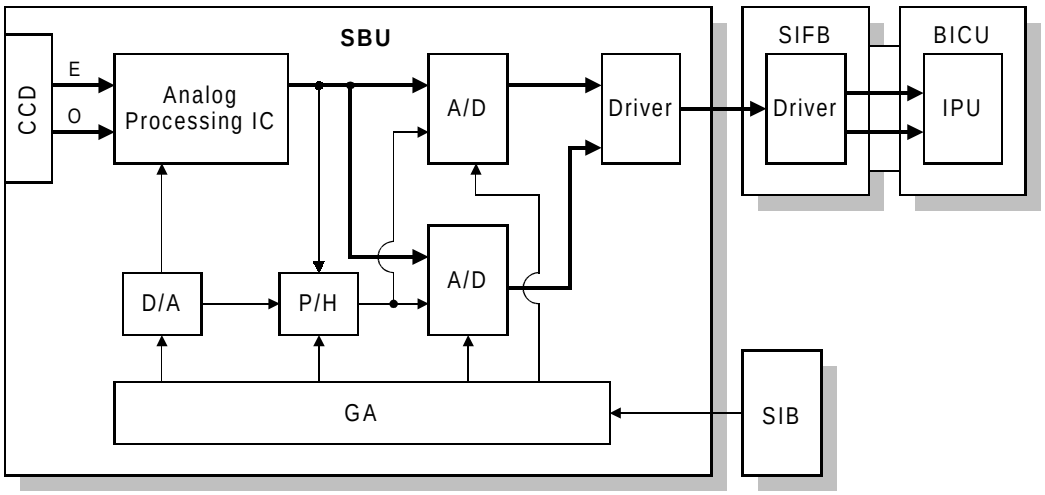
2.2.1 OVERVIEW



The image data flows similarly to the A230/A231/A232 machines. The differences are the following.

- The video data go to the IPU chip through only the SIFB.
- The MSU circuit is on the BICU board.
- The image processing is changed.

2.2.2 SBU



The CCD has two output lines, one each for odd and even pixels, to the analog processing IC. The analog processing IC performs the zero clamp and signal amplification. The analog signals are then converted to 8-bit signals by the A/D converter. The digital signals go to the driver, where they are converted to serial data. Then, these go to the SIFB. In the SIFB, the data is converted to parallel signals (8-bit x 2) by the driver, and these go to the IPU chip.

The SIB controls the circuits on the SBU (such as those for shading).

2.2.3 IMAGE PROCESSING

Overview

The differences in the image processing from the A230/A231/A232 are as follows.

- 600 dpi scanning and printing
- Only grayscale processing mode is available.
- The copy quality for the low contrast image is improved (the filters and the γ table have been modified).
- To consist with gradation and resolution in the text mode, using the error diffusion processing.

Image Processing Path

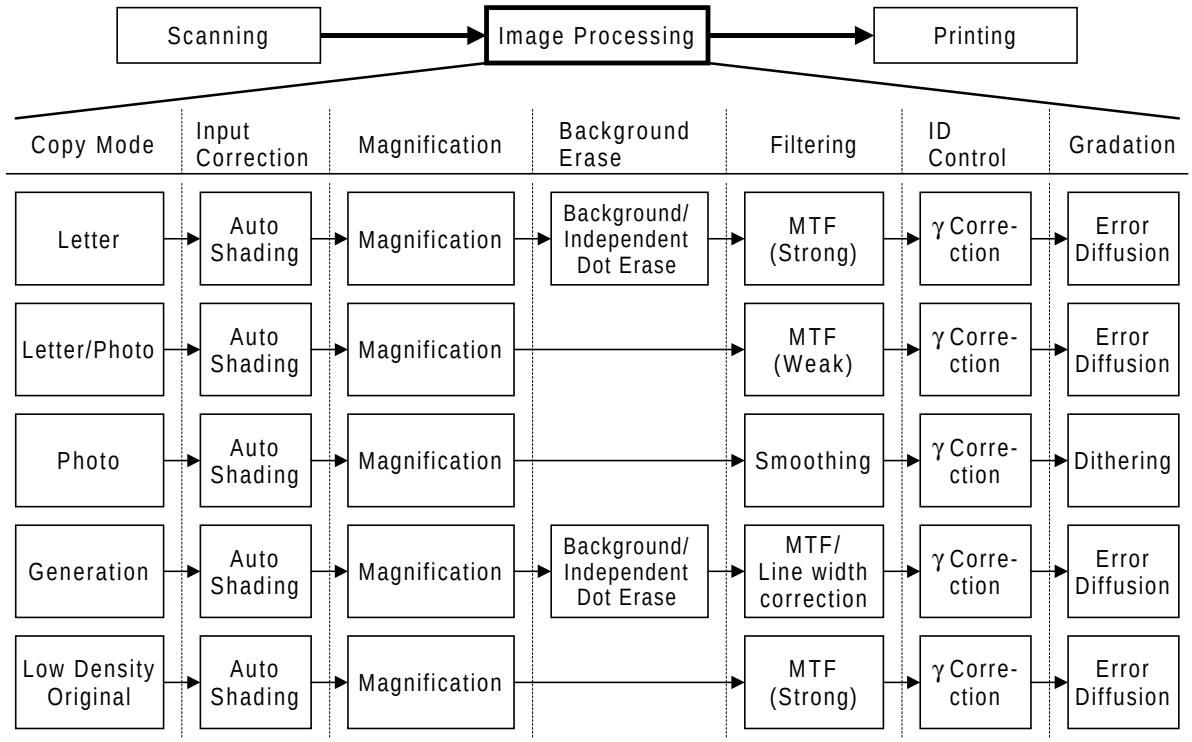


Photo mode: MTF can be used instead of smoothing (SP4-904-3).

SP modes for each image processing mode

Copy mode	Background erase	Filtering	Magnification	Gradation
Letter	**SP4903-34** Background erase level **SP4903-28** Independent dot erase level	**SP4903-11~14, 41~44** MTF filter coefficient **SP4903-20~23, 50~53** MTF filter strength	**SP2909-1** Main scan mag.	
Letter/ Photo	**SP4903-35** Background erase level **SP4903-30** Independent dot erase level	**SP4903-17, 47** MTF filter coefficient **SP4903-25, 55** MTF filter strength	**SP2909-1** Main scan mag.	
Photo	**SP4903-36** Background erase level	**SP4904-3** Filter type (smoothing or MTF) **SP4903-16** Smoothing filter coefficient **SP4903-15, 48** MTF filter coefficient **SP4903-24, 54** MTF filter strength	**SP2909-1** Main scan mag.	**SP4904-2** Dither matrix type
Copied Original	**SP4903-37** Background erase level **SP4903-32** Independent dot erase level	**SP4903-19, 46** MTF filter coefficient **SP4903-27, 57** MTF filter strength	**SP2909-1** Main scan mag.	**SP4904-6** Line width correction type
Low Density Original	**SP4903-31** Independent dot erase level	**SP4903-18, 45** MTF filter coefficient **SP4903-26, 56** MTF filter strength	**SP2909-1** Main scan mag.	

Filtering

There are two software filters: MTF and smoothing, as in the A230/A231/A232. There are four MTF filter types: filter strength for main scan direction, filter strength for sub scan direction, filter coefficient for main scan direction, and filter coefficient for sub scan direction. These filters can be adjusted with SP mode.

When the filter is stronger in the main scan direction, lines parallel to the feed direction are emphasized. When the filter is stronger in the sub scan direction, lines at right angles to the feed direction are emphasized.

The relationship between the filter coefficient and the filter strength is as follows.

MTF filter coefficient

(Weak) (Strong)
0 → 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11 → 12 → 13 → 14 → 15

MTF filter strength

(Weak) 0 → 1 → 2 → 3 → 4 → 5 → 6 → 7 (Strong)

Smoothing filter coefficient

(Weak) 0 → 1 → 2 → 3 → 4 → 5 → 6 → 7 (Strong)

It is difficult to explain how to use the filter coefficient and filter strengths to control MTF and smoothing. Refer to the following charts to determine how to make the filters weaker or stronger. The values in the bold columns are the default settings.

Text mode: 25 ~ 64 %							
MTF strength	Strong (Sharp)	←	←	**Normal**	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-11)	9	15	14	**12**	10	9	9
Sub scan: Filter coefficient (SP4903-41)	11	13	13	**12**	12	12	10
Main scan: Filter Strength (SP4903-20)	3	2	2	**2**	2	2	2
Sub scan: Filter Strength (SP4903-50)	3	2	2	**2**	2	2	2

Text mode: 65 ~ 154 %							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-12)	9	9	15	14	12	10	9
Sub scan: Filter coefficient (SP4903-42)	13	11	13	13	13	13	13
Main scan: Filter Strength (SP4903-21)	3	3	2	2	2	2	2
Sub scan: Filter Strength (SP4903-51)	3	3	2	2	2	2	2

Text mode: 155 ~ 400 %							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-13)	10	9	9	15	14	12	10
Sub scan: Filter coefficient (SP4903-43)	13	13	11	13	13	13	13
Main scan: Filter Strength (SP4903-22)	3	3	3	2	2	2	2
Sub scan: Filter Strength (SP4903-52)	3	3	3	2	2	2	2

Text mode: Notch 1 (lightest image density setting), 65 ~ 154 %							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-14)	9	9	15	14	12	10	9
Sub scan: Filter coefficient (SP4903-44)	13	11	13	13	13	13	13
Main scan: Filter Strength (SP4903-23)	4	4	3	3	3	3	3
Sub scan: Filter Strength (SP4903-53)	4	4	3	3	3	3	3

Photo mode: (when MTF filtering is selected with SP4903-3)							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-15)	9	9	15	14	12	10	9
Sub scan: Filter coefficient (SP4903-48)	13	11	13	13	13	13	13
Main scan: Filter Strength (SP4903-24)	2	2	1	1	1	1	1
Sub scan: Filter Strength (SP4903-54)	2	2	1	1	1	1	1

Text/Photo mode							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-17)	9	14	10	9	8	10	9
Sub scan: Filter coefficient (SP4903-47)	10	13	13	10	9	13	10
Main scan: Filter Strength (SP4903-25)	2	1	1	1	1	0	0
Sub scan: Filter Strength (SP4903-55)	2	1	1	1	1	0	0

Low density mode							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-18)	14	12	10	9	9	14	10
Sub scan: Filter coefficient (SP4903-45)	13	13	13	13	10	13	13
Main scan: Filter Strength (SP4903-26)	3	3	3	3	3	2	2
Sub scan: Filter Strength (SP4903-56)	3	3	3	3	3	2	2

Copied original mode							
MTF strength	Strong (Sharp)	←	←	Normal	→	→	Weak (Soft)
Main scan: Filter coefficient (SP4903-19)	9	9	12	10	9	9	14
Sub scan: Filter coefficient (SP4903-46)	13	10	13	13	13	10	13
Main scan: Filter Strength (SP4903-27)	3	3	2	2	2	2	1
Sub scan: Filter Strength (SP4903-57)	3	3	2	2	2	2	1

INSTALLATION

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

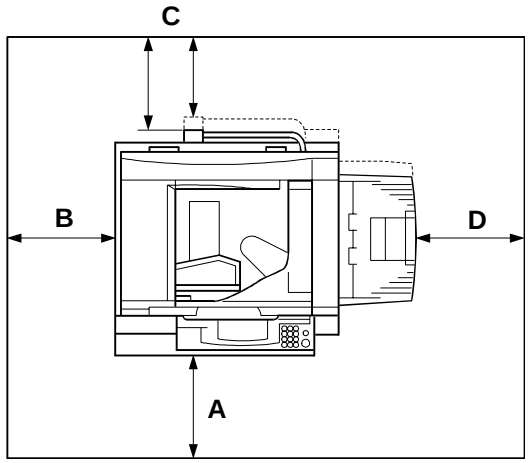
1. Temperature Range: 10°C to 30°C (50°F to 86°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10 -6 oz/yd^3)
6. Avoid an area which is exposed to sudden temperature changes. This includes:
   1) Areas directly exposed to cool air from an air conditioner.
   2) Areas directly exposed to heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the copier on a strong and level base. (Inclination on any side should be no more than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

3.1.2 MACHINE LEVEL

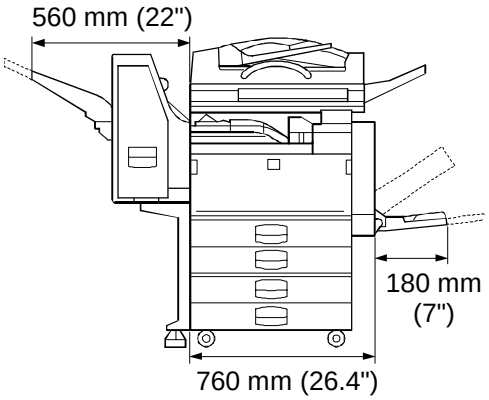
Front to back:	Within 5 mm (0.2") of level
Right to left:	With in 5 mm (0.2") of level

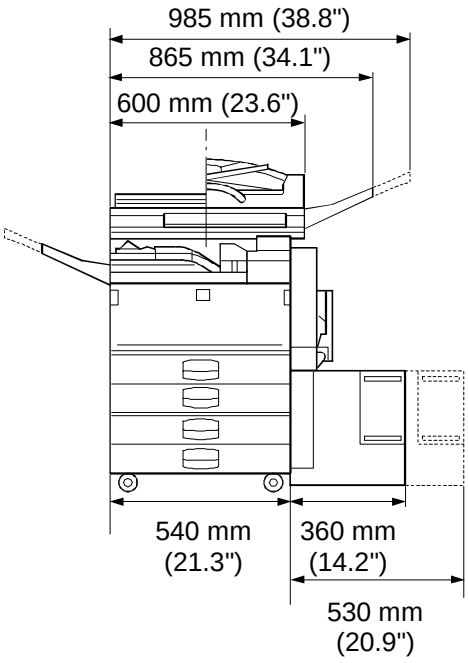
3.1.3 MINIMUM SPACE REQUIREMENTS

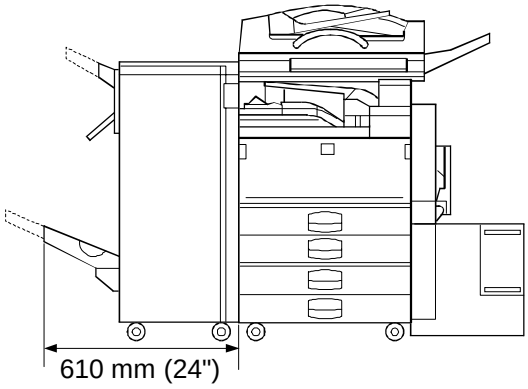
Place the copier near the power source, providing clearance as shown:



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







NOTE: The 75 cm recommended for the space at the front is for pulling out the paper tray only. If an operator stands at the front of the copier, more space is required.

3.1.4 POWER REQUIREMENTS

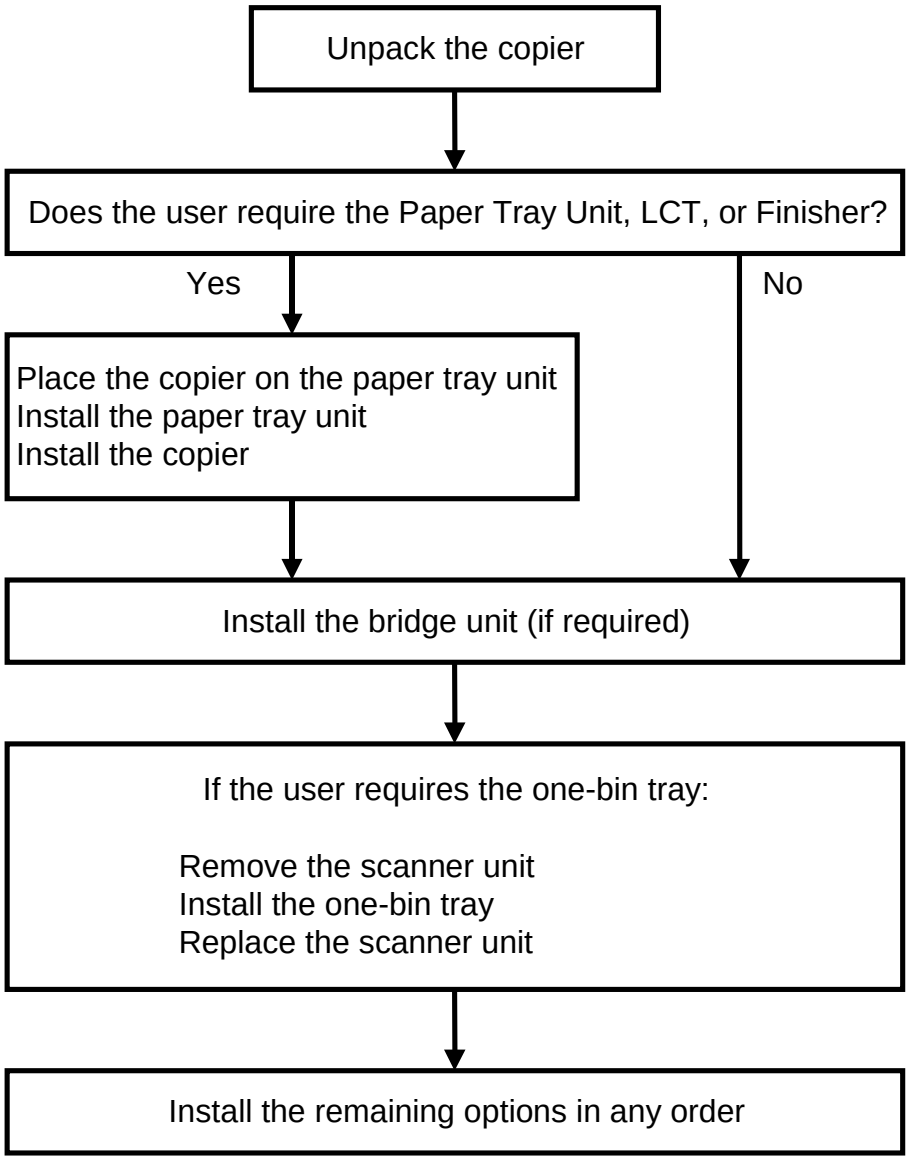
⚠CAUTION

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

1. Input voltage level: 120 V, 60 Hz: More than 10 A
2. Permissible voltage fluctuation: ±10 %
3. Do not set anything on the power cord.

3.2 INSTALLATION FLOW CHART

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



Bridge Unit: Needed for the finishers and the external output tray
Paper Tray Unit: Needed for the LCT and finishers
Other requirements: See Overall Machine Information – Installation Option Table

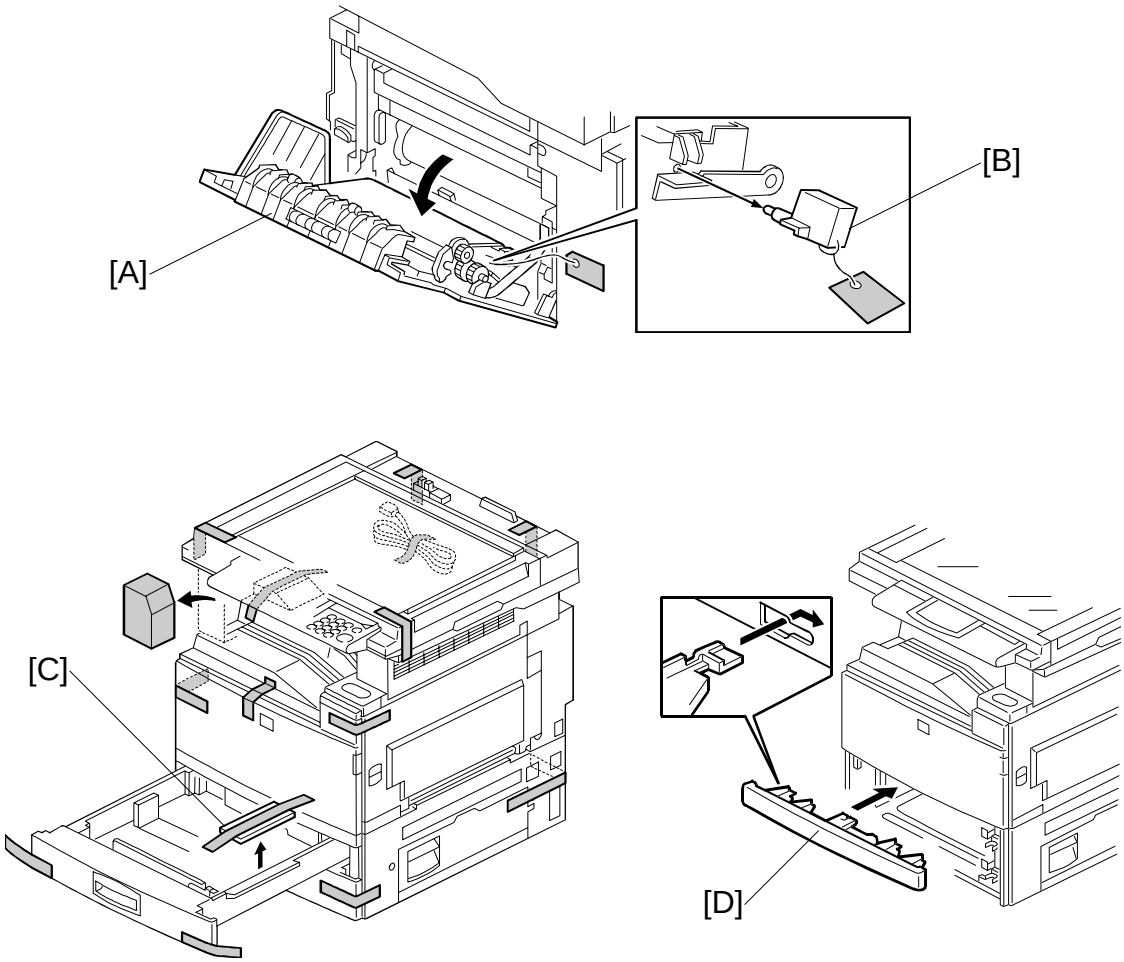
3.3 COPIER INSTALLATION

3.3.1 ACCESSORY CHECK

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

Description	Q'ty
1. Operation Panel Decal	1
2. Paper Size Decal	1
3. Model Name Decal (-10 machines)	1
4. Operation Panel Brand Sticker (-10 machines)	1
5. NECR – English (-17 machine)	1
6. Cushion	1
7. Operation Instructions – System Setting	1
8. Operation Instructions – Copy Reference	1
9. Operation Instructions – Quick Reference	1

3.3.2 INSTALLATION PROCEDURE



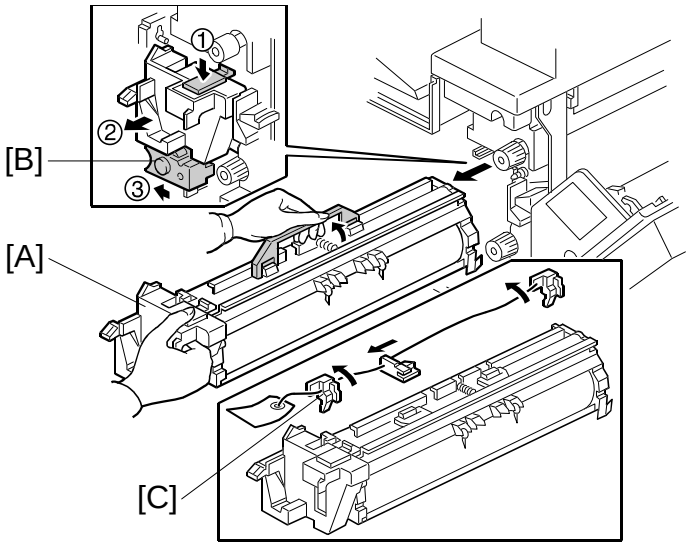
⚠CAUTION

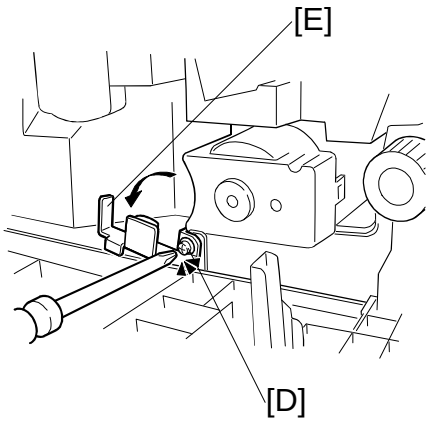
Unplug the machine power cord before starting the following procedure.

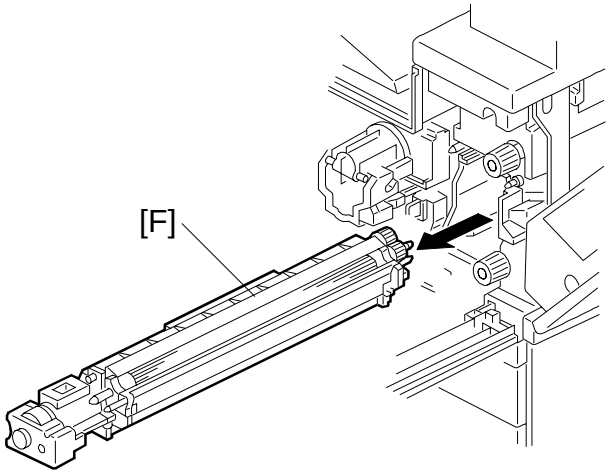
If the optional paper tray unit is going to be installed now, put the copier on the paper tray unit first, then install the paper tray unit, then install the copier.

NOTE: Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.

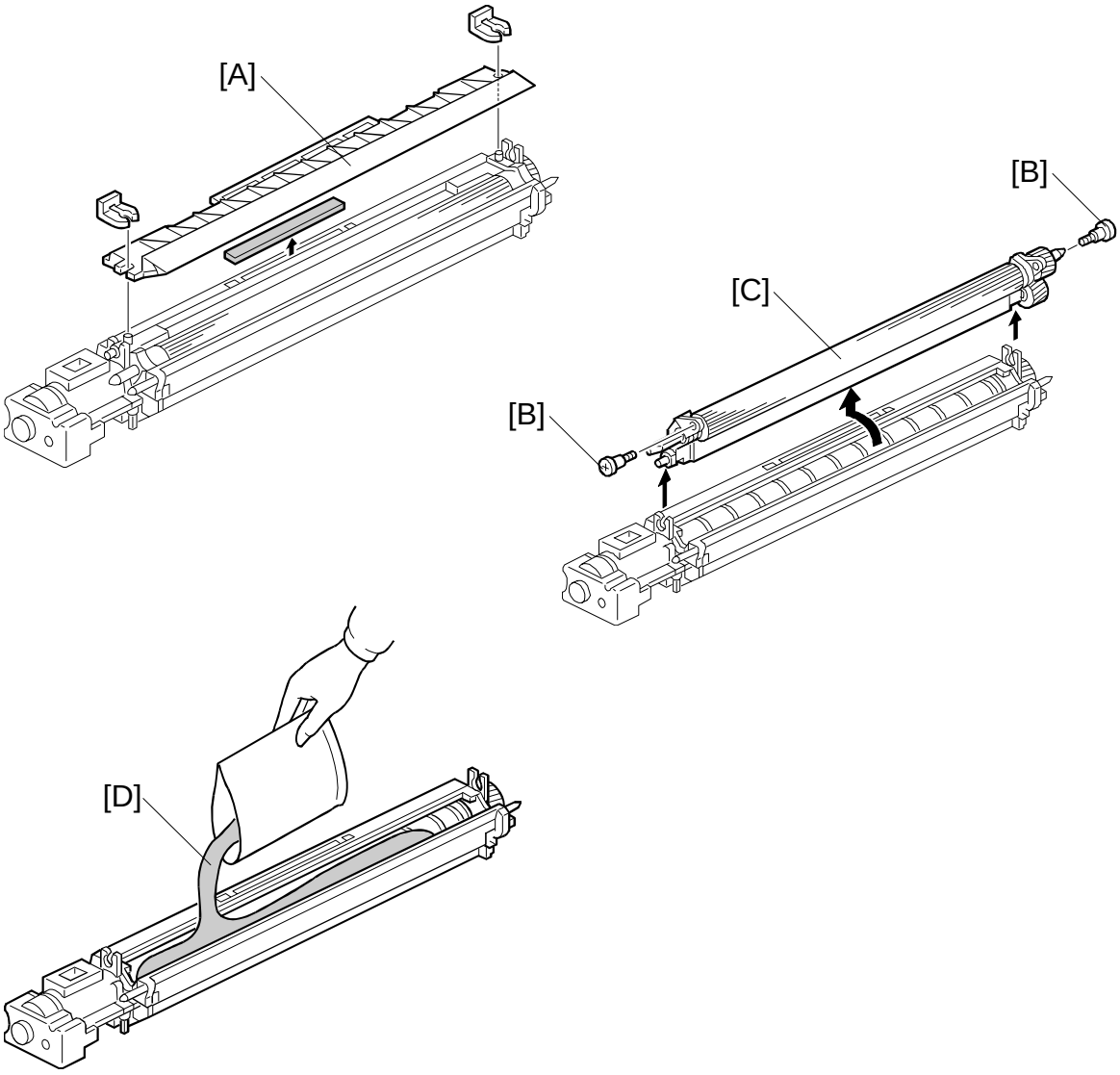
1. Remove the tapes on the exterior of the copier.
2. Open the duplex unit and open the upper right cover [A].
3. Remove the pin [B].
4. Pull out the paper trays and remove the bottom plate stoppers [C].
5. Install the middle front cover [D] which is in the second paper tray.
   NOTE: If the optional paper tray unit is installed, this step is done while installing the paper tray unit.



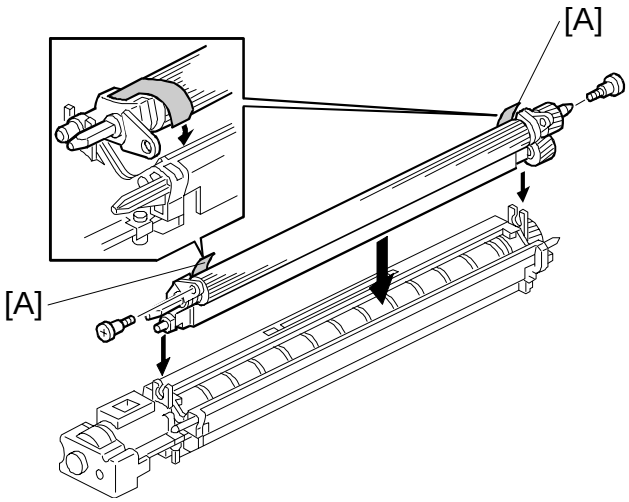


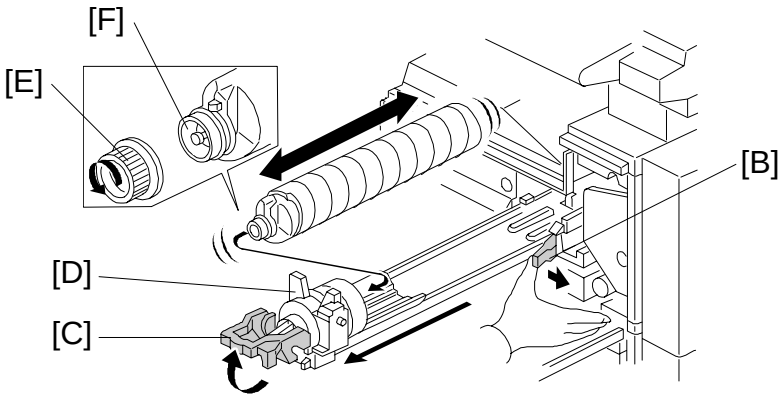


6. Open the front cover.
7. Push down the lever (1). Then pull the PCU [A] out a small distance (2), and move the development unit [B] to the left (3) so that the development unit is away from the drum, then slide out the PCU completely.
8. Remove three clamps [C].
9. Loosen the screw [D] and rotate the bracket [E] as shown.
10. Slide out the development unit [F].

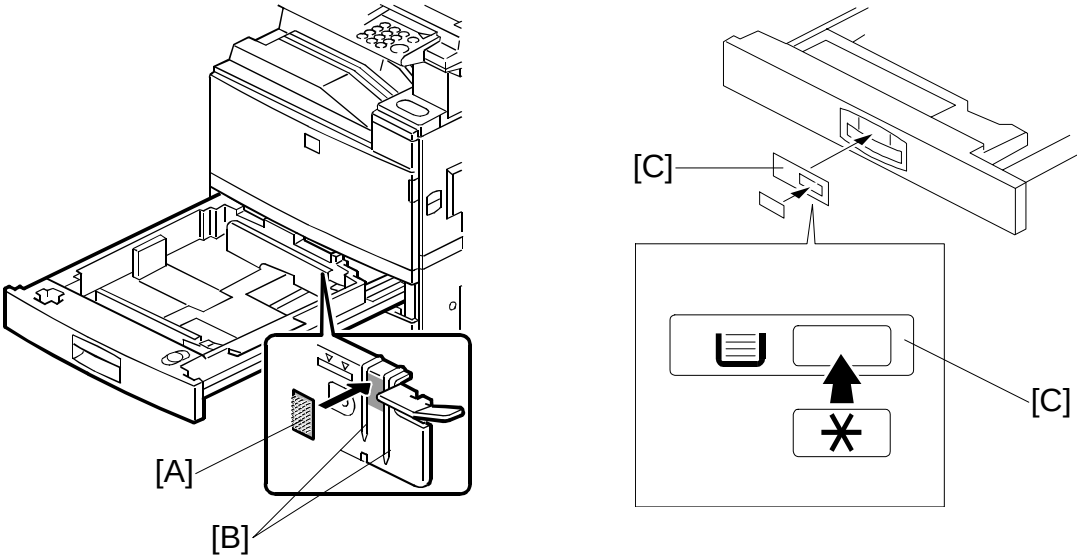


11. Remove the entrance seal plate [A] (2 clamps).
12. Remove two screws [B] and take out the development roller unit [C].
13. Pour all developer [D] into the development unit uniformly.





14. Reassemble the development unit.
    NOTE: Make sure that the development side seals [A] are set inside the development unit case.
15. Reassemble the machine.
    NOTE: When reinstalling the PCU, make sure it is installed properly. Otherwise, black copies may be printed.
16. Push lever [B] to the side, raise the toner bottle holder lever [C], and pull the toner bottle holder [D] out.
17. Shake the toner bottle well.
    NOTE: Do not remove the toner bottle cap [E] until after shaking.
18. Unscrew the bottle cap and insert the bottle into the holder.
    NOTE: Do not touch the inner bottle cap [F].
19. Reposition the holder and press down the holder lever to secure the bottle.



20. Turn on the main power switch.
21. After the fusing warm-up period, enter the SP mode.
    1) Press the “Clear Mode” key.
    2) Enter “107” using the numeric keys.
    3) Hold down the “Clear/Stop” key for more than 3 seconds.
    4) Select “1” (copier).
    NOTE: Do not enter SP mode during the fusing warm-up period (the LED of the start key is red during this period)
22. Perform the TD sensor initial setting as follows:
    1) Enter “2-801” and press the “Enter” key.
    2) Press “1” to start the TD sensor initial setting.
    NOTE: The machine will automatically stop when TD sensor initial setting is completed, and the TD sensor output voltage will appear on the LCD.
23. Perform the process control initial setting using SP2-805.
24. When loading paper bigger than A4 (11" x 8.5") in the 1st paper tray, attach the cushion [A] to the paper tray as shown.
    NOTE: 1) This procedure is required only for the 1st paper tray.
    2) Make sure that the pad is not attached over the ribs [B].
25. Change the side fences and end fence to match the paper size that will be used. Then pull the paper tray out and load paper into it.
26. Enter the proper paper size for each paper tray using UP mode.
27. Attach the appropriate paper size decal [C] to the paper tray.
    NOTE: Paper size decals are also used for the optional paper tray unit. Keep any remaining decals for use with the paper tray unit.
28. Check the copy quality and machine operation (refer to the “Replacement and Adjustment - Copy Adjustment” section of the service manual).

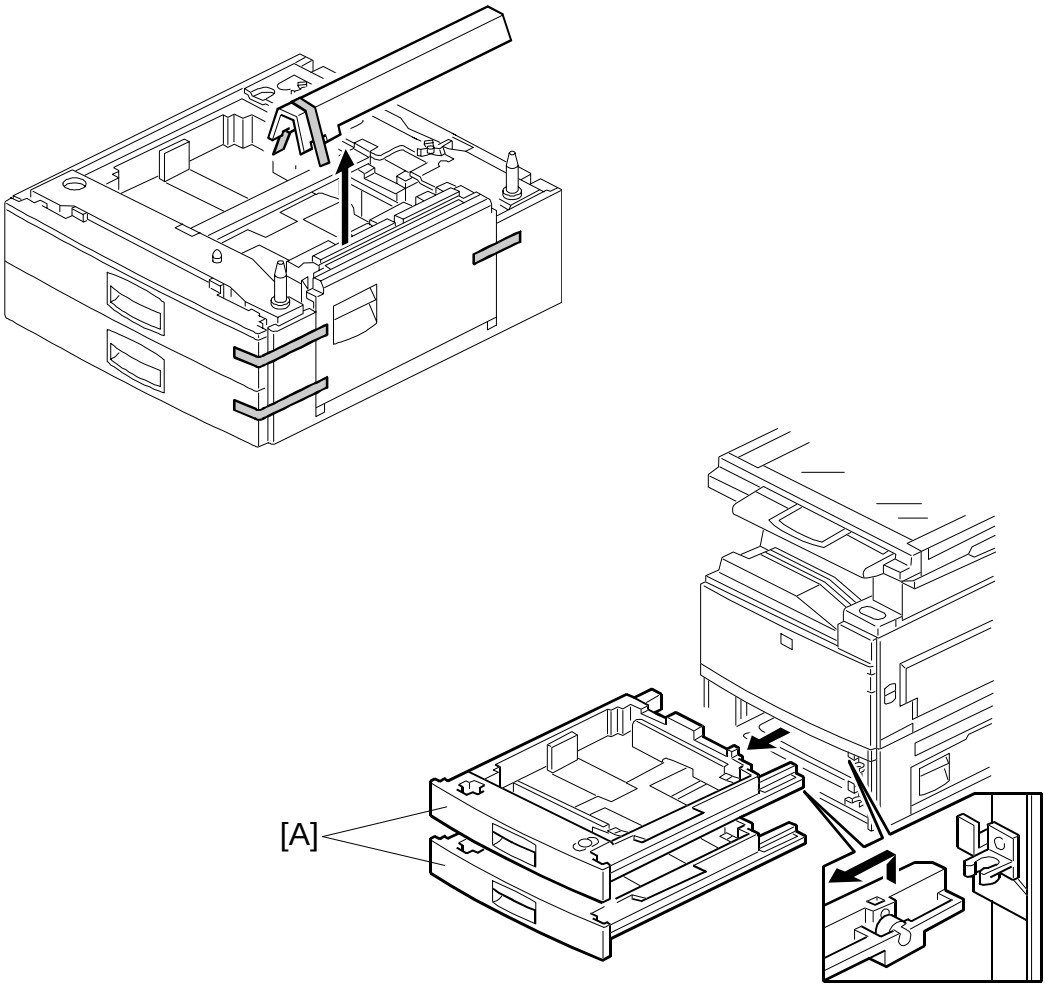
3.4 PAPER TRAY UNIT INSTALLATION

3.4.1 ACCESSORY CHECK

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

Description	Q'ty
1. Joint Bracket	1
2. Front Stand	1
3. Rear Stand	1
4. Stand Bracket	1
5. Knob Screw – M3	1
6. Knob Screw – M4x10	1
7. NECR – Multi-language (-17, -27 machines)	1
8. Installation Procedure	1

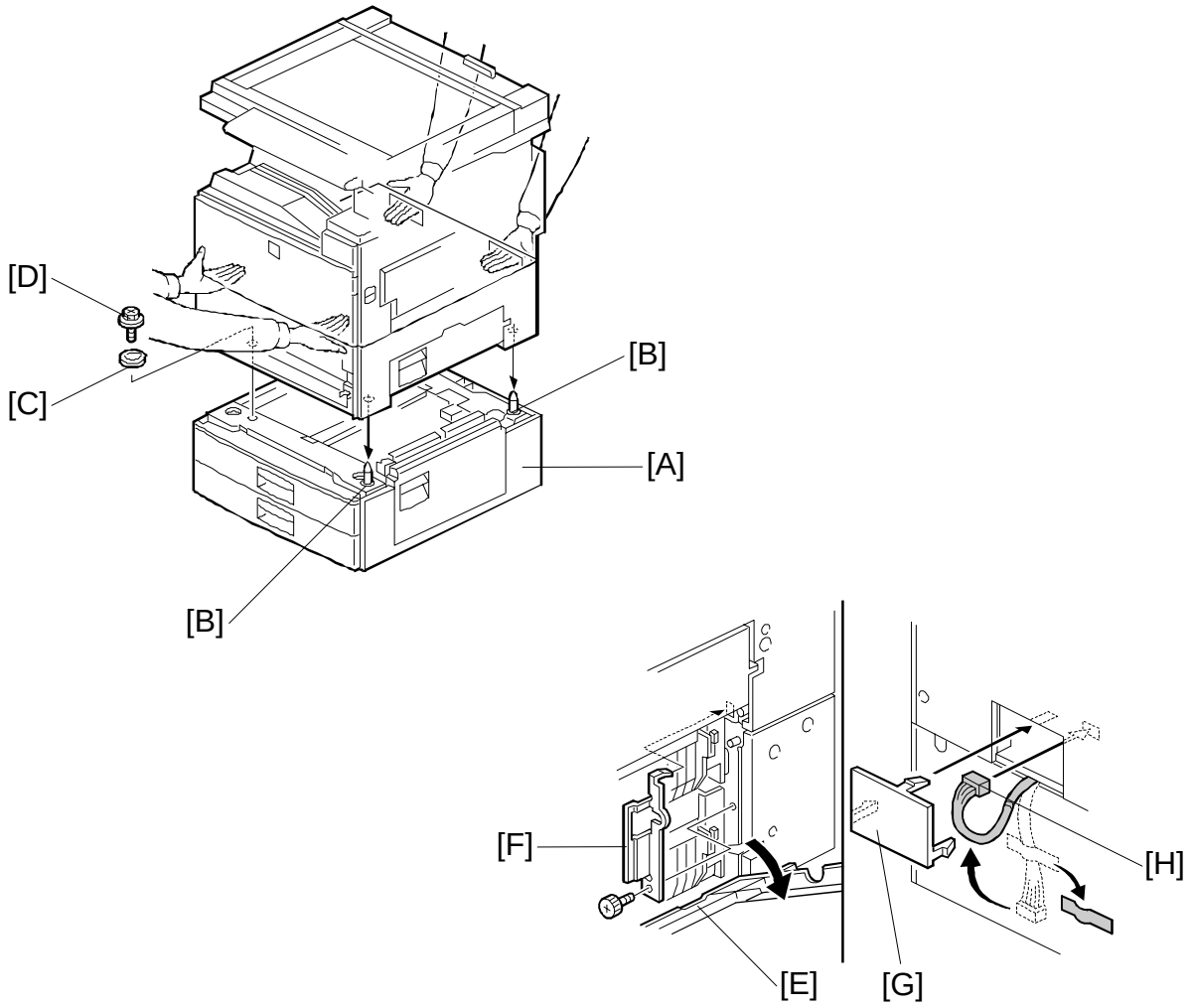
3.4.2 INSTALLATION PROCEDURE



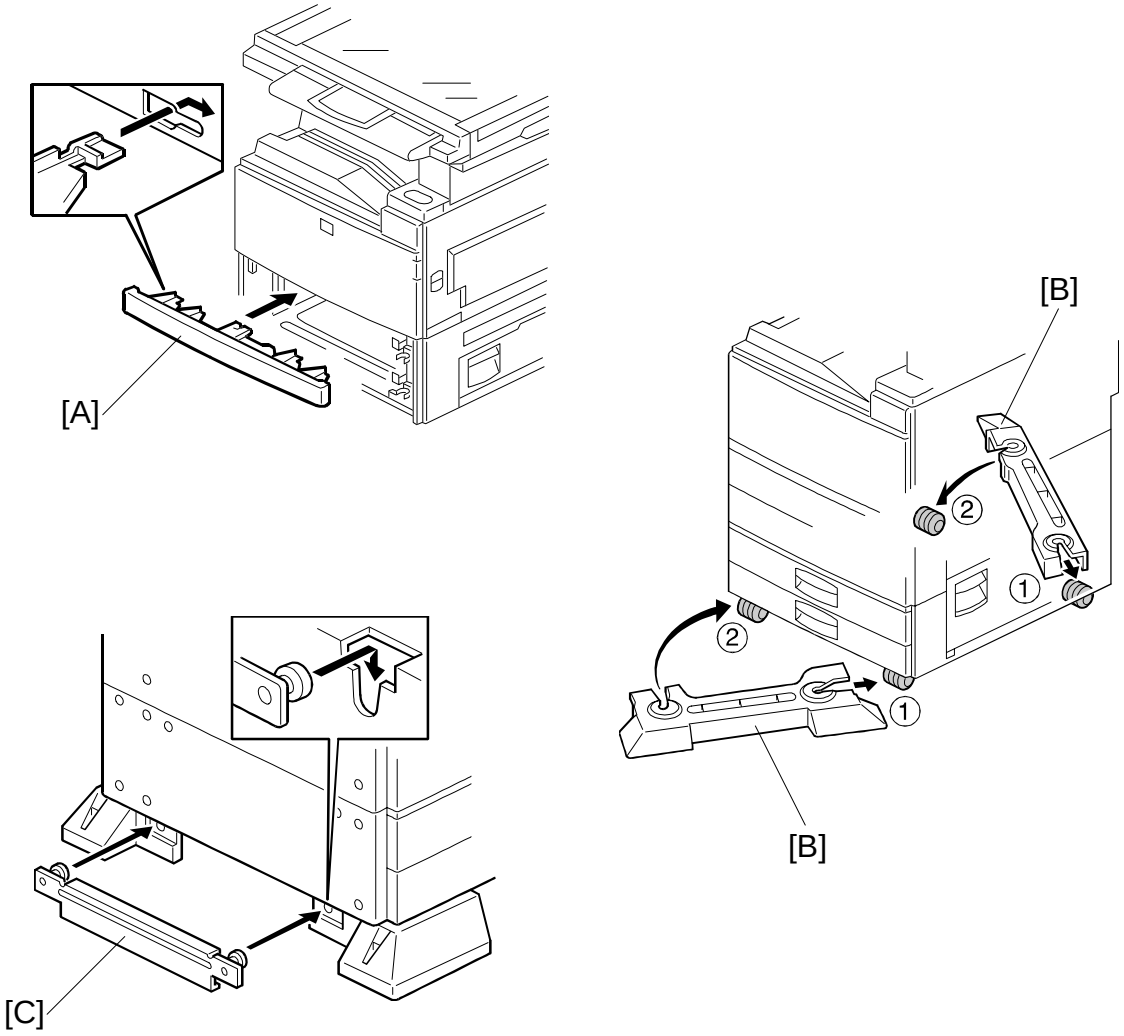
⚠CAUTION

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

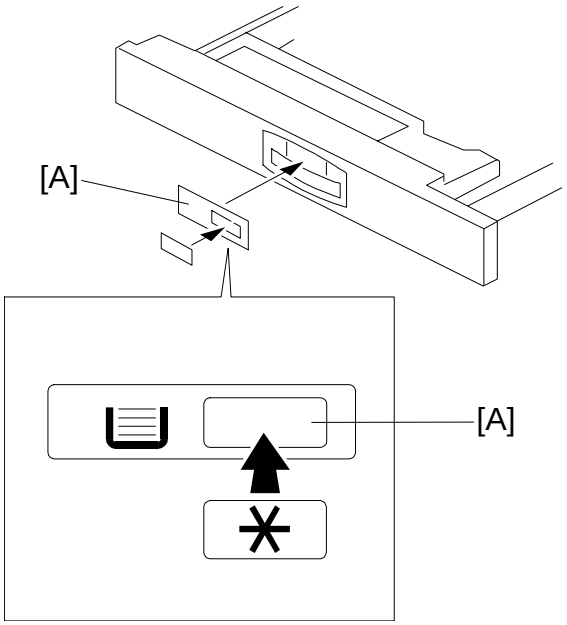
1. Unpack the paper tray unit. Then remove the tapes.
2. Remove the paper trays [A] from the base copier.



3. Place the main machine on the paper tray unit [A] with the pegs [B] fitting into main machine's peg holes.
   NOTE: 1) The machine must be held is as shown in the above illustration.
   2) Do not hold the scanner unit.
4. Attach the spring washer [C] to the short knob screw [D]. Then, secure the paper tray unit.
5. Open the right cover of the paper tray unit [E].
6. Secure the joint bracket [F] (1 long knob screw).
7. Remove the connector cover [G] of the main machine.
8. Connect the paper tray unit harness [H] to the main machine and reinstall the connector cover.



9. Install the middle front cover [A] which in the 2nd paper tray.
10. Install the front and rear stands [B] as shown above.
11. Install the stand bracket [C].



12. Load paper into the paper tray and install the paper trays.
    NOTE: The side and rear fences should be properly positioned using the green screw driver tool.
13. Attach the appropriate tray decals [A] which are included in the accessory box for the main machine.
14. Turn on the ac switch.
15. Enter the paper size for each paper tray using a UP mode.
16. Check the machine's operation and copy quality.

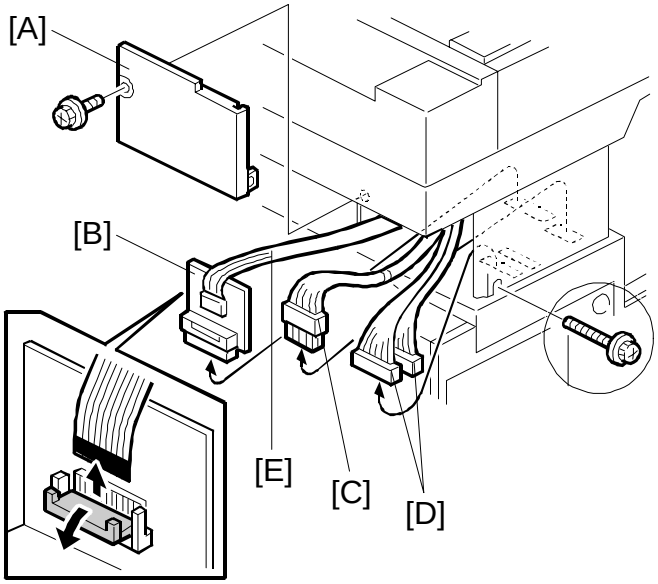
3.5 1-BIN TRAY UNIT INSTALLATION

3.5.1 ACCESSORY CHECK

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

Description	Q'ty
1. Grounding Bracket	1
2. Connector Cover	1
3. Base Cover	1
4. Copy Tray	1
5. Copy Tray Bracket	1
6. Snap Ring	1
7. Mylar Strip	2
8. Stepped Screw – M3x8	5
9. Screw – M3x8	1
10. Tapping Screw – M3x6	2
11. Tapping Screw – M3x14	1
12. Tapping Screw – M3x8	1
13. NECR	1
14. Installation Procedure	1

3.5.2 INSTALLATION PROCEDURE

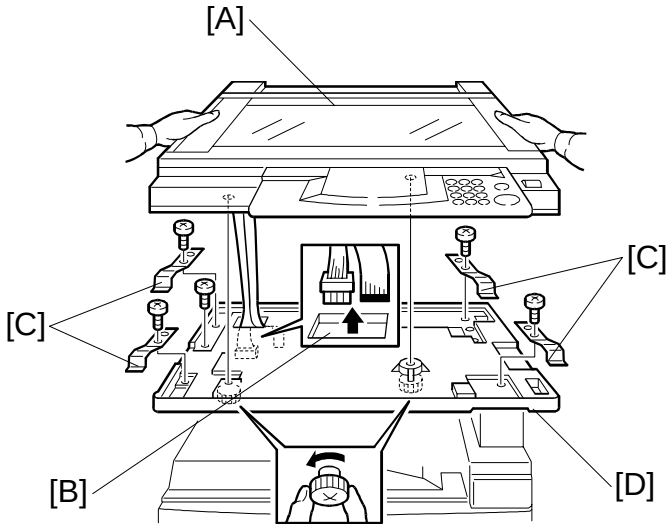


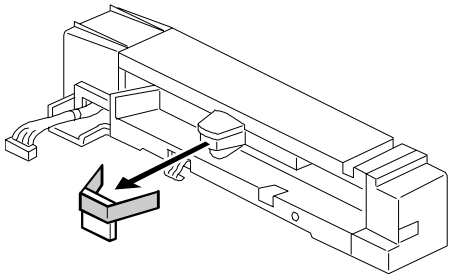
NOTE: The Interchange Unit (A690) must be installed before installing the 1-bin tray unit.

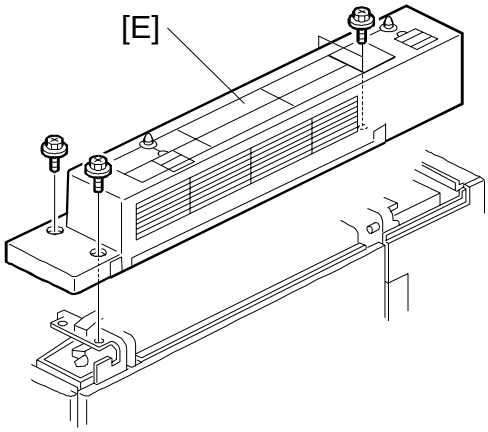
⚠CAUTION

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

1. Remove the scanner unit.
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the stand rear cover [A] (2 screws).
   2) Disconnect the scanner I/F board [B] and the power connector [C].
   3) Disconnect the harness [D].
   4) Disconnect the scanner I/F harness [E].





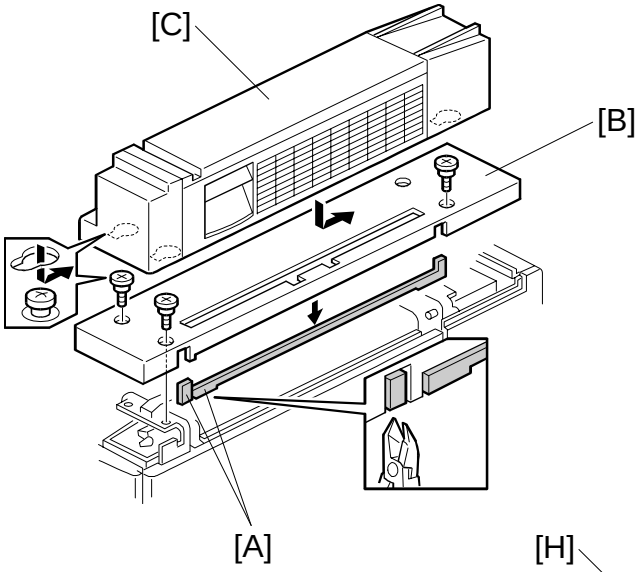


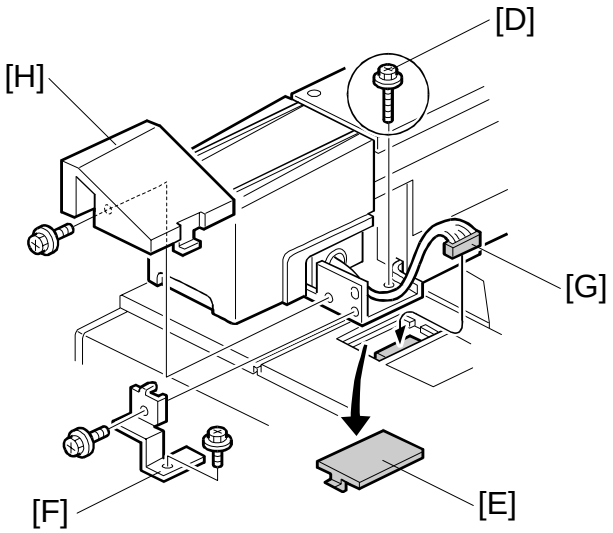
5) Remove the scanner unit [A] (2 knob screws).

NOTE: 1) Hold the scanner unit as shown in the above illustration. Otherwise, scanner unit may be damaged.
2) Make sure the harnesses are not damaged by the edges of the opening [B].
3) After removing the scanner, keep it in a flat level place.

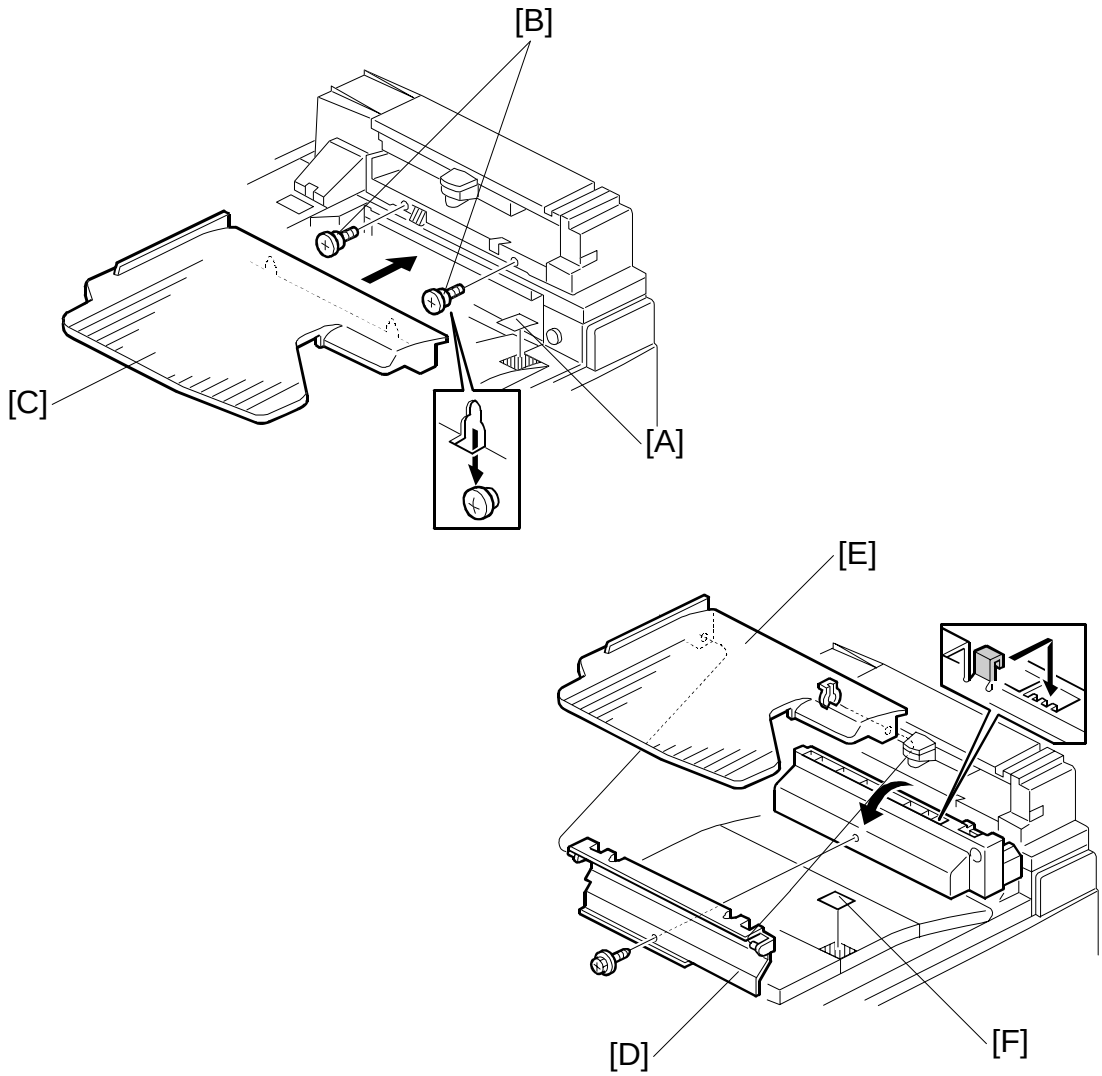
6) Remove four plates [C] (1 screw each).
7) Remove the scanner unit plate [D] (1 screw).

2. Unpack the 1-bin tray unit and remove the tapes.
3. Remove the paper exit cover [E] (4 screws).





4. Cut away two covers [A] from the base cover [B].
   NOTE: Trim off any remaining unevenness from the edges.
5. Install the base cover (3 stepped screws).
6. Place the 1-bin tray unit [C] on the base cover.
   NOTE: Make sure to hold the 1-bin tray unit at the both sides but never hold the unit at the center.
7. Secure the 1-bin tray unit (1 screw [D] - M3x10).
8. Remove the cover [E].
9. Install the grounding bracket [F] (2 screws - M3x6).
10. Connect the harness [G].
11. Install the connector cover [H] (1 screw - M3x8).



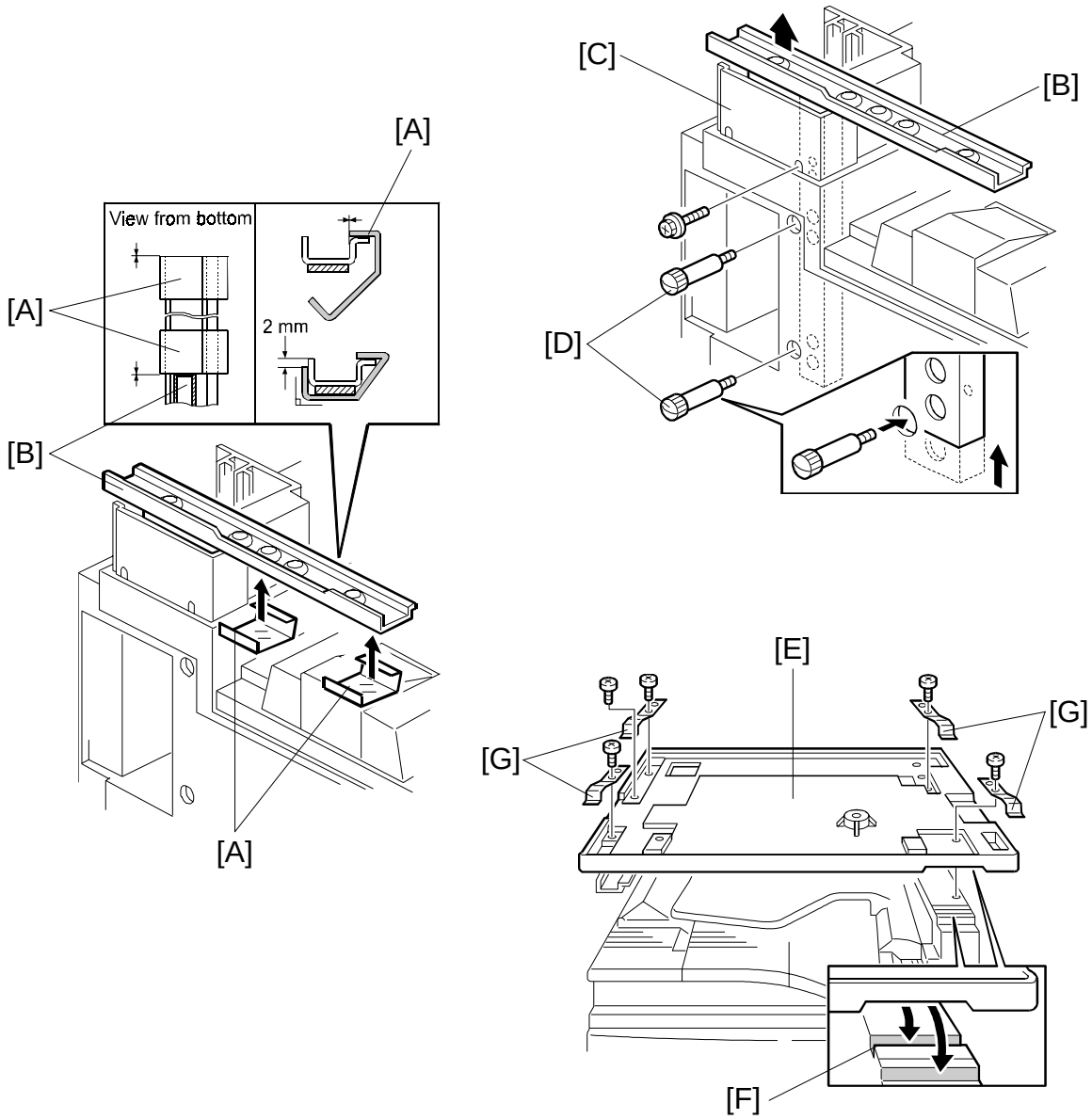
12. Install the copy tray.

- When the Bridge Unit (A688) is not installed -

1) Attach the decal [A], as shown.
2) Install two stepped screws [B], then attach the copy tray [C].

- When the Bridge Unit (A688) is installed -

1) Open the right cover of the bridge unit.
2) Install the copy tray bracket [D] (1 screw).
3) Install the copy tray [E] (1 snap ring).
4) Attach the decal [F], as shown.



13. Attach two mylar strips [A] to the scanner stand [B], as shown.
14. Change the height of the scanner stand.
    1) Remove the stand cover [C] (1 screw).
    2) Remove two screws [D] which are securing the scanner stand [B].
    3) Raise the scanner stand position.
    4) Secure the stand.
    5) Reinstall the stand cover.
15. Reinstall the scanner unit plate [E] (1 screw).
    NOTE: The scanner unit plate should be positioned at the rear, as shown [F].
16. Reinstall four plates [G] (1 screw each).
17. Reinstall the scanner unit (2 knob screws).
18. Turn on the ac switch and check the 1-bin tray unit operation.

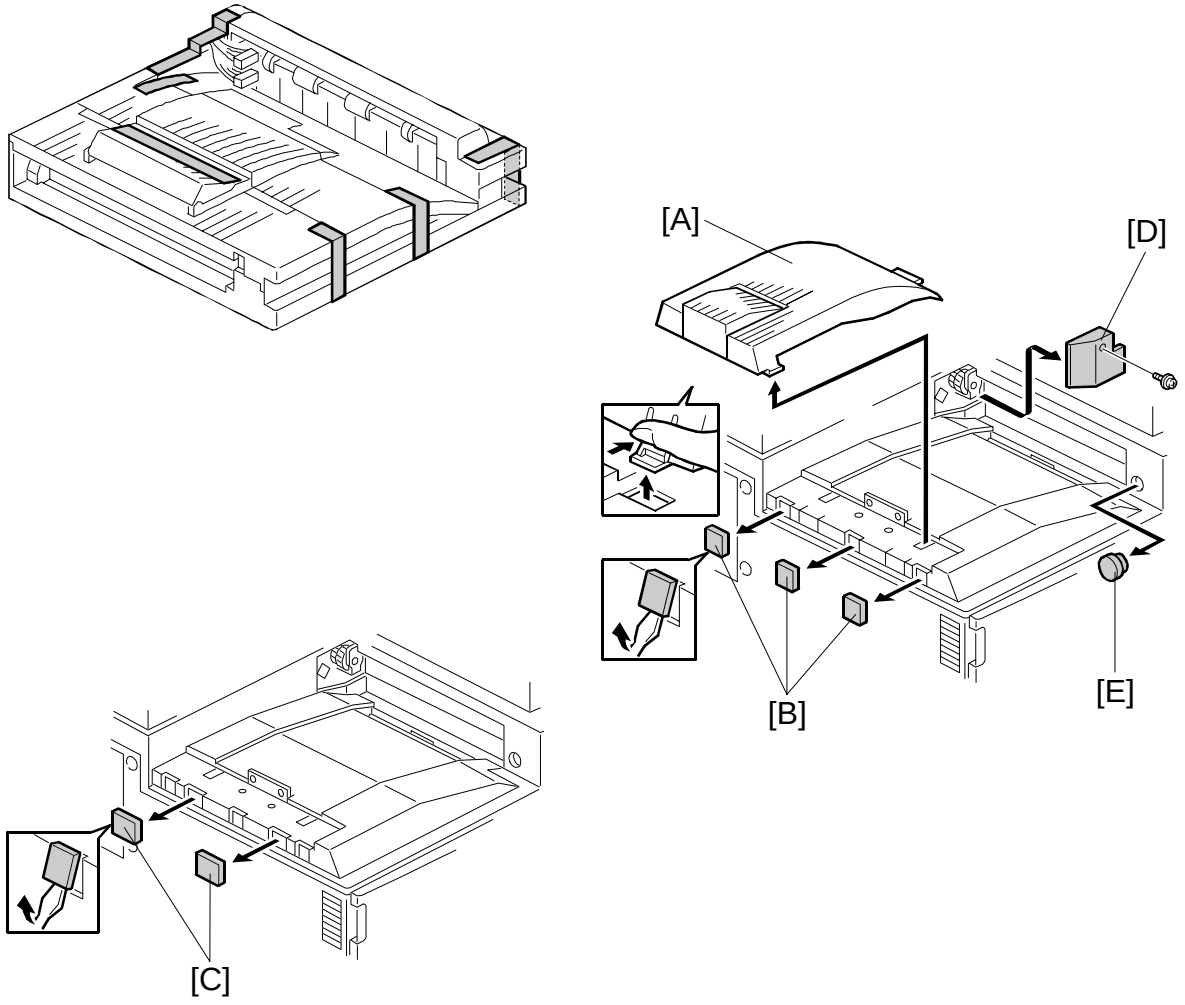
3.6 BRIDGE UNIT INSTALLATION

3.6.1 ACCESSORY CHECK

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

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

3.6.2 INSTALLATION PROCEDURE



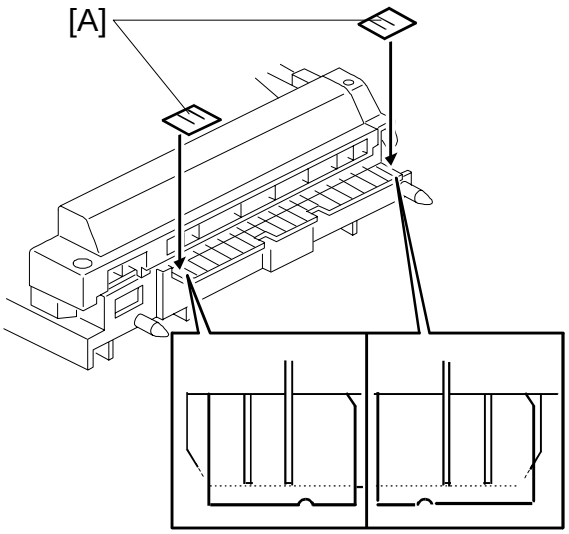
⚠CAUTION

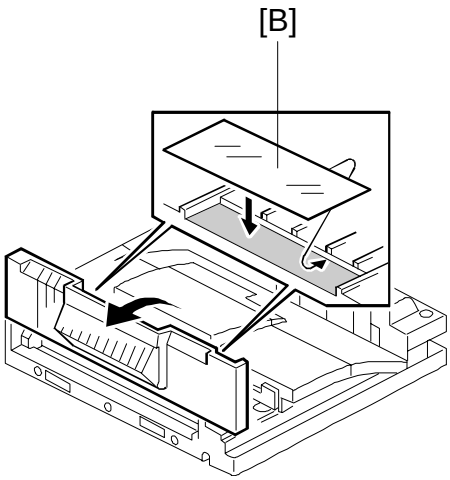
Unplug the main machine power cord before starting the following procedure.

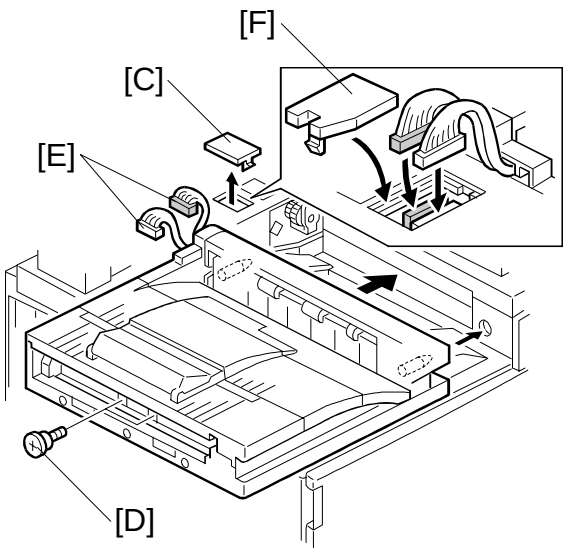
1. Unpack the bridge unit. Then remove the tapes.
2. Remove the inner tray [A].
3. Remove three covers [B].

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

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







7. Attach two mylars [A] to the paper entrance area of the bridge unit as shown.
8. **If the optional finisher is installed:**
   Attach two mylars [B] to the bridge unit as shown.
9. Remove the cover [C].
10. Install the bridge unit (2 screws) [D].
11. Connect the bridge unit I/F harnesses [E].
12. Install the connector cover [F].
13. Turn on the ac switch and check the bridge unit operation.

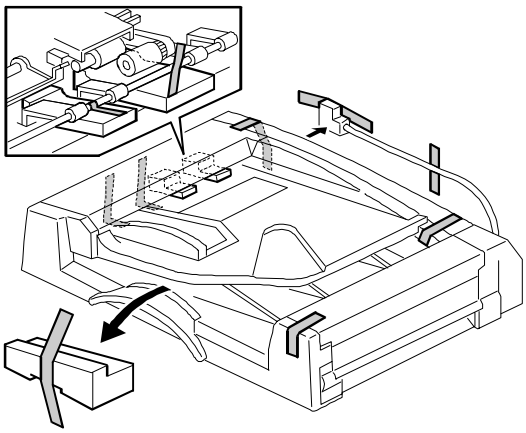
3.7 AUTO REVERSE DOCUMENT FEEDER INSTALLATION

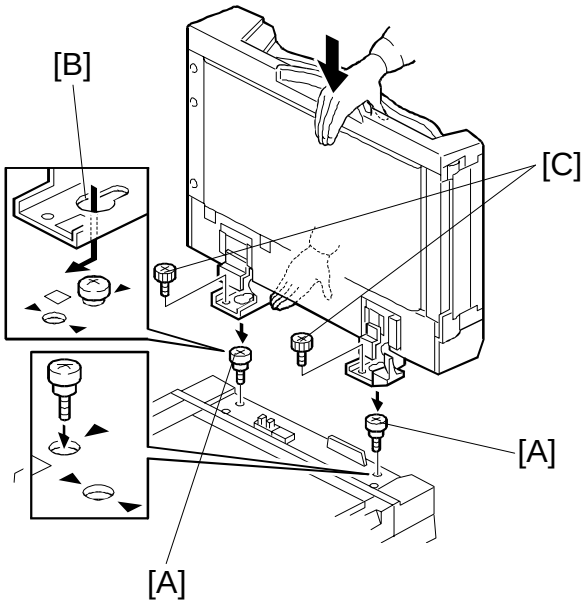
3.7.1 ACCESSORY CHECK

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

Description	Q'ty
1. Stepped Screw	2
2. Knob Screw	2
3. Original Tray	1
4. Screw – M4x17	2
5. NECR	1
6. Installation Procedure	1

3.7.2 INSTALLATION PROCEDURE



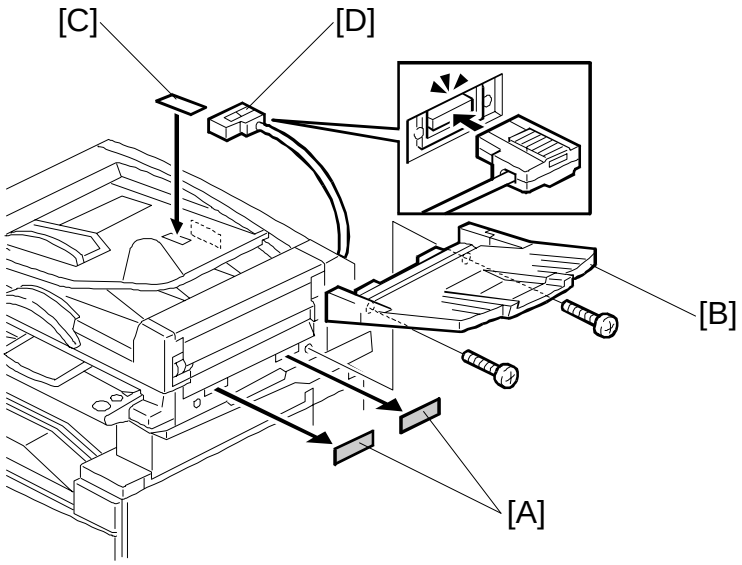


⚠CAUTION

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

1. Unpack the ARDF. Then remove the tapes on the exterior of the ARDF.
2. Tighten the two stud screws [A].
3. Mount the ARDF by aligning the screw holes [B] in the ARDF over the stud screws, and slide the ARDF to front as shown.

   NOTE: When mounting the ARDF, hold it by hand as shown in the illustration. Holding it in another way may damage the ARDF.
4. Secure the ARDF (2 knob screws [C]).



5. Remove the two seals [A].
6. Install the original tray [B] (2 screws).
7. Attach the original direction decal [C] to the DF table as shown.
8. Connect the I/F harness [D] to the main machine.
9. Turn on the ac switch.
10. Check the ARDF operation and copy quality.

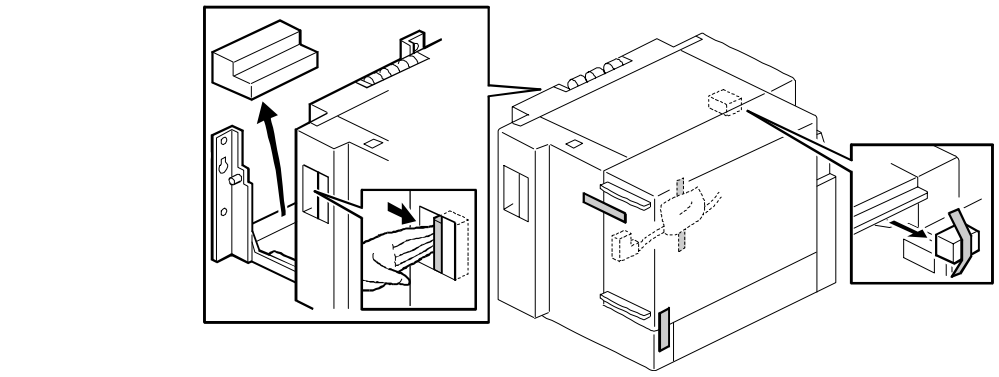
3.8 LCT INSTALLATION

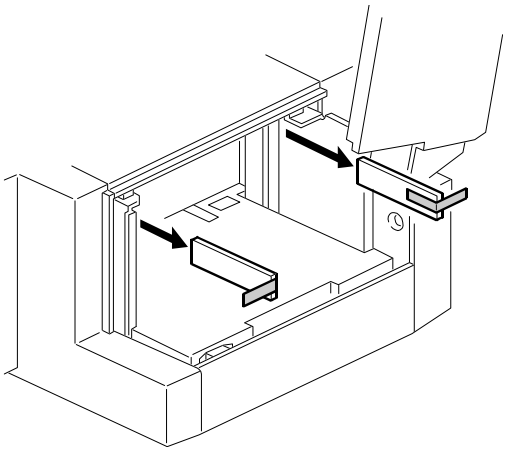
3.8.1 ACCESSORY CHECK

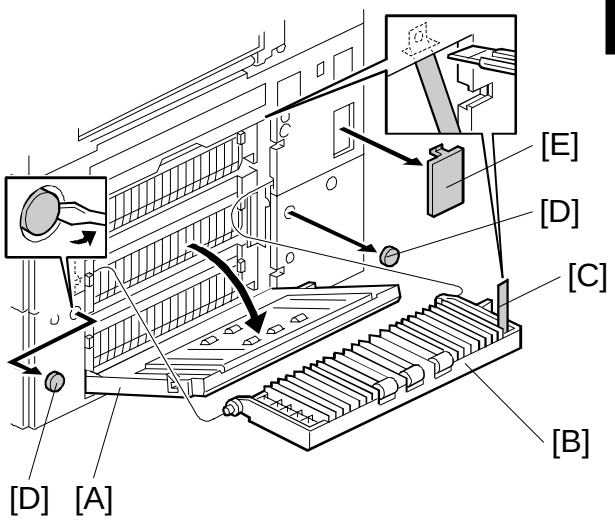
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Joint Pin	2
2. Stepped Screw M3x18	4
3. Magnet Cover	1
4. NECR (-17, -27 machines)	1
5. Installation Procedure	1

3.8.2 INSTALLATION PROCEDURE





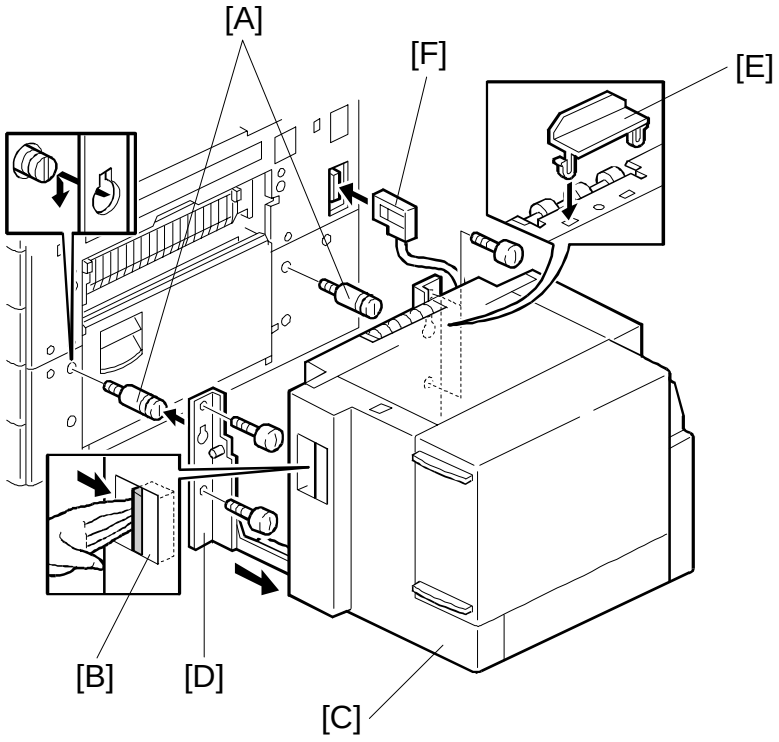


⚠CAUTION

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

NOTE: The Paper Tray Unit (A682) must be installed before installing the LCT.

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



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

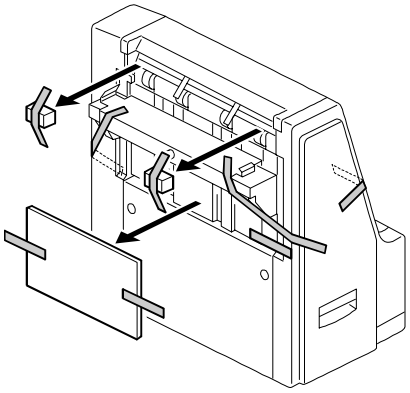
3.9 1,000-SHEET FINISHER INSTALLATION

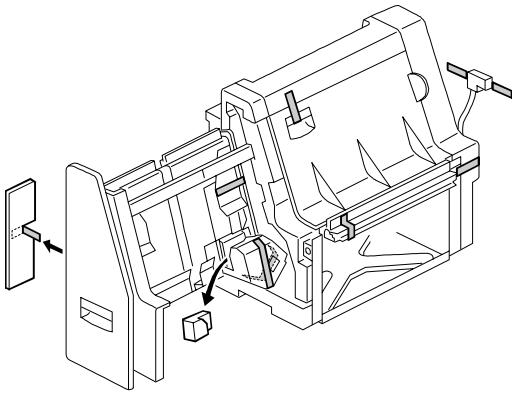
3.9.1 ACCESSORY CHECK

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

Description	Q'ty
1. Front Stand	1
2. Rear Stand	1
3. Knob Screw	1
4. Screw – M4x12	6
5. NECR (-17 machine)	1
6. Installation Procedure	1

3.9.2 INSTALLATION PROCEDURE



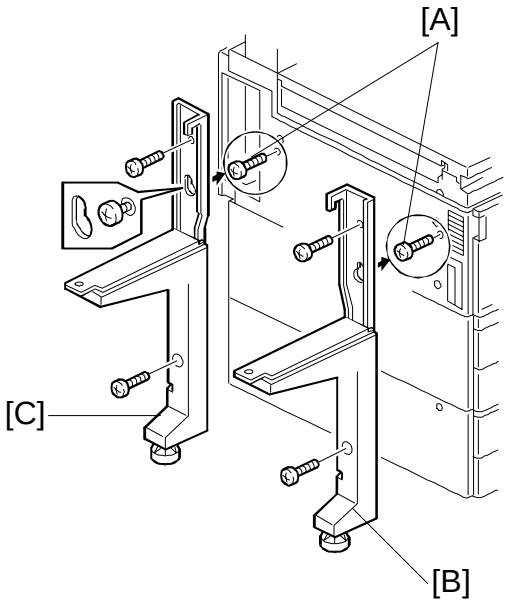


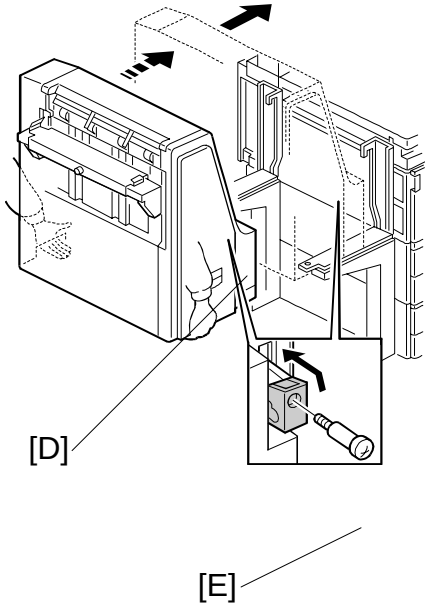
⚠CAUTION

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

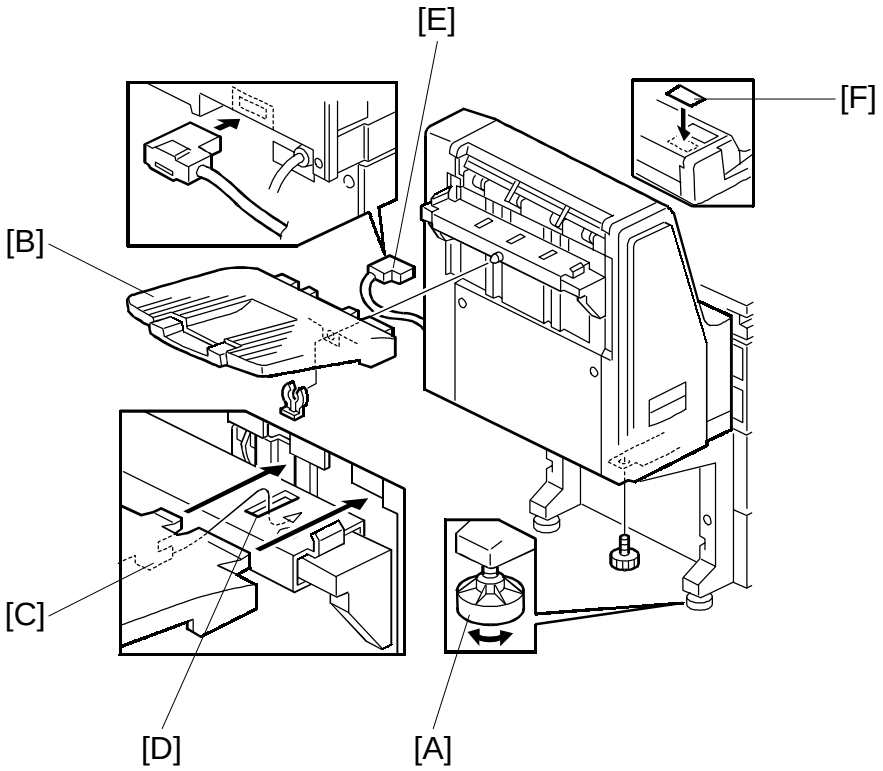
NOTE: The bridge unit (A688) and paper tray unit (A682) must be installed before installing this finisher.

1. Unpack the finisher and remove the tapes.





1. Install two screws [A] loosely.
2. Hang the front stand [B] and rear stand [C] on the screws which were installed in step 2.
3. Secure the front and rear stands (6 screws, including the two screws [A]).
4. Pull out the stapler unit [D].
5. Draw out the locking lever [E] (1 screw).
6. Align the finisher on the stands, and lock it in place by pushing the locking lever.
7. Secure the locking lever (1 screw) and push the stapler unit into the finisher.



8. Secure the finisher (1 screw).
9. Adjust the securing knobs [A] under the front and rear stand until the finisher is perpendicular to the floor.
10. Install the shift tray [B] (1 snap ring).
    NOTE: Make sure that the three pegs [C] fit into the slots [D] properly.
11. Connect the finisher cable [E] to the main machine.
12. Attach the staple position decal [F] to the ARDF as shown.
13. Turn on the main power switch and check the finisher operation.

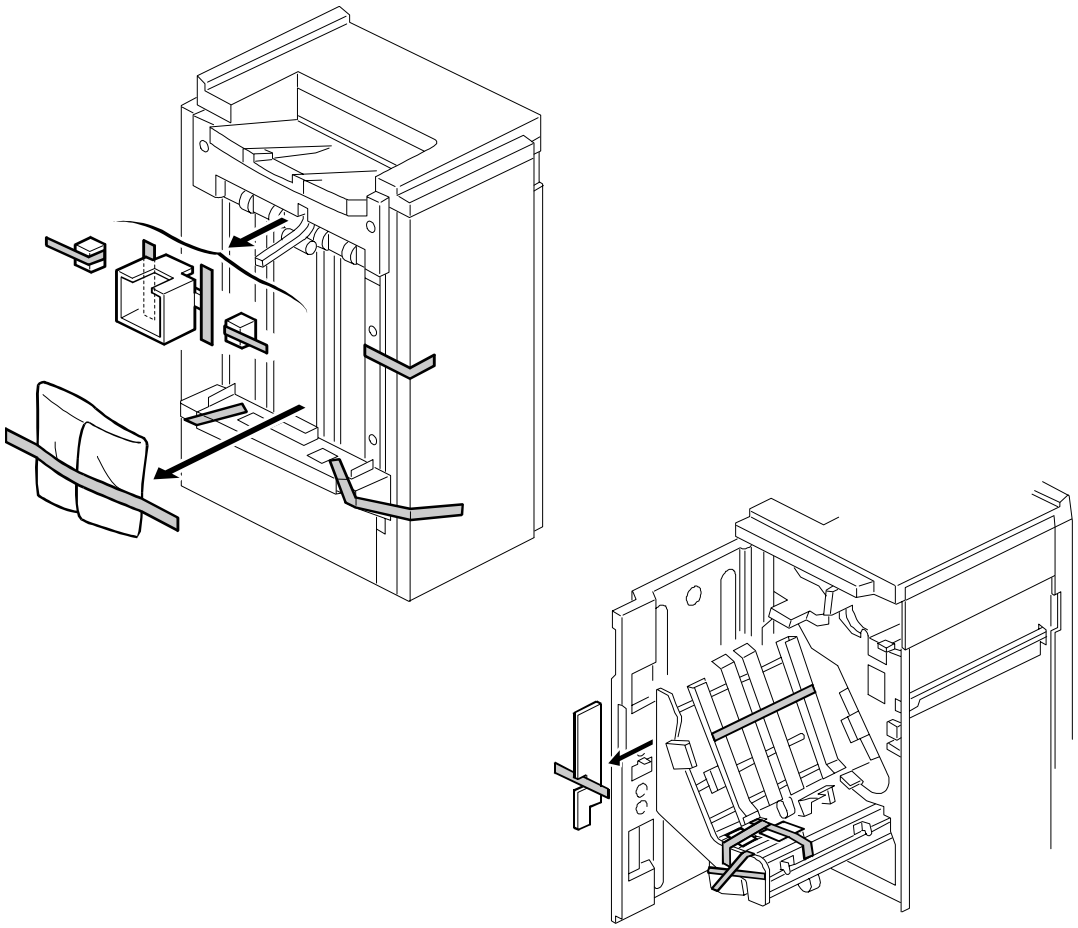
3.10 3,000-SHEET FINISHER INSTALLATION

3.10.1 ACCESSORY CHECK

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

Description	Q'ty
1. Front Joint Bracket	1
2. Rear Joint Bracket	1
3. Entrance Guide Plate	1
4. Shift Tray	1
5. Exit Guide Mylar (A229 copier only)	1
6. Shift Tray Guide	1
7. Staple Position Decal	1
8. Screw – M3x6	2
9. Screw – M4x14	4
10. Screw – M3x8	4
11. Cushion	1
12. Upper Grounding Plate	1
13. Lower Grounding Plate	2
14. NECR (-17 machine)	1
15. Installation Procedure	1

3.10.2 INSTALLATION PROCEDURE

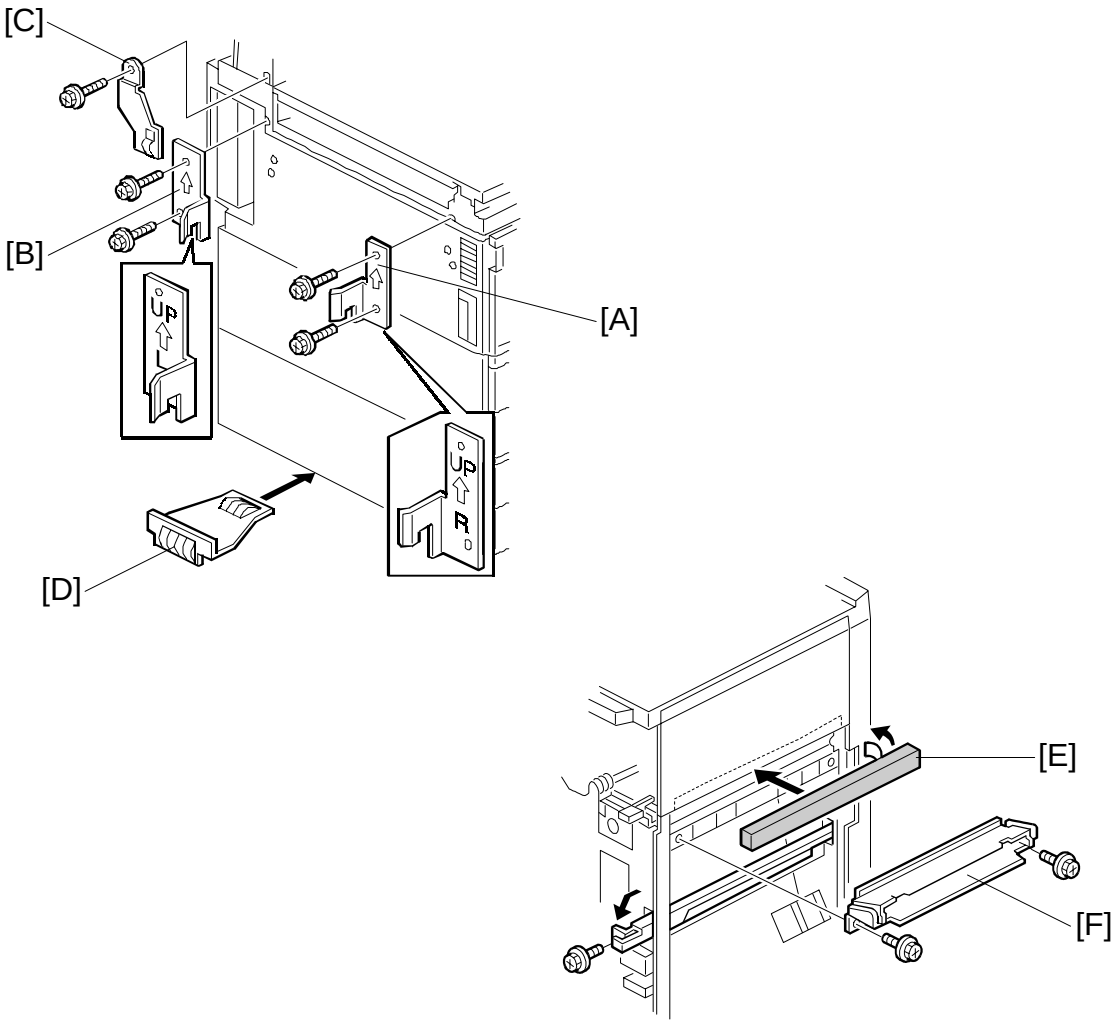


⚠CAUTION

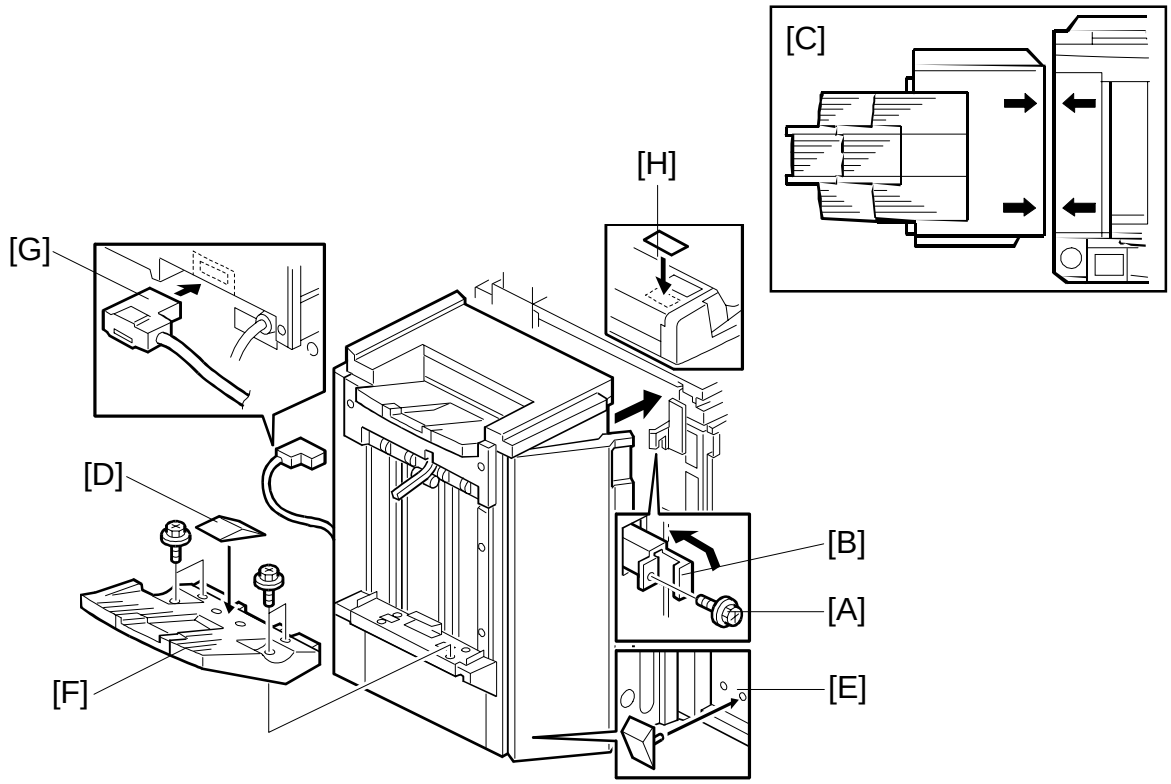
Unplug the main machine power cord before starting the following procedure.

NOTE: The bridge unit (A688) and paper tray unit (A682) must be installed before installing this finisher.

1. Unpack the finisher and remove the tapes.



2. Install the front joint bracket [A] and rear joint bracket [B] (2 screws each).
3. Attach the upper grounding plate [C] (1 screw).
4. Peel off the backing of the double sided tape that is attached to the lower grounding plate [D].
5. Attach one lower grounding plate to the center position of the paper tray unit as shown.
6. Attach the cushion [E] to the plate as shown.
7. Install the entrance guide plate [F] (2 screws).



8. If the customer requires the punch unit, install it now, before attaching the finisher to the machine. See Punch Unit Installation.
9. Open the front door of the finisher, and remove the screw [A] which secures the locking lever [B]. Then pull the locking lever.
10. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
    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].
11. Secure the locking lever (1 screw) and close the front door.
12. Install the sub shift tray [D] on the shift tray. If the customer does not wish to install it on the shift tray, store it at location [E].
    NOTE: The shift tray guide is required to assist in proper paper stacking. However, it reduces the capacity of the shift tray by 50, from 3,000 to 2,950.
13. Install the shift tray [F] (4 screws).
14. Connect the finisher cable [G] to the main machine.
15. Attach the staple position decal [H] to the ARDF as shown.
16. Turn on the main power switch and check the finisher operation.

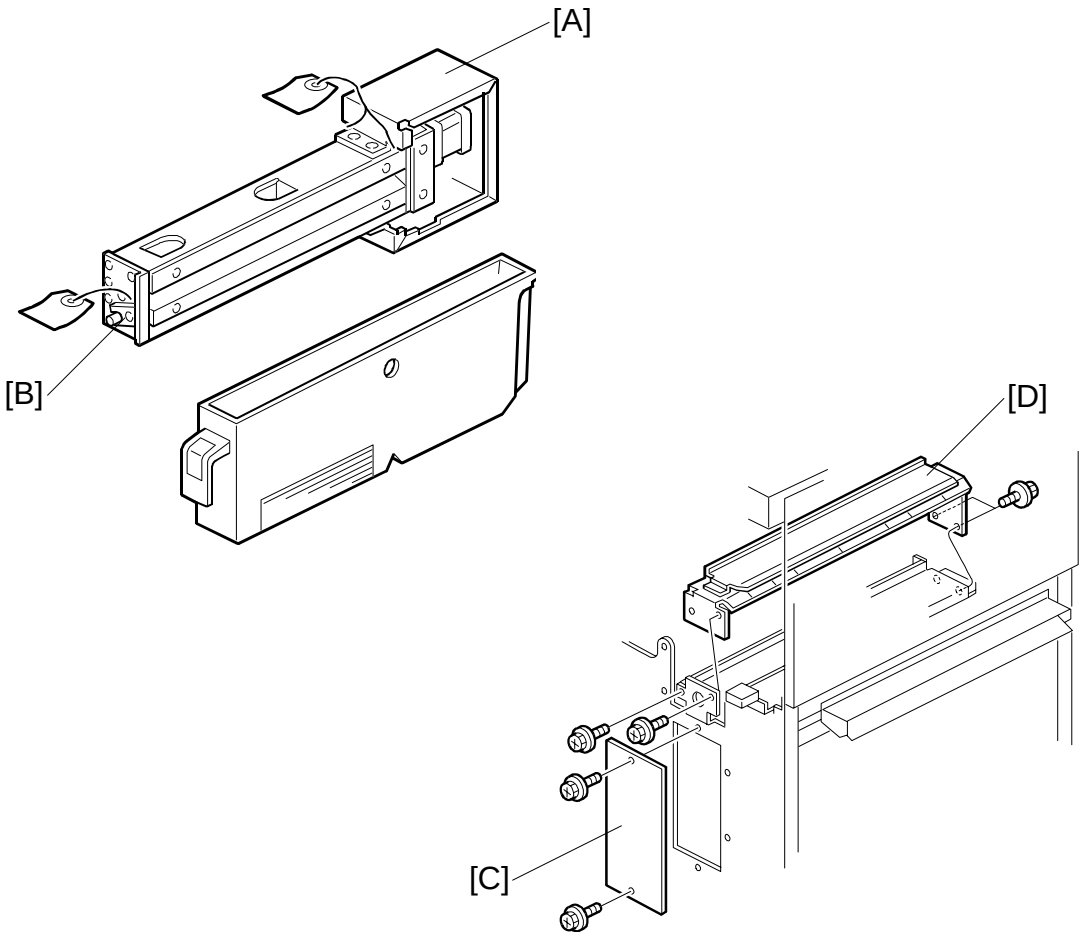
3.11 PUNCH UNIT INSTALLATION

3.11.1 ACCESSORY CHECK

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

Description	Q'ty
1. Spacer – 2 mm	1
2. Spacer – 1 mm	2
3. Stepped Screw – Short	1
4. Stepped Screw – Long	1
5. Punch Unit Knob	1
6. Spring	1
7. Harness – Long	1
8. Harness – Short	1
9. Hopper	1
10. Punch Position Decal	1
11. Tapping Screw – M4x10	2
12. Screw with Flat Washer – M4x6	1
13. NECR	1

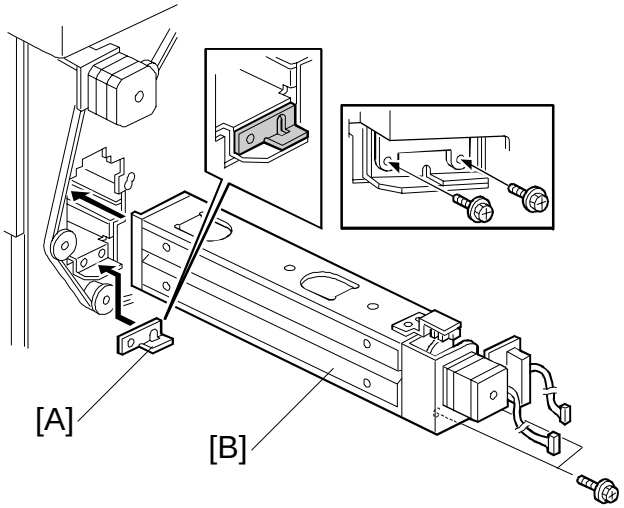
3.11.2 INSTALLATION PROCEDURE

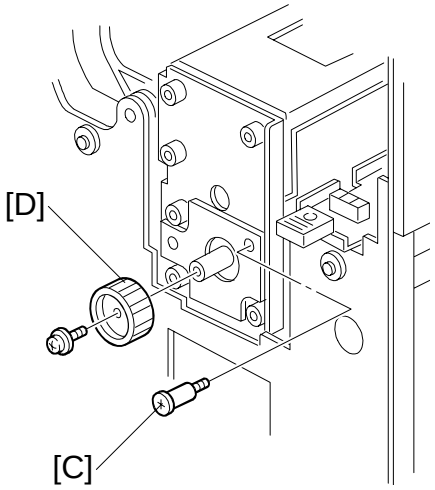


⚠CAUTION

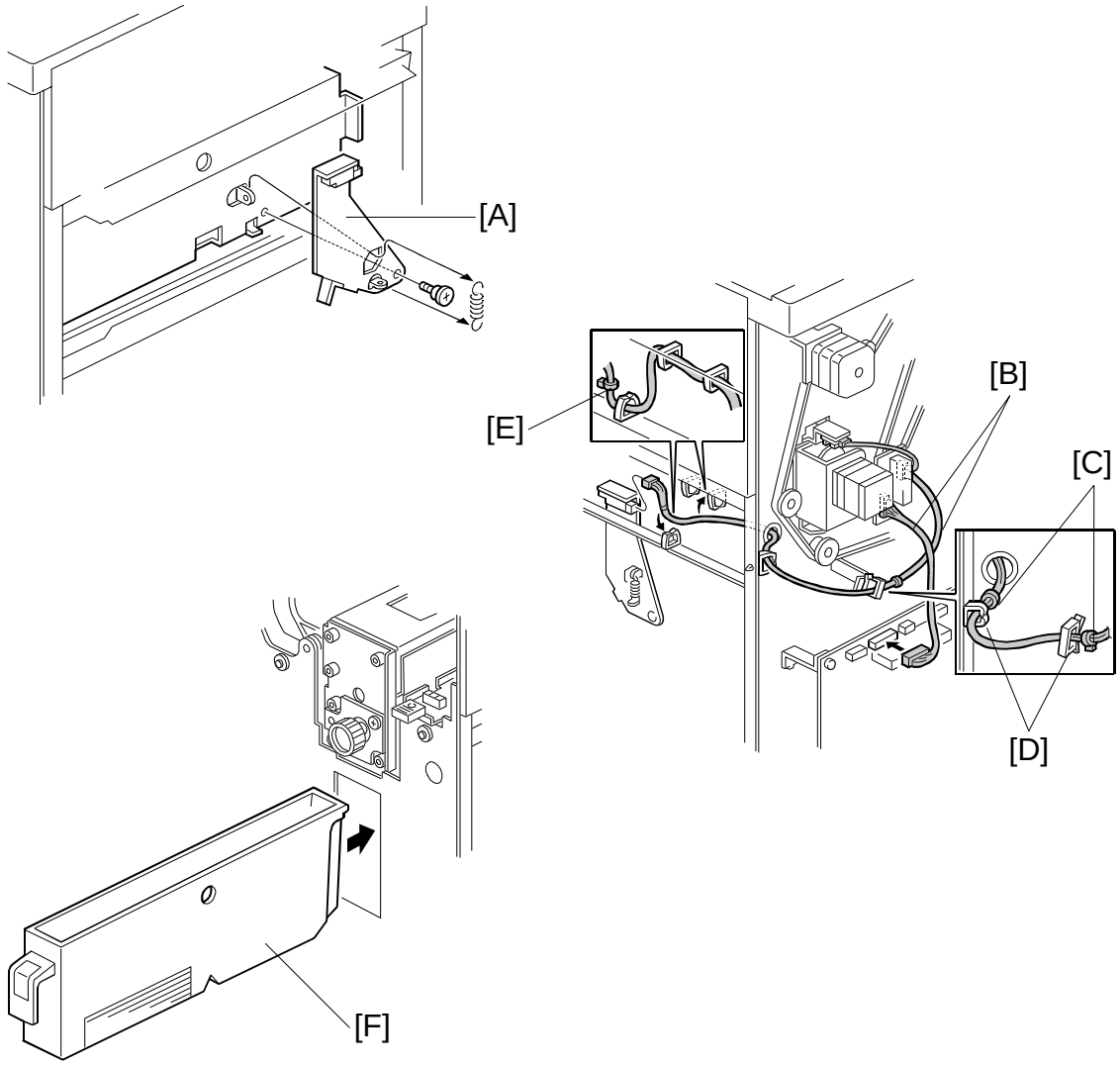
Unplug the copier power cord and remove the 3,000-sheet finisher from the copier before starting the following procedure.

1. Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw).
2. Open the front door and remove the hopper cover [C] (2 screws).
3. Remove the finisher rear cover (2 screws) and remove the transport guide plate [D] (4 screws).





4. Install the spacer [A] (thickness = 2 mm).
   NOTE: There are three spacers in the accessory box. Do not lose the other two spacers (1 mm) because they are used for adjusting the punch hole position.
5. Install the punch unit [B] and secure it with a long stepped screw [C].
6. Install the punch unit knob [D] (1 screw).
7. Secure the rear of the punch unit (2 screws).

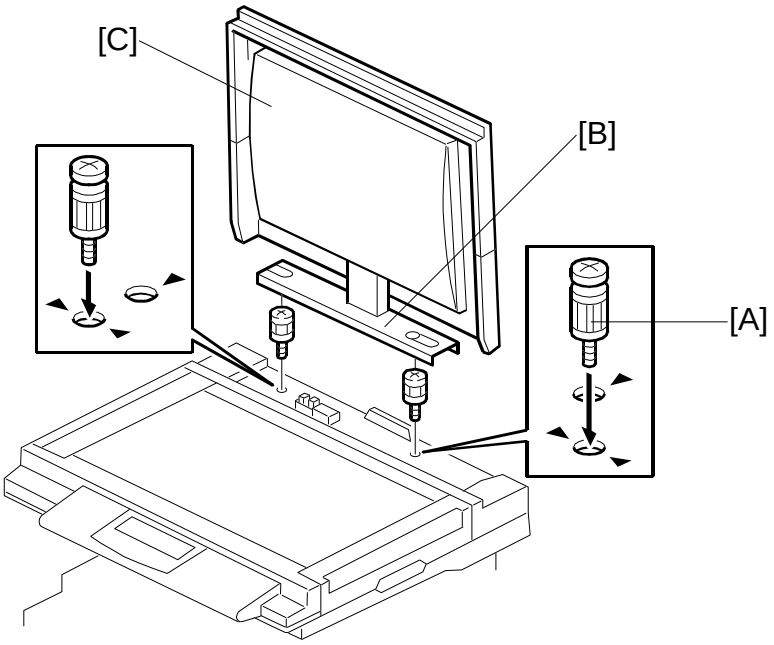


8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the harnesses [B].

NOTE: 1) The harness binders [C] must not be between the harness clamps [D].
2) The harness binder [E] must be positioned to the left of the harness clamp.

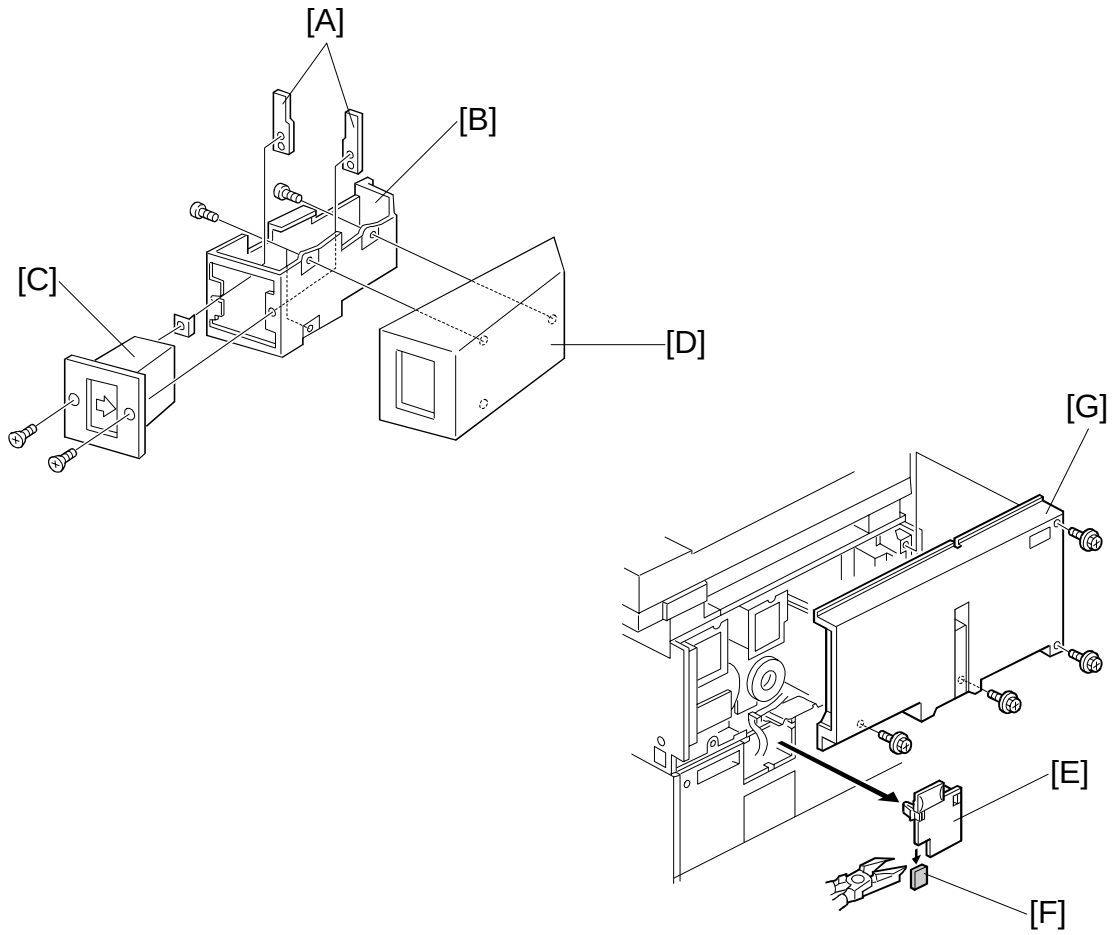
10. **When a three-punch-hole unit is installed:**
Change switch 1 of DIP SW 100 on the finisher control board to ON.
11. Slide the hopper [F] into the finisher.
12. Reassemble the finisher and attach the 3,000-sheet finisher to the copier, then check the punch unit function.

3.12 PLATEN COVER INSTALLATION



1. Install the two stud screws [A] on the top cover as shown.
2. Position the platen cover bracket [B] on the stud screws and slide the platen cover [C] to the left.

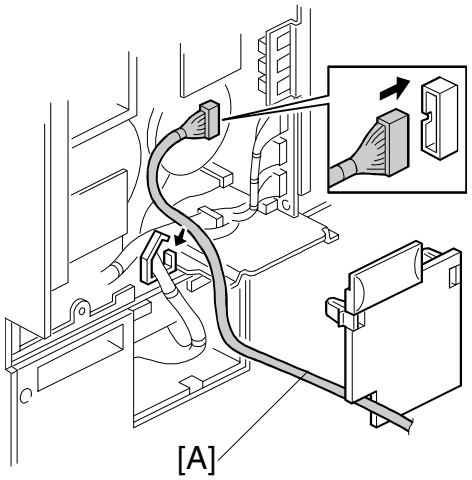
3.13 KEY COUNTER INSTALLATION

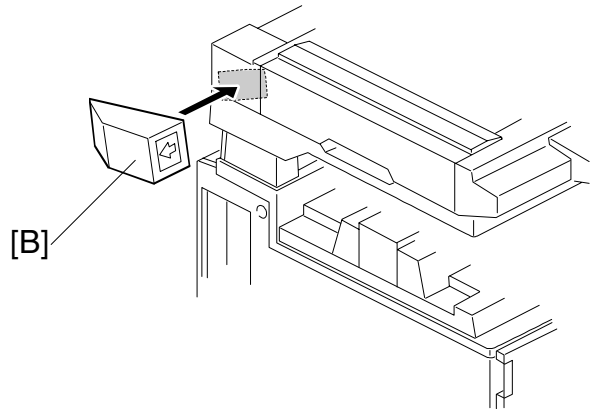


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Hold the key counter plates [A] on the inside of the key counter bracket [B] and insert the key counter holder [C]
2. Secure the key counter holder to the bracket (2 screws).
3. Attach the key counter cover [D] (2 screws).
4. Remove the connector cover [E].
5. Cut off the part [F] of the connector cover.
6. Remove the rear cover [G] (4 screws).

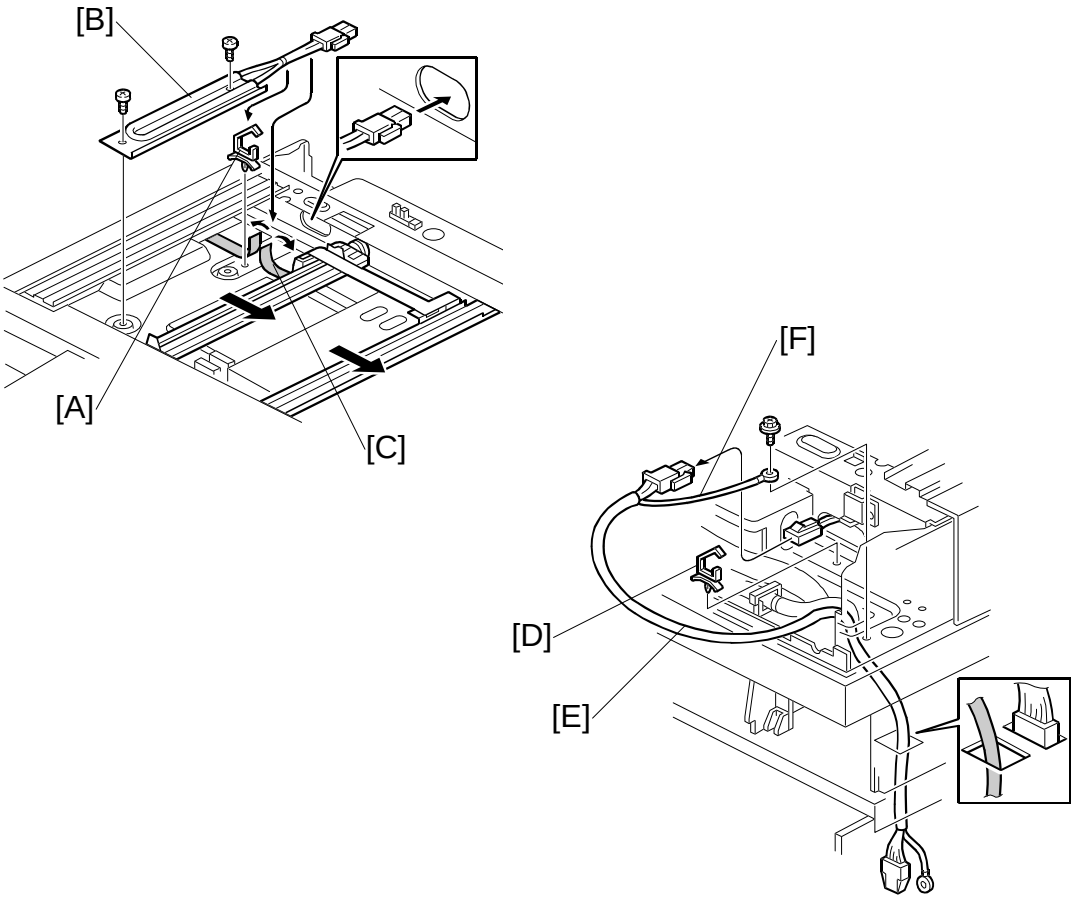




7. Connect the key counter connector [A] to CN211 on the I/O board.
8. Reinstall the covers.
9. Attach the double-sided tape to the key counter bracket.
10. Peel off the backing of the double-sided tape and attach the key counter assembly [B] to the left side of the scanner unit, as shown.
    NOTE: When attaching the key counter assembly, press the assembly against the scanner cover strongly. Otherwise, the key counter assembly may come off easily.

⇒11. Turn on the Key Counter Option under User Tools, #19 Management Settings, #5 Key Counter and select YES.

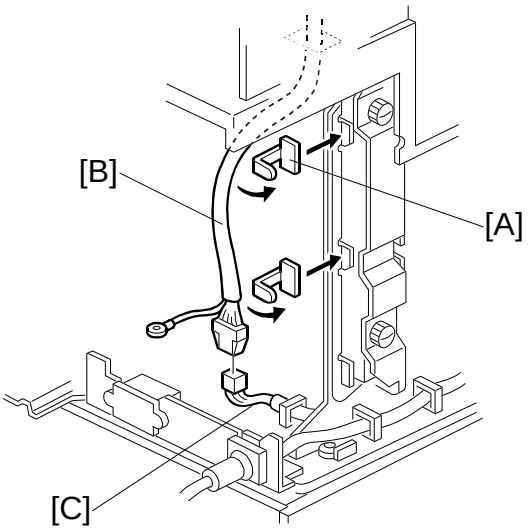
3.14 ANTI-CONDENSATION HEATER

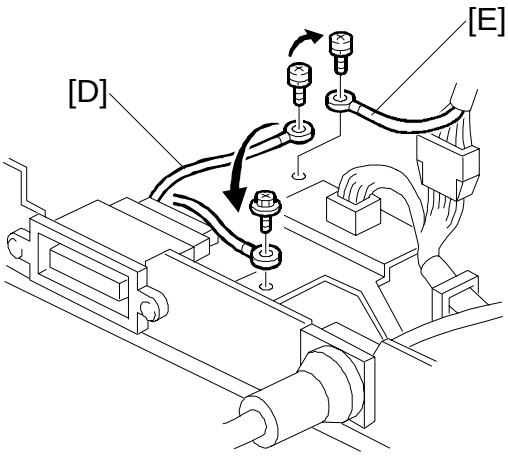


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

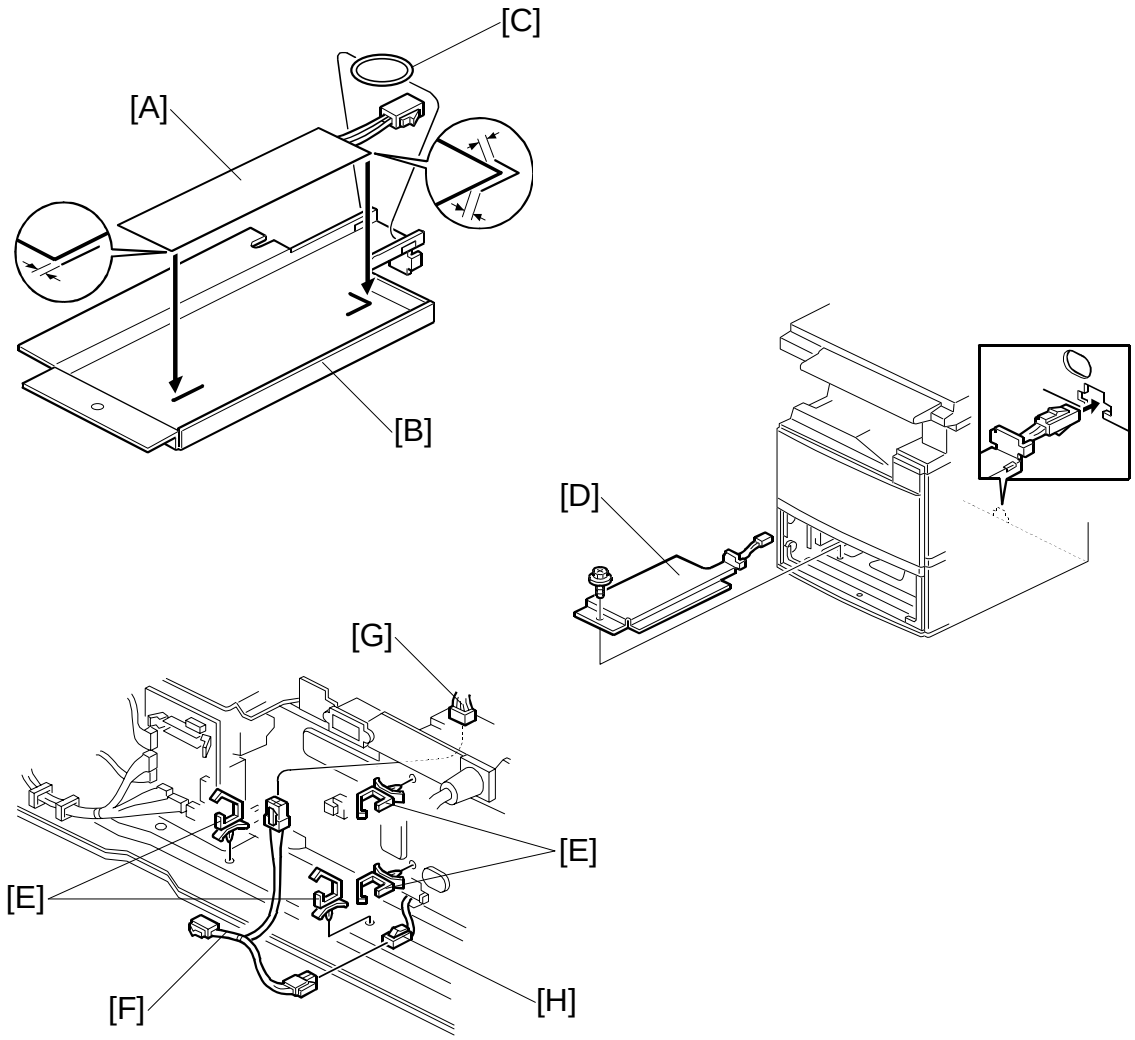
1. Remove the exposure glass, scanner rear cover, and stand rear cover (see Interchange Unit Installation for the stand rear cover).
2. Remove the rear cover and upper left cover.
3. Move the 1st and 2nd scanners to the right.
4. Install the harness clamp [A].
5. Install the anti-condensation heater [B] (2 screws).
   NOTE: The heater harness should be routed under the harness guard [C].
6. Install the harness clamp [D].
7. Connect the connector [E] to the heater, then secure the grounding wire [F] (1 screw).





8. Install two harness clamps [A] on the stand bracket.
9. Connect the connector [B] to the ac power harness [C].
10. Move the grounding wire of the connector [D], as shown.
11. Secure the grounding wire [E] of the connector cable (1 screw).

3.15 TRAY HEATER

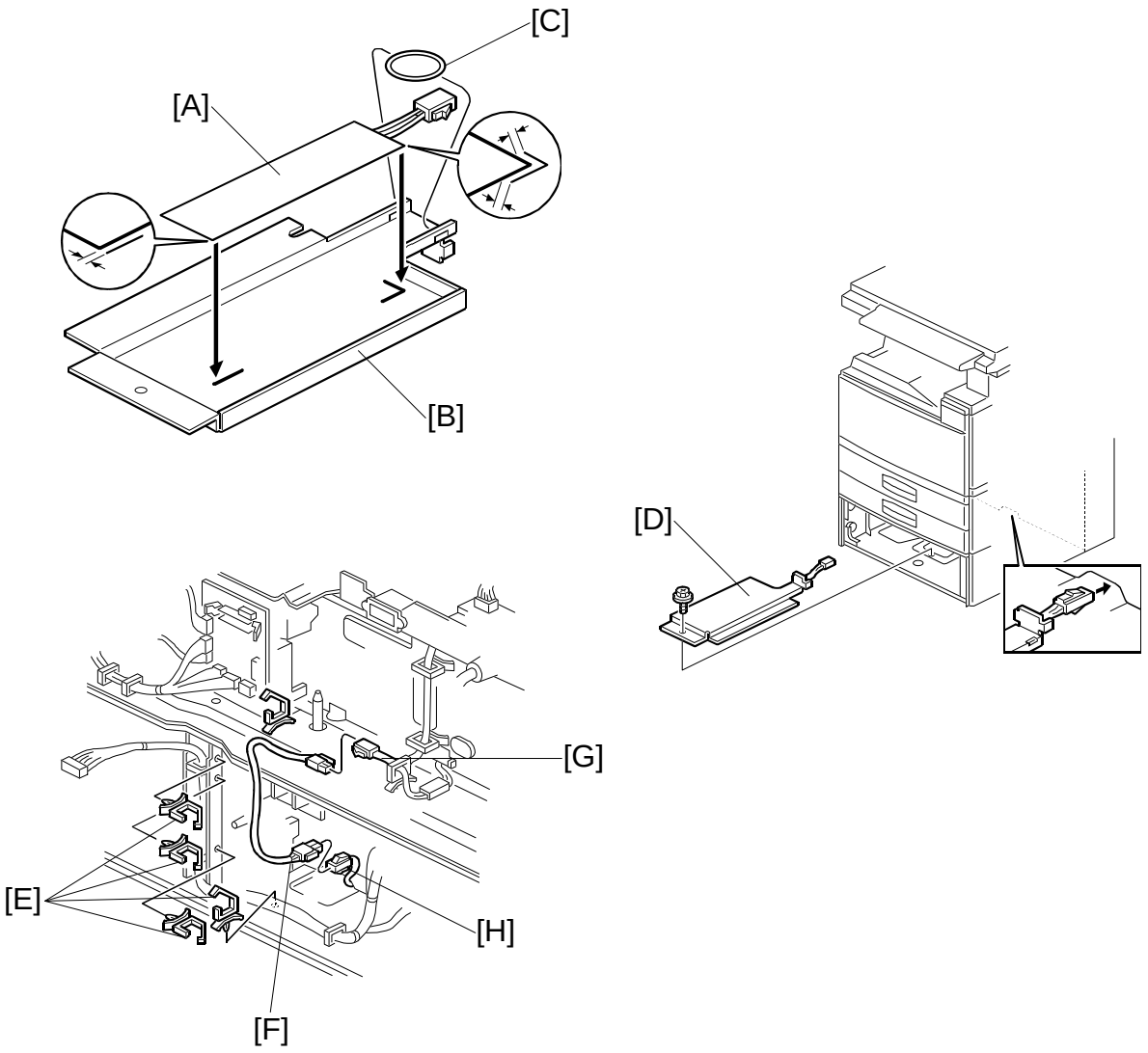


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Attach the optional tray heater [A] to the heater bracket [B].
2. Install the harness holder [C].
3. Remove the rear cover.
4. Draw out the upper and lower paper trays.
5. Install the heater assembly [D] (1 screw).
6. Install four harness clamps [E] as shown.
7. Route the harness [F] and connect it to the ac harness [G] and heater harness [H].

3.16 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)



⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Attach the optional tray heater [A] to the heater bracket [B].
2. Install the harness holder [C].
3. Remove the rear cover of the machine and the rear cover of the optional paper tray unit.
4. Draw out the upper and lower paper trays of the optional paper tray unit.
5. Install the heater assembly [D] (1 screw).
6. Install four harness clamps [E] as shown.
7. Route the harness [F] and connect it to the harness [G] and heater harness [H].

SERVICE TABLES

4. SERVICE TABLES

4.1 SERVICE PROGRAM MODE TABLES

NOTE: 1) A "#" mark by the mode number means that this SP mode has been changed.
2) In the Function column, comments are in italics.
3) In the Settings column, the default value is in bold letters.
4) An asterisk " * " after the mode number means that this mode is stored in the NVRAM. If you do a RAM reset, all these SP modes will be reset to their factory settings.
5) In the Settings column, (40) means A284 and (30) means A283.

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-001*		Leading Edge Registration	Adjusts the printing leading edge registration using the trimming area pattern (SP2-902-3, No.10).	+9 ~ –9 0.1 mm/step **+3.0 mm**
			Use the ●/✻ key to toggle between + and – before entering the value. *The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Adjustments" for details on SP1-001 and 1-002.*	
1-002*	1*	Side-to-Side Registration (1st paper feed)	Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ –9 0.1 mm/step **+3.0 mm**
			Use the ●/✻ key to toggle between + and – before entering the value. *The specification is 2 ±1.5 mm.*	
	2*	Side-to-Side Registration (2nd paper feed)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ –9 0.1 mm/step **+3.0 mm**
			Use the ●/✻ key to toggle between + and – before entering the value. *The specification is 2 ±1.5 mm.*	
	3*	Side-to-Side Registration (3rd paper feed: Option PFU tray 1 if present)	Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ –9 0.1 mm/step **+2.0 mm**
			Use the ●/✻ key to toggle between + and – before entering the value. *The specification is 2 ±1.5 mm.*	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-002*	4*	Side-to-Side Registration (4th paper feed: Option PFU tray 2 if present)	Adjusts the printing side-to-side registration from the 4th paper feed station using the trimming area pattern (SP2-902-3, No.10). *Use the ●/✻ key to toggle between + and – before entering the value. The specification is 2 ±1.5 mm.*	+9 ~ –9 0.1 mm/step **+2.0 mm**
	5*	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the trimming area pattern (SP2-902-3, No.10). *Use the ●/✻ key to toggle between + and – before entering the value. The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Adjustments" for details on SP1-002.*	+9 ~ –9 0.1 mm/step **+0.0 mm**
	6*	Side-to-Side Registration (By-pass feed)	Adjusts the printing side-to-side registration from the by-pass feed table using the trimming area pattern (SP2-902-3, No.10). *Use the ●/✻ key to toggle between + and – before entering the value. The specification is 2 ±1.5 mm.*	+9 ~ –9 0.1 mm/step **+3.0 mm**
	7*	Side-to-Side Registration (LCT)	Adjusts the printing side-to-side registration from the LCT using the trimming area pattern (SP2-902-3, No.10). *Use the ●/✻ key to toggle between + and – before entering the value. The specification is 2 ±1.5 mm.*	+9 ~ –9 0.1 mm/step **+1.5 mm**
1-003*	1*	Paper Feed Timing (Paper Feed Trays/LCT)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A +ve setting leads to more buckling.)	+9 ~ –9 1 mm/step **+0 mm**
	2*	Paper Feed Timing (Duplex)		
	3*	Paper Feed Timing (By-pass)		
1-007		By-pass Feed Paper Size Display	Displays the paper width sensor data for the by-pass feed table.	
1-103*		Fusing Idling	Selects whether fusing idling is done or not. *Normally disabled in this machine. However, if fusing is incomplete on the 1st and 2nd copies, switch it on. This may occur if the room is cold. Refer to "Detailed Section Descriptions - Fusing Temperature Control" of the A230/A231/A232 manual for more details.*	**0: Off** 1: On
1-104*		Fusing Temperature Control	Selects the fusing temperature control mode.	**0: On/Off** 1: Phase

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-105*	1*	Fusing Temperature Adjustment (Paper Tray)	Adjusts the fusing temperature for paper fed from a paper tray.	170 ~ 200 (40) 150 ~ 180 (30) 1°C/step **185°C (40)** **165°C (30)**
	2*	Fusing Temperature Adjustment (By-pass)	Adjusts the fusing temperature for paper fed from the by-pass feed unit.	170 ~ 200 (40) 160 ~ 190 (30) 1°C/step **185°C (40)** **175°C (30)**
1-106		Fusing Temperature Display	Displays the fusing temperature.	
1-109		Fusing Nip Band Check	Checks the fusing nip band *Refer to "Nip Band Width Adjustment" for more details.*	1: Start 0: Stop
1-111*		Paper Switch Back Timing (Duplex)	Adjusts the paper switch back timing *Use this SP mode when paper often jams at the inverter gate in the duplex unit.*	+5 ~ –5 1 mm/step **0 mm**
2-001*	1*	Charge Roller Bias Adjustment (Copying)	Adjusts the voltage applied to the grid plate during copying. *After replacing the drum or charge roller, change this value to the default.*	–1000 ~ –2000 10 V/step –**1650 V (40)** –**1630 V (30)**
	2*	Charge Roller Bias Adjustment (ID sensor pattern)	Adjusts the voltage applied to the charge roller when making the V_{SDP} ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2-001-1. ***Do not adjust.***	0 ~ 700 10 V/step **350 V**
2-005*	1*	Charge Roller Bias Correction 1 (Lower threshold)	Adjusts the lower threshold value for the charge roller correction. *When the value of V_{SP}/V_{SG} is greater than this value, the charge roller voltage increases by 30 V (e.g., from –500 to –530).*	0.1 ~ 1.0 0.05/step **0.85**
	2*	Charge Roller Bias Correction 2 (Upper threshold)	Adjusts the upper threshold value for the charge roller correction. *When the value of V_{SP}/V_{SG} is greater than this value, the charge roller voltage decreases by 30 V (absolute value).*	0.1 ~ 1.0 0.05/step **0.90**
	3*	Charge Roller Bias Correction 3 (Lower limit)	Adjusts the lower limit value for charge roller voltage correction.	–1000 ~ –2000 10 V/step –1650 V (40) –**1630 V (30)**
	4*	Charge Roller Bias Correction 4 (Upper limit)	Adjusts the upper limit value for charge roller voltage correction.	–1000 ~ –2000 10 V/step –**2000 V**
	5*	Charge Roller Bias Correction Step	Adjusts the correction voltage adjustment step size.	0 ~ 100 10 V/Step **30 V**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-101*	1*	Leading Edge Erase Margin (Printing)	Adjusts the leading edge erase margin. *The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Adjustments" for details.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	2*	Trailing Edge Erase Margin (Printing)	Adjusts the trailing edge erase margin. *The specification is 2 ±2 mm.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	3*	Right Side Edge Erase Margin (Printing)	Adjusts the right side erase margin. *The specification is 2 ±2.5/–1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	4*	Left Side Edge Erase Margin (Printing)	Adjusts the light side erase margin. *The specification is 2 +1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	5*	Trailing Edge Erase Margin (Back side)	Adjusts the trailing edge erase margin on the reverse side of duplex copies. *The specification is 2 ±2 mm*	0.0 ~ 4.0 0.1 mm/step **1.2 mm**
	6*	Left Side Erase Margin (Rear side)	Adjusts the left side erase margin in the reverse side of duplex copies. *The specification is 2 ±1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
	7*	Right Side Erase Margin (Rear side)	Adjusts the right side erase margin in the reverse side of duplex copies. *The specification is 2 +2.5/–1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
2-103*	1*	LD Power Adjustment LD1 - 400dpi	Adjusts the power of LD1 for 400 dpi resolution. ***Do not change the value.***	–127 ~ +127 1/step 1 = 0.6 µW (30) 1 = 0.8 µW (40) **+0**
	2*	LD Power Adjustment LD1 - 600dpi	Adjusts the power of LD1 for 600 dpi resolution. ***Do not change the value.***	–127 ~ +127 1/step 1 = 0.6 µW (30) 1 = 0.8 µW (40) **+0**
	3*	LD Power Adjustment LD2 - 400dpi	Adjusts the power of LD2 for 400 dpi resolution. ***Do not change the value.***	–127 ~ +127 1/step 1 = 0.6 µW (30) 1 = 0.8 µW (40) **+0**
	4*	LD Power Adjustment LD2 - 600dpi	Adjusts the power of LD2 for 600 dpi resolution. ***Do not change the value.***	–127 ~ +127 1/step 1 = 0.6 µW (30) 1 = 0.8 µW (40) **+0**
	5	LD Power Adjustment - LD1	**Factory use only. Do not use this SP mode.**	0: Stop 1: Start
	6	LD Power Adjustment - LD2	**Factory use only. Do not use this SP mode.**	0: Stop 1: Start

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-109*	1*	Laser Beam Pitch Adjustment - 400 dpi	Input the laser beam pitch value for 400 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-3 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	0 ~ 262 4 pulses/step **144**
	2*	Laser Beam Pitch Adjustment - 600 dpi	Input the laser beam pitch value for 600 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-4 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	0 ~ 284 4 pulses/step **168**
	3	Laser Beam Pitch Initial Setting - 400 dpi	Initializes the laser beam pitch for 400 dpi to the SP2-109-1 value. Press "1" to initialize. *After inputting data for SP2-109-1, this SP must be performed.*	1: Start
	4	Laser Beam Pitch Initial Setting - 600 dpi	Initializes the laser beam pitch for 600 dpi to the SP2-109-2 value. Press "1" to initialize. *After inputting data for SP2-109-2, this SP must be performed.*	1: Start
	5*	Laser Unit Auto. Adjustment Interval	Input the interval value of the laser beam pitch automatic adjustment. *When the number of times that the resolution been changed reaches this value, the laser unit position is automatically corrected.*	0 ~ 65535 1/step 1000 times
	6	Current LD Unit Position	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.	
	7	Laser Beam Pitch Change Counter	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) *When the laser beam pitch adjustment is done, this counter is reset to "0".*	
	8	Beam Pitch Data Reset	Resets the values of SP2-109-6 and SP2-109-7. Press "1" to reset. *After replacing the LD unit, this SP mode must be done.*	1: Start
⇒ 2-110		Image Resolution Change	Select the Image Resolution.	0: 400 dpi **8: 600 dpi**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-112*		Polygon Motor Off Timer	Input the time that the polygon motor turns off after entering the stand-by condition. *If set at "0", the polygon motor never turns off during stand-by. However, when the machine goes into energy saver mode, the polygon motor turns off regardless of this timer.*	0 ~ 60 5 s/step **10 s**
2-201*	1*	Development Bias Adjustment (for copying)	Adjusts the development bias for copying. *This can be adjusted as a temporary measure if faint copies appear due to an aging drum.*	200 ~ 700 10 V/step **600 V**
	2*	Development Bias Adjustment (for ID sensor pattern)	Adjusts the development bias for making the ID sensor pattern for V_{SP}. *This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply.*	200 ~ 700 1 V/step **380 V**
2-207		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit for 30 seconds. Press "1" to start. *Toner supply finishes automatically after 30 seconds. This process is not normally needed in the field for this model.*	1: Start
2-208*	1*	Toner Supply Mode	Selects the toner supply mode. *Use image pixel count mode only as a temporary measure if the ID or TD sensor is defective.*	**0**: Sensor 1: Image Pixel Count
2-209*	1	Toner Supply Rate	Adjusts the toner supply rate. *Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.*	10 ~ 800 5 mg/s/step **30 mg/s**
	2*	Toner Supply Correction Coefficient	Displays the toner supply correction coefficient (K). It can also be used to adjust K, but the value is changed again when V_T is measured for the next copy. *The toner supply rate depends on the amount of toner in the toner bottle. This change is corrected using this coefficient. This SP can be used to check the toner supply condition. In general, the lower the value of K, the lower the toner density.*	0.25 ~ 3.00 0.25/step **3.00**
2-210*		ID Detection Interval	Changes the interval for making the ID sensor pattern (V_{SP}/V_{SG} detection). *If the user normally makes copies with a high proportion of black, reduce the interval.*	10 ~ 200 1 copy/step **10 copies**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-213*		Number of Copies After Toner Near-end Condition	Selects the number of copies can be made after entering a toner near-end condition. *If the user normally makes copies with a high proportion of black, reduce the interval.*	**0: 90 copies** 1: Unlimited 2: 10 copies
2-220*		VREF Manual Setting	Adjust the TD sensor reference voltage (VREF). *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, do the following:* *1. Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to.* *2. Install the test development unit, then input the VREF for this unit into SP2-220.* *3. After the test, put back the old development unit, and change SP2-220 back to the original value.*	1.00 ~ 5.00 0.01 V/step **4.00 V**
2-223 *	1	VT Display	Displays the current TD sensor output voltage.	
	2	VT (10) Display	Displays the average of the most recent 10 TD sensor outputs.	
	3	VT Change Rate Display	Displays the rate of change in the TD sensor output.	
	4	GAIN Display	Displays the value of GAIN which is used for calculating the toner supply motor on time.	
	5	Image Pixel Count Display	Displays the image pixel count.	
2-301*	1*	Transfer Current Adjustment (1st side of the paper)	Adjusts the current applied to the transfer belt during copying on the 1st side of the paper. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**
	2*	Transfer Current Adjustment (2nd side of the paper)	Adjusts the current applied to the transfer belt during copying on the 2nd side of the paper. *See above.*	20 ~ 100 1 μA/step **32 μA (40)** **25 μA (30)**
	3*	Transfer Current Adjustment (Leading edge of the paper)	Adjusts the current applied to the transfer belt during copying at the leading edge of the paper. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-301*	4*	Transfer Current Adjustment (By-pass Feed)	Adjusts the current applied to the transfer belt during copying from the by-pass feed table. *See above. If the user normally feeds thicker paper from the bypass tray, use a higher setting.*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**
	5*	Transfer Current Adjustment (Leading edge of the paper from by-pass Feed)	Adjusts the current applied to the transfer belt during copying at the leading edge of paper from the by-pass feed table. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.*	20 ~ 100 1 μA/step **60 μA (40)** **45 μA (30)**
2-309*	1*	Transfer Current Correction (Paper width - lower)	Adjusts the lower paper width threshold for the transfer current correction. *Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2-309-3 (paper tray) or SP2-309-5 (by-pass).* *Refer to Detailed Section Descriptions - Image Transfer for more details.*	0 ~ 297 1 mm/step **150 mm**
	2*	Transfer Current Correction (Paper width - upper)	Adjusts the upper paper width threshold for the transfer current correction. *As for SP2-309-1, but the factors are in SP2-309-4 (paper tray) and SP2-309-6 (by-pass).*	0 ~ 297 1 mm/step **216 mm**
	3*	Transfer Current Correction - α (Paper tray)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-1.	1.0 ~ 3.0 0.1/step **1.2**
	4*	Transfer Current Correction - β (Paper tray)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-2.	1.0 ~ 3.0 0.1/step **1.2**
	5*	Transfer Current Correction - γ (By-pass feed)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-1.	1.0 ~ 3.0 0.1/step **1.5**
	6*	Transfer Current Correction - δ (By-pass feed)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-2.	1.0 ~ 3.0 0.1/step **1.5**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-801		TD Sensor Initial Setting	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press 1 to start. After finishing this, the TD sensor output voltage is displayed. *Use this mode only after installing the machine, changing the TD sensor, or adding new developer.*	1: Start
2-802*	1*	TD Sensor Manual Setting - V_{TS}	Adjusts the TD sensor output (V_T). *Change this value after replacing the development unit with another one that already contains toner.* *For example, when using a development unit from another machine for test purposes. To adjust V_T, use a similar procedure as for SP2-220.*	1.0 ~ 5.0 0.01 V/step **4.00 V**
	2*	TD Sensor Manual Setting - V_{TMAX}	Adjusts the maximum value for SP2-802-1.	1.0 ~ 5.0 0.01 V/step **4.10 V**
	3*	TD Sensor Manual Setting - V_{TMIN}	Adjusts the minimum value for SP2-802-1.	1.0 ~ 5.0 0.01 V/step **3.70 V**
2-805		Developer Initialization	Performs the developer initialization. Press 1 to start. *This SP should be performed after doing SP2-801-1 at installation and after replacing the drum.*	1: Start
2-902	2	Test Pattern Printing (IPU)	Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns. *This SP mode is useful for finding whether the BICU or the SBU is defective. If the printout is not OK, the BICU is defective.*	
	3	Test Pattern Printing (Printing)	Prints the printer test patterns. See section 4.2.3 for how to print test patterns. Example: 10. Trimming Area *This SP mode is useful for finding whether the LDDR or the BICU is defective. If the printout is not OK, the LDDR is defective.*	
2-909*	1*	Main Scan Magnification (Copier)	Adjusts the magnification in the main scan direction for copy mode. *Use the ●/✻ key to toggle between + and –. See "Replacement and Adjustment - Copy Adjustments" for details.*	–2.0 ~+2.0 0.1 %/step **+0.00 %**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-909*	2*	Main Scan Magnification (Printer)	Adjusts the magnification in the main scan direction when printing from a personal computer. *Use the ●/✻ key to toggle between + and –. See "Replacement and Adjustment - Copy Adjustments" for details.*	–2.0 ~+ 2.0 0.1 %/step **+0.00 %**
2-911*	1*	Transfer Current Timing (On Timing)	Adjusts the transfer current on timing at the leading edge.	–30 ~ +30 1 mm/step **0 mm**
	2*	Transfer Current Timing (Switch Timing)	Adjusts the transfer current switch timing. This determines when the leading edge stops and the image area current begins (see SP2-301).	–30 ~ +30 1 mm/step **10 mm**
	3*	Transfer Current Timing (Off Timing)	Adjusts the transfer current off timing (–5 mm is 5 mm after the trailing edge).	–30 ~ +30 1 mm/step **–5 mm**
2-912*		Drum Reverse Rotation Time	**Designer use only. Do not change the value.**	0 ~ 50 1 ms/step **0 ms**
2-914*	1*	Process Control Setting - Cα	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 400 10 V/step **250 V**
	2*	Process Control Setting - Cβ	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 400 10 V/step **50 V**
	3*	Process Control Setting - Bγ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 300 10 V/step **200 V**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-914*	4*	Process Control Setting - Bδ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 300 10 V/step **50 V**
2-920		LD Off Check	**Factory use only.**	**0: On** 1: Off
2-921*		Shading Correction - Printer	Selects whether shading correction for printing is done or not. ***Do not change the setting.***	0: No **1: Yes**
2-960*		Toner Overflow Sensor	Select whether the toner overflow sensor is activated or not. ***Do not change the setting.***	0: No **1: Yes**
# 2-969*		LD PWM Selection - Printer	Changes the LD power PWM control. A larger value causes a darker image. *Use this SP to adjust the image density for printing from a personal computer or printing a received fax message.*	1 ~ 5 1/step **4**
⇒ 2-971		Toner Full Sensor Counter	Displays total occurrence of connection errors for the toner overflow sensor. ***This SP is for factory use only.***	
3-001*	1*	ID Sensor PWM Setting	This SP mode is added to solve the following problem. A SC condition occurs when ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. *The PWM data is stored at doing the ID Sensor Initial Setting.*	0 ~ 255 1/step **100**
	2*	ID Sensor Initial Setting	Performs the ID sensor initial setting. The ID sensor output for the bare drum (V_{SG}) is adjusted to 4.0 ±0.2 V. *This SP mode should be performed after replacing or cleaning the ID sensor or replacing the drum or doing an NVRAM clear.*	1: Start
3-103*		ID Sensor Output Display	Displays the current V_{SG} and V_{SP} output. *If the ID sensor does not detect the ID pattern, "V_{SP} = 5.0 V/V_{SG} = 5.0 V" is displayed and an SC code is generated.* *If the ID sensor does not detect the bare area of the drum, "V_{SP} = 0.0 V/V_{SG} =0.0 V" is displayed and an SC code is generated.*	V_{SP} = x.xx V V_{SG} = x.xx V

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
3-903*		Initialization at Power-up	Decides whether or not the machine is initialized (drum cleaning, charge roller H.P check, charge roller voltage correction, etc) at power-up. *If set to "1", the fusing idling mode is disabled regardless of the setting of SP1-103.*	**0: Yes** 1: No
4-008*		Sub Scan Magnification (Scanning)	Adjusts the magnification in the sub scan direction for scanning. If this value is changed, the scanner motor speed is changed. *Use the ●/✻ key to toggle between + and –. See "Replacement and Adjustment - Copy Adjustments" for details.*	–9.0 ~ +9.0 0.1 %/step **+0.0 %**
4-010*		Leading Edge Registration (Scanning)	Adjusts the leading edge registration for scanning. *(–): The image moves in the direction of the leading edge* *Use the ●/✻ key to toggle between + and –. See "Replacement and Adjustment - Copy Adjustments" for details.*	–9.0 ~ +9.0 0.1 mm/step **+0.0 mm**
4-011*		Side-to Side Registration (Scanning)	Adjusts the side-to-side registration for scanning. *(–): The image disappears at the left side.* *(+): The image appears at the left side.* *Use the ●/✻ key to toggle between + and –. See "Replacement and Adjustment - Copy Adjustments" for details.*	–4.6 ~ +4.6 0.1 mm/step **+0.0 mm**
4-012*	1*	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge erase margin for scanning. *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	2*	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge erase margin for scanning. *See the comment for SP4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	3*	Left Side Erase Margin (Scanning)	Adjusts the left side erase margin for scanning. *See the comment for SP4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	4*	Right Side Erase Margin (Scanning)	Adjusts the right side erase margin for scanning. *See the comment for SP4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp off.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-301		APS Sensor Output Check	Displays the APS sensor output signals when an original is placed on the exposure glass. Bit 0: Width sensor 1 Bit 1: Width sensor 2 Bit 2: Length sensor 1 Bit 3: Length sensor 2 Bit 4: Length sensor 3 See "Detailed Section Descriptions - Original Size Detection in Platen Mode" for more details.	00000000 0: Not detected 1: Detected
4-303*		APS Small Size Original Detection	Selects whether or not the copier determines that the original is A5/HLT size when the APS sensor does not detect the size. *If A5 length/5 1/2" x 8 1/2" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise or 5 1/2" x 8 1/2".* *If "Not detected" is selected, "Cannot detect original size" will be displayed.*	**0: Not detected** 1: A5 length/ 5 1/2" x 8 1/2"
4-428*	1*	Standard White Level Adjustment Flag	Displays whether or not the standard white level adjustment has been done.	0: Performed 1: Not performed
	2	Standard White Level Adjustment	Corrects the standard white level of the white plate. ***This SP mode is for factory use only. Do not use this SP mode.***	1: Start
# 4-901*	1 #	Image Data Path (SBU)	***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 3 1/step **0**
	2 #	ASIC ID Display	Displays the ID code for the ASIC. ***This SP mode is for designer use only. Do not use this SP mode.***	
	3* #	Black Level Adjustment (current value)	Checks the black level adjustment value at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **209**
	4 *#	BK E/O Adjustment	Checks the difference between black levels for Even and Odd channels after adjusting the black level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **128**
	5* #	Temporary AGC Range Adjustment	Checks the temporary AGC range value after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **160 (30)** **187 (40)**
	6* #	AGC Range Adjustment	Checks the AGC range value after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **160 (30)** **187 (40)**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-901*	7* #	AGC Gain Adjustment - E ch	Checks the AGC gain value for the Even channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	8* #	AGC Gain Adjustment - O ch	Checks the AGC gain value for the Odd channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	9* #	Temporary AGC Range Adjustment (Scanner App.)	Checks the temporary AGC range value for the scanner application after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **140 (30)** **167 (40)**
	10* #	AGC Range Adjustment (Scanner App.)	Checks the AGC range value for the scanner application after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **160 (30)** **187 (40)**
	11* #	AGC Gain Adjustment - E ch (Scanner Option)	Checks the AGC gain value for the Even channel for the scanner application after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	12* #	AGC Gain Adjustment - O ch (Scanner Option)	Checks the AGC gain value for the Odd channel for the scanner application after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	13* #	Standard White Level Display	Checks the value of the standard white level after adjusting the white level. ***This SP mode is for factory use only. Do not use this SP mode.***	0 ~ 255 1/step **94**
	14* #	Overflow Flag	Checks the overflow flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	
	15* #	Time Out Flag	Checks the time out flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	
	16* #	Error Flag	Checks the error flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	
	17* #	SBU Reset Error Flag	Checks the SBU reset error flag after resetting the SBU at power-up. ***This SP mode is for factory use only. Do not use this SP mode.***	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-901*	18* #	AGC Range Adjustment (Factory)	Checks the AGC range value which is adjusted in the factory. ***This SP mode is for designer use only. Do not use this SP mode.***	
	19* #	AGC Gain Adjustment - E ch (Factory)	Checks the AGC gain value for the Even channel that is adjusted in the factory. ***This SP mode is for designer use only. Do not use this SP mode.***	
	20* #	AGC Gain Adjustment - O ch (Factory)	Checks the AGC gain value for the Odd channel that is adjusted in the factory. ***This SP mode is for designer use only. Do not use this SP mode.***	
	21* #	Standard White Level Display (Factory)	Checks the value of the standard white level that is adjusted in the factory. ***This SP mode is for factory use only. Do not use this SP mode.***	
	22* #	A/D Standard Voltage in ADS Mode	Adjusts the upper limit voltage for A/D conversion in ADS mode. ***This SP mode is for factory use only. Do not use this SP mode.***	0 ~ 255 1/step **204**
	23* #	Black Level Adjustment (Previous value)	Use this value when the timeout error for the black level adjustment occurs. This value updates after adjusting the black level without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **209**
	24* #	BK E/O Adjustment (Previous value)	Use this value when the timeout error occurs for adjusting the difference between the black levels for Even and Odd channel. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **128**
	25* #	Standard White Level Data	***This SP mode is for factory use only. Do not use this SP mode.***	0 ~ 255 1/step **94**
	26* #	AGC Range Adjustment (Previous value)	Use this value when the timeout error for the AGC range value adjustment occurs. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **160 (30)** **187 (40)**
	27* #	AGC Gain Adjustment - E ch (Previous value)	Use this value when the timeout error occurs for the AGC gain adjustment for the Even channel. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-901*	28* #	AGC Gain Adjustment - O ch (Previous value)	Use this value when the timeout error occurs for the AGC gain adjustment for the Odd channel. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	29 #	Temporally AGC Range Data (Scanner App.)	***This SP mode is for designer use only. Do not use this SP mode.***	
	30 #	AGC Range Data (Scanner App.)	***This SP mode is for designer use only. Do not use this SP mode.***	
	31* #	AGC Gain Adjustment - E ch (Scanner Option)	Use this value when the timeout error occurs for the AGC gain adjustment for the Even channel for the scanner application. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	32* #	AGC Gain Adjustment - O ch (Scanner Option)	Use this value when the timeout error occurs for the AGC gain adjustment for the Odd channel for the scanner application. This value updates after adjusting it without error. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
# 4-903*	5	Full Size Mode	Selects whether the copy is always in full size mode even if the magnification ratio has been changed. *Set to 1 when checking the magnification in the main scan direction. If the magnification is not 100%, something is wrong with the image processing circuits.*	**0: Normal operation** 1: Always full size mode
	7	Image Shift in Magnification Mode	Adjusts the pixel shift amount in the main scan direction in magnification mode. ***This SP mode is for designer use only.***	0 ~ 7680 1/step **0**
	10* #	25%/50% Reduction in Fax Mode	Selects whether 25% and 50% reduction in fax mode is available or not. ***Do not change the setting.***	**0: Available** 1: Not available
	11* #	MTF Filter Coefficient (Text: Main: 25% ~ 64%)	Selects the MTF filter coefficient in the main scan direction for letter mode. See “Detailed Descriptions - Image Processing” for details.	0 ~ 15 1/step **12**
	12* #	MTF Filter Coefficient (Text: Main: 65% ~ 154%)		0 ~ 15 1/step **14**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
# 4-903*	13* #	MTF Filter Coefficient (Text: Main: 155% ~ 400%)	Selects the MTF filter coefficient in the main scan direction for letter mode. See “Detailed Descriptions - Image Processing” for details.	0 ~ 15 1/step **15**
	14* #	MTF Filter Coefficient (Text: Main: Notch 1)		0 ~ 15 1/step **14**
	15* #	MTF Filter Coefficient (Photo: Main)		0 ~ 15 1/step **14**
	16* #	Smoothing Filter Coefficient (Photo)	Selects the smoothing filter coefficient for photo mode, if smoothing is enabled for photo mode with SP4-904-3.	0 ~ 7 1/step **2**
	17* #	MTF Filter Coefficient (Text/Photo: Main)	Selects the MTF filter coefficient in the main scan direction for each original type mode. See “Detailed Descriptions - Image Processing” for details.	0 ~ 15 1/step **9**
	18* #	MTF Filter Coefficient (Low Density Original: Main)		0 ~ 15 1/step **9**
	19* #	MTF Filter Coefficient (Copied Original: Main)		0 ~ 15 1/step **10**
	20* #	MTF Filter Strength (Text: Main: 25% ~ 64%)	Selects the MTF filter strength in the main scan direction for each original type mode. SP4-903-24 is only effective if MTF is enabled with SP4-904-3. See “Detailed Descriptions Image Processing” for details.	0 ~ 7 1/step **2**
	21* #	MTF Filter Strength (Text: Main: 65% ~ 154%)		0 ~ 7 1/step **2**
	22* #	MTF Filter Strength (Text: Main: 155% ~ 400%)		0 ~ 7 1/step **2**
	23* #	MTF Filter Strength (Text: Main: Notch 1)		0 ~ 7 1/step **3**
	24* #	MTF Filter Strength (Photo: Main)		0 ~ 7 1/step **1**
	25* #	MTF Filter Strength (Text/Photo: Main)		0 ~ 7 1/step **1**
	26* #	MTF Filter Strength (Low Density Original: Main)		0 ~ 7 1/step **3**
	27* #	MTF Filter Strength (Copied Original: Main)		0 ~ 7 1/step **2**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-903*	28* #	Independent Dot Erase Level (Text mode)	Selects the independent dot erase level for each original type mode. A larger value erases more independent dots. If “0” is selected, independent dot erase is disabled.	0 ~ 15 1/step **4**
	30* #	Independent Dot Erase Level (Text/Photo Mode)		0 ~ 15 1/step **0**
	31* #	Independent Dot Erase Level (Low Density Original)		0 ~ 15 1/step **0**
	32* #	Independent Dot Erase Level (Copied Original mode)		0 ~ 15 1/step **10**
	34* #	Background Erase Level (Text mode)	Adjust the threshold level for background erase. A larger value reduces dirty background. If “0” is selected, background erase is disabled.	0 ~ 255 1/step **5**
	35* #	Background Erase Level (Text/Photo mode)		0 ~ 255 1/step **0**
	36* #	Background Erase Level (Photo mode)		0 ~ 255 1/step **0**
	37* #	Background Erase Level (Copied Original mode)		0 ~ 255 1/step **10**
	41* #	MTF Filter Coefficient (Text: Sub: 25% ~ 64%)	Selects the MTF filter coefficient in the sub scan direction for each original type mode. SP4-903-48 is only effective if MTF is enabled with SP4-904-3. See “Detailed Descriptions - Image Processing” for details.	0 ~ 13 1/step **12**
	42* #	MTF Filter Coefficient (Text: Sub: 65% ~ 154%)		0 ~ 13 1/step **13**
	43* #	MTF Filter Coefficient (Text: Sub: 155% ~ 400%)		0 ~ 13 1/step **13**
	44* #	MTF Filter Coefficient (Text: Sub: Notch 1)		0 ~ 13 1/step **13**
	45* #	MTF Filter Coefficient (Low Density Original: Sub)		0 ~ 13 1/step **13**
	46* #	MTF Filter Coefficient (Copied Original: Sub)		0 ~ 13 1/step **13**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-903	47* #	MTF Filter Coefficient (Text/Photo: Sub)	Selects the MTF filter coefficient in the sub scan direction for each original type mode. SP4-903-48 is only effective if MTF is enabled with SP4-904-3. See "Detailed Descriptions - Image Processing" for details.	0 ~ 13 1/step **10**
	48* #	MTF Filter Coefficient (Photo: Sub)		0 ~ 13 1/step **13**
	50* #	MTF Filter Strength (Text: Sub: 25% ~ 64%)	Selects the MTF filter strength in the sub scan direction for each original type mode. SP4-903-54 is only effective if MTF is enabled with SP4-904-3. See "Detailed Descriptions - Image Processing" for details.	0 ~ 7 1/step **2**
	51* #	MTF Filter Strength (Text: Sub: 65% ~ 154%)		0 ~ 7 1/step **2**
	52* #	MTF Filter Strength (Text: Sub: 155% ~ 400%)		0 ~ 7 1/step **2**
	53* #	MTF Filter Strength (Text: Sub: Notch 1)		0 ~ 7 1/step **3**
	54* #	MTF Filter Strength (Photo: Sub)		0 ~ 7 1/step **1**
	55* #	MTF Filter Strength (Text/Photo: Sub)		0 ~ 7 1/step **1**
	56* #	MTF Filter Strength (Low Density Original: Sub)		0 ~ 7 1/step **3**
	57* #	MTF Filter Strength (Copied Original: Sub)		0 ~ 7 1/step **2**
4-904*	2*	Dither Matrix Setting	Selects the dither matrix for photo mode. *If "0" is selected, the image will be sharper.*	0: 4 x 4 **1: 6 x 6**
	3*	Filter Type Selection in Photo Mode	Selects the filter type for photo mode. *Coefficients used:* *0: SP4-903-15, 24, 48, and 54.* *1: SP4-903-16* *If "0" is selected, the image will be sharper. However, dot screen areas will be faint.*	0: MTF **1: Smoothing**
	6*	Line Width Correction Type in Copied Original Mode	Selects the line width correction type for copied original mode. *In copied original mode, lines may bulge in the main scan direction. Adjust this SP mode until the result is satisfactory.*	0: Not corrected 1: Thin line-1 **2: Thin line-2** 3: Thick line

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-904*	9	Image Data Path - MSU	Selects one of the following video data outputs, which will be used for printing. 0: After image scanning 1: After gradation processing 1 2: After gradation processing 2 3: After image data form application 4: After MSU 1 5: After MSU 2 6: Image synchronize signal only 7: Not output **8: Normal video processing**	
			Do not change the value.	
	12*	Threshold Level in Binary Picture Processing Mode	Adjusts the threshold level for binary picture processing.	0 ~ 255 1/step **128**
	18*	Binary Dither Pattern	Selects the dither pattern for photo mode in binary picture processing mode.	**0: 70 lines (8 x 8)** 1: 95 lines (6 x 6) 2: 140 lines (8 x 8) 3: 180 lines (8 x 8)
			A greater number of lines give a more detailed copy.	
	23*	Binary Error Diffusion Pattern	Selects the error diffusion pattern except for photo mode.	**0: Normal** 1: Matrix 1 2: Matrix 2
			Changes this value If the image quality for the texture original to be improved.	
4-905	1	Image Data Path - Filtering/Magnification	Selects one of the following video data outputs, which will be used for printing. **0: Magnification → Filtering** 1: Magnification only 2: Filtering only 3: No processing	
			Do not change the value.	
	2	Image Data Path - Gradation Processing	Selects one of the following video data outputs, which will be used for gradation processing. 0: After image scanning 1: After MSU 2. After image overlay **3: Normal operation**	
			Do not change the value.	
	4	Printout Type Selection	Selects one of the following video data outputs, which will be used for the printer controller. **0: Normal operation** 1: Black/white conversion 2: Not printout 3: Application through	
			Do not change the value.	
# 4-909*	2 * #	Line Width Correction - Black (Main scan)	Decides the threshold value in the main scan direction for a pixel to be black.	0 ~ 255 1/step **223**
			Do not change the value.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 4-909*	3 * #	Line Width Correction - White (Main scan)	Decides the threshold value in the main scan direction for a pixel to be white. ***Do not change the value.***	0 ~ 255 1/step **111**
	4 * #	Line Width Correction - Black (Sub scan)	Decides the threshold value in the sub scan direction for a pixel to be black. ***Do not change the value.***	0 ~ 255 1/step **223**
	5 * #	Line Width Correction - White (Sub scan)	Decides the threshold value in the sub scan direction for a pixel to be white. ***Do not change the value.***	0 ~ 255 1/step **111**
	19	Image Data Path - Application	Selects one of the following video data outputs, which will be used for the application. ***Do not change the value.***	0 ~ 14 1/step **14**
	20	Image Data Path - Printing	Selects one of the following video data outputs, which will be used for printing. ***Do not change the value.***	0 ~ 8 1/step **8**
4-910	3	Data Compression - ABS Through	Selects whether the ABS function is done or not. ***Do not change the value.***	**0: Yes** 1: No
4-911*	1	HDD Setting (Media Test)	Checks for bad sectors on the hard disk that develop during machine use. Press “1” to start. This takes 4 minutes. *This SP mode should be done when an abnormal image is printed. There is no need to do this at installation as the hard disk firmware already contains bad sector information, and damage is not likely during transportation.* *Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware.* *If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2.*	1: Start
	2	HDD Setting (Formatting)	Formats the hard disk. This takes 4 minutes. Press “1” to start. **Do not turn off the main power switch during this process.**	1: Start
	3*	HDD Setting (Spindle Control)	Decides the disk drive motor (spindle motor) stop timing. **0: Enabled** The hard disk stops in low power mode. The first copy after returning to standby will take longer. 1: Disabled The hard disk keeps going in low power mode.	
	6	HDD Setting (Bad Sector Information Reset)	Resets the bad sector information which is stored in the NVRAM. Press “1” to start. *This SP should be performed when the hard disk is replaced.*	1: Start

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-911*	7	HDD Setting (Bad Sector Display)	Displays the number of bad sectors there are on the hard disk. *If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2.*	Total: 0 Copy: 0 Printer: 0 AF: 0 (Archive File)
	8	HDD Model Name Display	Displays the model name of the HDD. *If the hard disk is not installed, "Not Connected" is displayed.*	
5-001		All Indicators On	Turns on all indicators on the operation panel. *Press "1" to check.* *Press [C] to exit this SP mode.*	M/C: Stop 1: Start
5-009*		Language Selection	Selects the language for the display. *After selecting the language, turn the main power switch off and on.*	
5-024*		mm/inch Display Selection	Selects what unit is used. *After selecting the unit, turn the main power switch off and on.*	**0: mm** 1: inch
5-104*		A3/11" x 17" Double Count	Specifies whether the counter is doubled for A3/11" x 17" paper. *If "1" is selected, the total counter and the current user code counter count up twice when A3/11" x 17" paper is used.*	**0: No** 1: Yes
5-106*		ADS Level Selection	Selects the image density level that is used in ADS mode.	1 ~ 5 1 notch/step **3**
5-112*		Non-standard Paper Size	Selects whether a non-standard paper size can be input or not. *If "1" is selected, the customer will be able to input a non-standard paper size using a UP mode.*	0: No **1: Yes**
5-113*		Optional Counter Type	**This SP is for Japan only. Do not change the value.**	0 ~ 5 1/step **0**
5-115*		Duplex Punch Hole Margin	Selects whether or not the image on the back of duplex copies shifts for making the punch holes.	**0: Yes** 1: No
5-118 *		Disable Copying	Selects whether the copy function is disabled or not.	**0: No** 1: Yes
5-120		Mode Clear - Op. Counter Removal	**This SP is for Japan only. Do not change the value.**	0 ~ 2 1/step **0**
5-121*		Counter Up Timing	Determines whether the optional key counter counts up at paper feed-in or at paper exit. *The total counter is not affected by this SP mode.*	**0: Feed-in** 1: Exit
5-127*		APS Mode	Selects whether the APS function is enabled or not.	0: Disabled **1: Enabled**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-131*		Paper Size Type Selection	Selects the paper size type (for originals and copy paper). • *After changing the value, turn the main power switch off and on.* • *If the paper size type of the archive files stored in the HDD is different, abnormal copies will be made. In this condition, perform SP5-822 and ask the user to restore the archive files.*	0: Japan **1: North America** 2: Europe
5-212*	3*	Page No. position in Duplex Mode (Horizontal)	**Japanese version only. Do not change the value.**	-10 ~ 10 1 mm/step **0 mm**
	4*	Page No. position in Duplex Mode (Vertical)		

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Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-501*		PM Alarm Interval	Sets the PM interval, with an alarm. *When the setting is "0", this function is disabled.*	0 ~ 255 1 k copies/step **0 k copies**
5-504*	1*	Jam Alarm Level (RSS function)	**Japanese version only.** **Do not change the values.**	0: Z 1: L 2: M **3: H**
5-504*	2*	Jam Auto Call (RSS function)	**Japanese version only.** **Do not change the values.**	0: Off **1: On**
5-505*		Error Alarm Level	**Japanese version only.** **Do not change the values.**	0 ~ 255 100 copies/step **2500 copies (30)** **5000 copies (40)**
5-507*	128*	Paper Control Call Interval - Other Paper Sizes (RSS function)	**Japanese version only.** **Do not change the values.**	250 ~ 10000 1 page/step **1000 pages**
	132*	Paper Control Call Interval - A3 (RSS function)		
	133*	Paper Control Call Interval - A4 (RSS function)		
	134*	Paper Control Call Interval - A5 (RSS function)		
	141*	Paper Control Call Interval - B4 (RSS function)		
	142*	Paper Control Call Interval - B5 (RSS function)		
	160*	Paper Control Call Interval - DLT (RSS function)		
	164*	Paper Control Call Interval - LG (RSS function)		
	166*	Paper Control Call Interval - LT (RSS function)		
	172*	Paper Control Call Interval - HLT (RSS function)		
5-590*	1*	Original Auto Call (RSS function)	**Japanese version only.** **Do not change the values.**	**0: Off** 1: On
	2*	Cover Open Auto Call (RSS function)		0: Off **1: On**
	3*	Paper Control Call (RSS function)		**0: Off** 1: On

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-590*	4*	Staple Auto Call (RSS function)	**Japanese version only.** **Do not change the values.**	**0: Off** 1: On
	5*	Toner Auto Call (RSS function)		**0: Off** 1: On
5-801		Memory All Clear	Resets all correction data for process control and all software counters. Also, returns all modes and adjustments to the default settings. See the "Memory All Clear" section for how to use this SP mode correctly. Press "1" for over 3 seconds, then turn the main power switch off and on. ***Normally, this SP mode should not be used.*** *It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.*	
5-802*		Free Run	Performs a free run. The scanner scans once and the printer prints for the number of copies requested. *To perform the free run, after selecting "1", press the # key to enter copy mode then input the number of copies. Then, press the Start key.* *To stop the free run, press C.*	**0: Stop** 1: Start
5-803	1 ~ 9	Input Check	Displays the signals received from sensors and switches. See the "Input Check" section for details.	
5-804		Output Check	Turns on the electrical components individually for test purposes. See the "Output Check" section for details.	
5-807	1	Option Connection Check - ADF	Checks the connectors to the optional peripherals.	0: Not connected 1: Connected
	2	Option Connection Check - Paper Tray Unit		
	3	Option Connection Check - LCT		
	4	Option Connection Check - Finisher		
5-811*		Machine Serial Number	Use to input the machine serial number. (Normally done at the factory.) *This serial number will be printed on the system parameter list.* *Use the ●/✻ key to input "A".*	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-812*	1*	Service Telephone Number at SC condition	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs.) *Press the ●/✻ key to input a pause. Press the "Clear modes" key to delete the telephone number.*	
5-812*	2*	Service Fax Number for Counter Printing	Use this to input the fax number of the service representative (this is printed on the Counter Report - UP mode, System No.19) *Press the ●/✻ key to input a pause. Press the "Clear modes" key to delete the telephone number.*	
5-816*	1*	CSS (CSS) Function	**Japanese version only.** **Do not change the values.**	**0: Off** 1: On
	2*	CE Visit Call (CSS function)		0: Start 1: Finish
5-821*		CSS PI Device Code (CSS function)	**Japanese version only.** **Do not change the value.**	0 ~ 4 1/step **0**
5-822		Archive File Clear	Clears all archive file data stored in the HDD. Press "1" to clear. *Before (or after) performing SP5-131, do this SP mode. After this, ask the user to restore the archive files.*	1: Start
# 5-824		NVRAM Data Upload	Uploads the UP and SP mode data (except for counters and the serial number) from the NVRAM on the BICU board to a flash memory card. **Note:** While using this SP mode, keep the front cover opened. *To prevent any software modules from accessing the NVRAM while uploading the NVRAM data, keep the front cover open.*	1: Start
# 5-825		NVRAM Data Download	Downloads the UP and SP mode data from a flash memory card to the NVRAM on the BICU board. **Note:** While using this SP mode, keep the front cover opened. *To prevent any software modules from accessing the NVRAM while downloading the NVRAM data, keep the front cover opening.*	1: Start
# 5-826		Program Upload	Uploads the system program from the flash memory on the BICU board to a flash memory card.	1: Start

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-907		Plug & Play Brand Name and Production Name Setting	Selects the brand name and the production name for Windows 95 Plug & Play. This information is stored in the NVRAM. If the NVRAM is defective, these names should be registered again. *After selecting, press the "Original Type" key and # at the same time. If the setting is completed, a "*" mark will be displayed before the selection.*	
5-914		Printer Counter Display	Selects whether or not the total printer counter is displayed in the UP mode.	**0: Off** 1: On
5-915		Mechanical Counter Detection	Checks whether the mechanical counter inside the inner cover is connected or not.	0: Not detected 1: Detected 2: Unknown
5-920*		Recovery Time for Low Power Mode	Selects the recovery time from the low power mode.	**0: 30 s** 1: 20 s
5-990	1	SMC Printing (All Data)	Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	2	SMC Printing (SP Mode Data)	Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	3	SMC Printing (UP Mode Data)	Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	4	SMC Printing (Machine Status Data)	Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	5	SMC Printing (UP Mode - Copy)	Prints the Copy Mode list (UP Mode No.10) See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	6	SMC Printing (Large Font Size)	Prints the SP mode data list with a large font size. See the "System Parameter and Data Lists" section for how to print the lists. *This SP mode is used when the SMC list is sent by fax to the number stored with SP5-812.*	1: Start
6-006*	1*	ADF Side-to Side Registration	Adjusts the printing side-to-side registration in the ADF mode. *Use the ●/✻ key to toggle between + and –.*	–3 ~ +3 0.1 mm/step **+0.0 mm**
	2*	ADF Leading Edge Registration (Simplex)	Adjusts the original stop position. *Use the ●/✻ key to toggle between + and –.*	–29 ~ +29 0.18 mm/step **+0.0 mm**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
6-006*	3*	ADF Leading Edge Registration (Duplex-front)	Adjusts the original stop position against the original left scale in one-sided original mode. *Use the ●/✻ key to toggle between + and –.*	–29 ~ +29 0.18 mm/step **+0.0 mm**
	4*	ADF Leading Edge Registration (Duplex-rear)	Adjusts the original stop position against the original left scale in two-sided original mode. *Use the ●/✻ key to toggle between + and –.*	–29 ~ +29 0.1 mm/step **+0.0 mm**
	For details on the correct way to use SP 6-006, see the ADF service manual.			
6-007	1	ADF Input Check 1	Displays the signals received from sensors and switches of the ADF. See the “Input Check” section for details.	
	2	ADF Input Check 2	Displays the signals received from sensors and switches of the ADF. See the “Input Check” section for details.	
6-008		ADF Output Check	Turns on the electrical components of the ADF individually for test purposes. See the “Output Check” section for details.	
6-009	1	ADF Free Run (Two-sided original)	Performs an ADF free run with two-sided. Press “1” to start. *This is a general free run controlled from the copier. For more detailed free run modes, see the DF manual.*	1: Start
	2	ADF Free Run (Stamp)	Performs an ADF free run with stamp mode. Press “1” to start. *This is a general free run controlled from the copier. For more detailed free run modes, see the DF manual.*	1: Start
6-010*		Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in facsimile mode. *Use the ●/✻ key to toggle between + and –.*	–3.5 ~ +3.5 0.5 mm/step **0 mm**
6-105*		Finisher Staple Position Adjustment (3,000-sheet Finisher Only)	Adjusts the staple position in the main scan direction when using the 3,000-sheet finisher. *Use the ●/✻ key to toggle between + and –.* *A larger value causes the staple position to shift outward.*	–1~ +3.5 0.5 mm/step **+0.0 mm**
6-113*	1*	Punch Hole Position Adjustment (2 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with two punch holes. *Use the ●/✻ key to toggle between + and –. A larger value shifts the punch holes towards the edge of the paper.*	–7.5 ~ +7.5 0.5 mm/step **0 mm**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
6-113*	2*	Punch Hole Position Adjustment (3 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with three punch holes. *Use the ●/✻ key to toggle between + and –. A larger value shifts the punch holes towards the edge of the paper.*	–7.5 ~ +7.5 0.5 mm/step **0 mm**
6-902*	1	Saddle Stitch Adjustment (A3)	**Japanese version only**	-30 ~ 30 0.5 mm/step **0.0 mm**
	2	Saddle Stitch Adjustment (B4)		
	3	Saddle Stitch Adjustment (A4)		
7-001*		Total Operation Time Display	Displays the total drum rotation time.	Min.
7-002*	1*	Total Original Counter (Copy and Fax Modes)	Displays the total number of fed originals in copy and fax modes.	
	2*	Total Original Counter (Copy Mode)	Displays the total number of fed originals in copy mode.	
	3*	Total Original Counter (Fax Mode)	Displays the total number of fed originals in fax mode.	
7-003*	1*	Total Copy Counter (All Modes)	Displays the total number of prints in all modes.	
	2*	Total Copy Counter (Copy Mode)	Displays the total number of prints in copy mode.	
	3*	Total Copy Counter (Fax Mode)	Displays the total number of prints in fax mode.	
	4*	Total Copy Counter (Printer Mode)	Displays the total number of prints in printer mode.	
7-006*	1*	C/O (Copy per Original) Counter	Displays the number of sets of copies per original when making 10 or more sets of copies. e.g.: When making 15 sets of copies of an original, this counter value will increase by “6”.	
	2*	P/O (Print per Original) Counter	Displays the number of sets of prints per original data when making 10 or more sets of prints. e.g.: When making 15 sets of prints of an original data, this counter value will increase by “6”.	
7-101*	4*	Total Copies by Paper Size (A3)	Displays the total number of prints by paper size.	
	5*	Total Copies by Paper Size (A4)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-101*	6*	Total Copies by Paper Size (A5)	Displays the total number of prints by paper size.	
	13*	Total Copies by Paper Size (B4)		
	14*	Total Copies by Paper Size (B5)		
	32*	Total Copies by Paper Size (DLT)		
	36*	Total Copies by Paper Size (LG)		
	38*	Total Copies by Paper Size (LT)		
	44*	Total Copies by Paper Size (HLT)		
	128*	Total Copies by Paper Size (Other Sizes)		
7-201*		Total Number of Scanning	Displays the total number of scanned originals.	
7-204*	1*	Total Paper Tray Counter (1st Paper Tray)	Displays the total number of sheets fed from each paper feed tray.	
	2*	Total Paper Tray Counter (1st Paper Tray)		
	3*	Total Paper Tray Counter (2nd Paper Tray)		
	4*	Total Paper Tray Counter (3rd Paper Tray)		
	5*	Total Paper Tray Counter (4th Paper Tray)		
	6*	Total Paper Tray Counter (By-pass Feed)		
7-205*		ADF Total Counter	Displays the total number of originals fed by the ADF.	
7-206*	1*	Total Staple Counter	Displays the total number of used staples.	
	2*	Total Staple Counter Booklet	**Japanese version only**	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-301*	1*	Total Copies by Reproduction Ratio (25% ~ 49%)	Displays the total number of prints by reproduction ratio.	
	2*	Total Copies by Reproduction Ratio (50% ~ 99%)		
	3*	Total Copies by Reproduction Ratio (Full size)		
	4*	Total Copies by Reproduction Ratio (101% ~ 200%)		
	5*	Total Copies by Reproduction Ratio (201% ~ 400%)		
	6*	Total Copies by Reproduction Ratio (Direct Mag.)		
	7*	Total Copies by Reproduction Ratio (Direct Size Mag.)		
	8*	Total Copies by Reproduction Ratio (Size Mag.)		
	9*	Total Copies by Reproduction Ratio (Fix Mag.)		
7-303*	1*	Total Copies by Image Editing (Pos./Neg.)	Displays the total number of prints by image editing mode.	
	2*	Total Copies by Image Editing (Repeat Copy)		
	3*	Total Copies by Image Editing (Memory Sort)		
	4*	Total Copies by Image Editing (Staple)		
	5*	Total Copies by Image Editing (Combine)		
	6*	Total Copies by Image Editing (Series Copy)		
	7*	Total Copies by Image Editing (Erase Copy)		
7-304*	1*	Total Copies by Copy Mode (Text)	Displays the total number of prints by copy mode.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-304*	2*	Total Copies by Copy Mode (Text/Photo)	Displays the total number of prints by copy mode.	
	3*	Total Copies by Copy Mode (Photo)		
	4*	Total Copies by Copy Mode (Generation)		
	5*	Total Copies by Copy Mode (Light Original)		
	6*	Total Copies by Copy Mode (Duplex)		
	7*	Total Copies by Copy Mode (ADF)		
	8*	Total Copies by Copy Mode (Double Copy)		
	9*	Total Copies by Copy Mode (2-sided Original)		
	10*	Total Copies by Copy Mode (Interrupt)		
	11*	Total Copies by Copy Mode (Archive File)		
	12*	Total Copies by Copy Mode (1-sided to 2-sided)		
	13*	Total Copies by Copy Mode (2-sided to 2-sided)		
	14*	Total Copies by Copy Mode (2-sided to 1-sided)		
	15*	Total Copies by Copy Mode (Book to 2-sided)		
7-305*	1*	Total Copies by Multiple Copy (1 to 1)	Displays the total number of prints by multiple copy quantity.	
	2*	Total Copies by Multiple Copy (1 to 2 ~ 5)		
	3*	Total Copies by Multiple Copy (1 to 6 ~ 10)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-305*	4*	Total Copies by Multiple Copy (1 to 11 ~ 20)	Displays the total number of prints by multiple copy quantity.	
	5*	Total Copies by Multiple Copy (1 to 21 ~ 99)		
	6*	Total Copies by Multiple Copy (1 to 100 ~)		
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.	
7-403*	1*	SC History (Latest)	Displays the latest 10 service call codes.	
	2*	SC History (2nd Latest)		
	3*	SC History (3rd Latest)		
	4*	SC History (4th Latest)		
	5*	SC History (5th Latest)		
	6*	SC History (6th Latest)		
	7*	SC History (7th Latest)		
	8*	SC History (8th Latest)		
	9*	SC History (9th Latest)		
	10*	SC History (10th Latest)		
7-501*		Total Jam Counter	Displays the total number of copy jams and original jams.	
7-502*		Total Copy Jam Counter	Displays the total number of copy jams.	
7-503*		Total Original Jam Counter	Displays the total number of original jams.	
7-504*	1*	Total Copy Jam by Location (At Power On)	Displays the total number of copy jams by location. These are paper non-feed jams.	
	3*	Total Copy Jam by Location (1st Paper Tray)		
	4*	Total Copy Jam by Location (2nd Paper Tray)		
	5*	Total Copy Jam by Location (3rd Paper Tray)		
	6*	Total Copy Jam by Location (4th Paper Tray)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-504*	7*	Total Copy Jam by Location (LCT)	Displays the total number of copy jams by location. These are paper non-feed jams.	
	8*	Total Copy Jam by Location (Upper Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	9*	Total Copy Jam by Location (Lower Relay Sensor)		
	10*	Total Copy Jam by Location (Upper Relay Sensor - Op. PTU)		
	13*	Total Copy Jam by Location (Regist. Sensor)		
	16*	Total Copy Jam by Location (Exit Sensor)		
	17*	Total Copy Jam by Location (Bridge Exit Sensor)		
	18*	Total Copy Jam by Location (Bridge Relay Sensor)		
	19*	Total Copy Jam by Location (Duplex Entrance Sensor)		
	23*	Total Copy Jam by Location (Duplex Exit Sensor)		
	24*	Total Copy Jam by Location (1-bin Tray Entrance Sensor)		
	25*	Total Copy Jam by Location (Finisher Entrance Sensor)		
	26*	Total Copy Jam by Location (3,000-sheet Finisher Upper Tray Exit Sensor)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	27*	Total Copy Jam by Location (3,000-sheet Finisher Shift Tray Exit Sensor, 1,000-sheet Finisher Exit Sensor)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	28*	Total Copy Jam by Location (3,000-sheet Staple Tray Paper Sensor, 1,000-sheet Finisher Jogger Unit Paper Sensor)		
	29*	Total Copy Jam by Location (Finisher Stack Feed-out Belt HP Sensor)		
	30*	Total Copy Jam by Location (Mail Box Entrance Sensor)		
	31*	Total Copy Jam by Location (Mail Box Proof Tray Exit Sensor)		
	32*	Total Copy Jam by Location (Mail Box Relay Sensor)		
	33*	Total Copy Jam by Location (Mail Box: Mailbox Section)		
	35*	Total Copy Jam by Location (Booklet Finisher: Entrance 1)	**35 ~ 41 are Japanese version only.**	
	36*	Total Copy Jam by Location (Booklet Finisher: Transport)		
	37*	Total Copy Jam by Location (Booklet Finisher: Entrance 2)		
	38*	Total Copy Jam by Location (Booklet Finisher: Finisher Stapler)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-504*	39*	Total Copy Jam by Location (Booklet Finisher: Saddle Stitch 1)	**35 ~ 41 are Japanese version only.**	
	40*	Total Copy Jam by Location (Booklet Finisher: Saddle Stitch 2)		
	41*	Total Copy Jam by Location (Booklet Finisher: Saddle Stitch Stapler)		
	57*	Total Copy Jam by Location (LCT)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	58*	Total Copy Jam by Location (Upper Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper stays at the sensor.	
	59*	Total Copy Jam by Location (Lower Relay Sensor)		
	60*	Total Copy Jam by Location (Upper Relay Sensor - Op. PTU)		
	61*	Total Copy Jam by Location (Lower Relay Sensor – Op. PTU)		
	63*	Total Copy Jam by Location (Regist. Sensor)		
	66*	Total Copy Jam by Location (Exit Sensor)		
	67*	Total Copy Jam by Location (Bridge Exit Sensor)		
	68*	Total Copy Jam by Location (Bridge Relay Sensor)		
	69*	Total Copy Jam by Location (Duplex Entrance Sensor)		
	73*	Total Copy Jam by Location (Duplex Exit Sensor)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	74*	Total Copy Jam by Location (1-bin Tray Entrance Sensor)	Displays the total number of copy jams by location. These are jams when the paper stays at the sensor.	
7-505*	1*	Total Original Jam by Location (At Power On)	Displays the total number of original jams by location. These are jams when the original does not activate the sensor.	
	3*	Total Original Jam by Location (ADF Feed-in Sensor)		
	4*	Total Original Jam by Location (ADF Feed-out Sensor)		
7-506*	4*	Total Copy Jam by Paper Size (A3)	Displays the total number of copy jams by paper size.	
	5*	Total Copy Jam by Paper Size (A4)		
	6*	Total Copy Jam by Paper Size (A5)		
	13*	Total Copy Jam by Paper Size (B4)		
	14*	Total Copy Jam by Paper Size (B5)		
	32*	Total Copy Jam by Paper Size (DLT)		
	36*	Total Copy Jam by Paper Size (LG)		
	38*	Total Copy Jam by Paper Size (LT)		
	44*	Total Copy Jam by Paper Size (HLT)		
	128*	Total Copy Jam by Paper Size (Other Sizes)		
7-507*	1*	Total Counter Value at Copy Jam (Latest)	Displays the last 5 digits of the total counter value for the most recent 10 copy jams.	
	2*	Total Counter Value at Copy Jam (2nd Latest)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-507*	3*	Total Counter Value at Copy Jam (3rd Latest)	Displays the last 5 digits of the total counter value for the most recent 10 copy jams.	
	4*	Total Counter Value at Copy Jam (4th Latest)		
	5*	Total Counter Value at Copy Jam (5th Latest)		
	6*	Total Counter Value at Copy Jam (6th Latest)		
	7*	Total Counter Value at Copy Jam (7th Latest)		
	8*	Total Counter Value at Copy Jam (8th Latest)		
	9*	Total Counter Value at Copy Jam (9th Latest)		
	10*	Total Counter Value at Copy Jam (10th Latest)		
	11*	Total Counter Value at Original Jam (Latest)		
	12*	Total Counter Value at Original Jam (2nd Latest)		
	13*	Total Counter Value at Original Jam (3rd Latest)		
	14*	Total Counter Value at Original Jam (4th Latest)		
	15*	Total Counter Value at Original Jam (5th Latest)		
	16*	Total Counter Value at Original Jam (6th Latest)		
	17*	Total Counter Value at Original Jam (7th Latest)		
	18*	Total Counter Value at Original Jam (8th Latest)		
	19*	Total Counter Value at Original Jam (9th Latest)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-507*	20*	Total Counter Value at Original Jam (10th Latest)	Displays the last 5 digits of the total counter value for the most recent 10 copy jams.	
7-801	1	ROM Version Display (BICU)	Displays the ROM versions. **No. 13, 14, and 15 are Japanese version only.**	
	2	ROM Version Display (CSS)		
	3	ROM Version Display (HDD Controller)		
	4	ROM Version Display (ADF)		
	5	ROM Version Display (SIB)		
	6	ROM Version Display (Finisher)		
	7	ROM Version Display (Paper Tray Unit)		
	8	ROM Version Display (LCT)		
	9	ROM Version Display (Mail Box)		
	10	ROM Version Display (FCU)		
	11	ROM Version Display (Printer Controller)		
	12	ROM Version Display (Scanner Controller)		
	13	ROM Version Display (ANITA)		
	14	ROM Version Display (Booklet Finisher)		
	15	ROM Version Display (Stamp Card)		
	16	ROM Version Display (SARIC)		
7-803*		PM Counter Display	Displays the PM counter since the last PM.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-804		PM Counter Reset	Resets the PM counter. Press “1” to reset.	1: Start
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. Press “1” to reset.	1: Start
7-808		Resets Counters (except for the total counter)	Resets all counters except for the following counters: Press “1” to reset. • All counters of SP7-003 • All counters of SP7-006 • All counters which are listed on the counter list (UP1-19-2)	1: Start
7-810		Key Operator Code Number Reset	Resets the key operator code. Press “1” to reset.	1: Start
7-816	1	Reset the total Copy Counter by Paper Tray (1st Paper Tray)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
7-816	2	Reset the total Copy Counter by Paper Tray (2nd Paper Tray)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
	3	Reset the total Copy Counter by Paper Tray (3rd Paper Tray)		1: Start
	4	Reset the total Copy Counter by Paper Tray (4th Paper Tray)		1: Start
	5	Reset the Total Copy Counter by Paper Tray (LCT)		1: Start
	6	Reset the total Copy Counter by Paper Tray (By-pass Feed)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
7-822		Reset the Total Copy Counter by Magnification	Resets all counters of SP7-301. Press “1” to reset.	1: Start
7-823		Reset the Total Copy Counter by Image Editing	Resets all counters of SP7-303. Press “1” to reset.	1: Start
7-825		Electrical Total Counter Reset	Resets the electrical total counter. Press “1” to reset. *Usually, this SP mode is done at installation.* *This SP mode affects only once when the minus (“–“) counter value.*	1: Start
# 7-901		SC990 Contents	Displays details about the latest SC990.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
# 7-902	1	SC Details (Latest)	Displays details about the latest SCs. Not all SCs have these details.	
	2	SC Details (Latest 1st)		
	3	SC Details (Latest 2nd)		
7-904		Reset the Total Copy Counter by Copy Mode	Resets all counters of SP7-304. Press “1” to reset.	1: Start
7-905		Reset the Total Copy Counter by Multiple Copies	Resets all counters of SP7-305. Press “1” to reset.	1: Start

4.1.1 TEST PATTERN PRINTING (SP2-902)

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. Press the ⧀ key on the operation panel to access the copy mode display.
3. Select required copy features such as paper size, image density, and reproduction ratio.
4. Press the “Start” key to print the test pattern.
5. After checking the test pattern, exit copy mode by pressing the ⧀ key again.
6. Exit the SP mode.

Test Pattern Table (SP2-902-2: Test Pattern Printing – IPU)

No.	Test Pattern	No.	Test Pattern
0	None	8	8 Grayscales (Horizontal)
1	Vertical Line (1-dot)	9	8 Grayscales (Vertical)
2	Horizontal Line (1-dot)	10	Patch Pattern (8-grayscale)
3	Vertical Line (2 dot)	11	Cross Pattern
4	Horizontal Line (2-dot)	12	Argyle Pattern
5	Alternating Dot Pattern	13	Not Used
6	Grid Pattern (Single-dot)	14	Not Used
7	Vertical Black Band	15	Not Used

Test Pattern Table (SP2-902-3: Test Pattern Printing – Printing)

No.	Test Pattern	No.	Teat Pattern
0	None	11	Argyle Pattern
1	Vertical Line (1-dot)	12	16 Grayscales (Horizontal)
2	Horizontal Line (1-dot)	13	16 Grayscales (Vertical)
3	Vertical Line (2 dot)	14	16 Grayscales (Vert./Hor.)
4	Horizontal Line (2-dot)	15	16 Grayscales (Vert./Hor Overlay)
5	Grid Pattern (Single-dot)	16	Slant Cross Stitch
6	Grid Pattern (Double-dot)	17	Horizontal Line (1-dot)
7	Alternating Dot Pattern	18	Grid Pattern (Single-dot)
8	Full Dot Pattern	19	Grid Pattern (Double-dot)
9	Black Band	20	Alternating Dot Pattern
10	Trimming Area	21	Blank Page

4.1.2 INPUT CHECK

Main Machine Input Check (SP5-803)

1. Access SP mode.
2. Select the class 3 SP number which will access the switch or sensor you wish to check.
3. Check the status of the sensor or switch.
   NOTE: If you wish to change to another class 3 level, press the "Next" or "Prev." key.
4. The reading ("0" or "1") will be displayed. The meaning of the display is as follows.

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

Class 3 No.	Bit No.	Description	Reading	
			0	1
1 (Upper Tray)	7	Not used		
	6	Height Sensor 2 (Op. Printer Controller)	Not activated	Activated
	5	Height Sensor 1 (Op. Printer Controller)	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1	Switch pressed	Switch not pressed
2 (Lower Tray)	7	Duplex Unit Set Sensor	Unit set	Unit not set
	6	Height Sensor 2 (Op. Printer Controller)	Not activated	Activated
	5	Height Sensor 1 (Op. Printer Controller)	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1	Switch pressed	Switch not pressed

Class 3 No.	Bit No.	Description	Reading	
			0	1
3 (Registration & Others)	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit H.P Sensor	Not at home position	At home position
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank not full	Tank full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected
4 (By-pass)	7	Not used		
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4	See table 1	
	3	Paper Size Sensor 3		
	2	Paper Size Sensor 2		
	1	Paper Size Sensor 1		
	0	Unit Set Signal	Connected	Not connected
5 (Bridge Unit)	7	Not used		
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor (Printer Controller Option)	Paper detected	Paper not detected
	4	Relay Sensor	Paper not detected	Paper detected
	3	Exit Sensor	Paper not detected	Paper detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Tray Exit Unit Switch	Switch pressed (cover closed)	Switch not pressed
6 (Unit Set)	7	Not used		
	6	F gate Signal	Active	Not active
	5	Height Sensor (Printer Controller Option)	At feed height position	Not at feed height position
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Not used		
7 (Paper End)	7	Not used		
	6	Right Lower Cover Switch	Switch not pressed	Switch pressed

Class 3 No.	Bit No.	Description	Reading	
			0	1
7 (Paper End)	5	2nd Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected
8 (I/O Board Dip Switch 101)	7	Dip Switch - 8	On	Off
	6	Dip Switch - 7	On	Off
	5	Dip Switch - 6	On	Off
	4	Dip Switch - 5	On	Off
	3	Dip Switch - 4	On	Off
	2	Dip Switch - 3	On	Off
	1	Dip Switch - 2	On	Off
	0	Dip Switch - 1	On	Off
9 (Duplex)	7	Not used		
	6			
	5			
	4			
	3	Exit Sensor	Paper detected	Paper not detected
	2	Entrance Sensor	Paper detected	Paper not detected
	1	Cover Guide Sensor	Cover guide opened	Cover guide closed
	0	Duplex Unit Switch	Switch pressed (cover closed)	Switch not pressed

Table 1: By-pass Feed Table Paper Size Data

Class 3 No.	Bit 4	Bit 3	Bit 2	Bit 1	Paper Width
4	1	1	1	1	Post card
	1	1	1	0	B6 lengthwise
	1	1	0	1	B5 lengthwise
	1	1	0	0	A5 lengthwise/5.5"
	1	0	1	1	B4 lengthwise
	1	0	0	1	A4 lengthwise/8.5"/8"
	0	1	1	1	A3 lengthwise
	0	0	1	1	11" x 17"

ADF Input Check (SP6-007)

Class 3 No.	Bit No.	Description	Reading	
			0	1
1	7	Inverter Sensor	Paper not detected	Paper detected
	6	Exit Sensor	Paper not detected	Paper detected
	5	Registration Sensor	Paper not detected	Paper detected
	4	Entrance Sensor	Paper not detected	Paper detected
	3	Original Width Sensor 1	Paper not detected	Paper detected
	2	Original Width Sensor 2	Paper not detected	Paper detected
	1	Original Width Sensor 3	Paper not detected	Paper detected
	0	Original Set Sensor	Paper not detected	Paper detected
2 (Lower Tray)	7	Not used		
	6			
	5	Original Stopper H.P Sensor	Original stopper up	Original stopper down
	4	Pick-up Roller H.P Sensor	Pick-up roller up	Pick-up roller down
	3	Exit Cover Sensor	Cover closed	Cover opened
	2	Feed Cover Sensor	Cover closed	Cover opened
	1	DF Position Sensor	Sensor not activated (cover open)	Sensor activated (cover closed or being closed)
	0	APS Start Sensor	Sensor not activated (cover open)	Sensor activated (cover closed or being closed)

4.1.3 OUTPUT CHECK

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

Main Machine Output Check (SP5-804)

1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check.
3. Press “1”, then press # to check that component.
4. Press “0” to interrupt the test.
5. If you wish to check another component, press the “Next” or “Prev.” Key.

No.	Description	No.	Description
1	Upper Paper Feed Clutch	35	Relay Clutch (PTU)
2	Lower Paper Feed Clutch	36	Relay Clutch
3	Upper Paper Feed Clutch (PTU)	37	Not used
4	Lower Paper Feed Clutch (PTU)	38	Relay Clutch (LCT)
5	Paper Feed Clutch (By-pass)	39	Registration Clutch
6	Paper Feed Clutch (LCT)	40	Not used
7 ~ 12	Not used	41	Exit Junction Gate Solenoid (Interchange Unit)
13	Pick-up Solenoid (By-pass)	42	Duplex Junction Gate Solenoid (Interchange Unit)
14	Pick-up Solenoid (LCT)	43, 44	Not used
15, 16	Not used	45	Inverter Gate Solenoid (Duplex)
17	Upper Transport Motor (Finishers)	46	Not used
18	Lower Transport Motor (3,000-sheet Finisher only)	47	Junction Gate Solenoid (Bridge Unit)
19	Shift Tray Exit Motor (3,000-sheet Finisher), Exit Motor (1,000-sheet Finisher)	48, 49	Not used
20	Staple Hammer Motor (Finishers)	50	Tray Junction Gate Solenoid (3,000-sheet Finisher only)
21	Punch Motor (Punch Unit)	51	Stapler Junction Gate Solenoid (Finishers)
22 ~ 24	Not used	52	Positioning Roller Solenoid (Finishers)
25	LCT Motor (LCT)	53 ~ 55	Not used
26	Tray Motor (PTU)	56	Toner Supply Motor
27	Not used	57	Transfer Belt Clutch
28	Main Motor	58 ~ 61	Not used
29	Transport Motor (Duplex)	62	Quenching Lamp
30	Inverter Motor – Reverse (Duplex)	63	Charge Roller Bias
31	Inverter Motor – Forward (Duplex)	64 ~ 66	Not used
32 ~ 34	Not used	67	Development Bias

No.	Description	No.	Description
68	Not used	86 ~ 89	Not used
69	Transfer Belt Bias	90	Laser Diode
70	ID Sensor	91	Not used
71 ~ 74	Not used	92	Shift Tray Lift Motor (Finishers)
75	Exhaust Fan Motor	93	Jogger Motor (3,000-sheet Finisher)/Jogger Fence Motor (1,000-sheet Finisher)
76	Cooling Fan Motor	94	Stapler Motor (3,000-sheet Finisher)
77	Not used	95	Stack Feed Out Motor (Finishers)
78	Cooling Fan Motor (Bridge Unit)	96	Shift Motor (Finishers)
79 ~ 84	Not used	97	Stapler Rotation Motor (3,000-sheet Finisher)
85	Mechanical Counter	98 ~ 99	Not used

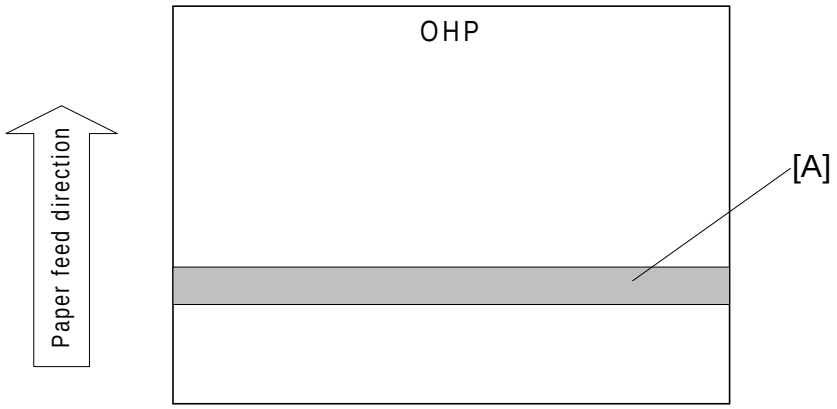
ADF Output Check (SP6-008)

No.	Description
1	Feed-in Motor (Forward)
2	Feed-in Motor (Reverse)
3	Transport Motor (Forward)
4	Transport Motor (Reverse)
5	Feed-out Motor
6	Exit Gate Solenoid
7	Inverter Gate Solenoid
8	DF Indicators
9	Pick-up Motor (Forward)
10	Pick-up Motor (Reverse)

4.1.4 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)

1. Access SP mode 5-990 and select the class 3 number corresponding to the list that you wish to print.
2. Press the ⏎ key to access the copy mode display.
3. Select the paper size and press the “Start” key to print the list.
4. After printing the list, exit the copy mode display by pressing the ⏎ key.
5. Exit SP mode.

4.1.5 NIP BAND WIDTH ADJUSTMENT (SP1-109)



When paper wrinkling or image off-set occurs, the pressure from the pressure roller can be adjusted by changing the position of the pressure springs. At this time, the nip band width can also be checked with SP1-109, as follows.

1. Do a free run (SP5-802) for about 50 sheets.
2. Enter SP1-109 and press the “1” key, then press the # key.
3. Press the ⌯ key to enter copy mode.
4. Place an OHP sheet (A4/8.5" x 5.5" sideways) on the by-pass feed tray.
5. Press the “Start” key.
   The OHP sheet is stopped in the fusing unit for about 10 seconds, then it will be fed out automatically.
6. Check the nip band width [A]. The relationship between the position of the pressure spring and the band width is as follows.
   NOTE: Check the nip band width around the center of the OHP.

Pressure spring position	Nip width
Upper (default position)	6.0 ± 0.5 mm
Lower	6.5 ± 0.6 mm

If the width is out of the above specification, the pressure spring should be replaced.

4.1.6 MEMORY ALL CLEAR (SP5-801)

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

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

Among the settings that are reset are the correction data for process control and all the software counters.

Normally, this SP mode should not be used. This procedure is required only after replacing the NVRAM or when the copier malfunctions due to a damaged NVRAM.

1. Print out all SMC Data Lists (SP mode 5-990).
2. Access SP mode 5-801.
3. Hold down the "1" key for over 3 seconds. At this time the beeper will sound.
4. Turn the main power switch off and back on.
5. Do the laser beam pitch adjustment.
6. Do the printer and scanner registration and magnification adjustments (see Replacement and Adjustment - Copy Adjustments).
7. Referring to the SMC data lists, re-enter any values which had been changed from their factory settings.
8. Do SP 3-001-2 (ID Sensor Initial Setting) and SP4-911-1 (HDD media test).
9. Check the copy quality and the paper path, and do any necessary adjustments.

4.1.7 SOFTWARE RESET

The software can be reset when the machine hangs up. Use the following procedure.

Either

Turn the main power switch off and on.

Or

Hold down the ●/✳ key and # key at the same time for over 10 seconds.

4.1.8 SYSTEM SETTING AND COPY SETTING (UP MODE) RESET

System Setting Reset

The system settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Confirm that the machine is in the copier standby mode.
2. Press the User Tool key.
3. Hold the # key and press “1” on the ten-key pad.
4. When a confirmation message is displayed, press “Yes”.

Copy Setting Reset

The copy settings in the UP mode can be reset to their defaults. Use the following procedure.

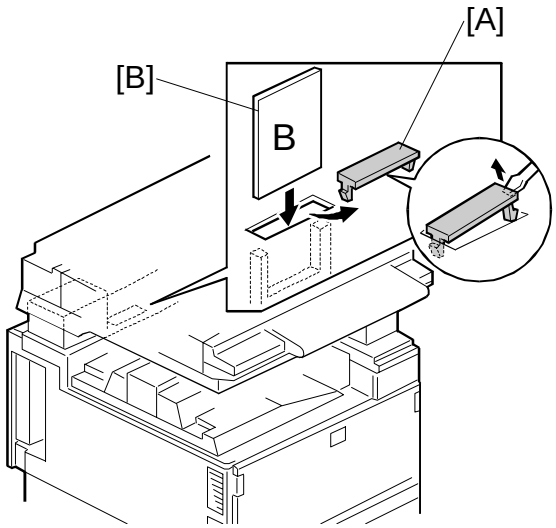
1. Confirm that the machine is in the copier standby mode.
2. Press the User Tool key.
3. Hold the # key and press “2” on the ten-key pad.
4. When a confirmation message is displayed, press “Yes”.

4.1.9 NVRAM DATA DOWNLOAD

After doing the memory all clear procedure, NVRAM data will be reset to their default settings. So, it is necessary to upload the NVRAM data before clearing the NVRAM, and to download the NVRAM data afterwards.

- SP5-824: Uploads from the BICU to a flash memory card.
- SP5-825: Downloads from a flash memory to the BICU.

NVRAM Data Upload (SP5-824)

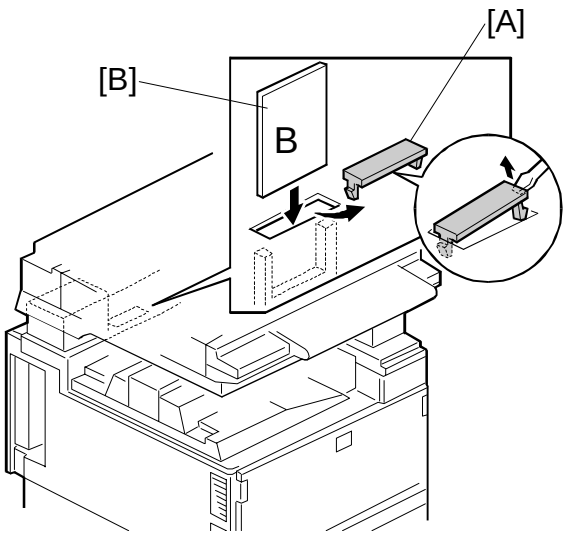


1. Turn off the main switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main switch.
5. Access the SP mode 5-824.
6. Open the front cover.
7. Press “1” to download the NVRAM data.

NVRAM Data Download (SP5-825)

NOTE: This procedure downloads all the settings stored in the NVRAM except for the following items.

- Electrical Total Counter (SP7-003)
- C/O, P/O Counters (SP7-006)
- Plug and Play brand name and production name settings (SP5-907)



1. Turn off the main switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main switch.
5. Access the SP mode 5-825.
6. Open the front cover.
7. Press “1” to download the NVRAM data.

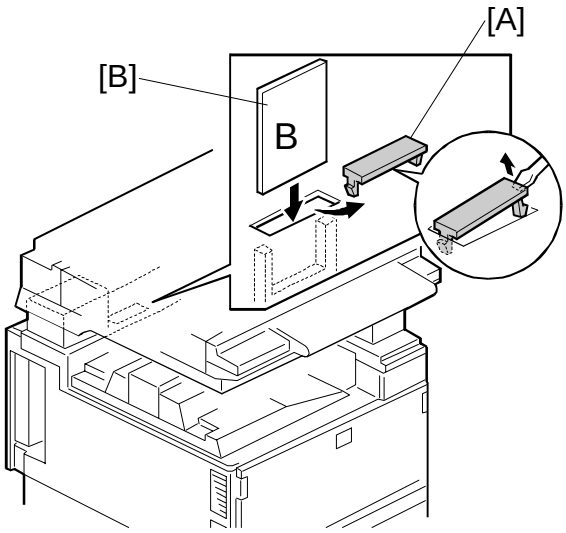
4.2 PROGRAM DOWNLOAD

In this machine, the BICU software is upgraded using a flash memory card.

There are two program download procedures. One downloads from the flash memory card to the BICU. The other downloads from the BICU to a flash memory card.

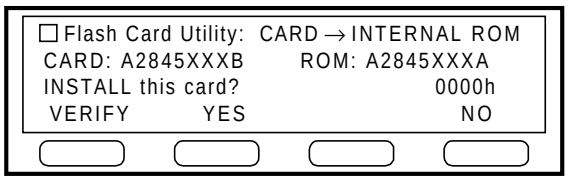
NOTE: The procedure for how to write the source software data from a flash memory card writer to a flash memory card is described in the SwapBox FTL manual.

Downloading to the BICU



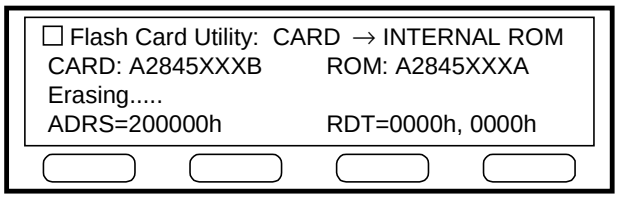
NOTE: Step 4 of the procedure is different from the A230/A231/A232 machines.

1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main power switch <u>while holding down the operation switch.</u>

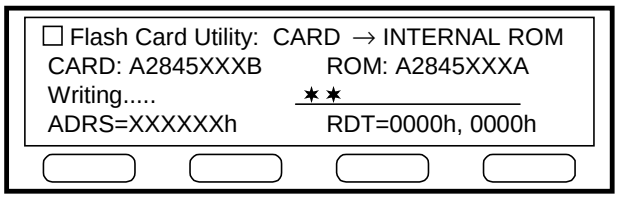


5. Press the “YES” key. The machine erases the current software, then writes the new software to the BICU. This takes about 100 seconds.

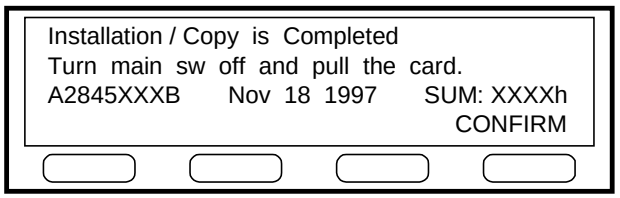
Display during erasing



Display during writing

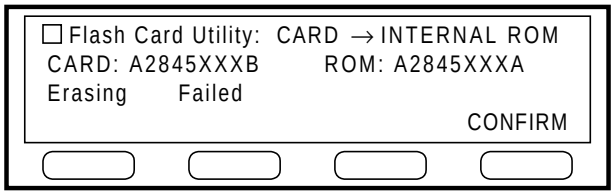


Display when the download is complete

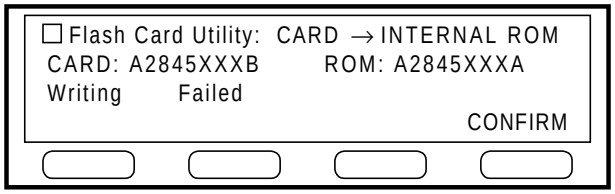


If downloading failed, an error message appears as follows. At this time, press the “CONFIRM” key to re-try the download.

Display if erasing failed

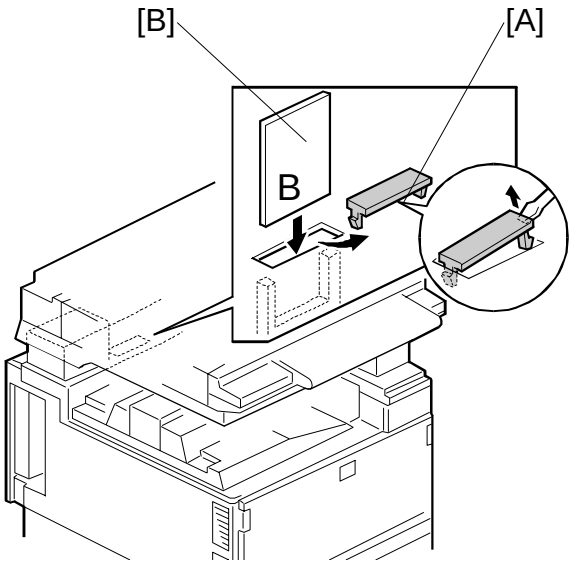


Display if writing failed

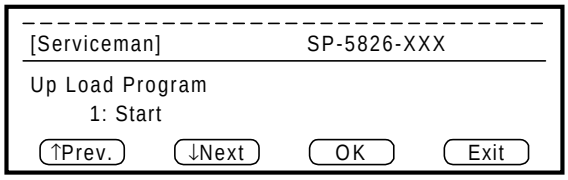


Download from BICU to Flash Memory Card (SP5-826)

NOTE: This function is done by SP mode instead of using the power switches.

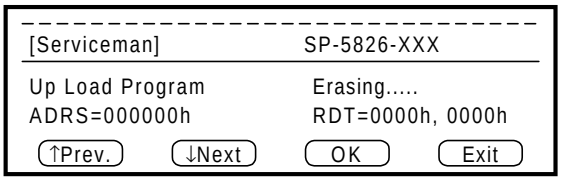


1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main power switch and access SP5-826.

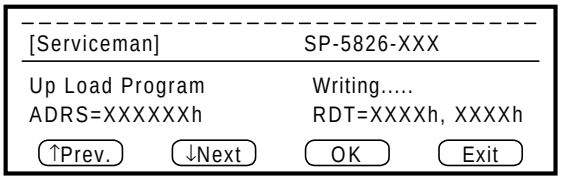


5. Press the “1” key. The machine erases the current software, then writes the new software to the flash memory card. This takes about 100 seconds.
   NOTE: The display is inverted black on white during downloading from BICU to flash memory card.

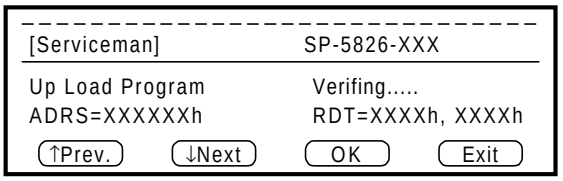
Display during erasing



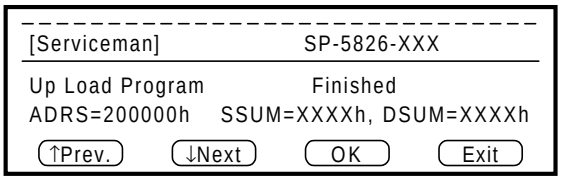
Display during writing



Display Verifing



Display when the download is complete



If downloading failed, an error message appears. At this time, re-try the download.

4.3 USER PROGRAM MODE

The user program (UP) mode is accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings.

4.3.1 HOW TO ENTER AND EXIT UP MODE

Press the User Tools button, then select the UP mode program. After finishing the UP mode program, press the User Tools button to exit UP mode.

4.3.2 UP MODE TABLE

NOTE: 1) A "#" mark by the item number means that this UP mode has been added.
2) The function of each UP mode is explained in the System Setting and Copy Reference section of the operating instructions.

System Setting Table

1. System	01. Function Priority	
	02. Panel Beeper	
	03. Ready Beeper	
	04. Copy Count Display	
	05. System Reset	
	06. Function Switch	
	07. Low Power Shift Timer	
	08. Low Power Timer	
	09. Energy Saver Mode	
	10. Auto Off Timer	
	11. Paper Size – Tray	
	12. Paper Tray Priority	
	13. Auto Tray Switch	
	14. Special Paper Indication	
	15. Output Tray	1. Copy
		2. Fax
		3. Printer
	16. Print Priority	
	17. Contrast	
	18. User Code Manage	
	19. Management Setting	1. Show/Print Counter
		2. Print Counter List
		3. Key Operator Code
		4. Register/Change Key Operator Code
		# 5. Key Counter: Copier Access
		# 6. AOF (Keep it on)
	22. ADF Original Eject	
	23. Memory Priority	
	# 24. Print/Scan Priority	
	25. F/F4 Size Setting	

Copy Setting Table

2. Copy	1. General Features	01. APS Priority	
		02. AID Priority	
		03. Original Priority	
		04. Show All Keys	
		05. Maximum Copy Q'ty	
		06. Original Beeper	
		07. Photo Mode	
		08. Reproduction Ratio	
		09. Slip Sheet Tray	
		10. Duplex Priority	
		11. Auto Reset	
		12. Density Pattern	
		13. Initial Mode Set	
		14. Management Setting	1. Counter Reset
			2. Clear Code/Counter
			3. Register User Code
			4. Change/Delete User Code
			5. Counter List Print
	2. Adjust Image	01. Erase Border	
		02. Erase Center	
		03. Margin Adjust – Front	
		04. Margin Adjust – Back	
		05. Double Copy	
		06. Combine Copy	
		07. Image Repeat	
		08. Booklet Original	
	3. Input/Output	01. Duplex Auto Eject	
		02. Combine Auto Eject	
		03. Original Count	
		04. SADF Auto Reset	
		05. Rotate Sort	
		06. Sort	
		07. Stack	
		08. Memory Full – Auto Sort	
		09. Auto Sort Mode	
	4. Shortcut Keys		

4.4 TEST POINTS/DIP SWITCHES/LEDS

4.4.1 DIP SWITCHES

I/O Board: DIP SW101

No.	Function	ON	OFF
1	Copy Speed	35 cpm (180 mm/s)	45 cpm (230 mm/s)
2	Jam Detection (see Note)	Off	**On**
3	SC Generation	Disabled	**Enabled**
4	Not used	Keep at “OFF”	
5	Not used	Keep at “OFF”	
6 7	Destination	Off)Japan On)N. America Off)Europe On)Not used Off Off On On	
8	Not used	Keep at “OFF”	

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

4.4.2 TEST POINTS

I/O Board

Number	Monitored Signal
TP103	Ground
TP104	+24 V
TP136	+5 V
TP154	Ground
TP156	+12 V
TP158	–12 V
TP159	+5 VE

BICU

Number	Monitored Signal
TP103	GND
TP145	F-gate signal

4.4.3 LEDS

BICU

Number	Monitored Signal
LED101	Monitors whether the program is working normally or not. The LED blinks in normal conditions.
LED102	Monitors +5VE. During the energy saver mode, this LED will blink.

4.5 SPECIAL TOOLS AND LUBRICANTS

4.5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
A2309352	Flash Memory Card – 4MB	1
A2309351	Case – Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
54209516	Test Chart – OS-A3 (10 pcs/Set)	1
A0299387	Digital Multimeter – FLUKE 87	1
A2849099	NVRAM – Minus Counter	1

4.5.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta JFE 5 5/2	1
52039501	Silicone Grease G-501	1

⇒4.6 USER CODES

The following is the procedure to set the machine for User Code mode:

1. Register at least one user code – User Tools, #2 Copy, #14 Management Settings, #3 Reg. User Code.
2. Turn on User Code Management – User Tools, #1 System, #18 User Code Manage, set to YES.

PREVENTIVE MAINTENANCE

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

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

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

A283/A284	EM	150K	300K	450K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		I	I	I	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
AROUND THE DRUM					
Charge Roller		R	R	R	
Charge Roller Cleaning Pad		R	R	R	
Quenching Lamp			C		Dry cloth
Pick-off Pawls		R	R	R	
Spur		C	C	C	Dry cloth or alcohol
ID Sensor		C	C	C	Perform the ID sensor initial setting (SP3-001-2) after cleaning (blower brush)
CLEANING UNIT					
Drum Cleaning Blade		R	R	R	
Cleaning Entrance Seal		C	C	C	Blower brush. Replace if necessary.
Side Seal		I	I	I	
DEVELOPMENT UNIT					
Development Drive Gears		I	I	I	Replace every 5 PM (750 k)
Development Filter			R		
Developer		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	

A283/A284	EM	150K	300K	450K	NOTE
PAPER FEED					
Registration Roller	C	C	C	C	Clean with water or alcohol.
Paper Feed Roller	I	R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150 k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Separation Roller	I	R	R	R	
Pick-up Roller	I	R	R	R	
Paper Feed Roller (By-pass feed table)	I	R	R	R	
Separation Roller (By-pass feed table)	I	R	R	R	
Pick-up Roller (By-pass feed table)	I	R	R	R	
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Relay Rollers		C	C	C	Clean with water or alcohol.
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
Registration Sensor		C	C	C	Blower brush
TRANSFER BELT UNIT					
Transfer Belt	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistor		I	I	I	Clean if necessary (suitable solvent)
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		L	L	L	Grease Barrierta JFE 55/2
Pressure Roller Strippers		C	C	C	Clean with water or alcohol.
Hot Roller Strippers		C	R	C	Clean with water or alcohol.
Paper Exit Guide Ribs		C	C	C	Clean with water or alcohol.
OTHERS					
Drive Belts			I		Replace if necessary

	EM	80K	160K	240K	NOTE
ADF (for originals)					
Transport Belt	C	R	R	R	Belt cleaner
Feed Belt	C	R	R	R	Belt cleaner
Separation Roller	C	R	R	R	Dry or damp cloth
Sensors		C	C	C	Blower brush
Drive Gears		L	L	L	Grease G501

	EM	150K	300K	450K	NOTE
PAPER TRAY UNIT					
Paper Feed Rollers		R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150 k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Pick-up Rollers		R	R	R	
Separation Rollers		R	R	R	
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	NOTE
LCT					
Paper Feed Roller		R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150 k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	NOTE
1,000-SHEET/3,000-SHEET FINISHER					
Rollers	C				Clean with water or alcohol.
Brush Roller	I	I	I	I	Replace if necessary.
Discharge Brush	C	C	C	C	Clean with a dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if necessary.
Punch Waste Hopper	I	I	I	I	Empty the hopper.

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

REPLACEMENT AND ADJUSTMENT

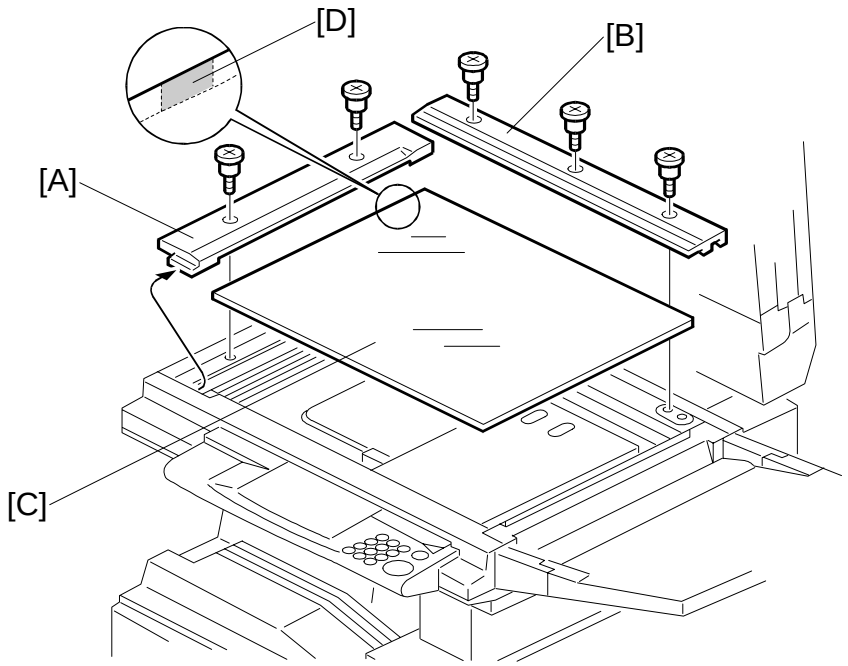
6. REPLACEMENT AND ADJUSTMENT

⚠CAUTION

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

6.1 SCANNER UNIT

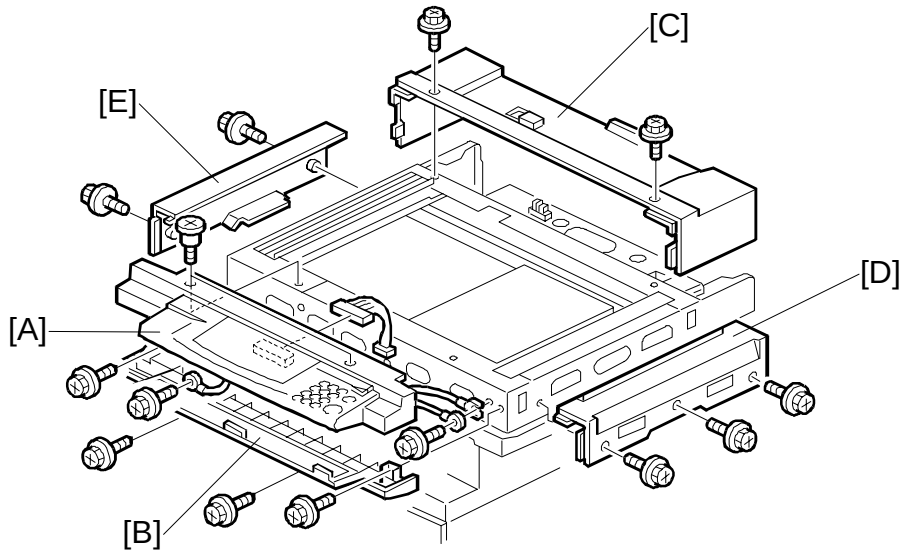
6.1.1 EXPOSURE GLASS

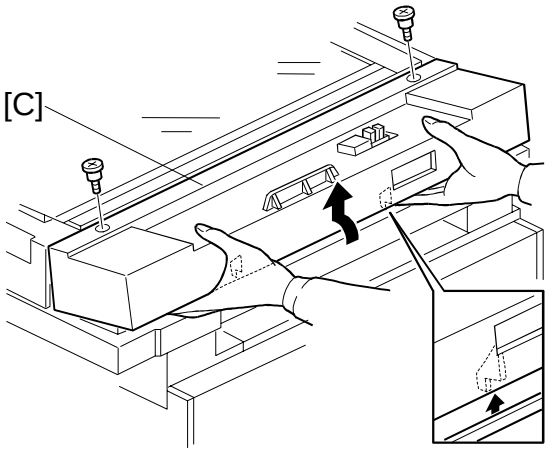


1. Open the ADF or platen cover.
2. Remove the left scale [A] (2 screws).
3. Remove the rear scale [B] (3 screws).
4. Remove the exposure glass [C].

NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.

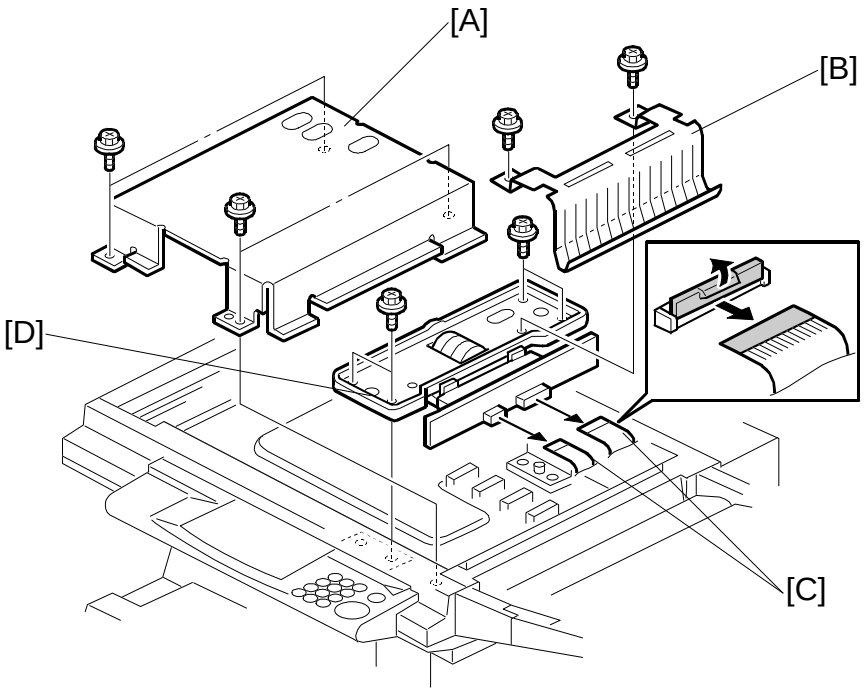
6.1.2 SCANNER EXTERIOR/OPERATION PANEL





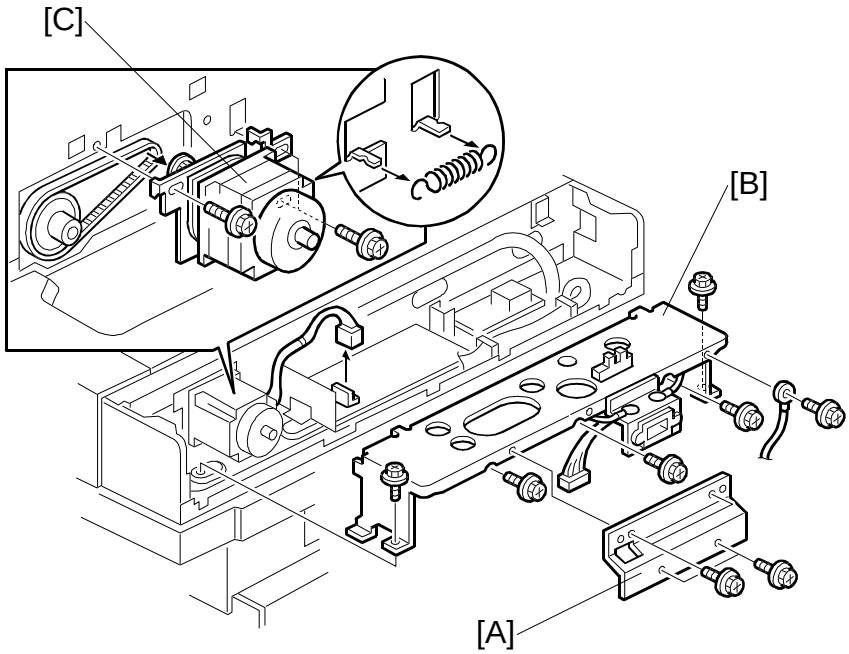
1. Remove the ADF or platen cover.
2. Remove the exposure glass. (See Exposure Glass.)
3. Remove the operation panel [A] (4 screws, 1 connector).
4. Remove the lower operation cover [B] (4 screws).
5. Remove the rear cover [C] (2 screws, 2 pegs).
6. Remove the right cover [D] (3 screws).
7. Remove the left cover [E] (2 screws).

6.1.3 LENS BLOCK/SBU ASSEMBLY



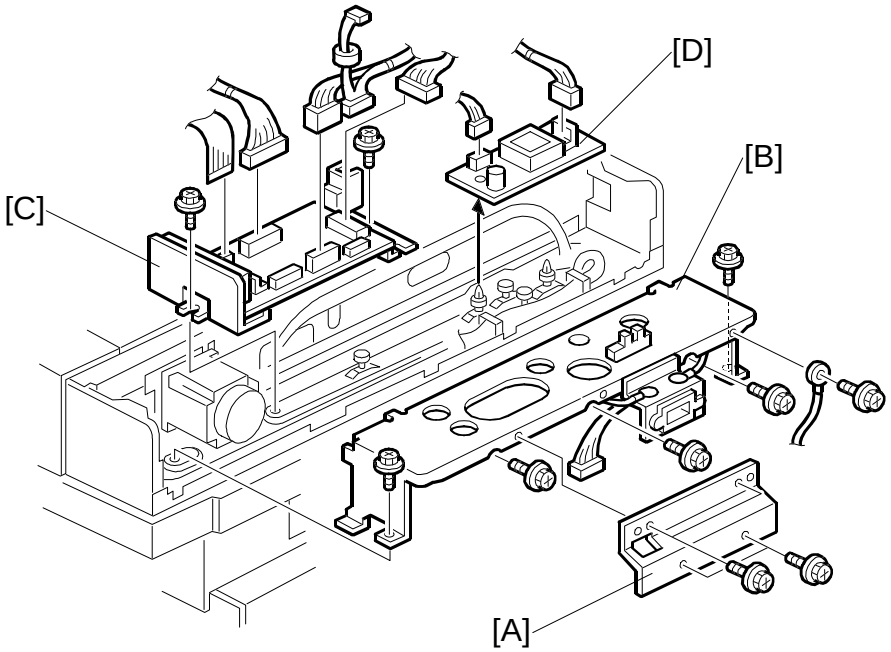
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lens cover [A] (4 screws).
3. Remove the grounding plate [B] (2 screws).
4. Disconnect the flexible harnesses [C].
5. Remove the lens block assembly [D] (4 screws).
6. Do the scanner and printer copy adjustments (see Replacement and Adjustment – Copy Adjustments).

6.1.4 SCANNER MOTOR



1. Remove the scanner rear cover. (See Scanner Exterior.)
2. Remove the bracket [A] (4 screws).
3. Remove the rear bracket [B] (5 screws, 1 grounding wire, 1 connector).
4. Remove the scanner motor assembly [C] (3 screws, 1 connector, 1 spring, 1 timing belt).
5. Do the scanner and printer copy adjustments (see Replacement and Adjustment – Copy Adjustments).

6.1.5 SIB/LAMP STABILIZER



1. Remove the scanner rear cover. (See Scanner Exterior.)
2. Remove the bracket [A] (4 screws).
3. Remove the rear bracket [B] (5 screws, 1 grounding wire, 1 connector).
4. Remove the SIB [C] (2 screws, all connectors).
5. Remove the lamp stabilizer [D] (2 connectors).

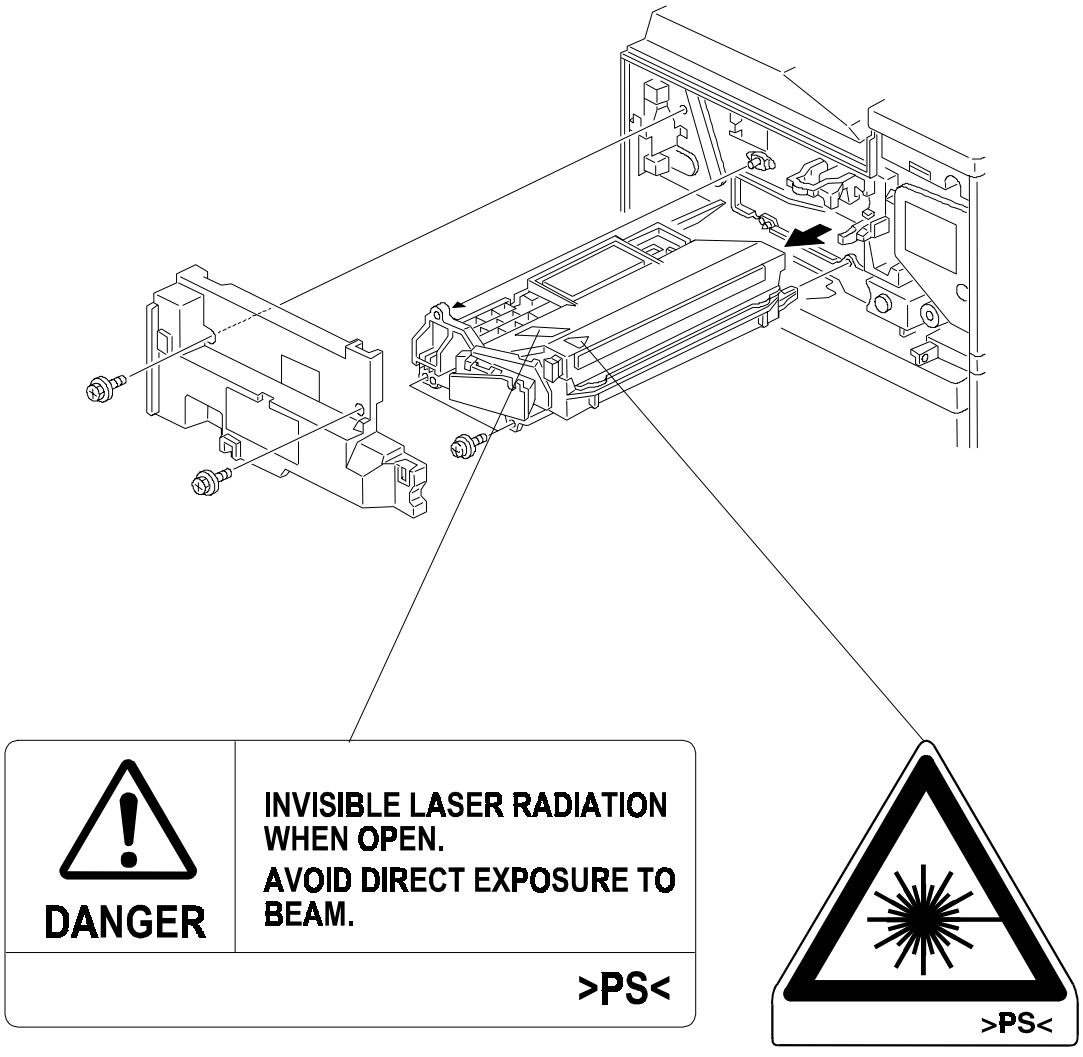
6.2 LASER UNIT

⚠WARNING

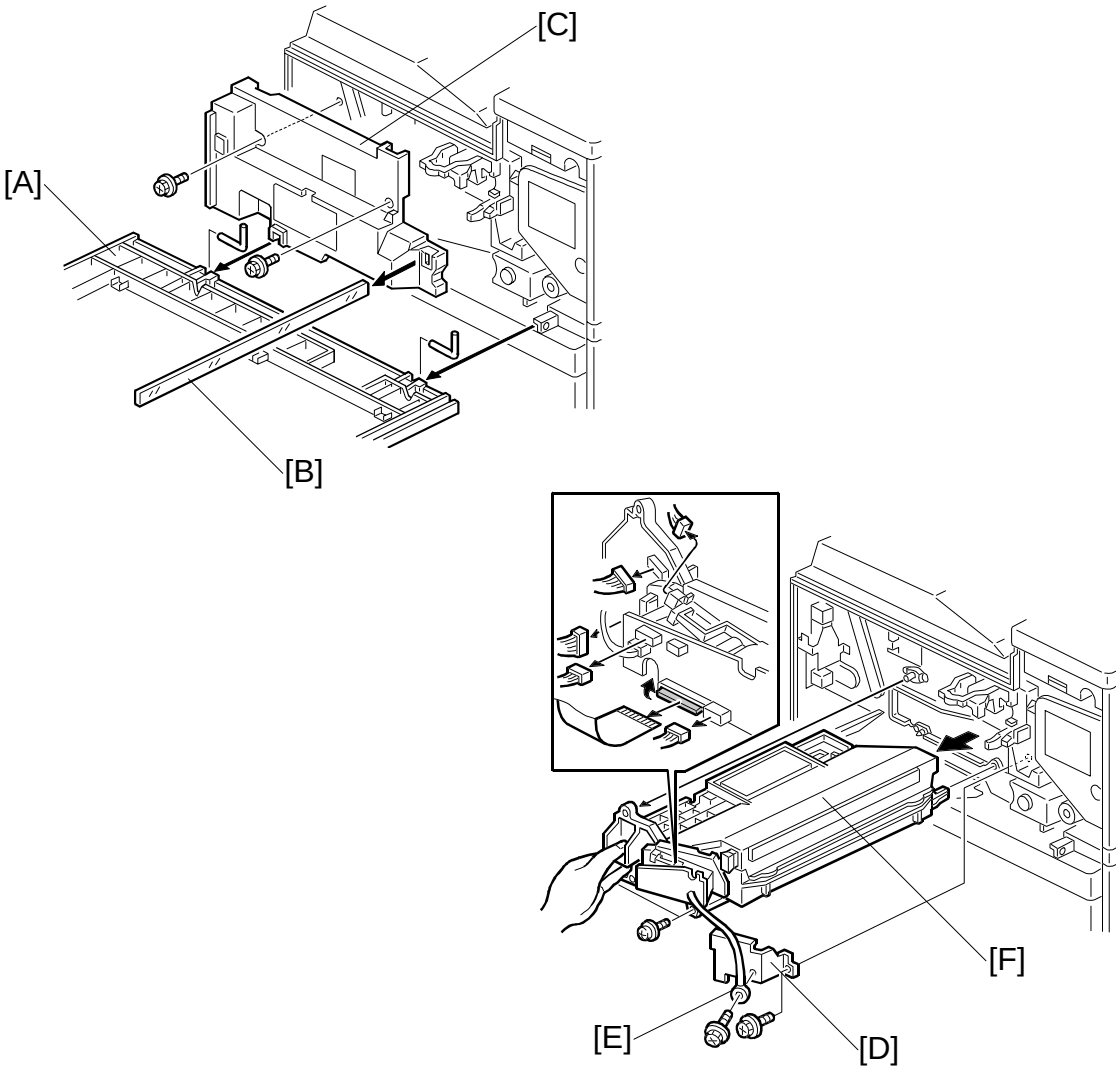
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

6.2.1 CAUTION DECAL LOCATIONS

Two caution decals are located in the laser section as shown below.



6.2.2 LASER UNIT



⚠WARNING

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

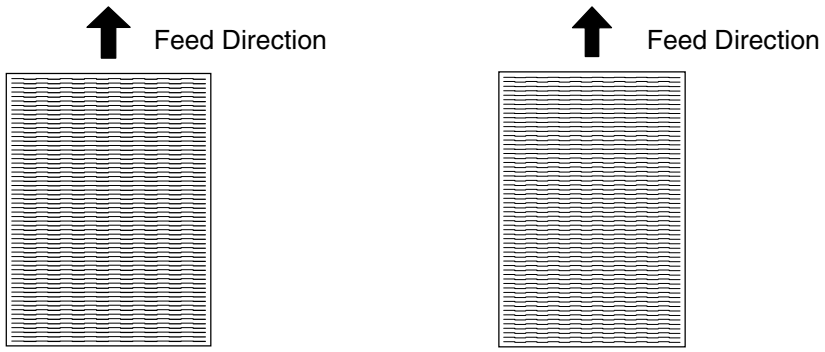
1. Remove the front cover [A] (2 pins).
2. Remove the shield glass [B].
3. Remove the inner cover [C] (2 screws, 1 connector - mechanical counter).
4. Remove the shield plate [D] and grounding wire [E] (1 screw each).
5. Remove the laser unit [F] (2 screws, 5 connectors, 1 flexible harness).
   NOTE: 1) When disconnecting the harnesses from the LD unit, hold on to the LD unit.
   2) When sliding out the laser unit, do not hold the LD unit.

6.2.3 LASER BEAM PITCH ADJUSTMENT

After replacing the LD unit, perform the laser beam pitch adjustment. There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. These adjustments use the following SP modes.

- SP2-109-1: LD Beam Pitch Adjustment – 400 dpi
- SP2-109-2: LD Beam Pitch Adjustment – 600 dpi
- SP2-109-3: LD Initial Setting – 400 dpi
- SP2-109-4: LD Initial Setting – 600 dpi
- SP2-110, no. 1: Image Resolution Change – 400 dpi
- SP2-110, no. 8: Image Resolution Change – 600 dpi
- SP2-902-3, no.16: Test Pattern Printing – Cross Stitch

1. Do SP 2-109-8.
2. Input the value “144” into SP2-109-1.
3. Perform SP2-109-3.
4. Print out 400 dpi test pattern A3 (11x17), change SP2-110 to 1 and print out the cross stitch test pattern using SP2-902-3 no. 16. For 600 dpi, set SP2-110 to 8.
5. Write the value of SP2-109-1 on the test pattern (in this case “144”).
6. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-109-1 (e.g. “48”, “96”, “192”, “240”).
7. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical strip pattern.
   NOTE: As an example, if the pattern made with the value “192” has less obvious strips than the other print outs, the correct value is near “192”.
8. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 1, 2, and 3 (in step 1, input a value which is estimated to be correct, then do steps 2 and 3, then if necessary go back to step 1 and try another value).
9. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). The laser beam pitch for 600 dpi should be 24 ~ 48 more than for 400 dpi.



Adjustment not complete **Adjustment complete**

6.3 COPY ADJUSTMENTS: PRINTING/SCANNING

NOTE: 1) You need to perform these adjustment(s) after replacing any of the following parts:
- Scanner Wire
- Lens Block/SBU Assembly
- Scanner Drive Motor
- Polygon Mirror Motor
- Paper Side Fence
- Memory All Clear

2) For more details about accessing SP modes, refer to section 4.

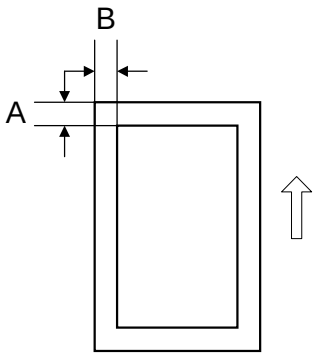
6.3.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
2) Use the Trimming Area Pattern (SP2-902-3, No.10) to print the test pattern for the following procedures.
3) Set SP 2-902-3 to 0 again after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration, and adjust it using SP1-001.
   The specification is: 3 ± 2mm.
2. Check the side-to-side registration for each paper feed station, and adjust them using the following SP modes.

	SP mode	Specification
1st paper feed	SP1-002-1	2 ± 1.5 mm
2nd paper feed	SP1-002-2	
3rd paper feed (Optional PFU tray 1)	SP1-002-3	
4th paper feed (Optional PFU tray 2)	SP1-002-4	
Duplex	SP1-002-5	
By-pass feed	SP1-002-6	
LCT	SP1-002-7	



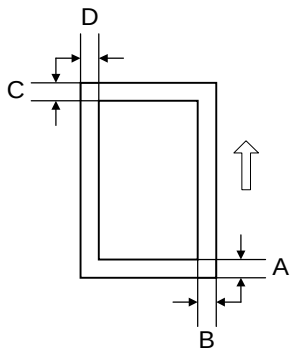
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge/side-to-side registration can not be adjusted within the specifications, adjust the leading/left side edge blank margin.

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

	SP mode	Specification
Trailing edge	SP2-101-2	2 ± 2 mm
Right edge	SP2-101-4	2 +2.5/-1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left edge	SP2-101-3	2 ± 1.5 mm
Trailing edge (duplex copy, 2nd side)	SP2-101-5	2 ± 2 mm
Left edge (duplex copy, 2nd side)	SP2-101-6	2 ± 1.5 mm
Right edge (duplex copy, 2nd side)	SP2-101-7	2 +2.5/-1.5 mm



A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin

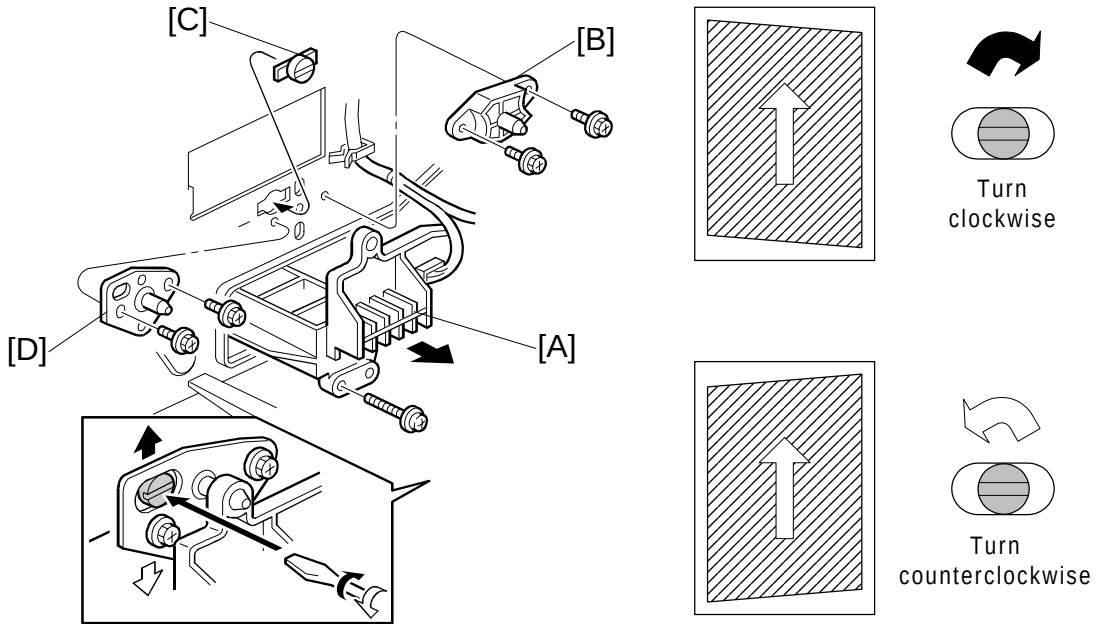
Main Scan Magnification

1. Print the single-dot grid pattern (SP2-902-3, no.5).
2. Check the magnification, and adjust the magnification using SP2-909-1 if necessary. The specification is ±1%.

Parallelogram Image Adjustment

Do the following procedure if a parallelogram is printed while adjusting the printing registration or the printing margin using a trimming area pattern.

NOTE: The following procedure should be done after adjusting the side-to-side registration for each paper tray station.



1. Check the trimming area pattern image (SP2-902-3, No.10) whether a parallelogram image appears or not, as shown. If it appears, do the following.
2. Remove the laser unit [A] (see Replacement and Adjustment - Laser Unit).
3. Remove the bracket [B] (2 screws).
4. Install the adjusting cam [C] (P/N: A2309003).
5. Secure the adjustment bracket [D] using the two screws which were used for the bracket [B]. However, do not tighten the screws at this time.
6. Adjusts the laser unit position by turning the adjusting cam. (Refer to the above illustration for the relationship between the image and the cam rotation direction).
7. Tighten the adjustment bracket.
8. Print the trimming area pattern to check the image. If it is still the same, repeat steps 6 to 8.

6.3.2 SCANNING

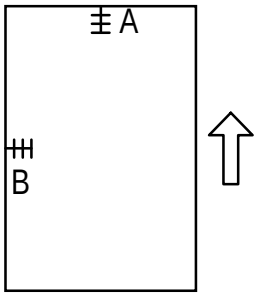
NOTE: 1) Perform or check the printing registration/side-to-side adjustment and the blank margin adjustment, before doing the following scanner adjustments.
2) Use an OS-A3 test chart to perform the following adjustments.

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	SP4-010
Side-to-side	SP4-011

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

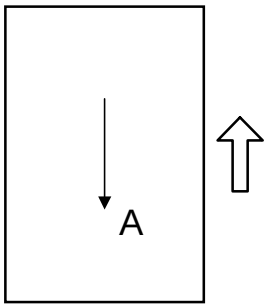


Magnification

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

Sub Scan Magnification

A: Main Scan Magnification



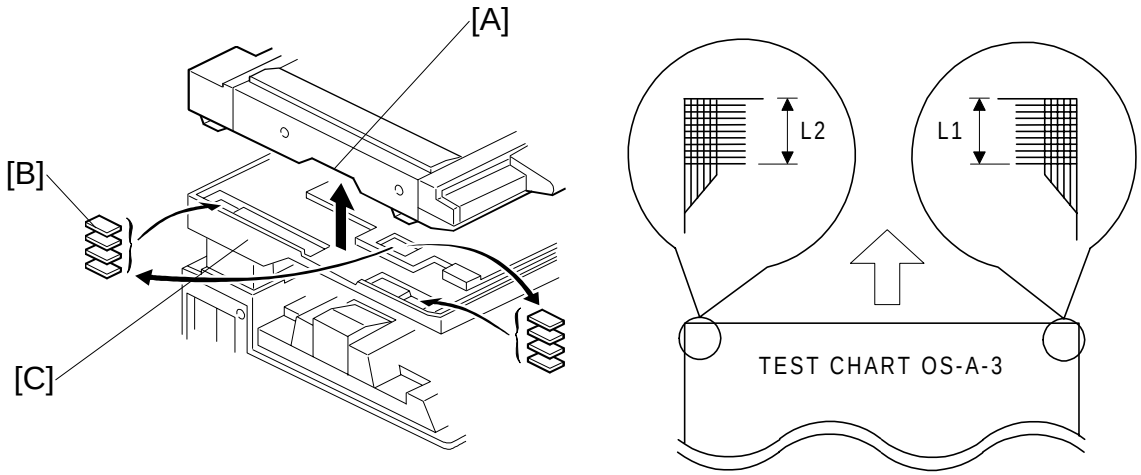
1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is ±1%.

	SP mode
Sub Scan Magnification	SP4-008

Scanner Skew Image Adjustment

Do the following procedure if skew is caused by the scanner (not the printer) while adjusting the scanner registration and magnification.

NOTE: 1) In machines with an ADF, do the following procedure after doing all ADF image adjustments on the following page.
2) The specification is 1.2 mm / 200 mm.



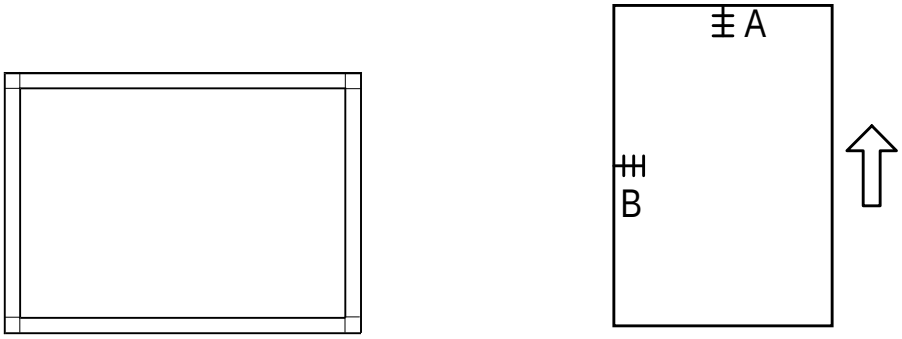
1. Place the OS-A3 test chart on the exposure glass and make a copy from one of the feed stations.
2. Measure the distance from the leading edge of the 10th line at both upper corners on the test chart (L1 and L2 in the above right illustration).
3. If the difference between the two positions is greater than 0.3 mm, do the following steps.
4. Remove the screws that secure the scanner unit and lift up the scanner, holding the grip [A].
5. Put spacer(s) [B] at the front or rear of the scanner plate [C], depending on the skew image.
   - If the distance at the right side is longer than at the left side, add the spacer(s) to the front side of the scanner plate.
   - If the distance at the left side is longer than at the right side, add the spacer(s) to the rear side of the scanner plate.

Difference	No. of spacers
0.3 mm ~ 0.6 mm	1
0.6 mm ~ 0.8 mm	2
0.8 mm ~ 1.1 mm	3

6. Make a copy again using the test chart to check the skew.
7. If there is still some skew, redo steps 5 and 6.
8. If the skew has been corrected, secure the scanner unit (2 screws).

6.3.3 ADF IMAGE ADJUSTMENT

Registration



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

NOTE: Make a temporary test chart as shown above 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	SP6-006-1
Leading Edge Registration (Simplex)	SP6-006-2
Leading Edge Registration (Duplex: front)	SP6-006-3
Leading Edge Registration (Duplex: rear)	SP6-006-4

TROUBLESHOOTING

7. TROUBLESHOOTING

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.	Enter SP mode, then turn the main power switch off and on.
B	The SC can be reset by turning the main power switch off and on if the SC was caused by incorrect sensor detection.	Turn the operation switch or main power switch off and on. A level B' SC can only be reset by turning the main power switch off and on.
C	The copier can be operated as usual except for the unit related to the service call.	Turn the operation switch off and on.
D	The SC history is updated. The machine can be operated as usual.	The SC will not displayed. All that happens is that the SC history is updated.

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

7.1.2 SC CODE DESCRIPTIONS

SC101: Exposure Lamp Error

Definition [B]

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

Possible Cause

- Exposure lamp defective
- Lamp stabilizer defective
- Exposure lamp connector defective
- Dirty standard white plate
- Dirty scanner mirror or scanner mirror out of position
- SBU board defective
- SBU connector defective
- Lens block out of position
- SIB defective

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
- Scanner drive motor defective
- SIB defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective

SC121: Scanner Home Position Error 2

Definition [B']

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

Possible Causes

- Scanner home position sensor defective
- Scanner drive motor defective
- SIB defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective

SC302: Charge Roller Current Leak

Definition [B]

A charge roller current leak signal is detected.

Possible Causes

- Charge roller damaged
- High voltage supply board defective
- Poor PCU connection

SC 304: Charge Roller Current Correction Error

Definition [B]

The charge roller bias correction is performed twice even if the maximum charge roller bias (-2000V) is applied to the roller.

Possible Causes

- ID sensor defective

SC320: Polygon Motor Error

Definition [B']

The polygon motor does not reach its operating speed within 20 seconds after the polygon motor on signal, or the lock signal is still activated for more than 20 seconds after the polygon motor off signal.

Possible Causes

- Polygon motor defective
- Poor connection between the polygon motor driver and the BICU board
- BICU board defective

SC321: No Laser Writing Signal (F-gate) Error 1

Definition [B]

The laser writing signal (F-GATE) does not go to LOW for more than 15 seconds after the copy paper reaches the registration sensor.

Possible Causes

- BICU board defective
- Poor connection of the fax controller or printer controller
- Fax controller or printer controller defective

SC322: 1st Laser Synchronization Error

Definition[B']

The 1st laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

Possible Causes

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC323: LD Drive Current Over

Definition [B']

The LD drive board applies more than 110 mA to the LD.

Possible Causes

- LD unit defective (not enough power, due to aging)
- Poor connection between the LD unit and the BICU board
- BICU defective

SC326: 2nd Laser Synchronization Error

Definition [B']

The 2nd laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

Possible Causes

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC327: LD Unit Home Position Error 1

Definition [B']

The LD unit home position sensor does not detect an on condition when the LD unit moves to its home position.

Possible Causes

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC328: LD Unit Home Position Rrror 2

Definition- [B']

The LD unit home position sensor does not detect an off condition when the LD unit moves from its home position.

Possible Causes

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC329: Laser Beam Pitch Adjustment Error

Definition [B]

The LD unit home position sensor does not detect an on condition while changing the LD unit position for correcting the LD position or changing the dpi.

Possible Causes

- The laser beam pitch adjustment (SP2-109-3 and 4) was not done after replacing the NVRAM or doing an NVRAM clear.
- The laser beam pitch adjustment (SP2-109-1 ~ 4) was not done after replacing the LD unit.
- LD unit movement blocked because of incorrect connector routing

SC350-1: ID Sensor Error 1

Definition [B]

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

1) Vsp ≥ 2.5V
2) Vsg ≤ 2.5V
3) Vsp = 0V
4) Vsg = 0V

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at ID sensor pattern writing area of the drum

SC350-2: ID Sensor Error 2

Definition [B]

The ID sensor output voltage is 5.0V and the PWM signal input to the ID sensor is 0 when checking the ID sensor pattern.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-3: ID Sensor Error 3

Definition [B]

The ID sensor pattern edge voltage is detected to be not 2.5V twice consecutively during an 800 ms interval.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-4: ID Sensor Error 4

Definition [B]

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

1) Vsg < 4.0V when the maximum PWM input (255) is applied to the ID sensor.
2) Vsg ≥ 4.0V when the minimum PWM input (0) is applied to the ID sensor.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-5: ID Sensor Error 5

Definition [B]

Vsg falls out of the adjustment target (4.0 ± 0.2V) during Vsg checking.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC360: Hard Disk Drive Error 1

Definition [B]

The machine does not detect the connection signal from the HDD.

Possible Causes

- Poor connection between the HDD and HDD controller board
- The ac power connector to the HDD is disconnected.
- HDD defective
- HDD controller board defective
- BICU defective

SC361: Hard Disk Drive Error 2

Definition [B]

The image data stored in the HDD cannot be output properly.

Possible Causes

- When this SC occurs only once, this problem will be solved after turning the main power switch off and on.
- When this SC occurs while performing SP4-911-1 (HDD media check), it can be cured by doing SP4-911-2 (HDD formatting).
- HDD defective

SC362: IMAC (Image Compression IC) Error

Definition [B]

An error occurs during image processing in the IMAC, which handles image compression and image data transmission.

Possible Causes

- BICU defective
- HDD controller board defective

SC365: Image Storage Address Error

Definition [B]

The BICU receives an image data output request signal for data that is not stored in memory.

Possible Causes

- BICU defective

SC390-1: TD Sensor Error 1

Definition [B]

The TD sensor output voltage is less than 0.5V or more than 5.0V 10 consecutively during copying.

Possible Causes

- TD sensor abnormal
- Poor connection between the TD sensor and the I/O board (IOB)
- I/O board (IOB) defective

SC390-2: TD Sensor Error 2

Definition [B]

The TD sensor output voltage is less than 1.8V or more than 4.8V during TD sensor initial setting.

Possible Causes

- TD sensor abnormal
- No developer in the development unit

SC391: Development Bias Leak

Definition [B]

A development bias leak signal is detected.

Possible Causes

- Poor connection between the development bias terminal and the high voltage supply board
- High voltage supply board defective

SC401-1: Transfer Roller Leak Error

Definition [B]

A transfer roller current leak signal is detected.

Possible Causes

- High voltage supply board defective
- Poor connection between the transfer current terminal and the high voltage supply board

SC401-2: Transfer Roller Open Error

Definition [B]

The transfer roller current feedback signal is not detected.

Possible Causes

- High voltage supply board defective
- Poor connection between the transfer current terminal and the high voltage supply board
- Poor PCU connection

SC403: Transfer Belt Position Sensor Error

Definition [B]

The transfer belt position sensor does not activate even if the transfer belt clutch has rotated once.

Possible Causes

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC 405: Transfer Belt Error

Definition [B]

The transfer belt does not move away from the drum during ID sensor pattern checking.

Possible Causes

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC440: Main Motor Lock

Definition [B]

A main motor lock signal is not detected within 2 seconds after the main motor turns on.

Possible Causes

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

SC490: Exhaust Fan Motor Lock

Definition [B]

An exhaust fan motor lock signal is not detected within 5 seconds after the exhaust fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Exhaust fan motor defective
- Poor fan motor connector connection

SC492: Cooling Fan Motor Lock

Definition [B]

A cooling fan motor lock signal is not detected within 5 seconds after the cooling fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Cooling fan motor defective
- Poor fan motor connector connection

SC493: Bridge Unit Cooling Fan Lock

Definition [B]

A bridge unit cooling fan motor lock signal is not detected within 5 seconds after the bridge unit cooling fan motor turns on.

Possible Causes

- Too much load on the drive mechanism
- Bridge unit cooling fan motor defective
- Poor fan motor connector connection

SC501-1: 1st Tray Lift Malfunction 1

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible Causes

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC501-2: 1st Tray Lift Malfunction 2

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

Possible Causes

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC502-1: 2nd Tray Lift Malfunction 1

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

Possible Causes

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC502-2: 2nd Tray Lift Malfunction 2

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

Possible Causes

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC503-1: 3rd Tray Lift Malfunction 1 (Optional Paper Tray Unit)

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 13 seconds.

Possible Causes

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC503-2: 3rd Tray Lift Malfunction 2 (Optional Paper Tray Unit)

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

Possible Causes

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC504-1: 4th Tray Lift Malfunction 1 (Optional Paper Tray Unit)

Definition [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 13 seconds.

Possible Causes

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC504-2: 4th Tray Lift Malfunction 2 (Optional Paper Tray Unit)

Definition [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

Possible Causes

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC506: Paper Tray Unit Main Motor Lock (Optional Paper Tray)

Definition [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

Possible Causes

- Paper tray unit main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC507: LCT Main Motor Lock (Optional LCT)

Definition [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

Possible Causes

- LCT main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC510-1: LCT Tray Malfunction 1

Definition [C]

1) The LCT lift sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
2) The LCT lower limit sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
3) The LCT lift sensor is already activated when the LCT lift motor turns on.

Possible Causes

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- LCT lift sensor defective
- LCT lower limit sensor defective

SC510-2: LCT Tray Malfunction-2

Definition [C]

1) During paper lifting, the LCT lift sensor does not activate for more than 1.5 seconds after the paper end sensor turned on. If this condition occurs four times consecutively, this SC will be generated.
2) During paper lifting, after the top of the paper reaches the upper limit position, the paper is lowered until the LCT lift sensor is de-activated. At this time, the LCT lift sensor does not de-activate for more than 5 seconds.

Possible Causes

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- Too much paper in the LCT
- Paper is not properly loaded in the LCT

SC541: Fusing Thermistor Open

Definition [A]

The fusing temperature detected by the thermistor was below 7°C for 16 seconds.

Possible Causes

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

SC542: Fusing Temperature Warming-up Error

Definition [A]

The fusing temperature does not reach the fusing standby temperature within 125 seconds after the main power switch is turned on.

Possible Causes

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BICU defective
- Power supply board defective
- Poor fusing unit connection

SC543: Fusing Overheat Error 1

Definition [A]

A fusing temperature of over 231°C is detected for 5 seconds by the fusing thermistor.

Possible Causes

- Fusing thermistor defective
- BICU defective
- I/O board (IOB) defective

SC545: Fusing Overheat Error 2

Definition [A]

The fusing lamp stays on at full power for 30 seconds while in the stand-by condition after warming-up is completed.

Possible Causes

- Fusing thermistor out of position

SC546-1: Fusing Ready Temperature Malfunction - 1

Definition [A]

After warming-up is completed, the fusing temperature continuously fluctuates between 40°C over and 40°C below the stand-by temperature.

Possible Causes

- Poor connection between the thermistor and the harness
- Poor fusing unit connection

SC546-2: Fusing Ready Temperature Malfunction - 2

Definition [A]

After warming-up is completed, the fusing temperature fluctuates between 40°C over and 40°C below the stand-by temperature 5 or more times per minutes.

Possible Causes

- Poor connection between the thermistor and the harness
- Poor fusing unit connection

SC547: Zero Cross Signal Malfunction

Definition [A]

Zero cross signals are not detected within a certain period within 500 ms after the main power switch has been turned on.

Possible Causes

- Power supply board defective
- Noise on the ac power line

SC548: Fusing Unit Installation Error

Definition [A]

The machine cannot detect the fusing unit when the front cover and right cover are closed.

Possible Causes

- Fusing unit is not installed
- Poor fusing unit connection

SC599: 1-Bin Tray Motor Lock (Optional 1-Bin Tray Unit)

Definition [C]

A 1-bin tray motor lock signal is not detected for more than 0.3 seconds during rotation.

Possible Causes

- 1-bin tray motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC601: Communication Error between BICU and Scanner Unit

Definition [B']

The BICU cannot communicate with the BIS board properly.

Possible Causes

- Poor connection between the SIB and SIFB boards.
- Poor connection between the SIFB and BICU boards.
- SIB board defective
- SIFB board defective
- BICU board defective

SC602: Communication Error between BICU and HDD Control Board

Definition [B']

The BICU cannot communicate with the HDD control board properly.

Possible Causes

- Poor connection between the BICU board and HDD control board
- HDD control board defective
- BICU board defective

SC620-1: Communication Error between BICU and ADF 1

Definition [B']

The BICU cannot receive a response signal three times when a communication error has occurred.

Possible Causes

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

SC620-2: Communication Error between BICU and ADF 2

Definition [B']

The BICU receives a "Break" signal from the ADF main board.

Possible Causes

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

SC620-3: Communication Error between BICU and ADF 3

Definition [B']

The BICU sends a command to the ADF main board which does not operate an ADF function.

Possible Causes

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

SC621: Communication Error between BICU and Finisher

Definition [B']

The BICU cannot communicate with the finisher properly.

Possible Causes

- Poor connection between the BICU board and the finisher main board
- Finisher main board defective
- BICU board defective

SC623: Communication Error between BICU and Paper Tray Unit

Definition [B']

The BICU cannot communicate with the paper tray unit properly.

Possible Causes

- Poor connection between the BICU board and the paper tray unit main board
- Paper tray unit main board defective
- BICU board defective

SC624: Communication Error between BICU and LCT

Definition [B']

The BICU cannot communicate with the LCT properly.

Possible Causes

- Poor connection between the BICU board and the LCT main board
- LCT main board defective
- BICU board defective

SC630: CSS (RSS) Communication Error between Line Adapter and CSS Center [D]

- **Japan Only**

SC700: ADF Original Pick-up Malfunction

Definition [B']

The original stopper H.P sensor does not activate three times consecutively after the pick-up motor has turned on.

Possible Causes

- Original stopper H.P sensor defective
- Pick-up motor defective
- Timing belt out of position
- ADF main board defective

SC701: ADF Original Pick-up Malfunction

Definition [B']

The original pick-up H.P sensor does not activate three times consecutively after the pick-up motor has turned on.

Possible Causes

- Original pick-up H.P sensor defective
- Pick-up motor defective
- ADF main board defective

SC722: Finisher Jogger Motor Error

Definition [B']

1) The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position.
2) The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.

Possible Causes

- Jogger H.P sensor defective
- Jogger motor defective

SC724: Finisher Staple Hammer Motor Error

Definition [B']

Stapling does not finish for more than 600 ms after the staple hammer motor turned on.

Possible Causes

- Staple hammer motor defective
- Staple jam

SC725: Finisher Stack Feed-out Motor Error

Definition [B']

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

Possible Causes

- Stack feed-out H.P sensor defective
- Stack feed-out motor defective

SC726: Finisher Shift/Lift Motor Error

Definition [B']

1) Tray shift does not finish within a certain time after the shift motor turned on.
2) The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

Possible Causes

- Shift motor defective
- Shift tray lift motor defective

SC727: Finisher Stapler Rotation Motor Error

Definition [B']

1) Stapler rotation does not finish within a certain time after the staple rotation motor turned on.
2) The stapler does not return to its home position within a certain time after stapling finished.

Possible Causes

- Stapler rotation motor defective
- Poor stapler rotation motor connection

SC729: Finisher Punch Motor Error

Definition [B']

The punch H.P sensor does not activate within a certain time after the punch motor turned on.

Possible Causes

- Punch motor defective
- Punch H.P sensor defective
- Poor punch motor connection

SC730: Finisher Stapler Position Motor Error

Definition [B']

1) The stapler does not return to its home position within a certain time after the stapler motor turned on.
2) The stapler H.P sensor does not activate within a certain time after the stapler motor turned on.

Possible Causes

- Stapler motor defective
- Stapler H.P sensor defective
- Poor stapler motor connection

SC900: Electrical Total Counter Error

Definition [A]

The value of the total counter has already exceeded 9,999,999

Possible Causes

- NVRAM defective

SC951: F-gate Signal Error 2

Definition [B']

When the IPU has already received the F-gate signal, the IPU receives another F-gate signal.

Possible Causes

- BICU defective

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

- Software defective

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

- Software defective

SC959: Printer Setting ID Error

Definition [B']

The ID that is required for image processing using the printer is not sent from the IPU.

Possible Causes

- Software defective

SC960: Printer Return ID Error

Definition [B']

The ID that is sent from the printer controller after finishing the printout is incorrect.

Possible Causes

- Software defective

SC961: Printer Ready ID Error

Definition [B']

The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

Possible Causes

- Software defective

SC962: Memory Setting ID Error

Definition [B']

The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

Possible Causes

- Software defective

SC963: Memory Finishing ID Error

Definition [B']

The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

Possible Causes

- Software defective

SC964: Printer Ready Error

Definition [B']

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

Possible Causes

- Software defective

SC980: HDD Access Error

Definition [B']

Incorrect parameter sent from the BICU to the MSU.

Possible Causes

- Software defective
- Poor connection between BICU and MSU.

SC981: HDD Response Error

Definition [B']

The HDD control board does not generate any response when the IPU sends a read/write signal to the MSU.

Possible Causes

- Software defective
- Poor connection between BICU and MSU
- HDD defective

SC982: HDD Construction Error

Definition [B']

1) The HDD has been installed without the electric sort kit (SIMM memory).
2) A HDD that does not have the correct specifications has been installed.

Possible Causes

- Hard disk defective
- Incorrect hard disk type
- The electric sort kit is not installed

SC990: Software Performance Error

Definition [B']

The software performs an unexpected function.

Possible Causes

- Software defective
- When this SC occurs, the file name, address, and data will be stored in the NVRAM. These data can be checked by using SP 7-901.
- Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.

7.2 ELECTRICAL COMPONENT DEFECTS

7.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home Position (S1)	505-5 (SIB)	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
Platen Cover (S2)	505-8 (SIB)	Open	APS and ARE do not function properly.
		Shorted	No symptom.
Original Width (S3)	501-A3, 4 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S4)	501-A8, 9 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S5)	501-A13 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
LD Unit Home Position (S6)	220-2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S7)	204-3 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-01 is displayed.
Paper Exit (S8)	203-B2 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration (S9)	207-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator will light whenever a copy is made.
Image Density (ID) (S10)	219-5 (IOB)	Open	SC350-03 is displayed after copying.
		Shorted	SC350-01 is displayed after copying.
Upper Paper Height (S11)	235-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-02 will be displayed.
		Shorted	SC501-01 is displayed.
Lower Paper Height (S12)	236-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-02 will be displayed.
		Shorted	SC502-01 is displayed.

Component (Symbol)	CN	Condition	Symptom
Upper Paper End (S13)	235-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.
Lower Paper End (S14)	236-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S15)	235-5 (PFB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay (S16)	236-5 (PFB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Upper Tray (S17)	239-1 (PFB)	Open	Add Paper indicated even if there is paper.
		Shorted	Add Paper indicated when the tray is set.
Lower Tray (S18)	239-3 (PFB)	Open	Add Paper indicated even if there is paper.
		Shorted	Add Paper indicated when the tray is set.
Transfer Belt Position (S19)	203-A8 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

7.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	232-3 (PFB)	Open	Doors/Covers Open is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	219-11 (IOB)	Open	Doors/Covers Open is displayed even if the front cover is closed.
		Shorted	Doors/Covers Open is not displayed even if the front cover is opened.

7.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main power switch
	115 V	210 ~ 230 V	
Power Supply Board			
FU1	6.3 A/125 V	6.3 A/250 V	“Doors/Covers Open” is displayed
FU2	6.3 A/125 V	6.3 A/250 V	“Doors/Covers Open” for the finisher is displayed
FU3	4 A/125 V	4 A/250 V	Paper end condition
FU4	6.3 A/125 V	6.3 A/250 V	SC121 is displayed
FU5	6.3 A/125 V	6.3 A/250 V	One of SC302, or SC403, or SC405 is displayed
FU101	15 A/125 V	---	No response
FU102	8 A/125 V	5 A/250 V	No response
FU103	2 A/125 V	1 A/250 V	Normal operation (optional heaters do not work)

SCANNER KIT
B359

The B359 scanner kit option has a network interface, but there is no SCSI interface.

Both hardware and software are completely different from the A695 scanner option for the A230/A231/A232.

Therefore, the only comparison with the A695 in this manual is the specification table, which compares the B359 with the A695.

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1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

1.1.1 SCANNER CONTROL BOARD

	B359	A695
Standard Scanner Resolution:	Main scan/Sub scan 600 dpi	Main scan/Sub scan 400 dpi
Available Scanning Resolution Range:	Main scan/Sub scan Book Mode Binary processing: 100 ~ 2400 dpi (in 1 dpi step) Grayscale Processing: 100 ~ 600 dpi (in 1 dpi step) ADF Mode Binary processing: 100 ~ 2400 dpi (in 1 dpi step) Grayscale Processing: 100 ~ 600 dpi (in 1 dpi step)	Main scan/Sub scan Binary Processing: 100 ~ 1600 dpi (in 1 dpi steps) Grayscale Processing: 100 ~ 400 dpi (in 1 dpi steps)
8 bits/pixel	8 bits/pixel	8 bits/pixel
Scanning Speed:	0.8 s/200 dpi (A4 lengthwise, Binary, Book mode, MMR Compression)	4 s/200 dpi (A4 lengthwise, Binary, Book mode)
Scanning Throughput:	30 spm for TWAIN (A283/A284) (local peer-to-peer scanning) 33 spm for Delivery mode (A283/A284) (network scanning to a server) (A4 lengthwise, Binary, ADF mode, MMR Compression)	Simplex mode (ADF): (A230/A231): 19 ppm/200 dpi (A4 lengthwise, Binary) (A232): 21 ppm/200 dpi (A4 lengthwise, Binary) Duplex mode (ARDF): (A230/A231): 17 ppm/200 dpi (A4 lengthwise, Binary) (A232): 18 ppm/200 dpi (A4 lengthwise, Binary)
Interface:	Network interface x 1 Ethernet (100 base-TX/10 base-T for TCP/IP)	SCSI-2, high density Interface Connector: 50 pin, half-pitch (x 1)
Compression Method:	MH, MR, MMR (Binary Picture Processing) JPEG (Grayscale Processing)	
Video Memory Capacity:	9 MB (Standard – 4 MB for image storage, 5MB for a work area) 1 DRAM SIMM slot (16 MB or 32 MB) Up to 36 MB (4MB + 32 MB)	2 MB
Power:	DC 5 V, 3 A (from the main machine)	DC 5 V, 2 A (from the main machine)

1.1.2 DRAM SIMM

Number of Pins:	72 pins
Access Speed:	60 ns or faster
Capacity:	16 or 32 MB
Parity:	Any setting is OK
Type:	EDO required

1.2 SOFTWARE

1.2.1 SCANNER DRIVERS

The following scanner drivers are included on the CD-ROM.

- Network TWAIN Driver for Windows 95/98/NT4.0/NT3.51

1.2.2 SCANNER UTILITIES

The following scanner utilities are included on the CD-ROM.

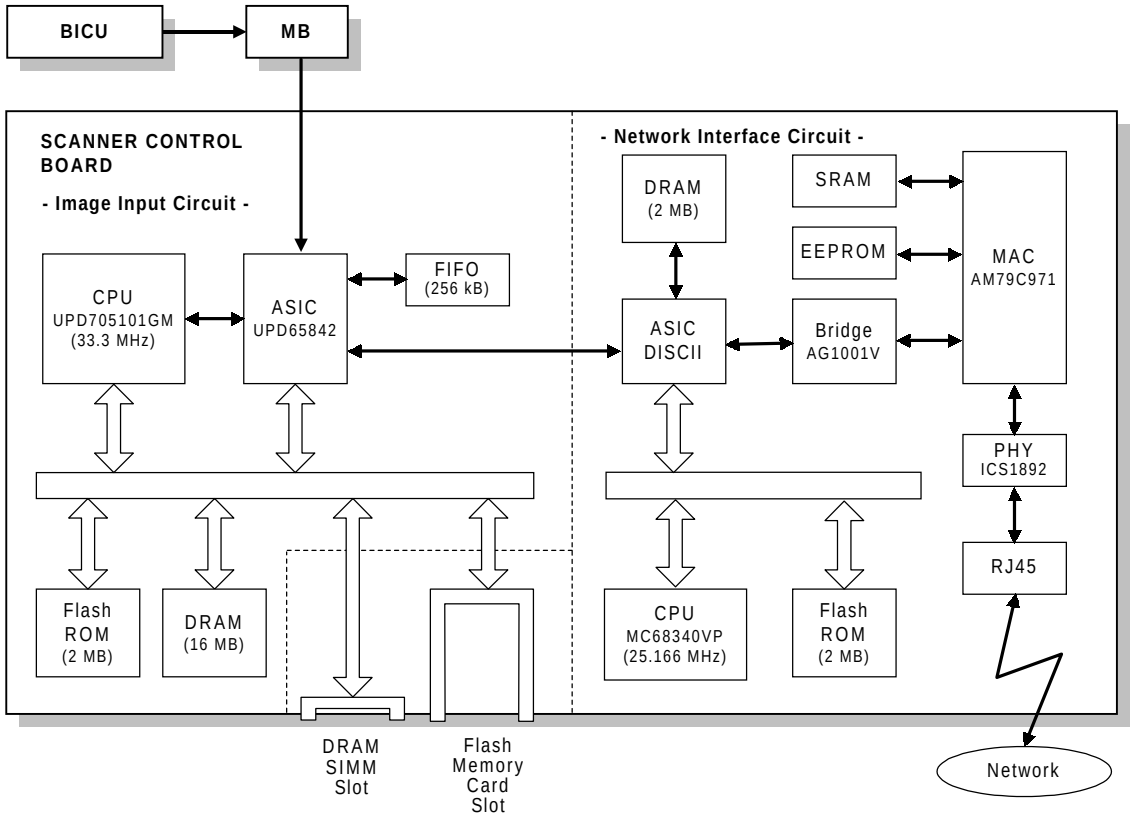
- Scan Router for Windows 95/98/NT4.0
- Aficio Manager for Admin/Client (Windows 95/98/2000/NT4.0)

1.2.3 SCANNER UTILITY (OPTION)

- Scan Router Professional (Windows NT4.0 and service pack 4)

2. DETAILED SECTION DESCRIPTIONS

2.1 HARDWARE OVERVIEW



The scanner controller contains image input and network interface circuits.

The image data from the BICU is compressed in the image input circuit, then the data goes to the network through the network interface circuit.

Each circuit has a CPU and flash memory IC. The functions of each major component are as follows.

1. Image input circuit

CPU: UPD705101GM

- Sequence control for the image input circuit
- Clock/time control
- DMA control

ASIC: UPD65842

- Stores the image data from the BICU board in the main machine into the buffer memory (DRAM)
- Address control when recalling the data from the memory
- DMA control for the network interface circuit

DRAM:

Compresses and stores the image data from the main machine (Total 16 MB. 9MB for work area, 4MB for buffer area, 3 MB for the working program)

Flash ROM:

Contains the scanner controller program and stores the UP/SP settings for the scanner (2 MB)

2. Network interface circuit

CPU: MC58340VP

- Sequence control for the network interface circuit
- Clock/time control
- DMA control

ASIC (DISCII):

- Bus interface between the image input circuit and network interface circuit

Bridge: AG1001V

This is an ISA-PCI bridge; it corrects the timing and decodes the commands between the ISA bus and the PCI bus.

MAC: AM79C971

This is a LAN controller; it covers the same functions as the Data Link Layer of the OSI model.

PHY:

This device covers the same functions as the Physical Layer of the OSI model.

Flash ROM:

Contains the program for the network interface (2 MB)

EEPROM:

Contains UP/SP settings for the network interface

2.2 SCANNER FUNCTIONS

2.2.1 SELF DIAGNOSTICS

Every time the main power switch has just been turned on, the scanner board performs the self diagnostics and the following items will be done automatically.

- SRAM read/write test
- Flash ROM read test
- Battery test
- Initializes the network interface circuit
- Application software for scanner controller test
- Connection test between the scanner board and the main body

If an error is detected, an appropriate error message or condition will be generated (refer to the Troubleshooting section).

2.2.2 IMAGE PROCESSING IN THE SCANNER CONTROLLER

The image processing for scanner mode is done in the IPU chip on the BICU board. However, the following processes are done in the scanner controller.

- Image compression
- Sub-scan magnification

Also, the scanner controller has a gamma table and dither matrix for scanner mode. When the user selects the image mode using the scanner driver, the appropriate gamma table and dither matrix are downloaded to the BICU board. Then the IPU chip does the image processing using these tables or matrixes.

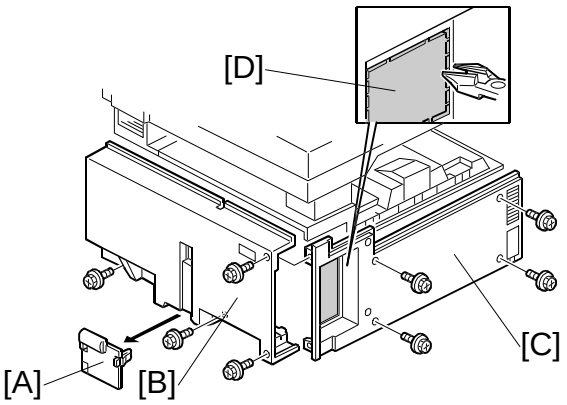
Image Compression

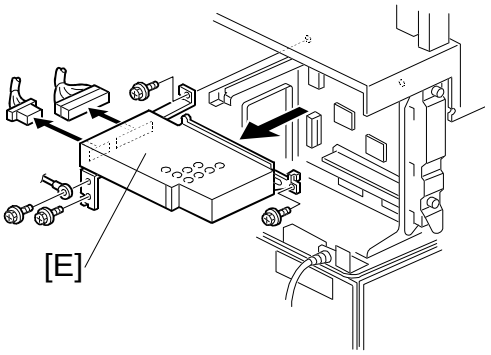
The image compression method for binary picture processing uses MH, MR, or MMR, depending on scanner SP mode 002. Grayscale processing uses JPEG. This is done by the software.

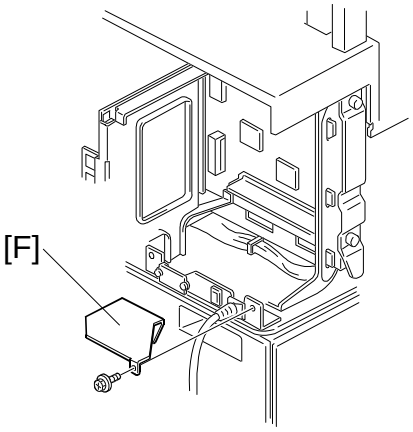
Sub-scan Magnification

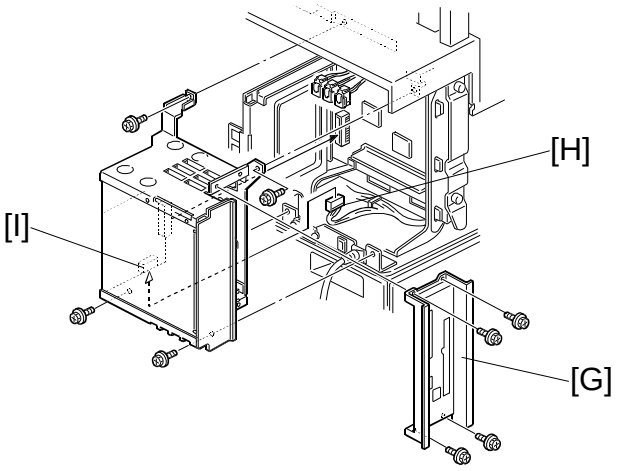
Usually, the sub-scan magnification is done by changing the scanner motor speed. However, when the amount of data being transferred is high (e.g., low resolution in grayscale processing mode), the scanner controller deletes every other line.

3. INSTALLATION PROCEDURE









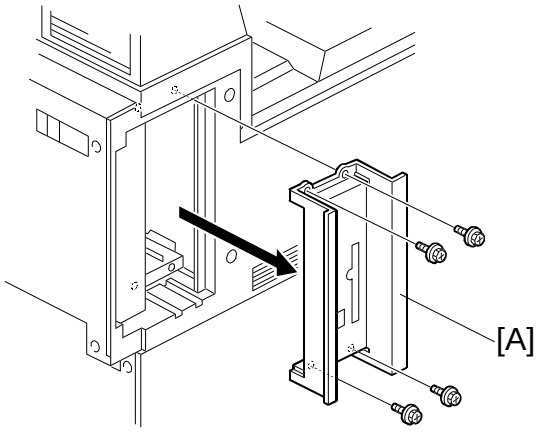
⚠CAUTION

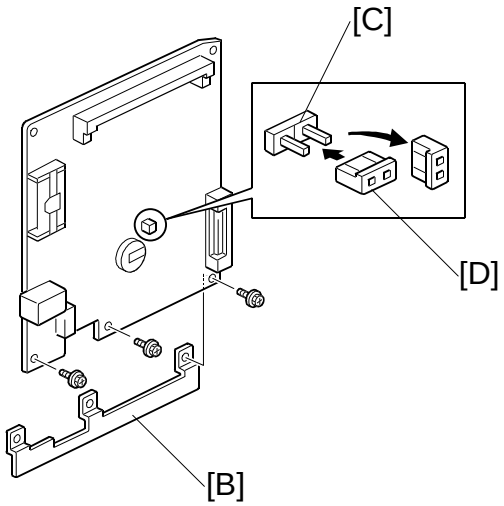
Unplug the main machine power cord before starting the following procedure.

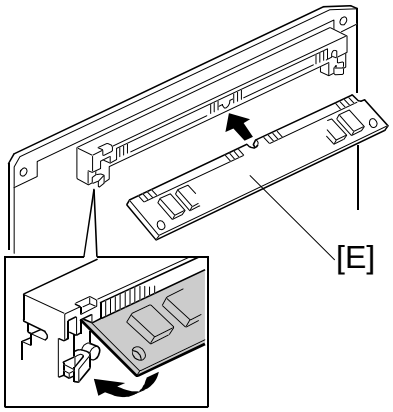
NOTE: If either the Printer Controller Type 450e or Fax Option Type 450e has been installed, skip steps 1 through 8.

1. Remove the connector cover [A], rear cover [B] (4 screws), and left cover [C] (4 screws).
2. Remove the cutout [D] in the left cover.
3. Remove the HDD [E] (4 screws, 2 connectors).
4. Remove the bracket [F] (1 screw).
5. Remove the plate [G] from the expansion box (4 screws).
6. Connect the cable [H] to the expansion box [I], then install the expansion box (4 screws).
7. Reinstall the HDD.

8. Reinstall the left, rear, and connector covers.



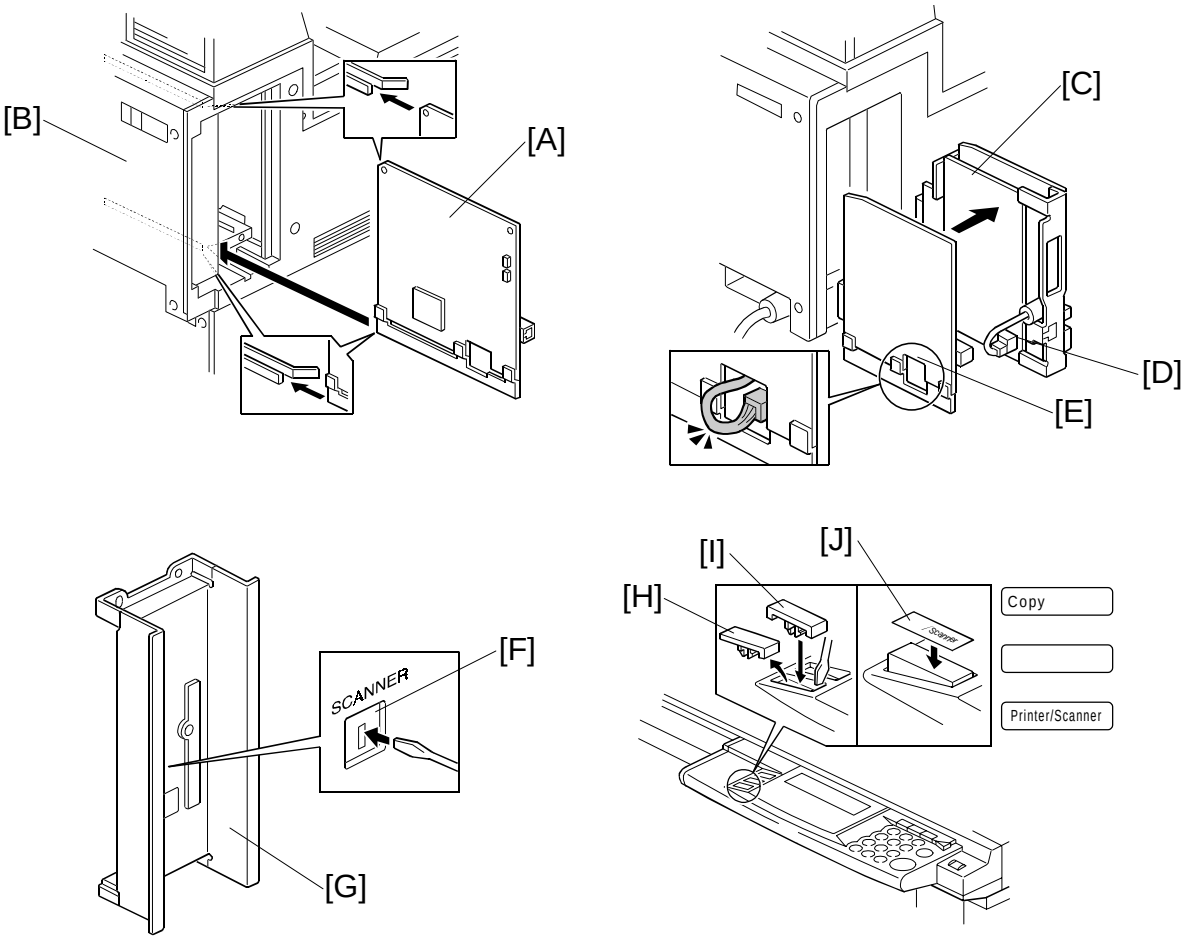




Scanner Controller Installation

NOTE: If either the Scanner Option Type 450e or Fax Option Type 450e has been installed, perform step 9. If neither have been installed, skip step 9.

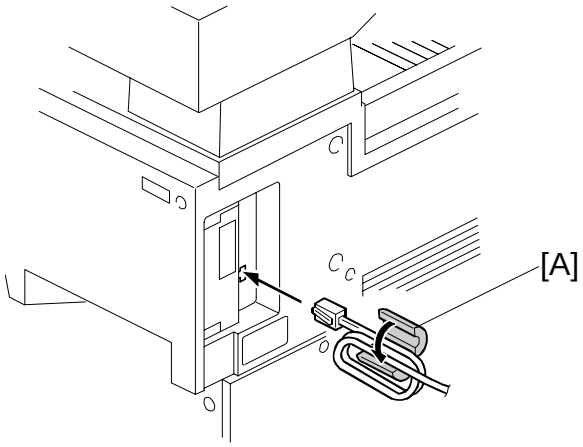
9. Remove plate [A] (4 screws).
10. Attach the guide plate [B] to the scanner controller board (3 screws).
11. Short TB4 [C] on the scanner board with the jumper [D].
12. If requested by the customer, install the optional SIMM memory [E] on the scanner board.



13. Install the scanner controller board [A] in the third slot from the right of the expansion box [B].

If the ISDN Option Type 450 has not been installed, skip steps 14 through 16.

14. Slide out the ISDN board [C].
15. Thread the ISDN modular cable [D] through the opening [E] in the scanner board, as shown.
16. Insert the scanner board and ISDN board into the expansion box at the same time.
17. Remove the cutout [F] in the plate [G] and file down any sharp edges. Reinstall the plate.
18. Remove the bottom cap [H] of the operation panel.
    NOTE: If both Printer Controller Type 450e and Fax Option Type 450e have not been installed, also remove the top cap of the operation panel.
19. Install the **Printer** key [I] on the operation panel and attach the **Scanner** label [J] to the Printer key as shown.
    NOTE: If both Scanner Option Type 450e and Fax Option Type 450e have not been installed, install the **Copy** key on the operation panel as well (see the illustration).



20. Turn the machine on. If SC4003 occurs, perform the following procedure to clear the SC condition:
    NOTE: SC4003 indicates that the battery is worn out. Even if TB4 has been shorted with the jumper, the battery level will be low the first time the machine is turned on after the scanner controller board is installed. This SC condition will not occur about 30 minutes after TB4 has been shorted.
    1) Enter SP mode (▭ → ① → ⓪ → ⑦ → C/⊘), pressing C/⊘ for more than 3 seconds.
    2) Select 4 (Scanner SP mode).
    3) Press the Next button 4 times to access SP005 (Error Log Indication).
    4) Exit the SP mode.
    5) Turn the machine off and on. If SC4003 still occurs, check the jumper position.
21. Make sure that the parallel cable is not connected to the printer controller and check the setting of the following copier SP mode (enter SP mode and select 1):
    - SP5-907: Plug & Play Brand Name and Production Name Setting – select the correct one.
22. Attach the core [A] to the STP (Shielded Twisted Pair) cable, then connect the cable to the scanner controller.
    NOTE: The STP cord should be coiled twice inside the core as shown.
23. If the customer wishes to use the machine as a delivery fax, perform the following.
    1) Install the Fax Option Type 450e (A874) and PC Fax Expander (B368).
    2) Enter the Fax SP mode and check that bit 0 of System Switch 1C is at “1”.
    3) Set bit 6 of System Switch 1F to “1”.
    4) Set bits 0 and 1 of User Parameter Switch 31 to “1” depending on the delivery fax function (refer to the ScanRouter Professional Operation Instructions Scanner & Fax Reference Type 450e for more detail).

4. SERVICE TABLE

4.1 SERVICE PROGRAM MODE

4.1.1 SERVICE PROGRAM ACCESS PROCEDURE

The service program access procedure, such as “Entering Service Program (SP) Mode” and “Exiting SP Mode” is the same as for copier and fax, as follows.

Entering SP mode

[⊛/◎] → ① → ⓪ → ⑦ → [C/⊛] (hold it for more than 3 seconds.)

Exiting SP mode

Press the “Back” and “Exit” keys until the standby mode display appears.

4.1.2 SERVICE PROGRAM MODE TABLES

NOTE: 1) In the Function column, comments are in italics.
2) In the Settings column, the default value is in bold letters.

No.		Function	Setting
001	FTP Port Number	Changes the FTP port number. *After changing this value, do the following:* *1. Run the Registry Editor.* *2. Access /HKEY_LOCAL_MACHINE/SOFTWARE/Ricoh/NetworkScanner* *3. Change the value of PortNo to this SP mode’s value.*	00000 ~ 65536 1/step **3670**
002	Compression Type	Selects the compression type for binary picture processing.	1: MH 2: MR **3: MMR**
003	Software Version	Displays the software version.	
004	Program Number	Displays the program’s part number.	
005	Error Log Display	Displays the error logging data *Check this data when SC4005 occurs. Then inform it to the service center.*	
006	Scan Data Reset	Resets all scanner data (UP and SP modes) except for the network interface data (UP-Network-1 ~ 8) *Press “1” three times to reset.*	
007	All Data Reset	Resets all UP and SP settings *Press “1” three times to reset.*	

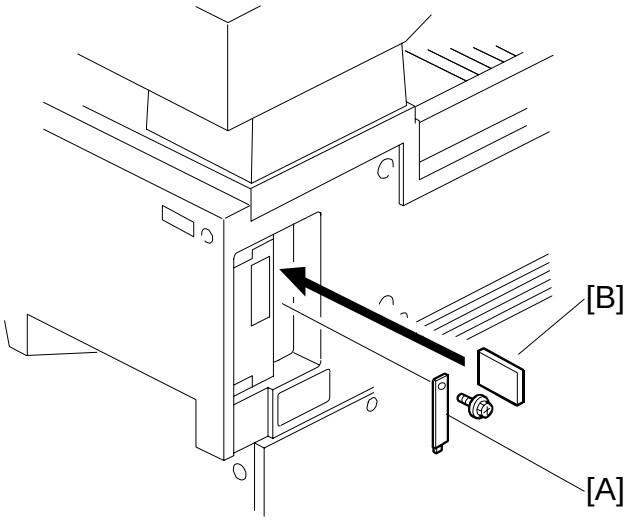
B359 Scanner Kit

No.		Function	Setting
008	NIC Data Reset	Resets all network interface data (UP-Network-1 ~ 8) *Press "1" three times to reset.*	
009	Density Adjustment 1	Adjusts the image density for each image density level which can be selected with UP mode (UP-Scan-Density)	0 ~ 255 1/step **40**
010	Density Adjustment 2		0 ~ 255 1/step **70**
011	Density Adjustment 3		0 ~ 255 1/step **100**
012	Density Adjustment 4		0 ~ 255 1/step **130**
013	Density Adjustment 5		0 ~ 255 1/step **160**
014	Density Adjustment 6		0 ~ 255 1/step **190**
015	Density Adjustment 7		0 ~ 255 1/step **220**
016	ROM Disk Format	Initializes the flash ROM. *Press "1" three times to initialize.*	
⇒ 017	Trimming	Adjusts the scanning margins for both main and sub-scan directions. *The larger the value, the wider the margin*	0 ~ 5 1 mm/step **0**

4.2 DOWNLOADING NEW SOFTWARE

4.2.1 SOFTWARE DOWNLOAD PROCEDURE

The software for the scanner controller contains the system software, application software, and network interface software. The new software can be downloaded from a flash memory card.



1. Prepare a flash memory card that has been programmed with the latest software.
2. Turn off the machine and disconnect the Ethernet (STP) cable from the scanner controller.
3. Remove the cover [A], and insert the flash memory card [B] into the slot so that the “A” side of the card faces the front of the machine.
4. Turn the machine on and press the Scanner Mode key.
5. Press the INSTALL key on the display in reply to the message. Software download will take several minutes.
6. Make sure that the machine displays the scanner SP mode, then after new software has been downloaded successfully, turn off the machine, remove the card, connect the Ethernet cable, and turn the machine back on.

4.2.2 ERROR MESSAGES DURING THE SOFTWARE DOWNLOAD

If downloading failed, one of the following error messages appears. At this time, press the “CONFIRM” bottom in the display to re-try the download.

Message	Action
SYS Erasing Failed ADDR:XXXXXXXX	Re-try the download. If the download fails again, replace the scanner controller.
SYS Writing Failed ADDR:XXXXXXXX	
SYS Verify Failed ADDR:XXXXXXXX	
APL Erasing Failed ADDR:XXXXXXXX	
APL Writing Failed ADDR:XXXXXXXX	
APL Verify Failed ADDR:XXXXXXXX	
NIC board is not equipped	
NIC Initialization failed. CODE:XXXX	
NIC Download mode is disable	
NIC Writing Failed ADDR:XXXXXXXX	
NIC Host Service Error CODE:XXXX	Re-try the download. If the download fails again, replace the scanner controller. Check whether the STP cable is disconnected. If it is connected, disconnect the cable and re-try the downloading.

5. REPLACEMENT AND ADJUSTMENT

5.1 PRECAUTION

⚠CAUTION

Lithium Battery
The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

5.2 NOTE FOR REPLACING THE SCANNER CONTROLLER BOARD

The scanner controller does not have a configuration report and cannot upload/download settings to an IC card. So, before replacing the scanner controller board, check all UP mode and SP mode settings. After replacing the board, re-input these settings.

6. TROUBLESHOOTING

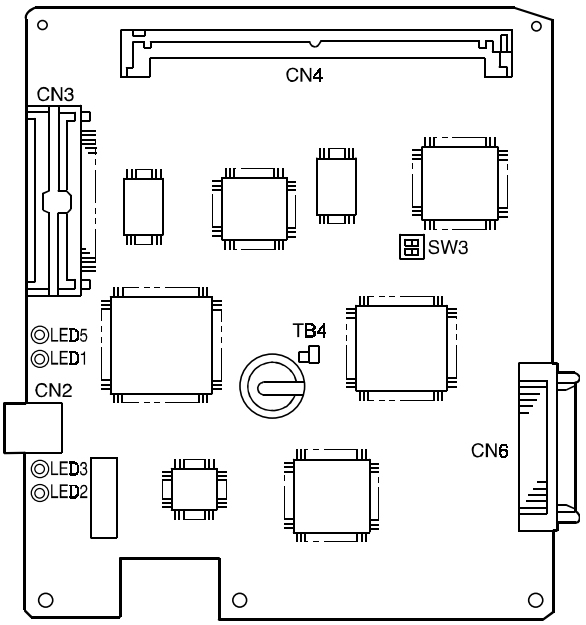
6.1 SERVICE CALL CONDITION

The scanner controller board automatically performs the self diagnostics whenever the main power switch is turned on. If an error is detected, it displays an error message on the LCD. Turn the main switch off and on to reset the SC condition.

6.1.1 SC CODE DESCRIPTIONS

SC code	Error Items	Conditions	Action
SC4001	DRAM Error	• SIMM defective • A SIMM type other than 16MB or 32MB SIMM is installed	Replace or re-install the SIMM
		• Standard SRAM defective	Replace the scanner controller board
SC4002	Flash ROM Error	The machine cannot scan	Defective firmware; try to download the software. If the download fails, replace the scanner controller.
SC4003	Battery Error	• The battery has run out	Replace the scanner controller board
		• The jumper TB4 is at the off position	Change the jumper position
SC4004	NIC Error	NIC circuit defective	Replace the scanner controller board
SC4005	Application Error	Logical error	Turn the main switch off and on, check the error log data (SP005), then inform it to the service center.

6.2 LEDS



LED No.	Color	Status	Condition
LED1	Yellow	Lit	The network interface circuit is working properly.
		Off	The network interface circuit does not work.
LED2	Green	Lit	The scanner controller board is connected to the network properly.
		Off	The scanner controller board is not connected to the network.
LED3	Green	Lit	100 Base-TX
		Off	10 Base-T
LED5	Red	Lit	+ 5V is supplied
		Off	+ 5V is not supplied
		Blinking	Communication error between the scanner controller board and BICU.

⇒6.3 FIRMWARE HISTORY

6.3.1 B359 FIRMWARE MODIFICATION HISTORY

B359 SCANNER OPTION FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
• 1st Mass Production	A8775810 **E**	1st Mass Production	3.0.1
• The firmware was modified so that it can be used with the scanner controller for A283/A284 • The machine sometimes scans part of the exposure glass scale and edge of the original. To prevent this, a new scanner SP mode has been added (SP017, Trimming Margin Adjustment). • Note: After installing the firmware, Scanner SP006 (Scan Data Reset) must be performed. • The machine stalls when the memory full condition is reached.	A8775810 **F**	February 2000 Production	4.0.0
• When Scanner Auto Clear is enabled: If an ADF jam occurs during a scanning job initiated before the Scanner Auto Clear timer expires, the scanner settings are reset to default.	A8775810 **G**	March 2000 Production	4.0.3
• Improvement: An MTF filter is used in Text Mode to improve the quality of the scanned image.	A8775810 **H**	November 2000 Production	4.0.4

FAX UNIT

A874

This manual explains the fax unit, as well as the following.

- EXFUNC board - Fax Function Expander (Machine Code: A892)
- Handset (Machine Code: A646)
- PCFE board - PC Fax Expander (Machine Code: B368)
- ISDN kit (Machine Code: A816)
- Stamp (Machine Code: A813)
- (EXMEM board – Expansion Memory)

Lithium Batteries

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

OVERALL INFORMATION

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX, ISDN

Connection
Direct couple

Original Size (Book)
Maximum Length: 432 mm [17 ins]
Maximum Width: 297 mm [11.7 ins]

Original Size (ADF)
Length: 128 – 432 mm [5.0 – 47.2 ins]
Width: 105 – 297 mm [4.1 – 11.7 ins]
Thickness: 40 – 128 g/m^2 [10 – 34 lbs]

Scanning Method
Flat bed, with CCD

Scan Width
210 mm [8.3 ins] ± 1% (A4)
216 mm [8.5 ins] ± 1% (8.5" x 11")
256 mm [10.1 ins] ± 1% (B4)
279 mm [11.0 ins] ± 1% (11" x 17")
297 mm [11.7 ins] ± 1% (A3)

Resolutions
8 x 3.85 lines/mm (G3 only)
8 x 7.7 lines/mm (G3 only)
8 x 15.4 lines/mm (G3 only)
16 x 15.4 lines/mm (G3 only)
200 x 100 dpi
200 x 200 dpi
400 x 400 dpi

Note:
To use the 8 x 15.4 lines/mm, 16 x 15.4 lines/mm and 400 x 400 dpi resolutions, an optional EXMEM board is required.

Memory Capacity

ECM: 128 Kbytes

SAF:
Standard: 2 Mbytes (160 pages)

With optional memory board (EXFUNC + EXMEM) :
30 Mbytes (3000 pages)

Measured using an ITU-T #1 test document (Slerexe letter)

Compression
MH, MR, MMR
JBIG (EXFUNC is required)
(MMR only with ECM and G4)
SAF storage for memory tx: MMR and/or raw data

Protocol
Group 3 with ECM
Group 4 (ISDN unit required)

Modulation
V.34, V.33, V.17 (TCM), V.29 (QAM), V.27ter (PHM), V.8, V.21 (FM)

Data Rate (bps)
G3:
33600/31200/28800/26400/24000/21600/19200/16800/14400/12000/9600/7200/4800/2400, Automatic fallback
G4 (option): 64 kbps/56 kbps

I/O Rate
With ECM: 0 ms/line
Without ECM: 2.5, 5, 10, 20, or 40 ms/line

Transmission Time
G3: 3 s at 28800 bps; Measured with G3 ECM using memory for an ITU-T #1 test document (Slerexe letter) at 8 x 3.85 l/mm resolution
G4 (option): 3 s at 64 kbps; Measured with an ITU-T #1 test document (Slerexe letter) at 200 x 200 dpi resolution

1.2 FEATURES

1.2.1 FEATURES LIST

KEY:
O = Used, X = Not Used,
A = Optional EXMEM board required
B = Optional EXFUNC board required
C = Optional PCFE board required
D = Optional ISDN unit required
E = Optional STAMP unit required

Video Processing Features	
Automatic image density selection	O
Contrast	O
Halftone (Basic & Error Diffusion)	O
JBIG compression	B
MTF	O
Reduction before tx	O
Scanning Resolution – Standard	O
Scanning Resolution – Detail	O
Scanning Resolution – Fine	A
Scanning Resolution – Superfine	A
Smoothing to 400 x 400 dpi when printing	O

Communication Features – Automatic	
Automatic fallback	O
Automatic redialing (Memory tx only)	O
Dual Access	O
Length Reduction	O
Resolutions available for reception Detail Fine Superfine	 O A A
Substitute reception	O
V34 communication	O

Communication Features - User Selectable	
90° Image Rotation before tx	O
Action as a transfer broadcaster	X
AI Redial (last ten numbers)	O
Answering machine interface	X
Authorized Reception	O
Auto Document	O
Automatic dialing (pulse or DTMF)	O
Automatic Voice Message	X
Batch Transmission	O
Book Original tx	O
Broadcasting	O
Chain Dialing	O
Communication Record Display	O
Confidential ID Override	O
Confidential Reception	O
Confidential Transmission	O
Create Margin Transmission	O
Direct Fax Number Entry	O
Economy Transmission	O
Fax on demand	X
Forwarding	O
Free Polling	O
Groups (Standard: 9 groups)	O
Hold	X
ID Transmission	O
Immediate Redialing	O
Immediate Transmission	O
ISDN	D
Keystroke Programs	O
Memory transmission	O
Multi-step Transfer	O
Non-standard original size transmission	O
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O
Page separation mark	O
Parallel memory transmission	O

Communication Features - User Selectable	
Partial Image Area Scanning	X
Personal Codes	O
Polling Reception	O
Polling Transmission	O
Polling tx file lifetime in the SAF	O
Quick Dial (Standard: 56 stations)	O
Reception modes (Fax, Tel)	O
Remote control features	X
Remote Transfer	X
Restricted Access	O
Secured Polling	O
Secured Polling with Stored ID Override	O
Send Later	O
SEP/SUB/PWD/SID	O
Silent ringing detection	X
Specified Image area	X
Speed Dial (Standard: 100 stations)	O
Stamp	E
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	O
Transmission Deadline (TRD)	X
Turnaround Polling	X
Two in one	O
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Cable Equalizer	O
Closed Network	O
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	X
Inch-mm conversion before tx	O
Length Reduction	O
Page retransmission times	O

Communication Features - Service Selectable	
Protection against wrong connection	O
Short Preamble	X

Other User Features	
Area code prefix	X
Center mark	O
Checkered mark	O
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	O
Counters	O
Daylight Saving Time	O
Destination Check	X
Direct entry of names	O
Energy Saver	O
File Retention Time	O
File Retransmission	O
Function Programs (F1 – F5)	O
Hard Disk Filing System	X
ID Code	O
Label Insertion ("To xxx")	O
Language Selection	SP mode
Memory Lock	O
Modifying a memory file (tx)	O
Multi Sort Document Reception	X
Own telephone number	O
Print density control	X
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	O
Remaining memory indicator	O
Reverse Order Printing	O
RTI, TTI, CSI	O
Service Report Transmission	O
Speaker volume control	O
Specified Cassette Selection	O
Substitute reception on/off	O
Telephone line type	O
Toner Saving Mode	X
TTI/CIL on/off	O

Other User Features	
User Function Keys (5 keys)	O
User Parameters	O
Wild Cards	O

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	O
Confidential File Report	O
Error Report	O
Fax On Demand Report	X
File Clear Report	O
File Reserve Report	O
Journal	O
Polling Result Report	O
Power Failure Report	O
Transfer Result Report	O
Transmission Result Report	O

Reports - User-initiated	
Authorized Reception List	O
Charge Control Report	X
File List	O
Forwarding List	O
Group List	O
Hard Disk File List	X
Journal	O
Personal Code List	O
Program List	O
Quick Dial Label	O
Quick Dial List	O
Specified Cassette Selection List	X
Speed Dial List	O
Transmission Status Report	X
User Function List	X
User Parameter List	O

Service Mode Features	
Back-to-back test	X
Bit switch programming	O
Cable equalizer	O
Comm. parameter display	O
Counter check	SP mode

Service Mode Features	
Country code	O
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	O
Error code display	O
Excessive jam alarm	O
File Transfer (all files)	O
LCD contrast adjustment	SP mode
Line error mark	O
Memory file printout (all files)	O
Modem Software Download	X
Modem test (includeV.34 / V.8)	O
NCU parameters	O
Periodic service call	O
PM Call	O
Printing all communication records kept in memory	O
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
RAM test	O
RDS - RAM read/write - Dial data transfer (Quick/Speed) - Software transfer	 O O O
Ringer test	O
ROM version display (FCU)	SP mode
Serial number	O
Service monitor report	O
Service station number	O
Software Upload/Download	O
SRAM data backup/restore	O
System parameter list	O
Technical data on the Journal	O

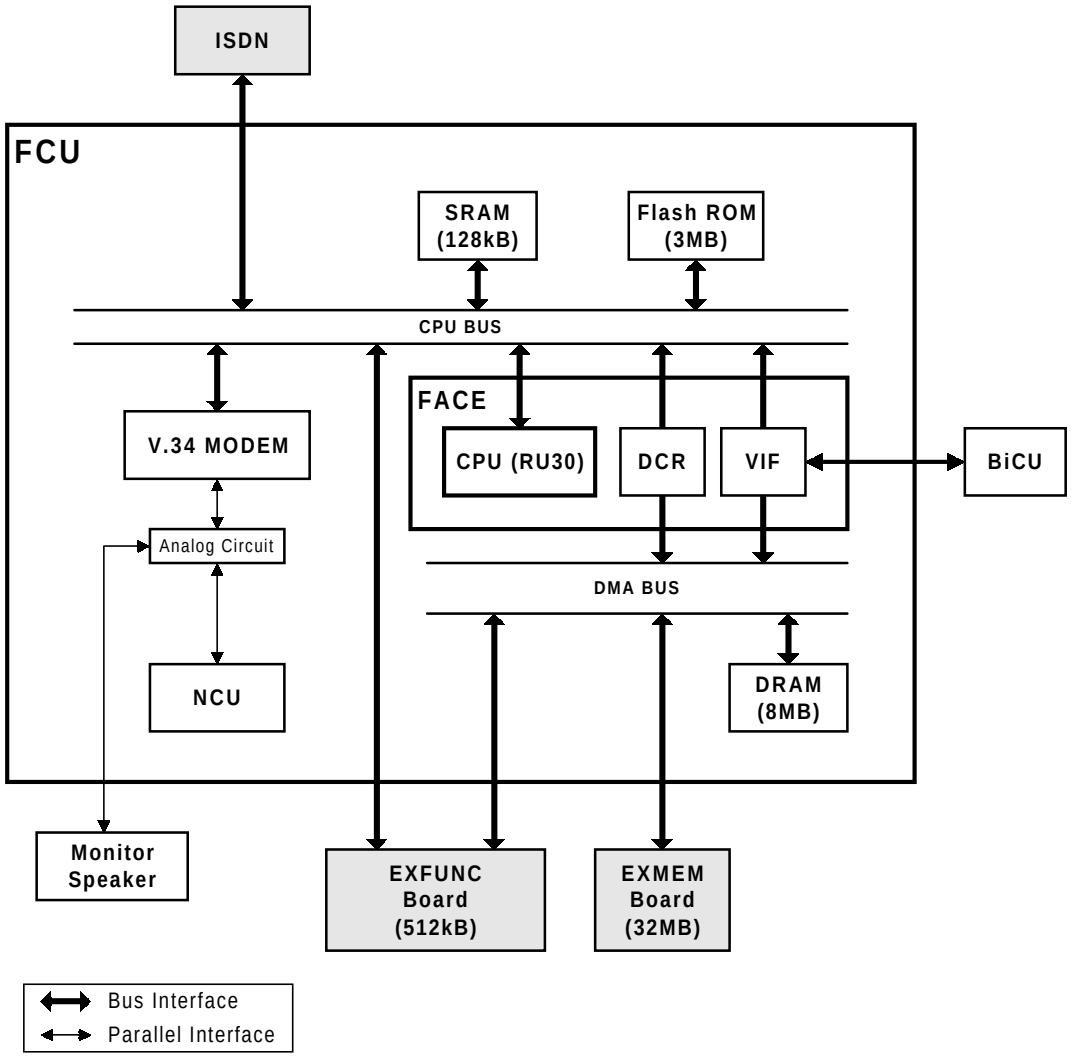
1.2.2 CAPABILITIES OF PROGRAMMABLE ITEMS

The following table shows how the capabilities of each programmable item will change after the optional function upgrade card is installed.

Item	Standard	With optional boards (EXFUNC + EXMEM)
Maximum number of memory files	200	1000
Maximum number of destinations per file	256	500
Maximum number of destinations overall	300	2000
Maximum number of pages overall	400	3000
Number of Quick Dials	56	56
Number of Speed Dials	100	1000
Number of Groups	9	30
Maximum number of destinations per Group	256	500
Maximum number of destinations dialed from the ten-key pad overall	100	1000
Maximum number of programs	56 (programmed in 56 Quick Dial keys)	56 (programmed in 56 Quick Dial keys)
Maximum number of Auto Documents	6 (programmed in 6 Quick Dial keys)	18 (programmed in 18 Quick Dial keys)
Maximum number of communication records for the Journal stored in the memory	100	900
Maximum number of addresses specified for features such as Authorized Reception and Specified Cassette Selection	30	50
Maximum number of user function keys	5	5
Maximum number of personal codes	20	50

1.3 OVERALL MACHINE CONTROL

1.3.1 SYSTEM CONTROL



The basic fax unit consists of two PCBs: an FCU and an NCU.
The FCU controls all the fax communications and fax features, in cooperation with the base copier's main board, the BiCU. The NCU switches the analog line between the fax unit and the external telephone.

Fax Options

1. EXFUNC board: JBIG compression becomes available. In addition, this expands the system's SRAM capacity to hold programmed telephone numbers, communication records, etc.
2. PC fax expander: Class 2 fax communication from a PC and local printing from a PC fax application become available (PC fax application required). Also, local scanning from the machine’s scanner using TWAIN API becomes available (CFM Twain driver required).
3. ISDN unit: This allows the fax unit to communicate over an ISDN (Integrated Services Digital Network) line.
4. EXMEM board: This expands the SAF memory capacity. Also, this expands the page memory capacity to enable 400 dpi communications.)

1.3.2 POWER DISTRIBUTION AND CONTROL

The FCU power is supplied from the base copier's BiCU (+24V, +12V, -12V, and +5V). Refer to the base copier's service manual for details.

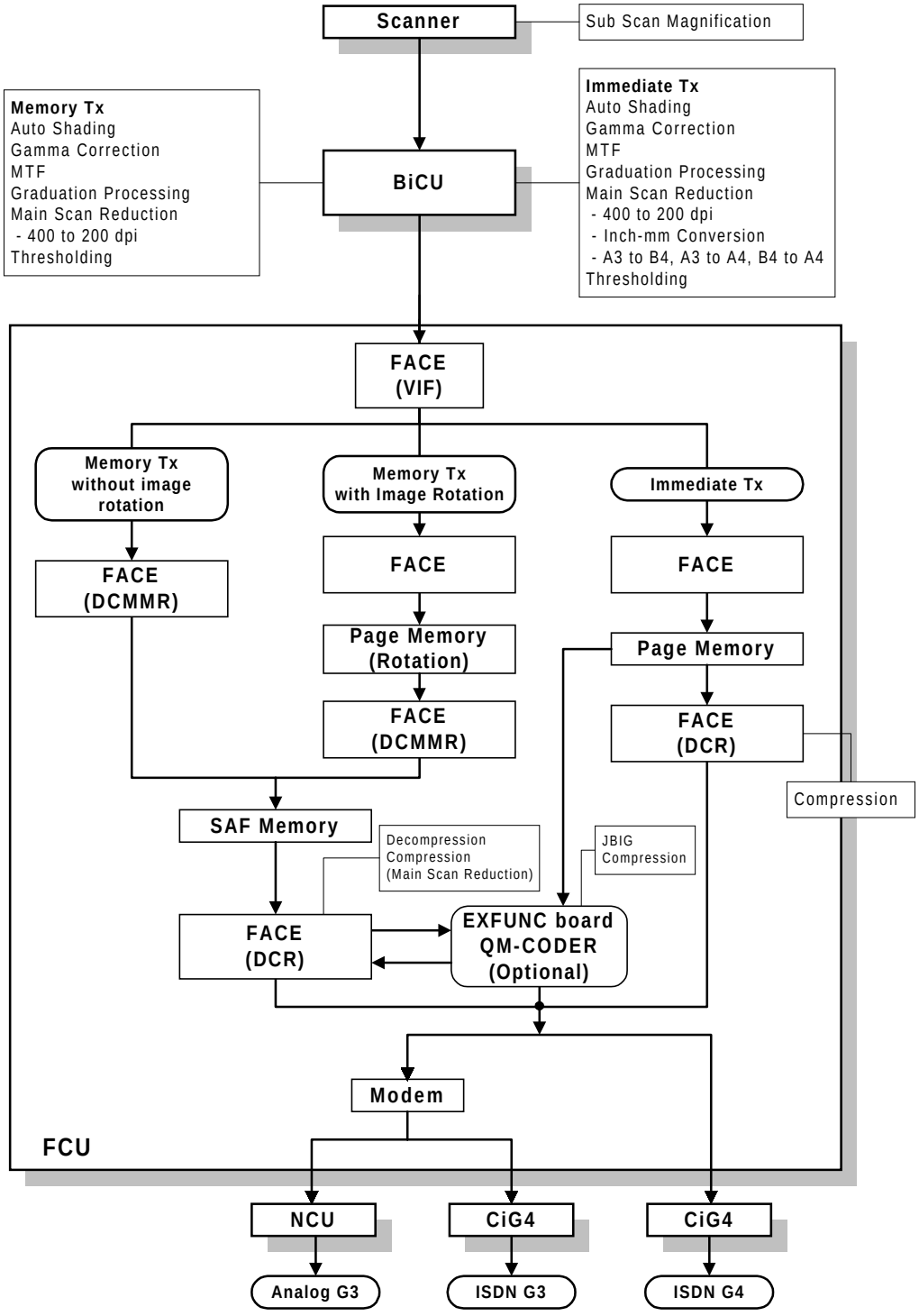
1.3.3 MEMORY BACK-UP

The system parameters and programmed items in the SRAM on the FCU and the EXFUNC board are backed up by batteries (long-term backup), in case the base copier's main switch is turned off.

The SAF memory (DRAM) on the FCU and the EXMEM board are backed up by rechargeable batteries for 1 hour.

1.4 VIDEO DATA PATH

1.4.1 TRANSMISSION



Memory Transmission and Parallel Memory Transmission

The base copier's scanner scans the original at the selected resolution in inch format. The BiCU processes the data and transfers it to the FCU.

NOTE: When scanning a fax original, the BiCU uses the MTF and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.

Then, the FCU converts the data to mm format, and compresses the data in MMR or raw format to store it in the SAF memory. If image rotation will be done, the image is rotated in page memory before compression.

At the time of transmission, the FCU decompresses the stored data, then re-compresses and/or reduces the data if necessary for transmission. Either the NCU or CiG4 (optional) transmits the data to the line.

Immediate Transmission

The base copier's scanner scans the original at the resolution agreed with the receiving terminal. The BiCU video processes the data and transfers it to the FCU.

NOTE: When scanning a fax original, the BiCU uses the MTF and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.

Then the FCU stores the data in page memory, and compresses the data for transmission. Either the NCU or CiG4 (optional) transmits the data to the line.

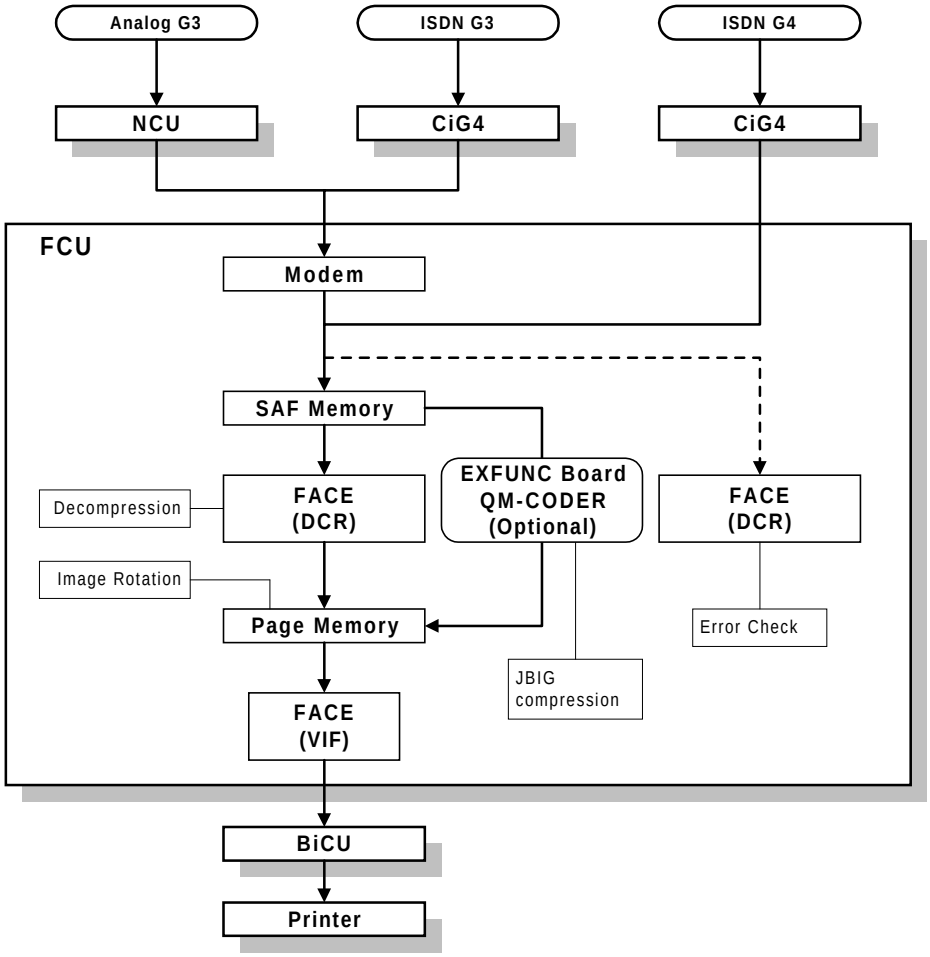
JBIG Transmission

- **Memory transmission:** If the receiver has JBIG compression, the data goes from the FACE (DCR) to the EXFUNC board for JBIG compression. Then either the NCU or CiG4 (ISDN G3) transmits the data to the line.
- **Immediate transmission:** If the receiver has JBIG compression, the data goes from the page memory to the EXFUNC board for JBIG compression. Then either the NCU or CiG4 (ISDN G3) transmits the data to the line.

Adjustments

- Line used for G3 transmissions (PSTN or ISDN): System switch 0A bit 6

1.4.2 RECEPTION



First, the FCU stores the incoming data from either an analog line or an ISDN line to the SAF memory. (The data goes to the FACE at the same time, and is checked for error lines/frames.)

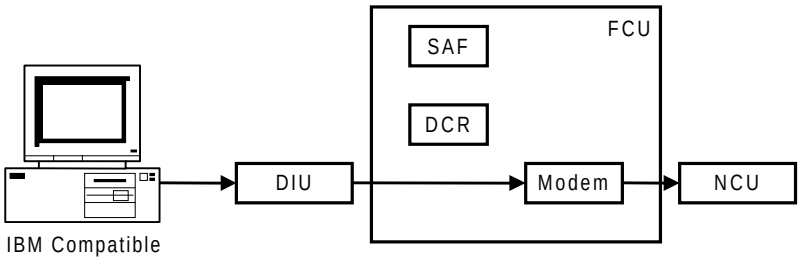
The FCU then decompresses the data and transfers it to page memory. If image rotation will be done, the image is rotated in the page memory. The data is transferred to the BiCU.

JBIG Reception

When data compressed with JBIG comes in on PSTN, the data is sent to the EXFUNC board for decompression. Then the data is stored in the page memory, and transferred to the BiCU.

1.4.3 PC FAX COMMUNICATION

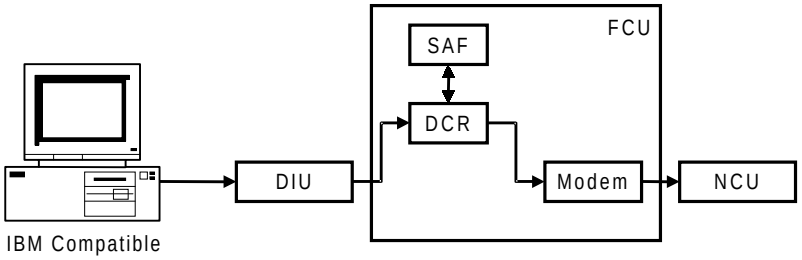
Direct transmission



The host computer sends commands and image data to the machine through the DIU during transmission.

NOTE: 1) Group dials programmed in the machine cannot be used.
2) T.30 optional protocols (e.g., BFT) are not supported by class 2 fax communication.
3) ISDN G4 numbers programmed in quick or speed dials cannot be used.
4) If ISDN is selected for G3 communication (system switch 0A, bit 6), the G3 numbers must have been programmed in quick or speed dials.

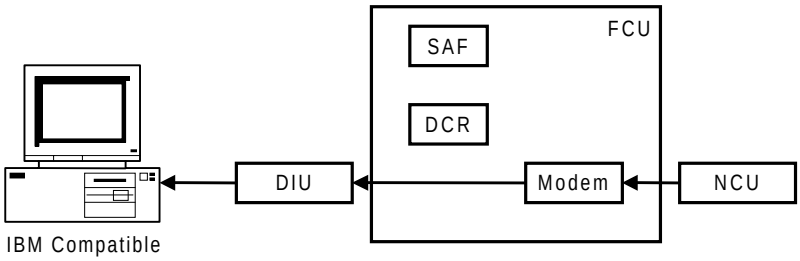
Memory transmission



The host computer sends destination number(s) and image data to the machine through the DIU during transmission. The machine stores the image in the SAF memory, then makes a fax transmission.

NOTE: 1) If the memory overflows while storing the first page into SAF memory, the machine does not start the transmission.
2) If the memory overflows while storing the second or subsequent page into SAF memory, the machine transmits all the successfully stored pages.
3) When fax numbers programmed in the machine's quick or speed dials are specified using the PC fax application, all the specified numbers must have been programmed in the fax machine.
4) T.30 optional protocols (e.g., BFT) are not supported by class 2 fax communication.

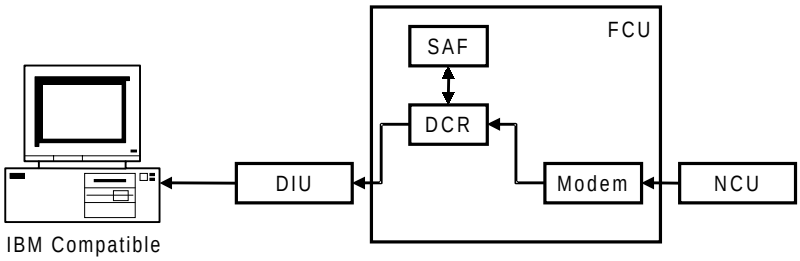
Direct reception



The machine transfers received image data directly to the host PC without storing it into SAF memory.

NOTE: 1) If the host PC is not ready to receive a fax message, the machine receives the message into SAF memory.
2) Even if the SAF memory is full, the machine starts fax reception. However, the machine will not continue reception if the host computer is not ready to receive a message.
3) The “Number of rings to answer” parameter in the PC fax application must not exceed 4.

Memory reception



The machine receives a fax message in the SAF memory, then transfers data to the host computer after the reception has finished. The machine prints the received message after transferring data to the host if user parameter 21 – bits 1 and 2 are set to “1: Print”.

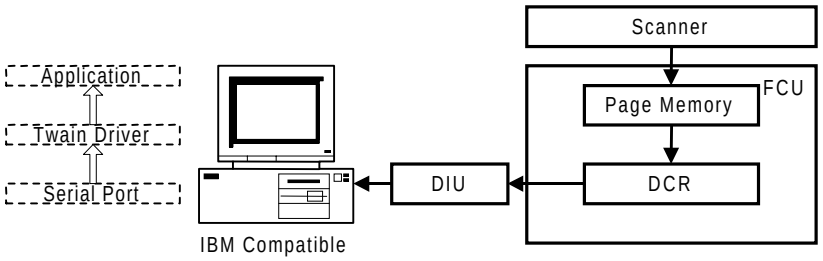
NOTE: 1) If an error occurs due to cable disconnection, the PC fax application must be restarted to receive the message.
2) Memory reception is not possible when forwarding is enabled.
3) Manual reception from the PC fax application is not supported.
4) The “Number of rings to answer” parameter in the PC fax application must not exceed 4.

Adjustments

- PC transmission mode (direct or memory): User parameter 20 (14H), bit 0
- Line for PC memory transmission (PSTN/ISDN G4): User parameter 20 (14H), bit 5
- PC fax reception mode (direct/memory): User parameter 21 (15H), bits 1 and 2

1.4.4 SCANNING AND PRINTING

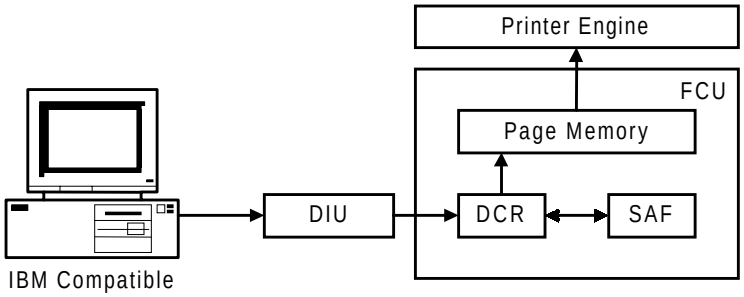
SCANNING



The machine scans an original into page memory, then transfers the data to the host PC. The data is sent to the application through the CFM Twain driver.

NOTE: The maximum resolution is 200 x 200 dpi.

PRINTING



The machine receives print data into SAF memory as fax image data, then prints it after all the data has been transferred from the host PC.
The destination number “0000” informed from the host PC identifies a print job.

NOTE: 1) If SAF memory runs out while receiving print data, the machine prints up to the successfully received data.
2) The machine cannot receive print data while printing a message from the SAF memory. The data will be received after printing.
3) If a fax destination is specified together with the print destination “0000”, the destinations specified after “0000” will be delayed until the machine prints all pages in the message.

DETAILED DESCRIPTIONS

2. DETAILED SECTION DESCRIPTIONS

2.1 AUTOMATIC SERVICE CALLS

2.1.1 SERVICE CALL CONDITIONS

The fax unit makes an automatic service call when the base copier's BiCU generates any SC code except for those stored in the following RAM.

NOTE: The service station's fax number has to be programmed in advance, or the machine cannot make a service call.

Exceptions

Address (H)	Definition	Default	SC code
680DC8	1st SC code - High byte (BCD)	03	329 Laser beam pitch adjustment error
680DC9	1st SC code - Low byte (BCD)	29	
680DCA	2nd SC code - High byte (BCD)	03	361 Hard disk drive error 2
680DCB	2nd SC code - Low byte (BCD)	61	
680DCC	3rd SC code - High byte (BCD)	03	365 Image storage address error
680DCD	3rd SC code - Low byte (BCD)	65	
680DCE	4th SC code - High byte (BCD)	05	548 Fusing unit installation error
680DCF	4th SC code - Low byte (BCD)	48	
680DD0	5th SC code - High byte (BCD)	06	630 CSS communication error Japan only
680DD1	5th SC code - Low byte (BCD)	30	
680DD2	6th SC code - High byte (BCD)	09	9AA From 900 to 999
680DD3	6th SC code - Low byte (BCD)	AA	
680DD4 to 680DEF	7th SC code - High byte (BCD) to 20th SC code - Low byte (BCD)	FF(H)	Not Programmed

To add additional SC codes, program them in the blank addresses.

Wild Cards

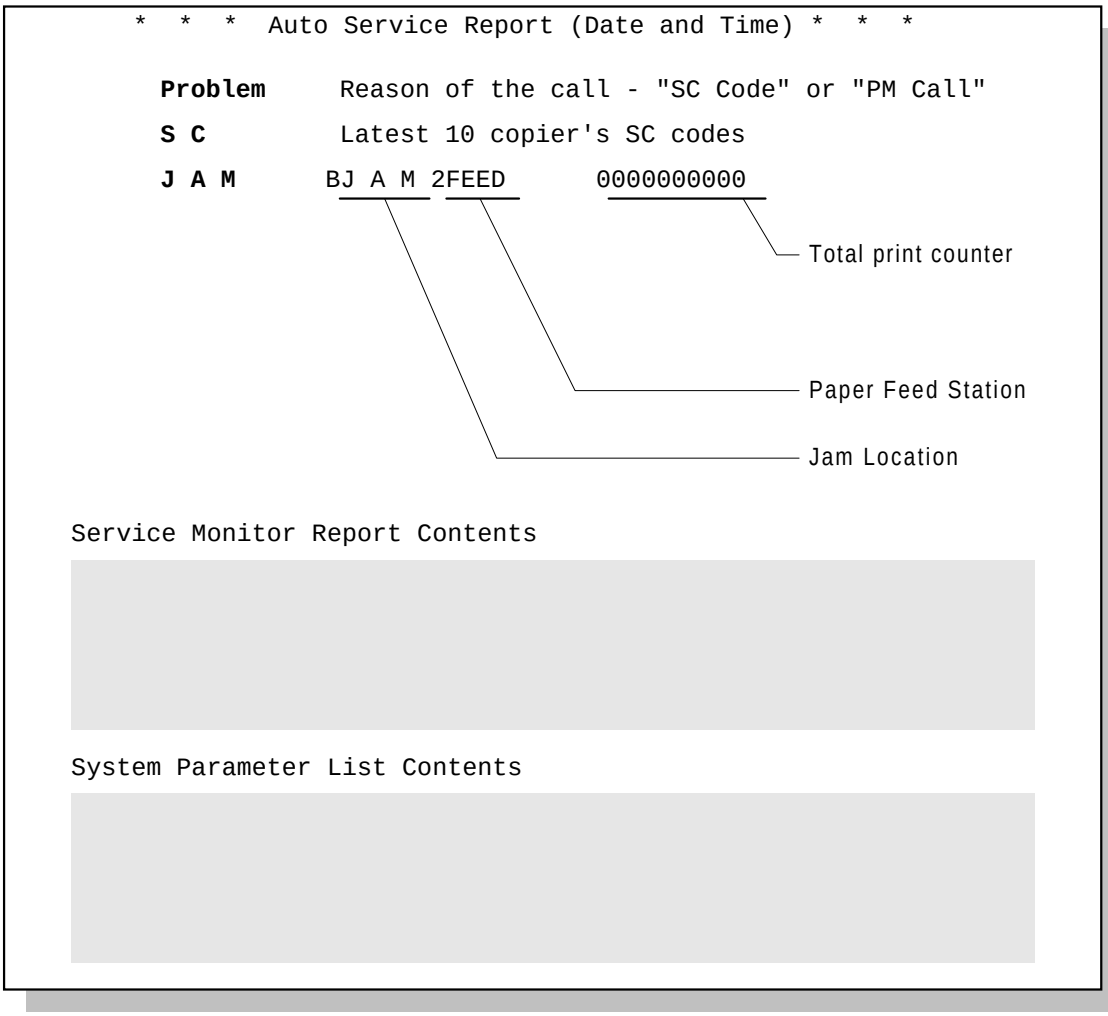
This function allows "A" or "a", to be used as a wild card instead of numbers from 0 to 9. For example, "1AA" or "1aa" means all the SC codes from 100 to 199, and "39A" or "39a" means all the SC codes from 390 to 399.

The fax unit cannot make an automatic service call when a Fax SC code condition has occurred. Refer to the Troubleshooting section for Fax SC code details.

Manual Service Call

If the service station needs a report, the user can make a service call manually, by changing bit 7 of User Parameter 14 (0E) to "1".

A sample auto service report



2.1.2 PERIODIC SERVICE CALL

The periodic service call notifies the service station of the machine's condition. The call is made at a time interval programmed in the following RAM addresses:

Parameters		Address (H)
Call interval: 01 through 15 months (BCD) 00: Periodic service call disabled		**6803A1**
Date and time of the next call	Day: 01 through 31 (BCD)	**6803A4**
	Hour: 01 through 24 (BCD)	**6803A5**

To change these settings after programming, change the call interval. The machine then automatically changes the remaining parameters by referring to the interval and the current date and time.

2.1.3 PM CALL

If PM alarm is enabled with the base copier's SP mode and PM call is enabled with system switch 01, the machine will make an automatic service call when the base copier's PM counter reaches the PM interval.

Cross reference

- PM service call on/off: System switch 01, bit 0
- PM alarm setting: SP mode 5-501 (default: 150K)

2.1.4 EFFECTIVE TERM OF SERVICE CALLS

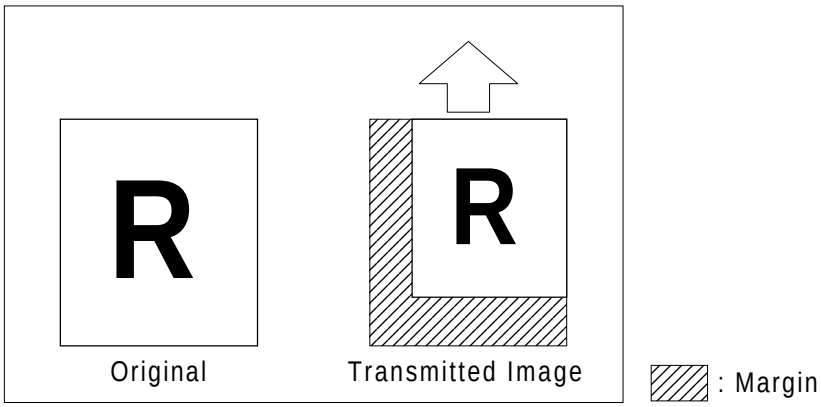
If a time limit for the effectiveness of service calls is programmed, the machine stops making automatic service calls after the time limit.

Program the time limit at the following addresses. This function is disabled when all of these addresses are 00(H).

Parameters	Address (H)
Year: last two digits of the year (BCD)	**6803AB**
Month: 01 through 12 (BCD)	**6803AC**
Day: 01 through 31 (BCD)	**6803AD**

2.2 SCANNING FEATURES

2.2.1 CREATE MARGIN TRANSMISSION



When this function is enabled, the scanner is able to reduce the image of the original. This allows the person at the other end to file the printout without losing any of the data to punch holes.

The machine adds a margin to the bottom and left borders of the image so that the transmitted page is the same size as the original.

Cross reference

- Reduction ratio - System switch 06 bits 0 to 7
  Default setting is 93% (71 to 99%)

NOTE: 1) This function is only possible during memory transmission.
2) “Create margin transmission” and “Image rotation before transmission” are not compatible. (Create margin transmission is given priority)
3) The sample image on reports is also reduced and contains the margin.
4) Both the main and sub scan directions use the same magnification ratio.

2.3 PRINTING FEATURES

2.3.1 REDUCTION FOR JOURNAL PRINTING

The machine reduces the size of the journal and adds a margin to the bottom and left edges of the journal.
This function allows the customer to add punch holes without losing any part of the image.

Cross Reference

- Reduction for journal printing on/off - Printer switch 07 bit 0
  Default setting is 0 (Disabled)

2.3.2 JOURNAL LINE TYPE SORT PRINTING

When an optional G4 unit is installed, the machine can print the journal arranged by type of fax line.

Cross Reference

- Journal arrangement by fax line on/off - User parameter switch 19 (13H) bit 1
  Default setting is 0 (Disabled)

2.3.3 PRINTING LISTS & REPORTS ON A5/HLT SIZE PAPER

This function allows the customer to print lists & reports on A5/HLT size paper under the following conditions.

Conditions:

- User parameter switch 19 (13H) bit 5 = 1 (enables the function)
- There is A5/HLT size paper in the machine
- No more than 58 lines on the list/report
- The report/list is only one page (not multi-page)

NOTE: Under these conditions, the following lists/reports will be printed out on A5/HLT size paper.

- Auto Document List
- ✻ Communication Failure Report
- Confidential file Report
- Error Report
- Group Dial List
- Immediate TX Result Report
- Keystroke Program List
- ✻ Memory Storage Report
- ✻ Memory TX Result Report
- Personal Code List
- Poling RX Reserve Report
- Polling RX Result Report
- ✻ Polling Transmission Clear Report
- Power Failure Report
- Quick Dial List
- Sender/Authorized Reception List
- Sender/Forwarding List
- Specified Sender List
- Speed Dial List
- ✻ Transfer Result Report
- TX File List

✻ : When printing these 5 reports, A5/HLT cannot be used if a sample of the image is included in the report (user parameter switch 04 bit 7).

2.3.4 REDUCTION OF THE SAMPLE IMAGE ON REPORTS

This function reduces the sample image on reports to 50%.

Cross Reference

- Reduction of sample image on reports on/off - User parameter switch 19 (13H) bit 4
  The default setting is 1 (Enabled)

NOTE: When the value of user parameter switch 19 (13H) bit 4 is 0, the machine uses the setting of printer switch 0E bits 3 and 4

Printer switch 0E bits 3 and 4

Bit 4	Bit 3	Settings
0	0	The upper half only, no reduction
0	1	50% reduction in sub scan only
1	0	Same size (no reduction, output separated in to two pages)
1	1	Not used

The diagram shows the protocol used by this model acting as the transmitting terminal.

2.4 LINE TYPE CHANGE

When the machine is initially used only with the PSTN, the line type programmed with phone numbers in Quick Dials and Speed Dials is stored as PSTN G3.
Later, if the line connection is changed so that G3 is to be used only with the ISDN, the communication port for all stored Quick and Speed Dials must be changed to ISDN G3.
This feature allows the communication mode and port to be changed for all stored numbers at once.

Procedure:

1) Change the data in the following RAM addresses.
   68E8E4 (H) - Current line type setting.
   68E8E5(H) – New line type setting.

NOTE: The default setting for the above addresses are FF(H).

2) Turn the main switch off and on.
   Then, the machine checks all phone numbers stored in Quick Dials, Speed Dials, AI Redial, and Forwarding Stations. If the communication mode and the port setting for a number is the same as specified for the “current setting” in the above address, the machine changes these to the “new setting”.
3) After this procedure, the data programmed automatically returns to FF(H).

Setting:

These settings can be used only when an optional G3 and/or G4 unit is installed in the machine.

Bit 0 and 1: Communication mode

Bit	1	0	Setting
	0	0	G3
	0	1	G4
	Other settings - Not used		

Bit 2 to 4: Communication port

Bit	4	3	2	Setting
	0	0	0	PSTN
	0	1	1	ISDN
	Other settings - Not used			

Bit 5 to 7: Not used

Allowable settings are as follows:

	7	6	5	4	3	2	1	0	Setting
00H	0	0	0	0	0	0	0	0	G3 (PSTN)
0DH	0	0	0	0	1	1	0	1	G4 (ISDN)

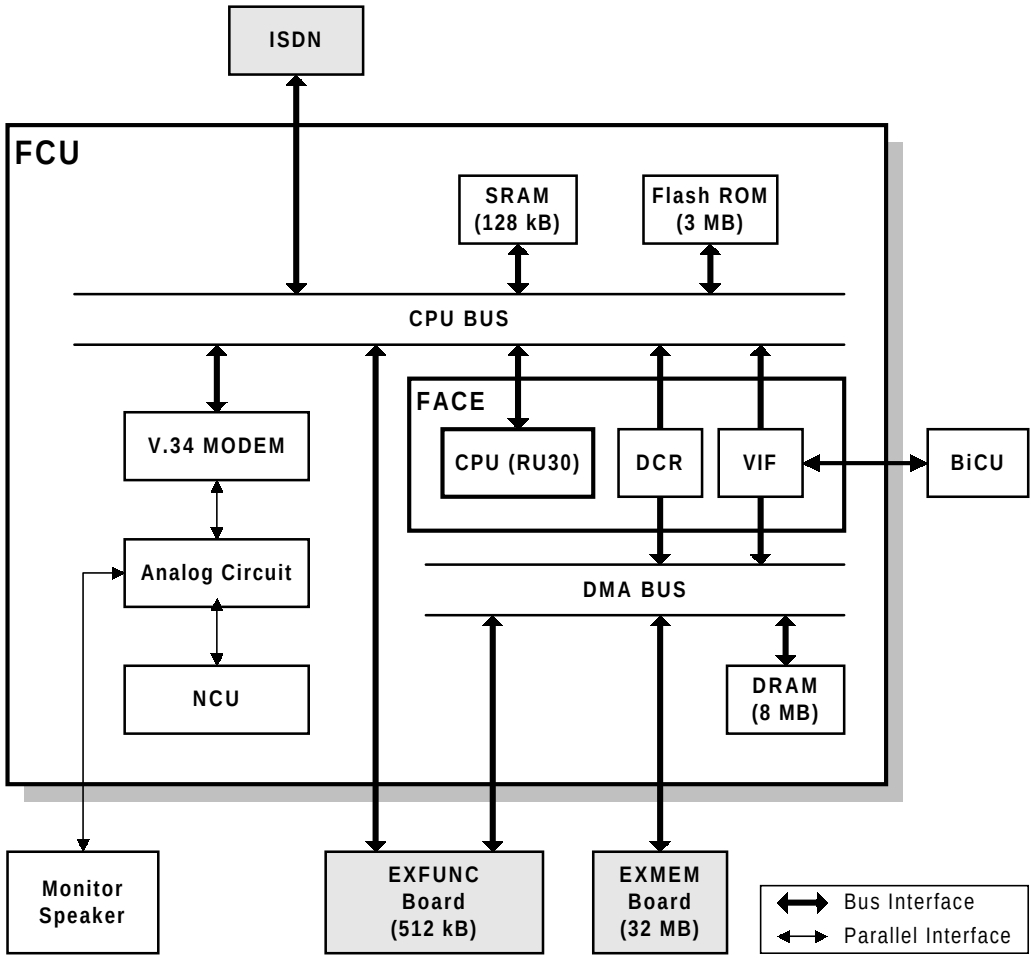
Example:

If you wish to change the port setting from PSTN to ISDN,
1. Change the data in address 68E8E4(H) to 00(H) (0000 0000)
2. Change the data in address 68E8E5(H) to 0D(H) (00001101)

NOTE: 1) Do not use this procedure if there are any files stored in the memory awaiting transmission.
2) Quick/Speed Dial addresses containing an F-code (i.e., for communications that will use SEP/SUB/PWD/SID) cannot be converted to ISDN G4.

2.5 PCBS

2.5.1 FCU



The FCU (Facsimile Control Unit) controls fax communications, the video interface to the base copier's engine, and all the fax options.

FACE (Fax Application Control Engine)

- CPU
- Data compression and reconstruction (DCR)
- DMA control
- Clock generation
- DRAM backup control
- Ringing signal/tone detection
- Video and command interface to the BiCU (VIF)

Modem (Rockwell R288F)

- V.34, V33, V17, V.29, V.27ter, V.21, and V.8

ROM

- 3MB (16 Mbit) flash ROM for system software storage

DRAM

- The 8 MB of DRAM is shared between SAF memory, ECM buffer, page memory, working memory, line buffer, and so on.
- The SAF memory (2MB) is backed up by a rechargeable battery.

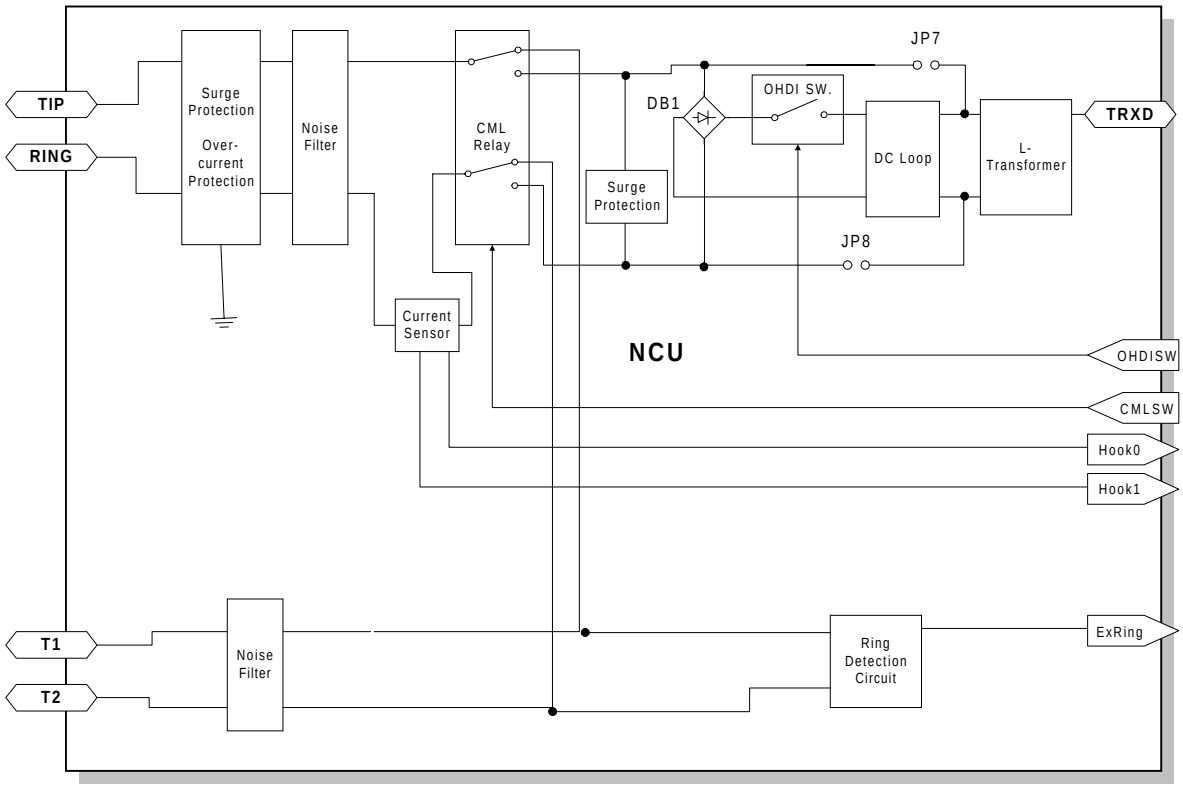
SRAM

- The 128 KB SRAM for system and user parameter storage is backed up by a lithium battery.

Switches

Item	Description
SW1	Switches the SRAM backup battery on/off
SW2	Reset switch, to reboot the FCU board
SW3	Determines which firmware the machine boots from. If the switch is OFF, the firmware on the FCU inside the machine is used. If the switch is ON, the firmware on the flash memory card or external FCU is used.

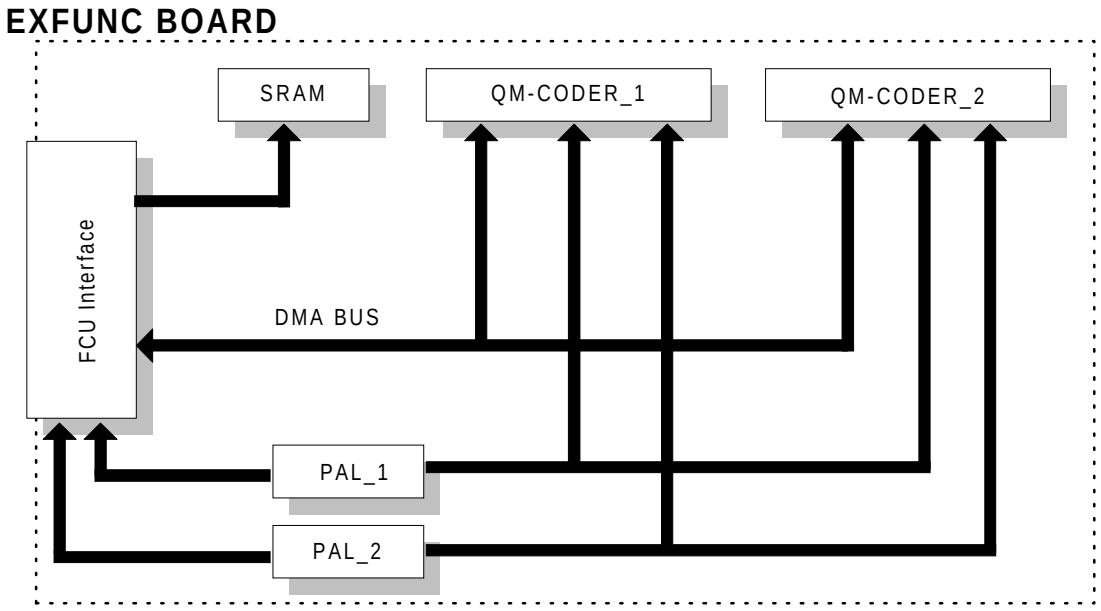
2.5.2 NCU (US)



Jumpers

Item	Description
JP7	These jumpers should be shorted when the machine is connected to a dry line.
JP8	
DB1	Also remove DB1 when the machine is connected to a dry line.

2.5.3 EXFUNC BOARD



The EXFUNC board allows JBIG compression and some additional features become available. In addition, this board expands the SRAM capacity.

QM Coder

- 2 QM coders for JBIG compression and decompression.

PAL (PALCE16V8H-15PC)

- 2 PALs make a strobe control signal. This is used for DMA selection.

SRAM

- 512KB SRAM for telephone numbers and other user parameters.

Lithium battery

- Backs up the SRAM.

Switches

Item	Description
SW1	Switches the backup battery on/off

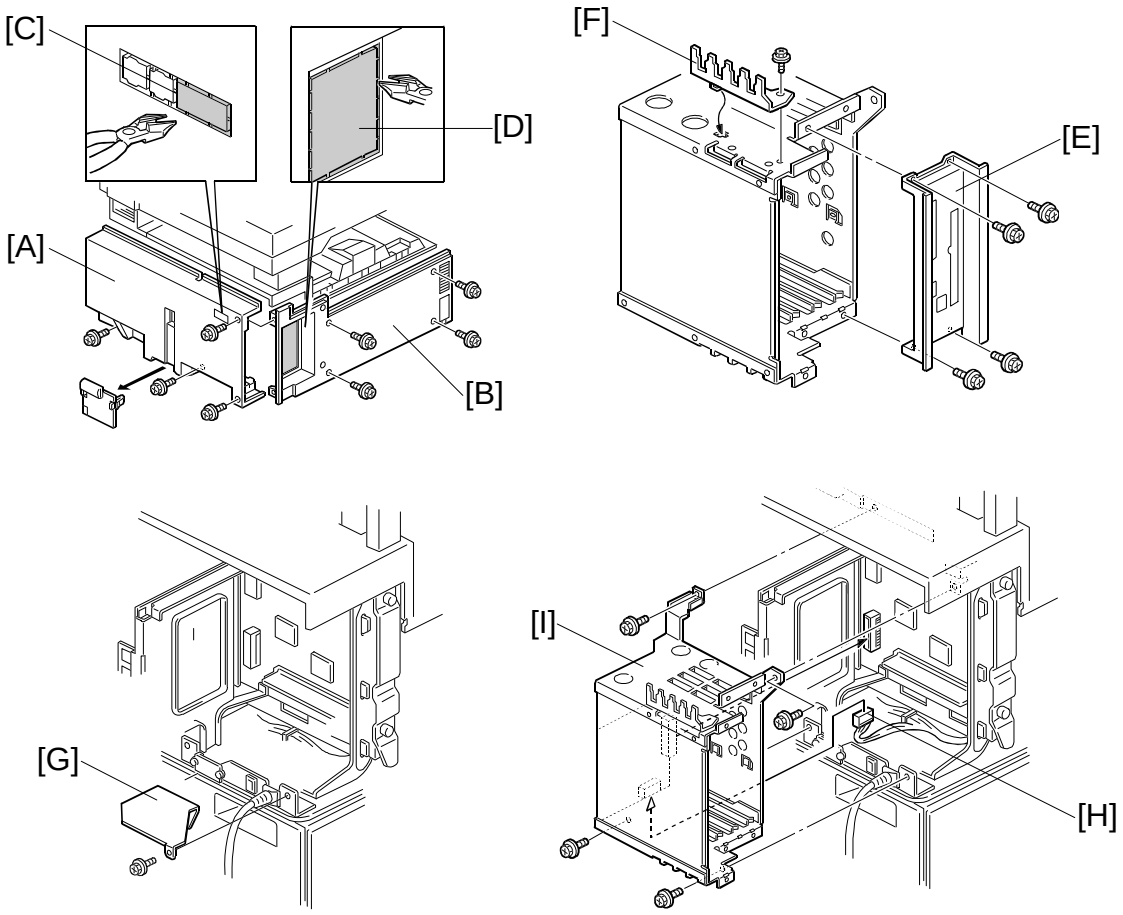
INSTALLATION

3. INSTALLATION

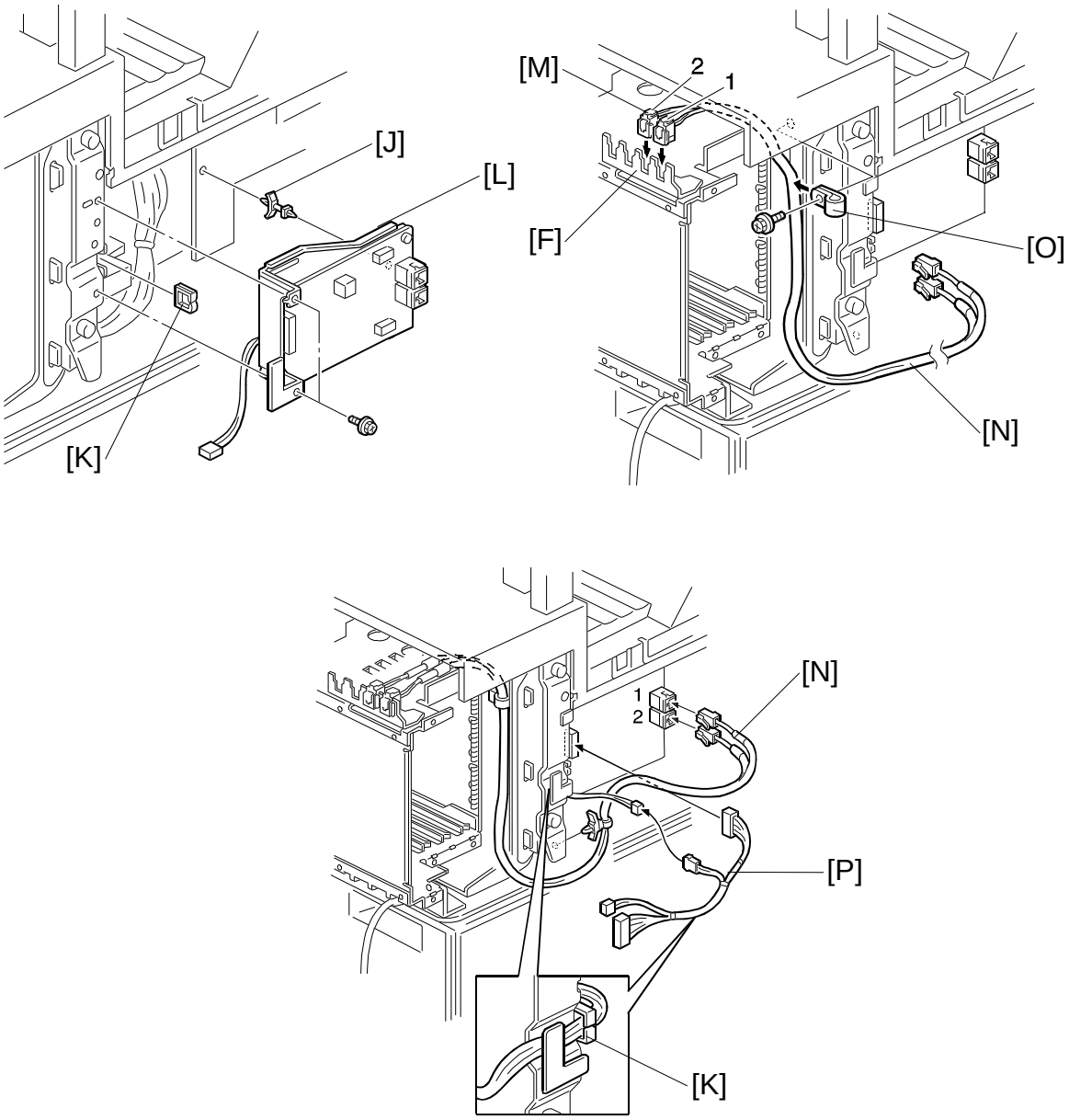
3.1 INSTALLATION PROCEDURE

3.1.1 FAX UNIT

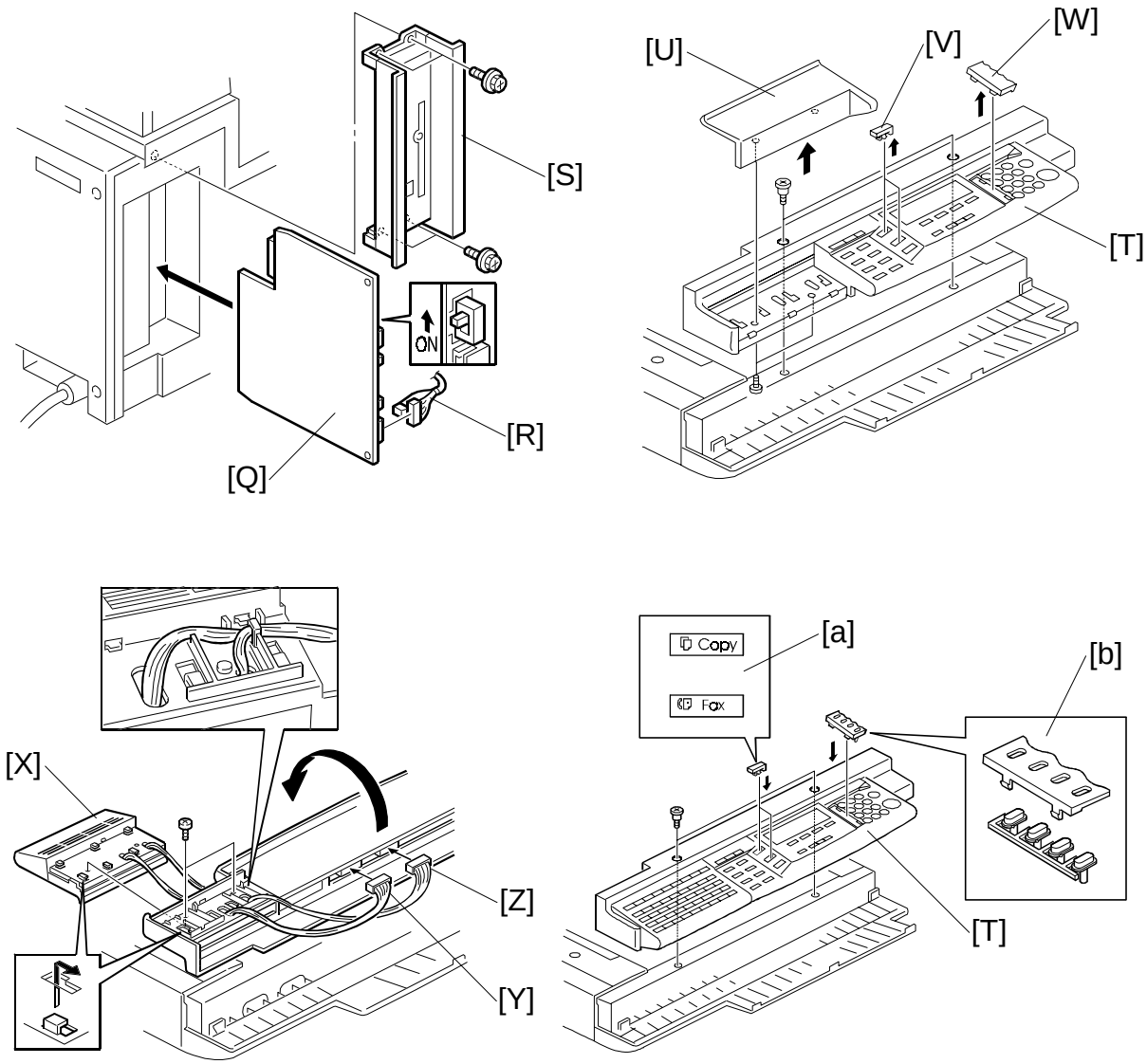
NOTE: To install the fax unit, the Expansion Box Type 450e is required. The following procedure is written on the premise that the Expansion Box has not been installed.



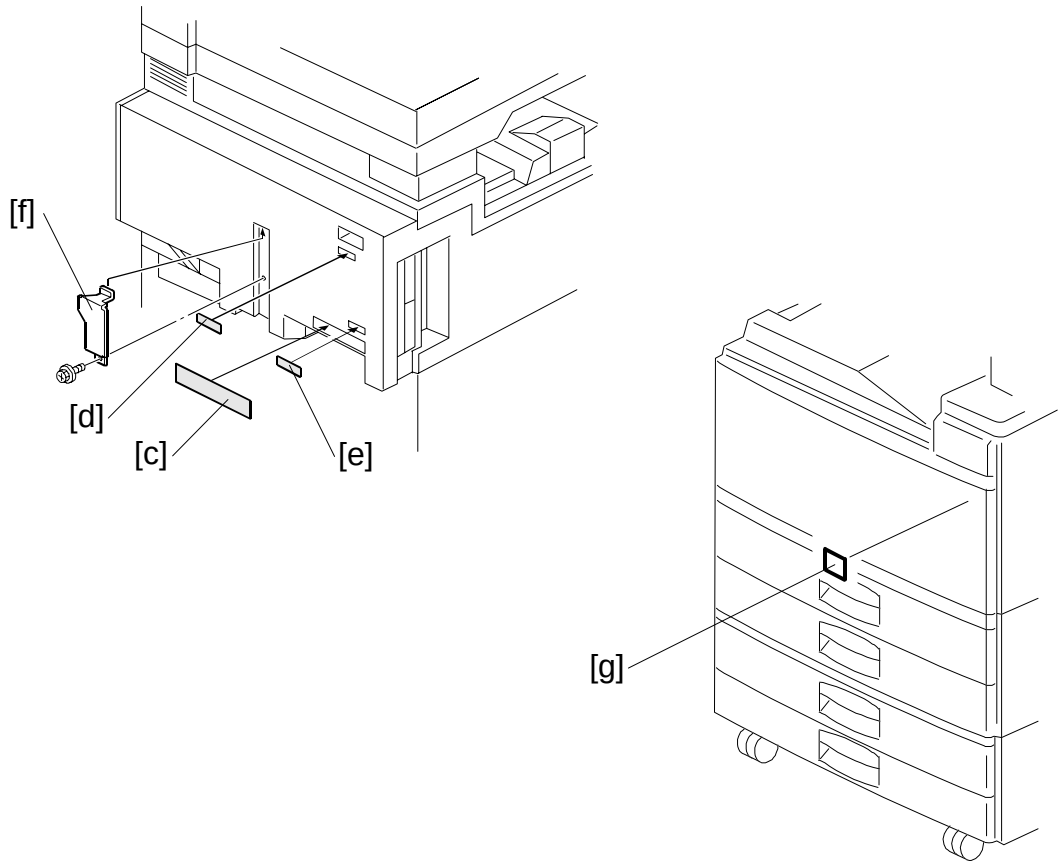
1. Remove the rear cover [A] (4 screws) and the left side cover [B] (4 screws).
2. Cut away the covers [C] and [D], as shown.
3. Remove the expansion box cover [E], then install the bracket [F] (1 screw) as shown.
   NOTE: The bracket [F] is contained in the fax unit.
4. Remove the bracket [G] as shown.
5. Connect the harness [H] to CN355 on the expansion box, then install the expansion box [I] (4 screws) so that the CN350 fits in CN304 [L] on the BiCU.
   NOTE: Use a magnetic screwdriver so as not to drop any screws inside the machine.



6. Set the locking support [J] and the edge saddle [K], then install the NCU/Speaker assembly [L] (2 screws).
7. Set the modular jacks [M] to the bracket [F] as indicated on the bracket. Then run the modular cable [N] through the clamp [O] and attach the clamp [O] onto the machine as shown.
8. Connect the modular cable [N] and the harness [P] to the NCU. Then the harness [P] must run through the edge saddle [K] as shown.



9. Replace the left side cover (4 screws) and the rear cover (4 screws). Then turn on the battery switch (SW1) on the FCU [Q] then insert it into the right-most slot of the expansion box. Connect the harnesses [R] to the FCU [Q] (CN328 and CN330). After that install the bracket [S] (4 screws) as shown.
10. Remove the operation panel [T], then remove parts [U], [V], and [W].
11. Install part [X], then connect the harnesses [Y] and [Z] to the operation panel as shown.
12. Replace the operation panel [T], then install the parts [a] and [b] as shown.



13. Affix the serial number label [c], the LINE/TEL label [d] and the appropriate approval label [e] on the rear cover. Then install the bracket [f].
14. Affix the Super G3 label [g] on the front cover.
15. Connect the telephone line to the “LINE” jack at the rear of the machine.
16. Plug in the machine and turn on the main switch.
17. Press the ‘Fax’ key and check the facsimile LED lights.
    At this time, the display reads: SC1201 - Functional problem with the fax. Data should be initialized.
    NOTE: This is not a functional problem. The machine shows this message only when the fax unit is first installed. If the same message appears at the next power-on, check whether the battery switch (SW1) on the FCU has been turned on.
18. Press “Yes” to initialize the fax unit.

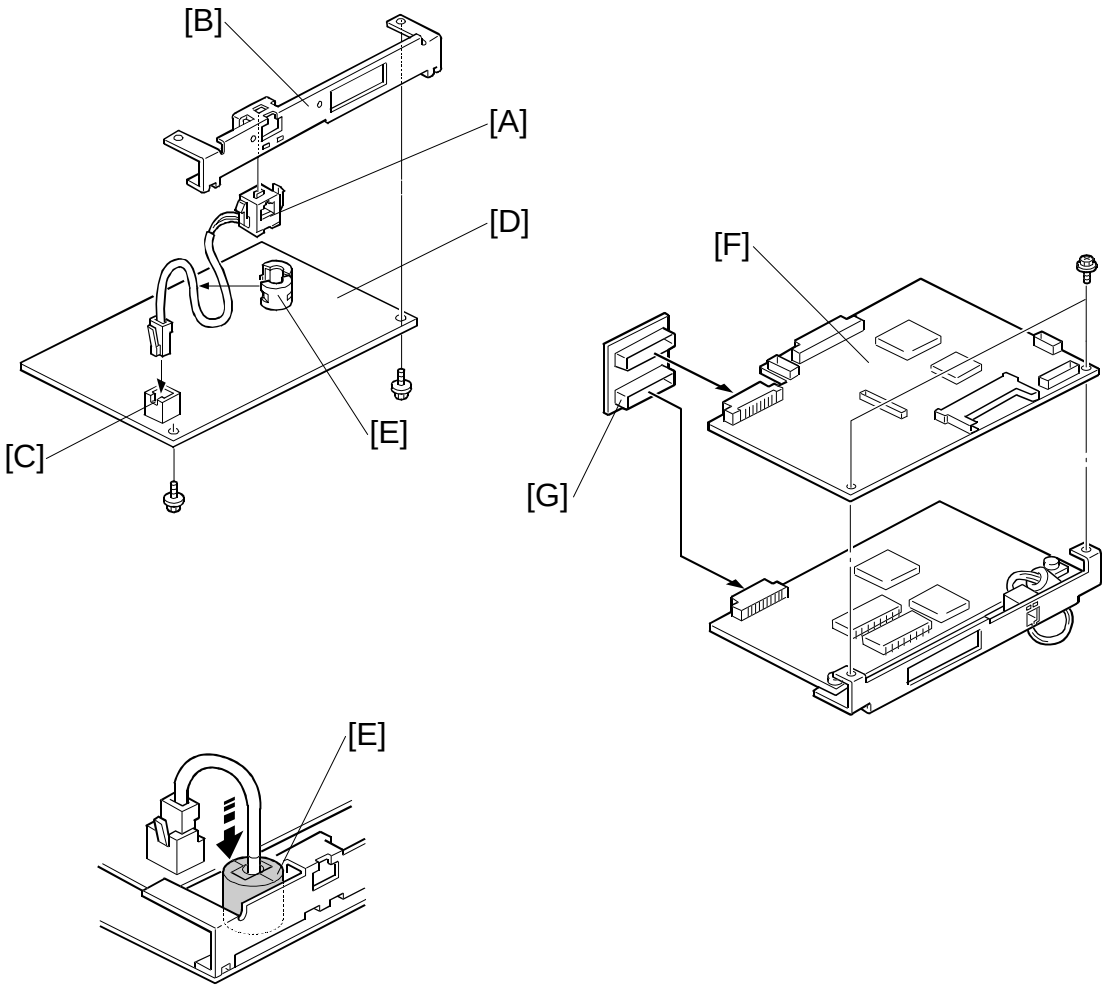
19. Set up and program the items required for fax communications as shown below. If the user function keys (F1, F2, F3, F4, and F5) need to be programmed, affix the blank labels above the proper keys.

    The default settings of the user function keys are as follows:
    - F1: Start Manual Rx
    - F2: TEL Mode
    - F3: Tx File Status
    - F4: Not programmed
    - F5: Not programmed

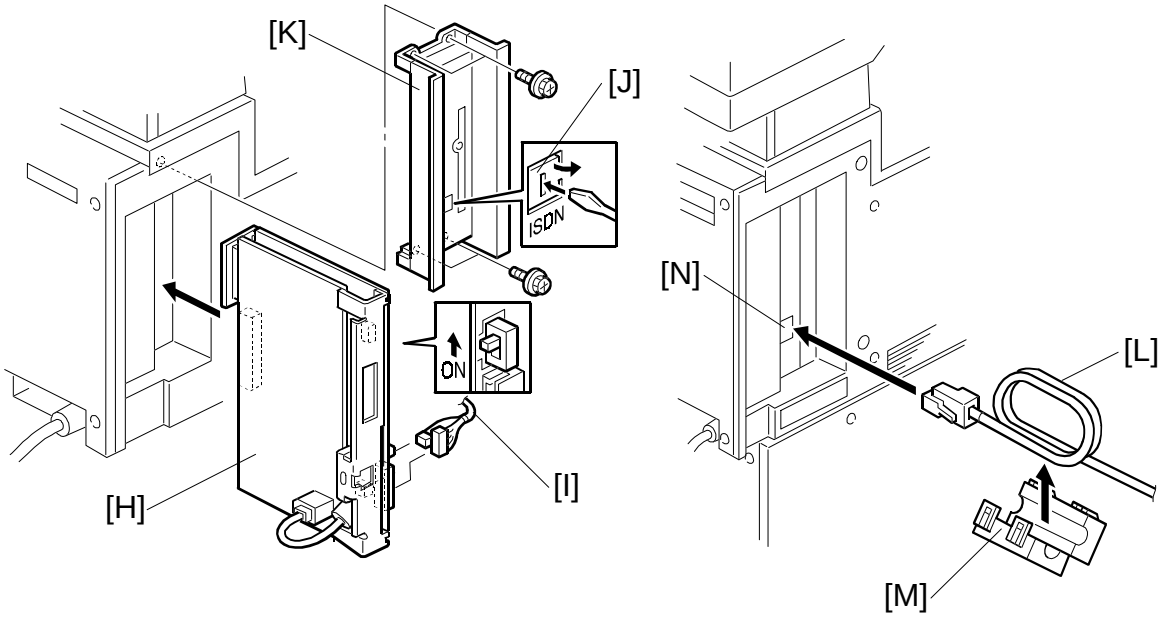
    NOTE: Be sure to set the clock (date and time).

20. Program the serial number into the fax unit (service function 10). The serial number can be found on the serial number label (attached to the machine in step 13).

3.1.2 ISDN UNIT

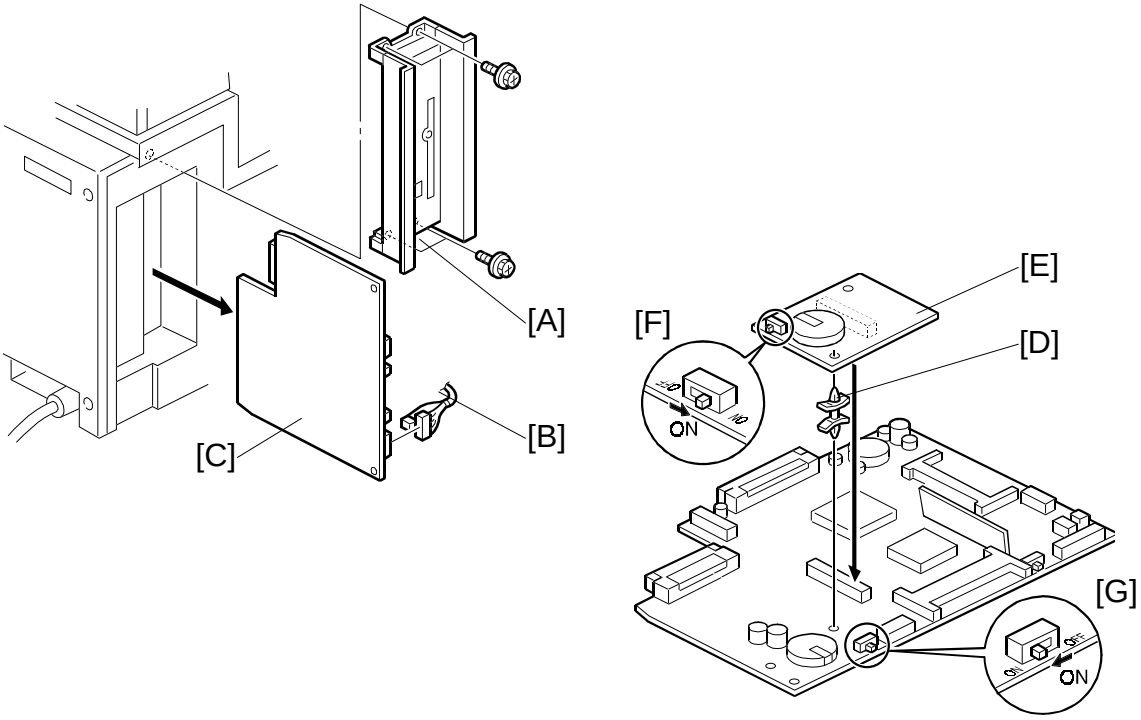


1. Remove the FCU from the expansion box.
2. Clip the ISDN modular jack [A] to the bracket [B], then connect the cable to the connector [C] on the CiG4 board [D].
3. Attach the bracket [B] to the CiG4 board [D] (2 screws), then set the metal core [E] on the cable as shown. Be sure to slide the metal core [E] in between the bracket and the CiG4 board as shown.
4. Attach the FCU [F] to the bracket (2 screws), then connect FCU and CiG4 using the relay board [G].



5. Insert the FCU/CiG4 assembly [H] into the expansion box, connect the harness [I], and then slide the assembly into the box to the bottom.
6. Open the ISDN modular jack window [J] on the bracket [K], then install the bracket [K] onto the application rack.
7. Affix the contained ‘G4’ label onto the function key (F4) space.
   After G4 unit installation, this key is dedicated to switching between G3 and G4 communication modes. (note the user function key assignment, below)
   Function keys with G4 unit
   - F1: Start Manual Rx
   - F2: Tx File Status
   - F3: TEL Mode
   - F4: G3/G4 Communication Mode Selection
   - F5: Not programmed
8. Make two turns on the ISDN cable [L] and attach the metal core [M] so that the cable goes into the core three times. Then, connect the cable to the ISDN jack [N]. If an analog telephone line has been removed before installation, re-connect it to the NCU.
9. Plug in the machine and turn on the main switch. Then enter the service mode.
10. Set bit 2 of communication switch 16 to “1.” Then turn the machine off and on. After that enter the service mode again.
    NOTE: This procedure is for A283/A284 models only.
11. Print the system parameter list and ensure that “G4” is listed as an option.

12. Set up and program the items required for ISDN communications.
    After setting up the ISDN parameters, be sure to turn the main switch off and on.



3.1.3 FAX FUNCTION

⚠CAUTION

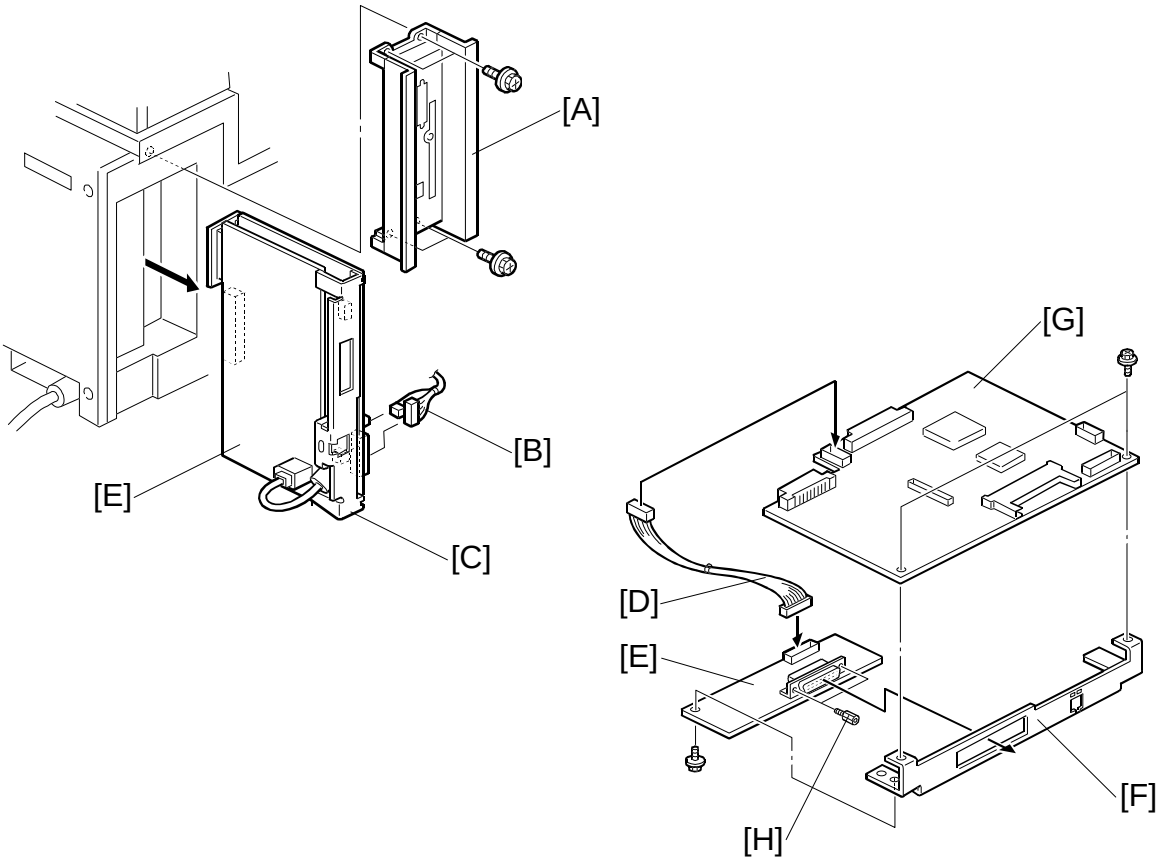
Before installing this option, do the following:

1. **Print out all messages stored in the memory, the lists of user-programmed items, and the system parameter list.**
2. **If there is a printer option in the machine, print out all data in the printer buffer.**
3. **Turn off the main switch and disconnect the power cord, the telephone line, and the STP cable.**

1. Remove the bracket [A] and disconnect the harness [B] as shown.
2. Remove the FCU assembly [C] as shown.
3. Install the locking support [D].
4. Install the FAX function upgrade board [E].
5. Turn on the battery switch [F].
   NOTE: If installing the FAX unit at the same time, be sure to turn on the FCU board battery switch [G].
6. Re-install the FCU assembly into the expansion box.

7. Plug in the machine and turn on the main switch.
8. Press the “Fax” key and ensure the Fax LED lights.
   At this time, the following message appears;
   “SC1207 - Adding FAX Feature Expander causes data loss. Turn main power switch off remove it to avoid loss. To continue press “Yes”.
9. Press “Yes” to initialize the SRAM.
   NOTE: Whenever installing the FAX FUNCTION UPGRADE board at the first time, the machine displays SC1207, but this is not a problem.
10. Enter the service mode, and set bit 7 of system switch 1E to “1”.
11. Print the system parameter list and make sure that “EXFUNC” is listed as an option. Also check that the memory indicator shows “100%” in standby mode.
12. Connect the telephone cable to the NCU.

3.1.4 PC-FAX EXPANDER TYPE 450E

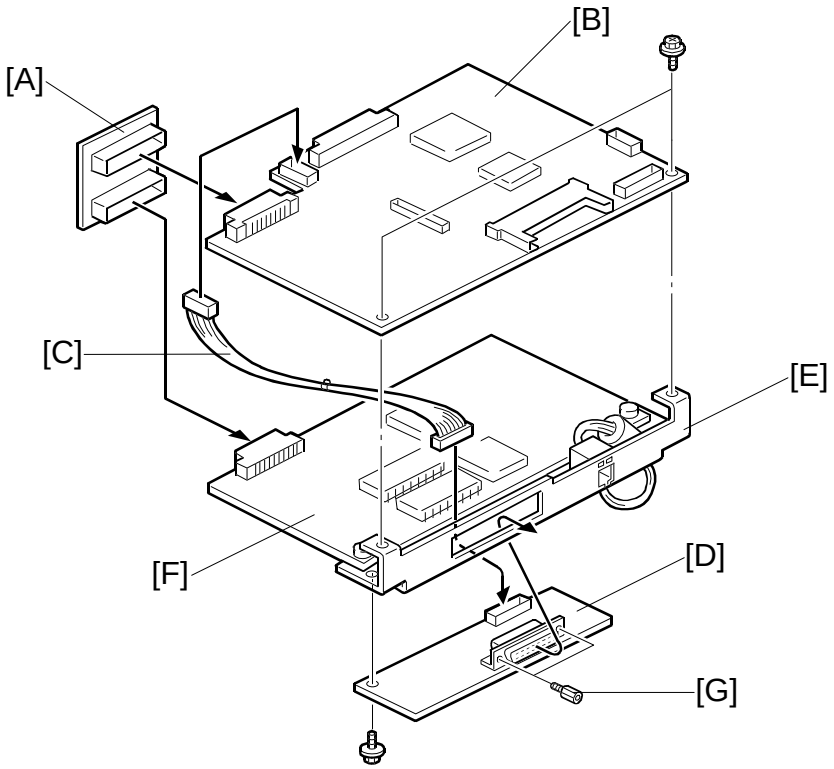


1. Remove the bracket [A] (4 screws) and disconnect the harness [B], then remove the FCU assembly [C] from the expansion box.
   NOTE: If the ISDN unit was already installed, go to “with the ISDN unit” section on the next page.

- **Without the ISDN unit**

2. Connect the harness [D] to the DIU [E] (RS232C interface).
   NOTE: The **white connector** must be connected to the DIU board.
3. Attach the bracket [F] enclosed in the PC-Fax Expander to the DIU [E] (2 screws).
4. Attach the FCU [G] to the bracket [F] (2 screws).
5. Connect the harness [D] to the CN326 on the FCU [G] as shown.
   NOTE: The **blue connector** must be connected to the FCU board.
6. Remove 2 hexagonal screws [H] from the DIU [G].

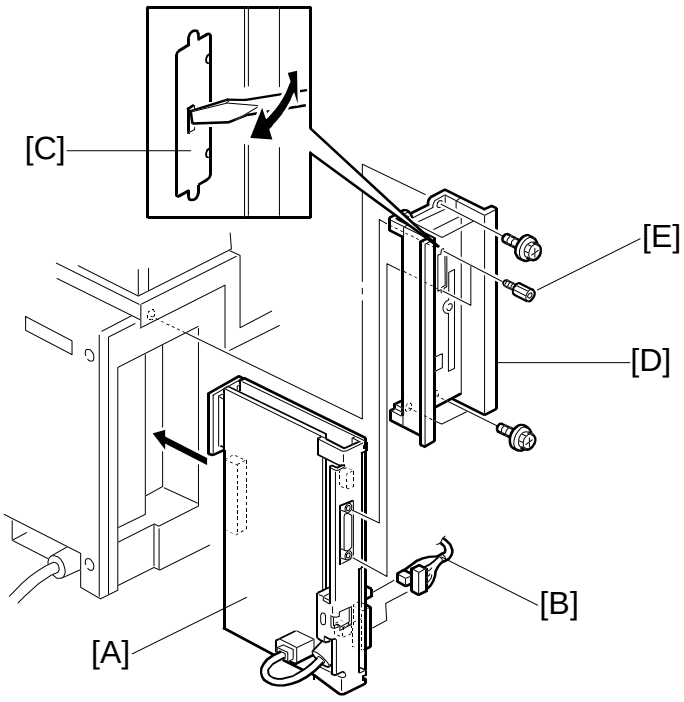
Go to step 7 on page 3-12.



- **With the ISDN unit**

NOTE: The bracket which is contained in the PC-Fax Expander is not used.

2. Disconnect the interface board [A], then remove the FCU [B] from the assembly as shown.
3. Connect the harness [C] to the DIU [D], then attach the DIU [D] to the bracket [E] as shown.
   NOTE: The **white connector** must be connected to the DIU board.
4. Make sure that the harness [C] is between the ISDN board [F] and the FCU [B], then replace the FCU [B] as shown.
5. Connect the harness [C] to the CN326 on the FCU [B], then replace the interface board [A] as shown.
   NOTE: Make sure not to pinch the harness [C] between the FCU [B] and the interface board [A] when connecting it.
   The **blue connector** must be connected to the FCU board.
6. Remove the 2 hexagonal screws [G] from the DIU [D].



7. Insert the FCU and DIU assembly [A] into the expansion box; connect the harness [B] and slide the assembly into bottom of the box.
8. Open the RS232C connector window [C] on the bracket [D], then replace the bracket [D] onto the expansion box.
9. Tighten the 2 hexagonal screws [E] as shown.
10. Plug in the machine and turn on the main switch.
11. Enter the service mode, and set bit 0 of system switch 1C to “1”, then turn off and on the main switch.
12. Print the system parameter list. If “TR29” appears in the “option” section of the system parameter list, go head. Otherwise, check the cable connection.
13. Follow the instructions in the Operator’s manual to connect the machine to a host computer and how to set up the machine and the computer, if required.
    NOTE: 1) A “Straight – through” shielded serial cable is required, but it is not enclosed.
    2) One end of the serial cable must have DB25 male connection to connect to the DIU.

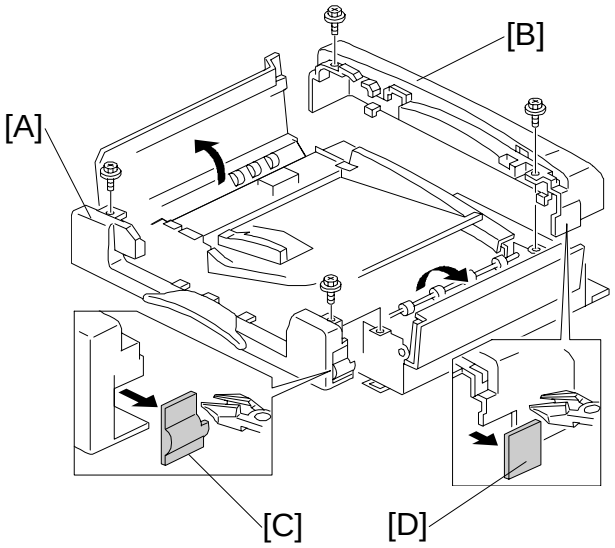
3.1.5 STAMP UNIT

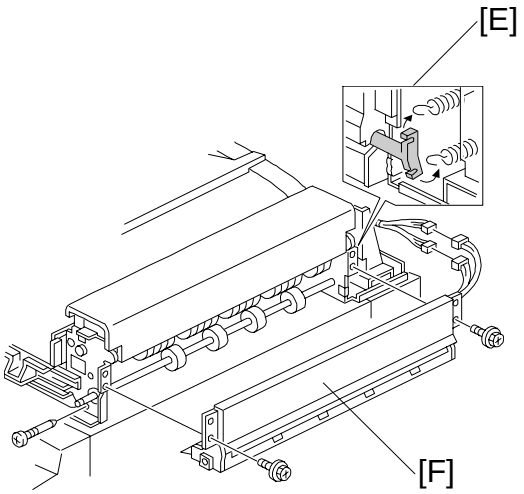
⚠CAUTION

Before installing an optional unit, do the following:

1. **Print out all messages stored in the memory.**
2. **Be sure to check the memory indicator shows "100%" in standby mode.**
3. **Print out the lists of user-programmed items and the system parameter list.**
4. **Switch off the main switch, and disconnect the power cord and the telephone line.**

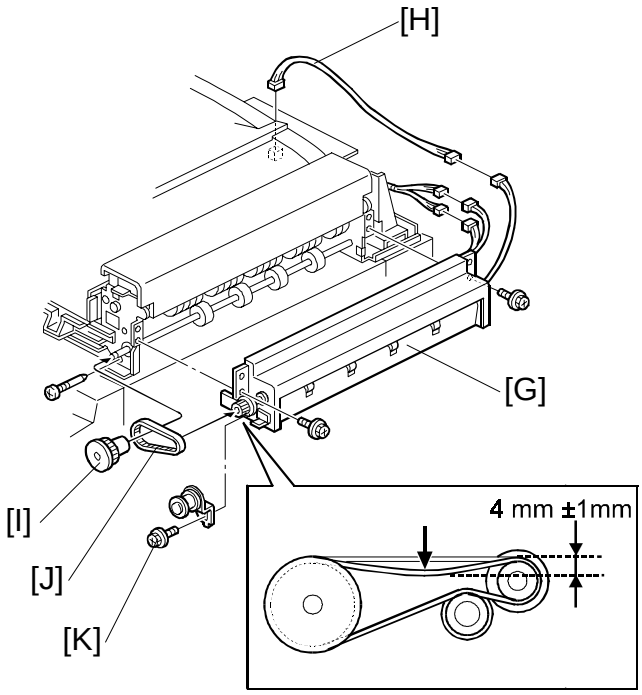
NOTE: A document feeder and a fax unit are required to use this option.



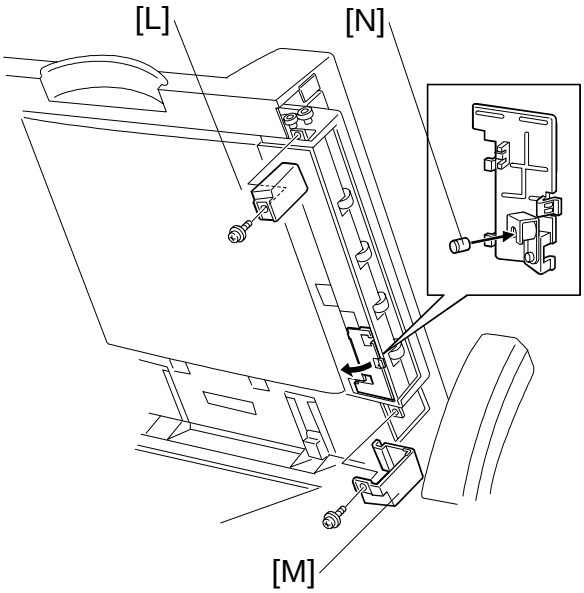


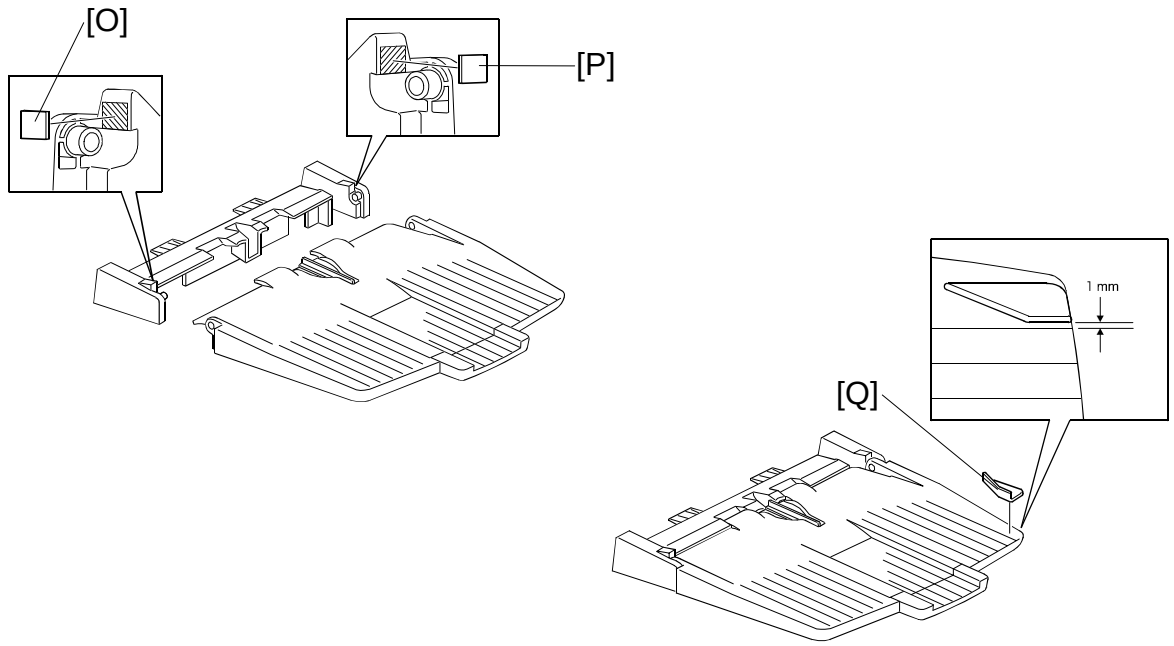
1. Remove the ADF front [A] (2 screws) and rear [B] (2 screws) covers.
2. Cut away the covers [C] and [D], as shown.
3. Remove two springs [E] and the cover [F] (3 screws, 2 harnesses).

4. Install the stamp unit [G] (3 screws, 3 harnesses) as shown. Then connect the harness [H] to CN270 on the DF control board.
5. Install the pulley [I], then loop the timing belt [J] as shown.
   NOTE: Before installing the pulley, first loosen the idler gear screw [K]
6. Adjust the tension of the timing belt, as shown in the callout. Then tighten the idler gear screw [K].
7. Turn on the DIP switch 4 on the DF control board.
8. Replace the ADF front (2 screws) and rear (2 screws) covers.



9. Lift up the document feeder and install the covers [L] (1 screw) and [M] (1 screw).
10. Install the stamper [N] into the stamp unit.

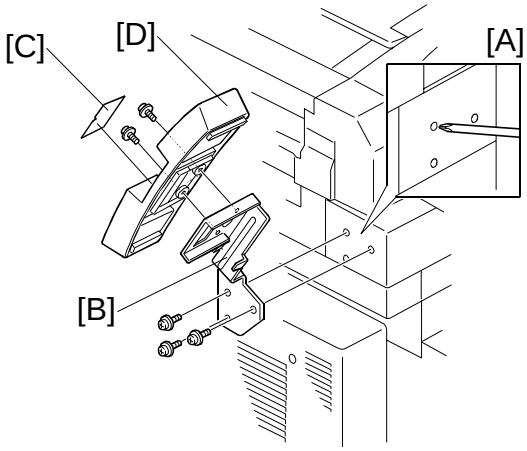


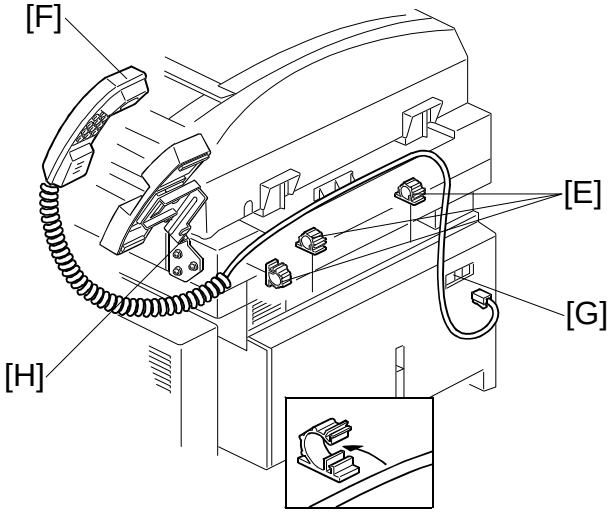


11. Affix the spacers [O] and [P] to the ADF external tray holder, as shown.
12. Affix the guide [Q] to the tray, as shown.
    NOTE: ADF external tray is included in the ADF, not in this option.
13. Change the “ADF original ejection” setting to the “ADF External Tray” using system setting in the “User Tools” menu.
    After the stamp unit has been installed, the F5 key is dedicated to switching the stamper on and off. (note the user function key assignment, below)
    Function keys with Stamp unit
    - F1 Start Manual Rx
    - F2 Tx File Status
    - F3 TEL Mode
    - F4 Not programmed
    - F5 Stamper on/off

    NOTE: Stamp is not possible if “ADF Tray” is selected.

3.1.6 HANDSET





1. Prick the screw holes on the right side of scanner rear cover as shown in [A].
2. Install the bracket [B] (3 screws).
   NOTE: The screws are self-threading.
3. Remove the label [C] from the handset cradle [D]. Install the cradle on the bracket [B] (2 screws), then replace the label [C].
4. Affix the wire clamps [E], as shown.
5. Install the handset [F] as shown. Run the handset cable through the clamps [E], then connect it to the “TEL” jack [G] at the rear of the machine.
6. Hook the curled cord onto the hook [H] of the bracket.

SERVICE TABLES

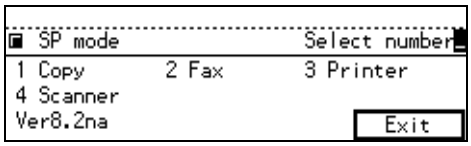
4. SERVICE TABLES

4.1 SERVICE LEVEL FUNCTIONS

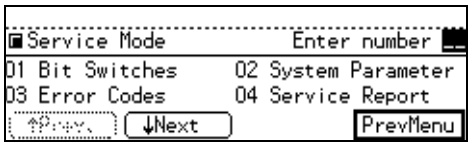
4.1.1 HOW TO ENTER AND EXIT THE FAX SERVICE MODE

To Enter Fax Service Mode:

1. Ensure that the machine is in standby mode.
2. Press ⊡ ① ⓪ ⑦, then hold down C/⊘ for more than 3 seconds.
   The SP mode main menu appears.



3. Press 2 to enter the fax service mode.

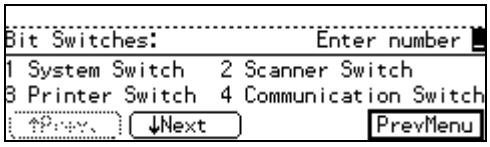


To Exit Fax Service Mode:

1. Press ⊡ or "PrevMenu" until the SP mode main menu appears.
2. Press the ⊡ key.

4.1.2 BIT SWITCH PROGRAMMING (FUNCTION 01)

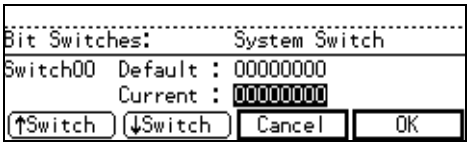
1. Enter the fax service mode.
2. Press 0 1.
3. Press one of the following numbers, as required:
   - 1 – System bit switches
   - 2 – Scanner bit switches
   - 3 – Printer bit switches
   - 4 – Communication bit switches
   - 5 – G3 bit switches
   - 6 – G4 internal switches
   - 7 – G4 parameter switches



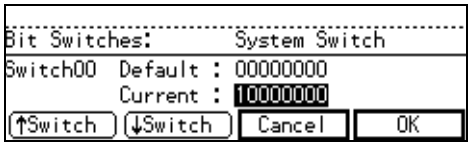
NOTE: An optional G4 interface is required to access the G4 internal and G4 parameter bit switches.

Example:

1. Press [1].
2. Scroll through the bit switches.
   To increment the bit switch number:
   press "↓ Switch".
   To decrement the bit switch number:
   press "↑ Switch".
   Example:
   To display bit switch 03:
   Press "↓ Switch" 3 times.



3. Adjust the bit switch.
   Example:
   To change the value of bit 7, press 7.
4. To adjust more bit switches, go to step 2.
   To finish, press "OK" then "PrevMenu".

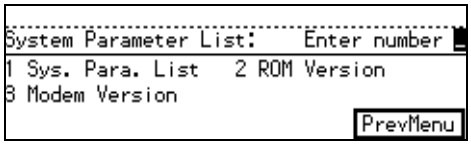


5. Exit the service mode.

NOTE: After changing any of the G4 bit switches, be sure to turn the main power switch off and back on to activate the new settings.

4.1.3 SYSTEM PARAMETER LISTS (FUNCTION 02)

1. Enter the fax service mode.
2. Press [0] [2].
3. Press [1].
4. Press ⓐ.
5. Exit the service mode.



NOTE: Pages 5 and 6 of the system parameter list are for designer use only. However some information may be useful for service technicians. See the next page.

- An example of the system parameter list (pages 5 and 6) -

```
       *  *  *  SYSTEM PARAMETER LIST (Date and Time) *  *  *
                                                              1)TTI 1
                                                              2)TTI 2

                  And later is information for a design.

REST ENTRY DATA
    TMP DIAL:1005  One key:30  Speed key:1000  PRG JOB:32  PRG DIAL:2000
    Rest Job file:1003(max:1004)  Rest Dial file:2002(max:2002)
Resouece
    Free:0x0FFEFDFF  Bad:0x0000001D  CCU:0x00   [P1|XX|XX|XX|S|p|H]
SAF CAPACITY
    100%(Rest block:0x1E00)
Receive
    Now status          0x00 OK




CCU TX ERROR
```

```
       *  *  *  SYSTEM PARAMETER LIST (Date and Time) *  *  *
                                                            1)TTI 1
                                                            2)TTI 2

Task Status
    ID  TASK   PRI STS       ISP         START       SP          PC
    00  idle   20  RDY       0x00800A5E  0x00004530  0x00800A5E  0x00004530
    01   :      :   :             :           :           :           :
```

REST ENTRY DATA

TEMP DIAL: Remaining number of destinations that can be programmed at the ten-key pad.

One key: Remaining number of destinations that can be programmed as Quick Dials

Speed key: Remaining number of destinations that can be programmed as Speed Dials

PRG JOB: Remaining number of keystroke programs that can be programmed

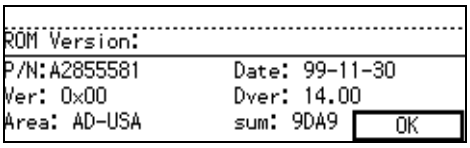
PRG DIAL: Remaining number of destinations that can be used in keystroke programs.

Rest Job file: Number of remaining job files that can be used.

Rest Dial file: Number of remaining destinations that can be used.

4.1.4 FCU ROM VERSION DISPLAY (FUNCTION 02)

1. Enter the fax service mode.
2. Press 0 2 then 2.

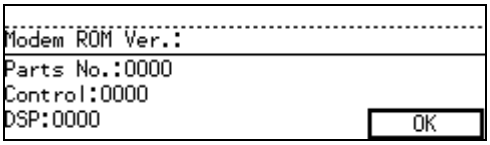


3. Exit the service mode.

NOTE: The check-sum value displayed is calculated in 16-bit little endian format.

4.1.5 MODEM PROGRAM VERSION DISPLAY (FUNCTION 02)

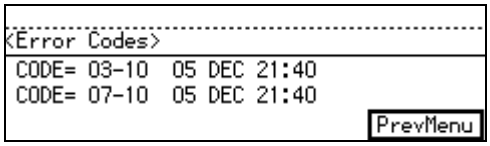
1. Enter the fax service mode.
2. Press 0 2 then 3.



3. Exit the service mode.

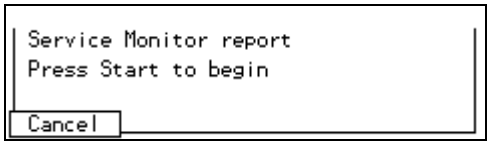
4.1.6 ERROR CODE DISPLAY (FUNCTION 03)

1. Enter the fax service mode.
2. Press 0 3.
3. Press either Prev. or Next to scroll through the error codes.
4. Exit the service mode.



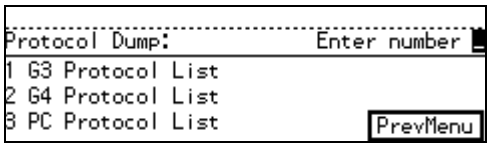
4.1.7 SERVICE MONITOR REPORT (FUNCTION 04)

1. Enter the fax service mode.
2. Press 0 4 then ⓐ.
3. Exit the service mode.



4.1.8 G3 PROTOCOL DUMP LIST (FUNCTION 05)

1. Enter the fax service mode.
2. Press [0] [5].

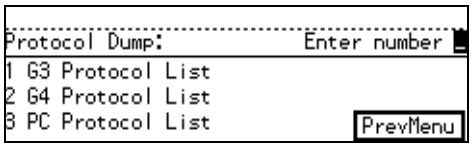


3. Press [1] then (Start).
4. Exit the service mode.

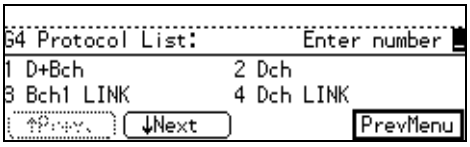
4.1.9 G4 PROTOCOL DUMP LIST (FUNCTION 05)

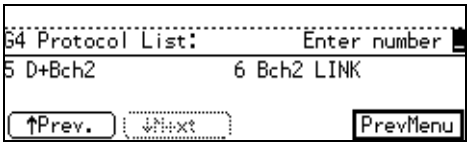
NOTE: An optional G4 interface is required to print the G4 protocol dump list.

1. Enter the fax service mode.
2. Press [0] [5].



3. Press [2].
4. Press one of the following numbers as required:
   - [1] – D + Bch
   - [2] – Dch
   - [3] – Bch1 Link
   - [4] – Dch Link
   - [5] – D + Bch2
   - [6] – Bch1 Link





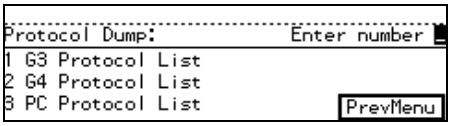
5. Exit the service mode.

Service Tables

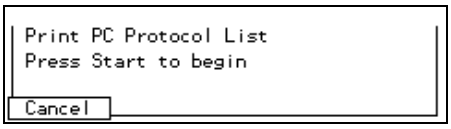
4.1.10 PC PROTOCOL DUMPLIST (FUNCTION 05)

NOTE: An optional PC fax expander board (PCFE) is required to print the PC protocol dump list.

1. Enter the fax service mode.
2. Press [0] [5].



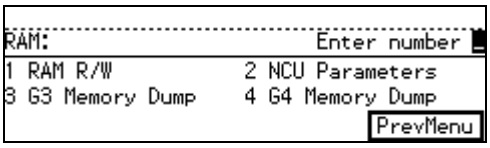
3. Press [3] then ⓐ.



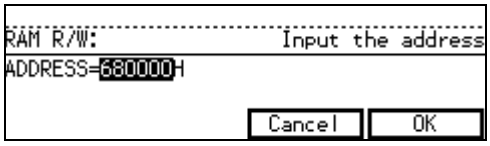
4. Exit the service mode.

4.1.11 RAM DISPLAY AND REWRITE (FUNCTION 06)

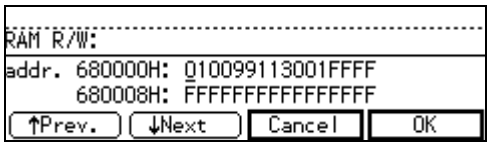
1. Enter the fax service mode.
2. Press [0] [6].
3. Press [1].



4. Enter the start address of the RAM area to be displayed, then press “OK”.



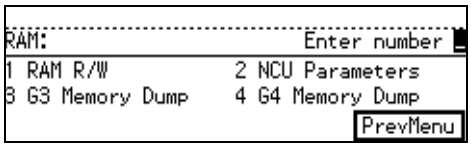
5. Move the cursor to the target address using the arrow keys, then enter a new value (0-9: Ten-key pad, A-F: Quick Dial keys).
6. To scroll through the RAM addresses: Press “Prev”. or “Next”.
   To jump to an another address: Press “OK”, and go back to step 3.



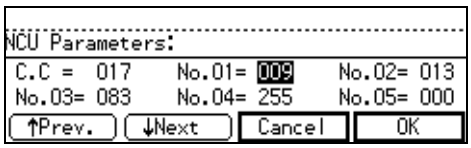
7. Exit the service mode.

4.1.12 NCU PARAMETERS (FUNCTION 06)

1. Enter the fax service mode.
2. Press [0] [6].
3. Press [2].

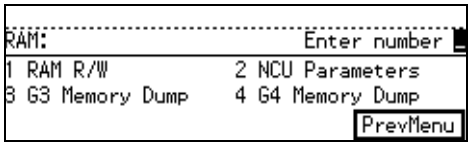


4. Move the cursor to the target parameter using the arrow keys, then enter a new value at the ten-key pad.
5. Exit the service mode.

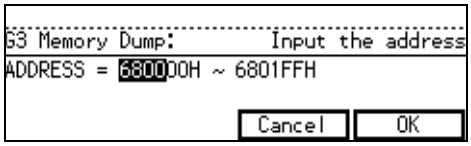


4.1.13 RAM DUMP (FUNCTION 06)

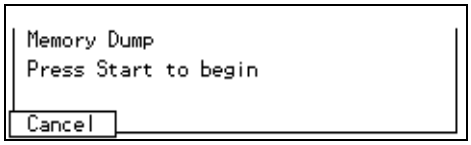
1. Enter the fax service mode.
2. Press [0] [6].
3. Press one of the following numbers as required:
   [3] – G3 memory dump list
   [4] – G4 memory dump list
   NOTE: An optional G4 interface is required to print the G4 memory dump list.



4. Enter the first four digits of the start and end addresses, then press “OK”
   Example: Start at 680000, end at 6801FF
   [6] [8] [0] [0] [6] [8] [0] [1] “OK”



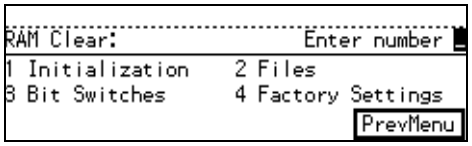
5. Press ◇.
6. Exit the service mode.



Service Tables

4.1.14 RAM CLEAR (FUNCTION 07)

1. Enter the fax service mode.
2. Press [0] [7].



3. Press one of the following numbers, as required:
   [1] Initializes the bit switches and user parameters, user data in the SRAM, files in the SAF memory, and the clock.
   [2] Erases all the files stored in the SAF memory.
   [3] Resets the bit switches and user parameters.
   [4] Initializes the bit switches and user parameters, user data in the SRAM, and files in the SAF memory.
4. The machine automatically returns to standby mode after self-initialization.

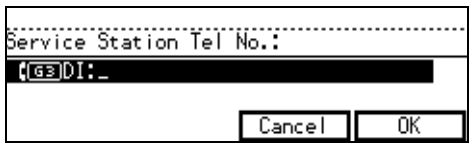
4.1.15 FCU REBOOT

To initialize the fax unit without erasing files or resetting the bit switches, do one of the following:

- Hold down the “Speed Dial” key for more than 10 s, while the machine is in facsimile mode. This initializes the fax unit only.
- Remove the rear cover and press SW2 on the FCU. This initializes the fax unit only.
- Turn off the main power and operation switches and turn them back on. This initializes the whole machine.
- Hold down the # and ☒ keys for more than 10 s. This initializes the whole machine.

4.1.16 SERVICE STATION FAX NUMBER (FUNCTION 09)

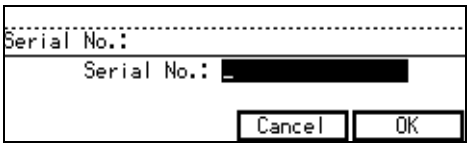
1. Enter the fax service mode.
2. Press [0] [9].
3. Enter the fax number of the service station that will receive Automatic Service Calls from this machine. To use a G4 number, press the “F4” key.



4. Press “OK”.
5. Exit the service mode.

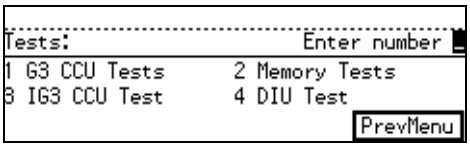
4.1.17 SERIAL NUMBER (FUNCTION 10)

1. Enter the fax service mode.
2. Press [1] [0].
3. Enter the fax unit's serial number at the keypad, then press "OK".
4. Exit the service mode.

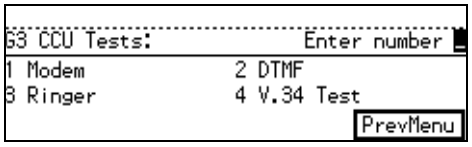


4.1.18 MODEM TEST (FUNCTION 11)

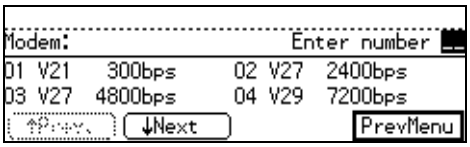
1. Enter the fax service mode.
2. Press [1] [1].



3. Press one of the following numbers:
   [1] – Modem test (analog line)
   [3] – Modem test (ISDN line [IG3 CCU])
   NOTE: An optional ISDN interface is required to test a modem on an ISDN line.



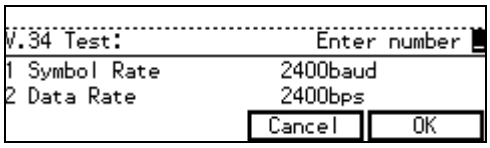
4. Press [1] (Modem).
5. Choose a modem signal type at the keypad, then press ◇.
   To stop, press C/⊘.
6. Exit the service mode.



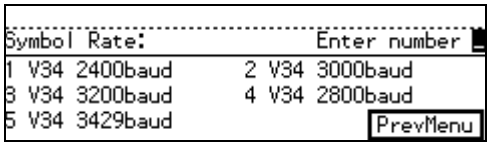
Service Tables

4.1.19 V.34 MODEM TEST (FUNCTION 11)

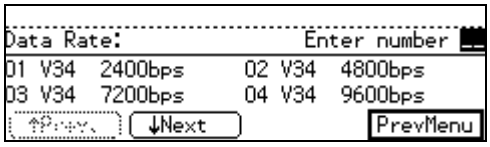
1. Enter the service mode.
2. Press 1 1 then press one of the following numbers:
   1 – Modem test (analog line)
   3 – Modem test (ISDN line [IG3 CCU])
   NOTE: An optional ISDN interface is required to test a modem on an ISDN line.
3. Press one of the following numbers:
   4 – Modem test (analog line) is selected
   3 – Modem test (ISDN line [IG3 CCU]) is selected
   NOTE: An optional ISDN interface is required to test a modem on an ISDN line.



4. Select a symbol rate and a data rate, then press OK.
   1 – Select a symbol rate



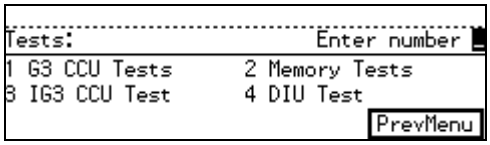
   2 – Select a data rate

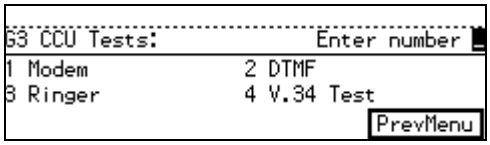


5. Press ⓕ to start the test.
   To stop the test, press ⓒ.
6. Exit the service mode.

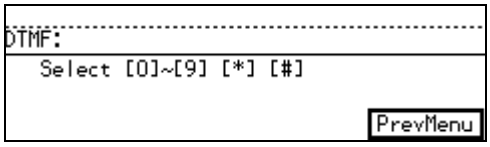
4.1.20 DTMF TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press 1 1.
3. Press one of the following numbers:
   1 – DTMF test (analog line)
   3 – DTMF test (ISDN line)
   NOTE: A G4 interface is required to test DTMF tones on an ISDN line.
4. Press 2.



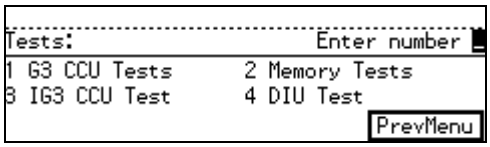


5. Choose a DTMF signal type at the keypad, then press ⓕ.
   To stop the test, press ⓒ.

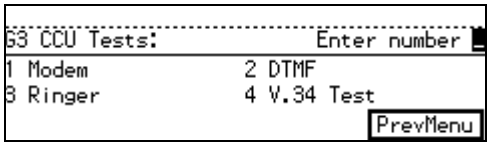


4.1.21 RINGER TEST (FUNCTION 11)

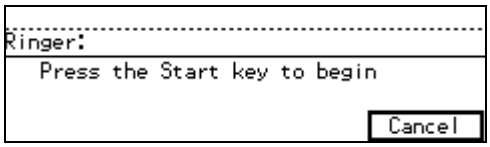
1. Enter the fax service mode.
2. Press [1] [1].



3. Press [1].

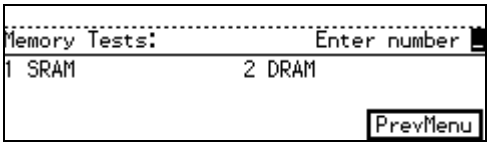


4. Press [3] then (Start). To stop the test, press (C).
5. Exit the service mode.

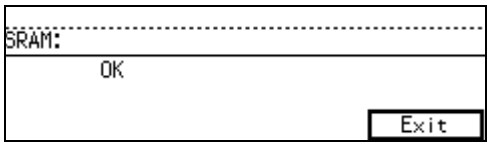


4.1.22 MEMORY TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press [1] [1].
3. Press [2].
4. Press one of the following numbers:
   [1] – SRAM test
   [2] – DRAM test



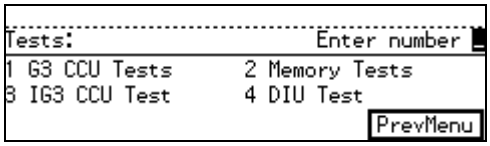
5. Press (Start) to start the test.
   To stop the test, press (C).
   If the test is successful, the display shows "OK".
   If the test is unsuccessful, the display shows "NG".



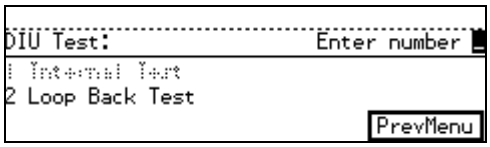
6. Exit the service mode.

4.1.23 DIU TEST (FUNCTION 11)

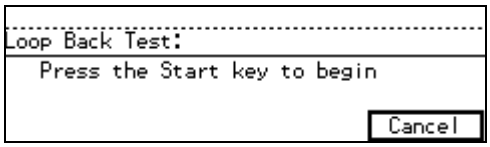
1. Enter the fax service mode.
2. Press [1] [1].



3. Press [4].

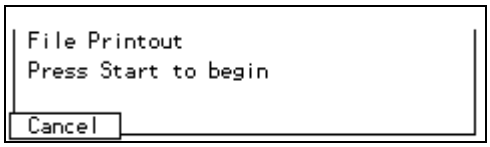


4. Press [2] then ⓐ.
   To stop the test, press ⓒ.
5. Exit the service mode.



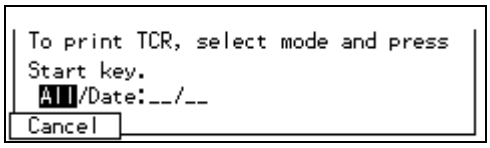
4.1.24 FILE PRINTOUT (FUNCTION 13)

1. Enter the fax service mode.
2. Press [1] [3] then ⓐ.
   The machine prints all the files stored in the SAF memory, including confidential messages.
   NOTE: Do not use this function, unless the customer is having trouble printing confidential messages or recovering files stored using the memory lock feature.



4.1.25 JOURNAL PRINTOUT (FUNCTION 14)

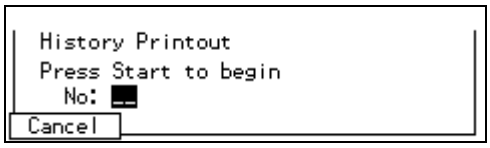
1. Enter the fax service mode.
2. Press [1] [4].
3. Either:
   Choose All - The machine prints all the communication records on the report. The maximum is 100 records, or 900 records if the optional EXFUNC board is installed.
   Specify a date - The machine prints all communication records after the specified date.
4. Press ⓚ.
5. Exit the service mode.



4.1.26 USAGE LOG PRINTOUT (FUNCTION 15)

The following functions are for designer use only. However, list 5 (SC history) may be useful.

1. Enter the fax service mode.
2. Press [1] [5].
3. Press the number, then press ⓚ.
   [5] – SC history
4. Exit the service mode.



4.1.27 DATA TRANSFER (FUNCTION 16)

This function allows ROM and SRAM data transfer between the FCU inside the machine and an external flash memory card or FCU. Refer to the following sections for details.

- Section 6.4.1 - FCU ROM download from a flash memory card
- Section 6.4.2 - FCU ROM upload to a flash memory card
- Section 6.4.3 - SRAM backup to a flash memory card
- Section 6.3.3 - SRAM restore from a flash memory card backup
- Section 6.3.2 – SRAM restore from FCU

4.2 BIT SWITCHES

⚠WARNING

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

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.
The switches that have been changed from A230/A231/A232 are marked "*****".

4.2.1 SYSTEM SWITCHES

<table>
<tr><th colspan="3">System Switch 00</th></tr>
<tr><th>No</th><th>FUNCTION</th><th>COMMENTS</th></tr>
<tr><td>0-1</td><td>Not used</td><td>Do not change the settings.</td></tr>
<tr><td rowspan="4">2</td><td>Technical data printout on the Journal
0: Disabled
1: Enabled</td><td>1: Instead of the personal name, the following data are listed on the Journal for each G3 communication.</td></tr>
<tr><td colspan="2">e.g. 0000 32V34 288/264 L0100 03 04
(1) (2)(3) (4) (5) (6) (7) (8)
(1): EQM value (Line quality data). A larger number means more errors.
(2): Symbol rate (V.34 only)
(3): Final modem type used
(4): Starting data rate (for example, 288 means 28.8 kbps)
(5): Final data rate
(6): Rx revel (refer to the note after this table for how to read the rx level)
(7): Total number of error lines that occurred during non-ECM reception.
(8): Total number of burst error lines that occurred during non-ECM reception.
Note:
EQM and rx level are fixed at "FFFF" in tx mode.
The seventh and eighth numbers are fixed at "00" for transmission records and ECM reception records.</td></tr>
<tr><td colspan="2">Rx level calculation

Example: 0000 32 V34 288/264 L <u>01</u> <u>00</u> 03 04

The four-digit hexadecimal value (N) after "L" indicates the rx level.
The <u>high</u> byte is given first, followed by the <u>low</u> byte. Divide the decimal value of N by -16 to get the rx level.

In the above example, the decimal value of N (= 0100 [H]) is 256.
So, the actual rx level is 256/-16 = -16 dB</td></tr>
<tr><td>3</td><td>Not used</td><td>Do not change the setting.</td></tr>
</table>

System Switch 00		
No	**FUNCTION**	**COMMENTS**
4 *	Line error marks on received pages **0:** Disabled **1:** Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occurred in the data. Such errors are caused by a noisy line, for example.
5	G3/G4 communication parameter display **0:** Disabled **1:** Enabled	This is a fault-finding aid. The LCD shows the key parameters (see below). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output after each communication **0:** Off **1:** On	This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing. If system switch 09 bit 6 is at "1", the list is only printed if there was an error during the communication.
7	Amount of protocol dump data in one protocol dump list printout operation **0:** Up to the limit of the memory area for protocol dumping **1:** Last communication only	Change this bit to 1 if you want to have a protocol dump list of the last communication only. If bit 6 is turned on, the machine prints a protocol dump list for the last communication only, regardless of this bit setting. If system switch 09 bit 6 is at "1", the list is only printed if there was an error during the communication.

G3 Communication Parameters

Modem rate	336: 33600 bps 168: 16800 bps 312: 31200 bps 144: 14400 bps 288: 28800 bps 120: 12000 bps 264: 26400 bps 96: 9600 bps 240: 24000 bps 72: 7200 bps 216: 21600 bps 48: 4800 bps 192: 19200 bps 24: 2400 bps
Resolution	S: Standard (8 x 3.85 dots/mm) D: Detail (8 x 7.7 dots/mm) F: Fine (8 x 15.4 dots/mm) SF: Superfine (16 x 15.4 dots/mm) 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi)
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression JBO: JBIG compression (Optional mode) JBB: JBIG compression (Basic mode)
Communication mode	ECM: With ECM NML: With no ECM

Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction
I/O rate	0: 0 ms/line 10: 10 ms/line 25: 2.5 ms/line 20: 20 ms/line 5: 5 ms/line 40: 40 ms/line **Note:** "40" is displayed while receiving a fax message using AI short protocol.

G4 Communication Parameters

Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Resolution	21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi)
Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction
Transfer	T: Transfer - : Other
Confidential	C: Confidential - : Other
Other parameters	The following information is shown in 6-bit format. Bit 1 is the first bit from the left, and bit 6 is at the right end. Bit 1 - Smoothing 0: Off, 1: On (Smoothing is disabled in halftone mode.) Bit 2 - CIL printing 0: On, 1: Off Bit 3 - Not used Bit 4 - mm/inch conversion 0: Off, 1: On Bit 5 - Engine type 0: mm, 1: inches Bit 6 - Document resolution unit 0: mm, 1: inches

System Switch 01		
No	**FUNCTION**	**COMMENTS**
0	Automatic Service Call at PM **0:** Disabled **1:** Enabled	This bit switch determines whether the machine will send an Auto Service Call to the service station when it is time for PM. **Cross reference** Auto service calls: Section 2.1
1-7	Not used	Do not change the settings.

System Switch 02		
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	File retention time **0:** Depends on User Parameter 24 [18(H)] **1:** No limit	**1:** A file that had a communication error will not be erased unless the communication is successful.
5	Not used	Do not change the setting.
6 **7**	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03. Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

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

System Switch 04		
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Printing dedicated tx parameters on Quick/Speed Dial Lists **0:** Disabled **1:** Enabled	**1:** Each Quick/Speed dial number on the list is printed with the dedicated tx parameters (8 bytes each). The last 10 bytes of data are the programmed dedicated tx parameters; 32 bytes of data are printed (the other 22 bytes have no use for service technicians).
4	Not used	Do not change the setting.

System Switch 04		
No	**FUNCTION**	**COMMENTS**
5	Memory file transfer operation **0:** User level **1:** Service level	If the machine is unable to print fax messages due to a mechanical problem, change this bit to 0 to transfer all messages in the memory (including confidential rx messages) to an another terminal. Always reset this bit to 1 after transfer. However, this bit can be left at 0, if the customer's key-operators want to transfer the files themselves. **Procedure** 1. Enter service mode and change this bit to 0. 2. Exit the service mode. 3. Enter the user tools, and select "Key-operator settings". 4. Choose "03" and specify a destination for the machine to transfer all the files to. 5. Press "Start". 6. After the machine transfers the memory files, enter the service mode and reset this bit to 1. Otherwise, anybody who knows how to enter the key-operator mode can transfer confidential messages.
6	G3 CSI/G4 Terminal ID programming level **0:** User level **1:** Service level	**1:** The CSI and Terminal ID can only be programmed by a technician (in the user tools). The Terminal ID can only be programmed if a Group 4 option is installed.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Telephone line type selection (choosing tone dial or pulse dial) can only be programmed by a technician (in the user tools).

System Switch 05		
No	**FUNCTION**	**COMMENTS**
0-1	Not used	Do not change the settings.
2	Display of both RTI and CSI on the LCD **0:** Disabled **1:** Enabled	**1:** An RTI will be displayed until phase B of the protocol sequence, and a CSI will be displayed after phase C.
3-7	Not used	Do not change the settings.

System Switch 06 *		
No	**FUNCTION**	**COMMENTS**
0 to 7	Margin setting for Create Margin Transmission	71 to 99 (BCD) %. This setting determines the reduction ratio when the user uses the Create Margin Transmission feature. Default setting:1001 0011 (93%)

System Switch 07 - Not used (Do not change the factory settings.)
System Switch 08 - Not used (Do not change the factory settings.)

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0	Addition of image data from confidential transmissions on the transmission result report **0:** Disabled **1:** Enabled	If this feature is enabled, the top half of the first page of confidential messages will be printed on transmission result reports.
1	Inclusion of communications on the Journal when no image data was exchanged. **0:** Disabled **1:** Enabled	**0:** Communications that reached phase C (message tx/rx) of the T.30 protocol are listed on the Journal. **1:** Communications that reached phase A (call setup) of T.30 protocol are listed on the Journal. This will include telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports will not be printed. **1:** Error reports will be printed automatically after failed communications.
3	Printing of the error code on the error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the setting.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last.
6	Conditions for printing the protocol dump list **0:** Print for all communications **1:** Print only when there is a communication error	This switch becomes effective only when system switch 00 bit 6 is set to 1. **1:** Set this bit to 1 when you wish to print a protocol dump list only for communications with errors.
7	Priority given to various types of remote terminal ID when printing reports **0:** RTI > CSI > Dial label > Tel. number **1:** Dial label > Tel. number > RTI > CSI	This bit determines which set of priorities the machine uses when listing remote terminal names on reports. In G4 communication, G4_TID (Terminal ID) is used instead of RTI or CSI. **Dial Label:** The name stored, by the user, for the Quick/Speed Dial number.

System Switch 0A		
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Continuous polling reception **0:** Disabled **1:** Enabled	This feature allows a series of stations to be polled in a continuous cycle. This will continue until the polling reception file is erased. The dialing interval is the same as memory transmission.
4	Dialing on the ten-key pad when the external telephone is off-hook **0:** Disabled **1:** Enabled	**0:** Prevents dialing from the ten-key pad while the external telephone is off-hook. Use this setting when the external telephone is not by the machine, or if a wireless telephone is connected as an external telephone. **1:** The user can dial on the machine's ten-key pad when the handset is off-hook.
5	On hook dial **0:** Disabled **1:** Enabled	**0:** On hook dial is disabled.
6	Line used for G3 transmission **0:** PSTN **1:** ISDN	If an ISDN unit has been installed, this bit determines whether G3 transmissions go out over the PSTN or the ISDN.
7	Line used when the machine falls back to G3 from G4 if the other end is not a G4 machine **0:** PSTN **1:** ISDN	This bit switch has no effect if Communication Switch 07 bit 0 is set to 0.

System Switch 0B - Not used (Do not change the factory settings.)
System Switch 0C - Not used (Do not change the factory settings.)
System Switch 0D - Not used (Do not change the factory settings.)

System Switch 0E		
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Action when the external handset goes off-hook **0:** Manual tx and rx operation **1:** Memory tx and rx operation (the display remains the same)	**0:** Manual tx and rx are possible while the external handset is off-hook. However, memory tx is not possible. **1:** The display stays in standby mode even when the external handset is used, so that other people can use the machine for memory tx operation. Note that manual tx and rx are not possible with this setting.
4-7	Not used	Do not change the settings.

System Switch 0F		
No	**FUNCTION**	**COMMENTS**
0 to 7	Country code for functional settings (Hex) 00: France **11: USA** 01: Germany 12: Asia 02: UK 13: Japan 03: Italy 14: Hong Kong 04: Austria 15: South Africa 05: Belgium 16: Australia 06: Denmark 17: NewZealand 07: Finland 18: Singapore 08: Ireland 19: Malaysia 09: Norway 1A: China 0A: Sweden 1B: Taiwan 0B: Switz. 20: Turkey 0C: Portugal 21: Greece 0D: Holland 0E: Spain 0F: Israel	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross reference** NCU country code: Function 06, parameter C.C.

System Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Threshold memory level for parallel memory transmission	Threshold = N x 128 kbytes + 256 kbytes N can be between 00 - FF(H) Default setting: 02(H) = 512 kbytes

System Switch 11		
No	**FUNCTION**	**COMMENTS**
0	TTI printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TTI overprints information that the customer considers to be important (G3 transmissions).
1	TSI (G3) or CIL/TID (G4) printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TSI (G3) or CIL/TID (G4) overprints information that the customer considers to be important. G4: Europe model only
2	Not used	Do not change the factory setting.
3 *	TTI used for broadcasting **0:** The TTIs selected for each Quick/Speed dial are used **1:** The same TTI is used for all destinations	**1:** The TTI (TTI_1 or TTI_2) which is selected with user switch 01 bit 6 is used for all destinations during broadcasting.

System Switch 11		
No	**FUNCTION**	**COMMENTS**
4 *	Type of TTI used for transmission using the ten-key pad **0:** TTI_1 **1:** TTI_2	**1:** The machine uses TTI_2 when the user dials the destination using the ten-key pad. It is also used for polling transmission and manual transmission using the handset.
5-6	Not used	Do not change the factory settings.
7	Use of parallel memory transmission with G4 transmission **0:** Disabled **1:** Enabled	This determines whether parallel transmission can be used with a G4 transmission or not. Note that this bit is only effective if Parallel Memory transmission is enabled (User Parameter 07 - bit 2).

System Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	TTI/CIL printing position in the main scan direction CIL: Command Information Line (Group 4)	TTI/CIL: 08 to 64 (BCD) mm Input even numbers only. This setting determines the print start position for the TTI and CIL from the left edge of the paper. If the TTI is moved too far to the right, it may overwrite the file number which is on the top right of the page. On an A4 page, if the CIL is moved over by more than 60 mm, it may overwrite the page number.

System Switch 13 - Not used (do not change the settings)
System Switch 14 - Not used (do not change the settings)

System Switch 15		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Going into the Night mode automatically **0**: Enabled **1**: Disabled	**1:** The machine will restart from the Energy Saver mode quickly, because the +5V power supply is active even in the Energy Saver mode.
2	Protocol dump data backup **0**: Disabled **1**: Enabled	**1:** The machine backs up the protocol dump data for approximately one hour when the main switch is turned off, in the same way as image data.
3-7	Not used	Do not change the settings.

System Switch 16		
No	**FUNCTION**	**COMMENTS**
0 *	Parallel Broadcasting **0**: Disabled **1**: Enabled	**1:** When the G4 unit is installed, the machine sends messages simultaneously using both available ports (PSTN/ISDN) during broadcasting.
1-7	Not used	Do not change the settings.

System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)

System Switch 19		
No	**FUNCTION**	**COMMENTS**
0 to 2	Key acknowledgement tone volume adjustment **000** (Min.: OFF)-**111** (Max.) Default setting – 011	This controls the volume of this tone when the machine is in fax mode (it has no effect on the tone when the machine is in copier or printer mode).
3-6	Not used	Do not change the settings.
7	Special Original mode **0:** Disabled **1:** Enabled	**1:** If the customer frequently wishes to transmit a form or letterhead which has a colored or printed background, change this bit to “1”. “Special Original” can be selected in addition to the “Text”, “Text/Photo” and “Photo” modes. **Cross reference** ❑ Type of special original mode – Scanner switch 00 bit 0.

System Switch 1A - Not used (do not change the settings)
System Switch 1B - Not used (do not change the settings)

System Switch 1C		
No	**FUNCTION**	**COMMENTS**
0	PC-Fax Expander option **0:** Not installed **1:** Installed	Change this bit to 1 when installing the PC-Fax Expander.
1	To omit the PSTN access code during a PC-Fax transmission **0:** Disabled **1:** Enabled	**1:** The machine does not dial the PSTN access code programmed in the PC-Fax application during PC-Fax memory transmission. This function becomes effective only when the PC fax application dials using a Quick/Speed/Group Dial stored in the fax machine. The machine will not omit dialing the PSTN access code when a destination number is programmed manually.
2	Not used	Do not change the setting.
3	Deleting the file when an error occurs during PC data storage to the SAF **0:** Not cleared **1:** Cleared	This function is effective for PC memory transmission. **0:** The pages stored in the SAF will be transmitted from the machine. **1:** All data is cleared when an error occurs. However, if the SAF memory becomes full during data storage, the setting of system bit switch 1E bit 1 determines how data is treated. This function is also effective for PC printing using the PCFE option for the fax board.
4	Resolution unit used for PC-Fax communication **0:** mm **1:** inches	This bit determines the resolution unit used for PC fax communication. This is because the PC fax application cannot automatically adjust the resolution unit. This setting is also effective for PC scanning using the PCFE option for the fax board.
5-6	Not used	Do not change the settings.
7	PC protocol dump list output after each PC communication **0:** Off **1:** On	**1:** This is only used for PC communication troubleshooting. ❑ Communications between the DIU (PCFE board) and a host PC are logged on the PC dump list. If system switch 09 bit 6 is at “1”, the list is only printed if there was an error during the communication. ❑ PC scan and PC print jobs using the PCFE option for the fax board are printed on the Journal. ❑ The Data-in LED turns on while data is coming in and going out to the PC. Be sure to reset this bit to “0” after a test.

System Switch 1D - Not used (do not change the settings)

System Switch 1E		
No	**FUNCTION**	**COMMENTS**
0	Communication after the Journal data storage area has become full **0:** Impossible **1:** Possible	This setting is effective only when Automatic Journal printout is enabled but the machine cannot print the report (e.g., no paper). **0:** If the buffer memory of the communication records for the Journal has become full, fax communications will become impossible, to prevent overwriting the communication records before the machine prints them out. **1:** If the buffer memory of the communication records for the Journal is full, fax communications are still possible. But the machine will overwrite the oldest communication records. **Cross Reference** ❑ Automatic Journal output - User switch 03 bit 7 ❑ Number of communication records for the Journal: 100 records (standard) 900 records (with the EXFUNC board installed)
1	Action when the SAF memory has become full during scanning **0:** The current page is erased. **1:** The entire file is erased.	**0:** If the SAF memory becomes full during scanning, the successfully scanned pages are transmitted. **1:** If the SAF memory becomes full during scanning, the file is erased and no pages are transmitted. This bit switch is ignored for parallel memory transmission.
2	RTI/CSI display priority 0: RTI 1: CSI	This bit determines which identifier, RTI or CSI, is displayed on the LCD while the machine is communicating in G3 non-standard mode.
3	File No. printing **0**: Enabled **1**: Disabled	**1:** File numbers are not printed on any reports.
4	Action when authorized reception is enabled but authorized RTIs/CSIs are **not yet** programmed **0**: All fax reception is disabled **1**: Faxes can be received if the sender has an RTI or CSI	If authorized reception is enabled but the user has stored no acceptable sender RTIs or CSIs, the machine will not be able to receive any fax messages. If the customer wishes to receive messages from any sender that includes an RTI or CSI, and to block messages from senders that do not include an RTI or CSI, change this bit to “1”, then enable Authorized Reception. Otherwise, keep this bit at “0 (default setting)”.
5	Address display priority in the AI redial mode **0:** RTI/CSI **1:** Telephone number	**0:** When the machine has both RTI/CSI and the telephone number information, the machine displays RTI/CSI. **1:** The machine always displays the telephone number.

System Switch 1E		
No	**FUNCTION**	**COMMENTS**
6	Not used	Do not change the setting
7	RAM initialization after the optional EXFUNC board is installed or removed **0:** Enabled **1:** Disabled	When the machine detects that an EXFUNC board has been installed or removed, the machine shows the following message on the display for the customer. *"Adding/Removing FAX Feature Expander causes data loss. Turn Main Power Switch off and remove/replace it to avoid loss. To continue, press Yes."* If Yes is pressed, the machine initializes the RAM to the "with" or "without card" configuration. However, changing this bit to "1" disables this initialization, even if Yes is pressed. Change this bit to 1 after installing the EXFUNC board. **0:** When the above message is displayed, the machine initializes the RAM if Yes is pressed. The amount of data lost depends on whether the board is in or out. To avoid losing data, the user must switch off immediately and put the EXFUNC board back in. **1:** When the above message is displayed, the machine does not initialize the RAM even if Yes is pressed. However, the fax unit cannot be used until the user switches off, puts the EXFUNC board back in, then switches back on. No data is lost.

System Switch 1F		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Report printout after an original jam during SAF storage or if the SAF memory fills up **0:** Enabled **1:** Disabled	**0:** When an original jams, or the SAF memory overflows during scanning, a report will be printed. Change this bit to "1" if the customer does not want to have a report in these cases. Memory tx – Memory storage report Parallel memory tx – Transmission result report
2	Not used	Do not change the setting.
3	Received fax print start timing (G3 reception) **0:** After receiving each page **1:** After receiving all pages	**0:** The machine prints each page immediately after the machine receives it. **1:** The machine prints the complete message after the machine receives all the pages in the memory.
4	Received fax print start timing (G4 reception) **0:** After receiving each page **1:** After receiving all pages	
5-6	Not used	Do not change the factory settings.
7	Action when a fax SC has occurred **0:** Automatic reset **1:** SC code display	**0:** When the fax unit detects a fax SC code other than SC1201 and SC1207, the fax unit automatically resets itself. **1:** When the fax unit detects any fax SC code, the fax unit displays the SC code and stops. **Cross Reference** Fax SC codes - See "Troubleshooting"

4.2.2 SCANNER SWITCHES

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Type of special original mode **0:** Monotone background **1:** Colored background	This setting determines the scanner parameters used for special original mode. **0:** This setting is for originals with random background of constant density, such as seen on banknotes (faxing banknotes is not recommended!). **1:** This setting is for originals with background of constant density, such as those made on colored paper. This switch becomes effective only when system switch 19 bit 7 is set to 1.
1-3	Not used	Do not change the settings.
4	OR processing (Text mode) **0:** Disabled **1:** Enabled	**1:** Each pair of scan lines goes through OR processing before transmission.
5-7	Not used	Do not change the settings.

Scanner Switch 01		
No	**FUNCTION**	**COMMENTS**
0 to 4	Scan density step value (Text mode)	When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. For example, with the default setting (14), the threshold value changes as follows. +3 (Darkest) : 77 (= 91 – 14) +2 : 91 (= 105 – 14) +1 : 105 (= 119 – 14) 0 (Normal) : 119 (Scanner Switch 02 setting) -1 : 133 (= 119 + 14) -2 : 147 (= 133 + 14) -3 (Lightest) : 161 (= 147 + 14) The value can be between 00 and 1F(H) [= 31(D)]. For smaller steps, input a lower value.
5-7	Not used	Do not change the settings.

Scanner Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Text mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text mode (when the scan density setting is at the center). The value can be between 01 and FF. For a darker threshold, input a lower value. Default setting: 77(H) = 119(D)

Scanner Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Photo and Text/Photo mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text/Photo mode (when the scan density setting is at the center). The value can be between 01 and FF. For a darker threshold, input a lower value. Default setting: 23(H) = 35(D)

Scanner Switch 04 - Not used (do not change the settings)
Scanner Switch 05 - Not used (do not change the settings)

Scanner Switch 06		
No	**FUNCTION**	**COMMENTS**
0 to 3	MTF filter level (Text mode)	The value can be between 0(Off) and F. For a weaker threshold, input a lower value. Default setting: 6 This setting is independent from the threshold specified by the copier SP modes.
4 to 7	MTF filter level (Text/Photo mode)	The value can be between 0(Off) and F. For a weaker threshold, input a lower value. Default setting: 6 This setting is independent from the threshold specified by the copier SP modes.

Scanner Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 2	Smoothing filter level (Photo mode)	The value can be between 0(Off) and 7. For a weaker threshold, input a lower value. Default setting: 2 This setting is independent from the threshold setting specified by the copier SP modes.
3-7	Not used	Do not change the settings.

Scanner Switch 08 - Not used (do not change the settings)
Scanner Switch 09 - Not used (do not change the settings)

Scanner Switch 0A		
No	**FUNCTION**	**COMMENTS**
0 to 2	Independent dot erase level (Text modes)	The value can be between 0 (Off) and 4. For a higher threshold, input a higher value (larger dots are erased). Default setting: 2 This setting is independent from the threshold setting specified by the copier SP modes.
3-7	Not used	Do not change the settings.

Scanner Switch 0B *		
No	**FUNCTION**	**COMMENTS**
0 to 3	Scan margin setting (top and bottom margin in book scan mode, and top margin in ADF mode) The setting can be between 0 and F (H) (in mm). Default setting: 3 mm	
4-7	Not used	Do not change the settings.

Scanner Switch 0C		
No	**FUNCTION**	**COMMENTS**
0	Action when an original jam has occurred while scanning the original into memory for memory tx **0:** Continues scanning after recovery **1:** Stops scanning and erases all scanned pages for that job	This bit is only effective when parallel memory tx is disabled (user parameter 07 - bit 2). If parallel memory tx is enabled, the machine always erases the scanned pages when an original jam occurs. The machine then asks the user to retry from the first page, even if the parallel memory tx is not actually used. **0:** The machine displays a message asking the user to put the jammed page back into the original stack, and continues scanning. The message is displayed for the time period specified by scanner switch 0E, bit 2. **1:** The machine erases all the scanned pages and asks the user to retry from the first page.
1 to 2	Setting when an original size cannot be recognized **Bit 2 1 Setting** 0 0 Depending on the copier's setting 0 1 A5 ▯ 1 0 A5 ▭ 1 1 No original	When both bits are set to "0", the machine recognizes an original size depending on SP4-303 in copier service mode.
3-5	Not used	Do not change the settings.
6	Scan width used for a document set in the ADF when the width is less than 230 mm. **0**: A4 (210 mm) **1**: LT (216 mm)	This bit is set at "1" when the country code is set to the US.
7	Sub-scan length correction using ADF **0:** Enabled **1:** Dsabled	**0:** The machine regards originals as following table. **1:** The original length data from the ADF sensor is used.

- **Scanner Switch 0C bit 6 = 0**

Before sub-scan length correction	After sub-scan length correction
Under 135mm	128mm (B6 short edge length)
136mm – 157mm	148mm (A5 short edge length)
158mm – 192mm	182mm (B6 long edge length)
193mm – 223mm	210mm (A4 short edge length)
248mm – 266mm	257mm (B5 long edge length)
267mm – 287mm	279mm (LT long edge length)
288mm – 307mm	297mm (A4 long edge length)
355mm – 374mm	364mm (B4 long edge length)
410mm – 425mm	420mm (A3 long edge length)
Over 426mm	432mm (DLT long edge length)

- **Scanner Switch 0C bit 6 = 1**

Before sub-scan length correction	After sub-scan length correction
Under 146mm	140mm (HLT short edge length)
158mm – 192mm	182mm (B6 long edge length)
193mm – 223mm	216mm (LT short edge length)
248mm – 266mm	257mm (B5 long edge length)
267mm – 287mm	279mm (LT long edge length)
288mm – 307mm	297mm (A4 long edge length)
346mm – 366mm	356mm (LG long edge length)
Over 418mm	432mm (DLT long edge length)

Scanner Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 **1**	Scan magnification ratio fine tuning (main scan direction) $\begin{pmatrix}0\\0\end{pmatrix}$= 0%, $\begin{pmatrix}1\\0\end{pmatrix}$=−1.5%, $\begin{pmatrix}0\\1\end{pmatrix}$=+1.5%, $\begin{pmatrix}1\\1\end{pmatrix}$=Do not use this setting The actual magnification ratio is the sum of the SP mode 4-008 setting and this setting.	
2 **3**	Scan magnification ratio fine tuning (sub scan direction) $\begin{pmatrix}0\\0\end{pmatrix}$=0%, $\begin{pmatrix}1\\0\end{pmatrix}$=−1.5%, $\begin{pmatrix}0\\1\end{pmatrix}$=+1.5%, $\begin{pmatrix}1\\1\end{pmatrix}$=Do not use this setting The actual magnification ratio is the sum of the SP mode 4-101 setting and this setting.	
4-6	Not used	Do not change the settings.
7	Scan width for A5 lengthwise or B5 lengthwise originals **0:** 210 mm (8.5") **1:** Original width	**0:** The machine scans the original as 210 mm (8.5") width. The transmitted image has a blank area on the right. **1:** The machine scans 148 mm (A5) or 182 mm (B5) and centers the scanned data on a 216 mm width transmitted image.

Scanner Switch 0E		
No	**FUNCTION**	**COMMENTS**
0	Wait time for the next page when scanning a book original into memory **0:** 60 s **1:** 30 s	This bit determines how long the machine waits for the next page when scanning a book original for memory transmission. If this timer expires, the machine transmits all the pages scanned so far as one document. **Note:** In immediate tx or parallel memory tx, the wait time for the next page is 10 s.
1	Scan resolution unit (except standard resolution in book scan mode) **0:** mm **1:** inches	This bit determines which resolution unit will be used for scanning a fax message. Default setting: mm
2	ADF jam alarm display time **0:** 60 s **1:** 30 s	The bit is only effective when bit 0 of scanner bit switch 0C is “0”. This bit determines how long the machine displays the ADF jam alarm after a jam occurred.
3-7	Not used	Do not change the settings.

Scanner Switch 0F		
No	**FUNCTION**	**COMMENTS**
0	Image rotation before transmission (A4/LT sideways) **0:** Disabled **1:** Enabled	This bit determines whether the machine rotates the scanned image by 90 degrees before transmission. If this bit is set at 1, A4 (LT) sideways images (297 mm width in the protocol) will be transmitted as A4 (LT) lengthwise images (216 mm width in the protocol). Refer to Image Rotation Before Transmission in chapter 2 for more details.
1	Not used	Do not change the setting
2	Image rotation before transmission (A5/HLT lengthwise) **0:** Disabled **1:** Enabled	This bit determines whether the machine rotates the scanned image by 90 degrees before transmission. If this bit is set at “1”, A5 (HLT) lengthwise images will be transmitted as A4 (LT) width images (216 mm width in the protocol). Refer to Image Rotation Before Transmission in chapter 2 for more details.
3-7	Not used	Do not change the settings.

4.2.3 PRINTER SWITCHES

Printer Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks are printed. **1**: If a received page has to be printed out on two sheets, an asterisk inside square brackets is printed at the bottom right hand corner of the first sheet, and a "2" inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split.
1	Repetition of data when the received page is longer than the printer paper **0:** Disabled **1:** Enabled	**0:** The next page continues from where the previous page left off. **1:** The final few mm of the previous page are repeated at the top of the next page. The amount of repeated data depends on printer switch 04, bits 5 and 6. See Sub Scan Reduction and Page Separation in section 2 for details.
2	Prints the date and time on received fax messages **0:** Disabled **1:** Enabled	This switch is only effective when user parameter 02 - bit 2 (printing the received date and time on received fax messages) is enabled. **1:** The machine prints the received and printed date and time at the bottom of each received page.
3-7	Not used	Do not change the settings.

Printer Switch 01		
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3 **4**	Maximum print width used in the setup protocol $\binom{0}{0}$=Do not use this setting $\binom{1}{0}$= A 3 $\binom{0}{1}$=B4 $\binom{1}{1}$=A4 These bits are only effective when bit 7 of printer switch 01 is "1".	
5	Not used	Do not change the setting.
6	Table selection of received message width. **0:** Table 1 **1:** Table 2	When bit 7 is set to 1, this bit determines which table the machine uses to choose the paper width from. The paper width will be informed in the setup protocol (NSF/DIS).
7	Received message width restriction in the protocol signal to the sender **0:** Disabled **1:** Enabled	**0:** The machine informs the transmitting machine of the print width depending on the paper size available from the paper feed stations. Refer to the tables on the next page. **1:** The machine informs the transmitting machine of the fixed paper width which is specified by bits 3 and 4 above.

Relationship between available paper sizes and printer width used in the setup protocol

- **Table 1 (Printer Switch 01 bit 6 = 0)**

Available Paper Size	Printer width used in the Protocol (NSF/DIS)
A4 or 8.5" x 11"	297 mm width
B5	256 mm width
A5 or 8.5" x 5.5"	216 mm width
No paper available (Paper end)	216 mm width

- **Table 2 (Printer Switch 01 bit 6 = 1)**

Available Paper Size	Printer width used in the Protocol (NSF/DIS)
A3 or DTL	297 mm width
B4	256 mm width
Others	216 mm width

Printer Switch 02		
No	**FUNCTION**	**COMMENTS**
0	1st paper feed station usage for fax printing **0:** Enabled **1:** Disabled	**0:** The paper feed station can be used to print fax messages and reports. **1**: The specified paper feed station will not be used for printing fax messages and reports. **Note:** Do not disable usage for a paper feed station which has been specified by User Parameter Switch 0F (15), or which is used for the Specified Cassette Selection feature.
1	2nd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
2	3rd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
3	4th paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
4	LCT usage for fax printing **0:** Enabled **1:** Disabled	
5-7	Not used	Do not change the settings.

Printer Switch 03		
No	**FUNCTION**	**COMMENTS**
0	Length reduction of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. (Page separation threshold: Printer Switch 03, bits 4 to 7) **1:** Incoming page length is reduced when printing. (Maximum reducible length: Printer Switches 04, bits 0 to 4)
1-3	Not used	Do not change the settings
4 to 7	Page separation threshold (with reduction disabled with switch 03-0 above) If the incoming page is up to x mm longer than the length of copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the length of copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits. Hex value of bits 4 to 7 x (mm) 0 0 1 1 and so on until F 15 Default setting: 6 mm **Cross reference** Length reduction On/Off: Printer Switch 03, Bit 0	

Printer Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 4	Maximum reducible length when length reduction is enabled with switch 03-0 above. <Maximum reducible length> = <Paper length> + (N x 5mm) “N” is the decimal value of the binary setting of bits 0 to 4. Bit 4 3 2 1 0 Setting 0 0 0 0 0 0 mm 0 0 0 0 1 5 mm 0 0 1 0 0 20 mm (default setting) 1 1 1 1 1 155 mm For A5 sideways and B5 sideways paper <Maximum reducible length> = <Paper length> + 0.75 x (N x 5mm)	

Printer Switch 04		
No	**FUNCTION**	**COMMENTS**
5 **6**	Length of the duplicated image on the next page, when page separation has taken place. $\binom{0}{0}$=4 mm $\binom{1}{0}$=10 mm $\binom{0}{1}$=15 mm $\binom{1}{1}$=Not used	
7	Not used.	Do not change the setting.

Printer Switch 05 - Not used (do not change the settings)

Printer Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Printing while a paper cassette is pulled out, when the Just Size Printing feature is enabled. **0**: Printing will not start **1**: Printing will start if another cassette has a suitable size of paper, based on the paper size selection priority tables.	Refer to Just Size Printing in section 2 for details. **Cross reference** Just size printing on/off – User switch 05, bit 5
1-7	Not used.	Do not change the settings.

Printer Switch 07 *		
No	**FUNCTION**	**COMMENTS**
0	Reduction for Journal printing **0:** Off **1:** On	**1:** The Journal is reduced to 91% to ensure that there is enough space in the left margin for punch holes or staples.
2-3	Not used.	Do not change the settings.
4	List of destinations in the Communication Failure Report for broadcasting **0**: All destinations **1**: Only destinations where communication failure occurred	**1:** Only destinations where communication failure occurred are printed on the Communication Failure Report.
5-7	Not used.	Do not change the settings.

Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)

Printer Switch 0E		
No	**FUNCTION**	**COMMENTS**
0	Paper size selection priority **0:** Width **1:** Length	**0:** A paper size that has the same width as the received data is selected first. **1:** A paper size which has enough length to print all the received lines without reduction is selected first.
1	Paper size selected for printing A4 width fax data **0:** 8.5" x 11" size **1:** A4 size	This switch determines which paper size is selected for printing A4 width fax data, when the machine has both A4 and 8.5" x 11" size paper.
2	Page separation **0:** Enabled **1:** Disabled	**1:** If all paper sizes in the machine require page separation to print a received fax message, the machine does not print the message (Substitute Reception is used). After a larger size of paper is set in a cassette, the machine automatically prints the fax message.
3 to 4	Printing the sample image on reports **Bit 4 Bit 3 Setting** 0 0 The upper half only 0 1 50% reduction in sub-scan only 1 0 Same size 1 1 Not used	"Same size" means the sample image is printed at 100%, even if page separation occurs. User Parameter Switch 19 (13H) bit 4 must be set to "0" to enable this switch. Refer to Detailed Section Descriptions for more on this feature.
5-6	Not used	Do not change the settings.
7	Equalizing the reduction ratio among separated pages (Page Separation) **0:** Enabled **1:** Disabled	**0:** When page separation has taken place, all the pages are reduced with the same reduction ratio. **1:** Only the last page is reduced to fit the selected paper size when page separation has taken place. Other pages are printed without reduction.

Printer Switch 0F		
No	**FUNCTION**	**COMMENTS**
0 to 1	Smoothing feature **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Disabled 1 0 Enabled 1 1 Not used	**(0, 0) (0, 1):** Disable smoothing if the machine receives halftone images from other manufacturers fax machines frequently.
2	Duplex printing **0:** Disabled **1:** Enabled	**1:** The machine always prints received fax messages in duplex printing mode:
3	Binding direction for Duplex printing **0:** Left binding **1:** Top binding	

Printer Switch 0F		
No	**FUNCTION**	**COMMENTS**
4	Printing fax messages in user code mode **0:** Enabled **1:** Disabled	**1:** The machine holds the received fax messages until the machine exits the restricted access mode (user code or key counter). If the machine enters the restricted access mode again while printing fax messages, the machine stops printing the machine exits the mode again.
5	Not used	Do not change the setting.
6 to 7	Wait timer for duplex printing $\binom{0}{0}$=No limit, $\binom{1}{0}$=1 min., $\binom{0}{1}$=3 min., $\binom{1}{1}$=10 min. If the duplex unit is already being used for a copy or print job when the fax unit is going to print a fax message in duplex mode, the fax unit waits until the duplex unit becomes available. The time that the fax unit will wait can be specified, as shown above. It the timer expires, the message is printed on single sides.	

4.2.4 COMMUNICATION SWITCHES

Communication Switch 00		
No	**FUNCTION**	**COMMENTS**
0 to 1	Compression modes available in receive mode **Bit 1 0 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2 to 3	Compression modes available in transmit mode **Bit 3 2 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol.
4	Not used	Do not change the setting.
5	JBIG compression method: Reception **0**: Only basic supported **1**: Basic and optional both supported	Change the setting when communication problems occur using JBIG compression.
6	JBIG compression method: Transmission **0**: Basic mode priority **1**: Optional mode priority	Change the setting when communication problems occur using JBIG compression.
7	Closed network (reception) **0:** Disabled **1:** Enabled	**1:** Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode.

Communication Switch 01		
No	**FUNCTION**	**COMMENTS**
0	ECM **0:** Off **1:** On	If this bit is set to 0, ECM is switched off for all communications. In addition, V.8 protocol and JBIG compression are switched off automatically.
1	Not used	Do not change the setting.
2 to 3	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will disconnect the line without sending a fax message, if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead. **Note:** This function does not work when dialing is done from the external telephone.
4-5	Not used	Do not change the setting.
6 to 7	Maximum printable page length available **Bit 7 6 Setting** 0 0 No limit 0 1 B4 (364 mm) 1 0 A4 (297 mm) 1 1 A3 (432 mm)	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution 100 dpi 200 dpi 400 dpi** **3.85 l/mm 7.7 l/mm 15.4 l/mm** Low settings 6 12 24 High settings 12 24 48
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end.

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
2	Treatment of pages received with errors during G3 reception **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4-6	Not used	Do not change the settings.
7	Method of total error rate calculation **0:** Normal method **1:** French PTT requirement	**0:** Error rate is calculated by dividing the number of total lines by the number of error lines. **1:** Error rate is calculated by dividing the number of total plus error lines by the number of error lines.

Communication Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmissions in a G3 memory transmission	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03(H)

Communication Switch 04 - Not used (do not change the settings)
Communication Switch 05 - Not used (do not change the settings)

Communication Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Dialing requirements: Germany **0:** Disabled **1:** Enabled	These switches are automatically set to the settings required by each country after the country code (System Switch 0F) is programmed.
1	Dialing requirements: Austria **0:** Disabled **1:** Enabled	
2	Dialing requirements: Norway **0:** Disabled **1:** Enabled	
3	Dialing requirements: Denmark **0:** Disabled **1:** Enabled	
4	Dialing requirements: France **0:** Disabled **1:** Enabled	
5	Dialing requirements: Switzerland **0:** Disabled **1:** Enabled	
6	Dialing requirements: USA **0:** Disabled **1:** Enabled	
7	Carrier drop display **0:** Disabled **1:** Enabled	This is an European PTT requirement. This bit is available only for the European models.

Communication Switch 07		
No	**FUNCTION**	**COMMENTS**
0	Fallback from G4 to G3 if the other terminal is not a G4 terminal **0:** Disabled **1:** Enabled	Also see system switch 0A bit 7. Refer to the ISDN G4 option service manual (G4 Internal Switches 17, 18, 1A, 1B, and 1C) for the CPS code set (Cause Value set) that determines G4 to G3 fallback.
1	Not used	Do not change the setting.
2	Not used	Do not change the setting.
3 *	Fallback from G4 to G3 reflected in programmed Quick/Speed dials **0:** Fallback enabled **1:** Always start with G4	**0:** If a communication falls back from G4 to G3, the machine will always start transmission with G3 from the next communication. **1:** The machine will always start to transmit with G4.
4 *	Fallback from G4 to G3 when G4 communication fails on the ISDN B-channel **0:** Fallback disabled **1:** Fallback enabled	**1:** Enable this switch only when G4 communication errors occur because the exchanger connects G4 calls to the PSTN. This problem occurs with some types of exchanger.
5	Not used	Do not change the setting.
6	Not used	Do not change the setting.
7	Not used	Do not change the setting.

Communication Switch 08 - Not used (do not change the settings)
Communication Switch 09 - Not used (do not change the settings)

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page, using normal memory transmission.
1-6	Not used	Do not change the settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the UK and some other countries.

Communication Switch 0B		
No	**FUNCTION**	**COMMENTS**
0	Use of Economy Transmission during a Transfer operation to end receivers **0:** Disabled **1:** Enabled	These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station.
1	Use of Economy Transmission during a Transfer operation to the Next Transfer Stations **0:** Disabled **1:** Enabled	
2	Use of Label Insertion for the End Receivers in a Transfer operation **0:** Disabled **1:** Enabled	This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station.
3	Conditions required for Transfer Result Report transmission **0:** Always transmitted **1:** Only transmitted if there was an error	**0:** When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. **1:** The machine will only send back a Transfer Result Report if there were errors during communication, meaning one or more of the End Receivers could not be contacted.
4	Printout of the message when acting as a Transfer Station **0:** Disabled **1:** Enabled	When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal.

Communication Switch 0B		
No	**FUNCTION**	**COMMENTS**
5	Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number **0:** Transfer is disabled **1:** Transfer is enabled	After the machine receives a transfer request, the machine compares the last N digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. (N is the number programmed in communication switch 0C.) **0:** If there is no matching number programmed in the machine, the machine rejects the transfer request. **1:** Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal.
6-7	Not used	Do not change the settings.

Communication Switch 0C		
No	**FUNCTION**	**COMMENTS**
0 to 4	Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station	00 - 1F (0 to 31 digits) After the machine receives a transfer request, the machine compares the own telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. This number determines how many digits from the end of the telephone numbers the machine compares. If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. Default setting - 05(H) = 5 digits
5-7	Not used	Do not change the settings.

Communication Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 to 7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 4 kbytes (e.g., 06(H) = 24 kbytes) One page is about 24 kbytes. The machine refers to this setting before each fax reception. If the amount of remaining memory is below this threshold, the machine cannot receive any fax messages. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory available. This will result in communication failure.

Communication Switch 0E		
No	**FUNCTION**	**COMMENTS**
0 to 7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F - Not used (do not change the settings.)

Communication Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FE (Hex) times

Communication Switch 11 - Not used (do not change the settings.)

Communication Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Interval between dialing attempts to the same destination	01 - FF (Hex) minutes

Communication Switch 13 - Not used (do not change the settings.)

Communication Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled **1:** Enabled	**0:** In immediate transmission, data scanned in inch format are transmitted without conversion. In memory transmission, data stored in the SAF memory in mm format are transmitted without conversion. **Note:** When storing the scanned data into SAF memory, the fax unit always converts the data into mm format. **1:** The machine converts the scanned data or stored data in the SAF memory to the format which was specified in the set-up protocol (DIS/NSF) before transmission.
1-5	Not used	Do not change the factory settings.
6 to 7	Available unit of resolution in which fax messages are received **Bit 7 Bit 6 Unit** 0 0 mm 0 1 inch 1 0 mm and inch (default) 1 1 Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 15 - Not used (do not change the settings)

Communication Switch 16 *		
No	**FUNCTION**	**COMMENTS**
0-1	Not used	Do not change the settings.
2	Optional ISDN unit **0:** Not installed **1:** Installed	Change this bit to 1 when installing the optional ISDN unit.
3-5	Not used	Do not change the settings.
6	ISDN Dual communication **0:** Enabled **1:** Disabled	**1:** The machine uses only one B channel for communication. This enables a customer to occupy another B channel for other purposes such as internet communication.
7	Not used	Do not change the setting.

Communication Switch 17 *		
No	**FUNCTION**	**COMMENTS**
0	SEP reception **0:** Disabled **1:** Enabled	**0:** Polling transmission to another maker's machine using the SEP (Selective Polling) signal is disabled.
1	SUB reception **0:** Disabled **1:** Enabled	**0:** Confidential reception to another maker's machine using the SUB (Sub-address) signal is disabled.
2-7	Not used	Do not change the settings.

Communication Switch 18 *		
No	**FUNCTION**	**COMMENTS**
0	Memory Lock for PSTN **0:** Disabled **1:** Enabled	Change this bit to 1 when the customer requires.
1	Not used	Do not change the setting.
2	Memory Lock for ISDN **0:** Disabled **1:** Enabled	Change this bit to 1 when the customer requires. This function requires an optional G4 unit.
3-7	Not used	Do not change the settings.

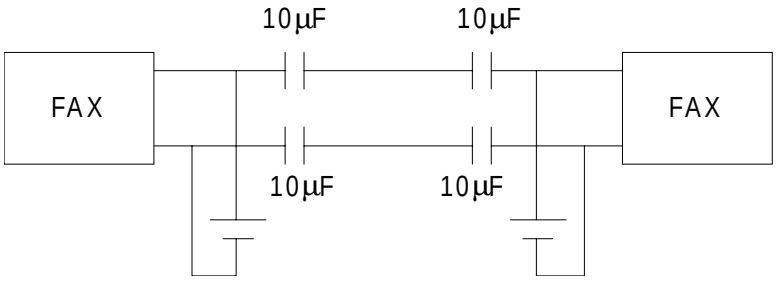
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)
Communication Switch 1B - Not used (do not change the settings)
Communication Switch 1C - Not used (do not change the settings)
Communication Switch 1D - Not used (do not change the settings)

Communication Switch 1E *		
No	**FUNCTION**	**COMMENTS**
0 to 7	Extension access code (0 to 7) to turn V.8 protocol On/Off **0:** On **1:** Off	If the PABX does not support V.8/V.34 protocol procedure, set this bit to "1" to disable V.8. **Example:** If "0" is the PSTN access code, set bit 0 to 1. When the machine detects "0" as the first dialed number, it automatically disables V.8 protocol. (Alternatively, if "3" is the PSTN access code, set bit 3 to 1.)

Communication Switch 1F *		
No	**FUNCTION**	**COMMENTS**
0 to 1	Extension access code (8 and 9) to turn V.8 protocol On/Off **0:** On **1:** Off	Refer to communication switch 1E. **Example:** If “8” is the PSTN access code, set bit 0 to 1. When the machine detects “8” as the first dialed number, it automatically disables V.8 protocol. (If “9” is the PSTN access code, use bit 1.)
2-7	Not used	Do not change the settings.

4.2.5 G3 SWITCHES

G3 Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Monitor speaker during communication (tx and rx) **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	**(0, 0):** The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission 0: Disabled 1: Enabled	**1:** The monitor speaker is enabled during memory transmission.
3-6	Not used	Do not change the settings.
7	Back to back test 0: Disabled 1: Enabled	Set this bit to 1 when you wish to do a back to back test. **115 V model:** Be sure to connect jumpers JP5 and JP6 on the NCU before doing the test. **220 V model:** Be sure to apply dc voltage between wires L1 and L2 on the NCU.



Back-to-Back Connection:
The dc power supplies should be adjusted so that the line current to the NCU is about 30mA.

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	DIS frame length **0:** 10 bytes **1:** 4 bytes	**1:** The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED/ANSam transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission.
7	Not used	Do not change the setting.

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. **1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1-4	Not used	Do not change the settings.
5	Use of modem rate history for transmission using Quick/Speed Dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed Dials always start from the highest modem rate. **1:** The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3 Switch 03		
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	V.8 protocol in manual reception **0:** Disabled **1:** Enabled	**0:** The machine sends CED instead of ANSam when starting a manual reception. **1:** The machine sends ANSam during manual reception.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not set to 0 unless the line condition is always bad enough to slow down the data rate to 14.4 kbps or lower.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	Keep this bit at “0” in most cases.

G3 Switch 03		
No	**FUNCTION**	**COMMENTS**
4	CTC transmission conditions **0:** After one PPR signal received **1:** After four PPR signals received (ITU-T standard)	**0:** When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the following condition is met in communications at 14.4, 12.0, 9.6, and 7.2 kbps. $\sqrt{N\,Transmit \leq NResend}$ $N_{Transmit}$- Number of transmitted frames N_{Resend}- Number of frames to be retransmitted **1:** When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs. PPR, CTC: These are ECM protocol signals. This bit is not effective in V.34 communications.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6 *	V.8 protocol in manual transmission **0:** Disabled **1:** Enabled	**1:** The machine detects either ANSam or CED during manual transmission.
7	Not used	Do not change the setting.

G3 Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded.
4-7	Not used	Do not change the settings.

G3 Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2
4 to 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 0 0 V.29 0 1 V.17 1 0 V.34 1 1 Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7	Not used	Do not change the settings.

G3 Switch 06		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for reception. Use a lower setting if high speeds pose problems during reception. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2

G3 Switch 06		
No	**FUNCTION**	**COMMENTS**
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29 V.33 0 1 0 0 V.27ter, V.29, V.17/V.33 0 1 0 1 V.27ter, V.29, V.17/V33, V.34 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. If V.34 is not selected, V.8 protocol must be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2

G3 Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 1	PSTN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
2 to 3	PSTN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
4	PSTN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “1”.

G3 Switch 07		
No	**FUNCTION**	**COMMENTS**
5	PSTN cable equalizer (V.34 rx mode; External)	Keep this bit at “1”.
6-7	Not used	Do not change the settings.

G3 Switch 08 - Not used (do not change the settings)

G3 Switch 09		
No	**FUNCTION**	**COMMENTS**
0 to 1	ISDN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
2 to 3	ISDN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
4	ISDN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “0” in most cases.
5	ISDN cable equalizer (V.34 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “0” in most cases.
6-7	Not used	Do not change the settings.

G3 Switch 0A		
No	**FUNCTION**	**COMMENTS**
0 **1**	Maximum allowable carrier drop during image data reception **Bit 1 Bit 0 Value (ms)** 0 0 200 0 1 400 1 0 800 1 1 Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2-3	Not used	Do not change the settings.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum interval between EOL (end-of-line) signals and the maximum interval between ECM frames from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the settings.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 s of CFR.
7	Not used	Do not change the setting.

G3 Switch 0B		
No	**FUNCTION**	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	The machine does not automatically reset these bits for each country after a country code (System Switch 0F) is programmed. Change the required bits manually at installation.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5	PTT requirements: France **0:** Disabled **1:** Enabled	
6	Not used	Do not change the setting.
7	DTS requirements : Germany **0:** Disabled **1:** Enabled	Change this bit manually if required.

G3 Switch 0C		
No	**FUNCTION**	**COMMENTS**
0 **1**	Pulse dialing method **Bit 1 Bit 0 Setting** 0 0 Normal(P=N) 0 1 Oslo (P=10 - N) 1 0 Sweden (N+1) 1 1 Not used	P = Number of pulses sent out, N = Number dialed.
2-7	Not used	Do not change the settings.

G3 Switch 0D *		
No	**FUNCTION**	**COMMENTS**
0-1	Not used	Do not change the settings.
2 to 5	Data rate threshold during V.34 reception **Bit 5 4 3 2 Setting** 0 0 0 0 Normal 0 1 1 1 Lower by one step 1 1 1 1 Lower by two steps	The machine changes the modulation parameters in the MPh signal to lower the initial modem rate during V.34 reception. If this switch is set to "0111", the machine lowers the initial speed one step, for example, from 28,800 to 26,400 bps. This switch reduces transmission time if the machine frequently sends PPR signals during V.34 reception.
6	Not used	Do not change the settings.
7	B signal detection time for V.34 polling transmission **0:** 75 ms (default setting) **1:** 65 ms	Change this switch only when there are communication errors during V.34 polling transmission to a machine with a Panasonic modem.

G3 Switch 0E - Not used (do not change the settings)

G3 Switch 0F		
No	**FUNCTION**	**COMMENTS**
0	Alarm when an error occurred in Phase C or later **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm after each error communication, change this bit to "1".
1	Alarm when the handset is off-hook at the end of communication **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm if the handset is off-hook at the end of fax communication, change this bit to "1".
2-7	Not used	Do not change the settings.

4.1 NCU PARAMETERS

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (Function 06-1), but some can be changed using NCU Parameter programming (Function 06-2); if Function 06-2 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

<table>
<tr><th>Address</th><th>Function</th><th>Unit</th><th>Remarks</th></tr>
<tr><td>680400</td><td>Country code for NCU parameters</td><td colspan="2">Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 06-2 (parameter 00).

Country Decimal Hex
France 00 00
Germany 01 01
UK 02 02
Italy 03 03
Austria 04 04
Belgium 05 05
Denmark 06 06
Finland 07 07
Ireland 08 08
Norway 09 09
Sweden 10 0A
Switzerland 11 0B
Portugal 12 0C
Holland 13 0D
Spain 14 0E
Israel 15 0F
USA 17 11
Asia 18 12
Hong Kong 20 14
South Africa 21 15
Australia 22 16
New Zealand 23 17
Singapore 24 18
Malaysia 25 19
China 26 1A
Taiwan 27 1B
Greece 33 21</td></tr>
<tr><td>680401</td><td>Line current detection time</td><td rowspan="3">20 ms</td><td rowspan="3">Line current detection is disabled.
Line current is not detected if 680401 contains FF.</td></tr>
<tr><td>680402</td><td>Line current wait time</td></tr>
<tr><td>680403</td><td>Line current drop detect time</td></tr>
</table>

Address	Function	Unit	Remarks
680404	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680405	PSTN dial tone frequency upper limit (low byte)		
680406	PSTN dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680407	PSTN dial tone frequency lower limit (low byte)		
680408	PSTN dial tone detection time	20 ms	If 680408 contains FF(H), the machine pauses for the pause time (address 68040D / 68040E). Italy: See Note 2.
680409	PSTN dial tone reset time (LOW)		
68040A	PSTN dial tone reset time (HIGH)		
68040B	PSTN dial tone continuous tone time		
68040C	PSTN dial tone permissible drop time		
68040D	PSTN wait interval (LOW)		
68040E	PSTN wait interval (HIGH)		
68040F	PSTN ring-back tone detection time	20 ms	Detection is disabled if this contains FF.
680410	PSTN ring-back tone off detection time	20 ms	
680411	PSTN detection time for silent period after ring-back tone detected (LOW)	20 ms	
680412	PSTN detection time for silent period after ring-back tone detected (HIGH)	20 ms	
680413	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680414	PSTN busy tone frequency upper limit (low byte)		
680415	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680416	PSTN busy tone frequency lower limit (low byte)		
680417	PABX dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680418	PABX dial tone frequency upper limit (low byte)		
680419	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
68041A	PABX dial tone frequency lower limit (low byte)		

Address	Function	Unit	Remarks
68041B	PABX dial tone detection time	20 ms	If 68041B contains FF, the machine pauses for the pause time (680420 / 680421).
68041C	PABX dial tone reset time (LOW)		
68041D	PABX dial tone reset time (HIGH)		
68041E	PABX dial tone continuous tone time		
68041F	PABX dial tone permissible drop time		
680420	PABX wait interval (HIGH)		
680421	PABX wait interval (LOW)		
680422	PABX ringback tone detection time	20 ms	If both addresses contain FF(H), tone detection is disabled.
680423	PABX ringback tone off detection time	20 ms	
680424	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	If both addresses contain FF(H), tone detection is disabled.
680425	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	
680426	PABX busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680427	PABX busy tone frequency upper limit (low byte)		
680428	PABX busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680429	PABX busy tone frequency lower limit (low byte)		
68042A	Busy tone ON time: range 1	20 ms	
68042B	Busy tone OFF time: range 1		
68042C	Busy tone ON time: range 2		
68042D	Busy tone OFF time: range 2		
68042E	Busy tone ON time: range 3		
68042F	Busy tone OFF time: range 3		
680430	Busy tone ON time: range 4		
680431	Busy tone OFF time: range 4		
680432	Busy tone continuous tone detection time		

Address	Function	Unit	Remarks
680433	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance (±) **Bit 1 0** 0 0 75% Bits 2 and 3 must always 0 1 50% be kept at 0. 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		
680434	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680435	International dial tone frequency upper limit (low byte)		
680436	International dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680437	International dial tone frequency lower limit (low byte)		
680438	International dial tone detection time	20 ms	If 680438 contains FF, the machine pauses for the pause time (68043D / 68043E). Belgium: See Note 2.
680439	International dial tone reset time (LOW)		
68043A	International dial tone reset time (HIGH)		
68043B	International dial tone continuous tone time		
68043C	International dial tone permissible drop time		
68043D	International dial wait interval (HIGH)		
68043E	International dial wait interval (LOW)		
68043F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680440	Country dial tone upper frequency limit (LOW)		
680441	Country dial tone lower frequency limit (HIGH)		If both addresses contain FF(H), tone detection is disabled.
680442	Country dial tone lower frequency limit (LOW)		

Address	Function	Unit	Remarks
680443	Country dial tone detection time	20 ms	If 680443 contains FF, the machine pauses for the pause time (680448 / 680449).
680444	Country dial tone reset time (LOW)		
680445	Country dial tone reset time (HIGH)		
680446	Country dial tone continuous tone time		
680447	Country dial tone permissible drop time		
680448	Country dial wait interval (LOW)		
680449	Country dial wait interval (HIGH)		
68044A	Time between opening or closing the DO relay and opening the OHDI relay	1 ms	See Notes 3, 6 and 8. Function 06-2 (parameter 11).
68044B	Break time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 12).
68044C	Make time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 13).
68044D	Time between final OHDI relay closure and DO relay opening or closing	1 ms	See Notes 3, 6 and 8. Function 06-2 (parameter 14). This parameter is only valid in Europe.
68044E	Minimum pause between dialed digits (pulse dial mode)	20 ms	See Note 3 and 8. Function 06-2 (parameter 15).
68044F	Time waited when a pause is entered at the operation panel		Function 06-2 (parameter 16). See Note 3.
680450	DTMF tone on time	1 ms	Function 06-2 (parameter 17).
680451	DTMF tone off time		Function 06-2 (parameter 18).
680452	Tone attenuation level of DTMF signals while dialing	-N x 0.5 –3.5 dBm	Function 06-2 (parameter 19). See Note 5.
680453	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-dBm x 0.5	Function 06-2 (parameter 20). The setting must be less than –5dBm, and should not exceed the setting at 680452h above. See Note 5.
680454	PSTN: DTMF tone attenuation level after dialing	-N x 0.5 –3.5 dBm	Function 06-2 (parameter 21). See Note 5.

Address	Function	Unit	Remarks
680455	ISDN: DTMF tone attenuation level after dialing	-dBm x 0.5	See Note 5
680456	Not used		Do not change the settings.
680457	Time between 68044Dh (NCU parameter 14) and 68044Eh (NCU parameter 15)	1 ms	This parameter takes effect when the country code is set to France.
680458	Not used		Do not change the setting.
680459	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
68045A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
68045B	International dial access code (High)	BCD	For a code of 100: 68045B - F1 68045C - 00
68045C	International dial access code (Low)		
68045D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. If this address contains FF[H], the pause time stored in address 68044F is used. Do not set a number more than 7 in the UK.
68045E	Progress tone detection level, and cadence detection enable flags	Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 1 0 0 -40.0 1 1 0 -49.0 Bits 2, 0 - See Note 2.	
68045F to 680464	Not used		Do not change the settings.
680465	Long distance call prefix (HIGH)	BCD	For a code of 0: 680465 - FF 680466 - F0
680466	Long distance call prefix (LOW)	BCD	
680467 to 680471	Not used		Do not change the settings.

Address	Function	Unit	Remarks
680472	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 06-2 (parameter 02).
680473	Acceptable ringing signal frequency: range 1, lower limit		Function 06-2 (parameter 03).
680474	Acceptable ringing signal frequency: range 2, upper limit		Function 06-2 (parameter 04).
680475	Acceptable ringing signal frequency: range 2, lower limit		Function 06-2 (parameter 05).
680476	Number or rings until a call is detected	1	Function 06-2 (parameter 06). The setting must not be zero.
680477	Minimum required length of the first ring	20 ms	See Note 4. Function 06-2 (parameter 07).
680478	Minimum required length of the second and subsequent rings	20 ms	Function 06-2 (parameter 06-2).
680479	Ringing signal detection reset time (LOW)	20 ms	Function 06-2 (parameter 09).
68047A	Ringing signal detection reset time (HIGH)		Function 06-2 (parameter 10).
68047B to 680480	Not used		Do not change the settings.
680481	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms
680482	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
680483 to 6804A0	Not used		Do not change the settings.

Address	Function	Unit	Remarks
6804A1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6804A2	Acceptable CED detection frequency upper limit (low byte)		
6804A3	Acceptable CED detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6804A4	Acceptable CED detection frequency lower limit (low byte)		
6804A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
6804A6	Acceptable CNG detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6804A7	Acceptable CNG detection frequency upper limit (low byte)		
6804A8	Acceptable CNG detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6804A9	Acceptable CNG detection frequency lower limit (low byte)		
6804AA	Not used		Do not change the setting.
6804AB	CNG on time	20 ms	Factory setting: 500 ms
6804AC	CNG off time	20 ms	Factory setting: 200 ms
6804AD	Number of CNG cycles required for detection		The data is coded in the same way as address 680433.
6804AE	Not used		Do not change the settings.
6804AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
6804B0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		
6804B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
6804B2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		
6804B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
6804B4	PSTN: Tx level from the modem	-N – 3 dBm	Function 06-2 (parameter 01).
6804B5	PSTN: 1100 Hz tone transmission level	- N 6804B4 - 0.5N 6804B5 –3.5 (dB) See Note 7.	
6804B6	PSTN: 2100 Hz tone transmission level	- N6804B4 - 0.5N 6804B6 –3 (dB) See Note 7.	
6804B7	PABX: Tx level from the modem	- dBm	

Address	Function	Unit	Remarks
6804B8	PABX: 1100 Hz tone transmission level	- N 6804B7 - 0.5N 6804B8 (dB)	
6804B9	PABX: 2100 Hz tone transmission level	- N 6804B7 - 0.5N 6804B9 (dB)	
6804BA	ISDN: Tx level from the modem	- dBm	The setting must be between -12dBm and -15dBm.
6804BB	ISDN: 1100 Hz tone transmission level	- N 6804BA - 0.5N 6804BB (dB)	
6804BC	ISDN: 2100 Hz tone transmission level	- N 6804BA - 0.5N 6804BC (dB)	
6804BD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	
6804BE to 6804C6	Not used		Do not change the settings.
6804C7	Bits 0 to 3 – Not used. Bit 4 – V.34 protocol dump **0:** Simple, **1:** Detailed (default) Bits 5 to 7 – Not used.		
6804C8 to 6804D9	Not used		Do not change the settings.
6804DA	T.30 T1 timer	1 s	
6804E0 bit 3	Maximum wait time for post message	**0:** 12 s **1:** 30 s	**1:** Maximum wait time for post message (EOP/EOM/MPS) can be changed to 30 s. Change this bit to “1” if communication errors occur frequently during V.17 reception.

NOTES

1. If a setting is not required, store FF in the address.
2. Italy and Belgium only

   RAM address 68045E: the lower four bits have the following meaning.
   Bit 2 - 1: International dial tone cadence detection enabled (Belgium)
   Bit 1 - Not used
   Bit 0 - 1: PSTN dial tone cadence detection enabled (Italy)

   If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
   680408 (if bit 0 = 1) or 680438 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 680433.
   68040B (if bit 0 = 1) or 68043B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   68040C (if bit 0 = 1) or 68043C (if bit 2 = 1): off time, hex code (unit = 20 ms)
3. Pulse dial parameters (addresses 68044A to 68044F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: – 0.5 x $N_{680452/680454}$–3.5 dBm
   – 0.5 x N_{680455} dBm
   Low frequency tone: – 0.5 x ($N_{680452/680454}$ + N_{680453}) –3.5 dBm
   – 0.5 x (N_{680455} + N_{680453}) dBm
   NOTE: N_{680452}, for example, means the value stored in address 680452(H)
6. 68044A: Europe - Between Ds opening and Di opening.
   68044D: Europe - Between Ds closing and Di closing.
7. Tone signals which frequency is lower than 1500Hz (e.g., 800Hz tone for AI short protocol) refer to the setting at 6804B5h. Tones which frequency is higher than 1500Hz refer to the setting at 6804B6h.
8. 68044A, 68044D, 68044E: The actual inter-digit pause (pulse dial mode) is the sum of the period specified by the RAM addresses 68044A, 68044D, and 68044E.

4.2 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has eight bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

The programming procedure will be explained first. Then, the eight bytes will be described.

4.2.1 PROGRAMMING PROCEDURE

1. Make sure the machine is in "Facsimile" mode. Press "User Tools" key then choose "Fax".
2. Press [1], then either choose "Registering Quick Dial" or "Registering Speed Dial".
   Example: Change the Parameters in Quick Dial 10.
3. Press Quick Dial key 10.
   NOTE: The selected Quick or Speed Dial must be programmed beforehand.
4. When the programmed dial number is displayed, press S - V - C using Quick Dial keys, then press "Start".
5. The settings for byte 0 are now displayed. Press a number from 0 to 7 corresponding to the bit that you wish to change.
   Example: Change bit 7 to 1: Press 7
6. To scroll through the parameter bytes, either:
   Select the next byte: press "↓ Switch"
   or
   Select the previous byte: press "↑ Switch" until the correct byte is displayed.
   Then go back to step 5.
7. After the setting is changed, press OK.
8. To finish, press "User Tools".

4.2.2 PARAMETERS

The initial settings of the following parameters are all FF(H) - all the parameters are disabled.

Switch 01
FUNCTION AND COMMENTS
ITU-T T1 time (for PSTN G3 mode) If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. **Range:** 0 to 120 s (00h to 78h) FFh - The local NCU parameter factory setting is used. Do not program a value between 79h and FEh.

Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 4	Tx level **Bit 4 3 2 1 0 Setting** 0 0 0 0 0 0 0 0 0 0 1 -1 0 0 0 1 0 -2 0 0 0 1 1 -3 0 0 1 0 0 -4 : : 0 1 1 1 1 -15 1 1 1 1 1 Disabled	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. If the setting is “Disabled”, the NCU parameter 01 setting is used. **Note:** Do not use settings other than listed on the left.
5 to 7	Cable equalizer **Bit 7 6 5 Setting** 0 0 0 None 0 0 1 Low 0 1 0 Medium 0 1 1 High 1 1 1 Disabled	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** Do not use settings other than listed on the left. If the setting is “Disabled”, the bit switch setting is used.

Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 0 Not used 0 0 0 1 2,400 0 0 1 0 4,800 0 0 1 1 7,200 0 1 0 0 9,600 0 1 0 1 12,000 0 1 1 0 14,400 0 1 1 1 16,800 1 0 0 0 19,200 1 0 0 1 21,600 1 0 1 0 24,000 1 0 1 1 26,400 1 1 0 0 28,800 1 1 0 1 31,200 1 1 1 0 33,600 1 1 1 1 Disabled Other settings: Not used	If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. For the settings 14.4 or kbps slower, Switch 04 bit 4 must be changed to 0. **Note:** Do not use settings other than listed on the left. If the setting is “Disabled”, the bit switch setting is used.
4-5	Not used	Do not change the settings.
6	AI short protocol **0:** Off **1:** Disabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol. If the setting is “Disabled”, the bit switch setting is used.
7	Not used	Do not change the setting.

Switch 04		
No	**FUNCTION**	**COMMENTS**
0 1	Inch-mm conversion before tx **Bit 1 Bit 0 Setting** 0 0 Inch-mm conversion available 0 1 Inch only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. If “inch only” is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions. If the setting is “Disabled”, the bit switch setting is used.
2 to 3	DIS/NSF detection method **Bit 3 Bit 2 Setting** 0 0 First DIS or NSF 0 1 Second DIS or NSF 1 0 Not used 1 1 Disabled	**(0, 1):** Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS. If the setting is “Disabled”, the bit switch setting is used.

Switch 04		
No	**FUNCTION**	**COMMENTS**
4	V.8 protocol **0**: Off **1**: Disabled	If transmissions to a specific destination always end at a lower modem rate (14,400 bps or lower), disable V.8 protocol so as not to use V.34 protocol. **0:** V.34 communication will not be possible. If the setting is “Disabled”, the bit switch setting is used.
5	Compression modes available in transmit mode **0:** MH only **1:** Disabled	This bit determines the capabilities that are informed to the other terminal during transmission. If the setting is “Disabled”, the bit switch setting is used.
6 **7**	ECM during transmission **Bit 7 Bit 6 Setting** 0 0 Off 0 1 On 1 0 Not used 1 1 Disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting. Note that V.8/V.34 protocol and JBIG compression are automatically disabled if ECM is disabled. If the setting is “Disabled”, the bit switch setting is used.

Switch 05 - Not used (do not change the settings)
Switch 06 - Not used (do not change the settings)

Switch 07 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 **to** **3**	Data rate **Bits 3 2 1 0 Setting** 0 0 0 0 64 kbps 0 0 0 1 56 kbps 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 2 (bits 0 and 1) is used.
4-7	Not used	Do not change the settings.

Switch 08 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 **to** **3**	Link modulus **Bits 3 2 1 0 Setting** 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 3 (bit 0) is used.
4-7	Not used	Do not change the settings.

Switch 09 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 to 3	Layer 3 protocol **Bits 3 2 1 0 Setting** 0 0 0 0 ISO 8208 0 0 0 1 T.70 NULL 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 6 (bit 0) is used.
4 to 7	Packet modulus **Bits 3 2 1 0 Setting** 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 6 (bit 4) is used.

Switch 0A - Not used

4.3 SERVICE RAM ADDRESSES

⚠CAUTION
Do not change the settings which are marked as "Not used" or "Read only."

680001 to 680004(H) - ROM version (Read only)
680001(H) - Revision number (BCD)
680002(H) - Year (BCD)
680003(H) - Month (BCD)
680004(H) - Day (BCD)

680006 to 680015(H) - Machine's serial number (16 digits - ASCII)

680018(H) - Total program checksum (low)
680019(H) - Total program checksum (high)

680020 to 68003F(H) - System bit switches
680040 to 68004F(H) - Scanner bit switches
680050 to 68005F(H) - Printer bit switches
680060 to 68007F(H) - Communication bit switches
680080 to 68008F(H) - G3 bit switches

6800C0(H) - User parameter switch 00 (SWUER_00)
Bit 0: Stamp home position 0: Disabled, 1: Enabled
Bits 1 to 3: Scanning contrast home position

Bit 3	2	1	Setting
0	0	0	Automatic
0	0	1	Position 1 (Lightest)
0	1	0	Position 2
0	1	1	Position 3 (Medium)
1	0	0	Position 4
1	0	1	Position 5 (Darkest)

Bits 4 and 5: Scanning resolution home position
(This switch is not printed on the user parameter list.)

Bit 5	4	Setting
0	0	Standard
0	1	Detail
1	0	Superfine
1	1	Superfine

Bit 6: Transmission mode home position
(This switch is not printed on the user parameter list.)
0: Memory tx, 1: Immediate tx
Bit 7: Not used

6800C1(H) - User parameter switch 01 (SWUSR_01)
Bit 0: Label insertion home position 0: Disabled, 1: Enabled
Bit 1: ID transmission home position 0: Disabled, 1: Enabled
Bit 2: Automatic reduction (tx) home position 0: Disabled, 1: Enabled
Bits 3 and 4: Scanning mode LED home position
(This switch is not printed on the user parameter list.)

Bit 4	3	Setting
0	0	Text
0	1	Text/ Photo
1	0	Photo
1	1	Special Original (See the note below)

Note: The “Special Original” setting is not explained in the Operator’s Manual, because it can be selected only if System Switch 19 – bit 7 is set to “1”.

Bit 5: TTI print home position 0: Disabled, 1: Enabled
Bit 6: TTI used for broadcasting; the TTI selected with this switch is used for all destinations during broadcasting.
0: TTI_1, **1:** TTI_2
(This switch is not printed on the user parameter list.)

Note: System Switch 11 bit 3 must be set to “1” to enable this switch.

Bit 7: Settings return to home position after scanning 0: Disabled, 1: Enabled

6800C2(H) - User parameter switch 02 (SWUSR_02)
Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 2: Reception time printing
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 3: TSI print on received messages 0: Disabled, 1: Enabled
Bit 4: Checkered mark printing
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled
Bit 6: TID printing (G4) 0: Disabled, 1: Enabled
Bit 7: Not used

6800C3(H) - User parameter switch 03 (SWUSR_03: Automatic report printout)
Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report 0: Off, 1: On
Bit 3: Polling reserve report (polling reception) 0: Off, 1: On
Bit 4: Polling result report (polling reception) 0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Polling clear report 0: Off, 1: On
Bit 7: Journal 0: Off, 1: On

6800C4(H) - User parameter switch 04 (SWUSR_04: Automatic report printout)

Bit 0: Automatic confidential reception report output 0: Off, 1: On
Bits 1 to 6: Not used
Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

6800C5(H) - User parameter switch 05 (SWUSR_05)

Bit 0: Substitute reception when the base copier is in an SC condition
0: Enabled, 1: Disabled
Bits 1 and 2: Condition for substitute rx when the machine cannot print messages (Paper end, toner end, jam, and during night mode)

Bit 2	1	Setting
0	0	The machine receives all the fax messages.
0	1	The machine receives the fax messages with RTI or CSI.
1	0	The machine receives the fax messages with the same ID code.
1	1	The machine does not receive anything.

Bit 3: Not used
Bit 4: Restricted Access using personal codes 0: Off, 1: On
Bit 5: Just size printing 0: Off, 1: On
Bit 6: Allow document with mixed paper sizes in the ADF 0: No, 1: Yes
Bit 7: Add paper display when a cassette is empty 0: Off, 1: On

6800C6(H) - User parameter switch 06 (SWUSR_06)

Bit 0: Not used
Bit 1: G3/G4 LED home position 0: G3, 1: G4
Bits 2 and 3: Not used
Bit 4: Quick dial label print format
0: Suitable for white paper, 1: Suitable for transparent paper
Bit 5: Not used
Bit 6: Scan sequence in Book transmission
0: Left page then right page, 1: Right page then left page
Bit 7: Not used

6800C7(H) - User parameter switch 07 (SWUSR_07)

Bits 0 and 1: Not used
Bit 2: Parallel memory transmission 0: Off, 1: On
Bits 3 to 7: Not used

6800C8(H) - User parameter switch 08 (SWUSR_08)

Bits 0 and 1: Not used.
Bit 2: Authorized reception
0: Only faxes from senders whose RTIs/CSIs are specified for this feature are accepted.
1: Only faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.
Bits 3 to 7: Not used.

6800C9(H) - User parameter switch 09 (SWUSR_09)

Bits 0 to 7: Not used

6800CA(H) - User parameter switch 10 (SWUSR_0A)
Bit 0: Not used
Bit 1: 2 into 1 0: Off, 1: On
Bit 2: Not used
Bit 3: Page reduction 0: Off, 1: On
Bits 4 to 7: Not used

6800CB(H) - User parameter switch 11 (SWUSR_0B)
Bit 0: Not used
Bit 1: Method of transmitting numbers after the “Tone” mark over an ISDN line
0: UUI, 1: Tone
Bits 2 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station
0: Off, 1: On
Bit 7: Polling Standby duration 0: Once, 1: No limit

6800CC(H) - User parameter switch 12 (SWUSR_0C)
Bits 0 to 7: Not used

6800CD(H) - **User parameter switch 13 (SWUSR_0D)**
(This switch is not printed on the user parameter list.)
Bits 0 and 1: PSTN access method from behind a PABX

Bit 1	0	Setting
0	0	PSTN
0	1	Loop start
1	0	Ground start
1	1	Flash start

Bits 2 to 4: Not used
Bit 5: Action when receiving a SETUP signal containing no called number and the G4 subscriber number was programmed in this machine.
0: Respond to the call, 1: Do not respond to the call
Bit 6: Action when the received HLC (Higher Level Capabilities) is Tel or BC (Bearer Capabilities) is Speech.
0: Do not respond to the call, 1: Respond to the call
This switch determines which information transfer capabilities the machine can accept when receiving a call.
1: When the received HLC is Tel (digital telephone) or BC is Speech (voice), the machine responds to the call. In short, the machine receives every call.
This switch is useful for communication problems when the other terminal informs the above transfer capabilities although it is a fax machine.
Bit 7: Not used

6800CE(H) - User parameter switch 14 (SWUSR_0E)
Bit 0: Message printout while the machine is in Night Timer mode 0: On, 1: Off
Bit 1: Not used
Bit 2: Batch transmission 0: Off, 1: On
Bit 3: Fax mode settings, such as resolution, before a mode key (Copy/Fax/Printer /Scanner) is pressed
0: Not cleared, 1: Cleared
Bits 4 to 6: Not used
Bit 7: Manual service call (sends the system parameter list to the service station)
0: Off, 1: On

6800CF(H) - User parameter switch 15 (SWUSR_0F)
Bits 0, 1 and 2: Cassette for fax printout

Bit 2	1	0	Setting
0	0	1	1st paper feed station
0	1	0	2nd paper feed station
0	1	1	3rd paper feed station
1	0	0	4th paper feed station
1	0	1	LCT

Other settings Not used
Bits 3 and 4: Not used
Bit 5: Using the cassette specified by bits 0, 1 and 2 above only 0: On, 1: Off
Bits 6 and 7: Not used

6800D0(H) – User parameter switch 16 (SWUSR_10)
(This switch is not printed on the user parameter list.)
Bits 0 and 1: Not used
Bit 2: Paper size selection priority for an A4 size fax message when A4/LT size paper is not available.
0: A3 has priority, 1: B4 has priority
Bits 3 to 7: Not used

6800D1(H) – User parameter switch 17 (SWUSR_11)
Bits 0 and 1: Not used
Bit 2: Inclusion of the “Add” button when a sequence of Quick/Speed dials is selected for broadcasting
0:Not needed, 1: Needed
Bits 3 to 7: Not used

6800D2(H) - User parameter switch 18 (SWUSR_12)
Bit 0: TTI date 0: Off, 1: On
Bit 1: TTI sender 0: Off, 1: On
Bit 2: TTI file number 0: Off, 1: On
Bit 3: TTI page number 0: Off, 1: On
Bit 4 to 7: Not used

6800D3(H) - User parameter switch 19 (SWUSR_13)

Bit 0: Offset sort function for the fax (only using the shift tray on the 1,000 sheet finisher)
0: Disabled, 1: Enabled

Bit 1: Journal format
0: The Journal is separated into transmissions and receptions
1: The Journal is separated into PSTN and G4 (ISDN) communications

Bit 2: Action when the paper cassette that was selected by the specified cassette selection feature becomes empty.
(This switch is not printed on the user parameter list.)
0: The machine will not print any received files until paper is added.
1: The machine will use other cassettes to print received files that are not specified by this feature.

Bit 3: 90° image rotation during B5 portrait Tx
(This switch is not printed on the user parameter list.)
0: Off, 1: On

Bit 4: Reduction of sample images on reports to 50% in the main scan and sub-scan directions. (This switch is not printed on the user parameter list.)
0: Technician adjustment (printer switch 0E bits 3 and 4), 1: 50% reduction

Bit 5: Use of A5 size paper for reports
(This switch is not printed on the user parameter list.)
0: Off, 1: On

Bits 6 and 7: Line type selection for printing out to the one-bin tray (messages coming in on other lines do not go to the one-bin tray)

Bit 7	Bit 6	Setting
0	0	Disabled
0	1	PSTN
1	0	Not used
1	1	ISDN

6800D4(H) - User parameter switch 20 (SWUSR_14)

Bit 0: PC transmission mode
0: Direct Tx, 1: Memory Tx

Bit 1: Addition of fax TTI during PC memory transmission
0: Disabled, 1: Enabled

Bit 2: Checkered mark on printouts during PC printing
0: Disabled, 1: Enabled

Bit 3 and 4: Not used

Bit 5: Communication port for PC memory transmission
(This switch is not printed on the user parameter list.)
0: PSTN (the line used depends on bit 4), 1: ISDN G4

Bits 6 and 7: Buffer threshold for PC direct transmission
Keep this bit at “0,0” in most cases.
(This switch is not printed on the user parameter list.)

Bit 7	Bit 6	setting
0	0	Minimum (default)
0	1	:
1	0	:
1	1	Maximum

6800D5(H) - User parameter switch 21 (SWUSR_15)
Bit 0: PC fax reception 0: Disabled, 1: Enabled
Bits 1 and 2: PC fax reception mode

Bit 2	Bit 1	Setting
0	0	Direct rx
0	1	Memory rx
1	0	Not used
1	1	Memory rx and print on the fax machine

Bit 3: Automatic reduction when the machine transfers data to the PC from the machine. This switch is effective only for PC memory rx.
(This switch is not printed on the user parameter list.)
0: Enabled, 1: Disabled
Bits 4 and 5: Scan density for the “Light” setting.
(This switch is effective only when a PC scanner application with the CMF-TWAIN driver is used.)

Bit 5	Bit 4	Setting
0	0	Level 1 (default)
0	1	Level 1
1	0	Level 2
Other settings		Level1

Bits 6 and 7: Scan density for the “Dark” setting.
(This switch is effective only when a PC scanner application with the CMF-TWAIN driver is used.)

Bit 7	Bit 6	Setting
0	0	Level 5 (default)
0	1	Level 4
1	0	Level 5
Other settings		Level 5

6800D6(H) - User parameter switch 22 (SWUSR_16)
Bits 0 to 7: Not used

6800D7(H) – User Parameter switch 23 (SWUSR_17)
Bits 0 to 7: Not used

6800D8(H) - User parameter switch 24 (SWUSR_18)
Bits 0 and 1: File retention time (Cross reference: System switch 02 bit 4)

Bit 1	0	Setting
0	0	File retention impossible
0	1	24 hours
1	0	File retention impossible
1	1	72 hours

Bits 2 to 7: Not used

6800D9(H) - User parameter switch 25 (SWUSR_19)
Bits 0 to 3: Not used
Bit 4: RDS operation
0: Not acceptable
1: Acceptable for the limit specified by system switch 03
Note: This bit is only effective when RDS operation can be selected by the user (see system switch 02).
Bits 5 and 6: Not used
Bit 7: Daylight saving time 0: Disabled, 1: Enabled

6800DA(H) - User parameter switch 26 (SWUSR_1A)
(This switch is not printed on the user parameter list.)
Bit 0: Not used
Bit 1: PSTN Dialing type 0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing
Bits 2 to 7: Not used

6800DB(H) - User parameter switch 27 (SWUSR_1B)
PSTN-1 access code from behind a PABX
(This switch is not printed on the user parameter list.)

Access number	Hex value to program (BCD)
0	F0
⇩	⇩
0	F0
00	00
⇩	⇩
99	99

6800DC(H) to 6800DF - User parameter switch 28 to 31 (SWUSR_1C to 1F)
Bits 0 to 7: Not used

6800E0 to 6800EF(H) - G4 Parameter Switches
(Refer to the ISDN G4 option service manual for details.)

6800F0 to 68010F(H) - G4 Internal Switches
(Refer to the ISDN G4 option service manual for details.)

680110 to 68011E(H) - Service station's fax number (Service mode 09)
See 68027C(H) for the type of network used for this number**.**

68011F to 68012D(H) - Own fax PABX extension number
68012E to 68013C(H) - Own fax number (PSTN)
68013D to 68014B(H) - Own fax number (ISDN G4)
68014C to 68015A(H) - The first subscriber number (ISDN G3)
68015B to 680169(H) - The second subscriber number (ISDN G3)
68016A to 680178(H) - The first subscriber number (ISDN G4)
680179 to 680187(H) - The second subscriber number (ISDN G4)

680188 to 68019B(H) - PSTN RTI (Max. 20 characters - ASCII) - See the following note.
6801B0 to 6801EF(H) - TTI 1 (Max. 64 characters - ASCII) - See the following note.
6801F0 to 680229(H) - TTI 2 (Max. 64 characters - ASCII) - See the following note.
680230 to 680243(H) - PSTN CSI (Max. 20 characters - ASCII)
680258 to 68026B(H) - ISDN G3 CSI (Max. 20 characters - ASCII)
68026C(H) - Number of PSTN CSI characters (Hex)
68026E(H) - Number of ISDN G3 CSI characters (Hex)

NOTE: If the number of characters is less than the maximum (20 for RTI, 64 for TTI), add a stop code (FF[H]) after the last character.

680270(H) - ID code (low - Hex)
680271(H) - ID code (high - Hex)

680272(H) - Confidential ID (low - BCD)
680273(H) - Confidential ID (high - BCD)

68027C(H) - Network type used for the service station number
0 0 (H) - PSTN
0 D (H) - G4

680280 to 680287(H) - Last power off time (Read only)
680280(H) - 01(H) - 24-hour clock, 00(H) - 12-hour clock (AM), 02(H) - 12-hour clock (PM)
680281(H) - Year (BCD)
680282(H) - Month (BCD)
680283(H) - Day (BCD)
680284(H) - Hour
680285(H) - Minute
680286(H) - Second
680287(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

680294(H) - Optional equipment (Read only – Do not change the settings)
Bits 0 to 2: EXMEM board 0: Not installed, 1: Installed
Bit 3: Not used
Bit 4: EXFUNC board 0: Not installed, 1: Installed
Bit 5 to 7: Not used

680295(H) - Optional equipment (Read only – Do not change the settings)
Bit 0: EXFUNC board 0: Not installed, 1: Installed
Bit 1 to 4: Not used
Bit 5: Not used 0: Not installed, 1: Installed
Bit 6: ISDN unit 0: Not installed, 1: Installed
Bit 7: PC Fax Expander unit 0: Not installed, 1: Installed

680296(H) - Optional equipment (Read only – Do not change the settings)
Bit 0: Paper tray unit 0: Not installed, 1: Installed
Bit 1: Bypass Tray 0: Not installed, 1: Installed
Bit 2: LCT 0: Not installed, 1: Installed
Bit 3: Duplex unit 0: Not installed, 1: Installed
Bit 4: 1-bin sorter 0: Not installed, 1: Installed
Bit 5: Finisher 0: Not installed, 1: Installed
Bit 6: Bridge unit 0: Not installed, 1: Installed
Bit 7: Not used

680297(H) - Optional equipment (Read only – Do not change the settings)
Bit 0: Not used
Bit 1: Document feeder 0: Not installed, 1: Installed
Bit 2: Not used
Bit 3: Stamp unit
Bit 4: Copier Feature Expander
Bits 5 to 7: Not used

6802CC to 6802E3(H) - G4 terminal ID (ASCII - Max. 24 characters)
6802FD to 680300(H) - ISDN G3 sub-address
680301 to 680304(H) - ISDN G4 sub-address
680305 to 680309(H) - CiG4 board ROM information (Read only)
680305(H) - Suffix
680306(H) - Version (BCD)
680307(H) - Year (BCD)
680308(H) - Month (BCD)
680309(H) - Day (BCD)

680314 to 680319(H) - Modem ROM version (Read only)
680314(H) - Part number (low)
680315(H) - Part number (high)
680316(H) - Control (low)
680317(H) - Control (high)
680318(H) - DSP (low)
680319(H) - DSP (high)

68037E(H) - Time for economy transmission (hour in 24h clock format - BCD)
68037F(H) - Time for economy transmission (minute - BCD)

68039A(H) - Transmission monitor volume 00 - 07(H)
68039B(H) - Reception monitor volume 00 - 07(H)
68039C(H) - On-hook monitor volume 00 - 07(H)
68039D(H) - Dialing monitor volume 00 - 07(H)
68039E(H) - Buzzer volume 00 - 07(H)

6803A1 to 6803A5(H) - Periodic service call parameters

Parameters		Address (H)
Call interval: 01 through 15 month(s) (BCD) 00: Periodic service call disabled		**6803A1**
Date and time of the next call	Day: 01 through 31 (BCD)	**6803A4**
	Hour: 01 through 24 (BCD)	**6803A5**

6803AB to 6803AD(H) - Effective term of automatic service calls

Parameters	Address (H)
Year: last two digits of the year (BCD)	**6803AB**
Month: 01 through 12 (BCD)	**6803AC**
Day: 01 through 31 (BCD)	**6803AD**

680400 to 6804E0(H) - NCU parameters (Refer to section 4.3 for details)

680DC8 to 680DEF(H) - SC codes NOT for automatic service call

If the fax unit receives a copier engine SC code other than those programmed in these addresses, the fax unit sends an automatic service call report to the programmed service station.
Six SC codes have already been programmed at default, as shown in the table below. Fourteen more SC codes can be programmed, if required (if an address contains FF(H), a code is not programmed in it).
Program a SC code in four-digit BCD format as shown in the example below.
Example 1: SC code “329”
Address (High) - 03 (BCD)
Address (Low) - 29 (BCD)

Wildcard characters “a” or “A” can be used to specify a series of SC codes.
Example 2: SC code “900 to 999”
Address (High) – 09 (BCD)
Address (Low) – aa or AA (Hex)

Example 3: SC code “330 to 339”
Address (High) – 03 (BCD)
Address (Low) – 3a or 3A (Hex)

- Default settings -

High Address (H)	Data (BCD)	Low Address (L)	Data (BCD)	SC code
680DC8	03	680DC9	29	329
680DCA	03	680DCB	61	361
680DCC	03	680DCD	65	365
680DCE	05	680DCF	48	548
680DD0	06	680DD1	30	630
680DD2	09	680DD3	AA	900 to 999
680DD4 to 680DEE	FF(H)	680DD5 to 680DEF	FF(H)	Not Programmed

68849C to 688B9B(H) - Dedicated tx parameters for Quick Dial 01 - 56.
There are 32 bytes for each Quick Dial. Only the 23rd to 32nd bytes are used.
6884B2 to 6884BB(H) - Dedicated tx parameters for Quick 01
6884D2 to 6884DB(H) - Dedicated tx parameters for Quick 02
6884F2 to 6884FB(H) - Dedicated tx parameters for Quick 03
⇩
688B92 to 688B9B(H) - Dedicated tx parameters for Quick 56

688B9C to 68981B(H) - Dedicated tx parameters for Speed Dial #00 - #99.
There are 32 bytes for each Speed Dial. Only the 23rd to 32nd bytes are used.
688BB2 to 688BBB(H) - Dedicated tx parameters for Speed #00
688BD2 to 688BDB(H) - Dedicated tx parameters for Speed #01
688BF2 to 688BFB(H) - Dedicated tx parameters for Speed #02
⇩
689812 to 68981B(H) - Dedicated tx parameters for Speed #99

68E8E4 to 68E8E5(H) - Line type change (refer to section 2 for more details)
68E8E4(H) - Current line type setting
68E8E5(H) - New line type settings

69CA00 to 69CBFF(H) - Latest 64 error codes (Read only)

One error record consists of 8 bytes of data.

First error record start address – 69CA00(H)
Second error record start address – 69CA08(H)
Third error record start address – 69CA10(H)
:
64th error record start address – 69CBF8(H)

The format is as follows:
1st byte - Minute (BCD)
2nd byte - Hour (BCD)
3rd byte - Day (BCD)
4th byte - Month (BCD)
5th byte - Error code – low (BCD) [If the error code is 1-23, 23 is stored here.]
6th byte - Error code – high (BCD) [If the error code is 1-23, 01 is stored here.]
7th byte - Communication line (Hex)
PSTN: 00(H), PABX: 02(H), ISDN G3: 0C(H), ISDN G4: 0D(H)
8th byte - Not used

69E134 to 69E813(H) - Latest 20 error communication records (Read only)

One error communication record consists of 88 bytes. The format is as follows:

1st byte - Header
Bit 0: Communication result 0: OK, 1: NG
Bit 1: Document jam 1: Occurred
Bit 2: Power down 1: Occurred
Bit 3: Not used
Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes
Bit 5: Type of technical data 0: Rx level, 1: Measure of error rate
Bit 6: Error report 0: Not printed, 1: Printed
Bit 7: Data validity 0: Not valid, 1: Valid

2nd byte - Not used

3rd to 6th bytes - Date and time when the communication started
3rd byte - Month (BCD)
4th byte - Day (BCD)
5th byte - Hour (BCD)
6th byte - Minute (BCD)

7th and 8th bytes - Communication time
7th byte - Minutes (BCD)
8th byte - Seconds (BCD)

9th and 10th bytes - Number of pages transmitted or received
9th byte - Low byte (Hex)
10th byte - High byte (Hex)

11th and 12th bytes - Personal code or number of total/burst error lines
If bit 4 of the 1st byte is 0:
11th byte - Personal code (low - BCD)
12th byte - Personal code (high - BCD)
If bit 4 of the 1st byte is 1:
11th byte - Number of total error lines (Hex)
12th byte - Number of burst error lines (Hex)

13th byte - File number (low - Hex)
14th byte - File number (high - Hex)

15th and 16th bytes - Rx level or a measure of the error rate
If bit 5 of the 1st byte is 0:
15th byte - Rx level (low - Hex)
16th byte - Rx level (high - Hex)
If bit 4 of the 1st byte is 1:
15th byte - Measure of error rate (low - Hex)
16th byte - Measure of error rate (high - Hex)

17th byte - Final modem rate
Bits 0 to 3: Final modem speed

$$\begin{pmatrix} Bit0 \\ Bit1 \\ Bit2 \\ Bit3 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : 2.4\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : 4.8\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : 7.2\,\text{k} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : 9.6\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : 12.0\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 1 \\ 0 \end{pmatrix} : 14.4\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 1 \\ 0 \end{pmatrix} : 16.8\,\text{k}$$

$$\begin{pmatrix} Bit0 \\ Bit1 \\ Bit2 \\ Bit3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} : 19.2\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} : 21.6\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 1 \end{pmatrix} : 24.0\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 1 \end{pmatrix} : 26.4\,\text{k} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 1 \end{pmatrix} : 28.8\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix} : 31.2\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 1 \\ 1 \end{pmatrix} : 33.6\,\text{k}$$

Bits 4 to 6: Final modem type

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{V.27ter} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{V.29} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{V.33} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{V.17 (Long)} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{V.17 (Short)}$$

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} : V.34\ 2400\,baud \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 1 \end{pmatrix} : V.34\ 3000\,baud \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 1 \end{pmatrix} : V.34\ 3200\,baud \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 1 \end{pmatrix} : V.34\ 2800\,baud \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix} : V.34\ 3429\,baud$$

18th to 20th byte - Not used

21st to 44th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

45th byte - Communication mode #1
Bits 0 - 1: Network

$$\begin{pmatrix} Bit0 \\ Bit1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} : PSTN \quad \begin{pmatrix} 0 \\ 1 \end{pmatrix} : ISDN$$

Bit 2: Communication protocol 0: G3, 1: G4
Bit 3: ECM 0: Off, 1: On
Bits 4 to 7: Communication mode used

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Normal} \quad \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{Transfer}$$

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Forwarding} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{Automatic Service Call}$$

46th byte - Communication mode #2

Bit 0: Tx or Rx 0: Tx, 1: Rx
Bit 1: Reduction during Tx 0: Not reduced, 1: Reduced
Bit 2: Batch transmission 0: Not used, 1: Used
Bit 3: Send later transmission 0: Not used, 1: Used
Bit 4: Transmission from 0: ADF, 1: Memory
Bits 5 to 7: Not used

47th byte - Not used

48th byte - Number of errors during communication (Hex)

49th to 52nd byte - 1st error code and page number where the error occurred
- 49th byte - Page number where the error occurred (low - Hex)
- 50th byte - Page number where the error occurred (high - Hex)
- 51st byte - Error code (low - BCD)
- 52nd byte - Error code (high - BCD)

53rd to 56th byte - 2nd error code and page number where the error occurred
57th to 60th byte - 3rd error code and page number where the error occurred
61st to 64th byte - 4th error code and page number where the error occurred
65th to 68th byte - 5th error code and page number where the error occurred
69th to 72nd byte - 6th error code and page number where the error occurred
73rd to 76th byte - 7th error code and page number where the error occurred
77th to 80th byte - 8th error code and page number where the error occurred
81st to 84th byte - 9th error code and page number where the error occurred
85th to 88th byte - 10th error code and page number where the error occurred

7644F0 to 76B56F(H) - Dedicated tx parameters for Speed Dial #100 - #999, when the optional EXFUNC board is installed.
There are 32 bytes for each Speed Dial. Only the 23rd to 32nd bytes are used.

764506 to 76450F(H) - Dedicated tx parameters for Speed #100
764526 to 76452F(H) - Dedicated tx parameters for Speed #101
764546 to 76454F(H) - Dedicated tx parameters for Speed #102
⇩
76B566 to 76B56F(H) - Dedicated tx parameters for Speed #999

PREVENTIVE MAINTENANCE

5. PREVENTIVE MAINTENANCE

5.1 SPECIAL TOOLS AND LUBRICANTS

- Flash/SRAM data copy tool (P/N: A1939353)
- Flash Memory Card – 4MB (P/N: A2309352)
- Card Case (P/N: A2309351)

5.2 PM TABLE

No PM necessary for the fax option.

REPLACEMENT AND ADJUSTMENT

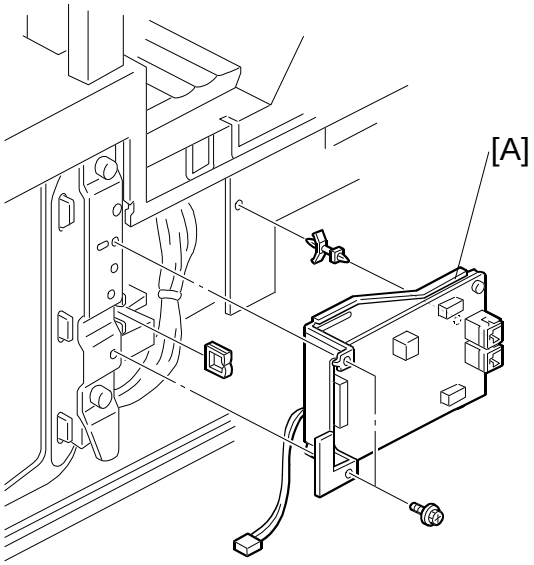
6. REPLACEMENT AND ADJUSTMENT

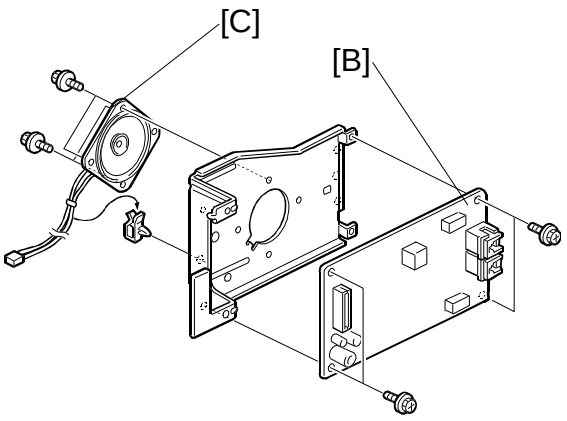
6.1 PRECAUTION

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

6.2 NCU AND SPEAKER

NOTE: If the machine has an optional finisher and/or a mailbox installed, remove it/them before starting the following procedure.



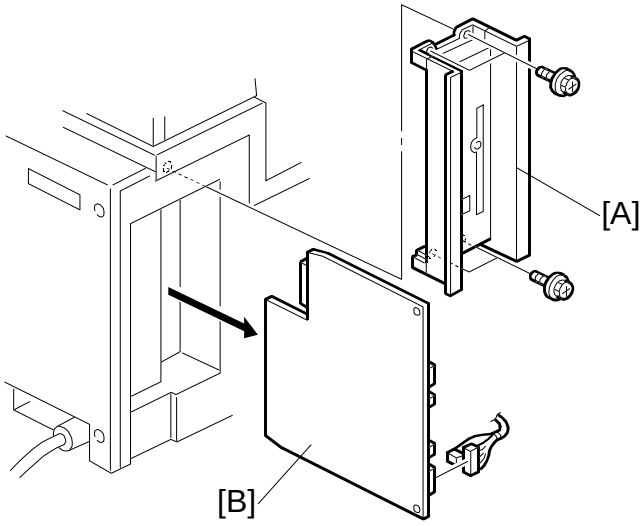


1. Remove the rear cover and the left side cover (4 screws each).
2. Remove the NCU/speaker assembly [A] (2 screws).
3. Remove the NCU [B] (4 screws) and speaker [C] (2 screws) from the assembly.

6.3 FCU

6.3.1 REMOVAL

NOTE: If the machine has an optional finisher and/or a mailbox installed, remove it/them before starting the following procedure.



1. Remove the rear cover and the left side cover (4 screws each).
2. Remove the FCU bracket [A] (4 screws), then the FCU [B] (2 connectors).
3. Go to one of the following procedures:
   - To restore SRAM data from the old FCU (if you do not have the latest data backup) – Go to section 6.3.2.
   - To restore SRAM data from a flash memory card backup – Go to section 6.3.3.

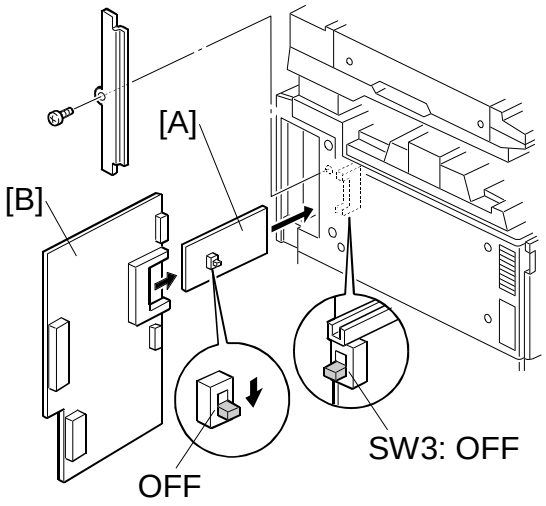
6.3.2 SRAM DATA RESTORE FROM FCU

Before restoring the SRAM data, install a new FCU and initialize the SRAM on the new FCU using the following procedure.

1. Install a new FCU in the machine (see section 6.3.1)
   NOTE: Do not install the EXFUNC and EXMEM yet, if they were present.
2. Turn on the machine. The machine displays “SC1201”.
   NOTE: The machine always displays “SC1201” the first time the FCU is installed. Please ignore it.
3. Press OK to initialize the SRAM.

Then, restore the SRAM using the following procedure.

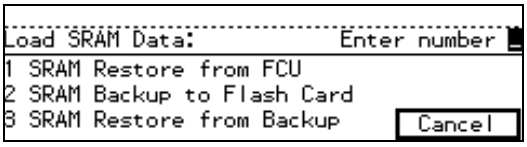
4. Turn off the machine.
5. Connect the data copy tool [A] with the old FCU [B] to the card slot as shown. See the note below for the switch settings.



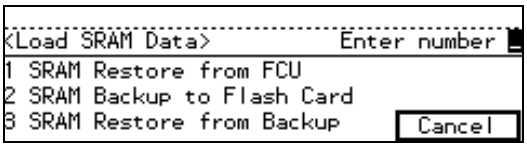
IMPORTANT: Support the old FCU by hand from now until the end of the download procedure

NOTE: 1) The switch on the data copy tool must be OFF.
2) SW3 below the card slot must be OFF (lower position).
3) Do not turn off the battery switch (SW1) on the old FCU.

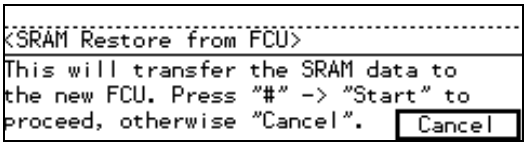
6. Turn on the machine, and enter the fax service mode.
7. Press [1] [6] then [2].



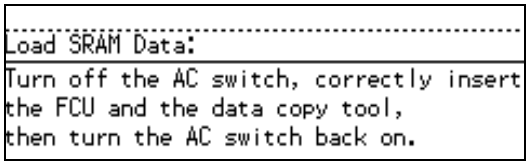
8. Press [1].



If the switch settings are correct, the message on the right appears. Then go to the next step.



If the one of the switch settings is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure.



9. Press “#” then ⊡.
   If data has been restored successfully, the message on the right appears.

<SRAM Restore from FCU>
Loading Completed

Turn the AC switch off then back on.

10. Turn off the main power switch then disconnect the tools.
11. Install the EXFUNC and EXMEM if they were present.
12. Turn the machine back on.
13. Print the system parameter list to check if the previous settings have been successfully recovered.

6.3.3 SRAM DATA RESTORE FROM FLASH CARD BACKUP

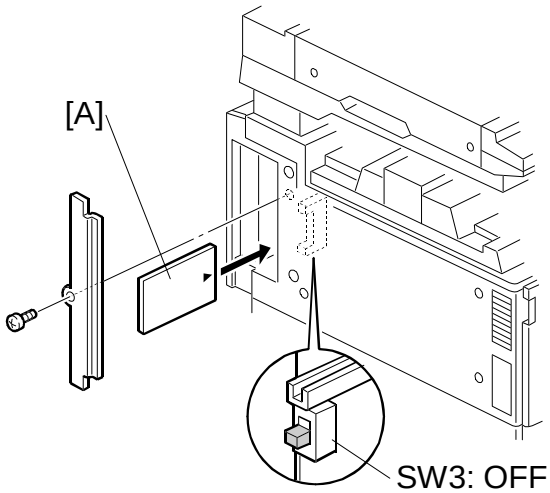
SRAM data can be copied to a flash memory card. For how to do this, refer to section 6.4.3.

Before restoring the SRAM data, install a new FCU and initialize the SRAM on the new FCU using the following procedure.

1. Install a new FCU in the machine (see section 6.3.1).
2. Turn on the machine. The machine displays “SC1201”.
   NOTE: The machine always displays “SC1201” the first time the FCU is installed. Please ignore it.
3. Press OK to initialize the SRAM.

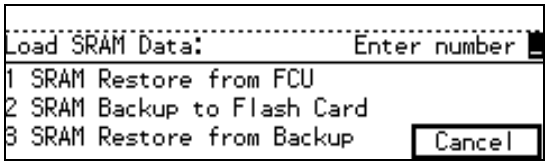
Then, restore the SRAM using the following procedure.

4. Turn off the machine.
   NOTE: If the EXFUNC board was present; make sure that the backup of EXFUNC and FCU SRAM is available, then install the EXFUNC.
   If this backup is not available, restore the data from the old FCU. After restoring, connect the EXSAF to the new FCU.

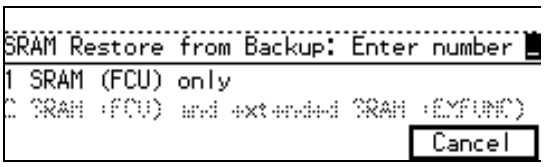


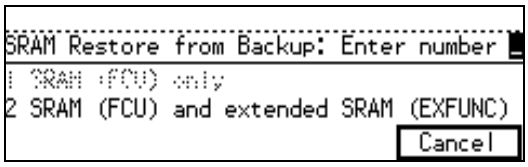
5. Connect the flash memory card [A] to the card slot as shown.
   See the note below for the switch settings.
   NOTE: 1) SW3 below the card slot must be OFF (lower position).
   2) If the switch setting is wrong, the fax function will not start up.
6. Turn on the machine, and enter the fax service mode.

7. Press 1 6 then 2.



8. Press 3.
   If the switch settings are correct, either of the messages below appears.

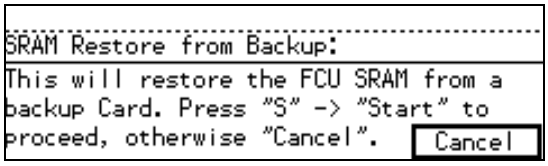




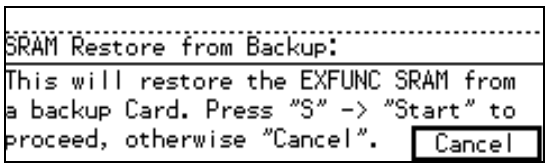
   Refer to the table below for which type of backup must be used, depending on the presence of EXFUNC.

EXFUNC	Type of backup	
	FCU SRAM	FCU and EXFUNC SRAM
Not present	OK	Do not use.
Present	Do not use.	OK

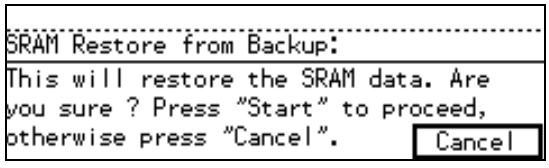
9. Press either of the following:
   1 – Standard SRAM only



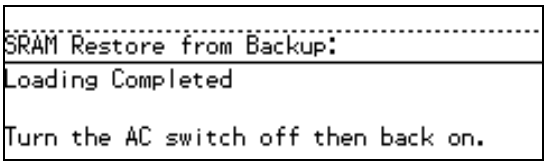
   2 – Standard SRAM and SRAM on the EXFUNC.



10. Press "S" then ◇; a confirmation message appears.



11. Press Start to restore the SRAM.
    If data has been restored successfully, the message on the right appears.



12. Turn off the main power switch then disconnect the card.
13. Turn the machine back on.
14. Print the system parameter list to check if the previous settings have been successfully recovered.

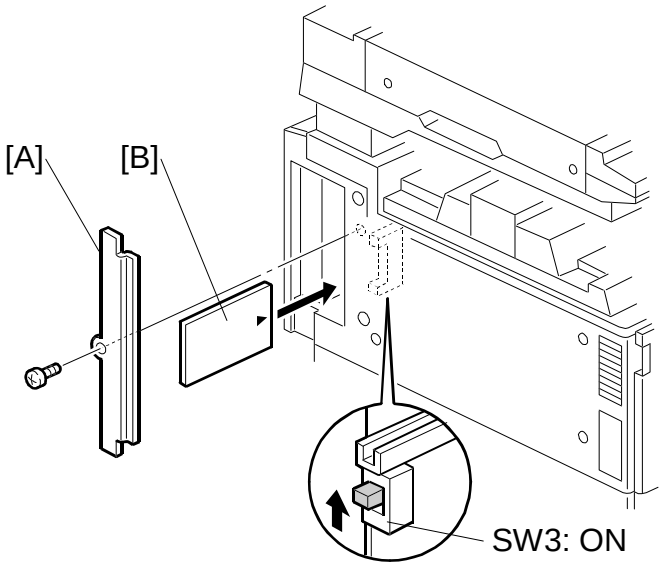
6.4 ROM UPDATE

6.4.1 FCU ROM DOWNLOAD

This function updates the FCU ROM using a flash memory card.

NOTE: The flash memory card must be programmed with FCU ROM data as explained in section 6.6.

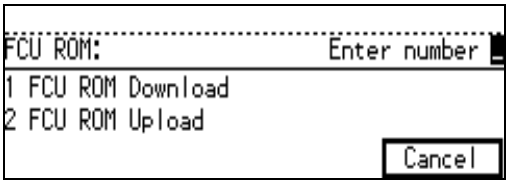
1. Turn off the machine and remove the bracket [A].



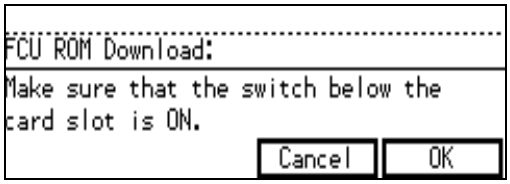
2. Connect the flash memory card [B] to the card slot as shown.

   NOTE: SW3 below the card slot must be **ON** (upper position).

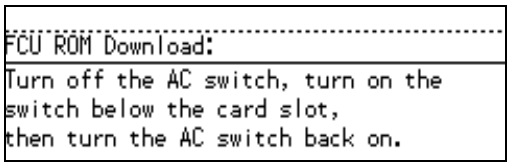
3. Turn on the machine and enter the fax service mode.
4. Press 1 6 then 1.



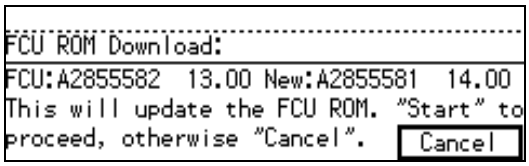
5. Press 1.
   If the switch setting is correct, the message on the right appears. Then go to the next step.



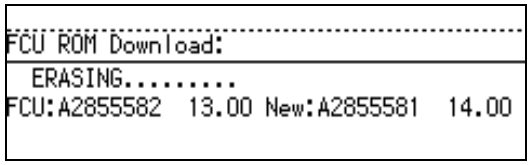
If the switch setting is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure again.



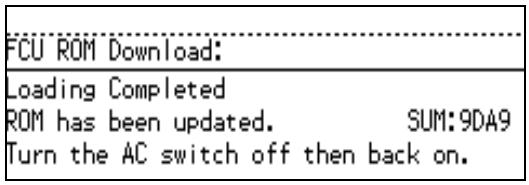
6. Press OK, then check the ROM version.
   If the card does not contain FCU ROM data, “Please check flash card” appears. Turn off the machine and retry the procedure with the correct card.



7. Press Start.



After the machine updates the ROM data, the message on the right appears.

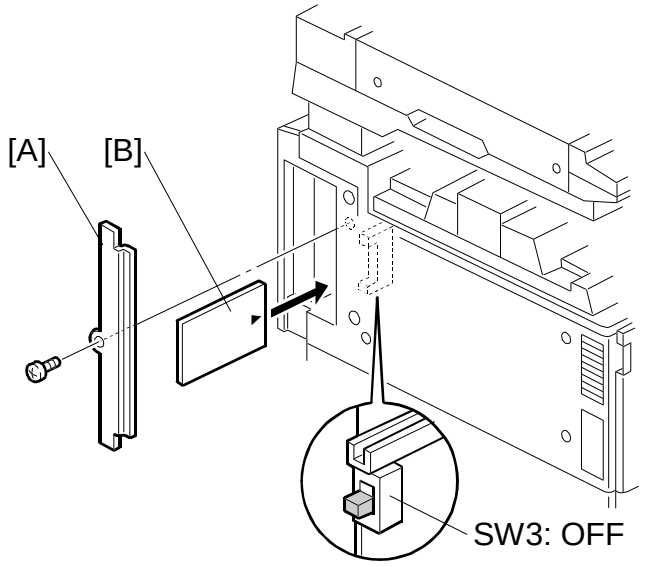


8. Turn off the main power switch then disconnect the flash memory card.
9. Turn the machine back on.
10. Print the system parameter list to check if the new ROM version is printed.

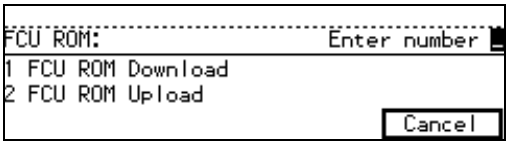
6.4.2 FCU ROM UPLOAD

This function makes a copy of the FCU ROM inside the machine onto a flash memory card.

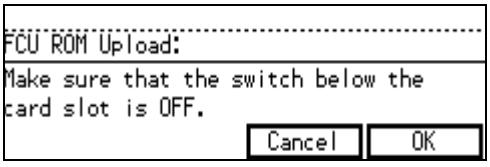
NOTE: This procedure erases the flash memory card completely before uploading ROM data.



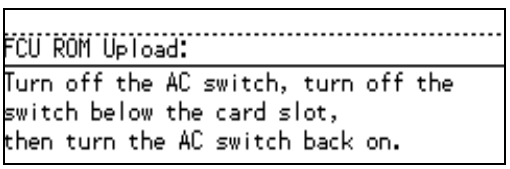
1. Turn off the machine and remove the bracket [A].
2. Connect the flash memory card [B] to the card slot as shown.
   NOTE: SW3 below the card slot must be **OFF** (lower position).
3. Turn on the machine and enter the fax service mode.
4. Press 1 6 then 1.



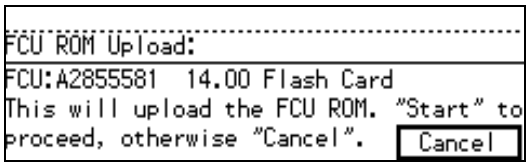
5. Press 2.
   If the switch setting is correct, the message on the right appears. Then go to the next step.



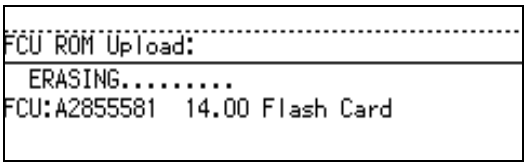
   If the switch setting is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure.



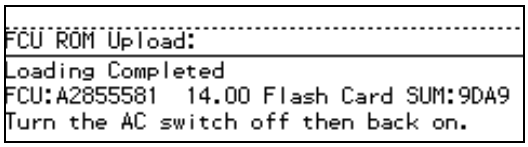
6. Press OK, then check the ROM version.



7. Press Start.



After the machine updates the ROM data, the message on the right appears.



8. Turn off the main power switch then disconnect the flash memory card.
9. Turn the machine back on.

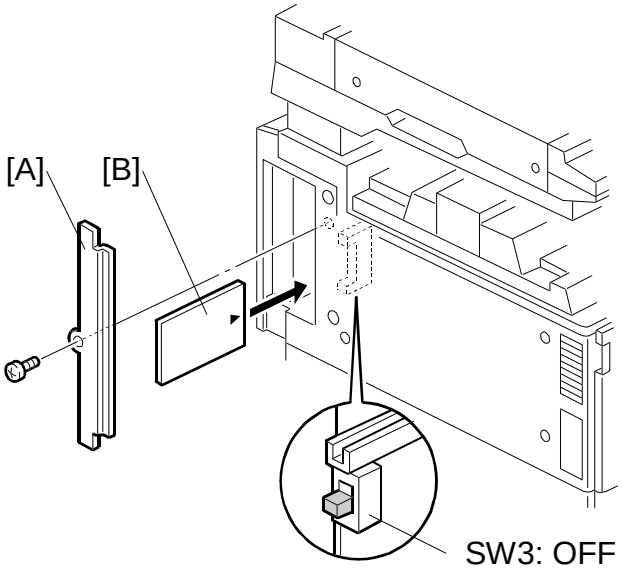
6.4.3 SRAM BACKUP TO A FLASH MEMORY CARD

This function makes a backup copy of all the fax SRAM data onto a flash memory card. If a computer based PC card writer system is available, the backup can be saved as a computer file from the flash memory card.

If the EXSAF board is not installed, this function makes a backup copy of the standard SRAM on the FCU.
If the EXSAF board is installed, this function makes a backup copy of the standard SRAM and the SRAM on the optional EXSAF board.

NOTE: This procedure erases the flash memory card completely before uploading SRAM data.

1. Turn off the machine and remove the bracket [A].

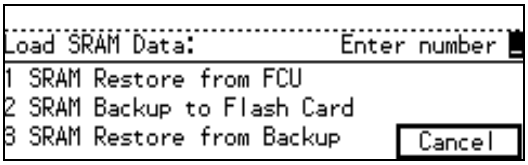


2. Connect the flash memory card [B] to the card slot as shown.

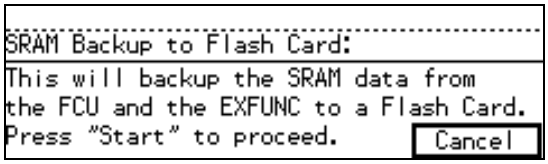
   NOTE: SW3 below the card slot must be **OFF** (lower position).

3. Turn on the machine and enter the fax service mode.

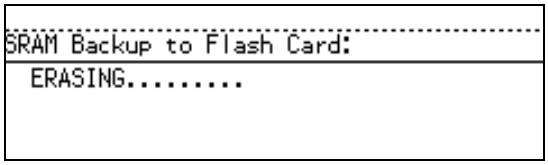
4. Press 1 6 then 2.



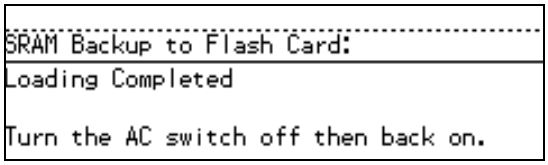
5. Press 2.



6. Press Start.



After the machine backs up the data to the flash card, the message on the right appears.



7. Turn off the main power switch then disconnect the flash memory card.
8. Turn the machine back on

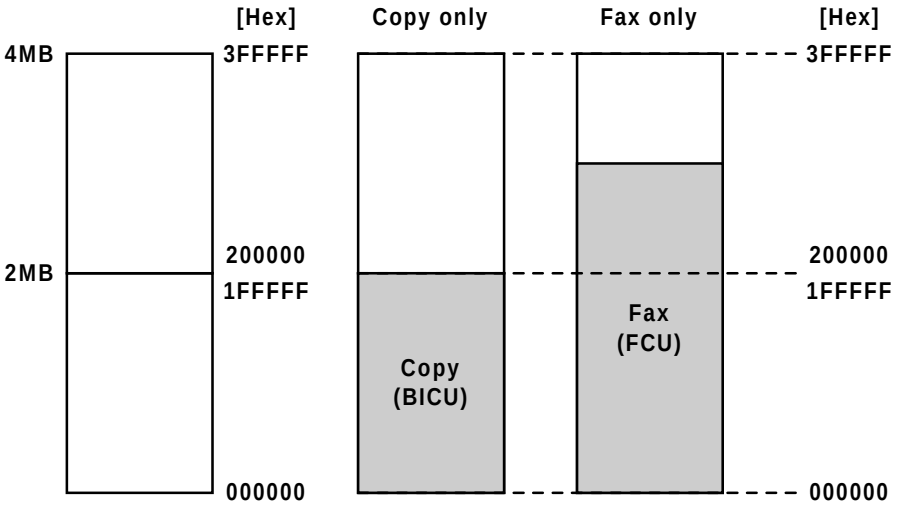
The data in the flash card can be copied to a PC for safe keeping. This data can then be uploaded from the PC to a flash memory card if the SRAM data has to be restored later.

Refer to the SwapFTL manual for details.

6.5 DATA ADDRESS RANGES ON THE CARD

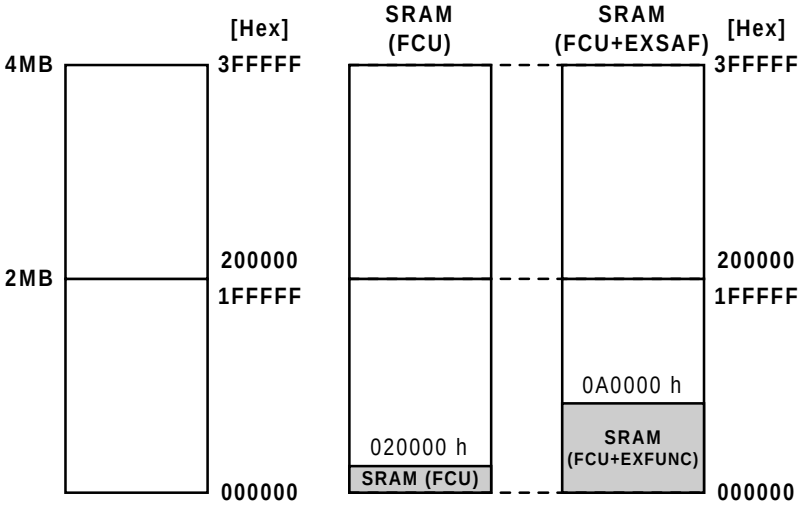
The following sections show how ROM and RAM data must be programmed before downloading, or how data is uploaded onto the 4MB flash memory card.

6.5.1 FCU AND BICU ROM DATA



Start Address (Hex)	0	0
Length (Hex)	200000	300000
Size (kB)	2,000 (2MB)	3,000 (3MB)

6.5.2 MODEM ROM AND SRAM DATA



Start Address (Hex)	0	0
Length (Hex)	20000	A0000
Size (kB)	256	128+512

TROUBLESHOOTING

7. TROUBLESHOOTING

7.1 ERROR CODES

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

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	• Check the line connection. • Check the NCU - FCU connectors. • The machine at the other end may be incompatible. • Replace the NCU or FCU. • Check for DIS/NSF with an oscilloscope. • If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	• The other party is out of paper or has a jammed printer. • The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	• The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	• Check the line connection. • Check the NCU - FCU connectors. • Try changing the tx level and/or cable equalizer settings. • Replace the FCU or NCU. • The other terminal may be faulty; try sending to another machine. • If the rx signal is weak or defective, there may be a bad line. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters - Section 4
0-05	Unsuccessful after modem training at 2400 bps	• Check the line connection. • Check the NCU - FCU connectors. • Try adjusting the tx level and/or cable equalizer. • Replace the FCU or NCU. • Check for line problems. **Cross reference** • See error code 0-04.

Code	Meaning	Suggested Cause/Action
0-06	The other terminal did not reply to DCS	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. • The other end may be defective or incompatible; try sending to another machine. • Check for line problems. **Cross reference** • See error code 0-04.
0-07	No post-message response from the other end after a page was sent	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed or run out of paper. • The other end user may have disconnected the call. • Check for a bad line. • The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed, or run out of paper or memory space. • Try adjusting the tx level and/or cable equalizer settings. • The other end may have a defective modem/NCU/FCU; try sending to another machine. • Check for line problems and noise. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters - Section 4
0-14	Non-standard post message response code received	• Check the FCU - NCU connectors. • Incompatible or defective remote terminal; try sending to another machine. • Noisy line: resend. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. **Cross reference** • See error code 0-08.

Code	Meaning	Suggested Cause/Action
0-15	The other terminal is not capable of specific functions.	The other terminal is not capable of accepting the following functions, or the other terminal's memory is full. • Confidential rx • Transfer function • SEP/SUB/PWD/SID
0-16	CFR or FTT not detected after modem training in confidential or transfer mode	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Try adjusting the tx level and/or cable equalizer settings. • The other end may have disconnected, or it may be defective; try calling another machine. • If the rx signal level is too low, there may be a line problem. **Cross reference** • See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel.
0-20	Facsimile data not received within 6 s of retraining	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Check for line problems. • Try calling another fax machine. • Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. **Cross reference** • Reconstruction time - G3 Switch 0A, bit 6 • Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	• Check the connections between the FCU, NCU, & line. • Check for line noise or other line problems. • Replace the NCU or FCU. • The remote machine may be defective or may have disconnected. **Cross reference** • Maximum interval between EOLs and between ECM frames - G3 Bit Switch 0A, bit 4

Code	Meaning	Suggested Cause/Action
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 200 ms)	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try adjusting the acceptable modem carrier drop time. **Cross reference** • Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1
0-23	Too many errors during reception	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try asking the other end to adjust their tx level. • Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN) • Rx error criteria - Communication Switch 02, bits 0 and 1
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • The other terminal may not be compatible. **Cross reference** • Dedicated tx parameters - Section 4
0-32	The other terminal sent a DCS, which contained functions that the receiving machine cannot handle.	• Check the protocol dump list. • Ask the other party to contact the manufacturer.
0-52	Polarity changed during communication	• Check the line connection. Retry communication.
0-70	The communication mode specified in CM/JM was not available (V.8 calling and called terminal)	• The other terminal did not have a compatible communication mode (e.g., the other terminal was a V.34 data modem and not a fax modem.) • A polling tx file was not ready at the other terminal when polling rx was initiated from the calling terminal.
0-74	The calling terminal fell back to T.30 mode, because it could not detect ANSam after sending CI.	• The calling terminal could not detect ANSam due to noise, etc. • ANSam was too short to detect. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.

Code	Meaning	Suggested Cause/Action
0-75	The called terminal fell back to T.30 mode, because it could not detect a CM in response to ANSam (ANSam timeout).	• The terminal could not detect ANSam. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-76	The calling terminal fell back to T.30 mode, because it could not detect a JM in response to a CM (CM timeout).	• The called terminal could not detect a CM due to noise, etc. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.
0-77	The called terminal fell back to T.30 mode, because it could not detect a CJ in response to JM (JM timeout).	• The calling terminal could not detect a JM due to noise, etc. • A network that has narrow bandwidth cannot pass JM to the other end. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-79	The called terminal detected CI while waiting for a V.21 signal.	Check for line noise or other line problems. If this error occurs, the called terminal falls back to T.30 mode.
0-80	The line was disconnected due to a timeout in V.34 phase 2 – line probing.	• The guard timer expired while starting these phases. Serious noise, narrow bandwidth, or low signal level can cause these errors. If these errors happen at the transmitting terminal: • Try making a call at a later time. • Try using V.17 or a slower modem using dedicated tx parameters. • Try increasing the tx level. • Try adjusting the tx cable equalizer setting. If these errors happen at the receiving terminal: • Try adjusting the rx cable equalizer setting. • Try increasing the tx level. • Try using V.17 or a slower modem if the same error is frequent when receiving from multiple senders.
0-81	The line was disconnected due to a timeout in V.34 phase 3 – equalizer training.	
0-82	The line was disconnected due to a timeout in the V.34 phase 4 – control channel start-up.	
0-83	The line was disconnected due to a timeout in the V.34 control channel restart sequence.	
0-84	The line was disconnected due to abnormal signaling in V.34 phase 4 – control channel start-up.	• The signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.
0-85	The line was disconnected due to abnormal signaling in V.34 control channel restart.	• The signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.
0-86	The line was disconnected because the other terminal requested a data rate using MPh that was not available in the currently selected symbol rate.	• The other terminal was incompatible. • Ask the other party to contact the manufacturer.

Code	Meaning	Suggested Cause/Action
0-87	The control channel started after an unsuccessful primary channel.	• The receiving terminal restarted the control channel because data reception in the primary channel was not successful. • This does not result in an error communication.
0-88	The line was disconnected because PPR was transmitted/received 9 (default) times within the same ECM frame.	• Try using a lower data rate at the start. • Try adjusting the cable equalizer setting.
2-10	The modem cannot enter tx mode	• Replace the FCU.
2-11	Only one V.21 connection flag was received	• Replace the FCU.
2-12	Modem clock irregularity	• Replace the FCU.
2-13	Modem initialization error	• Turn off the machine, then turn it back on. • Update the modem ROM. • Replace the FCU.
2-20	Abnormal coding/decoding (cpu not ready)	• Replace the FCU.
2-23	JBIG compression or reconstruction error	• Turn off the machine, then turn it back on. • Replace the EXFUNC board if the error is frequent.
2-24	JBIG ASIC error	• Turn off the machine, then turn it back on. • Replace the EXFUNC board if the error is frequent.
2-25	JBIG data reconstruction error (BIH error)	• JBIG data error • Check the sender's JBIG function. • Update the FCU ROM.
2-26	JBIG data reconstruction error (Float marker error)	
2-27	JBIG data reconstruction error (End marker error)	
2-28	JBIG data reconstruction error (Timeout)	
2-50	The machine resets itself for a fatal FCU system error	• If this is frequent, update the ROM, or replace the FCU.
2-51	The machine resets itself because of a fatal communication error	• If this is frequent, update the ROM, or replace the FCU.
3-00	G4 interface board reset	• Replace the G4 interface board or FCU.
3-10	Disconnection during ISDN G3 communication	• Check the other terminal and the ISDN line. • The other terminal may have dialed a wrong number.
3-11	Disconnection during ISDN G4 communication	• Check the other terminal and the ISDN line.
3-20	A CSA signal was received during ISDN G4 communication	• The operator at the other terminal may have interrupted the communication.

Code	Meaning	Suggested Cause/Action
3-21	A CSA signal was sent during ISDN G4 communication, because the Stop key was pressed	• The local operator has interrupted the communication.
3-30	Mismatched specifications (rx capability)	• Check the receive capabilities requested from the other terminal.
4-01	Line current was cut	• Check the line connector. • Check the connection between FCU and NCU. • Check for line problems. • Replace the FCU or the NCU.
4-10	Communication failed because of an ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	• Get the ID Codes the same and/or the CSIs programmed correctly, then resend. • The machine at the other end may be defective.
5-00	Data construction not possible	• Replace the FCU.
5-01	Data reconstruction not possible	
5-10	DCR timer expired	
5-20	Storage impossible because of a lack of memory	• Temporary memory shortage. • Test the SAF memory. • Replace the FCU or optional EXMEM board
5-21	Memory overflow	
5-22	Mode table overflow after the second page of a scanned document	• Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	• Test the SAF memory. • Ask the other end to resend the message. • Replace the FCU or optional EXMEM board.
5-24	Memory overflow after the second page of a scanned document	• Try using a lower resolution setting. • Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	• Replace the FCU or EXMEM board.
6-00	G3 ECM - T1 time out during reception of facsimile data	• Try adjusting the rx cable equalizer. • Replace the FCU or NCU.
6-01	G3 ECM - no V.21 signal was received	
6-02	G3 ECM - EOR was received	

Code	Meaning	Suggested Cause/Action
6-04	G3 ECM - RTC not detected	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU. • Try adjusting the rx cable equalizer **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN)
6-06	G3 ECM - coding/decoding error	• Defective FCU. • The other terminal may be defective.
6-08	G3 ECM - PIP/PIN received in reply to PPS.NULL	• The other end pressed Stop during communication. • The other terminal may be defective.
6-09	G3 ECM - ERR received	• Check for a noisy line. • Adjust the tx levels of the communicating machines. • See code 6-05.
6-10	G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps	• Check for line noise. • Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). • Check the line connection. • Defective remote terminal.
6-21	V.21 flag detected during high speed modem communication	• The other terminal may be defective or incompatible.
6-22	The machine resets the sequence because of an abnormal handshake in the V.34 control channel	• Check for line noise. • If the same error occurs frequently, replace the FCU. • Defective remote terminal.
6-99	V.21 signal not stopped within 6 s	• Replace the FCU.

Code	Meaning	Suggested Cause/Action
9-40	CRC error during PC fax communication	• Check the serial interface and cable connection between the PC. • Replace the DIU (PCFE board) or FCU.
9-41	Third failure during PC fax communication	
9-42	DCN received unexpectedly during PC fax communication	
9-43	Frame received unexpectedly during PC fax communication	
9-44	Response time over during PC fax communication	
9-45	Frame transmission error during PC fax communication	
9-61	Memory overflow occurs during reception	Check the SAF.
22-00	Original length exceeded the maximum scan length	• Divide the original into more than one page. • Check the resolution used for scanning. Lower the scan resolution if possible. • Add optional page memory.
22-01	Memory overflow while receiving	• Wait for the files in the queue to be sent. • Delete unnecessary files from memory. • Transfer the substitute reception files to an another fax machine, if the machine's printer is busy or out of order. • Add an optional SAF memory card or hard disk.
22-02	Tx or rx job stalled due to line disconnection at the other end	• The job started normally but did not finish normally; data may or may not have been received fully. • Restart the machine.
22-04	The machine cannot store received data in the SAF	• Update the ROM • Replace the FCU.
23-00	Data read timeout during construction	• Restart the machine. • Replace the FCU
24-xx		•
25-00	The machine software resets itself after a fatal transmission error occurred	• Update the ROM • Replace the FCU.
F0-xx	V.34 modem error	• Replace the FCU.

7.2 FAX SC CODES

7.2.1 OVERVIEW

When the FCU detects a Fax SC Code condition other than SC1201 and SC1207, it resets itself automatically (default setting). This initializes the FCU without erasing files in the SAF memory or resetting the switches.

NOTE: For details on Fax SC Codes 1201 and 1207, refer to the following sections.

If bit 7 of System Switch 1F is changed to “1”, when the FCU detects a Fax SC Code condition, it displays the code on the display and stops working until the fax unit is initialized using one of the following methods:

- Hold down the “#” and “*” keys for more than 10 s.
- Turn off the main power switch and turn it back on.
- Remove the rear cover, and press SW2 on the FCU.

The fax unit cannot make automatic service calls in reaction to a Fax SC Code, because the fax unit cannot make fax communications in fax SC code conditions.

7.2.2 SC1201

When the FCU detects an unrecoverable error in the SRAM, which requires a complete SRAM initialization, the fax unit displays this SC Code and stops. There is no way to recover from this error condition without a complete SRAM initialization (all the user and service programmed data will be erased).

The possible causes are:

- SRAM backup battery defect, or SW1 on the FCU is at the “OFF” position
- SRAM on the FCU has a physical defect
- Flash memory card or data copy tool connection was loose

7.2.3 SC1207

This is the same as SC1201 except the error location is the SRAM on the EXFUNC board.

The possible causes are:

- SRAM backup battery defect, or SW1 on the EXFUNC board is at the “OFF” position.
- SRAM on the EXFUNC has a physical defect.
- The EXFUNC connection was loose.

7.2.4 FAX SC CODE TABLE

SC Code	Description	Suggested Action	Sys Switch 1F bit 7 = 0	Sys Switch 1F bit 7 = 1
1102	Handshake error with BiCU at start-up	Initialize the fax unit. (See section 7.2.1.for the initialization procedure)	Automatic reset	SC Code display
1111	Command TX/RX error to/from the BiCU			
1112	Base copier's engine was reset			
1120	Interface module error			
1201	Unrecoverable FCU - SRAM error	Refer to section 7.2.2.	SC Code display	
1207	Unrecoverable EXFUNC - SRAM error	Refer to section 7.2.3.	SC Code display	
1299	Software error	Turn off and on the main switch.	Automatic reset	
1301	Original size error	Check the scanner mechanism.		
1302	Scanner parameter error	Initialize the fax unit.		
1303	Software error	Initialize the fax unit.		
1304				
1305				
1306				
1308				
1313				
1314				
1316				
1318				
1323				
1324				
1326				
1328				
1334				
1338				
1401	Command timeout error - after scanning	Initialize the fax unit.		
1402	Software error	Initialize the fax unit.		
1403				
1404				
1405	Command timeout error - during storage	Check the connection for the FCU.		
1406	Command timeout error - original feed out	Initialize the fax unit.		
1410	Software error	Initialize the fax unit.		
1601				

⇒7.3 FIRMWARE HISTORY

7.3.1 A874 FIRMWARE MODIFICATION HISTORY

A874 FAX OPTION FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
Initial Production	A2855581 **A**	Initial Production	16.01
• When sending an original wider than the maximum paper width of the receiving machine (Auto-Reduction OFF / JBIG compression), the machine reduces the image to the smaller size but sends the left most area of the image instead of the central area. • Even though the following bit switch settings should disable the File Retention function, the machine retains files for 24 hours: User Parameter switch 24 (swusr_18): (bit1, bit0) = (1, 0) • When bit 4 of Communication switch07 is 1 (Fallback from G4 to G3 when G4 communication fails on the ISDN B-channel is enabled) and a G4 communication error occurs on the ISDN B-channel (ADF mode), the machine falls back to G3 and resumes transmission from the second page. This is because the first page has already exited from the ADF.	A2855581 **B**	April '00 Production	18.00

TECHNICAL SERVICE BULLETINS

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 - 001 **05/30/2000**

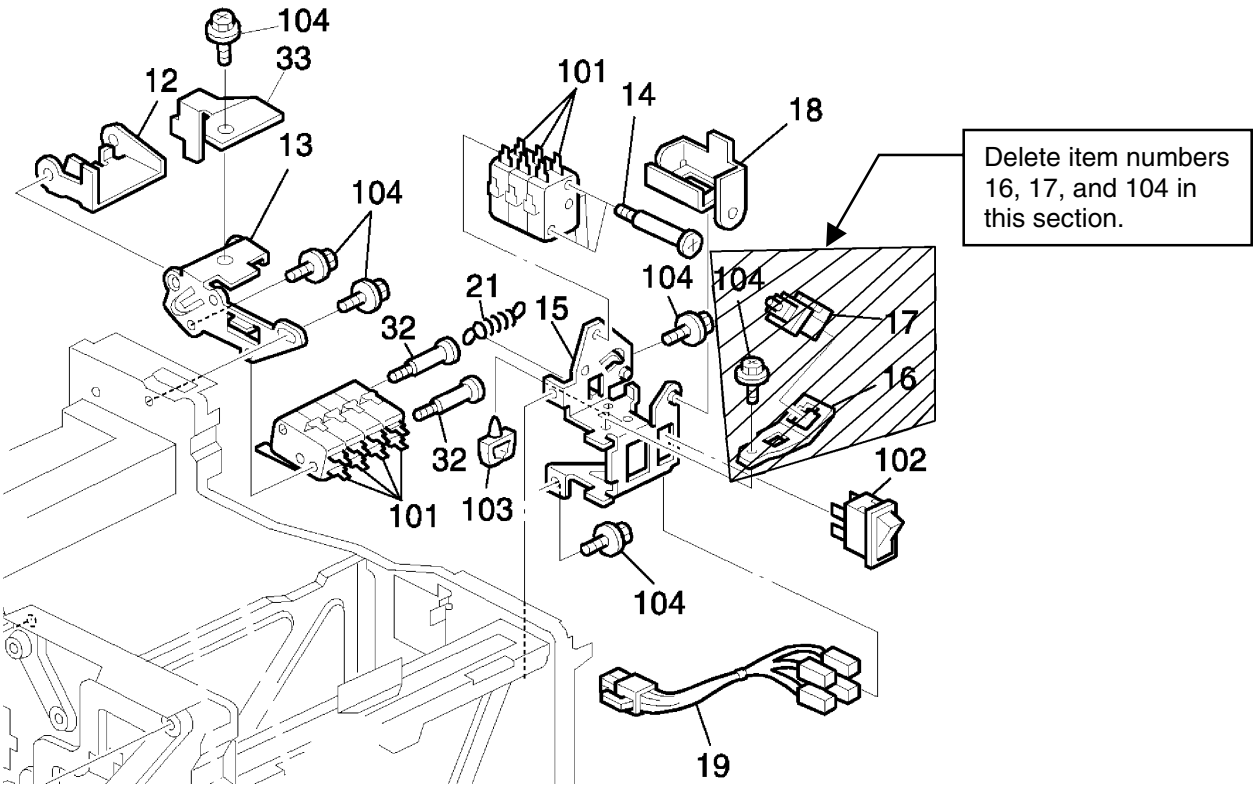
APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: ANGLE BRACKET & PUSH SWITCH

GENERAL:

The following parts corrections are being issued for all A283 and A284 Parts Catalogs.



				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2325867		Angle Bracket – Push Switch	1-0	63	16
AW500022		Push Switch	1-0	63	17
A2323552	A2323561	Ball Bearing 8x22x7	1-1	57	24

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 - 002 **08/22/2000**

APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: SERVICE MANUAL - INSERT

■ SERVICE MANUAL

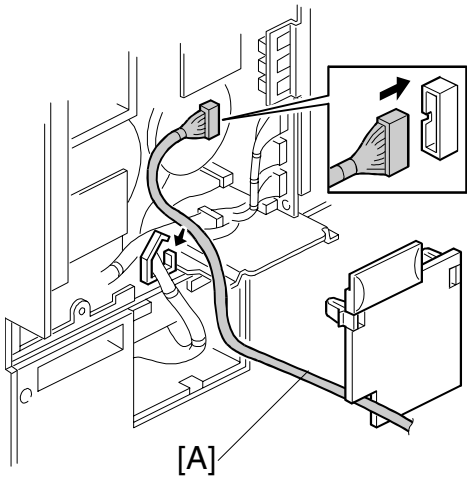
GENERAL:

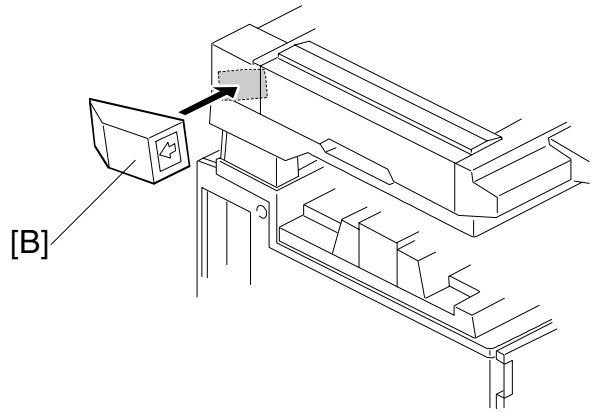
The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 3-45 Updated Information (Key Counter Installation)
- 4-5, 11 and 23 Updated Information (SP Mode Tables)
- 4-61 Additional Information (User Codes)
- 6-8 Updated Information (Laser Beam Pitch Adjustment)





7. Connect the key counter connector [A] to CN211 on the I/O board.
8. Reinstall the covers.
9. Attach the double-sided tape to the key counter bracket.
10. Peel off the backing of the double-sided tape and attach the key counter assembly [B] to the left side of the scanner unit, as shown.
    NOTE: When attaching the key counter assembly, press the assembly against the scanner cover strongly. Otherwise, the key counter assembly may come off easily.

⇒11. Turn on the Key Counter Option under User Tools, #19 Management Settings, #5 Key Counter and select YES.

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-109*	1*	Laser Beam Pitch Adjustment - 400 dpi	Input the laser beam pitch value for 400 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-3 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	0 ~ 262 4 pulses/step **144**
	2*	Laser Beam Pitch Adjustment - 600 dpi	Input the laser beam pitch value for 600 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-4 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	0 ~ 284 4 pulses/step **168**
	3	Laser Beam Pitch Initial Setting - 400 dpi	Initializes the laser beam pitch for 400 dpi to the SP2-109-1 value. Press "1" to initialize. *After inputting data for SP2-109-1, this SP must be performed.*	1: Start
	4	Laser Beam Pitch Initial Setting - 600 dpi	Initializes the laser beam pitch for 600 dpi to the SP2-109-2 value. Press "1" to initialize. *After inputting data for SP2-109-2, this SP must be performed.*	1: Start
	5*	Laser Unit Auto. Adjustment Interval	Input the interval value of the laser beam pitch automatic adjustment. *When the number of times that the resolution been changed reaches this value, the laser unit position is automatically corrected.*	0 ~ 65535 1/step 1000 times
	6	Current LD Unit Position	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.	
	7	Laser Beam Pitch Change Counter	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) *When the laser beam pitch adjustment is done, this counter is reset to "0".*	
	8	Beam Pitch Data Reset	Resets the values of SP2-109-6 and SP2-109-7. Press "1" to reset. *After replacing the LD unit, this SP mode must be done.*	1: Start
⇒ 2-110		Image Resolution Change	Select the Image Resolution.	0: 400 dpi **8: 600 dpi**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-914*	4*	Process Control Setting - Bδ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 300 10 V/step **50 V**
2-920		LD Off Check	**Factory use only.**	**0: On** 1: Off
2-921*		Shading Correction - Printer	Selects whether shading correction for printing is done or not. ***Do not change the setting.***	0: No **1: Yes**
2-960*		Toner Overflow Sensor	Select whether the toner overflow sensor is activated or not. ***Do not change the setting.***	0: No **1: Yes**
# 2-969*		LD PWM Selection - Printer	Changes the LD power PWM control. A larger value causes a darker image. *Use this SP to adjust the image density for printing from a personal computer or printing a received fax message.*	1 ~ 5 1/step **4**
⇒ 2-971		Toner Full Sensor Counter	Displays total occurrence of connection errors for the toner overflow sensor. ***This SP is for factory use only.***	
3-001*	1*	ID Sensor PWM Setting	This SP mode is added to solve the following problem. A SC condition occurs when ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. *The PWM data is stored at doing the ID Sensor Initial Setting.*	0 ~ 255 1/step **100**
	2*	ID Sensor Initial Setting	Performs the ID sensor initial setting. The ID sensor output for the bare drum (V_{SG}) is adjusted to 4.0 ±0.2 V. *This SP mode should be performed after replacing or cleaning the ID sensor or replacing the drum or doing an NVRAM clear.*	1: Start
3-103*		ID Sensor Output Display	Displays the current V_{SG} and V_{SP} output. *If the ID sensor does not detect the ID pattern, "V_{SP} = 5.0 V/V_{SG} = 5.0 V" is displayed and an SC code is generated.* *If the ID sensor does not detect the bare area of the drum, "V_{SP} = 0.0 V/V_{SG} =0.0 V" is displayed and an SC code is generated.*	V_{SP} = x.xx V V_{SG} = x.xx V

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-131*		Paper Size Type Selection	Selects the paper size type (for originals and copy paper). • *After changing the value, turn the main power switch off and on.* • *If the paper size type of the archive files stored in the HDD is different, abnormal copies will be made. In this condition, perform SP5-822 and ask the user to restore the archive files.*	0: Japan **1: North America** 2: Europe
5-212*	3*	Page No. position in Duplex Mode (Horizontal)	**Japanese version only. Do not change the value.**	-10 ~ 10 1 mm/step **0 mm**
	4*	Page No. position in Duplex Mode (Vertical)		

⇒

4.4.3 LEDS

BICU

Number	Monitored Signal
LED101	Monitors whether the program is working normally or not. The LED blinks in normal conditions.
LED102	Monitors +5VE. During the energy saver mode, this LED will blink.

4.5 SPECIAL TOOLS AND LUBRICANTS

4.5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
A2309352	Flash Memory Card – 4MB	1
A2309351	Case – Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
54209516	Test Chart – OS-A3 (10 pcs/Set)	1
A0299387	Digital Multimeter – FLUKE 87	1
A2849099	NVRAM – Minus Counter	1

4.5.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta JFE 5 5/2	1
52039501	Silicone Grease G-501	1

⇒4.6 USER CODES

The following is the procedure to set the machine for User Code mode:

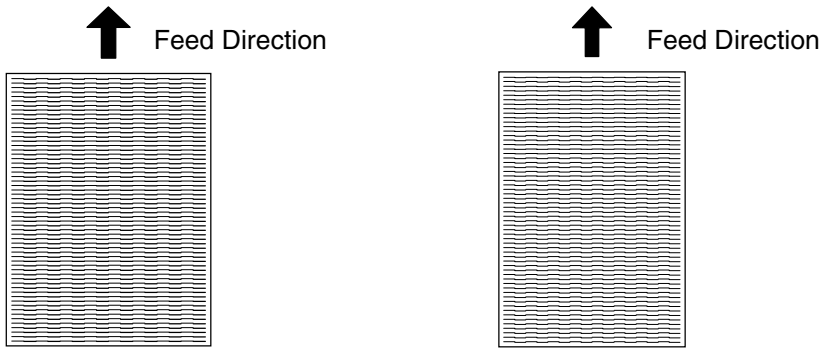
1. Register at least one user code – User Tools, #2 Copy, #14 Management Settings, #3 Reg. User Code.
2. Turn on User Code Management – User Tools, #1 System, #18 User Code Manage, set to YES.

6.2.3 LASER BEAM PITCH ADJUSTMENT

After replacing the LD unit, perform the laser beam pitch adjustment. There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. These adjustments use the following SP modes.

- SP2-109-1: LD Beam Pitch Adjustment – 400 dpi
- SP2-109-2: LD Beam Pitch Adjustment – 600 dpi
- SP2-109-3: LD Initial Setting – 400 dpi
- SP2-109-4: LD Initial Setting – 600 dpi
- SP2-110, no. 1: Image Resolution Change – 400 dpi
- SP2-110, no. 8: Image Resolution Change – 600 dpi
- SP2-902-3, no.16: Test Pattern Printing – Cross Stitch

1. Do SP 2-109-8.
2. Input the value “144” into SP2-109-1.
3. Perform SP2-109-3.
4. Print out 400 dpi test pattern A3 (11x17), change SP2-110 to 1 and print out the cross stitch test pattern using SP2-902-3 no. 16. For 600 dpi, set SP2-110 to 8.
5. Write the value of SP2-109-1 on the test pattern (in this case “144”).
6. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-109-1 (e.g. “48”, “96”, “192”, “240”).
7. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical strip pattern.
   NOTE: As an example, if the pattern made with the value “192” has less obvious strips than the other print outs, the correct value is near “192”.
8. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 1, 2, and 3 (in step 1, input a value which is estimated to be correct, then do steps 2 and 3, then if necessary go back to step 1 and try another value).
9. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). The laser beam pitch for 600 dpi should be 24 ~ 48 more than for 400 dpi.



Adjustment not complete **Adjustment complete**

TECHNICAL SERVICE BULLETIN

Originally issued as A283/A284 – 011. Please disregard A283/A284 – 011.

BULLETIN NUMBER: A283/A284 – 003 **10/12/2000**

APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- iii and iv — Updated Information (Table of Contents)
- 7-27 — Updated information (Firmware History)

PREVENTIVE MAINTENANCE

REPLACEMENT AND ADJUSTMENT

TROUBLESHOOTING

SCANNER KIT B359

⇒7.4 FIRMWARE HISTORY

7.4.1 A283/A284 BICU FIRMWARE MODIFICATION HISTORY

A283/A284 BICU FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
Initial Production	A2845113 **B**	First Mass Production	8.9
Corrects the Following: **SC990/542 occur simultaneously** Symptom: When the main power switch is turned ON or the machine recovers from Energy Saver Mode, an SC990 may occur before the machine reaches standby-by temperature. (This has a very low occurrence rate). If this happens, an SC542 will be triggered. *SC990: Software Performance Error* *SC542: Fusing Temperature Warm-Up Error* Correction: Fusing temperature control turns off whenever an SC990 occurs.	A2845113 **C**	May '00 Production	8.10

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 - 004 **02/06/2001**

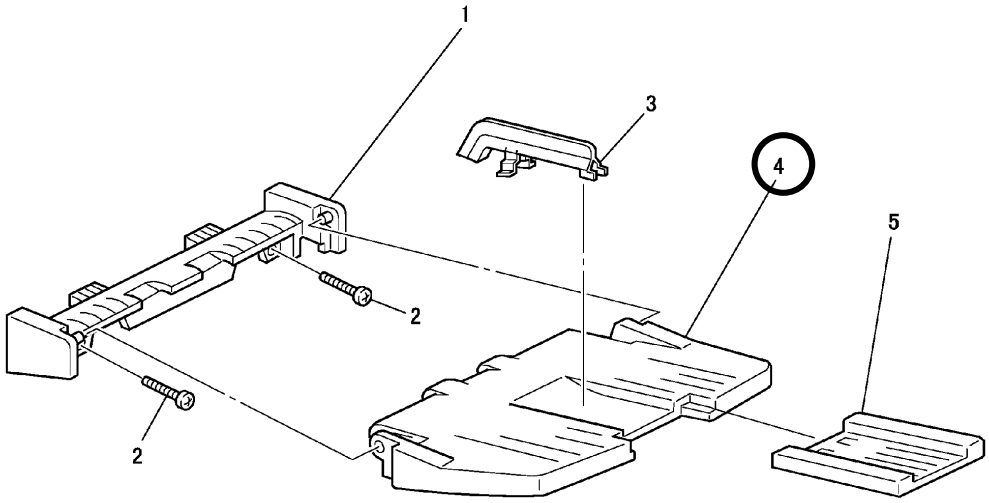
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SUBJECT: EXIT TRAY

GENERAL:

The following part correction is being issued for all A283 and 284 Parts Catalogs.



				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
A6804321	A6804331	Exit Tray	1	69	4

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 005 **04/13/2001**

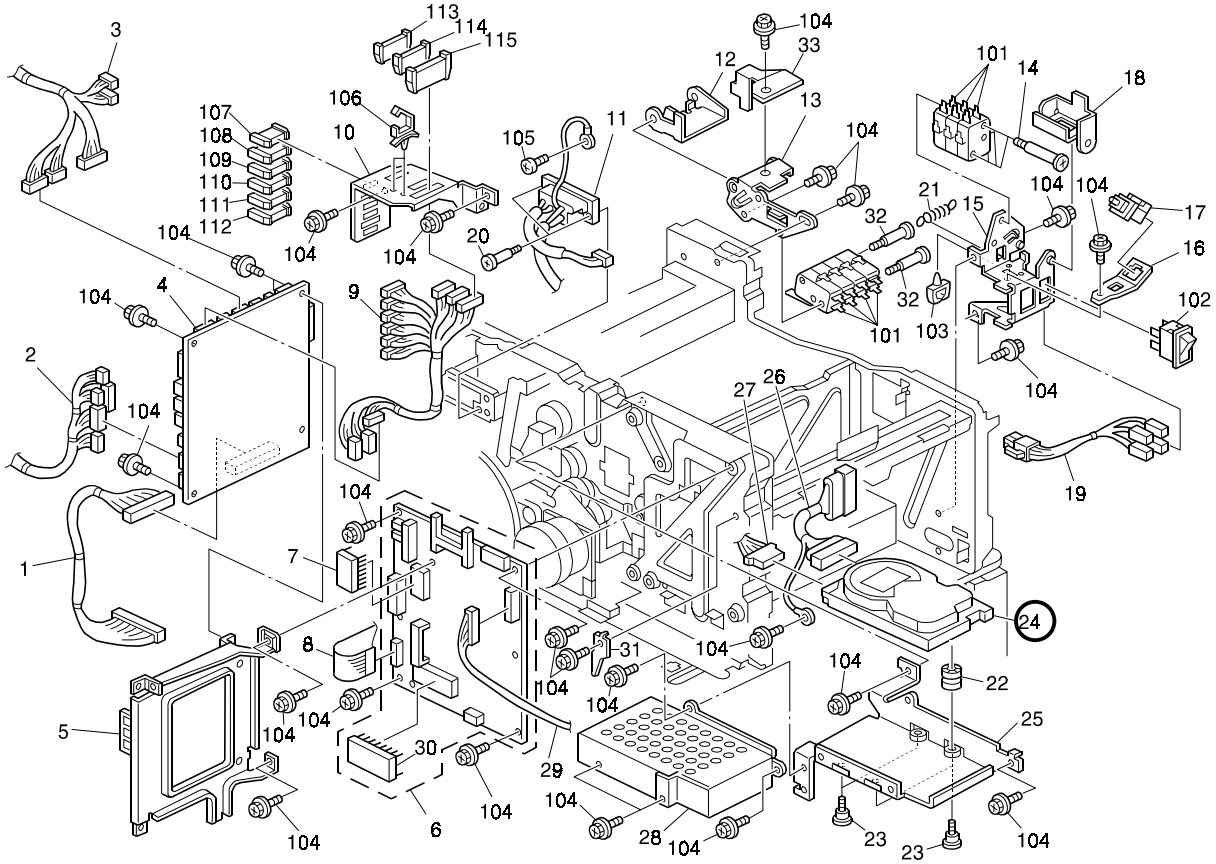
APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: HARD DISK

GENERAL:

The hard disk for the copier A283/A284 has been changed.



The following parts corrections are being issued for all A283/A284 Parts Catalogs.

Continued…

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A6915879	A6915862	Hard Disk	1-1	0	63	24

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Hard disk installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52006xxxxx
Gestetner 3245e	H53006xxxxx
Ricoh AFICIO 350e	H52006xxxxx
Ricoh AFICIO 450e	H53006xxxxx
Savin 9935DPE	H52006xxxxx
Savin 9945DPE	H53006xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 005 REISSUE ★ **08/21/2001**

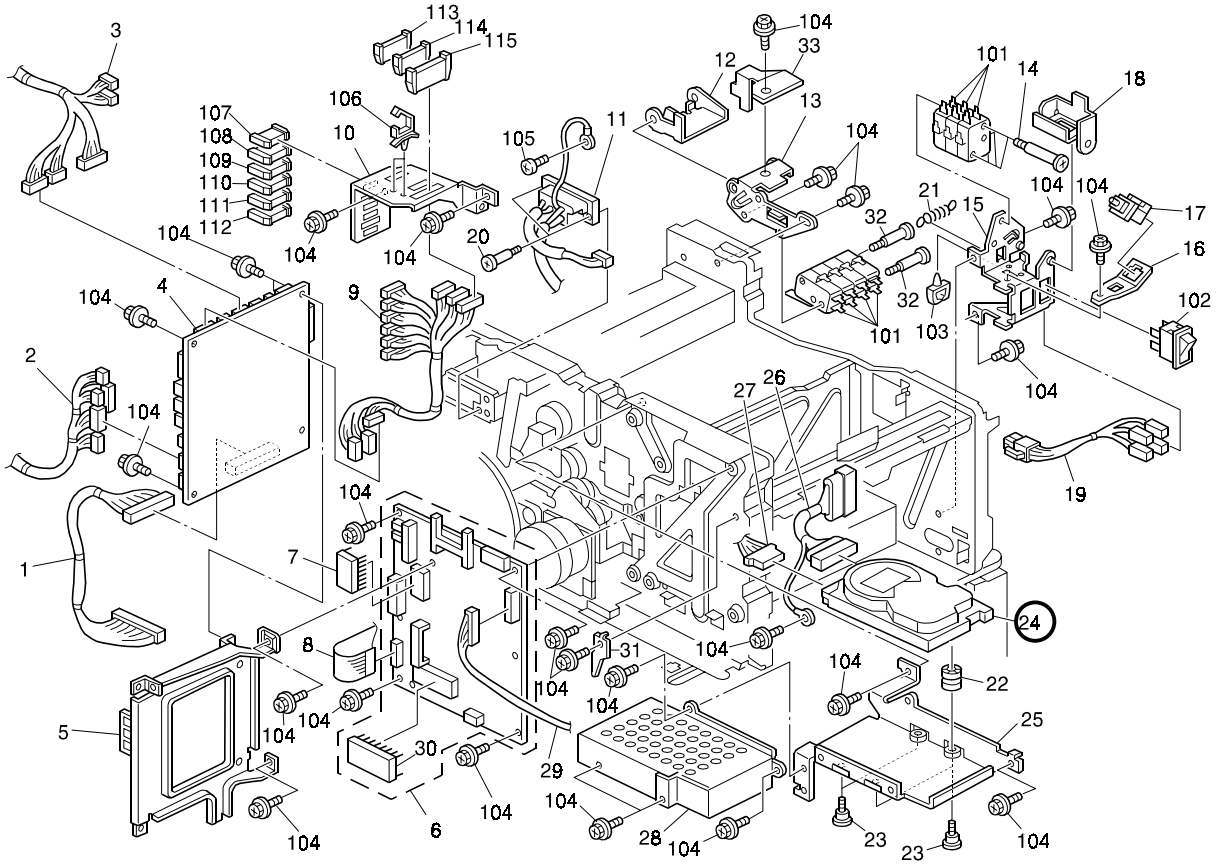
APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: HARD DISK

GENERAL:

The hard disk for the A283/A284 copier has been changed.



The following parts corrections are being issued for all A283/A284 Parts Catalogs.

Continued…

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A6915879	A6915862	Hard Disk	1-1	0	63	24

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Hard disk installed during production.

★

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52066xxxxx
Gestetner 3245e	H53066xxxxx
Ricoh AFICIO 350e	H52066xxxxx
Ricoh AFICIO 450e	H53066xxxxx
Savin 9935DPE	H52066xxxxx
Savin 9945DPE	H53066xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 006 **04/13/2001**

APPLICABLE MODEL:

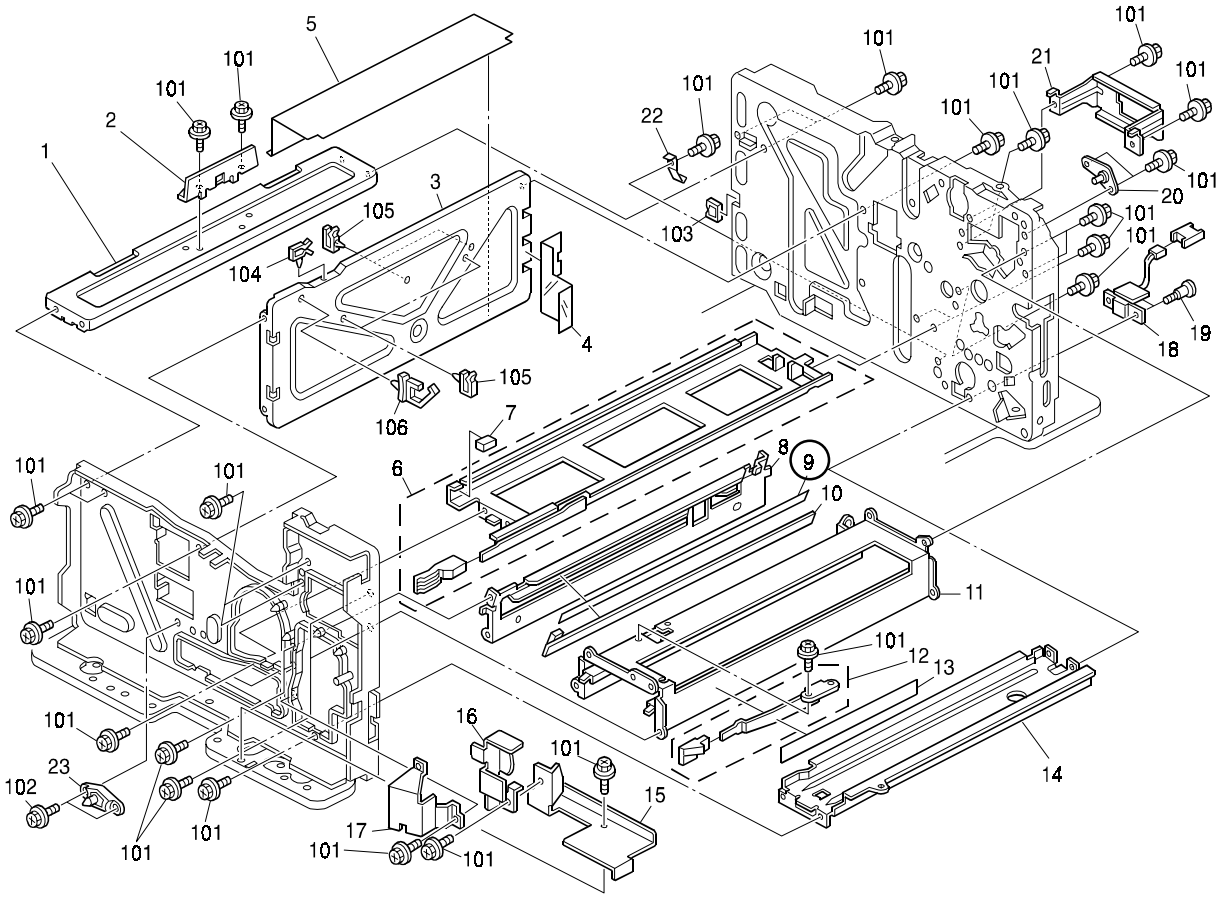
GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: MAGNET – QUENCHING LAMP

GENERAL:

To standardize the part with other models, the quenching lamp magnet number has been changed.

The following parts corrections are being issued for all A283/A284 Parts Catalogs.



Continued…

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2322373	A2673455	Magnet – Quenching Lamp	1-1	0/0	65	9

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Magnet – Quenching Lamp installed during production

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52009xxxxx
Gestetner 3245DPE	H53009xxxxx
Ricoh AFICIO 350e	H52009xxxxx
Ricoh AFICIO 450e	H53009xxxxx
Savin 9935DPE	H52009xxxxx
Savin 9945DPE	H53009xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 006 REISSUE ★ **08/21/2001**

APPLICABLE MODEL:

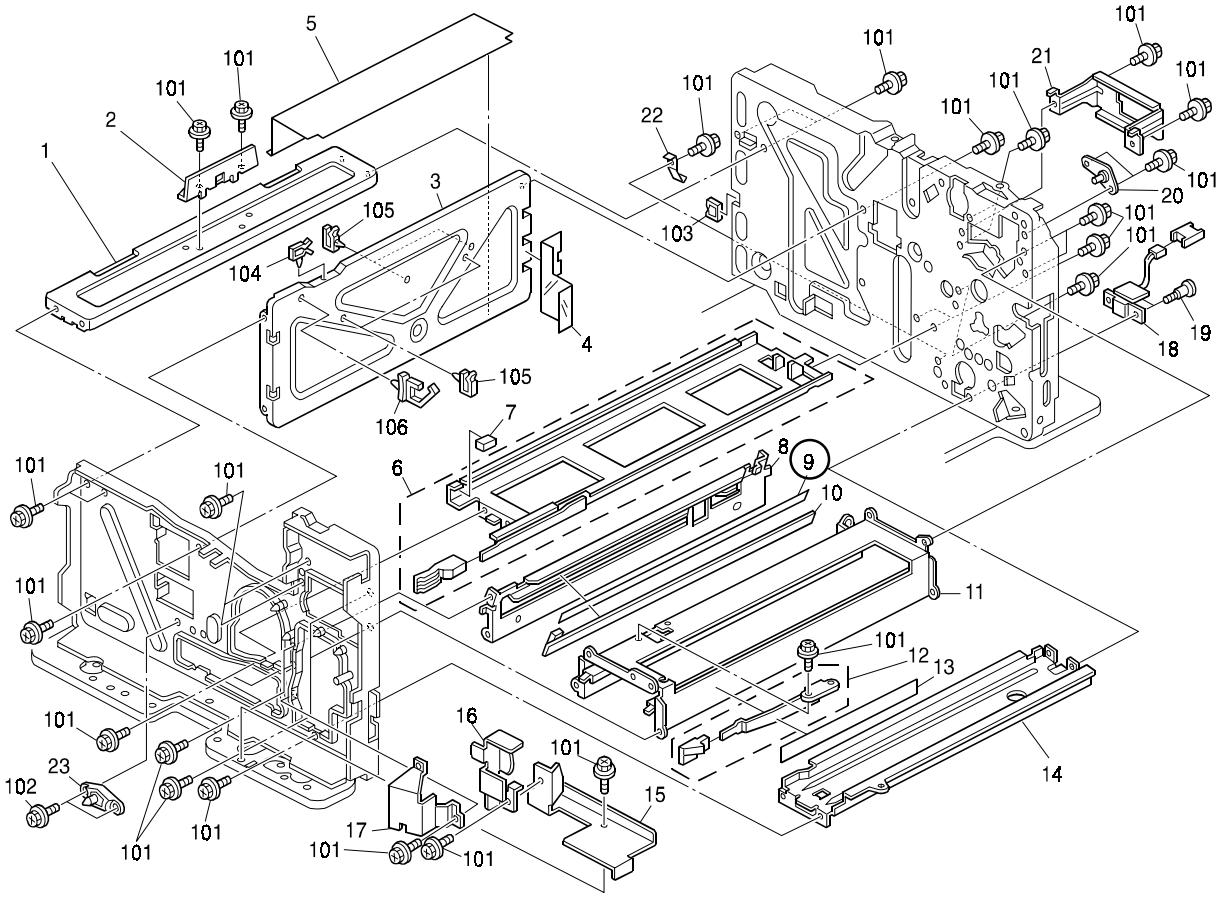
GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: MAGNET – QUENCHING LAMP

GENERAL:

To standardize the part with other models, the quenching lamp magnet number has been changed.

The following parts corrections are being issued for all A283/A284 Parts Catalogs.



Continued…

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2322373	A2673455	Magnet – Quenching Lamp	1-1	0/0	65	9

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Magnet – Quenching Lamp installed during production.

★

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52069xxxxx
Gestetner 3245DPE	H53069xxxxx
Ricoh AFICIO 350e	H52069xxxxx
Ricoh AFICIO 450e	H53069xxxxx
Savin 9935DPE	H52069xxxxx
Savin 9945DPE	H53069xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 007 **04/13/2001**

APPLICABLE MODEL:

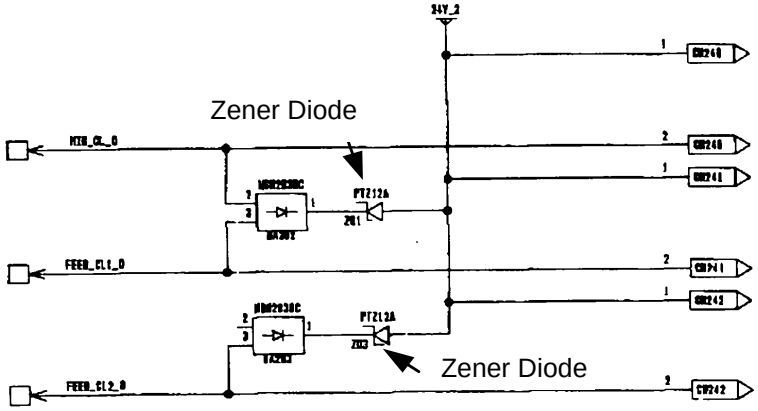
GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: PFB BOARD

GENERAL:

A counter electromotive force flows through the clutch drive circuits and causes the off timing of the clutch to be delayed. This can result in a paper jam.
A zener diode has been added to the drive circuits of the PFB board for the following clutches, preventing any counter electromotive force from flowing through the circuits:

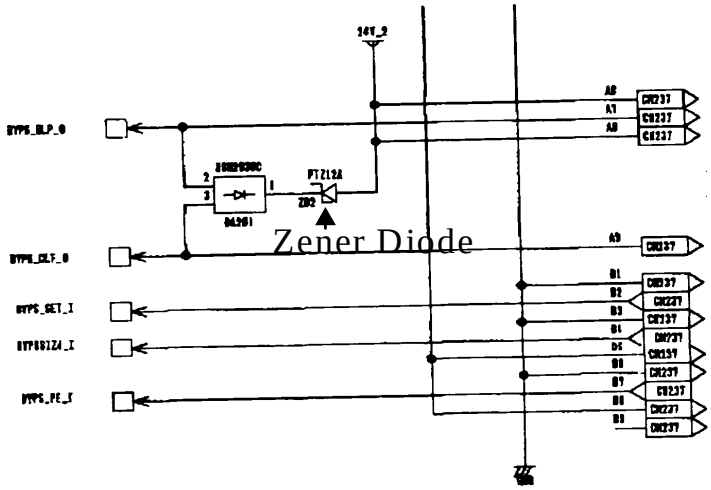
1. Relay clutch
2. Upper Paper Feed Clutch
3. Lower Paper Feed Clutch
4. By-pass Tray Feed Clutch



Relay Clutch

Upper Paper Feed

Lower Paper Feed



Bypass Tray Clutch

Continued…

: The following parts corrections are being issued for all A283/A284 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2325130	A2325135	PFB Board	1-1	1	59	20

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style PFB Board installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52010xxxxx
Gestetner 3245e	H53010xxxxx
Ricoh AFICIO 350e	H52010xxxxx
Ricoh AFICIO 450e	H53010xxxxx
Savin 9935DPE	H52010xxxxx
Savin 9945DPE	H53010xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 007 REISSUE ★ **08/21/2001**

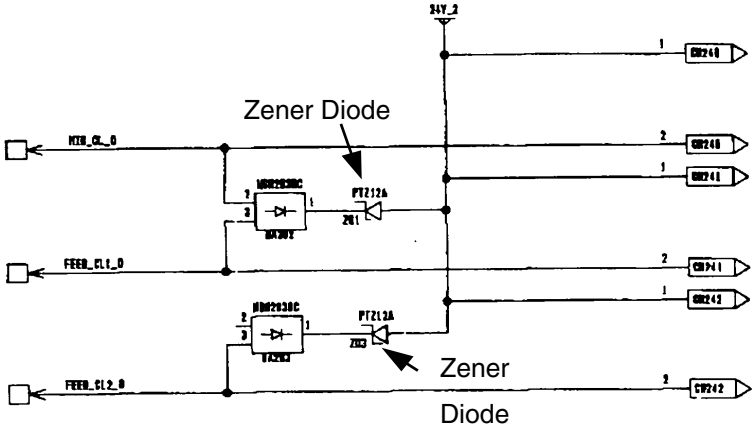
APPLICABLE MODEL:
GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: PFB BOARD

GENERAL:

A counter electromotive force flows through the clutch drive circuits and causes the off timing of the clutch to be delayed. This can result in a paper jam.
A zener diode has been added to the drive circuits of the PFB board for the following clutches, preventing any counter electromotive force from flowing through the circuits:

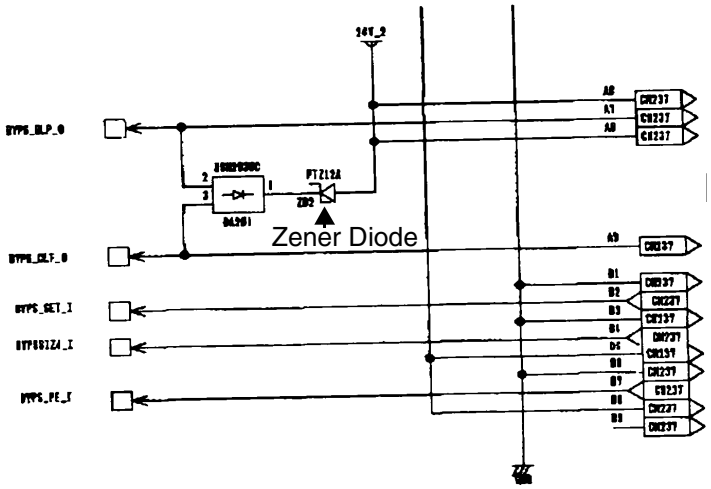
1. Relay clutch
2. Upper Paper Feed Clutch
3. Lower Paper Feed Clutch
4. By-pass Tray Feed Clutch



Relay Clutch

Upper Paper Feed

Lower Paper Feed



Bypass Tray Clutch

Continued…

The following parts corrections are being issued for all A283/A284 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2325130	A2325135	PFB Board	1-1	1	59	20

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style PFB Board installed during production.

★

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52070xxxxx
Gestetner 3245e	H53070xxxxx
Ricoh AFICIO 350e	H52070xxxxx
Ricoh AFICIO 450e	H53070xxxxx
Savin 9935DPE	H52070xxxxx
Savin 9945DPE	H53070xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 008 **04/13/2001**

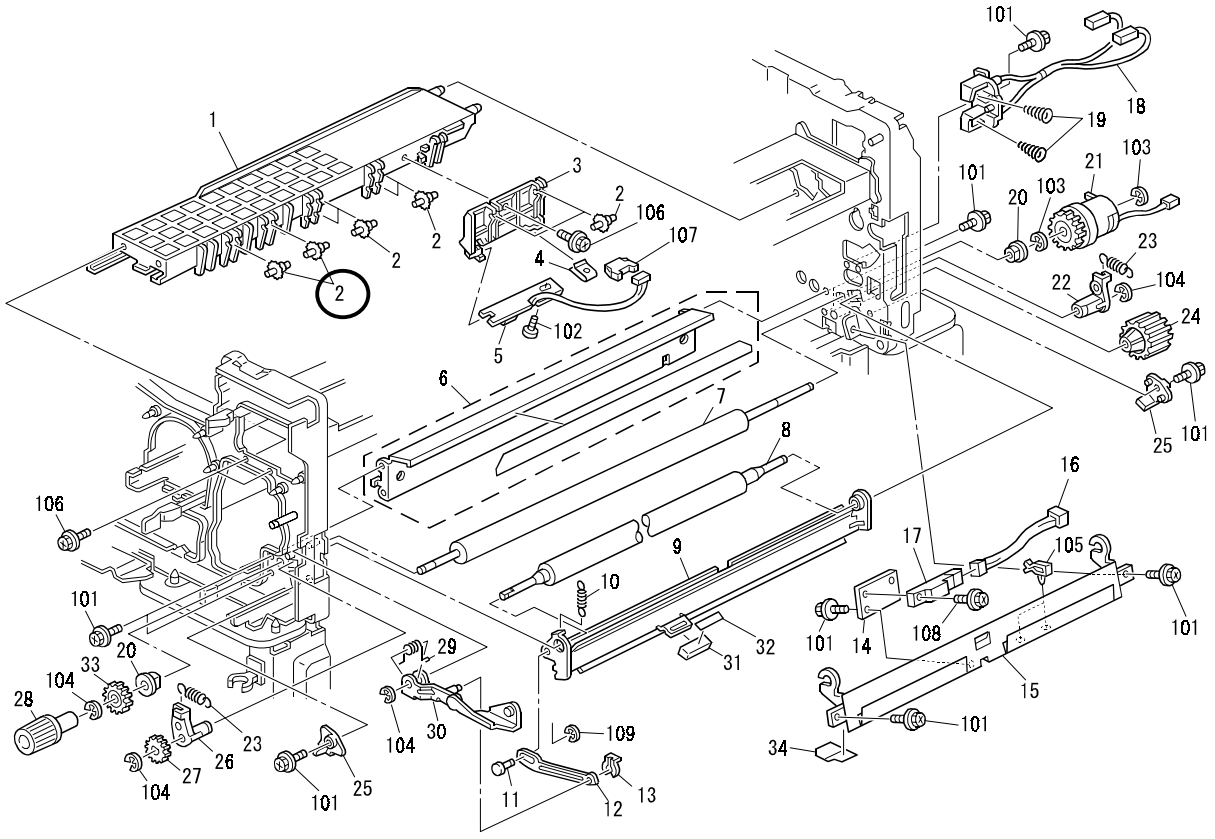
APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: SPUR

GENERAL:

To prevent toner from adhering to the spur, the material of the spur has been changed.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2322374	B0042310	Spur	6	0	33	2

Continued…

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Spur installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52010xxxxx
Gestetner 3245e	H53010xxxxx
Ricoh Aficio 350e	H52010xxxxx
Ricoh Aficio 450e	H53010xxxxx
Savin 9935DPE	H52010xxxxx
Savin 9945DPE	H53010xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 008 REISSUE ★ **08/21/2001**

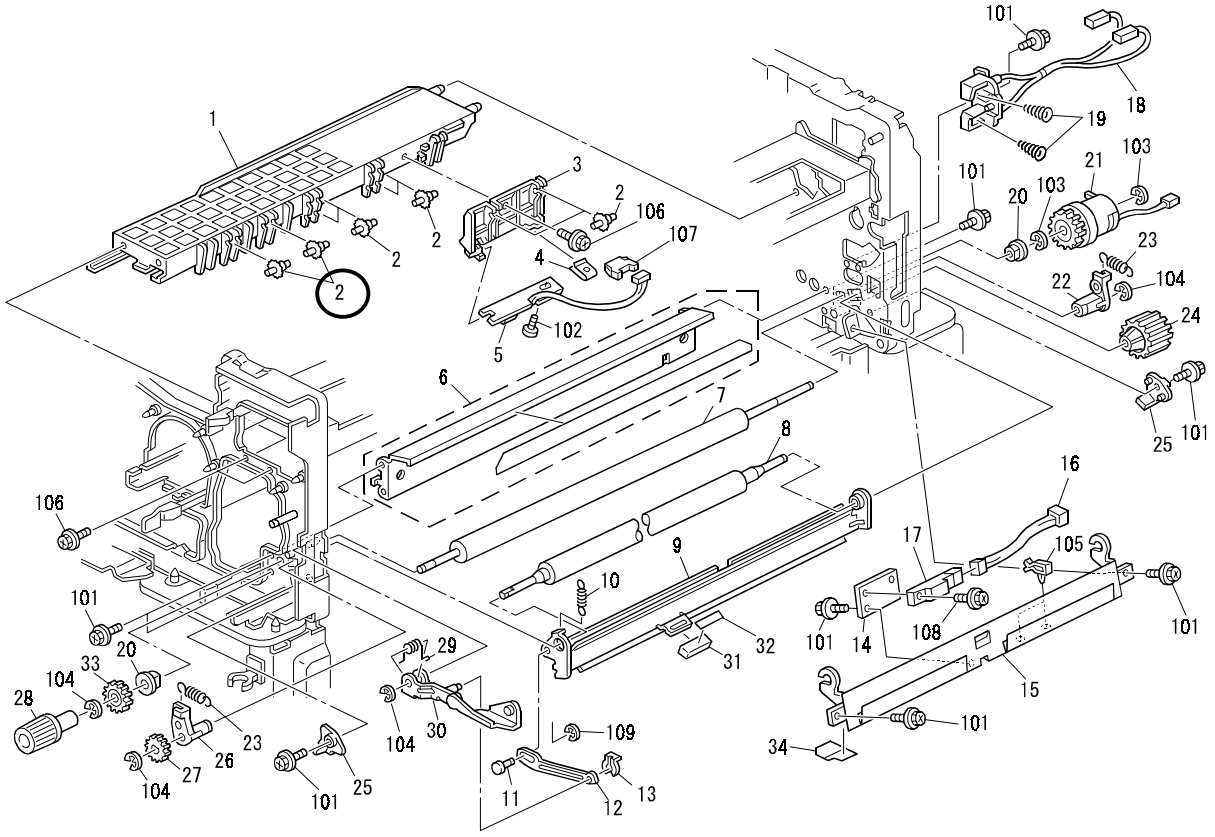
APPLICABLE MODEL:

GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: SPUR

GENERAL:

To prevent toner from adhering to the spur, the material of the spur has been changed.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2322374	B0042310	Spur	6	0	33	2

Continued…

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Spur installed during production.

★

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52070xxxxx
Gestetner 3245e	H53070xxxxx
Ricoh AFICIO 350e	H52070xxxxx
Ricoh AFICIO 450e	H53070xxxxx
Savin 9935DPE	H52070xxxxx
Savin 9945DPE	H53070xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 009 **04/13/2001**

APPLICABLE MODEL:

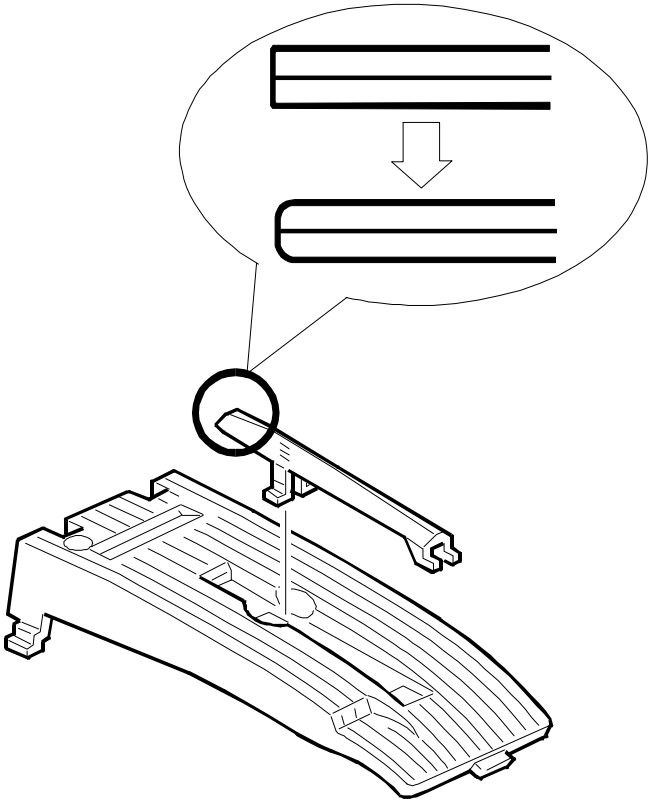
GESTETNER – 3235e/3245e
RICOH – AFICIO 350e/450e
SAVIN – 9935DPE/9945DPE

SUBJECT: COPY TRAY GUIDE

GENERAL:

The edge of the Copy Tray Guide has been rounded to ensure that scratches or other minor injuries do not occur.

The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2324498	A2844498	Copy Tray Guide	1	0	13	2

Continued…

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Copy Tray Guide installed during production

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H52010xxxxx
Gestetner 3245e	H53010xxxxx
Ricoh Aficio 350e	H52010xxxxx
Ricoh Aficio 450e	H53010xxxxx
Savin 9935DPE	H52010xxxxx
Savin 9945DPE	H53010xxxxx

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 010 **08/06/2001**

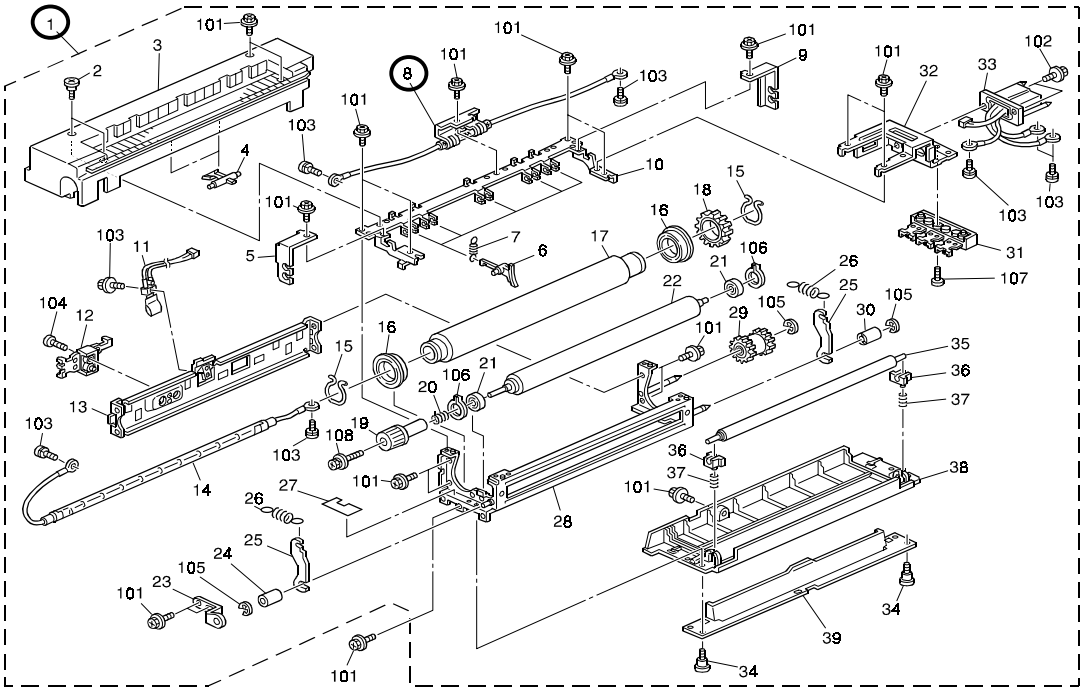
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450
SAVIN – 9935DPE/9945DPE

SUBJECT: THERMOFUSE

GENERAL:

The A2324100 thermofuse has been discontinued and has been changed to A2314100. With this change, the Part Number for the fusing unit assembly has also been changed as shown below. The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2324100	A2314100	Thermofuse	1	0	47	8
A2327320	A2317320	Fusing Unit Ass'y (115V)	1	0	47	1

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 011 **08/06/2001**

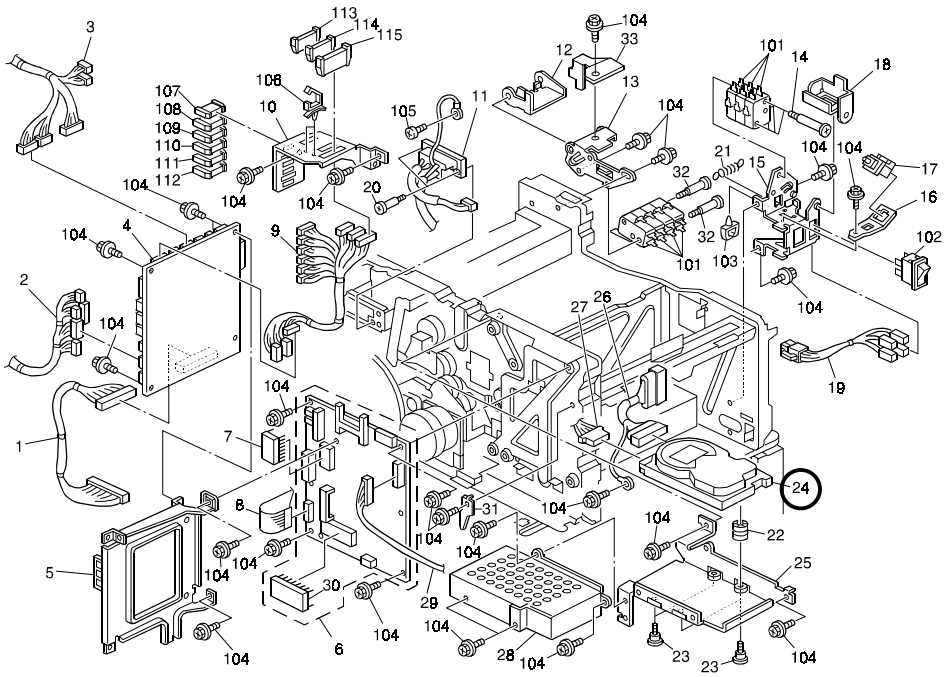
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SUBJECT: HARD DISK

GENERAL:

The A6915860 hard disk for the mainframe copier has been changed to A6915861. It was then changed again to A6915862 however, there are no functional changes. The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A6915860	A6915862	Hard Disk	1-1	0	63	24

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

 CONTROL NO 095ABW

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 012 **08/06/2001**

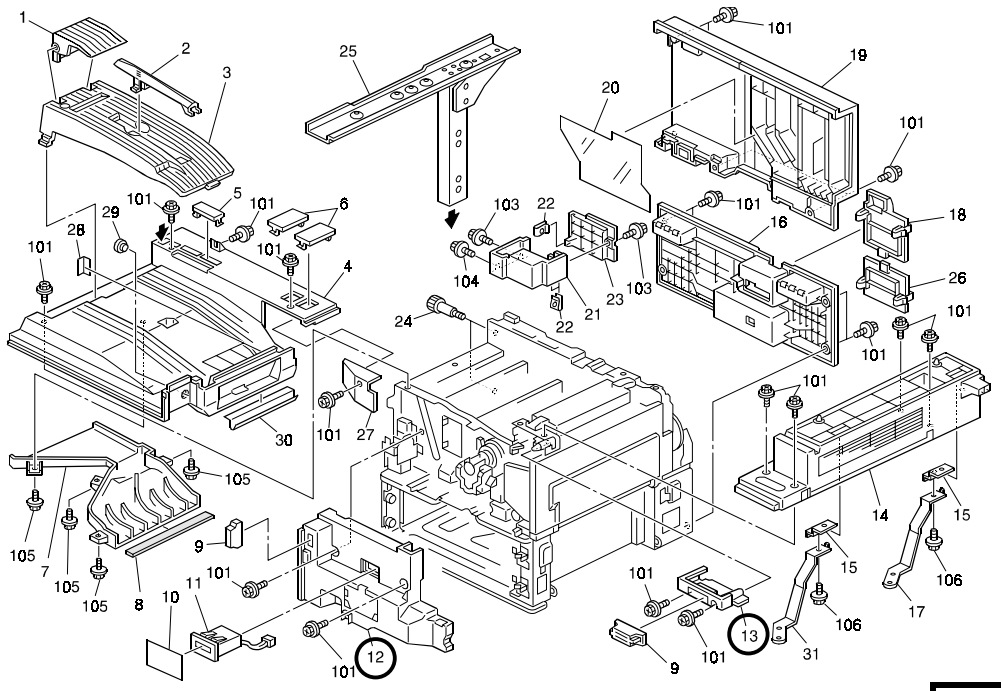
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SUBJECT: INNER COVERS

GENERAL:

To facilitate parts standardization, the left inner cover and right upper inner cover have been changed to A2841376 and A2841372.
The following parts corrections are being issued for all A283/A284 Parts Catalogs.



			REFERENCE			
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2321375	A2841376	Left Inner Cover	1-1	0	13	12
A2321371	A2841372	Inner Cover – Right Upper	1-1	0	13	13

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 013 **08/06/2001**

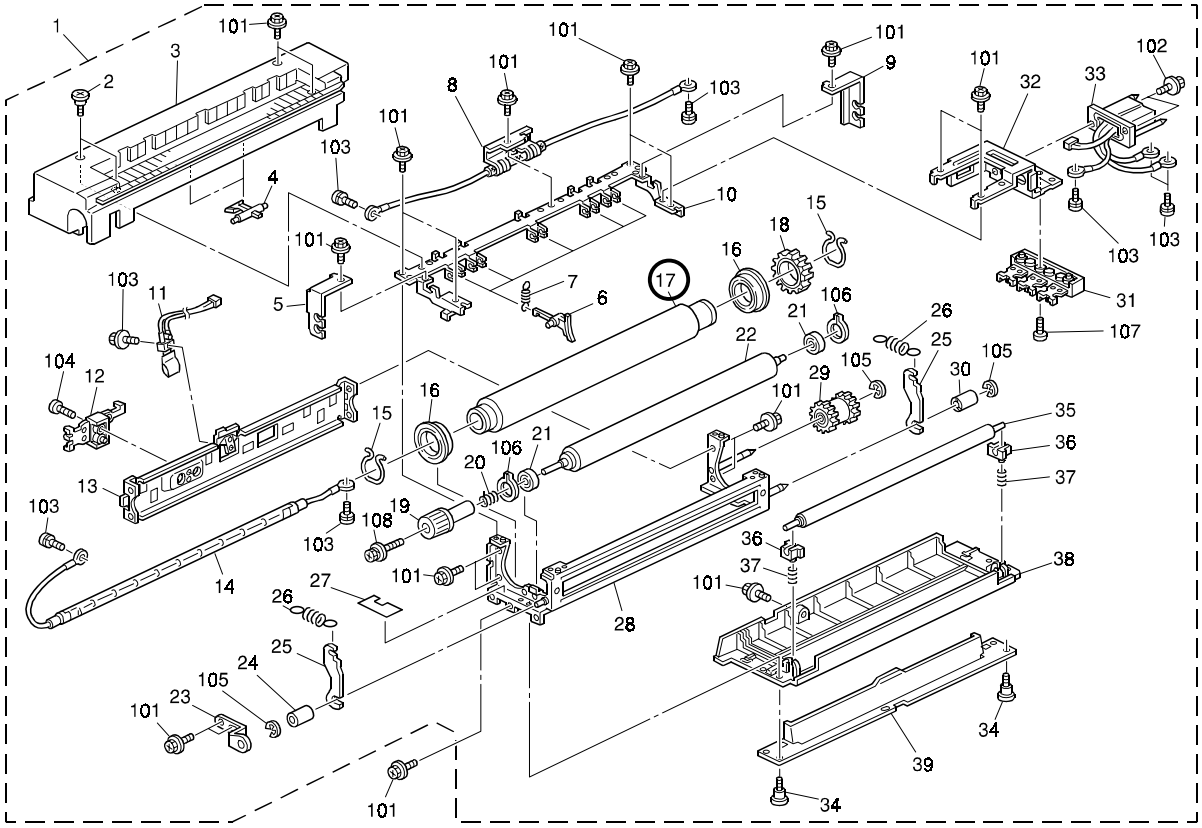
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SUBJECT: HOT ROLLER

GENERAL:

Due to a vendor change the hot roller has been changed.
The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AE011041	AE011059	Hot Roller	1-1	0	47	17

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 –014 **08/06/2001**

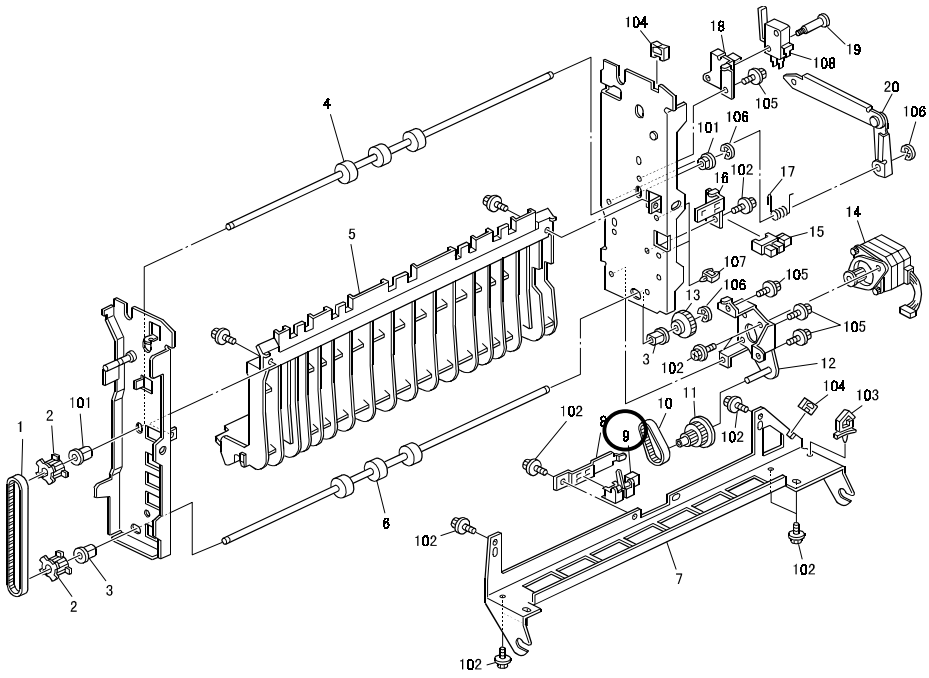
APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/450E
SAVIN – 9935DPE/9945DPE

SUBJECT: PHOTOINTERRUPTOR

GENERAL:

To facilitate parts standardization, the photointerruptor (feeler) has been changed from AW020102 to AW020126. The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AW020102	AW020126	Photointerruptor	1-1	0	55	9

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 015 **08/06/2001**

APPLICABLE MODEL:

GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/4505E
SAVIN – 9935DPE/9945DPE

SUBJECT: DEVELOPMENT UNIT

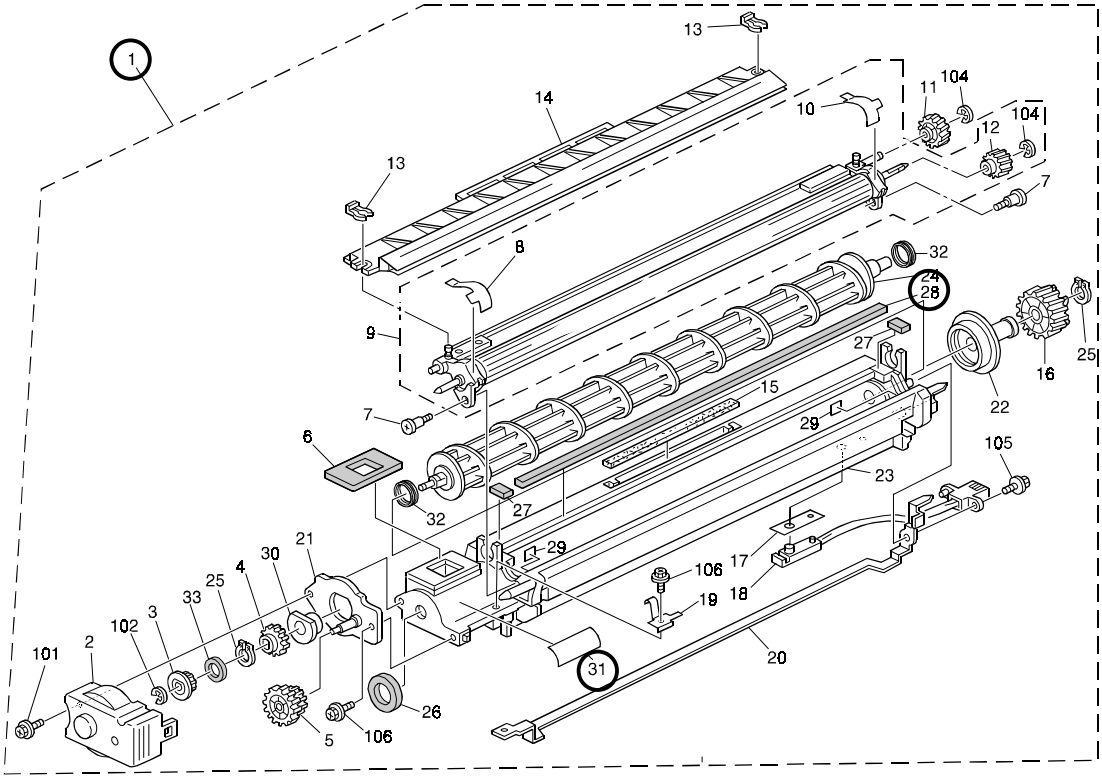
GENERAL:

The parts listed below have been modified to facilitate the assembly process at the factory. However their part numbers remain the same except for the development unit.

1. Sponge (AA153053, P45, #28): The material of the double-sided tape has been changed to facilitate attachment, as the previous type tended to stretch and not stick well.

2 Decal (A2323066, P45, #31): The decal's thickness has been reduced from 0.1 to 0.065mm to prevent it from partially peeling off, as it tended to do since it was attached to a curved surface**.**

The following parts corrections are being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2327460	A2327459	Development Unit	1	0	45	1

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A283/A284 – 016 **05/23/2002**

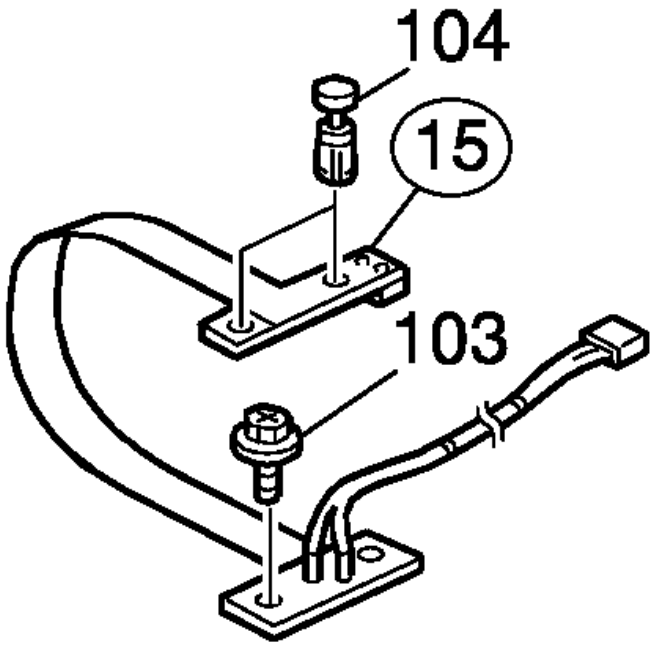
APPLICABLE MODEL:
GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/4505E
SAVIN – 9935DPE/9945DPE

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A283/A284 Parts Catalogs.

- **UPDATE 1:** **Flexible Board –** During board assembly, slack in the Flexible Board high-voltage lines may cause these lines to get caught in between the board and the base plate. To prevent this from occurring, the two lines have been bound in 3 additional locations and the insulating material has been strengthened. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2845620	A2845621	Flexible Board	1	1	21	15

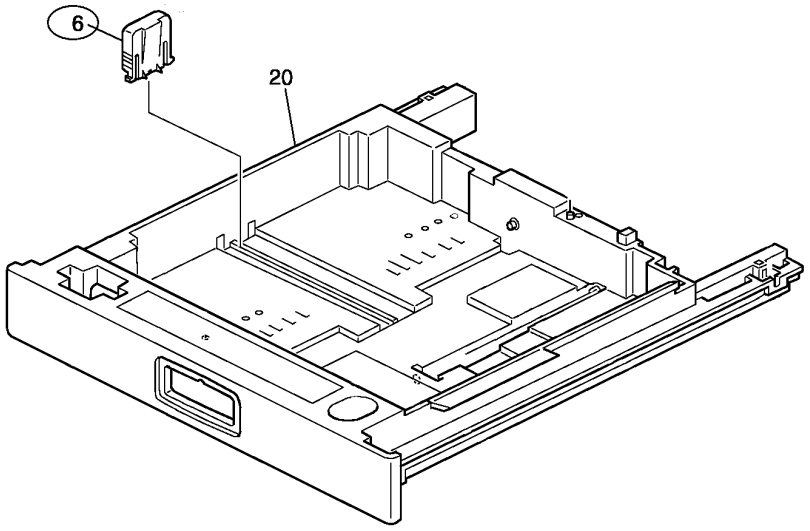
Continued…

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Flexible Board installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H5216100834
Gestetner 3245e	H5316100001
Ricoh Aficio 350e	H5216100876
Ricoh Aficio 450e	H5316100731
Savin 9935DPE	H5216100834
Savin 9945DPE	H5316100001

- **UPDATE 2:** **End Fence –** The shape of the End Fence edge has been changed to ensure the fence hooks pinch the proper location. This will prevent the hooks from getting caught and breaking. The End Fence has also been changed to a stronger material. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
AF017020	AF017026	End Fence	1	1	29	6

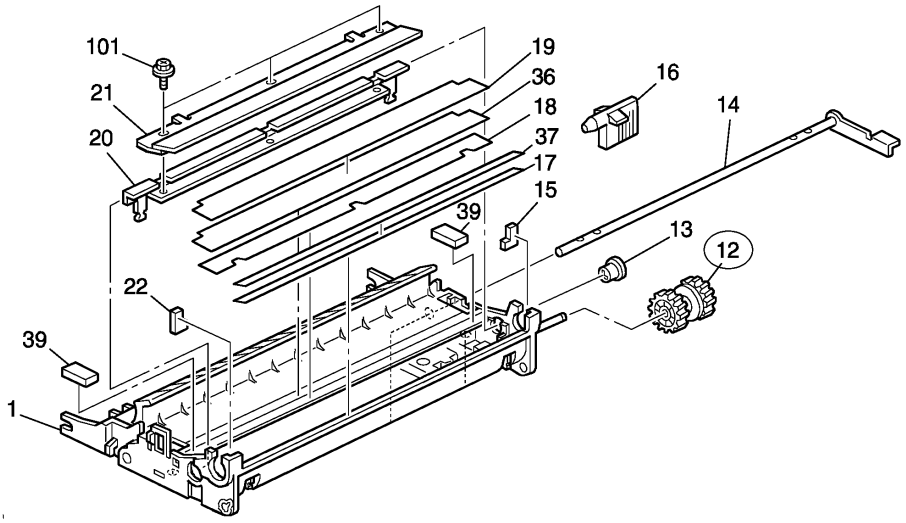
UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style End Fence installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H5206900001
Gestetner 3245e	H5306900001
Ricoh Aficio 350e	H5206900316
Ricoh Aficio 450e	H5306900426
Savin 9935DPE	H5206900001
Savin 9945DPE	H5306900001

Continued…

- **UPDATE 3:** **Idler Gear –** Bands of low image density may appear at 5 mm intervals, especially noticeable with half-tones. Slight warping in the gear created by the supporting tension of the ribs causes this to occur. A new style Idler Gear has been created where, the gear ribs have been removed to ensure the diameter remains consistent. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AB017429	AB014189	Gear – 27Z	1	1	41	12

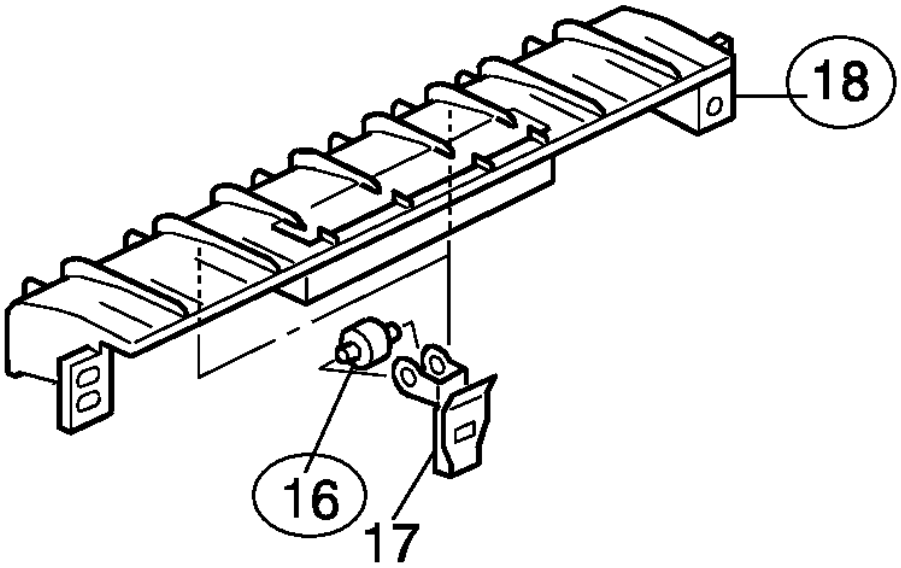
UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Idler Gear installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H5207100001
Gestetner 3245e	H5307100001
Ricoh Aficio 350e	H5207100751
Ricoh Aficio 450e	H5307100466
Savin 9935DPE	H5207100001
Savin 9945DPE	H5307100001

Continued…

- **UPDATE 4:** **Driven Roller & Guide Plate –** To protect against heat deformation, the materials for the Driven Roller and Guide Plate have been changed. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AF040559	AF040575	Driven Roller – M9	2	1	43	16
A2324491	A2844491	Guide Plate – Fusing Unit	1	1	43	18

UNITS AFFECTED:

All A283/A284 copiers manufactured after the Serial Numbers listed below will have the new style Driven Roller and Guide Plate installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235e	H5207100001
Gestetner 3245e	H5307100001
Ricoh Aficio 350e	H5207100751
Ricoh Aficio 450e	H5307100466
Savin 9935DPE	H5207100001
Savin 9945DPE	H5307100001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

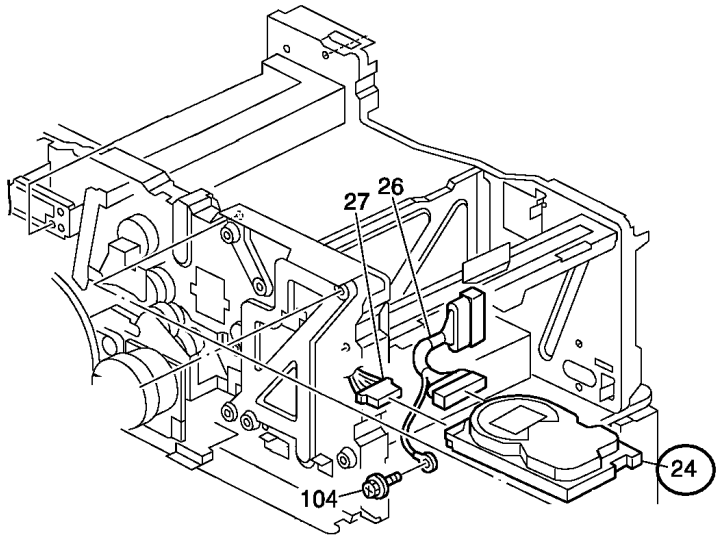
BULLETIN NUMBER: A283/A284 – 017 **06/24/2002**

APPLICABLE MODEL:
GESTETNER – 3235E/3245E
RICOH – AFICIO 350E/4505E
SAVIN – 9935DPE/9945DPE

SUBJECT: HARD DISK

GENERAL:

The Hard Disk Drive has been changed because the old style Hard Disk Drive (P/N A6915862) has been discontinued from production. The following part update is being issued for all A283/A284 Parts Catalogs.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6915862	A6915863	Hard Disk Drive	1	0	63	24

UNITS AFFECTED:

A283/A284 Serial Number cut-in was not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

 CONTROL NO. 140ABW