BELLINI (Machine Code: A294) SERVICE MANUAL

Subject to change Ricoh Technical Service October 22th, 1999

MIMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

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

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

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

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

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

LASER SAFETY

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

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

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

CAUTION MARKING:



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

TABLE OF CONTENTS

1. OVERALL MACHINE INFORMATION	. 1-1	1
1.1 SPECIFICATIONS	1-	1
1.1.1 COPIER ENGINE	1-	1
1.1.2 ADF	1-4	4
1.2 MACHINE CONFIGURATION	1-!	5
1.3 COMPONENT LAYOUT	1-6	6
1.3.1 COPIER ENGINE	1-(6
1.3.2 ADF	1-7	7
1.4 PAPER PATH	1-8	8
1.5 COPY PROCESS	1-9	9
1.6 DRIVE LAYOUT	1-1	1
1.6.1 COPIER ENGINE	1-1	1
1.6.2 ADF	1-1;	2
1.7 ELECTRICAL COMPONENT DESCRIPTIONS	1-1:	3
1.7.1 COPIER ENGINE	1-1;	3
1.7.2 ADF	1-19	9
	-	
2. DETAILED SECTION DESCRIPTIONS	. 2-	1
2.1 DOCUMENT FEEDER	2-	1
2.1.1 PICK-UP ROLLER RELEASE	2-	1
2.1.2 BOTTOM PLATE LIFT	2-2	2
2.1.3 PICK-UP AND SEPARATION	2-:	3
2.1.4 ORIGINAL FEED	2-4	4
2.1.5 ORIGINAL SIZE DETECTION	2-!	5
2.1.6 ORIGINAL TRANSPORT	2-6	6
2.1.7 ORIGINAL SKEW CORRECTION	2-	7
2.1.8 ORIGINAL INVERSION AND FEED-OUT	2-8	8
2.1.9 JAM CONDITIONS	2-12	2
2.2 SCANNING	2-13	3
2.2.1 OVERVIEW	2-1:	3
2.2.2 SCANNER DRIVE	2-14	4
2.2.3 ORIGINAL SIZE DETECTION IN BOOK MODE	2-1	5
2.3 IMAGE PROCESSING	2-1	7
2.3.1 OVERVIEW	2-1	7
2.3.2 SBU	2-18	8
2.3.3 AUTO IMAGE DENSITY (ADS)	2-19	9
2.3.4 IMAGE PROCESSING STEPS AND RELATED SP MODE	2-20	0
2.3.5 AUTO SHADING	2-26	6
2.3.6 BACKGROUND ERASE	2-2	7
2.3.7 INDEPENDENT DOT ERASE	2-28	8
2.3.8 FILTERING, MAIN SCAN MAGNIFICATION/REDUCTION	2-2	9
	2-3 ⁻	1
2.3.10 GRADATION PROCESSING	2-3	1
2.3.11 LINE WIDTH CORRECTION	2-3	2

2.4 LASER EXPOSURE	. 2-33
2.4.1 OVERVIEW	. 2-33
2.4.2 OPTICAL PATH	. 2-34
2.4.3 AUTO POWER CONTROL (APC)	. 2-35
2.4.4 FOUR BEAM LASER WRITING	. 2-36
2.4.5 LD SAFETY SWITCHES	. 2-37
2.5 DRUM UNIT	. 2-38
2.5.1 PROCESS CONTROL	. 2-38
2.5.2 TONER DENSITY CONTROL	. 2-43
2.5.3 DRUM UNIT COMPONENTS	. 2-46
2.5.4 DRIVE	. 2-47
2.5.5 DRUM CHARGE	. 2-48
2.5.6 DRUM CLEANING	. 2-50
2.5.7 OTHERS	. 2-53
2.6 DEVELOPMENT	. 2-56
2.6.1 OVERVIEW	. 2-56
2.6.2 DEVELOPMENT MECHANISM	. 2-57
2.6.3 DRIVE	. 2-58
2.6.4 CROSSMIXING	2-59
265 DEVELOPMENT BIAS	2-60
27 TONER SUPPLY AND RECYCLING	2-61
2.7.1 TONER BANK	2-61
2.7.2 SUPPLYING TONER TO THE DEVELOPMENT LINIT	2-65
273 TONER HOPPER	2-66
2.7.4 TONER BECYCLING AND WASTE TONER COLLECTION	2-68
28 PAPER FEED	2-71
2 8 1 OVERVIEW	2-71
282 DBIVE	2-72
283 PAPER LIET – TRAYS 2&3	2-73
2.8.4 PICK-UP AND FEED – TBAYS 1 TO 3	2-75
2.8.5 REMAINING PAPER/	. 270
PAPER END DETECTION – TRAYS 2 & 3	2-79
286 PAPER SIZE DETECTION - TRAYS 2 & 3	2-80
2.8.7 TRAVIOCK – TRAVS 2.8.3	2-81
2.8.8 TANDEM FEED – TRAY 1	2-82
289 VERTICAL TRANSPORT	2-89
2.8.10 PAPER BEGISTRATION	2-90
2.9 IMAGE TRANSFER AND PAPER SEPARATION	2-93
2.9 1 OVERVIEW	2-93
292 IMAGE TRANSFER AND PAPER SEPARATION	2-94
2.9.2 TRANSFER BELT LINIT LIFT	2-96
2.9.4 PAPER TRANSPORTATION AND RELT DRIVE	2-00
2.9.5 TRANSFER BELT CLEANING	2_98
	2-90
2.9.0 TONER OULLOTION	2_100
	2_101
2 10 1 OV/FRV/IEW	2-101 2-101
	<u>-</u> -101 2_102
	2-102
	C-103

	2.10.4 FUSING LAMP CONTROL	2-104
	2.10.5 OIL SUPPLY AND CLEANING	2-105
	2.10.6 PAPER COOLING	2-106
	2.10.7 FUSING PRESSURE	2-107
	2.10.8 HOT ROLLER STRIPPER RELEASE	2-108
	2.11 PAPER EXIT/DUPLEX	2-109
	2.11.1 OVERVIEW	2-109
	2.11.2 PAPER EXIT MECHANISM	2-110
	2.11.3 DUPLEX DRIVE MECHANISM	2-111
	2.11.4 INVERTER	2-112
	2.11.5 DUPLEX TRAY FEED MECHANISM	2-114
	2.11.6 BASIC DUPLEX FEED OPERATION	2-115
	2.12 ENERGY SAVER MODES	
	2.12.1 OVERVIEW	
	2.12.2 ENERGY SAVER (PANEL OFF) MODE	2-120
	2.12.3 LOW POWER MODE	
	2.12.4 OFF MODE	2-122
	2.12.5 SUMMARY	
	2.13 OTHERS	
	2.13.1 OPERATION UNIT	
	2.13.2 DOOR SAFETY SWITCH LOCK TOOLS	
	2.13.3 HDD CONTROL	
	2.13.4 DATA PATH THROUGH THE INTERFACE BOARD	
		_
Z		21
U.		
0.	3.1 INSTALLATION REQUIREMENTS	3-1
J.	3.1 INSTALLATION REQUIREMENTS	
J.	3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL	3-1 3-1 3-1 3-1
J.	3.1 INSTALLATION REQUIREMENTS	
J.	3.1 INSTALLATION REQUIREMENTS	
J.	3.1 INSTALLATION REQUIREMENTS	
J.	 3.1 INSTALLATION REQUIREMENTS	
	 3.1 INSTALLATION REQUIREMENTS	
	 3.1 INSTALLATION REQUIREMENTS	3-1 3-1 3-1 3-2 3-2 3-2 3-3 3-3 3-3 3-3 3-3 3-3 3-5 3-12
	 3.1 INSTALLATION REQUIREMENTS	3-1 3-1 3-1 3-2 3-2 3-2 3-2 3-3 3-3 3-3 3-3 3-5 3-12 3-12
	 3.1 INSTALLATION REQUIREMENTS	
	 3.1 INSTALLATION REQUIREMENTS	3-1 3-1 3-1 3-2 3-2 3-2 3-2 3-3 3-3 3-3 3-3 3-5 3-12 3-12 3-12 3-13 3-16
	 3.1 INSTALLATION REQUIREMENTS	3-1
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.1 ACCESSORY CHECK 	3-1
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION PROCEDURE 3.5 PUNCH UNIT INSTALLATION (A812) 	3-1 3-1 3-1 3-2 3-2 3-2 3-2 3-3 3-3 3-3 3-3 3-12 3-12
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.1 ACCESSORY CHECK 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 	3-1 3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-2 3-2 3-3 3-3 3-5 3-12 3-12 3-13 3-16 3-16 3-16 3-17 3-19 3-19 3-19
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION PROCEDURE 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 	3-1
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 	3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-2 3-3 3-3 3-5 3-12 3-12 3-12 3-16 3-16 3-16 3-17 3-19 3-19 3-20 3-23
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.1 ACCESSORY CHECK 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 	3-1 3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-3 3-3 3-5 3-12 3-12 3-12 3-13 3-16 3-16 3-16 3-17 3-19 3-19 3-20 3-23 3-23 3-23
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 3.6.2 INSTALLATION PROCEDURE 	3-1
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS. 3.1 A POWER REQUIREMENTS. 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 3.6.2 INSTALLATION PROCEDURE 3.7 KEY COUNTER INSTALLATION 	3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-3 3-3 3-5 3-12 3-12 3-12 3-12 3-16 3-16 3-16 3-16 3-17 3-19 3-19 3-20 3-23 3-23 3-24 3-27
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.1 ACCESSORY CHECK 3.5.1 ACCESSORY CHECK 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 3.6.2 INSTALLATION PROCEDURE 3.7 KEY COUNTER INSTALLATION 3.8 INTERFACE BOARD 	3-1 3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-3 3-5 3-12 3-12 3-12 3-12 3-13 3-16 3-16 3-16 3-16 3-17 3-19 3-19 3-20 3-23 3-23 3-24 3-27
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 3.6.2 INSTALLATION PROCEDURE 3.7 KEY COUNTER INSTALLATION 3.8 INTERFACE BOARD (CD-RW/TANDEM COPY KIT/PRINTER CONTROLLER) 	3-1 3-1 3-1 3-1 3-1 3-2 3-2 3-3 3-3 3-3 3-3 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-12 3-19 3-23 3-23 3-27 3-27 3-27 3-27 3-27 3-27 3-20 3-27
	 3.1 INSTALLATION REQUIREMENTS 3.1.1 ENVIRONMENT 3.1.2 MACHINE LEVEL 3.1.3 MINIMUM SPACE REQUIREMENTS 3.1.4 POWER REQUIREMENTS 3.2 COPIER (A294) 3.2.1 ACCESSORY CHECK 3.2.2 INSTALLATION PROCEDURE 3.3 FINISHER INSTALLATION (B302) 3.3.1 ACCESSORY CHECK 3.2 INSTALLATION PROCEDURE 3.4 LCT INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.4.2 INSTALLATION (B303) 3.4.1 ACCESSORY CHECK 3.5 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION (A812) 3.5.1 ACCESSORY CHECK 3.5.2 PUNCH UNIT INSTALLATION 3.6 A3/DLT TRAY (B331) 3.6.1 ACCESSORY CHECK 3.6.2 INSTALLATION PROCEDURE 3.7 KEY COUNTER INSTALLATION 3.8 INTERFACE BOARD (CD-RW/TANDEM COPY KIT/PRINTER CONTROLLER) 3.8.1 INSTALLATION PROCEDURE 	3-1 3-1 3-1 3-1 3-1 3-2 3-2 3-2 3-3 3-3 3-5 3-12 3-12 3-12 3-12 3-13 3-16 3-16 3-16 3-16 3-16 3-17 3-19 3-19 3-20 3-23 3-23 3-23 3-24 3-27 3-30 3-30 3-30 3-30

4.	SERVICE TABLES	4-1
	4.1 GENERAL CAUTIONS	4-1
	4.1.1 DRUM	4-1
	4.1.2 DRUM UNIT	4-1
	4.1.3 TRANSFER BELT UNIT	4-2
	4.1.4 SCANNER UNIT	4-2
	4.1.5 LASER UNIT	4-2
	4.1.6 CHARGE CORONA	4-3
	4.1.7 DEVELOPMENT	4-3
	4.1.8 CLEANING	4-4
	4.1.9 FUSING UNIT	4-4
	4.1.10 PAPER FEED	4-4
	4.1.11 USED TONER	4-4
	4.2 SERVICE PROGRAM MODE	4-5
	4.2.1 SERVICE PROGRAM MODE OPERATION	4-5
	4.2.2 SERVICE PROGRAM MODE TABLES	4-10
	4.2.3 TEST PATTERN PRINTING (SP2-902)	4-59
	4.2.4 INPUT CHECK	4-60
	4.2.5 OUTPUT CHECK	4-68
	4.2.6 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)	4-70
	4.2.7 MEMORY ALL CLEAR (SP5-801)	4-70
	4.2.8 SOFTWARE RESET	4-71
	4.2.9 SYSTEM SETTING AND	
	COPY SETTING (UP MODE) RESET	4-71
	4.3 PM COUNTER	4-72
	4.3.1 PM COUNTER ACCESS PROCEDURE	4-72
	4.4 PROGRAM DOWNLOAD	4-78
	4.5 NVRAM DATA DOWNLOAD	4-80
	4.6 LANGUAGE DATA DOWNLOAD	4-81
	4.7 STAMP DATA DOWNLOAD	4-81
	4.8 USER PROGRAM MODE	4-82
	4.8.1 HOW TO ENTER AND EXIT UP MODE	4-82
	4.8.2 UP MODE TABLE	4-82
	4.8.3 IMAGE QUALITY SETTING BY UP MODE	4-85
	4.8.4 LEDS	4-91
	4.9 TEST POINTS/DIP SWITCHES/LEDS	4-92
	4.9.1 DIP SWITCHES	4-92
	4.9.2 TEST POINTS	4-93
	4.9.3 FUSES	4-93
	4.9.4 VARIABLE RESISTORS	4-93
	4.10 SPECIAL TOOLS AND LUBRICANTS	4-94
	4.10.1 SPECIAL TOOLS	4-94
	4.10.2 LUBRICANTS	4-94
_		
5.		5-1
	5.1 PM PARIS	5-1

6. REPLACEMENT AND ADJUSTMENT	6-1
6.1 EXTERIOR	6-1
6.1.1 FRONT	6-1
6.1.2 RIGHT	6-2
6.1.3 LEFT	6-3
6.1.4 REAR	
6.2 DOCUMENT FEEDER	
6.2.1 COVER REMOVAL	6-5
6.2.2 FEED UNIT REMOVAL AND	0.7
	6 10
	6-14
6.2.7 MOTOR BEPLACEMENT	6-15
6.2.8 FEED-IN CLUTCH BEPLACEMENT	6-17
6.3 SCANNER UNIT	
6.3.1 EXPOSURE GLASS	
6.3.2 LENS BLOCK	6-19
6.3.3 ORIGINAL SIZE SENSORS	6-20
6.3.4 EXPOSURE LAMP	6-21
6.3.5 LAMP REGULATOR	6-22
6.3.6 OPTICS DUST FILTER	6-23
6.3.7 SCANNER H.P. SENSOR	6-24
6.3.8 SCANNER MOTOR	6-25
6.3.9 SCANNER DRIVE WIRES	
6.4 LASER UNIT	
6.4.1 GAUTION DECAL LOCATIONS	
	0-31 T 6.22
6.5 DRUMUNIT	6-33
6.5.1 DRUM UNIT REMOVAL AND DRUM REPLACEMENT	6-33
6.5.2 OUENCHING LAMP BEPLACEMENT	6-34
6.5.3 GRID PLATE/CHARGE CORONA WIRE/	
WIRE CLEANER REPLACEMENT	
6.5.4 DRUM POTENTIAL SENSOR REPLACEMENT	6-37
6.5.5 CLEANING BLADE/ID SENSOR REPLACEMENT	6-38
6.5.6 CLEANING BRUSH REPLACEMENT	6-39
6.5.7 PICK-OFF PAWL REPLACEMENT	6-40
6.5.8 DRUM FILTER REPLACEMENT	6-41
6.6 DEVELOPMENT AND TONER SUPPLY	6-42
6.6.1 DEVELOPMENT UNIT REMOVAL	6-42
6.6.2 DEVELOPER REPLACEMENT	6-43
6.6.3 DEVELOPMENT AND AIR DUST FILTER REPLACEMENT	6-45
6.6.4 DEVELOPMENTENTRANCE, FRONT, AND	0.40

6.6.6 TONER HOPPER SENSOR REPLACEMENT	6-48
6.6.7 DEVELOPMENT MOTOR REPLACEMENT	6-49
6.6.8 DEVELOPMENT ROLLER SHAFT CLEANING	6-50
6.7 TRANSFER BELT UNIT	6-51
6.7.1 TRANSFER BELT UNIT REMOVAL/INSTALLATION	6-51
6.7.2 TRANSFER BELT BEPLACEMENT	6-53
6.7.3 TRANSFER BELT CLEANING BLADE BEPLACEMENT	6-55
6 7 4 TRANSFER BELT BIAS BRUSH BEPLACEMENT	6-56
68 PAPER FEED	6-57
6.8.1 PAPER TRAY REMOVAL	6-57
6 8 2 PAPER FEED BOLLER REPLACEMENT	6-60
	0-00
DADED END SENSOD DEMOVAL	6 61
	6 64
	0-04
6.8.5 REAR FEINCE HP SEINSUR REPLACEMENT	0-00
6.8.6 RIGHT IST TRAY PAPER SENSOR REPLACMENT	6-66
6.8.7 BOTTOM PLATE LIFT WIRE REPLACEMENT	6-67
6.8.8 PAPER DUST REMOVER CLEANING	6-69
6.8.9 REGISTRATION SENSOR CLEANING	6-70
6.8.10 UNIVERSAL TRAY SIZE SWITCH REPLACEMENT	6-71
6.8.11 1ST TRAY LIFT MOTOR REMOVAL	6-72
6.8.12 LIFT MOTOR REMOVAL (2ND & 3RD TRAYS)	6-73
6.8.13 PAPER FEED MOTOR REMOVAL	6-74
6.8.14 RELAY MOTOR, UPPER RELAY CLUTCH,	
LCT RELAY CLUTCH REMOVAL	6-75
6.8.15 REGISTRATION MOTOR REMOVAL	6-76
6.8.16 COPIER FEED UNIT/DEVELOPMENT FAN MOTOR	
REMOVAL	6-77
6.8.17 LCT RELAY AND RELAY SENSOR REMOVAL	6-78
6.8.18 TANDEM FEED TRAY PAPER SIZE CHANGE	6-79
6.8.19 MECHANICAL SIDE REGISTRATION ADJUSTMENT	6-82
6.9 FUSING UNIT	6-83
6.9.1 OIL SUPPLY & CLEANING WEB UNIT REMOVAL	6-83
6.9.2 HOT ROLLER UNIT REMOVAL AND	
PRESSURE ROLLER REPLACEMENT	6-84
6.9.3 HOT ROLLER REPLACEMENT	6-86
6.9.4 OIL SUPPLY & CLEANING WEB REPLACEMENT	6-88
695 WEB CLEANING BOLLEB BEPLACEMENT	6-90
696 HOT BOLLER STRIPPER REPLACEMENT	6-91
6 9 7 PRESSURE BOLLER STRIPPER BEPLACEMENT	6-92
6 9 8 PRESSURE BOLLER CLEANING BOLLER BEPLACEMENT	6-93
699 FUSING AND EXIT UNIT REMOVAL	6-94
	6 95
	0-90
	0-90
	0-90
	0-9/
	0-98
6.10.4 JUGGER MUTUR REPLACEMENT	b-99

6.10.5 DUPLEX UNIT CLUTCH REPLACEMENT	
6.10.6 DUPLEX ENTRANCE SENSOR REPLACEMENT	
6.10.7 DUPLEX TRANSPORT SENSORS 2 & 3	
6.10.8 DUPLEX TRANSPORT SENSOR 1/	
DUPLEX INVERTER SENSOR	
6.11 TONER BANK	
6.11.1 WASTE TONER BOTTLE REMOVAL	
6.11.2 TONER BANK UNIT REMOVAL	
6.11.3 TONER SUPPLY MOTOR AND	
TONER SUPPLY MOTOR SENSOR REMOVAL	
6.11.4 ACCESS TO INSIDE THE TONER BANK	6-109
6.12 BOARDS AND OTHER ITEMS	6-110
6.12.1 SICU BOARD	
6.12.2 HARD DISK DRIVE	
6.12.3 BCU BOARD	
6.12.4 I/O BOARD	
6.12.5 PSU	
6.12.6 CHARGE/GRID/BIAS POWER PACK	
6.12.7 FUSING/DUPLEX MOTOR REPLACEMENT	
6.12.8 DRUM MOTOR REPLACEMENT	
6.13 COPY IMAGE ADJUSTMENT: PRINTING/SCANNING.	
6.13.1 PRINTING	
6.13.2 PARALLELOGRAM IMAGE ADJUSTMENT	
6.13.3 SCANNING	
6.13.4 ADF IMAGE ADJUSTMENT	
6.14 TOUCH SCREEN CALIBRATION	6-125
	7 4
	······ /-I
7.2 ELECTRICAL COMPONENT DEFECTS	
1.2.1 3EIN3UN3 フクク SWITCHES	
	-40 7 41

OPTION

3,000-SHEET FINISHER (B302)

1. OVERALL MACHINE INFORMATION	B302-1
1.1 SPECIFICATIONS	B302-1
1.2 MECHANICAL COMPONENT LAYOUT	B302-3
1.3 ELECTRICAL COMPONENT DESCRIPTION	B302-4
1.4 DRIVE LAYOUT	B302-6
2. DETAILED DESCRIPTIONS	B302-7
2.1 TRAY AND STAPLER JUNCTION GATE	B302-7
2.2 PAPER PRE-STACKING	B302-8
2.3 JOGGER UNIT PAPER POSITIONING	B302-9
2.4 STAPLER UNIT MOVEMENT	B302-10
2.5 STAPLER	B302-12
2.6 FEED-OUT	B302-14
2.7 SHIFT TRAY UP/DOWN MOVEMENT	B302-15
2.8 SHIFT TRAY SIDE-TO-SIDE MOVEMENT	B302-16
2.9 PUNCH UNIT DRIVE	B302-17
2.10 PUNCH WASTE COLLECTION	B302-18
2.11 JAM CONDITIONS	B302-19
3. SERVICE TABLES	B302-20
3.1 DIP SWITCHES	B302-20
3.2 TEST POINTS	B302-20
3.3 FUSES	B302-20
	D000 01
	B302-21
	B302-24
	B302-25
	B302-20
4.4.1 STACK HEIGHT 1, 2 AND EXIT GUIDE OPEN SENSOR	
	0302-20
	B303 30
	D302-29
4.4.5 THE-STACK STOFF ENGLAGING	R302-30
4.4.7 STAPIER ΒΟΤΔΤΙΟΝ ΗΡΑΝΙΟ	0002-01
STAPI ER BETLIBNI SENSORS	B305-35
4.5 STAPI FR REMOVAL	B302-32
4.6 PUNCH POSITION ADJUSTMENT	B302-34

LCT (B303)

1. OVERALL MACHINE INFORMAT	IONB303-1
1.1 SPECIFICATIONS	B303-1
1.2 MECHANICAL COMPONENT LAYO	UTB303-2
1.3 ELECTRICAL COMPONENT DESC	RIPTIONSB303-3
1.4 DRIVE LAYOUT	B303-5
2. DETAILED DESCRIPTIONS	B303-6
2.1 PAPER FEED	
2.2 PICK-UP AND FEED	B303-7
2.2.1 OVERVIEW	
2.2.2 PICK-UP AND FEED	B303-8
2.2.3 SEPARATION ROLLER RELE	ASE B303-9
2.3 PAPER LIFT	
2.3.1 TRAY DETECTION	
2.3.2 LIFT MECHANISM	
2.3.3 LIFT SENSOR	B303-11
2.4 PAPER SIZE DETECTION	B303-12
1.5 PAPER END DETECTION	B303-13
3. REPLACEMENT AND ADJUSTM	ENTB303-14
3.1 EXTERIOR COVER REMOVAL	B303-14
3.2 INNER COVER REMOVAL	B303-15
3.3 PAPER FEED ROLLER REPLACEM	1ENT B303-16
3.4 LCT MOTOR REPLACEMENT	B303-17
3.5 RELAY SENSOR REPLACEMENT	B303-18
3.6 PAPER HEIGHT SENSOR AND	
PAPER SIZE SWITCH REPLACEME	ENTB303-19
3.7 MAIN DRIVE BELT REPLACEMENT	B303-20
3.8 SIDE REGISTRATION ADJUSTMEN	NTB303-21

A3/DLT TRAY KIT (B331)

1. OVERALL MACHINE INFORMATION	B331-1
1.1 SPECIFICATIONS	B331-1
2. DETAILED DESCRIPTIONS	B331-2
2.1 SECTIONAL DESCRIPTION	B331-2
3. REPLACEMENT AND ADJUSTMENT	B331-3
3.1 BOTTOM PLATE LIFT WIRE REPLACEMENT	B331-3

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

1.1.1 COPIER ENGINE

Configuration:	Console
Copy Process:	Dry electrostatic transfer system
Originals:	Sheet/Book
Original Size:	Maximum: A3/11" x 17" Minimum: A5, 51/2"x 81/2" (using ADF)
Original Alignment:	Rear left corner
Paper Size/Weight:	
Size:	Mainframe, Tray 1 (Tandem Tray): A4 sideways and LT sideways Mainframe, Trays 2 and 3 (Universal Trays): Europe/Asia: A5 sideways - A3 lengthwise, 8-kai sideways, 16-kai N. America: 51/2" x 81/2" sideways - 11" x 17" lengthwise LCT, Trays 4 ~ 6: A4 sideways, B5 sideways, LT sideways, A5, HLT Duplex Tray: A5/HLT (lengthwise or sideways) to A3/DLT, except that tab paper cannot be used
Weight:	Mainframe, Trays 1 to 3: $52 \text{ to } 163 \text{ g/m}^2$ 16 to 40 lbs Bond 50 to 60 lbs Cover 90 lbs Index (no Tab) LCT, Trays 4 and 5: $52 \text{ to } 216 \text{ g/m}^2$ 16 to 40 lbs Bond 50 to 80 lbs Cover 90 to 110 lbs Index LCT, Tray 6: Same as Mainframe, Trays 1 to 3 Duplex Tray: $64 \text{ to } 163 \text{ g/m}^2$ 20 to 40 lbs Bond 50 to 60 lbs Cover 90 lbs Index (no Tab)

SPECIFICATIONS

Reproduction Ratios:

7 reduction and 5 enlargement

	Metric Version	Inch Version
	400%	400%
	200%	200%
Enlargement	141%	155%
-	122%	129%
	115%	121%
Full Size	100%	100%
	93%	93%
	82%	85%
	75%	78%
Reduction	71%	73%
	65%	65%
	50%	50%
	25%	25%

Zoom:	25 ~ 400%
Copy Speed:	Max. 85 cpm (A4/81/2" x 11" sideways)
Resolution:	Scanning: 600 dpi Printing: 600 dpi
Gradation:	256 levels
Warm-up Time:	Less than 360 s (from Off mode)
First Copy Time: (1st Tray, A4 sideways)	Less than 5.4 s (Finisher upper tray: face down) Less than 4.1 s (Finisher upper tray: face up) Less than 4.5 s (Copier: face down) Less than 3.2 s (Copier: face up)
Copy Number Input:	Ten-key pad, 1 to 9999
Copy Paper Capacity:	1st Tray: 1,000 sheets (2,000 when used as a tandem tray) 2nd/3rd Tray: 500 sheets each 4th/5th Tray (LCT): 1,000 sheets each 6th Tray (LCT): 2,500 sheets
Memory Capacity:	RAM: 48 MB x 2 HDD: 4.3 GB x 2
Toner Replenishment:	Cartridge exchange (1,450 g/cartridge)
Toner Yield:	55 k copies (A4 sideways, 6% full black, 1 to 25 copying)
Power Source:	North America: 240 V, 60 Hz, 20 A Europe/Asia: 220 ~ 240 V, 50Hz/60 Hz, 16 A

Power Consumption:

N. America Version

N. America Version (Unit: Wh)					
		NA (240 V/60 Hz)			
		Copier Only		System	
		Single Side	Duplex	Single Side	Duplex
		Сору	Сору	Сору	Сору
Warm-up	ON	1,864 1,888		88	
Copying	OFF	444	462	470	502
	ON	2,122	2,135	2,152	2,182
Stand-by	OFF	190		203	
	ON	753		766	
Energy Star	OFF	169 183		3	
(15 min)	ON	73	33	74	-6
Low Power Mode		293.2			
OFF Mode		11			

Europe Version

(Unit: Wh)

		EU (230 V/50 Hz)				
		Copie	r Only	Sys	tem	
		Single Side	Duplex	Single Side	Duplex	
		Сору	Сору	Сору	Сору	
Warm-up	ON	1,8	1,800		1,810	
Copying	OFF	453	472	467	510	
	ON	2,014	2,036	2,032	2,074	
Stand-by	OFF	190		203		
	ON	718		733		
Energy Star	OFF	F 169		18	32	
(15 min)	ON 698		71	712		
Low Power Mode		299.0				
OFF Mode		11				

NOTE: ON: Fusing Lamp On, OFF: Fusing Lamp Off

Noise Emission:

Sound Power Level:

The measurements were made in accordance with ISO 7779.

	Copier only	Full system
Stand-by	Less than 59 dB(A)	Less than 58 dB(A)
Copying (ADF 1 to 1)	Less than 72 dB(A)	Less than 78 dB(A)
Copying	Less than 71 dB(A)	Less than 77 dB(A)

Sound Pressure Level:

The measurements were made in accordance with ISO 7779.

	Copier only	Full system
Stand-by	Less than 44 dB(A)	Less than 45 dB(A)
Copying (ADF 1 to 1)	Less than 67 dB(A)	Less than 68 dB(A)
Copying (From Memory)	Less than 59 dB(A)	N/A

Dimensions: (W x D x H)	870 x 735 x 1,476 mm (34.3" x 28.9" x 58.1") (without options)
Weight:	252 kg (without options)
Optional Equipment:	Refer to Machine Configuration

1.1.2 ADF

Original Size:	Normal Original Mode: A3 to B6. DLT to HLT
	Thin Original Mode:
	A3 to B6 sideways, DLT to HLT
	A3 to A5, DLT to HLT
Original Weight:	Normal Original Mode: 52 ~ 156 g/m ² , 14 ~ 42 lb
	Thin Original Mode: $40 \sim 156 \text{ g/m}^2$, $11 \sim 42 \text{ lb}$
	Duplex Original Mode: $52 \sim 128 \text{ g/m}^{-}$, $14 \sim 34 \text{ lb}$
Table Capacity:	100 sheets (80 g/m², 20 lb)
Original Feeding Speed:	72 cpm (A4/LT sideways, 1 to 1)
Original Standard Position:	Rear left corner
Separation:	FRR
Original Transport:	One flat belt
Original Feed Order:	From the top original
Power Source:	DC 24 V and DC 38 V from the copier
Power Consumption:	145 W
Dimensions (W x D x H):	680 x 560 x 150 mm

1.2 MACHINE CONFIGURATION



Item	Machine Code	No.
Mainframe	A294	1
Finisher	B302	2
LCT	B303	3
Interface Kit Type 850: *	B327	4
A3/DLT Tray Kit Type 850	B331	7 Replaces the tandem LCT
CD-RW (CDROM reader/writer): *	B334	5
Punch Unit	A812-30, 31, 32, 57, 67	Inside the Finisher
Connector (for the Tandem Copy feature): *	B328	6

*: When the CD-RW and/or the copy connector cable are/is installed, the interface kit is required.

1.3 COMPONENT LAYOUT

1.3.1 COPIER ENGINE



- 1. Laser Diode Board
- 2. $f\theta$ Lenses
- 3. Sensor Board Unit
- 4. Exposure Lamp
- 5. Cleaning Brush
- 6. Lamp Regulator
- 7. Cleaning Blade
- 8. Charge Corona Unit
- 9. System Image Control Unit
- 10. Color LCD
- 11. Drum
- 12. Development Unit
- 13. Registration Roller
- 14. LCT Relay Roller
- 15. Transfer Belt Unit
- 16. Relay Roller
- 17. Pick-up Roller

- 18. Vertical Transport Rollers
- 19. Separation Roller
- 20. Feed Roller
- 21. 1st Tray (Tandem, 1,000 sheets each)
- 22. 2nd Tray (500 sheets)
- 23. 3rd Tray (500 sheets)
- 24. Used Toner Bottle
- 25. Toner Bank Unit
- 26. Duplex Tray
- 27. Inverter Unit Paper Exit Roller
- 28. Inverter Feed Roller
- 29. Pressure Roller
- 30. Paper Cooling Pipe
- 31. Hot Roller
- 32. Motor Control Unit
- 33. Oil Supply & Cleaning Web
- 34. Drum Unit

1.3.2 ADF



B301V001.WMF

- 1. Separation Roller
- 2. Feed Belt
- 3. Pick-up Roller
- 4. Bottom Plate
- 5. Original Tray
- 6. Upper Tray Exit Roller
- 7. Inverter Gate
- 8. Inverter Guide Roller
- 9. Inverter Sensor
- 10. Right Tray Exit Roller
- 11. Right Exit Tray

- 12. Exit Gate
- 13. Inverter Roller
- 14. Exit Sensor
- 15. Upper Exit Tray
- 16. Transport Belt
- 17. Registration Sensor
- 18. Lower Transport Roller
- 19. Width Sensor
- 20. Upper Transport Roller
- 21. Entrance Sensor

1.4 PAPER PATH



A294V504.WMF

- 1. ADF
- 2. Optional LCT
- 3. Tray 3 (1,500-sheet LCT)
- 4. Tray 2 (550-sheet Tray)
- 5. Tray 1 (Tandem Tray)

- 6. Duplex Unit
- 7. Finisher
- 8. Inverter Unit
- 9. Shift Tray
- 10. Upper Tray

COPY PROCESS

1.5 COPY PROCESS



A229V508.WMF



A229V510.WMF

1. EXPOSURE

A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the hard disk.

2. DRUM CHARGE

An OPC (organic photoconductor) drum is used in this machine. In the dark, the charge corona unit gives a negative charge to the drum. The grid plate ensures that corona charge is applied uniformly. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

3. LASER EXPOSURE

The processed data from the scanned original is retrieved from the hard disk and transferred to the drum by four laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the laser diode board (LDB).

4. DRUM POTENTIAL SENSOR

The drum potential sensor detects the electric potential on the drum to correct various process control elements.

5. DEVELOPMENT

The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

6. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer belt at the proper time to align the copy paper and the developed image on the drum. Then, the transfer bias roller and brush apply a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum to the paper. At the same time, the paper is electrically attracted to the transfer belt.

7. PAPER SEPARATION

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. The pick-off pawls also help separate the paper from the drum.

8. ID SENSOR

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control.

9. CLEANING

The cleaning brush removes toner remaining on the drum after image transfer and the cleaning blade scrapes off all remaining toner.

10. QUENCHING

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

1.6 DRIVE LAYOUT

1.6.1 COPIER ENGINE





A294V501.WMF

- 1. Drum Motor
- 2. Scanner Motor
- 3. Fusing/Duplex Motor
- 4. Paper Feed Motor
- 5. Registration Motor
- 6. Relay Motor
- 7. Development Motor

1.6.2 ADF



B301V101.WMF

- 1. Pick-up Motor
- 2. Bottom Plate Motor
- 3. Feed-in Motor
- 4. Transport Motor
- 5. Upper Exit Roller
- 6. Feed-out Motor
- 7. Right Exit Roller

- 8. Transport Belt
- 9. Lower Transport Roller
- 10. Upper Transport Roller
- 11. Separation Roller
- 12. Feed Belt
- 13. Pick-up Roller
- 14. Feed-in Clutch

1.7 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components using the symbols and index numbers.

1.7.1 COPIER ENGINE

Symbol	Name	Function
Motors		
M1	Scanner	Drives the 1st and 2nd scanners.
M2	Polygonal Mirror	Turns the polygonal mirror.
M3	Drum	Drives the drum, cleaning unit, and transfer belt unit.
M4	Development	Drives the development unit.
M5	Toner Supply	Supplies the toner to the toner hopper.
M6	Toner Bank	Drives the toner transport coil, which feeds fresh toner from the toner bank to the toner supply cylinder.
M7	Upper Toner Bottle	Rotates the upper toner bottle to supply toner to the toner entrance tank.
M8	Upper Bottle Cap	Opens and closes the inner cap of the upper toner bottle.
M9	Lower Toner Bottle	Rotates the lower toner bottle to supply toner to the toner entrance tank.
M10	Lower Bottle Cap	Opens and closes the inner cap of the lower toner bottle.
M11	Charge Corona Wire Cleaner	Drives the charge corona wire cleaner.
M12	Fusing/Duplex	Drives the fusing unit, duplex unit, inverter unit, and paper exit rollers.
M13	Paper Feed	Drives the paper feed, separation, pick-up, lower relay, and vertical transport rollers.
M14	Relay	Drives the upper relay roller and the LCT relay roller.
M15	1st Tray Lift	Raises and lowers the bottom plate in the 1st paper tray.
M16	2nd Tray Lift	Raises and lowers the bottom plate in the 2nd paper tray.
M17	3rd Tray Lift	Raises and lowers the bottom plate in the 3rd paper tray.
M18	Registration	Drives the registration rollers.
M19	Oil Supply/Cleaning Web	Drives the oil supply/cleaning web.
M20	Rear Fence Drive	Moves the paper stack in the left tandem tray to the right tandem tray.
M21	Jogger	Drives the jogger fences to square the paper stack in the duplex unit.
M22	Optics Cooling Fan	Removes heat from the scanner optics unit.
M23	Polygonal Mirror Motor Cooling Fan	Removes heat from around the polygonal mirror motor.
M24	LDB Cooling Fan	Removes heat from around the LDB.

Symbol	Name	Function
M25	SICU Cooling Fan	Removes heat from around the SICU.
M26	Drum Cooling Fan	Removes heat from the drum.
M27	Development Unit Cooling Fan 1	Removes heat from the development unit.
M28	Development Unit Cooling Fan 2	Removes heat from the development unit.
M29	Paper Cooling Pipe Fan	Removes heat from the paper cooling pipe.
M30	Duplex Cooling Fan	Removes heat from around the duplex unit.
M31	Exhaust Fan	Removes heat from around the fusing unit.
M32	Steam Removal Fan	Removes water vapour from around the fusing unit.
M33	PSU Cooling Fan 1	Removes heat from the PSU.
M34	PSU Cooling Fan 2	Removes heat from the PSU.
Sensors		
S1	Scanner HP	Informs the CPU when the 1st and 2nd scanners are at home position.
S2	Original Width	Detects original width. This is one of the APS (Auto Paper Select) sensors.
S3	Original Length 1	Detects original length. This is one of the APS (Auto Paper Select) sensors.
S4	Original Length 2	Detects original length. This is one of the APS (Auto Paper Select) sensors.
S5	Drum Potential	Detects the drum surface potential.
S6	Toner Density (TD)	Detects the amount of toner in the developer.
S7	Image Density (ID)	Detects the density of the ID sensor pattern on the drum.
S8	Toner Hopper	Detects toner in the toner hopper.
S9	Toner Supply Motor	Monitors the toner supply motor.
S10	Upper Toner Bottle	Detects when the upper toner bottle is set.
S11	Lower Toner Bottle	Detects when the lower toner bottle is set.
S12	Upper Bottle Inner Cap	Detects when the inner cap of the upper toner bottle is opened.
S13	Lower Bottle Inner Cap	Detects when the inner cap of the lower toner bottle is opened.
S14	Toner Collection Bottle	Detects when the waste toner collection bottle is set.
S15	Toner Overflow	Detects when the waste toner collection bottle is full.
S16	Toner Near End	Detects toner near end in the toner bank unit.
S17	1st Paper Feed	Controls the 1st paper feed clutch on/off timing and the 1st pick-up solenoid off timing.
S18	2nd Paper Feed	Controls the 2nd paper feed clutch on/off timing and the 2nd pick-up solenoid off timing.
S19	3rd Paper Feed	Controls the 3rd paper feed clutch on/off timing and the 3rd pick-up solenoid off timing.
S20	1st Tray Lift	Detects when the paper in tray 1 is at the correct height for paper feed.

Symbol	Name	Function
S21	2nd Tray Lift	Detects when the paper in tray 2 is at the correct
521		height for paper feed.
S22	3rd Tray Lift	Detects when the paper in tray 3 is at the correct
022		height for paper feed.
S23	1st Paper End	Informs the CPU when tray 1 runs out of paper.
S24	2nd Paper End	Informs the CPU when tray 2 runs out of paper.
S25	3rd Paper End	Informs the CPU when tray 3 runs out of paper.
S26	Rear Fence HP	Informs the CPU when the tandem tray rear fence is in the home position.
S27	Rear Fence Return	Informs the CPU when the tandem tray rear fence is in the return position.
S28	Front Side Fence Open	Detects whether the tandem tray front side fence is opened.
S29	Front Side Fence Closed	Detects whether the tandem tray front side fence is closed.
S30	Rear Side Fence Open	Detects whether the tandem tray rear side fence is opened.
S31	Rear Side Fence Closed	Detects whether the tandem tray rear side fence is closed.
S32	Base Plate Down	Detects when the bottom plate is completely lowered, to stop the 1st tray lift motor.
S33	1st Tray Paper Height 1	Detects the paper height in the 1st tray.
S34	1st Tray Paper Height 2	Detects the paper height in the 1st tray.
S35	1st Tray Paper Height 3	Detects the paper height in the 1st tray.
S36	1st Tray Paper Height 4	Detects the paper height in the 1st tray.
S37	Left 1st Tray Paper	Detects whether there is paper in the left side of the 1st tray.
S38	Right 1st Tray Paper	Detects whether there is paper in the right side of the 1st tray, allowing the tray to lift if paper is present.
S39	Duplex Inverter	Detects misfeeds.
S40	Duplex Entrance	Detects the leading and trailing edges of the paper to determine the reverse roller solenoid on or off timing.
S41	Duplex Transport 1	Detects the position of paper in the duplex unit.
S42	Duplex Transport 2	Detects the position of paper in the duplex unit.
S43	Duplex Transport 3	Detects the position of paper in the duplex unit.
S44	Duplex Jogger HP	Detects if the duplex jogger fences are at the home position or not.
S45	LCT Relay	Detects misfeeds.
S46	Relay	Detects misfeeds.
S47	Registration	Detects misfeeds and controls registration clutch on/off timing.
S48	Guide Plate Position	Detects whether the registration guide plate is open or closed.

Overall Information

Symbol	Name	Function
S49	Oil Supply/Cleaning Web End	Detects when the oil supply/cleaning web has been used up.
S50	Fusing Exit	Detects misfeeds.
S51	Exit	Detects misfeeds.
Switches	š	
SW1	Main Power	Provides power to the machine. If this is off, there is no power supplied to the machine.
SW2	Right Front Door Safety 1	Cuts the +24 V dc power line for the fusing/duplex motor.
SW3	Right Front Door Safety 2	Detects if the front door is open or not, and cuts the +24 V dc power line for the IOB.
SW4	Right Front Door Safety 3	Cuts the +5 V LD dc power line.
SW5	Right Front Door Safety 4	Cuts the +5 V LD dc power line.
SW6	Left Front Door Safety 1	Cuts the +24 V dc power line for the fusing/duplex motor.
SW7	Left Front Door Safety 2	Detects if the front door is open or not, and cuts the +24 V dc power line for the IOB.
SW8	Left Front Door Safety 3	Cuts the +5 V LD dc power line.
SW9	Left Front Door Safety 4	Cuts the +5 V LD dc power line.
SW10	2nd Tray Paper Size	Determines the size of paper in tray 2. Also detects when the tray has been placed in the machine.
SW11	3rd Tray Paper Size	Determines the size of paper in tray 3. Also detects when the tray has been placed in the machine.
Solenoid	S	
SOL1	Transfer Belt Lift	Controls the up-down movement of the transfer belt unit.
SOL2	1st Pick-up	Controls the up-down movement of the pick-up roller in tray 1.
SOL3	2nd Pick-up	Controls the up-down movement of the pick-up roller in tray 2.
SOL4	3rd Pick-up	Controls the up-down movement of the pick-up roller in tray 3.
SOL5	1st Separation Roller	Controls the up-down movement of the separation roller in tray 1.
SOL6	2nd Separation Roller	Controls the up-down movement of the separation roller in tray 2.
SOL7	3rd Separation Roller	Controls the up-down movement of the separation roller in tray 3.
SOL8	Front Side Fence	Opens and closes the front side fence in the tandem tray.
SOL9	Rear Side Fence	Opens and closes the rear side fence in the tandem tray.

Symbol	Name	Function
- Cymbol	Tandem Trav	Connects/disconnects the two halves of the tandem
SOL10	Connect	tray.
SOL11	Left 1st Tray Lock	Locks the left tandem tray while paper is being transported from left tray to right tray.
SOL12	Duplex Inverter Gate	Moves the junction gate to direct copies to the duplex tray or to the paper exit.
SOL13	Reverse Roller	Controls the up-down movement of the reverse roller in the duplex unit.
SOL14	Inverter Guide Plate	Controls the up-down movement of the inverter feed guide plate in the duplex unit.
SOL15	Guide Plate	Opens the guide plate when a paper misfeed occurs around this area.
SOL16	Inverter Gate	Moves the junction gate to direct copies to the duplex/inverter unit or to the paper exit unit.
Magnetic	Clutches	
	Toner Supply Coil	Transfers drive from the toper bank motor to the toper
MC1		transport coil, to transport toner towards the hopper.
MC2	Toner Supply Roller	Turns the toner supply roller to supply toner from the toner hopper to the development unit.
MC3	1st Paper Feed	Starts paper feed from tray 1.
MC4	2nd Paper Feed	Starts paper feed from tray 2.
MC5	3rd Paper Feed	Starts paper feed from tray 3.
MC6	Inverter Exit Roller	Releases the drive from the inverter exit roller in the duplex unit.
MC7	Duplex Transport	Drives the duplex transport rollers to transport the paper to the duplex feed rollers.
MC8	Duplex Feed	Starts paper feed out of the duplex tray back into the machine via to the relay rollers.
MC9	1st Vertical Transport	Drives the 1st vertical transport rollers.
MC10	2nd Vertical Transport	Drives the 2nd vertical transport rollers.
MC11	3rd Vertical Transport	Drives the 3rd vertical transport rollers.
MC12	Upper Relay	Drives the upper relay rollers (between tray1 and the registration rollers)
MC13	LCT Relay	Drives the relay rollers for paper feed into the machine from the LCT.
MC14	Lower Relay	Drives the lower relay rollers (between paper trays 1 and 2).
PCBs		<u> </u>
PCB1	BCU (Base Engine Control Unit)	Controls all base engine functions both directly and through other control boards.
PCB2	SICU (Scanner Image Control Unit)	Controls image processing, the laser diode, and the polygonal mirror motor.

Symbol	Name	Function		
PCB3	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp and heaters.		
PCB4	IOB (Input/Output Board)	Controls the paper feed components.		
PCB5	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the SBICU board.		
PCB6	MCU (Motor Control Unit)	Drives the scanner motor.		
PCB7	Lamp Regulator	Provides dc power to the exposure lamp.		
PCB8	Polygonal Mirror Motor Control	Drives and controls the polygonal mirror motor.		
PCB9	LDB	Controls the laser diode.		
PCB10	AC Drive	Drives the ac components.		
PCB11	Operation Panel	Controls the components of the operation panel.		
PCB12	Operation Key	Controls the operation switch.		
Lamps				
L1	Exposure Lamp	Applies high intensity light to the original for exposure.		
L2	Fusing Lamp 1	Provides heat to the hot roller.		
L3	Fusing Lamp 2	Provides heat to the hot roller.		
L4	Fusing Lamp 3	Provides heat to the hot roller.		
L5	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.		
Power Pa	acks			
PP1	Charge/bias/grid	Provides high voltage for the charge corona wires, grid plate, and the development roller.		
PP2	Transfer	Provides high voltage for the transfer belt.		
Others				
CB1	Circuit Breaker	Provides back-up high current protection for the electrical components.		
H1	Optics Anti-Condensation (option)	Turns on when the main switch is off to prevent moisture from forming on the optics.		
H2	Drum (option)	Turns on when the main switch is off to prevent moisture from forming around the drum.		
H3	Tray Heater 1 (option)	Turns on when the main switch is off to keep paper dry in the paper tray.		
H4	Tray Heater 2 (option)	Turns on when the main switch is off to keep paper dry in the paper tray.		
HDD1	HDD	Scanned image data is compressed and held here temporarily.		
HDD2	HDD	Scanned image data is compressed and held here temporarily.		
NF1	Noise Filter	Removes noise from the power line.		

Symbol	Name	Function	
SD1	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.	Overall
TC1	Total Counter	Counts the number of copies.	
TF1	Fusing Thermofuse	Opens the fusing lamp circuit if the fusing unit overheats.	
TH1	Fusing Thermistor	Detects the temperature of the hot roller.	

1.7.2 ADF

Symbol	Name	Function	Index No.
Motors			
M1	Pick-up	Moves the pick-up roller up and down.	3
M2	Feed-in	Drives the feed belt, and the separation, pick-up, and transport rollers.	8
M3	Transport Belt	Drives the transport belt.	9
M4	Feed-out	Drives the exit and inverter rollers.	14
M5	Bottom Plate	Moves the bottom plate up and down.	7
Sensors			
S1	APS Start	Informs the CPU when the DF is opened and closed (for platen mode) so that the original size sensors in the copier can check the original size.	12
S2	DF Position	Detects whether the DF is lifted or not.	13
S3	Original Set	Detects whether an original is on the table.	19
S4	Bottom Plate HP	Detects whether the bottom plate is in the down position or not.	20
S5	Bottom Plate Position	Detects when the original is at the correct position for feeding.	4
S6	Pick-up Roller HP	Detects whether the pick-up roller is up or not.	2
S7	Entrance	Detects when to restart the pick-up motor to lift up the pick-up roller, detects when to change the feed motor direction, detects the trailing edge of the original to finish checking the original length, and checks for misfeeds.	26
S8	Registration	Detects the leading edge of the original to check the original length, detects when to stop the original on the exposure glass, and checks for misfeeds.	21
S9	Original Width 1	Detects the original width.	22
S10	Original Width 2	Detects the original width.	23

Symbol	Name	Function	Index No.		
S11	Original Width 3	Detects the original width.	24		
S12	Original Length	Detects the original length.	25		
S13	Exit	Detects when to stop the transport belt motor and checks for misfeeds.	18		
S14	Inverter	Detects when to turn the inverter gate and exit gate solenoids off and checks for misfeeds.	17		
S15	Feed Cover	Detects whether the feed cover is open or not.	5		
S16	Exit Cover	Detects whether the exit cover is open or not.	15		
Solenoid	Solenoids				
SOL1	Exit Gate	Opens and closes the exit gate.	16		
SOL2	Inverter Gate	Opens and closes the inverter gate.	11		
Magnetic	Clutches				
MC1	Feed-in	Drives the feed belt, separation roller, and pick-up roller.	1		
PCBs					
PCB1	DF Main	Controls the DF and communicates with the main copier boards.	10		
PCB2	DF Indicator	Indicates whether an original has been placed in the feeder, and indicates whether SADF mode has been selected.	6		

2. DETAILED SECTION DESCRIPTIONS

2.1 DOCUMENT FEEDER

2.1.1 PICK-UP ROLLER RELEASE



B301D103.WMF

When the original set sensor is off (no original on the original tray), the pick-up roller stays in the up position.

When the original set sensor turns on (or when the trailing edge of a page passes the entrance sensor while pages remain on the original tray), the pick-up motor [A] turns on. The cam [B] rotates away from the pick-up roller release lever [C]. The lever then rises and the pick-up roller [D] drops onto the original.

When the original reaches the entrance sensor, the pick-up motor turns on again. The cam pushes the lever down, and the pick-up roller rises until the pick-up roller HP sensor [E] detects the actuator [F].

2.1.2 BOTTOM PLATE LIFT



B301D105.WMF

When an original is placed on the original tray, the original set sensor [A] turns on, the pick-up roller [B] drops on to the original, and the bottom plate position sensor [C] turns off. Then the bottom plate motor [D] turns on and lifts the bottom plate [E] by raising the lift lever [F] until the bottom plate position sensor turns on.

The level of the pick-up roller drops as the stack of originals becomes smaller, and eventually, the bottom plate position sensor [C] turns off. Then, the bottom plate motor turns on and lifts the bottom plate until the bottom plate position sensor turns on. This keeps the original at the correct height for feeding.

2.1.3 PICK-UP AND SEPARATION



B301D506.WMF

The original separation system is a Feed and Reverse Roller (FRR) system. The pick-up roller [A], feed belt [B], and separation roller [C] are driven by the feed-in motor [D].

To drive this mechanism, the feed-in motor [D] and feed-in clutch [E] turn on.

When two sheets of originals are fed by the pick-up roller, the separation roller turns in the opposite direction to the feed belt and the 2nd sheet is pushed back to the original tray. When there is only one sheet between the feed belt and separation roller, the separation roller rotates in the same direction as the feed belt. This is because the separation roller contains a torque limiter.

2.1.4 ORIGINAL FEED



When the leading edge of the original turns the entrance sensor [A] on, the feed-in clutch [B] turns off and the drive for the feed belt is released. The original is fed by the transport rollers [C].

At the same time, the pick-up motor starts again and the pick-up roller [D] is lifted up. When the pick-up roller HP sensor turns on, the pick-up motor stops (see Pick-up Roller Release).
2.1.5 ORIGINAL SIZE DETECTION



B301D503.WMF

The DF detects the original size by combining the readings of original length sensor [A], and original width sensors-1 [B], -2 [C], and -3 [D].

Original Length

The original length sensor and the disk [E] (connected to the transport roller) generate a pulse signal. The CPU counts pulses, starting when the leading edge of the original turns on the registration sensor [F], until the trailing edge of the original turns off the entrance sensor [G].

Original Width

The CPU detects original width using three original width sensors -1, -2, -3 as shown above. Three small circles on the diagram indicate the positions of the sensors.

2.1.6 ORIGINAL TRANSPORT



B301D106.WMF



B301D509.WMF

The transport belt [A] is driven by the transport belt motor [B]. The transport belt motor starts when the copier sends an original feed-in signal.

Inside the transport belt are six pressure rollers which maintain the correct pressure between the belt and original. The pressure roller [C] closest to the left original scale is made of rubber for the stronger pressure needed for thick originals. The other rollers are sponge rollers.

Normally, originals are manually placed at the left rear corner, so an original [D] fed from the DF must also be at this position. But if the original is fed along the rear scale [E], original skew, jam, or wrinkling may occur.

To prevent such problems, the original transfer position is set to 3.5 mm away from the rear scale as shown. The 3.5 mm gap is compensated for by changing the starting position of the main scan.

2.1.7 ORIGINAL SKEW CORRECTION



B301D500.WMF

The transport belt motor remains energized to carry the original about 7 mm past the left scale [A] (see the middle drawing). Then the motor stops and reverses to feed the original back against the left scale (see the bottom drawing). This forces the original to hit the left scale, which aligns the trailing edge to minimize original skew on the exposure glass.

If thin original mode is selected, the original is not forced back against the left scale. This is to prevent damage to the original.

After a two-sided original has been inverted to copy the 2nd side, it is fed in from the inverter against the left scale (see the bottom drawing; the top two drawings do not apply in this mode).

The amount of reverse feed against the left scale can be adjusted with SP modes.

2.1.8 ORIGINAL INVERSION AND FEED-OUT

General Operation



When the scanner reaches the return position, the copier's CPU sends the feed-out signal to the DF. When the DF receives the feed-out signal, the transport belt motor and feed-out motor [A] turn on. The original is then fed out to the exit tray or fed back to the exposure glass after reversing in the inverter section.

This DF has two exit trays. For single-sided original mode, the original is fed out to the right exit tray and for double-sided original mode, the original is fed out to the upper exit tray.

This causes the originals to be fed out in the correct order on the exit trays and allow the maximum one-to-one copy speed for each mode. The user can change the exit tray to the upper exit tray for single-sided mode (for example, if there is not enough space in the room for the right exit tray to be installed). However, one-toone copy speed for this mode is reduced.

Original Inversion



Detailed Descriptions

B301D113.WMF

When the DF receives the original invert signal from the copier, the transport belt motor, feed-out motor, exit gate solenoid [A], and inverter gate solenoid [B] turn on and the original is fed back to the exposure glass through the inverter roller [C], exit gate [D], inverter guide roller [E], inverter gate [F], and inverter roller.

The transport belt motor turns in reverse shortly after the leading edge of the original turns on the inverter sensor [G], and feeds the original to the left scale.

Original Exit (Single-Sided Original Mode)



The exit gate solenoid [A] remains off and the original is fed out to the right exit tray. The transport belt motor turns off after the exit sensor [B] turns off.

To stack the originals neatly on the exit tray, the feed-out motor speed is reduced about 30 mm before the trailing edge of the original turns off the exit sensor.

Original Exit (Double-Sided Original Mode)



Detailed Descriptions

The exit gate solenoid [A] turns on and the inverter gate solenoid [B] remains off, and the original is fed out to the upper tray. The transport belt motor turns off when the trailing edge of the original passes through the exit sensor [C].

To stack the originals neatly on the upper tray, the feed-out motor speed is reduced shortly after the trailing edge of the original turns off the inverter sensor [D].

2.1.9 JAM CONDITIONS



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Feed-in

- 1. The entrance sensor [A] is still off 500 ms after the feed-in motor turned on.
- 2. The registration sensor [B] is still not off 300 ms after the feed-in motor speed increased.
- 3. The entrance sensor is still on when the feed-in and transport motors have fed the original 442 mm after the registration sensor turned on.

Feed-out

- 4. The registration sensor is still on when the feed-in and transport motors have fed the original 751 mm after the registration sensor turned on.
- 5. The exit sensor [C] is still off when the transport and feed-out motors have fed the original 129 mm after the feed-out motor turned on.
- 6. The exit sensor is still on when feed-out motor has fed the original X mm $(X = original \ length \ x \ 1.3)$ after the exit sensor turned on.

Inversion

- 7. The exit sensor is still off when the transport and exit motors have fed the original 198 mm after the transport motor turned on to feed the original to the inverter section.
- 8. The exit sensor is still on when the feed-out motor has fed the original X mm (X = original length x 1.3) after the exit sensor turned on.
- 9. The inverter sensor [D] is still off when the transport and feed-out motors have fed the original 96 mm after the exit sensor turned on.
- 10. The inverter sensor is still off when the transport and feed-out motors have fed the original 96 mm to the exposure glass after the exit sensor turned off.

2.2 SCANNING

2.2.1 OVERVIEW



The original is illuminated by the exposure lamp (a xenon lamp) [A]. The image is reflected onto a CCD (Charge Coupled Device) [B] via the 1st, 2nd, and 3rd mirrors, and through the lens [C].

The 1st scanner consists of the exposure lamp, the lamp regulator and the 1st mirror.

There are two fans, optics cooling fan [D] and the SICU cooling fan on the right side of the optics cavity to draw cool air inside. The hot air exits through the vents in the upper cover. The optics cooling fan is turned on when the scanner motor starts and it turns off 10 seconds after the scanner motor turns off. The SICU cooling fan operates whenever the operation switch is on.

If the optional optics anti-condensation heater [E] is installed, it turns on while the main switch is off, to prevent moisture from forming on the optics.

2.2.2 SCANNER DRIVE



The scanner drive motor is a dc servo motor. The 1st and 2nd scanners [A, B] are driven by the scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

The MCU board controls the scanner drive motor. In full size mode, the 1st scanner speed is 425 mm/s during scanning. The 2nd scanner speed is half that of the 1st scanner.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length is changed in the sub scan direction by changing the scanner drive motor speed, and in the main scan direction it is changed by image processing on the SICU board.

Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-008.

2.2.3 ORIGINAL SIZE DETECTION IN BOOK MODE



There are three reflective sensors in the optics cavity for original size detection. The original width sensor [A] detects the original width, and the original length sensor-1 [B] and original length sensor-2 [C] detect the original length. These are the APS (Auto Paper Select) sensors.

Inside each APS sensor, there is an LED [D] and either three photoelectric devices [E] (for the width sensor) or one photoelectric device (for each length sensor). In the width sensor, the light generated by the LED is separated into three beams and each beam scans a different point of the exposure glass (in each length sensor, there is only one beam). If the original or DF cover is present over the scanning point, the beam is reflected and each reflected beam exposes a photoelectric device and activates it.

While the main switch is on, these sensors are active and the original size data is always sent to the main CPU. However, the main CPU checks the data only when the DF is being closed.

Original Size			Length Sensor Width Sensor		nsor	SP4301 Display	
A4/A3 Version	LT/DLT Version	2	1	3	4	5	Display
A3	11" x 17"	Ο	Ο	0	Ο	Ο	00011111
B4	10" x 14"	Ο	Ο	Ο	Ο	X	00011110
F4	81/2" x 14" (8" x 13")	Ο	Ο	Ο	X	X	00011100
A4-L	81/2" x 11"	X	Ο	Ο	X	X	00001100
B5-L	—	X	Ο	X	X	X	00001000
A5-L	51/2" x 81/2"	X	X	X	X	X	00000000
A4-S	11" x 81/2"	X	X	Ο	Ο	Ο	00000111
B5-S	—	X	X	Ο	Ο	X	00000110
A5-S	81/2" x 51/2"	X	X	0	X	X	00000100
		<u> </u>		<u> </u>		-	

-L: Lengthwise -S: Sideways O:High (Paper Present) X: Low

The original size data is taken by the main CPU when the DF position sensor is activated. This is when the DF is positioned about 12 cm above the exposure glass. At this time, only the sensor(s) underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU recognizes the original size from the on/off signals from the five sensors.

If the copy is made with the ADF open, the main CPU decides the original size from the sensor outputs when the Start key is pressed.

The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine productivity.

2.3 IMAGE PROCESSING

2.3.1 OVERVIEW



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The CCD generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal to the SICU (Scanner and Image Processing Control Unit) board.

The SICU board can be divided into two image processing blocks: the IPU (Image Processing Unit) and the MSU (Memory Supercharger Unit). These two ICs mainly do the following:

- **IPU:** Auto shading, filtering, magnification, γ correction, gradation processing, and video path control
- **MSU:** Image compression, image rotation, interface with HDD controller, image repeat, and combine originals

Finally, the SICU board sends the video data to the laser diode array (LDA) on the LD drive board (LDB).

2.3.2 SBU



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The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,500 pixels and the resolution is 600 dpi (23.6 lines/mm).

The CCD has four output lines: OS1, OS2, OS3, and OS4. OS1 and OS2 are for the first half of the scan line (Non-operation side), and OS3 and OS4 are for the last half of the scan line (Operation side). There are two analog processing ICs; one handles the first half line (OS 1 and OS2) and the other handles the last half line (OS3 and OS4). The analog processing IC performs the following operations:

- 1) Combines the odd and even signals into one line signal.
- 2) Adjust the black reference level of each CCD output channel.
- 3) Amplifies the analog signal from the CCD.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This gives a value for each pixel on scale of 256 grades. Then, the two 8-bit signals are sent to the SICU board through the LVDS (Low Voltage Differential Signaling). The LVDS is a noise-resistant interface.

2.3.3 AUTO IMAGE DENSITY (ADS)



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

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

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

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

2.3.4 IMAGE PROCESSING STEPS AND RELATED SP MODE

The following tables shows the image processing path and the related SP modes used for each image processing mode.

The user can adjust many of the image processing parameters with a UP mode (Copy/Document Server Features – General Features – Original Mode Quality Level), using fixed settings such as Sharp, Normal, and Soft. Each of these fixed settings has different parameter settings. The user's changes do not affect the SP mode settings.

If the user is not satisfied with any of the available settings for this UP mode, the technician can adjust the SP modes. However, the SP mode settings are not used unless the user selects 'Service Mode' with the UP Mode.

Text	Soft	Normal	Sharp	Service Mode
Text/Photo	Photo Priority	Normal	Text Priority	Service Mode
Photo	Screened Printed	Normal	Glossy Phot	Service Mode
Pale	Soft	Normal	Sharp	Service Mode
Generation	Soft	Normal	Sharp	Service Mode

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For more details about the settings available for the user, see Service Tables – Image Quality Setting by UP Mode.

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Text Mode

MTF filtering is used in text mode. The MTF filtering coefficient and strength can be adjusted individually for both main and sub scan. Low density originals are produced better when a stronger MTF filter is selected, but in this case, moiré tends to appear.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'Service Mode'.

	Image Processing Steps	Related SP Modes	
Input Correction 1	Auto Shading		
Input Correction 2	Background Erase	 SP4903-065 * (Scanner Gamma Threshold Level) SP4903-070 * (Background Erase Level) 	
	Independent Dot Erase	 SP4903-060 (Independent Dot Erase Level) 	
Filtering	MTF	 SP4903-010 to 011 * (Pre-Filter Coefficient) SP4903-020 to 035 * (MTF Filter Strength) 	
Magnification	Main Scan Magnification	 SP2909-001 (Main Scan Magnification) 	
ID Control	γ Correction	 SP4903-84 * (Scanner gamma setting) 	
Gradation	Error Diffusion/ Line Width Correction	 SP4903-78 to 80 *, 4904-20 (Line Width Correction Type) 	

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Photo Mode

Normally, the smoothing filter is used in photo mode but MTF filtering can also be selected with SP mode.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Screen Printed', 'Normal', 'Continuous Tone', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'Service Mode'.

When the user selects "Normal Paper" and "Continuous Tone", error diffusion is used for the gradation process. However, if the user selects "Screen Printed", dither processing is used.

	Image Processing Path	Related SP Modes
Input Correction 1	Auto Shading	
Input Correction 2	Background Erase	 SP4903-66 * (Scanner Gamma Thresh Level) SP4903-071 * (Background Erase Level)
Filtering	Smoothing/MTF	 SP4903-012 * (Pre Filter Coefficient) SP4903-009 * (Filter Type Selection) SP4903-036 to 038 * (Smoothing/MTF Filter Coefficient Level in Photo Mode) SP4904-006 (Smoothing Filter Level)
Magnification	Main Scan Magnification	 SP2909-001 (Main Scan Magnification)
ID Control		
Gradation	♦ Error Diffusion/ Dither Matrix	 SP4904-002 * (Grayscale Process Selection: Dither or Error Diffusion)

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Text/Photo Mode

MTF filtering is used for text/photo mode.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Photo Mode', 'Normal', 'Text Mode', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'Service Mode'.

1	Image Processing Path	Related SP Modes
Input Correction 1	Auto Shading	
Input Correction 2	Background Erase	 SP4930-67 * (Scanner Gamma Thresh Level) SP4903-072 * (Background Erase Level) SP4906 * (On/Off in Text/Photo Mode)
	Independent Dot Erase	SP4903-062 (Independent Dot Erase Level)
Filtering	MTF	 SP4903-013 to 014 * (Pre Filter Coefficient) SP4903-039 to 054 * (Filter Level and Strength) SP4904-007 (Texture Erase Filter Level)
Magnification	Main Scan Magnification	 SP2909-001 (Main Scan Magnification)
ID Control	γ Correction	 SP4903-85 * (Scanner gamma setting)
Gradation	Error Diffusion/ Line Width Correction	 SP4904-003, 005 * (Error Diffusion) SP4903-81 to 83 *, SP4904-22 (Line Width Correction Type)

Pale Mode

The image processing for pale mode is basically the same as in text mode. However, the contrast of the original is low. So, to preserve details, a stronger MTF filter is used. Also, the independent dot erase level is set at a lower level, so that only the faintest of dots are deleted; this ensures that dotted lines and periods are not deleted.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'Service Mode'.

	Image Processing Path	Related SP Modes
Input Correction 1	Auto Shading	
Input Correction 2	Background Erase	 SP4903-068 * (Scanner Gamma Thresh Level) SP4903-73 * (Background Erase Level)
Independent Do	Independent Dot Erase	 SP4903-063 (Independent Dot Erase Level)
Filtering	MTF	 SP4903-015 * (Pre Filter) SP4903-055 to 056 * (MTF Filter Coefficient – Pale Originals)
Magnification	Main Scan Magnification	 SP2909-001 (Main Scan Magnification)
ID Control	V γ Correction	
Gradation	Grayscale Processing/ Line Width Correction	SP4904-23 (Line Width Correction Type)

Generation Copy Mode

The image processing for generation mode is basically the same as in text mode, except that in order to prevent lines in the main scan direction from being reproduced too thickly, line width correction is applied for the final gradation treatment. Also, to reduce unwanted black dots, a weaker MTF filter is used; this ensures that isolated dots do not get bigger, and are spread out. These dots will then be deleted by the independent dot erase feature. This feature, however, is kept at a low setting to ensure that important details such as dotted lines and periods are not deleted.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'Service Mode'.

	Image Processing Path	Related SP Modes
Input Correction 1	Auto Shading	
Input Correction 2	Background Erase	 SP4903-069 * (Scanner Gamma Thresh Level) SP4903-074 * (Background Erase Level)
	Independent Dot Erase	 SP4903-064 (Independent Dot Erase Level)
Filtering	MTF	 SP4903-016 * (Pre Filter Coefficient) SP4903-057 to 058 * (MTF Filter Coefficient – Generation Copy)
Magnification	Main Scan Magnification	 SP2909-001 (Main Scan Magnification)
ID Control	γ Correction	
Gradation	Grayscale Processing/ Line Width Correction	 SP4903-75 to 77*, SP4904-24 (Line Width Correction Type)

Detailed Descriptions

2.3.5 AUTO SHADING



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Two things happen during auto shading.

Black Level Correction

The black level is zeroed for each scan line of data by reading the dummy elements at the end of the CCD signal for each scan line, which should be black.

White Level Correction

The data is corrected for variations in white level across the main scan. To do this, a white reference plate is scanned before each original (book mode) or every 30 s (ADF mode). This corrects for the following effects on each pixel:

- Loss of brightness at the ends of the exposure lamp and the edges of the lens
- Variations in sensitivity among the CCD elements
- Distortions in the light path

2.3.6 BACKGROUND ERASE





Background Erase

The background erase process is used only when setting of SP 4-903-70 to 75 is changed from the default setting (the default is 'disabled').

Usually, dirty background is erased using Auto Image Density (ADS). Background Erase should be used when ADS cannot fully erase the dirty background.

There are two Background Erase modes. The one that is being used depends on the SP mode setting. Setting 2 has a stronger effect than setting 1, but setting 2 may cause sudden changes in the data around the threshold level.

- Setting 1: MTF correction is not applied to any low image density data that remains after auto shading if the data is lower than a threshold level [A]. The overall effect is to reduce the background in a similar way to that shown by the dotted line in the diagram. This process can be applied for each image mode (except for photo mode) by changing the setting of SP4-903-70, 72, 73 or 74.
- Setting 2: Any low image density data that remains after auto shading will be treated as "0" if the data is lower than a threshold level [A]. The background is cut off as shown by the solid vertical line in the diagram at [A]. This process can be applied for each image mode by changing the setting of SP4-903-70, 71, 72, 73 or 74.

The thresholds can be changed with SP4-903-65 to 69.

2.3.7 INDEPENDENT DOT ERASE

By default, this process is used in all image processing modes except for photo mode. This function allows independent black dots appearing on copies to be erased.

As shown in the drawing below, the software compares each pixel with the pixels in the surrounding 5 x 5 area (except for the immediately adjacent pixels).

If all of the surrounding pixels are white, and the difference between the value of the object pixels and the average of the surrounding pixel is larger than the threshold level, the object pixel is either changed to 0 (white) or reduced in density. The combination of the threshold value and the pixel data reduction ratio depends on the setting of SP4-903-60, 62, 63 or 64. If a larger number is selected, the effect of independent dot erase will be stronger. If 0 is selected, independent dot erase is disabled.

20	40	30	20	40	50 Object pixel
30	0	70	30	30	
30	10	50	20	30	Surrounding pixels to be used for calculation
60	20	0	30	0	
20	30	40	30	30	Ignored pixels

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2.3.8 FILTERING, MAIN SCAN MAGNIFICATION/REDUCTION

Overview

After auto shading, the image data is processed by both filtering and main scan magnification. However, to reduce the occurrence of moiré in the image, the processing order depends on the reproduction ratio, as follows.

- 1. 64% reduction or less Main Scan Reduction \rightarrow Filtering
- 2. 65% reduction or higher Filtering \rightarrow Main Scan Magnification

Filtering

By default, an individual MTF filter is used for each image processing mode, to enhance the desired image qualities. (For Photo mode, smoothing filter is selected as the default setting.)

A stronger MTF filter emphasizes sharpness and leads to better reproduction of low image density areas, but may leads to the occurrence of moiré in the image.

The MTF filter strength can be changed by changing the coefficient (MTF Filter Level) and strength of the MTF filter in combination using SP mode. Refer to the combination chart in 'Image Quality Setting by UP Mode' in section 4. The filter coefficient and strength can be adjusted in the main scan and sub scan directions individually. This allows the copy quality to be adjusted more precisely, to match the originals normally scanned by a particular customer.

Example: In a case when vertical lines (sub scan) are reproduced clearly, but horizontal lines (main scan) are not reproduced clearly, the technician can adjust the main scan filter only.

For photo mode, the smoothing filter is the default filter, but the MTF filter may be selected by SP mode 4-903-9. This is effective when putting more weight on improving the resolution when copying from "continuous tone" originals.

Main Scan Magnification/Reduction



However, reduction and enlargement in the main scan direction are handled by the IPU chip on the SICU board.

Scanning and laser writing are done at a fixed pitch (the CCD elements cannot be squeezed or expanded). So, to reduce or enlarge an image, imaginary points are calculated that would correspond to a physical enlargement or reduction of the image. The correct image density is then calculated for each of the imaginary points based on the image data of the nearest four true points. The calculated image data then becomes the new (reduced or enlarged) image data.

Main scan magnification can be disabled with SP4-903-5 to test the IPU chip.

Sub Scan Magnification

When the selected magnification is 50% or larger, the image magnification in the sub scan direction is changed by changing the scanner speed. (As the magnification ratio increases, the scanner speed is reduced.)

However, when a magnification ratio smaller than 50% is selected, the required scanner speed exceeds the limit of the scanner motor. So, the scanner speed is reduced to half of the required speed for that reduction ratio. As a result, there are twice as many scan lines as needed. So alternate lines are removed.

Foe example, if a 49% magnification ratio is selected, the scanner speed is the same as the speed of 98% magnification, but the number of sub scan lines used for the image is half of that for 98% magnification.

2.3.9 GAMMA (γ) CORRECTION

Gamma correction ensures accurate generation of the various shades in the gray scale from black to white, accounting for the characteristics of the scanner and printer.

Scanner gamma correction corrects the data output to the IPU to account for the characteristics of the scanner (e.g., CCD response, scanner optics).

Printer gamma correction corrects the data output from the IPU to the laser diode to account for the characteristics of the printer (e.g., the characteristics of the drum, laser diode, and lenses).

The scanner and printer gamma settings can be changed for the 'Service Mode' original type of text and text/photo modes, using SP4-903-84 and 85.

2.3.10 GRADATION PROCESSING

Various processes are available to try to reproduce various types of original as faithfully as possible.

The following processes are used in combination depending on the image mode settings.

- 1) Three-graduation processing
- 2) Four-graduation processing
- 3) Error diffusion
- 4) Dithering

These three processes are used as follows:

Text Mode:	Error diffusion + line width correction and four- graduation processing
Text/Photo Mode:	Error diffusion + line width correction and four- graduation processing
Photo Mode:	Error diffusion or dithering, and three-graduation processing
Generation Copy Mode:	Error diffusion + line width correction, and three- graduation processing
Pale Mode:	Error diffusion and four-graduation processing

Three-graduation Processing

This mode is used in Photo mode.

The image density data after gamma correction is changed into three-graduation data (full dot, half dot, or blank) using two thresholds. With this processing, halftone images are reproduced smoother than with four-graduation processing because of stable dot image reproduction due to only one intermediate density level.

Four-graduation Processing

This process is used in Text mode and Text/Photo mode.

The image density data after gamma correction is changed into 2-bit data using 3 thresholds. The four graduations are reproduced by laser power control. This process is suitable for reproducing fine originals which do not include halftone areas.

Error Diffusion and Dithering

Error diffusion reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are then corrected using an error diffusion matrix.

With dithering, each pixel is compared with a pixel in a dither matrix. Several matrixes are available, to increase or decrease the detail on the copy.

Comparing with dithering, error diffusion gives a better resolution, and is more suitable for "continuous toned" originals. On the other hand, dithering is more suitable for "screen printed" originals.

In Photo mode, when the user selects "Normal Paper" or "Continuous Tone", error diffusion is used. However, if the user selects "Screen Printed", dither processing is used. If the user selects "SP Mode Changed", then error diffusion or one of three types dither matrix can be selected with SP4-904-002. There are three types of dither matrix, 8" x 8", 6" x 6", and 4" x 4". A larger dither matrix causes halftone areas to become coarser.

2.3.11 LINE WIDTH CORRECTION

This function is effective for Text, Text/Photo and Generation modes.

The software compares each pixel with adjacent pixels. If the differences between the object pixel and adjacent pixels are more than a threshold, the software judges that the pixel is on a line edge, and line width correction is applied.

The line width correction setting can be changed separately for Text, Text/Photo and Generation modes. The widths of vertical and horizontal lines can be corrected separately.

- Thinner 1: If the pixel is on the edge of a line, its density is multipled by 0.75
- Thinner 2: If the pixel is on the edge of a line its density is multipled by 0.5
- Thicker: If the pixel is on the edge of a line, 48 is added to its density

The threshold for detecting edges of lines can also be changed separately for vertical lines and horizontal lines.

Use SP4-903-75 to 83 to adjust the line width correction settings.

Line width can also be corrected by adjusting the laser output (SP4904-20 to 24).

2.4 LASER EXPOSURE

2.4.1 OVERVIEW





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This machine uses four laser diodes to produce electrostatic images on an OPC drum. The four parallel beams write four lines at once.

The laser diode unit converts image data from the SICU board into laser pulses, and the optical components direct these pulses to the drum.

Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

The strength of each beam is 10 mW on the drum surface at a wavelength of 785 mm.

The polygon motor speed is 29,528 rpm.

There are up to 4 image density levels for each pixel. To realize this, this machine uses a form of pulse width modulation. In this machine, pulse width modulation consists of the following processes:

- Laser diode pulse positioning
- Laser diode power/pulse width modulation

Laser diode power and pulse width modulation is done by the laser diode drive board (LDR). Briefly, the width of the laser pulse for a pixel depends on the output level (from 0 to 3) required for the pixel.

There are two fan motors, the polygonal motor cooling fan [A] and LDB cooling fan [B], for removing heat in the laser unit.

2.4.2 OPTICAL PATH



The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs four laser beams to the polygonal mirror [B] (six mirror surfaces) through the cylindrical lens [C] and the 1st mirror [D].

Each surface of the polygon mirror reflects four full main scan lines. The laser beams go to the F-theta lens 1 [E], F-theta lens 2 [F], BTL (barrel toroidal lens) [G], and mirror [H]. Then these laser beams go to the drum through the toner shield glass [I].

The laser synchronizing detector [J] determines the main scan starting position. This board generates and sends a synchronization signal when the laser synchronization detector mirror [K] reflects the laser beam to the detector as the laser beam starts its sweep across the drum. The detector detects only the uppermost beam (channel 1) of the four.

2.4.3 AUTO POWER CONTROL (APC)



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There are four LD drivers (IC408, IC409, IC422 and IC423) on the LDB (Laser diode Drive Board). The LD drivers control the laser diodes on the 4-channel laser diode array. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, IC410 and IC411 monitor the current passing through the photodiode (PD). Then they increase or decrease the current to the laser diode as necessary, comparing it with the reference levels (VREF). To apply APC separately to each laser diode using only one photo diode, the monitor current is sent in turn to each laser diode.

This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDB in the field.

2.4.4 FOUR BEAM LASER WRITING



This laser unit has four LD diodes for writing the image. This means that each surface of the polygonal mirror motor writes four main scan lines, and 24 main scan lines are produced when the polygonal mirror rotates once. Due to this multi beam writing, the polygonal mirror motor speed can be reduced, thus the noise generated by the polygonal mirror motor can be reduced.

The four laser beams are transferred to the polygonal mirror through a collimating lens. When the four laser beams arrive on the drum surface, the diameter of the beam spot is 50 x 60 (main scan direction x sub scan direction) μ m, and the distance between each pixel is approximately 42 μ m. So the beam spots overlap each other as shown above.

The laser diode array is assembled and adjusted in the factory, and no adjustment can be done in the field.

2.4.5 LD SAFETY SWITCHES



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To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, there are four safety switches inside the front cover.

When one of the front covers is open, the 5 V line connecting to the LD drivers (LDD) is disconnected. The above diagram shows one LD and driver circuit as an example. There are four of these on the LDB board. Additionally, the OUT terminal of the PWM IC is automatically set at a low level to prevent any power from being supplied from the PWM IC to the LDD.

Even if 12 V is supplied from the op amp which controls the LD power level, the power will be less than the minimum power required for LD lighting (5 mA) due to the 2.7 k Ω resistor.

2.5 DRUM UNIT

2.5.1 PROCESS CONTROL

Overview

The drum potential will gradually change because of the following factors.

- Dirty charge corona casing and grid plate
- Changes in drum sensitivity

To maintain good copy quality, the machine does the following just after the main switch has been turned on (if the fusing temperature is less than 100 $^{\circ}$ C and SP3-901 is on).

- 1) Potential Sensor Calibration
- 2) VSG Adjustment
- 3) VG (Grid Voltage) Adjustment
- 4) LD Power Adjustment
- 5) VREF Update

This process is known as 'Process Control Initial Setting'. The rest of this section will describe these steps in more detail.

Processes 1, 3, and 4 in the above list compensate for changes in drum potential. Processes 2 and 5 are for toner density control; see the "Toner Density Control" section for more details.

Drum Potential Sensor Calibration



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The drum potential sensor [A] detects the electric potential of the drum surface [B].

Since the output of the sensor is affected by environmental conditions, such as temperature and humidity, the sensor needs recalibration at times. This is done during process control initial setting.

The charge/bias/grid power pack [C] has two relay contacts. Usually RA2 grounds the drum. However, to calibrate the sensor, the BCU switches RA2 and RA1 over, which applies the power pack output voltage to the drum shaft [D].

The machine automatically calibrates the drum potential sensor by measuring the output of the sensor when -200 V and -700 V are applied to the drum. From these two readings, the machine can determine the actual drum potential from the potential sensor output that is measured during operation.

During calibration, if the rate of change in drum potential sensor response to applied voltage is out of the target range, an SC310 or SC311 is logged and auto process control turns off. The VG and LD power adjustments are skipped; VG is set to the value stored in SP2-001-01, and LD power is set to the values stored in SP2-103.

Vsg Adjustment

This calibrates the ID sensor output for a bare drum to 4.0 ± 0.2 V. It does this by changing the intensity of the light shining on the drum from the sensor. This is done automatically during process control initial setting, and it can also be done manually with SP3-001-002.

If the ID sensor output cannot be adjusted to within the standard, an SC353 or 354 is logged and the light intensity is set to the previous accepted value.

VG Adjustment



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The potential on unexposed areas of the drum (VD) gradually changes during drum life. To keep VD constant, the grid voltage (VG) is adjusted during process control initial setting.

The BCU checks VD using the drum potential sensor [A]. If it is not within the target range ($-900 \text{ V} \pm 20 \text{ V}$), the BCU adjusts VG (Grid Voltage) through the charge/bias/grid power pack to get the correct target voltage.

The most recently detected values can be displayed with SP3-902-2 (VD) and 3-902-4 (VG).

If the CPU cannot get VD within the target range by changing VG, VG is set to the value stored in SP2-001-01 and LD power is set to the value stored in SP2-103. Then SC312, SC313, or SC315 is logged.
LD Power Adjustment



A294D643.WMF

This adjustment uses the drum potential sensor to keep the ID sensor pattern at the same density, so that VREF will be updated correctly (see the next page).

The VH pattern is developed using the current LD power (the density is the same as the ID sensor pattern). The drum potential sensor detects the potential on this pattern. The LD power is adjusted until VH becomes $-265 \text{ V} \pm 20 \text{ V}$.

This is done only during process control initial setting.

The latest VH can be displayed using SP3-902-3. The size of the correction applied to the LD power can be displayed using SP3-902-5 (the default is stored in SP2-103-1-4).

If VH cannot be adjusted to within the standard within 20 attempts, LD power is set to the latest value (the one used for the 20th attempt) and SC314 or SC316 is logged.

DRUM UNIT

VREF Update

The TD sensor reference voltage (VREF) is updated to stabilize the concentration of toner in the development unit as follows;

New VREF = Current VREF + Δ VREF

 $\Delta VREF$ is determined using the following table.

VSP/VSG	ΔVREF
≤ 3 /40	+0.08
≤ 9 /100	+0.04
≤ 21/200	+0.00
≤ 1 /8	-0.06
≤ 4 /25	-0.12
≤ 41/200	-0.18
≤ 1 /2	-0.24
> 1/2	Previous VREF

When SC353 or SC354 is generated, VREF is not updated. The machine uses the current value.

VREF is updated during process control initial setting. It is also updated at the end of the copy job, if 10 or more copies have been made since the last VREF update. It is not updated at the start of a job or at any time during a job.

2.5.2 TONER DENSITY CONTROL

Overview

There are two modes for controlling toner supply: sensor control mode and image pixel count control mode. The mode can be selected with SP2-208. The factory setting is sensor control mode. Image pixel count mode should only be used if the TD or ID sensor is defective and cannot be replaced immediately.



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Sensor Control Mode

Introduction

In sensor control mode, the machine varies toner supply for each copy to maintain the correct proportion of toner in the developer and to account for changes in drum reflectivity over time. The adjustment depends on two factors.

- Amount of toner needed to print the page (based on the black pixel amount for the page).
- Readings from the TD sensor [A] and ID sensor [B].

Sensor control mode has two phases, called 'ID sensor control' and 'TD sensor control'. In ID sensor control, VSP/VSG from the most recent ID sensor pattern check determines the GAIN factor in the toner supply calculation (see later in this section). In TD sensor control mode, GAIN depends on the current TD sensor output also (VT – VREF is used).

The phase that is used depends on the number of copies since the start of the job. See the table below for details.

Number of copies in the job	Copy no.	Control method
10 or fewer	1 to 10	ID Sensor Control
More than 10	First 10	ID Sensor Control
	From 11	TD Sensor Control

Toner Density Sensor Initial Setting

When new developer is installed, TD sensor initial setting must be done using SP2-801. This sets the sensor output to 2.5 V. This value will be used as the TD sensor reference voltage (VREF).

If the sensor output cannot be adjusted to within the standard, SC341 or SC342 is logged and the toner density control is set to the pixel count control.

VSP and VSG Detection

The ID sensor detects the following voltages.

- VSG: The ID sensor output when checking the drum surface
- VSP: The ID sensor output when checking the ID sensor pattern

In this way, the reflectivity of both the drum and the pattern on the drum are checked.

The ID sensor pattern is made on the drum with the charge corona and laser diode.

VREF Update

To update VREF (the TD sensor reference voltage), VSP/VSG is detected at the end of the copy job, if 10 or more copies have been made since the last VREF update. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface. The 10-copy interval can be changed using SP2-210.

VREF is also updated during process control initial setting.

If the reading of the ID sensor becomes abnormal while checking the ID sensor pattern, SC350, SC351, or SC352 is logged and the toner density control is done using TD sensor only.

See "VREF Update" in the Process Control section for more details.

VT Detection

The toner density in the developer is detected once every copy cycle, after the trailing edge of the image passes the development roller.

If the reading from the TD sensor becomes abnormal during a copy job, the machine holds the GAIN factor constant to allow toner supply to vary with only the pixel count for the rest of the copy job. Then at the end of the job, SC340 is generated and the machine must be repaired.

If the TD sensor needs to be replaced and none is available, the toner supply mode can be set to image pixel count mode using SP2-208.

Image Pixel Count

For each copy, the CPU adds up the value of each pixel and converts the sum to a value between 0 and 255. (The value would be 255 if the page was all black.)

Gain Determination

GAIN is another factor in the toner supply clutch on time calculation. Its value can be 0, 1, 1.5, 2, 3, or 4. It is calculated either using VSP/VSG if ID sensor control is being used, or every copy using "VT – VREF" if TD sensor control is being used (see Sensor Control Mode – Overview for more on TD and ID sensor control).

ID Sensor Control		
VSP/VSG	GAIN	
≤ 3 /40	0	
≤ 9 /100	0	
≤ 21/200	1	
≤ 1 /8	1.5	
≤ 4 /25	2	
≤ 41/200	3	
≤ 1 /2	4	
> 1/2	1	

TD Sensor Control		
a = VT - VREF	GAIN	
a < 0.00	0	
$0.00 \leq a < 0.02$	1	
$0.02 \leq a < 0.08$	2	
$0.08 \leq a < 0.14$	3	
0.14 ≤ a	4	

Toner Supply Clutch On Time Calculation

The toner supply clutch on time for each copy is decided using the following formula: (GAIN x Image pixel count x 0.7mg/cm²/Toner Supply Rate) + 50 ms

When GAIN is "0", the above 50 ms is set to "0".

The toner supply rate can be changed using SP2-209.

Image Pixel Count Control

This mode should only be use as a temporary countermeasure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply using the same formula for the toner supply clutch on time. However, the GAIN value is fixed at 0.7.

2.5.3 DRUM UNIT COMPONENTS



The drum unit consists of the components shown in the above illustration. An organic photoconductor drum (diameter: 100 mm) is used for this model.

- 1. OPC Drum
- 2. Drum Potential Sensor
- 3. Pick-off Pawl
- 4. Image Density Sensor
- 5. Toner Collection Coil

- 6. Cleaning Brush
- 7. Cleaning Blade
- 8. Quenching Lamp
- 9. Charge Corona Unit

2.5.4 DRIVE



Detailed Descriptio

The drive from the drum motor [A] is transmitted to the drum and the cleaning unit through some timing belts, gears, the drum drive shaft [B], and the cleaning unit coupling [C].

The drum motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheel [D] on the end of the drum drive shaft stabilizes the rotation speed.

2.5.5 DRUM CHARGE

Overview



This copier uses a double corona wire scorotron system to charge the drum. Because of the high speed of this copier, two corona wires are needed to give a sufficient negative charge to the drum surface. The stainless steel grid plate makes the corona charge uniform and controls the amount of negative charge on the drum surface by applying a negative voltage to the grid.

The charge/bias/grid power pack [A] gives a constant corona current to the corona wires $(-1,200 \ \mu A)$.

The voltage to the grid plate is automatically controlled to maintain the correct image density in response to changes in drum potential caused by dirt on the grid plate and charge corona casing. This is described in the Process Control section in more detail.

Charge Corona Wire Cleaning



Detailed Descriptio

Air flowing around the charge corona wire may deposit toner particles on the corona wires. These particles may interfere with charging and cause low density bands on copies.

The wire cleaner pads [A] automatically clean the wires to prevent such a problem.

The wire cleaner is driven by a dc motor [B]. Normally the wire cleaner [C] is at the front end (this is the home position). Just after the main switch is turned on, the wire cleaner motor turns on to bring the wire cleaner to the rear and then back to the home position. When the wire cleaner moves from the rear to the home position (black arrow in the illustration), the wire cleaner pads clean the wires. Cleaning is done at auto process control, if 5,000 copies were made since since the wires were cleaned last, but only if the fusing temperature is less than 100°C.

2.5.6 DRUM CLEANING

Overview



This copier uses a counter blade system to clean the drum. In a counter blade system, the drum cleaning blade [A] is angled against drum rotation. The counter blade system has the following advantages:

- · Less wearing of the cleaning blade edge
- High cleaning efficiency

Due to the high efficiency of this cleaning system, the pre-cleaning corona and cleaning bias are not used for this copier.

The cleaning brush [B] helps the cleaning blade. The brush removes toner from the drum surface and any remaining toner is scraped off by the cleaning blade. Toner on the cleaning brush is scraped off by the mylar [C] and falls onto the toner collection coil [D]. The coil transports the toner to back to the toner entrance tank in the toner bank unit for recycling.

To remove any accumulated toner at the edge of the cleaning blade, the drum turns in reverse for about 4 mm [E] at the end of every copy job. The accumulated toner is deposited on the drum and is removed by the cleaning brush.

Cleaning Unit Drive



Drive from the drum motor is transmitted to the cleaning unit drive gear via the timing belt [A] and the cleaning unit coupling [B]. This coupling drives the cleaning brush [C] directly. The cleaning brush then transmits the drive to the gear at the front, which drives the toner collection coil gear [D].

Toner recycling is described in the Toner Supply and Recycling section.



Cleaning Blade Pressure and Side-to-Side Movement

The spring [A] always pushes the cleaning blade against the drum. The cleaning blade pressure can be manually released by pushing up the release lever [B]. To prevent cleaning blade deformation during transportation, the release lever must be locked in the pressure release (upper) position.

The guide roller [C] at the rear end of the cleaning blade holder touches the cam gear [D], which moves the blade from side to side. This movement helps to disperse accumulated toner to prevent early blade edge wear.

2.5.7 OTHERS

Air Flow Around the Drum



The drum cooling fan [A] provides air flow into the drum to cool the drum and the charge corona unit to prevent uneven build-up of negative ions that can cause uneven drum surface charge. The exhaust fan [B] located above the fusing unit causes air to flow out of the machine.

An ozone filter [C] absorbs the ozone around the drum.

To keep the temperature inside the machine constant, the drum cooling fan and the exhaust fan turn slowly during stand-by, and turn quickly during copying.

To prevent foreign matter from entering the copier inside, there is a dust protection filter in the entrance [D] of the duct. Another dust filter [E] prevents dust from reaching the ozone filter.

Pick-off Pawls



The pick-off pawls always contact the drum surface as a result of weak spring pressure. They move from side to side during the copy cycle to prevent drum wear at any particular location. This movement is made via a shaft [A] and a cam [B].

Quenching





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In preparation for the next copy cycle, light from the quenching lamp [A] neutralizes any charge remaining on the drum.

The quenching lamp consists of a line of 16 red LEDs extending across the full width of the drum.

2.6 **DEVELOPMENT**

2.6.1 OVERVIEW



A294D301.WMF

- 1. Development Filter
- 2. Toner Auger
- 3. Developer Agitator
- 4. Toner Density Sensor
- 5. Paddle Roller
- 6. Lower Development Roller



A294D302.WMF

- 7. Upper Development Roller
- 8. Toner Hopper
- 9. Toner Agitator
- 10. Toner Supply Roller
- 11. Toner Hopper Sensor

This copier uses a double roller development (DRD) system. Each roller has a diameter of 20 mm.

This system differs from single roller development systems in that:

- It develops the image in a narrower area
- It develops the image twice
- The relative speed of each development roller against the drum is reduced.

The particle diamaters are about 9.5 μ m for toner, and about 70 μ m for developer. Both the DRD system and new consumables improve the image quality, especially of thin horizontal lines, the trailing edges of the half-tone areas, and black cross points.

The machine contains a toner recycling system. Toner recycled from the drum cleaning unit is transferred to the toner hopper with fresh toner, where they are mixed by the toner agitator. The mechanism is explained in the Toner Supply and Recycling section.

2.6.2 DEVELOPMENT MECHANISM





A294D303.WMF

The paddle roller [A] picks up developer and transports it to the upper development roller [B]. Internal permanent magnets in the development rollers attract the developer to the development roller sleeve. The upper development roller carries the developer past the doctor blade [C]. The doctor blade trims the developer to the desired thickness and creates backspill to the cross mixing mechanism.

In this machine, black areas of the latent image are at a low negative charge (about -150 V) and white areas are at a high negative charge (about -950 V).

The development roller is given a negative bias to attract negatively charged toner to the black areas of the latent image on the drum.

The development rollers continue to turn, carrying the developer to the drum [D]. When the developer brush contacts the drum surface, the low-negatively charged areas of the drum surface attract and hold the negatively charged toner. In this way, the latent image is developed.

2.6.3 DRIVE



The gears in the development unit are driven by the development drive gear [A] when the development motor [B] (a dc servomotor) turns.

The gears in the toner hopper are driven by the toner supply roller drive gear [C] when the toner supply roller clutch [D] activates.

The above gears are helical gears. Helical gears are more quiet than normal gears. The teeth of the development drive gear are chamfered so that they smoothly engage the development roller gear [E] when the unit is installed.

2.6.4 CROSSMIXING



This copier uses a standard cross-mixing mechanism to keep the toner and developer evenly mixed. It also helps agitate the developer to prevent developer clumps from forming and helps create the triboelectric charge.

The developer on the turning development rollers [A] is split into two parts by the doctor blade [B]. The part that stays on the development rollers forms the magnetic brush and develops the latent image on the drum. The part that is trimmed off by the doctor blade goes to the backspill plate [C].

As the developer slides down the backspill plate to the agitator [D], the mixing vanes [E] move it slightly toward the rear of the unit. Part of the developer falls into the auger inlet and is transported to the front of the unit by the auger [F].

The agitator moves the developer slightly to the front as it turns, so the developer stays level in the development unit.

2.6.5 DEVELOPMENT BIAS



A294D305.WMF

The charge/bias/grid power pack [A] applies the negative development bias to both the lower sleeve roller and upper sleeve roller through the receptacles [B] and the sleeve roller shafts [C].

The development bias prevents toner from being attracted to the non-image areas on the drum where there is residual voltage. In addition, the development bias changes with the image density setting chosen by the customer.

2.7 TONER SUPPLY AND RECYCLING

2.7.1 TONER BANK

Overview



A294D909.WMF

Toner is supplied from a toner bank unit, which is in a different part of the machine from the development unit.

The toner bank [A] holds two toner bottles. The machine works even if there is only one bottle installed. Toner can be supplied from either the upper or lower toner bottle (not from both at the same time). When the upper toner bottle is supplying toner, the upper bottle cap motor [B] pulls out the toner bottle cap. The upper bottle inner cap sensor [C] detects the actuator in the toner bottle opening rod.

Toner is supplied from the toner bottle to the toner entrance tank [D]. The toner near end sensor [E] (at the rear right of the toner bank unit) checks for the presence of toner in the toner entrance tank.



Toner Near-end and End Detection/Bottle Replacement

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An empty toner bottle can be replaced during printing.

The toner near-end sensor detects toner as it falls from the toner bottle into the toner entrance tank [B]. If the toner near end sensor [C] detects that no toner has come out of the toner bottle, the toner bottle enters the toner near-end condition.

The toner bottle motor [A] then rotates the toner bottle up to 15 times to try to supply toner to the toner entrance tank [B]. If the sensor detects toner more than 5 times, the near-end condition is cleared. However, if the toner near end sensor [C] fails to detect toner 10 consecutive times, 200 more copies can be made from that bottle, then the machine declares it to be empty.

When the bottle is empty, the machine switches to the second toner bottle. The first toner bottle cap motor closes the bottle cap and the second toner bottle cap motor pulls out the second bottle cap. The motors operate until the first bottle inner cap sensor does not detect the actuator and the second bottle inner cap sensor does detect the actuator.

The second toner bottle is then rotated up to 15 times. If the near-end sensor detects toner after 5 times, the machine can print from that bottle.

Meanwhile, the machine indicates that the first bottle is empty. When the user takes out the old bottle, and puts in a new one, this is detected by the toner bottle sensor (see the next page for more about the toner bottle sensors). However, this bottle is not tested until the second bottle is empty.

NOTE: If an empty bottle is not replaced, and the other bottle becomes empty (no toner detected 10 consecutive times, as described above), 200 more copies can be made. Then the machine enters the 'system toner end condition' (both bottles are empty), and this is indicated in the operation panel display.

When the second bottle is empty, the machine switches back to the first bottle.

The first bottle is tested now, by rotating it 15 times as usual. If this bottle is also found to be empty, the machine enters the system toner end condition. This time, the machine cannot print until one of the toner bottle sensors detects that a new toner bottle has been inserted (the machine does not allow the 200 extra copies).

When both bottles are empty and a new toner bottle is placed in the toner bank, the new toner bottle is rotated 15 times to supply toner to the toner entrance tank. If the toner near end sensor then detects toner in the toner entrance tank, the system toner end condition is cleared. If the toner near end sensor detects there is still no toner in the toner entrance tank, the bottle cap motor closes the toner bottle cap. The system toner end condition continues and printing is not possible.

Toner Bottle Sensors



When placing a toner bottle in the toner bank, the toner bottle pushes the lock arm [A] downwards. Then the lock arm catches the toner bottle. Also, lever [B] is pushed down, which causes the toner bottle sensor [C] to detect that a bottle has been installed (the actuator leaves the toner bottle sensor while the bottle is being inserted in the holder).

When replacing a toner bottle, push the toner bottle release lever [D] to release the lock mechanism. When a toner bottle is being used to supply toner, the toner bottle opening rod is pulled to the rear and the lock plate [E] is lowered by the link [F] so that the toner bottle release lever cannot be pushed. Therefore, the toner bottle that is supplying toner is locked in place. The user cannot pull out the bottle until it is empty.

2.7.2 SUPPLYING TONER TO THE DEVELOPMENT UNIT



A294D902.WMF

A294D906.WMF

The toner bottle motor turns the toner bottle, causing toner to leave the toner bottle [A] and drop into the toner entrance tank [B]. Recycled toner in the tube from the drum cleaning unit also enters the toner entrance tank, and is mixed with fresh toner from the toner bottle.

The toner transport coil [C] in the toner transport tube transports toner to the toner supply cylinder [D]. The toner bank motor [E] drives the toner transport coil via the toner supply coil clutch [F].

The toner supply motor [G] pushes air toward the toner hopper. Toner in the toner supply cylinder is transported from the toner supply cylinder to the toner hopper [H]. The toner hopper has two air pressure release filters and an air return tube [I] connected to the toner supply cylinder. Air returns to the toner supply cylinder from the toner hopper.

If the toner hopper sensor (in the toner hopper – see 'Toner Hopper') detects that there is insufficient toner in the hopper, the toner bank mechanism is started up. If there is toner in the toner entrance tank (detected by the toner near end sensor in the toner bank), the toner supply coil clutch turns on for 2 seconds. The toner supply motor turns on for 7 seconds at the same time as the toner supply coil clutch. After this, if the toner hopper sensor still does not detect toner, the toner supply coil clutch turns on for two seconds again until the toner hopper sensor detects toner (this is done for a maximum of 10 times). When the toner hopper sensor detects toner, the toner supply coil clutch turns off.

If the toner hopper sensor does not detect toner in the toner hopper after the toner supply coil clutch has turned on ten times, the operation panel indicates SC495 (toner bank error).

The toner supply motor sensor monitors the toner supply motor. If the sensor detects that the motor does not rotate during the toner supply process, the operation panel indicates SC591 (toner supply motor lock).

2.7.3 TONER HOPPER

Toner Supply



A294D306.WMF

When the toner supply roller clutch [A] (inside the development motor unit [B]) turns on, the agitator [C] mixes the toner transported by the air tube [G] from the toner bank (the toner from the toner bank is new toner mixed with recycled toner). Then it moves the toner from front to rear and sends it to the toner supply roller. Toner is caught in the grooves in the toner supply roller [F]. Then, as the grooves turn past the opening, the toner falls into the development unit.

The toner supply roller clutch [A] transfers drive from the development motor to the toner supply roller gear [D], which drives the agitator gear [E].

For details about Toner Supply Control, see Drum Unit – Toner Supply Control.

Toner Hopper Empty Detection



Detailed Descriptions

A294D307.WMF

The toner hopper sensor [A] detects whether there is enough toner in the toner hopper. The toner hopper sensor checks for toner once when the toner supply roller clutch turns on. When there is only a small amount of toner inside the toner hopper and pressure on the toner hopper sensor becomes low, the toner hopper sensor outputs a pulse signal (once per copy). Then the toner bank mechanism supplies more toner to the toner hopper, as explained in previous sections.

2.7.4 TONER RECYCLING AND WASTE TONER COLLECTION

Overview



Recycling: The toner recycling coil in the tube [A] transports the toner collected by the drum cleaning to the toner entrance tank for recycling.

Waste toner collection: The toner collection coil in the tube [B] transports the toner collected by the transfer belt unit to the waste toner collection bottle.

The drum motor [C] drives the toner recycling coil [A] via timing belts and gears, whose rotation in return drives the toner collection coil [B] via gears.

Toner Recycling



The toner recycling coil in the tube [A] transports the toner collected by the drum cleaning unit to the toner entrance tank [B] for recycling. This toner is dropped into the toner entrance tank and mixed with fresh toner from the toner bottle. The toner bank motor [C] drives the toner transport coil via the toner supply coil clutch [D].

Waste Toner Collection



The toner collection coil in the tube [A] transports the toner collected by the transfer belt unit to the waste toner collection bottle. This toner contains paper dust and cannot be recycled.

The waste toner coil [B] transports the waste toner dropped from the toner collection coil tube to the waste toner collection bottle [C]. The waste toner coil tube has five holes [D] and the end [E] of the tube is open. The waste toner drops from these holes.

When the waste toner collection bottle fills up, the pressure in the bottle increases and the waste toner coil becomes harder to turn. Then, the actuator plate [F] does not rotate because the waste toner coil drive gear [G] has a torque limiter, and the output of the toner overflow sensor [H] becomes constant. In this condition, the operation panel LCD indicates "Waste Toner Full" and printing is disabled.

The bottle contains 1,000 g to 1,200 g of waste toner. The amount of waste toner from the transfer belt unit is around 3 g per 10 k copies. Three to four million copies (3,000 to 4,000 k) can be made before the waste toner bottle becomes full.

If the waste toner bottle is not properly placed inside the toner bank, the operation panel LCD indicates SC496 (toner collection bottle error). The toner collection bottle sensor [I] detects this condition.

2.8 PAPER FEED

2.8.1 OVERVIEW



A294D701.WMF

This model has three paper tray feed stations.

The 1st tray is the tandem feed tray. It can hold 2,000 sheets of paper (1,000 sheets x 2 stacks). It can be converted to a 1,000-sheet tray for larger paper sizes with an optional kit.

The 2nd and 3rd trays are universal trays. They can each hold 500 sheets of paper.

All feed stations use an FRR feed system. Rotation of the pick-up roller [A] drives the top sheet of paper to the feed [B] and separation [C] rollers. These rollers then take over the paper drive. If the pick-up roller feeds more than one sheet, the separation rollers rotate in the opposite direction and prevent all but the top sheet from passing through to the registration rollers.

2.8.2 DRIVE



A294D709.WMF

- [A]: Paper Feed Motor
- [B]: Paper Feed Clutches 1 to 3
- [C]: Vertical Transport Clutches 1 to 3
- [D]: Lower Relay Clutch
- [E]: Relay Motor
- [F]: Upper Relay Clutch
- [G]: LCT Relay Clutch

The paper feed motor [A] drives feed, pick-up, and separation rollers in trays 1, 2, and 3 via timing belts, clutches [B], and gears. The paper feed motor also drives the vertical transport rollers and the lower relay roller. Drive is transferred to each of the three vertical transport rollers by a vertical transport clutch [C], and to the lower relay roller by the lower relay clutch [D].

The relay motor [E] drives the upper relay roller and LCT relay roller via gears and clutches [F] and [G].

The 2nd vertical transport clutch has a one-way-gear [H]. This prevents the clutch from slipping when the knob [I] is turned to remove jammed paper in the paper feed tray and vertical transport area.

2.8.3 PAPER LIFT – TRAYS 2 & 3



Detailed Descriptions

The machine detects when a tray has been placed in the machine by a signal from the paper size switch. When this is detected, the lift motor [A] turns on. The coupling gear [B] on the tray lift motor engages the pin [C] on the lift arm shaft [D], then it turns the tray lift arm [E] to lift the tray bottom plate [F].

For tray 1, an electrical signal from the tray connector automatically informs the cpu when the tray has been placed in the machine.



When the lift motor turns on, the pick-up solenoid [A] activates to lower the pick-up roller [B]. When the top sheet of paper reaches the correct height for paper feed, the paper pushes up the pick-up roller, and the actuator [C] on the pick-up roller supporter [D] leaves the lift sensor [E]. Then, the lift motor stops.

After several paper feeds, the paper level gradually lowers and the lift sensor is deactivated. Then the lift motor turns on again until the lift sensor detects the actuator again.

When the tray is drawn out of the feed unit, the lift motor coupling gear [F] disengages the pin [G] of the lift arm shaft [H], then the tray bottom plate [I] drops under its own weight.

2.8.4 PICK-UP AND FEED – TRAYS 1 TO 3

Overview





A294D598.WMF

Drive from the paper feed motor is transmitted to the gear [A] in the paper feed unit via the timing belt [B].

Then the gear [A] transmits this drive to the pick-up [C], paper feed [D] and separation [E] rollers via gears and the paper feed clutch [F].

The gear [A] also transmits this drive to the vertical transport roller [G] via gears and the vertical transport clutch [H].

Pick-up and Feed



If a paper feed station is not selected, its separation roller solenoid [A] de-activates and the separation roller [B] can turn freely in the opposite direction to paper feed.

When the paper feed station is selected and the start key is pressed, the feed clutch [C], separation roller solenoid [A], and the pick-up solenoid [D] all turn on.

When the feed clutch [C] activates to transfer drive to the feed roller [E], the pick-up roller [F] also turns because it is linked to the feed roller by an idle gear [G].

When the separation roller solenoid [A] turns on, the separation roller [B] contacts the paper feed roller [E] and turns with the feed roller in spite of the torque limiter in the separation roller, which forces it in the opposite direction.

When the pick-up solenoid [D] activates, the pick-up roller [F] lowers to contact the top sheet of the paper stack and send it to the paper feed and separation rollers.

When the paper feed sensor [H] detects the leading edge of the paper, the pick-up solenoid de-energizes to lift the pick-up roller [F], and the vertical transport clutch [I] energizes to feed the paper to the vertical paper feed section.
Separation Roller Release



Detailed Descriptions

A294D602.WMF

The separation roller [A] is normally away from the feed roller [B]. When the paper feed station is selected, the separation roller solenoid [C] contacts the separation roller with the feed roller as explained on the previous two pages.

This contact/release mechanism has the following three advantages:

- 1. When the paper feed motor turns on, all the separation rollers in the three feed stations rotate. If the separation roller is away from the feed roller, it reduces the load on the paper feed motor and drive mechanism, and it also reduces wear to the rubber surface of the separation roller caused by friction between the separation roller and the feed roller.
- 2. After paper feed is completed, paper sometimes remains between the feed and separation rollers. If the feed tray is pulled out in this condition, this paper might be torn. When the separation roller is away from the feed roller, the remaining paper can be removed from between the rollers.
- 3. When paper misfeeds occur around this area, the user can easily pull out the jammed paper between the feed and the separation rollers if the separation roller is away from the feed roller.

After paper feed and the paper feed clutch tuns off, the paper feed motor still turns the separation roller [A] in reverse. The separation roller, still contacting the feed roller, turns the feed roller in reverse for 100 ms. Then the separation solenoid turns off.

Paper Skew Prevention



A294D603.WMF

The paper press arms [A] on each side press down both sides of the paper, especially if the paper is curled. This helps to prevent paper skew or jams.

2.8.5 REMAINING PAPER/PAPER END DETECTION – TRAYS 2 & 3



Remaining Paper Detection

The lift motor [A] rotates when the tray is pushed in. The machine's CPU detects the remaining paper by monitoring the lift motor rotation angle (4 levels).

End Detection

If there is paper in the tray, the paper stack lifts the paper end feeler [B] and the paper end sensor [C] is deactivated. When the paper tray runs out of paper, the paper end feeler drops into the cutout [D] in the tray bottom plate and the paper end sensor is activated.

2.8.6 PAPER SIZE DETECTION – TRAYS 2 & 3



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Paper Size	Paper Size	
Switch	A4/A3 Version	LT/DLT Version
00111	A3-L	11" x 17"-L
00011	81/4" x 13"	81/2" x 14"-L
10011	A4-L	81/2" x 11"-L
01001	A4-S	81/2" x 11"-S
00100	81/2" x 13"	51/2" x 81/2"-S
00010	—	8" x 10"-S
00001	A5-S	8" x 10"-L
10000	8 k-L (Taiwan version only)	8" x 13"-L
11000	16 k-L (Taiwan version only)	10" x 14"-L
11100	16 k-S (Taiwan version only)	11" x 15"-L
11110	*	*

Actuated - 0 De-actuated - 1 L: Lengthwise S: Sideways

For the 1st feed tray, the paper size has to be stored with SP5-019-001.

For the 2nd and 3rd feed tray (universal trays), the paper size switch [A] detects the paper size. The paper size switch contains five microswitches. The paper size switch is actuated by an actuator plate [B] at the rear of the tray. Each paper size has its own unique combination as shown in the table and the CPU determines the paper size by the combination.

Using the asterisk setting (*), a wider range of paper sizes can be used, but the size has to be entered with a UP mode.

	Metric version	Inch version
Main Scan Direction	148 mm ~ 297 mm	5.9" ~ 11.8"
Sub Scan Direction	210 mm ~ 432 mm	8.3" ~ 17.0"

2.8.7 TRAY LOCK - TRAYS 2 & 3



Detailed Descriptions

A294D618.WMF

When the tray is placed in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the support bracket to lock the tray in the proper position.

2.8.8 TANDEM FEED – TRAY 1

Overview



1,000 sheets of paper can be set in each of the left [A] and right trays [B]. Paper is fed from the right tray. When the paper in the right tray runs out, the paper in the left tray automatically transfers to the right tray. After the paper transfer to the right tray, paper feeding resumes.

Normally both the right and the left trays are joined together. However, during copying, if there is no paper in the left tray, the left tray can be pulled out to load paper. During that time, the right tray stays in the machine and paper feed continues.

Connecting the Left and Right Sides of the Tray



A294D703.WMF

A294D704.WMF



A294D654.WMF

Normally the left tray lock lever [A] in the left tray catches the pin [B] in the right tandem tray. During copying, if there is no paper in the left tray, the tandem tray connect solenoid [C] turns on to release the tray lock lever so that the left tray separates from the right tray. Therefore, the left tray can be pulled out to load paper while paper is still being fed into the machine from the right tray.

When the tandem tray is drawn out fully, the projection [D] pushes up the left tray lock lever [A] so that both trays separate for easier paper loading.

Paper Lift/Remaining Paper Detection

The machine detects when the 1st tray has been placed in the machine by monitoring the tray set signal through the connector.



When the machine detects that the 1st paper tray is set in the machine, the right 1st tray paper sensor [N] (under the tray) checks whether there is paper in the right tandem tray.

NOTE: The right half of the tray holds up to 1,000 sheets. So, if the right 1st tray paper sensor was not present and the tray was empty, the bottom plate would have to lift up fully until the paper end sensor at the top of the tray detected that there was no paper, and this would waste several seconds.

If paper is detected, the lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] of the lift shaft [D]. The tray wires [E] are fixed in the slots [F] at the ends of the tray support rods [G, H]. When the lift motor rotates clockwise, the tray support rods and the tray bottom plate [I] move upward. The tray goes up until the top paper pushes up the pick-up roller and the lift sensor in the 1st feed unit is activated, and the paper end sensor at the top of the tray is deactivated.

When the actuator [K] on the front end of the right support rod [G] activates the paper height sensors [J], the remaining paper capacity is detected (4 levels).

When removing the tray, the coupling gear [B] separates from the pin [C], so that the tray bottom plate moves downward. The tray lowers until the actuator activates the tray down sensor [L]. The damper [M] lets the tray bottom plate drop down slowly.





A294D098.WMF

When the lift motor turns on, the pick-up solenoid [A] activates to lower the pick-up roller [B]. When the top sheet of paper reaches the correct height for paper feed, the paper pushes up the pick-up roller and the actuator [C] on the pick-up roller supporter [D] activates the lift sensor [E] to stop the lift motor.

After several paper feeds, the paper level gradually lowers then the lift sensor is de-activated and the lift motor turns on again until the lift sensor is activated again.

When the tray is drawn out of the feed unit, the lift motor coupling gear [F] disengages the pin [G] of the lift shaft [H], then the tray bottom plate [I] drops (the damper slows the fall, as explained on the previous page).

There is also a paper end sensor for the 1st tray, which works in the same way as the sensor in the 2nd and 3rd trays.

Side Fence Drive



The side fences [A] of the right tray are normally closed. They open only when paper in the left tray is moving to the right tray.

The side fence solenoids [B] drive the side fences. When the paper loaded in the left tray transfers to the right tray, the side fence solenoids turn on to open the side fences until the side fence open sensors [C] activate.

When the rear fence in the left tray has pushed the stack of paper into the right tray, the side fence solenoids turn off to close the side fences. Then, when the side fence closed sensors [D] actuate, the LCD displays a message advising the user to load some paper into the left side of the tandem tray.

Rear Fence Drive



A294D705.WMF

When the left 1st tray paper sensor [A] detects paper but the right 1st tray paper sensor does not, the rear fence drive motor [B] (a DC motor) in the left tray turns counter-clockwise causing the rear fence [C] to push the paper stack into the right tray.

When the actuator on the rear fence activates the rear fence return position sensor [D], the rear fence drive motor turns clockwise until the actuator activates the rear fence HP sensor [E].

While the rear fence is moving, the left 1st tray lock solenoid [F] turns on and the lock lever [G] locks the left tray.

Tray Positioning

PAPER FEED



A294D612.WMF

Tray Lock

When the feed tray is set in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the Accuride support bracket to lock the tray in the proper position.

Side-to-side Positioning

When the feed tray is set in the paper feed unit, the side-to-side positioning plate [C] presses the feed tray against the stopper [D]. By moving the positioning plate, the tray position can be changed to adjust the side-to-side registration.

2.8.9 VERTICAL TRANSPORT



The vertical transport rollers [A] in each feed unit are all driven by the paper feed motor. The vertical transport rollers and the vertical transport idle rollers [B], on the inner and outer vertical guide plates, transport the paper up from each feed unit towards the relay and registration rollers.

The vertical transport guides [C] can be opened to remove jammed paper in the vertical transport area.

2.8.10 PAPER REGISTRATION

Overview



The registration sensor [A] is positioned just before the registration rollers [B].

When the paper leading edge activates the registration sensor, the registration motor is off and the registration rollers are not turning. However, the upper relay roller (or LCT relay roller for feed from the LCT) [C] stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Then, the registration motor energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.

Registration Drive



Detailed Descriptions

The registration motor [A] drives the lower registration roller [B] through a timing belt [C] and some gears. Drive is transmitted to the upper registration roller [D] via two gears [E] at the front.

There is a paper dust remover [F] at the center of the upper registration roller [D]. This is in line with the feed rollers, where most paper dust is generated. **NOTE:** Clean the dust remover every PM visit.

2-91

Guide Plate Release



When a paper misfeed occurs between the vertical transport rollers and the registration rollers, the lower paper guide plate [A] automatically opens.

When the registration sensor is not activated at a certain jam check timing, the guide plate solenoid [B] turns on. The lever [C] raises the lock lever [D] on the guide plate to release it from the pin [E] on the rear side frame. Then the guide plate falls open.

The actuator [F] on the guide plate activates the guide plate position sensor [G] when the guide plate opens.

The user must close this guide plate manually after removing the jam, To prevent the guide plate from being left open, if the guide plate position sensor is activated, copying is disabled and a caution is displayed on the LCD panel.

2.9 IMAGE TRANSFER AND PAPER SEPARATION

2.9.1 OVERVIEW



Detailed Descriptions

The transfer belt unit consists of the following parts:

[A]: Transfer belt

A belt (length: 321 mm) with high electrical resistance which holds a high positive electrical potential to attract toner from the drum to the paper. Also, the electrical potential attracts the paper itself and helps the paper to separate from the drum.

- [B]: Transfer bias roller and transfer belt bias brush Applies transfer voltage to the transfer belt.
- [C]: Transfer belt lift lever (driven by a solenoid) Lifts the transfer belt into contact with the drum.
- [D]: Transfer power pack Generates a constant transfer current.
- [E]: Cleaning roller and cleaning roller cleaning blade Removes toner remaining on the transfer belt to prevent the rear side of the paper from getting dirty.
- [F]: Transfer belt cleaning blade Removes toner from the transfer belt. Any toner that is not removed by this blade is removed by the cleaning roller [E].

2.9.2 IMAGE TRANSFER AND PAPER SEPARATION

The registration rollers [A] feed the paper [B] to the gap between the drum [C] and the transfer belt [D].



A294D507.WMF

As soon as the leading edge of the first sheet reaches the gap between the transfer belt and the drum, the transfer belt lift lever [E] raises the transfer belt into contact with the drum. The lift lever is driven by a solenoid.



Then a positive charge is applied to the transfer bias roller [F] and transfer belt bias brush to attract the negatively charged toner [G] from the drum. It also attracts the paper and separates it from the drum.



A294D648.WMF

After the image transfer is completed, the charge on the transfer belt holds the paper to the transfer belt. After separating the paper from the transfer belt, the transfer belt is discharged by the transfer belt drive roller [A].

The transfer power pack [B] inside the transfer belt unit monitors the current (I1 and I2) fed back from the drive rollers at each end of the transfer belt to adjust the transfer current.

Then, the power pack adjusts It to keep the current through the drum (I3) constant, even if the paper, environmental conditions, or transfer belt surface resistance change.

The varistor [C] keeps the voltage at the cleaning bias roller [D] constant.

To apply a higher current to the transfer belt without a higher voltage, the bias brush [E] has been incorporated near the nip between drum and belt. This ensures that enough transfer current is applied for this machine, which has a higher copy volume.







A294D503.WMF

2.9.3 TRANSFER BELT UNIT LIFT



The transfer belt lift solenoid [A] inside the transfer belt unit turns on to raise the transfer belt into contact with the drum. The front lever [B] and the rear lever [C] are connected to the solenoid by links [D], and they push up the stays [E] when the solenoid turns on.

The support spring [F] helps the solenoid to raise the transfer belt.

The solenoid turns off after the copy job is finished.

The transfer belt must be released from the drum for the following reasons:

- 1. To prevent the ID sensor pattern on the drum from being rubbed off by the transfer belt, because the transfer belt is located between the development unit and the ID sensor.
- 2. To decrease the load on the bias roller cleaning blade, it is better to prevent toner on non-image areas (for example VD, VH, ID sensor patterns developed during process control data initial setting) from being transferred onto the transfer belt.
- 3. To prevent drum characteristics from being changed by remaining in contact with the rubber belt.

2.9.4 PAPER TRANSPORTATION AND BELT DRIVE



Detailed Descriptions

A294D402.WMF

The drum motor [A] drives the transfer belt through belts and gears. Since the transfer belt electrically attracts the paper [B], a transport fan is not required.

At the turn in the transfer belt, the transfer belt drive roller [C] discharges the belt to reduce paper attraction, and the paper separates from the belt as a result of its own stiffness.

The tapered parts [D] at both ends of the roller [E] help keep the transfer belt [F] in the center, so that it does not run off the rollers.



2.9.5 TRANSFER BELT CLEANING



Some toner may adhere to the transfer belt when paper jams occur. The adhered toner must be removed to prevent the rear side of the copy paper from getting dirty.

The cleaning blade [A] scrapes off any toner remaining on the transfer belt. This is a counter blade system.

Even if the toner is not completely removed due to paper dust stuck on the transfer belt cleaning blade [A], the positively charged cleaning bias roller [B] attracts the remaining toner. The bias roller cleaning blade [C] scrapes toner off the cleaning bias roller.

The surface of the transfer belt is coated to make it smooth and prevent the transfer belt from flipping the cleaning blade.

The toner collection coil [D] transports toner cleaned off the transfer belt to the waste toner collection bottle (see Toner Supply and Recycling for more on this).

2.9.6 TONER COLLECTION



Detailed Descriptions

A294D505.WMF

Transfer belt drive is transmitted to the toner collection coil [A] through idle gears [B]. The toner collection coil [C] transports the collected toner to the toner recycling unit [D] and from there it goes to the waste toner collection bottle.

See Toner Supply and Recycling for details.

2.9.7 TRANSFER ANTI-CONDENSATION HEATER

A294D048.WMF

The transfer anti-condensation heater [A] is located under the transfer belt unit. It turns on when the main switch is off to prevent moisture from forming on the transfer belt.

The heater is included in the machine at the factory, but the connector is not connected.

2.10 FUSING

2.10.1 OVERVIEW



Detailed Descriptions

After transferring the image, the copy paper enters the fusing unit. A heat and pressure process using a hot roller [A] and a pressure roller [B] fuses the image to the copy paper.

There are three identical fusing lamps (530 W each) [C] inside the hot roller. They are turned on and off to maintain the operating temperature of 175°C. The CPU monitors the hot roller surface temperature through a thermistor [D], which is in contact with the hot roller's surface. A thermofuse [E] protects the fusing unit from overheating.

The fusing exit sensor [F] monitors the progress of the copy paper through the fusing unit and acts as a mis-feed detector while the exit rollers drive the copy paper to the inverter section.

The oil supply roller and cleaning web [G] applies a light coat of silicone oil to the hot roller. It also removes the paper dust on the hot roller.

The hot roller and pressure roller have stripper pawls [H] to prevent wrap-around jams.

The pressure roller is cleaned by a steel cleaning roller [I]. Toner adheres to steel more readily than to silicone rubber.

2.10.2 FUSING ENTRANCE GUIDE



A294D009.WMF

The entrance guide [A] for this machine is adjustable for thick or thin paper by changing the screw position from the upper to the lower.

With thin paper, set the entrance guide in the upper position. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit.

With thick paper, set the entrance guide in the lower position. This is because thick paper does not bend as easily, and is therefore less prone to creasing. In addition, the lower setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy.

In this model, the transfer belt improves paper transport and stabilizes the paper path to the fusing entrance. This reduces the chance of paper creasing due to paper skews in the fusing unit.

Use the screws to adjust the guide plate position. Since there are very few reasons to change the guide plate position, there is no guide plate position adjustment lever for customer use.

2.10.3 FUSING UNIT DRIVE



Detailed Descriptions

A294D510.WMF

The fusing drive gear [A] transmits drive from the fusing/duplex drive motor [B] to the gear [C], which drives the hot roller gear [D]. Rotation passes from the gear [C] through an idle gear to the exit roller drive section. The pressure roller is driven by the friction between the hot and pressure rollers.

2.10.4 FUSING LAMP CONTROL



After turning the main switch on, the CPU turns on all three fusing lamps one at time, with a 1 second interval between each lamp turning on. This prevents the power on the AC line from dropping suddenly.

When the fusing temperature reaches 155°C, the machine starts the process control data initialization. If the fusing temperature was already above 100°C when the main switch was turned on, the process control initial setting is not done.

When the fusing temperature reaches 155°C, the copier starts fusing idling. If the fusing temperature was already above 155°C at power on, fusing idling is not done.

When the temperature has reached 177°C, the warm-up period is completed and the "Ready" indicator turns on. After this, the machine maintains a fusing temperature of 173°C.

In stand-by mode, one of the fusing lamps turns on alternately to maintain the ready temperature. During the copy cycle, the three fusing lamps maintain the operating temperature; if they have to turn on, they turn on one at time, with a 1 second interval between each lamp.

The CPU changes the fusing lamp on period depending on the temperature measured by the thermistor, to keep the fusing temperature as close as possible to the target temperature.

If one lamp breaks during copying, the machine still works. But, if it discovers a broken lamp just after being switched on, an SC occurs and copying is impossible.

The machine uses on-off control mode to maintain the fusing temperature.

Even if thick paper mode is selected, fusing temperature control does not change.

2.10.5 OIL SUPPLY AND CLEANING

The oil supply and cleaning web [A] feeds the web felt soaked with silicone oil. The roller [B] contacting the web felt also contacts the hot roller because of pressure from springs [C]. It applies a light coat of silicone oil to the hot roller and removes paper dust from the hot roller. A spring clutch inside the mechanism pulls the web to take up the slack, to prevent it getting pulled in between the fusing rollers.

Every 40 s during printing, the oil supply/cleaning web motor turns for 0.8 s to move the oil supply and cleaning web felt. This 40-second interval starts when the first copy reaches the fusing exit sensor, and ends 2 s after the last copy has passed this sensor. SP1-902-2 & 3 adjust the motor rotation interval and rotation time.

SP1-902-1 displays the web consumption. When the web consumption exceeds the value set with SP1-902-4 (web near-end), the machine indicates web near-end on the operation display. The machine still works until the oil supply/cleaning web end sensor [D] detects when the feeler [E] drops from the web. At this time, SC550 is indicated in the operation panel display. In this condition, a technician must install a new oil supply and cleaning web, and return SP1-902-1 to 0. Then, the SC will be cleared.

Adjust SP1-902-4 (web near-end) to change the near-end period. The default is 100%. With this setting, about 400 k copies can be made before the near-end message is displayed. After that, another 40 k can be made until the web ends. If this SP is changed to 80%, about 320 k copies can be made before the near-end message is displayed. After that, another 120 k can be made until the web ends. These figures assume that 80% of the user's output is A4 sideways.



A294D553.WMF



A294D504.WMF



2.10.6 PAPER COOLING



A294D653.WMF

The paper cooling pipe cools the copy paper after it has gone through the fusing unit. This prevents the temperature around the drum from increasing in duplex mode.

The paper cooling pipe has fins at the rear end. A fan cools the fins.

The paper cooling pipe has a hollow metal tube inside. Water capillary tubes [A] run along the inside of the paper cooling pipe, and these transfer heat within the pipe. The hot paper [B] leaving the fusing unit heats the parts of the cooling pipe that it touches (black arrows [C]), causing the water in the pipe to vaporize. This creates a high-speed flow of steam [D] to the ends of the pipe, which are cooler, and especially to the rear end [E], which is well away from the paper feed path, and has the cooling fins [F] attached to it. When the steam reaches that area, it cools and condenses. The condensed water is returned to the heated part of the pipe by capillary action.

This cycle (vaporization \rightarrow steam transfer \rightarrow condensation) repeats again and again. The paper cooling pipe transfers heat from the paper to the fins continuously.

The paper cooling pipe fan [G] in the duct [H] at the machine rear side cools the fins [F].

2.10.7 FUSING PRESSURE



Fusing pressure is constantly applied between the hot roller [A] and pressure roller [B] by the upper pressure lever [C] and lower pressure lever [D], which are lifted by the fusing unit release lever [E] via the pressure cam [F]. The pressure can be adjusted by using the pressure adjustment screw [G].

The fusing pressure is released by turning the fusing unit release lever counterclockwise.

2.10.8 HOT ROLLER STRIPPER RELEASE



For easier jam removal, when the hot roller stripper unit [A] is opened, the stripper pawls [B] turn clockwise to expand the jam removal area.

2.11 PAPER EXIT/DUPLEX

2.11.1 OVERVIEW



The printed page from the fusing unit goes either straight through to the output tray or finisher, or downward through to the inverter or duplex unit, depending on the position of the junction gate [A].

If the page is fed out directly, it arrives on the tray face-up. If the user selected face-down output, the page goes to the inverter [B] before being fed out.

If the user selects duplex mode, the page is directed to the duplex tray [C] after inverting, and back to the machine for printing the second side.

2.11.2 PAPER EXIT MECHANISM



Drive from the fusing/duplex motor is transmitted to the paper exit roller [A] and transport rollers [B].

To feed the printed page from the fusing unit straight through to the output tray or finisher, the inverter gate solenoid [C] energizes to open the junction gate [D]. To feed the page to the inverter and duplex unit, the solenoid stays off.

2.11.3 DUPLEX DRIVE MECHANISM



Detailed Descriptions

A294D801.WMF

The duplex drive coupling gear [A] transmits drive from the fusing/duplex drive motor [B] to the duplex unit.

The duplex transport clutch [C] transmits this drive to the duplex transport section, the inverter exit roller clutch [D] transmits it to the duplex inverter exit section, and the duplex feed clutch [E] transmits it to the duplex paper feed-out section.

The inverter exit roller clutch engages the drive (i.e., the roller turns) while the clutch is not energized. This clutch disengages the drive when the clutch is turned on. This prevents the clutch from being energized for a long time.

2.11.4 INVERTER

Feed-in and Jogging



The inverter feed roller [A] feeds paper to the jogger section. After the trailing edge of the paper passes through the inverter feed roller, the jogger fences [B] move to square the paper. This happens every page.

The jogger motor (a stepper motor) [C] moves the jogger fences [B] inward or outward.

When the main switch is turned on, the jogger motor places the jogger fences at the home position, which is determined by monitoring the signal from the jogger home position sensor [D].

When the start key is pressed, the jogger motor positions the jogger fences 15 mm away from the selected paper size to wait for the paper.

When the paper is delivered to the jogger fences, the jogger fences move inward to square the paper. After this, the jogger fences move back to the previous position (15 mm away from the paper).
Feed-out



After jogging, the reverse roller solenoid [A] energizes to push down the reverse trigger roller [B]. The reverse roller [C] turns counterclockwise continuously, so the paper starts to reverse when the reverse trigger roller is down and catches the paper between the rollers. The inverter guide plate solenoid [D] energizes to lower the inverter guide plate [E], so that the paper is guided by the inverter guide plate. The next sheet waits at the inverter guide plate.

The paper is fed from the reverse roller to the inverter exit roller [F]. After the paper starts to be fed by the inverter exit roller, the reverse trigger roller and inverter guide plate move back up.

2.11.5 DUPLEX TRAY FEED MECHANISM



In duplex mode, after the paper leaves the inverter, the duplex inverter gate solenoid [A] switches the junction gate [B] to direct the paper to the duplex tray. The paper is fed through the duplex tray by duplex transport rollers 1 [C], 2 [D], 3 [E], and the duplex feed roller [F].

If duplex mode is not selected, the solenoid does not switch the junction gate, and the paper goes to the output tray or finisher face down.

2.11.6 BASIC DUPLEX FEED OPERATION

To improve the productivity of duplex copying, a non-stacking style duplex mechanism is adopted. This type of mechanism allows more than one page to be processed at once, in a process called 'interleaving'. Examples of this are given below.

For paper lengths up to A4/Letter sideways, the top duplex speed is possible, with the duplex unit processing four sheets of copy paper at the same time.

For paper longer than this, the duplex tray can process two sheets of copy paper at once.

For a single-set duplex copy job, the duplex unit stores only one sheet of copy paper. For a multi-set duplex job, the job is stored first, then the first set is made using inerleaving.



Length up to A4/Letter Sideways

The duplex unit can process four sheets of copy paper

Example: A 14-page copy. The large numbers in the illustration show the order of pages. The small numbers in circles show the order of sheets of copy paper (if shaded, this indicates the second side).

$$\begin{array}{c}
1 \\
1 \\
2
\end{array} \Rightarrow \begin{array}{c}
5 \\
3
\end{array} \Rightarrow \begin{array}{c}
7 \\
4
\end{array} \Rightarrow \begin{array}{c}
2 \\
1
\end{array} \Rightarrow \begin{array}{c}
9 \\
9 \\
5
\end{array} \Rightarrow \begin{array}{c}
4 \\
2
\end{array}$$

A294D550.WMF

- 1. The first 4 sheets are fed and printed.
 - 1) 1st sheet printed (1st page)
 - 2) 2nd sheet printed (3rd page)
 - 3) 3rd sheet printed (5th page)
 - 4) 4th sheet printed (7th page)



A294D807.WMF

PAPER EXIT/DUPLEX

- 2. The back of the 1st sheet is printed (2nd page).
- 3. The 2nd, 3rd, 4th sheets (3rd, 5th, and 7th pages) go into the duplex unit.
- 4. The 5th sheet (9th page) is fed in.



A294D808.WMF

- 5. The 5th sheet is printed (9th page).
- 6. The 1st sheet is fed out (1st and 2nd pages printed).



- 8. The 6th sheet (11th page) is fed.
- 9. The back of the 2nd sheet is printed (4th page).



A294D809.WMF



A294D810.WMF

- 10. The 2nd sheet is fed out (3rd and 4th pages printed).
- 11. The 6th sheet is printed (11th page) and directed to the duplex unit.
- 12. The back of the 3rd sheet (6th page) is printed.
- 13. The 7th sheet is fed and printed (13th page).
- 14. The back of the 4th sheet is printed (8th page) and fed out (7th and 8th page).



- 15. The back of the 5th sheet is printed (10th page) and fed out (9th and 10th pages).
- 16. The back of the 6th sheet is printed (12th page) and fed out (11th and 12th pages).
- 17. The back of the 7th sheet is printed and fed out (13th and 14th pages).

Longer than A4/Letter Sideways

The duplex unit can process two sheets of copy paper

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



- 1. The first 2 sheets are fed and printed.
 - 1) 1st sheet printed (1st page)
 - 2) 2nd sheet printed (3rd page)



A294D857.WMF



PAPER EXIT/DUPLEX

2. The first 2 sheets go into the duplex unit.



A294D858.WMF

- 3. The back of the 1st sheet (2nd page) is printed.
- 4. The 3rd sheet (5th page) is fed and printed.



A294D859.WMF

0

A294D860.WMF

(7p)

- 5. The 1st sheet (1st and 2nd pages) is fed out.
- 6. The back of the 2nd sheet (4th page) is printed.
- 7. The 4th sheet (7th page) is fed and printed.
- 8. The 2nd sheet (3rd and 4th pages) is fed out.
- 9. The back of the 3rd sheet (6th page) is printed.



A294D861.WMF

- 10. The 3rd sheet (5th and 6th pages printed) is fed out.
- 11. The back of the 4th sheet (8th page) is printed.
- 12. The 4th sheet (7th and 8th pages) is fed out.

2.12 ENERGY SAVER MODES

2.12.1 OVERVIEW



Descriptior

A294D647.WMF

When the machine is not used, the energy saver function reduces power consumption by decreasing the fusing temperature.

This machine has three energy saver modes.

- 1) Energy saver (Panel off) mode
- 2) Low power mode
- 3) Off mode (this has two modes, Auto Off Mode and Weekly Timer Off Mode)

These modes are controlled by the following UP modes.

- Panel off timer: The machine enters energy saver (panel off) mode when this runs out
- Energy saver timer: The machine enters low power mode when this runs out
- Auto off timer: The machine enters auto off mode when this runs out
- Weekly timer programming: Programs a timer for the machine to switch itself on and off (this is for Weekly Timer Off Mode)
- Auto off mode disabling (User Tools System Setting Count Manager AOF) If auto off mode is disabled, the machine will never enter auto off mode. The fusing lamps will always stay on, but the machine will still be able to enter energy saver and low power modes.

The way that the machine operates depends on the combination of installed equipment (copier only, copier/printer).

2.12.2 ENERGY SAVER (PANEL OFF) MODE

Entering Energy Saver (Panel Off) Mode

The machine enters energy saver mode (also known as 'panel off mode') when one of the following is done.

- The panel off timer runs out after the end of a job.
 - **NOTE:** If the panel off timer is 0, the machine will wait for the energy saver timer to run out, and then it will go straight to low power mode (see Low Power Mode).
- The Clear Mode/Energy Saver Key is held down for a second.

What Happens in Energy Saver (Panel Off) Mode

When the machine enters energy saver (panel off) mode, the fusing unit temperature stays at 173°C and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED. There is only one energy saver level.

If the CPU receives the image print out command from an application (e. g. to print data from a PC), the fusing temperature rises to print the data. However, the operation panel stays off.

Return to Stand-by Mode

If one of the following is done, the machine returns to stand-by mode:

- The Clear Mode/Energy Saver Mode key is pressed
- Any key on the operation panel is pressed
- An original is placed in the ADF
- The ADF is lifted

The recovery time from energy saver to rise the fusing temperature is about **0 s**. **NOTE:** The polygon motor needs 10 seconds to reach the correct speed.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5 V	Main Power LED
Energy Saver	On	On	173°C	On	On

2.12.3 LOW POWER MODE

Entering Low Power Mode

The energy saver timer runs out after the end of a job. **NOTE:** The energy saver timer cannot be cancelled.

What Happens in Low Power Mode

The fusing lamp drops to 143°C. The other conditions are the same as for energy saver (panel off) mode.

Return to Stand-by Mode

The machine returns to standby mode in exactly the same way as from energy saver (panel off) mode.

Recovery	Operation	Energy	Fusing	System +5 V	Main Power
Time	Switch	Saver LED	Temp.		LED
About 40 seconds	On	On	143°C	On	On

2.12.4 **OFF MODE**

Off mode has two separate modes.

- Auto Off Mode (Sleep mode)
- Weekly Timer Off Mode

Off Mode (Sleep Mode)

Entering Off Mode

The machine enters off mode when one of the following is done.

- The auto off timer runs out after the end of a job
- The operation switch is pressed to turn the power off

What Happens in Off Mode

When the machine enters auto off mode, the operation switch turns off automatically. The fusing lamp and all dc supplies except +5 VE (+5 V for energy saver mode) turns off. At this time, only the main power LED is lit.

Operation Switch	Energy Saver LED	Fusing Temp.	System +5 V	Main Power LED
Off	Off	Room Temp. (Fusing lamp off)	Off	On

NOTE: Only +5 VE is supplied to the SICU.

LED (+5 V) is supplied to the operation panel from the SICU.

Returning to Stand-by Mode

The machine returns to stand-by mode when the operation switch is pressed.

Printing Incoming Data

If the machine receives print data from a PC, the fusing temperature rises to print the data. However, the operation panel stays off. After completing the print job, the machine returns to off mode (sleep mode).

Weekly Timer Off Mode

Weekly Timer

The user can program 'on periods' and 'off periods' for each day of the week.

Entering Weekly Timer Off Mode

The machine enters this mode when:

- The auto off timer runs out after the end of a job, and the weekly timer has already reached the start of an off period
- The operation switch is pressed to turn the power off, and the weekly timer has already reached the start of an off period
- The weekly timer reaches the start of an off period while in Off Mode.

What Happens in Weekly Timer Off Mode

When the machine enters this mode, the operation switch turns off automatically. The fusing lamp and all dc supplies except +5VE (+5V for energy saver mode) turn off. At this time, only the main power LED is lit.

Operation Switch	Energy Saver LED	Fusing Temp.	System +5 V	Main Power LED
Off	Off	Room Temp. (Fusing lamp off)	Off	On

NOTE: Only +5 VE is supplied to the SICU.

LED (+5 V) is supplied to the operation panel from the SICU.

Returning to Stand-by Mode

If a weekly timer code (Key Operator Code for Off Setting - UP mode) is set, the machine returns to stand-by mode when the operation switch is pressed and the weekly timer code is entered.

If a weekly timer code is not set, the machine returns to stand-by mode when the operation switch is pressed.

Printing Received Data

If no weekly timer code is set:

If the machine receives print data from a PC, the fusing temperature rises to print the data. However, the operation panel stays off. After completing the print job, the machine returns to weekly timer off mode.

If a weekly timer code is set:

When print data is sent from a PC, the printer stays off-line. After someone enters the weekly timer code, the printer will go on-line and print the data.

2.12.5 SUMMARY

For reference, the following flow chart summarizes the various energy saver modes, and their entry and exit conditions.



A294D649.WMF

Anti-condensation Heaters

All the anti-condensation heaters are unplugged. The tranfer anti-condensation (drum) heater is still on the machine. However, the tray heaters and optics anticondensation heater are not mounted on the machine (option).

2.13 OTHERS

2.13.1 OPERATION UNIT

The operation unit consists of the LCD, touch panel, hard keys, back light (cold cathode tube) and the status indicator lamp. A 10.4 inch full color LCD (640 x 480 dot) is used for the operation panel. This operation panel is controlled by the LCD controller on the SICU board inside the copier.

The information on the LCD can be displayed in 256 colors using an 8-bit color scheme (3 bits for R, 3 bits for G, and 2 bits for B).

The status indicator on the top of the operation unit shows the condition of the machine as follows:

- Off: The machine is ready.
- Green (lights): Copying
- Green (blinks): Scanning originals
- Red (blinks): Toner is running out.
- Red (lights): The machine has a problem.

2.13.2 DOOR SAFETY SWITCH LOCK TOOLS



A294D942.WMF

There are two service tools are initially placed on the rear side of the left tandem tray. These tools can be used to hold the front door safety switches when the front doors are opened.

- 1. When the inner cover is installed, the front door safety switches can be held as shown in the illustration [A].
- 2. When the inner cover is removed, the front door safety switches can be held as shown in the illustration [B].

2.13.3 HDD CONTROL

This model has two hard disks to store image data. This allows scanned images to be stored to one hard disk while image data is printed from the other hard disk. Because of this, printing speed does not drop if printing and scanning are done at the same time.

There are two modes (selected with the 'Memory Allocation' UP mode) which determine how the hard disks are shared between normal copy jobs and copy server jobs. The initial setting is "Copier Priority" and the data for copy server jobs is stored only on HDD 1 (this is the disk at the front side).

The following table shows the capacity of the hard disks used for each function.

UP Setting for "Memory Allocation"	HDD 1 (Fro	nt)	HDD 2 (Re	ar)
Copier Priority	Copy Jobs:	0.82 GB	Copy Jobs:	3.35 GB
	Copy Server Jobs:	3.08 GB	Copy Server Jobs:	Not used
	Printer Jobs:	0.20 GB	Printer Jobs:	0.76 GB
Max. Memory for Document	Copy Jobs:	1.23 GB	Copy Jobs:	1.23 GB
Server	Copy Server Jobs:	2.57 GB	Copy Server Jobs:	2.57 GB
	Printer Jobs:	0.31 GB	Printer Jobs:	0.31 GB

When a Copy Job is Done

Basically, the scanned image is stored on the hard disk that has the largest remaining capacity. (If the remaining capacity is the same, the image is stored in HDD 1.) If one hard disk is already being used for printing or while transporting image data from a hard disk to the CD-RW, the other hard disk is used to store new data regardless of the remaining capacity.

Even if the selected hard disk becomes full, data storage continues using the other hard disk. If both hard disks becomes full, data storage stops and a message is displayed on the screen.

When a Copy Server Job is Done

Initially, "Copier Priority" is selected for "Memory Allocation" in UP mode. In this setting, only HDD 1 is used for copy server jobs. If "Max. Memory for Document Server" is selected, HDD 1 and HDD 2 each have the same areas for normal copy jobs and copy server jobs. The hard disk with the greater remaining capacity is selected to store the image if neither hard disk is being used (same as for a copy job).

The image files stored in the hard disks are managed in the NVRAM on the SICU. When the NVRAM is replaced or a memory clear is done, all the copy server files are deleted.

If one of the hard disks is replaced or if SP4-911-1 (HDD 1 Media Check) or SP4-912-1 (HDD 2 Media Check) is performed, the file data in the NVRAM is updated and the deleted files (in the replaced HDD) will not be displayed.

Limitation when "Max. Memory for Document Server" is Selected

Magazine mode cannot be used for a copy server job if "Max. Memory for Document Server" is selected. This is because parts of a data file could be stored on separate hard disks, and the image data cannot be combined if that happens.

Machine Operation when Hard Disk(s) is Defective

If one of the hard disks is defective, copying is done using the other hard disk. There is no disabled function but the productivity will be reduced when image scanning is done during printing.

If both of the hard disks are defective, functions which need a hard disk (duplex, sort, next job, etc.) are disabled.

If HDD 1 is defective, copy server functions cannot be used in "Copier Priority" mode. An SC code is displayed when a copy server function is selected, but the machine can be operated if that function is not selected. If "Max. Memory for Document Server" is selected, copy server functions can be operated using the remaining hard disk.

Stamp Function

Preset stamp data is stored in the hard disks in the factory. The data is stored in both of the hard disks, so that the data can be read regardless of which hard disk is used for other functions. When a user stamp is programmed, the stamp data is stored in both of the hard disks.

If SP4-911-1 (HDD 1 Media Check) or SP4-912-1 (HDD 2 Media Check) is performed, the preset stamp data and user stamp data are erased from both of the hard disks. (This is because the stamp data on each disk must be exactly the same, and if only one set of data is erased, it is possible that different data will become stored on each disk.) The stamp data must be reinstalled using a flash memory card after one of the hard disks is replaced. Refer to Stamp Data Installation in section 4.

2.13.4 DATA PATH THROUGH THE INTERFACE BOARD

When the connect copy kit, CD-ROM reader/writer, or printer controller is used, the image data are transferred through the interface board as shown in the diagram below.



Detailed Descriptions

A294D994.WMF

- GACNIU_B: An ASIC which handles the data transmission between the memories in the SICU and CD-ROM reader/writer or the connect copy interface.
- LVDS: A noise-resistant interface
- IMACB: AN ASIC which controls data memory
- H8: A CPU which controls the SCSI controller

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

- 1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
- 2. Humidity Range: 15% to 80% RH
- 3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight or strong light)
- 4. Ventilation: Room air should turn over at least 3 times per hour
- 5. Ambient Dust: Less than 0.10 mg/m³ ($2.7 \times 10^{-6} \text{ oz/yd}^3$)
- 6. If the place of installation is air-conditioned or heated, do not place the machine where it will be:
 - 1) Subjected to sudden temperature changes
 - 2) Directly exposed to cool air from an air-conditioner
 - 3) Directly exposed to heat from a heater
- 7. Do not place the machine where it will be exposed to corrosive gases.
- 8. Do not install the machine at any location over 2,000 m (6,500 feet) above sea level.
- 9. Place the copier on a strong and level base.
- 10. Do not place the machine where it may be subjected to strong vibrations.

3.1.2 MACHINE LEVEL

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

Installation

3.1.3 MINIMUM SPACE REQUIREMENTS

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





3.1.4 POWER REQUIREMENTS

E

- 1. Make sure the plug is firmly inserted in the outlet.
- 2. Avoid multi-wiring.
- 3. Do not set anything on the power cord.
- 1. Input voltage level: 220 ~ 240 V, 50/60 Hz: More than 16 A
- 2. Permissible voltage fluctuation: 10%

Installation

3.2 COPIER (A294)

3.2.1 ACCESSORY CHECK



A294I001.WMF

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

Des	cription C	Quantity
1.	Operation Unit	. 1
2.	Upper Cover - Operation Unit Holder	. 1
3.	Lower Cover - Operation Unit Holder	. 1
4.	Operation Unit Arm	. 1
5.	Right Arm Cover	. 1
6.	Arm Upper Cover	. 1
7.	ADF Exit Tray	. 1
8.	Optics Dust Filter	. 1
9.	Dust Filter	. 1
10.	Leveling Shoe	. 4

11. Operating Instruction Holder	1
12. Metal Cable Clamp	1
13. Tapping Screw - M4 x 8	25
14. Tapping Screw - M4 x 12	2
15. Philips Pan Head Screw - M4 x 6	1
16. Paper Size Decal	1
17. Decal – Face Up	1
18. Nylon Clamp	1
19. Model Name Plate (-10, -15, -22 machines) - not shown	1
20. Operating Instructions – not shown	2

3.2.2 INSTALLATION PROCEDURE



Installation

COPIER (A294)

NOTE: Since the installation procedure is not packed with the copier as an accessory, always bring this manual with you.



A294I004.WMF

Keep the power cord unplugged when starting the following procedure.

- NOTE: 1) Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future. 2) Insert the leveling shoes [A] under the leveling feet [B], and level the
 - machine before starting the installation.
- 1. Remove all strips of tapes as shown above.
- 2. Keep the factory data sheet [C] for future use.



- 3. Pull out the tandem tray and remove the tray lock plate [A] (1 screw) and 1 cushion between trays.
- 4. Pull out the foam cushion between trays 2 and 3.
- 5. Open the front door and remove the strips of tape.
- 6. Remove the inner cover [B] (3 screws).
- 7. Remove the blade release pin [C] and the transfer belt lock plate [D] (1 screw).
- 8. Remove the screw [E] that holds the drum stay [F].



- 9. Remove the drum stay knob [G] and the drum stay (turn the knob clockwise to remove it).
- 10. Remove the tape and foam cushion from fusing unit.
- 11. Disconnect the two connectors [A].
- 12. Pull out the development unit [B] as shown.
 - **NOTE:** 1) To prevent scratches on the drum, push the development unit to the right while pulling it out.
 - 2) When pulling out the development unit, do not pull the knob [C].
 - 3) Place the development unit on a clean sheet of paper, to prevent foreign matter from being attracted to the sleeve rollers.
- 13. Remove the toner hopper [D] (2 screws).
- 14. Pour in one pack of developer [E] while turning the knob [F]. Distribute the developer evenly along the development unit.
- 15. Attach the toner hopper to the development unit.
- Install the development unit in the machine and connect two connectors.
 NOTE: When reinstalling the development unit, confirm that the harness layout is as shown [G].
- 17. Attach the drum stay and attach the drum stay knob and one screw.
- 18. Reinstall the inner cover.



- 19. Remove the right upper cover [A] (4 screws).
- 20. Pass the harness through the operation unit arm [B], and install the arm as shown (9 screws).
- 21. Connect the 2 connectors [C] of the operation unit.
- 22. Secure the harness clamp [D] on the operation unit (one M4 x 6 pan head screw). Pass the harness [E] through the clamps as shown. Then install the operation unit on the arm (4 screws).
- 23. Set the nylon clamp [F].
- 24. Install the right arm cover [G] (3 screws) and the arm upper cover [H] (2 screws).



- 25. Install the upper [A] (3 screws) and lower [B] (3 screws) covers of the operation unit holder.
- 26. Set the dust filter [C] as shown.
- 27. Set the optics dust filter [D] as shown.
- 28. Loosen the two screws [E] of the bracket [F]. Then set the original exit tray [G].
- 29. Secure the original exit tray with 2 M4 x 12 screws [H] and 1 M4 x 8 screw [I].
 NOTE: Do not use these M4 x 12 screws for securing the other exterior covers. They might hit a moving part inside the machine and damage that part.
- 30. Secure the bracket [F] to the operation unit arm with screw [I]. Then retighten the two screws [E] to secure the bracket to the original exit tray.
- 31. Reinstall the right upper cover [J].
- 32. Plug in the power cord and turn the main switch on. Put toner bottle(s) in the toner bank.

- 33. When the machine is ready, enter SP mode as follows:
 - 1) Press the clear modes key.
 - 2) Enter "107".
 - 3) Hold down the clear/stop key for more than 3 seconds.
- 34. Press "Copy SP" on the LCD, and perform the TD initial setting as follows: 1) Select SP No. 2-801
 - 2) Press the "Start key" on the LCD.

NOTE: This SP mode performs the TD initial setting. It will stop automatically in about 1 minute.

- 35. Supply toner from the toner bank to the toner hopper as follows:
 - 1) Select SP2-207-2 (Toner Bank Toner Supply)
 - 2) Press the "Start key" on the LCD.
 - **NOTE:** By performing this SP mode, the toner is distributed into the toner hopper and the toner transport path. It will stop automatically in about 7 minutes. If SP2-207-2 fails after SP2-801 is completed (an SC code is displayed), repeat only SP2-207-2 again.
- Installation
- 36. Change the paper size for all paper trays to suit the customer's request.
- 37. Attach the appropriate paper size decals, which are included as accessories, to each paper tray.
- 38. Attach the face-up decal to the ADF.
- 39. Check copy quality and machine operation.
- **NOTE:** The first time that the ADF is used, dust on the ADF transport belt will transfer to the exposure glass. To remove this dust, perform SP6-009 (DF Free Run) for 3 minutes, and then remove the dust on the exposure glass if necessary.

40. Initialize the electrical total counter using SP7-825, if required.

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3.3 FINISHER INSTALLATION (B302)

3.3.1 ACCESSORY CHECK



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

Description	Quantity
1. Front Joint Bracket	1
2. Rear Joint Bracket	1
3. Entrance Guide Plate	1
4. Shift Tray	1
5. Grounding Plate	1
6. Table Extension	1
7. Cushion	1
8. Tapping Screw - M3 x 6	4
9. Tapping Screw - M3 x 8	4
10. Tapping Screw - M4 x 14	4
11. Tapping Screw - M4 x 8	2
12. Installation Procedure	1

3.3.2 INSTALLATION PROCEDURE





Installation

B302I003.WMF



B302I014.WMF

B302I002.WMF



Unplug the machine power cord before starting the following procedure.

- 1. Unpack the finisher and remove the tapes and shipping retainers as shown above.
- 2. Open the front door and remove the shipping retainers. Remove the bracket [A] (2 screws) securing the stapler unit.
- 3. Install the front joint bracket [B] and rear joint bracket [C] (two M4 x 14 screws each) on the left side of the copier.
- 4. Remove the connection plate [D].



B302I107.WMF

- Install the grounding plate [A] (two M3 x 6 screws).
 NOTE: Set the grounding plate so that there is no gap between the grounding plate and the bottom frame of the finisher (as shown).
- Install the rear tray as shown [B] (two M4 x 8 screws).
 NOTE: The edge of the rear tray should be aligned with the edge of the finisher (as shown).
- 7. Attach the cushion [C] to the right side of the upper cover.
- 8. Install the entrance guide plate [D] (two M3 x 6 screws).



- 9. Open the front door of the finisher, and remove the screw [A] which secures the locking lever. Then pull the locking lever [B].
- 10. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever [B].
 NOTE: Before securing the locking lever, make sure that the top edges of the finisher and the copier are parallel from front to rear as shown [C].
- 11. Secure the locking lever (1 screw) and close the front door.
- 12. Install the shift tray [D] (four M3 x 8 screws).
- 13. Connect the finisher cable [E] to the copier.

3.4 LCT INSTALLATION (B303)

3.4.1 ACCESSORY CHECK



B303I001.WMF

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

Description

Quantity

1	Leveling Shoe	3
••		U
2.	Upper Joint Pin	2
3.	Lower Joint Pin	2
4.	Decal - Paper Size	1
5.	Decal - Tab Paper End Fence	1
6.	Tab Paper End Fence	1
7.	Philips Screw - M4 x 8	1
8.	Installation Procedure (English)	1

3.4.2 INSTALLATION PROCEDURE





Installation

B303I004.WMF

B303I003.WMF

AUTION Unplug the power cord before starting the following procedure.

- 1. Remove the strips of tape on the covers (shown in the top position of the illustration).
- 2. Open the LCT left door and remove the strips of tape holding the levers.



- 3. Remove the three small covers [A] from the upper right side cover. **NOTE:** Small cover [I] can be removed at this time, to facilitate software upgrade using a flash card.
- 4. Remove the three small covers [B] from the lower right side cover.
- 5. Install the four joint pins [C] on the right side of the copier. The pins with slots in them should be used for the upper right side cover.
- 6. Remove the two screws that secure the grounding plate [D]. Turn the plate 180 degrees (so that left becomes right, and vice-versa) and secure it with the two screws.
- 7. Remove the screw [E], which secures the locking lever [F]. Slide the locking lever toward you (about 1/2 inch).
- 8. Connect the four connectors [G] and secure the grounding wire [H] (1 screw).
- 9. Align the LCT on the joint pins, and lock it in place with the locking lever.
- 10. Insert the leveling shoes under the leveling feet and level the LCT.

3.5 PUNCH UNIT INSTALLATION (A812)

3.5.1 ACCESSORY CHECK



Installation

A812I101.WMF

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

Des	cription Q	uantity
1.	Spacer - 2 mm	1
2.	Spacer - 1 mm	2
3.	Stepped Screw - Short	1
4.	Stepped Screw - Long	1
5.	Punch Unit Knob	1
6.	Spring	1
7.	Hopper	1
8.	Tapping Screw - M4 x 10	2
9.	Screw with Flat Washer - M4 x 6	1
10.	Sensor Bracket	1
11.	Punch Position Decal	1
3.5.2 PUNCH UNIT INSTALLATION





A812I008.WMF

Unplug the copier power cord and remove the finisher from the copier before starting the following procedure.

Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw)

- 1. Remove the inner cover [C] of the finisher and remove the caps [D].
- 2. Remove the rear cover of the finisher (2 screws) and remove the transport guide plate [E] (4 screws).

Installation



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



A812I009.WMF





A812I012.WMF

A812I013.WMF

- 8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
- 9. Connect the cables [B] as shown.
- 10. Slide the hopper [C] into the finisher.
- 11. Reassemble the finisher and attach it to the copier. Then check the punch unit operation.

3.6 A3/DLT TRAY (B331)

3.6.1 ACCESSORY CHECK



Installation

B331I001.WMF

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

Description

Quantity

1.	A3/DLT Tray	1
2.	Short Connector	1
3.	Paper Size Decal	1

3.6.2 INSTALLATION PROCEDURE



B3311006.WMF





B331I707.WMF

B331I708.WMF

ACAUTION Unplug the machine before starting the following procedure.

- **NOTE:** If necessary, remove the front frame [A] (4 screws) and change the side fence positions (1 screw each).
- 1. Open the front cover.
- 2. Draw out the tandem feed tray [B] fully to separate the right tandem tray [C] from the left.
- 3. Push in the right tandem tray.
- 4. Remove the left tandem tray [D] (5 screws).

Installation



- 5. Remove the right tandem tray [A] (2 screws).
- 6. Remove the front cover [B] (2 screws).
- 7. Remove the safety switch holders [C] (1 screw each).
- 8. Connect the short connector [D] to the terminal for the right tandem tray as shown.



B331I005.WMF

- 9. Install the A3/DLT tray [A] using the screws removed in steps 4 and 5.
- 10. Install the front cover [B] and safety switch holders [C] removed in steps 6 and 7.
- 11. Access SP5-019-001, and change the paper size setting to the size required by the user.

3.7 KEY COUNTER INSTALLATION



[E]

Common Steps

- 1. Hold the key counter plates [A] on the inside of the key counter bracket [B] and insert the key counter holder [C].
- 2. Secure the key counter holder to the bracket (2 screws).
- 3. Attach the key counter cover [D] (2 screws).
- 4. Remove the small cover [E] on the right side of the copier as shown.
- 5. Remove the jumper connector [F].

If the optional LCT is not installed:

The following steps 6 to 8 are for installing the key counter without the optional LCT. If the LCT is installed, skip steps 6 to 8, and go to step 9.

- 6. Install the stepped screw [G].
- 7. Install the key counter assembly [H] (1 screw).
- 8. Instruct the user's key operator to enable the key counter with the user tools (User Tools - System Settings - Count Manager - Key Counter).



If the optional LCT is installed:

The following steps are required when the key counter is installed with the optional LCT.

- **NOTE:** The extension cable is required to install the key counter with the LCT. The cable is supplied with 6 clamps as a service part.
- 9. Remove the small cover [A] (2 screws) on the LCT right cover.
- 10. Remove the LCT right cover [B] (6 screws) and rear cover [C] (3 screws).
- 11. Install 2 clamps [D] on the right side of the LCT, then set the cable [E] in the clamps.



- 12. Install 2 clamps [A] on the rear side of the LCT. Route the cable as shown.
- 13. Install 2 clamps [B] on the left side of the LCT. Route the cable as shown.NOTE: If the cable coming from the right cover opening is too long, make a loop [C] to adjust the length.
- 14. Install the stepped screw [D].
- 15. Install the right LCT cover, then install the key counter assembly [E] (1 screw) that was assembled in steps 1 to 3.
- 16. Connect the cable [F] from the LCT to the connector in the copier. Then join the LCT to the copier.
- 17. Instruct the user's key operator to enable the key counter with the user tools (User Tools System Settings Count Manager Key Counter).

3.8 INTERFACE BOARD (CD-RW/TANDEM COPY KIT/PRINTER CONTROLLER)

3.8.1 INSTALLATION PROCEDURE

E

The interface control board is needed to use the optional CD-ROM writer (CD-RW), optional printer controller, or the tandem copy kit.



B327I103.WMF

- 1. Remove the upper rear cover of the copier.
- 2. Remove the fly wheel [A] (3 screws) and the drum cooling fan [B].
- Install the support bracket [C] (2 screws) on the interface board [D].
 NOTE: When the CD-RW is installed, remove the short connector [E] installed on TB101.
- 4. Connect the interface board to the connector on the SICU. Then secure the support bracket to the copier (2 screws).
 - 5. Connect the cable of the optional equipment to the terminal of the interface board.
 - 1) When the CD-RW is installed, connect the cable from the CD-RW to the connector [a] and route the cable as shown. Secure the cable with the upper clamp.
 - 2) When the cable for the tandem copy kit is installed, connect the cable to the connector [b] and route the cable as shown. Secure the cable with the lower clamp.

NOTE: The connector [c] is for the printer controller.

- 6. Reinstall the drum cooling fan and the fly wheel removed in step 2.
- 7. Reinstall the upper rear cover of the copier.

4. SERVICE TABLES

4.1 GENERAL CAUTIONS

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

4.1.1 DRUM

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

- 1. Never expose the drum to direct sunlight.
- 2. Never expose the drum to direct light of more than 1,000 Lux for more than a minute.
- 3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
- 4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
- 5. Store the drum in a cool, dry place away from heat.
- 6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
- 7. Never expose the drum to corrosive gases such as ammonia gas.
- 8. Always keep the drum in the protective sheet when keeping the drum unit, or the drum itself, out of the copier. Doing so avoids exposing it to bright light or direct sunlight, and will protect it from light fatigue.
- 9. Dispose of used drums in accordance with local regulations.
- 10. When installing a new drum, do the Auto Process Control Data Adjustment (SP 2-962).

4.1.2 DRUM UNIT

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

4.1.3 TRANSFER BELT UNIT

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

4.1.4 SCANNER UNIT

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

4.1.5 LASER UNIT

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

4.1.6 CHARGE CORONA

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

4.1.7 DEVELOPMENT

- 1. Be careful not to nick or scratch the development roller.
- 2. Place the development unit on a sheet of paper after removing it from the copier.
- 3. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller.
- 4. Clean the drive gears after removing used developer.
- 5. Dispose of used developer in accordance with local regulations.
- 6. Never load types of developer and toner into the development unit other than specified for this model. Doing so will cause poor copy quality and toner scattering.
- 7. Immediately after installing new developer, the TD sensor initial setting procedure should be performed to avoid damage to the copier. Do not perform the TD sensor initial setting with used developer. Do not make any copies before doing the TD sensor initial setting.
- 8. When using a vacuum cleaner to clean the development unit casing, always ground the casing with your fingers to avoid damaging the toner density sensor with static electricity.
- 9. When replacing the TD sensor, the developer should be replaced and then the TD sensor initial setting procedure (SP2-801) should be done, followed by process control initialization (SP2-962).

4.1.8 CLEANING

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



4.1.9 FUSING UNIT

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

4.1.10 PAPER FEED

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

4.1.11 USED TONER

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

4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

Service Program Access Procedure

Entering SP mode

1) Press the following keys in sequence.



Hold the **C** key for more than 3 seconds.

2) A menu of SP modes is displayed on the LCD.

SP mode					Ext
	C	opy S	P		
	PM	Coun	ter		
SICU S	aft Version 5.23		BCU Soft Ver	nine 5.20	
				A 204	

- A29410001.FUA
- **NOTE:** The installed applications appear as Copy SP and Printer SP. If the printer application is not installed, its name does not appear.

3) Touch the application which you need. Then, the application's SP mode display will appear, as shown.

SP Mode (Service)	Capy Mode Prev. Menu Exit
Select S ^e Mode	57-2222-2222
SP-1222 Feed/Transport	SP-6IIII Peripherals
SP-21111 Dram	SP-7828 Data Log
SP-3111 Praceto	SP-EEEE Data Log2
Scanner	SP-SEEX Designer Use
SP-SEE Mode	

A294M002.PCX

Exiting SP mode

1) Touch the "Exit" keys to return to the standby mode display.

Accessing Copy Mode from within an SP Mode

1) Touch the "Copy Mode" key.

SP I	Mode (Service)	Cap	Mode	Prev. Menu	Ealt
Select SP Mode	Cless1 Ne.				\$7-2228-3566
1001-#	Leading Edge Registration	1109	Fusing I	4p Band Check	
1002-#	Side-to-side Registration	1902-4	Web His	ter Control	
1008-+	Paper Duckle Adjustment (Registration)				
1006	Duplex Fence Adjustment				
1103	Fusing Idling After Energy Saving				
1105-4	Fissing Temperature Adjustment				
1106	Pusing Temperature Display			Phily.	Next

A294M003.PCX

- 2) Select the appropriate copy mode and make trial copies.
- 3) To return to the SP mode, touch the "SP mode" key.



Service Tables

A294M004.PCX

Selecting the Program Number

Program numbers are composed of two or three levels. There are two ways to select the program number.

Ten-key Pad

Input the required program number.

Touch Panel

1) Touch the 1st level program.

SP Mode (Service)	Capy Mode Prev. Menu Exit
Select S ^a Mode	SP-8888-X60
SP-1222 Feed/Transport	SP-6222 Peripherals
SP-21111 Dram	SP-71111 Data Log
SP-1EEI Pracess	SP-EEEE Data Log2
Stratts Scame	SP-SEEL Designer Use
SP-SEE	

A294M002.PCX

2) Touch the 2nd level program.

SP Mode (Service)	Capy Mode Prev. Menu Euit
Select S ^a Mode Class 1 No.	57-2222-200
1001-# Leading Edge Registration	1100 Fusing Np Band Check
1002-# Side-to-side Registration	1902-a Web Motor Control
1003-+ Paper Duckle Adjustment (Registration)	
1008 Duplex Fence Adjustment	
1103 Fusing Idling After Energy Saving	
1105-« Fusing Temperature Adjustment	
1106 Pusing Temperature Display	Prev. Next

A294M003.PCX

NOTE: A "*" mark indicates that there are 3rd level programs.

3) Touch the 3rd level program.

SP Mode (Service)	Capy Made Prev. Menu Esit
Select SP Mode Class2 No.	SP-8888-X00
SP=1002 Side-to-side Registration	
1002-1 Trig-1	1002-7 Duplex Tray
1002-2 Tray-2	
1002-3 Tray-3	
1002-4 Tray-4	
1002-5 Tray-5	
1002-8 Trig-5	

A294M005.PCX

Inputting a Value or Setting for an SP Mode

- 1. Select the required program mode as explained on the previous page.
- 2. Enter the required setting using the ten-key pad, then touch the "Start" key or OK key or ⊞ key.
 - **NOTE:** 1) If you forget to touch the "Start" key or OK key, the previous value remains.
 - 2) Change between "+" and "-" using the "•" key before entering the required value.
- 3. Exit SP mode.

4.2.2 SERVICE PROGRAM MODE TABLES

- **NOTE:** 1) In the Function column, comments are in italics.
 - 2) In the Settings column, the default value is in bold letters.
 - 3) S and B in the right hand side of the mode number column means that this mode is stored in the NVRAM on the SICU (S) or BCU (B). If you do a RAM reset, all these SP modes will be reset to their factory settings.

		M (Class	ode No. (1, 2, and 3)		Function	Settings		
	1-001	Leadi	ng Edge Registrat	ion				
		1	Paper Tray (Copier and LCT)		Adjusts the printing leading edge registration for feeding from the trays using the trimming area pattern (SP2-902-3, No.15).	+9 ~ -9 0.1 mm/step + 3.0 mm		
				В	Use the "•" key to toggle between + and – before entering the value. The specification is 3 ± 2 mm. See "Replacement and Adjustment – Copy Image Adjustments" for details.			
		2	Duplex Tray		Adjusts the printing leading edge registration for the duplex feeding using the trimming area pattern (SP2-902-3, No.15).			
		В	В	Use the "•" key to toggle between + and – before entering the value. The specification is 3 ± 2 mm. See "Replacement and Adjustment – Copy Image Adjustments" for details.				
=	1-002	Side-I	to-Side Registratio	n				
		1	Tray-1	В	Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value. See "Replacement and Adjustment – Copy Image Adjustments" for details on SP1-002.	+9 ~ –9 0.1 mm/step +0.0 mm		
		2	Tray-2	В	Adjusts the printing side-to-side registration from the 2nd paper feed station using the trimming area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value. The specification is 0 ± 2.0 mm.	+9 ~ -9 0.1 mm/step +0.0 mm		
		3	Tray-3	В	Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value. The specification is 0 ± 2.0 mm.	+9 ~ -9 0.1 mm/step +0.0 mm		

	IV (Clas	lode No. s 1, 2 and 3)		Function	Settings
1-002	Side-	to-Side Registratio	on		
	4	Tray-4 (LCT)	B	Adjusts the printing side-to-side registration from the 4th paper feed station using the trimming area pattern (SP2-902-3, No.15).	+9 ~ -9 0.1 mm/step + 0.0 mm
		T 5 (1 0T)		Use the "•" key to toggle between + and – before entering the value. The specification is 0 ± 2.0 mm.	
	5	Tray-5 (LCT)	В	Adjusts the printing side-to-side registration from the 5th paper station using the trimming area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value. The specification is 0 ± 2.0 mm.	+9 ~ -9 0.1 mm/step +0.0 mm
	6	Tray-6 (LCT)	В	Adjusts the printing side-to-side registration from the 6th paper station using the trimming area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value	+9 ~ -9 0.1 mm/step + 0.0 mm
	7	Duplex Tray		The specification is 0 ± 2.0 mm. Adjusts the printing side-to-side registration from the duplex trav using the trimming	+9 ~ -9 0 1 mm/step
			В	area pattern (SP2-902-3, No.15). Use the "•" key to toggle between + and – before entering the value. The specification is 0 ±2.0 mm.	+0.0 mm
1-003	Pape	r Buckle Adjustme	ent (F	Registration)	
	1	Copier Paper Tray	В	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at	+9 ~ -9 1 mm/step
	2	Duplex Tray	B B	registration. (A +ve setting leads to more buckling.)	+0.0 mm
1-008	Duple	ex Fence Adjustme	ent		
			В	Adjusts the distance between the front and rear fences.	+4 ~ −4 0.5 mm/step ± 1.0 mm
1-103	Fusin	ng Idling After Ener	rgy S	aving	•
			В	Selects whether fusing idling is done or not when recovering from the Energy Saver mode.	0: Not done 1: Done
1-105	Fusin	ng Temperature Ac	ljustr	nent	
		Fusing Temperature in Waiting Condition	В	Adjusts the fusing temperature for stand- by.	170 ~ 200 1°C/step 173°C
	2	Fusing Temperature Lower Limit	В	Adjusts the fusing temperature lower limit. When the fusing unit falls below this temperature, the machine stops copying. Copying automatically restarts when the fusing temperature recovers. <i>This SP mode is for designer's use only.</i>	157 ~ 167 1°C/step 163°C

SERVICE PROGRAM MODE

	M (Clase	ode No. s 1, 2 and 3)		Function	Settings
1-105	Fusin	g Temperature Ad	justr	nent	
	3	Fusing Temperature Correction (<a4 lt)<="" td=""><td>В</td><td>Specifies the amount to raise the fusing temperature from standby mode to print on A4/LT or smaller width paper.</td><td>+0 ~ +20 1°C/step +15°C</td></a4>	В	Specifies the amount to raise the fusing temperature from standby mode to print on A4/LT or smaller width paper.	+0 ~ +20 1°C/step +15°C
	4	Fusing Temperature Correction (A4/LT)	В	Specifies the amount to raise the fusing temperature from standby mode to print on paper of A4/LT width.	+0 ~ +25 1°C/step +10°C
1-106	Fusin	g Temperature Dis	splay	,	
				Displays the fusing temperature.	
1-109	Fusin	g Nip Band Check			
				Feeds a sheet from a paper tray and stops the sheet when it is between the hot roller and the pressure roller. Use an OHP sheet. After keeping the sheet there for 30 seconds, the sheet is automatically fed out. For details, see Replacement and Adjustment – Fusing.	
1-902	Web	Motor Control			
	1	Web Consumption	В	Displays the percentage of the web consumption in 1% steps (0% ~ 100%). The value can be manually input using number keys.	
	2	Web Motor Drive Interval	В	Change the interval of copy operation time after which the web motor is driven	15 ~ 130 1 s/step 40 s
	3	Web Motor Drive Time	В	Changes the time that the web motor is driven.	0.1 ~ 3.0 0.1 s/step 0.8 s
	4	Web Near End Setting	В	Changes the web consumption ratio at which web near end is displayed. About 40k A4 copies can be made after the	0 ~ 100 1%/step 100%
1 000	Durala	v Ctan Desition	Diala	web consumption reaches 100%.	
1-906	Duple	ex Stop Position –	Rign		10 10
			В	duplex unit after passing duplex transport sensor 2. For designer use only.	2 mm/step -8 mm
2-001	Charg	je Corona Bias Ac	ljustr	nent	
	1	Image Area (Auto Process Control OFF)	В	Adjusts the voltage applied to the grid plate during copying when auto process control is off . <i>Normally, there is no need to adjust this.</i> <i>If there is an ID or TD sensor problem, the</i> <i>machine goes into fixed toner supply mode.</i> <i>After replacing the drum or charge corona</i> <i>wire, change this value to the default.</i>	–650 ~ −1,300 10 V/step −1,000 V

	M (Class	ode No. s 1, 2 and 3)		Function	Settings
2-001	Charc	e Corona Bias Ad	iustr	nent	
	2	ID Sensor Pattern (Auto Process Control OFF)	B	Adjusts the voltage applied to the grid plate when making the ID sensor pattern, when auto process control is switched off. <i>Normally, there is no need to adjust this.</i> <i>If the user wants high density copies, the</i> <i>sensor pattern must be lighter, so this</i> <i>voltage must be a higher negative voltage.</i>	–650 ∼ –1,300 10 V/step – 800 V
	3	Image Area (Auto Process Control ON)	В	Adjusts the voltage applied to the grid plate during copying when auto process control is switched on . This voltage changes every time auto process control starts up (every time the machine is switched on)	-650 ~ −1,300 10 V/step - 1,000 V
Ę	4	Grid Voltage for Transparent Sheet	в	Adjusts the voltage applied to the grid plate when translucent mode is selected. Use this if there is a copy quality problem when making copies on translucent paper. Normally there is no need to adjust this. See 2-001-1.	–650 ∼ –1,300 10 V/step – 1,000 V
	5	Total Corona Current	В	Adjusts the current applied to the charge corona wire except for Photo mode.	-1,400 ~ -2,800 100μA/step - 1,400 μ A
	6 Total Corona Current (Photo mode)		В	Adjusts the current applied to the charge corona wire for Photo mode.	1,400 ~ -2,800 100μA/step - 1,600 μ A
2-101	Printir	ng Erase Margin			
	1	Leading Edge	S	Adjusts the leading edge erase margin. See "Replacement and Adjustment – Copy Image Adjustments" for more on SP2-101.	0.0 ~ 9.0 0.1 mm/step 2.5 mm
	2	Trailing Edge	S	Adjusts the trailing edge erase margin.	0.0 ~ 9.0 0.1 mm/step 2.5 mm
	3	Left	S	Adjusts the left side erase margin.	0.0 ~ 9.0 0.1 mm/step 2.0 mm
	4	Right	S	Adjusts the right side erase margin.	0.0 ~ 9.0 0.1 mm/step 2.0 mm
2-103	LD Po	ower Adjustment			·
	1	LD1 - 600dpi	В	Adjusts the power of LD1. Do not change the value.	-127 ~ +127 1/step 1 = 1.1 μW + 0
	2	LD2 - 600dpi	В	Adjusts the power of LD2. <i>Do not change the value.</i>	-127 ~ +127 1/step 1 = 1.1 μW +0

		M (Class	ode No. s 1, 2 and 3)		Function	Settings				
	2-103	LD Po	wer Adjustment							
		3	LD3 - 600dpi		Adjusts the power of LD3.	–127 ~ +127				
				В	Do not change the value.	1/step 1 = 1.1 μW				
						+0				
		4	LD4 - 600dpi		Adjusts the power of LD4.	-127 ~ +127				
				В	Do not change the value.	1/step 1 = 1.1 μW +0				
		5	LD1 Power		Factory use only. Do not use this SP	Start				
			Adjustment (Start/End)	В	mode.	Stop				
		6	LD2 Power		Factory use only. Do not use this SP	Start				
			Adjustment	В	mode.	Stop				
			(Start/End)							
		7	LD3 Power	-	Factory use only. Do not use this SP	Start				
			Adjustment (Start/End)	в	mode.	Stop				
		8	1 D4 Power		Factory use only. Do not use this SP	Start				
		Ŭ	Adjustment	в	mode.	Stop				
			(Start/End)			·				
	2-104	LD Po	ower Adjustment (for II	pattern)					
				-	Selects the LD power for making the ID	0~7				
				в	pattern when auto process control is	1/step 4				
	2-114	Printer Dot Edge Parameter Setting								
		1	Leading Dot		Changes the LD power level for the left	20 ~ 100%				
			Level Setting (Left Edge)	S	edge pixel in printer mode, if FCI is off.	1% step 50%				
		2	Trailing Dot		Changes the LD power level for the left	20 ~ 100%				
			Level Setting (Bight Edge)	S	edge pixel in printer mode, if FCI is off.	1% step 50%				
		3	Multiple Dot		Changes the LD power level for continuous	20 ~ 100%				
			Level Setting	S	pixels in printer mode, if FCI is off.	1% step 100%				
		4	Independent	_	Changes the LD power level for	20 ~ 100%				
			Dot Level	s	independent dots in printer mode, if FCI is	1% step				
	2-201	Devel	onment Rias Adiu	stme	on:	50 /8				
		1	Image Area		Adjusts the development bias for copying	-200 ~ -700				
			in ago / i oa	-	This can be adjusted as a temporary	10 V/step				
				в	measure if faint copies appear due to an	–550 V				
		-			aging drum.					
		2	ID Sensor		Adjusts the development bias for making	-200 ~ -700				
			Pallem		measurement	-400 V				
					This should not be used in the field.					
				в	because it affects ID sensor pattern					
					density, which affects toner supply.					

Mode No. (Class 1, 2 and 3)				Function	Settings
2-201	Deve	lopment Bias Adiu	stme	ent	
Ę	3	Transparent Sheet	В	Adjusts the development bias for copying onto translucent sheets.	–200 ~ –700 10 V/step –550 V
	4	ID Sensor Development Potential	В	Adjusts the development potential for making the ID sensor pattern for VSP measurement. Do not adjust.	−140 ~ −380 1 V/step −280 V
2-207	Force	d Toner Supply			
	1	Forced Toner Supply		Forces toner supply for 7 seconds from the toner bank through the toner hopper to the development unit. <i>This mode finishes automatically after the</i>	Start
				toner is supplied 7 times (1 s for each time).	
	2	Toner Bank Toner Setup		Turns on the main motor, development motor, development bias, toner supply motor and charge corona. Then turns on the toner supply coil clutch to supply toner to the toner hopper, but not to the development unit. It takes about 7 minutes. <i>This mode should be used to fill the toner</i> <i>transport path with toner after cleaning the</i> <i>toner supply unit, or at installation.</i>	Start
2-208	Tone	r Supply Mode			
			В	Selects the toner supply mode. Use image pixel count mode only as a temporary countermeasure if the ID or TD sensor is defective.	Sensor Control Pixel Count Control
2-209	Tone	r Supply Rate			
			В	Adjusts the toner supply rate from the hopper. Increasing this value reduces the toner supply roller clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.	100 ~ 2,000 10 mg/s/step 800 mg/s
2-210	ID Se	nsor Pattern Inter	val		1
				Changes the interval for making the ID sensor pattern (VSP/VSG detection). If the user normally makes copies with a high proportion of black, reduce the interval.	0 ~ 500 1 copy/step 10 copies
			В		

SERVICE PROGRAM MODE

Mode No. (Class 1, 2 and 3)				Function	Settings
2-220	VREF	Manual Setting			
		inanaa oottiing		Adjusts the TD sensor reference voltage (VREF).	0 ~ 5.0 0.01 V/step
2-223	VT Di	splay	В	 Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes, do the following: 1. Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to. 2. Install the test development unit, then input the VREF for this unit into SP2-220. 3. After the test, put back the old development unit, and change SP2-220 back to the original value. 	2.5 V
			В	Displays the current TD sensor output voltage.	
2-226	Toner	Bank Toner Disc	harg	e	·
				This SP removes toner from the toner bank to the toner hopper. After turning the toner supply motor and the toner bank motor on, the toner supply coil clutch turns on and off at 2 second intervals. The motors and clutch stop when the toner near-end sensor (in the toner bank unit) detects no toner. Even if the sensor continues to detect toner, this operation stops when the clutch has been turned on and off 10 times, so this SP may have to be repeated to clean out the system completely.	Start
2-227	Ioner	Supply Mode Dis	play	Displays the taper supply made used for	
				 the last copy. 1: ID Sensor and TD Sensor (from the 11th copy, using VT – VREF) 2: ID Sensor and TD Sensor (using VSP/VSG) – before the 10th copy of a job 3: TD Sensor – temporary mode when ID sensor output is abnormal 4: Image Pixel Count 	
2-301	Trans	·			
	1	1st Copy Side	В	Adjusts the current applied to the transfer belt during copying on the 1st side of the paper. If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.	15 ~ 200 1 μA/step 120 μ Α
	2	Thick Paper	В	Adjusts the current applied to the transfer belt during copying on thick paper. See above.	15 ~ 200 1 μA/step 120 μ Α

Mode No. (Class 1, 2 and 3)				Function	Settings		
2-301	Trans	fer Current Adjust	men				
2 001	3	OHP Sheet	В	Adjusts the current applied to the transfer belt during copying on OHP sheet. See above. If the user normally feeds thicker paper from the bypass tray, use a	15 ~ 200 1 μA/step 140 μ A		
				higher setting.	45 000		
	4	I ransparent Paper	В	Adjusts the current applied to the transfer belt during copying on translucent paper.	15 ~ 200 1 μA/step 120 μA		
	5	2nd Copy	В	Adjusts the current applied to the transfer belt during copying on the 2nd side of the paper.	15 ~ 200 1 μA/step 120 μ A		
	6	Between Pages	В	Adjusts the current applied to the transfer belt between the pages.	15 ~ 200 1 μA/step 20 μA		
2-506	Clean	ing Interval – Mult	iple	Сору			
	1	On/Off		Selects whether multiple copy jobs are stopped at regular intervals for the following purposes. 1. Stop and turn the drum motor in reverse to clean the cleaning blade edge	1: No 2: Yes		
			В	 Make an ID sensor pattern to correct the toner density control. The interval depends on SP2-506-2. Use if the drum gets dirty or images get too pale or too dark during a long job. Normally keep at 'No', because the 'Yes' setting causes the machine to stop copying every 15 minutes, which may cause problems for the customer. 			
	2	Interval	В	Selects the interval at which multi copy jobs are stopped.	1 ~ 100 1 minute/step 15 minutes		
2-801	TD Se	ensor Initial Setting	g				
			В	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 2.5 V. After finishing this, the TD sensor output voltage is displayed. Use this mode only after changing the TD sensor or the developer.	Start		
2-803	Coron	a Wire Cleaner O	n				
				Turns on the corona wire cleaner manually. When copy density across the paper is uneven at EM, clean the wire with this mode.	Start		

Mode No.				Function	Settings
	(Class	s 1, 2 and 3)			octango
2-804	Charg	ge Corona Cleane	r Set	tting	
	1	Corona Wire Cleaner Operation Setting	В	 Selects when automatic corona wire cleaning is done. 0: Corona wire cleaning is not done. 1: When process control initial setting is done, if the copy number after the last cleaning operation is over the number set in SP2-804-2. 2: At the period set in SP2-804-2. 	0: Not done 1: Done 2:Periodically
	2	Operation Interval	В	Selects the interval for automatic corona wire cleaning.	100 ~ 10,000 100 print/step 5,000
2-813	Printe	er Gamma Setting			·
			S	Select if printer gamma correction is applied or not. <i>This SP mode is for designer use only.</i>	0: Applied 1: Not applied
2-902	Printi	ng Test Pattern			1
	2	IPU Test Pattern Selection (for Scanner)		Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns. This SP mode is useful for finding whether the SICU or the SBU is defective. If the printout is not OK, the SICU is defective.	-
	3	Printing Test Pattern		Prints the printer test patterns. See section 4.2.3. for how to print test patterns. Example: 15. Trimming Area This SP mode is useful for finding whether the LDDR or the SICU is defective. If the printout is not OK, the LDDR is defective.	-
	4	Outer I/F Block Test Pattern		Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns. This SP mode is useful for finding whether the SICU or the printer application is defective. If the printout is not OK, the SICU is defective.	-
	5	Frequency Pattern Density		Designer use only.	
2-906	Vcont	Manual Setting		·	·
			В	Factory use only.	9.7 V
2-909	Main	Scan Magnificatio	n		
	1	Copier	S	Adjusts the magnification in the main scan direction for copy mode. Use the "•" key to toggle between + and –. See "Replacement and Adjustment – Copy Image Adjustments" for details.	-2.0 ~ +2.0 0.1%/step + 0.0%
	2	Printer	S	Adjusts the magnification in the main scan direction when printing from a personal computer. Use the "•" key to toggle between + and –. See "Replacement and Adjustment – Copy Image Adjustments" for details.	-2.0 ~ +2.0 0.1%/step + 0.0%

Mode No. (Class 1, 2 and 3)				Function	Settings
2-910	Writir	ng Sub Scan Magn	ifica	tion	
		5	S	Adjusts the magnification in the sub scan direction. Use the "•" key to toggle between + and –. See "Replacement and Adjustment – Copy	-1.0 ~ +1.0 0.1%/step + 0.0%
2-911	Trans	sfer Current On/Of	f Tim	linage Adjustments for details.	
2 311	1	La (ON)	В	Adjusts the transfer current on timing at the leading edge.	-30 ~ +30 1 mm/step 0 mm
	3	Lc (OFF)	В	Adjusts the transfer current off timing (for example: -5 mm is 5 mm after the trailing edge).	-30 ~ +30 1 mm/step - 10 mm
2-912	Drum	Reverse Rotation	Inte	rval	
			В	This SP mode is for designer use only. Do not change the value.	0 ~ 10 1/step 2
2-913	Test	Pattern ID Adjustm	nent		
				Adjusts the image density for printing test patterns (with SP2-902). Usually this SP mode is only used by designers. <i>The value is cleared when the main power</i>	0 ~ 15 1/step 15
				switch is turned off and on.	
2-920	LD O	ff Check			
				Checks whether the LD turns off or on when the front door is opened. 0: On 1: Off	0: ON 1: OFF
2-930	Trans	fer Pre-cleaning		raciory use only.	
2 000	mane	lor r ro oloannig		Designer use only	
2-961	Deve	loper Initialization	(Fac	tory)	
		1		Factory use only.	
2-962	Auto	Process Control			
			В	Automatically adjusts the following process control factors. 1. Drum potential sensor 2. ID sensor 3. Charge grid voltage (by changing VD) 4. LD power (by changing VH) Before using this SP, auto process control should be on (SP3-901). After changing the drum, ID sensor, drum potential sensor, LD unit, charge corona wires, or toner density sensor, this SP should be used	Start
2-966	Perio	dical Auto Process		atrol	L
2-300			В	Selects whether auto process control is done after the first job since 24 hours is finished. This setting is required for a customer who keeps the main switch on all day.	ON OFF

SERVICE PROGRAM MODE

Mode No. (Class 1, 2 and 3)				Function	Settings	
2-967	Auto	Image Density Ad	ustm	nent		
			В	Selects whether auto image density adjustment is done during machine warm up. This mode is to counter dirty background that occurs when a machine is used in an area that contains ammonia. <i>If Periodical Auto Process Control (SP2- 966) is used, this adjustment is done also</i> <i>after the auto process control is finished.</i>	OFF ON	
2-968	Toner	r Density Correction	n			
			В	To prevent the image density dropping during continuous copying after a long interval (this is caused by a sudden increase of Q/M), VREF is changed by – 0.06 V every 100 prints. This correction is applied from when the auto process control is done, until the number of prints set with this SP mode have been made.	0 ~ 20 k 1 k/step 0	
3-001	ID Se	nsor Initial Setting				
	1	ID Sensor PWM Setting	В	This SP mode is added to recover the machine when an SC condition occurs because ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. Reset this SP to the factory setting in this case. The PWM data is stored when ID Sensor Initial Setting is done.	0 ~ 255 1/step 72	
3-001	ID Se	nsor Initial Setting				
	2	Initialization	В	Performs the ID sensor initial setting. The ID sensor output for the bare drum (VSG) is adjusted to 4.0 ± 0.2 V. This SP mode should be performed after: 1. Replacing or cleaning the ID sensor 2. Replacing the NVRAM or doing an NVRAM clear.	Start	
3-103	ID Se	nsor Output Displa	ay			
	1 2 3 4	VSG VSG Initial (Designer Use) VSP VSP Initial (Designer Use)	В	Displays the current VSG and VSP output. If the ID sensor does not detect the ID pattern, "VSP = 5.0 V/VSG = 5.0 V" is displayed and an SC code is generated. If the ID sensor does not detect the bare area of the drum, "VSP = 0.0 V/VSG = 0.0 V" is displayed and an SC code is generated.		
3-901	Auto Process Control Setting					
0.000			В	Decides whether or not the machine checks and corrects the drum potential (VD) and LD power when the fusing temperature is lower than 100°C at power- up.	OFF	
3-902	Proce	ess Control Data D	vispla	ly Diaplaya whether oute presses control in an		
		Control (O: OFF, 1: ON)	В	or off.		



	M (Clas	lode No. s 1. 2 and 3)		Function	Settings
3-902	Proce	ess Control Data D	ispla	RV	
	2	VD	B	Displays the drum potential.	
	3	Half Tone VH	В	Displays the drum potential in areas illuminated by the laser during LD power adjustment (auto process control).	
	4	VG	В	Displays the charge grid voltage which resulted from the latest VD adjustment.	
	5	LD Power (Correction)	В	Displays the LD power correction value which resulted from the latest VH adjustment.	
	6	VID	В	Displays the latest drum surface voltage measured on the ID sensor pattern.	
	7	VM200	В	Displays the drum potential sensor output when 200 V is applied during potential sensor correction.	
	8	VM700	В	Displays the drum potential sensor output when 700 V is applied during potential sensor correction.	
4-008	Scan	ner Sub Scan Mag	gnific	ation	
			S	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	-0.9 ~ +0.9 0.1 %/step + 0.0 %
4.040				See "Replacement and Adjustment – Copy Image Adjustments" for details.	
4-010	Scan	ner Side-to-Side F	legis	tration	
			s	 Adjusts the leading edge registration for scanning. (-): The image moves in the direction of the leading edge 	–9.0 ~ +9.0 0.1 mm/step +0.0 mm
				Use the "•" key to toggle between + and –. See "Replacement and Adjustment – Copy Image Adjustments" for details.	
4-011	Scan	ner Side-to-Side F	legis	tration	
				Adjusts the side-to-side registration for scanning.	-6.0 ~ +6.0 0.1 mm/step +0.0 mm
			S	 (-). The image disappears at the left side. (+): The image appears at the left side. Use the "•" key to toggle between + and See "Replacement and Adjustment - Copy 	
				Image Adjustments" for details.	
4-012	Scan	ner Erase Margin			
	1	Leading Edge		Adjusts the leading edge erase margin for scanning.	0.0 ~ 0.9 0.1 mm/step
			S	Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.	U.5 mm
	2	Trailing Edge	S	Adjusts the trailing edge erase margin for scanning. See the comment for SP4-012-1.	0.0 ~ 0.9 0.1 mm/step 0.5 mm

	M (Clas	ode No. s 1 2 and 3)		Function	Settings
4-012	Scan	ner Frase Margin		<u> </u>	
	3	Right	s	Adjusts the right side erase margin for scanning.	0.0 ~ 0.9 0.1 mm/step 0.5 mm
	4	Left	s	Adjusts the left side erase margin for scanning. See the comment for SP4-012-1.	0.0 ~ 0.9 0.1 mm/step 0.5 mm
4-013	Scan	ner Free Run	1		1
				Performs a scanner free run with the exposure lamp on.	0: Stop 1: Start
4-015	Scan	ner Speed Adjustr	nent		
			S	Displays the value of the scanner speed fine adjustment. This setting can be changed using the number keys. The scanner speed fine adjustment is automatically done when the main switch is turned on, and the current setting is overwritten.	-20 ~ +20 1/step 0
4-301	APS	Sensor Output Dis	play		
			[Displays the APS sensor output signals when an original is placed on the exposure glass	
4-303	APS	A5/HLT Size Origi	nal C	Detection	·
			S	Selects whether or not the copier determines that the original is A5/HLT size when the APS sensor does not detect the size. If "A5 length/51/2" x 81/2"" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise or $51/2" \times 81/2"$	0: Not detected 1: A5 length/ 51/2" x 81/2" 2: Not detected 3: A5 length/ 51/2" x 81/2"
4 428	Soon			If "Not detected" is selected, "Cannot detect original size" will be displayed.	(Setting 2 or 3 is required if 267 x 390 and 267 x 195 paper is used.)
4-420	SCan		—	D' to a both so as not the atomaterial solution	المحلك المحل
		Flag Display	S	Displays whether or not the standard white level adjustment has been done.	Adjusted Not adjusted
	2	Standard		white plate. This SP mode is for factory use only. Do	Start
1 200				not use this SP mode.	
4-902	SBU	Setting			
	1	Image data Path Setting	S	This SP mode is for factory use only. Do not use this SP mode.	0 ~5 1/step 0
	2	ASIC ID Display		Displays the ASIC ID of the SBU. <i>This SP mode is for factory use only.</i>	-

Mode No. (Class 1, 2 and 3)				Function	Settings
4-902	SBU	Setting			
	3	E/O Adjustment - First Side	S	Checks the difference value of the black level for the first side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~ 255 1/step 128
	4	E/O Adjustment - Last Side	S	Checks the difference value of the black level for the last side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~ 255 1/step 128
	7	Black Level - First Side	s	Do not use this SP mode. Checks the value of the black level for the first side after adjusting the black level at power-up. This SP mode is for designer use only. Do not use this SP mode	0 ~ 255 1/step 170
	8	Black Level - Last Side	s	Checks the value of the black level for the last side after adjusting the black level at power-up. This SP mode is for designer use only. Do not use this SP mode.	0 ~ 255 1/step 170
	15	Range Adjustment - First Side	S	Checks the AGC gain range of the white level for the first side after adjusting the white level at power-up. This SP mode is for designer use only. Do not use this SP mode.	0 ~ 255 1/step 80
	16	Gain Range Adjustment - Last Side	S	Checks the AGC gain value of the white level for the last side after adjusting the white level at power-up. This SP mode is for designer use only. Do not use this SP mode.	0 ~ 255 1/step 80
	19	Gain Adjustment - First Side E-ch	s	Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i> <i>Do not use this SP mode.</i>	0 ~ 255 1/step 0
	20	Gain Adjustment - First Side O-ch	S	Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i> <i>Do not use this SP mode.</i>	0 ~ 255 1/step 0
	21	Gain Adjustment - Last Side E-ch	s	Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i> <i>Do not use this SP mode.</i>	0 ~ 255 1/step 0
	22	Gain Adjustment - Last Side O-ch	S	Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i> <i>Do not use this SP mode.</i>	0 ~ 255 1/step 0

Mode No. (Class 1, 2 and 3)				Function	Settings
4-902	SBU	Settina			
	25	Reference Voltage Adjustment	S	Checks the value of the standard white level after adjusting the white level. This SP mode is for factory use only. Do not use this SP mode.	0 ~ 255 1/step 117
	31	E/O Adjustment - First Side (Memory)	S	Checks the difference value of the black level for the First side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~255 1/step 128
	32	E/O Adjustment - Last Side (Memory)	S	Checks the difference value of the black level for the last side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~255 1/step 128
	35	Black Level - First Side (Memory)	S	Checks the value of the black level for the first side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~ 255 1/step 170
	36	Black Level - Last Side (Memory)	S	Checks the value of the black level for the last side after adjusting the black level at power-up. This SP mode is for designer use only.	0 ~ 255 1/step 170
	43	Range Adjustment - First Side (Memory)	S	Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	44	Range Adjustment - Last Side (Memory)	S	Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	47	Gain Adjustment - F/E ch (Memory)	S	Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	48	Gain Adjustment - F/O ch (Memory)	S	Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	49	Gain Adjustment - L/E ch (Memory)	S	Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	50	Gain Adjustment - L/O ch (Memory)	S	Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	53	Reference Voltage Adjustment (Memory)	S	Checks the value of the standard white level after adjusting the white level. <i>This SP mode is for factory use only.</i>	0 ~ 255 1/step 117
	59	Standard White Level		Checks either the maximum or minimum white shading data. <i>This SP mode is for designer use only.</i>	0: Maximum 1: Minimum

	M (Clas	lode No. s 1 2 and 3)		Function	Settings
4-902	SBU	Settina			
	61	Range F (Factory Setting)	S	Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 80
	62	Gain Adjustment - First Side O ch (Factory Setting)	S	Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 80
	65	Range L (Factory Setting)	S	Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	66	Gain F-O ch (Factory Setting)	S	Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	67	Gain L/F ch (Factory Setting)	S	Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	68	Gain L-O ch (Factory Setting)	S	Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	71	Reference Voltage (Factory Setting)	S	Checks the value of the standard white level after adjusting the white level. <i>This SP mode is for factory use only.</i>	0 ~ 255 1/step 117
	75	Overflow Flag		Checks the overflow flag data during the automatic scanner adjustment. <i>This SP mode is for designer use only.</i>	0 ~ 1023 1/step 0
	76	Time Out Flag		Checks the time out flag data during the automatic scanner adjustment. <i>This SP mode is for designer use only.</i>	0 ~ 1023 1/step 0
	78	SBU Reset Error Flag		Checks the error flag data during the automatic scanner adjustment. <i>This SP mode is for designer use only.</i>	0 ~ 15 1/step 0
	79	Error Flag		Checks the error flag data during the automatic scanner adjustment. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	80	E/O Adjustment Error Count	S	Counts the errors during the automatic scanner adjustment. <i>This SP mode is for designer use only.</i>	0 ~ 255 1/step 0
	81	Black Adjustment Error Count	S	Counts the errors during the automatic scanner adjustment. This SP mode is for designer use only.	0 ~ 255 1/step 0
	82	Gain F/L Difference Error Count	S	Counts the errors during the automatic scanner adjustment. This SP mode is for designer use only.	-
Mode No. (Class 1, 2 and 3)				Function	Settings
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4-902	SBU	Setting			
	83	Black Reading Error Count	S	Counts the errors during the automatic scanner adjustment. This SP mode is for designer use only.	
	84	White Reading Error Count	S	Counts the errors during the automatic scanner adjustment.	
	85	Retry Error Fault Count	S	Counts the errors during the automatic scanner adjustment. This SP mode is for designer use only.	
	86	Retry Error Success Count	S	Counts the errors during the automatic scanner adjustment. This SP mode is for designer use only.	
	87	White Reading Value - F/E ch	S	Displays the white peak level when the main switch is turned on. This SP mode is for designer use only	
	88	White Reading Value - F/O ch	S	Displays the white peak level when the main switch is turned on. This SP mode is for designer use only.	
	89	White Reading Value - L/E ch	S	Displays the white peak level when the main switch is turned on. This SP mode is for designer use only.	
	90	White Reading Value - L/O ch	S	Displays the white peak level when the main switch is turned on. This SP mode is for designer use only.	
	91	BIPU IO	S	This SP mode is for designer use only.	
4-903	Filter	Setting			
	5	Full Size Mode		Selects whether the copy is always in full size mode even if the magnification ratio has been changed. Set to 1 when checking the magnification in the main scan direction. If the magnification is not 100%, something is wrong with the image processing circuits.	0: Normal operation 1: Always full size mode
	7	Image Shift in Magnification		Adjusts the pixel shift amount in the main scan direction in magnification mode. This SP mode is for designer use only.	0 ~ 8191 1/step 0
	9	Filter Type Selection - Photo Mode	S	Selects the filter type for Photo mode. Coefficients used: 0: SP4-903-36 1: SP4-903-37 If "0" is selected, the image will be sharper. However, dot screen areas will be faint. This SP is ignored unless the user selects 'Service Mode' in UP mode.	0: MTF 1: Smoothing

	Mode No. (Class 1, 2 and 3)			Function	Settings	
4-903	Filter	Setting				1
	10	Pre-filter Type (Text mode 25% ~ 49%)	S	Selects the pre-filter type. 0: None	0 ~ 10 1/step 1	-
	11	Pre-filter Type (Text mode 50% ~ 154%)	S	1: Smoothing (Normal) 2: Smoothing (Weak) 3 ~ 5: Special smoothing filters which	0 ~ 10 1/step 0	
	12	Pre-filter Type (Photo mode)	s	reduce moiré but do not weaken the edges of low contrast text. A suitable filter should be selected depending	0 ~ 10 1/step 1	
	13	Pre-filter Type (Text/Photo mode 25% ~ 49%)	S	on the original type. 6: MTF (Weak) 7: MTF (Normal) 8 ~ 10: Special smoothing filters only for	0 ~ 10 1/step 1	
	14	Pre-filter Type (Text/Photo mode 50% ~ 154%)	S	the main scan direction. These filters should be used if the edges of lines that are parallel to the sub scan line are weakened when a	0 ~ 10 1/step 0	
	15	Pre-filter Type (Pale mode)	s	filter from 3 ~ 5 is selected. A suitable filter should be selected depending on the original type.	0 ~ 10 1/step 1	rvice bles
	16	Pre-filter Type (Generation mode)	s	This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 10 1/step 1	Sel Ta
	20	Filter Level - Text (25% ~ 49%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 25% ~ 49% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3	
	21	Filter Level - Text (25% ~ 49%) Sub Scan Direction	s	Selects the MTF filter coefficient in the sub scan direction for 25% ~ 49% reduction for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3	-
	22	Filter Strength - Text (25% ~ 49%) Main Scan Direction	s	Selects the MTF strength in the main scan direction for 25% ~ 49% reduction for text mode. 0: Weak 6:Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 1	-
	23	Filter Strength - Text (25% ~ 49%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 25% ~ 49% magnification for text mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 0	

	M (Clas)	ode No. s 1, 2 and 3)		Function	Settings
4-903	Filter	Setting			
	24	Filter Level - Text (50% ~ 154%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 50% ~ 154% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3
	25	Filter Level - Text (50% ~ 154%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 50% ~ 154% reduction for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3
	26	Filter Strength - Text (50% ~ 154%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 50% ~ 154% reduction for text mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 2
	27	Filter Strength - Text (50% ~ 154%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 50% ~ 154% magnification for text mode. 0: Weak 6: Strong. This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 1
	28	Filter Level - Text (155% ~ 256%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 155% ~ 256% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3
	29	Filter Level - Text (155% ~ 256%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 155% ~ 256% reduction for text mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	30	Filter Strength - Text (155% ~ 256%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 155% ~ 256% reduction for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 5

Mode No. (Class 1, 2 and 3)				Function	Settings
4-903	Filter	Setting			
	31	Filter Strength - Text (155% ~ 256%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 155% ~ 256% magnification for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3
	32	Filter Level - Text (257% ~ 400%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 256% ~ 400% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3
	33	Filter Level - Text (257% ~ 400%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 257% ~ 400% reduction for text mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	34	Filter Strength - Text (257% ~ 400%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 257% ~ 400% reduction for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 5
	35	Filter Strength - Text (257% ~ 400%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 257% ~ 400% magnification for text mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3
	36	MTF Filter in Photo Mode	S	Selects the MTF filter coefficient for photo mode, if MTF is enabled for this mode with SP4-903-9. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3
	37	Smoothing Filter in Photo mode	S	Selects the smoothing filter coefficient for photo mode, if smoothing is enabled for this mode with SP4-903-9. 0: Weak 4: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 4 1/step 1
	38	Filter Strength in Photo mode	S	Selects the smoothing filter coefficient for photo mode, if MTF is enabled for this mode with SP4-903-9. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3

	M (Class	ode No. s 1. 2 and 3)		Function	Settings
4-903	Filter	Settina			
	39	Filter Level - Text/Photo (25% ~ 49%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 25% ~ 49% magnification for text areas in text/photo mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 13
	40	Filter Level - Text/Photo (25% ~ 49%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 25% ~ 49% magnification for text areas in text/photo mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3
	41	Filter Strength - Text/Photo (25% ~ 49%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 25% ~ 49% magnification for text areas in text/photo mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 0
	42	Filter Strength - Text/Photo (25% ~ 49%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 25% ~ 49% magnification for text areas in text/photo mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 0
	43	Filter Level - Text/Photo (50% ~ 154%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 50% ~ 154% magnification for text areas in text/photo mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 13
	44	Filter Level - Text/Photo (50% ~ 154%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 50% ~ 154% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	45	Filter Strength - Text/Photo (50% ~ 154%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 50% ~ 154% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 1

Mode No. (Class 1, 2 and 3)				Function	Settings
4-903	Filter	Setting			
	46	Filter Strength - Text/Photo (50% ~ 154%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 50% ~ 154% magnification for text areas in text/photo mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 1
	47	Filter Level - Text/Photo (155% ~ 256%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 155% ~ 256% magnification for text areas in text/photo mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 13
	48	Filter Level - Text/Photo (155% ~ 256%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 155% ~ 256% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	49	Filter Strength - Text/Photo (155% ~ 256%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 155% ~ 256% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 1
	50	Filter Strength - Text/Photo (155% ~ 256%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 155% ~ 256% magnification for text areas in text/photo mode. 0: Weak 6: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 6 1/step 3
	51	Filter Level - Text/Photo (257% ~ 400%) Main Scan Direction	S	Selects the MTF filter coefficient in the main scan direction for 257% ~ 400% magnification for text areas in text/photo mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 13
	52	Filter Level - Text/Photo (257% ~ 400%) Sub Scan Direction	S	Selects the MTF filter coefficient in the sub scan direction for 257% ~ 400% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3

	M (Class	ode No. s 1, 2 and 3)		Function	Settings
4-903	Filter	Setting			I
	53	Filter Strength - Text/Photo (257% ~ 400%) Main Scan Direction	S	Selects the MTF strength in the main scan direction for 257% ~ 400% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode	0 ~ 6 1/step 1
	54	Filter Strength - Text/Photo (257% ~ 400%) Sub Scan Direction	S	Selects the MTF strength in the sub scan direction for 257% ~ 400% magnification for text areas in text/photo mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	55	Filter Level in Pale Mode	S	Selects the table of the MTF filter coefficient for pale original mode Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 3
	56	Filter Strength in Pale Mode	S	Selects the table of the MTF filter strength for pale original mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	57	Filter Level in Generation Mode	S	Selects the table of the MTF filter coefficient for pale original mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong <i>This SP is ignored unless the user selects</i> <i>'Service Mode' in UP mode.</i>	0 ~ 13 1/step 13
	58	Filter Strength in Generation Mode	S	Selects the table of the MTF filter strength for generation original mode. 0: Weak 6: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 6 1/step 3
	60	Independent Dot Erase - Text Mode	S	Selects the independent dot erase level for text mode. A larger number erases more dots. 0 means disabled. Refer to "Detailed Section Description – Independent Dot Erase" for details.	0 ~ 14 1/step 3
	62	Independent Dot Erase - Text/Photo Mode	S	Selects the independent dot erase level for text/photo mode. A larger number erases more dots. 0 means disabled. Refer to "Detailed Sectional Description – Independent Dot Erase" for details.	0 ~ 14 1/step 3

	Mode No. (Class 1, 2 and 3)			Function	Settings	
4-903	Filter	Setting				1
	63	Independent Dot Erase - Pale Mode	S	Selects the independent dot erase level for pale mode. A larger number erases more dots. 0 means disabled. Refer to "Detailed Section Description – Independent Dot Erase" for	0 ~ 14 1/step 3	
	64	Independent Dot Erase - Generation Copy Mode	S	details. Selects the independent dot erase level for generation copy mode. A larger number erases more dots. 0 means disabled. Refer to "Detailed Sectional Description – Independent Dot	0 ~ 14 1/step 3	
	65	Scanner Gamma Thresh Level - Text	S	<i>Erase" for details.</i> Adjust the threshold level for the background erase function in letter mode. <i>A larger value reduces dirty background.</i> <i>This SP is ignored unless 1 or 2 is selected</i> <i>with SP4-903-70.</i>	0 ~ 255 1/step 0	
	66	Scanner Gamma Thresh Level - Photo	S	Adjust the threshold level for the background erase function in photo mode. A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-71.	0 ~ 255 1/step 0	Service Tables
	67	Scanner Gamma Thresh Level - Text/Photo	S	Adjust the threshold level for the background erase function in text/photo mode. A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-72.	0 ~ 255 1/step 0	
	68	Scanner Gamma Thresh Level - Pale	S	Adjust the threshold level for the background erase function in pale mode. A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-73.	0 ~ 255 1/step 0	
	69	Scanner Gamma Thresh Level - Generation	S	Adjust the threshold level for background erase in generation copy mode. A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-74.	0 ~ 255 1/step 0	
	70	Background Erase Mode Text	S	 Selects the background erase function setting in text mode. 0: Not done 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-65.) 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-65.) This SP is ignored unless the user selects 'Service Mode' in UP mode. 	0 ~ 2 1/step 0	

(C	Mode I Class 1, 2	No. and 3)		Function	Settings
4-903 Fi	ilter Settir	ng			
	71 Back Eras Phot	kground se Mode to	S	Selects the background erase function setting in photo mode. 0: Not done 1: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-66.) This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 1 1/step 0
	72 Back Eras Text	kground se Mode t/Photo	S	 Selects the background erase function setting in text/photo mode. 0: Not done 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-67.) 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-67.) This SP is ignored unless the user selects 'Service Mode' in UP mode. 	0 ~ 2 1/step 0
	73 Back Eras Pale	kground se Mode	S	 Selects the background erase function setting in pale mode. 0: Not done 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-68.) 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-68.) This SP is ignored unless the user selects 'Service Mode' in UP mode. 	0 ~ 2 1/step 0
	74 Back Eras Gen	kground se Mode eration	S	 Selects the background erase function setting in generation mode. 0: Not done 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-69. 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-69. This SP is ignored unless the user selects 'Service Mode' in UP mode. 	0 ~ 2 1/step 0

Mode No. (Class 1, 2 and 3)		ode No. s 1, 2 and 3)	Functio	on	Settings	
4-903	Filter	Settina				·
	75	Line Thickness Correction -		elects the line thickness eneration mode.	0 ~ 15 1/step	
		Setting in Generation Mode	S	Main Scan0:No Correction1:No Correction2:No Correction3:No Correction4:Thinner 15:Thinner 16:Thinner 17:Thinner 18:Thinner 29:Thinner 20:Thinner 21:Thinner 22:Thicker3:Thicker5:Thicker5:Thicker6:Thicker7:Thicker8:Thicker9:Thicker9:Thicker1:Thicker1:Thicker5:Thicker5:Thicker1:Thicker5:Thicker5:Thicker1:Thicker5:Thicker1:Thicker5:Thicker	Sub Scan No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker	
	76	Line Thickness		Pefer 'Line Width Correct elects the threshold to (ction' in section 2.	0~5
	10	Correction Threshold - in Generation Main Scan Direction	S	a higher number is selection is a ffectiveness of the line prrection selected with ecomes stronger.	pplied for a pixel. ected, the thickness SP4-903-75	1/step 2
	77	Line Thickness Correction - Generation Mode - Sub Scan Direction	S	elects the threshold to ickness correction is a higher number is select ffectiveness of the line prrection selected with ecomes stronger.	determine if line pplied for a pixel. If ted, the thickness SP4-903-75	0 ~ 5 1/step 2

Mode No. (Class 1, 2 and 3)		ode No. s 1, 2 and 3)		Function	Settings
4-903	Filter	Settina			· · · · · · · · · · · · · · · · · · ·
	78	Line Thickness Correction -		Selects the line thickness setting in generation mode.	0 ~ 15 1/step
		Setting in Text Mode	S	Main ScanSub Scan0:No CorrectionNo Correction1:No CorrectionThinner 12:No CorrectionThinner 23:No CorrectionThicker4:Thinner 1No Correction5:Thinner 1Thinner 16:Thinner 1Thinner 27:Thinner 1Thicker8:Thinner 2No Correction9:Thinner 2Thinner 110:Thinner 2Thinner 211:Thinner 2Thicker12:ThickerNo Correction13:ThickerThinner 114:ThickerThinner 215:ThickerThickerLine Thickness:Thicker > No Correction > Thinner 1 > Thicker 2	_ 5
	79	Line Thickness Correction -		Refer 'Line Width Correction' in section 2. Selects the threshold to determine if line thickness correction is applied for a pixel. I	0 ~ 5 1/step 2
		Text Mode - Main Scan Direction	S	effectiveness of the line thickness correction selected with SP4-903-78 becomes stronger.	2
	80	Line Thickness Correction - Threshold in Text Mode - Sub Scan Direction	S	Selects the threshold to determine if line thickness correction is applied for a pixel. I a higher number is selected, the effectiveness of the line thickness correction selected with SP4-903-78 becomes stronger.	0~5 1/step 2

Mode No. (Class 1, 2 and 3)			Function		Settings		
4-903	Filter	Setting					
	81	Line Thickness Correction -		Sele gene	cts the line thickness ration mode.	s setting in	0 ~ 15 1/step
		Setting in Text/Photo Mode	S	0: 1: 2: 3: 4: 5: 6: 7: 8: 9: 10: 11: 12: 13: 14: 15: Line	Main Scan No Correction No Correction No Correction Thinner 1 Thinner 1 Thinner 1 Thinner 1 Thinner 2 Thinner 2 Thinner 2 Thinner 2 Thinner 2 Thinner 2 Thicker Thicker Thicker Thicker Thicker	Sub Scan No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 1 Thinner 2 Thicker	
				Thick Thin	ker > No Correction ner 2	> Thinner 1 >	
	82	Line Thickness Correction Threshold in Text/Photo Mode - Main Scan Direction	S	Select thick highe effect corre beco	cts the threshold to ness correction is a er number is selecte tiveness of the line ection selected with mes stronger.	determine if line oplied for a pixel. If d, the thickness SP4-903-81	0 ~ 5 1/step 2
	83	Line Thickness Correction Threshold in Text/Photo Mode - Sub Scan Direction	S	Select thick higher effect correct beco	cts the threshold to ness correction is a er number is selecte tiveness of the line ection selected with mes stronger.	determine if line oplied for a pixel. If d, the thickness SP4-903-81	0 ~ 5 1/step 2
	84	Scanner Gamma Setting in Text Mode	S	Selection settin mode 0: Sc 1: Sc 2: Sc	cts the scanner and ngs used when 'Serve is selected. canner gamma for 'S canner gamma for 'N canner gamma for 'S	printer gamma vice Mode' for Text Soft' is used. Jormal' is used. Sharp' is used.	0~5 1/step 1
	85	Scanner Gamma Selection in Text/Photo Mode	S	Selec settir Text/ 0: Sc St 1: Sc 2: Sc us	cts the scanner and ngs used when 'Serv 'Photo mode is selec- canner gamma for 'F used. canner gamma for 'N canner gamma for 'T ced.	printer gamma vice Mode' for cted. Photo Priority' is Jormal' is used. Text Priority' is	0~5 1/step 1

	M (Class	ode No. s 1, 2 and 3)		Function	Settings
4-904	IPU S	Setting-1			
	2	Gradation Processing Selection - Photo	S	Selects the gradation processing procedure. 0: Three-gradation error diffusion 1: Four-gradation error diffusion 2: 8" x 8" dither matrix 3: 6" x 6" dither matrix 4: 4" x 4" dither matrix <i>A larger dither matrix gives coarser</i> <i>reproduction of halftones. This SP is</i> <i>ignored unless the user selects 'Service</i> <i>Mode' in UP mode.</i>	0 ~ 4 1
	3	Gradation Processing Selection - Text/Photo	S	Selects the gradation processing procedure. 0: Three-gradation error diffusion 1: Four-gradation error diffusion This SP is ignored unless the user selects 'Service Mode' in UP mode.	0 ~ 1 1
	4	Forced Binary Mode	S	1: Binary processing is done for all image modes.	0: No 1: Yes
-	5	Laser Pulse Positioning in Text/Photo Mode	Selects whether phase control is done in text/photo mode or not. <i>This mode is available when 0 is selected</i> <i>with SP4-904-003.</i>	0: No 1: Yes	
	6	Smoothing Filter Level in Photo Mode	S	Selects the smoothing filter level in photo mode. 0: None 1: Weak 5: Strong	0 ~ 5 2
	7	Texture Erase Filter Level in Text/Photo Mode	S	Selects the strength of the filter for erasing texture from the image in text/photo mode. 0: None 1: Weak 2: Strong	0 ~ 2 0
	20	Thin Line Mode in Laser Writing - Text	S	Selects thin line mode level in laser writing for text mode. 0: None 1: Thin Line Mode - Weak 2: Thin Line Mode - Strong	0 ~ 2 1
	22	Thin Line Mode in Laser Writing - Text/Photo	S	Selects thin line mode level in laser writing for text/photo mode. 0: None 1: Thin Line Mode - Weak 2: Thin Line Mode - Strong	0 ~ 2 1
	23	Thin Line Mode in Laser Writing - Pale	S	Selects thin line mode level in laser writing for pale mode. 0: None 1: Thin Line Mode - Weak 2: Thin Line Mode – Strong	0 ~ 2 1

Mode No. (Class 1, 2 and 3)				Function	Settings
4-904	IPU S	Setting-1			
	24	Thin Line Mode in Laser Writing - Generation	S	Selects thin line mode level in laser writing for generation mode. 0: None 1: Thin Line Mode - Weak 2: Thin Line Mode - Strong	0 ~ 2 1
4-905	Image	e Data Path			
	1	Image Data Path - Filtering/ Magnification	S	Selects one of the following video data output be used for printing. 0: Magnification \rightarrow Filtering 1: Filtering \rightarrow Magnification 2: Pre-filter \rightarrow Magnification \rightarrow Filtering 3: Pre-filter \rightarrow Filtering \rightarrow Magnification 4: Normal operation Do not change the value.	uts, which will
	4	Printout Type selection	S	Selects one of the following video data output be used for the printer controller 0: Normal operation 1: Black/White 2: Not printed out 3: Application through Do not change the value.	uts, which will
4-906	Image	e Processing Prior	ity in	Text/Photo Mode	
			S	Selects either text priority or photo priority for text/photo mode. Photo priority:Background erase is off Letter priority:Background erase is on. This SP is ignored unless the user selects 'Service Mode' in UP mode.	0: Photo priority 1: Text priority
4-909	IPU S	Settina-2			
			S	Designer use only. Do not change the value.	
4-910	Data	Compression			
	3	ABS Core	S	Designer use only. Do not change the value.	

Mode No. (Class 1, 2 and 3)			Function	Settings
4-911 HDD	1 Front (Black)			
1	HDD 1 Media Check	S	Checks for bad sectors on hard disk 1 that develop during machine use. This takes 4 minutes. All the image data on this disk is erased, and the stamp data is erased from both disks.	
			This SP mode should be done when an abnormal image is printed. There is no need to do this at installation because the hard disk firmware already contains bad sector information, and damage is not likely during transportation. Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware. If the machine detects over 50 bad sectors, SC364 will be generated. At this time, use SP4-911-2.	-
2	HDD 1 Formatting	S	Formats hard disk 1. This takes 4 minutes. Do not turn off the main power switch during this process.	Start
6	HDD 1 Bad Sector Information Reset		Resets the bad sector information which is stored in the NVRAM. <i>This SP should be used when the hard disk</i> <i>is replaced.</i>	
7	HDD 1 Bad Sector Display	S	Displays the number of bad sectors there are on hard disk 1. If the machine detects a total of over 50 bad sectors on the disk, SC364 will be generated. At this time, use SP4-911-2.	Total: 0 Copy: 0 Printer: 0 AF (Copy Server): 0
8	HDD 1 Model Name Display		Displays the model name of HDD 1. If the HDD is not installed or the HDD connector is not connected, SC360 will be displayed. However, the user can make single copies.	

Mode No. (Class 1, 2 and 3)				Function	Settings	
4-912	HDD	2 Rear (Grav)		1	•	
	1	HDD 2 Media Check		Checks for bad sectors on hard disk 2 that develop during machine use. This takes 4 minutes.		
				and the stamp data is erased from both disks. This SP mode should be done when an abnormal image is printed. There is no	-	
				need to do this at installation because the hard disk firmware already contains bad sector information, and damage is not likely during transportation. Bad sectors detected with this SP mode will be stored in the NVRAM with the bad		
				sector data copied across from the firmware. If the machine detects over 50 bad sectors, SC365 will be generated. At this time, use SP4-912-2.		e e
	2	HDD 2 Formatting		Formats hard disk 2. This takes 4 minutes. Do not turn off the main power switch during this process.	Start	Servic Tables
	6	HDD 2 Bad Sector Information Reset		Resets the bad sector information which is stored in the NVRAM. <i>This SP should be used when the hard disk</i> <i>is replaced.</i>	_	
	7	HDD 2 Bad Sector Display	S	Displays the number of bad sectors there are on hard disk 2. If the machine detects a total of over 50 bad sectors on the disk, SC365 will be generated. At this time, use SP4-912-2.	Total: 0 Copy: 0 Printer: 0 AF (Copy Server): 0	
	8	HDD 2 Model Name Display		Displays the model name of HDD 2. If the HDD is not installed or the HDD connector is not connected, SC361 will be displayed. However, the user can make single copies. (See Detailed Section Descriptions – Others for details on the use of the two hard disks.)	-	
4-913	HDD	Interface Type Se	lectio	on		
			S	<i>Designer use only. Do not change this setting.</i>	0: Ultra DMA/33 I/F 1: Multiword DMA I/F	
4-914	Force	ed HDD Selection				
				<i>Designer use only. Do not change this setting.</i>	0: Default 1: HDD1 2: HDD2	

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	M (Class	ode No. s 1, 2 and 3)		Function	Settings
5-019	Trav	Paper Size Select	ion		
	1	1st Tray	B	Selects the paper size in the 1 st tray.	A4 81/2" x 11" A3 B4 A4R 11" x 17" 81/2" x 14"R 81/2" x 11"R
	6	6th Tray	В	Selects the paper size in the 6 th tray (tray 3 of the optional LCT).	A4 B5 A5 A5R 81/2" x 11" 51/2" x 81/2" 51/2" x 81/2"R
5-024	mm/ir	nch Display Select	tion		1
			s	Selects what unit is used. After selecting the unit, turn the main power switch off and on.	0: mm 1: inch
5-038	Job N	lemory in Sample	Сор	у	1
			S	 Selects whether Next Job can be set before sample copy is finished. 0: Next Job cannot be set until sample copy is finished. 1: Next Job can be set before sample copy is finished. 	
5-104	A3/DI	T Double Count			
			s	Specifies whether the counter is doubled for A3/11" x 17" paper. If "1" is selected, the total counter and the current user code counter count up twice when A3/11" x 17" paper is used.	NO YES
5-106	ID Le	vel Setting		· · ·	
	6	ADS Level Selection	s	Selects the image density level that is used in ADS mode.	1 ~ 9 1 notch/step 5
5-112	Non-s	tandard Paper Se	electi	on	
- F 110	Orti		S	Selects whether a non-standard paper size can be input for trays 2 and 3 (universal tray) or not. <i>If "Yes" is selected, the customer will be able to input a non-standard paper size using a UP mode.</i>	NO YES
5-113	Option	nal Counter Type		This OD is fay laway and Da wat	0 5
			S	change the value.	0 ~ 5 1/step 0
5-118	Disab	le Copying			
			S	Disables copying. The setting should always be "0".	0: No 1: Yes

	M (Clas)	lode No. s 1, 2 and 3)		Function	Settings
5-120	Mode	Clear-Opt. Contro	oller	Removal	<u> </u>
			S	This function is for Japanese machines only.	0: Yes 1: Stand-by 2: No
5-121	Coun	ter Up Timing			
			S	 Determines the key counter count up timing. 0: The key counter counts up at paper feed timing. 1: The key counter counts up when the paper exits to the finisher tray. This setting does not affect the timing of the copier total counter. 	0: Feed 1: Exit
5-127	APS	Mode		,	
			S	Selects the availability of APS mode. 0: APS can be used 1: APS cannot be used	0: Yes 1: No
5-131	Pape	r Size Type Select	ion		
			В	Selects the paper size type (for originals and copy paper). (The default setting depends on the settings of DIP SW 1 and 2 on the SICU.)	0: Japan 1: North America 2: Europe 3: China
				power switch off and on.	
5-212	Pape	r Print Setting			
	3	Page Print Position Side - Side to Side	S	Adjusts the page print position for the reverse side when compared to the front side. –10 (To the right) ~ 10 (To the left)	–10 ~ 10 mm 1 mm/step 0
	4	Page Print Position Up and Down	S	Adjusts the page print position for the reverse side when compared to the front side. –10 (Upper) ~ 10 (Lower)	–10 ~ 10 mm 1 mm/step 0
5-501	PM A	larm Interval			
5-504	Jam	Alarm Interval (BD	S	Set the PM alarm interval. A message is displayed on the screen when the PM counter reaches this value x 1,000. The message can be turned off by the following procedure: Clear Modes key – 0 – Clear key – 0 – Clear key (hold for more than 3 seconds). However, the PM counter is not cleared. To clear the PM counter, use SP7-804.	0 ~ 999 (k) 0 (No PM Alarm)
5-504	1	lam Alarm	5 FU	Japanese version only. Do not change	0.2
		Level	S	the setting.	1: L 2: M 3: H
	2	Jam Alarm Long Time	S	Japanese version only. Do not change the setting.	0: OFF 1: ON
5-505	Error	Alarm (RDS Func	tion)		
			S	<i>Japanese version only. Do not change the setting.</i>	0 ~ 255 (k) 30 k

Mode No. (Class 1, 2 and 3)				Function	Settings
5-513	PM C	all Interval (RDS I	Func	tion)	
	1	Copy Paper Standard	S	Japanese version only. Do not change the setting.	0 ~ 9999 k 300 k 1 k step
	2	Original Paper Standard	s	<i>Japanese version only. Do not change the setting.</i>	0 ~ 9999 k 300 k 1 k step
5-514	PM C	all On/Off Setting			
	1	Copy Paper Standard	S	<i>Japanese version only. Do not change the setting.</i>	0: No 1: Yes
	2	Original Paper Standard	S	Japanese version only. Do not change the setting.	0: No 1: Yes
5-590	Auto	Call Setting (RSS	Fund	ction)	
	2	Door Open	S	Japanese version only. Do not change the setting.	0: OFF 1: ON
	3	Paper Supply	s	Japanese version only. Do not change the setting.	0: OFF 1: ON
	4	Staple Supply	s	Japanese version only. Do not change the setting.	0: OFF 1: ON
	5	Toner Supply	s	Japanese version only. Do not change the setting.	0: OFF 1: ON
5-801	Memo	ory All Clear		5	I
	1	ÁLL		Resets all correction data for process	Start
	2	SICU		control and all software counters. Also,	
	3	BCU		returns all modes and adjustments to the	
				default settings.	
				cleared separately (marked with an S or a	
				B in the Mode No column of this table).	
				See the "Memory All Clear" section for how	
				to use this SP mode correctly.	
				Touch "Start" for over 3 seconds, then turn	
				the main power switch off and on.	
				Normally, this SP mode should not be	
				<i>used.</i> It is used only after replacing the NVRAM	
				or when the copier malfunctions due to a	
				damaged NVRAM.	
				The LCD coordinates are also cleared, see	
	.			"Touch Screen Calibration".	
5-802	Printe	er Free Run		Dunne "On" on the disclose these sets	
				mode	
				Input the required settings, then press the	
				"Start" key to start the free run. The free run	
				stops when the simulation for the set	
				number of copies is finished.	
				Before starting the free run, disconnect the	
				innisher connector. Otherwise, a paper Jam	
5-803	Input	Check	1		<u> </u>
2 200				Displays the signals received from sensors	
				and switches.	
				See the "Input Check" section for details.	

)	5-804	Outpu	t Check				
	0 004	Outpe					
					Turns on the electrical components individually for test purposes. See the "Output Check" section for details.	ON OFF	
	5-811	Mach	ine Serial Number	r			
		1	Machine Serial Number	s	Displays the machine serial number. The number can be reinput using the number keys.		
		3	ID 2 Code	S	This function is for Japanese machines only.		
	5-812	Phone	e No. Setting for S	Servio	cing		
		1	Phone No. for Servicing	S	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs.) <i>Press the "•" key to input a pause.</i>		
					Press the "Clear modes" key to delete the telephone number.		
		2	Fax No. for SMC Report	s	Use this to input the telephone number of the service representative. This number is printed on the SMC print.		
	5-816	CSS	Function (RDS Fu	nctio	n)		
				S	Japanese version only. Do not change the setting.		
	5-821	CSS	PI Device Code (F	RDS	Function)		
				S	<i>Japanese version only. Do not change the setting.</i>	0 ~ 4 0	
	5-907	Plug a	and play				
					This SP mode is for designer use only.		
	5-914	Printe	er Counter Display				
				S	Selects whether or not the total printer counter is displayed in the UP mode.	Off On	
	5-915	Mech	anical Counter De	etecti	on		
					Checks whether the mechanical counter inside the inner cover is connected or not.	0: Not detected 1: Detected 2: Unknown	
	5-917	GPC	Counter				
					Japanese version only. Do not change the setting.		
	5-918	A3/DI	_T Counter Displa	y	-		
				s	Selects whether the A3/DLT counter is displayed in UP mode or when the "Total Counter" key is pressed.		
	5-954	Copv	Server Password	Che	ck	1	
				s	If "1" is selected, when a file in the copy server is selected, the password for that file is displayed.	0: Normal 1: Display the password.	
⊢	5-965		e All the Saved Fil	60			
	0-900	Delet	e Ali lite Saveu Fli	65	Deletes all the copy server files stored in the HDD.		

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	M (Clas	lode No. s 1, 2 and 3)		Function	Settings
5-967	Copy	Server: Disable F	unct	ion	
			S	If "1" is selected, the copy server function is disabled.	0: Normal 1: Disable copy server
				changing the setting.	.,
5-968	Delet	e All the Stored Fi	les ir	1 CD	
				Deletes all the copy server files stored in the CD currently in the CD-RW.	
5-990	SMC	Print			
	1	All		Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.	Start
	2	SP		Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	Start
	3	User Program		Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	Start
	4	Logged Data		Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.	Start
6-006	DF R	egistration Adjustn	nent		
	1	Side-to-Side	В	Adjusts the printing side-to-side registration in the ADF mode.	-3 ~ +3 0.1 mm/step
		Laadina Edua		Use the "•" key to toggle between + and	+0.0 1111
	2	(Thin Original)	В	Adjusts the original stop position. Use the " \bullet " key to toggle between + and –.	-10 ~ +10 0.13 mm/step +0.0 mm
	3	Leading Edge (Duplex-1st)	В	Adjusts the original stop position against the original left scale in one-sided original mode.	-29 ~ +29 0.13 mm/step +0.0 mm
	4	4 Leading Edge		Adjusts the original stop position against the original left scale in two-sided original	-29 ~ +29 0.13 mm/step
			В	mode.	+0.0 mm
6-007	ADF	Input Check			
0.001	1	Group 1		Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.	
	2	Group 2		Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.	
	3	Group 3		Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.	
6-008	ADF	Output Check			
				Turns on the electrical components of the ADF individually for test purposes. See the "Output Check" section for details.	

		M (Class	ode No. s 1. 2 and 3)		Function	Settings		
	6-009	DF Fr	ee Run (Two-side	d Or	iginal)			
					Performs an ADF free run in two-sided original mode. Press "1" to start.	OFF ON		
					This is a general free run controlled from the copier. For more detailed free run modes, see the 'Test Points/Dip			
					Switches/LEDs' section.			
	6-016	ADF N	Motor Speed Adjus	stme	nt			
					After pressing the Start key, the machine automatically adjusts the speeds of the ADF motors in the following order: Feed-in motor \rightarrow Transport Belt Motor \rightarrow Feed-out Motor (High) \rightarrow Feed-out Motor			
		a . 1			(Low)			
	6-105	Staple	e Position Adjustm	ent		1 0 5		
					Adjusts the stapling position in the main scan direction	-1~ +3.5 0.5 mm/step		
				В	Use the "•" key to toggle between + and –. A larger value causes the stapling position to shift outward.	+0.0 mm		
	6-107	Finish	er Free Run			•		
		1	Staple Mode		The finisher simulates staple mode operation. Press [1] to start the free run. To stop the free run, press [0].			
		2	Shift Mode		The finisher simulates staple mode free run with tray shifting (without stapling). Press [1] to start the free run.			
Ξ	6-113	Punch	n Hole Position Ad	justr	nent			
				В	Adjusts the punch hole position in the sub- scan direction for the punch unit. Use the "•" key to toggle between + and –. A larger value shifts the punch holes towards the edge of the paper.	-7.5 ~ +7.5 0.5 mm/step 0 mm		
	6-116	Sheet	Conversion (Thic	k Pa	per)			
				В	Multiply the normal limit by this number to determine the staple limit number for thick paper mode.	1 ~ 3 3		
	6-117	Finish	er Input Check					
		1	Group 1		Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.			
		2	Group 2		Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.			
		3	Group 3		Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.			
	6-117	Finish	er Input Check			1		
		4	Group 4		Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.			

	M (Class	ode No. s 1, 2 and 3)		Function	Settings
6-118	Finish	ner Output Check			•
				Turn on the electrical components of the finisher individually for test purposes. See the "Output Check" section for details.	
6-119	Punch	n Function Enable	d (Tł	nick Paper)	
			В	Determines whether punch mode is enabled or not in thick paper mode.	0: No 1: Yes
6-801	Comr	nunication Test - 1	Fand	em Job This SP mode is for designer use only	
7-001	Main	Motor (Drum Moto	r) O	neration Time	
7 001	Iviairi		B	Displays the total drum rotation time	Min
7-002	Origin	al Counter	D	Displays the total druin rotation time.	171111.
7-002		Total	9	Displays the total number of fod originals	
	- 1	Conv	3	Displays the total number of fed originals.	
	2	Сору	S	copy mode.	
	3	Copy Server	S	Displays the total number of fed originals in copy server mode.	
7-003	Copy/	Printer Counter			•
	1	Total Count	S	Displays the total number of prints in all modes.	
	2	Сору	S	Displays the total number of prints in copy mode.	
	4	Printer	S	Displays the total number of prints in printer mode.	
7-006	GPC	Counter			1
	1	GPC Total	S	Japanese version only.	
	2	GPC Copy	S		
	3	GPC Printer	S		
7-009	Renta	al GPC Counter			
	1	GPC Total	S	Japanese version only.	
	2	GPC Copy	S		
	3	GPC Printer	S		
7-101	Copy	Counter by Paper	Size	9	1
	5	A4 Sideways	S	Displays the total number of prints by paper	
	6	A5 Sideways	S	size.	
	14	, B5 Sideways	S		
	38	LT Sideways	S		
	44	HLT Sideways	S		
	128	Other Sizes	S		
	132	A3	S		
	133	A4 Lenathwise	S		
	134	A5 Lengthwise	S		
	141	B4	S		
	142	B5 Lenathwise	S		
	160	DLT	S		
	164	LG	S		
	166	LT Lengthwise	S		
7-101	vaoO	Counter by Paper	Size	2	1
	172	HLT Lengthwise	S	Displays the total number of prints by paper size.	
	1	1		1	1

Mode No. (Class 1, 2 and 3)				Function	Settings
7-201	Total	Scan Count			
7 201	Total			Displays the total number of scanned	
			S	originals.	
7-202	Origir	nal Counter by Siz	е	-	
	4	A3	S	Displays the total number of scanned	
	5	A4	S	originals by original size.	
	6	A5	S		
	13	B4	S		
	14	B5	S		
	32	DLT	S		
	36	LG	S		
	38	LT	S		
	44	HLT	S		
	128	Other Sizes	S		
7-204	Сору	Counter by Paper	⁻ Tra	у	
	1	1st Paper Tray	S	Displays the total number of sheets fed	
	2	2nd Paper Tray	S	from each paper feed tray.	
	3	3rd Paper Tray	S		
	4	4th Paper Tray	S		
	5	5th Paper Tray	S		
7-204	Copy Counter – Paper Tray		Tray		
	6	6th Paper Tray	S	Displays the total number of sheets fed	
			Ŭ	from each paper feed tray.	
7-205	Iotal	ADF Counter			
			S	Displays the total number of originals fed	
7-206	Stanl	e Counter			
7 200	σιαρι	e oounter	S	Displays the total number of staples used	
7-207	Punc	h Counter	0		
. 201	1 arro		_	Displays the total number of hole punch	
			S	operations.	
7-301	Total	Copies By Reproc	duction	on Ratio	
	1	32% ~ 49%	S	Displays the total number of prints by	
	2	50% ~ 99%	S	reproduction ratio.	
	3	100%	S		
	4	101% ~ 200%	S		
	5	201% ~ 400%	S		
	6	Direct Mag.	S		
	7	Direct Size	S		
		Mag.		4	
	8	Size Mag.	S	4	
7.001	9	Fixed Mag.	S		
7-304	Iotal	Copies By Copy N	/lode		
		Letter	S	Displays the total number of prints by copy	
	2	Letter/Photo	S		
	3	Photo	S	4	
	4	Generation	S	4	
	5	Pale	S	4	
	6	Punch	S	4	
	7	Multiple Copy	S		

Mode No.				Function Settings		
7 204	(Class	S 1, 2 allu 3)	lada		_	
7-304	Total			Displays the total symbols of prints by some		
	8	Sori	5 C	Displays the total number of prints by copy		
	9	Staple	5 C	inode.		
	10		20			
	11	Erase Copy	5			
	12		S			
	13		5			
	14		5			
	15	2-sided Original	S			
	16		5			
	17		S			
	10	- I Side Combine Mede				
	18	- 2 Side	S			
	19	Mini Book Mode	S			
	20	Magazine Mode	S			
	21	Batch (SADF) Mode	S			
	22	Mixed Size Mode	S			
	23	Thin Original	S			
7-305	5 Total Copies in Multiple Cor			y Mode	•	
	1	1 to 1	S	Displays the total number of prints by		
	2	1 to 2 ~ 5	S	multiple copy quantity.		
	3	1 to 6 ~ 10	S			
	4	1 to 11 ~ 20	S			
	5	1 to 21 ~ 50	S			
	6	1 to 51 ~ 100	S			
	7	1 to 100 ~ 300	S			
	8	1 to 301 ~	S			
7-306	Сору	: Each Mode Job				
	1	Sort	S	Displays the total number of copy jobs that		
	2	Staple	S	have been done for various modes.		
	3	Punch	S			
	4	Next Job	S			
	5	Sample Copy	S			
7-320	Сору	Server: Scanned	Stora	age		
	1	Number of Scan	S	Displays the total number of stored originals in the copy server.		
7-321	Сору	Server: Original C	oun	ter by Size		
	4	A3	S	Displays the total number of stored		
	5	A4	S	originals in the server by size.		
	6	A5	S			
	13	B4	S			
	14	B5	S			
	32	DLT	S			
	36	LG	S			
	38	LT	S			
	44	HLT	S			
	128	Other Size	S			

Mode No. (Class 1, 2 and 3)				Function	Settings	
7-323	, Vqo	Server: Each Size	e of (Copies	1	
	5	A4 Sidewavs	S	Displays the total number of prints made		
	6	A5 Sideways	S	from the copy server by paper size.		
	14	B5 Sideways	S			
	38	LT Sideways	S			
	44	HLT Sideways	S			
	128	Other Sizes	S			
	132	A3	S			
	133	A4 Lengthwise	S			
	134	A5 Lengthwise	S			
	141	R4	S			
	142	B5 Lenathwise	S			
	160	DIT	S			
	164		S			
	166	L T L enathwise	S			
	172	HIT Lengthwise	9			
7-324	Copy	Sorvor: Print Joh		l		
7-524		Duploy Job		Displays the total number of eany jobs		
	2	Sort Job	0	made from the conviserver		ce
	2	Sult JUD Stapla Brint Jah	0	inade nom the copy server.		rvi able
	3	Staple Print Job	5			Se Ta
	4	Punch Print Job	5			
	5	Sample Copy	5			
7.005	6	First Page Print	5	- Distribution		
7-325	Сору	Server: Print Job	Page	e Distribution		
		1	5	Displays the number of jobs by number of		
	2	2	5	pages, made nom the copy server.		
	3	3-5	S			
	4	6 - 10	S			
7.000	5		5			
7-326	Сору	Server: Print Job	File			
	1	1	S	Displays the number of jobs by the number		
	2	2-5	S	the copy server		
	3	6 - 10	S			
7.007	4	11 - 0	S			
7-327	Сору	Server: Print Job	Set			
	1	1 to 1	S	Displays the total number of prints by		
	2	1 to 2 ~ 5	S	nulliple copy quantity, using the copy		
	3	1 to 6 ~ 10	S			
	4	1 to 11 ~ 20	S	-		
	5	1 to 21 ~ 50	S			
	6	1 to 51 ~ 100	S	-		
	7	1 to 100 ~ 300	S			
7.000	8	1 to 301 ~	S			
7-328	Сору	Server: Copy Nur	nber	of Each Job		
	1	Duplex Copy	S	Displays the total number of duplex prints		
7 000	0.000		 	of Each Joh		
7-328	Copy	Server: Copy Nur	nper	OI Each JOD		
	2	Duplex Original	c	Display the total number of prints of two-		
	1		1			11

Mode No. (Class 1, 2 and 3)				Function	Settings
7-330	Tand	em Job		•	
			S	Displays the number of jobs made as the master in tandem mode.	0
7-331	7-331 Tandem: Copy			•	•
	1	Master: Copy	S	Displays the number of copies made in tandem mode as the master.	
	2	Slave: Copy	S	Displays the number of copies made in tandem mode as the slave.	
7-332	Tand	em/Master: Copy			
	1	Original Mode: Text	S	Displays the number of copies made in each master mode.	
	2	Original Mode: Text/Photo	S		
	3	Original Mode: Photo	S		
	4	Original Mode: Generation	S		
	5	Original Mode: Pale	S		
	6	Punch	S		
	7	Repeat	S		
	8	Sort	S		
	9	Staple	S		
	10	Series	S		
	11	Erase	S		
	12	Duplex Copy	S		
	13	ADF Mode	S		
	14	Double Copy	S		
	15	Duplex Original	S		
	16	Interrupt	S		
	17	Combine 1 Side	S		
	18	Combine 2 Side	S		
	19	Booklet	S		
	20	Magazine	S		
	21	Batch Mode	S		
	22	Mixed Sizes	S	4	
	_23	Thin	S		
7-333	Tand	em/Slave: Copy		1	1
	1	Original Mode: Text	S	Displays the number of copies made in each slave mode.	
	2	Original Mode: Text/Photo	S		
	3	Original Mode: Photo	S		
	4	Original Mode: Generation	S		
	5	Original Mode: Pale	S		
	6	Punch	S	1	
	7	Repeat	S	1	
	8	Sort	S		

Mode No. (Class 1, 2 and 3)				Function	Settings	
7-333	Tand	em/Slave: Copy				
	9	Staple	S	Displays the number of copies made in		
	10	Series	S	each slave mode.		
	11	Erase	S			
	12	Duplex Copy	S			
	13	ADF Mode	S			
	14	Double Copy	S			
	15	Duplex Original	S			
	16	Interrupt	S			
	17	Combine 1 Side	S			
	18	Combine 2 Side	S			
	19	Booklet	S			
	20	Magazine	S			
	21	Batch Mode	S			
	22	Mixed Sizes	S			
	23	Thin	S			
7-401	Total	SC Counter				
			S	Displays the total number of service calls		0
			3	that have occurred.		vice
7-403	SC H	istory			1	ser Tab
	1	Latest	S	Displays the latest 10 service call codes.		0,7 1
	2	Latest 1st	S			
	3	Latest 2nd	S			
	4	Latest 3rd	S			
	5	Latest 4th	S			
	6	Latest 5th	S			
	7	Latest 6th	S			
	8	Latest 7th	S			
	9	Latest 8th	S			
	10	Latest 9th	S			
7-501	Total	Jam Counter		1	1	
			S	Displays the total number of copy jams and original jams.		
7-502	Total	Copy Jam Counte	er			
			S	Displays the total number of copy jams.		
7-503	Total	Original Jam Cou	nter			
			S	Displays the total number of original jams.		

	Mode No. (Class 1, 2 and 3)			Function	Settings
7-504	Copy	Jam Counter by J	am I		
	These	e are jams when the		aper does not activate the sensor	
	1	At Power On	S	Displays the total number of copy jams by location. The information in brackets shows the sensors that are used to detect these	
	3	1st Paper Trav	S	Jams. (1st Paper Feed Sensor)	
	1	2nd Paper Tray	9	(2nd Paper Food Sonsor)	
	5	2rd Dopor Troy	5 6	(2rd Paper Food Sensor)	
	5	Ath Dener Trees	00	(Stu Paper Feed Sensor)	
	6	4th Paper Tray	S	(4th Paper Feed Sensor)	
	/	5th Paper Tray	S	(5th Paper Feed Sensor)	
	8	6th Paper Tray	S	(6th Paper Feed Sensor)	
	9	LCT Relay Sensor	S		
	10	LCT Exit Sensor	S		
	12	Relay Sensor	S		
	13	Registration Sensor	S		
	15	Fusing Exit Sensor	S		
	16	Exit Sensor	S		
	19	Duplex Entrance Sensor	S		
	20	Duplex Transport Sensor 1	S		
	21	Duplex Transport Sensor 2	S		
	22	Duplex Transport Sensor 3	S		
	23	Inverter Tray Paper Sensor	S		
	25	Entrance Sensor - Fin.	S		
	26	Upper Tray Exit Sensor - Fin.	S		
	27	Shift Tray Exit Sensor - Fin.	S		
	28	Stapler Tray Entrance Sensor - Fin.	S		
	29	Stapler Tray Paper Sensor - Fin.	S		
	35	Entrance Sensor - FIN Staple Tray	S		

Mode No.				Function	Settings
7 504	(Clas	s 1, 2 and 3)			g -
7-504	Сору	Jam Counter by J	am I		
	Ines	e are jams when ti	ne pa	aper stays at the sensor.	
	53	Ist Paper Tray	5	(Ist Paper Feed Sensor)	
	54	2nd Paper Tray	5	(2nd Paper Feed Sensor)	
	55	3rd Paper Tray	S	(3rd Paper Feed Sensor)	
	56	4th Paper Tray	S	(4th Paper Feed Sensor)	
	5/	5th Paper Tray	S	(Sth Paper Feed Sensor)	
	58	6th Paper Tray	S	(6th Paper Feed Sensor)	
	59	Sensor	S		
	60	LCT Exit Sensor	s		
	62	Relay Sensor	S		
	63	Registration Sensor	S		
	65	Fusing Exit Sensor	S		
	66	Exit Sensor	S		
	69	Duplex			
		Entrance	S		
	70	Sensor			
	70	Duplex Transport Sensor 1	S		
	71	Duplex Transport Sensor 2	S		
	72	Duplex Transport Sensor 3	S		
	73	Inverter Tray Paper Sensor	S		
7-505	Origir	nal Jam Counter b	y Jar	m Location	
	1	At Power On	S		
	3	ADF Feed-in Sensor	S	Detected by the entrance and registration sensors	
	4	ADF Feed-out Sensor	S	Detected by the exit and inverter sensors.	
7-506	Jam (Counter by Copy S	Size	1	
	5	A4 Sideways	S	Displays the total number of copy jams by	
	6	A5 Sideways	S	paper size.	
	14	B5 Sideways	S		
	38	LT Sideways	S		
	44	HLT Sideways	S		
	128	Other Size	S		
	132	A3	S		
	133	A4 Lengthwise	S		
	134	A5 Lengthwise	S		
	141	B4 Lengthwise	S		
	142	B5 Lengthwise	S		
	160	DLT	S		

Mode No. (Class 1, 2 and 3)				Function Settings		
7-506	Jam (Counter by Copy S	Size			
1 000	164		S	Displays the total number of copy jams by		
	166	LT Lengthwise	S	paper size.		
	172	HIT Lengthwise	S			
7-507	Jam I	History	<u> </u>			
	1	Copy: Latest	S	Displays the following items for the most		
	2	Latest 1st	S	recent 10 jams.		
	3	Latest 2nd	S	1. Last 5 digits of the total counter value		
	4	Latest 3rd	S	2. Paper size		
	5	Latest 4th	S	3. Detected position		
	6	Latest 5tht	S	4. Stuck or not fed		
	7	Latest 6th	S			
	8	Latest 7th	S			
	9	Latest 8th	S			
	10	Latest 9th	S			
	11	Original: Latest	S			
	12	Latest 1st	S			
	13	Latest 2nd	S			
	14	Latest 3rd	S			
	15	Latest 4th	S			
	16	Latest 5th	S			
	17	Latest 6th	S			
	18	Latest 7th	S			
	19	Latest 8th	S			
	20	Latest 9th	S			
7-617	Parts	PM Alarm Counte	r Dis	splay		
	1	Copy Paper Standard	S	This counter is used for the Japanese market only.		
	2	Original Paper		This counter is used for the Japanese		
		Standard		market only.		
7-618	Parts	PM Alarm Counte	r Cle	ear		
	1	Copy Paper		Clears the counter of SPS7-617-1.		
		Standard				
	2	Original Paper Standard		Clears the counter of SPS7-617-2.		
7-801	ROM	Version Display				
				Displays the ROM versions. 001: SICU 002: BCU 003: CSS (P1) – Japan only 004: HDC (Hard disk controller)		
				005: Scanner 006: ADF 007: Finisher 008: Printer		
7-803	PM C	ounter Display				
7.004			S	Displays the PM counter since the last PM.		
7-804	РМС	ounter Reset		Departs the DM security:	Chart	
				nesels life Mill Counter.	Start	

	M	lode No.	Function	Settings
7 007		s 1, 2 and 3)		J
7-807	SC/Ja	am Counter Reset		0
			"Start" to reset.	Start
7-808	Coun	ter Clear		
			Resets all counters, except for the total counters (SP 7-003):	Start
7-810	Acce	ss Code Clear	1 1833 Start 10 1836t.	
7 010	7000		Besets both the key operator code and the	Start
			weekly timer code ('key operator code for off setting'). Press "Start" to reset.	Oldit
7-816	Сору	Counter Clear- Paper	Tray	
	1	Paper Tray 1	Resets the total copy counter by paper	Start
	2	Paper Tray 2	tray. These SP modes can be used after	
	3	Paper Tray 3	replacing the pick-up, feed, and separation	
	4	Paper Tray 4	rollers in the paper feed stations.	
	5	Paper Tray 5		
	6	Paper Tray 6		
7-817	Total	ADF Counter Reset		_
			Resets the ADF Counter (SP7-205). Press "Start" to reset.	Start
7-822	Сору	Counter Clear - Magn	ification	
			Resets all counters of SP7-301.	Start
7-825	Total	Counter Clear		
			Resets the electrical total counter.	Start
			Usually, this SP mode is done at installation.	
			This SP mode works only once when the counter value is negative.	
7-826	Optio	n Counter Error Count	er	•
	1	Total S	For Japanese version only.	
	2	Staple S		
7-827	Optio	n Counter Error Count	er Clear	1
			For Japanese version only.	
7-828	Punc	h Counter Clear		1
7.000			Resets the punch counter (SP7-207)	
7-829	Kenta	al GPC Counter Clear		
7 000	00 5	ataila	⊢or Japanese version only.	
7-902	SC D	etails	Disate a data ita aka tuka tata di 00 - Nat	
			all SCs have these details. For designer	
7.001			use only.	
7-904	Сору	Counter Clear – Copy		Ctort
			7-332, and 7-333.	Sian
7-905	Сору	Counter Clear – Multi	ple Copy Mode	
			Resets all counters of SP7-305.	Start
7-906	Origin	nal Counter Clear – Siz		
7.007			Resets all counters of SP7-202.	Start
7-907	Jop (Jounter Clear		
			Resets all counters of SP7-306, and 7-330.	Start

	Mode No. (Class 1, 2 and 3)	Function	Settings				
7-908	Copy: Original Counter Cle	ar					
		Resets SP7-002-2.	Start				
7-920	Copy Server: Scanned Stor	age Counter Clear					
		Resets the counter of SP7-320.	Start				
7-921	Copy Server: Original Cour	iter Clear - Size					
		Resets all counters of SP7-321.	Start				
7-923	Copy Server: Print Counter	Clear					
		Resets all counters of SP7-323.	Start				
7-924	Copy Server: Print Job Counter Clear						
		Resets all counters of SP7-324.	Start				
7-925	Copy Server Print Job Page	e Distribution Clear					
		Resets all counters of SP7-325.	Start				
7-926	Copy Server: Print Job File Distribution Clear						
		Resets all counters of SP7-326.	Start				
7-927	Copy Server: Print Job Set Distribution Clear						
		Resets all counters of SP7-327.	Start				
7-928	Copy Server: Copy Counte	r Clear – Copy Mode					
		For Japanese machines only.					
7-990	SC990 Information						
	S	Designer use only.					

4.2.3 TEST PATTERN PRINTING (SP2-902)

- **NOTE:** Do not operate the machine until the test pattern is printed out completely. Otherwise, an SC may occur.
- 1. Access the SP mode which contains the test pattern you need.
- 2. Touch the "Copy Mode" key on the operation panel to access the copy mode display.
- 3. Select the paper size.
- 4. Press the "Start" key to print the test pattern.
- 5. After checking the test pattern, exit copy mode by touching the "SP Mode" key.
- 6. Exit the SP mode.
- **NOTE:** Test patterns are printed out until the main switch is turned off and on. Use this test pattern to test the printer controller.

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

No.	Test Pattern	No.	Test Pattern
0	None	7	Vertical Strips
1	Vertical Line (1-dot)	8	Grayscale (Vertical)
2	Vertical Line (2-dot)	9	Grayscale (Horizontal)
3	Horizontal Line (1-dot)	10	Cross Pattern
4	Horizontal Line (2-dot)	11	Argyle Pattern
5	Alternating Dot Pattern	12	Frequency (Horizontal)
6	Grid Pattern (1-dot)	13	Frequency (Vertical)

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

No.	Test Pattern	No.	Teat Pattern
1	Alternating Dot Pattern (1,024-dot)	15	16 Trimming Area
2	Alternating Dot Pattern (4-dot)	16	Argyle Pattern
3	Alternating Dot Pattern (2-dot)	17	Line Cross Stitch
4	Alternating Dot Pattern (1-dot)	18	Black Band (Vertical)
5	Grid Pattern (1-dot 0 ch)	19	Black Band (Horizontal)
6	Grid Pattern (1-dot 1 ch)	20	Gray Trim
7	Grid Pattern (1-dot 2 ch)	21	Stair Pattern
8	Grid Pattern (1-dot 3 ch)	22	Grayscale Vertical 20 mm
9	Vertical Line (1-dot)	23	Grayscale Vertical 40 mm
10	Horizontal Line (1-dot)	24	Grayscale Vertical 20 mm
11	Vertical Line (2-dot)	25	Grayscale Horizontal 40 mm
12	Horizontal Line (2-dot)	26	Grayscale Horizontal 20 mm
13	Grid Pattern (1-dot)	27	White (Out data mask)
14	Full Dot Pattern	28	Grid Pattern (1-dot) (0 ch mode) (Out data overlay)

4.2.4 INPUT CHECK

Main Machine Input Check (SP5-803)

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

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

Class 3 No.	Bit No.	Description	Reading	
			0	1
1	7	Not Used		
	6	Not Used		
	5	LCT 3rd Paper End Sensor (6th tray)	Not paper end	Paper end
	4	LCT 2nd Paper End Sensor (5th tray)	Not paper end	Paper end
	3	LCT 1st Paper End Sensor (4th tray)	Not paper end	Paper end
	2	3rd Paper End Sensor	Not paper end	Paper end
	1	2nd Paper End Sensor	Not paper end	Paper end
	0	1st Paper End Sensor	Not paper end	Paper end
	7	Not Used		
2	6	Not Used		
	5	LCT 3rd Paper Feed Sensor (6th tray)	Paper detected	No paper
	4	LCT 2nd Paper Feed Sensor (5th tray)	Paper detected	No paper
	3	LCT 1st Paper Feed Sensor (4th tray)	Paper detected	No paper
	2	3rd Paper Feed Sensor	Paper detected	No paper
	1	2nd Paper Feed Sensor	Paper detected	No paper
	0	1st Paper feed Sensor	Paper detected	No paper
3	7	Not Used		
	6	Duplex Entrance Sensor	Detected	Not detected
	5	Duplex Jogger H.P.	Not detected	Detected
	4	Duplex Transport 3 Sensor	Detected	Not detected
	3	Duplex Transport 2 Sensor	Detected	Not detected
	2	Duplex Transport 1 Sensor	Detected	Not detected

No.No.Description0131Inverter Tray Paper SensorDetectedNot detected0Duplex ConnectionConnectedNot connected7Not Used	Class 3	Bit No.	Description	Reading		
3 1 Inverter Tray Paper Sensor Detected Not detected 0 Duplex Connection Connected Not connected 6 Not Used Connected Not connected 6 Not Used	No.			0	1	
3 0 Duplex Connection Connected Not connected 7 Not Used	3	1	Inverter Tray Paper Sensor	Detected	Not detected	
4 7 Not Used - 6 Not Used - - 5 LCT 3rd Lift Sensor (6th tray) Lifted No paper 3 LCT 1st Lift Sensor (4th tray) Lifted No paper 2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 6 Not Used - - 5 Not Used - - 4 Not Used - - 5 Not Used - - 4 Not Used - - 4 Not Used - - 7 Not Used - - 8 Polygon Motor Cooling Fan Lock No lock Lock 1 Toner Hopper Sensor Toner end Not toret 1 Toner Kopper Sensor Toner end Not toret 6 Fusing/Duplex Motor Lock No lock		0	Duplex Connection	Connected	Not connected	
4 6 Not Used Not Used 5 LCT 3rd Lift Sensor (6th tray) Lifted No paper 3 LCT 1st Lift Sensor (5th tray) Lifted No paper 2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 6 Not Used		7	Not Used			
5 LCT 3rd Lift Sensor (6th tray) Lifted No paper 4 LCT and Lift Sensor (5th tray) Lifted No paper 3 LCT 1st Lift Sensor (4th tray) Lifted No paper 2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 6 Not Used		6	Not Used			
4 LCT 2nd Lift Sensor (5th tray) Lifted No paper 3 LCT 1st Lift Sensor (4th tray) Lifted No paper 2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 6 Not Used		5	LCT 3rd Lift Sensor (6th tray)	Lifted	No paper	
3 LCT 1st Lift Sensor (4th tray) Lifted No paper 2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 7 Not Used	4	4	LCT 2nd Lift Sensor (5th tray)	Lifted	No paper	
2 3rd Lift Sensor Lifted No paper 1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 7 Not Used	4	3	LCT 1st Lift Sensor (4th tray)	Lifted	No paper	
1 2nd Lift Sensor Lifted No paper 0 1st Lift Sensor Lifted No paper 7 Not Used		2	3rd Lift Sensor	Lifted	No paper	
0 1st Lift Sensor Lifted No paper 7 Not Used		1	2nd Lift Sensor	Lifted	No paper	
7 Not Used		0	1st Lift Sensor	Lifted	No paper	
6 Not Used	5	7	Not Used			
5 Not Used		6	Not Used			
4 Not Used Set Not set 3 Drum Unit set Set Not set 2 Polygon Motor Cooling Fan Lock No lock Lock 1 Toner Hopper Sensor Toner end Not toner end 0 Key Counter Set Set Not set 7 Drum Motor Lock No lock Lock 6 Fusing/Duplex Motor Lock No lock Lock 5 XFGATE		5	Not Used			
5 3 Drum Unit set Set Not set 2 Polygon Motor Cooling Fan Lock No lock Lock 1 Toner Hopper Sensor Toner end Not toner end 0 Key Counter Set Set Not set 7 Drum Motor Lock No lock Lock 6 Fusing/Duplex Motor Lock No lock Lock 5 XFGATE		4	Not Used			
2Polygon Motor Cooling Fan LockNo lockLock1Toner Hopper SensorToner endNot toner end0Key Counter SetSetNot set7Drum Motor LockNo lockLock6Fusing/Duplex Motor LockNo lockLock5XFGATE		3	Drum Unit set	Set	Not set	
1Toner Hopper SensorToner endNot toner end0Key Counter SetSetNot set7Drum Motor LockNo lockLock6Fusing/Duplex Motor LockNo lockLock5XFGATE		2	Polygon Motor Cooling Fan Lock	No lock	Lock	
0Key Counter SetSetNot set7Drum Motor LockNo lockLock6Fusing/Duplex Motor LockNo lockLock5XFGATE		1	Toner Hopper Sensor	Toner end	Not toner end	
7Drum Motor LockNo lockLock6Fusing/Duplex Motor LockNo lockLock5XFGATE		0	Key Counter Set	Set	Not set	
6 Fusing/Duplex Motor Lock No lock Lock 5 XFGATE		7	Drum Motor Lock	No lock	Lock	
6 5 XFGATE	6	6	Fusing/Duplex Motor Lock	No lock	Lock	
6 4 Not used Not lock Lock 3 Development Motor Lock No lock Lock 2 Not used		5	XFGATE			
3 Development Motor Lock No lock Lock 2 Not used		4	Not used			
2 Not used 1 Not used 1 Not used 0 Toner Supply Motor Sensor Not interrupted Interrupted 7 Left Front Door Safety Switch Door closed Door open 6 Right Front Door Safety Switch Door closed Door open 5 Paper Feed Motor Lock No lock Lock 4 Guide Plate Position Sensor In position Out of position 3 LCT Relay Sensor On Off 2 Relay Sensor On Off 1 Not Used On Off 0 Registration Sensor On Off 1 Not Used On Off 1 Not Used On Off 1 Not Used On Off 3 Lorer Bottle Inner Cap Sensor Cap opened Cap closed 6 Upper Bottle Inner Cap Sensor Toner end Toner not end 4 Toner Collection Bottle Sensor Bottle set Bottle not set 3 Toner Overflow Sensor No lock Lock	, , , , , , , , , , , , , , , , , , ,	3	Development Motor Lock	No lock	Lock	
1Not usedImage: constraint of the set0Toner Supply Motor SensorNot interruptedInterrupted7Left Front Door Safety SwitchDoor closedDoor open6Right Front Door Safety SwitchDoor closedDoor open5Paper Feed Motor LockNo lockLock4Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used		2	Not used			
0Toner Supply Motor SensorNot interruptedInterrupted7Left Front Door Safety SwitchDoor closedDoor open6Right Front Door Safety SwitchDoor closedDoor open5Paper Feed Motor LockNo lockLock4Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used		1	Not used			
7Left Front Door Safety SwitchDoor closedDoor open6Right Front Door Safety SwitchDoor closedDoor open5Paper Feed Motor LockNo lockLock4Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used		0	Toner Supply Motor Sensor	Not interrupted	Interrupted	
76Hight Front Door Safety SwitchDoor closedDoor open5Paper Feed Motor LockNo lockLock4Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used	7	/	Left Front Door Safety Switch	Door closed	Door open	
73Paper Feed Motor LockNo lockLock4Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used		6	Right Front Door Safety Switch	Door closed	Door open	
74Guide Plate Position SensorIn positionOut of position3LCT Relay SensorOnOff2Relay SensorOnOff1Not Used		5	Paper Feed Motor Lock		LOCK	
3LCT Relay SensorOnOn2Relay SensorOnOff1Not Used		4	Guide Plate Position Sensor			
2Netlay SensorOnOn1Not Used		ა ი	Polov Soncor	On	Oll	
1Not OsedOnOff0Registration SensorOnOff7Lower Bottle Inner Cap SensorCap openedCap closed6Upper Bottle Inner Cap SensorCap openedCap closed5Toner Near-end SensorToner endToner not end4Toner Collection Bottle SensorBottle setBottle not set3Toner Overflow SensorNo lockLock2Toner Bottle Unit Motor LockNo lockLock81Lower Toner BottleBottle setBottle not set97Total Counter SetSetNot set		2 1	Not Used	Oli		
87Lower Bottle Inner Cap SensorCap openedCap closed6Upper Bottle Inner Cap SensorCap openedCap closed5Toner Near-end SensorToner endToner not end4Toner Collection Bottle SensorBottle setBottle not set3Toner Overflow SensorNo lockLock2Toner Bottle Unit Motor LockNo lockLock81Lower Toner BottleBottle setBottle not set97Total Counter SetSetNot set		0	Registration Sensor	On	Off	
86Upper Bottle Inner Cap SensorCap openedCap closed5Toner Near-end SensorToner endToner not end4Toner Collection Bottle SensorBottle setBottle not set3Toner Overflow SensorNo lockLock2Toner Bottle Unit Motor LockNo lockLock81Lower Toner BottleBottle setBottle not set97Total Counter SetSetNot set	8	7	Lower Bottle Inner Can Sensor	Can onened	Can closed	
8 5 Toner Near-end Sensor Toner end Toner not end 4 Toner Collection Bottle Sensor Bottle set Bottle not set 3 Toner Overflow Sensor No lock Lock 2 Toner Bottle Unit Motor Lock No lock Lock 8 1 Lower Toner Bottle Bottle set Bottle not set 9 7 Total Counter Set Set Not set		6	Lipper Bottle Inner Cap Sensor	Cap opened	Cap closed	
8 4 Toner Collection Bottle Sensor Bottle set Bottle not set 3 Toner Overflow Sensor No lock Lock 2 Toner Bottle Unit Motor Lock No lock Lock 8 1 Lower Toner Bottle Bottle set Bottle not set 9 7 Total Counter Set Set Not set		5	Toner Near-end Sensor	Toner end	Toner not end	
3Toner Overflow SensorNo lockLock2Toner Bottle Unit Motor LockNo lockLock81Lower Toner BottleBottle setBottle not set97Total Counter SetSetNot set		4	Toner Collection Bottle Sensor	Bottle set	Bottle not set	
2 Toner Bottle Unit Motor Lock No lock Lock 8 1 Lower Toner Bottle Bottle set Bottle not set 0 Upper Toner Bottle Bottle set Bottle not set 9 7 Total Counter Set Set Not set		3	Toner Overflow Sensor	No lock	Lock	
8 1 Lower Toner Bottle Bottle set Bottle not set 9 7 Total Counter Set Set Not set		2	Toner Bottle Unit Motor Lock	No lock	Lock	
8 0 Upper Toner Bottle Bottle set Bottle not set 9 7 Total Counter Set Set Not set	8	1	Lower Toner Bottle	Bottle set	Bottle not set	
9 7 Total Counter Set Not set		0	Upper Toner Bottle	Bottle set	Bottle not set	
9 6	9	7	Total Counter Set	Set	Not set	
		6		- ••		
Class 3	Bit	Description	Reading			
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No.	No.	Description	0	1		
	5	Not Used				
	4	Exit Unit Set	Set	Not set		
9	3	Oil Supply/Cleaning Web End Sensor	Not end	End		
	2	Exit Sensor	On	Off		
	1	Fusing Exit Sensor	On	Off		
	0	Fusing Unit Set	Set	Not set		
	7	Not Used				
	6	Not Used				
	5	Not Used				
10	4	Not Used				
(Duplex)	3	Not Used				
	2	Not Used				
	1	Dip Switch 2 - SICU	On	Off		
	0	Dip Switch 1 - SICU	On	Off		
	7	Not used				
	6	Not used				
	5	Not used				
4.4	4	2nd Tray Paper Size 5				
	3	2nd Tray Paper Size 4				
	2	2nd Tray Paper Size 3	See T	able 1		
	1	2nd Tray Paper Size 2				
	0	2nd Tray Paper Size 1				
	7	Not used				
	6	Not used				
	5	Not used				
10	4	3rd Tray Paper Size 5				
12	3	3rd Tray Paper Size 4				
	2	3rd Tray Paper Size 3	See Table 1			
	1	3rd Tray Paper Size 2				
	0	3rd Tray Paper Size 1				
	7	Not used				
	6	Not used				
	5	Not used				
	4	Rear Fence Return Sensor	Not detected	Return Position		
13	3	Front Side Fence Closed Sensor	Open	Closed		
	2	Front Side Fence Open Sensor	Open	Closed		
	1	Rear Side Fence Closed Sensor	Open	Closed		
	0	Rear Side Fence Open Sensor	Open	Closed		
	7	Not used				
	6	Not used				
14	5	Not Used				
	4	Rear Fence HP	Not detected	At home position		
	3	Left Tandem Tray Set	Set	Not set		

Class 3	Bit	Description	Reading			
No.	No.	Description	0	1		
	2	Right Tandem Tray Set	Set	Not set		
14	1	Left 1st Tray Paper	Detected	Not Detected		
	0	Right 1st Tray Paper	Detected	Not Detected		
	7	Not Used				
15	6	Not Used				
	5	Not Used				
	4	Base Plate Down Sensor	Not detected	Detected		
	3	1st Tray Paper Height 4	_	Paper 80 ~ 100%		
	2	1st Tray Paper Height 3	_	Paper 50 ~ 80%		
	1	1st Tray Paper Height 2	_	Paper 30 ~ 50%		
	0	1st Tray Paper Height 1	_	Paper 0 ~ 30%		
	7	Not Used				
	6	Not Used				
	5	Not Used				
	4	Toner Supply Motor Lock	No lock	Lock		
10	3	Not Used				
16	2	Not Used				
		2nd Tray Paper Height Sensor				
	1 0	2	- See Table 2			
		2nd Tray Paper Height Sensor				
		1				
	7	Not Used				
-	6	Not Used				
	5	Not Used				
17	4	Not Used				
17	3	Not Used				
	2	Not Used				
	1	3rd Tray Paper Height 2	Coo T	abla 0		
	0	3rd Tray Paper Height 1	See I	able 2		
	7	Not Used				
18	6	Not Used				
	5	Not Used				
	4	Not Used				
	3	Not Used				
	n	LCT 1st Tray Paper Size				
18	2	Switch 3 (4th tray)				
10	1	LCT 1st Tray Paper Size	ς _{οο} Τ	ahla 3		
	-	Switch 2 (4th tray)	Jee 1			
	0	LCT 1st Tray Paper Size				
		Switch 1 (4th tray)				
	7	Not Used				
	6	Not Used				
19	5	Not Used				
	4	Not Used				
	3	Not Used				

Service Tables

Class 3	Bit	Description	Reading					
No.	No.	Description	0	1				
	2	LCT 2nd Tray Paper Size Switch 3 (5th tray)						
19	1	LCT 2nd Tray Paper Size Switch 2 (5th tray)	See Table 3					
	0	LCT 2nd Tray Paper Size Switch 1 (5th tray)						
-	7	Not Used						
	6	Not Used						
	5	Not Used						
20	4	Not Used						
20	3	LCT Motor Lock Signal	Lock	Not Lock				
	2	LCT Door Open Switch	Closed	Open				
	1	LCT Relay Sensor	On	Off				
	0	LCT 3rd Tray Set	Set	Not set				
	7	Not Used						
	6	Not Used						
	5	Not Used						
01	4	Not Used						
21	3	Not Used						
	2	Not Used						
	1	Not Used						
	0	LCT Connection	Connected	Not Connected				
	7	Not Used						
	6	Not Used						
	5	Not Used						
	4	Not Used						
22	3	LCT 1st Tray Paper Height sensor 4 (4th tray)		Paper 80 ~ 100%				
	2	LCT 1st Tray Paper Height sensor 3 (4th tray)	_	Paper 50 ~ 80%				
	1	LCT 1st Tray Paper Height sensor 2 (4th tray)	_	Paper 30 ~ 50%				
	0	LCT 1st Tray Paper Height sensor 1 (4th tray)	_	Paper 0 ~ 30%				
	7	Not Used						
	6	Not Used						
	5	Not Used						
	4	Not Used						
23	3	LCT 2nd Tray Paper Height sensor 4 (5th tray)	_	Paper 80 ~ 100%				
	2	LCT 2nd Tray Paper Height sensor 3 (5th tray)	—	Paper 50 ~ 80%				
	1	LCT 2nd Tray Paper Height sensor 2 (5th tray)	_	Paper 30 ~ 50%				
	0	LCT 2nd Tray Paper Height sensor 1 (5th tray)	_	Paper 0 ~ 30%				

Class 3	Bit	Description	Reading		
No. No.		Description	0	1	
	7	Not Used			
	6	Not Used			
	5	Not Used			
	4	Not Used			
	3	LCT 3rd Tray Paper Height	_	Paper 80 ~ 100%	
24		sensor 4 (6th tray)			
	2	LCT 3rd Tray Paper Height		Paper 50 ~ 80%	
		sensor 3 (6th tray)			
	1	LCT 3rd Tray Paper Height	_	Paper 30 ~ 50%	
	•	sensor 2 (6th tray)			
	0	LCT 3rd Tray Paper Height		Paper 0 ~ 30%	
	0	sensor 1 (6th tray)	—	Faper 0 ~ 30%	

Table 1: 2nd and 3rd Tray Paper Size Switch Combination

Class 3	Bit	Bit	Bit	Bit	Bit	Paper Width		0) 10
No.	4	3	2	1	0	A/B size version	Inch version	vic
	0	1	1	1	1	A3	DLT	Ser Tat
	0	0	1	1	1	81/4" x 13"	81/2" x 14"	
	1	0	0	1	1	A4 lengthwise	LT lengthwise	
	0	1	0	0	1	A4 sideways	LT sideways	
	0	0	1	0	0	81/2" x 13"	HLT sideways	
	0	0	0	1	0	—	8" x 101/2"	
11 12	0	0	0	0	1	A5 sideways	8" x 10"	
11, 12	1	0	0	0	0	8 k lengthwise (Taiwan Version only)	8" x 13"	
	1	1	0	0	0	16 k lengthwise (Taiwan Version only)	10" x 14"	
	1	1	1	0	0	16 k sideways (Taiwan Version only)	11" x 15"	
	1	1	1	1	0	*	*	

Table 2: 2nd and 3rd Tray Paper Height Sensor Combination

Class 3 No.	Bit 4	Bit 3	Paper Height
	1	1	70 ~ 100%
16 17	1	0	30 ~ 70%
10, 17	0	1	10 ~ 30%
	0	0	0 ~ 10%

Class 3 No.	Bit 2	Bit 1	Bit 0	Paper Size
	1	1	1	A4 Sideways
10 10	1	0	1	B5 Sideways
10, 19	0	1	0	A5 Sideways
	1	0	0	B5 Sideways

Table 3: LCT 1st and 2nd Paper Size Switch Combination

ADF Input Check (SP6-007)

Class 3	Bit	Description	Reading		
No. No.		Description	0	1	
	7	Original Set Sensor	No original	Original detected	
1	6	Original Width Sensor 1	No original	Original detected	
	5	Original Width Sensor 2	No original	Original detected	
	4	Original Width Sensor 3	No original	Original detected	
	3	Entrance Sensor	No original	Original detected	
	2	Registration Sensor	No original	Original detected	
	1	Exit Sensor	No original	Original detected	
	0	Inverter Sensor	No original	Original detected	
	7	DF Position Sensor	Down	Up	
	6	APS Start Sensor	Start	Off	
	5	Feed Cover Sensor	Close	Open	
	4	Exit Cover Sensor	Close	Open	
2	3	Bottom Plate HP Sensor	At home position	Not home position	
	2	Bottom Plate Position Sensor	Detected	Not detected	
	1	Pick-up Roller HP Sensor	At home position	Not home position	
	0	ADF Feed-in Motor Encoder Pulse			
	7	ADF Transport Motor Encoder Pulse			
	6	ADF Feed-out Motor Encoder Pulse			
0	5	Original Length Sensor	No original	Original detected	
3	4	Not Used			
	3	Not Used			
	2	Not Used			
	1	Not Used			
	0	Not Used			

Finisher	Input	Check	(SP6-117)
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Class 3	Bit Description		Rea	ding
No.	No.	Description	0	1
	7	Stack Feed-out Belt HP Sensor	HP	Not HP
1	6	Not Used		
	5	Shift Tray Lower Limit 1 Sensor	Off	On
	4	Shift Tray Lower Limit 2 Sensor	Off	On
	3	Stapler Tray Entrance Sensor	Not detected	Detected
	2	Shift Tray Exit Sensor	Detected	Not detected
	1	Upper Tray Exit Sensor	Detected	Not detected
	0	Entrance Sensor	Not detected	Detected
	7	Not used		
	6	Front Door Safety Switch	Door closed	Door open
	5	Stapler Tray Paper Sensor	Detected	Not detected
0	4	Staple End Sensor	End	Not end
2	3	Staple Hammer HP Sensor	HP	Not HP
	2	Stapler HP Sensor	Not HP	HP
	1	Shift Tray Half-turn Sensor	HP	Not HP
	0	Jogger Fence HP Sensor	Not HP	HP
	7	Not Used		
	6	Staple Cartridge Set Sensor	Not set	Set
	5	Stack Height Sensor 2	Off	On
0	4	Stack Height Sensor 1	Off	On
3	3	Not Used		
	2	Punch Waste Hopper Sensor	Full	Not full
	1	Punch HP Sensor	HP	Not HP
	0	Punch Unit Connection	Not connected	Connected
	7	Stapler Ready	Ready	Not ready
	6	Stapler Return Sensor	HP	Not HP
	5	Exit Guide Open Sensor	HP	Not HP
Λ	4	Stack Plate HP Sensor	Not HP	HP
4	3	Pre-stack Tray Paper Sensor	Not detected	Detected
	2	Staple Waste Hopper Sensor	Not full	Full
	1	Stapler Rotation HP Sensor	Not HP	HP
	0	Upper Tray Paper Limit Sensor	Not full	Full

Service Tables

4.2.5 OUTPUT CHECK

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

Main Machine Output Check (SP5-804)

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

No.	Description	No.	Description
1	1st Paper Feed Clutch	34	LCT 3rd Tray Lift Motor
2	2nd Paper Feed Clutch	35	Rear Fence Drive Motor
3	3rd Paper Feed Clutch	36	Tandem Tray Connect Solenoid
4	LCT 1st Paper Feed Clutch	37	Front Side Fence Solenoid
5	LCT 2nd Paper Feed Clutch	38	Rear Side Fence Solenoid
6	LCT 3rd Paper Feed Clutch	39	Left Tandem Lock Solenoid
7	1st Pick-up Solenoid	40	Relay Motor
8	2nd Pick-up Solenoid	41	Paper Feed Motor
9	3rd Pick-up Solenoid	42	LCT Motor
10	LCT 1st Pick-up Solenoid	43	Drum Motor
11	LCT 2nd Pick-up Solenoid	44	Fusing/Duplex Motor
12	LCT 3rd Pick-up Solenoid	45	Registration Motor
13	1st Separation Roller Solenoid	46	Oil Supply/Cleaning Web Motor
14	2nd Separation Roller Solenoid	47	Guide Plate Solenoid
15	3rd Separation Roller Solenoid	48	Inverter Gate Solenoid
16	LCT 1st Separation Roller Solenoid	49	Duplex Transport Clutch
17	LCT 2nd Separation Roller Solenoid	50	Duplex Feed Clutch
18	LCT 3rd Separation Roller Solenoid	51	Inverter Exit Roller Clutch
19	Lower Relay	52	Inverter Guide Plate Solenoid
20	LCT Transport Clutch	53	Duplex Inverter Gate Solenoid
21	1st Vertical Transport Clutch	54	Reverse Roller Solenoid
22	2nd Vertical Transport Clutch	55	Jogger Motor
23	3rd Vertical Transport Clutch	56	Toner Supply Roller Clutch
24	LCT 1st Grip Clutch	57	Development Motor
25	LCT 2nd Grip Clutch	58	Toner Supply Motor
26	LCT 3rd Grip Clutch	59	Upper Toner Bottle Motor
27	Upper Relay Clutch	60	Lower Toner Bottle Motor
28	LCT Relay	61	Toner Bank Motor
29	1st Tray Lift Motor	62	Upper Toner Cap Motor
30	2nd Tray Lift Motor	63	Lower Toner Cap Motor
31	3rd Tray Lift Motor	64	Toner Supply Coil Clutch
32	LCT 1st Tray Lift Motor	65	ID Sensor LED
33	LCT 2nd Tray Lift Motor	66	Transfer Belt Lift Solenoid

SERVICE PROGRAM MODE

No.	Description	No.	Description
67	Quenching Lamp	78	Drum Cooling Fan (Low)
68	Charge Corona	79	Drum Cooling Fan (High)
69	Grid Plate	80	Paper Cooling Pipe Fan
70	Development Bias	81	Steam Removal Fan (Low)
71	Transfer Belt Bias	82	Steam Removal Fan (High)
72	Exposure Lamp	83	Development Unit Cooling Fan 1
73	Optics Cooling Fan	84	Development Unit Cooling Fan 2
74	Polygonal Mirror Motor Cooling Fan	85	Duplex Cooling Fan
75	SICU Cooling Fan	86	LDB Cooling Fan
76	Exhaust Fan - Low Speed	87	Not Used
77	Exhaust Fan - High Speed	88	Total Counter

ADF Output Check (SP6-008)

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

Finisher Output Check (SP6-118)

No.	Description
1	Upper Transport Motor
2	Shift Tray Exit Motor
3	Tray Junction Gate Solenoid
4	Shift Tray Lift Motor
5	Jogger Motor
6	Stapler Motor
7	Staple Hammer Motor
8	Punch Motor
9	Stapler Junction Gate Solenoid
10	Positioning Roller Solenoid
11	Stack Feed-out Motor
12	Shift Motor
13	Stapler Rotation Motor
14	Lower Transport Motor
15	Exit Guide Motor
16	Stack Plate Motor
17	Pre-stack Junction Gate Solenoid
18	Pre-stack Paper Stopper Solenoid
19	Stapler Return Solenoid

Service Tables

4.2.6 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)

- 1. Access the SP mode corresponding to the list that you wish to print.
 - 1) SP5-990-1: All system parameter list
 - 2) SP5-990-2: SP mode data list
 - 3) SP5-990-3: UP mode data list
 - 4) SP5-990-4: Machine status history data list
- 2. Touch the "Copy Mode" key to access the copy mode display.
- 3. Select the paper size and press the "Start" key to print the list.
- 4. After printing the list, exit the copy mode display by touching the "SP Mode" key.
- 5. Exit SP mode.

4.2.7 MEMORY ALL CLEAR (SP5-801)

NOTE: Memory All Clear mode resets all the SP mode settings stored in the NVRAMs on the SICU and the BCU to their default settings except for SP7-003-1 (Electrical total counter value).

There are three RAM clear modes which can be selected after entering SP5-801.

- 1) Clear all data in the NVRAMs on the SICU and BCU.
- 2) Clear the data in the NVRAM on the SICU.
- 3) Clear the data in the NVRAM on the BCU.

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

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

- 1. Print out all SMC Data Lists (SP mode 5-990-1).
- 2. Access SP mode 5-801, and select 1, 2, or 3 for the required RAM clear mode.
- 3. Press "Start" on the display. At this time the beeper will sound.
- 4. A confirmation message will be displayed, then press "Yes" .
- 5. Turn the main power switch off and back on.
- 6. Do the printer and scanner registration and magnification adjustments (see Replacement and Adjustment Copy Image Adjustments).
- 7. Referring to the SMC data lists, re-enter any values which had been changed from their factory settings.
- 8. Do SP3-001-2 (ID Sensor Initial Setting). If the SICU data was cleared, also do SP4-911-1 and 4-912-1 (HDD media tests). Note that the HDD media tests will delete copy server and stamp data on the disks.
- 9. Check the copy quality and the paper path, and do any necessary adjustments.

iervice Tables

4.2.8 SOFTWARE RESET

The software can be reset when the machine hangs up. Do either of the following. Either:

Turn the main power switch off and on.

Or:

Hold down the "#" key and "." key at the same time for over 10 seconds.

4.2.9 SYSTEM SETTING AND COPY SETTING (UP MODE) RESET

System Setting Reset

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

- 1. Make sure that the machine is in the copier standby mode.
- 2. Press the User Tools key.
- 3. Hold down the "#" key and touch the "System Setting" key.
- 4. A confirmation message will be displayed, then press "Yes".

Copy Features Reset

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

- 1. Make sure that the machine is in the copier standby mode.
- 2. Press the User Tools key.
- 3. Hold down the "#" key and touch "Copy Features" key.
- 4. A confirmation message will be displayed, then press "Yes".

4.3 PM COUNTER

Each PM part has a counter which counts up at the appropriate time. (For example, the counter for the hot roller counts up every copy, and the counter for a feed roller counts up when paper is fed from the corresponding tray.) These counters should be used as references for part replacement timing.

4.3.1 PM COUNTER ACCESS PROCEDURE

1) Press the following keys in sequence.



Hold the C key for more than 3 seconds

The SP mode menu is displayed.

SP mode		Eif
	Copy SP	
	PM Counter	
sicu so	t Vereien 5,25 / 80s Seft Vereien 5,	

A294M001.PCX

- 2) Press [PM Counter] on the display.
- 3) The following menu appears on the display.

SP Mode (Parts replacement)	Pron. Motor Exil
Select item	
All PH parts list	Counterlial print out
Parts list to Ptri yield indicator	CSS CHING SETTING
Parts according torger point	
Counter close for parts exceeding larget yield	
Geor all PM sattings	
constant of a particular	

A294M013.PCX

1. All PM Parts List

Displays all the counters for PM parts.

SP Mode (Parts replacement)					tev. Metu	Eat
AL PH	parto list.					
190	Description	PM yeard	Carriert	Target		
001	Developer	Ves	0000538	0000K	Cisar	
002	Oil Supply & Cleaning Web	Ves	0000238	0300K	Clear	
111	Web Cleaning Rallier	199	0000238	0300K	Clear	
004	Hot Relier	Vez	0000235	0450K	Cear	
005	Pressure Roller	Ves	0000536	0450K	Cear	
005	Pressure Roller Cleaning Roller	Vec	0000238	0300K	Citor	
007	Hot Ralier Strippers	Yes	0000238	0300K	Clear	
008	Development Filter	Vec	0000235	0300K	Cear	
009	Toner Hopper Filter - Center	Ves	0000538	0300K	Cear	
010	Toner Happer Filter - Front	V90	0000228	0300K	Clear	
011	Feed Roller - Tray 1	Yes	0000228	0300K	Clear	
\$12	Photoup Photeer - Tray 1	Vec	0000228	0300K	Cent	
012	Separation Roller - Tray 1	Ves	0000228	0300K	Cear	
114	Feed Roller - Tray 2	Vito	0000000	0300K	Other	01/03
0.15	Pickup Roler - Tray 2	Ves	0000000	0300K	Gent	
\$19	Separation Roller - Tray 2	Vec	0000000	0300K	Diet	Previous page
0.17	Feed Rollet - Tray 3	Ves	00000000	0300K	Case	
0.18	Pick-up Roller - Tray 3	100	0000000	0300K	Dille	Next page

A294M014.PCX

On this screen, the current counter and the target yield of each PM part can be checked.

Additionally, the PM yield indicator setting can be changed. To change the setting press [Yes/No] key in the "PM yield" column.

When "Parts list for PM yield" is selected in the parts replacement menu, only the parts with [Yes] in the "PM yield" are listed.

To clear a counter, press [Clear] on the display. The following appears.



A294M016.PCX

Then press [Yes] to clear the counter.

If one of the keys in the "No" column is pressed, the following appears on the display.

	SP Mode (Parts repla	Prev. Monu Est						
AL PHI p	val Philiparto Kat.							
110	Description	PNI yeaks	Canality	Tirgif				
E331	Developer	Ves	0000538	COUCK Ciese				
222	Oil Supply & Cleaning Web	125	0000538	0300K CINF				
	Web Cleaning Relier	Yes	0000238	0300K Citir				
1114	Hot Reliev	Ver	30000038	O450K Cear				
663	Pressure Roller	Ves	8030000	0450K Citer				
883	Pressure Roller Cleaning Roller	495	0000228	0300K Citer				
	Hot Ralier Strippers	001: Developer						
m	Development Filler	our relate						
1000	Toner Hopper Riller - Center	Ownert country	000038	One constant				
1111	Toner Hipper Filter - Front	0.000	00000000	Crear content cost las				
m	Feed Roller - Tray 1	Target yield	0000K	Change target yield				
111	Pickup Roler - Tray I							
	Separation Rober - Tray 1	Lafest 1	0000000	PM yield indicator settings				
	Feed Boller - Tray 2	Lidert 2	0000000					
115	Pick-up Roter - Tray 2	Lafest 3	0000000	70 Yes				
EII	Separation Rober - Tray 2							
ETH I	Feed Rollet - Tray 2	0398		Prev. Not				
	Pickup Roller - Tray 3	12	www	U3000 _ [[[[[]]				

A294M017.PCX

On this screen, the records of the last three part replacements are displayed. When 'Clear current counter' is pressed, the current counter is cleared, the current counter is overwritten to "Latest 1", the Latest 1 counter is overwritten to "Latest 2", and the Latest 2 counter is overwritten to "Latest 3".

Additionally, the target yield can be changed on this screen. To change the target yield setting, do the following:

- 1) Press [Change target yield] on the screen.
- 2) Input the target yield using the ten-key pad.
- 3) Press the # key.

22 October 1999

2. Parts List for PM Yield Indicator

	SP Mode (Parts replace	ement)		P	tev. Menu	Eat
Parts lis	t for PM yield indicator					
760 001	Description Developer	Exceed	Carrent 00000236	Targel 0000K	Citer	
002	Oil Supply & Cleaning Web		0000238	0300K	Citor	
003	Web Cleaning Rallier		0000238	0300K	Clear	
004	Hot Rollier		0000235	0450K	Case	
005	Pressure Roller		0000536	0450K	Cear	
006	Pressure Roller Cleaning Roller		0000238	0300K	Citor	
007	Hot Relier Strippers		0000938	0300K	Clear	
008	Development Filter		0000235	0300K	Ciear	
009	Toner Hopper Filter - Center		0000236	0300K	Cear	
010	Toner Happer Filter - Front		0000238	0300K	Clear	
011	Feed Roller - Tray 1		0000228	0300K	Clear	
012	Photoup Roller - Tray 1		0000228	0300K	Ciear	
012	Separation Rober - Tray 1		8550000	0300K	Citer	
114	Feed Roller - Tray 2		0000000	0300K	C (R)	01/01
015	Pick-up Roter - Tray 2		0000000	0300K	Cost	
0.16	Separation Roller - Tray 2		0000000	0300K	Date	Privite page
017	Feed Roller - Tray 3		0000000	0300K	Cept	
0.18	Pick-up Roller - Tray 3		0000000	0300K	Ditte	Hotpage

A294M015.PCX

On this screen, only the parts selected in the "All PM parts list" screen are displayed. Normally, the PM parts counters should be checked on this screen.

If the current counter exceeds the target yield, there is a * mark in the "Exceed" column.

Each counter can also be cleared on this screen. To clear all counters on this screen at once, see 'Counter Clear for Parts Exceeding Target Yield' on the next page.

3. Parts Exceeding Target Yield

Only the parts whose counters are exceeding the target yield are displayed. If none of the PM counters is exceeding the target yield, this item cannot be selected from the parts replacement menu.

4. Counter Clear for Parts Exceeding Target Yield

Clears all the counters which are exceeding the target yield. When this item is selected, the following appears on the display.



A294M018.PCX

Press [Yes] to clear the counters.

5. Clear All PM Settings

Clears all the PM counters and returns all the settings (PM parts list and target yield) to the defaults. When this item is selected, the following appears.



A294M019.PCX

Press [Yes] to clear the settings.

Service Tables

6. Counter List Print Out

Prints a list of all the PM part counters. When this item is selected, the following appears on the display.



A294M010.PCX

Press [Print] to print out the counter list.

7. CSS Calling Setting (RSS Function)

This function is for Japanese machines only.

4.4 PROGRAM DOWNLOAD

The flash memory card holds two programs, one is for the SICU and the other is for the BCU. Both programs can be downloaded from the slot in the SICU (the program for the BCU is transferred from the SICU).

There is also a function to download the program from the SICU to a flash memory card. However, the BCU program cannot be downloaded to a flash memory card.

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

Download to the SICU and BCU

NOTE: The program for the SICU and the program for the BCU can be downloaded separately. However, both programs should be updated at the same time to prevent mismatching of the programs.



A294M900.WMF

A294M025.WMF

- 1. Turn off the main power switch.
- 2. Remove the flash memory card cover [A]. If the optional LCT is installed, open the left cover [B] of the LCT.
- 3. Plug the flash memory card [C] into the card slot in the SICU. **NOTE:** Make sure that the surface printed "A" faces upwards.
- 4. Turn on the main power switch.
- 5. Touch "Install" to download the SICU software. The machine erases the current software, then writes the new software to the SICU.
- 6. Touch "Install" to download the BCU software. The machine erases the current software, then writes the new software to the BCU.

If downloading from the flash card to the SICU failed, an error message appears on the display. At this time, touch the "OK" key to re-try the download.

Download to the BCU

- **NOTE:** This procedure is required only when download from the SICU to the BCU failed for some reason.
- 1. Turn off the main power switch.
- 2. Remove the upper rear cover.
- 3. Plug the flash memory card into the card slot of the BCU. **NOTE:** Set the card so that the surface printed "A" is visible.
- 4. Turn on the main power switch.
- 5. Touch "Install" on the display to download the BCU software. The machine erases the current software, then writes the new software to the BCU.
- 6. Turn the main switch off, then remove the card from the BCU.

Download from SICU to Flash Memory Card

- 1. Turn off the main switch.
- 2. Plug a blank flash memory card into the card slot of the SICU. **NOTE:** Make sure that the surface printed "A" faces upwards.
- 3. Turn on the main switch.
- 4. Select [4. Program Upload (SICU)].
- 5. Press [EXEC] on the display.
- 6. After download is completed, turn the main switch off and remove the flash memory card.

4.5 NVRAM DATA DOWNLOAD

The NVRAM data in the SICU and BCU can be downloaded to a flash memory card. The downloaded data can be copied back to the machine.

This is useful to save the settings before a RAM clear is done. The procedure is as follows:

NOTE: It is recommended that the current settings are printed out before starting the following procedure, in case the download fails.

Download from the SICU and BCU NVRAMs to the Flash Memory Card

- 1. Turn the main switch off.
- 2. Plug a blank flash memory card into the card slot of the SICU. **NOTE:** Make sure that the surface printed "A" faces upwards.
- 3. Turn on the main switch.
 - **NOTE:** If the flash memory card contains SICU and BCU firmware, the firmware download screen will now appear. Press [EXIT] on this screen to go on to step 4. (Note that the firmware on the card will be erased by the following steps.)
- 4. Select [3. NVRAM Upload]
- 5. Press [EXEC] on the display.
- 6. After the download is completed, turn the main switch off and remove the flash memory card.

Download from the Flash Memory Card to the NVRAMs

- **NOTE:** The download can be done separately for the BCU or SICU, or for user tool settings only.
- 1. Turn the main switch off.
- 2. Plug the flash memory card which contains the NVRAM data into the card slot of the SICU.

NOTE: Make sure that the surface printed "A" faces upwards.

- 3. Turn on the main switch.
- 4. Select [2. NVRAM Download]
- 5. Select the required menu item from the following.
 [1. All NVRAM Download]: (Downloads all data in the NVRAMs to the SICU and BCU.)
 [2. Mode NVRAM Down load]: (Downloads only UP mode settings)
 [3. SICU NVRAM Down load]: (Downloads the data to the NVRAM on the SICU)
 [4. BCU NVRAM Down load]: (Downloads the data to the NVRAM on the BCU)
- 6. Press [EXEC] on the display.
- 7. After the download is completed, turn the main switch off and remove the flash memory card.



4.6 LANGUAGE DATA DOWNLOAD

This machine can use up to two languages for the operation panel display. The stored languages can be replaced with other languages.

- 1. Turn the main switch off.
- 2. Connect the flash memory card which contains the language data to the SICU flash card slot.
- 3. Turn the main switch on.
- 4. Select the language to be replaced (1st or 2nd), and press [Select] on the screen.
- 5. Select the language to be installed on the screen. (If the 2nd language is unnecessary, it can be deleted by selecting [0. Delete].)
- 6. If necessary, repeat steps 4 and 5 to replace another language (1st or 2nd).
- 7. Press [Install] on the screen, or press # to start overwriting the language(s). The machine erases the current language(s) and writes the new language(s).
- 8. When the downloading is completed, turn the main switch off and remove the flash memory card.

4.7 STAMP DATA DOWNLOAD

Both hard disks contain the stamp data used with the stamp feature. However, if a disk is replaced, the replacement disk does not have this stamp data. The data must be reinstalled from an IC card which contains the stamp data.

- 1. Turn the main switch off.
- 2. Connect the flash memory card which contains the stamp data to the SICU flash card slot.

NOTE: Make sure that the surface printed "A" faces upwards.

- 3. Turn the main switch on.
 - NOTE: If the flash memory card contains SICU and BCU firmware, the firmware download screen will now appear. Press [EXIT] on this screen to go on to step 4. (Note that the firmware on the card will be erased by the following steps.)
- 4. Select [1. Stamp Data Download].
- 5. Press [EXEC] on the display.
- 6. After the download is completed, turn the main switch off and remove the flash memory card.

4.8 USER PROGRAM MODE

4.8.1 HOW TO ENTER AND EXIT UP MODE

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

Press the User Tools/Counter button, then select the UP mode program. After finishing the UP mode program, touch "Exit" key to exit UP mode.

4.8.2 UP MODE TABLE

NOTE: Each UP mode is explained in the operating instructions.

System Settings

General	Function Priority	Pap
Features	Panel tone	Siz
	Ready Panel Tone	Set
	Copy Count Display	
	System Reset	
	Panel Off Timer	
	Auto Tray Switching	
	Copier/Document Sever	
	Output Tray	
	Status Indicator	
	Language Priority	
	Screen Color Setting	Key
	Paper Tray Priority	Ор
	Original: F/F4 Size Setting	То
Timer	Date	
Setting	Time	
	Weekly Timer: Monday	
	Weekly Timer: Tuesday	
	Weekly Timer: Wednesday	
	Weekly Timer: Thursday	
	Weekly Timer: Friday	
	Weekly Timer: Saturday	
	Weekly Timer: Sunday	
	Key Operator Code for Off Setting	

Paper	Tray 1: Paper Type		
Size Setting	Tray 2: Paper Type		
	Tray 3: Paper Type		
	Tray 4: Paper Type		
	Tray 5: Paper Type		
	Tray 6: Paper Type		
	Slip Sheet 1		
	Slip Sheet 2		
	Slip Sheet 3		
	Cover Sheet		
	Separation sheet		
Key	User Codes:		
Operator	Copier/Document Server		
Tools	Key Counter: Copier Access		
	Key Operator Access		
	User Code Display		
	AOF (Keep it on)		
	Memory Allocation		
	Display/Print Counter		

Copy Features Table

Tab	Category	Item
General Features	General Features	Auto Paper Select Priority
		Auto Density Select Priority
		Original Mode Priority
		Paper Tray Priority
		Duplex Mode Priority
		Original Orientation in Duplex Mode
		Copy Orientation in Duplex Mode
		Initial Mode Set
		Maximum Copy Quantity
		Copy Reset Timer
		Job List Screen Timeout
	Set Ratio	Preset Reduce Enlarge Setting
		Ratio Priority
		Shortcut R/E
		Create Margin ration Setting
	Image Quality	Text
		Text/Photo
		Photo
		Pale
		Generation
	Display/Panel Tone	Original Mode Display
		Paper Tray Display
		Other Tab Priority Function Setting
		Image Adjustment Priority
		Stamp Priority
		Staple Format Setting
		Original Tone
		Job End Call
	Adjust Image	Copy Back Cover
		Front Margin: Left/Right
		Back Margin: Left/Right
		Front Margin: Top/Bottom
		Back Margin: Top/Bottom
		$1 \rightarrow$ Duplex Auto Margin Adjust
		Border Erase Width
		Combine Orig. Shadow Erase
		Center Erase Width
		Repeat Separation Line
		Double Copies Separation Line
		Combine Separation Line
		Copy Orientation in Combine Mode
		Booklet/Magazine Original Orientation
Stamp Setting	Background No.	Background Numbering Size
	Setting	Background Numbering Density

Service Tables

Tab	Category	Item		
Stamp Setting	Background No.	Background Numbering: Positive Negative		
	Setting			
	Preset Stamp Setting	Language Setting		
		Stamp Type Priority		
		Stamp Layout		
		Position Setting		
		Size Setting		
		Density		
		Print Page		
		Preset Stamp: Positive/Negative		
	User Stamp Setting	Register/Delete Stamp		
		Position: Stamp 1-5		
	Data Stamp Setting	Type Setting		
		Font Setting		
		Position Setting		
		Size Setting		
		Date Stamp: Positive/Negative		
	Page Number Setting	Page Numbering type Priority		
		Font Setting		
		Size setting		
		Duplex Back Page Number		
		Page Numbering in Combine Mode		
		Copy On Slip In Designate Mode		
		Page Numbering: Positive/Negative		
		Position: P1, P2		
		Position: 1/5, 2/5		
		Position: -1-, -2		
		Position: P.1, P.2		
		Position: $1, 2$		
	SADE Auto Rosot	1 0510011. 1-1, 1-2,		
input Output	Bise ADE Orig Table	Nhan		
	Doliver Copies Face II	n/Down From Platon		
	Auto Sort Mode			
	Memory Full Auto Sca	n Bestart		
	Shift Print In Sort/Stac	k Mode		
	Separation Sheet	(Mode		
Document server	Auto Filo Delete Perior	4		
Document server	List Display Priority			
	Delete All Stored Files			
Key Operator Tools	Print Counter List			
Count Manager	Reset Counters			
	Reset All			
	Register			
	Change			
	Delote Liser Code			
	Delete All Lleer Codos			
	Delete Mil Osel Codes			

4.8.3 IMAGE QUALITY SETTING BY UP MODE

'Original Mode Level' in the 'General Features' UP menu is related to the 'MTF Filter Settings' SP mode.



If a setting from the above three columns [A] is selected, the MTF level (coefficient) and MTF strength (SP4-903-20 to 58) are fixed. Any changes to the SP mode settings are not reflected on the copy. To use the settings specified by SP mode, the user must select "Service Mode" [B].

The detailed relationship between the different original modes, the UP modes, and the SP modes are as follows.

Text Mode

Different gamma correction settings are used for "Sharp", "Normal" or "Soft" mode. So, when adjusting the "Service Mode" setting, first select a gamma correction setting for the basic image setting using SP4-903-84.

1. The following tables should be used when 1 (Normal) or 2 (Sharp) is selected in SP4-903-84.

MTF Filter Strength	Strong				Weak
UP mode		Sharp	Normal		
Pre-filter Type – Text SP4-903-010	1	1	1	1	1
Filter Level – Text Main Scan Direction SP4-903-020	13	13	13	13	7
Filter Strength – Text Main Scan Direction SP4-903-022	3	2	1	0	0

Magnification Ratio: 25 ~ 49%

Magnification Ratio: 50 ~ 154%

MTF Filter Strength	Strong				Weak
UP mode		Sharp	Normal		
Pre-filter Type – Text SP4-903-011	0	0	0	0	2
Filter Level – Text Main Scan Direction SP4-903-024	13	13	13	13	13
Filter Strength – Text Main Scan Direction SP4-903-026	3	2	1	0	0

Magnification Ratio: 155 ~ 256%

MTF Filter Strength	Strong				Weak
UP mode		Sharp	Normal		
Filter Level – Text SP4-903-028	13	13	13	9	7
Filter Strength – Text Main Scan Direction SP4-903-030	2	1	0	0	0

Magnification Ratio: 257 ~ 400%

MTF Filter Strength	Strong				Weak
UP mode		Sharp	Normal		
Filter Level – Text SP4-903-032	13	13	13	9	7
Filter Strength – Text Main Scan Direction SP4-903-034	2	1	0	0	0

2. The following tables should be used when 0 (Soft) is selected in SP4-903-84.

Magnification Ratio: 25 ~ 49%

MTF Filter Strength	Strong				Weak
UP mode			Soft		
Pre-filter Type – Text SP4-903-010	1	1	1	1	1
Filter Level – Text Main Scan Direction SP4-903-020	3	3	3	3	3
Filter Level – Text Sub Scan Direction SP4-903-021	6	6	6	6	6
Filter Strength – Text Main Scan Direction SP4-903-022	4	3	2	1	1
Filter Strength – Text Sub Scan Direction SP4-903-023	2	2	1	1	0

Magnification Ratio: 50 ~ 154%

MTF Filter Strength	Strong				Weak
UP mode			Soft		
Pre-filter Type – Text SP4-903-011	0	0	0	0	0
Filter Level – Text Main Scan Direction SP4-903-024	3	3	3	3	3
Filter Level – Text Sub Scan Direction SP4-903-025	6	6	6	6	6
Filter Strength – Text Main Scan Direction SP4-903-026	4	3	2	1	1
Filter Strength – Text Sub Scan Direction SP4-903-027	2	2	1	1	0

Magnification Ratio: 155 ~ 256%

-					
MTF Filter Strength	Strong				Weak
UP mode			Soft		
Filter Level – Text Main Scan Direction SP4-903-028	0	0	0	0	0
Filter Level – Text Sub Scan Direction SP4-903-029	2	2	2	2	2
Filter Strength – Text Main Scan Direction SP4-903-030	5	4	2	2	1
Filter Strength – Text Sub Scan Direction SP4-903-031	5	4	4	2	1

Magnification Ratio: 257 ~ 400%

MTF Filter Strength	Strong				Weak				
UP mode		Soft							
Filter Level – Text Main Scan Direction SP4-903-032	0	0	0	0	0				
Filter Level – Text Sub Scan Direction SP4-903-033	2	2	2	2	2				
Filter Strength – Text Main Scan Direction SP4-903-034	5	4	2	2	1				
Filter Strength – Text Sub Scan Direction SP4-903-035	5	4	4	2	1				

Service Tables

Text/Photo Mode

Initially, the same filter settings are used for Sharp, Normal, and Soft in Text/Photo mode. The difference of each image mode is due to the gamma correction setting. The following filter settings should be changed after selecting the gamma correction setting in SP4-903-85.

Magnification Ratio: 25 ~ 49%

MTF Filter Strength	Strong				Weak
UP mode			Photo Priority Normal Text Priority		
Pre-filter Type – Text/Photo SP4-903-013	1	1	1	1	1
Filter Level – Text/Photo Main Scan Direction SP4-903-039	13	13	13	9	7
Filter Strength – Text/Photo Main Scan Direction SP4-903-041	2	1	0	0	0

Magnification Ratio: 50 ~ 154%

MTF Filter Strength	Strong				Weak
UP mode			Photo Priority Normal Text Priority		
Pre-filter Type – Text/Photo SP4-903-014	0	0	0	2	1
Filter Level – Text/Photo Main Scan Direction SP4-903-43	13	13	13	13	13
Filter Strength – Text/Photo Main Scan Direction SP4-903-045	2	1	0	0	0

Magnification Ratio: 155 ~ 256%

MTF Filter Strength	Strong				Weak
UP mode			Photo Priority Normal Text Priority		
Filter Level – Text/Photo Main Scan Direction SP4-903-047	13	13	13	9	7
Filter Strength – Text/Photo Main Scan Direction SP4-903-049	2	1	0	0	0

Magnification Ratio: 257 ~ 400%

MTF Filter Strength	Strong				Weak
UP mode			Photo Priority Normal Text Priority		
Filter Level – Text/Photo Main Scan Direction SP4-903-051	13	13	13	9	7
Filter Strength – Text/Photo Main Scan Direction SP4-903-053	2	1	0	0	0

Photo Mode

Normally the smoothing filter is used in this mode, whether the user selects "Glossy Photo", "Normal", or "Screen Printed".

When a stronger setting is selected, the reproduction of graduations is improved. However, the image tends to go out of focus.

MTF Filter Strength	Strong	9							Weak	
UP mode		Screened Printed			Normal			Glossy Photo		
Pre-filter Type – Photo Mode SP4-903-012		1	2	1	1	1	7	7	10	
Smoothing Filter – Photo Mode SP4-903-037		4	4	2	1	0	1	0	0	

lables

If the user selects "Service Mode" to use another smoothing filter setting, SP4-903-009 (Filter Type Selection in Photo Mode) should be "1: Smoothing".

If the user selects "Service Mode" to use an MTF filter setting for photo mode, SP4-903-009 (Filter Type Selection in Photo Mode) should be "0: MTF".

The following table should be used to change the MTF filter strength for Photo mode.

MTF Filter Strength	Strong				Weak
UP mode					
Pre-filter Type – Photo Mode SP4-903-012	10	10	7	2	1
MTF Filter – Photo Mode SP4-903-36	13	13	13	13	13
MTF Filter Strength – Photo Mode SP4-903-38	2	1	1	1	0

USER PROGRAM MODE

Pale Mode

MTF Filter Strength	Strong						Weak
UP mode		Sharp		Normal		Soft	
Pre-filter Type – Pale Mode SP4-903-015	1	1	1	1	1	1	1
Filter Level – Pale Mode SP4-903-055	3	3	3	3	3	3	1
Filter Strength – Pale Mode SP4-903-056	6	5	4	3	2	1	0

Generation Mode

MTF Filter Strength	Strong						Weak
UP mode		Sharp		Normal		Soft	
Pre-filter Type – Generation Mode SP4-903-016	1	1	1	1	1	1	1
Filter Level – Generation Mode SP4-903-057	13	13	10	13	10	13	7
Filter Strength – Generation Mode SP4-903-058	3	2	2	1	1	0	0

4.8.4 LEDS

SICU

Number	Monitored Signal
LED101	Blinking: Normal
	Stays on or off: CPU defective
LED102	Off: Normal
LED103	Off: Normal
LED104	Blinking: Normal

BCU

Number	Monitored Signal		
LED601	Off: Normal		
(Green)	Stays on: While downloading the flash memory card.		
LED602	Blinking: Normal		
(Red)	Stays on: While downloading the flash memory card.		

I/O Board

Number	Monitored Signal			
LED1	Turns on when motor/solenoid drive signal is sent from the BCU to IOB (Normally on).			

PSU

Number	Monitored Signal	
LED1	On: Normal	
LED2	On: Stand-by Off: Energy saver mode	
LED3	On: Stand-by Off: Energy saver mode	

LED102

ADF Main Board

Ο

Ο

LED100 LED101

Ο

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Entrance Sensor Jam Registration Sensor Jam Exit Sensor Jam Inverter Sensor Jam

O: ON ☆: Blinking

—		О	Inverter Sensor Jam	
		\cap	Jammed paper not removed:	
			Between entrance sensor + registration sensor	
0	0	0	Jammed paper not removed: On the exposure glass	
Δ		—	Feed-in Motor Abnormal	
	☆	—	Transport Motor Abnormal	
		Δ	Feed-out Motor Abnormal	
Δ	☆	—	Pick-up Motor Abnormal	
	☆	\$	Bottom Plate Motor Abnormal	
Δ	☆	Δ	DF Position (Open)	
Δ		Δ	APS Sensor ON	
्रे		— Normal		

4.9 TEST POINTS/DIP SWITCHES/LEDS

4.9.1 DIP SWITCHES

SICU

Paper size type default (see SP 5-131)

SW101		Destination			
1	2	Destination			
0	0	Japanese version			
1	0	North America version			
0	1	Europe version			
1	1	Chinese version			

ADF Main Board

	DPS100			Description		
4	3	2	1	Description		
0	0	0	0	Normal operating mode		
0	0	0	1	Motor Test: Transport motor – Forward		
0	0	1	0	Motor Test: Transport motor – Reverse		
0	0	1	1	Motor Speed Adjustment (Automatic)		
0	1	0	0	Original stop position adjustment – Single-sided original mode (No original skew correction)		
0	1	0	1	Original stop position adjustment – Double sided original mode		
1	0	0	0	Free Run: Single-sided original mode with skew correction		
1	0	1	0	Free Run: Single-sided original mode without skew correction		
0	1	1	0	Free Run: Double-sided original mode		
	Oth	iers		Do not select		

"SADF" LED turns on when one of DIP switch turns on.

MCU: All the dip switches should be OFF. Do not change the settings.



4.9.2 TEST POINTS

ADF Main Board

1	-	
Number	Label	Monitored Signal
TP100	TXD	TXD to the copier
TP101	RXD	RXD from the copier
TP102	GND	Ground
TP103	12 V	+12 V
TP104	5 V	+5 V

BCU

Number	Monitored Signal
TP647	Ground
TP679	Ground

4.9.3 FUSES

ADF Main Board

Number	Description
FU100	Protects the 38 V line
FU101	Protects the 24 V line

PSU

Number	Description	
FU401	Protect the ac input line.	

I/F Board (Option)

Number	Description
FJ101	Protects the 5 V power line. If this fuse is broken, all the related
(T1A250U)	options are not recognized.

4.9.4 VARIABLE RESISTORS

ADF Main Board

Number	Function		
VR100	Adjusts the original stop position for the single-sided original at no skew correction mode.		
VR101	Adjusts the original stop position for the double-sided original.		

Charge/Bias/Grid Power Pack

Number	Function		
VRC	For the charge corona PWM. This VR is secured by paintlock. Do not change the setting in the field.		
VRG	For the grid PWM. This VR is secured by paintlock. Do not change the setting in the field.		

4.10 SPECIAL TOOLS AND LUBRICANTS

4.10.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309352	Flash Memory Card - 4MB	1
A2309351	Case - Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
54209516	Test Chart - OS-A3 (10 pcs/Set)	1
A0299387	Digital Multimeter – FLUKE 87	1

4.10.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta JFE 5 5/2	1
52039502	Silicone Grease G-501	1
G0049668	Grease: KS660: SHIN ETSU	1

5. PREVENTIVE MAINTENANCE SCHEDULE



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5.1 PM PARTS

NOTE: The amount mentioned as the PM interval indicates the number of prints, unless stated otherwise.

Symbol key: **R**, r: Replace on a PM part counter basis (refer to Service Tables – PM Counter)

R: The counter counts up every copy, in the same way as the copy counter

r: The counter only counts up if that part was used for the copy I: Inspect, and clean and/or lubricate

i: Inspect, and clean and/or lubricate only if necessary

Description	Activity Type	Interval	Note/Remarks
OPTICS			
Exposure Glass	i	300 k	
1st ~ 3rd Mirrors	i	300 k	Optical cloth
APS Sensor	i	300 k	Dry cloth
Scanner Rail	i	300 k	Dry cloth
Scanner Filter	Ι	600 k	Blower brush
Toner Shield Glass	Ι	300 k	Optical cloth
LD Filter	I	300 k	Blower brush
DEVELOPMENT UNIT			
Side Seal	Ι	300 k	Blower brush or dry cloth
Development Unit	i	300 k	Blower brush or dry cloth
Entrance Seal	Ι	300 k	Blower brush or dry cloth
Toner Hopper (Outside)	i	300 k	Blower brush or dry cloth
Gears (All Gears)	i	300 k	Blower brush
Development Filter	r	320 k	
Toner Filter (Center)	r	400 k	
Toner Filter (Front)	r	400 k	
Developer	r	390 k	TD sensor initial setting (SP2-801)
AROUND THE DRUM			
Side Seal	i	300 k	Blower brush or dry cloth
Ground Plate/Screw	i	300 k	Electrical connection check
Drum Filter	1	380 k	Blower brush
Cleaning Brush Seal	i	300 k	Blower brush or dry cloth
Cleaning Entrance Seal		300 k	Blower brush or dry cloth
ID Sensor	1	300 k	Blower brush or dry cloth
Transfer Unit Entrance			Blower brush or dry cloth
Stay	I	300 k	
Corona Wire Casing	I	300 k	Damp cloth

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Description	Activity Type	Interval	Note/Remarks
Drum Potential Sensor	I	300 k	Blower brush
Quenching Lamp		300 k	Blower brush or dry cloth
Cleaning Brush	R	300 k	
Toner Filter	R	300 k	
Transfer Belt Cleaning	R	450 k	
Blade			
Cleaning Blade	R	300 k	
Grid Plate	r	380 K	
Charge Corona Wire	r	380 K	
Wire Cleaner	r	380 k	
Pick-off Pawls	R	300 K	
Transfer Belt	R	450 K	<u> </u>
Transfer Belt Bias Brush		450 K	Blower brush
Rear Casing Guide		300 k	Dry cloth
Exit Bias Plate		300 k	Blower brush
Belt Drive Roller	l	450 k	Alcohol
Belt Roller	l	450 k	Alcohol
Cleaning Bias Roller	l	450 k	Alcohol
	· · · · · · · · · · · · · · · · · · ·		
Pressure Roller Cleaning	i	600 k	Inspect only
Roller Bearings		-	
Pressure Roller Cleaning	R	600 k	
Roller Eusing Entropol Guido		200 k	Clean with water or alcohol
Cil Supply & Cleaning		300 r	Clean with water of aconor
Web	r	300 k	
Hot Roller	r	600 k	+
Hot Roller Stripper	r	600 k	
Pressure Roller Stripper		600 k	Clean with a dry cloth
Fusing Exit Roller		600 k	Clean with water or alcohol
Pressure Roller	r	700 k	
Pressure Roller Cleaning		600 k	
Roller Cleaner	1	600 K	
Bearings	i	300 k	Inspect only
Bushings	i	700 k	Inspect only
PAPER FEED			
Relay Roller		300 k	Damp cloth
Paper Feed Guide Plate	i	300 k	Damp cloth
Registration Rollers		300 k	Damp cloth
Registration Sensor		300 k	Blower brush
Relay Sensor	I	300 k	Blower brush
Paper Dust Remover	I	300 k	Damp cloth
Paper Feed Sensor	I	300 k	Blower brush
Paper Feed Rollers	r	300 k	

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Description	Activity Type	Interval	Note/Remarks
DUPLEX			
Feed and Transport Rollers	I	300 k	Damp cloth
Reverse and Inverter Rollers	I	300 k	Damp cloth
Entrance Sensor	I	300 k	Blower brush
Entrance Anti-static Brush	i	300 k	Blower brush

Description	Activity Type	Interval	Note/Remarks
ADF			
Transport Belt	r	80 k	Belt cleaner
Feed Belt	r	80 k	Belt cleaner
Separation Roller	r	80 k	Dry or damp cloth
Pick-up Roller	r	80 k	Dry or damp cloth
Sensors	i	80 k	Blower brush
Drive Gears	i	80 k	Grease G501

Description	Activity Type	Interval	Note/Remarks
LCT			
Paper Feed Roller	r	300 k	
Pick-up Roller	r	300 k	
Separation Roller	r	300 k	
Bottom Plate Pad	i	300 k	Dry or damp cloth

Description	Activity Type	Interval	Note/Remarks
3,000-SHEET FINISHER			
Rollers		300 k	Clean with water or alcohol.
Brush Roller	i	300 k	Inspect only. Replace if necessary.
Discharge Brush	i	300 k	Clean with a dry cloth.
Sensors		300 k	Blower brush
Jogger Fences	i	300 k	Inspect only. Replace if necessary.
Punch Waste Hopper		300 k	Empty the hopper.

NOTE: PM parts should be replaced on a PM counter basis. The PM counter corresponding to the replaced part should be cleared (refer to Service Tables – PM Counter).
6. REPLACEMENT AND ADJUSTMENT

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

6.1 EXTERIOR

6.1.1 FRONT



A294R945.WMF

Left Door

- 1. Open the left door [A].
- 2. Remove the stopper [B] (1 screw).
- 3. Lift up the left door and remove it.

Right Door

- 1. Open the right door [C].
- 2. Remove the stopper [D] (1 screw).
- 3. Lift up the right door and remove it.

6.1.2 **RIGHT**



A294R946.WMF

Upper Right Cover

1. Remove the upper right cover [A] (4 screws).

Lower Right Cover

1. Remove the lower right cover [B] (4 screws).

6.1.3 LEFT



A294R910.WMF

Upper Left Cover

- 1. Remove the optional finisher, if it is installed.
- 2. Remove the front and rear joint brackets [A] (2 screws each), if the optional finisher was installed.
- 3. Remove the upper left cover [B] (4 screws)

Lower Left Cover

1. Remove the lower left cover [C] (4 screws).



6.1.4 REAR



A294R911.WMF

Upper Rear Cover

1. Remove the upper rear cover [A] (6 screws).

Lower Rear Cover

1. Remove the lower rear cover [B] (6 screws).

6.2 DOCUMENT FEEDER

6.2.1 COVER REMOVAL



B301R106.WMF

Front Cover Removal

1. Remove the front cover [A] (2 screws).

Rear Cover Removal

1. Remove the rear cover [B] (3 screws).

Left Cover Removal

- 1. Remove the front cover.
- 2. Remove the grounding wire (not shown) (1 screw).
- 3. Remove the left cover [C] (1 screw, 2 connectors).

Upper Exit Cover Removal

- 1. Remove the front cover.
- 2. Remove the upper exit cover [D] (1 screw).



B301R105.WMF

Original Tray Removal

- 1. Remove the front and rear covers.
- 2. Remove the original tray [A] (4 screws).

Upper Cover Removal

- 1. Remove the front and rear covers.
- 2. Remove the original tray.
- 3. Remove the upper cover [B] (2 screws).

Bottom Plate Removal

- 1. Remove the front and rear covers.
- 2. Remove the original tray.
- 3. Remove the bottom plate [C] (1 snap ring, 1 connector).

6.2.2 FEED UNIT REMOVAL AND SEPARATION ROLLER REPLACEMENT



B301R107.WMF

- 1. Open the left cover.
- 2. Remove the clip [A].
- Remove the feed unit [B]. (Pull the feed unit to the front, release the shaft at the rear, and release the front bushing.)
- 4. Remove the separation roller cover [C].
- 5. Remove the snap ring [D].
- 6. Remove the torque limiter [E] and separation roller [F].



6.2.3 FEED BELT REPLACEMENT



- 1. Remove the feed unit.
- 2. Remove the pick-up roller unit [A].
- 3. Remove the feed belt holder [B]. **NOTE:** The springs [C] come off the feed belt cover easily.
- Replace the feed belt [D].
 NOTE: When reinstalling the pick-up roller unit, make sure that levers [E] and [F] on the front and rear original guides are resting on the pick-up roller unit cover.

6.2.4 PICK-UP ROLLER REPLACEMENT



- 1. Open the left cover.
- 2. Remove the two snap rings [A].
- 3. Remove the two bushings [B].
- Replace the pick-up roller [C].
 NOTE: When reinstalling the pick-up roller, make sure that the one-way clutch [D] is not at the gear side.

Replacement Adjustment

6.2.5 SENSOR REPLACEMENT



B301R125.WMF

- 1. Remove the left cover.
- 2. Remove the guide plate [A] (5 screws).

Entrance Sensor

3. Replace the entrance sensor [B] (1 connector).

Length Sensor

- 3. Remove the length sensor bracket [C] (1 screw).
- 4. Replace the length sensor [D] (1 connector).

Registration Sensor



B301R103.WMF



B301R108.WMF

- 1. Release the entrance guide [A] (2 screws).
- 2. Release the transport belt unit [B].
- 3. Remove the sensor bracket [C] (1 screw).
- 4. Replace the registration sensor [D] (1 connector, 1 screw).



Width Sensor



B301R507.WMF

- 1. Remove the feed unit.
- 2. Remove the front cover.
- 3. Remove the stopper screw [A].
- 4. Remove the guide plate [B] (2 screws).
- 5. Release the front end of the upper transport roller [C] (1 bushing, 1 E-ring).
- 6. Remove the sensor unit [D] (1 screw).
- 7. Replace the width sensor.

Exit Sensor and Inverter Sensor



B301R508.WMF

Exit Sensor

- 1. Remove the front and rear covers.
- 2. Remove the exit guide unit [A] (4 screws).
- Replace the exit sensor [B] (1 connector).
 NOTE: When reinstalling the exit guide unit, make sure that the guide plate [C] on the exit unit is over the exit gate [D].

Inverter Sensor

- 1. Remove the front and rear covers.
- 2. Remove the right lower cover [E] (4 screws).
- 3. Remove the guide plate [F] (3 screws).
- 4. Replace the inverter sensor [G] (1 connector).



6.2.6 TRANSPORT BELT REPLACEMENT



B301R512.WMF

- 1. Remove the front cover.
- 2. Release the entrance guide [A] (2 screws).
- 3. Remove the three screws securing the transport belt assembly [B].
- 4. Fold up the transport belt assembly extension [C].
- 5. Pull off the transport belt [D] and replace it.
- **NOTE:** When installing the transport belt, make sure that the belt runs under the upper and lower belt guide spacers [E].
- 6. Using SP6-009, do a DF free run for 3 minutes. After the free run is finished, clean off any dust that came off the transport belt onto the exposure glass.

6.2.7 MOTOR REPLACEMENT



B301R119.WMF



B301R121.WMF

1. Remove the rear cover.

Bottom Plate Motor

2. Replace the bottom plate motor [A] (2 screws, 1 connector).

Pick-up Motor

2. Replace the pick-up motor [B] (2 screws, 1 connector).



B301R117.WMF

1. Remove the rear cover.

Feed-in Motor

2. Replace the feed-in motor [A] (4 screws, 2 connectors).

Transport Motor

2. Replace the transport motor [B] (4 screws, 2 connectors).

Feed-out Motor

- 2. Remove the grounding wire [C] (1 screw).
- 3. Remove the feed-out motor assembly [D] (2 screws, 2 connectors).
- 4. Replace the feed-out motor [E] (2 screws).

6.2.8 FEED-IN CLUTCH REPLACEMENT





B301R123.WMF

- 1. Remove the rear cover.
- 2. Remove a screw from the tightener [A].
- 3. Remove the timing belt [B].
- 4. Remove the pulley [C] and ball bearing [D] from the feed-in drive shaft (1 E-ring, 1 pin).
- 5. Remove the pulley [E] and bushing [F] from the pick-up roller cam shaft (1 Ering, 1 pin)
- 6. Remove the ball bearing [G] from the feed belt drive shaft (1 E-ring).
- 7. Remove the feed-in clutch assembly [H] (5 screws).
- 8. Remove 2 ball bearings [I] from the feed-in clutch shaft (1 E-ring each).
- 9. Remove the pulley [J], pin and timing belt [K].
- 10. Replace the feed-in clutch [L].
 - **NOTE:** When re-installing the feed-in clutch, put the stopper screw [M] in the clutch hook.

6.3 SCANNER UNIT

6.3.1 EXPOSURE GLASS



A294R001.WMF

- 1. Remove the left scale [A] (3 screws).
- 2. Remove the 2 screws [B] holding the rear scale.
- 3. Slide the rear scale [C] in the direction of the arrow, then remove it.
- Remove the exposure glass [D].
 NOTE: When reinstalling the exposure glass, make sure that the mark [E] is at the rear left corner, as shown.

6.3.2 LENS BLOCK



- 1. Remove the exposure glass. (See Exposure Glass.)
- 2. Remove the lens cover [A] (8 screws).
- 3. Remove the lens block [B] (4 screws, 3 connectors).
- 4. After reassembly, do the scanner and printer copy adjustment. (See Replacement and Adjustment Copy Image Adjustment.)
- **NOTE:** Do not drive the scanner unit without the lens cover. The grounding plates [C] will contact the 1st scanner and damage the scanner.



6.3.3 ORIGINAL SIZE SENSORS



A294R052.WMF

- 1. Remove the exposure glass. (See Exposure Glass.)
- 2. Remove the original width sensor [A] (1 screw, 1 connector).
- 3. Remove the lens cover (8 screws). (See Lens Block.)
- 4. Remove the original length sensors [B] (1 screw, 1 connector each).

6.3.4 EXPOSURE LAMP



A294R050.WMF

- 1. Remove the exposure glass. (See Exposure Glass.)
- 2. Remove the front upper cover (7 screws, 1 connector). See Scanner Motor Removal.
- 3. Remove the lamp regulator cover [A] (2 screws).
- Remove the exposure lamp [B] (2 screws, 1 connector).
 NOTE: When reinstalling the exposure lamp, pass the cable through the opening [C] in the bracket.

Replacement Adjustment

6.3.5 LAMP REGULATOR



A294R007.WMF

- 1. Remove the exposure glass. (See Exposure Glass.)
- 2. Remove the lamp regulator cover [A] (2 screws).
- 3. Slide the holder [B] in the direction of the arrow. Then disconnect the flat cable [C].
- 4. Remove the lamp regulator [D] (2 screws, 1 connector).

6.3.6 OPTICS DUST FILTER



A294R006.WMF

- 1. Remove the original exit tray [A] (3 screws).
- 2. Remove the optics dust filter [B].

Replacement Adjustment

6.3.7 SCANNER H.P. SENSOR



A294R017.WMF

- 1. Remove the front upper cover (7 screws, 1 connector). See Scanner Cover Removal.
- 2. Remove the left upper inner cover [A] (3 screws).
- 3. Remove the scanner H.P. sensor bracket [B] (1 screw).
- 4. Remove the scanner H.P. sensor [C] (1 connector).

6.3.8 SCANNER MOTOR



- 1. Remove the exposure glass. (See Exposure Glass.)
- 2. Remove the upper left cover. (See Exterior.)
- 3. Remove the front upper cover [A] (7 screws, 1 connector).
- 4. Loosen the screw [B] holding the belt tension bracket [C].
- 5. Remove the 3 screws [D] securing the scanner motor assembly [E].
- 6. Disconnect the two connectors [F] from the MCU.
- 7. While pushing down the bracket [C] to release belt tension, remove the scanner motor assembly.

6-25

- 8. Remove the scanner motor from the bracket (3 screws) and replace it.
- 9. After reassembly, do the copy image adustments.

6.3.9 SCANNER DRIVE WIRES

Preparation



- 1. Remove the ADF.
- 2. Remove the original exit tray [A] (3 screws).
- 3. Remove the scanner front cover [B] (7 screws, 1 connector) and the rear upper cover [C] (6 screws).
- 4. Remove the scanner right cover [D] (4 screws).
- 5. Remove the bracket [E] (4 screws).
- 6. Remove the scanner frame [F] (10 screws).

Scanner Drive Wires (Front and Rear)



A294R014.WMF

- 1. Remove the wire tension bracket [A] (1 screw).
- 2. Remove the front scanner wire bracket [B].
- 3. Remove the front scanner wire.

Reinstallation

- 4. Remove the scanner wire pulley [C] (1 screw).
- 5. While making sure of the direction, place the beads on the middle of the wire on the pulley openings. Then wind the wire (ball side) 3 times and the other side (ring side) once as shown ①. Secure the pulley with tape to keep this condition.
- 6. Install the pulley on the scanner drive shaft (1 screw).
- 7. Wind the end of the wire with the ball as shown (2, 3, and 4).
- 8. Wind the end of the wire with the ring as shown ((5, 6), and (2)).
- 9. Install the tension spring on the tension bracket, and slightly tighten the tension bracket (1 screw).

Replacement Adjustment



- 10. Install the 1st scanner and adjust the position with the positioning tools (P/N A0069104) [A].
- 11. Secure the 1st scanner with the scanner wire bracket [B] (1 screw).
- 12. Fully tighten the tension bracket [C].
- 13. Remove the positioning tools. After sliding the scanner to the right and left several times, set the positioning tools to check the scanner wire bracket and the tension bracket again.
- 14. Reassemble the scanner and do the scanner and copy adjustments (see Replacement and Adjustment Copy Image Adjustments).

6.4 LASER UNIT

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

6.4.1 CAUTION DECAL LOCATIONS

There are two caution decals in the laser section as shown below.





A294R106.WMF

6.4.2 LDB AND LD FILTER REPLACEMENT



A294R102.WMF

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

NOTE: Do not touch the printed circuit board, to avoid damaging the board with static electricity.

- 1. Remove the exposure glass. (See Exposure Glass Removal.)
- 2. Remove the LD cover [A] (4 screws).
- 3. Remove the LD filter [B].
- 4. Replace the LDB [C] (2 screws and 5 connectors). **NOTE:** When disconnecting the cables, hold the LD unit.
- 5. Do SP 2-962 (process control initialization).

6.4.3 POLYGON MIRROR MOTOR REPLACEMENT



A294R101.WMF

- **NOTE:** Do not remove the polygon mirror motor within 3 minutes after the main switch is turned off (wait until the motor rotation stops). Otherwise, the motor will be damaged.
- 1. Turn off the main power switch and unplug the machine.
- 2. Remove the exposure glass. (See Exposure Glass Removal.)
- 3. Remove the LD cover [A] (4 screws).
- Replace the polygon mirror motor [B] (3 screws, 1 connector.)
 NOTE: 1) When reinstalling, make sure that the polygon mirror opening faces the right.
 - 2) Do not touch the glass surface of the polygon mirror motor with bare hands.
- 5. After reassembly, do the scanner and printer copy adjustments. (See Replacement and Adjustment Copy Image Adjustments.)

Replacement Adjustment

6.4.4 LASER SYNCHRONIZATION DETECTOR REPLACEMENT



A294R105.WMF

- 1. Turn off the main power switch and unplug the machine.
- 2. Remove the ground plate [A] (1 screw).
- 3. Remove the detector cover [B] (2 screws).
- 4. Replace the laser synchronization detector [C] (1 screw, 1 connector).

6.5 DRUM UNIT

6.5.1 DRUM UNIT REMOVAL AND DRUM REPLACEMENT



A294R551.WMF

- 1. Take out the development unit. (Refer to Development Unit Removal.)
- 2. Lower the transfer belt unit.
- Take out the drum unit by holding the handle [A].
 NOTE: 1) Cover the drum unit with a sheet of paper to protect it from light when the drum unit is left outside the machine for servicing.
 - 2) Do not touch the drum surface with bare hands.
- 4. Disconnect the connector of the drum potential sensor [B].
- 5. Open the upper drum unit (2 screws [C]).
- 6. Replace the drum [D]. Then remove the drum protective sheet from the new drum.
 - **NOTE:** If it is hard to completely set the drum unit in the machine because the gear is disengaged, push in the drum unit while holding down the cleaning blade release lever [E].

After installing a new drum, do the following SP mode: 2-962 (process control initialization).

6.5.2 QUENCHING LAMP REPLACEMENT



A294R202.WMF

- Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.) NOTE: Wrap a protective sheet or a few sheets of paper around the drum to protect it from light.
- Slightly pull up the quenching lamp cable [A], then release the hook [B] at the center of the quenching lamp.
 NOTE: Do not pull the wire too strongly.
- 3. Disconnect the connector [A].
- 4. Replace the quenching lamp.

6.5.3 GRID PLATE/CHARGE CORONA WIRE/WIRE CLEANER REPLACEMENT



A294R305.WMF

Replacemen Adjustment

- 1. Take out the charge corona unit [A] (1 screw, 1 connector).
- 2. Remove the grid plate [B] (1 plastic screw, 4 hooks).
 - **NOTE:** 1) When installing the grid plate, do not tighten the plastic screw [C] too strongly.
 - 2) Do not touch the corona wire and grid plate with bare hands.
- 3. Remove the front grid terminal [D], then the front end block cover [E].
- 4. Remove the plate [F].
- 5. Remove the terminal spring [G].
- 6. Slide the rear grid terminal [H] to the rear and remove it, then remove the rear end block cover [I].
- 7. Remove the charge corona wire [J].



A294R553.WMF

- 8. Remove the wire cleaner [A] (1 snap ring).
- 9. Install the wire cleaner and the charge corona wire. **NOTE:** Locate the joint part [B] of the wire in the rear end block as shown.

After installing new wires, reset SP2-001-1 to 2-001-6 (corona voltage and current) to the defaults. Then do SP2-962 (process control initialization).
6.5.4 DRUM POTENTIAL SENSOR REPLACEMENT



- 1. Take out the drum unit. (Refer to Drum Unit Removal.)
- Disconnect the connector [A].
 NOTE: Before removing the drum potential sensor, put a few sheets of paper between the sensor and the drum to protect the drum surface.
- 3. Remove the drum potential sensor [B] and the grounding plate [C] (2 screws).
- 4. Replace the drum potential sensor [B].

After replacing the drum potential sensor, perform the process control data initial setting (SP mode No. 2-962).

Replacemen Adjustment

6.5.5 CLEANING BLADE/ID SENSOR REPLACEMENT



- 1. Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.)
- 2. Remove the cleaning blade [A] (2 screws).
- 3. Clean the side seals [B] and cleaning brush [C].
 - **NOTE: When a vacuum cleaner is used**, to protect the electrical parts from static electricity, disconnect the connector on the charge power pack and remove the ID sensor as follows:
 - 1) Disconnect the 12-pin connector [D].
 - 2) Separate the upper and lower drum units.
 - 3) Remove the spur bracket [E] and pick-off pawl bracket [F] (2 screws).
 - 4) Disconnect the connector [G].
 - 5) Slide the pick-off pawl bracket to the rear, while turning it counterclockwise (as seen from the front). The ID sensor is on this bracket.

NOTE: After installing a new ID sensor, do SP3-001-2.

4. Install the new cleaning blade. **NOTE:** Do not clean the edge of the cleaning blade with a cloth; this damages

the edge and causes black lines on copies. Do not touch the edge of the new cleaning blade. If some setting powder or toner on the blade edge is removed, apply toner at that place.

When installing the cleaning blade, do not pinch the side seals.

6.5.6 CLEANING BRUSH REPLACEMENT



A294R204.WMF

- 1. Remove the cleaning blade. (Refer to Cleaning Blade Replacement.)
- 2. Remove the coupling gear [A] (1 screw).
- 3. Remove the bushing [B] (1 screw).
- 4. Pull the cleaning brush shaft to the rear to release the cleaning brush [C], then remove the cleaning brush.

NOTE: Do not touch the cleaning brush with bare hands.

After replacement, clean the ID sensor surface. Then do SP3-001-2 to initialize the sensor.



6.5.7 PICK-OFF PAWL REPLACEMENT



A294R561.WMF

- 1. Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.)
- 2. Remove the spur bracket [A] and pick-off pawl bracket [B] (2 screws).
- 3. Remove the bushing [C] (1 screw, 1 retaining ring).
- 4. While pulling the shaft [D] to the rear, turn the pick-off pawl shaft about 45 degrees clockwise (as viewed from the front) in order to move up the pick-off pawl.
- 5. Replace the pick-off pawl [E].

NOTE: 1) Do not forget to hook the tension spring [F].

- 2) After replacement, check that the pick-off pawl moves smoothly.
- 3) Do not touch the pick-off pawl edge.

6.5.8 DRUM FILTER REPLACEMENT



A294R205.WMF

- 1. Open the front doors.
- 2. Remove the right inner cover [A] (3 screws).
- 3. Replace the filter unit [B].

Replacement Adjustment

6.6 DEVELOPMENT AND TONER SUPPLY

6.6.1 DEVELOPMENT UNIT REMOVAL



- 1. Turn off the main switch.
- 2. Open the right door.

- 3. Remove the right inner cover [A] (3 screws).
- 4. Remove the screw [B] that holds the drum stay.
- 5. Remove the drum stay knob [C] then take out the drum stay [D].
- 6. Disconnect the two connectors [E].
- 7. Pull out the development unit [F].
 - **NOTE:** 1) To prevent scratches on the drum, push the development unit to the right while pulling it out.
 - 2) When installing the development unit, do not forget to connect the two connectors [E].
 - 3) When pulling out the development unit, do not hold the knob [G].
 - 4) Keep the development unit connector as far as possible away from the development unit when cleaning the unit with a vacuum cleaner.
 - 5) When removing the development unit, hold the knob [C] to pull out the unit.

6.6.2 DEVELOPER REPLACEMENT



- 1. Take out the development unit. (Refer to Development Unit Removal.)
- 2. Place the development unit on a sheet of paper [A].
- 3. Remove the two screws [B] that hold the toner hopper [C].
- 4. Remove the toner hopper from the development unit.
- 5. Turn over the development unit. Then turn the paddle roller knob [D] to empty the remaining developer onto the sheet. (The knob [D] allows the paddle roller to be turned counterclockwise only.)

NOTE: Dispose of used developer in accordance with local regulations. Make sure that no developer remains on the development rollers or in the development unit. Replacemen Adjustment



- Clean the side seals [A] and entrance seal [B].
 NOTE: Cover the sleeve rollers with a sheet of paper [C] to prevent the used developer from being attracted to the sleeve rollers.
- 7. Pour in one pack of developer [D] evenly across the width of the development unit, while turning the knob [E].
- 8. Re-install the toner hopper, then re-assemble the machine.
 - **NOTE:** 1) Be sure to connect the connectors after installing the development unit in the machine.
 - 2) Tilt the toner hopper so that there is toner near the toner hopper sensor.
- 9. Turn on the main switch, then do developer initial setting (SP mode No. 2-801). **NOTE:** 1) Do not make any copies with the new developer before completing
 - the developer initial setting, otherwise toner density control will be abnormal.
 - 2) If the developer initial setting did not complete correctly, you cannot exit the SP mode by pressing the "Quit" key. If this problem occurs, turn the main switch off and on, then perform the initial setting again. If the result is the same, see "SC342" in the troubleshooting section.

6.6.3 DEVELOPMENT AND AIR DUST FILTER REPLACEMENT



A294R301.WMF

- 1. Take out the development unit. (Refer to Development Unit Removal.)
- 2. Remove the toner hopper. (Refer to Developer Replacement.)
- 3. Replace the development filter [A].
- 4. Remove the central air dust filter cover [B] (1 hook).
- 5. Replace the central air dust filter [C].
- 6. Remove the front air dust filter cover [D].
- 7. Replace the front air dust filter [E].

NOTE: Make sure that the air dust filter cover [B] is fully installed.

6.6.4 DEVELOPMENT ENTRANCE, FRONT, AND REAR SIDE SEALS



A294R546.WMF

- 1. Remove the developer. (Refer to Developer Replacement.)
- 2. Replace the developer entrance seal [A] (2 screws, 2 hooks).
- Replace the front and rear side seals [B].
 NOTE: When re-assembling the development unit, use new side seals and align the edges of the side seals with the corner [C] and the edge [D] as shown.
 There is no need to change the developer with this procedure.

6.6.5 TONER DENSITY SENSOR REPLACEMENT



A294R547.WMF

- 1. Remove the developer. (Refer to Developer Replacement.)
- Replace the TD sensor [A] (2 screws).
 NOTE: Before installing the TD sensor, clean the development unit well so that no carrier particles remain in the gap between the TD sensor and the development unit casing.
- 3. Install new developer and reassemble the development unit.
- 4. Perform the developer initial setting (SP2-801) then process control initialization (SP2-962).
 NOTE: Do not make any copies before completing the developer initial setting (SP2-801).

Replacement Adjustment

6.6.6 TONER HOPPER SENSOR REPLACEMENT



A294R303.WMF

- 1. Take out the toner hopper. (Refer to Developer Replacement.)
- 2. Replace the toner hopper sensor [A] (2 screws, 1 connector).

6.6.7 DEVELOPMENT MOTOR REPLACEMENT



A294R919.WMF

- 1. Turn off the main switch.
- 2. Remove the rear covers. (Refer to Exterior Cover Removal.)
- 3. Remove the fly wheel (3 screws).
- 4. Replace the development motor unit [A] (4 screws, 2 connectors, and 1 hook).

6.6.8 DEVELOPMENT ROLLER SHAFT CLEANING



A294R405.WMF

- 1. Take out the development unit. (Refer to Development Unit Replacement.)
- 2. Remove toner and developer from the development roller shafts with teflon tape.

6.7 TRANSFER BELT UNIT

6.7.1 TRANSFER BELT UNIT REMOVAL/INSTALLATION



Removal

- 1. Turn off the main switch.
- 2. Remove the right inner cover (see Development Unit Removal).
- 3. Remove the transfer belt unit holder [A] (1 screw).
- 4. Disconnect the connector [B].
- 5. While turning the lever [C] counterclockwise, take out the transfer belt unit.
- **NOTE:** 1) Do not touch the transfer belt with bare hands.
 - 2) Take care not to scratch the drum with the transfer belt unit. Be careful when installing the transfer belt unit.

Reassembly

- 1. While keeping the lever [C] rotated fully counterclockwise, install the transfer belt unit.
- **NOTE:** 1) Insert the gear [D] into the opening [E] in the rear frame.
 - 2) Place the slot [F] in the transfer belt unit on the rail.





A294R404.WMF

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

6.7.2 TRANSFER BELT REPLACEMENT



- 1. Take out the transfer belt unit. (Refer to Transfer Belt Unit Removal.)
- 2. While raising the knob [A], disconnect the two connectors [B].
- 3. Turn the transfer belt upper unit [C] 90 degrees counterclockwise, then raise and remove it.
- 4. Remove the screws [D].



- 5. Turn the belt drive roller holder [A] clockwise (front view).
- 6. Replace the transfer belt [B].
 - **NOTE:** 1) Before installing the transfer belt, clean both sides of the transfer belt with a dry cloth (do not use alcohol).
 - 2) Before installing the transfer belt, clean the following items with alcohol.
 - Belt drive roller [C]
 - Belt roller [D]
 - Bias roller [E]
 - 3) Position the transfer belt at the center of the belt roller [D]. (Both marks [F] should be visible.)
 - 4) Set the transfer belt under the bias terminals [G] (see the previous page).

6.7.3 TRANSFER BELT CLEANING BLADE REPLACEMTNT



A294R108.WMF

- 1. Remove the transfer belt unit. (Refer to Transfer Belt Replacement.)
- 2. Remove the transfer belt cleaning blade [A].
- Clean the cleaning bias roller [B].
 NOTE: When using a vacuum cleaner, to protect the transfer power pack from static electricity, remove the power pack connectors [C].
- Install the new cleaning blade.
 NOTE: Do not touch the edge of the cleaning blade. If some of the setting powder on the blade edge is removed, apply setting powder or toner at that place.



6.7.4 TRANSFER BELT BIAS BRUSH REPLACEMENT



A294R455.WMF

- 1. Remove the transfer belt.
- 2. Remove the transfer belt bias brush holder [A] (1 screw).
- 3. Replace the transfer belt bias brush [B].

6.8 PAPER FEED

6.8.1 PAPER TRAY REMOVAL

Tandem Tray Removal



1. Open the front cover.

- 2. Draw out the tandem feed tray [A] so that the right tandem tray [B] fully separates from the left one.
- 3. Push in the right tandem tray.
- 4. Remove the left tandem tray [C] (5 screws).



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

Universal Tray Removal



A294R711.WMF

- 1. Draw out the tray.
- 2. Remove the tray [A] from both guide rails, as shown (4 screws).

Replacement Adjustment

6.8.2 PAPER FEED ROLLER REPLACEMENT



- 1. Turn off the main switch.
- 2. Remove the paper tray for the appropriate feed unit. (Refer to Paper Tray Removal.)
- 3. Remove the pick-up roller [A] (1 snap ring).
- 4. Remove the feed roller [B] (1 snap ring).
- 5. Remove the separation roller [C] from the torque limiter [D] (1 snap ring).
- **NOTE:** 1) The paper feed rollers (pick-up, feed, separation) used in the 1st ~ 3rd feed units in the paper tray unit are different from the rollers used in the LCT. They are not interchangeable.
 - 2) Do not touch the surface of the rollers with your bare hands.

Note that there are counters for these rollers that you may wish to reset after installing a new roller (SP 7-816).

6.8.3 PAPER FEED AND VERTICAL TRANSPORT CLUTCH, AND TRAY LIFT, PAPER FEED, AND PAPER END SENSOR REMOVAL



This procedure is described for the 1st feed unit as an example.

- 1. Turn off the main switch.
- 2. Remove the right front door.
- 3. Remove the lower right cover. (Refer to Lower Right Cover Removal.) **NOTE:** If the LCT is installed, remove it from the copier.
- 4. Remove the feed unit cover. (Refer to Feed Unit Cover Removal.)
- 5. Slightly lift the vertical transport guide [A] and remove it.
- 6. Remove the securing screw [B], then remove the knob [C].
- 7. Pull out the paper trays, then remove the paper tray unit inner cover [D] (2 screws).



A294R704.WMF

8. Hold the inner vertical transport guide [A] and pull it out (2 screws, 1 connector).

NOTE: When re-installing the inner vertical transport guide, make sure to set the pin [B] of the inner vertical transport guide into the slot [C] on the main body.

- 9. Disconnect the two connectors [D].
- 10. Grasp the 1st or 2nd paper feed unit [E] and pull it out (2 screws).
 - **NOTE:** Before removing the 1st or 2nd paper feed unit, remove the inner vertical transport guide [A]. Otherwise, the 1st or 2nd paper feed unit may be damaged.



A294R705.WMF

- 11. Remove the paper feed clutch [A] (1 hook, 1 connector).
- 12. Remove the vertical transport clutch [B] (1 hook, 1 connector).
- 13. When re-installing the clutches, put the stopper [C] of each clutch on the correct hook on the bracket.
- 14. Remove the paper feed [D], paper end [E], or tray lift sensor [F] as required (1 bracket, 1 screw, and 1 connector for each sensor).

Replacement Adjustment

6.8.4 REAR FENCE RETURN SENSOR REPLACEMENT



A294R525.WMF

- 1. Turn off the main switch.
- 2. Draw out the tandem feed tray.
- 3. Remove the rear bottom plate [A] (1 screw).
- 4. Replace the rear fence return sensor [B] (1 connector).

6.8.5 REAR FENCE HP SENSOR REPLACEMENT



- 1. Turn off the main switch.
- 2. Draw out the tandem feed tray.
- 3. Remove the rear bottom plate [A] (1 screw).
- 4. Remove the rear fence transport gear [B] (1 screw).
- 5. Move the rear fence [C] to the right.
- 6. Remove the rear fence HP sensor [D] (1 connector).

Replacement Adjustment

6.8.6 RIGHT 1ST TRAY PAPER SENSOR REPLACMENT



A294R526.WMF

- 1. Turn off the main switch.
- 2. Remove the right tandem tray. (Refer to Paper Tray Removal.)
- 3. Remove the inner cover [A] (2 screws).
- Remove the side fences [B] (1 screw each).
 NOTE: When putting back the side fences, make sure that the position of the side fences is correct.

A4: Outer LT: Inner

- 5. Remove the bottom plate [C] (4 screws).
- 6. Replace the right 1st tray paper sensor [D] (1 screw and 1 connector).

6.8.7 BOTTOM PLATE LIFT WIRE REPLACEMENT

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



- 1. Remove the right tandem tray [A]. (Refer to Paper Tray Removal.)
- 2. Remove the inner cover (2 screws). (See Right 1st Tray Paper Sensor Removal.)
- 3. Remove the sensor bracket [B] (3 screws).
- 4. Slightly lift the front bottom plate and unhook the wire stoppers [C] (1 stopper [D] and 1 actuator [E]).
- 5. Remove the wire covers [F] (1 E-ring each).
- 6. Remove the bracket [G] (1 screw, 1 E-ring, and 1 bushing).
- 7. Remove the gear [H].
- 8. Replace the bottom plate lift wire [I].



- **NOTE:** When re-installing the bottom plate lift wire: 1) Set the positioning pin [A] in the hole [B] and set the projection [C] in the hole [D].
 - 2) Position the wire as shown [E].
 - 3) Do not cross the wires.

6.8.8 PAPER DUST REMOVER CLEANING



A294R936.WMF

- 1. Remove the development unit. (Refer to Development Unit Removal.)
- 2. While pushing down the hook lever [A], remove the paper dust remover [B].
- 3. Remove the paper dust inside the paper dust remover and clean inside it with a dry cloth or a blower-brush.



6.8.9 REGISTRATION SENSOR CLEANING



A294R937.WMF

- 1. Remove the lower right inner cover [A] (4 screws, 3 knobs).
- 2. Disconnect the connector [B].
- 3. Pull out the registration sensor assembly [C].
- 4. Clean the photo sensor [D] with a blower-brush.

6.8.10 UNIVERSAL TRAY SIZE SWITCH REPLACEMENT



- 1. Turn off the main switch.
- 2. Remove the lower rear cover. (See Exterior.)
- 3. Remove the PSU (5 screws, all connectors). See Boards and Other Items.
- 4. Disconnect the connector [A].
- 5. Remove the tray size switch bracket [B] (2 screws).
- 6. Replace the universal tray size switch [C] (1 connector).

Replacement Adjustment

6.8.11 1ST TRAY LIFT MOTOR REMOVAL



A294R929.WMF



A294R926.WMF

- 1. Turn off the main switch.
- 2. Remove the lower rear cover. (See Exterior.)
- 3. Remove the PSU (5 screws, all connectors) and IOB board (4 screws, all connectors). See Boards and Other Items.
- 4. Remove the tension spring [A].
- 5. Remove the upper timing belt [B].
- 6. Disconnect the connector [C].
- 7. Remove the 1st tray lift motor [D] (3 screws).
6.8.12 LIFT MOTOR REMOVAL (2ND & 3RD TRAYS)



- 1. Turn off the main switch.
- 2. Remove the lower rear cover. (See Exterior.)
- 3. Remove the PSU (5 screws, all connectors) and IOB board (4 screws, all connectors). See Boards and Other Items.
- 4. Remove the tension spring [A].
- 5. Remove the screw [B].
- 6. Remove the lower timing belt [C].
- 7. Disconnect the connectors [D].
- 8. Remove the lift motors [E] (2 screws each).

6.8.13 PAPER FEED MOTOR REMOVAL



A294R934.WMF

- 1. Remove the upper and lower timing belts: Follow steps from 1 to 5 of 1st tray lift motor removal and from 1 to 6 of 2nd and 3rd lift motor removal.
- 2. Remove the paper feed motor [A], as shown above (4 screws, 2 connectors).

6.8.14 RELAY MOTOR, UPPER RELAY CLUTCH, LCT RELAY CLUTCH REMOVAL





A294R916.WMF

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- 1. Remove the upper rear cover. (Refer to Upper Rear Cover Removal.)
- 2. Remove the fly wheel [A] (3 screws).
- 3. Remove the relay motor [B] (2 screws, 2 connectors).
- 4. Remove the clutch stopper [C] (1 screw).
- Remove the relay clutch [D] (1 retaining ring, 1 connector).
 NOTE: When re-installing the clutch [D], put the pin [E] in the stopper in the cutout [F] in the clutch.
- 6. Remove the LCT relay clutch [G] (1 retaining ring, 1 connector).

6.8.15 REGISTRATION MOTOR REMOVAL



- 1. Remove the upper rear cover. (Refer to Cover Removal.)
- 2. Remove the fly wheel (3 screws).
- 3. Remove the timing belt [A].
- 4. Remove the bracket [B] with the motor (3 screws, 1 connector).
- 5. Remove the registration motor [C] (3 screws, 1 timing belt, and 1 spring).

6.8.16 COPIER FEED UNIT/DEVELOPMENT FAN MOTOR REMOVAL



A294R940.WMF

- 1. Turn off the main switch.
- 2. Remove the development unit. (Refer to Development Unit Removal.)
- 3. Remove the lower right inner cover. (Refer to Registration Sensor Cleaning.)
- 4. Draw out the duplex unit about 10 cm.
- 5. Remove the LCT relay motor. (Refer to LCT Relay Motor Removal.)
- 6. Remove the upper right cover. (See Exterior.)
- 7. Remove the two fan motors [A] (1 screw, 1 connector each).
- 8. Remove the copier feed unit [B] (5 screws, 2 connectors).

6.8.17 LCT RELAY AND RELAY SENSOR REMOVAL



- 1. Remove the upper right cover. (See Exterior.)
- 2. Remove the bracket [A] with the LCT relay sensor (1 screw, 1 connector and 1 harness clamp [B]).
- 3. Remove the LCT relay sensor [C].
- 4. Remove the bracket [D] with the relay sensor (1 screw, 1 connector).
- 5. Remove the relay sensor [E].

6.8.18 TANDEM FEED TRAY PAPER SIZE CHANGE

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



A294R565.WMF

- 1. Open the front cover.
- 2. Completely pull out the tandem feed tray [A] so that the right tandem tray [B] separates from the left tandem tray.
- 3. Remove the right tandem inner cover [C].
- 4. Re-position the side fences [D] (1 screw each). The outer slot position is used when loading A4 size paper.
- 5. Re-install the right tandem inner cover [C].



A294R523.WMF

- 6. Remove the tray cover [A] (2 screws).
- 7. Remove the motor cover [B] (4 screws).
- 8. Re-position the side fences [C] (4 screws each). The outer slot position is used when loading A4 size paper.
- 9. Re-install the motor cover and the tray cover.



- 10. Remove the rear bottom plate [A] (1 screw).
- 11. Re-position the return position sensor bracket [B] (1 screw). To use the paper tray for A4 size, put the screw in the left hole as shown. (For LT size, the screw should be placed on the right.)
- 12. Re-install the rear bottom plate.
- 13. Change the paper size using SP5-019-001.





- **NOTE:** Normally the side registration of the image can be adjusted with SP mode. When the punch hole positions are not aligned from a particular feed station, adjusted the side registration by changing the tray cover position for that tray, as described below. Then adjust the side registration of the image with the SP mode.
- 1. Pull out the tray.
- 2. Move the plate [A] as shown.

Adjustment range: 0 ± 2.0 mm adjustment step: 1.0 mm/step

6.9 FUSING UNIT

6.9.1 OIL SUPPLY & CLEANING WEB UNIT REMOVAL



A294R501.WMF

- 1. Turn off the main switch.
- 2. Pull out the fusing and exit unit [A].
- Remove the fusing unit inner cover [B] (2 screws).
 NOTE: The oil supply and cleaning web unit is still hot even if the main switch is turned off for servicing.
- Remove the oil supply and cleaning web unit [C] (1 screw).
 NOTE: Make sure that the web collecting roller gear engages with the gears on the fusing/exit unit after re-installing the oil supply and cleaning web unit.

Replacement Adjustment A294R501.WMF

6.9.2 HOT ROLLER UNIT REMOVAL AND PRESSURE ROLLER REPLACEMENT





A294R502.WMF

- 1. Remove the oil supply and cleaning web unit. (See Oil Supply and Cleaning Web Unit Removal.)
- 2. Remove the top cover [A] of the fusing unit (1 screw).
 - **NOTE:** When re-installing this cover, align the cutouts [B] and projections [C] and slide the cover to the right. Make sure that the cover does not pinch the thermistor and thermofuse cables against the stay.
- 3. Turn the hot roller stripper unit [D] clockwise approximately 160° and slide the pivot shaft out of the cutout [E].
- 4. Release the fusing pressure by turning the pressure lever [F] 1/4 of a turn counterclockwise with a screw driver.
 NOTE: If the fusing pressure is still released when re-installing the inner cover of the fusing unit, that cover cannot be installed.



NOTE: Do not remove the four <u>M4 bind screws</u> [A] in the next step.

- Remove the four <u>M5 pan head screws</u> [B] and remove the hot roller unit [C].
 NOTE: 1) When re-installing the hot roller unit, make sure that the flanges of the ball bearings in the hot roller unit are set inside the fusing exit side plate [D] and the gear in the hot roller unit is installed on the rear side.
 - 2) Secure the M5 pan head screws at the rear side first. Then, secure the screws at the front side.
 - 6. Remove the two bind screws [E] securing the pressure roller stripper unit [F].
 - Slide the pressure roller stripper unit [F] to the right while slightly raising the side near the pressure roller (1 connector [G] and 1 clamp [H]).
 NOTE: Be careful not to touch the pressure roller surface during this step.
 - 8. Lift up the pressure roller unit [I].
 - 9. Remove the C-ring [J] from the pressure roller and replace the pressure roller [K] (2 ball bearings, 2 bushings).
 - **NOTE:** Lubricate the inner surface [L] of the pressure roller (bearing [M] contact part) with BARRIERTA L55/2 grease when replacing the pressure roller.

6.9.3 HOT ROLLER REPLACEMENT



A294R508.WMF

- 1. Remove the hot roller unit: Follow steps 1 to 5 of hot roller unit removal and pressure roller replacement.
- 2. Remove the fusing entrance guide [A] (2 screws).
- Remove the two screws [B] securing the harness terminal bracket, and unhook the bracket.
 NOTE: Unhook the thermistor cable [C] and themofuse cable [D] to prevent them from becoming damaged.
- 4. Disconnect the three green connectors [E] for the fusing lamp cables from the terminal on the rear side.
- 5. Disconnect the three white fusing lamp connectors [F] on the front side.



- 6. Remove the front and rear lamp holders [A] (1 screw each).
- 7. Remove the three fusing lamps [B] one-by-one.
- Replace the hot roller [C] (1 gear, 2 C-rings, 2 bushings, and 2 ball bearings).
 NOTE: 1) When replacing the hot roller, make sure that the end with long part of the shaft [D] is at the rear (gear side).
 - 2) When re-installing the ball bearings and bushings, make sure that the flanges for the bearings and bushings are placed on the outside.
 - 3) Lubricate the inner and outer surfaces of the bushings [E] with BARRIERTA L55/2 grease when replacing the pressure roller.

When re-installing the three fusing lamps, make sure of the following points:

- 1) The three lamps must be parallel inside the hot roller (DO NOT CROSS THEM).
- 2) While aligning the three lamps with the cutouts in the front lamp holder, reinstall the front and rear lamp holders.
- 3) At the front, connect the white fusing lamp connectors to the white connectors on the cable. At the rear, connect the green fusing lamp connectors to the green connectors on the cable.
- 4) Route the thermistor cable and themofuse cable (refer to [C] and [D] on the previous page).

Make sure that the cables are not pinched and do not contact the gears.

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6.9.4 OIL SUPPLY & CLEANING WEB REPLACEMENT



- 1. Remove the oil supply and cleaning web unit. (See Oil Supply And Cleaning Web Unit Removal.)
- 2. Put the oil supply and cleaning web unit on a stable flat surface (opening side up) as shown.
- 3. Remove the screw [A] from the oil supply and cleaning web unit cover.
- 4. Slide the oil supply and cleaning web assembly [B] to the rear while holding the oil supply and cleaning web unit cover [C]. Then, remove the oil supply and cleaning web assembly [B].
- 5. Remove two bushings [D] from the short shaft side (rear side).
- 6. Push the web collecting roller shaft [E] to the short shaft side (rear side). Then remove the web collecting roller gear [F] and bushing [G].
- 7. Replace the oil supply and cleaning web [H] (1 gear and 1 bushing).



A294R514.WMF



A294R515.WMF

- **NOTE:** 1) When re-installing parts, make sure that the feeler lever [A] for the web end sensor is on the web as shown. Otherwise, after re-installing the parts and turning on the main switch, web end (SC550) will be displayed.
 - 2) When putting back the oil supply and cleaning web assembly, make sure that the flange for the bushings does not ride on the side edges [B] of the oil supply and cleaning web unit cover.
 - 3) If the web has a buckle between the web supply roll and web collecting roll, turn the web collecting roller gear [C] clockwise (front view) until the buckle is pulled straight.
- Reassemble the fusing unit.
 NOTE: Make sure that the web collecting roller gear engages with the gears on the fusing unit exit unit after re-attaching the oil supply and cleaning web unit.
- 9. Access SP1-902-1 (web consumption counter), and change the value to 0.

6.9.5 WEB CLEANING ROLLER REPLACEMENT



A294R519.WMF

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

6.9.6 HOT ROLLER STRIPPER REPLACEMENT



A294R517.WMF

- 1. Remove the hot roller stripper unit: Follow steps 1 to 3 of hot roller unit removal.
- 2. Replace the hot roller strippers [A].

Replacement Adjustment

6.9.7 PRESSURE ROLLER STRIPPER REPLACEMENT



- 1. Remove the pressure roller stripper unit: Follow steps 1 to 7 of hot roller unit removal and pressure roller replacement.
- 2. Remove the stripper pawl cover [A] (2 screws).
- 3. Replace the pressure roller strippers [B].

6.9.8 PRESSURE ROLLER CLEANING ROLLER REPLACEMENT



- 1. Remove the screw [A] through the hole [B] in the fusing unit exit inner cover as shown.
- 2. Pull the pressure cleaning roller unit [C] to the front, then swing the pressure roller cleaning roller unit down clockwise.
- 3. Pull out the pressure roller cleaning roller unit again. The pressure roller cleaning roller unit dislodges from the pins [D] on the front and rear side plate of the fusing exit.
- 4. Remove the two plate springs [E] (2 screws) and replace the pressure roller cleaning roller (1 spacer [F], 1 ball bearing [G] and 1 shaft assembly [H]).
- **NOTE:** When re-installing the pressure roller cleaning roller unit, fit the holes [I] (first the rear, then the front) in the pressure roller cleaning roller unit bracket onto the pins [D] on the rear and front side plates of the fusing unit exit. Then, turn the pressure roller cleaning roller unit counterclockwise, and push the pressure roller cleaning roller unit to the rear. Finally, secure it with the screw [A].

6.9.9 FUSING AND EXIT UNIT REMOVAL



The fusing and exit unit is heavy. Take care not to injure yourself by dropping the fusing and exit unit when removing and installing it.

- 1. Remove the fusing unit inner cover [A] (2 screws).
- 2. Remove the fusing and exit unit [B] (4 screws).
- **NOTE:** 1) When putting back the fusing and exit unit, hook the cutouts [C] on the projections [D] on the right and left slide rails.
 - 2) The fusing inner cover prevents the fusing and exit unit from hooking the fusing and exit unit on the slide rails. Put back the fusing and exit unit without the fusing inner cover. Then, put back the fusing inner cover.

6.9.10 FUSING PRESSURE ADJUSTMENT



Adjustment standards: Nip width 11.5 ± 0.5 mm (the difference between front and rear measurements should be less than 0.5 mm).

- 1. Select the fusing nip band check mode (SP1-109).
- Make a copy using an A4/LT OHP sheet. Copying will start. It will stop in the fusing unit for 30 seconds and then will exit.
 NOTE: If an OHP sheet is not available, use a solid black copy on plain paper (make the copy with the ADF open the copy will be all black).
- 3. Measure the nip band width (the shiny band) at both ends.
- 4. It the nip band width is not within specifications at both ends, release the fusing pressure and adjust it using the adjustment screw [A] (clockwise = increases the pressure, counterclockwise = decreases the pressure).
 NOTE: Loosen the lock nuts [B] before turning the pressure adjustment screw. Re-tighten the nuts after adjusting.
- 5. Repeat steps 1 to 4 to confirm the nip band width.

6.10 PAPER EXIT/DUPLEX UNIT

6.10.1 EXIT SENSOR REPLACEMENT



- 1. Pull out the fusing and exit unit.
- 2. Remove the sensor bracket [A] with the sensor (1 screw, 1 connector, and 2 clamps).
- 3. Replace the exit sensor [B].
- **NOTE:** When putting back the sensor bracket, run the cable through the cutout [C] to slacken the cable.

6.10.2 DUPLEX UNIT REMOVAL



- 1. Open the left and right front doors and pull out the duplex unit [A].
- 2. Remove the 2 shoulder screws [B].
- 3. Lift up the duplex unit.
- **NOTE:** When putting back the duplex unit, align the cutouts [C] with the slide rail projections [D].

Replacement Adjustment

6.10.3 DUPLEX UNIT INNER COVER REMOVAL



A294R802.WMF

- 1. Pull out the duplex unit.
- 2. Remove the duplex unit inner cover [A] (1 knob and 4 screws).

6.10.4 JOGGER MOTOR REPLACEMENT



- 1. Remove the duplex inner cover. (See Duplex Unit Inner Cover Removal.)
- 2. Remove the duplex grip [A] (2 screws).
- 3. Remove the E-ring [B] and slide the duplex grip shaft [C] to the left.
- 4. Remove the jogger motor [D] (2 screws, 1 connector, 2 clamps).
- **NOTE:** When putting back the jogger motor, put back the duplex grip shaft and E-ring first. Then, tighten the screws for the jogger motor.

6.10.5 DUPLEX UNIT CLUTCH REPLACEMENT



- 1. Remove the duplex unit.
- 2. Replace each clutch [A] (1 connector and 1 E-ring or 1 clutch stopper).

6.10.6 DUPLEX ENTRANCE SENSOR REPLACEMENT



A294R805.WMF

- 1. Pull out the duplex unit.
- 2. Remove the entrance sensor bracket [A] with the sensor (2 screws).
- 3. Replace the duplex entrance sensor [B] (1 connector).

Replacement Adjustment

6.10.7 DUPLEX TRANSPORT SENSORS 2 & 3



- 1. Pull out the duplex unit.
- 2. Remove the 2 screws [A] (front side: shoulder screw) securing the upper duplex cover and slide the upper duplex cover [B] to the right.
- 3. Remove both the front and rear jogger fences [C] (1 screw each).
- 4. Remove the upper duplex cover [D] (1 connector).
- 5. Replace duplex transport sensor 2 [E] (1 connector).
- 6. Remove the sensor bracket [F] with duplex transport sensor 3 (2 screws and 1 connector).
- 7. Replace duplex transport sensor 3 [G].
- **NOTE:** When putting back the jogger fences, re-install both the jogger fences so that they are parallel.

6.10.8 DUPLEX TRANSPORT SENSOR 1/DUPLEX INVERTER SENSOR



A294R809.WMF

- 1. Pull out the duplex unit.
- 2. Remove the upper duplex cover.
- 3. Remove the reverse trigger roller [A] (1 E-ring, 2 bushings, and 2 solenoid links).
- 4. Remove the 2 screws [B] (front side: shoulder screw) securing the left upper cover and slide the left upper cover [C] to the right and remove it.
- 5. Replace each sensor [D] (1 connector each).
- **NOTE:** When putting back the upper left cover, make sure that the cutouts [E] catch the duplex side plate projections [F] and the hooks [G] are underneath the bracket plate [H].

6.11 TONER BANK

6.11.1 WASTE TONER BOTTLE REMOVAL



A294R901.WMF



- 1. Remove the toner bank cover [A] (2 pins).
- 2. Remove the toner bank inner cover [B] (3 screws).
- 3. Remove the waste toner bottle [C].



6.11.2 TONER BANK UNIT REMOVAL



A294R903.WMF





A294R905.WMF

- 1. Close the toner bottle cap using SP5-804-62 (upper bottle) or -63 (lower bottle). Then remove the toner bottles from the bank.
- 2. Turn the toner bank motor for 1 minute using SP5-804-61.
- 3. Discharge toner from the toner bank by using SP2-226.
- 4. Turn off the main switch and unplug the power cord. Follow steps 1 and 2 of waste toner bottle removal.
- 5. Remove the upper rear and lower rear covers. (See Exterior.)
- 6. Remove the upper left cover and lower left cover. (See Exterior.)
- 7. Remove the two screws [A] securing the toner supply cylinder so that the toner transport coil tube [B] can be shifted to the left to remove the snap ring in the toner bank drive section later.

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

- 8. Remove the noise filter [C] (2 screws and 4 connectors; upper: ④, ② white lower: ③, ① yellow) and toner bank motor [D] (2 screws, 1 connector).
- 9. Disconnect the three connectors [E] from the toner bank unit.

Replacemen[.] Adjustment



A294R907.WMF



A294R906.WMF

- 10. Remove the two screws [A] securing the toner transport coil tube.
- 11. While sliding the toner transport coil tube, remove the snap ring [B].



A294R909.WMF

- 12. Remove the four screws [A] securing the toner bank unit. **NOTE:** Try not to spill much toner from the toner bank.
- 13. Remove the screw [B] securing the toner recycling and collection cover [C].
- 14. While lifting the toner recycling and collection cover [C], pull out the toner bank unit.

Replacement Adjustment

6.11.3 TONER SUPPLY MOTOR AND TONER SUPPLY MOTOR SENSOR REMOVAL



A294R912.WMF

- 1. Remove the upper right cover.
- 2. Remove the bracket [A] with the toner supply motor (2 screws, 2 connectors and 2 pipes).
- 3. Remove the toner supply motor sensor [B].
- 4. Remove the toner supply motor [C] (2 screws).
- **NOTE:** When putting back the parts, make sure that the 2 pipes are connected at the correct positions, as shown.
6.11.4 ACCESS TO INSIDE THE TONER BANK



A294R948.WMF

- **NOTE:** The toner bottle sensors and toner collection bottle sensor are inside the toner bank.
- 1. Remove the toner bank (see Toner Bank Unit Removal).
- 2. Remove the toner release link bracket [A] (2 screws).
- Remove the left side plate [B] (9 screws and 2 links [C]).
 NOTE: When putting back the links [C], put the front pin [D] under the lock plate [E].
- 4. Remove the toner bottle bottom plates [F] (3 screws each).

6.12 BOARDS AND OTHER ITEMS

6.12.1 SICU BOARD



A294R005.WMF

- 1. Remove the exposure glass (see Exposure Glass).
- 2. Remove the lens cover (8 screws) (see Lens Block).
- 3. Remove the original exit tray [A] (3 screws).
- 4. Remove the scanner right cover [B] (4 screws).
- 5. Remove the cover bracket [C] (4 screws).
- 6. Remove the cooling fan bracket [D] (2 screws).
- 7. Remove the SICU cover bracket [E] (7 screws).
- 8. Replace the SICU [F] (4 flat cables, 9 connectors, and 7 screws).
- 9. Remove the NV-RAM [G] from the old SICU and install it on the new board.

6.12.2 HARD DISK DRIVE



- 1. Remove the upper right cover (4 screws). See Exterior.
- 2. Remove three screws [A] holding the HDD bracket [B]. Then pull out the HDD assembly.
- Replace hard disk drive 1 [C] or hard disk drive 2 [D] (2 screws and 2 connectors each).
 NOTE: Connect the black connector to HDD 1, and the gray connector to HDD 2.
- 4. Turn the main switch on and do SP4-911-1 (for HDD 1) or SP4-912-1 (for HDD 2).

NOTE: If either SP4-911-1 or SP4-912-1 is done, all the data for pre-set stamps and user stamps are deleted from both disks.

5. Install the stamp data using a flash memory card. (Refer to Stamp Data Installation in section 4.)

Replacement Adjustment

6.12.3 BCU BOARD



- 1. Remove the upper rear cover (6 screws). See Exterior.
- 2. Replace the BCU board [A] (6 screws and 20 connectors).
- 3. Remove the NV-RAM [B] from the old BCU board and install it on the new board.
- **NOTE:** If the screws [C] are removed, the BCU board can be swung out.

6.12.4 I/O BOARD



A294R925.WMF

- 1. Remove the lower rear cover (6 screws). See Exterior.
- 2. Replace the I/O board [A] (6 screws and 16 connectors).

6.12.5 PSU



A294R927.WMF

- 1. Remove the lower rear cover (6 screws). See Exterior.
- 2. Replace the PSU [A] (4 screws and 8 connectors).

6.12.6 CHARGE/GRID/BIAS POWER PACK



A294R915.WMF

- 1. Remove the upper rear cover (6 screws). See Exterior.
- 2. Replace the charge/grid/bias power pack [A] (2 screws and 5 connectors).

Replacement Adjustment

6.12.7 FUSING/DUPLEX MOTOR REPLACEMENT



- 1. Remove the upper rear cover.
- 2. Swing out the BCU board. (Refer to the BCU board replacement procedure)
- 3. Loosen screw [A] to release the belt tension.
- 4. Remove the timing belt [B].
- 5. Remove the fusing/duplex motor [C] (4 screws, 2 hooks [D]).
- **NOTE:** When putting back the parts, hook up the tension spring (this automatically gives the belt the correct tension), then tighten screw [A].

6.12.8 DRUM MOTOR REPLACEMENT



A294R924.WMF

- 1. Remove the upper rear cover.
- 2. Remove the fly wheel (3 screws).
- 3. Lower the BCU board (4 screws).
- 4. Loosen the screws [A] to loosen the belts, and remove the three timing belts [B].
- 5. Remove the drum motor [C] (5 screws, 2 connector, 1 hook, and 1 stopper [D]).
- **NOTE:** When putting back the parts, hook up the tension spring (this automatically gives the belt the correct tension), then tighten screw [A].



6.13 COPY IMAGE ADJUSTMENT: PRINTING/SCANNING

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

6.13.1 PRINTING

- **NOTE:** 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
 - 2) Use the Trimming Area Pattern (SP2-902-3, No.15) to print the test pattern for the following procedures.
 - 3) Set SP2-902-3 to 0 again after completing these printing adjustments.

Registration – Leading Edge

1. Check the leading edge registration using the Trimming Area Pattern, and adjust it using SP1-001 if necessary. The specification is: 3 ± 2 mm.

Registration – Side-to-Side

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

Using SP Mode

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

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



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

A294R633.WMF

Blank Margin

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

	SP mode	Specification
Trailing edge	SP2-101-2	$3\pm2~\text{mm}$
Right edge	SP2-101-4	More than 0.5 mm
Leading edge	SP2-101-1	$3\pm2~\text{mm}$
Left edge	SP2-101-3	2 ± 1.5 mm

A: Trailing Edge Blank Margin

B: Right Edge Blank Margin

C: Leading Edge Blank Margin

D: Left Edge Blank Margin



A294R634.WMF



Magnification Adjustment



A294R999.WMF

- 1. Enter SP mode and access SP2-902-3.
- 2. Select pattern 1 (Alternating Dot pattern 1,024 dots) and make a print using A3 (DLT) paper.
- 3. Check the length between the edges of the black squares. The length should be 130 mm.
 - 1) If the magnification in the main scan direction is not within 100 \pm 0.5%, adjust using SP2-909-1.
 - 2) If the magnification in the sub scan direction is not within $100 \pm 1.0\%$, adjust using SP2-910.
- **NOTE:** Check the magnification after the paper cools down.

6.13.2 PARALLELOGRAM IMAGE ADJUSTMENT

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

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



Replacement Adjustment

- 1. Check whether a parallelogram image appears as shown on the next page when printing a trimming area pattern (SP2-902-3, No.15). If it appears, do the following.
- 2. Remove the exposure glass (see Replacement and Adjustment Exposure Glass Removal).
- 3. Remove the original exit tray and the scanner right cover. (see Replacement and Adjustment Scanner Drive Wires)
- 4. Peel away the mylar [A] covering the opening in the frame.
- 5. Loosen the three screws [B] that hold the laser unit.



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

6.13.3 SCANNING

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

Registration: Platen Mode

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

	SP mode
Leading Edge	SP4-010
Side-to-side	SP4-011



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

A294R635.WMF

Magnification

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

Scanner Sub Scan Magnification

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

	SP mode
Scanner Sub Scan Magnification	SP4-008



A294R636.WMF

A: Sub Scan Magnification

6.13.4 ADF IMAGE ADJUSTMENT

Registration

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

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

	SP mode
Side-to-side Registration	SP6-006-1
Leading Edge Registration (Thin original mode)	SP6-006-2
Leading Edge Registration (Single-sided/Duplex: front)	SP6-006-3
Leading Edge Registration (Duplex: rear)	SP6-006-4





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

A294R692.WMF

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6.14 TOUCH SCREEN CALIBRATION

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

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

	Self Diagnostic Menu
[1]	Touch Screen Adjust
[2]	LED Test
[3]	Print Screen
[4]	Record Monitor

A294R116.PCX

- 2. Select "[1] Touch Screen Adjust".
 - NOTE: [2] tests the LEDs on the operation unit, not the machine's main operation panel.

[3] and [4] are for factory use only. Do not use unless directed by senior technical staff.



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A294R117.PCX

TOUCH SCREEN CALIBRATION

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

7. TROUBLESHOOTING

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

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

- **NOTE:** 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
 - 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
 - 3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.

Troubleshooting

7.1.2 SC CODE DESCRIPTIONS

SC101: Exposure Lamp Error

Definition [B]

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

Possible Causes

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

SC120: Scanner Home Position Error 1

Definition [B]

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

Possible Causes

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

SC121: Scanner Home Position Error 2

Definition [B]

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

- Scanner home position sensor defective
- Scanner drive motor defective
- MCU defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- Scanner drive wire, timing belt out of position

SC124: Scanner Motor Error 1

Definition [B]

The feedback signal from the scanner motor is not detected within 200 ms after the scanner motor turns on.

Possible Causes

- Scanner motor defective
- Poor connection of the connector for the feedback signal
- Poor connection of the connector for the scanner motor power line

SC125: Scanner Motor Error 2

Definition [B]

- 1) The scanner motor speed is less than 300 mm/s when the scanner home position sensor turns on.
- 2) The scanner motor stops before scanner home position when the scanner returns.

Possible Causes

- Scanner motor defective
- Large load on the scanner drive

SC126: Scanner Motor Error 3

Definition [B]

The scanner motor does not stop within 12 mm after the scanner home position sensor turns on when the scanner returns.

Possible Causes

- Scanner motor defective
- MCU defective

SC127: Scanner Motor Error 4

Definition [B]

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

Possible Causes

• Scanner motor defective

SC128: Scanner Motor Error 5

Definition [B]

The scanner motor speed does not reach the target speed within a certain time after the scanner motor starts.

Possible Causes

- Scanner motor defective
- MCU defective
- Scanner drive mechanism defective

SC129: Scanner Motor Error 6

Definition [B]

The scanner motor speed is not controlled properly.

Possible Causes

- Scanner motor defective
- PSU defective
- Scanner unit defective

SC130: SBU Error

Definition [B]

The SICU does not receive the correct signal from the SBU.

Possible Causes

- SICU defective
- SBU defective
- Poor connection between SICU and SBU



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SC300: Charge Corona Output Error 1

Definition [B]

A feedback voltage for the charge corona of more than 4.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

Possible Causes

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

SC301: Charge Corona Output Error 2

Definition [B]

A feedback voltage for the charge corona of less than 1.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

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



SC303: Charge Grid Output Error 1

Definition [B]

A feedback voltage for the grid of more than 4.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

Possible Causes

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



SC304: Charge Grid Output Error 2

Definition [B]

A feedback voltage for the grid of less than 1.0 V was detected from the charge/bias/grid power pack 9 times consecutively.

Possible Causes

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

SC305: Charge Corona Wire Cleaner Error 1

Definition [B]

The charge corona wire cleaner does not return to its home position.

Possible Causes

- Charge corona wire cleaner motor defective
- BCU defective

SC306: Charge Corona Wire Cleaner Error 2

Definition [D]

The charge corona wire cleaner motor connector is not connected.

Possible Causes

 Poor connection or disconnected charge corona wire cleaner motor connector



SC310: Drum Potential Sensor Error 1

Definition [D]

When calibrating the drum potential sensor during process control initial setting, the drum potential sensor output voltage is out of specification.

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective



SC311: Drum Potential Sensor Error 2

Definition [D]

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

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective

E

SC312: Drum Potential Sensor Error 3

Definition- [D]

When adjusting VD for the unexposed drum during process control initial setting, -1,000 V is applied to the charge grid, but the drum potential sensor detects that VD is more than -970 V.

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum unit and the BCU
- Charge/bias/grid power pack defective
- Dirty or worn charge corona wire

SC313: Drum Potential Sensor Error 4

Definition [D]

When adjusting the drum potential (VD) during process control initial setting, the drum potential sensor detects that VD is more than VG (grid voltage).

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective
- · Dirty or worn charge corona wire

22 October 1999



SC314: Drum Potential Sensor Error 5

Definition [D]

When adjusting the drum potential (VH) for LD power adjustment during process control initial setting, the first time the VH pattern is made, the drum potential sensor detects that VH is more than 500 V.

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- LDB defective

SC315: Drum Potential Sensor Error 6

Definition [D]

When adjusting VD for the unexposed drum during process control initial setting, VD does not reach -900 ± 20 V even if VG has been adjusted 5 times.

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective

SC316: Drum Potential Sensor Error 7

Definition [D]

When adjusting the drum potential (VH) for half tone during process control initial setting, the drum potential sensor detects that VH does not become -265 ± 20 V even though the LD power has been changed twenty times.

Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the IBCU
- BCU defective
- LDB defective
- Poor drum cleaning

SC321: Laser Writing Signal (F-gate) Error

Definition- [B]

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

- SICU board defective
- Poor connection of the printer controller
- Printer controller defective

SC322: Laser Synchronization Error

Definition [B']

The laser synchronization signal cannot be detected from the synchronization detector even if the laser diodes are activated.

Possible Causes

- Poor connection between the laser synchronization detector and the LDB
- Laser synchronization detector out of position
- Laser synchronization detector defective
- LDB defective
- SICU defective
- Front door safety switches defective

SC323: Excessive LD Drive Current

Definition [B']

The LDB applies more than 110 mA to the LD.

Possible Causes

- LDB defective (not enough power, due to aging)
- Poor connection between the LDB and the SICU board
- High temperature of LD on LDB

SC335: Polygonal Mirror Motor Error 1

Definition [B]

The polygonal mirror motor does not reach its operating speed within 20 seconds after the polygonal mirror motor turns on, or the polygonal mirror motor speed is changed.

Possible Causes

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

SC336: Polygonal Mirror Motor Error 2

Definition [B]

The SICU does not receive the stop signal from the polygonal mirror motor for more than 20 seconds after the polygonal mirror motor turns off.

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

SC337: Polygonal Mirror Motor Error 3

Definition [B]

The polygonal mirror motor status is changed even though no signal is sent from the SICU.

Possible Causes

- Polygonal mirror motor defective
- Electrical noise
- Polygonal mirror motor drive board defective
- SICU board defective

SC338: Polygonal Mirror Motor Error 4

Definition [B]

- 1) The polygonal mirror motor operating speed does not become stable for 20 seconds after the polygonal mirror motor is turned on, or the polygonal mirror motor speed is changed.
- 2) The stop signal from the polygonal mirror motor does not become stable for 20 seconds after the polygonal mirror motor is turned off.

Possible Causes

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

SC340: TD Sensor Error 1

Definition [B]

The TD sensor output voltage is less than 0.5 V or more than 4.0 V 10 times consecutively during copying.

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective

SC341: TD Sensor Error 2

Definition [B]

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

1) Less than 2.5 V when the maximum PWM (255) is applied to the TD sensor.

2) 2.5 V or more when minimum PWM (0) is applied to the TD sensor.

Possible Causes

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective

SC342: TD Sensor Error 3

Definition [B]

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

Possible Causes

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective



Definition [B]

Maximum PWM for the development bias signal is applied 10 times consecutively.

- Poor connection between the development bias terminal and the charge/bias/grid power pack
- Charge/bias/grid power pack

SC350: ID Sensor Error 1

Definition [D]

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

- 1) VSP \geq 2.5 V
- 2) VSP = 0 V

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid power pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

SC351: ID Sensor Error 2

Definition [D]

The following two conditions were detected at the same time when checking the ID sensor pattern.

- 1) VSG \leq 2.5 V or VSG= 0 V
- 2) The ID sensor output voltage is 5.0 V and the PWM signal input to the ID sensor is 0

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

SC352: ID Sensor Error 3

Definition [D]

The ID sensor pattern edge voltage is not at 2.5 V for 1.5 seconds during the ID sensor pattern check.

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

SC353: ID Sensor Error 4

Definition [D]

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

- 1) VSG < 4.0 V when the maximum PWM input (255) is applied to the ID sensor.
- 2) VSG \geq 4.0 V when the minimum PWM input (0) is applied to the ID sensor.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

SC354: ID Sensor Error 5

Definition [D]

VSG is not adjusted within the target (4.0 \pm 0.2 V) within 20 seconds during VSG checking.

Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

SC355: ID Sensor Voltage Error

Definition [B]

The ID sensor voltage (VP) exceeds 700 V, 10 times consecutively.

- Drum potential sensor defective
- IO Board defective
- Poor connection of the drum unit connector
- LD defective
- Poor drum cleaning
- Dirty optics
- Drum wear

SC360: Hard Disk Drive Error 1

Definition [B]

The machine does not detect the connection signal from HDD 1 when the main switch is turned on.

Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

SC361: Hard Disk Drive Error 2

Definition [C]

The machine does not detect the connection signal from HDD 2 when the main switch is turned on.

Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

SC362: Hard Disk Drive Error 3

Definition [C]

The machine does not detect the connection signal from HDD 1 when the operation switch is turned on.

Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

SC363: Hard Disk Drive Error 4

Definition [C]

The machine does not detect the connection signal from HDD 2 when the operation switch is turned on.

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

SC364: Hard Disk Drive Error 5

Definition [C]

The image data stored in HDD 1 cannot be output properly.

Possible Causes

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

SC365: Hard Disk Drive Error 6

Definition [C]

The image data stored in HDD 2 cannot be output properly.

Possible Causes

- When this SC occurs only once, this problem will be solved after turning the main power switch off and on.
- When this SC occurs while performing SP4-912-1 (HDD 2 media check), it can be cured by doing SP4-912-2 (HDD 2 formatting).
- HDD 2 defective

SC366: Hard Disk Drive Error 7

Definition [C]

The number of bad sectors in HDD 1 exceeds the maximum value.

Possible Causes

- NVRAM defective
- HDD 1 defective

SC367: Hard Disk Drive Error 8

Definition [C]

The number of bad sectors in HDD 2 exceeds the maximum value.

Possible Causes

- NVRAM defective
- HDD 2 defective

SC370, 371, 372, 373, 374, 375: IMAC (Image Compression IC) Error 1

Definition [B]

An error occurs during image processing in the IMAC, which handles image compression and image data transfer between the machine's components.

Possible Causes

SICU defective

SC376, 377: IMAC (Image Compression IC) Error 2

Definition [B]

While image data is transferred in tandem mode, an error occurs during image processing in the IMAC, which handles image compression and image data transfer between the machine's components.

Possible Causes

• SICU defective

SC380, 381, 382, 383: Image Data Transfer Timeout

Definition [B]

The image data could not be transferred to the memory within 20 seconds.

Possible Causes

- SICU defective
- Printer controller defective
- SBU defective

SC384, 385: Image Data Transfer Timeout in Tandem Mode

Definition [B]

The image data could not be transferred to the memory within 20 seconds in tandem mode.

Possible Causes

- SICU defective
- Printer controller defective
- SBU defective
- Interface board defective

SC386, 387: Image Data Transfer Timeout (HDD)

Definition [B]

The image data could not be transferred to the HDD within 15 seconds.

- SICU defective
- Printer controller defective
- SBU defective
- Interface board defective

SC390: Tandem Image Data Transfer Error

Definition [B]

The image data sent from the master does not match the data received by slave.

Possible Causes

- SICU defective
- Interface board defective
- Electrical noise

SC391, 392: Image Storage Address Error

Definition [B]

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

Possible Causes

SICU defective

SC400: Transfer Bias Roller Leak

Definition [B]

Abnormal feedback data from the transfer power pack is detected 6 times consecutively.

Possible Causes

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

SC401: Transfer roller open error

Definition [B]

The following conditions are detected at the same time 6 times consecutively.

- 1) The transfer bias roller feedback data is less than the minimum target.
- 2) Maximum PWM for the transfer bias roller is applied.

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

SC430: Quenching Lamp Error

Definition [D]

When finishing the process control initial setting, the drum potential which is detected by the drum potential sensor is out of the normal range.

Possible Causes

- Quenching lamp defective
- Poor connection between quenching lamp and charge/bias/grid power pack

SC440: Drum Motor Lock

Definition [B]

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

Possible Causes

- Too much load on the drive mechanism
- Drum motor defective
- Poor drum motor connector connection
- BCU defective

SC441: Development Motor Lock

Definition [B]

The development motor lock signal is longer than 2 seconds while the development motor is on.

Possible Causes

- Too much load on the drive mechanism
- Development motor defective
- Poor development motor connector connection
- BCU defective

SC491: Polygonal Mirror Motor Cooling Fan Motor Lock

Definition [B]

The polygonal mirror motor cooling fan motor lock signal is longer than 5 seconds while the polygonal mirror motor cooling fan motor is on.

- Too much load on the drive mechanism
- Polygonal mirror motor cooling fan motor defective

SC495: Toner Bottle Unit Error

Definition [B]

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The toner hopper sensor cannot detect toner even if the toner supply coil clutch turns on for 2 seconds x 10 times during toner supply during copying.

Possible Causes

- Toner supply motor defective
- Toner supply coil clutch defective
- Toner supply motor connector connection
- Toner supply coil clutch connector connection
- Toner near-end sensor (in the toner bank) defective
- Toner hopper sensor defective
- Toner clogged in the supply system

SC496: Toner Collection Bottle Error

Definition [B]

The toner collection bottle sensor remains off for 3 seconds.

Possible Causes

- No toner collection bottle
- Toner collection bottle sensor defective

SC501: 1st Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 1st tray.

- 1) The 1st lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 1st lift sensor is already activated when the 1st tray is placed in the machine.

- 1st lift sensor defective
- 1st tray lift motor defective
- Poor 1st pick-up solenoid connection
- Poor 1st tray lift motor connection
SC502: 2nd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 2nd tray.

- 1) The 2nd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 2nd lift sensor is already activated when the 2nd tray is placed in the machine.

Possible Causes

- 2nd lift sensor defective
- 2nd tray lift motor defective
- Poor 2nd pick-up solenoid connection
- Poor 2nd tray lift motor connection

SC503: 3rd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the 3rd tray.

- 1) The 3rd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 3rd lift sensor is already activated when the 3rd tray is placed in the machine.

Possible Causes

- 3rd lift sensor defective
- 3rd tray lift motor defective
- Poor 3rd pick-up solenoid connection
- Poor 3rd tray lift motor connection

SC504: LCT 1st Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the LCT 1st tray.

- 1) The LCT 1st lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 1st lift sensor is already activated when the LCT 1st tray is placed in the machine.

- LCT 1st lift sensor defective
- LCT 1st tray lift motor defective
- Poor LCT 1st pick-up solenoid connection
- Poor LCT 1st tray lift motor connection

SC505: LCT 2nd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the LCT 2nd tray.

- 1) The LCT 2nd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 2nd lift sensor is already activated when the LCT 2nd tray is placed in the machine.

Possible Causes

- LCT 2nd lift sensor defective
- LCT 2nd tray lift motor defective
- Poor LCT 2nd pick-up solenoid connection
- Poor LCT 2nd tray lift motor connection

SC506: LCT 3rd Tray Lift Malfunction

Definition [C]

One of the following conditions is detected in the LCT 3rd tray.

- 1) The LCT 3rd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 3rd lift sensor is already activated when the LCT 3rd tray is placed in the machine.

Possible Causes

- LCT 3rd lift sensor defective
- LCT 3rd tray lift motor defective
- Poor LCT 3rd pick-up solenoid connection
- Poor LCT 3rd tray lift motor connection

SC510: Paper Feed Motor Lock

Definition [B]

A paper feed motor lock signal is detected for more than 50 ms during rotation.

Possible Causes

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

SC511: LCT Motor Lock (Optional LCT)

Definition [B]

An LCT motor lock signal is detected for more than 50 ms during rotation.

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



SC515: Tandem Rear Fence Drive Motor Error

Definition [C]

One of the following conditions is detected in the tandem tray.

- 1) The rear fence return sensor and the rear fence HP sensor are on at the same time.
- 2) It takes 10 seconds or more for the rear fence return sensor to detect the on condition after the rear fence drive motor starts.
- 3) It takes 10 seconds or more for the rear fence HP sensor to detect the on condition after this fence starts moving to the home position.

Possible Causes

- Rear fence drive motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC520: Jogger Motor Error 1

Definition [C]

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

Possible Causes

- Jogger fence motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC521: Duplex Jogger Motor Error 2

Definition [C]

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

- Jogger fence motor defective
- Too much load on the drive mechanism
- Poor motor connector connection



SC531: Fusing/Duplex Motor Lock

Definition [B]

A fusing/duplex motor lock signal is detected for more than 2 seconds during rotation.

Possible Causes

- Fusing/duplex motor defective
- Too much load on the drive mechanism
- Poor fusing/duplex motor connector connection
- BCU defective
- Front door safety switches defective

SC532: Relay Motor Lock

Definition [C]

A relay motor lock signal is detected for more than 2 seconds during rotation.

Possible Causes

- Relay motor defective
- Too much load on the drive mechanism
- Poor relay motor connector connection
- BCU defective

SC541: Fusing Thermistor Open

Definition [A]

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

Possible Causes

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

SC542: Fusing Temperature Warming-up Error

Definition [A]

The fusing temperature does not reach the fusing standby temperature within 6 minutes after the main power switch is turned on, or after the front doors are closed.

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BCU defective
- AC drive board defective
- Poor fusing unit connection

SC543: Fusing Overheat Error 1

Definition [A]

A fusing temperature of over 220°C is detected for 5 seconds by the fusing thermistor.

Possible Causes

- Fusing thermistor defective
- BCU defective

SC544: Fusing Overheat Error 2

Definition [A]

The fusing temperature monitoring circuit defects abnormal fusing temperature.

Possible Causes

- Fusing thermistor defective
- BCU defective

SC545: Fusing Overheat Error 3

Definition [A]

The fusing lamp stays on at full power for 45 seconds while in the stand-by condition after warming-up is completed.

Possible Causes

• Fusing thermistor out of position

SC546: Fusing Ready Temperature Malfunction

Definition [A]

The fusing temperature twice consecutively is detected 20°C lower or 20°C higher than the temperature 1 second earlier.

Possible Causes

- Poor thermistor connector connection
- Poor fusing unit connection

SC547: Zero Cross Signal Malfunction

Definition [A]

When one of the following conditions is detected 10 times consecutively.

- 1) More than 66 or fewer than 45 zero-cross signals in 500 ms.
- 2) An interval between zero-cross signals shorter than 7.5 ms is detected 3 times in 500 ms.

Possible Causes

• Noise on the ac power line



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SC550: Oil Supply/Cleaning Web End

Definition [A]

The oil supply/cleaning web end sensor stays on for 500 ms after the oil supply/web end motor starts.

Possible Causes

- Oil supply/cleaning web end
- Oil supply/cleaning web motor defective

SC591: Toner Supply Motor Lock

Definition [B]

The toner supply motor sensor status does not change for 1 second while the toner supply motor is energized.

Possible Causes

- Toner supply motor defective
- Toner supply motor sensor defective
- BCU defective

SC592: Toner Bank Motor Error

Definition [B]

The BCU receives an abnormal signal from the toner bank motor.

Possible Causes

- Toner bank motor defective
- Too much load on the drive mechanism
- BCU defective

SC601: Communication Error Between SICU and SBU

Definition [B']

The SICU cannot communicate with the SBU board properly.

Possible Causes

- Poor connection between the SICU and SBU
- SBU defective
- SICU defective

SC602: Communication Error Between SICU and HDD Controller

Definition [B]

The SICU cannot communicate with the HDD controller properly.

- Poor connection between the SICU board and HDD
- SICU board defective

SC620: Communication Error between BCU and ADF 1

Definition [B']

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

Possible Causes

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

SC621: Communication Error between BCU and ADF 2

Definition [B']

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

Possible Causes

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

SC622: Communication Error between BCU and ADF 3

Definition- [B']

Software error after abnormal user operation.

Possible Causes

Software error

SC625, 626: Communication Error between BCU and Finisher

Definition [B]

The BCU cannot communicate with the finisher properly.

Possible Causes

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

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

• Japan only

SC640: Communication Error between SICU and BCU (CH1) 1

Definition [B]

The SICU cannot communicate with the BCU properly.

Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC641: Communication Error between SICU and BCU (CH1) 2

Definition [A]

The BCU cannot receive the data from the SICU properly.

Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC642: Communication Error between SICU and BCU (CH1) 3

Definition [B]

The SICU cannot receive the data from the BCU properly.

Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC643: Communication Error between SICU and BCU (CH2) 1

Definition [B]

The SICU cannot communicate with the BCU properly.

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC644: Communication Error between SICU and BCU (CH2) 2

Definition [A]

The BCU cannot receive the data from the SICU properly.

Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC645: Communication Error between SICU and BCU (CH2) 3

Definition [B]

The SICU cannot receive the data from the BCU properly.

Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

SC646: SICU Error

Definition [B] The BICU detects a defective SICU.

Possible Causes

SICU board defective

SC650: Optional Counter Error 1

Japanese version only

SC651: Optional Counter Error 2

• Japanese version only

SC652: Optional Counter Error 3

• Japanese version only

SC653: Optional Counter Error 4

• Japanese version only

SC701: ADF Pick-up Roller Release Malfunction

Definition [B']

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

Possible Causes

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

SC702: ADF Feed-in Motor Error

Definition [B]

The feed-in motor does not turn properly.

Possible Causes

- Feed-in motor defective
- ADF main board defective
- Poor connection between the feed-in motor and ADF main board
- Too much load

SC703: ADF Transport Belt Motor Error

Definition [B]

The transport belt motor does not turn properly.

Possible Causes

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

SC704: ADF Feed-out Motor Error

Definition [B']

The feed-out motor does not turn properly

- Feed-out motor defective
- ADF main board defective
- Poor connection between the feed-out motor and ADF main board
- Too much load

SC705: ADF Original Table Lift Malfunction

Definition [B]

One of the following conditions was detected.

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

Possible Causes

- Bottom plate H.P sensor defective
- Bottom plate motor defective
- ADF main board defective
- Bottom plate position sensor defective

SC720: Finisher Lower Transport Motor Error

Definition [B']

The lower transport motor does not turn properly

Possible Causes

- Lower transport motor defective
- Finisher main board defective
- Poor connection between the lower transport motor and finisher main board
- Too much load

SC722: Finisher Jogger Motor Error

Definition [B]

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

- Jogger H.P sensor defective
- Jogger motor defective
- Poor connection between the jogger motor and finisher main board
- Too much load

SC724: Finisher Staple Hammer Motor Error

Definition [B]

Stapling does not finish within a certain time after the staple hammer motor turned on.

Possible Causes

- Staple hammer motor defective
- Staple jam
- Too much load on the stapling mechanism
- Poor hammer motor cable connection

SC725: Finisher Stack Feed-out Motor Error

Definition [B]

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

Possible Causes

- Stack feed-out HP sensor defective
- Stack feed-out motor defective
- Too much load
- Poor stack feed-out motor cable connection

SC726: Finisher Shift Motor Error

Definition [B]

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

Possible Causes

- Shift motor defective
- Shift tray half-turn sensor defective
- Too much load

SC727: Finisher Stapler Rotation Motor Error

Definition [B]

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

- Stapler rotation motor defective
- Poor stapler rotation motor connection
- Staple rotation HP sensor defective
- Too much load



SC729: Finisher Punch Motor Error

Definition [B]

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

Possible Causes

- Punch motor defective
- Punch HP sensor defective
- Poor punch motor connection

SC730: Finisher Stapler Motor Error

Definition [B]

- 1) The stapler HP sensor stays on for longer than normal when the stapler motor turns on to return the stapler to its home position.
- 2) The stapler HP sensor does not turn on within a certain time after the stapler motor turned on to move the stapler away from home position.

Possible Causes

- Stapler motor defective
- Stapler HP sensor defective
- Poor stapler motor connection

SC735: Finisher Paper Stack Plate Motor Error

Definition [B]

The stack plate HP sensor does not turn on within a certain time after the stack plate motor turned on.

Possible Causes

- Stack plate motor defective
- Stack plate HP sensor defective
- Poor stack plate motor connection



Definition [B]

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The exit guide open sensor does not change within 750 mm after the exit guide motor is energized.

- Exit guide motor defective
- Exit guide open sensor defective
- Poor exit guide motor connection



SC737: Full Finisher Staple Hopper

Definition [B]

The staple waste hopper is full.

Possible Causes

- Full staple waste hopper
- Staple waste hopper sensor defective

SC738: Finisher Shift Tray Lift Motor Error

Definition [B]

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

Possible Causes

- Shift tray lift motor defective
- Too much load

SC900: Electrical Total Counter Error

Definition [A]

The total counter contains something that is not a number.

Possible Causes

NVRAM defective

SC901: Mechanical Total Counter Error

Definition [B]

The mechanical total counter is disconnected.

Possible Causes

Mechanical total counter defective

SC951: F-gate Signal Error

Definition [B']

When the IPU has already received the F-gate signal (laser writing start trigger signal), the IPU receives another F-gate signal.

Possible Causes

SICU defective

SC953: Scanner Image Setting Error

Definition [B']

The settings that are required for image processing using the scanner are not sent from the IPU.

Possible Causes

• Software defective

SC954: Printer Image Setting Error

Definition [B']

The settings that are required for image processing using the printer controller are not sent from the IPU.

Possible Causes

• Software defective



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SC955: Memory Setting Error

Definition [B']

The settings that are required for image processing using the memory are not sent from the IPU.

Possible Causes

• Software defective

SC964: Printer Ready Error

Definition [B']

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

Possible Causes

• Software defective

SC970: Scanner Ready Error

Definition [B']

The scan ready signal is not generated by the MCU for more than 10 seconds after the read start signal is sent to the MCU.

- Poor connection between SICU and MCU
- MCU software error

SC980: HDD Access Error

Definition [B]

Incorrect parameter sent to the HDD controller.

Possible Causes

- Software defective
- SICU defective

SC982: HDD Construction Error

Definition [B']

A HDD that does not have the correct specifications has been installed.

Possible Causes

- HDD defective
- Incorrect HDD type

SC984: HDD 1 Data Transfer Error 1

Definition [B']

The data transfer from the DRAM to HDD 1 is not completed within 15 seconds.

Possible Causes

- HDD 1 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 1

SC985: HDD 2 Data Transfer Error 2

Definition [B']

The data transfer from the DRAM to HDD 2 is not completed within 15 seconds.

- HDD 2 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 2

SC986: HDD 1 Data Transfer Error 2

Definition [B']

The data transfer from HDD 1 to the DRAM is not completed within 15 seconds.

Possible Causes

- HDD 1 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 1

SC987: HDD 2 Data Transfer Error 2

Definition [B']

The data transfer from HDD 2 to the DRAM is not completed within 15 seconds.

Possible Causes

- HDD 2 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 2

SC990: Software Performance Error

Definition [B']

E

The software performs an unexpected function.

Possible Causes

• Software defective

7.2 ELECTRICAL COMPONENT DEFECTS

7.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home	CN555-2	Stays On	SC121 is displayed.
Position (S1)	(MCU)	Stays Off	SC120 is displayed.
Original Width (S2)	CN555-6.7.8	Stays On	The CPU cannot detect the original size properly. APS and ARE (Auto Reduce/Enlarge) do not function correctly.
	(1000)	Stays Off	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
Original Length 1 (S3)	CN555-11	Stays On	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
	(MCU)	Stays Off	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
Original Length 2 (S4)	CN555-14	Stays On	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
	(MCU)	Stays Off	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
Drum Potential	CN609-10	Open	The machine quits auto process
Sensor (S5)	(BCU)	Shorted	control and goes to auto process control off mode.
Toner Density (S6)	CN610-B6	Stays On	SC340 is displayed.
	(BCU)	Stays Off	SC340 is displayed.
Image Density	CN609-5	Open	SC350 is displayed after copying.
(S7)	(BUC)	Shorted	SC350 is displayed after copying.
Toner Supply Motor (S9)	CN613-B8 (BCU)	Stays On Stays Off	SC591 is displayed.
Upper Toner Bottle (S10)	CN623-A2	Stays On	A toner bottle is detected in the upper position even if there is no toner bottle there.
		Stays Off	The toner bottle in the upper position is not detected.
Lower Toner Bottle (S11)	CN623-B2	Stays On	A toner bottle is detected in the lower position even if there is no toner bottle there.
		Stays Off	The toner bottle in the lower position is not detected.
Upper Bottle Inner		Stays On	Normally, the machine works properly
Cap (S12)	CN623-A5 (BCU)	Stays Off	because the current status of the toner bottle cap is stored in the memory.

Component (Symbol)	CN	Condition	Symptom
Lower Bottle Inner		Stays On	Normally, the machine works properly
Cap (S13)	CN623-B5 (BCU)	Stays Off	because the current status of the toner bottle cap is stored in the memory.
Toner Near End (S16)	CN610-B9	Open	"Toner End" is displayed even if there is enough toner in the toner entrance tank.
	(BCU)	Shorted	"Toner End" is not displayed even if there is no toner in the toner entrance tank.
Toner Collection Bottle (S14)	CN624-11	Stays On	The machine cannot detect a no toner collection bottle condition.
	(000)	Stays Off	SC496 is displayed.
Toner Overflow (S15)	CN624-8	Stays On	"Waste Toner Bottle Full" is detected and printing is disabled.
	(BCU)	Stays Off	"Waste Toner Bottle Full" is detected and printing is disabled.
Toner Hopper (S8)		Stays On	SC495 is displayed.
	CN624-14 (BCU)	Stays Off	Toner is not supplied to the toner hopper, and toner end is detected even if there is enough toner in the toner bottle.
1st Paper Feed (S17)	CN514-2	Stays On	"Paper Jam" is displayed even if there is no paper.
	(IOB)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
2nd Paper Feed (S18)	CN511-A2	Stays On	"Paper Jam" is displayed even if there is no paper.
	(IOB)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
3rd Paper Feed (S19)	CN511-B2	Stays On	"Paper Jam" is displayed even if there is no paper.
	(IOB)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
1st Tray Lift (S20)	CN514-8	Stays On	SC501 is displayed.
	(IOB)	Stays Off	SC501 is displayed.
2nd Tray Lift (S21)	CN511-A8	Stays On	SC502 is displayed.
	(IOB)	I1Stays OnStays Off8Stays Off8Stays Off14Stays Off14Stays Off2Stays Off2Stays Off32Stays Off32Stays Off8Stays Off8Stays Off8Stays Off8Stays Off8Stays Off8Stays Off38Stays Off5Stays Off5Stays Off	SC502 is displayed.
3rd Tray Lift (S22)	CN511-B8	Stays On	SC503 is displayed.
	(IOB)	Stays Off	SC503 is displayed.
1st Paper End (S23)	CN514-5	Stays On	"Paper End" is displayed even if there is paper in the 1st paper tray.
	(IOB)	Stays Off	"Paper End" is not displayed even if there is no paper in the 1st paper tray.
2nd Paper End (S24)	CN511-A5	Stays On	"Paper End" is displayed even if there is paper in the 2nd tray.
	(IOB)	Stays Off	"Paper End" is not displayed even if there is no paper in the 2nd tray.

Troubleshooting

Component (Symbol)	CN	Condition	Symptom
3rd Paper End (S25)	CN511-B5	Stays On	"Paper End" is displayed even if there is paper in the 3rd tray.
	(IOB)	Stays Off	"Paper End" is not displayed even if there is no paper in the 3rd tray.
Rear Fence HP	CN515-5	Stays On	SC515 is displayed
(S26)	(IOB)	Stays Off	SC515 is displayed
Rear Fence Return	CN515-9	Stays On	SC515 is displayed
(S27)	(IOB)	Stays Off	SC515 is displayed
Front Side Fence	CN516-A3	Stays On	Wrench mark appears in the 1st tray
Open (S28)	(IOB)	Stays Off	indicator.
Front Side Fence	CN516-A6	Stays On	Wrench mark appears in the 1st tray
Closed (S29)	(IOB)	Stays Off	indicator.
Rear Side Fence Open (S30)	CN516-A9 (IOB)	Stays On Stays Off	Wrench mark appears in the 1st tray indicator.
Rear Side Fence	CN516-A12	Stays On	Wrench mark appears in the 1st tray
Closed (S31)	(IOB)	Stays Off	indicator.
Base Plate Down (S32)		Stays On	The bottom plate lift lever locks at the lowest position.
	CN516-B13 (IOB)	Stays Off	The bottom plate is not lowered when paper on the left tray needs to be moved to the right tray and paper is set in the incorrect position.
1st Tray Paper Height 1 (S33)	CN516-B10	Stays On	"Paper Near End" is not displayed even if the tray is almost empty.
	(IOB)	Stays Off	"Paper Near End" is displayed even if there is enough paper in the paper tray.
1st Tray Paper Height 2 (S34)		Stays On	"Paper Near End" is not displayed even if the tray is almost empty.
	(IOB)	Stays Off	"Paper Near End" is displayed even if there is enough paper in the paper tray.
1st Tray Paper Height 3 (S35)		Stays On	"Paper Near End" is not displayed even if the tray is almost empty.
	(IOB)	Stays Off	"Paper Near End" is displayed even if there is enough paper in the paper tray.
1st Tray Paper Height 4 (S36)		Stays On	"Paper Near End" is not displayed even if the tray is almost empty.
	(IOB)	Stays Off	"Paper Near End" is displayed even if there is enough paper in the paper tray.
Left 1st Tray Paper (S37)	CN516-B10	Stays On	The rear fence moves back and forth continuously.
	(IOB)	Stays OnStays OffStays Off	The paper in the left tray is not moved to the right tray.

Component (Symbol)	CN	Condition	Symptom
Right 1st Tray Paper (S38)		Stays On	"Paper Jam" is displayed after the last sheet is fed from the right 1st tray.
	CN515-12 (IOB)	Stays Off	Paper end is detected in the 1st tray even if there is paper in the tray. If there is paper in the left tray, the rear plate locks and SC515 is displayed.
Inverter Tray Paper (S39)	CN611-A3	Stays On	"Paper Jam" is displayed even if there is no paper.
	(BCU)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
Duplex Entrance (S40)	CN611-A11	Stays On	"Paper Jam" is displayed even if there is no paper.
	(BCU)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
Duplex Transport 1 (S41)	CN611-A5	Stays On	"Paper Jam" is displayed whenever a copy is made.
	(BCU)	Stays Off	"Paper Jam" is displayed even if there is no paper.
Duplex Transport 2 (S42)	CN611-A7	Stays On	"Paper Jam" is displayed whenever a copy is made.
	(BCU)	Stays Off	"Paper Jam" is displayed even if there is no paper.
Duplex Transport 3 (S43)	CN611-A9	Stays On	"Paper Jam" is displayed whenever a copy is made.
	(BCU)	Condition Stays On Stays Off Stays Off	"Paper Jam" is displayed even if there is no paper.
Duplex Jogger HP	CN611-A10	Stays On	SC521 is displayed.
(S44)	(BCU)	Stays Off	SC520 is displayed.
LCT Relay (S45)	CN602-A7	Stays On	"Paper Jam" is displayed even if there is no paper.
	(BCU)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
Relay (S46)	CN602-A4	Stays On	"Paper Jam" is displayed even if there is no paper.
	(BCU)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
Registration (S47)	CN602-A9	Stays On	"Paper Jam" is displayed even if there is no paper.
	(BCU)	Stays Off	"Paper Jam" is displayed whenever a copy is made.
Guide Plate Position (S48)		Stays On	A paper jam will occur when the guide plate is opened.
	(BCU)	Stays Off	"Guide Plate Close" is displayed after the front door is closed even if the guide plate is closed.

Troubleshooting

Component (Symbol)	CN	Condition	Symptom
Oil Supply/		Stays On	Cleaning web end is not detected.
Cleaning Web End (S49)	(BCU)	Stays Off	SC550 is displayed.
Fusing Exit (S50)	CN602-A11	Stays On	"Paper Jam" is displayed whenever a copy is made.
	(BCU)	Stays Off	"Paper Jam" is displayed even if there is no paper.
Exit (S51)	CN602-A14	Stays On	"Paper Jam" is displayed whenever a copy is made.
	(BCU)	Stays Off	"Paper Jam" is displayed even if there is no paper.

NOTE: For a photointerrupter, "Stays on" means that the actuator is in the sensor.

7.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Main Power (SW1)	CN703-1, 3	Open	The machine does not turn on.
	(PSU)	Shorted	The machine does not turn off.
Right Front Door Safety 1 (SW2)	CN625-1	Open	The door open indicator does not turn off.
	(BCU)	Shorted	The door open condition is not detected.
Right Front Door	CN404-3	Open	SC322 is displayed.
Safety 2 (SW3)	(LDB)	Shorted	
Right Front Door	CN404-3	Open	SC322 is displayed.
Safety 3 (SW4)	(LDB)	Shorted	
Right Front Door	CN715-2	Open	SC531 is displayed.
Safety 4 (SW5)	(PSU)	Shorted	
Left Front Door Safety 1 (SW6)	CN625-3	Open	The door open indicator does not turn off.
	(BUC)	Shorted	The door open condition is not detected.
Left Front Door	CN404-3	Open	SC322 is displayed.
Safety 2 (SW7)	(LDB)	Shorted	
Left Front Door	CN404-3	Open	SC322 is displayed.
Safety 3 (SW8)	(LDB)	Shorted	
Left Front Door	CN715-2	Open	SC531 is displayed.
Safety 4 (SW9)	(PSU)	Shorted	
2nd Tray Paper	CN510-A8,	Open	The CPU cannot detect the proper
Size (SW10)	A9, A10, A11, A12	Shorted	paper size, and misfeeds may occur when a copy is made.
3rd Tray Paper	CN510-A2,	Open	The CPU cannot detect the proper
Size (SW11)	A3, A4, A5, A6	Shorted	paper size, and misfeeds may occur when a copy is made.

7.3 BLOWN FUSE CONDITIONS

Fuses are not used for the output lines from the PSU. An electronic current cut-off method is used instead.

The PSU consists of three converters; 1st converter, 2nd converter, and Energy saver converter. Each converter has an LED which indicates the status of the converter.

LED No.	LED 1	LED 2	LED 3	
Converter	Energy saver	1st Converter	2nd Converter	
Output	Vcc1	Vcc2, Vmm	Vaa, Vca, Vcb	
In Stand-by Condition	On	On	On	
In Energy Saver Mode	On	Off	Off	
LED status when a converter is defective				
Energy saver	Off	Off	Off	
1st	On	Off	Off	
2nd	On	On	Off	

When the 1st converter is defective, the output of the 2nd converter is also stopped. When the energy saver converter is defective, all the outputs are stopped.

There is a circuit breaker CB1 on the PSU which cuts all the power from the PSU when excess current flows.

Additionally, there is a fuse only for the AC input line of the energy saver converter.

Fuse	Fuse Symptom when turning on the main power switch		
Power Supply Board			
FU404	No response		

COPIER (A294) ELECTRICAL COMPONENT LAYOUT (1/2)





A294S104.WMF

A294S153.WMF





45

44 -

43-









A294S110.WMF

COPIER (A294) ELECTRICAL COMPONENT LAYOUT (2/2)

Symbol	Index No.	Description	P to P
Motors			
M1	1	Scanner	1-J21
M2	16	Polygonal Mirror	2-K22
M3	150	Drum	1-J11
M4	151	Development	1-J11
M5	38	Toner Supply	1-110
M6	39	Toner Bank	1-113
M7	35	Lipper Toner Bottle	1-115
 	33	Upper Bottle Cap	1-115
MQ	45	Lower Toner Bottle	1.11/
M10	40	Lower Bottle Cap	1-114 1-D16
M11	22	Charge Corona Wire Cleaner	1 112
M10	140		1 N7
M12	149	Pushig/Duplex	1 1 22
M14	103		1-L22
IVI 14	104	Aelay	1-INZ
	104	ISLITAY LIL	
M16	106		1-IVI2
	107	STU I RAY LITE	1-M2
IVI18	154		1-IN8
M19	65	Oil Supply/Cleaning Web	1-013
M20	118	Hear Hence Drive	1-G2
M21	58	Jogger	1-017
M22	12	Optics Cooling Fan	2-N12
M23	18	Polygonal Mirror Motor Cooling Fan	1-N9
M24	20	LDB Cooling Fan	2-016
M25	11	SICU Cooling Fan	2-N12
M26	129	Drum Cooling Fan	1-N10
M27	135	Development Unit Cooling Fan 1	1-I10
M28	130	Development Unit Cooling Fan 2	1-I10
M29	126	Paper Cooling Pipe Fan	1-N11
M30	144	Duplex Cooling Fan	1-N11
M31	127	Exhaust Fan	1-N9
M32	124	Steam Removal Fan	1-N10
M33	133	PSU Cooling Fan 1	1-E13
M34	134	PSU Cooling Fan 2	1-E13
Sensors			
S1	21	Scanner HP	2-H21
S2	4	Original Width	2-H21
S3	5	Original Length 1	2-121
S4	6	Original Length 2	2-121
S5	25	Drum Potential	1-015
S6	27	Toner Density (TD)	1-N9
	26	Image Density (ID)	1-015
<u> </u>	28	Toner Hopper	1-N8
<u> </u>	37	Toner Supply Motor	1-110
<u>S10</u>	21	Lipper Toner Bottle	1_115
<u>S10</u>	11	Lower Toner Bottle	1_11/
Q12	21	Loner Bottle Inner Can	1_115
Q12	26	Lower Bottle Inner Cap	1 11 1
010 01/	30	Topor Collection Pottlo	1-114
014 015	42		1-113
010	43		1-113
010	40	1 oner Near End	1-112
51/	95	I ISL MAPER FEED	1-A2
<u>S18</u>	92	2nd Paper Feed	1-B2
S19	90	3rd Paper Feed	1-D2
S20	75	1st Iray Litt	1-B2
S21	94	2nd Tray Lift	1-C2
S22	88	3rd Tray Lift	1-D2
S23	74	1st Paper End	1-B2

Symbol	Index No.	Description	P to P
S24	93	2nd Paper End	1-C2
S25	89	3rd Paper End	1-D2
S26	97	Rear Fence HP	1-G2
S27	98	Rear Fence Return	1-G2
S28	117	Front Side Fence Open	1-H2
<u> </u>	96	Front Side Fence Closed	1-H2
<u> </u>	100	Poar Sido Eonoo Opon	1 12
<u> </u>	100	Real Side Fence Open	1 12
531	99	Rear Side Fence Closed	1-12
S32	113	Base Plate Down	1-K2
S33	111	1st Tray Paper Height 1	1-K2
S34	115	1st Tray Paper Height 2	1-J2
S35	112	1st Tray Paper Height 3	1-J2
S36	114	1st Tray Paper Height 4	1-J2
S37	119	Left 1st Tray Paper	1-G2
S38	110	Right 1st Tray Paper	1-12
S39	59	Duplex Inverter	1-020
<u>S40</u>	63	Duplex Entrance	1-019
<u>S/1</u>	62	Duplex Transport 1	1_020
C/D	56	Duplox Transport 9	1 020
042	50	Duplex Transport 2	1-020
543	55	Duplex Transport 3	1-019
544	5/		1-019
S45	69	LCT Relay	1-K22
S46	68	Relay	1-K22
S47	67	Registration	1-K22
S48	70	Guide Plate Position	1-L22
S49	64	Oil Supply/Cleaning Web End	1-013
S50	49	Fusing Exit	1-012
S51	46	Fxit	1-012
Switches	1		
SW1	148	Main Power	1-C12
SW2	122	Bight Front Door Safety 1	1-F13
SW3	143	Bight Front Door Safety 2	1-D9
SW/4	102	Pight Front Door Safety 2	2 016
SW4	140	Right Front Door Safety 5	2-010
3000	142		2-F10
SW6	120	Left Front Door Safety 1	1-G13
SW/	146	Left Front Door Safety 2	1-D8
SW8	121	Left Front Door Safety 3	2-P15
SW9	145	Left Front Door Safety 4	2-015
SW10	108	2nd Tray Paper Size	1-L2
SW11	109	3rd Tray Paper Size	1-K2
Solenoids			
SOL1	30	Transfer Belt Lift	1-016
SOL2	76	1st Pick-up	1-B2
SOL3	83	2nd Pick-up	1-C2
SOL4	86	3rd Pick-up	1-D2
SOL5	79	1st Separation Roller	1-F2
SOLE	91	2nd Separation Boller	1_F2
<u>SOL7</u>	87	3rd Separation Roller	1_E0
	110	Eront Sido Espan	1-62
SULØ	011		1-12
SOL9	101		1-12
SOL10	105	Tandem Tray Connect	1-N2
SOL11	102	Left 1st Tray Lock	1-N2
SOL12	61	Duplex Inverter Gate	1-018
SOL13	60	Reverse Roller	1-018
SOL14	51	Inverter Guide Plate	1-018
SOL15	72	Guide Plate	1-K22
SOI 16	48	Inverter Gate	1-012
00210			1012
	1		

Symbol	Index No.	Description	P to P
Magnetic C	lutches		
MC1	41	Toner Supply Coil	1-113
MC2	152	Toner Supply Roller	1-111
MC3	77	1st Paper Feed	1-E2
MC4	81	2nd Paper Feed	1-E2
MC5	85	3rd Paper Feed	1-F2
MC6	52	Inverter Exit Boller	1-018
MC7	53	Duplex Transport	1-018
MC8	54	Duplex Feed	1-018
MC9	78	1st Vertical Transport	1-F2
MC10	82	2nd Vertical Transport	1-F2
MC11	84	3rd Vertical Transport	1-F2
MC12	71		1_1 22
MC13	73		1-122
MC14	80	Lower Belay	1 NO
101014	00	Lower helay	I-INZ
DCPa			
	105	PCU	1 1 1 0
POD0	125		1-L13
POB2	9		2-F10
PCB3	131	100	1-D14
PCB4	132	IOR	1-B5
PCB5	8	SBU	2-E20
PCB6	22	MCU	2-G20
PCB7	3	Lamp Regulator	2-G21
PCB8	15	Polygonal Mirror Motor Control	2-K20
PCB9	19	LDB	2-N17
PCB10	136	AC Drive	1-B10
PCB11	7	Operation Panel	2-N9
PCB12	14	Operation Key	2-011
Lamps			
L1	2	Exposure Lamp	2-G22
L2	66	Fusing Lamp 1	1-B8
L3	66	Fusing Lamp 2	1-B8
L4	66	Fusing Lamp 3	1-B8
L5	24	Quenching	1-P16
-			
Power Pac	ks	1	
PP1	128	Charge/bias/grid	1-N14
PP2	30	Transfer	1-016
Others		1	
CR1	140	Circuit Breaker	1-Δ7
<u></u> Н1		Ontice Anti-Condensation (option)	1_1/
<u>н</u> о	1/1	Drum (option)	1_110
п <u>с</u> Цр	190	Tray Hostor 1 (option)	1 1 1 1 1
<u>п</u> з	109	Tray Heater 2 (aption)	1-A12
	138		1-A12
	13		2-+3
	10		2-J3
	137		1-A8
SD1	17	Laser Synchronization Detector	2-015
TC1	147	Total Counter	1-N11
	47	Fusing Thermofuse	1-B8
TF1	1		

ELECTRICAL COMPONENT LAYOUT (ADF: B301)



B301S108.WMF

Symbol	Index No.	Description	P to P		
Motors					
M1	3	Pick-up	F1		
M2	8	Feed-in	D1		
M3	9	Transport	E1		
M4	14	Feed-out	F1		
M5	7	Bottom plate	G1		
Sensors					
S1	12	APS Start	16		
S2	13	DF Position	H6		
S3	19	Original Set	A6		
S4	20	Bottom Plate HP	B6		
S5	4	Bottom Plate Position	D6		
S6	2	Pick-up Roller HP	D6		
S7	26	Entrance	C7		
S8	21	Registration	C6		
S9	22	Original Width 1	E6		
S10	23	Original Width 2	F6		
S11	24	Original Width 3	F6		
S12	25	Original Length	B6		
S13	18	Exit	G6		
S14	17	Inverter	G6		
S15	5	Feed Cover	E6		
S16	15	Exit Cover	H6		
Solenoids	Solenoids				
SOL1	16	Exit Gate	H1		
SOL2	11	Inverter Gate	1		

Symbol	Index No.	Description	P to P				
Magnetic	Magnetic Clutches						
MC1	1	Feed-in	H1				
PCBs							
PCB1	10	DF Main	J4				
PCB2	6	DF Indicator	11				
PCB1	10	DF Main	J4				
PCB2	6	DF Indicator	11				

ELECTRICAL COMPONENT LAYOUT (FINISHER: B302)





B302S502.WMF

B302S501.WMF

Symbol	Index No.	Description	P to P	Symbol	Index No.	Description	P to P
Motors	1	-		S15	43	Shift Tray Exit	C2
M1	7	Upper Transport	A6	S16	45	Stack Height 1	D2
M2	14	Lower Transport	C6	S17	44	Stack Height 2	D2
M3	37	Jogger	F6	S18	1	Upper Tray Exit	C2
M4	23	Stack Plate	G6	S19	48	Upper Tray Paper Limit	C2
M5	22	Stapler	G6	S20	41	Shift Tray Half-turn	D2
M6	33	Stapler Rotation	16	S21	19	Shift Tray Lower Limit 1	E2
M7	28	Staple Hammer	16	S22	20	Shift Tray Lower Limit 2	E2
M8	38	Stack Feed-out	F6	S23	13	Punch Waste Hopper	J2
M9	47	Exit Guide	C6	S24	8	Punch HP	12
M10	3	Shift Tray Exit	B6	S25	25	Stapler Return	12
M11	40	Shift	D6				
M12	2	Shift Tray Lift	C6	Switches			
M13	9	Punch	J2	SW1	17	Front Door Safety	B2
				SW2	42	Shift Tray Upper Limit	C6
Sensors							
S1	10	Entrance	B2	Solenoids	3		
S2	39	Pre-stack	E2	SOL1	4	Stapler Junction Gate	D6
S3	21	Stapler Tray Entrance	F2	SOL2	5	Tray Junction Gate	D6
S4	36	Jogger Fence HP	F2	SOL3	11	Pre-stack Junction Gate	E6
S5	35	Stapler Tray Paper	F2	SOL 4	16	Pre-stack Paper	Ee
S6	24	Stack Plate HP	G2	30L4	10	Stopper	LO
S7	32	Stapler HP	G2	SOL5	15	Positioning Roller	E6
S8	31	Stapler Rotation HP	G2	SOL6	26	Stapler Return	16
S9	30	Staple Hammer HP	J2				
S10	29	Cartridge Set	J2	PCBs			
S11	27	Staple End	J2	PCB1	12	Main	K4
S12	18	Staple Waste Hopper	12	PCB2	6	Punch	J3
S13	34	Stack Feed-out Belt HP	F2				
S14	46	Exit Guide Open	C2				

ELECTRICAL COMPONENT LAYOUT (LCT: B303)



Symbol	Index No.	Description	P to P
Motors			
M1	18	LCT	E2
M2	9	1st Lift	F2
M3	16	2nd Lift	F2
M4	22	3rd Lift	E2
Sensors			
S1	40	1st Paper Feed	E6
S2	35	2nd Paper Feed	F6
S3	28	3rd Paper Feed	G6
S4	42	1st Lift	F6
S5	38	2nd Lift	G6
S6	30	3rd Lift	H6
S7	41	1st End	F6
S8	34	2nd End	G6
S9	27	3rd End	H6
S10	3	1st Paper Height 1	A6
S11	4	1st Paper Height 2	B6
S12	5	1st Paper Height 3	B6
S13	6	1st Paper Height 4	B6
S14	11	2nd Paper Height 1	C6
S15	12	2nd Paper Height 2	C6
S16	13	2nd Paper Height 3	C6
S17	33	2nd Paper Height 4	D6
S18	17	3rd Paper Height 1	D6
S19	19	3rd Paper Height 2	D6
S20	24	3rd Paper Height 3	E6
S21	23	3rd Paper Height 4	E6

Symbol	Index No.	Description	P to P
S22	37	Relay	E6
Switches			
SW1	29	Front Door Safety	J6
SW2	7	1st Paper Size	H6
SW3	14	2nd Paper Size	16
SW4	21	3rd Paper Size	16
Magnetic	Clutches		
MC1	2	1st Paper Feed	G2
MC2	10	2nd Paper Feed	H2
MC3	25	3rd Paper Feed	H2
MC4	1	1st Grip	G2
MC5	8	2nd Grip	H2
MC6	32	3rd Grip	12
MC7	15	Transport	F2
Solenoids	;		
SOL1	43	1st Pick-up	12
SOL2	39	2nd Pick-up	12
SOL3	31	3rd Pick-up	J2
SOL4	44	1st Separation	G2
SOL5	39	2nd Separation	G2
SOL6	31	3rd Separation	H2
PCBs			
PCB1	20	Main	J4







	4	2		4	F				,
	1	2	3	4	5		6	(
	POINT TO P	UNI DIAGI	KAM (FINISNE	er: B302)					
			ι.						
А		CN 500-8	CN100-1						A
		-7	-2 [24] +24V	+24V SW	[24] CN 145-1	CN405-12	7		
		↓ <u>↓</u> <u>-</u> 6	<u>-3</u> [24] +24V	+24V SW	[24] 6 -2	<u>-11</u>			
			-4 [0] GND	GNE) [0] d -3	<u>10</u>			
		$-\frac{4}{-3}$		GNE	(0] - 4	<u>-9</u>	\perp		
	Copier		-7 C [0] GND	Speed [Retete [$\frac{6}{7}$ $($	M1 11	nor Transport	
		-1	<u>-8</u> [0] GND	Rotate [Clock [⁻⁵		Motor	
		<u> </u>	<u>CN105-1</u> [0] GND	Direction	1 [5] 0 9	-4 J	\checkmark	Wotor	
		$\phi = -\frac{7}{6}$	— — — — — — <u>-</u> 2 — ф тхр	ON [▼5] 0 -10	<u>3</u> ►¢			
		$\dot{\mathbf{q}}$	-4 0 [0] GND	GNE	$\gamma_{[0]} - \frac{-11}{12}$	<u></u>			
		<u>y</u>		+5\	/ [5] q	ę			
В	Front Door Safety	SW1	<u>CN110-1</u> [24] +24V						В
	Switch		<u>-2</u> ↓ [▲24] +24V	/ SW +24V SW	[24] CN 150-1	<u>CN410-7</u>			
		CN305-3	CN510-3 CN115-1	+24V SW	[24] 0	<u>-6</u> -4.			
	Entrance Sensor	S1 4	o <u>-2</u> -2 → o[▼5]	A [24 ➡0 (A [24 ➡0	$\frac{124}{5}$		Shift	Tray Exit Motor	
			o <u>-1</u> <u>-3</u> [5] +5V	R [24 ■ 0 B [24 ■ 0	124] O				
		CN310-3	CN 515-3 CN 115-4	/B [24 → 0	^{124]} J – – – – – – – – – – – – – – – – – – –				
	Upper Tray Exit			▲ [▲	CN 160-3 CN 56	⁰⁻³	SW2 Sh	ift Trav Upper	
	Sensor		-1 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6		/24] - 5	-1		Limit Switch	
		LY		L *		·	\frown		
	Upper Tray Paper	CN315-3	$O_{2}^{CN520-3} CN115-7}{9} \phi_{[5]+5V}$	L + [4	^{24]} 6 <u>CN150-9</u>		(M) Shift	Trav Lift Motor	
	Limit Sensor	$\int S19 q -\frac{-2}{-1}$	$\mathbf{O} \xrightarrow{-2} \mathbf{O} \mathbf{O} [\mathbf{\nabla} 5]$	- [▲	·24] ^				
С		Ŷ					$\widetilde{\frown}$		C
		CN 320-3	OCN 525-3 CN 120-1	+24V SW	[24] CN 150-12	<u>CN420-2</u> 0 1	(M9) =~	it Guide Motor	
	Shift I ray Exit	S15 4	o <u>2</u> 2 ≥↓↓ [▼5]	[▼	^{(24]}				
	Sensor	└── <u></u>	• <u>-1</u> -3 •[5] +5V	10AV 0W	[24] L CN 155-1	-7 ^	\sim		
		CN 325-3	- CN 530-9 CN 120-4 CN - CN	+24V SW	[24] -2	<u> </u>			
	Exit Guide Open	S14 -2	O <u>8</u> 5►O[V] GND	A [24 ⇒ 0	124] J – – – <u>–</u> – – – –			wer Transport	
	Sensor		o <u>-7</u> <u>-6</u> [5] +5∨	/A [24 ⇒ 0	^{/24]} $\phi \frac{-5}{6}$	<u>-</u> ³ ⊳ }	< ^{™2} /	Motor	
				B [24 ⇒ 0	$[24] \frac{-6}{-7}$		\bigcirc		
	Stack Height 2		$O_{-5}^{CN530-6} CN120-7} \Phi[0] GND$	/B [24 ⇒ 0	^[24] (_		
	Sensor	$1 S1/ Q - \frac{2}{-1}$			24] CN 160-1 CN 56	0-5 0 CN425-2	M	0.0	
		y		+24V SW	[24] -2	40-10-1	<u>11</u>	Shift Motor	
D	Stock Height 1	CN335-3	OCN 530-3 CN 120-10 0 [0] GND				\smile		D
		S16 $\phi - \frac{-2}{1}$	\circ -2 $-11 \rightarrow \circ$ [\blacktriangle 5]	+24V	[24] CN 165-1	CN430-2	SOL Tray	Junction Gate	
	Gensor	¢	φ -12 φ [5] +5V	[▼	² 24] 4	<u>-1</u>	<u>2</u>)	Solenoid	
		CN340-3	CN 535-3 CN 125-1				\smile		
	Shift Tray Half Turn	S20 -2	<u>-2</u> <u>-2</u> [0] GND	+24V	[24] CN 165-3	CN435-2	SOL St;	apler Junction	
	Sensor		o <u></u>	[▼	^{'24]} 4	<u>-1</u> 0	、1) G	ate Solenoid	
		CN345-3	CN125-4				$\mathbf{\nabla}$		
	Shift Tray Lower		-5 C (4 5)	+24V	[24] CN 170-1		SOL Pre-	-stack Junction	
	Limit 2 Sensor	322 0 -1	<u>-6</u> [5] +5V	[▼	[′] 24] d <u>-2</u>		、3) G	ate Solenoid	
		r					$\mathbf{\nabla}$		
_	Shift Tray Lower		<u>CN125-7</u> (0) GND	+24V	[24] CN 175-1		SOL Pr	e-stack Paper	_
Е	Limit 1 Sensor	$S21 q -\frac{-2}{-1}$		[▼	^{′24}] d <u>-2</u>		、4) Sto	pper Soleniod	E
		<u> </u>					$\mathbf{\nabla}$		
	Dre steek Trey Dener	CN355-3	OCN 540-1 CN 130-1 0 [0] GND	+24V SW	[24] CN 180-1		SOL Por	sitioning Roller	
	Pre-stack Tray Paper	$ $ S2 φ $\frac{-2}{1}$	o <u>-2</u> 2→o[▼5]	[▼	² 24] 4 -2		<u>5</u>	Solenoid	
	Selisoi	¢	o <u>-3</u> of[5] +5∨		CN 190-1	CN440-7	\bigcirc		
		CN 360-3	CN 545-3 CN 130-4 101 GND	+24V SW +24V SW	[24] 0 -2	-6			
	Stapler Tray	S3 d <u></u> 2	<u> </u>	A [24 ⇒ 0	/24] 6	<u>-</u> 4		agger Meter	
	Entrance Sensor		• <u>-1</u> <u>-6</u> [5] +5V	/A [24 → 0	124] d	ر ³	, ^{M3}) ³	ogger Motor	
			-CN550-6 CN135-1-	B [24 → 0	$[24] \frac{-5}{-7}$		\smile		
	Stack Feed-out Belt			/B [24 → 0	^{(24]} f				
F	HP Sensor		<u>-4</u> <u>-3</u> [0] GND	+24V SW	[24] CN 190-9	CN445-7			_
Г		F	I , ,	+24V SW	[24] 4 -10	<u> </u>	\sim		
	Stapler Trav Paper	CN 370-3	$O_{-2}^{UN550-3} CN135-4 - \phi$ [0] GND	A [24 → 0	/24] \(<u>-</u> 4 >>	(_{M8}) St	ack Feed-out	
	Sensor	$55 q - \frac{-2}{-1}$		/A [24 → 0	$\frac{124}{2} \frac{15}{-14}$			Motor	
		у		B [24 ■ 0 /B [24 ■ 0	24 $0 =$		U		
	lagger Fener HD	CN375-3	<u>CN135-7</u> [0] GND	, D (2 1 1 0					
		$S4 \varphi \frac{-2}{4}$		+24V SW	[24] CN 195-1	<u>CN450-7</u>			
	0611501	¢1	- y [5] +5V	+24V SW	[24] - 2 -2	<u> </u>	\sim		
		CN380-3		A [24 ➡0 /∆ [24 ➡0	124] O		(M4) ^{Sta}	ck Plate Motor	
	Stack Plate HP	S6 d -2	<u></u> [▲5]	B [24=0	124] d 6		\bigcirc		
	Sensor		<u>-12</u> [5] +5V	/B [24 → 0	124] -				
G			CN140-1		CN 195-9	CN455-7			ر ا
5			Q[0] GND	+24V SW	124] 0 -10	<u>-6</u>	_		3
	Stapler HP Sensor		<u>-3</u> [5] +5V	+24V SVV A [24 🖬 0	/24	4	-		
		цΥ	Υ	/A [24 ⇒ 0	/24] J <u>13</u>		, M5) S	tapler Motor	
		CN 390-3	<u> </u>	B [24 → 0	124] - <u>-</u> <u>-</u> <u>-</u> <u>-</u>	² ••••⁄	\smile		
	Stapler Rotation HP	S8 0 -2		/B [24 ⇒ 0	^{/24}] (
	Sensor		O[5] +5V	±241/ 0141	[24] CN200-1	CN460-7			—
		CN 395-3		+24V SW +24V SW	[24] 62	<u>6</u>	\sim		
	Stapler Return Sensor	S25 4 2	<u>-9</u> ↓[▲5]	A [24 = 0	124] d <u>4</u>			apler Rotation	
			- <u>10</u> [5] +5V	/A [24 → 0	/24] 0	<u>-</u> ;••	<u>、</u> "	Motor	
		CN400-3	<u>CN555-3 CN140-11</u>	B [24 ⇒ 0	124] O		\sim		
I	Stanle Waste Honnor	S12 -2		/B [24 ⇒ 0					
•	Sensor	- <u>-</u>		+24V SW	[24] CN200-9	CN465-2	(sol) S	tapler Return	'



	1	2	3		4	5	6	7
				- 0202)				
A	POINT TO P			: B303)				
		CN550-1	CN500-1	+5V	GND [0	CN507-1 CN598	- <u>3</u> - <u>2</u> 510	1st Paper Height 1
		-3	<u>-3</u> (24 -4 (0]] +24V GND	+5V [5	-3	<u>-1</u>	Sensor
		CN 551-8	<u></u> CN501-1	5] 2nd Paper End Sensor 5] 1st Paper End Sensor	GND [0 [▲5	$\begin{bmatrix} CN 507-4 \\ -5 \\ -6 \end{bmatrix}$	$\frac{-3}{-2} \phi$ S11	1st Paper Height 2 ⁻ Sensor
			<u>-3</u> 0[▼5 -4 0[▼5	5] 3rd Lift Sensor 5] 2nd Lift Sensor	+5V [5		Q]
В		-3 -2		5] 1st Lift Sensor 5] 3rd Paper Feed Senso 5] 2nd Paper Feed Senso	GND [0 r [▲5 or +5V [5		-2 S12	1st Paper Height 3 Sensor
		CN 557-8	8[▼5	5] 1st Paper Feed Sensor	r GND [0	CN 507-10 CN 568	- <u>3</u>] 1st Paper Height 4
			$-\frac{2}{3} \neq 0$	5] 3rd Grip Clutch 5] 2nd Grip Clutch 5] 2nd Grip Clutch	[▲5 +5V [5	○ -11 ○ -12	- <u>2</u>	Sensor
\vdash	Copier	$-\frac{-5}{4}$		5] 1st Grip Clutch 5] 3rd Paper Feed Clutch	GND [0 [▲5	CN 508-1 CN 599	- <u>3</u> - <u>2</u> -2 -2 -2 -2 -2 -2 -2 -3 -3 -3 -3 -3 	2nd Paper Height 1
		-2 -1	-7 → 0 [¥ -8 → 0 [¥ -8 → 0 [▲	5] 1st Paper Feed Clutch 5] 3rd Paper End Sensor	+5V [5		<u>-1</u> _{	Sensor
		C <u>N552</u> -13		5] Signal A 5] Signal B	GND [0 [▲5 +5V [5	$\begin{bmatrix} -5 \\ -6 \end{bmatrix}$	<u>-3</u> - <u>2</u> -1	2nd Paper Height 2 Sensor
		$\frac{11}{2}$		5] Signal C 5] Signal D 5] Signal D	GND 10	CN 508-7 CN 579	۲ -3	ן ר
				5] Select A 5] Select B 5] Select C	[▲5 +5V [5	-8 -9 -9	- <u>2</u> - <u>2</u> -1 -1	2nd Paper Height 3 Sensor
		$\begin{array}{c} -\frac{-5}{4} \\\frac{-4}{-3} \end{array}$	<u>-9</u> [0] 	GND	GND [0	CN508-10 CN569	-3 -2 -2 -2 -2 -2 -2 -2 -2	 2nd Paper Height 4 [_]
				K-L K-S DATA	ι▲α +5V [5		<u>-1</u> 0 SI7	Sensor
		CN 520-1			GND [0 [▲5	$\begin{bmatrix} CN509-1 & CN600 \\ -2 & -3 \end{bmatrix}$	-3 -2 -2 -2 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	3rd Paper Height 1 Sensor
D	Tray Heater	CN530-1			+5V [5	CN 509-4 CN 590	- <u>-</u> 2]
	(Option) Tray Heater	CN 540-1			(310) [▲5 +5V [5] 0	- <u>-</u> -1	3rd Paper Height 2 Sensor
	(Option)	-2			GND [0	CN509-7 CN580	$-\frac{3}{-2}$	_]
			-2 -2 -3 -3 -3 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2] +24V SW] +24V SW GND	+5V [5	-9	<u>-1</u>	Sensor
	LCT Motor	M1	-4 -5 -5 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6	GND +5V	GND [0 [▲5	$\begin{bmatrix} -11 \\ -12 \end{bmatrix}$	$\frac{-3}{-2} \phi$ S21	3rd Paper Height 4 Sensor
E			-7 0[♥! -7 0[♥! -8 ▶0[5:0	GND 5] ON CW / 0:CCW] Direction	+5V [0	CN510-1 CN560	- <u>3</u>]
		-10		+5V 5] Rotate	[▼5 +5V [5	i d	- <u>2</u> 6 S22 -1 6	Relay Sensor
	3rd Lift Motor		<u> </u>	24] + 24] -	GND [0 [▼5	CN515-1 CN565-	11 10 0 S1	1st Paper Feed
	2nd Lift Motor	M3 CN 565-2	<u>CN505-3</u>	24] +	+5 V [5		<u>-9</u> -6	Sensor
		CN 555-2	CN505-5	24] -	GND [0 [▲5 +5V [5]	- <u>-</u> - <u>7</u>	1st Paper End Sensor
F	1st Lift Motor	M2 -1	-6 •6 [▲2	24] + 24] -	GND [0	CN515-6 CN565	- <u>5</u>]
	Transport Clutch	MC 0 CN 556-2 7 0	<u>CN506-1</u> [24 [▼2] +24V 24]	[▲5 +5V [5] ¢ ◀ <u>-′</u>] ↓	- <u>4</u>	1st Lift Sensor
	1st Separation Roller	SOL	<u>CN514-1</u> [24] +24V	GND [0 [▼5	cn520-1 $cn575-$	$\begin{array}{c} 11 \\ 0 \\ 0 \\ 0 \end{array} \phi S2 \end{array}$	2nd Paper Feed
	Solenoid		O[▼2	24]	+5V [5	CN 520-4 CN 575	-* ^	
	1st Paper Feed Clutch] +24V 24]	(310) [▲5 +5V [5	0	-7 -7 -6 -6 -6 -6 -6 -6 -6 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	2nd Paper End Sensor
G	1st Grip Clutch	MC CN 564-2	<u>CN514-5</u> -6 [24] +24V 24]	GND [0	CN 520-6 CN 575	- <u>5</u> -4 0 55	- 2nd Lift Songer
	2nd Separation	SOL	CN518-1] +24V	[▲⊃ +5V [5		<u>-3</u>	
	Roller Solenoid		<u>-2</u> 0 [▼2	24]	GND [0 [▼5	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\frac{11}{10} \phi S3$	3rd Paper Feed Sensor -
	2nd Paper Feed Clutch	$\begin{pmatrix} MC \\ 2 \end{pmatrix} \xrightarrow{CN574-4} -3 \end{pmatrix}$	<u>CN518-3</u> 6[₹2] +24 V 24]	+3V [3 GND [0	CN521-4 CN585		
	2nd Grip Clutch	MC	<u>CN518-5</u> [24] +24V	[▲5 +5V [5] ♦ -5] ♦ -6	- <u>7</u> d S9 -6 d S9	Sig Paper Eng Sensor
Н	3rd Separation Balles	$\bigcirc \bigcirc $	CN519-1		GND [0 [▲5	CN521-6 CN585	- <u>5</u> -4	3rd Lift Sensor
1	ora ocparation Ruller	(30LY-0	γ ²⁴	J ·∠ , v		1 - 8	-3	1



APPENDIX 1

1. RSS (REMOTE SERVICE SYSTEM)

1.1 RSS SET UP





A294X201.WMF

A294X202.WMF



A294X538.WMF

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

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

NOTE: When connecting only one machine to the line adapter, start from step 6.

- 1. Turn the main switch off and unplug the machine.
- 2. Remove the ADF connector and remove the rear cover [A] (6 screws).
- 3. Set the jumper switch [B] on the BCU as shown (default setting is 1-2).
- 4. Reinstall the rear cover and ADF connector.
- Set the PI device code with SP5-821 (default 0).
 NOTE: After changing the value, turn the main power switch off and on to enable the PI device code.

APPENDIX-1

- Connect the modular cord [C] to the left modular connector, as shown.
 NOTE: Make sure that the harness end with the ferrite core [D] is connected to the terminal.
- 7. Install the line adapter (refer to chapter 2-1 L-ADP Installation Procedure in the CSS L-ADP Service Manual).

1.2 SP MODE SETTING

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

Check and set the value of the following SP modes. Ensure they are set correctly. **NOTE:** SP5-507 is only for the Japanese version. Do not change.

- SP5-504-1 (Jam Alarm Level): 3
- SP5-504-2 (Jam Auto Call): 1 (On)
- SP5-505 (Error Alam Level): 30
- SP5-513-1 (PM Call Interval Copy Paper): 300
- SP5-514-1 (PM Call On/Off Setting Copy Paper): 1 (Yes)
- SP5-590-2 (Cover Open Auto Call): 0 (Off) \rightarrow 1 (On)

1.3 CHECKING ITEMS USING RSS

1.3.1 READ ONLY ITEMS

Item	Item
Paper end	Total original jam counter
Toner end	Paper jam counter by location
Staple end	Original jam counter by location
Toner near-end	Jam counter by copy size
Door open	Jam history
Jammed paper position	Number of each SCs
Unit connection condition	Total copies by reproduction ratio
Machine condition	Total copies by copy mode
Paper size information	PM call interval
System configuration	Counter level by PM part *Note
Total counter	Total machine operation time
Original counter	Fusing temperature
Copy counter by paper tray	ID sensor data
Staple counter	Process control data
Total paper jam counter	ROM version

NOTE: The counter level for each PM part is indicated as a code. The code shows the current value of the parts counter compared with the alarm level for the part. The diagram below shows the relationship between the code and the counter level. A part which is not selected for the PM list ("No" is selected in the All PM Parts List) is shown as "Z".



A294X500.WMF

APPENDIX-3
1.3.2 AUTO CALL AND READ ITEMS

ltem		
Continuously jam auto call		
Cover open auto call		
Jam condition auto call		
Jam alarm		
SC alarm		
SC auto call:		
PM Alarm		
Fusing cleaning web near end call		

1.3.3 READ AND WRITE ITEMS

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

1.3.4 EXECUTE ITEMS

Item	Item
TD sensor initial setting	Original counter reset
ID sensor initial setting	Reset counter by each paper tray
User code (clear, register, change)	Reset counter by magnification
SC reset	Reset counter by image editing
PM counter reset	Reset counter by copy mode
SC/jam counters rest	Reset counter by multiple copies
Counters reset (except total counter)	Punch counter reset
Copy counter reset	Staple counter reset

1.4 JAM HISTORY

The jam history is read in this way.



1.4.1 JAM CONDITION TABLE

<u></u>	nior
\mathbf{u}	ρισι

Code	Condition
01	Jams at power on
03	1st paper tray: paper non-feed jam
04	2nd paper tray: paper non-feed jam
05	3rd paper tray: paper non-feed jam
06	4th paper tray (LCT): paper non-feed jam
07	5th paper tray (LCT): paper non-feed jam
08	6th paper tray (LCT): paper non-feed jam
09	Relay sensor (LCT): paper does not activate the sensor
10	LCT relay sensor: paper does not activate the sensor
12	Relay sensor paper does not activate the sensor
13	Registration sensor: paper does not activate the sensor
15	Fusing exit sensor: paper does not activate the sensor
16	Exit sensor: paper does not activate the sensor
19	Duplex entrance sensor: paper does not activate the sensor
20	Duplex transport sensor 1: paper does not activate the sensor
21	Duplex transport sensor 2: paper does not activate the sensor
22	Duplex transport sensor 3: paper does not activate the sensor
23	Inverter tray paper sensor: paper does not activate the sensor
25	Finisher entrance sensor: paper does not activate the sensor
26	Finisher upper tray exit sensor: paper does not activate the sensor
27	Finisher shift tray exit sensor: paper does not activate the sensor
28	Finisher staple tray paper sensor: paper does not activate the sensor
29	Finisher stack feed-out belt HP sensor: paper does not activate the sensor
35	Finisher stapler tray entrance sensor: paper does not activate the sensor
53	1st paper feed sensor does not turn off
54	2nd paper feed sensor does not turn off
55	3rd paper feed sensor does not turn off
56	LCT 1st paper feed sensor does not turn off

APPENDIX-5

Code	Condition
57	LCT 2nd paper feed sensor does not turn off
58	LCT 3rd paper feed sensor does not turn off
59	Relay sensor (LCT) does not turn off
60	LCT relay sensor does not turn off
62	Relay sensor does not turn off
63	Registration sensor does not turn off
65	Fusing exit sensor does not turn off
66	Exit sensor does not turn off
69	Duplex entrance sensor does not turn off
70	Duplex transport sensor 1 does not turn off
71	Duplex transport sensor 2 does not turn off
72	Duplex transport sensor 3 does not turn off
73	Inverter tray paper sensor does not turn off

Document Feeder

Code	Condition
01	Jams at power on
03	Jams in the feed-in area
04	Jams in the feed-out area

1.4.2 PAPER SIZE

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

1.5 OTHERS

1.5.1 SC630 [RDS COMMUNICATION ERROR]

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

1.5.2 PM PROCEDURE OR OTHER MAINTENANCE

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

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

1. RSS INSTALLATION PROCEDURE

1.1 COPIER SET UP





A294X201.WMF

A294X202.WMF



A294X538.WMF

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

Unplug the machine power cord before starting the following procedure.

NOTE: When connecting only one machine to the line adapter, start from step 6.

- 1. Turn the main switch off and unplug the machine.
- 2. Remove the ADF connector and remove the rear cover [A] (6 screws).
- 3. Set the jumper switch [B] on the BCU as shown (default setting is 1-2).
- 4. Reinstall the rear cover and ADF connector.
- Set the PI device code with SP5-821 (default 0).
 NOTE: After changing the value, turn the main power switch off and on to enable the PI device code.
- 6. Connect the modular cord [C] (included with the L-ADP) to the **left** modular connector, as shown.

NOTE: Make sure that the harness end with the ferrite core [D] is connected to the terminal.

1.2 L-ADP SET UP

1.2.1 L-ADP INITIAL PROGRAMMING

 Set FAX mode or Tel mode with DIP switch 2. If the fax machine is set to auto receive mode, the L-ADP must be set to fax mode (DIP switch 2: on). (Refer to 1.3 CONNECTION EXAMPLES.)



 Install the AC adapter [A] on the L-ADP and plug it in. Confirm that the POWER-LED [B] is blinking green and STATUS LED 1 and 2 [C] are off.



3. To set the back up battery, turn on DIP switch 8. Ensure that DIP switch 6 is off.

1.2.2 CONNECTING L-ADP WITH TELEPHONE OR FAX LINE



CSS131.WMF

- 1. Unplug the PSTN line connected with the fax or telephone. **NOTE:** Make sure that the telephone or fax is not in use.
- 2. Plug the PSTN line [A] into PSTN/PBX on the L-ADP.
- 3. Connect the L-ADP and the copier with the modular cord [C] installed in step 6 of "COPIER SET UP".
- 4. Connect the L-ADP and the fax or telephone with a modular cord [B]. Prepare the cord in advance.
- 5. Install the protection cover [D].

1.2.3 CONNECTION TEST



- 1. Turn on the copier main switch.
- 2. Inform the Concorde Center that the installation is completed.
- 3. Concorde Center will send L-ADP default setting parameters to the L-ADP. Once the L-ADP receives the parameters, the cycle of POWER_LED [A] blinking rate changes from 0.2 s to 1.0 s.

1.3 CONNECTION EXAMPLES

L-ADP has two modes to receive data from Concorde center:

Fax Mode: The L-ADP will not receive incoming calls. It will pass them through to the fax/telephone line. Once the line is answered by the fax or telephone, the L-ADP will monitor the signal. If the L-ADP determines that the signal is from the Concorde center, it will intercept the call and begin communications with the Concorde center.

TEL mode: The L-ADP will receive all incoming calls. At the time of reception, the L-ADP will determine if the signal is from the Concorde center. If so, the L-ADP will begin communications with the Concorde center. If the incoming calls is not from the Concorde center, the L-ADP will ring the fax/telephone line and pass the signal to that line.

The following is connection examples and L-ADP mode.

1. Connecting to a Fax



12.WMF

2. Connecting to a Telephone or a Fax in TEL mode



13.WMF

- **NOTE:** 1) When a call comes in, the telephone or fax rings once or twice. Then the L-ADP rings a *different tone* for 5-6 seconds while determining where the call comes from.
 - 2) A telephone charge is accrued during determination.
- 3. If auto line switching equipment is used, the L-ADP can be connected at positions 1 or 2.



4. Connecting to a fax in AUTO mode (auto Tel/Fax switching), the L-ADP can be connected at positions 1 or 2. Refer to the mode chart for setting Tel/FAX mode.



15.WMF

Mode chart

L-ADP position ✔	TEL mode DIP switch 2: OFF	FAX mode DIP switch 2: ON
1	Line switching is done twice, at the L-ADP and FAX. This requires more time until the line is connected to the fax. During this time, the fax may not be able to receive.	An incoming call from the Concorde center will go through to the telephone. Fax operations will be unaffected.
2	Line switching is done twice, at the L-ADP and FAX. This requires more time until the line is connected to the telephone. Fax operations will be unaffected.	N/A

5. If a PBX is connected, the L-ADP can be connected at positions 1 or 2. Refer to the mode chart for setting TEL/FAX mode.



Mode chart

L-ADP position ✔	TEL mode DIP switch 2 : OFF	FAX mode DIP switch 2 : ON	
1	N/A	The L-ADP must be connected to the fax line.	
2	The L-ADP in TEL mode can be installed at point 2.	The L-ADP can be installed at point 2, when the fax is set to auto mode (auto Tel/Fax switching) or fax mode.	
	NOTE: In case of PBX with the auto TEL/FAX switching feature, the L- ADP can not be installed at point 2.		