A224 COPIER

SERVICE MANUAL

The A224 copier is based on the A193 copier.

Only the differences from the base copier are described in the following pages. Therefore, this document should be treated as an insert version of the base copier's service manual, although it has a separate binder. It should always be used together with the base copier's service manual.

⚠ IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

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

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

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

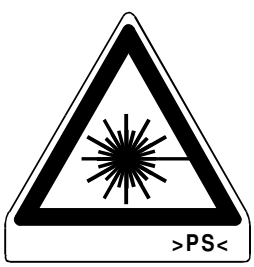
⚠ WARNING

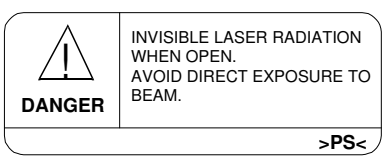
Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

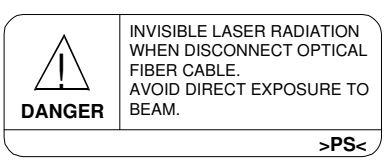
⚠ WARNING FOR LASER UNIT

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:







1. SPECIFICATIONS

Items	A193	A224
Configuration:	Desktop	As for A193
Copy Process:	Dry electrostatic transfer system	As for A193
Originals:	Sheet/Book	As for A193
Original Size:	Maximum: A3/11" x 17" Minimum: A5/8.5" x 5.5" sideways (paper tray) A6/5.5" x 8.5" lengthwise (by-pass feed)	As for A193
Copy Paper Weight:	Paper tray: 60 ~ 90 g/m^2, 16 ~ 24 lb By-pass: 60 ~ 157 g/m^2, 16 ~ 24 lb	As for A193
Reproduction Ratios:	5 Enlargement and 7 Reduction (5E7R)	Non-memory copy: 5E6R (25% is excluded) Memory copy: Letter: 5E7R Others: 5E6R (25% is excluded; it can be included with an SP mode)
Zoom:	25% to 400% in 1% steps	Non-memory copy: 50% to 400% in 1% steps Memory copy: Letter: 25% to 400% Others: 50% to 400% in 1% steps (down to 25% can be included with an SP mode)
Power Source:	120V/60 Hz: more than 12A (for North America) 220V ~ 240V/50 Hz: more than 7A (for Europe) 220V ~ 240V/60 Hz: more than 7A (for Asia)	As for A193
Dimensions (W x D x H):	550 x 580 x 652 mm (21.7" x 22.9" x 25.7") Measurement conditions 1) With by-pass feed table closed 2) Without all options	As for A193
Weight:	Less than 57 kg (126 lb)	Less than 58 kg (128 lb)
Warm-up Time:	Less than 30 s (20°C, 68°F): 115V machine Less than 35 s (20°C, 68°F): 230V machine	Less than 40 s (20°C, 68°F): 115V/230V machine

Items	A193	A224
First Copy Time	Less than 9.8 s (from 1st paper tray to face-down copy tray) Less than 8.8 s (from 1st paper tray to face-up copy tray)	Less than 9.8 s (from 1st paper tray to face-down copy tray) Less than 8.8 s (from 1st paper tray to face-up copy tray) Less than 9.5 s (from LCT to face-down copy tray)
Copy Number Input:	Ten-key pad, 1 to 99 (count up or count down)	As for A193
Manual Image Density:	7 steps	As for A193
Automatic Reset:	60s is the standard setting; it can be changed with a UP mode.	As for A193
Auto Shut Off	15 min. is the standard setting; it can be changed with a UP mode.	30 min. is the standard setting; it can be changed with a UP mode.
Copy Paper Capacity:	Paper Tray: 250 sheets Option Paper Tray Unit: 500 sheets x 2 By-pass: 100 sheets (≤A4, LT) 10 sheets (>A4, LT) 1 sheet (non-standard)	As for A193
Toner Replenishment:	Cartridge exchange (216 g/cartridge)	As for A193
Toner Yield:	8 k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)	As for A193
Optional Equipment:	-Platen cover -ADF -ARDF -Paper tray unit -1-bin sorter -Finisher -4 MB memory -8 MB memory -Key counter -Tray heater -Optical anti-condensation heater	-Platen cover -ADF -ARDF -Paper tray unit -1-bin sorter -Finisher -LCT -Key counter -Tray heater -Optical anti-condensation heater -Drum heater
Copy Tray Capacity	face-down mode: 500 sheets face-up mode: 100 sheets	As for A193

Power Consumption:

- A193 -

	Mainframe Only		Full System	
	120 V	220 V ~ 240 V	120 V	220 V ~ 240 V
Maximum	Less than 1.1 kW	Less than 850 W	Less than 1.2 kW	Less than 1 kW
Copying	Approx. 470 W	Approx. 500 W	Approx. 500 W	Approx. 530 W
Warm-up	Approx. 1.0 kW	Approx. 750 W	Approx. 1.0 kW	Approx. 750 W
Stand-by	Approx. 130 W	Approx. 130 W	Approx. 140 W	Approx. 140 W
Auto Shut-off	Approx. 2.0 W	Approx. 2.2 W	Approx. 2.2 W	Approx. 2.4 W

- A224 -

	Mainframe Only		Full System	
	120 V	220 V ~ 240 V	120 V	220 V ~ 240 V
Maximum	Less than 1.1 kW	Less than 850 W	Less than 1.2 kW	Less than 1 kW
Copying	Approx. 570 W	Approx. 570 W	Approx. 600 W	Approx. 600 W
Warm-up	Approx. 1.0 kW	Approx. 750 W	Approx. 1.0 kW	Approx. 750 W
Stand-by	Approx. 130 W	Approx. 130 W	Approx. 140 W	Approx. 140 W
Auto Shut-off	Approx. 2.0 W	Less than 2.0 W	Approx. 2.2 W	Approx. 2.4 W

Noise Emission:

- A193 -

	Mainframe Only	Full System
1. Sound Power Level		
Copying	61.5 dB (A)	64.5 dB (A)
Stand-by	30.0 dB (A)	30.0 dB (A)
2. Sound Pressure Level at the Operation Position		
Copying	47.5 dB (A)	52.0 dB (A)
Stand-by	17.5 dB (A)	17.5 dB (A)

- A224 -

	Mainframe Only	Full System
1. Sound Power Level		
Copying	62.5 dB (A)	66.0 dB (A)
Stand-by	40.0 dB (A)	40.0 dB (A)
2. Sound Pressure Level at the Operation Position		
Copying	47.5 dB (A)	52.0 dB (A)
Stand-by	17.5 dB (A)	17.5 dB (A)

Copying Speed in Multicopy Mode:

- A193 -

	A4 sideways/ 11" x 8.5"	**A3/11" x 17"**	**B4/8.5" x 14"**
Non-memory copy mode	15	9	10
Memory copy mode	20	11	12

- A224 -

	A4 sideways/ 11" x 8.5"	**A3/11" x 17"**	**B4/8.5" x 14"**
Non-memory copy mode	20	11	13
Memory copy mode	25	13	15

Memory Capacity:

- A193 -

		Standard (4 MB)	**Optional 4 MB**	**Optional 8 MB**
Multi-page duplex copy		x	O	O
Sort, Rotate Sort	A4, LT	O	O	O
	B4, LG	x	O	O
	A3, DLT	x	O	O
Number of pages	A4, 6%	35	99	99
	ITU-T #4	15	45	75

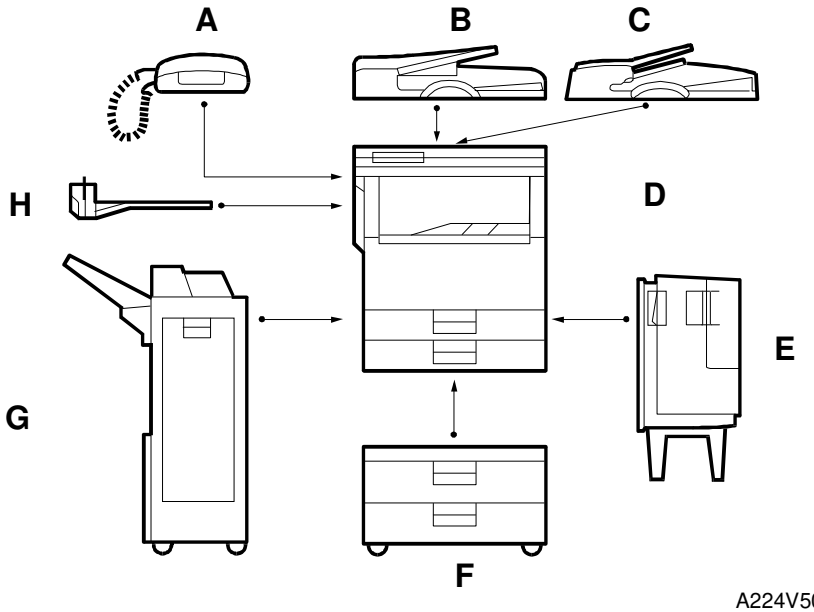
x: Not available O: Available

- A224 -

		Standard 12 MB (4 MB + 8 MB)
Multi-page duplex copy		O
Sort, Rotate Sort	A4, LT	O
	B4, LG	O
	A3, DLT	O
Number of pages	A4, 6%	99
	ITU-T #4	75

x: Not available O: Available

2. MACHINE CONFIGURATION



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Version	Item	Machine Code		No.
		A193	A224	
Copy	Copier	A193	A224	D
	ADF (Option)	A628		B
	ARDF (Option)	A661		C
	Platen Cover (Option)	A645		
	Paper Tray Unit (Option)	G697		F
	Duplex Unit	G694 (Option)	Standard	
	1-bin Sorter (Option)	A629		H
	Finisher (Option)	A666		G
	LCT	N/A	A667(Option)	E
	Memory 4 MB	A642-01 (Option)	N/A	
	Memory 8 MB	A642-02 (Option)	Standard	
Fax	Fax Controller (Option)	A693	A804	
	Telephone (Option)	H160		A
	ISDN (Option)	A644		
	HDD (Option)	A641		
	Memory Card (Option)	H130-54		
	Function Card (Option)	H130-52		
	Page Memory (Option)	A640		
Printer	Printer Controller (Option)	A643-00 (115V) A643-01 (230V)	A805-00 (115V) A805-01 (230V)	
	PS (Option)	A643-02		
	HDD (Option)	A643-03		

3. 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.

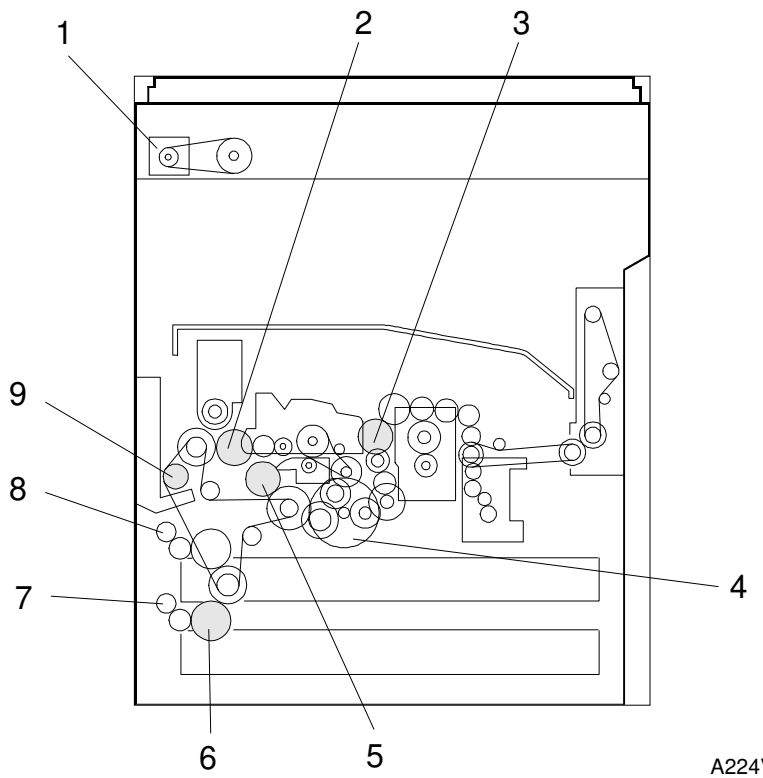
Symbol	Index No.	Description	Note
Printed Circuit Boards			
PCB1	54	High Voltage Supply Board	Supplies high voltage to the drum charge roller, development roller, transfer roller, and discharge brush.
PCB2	50	Lamp Stabilizer	Provides dc power for the exposure lamp.
PCB3	58	PSU	Provides dc power to the system and ac power to the fusing lamp.
PCB4	61	LD Unit	Controls the laser diode.
PCB5	63	Operation Panel	Controls the touch panel display and LED matrix, and monitors the key matrix.
PCB6	51	SBU	Contains the CCD, and outputs a video signal to the BICU board.
PCB7	55	IOCSS	Controls the mechanical parts of the printer.
PCB8	52	BICU	Controls all copier functions both directly or through other control boards.
PCB9	53	MSU	Compresses the image data, stores the data, and applies the image editing.
PCB10	62	Polygon Motor Driver (A224 only)	Drives the polygon motor.
Motors			
M1	45	Main	Drives the main body components.
M2	37	Scanner Drive	Drives the 1st and 2nd scanners (dc stepper motor).
M3	47	Transport Vacuum Fan	Aids paper transportation from the transfer roller to the fusing unit.
M4	49	Polygonal Mirror	Turns the polygonal mirror.
M5	38	Toner Supply	Rotates the toner bottle to supply toner to the toner supply unit.
M6	35	Exhaust Fan	Removes heat from around the fusing unit.
M7	46	Fusing Unit Fan (A224 only)	Removes heat from around the fusing unit.
Sensors			
S1	33	Upper Exit	Detects misfeeds.
S2	31	Lower Exit	Detects misfeeds.
S3	28	Left Vertical Door	Cuts the +5 and +24 Vdc power lines.
S4	27	Left Door	Detects whether the left door is open or closed.
S5	17	Relay	Detects the leading edge of paper from the paper tray and duplex unit to determine the stop timing of the paper feed clutch and duplex feed motor. Also detects misfeeds.

Symbol	Index No.	Description	Note
S6	10	PCU	Detects when a new PCU is installed.
S7	29	Fusing Exit	Detects misfeeds.
S8	9	Charge Roller H.P	Informs the CPU when the drum charge roller is at home position.
S9	—	Upper Tray Paper End (A193 only)	Informs the CPU when the upper paper tray runs out of paper.
S10	15	Lower Tray Paper End	Informs the CPU when the lower paper tray runs out of paper.
S11	16	By-pass Feed Paper End	Informs the CPU when there is no paper in the by-pass tray.
S12	13	Registration	Detects the leading edge of the copy paper to determine the stop timing of the paper feed clutch, and detects misfeeds.
S13	12	By-pass Feed Paper Width	Detects the width of the paper in the by-pass feed table.
S14	59	Humidity	Monitors the humidity around the PCU.
S15	4	Original Width	Detects the width of the original. This is one of the APS (Auto Paper Select) sensors.
S16	5	Original Length-1	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S17	6	Original Length-2	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S18	3	Platen Cover	Informs the CPU whether the platen cover is up or down (related to APS/ARE functions). ARE: Auto Reduce and Enlarge
S19	1	Scanner H.P.	Informs the CPU when the 1st and 2nd scanners are at the home position.
S20	23	Toner Density (TD)	Detects the amount of toner inside the development unit.
Switches			
SW1	20	AC	Supplies power to the copier.
SW2	32	Main	Supplies power to operate the machine.
SW3	14	Right Vertical Guide	Cuts the +5 and +24 Vdc power lines.
SW4	—	Upper Paper Size (A193 only)	Determines what size of paper is in the upper paper tray.
SW5	19	Lower Paper Size	Determines what size of paper is in the lower paper tray.
SW6	26	Front Door Safety	Cuts the +5VLD and +24V dc power lines and detects whether the front cover is open or not.
Magnetic Clutches			
MC1	36	Charge Roller Contact	Controls the touch and release movement of the drum charge roller.
MC2	42	Upper Relay	Drives the upper relay rollers.
MC3	43	Lower Relay	Drives the lower relay rollers.

Symbol	Index No.	Description	Note
MC4	41	By-pass Feed	Starts paper feed from the by-pass feed table.
MC5	—	Upper Paper Feed (A193 only)	Starts paper feed from the upper paper tray.
MC6	44	Lower Paper Feed	Starts paper feed from the lower paper tray.
MC7	40	Registration	Drives the registration rollers.
MC8	39	Development	Drives the development roller.
Solenoids			
SOL1	48	Junction Gate	Moves the junction gate to direct copies to the face-up or face-down copy tray.
Lamps			
L1	60	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.
L2	2	Scanner	Applies light to the original for exposure.
L3	8	Fusing	Provides heat to the hot roller.
Heaters			
H1	18	Tray (option)	Turns on when the main switch is off to keep paper in the paper tray dry. Tray heaters are also available for the optional paper feed unit.
H2	34	Anti-condensation (option)	Turns on when the main switch is off to prevent moisture from accumulating.
H3	11	Drum (option)	Keeps the drum warm to prevent condensation on the drum.
Thermistors			
TH1	24	Charge Roller	Monitors the temperature of the drum charge roller.
TH2	21	Fusing	Monitors the temperature of the hot roller.
TH3	22	Fusing Edge (A224 only)	Monitors the temperature for the front edge of the hot roller.
Thermofuses			
TF1	7	Fusing	Provides back-up overheat protection in the fusing unit.
Counters			
CO1	25	Total	Keeps track of the total number of copies made.
CO2	—	Key (option)	Used for control of authorized use. The copier will not operate until it is installed.

Symbol	Index No.	Description	Note
Others			
LSD1	30	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
NF	56	Noise Filter (230V machine only)	Removes electrical noise from the AC input line.
CB	57	Circuit Breaker (230V machine only)	Guards against voltage surges in the AC input line.

4. DRIVE LAYOUT



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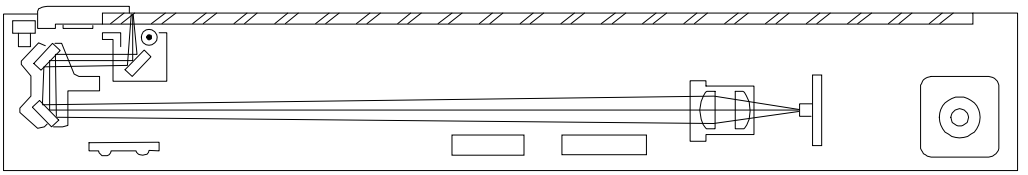
1. Scanner Drive Motor
2. Development Clutch
3. Charge Roller Contact
4. Main Motor
5. Registration Clutch
6. Lower Paper Feed Clutch
7. Lower Relay Clutch
8. Upper Relay Clutch
9. By-pass Feed Clutch

5. COPY PROCESS

5.1 OVERVIEW



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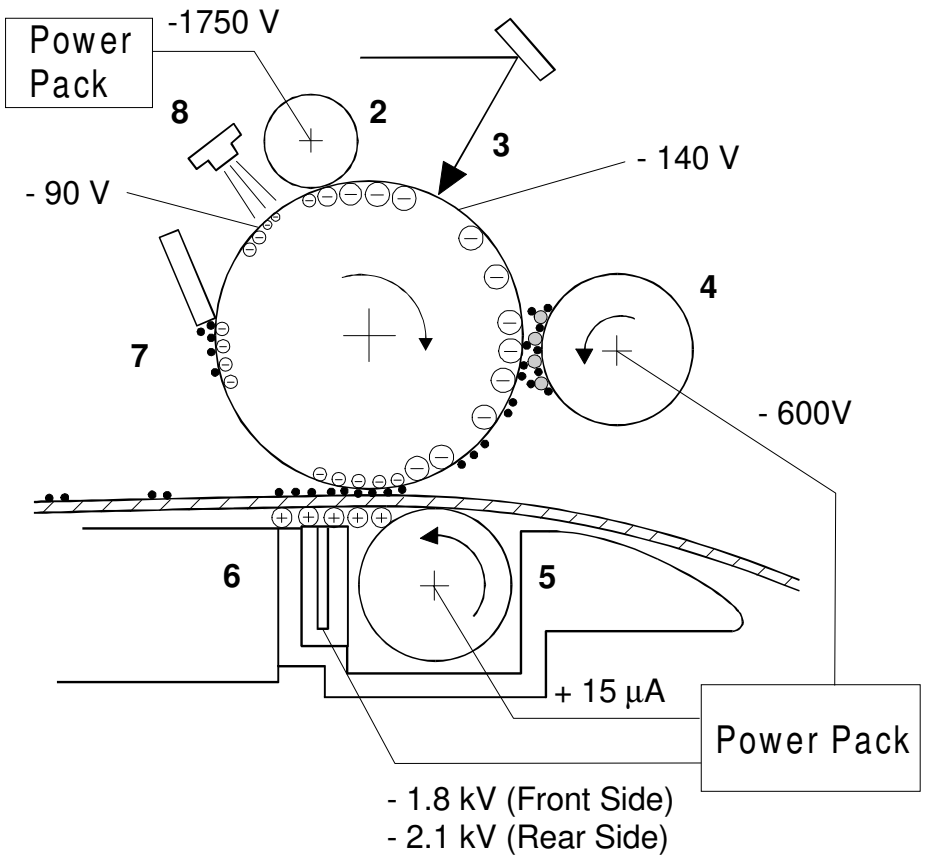

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The separation (discharge brush) voltage has been changed.

6. MAIN SCAN MAGNIFICATION/REDUCTION

The specification of the reproduction ratios in the memory mode (binary picture processing mode) has been changed to 5 enlargement and 6 reduction. This is because the higher copy speed of this model causes poor copy quality at a reproduction ration of 25%.

Reproduction ratios of 48% ~ 400% are achieved for main and sub scan magnifications in the same way as for the A193 copier, and for reproduction ratios of 25% ~ 47%, it is done by changing the scanner speed and deleting every other line.

7. LASER EXPOSURE

7.1 OVERVIEW

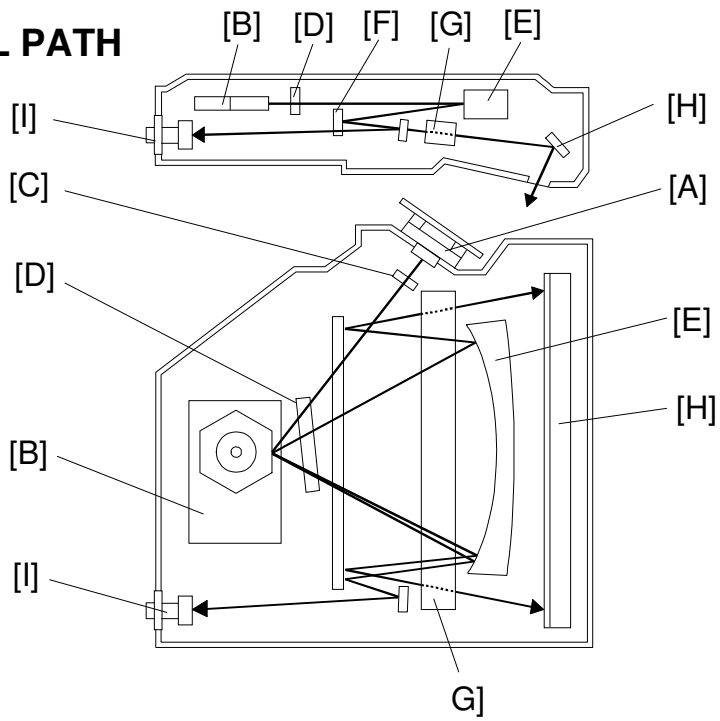
The strength of the beam is 0.6 mW on the drum surface (10 mW output from the LDDR board) at a wavelength of 780 nm.

The polygon motor speeds have been changed as follows:

Resolution (dpi)	Modes	Motor Speed (rpm)	Data Frequency (MHz)
400 dpi	Copy and Fax	17952.8	11.750
600 dpi	Printer	26926.1	26.438
391.16 dpi	Fax (image rotation)	18240.0	11.674
406.4 dpi	Fax (mm printing)	17556.0	11.674

The polygon mirror motor and motor driver are separated to prevent the laser unit from being heated by the motor driver. Also, the laser unit has a polygon motor cover and shield glass to reduce the noise from the polygon motor.

7.2 OPTICAL PATH



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The shield glass has been added.

[A]: LD Unit

[B]: Polygon Mirror

[C]: Cylindrical Lens

[D]: Shield Glass

[E]: F - Theta Mirror

[F]: 1st Mirror

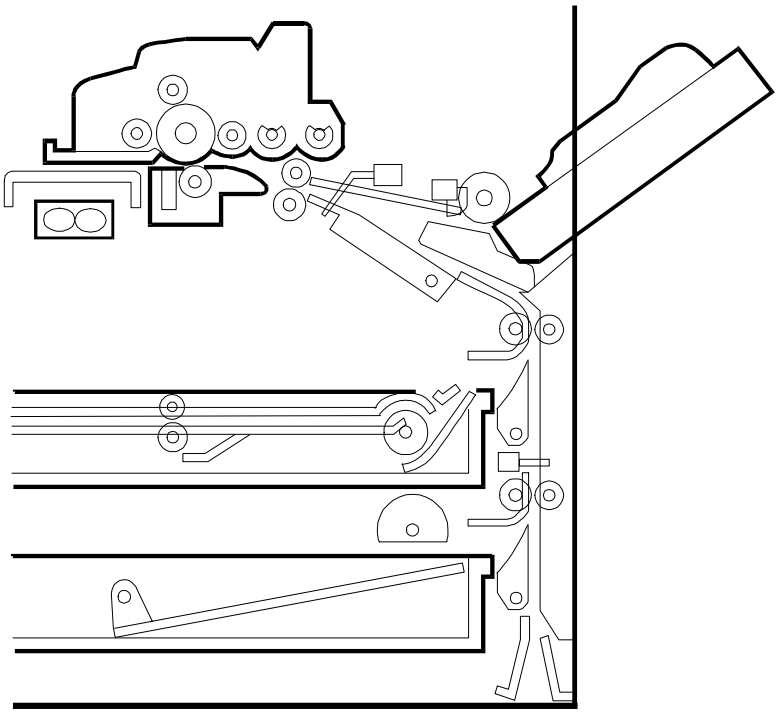
[G]: BTL

[H]: 2nd Mirror

[I]: Laser Syncronization Detector

8. PAPER FEED

8.1 OVERVIEW



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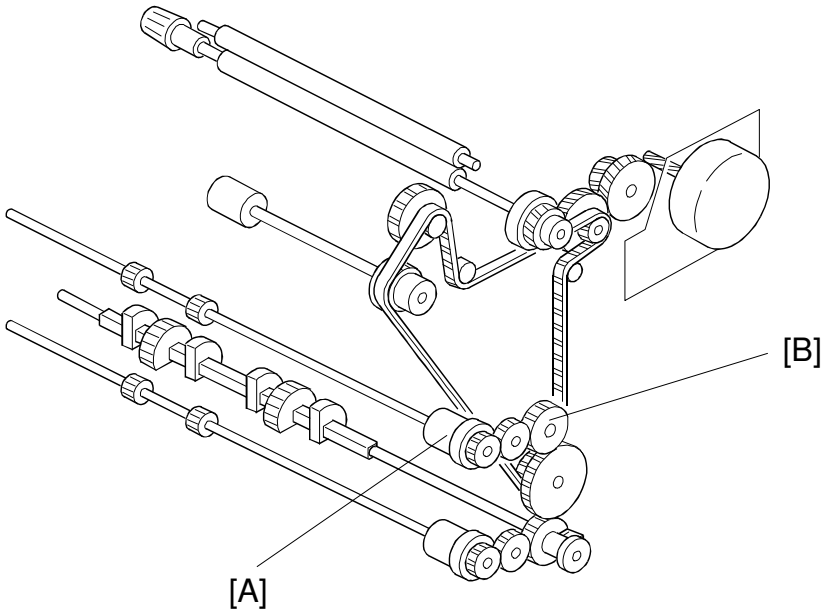
This machine has a duplex unit as a standard component, so the following parts have been deleted.

1. Upper Paper Feed Rollers
2. Upper Paper Feed Clutch
3. Upper Paper End Sensor and Feeler
4. Upper Paper Size Sensor

8.2 DRIVE MECHANISM



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Drive transfers to the upper relay clutch [A] through the gear [B] instead of the paper feed clutch.

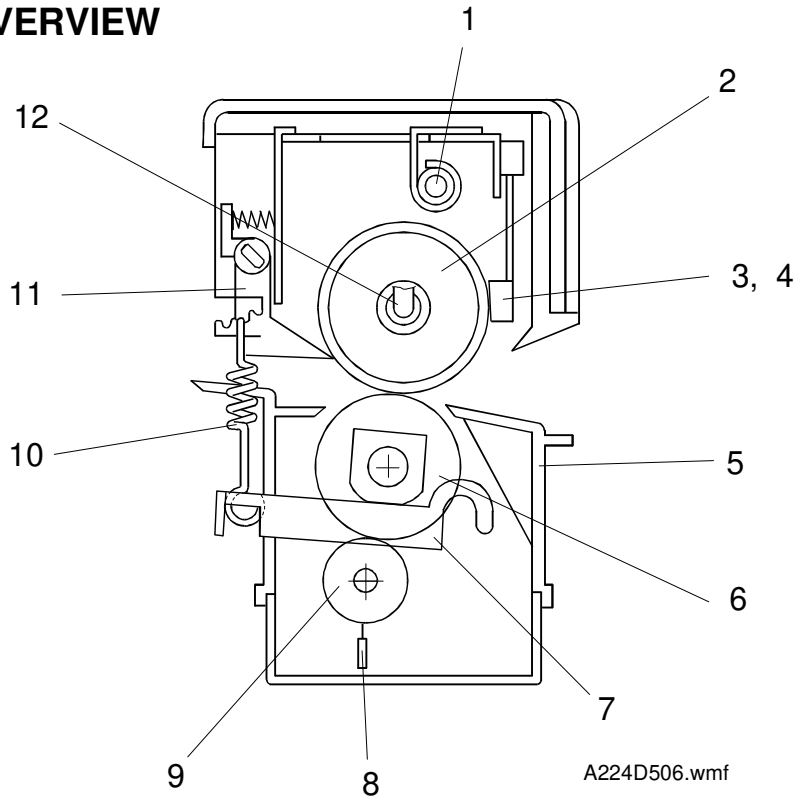
9. PAPER SEPARATION AND TRANSPORT

The voltage for the discharge brush has been changed.

- -1.8 kV (feeding from a paper tray)
- -2.1 kV (second side of duplex copies, feeding from the duplex unit)

10. IMAGE FUSING

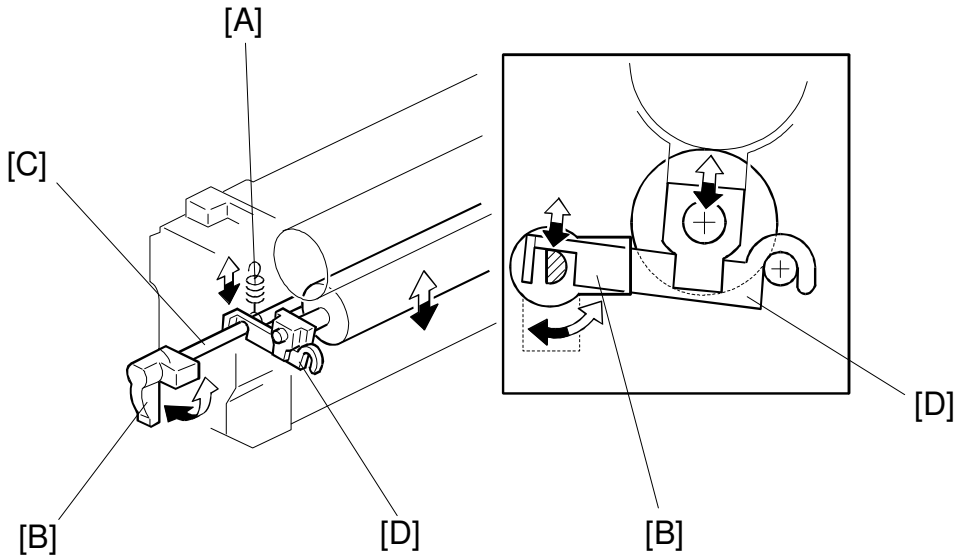
10.1 OVERVIEW



Two new parts; fusing edge thermistor and antistatic brush have been added. The fusing edge thermistor is for over heat prevention at the end of the hot roller. The antistatic brush is for prevention of off-set fusing image.

1. Fusing thermofuse
2. Hot roller
3. Fusing thermistor
4. Fusing edge thermistor
5. Lower entrance guide
6. Pressure roller
7. Pressure lever
8. Antistatic brush
9. Cleaning roller
10. Pressure spring
11. Hot roller strippers
12. Fusing lamp

10.2 PRESSURE ROLLER



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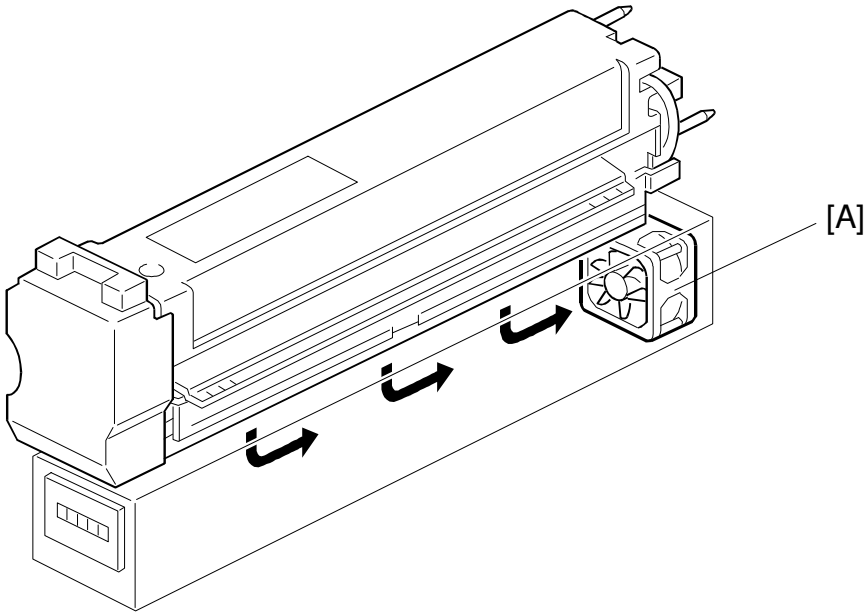
The pressure of the pressure roller can be changed in the same way as for the A193 machine. It is done by adjusting the position of the pressure springs [A]. In this machine, the fusing pressure can also be adjusted with the lever handle [B] (this is a finer adjustment than the pressure springs). The user can do this when printing on a thicker medium, such as an envelope.

The lever shaft [C] contacts the pressure lever [D]. When the lever handle rotates down, the shaft lowers the pressure lever. At this time, the pressure of the pressure roller is decreased. The upper position of the lever is normal.

10.3 FUSING UNIT FAN



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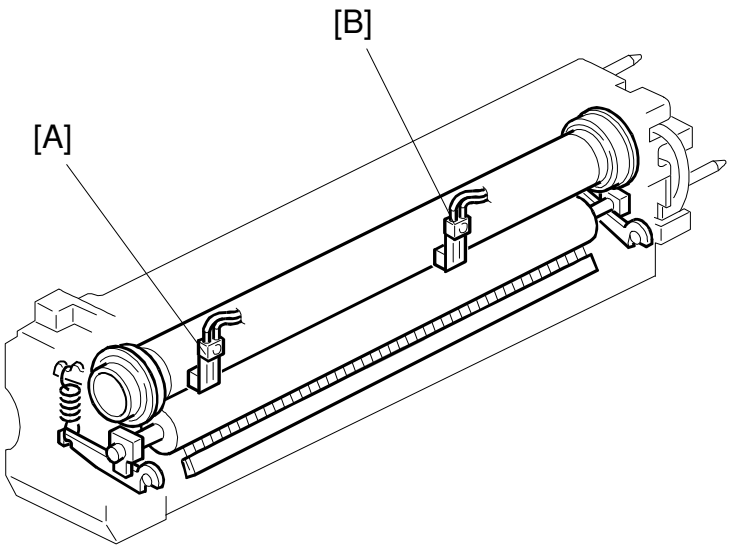
The fusing unit fan [A] has been added below the fusing unit. The fusing unit fan is necessary because the wattage of the fusing lamp is higher than in the A193 machine, as a result of the higher copy speed.

The fusing unit fan turns on if the charge roller thermistor detects a temperature in the machine of over 43°C when the main motor starts to rotate or at any time that the main motor is rotating.

The fusing unit fan stops either when the main motor stops or when the temperature in the machine falls below 40°C.

10.4 FUSING TEMPERATURE CONTROL AND OVERHEAT PROTECTION



A224D504.wmf

The fusing control type can be either phase control or on-off control, depending on an SP mode setting.

The fusing edge thermistor [A] has been added. It measures the temperature at the end of the hot roller. This is because this machine has a higher copy speed and more power is supplied to the fusing lamp. So, when making a multi-copy run with A4 size paper, the temperature at the ends of the hot roller is higher than at the middle.

Usually, the fusing temperature is controlled using the fusing thermistor [B] (at the middle). However, if the temperature at the end of the hot roller becomes greater than 230° C, the fusing lamp turns off until the temperature at the middle of the hot roller has fallen by 5°C.

11. ENERGY SAVER MODES

Basically, the function and performance of the energy saver mode in all machine configurations, except the copier configuration for the 230V machine, are the same as for the A193 machine. The following are the items which have been changed.

1. Fusing temperature in the energy saver level 2
   80°C (230V machine)
2. The recovery time from energy saver level 2
   30 s (230V machine)
3. When the auto shut-off timer runs out in the copier configuration (230V machine only)
   When the auto shut-off timer runs out, the machine enters auto shut off mode and the **ac switch** turns off automatically. This function can be disabled with SP 5-948. If this function is disabled, the main switch turns off when the timer runs out.

   NOTE: This function is necessary to meet new BAM regulations in Germany (enforced from January, 1999). The new BAM regulation requires low power consumption in the auto-shut off mode (less than 2 W).
4. Power consumption in the copier configuration

Mode	AC Switch	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF or ARDF.
Energy Saver Level 2	On	On	On	140°C (115 V) 80°C (230 V)	On	
Auto Shut-off Mode (SP5-948 enabled)	Off (230V) On (115V)	On (230V) Off (115V)	Off	Off	Off	The machine returns to standby mode only if either the main switch or ac switch is turned on.

12. SERVICE PROGRAM MODE TABLE

12.1 MAIN SP MODE TABLE

NOTE: 1) A "#" mark after the mode number means that this SP mode is only used for the A193 machine.
2) A "##" mark after the mode number means that this SP mode is only used for the A224 machine.
3) In the Function column, comments are in italics.
4) In the Settings column, the default value is in bold letters.
5) An asterisk (*) after the mode number means that this mode is stored in the NVRAM. If the RAM is reset, all these SP modes will return to their factory settings.

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-001 *	1	Leading Edge Registration (Normal copying, and duplex 1st side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10).	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.	
	2	Leading Edge Registration (Duplex: 2nd side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10).	+12.5 ~ -12.5 0.1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.	
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 (SP5-902, No.10).	+9 ~ -9 0.1 mm/step + 0.0 mm
			Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.	
	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 (SP5-902, No.10).	+9 ~ -9 1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-002 *	3	Side-to-Side Registration (3rd paper feed: Option PFU tray 1)	Adjusts the printing side-to-side registration from the 3rd paper feed station using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2±1.5 mm.*	+9 ~ -9 1 mm/step + 0.0 mm
	4	Side-to-Side Registration (4th paper feed: Option PFU tray 2)	Adjusts the printing side-to-side registration from the 4th paper feed station using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2±1.5 mm.*	+9 ~ -9 0.1 mm/step + 0.0 mm
	5	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 (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2±1.5 mm.*	+9 ~ -9 0.1 mm/step + 0.0 mm
	6	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2±1.5 mm.*	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
	7 ##	Side-to-Side Registration (LCT)	Adjusts the printing side-to-side registration from the LCT using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2±1.5 mm.*	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
1-003 *	1	Paper Feed Timing (Paper Feed Trays)	Adjusts the relay clutch timing (or transport motor timing when using the LCT) at registration. The relay clutch timing (transport motor timing) determines the amount of paper buckle at registration. (A larger setting leads to more buckling.)	0 ~ 10 1 mm/step **7 mm**
	2	Paper Feed Timing (By-pass)		0 ~ 10 1 mm/step **8 mm**
	3 ##	Paper Feed Timing (LCT)		0 ~ 10 1 mm/step **7 mm**
1-006 *		Double copy registration	Adjusts the position of the second copy from the center line in double copy mode. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	+9 ~ -9 1 mm/step **+ 0 mm**
1-007 *		By-pass Feed Paper Size Display	Displays the paper width sensor data for the by-pass feed table.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-104 *		Fusing Temperature Control	Selects the fusing temperature control mode.	**0: On/Off** 1: Phase
1-105 *	1	Fusing Temperature Adjustment (Operation)	Adjusts the fusing temperature in the operation mode.	100 ~ 200 *1°C/step* **180°C**
	2	Fusing Temperature Adjustment (Energy Saver Level 2)	Adjusts the fusing temperature in the energy saver level 2 mode. *With a lower value, the machine takes more time to reach the ready condition.*	0 ~ 165 *1°C/step* **140°C (115V machine)** **0°C (A193 - 230V machine)** **80°C (A224 - 230V machine)**
1-106		Fusing Temperature Display	Displays the fusing temperature. *Press the ⎆/⎚ key to exit the display.*	
1-901		Auto Restart Interval	**Do not change the value.**	
1-902		Fusing Control Frequency Display	Displays the fusing control frequency which is detected by the zero cross signal generator. *Around "50" equals 50 Hz. Around "60" equals 60 Hz.*	
1-903 *		Envelope Feeding	Adjusts the by-pass feed clutch on time when the paper is fed by the registration roller. *The by-pass feed clutch turns on again after paper buckling to help the registration roller to feed thick paper.*	0 ~ 10 1 mm/step **3 mm**
2-001 *		Charge Roller Bias Adjustment	Adjusts the voltage applied to the charge roller. ***Do not change the value.***	-1000 ~ -2500 1 V/step **- 1750 V**
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 Image Adjustments" for details.*	0 ~ 9 1 mm/step **3.0 mm**
	2	Trailing Edge Erase Margin (Printing)	Adjusts the trailing edge erase margin. *The specification is 2±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-101 *	3	Left Side Edge Erase Margin (Printing)	Adjusts the left side erase margin. *The specification is 2±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**
	4	Right Side Edge Erase Margin (Printing)	Adjusts the right side erase margin. *The specification is 2±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**
2-103 *		LD Power Adjustment	Adjusts the LD power. ***Do not change the value.***	-128 ~ +127 1 μW/step **- 103**
2-106*		ID Adjustment for a Test Pattern	Adjusts the image density level for black pixels on test pattern printouts (made with SP5-902).	0 ~ 255 1/step **255**
2-201 *		Development Bias Adjustment	Adjusts the development bias during copying. *This can be adjusted as a temporary measure if faint copies appear due to an aging drum.*	-500 ~ -700 1 V/step **- 600 V**
2-213*		Number of Copies After Toner Near End Detection	Selects the number of copies after toner near-end has been detected.	**0: 50 copies** 1: 20 copies
2-220 *		VT Display	Displays the TD sensor output voltage. *Press the [Clear Modes/#] key to exit the display.*	
2-301 *	1	Transfer Current Adjustment (Paper Tray)	Adjusts the current applied to the transfer roller during printing from the paper tray. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	2	Transfer Current Adjustment (By-pass Feed Table)	Adjusts the current applied to the transfer roller during printing from the by-pass feed table. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	3	Transfer Current Adjustment (Duplex)	Adjusts the current applied to the transfer roller during printing from the duplex tray. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	4	Transfer Current Adjustment (Cleaning)	Adjusts the current applied to the transfer roller during roller cleaning. *If toner remains on the roller after cleaning, increase the current.*	-10 ~ 0 1 μA/step **- 4 μA**

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 2.0 V. *After installing a new PCU, the machine performs this function automatically.* ***Do not use this SP mode.***	**0: No** 1: Yes
2-901*	1	Separation Voltage Adjustment (Front side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the front side. *Increase if the paper is getting wrapped around the drum.*	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step **- 1800 V**
	2	Separation Voltage Adjustment (Front side - other areas)	Adjusts the discharge brush voltage on the front side except at the leading edge.	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step **- 1800 V**
	3	Separation Voltage Adjustment (Rear side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the rear side. *For the rear side in duplex mode, higher voltage is needed. The paper has more static on it, and there is toner on one side of the paper.*	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step **- 2500 V (A193)** **- 2100V (A224)**
	4	Separation Voltage Adjustment (Rear side - other areas)	Adjusts the discharge voltage on the rear side except at the leading edge.	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step **- 2500 V (A193)** **- 2100V (A224)**
2-902*		FCI Smoothing (Letter Mode)	Selects whether the FCI smoothing function to remove jagged edges is enabled or disabled (this adjustment does not affect fax mode)	0: No (Disabled) **1: Yes (Enabled)**
2-903*	1	LD PWM Laser Pulse Positioning (Independent Pixels)	Selects the laser pulse positioning type that is used for independent black or gray pixels (white pixels to left and right). *Item 3 is not used.*	**0: Center** 1: Right 2: Left 3: Concentrated

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-903*	2	LD PWM Laser Pulse Positioning (Left Edge)	Selects the laser pulse positioning type that is used for the the leftmost pixel of a series of black or gray pixels. *Item 3 is not used.*	0: Center **1: Right** 2: Left 3: Concentrated
	3	LD PWM Laser Pulse Positioning (Right Edge)	Selects the laser pulse positioning type that is used for the rightmost pixel of a series of black or gray pixels. *Item 3 is not used.*	0: Center 1: Right **2: Left** 3: Concentrated
	4	LD PWM Laser Pulse Positioning (Continuous)	Selects the laser pulse positioning type that is used for pixels in the middle of a series of black or gray pixels. *Item 3 is not used.*	**0: Center** 1: Right 2: Left 3: Concentrated
2-904*	1	ID Adjustment - Binary Processing Mode (Independent pixel)	Density of independent black or gray pixels in binary processing mode (white pixels to left and right).	0 ~ 255 1/step **128**
	2	ID Adjustment - Binary Processing Mode (Left Edge)	Density of the leftmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step **128**
	3	ID Adjustment - Binary Processing Mode (Right Edge)	Density of the rightmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step **255**
	4	ID Adjustment - Binary Processing Mode (Continuous)	Density of pixels in the middle of a series of black or gray pixels in binary processing mode.	0 ~ 255 1 / step **255**
	The threshold value for binary picture mode is set with SP 4-418. The SP2-904 settings determine how black the black pixels are.			
2-905		Gradation Type	This is for the designer's test purposes. **Do not change the value.**	
2-907*		Laser Pulse Positioning	Selects the laser pulse position type that is used for test pattern printouts (printed with SP5-902). *Item 3 is not used.*	**0: Center** 1: Left 2: Right 3: Concentrated

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-908		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit for 1.5 minutes. *Toner supply finishes automatically after 1.5 minutes. This process is not normally needed in the field for this model, as the machine can handle most cases where toner runs short temporarily.*	**0: No** 1: Yes
2-909		Forced Charge Roller Cleaning	Forces charge roller cleaning. *After selecting "1", press Enter or # to start this feature. Press C to stop.*	**0: No** 1: Yes
2-910		Forced Transfer Roller Cleaning	Forces transfer roller cleaning. *After selecting "1", press Enter or # to start this feature. Press C to stop.*	**0: No** 1: Yes
2-911*		Image Density Selection	Selects the humidity coefficients for determining VTREF and VTE from the TD sensor initial setting output. *This setting can be adjusted by the key operator to make image density lighter or darker (see Replacement and Adjustment - Image Density Adjustment by Key Operator).*	0: Darker 1: Dark **2: Normal (A224)** **3: Light (A193)** 4: Lighter
2-912*		Charge Roller Temperature Correction	Corrects the charge roller temperature. *Do not use this SP mode unnecessarily (i.e., unless it is impossible to cure dirty backgrouund by any other means).*	-5 ~ +5 1 (25V)/step **0 (A193)** **2 (A224)**
2-913*		Auto TD Sensor Initial Setting Mode	Selects whether or not the TD sensor initial setting process is performed automatically at installation. *Select "No" if the PCU detection mechanism has a problem. However, **usually do not use this SP mode.***	0: No **1: Yes**
2-916*		Printer γ Table (GAVD) Selection	Selects the printer γ table (GAVD) type. *This SP mode is only effective in the grayscale processing mode.* *A larger value gives a darker image.*	1 ~ 4 1/Step **2**
2-980		Humidity Sensor Output Display	Displays the humidity sensor output data in hex code as %Rh.	
2-995*	1	TD Sensor Control Value Display (Factory)	Displays the TD sensor control value (V_{CONT}), which was adjusted in the factory. The machine normally uses this value, unless SP 2-999 is changed away from 0.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-995*	2	Factory V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted in the factory. *When V_{CONT} is adjusted at the factory, the counter is automatically set at "9999999".*	
2-996*	1	TD Sensor Control Value Setting	Inputs the TD sensor control value (V_{CONT}) *If the V_{CONT} voltage is out of specification after replacing the IOCSS board, adjust V_{CONT} using this SP mode. After changing this value, SP2-999 should be set at "1". See "Replacement and Adjustment - IOCSS Board".*	80 ~ 170 1/step **140 (A193)** **120 (A224)**
	2	Manual V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted in the field.	
2-997*	1	TD Sensor Control Value Display (Installation)	Displays the TD sensor control value (V_{CONT}) which was adjusted at installation. The machine uses this value only if SP 2-999 is set to 2.	
	2	Installation V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted at machine installation.	
2-998*		Printer Main Scan Magnification	Adjusts the magnification in the main scan direction for the printer. *Use the •/∗ key to toggle between + and -. The specification is ± 1%. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 0.5 ~ + 0.5 0.1%/step **0.0 %**
2-999*		TD Sensor Control Value Selection	Selects the TD sensor control voltage *If the V_{CONT} value is out of specification after replacing the IOCSS board, this value should be changed to "1" after inputting the correct value with SP 2-996. See "Replacement and Adjustment - IOCSS Board".*	**0: Factory** 1: Manual 2: Installation Never select 2.
4-008 *		Main Scan Magnification (Scanning)	Adjusts the magnification in the main scan direction for scanning. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 1.0 ~ + 1.0 0.5 %/step **+ 0.0 %**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
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 Image Adjustments" for details.*	- 2.0 ~ + 9.0 0.5 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.* *Use the •/∗ key to toggle between + and -.* *See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 6.0 ~ + 6.0 0.1 mm/step **+ 0.0 mm**
4-012 *	1	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge 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 ~ 9.0 0.1 mm/step **1.0 mm**
	2	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
	3	Left Side Erase Margin (Scanning)	Adjusts the left side margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
	4	Right Side Erase Margin (Scanning)	Adjusts the right side margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp on. *After selecting "1", press Enter or # twice to start this feature. Press C/⊘ to stop.*	**0: No** 1: Yes
4-015*	1	White Plate Scanning Start Position	Adjusts the scanning start position on the white plate for auto shading. *The default is 6 mm from the leading edge. The setting specifies how far scanning starts from the default position.*	- 3.0 ~ + 6.0 0.5 mm/step **0 mm**
	2	White Plate Scanning Area	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading. *The default is 5 mm (for 41 - 400% reproduction ratios) or 6.5 mm (25 - 40%). The current setting specifies the difference from these defaults.*	- 3.0 ~ + 6.0 0.5 mm/step **0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-101*		Sub Scan Magnification (Scanning: Book Mode)	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 Image Adjustments" for details.*	- 1.0 ~ + 1.0 0.5 %/step **+ 0.0 %**
4-301		APS and Platen/DF Sensor Output Display	Displays the status of the APS sensors and platen/DF cover sensor. *See "APS and Platen/DF Sensor Output Display" after the SP mode table.*	
4-303 *		APS Small Size Original Detection	Selects whether or not the copier determines that the original is A5 size when the APS sensor does not detect the size. *If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Original size" will be displayed.*	**0: No (Not detected)** 1: Yes (A5 lengthwise)
4-401*		Binary Processing Mode (Neg./Pos.)	**Japanese version only.** **Do not change the value**.	
4-402*		Binary Processing Mode (Marker Mode)	**Japanese version only.** **Do not change the value**.	
4-403*		Gradation Processing Mode for One-to-one Copying	Selects whether binary picture processing or grayscale processing mode is done. *For example, if binary processing mode is selected, all image processing is handled using binary picture processing mode. Note that memory copying always uses binary picture processing, regardless of this setting.*	**0: No (Grayscale processing)** 1: Yes (Binary processing)
4-406*		Marker Detection	**Japanese version only.** **Do not change the value**.	
4-407*	1	MTF Filter Selection in Letter Mode (25% ~ 64%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **4**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-407*	2	MTF Filter Selection in Letter Mode (65% ~ 154%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **7**
	3	MTF Filter Selection in Letter Mode (155% ~256%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **3**
	4	MTF Filter Selection in Letter Mode (257% ~ 400%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **10**
	5	Smoothing Filter Selection in Photo Mode	Selects the smoothing filter level for Photo mode. A stronger filter gives a smoother image. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 8 1/step **3**
	6	MTF Filter Selection in Letter/Photo Mode	Selects the MTF filter level for Letter/Photo mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **2**
	7	MTF Filter Selection in Marker Mode	**Japanese version only.**	
	8	MTF Filter Selection in Letter Mode - Binary picture mode (25% ~ 83 %)	Selects the MTF filter level for Letter mode (binary picture mode). A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **0**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-407*	9	MTF Filter Selection in Letter Mode - Binary picture mode (84% ~ 400 %)	Selects the MTF filter level for Letter mode (binary picture mode). A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **4**
4-410*		AGC Default Setting	Not used ***Do not change the value.***	- 5 ~ 2 1/step **0**
4-412*		Video Data Path	Selects one of the following video data outputs, which will be used for printing. **0. Normal video processing** 1. After auto shading processing 2. After MTF processing 3. After gamma correction 4. Data straight through (no video processing) ***Do not change the value.***	
4-417		IPU Test Pattern Print	Prints the test pattern for the IPU or selects one of the following video data outputs for printing. **0. No Print** 1. Grayscale 1 2. Grayscale 2 3. Vertical Bands 4. Vertical Line - 1 dot 5. Vertical Line - 2 dot 6. Grid Pattern *Change to the copy mode display by pressing the "Interrupt" key, then print the test pattern.*	
4-418*	1	Threshold Level in Letter Mode	Selects the threshold level for Letter Mode - *Binary picture processing mode*	0 ~ 255 1/step 48
	2	Threshold Level in Letter/Photo Mode	Selects the threshold level for Letter/Photo Mode - *Binary picture processing mode*	0 ~ 255 1/step 240
4-419*	1	Threshold Level for Marker Mode (Main scan magnification)	**Japanese version only.**	
	2	Threshold Level for Marker Mode (Sub scan magnification)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-421*	1	Dither Pattern Selection (Grayscale Mode/Photo Mode)	Selects the dither pattern used in grayscale processing mode. *A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.*	**0: 180-line** 1: 140-line 2: 95-line
	2	Dither Pattern Selection (Binary Picture/Photo Mode)	Selects the dither pattern used in binary picture processing mode. *A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.*	**0: 140-line** 1: 95-line 2: 70-line
4-902		Exposure Lamp On	Turns on the exposure lamp. *To turn off the exposure lamp, select "0".*	**0: No (Off)** 1: Yes (On)
4-904*		SBU Gain Adjustment	Adjusts the coefficient of the D/A converter for the standard AGC gain curve ***Do not adjust this value.** However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **30**
4-905*		SBU DC Count Adjustment	Adjusts the coefficient of the D/A converter for the AGC gain curve for dc count. ***Do not adjust this value.** However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **30**
4-906*		SBU Reference Value Adjustment	Adjusts the coefficient of the D/A converter for the AGC gain curve for scanning the white plate. ***Do not adjust this value.** However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **147**
4-907*		SBU Offset Value Adjustment	Adjusts the coefficient of the D/A converter for the offset (Z/C) for the analog image data processing ***Do not adjust this value.** However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **180**
4-908*		SBU Auto Adjustment	Performs the auto scanner adjustment. *Using this SP mode after replacing the white plate or the memory on the BICU board. See "Replacement and Adjustment - Standard White Level" for details on how to do this.*	**0: Normal operation** 1: Start the adjustment
4-909*		EDU Test Mode	**Japanese version only.** **Do not change the value.**	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-910*		Scanner Motor Control Method	Selects the scanner motor control method. *If "1" is selected, the current for the scanner motor will be reduced and jitter copy image problems will be alleviated. However, copy speed will be reduced.*	**0: Normal** 1: Special
4-912*	1	White Level Value Display (Current)	Displays the current white level value.	
	2	White Level Value Display (Factory)	Displays the white level value for the white plate scanned at the factory.	
4-913*		Shading Interval Time in DF Mode	Adjusts the interval for shading processing in DF mode. *Light and heat may affect the scanner response. If copy quality indicates that white level is drifting during a DF copy job, reduce this setting.*	0 ~ 60 1 s/step **30 s**
4-914		Mirroring Test	**These SP modes are for designer use. Do not change the values.**	
4-915*		Image Data Through Mode		
4-998*	1	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch1	Selects the MTF filter level for Letter mode (binary picture mode) at notch 1 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **0**
	2	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 2	Selects the MTF filter level for Letter mode (binary picture mode) at notch 2 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **0**
	3	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 3	Selects the MTF filter level for Letter mode (binary picture mode) at notch 3 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **9**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-998*	4	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 4	Selects the MTF filter level for Letter mode (binary picture mode) at notch 4 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **9**
	5	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 5	Selects the MTF filter level for Letter mode (binary picture mode) at notch 5 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **2**
	6	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 6	Selects the MTF filter level for Letter mode (binary picture mode) at notch 6 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **2**
	7	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 7	Selects the MTF filter level for Letter mode (binary picture mode) at notch 7 image density level. A stronger filter gives a sharper line. ***Never select 1.***	0 ~ 11 1/step **2**
4-999*	1	Threshold Level in Letter Mode - Binary Picture Mode for Notch 1	Selects the threshold level for Letter mode (binary picture mode) at notch 1 image density level.	0 ~ 255 1/step **45**
	2	Threshold Level in Letter Mode - Binary Picture Mode for Notch 2	Selects the threshold level for Letter mode (binary picture mode) at notch 2 image density level.	0 ~ 255 1/step **50**
	3	Threshold Level in Letter Mode - Binary Picture Mode for Notch 3	Selects the threshold level for Letter mode (binary picture mode) at notch 3 image density level.	0 ~ 255 1/step **40**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-999*	4	Threshold Level in Letter Mode - Binary Picture Mode for Notch 4	Selects the threshold level for Letter mode (binary picture mode) at notch 4 image density level.	0 ~ 255 1/step **45**
	5	Threshold Level in Letter Mode - Binary Picture Mode for Notch 5	Selects the threshold level for Letter mode (binary picture mode) at notch 5 image density level.	0 ~ 255 1/step **30**
	6	Threshold Level in Letter Mode - Binary Picture Mode for Notch 6	Selects the threshold level for Letter mode (binary picture mode) at notch 6 image density level.	0 ~ 255 1/step **30**
	7	Threshold Level in Letter Mode - Binary Picture Mode for Notch 7	Selects the threshold level for Letter mode (binary picture mode) at notch 7 image density level.	0 ~ 255 1/step **30**
5-001*		All Indicators On	Turns on all indicators on the operation panel. *Press # to check.* *Press Clear/Stop to exit this SP mode.*	
5-103*		Auto Paper Tray Shift	Selects whether auto paper tray shift is done or not.	0: No **1: Yes**
5-104 *		A3/11"x17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. *If "YES" is selected, the total counter (mechanical counter) and the current user code counter counts up twice when A3/11"x17" paper is used.*	**No** Yes
5-106 *		ADS Level Selection	Selects the image density level that is used in ADS mode.	1 ~ 7 1 notch/step **4**
5-113*		Option Counter Type	Selects the optional counter type. *When the optional key counter is installed, this value should be set at "1".* ***The values "2","3", and "4" are used for the Japanese version only.***	**0: No counter** 1: Key Counter 2: Key Card 3: Coin Lock 1 4: Coin Lock 2
5-116*		Total Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit.	**0: Feed-in** 1: Exit

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-401*	1	User Code Mode (Copier)	Selects whether the user code function is enabled in copy mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
	2	User Code Mode (Fax)	Selects whether the user code function is enabled in facsimile mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
	3	User Code Mode (Printer)	Selects whether the user code function is enabled in printer mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
5-501 *	1	PM Alarm Interval	Sets the PM interval, with an alarm. The Auto Service Call feature of the fax option also refers to this setting. *When the setting is "0", this function is disabled.*	0 ~ 255 1k copies/step **100 k copies**
	2	PM Alarm	Selects whether the PM alarm is enabled or not. If this is "0", the Auto Service Call feature of the fax option is also disabled.	0: No **1: Yes**
	3	PM Alarm (Original)	**Japanese version only.** **Do not change the value.**	
5-504*		PM Alarm (Jam Alarm)	**Japanese version only.** **Do not change the value.**	
5-507*	1	PM Alarm (Copy Size)	**Japanese version only.** **Do not change the value.**	
	2	PM Alarm (Staple)		
	3	PM Alarm (Toner End)		
5-508*	1	CE Call (Jam Level 1)	**Japanese version only.** **Do not change the value.**	
	2	CE Call (Jam Level 2)		
	3	CE Call (Door Open)		
5-801		Memory All Clear	Resets 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. ***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.*	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-802		Free Run	Performs a free run for both the scanner and the printer. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
5-803		Input Check	Displays the signals received from sensors and switches. See the "INPUT CHECK" section for details. *Press ⊘/⊘ to exit the program.*	
5-804		Output Check	Turns on the electrical components individually for test purposes. See the "OUTPUT CHECK" section for details.	
5-808*	1	Display Language (115V machines)	Selects the display language for 115V machines.	**0: English** 1: French 2: Spanish
	2	Display Language (230V machines - Standard)	Selects the standard display language for 230V machines.	**0: English** 1: German 2: Dutch 3: French 4: Italian 5: Spanish
	3	Display Language (230V machines - Option)	Selects the option display language for 230V machines.	**0: English** 1: German 2: Dutch 3: Swedish 4: Norwegian 5: Danish
5-810		SC Code Reset	Resets Type A service call conditions. After performing this SP mode, turn the machine main switch off and on. See "Troubleshooting - Service Call Conditions" for how to use this mode.	**0: No** 1: Yes
5-812 *		Service Telephone Number	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs). *Press the "•/#" key if you need to input a pause (—).* *Press the ⊘/⊘ key to delete the telephone number.*	
5-816*		CSS Function	**Japanese version only.** **Do not change the value.**	
5-817	1	CE Start Call	**Japanese version only.** **Do not change the value.**	
	2	CE Finish Call		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-901		Printer Free Run	Performs the printer free run. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
5-902		Test Pattern Printouts	Prints the test pattern. *See the "TEST PATTERN PRINTING" section for how to print a test pattern. Change to the copy mode display by pressing the "Interrupt" key, then print out the test pattern.*	
5-903*		LCD Contrast Adjustment	Adjusts the contrast for the LCD on the operation panel. *Use the "Zoom" (+ or -) key to change the contrast.*	1 ~ 7 1/step **3**
5-904*		Auto Shut-off Mode Timer Setting	Inputs the auto shut-off mode timer. *If "0" is selected, the timer function is disabled.*	0 ~ 120 1 min/step **15 (A193)** **30 (A224)**
5-905*		CSS 25H Off Detection	**Japanese version only.** **Do not change the value.**	
5-906*		Exhaust Fan Control Timer Setting	Inputs the exhaust fan control timer in the energy saver mode *This time is for entering the exhaust fan motor control mode after the fusing lamp off or the main motor turns off. Until this timer expires, the exhaust fan stays on. Then the fan turns off and on in accordance with the fan control mode algorithm.*	30 ~ 120 1 s / step **30**
5-907		Brand Name and Product Name Setting	Selects the brand name and the product name for the Plug and Play function of Windows 95. The brand name and the product name for the Plug and Play function are registered in the NVRAM. If the NVRAM is defective, these names should be registered again after replacing the NVRAM. *Press down the "Photo mode" key and the # key at the same time to register the setting.*	
5-911*		APS A4/LT Sideways Priority	Specifies whether the machine selects LT sideways paper if the original is A4. If "Yes" is selected, LT sideways is selected automatically when the APS sensors detect an A4 sideways original. This feature does not work in reverse (A4 sideways paper is not selected for an LT sideways original).	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-912*	1	PCU Alarm Interval	Inputs the PCU alarm interval. *When the machine reaches the value, "Change Photoconductor Unit" will be displayed on the LCD to inform the user.*	**1 ~ 255** 1 k / Step **45 k**
	2	PCU Alarm Mode	Selects whether the PCU alarm function is performed or not.	0: No **1: Yes**
5-913		User Program (UP) Mode Data Reset	Resets the UP mode data to the defaults, except for the user codes, counters for each user code, and restricted access features.	**0: No** 1: Yes
5-930*		Fax Forwarding Mode	Selects whether the fax mode application key is accepted or not in the SC condition. *When an SC condition occurs while incoming data has been stored in the SAF memory, change the value to "1" to access fax mode. Then forward the incoming data to another fax machine by using the fax mode bit switches.*	**0: No** 1: Yes
5-932		Program Download	Downloads the system program from a ROM board to the Flash Memory on the BICU board. (Copier mode software only) See "Service Tables - Program Download" for details. *This SP can be operated when the ROM board is installed in the machine.*	**0: No** 1: Yes
5-940*		Image Rotation Mode	Selects whether the image rotation function is performed or not. *If there is a problem with the MSU, image rotation may lead to abnormal copies. If so, disable image rotation while waiting for new parts.*	**0: Yes** 1: No
5-941*		Duplex Blank Page	Selects whether the blank page is made on the front side or back side when duplex copy mode is selected.	**0: Back side** 1: Front side
5-942*		Image Compression Method	Selects the image compression method for memory mode copying.	0: MH 1: MR **2: MMR**
5-943*		Charge Roller H.P Detection	Selects whether the charge roller home position is detected or not. ***Do not use in the field, except in the following case.*** If the power goes off during TD sensor initialization, the charge roller is in contact with the PCU, so the PCU cannot be removed. Set SP 5-943 to 1, and the roller goes back to home position.	**0: No** 1: Yes
5-944*		APS Mode	Selects whether the APS mode is selected as power-up default or not.	0: No **1: Yes**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-945*		Memory Copy Priority	Selects whether or not the memory copy mode is selected when the main switch is turned on.	0: No **1: Yes**
5-946*		Auto Shut-off Mode Disabling when there is paper in the 1-bin sorter	Selects whether the auto shut-off mode is disabled or not when there is paper in the 1-bin sorter. *When the machine enters the auto shut-off mode while there is paper in the 1-bin sorter, the sorter paper indicator will go off. If this is not acceptable, this SP mode should be set at "1"*	**0: No** 1: Yes
5-947* ##		Use of 25% Reduction Ratio in the Photo and Letter/Photo Modes	Determines whether a reduction ratio of 25% can be used in the Photo and Letter/Photo modes (binary picture mode).	**0: No (50% - 400%)** 1: Yes (25% - 400%)
5-948* ##		AC Switch Auto Shut Off	Selects whether the ac switch auto shut-off mode or not. *If at "1", the ac switch turns off automatically when entering the auto shut off mode.*	**0: No (115V Machine)** **1: Yes (230V machine)**
5-991*		VRAM Data Download	**This SP mode is only used by the designer.** **Do not change the value.**	**0: Off** 1: On
5-992		System Parameter and Data List Printing	Prints the machine status history data list. See the "SYSTEM PARAMETER AND DATA LISTS" section for how to print the lists.	**0: No Print** 1: SP mode 2: UP mode 3: Log data
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 -.*	-1.5 ~ +1.5 0.5 mm/step **+ 0.0 mm**
	2	ADF Leading Edge Registration	Adjusts the leading edge registration in the ADF mode. *Use the •/∗ key to toggle between + and -.*	-10 ~ +10 0.5 mm/step **+ 6.0 mm**
	3	ADF Trailing Erase Margin	Adjusts the trailing edge erase margin in ADF mode. *Use the •/∗ key to toggle between + and -.*	-3.0 ~ +3.0 0.1 mm/step **+ 0.0 mm**
6-007*		ADF Sub-scan Magnification	Adjusts the magnification in the sub-scan direction for ADF mode. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 4.0 ~ + 4.0 0.1 %/step **0.0 %**
6-009		ADF Free Run	Performs an ADF free run. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
6-010*		Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in facsimile mode.	- 10 ~ + 10 1 mm/step **0 mm**
6-901		ADF Original Sensor Output Display	Displays the status of the original sensor for the ADF and paper size. *See "DF APS Original Sensor Output Display" after the SP mode table.*	
6-902*		ADF Original Scanning Method	Selects the original scanning method in ADF mode.	**0: Original** 1: Copy paper size + magnification
6-903*		Original Non-waiting Start	Selects whether original non-waiting start is performed or not. *If the user often feeds originals that slip, and the leading edge is catching up with the trailing edge of the previous page, set this SP mode to No.*	0: No 1: Yes
6-904*		Original Scanning Interval	Adjusts the interval between originals in original non-waiting start mode. *This SP mode is only effective when SP 6-903 is set at "1".* ***A224 only:** If the user wishes to use the ARDF at the highest copy speed possible, set SW1 on the ARDF main board to 'EX', and change SP 6-904 to -85.*	30 ~ 50 (A193) -110 ~ +110 (A224) 1 mm/step 40 mm (A193) **0 mm (A224)**
6-905*		ARDF Skew Correction	Selects whether the skew correction is done or not when the ARDF feeds the rear side of the original.	**0: Yes** 1: No
6-906*		ARDF Original Buckle Adjustment	Adjusts the amount of original buckle at the ARDF registration roller when the ARDF starts to feed the rear side original. *This SP mode is only effective when SP 6-905 is at "0."*	10 ~ 40 1 mm/step **15 mm**
6-910		ADF and Printer Free Run	Performs both an ADF and printer free run . *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
6-911		Binding Hole Range	Selects the range for which binding holes in originals are ignored *An original jam may occur when an original with binding holes is fed, because these holes are detected by the sensors. However, if using this SP mode, this can be avoided. For example, when this value is set at "12", the machine ignores binding holes within 12 mm of the leading edge of the original.*	0 ~ 20 1 mm/step **12 mm**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-001		Total Operation Time Display	Displays the total operation time (total drum rotation time).	
7-002*	1	Total Original Counter (Copy + Fax)	Displays the total number of scanned originals (copy + fax modes).	
	2	Total Original Counter (Copy	Displays the total number of scanned originals (copy mode only).	
	3	Total Original Counter (Fax)	Displays the total number of scanned originals (fax mode only).	
7-003*	1	Total Copy Counter (All Modes)	Displays the total number of copies (all modes).	
	2	Total Copy Counter (Copy mode)	Displays the total number of copies (copy mode only).	
	3	Total Copy Counter (Fax mode)	Displays the total number of copies (fax mode only).	
	4	Total Copy Counter (Printer mode)	Displays the total number of copies (printer mode only).	
7-004*		CE Counter Reset	**Japanese version only.** **Do not change the value.**	
7-101*	1	Total Copies by Paper Size (A3)	Displays the total number of copies by paper size.	
	2	Total Copies by Paper Size (B4)		
	3	Total Copies by Paper Size (A4)		
	4	Total Copies by Paper Size (B5)		
	5	Total Copies by Paper Size (11" x 17")		
	6	Total Copies by Paper Size (8 1/2" x 14")		
	7	Total Copies by Paper Size (8 1/2" x 11")		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-101*	8	Total Copies by Paper Size ($8_{1/2}$" x $5_{1/2}$")	Displays the total number of copies by paper size.	
	9	Total Copies by Paper Size (Other Size)		
7-201*		Total Number of Scans	Displays the total number of scanned originals.	
7-204*	1	Total Paper Tray Counter (1st paper tray)	Displays the total number of copies fed from each paper feed tray.	
	2	Total Paper Tray Counter (2nd paper tray)		
	3	Total Paper Tray Counter (3rd paper tray)		
	4	Total Paper Tray Counter (4th paper tray)		
	5	Total Paper Tray Counter (By-pass feed)		
	6	Total Paper Tray Counter (Duplex tray)		
	7 ##	Total Paper Tray Counter (LCT)		
7-205*		ADF Total Counter	Displays the total number of originals fed by the ADF.	

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 copies 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.)		

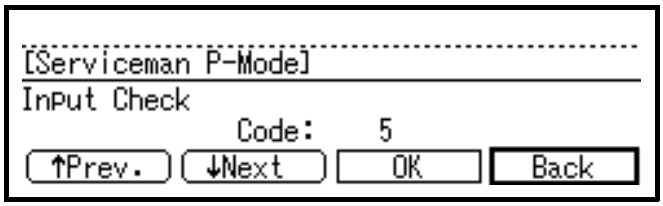
Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-303*	1 ~ 23	Total Copies by Image Editing Mode	**Japanese version only.**	
	24	Total Copies by Image Editing Mode (Memory Sort)	Displays the total number of copies by image editing mode.	
	25	Total Copies by Image Editing Mode (Combine)		
	26	Total Copies by Image Editing Mode (Repeat Copy)		
	27	Total Copies by Image Editing Mode (Erase Copy)		
7-304*	1	Total Copies by Copy Mode (Overlay)	Displays the total number of copies by copy mode.	
	2	Total Copies by Copy Mode (Letter)		
	3	Total Copies by Copy Mode (Letter/Photo)		
	4	Total Copies by Copy Mode (Photo)		
	5	Total Copies by Copy Mode (Duplex)		
	6	Total Copies by Copy Mode (ADF)		
	7	Total Copies by Copy Mode (Double-copy)		
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.	
7-501*		Total Jam Counter (Copies + Original)	Displays the total number of copy jams and original jams.	
7-502*		Total Copy Jam Counter	Displays the total number of copy jams.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-503*		Total Original Jam Counter	Displays the total number of original jams.	
7-504*	1	Total Jams by Location (A Jams)	Displays the total copy paper jam counters by location.	
	2	Total Jams by Location (B Jams)		
	3	Total Jams by Location (C Jams)		
	4	Total Jams by Location (D Jams)		
	5	Total Jams by Location (R Jams)		
	6 ##	Total Jams by Location (U Jams)		
	7	Total Jams by Location (W Jams)		
	8	Total Jams by Location (Y Jams)		
	9	Total Jams by Location (Z Jams)		
	10	Total Jams by Location (1st Paper Tray)		
	11	Total Jams by Location (2nd Paper Tray)		
	12	Total Jams by Location (3rd Paper Tray)		
	13	Total Jams by Location (4th Paper Tray)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	14	Total Jams by Location (By-pass Feed)	Displays the total copy paper jam counters by location.	
	15 ##	Total Jams by Location (Duplex Tray)		
7-801	1	ROM/CPU Version (IOCSS)	Displays the ROM version. **NOTE:** **Class 3 nos, 3, 7, and 8 are used only for the Japanese version.**	
	2	ROM/CPU Version (BiCU)		
	3	ROM/CPU Version (Edit)		
	4	ROM/CPU Version (Duplex)		
	5	ROM/CPU Version (Fax Control)		
	6	ROM/CPU Version (Printer Control)		
	7	ROM/CPU Version (ANITA)		
	8	ROM/CPU Version (Scanner Control)		
	9	ROM/CPU Version (Stapler)		
7-803*		PM Counter Display	Displays the PM counter after the last PM.	
7-804		PM Counter Reset	Resets the PM counter. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-808		Resets Counters (except for the total counter)	Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-810		User Code Number Reset	Resets the user code numbers. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-901*		SC History Display	Displays the SC codes that have occurred.	
7-902		SC History Clear	Clears the SC history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-903*		Copy Jam History Display	Displays the copy jams that have occurred.	
7-904		Copy Jam History Clear	Clears the copy jam history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-905*		Original Jam History Display	Displays the original jams that have occurred.	
7-906		Original Jam History Clear	Clears the original jam history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-907		Timer Counter Clear	Clears the timer counter. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-908		PCU Counter Display	Displays the number of copies that have been made using the current PCU.	
7-909		PCU Counter Clear	**Japanese version only** ***Do not use.***	
7-991		Timer Counter Display	Displays the time since the last time that the main switch was turned on.	**0: No** 1: Yes

12.1.1 Input Check (SP5-803)



A224M500.wmf

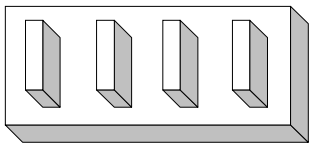
1. Access SP mode 5-803.
2. Select the number which will access the switch or sensor you wish to check (see the following table).
3. Check the status of the sensor or switch.
4. If you wish to check the signal during a copy cycle, select the required copy modes, then press the Start key. After that, re-enter the SP mode to check the next signal.
5. The reading (“0" or ”1") will be displayed. The meaning of the display is as follows.

Number	Description	Reading	
		0	1
1	Front Door Safety Switch - +24V	Closed	Opened
2	Front Door Safety Switch - LD5V	Closed	Opened
3	Right Vertical Guide Switch	Closed	Opened
4	Left Vertical Door Sensor	Closed	Opened
5	Left Door Sensor	Closed	Opened
6	Fusing Exit Sensor	Paper not detected	Paper detected
7	Upper Exit Sensor	Paper not detected	Paper detected
8	Lower Exit Sensor	Paper not detected	Paper detected
9	Registration Sensor	Paper not detected	Paper detected
10	Upper Relay Sensor	Paper not detected	Paper detected
11	Charge Roller H. P. Sensor	Not home position (Off)	At home position (On)
12	By-pass Feed Paper End Sensor	Paper not detected	Paper detected
13	Upper Tray Paper End Sensor -A193 only-	Paper not detected	Paper detected
14	Lower Tray Paper End Sensor	Paper not detected	Paper detected

Number	Description	Reading	
		0	1
15	Upper Paper Size Sensor -A193 only-	See Table 1	
16	Lower Paper Size Sensor	See Table 1	
17	Main Motor Lock	Not locked	Locked
18	PCU ensor	PCU not detected	PCU detected
19	Not used		
20			
21			
22			
23	Upper Paper End Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
24	Lower Paper End Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
25	Upper Relay Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
26	Lower Relay Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
27	Upper Paper Size Sensor (Optional Paper Tray Unit)	See Table 1	
28	Lower Paper Size Sensor (Optional Paper Tray Unit)	See Table 1	
29	Tray Cover Switch (Optional Paper Tray Unit)	Closed	Opened
30	Paper Tray Unit Set (Optional Paper Tray Unit)	Not connected	Connected
31	Main Motor Lock (Optional Paper Tray Unit)	Not locked	Locked
32	Upper Tray Upper Limit Sensor (Optional Paper Tray Unit)	Paper not at high position	Paper at high position
33	Lower Tray Upper Limit Sensor (Optional Paper Tray Unit)	Paper not at high position	Paper at high position
34	Not used		
35			
36			
37	Duplex Entrance Sensor (Optional Duplex Unit)	Paper not detected	Paper detected
38	Inverter Unit Set (Optional Duplex Unit)	Not connected	Connected
39	Duplex Unit Set (Optional Duplex Unit)	Not connected	Connected
40	Not used		
41			
42			
43	1-bin Vertical Guide Door Switch (Optional 1-bin Sorter)	Closed	Opened
44	1-bin Sorter Unit Set (Optional 1-bin Sorter)	Not connected	Connected
45	1-bin Sorter Paper Sensor	Paper not detected	Paper detected
46	Finisher Set (Optional Finisher Unit)	Not connected	Connected
47	Not used		
48	Feed Cover Open Sensor (Optional ADF and ARDF)	Closed	Opened

Number	Description	Reading	
		0	1
49	Original Set Sensor (Optional ADF and ADRF)	Paper not detected	Paper detected
50	DF Position Sensor (Optional ADF and ARDF)	DF closed	DF opened
51	Registration Sensor (Optional ADF and ARDF)	Paper not detected	Paper detected
52	ADF Set (Optional ADF)	Not connected	Connected
53	Not used		
54			
55			
56	ARDF Set (Optional ARDF)	Not connected	Connected
57	ARDF Reverse Table Sensor (Optional ARDF)	Paper not deteted	Paper detected
58	Not used		
59			
60	Polygonal Mirror Motor Lock	Not locked	Locked
61	Not used		
62	Fusing Unit Set	Not connected	Connected
63	Main Switch	Off	On
64	BiCU Connection	Not connected	Connected
65	Not used		
66	Total Counter Connection	Not connected	Connected
67	Not used		
68	Key Counter Connection	Not connected	Connected
69	Not used		
70	LCIT Set (Optional LCIT)	Not connected	Connected
71	LCIT Unit Set Sensor (Optional LCIT) -A224 only-	LCIT closed	LCIT opened
72	LCIT Cover Sensor (Optional LCIT) -A224 only-	Cover closed	Cover opened
73	LCIT Paper Size Sensor (Optional LCIT) -A224 only-	A4	11" x 8.5"
74	LCIT Upper Limit Sensor (Optional LCIT) -A224 only-	Shift tray not at upper limit position	Shift tray is at upper limit position
75	LCIT Lower Limit Sensor (Optional LCIT) -A224 only-	Shift tray not at lower limit position	Shift tray is at lower limit position
76	LCIT Tray Down Switch (Optional LICT) -A224 only-	Switch is not pressed	Switch is pressed
77	LCIT Paper Near End Level (Optional LCIT) -A224 only-	See Table 2	
78	Not used		
79			

Table 1: Paper Size Data (No. 15, 16, 27, and 28)



A224M502.wmf

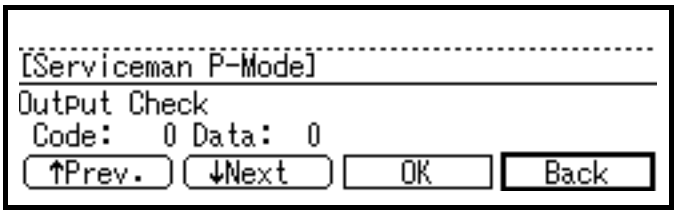
Number	SW 1	SW 2	SW 3	SW 4	SP Value	Paper Size
15,16,27,28	0	0	0	0	0	—-
	0	0	0	1	1	A3, F($8_{1/2}$“ x 13")
	0	0	1	1	3	A4 Sideways
	0	1	0	1	5	A4 Lengthwise
	0	1	1	1	7	A5 Sideways, 11" x 17"
	1	0	1	1	11	B4, $8_{1/2}$“ x 14"
	1	1	0	0	12	* (Asterisk)
	1	1	0	1	13	B5 Sideways, 11" x $8_{1/2}$“
	1	1	1	1	15	B5 Lengthwise, $8_{1/2}$“ x 11"

1: Pushed

Table 2: LCT Paper Near End Level (No.77)

SP value	000	001	025	050	075	100
Level	Paper end	Near-end	25% full	50% full	75% full	Full

12.1.2 Output Check (SP5-804)



A224M501.wmf

CAUTION: To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check (see the following table), then press #.
3. Press "1", then press # to check that component.
4. Exit the SP mode to interrupt the test.
5. If you wish to check another component, re-enter the SP mode.

- Output check table -

No.	Description	No.	Description
1	Junction Gate Solenoid	14	Transport Fan
2	Registration Solenoid	15	Fusing Unit Fan -A224 only-
3	Upper Relay Clutch	16	Not used
4	Lower Relay Clutch	17	
5	Charge Roller Contact Clutch	18	
6	By-pass Feed Clutch	19	Upper Paper Feed Clutch (Optional Paper Tray Unit)
7	Upper Paper Feed Clutch -A193 only-	20	Lower Paper Feed Clutch (Optional Paper Tray Unit)
8	Lower Paper Feed Clutch	21	Upper Relay Clutch (Optional Paper Tray Unit)
9	Development Clutch	22	Lower Relay Clutch (Optional Paper Tray Unit)
10	Toner Bottle Drive Motor	23	Main Motor (Optional Paper Tray Unit)
11	Main Motor (Forward)	24	Upper Paper Lift Motor (Up) (Optional Paper Tray Unit)
12	Main Motor (Reverse)	25	Lower Paper Lift Motor (Up) (Optional Paper Tray Unit)
13	Exhaust Fan	26	Upper Paper Lift Motor (Down) (Optional Paper Tray Unit)

No.	Description	No.	Description
27	Lower Paper Lift Motor (Down) (Optional Paper Tray Unit)	44	Not used
28	Not used	45	
29	Duplex Junction Gate Solenoid (Optional Duplex Unit)	46	ARDF Junction Gate Solenoid (Optional ARDF)
30	Not used	47	ARDF Transport Motor (Foward) (Optional ARDF)
31		48	ARDF Transport Motor (Reverse) (Optional ARDF)
32		49	Not used
33	1-bin Junction Gate Solenoid (Optional 1-bin Sorter)	50	
34	1-bin Transport Motor (Optional 1-bin Sorter)	51	
35	1-bin Paper indicator (Optional 1-bin Sorter)	52	
36	Not used	53	Polygonal Mirror Motor
37		54	Not used
38	DF Feed Motor (Optional ADF and ARDF)	55	LCIT Paper Feed Motor (Optional LCIT)
39	DF Feed Motor (Power Down) (Optional ADF and ARDF)	56	LCIT Transport Motor (Optional LCIT)
40	DF Pick-up Solenoid (Optional ADF and ARDF)	57	LCIT Tray Lift Motor (up) (Optional LCIT)
41	Stamper Solenoid (Optional ADF and ARDF)	58	LCIT Tray Lift Motor (down) (Optional LCIT)
42	DF Paper Feed Clutch (Optional ADF and ARDF)	59	Tray Down LED (Optional LCIT)
43	Not used	60	Not used

13. PREVENTIVE MAINTENANCE SCHEDULE

13.1 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

A224	EM	100K	200K	300K	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		C	C	C	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					
Transfer Roller		R	R	R	To clean, use a blower brush.
Quenching Lamp		C	C	C	Dry cloth
Discharge Brush		R	R	R	
PAPER FEED					
Registration Roller		C	C	C	Clean with water or alcohol.
Paper Feed Roller (By-pass feed table)	C	C	C	C	Clean with water or alcohol.
Registration Mylar		C	C	C	Clean with water or alcohol.
Relay Rollers		I	I	I	Clean/replace if necessary
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Paper Feed Rollers		R	R	R	
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.
FUSING UNIT					
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 Thermistors		I	I	I	Clean if necessary
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Alcohol

A224	EM	100K	200K	300K	NOTE
Hot Roller Strippers		R	R	R	
Cleaning Roller Discharge Brush		R	R	R	
OTHERS					
Drive Belts		I	I	I	Replace if necessary

	EM	200K	400K	600K	800K	NOTE
LCT						
Paper Feed Roller	C	R	R	R	R	Dry or damp cloth
Transport Roller	C					Dry or damp cloth
Bottom plate pad	C					Dry or damp cloth

14. REPLACEMENT AND ADJUSTMENT

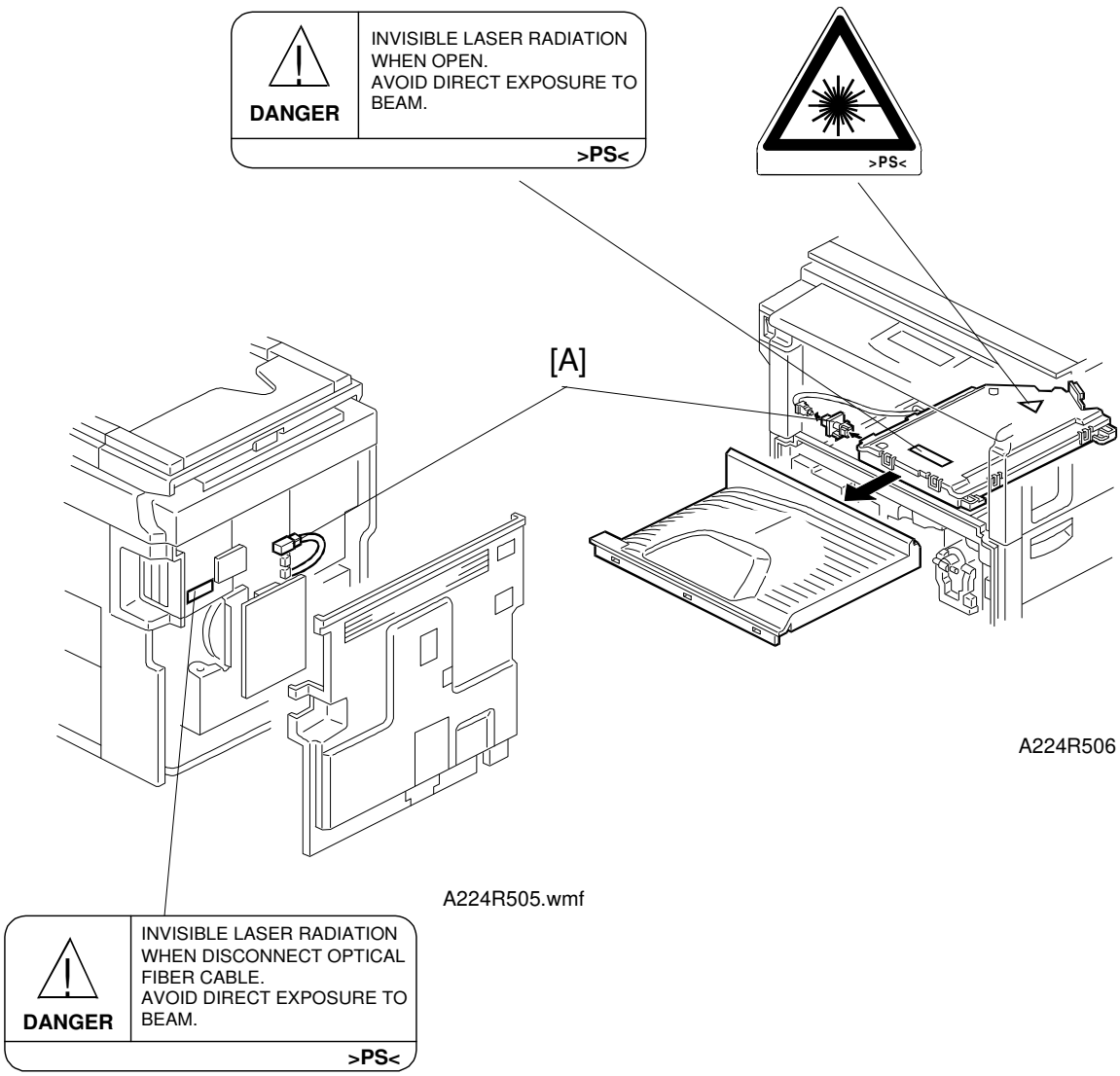
14.1 LASER UNIT

⚠ WARNING

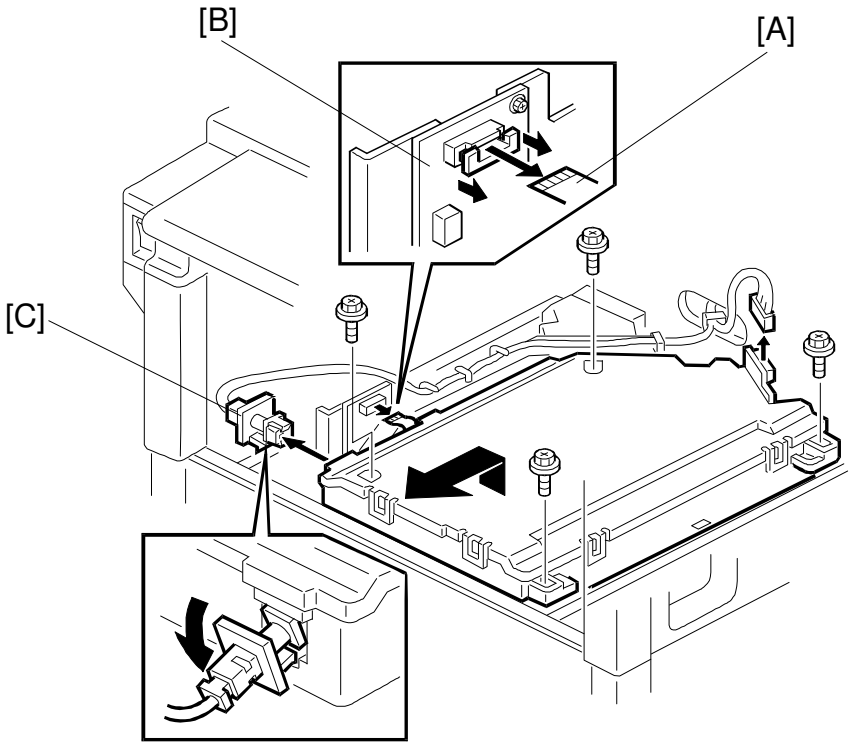
Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

- CAUTION DECALS -

Three caution decals and the optical fiber cable [A] are located in the laser section as shown below.



14.2 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR



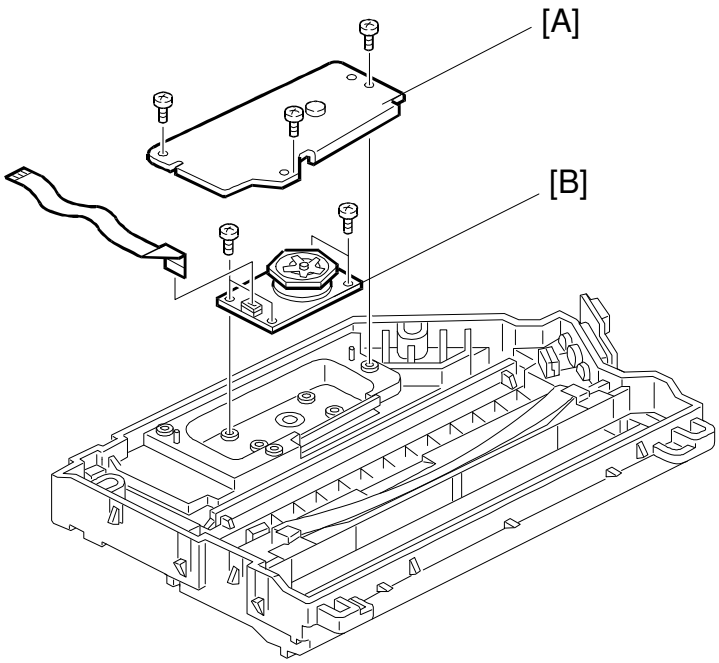
A224R512.wmf

⚠ WARNING

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

1. Remove the copy tray.
2. Disconnect the harness [A] from the polygon motor driver [B].
3. Remove the main scan syncronization detector [C].
4. Remove the laser unit (4 screws and 1 connector).

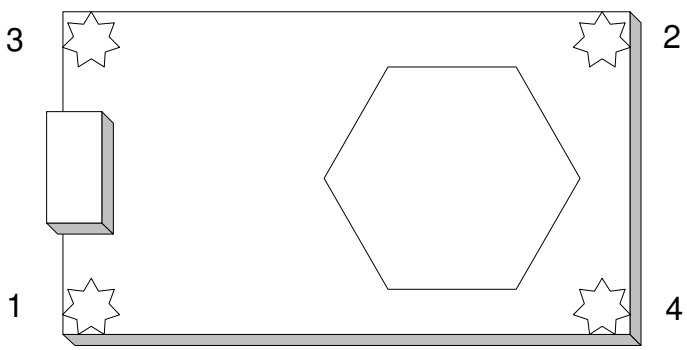
14.3 POLYGON MIRROR MOTOR



A224R501.wmf

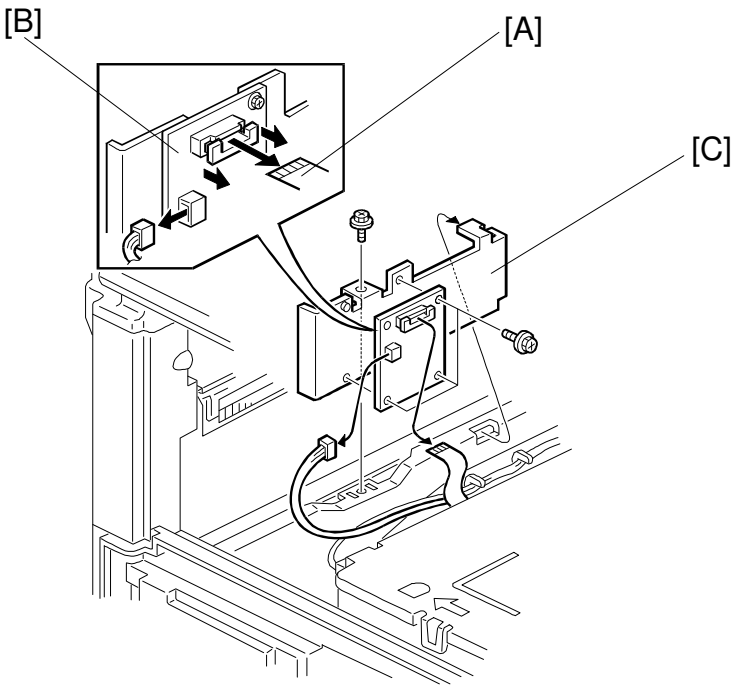
1. Remove the laser unit (see Laser Unit/Main Scan Syncronization Detector).
2. Remove the polygon motor cover [A] (3 screws).
3. Remove the polygon motor [B] (4 screws, 1 connector).

NOTE: When reinstalling the polygon motor, the securing order should be as shown below. Otherwise, the polygon motor board may be bent.



A224R510.wmf

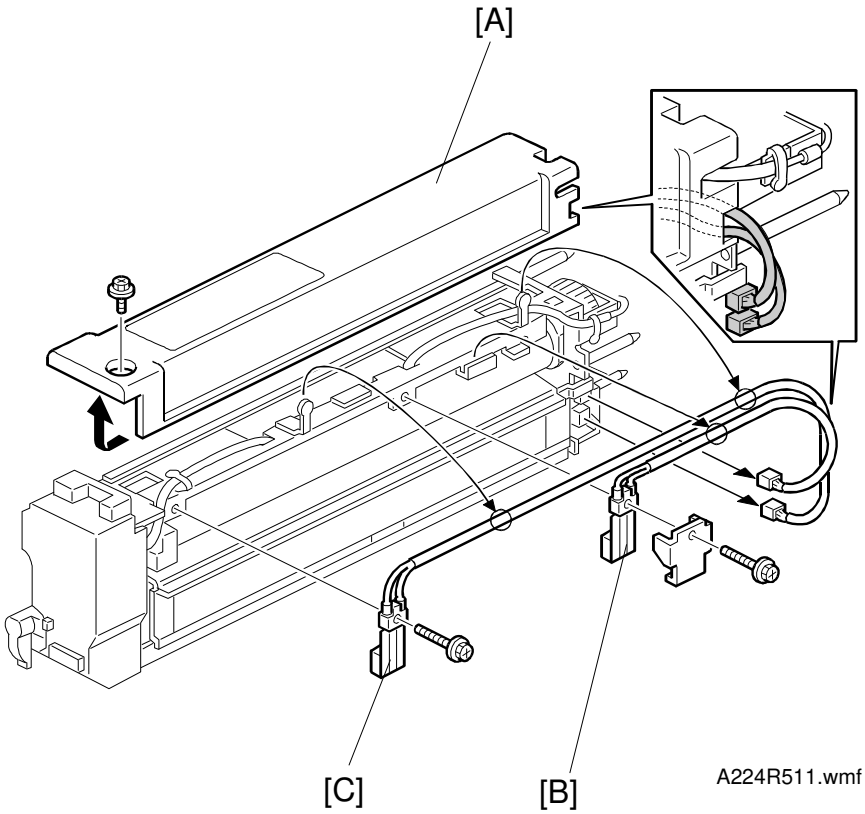
14.4 POLYGON MOTOR DRIVER



A224R502.wmf

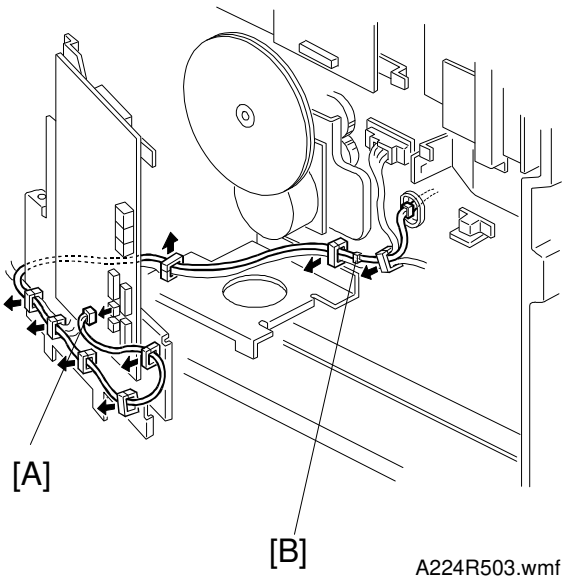
1. Remove the copy tray.
2. Disconnect two harnesses [A] from the polygon motor driver [B].
3. Remove the polygon motor driver bracket [C] (1 screw).
4. Remove the polygon motor driver [B] (3 screws).

14.5 FUSING THERMISTOR/FUSING EDGE THERMISTOR

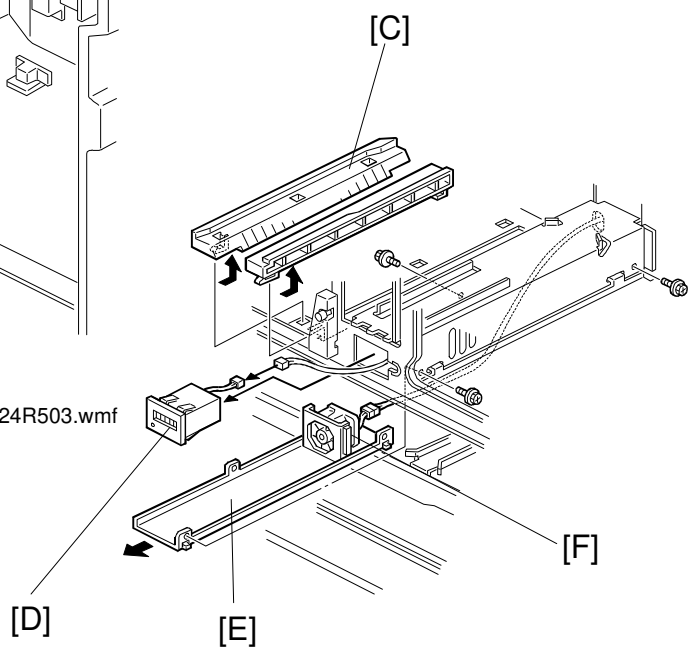


1. Pull out the fusing unit (1 screw).
2. Remove the upper cover [A] (1 screw).
3. Remove the fusing thermistor [B] (1 screw, 1 connector).
4. Remove the fusing edge thermistor [C] (1 screw, 1 connector).

14.6 FUSING UNIT FAN



A224R503.wmf



A224R504.wmf

1. Remove the front cover and rear cover.
2. Remove the PCU, transfer roller unit, fusing unit, duplex inverter unit, duplex unit, paper feed tray, and inner cover.
3. Remove the PSU.
4. Disconnect the fusing unit fan harness [A] and unclamp this harness from the harness clamps.
5. Cut the clamp [B].

   NOTE: Take care not to cut the harnesses.
6. Remove the duplex entrance guide [C].
7. Remove the total counter [D] (1 connector).
8. Remove the fusing unit fan bracket [E] (3 screws).
9. Remove the fusing unit fan [F] (2 screws, 1 connector).

15. SERVICE CALL CONDITIONS

15.1 SUMMARY

There are 3 levels of service call conditions.

Level	Definition
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.
B	The SC can be reset by turning the main switch off and on if the SC was caused by a sensor error.
C	The copier can be operated as usual except for the unit related to the service call.

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) To reset a Level A SC, enter SP 5-810 (SC code reset) and select "1". Then hold down the Photo mode key and the # key at the same time for at least 3 seconds (this does not require the main switch to be turned off and on).

4) 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.

16. SC CODE DESCRIPTIONS

SC101: Xenon lamp error (A193/A224)

- Definition - [B]

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

- Possible cause -
- Xenon lamp defective
- Xenon lamp harness defective
- SBU board defective
- SBU harness defective

SC120: Scanner home position error 1 (A193/A224)

-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
- IOSCC board defective
- Scanner home position sensor harness defective

SC121: Scanner home position error 2 (A193/A224)

-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
- IOCSS board defective
- Scanner home position sensor harness defective

SC122: Scanner home position error 3 (A193/A224)

-Definition- [B]

The scanner home position sensor detects the on condition while the scanner is returning to the home position.

- Possible causes -
- Scanner home position sensor defective
- Scanner drive motor defective
- IOCSS board defective
- Scanner home position sensor harness defective

SC123: Scanner home position error 4 (A193/A224)

-Definition- [B]

The scanner home position sensor does not detect the on condition after the scanner returns to the home position.

- Possible causes -
- Scanner home position sensor defective
- Scanner drive motor defective
- IOCSS board defective
- Scanner home position senor harness defective

SC192: Automatic SBU adjustment error (A193/A224)

-Definition- [B]

An error is detected during automatic SBU adjustment.

- Possible cause -
- SBU defective
- BiCU board defective
- Lamp regulator defective
- Exposure lamp deective
- Dirty white plate

SC302: Charge roller current leak (A193/A224)

-Definition- [B]

A charge roller current leak signal is detected.

- Possible causes -
- Charge roller damaged
- Charge high voltage supply board defective
- Poor connection of the PCU

SC306: Charge roller home position error (A193/A224)

-Definition- [B]

The charge roller home position sensor does not detect the on condition.

- Possible causes -
- Charge roller home position sensor defective
- Charge roller contact clutch defective

SC320: Polygon motor error (A193/A224)

-Definition- [B]

The polygon motor does not reach its operating speed within 10 seconds after the polygon motor on signal, or the lock signal is not detected for more than 40 ms continuously during operation.

- Possible causes -
- Polygon motor defective
- Poor connection of the interface harness which connects the polygon motor driver and the IOCSS board
- IOCSS board defective

SC321: No laser start signal (F-GATE error) (A193/A224)

NOTE: This SC code is only for copy mode.

- Definition- [B]

The CPU does not detect the laser start signal (F-GATE) after the copy paper reaches the registration sensor.

- Possible causes -
- BiCU board defective
- MSU board defective

SC322: Laser synchronization error (A193/A224)

-Definition- [B]

The laser synchronization signal cannot be detected by the main scan synchroniziation detector board for more than 5 consecutive 100 ms intervals.

- Possible causes -
- Poor connection of the interface harness which connects the laser synchronization detector board and the BiCU board
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- BiCU board defective

SC324: LD drive current over (A193/A224)

-Definition- [B]

The LD drive board applies more than 100 mA to the LD.

- Possible causes -
- LD unit defective (not enough power, due to aging)
- Poor connection of the interface harness which connects the LD unit and the BiCU board
- Temperature around the LD unit is too high

SC390: TD sensor error 1 (A193/A224)

-Definition- [B]

The TD sensor outputs less than 0.5V, 20 s after the TD sensor initial setting has been performed.

- Possible causes -
- TD sensor abnormal
- Poor connection of the PCU

SC391: Development bias leak (A193/A224)

-Definition- [B]

A development bias leak signal is detected.

- Possible causes -
- Poor connection of the PCU
- High voltage supply board defective

SC393: TD sensor error 2 (A193/A224)

-Definition- [B]

TD sensor output voltage falls out of the adjustment range (2.0 ± 0.2 V) after the TD sensor initial setting has been finished.

- Possible causes -
- TD sensor abnormal
- Poor connection of the PCU

SC401: Transfer roller leak error 1 (A193/A224)
SC402: Transfer roller leak error 2 (A193/A224)

-Definition- [B]

A transfer roller current leak signal is detected.

- Possible causes -
- High voltage supply board defective
- Poor connection of the PCU
- Transfer roller damaged

SC411: Separation bias error (A193/A224)

-Definition- [B]

A separation bias leak signal is detected.

- Possible causes -
- High voltage supply board defective
- Poor connection of the PCU
- Discharge brush defective

SC500: Main motor lock (A193/A224)

-Definition- [B]

A main motor lock signal is detected for more than 5 seconds or the lock signal is not detected for more than 500 ms during rotation.

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

SC503: Upper tray lift motor malfunction (optional paper tray unit only) (A193/A224)
SC504: Lower tray lift motor malfunction (optional paper tray unit only) (A193/A224)

-Definition- [C]

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

- Possible causes -
- Upper limit sensor defective
- Tray lift motor defective
- IOCSS board defective

SC506: Paper tray unit main motor lock (optional paper tray unit only) (A193/A224)

-Definition- [C]

A main motor lock signal is detected for more than 5 seconds or the lock signal is not detected for more than 5 seconds during rotation.

- Possible causes -
- Paper tray unit main motor defective
- Too much load on the drive mechanism

SC542: Fusing temperature warm-up error (A193/A224)

-Definition- [A]

The fusing temperature does not reach the fusing standby temperature within 50 seconds after the main switch is turned on.

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

SC543: Fusing overheat error (A193/A224)

-Definition- [A]

A fusing temperature of over 231°C is detected for 1 second by the fusing thermistor.

- Possible causes -
- Fusing thermistor defective
- Power supply board defective

SC544: Fusing low temperature error (A193/A224)

-Definition- [A]

A fusing temperature of below 100°C is detected for 1 second by the fusing thermistor.

- Possible causes -
- Fusing thermistor defective
- Power supply board defective

SC546: Fusing ready temperature malfunction (A193/A224)

-Definition- [A]

The fusing temperature goes 10 °C below or 10 °C over the stand-by temperature after warm-up is completed.

- Possible causes -
- Thermistor defective
- Poor connection of the fusing unit
- Power supply board defective

SC547: Zero cross signal malfunction (A193/A224)

-Definition- [A]

Zero cross signals are not detected within a certain period.

- Possible causes -
- Power supply board defective
- IOCSS defective
- BICU defective

SC548: Fusing edge temperature error 1 (A224)

- Definition - [A]

A fusing temperature of over 251°C is detected for 3 seconds by the fusing edge thermistor.

- Possible causes -
- Fusing edge thermistor defective
- PSU defective

SC549: Fusing edge temperature error 2 (A224)

- Definition - [A]

A fusing temperature of below 100°C is detected for 1 second by the fusing edge thermistor.

- Possible causes -
- Fusing edge thermistor defective
- PSU defective
- Poor connenction of the fusing unit

SC610: Communication error between IOCSS and duplex unit (A193/A224)

-Definition- [B]

The IOCSS board cannot communicate with the duplex unit properly.

- Possible causes -
- Poor connection of the duplex unit
- IOCSS board defective
- Duplex control board defective

SC681: Fax option version error (A224)

- Definition - [C]

The machine detected that a A639 fax unit is installed.

- Possible causes -
- Installing an A639 fax unit in an A224 machine.
- Downloading the software for the A639 fax unit to the A224 machine.

SC682: Printer option version error (A224)

- Definition - [C]

The machine detected that a A643 printer controller is installed.

- Possible causes -
- Installing an A643 printer controller in an A224 machine.
- Downloading the software for the A643 printer controller to the A224 machine.

SC691: Communication error between BICU and fax controller (A193/A224)

-Definition- [B]

The BiCU board cannot communicate with the fax controller properly.

- Possible causes -
- Poor connection of the interface harness which connects the BiCU board and the fax controller
- BICU board defective
- Fax controller defective

SC692: Communication error between BiCU and printer controller (A193/A224)

-Definition- [B]

The BICU board cannot communicate with the printer controller properly.

- Possible causes -
- Poor connection of the interface harness which connects the BICU board and the mother board.
- Poor connection between the mother board and the printer controller
- BICU board defective
- Printer controller defective
- Mother board defective

SC696: Communication error between finisher and BiCU board (A193/A224)

- Definition - [B]

The BiCU board cannot communicate with the finisher properly.

- Possible causes -
- Poor connection of the interface cable for the finisher.
- BiCU board defective
- Finisher drive board defective

SC700: Finisher feed out error (A193/A224)

- Defenition - [B]

1. The stack height sensor does not detect the on condition within 12 seconds after the shift tray lift motor is turned on so that the shit tray keeps moving up.
2. The stack height sensor does not detect the off condition within 5 seconds after the shift tray lift motor is turned on so that the shift tray keeps moving down.
3. The shift tray position sensor does not detect the on condition within 1.25 seconds after the shift motor is turned on.

- Possible causes -
- Shift tray lift motor defective
- Shift motor defective
- Finisher drive board defective

SC701: Finisher inverter error (A193/A224)

- Defenition - [B]

1. The jogger H.P sensor does not detect the off condition within 3 seconds after the jogger motor is turned on.
2. The jogger H.P sensor does not detect the on condition within 576 pulses (about 80 mm) after the jogger motor is turned on.
3. The Feed belt H.P sensor does not detect the off condition within 3 seconds after the feed-out motor is turned on.
4. The Feed belt H.P sensor does not detect the on condition within 2059 pulses (about 700 mm) after the feed-out motor is turned on.

- Possible causes -
- Jogger motor defective
- Feed-out motor defective
- Finisher drive board defective

SC702: Finisher staple error (A193/A224)

- Defenition - [B]

The staple home position sensor does not detect the on condition within 0.485 seconds after the staple motor on signal.

- Posible causes -
- Staple motor defective
- Finisher drive board defective

SC900: Total counter error (A193/A224)

-Definition- [C]

The total counter is not working properly.

- Possible causes -
- Total counter defective
- IOCSS board defective

SC920: MSU connection error (A193/A224)

-Definition- [B]

The MSU set signal is not detected

- Possible cause -
- Poor connection between the BICU board and the MSU
- BICU board defective
- MSU defective

SC921: MSU hardware error (A193/A224)

-Definition- [B]

The hardware of the MSU is defective

- Possible cause -
- MSU defective
- BICU defective
- Front door safety switch does not work properly

SC980: Program loading error (A193/A224)

-Definition- [C]

The program cannot load properly.

- Possible cause -
- Poor connection between the BICU and the ROM board
- BICU board defective
- ROM board or the program defective

SC981: NVRAM clear error (A193/A224)

-Definition- [C]

The data stored in the NVRAM is not cleared properly when the Memory All Clear is performed.

- Possible cause -
- NVRAM defective

SC990: Communication error between BICU and IOCSS board (A193/A224)

-Definition- [B]

The BiCU board cannot communicate with the IOCSS board properly.

- Possible cause -
- Poor connection between the BiCU board and the IOCSS board
- BiCU board defective
- IOCSS board defective

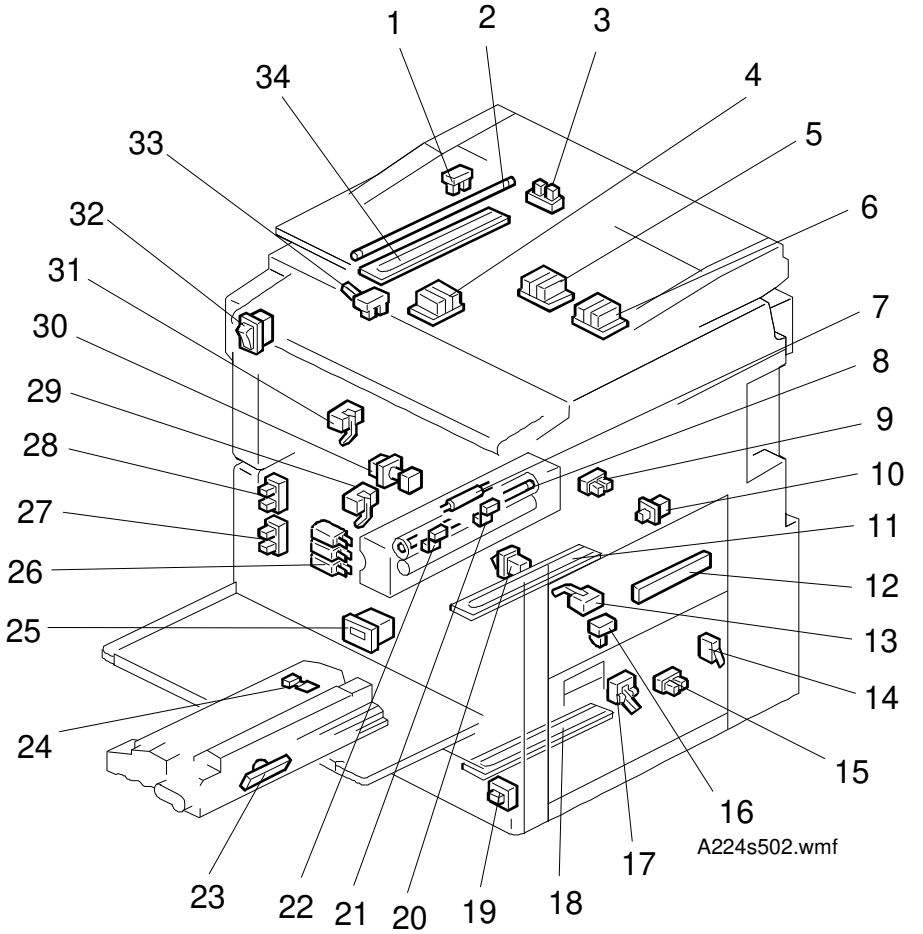
SC999: Program version error (A193/A224)

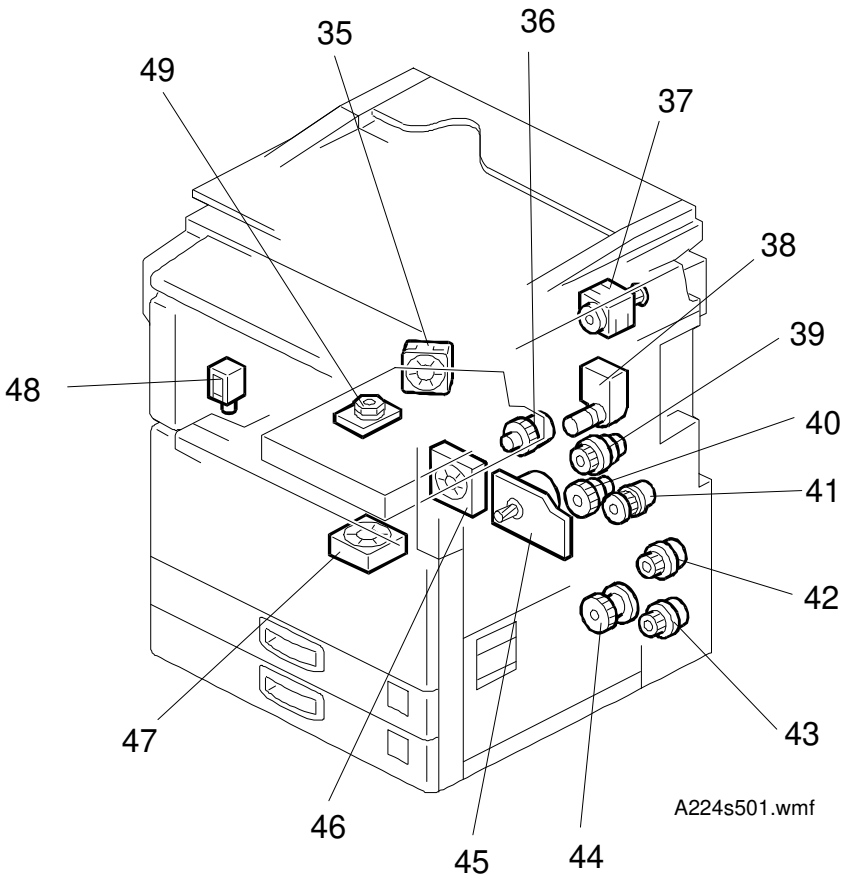
- Definition - [C]

Downloading the incorrect type of main software

- Possible cases -
- Downloading the main software for the A224 machine to the A193 machine or the opposite case.

ELECTRICAL COMPONENT LAYOUT
Copier (A224)

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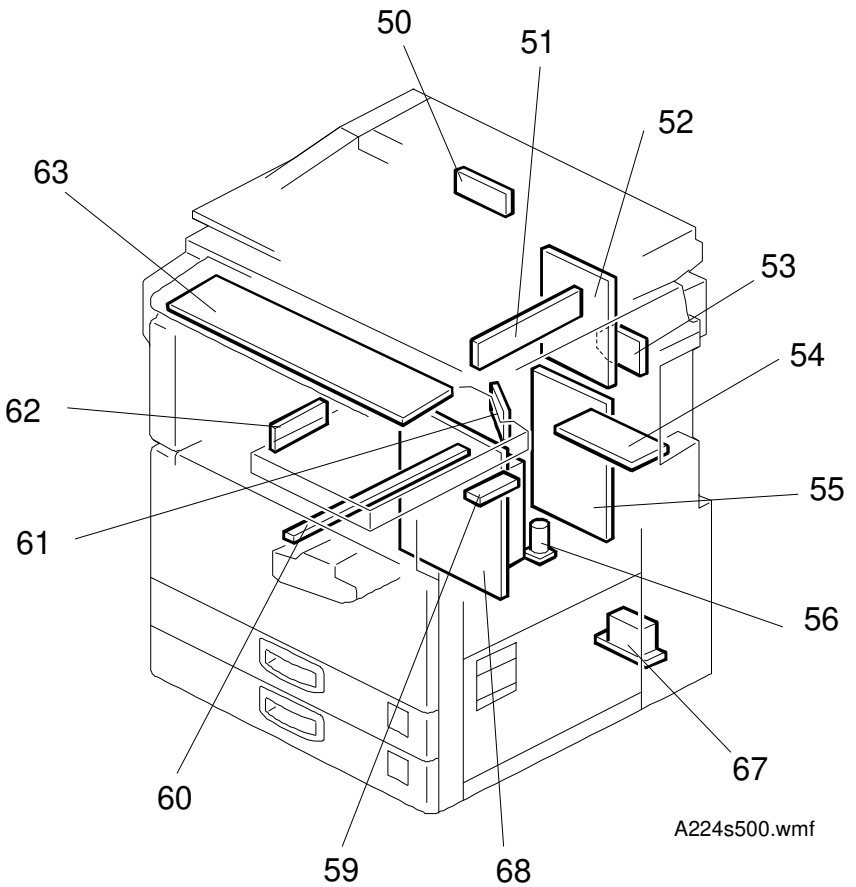
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A224s500.wmf

Copier

Symbol	Index No.	Description	P to P (2/2)
Printed Circuit Boards			
PCB1	54	High Voltage Supply Board	K17
PCB2	50	Lamp Stabilizer	M16
PCB3	58	PSU	C7
PCB4	61	LD Unit	E5
PCB5	63	Operation Panel	F1
PCB6	51	SBU	H1
PCB7	55	IOCSS	I14
PCB8	52	BICU	H12
PCB9	53	MSU	I6
PCB10	62	Polygon Motor Driver (A224 only)	E3
Motors			
M1	45	Main	I17
M2	37	Scanner Drive	N17
M3	47	Transport Vacuum Fan	O17
M4	49	Polygonal Mirror	D4
M5	38	Toner Supply	F17
M6	35	Exhaust Fan	D17
M7	46	Fusing Unit Fan (A224 only)	P11
Sensors			
S1	33	Upper Exit	B17
S2	31	Lower Exit	B17
S3	28	Left Vertical Door	B17
S4	27	Left Door	C17
S5	17	Relay	C17
S6	10	PCU	C17
S7	29	Fusing Exit	D17
S8	9	Charge Roller H.P	D17
S9	—-	Upper Tray Paper End (A193 only)	E17
S10	15	Lower Tray Paper End	E17
S11	16	By-pass Feed Paper End	F17
S12	13	Registration	G17
S13	12	By-pass Feed Paper Width	G17
S14	59	Humidity	C11
S15	4	Original Width	L17
S16	5	Original Length-1	L17
S17	6	Original Length-2	L17
S18	3	Platen Cover	M17
S19	1	Scanner H.P.	M17
S20	23	Toner Density (TD)	H17
Switches			
SW1	20	AC	B6

Symbol	Index No.	Description	P to P (2/2)
SW2	32	Main	D2
SW3	14	Right Vertical Guide	H17
SW4	—-	Upper Paper Size (A193 only)	N17
SW5	19	Lower Paper Size	O17
SW6	26	Front Door Safety	D11
Magnetic Clutches			
MC1	36	Charge Roller Contact	E17
MC2	42	Upper Relay	E17
MC3	43	Lower Relay	I17
MC4	41	By-pass Feed	F17
MC5	—-	Upper Paper Feed (A193 only)	I17
MC6	44	Lower Paper Feed	I17
MC7	40	Registration	F17
MC8	39	Development	J17
Solenoids			
SOL1	48	Junction Gate	B17
Lamps			
L1	60	Quenching	E17
L2	2	Scanner	M17
L3	8	Fusing	B7
Heaters			
H1	18	Tray (option)	C3
H2	34	Anti-condensation (option)	C3
H3	11	Drum (option)	C3
Thermistors			
TH1	24	Charge Roller	H17
TH2	21	Fusing	B6
TH3	22	Fusing Edge (A224 only)	B6
Thermofuses			
TF1	7	Fusing	B7
Counters			
CO1	25	Total	I17
CO2	—-	Key (option)	G17
Others			
LSD1	30	Laser Synchronization Detector	D4
NF	56	Noise Filter (230V machine only)	C10
CB	57	Circuit Breaker (230V machine only)	B8

A193 and A224 Point to Point Diagram (1/2)

(Ver. 2)

PSU(PCB3)

MSU(PCB9)

BICU (PCB8)

<CN301> (SBU)

PIN	NAME	PIN	NAME
1	< /OPBSYNC	26	< AD0
2	/RDSYNC >	27	GND
3	GND	28	AGC0 >
4	/CLK 0 >	29	AGC1 >
5	GND	30	GND
6	/WTGT >	31	AGC2 >
7	/PWIND >	32	AGC3 >
8	/AEMODE >	33	GND
9	GND	34	+12
10	DAD1 >	35	+12
11	GND	36	+12
12	DACLK >	37	+12
13	GND	38	+12
14	DALD >	39	+12
15	GND	40	GND
16	< AD7	41	-12V
17	< AD6	42	-12V
18	GND	43	-12V
19	< AD5	44	GND
20	< AD4	45	+5V
21	GND	46	+5V
22	< AD3	47	+5V
23	< AD2	48	+5V
24	GND	49	+5V
25	< AD1	50	+5V

<CN311> (BICU - ROM Board)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	GND	21	A12 >	41	< D14 >	61	</SLEEP
2	< D3 >	22	A7 >	42	< D15 >	62	NC
3	< D4 >	23	A6 >	43	/CE2 >	63	NC
4	< D5 >	24	A5 >	44	NC	64	NC
5	< D6 >	25	A4 >	45	NC	65	<D8 >
6	< D7 >	26	A3 >	46	NC	66	<D9 >
7	/CE1 >	27	A2 >	47	A17 >	67	< D10 >
8	A10 >	28	A1 >	48	A18 >	68	NC
9	/OE >	29	A0 >	49	A19 >	69	GND
10	A11 >	30	< D0 >	50	A20 >	70	GND
11	A9 >	31	< D1 >	51	A21 >		
12	A8 >	32	< D2 >	52	+5V		
13	A13 >	33	NC	53	VPP2		
14	A14 >	34	GND	54	A22 >		
15	/WE >	35	GND	55	A23 >		
16	/BSY >	36	GND	56	< /WP		
17	+5V	37	NC	57	</BYTE		
18	VPP1	38	< D11 >	58	NC		
19	A16 >	39	< D12 >	59	NC		
20	A15 >	40	< D13 >	60	</EXCARD		

<CN308> (BICU - IOCSS)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	-12V	21	< FUTMP	41	+12V	61	GND
2	-12V	22	< PP-C	42	BDTCT	62	< CHTMP
3	+5VE	23	< PP-B	43	+12V	63	GND
4	+5VS	24	< HUM	44	+5V	64	< PP-TP
5	S1 >	25	< PP-D	45	+5V	65	GND
6	S3 >	26	GND	46	S2 >	66	< TSENS
7	A0 >	27	GND	47	+5V	67	GND
8	A2 >	28	MA1 >	48	A1 >	68	GND
9	A3 >	29	MA2 >	49	+5V	69	GND
10	< D9 >	30	MA4 >	50	< D8 >	70	MA3 >
11	< D10 >	31	MA5 >	51	+5V	71	GND
12	< D12 >	32	MA7 >	52	< D11 >	72	MA6 >
13	< D13 >	33	MA8 >	53	+5V	73	GND
14	< D15 >	34	MA10 >	54	< D14 >	74	MA9 >
15	/RD >	35	MB1 >	55	+5V	75	GND
16	/RST, 10B>	36	MB2 >	56	/HWR >	76	GND
17	< /INT 1	37	MB3 >	57	+5V	77	GND
18	CLKP >	38	MB4 >	58	< /INT2	78	+24V
19	GND	39	/RTRG >	59	GND	79	+24V
20	GND	40	< SN-ON	60	GND	80	BDTCT

<CN310> (BICU-Mother Board)

PIN	NAME	PIN	NAME
1	GND	11	GND
2	< /VIDEO	12	TXD 2 >
3	GND	13	< RXD 2
4	/FGATE >	14	GND
5	/CE 2 >	15	TXD 3 >
6	/CE 3 >	16	< RXD 3
7	N.C.	17	GND
8	GND	18	/BD >
9	/RTS >	19	N.C.
10	< /CTS	20	/WRSYNC >

<CN303> (BICU - MSU)

PIN	NAME	PIN	NAME
1	GND	31	GND
2	GND	32	GND
3	/MWCLK >	33	GND
4	/MWLGT >	34	GND
5	/MWLSYC >	35	/MWFGT >
6	MOD >	36	GND
7	GND	37	GND
8	< /MRCLK	38	GND
9	< /MRLGT	39	/WRSYNC >
10	< /MRLSYC	40	< /MRFGT
11	< MID	41	GND
12	GND	42	GND
13	A7(N.C)	43	A6(N.C)
14	A5(N.C)	44	A4 >
15	A3 >	45	A2 >
16	A1 >	46	A0 >
17	GND	47	GND
18	< D15 >	48	< D14 >
19	< D13 >	49	< D12 >
20	< D11 >	50	< D10 >
21	< D9 >	51	< D8 >
22	/RD >	52	/HWR >
23	CS50 >	53	/CS51 >
24	/RESET >	54	< /MDTCT
25	GND	55	GND
26	+5V	56	+5V
27	+5V	57	+5V
28	+5V	58	+5V
29	GND	59	GND
30	GND	60	GND

Signal Table

———	AC Line
———	DC Line
- - - - - - - -	Pulse Signal
< >	Signal Direction
	Active High
	Active Low
[ ]	Voltage
[A]	Analog Signal

A193 and A224 Point to Point Diagram (2/2)

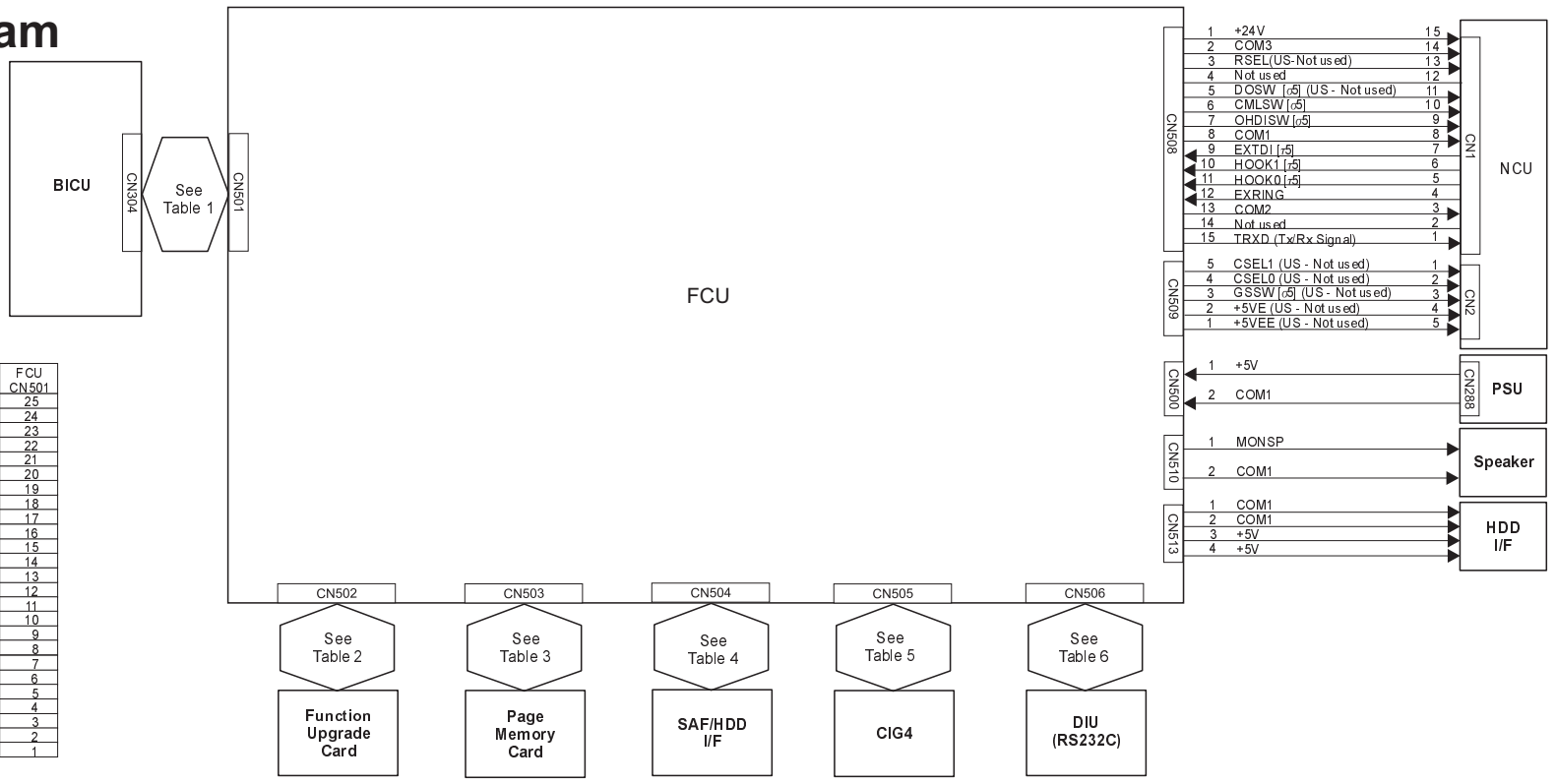

Table 1 (BICU - FCU)

BICU CN304	NAME	FCU CN501	BICU CN304	NAME	FCU CN501
1	+24V	50	26	GND	25
2	+24V	49	27	< /ARLGT	24
3	+12V	48	28	< /ARLSYC	23
4	-12V	47	29	< /ARFGT	22
5	TXD 1 >	46	30	/WRSYNC >	21
6	< RXD 2	45	31	/FSYNC >	20
7	GND	44	32	GND	19
8	/AWCLK >	43	33	< /ARKS 0	18
9	GND	42	34	< /ARKS 1	17
10	/AWLGT >	41	35	< /ARKS 2	16
11	/AWLSYC >	40	36	< /ARKS 3	15
12	/AWFGT >	39	37	< /ARKS 4	14
13	GND	38	38	< /ARKS 5	13
14	/AWKS 0 >	37	39	< /ARKS 6	12
15	/AWKS 1 >	36	40	< /ARKS 7	11
16	/AWKD 0 >	35	41	/OE 1 >	10
17	/AWKD 1 >	34	42	GND	9
18	/AWKD 2 >	33	43	< /OP-LED	8
19	/AWKD 3 >	32	44	< /RTRG	7
20	/AWKD 4 >	31	45	/OP-KEY >	6
21	/AWKD 5 >	30	46	/SW-ON >	5
22	/AWKD 6 >	29	47	/SN-ON >	4
23	/AWKD 7 >	28	48	< EX-FCU	3
24	GND	27	49	+5VE	2
25	< /ARCLK	26	50	+5VE	1

Table 2 (Function Upgrade Card - FCU)

FCU CN502	NAME	FCU CN502	NAME
1	COM1	35	COM1
2	< CPD 3 >	36	< CD1
3	< CPD 4 >	37	< CPD 11 >
4	< CPD 5 >	38	< CPD 12 >
5	< CPD 6 >	39	< CPD 13 >
6	< CPD 7 >	40	< CPD 14 >
7	/CROMCSO >	41	< CPD 15 >
8	CPA 10 >	42	/CRAMCSO >
9	/MRD >	43	N.C
10	CPA 11 >	44	< /FROMCS >
11	CPA 9 >	45	N.C
12	CPA 8 >	46	CPA 17 >
13	CPA 13 >	47	CPA 18 >
14	CPA 14 >	48	CPA 19 >
15	/MWRL >	49	CPA 20 >
16	< BSY	50	< RAMCS
17	+5V	51	+5V
18	+12VP	52	+12VP
19	CPA 16 >	53	N.C
20	CPA 15 >	54	N.C
21	CPA 12 >	55	< /WP
22	CPA 7 >	56	< /BYTE
23	CPA 6 >	57	N.C
24	CPA 5 >	58	/MWRH >
25	CPA 4 >	59	/EXCARD >
26	CPA 3 >	60	< /SLEEP
27	CPA 2 >	61	/VPCNT0 >
28	CPA 1 >	62	< /VPCNT1
29	CPA 0 >	63	< /CSCNT
30	< CPD 0 >	64	< CPD 8 >
31	< CPD 1 >	65	< CPD 9 >
32	< CPD 2 >	66	< CPD 10 >
33	RTCCS >	67	< CD2
34	COM1	68	COM1

Table 3 (Page Memory Card - FCU)

FCU CN503	NAME	FCU CN503	NAME
1	COM1	35	COM1
2	< DMD 3 >	36	< CD1
3	< DMD 4 >	37	< DMD 11 >
4	< DMD 5 >	38	< DMD 12 >
5	< DMD 6 >	39	< DMD 13 >
6	< DMD 7 >	40	< DMD 14 >
7	/RAS 4 >	41	< DMD 15 >
8	N.C	42	/RAS5 >
9	/DMRD >	43	N.C
10	N.C	44	N.C
11	DMA 9 >	45	N.C
12	DMA 8 >	46	N.C
13	N.C	47	N.C
14	N.C	48	N.C
15	/DMWR >	49	N.C
16	N.C	50	N.C
17	+5V	51	+5V
18	N.C	52	N.C
19	N.C	53	N.C
20	N.C	54	N.C
21	N.C	55	/DCAS 1 >
22	DMA 7 >	56	/DCAS 0 >
23	DMA 6 >	57	N.C
24	DMA 5 >	58	N.C
25	DMA 4 >	59	N.C
26	DMA 3 >	60	N.C
27	DMA 2 >	61	N.C
28	DMA 1 >	62	N.C
29	DMA 0 >	63	N.C
30	< DMD 0 >	64	< DMD 8 >
31	< DMD 1 >	65	< DMD 9 >
32	< DMD 2 >	66	< DMD 10 >
33	N.C	67	< CD 2
34	COM1	68	COM1

Table 4 (SAF/HDD interface - FCU)

FCU CN504	NAME	FCU CN504	NAME
1	COM1	45	COM1
2	< CPD 0 >	46	< CPD 1 >
3	< CPD 2 >	47	< CPD 3 >
4	< CPD 4 >	48	< CPD 5 >
5	< CPD 6 >	49	< CPD 7 >
6	< CPD 8 >	50	< CPD 9 >
7	< CPD 10 >	51	< CPD 11 >
8	< CPD 12 >	52	< CPD 13 >
9	+5V	53	< CPD 14 >
10	< CPD 10 >	54	/MRD >
11	< DMD 15 >	55	/MWRH >
12	/MWRL >	56	COM1
13	CPA 1 >	57	CPA 2 >
14	CPA 3 >	58	CPA 4 >
15	+5V	59	CPA 5 >
16	CPA 6 >	60	CPA 7 >
17	< DMD 14 >	61	CPA 8 >
18	CPA 9 >	62	CPA 10 >
19	CPA 11 >	63	COM1
20	CPA 12 >	64	CPA 13 >
21	CPA 14 >	65	CPA 15 >
22	/FROMCS >	66	/SRAMCS >
23	RTCCS >	67	< /INTHDD
24	+12V	68	< DMD 0 >
25	DMD 13 >	69	< DMD 1 >
26	< DMD 2 >	70	< DMD 3 >
27	< /EXCARD	71	< DMD 4 >
28	< DMD 5 >	72	< DMD 6 >
29	< DMD 7 >	73	COM1
30	< DMD 8 >	74	< DMD 9 >
31	< DMD 10 >	75	< DMD 11 >
32	+5VD	76	/RAS 0 >
33	/CAS0 >	77	/CAS1 >
34	/DMMRD >	78	/DMMWR >
35	< DMD 12 >	79	/HDCS >
36	/DMIORD >	80	/RESET >
37	+5V	81	/DMIOWR >
38	DMA 1 >	82	DMA 2 >
39	DMA 3 >	83	DMA 4 >
40	DMA 5 >	84	DMA 6 >
41	DMA 7 >	85	DMA 8 >
42	DMA 9 >	86	DMA 10 >
43	HDDACK >	87	DMA 11 >
44	COM1	88	COM1

Table 5 (CIG4 - FCU)

FCU CN505	NAME	FCU CN505	NAME
1	VTXMD >	21	CPA 3 >
2	< VRXMDM	22	CPA 2 >
3	COM3	23	CPA 1 >
4	-12V	24	CPA 0 >
5	/G4CS >	25	COM3
6	/RESET >	26	< CPD 7 >
7	COM3	27	< CPD 6 >
8	< /INTG4	28	< CPD 5 >
9	< /CWAIT	29	< CPD 4 >
10	/CODCCS >	30	< CPD 3 >
11	CPA 14 >	31	< CPD 2 >
12	CPA 13 >	32	< CPD 1 >
13	CPA 12 >	33	< CPD 0 >
14	CPA 10 >	34	/MWRL >
15	CPA 9 >	35	N.C
16	CPA 8 >	36	/MRD >
17	CPA 7 >	37	COM3
18	CPA 6 >	38	+24V
19	CPA 5 >	39	COM3
20	CPA 4 >	40	+24V

Table 6 (DIU (RS232C) - FCU)

FCU CN506	NAME	FCU CN506	NAME
1	< CPD 0 >	13	< CPD 6 >
2	< CPA 0 >	14	/IOWR >
3	< CPD 1 >	15	< CPD 7 >
4	< CPA 1 >	16	/RST232 >
5	< CPD 2 >	17	< IOIT2
6	< CPA 2 >	18	/R232CS >
7	< CPD 3 >	19	N.C
8	< CPA 3 >	20	N.C
9	< CPD 4 >	21	+5V
10	N.C	22	N.C
11	< CPD 5 >	23	COM1
12	/IORD >	24	N.C

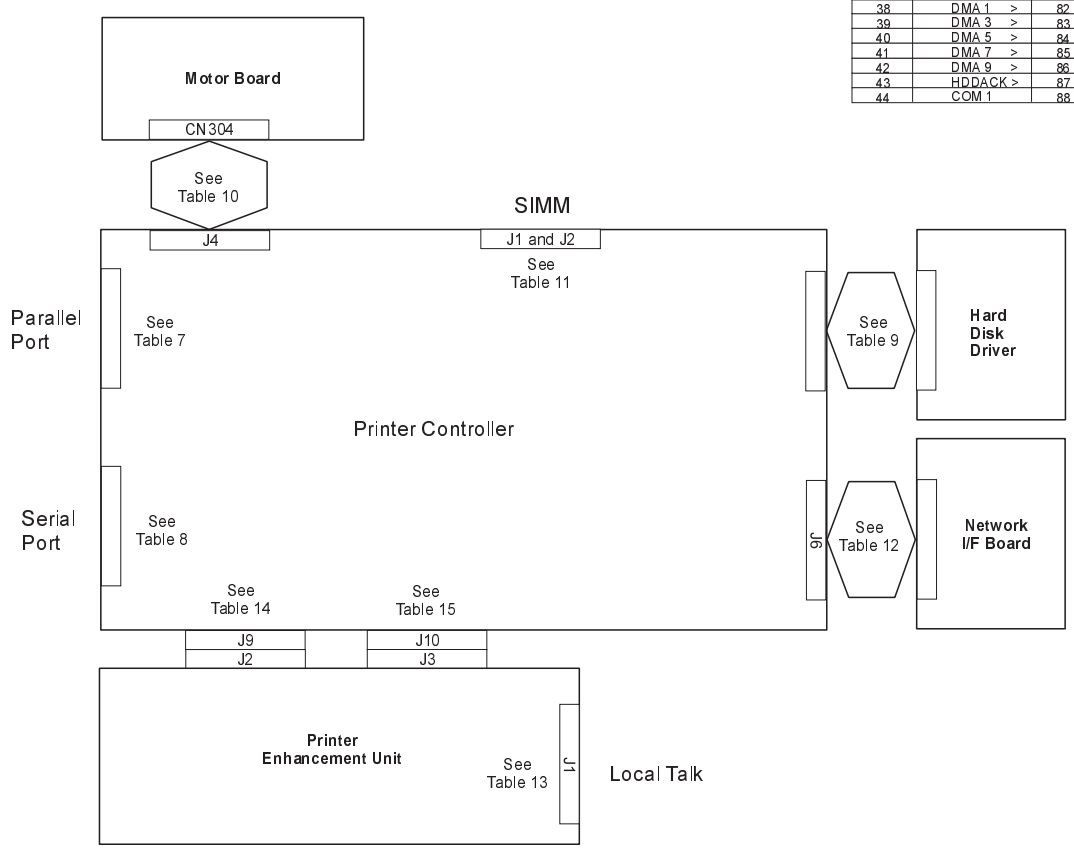

Table 7 (Parallel Porl - Printer Controller)

PIN	NAME
1	< /STROBE
2	< DATA BIT 0 >
3	< DATA BIT 1 >
4	< DATA BIT 2 >
5	< DATA BIT 3 >
6	< DATA BIT 4 >
7	< DATA BIT 5 >
8	< DATA BIT 6 >
9	< DATA BIT 7 >
10	/ACKNLG >
11	BUSY >
12	PE >
13	SLCK >
14	< /AUTO FEED XT
15	NC
16	GND
17	GND
18	NC
19~30	GND
31	< /INIT
32	/ERROR >
33	GND
34	NC
35	NC
36	< /SLCT IN

Table 8 (Serial Porl - Printer Controller)

PIN	NAME
2	STXD >
3	< SRXD
4	+10V >
6	< SDSR
20	SDTR >

Table 9 (Hard Disk Driver - Printer Controller)

PIN	NAME	PIN	NAME
1	CPURST >	26	GND
2	GND	27	CHRDY (5V)
3	< DATA 7 >	28	GND
4	< DATA 8 >	29	NC
5	< DATA 6 >	30	GND
6	< DATA 9 >	31	< HDDINT
7	< DATA 5 >	32	NC
8	< DATA 10 >	33	ADDRESS 3 >
9	< DATA 4 >	34	NC
10	< DATA 11 >	35	ADDRESS 2 >
11	< DATA 3 >	36	ADDRESS 4 >
12	< DATA 12 >	37	/ HDDCS0 >
13	< DATA 2 >	38	/ HDDCS1 >
14	< DATA 13 >	39	NC
15	< DATA 1 >	41	+5V
16	< DATA 14 >	42	+5V
17	< DATA 0 >	44	NC
18	< DATA 15 >	47	NC
19	GND	48	NC
20	NC	49	NC
21	NC	50	NC
22	GND		
23	< / IOWR		
24	GND		
25	< /IORD		

Table 10 (Motor Board - Printer Controller)

PIN	NAME
A1	< / EBD
A2	/ CVDO >
A3	< / EVSYNC
A4	< / ESTS
A5	ECMD >
A6~10	+5V
B1~3	NC
B4	< / ESBSY
B5	/ ECBSY >
B6~10	GND

Table 11 (SIMM - Printer Controller)

PIN	NAME	PIN	NAME
1	GND	37	NC
2	< DATA 0 >	38	NC
3	< DATA 16 >	39	GND
4	< DATA 1 >	40	CAS 0 >
5	< DATA 17 >	41	CAS 2 >
6	< DATA 2 >	42	CAS 3 >
7	< DATA 18 >	43	CAS 1 >
8	< DATA 3 >	44	RAS 0 >
9	< DATA 19 >	45	RAS 1 >
10	+5V	46	NC
11	NC	47	/ WE >
12	ADDRESS 0 >	48	NC
13	ADDRESS 1 >	49	< DATA 8 >
14	ADDRESS 2 >	50	< DATA 24 >
15	ADDRESS 3 >	51	< DATA 9 >
16	ADDRESS 4 >	52	< DATA 25 >
17	ADDRESS 5 >	53	< DATA 10 >
18	ADDRESS 6 >	54	< DATA 26 >
19	ADDRESS 10>	55	< DATA 11 >
20	< DATA 4 >	56	< DATA 27 >
21	< DATA 40 >	57	< DATA 12 >
22	< DATA 5 >	58	< DATA 28 >
23	< DATA 21 >	59	+5V
24	< DATA 6 >	60	< DATA 29 >
25	< DATA 22 >	61	< DATA 13 >
26	< DATA 7 >	62	< DATA 30 >
27	< DATA 23 >	63	< DATA 14 >
28	ADDRESS 7 >	64	< DATA 31 >
29	NC	65	< DATA 15 >
30	+5V	66	NC
31	ADDRESS 8 >	67	NC
32	ADDRESS 9 >	68	NC
33	RAS 3 >	69	NC
34	RAS 2 >	70	NC
35	NC	71	NC
36	NC	72	GND

Table 12 (Network I/F Board - Printer Controller)

PIN	NAME	PIN	NAME
1	NC	27	ADDRESS 4 >
2	+5V	28	ADDRESS 5 >
3	GND	29	ADDRESS 6 >
4	< DATA 0 >	30	ADDRESS 7 >
5	< DATA 1 >	31	ADDRESS 8 >
6	< DATA 2 >	32	ADDRESS 9 >
7	< DATA 3 >	33	ADDRESS 10 >
8	< DATA 4 >	34	ADDRESS 11 >
9	< DATA 5 >	35	ADDRESS 12 >
10	< DATA 6 >	36	ADDRESS 13 >
11	< DATA 7 >	37	ADDRESS 14 >
12	< DATA 8 >	38	ADDRESS 15 >
13	< DATA 9 >	39	GND
14	< DATA 10 >	40	GND
15	+5V	41	< / XNICID
16	+5V	42	< / NICINT
17	< DATA 11 >	43	/ PNTIRQ >
18	< DATA 12 >	44	/ BHE >
19	< DATA 13 >	45	< / NICREQ
20	< DATA 14 >	46	/ NICACK >
21	< DATA 15 >	47	/ IOWR >
22	GND	48	/ NICCS >
23	ADDRESS 0 >	49	/ IORD >
24	ADDRESS 1 >	50	< / RDY
25	ADDRESS 2 >	51	CPURST >
26	ADDRESS 3 >	52	CLK2 >

Table 13 (Local Talk - Printer Enhancement Unit)

PIN	NAME
1	GND
2	< HSK
3	TXD- >
4	GND
5	< RXD-
6	TXD+ >
7	NC
8	< RXD+

Table 14 (Printer Enhancement Unit - Printer Controller)

PIN	NAME	PIN	NAME	PIN	NAME
A1	< DATA16 >	B1	< DATA17 >	C1	< DATA18 >
A2	< DATA19 >	B2	< DATA20 >	C2	< DATA21 >
A3	< DATA22 >	B3	< DATA23 >	C3	< DATA24 >
A4	< DATA25 >	B4	+ 5V	C4	GND
A5	GND	B5	< SCCCS	C5	< /ROMCS 1
A6	< ADDRESS 0	B6	< ADDRESS 1	C6	< ADDRESS 2
A7	< ADDRESS 3	B7	< ADDRESS 4	C7	< ADDRESS 5
A8	< ADDRESS 6	B8	< ADDRESS 7	C8	< ADDRESS 8
A9	+ 5V	B9	GND	C9	< ADDRESS 9
A10	< ADDRESS 10	B10	< ADDRESS 11	C10	< ADDRESS 12
A11	< ADDRESS 13	B11	< ADDRESS 14	C11	< ADDRESS 15
A12	< ADDRESS 16	B12	+ 5V	C12	GND
A13	< ADDRESS 17	B13	< ADDRESS 18	C13	< ADDRESS 19
A14	< ADDRESS 20	B14	< ADDRESS 21	C14	< ADDRESS 22
A15	< ADDRESS 23	B15	< ADDRESS 24	C15	+ 5V
A16	GND	B16	< ADDRESS 25	C16	< ADDRESS 26
A17	< ADDRESS 27	B17	< ADDRESS 28	C17	< ADDRESS 29
A18	< ADDRESS 30	B18	< ADDRESS 31	C18	GND
A19	GND	B19	< /ALE	C19	< /DEN
A20	< /BLAST	B20	< /W/R	C20	< CPURST
A21	+ 5V	B21	GND	C21	+ 5V
A22	/ARAMWR >	B22	/ARAMOE >	C22	AMA 0 >
A23	AMA 1 >	B23	AMA 2 >	C23	AMA 3 >
A24	AMA 4 >	B24	AMA 5 >	C24	AMA 6 >
A25	AMA 7 >	B25	AMA 8 >	C25	AMA 9 >
A26	AMA 10 >	B26	< ALE	C26	/ACAS 0 >
A27	/ACAS 1 >	B27	ACAS 2 >	C27	/ACAS 3 >
A28	+ 5V	B28	GND	C28	GND
A29	+ 5V	B29	/ARAS 0 >	C29	/ARAS 1 >
A30	/ARAS 2 >	B30	/ARAS 3 >	C30	/ARAS 4 >
A31	/ARAS 5 >	B31	/ARAS 6 >	C31	+ 5V
A32	+ 5V	B32	GND	C32	GND

Table 15 (Printer Enhancement Unit - Printer Controller)

PIN	NAME	PIN	NAME	PIN	NAME
A1	< DATA 0 >	B1	< DATA 1 >	C1	< DATA 2 >
A2	< DATA 3 >	B2	< DATA 4 >	C2	GND
A3	GND	B3	< DATA 5 >	C3	< DATA 6 >
A4	< DATA 7 >	B4	< DATA 8 >	C4	+ 5V
A5	GND	B5	< DATA 9 >	C5	< DATA 10 >
A6	< DATA 11 >	B6	< DATA 12	C6	GND
A7	GND	B7	< DATA 13 >	C7	< DATA 14 >
A8	< DATA 15 >	B8	+ 5V	C8	GND
A9	GND	B9	< DATA 26 >	C9	< DATA 27 >
A10	< DATA 28 >	B10	< DATA 29 >	C10	< DATA 30 >
A11	< DATA 31 >	B11	GND	C11	+ 5V
A12	+ 5V	B12	GND	C12	< /D5BREQ
A13	< /D5BACK	B13	/SCCREQ >	C13	NC
A14	+ 5V	B14	GND	C14	GND
A15	+ 5V	B15	/SOOTINT >	C15	/SCCINT >
A16	+ 5V	B16	GND	C16	GND
A17	GND	B17	+ 5V	C17	< /RDY
A18	< CLK 2	B18	GND	C18	GND
A19	+ 5V	B19	+ 5V	C19	< /IORD
A20	< /IOWR	B20	< /DRAMOE	C20	< /ORAMWR
A21	+ 5V	B21	+ 5V	C21	< DMA 0
A22	< DMA 1	B22	< DMA 2	C22	< DMA 3
A23	< DMA 4	B23	< DMA 5	C23	< DMA 6
A24	< DMA 7	B24	< DMA 8	C24	< DMA 9
A25	< DMA 10	B25	< DMA 11	C25	GND
A26	GND	B26	< /DCAS 0	C26	< /DCAS 1
A27	< /DCAS 2	B27	< /DCAS 3	C27	+ 5V
A28	GND	B28	< /DRAS 0	C28	< /DRAS 1
A29	< /DRAS 2	B29	< /DRAS 3	C29	< /DRAS 4
A30	< /DRAS 5	B30	< /DRAS 6	C30	< /DRAS 7
A31	< /DRAS 8	B31	< /DRAS 9	C31	+ 5V
A32	+ 5V	B32	GND	C32	GND