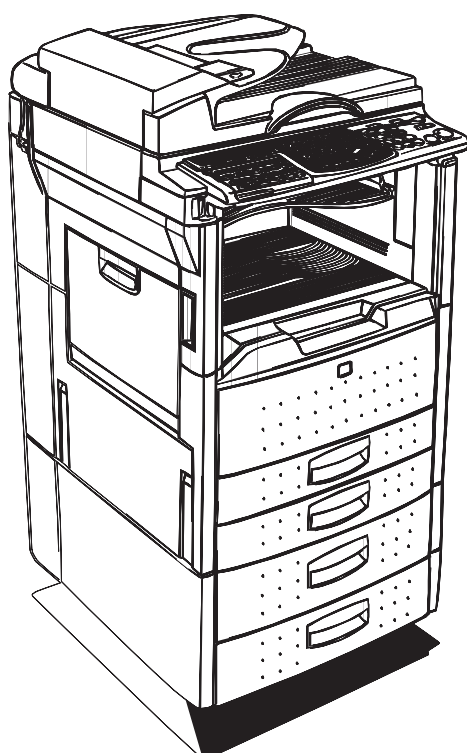


***Gestetner* RICOH SAVIN**



A193/A224
SERVICE MANUAL

RICOH GROUP COMPANIES

PN: RCPC0200



A193/A224
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A193/A224
SERVICE MANUAL

WARNING

The Service Manual contains information regarding service techniques, procedures, processes and spare parts of office equipment distributed by Ricoh Corporation. Users of this manual should be either service trained or certified by successfully completing a Ricoh Technical Training Program.

Untrained and uncertified users utilizing information contained in this service manual to repair or modify Ricoh equipment risk personal injury, damage to property or loss of warranty protection.

Ricoh Corporation

LEGEND

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Table of Contents

COPIER

A193 OVERALL MACHINE INFORMATION

1. SPECIFICATIONS	1-1
2. MACHINE CONFIGURATION	1-4
3. PAPER PATH.....	1-5
4. MECHANICAL COMPONENT LAYOUT	1-6
5. ELECTRICAL COMPONENT DESCRIPTIONS.....	1-8
6. DRIVE LAYOUT	1-11
7. COPY PROCESS.....	1-12
7.1 OVERVIEW	1-12
8. BOARD STRUCTURE	1-14
8.1 OVERVIEW	1-14
8.2 DESCRIPTION.....	1-15

A193 DETAILED DESCRIPTIONS

1. SCANNING.....	2-1
1.1 OVERVIEW	2-1
1.2 SCANNER DRIVE	2-2
1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE	2-3
2. IMAGE PROCESSING	2-5
2.1 OVERVIEW	2-5
2.2 SBU (SENSOR BOARD UNIT)	2-6
2.3 AUTO IMAGE DENSITY (ADS)	2-7
2.4 IPU (IMAGE PROCESSING UNIT)	2-8
2.4.1 Overview.....	2-8
2.4.2 Image Processing Path	2-9
2.4.3 Auto Shading	2-10
2.4.4 Filtering and Main Scan Magnification/Reduction.....	2-11
2.4.5 Gamma (γ) Correction	2-13
2.4.6 Gradation Processing	2-13
2.4.7 Line Width Correction	2-15
2.5 MSU (MEMORY SUPER-CHARGER UNIT)	2-16

2.6 FCI (FINE CHARACTER AND IMAGE)	2-17
3. LASER EXPOSURE	2-18
3.1 OVERVIEW	2-18
3.2 OPTICAL PATH	2-19
3.3 GRADATION CONTROL (LASER POWER MODULATION)	2-20
3.4 AUTO POWER CONTROL (APC)	2-21
3.5 LD SAFETY SWITCHES	2-22
4. PCU (PHOTOCONDUCTOR UNIT)	2-23
4.1 OVERVIEW	2-23
4.2 DRIVE MECHANISM	2-24
4.3 NEW PCU DETECTION MECHANISM	2-25
4.4 DRUM CHARGE	2-26
4.4.1 Overview.	2-26
4.4.2 Charge Roller Contact Mechanism.	2-27
4.4.3 Drum Charge Roller Cleaning.	2-28
4.4.4 Temperature Compensation.	2-29
4.5 DEVELOPMENT	2-30
4.5.1 Overview.	2-30
4.5.2 Drive Mechanism	2-31
4.5.3 Mixing	2-32
4.5.4 Development Bias.	2-33
4.5.5 Toner Density Control.	2-34
4.5.6 Toner Supply in Abnormal sensor Conditions	2-37
4.5.7 Toner Supply	2-38
4.6 DRUM CLEANING AND TONER RECYCLING	2-42
4.6.1 Drum Cleaning	2-42
4.6.2 Toner Recycling	2-43
5. PAPER FEED	2-44
5.1 OVERVIEW	2-44
5.2 PAPER TRAY	2-45
5.2.1 Paper Feed Drive Mechanism	2-45
5.2.2 Paper Lift Mechanism	2-46
5.2.3 Paper End Detection	2-47
5.2.4 Side Fence Double Stopper Mechanism	2-48
5.2.5 Paper Size Detection	2-49

5.3 BY-PASS FEED	2-50
5.3.1 Overview.	2-50
5.3.2 Paper Feed Mechanism and Paper End Detection	2-51
5.3.3 By-pass Feed Paper Width Detection	2-52
5.4 PAPER REGISTRATION	2-53
6. IMAGE TRANSFER AND PAPER SEPARATION.	2-54
6.1 OVERVIEW	2-54
6.2 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM	2-55
6.3 ROLLER CLEANING	2-56
6.4 PAPER SEPARATION AND TRANSPORTATION	2-57
7. IMAGE FUSING	2-58
7.1 OVERVIEW	2-58
7.2 FUSING DRIVE AND RELEASE MECHANISM	2-59
7.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM	2-60
7.4 PRESSURE ROLLER	2-61
7.5 CLEANING MECHANISM	2-61
7.6 FUSING TEMPERATURE CONTROL.....	2-62
7.7 OVERHEAT PROTECTION.....	2-62
8. ENERGY SAVER MODES.....	2-63
8.1 OVERVIEW	2-63
8.2 COPIER ONLY.....	2-64
8.3 COPIER/PRINTER.....	2-66
8.4 COPIER/FAX, COPIER/PRINTER/FAX.....	2-68
8.5 ENERGY SAVER CONTROL	2-71
8.6 ENERGY SAVER TIMING CHARTS	2-73
9. PAPER EXIT.....	2-75
INSTALLATION PROCEDURE (A193)	
1. INSTALLATION REQUIREMENTS	3-1
1.1 ENVIRONMENT.....	3-1
1.2 MACHINE LEVEL.....	3-1
1.3 MINIMUM SPACE REQUIREMENTS	3-2
1.4 POWER REQUIREMENTS	3-2
2. COPIER INSTALLATION.....	3-3
2.1 ACCESSORY CHECK.....	3-3

2.2 COPIER INSTALLATION PROCEDURE	3-4
2.3 AUTO DOCUMENT FEEDER INSTALLATION	3-8
2.4 PAPER TRAY UNIT INSTALLATION	3-10
2.5 DUPLEX UNIT INSTALLATION	3-13
2.6 1-BIN SORTER INSTALLATION	3-16
2.7 MEMORY BOARD	3-18
2.8 KEY COUNTER HOLDER INSTALLATION	3-19
2.9 ANTI-CONDENSATION HEATER INSTALLATION	3-21
2.10 TRAY HEATER	3-22
2.11 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)	3-23

A193 SERVICE TABLES

1. SERVICE REMARKS 4-1

1.1 GENERAL CAUTION	4-1
1.2 PCU	4-1
1.3 TRANSFER ROLLER UNIT	4-2
1.4 SCANNER UNIT	4-2
1.5 LASER UNIT	4-2
1.6 FUSING UNIT	4-2
1.7 PAPER FEED	4-3
1.8 OTHERS	4-3

2. SERVICE PROGRAM MODE 4-4

2.1 SERVICE PROGRAM MODE OPERATION	4-4
2.1.1 Service Program Access Procedure	4-4
2.1.2 Accessing Copy Mode from within an SP Mode	4-4
2.1.3 How to select the program number	4-5
2.1.4 To Input a Value or Setting for an SP Mode	4-5
2.2 SERVICE PROGRAM MODE TABLES	4-6
2.2.1 Main SP Mode Table	4-6
2.2.2 Test Pattern Printing (SP 5-902)	4-32
2.2.3 Input Check (SP5-803)	4-33
2.2.4 Output Check (SP5-804)	4-36
2.2.5 Copy Jam History Display (SP7-903)	4-38
2.2.6 Original Jam History Display (SP7-905)	4-39
2.2.7 System Parameter And Data Lists (SP5-992)	4-39

2.2.8 Memory All Clear (SP5-801)	4-40
2.2.9 Program Download	4-41
3. USER PROGRAM MODE	4-42
3.1 HOW TO ENTER AND EXIT UP MODE	4-42
4. SWITCHES/LEDS	4-44
4.1 SWITCHES	4-44
4.2 LEDS	4-44
4.3 TEST PIN	4-44
5. SPECIAL TOOLS AND LUBRICANTS	4-44
5.1 SPECIAL TOOLS	4-44
6. PREVENTIVE MAINTENANCE SCHEDULE	4-45
6.1 PM TABLE	4-45
7. SERVICE PROGRAM MODE TABLE	4-47
7.1 SERVICE PROGRAM TABLE INDEX	4-47
7.2 COPIER USER TOOLS/PRINTER TOOLS/FAX SERVICE MODES	4-53

A193 REPLACEMENT AND ADJUSTMENT

1. EXTERIOR	5-1
1.1 FRONT COVER/INNER COVER	5-1
1.2 REAR COVER	5-2
1.3 LEFT/RIGHT COVER	5-2
1.4 EXPOSURE GLASS/OPERATION PANEL/UPPER COVER	5-3
2. PHOTOCONDUCTOR UNIT (PCU)	5-4
2.1 PCU	5-4
2.2 DRUM CHARGE ROLLER UNIT	5-6
2.3 DRUM	5-7
2.4 CLEANING BLADE	5-8
3. TRANSFER UNIT	5-9
3.1 TRANSFER UNIT	5-9
3.2 TRANSFER ROLLER/SEPARATION UNIT	5-9
4. SCANNER UNIT	5-10
4.1 LENS COVER	5-10
4.2 SCANNER FRAME	5-11
4.3 ORIGINAL SIZE SENSOR	5-12

4.4 LENS BLOCK/SBU ASSEMBLY	5-12
4.5 XENON LAMP	5-13
4.6 SCANNER H. P. SENSOR/PLATEN COVER SENSOR	5-14
4.7 SCANNER MOTOR	5-15
4.8 SCANNER WIRE	5-16
5. LASER UNIT	5-18
5.1 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR	5-19
5.2 POLYGON MIRROR MOTOR	5-20
5.3 LD UNIT	5-21
5.4 LASER UNIT POSITIONING ADJUSTMENT	5-22
6. FUSING/EXIT	5-23
6.1 HOT ROLLER STRIPPERS	5-23
6.2 FUSING THERMISTOR/THERMOFUSE	5-23
6.3 HOT ROLLER/FUSING LAMP	5-24
6.4 PRESSURE ROLLER/CLEANING ROLLER	5-25
7. EXIT	5-26
7.1 EXIT UNIT	5-26
7.2 UPPER EXIT SENSOR/LOWER EXIT SENSOR	5-27
8. PAPER FEED/ REGISTRATION	5-28
8.1 BY-PASS FEED TRAY	5-28
8.2 BY-PASS FEED PAPER END SENSOR/REGISTRATION SENSOR	5-29
8.3 PAPER FEED ROLLER/FRICTION PAD	5-30
8.4 BY-PASS FEED PAPER WIDTH SENSOR	5-30
8.5 PAPER FEED ROLLERS/PAPER SIZE DETECTOR	5-31
8.5.1 Paper Feed Rollers	5-31
8.5.2 Paper Size Detector	5-31
8.6 PAPER END SENSORS	5-32
8.7 PAPER FEED CLUTCHES/RELAY CLUTCHES	5-33
8.8 RELAY SENSOR/RIGHT VERTICAL GUIDE SWITCH	5-34
9. OTHERS	5-35
9.1 IOCSS BOARD	5-35
9.2 MSU BOARD/BICU BOARD	5-36
9.3 PSU BOARD	5-37
10. STANDARD WHITE DENSITY ADJUSTMENT	5-38

11. COPY ADJUSTMENT PRINTING/SCANNING	5-39
11.1 PRINTING	5-39
11.1.1 Registration - Leading Edge/Side-to-Side	5-39
11.1.2 Blank Margin	5-40
11.1.3 Main Scan Magnification	5-40
11.1.4 Double Copy Registration	5-41
11.2 SCANNING	5-41
11.2.1 Registration: Platen Mode	5-41
11.2.2 Magnification	5-42
11.3 ADF IMAGE ADJUSTMENT	5-43
11.3.1 Registration and Blank Margin	5-43
11.3.2 Sub Scan Magnification	5-43
12. IMAGE DENSITY ADJUSTMENT BY KEY OPERATOR	5-44

A193 TROUBLESHOOTING

1. SERVICE CALL CONDITIONS	6-1
1.1 SUMMARY	6-1
2. SC CODE DESCRIPTIONS	6-2
3. ELECTRICAL COMPONENT DEFECTS.....	6-11
3.1 SENSORS	6-11
3.2 SWITCHES	6-13
4. BLOWN FUSE CONDITIONS	6-13
5. ROM MODIFICATION HISTORY.....	6-14

DOCUMENT FEEDER A628

1. SPECIFICATIONS	7-1
2. COMPONENT LAYOUT.....	7-2
2.1 MECHANICAL COMPONENT LAYOUT	7-2
2.2 ELECTRICAL COMPONENT LAYOUT	7-3
2.3 ELECTRICAL COMPONENT DESCRIPTION.....	7-4
2.4 DRIVE LAYOUT.....	7-5
3. DETAILED DESCRIPTIONS	7-6
3.1 ORIGINAL SIZE DETECTION	7-6
3.2 PICK-OFF AND SEPARATION MECHANISM.....	7-8

3.3 ORIGINAL TRANSPORT AND EXIT MECHANISM	7-9
3.4 STAMP	7-10
3.5 TIMING CHARTS	7-11
3.5.1 A4 Lengthwise	7-11
3.5.2 A4 Sideways (Stamper Mode)	7-12
3.6 OVERALL ELECTRICAL CIRCUIT	7-13
4. REPLACEMENT AND ADJUSTMENT	7-14
4.1 ORIGINAL FEED UNIT REMOVAL	7-14
4.2 SEPARATION ROLLER REPLACEMENT	7-15
4.3 PICK-UP ROLLER REPLACEMENT	7-16
4.4 FEED BELT REPLACEMENT	7-17
4.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT	7-18
4.6 DF COVER REMOVAL	7-19
4.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT	7-20
4.8 ORIGINAL LENGTH SENSOR REPLACEMENT	7-21
4.9 DF FEED CLUTCH AND DF PICK-UP SOLENOID REPLACEMENT	7-22
4.10 REGISTRATION SENSOR REPLACEMENT	7-23
4.11 STAMPER SOLENOID REPLACEMENT	7-24
4.12 SP MODES	7-25
 PAPER TRAY UNIT G697	
1. SPECIFICATIONS	8-1
2. COMPONENT LAYOUT	8-2
2.1 MECHANICAL COMPONENT LAYOUT	8-2
2.2 ELECTRICAL COMPONENT LAYOUT	8-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	8-4
2.4 DRIVE LAYOUT	8-5
3. DETAILED DESCRIPTION	8-6
3.1 PAPER FEED AND TRAY LIFT/LOWER MECHANISM	8-6
3.2 TIMING CHART	8-7
3.3 OVERALL ELECTRICAL CIRCUIT	8-8
4. REPLACEMENT AND ADJUSTMENT	8-9
4.1 EXTERIOR COVER REMOVAL	8-9
4.2 PAPER FEED ROLLER REPLACEMENT	8-10

4.3 PAPER FEED AND RELAY CLUTCH REPLACEMENT	8-11
4.4 PAPER FEED MOTOR REPLACEMENT	8-12
4.5 LIFT MOTOR REPLACEMENT	8-12
4.6 PAPER END AND UPPER LIMIT SENSOR REPLACEMENT	8-13
4.7 UPPER RELAY SENSOR REPLACEMENT	8-14
4.8 LOWER RELAY SENSOR REPLACEMENT	8-15
4.9 PAPER SIZE SENSORS	8-16
4.10 TRAY COVER SWITCH REPLACEMENT	8-17

DUPLEX G694

1. SPECIFICATIONS	9-1
2. COMPONENT LAYOUT	9-2
2.1 MECHANICAL COMPONENT LAYOUT	9-2
2.2 ELECTRICAL COMPONENT LAYOUT	9-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	9-4
3. DRIVE LAYOUT	9-5
4. BASIC OPERATION	9-6
4.1 A3 PAPER SIZE	9-6
4.2 SHORTER THAN A4 LENGTHWISE (MEMORY COPY) 8 Original (① ~ ⑧)	9-8
5. DETAILED DESCRIPTIONS	9-12
5.1 DUPLEX JUNCTION GATE MECHANISM	9-12
5.2 PAPER TRANSPORT AND FEED MECHANISM	9-13
5.3 TIMING CHARTS	9-14
5.3.1 A3 (without memory)	9-14
5.3.2 A4 sideways (Memory)	9-15
5.4 OVERALL ELECTRICAL CIRCUIT	9-16
6. DIP SWITCHES	9-17
6.1 DUPLEX CONTROL BOARD : DSW1	9-17
7. REPLACEMENT AND ADJUSTMENT	9-18
7.1 DUPLEX TRANSPORT UNIT REMOVAL	9-18
7.2 DUPLEX TRANSPORT AND FEED MOTOR REPLACEMENT	9-19
7.3 DUPLEX TURN AND DUPLEX EXIT SENSORS	9-19
7.4 DUPLEX JUNCTION GATE SOLENOID AND DUPLEX ENTRANCE SENSOR REPLACEMENT	9-20

1-BIN SORTER A629

1. SPECIFICATIONS	10-1
2. COMPONENT LAYOUT	10-2
2.1 MECHANICAL COMPONENT LAYOUT	10-2
2.2 ELECTRICAL COMPONENT LAYOUT	10-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	10-4
2.4 DRIVE LAYOUT	10-5
3. DETAILED DESCRIPTIONS	10-6
3.1 BIN JUNCTION GATE AND PAPER TRANSPORT MECHANISM	10-6
3.2 DRIVE MECHANISM	10-7
3.3 TIMING CHART	10-8
3.4 OVERALL ELECTRICAL CIRCUIT	10-8
4. REPLACEMENT AND ADJUSTMENT	10-9
4.1 BIN JUNCTION GATE SOLENOID, TRANSPORT MOTOR AND SORTER DRIVE BOARD REMOVAL	10-9
4.2 BIN PAPER SENSOR AND INDICATOR REPLACEMENT	10-10

AUTO REVERSE DOCUMENT FEEDER A661

1. OVERALL MACHINE INFORMATION	11-1
1.1 SPECIFICATIONS	11-1
1.2 MECHANICAL COMPONENT LAYOUT	11-2
1.3 ELECTRICAL COMPONENT LAYOUT	11-3
1.4 ELECTRICAL COMPONENT DESCRIPTION	11-4
1.5 DRIVE LAYOUT	11-5
2. DETAILED DESCRIPTIONS	11-6
2.1 ORIGINAL SIZE DETECTION	11-6
2.2 PICK-OFF AND SEPARATION MECHANISM	11-8
2.3 ORIGINAL TRANSPORT AND EXIT MECHANISM	11-9
2.3.1 Single-sided Original	11-9
2.3.2 Double-sided Original	11-10
2.4 STAMP	11-12
2.5 TIMING CHARTS	11-13
2.5.1 LT Sideways (Single-sided Original Mode)	11-13
2.5.2 LT Sideways-Stamper Mode (Single-sided Original Mode)	11-14

2.5.3 LT Sideways (Double-sided Original Mode)	11-15
2.5.4 LT Sideways-Stamper Mode (Double-sided Original Mode)	11-16
2.6 JAM DETECTION	11-17
2.7 OVERALL ELECTRICAL CIRCUIT	11-18
3. INSTALLATION	11-19
4. PREVENTIVE MAINTENANCE	11-22
5. REPLACEMENT AND ADJUSTMENT	11-23
5.1 ORIGINAL FEED UNIT REMOVAL	11-23
5.2 SEPARATION ROLLER REPLACEMENT	11-24
5.3 PICK-UP ROLLER REPLACEMENT	11-25
5.4 FEED BELT REPLACEMENT	11-26
5.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT	11-27
5.6 DF COVER REMOVAL	11-28
5.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT	11-29
5.8 ORIGINAL LENGTH SENSOR REPLACEMENT	11-30
5.9 DF FEED CLUTCH, DF PICK-UP SOLENOID, AND JUNCTION SOLENOID GATE REPLACEMENT	11-31
5.10 REGISTRATION SENSOR REPLACEMENT	11-32
5.11 ORIGINAL EXIT SENSOR REPLACEMENT	11-33
5.12 STAMPER SOLENOID REPLACEMENT	11-34

FINISHER A666

1. OVERALL MACHINE INFORMATION	12-1
1.1 SPECIFICATIONS	12-1
1.2 MECHANICAL COMPONENT LAYOUT	12-2
1.3 ELECTRICAL COMPONENT LAYOUT	12-3
1.4 ELECTRICAL COMPONENT DESCRIPTION	12-4
1.5 DRIVE LAYOUT	12-5
2. DETAILED DESCRIPTIONS	12-6
2.1 JUNCTION GATE MECHANISM	12-6
2.2 PAPER REVERSING MECHANISM	12-7
2.3 JOGGER UNIT PAPER POSITIONING MECHANISM	12-8
2.4 STAPLER	12-9
2.5 FEED OUT MECHANISM	12-10
2.6 SHIFT TRAY UP/DOWN MECHANISM	12-11

2.7 SHIFT TRAY SIDE-TO-SIDE MECHANISM	12-12
2.8 TIMING CHART	12-13
2.8.1 Face-up Mode (A4: 2 sheets)	12-13
2.8.2 Face-down Mode (A4: 2 sheets)	12-14
2.8.3 Staple Mode (A4: 2 sheets)	12-15
2.8.4 Jam Detection	12-16
2.8.5 Electrical Circuit	12-17
3. INSTALLATION PROCEDURE	12-18
4. PREVENTIVE MAINTENANCE	12-21
5. SERVICE TABLES	12-22
5.1 LED TABLE	12-22
5.2 DIP SWITCH TABLE	12-22
5.2.1 Factory Setting	12-22
5.2.2 Stapling Position Adjustment	12-22
5.2.3 Sensor Check	12-22
5.2.4 FREE RUN WITHOUT PAPER	12-23
6. REPLACEMENT AND ADJUSTMENT	12-24
6.1 EXTERIOR REMOVAL	12-24
6.2 ALIGNMENT BRUSH ROLLER REPLACEMENT	12-25
6.3 BELT TENSION ADJUSTMENT	12-26
6.4 STACK HEIGHT SENSOR REPLACEMENT	12-27
6.5 EXIT SENSOR REPLACEMENT	12-28
6.6 INVERTER SENSOR REPLACEMENT	12-29

A224 COPIER

1. SPECIFICATIONS	13-1
2. MACHINE CONFIGURATION	13-5
3. ELECTRICAL COMPONENT DESCRIPTIONS	13-6
4. DRIVE LAYOUT	13-9
5. COPY PROCESS	13-10
5.1 OVERVIEW	13-10
6. MAIN SCAN MAGNIFICATION/REDUCTION	13-11
7. LASER EXPOSURE	13-12
7.1 OVERVIEW	13-12

7.2 OPTICAL PATH	13-12
8. PAPER FEED	13-13
8.1 OVERVIEW	13-13
8.2 DRIVE MECHANISM	13-14
9. PAPER SEPARATION AND TRANSPORT.....	13-14
10. IMAGE FUSING	13-15
10.1 OVERVIEW	13-15
10.2 PRESSURE ROLLER	13-16
10.3 FUSING UNIT FAN	13-17
10.4 FUSING TEMPERATURE CONTROL AND OVERHEAT PROTECTION..	13-18
11. ENERGY SAVER MODES	13-19
12. SERVICE PROGRAM MODE TABLE	13-20
12.1 MAIN SP MODE TABLE	13-20
12.1.1 Input Check (SP5-803)	13-49
12.1.2 Output Check (SP5-804)	13-53
13. PREVENTIVE MAINTENANCE SCHEDULE.....	13-55
13.1 PM TABLE	13-55
14. REPLACEMENT AND ADJUSTMENT	13-57
14.1 LASER UNIT	13-57
14.2 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR	13-58
14.3 POLYGON MIRROR MOTOR	13-59
14.4 POLYGON MOTOR DRIVER.....	13-60
14.5 FUSING THERMISTOR/FUSING EDGE THERMISTOR	13-61
14.6 FUSING UNIT FAN	13-62
15. SERVICE CALL CONDITIONS	13-63
15.1 SUMMARY.....	13-63
16. SC CODE DESCRIPTIONS	13-64
17. ROM MODIFICATION HISTROY.....	13-77

LARGE CAPACITY TRAY A667

1. SPECIFICATIONS	14-1
2. COMPONENT LAYOUT.....	14-2
2.1 MECHANICAL COMPONENT LAYOUT	14-2
2.2 ELECTRICAL COMPONENT LAYOUT	14-3
2.3 ELECTRICAL COMPONENT DESCRIPTIONS.....	14-4

2.4 DRIVE LAYOUT	14-5
3. DETAILED SECTION DEACRIPTION	14-6
3.1 PAPER LIFT MECHANISM	14-6
3.2 PAPER FEED MECHANISM	14-7
3.3 PAPER NEAR END/END DETECTION	14-8
3.4 PAPER FEED TIMING AND JAM DETECTION	14-10
4. INSTALLATION	14-11
4.1 ACCESSORY CHECK	14-11
4.2 INSTALLATION PROCEDURE	14-11
4.3 PAPER SIZE CHANGE	14-15
5. PREVENTIVE MAINTENANCE TABLE	14-16
6. SERVICE TABLE	14-16
6.1 TEST POINT TABLE	14-16
6.2 FUSE TABLE	14-16
7. REPLACEMENT AND ADJUSTMENT	14-17
7.1 EXTERIOR COVER REMOVAL	14-17
7.2 PAPER FEED ROLLER REMOVAL	14-18
7.3 TRAY LIFT MOTOR REMOVAL	14-19
7.4 PAPER FEED MOTOR AND TRNSPORT MOTOR	14-20
7.5 PAPER SIZE SENSOR	14-20
7.6 LOWER LIMIT SENSOR	14-21

Table of Contents

FAX

OVERALL MACHINE INFORMATION A639

1. SPECIFICATIONS	1-1
2. FEATURES.....	1-2
2.1 FEATURES LIST	1-2
2.2 CAPABILITIES OF PROGRAMMABLE ITEMS	1-5
2.3 POSSIBLE COMBINATIONS OF OPTIONAL IC CARDS	1-6
3. OVERALL MACHINE CONTROL	1-7
3.1 SYSTEM CONTROL	1-7
3.2 POWER DISTRIBUTION AND CONTROL	1-8
3.3 MEMORY BACK-UP	1-8
4.VIDEO DATA PATH	1-9
4.1 TRANSMISSION	1-9
4.2 RECEPTION	1-11

DETAILED SECTION DESCRIPTIONS A639

1. AUTOMATIC SERVICE CALLS.....	2-1
1.1 SERVICE CALL CONDITIONS	2-1
1.2 PERIODIC SERVICE CALL	2-3
1.3 PM CALL	2-3
1.4 EFFECTIVE TERM OF SERVICE CALLS	2-3
2. PARALLEL MEMORY TRANSMISSION.....	2-4
3. TRANSFER BROADCASTING	2-6
4. ORIGINAL SCAN PROCESS.....	2-9
4.1 MAIN SCAN DIRECTION.....	2-9
4.2 SUB SCAN DIRECTION	2-9
5. PAGE SPLIT TRANSMISSION (BOOK TRANSMISSION).....	2-10
6. IMAGE ROTATION BEFORE TRANSMISSION	2-11
7. SMOOTHING	2-12
8. PAPER SIZE SELECTION.....	2-13
8.1 WIDTH PRIORITY AND LENGTH PRIORITY	2-13

8.2 IMAGE ROTATION BEFORE PRINTING	2-13
8.3 SUB SCAN REDUCTION AND PAGE SEPARATION.....	2-14
8.4 PAGE REDUCTION.....	2-17
8.5 TWO IN ONE	2-18
8.6 PAPER SIZE SELECTION PRIORITIES	2-19
9. TWO-SIDED (DUPLEX) PRINTING	2-25
10. PCBs.....	2-26
10.1 FCU	2-26
10.2 NCU (US)	2-28
10.3 NCU (Europe/Asia).....	2-29
10.4 NCU (France)	2-30

INSTALLATION A639

1. FAX UNIT	3-1
1.1 INSTALLATION PROCEDURE	3-1
1.2 INITIAL PROGRAMMING	3-5
2. ISDN G4 UNIT	3-7
2.1 INSTALLATION PROCEDURE	3-7
2.2 INITIAL PROGRAMMING	3-9
3. HARD DISK	3-10
3.1 INSTALLATION PROCEDURE	3-10
3.2 INITIAL PROGRAMMING	3-11
4. HANDSET.....	3-12
4.1 INSTALLATION PROCEDURE	3-12
5. IC CARDS.....	3-13
5.1 INSTALLATION PROCEDURE	3-13
5.2 ITEMS INITIALIZED WHEN FUNCTION UPGRADE CARD IS INSTALLED OR REMOVED	3-14

SERVICE TABLES AND PROCEDURES A639

1. SERVICE LEVEL FUNCTIONS	4-1
1.1 HOW TO ENTER AND EXIT THE FAX SERVICE MODE.....	4-1
1.2 BIT SWITCH PROGRAMMING (FUNCTION 01).....	4-1
1.3 SYSTEM PARAMETER LISTS (FUNCTION 02)	4-2
1.4 ROM VERSION DISPLAY (FUNCTION 02).....	4-5

1.5 ERROR CODE DISPLAY (FUNCTION 03)	4-5
1.6 SERVICE MONITOR REPORT (FUNCTION 04).....	4-5
1.7 G3 PROTOCOL DUMP LIST (FUNCTION 05)	4-5
1.8 G4 PROTOCOL DUMP LIST (FUNCTION 05)	4-5
1.9 RAM DISPLAY AND REWRITE (FUNCTION 06)	4-6
1.10 NCU PARAMETERS (FUNCTION 06).....	4-6
1.11 RAM DUMP (FUNCTION 06).....	4-7
1.12 RAM CLEAR (FUNCTION 07)	4-7
1.13 HARD DISK (FUNCTION 08).....	4-8
1.14 SERVICE STATION FAX NUMBER (FUNCTION 09)	4-8
1.15 SERIAL NUMBER (FUNCTION 10).....	4-9
1.16 MODEM TEST (FUNCTION 11)	4-9
1.17 DTMF TEST (FUNCTION 11)	4-9
1.18 MODEM SIGNAL DETECTION TEST (FUNCTION 11)	4-10
1.19 RINGER TEST (FUNCTION 11)	4-10
1.20 STAMP TEST.....	4-10
1.21 G4 PARAMETER PROGRAMMING (FUNCTION 12).....	4-11
1.22 FILE PRINTOUT (FUNCTION 13).....	4-11
1.23 TCR/JOURNAL PRINTOUT (FUNCTION 14)	4-11
1.24 USAGE LOG PRINTOUT (FUNCTION 15)	4-12
1.25 SOFTWARE DOWNLOAD (FUNCTION 16)	4-13
1.26 SOFTWARE UPLOAD (FUNCTION 16)	4-15
1.27 SRAM DATA DOWNLOAD (FUNCTION 16)	4-16
2. BIT SWITCHES	4-18
2.1 SYSTEM SWITCHES.....	4-18
2.2 SCANNER SWITCHES	4-30
2.3 PRINTER SWITCHES	4-35
2.4 COMMUNICATION SWITCHES	4-40
2.5 G3 SWITCHES.....	4-47
3. NCU PARAMETERS	4-54
4. DEDICATED TRANSMISSION PARAMETERS	4-63
4.1 PROGRAMMING PROCEDURE	4-63
4.2 PARAMETERS.....	4-64

5. SERVICE RAM ADDRESSES	4-67
6. SPECIAL TOOLS AND LUBRICANTS	4-77
7. SERVICE PROGRAM / BIT SWITCH TABLE INDEX.....	4-79

REMOVAL AND REPLACEMENT A639

1. PRECAUTION	5-1
2. NCU	5-2
3. FCU.....	5-3

TROUBLESHOOTING A639

1. ERROR CODES	6-1
2. FAX SC CODES.....	6-7
2.1 SC1201.....	6-7
2.2 SC1701.....	6-7
2.3 FAX SC CODE TABLE.....	6-8
3. ROM MODIFICATION HISTORY.....	6-9

FAX UNIT A804

1. OVERALL INFORMATION	7-1
1.1 SPECIFICATIONS	7-1
1.2 OVERALL MACHINE CONTROL.....	7-2
2. DETAILED DESCRIPTIONS	7-3
2.1 DOUBLE-SIDED ORIGINAL TRANSMISSION	7-3
2.1.1 Portrait Original - Side Binding	7-4
2.1.2 Portrait Original - Top Binding	7-5
2.1.3 Landscape Original - Side Binding	7-6
2.1.4 Landscape Original - Top Binding	7-7
2.2 PAPER SIZE SELECTION PRIORITIES.....	7-8
3. INSTALLATION	7-14
3.1 INITIAL PROGRAMMING	7-19
4. SERVICE TABLES AND PROCEDURE	7-21
4.1 BIT SWITCHES	7-21
4.1.1 System Switch	7-21

4.1.2 Printer Switch	7-22
4.2 RAM ADDRESSES	7-22
5. TROUBLESHOOTING	7-23
5.1 SC681 (A224 Copier only)	7-23
5.2 OTHER POSSIBLE CASES.	7-24
5.2.1 Possible Cases and Results.	7-24
5.2.2 When A804 Software is Downloaded to the A639 Fax Unit	7-24
5.2.3 When A639 Software is Downloaded to the A804 Fax Unit	7-24
6.0 ROM MODIFICATION HISTORY	7-25

Table of Contents

ISDN

INSTALLATION A644

1. INSTALLATION PROCEDURE	1-1
1.1 USER LEVEL PROGRAMMING	1-1
1.2 SERVICE LEVEL PROGRAMMING	1-2
2. SWITCH SETTINGS.....	1-3
2.1 INTERNAL SWITCHES	1-3
2.2 PARAMETER SWITCHES.....	1-4

SERVICE TABLES AND PROCEDURES A644

1. SERVICE LEVEL FUNCTIONS	2-1
2. BIT SWITCHES	2-2
2.1 G4 INTERNAL SWITCHES	2-2
2.2 G4 PARAMETER SWITCHES.....	2-10
3. DEDICATED TRANSMISSION PARAMETERS	

TROUBLESHOOTING A644

1. ERROR CODES	3-1
1.1. D-CHANNEL LAYER MANAGEMENT	3-2
1.2. D-CHANNEL, LAYER 1.....	3-2
1.3. D-CHANNEL LINK LAYER	3-2
1.4. D-CHANNEL NETWORK LAYER.....	3-3
1.5. B-CHANNEL LINK LAYER	3-3
1.6. B-CHANNEL NETWORK LAYER.....	3-4
1.7. TRANSPORT LAYER	3-4
1.8. SESSION LAYER	3-5
1.9. DOCUMENT LAYER.....	3-5
1.10. PRESENTATION LAYER	3-6
2. G4CCU STATUS CODES	3-7
2.1. LAYER 1 (PHYSICAL LAYER)	3-7
2.2. LAYER 2 (LINK LAYER)	3-7
2.3. NETWORK LAYER (LAYER 3).....	3-8
2.4. TRANSPORT LAYER (LAYER 4).....	3-8

2.5. SESSION LAYER, SESSION CONTROL LAYER (LAYER 5)	3-8
2.6. SESSION LAYER, DOCUMENT CONTROL LAYER (LAYER 5)	3-8
3. LEDs	3-9
4. BACK-TO-BACK TEST	3-10
APPENDIX A A644	
1. D-Channel Layer 1 Dump List	A-2
1.1. How to Print the Dump List	A-2
1.2. How to Read the Dump List.	A-3
1.2.1. Data Format.	A-3
1.2.2. Reading the Sample Dump List.	A-5
1.2.3. Layer 1 Status	A-8
1.2.3.1. Activation Procedure from the TE	A-9
1.2.3.2. Activation ProcEDURE from the NT	A-9
1.2.3.3. Termination Procedure from the NT	A-10
APPENDIX B A644	
1. G4 Parameter Locations.	B-2
1.1. Initial Programming Items Comparison List.	B-2
1.2. Switch Locations Comparison List.	B-3
1.2.1. Communication Parameter Display	B-3
1.2.2. Default Communication Mode	B-3
1.2.3. Network Used for G3 Transmission	B-3
1.2.4. Network Used for G3 transmission in G4-to-G3 Fallback	B-3
1.2.5. Automatic G4-to-G3 Fallback.	B-3
1.2.6. Specified Two Step Transfer	B-4
1.2.7. Cable Equalizer for ISDN Transmission	B-4
1.2.8. Cable Equalizer for ISDN Reception	B-4
APPENDIX C A644	
1. Conditions for Receiving a Call	C-2

Table of Contents

PRINTER

1. OVERALL INFORMATION	1-1
1.1 INTRODUCTION	1-1
1.1.1 Hardware	1-1
1.1.2 Software	1-1
1.2 CONTROLLER SPECIFICATIONS	1-2
2. DETAILED SECTION DESCRIPTIONS.	1-3
2.1 BLOCK DIAGRAM (OVERALL)	1-3
2.2 INTERFACE	1-5
2.2.1 Host Interface	1-5
2.2.2 Machine Interface	1-7
2.3 BLOCK DIAGRAM (INTERNAL)	1-8
2.3.1 Printer Controller.	1-8
2.3.2 Printer Enhancement Unit.	1-11
2.4 Hard Disk Drive	1-11
2.5 Features	1-12
2.5.1 Sorting Function	1-12
2.5.2 Duplex Printing	1-13
3. INSTALLATION.	1-14
3.1 PRINTER CONTROLLER	1-14
3.2 PRINTER ENHANCEMENT UNIT	1-16
3.3 HARD DISK DRIVE	1-17
3.4 SIMM MODULE	1-18
3.5 CONNECTING THE INTERFACE CABLE.	1-19
3.5.1 Parallel Interface.	1-19
3.5.2 Serial (RS-232C) Interface	1-19
3.5.3 LocalTalk Interface	1-19
3.6 CHECKING THE CONNECTIONS.	1-20
3.6.1 Connection Between Printer Controller (and related options; Printer Enhancement Unit, Hard Disk Drive, SIMM) and Copier	1-20
3.6.2 Connection Between Printer Controller (Printer Enhancement Unit) and Host PC or Macintosh	1-22

4. SERVICE TABLES AND PROCEDURES	1-24
4.1 SERVICE REMARKS	1-24
4.1.1 Hard Disk Initialization	1-24
4.1.2 About Settings	1-24
5. TROUBLESHOOTING	1-25
5.1 ERROR MESSAGES	1-26
5.2 HARDWARE ERRORS	1-27
5.3 CONNECTION ERRORS	1-27
5.4 IMAGE PROBLEMS	1-28
6.0 Printer Controller ROM Modification History	
Printer Controller (A643) ROM Modification History	1-29
APPENDIX A	

IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

1. Always replace the ozone filters with the specified ones at the specified intervals.
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 RAM board on the system control board has a lithium battery which can explode if replaced incorrectly. Replace the battery only with an identical one. The manufacturer recommends replacing the entire RAM board. Do not recharge or burn this battery. Used batteries must be handled in accordance with local regulations.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

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

LASER SAFETY

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

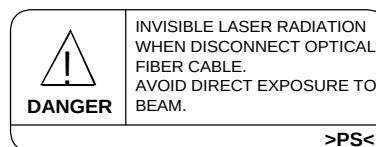
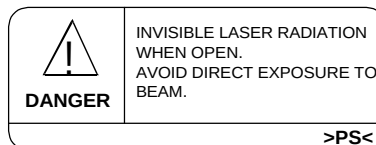
WARNING

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

WARNING FOR LASER UNIT

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

CAUTION MARKING:



A193/A224 TAB INDEX

Rev. 7/97

A193 OVERALL MACHINE INFORMATION	
DOCUMENT FEEDER A628	
OVERALL MACHINE INFORMATION A639	
PRINTER CONTROLLER A643	
A224 OVERALL MACHINE INFORMATION	
A193 DETAILED DESCRIPTIONS	
PAPER TRAY UNIT G697	
DETAILED DESCRIPTIONS A639	
A193 INSTALLATION	
DUPLEX UNIT G694	
INSTALLATION A639	
A193 SERVICE TABLES	
1 BIN SORTER TRAY A629	
SERVICE TABLES A639	
A193 REPLACEMENT & ADJUSTMENT	
REPLACEMENT & ADJUSTMENT A639	
AUTO REVERSE DOCUMENT FEEDER A661	
A224 OVERALL MACHINE INFORM	
A193 TROUBLESHOOTING	
FINISHER A666	
TROUBLESHOOTING A639	
LARGE CAPACITY TRAY A667	
ISDN A644	
FAX UNIT A804	
APPENDIX A, B, C,	

TAB
POSITION 1

TAB
POSITION 2

TAB
POSITION 3

TAB
POSITION 4

TAB
POSITION 5

TAB
POSITION 6

TAB
POSITION 7

TAB
POSITION 8

COPIER (A193)

SECTION 1

OVERALL MACHINE INFORMATION

1. SPECIFICATIONS

Configuration:	Desktop
Copy Process:	Dry electrostatic transfer system
Originals:	Sheet/Book
Original Size:	Maximum A3/11" x 17"
Copy Paper Size:	Maximum A3/11" x 17" Minimum A5/8 1/2" x 5 1/2" sideways (Paper tray) A6/5 1/2" x 8 1/2" lengthwise (By-pass)
Copy Paper Weight:	Paper tray: 60 ~ 90 g/m ² , 16 ~ 24 lb By-pass: 60 ~ 157 g/m ² , 16 ~ 42 lb
Reproduction Ratios:	5 Enlargement and 7 Reduction

	A4/A3 Version	LT/DLT Version
Enlargement	400%	400%
	200%	200%
	141%	155%
	122%	129%
	115%	121%
Full size	100%	100%
Reduction	93%	93%
	87%	85%
	82%	77%
	71%	74%
	65%	65%
	50%	50%
	25%	25%

Zoom:	25% to 400% in 1% steps
Power Source:	120V/60 Hz: More than 12 A (for North America) 220V ~ 240V/50 Hz: More than 7 A (for Europe) 220V ~ 240V/60 Hz: More than 7 A (for Asia) Power Consumption:

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

NOTE: Full System: Mainframe + ADF + Paper Tray Unit + Duplex Tray + 1-bin Sorter

Noise Emission:

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

NOTE: The above measurements were made in accordance with ISO 7779.
Full System: Mainframe + ADF + Paper Tray Unit + Duplex Tray + 1-bin Sorter

Dimensions (W x D x H): 550 x 580 x 652 mm (21.7" x 22.9" x 25.7")
Measurement Conditions
1) With by-pass feed table closed
2) Without the optional paper tray unit
3) Without the ADF

Weight: Less than 57 kg (126 lb)

Copying Speed in Multicopy mode (copies/minute):

⇒	Non-Memory Mode	A4 sideways/ 11" x 8 1/2"	A3/11" x 17"	B4/8 1/2" x 14"
	(1 to 1 copy)	15	9	10
	Memory Copy Mode	20	11	12

Warm-up Time
Less than 30 seconds (20°C, 68°F): 115V machine
Less than 35 seconds (20°C, 68°F): 230V machine

First Copy Time:
Less than 9.8 s (from 1st paper tray to face down copy tray)
Less than 8.8 s (from 1st paper tray to face up copy tray)

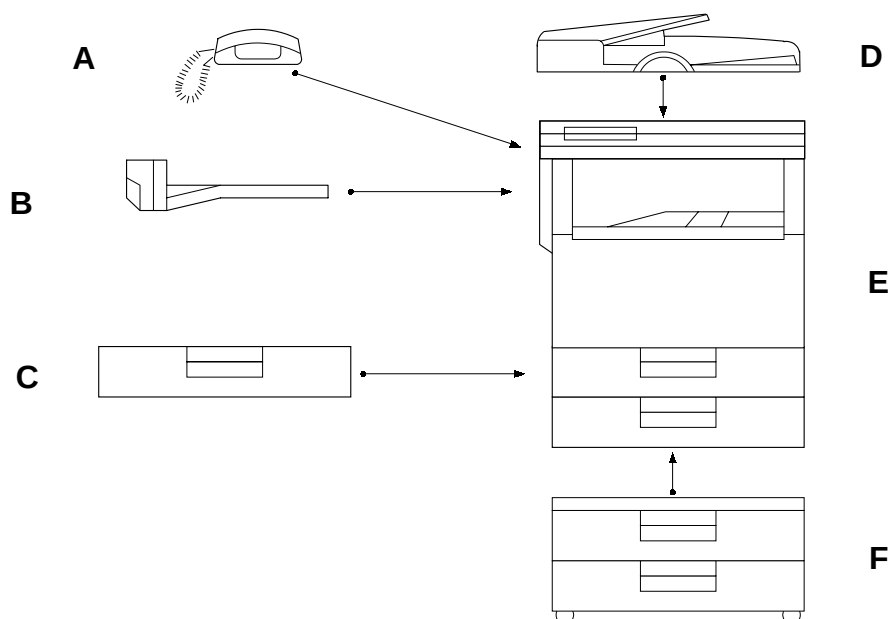
Copy Number Input:	Ten-key pad, 1 to 99 (count up or count down)
Manual Image Density:	7 steps
Automatic Reset:	60 s is the standard setting; it can be changed with a UP mode.
Auto Shut Off	15 min. is the standard setting; it can be changed with a UP mode.
Copy Paper Capacity:	Paper Tray: 250 sheets Optional Paper Tray Unit: 500 sheets x 2 Bypass: 100 sheets (A4, B5, A5, B6, 8.5 x 11", 5.5 x 8.5") 10 sheets (A3, B4, 11 x 17", 8 x 13") 1 sheet (non-standard sizes)
Toner Replenishment:	Cartridge exchange (216 g/cartridge)
Toner Yield:	8 k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)
Optional Equipment:	• Platen cover • Auto document feeder • Paper tray unit with two paper trays • 1-bin sorter (tray) • Duplex unit • Key counter • Tray heater • Optical anti-condensation heater • Auto Reversing Document Feeder
Copy Tray Capacity	Face down mode: 500 sheets Face up mode: 100 sheets

Memory Capacity:

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

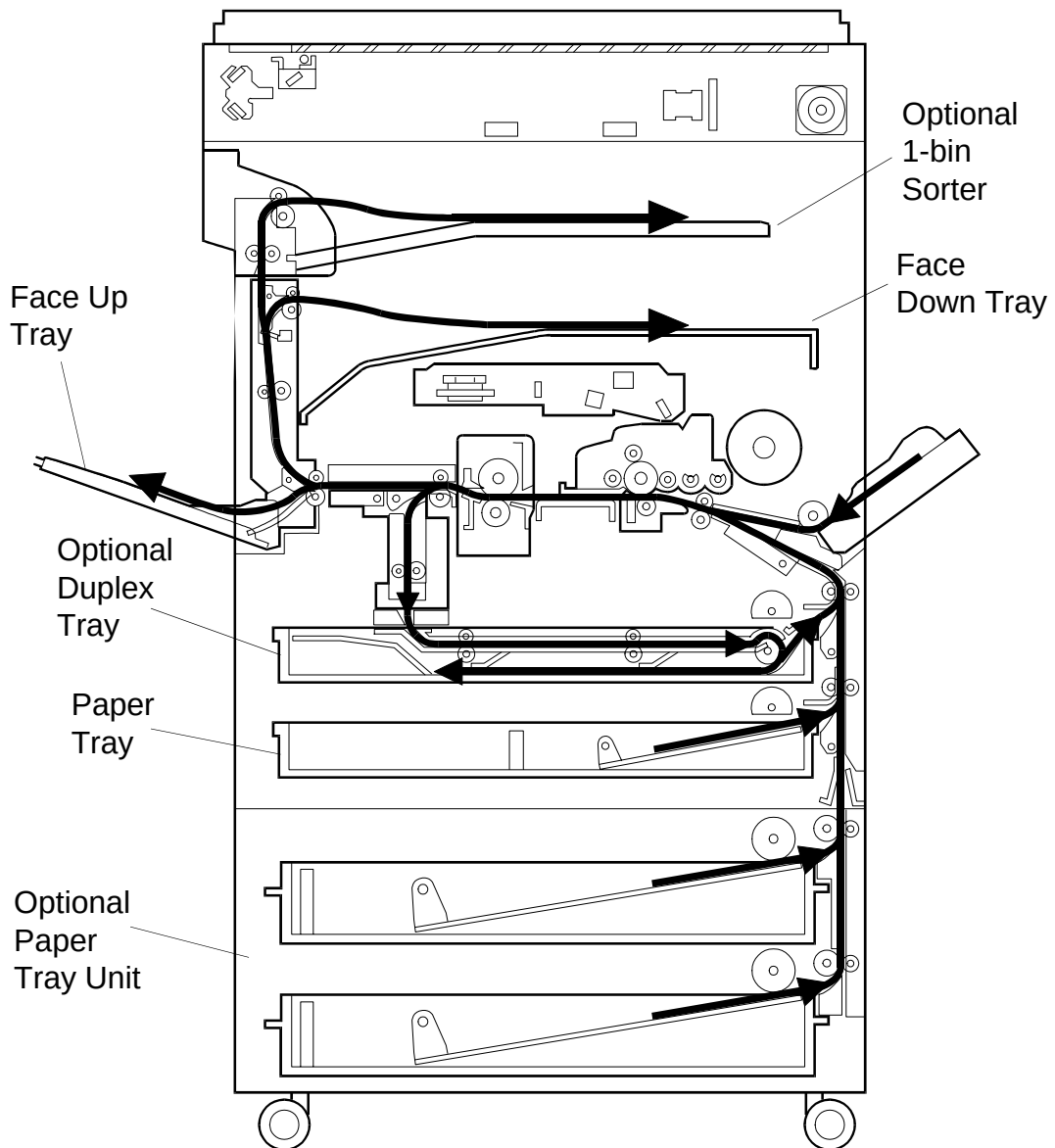
X: Not Available O: Available

2. MACHINE CONFIGURATION

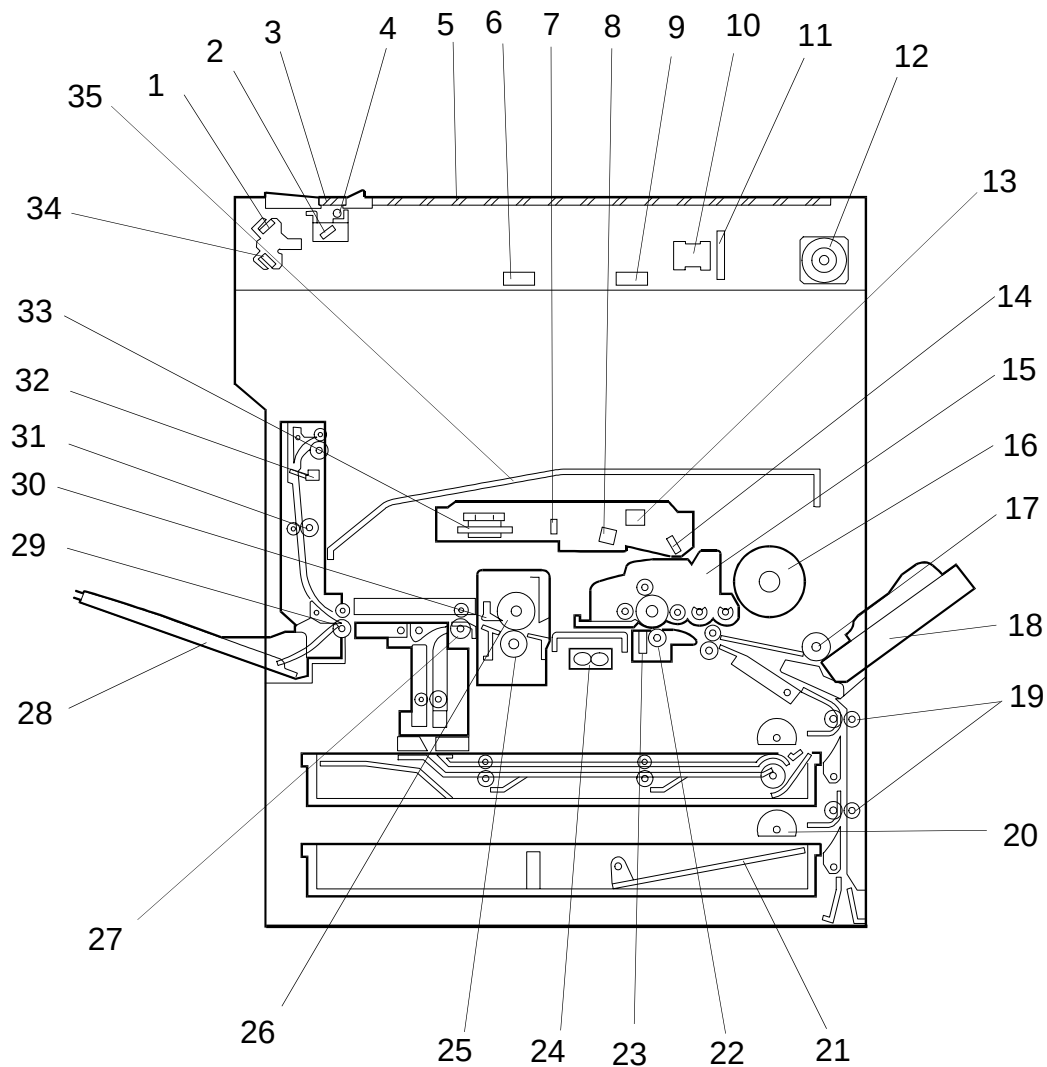


Version	Item	Machine Code	No.
Copier	Copier	A193	E
	ADF (Option)	A628	D
	Paper Tray Unit (Option)	G697	F
	Duplex Unit (Option)	G694	C
	1-bin Sorter (Option)	A629	B
	Platen Cover (Option)	A645	
	Memory 4MB (Option)	A642-01	
	Memory 8MB (Option)	A642-02	
Fax	Fax Controller (Option)	A639-01 (115V), -02(230V), -03(France), -04 (TWN)	
	Telephone (Option)	H160	A
	ISDN (Option)	A644-01(115V), -02(230V)	
	HDD (Option)	A641	
	Memory Card (Option)	H130-54	
	Function Card (Option)	H130-52	
	Page Memory (Option)	A640	
Printer	Printer Controller (Option)	A643-00 (115V), -01(230V)	
	PS Option (Option)	A643-02	
	HDD (Option)	A643-03	

3. PAPER PATH



4. MECHANICAL COMPONENT LAYOUT



1. 2nd Mirror (Scanner)	22. Transfer Roller
2. 1st Mirror (Scanner)	23. Separation Brush
3. DF Exposure Glass	24. Transport Vacuum Fan
4. Xenon Lamp	25. Pressure Roller
5. Exposure Glass	26. Hot Roller
6. Original Width Sensors	27. Fusing Exit Roller
7. 1st Mirror (Laser)	28. Left Vertical Door/Face Up Tray
8. Barrel Toroidal Lens (BTL)	29. Junction Gate
9. Original Length Sensors	30. Hot Roller Strippers
10. Lens	31. Left Vertical Roller
11. SBU Board	32. Lower Exit Sensor
12. Scanner Motor	33. Polygonal Mirror Motor
13. F-theta Mirror	34. 3rd Mirror (Scanner)
14. 2nd Mirror (Laser Unit)	35. Face Down Tray
15. PCU	
16. Toner Bottle	
17. By-pass Feed Roller	
18. By-pass Table	
19. Relay Rollers	
20. Paper Feed Rollers	
21. Bottom Plate	

5. ELECTRICAL COMPONENT DESCRIPTIONS

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

Symbol	Index No.	Description	Note
Printed Circuit Boards			
PCB1	54	High Voltage Supply Board	Supplies high voltage to the drum charge roller, development roller, transfer roller, and discharge brush.
PCB2	50	Lamp Stabilizer	Provides dc power for the exposure lamp.
PCB3	58	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp.
PCB4	61	LD Unit (Laser Diode)	Controls the laser diode.
PCB5	62	Operation Panel	Controls the touch panel display and LED matrix, and monitors the key matrix.
PCB6	51	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the BICU board.
PCB7	55	IOCSS (Input/Output & Customer Support System)	Controls the mechanical parts of the printer.
PCB8	52	BICU (Base Engine & Image Control Unit)	Controls all copier functions both directly or through other control boards.
PCB9	53	MSU (Memory Supercharge Unit)	Compresses the image data, stores the data, and applies the image editing.
Motors			
M1	45	Main	Drives the main body components.
M2	36	Scanner Drive	Drives the 1st and 2nd scanners (dc stepper motor).
M3	47	Transport Vacuum Fan	Aids paper transportation from the transfer roller to the fusing unit.
M4	49	Polygonal Mirror	Rotates the polygonal mirror.
M5	37	Toner Supply	Rotates the toner bottle to supply toner to the toner supply unit.
M6	35	Exhaust Fan	Removes heat from around the fusing unit.
Sensors			
S1	33	Upper Exit	Detects paper feed misfeeds from the upper optional cassette tray.
S2	31	Lower Exit	Detects paper feed misfeeds from the lower optional cassette tray.
S3	28	Left Vertical Door	Cuts the +5 and +24 Vdc power lines.
S4	27	Left Door	Detects when the left door is open.
S5	17	Relay	Detects the leading edge of paper from the paper tray and duplex unit to determine the stop timing of the paper feed clutch and duplex feed motor. Also detects misfeeds.

ELECTRICAL COMPONENT DESCRIPTIONS

Overall
Machine
Information

Symbol	Index No.	Description	Note
S6	10	PCU	Detects when a new PCU (Photo Contactor Unit) is installed.
S7	29	Fusing Exit	Detects misfeeds in the fuser unit.
S8	9	Charge Roller H.P	Informs the CPU when the drum charge roller is in home position.
S9	14	Upper Tray Paper End	Informs the CPU when the upper paper tray is out of paper.
S10	15	Lower Tray Paper End	Informs the CPU when the lower paper tray runs out of paper.
S11	16	By-pass Feed Paper End	Informs the CPU when there is no paper in the by-pass tray.
S12	12	Registration	Detects the leading edge of the copy paper to determine the stop timing of the paper feed clutch, and detects misfeeds.
S13	11	By-pass Feed Paper Width	Detects the width of the paper in the by-pass feed table.
S14	59	Humidity	Monitors the humidity around the PCU.
S15	4	Original Width	Detects the width of the original. This is one of the APS (Auto Paper Select) sensors.
S16	5	Original Length-1	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S17	6	Original Length-2	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S18	3	Platen Cover	Informs the CPU when the platen cover is up (related to APS/ARE functions). ARE: Auto Reduce and Enlarge
S19	1	Scanner H.P.	Informs the CPU when the 1st and 2nd scanners are at the home position.
S20	23	Toner Density (TD)	Detects the amount of toner inside the development unit. (PCU)
Switches			
SW1	21	AC	Supplies power to the copier.
SW2	32	Main	Supplies power to operate the machine.
SW3	13	Right Vertical Guide	Cuts the +5 and +24 Vdc power lines.
SW4	20	Upper Paper Size	Identifies the size of paper is in the upper paper tray.
SW5	19	Lower Paper Size	Identifies the size of paper is in the lower paper tray.
SW6	26	Front Door Safety	Cuts the +5VLD and +24V dc power lines and detects whether the front cover is open or not.
Magnetic Clutches			
MC1	46	Charge Roller Contact	Controls the touch and release movement of the drum charge roller.
MC2	42	Upper Relay	Drives the upper relay rollers.
MC3	43	Lower Relay	Drives the lower relay rollers.

ELECTRICAL COMPONENT DESCRIPTIONS

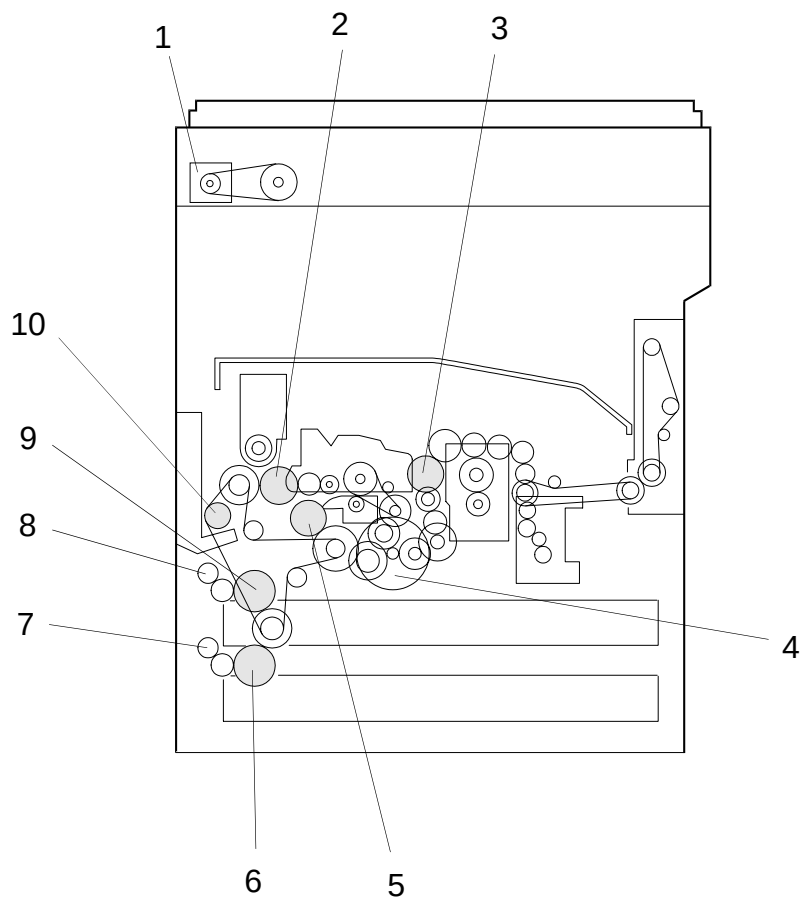
Symbol	Index No.	Description	Note
MC4	40	By-pass Feed	Starts paper feed from the by-pass feed table.
MC5	41	Upper Paper Feed	Starts paper feed from the upper paper tray.
MC6	44	Lower Paper Feed	Starts paper feed from the lower paper tray.
MC7	39	Registration	Drives the registration rollers.
MC8	38	Development	Drives the development roller.
Solenoids			
SOL1	48	Junction Gate	Moves the junction gate to direct copies to the face up or face down copy tray.
Lamps			
L1	60	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.
L2	2	Scanner	Applies light to the original for exposure.
L3	8	Fusing	Provides heat to the hot roller.
Heaters			
H1	18	Tray (option)	Turns on when the main switch is off to keep paper in the paper tray dry. Tray heaters are also available for the optional paper feed unit.
H2	34	Anti-condensation (option)	Turns on when the main switch is off to prevent moisture from accumulating.
Thermistors			
TH1	24	Charge Roller	Monitors the temperature of the drum charge roller.
TH2	22	Fusing	Monitors the temperature of the hot roller.
Thermofuses			
TF1	7	Fusing	Provides back-up overheat protection in the fusing unit.
Counters			
CO1	25	Total	Keeps track of the total number of copies made.
CO2	---	Key (option)	Used for control of authorized use. The copier will not operate until it is installed.
Others			
LSD1	30	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
NF	56	Noise Filter (230V machine only)	Removes electrical noise from the AC input line.

ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Index No.	Description	Note
CB	57	Circuit Breaker (230V machine only)	Guards against voltage surges in the AC input line.

Overall
Machine
Information

6. DRIVE LAYOUT



1. Scanner Drive Motor

2. Development Clutch

3. Charge Roller Contact

4. Main Motor

5. Registration Clutch

6. Lower Paper Feed Clutch

7. Lower Relay Clutch

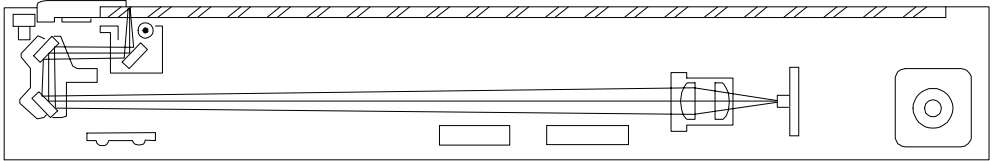
8. Upper Relay Clutch

9. Upper Paper Feed Clutch

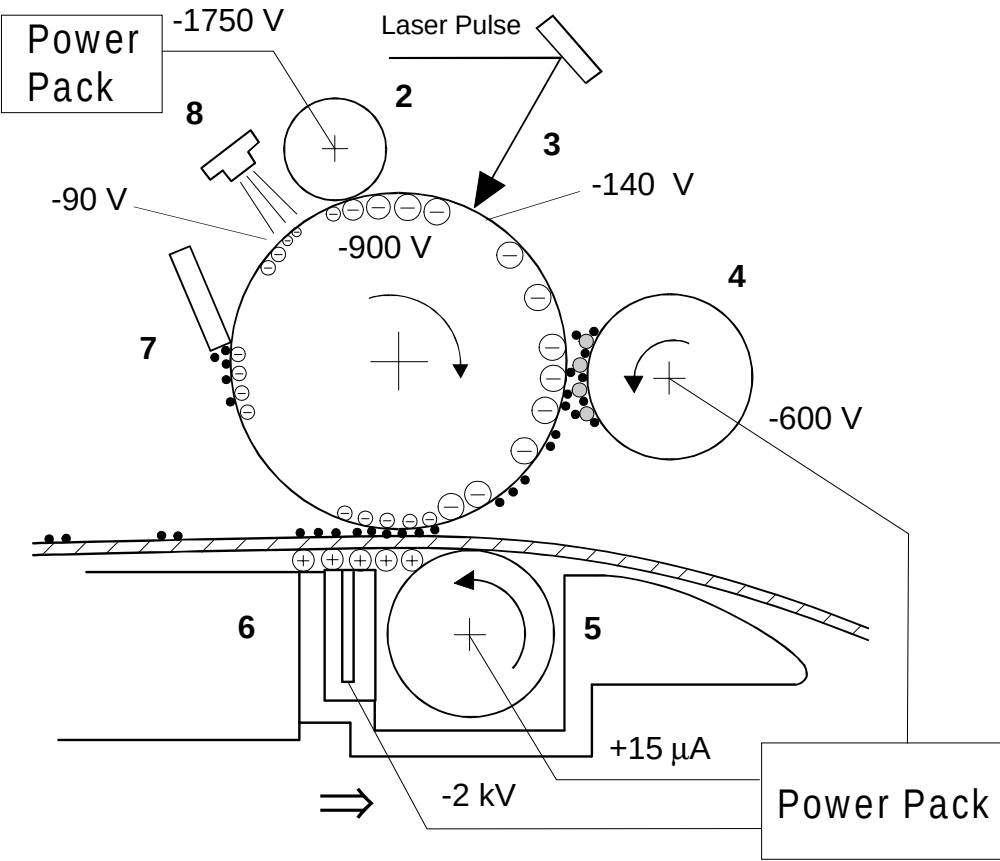
10. By-pass Feed Clutch

7. COPY PROCESS

7.1 OVERVIEW



1



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. The analog data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the digital data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the memory.

2. DRUM CHARGE

In the dark, the charge roller gives a negative charge to the organic photo-conductive (OPC) drum. The charge remains on the surface of the drum because the OPC material has a high electrical resistance in the dark.

3. LASER EXPOSURE

The processed data scanned from the original is retrieved from the memory and transferred to the drum by a laser beam, which forms an electrical 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 BICU board.

4. 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.

5. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer roller at the proper time for aligning the copy paper and the developed image on the drum surface. Then, the transfer roller applies a high positive charge to the reverse side of paper. This positive charge produces an electrical force which pulls the toner particles from the drum surface on to the paper. At the same time, the paper is electrically attracted to the transfer roller.

6. PAPER SEPARATION

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer roller. The discharge brush helps separate the paper from the drum.

7. CLEANING

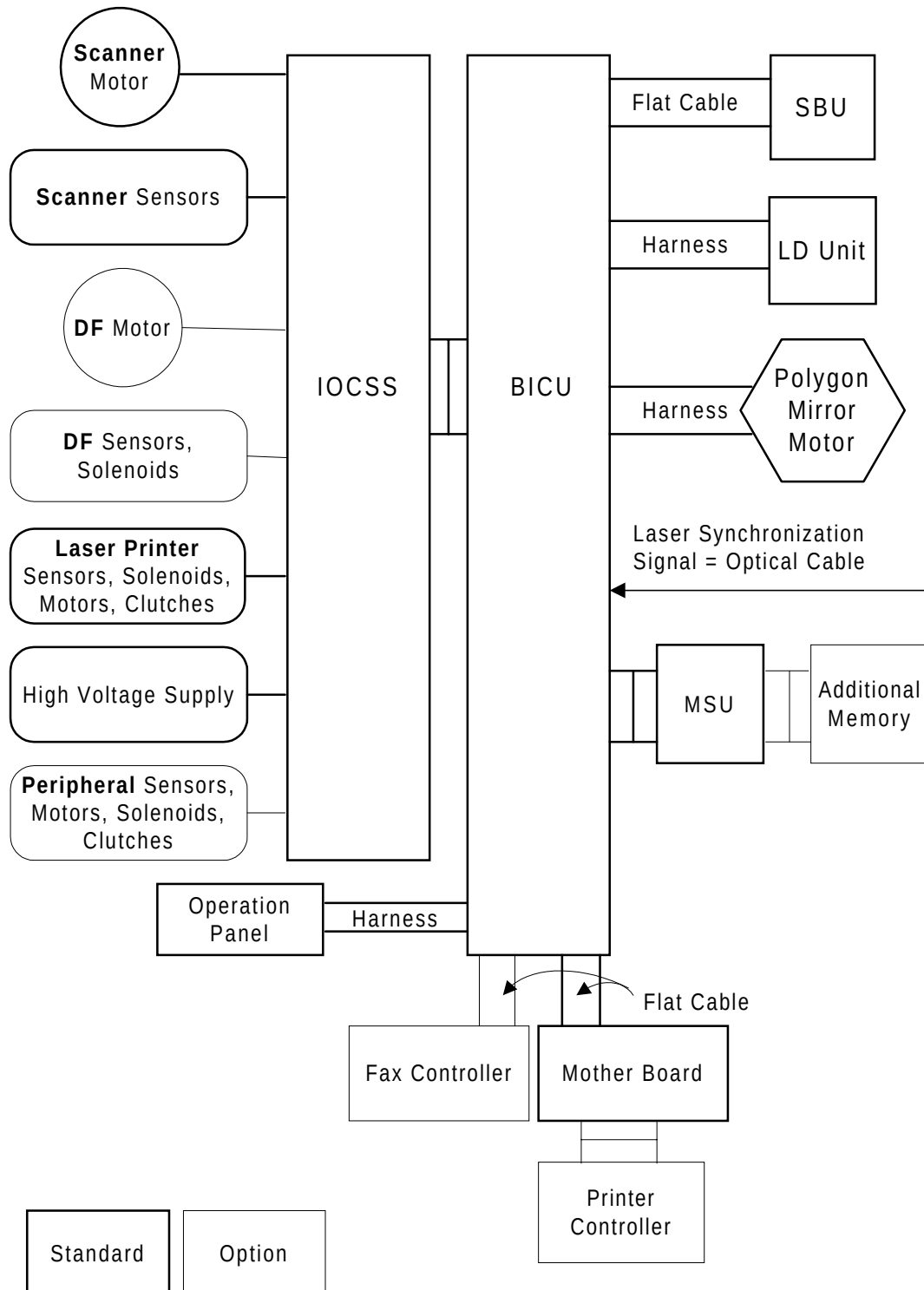
The cleaning blade removes any toner remaining on the drum surface after the image is transferred to the paper.

8. QUENCHING

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

8. BOARD STRUCTURE

8.1 OVERVIEW



8.2 DESCRIPTION

1. BICU (Base Engine and Image Control Unit)

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

- Engine sequence
- Scanner, laser printer engine
- Timing control for peripherals
- Image processing, video control
- Operation control
- Corresponding application boards
- Machine control, system control

2. IOCSS (I/O and Customer Support System Unit)

The IOCSS board handles the following functions:

- Drive control for the sensors, motors, solenoids of the printer and scanner
- PWM control for the high voltage control board
- Serial interfaces with peripherals
- Circuit for fusing control

3. SBU (Sensor Board Unit)

The SBU deals with the analog signals from the CCD and converts the analog signals into digital signals.

4. MSU (Memory Super-charger Unit)

The MSU stores and compresses the image data. It also performs the image editing on the data if requested by the user. An extra 4 MB or 8 MB of memory can be added (see below).

5. Additional Memory (Option)

This is an additional image memory board for the MSU.

6. LD Unit

This is the laser diode drive circuit board. It controls the laser diode drive circuit to write the latent image onto the surface of the drum.

7. Mother Board

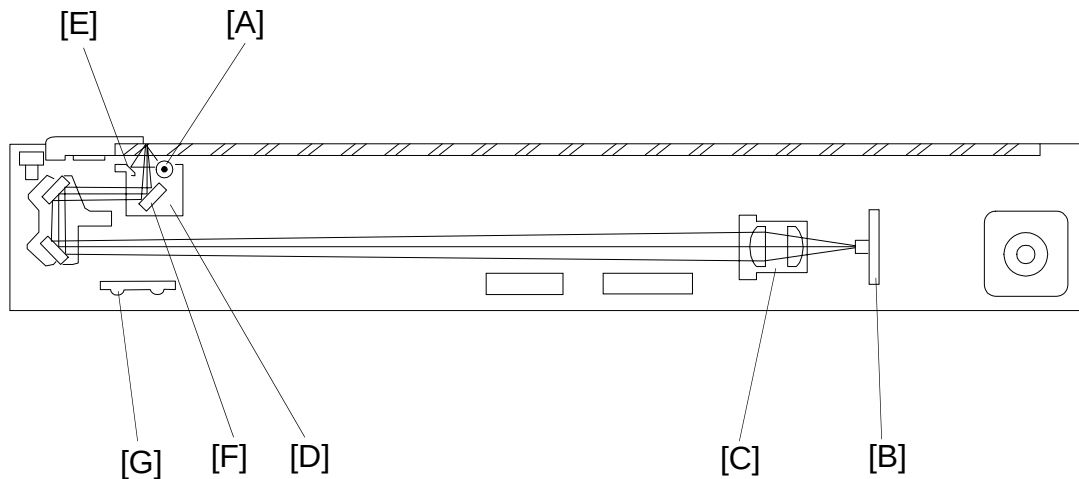
The printer control board which works in conjunction with the BICU interface board. It receives the signals from the printer control board and sends signals to the printer control board.

SECTION 2

DETAILED SECTION DESCRIPTIONS

1. SCANNING

1.1 OVERVIEW


 Detailed
Descriptions

The original is illuminated by the exposure lamp (a xenon lamp in this model) [A]. The image is reflected onto a CCD (charge coupled device) [B] via the 1st, 2nd, 3rd mirrors, and lens [C].

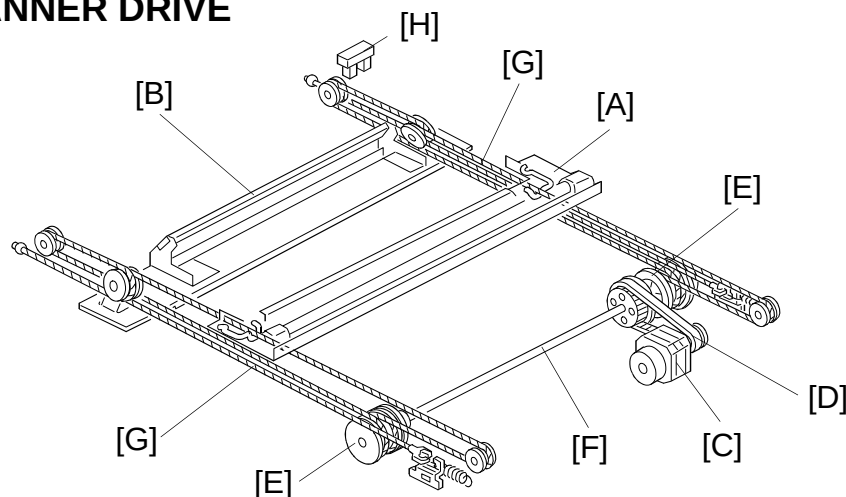
The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

The exposure lamp is energized by a dc supply to avoid uneven light intensity as the 1st scanner moves in the sub scan direction. The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction.

The light reflected by the reflector is of almost equal intensity, to reduce shadows on pasted originals.

An optics anti-condensation heater [G] is available as an option. It can be installed on the left side of the inner cover. The heater will turn on whenever the power cord is plugged in.

1.2 SCANNER DRIVE



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

– Book mode –

The scanner drive board controls and operates the scanner drive motor. In full size mode, the 1st scanner speed is 90 mm/second during scanning. The 2nd scanner speed is half that of the 1st scanner. (45mm/second)

In reduction or enlargement mode, the scanning speed depends on the magnification ratio (M: 0.25 to 4.00). The return speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the BICU board.

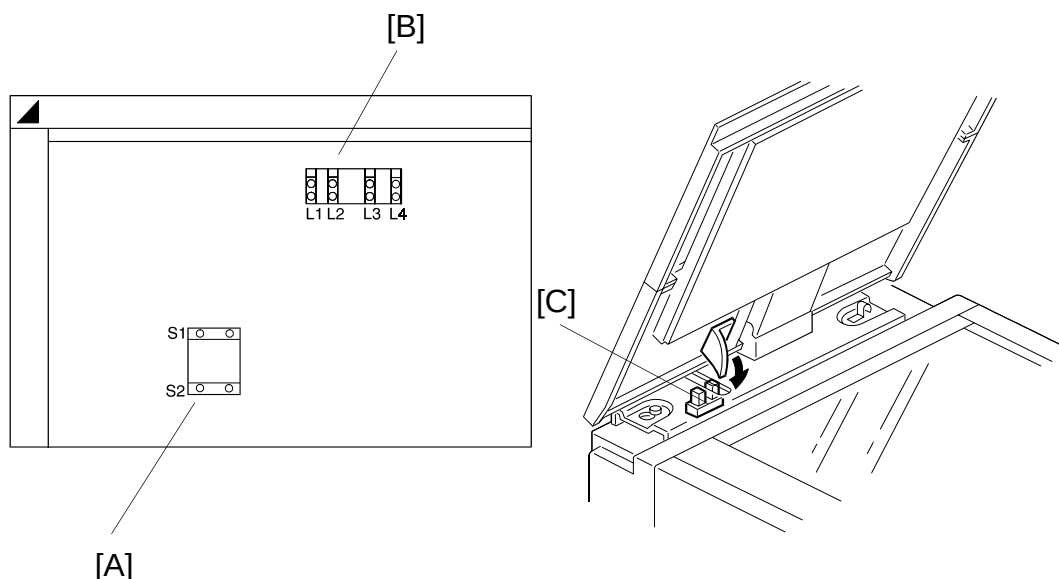
Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-101. Magnification in the main scan direction can be adjusted using SP4-008. Refer to section 4.2.2.

– ADF mode –

The scanners are kept at their home position (the scanner H.P. sensor [H] detects the 1st scanner) to scan the original. The ADF motor feeds the original through the ADF. In reduction/enlargement mode, the image length change in the sub-scan direction is performed by changing the ADF motor speed. Magnification in the main scan direction is performed in the BICU board, same as the book mode.

Magnification in the sub-scan direction can be adjusted by changing the ADF motor speed using SP6-007. In the main scan direction, it can be adjusted with SP4-008, like for book mode. Refer to section 4.2.2.

1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE



Detailed
Descriptions

In the optics to identify the size of the original placed on the exposure glass, there are four (4) reflective sensors in the 115V machines, and six (6) reflective sensors in the 230V machines. The Original Width Sensors [A] detect the original width, and the Original Length Sensors [B] detect the original length. These are the APS (Auto Paper Select) sensors. Each APS sensor is a reflective photosensor.

While the main switch is on, these sensors are active and the original size data is always sent to the CPU. However, the CPU will only check the data from the sensors only when the platen cover is in the process of being closed.

The original size data is sent to the main CPU when the platen cover sensor [C] is activated. This is when the platen is positioned about 15 cm above the exposure glass. At this time, only the sensor(s) located underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU will identify the original size from the on/off signals from the APS sensors.

If the copy is made with the platen fully open, the main CPU will identify the original size from the sensor outputs when the Start key is pressed.

Original Size		Length Sensors				Width Sensors	
A4/A3 version	LT/DLT version	L1	L2	L3	L4	S1	S2
A3	11" x 17"	O	O	O	O	O	O
B4	10" x 14"	O	O	O	O	O	X
F4	8 1/2" x 14" (8" x 13")	O	O	O	X	X	X
A4-L	8 1/2" x 11"	O	O	X	X	X	X
B5-L	—	O	X	X	X	X	X
A4-S	11" x 8 1/2"	X	X	X	X	O	O
B5-S	—	X	X	X	X	O	X

O: ON X: OFF

NOTE: The length sensors L3 and L4 are used only for 230V machines.

For other combinations, the message "CANNOT DETECT ORIG. SIZE" will be displayed on the operation panel display.

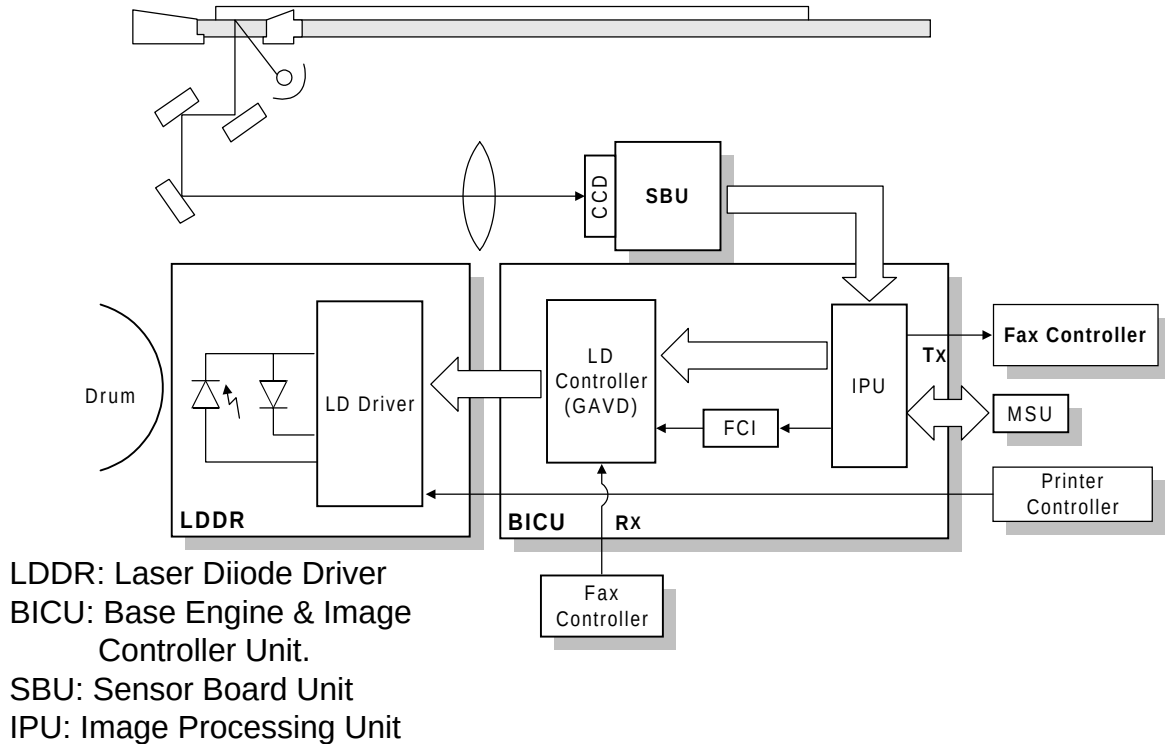
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan cycle and increases the machine's productivity.

⇒ However, if the by-pass feeder is used, note that the machine assumes that the copy paper is lengthwise. For example, if A4 sideways paper is placed on the by-pass tray, the machine assumes it is A3 paper and scans the full A3 area, disregarding the original size sensors. However, in this machine, for each page, the data signal to the laser diode is stopped to match the copy paper length detected by the registration sensor.

Original size detection using the ADF is described in the manual for the ADF.

2. IMAGE PROCESSING

2.1 OVERVIEW



Detailed Descriptions

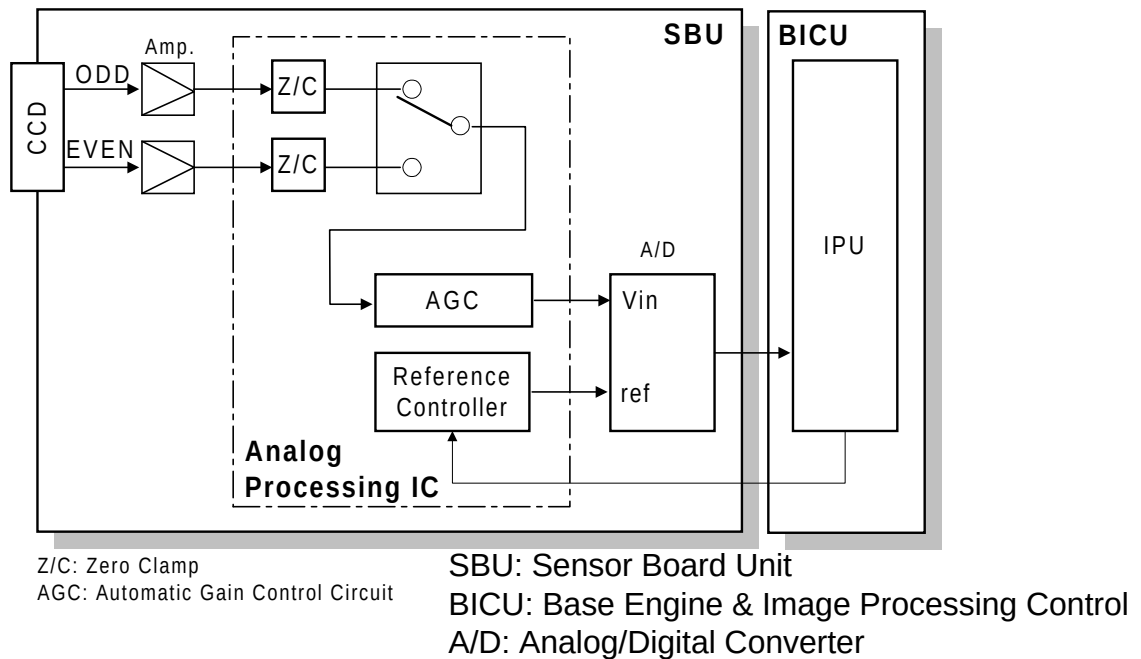
The CCD (Charged Couple Device) generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal into the BICU (Base-engine and Image Control Unit) board.

The BICU board can be divided into three image processing blocks; the IPU (Image Processing Unit), FCI (Fine Character Image), and LD controller GAVD (Gate Array Video Drive)

- IPU: Auto shading, filtering, magnification, γ correction, and gradation processing
- FCI: Smoothing (binary picture processing mode only)
- LD controller: LD print timing control and laser power PWM (Pulse Width Modulation) control

On completion, the BICU board sends the video data to the LD drive board at the proper exposure time.

2.2 SBU (SENSOR BOARD UNIT)



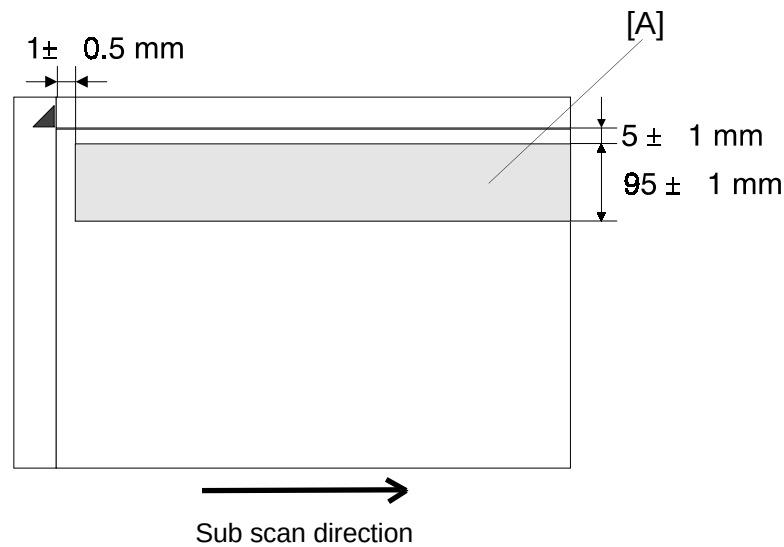
The CCD converts the light reflected from the original into an analog signal. The CCD line contains 5,000 pixels and the resolution is 400 dpi (15.7 lines/mm).

The CCD has two output lines, for odd and even pixels, which are sent to the analog processing IC. The analog processing IC performs the following operations on the signals from the CCD:

- 1) Z/C (Zero Clamp):
Adjusts the black level reference for even numbered pixels to match black level of the numbered odd pixels.
- 2) Signal Composition:
Analog signals for odd and even pixels from the CCD are merged by a switching device.
- 3) Signal Amplification
The analog signal is amplified by operational amplifiers in the AGC circuit. The maximum gains of the operational amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted into 8-bit signals by the A/D converter. This will give a value for each pixel on a scale of 256 grades. Then, the digitized image data will be sent to the BICU board.

2.3 AUTO IMAGE DENSITY (ADS)



Detailed
Descriptions

The auto image density (ADS) mode prevents the background of an original from appearing on copies.

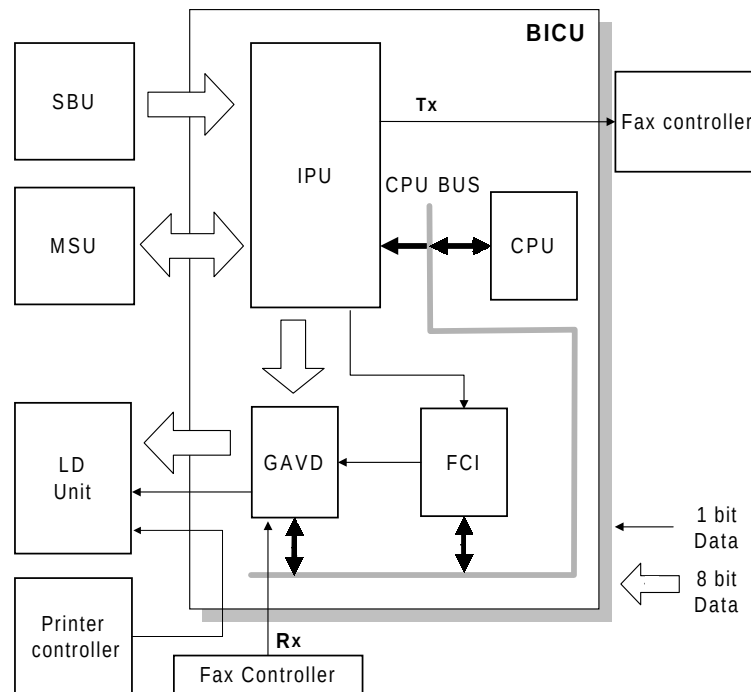
The copier scans the auto image density detection area [A] as shown in the diagram. This corresponds to a few mm at one end of the main scan line. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line. The IPU determines the reference value for the A/D conversion for a particular scan line using the peak white level for that scan line. Then, the IPU sends the reference value data to the reference 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 while scanning down the page.

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

2.4 IPU (IMAGE PROCESSING UNIT)

2.4.1 Overview

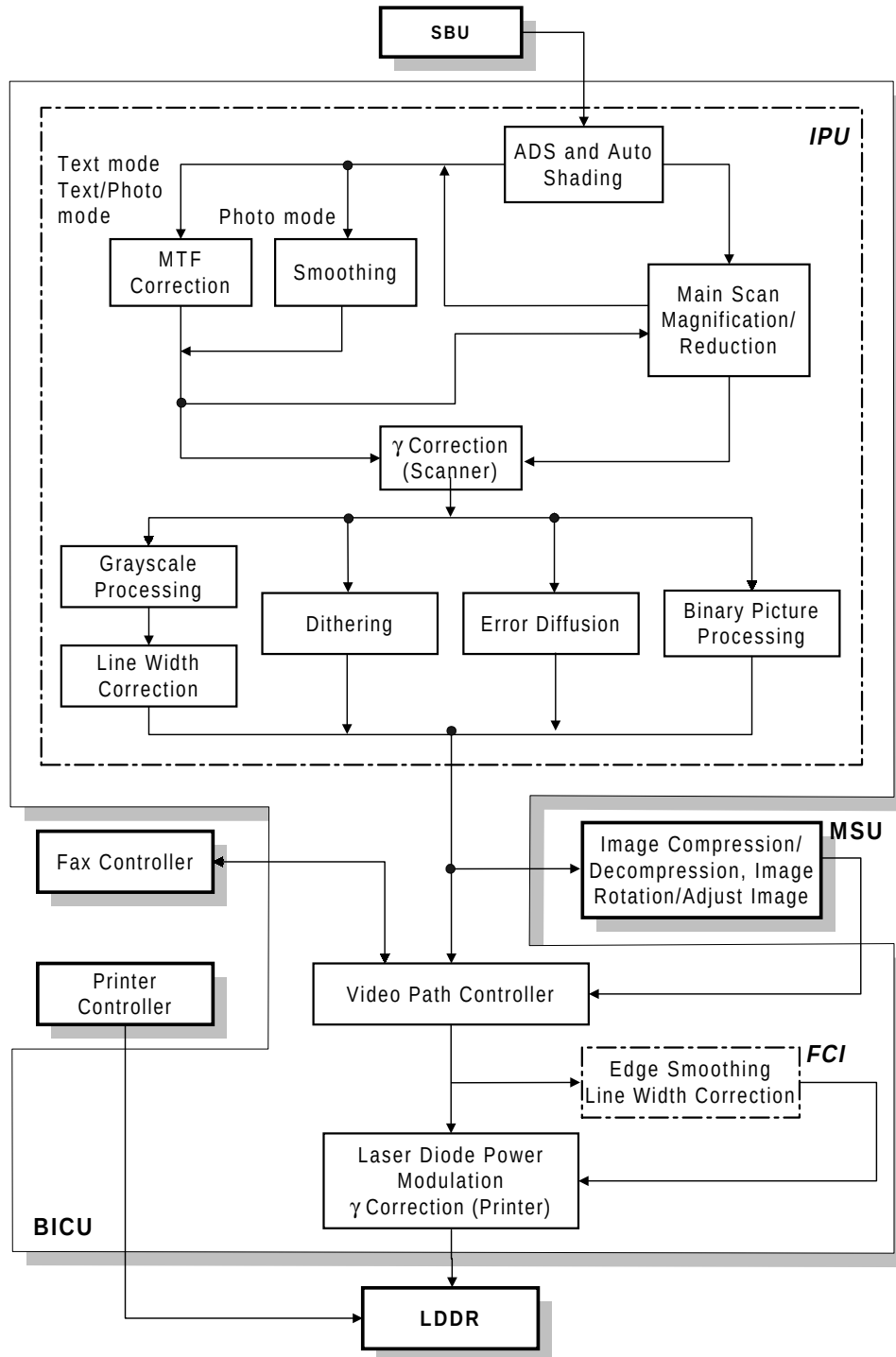


The image data from the SBU (Sensor Board Unit) is sent to the IPU (Image Processing Unit) IC on the BICU board, which can perform any of the following processes on the image data:

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

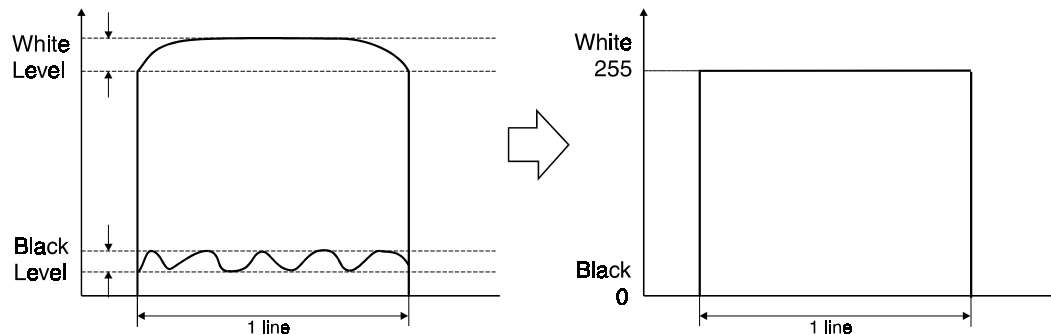
The image data then goes to either the LD controller (GAVD) or the FCI depending on the selected copy modes.

2.4.2 Image Processing Path



Detailed
Descriptions

2.4.3 Auto Shading



There are two different auto shading methods, black level correction and white level correction. Auto shading corrects errors in the signal level for each pixel.

1) Black Level Correction

The CPU reads the black level from the dummy pixels located at one end of the CCD signal (64 pixels at the end are blacked off) and takes the average value of the black dummy data. Then, the CPU deletes the black level value from each image pixel.

2) White Level Correction

Before scanning the original, the machine reads a reference waveform from the white plate. The average of the white video level for each individual pixel is stored as the white shading data in the FIFO memory in the IPU chip.

The video signal information for each pixel obtained during image scanning is corrected by the IPU chip.

In book mode, auto shading is done at the beginning of each scan.

In ADF mode, auto shading is done at a specific time interval. This interval can be set with SP4-913 (the default setting is 30 seconds). The machine waits until the end of the page before performing the auto shading.

2.4.4 Filtering and Main Scan Magnification/Reduction

1. Overview

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

- 1) Reduction and Full size
Main Scan Reduction → Filtering
- 2) Enlargement
Filtering → Main Scan Magnification

2. Filtering

There are two software filters for enhancing the desired image qualities of the selected original mode: the MTF filter and the smoothing filter.

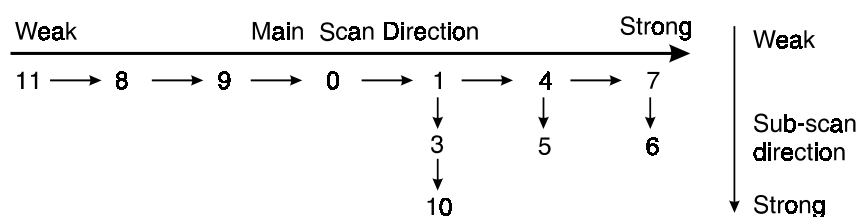
The MTF filter emphasizes sharpness and is used in Text and Text/Photo modes. The smoothing filter is used in Photo mode.

The relationships between the coefficient of the filter and the filter strengths are as follows. Note that these relationships are for copier mode only. Fax mode has its own unique table. (Refer to the fax section of the service manual)

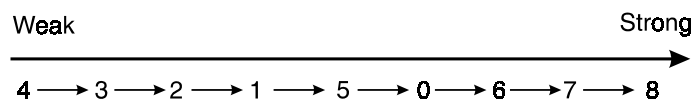
The filter strengths for each mode can be adjusted using the service program mode, SP4-407.

NOTE: Never select "1." Abnormal images may result.

- MTF Filter -



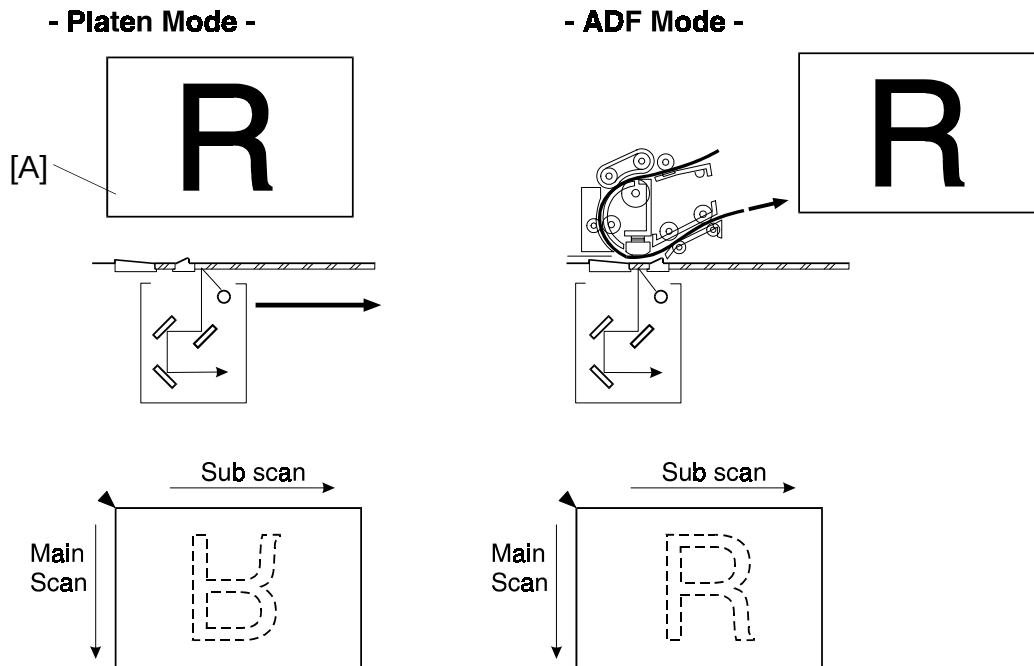
- Smoothing Filter -



Note: The value is the filter number

3. Main Scan Magnification/Reduction

Reduction and enlargement in the sub scan direction are done by changing the scanner speed. However, reduction and enlargement in the main scan direction are handled by the IPU chip. The processing for main scan magnification/reduction is the same as in the previous digital machines.



When making a copy using the ADF, the magnification circuit creates a mirror image. This is because the scanning starting position in the main scan direction is at the other end of the scan line in ADF mode (as compared with platen mode). In platen mode, the original is placed face down on the exposure glass, and the corner at [A] is at the start of the main scan. The scanner moves down the page. In ADF mode, the ADF feeds the leading edge of the original to the DF exposure glass, and the opposite top corner of the original is at the main scan start position.

To convert the mirror image, the CPU stores the main scan line data in the LIFO (Last In First Out) memory of the magnification block, from the last pixel. When loading the main scan line data from the LIFO memory, the CPU loads the first pixel of the main scan line.

2.4.5 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 data for the scanner gamma correction is fixed and stored in the memory. The printer gamma correction can be adjusted using the service program mode, SP 2-916.

2.4.6 Gradation Processing

These are four types of gradation processing:

- Grayscale processing: This has 64 output levels for each pixel, and is used only in one-to-one copy mode.
- Binary picture processing: This has only two output levels (black and white), and is used in memory copying (e.g., multiple copy, rotate sort, and editing image) and facsimile transmission.
- Error diffusion: In Text/Photo mode, this is used with either grayscale processing or binary processing.
- Dithering: In Photo mode, this is used with either grayscale processing or binary processing.

These four processes are used as follows.

1) Grayscale processing mode

Text mode:	Grayscale processing
Text/Photo mode:	Grayscale processing + error diffusion
Photo mode:	Grayscale processing + dithering

2) Binary picture processing mode

Text mode:	Binary picture processing
Text/Photo mode:	Binary picture processing + error diffusion
Photo mode:	Binary picture processing + dithering

Copying using the memory (e.g., multiple copying) and fax mode always use binary picture processing. (Users requiring grayscale mode output for multiple copies will have to make a succession of one-to-one copies.)

For one-to-one copying, the processing mode used depends on the setting of the service program mode, SP 4-403. The factory setting is for grayscale processing.

1. Grayscale Processing

As stated on the previous page, the gray scale process generates up to 64 image density levels for each pixel. To realize this, this machine uses a form of pulse width modulation. Pulse width modulation consists of the following processes:

- Laser diode pulse positioning (Horizontal)
- Laser diode power/pulse width modulation (Vertical)

Laser diode power and pulse width modulation is done by the laser diode drive board (LDDR), and will be explained in the Laser Exposure section. Briefly, the width of the laser pulse for a pixel depends on the output level (from 0 to 63) of the pixel.

For each pixel, the location of the active (laser on) part of the pixel can be either at the left side of the pixel, at the center, or at the right side (see fig 2). The machine determines which method to use depending on the settings of the service program mode, SP 2-903. There are different settings for pixels at the left edge, at the right edge, and in the middle of a series of black/grey pixels across the main scan, and for single black pixels with white pixels at the left and right. The edges of characters and lines become clearer and sharper with this processing.

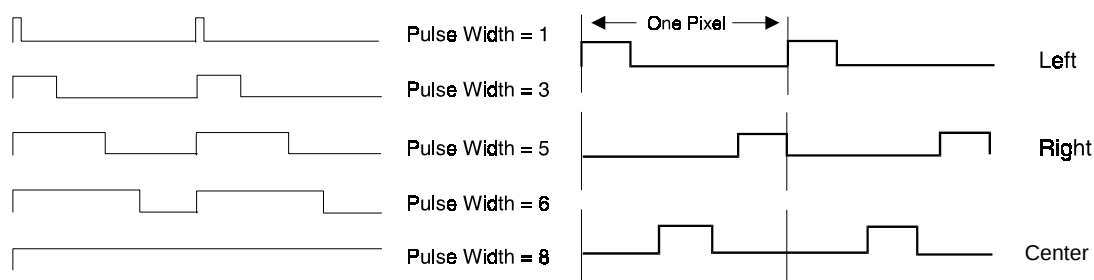


Fig. 1

Fig. 2

2. Binary Picture Processing

Each video signal level is converted from 8-bit to 1-bit (black and white image data) in accordance with a threshold value.

The threshold value can be adjusted using service program mode, SP 4-418.

The printout density of the black pixel depends on the pixel type (left, center, or right of a series, or isolated, in the same way as for grayscale processing). These values can be adjusted using service program mode, SP2-904.

3. Error Diffusion

Error Diffusion is used only in Text/Photo mode.

The error diffusion process 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 compared with a error diffusion matrix. Separate error diffusion matrixes are used for copy mode and fax mode.

1) Grayscale processing mode

The output image signal level has 9 levels (from white to black). There is only one matrix available.

2) Binary picture processing mode

The output image signal level has just 2 levels (white and black). The threshold level can be changed using the service program mode, 418-2.

4. Dithering

Dithering is only used in Photo mode.

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

1) Grayscale processing mode

The matrix type can be selected using the service program mode, 421-1 or the user tool program mode.

2) Binary picture processing

The matrix type can be selected using the service program mode, 421-2 or the user tool program mode.

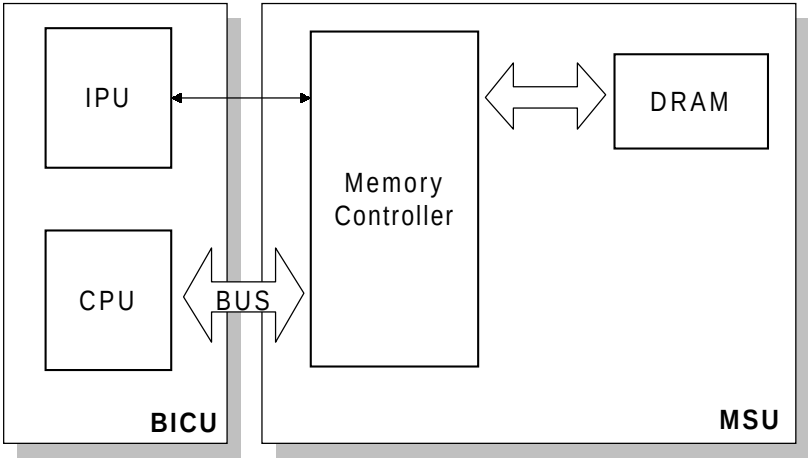
2.4.7 Line Width Correction

This function is effective only in Letter mode.

Usually, lines will bulge in the main scan direction as a result of the negative/positive development system that is used in this machine. So, the pixels on the edges between black and white areas are compared with their adjacent pixels, and if the pixel is on a line, the line thickness will be reduced.

The line width correction in grayscale processing mode is done in the IPU, and in binary processing mode, it is done in the FCI chip.

2.5 MSU (MEMORY SUPER-CHARGER UNIT)



The MSU consists of the memory controller and the DRAM. The functions of each device are as follows.

- Memory Controller:
- Compressing the 1-bit image data
Image rotation
Image data transfer to the DRAM
- DRAM (standard 4MB):
- Stores the compressed data (2 MB)
Working area (2 MB)

The data which was treated with binary picture processing is sent to the MSU. The data is first compressed using the MMR (modified modified read) process and the compressed data is stored in the DRAM. When printing, the data from the DRAM goes back to the memory controller, where the data is decompressed and image editing is performed (e.g., image rotation, repeat image, combine image).

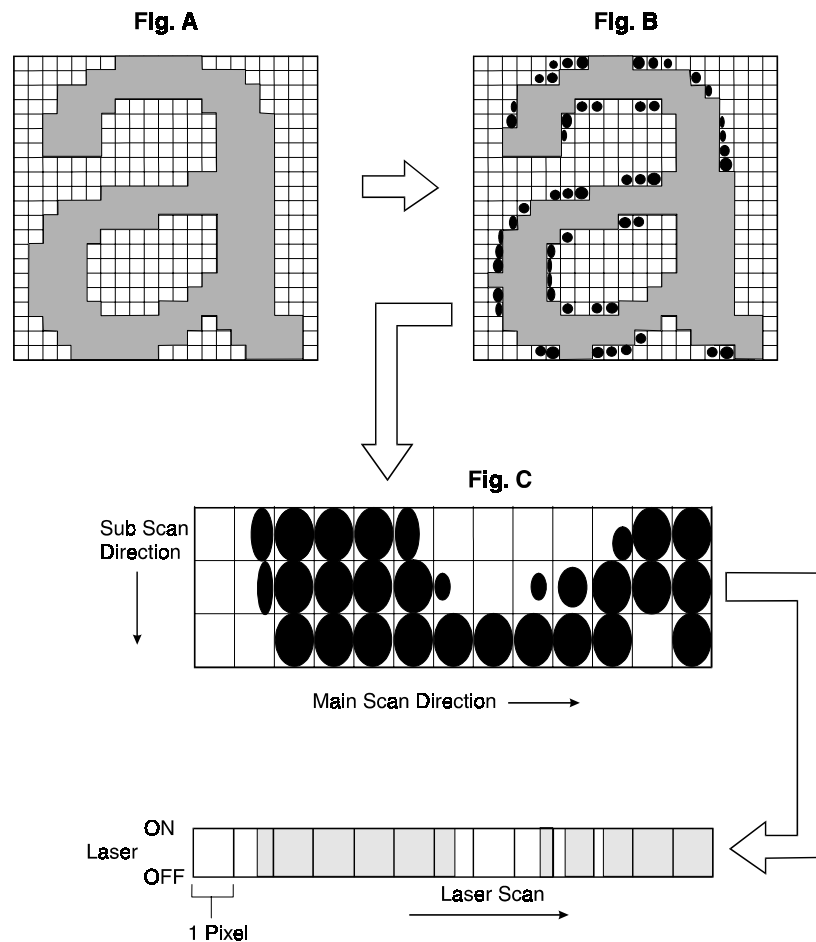
The memory capacity changes when optional memory is installed onto the MSU board. The copier functions for each memory combination are as follows.

		Standard (4 MB)	Optional 4 MB	Optional 8 MB
Multi duplex copy		X	O	O
Sort, Rotate Sort	A4, LT	O	O	O
	B4, LG	X	O	O
	A3, DLT	X	O	O
Number of pages	A4 6%	35	99	99
	ITU-T#4 (12% black)	15	45	75

X: Not Available O: Available

2.6 FCI (FINE CHARACTER AND IMAGE)

The FCI performs image smoothing and line width correction. These functions only affect binary picture processed images in Letter mode. The fax board and the printer controller each have independent smoothing circuits.



Detailed
Descriptions

Usually, binary picture processing generates jagged edges on characters as shown in the above left illustration. The FCI reduces jagged edges of characters using the image smoothing process.

Whether or not the object pixel undergoes smoothing depends on the surrounding image data. The smoothing process for the object pixel is performed by changing the laser pulse positioning and the laser power.

FCI smoothing can be switched on or off using the service program mode, SP 2-902.

3. LASER EXPOSURE

3.1 OVERVIEW

This machine uses a laser diode to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum surface.

To produce a high quality copy image, there are 64 gradations for the laser pulses, controlled through power modulation and pulse width modulation.

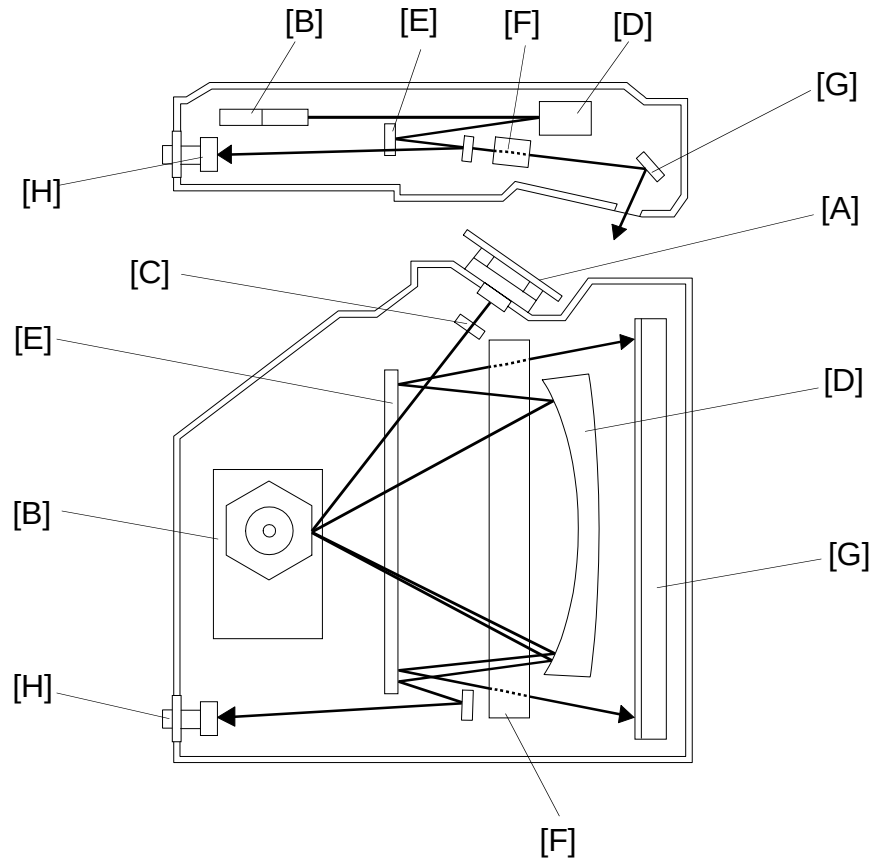
Exposure of the drum surface by the pulsing laser beam creates the latent image. The laser beam creates the main scan while the drum rotation controls the sub scan.

The strength of the beam is 0.6 mW on the drum surface at a wavelength of 780 nm.

There are four polygon motor speeds:

Resolution (dpi)	Modes	Motor Speed (rpm)	Data Frequency (MHz)
⇒ 400 dpi	Copy and Printer	14173.23	9.276
600 dpi	Printer	21259.84	20.872
391.16 dpi	Fax (Image rotation)	13860.00	9.216
406.4 dpi	Fax (mm printing)	14400.00	9.216

3.2 OPTICAL PATH



Detailed
Descriptions

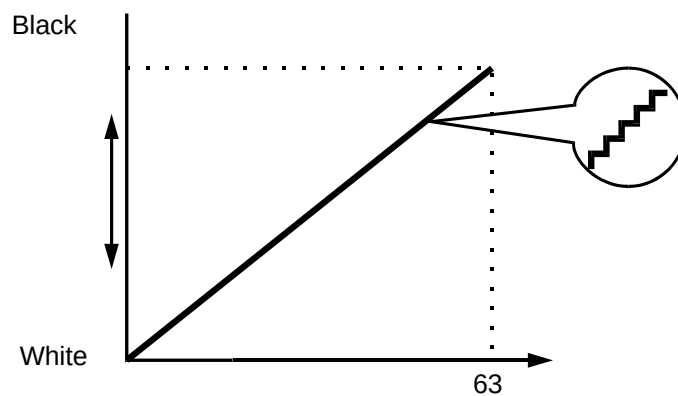
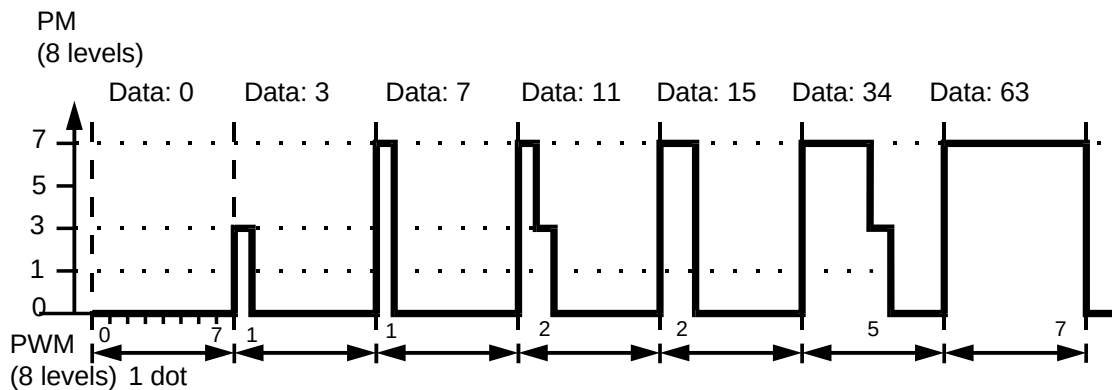
The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs pulsing the laser beam to the rotating polygon mirror [B] through the cylindrical lens [C].

Each surface of the polygon mirror reflects a full main scan line. The laser beam goes to the F-theta mirror [D], 1st mirror [E], and BTL (Barrel Toroidal Lens) [F]. The 2nd mirror [G] reflects the laser beam onto the surface of the drum through the toner shield glass.

The laser synchronizing detector [H] is used to determine the main scan starting position.

3.3 GRADATION CONTROL (LASER POWER MODULATION)

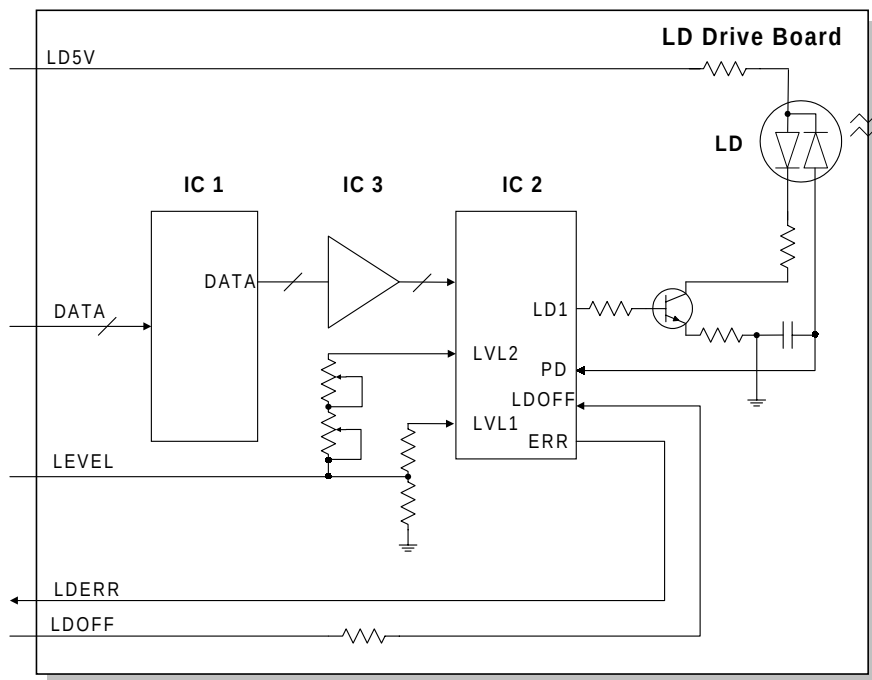


To create the latent image, the laser beam illuminates the image area of the drum surface. The longer the laser is on and the stronger its intensity is, the darker the developed pixel becomes. Modulating (changing) the width of the pulse changes the on time of the laser longer or shorter (PWM). There are eight pulse width levels in this machine.

While the laser is on to make one dot, the intensity of the laser is controlled by power modulation (PM). The laser's intensity is controlled by the amount of current sent to the laser diode. Modulating the power makes the laser brighter or dimmer. There 8 power levels, or laser intensity levels. The power is modulated only on the final part of the laser pulse (example: see data 11 in the diagram).

The machine uses the 8 pulse width levels and 8 power levels to create the 64 possible grayscale values for each pixel.

3.4 AUTO POWER CONTROL (APC)



Detailed
Descriptions

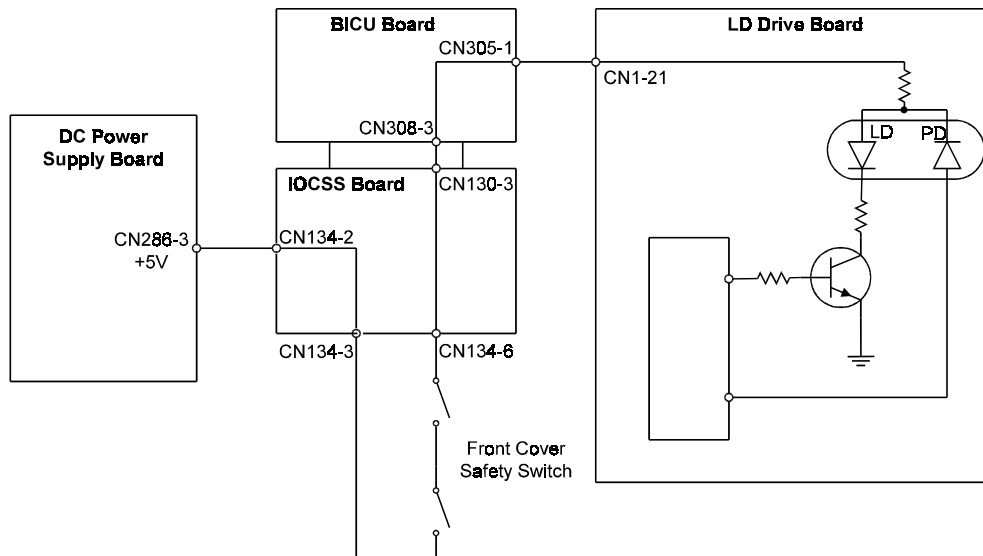
Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to maintain a constant output level, the output light intensity is monitored through a photodiode (PD) enclosed in the laser diode. The photodiode passes an electrical current that is proportional to the light intensity. The output is not affected by temperature, so it faithfully reflects the changes in the LD output, without adding anything itself.

Just after the machine is turned on, IC2 on the laser drive board excites the laser diode at full power and the output of the photodiode is stored as a reference in IC2. IC2 monitors the current passing through the photodiode (PD). Then it increases or decreases the current to the laser diode as necessary, comparing it with the reference level (LVL2). Auto power control is performed during printing while the laser diode is active.

The laser diode level is adjusted on the production line. Do not touch the variable resistors on the LD unit in the field.

3.5 LD SAFETY SWITCHES

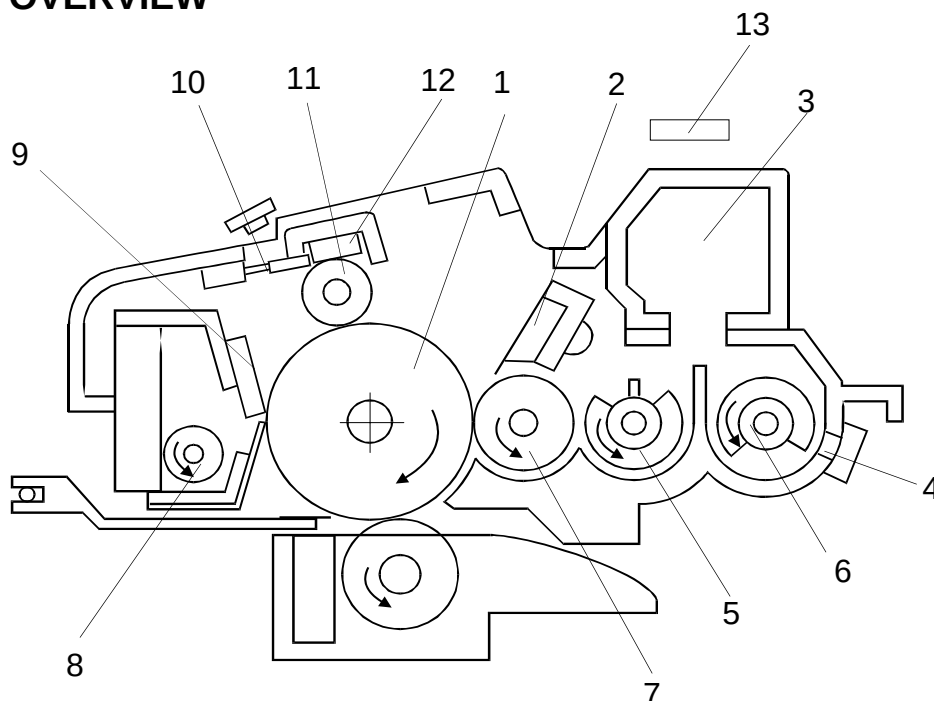


To ensure that the laser beam does not inadvertently expose the drum during servicing, there are two safety switches located at the front cover. The two switches are installed in series on the LD5 V line from the dc power supply board.

When the front cover is opened, the power supply to the laser diode is interrupted.

4. PCU (PHOTOCONDUCTOR UNIT)

4.1 OVERVIEW



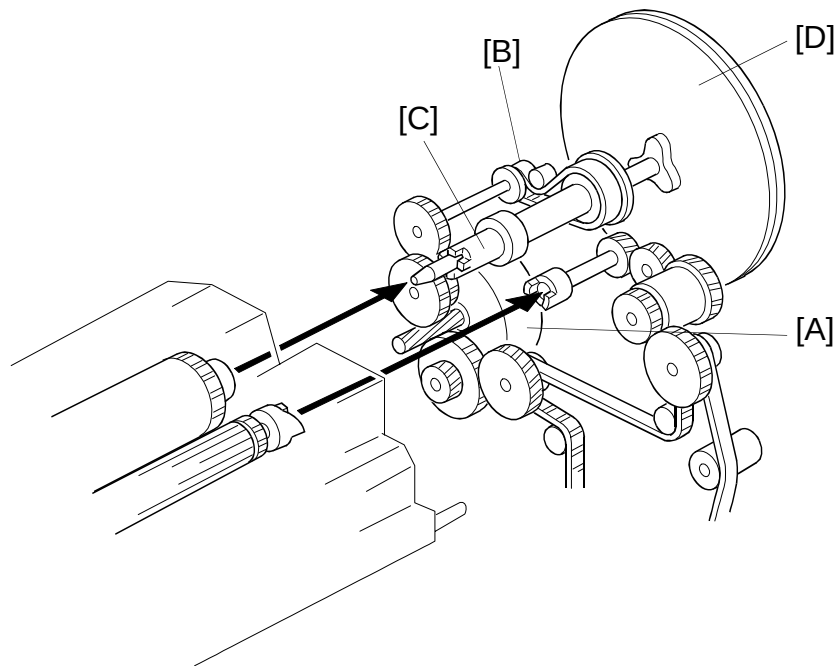
Detailed
Descriptions

The PCU consists of the components shown in the above illustration. An organic photoconductor (OPC) drum (diameter: 30 mm) is used in this machine.

1. OPC Drum (CW)	8. Toner Collection Coil (CCW)
2. Doctor Blade	9. Cleaning Blade
3. Developer Cartridge	10. Charge Roller Thermistor
4. TD Sensor	11. Charge Roller (CCW)
5. Mixing Auger 1 (CCW)	12. Charge Roller Cleaning Pad
6. Mixing Auger 2 (CCW)	13. Humidity Sensor
7. Development Roller (CCW)	

The output of the humidity sensor is used for toner density control processing.

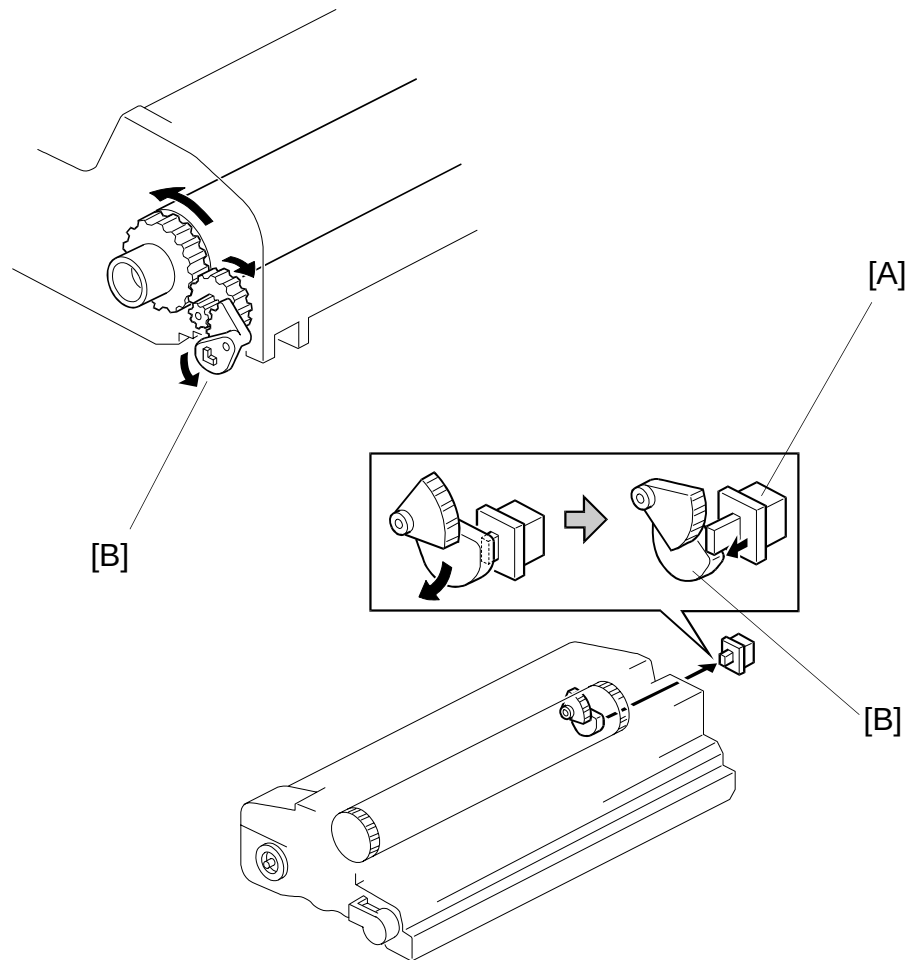
4.2 DRIVE MECHANISM



The drive from the main motor [A] is transmitted to the drum through a series of gears, a timing belt [B], and the drum drive shaft [C]. The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheels (2) [D] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter of the image from appearing on copies).

4.3 NEW PCU DETECTION MECHANISM



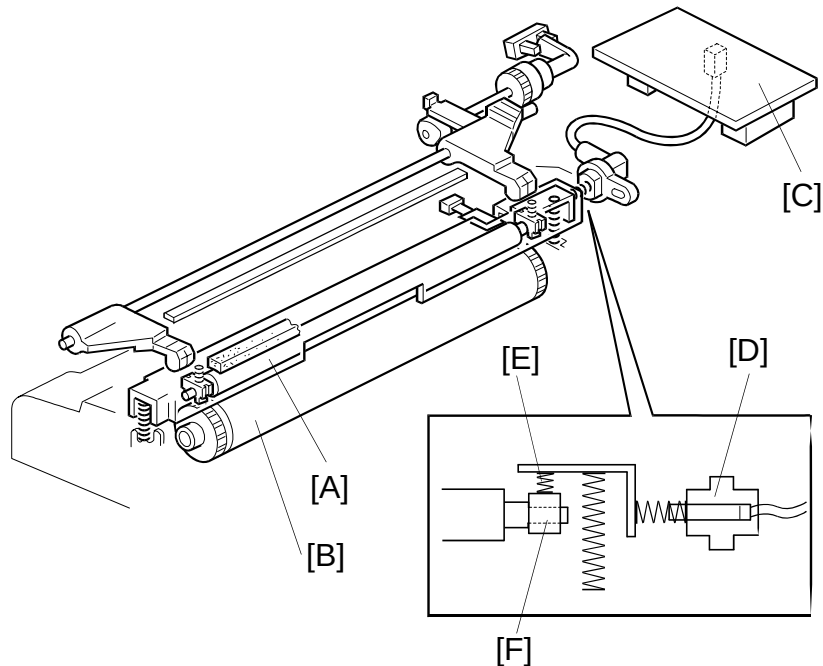
Detailed
Descriptions

The PCU sensor (a push switch) [A] detects when a new PCU is installed. Each PCU has an actuator. When a new PCU is installed in the machine, the actuator [B] pushes the PCU sensor. The actuator is a sector gear, and this gear engages with the drum gear. When the drum rotates, the actuator is released from the drum gear. The actuator drops away from the PCU sensor and remains in this "down" position for the duration of the PCU's life.

The machine recognizes when a new PCU has been installed in the machine because the actuator of the new PCU contacts the PCU sensor. After the front cover is closed, the machine then performs the TD sensor initial setting procedure automatically (for about two minutes). During this time, the drum rotates and the actuator drops away from the sensor.

4.4 DRUM CHARGE

4.4.1 Overview



This copier uses a drum charge roller system instead of a corona wire scorotron system to charge the drum. For the copy image area or during roller cleaning, the drum charge roller [A] contacts the surface of the drum [B] to give it a negative charge.

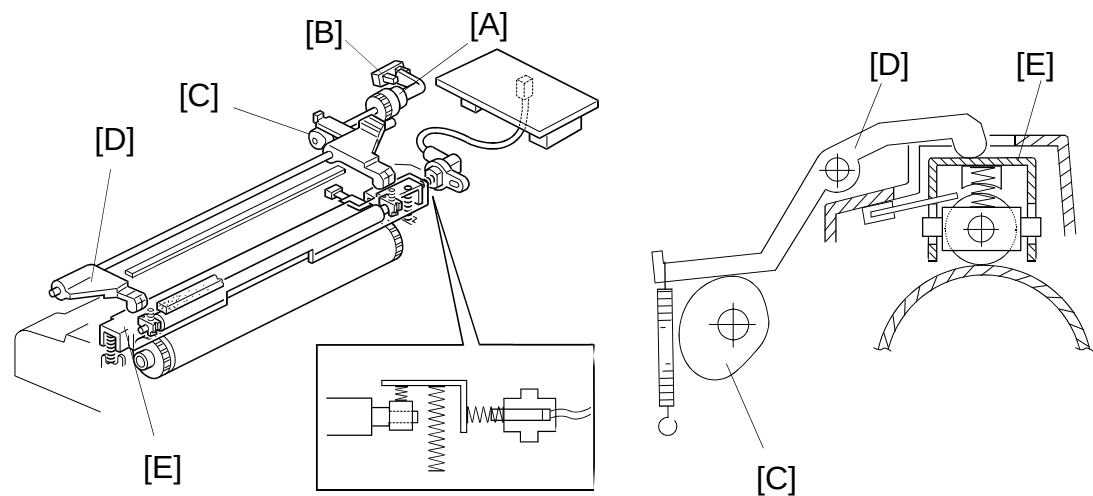
The drum charge roller system has the following advantages over the corona wire scorotron charge system.

- The amount of ozone generated during drum charging is less than about 1/10 of that for a corona wire scorotron system.
- The applied voltage is 1/2 ~ 1/3 that of a corona wire scorotron system.
- The efficiency of drum charge is high.

Due to these advantages, no ozone filter is required in this copier.

The high voltage supply board [C] provides a negative dc voltage to the drum charge roller through the charge roller terminal [D], rear pressure spring [E], and the rear roller bushing [F]. The charge roller will provide the drum surface with a negative charge of -900 V.

4.4.2 Charge Roller Contact Mechanism



Detailed
Descriptions

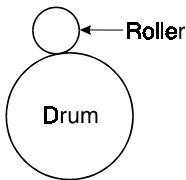
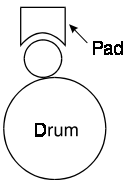
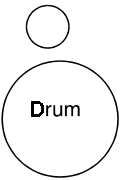
To prevent toner from adhering to the drum charge roller and to prevent the drum charge roller from sticking to the drum, the drum charge roller contacts the drum only under the following conditions:

- When the image processing area comes under the drum charge roller
- During charge roller cleaning

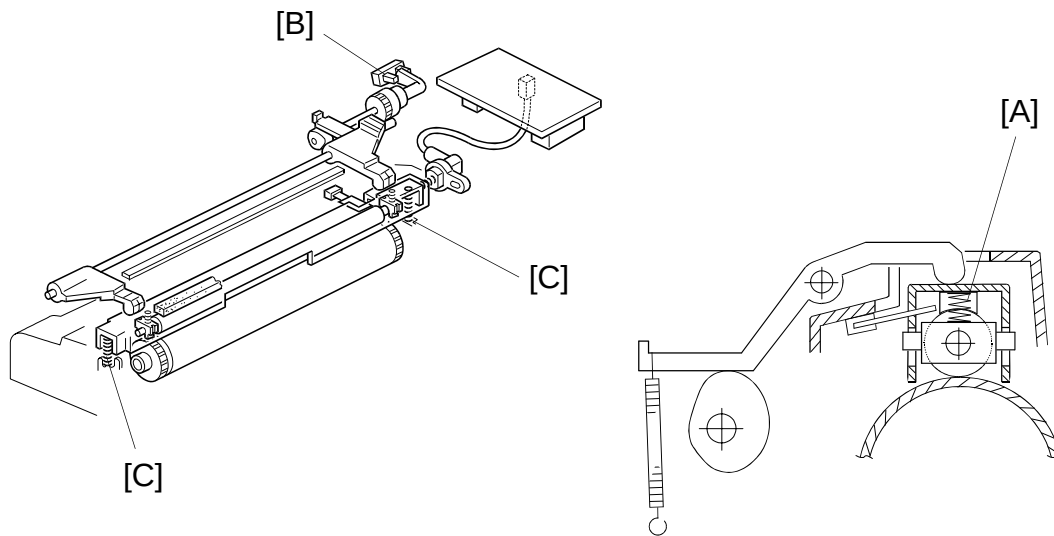
This function is performed by the charge roller contact clutch [A] (a one-third turn clutch) charge roller H.P. (home position) sensor [B], and cam [C] located at the end of the clutch shaft. When the clutch is driven one third of a complete rotation, the pressure lever [D] riding on the cam presses down the drum charge roller unit [E] downward to contact the roller with the drum.

When the drum charge roller contacts the drum, the drum charge roller is rotated by the drum.

The following table shows the relationship between the clutch rotation and each processing mode.

Mode	Copying	Cleaning (see next page)	Home Position
Clutch	1/3 turn	1/3 turn	1/3 turn
Charge Roller Position			
Charge Roller Contact H.P. Sensor	OFF	OFF	ON

4.4.3 Drum Charge Roller Cleaning



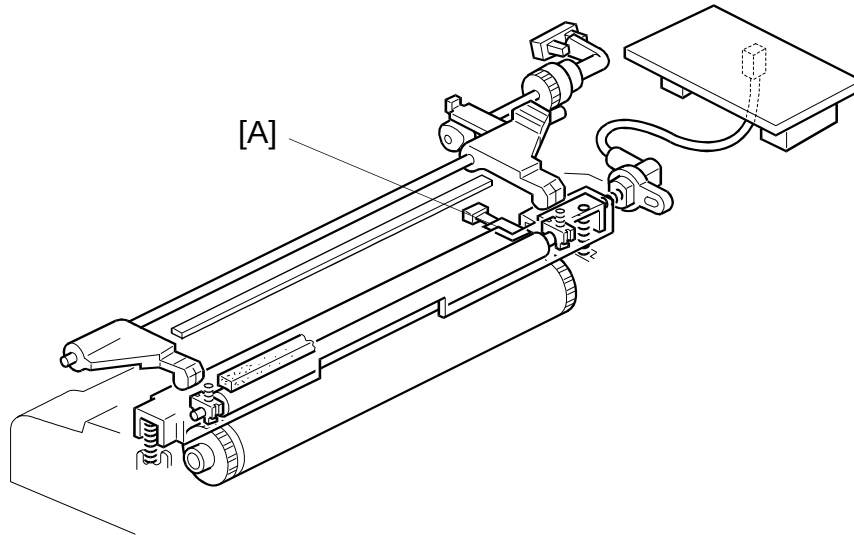
If the drum charge roller gets dirty, drum charge efficiency decreases. This affects the copy quality, for example causing vertical black lines.

Drum charge roller cleaning is performed for 2 seconds after every copy job.

After the copy job, the charge roller contact clutch is driven another third of a rotation (see the diagram at the bottom of the previous page). The pressure lever presses down further, so that the cleaning pad [A] contacts the charge roller.

After charge roller cleaning, the clutch is driven the final third of the rotation (until the charge roller H.P sensor [B] is activated) to release the charge roller from the drum. The pressure lever moves away from the charge roller unit. Then the charge roller unit is released from the drum by the spring [C].

4.4.4 Temperature Compensation



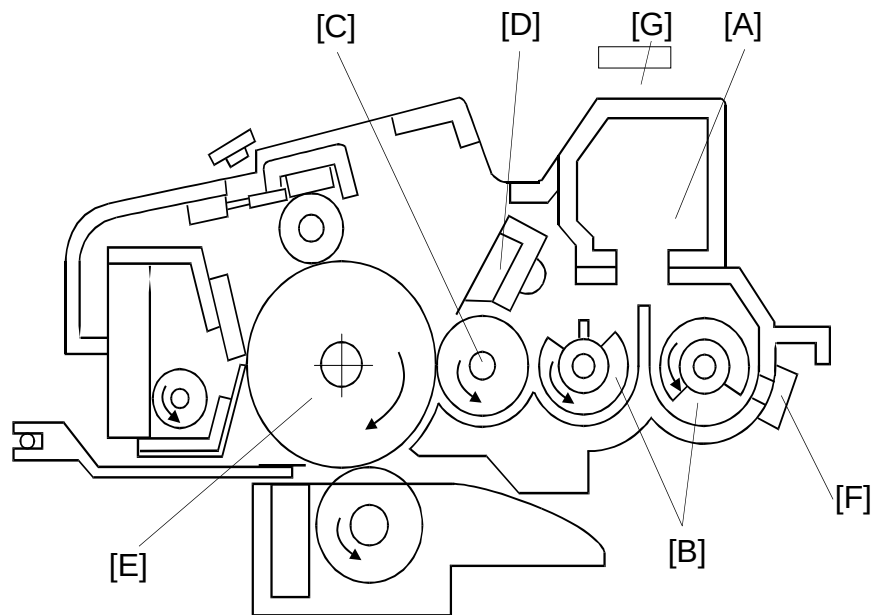
Detailed
Descriptions

The voltage transferred from roller to drum varies with the temperature around the drum charge roller. The lower the temperature is, the higher the applied voltage required.

To compensate for this, the drum charge thermistor [A] detects the temperature around the drum charge roller. Before the copy job starts, the CPU monitors the temperature and instructs the high voltage supply board to supply the correct the charge voltage in accordance with the temperature.

4.5 DEVELOPMENT

4.5.1 Overview

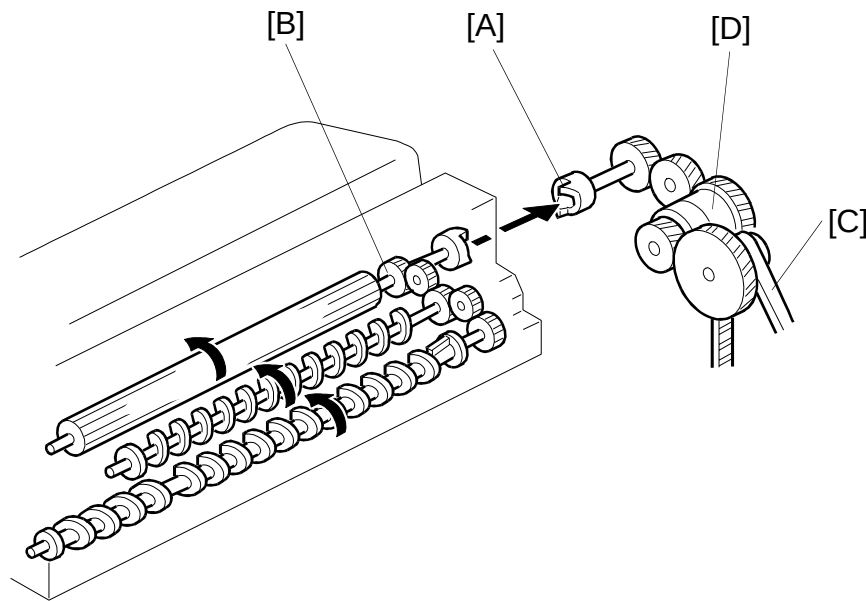


This copier uses a single roller development system.

The developer cartridge [A], which includes the developer, is located just above the development unit section of the PCU. At installation, the developer falls into the development unit. The mixing augers [B] transport the developer and toner to the development roller [C]. Internal permanent magnets in the development roller attract the developer to the development roller sleeve. The development roller carries the developer past the doctor blade [D]. The doctor blade trims the developer to the desired thickness and creates backspill into the mixing mechanism. The development roller continues to rotate, carrying the developer to the drum [E] where the latent image is developed.

The toner density sensor [F], located on the side of the development unit, measures the toner concentration in the developer. The humidity sensor [G] located above the development cartridge measures the humidity level around the drum.

4.5.2 Drive Mechanism

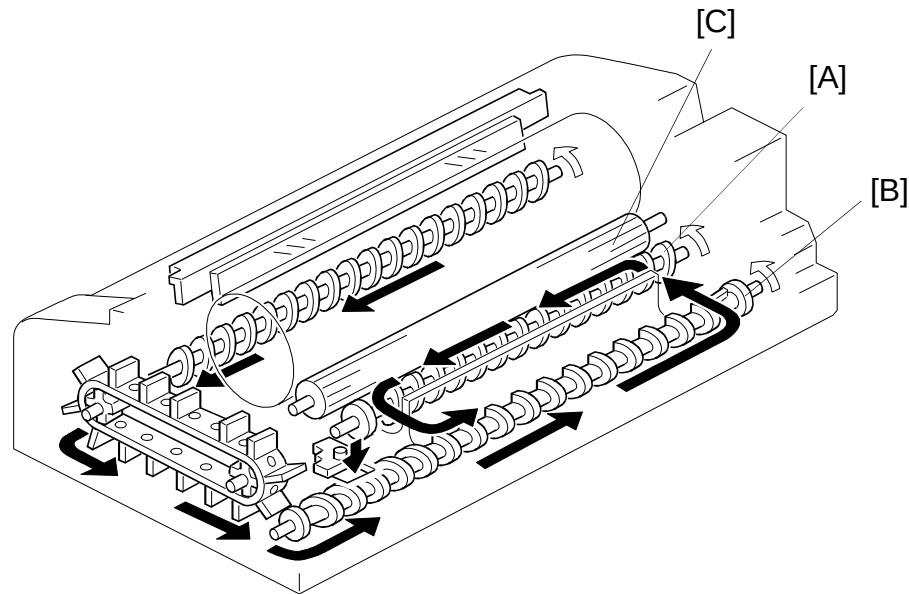


Detailed
Descriptions

When the development clutch [D] turns on, the main motor drive is transmitted to the development drive shaft [A] and the development drive gear [B] through a timing belt [C], and a train of gears.

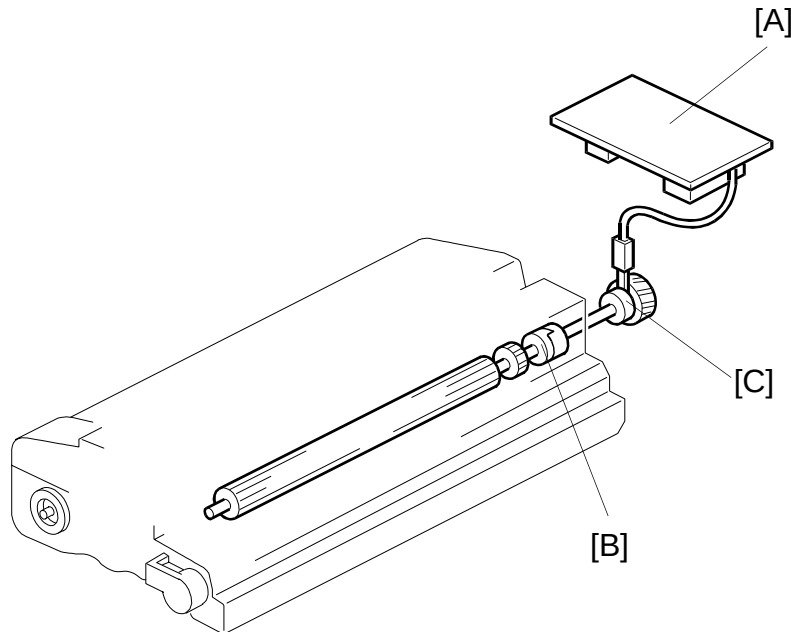
The development drive gears (except for the gears in the development unit) are helical gears. These gears are quieter than normal gears. When the PCU is pushed in, the development drive shaft engages the development roller gear.

4.5.3 Mixing



The PCU uses 2 mixing augers, [A] and [B], to keep the developer evenly mixed. Mixing auger 1 [A] transports excess developer, scraped off the development roller [C] by the doctor blade, towards the front of the machine. Mixing auger 2 [B] returns the excess developer, along with new toner, to the rear of the mixing assembly. Here the developer is reapplied to the development roller.

4.5.4 Development Bias


 Detailed
Descriptions

This machine uses a negative-positive development system (write to black), in which the black areas of the latent image are at a low negative charge (-140 ± 50 V) and white areas are at a high negative charge (-900 V).

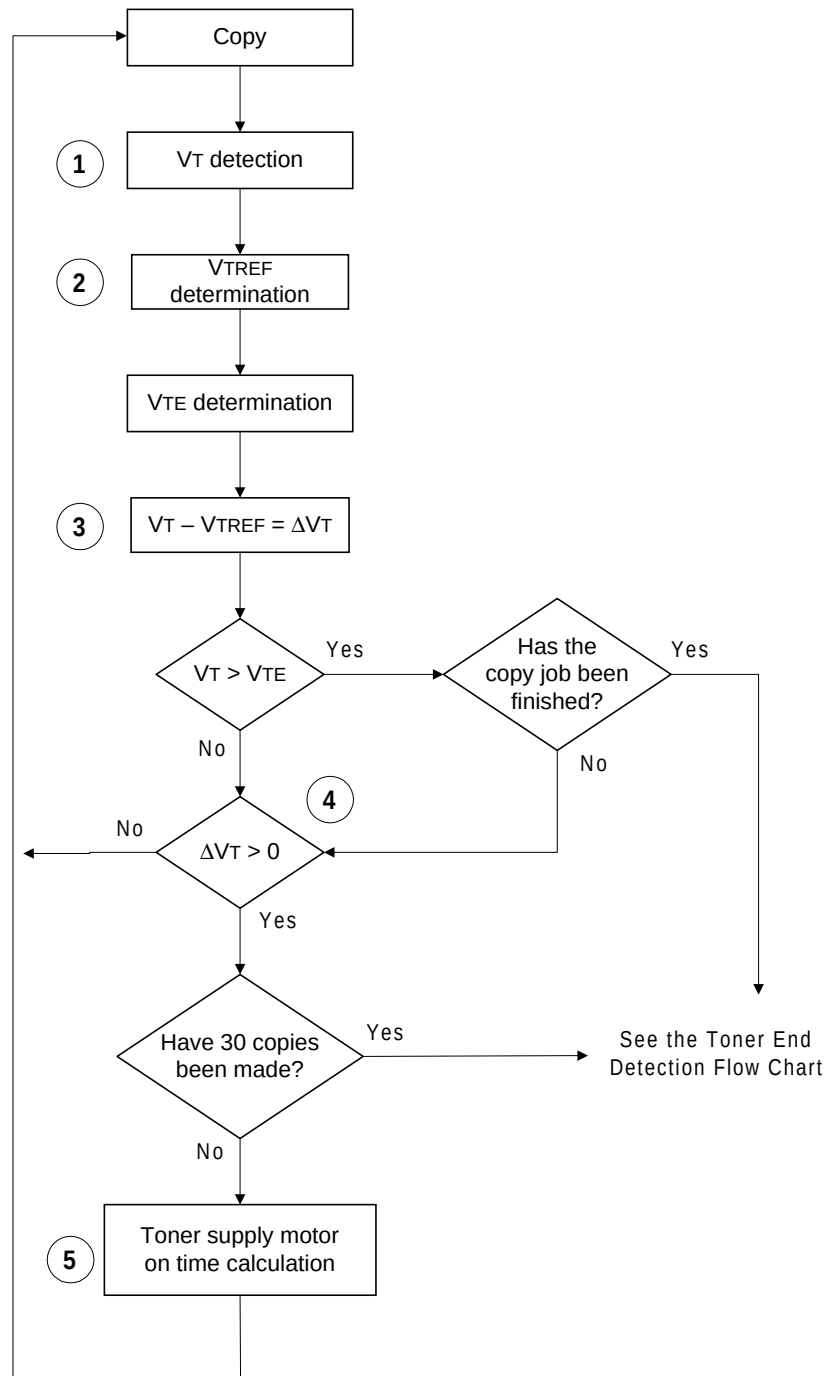
To transfer negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of -600 volts to the development rollers throughout the image development process. The bias is applied to the development roller shaft [B] through that shaft's gear [C].

The development bias is kept at 0 V until the latent image on the drum comes to the development roller. This is to prevent toner from transferring to the area of drum near the development roller, which has not yet been charged. The development bias is then increased to -600 V at the same time as the development clutch turns on.

The development bias voltage (-600 V) can be adjusted using the service program mode, SP2-201.

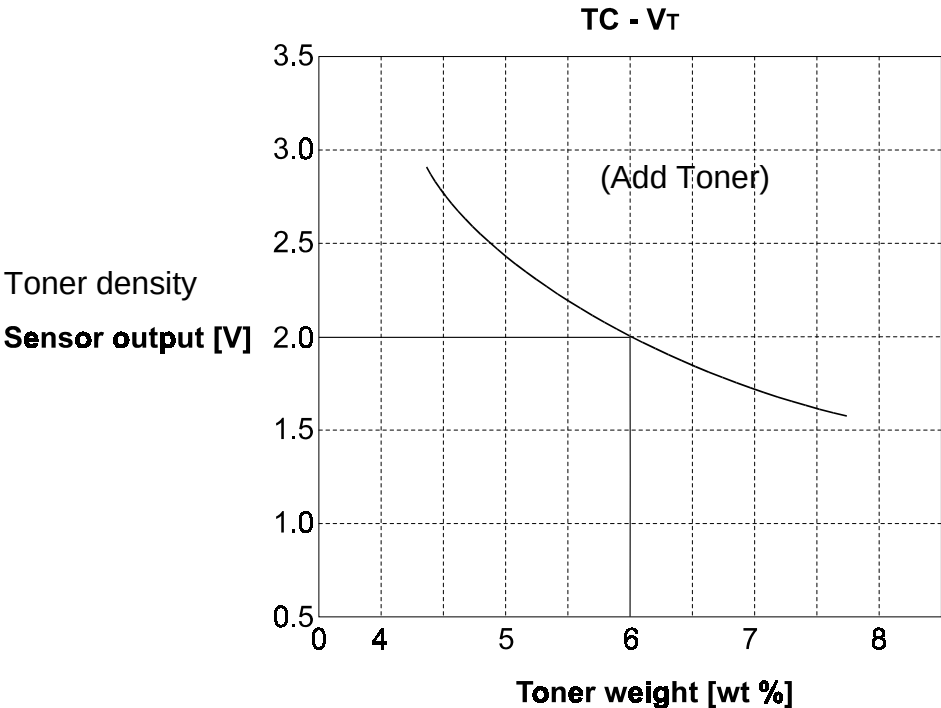
4.5.5 Toner Density Control

- Toner Density Control Flow Chart -



Each step is explained in more detail on the following pages.

- Toner Density Sensor -



Detailed
Descriptions

Developer consists of carrier particles (ferrite) and toner particles (resin and pigment). Inside the development unit, developer passes through a magnetic field created by coils inside the toner density sensor, When the toner concentration changes, the voltage output of the sensor changes accordingly.

The output from the sensor (V_T) is checked before every copy. The machine tries to keep V_T constant by varying the toner supply, as shown in the flow chart on the previous page.

- Toner Density Sensor Initial Setting -

The TD sensor initial setting procedure is performed in the factory. During TD initial setting, the machine calibrates the TD sensor control voltage (V_{CONT}) so that the TD sensor output voltage is $2.0 \pm 0.1\text{V}$ using new developer with a standard toner concentration (6% by weight, 21.6 g of toner in 360 g of developer). This factory-adjusted value will be used for toner density control processing.

- Toner Density Measurement -

Toner density in the developer is detected once every copy cycle (point "1" on the flow chart). The sensor output voltage (V_T) during the detection cycle is compared with the toner supply reference voltage (V_{TREF}).

- Toner Supply Reference Voltage (V_{TREF}) Determination -

The toner reference voltage (V_{TREF}) is the TD sensor initial setting voltage, corrected for humidity as detected by the humidity sensor (point "2" on the flow chart). To change the image density, the humidity correction coefficient for V_{TREF} can be changed using SP 2-911 (there are five settings). The larger the value entered in this SP mode, the lighter the copies will be.

- Toner Supply Determination -

V_{TREF} is the threshold voltage for determining whether or not to supply toner. If V_T becomes greater than V_{TREF} (points "3" and "4" on the flow chart), the machine supplies additional toner.

- Toner Supply Motor On Time Calculation -

The toner motor on time is determined by the following factors (point "5" on the flow chart).

- ΔV_T (this is $V_T - V_{TREF}$)
- Copy volume counter
- Paper size

The copy volume counter (C_{VOL}) is determined as follows:

0: 1-9 consecutive copies have been made with $\Delta V_T > 0$

1: 10-19 consecutive copies have been made with $\Delta V_T > 0$

If ΔV_T becomes negative at any time (i.e., there is enough toner), the counter (C_{VOL}) will be reset to 0.

The toner motor on times are shown below.

	Paper Length < 250 mm	Paper Length 250 - 400 mm	Paper Length > 400 mm
$0 < \Delta V_T \leq 0.22$, $C_{VOL} = 0$	0.5	0.7	0.9
$0 < \Delta V_T \leq 0.22$, $C_{VOL} = 1$	1.0	1.3	1.8
$\Delta V_T > 0.22$, $C_{VOL} = 0$ or 1	1.0	1.3	1.8

NOTE: The toner supply amount is 0.1 g for 0.5 seconds

4.5.6 Toner Supply in Abnormal Sensor Conditions

There are two service codes for a TD sensor error. These SC conditions can be cleared by turning the main switch off and on again. After doing this, the machine automatically performs the TD sensor initial setting.

1. TD sensor error 1

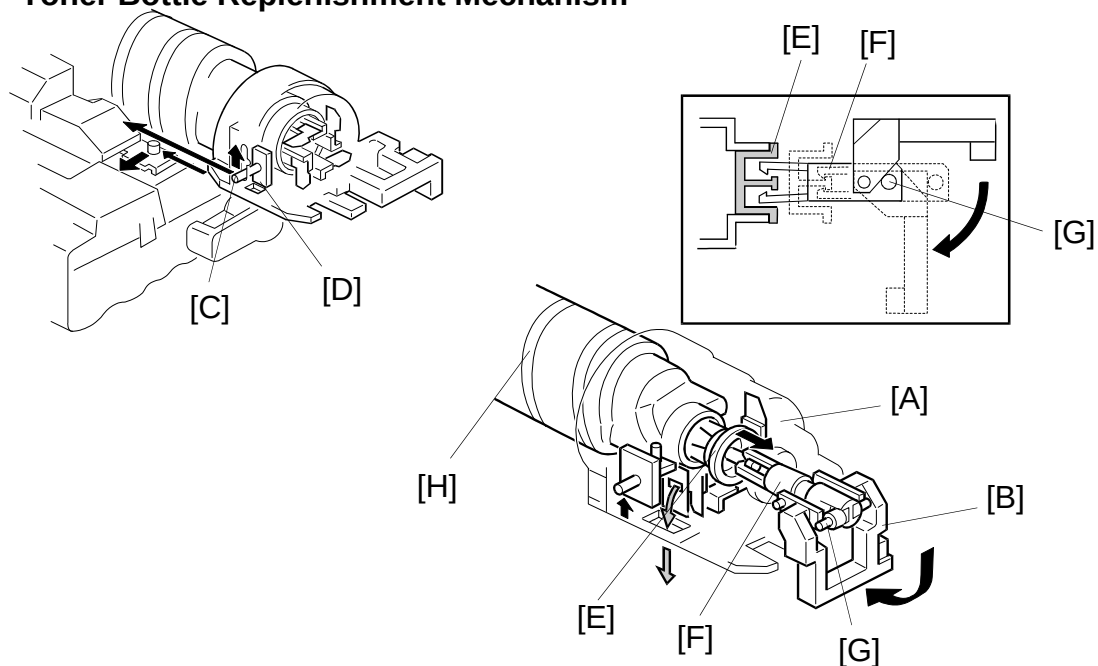
When the TD sensor output voltage (V_T) is less than 0.5 Volts for, 20 seconds after the TD sensor initial setting has been performed, SC390 will be generated. Refer to section 7.1.2 for the definition and possible cause.

2. TD sensor error 2

When the TD sensor initial setting is completed, if the TD sensor output voltage (V_T) exceeds the specified range (2 ± 0.2 V), SC393 is generated. Refer to section 7.1.2. for the definition and possible cause.

4.5.7 Toner Supply

- Toner Bottle Replenishment Mechanism -



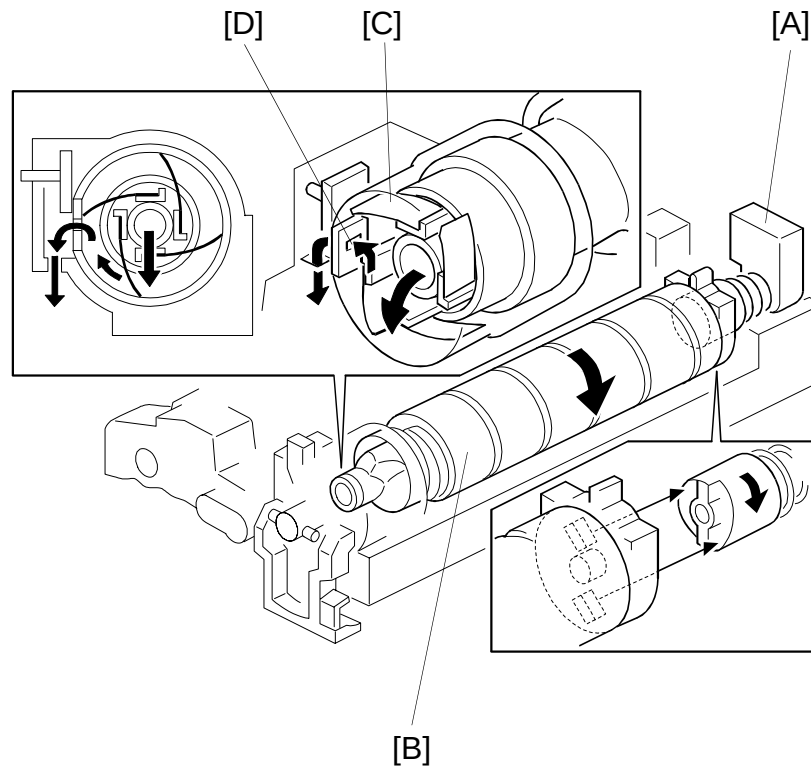
When a toner bottle is placed on the bottle holder unit [A] and pushed forward and the toner bottle holder lever [B] is lowered to its original position, the following actions will occur automatically to allow toner to be supplied to the development unit.

- The pin [C] on the toner shutter [D] is pulled out (opened) as a result of the shape of the developer cartridge.
- The cap [E] remaining on the toner bottle is pulled out of the bottle and moved away from the movement of the roller [G] by the chuck [F], which rides along the curved rail behind the toner bottle holder lever.

The toner end detection system determines when to drive the toner bottle replenishment mechanism (see Toner End Detection). The toner supply mechanism transports toner from the bottle to the development unit. The toner bottle has a spiral groove [H] that helps move toner to the development unit.

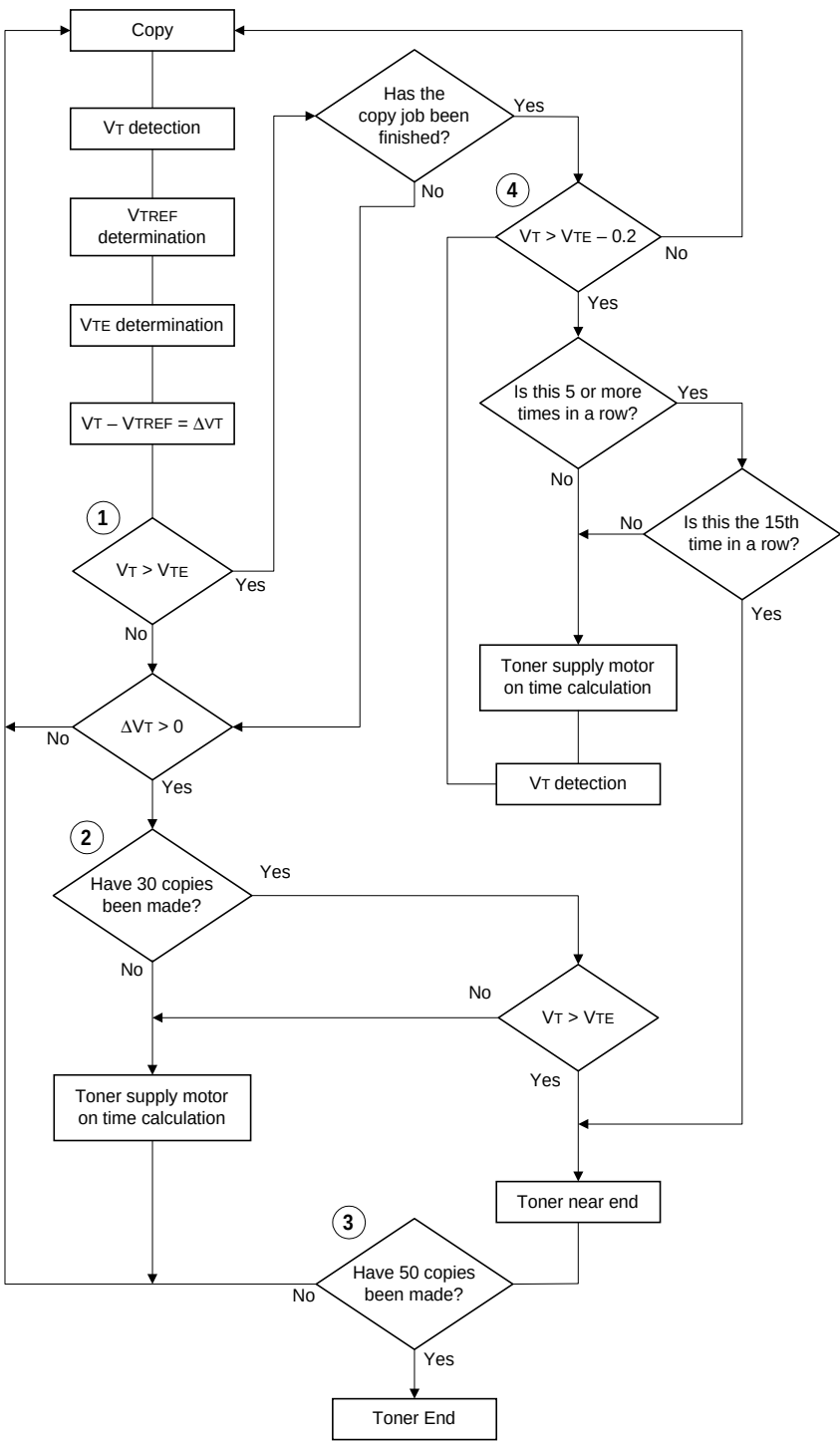
When the bottle holder unit is pulled out to add new toner, the following actions will occur automatically to prevent toner from spilling.

- The chuck releases the toner bottle cap and insert the cap into the bottle.
- The toner shutter shuts the opening as a result of pressure from a spring.

- Toner Supply Mechanism -**Detailed
Descriptions**

The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner holder. The toner supply mylar blades are used to transfer the toner to the slit [D], then the toner falls down into the development unit through the opening.

- Toner Near End/End Detection -



There is no toner end sensor in this machine. Instead, toner end/near-end condition is detected using the TD sensor output data.

The machine checks for toner near end/end condition every copy. If toner near-end or toner end is detected during the copy job, it is also checked after finishing the copy job. To detect toner near end, the machine first decides the toner end reference voltage (V_{TE}) based on the TD sensor initial setting and the humidity sensor output. Then, the machine compares V_{TE} with the TD sensor output voltage (V_T): this is point 1 on the flow chart.

During a copy job:

If V_T is greater than V_{TREF} (this means the amount of toner in the development unit is low), the machine supplies toner (see Toner Supply).

If toner concentration is still low after 30 copies (point 2 on the flow chart), the machine checks for a toner near end condition (if V_T is greater than V_{TE} , there is a near end condition).

If toner concentration is still low 50 copies after toner near-end condition was determined (point 3 on the flow chart), the machine detects a toner end condition.

After a copy job:

When the machine detects that toner concentration is low, after the copy job is finished, the machine decreases V_{TE} by 0.2 V and compares the new V_{TE} with V_T ("4" on the flow chart). If the toner concentration is still low, the machine supplies toner. The machine then compares V_{TE} with V_T again, and supplies toner again if V_T is too low.

If the toner concentration is still too low after supplying toner 15 times ("5" on the flow chart), the machine detects a toner near-end condition.

If toner concentration is still low 50 copies after toner near-end was determined ("3" on the flow chart), the machine detects a toner end condition.

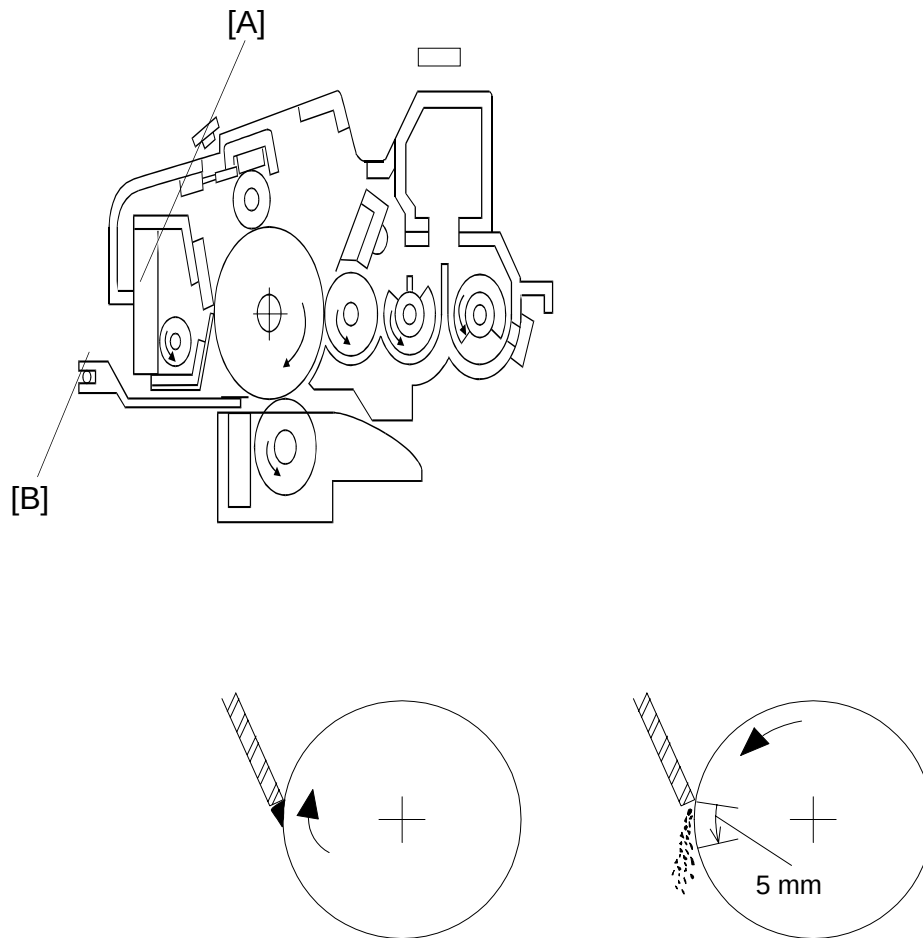
The number of copies between toner near-end and toner end can be changed with SP 2-213. The default value is 50.

- Toner End Recovery -

If the front cover is opened for more 10 seconds and closed while a toner near-end/end condition exists and the toner bottle is replaced, the machine will attempt to recover for 3 minutes using the same procedure as for toner near-end/end detection after a copy job.

4.6 DRUM CLEANING AND TONER RECYCLING

4.6.1 Drum Cleaning

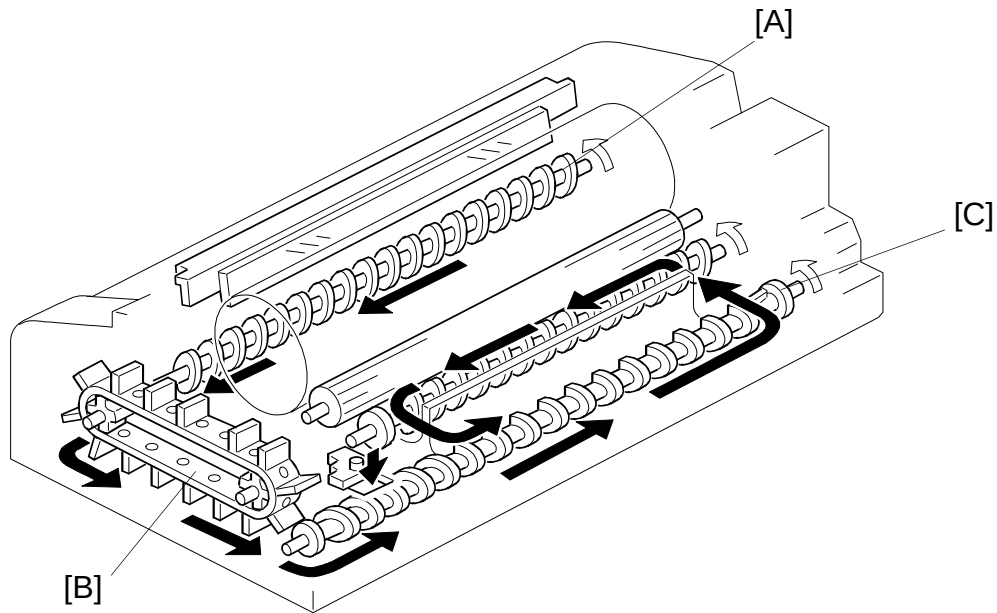


The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This machine uses a counter blade system.

The toner remaining on the drum is scraped off by the cleaning blade, and it falls onto the toner collection coil [B]. (an auger)

To remove the toner and other particles that are accumulated at the edge of the cleaning blade, the drum rotate in reverse direction for about 5 mm at the end of every copy job, as shown in the illustration. However, this is not done during transfer roller cleaning cycle is performed.

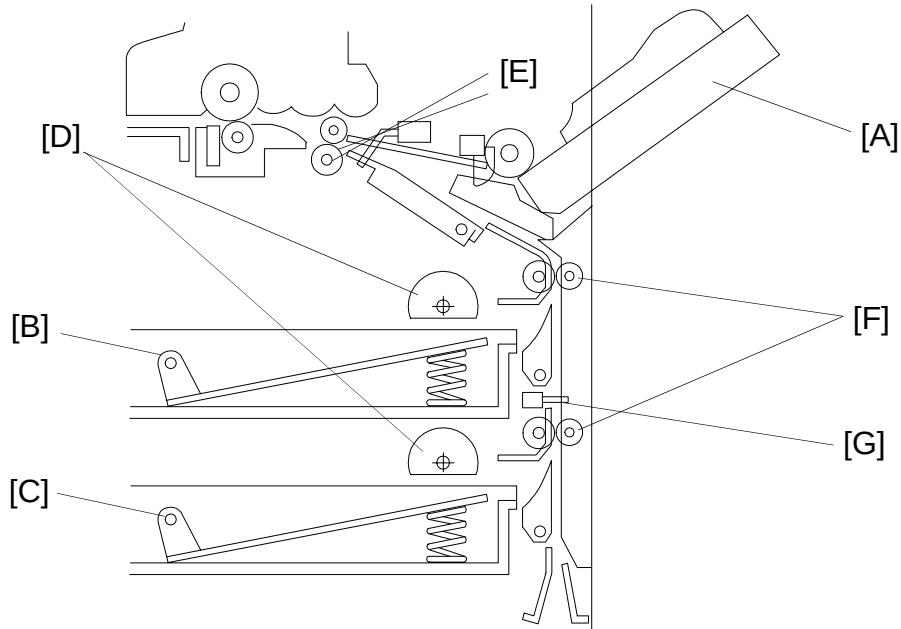
4.6.2 Toner Recycling



The used toner which falls onto the toner collection coil [A] is transported to the recycled toner transport belt [B] located at the front of the PCU. The recycled toner transport belt carries the toner to mixing auger 2 [C] in the development unit. The recycled toner is mixed with new toner by mixing auger 2 and used again.

5. PAPER FEED

5.1 OVERVIEW



There are two paper trays and a by-pass feed table [A].

The first [B] and second [C] paper trays each hold 250 sheets. The by-pass feed table can hold 1, 10, or 100 sheets of paper, depending on the paper size.

The semicircular feed rollers [D] drive the top sheet of paper from the tray to the registration rollers [E] through the relay rollers [F].

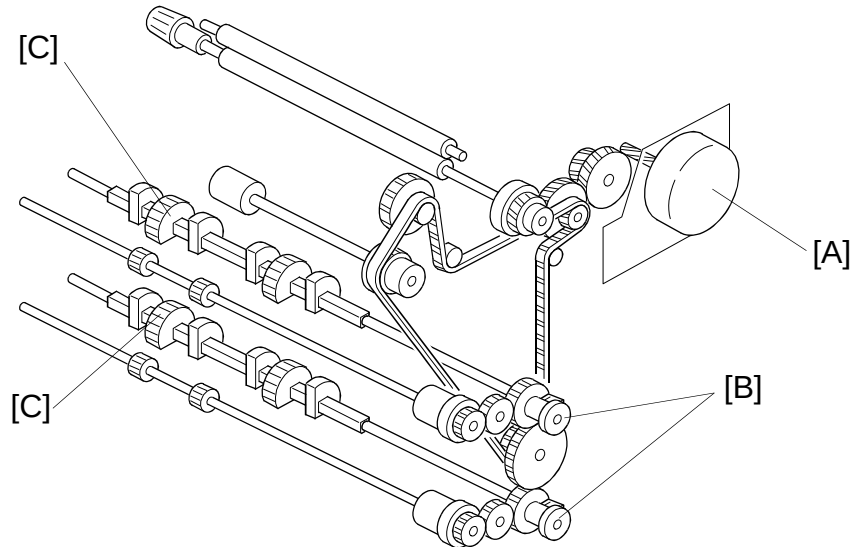
The tray has two corner separators (see [F] in the diagram in the "Paper Lift Mechanism" section), which allow only one sheet to feed at a time. The corner separators, along with the tray's springs, also serve to set the height of the paper stack.

When the tray is closed after the paper is loaded, the paper size actuator located at the front right of the tray pushes against the paper size sensor. This informs the cpu what paper size is loaded in the tray and that the tray is in place.

There is a relay sensor [G] located between the relay rollers. This sensor is used for paper jam detection.

5.2 PAPER TRAY

5.2.1 Paper Feed Drive Mechanism

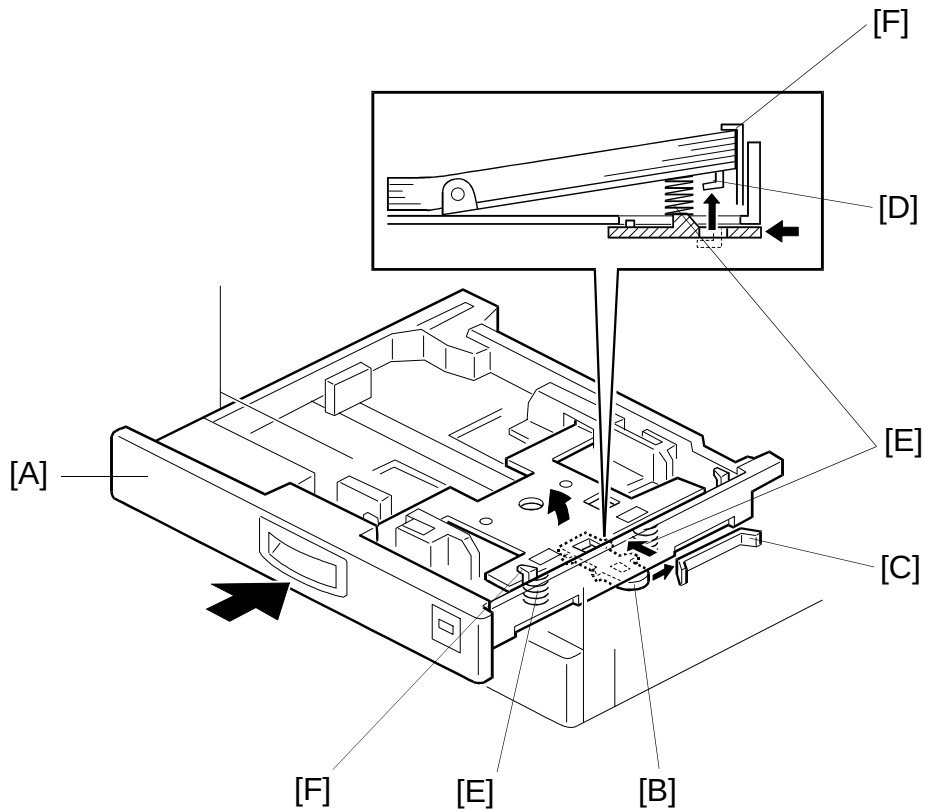


Detailed
Descriptions

The main motor [A] drives the pick-up and feed mechanism of both, the first and second paper trays. The paper feed clutches [B] transfer drive from this motor to the feed rollers [C].

The paper feed clutch turns on and the feed rollers start rotating to feed the paper. The paper feed clutch stays on for enough time to turn the paper feed rollers for one rotation.

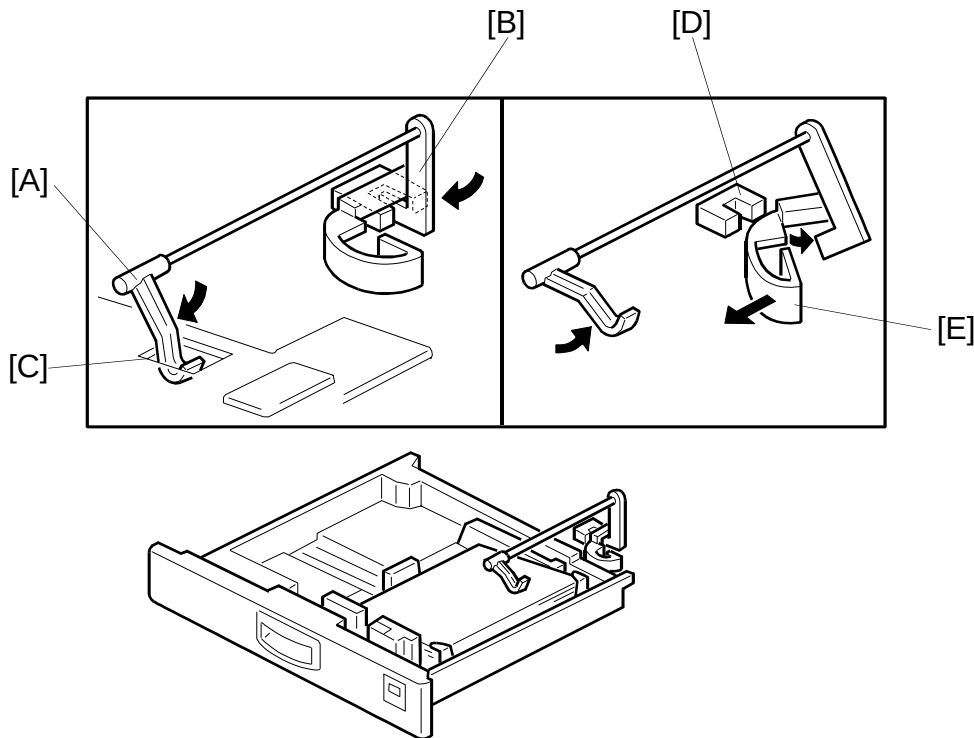
5.2.2 Paper Lift Mechanism



When the paper tray [A] is closed after paper is loaded, the release slider [B], which is mounted on the bottom part of the tray, is pushed against the projection [C] on the main frame and the release slider comes off the bottom plate hook [D].

Once the release slider comes off, the bottom plate is raised by the pressure springs [E] and the top sheet of paper pushes upward against the corner separators [F]. This keeps the stack of paper at the correct height.

5.2.3 Paper End Detection

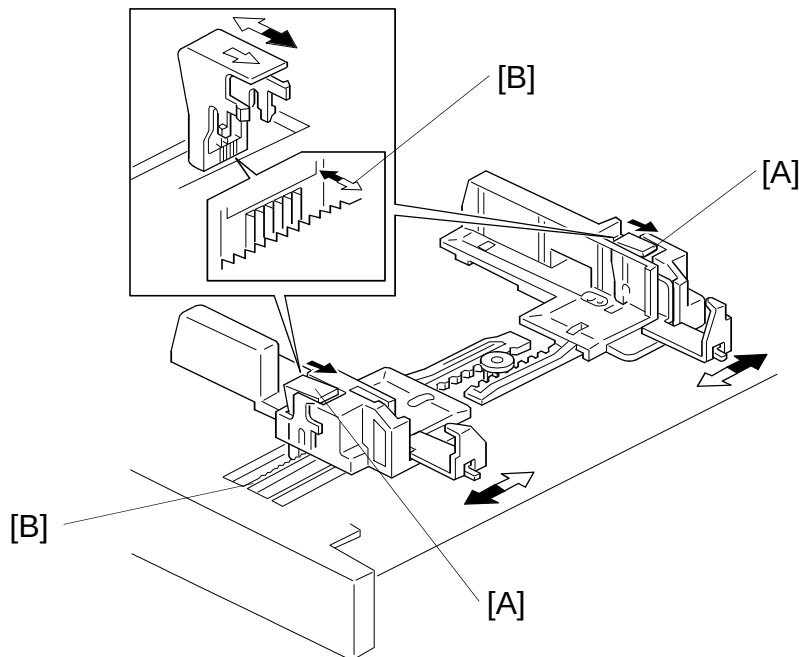


Detailed
Descriptions

The paper end feeler [A] is located on the same shaft as the paper end actuator [B]. When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate. The paper end actuator activates the paper end sensor [D].

The paper end actuator is in contact with the lever [E]. When the tray is drawn out, the lever turns as shown by the arrow in the figure. Then the lever pushes up the actuator inward. As a result, the feeler rotates upwards. This mechanism is necessary to prevent the feeler from being damaged by the paper tray body.

5.2.4 Side Fence Double Stopper Mechanism

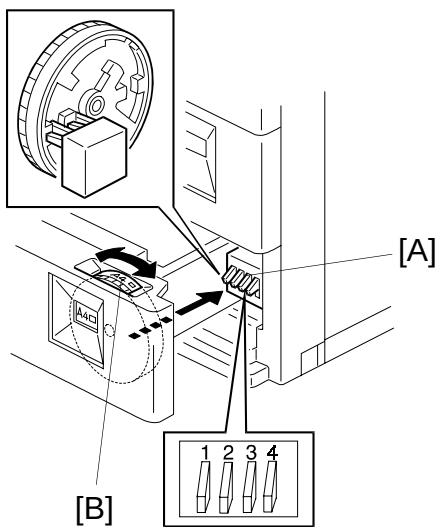


There is a side fence stopper mechanism added for both the front and rear side fences.

If the tray is closed with excessive force after loading paper, paper may move over the rear side fence, because the fence can become deformed by the weight of the paper leaning against it. As a result, skewing or paper jams may occur. To prevent this, a side fence stopper mechanism has been added to the rear side fence.

The release levers [A] each have a stopper which contains teeth like those on a gear. The guide rails [B] also have teeth. When the release lever is pushed, the gear teeth release each other and the side fences can be moved.

5.2.5 Paper Size Detection



SW	1	2	3	4
Size				
A3, F(81/2"x13")	●	●	●	○
A4 Lengthwise	●	○	●	○
A4 Sideways	●	●	○	○
A5 Sideways, 11"x17"	●	○	○	○
B4, 81/2"x14"	○	●	○	○
B5 Sideways, 81/2"x11"	○	○	○	○
B5 Lengthwise, 11"x81/2"	○	○	●	○
* (Asterisk)	○	○	●	●

Detailed Descriptions

●: ON (Not pushed) ○: OFF (Pushed)

There are four paper size sensors (microswitches) [A] on the front right plate of the main frame. The sensors are actuated by a paper size actuator [B] behind the paper size indicator plate which is located on the front right corner of the tray.

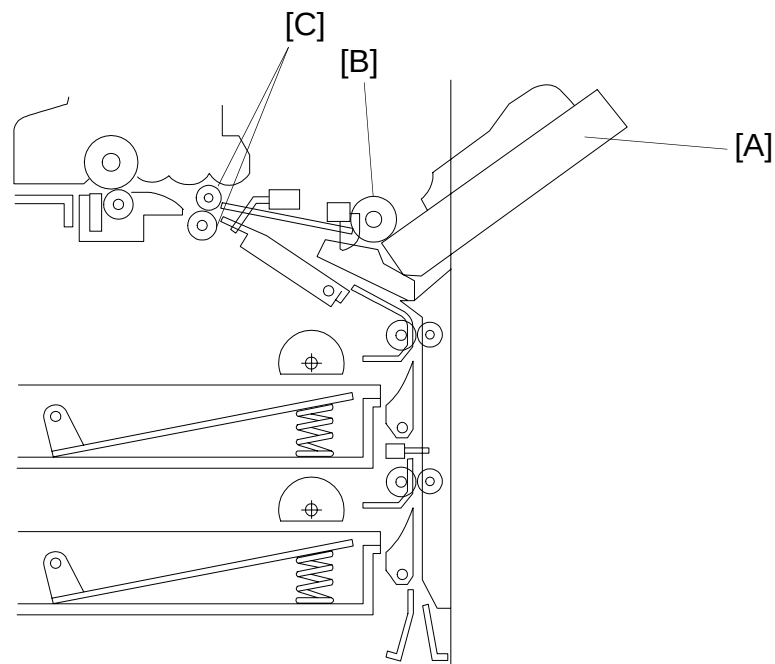
Each paper size has its own actuator, with a unique combination of notches. To determine the paper size in the tray, the cpu reads which micro switches have been closed by the actuator.

The cpu disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the Add Paper indicator will light.

When the paper size actuator is at the "*" mark, the paper tray can be set to accommodate one of a wider range of paper sizes by using a User Tool. If the paper size for this position is changed without changing the User Tool setting, a paper jam will result.

5.3 BY-PASS FEED

5.3.1 Overview

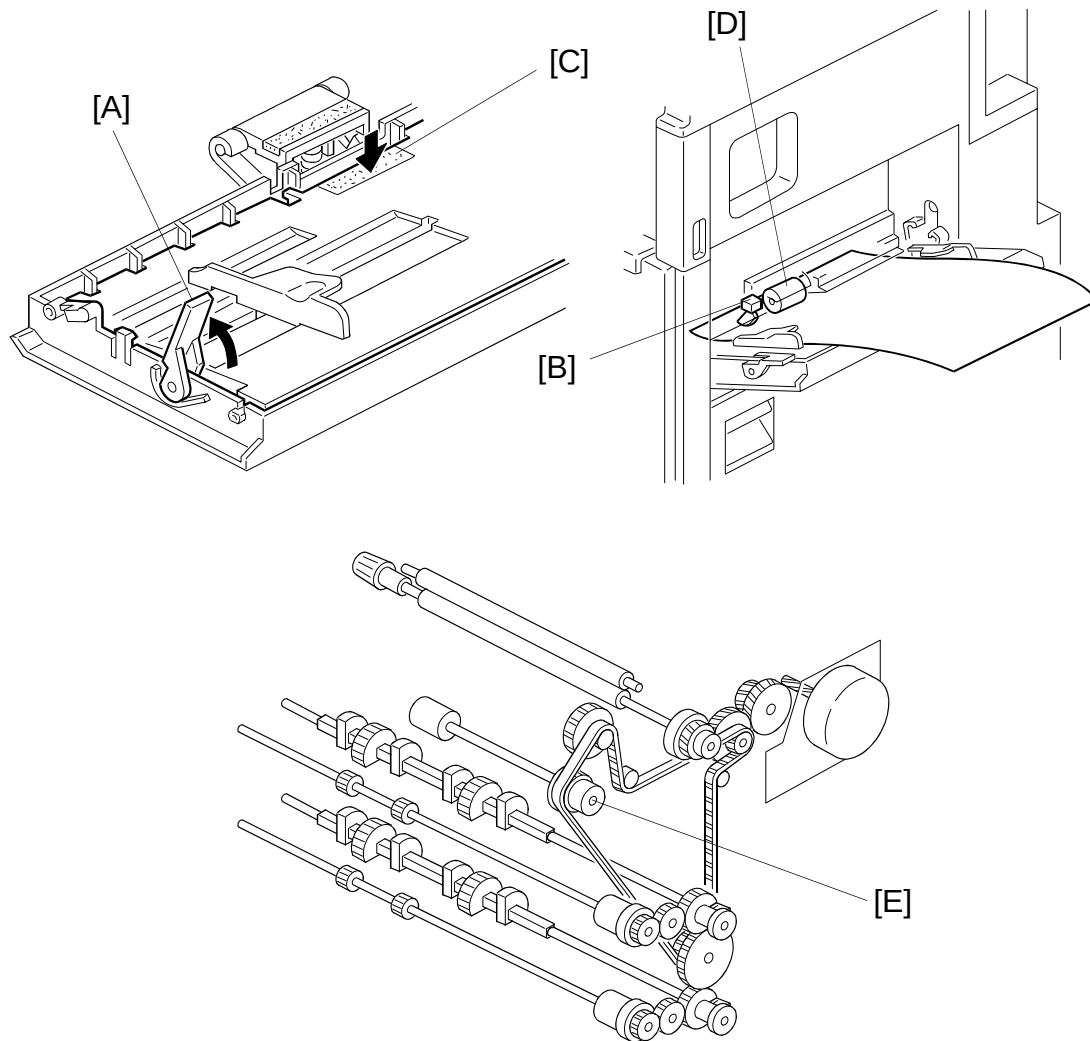


The by-pass feed table [A] can hold 100 sheets of paper.

This machine does not have a by-pass feed cover sensor. The by-pass feed indicator is always displayed on the LCD. The Add Paper indicator will light when the user selects by-pass feed while the by-pass feed table is closed or if there is no paper on the by-pass feed table.

After the Start key is pressed, the cpu energizes the by-pass feed clutch and the by-pass feed roller [B] starts to feed paper towards the registration rollers [C].

5.3.2 Paper Feed Mechanism and Paper End Detection



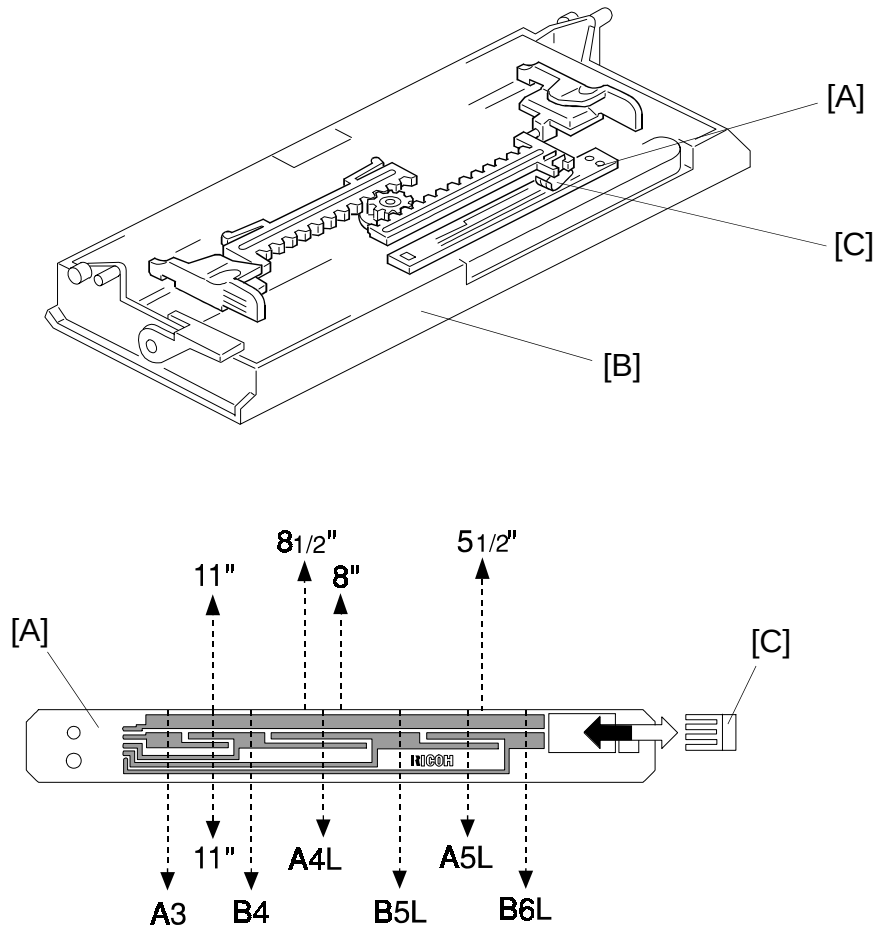
Detailed
Descriptions

This machine uses a feed roller [B] and friction pad mechanism [C], with drive from the main motor transmitted when the by-pass feed clutch [E] turns on. The friction pad prevents all but the top sheet of paper from feeding. Therefore, during paper feed, the top sheet of paper is separated from the stack and fed towards the registration rollers.

Before placing the paper on the by-pass feed table, the user must lower the by-pass feed table by using the lever [A]. This is to ensure that the paper is placed between the friction pad [C] and the feed roller [D]. Then, before starting to copy, the lever must be raised to move the paper stack into contact with the feed roller.

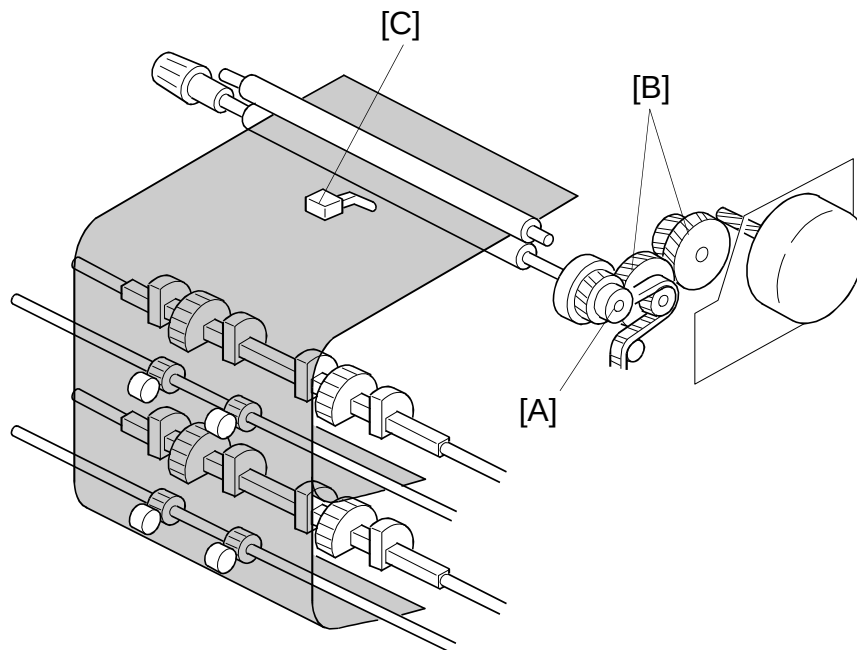
When there is no paper on the by-pass feed table, the paper end feeler [B] drops into the cutout in the by-pass feed table and the by-pass feed paper end sensor is activated.

5.3.3 By-pass Feed Paper Width Detection



The paper width switch [A] is a slide switch that is located inside the by-pass feed table [B]. It measures the paper width manually. The rear side fence is connected to the terminal plate [C]. When the side fences are moved to match the paper width, the terminal plate slides along the wiring patterns on the detection board. The patterns for each paper width on the paper width detection board are unique. Therefore, the machine determines which paper width of the paper that has been placed in the by-pass feed table by the signal output from the board. However, the machine will not determine the paper length. For example, A4 paper set sideways will be identified as to be A3 paper.

5.4 PAPER REGISTRATION



Detailed
Descriptions

Main motor rotation is transmitted to the registration clutch [A] (located on the lower registration roller shaft) through the relay gears [B].

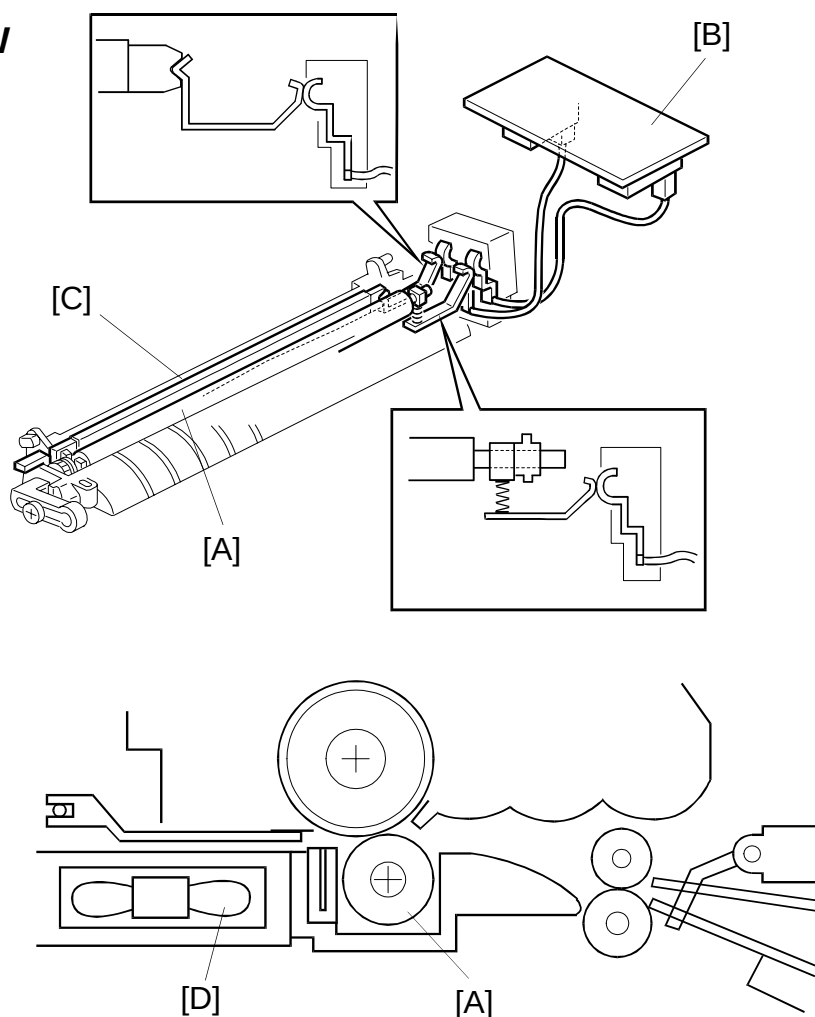
The registration sensor [C] is positioned just before the registration rollers.

When the paper's leading edge activates the registration sensor, the registration clutch turns off and the registration rollers stop turning. However, the relay clutch stays on for a bit longer. This delay allows time for the paper to press against the non-turning registration rollers and buckle slightly to correct skew. The registration clutch 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 towards the image transfer section.

The registration sensor is also used to detect paper misfeed.

6. IMAGE TRANSFER AND PAPER SEPARATION

6.1 OVERVIEW



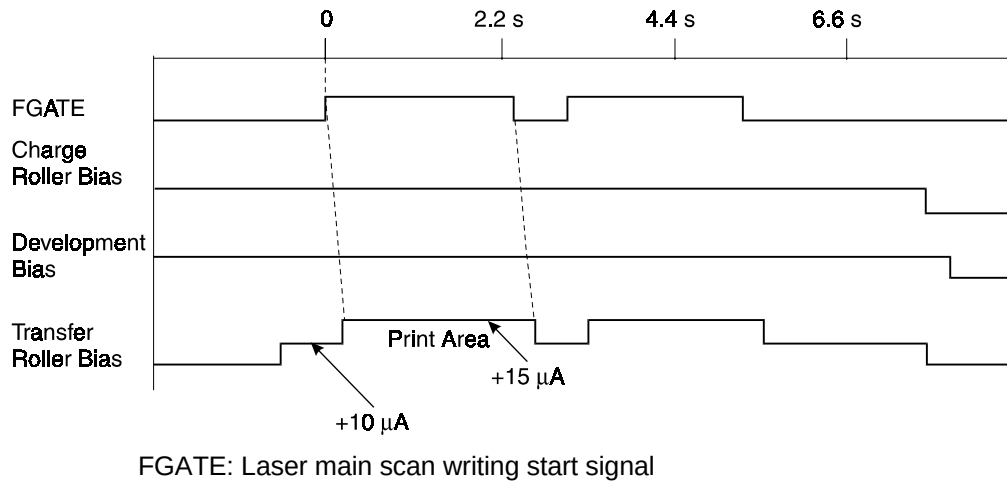
Instead of using a transfer wire and a transfer belt, this machine uses a transfer roller [A], is in contact with the surface of the drum.

The high voltage supply board [B] supplies a positive current (approximately $+15\ \mu\text{A}$) to the transfer roller. The roller has a high electrical resistance, so it can hold a high positive electrical potential to attract toner from the drum's surface onto the paper.

There is a discharge brush [C] after the transfer roller. The combination of the curvature of the drum and the discharge brush helps the paper to drop away from the drum.

The vacuum transport fan [D] located under the transport guide plate helps to transport the paper from the transfer area into the fusing unit.

6.2 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM

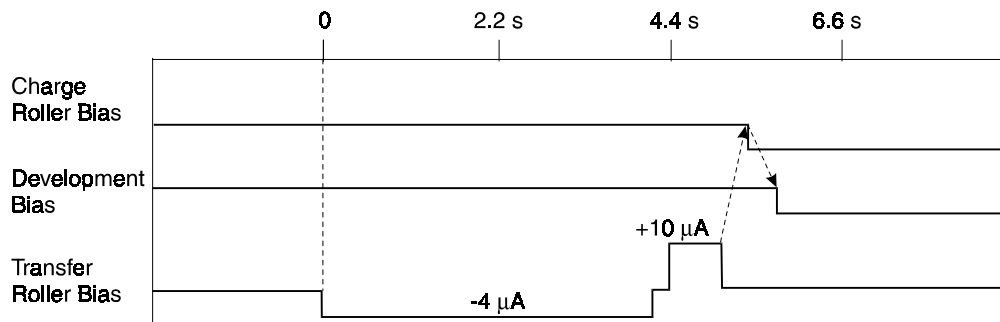


Detailed
Descriptions

The transfer roller starts rotating at the same time as the main motor starts to rotate.

1. When the CPU receives the image writing start signal (FGATE signal), the CPU instructs the power pack to supply +10 μA (low transfer bias) to the roller. This prevents any positively charged toner on the drum surface from transferring to the transfer roller.
2. At a certain time after the low transfer bias has been supplied to the roller, +15 μA (high transfer bias) is applied to the roller to transfer the toner from the drum and onto the paper.
3. After the trailing edge of the paper has passed through the roller, the transfer bias turns off. In the multiple copy mode, the transfer bias shifts again to the low transfer bias.

6.3 ROLLER CLEANING



If the paper size is smaller than the printed image, or if a paper jam occurs during printing, toner may be transferred to the transfer roller surface. To prevent this toner from transferring to the back side of copies, the transfer roller has to be cleaned before the start of the next printing run.

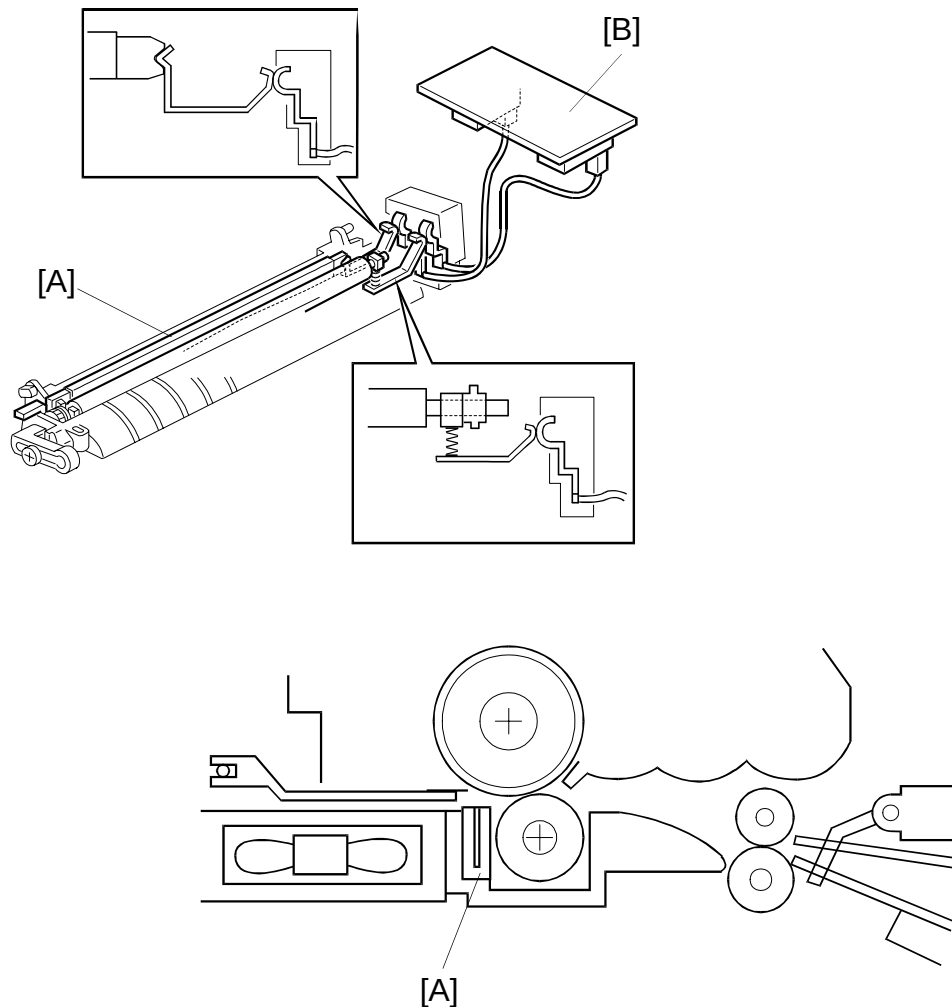
During transfer roller cleaning, the power pack supplies a negative cleaning bias ($-4 \mu\text{A}$) to the transfer roller. So, any negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning bias of $+10 \mu\text{A}$ is applied to the transfer roller to transfer any toner which was positively charged by the transfer roller back onto the drum.

The machine will perform the cleaning mode in the following conditions:

- After a copy job has been finished.
- At the same time as power on.
- After a printer jam has been cleared.

Also, transfer roller cleaning process can be performed forcibly by using SP2-910.

6.4 PAPER SEPARATION AND TRANSPORTATION



Detailed
Descriptions

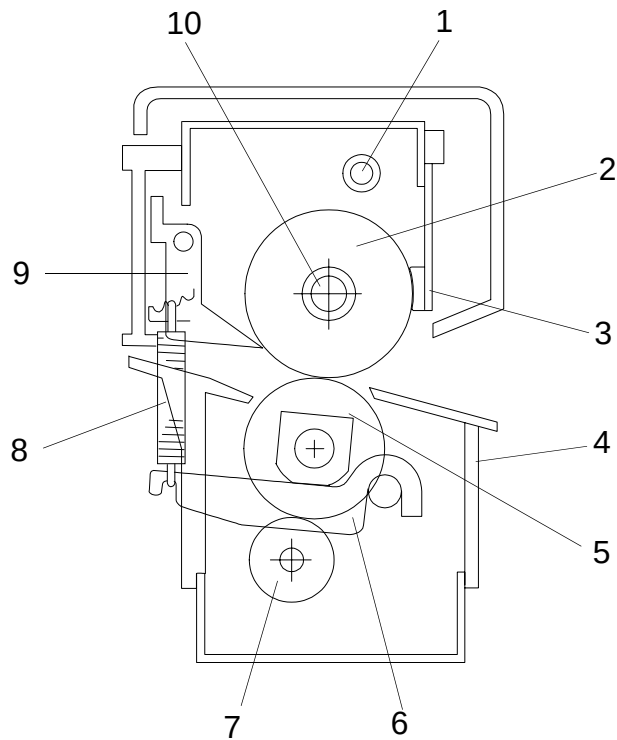
⇒ The discharge brush [A] and the curvature of the drum help the paper to drop away from the drum. The high voltage supply board [B] applies a constant dc voltage, -2 kV (when feeding from a paper tray), or -2.5 kV (from the duplex tray) to the discharge brush.

The transport vacuum fan helps to transport the paper from the transfer area to the fusing unit. The transport vacuum fan turns on and off at the same time as the main motor.

The discharge brush voltage can be adjusted using SP 2-901 (there are separate settings for the front and rear side, and for the leading edge and other areas of the paper).

7. IMAGE FUSING

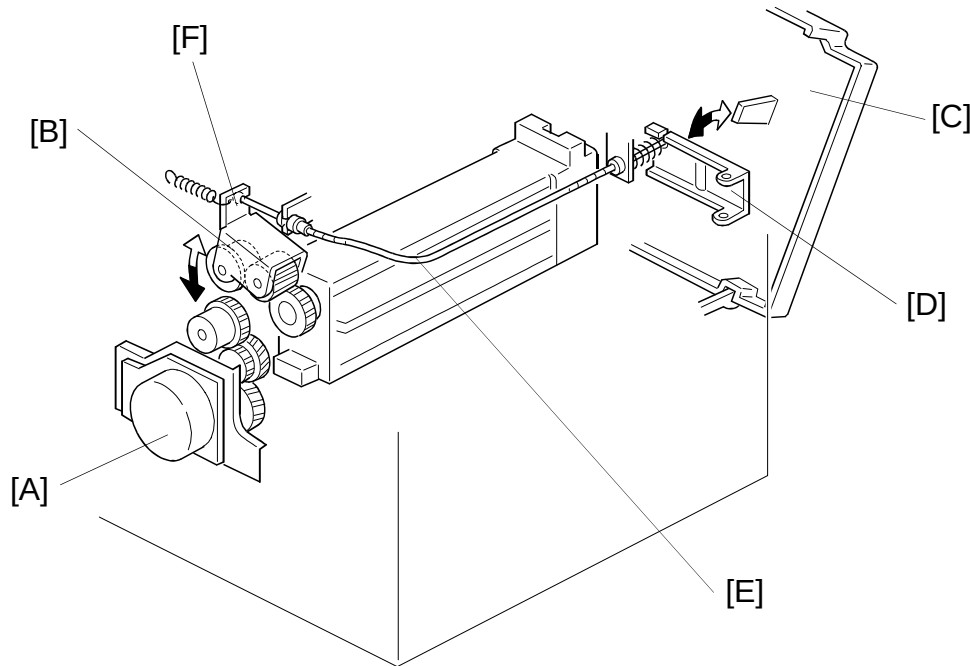
7.1 OVERVIEW



The fusing unit consists of the following parts.

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

7.2 FUSING DRIVE AND RELEASE MECHANISM



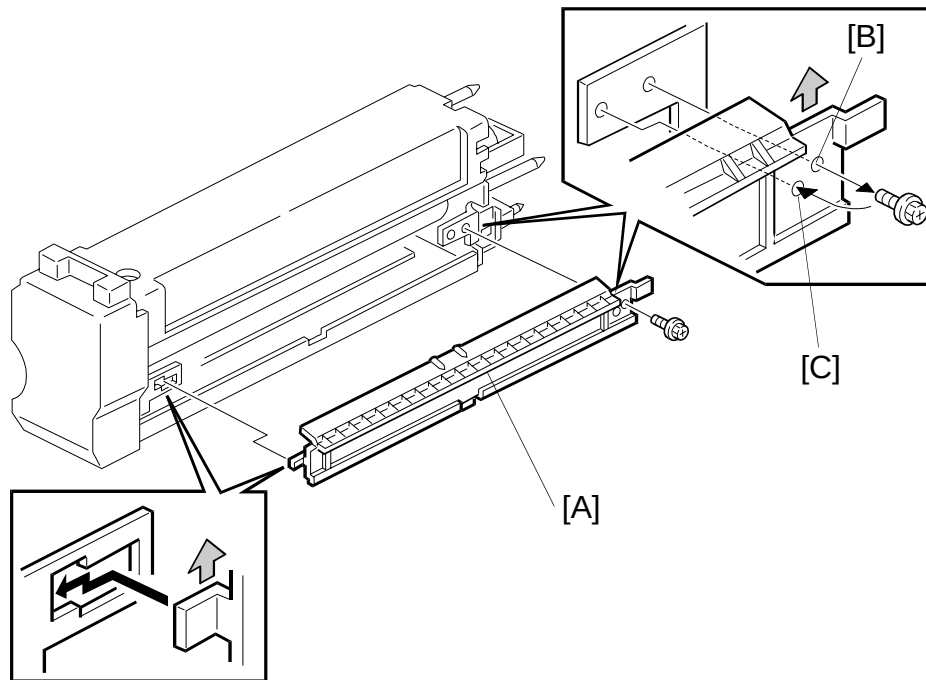
Detailed
Descriptions

The main motor [A] drives the fusing unit through a train of gears.

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [B] when the front cover [C] is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can be easily removed.

When the front cover is opened, the actuator plate [D] pulls release wire [E]. The release wire pulls the fusing unit gear bracket [F] upward and the fusing unit drive is disengaged.

7.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM

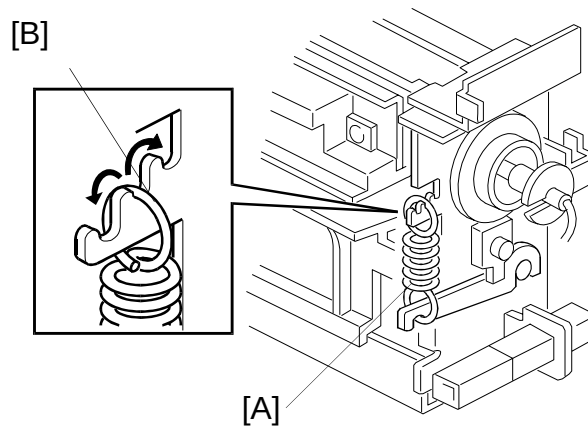


The entrance guide [A] has two holes on the rear side of the entrance guide to adjust for thick or thin paper. Normally, the upper screw hole [B] is used.

For thin paper, move the entrance guide up by securing it with screw hole [B]. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit.

For thick paper, move the entrance guide down (use the lower screw hole). This is because 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. Also, thick paper does not bend as easily, and is therefore less prone to creasing.

7.4 PRESSURE ROLLER

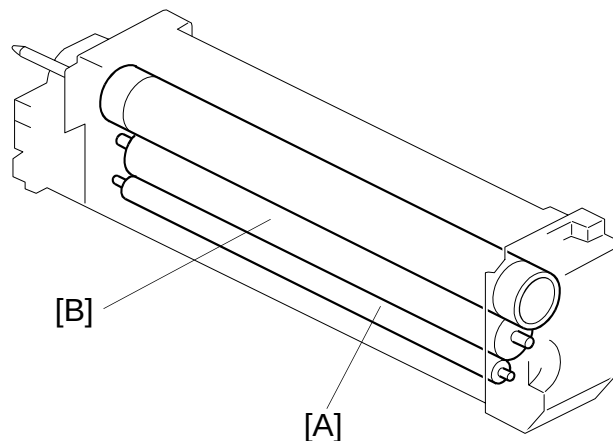


Detailed
Descriptions

The pressure roller is made of silicone rubber with teflon tube coating. The pressure spring [A] constantly applies pressure between the hot roller and the pressure roller.

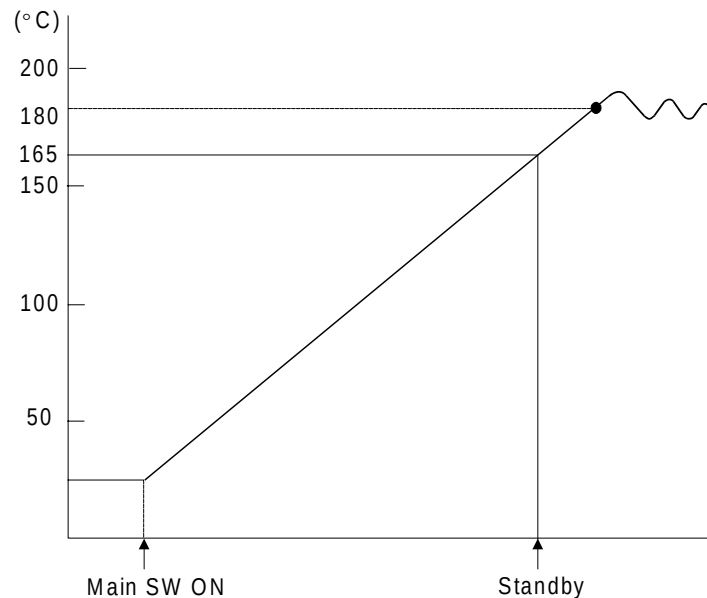
The pressure roller can be changed by adjusting the position of the pressure springs. The middle position [B] is the normal setting. The upper position increases the spring pressure and this prevents insufficient fusing.

7.5 CLEANING MECHANISM



The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhering to the surface of the pressure roller. This is because the cleaning roller is made of metal and collects adhering matter more easily than the pressure roller (which has a teflon coating).

7.6 FUSING TEMPERATURE CONTROL



When the main switch turns on, the CPU checks the ac frequency for 500 ms. Then the CPU turns on the fusing lamp. When the thermistor detects the stand-by temperature (165 °C), the machine can start to print. When the thermistor detects the operating fusing temperature (180 °C), the CPU maintains this temperature using phase control.

Phase control is the only type of fusing control in this machine.

7.7 OVERHEAT PROTECTION

If the hot roller temperature becomes greater than 230°C, the CPU cuts off the power to the fusing lamp. At this time, service code, SC543 will be generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thermofuse reaches 169°C, the thermofuse opens, removing power from the fusing lamp. At this time, the copier stops operating.

8. ENERGY SAVER MODES

8.1 OVERVIEW

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

This machine has three types of energy saver mode as shown below.

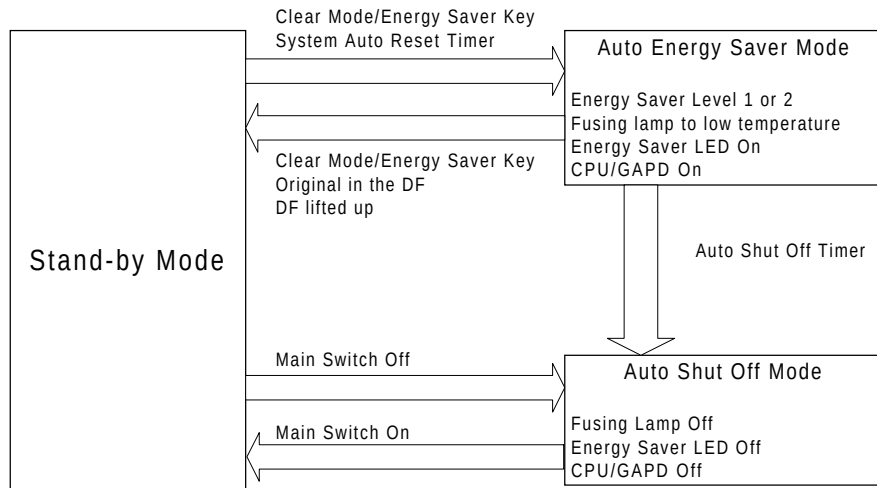
1. Auto Energy Saver Mode
2. Auto Shut Off Mode
3. Night Mode

These modes are controlled by the following UP modes.

- System Auto Reset Timer
- Auto Shut Off Timer
- Auto Energy Saver Mode Enable/Disable
- Auto Shut Off Mode Enable/Disable (SP mode only)

The energy saving mode that the machine operates depends on the combination of the installed options (copier only, copier/printer, copier/fax, copier/fax/printer)

8.2 COPIER ONLY



Entering energy saver mode

The machine enters energy saver level 1 or 2 when one of the following is detected.

- The system auto reset timer runs out.
- The Clear Mode/Energy Saver key is held down for over 1 seconds

What happens in energy saver modes 1 and 2

When the machine enters energy saver level 1 or 2, the fusing lamp drops to a preset temperature, depending on the energy saver level selected (UP mode).

The fusing temperature for energy saver level 1 is 15°C below the fusing lamp operating temperature, which is set by SP1-105-1 (default: 180 - 15 = 165°C). The fusing temperature for energy saver level 2 is the value set by SP1-105-2 (default: 140°C for 115V machines, room temperature for 230V machines).

When the auto shut off timer runs out

The auto shut off timer starts when the machine enters standby mode.

When this timer runs out, the machine enters auto shut off mode and the main switch turns off automatically. The fusing lamp and all dc supplies except +5VE turn off.

+5VE is the 5 volt supply for energy saver mode. It saves energy by supplying +5V power only for the components needed in energy saver mode.

Note that turning the main switch off is the same as entering auto shut off mode.

Returning to standby mode

- From energy saver level 1 or 2 -

If one of the following is performed, the machine returns to standby mode:

- Pressing the Clear Mode/Energy Saver key
- Placing an original in the ADF
- Lifting the ADF cover

The recovery time from energy saver level 1 is about 3 seconds.

The recovery time from energy saver level 2 is about 10 seconds (115 V machines) or about 35 seconds (230 V machines).

- From auto shut off mode -

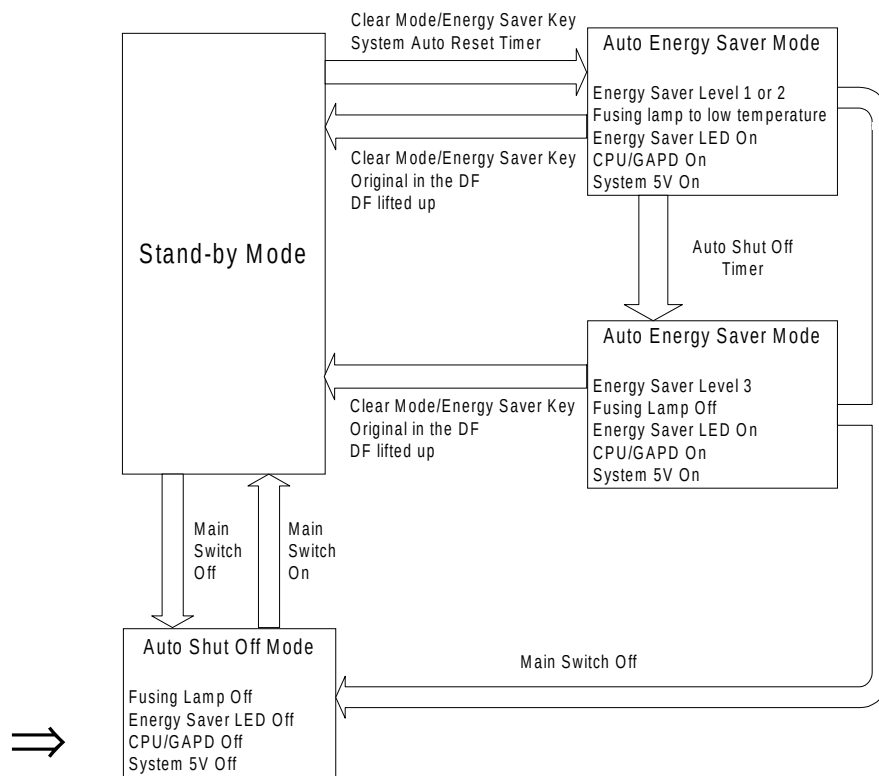
The machine returns to the ready condition when the main switch is turned on.

The recovery time is less than 30 seconds for 115V machines, and less than 35 seconds for 230V machines.

Power Consumption

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

8.3 COPIER/PRINTER



Entering energy saver mode

The machine enters energy saver level 1 or 2 in the same way as the copier only configuration.

What happens in energy saver modes 1 and 2

The behavior of the machine in energy saver levels 1 and 2 is the same as in the copier only configuration (fusing lamp at low temperature).

However, when the auto shut off timer runs out, the machine enters energy saver mode level 3 instead of auto shut off mode.

What happens in energy saver level 3

When the machine enters energy saver level 3, the fusing lamp turns off completely. However, the system 5 volt supply stays on. The recovery time from this level is the same as for recovery from auto shut off mode. The machine will print incoming print jobs from a computer.

From energy saver level 3, the machine returns to standby mode in the same way as from energy saver levels 1 and 2.

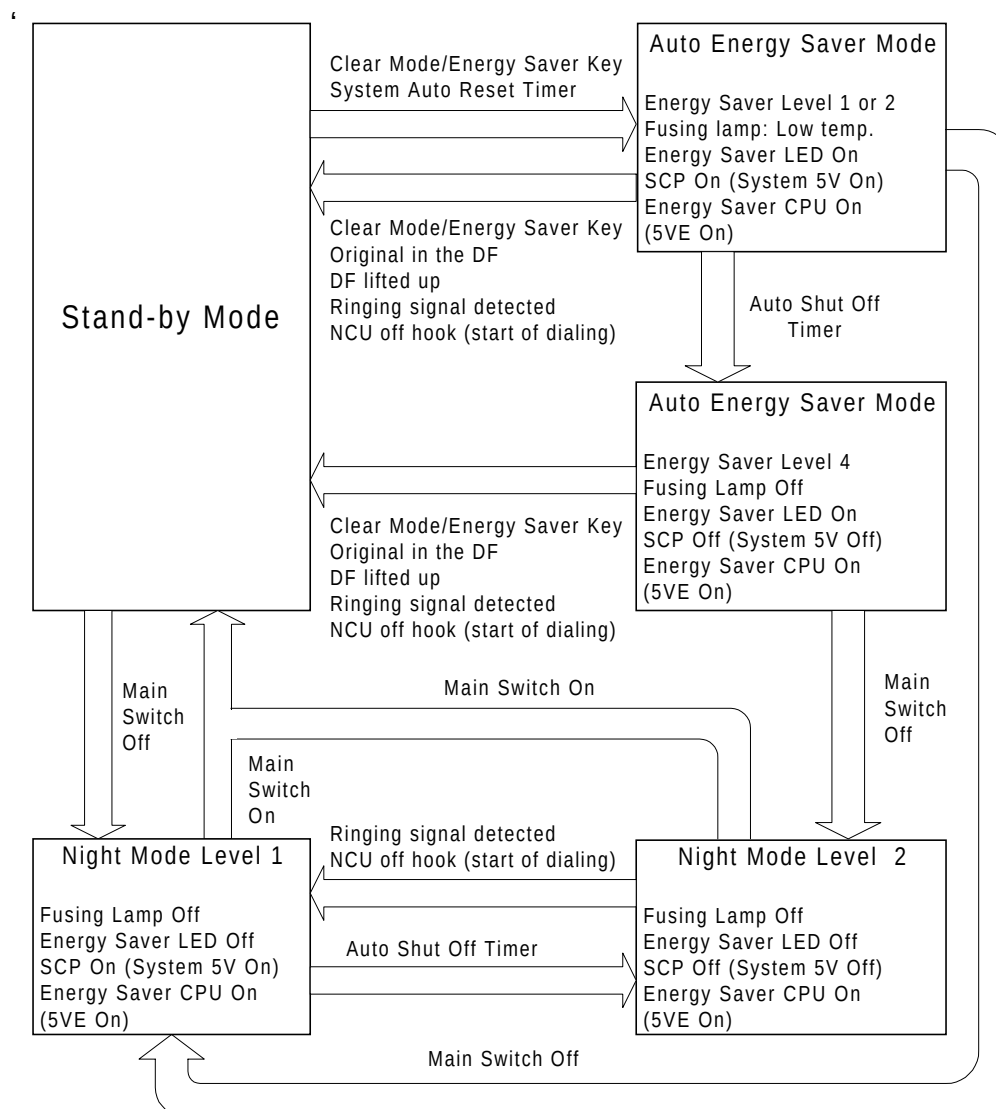
Entering auto shut off mode

The machine only enters auto shut off mode if the main switch is turned off. In this mode, the fusing lamp turns off and the machine will not print anything coming in from a computer.

Power Consumption

Mode	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF. Data from a PC is printed.
Energy Saver Level 2	On	On	140°C (115V) Room T (230V)	On	
Energy Saver Level 3	On	On	Off	On	
Auto Shut Off Mode	Off	Off	Off	Off	The machine returns to standby mode only if the main switch is turned on. Data from a PC is not printed.

8.4 COPIER/FAX, COPIER/PRINTER/FAX



Energy saver mode is more complex in this configuration. This is because there are two night modes, instead of the auto shut off mode. Night mode level 2 is similar to auto shut off mode. Night mode level 1 keeps the machine in a slightly higher state of readiness (the main cpu is active and the system 5 volt supply is on, but the fusing lamp is still off).

Entering energy saver mode

The machine enters energy saver level 1 or 2 in the same way as the copier only and copier/printer configurations.

What happens in energy saver modes 1 and 2

The behaviour in these levels is the same also (fusing lamp at low temperature). However, there are two extra cases for leaving energy saver mode:

- Ringing signal detected
- NCU off-hook (the machine starts to dial a fax number)

If the auto shut off timer runs out while the main switch is still on, the machine enters energy saver level 4.

What happens in energy saver mode 4

In this mode, the fusing lamp switches off. Also, the system +5V supply switches off. Only the +5VE supply stays on, so that the machine can monitor the ADF, the telephone line, and the operation panel.

The machine recovers to standby mode in the same conditions as for level 1 or 2. For example, incoming faxes and printer jobs will be printed. The recovery time from this level is the same as for recovery from auto shut off mode.

Entering night mode

If the main switch is turned off while the machine is in standby or energy saver mode 1 or 2, the machine enters night mode 1.

If the main switch is turned off while the machine is energy saver mode 4, the machine enters night mode 2.

- Night mode 1 -

The fusing lamp turns off. However, the system +5V is still supplied to all components. When the machine detects a ringing signal, the machine automatically prints the incoming message.

From night mode level 1, the machine goes to night mode level 2 when the auto shut off timer runs out.

- Night mode 2 -

The system +5V supply also turns off. However, +5VE (+5V for the energy saver) is still activated. If the machine detects a ringing signal or off-hook signal, the machine goes back to night mode level 1. At this time, the system +5V supply is activated. Then the machine receives the incoming message and prints it.

The machine leaves night mode and returns to standby mode if the main switch is turned on.

Power Consumption

Mode	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF. Incoming faxes and data from a PC are printed.
Energy Saver Level 2	On	On	140°C (115V) Room T (230V)	On	
Energy Saver Level 4	On	On	Off	On	
Night Mode Level 1	Off	Off	Off	On	Incoming faxes are printed, and faxes can be sent. However, PC data is not printed. For copying, the machine returns to standby mode only if the main switch is turned on.
Night Mode Level 2	Off	Off	Off	Off	If an incoming call (ringing signal) is detected, the machine goes into Night Mode Level 1. PC data is not printed. For copying, the machine returns to standby mode only if the main switch is turned on.



8.5 ENERGY SAVER CONTROL

The block diagram on the next page shows the relationship between the power supply signals and the command signals for energy saver mode.

There are two CPUs for energy saver mode. One is the CPU/GAPD (Gate Array Power Drive) on the BICU board and the other is the Energy Saver CPU on the FCU board.

The +5VE supply is for energy saver mode, and it is always supplied to the machine. The +5V supply is shut down in several of the energy saver modes.

Copier configuration

When either the Clear Modes/Energy Saver Mode key is pressed or the system auto reset timer runs out, the GAPD turns on the Energy Saver LED and requests the main CPU to reduce the fusing temperature.

When the auto shut off timer runs out, the GAPD turns off the main switch using the SW_TRG signal. Then IC 11 on the BICU board sends a signal to the PSU, and the PSU shuts down the +5V, +12V, -12V, and +24V supplies and cuts the ac power for the fusing lamp.

Copier/printer configuration

The GAPD controls the energy saver function, as in the copier configuration. When the auto shut off timer runs out, the GAPD keeps the Energy Saver LED on but requests the main CPU to cut the fusing lamp power.

When the main switch has been turned off manually, the CPU requests the PSU to shut down the +5V, +12V, -12V, and +24V supplies.

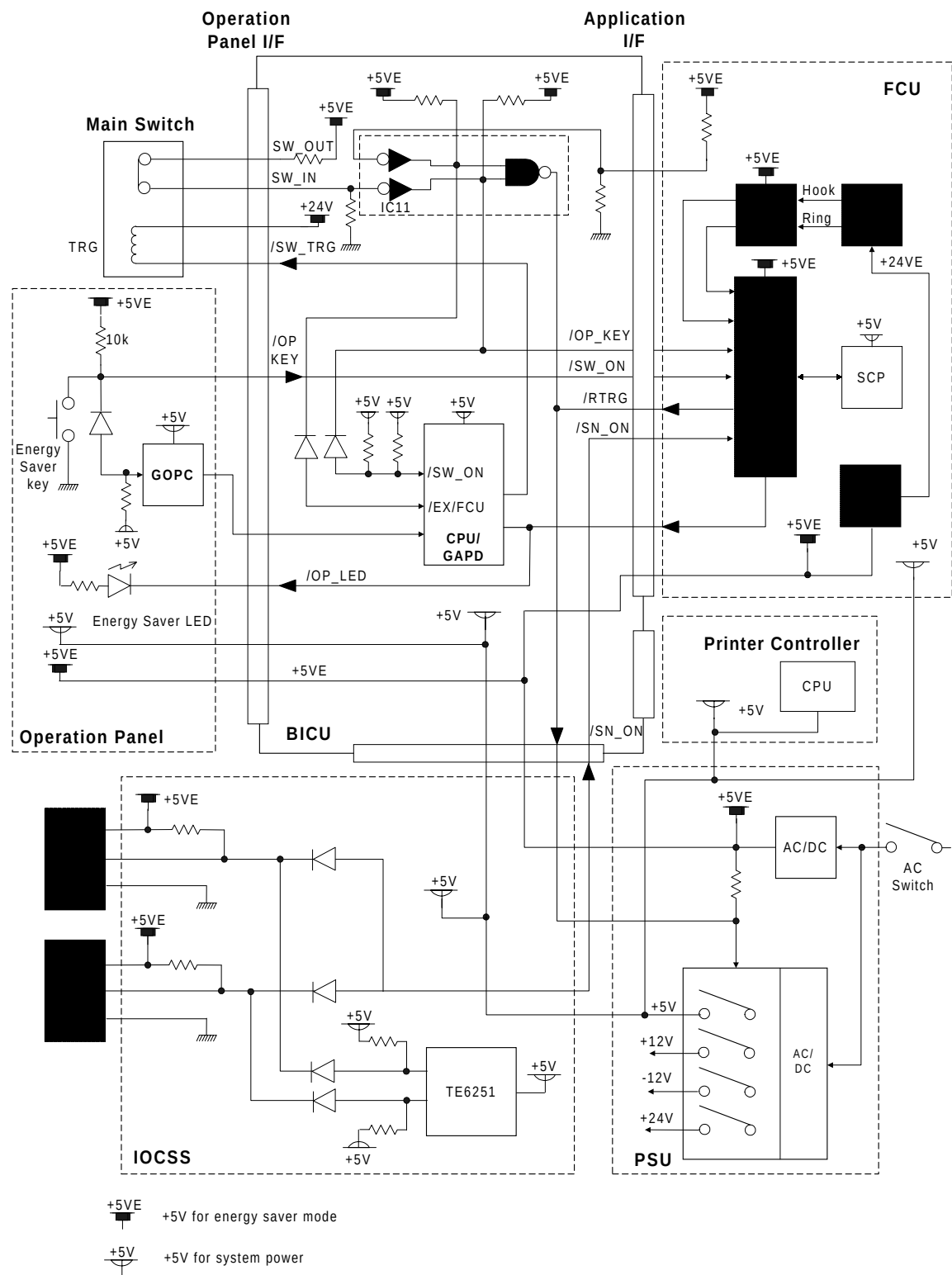
Fax configurations (Copier/fax and Copier/fax/printer)

The Energy Saver CPU monitors the Clear Modes/Energy Saver Mode key, and controls the Energy Saver LED. When either the Clear Modes/Energy Saver Mode key is pressed or the system auto reset timer runs out, the Energy Saver CPU turns the Energy Saver LED on and requests the copier main CPU to reduce the fusing temperature. When the auto shut off timer runs out, the Energy Saver CPU keeps on the Energy Saver LED, but requests the copier main CPU to cut the fusing lamp power. Then the CPU instructs the PSU to shut down the +5V, +12V, -12V, and +24V supplies.

When the main switch has been turned off manually (night mode), the Energy Saver CPU turns off the Energy Saver LED, and the fusing lamp goes off. When the CPU detects one of the energy saver recovery conditions, it requests the PSU to supply all dc supplies using the /RTRG signal.

ENERGY SAVER MODES

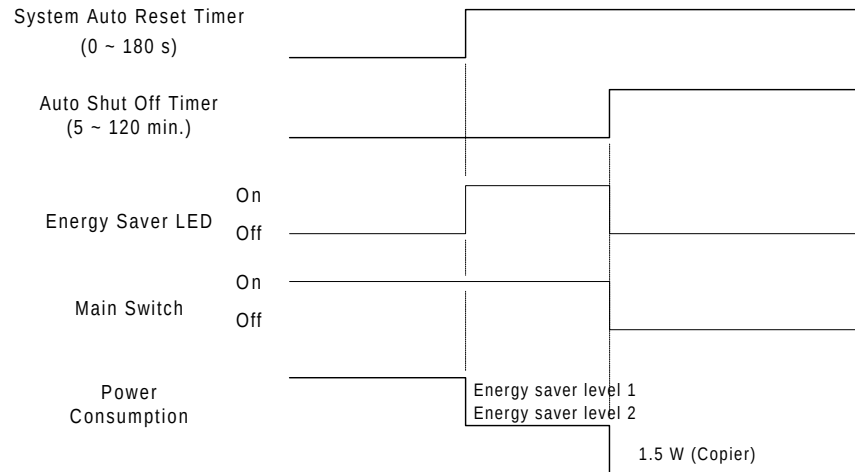
- Block Diagram -



8.6 ENERGY SAVER TIMING CHARTS

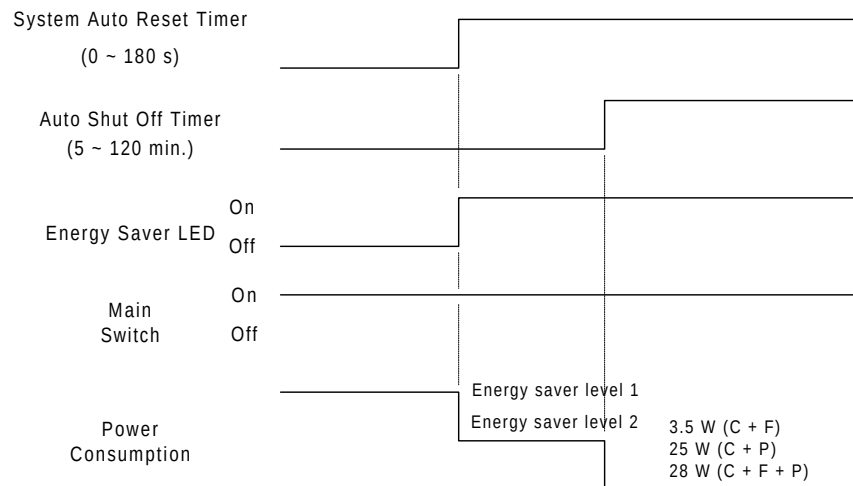
1. Auto Energy Saver mode: On Auto Shut Off mode: On

- Copier Configuration -



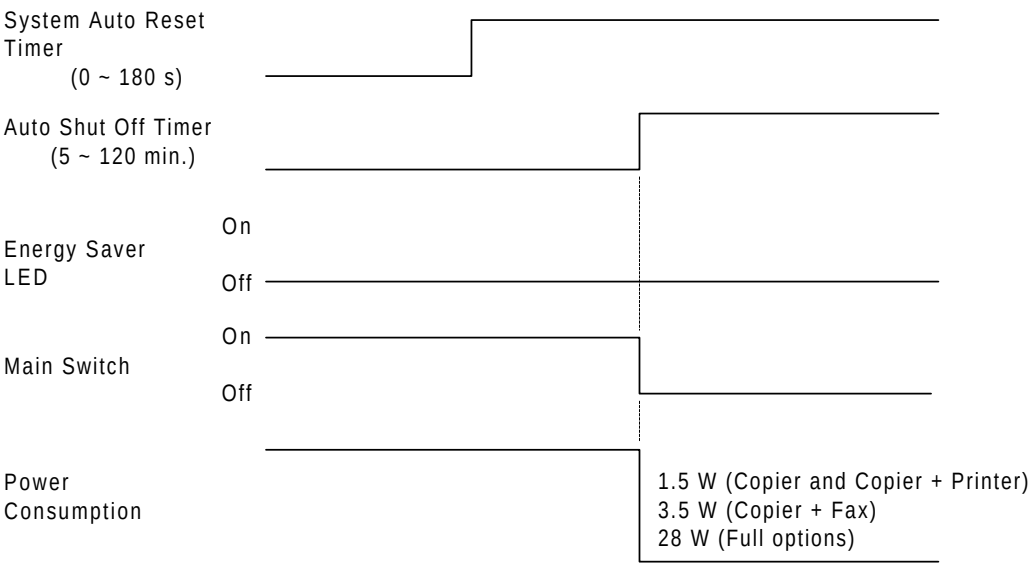
Detailed
Descriptions

- Copier + Fax or Copier + Fax + Printer Configurations -

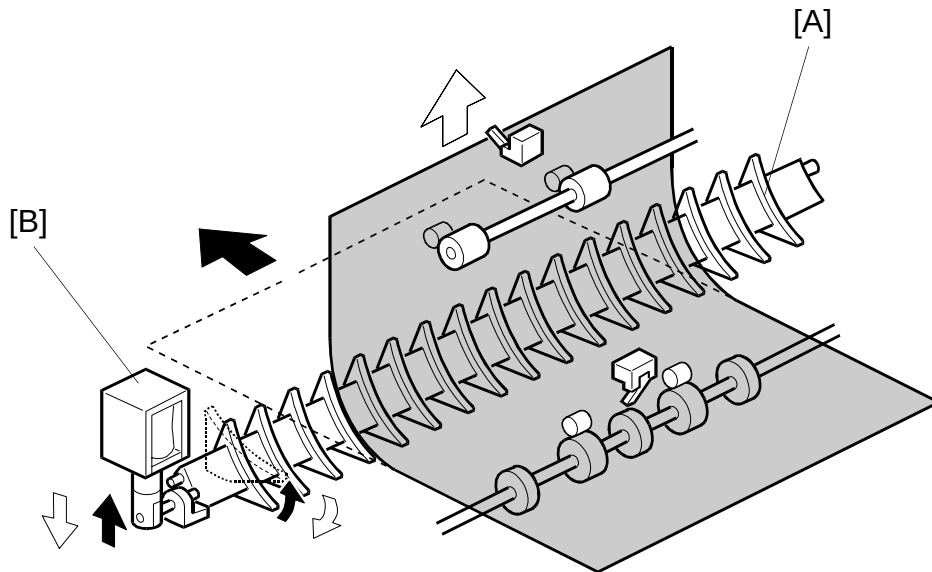


2. Auto Energy Saver mode: Off Auto Shut Off mode: On

- All configurations -



9. PAPER EXIT



Detailed
Descriptions

The copy from the fusing unit can travel either upwards to deliver the copy paper to the face down tray, or straight through to the face up tray, depending on the junction gate [A].

The junction gate solenoid [B] operates the junction gate. Usually, the junction gate is off and the copy goes up to the face down copy tray. When the junction gate solenoid is energized, the junction gate is opened, then the copy will travel to the face up copy tray.

SECTION 3

INSTALLATION

1. INSTALLATION REQUIREMENTS

1.1 ENVIRONMENT

1. Temperature Range: 10 °C to 30 °C (50 °F to 86 °F)
2. Humidity Range: 15 % to 90 % RH
3. Ambient Illumination: Less than 1,500 lux (Do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m³/hr/person
5. Ambient Dust: Less than 0.10 mg/m³ (2.7 x 10⁻⁶ oz/yd³)
6. Avoid an area which is exposed to sudden temperature changes. This includes:
 - 1) Where it will not be directly exposed to cool air from an air conditioner.
 - 2) Where it will not be directly exposed to reflected heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gasses.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the copier on a strong and level base. (Inclination on any side should be less than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

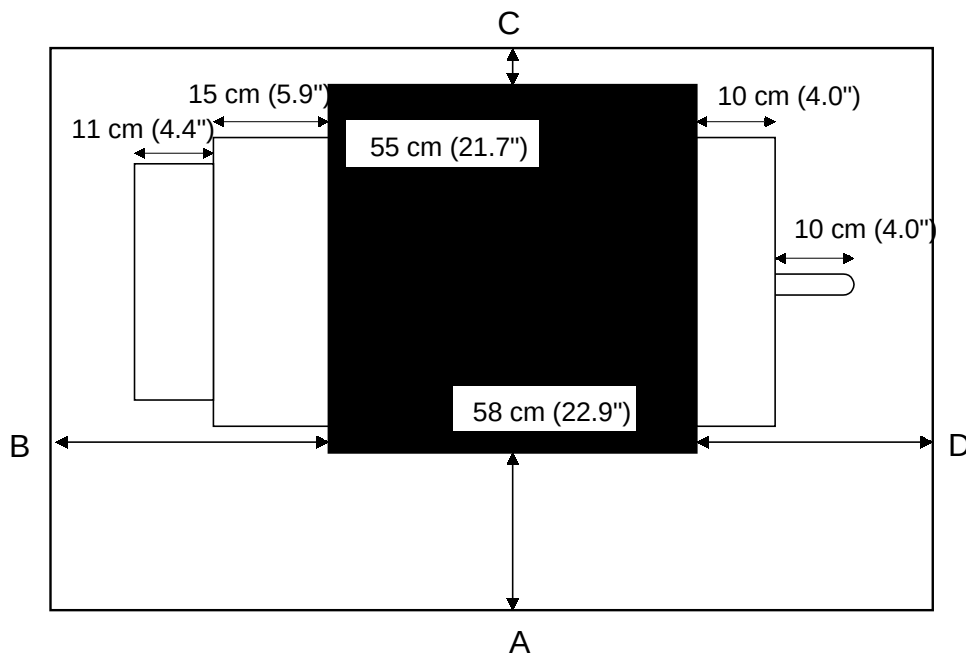
1.2 MACHINE LEVEL

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

INSTALLATION REQUIREMENTS

1.3 MINIMUM SPACE REQUIREMENTS

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



- A: In front: Over 75 cm (29.6")
B: Left: Over 34 cm (13.4")
C: To rear: Over 1 cm (0.4")
D: Right: Over 31 cm (12.2")

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

1.4 POWER REQUIREMENTS

⚠ CAUTION

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

1. Input voltage level: 120 V, 60 Hz: More than 10 A
220 V ~ 240 V, 50 Hz/60 Hz: More than 6 A
2. Permissible voltage fluctuation: 10 %
3. Do not set anything on the power cord.

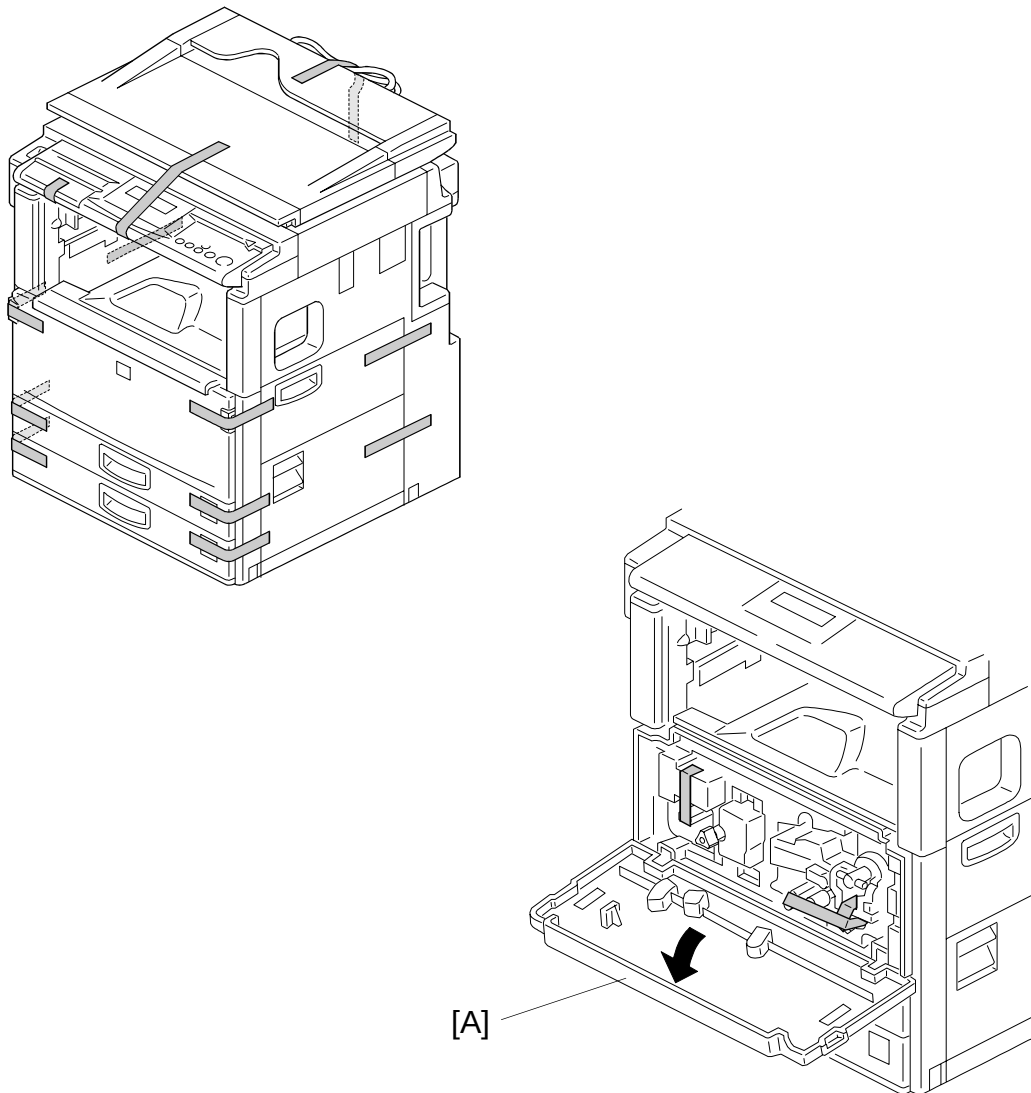
2. COPIER INSTALLATION

2.1 ACCESSORY CHECK

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

No.	Description	Q'ty
1	Operating Instructions	2
2	User Survey Card (-17 machine only)	1
3	NECR	1

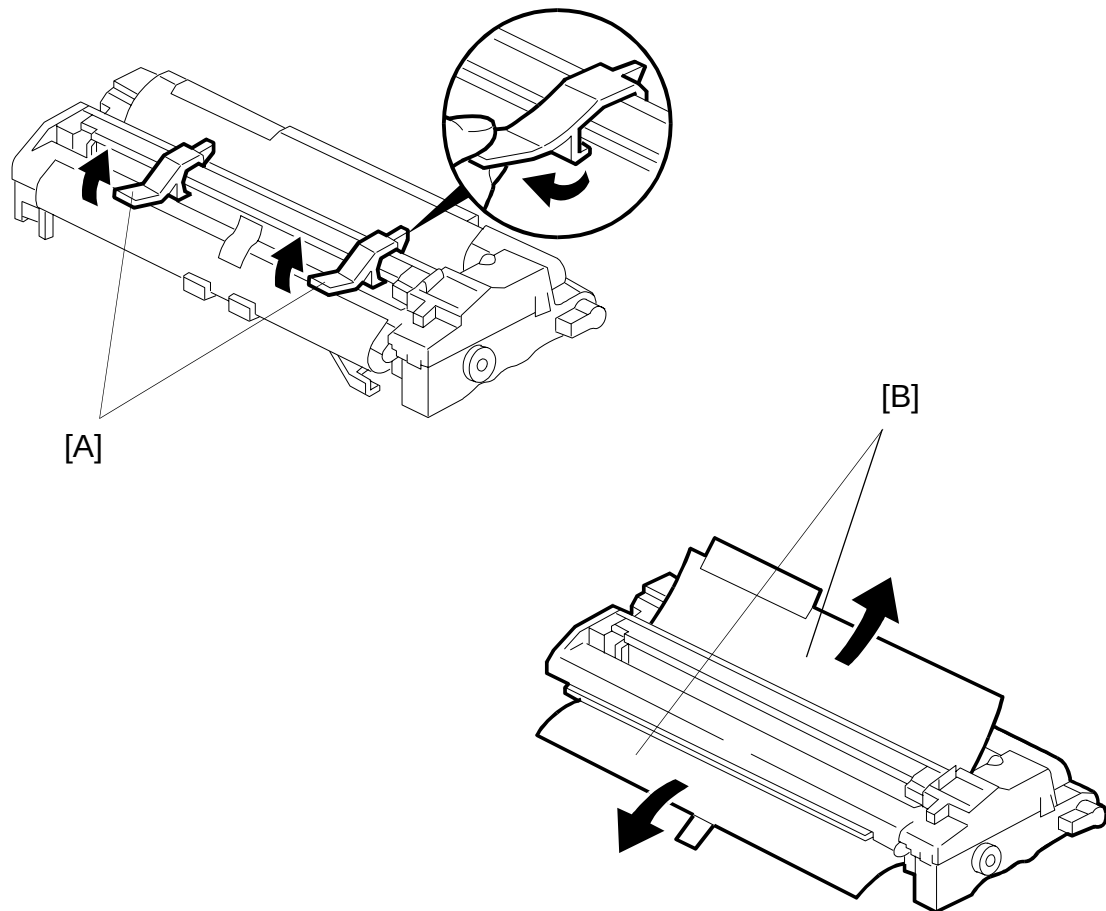
2.2 COPIER INSTALLATION PROCEDURE



⚠ CAUTION

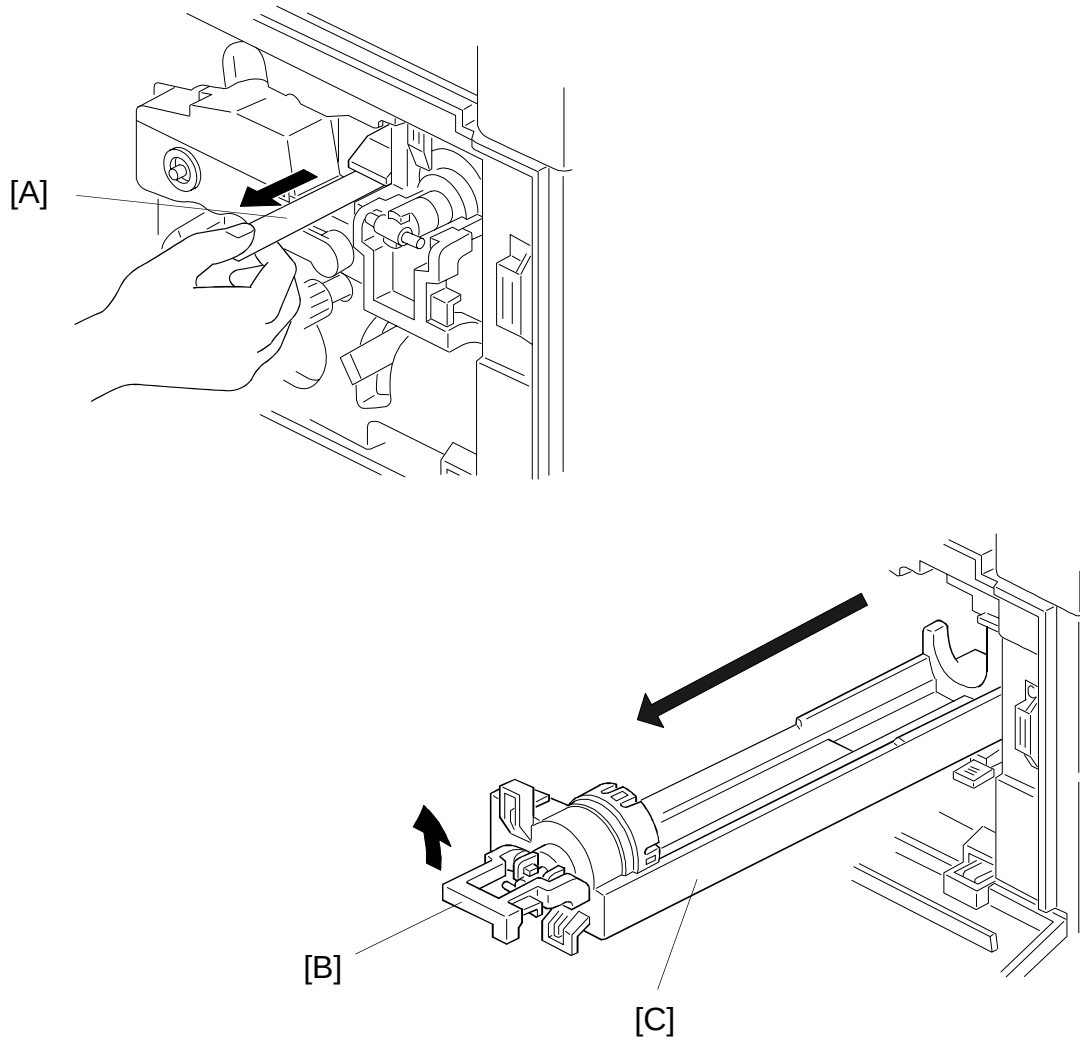
Unplug the copier power cord before starting the following procedure.

1. Remove the tapes on the exterior of the copier.
2. Open the front cover [A].
3. Remove the tapes from inside the copier and the paper tays.



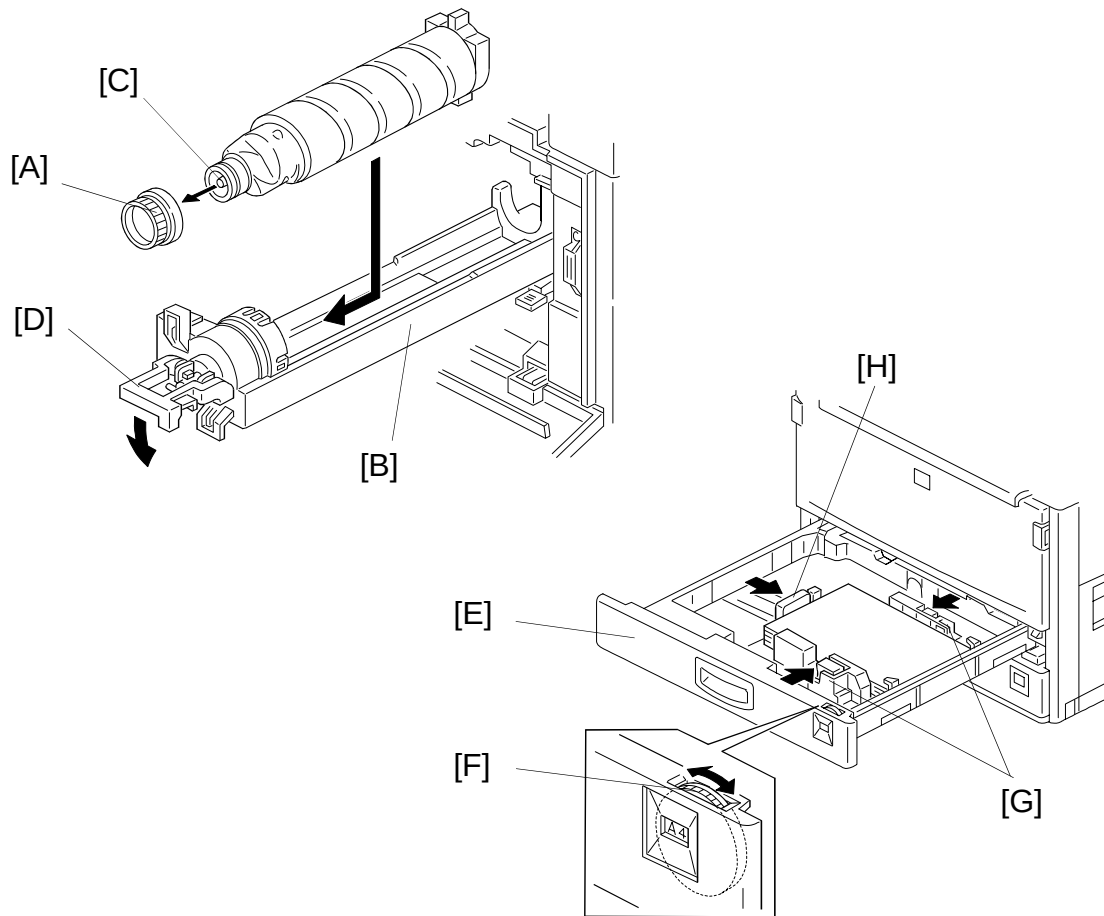
4. Unpack the new PCU (photo-conductor unit).
5. Remove 2 clamps [A] and 2 drum protection sheet [B] from the new PCU.
NOTE: Do not touch the photoconductor, copy quality may be abnormal.
6. Insert the new PCU into the machine. Push the new PCU inward until the release lever locks.

COPIER INSTALLATION



7. Gently peel the sealing tape [A] off the development unit of the PCU to install the developer.
8. Raise the toner bottle holder lever [B] and pull the toner bottle holder [C] out.
9. Shake the toner bottle well.

NOTE: Do not remove the bottle cap of the toner bottle at this time.



10. Unscrew the bottle cap [A] and insert the bottle into the holder [B] position the rear tab upward.

NOTE: Do not remove the inner bottle cap [C].

11. Reposition the holder and press down the holder lever [D] to secure the bottle.

12. Install the optional platen cover if required:

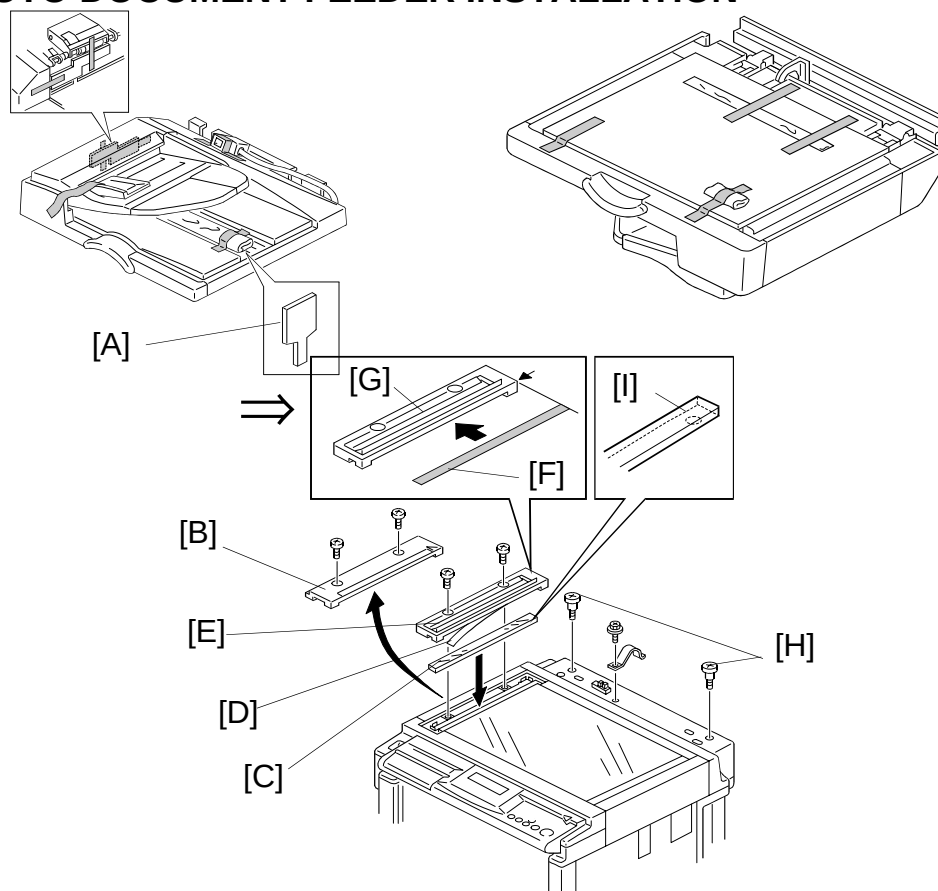
- 1) Install two stud screws on the top cover.
- 2) Position the platen cover bracket on the stud screws and slide the platen cover to the left secure with 2 screws.

13. Pull the paper tray [E] out and turn the paper size dial [F] to select the appropriate size. Adjust the side guides [G] and end guide [H] to match the paper size.

14. Turn both the ac and main switches on. The machine automatically performs TD (Toner Density) sensor initial setting. Then, check the copy quality and copying functions.

NOTE: Do not turn the ac and main switches off or open any covers during the TD sensor initial setting.

2.3 AUTO DOCUMENT FEEDER INSTALLATION

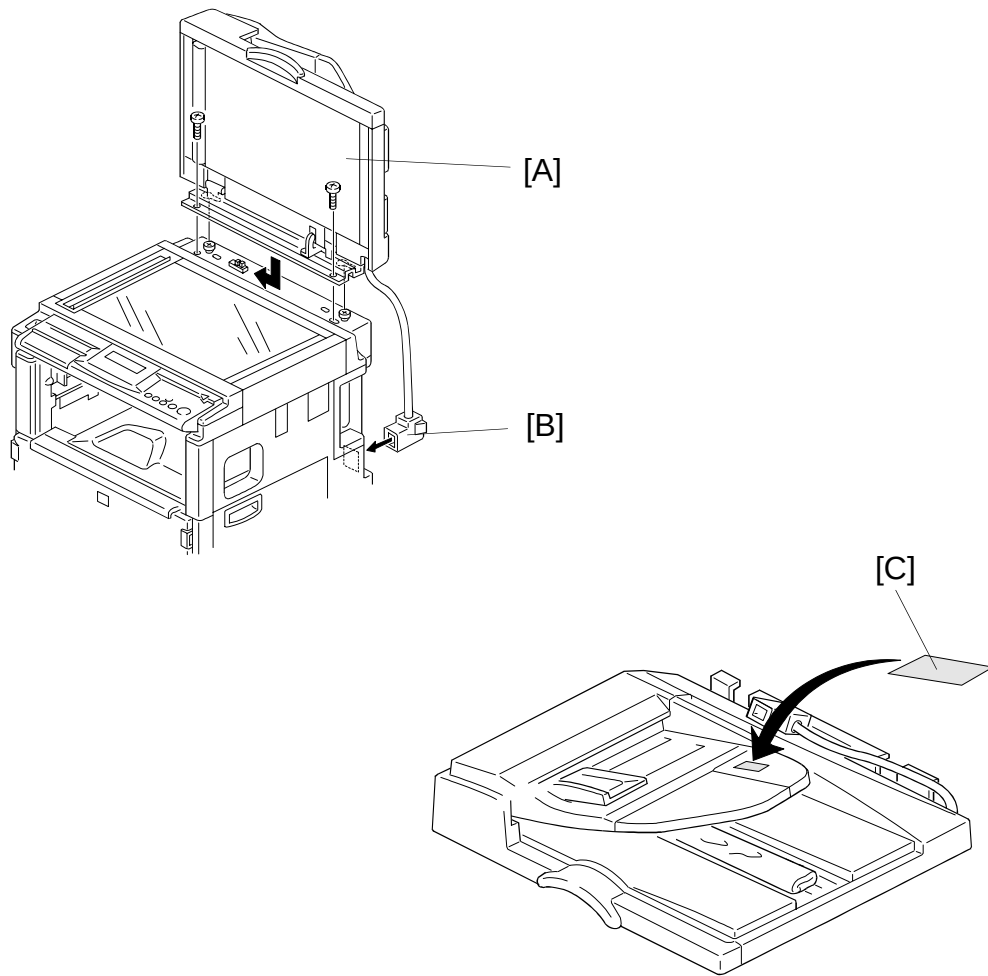


⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

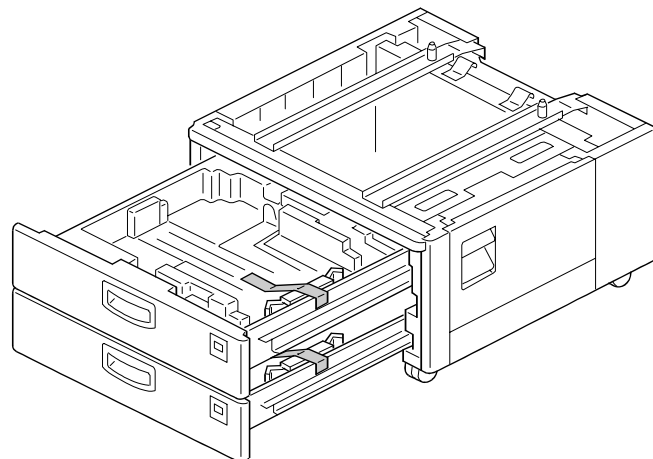
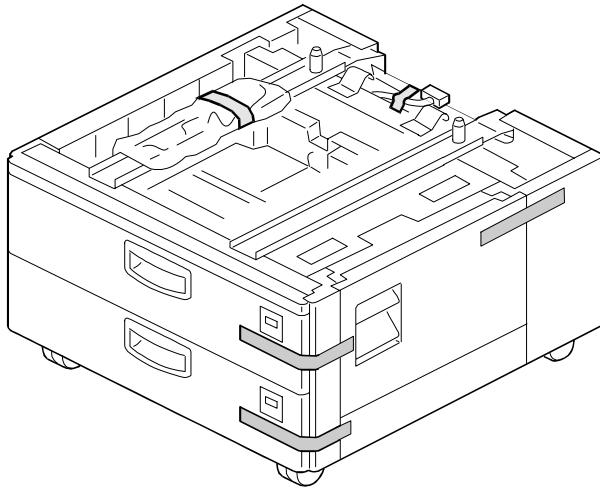
NOTE: When installing the DF, use the tool [A] in the accessory bag or a screw driver.

1. Unpack the document feeder. Then, remove all tapes.
2. Remove the left scale [B] (2 screws).
- ⇒ 3. Place the DF exposure glass [C] on the glass holder. The white mark [I] must be at the rear side facing down.
4. Peel off the backing [D] of the double side tape attached to the rear side of the scale guide [E], then adhere the scale guide (2 screws removed in step 2).
5. Attach the original size decal [F] to the scale guide.
- NOTE:** Place the decal at the rear edge, and the left side flush with the scale paper guide [G], as shown.
6. Install the stud screws [H] for the DF on the copier.



7. Install the DF unit [A].
8. Slide the DF to the left, then secure the DF unit with 2 screws (M4 x 10).
9. Connect the I/F harness [B] to the copier.
10. Attach the original direction decal [C] to the DF table as shown.
11. Turn both the ac and main switches on. Then, check if the document feeder works properly.

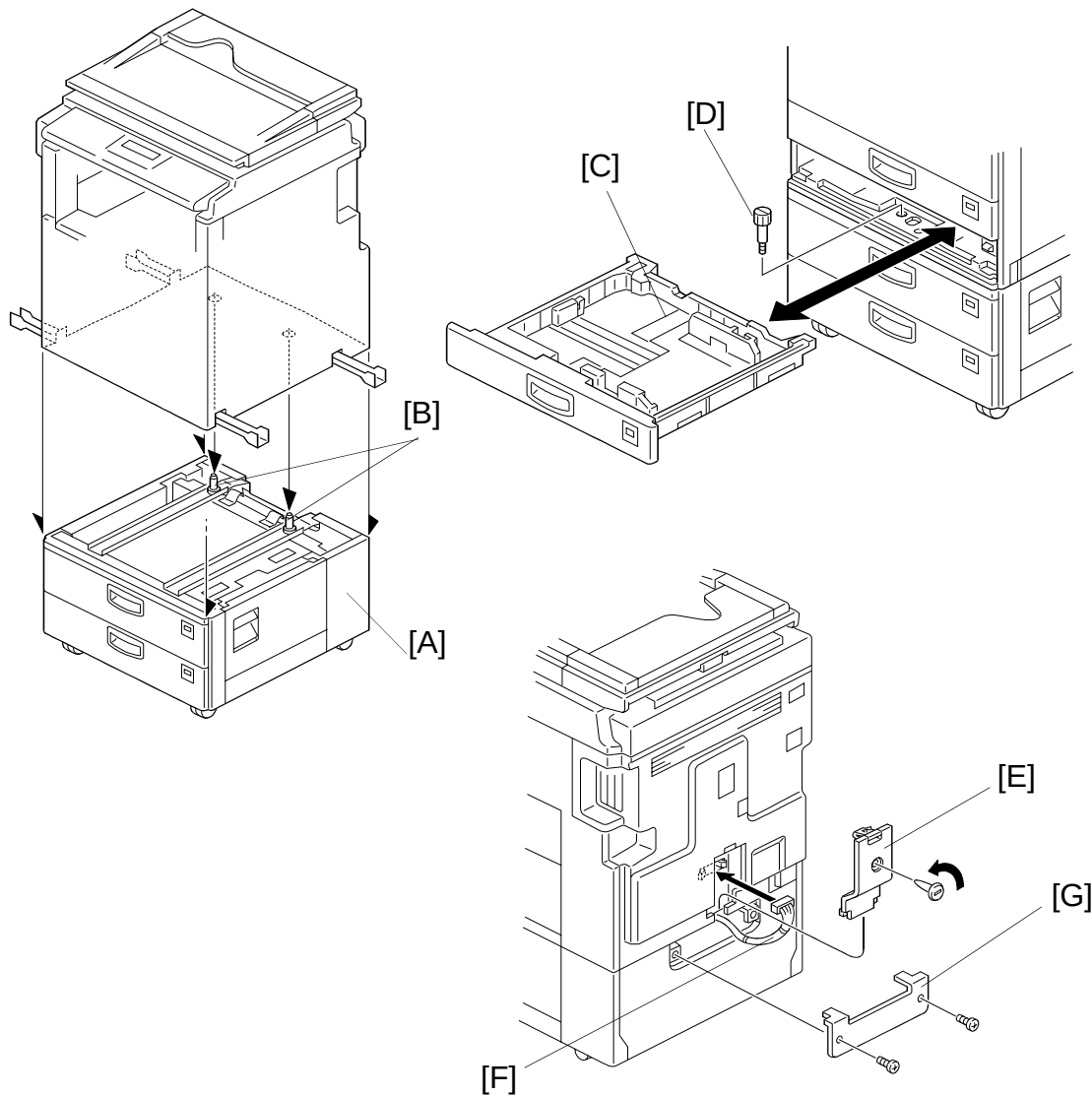
2.4 PAPER TRAY UNIT INSTALLATION



⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Unpack the paper tray unit. Then, remove all the tape.

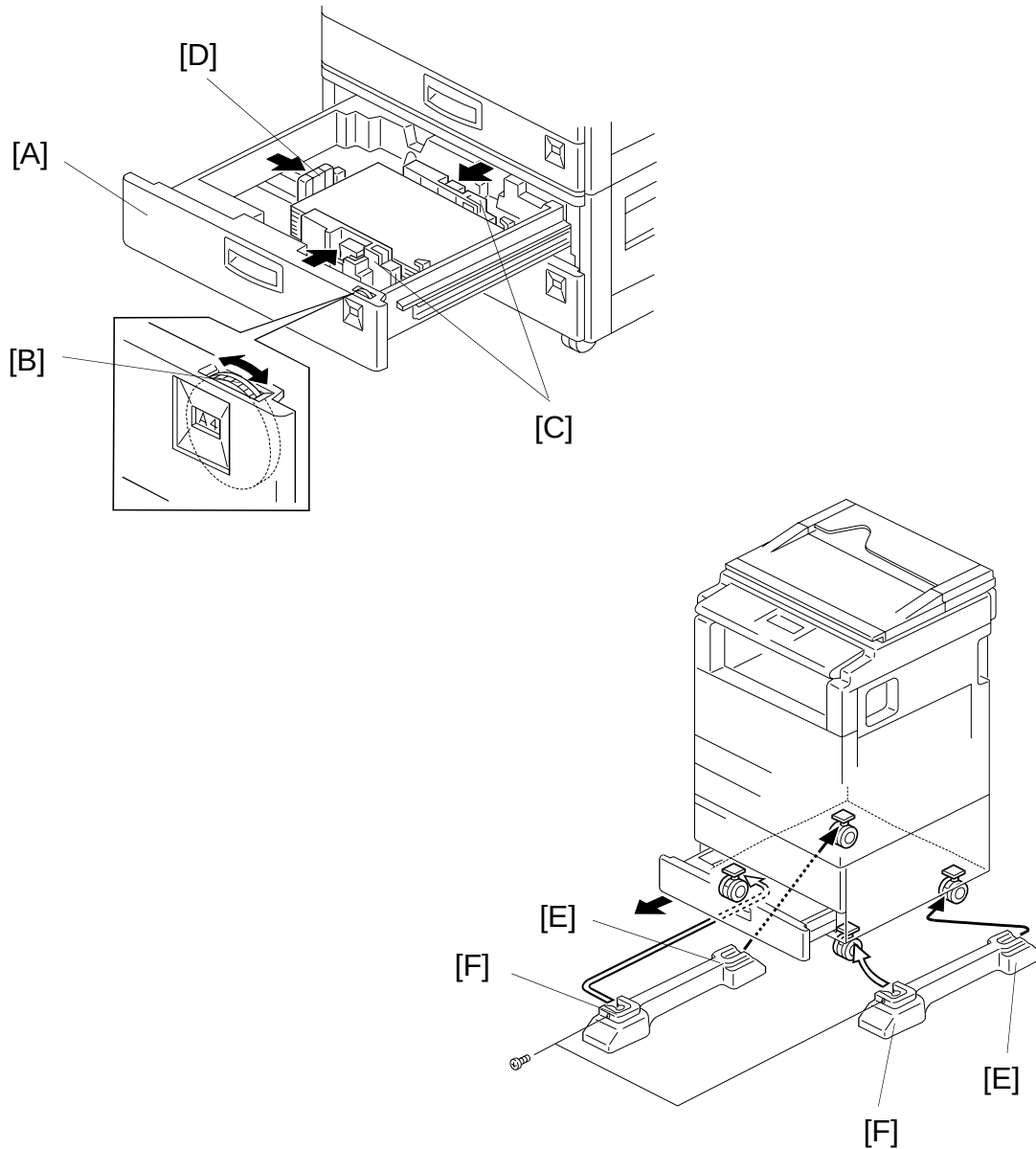


Installation

2. Place the copier on the paper tray unit [A] with the pegs [B] fitting into the copier's peg holes.
3. Remove the copier's paper tray [C].
4. Secure the knob screw [D].
5. Reinstall the copier's second paper tray back into the copier.
6. Remove the connector cover [E].
7. Connect the paper feed unit harness [F] to the copier.
8. Reinstall the connector cover.
9. Secure the joint bracket [G] to the copier (2 screws).

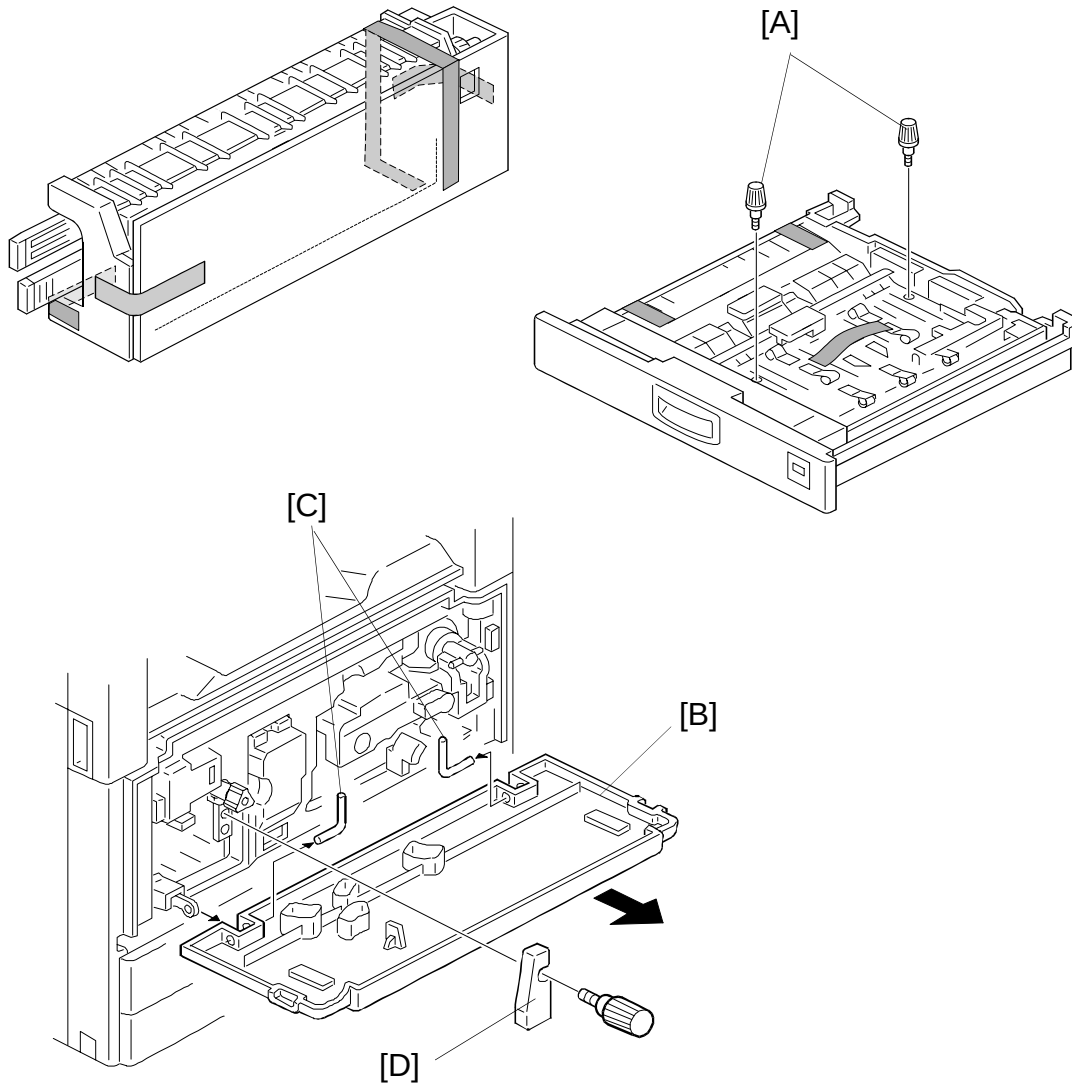
NOTE: Do not pinch the harness.

COPIER INSTALLATION



10. Pull out the paper tray [A] and turn the paper size dial [B] to select the appropriate size. Then, adjust the side guides [C] and end guide [D] to match the paper size . Repeat the procedure for the bottom tray.
11. Turn both the ac and main switches on. Then, check if the paper tray unit works properly.
12. Install the rear hooks of the stands [E] until they snap into place (1 screw).
13. Install the front hooks of the stands [F] until they snap into place (1 screw).

2.5 DUPLEX UNIT INSTALLATION

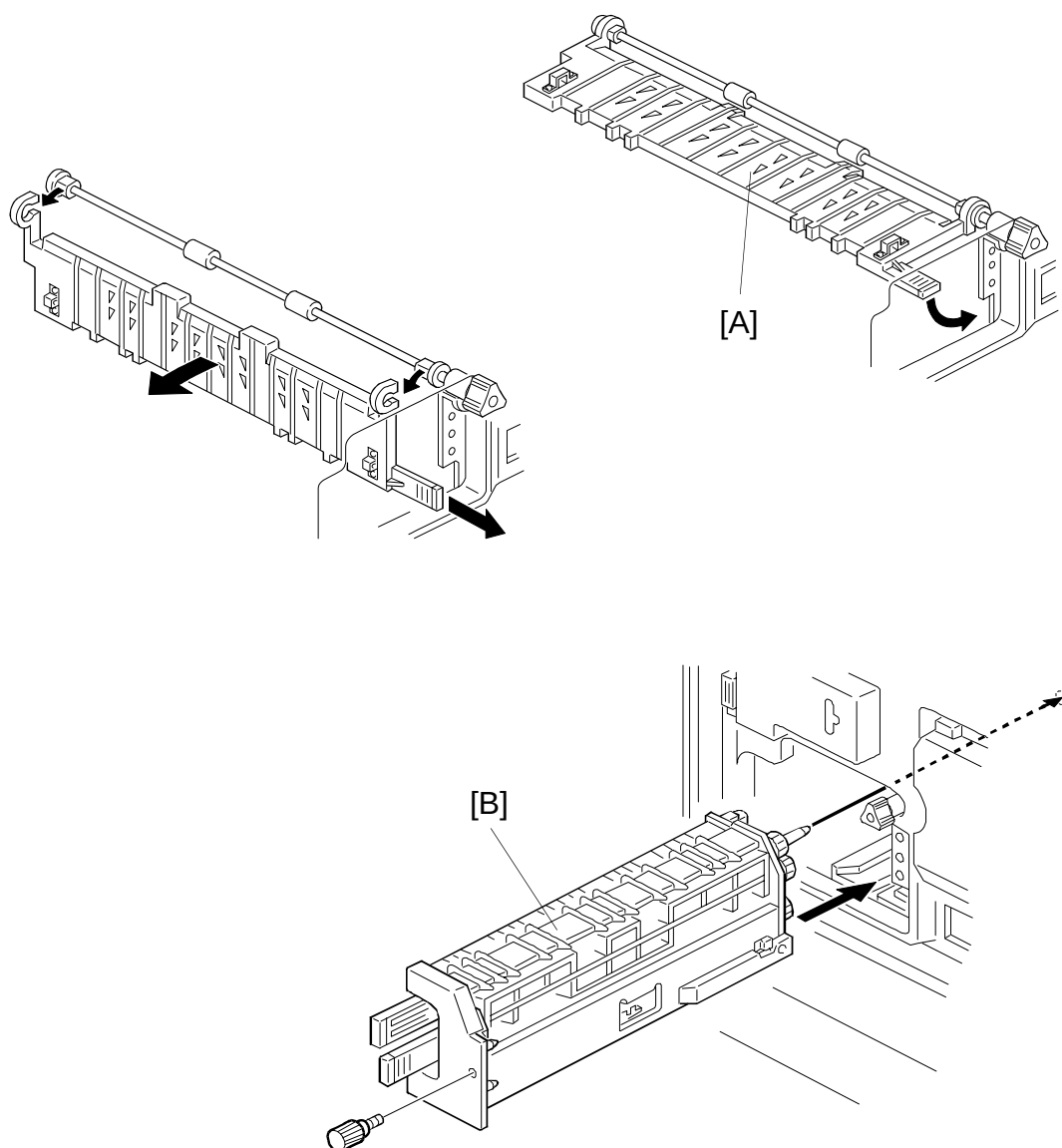


Installation

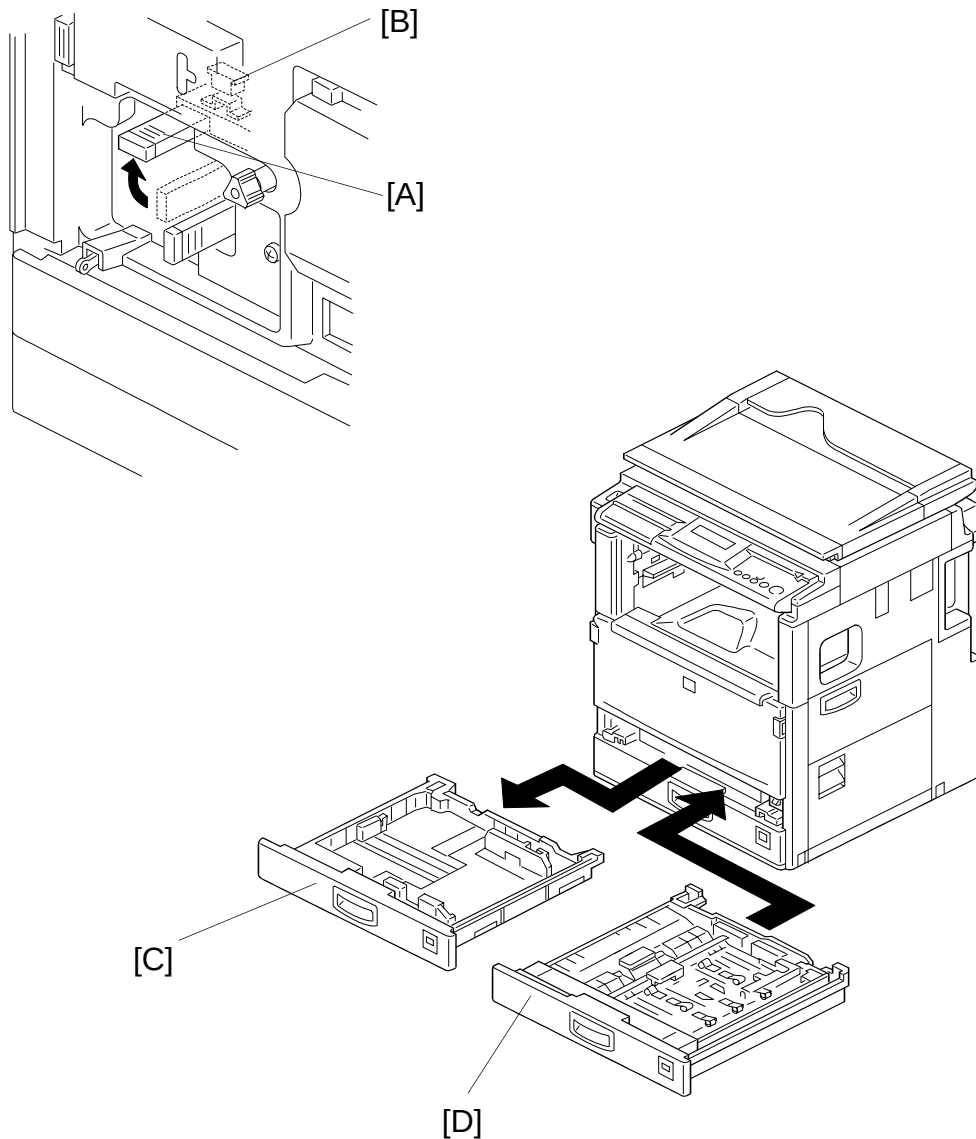
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Unpack the inverter unit and duplex unit and remove all the tape and two red knob screws [A] from the duplex unit..
2. Open the front cover [B].
3. Slide the two hinges [C] inward and remove the hinges as shown in the illustration. Then, remove the front cover.
4. Remove the inverter unit cover [D] (1 screw).

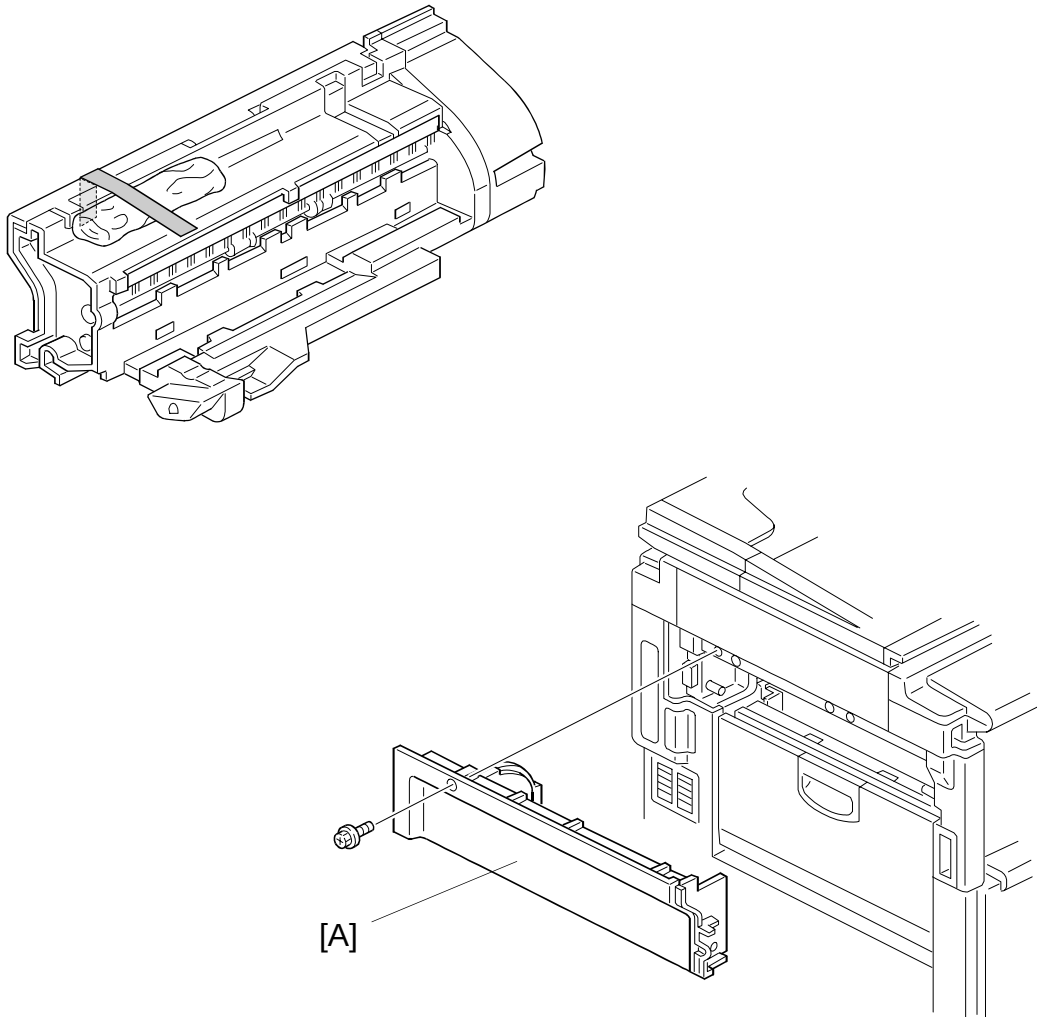


5. Swing the lower transport guide plate [A] down as shown in the illustration.
6. Remove the lower transport guide plate and pull it out as shown in the illustration.
7. Push the inverter unit [B] into the copier until the pin is completely inserted in the pin hole. It may be necessary to rotate the blue knob for clearance.
8. Secure the inverter unit with the screw which was removed in step 4.



9. Swing the upper inverter guide plate [A] up as shown in the illustration until it is secured by the magnets [B] located at the front and rear of the unit.
10. Reinstall the front cover.
11. remove the 1st paper tray [C].
12. install the duplex unit [D] into the 1st paper tray slot.
13. Turn both the ac and main switches on and check if the duplex unit works properly.

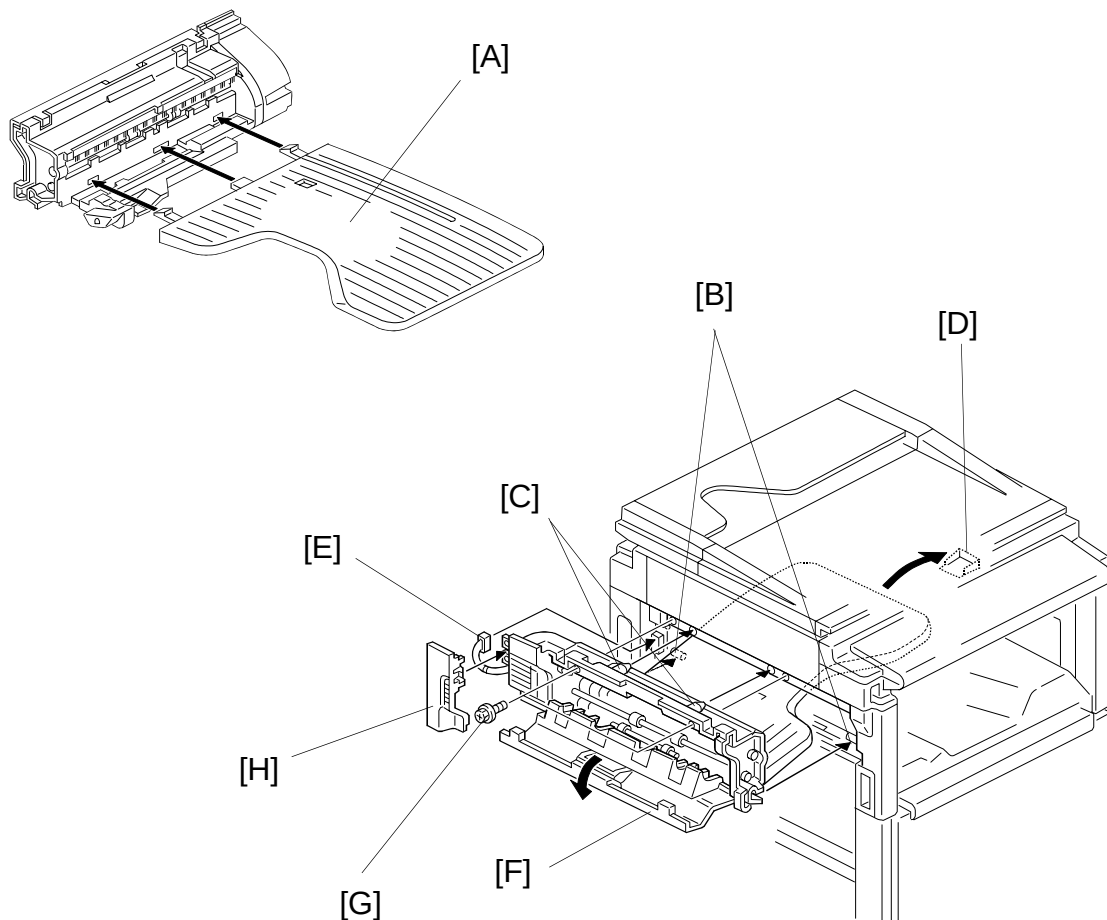
2.6 1-BIN SORTER INSTALLATION



⚠ CAUTION

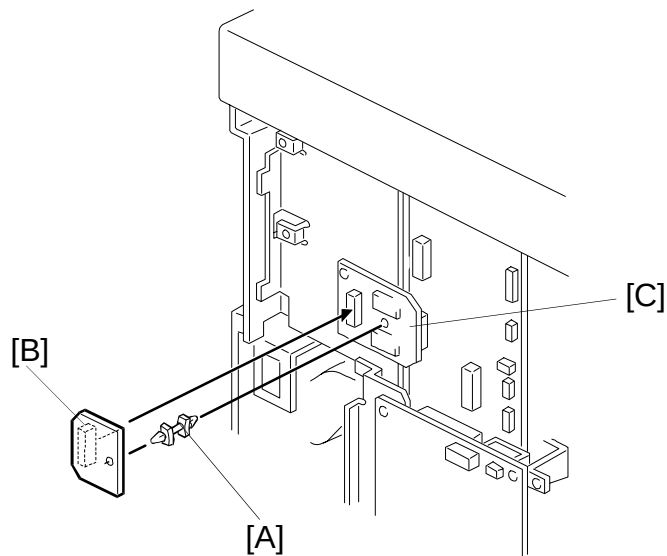
Unplug the copier power cord before starting the following procedure.

1. Unpack the copy tray and remove the tape.
2. Remove the left upper cover [A] (1 screw).



3. Insert the hooks on the 1-bin sorter tray into the slots in the sorter unit [A].
4. Hook the clips on the 1-bin sorter unit onto the stud pins [B] on the copier.
5. Insert the pins [C] into the pin holes in the copier. Make sure to rest the 1-bin sorter tray on the tray support [D].
NOTE: Do not pinch the I/F harness [E].
6. Open the left cover [F] and secure the unit (2 screws [G]).
NOTE: Use the screw which was removed in step 2 and the screw which was packed with the unit.
7. Couple the I/F cable connector with the copier.
8. Install the connector cover [H].
9. Turn both the ac and main switches on and check if copies are delivered to the 1-bin sorter properly.

2.7 MEMORY BOARD

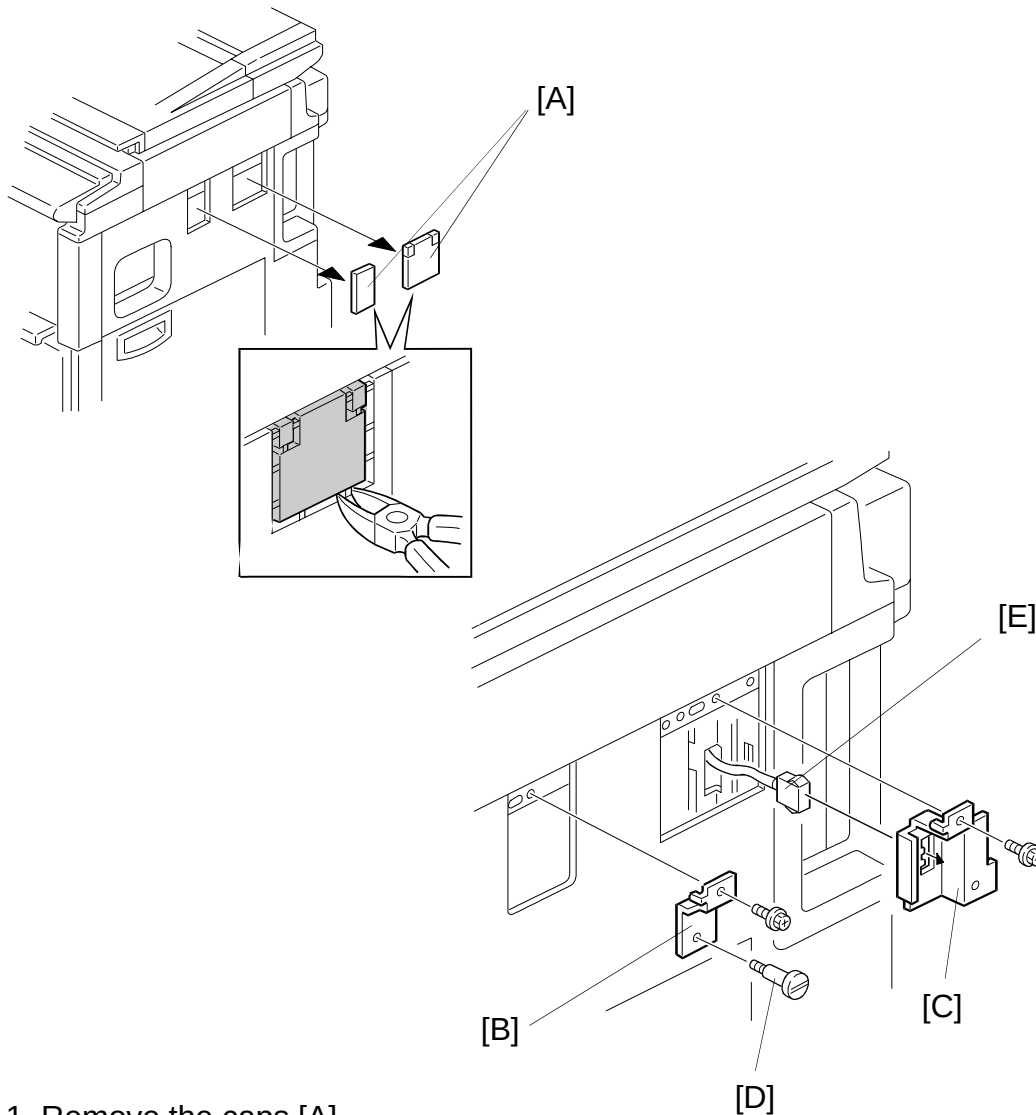


⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

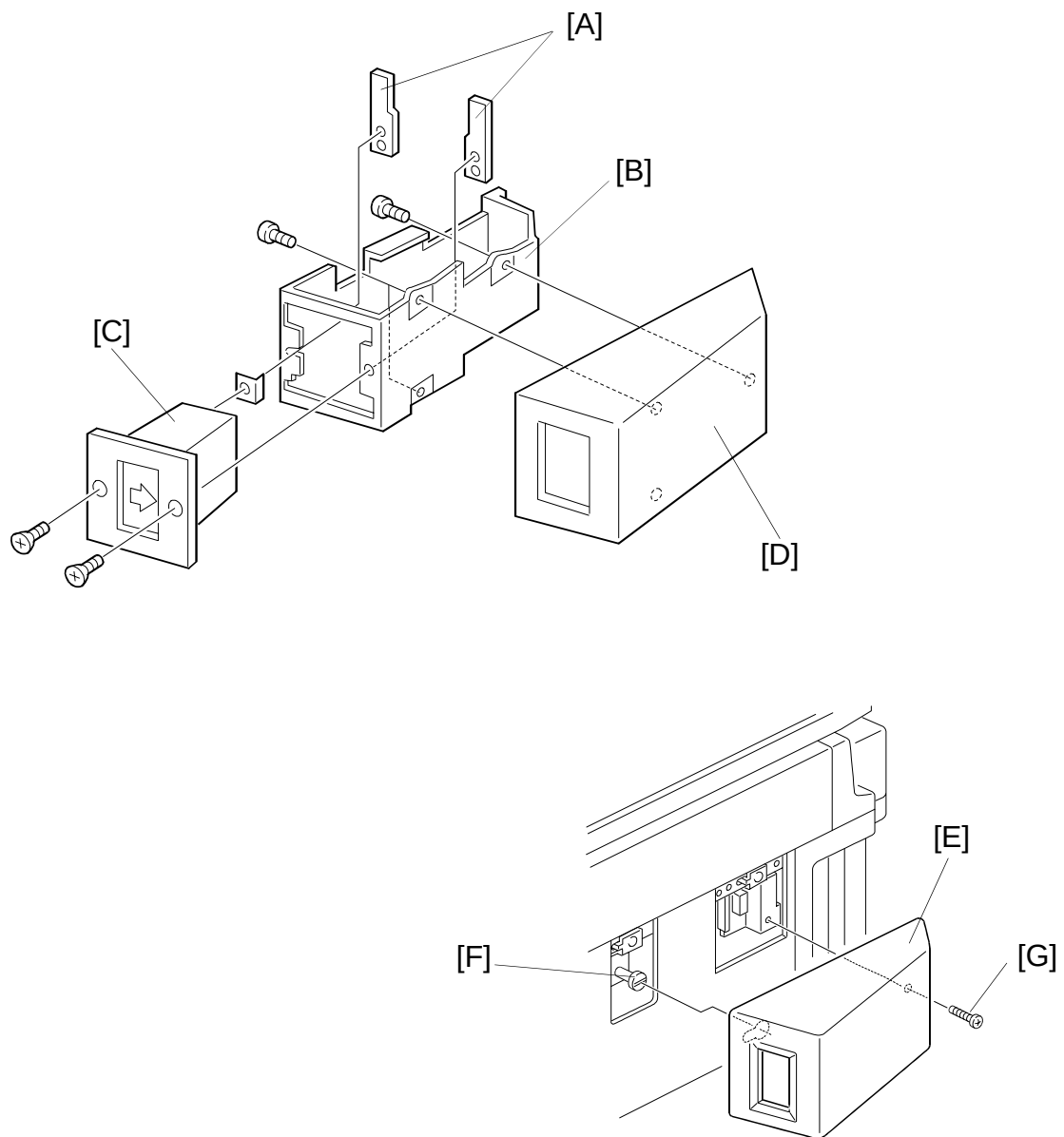
1. Remove the rear cover. (See Rear Cover Removal in Section 6.)
2. Install the spacer [A]. (May be pre-attached to the memory board)
3. Install the memory board [B] onto the MSU board [C].
4. Reassemble the machine.

2.8 KEY COUNTER HOLDER INSTALLATION



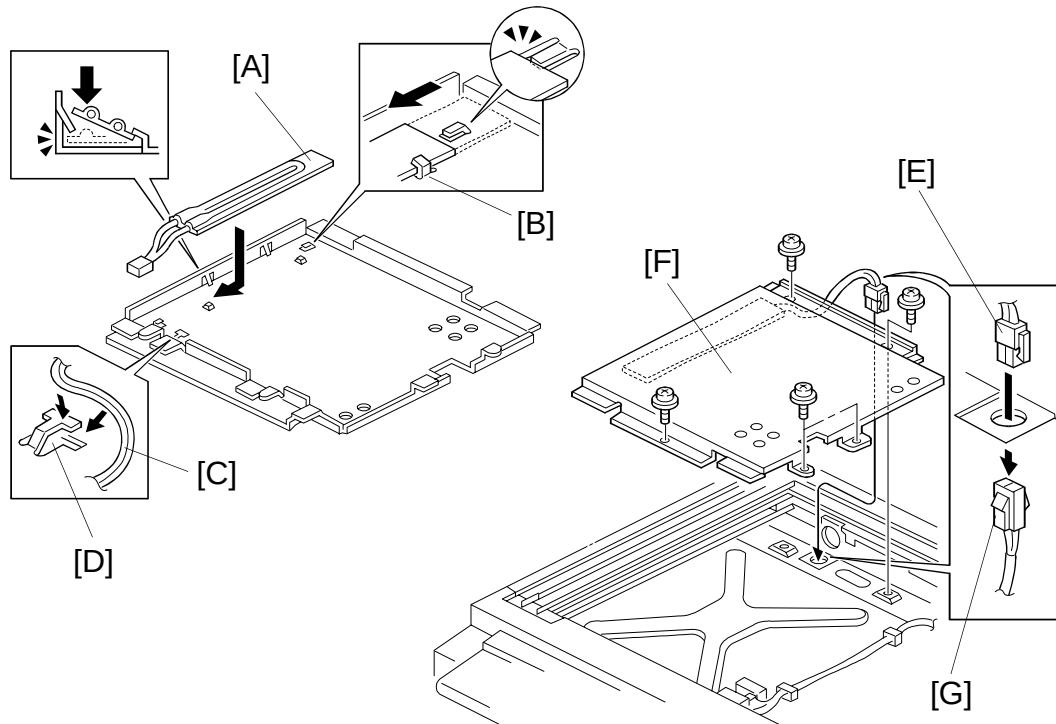
Installation

1. Remove the caps [A].
2. Secure the front key counter bracket [B] (1 screw).
3. Secure the rear key counter bracket [C] (1 screw).
4. Install the stepped screw [D] into the front key counter bracket.
5. Plug the connector [E] into the rear key counter bracket.
- ⇒ 6. Select user tool, select system, enter 18 on key pad. Enter 6 on key pad. Select "Yes", press "OK". Exit user tools.
7. Set SP5-113 to "1" to enable key counter operation.



6. Hold the key counter plate nuts [A] onto the inside of the key counter bracket [B] and insert the key counter holder [C].
7. Secure the key counter holder to the bracket (2 screws).
8. Install the key counter cover [D] (2 screws).
9. Connect the connector of the key counter holder.
10. Hook the key counter holder assembly [E] onto the stepped screw [F].
11. Secure the key counter holder assembly with a screw [G].

2.9 ANTI-CONDENSATION HEATER INSTALLATION



Installation

⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

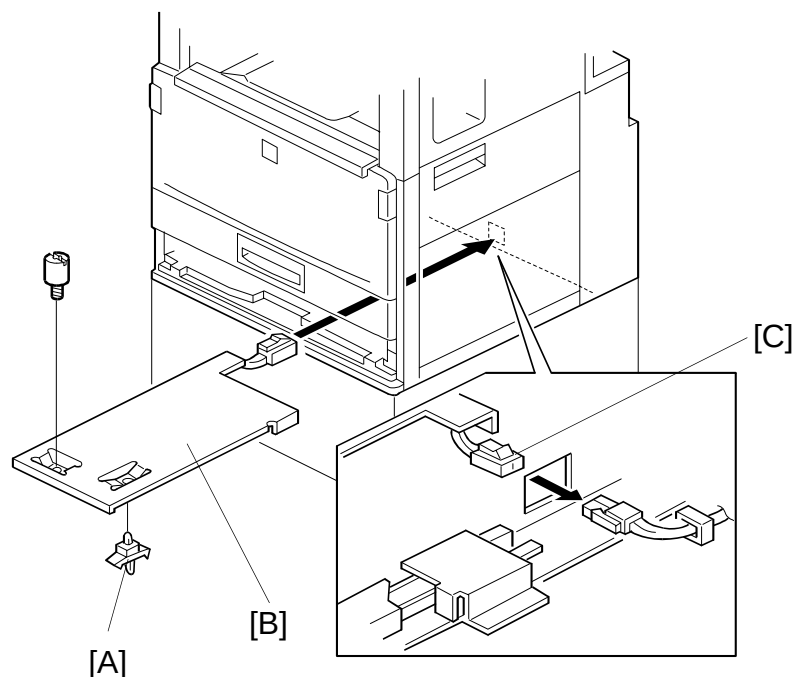
1. Remove the rear cover and lens cover. (See Rear Cover Removal and Lens Cover Removal in Section 6.)
2. Hook both ends of the heater [A] onto the clips [B].
3. Push the heater into the two clips.
4. Slide the heater to the left until it clicks into place. Fit the harness [C] into the clip [D].

NOTE: Leave the clip out to prevent the heater from slipping off.

5. Insert the connector [E] into the hole.
6. Secure the inner cover [F].
7. Couple the connector coming down from the hole with the connector [G] coming up from the printer.

NOTE: Instruct the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the heater will not function.

2.10 TRAY HEATER



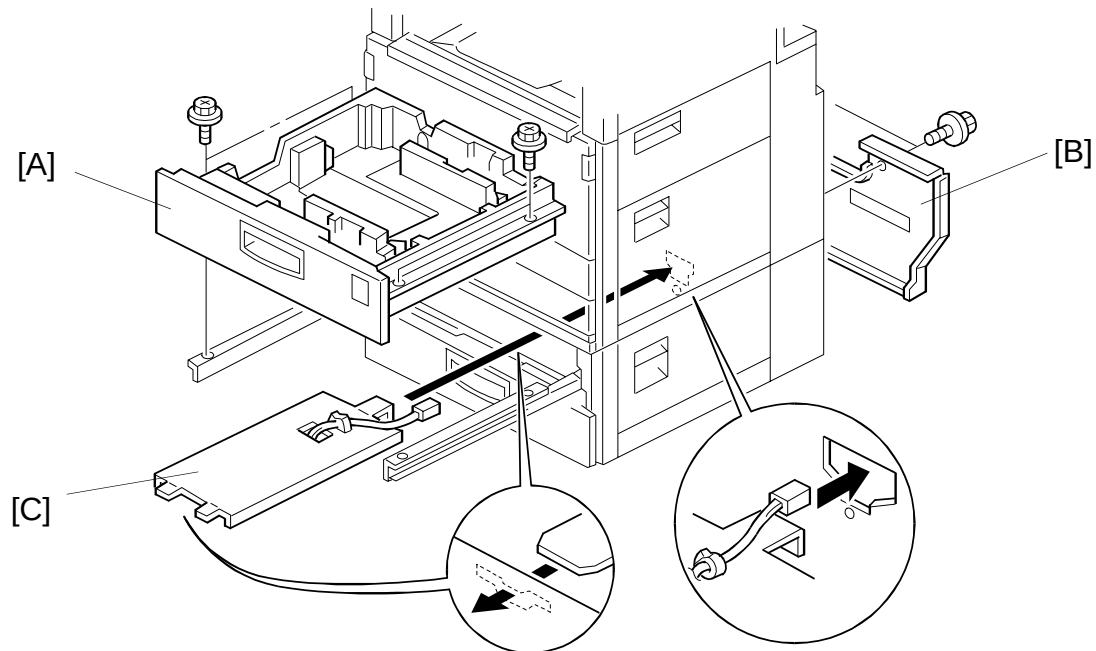
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the 2nd paper feed tray.
2. Install the clamp [A] on the base. Then, install the tray heater [B] (1 screw).
3. Connect the connector [C] of the heater to the copier's connector [D], which is on the rear frame.
4. Reassemble the machine.
5. Check the printer side-to-side registration (2nd paper tray).

NOTE: Instruct the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the tray heater will not function.

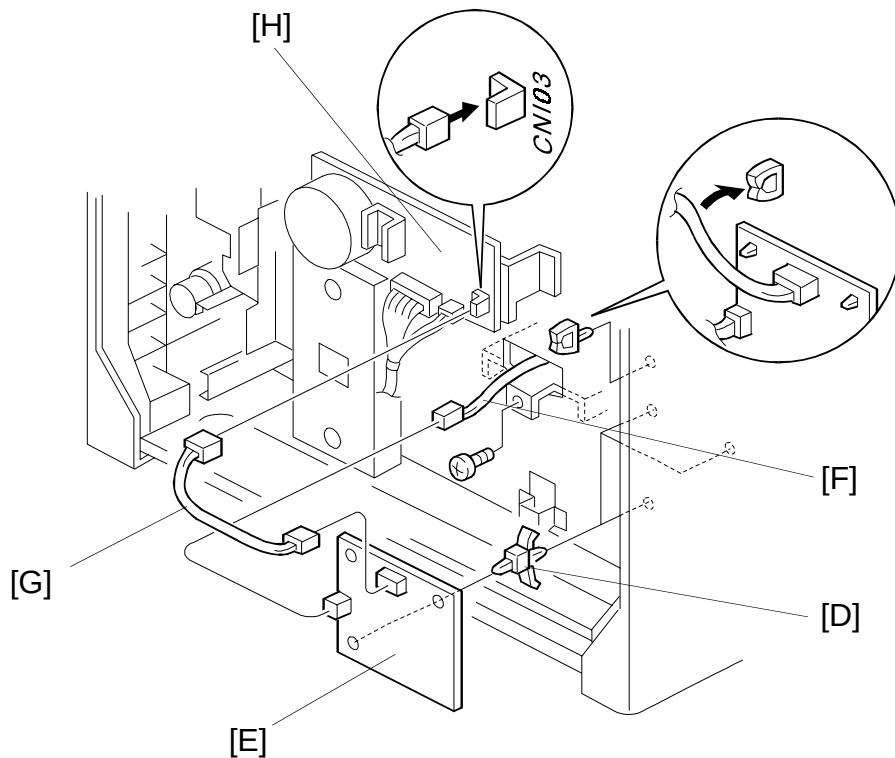
2.11 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)



Installation

⚠ CAUTION**Unplug the copier power cord before starting the following procedure.**

1. Remove the upper paper tray [A] (4 screws).
2. Remove the rear cover [B] (2 screws).
3. Install the tray heater [C] (1 screw)



4. Install 3 clamps [D]
5. Install the interface board [E], and connect the tray heater harness [F] to the interface board. Then, clamp the harness as shown in the illustration.
6. Connect the interface harness [G] to the motor [H] and the interface board.
7. Reassemble the machine.
8. Check the printer side-to-side registration (3rd and 4th tray).

NOTE: Instruct the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the tray heater will not function.

SECTION 4
SERVICE TABLES

1. SERVICE REMARKS

1.1 GENERAL CAUTION

Do not turn off the main switch while any of the electrical components are active. Doing so might cause damage to units, such as the PCU, when they are pulled out of or re-inserted into the copier.

1.2 PCU (Photo-Contactor Unit)

The PCU consists of the OPC drum, development unit, charge roller unit, and cleaning unit. Follow the cautions below when handling a PCU.

1. Never touch the drum surface with bare hands. When the drum surface is touched or becomes dirty, wipe it with the special cleaning cloth, part number, A1539004.
2. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
3. Store the PCU in a cool, dry place away from heat.
4. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
5. Never expose the drum to corrosive gases such as ammonia gas.
6. Never shake the PCU. Doing so may cause toner and/or developer to spill out.
7. Do not bend the PCU. Doing so may cause toner and/or developer to spill out.
8. Dispose of used PCUs in accordance with local regulations.
9. Do not touch the charge roller with bare hands. Oil stains may cause black bands on copies due to excessive drum charge.
10. Prevent the charge roller from being exposed to dusty air. Dust on the charge roller may cause white spots on copies due to insufficient drum charge.
11. Never use alcohol or water to clean the drum charge roller. Alcohol or water corrode its surface. Wipe with a dry cloth.

1.3 TRANSFER ROLLER UNIT

1. Never touch the transfer belt surface with bare hands.
2. Take care not to scratch the transfer roller as the surface is easily damaged.

1.4 SCANNER UNIT

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.

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 mirror are very sensitive to dust. Never open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.

1.6 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it rotates freely.
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.

1.7 PAPER FEED

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

1.8 OTHERS

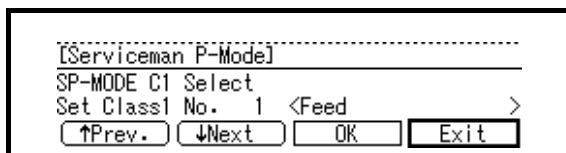
1. The TD sensor initial setting is performed automatically after installing the new PCU and closing the front cover. Never open the front cover or turn off the main switch during this time. The main motor stops when the initial setting has finished.
2. The toner bottle should be replaced while the main switch is on.
3. If the optional tray and anti-condensation heaters have been installed, keep the copier power cord plugged in, even when the copier main switch is turned off. This keeps the heaters energized.

2. SERVICE PROGRAM MODE

2.1 SERVICE PROGRAM MODE OPERATION

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

2.1.1 Service Program Access Procedure



1) How to enter the SP mode

Press the following keys in sequence.

 → **1** → **0** → **7** → 

Hold the  key for more than 3 seconds. (the digit 7 key will not beep when pressed)

2) How to exit SP mode

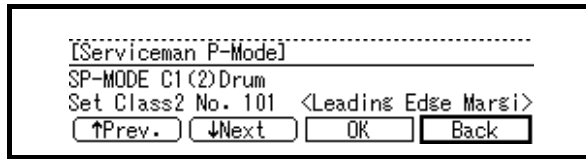
Press the  key or the exit key three times.

2.1.2 Accessing Copy Mode from within an SP Mode

1. Press the Interrupt key.
2. Select the appropriate copy mode and make trial copies.
3. To return to the SP mode, press the Interrupt key again.

2.1.3 How to select the program number

Program numbers are composed of two or three levels.



To input the required program number, select each program level in sequence.

1. Select the 1st level program number at the numeric key pad and press the **#** key or OK key.

NOTE: The 1st level program number can be selected using the arrow keys or Prev key or Next key.

2. Select the 2nd level program number at the numeric key and press the **#** key or OK key.

NOTE: The 2nd level program number can be selected using the arrow keys or Prev key or Next key.

3. If there any are third level programs in the SP mode, they can be selected the same way as the 1st and 2nd level SP modes.

NOTE: The 3rd level program number can be selected using the arrow keys or Prev key or Next key.

2.1.4 To Input a Value or Setting for an SP Mode

1. Enter the required program mode as explained above.
2. Enter the required setting using the numeric keys, then press the **#** key or OK key.

NOTE: If you forget to press the **#** key or OK key, the previous value remains.

3. Exit SP mode.

2.2 SERVICE PROGRAM MODE TABLES

2.2.1 Main SP Mode Table

NOTE: 1) In the Function column, comments are in italics.
 2) In the Settings column, the default value is in bold letters.
 3) An asterisk " * " after the mode number indicates that this mode is stored in the NVRAM. If the RAM is reset, all these SP modes will return to their factory settings.

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-001 *	1	Leading Edge Registration (Normal copying, and duplex 1st side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
	2	Leading Edge Registration (Duplex: 2nd side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	+12.5 ~ -12.5 0.1 mm/step + 0.0 mm
1-002 *	1	Side-to-Side Registration (1st paper feed)	Adjusts the printing side-to-side registration from the 1st paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
	2	Side-to-Side Registration (2nd paper feed)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ±1.5 mm.</i>	+9 ~ -9 1 mm/step + 0.0 mm
	3	Side-to-Side Registration (3rd paper feed: Option PFU tray 1)	Adjusts the printing side-to-side registration from the 3rd paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ±1.5 mm.</i>	+9 ~ -9 1 mm/step + 0.0 mm

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-002 *	4	Side-to-Side Registration (4th paper feed: Option PFU tray 2)	Adjusts the printing side-to-side registration from the 4th paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ± 1.5 mm.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
		Side-to-Side Registration By-pass feed (-T)	Adjusts the printing side-to-side registration from the by-pass feed table using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ± 1.5 mm.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
	6	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ± 1.5 mm.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
1-003 *	1	Paper Feed Timing (Paper Feed Trays)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A larger setting leads to more buckling.)	0 ~ 10 1 mm/step 7 mm
	2	Paper Feed Timing By-pass (-T)	Display Message: Regist. curl adjustment	0 ~ 10 1 mm/step 8 mm
1-006 *		Double copy registration	Adjusts the position of the second copy from the center line in double copy mode. <i>Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	+9 ~ -9 1 mm/step + 0 mm
1-007 *		By-pass Feed Paper Size Display	Displays the paper width sensor data for the by-pass feed table.	
1-105 *	1	Fusing Temperature Setting (Operation)	Adjusts the fusing temperature in the operation mode.	100 ~ 200 1°C/step 180°C
	2	Fusing Temperature Adjustment (Energy Saver Level 2)	Adjusts the fusing temperature in the energy saver level 2 mode. <i>With a lower value, the machine takes more time to reach the ready condition.</i>	0 ~ 165 1°C/step 140°C (115V machine) 0°C (230V machine)
1-106		Fusing Temperature Display	Displays the fusing temperature. <i>Press the  key to exit the display.</i>	
1-901		Auto Restart Interval	Do not change the value.	

SERVICE PROGRAM MODE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-902		Fusing Control Frequency Display	Displays the fusing control frequency which is detected by the zero cross signal generator. Display message: AC frequency count. <i>Around "50" equals 50 Hz. Around "60" equals 60 Hz.</i>	
2-001 *		Charge Roller Voltage Adjustment	Adjusts the voltage applied to the charge roller. Do not change the value.	-1000 ~ -2500 1 V/step - 1750 V
2-101 *	1	Leading Edge Margin (Printing)	Adjusts the leading edge erase margin. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 3.0 mm
	2	Trailing Edge Margin (Printing)	Adjusts the trailing edge erase margin. <i>The specification is 2 ± 2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 2.0 mm
	3	Left Margin (Printing)	Adjusts the left side erase margin. <i>The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 2.0 mm
	4	Right Margin (Printing)	Adjusts the right side erase margin. <i>The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 2.0 mm
2-103 *		LD Power Adjustment	Adjusts the LD power. Do not change the value.	-128 ~ +127 1 μ W/step - 103
2-106*		Test Pattern ID	Adjusts the image density level for black pixels on test pattern printouts (made with SP5-902).	0 ~ 255 1/step 255
2-201 *		Development Bias Adjustment	Adjusts the development bias during copying. <i>This can be adjusted as a temporary measure if faint copies appear due to an aging drum.</i>	-200 ~ -900 1 V/step - 600 V
2-213*		Number of Copies After Toner Near End Detection	Selects the number of copies after toner near-end has been detected. Display message: Toner end count	0: 50 copies 1: 20 copies
2-220 *		Toner sensor Display	Displays the TD sensor output voltage. (VT) <i>Press the  key to exit the display.</i>	

Mode No.		Function	Settings
Class 1 and 2	Class 3		
2-301 *	1 *	Transfer Current Front (Paper Tray) <i>Adjusts the current applied to the transfer roller during printing from the paper tray.</i> <i>If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.</i>	0: -2 μ A 1: 0 μA 2: +2 μ A 3: +4 μ A
	2 *	Transfer Current By-pass <i>Adjusts the current applied to the transfer roller during printing from the by-pass feed table.</i> <i>If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.</i>	0: -2 μ A 1: 0 μA 2: +2 μ A 3: +4 μ A
	3	Transfer Current Rear (Duplex) <i>Adjusts the current applied to the transfer roller during printing from the duplex tray.</i> <i>If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.</i>	0: -2 μ A 1: 0 μA 2: +2 μ A 3: +4 μ A
	4	Transfer Current (Cleaning) <i>Adjusts the current applied to the transfer roller during roller cleaning.</i> <i>If toner remains on the roller after cleaning, increase the current.</i>	-10 ~ 0 1 μ A/step - 4 μA
2-801		TD Sensor Initial Setting Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 2.0 V. <i>After installing a new PCU, the machine performs this function automatically.</i> Do not use this SP mode.	0: No 1: Yes
2-901*	1	Separation Voltage Adjustment (Front side - leading edge) <i>Adjusts the discharge brush voltage at the leading edge on the front side.</i> <i>Increase if the paper is getting wrapped around the drum.</i>	-1000 ~ -4000 1 V/step - 2300 V
	2	Separation Voltage Adjustment (Front side - other areas) <i>Adjusts the discharge brush voltage on the front side except at the leading edge.</i>	-1000 ~ -4000 1 V/step - 2300 V
	3	Separation Voltage Adjustment (Rear side - leading edge) <i>Adjusts the discharge brush voltage at the leading edge on the rear side.</i> <i>For the rear side in duplex mode, higher voltage is needed. The paper has more static on it, and there is toner on one side of the paper.</i>	-1000 ~ -4000 1 V/step - 3000 V
	4	Separation Voltage Adjustment (Rear side - other areas) <i>Adjusts the discharge voltage on the rear side except at the leading edge.</i>	-1000 ~ -4000 1 V/step - 3000 V



Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-902*		FCI Enable (Smoothing Letter Mode)	Selects whether the FCI smoothing function to remove jagged edges is enabled or disabled (this adjustment does not affect fax mode)	0: No (Disabled) 1: Yes (Enabled)
2-903*	1	Phase Independent Dots (Factory use only)	Selects the laser pulse positioning type that is used for independent black or gray pixels (white pixels to left and right). <i>Item 3 is not used.</i>	0: Center 1: Right 2: Left 3: Add
	2	Phase left edge (Factory use only)	Selects the laser pulse positioning type that is used for the the leftmost pixel of a series of black or gray pixels. <i>Item 3 is not used.</i>	0: Center 1: Right 2: Left 3: add
	3	Phase right edge (Factory use only)	Selects the laser pulse positioning type that is used for the rightmost pixel of a series of black or gray pixels. <i>Item 3 is not used.</i>	0: Center 1: Right 2: Left 3: Add
	4	Phase continous dots (Factory use only)	Selects the laser pulse positioning type that is used for pixels in the middle of a series of black or gray pixels. <i>Item 3 is not used.</i>	0: Center 1: Right 2: Left 3: Add
2-904*	1	ID Independent dots	Density of independent black or gray pixels in binary processing mode (white pixels to left and right).	0 ~ 255 1/step 128
	2	ID (Left Edge)	Density of the leftmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step 128
	3	ID (Right Edge)	Density of the rightmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step 255
	4	ID (Continuous)	Density of pixels in the middle of a series of black or gray pixels in binary processing mode.	0 ~ 255 1 / step 255
The threshold value for binary picture mode is set with SP 4-418. The SP2-904 settings determine how black the black pixels are.				
2-905		Gradation Type	This is for the designer's test purposes. Do not change the value.	0:400
2-907*		Laser Pulse Positioning	Selects the laser pulse position type that is used for test pattern printouts (printed with SP5-902). <i>Item 3 is not used.</i>	0: Center 1: Left 2: Right 3: Add
2-908		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit for 1.5 minutes. <i>Toner supply finishes automatically after 1.5 minutes. This process is not normally needed in the field for this model, as the machine can handle most cases where toner runs short temporarily.</i>	0: No 1: Yes

Mode No.		Function	Settings
Class 1 and 2	Class 3		
2-909		Charge Roller Cleaning Forces charge roller cleaning. <i>After selecting "1", press Enter or  to start this feature. Press  to stop.</i>	0: No 1: Yes
2-910		Transfer Roller Cleaning Forces transfer roller cleaning. <i>After selecting "1", press Enter or  to start this feature. Press  to stop.</i>	0: No 1: Yes
2-911*		Image Density Selection Selects the humidity coefficients for determining VTREF and VTE from the TD sensor initial setting output. <i>This setting can be adjusted by the key operator to make image density lighter or darker (see Replacement and Adjustment - Image Density Adjustment by Key Operator).</i>	0: Darker 1: Dark 2: Normal 3: Light 4: Lighter
2-912*		Charge Roller Temperature Correction Corrects the charge roller temperature. <i>If a copy with a dirty background is made, this value should be increased. However, do not use this SP mode unnecessarily.</i>	-5 ~ +5 1 (25V)/step 0
2-913*		Auto TD Sensor Initial Setting Mode Selects whether or not the TD sensor initial setting process is performed automatically at installation. <i>Select "No" if the PCU detection mechanism has a problem. However, usually do not use this SP mode.</i>	0: No 1: Yes
2-916*		Light character density control Selects the printer γ table (GAVD) type. <i>This SP mode is only effective in the grayscale processing mode. A larger value gives a darker image.</i>	1 ~ 4 1/Step 2
2-980		Humidity Sensor Output Display Displays the humidity sensor output data in hex code as %Rh. Press clear modes to exit.	
2-995*	1	TD Sensor Control Value Display (Factory) Displays the TD sensor control value (VCONT), which was adjusted in the factory. The machine normally uses this value, unless SP 2-999 is changed away from 0.	
	2	Factory VCONT Counter Displays the total counter value when the TD sensor control value was adjusted in the factory. <i>When VCONT is adjusted at the factory, the counter is automatically set at "9999999".</i>	

SERVICE PROGRAM MODE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-997*	1	TD Sensor Control Value Display (Installation)	Displays the TD sensor control value (V _{CONT}) which was adjusted at installation. The machine uses this value only if SP 2-999 is set to 2.	
	2	Installation V _{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted at machine installation.	
2-998*		Printer magnification adjustment	Adjusts the magnification in the main scan direction for the printer. <i>Use the ●/* key to toggle between + and -. The specification is 0% ± 1%. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 0.5 ~ + 0.5 0.1%/step 0.0 %
2-999*		TD Sensor Control (Value Selection)	inputs the TD control value (V _{cont}) <i>If the V_{CONT} value is out of specification after replacing the IOCSS board, this value should be changed.</i>	0-255 1/ Step 130
4-008 *		Main Scan Magnification (Scanning)	Adjusts the magnification in the main scan direction for scanning. <i>Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 1.0 ~ + 1.0 0.5 %/step + 0.0 %
4-010 *		Leading Edge Registration (Scanning)	Adjusts the leading edge registration for scanning. <i>(-): The image moves in the direction of the leading edge Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 2.0 ~ + 9.0 0.5 mm/step + 0.0 mm
4-011 *		Side-to-side Registration (Scanning)	Adjusts the side-to-side registration for scanning. <i>(-): The image disappears at the left side. (+): The image appears. Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 6.0 ~ + 6.0 0.1 mm/step + 0.0 mm

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-012 *	1	Leading Edge Margin (Scanning)	Adjusts the leading edge margin for scanning.	0.0 ~ 9.0
			<i>Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.</i>	0.1 mm/step 1.0 mm
	2	Trailing Edge Margin (Scanning)	Adjusts the trailing edge margin for scanning.	0.0 ~ 9.0
			<i>See the comment for SP 4-012-1.</i>	0.1 mm/step 1.0 mm
	3	Left Side Margin (Scanning)	Adjusts the left side margin for scanning.	0.0 ~ 9.0
			<i>See the comment for SP 4-012-1.</i>	0.1 mm/step 1.0 mm
	4	Right Side Margin (Scanning)	Adjusts the right side margin for scanning.	0.0 ~ 9.0
			<i>See the comment for SP 4-012-1.</i>	0.1 mm/step 1.0 mm
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp on.	0: No 1: Yes
			<i>After selecting "1", press Enter or  twice to start this feature. Press  to stop.</i>	
4-015*	1	White Plate Scanning Start Position	Adjusts the scanning start position on the white plate for auto shading.	- 3.0 ~ + 6.0 0.5 mm/step 0 mm
			<i>The default is 6 mm from the leading edge. The setting specifies how far scanning starts from the default position.</i>	
	2	White Plate Scanning Area	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading.	- 3.0 ~ + 6.0 0.5 mm/step 0 mm
			<i>The default is 5 mm (for 41 - 400% reproduction ratios) or 6.5 mm (25 - 40%). The current setting specifies the difference from these defaults.</i>	
4-101*		Sub Scan Magnification (Scanning: Book Mode)	Adjusts the magnification in the sub scan direction for scanning. If this value is changed, the scanner motor speed is changed.	- 1.0 ~ + 1.0 0.5 %/step + 0.0 %
			<i>Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	
4-301		APS Sensor check	Displays the status of the APS sensors and platen/DF cover sensor.	
			<i>See "APS and Platen/DF Sensor Output Display" after the SP mode table.</i>	

SERVICE PROGRAM MODE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-303 *		APS (A5) Small Size Original Detection	Selects whether the copier determines that the original is A5 size when the APS sensor does not detect the size. <i>If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Original size" will be displayed.</i>	0: No (Not detected) 1: Yes (A5 lengthwise)
4-401*		Binary Processing Mode (Neg./Pos.)	Japanese Version Only. Do not change the value.	
4-402*		Binary Processing Mode (Marker Mode)	Japanese Version Only. Do not change the value.	
4-403*		Gradation Processing Mode for One-to-one Copying	Selects whether binary picture processing or grayscale processing mode is done. <i>For example, if binary processing mode is selected, all image processing is handled using binary picture processing mode. Note that memory copying always uses binary picture processing, regardless of this setting.</i>	0: No (Grayscale processing) 1: Yes (Binary processing)
4-406*		Marker Detection	Japanese Version Only. Do not change the value.	

Mode No.		Function	Settings
Class 1 and 2	Class 3		
4-407*	1	MTF Filter Selection in Letter Mode (25% ~ 64%) Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 11 1/step 4
	2	MTF Filter Selection in Letter Mode (65% ~ 154%) Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 11 1/step 7
	3	MTF Filter Selection in Letter Mode (155% ~ 256%) Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 11 1/step 3
	4	MTF Filter Selection in Letter Mode (257% ~ 400%) Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 11 1/step 10
	5	Smoothing Filter Selection in Photo Mode Selects the smoothing filter level for Photo mode. A stronger filter gives a smoother image. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 8 1/step 3
	6	MTF Filter Selection in Letter/Photo Mode Selects the MTF filter level for Letter/Photo mode. A stronger filter gives sharper lines. <i>For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".</i> Never select "1".	0 ~ 11 1/step 2
4-410*		AGC Default Setting Not used Do not change the value.	- 5 ~ 2 1/step 0

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-412*		IPU Image Data Path	Selects one of the following video data outputs, which will be used for printing. 0. Normal video processing 1. After auto shading processing 2. After MTF processing 3. After gamma correction 4. Data straight through (no video processing) Do not change the value.	
4-417		IPU Test Pattern Print	Prints the test pattern for the IPU or selects one of the following video data outputs for printing. 0. No Print 1. Grayscale 1 2. Grayscale 2 3. Vertical Bands 4. Vertical Line - 1 dot 5. Vertical Line - 2 dot 6. Grid Pattern 7. No Function 8. No Function 9. No Function <i>Change to the copy mode display by pressing the "Interrupt" key, then print the test pattern.</i>	
4-418*	1	Threshold Level in Letter Mode	Selects the threshold level for Letter Mode - <i>Binary picture processing mode</i>	0 ~ 255 1/step 48
	2	Threshold Level in Letter/Photo Mode	Selects the threshold level for Letter/Photo Mode - <i>Binary picture processing mode</i>	0 ~ 255 1/step 240
4-419*	1	Threshold Level for Marker Mode (Main scan magnification)	Japanese version only.	
	2	Threshold Level for Marker Mode (Sub scan magnification)		

Mode No.		Function	Settings
Class 1 and 2	Class 3		
4-421*	1	Photo Select (Normal Dither Pattern) Selects the dither pattern used in grayscale processing mode. <i>A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.</i>	0: 180-line 1: 140-line 2: 95-line 0:140-line
	2 *	Photo Select (B&W) (Dither Pattern) Selects the dither pattern used in binary picture processing mode. <i>A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.</i>	1: 95-line 2: 70-line
4-902		Scanner Lamp On Turns on the exposure lamp. <i>To turn off the exposure lamp, select "0".</i>	0: No (Off) 1: Yes (On)
4-904*		SBU Gain Adjustment Adjusts the coefficient of the D/A converter for the standard AGC gain curve Do not adjust this value. However, after performing the memory all clear (SP5-801), use it to re-input the previous value.	0 ~ 255 1/step 40
4-905*		SBU DC Count Adjustment Adjusts the coefficient of the D/A converter for the AGC gain curve for dc count. Do not adjust this value. However, after performing the memory all clear (SP5-801), use it to re-input the previous value.	0 ~ 255 1/step 30
4-906*		SBU Reference Value Adjustment Adjusts the coefficient of the D/A converter for the AGC gain curve for scanning the white plate. Do not adjust this value. However, after performing the memory all clear (SP5-801), use it to re-input the previous value.	0 ~ 255 1/step 147
4-907*		SBU Offset Value Adjustment Adjusts the coefficient of the D/A converter for the offset (Z/C) for the analog image data processing Do not adjust this value. However, after performing the memory all clear (SP5-801), use it to re-input the previous value.	0 ~ 255 1/step 180
4-908*		SBU Auto Adjustment Performs the auto scanner adjustment. <i>Using this SP mode after replacing the white plate or the memory on the BICU board. See "Replacement and Adjustment - Standard White Level" for details on how to do this.</i>	0: Normal operation 1: Start the adjustment
4-909*		EDU Test Mode Japanese version only. Do not change the value.	

Mode No.		Function	Settings
Class 1 and 2	Class 3		
4-910*		Scanner Motor Control Method <i>If "1" is selected, the current for the scanner motor will be reduced and jitter copy image problems will be alleviated. However, copy speed will be reduced.</i>	0: Normal 1: Special
4-912*	1	SBU Initial Gain (White Level Value Display Current)	
	2	SBU Initial Ref Cont (White Level Value Display Factory)	
4-913*		Shading Interval Time in DF mode <i>Light and heat may affect the scanner response. If copy quality indicates that white level is drifting during a DF copy job, reduce this setting.</i>	0 ~ 60 1 s/step 30 seconds
⇒ 4-998*	1	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch1	0 ~ 11 1/step 0
		Never select 1.	
	2	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 2	0 ~ 11 1/step 0
		Never select 1.	
	3	MTF Filter Selection in Letter Mode - Binary Picture Mode for Notch 3	0 ~ 11 1/step 9
		Never select 1.	

Note: The "Notch" mentioned above is the Exposure Setting and has a range from 1 to 7. A setting of 1=Dark and 7=Light

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

Mode No.		Function	Settings
Class 1 and 2	Class 3		
4-999*	4	Threshold level in Letter Mode - Binary Picture Mode for Notch 4	Selects the threshold level for Letter mode (binary picture mode) at notch 4 image density level. 0~255 1/step 45
	5	Threshold level in Letter Mode - Binary Picture Mode for Notch 5	Selects the threshold level for Letter mode (binary picture mode) at notch 5 image density level. 0~255 1/step 30
	6	Threshold level in Letter Mode - Binary Picture Mode for Notch 6	Selects the threshold level for Letter mode (binary picture mode) at notch 6 image density level. 0~255 1/step 30
	7	Threshold level in Letter Mode - Binary Picture Mode for Notch 7	Selects the threshold level for Letter mode (binary picture mode) at notch 7 image density level. 0~255 1/step 30
5-001*		All Indicators On	Trunes on all indicators on the operation panel Press # key to check. Press  to exit this SP mode.
5-103*		Auto Paper Tray Shift	Selects whether auto paper tray shift is done or not. 0: No 1: Yes
5-104*		A3/11x17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. If "YES" is selected the total counter (mechanical counter) and ther current user code counter counts up twice when a3/11"x17" paper is used. No Yes
5-106*		ADS Level Selection	Selects the image density level that is used in ADS mode. 1~7 1 notch/step 4
⇒ 5-113		Option Counter Type	Selects the optional counter type After installing the optional key counter, this value should be set to "1". Setting numbers from 2 to 4 are used in the Japanese version only.
			0: No 1: Key Counter 2: Key Card 3: Coin Rack 1 4: Coin Rack 2
5-116*		Total Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit. 0: Feed-in 1: Exit

Mode No.		Function	Settings
Class 1 and 2	Class 3		
5-401*	1	User Code Mode (Copier)	0: No 1: Yes
		<i>If this value is changed, the UP mode setting is also changed.</i>	
	2	User Code Mode (Fax)	0: No 1: Yes
		<i>If this value is changed, the UP mode setting is also changed.</i>	
	3	User Code Mode (Printer)	0: No 1: Yes
		<i>If this value is changed, the UP mode setting is also changed.</i>	
5-501 *	1	PM Alarm Interval	0 ~ 255 1k copies/step 45 k copies
		<i>When the setting is "0", this function is disabled.</i>	
	2	PM Alarm	0: No 1: Yes
5-504*	3	PM Alarm (Original)	Japanese version only. Do not change the value.
		PM Alarm (Jam Alarm)	Japanese version only. Do not change the value.
		PM Alarm (Copy Size)	Japanese version only. Do not change the value.
5-507*	1	PM Alarm (Copy Size)	
	2	PM Alarm (Staple)	
	3	PM Alarm (Toner End)	
5-508*	1	CE Call (Jam Level 1)	Japanese version only. Do not change the value.
	2	CE Call (Jam Level 2)	
	3	CE Call (Door Open)	
5-801		Memory All Clear	0: no 1: yes
		Resets all software counters. Also, returns all modes and adjustments to the default settings. See the "MEMORY ALL CLEAR" page 4-40 for how to use this SP mode correctly. Normally, this SP mode should not be used. <i>It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.</i>	

SERVICE PROGRAM MODE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-802		Free Run	Performs a free run for both the scanner and the printer. <i>To perform the free run, press 1 then press  twice. Press  to stop.</i>	0: No 1: Yes
5-803		Input Check	Displays the signals received from sensors and switches. See the "INPUT CHECK" page 4-33 for details. <i>Press  to exit the program.</i>	
5-804		Output Check	Turns on the electrical components individually for test purposes. See the "OUTPUT CHECK" page 4-36 for details.	
5-808*	1	Display Language (115V machines)	Selects the display language for 115V machines.	0: English 1: French 2: Spanish
	2	Display Language (230V machines - Standard)	Selects the display language for 230V machines.	0: English 1: German 2: Dutch 3: French 4: Italian 5: Spanish
	3	Display Language (230V machines - Option)	Selects the option display language for 230V machines.	0: English 1: German 2: Dutch 3: Swedish 4: Norwegian 5: Danish
5-810		SC Code Reset	Resets any service call condition. After performing this SP mode, turn the machine main switch off and on. See "Troubleshooting - Service Call Conditions" for how to use this mode.	0: No 1: Yes
5-812 *		Service Telephone Number	Use this to input the telephone number of the service representative (it will be displayed when a service call condition occurs). <i>Press the "•/#" key if you need to input a pause (—). Press the  key to delete the telephone number.</i>	
5-816*		CSS Function	Japanese version only. Do not change the value.	
5-817	1	CE Start Call	Japanese version only. Do not change the value.	
	2	CE Finish Call		

Rev. 03/99

Mode No.		Function	Settings
Class 1 and 2	Class 3		
5-901		Printer Free Run Performs the printer free run. <i>To perform the free run, press 1 then press  twice. Press  to stop.</i>	0: No 1: Yes
5-902		Test Pattern Printouts Prints the test pattern. <i>See the "TEST PATTERN PRINTING" Page 4-32 for how to print a test pattern. Change to the copy mode display by pressing the "Interrupt" key, then print out the test pattern.</i>	
5-903*		LCD Contrast Adjustment Adjusts the contrast for the LCD on the operation panel. <i>Use the "Zoom" (+ or -) key to change the contrast. Press clear mode to exit.</i>	1 ~ 7 1/step 4
5-904*		Auto Shut Off Mode Timer Setting Inputs the auto off mode timer. <i>If "0" is selected, the auto timer function is disabled.</i>	0 ~ 120 1 min/step 15
5-905*		CSS 25H Off Detection Japanese version only. Do not change the value.	
5-906*		Fan Control Timer Setting Inputs the fan control timer in the energy saver mode <i>This time is for entering the fan motor control mode after the fusing lamp turns off or the main motor turns off.</i>	30 ~ 120 1 seconds / step 30
⇒ 5-907		Brand Name and Production Name Setting Selects the brand name and the production name for the Plug and Play function of Windows 95. The brand name and the production name for the Plug and Play function is registered in the NVRAM. If the NVRAM is defective, these names should be registered. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to register the setting.</i>	
5-911*		APS A4/LT Sideways Priority Specifies whether the machine selects LT sideways paper if the original is A4. If "Yes" is selected, LT sideways is selected automatically when the APS sensors detect an A4 sideways original. This feature does not work in reverse (A4 sideways paper is not selected for an LT sideways original).	0: No 1: Yes
5-912	1	PCU Alarm Interval Inputs the PCU alarm interval. <i>When the machine reaches the value, "Change Photoconductor Unit" will be displayed on the LCD to inform the user.</i>	1 ~ 255 1 k / Step 45 k
	2	PCU Alarm Mode Selects whether the PCU alarm function is performed or not.	0: No 1: Yes



Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-930*		Fax Forwarding Mode	Selects whether the fax mode application key is accepted or not in the SC condition. <i>When an SC condition occurs while incoming data has been stored in the SAF memory, change the value to "1" to access fax mode. Then forward the incoming data to another fax machine by using the fax mode bit switches.</i>	0: No 1: Yes
5-932		Program Download	Downloads the system program from a ROM board to the Flash Memory on the BICU board. (Copier mode software only) See "Service Tables - Program Download" for details. <i>This SP can be operated when the ROM board is installed in the machine.</i>	0: No 1: Yes
5-940*		Image Rotation Mode	Selects whether the image rotation function is performed or not. <i>If there is a problem with the MSU, image rotation may lead to abnormal copies. If so, disable image rotation while waiting for new parts.</i>	0: Yes 1: No
5-941*		Duplex Blank Page	Selects whether the blank page is made on the front side or back side when duplex copy mode is selected.	0: Back side 1: Front side
5-942*		Image Compression Method	Selects the image compression method for memory mode copying. (Factory use only)	0: MH 1: MR 2: MMR
5-943*		Charge Roller H.P Detection	Selects whether the charge roller home position is detected or not. Do not use in the field.	0: No 1: Yes
5-944*		APS Mode	Selects whether the APS mode is selected as power-up default or not.	0: No 1: Yes
5-945*		Memory Copy Priority	Selects whether or not the memory copy mode is selected when the main switch is turned on.	0: No 1: Yes
5-991*		VRAM Data Download	This SP mode is only used by the designer. Do not change the value.	0: Off 1: On
5-992		System Parameter and Data List Printing	Prints the machine status history data list. See the "SYSTEM PARAMETER AND DATA LISTS" section for how to print the lists.	0: No Print 1: SP mode 2: UP mode 3: Log data

Mode No.			Function	Settings
Class 1 and 2	Class 3			
⇒		1	ADF/ARDF Side-to-Side Registration <i>Use the ●/* key to toggle between + and -.</i>	-1.5 ~ +1.5 0.5 mm/step + 0.0 mm
	6-006 *	2	ADF/ARDF Leading Edge Registration <i>Use the ●/* key to toggle between + and -.</i>	-10 ~ +10 0.5 mm/step + 6.0 mm
		3	ADF/ARDF Trailing Erase Margin <i>Use the ●/* key to toggle between + and -.</i>	-3.0 ~ +3.0 0.1 mm/step + 0.0 mm
⇒	6-007*		ADF/ARDF Sub-scan Magnification <i>Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 4.0 ~ + 4.0 0.1 %/step 0.0 %
⇒	6-009		ADF/ARDF Free Run <i>To perform the free run, press 1 then press [F] twice. Press [C/⊗] to stop.</i>	0: No 1: Yes
	6-010*		Stamp Position Adjustment	- 10 ~ + 10 1 mm/step 0 mm
⇒	6-901		ARDF/ADF Original Sensor Output Display <i>See "DF APS Original Sensor Output Display" after the SP mode table.</i>	
⇒	6-902*		ADF/ARDF Original Scanning Method	0: Original 1: Copy paper size + magnification
	6-903*		Original Non-waiting Start <i>If the user often feeds originals that slip, and the leading edge is catching up with the trailing edge of the previous page, set this SP mode to "0".</i>	0: No 1: Yes
	6-904*		Original Scanning Interval <i>This SP mode is only effective when SP 6-903 is set at "1".</i>	30 ~ 50 1 mm/step 40 mm
⇒	6-905*		ARDF Skew Correction	0: No 1: Yes
	6-906*		ARDF Original Curl Adjustment <i>This SP mode is only effective when SP 6-905 is at "0."</i>	10 ~ 40 1 mm/step 15 mm

Mode No.			Function	Settings
Class 1 and 2	Class 3			
⇒ 6-910		ADF/ARDF and Printer Free Run	Performs both an ADF and printer free run . <i>To perform the free run, press 1 then press  twice. Press  to stop.</i>	0: No 1: Yes
		Total Operation Time Display	Displays the total operation time (total drum rotation time).	
7-002*	1	Total Original Counter (Copy + Fax)	Displays the total number of scanned originals (copy + fax modes).	
	2	Total Original Counter (Copy	Displays the total number of scanned originals (copy mode only).	
	3	Total Original Counter (Fax)	Displays the total number of scanned originals (fax mode only).	
7-003*	1	Total Copy Counter (All Modes)	Displays the total number of copies (all modes).	
	2	Total Copy Counter (Copy mode)	Displays the total number of copies (copy mode only).	
	3	Total Copy Counter (Fax mode)	Displays the total number of copies (fax mode only).	
	4	Total Copy Counter (Printer mode)	Displays the total number of copies (printer mode only).	
7-004*		CE Counter Reset	Japanese version only. Do not change the value.	
7-101*	1	Total Copies by Paper Size (A3)	Displays the total number of copies by paper size.	
	2	Total Copies by Paper Size (B4)		
	3	Total Copies by Paper Size (A4)		
	4	Total Copies by Paper Size (B5)		
	5	Total Copies by Paper Size (11" X 17")		
	6	Total Copies by Paper Size (8 1/2" X 14")		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-101*	7	Total Copies by Paper Size (8 1/2" X 11")	Displays the total number of copies by paper size.	
	8	Total Copies by Paper Size (8 1/2" X 5 1/2")		
	9	Total Copies by Paper Size (Other Size)		
7-201*		Total Number of Scanning	Displays the total number of scanned originals.	
7-204*	1	Total Paper Tray Counter (1st paper tray)	Displays the total number of copies fed from each paper feed tray.	
	2	Total Paper Tray Counter (2nd paper tray)		
	3	Total Paper Tray Counter (3rd paper tray)		
	4	Total Paper Tray Counter (4th paper tray)		
	5	Total Paper Tray Counter (By-pass feed)		
	6	Total Paper Tray Counter (Duplex tray)		
7-205*		DF Total Original	Displays the total number of originals fed by the ADF.	
7-301*	1	Total Copies by Reproduction Ratio (25% ~ 49%)	Displays the total number of copies by reproduction ratio.	
	2	Total Copies by Reproduction Ratio (50% ~ 99%)		

SERVICE PROGRAM MODE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-301*	3	Total Copies by Reproduction Ratio (Full size)	Displays the total number of copies by reproduction ratio.	
7-301*	4	Total Copies by Reproduction Ratio (101% ~ 200%)	Displays the total number of copies by magnification	
	5	Total Copies by Reproduction Ratio (201% ~ 400%)		
	6	Total Copies by Reproduction Ratio (Direct Mag.)		
	7	Total Copies by Reproduction Ratio (Direct Size Mag.)		
	8	Total Copies by Reproduction Ratio (Size Mag.)		
7-303*	1 ~ 23	Total Copies by Image Editing Mode	Japanese version only.	
	24	Total Copies by Image Editing Mode (Memory Sort)	Displays the total number of copies by image editing mode.	
	25	Total Copies by Image Editing Mode (Combine)		
	26	Total Copies by Image Editing Mode (Repeat Copy)		
	27	Total Copies by Image Editing Mode (Erase Copy)		

Mode No.		Function	Settings
Class 1 and 2	Class 3		
7-304*	1	Total Copies by Copy Mode (Overlay)	Displays the total number of copies by copy mode.
	2	Total Copies by Copy Mode (Letter)	
	3	Total Copies by Copy Mode (Letter/Photo)	
	4	Total Copies by Copy Mode (Photo)	
	5	Total Copies by Copy Mode (Duplex)	
	6	Total Copies by Copy Mode (ADF)	
	7	Total Copies by Copy Mode (Double-copy)	
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.
7-501*		Total Jam Counter (Copies + Original)	Displays the total number of copy jams and original jams.
7-502*		Total Copy Jam Counter	Displays the total number of copy jams.
7-503*		Total Original Jam Counter	Displays the total number of original jams.
7-504*	1	Total Jam by Location (A Jam)	Displays the total copy paper jam counter by location.
	2	Total Jam by Location (B Jam)	
	3	Total Jam by Location (C Jam)	
	4	Total Jam by Location (L Jam)	
	5	Total Jam by Location (R Jam)	

SERVICE PROGRAM MODE

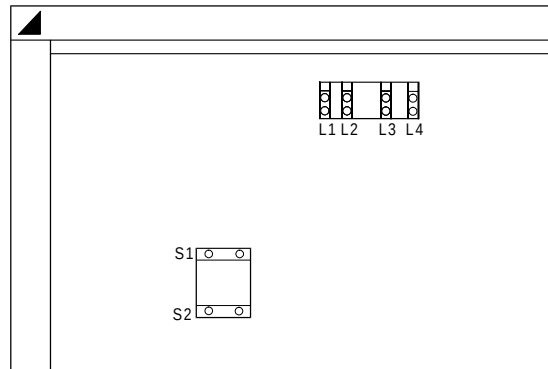
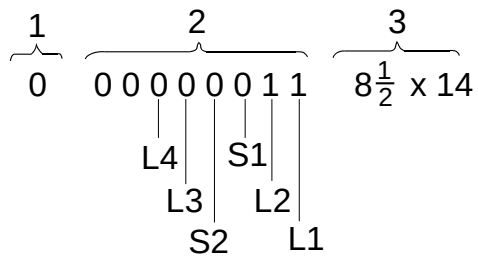
Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	6	Total Jam by Location (Y Jam)	Displays the total copy paper jam counter by location.	
	7	Total Jam by Location (Z Jam)		
	8	Total Jam by Location (1st Paper Tray)		
	9	Total Jam by Location (2nd Paper Tray)		
	10	Total Jam by Location (3rd Paper Tray)		
	11	Total Jam by Location (4th Paper Tray)		
	12	Total Jam by Location (By-pass Feed)		
	13	Total Jam by Location (Duplex Tray)		
7-801	1	ROM/CPU Version (IOCSS)	Displays the ROM version. NOTE: Class 3 nos, 3, 7, and 8 are used only for the Japanese version.	
	2	ROM/CPU Version (BiCU)		
	3	ROM/CPU Version (Edit)		
	4	ROM/CPU Version (Duplex)		
	5	ROM/CPU Version (Fax Control)		

Rev. 03/99

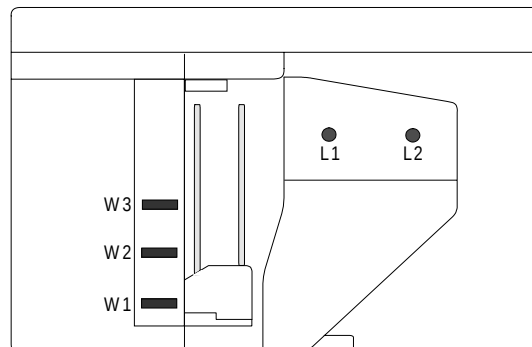
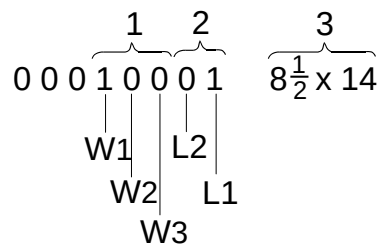
Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-801	6	ROM/CPU Version (Printer Control)	Displays the ROM version. NOTE: Class 3 nos, 3, 7, and 8 are used only for the Japanese version.	
	7	ROM/CPU Version (ANITA)		
	8	ROM/CPU Version (Scanner Control)		
	9	ROM/CPU Version (Stapler)		
7-803*		PM Counter Display	Displays the PM counter after the last PM.	
⇒ 7-804		PM Counter Reset	Resets the PM counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>	0: No 1: Yes
⇒ 7-807		Jam Counter Clear	Resets the jam counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>	0: No 1: Yes
⇒ 7-808		Resets Counters (except for the total counter)	Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>	0: No 1: Yes
⇒ 7-810		User Code Number Reset (Access code)	Resets the user code numbers. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>	0: No 1: Yes
7-901*		SC History Display	Displays the SC codes that have occurred.	0: No 1: Yes
⇒ 7-902		SC History Clear	Clears the SC history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>	0: No 1: Yes
7-903*		Copy Jam History Display	Displays the copy jams that have occurred. Refer to section 2.2.5 later in this chapter.	0: No 1: Yes

Service
Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
⇒ 7-904		Copy Jam History Clear	Clears the copy jam history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
7-905*		Original Jam History Display	Displays the original jams that have occurred. See section 2.2.5 later in this chapter.	0: No 1: Yes
⇒ 7-906		Original Jam History Clear	Clears the original jam history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
⇒ 7-907		Timer Counter Clear	Clears the timer counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
7-908		PCU Counter Display	Displays the number of copies that have been made using the current PCU.	
7-909		PCU Counter Clear	Japanese version only Do not use.	
7-990		RAM Read	Displays the data in the RAM.	
7-991		Timer Counter Display	Displays the time since the last time that the main switch was turned on.	

- APS and Platen/ADF Sensor Output Display (SP4-301) -

1. Cover sensor status	1 = Closed
2. APS sensor status	1 = Paper detected
3. Paper size display	

- DF APS Sensor Output Display (SP6-901) -

1. Original width sensor status	1 = Original detected
2. Original length sensor status	0 = Original detected
3. Paper size	

2.2.2 Test Pattern Printing (SP 5-902)

1. Access the SP mode which contains the test pattern you need.
2. Press the Interrupt key on the display to access the copy mode display.
3. Select the required copy features such as paper size, image density, and reproduction ratio.
4. Press the Start key on the operation panel.
5. After checking the test pattern, exit copy mode by pressing the Interrupt key on the operation panel.
6. Press the  key three times to exit the SP mode.

Test Pattern Table for SP5-902

No.	Test Pattern	No.	Test Pattern
0	No Print	16	32 Grayscales (Horizontal)
1	Vertical Lines (single dot)	17	32 Grayscales (Vertical)
2	Horizontal Lines (single dot)	18	32 Grayscales (Vert./Hor.)
3	Vertical Lines (double dots)	19	32 Grayscales (V/H Overlay)
4	Horizontal Lines (double dots)	20	64 Grayscales (Horizontal)
5	Grid Pattern (single dot)	21	64 Grayscales (Vertical)
6	Grid Pattern (double dots)	22	64 Grayscales (Vert./Hor.)
7	Alternating Dot Pattern	23	64 Grayscales (V/H Overlay)
8	Full Dot Pattern	24	16 Grayscales (Horizontal)
9	Black Band	25	16 Grayscales (Vertical)
10	Trimming Area	26	16 Grayscales (Vert./Hor.)
11	Argyle Pattern	27	32 Grayscales (Horizontal)
12	16 Grayscales (Horizontal)	28	32 Grayscales (Vertical)
13	16 Grayscales (Vertical)	29	32 Grayscales (Vert./Hor.)
14	16 Grayscales (Vert./Hor.)	30	64 Grayscales (Horizontal)
15	16 Grayscales (Vert./Hor. Overlay)	31	64 Grayscales (Vertical)
		32	64 Grayscales (Vert./Hor.)

2.2.3 Input Check (SP5-803)

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

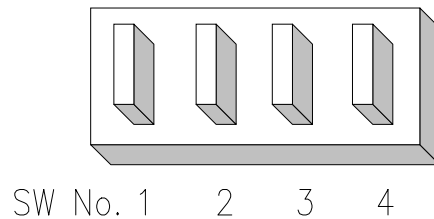
Number	Description	Reading	
		0	1
1	Front Door Safety Switch - +24V	Closed	Opened
2	Front Door Safety Switch - LD5V	Closed	Opened
3	Right Vertical Guide Switch	Closed	Opened
4	Left Vertical Door Sensor	Closed	Opened
5	Left Door Sensor	Closed	Opened
6	Fusing Exit Sensor	Paper not detected	Paper detected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

SERVICE PROGRAM MODE

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

Number	Description	Reading	
		0	1
51	Registration Sensor (Optional ADF)	Paper not detected	Paper detected
52	ADF Set (Optional ADF)	Not connected	Connected
53	Not used		
54			
55			
56			
57			
58			
59			
60	Polygonal Mirror Motor Lock	Not locked	Locked
61	Not used		
62	Fusing Unit Set	Not connected	Connected
63	Main Switch	Off	On
64	BiCU Connection	Not connected	Connected
65	Not used		
66	Total Counter Connection	Not connected	Connected
67	Not used		
68	Key Counter Connection	Not connected	Connected
69	Not used		
70			

Table 1: Paper Size Data



Number	SW 1	SW 2	SW 3	SW 4	SP Value	Paper Size
15,16,27,28	0	0	0	0	0	---
	0	0	0	1	1	A3, F(8 $\frac{1}{2}$ "X13")
	0	0	1	1	3	A4 Sideways
	0	1	0	1	5	A4 Lengthwise
	0	1	1	1	7	A5 Sideways, 11"X17"
	1	0	1	1	11	B4, 8 $\frac{1}{2}$ "X14"
	1	1	0	0	12	* (Asterisk)
	1	1	0	1	13	B5 Sideways, 11"X8 $\frac{1}{2}$ "
	1	1	1	1	15	B5 Lengthwise, 8 $\frac{1}{2}$ "X11"

1: Pushed

2.2.4 Output Check (SP5-804)

[Serviceman P-Mode]			
Output Check			
Code: 0 Data: 0			
↑Prev.	↓Next	OK	Back

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

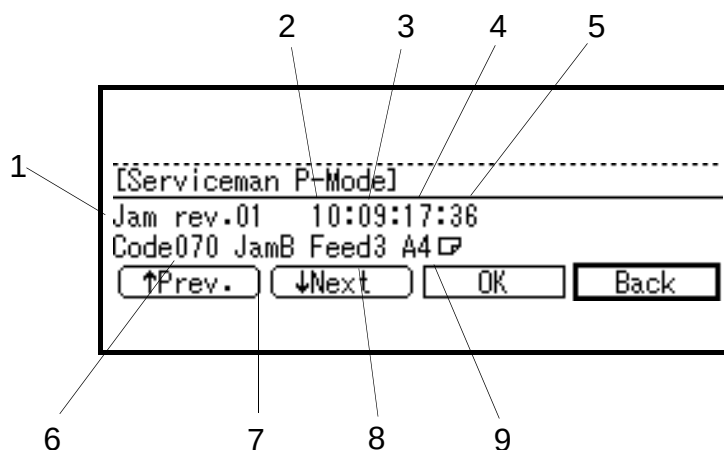
1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check (see the following table), then press **#**.
3. Press "1", then press **#** to check that component.
4. Exit the SP mode to interrupt the test.
5. If you wish to check another component, re-enter the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

- Output check table -

No.	Description	No.	Description
1	Junction Gate Solenoid	31	Not used
2	Registration Solenoid	32	
3	Upper Relay Clutch	33	1-bin Junction Gate Solenoid (Optional Sorter)
4	Lower Relay Clutch	34	1-bin Transport Motor (Optional Sorter)
5	Charge Roller Contact Clutch	35	Not used
6	By-pass Feed Clutch	36	
7	Upper Paper Feed Clutch	37	
8	Low Paper Feed Clutch	38	DF Feed Motor (Optional ADF)
9	Development Clutch	39	DF Feed Motor (Power Down) (Optional ADF)
10	Toner Bottle Drive Motor	40	DF Pick-up Solenoid (Optional ADF)
11	Main Motor (Forward)	41	Stamper Solenoid (Optional ADF)
12	Main Motor (Reverse)	42	DF Paper Feed Clutch (Optional ADF)
13	Exhaust Fan	43	Not used
14	Not used	44	
15		45	
16		46	
17		47	
18		48	
19	Upper Paper Feed Clutch (Optional Paper Tray Unit)	49	
20	Lower Paper Feed Clutch (Optional Paper Tray Unit)	50	
21	Upper Relay Clutch (Optional Paper Tray Unit)	51	
22	Lower Relay Clutch (Optional Paper Tray Unit)	52	
23	Main Motor (Optional Paper Tray Unit)	53	Polygonal Mirror Motor
24	Upper Paper Lift Motor (Up) (Optional Paper Tray Unit)	54	Not used
25	Lower Paper Lift Motor (Up) (Optional Paper Tray Unit)	55	
26	Upper Paper Lift Motor (Down) (Optional Paper Tray Unit)	56	
27	Lower Paper Lift Motor (Down) (Optional Paper Tray Unit)	57	
28	Not used	58	
29	Duplex Junction Gate Solenoid (Optional Duplex Unit)	59	
30	Not used	60	

2.2.5 Copy Jam History Display (SP7-903)

After entering the SP mode, select "1" and press the **#** key. The following message will be displayed.



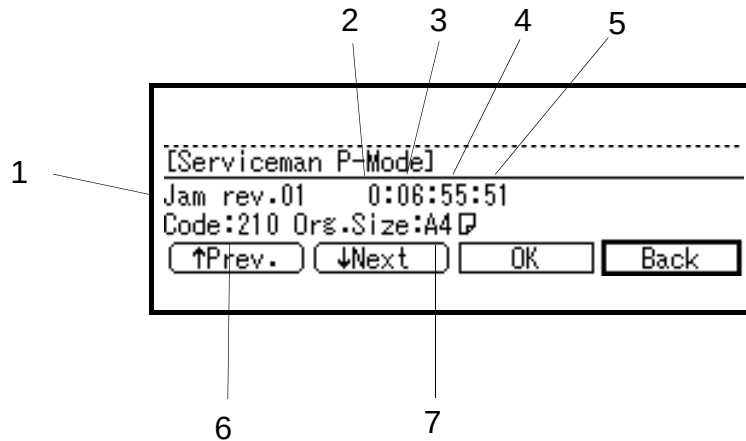
1: Jam history no. 2: Main motor operating date 3: Hour 4: Minute
 5: Second 6: Jam code (see the table below) 7: Jam location
 8: Paper feed station 9: Paper size

Jam Code	Meaning	Jam Code	Meaning
10	Registration sensor not activated (from paper tray).	120	Lower exit sensor not activated.
11	Relay sensor not activated.	121	Lower exit sensor remained activated by paper
30	Upper relay sensor (Optional PTU) not activated.	122	Upper exit sensor not activated.
31	Lower relay sensor (Optional PTU) not activated.	123	Upper exit sensor remained activated by paper
50	Registration sensor not activated (from by-pass feed)	124	Duplex exit sensor not activated.
70	Registration sensor remained activated by paper	125	Duplex exit sensor remained activated by paper
90	Fusing exit sensor not activated	150	Paper sensor (Optional 1-bin sorter) does not detect paper.
100	Duplex entrance sensor not activated		

NOTE: The NVRAM can store data for up to 10 copy jams. If more than 10 copy jams occur, the oldest data will be erased.

2.2.6 Original Jam History Display (SP7-905)

After entering the SP mode, select "1" and press the **#** key. The following message will be displayed.



1: Jam history no. 2: Main motor operating date 3: Hour 4: Minute
5: Second 6: Jam code (see the table below) 7: Original size

Jam Code	Meaning
210	Registration sensor not activated.
211	The registration sensor remained activated by paper.

NOTE: The NVRAM can store data for up to 10 original jams. If more than 10 original jams occur, the oldest data will be erased.

2.2.7 System Parameter And Data Lists (SP5-992)

1. Access SP mode 5-992 and select the number corresponding to the list that you wish to print.
2. Press the Interrupt key on the operation panel to access the copy mode display.
3. Select the paper size.
4. Press the Start key on the operation panel to print the list.
5. After printing the list, exit copy mode by pressing the Interrupt key on the operation panel.
6. Press the **⏏** key three times to exit the SP mode.

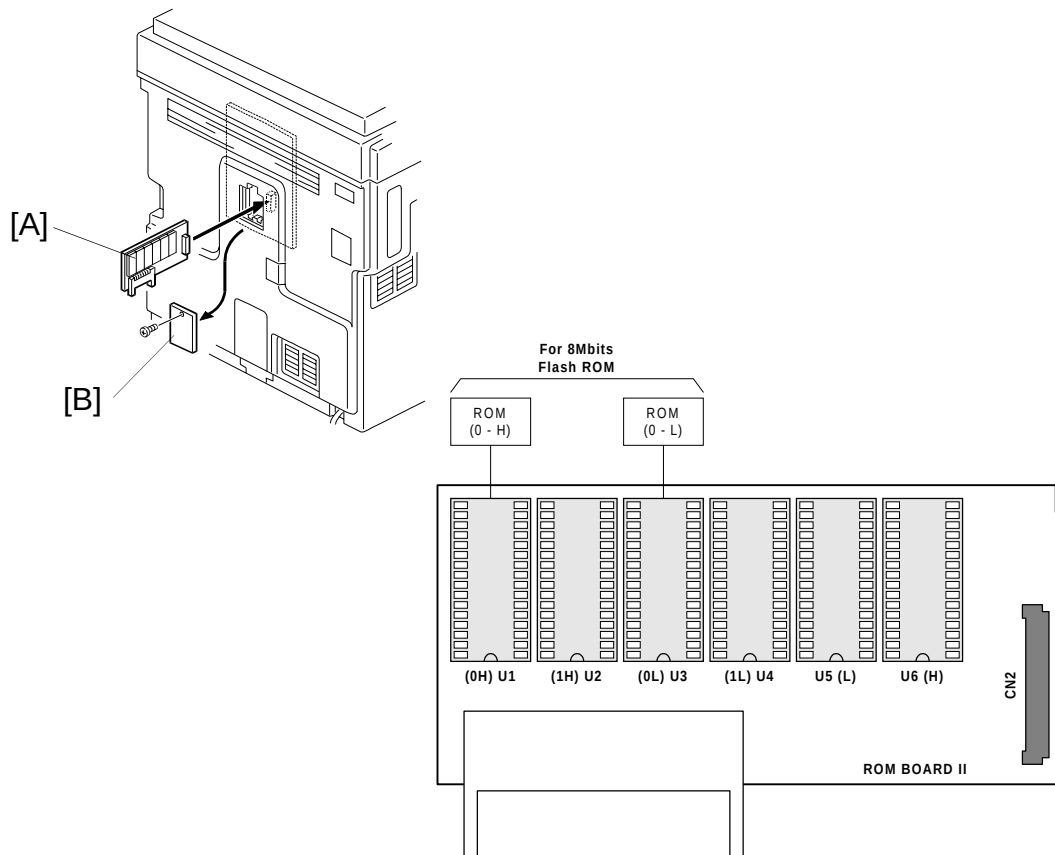
2.2.8 Memory All Clear (SP5-801)

CAUTION: Memory All Clear mode resets all the settings stored in the NVRAM to their default settings. Among these settings 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 RAM board or when the copier malfunctions due to a damaged RAM board.

1. Print out all System Parameter Lists (SP mode 5-992).
2. Enter SP mode 5-801.
3. Hold the "Photo Mode" key and  at the same time.
(If the all memory clear was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.)
4. Turn the main switch off and back on.
5. Reset the printer and scanner registration and magnification adjustments (see section 11 of Replacement and Adjustment).
6. Referring to the system parameter list, re-enter any values which had been changed from their factory settings. In particular, the values for SP4-904, SP4-905, SP4-906, and SP4-907 must be re-entered.
7. Perform the standard white level adjustment (SP 4-908). See Replacement and Adjustment - White Level Adjustment for details.
8. Check the copy quality and the paper path, and perform any necessary adjustments.

2.2.9 Program Download

This procedure copies the software from an ROM board to the Flash ROM on the BICU board.



Service
Tables

1. Turn off the main and ac switches.
2. When the new software is downloaded from an ROM board [A], mount the ROMs on the correct ROM sockets as shown above.
3. Remove the ROM cover [B].
4. Plug the ROM board into the connector on the BICU board.
5. Turn on the ac and main switches, access SP5-932, select YES, and press the **#** key.
6. After completing the download, turn off the ac and main switches, then remove the ROM board.

3. USER PROGRAM MODE

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

3.1 HOW TO ENTER AND EXIT UP MODE

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

UP Mode Table (System Settings)

System	1. Function Priority	
	2. Clear Function Setting	
	3. Panel Beeper	
	4. Copy Count Display	
	5. Auto Reset	1. System Auto Reset
		2. Copy Reset
		3. Fax Reset
		4. Printer Reset
	6. Function Timeout	
	7. Auto Energy Saver	
	8. Energy Save Mode	
	9. Auto Shut Off	
	10. Special Paper Size	
	11. Paper Tray Priority	
	12. Auto Tray Switch	
	13. By-pass Auto Select	
	14. Output Tray	1. Copier
		2. Fax
		3. Printer
	15. Simultaneous Print	
	16. Contrast	
	17. Set User Codes	1. Copy User Codes
		2. Fax User Codes
		3. Printer User Codes
	18. Restricted Access	1. Reset Counters
		2. Register User Codes
		3. Change/Delete User Codes
		4. Key Operator Code
		5. Register/Change Key Operator Code
		6. Copier Access
		7. Fax Access
		8. Printer Access

UP Mode Table (Copy Settings)

Copy	1. General Features	1. APS Priority
		2. AID Priority
		3. Original Priority
		4. Show All Keys
		5. Maximum Copy Q'ty
		6. Original Beeper
		7. Photo Mode
	2. Adjust Image	1. Erase Border
		2. Erase Center
		3. Left Duplex Margin
		4. Top Duplex Margin
		5. Double Copy Separation Line
		6. Combine/Image Repeat Separation Line
	4. Input/Output	1. Duplex Auto Eject
		2. Combine Auto Eject
		3. Original Count
		4. SADF Auto Reset
		5. ADF Auto Sort
		6. Rotate Sort
		7. Rotate Sort Auto Paper Continue

4. SWITCHES/LEDS

4.1 SWITCHES

BICU

Number	Function
SW 1	Resets all systems (like turning the main switch off/on).

4.2 LEDS

BICU

Number	Function
LED 2	Monitors the +5V line for the slave CPU (IC5). Usually, this LED is blinking.
LED 1	Monitors the +5V line. Usually, this LED is lit.

IOCSS

Number	Function
D103	Monitors the connection between the IOCSS and the BICU. Usually, this LED is lit.

4.3 TEST PIN

IOCSS

Number	Monitored Signal
TP105	Monitors the control voltage of the TD sensor (Vcont).

5. SPECIAL TOOLS AND LUBRICANTS

5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A006 9104	Scanner Positioning Pin (4 pcs/set)	1
A193 9351	ROM Board 2	1
A193 9353	Flash ROM/SRAM Copy Tool 2	1
A153 9004	Wiping Cloth (for the Drum Charge Roller)	1
5420 9516	Test Chart - OS-A3 (10 pcs/set)	1
5420 9507	Digital Multimeter	1

6. PREVENTIVE MAINTENANCE SCHEDULE

6.1 PM TABLE

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

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

A193	EM	100K	200K	300K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		C	C	C	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
AROUND THE DRUM					
Transfer Roller		R	R	R	To clean, use a blower brush.
Quenching Lamp		C	C	C	Dry cloth
Discharge Brush		R	R	R	
PAPER FEED					
Registration Roller		C	C	C	Clean with water or alcohol.
Paper Feed Roller (By-pass feed table)	C	C	C	C	Clean with water or alcohol.
Registration Mylar		C	C	C	Clean with water or alcohol.
Relay Rollers		I	I	I	Clean/replace if necessary
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Paper Feed Rollers		R	R	R	
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
FUSING UNIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistor		I	I	I	Clean if necessary
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Alcohol
Hot Roller Strippers		R	R	R	
Hot Roller Bushing		R	R	R	

PREVENTIVE MAINTENANCE SCHEDULE

A193	EM	100K	200K	300K	NOTE
OTHERS					
Drive Belts		I	I	I	Replace if necessary

	EM	60K	120K	185K	240K	NOTE
AUTO DOCUMENT FEEDER (for originals)						
Transport Belt	C	R	R	R	R	Alcohol
Separation Roller	C	R	R	R	R	Alcohol
Pick-up Roller	C	R	R	R	R	Alcohol
Stamper	I					Replace if necessary
White Plate	C					Alcohol
DF Exposure Glass	C					Alcohol
Platen Cover	C					Alcohol

PAPER TRAY UNIT	EM	100K	200K	300K	400K	NOTE
Paper Feed Rollers			R		R	
Relay Rollers			C		C	Dry or damp cloth
Relay Driven Rollers			C		C	Dry or damp cloth
Bottom Plate Pads			C		C	Dry or damp cloth
Relay Clutches			I		I	Replace if necessary
Paper Feed Clutches			I		I	Replace if necessary

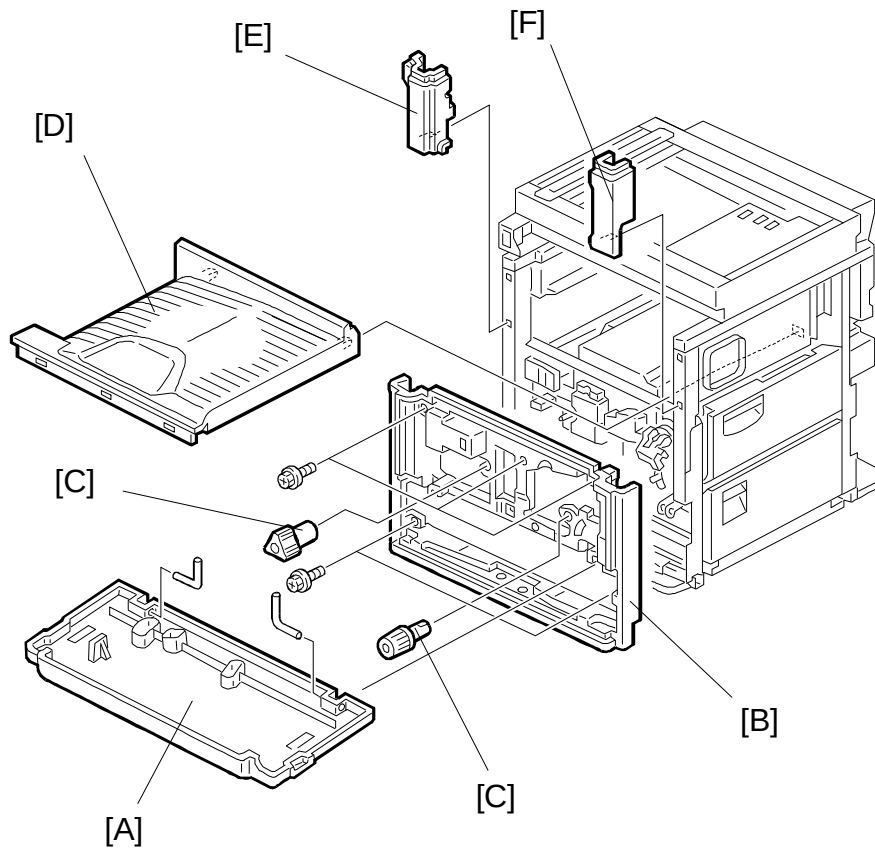
DUPLEX TRAY	EM					NOTE
Paper Feed Roller	C					Damp cloth
Transport Rollers	C					Damp cloth
Inverter Rollers	C					Damp cloth

SECTION 5

**REPLACEMENT
AND ADJUSTMENT**

1. EXTERIOR

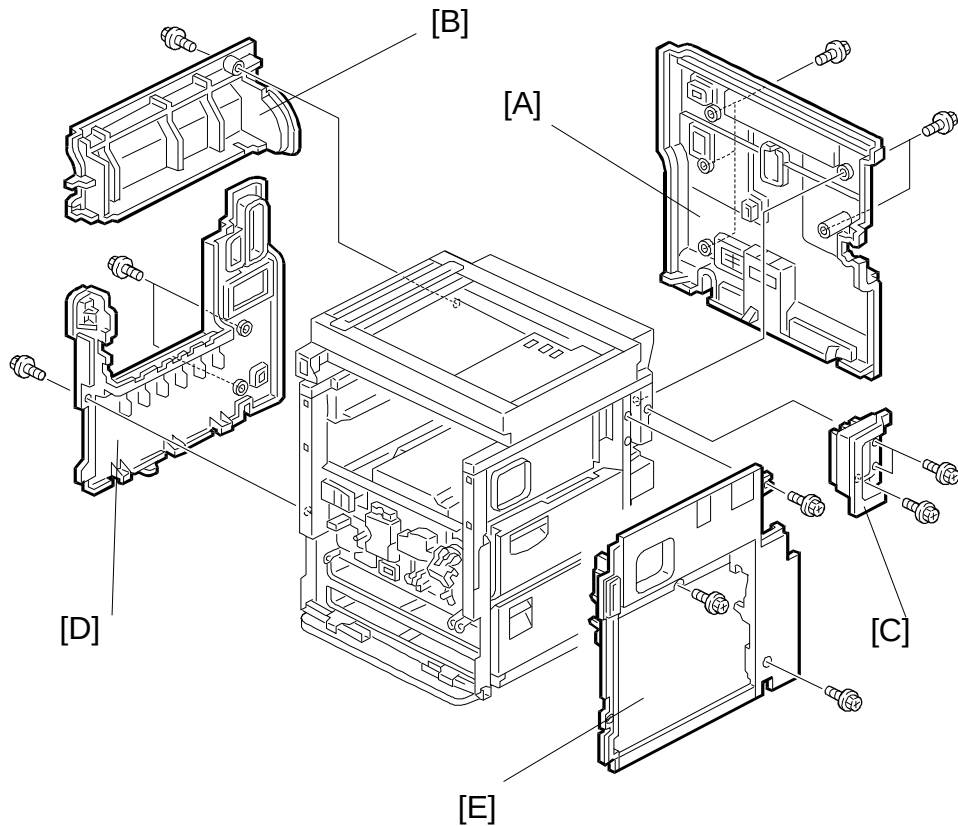
1.1 FRONT COVER/INNER COVER



Replacement
Adjustment

1. Open the front cover [A].
2. Remove the front cover (2 pins).
3. Remove the inner cover [B] (2 knobs [C], 6 screws and 1 screw if the optional paper tray unit is installed).
4. Remove the copy tray [D].
5. Remove the front left cover [E] and front right cover [F].

1.2 REAR COVER



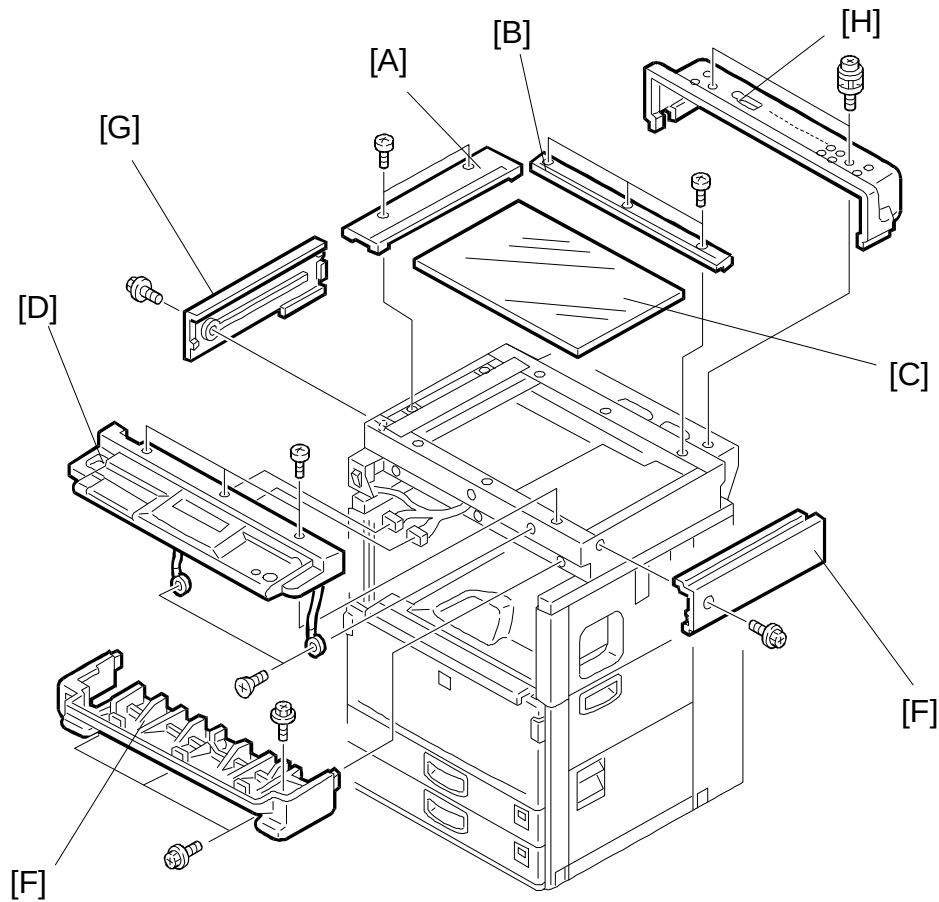
CAUTION: If the machine is equipped with a DF and a paper tray unit, disconnect the ADF cable and the paper tray unit, before removing the rear cover.

1. Remove the rear cover [A] (6 screws).
2. Remove the upper left cover [B] (1 screw) and the upper right cover [C] (3 screws).

1.3 LEFT/RIGHT COVER

1. Remove the front cover, inner cover, rear cover, upper left cover, and upper right cover.
2. Remove the left cover [D] (4 screws) and right cover [E] (5 screws).

1.4 EXPOSURE GLASS/OPERATION PANEL/UPPER COVER



Replacement
Adjustment

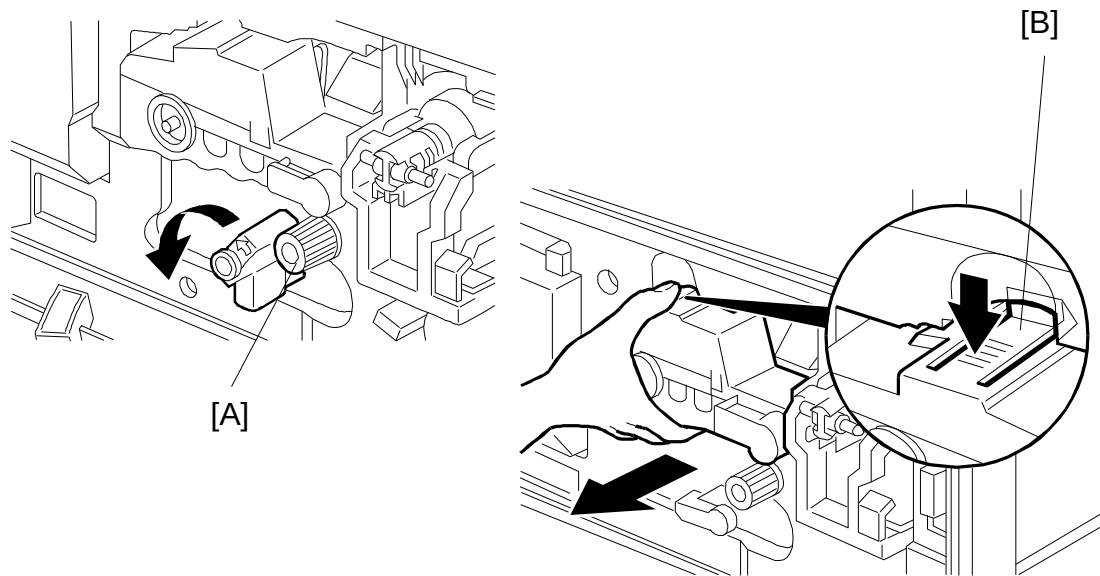
1. Remove the left scale [A] and rear scale [B] (5 screws).
2. Remove the exposure glass [C].
3. Remove the operation panel [D] (5 screws).
NOTE: When reinstalling the operation panel, connect the grounding terminal [E] so that the wire is vertical.
4. Remove the operation lower cover [E] (4 screws).
5. Remove the scanner right cover [F] (1 screw).
6. Remove the scanner left cover [G] (1 screw).
7. Remove the scanner rear cover [H].

2. PHOTOCONDUCTOR UNIT (PCU)

WARNING

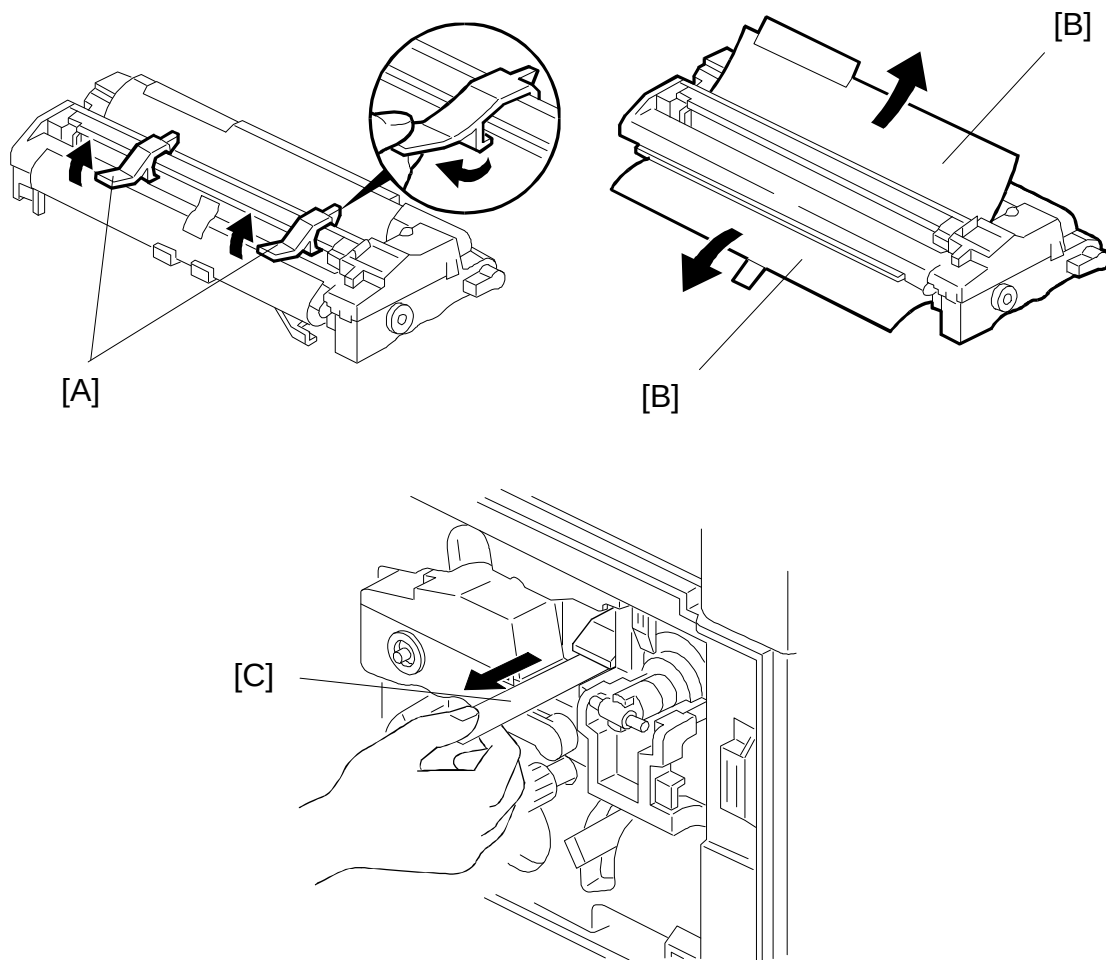
Do not incinerate the photoconductor unit. Toner dust might ignite when exposed to an open flame. Dispose of the used photoconductor unit in accordance with local regulations for plastics.

2.1 PCU



1. Turn the lever [A] to the left to release the transfer unit. Then, pull the PCU out slightly, while pushing the release lever [B] downward to unlock the PCU.
2. Pull the PCU out until it stops.
3. Hold the PCU with both hands. Slightly tilt the PCU to the left and right to unlock it. Then, pull the PCU out.

NOTE: Do not tilt the used PCU after removing it from the machine, to prevent toner spillage.



4. Remove the 2 clamps [A] and the drum protection sheets [B] from the new PCU.

NOTE: Do not touch the photoconductor. If you do, copy quality may be abnormal.

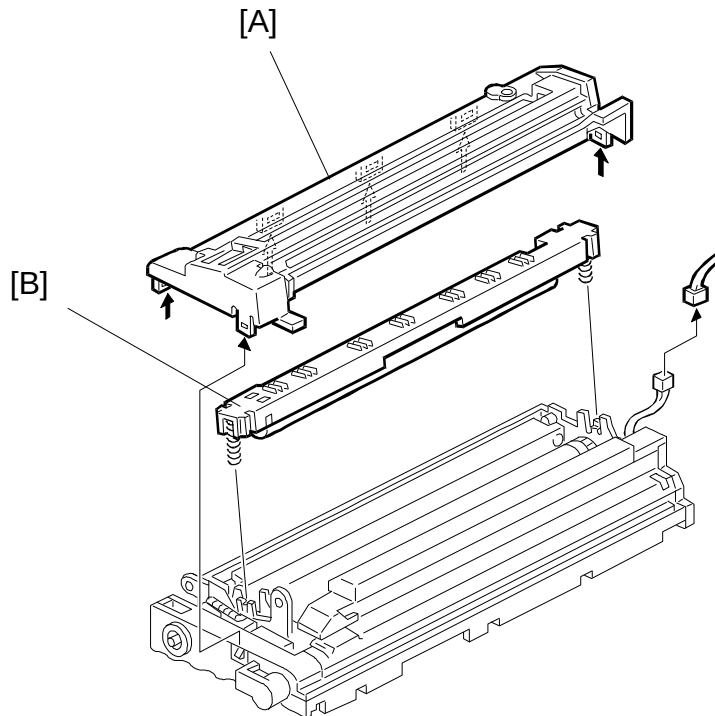
5. Insert the new PCU into the machine. Push the new PCU inward until the release lever locks.

6. Gently peel the sealing tape [C] off gently.

7. Return the transfer unit lever to its original position (see lever [A] on the previous page).

NOTE: After replacing the PCU, the machine will take about 2 minutes to warm up. During this warm-up period, do not open the front cover or turn off either the ac or main switches or a fault may occur.

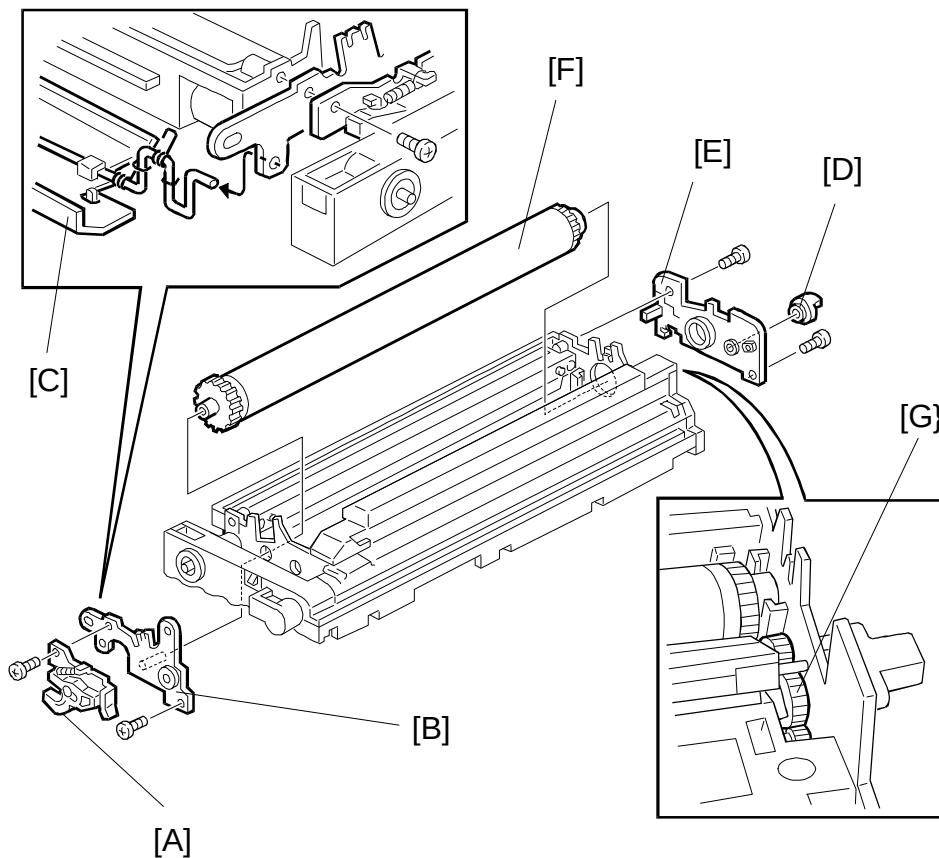
2.2 DRUM CHARGE ROLLER UNIT



1. Remove the upper cover [A] of the PCU (6 hooks 1 connector).
2. Remove the drum charge roller unit [B].

NOTE: 1. Do not let the springs fall. Do not remove the drum charge roller from the case when cleaning or replacing.
2. Never touch the surface of the drum charge roller.
3. If there is any dirt on the surface of the drum charge roller, wipe it off with a dry cloth or a special cloth for the drum charge roller. (The special cloth is available as a service part: A1539004.) **Never use alcohol or water to clean the drum charge roller.**

2.3 DRUM



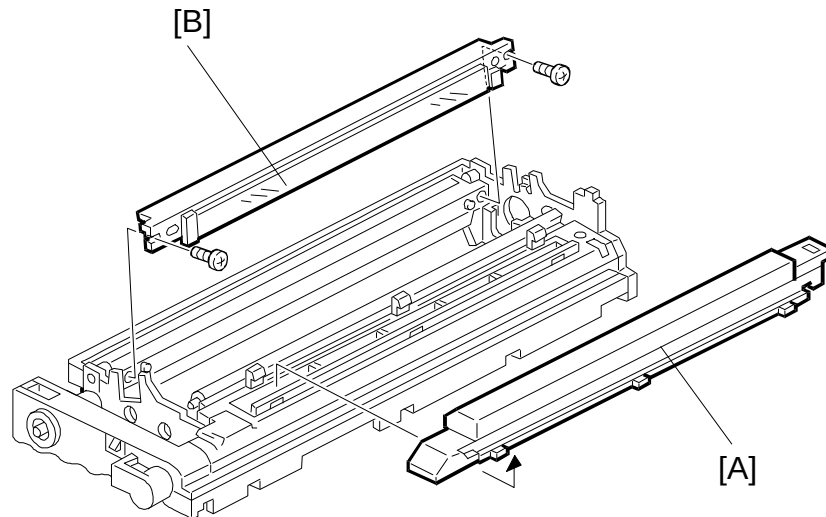
Replacement
Adjustment

1. Remove the drum charge roller unit. (See Drum Charge Roller Unit.)
2. Remove the shutter cam [A] (1 screw) and the front plate [B] (1 screw).
3. Remove the shutter [C].
4. Remove the joint [D] and rear plate [E] (2 screws).
5. Remove the drum [F].

NOTE: Do not touch the drum surface with bare hands.

CAUTION: Be careful not to spill toner over the train of gears [G] when removing the front or rear plate. Otherwise, development roller torque is likely to increase.

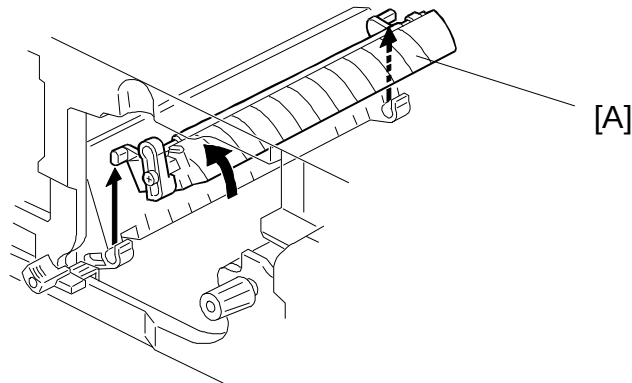
2.4 CLEANING BLADE



1. Remove the drum. (See Drum.)
2. Remove the developer cartridge [A] (3 hooks).
3. Remove the cleaning blade [B] (2 screws).

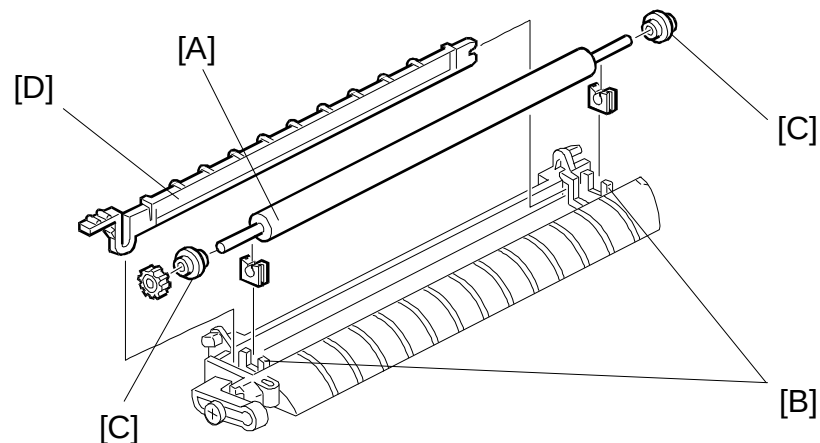
3. TRANSFER UNIT

3.1 TRANSFER UNIT



1. Remove the PCU.
2. Raise the transfer unit [A] vertically and remove it.

3.2 TRANSFER ROLLER/SEPARATION UNIT


 Replacement
Adjustment

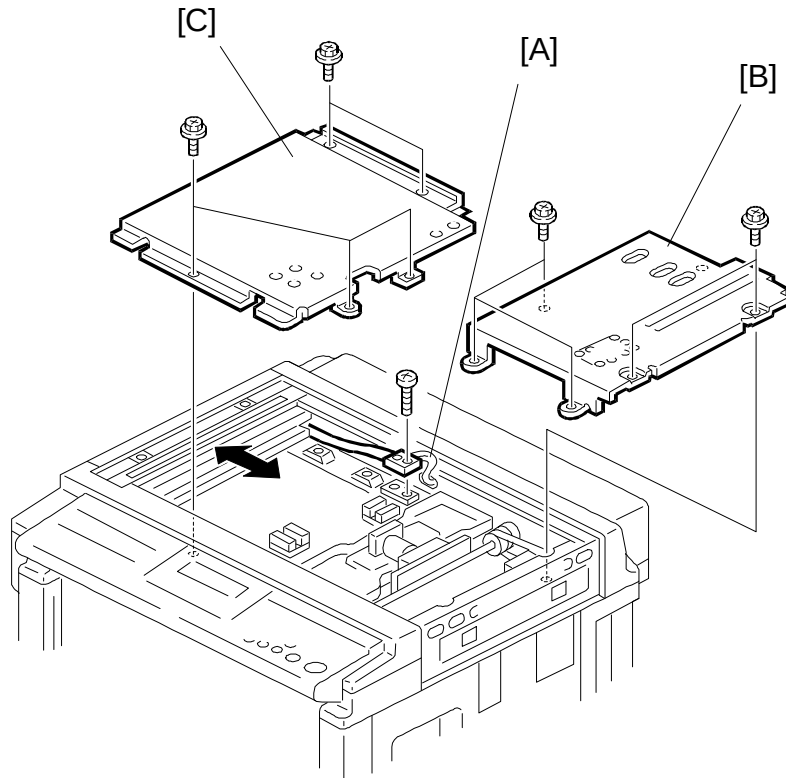
1. Remove the transfer unit. (See Transfer Unit.)
2. Remove the transfer roller [A].

NOTE: 1) Clean the bushings [B] and pulleys [C]. When replacing the transfer roller, replace the bushings and pulleys.

2) Do not touch the surface of the transfer roller with bare hands. When cleaning the transfer roller, use a blower brush, not a cloth.
3. Remove the discharge brush [D].

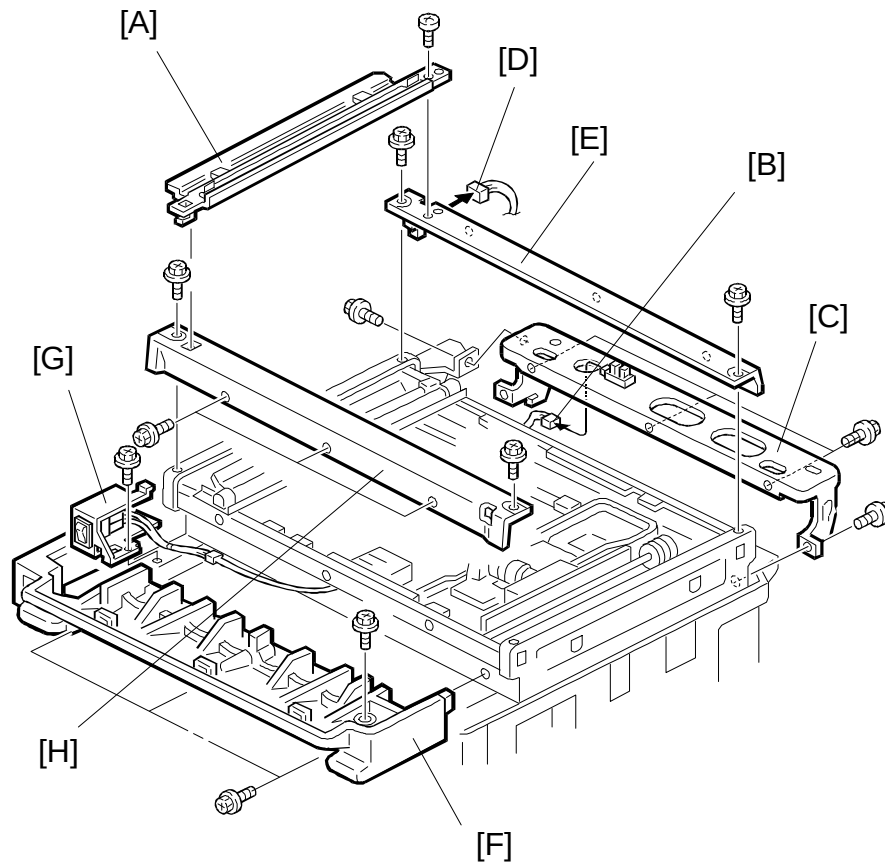
4. SCANNER UNIT

4.1 LENS COVER



1. Remove the scales and exposure glass. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the flat cable [A] (1 screw).
3. Remove the right lens cover [B] (5 screws) and left lens cover [C] (5 screws).

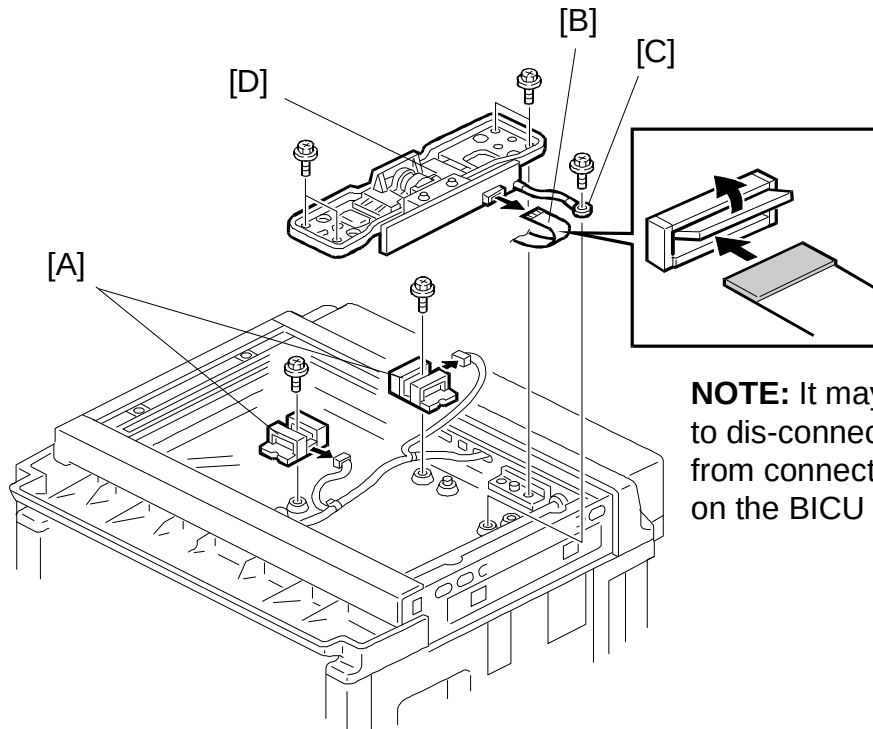
4.2 SCANNER FRAME



Replacement
Adjustment

1. Remove the platen cover (ADF).
2. Remove all parts indicated in the Exposure Glass/Operation Panel/Upper Cover section.
3. Remove the exposure glass bracket [A] (1 screw).
4. Disconnect the platen cover sensor [B] and remove the lower rear scanner frame [C] (6 screws).
5. Disconnect the scanner H.P. sensor [D] and remove the upper rear scanner frame [E] (2 screws).
6. Remove the lower operation panel [F] (4 screws).
7. Remove the main switch bracket [G] (1 screw).
8. Remove the front scanner frame [H] (5 screws).

4.3 ORIGINAL SIZE SENSOR



NOTE: It may be easier to dis-connect the cable from connector CN301 on the BICU Board.

1. Remove the exposure glass. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Change the original size sensors [A]: two for 115 V machines and three for 230 V machines (2 screws each).

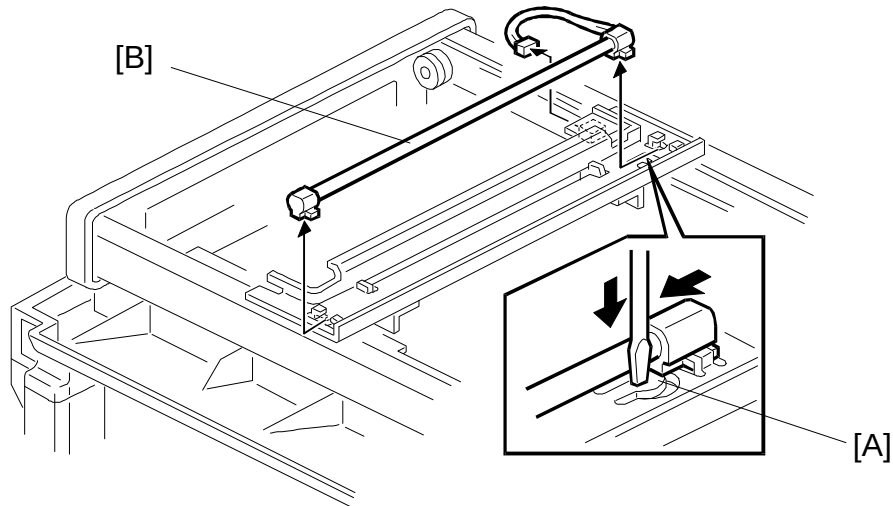
4.4 LENS BLOCK/SBU ASSEMBLY

1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)

CAUTION: Use extreme care during the removal and installation of the flat ribbon cable, carefully open the latch on the connector before removing or inserting the cable.

3. Disconnect the flexible harness [B].
4. Remove the grounding wire [C]. (1 screw)
5. Remove the lens block [D] (4 screws).
6. Perform the scanner and printer copy adjustments as described on page 6-39..

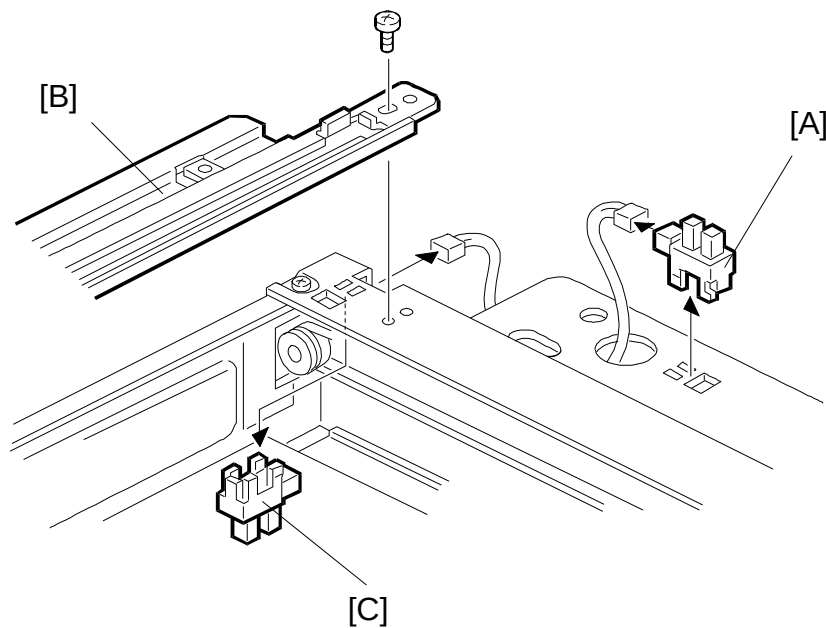
4.5 XENON LAMP



1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the scanner frames. (See Scanner Frame.)
3. Press the lamp holder [A] down with a screw driver, as shown.
4. Slide the xenon lamp [B] forward and remove it (1 connector).
NOTE: Do not touch the glass surface of the xenon lamp.
5. After installing the new lamp, press the lamp holder up to the original position so that it holds the lamp properly.

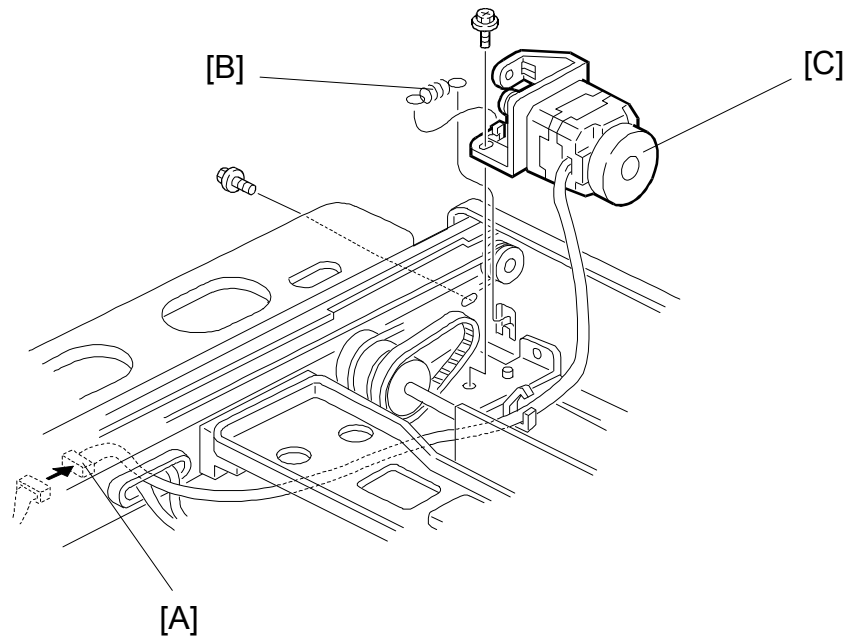
Replacement
Adjustment

4.6 SCANNER H. P. SENSOR/PLATEN COVER SENSOR



1. Remove the exposure glass and upper rear cover. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove and replace the platen cover sensor [A] (1 connector).
3. Remove the scale bracket [B] (1 screw) remove and replace the scanner H.P. sensor [C].

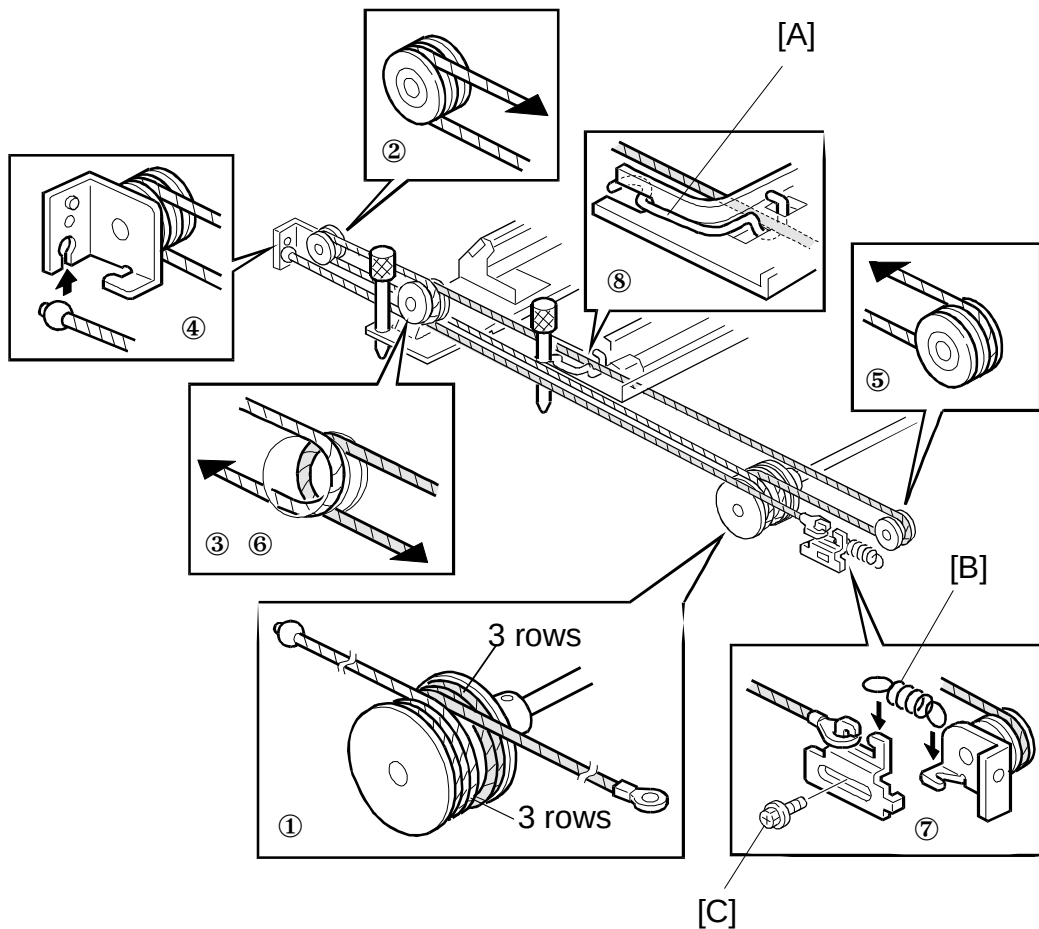
4.7 SCANNER MOTOR



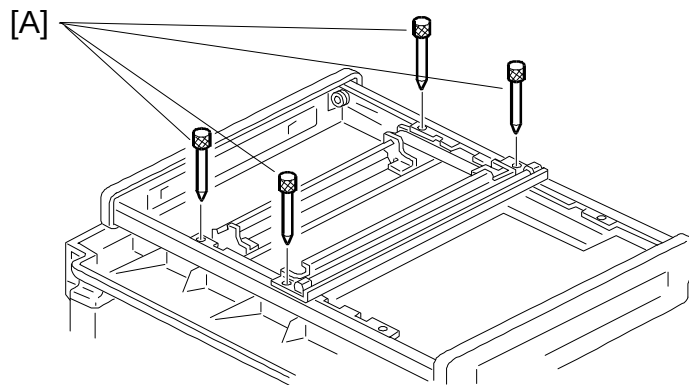
1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Remove the scanner frames. (See Scanner Frame.)
4. Remove the harness [A].
5. Remove the tension spring [B].
6. Remove the motor bracket [C] (2 screws).
7. Secure the new motor with the tension spring.
- ⇒ 8. Perform the scanner and printer copy adjustments as described on page 5-39.

Replacement
Adjustment

4.8 SCANNER WIRE



1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Remove the scanner frames. (See Scanner Frame.)
4. Remove the pin [A] securing the 1st scanner and remove the 1st scanner.
5. Remove the spring [B].
6. Loosen the screw [C] securing the wire tension bracket. Loosen the screw at the opposite side.
7. Remove the scanner wire.



8. Feed the bead end of the cable through the pulley ① . The direction the cable is fed is from the inside of the machine toward the outside of the machine.
9. Position the center bead of the cable into the locking position of the pulley. (Not shown in the illustration ①)
10. Wrap the cable around the pulley as illustrated in ① , 2½ wraps on each cord. The cable is wrapped from the outer edge of the pulley to the center of the pulley.
11. Wind the end of the new wire with a ball as shown in illustrations ② to ④ on the previous page.
12. Wind the end of the new wire with a ring as shown in illustrations ⑤ to ⑦ on the previous page.
13. Secure the screw of the wire tension bracket, with the wire tension spring pulled as shown in illustration ⑦ on the previous page.
14. Install the 1st scanner and adjust its position with the scanner positioning tools (P/N A0069104) [A]. Then clamp the 1st scanner with the scanner positioning pin as shown in illustration ⑧ on the previous page.
15. Remove the positioning tools. After sliding the scanner to the left and right several times, set the scanner positioning tools to check the clamp position and wire tension bracket position again.
16. Perform the scanner and printer copy adjustments as described on page 6-38.

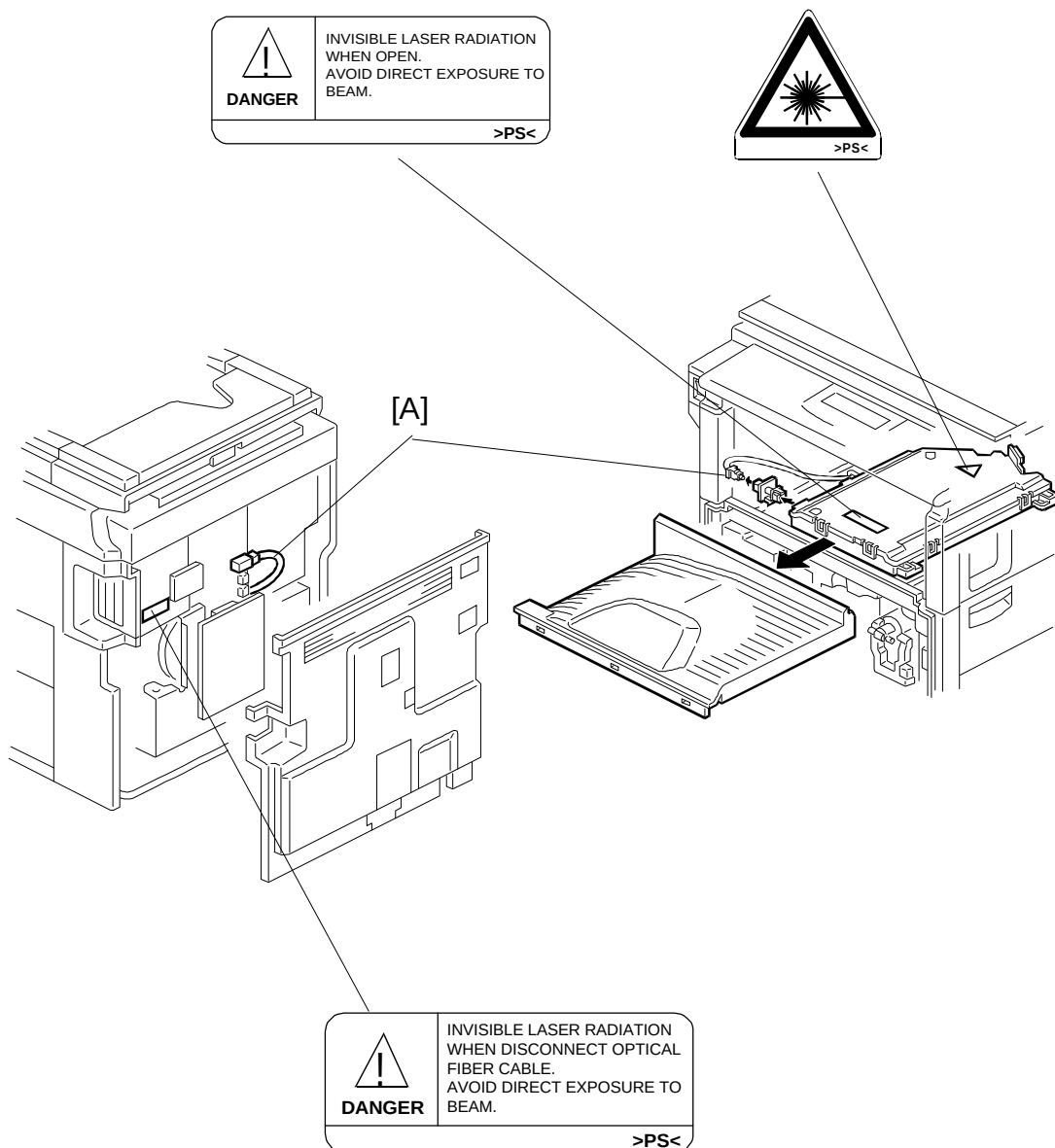
5. LASER UNIT

WARNING

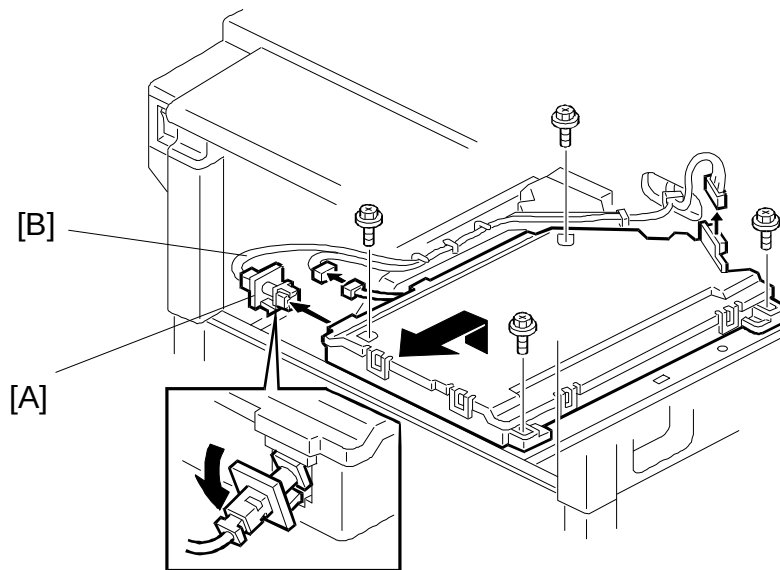
Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

- CAUTION DECALS -

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



5.1 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR



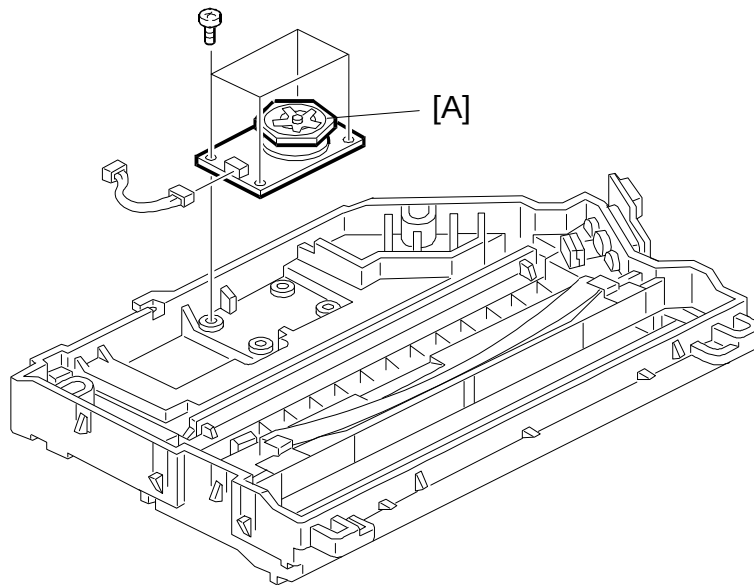
⚠ WARNING

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

1. Remove the front cover, inner cover, copy tray, and the front left and right covers (see section 1.1)..
2. Remove the main scan synchronizing detector [A].
3. Disconnect the optical fiber cable [B].
4. Remove the laser unit (4 screws and 1 connector).

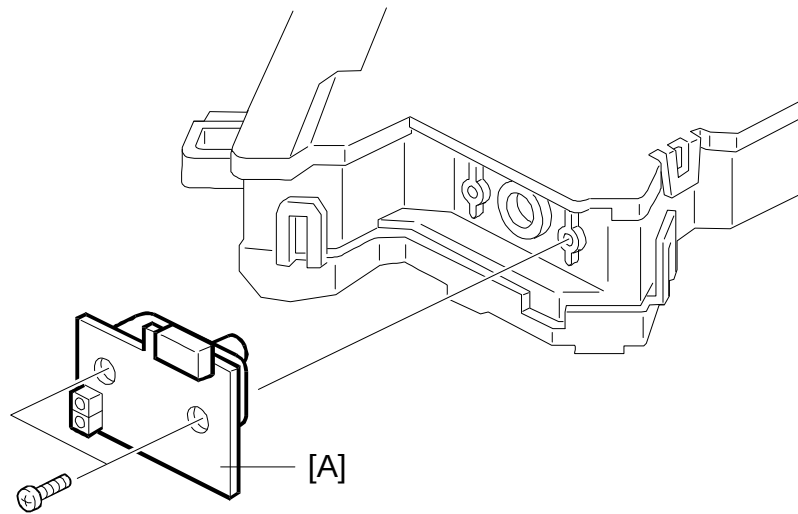
Replacement
Adjustment

5.2 POLYGON MIRROR MOTOR



1. Remove the front cover, inner cover, copy tray, and the front left and right covers (see section 6.1.1)
2. Remove the main scan synchronizing detector. (see laser unit/mainscan synchronization detection)
3. Remove the laser unit (4 screws, 2 connectors).
4. Remove the laser unit cover.
5. Remove the polygon mirror motor [A] (4 screws, 1 connector).
6. Perform the scanner and printer copy adjustments described on page 6-39.

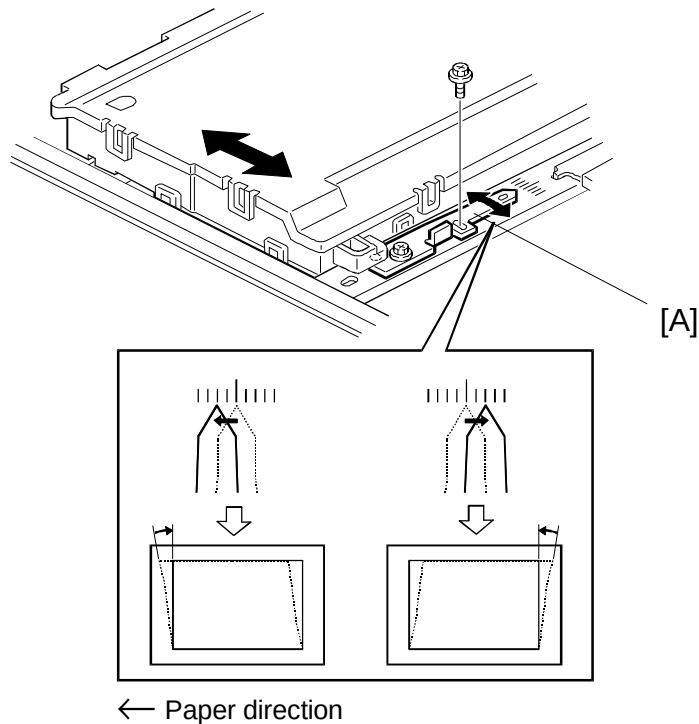
5.3 LD UNIT



1. Remove the copy tray.
2. Remove the main scan synchronizing detector. (see laser unit/mainscan synchronization detection)
3. Remove the laser unit (4 screws, 2 connectors).
4. Remove the LD unit [A] (2 screws).

Replacement
Adjustment

5.4 LASER UNIT POSITIONING ADJUSTMENT



⚠ CAUTION

Do not open the laser unit cover during the adjustment.

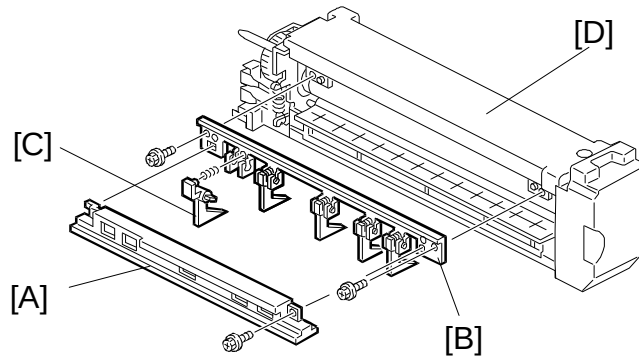
1. Print the trimming pattern on 8 $\frac{1}{2}$ " x 11" paper and estimate the amount of skew on the printed parallelogram.
2. Loosen the screws securing the laser unit (4 screws).
3. Loosen the screws securing the adjustment lever [A] (2 screws).
4. Move the adjustment lever to the proper position on the scale.
NOTE: When the adjustment lever is shifted by one unit on the scale, the image shifts by 0.2 mm.
5. Secure the adjustment lever (2 screws).
6. Secure the laser unit (4 screws).
7. Check the copy image.

6. FUSING/EXIT

⚠ CAUTION

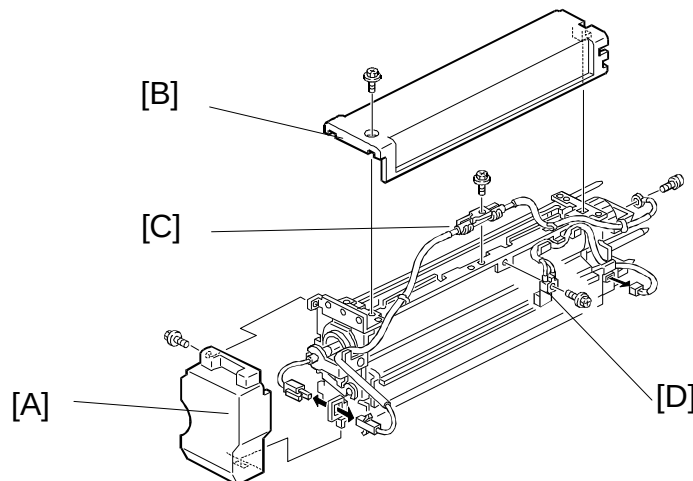
The fusing unit gets hot. Do not touch the metal part with bare hands.

6.1 HOT ROLLER STRIPPERS



1. Remove the fusing unit (1 screw).
2. Remove the exit guide plate [A] and cover [D] (1 screw each).
3. Remove the hot roller stripper bracket [B] (2 screws).
4. Replace the hot roller strippers [C] .

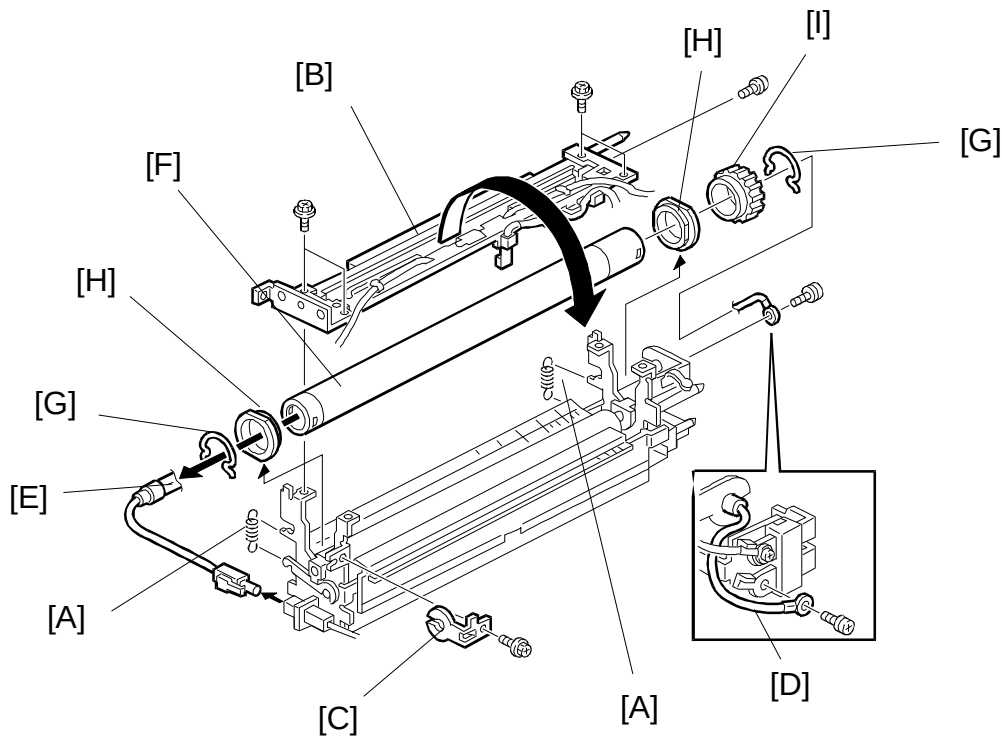
6.2 FUSING THERMISTOR/THERMOFUSE



1. Remove the fusing unit (1 screw).
2. Remove the front cover [A] (1 screw) and the upper cover [B] (1 screw).
3. Remove the fusing thermofuse [C] (2 screws, 1 connector).
4. Remove the fusing thermistor [D] (1 screw, 1 connector).

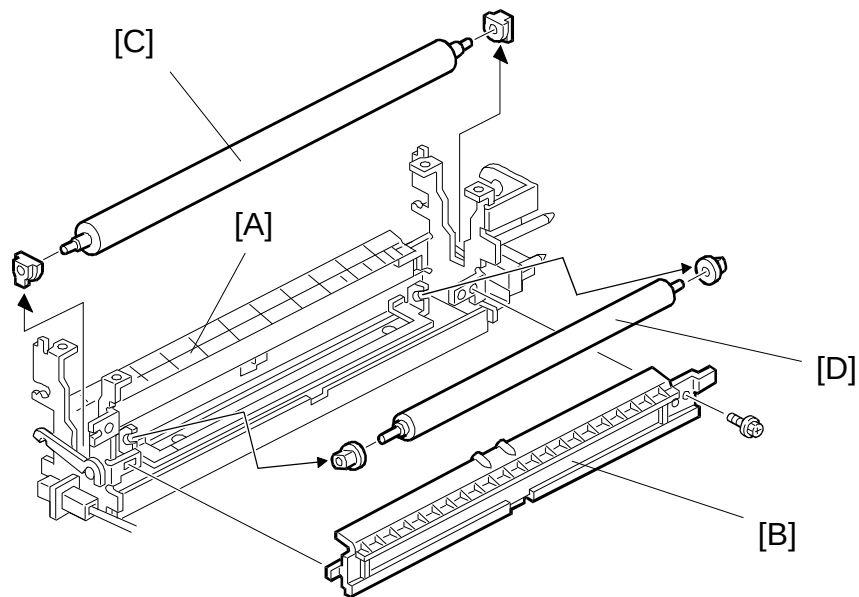
Replacement
Adjustment

6.3 HOT ROLLER/FUSING LAMP



1. Remove the fusing unit (1 screw).
2. Remove the front cover and upper cover. (See Fusing Thermister/Thermofuse.)
3. Remove the front and rear pressure springs [A] after checking their positions. (The standard setting is in the middle position.)
4. Remove the fusing stay [B] (5 screws).
5. Remove the front lamp holder [C] (1 screw).
6. Remove the fusing harness [D] (1 screw and 1 connector), pull the fusing lamp [E] out forward, and keep it in a safe place.
7. Remove the hot roller [F].
NOTE: Do not touch the hot roller with bare hands.
8. Remove the front and rear C-rings [G], then remove the hot roller bushings [H] and fusing gear [I].
NOTE: Do not touch the fusing lamp with bare hands.

6.4 PRESSURE ROLLER/CLEANING ROLLER

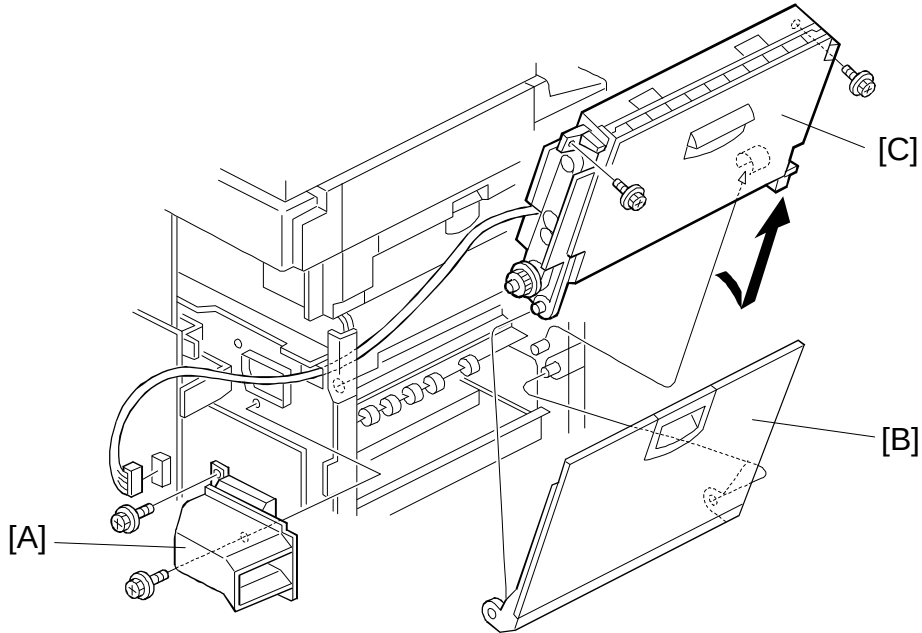


1. Remove the hot roller. (See Hot Roller/Fusing Lamp.)
2. Remove the exit guide plate [A] (1 screw).
3. Check the height position of the entrance guide plate [B] (the upper position is standard) and remove it (1 screw).
4. Remove the pressure roller [C].
5. Remove the cleaning roller [D].

Replacement
Adjustment

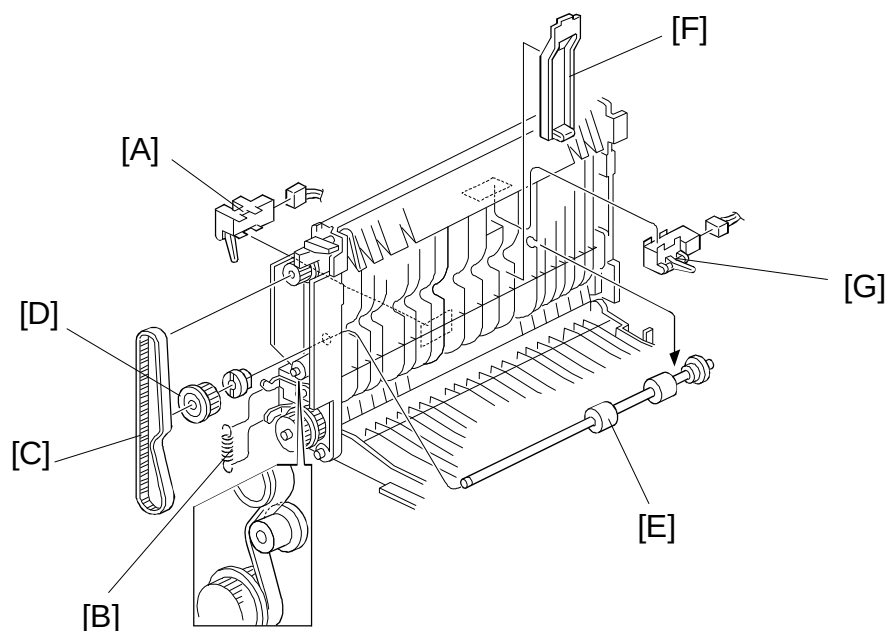
7. EXIT

7.1 EXIT UNIT



1. Remove the left cover, front left cover, and rear cover. (See Rear Cover Removal and Left/Right Cover.)
2. Remove the duct [A] (2 screws).
3. Remove the face up tray [B] and the exit unit [C] (2 screws and 1 connector)

7.2 UPPER EXIT SENSOR/LOWER EXIT SENSOR

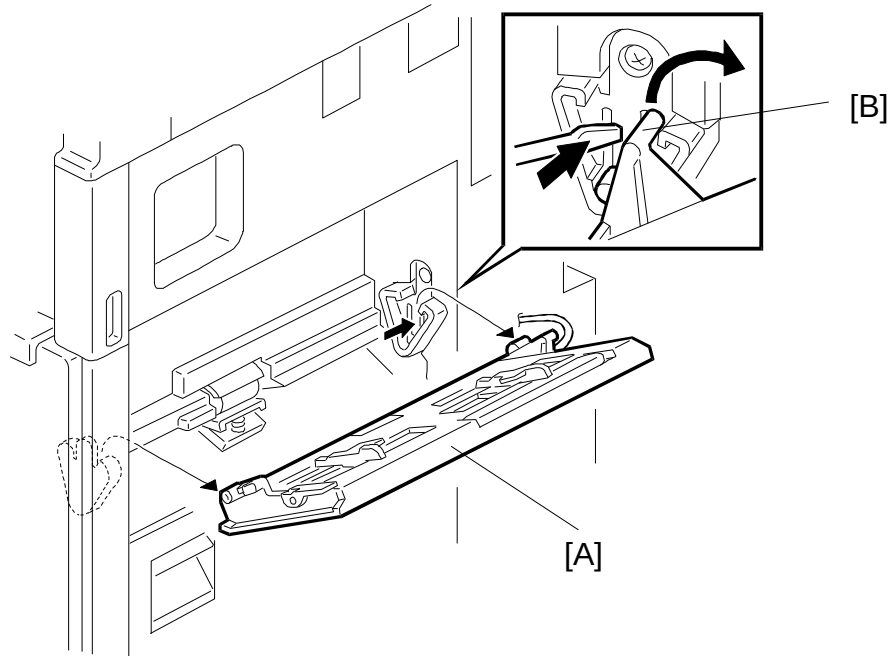


1. Remove the exit unit. (See Exit Unit.)
2. Replace the lower exit sensor [A] (1 connector).
3. Remove the spring [B].
4. Remove the timing belt [C].
5. Remove the pulley [D].
6. Remove the transport roller [E] (2 bushing).
7. Remove the harness cover [F].
8. Replace the upper exit sensor [G] (1 connector).

Replacement
Adjustment

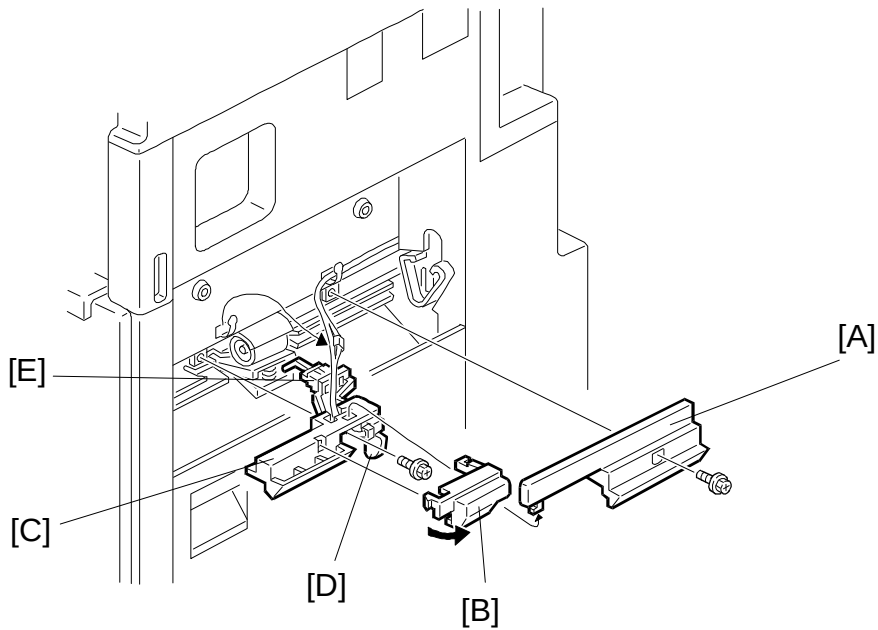
8. PAPER FEED/ REGISTRATION

8.1 BY-PASS FEED TRAY



1. Remove the by-pass feed tray [A], by holding the hook [B] on the by-pass feed tray with a tool, such as a screwdriver.
2. Disconnect the harness from the IOCSS board.

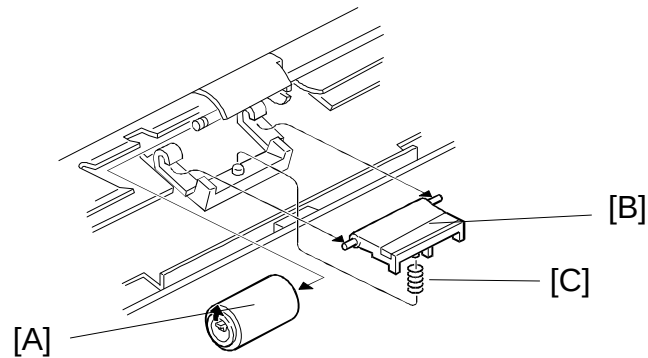
8.2 BY-PASS FEED PAPER END SENSOR/REGISTRATION SENSOR



1. Remove the by-pass feed tray. (See By-pass Feed Tray.)
2. Remove the paper feed roller cover [A] (1 screw).
3. Remove the cap [B].
4. Remove the sensor holder [C] (1 screw).
5. Remove the by-pass feed paper end sensor [D] .
6. Remove the registration sensor [E] .

Replacement
Adjustment

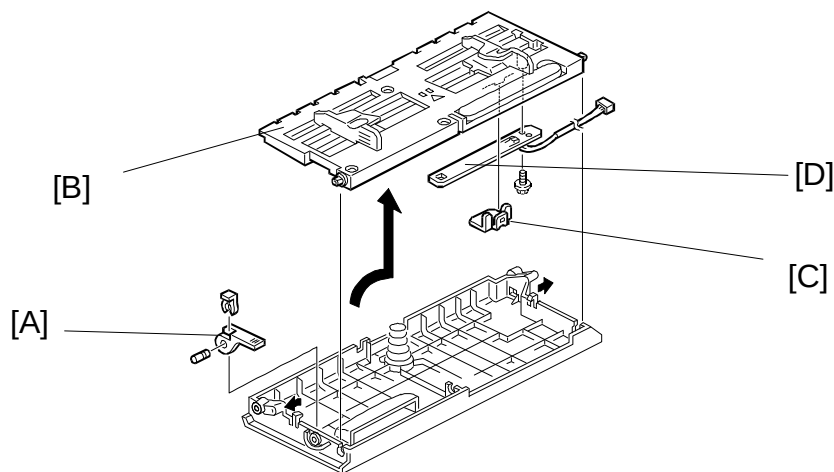
8.3 PAPER FEED ROLLER/FRICTION PAD



1. Remove the registration sensor and paper end sensor unit. (See By-pass Feed Paper End Sensor/Registration Sensor.)
2. Remove the paper feed roller [A] (1 hook).
3. Remove the friction pad [B].

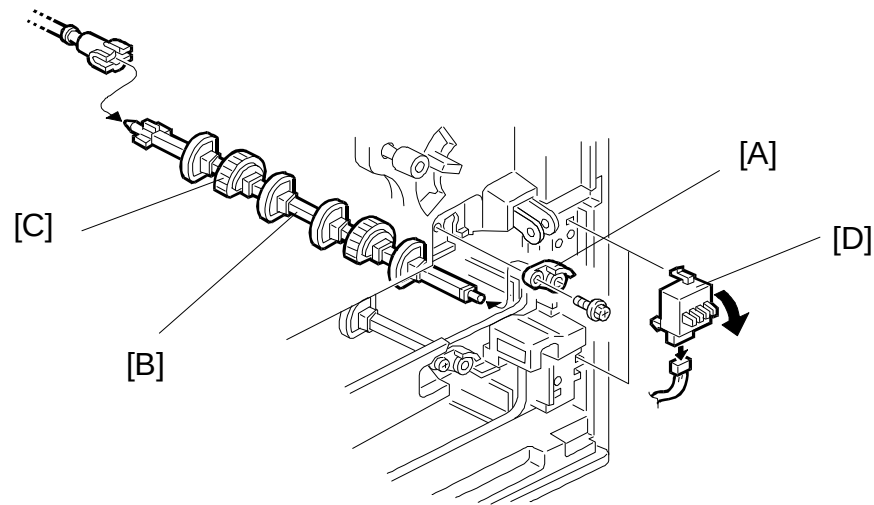
NOTE: Do not lose the spring [C].

8.4 BY-PASS FEED PAPER WIDTH SENSOR



1. Remove the by-pass feed table assembly (see By-pass Feed Tray).
2. Remove the table lever [A] (1 snap ring and 1 pin).
3. Remove the by-pass feed table [B] (2 hooks).
4. Remove the width sensor spring plate [C].
5. Remove the by-pass feed paper width sensor [D] (1 screw).

8.5 PAPER FEED ROLLERS/PAPER SIZE DETECTOR



8.5.1 Paper Feed Rollers

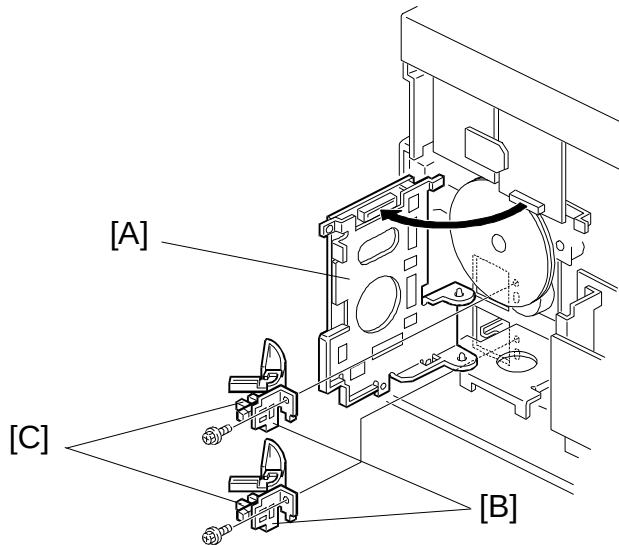
1. Remove the paper tray.
2. Remove the front door only when replacing the 1st paper feed roller.
3. Remove the paper feed bushing [A] (1 screw).
4. Pull the paper feed roller shaft [B] outward.
5. Replace the paper feed roller [C].

Replacement
Adjustment

8.5.2 Paper Size Detector

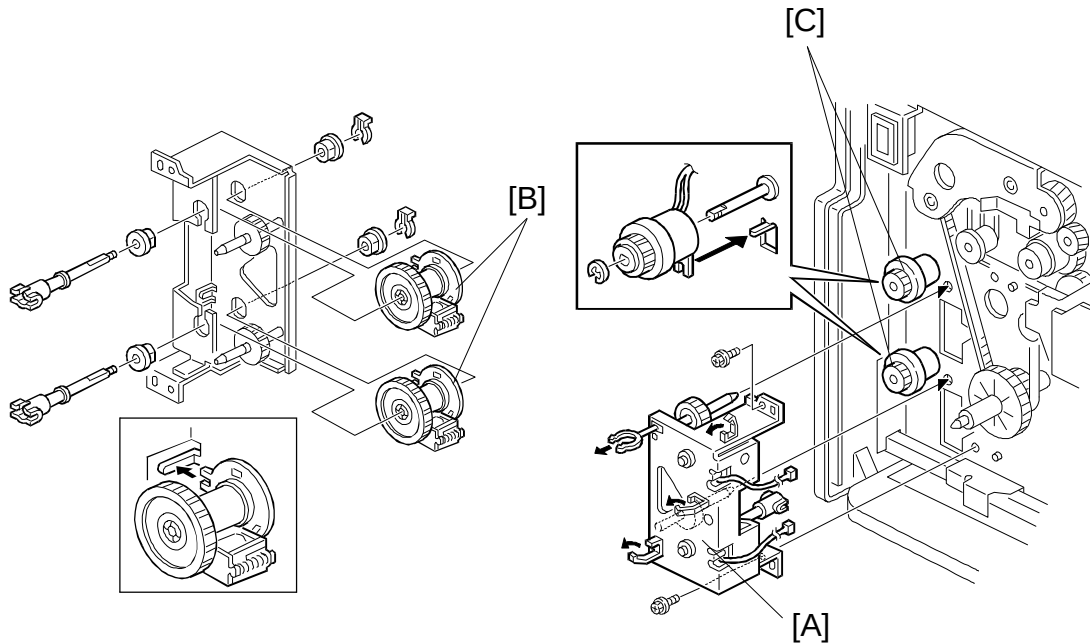
1. Remove the paper tray.
2. Remove the paper size detector [D] (1 connector), while pressing the detector downward.

8.6 PAPER END SENSORS



1. Remove the rear cover. (See Rear Cover.)
2. Disconnect the connectors from the right half of the IOCSS board [A] and swing out the IOCSS board (4 screws).
3. Remove the paper end sensor assemblies [B] (1 screw and 1 connector each).
4. Remove the paper end sensors [C].

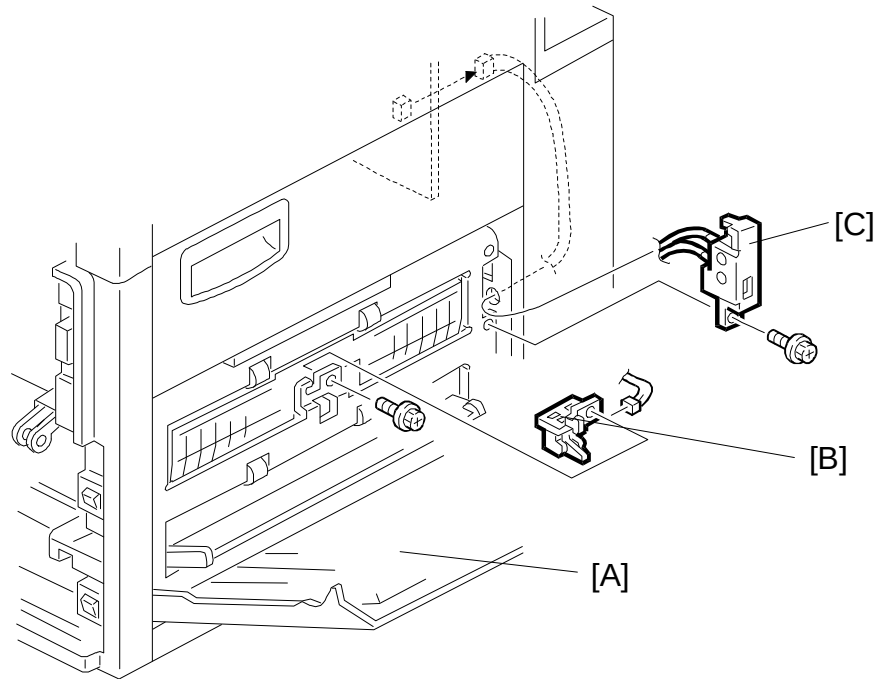
8.7 PAPER FEED CLUTCHES/RELAY CLUTCHES



1. Remove the paper feed roller shafts. (See Paper Feed Rollers.)
2. Remove the rear cover. (See Rear Cover.)
3. Remove the paper feed drive bracket [A] (2 screws).
4. Remove the paper feed clutches [B] (1 clip and 1 connector each) and the relay clutches [C] (1 E-ring and 1 connector each).

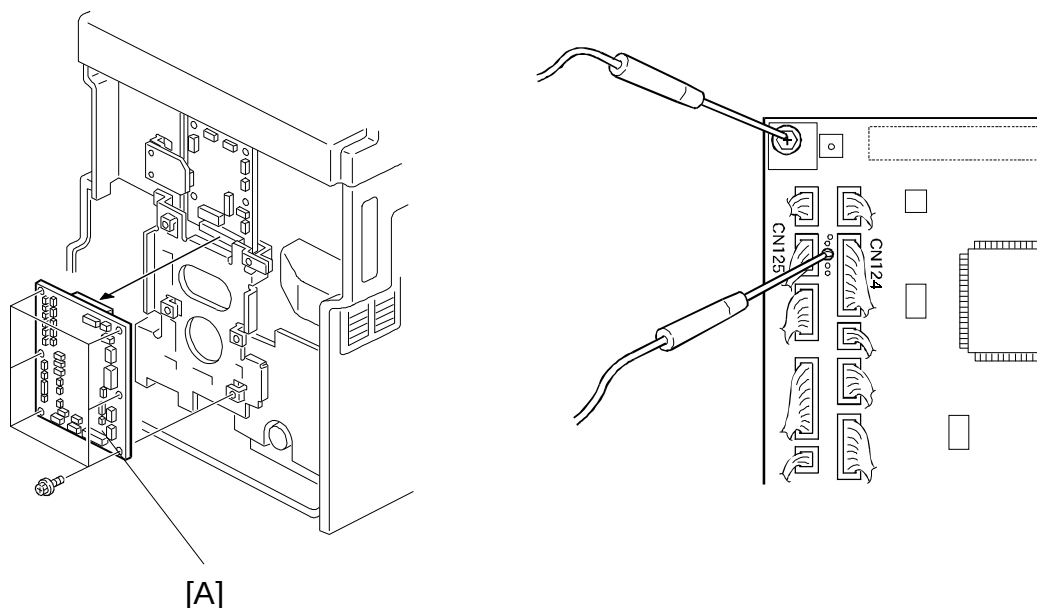
Replacement
Adjustment

8.8 RELAY SENSOR/RIGHT VERTICAL GUIDE SWITCH



1. Open the right cover [A].
2. Remove the relay sensor [B] (1 connector).
3. Remove the rear cover (See Rear Cover).
4. Remove the right vertical guide switch [C] (1 screw, 1 connector).

9. OTHERS

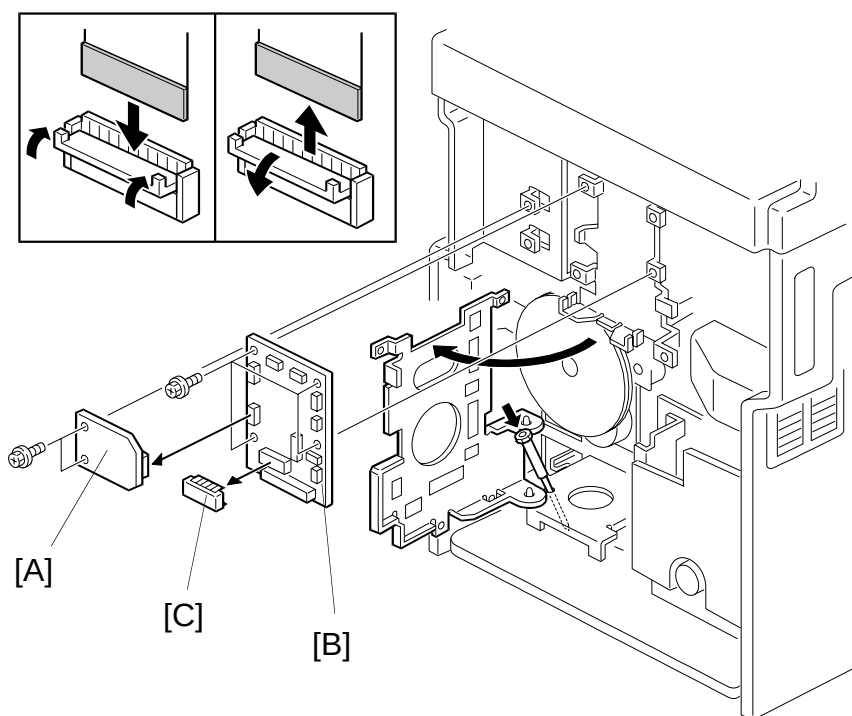


9.1 IOCSS BOARD

1. Remove the rear cover. (See Rear Cover.)
2. Disconnect all connectors from the IOCSS board [A].
3. Replace the IOCSS board (6 screws).
4. Measure the voltage of the IOCSS board between TP105 and the IOCSS bracket with a multimeter. This is V_{CONT} .
5. Check that the multimeter shows $5.63 \pm 0.2 \text{ V}$.
6. If V_{CONT} is not $5.63 \pm 0.2 \text{ V}$, access SP2-999 and select 1. Then change the setting of SP 2-996-1 until V_{CONT} is within the specified range.

Replacement
Adjustment

9.2 MSU BOARD/BICU BOARD

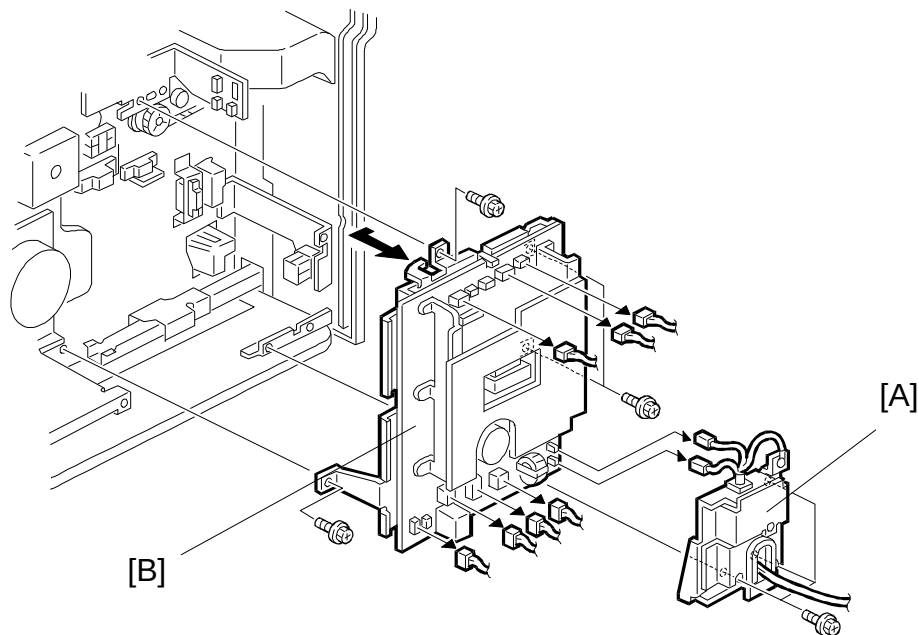


1. Remove the MSU board [A] (2 screws).
2. Disconnect the connectors from the right half of the IOCSS board, remove the 4 screws that secure the bracket, and swing out the IOCSS board.
3. Disconnect all connectors from the BICU board [B] (7 connectors) Use extreme care during the tag removal and insertion of the flat cable to prevent damage to the connector latch.

CAUTION: *Handle the connector latches for the flat cable very carefully!*
When installing the flat cable, gently push the connector latch holding the both ends until it clicks into place.

4. Remove the BICU board (4 screws).
5. Remove the NVRAM [C] from the old BICU board and install it onto the new BICU board.
6. Install the new BICU board and MSU.

9.3 PSU BOARD



1. Remove the rear cover. (See Rear Cover).
2. Disconnect the connectors from the right half of the IOCSS board, remove the 4 screws that secure the bracket, and swing out the IOCSS board outward. (See MSU Board/BICU Board.)
3. Remove the power supply cord bracket [A] (3 screws and 2 connectors).
4. Disconnect all connectors from the PSU board.
5. Remove the PSU board bracket assembly [B] (4 screws).

Replacement
Adjustment

10. STANDARD WHITE DENSITY ADJUSTMENT

This is to adjust the standard white density level.

Perform this adjustment after any of the following conditions:

- After replacing the standard white plate.
- After replacing the NVRAM on the BICU. (If only the BICU is replaced, this adjustment is not necessary, as long as the NVRAM from the old BICU was installed onto the new BICU.)
- After performing a memory all clear (SP5-801).

Procedure:

1. Place 10 sheets of new letter size paper sideways or A3 paper onto the exposure glass and close the platen cover or the ADF.
2. Enter SP 4-908 and select "1:YES". The standard white density is automatically adjusted.

11. COPY ADJUSTMENT PRINTING/SCANNING

NOTE: 1) Perform the listed adjustment(s) after replacing any of the following parts:

Scanner Wire
 Lens Block/SBU Assembly
 Scanner Drive Motor
 Polygon Mirror Motor
 Paper Trays
 Duplex Tray
 Paper Side Fence
 Memory All Clear

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

11.1 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 (SP5-902, No.10) to print the test pattern for the following procedures.

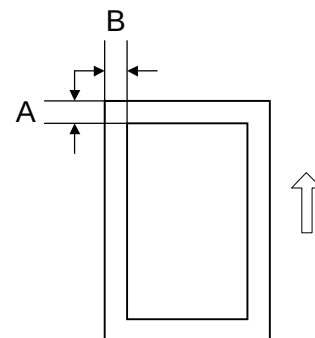
3) Re-set SP 5-902 to 0 after completing the printing adjustments.

11.1.1 Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration, and adjust it using SP1-001.
 The specification is: 3 ± 2 mm

2. Check the side-to-side registration for each paper feed station, and adjust each using the following SP modes.

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



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

Replacement
Adjustment

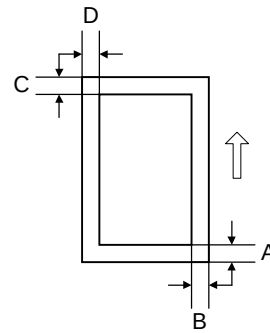
11.1.2 Blank Margin

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

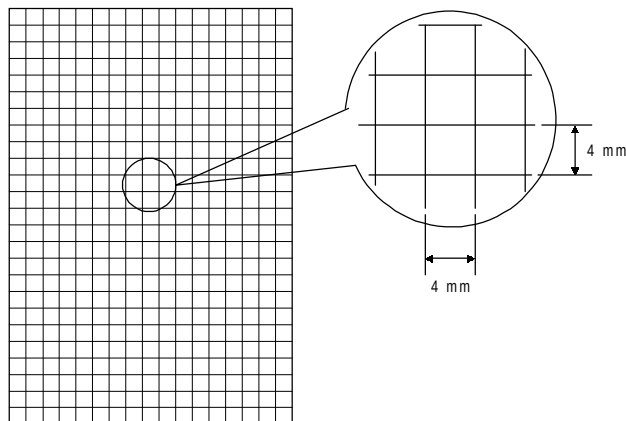
1. Check the trailing edge and right side edge blank margins, and adjust each using the following SP modes.

	SP mode	Specification
Trailing edge	SP2-101-2	2 ± 2 mm
Right side edge	SP2-101-4	2 ± 1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left side edge	SP2-101-3	2 ± 1.5 mm

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



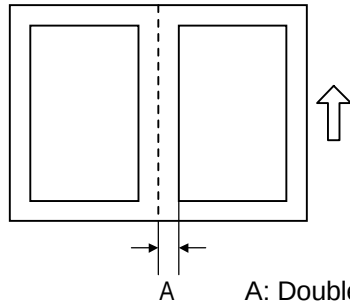
11.1.3 Main Scan Magnification



1. Print the Grid Pattern (SP5-902, No.5).
2. Check the magnification (the grid size should be 4 mm), and adjust the magnification using SP2-998 if necessary. The specification is $\pm 1\%$.

11.1.4 Double Copy Registration

- NOTE:** 1) Perform this adjustment after completing the registration adjustment and the blank margin adjustment for single copies.
- 2) Select the double copies mode by the Double Copies key using the copy mode to print the test pattern.



A: Double Copy Registration

1. If you need to adjust the double copy registration, use SP1-006.

11.2 SCANNING

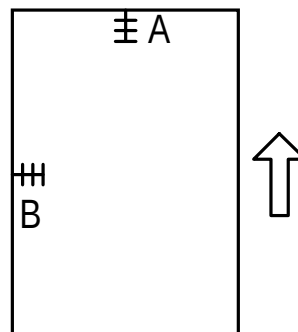
- NOTE:** 1) Perform or check the printing registration/side-to-side adjustment and the blank margin adjustment, before performing the following scanner adjustment.
- 2) Use an OS-A3 test chart to perform the following adjustments.

Replacement
Adjustment

11.2.1 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 each using the following SP modes if necessary.

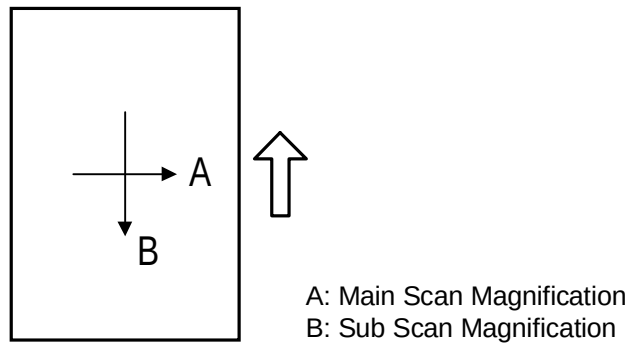
	SP mode
Leading edge	SP4-010
Side-to-side	SP4-011



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

11.2.2 Magnification

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



1) Main Scan Magnification

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

SP mode	
Main Scan Magnification	SP4-008

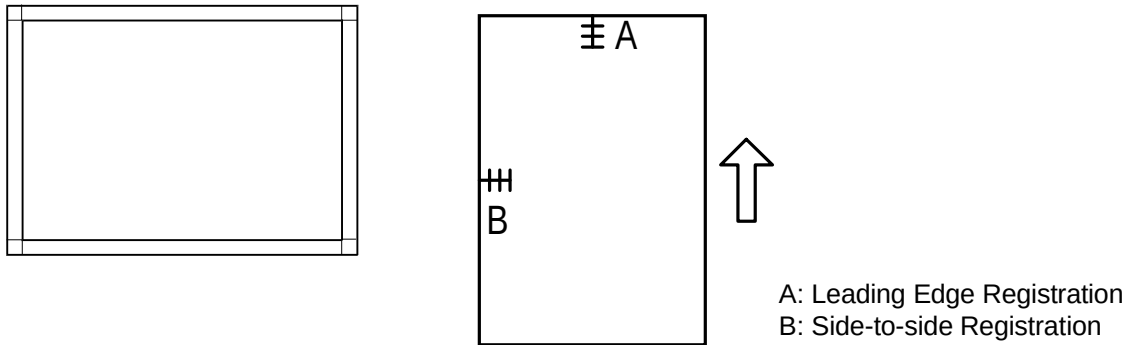
2) Sub Scan Magnification

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 $\pm 1\%$.

SP mode	
Sub Scan Magnification	SP4-101

11.3 ADF IMAGE ADJUSTMENT

11.3.1 Registration and Blank Margin



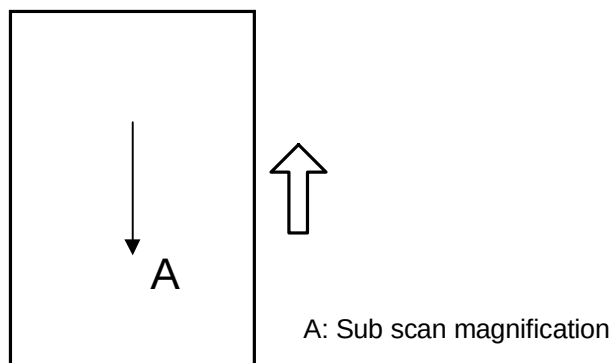
NOTE: Make a temporary test chart as shown above using A3/DLT paper.

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

	SP mode
Side-to-side Registration	SP6-006-1
Leading Edge Registration (Simplex)	SP6-006-2
Trailing Edge Blank Margin	SP6-006-3

Replacement
Adjustment

11.3.2 Sub Scan Magnification



NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using SP 6-007 if necessary. The specification is $\pm 1\%$.

12. IMAGE DENSITY ADJUSTMENT BY KEY OPERATOR

Usually, the image density is adjusted with SP2-911 (this changes the coefficient for the TD sensor output). However, if the user wishes to change the image density, the service representative can instruct the user to do this using the following procedure.

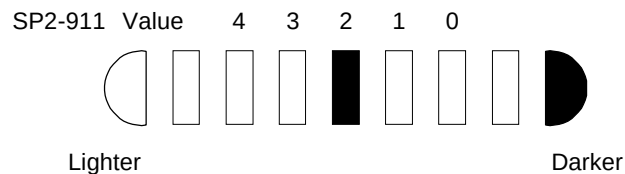


Illustration 1

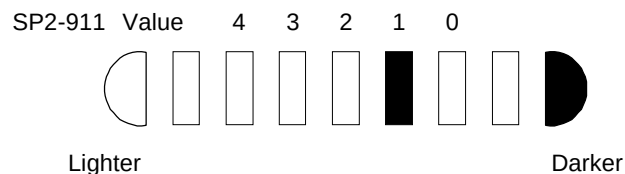


Illustration 2

1. Press the User Tool key.
2. Select the System menu.
3. Press the Darker (or Lighter) key and the # key at the same time.

NOTE: At this time, the current setting level is displayed on the image density LED. See illustration 1.
4. When holding down both the Darker (or Lighter) key and the # key for over 3 seconds, the image density LED will be changed to a darker level (or lighter level). See illustration 2.

NOTE: 1) If the image density level is changes to a darker setting, the machine automatically supplies toner.
 2) Do not select the "0" level.

SECTION 6

TROUBLESHOOTING

1. SERVICE CALL CONDITIONS

1.1 SUMMARY

There are 3 levels of service call conditions.

Level	Definition
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.
B	The SC can be reset by turning the main switch off and on if the SC was caused by a sensor error.
C	The copier can be operated as usual except for the unit related to the service call.

- NOTE:**
- 1) If the problem concerns electrical circuit boards, first disconnect and then reconnect the connectors before replacing the PCBs.
 - 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
 - 3) To reset a Level A SC, enter SP 5-810 (SC code reset) and select "1". Press and hold the "Photo mode" key and while holding "Photo mode" key then press "#" key to register setting.
 - 4) When a Level A or B SC occurs while in an SP mode, the display message will not indicate the SC number. If this occurs, check the SC number after leaving the SP mode.

2. SC CODE DESCRIPTIONS

SC120: Scanner home position error 1

-Definition- [B]

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

- Possible causes -

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

SC121: Scanner home position error 2

-Definition- [B]

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

- Possible causes -

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

SC122: Scanner home position error 3

-Definition- [B]

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

- Possible causes -

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

SC123: Scanner home position error 4**-Definition- [B]**

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

- Possible causes -

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

SC192: Automatic SBU adjustment error**-Definition- [B]**

An error is detected during automatic SBU adjustment.

- Possible cause -

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

SC302: Charge roller current leak**-Definition- [B]**

A charge roller current leak signal is detected.

- Possible causes -

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

SC306: Charge roller home position error

-Definition- [B]

The charge roller contact sensor does not detect the on condition.

- Possible causes -

- Charge roller contact sensor defective
- Charge roller contact clutch defective

SC320: Polygon motor error

-Definition- [B]

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

- Possible causes -

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

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

NOTE: This SC code is only for copy mode.

- Definition- [B]

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

- Possible causes -

- BiCU board defective
- MSU board defective

SC322: Laser synchronization error

-Definition- [B]

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

- Possible causes -

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

SC324: LD drive current over**-Definition- [B]**

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

- Possible causes -

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

SC390: TD sensor error 1**-Definition- [B]**

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

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC391: Development bias leak**-Definition- [B]**

A development bias leak signal is detected.

- Possible causes -

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

SC393: TD sensor error 2**-Definition- [B]**

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

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC401: Transfer roller leak error 1

SC402: Transfer roller leak error 2

-Definition- [B]

A transfer roller current leak signal is detected.

- Possible causes -

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

SC411: Separation bias error

-Definition- [B]

A separation bias leak signal is detected.

- Possible causes -

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

SC500: Main motor lock

-Definition- [B]

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

- Possible causes -

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

SC503: Upper tray lift motor malfunction (optional paper tray unit only)

SC504: Lower tray lift motor malfunction (optional paper tray unit only)

-Definition- [C]

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

- Possible causes -

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

SC506: Paper tray unit main motor lock (optional paper tray unit only)**-Definition- [C]**

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

- Possible causes -

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

SC542: Fusing temperature warm-up error**-Definition- [A]**

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

- Possible causes -

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

SC543: Fusing overheat error**-Definition- [A]**

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

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

**Trouble-
shooting**
SC544: Fusing low temperature error**-Definition- [A]**

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

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC546: Fusing ready temperature malfunction

-Definition- [A]

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

- Possible causes -

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

SC547: Zero cross signal malfunction

-Definition- [A]

Zero cross signals are not detected within a certain period.

- Possible causes -

- Power supply board defective
- IOCSS defective
- BICU defective

SC610: Communication error between IOCSS and duplex unit

-Definition- [B]

The IOCSS board cannot communicate with the duplex unit properly.

- Possible causes -

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

SC691: Communication error between BICU and fax controller

-Definition- [B]

The BiCU board cannot communicate with the fax controller properly.

- Possible causes -

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

SC692: Communication error between BiCU and printer controller**-Definition- [B]**

The BICU board cannot communicate with the printer controller properly.

- Possible causes -

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

SC900: Total counter error**-Definition- [C]**

The total counter is not working properly.

- Possible causes -

- Total counter defective
 - IOCSS board defective
- ⇒ • Fuse #5, PSU blown

SC920: MSU connection error**-Definition- [B]**

The MSU set signal is not detected

- Possible cause -

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

Trouble-
shooting

SC921: MSU hardware error**-Definition- [B]**

The hardware of the MSU is defective

- Possible cause -

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

SC980: Program loading error

-Definition- [C]

The program cannot load properly.

- Possible cause -

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

SC981: NVRAM clear error

-Definition- [C]

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

- Possible cause -

- NVRAM defective

SC990: Communication error between BICU and IOCSS board

-Definition- [B]

The BiCU board cannot communicate with the IOCSS board properly.

- Possible cause -

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

3. ELECTRICAL COMPONENT DEFECTS

3.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Upper Exit (S1)	157-11 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights when there is no paper.
Lower Exit (S2)	157-8 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights when there is no paper.
Left Vertical Door (S3)	157-5 (IOCSS)	Open	The Door Open indicator does not light when the left vertical door is opened.
		Shorted	The Door Open indicator lights when the left vertical door is closed.
Left Door (S4)	157-2 (IOCSS)	Open	The Door Open indicator does not light when the left door is opened.
		Shorted	The Door Open indicator lights when the left door is closed.
Relay (S5)	104-2 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights when there is no paper.
PCU Detect (S6)	151-1 (IOCSS)	Open	The TD sensor initial setting procedure is not performed when a new PCU is installed.
		Shorted	The TD sensor initial setting procedure is performed whenever the front cover is closed.
Fusing Exit (S7)	151-6 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights when there is no paper.
Charge Roller Contact (S8)	151-9 (IOCSS)	Open	No Symptom
		Shorted	SC306 is displayed.
Upper Tray Paper End (S9)	103-2 (IOCSS)	Open	The Paper End indicator lights when paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light when there is no paper in the upper paper tray.
Lower Tray Paper End (S10)	103-5 (IOCSS)	Open	The Paper End indicator lights when paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light when there is no paper in the lower paper tray.
By-pass Feed Paper End (S11)	119-4 (IOCSS)	Open	The Paper End indicator lights when paper is placed on the by-pass feed tray.
		Shorted	The Paper End indicator does not light when there is no paper on the by-pass feed tray.

Trouble-shooting

ELECTRICAL COMPONENT DEFECTS

Component (Symbol)	CN	Condition	Symptom
Registration (S12)	119-6 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights when there is no paper.
By-pass Feed Paper Width (S13)	122-1~4 (IOCSS)	Open	The CPU cannot detect the proper paper width.
		Shorted	
Humidity (S14)	109-3 (IOCSS)	Open	A lighter image copy will be made.
		Shorted	A darker image copy will be made.
Original Width (S15)	131-2~3 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE can not function correctly.
		Shorted	
Original Length-1 (S16)	132-A1~A2 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE can not function correctly.
		Shorted	
Original Length-2 (S17)	132-A8~A9 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE can not function correctly.
		Shorted	
Platen Cover (S18)	132-B7 (IOCSS)	Open	APS and ARE can not function correctly.
		Shorted	No symptom
Scanner H.P (S19)	132-B9 (IOCSS)	Open	SC120 is displayed.
		Shorted	The CPU does not detect the scanner home position and the scanner motor will not stop.
Toner Density (S20)	125-3 (IOCSS)	Open	SC393 is displayed. (See the note.)
		Shorted	SC390 is displayed. (See the note.)

NOTE: An SC condition occurs only when a new PCU is being installed in the machine. During copying, if the TD sensor fails, the image density will be changed.

APS: Automatic paper size

ARE: Automatic Reduction Enlargement

3.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
AC (SW1)	282-1,2 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Main (SW2)	309-12 (BICU)	Open	The LCD does not off when the main switch is turned off.
		Shorted	The LCD does not on when the main switch is turned on.
Right Vertical Guide (SW3)	112-2 (IOCSS)	Open	The Cover Open indicator is not lit when the right vertical guide is opened.
		Shorted	The Cover Open indicator is lit when the right vertical guide is closed.
Upper Paper Size (SW4)	102-1,2,4,5 (IOCSS)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Lower Paper Size (SW5)	102-6,7,9,10 (IOCSS)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Front Door Safety (SW6)	120-1,134-3 (IOCSS)	Open	The Cover Open indicator is not lit when the right vertical guide is opened.
		Shorted	The Cover Open indicator is lit when the right vertical guide is closed.

4. BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	115 V	220 ~ 240 V	
Power Supply Board			
FU1	15 A/125 V	----	No response.
FU2	8 A/125 V	5 A/250 V	No response
FU4	6.3 A/125 V	6.3 A/125 V/250V	"Doors/Covers Open" is displayed then SC120 is displayed
FU5	4 A/125 V	4 A/125 V/250 V	SC900 is displayed
FU6	4 A/125 V	4 A/125 V/250 V	Normal operation (This fuse is on the +24V line of CN287 but it is not used.)

⇒ 5. ROM HISTORY

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- Version A, B & C were for the pre-production machines.	A1935532D	1st Mass Production	1.16
Corrects the following: - While feeding out the original from ADF, "Start key" can be detected, then the incorrect document size is detected. - ARDF is supported.	A1935532E	November '96	1.23
Corrects the following: - SC921-Memory Access Error After a paper jam during memory output and opening the door. - SC101- occurs at night timer in and out after the IPU test pattern in SP mode. - SP5-803: New PCU Detect is added for Input check. - Memory copy priority of SP5-945 is added to Salesman Program Mode. - SP-mode cannot be cleared at night timer in and out after going to the interrupt copy mode from SP mode. - Finisher is supported.	A1935532F	December '96	1.31
Corrects the following: - The Black Spots in the scanned image - The scanned low contrast image can be adjusted by 7 "notches." Each notch has the different gamma correct characteristic, MTF filter and threshold level by new SP mode(SP4-998,999). - The dirty background on the white image after the negative and positive reversing. - SC321 appears when the door is opened during the memory copying then the start key is pressed after closing the door. - The developing bias setting(SP2-201) is initialized by turning off the main switch.	A1935532G	January '97	1.33
- Dirty Background. 1) Toner Density (SP2-911) was changed from 2 to 3 (Lighter). 2) Free run time at the Installation of the PCU was changed from 1min. to 3min.	A1935532H	January '97	1.35

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- A blank sheet is printed out when the start key is pressed if the memory is full and the scanning restarted after printing the scanned image and then the first original jammed.	A1935532J	January '97	1.36
- Toner scattering around the black image on the rear side in the duplex mode. The default of the separation output voltage was changed. SP2-901-1→ -1800 SP2-901-2→ -1800 SP2-901-3→ -2500 SP2-901-4→ -2500	A1935532K	February '97	1.38
- When the RAM was cleared by SP5-801, the white level and the standard white plate density at the factory were erased.	A1935532L	March '97	1.43
- Paper jam when paper is fed from the 3rd tray immediately after feeding the paper from the 4th tray.(A jam or Y jam) with the following papers. - 3rd Tray has the paper less than 288mm length (A4 ☐) - 4th Tray has the paper 289mm to 401mm length (A4 ☐) - If when the duplex copy is made with ADF, Duplex Unit and 12M Memory and the original is jammed, only the jammed original cannot be copied correctly at recovery copy.	A1935532M	May '97	1.48

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- (New SP Mode) SP-606-6: ARDF Main-Scan Magnification of the rear side. - (Specification) When the trays do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected. (The previous version software stops the copy job when one of tray is empty) - Stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode. - When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper. - SP5-808: The 3 languages cannot be selected on the previous software ver.N (Europe & Asia only)	A1935532N	June '97	1.54
- New SP is added. SP5-945:1= When one of the trays is empty, the paper end indicator (red LED) lights. - The DF Jam display is cleared by DF lifting up and down	A1935532P	August '97	1.60
-(For U.S.A. only) -New SP is added. SP5-950: LG size paper detection on the by pass tray. When this function is selected and LT size is inserted in the by-pass tray, the machine detects it as LG size paper. -Correspond to the Energy Star standard. After the fax transmission through ARDF with the stamper, the registration of the 1st copied paper by the ARDF is delayed.	A1935532R	September '97	1.62

A193 ROM MODIFICATION HISTORY (Copier Section)																																																						
DESCRIPTION OF MODIFICATION		FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																																																		
-Dirty background problem -Vt Correction -Mixing time -(New SP Modes) SP 2-994: Vcount offset SP 9-999-14: Additional Mixing Time Display		A1935532T	October '97	1.70																																																		
-The table for VT correction & Mixing time have been changed. <table border="1"><thead><tr><th>Remaining Mixing Time</th><th>VT Correction</th></tr></thead><tbody><tr><td>100</td><td>0</td></tr><tr><td>200</td><td>0.1</td></tr><tr><td>400</td><td>0.4</td></tr><tr><td>450</td><td>0.6</td></tr><tr><td>500</td><td>0.8</td></tr></tbody></table> <table border="1"><thead><tr><th>Pre. Vt-Latest VT</th><th>Mixing Time</th></tr></thead><tbody><tr><td>~0.1</td><td>10</td></tr><tr><td>~0.2</td><td>30</td></tr><tr><td>~0.3</td><td>50</td></tr><tr><td>~0.4</td><td>300</td></tr><tr><td>0.5~</td><td>500</td></tr></tbody></table>		Remaining Mixing Time	VT Correction	100	0	200	0.1	400	0.4	450	0.6	500	0.8	Pre. Vt-Latest VT	Mixing Time	~0.1	10	~0.2	30	~0.3	50	~0.4	300	0.5~	500	A1935532V	February '98	1.72																										
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~0.4	300																																																					
0.5~	500																																																					
-SC544 is sometime displayed when the machine shift to the night mode or the pre-heat mode. -When the longer paper than A4 is fed at the toner near end, the toner is not supplied enough. -Copy Quality in duplex mode. When the quality of the rear copy is poor, the added transfer current must be decreased by SP 2-301-3. The new table shows that transfer current can be set to a lower range.		A1935532W	September '98	1.73																																																		
Current Table (SP2-301-3) <table><thead><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr></thead><tbody><tr><td>275</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>250~275</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>200~250</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>~200</td><td>15</td><td>17</td><td>19</td><td>21</td></tr></tbody></table> Default Setting New Table (SP2-301-3) <table><thead><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr></thead><tbody><tr><td>275</td><td>8</td><td>11</td><td>14</td><td>17</td></tr><tr><td>250~275</td><td>10</td><td>12</td><td>15</td><td>17</td></tr><tr><td>200~250</td><td>12</td><td>14</td><td>16</td><td>17</td></tr><tr><td>~200</td><td>14</td><td>15</td><td>16</td><td>17</td></tr></tbody></table> Default Setting		Table No./ Paper width	0	1	2	3	275	15	17	19	21	250~275	15	17	19	21	200~250	15	17	19	21	~200	15	17	19	21	Table No./ Paper width	0	1	2	3	275	8	11	14	17	250~275	10	12	15	17	200~250	12	14	16	17	~200	14	15	16	17			
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~200	14	15	16	17																																																		

Troubleshooting

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
-White copy problem on 1st scanning. A. Two new SP modes have been added: 1. SP4-916-1: Scanner Lamp OFF counter default: 120min range: 0-300min 2. SP4-916-2 Scanner lamp warm-up time default: 200ms range:0-500ms If the scanner lamp remains off for 120min or longer in between the first and second scans of each job, the machine will allow the scanner 120ms for warm-up (default). B. When the scanner lamp is turned on for the first time after the main power switch has been turned on, the machine allows the scanner 300ms for warm-up.	A1935532Y	March '99	1.75

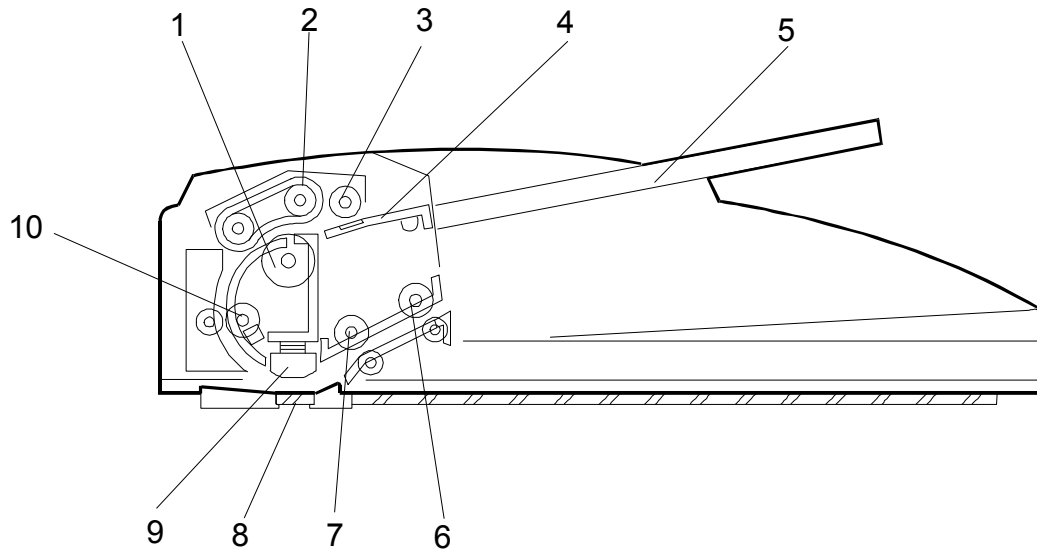
SECTION 7
DOCUMENT FEEDER (A628)

1. SPECIFICATIONS

Original Size:	Standard Size A3 to A5 Non-standard Size Max. width 297 mm Min. width 105 mm Max. length 1260 mm Min. length 128 mm
Original Weight :	50 g to 90 g
Table Capacity :	30 sheets (70 kg)
Original Standard Position:	Rear left corner
Separation:	FRR (Feed and Reverse Roller)
Original Transport:	Roller transport
Original Feed Order:	From top original
Reproduction Range:	37 to 150%
Power Source:	24 & 5 Vdc from the copier
Power Consumption:	25 W
Dimensions (W x D x H):	550 x 470 x 120 mm
Weight:	9 kg

2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



1. Separation Roller

2. Paper Feed Belt

3. Pick-up Roller

4. Original Entrance Guide

5. Original Table

6. Original Exit Roller

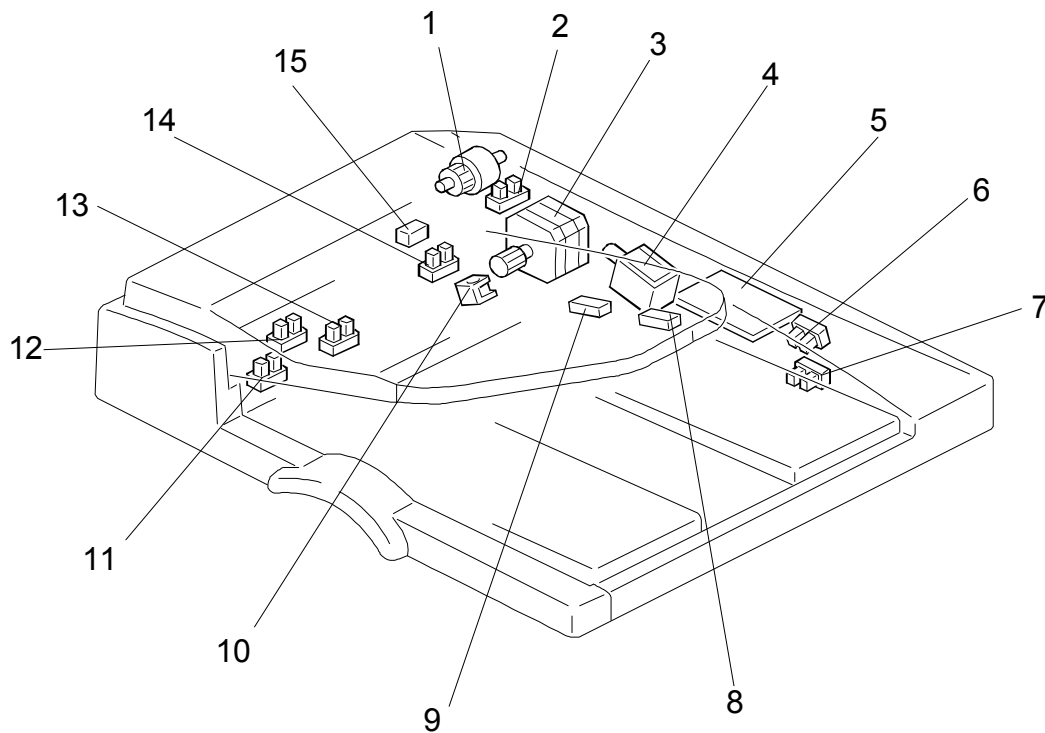
7. 2nd Transport Roller

8. DF Exposure Glass

9. Original Exposure Guide

10. 1st Transport Roller

2.2 ELECTRICAL COMPONENT LAYOUT

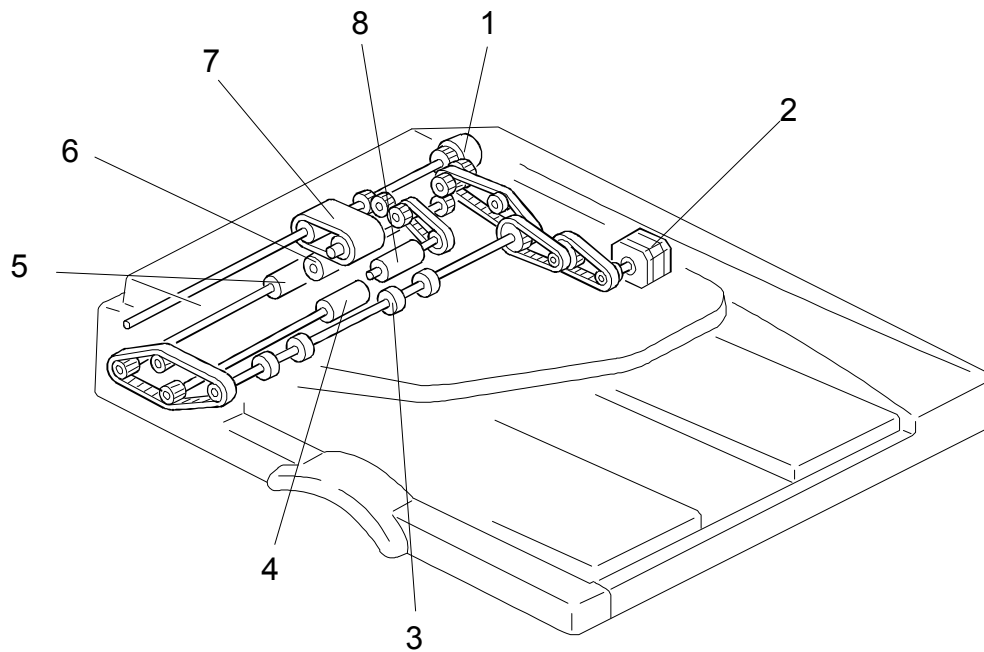


1. DF Feed Clutch	9. Original Length Sensor 1
2. Feed Cover Open Sensor	10. Stamper Solenoid
3. DF Feed Motor	11. Original Width Sensor 3
4. DF Pick-up Solenoid	12. Original Width Sensor 2
5. DF Drive PCB	13. Original Width Sensor 1
6. DF Position Sensor	14. Original Set Sensor
7. APS Start Sensor	15. Registration Sensor
8. Original Length Sensor 2	

2.3 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
S1	DF Feed	Drives all the rollers.	3
Sensors			
S1	APS Start	Informs the CPU when the DF is opened and closed (for platen mode) so that original size sensors in the copier can check the original size.	7
S2	DF Position	Detects when the DF is lifted.	6
S3	Registration	Detects the leading edge of the original to turn off the transport motor, detects the original exposure timing, and checks for original misfeeds.	5
S4	Feed Cover Open Sensor	Detects when the feed-in cover is opened.	2
S5	Original Width - 1	Detects the original width	13
S6	Original Width - 2	Detects the original width	12
S7	Original Width - 3	Detects the original width	11
S8	Original Length - 1	Detects the original length.	9
S9	Original Length - 2	Detects the original length.	8
S10	Original Set	Detects if an original is on the feed table.	14
Solenoids			
SOL1	DF Pick-up	Controls the up-down movement of the original entrance guide.	4
SOL2	Stamper	Energizes the stamper to mark on the original.	10
Clutches			
MC1	DF Feed	Transfers transport motor drive to the pick-up roller and feed belt.	1
PCBs			
PCB1	DF Drive	Interfaces the sensor signals with the copier, and transfers the magnetic clutch, solenoid and motor drive signals from the copier.	5

2.4 DRIVE LAYOUT

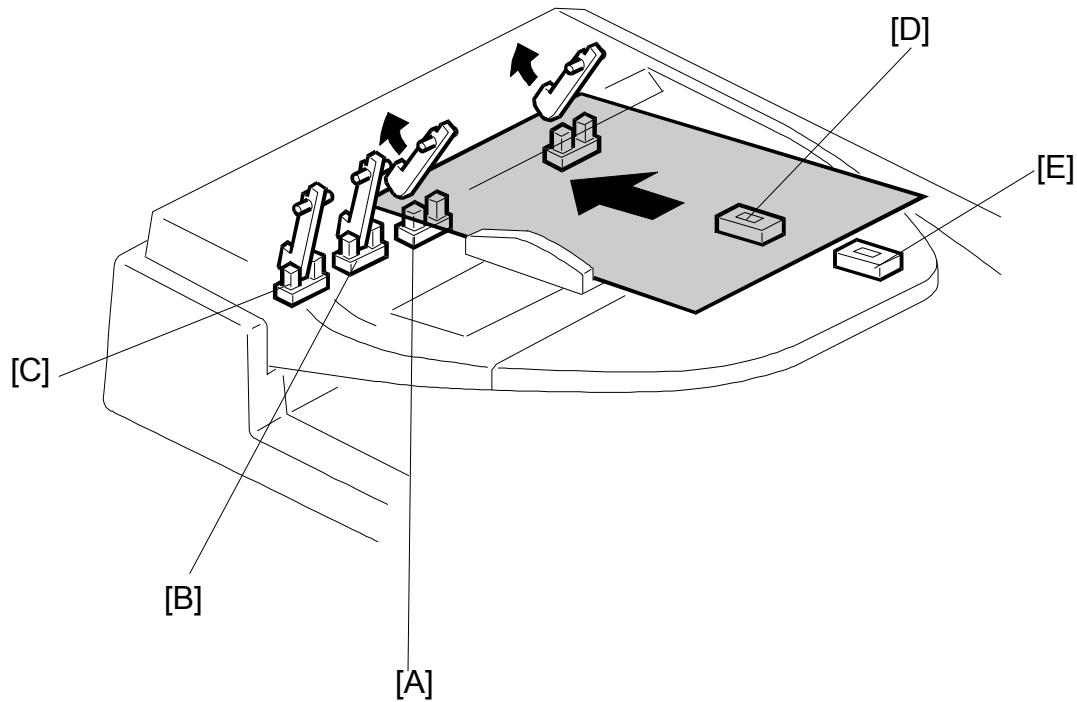


- 1. DF Feed Clutch
- 2. DF Feed Motor
- 3. Exit Roller
- 4. 2nd Transport Roller

- 5. 1st Transport Roller
- 6. Separation Roller
- 7. Original Feed Belt
- 8. Pick-up Roller

3. DETAILED DESCRIPTIONS

3.1 ORIGINAL SIZE DETECTION



The DF has three width sensors (- 1 [A], - 2 [B], and - 3[C]) to detect the original width and two original length sensors (-1 [D] and -2 [E]) to detect the original length. The DF detects the original size through the combination of those five sensors as shown in the table on the next page.

When using an original of a non-standard size, the user needs to input the original length at the operation panel.

DETAILED DESCRIPTIONS

	NA	EU	Original Width-1	Original Width-2	Original Width-3	Original Length-1	Original Length-2
A3 (297 x 420)	X	○	ON	ON	ON	ON	ON
B4 (257 x 364)	X	○	ON	ON	–	ON	ON
A4 (Lengthwise) (210 x 297)	X	○	ON	–	–	ON	–
A4 (297 x 210) (Sideways)	X	○	ON	ON	ON	–	–
B5 (182 x 257) (Lengthwise)	X	○	–	–	–	ON	–
B5 (257 x 182) (Sideways)	X	○	ON	ON	–	–	–
A5 (148 x 210) (Lengthwise)	X	X	–	–	–	–	–
A5 (210 x 148) (Sideways)	X	○	ON	–	–	–	–
11" x 17" (DLT)	○	X	ON	ON	ON	ON	ON
11" x 15"	○	X	ON	ON	ON	ON	ON
10" x 14"	○	X	ON	ON	–	ON	ON
8.5" x 14" (LG)	○	X	ON	–	–	ON	ON
8.5" x 13" (F4)	X	○	ON	–	–	ON	ON
8" x 13" (F)	○	○	ON	–	–	ON	ON
8.5" x 11" (Lengthwise)	○	X	ON	–	–	ON	–
8.5" x 11" (Sideways)	○	X	ON	ON	ON	–	–
10" x 8" (Lengthwise)	○	X	ON	–	–	ON	–
5.5" x 8.5" (Lengthwise) (HLT)	○	X	–	–	–	–	–
5.5" x 8.5" (Sideways) (HLT)	○	X	ON	–	–	–	–

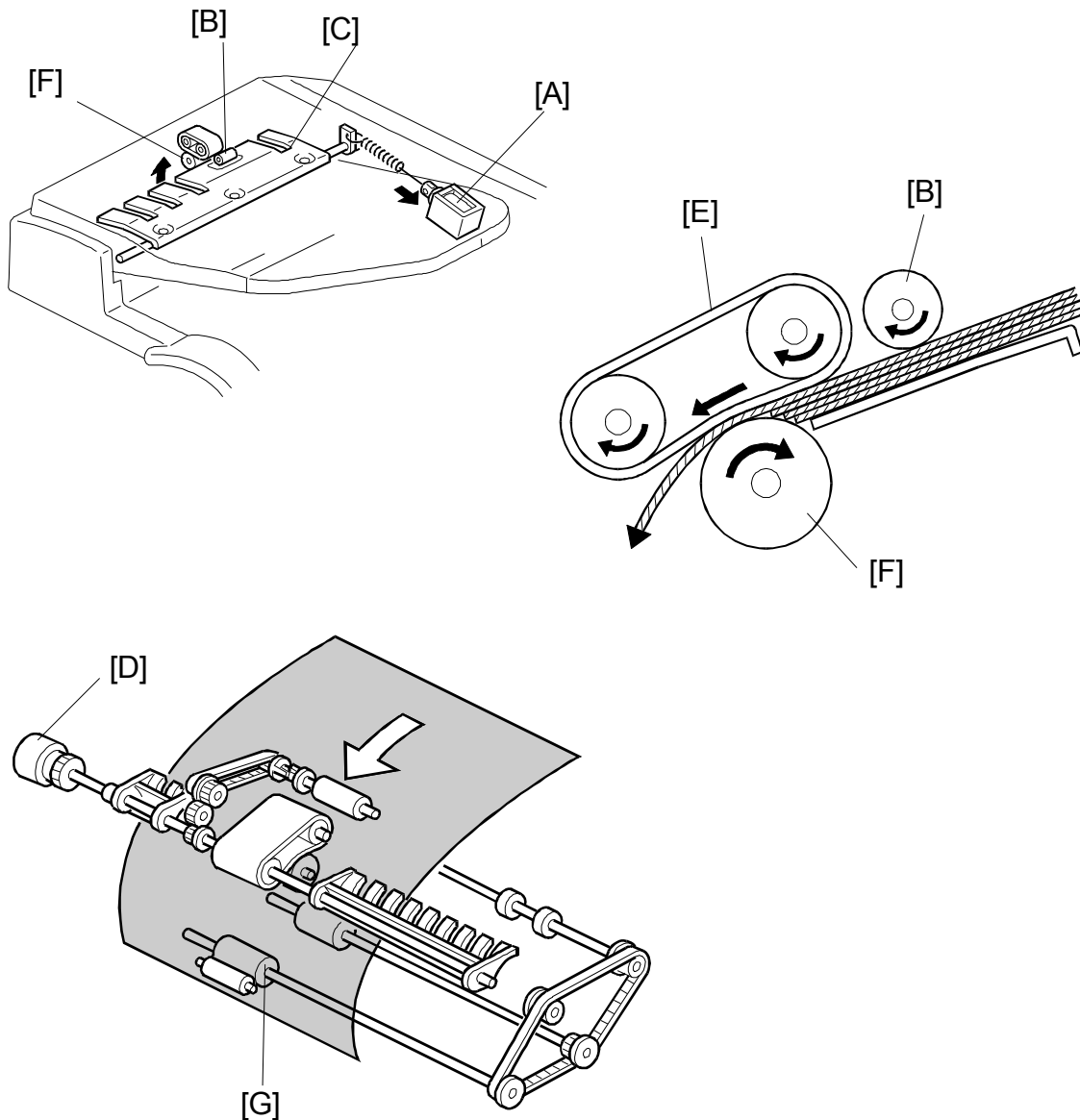
Document Feeder

Key

X: No, ○: Yes

ON: Paper present

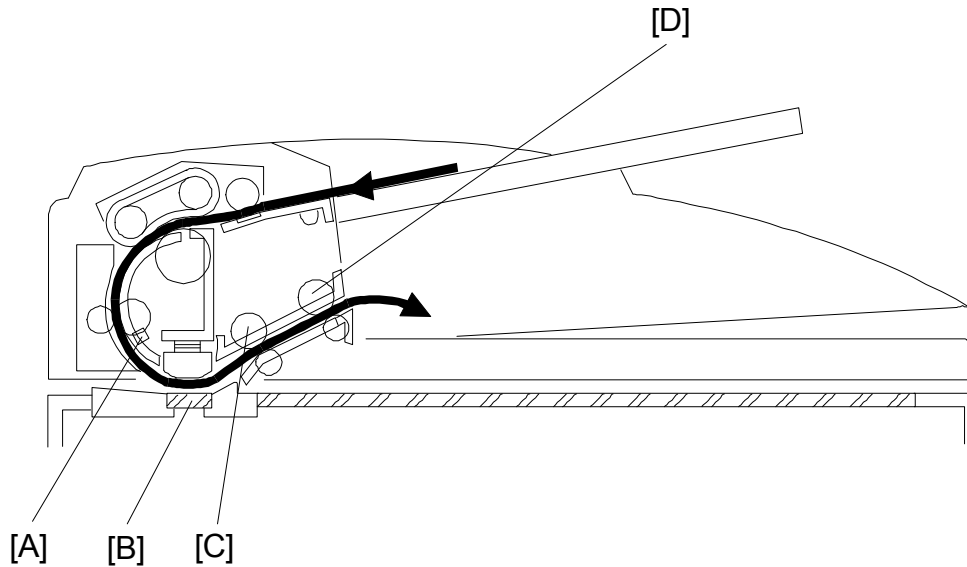
3.2 PICK-OFF AND SEPARATION MECHANISM



When the print key is pressed, the DF pick-up solenoid [A] turns on and the originals are lifted up to the pick-up roller [B] by the entrance guide [C]. At the same time, the DF feed clutch [D] turns on.

300 ms later, the DF feed motor turns on. The original is fed to the paper feed belt [E] from the top page. The pages are separated by the separation roller [F] and only the top sheet of the original is fed to the 1st transport roller [G]. The original separation system uses the FRR system.

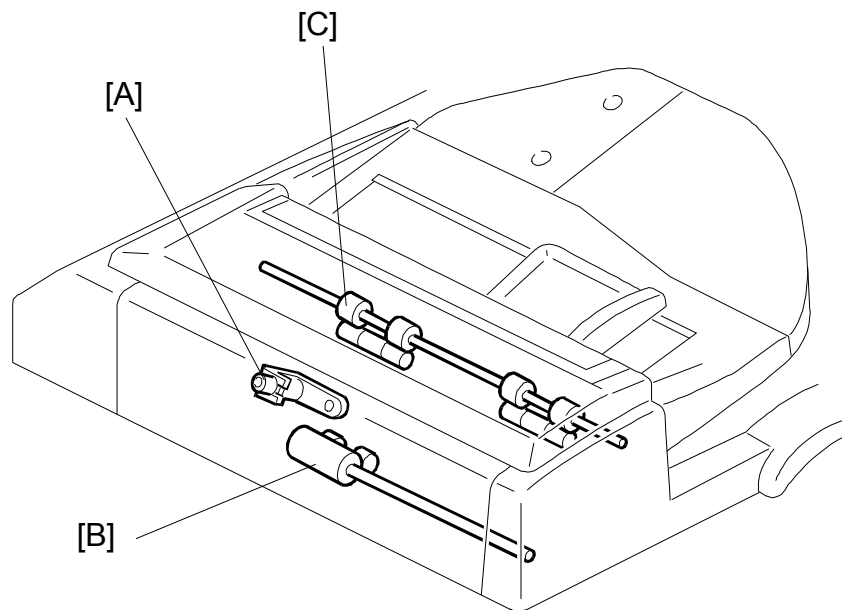
3.3 ORIGINAL TRANSPORT AND EXIT MECHANISM



When the leading edge of the original reaches the registration sensor [A], the DF feed motor turns off. After a short time the DF feed motor turns on again. The original is fed to the DF exposure glass [B] and it is scanned in this area. The original is fed through to the 2nd transport roller [C] and fed out of the DF unit by the exit roller [D].

The DF feed motor speed while feeding the original to the registration sensor is 47.5 mm/s. However, when the motor turns on the second time to feed the original to the exposure glass, the speed depends on the selected reproduction ratio. At 100%, it is 90 mm/s.

3.4 STAMP



This function is only for fax mode only.

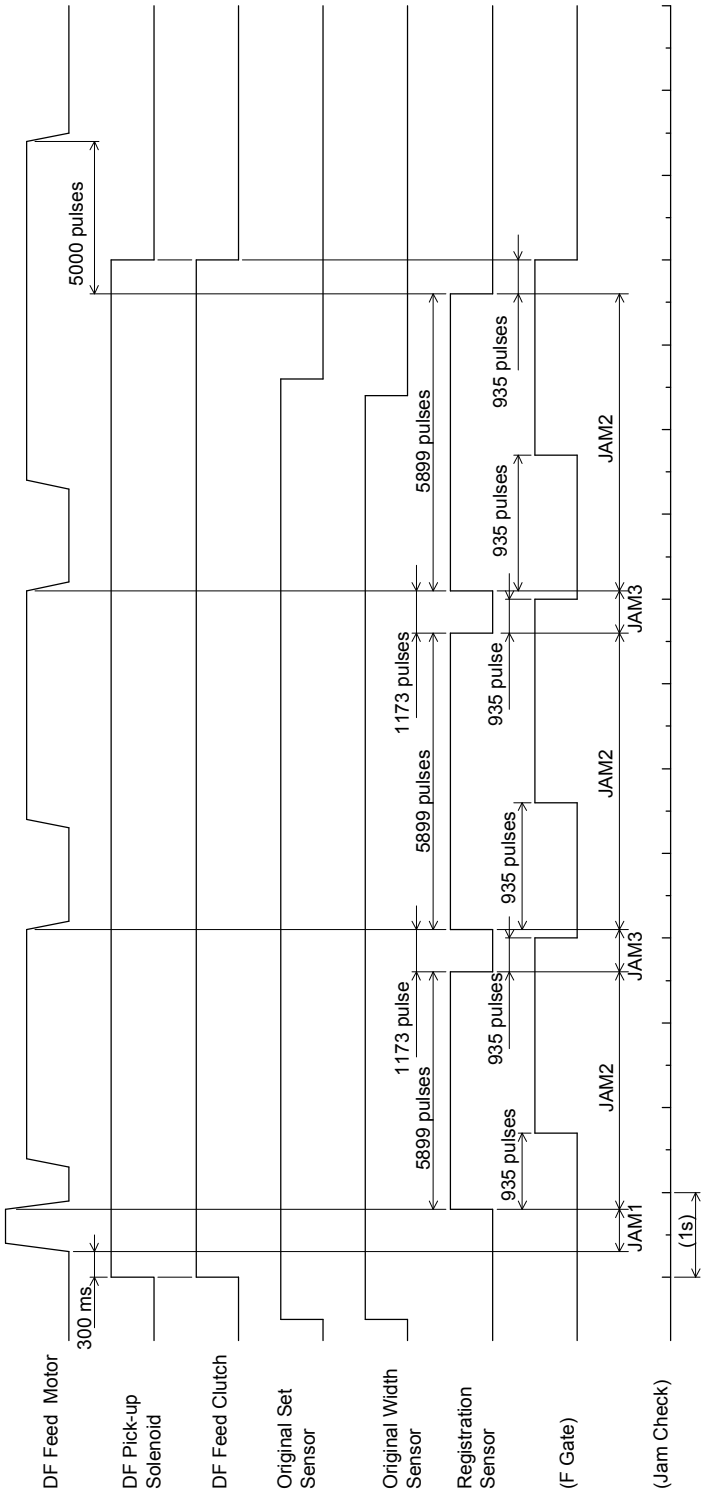
There is a stamp [A] located between the 2nd transport roller [B] and the exit roller [C], and its solenoid is controlled by the copier directly.

When the original reaches the stamp position, the DF feed motor stops. At 300 milliseconds after stopping the DF feed motor, the stamper solenoid turns on if the page was sent successfully (immediate transmission) or stored successfully (memory transmission). After stamping, the DF feed motor turns on again to feed out the document, and its speed is about 1.3 times the normal speed.

The stamping position on the original can be changed by adjusting SP6-010.

3.5 TIMING CHARTS

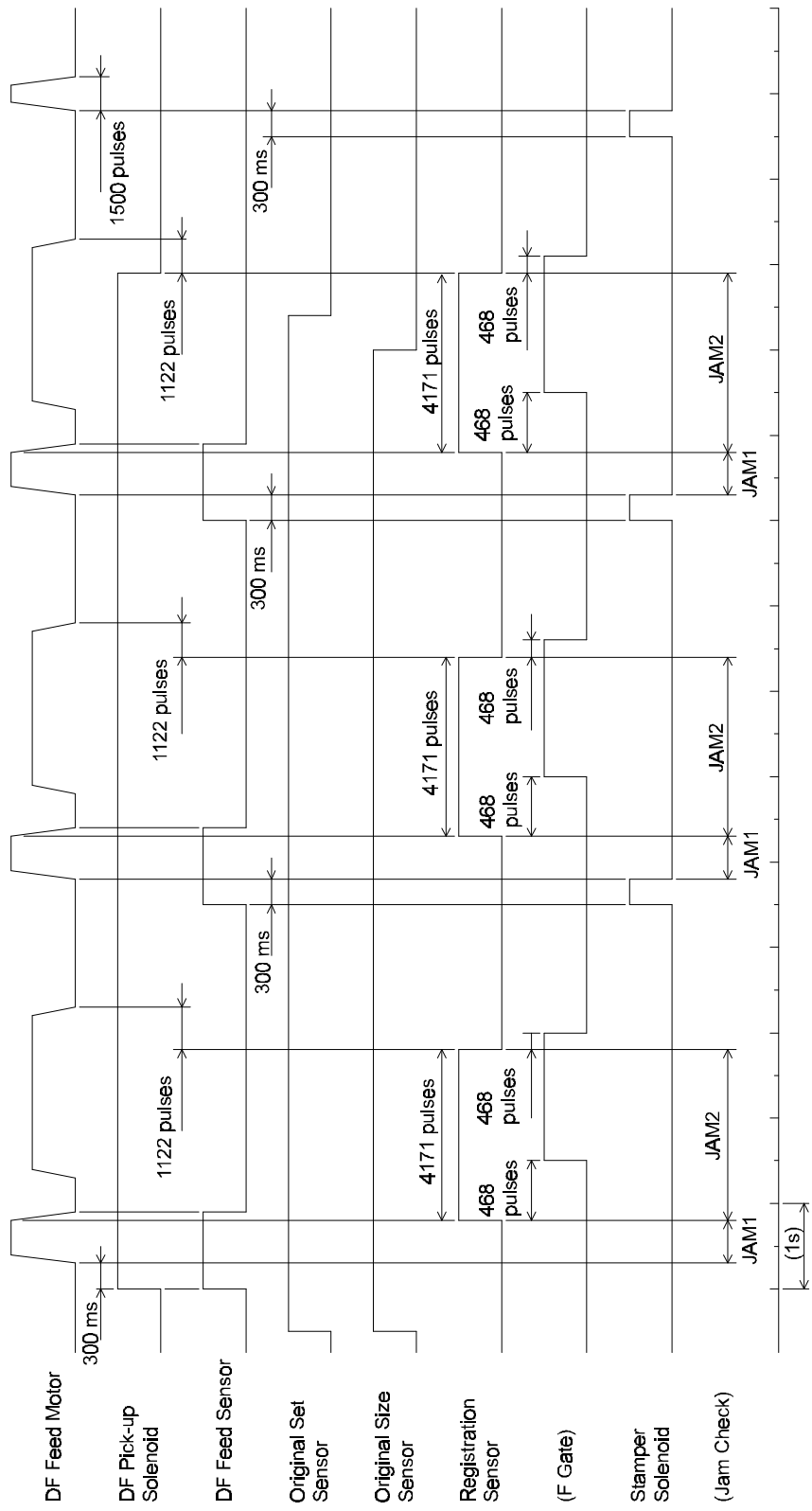
3.5.1 A4 Lengthwise



does

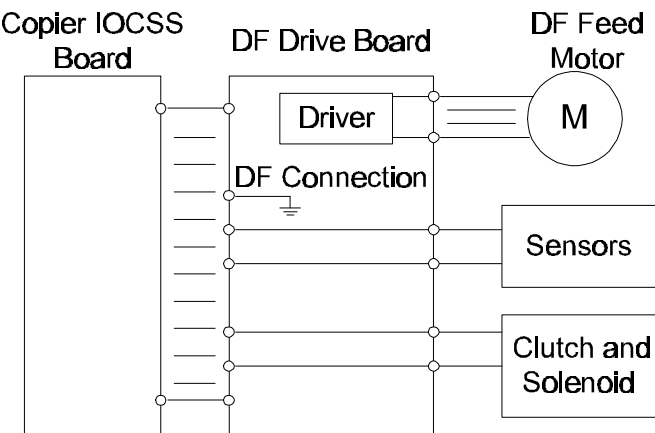
JAM3: The 2nd or a later original does not reach the registration sensor (after 5596 pulses).
F Gate: Laser scan start signal.

3.5.2 A4 Sideways (Stamper Mode)



JAM1: The original does not reach the registration sensor (after 6413 pulses).
JAM2: The original remains at the registration sensor (after 5840 pulses).
F Gate: Laser scan start signal.

3.6 OVERALL ELECTRICAL CIRCUIT

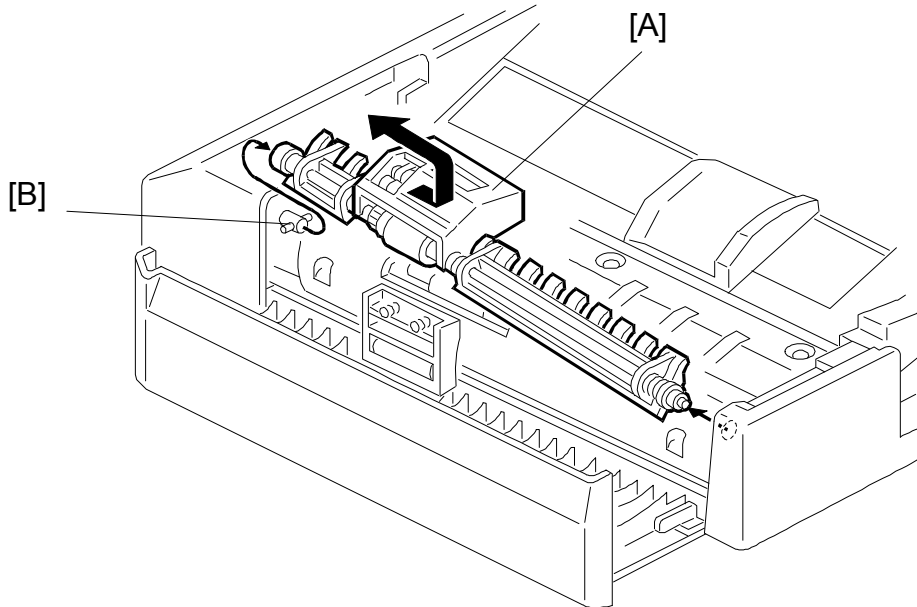


The DF pick-up solenoid, stamper solenoid and DF feed clutch are directly controlled by the copier through the DF drive board. The sensor signals are directly sent to the copier through the DF interface board. The DF drive board has a driver for the DF feed motor and its drive signal is sent from the copier.

When the DF connector is connected to the copier IOCSS board, the DF connection signal to the copier is grounded. Then the copier detects that the DF is connected.

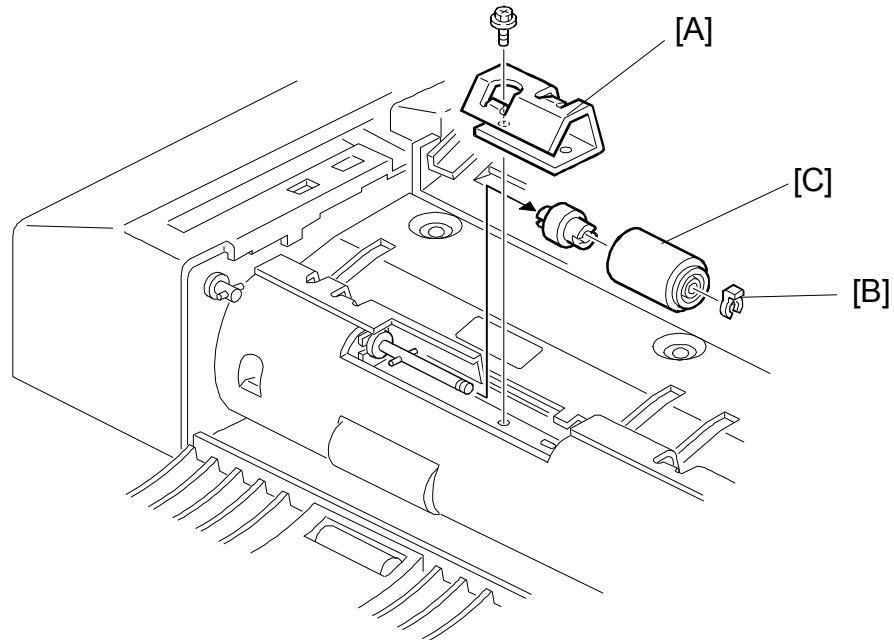
4. REPLACEMENT AND ADJUSTMENT

4.1 ORIGINAL FEED UNIT REMOVAL



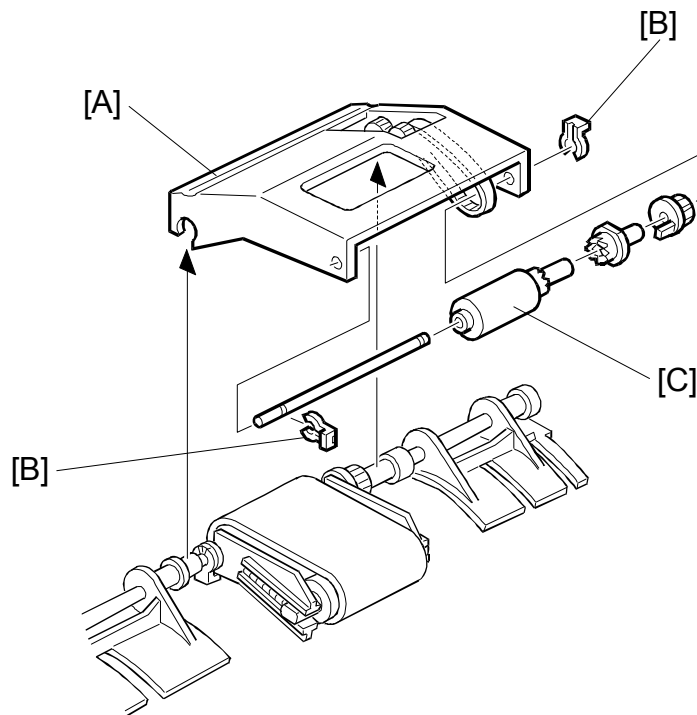
1. Open the DF feed cover.
2. Push the original feed unit to the front [A].
3. Release the rear joint of the original feed unit [B].
4. Remove the original feed unit.

4.2 SEPARATION ROLLER REPLACEMENT



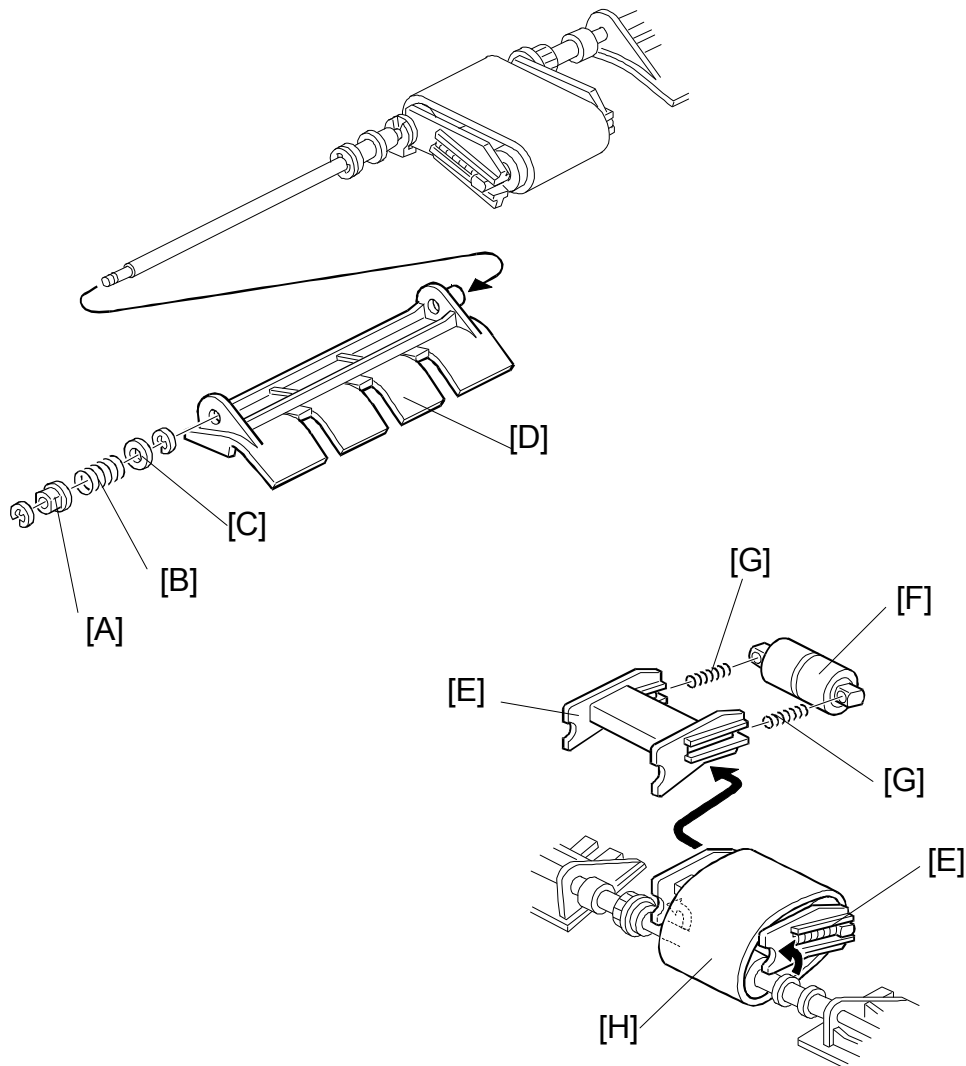
1. Remove the original feed unit.
2. Remove the support guide [A] (1 screw).
3. Remove the snap ring [B].
4. Replace the separation roller [C].

4.3 PICK-UP ROLLER REPLACEMENT



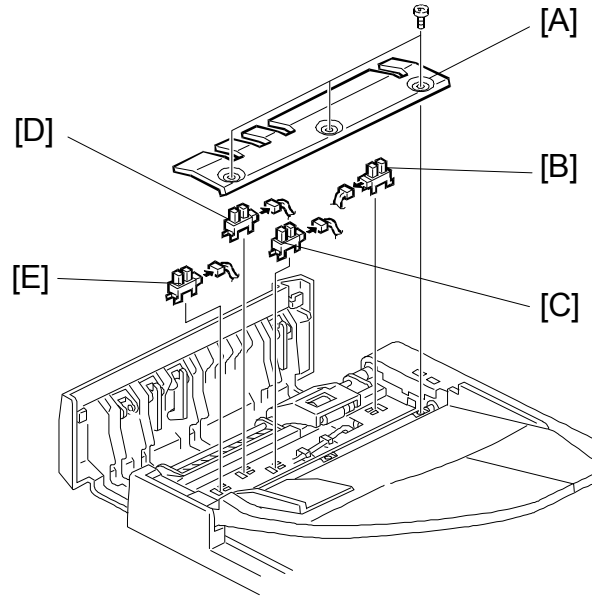
1. Remove the original feed unit.
2. Remove the pick-up roller unit [A].
3. Remove the two snap rings [B].
4. Replace the pick-up roller [C].

4.4 FEED BELT REPLACEMENT



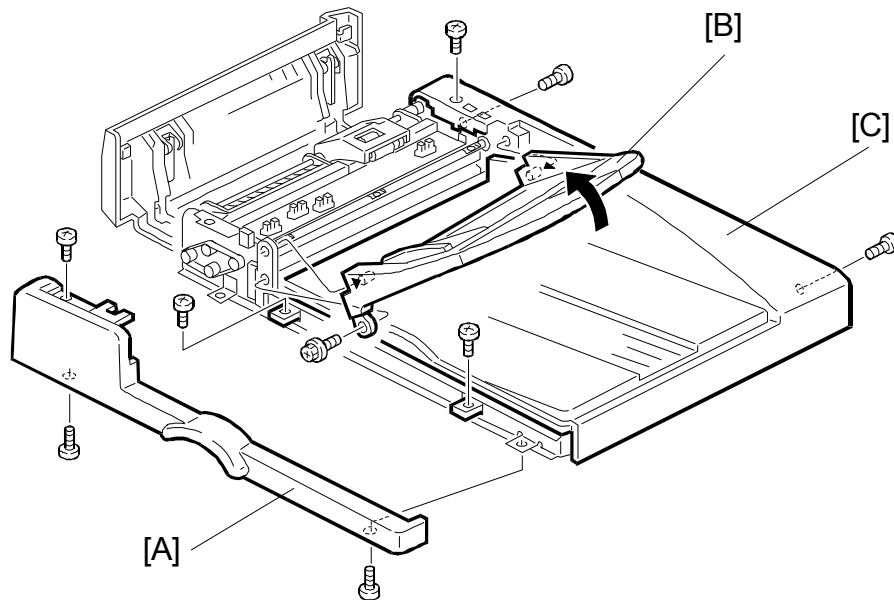
1. Remove the original feed unit.
2. Remove the pick-up roller unit.
3. Remove the front bushing [A], spring [B], and washer [C] (1 E-ring).
4. Remove the original guide [D] (1 E-ring).
5. Release the idle roller holder [E] from the drive roller shaft.
6. Remove the idle roller [F], idle roller holder [E], and 2 springs [G].
7. Replace the feed belt [H].

4.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT



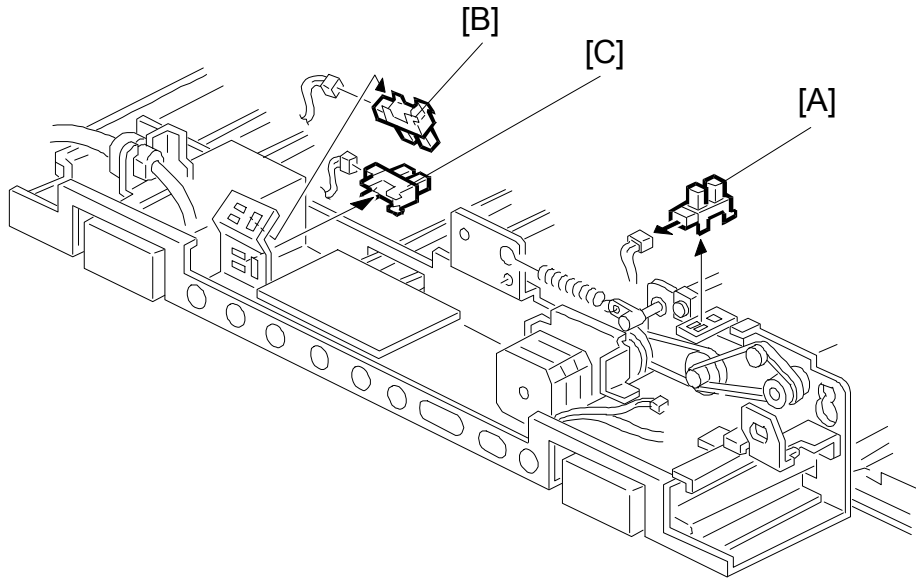
1. Open the DF feed cover.
2. Remove the entrance guide [A] (3 screws).
3. Replace the following sensors.
 - Original Set Sensor [B]
 - Original Width Sensor 1 [C]
 - Original Width Sensor 2 [D]
 - Original Width Sensor 3 [E]

4.6 DF COVER REMOVAL



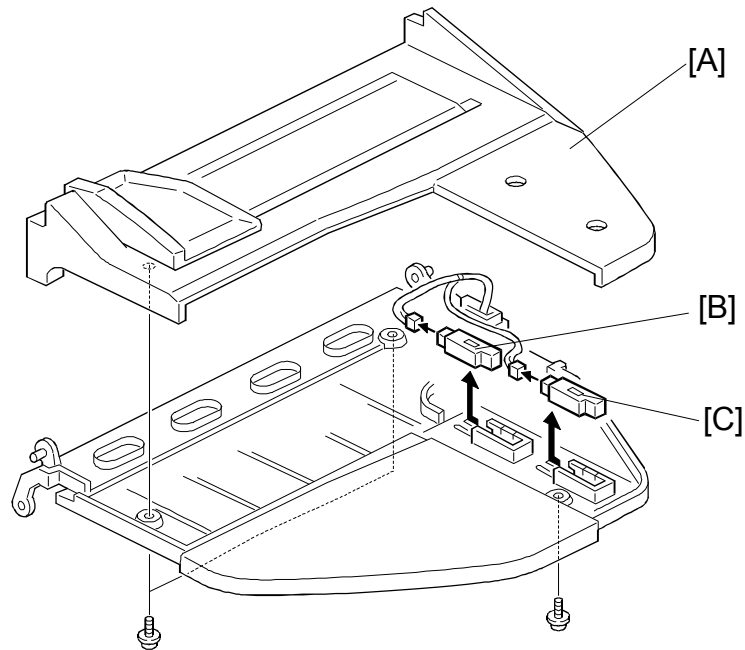
1. Open the DF feed cover.
2. Remove the front cover [A] (3 screws).
3. Remove the original table [B] (1 screw).
4. Remove the rear cover [C] (5 screws).

4.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT



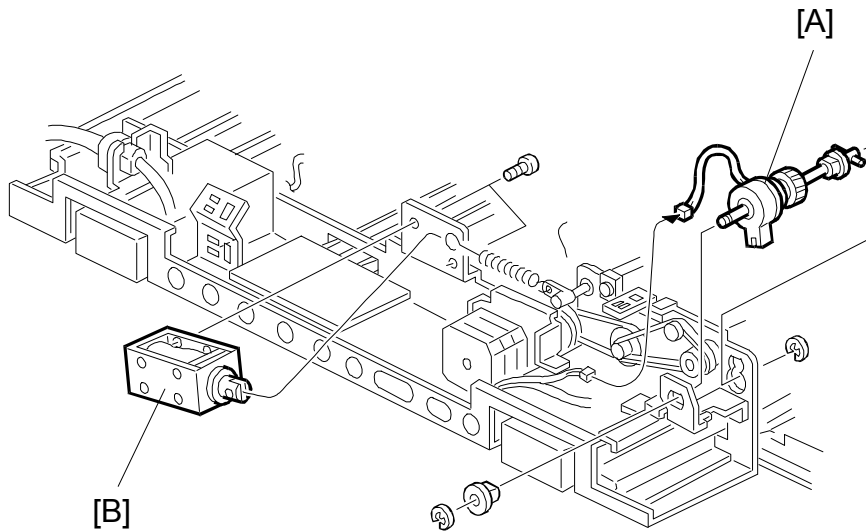
1. Remove the rear cover.
2. Replace the following sensors.
 - DF Feed Cover Open Sensor [A].
 - DF Position Sensor [B].
 - APS Start Sensor [C].

4.8 ORIGINAL LENGTH SENSOR REPLACEMENT



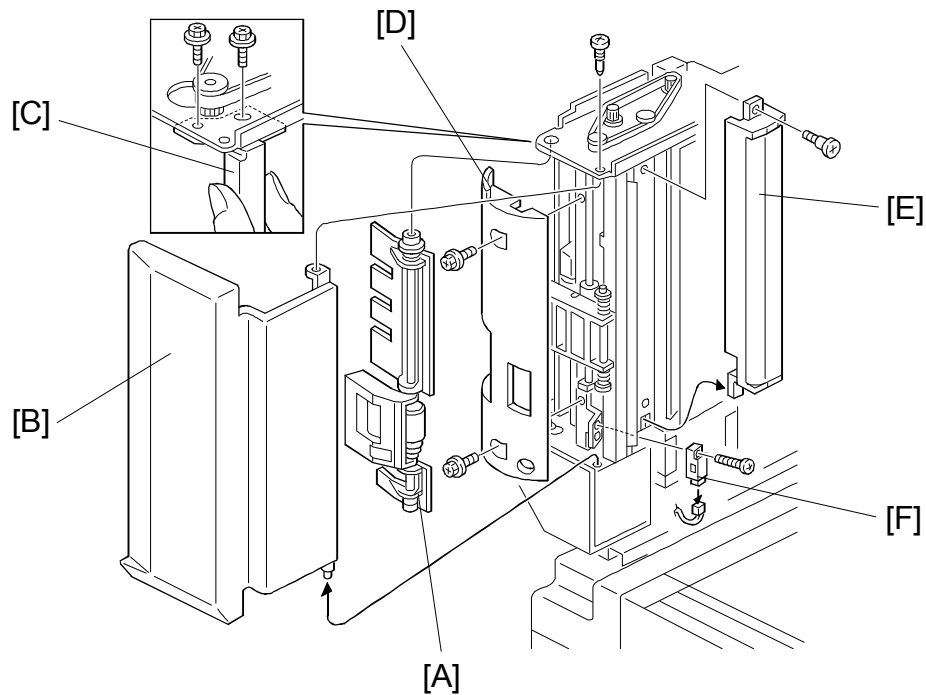
1. Remove the original table.
2. Remove the original guide [A] (3 screws).
3. Replace the following sensors.
 - Original Length Sensor 1 [B]
 - Original Length Sensor 2 [C]

4.9 DF FEED CLUTCH AND DF PICK-UP SOLENOID REPLACEMENT



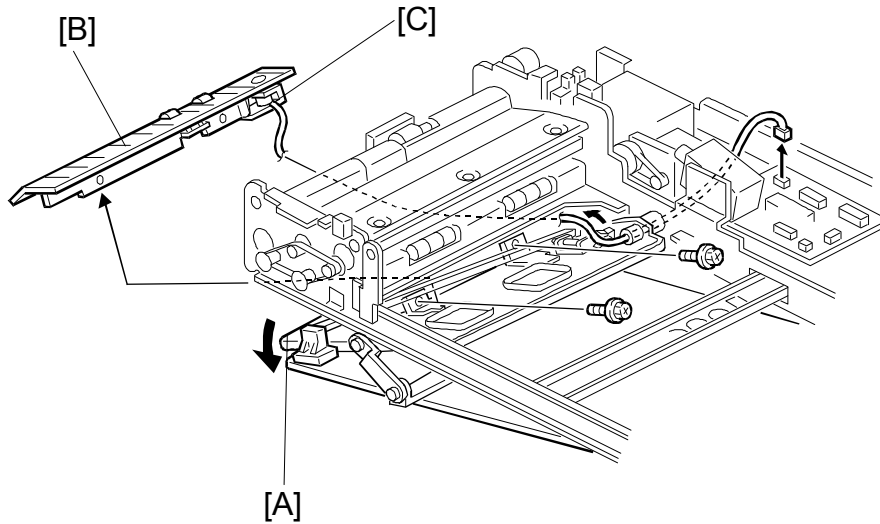
1. Remove the rear cover.
2. Replace the following clutch and solenoid.
DF Feed Clutch [A] (2 E-rings, 1 connector)
DF Pick-up Solenoid [B] (2 screws, 1 connector)

4.10 REGISTRATION SENSOR REPLACEMENT



1. Remove the front cover.
2. Remove the original feed unit [A].
3. Remove the DF feed cover [B] (1 screw).
4. Remove the front two screws for the stay [C].
5. Remove the transport guide [D] (2 screws).
6. Remove the original exposure guide [E] (2 screws).
7. Replace the registration sensor [F] (1 screw, 1 connector).

4.11 STAMPER SOLENOID REPLACEMENT



1. Remove the front cover, original table, and rear cover.
2. Release the lever and open the original guide [A].
3. Remove the lower original guide [B] (2 screws).
4. Replace the stamper solenoid [C] (1 screws, 1 connector).

4.12 SP MODES

6-006-1 ADF Side-to-Side Registration

See Copy Adjustment Printing/Scanning in Replacement and Adjustment.

6-006-2 ADF Leading Edge Registration

See Copy Adjustment Printing/Scanning in Replacement and Adjustment.

6-006-3 ADF Trailing Edge Registration

See Copy Adjustment Printing/Scanning in Replacement and Adjustment.

6-007 ADF Sub-scan Magnification

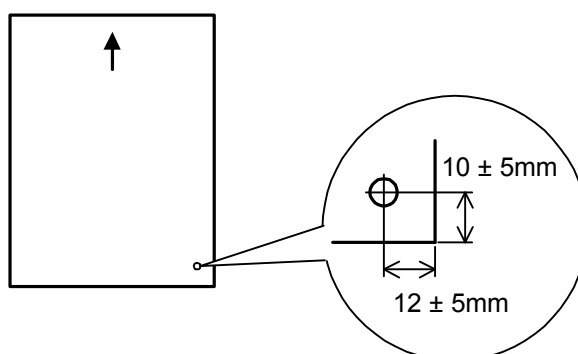
See Copy Adjustment Printing/Scanning in Replacement and Adjustment.

6-009 ADF Free Run

After starting the Free Run (1 + # + #), the ADF automatically cycles without exposing when an original is placed on the original table. Jams are detected.

6-010 Stamp Position Adjustment

The default position is shown below. The position can be adjusted in the sub-scan direction.



6-901 ADF Original Sensor Output Display

See the SP mode table.

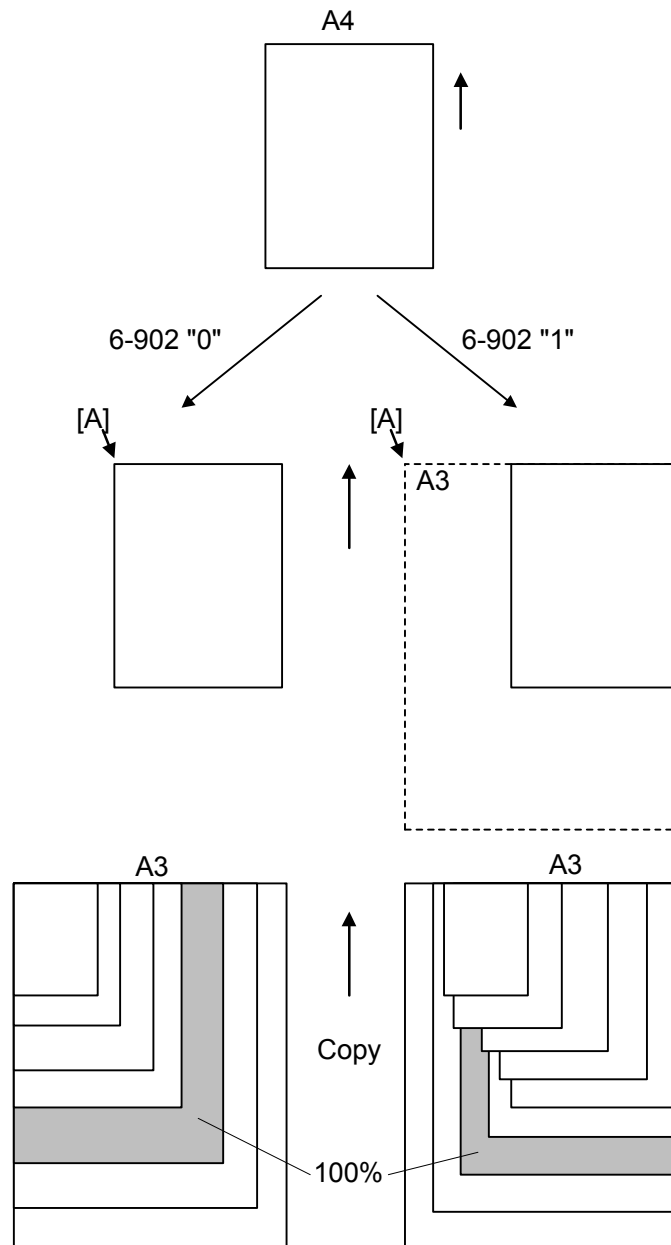
REPLACEMENT AND ADJUSTMENT

6-902 ADF Original Scanning Method

The position [A] of the last pixel of the main scan line is changed.

0 : Original 1 : Copy paper + magnification

Example : Copying A4 size original to A3 paper at various reproduction ratios



6-903 Original Non-waiting Start

If SP6-903 is '0', the next original is not fed until the trailing edge of the current original has passed the registration sensor. This leaves a gap of about 72 mm between originals.

If SP6-903 is '1', the next original is fed earlier. The gap between originals depends on the setting of SP6-904.

6-904 Original Scanning Interval

This SP mode is effective only if SP6-903 is '1'

Use it to adjust the distance between the trailing edge of the original and the leading edge of the next original.

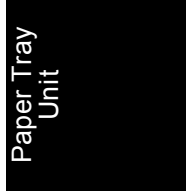
6-910 ADF/Printer Free Run

After starting the Free Run (1 + # + #), the ADF automatically cycles without exposing when an original is placed on the original table. Jams are detected.

SECTION 8
PAPER TRAY UNIT (G697)

1. SPECIFICATIONS

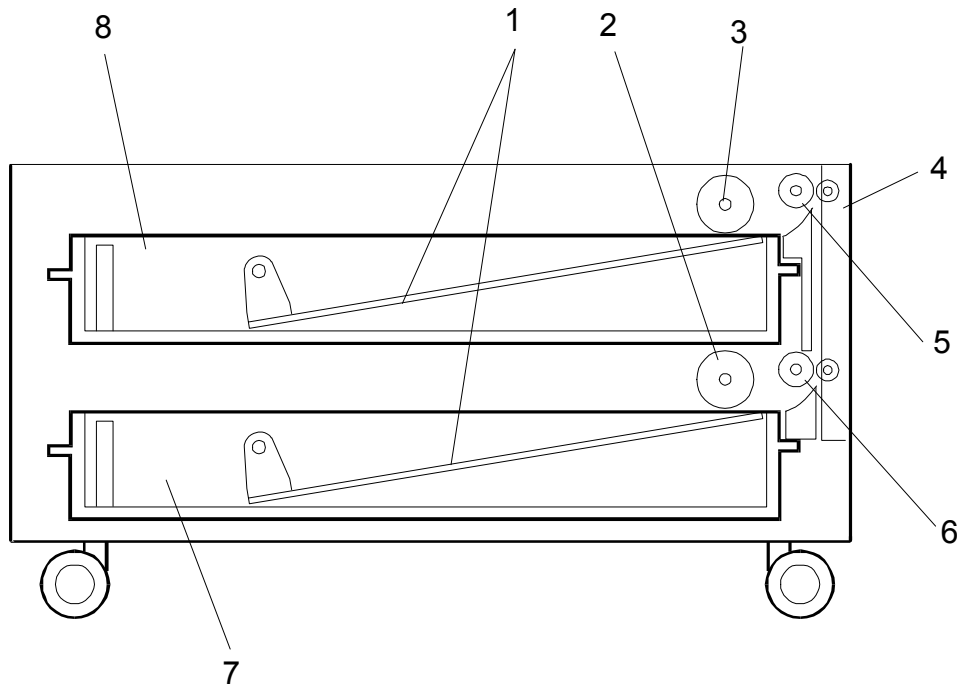
Copy Paper Size:	A3 to A5 sideways
Paper Weight:	60 g to 90 g
Tray Capacity:	500 sheets (70 kg)
Power Source:	24 & 5 Vdc from the copier
Power Consumption:	40 W
Dimensions (W x D x H):	530 x 565 x 255 mm
Weight:	20 kg

A black rectangular box with the text "Paper Tray Unit" written vertically in white.

Paper Tray
Unit

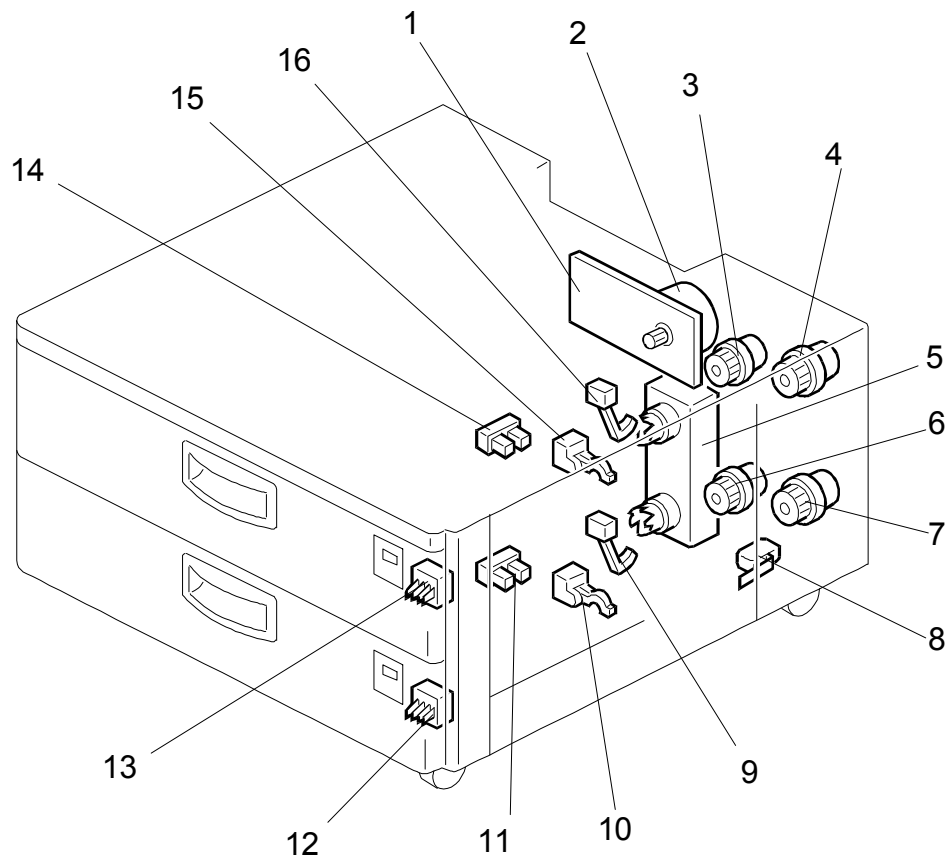
2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



1. Bottom Plate	5. Upper Relay Roller
2. Lower Paper Feed Roller	6. Lower Relay Roller
3. Upper Paper Feed Roller	7. Lower Tray
4. Bank Door	8. Upper Tray

2.2 ELECTRICAL COMPONENT LAYOUT



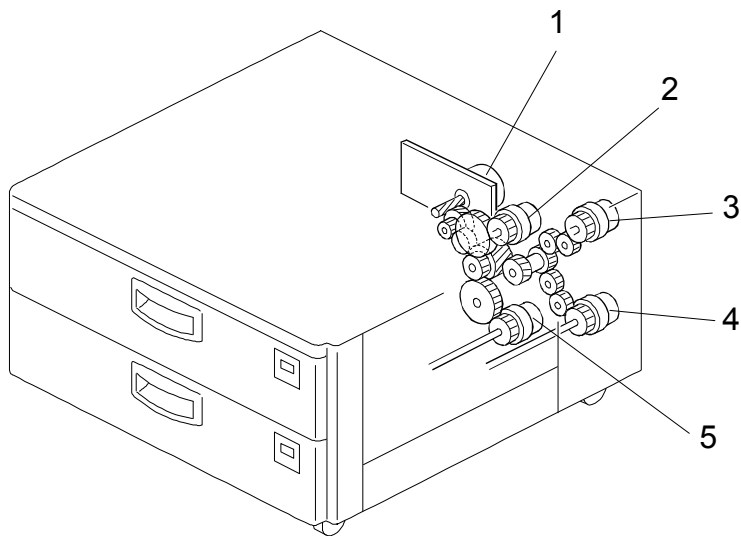
1. Paper Tray Unit Drive Board	9. Lower Paper End Sensor
2. Paper Feed Motor	10. Lower Relay Sensor
3. Upper Paper Feed Clutch	11. Lower Tray Upper Limit Sensor
4. Upper Relay Clutch	12. Lower Paper Size Sensor
5. Upper/Lower Lift Motor	13. Upper Paper Size Sensor
6. Lower Paper Feed Clutch	14. Upper Tray Upper Limit Sensor
7. Lower Relay Clutch	15. Upper Relay Sensor
8. Tray Cover Switch	16. Upper Paper End Sensor

2.3 ELECTRICAL COMPONENT DESCRIPTION

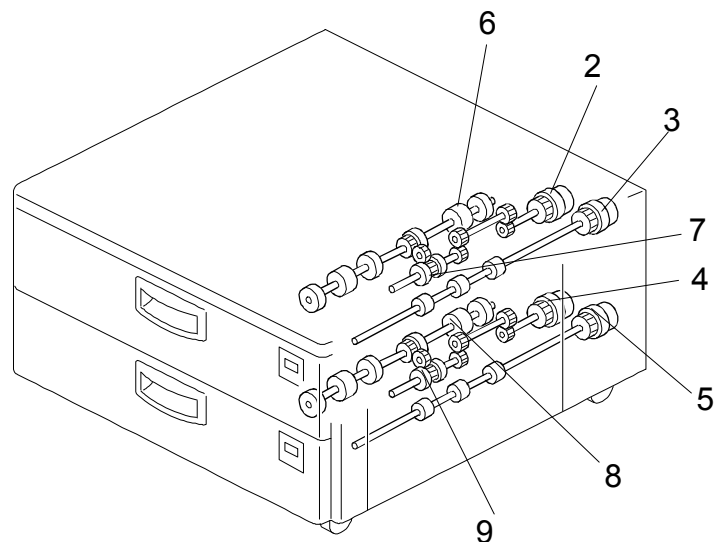
Symbol	Name	Function Motors	Index. No.
Motors			
M1	Paper Feed	Drives all the rollers.	2
M2	Upper Lift	Lifts and lowers the upper tray bottom plate.	5
M3	Lower Lift	Lifts and lowers the lower tray bottom plate.	5
Sensors			
S1	Upper Paper End	Informs the CPU when there is no paper in the upper tray.	16
S2	Lower Paper End	Informs the CPU when there is no paper in the lower tray.	9
S3	Upper Tray Upper Limit	Detects when the paper in the upper tray is at the correct height for paper feed.	14
S4	Lower Tray Upper Limit	Detects when the paper in the lower tray is at the correct height for paper feed.	11
S5	Upper Relay	Detects misfeeds and controls the upper paper feed clutch off timing.	15
S6	Lower Relay	Detects misfeeds and controls the lower paper feed clutch off timing.	10
S7	Upper Paper Size	Determines what paper size is in the upper tray.	12
S8	Lower Paper Size	Determines what paper size is in the lower tray.	13
Clutches			
MC1	Upper Paper Feed	Starts paper feed from the upper feed tray.	3
MC2	Lower Paper Feed	Starts paper feed from the lower feed tray.	6
MC3	Upper Relay	Starts the upper relay roller.	4
MC4	Lower Relay	Starts the lower relay roller.	7
PCBs			
PCB1	Paper Tray Unit Drive	Interfaces the sensor signals to the copier and transfers the magnetic clutch, heater, and motor drive signals from the copier.	1

Optional tray heaters are also available.

2.4 DRIVE LAYOUT



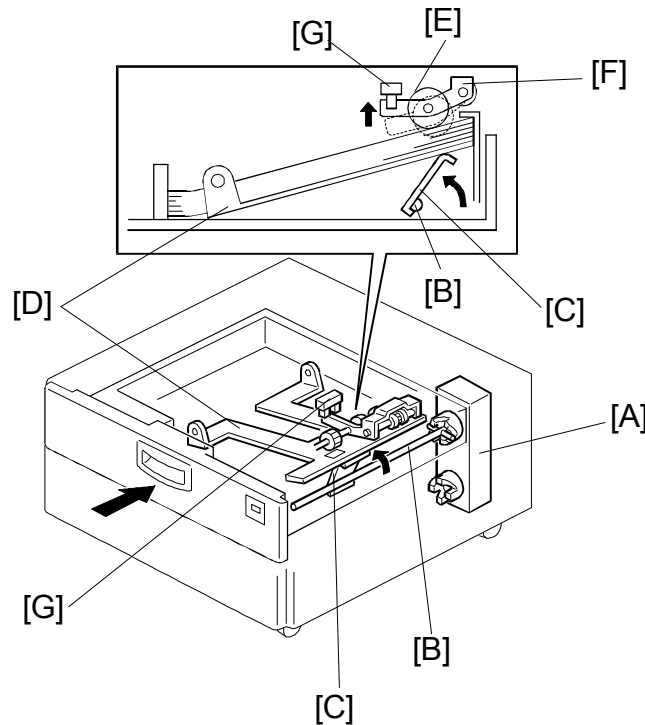
Paper Tray
Unit



1. Paper Feed Motor	7. Drive Gear - Upper Paper Feed Roller
2. Upper Paper Feed Clutch	8. Lower Paper Feed Roller
3. Upper Relay Clutch	9. Drive Gear - Lower Paper Feed Roller
4. Lower Relay Clutch	
5. Lower Paper Feed Roller	
6. Upper Paper Feed Roller	

3. DETAILED DESCRIPTION

3.1 PAPER FEED AND TRAY LIFT/LOWER MECHANISM



This paper tray unit has two trays. Each paper tray is a drawer type that can hold up to 500 sheets of paper. The mechanism is the same as for the main machine, except for the lifting and lowering mechanism of the tray bottom plate.

When the tray is slid into the machine, the lift motor [A] turns on. The paper size sensor also functions as the tray detector. When the paper size sensor detects the tray, the lift motor turns the tray arm shaft [B], and the tray arm [C] lifts the tray bottom plate [D].

The tray bottom plate lifts the paper feed roller [E]. When the shutter on the paper feed roller holder [F] turns on the lift sensor [G], the lift motor turns off. When the lift sensor turns off during multicopying, the lift motor turns on until lift sensor turns on again. Between copies, the bottom plate is lowered (see below). This mechanism provides a stable paper feed pressure.

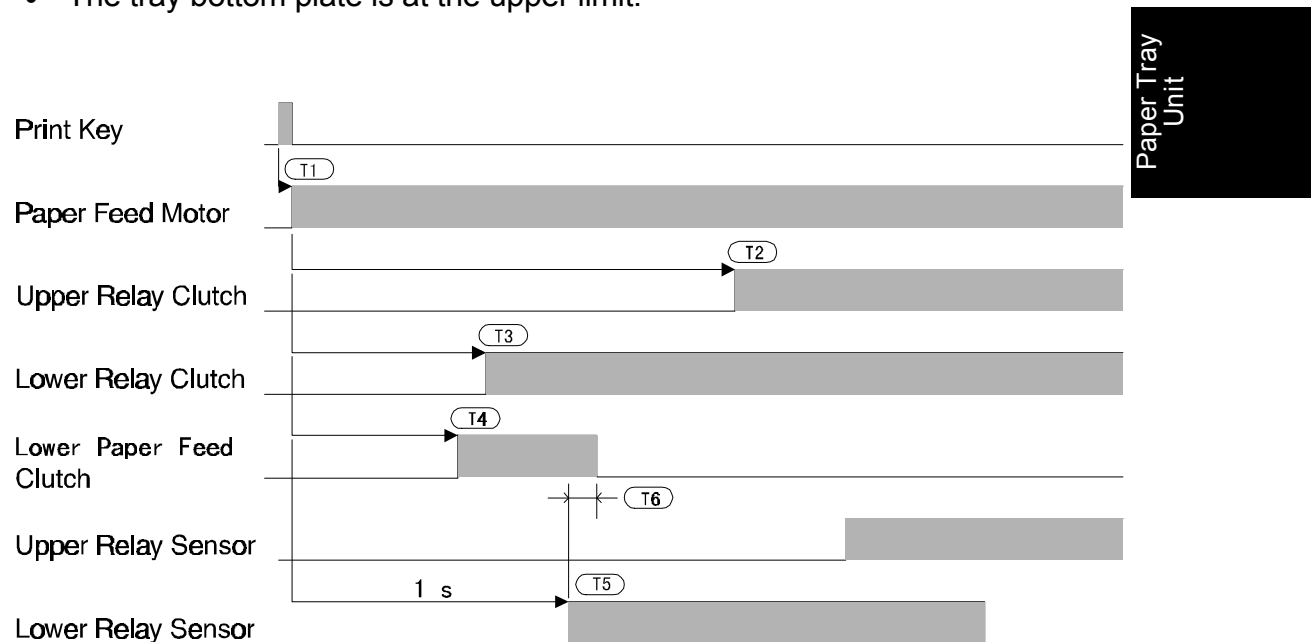
In the following conditions, the lift motor turns on clockwise for approximately 1 second to lower the tray. This mechanism prevents paper feed roller marks from appearing on the paper and stabilizes the paper transport.

- 30 seconds after the paper feed clutch turns off for the last sheet of a copy job.
- When the tray becomes empty.

3.2 TIMING CHART

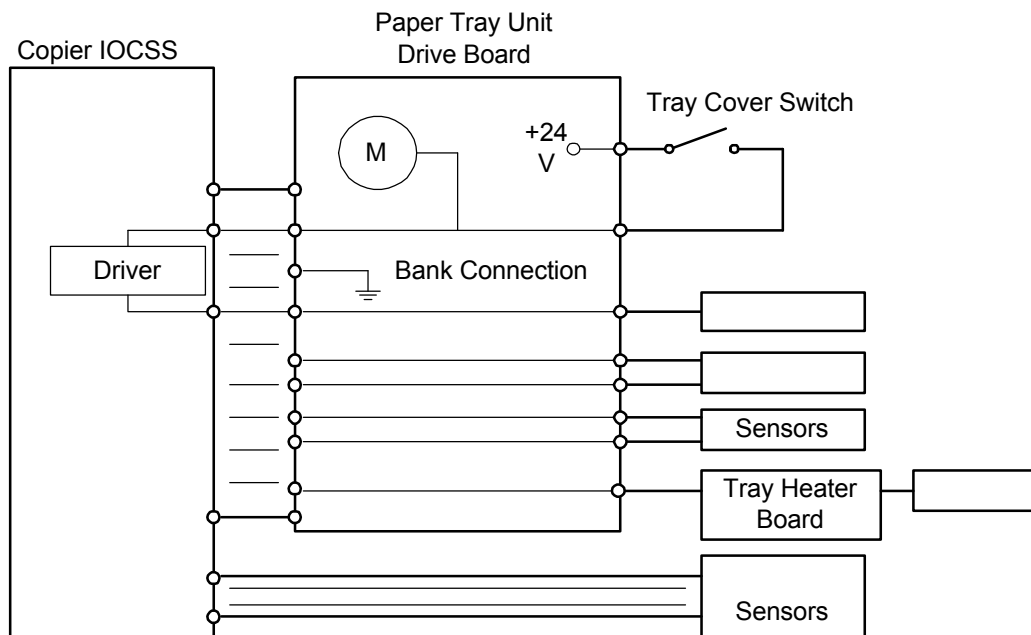
Conditions:

- A4 sideways
- Lower paper tray
- The tray bottom plate is at the upper limit.



- T1: 50 ms after the print key is pressed, the paper feed motor turns on.
- T2: 1.6 seconds after the paper feed motor turns on, the upper relay clutch turns on.
- T3: 700 ms after the paper feed motor turns on, the lower relay clutch turns on.
- T4: 600 ms after the paper feed motor turns on, the lower paper feed clutch turns on.
- T5: 1 sections after the paper feed motor turns on, the lower relay sensor should turn on.
- T6: 100 ms after the lower relay sensor turns on, the lower feed clutch turns on.

3.3 OVERALL ELECTRICAL CIRCUIT



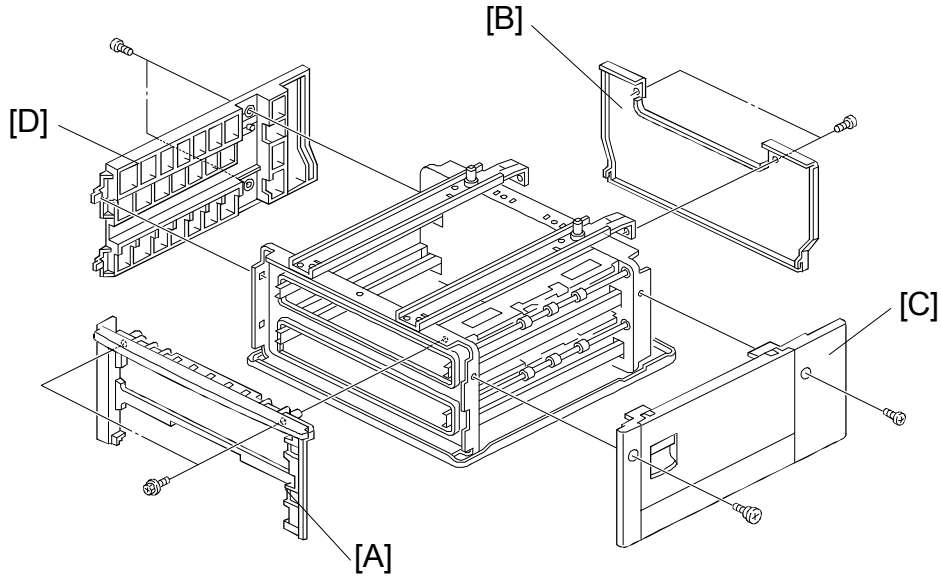
The lift motors, clutches, and tray heater are directly controlled by the copier through the paper tray unit drive board. The sensor signals are directly sent to the copier.

The power for the paper feed motor and lift motors is supplied through the tray cover switch.

When the bank connector is connected to the copier IOCSS board, the bank connection signal to the copier is grounded. Then the copier detects that the paper tray unit is connected.

4. REPLACEMENT AND ADJUSTMENT

4.1 EXTERIOR COVER REMOVAL

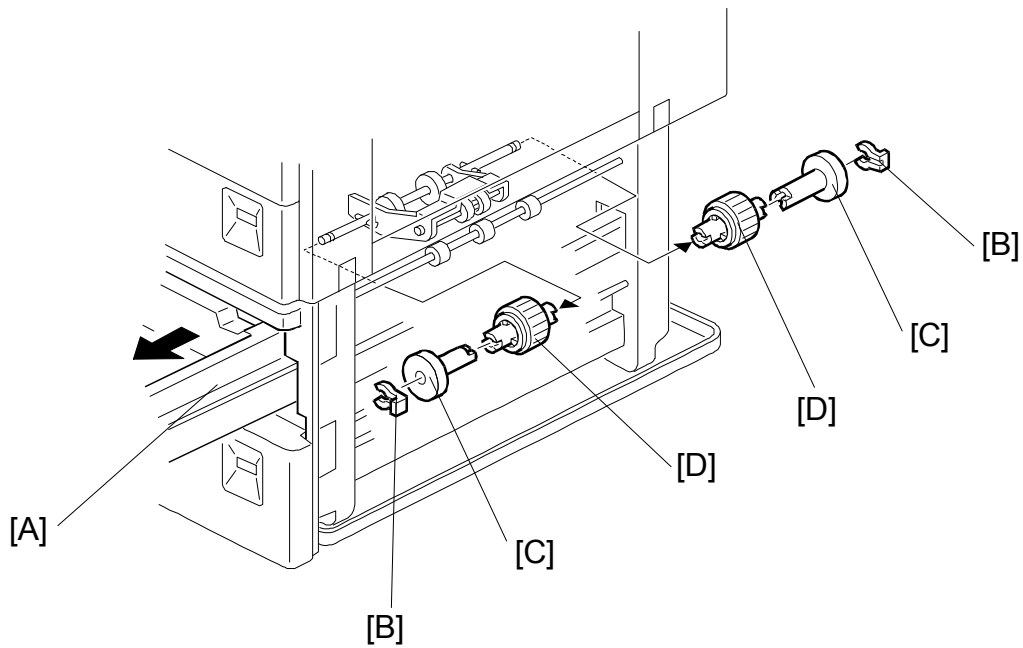


Paper Tray
Unit

Front Cover

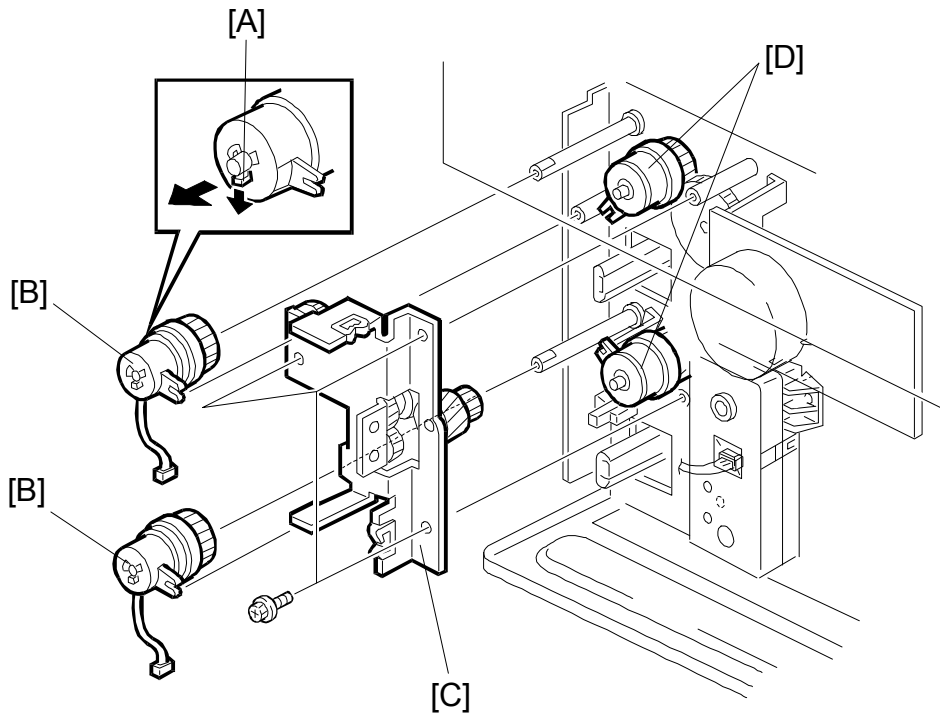
1. Remove the upper tray and lower tray (4 screws each).
2. Remove the front cover [A] (2 screws).
Rear Cover [B] (2 screws).
Right Cover [C] (2 screws).
Left Cover [D] (2 screws).

4.2 PAPER FEED ROLLER REPLACEMENT



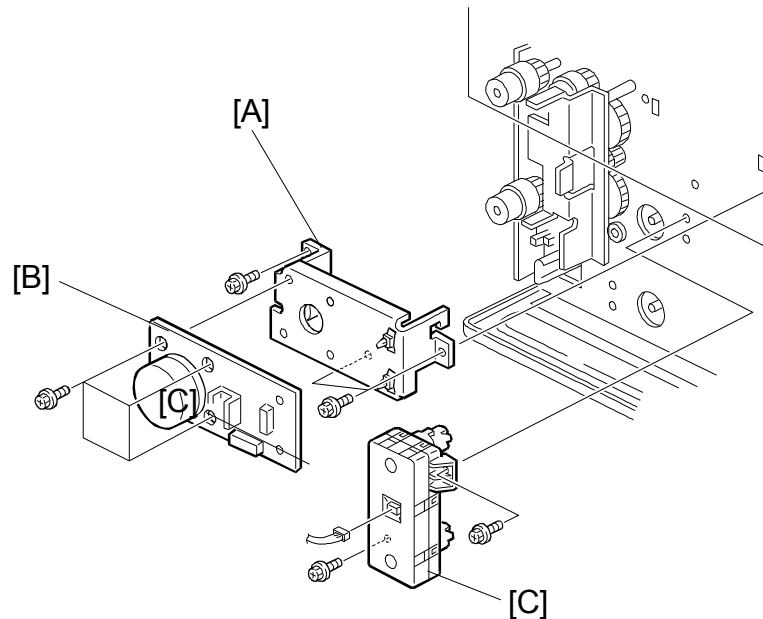
1. Remove the right cover.
2. Pull out the tray [A].
3. Remove the snap ring [B].
4. Remove the auxiliary roller [C].
5. Replace the paper feed roller [D].

4.3 PAPER FEED AND RELAY CLUTCH REPLACEMENT

Paper Tray
Unit

1. Remove the rear cover.
2. Remove the right cover.
3. Release the hook [A] and remove (replace) the relay clutches [B] (1 connector each).
4. Remove the drive unit [C] (3 screws).
5. Replace the paper feed clutches [D] (1 E-ring and connector each).

4.4 PAPER FEED MOTOR REPLACEMENT

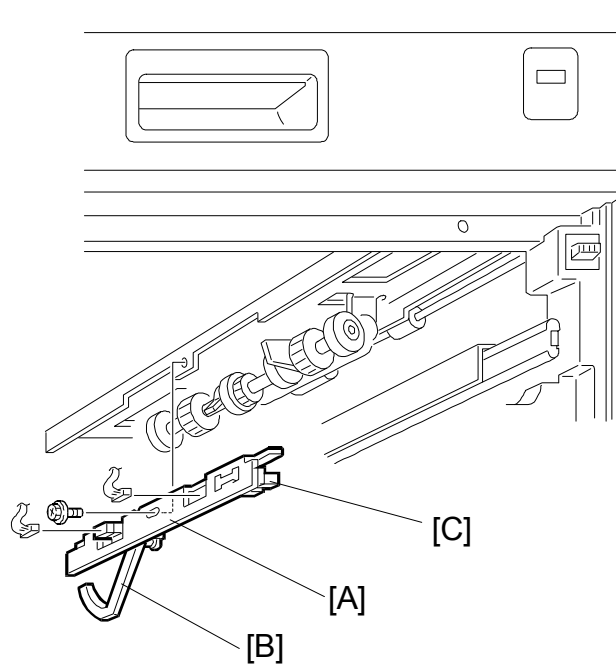


1. Remove the rear cover.
2. Disconnect the 3 connectors on the paper tray unit drive board.
3. Remove the paper tray unit drive board ass'y [A] (3 screws).
4. Replace the paper feed motor [B] (4 screws, 2 hooks).

4.5 LIFT MOTOR REPLACEMENT

1. Remove the rear cover.
2. Pull out the tray.
3. Replace the lift motor [C] (2 screws, 1 connector).

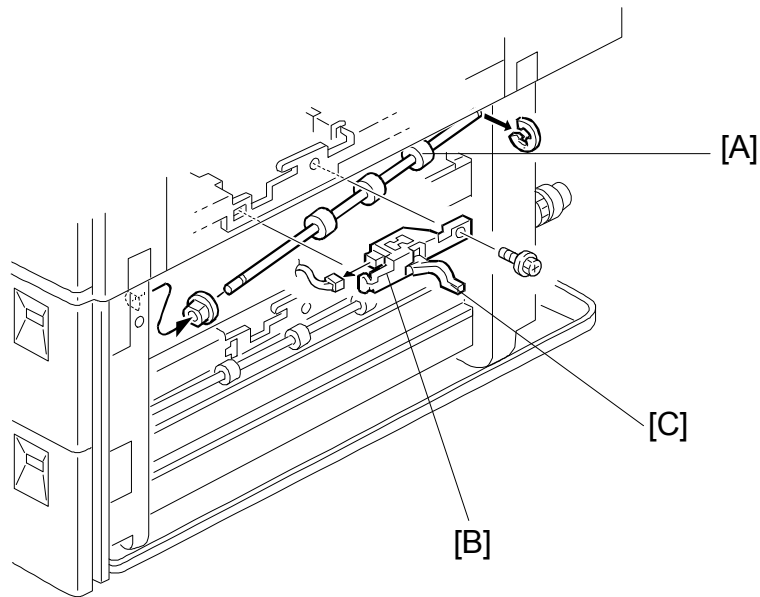
4.6 PAPER END AND UPPER LIMIT SENSOR REPLACEMENT

Paper Tray
Unit

1. Remove the paper tray.
2. Remove the paper end and upper limit sensor with bracket [A] (1 screw, 2 connectors).
3. Replace the paper end sensor [B] or replace the upper limit sensor [C].

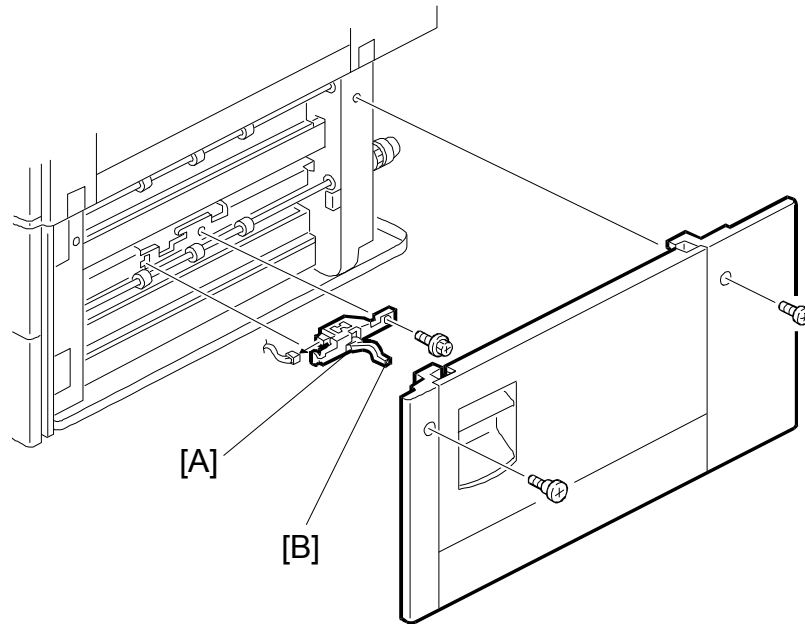
NOTE: When reinstalling the sensor ass'y, insert the harness into the clamp to prevent the harness from touching the paper.

4.7 UPPER RELAY SENSOR REPLACEMENT



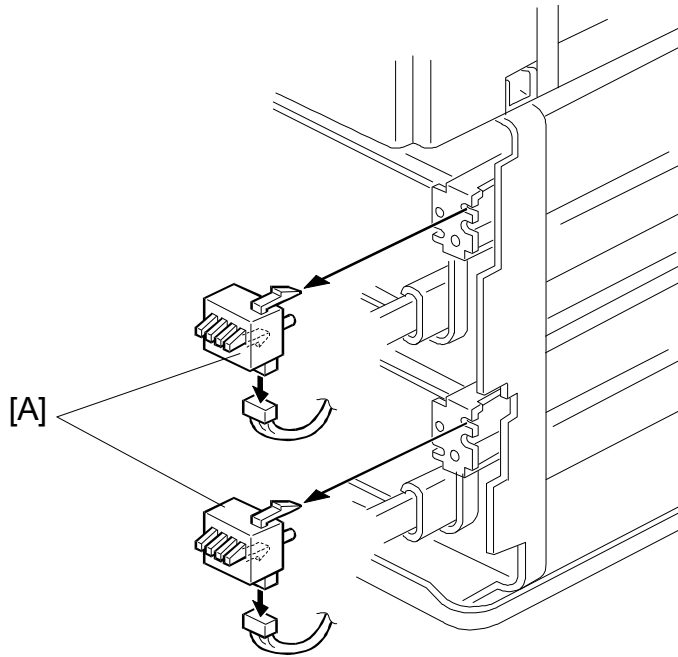
1. Remove the right cover.
2. Remove the upper relay roller [A] (1 E-ring, 1 bushing).
3. Remove the upper relay sensor with bracket [B] (1 screw, 1 connector).
4. Replace the upper relay sensor [C].

4.8 LOWER RELAY SENSOR REPLACEMENT

Paper Tray
Unit

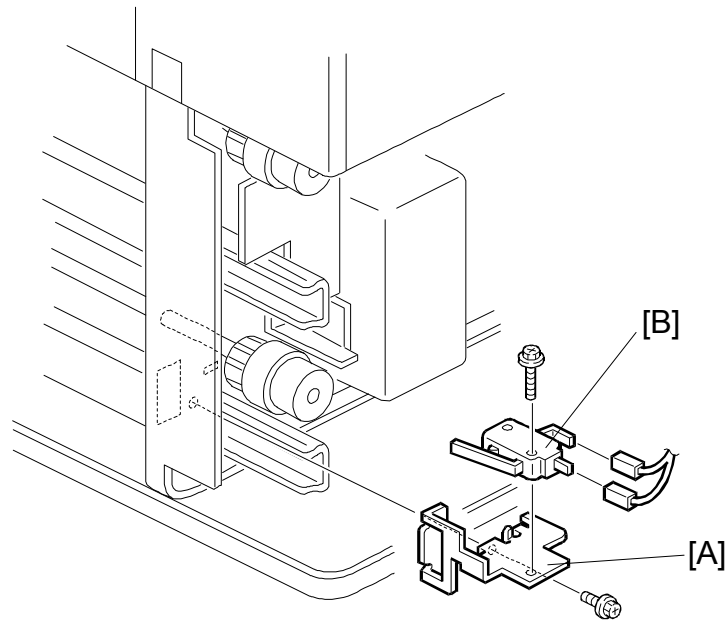
1. Remove the right cover.
2. Remove the lower relay sensor with bracket [A] (1 screw, 1 connector).
3. Replace the lower relay sensor [B].

4.9 PAPER SIZE SENSORS



1. Remove the front cover.
2. Remove the left cover.
3. Replace the paper size sensors [A] (1 connector).

4.10 TRAY COVER SWITCH REPLACEMENT

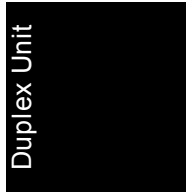
Paper Tray
Unit

1. Remove the left cover
2. Remove the rear cover.
3. Remove the tray cover switch with bracket [A] (1 screw, 2 connectors).
4. Replace the tray cover switch [B] (1 screw).

SECTION 9
DUPLEX UNIT (G694)

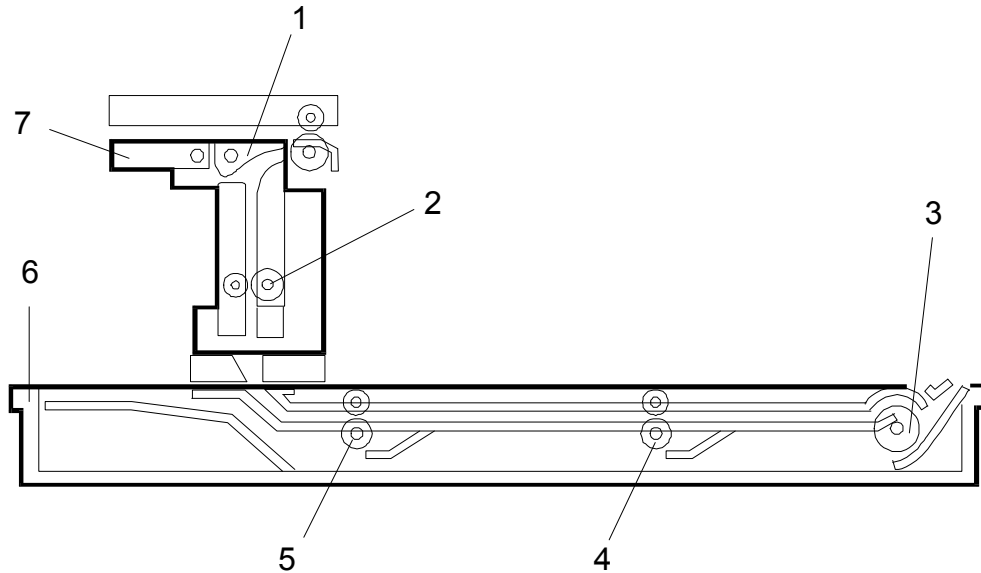
1. SPECIFICATIONS

Copy Paper Size :	Width Max. 297 mm, Min. 182 mm Length Max. 432 mm, Min. 148 mm
Paper Weight :	60 g to 90 g
Capacity:	1 sheet
Power Source :	24 Vdc from the copier
Power Consumption :	25 W
Dimensions (W x D x H) :	Duplex Tray - 530 x 565 x 255 mm Inverter Unit - 75 x 428 x 101 mm
Weight :	Duplex Tray - 4.1 kg Inverter Unit - 1 kg

Duplex Unit

2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



1. Duplex Junction Gate

2. Inverter Unit Transport Roller

3. Duplex Feed Roller

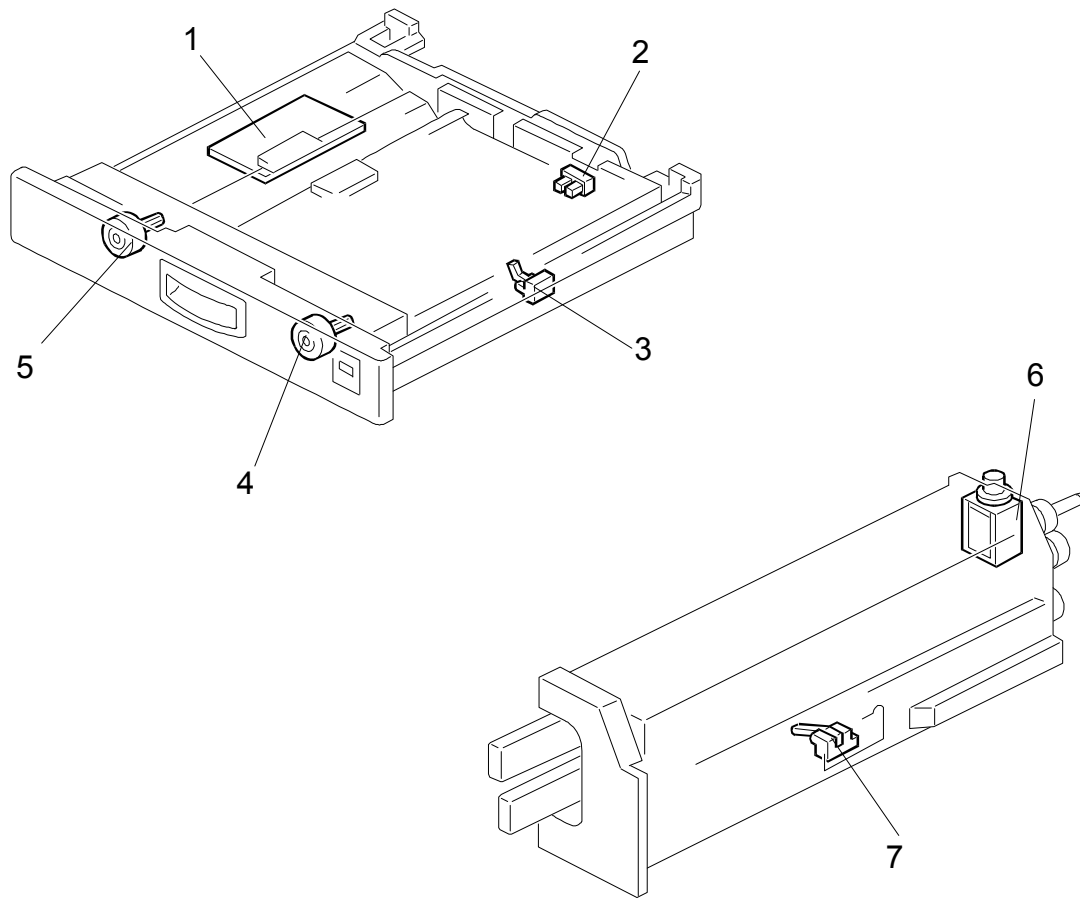
4. Central Transport Roller

5. Left Transport Roller

6. Duplex Tray

7. Inverter Unit

2.2 ELECTRICAL COMPONENT LAYOUT



Duplex Unit

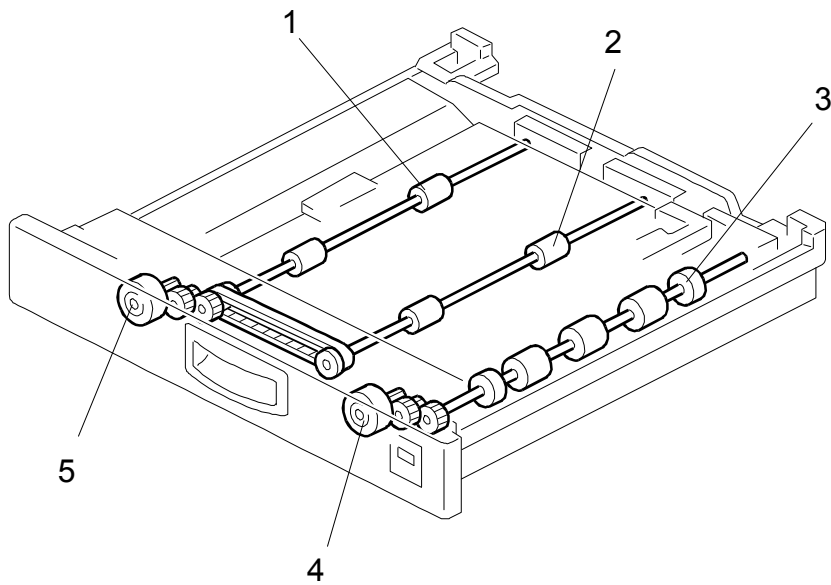
1. Duplex Control Board
2. Duplex Turn Sensor
3. Duplex Exit Sensor
4. Duplex Feed Motor

5. Duplex Transport Motor
6. Duplex Junction Gate Solenoid
7. Duplex Entrance Sensor

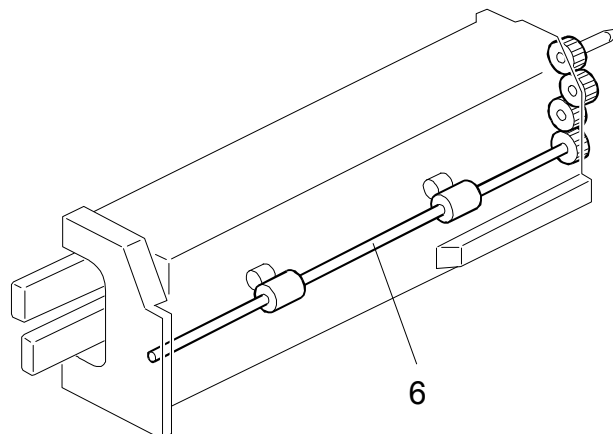
2.3 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Duplex Transport	Drives the left and central transport rollers.	5
M2	Duplex Feed	Drives the duplex feed roller.	4
Sensors			
S1	Duplex Entrance	Detects misfeeds and controls the transport motor speed.	7
S2	Duplex Turn	Detects misfeeds, controls the paper stop position, and controls the duplex feed roller timing.	2
S3	Duplex Exit	Detects misfeeds and controls the duplex feed roller off timing.	3
Solenoid			
SOL1	Duplex Junction Gate Control	Controls the duplex junction gate.	6
PCBs			
PCB1	Duplex Control	Controls the overall duplex tray operation.	1

3. DRIVE LAYOUT



Duplex Unit



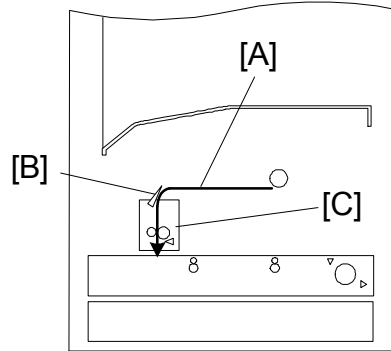
- 1. Left Transport Roller
- 2. Central Transport Roller
- 3. Duplex Feed Roller

- 4. Duplex Feed Motor
- 5. Transport Motor
- 6. Inverter Unit Transport Roller

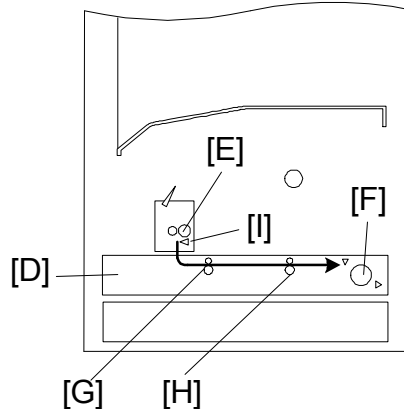
4. BASIC OPERATION

4.1 11 x 17 PAPER SIZE

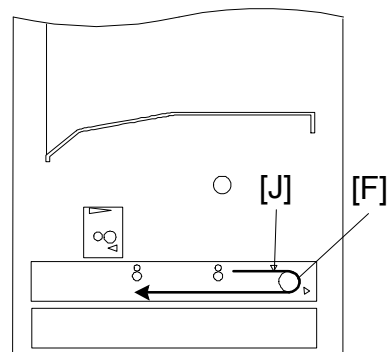
1. When the leading edge of the paper [A] has passed through the fusing unit, the junction gate solenoid energizes and the junction gate [B] is opened. The paper is guided into the inverter unit [C]. The on timing of the junction gate solenoid is controlled by the registration sensor.



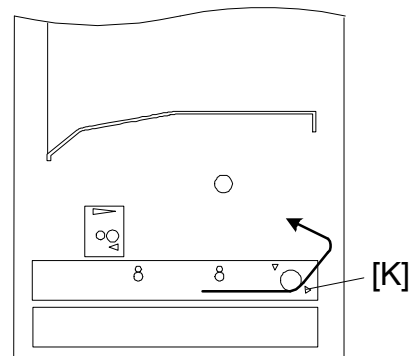
2. The paper is fed to the duplex tray [D] by the inverter unit transport roller [E], and to the duplex feed roller [F] by the left and central transport rollers ([G], [H]) in the duplex tray. When the trailing edge of the paper has passed through the duplex entrance sensor [I], the speed of the paper movement will be doubled.



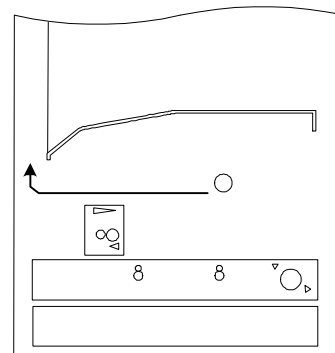
3. The paper is inverted by the duplex feed roller [F]. The duplex feed motor turns off shortly after the trailing edge of the paper passes through the duplex turn sensor [J].



4. Almost immediately after stopping, the duplex feed motor turns on again in reverse direction, and the inverted paper is fed back to the copier. When the trailing edge of the paper passes through the duplex exit sensor [K], the duplex feed motor turns off.



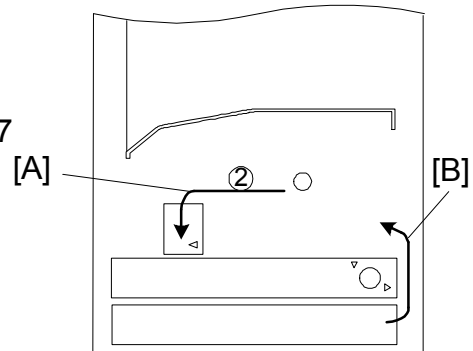
5. The paper is transported to the exit area.



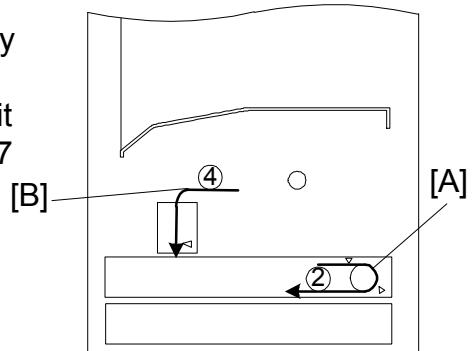
Duplex Unit

4.2 SHORTER THAN LTR LENGTHWISE (MEMORY COPY) 8 Original (① ~ ⑧)

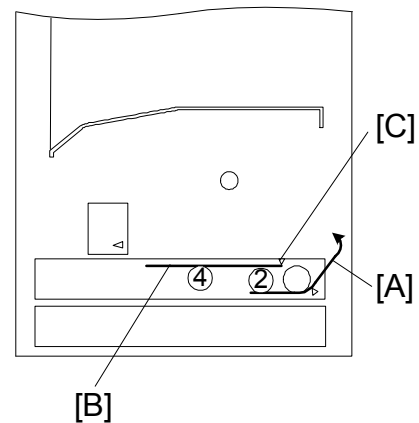
1. Two sheets of paper [A] [B] are fed from the lower paper tray and the first paper transported to the duplex tray in the same manner as described for the 11x17 paper size.



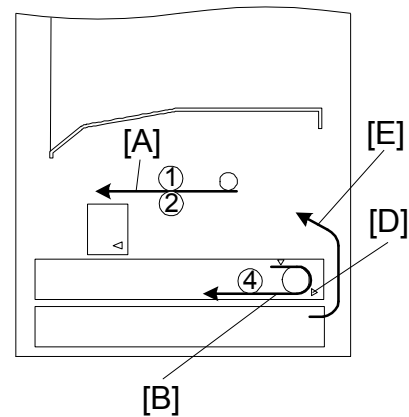
2. The first sheet [A] of paper is reversed by the duplex turn roller and the second sheet [B] is transported to the duplex unit in the manner as described for the 11x17 paper size.



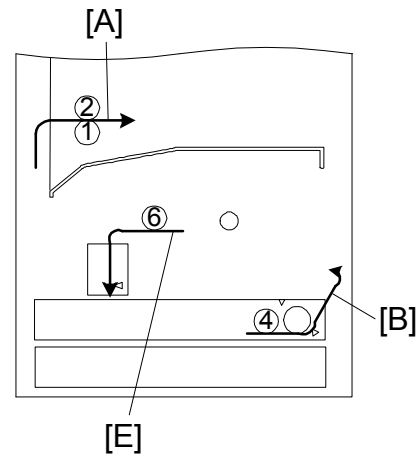
3. The first sheet [A] is fed out to the copier from the duplex tray in the same way. The transport motor stops when the leading edge of the second sheet [B] turns on the duplex turn sensor [C]. The second sheet [B] stops in the waiting position.



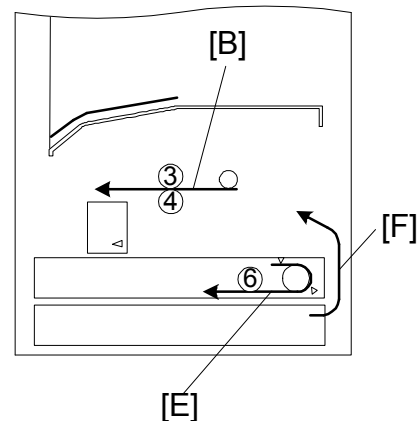
4. The second sheet [B] starts again when the trailing edge of the first sheet [A] passes through the duplex exit sensor [D], and it is reversed. The second sheet is being reversed, the third sheet [E] is fed out from the lower tray after the first sheet has reached the registration roller.



5. The first sheet [A] is fed out to the copy tray. The second sheet [B] is fed out from the duplex tray. The third sheet [E] is transported to the duplex tray.



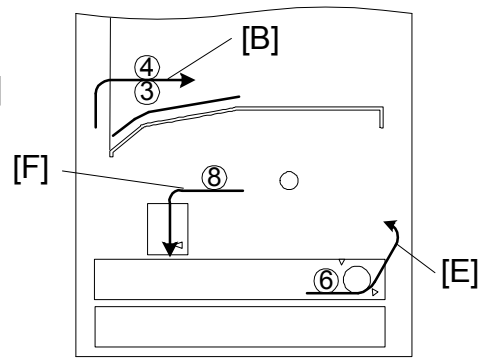
6. The second sheet [B] is transported to the exit section. The third sheet [E] is reversed. While the third sheet is being reversed, the fourth sheet [F] is fed out from the lower tray after the second sheet [B] has reached the registration roller.



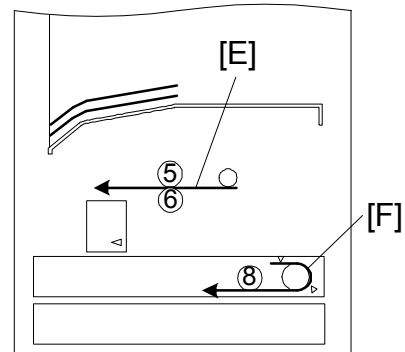
Duplex Unit

BASIC OPERATION

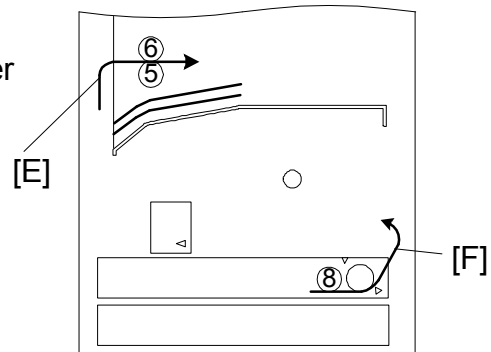
7. The second sheet [B] is fed out to the copy tray. The third sheet [E] is fed out from the duplex tray. The fourth sheet [F] is transported to the duplex tray.



8. The third sheet [E] is transported to the exit section. The fourth sheet [F] is reversed.

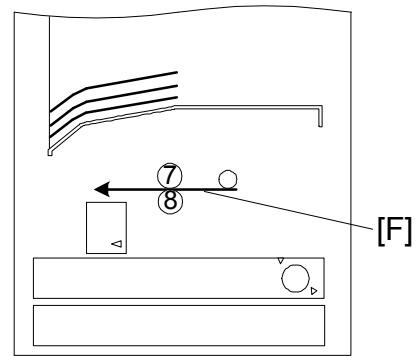


9. The third sheet [E] is fed out to the copier exit tray. The fourth sheet [F] is fed out from the duplex tray.

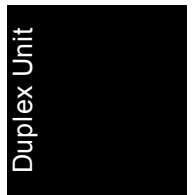
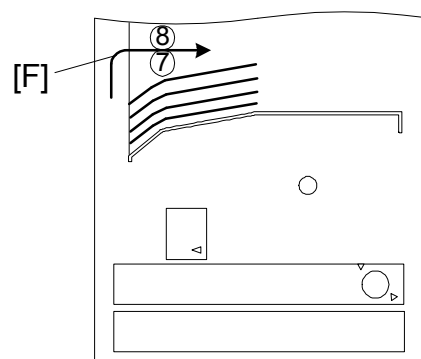


BASIC OPERATION

10. The fourth sheet [F] is transported to the exit section.



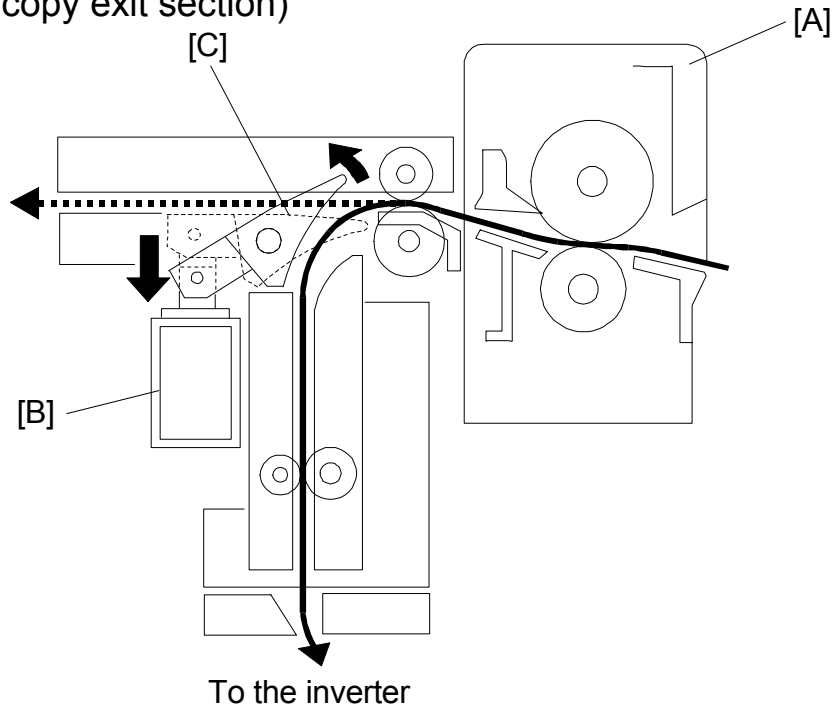
11. The fourth sheet [F] is fed out to the copier exit tray.



The actual printing sequence is page 2-4-1-6-3-8-5-7.

5. DETAILED DESCRIPTIONS

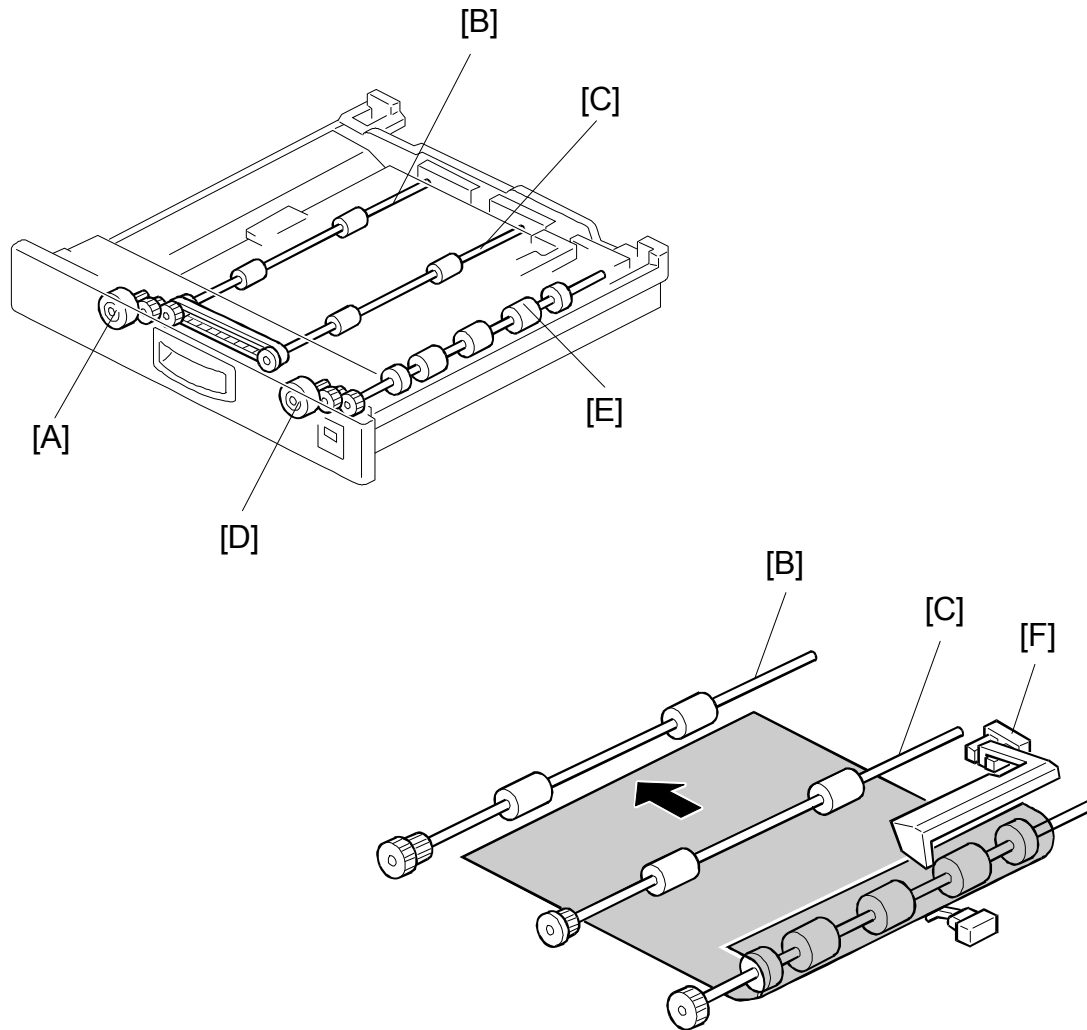
5.1 DUPLEX JUNCTION GATE MECHANISM (to the copy exit section)



The paper that is fed out from the fusing unit [A] is delivered to either the copier exit section or the inverter unit.

When the duplex junction gate solenoid [B] energizes, the junction gate [C] opens, and the paper is fed downward to the inverter unit.

5.2 PAPER TRANSPORT AND FEED MECHANISM



Duplex Unit

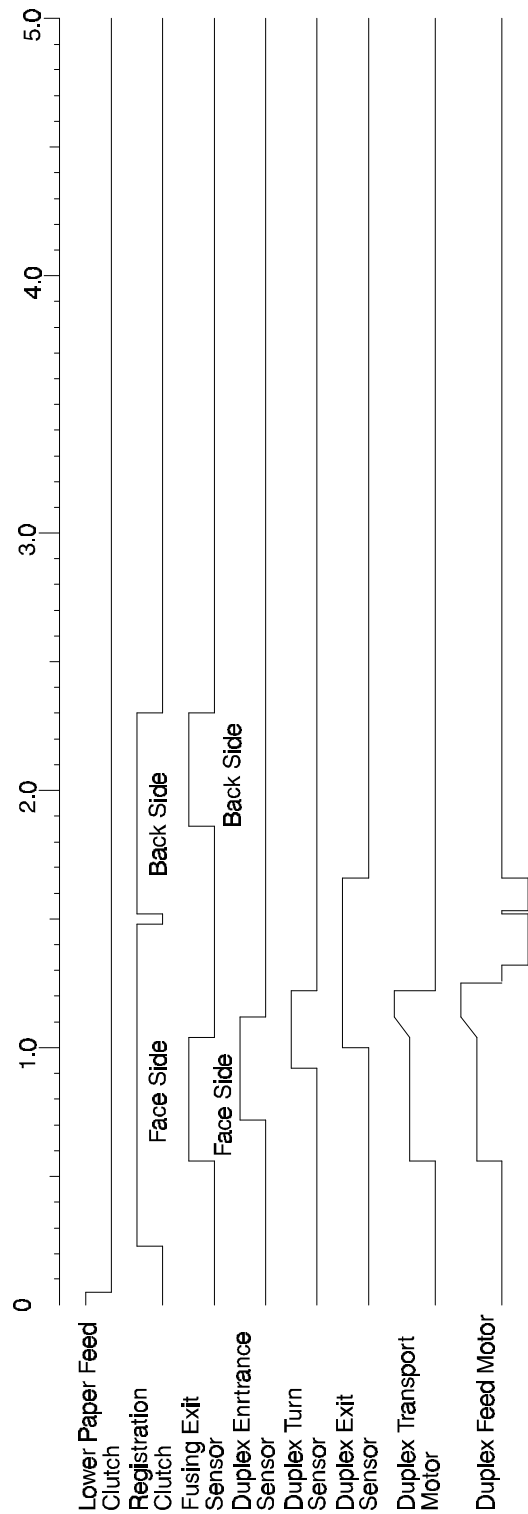
The duplex transport motor [A] drives the left and central transport rollers ([B], [C]) and the duplex feed motor [D] drives the duplex feed roller [E].

The paper sent from the inverter unit is fed by the left and central transport rollers to the duplex feed roller.

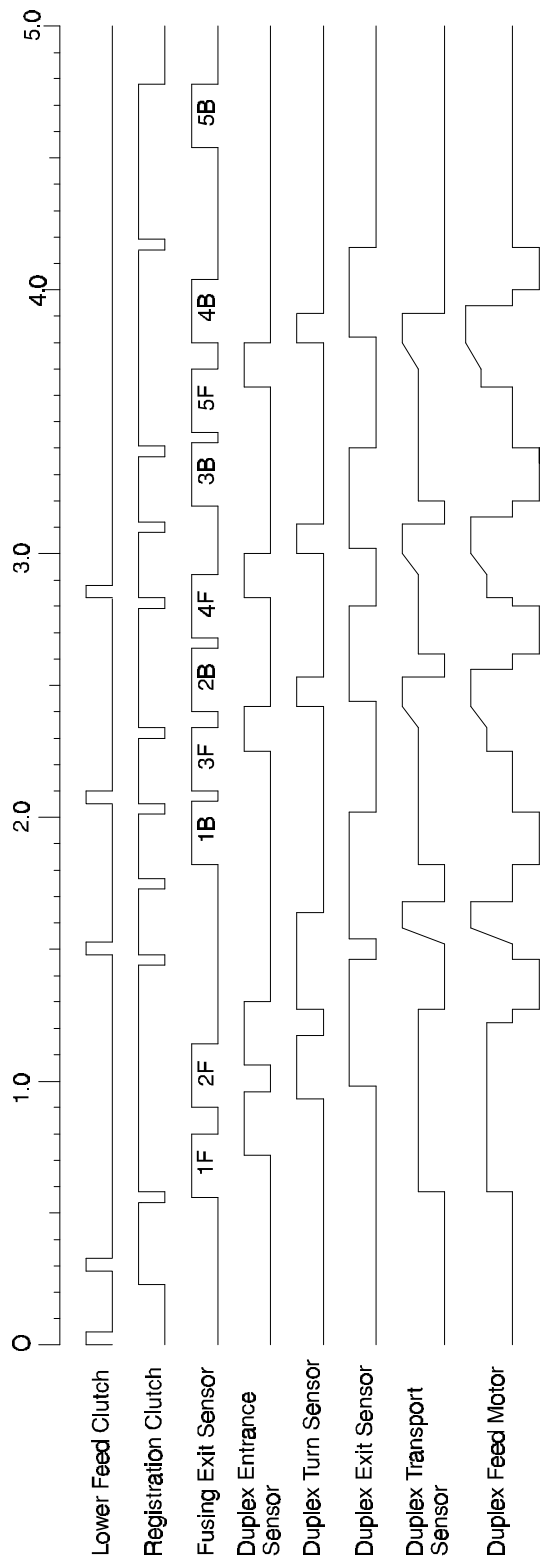
The duplex feed roller inverts the paper. The duplex feed roller stops shortly after the trailing edge of the paper turns off the duplex turn sensor [F]. Immediately after this, the duplex feed roller [E] turns in reverse direction and the inverted paper is fed out to the copier.

5.3 TIMING CHARTS

5.3.1 11x17 (without memory)

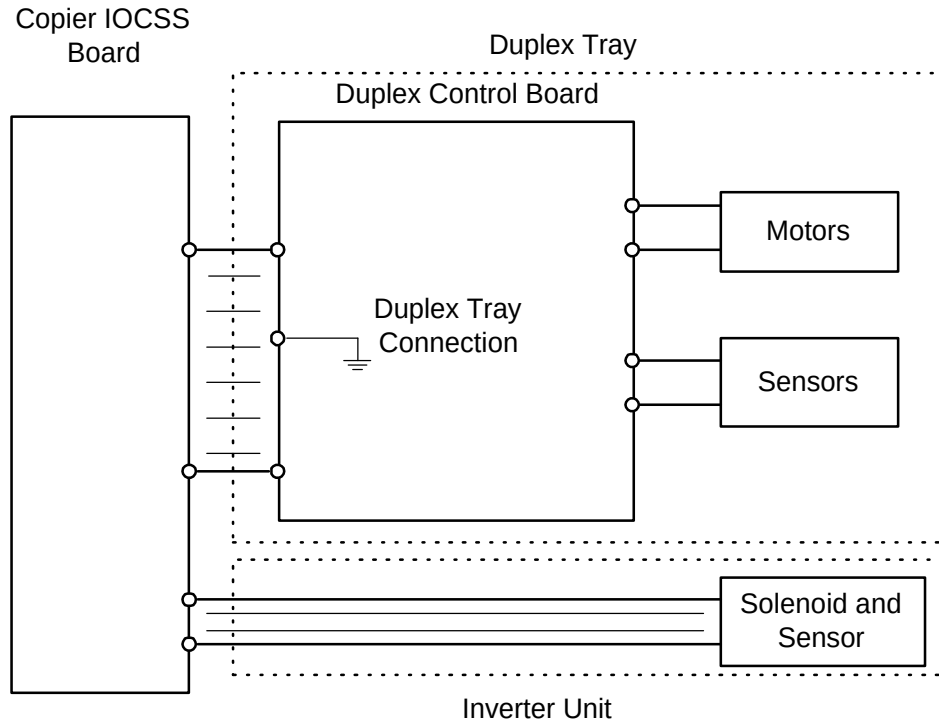


5.3.2 LTR sideways (Memory)



Duplex Unit

5.4 OVERALL ELECTRICAL CIRCUIT



The solenoid and sensor in the inverter unit are directly connected to the copier. The motors and sensors in the duplex tray are controlled by the duplex control board.

When the duplex tray connector is connected (this happens when the duplex tray is slid into the machine), the duplex tray connection signal to the copier is grounded. Then the copier detects that the duplex tray has been inserted.

6. DIP SWITCHES

6.1 DUPLEX CONTROL BOARD : DSW1

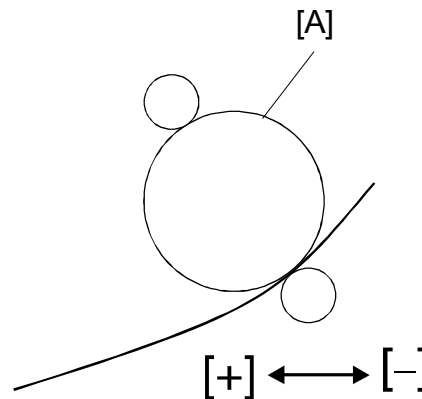
SW No.	Function
1	Adjustment Value
2	
3	Free Run
4	Adjustment Direction

SW1	SW2	Value
OFF	OFF	0 mm
ON	OFF	2 mm
OFF	ON	4 mm
ON	ON	6 mm

SW4

ON: [-] direction

OFF: [+] direction



Duplex Unit

Adjustment of the paper stop position at the duplex feed roller [A]
(SW1,2,4)

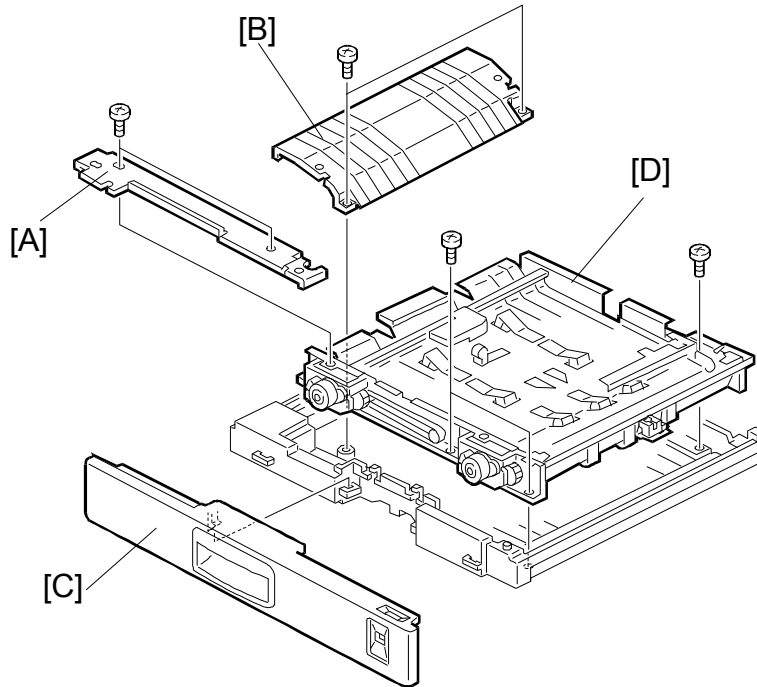
If paper jams occur after changing the duplex turn sensor, because the sensor was not installed correctly, adjust the paper stop position at the duplex feed roller [A].

Free run (SW3)

The duplex transport and feed motor turn on with A4 paper sideways timing.

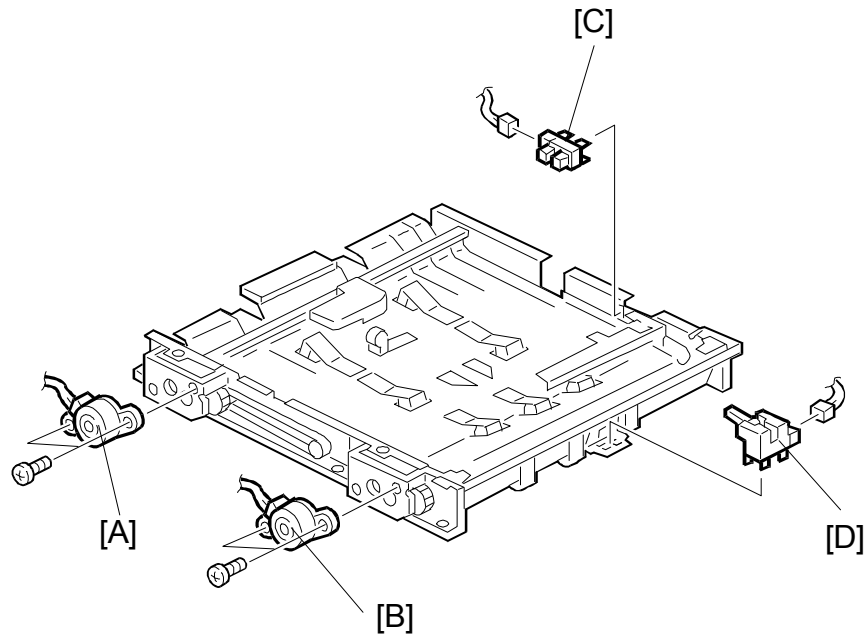
7. REPLACEMENT AND ADJUSTMENT

7.1 DUPLEX TRANSPORT UNIT REMOVAL



1. Remove the inner cover [A] of the duplex tray (2 screws).
2. Remove the duplex control board cover [B] (2 screws).
3. Release the hook and remove the front cover [C].
4. Remove the duplex transport unit [D] (4 screws, 4 connectors).

7.2 DUPLEX TRANSPORT AND FEED MOTOR REPLACEMENT



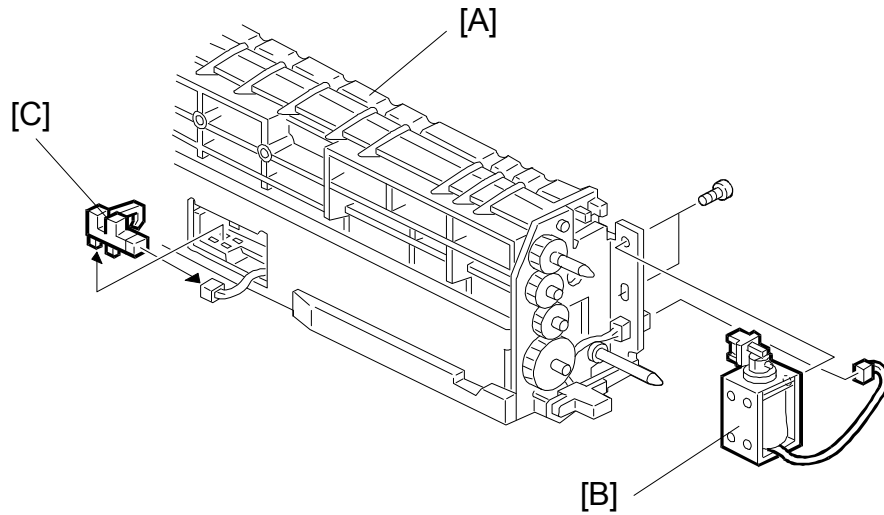
Duplex Unit

1. Remove the transport unit.
2. Replace the duplex transport motor [A] (2 screws, 1 connector).
Replace the duplex feed motor [B] (2 screws, 1 connector).

7.3 DUPLEX TURN AND DUPLEX EXIT SENSORS

1. Remove the duplex transport unit.
2. Replace the duplex turn sensor [C] (1 connector).
Replace the duplex exit sensor [D] (1 connector).

7.4 DUPLEX JUNCTION GATE SOLENOID AND DUPLEX ENTRANCE SENSOR REPLACEMENT



1. Remove the inverter unit [A] (1 screw).
2. Replace the junction gate solenoid [B] (2 screws, 1 connector)
Replace the duplex entrance sensor [C] (1 connector).

SECTION 10
1-BIN SORTER (A629)

1. SPECIFICATIONS

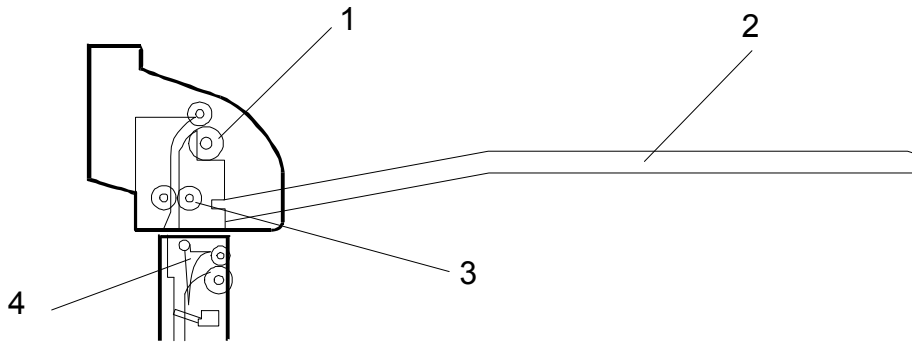
Copy Paper Size :	A3 to A5 sideways
Paper Weight :	60 g to 90 g
Tray Capacity :	125 sheets (A4, 80 g)
Power Source :	24 and 5 Vdc from the copier
Power Consumption :	29 W
Dimensions (W x D x H) :	486 x 442 x 106 mm
Weight :	2 kg



1 Bin Sorter

2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



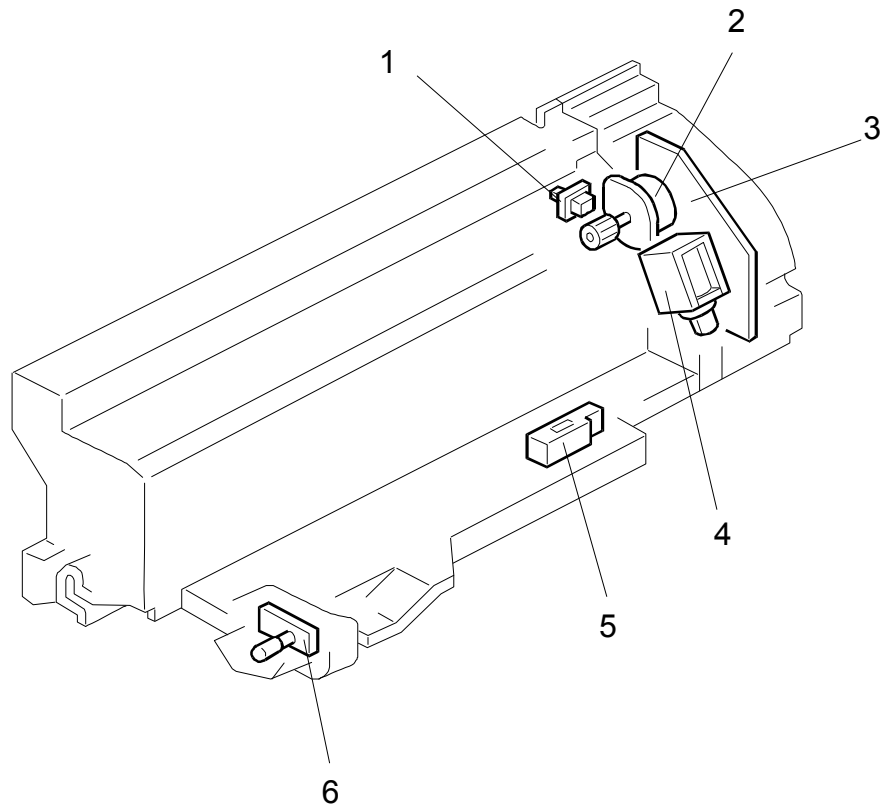
1. Sorter Exit Roller

3. Sorter Transport Roller

2. Sorter Receiving Tray

4. Sorter Junction Gate

2.2 ELECTRICAL COMPONENT LAYOUT



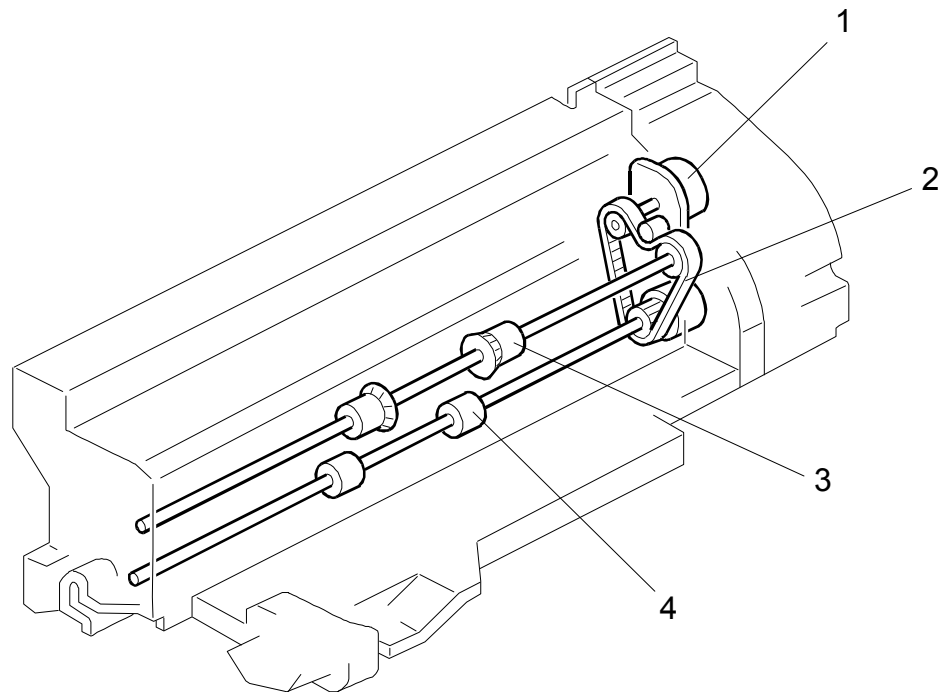
1 Bin Sorter

1. Sorter Vertical Guide Door Sw.	4. Sorter Junction Gate Solenoid
2. Sorter Transport Motor	5. Sorter Paper Sensor
3. Sorter Sorter Drive Board	6. Sorter Paper Indicator

2.3 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	
Motors			
M1	Sorter Transport	Drives all the rollers.	2
Sensors			
S1	Sorter Paper	Detects when there is paper on the receiving tray.	5
Switches			
SW1	Sorter Vertical Guide Door	Detects when the vertical guide door is opened.	1
Solenoid			
SOL1	Sorter Junction Gate	Controls the sorter junction gate.	4
PCBs			
PCB1	Sorter Sorter Drive	Controls the overall sorter operation.	3
PCB2	Sorter Paper Indicator	Indicates when there is paper on the receiving tray.	6

2.4 DRIVE LAYOUT



1 Bin Sorter

1. Sorter Transport Motor

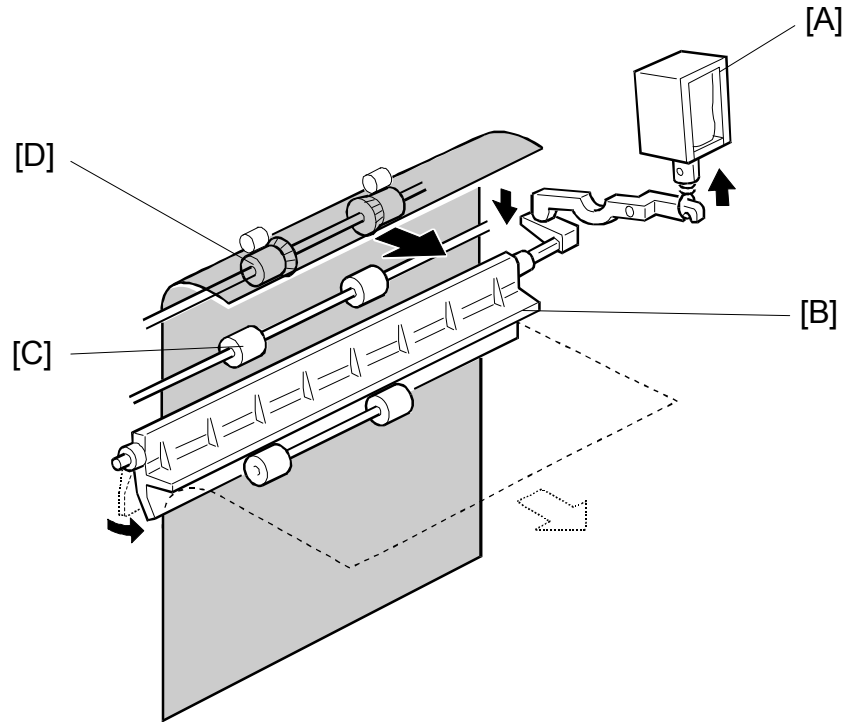
2. Timing Belt

3. Sorter Exit Roller

4. Sorter Transport Roller

3. DETAILED DESCRIPTIONS

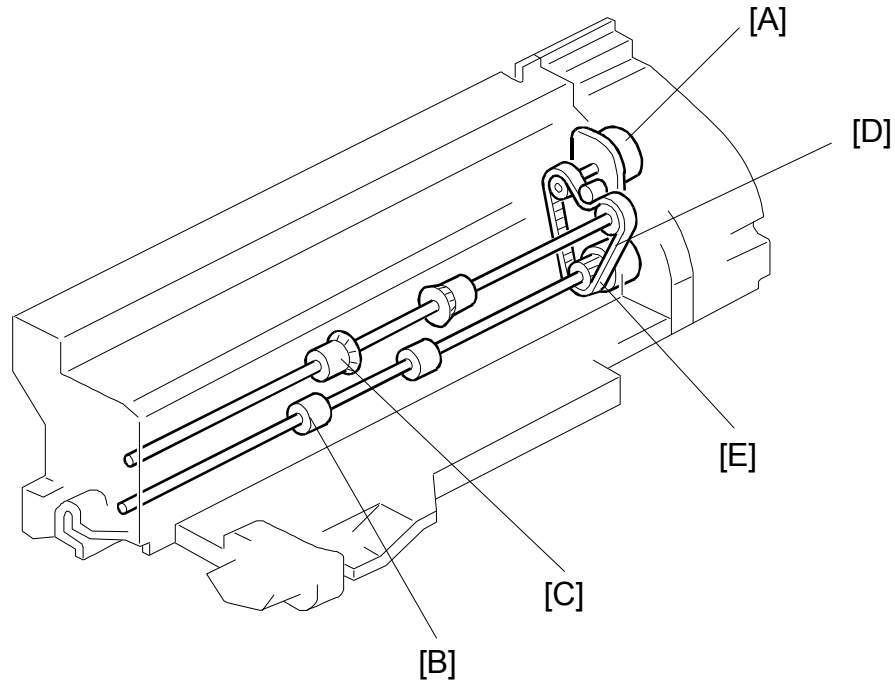
3.1 BIN JUNCTION GATE AND PAPER TRANSPORT MECHANISM



When the leading edge of the paper turns on the exit sensor in the copier, the sorter junction gate solenoid [A] turns on and the sorter junction gate [B], which is mounted on the copier, is opened. The paper is sent upwards to the 1-bin sorter.

The paper is fed out by the sorter transport roller [C] and exit roller [D].

3.2 DRIVE MECHANISM



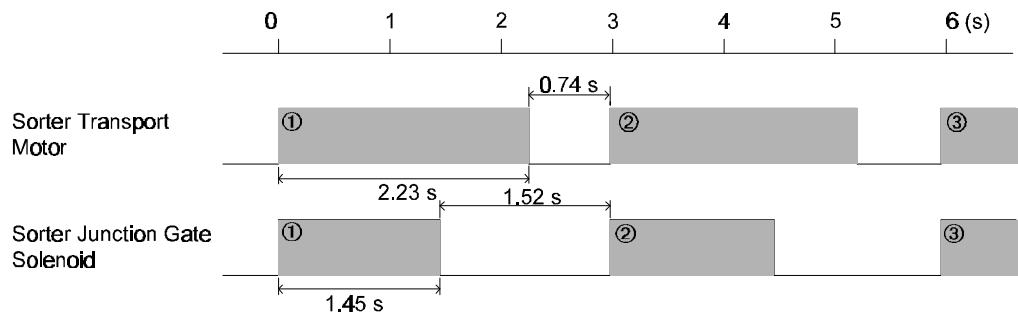
The sorter transport motor [A] drives sorter transport roller [B] and exit roller [C].

Because the paper transport speed of the sorter is different from the copier, the sorter transport roller gear [E] and sorter exit roller gear [D] each have a torque limiter to prevent roller marks on the copy.

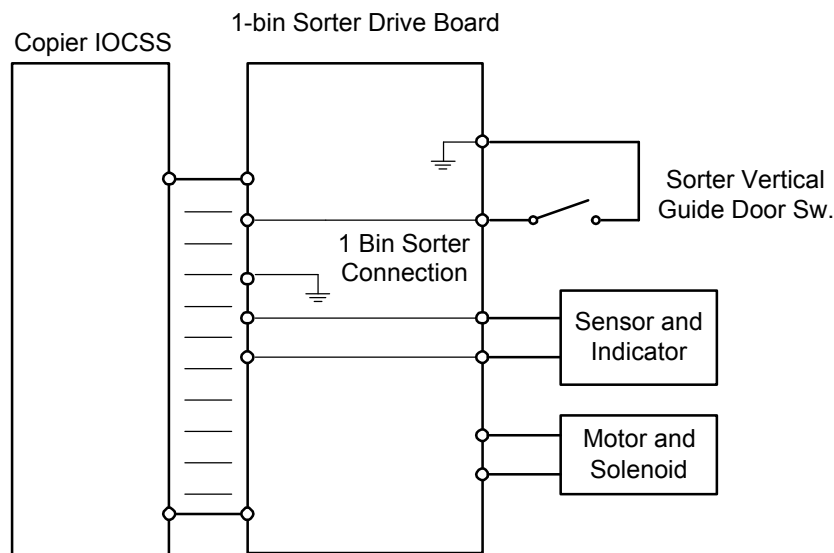
DETAILED DESCRIPTIONS

3.3 TIMING CHART

A4 (sideways, memory)



3.4 OVERALL ELECTRICAL CIRCUIT



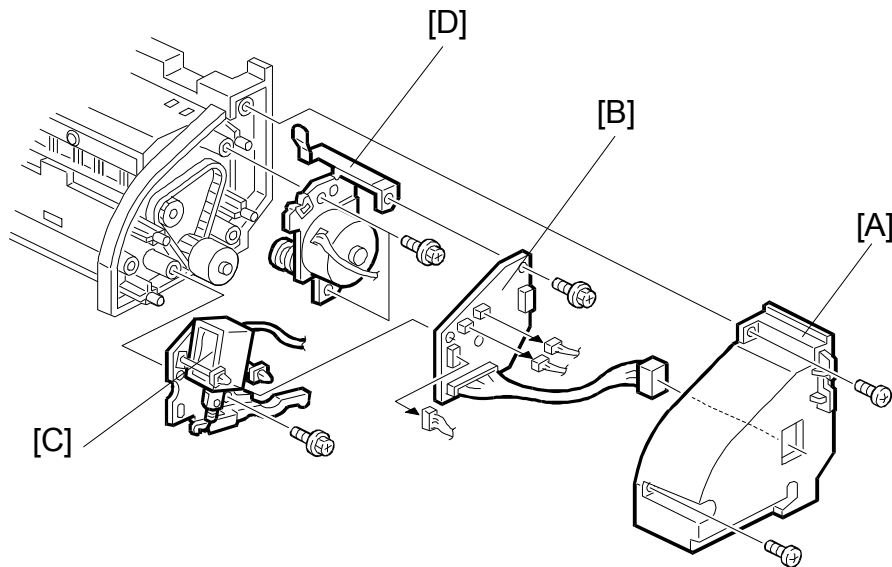
The sorter paper sensor, paper indicator, and vertical guide door switch are directly connected to the copier through the 1-bin sorter drive board.

The motor and solenoid are controlled by the 1-bin sorter drive board.

When the 1-bin sorter connector is connected to the copier, the connection signal to the copier is grounded. Then, the copier detects that the 1-bin sorter is installed.

4. REPLACEMENT AND ADJUSTMENT

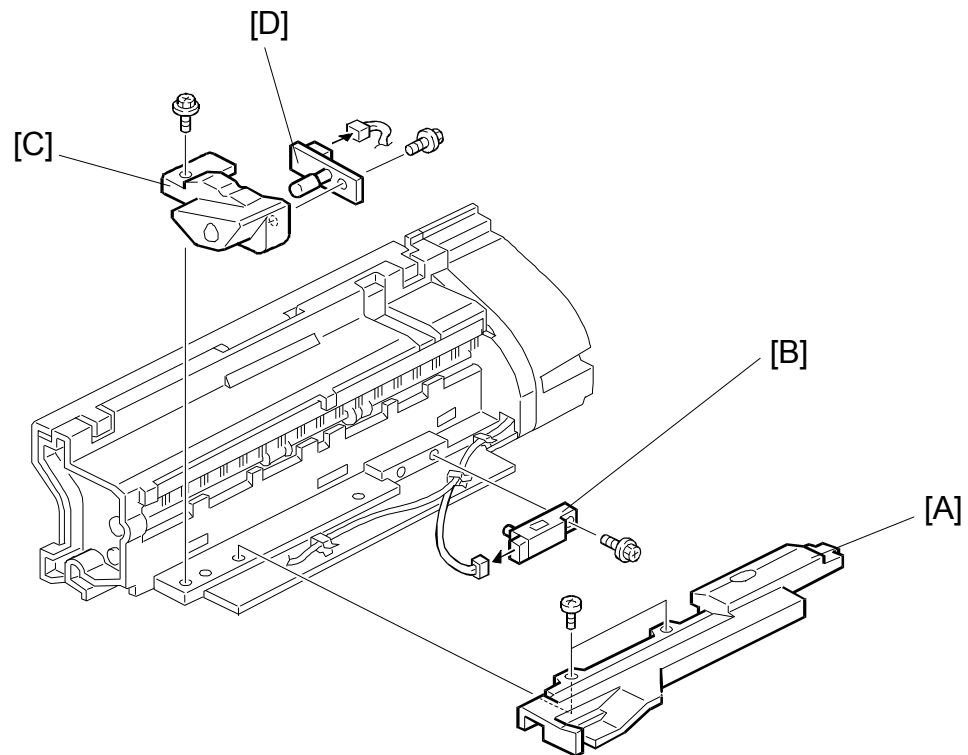
4.1 BIN JUNCTION GATE SOLENOID, TRANSPORT MOTOR AND SORTER DRIVE BOARD REMOVAL



1 Bin Sorter

1. Remove the 1-bin sorter unit (2 screws, 1 connector).
2. Remove the rear cover [A] (2 screws).
3. Remove (replace) the 1-bin sorter drive board [B] (1 screw, 2 hooks, 4 connectors).
4. Replace the sorter junction gate solenoid [C] (1 screw, 1 connector).
Replace the sorter transport motor [D] (2 screws, 1 connector).

4.2 BIN PAPER SENSOR AND INDICATOR REPLACEMENT



1. Remove the 1-bin sorter unit (2 screws, 1 connector).

2. Remove the harness cover [A] (2 screws).

- Sorter Paper Sensor -

3. Replace the sorter paper sensor [B] (1 screw, 1 connector).

- Sorter Paper Indicator -

3. Remove the sorter paper indicator and cover [C] (1 screw).

4. Replace the sorter paper indicator [D] (1 screw, 1 connector)

SECTION 11

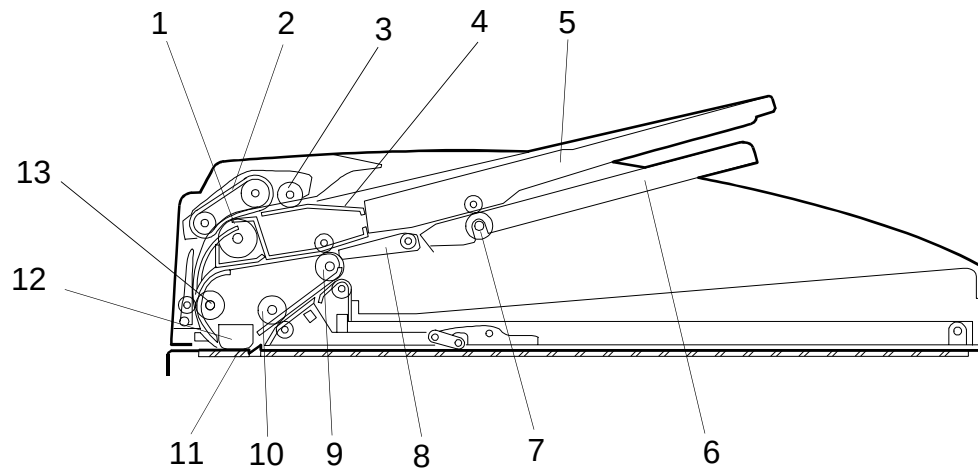
AUTO REVERSE DOCUMENT FEEDER A661

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

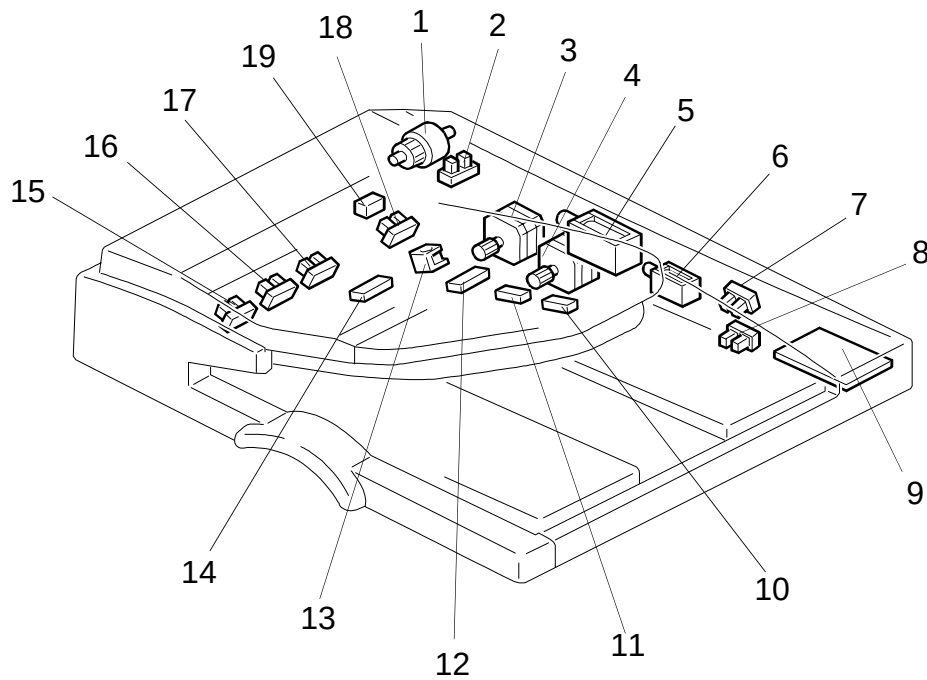
Original Size:	Standard Size Single-sided Mode: A3 to A5, DLT to HLT Double-sided Mode: A3 to A4, DLT to LT Non-standard Size (Single-sided Mode only) Max. width 297 mm Min. width 105 mm Max. length 1260 mm Min. length 128 mm
Original Weight :	45 kg to 90 kg
Table Capacity :	30 sheets (70 kg)
Original Standard Position:	Rear left corner
Separation:	FRR (Feed and Reverse Roller)
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	37 to 150%
Power Source:	24 & 5 Vdc from the copier
Power Consumption:	50 W
Dimensions (W x D x H):	550 x 470 x 130 mm
Weight:	11 kg

1.2 MECHANICAL COMPONENT LAYOUT



1. Separation Roller	8. Junction Gate
2. Paper Feed Belt	9. Original Exit Roller
3. Pick-up Roller	10. 2nd Transport Roller
4. Original Entrance Guide	11. DF Exposure Glass
5. Original Table	12. Original Exposure Guide
6. Reverse Table	13. 1st Transport Roller
7. Reverse Roller	

1.3 ELECTRICAL COMPONENT LAYOUT

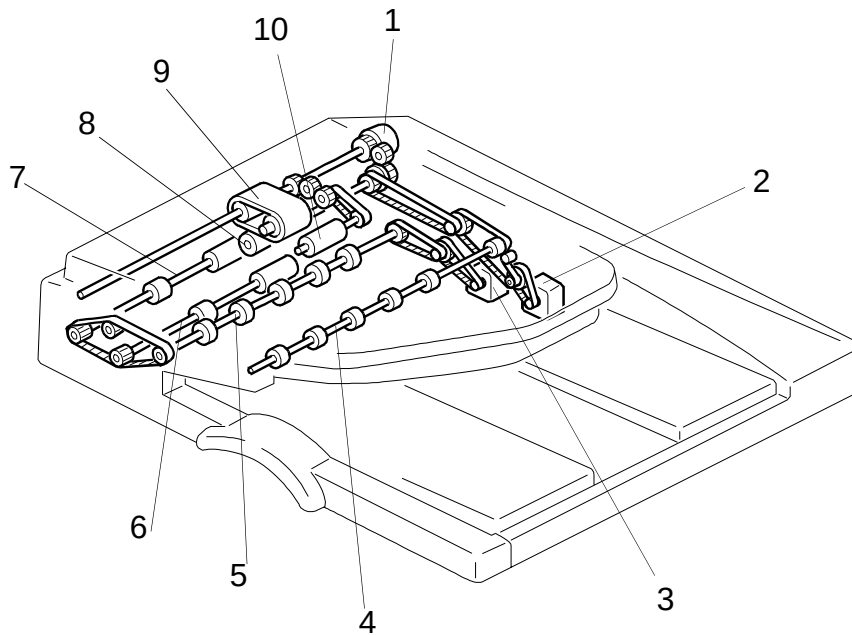


1. DF Feed Clutch	11. Original Length Sensor 1
2. Feed Cover Open Sensor	12. Reverse Table Sensor
3. DF Transport Motor	13. Stamper Solenoid
4. DF Feed Motor	14. Original Exit Sensor
5. DF Pick-up Solenoid	15. Original Width Sensor 3
6. Junction Gate Solenoid	16. Original Width Sensor 2
7. DF Position Sensor	17. Original Width Sensor 1
8. APS Start Sensor	18. Original Set Sensor
9. DF Drive PCB	19. Registration Sensor
10. Original Length Sensor 2	

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	DF Feed	Drives the feed belt, separation, pick-up, and reverse table rollers.	4
M2	DF Transport	Drives the transport and exit rollers	3
Sensors			
S1	APS Start	Informs the CPU when the DF is opened and closed (for platen mode) so that original size sensors in the copier can check the original size.	8
S2	DF Position	Detects when the DF is lifted.	7
S3	Registration	Detects the leading edge of the original to turn off the DF feed and transport motors, detects the original exposure timing, and checks for original misfeeds.	19
S4	Feed Cover Open Sensor	Detects when the feed-in cover is opened.	2
S5	Original Width - 1	Detects the original width.	17
S6	Original Width - 2	Detects the original width.	16
S7	Original Width - 3	Detects the original width.	15
S8	Original Length - 1	Detects the original length.	11
S9	Original Length - 2	Detects the original length.	10
S10	Original Set	Detects if an original is on the feed table.	18
S11	Original Exit	Detects the leading edge of the original to turn on the junction gate solenoid and checks for original misfeeds. Detects the trailing edge of the original to turn off the transport motor, and feed motor and the junction gate solenoid.	14
S12	Reverse Table	Detects the trailing edge of the original to turn on the DF feed clutch for next original and checks for original misfeeds.	12
Solenoids			
SOL1	DF Pick-up	Controls the up-down movement of the original table.	5
SOL2	Stamper	Energizes the stamper to mark the original.	13
SOL3	Junction Gate	Opens and closes the junction gate.	6
Clutches			
MC1	DF Feed	Transfers transport motor drive to the pick-up roller and feed belt.	1
PCBs			
PCB1	DF Drive	Interfaces the sensor signals with the copier, and transfers the magnetic clutch, solenoid and motor drive signals from the copier.	9

1.5 DRIVE LAYOUT



1. DF Feed Clutch

2. DF Feed Motor

3. DF Transport Motor

4. Reverse Table Roller

5. Exit Roller

6. 2nd Transport Roller

7. 1st Transport Roller

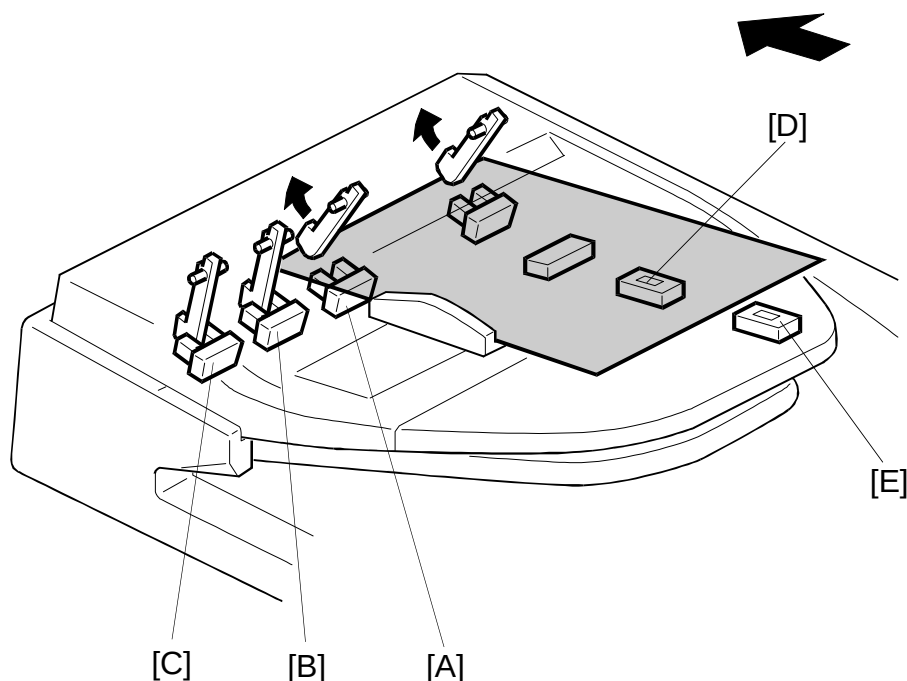
8. Separation Roller

9. Original Feed Belt

10. Pick-up Roller

2. DETAILED DESCRIPTIONS

2.1 ORIGINAL SIZE DETECTION



The DF has three width sensors (- 1 [A], - 2 [B], and - 3[C]) to detect the original width and two original length sensors (-1 [D] and -2 [E]) to detect the original length. The DF will determine the original size through the combination of those five sensors as shown in the table on the next page.

When using a non-standard size original, the user will need to input the original length at the operation panel.

DETAILED DESCRIPTIONS

	NA	EU	Original Width-1	Original Width-2	Original Width-3	Original Length-1	Original Length-2
A3 (297 x 420)	X	○	ON	ON	ON	ON	ON
B4 (257 x 364)	X	○	ON	ON	–	ON	ON
A4 (Lengthwise) (210 x 297)	X	○	ON	–	–	ON	–
A4 (297 x 210) (Sideways)	X	○	ON	ON	ON	–	–
B5 (182 x 257) (Lengthwise)	X	○	–	–	–	ON	–
B5 (257 x 182) (Sideways)	X	○	ON	ON	–	–	–
A5 (148 x 210) (Lengthwise)	X	X	–	–	–	–	–
A5 (210 x 148) (Sideways)	X	○	ON	–	–	–	–
11" x 17" (DLT)	○	X	ON	ON	ON	ON	ON
11" x 15"	○	X	ON	ON	ON	ON	ON
10" x 14"	○	X	ON	ON	–	ON	ON
8.5" x 14" (LG)	○	X	ON	–	–	ON	ON
8.5" x 13" (F4)	X	○	ON	–	–	ON	ON
8" x 13" (F)	○	○	ON	–	–	ON	ON
8.5" x 11" (Lengthwise)	○	X	ON	–	–	ON	–
8.5" x 11" (Sideways)	○	X	ON	ON	ON	–	–
10" x 8" (Lengthwise)	○	X	ON	–	–	ON	–
5.5" x 8.5" (Lengthwise) (HLT)	○	X	–	–	–	–	–
5.5" x 8.5" (Sideways) (HLT)	○	X	ON	–	–	–	–

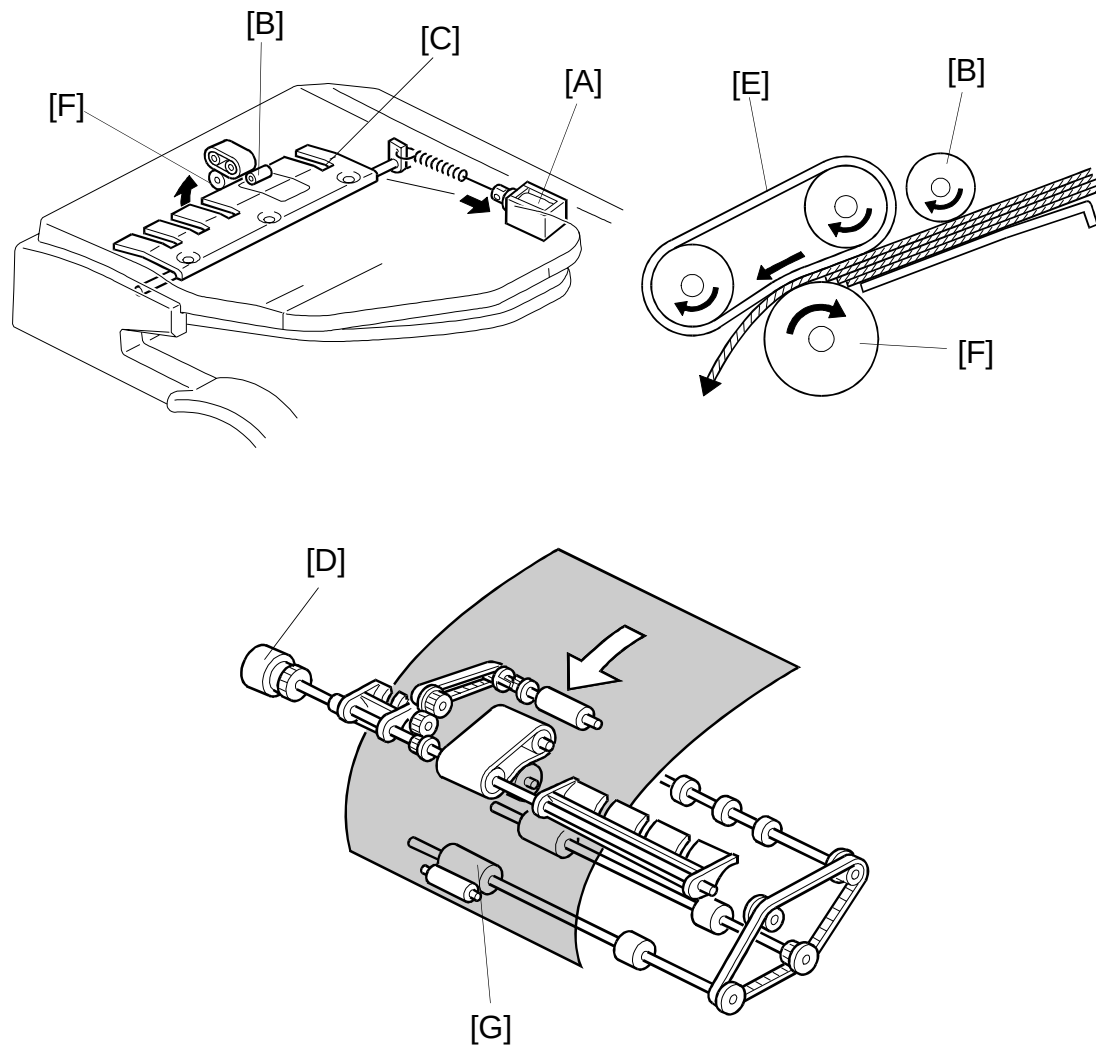
Key

X: No, ○: Yes

ON: Paper present

Auto Reverse
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2.2 PICK-OFF AND SEPARATION MECHANISM

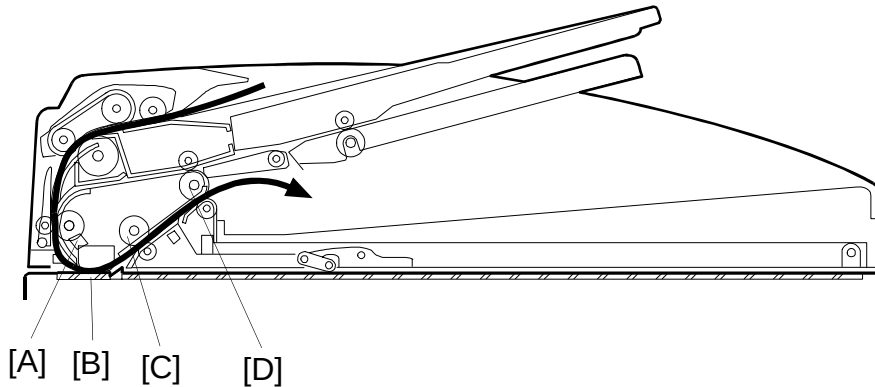


When the print key is pressed, the DF pick-up solenoid [A] will energize and the originals are lifted up to the pick-up roller [B] by the entrance guide [C]. At the same time, the DF feed clutch [D] will turn on.

After 200 ms, the DF feed motor will turn on. The top sheet of the originals is fed to the paper feed belt [E]. The pages are separated by the separation roller [F] and the top sheet of the original is fed to the 1st transport roller [G]. The original separation system uses the FRR (Feed and Reverse Roller) system.

2.3 ORIGINAL TRANSPORT AND EXIT MECHANISM

2.3.1 Single-sided Original

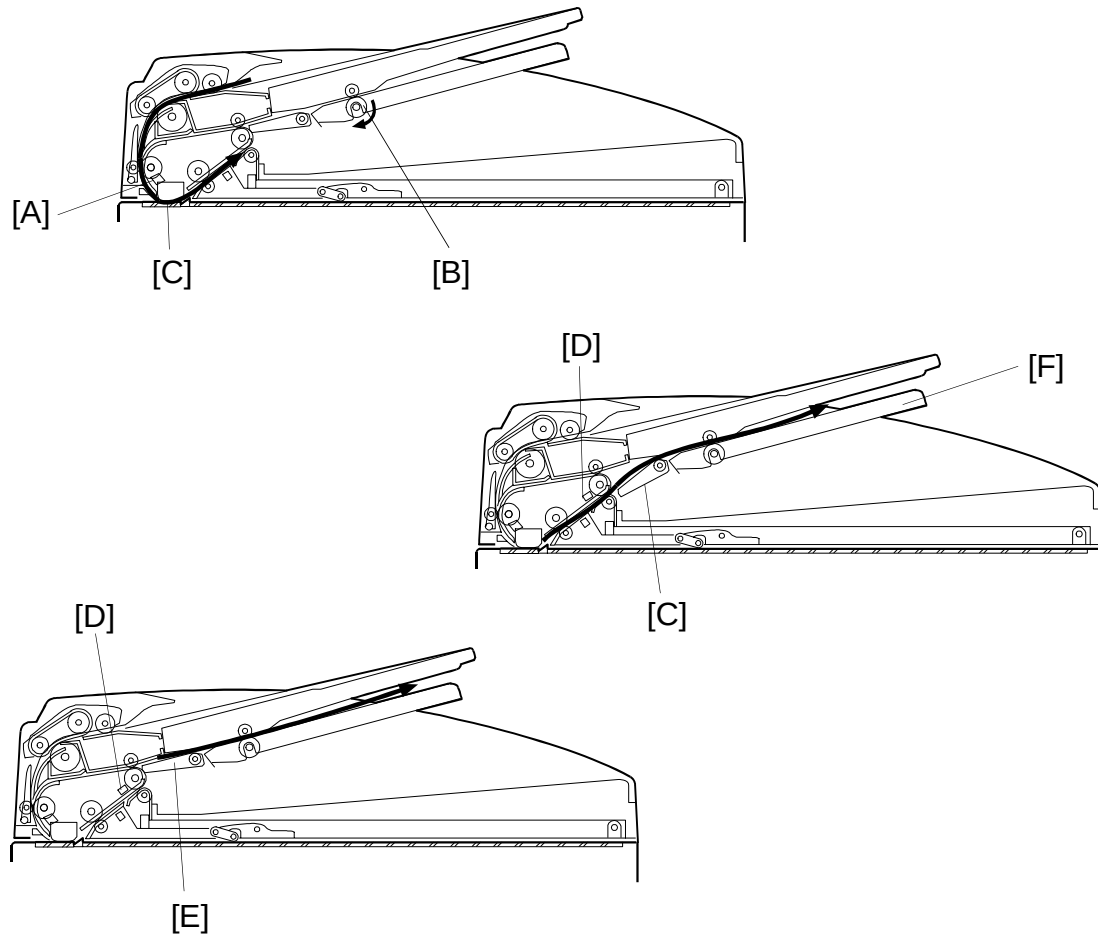


When the leading edge of the original reaches the registration sensor [A], the DF feed and transport motor will turn off. After a short delay, the DF feed and transport motors will turn on again. The original is fed across the DF exposure glass [B] and it is scanned in this area.

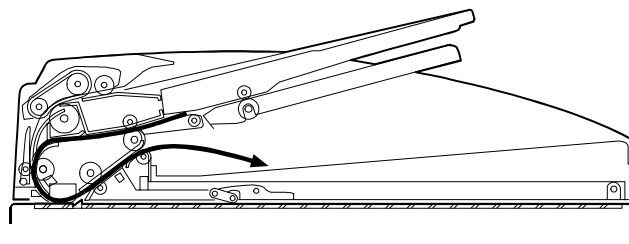
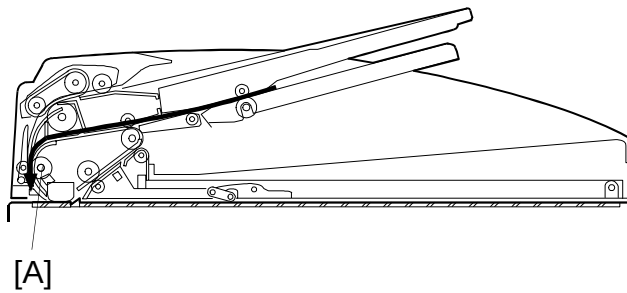
The original is fed through to the 2nd transport roller [C] and fed out by the exit roller [D].

The DF feed motor speed while feeding the original to the registration sensor is 59.4 mm/s. However, when the motor turns on again to feed the original to the exposure glass, the speed will depend on the selected reproduction ratio. At 100%, it is 90 mm/s.

2.3.2 Double-sided Original



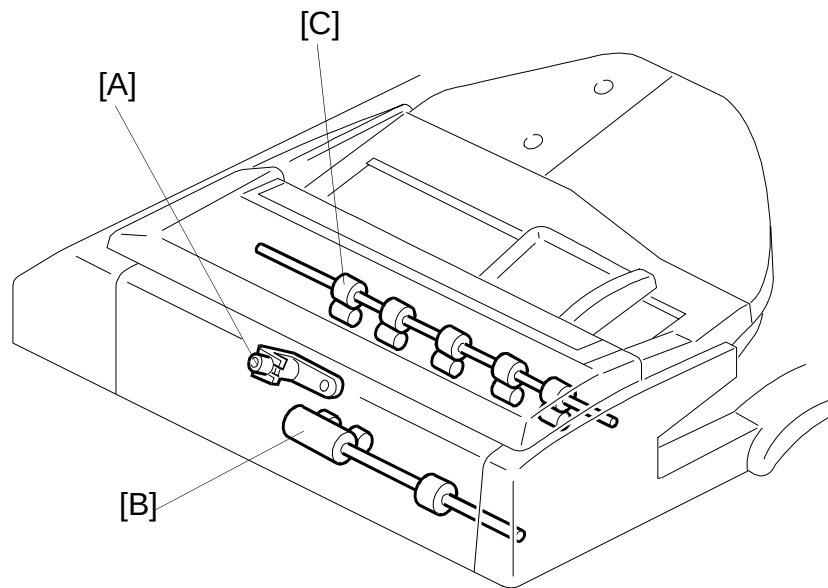
1. When the leading edge of the original reaches the registration sensor [A] the DF feed and transport motors turn off. After a short delay, the DF feed motor will turn on and the DF transport motor will turn on in reverse direction to drive the reverse table roller [B]. The original is fed across the DF exposure glass [C] and it is scanned in this area.
2. When the leading edge of the original reaches the exit sensor [D], the junction gate solenoid is energized and the junction gate [E] is opened. The original is transported onto the reverse table [F] to reverse the original.
3. 33 mm after the trailing edge of the original reaches the exit sensor [D], the junction gate solenoid is turned off and the junction gate [E] will close. At the same time, the DF feed and transport motors will turn off.



4. After a short delay, both motors will turn on in the same direction and the original is fed to the 1st transport roller [A].
5. The original is fed and exposed in the same way as in steps 1, 2 and 3, to copy the reverse side.
6. The original is then fed out onto the original exit tray.

Auto Reverse
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2.4 STAMP



This is a fax mode function only.

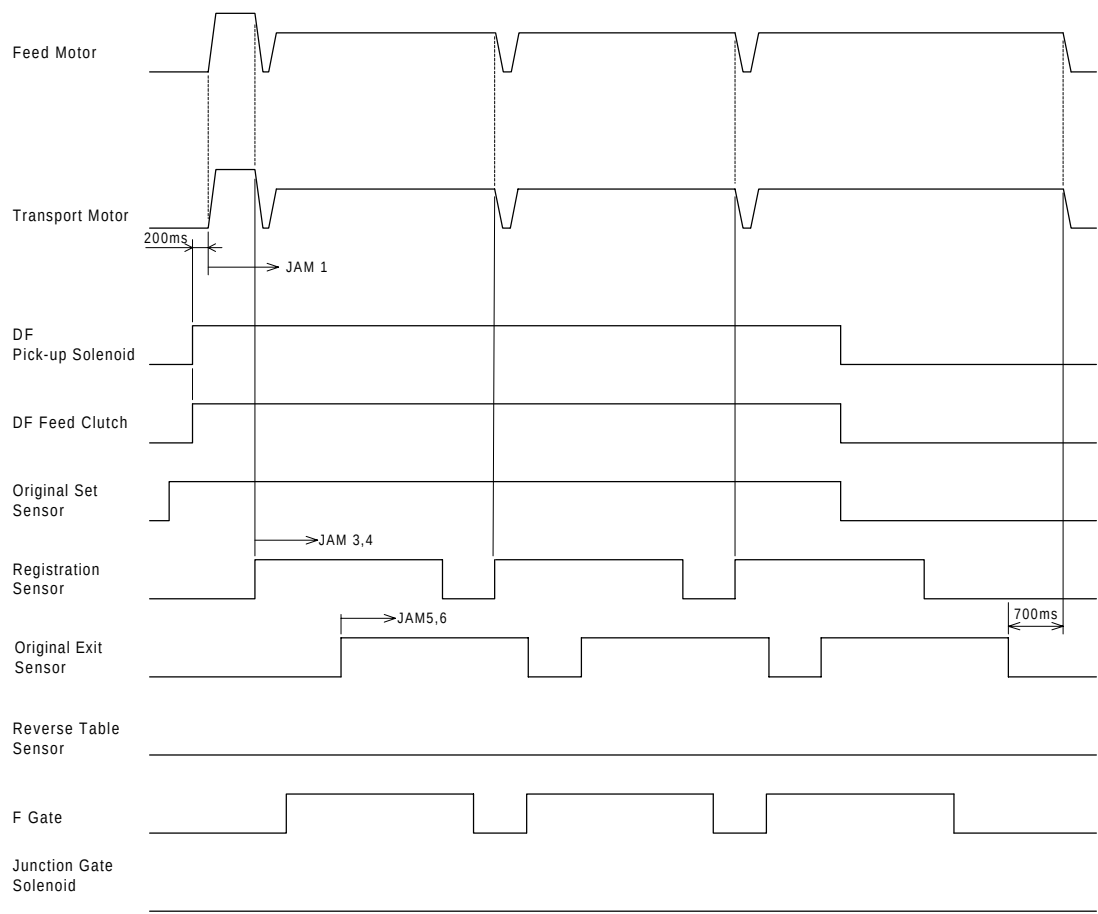
The stamp [A] is located between the 2nd transport roller [B] and the exit roller [C], and its solenoid is controlled by the copier directly.

When the original reaches the stamp position, the DF feed motor will stop. At 300 milliseconds after the DF feed motor has stopped, the stamper solenoid will energize if the page was sent successfully (immediate transmission) or stored successfully (memory transmission). After stamping, the DF feed motor will start again to feed the document out, and its speed is about 1.3 times the normal speed.

The stamping position on the original can be changed by adjusting Service Program Mode, SP6-010.

2.5 TIMING CHARTS

2.5.1 LT Sideways (Single-sided Original Mode)



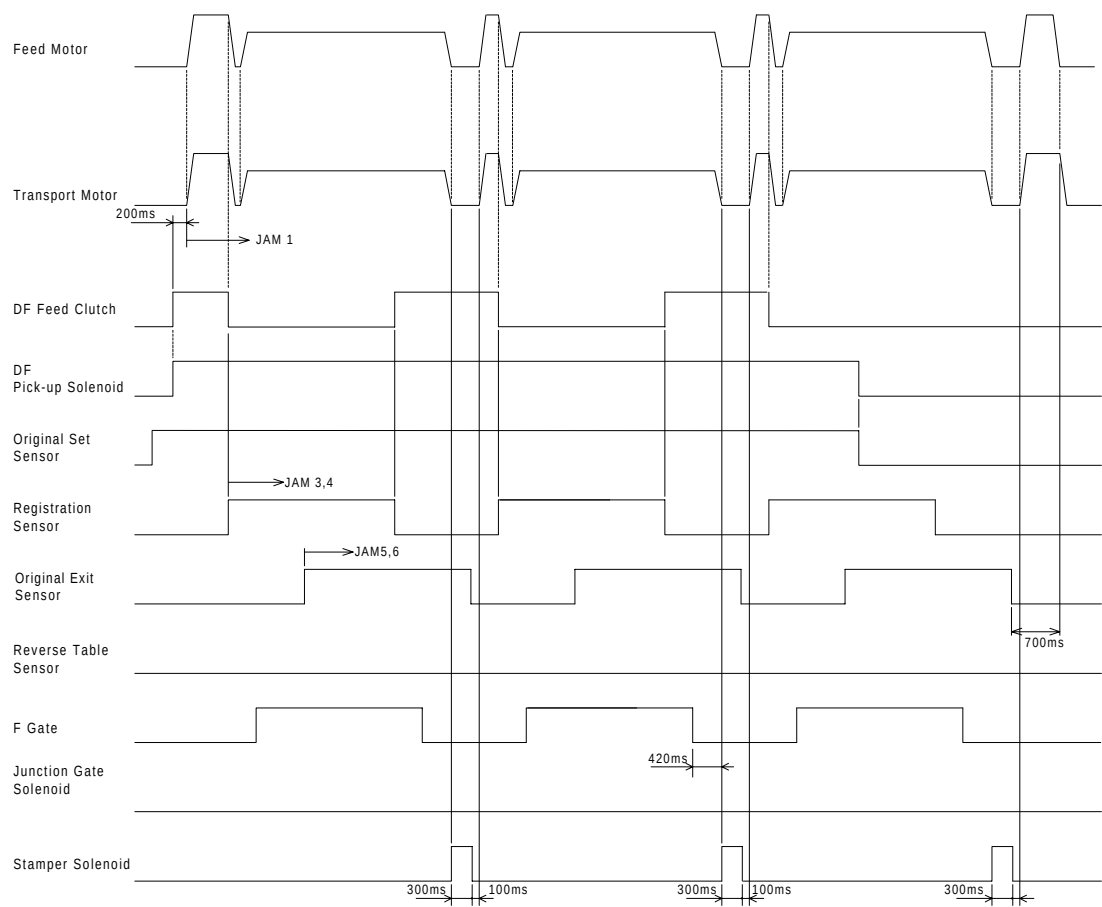
Auto Reverse
Document
Feeder A661

Jam conditions: Refer to Section 2.6 for details.

The signal, F Gate goes high when the laser starts to write a page to the drum.

DETAILED DESCRIPTIONS

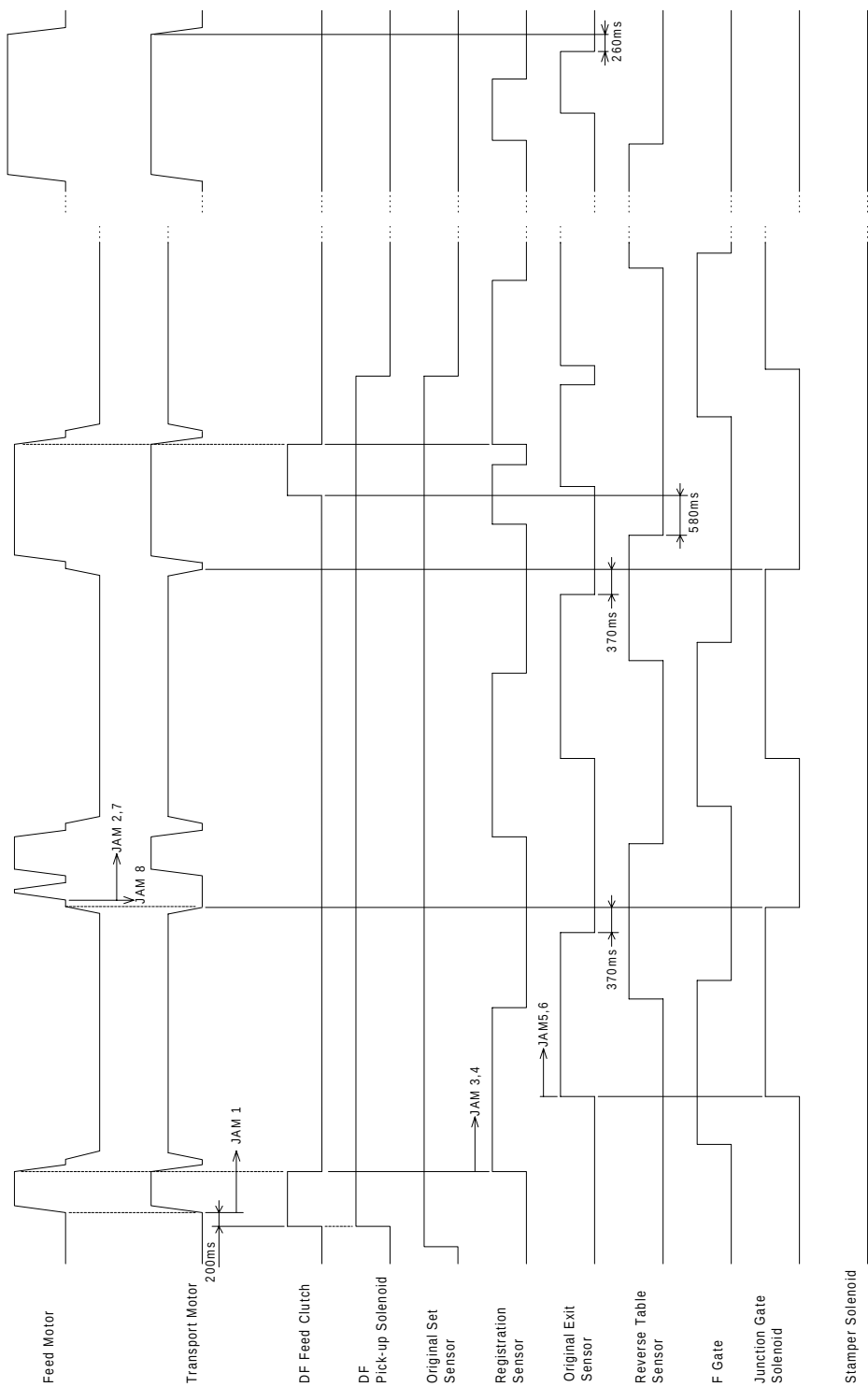
2.5.2 LT Sideways-Stamper Mode (Single-sided Original Mode)



Jam conditions: Refer to Section 2.6 for details.

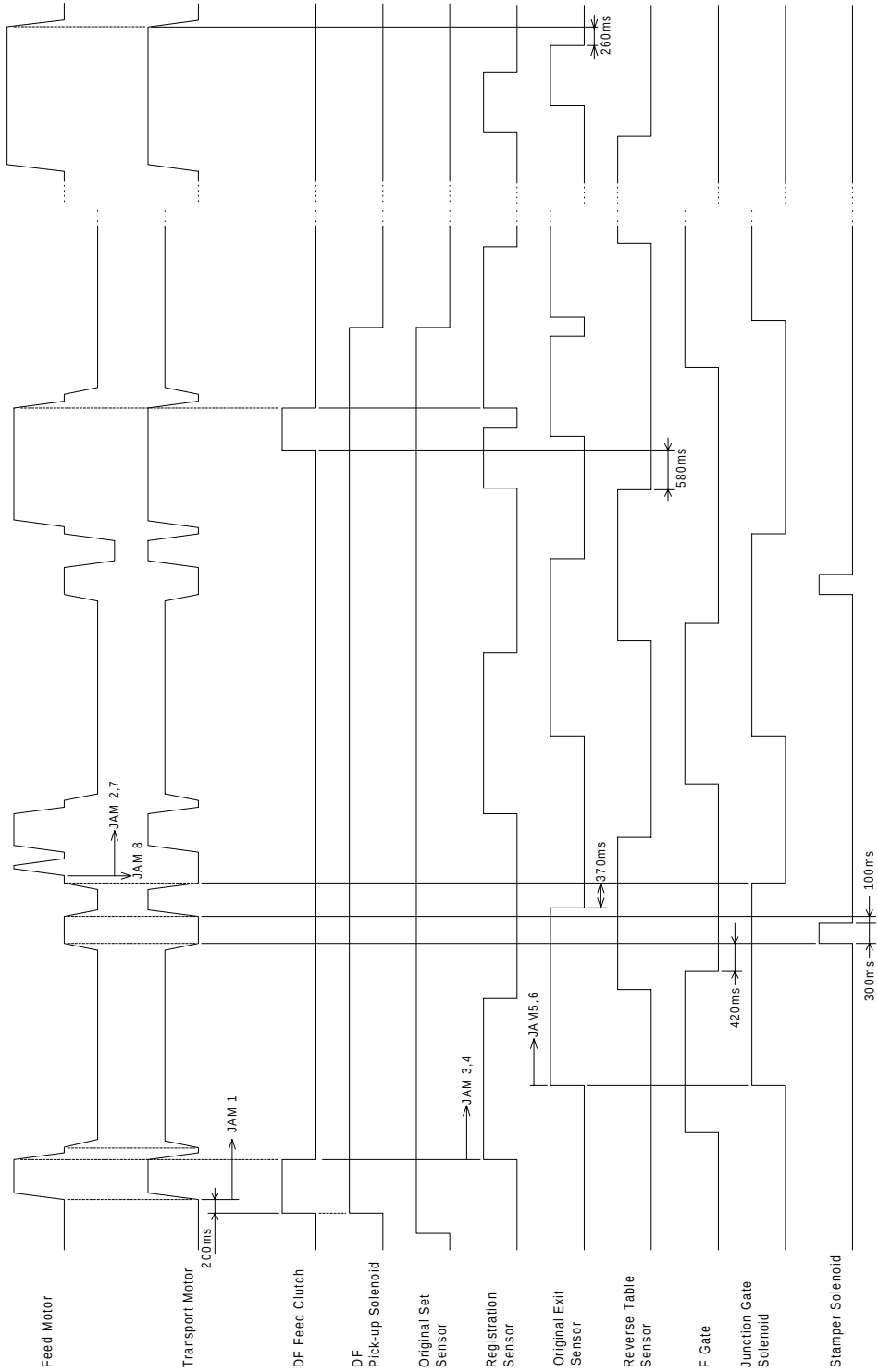
The signal, F Gate goes high when the laser starts to write a page to the drum.

2.5.3 LT Sideways (Double-sided Original Mode)



Jam conditions: Refer to Section 2.6 for details.
The signal, F Gate goes high when the laser starts to write a page to the drum.

2.5.4 LT Sideways-Stamper Mode (Double-sided Original Mode)



Jam conditions: Refer to Section 2.6 for details.

The signal, F gate goes high when the laser starts to write a page to the drum.

2.6 JAM DETECTION

JAM 1: If the registration sensor does not turn on before the CPU judges that the original was fed 255 mm since the DF feed motor had turned on, when the original was fed from the original tray.

JAM 2: If the registration sensor does not turn on before the CPU judges that the original was fed 190 mm since the DF feed motor had turned on, when the original was fed from the reverse tray.

JAM 3: If the registration sensor does not turn off before the CPU judges that the original was fed X1 mm since the registration sensor had turned on.

Standard sizes : $X1 = \text{Original Size} \times 1.4$

Non-standard sizes : $X1 = 1765$

JAM 4: If the original exit sensor does not turn on before the CPU judges that the original was fed 140 mm since the registration sensor had turned on.

JAM 5: If the original exit sensor does not turn off before the CPU judges that the original was fed X1 mm since the original exit sensor had turned on.

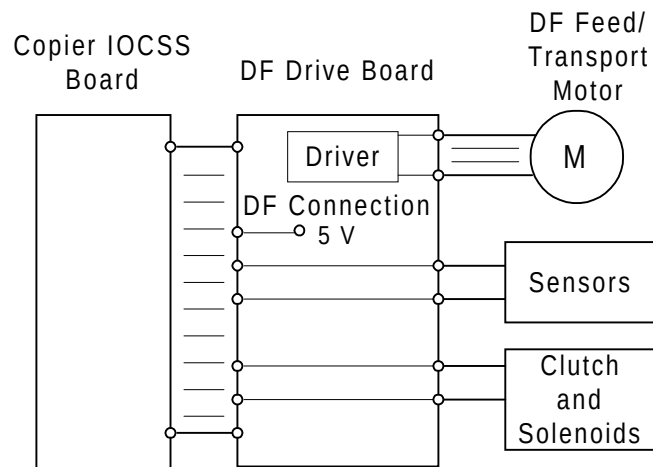
JAM 6: If the reverse table sensor does not turn on before the CPU judges that the original was fed 180 mm since the original exit sensor had turned on.

JAM 7: If the reverse table sensor does not turn off before the CPU judges that the original was fed X2 mm since the DF feed motor had turned on again.

$X2 = \text{Original Size} \times 1.4$

JAM 8: If the reverse table sensor is off when the DF feed motor turns on again.

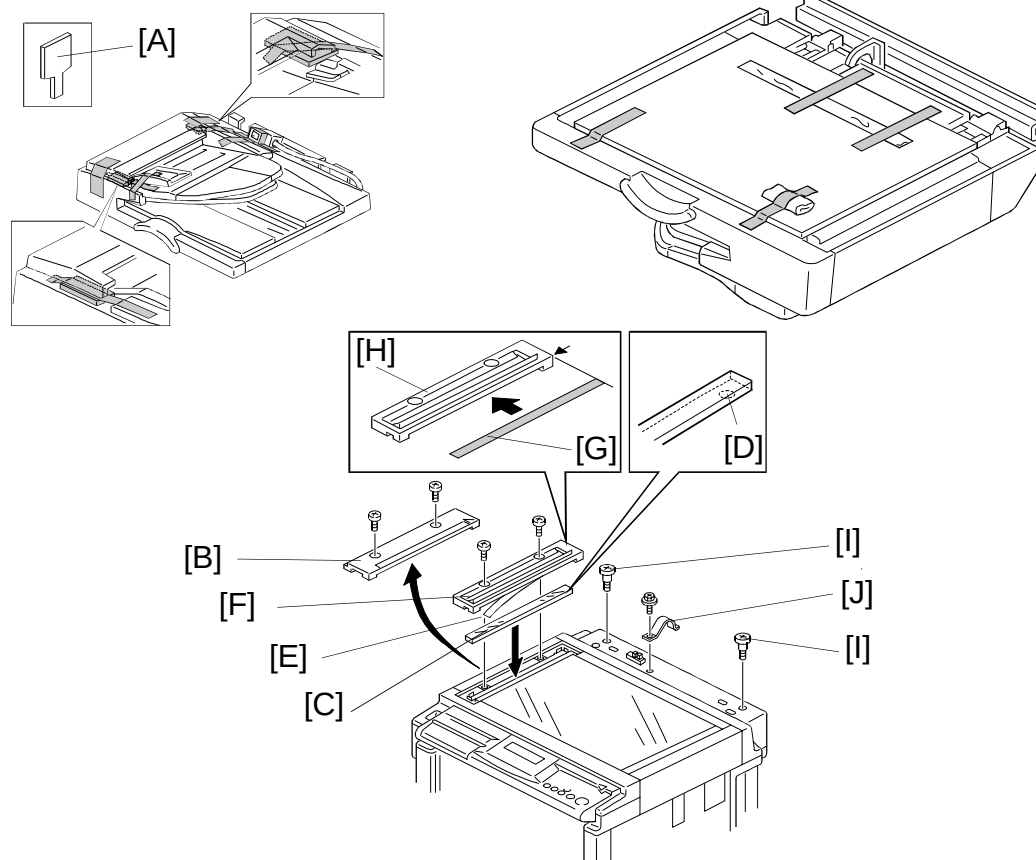
2.7 OVERALL ELECTRICAL CIRCUIT



The DF pick-up solenoid, junction gate solenoid, stamper solenoid, and DF feed clutch are directly controlled by the copier through the DF drive board. The sensor signals are sent directly to the copier through the DF drive board. The DF drive board has a driver for the DF feed and transport motors and their drive signals are sent from the copier.

When the DF connector is connected to the copier IOCSS board, the DF connection signal to the copier will go to 5 V. Then, the copier will detect that the ARDF is connected.

3. INSTALLATION



⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

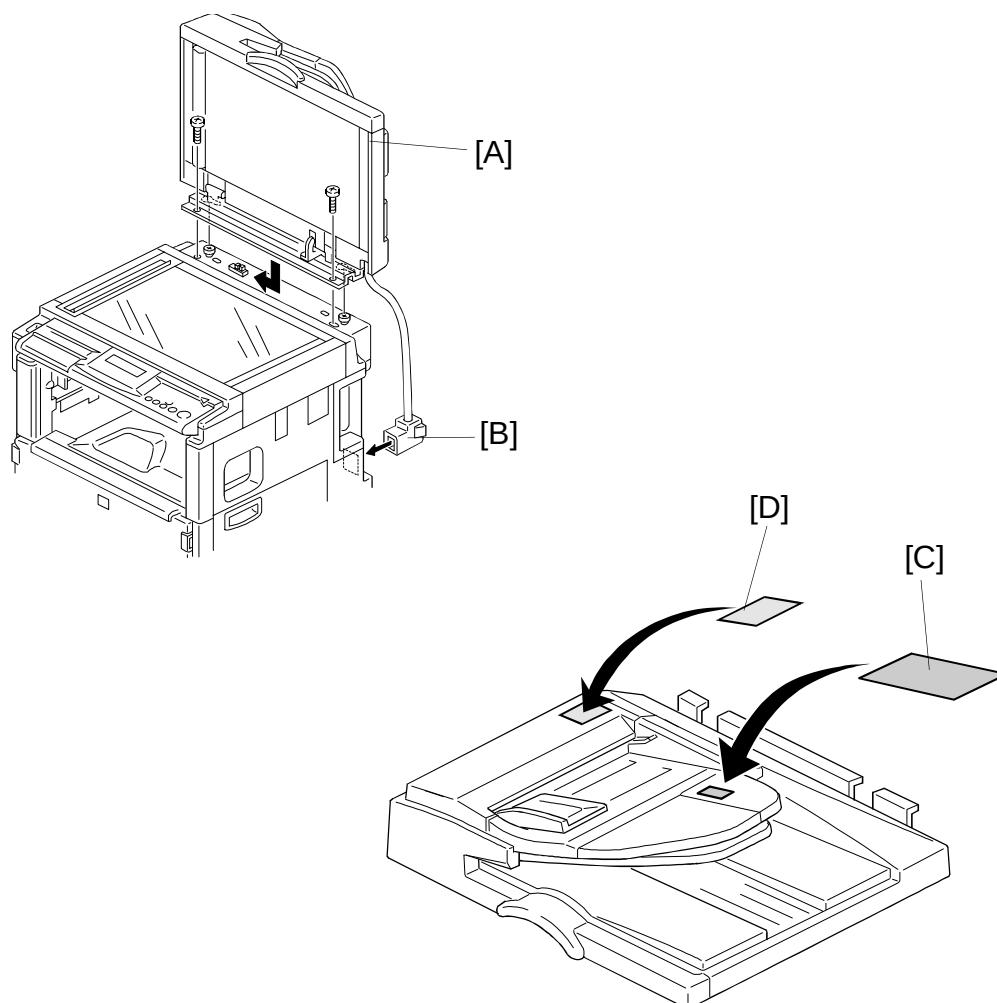
NOTE: When installing the DF, use the tool [A] in the accessory bag or a usual screw driver.

1. Unplug the document feeder. Then, remove all tapes.
2. Remove the left scale [B] (2 screws).
3. Place the DF exposure glass [C] on the glass holder. The white mark [D] must be at the rear side facing down.
4. Peel off the backing [E] of the double side tape attached to the rear side of the scale guide [F], then install the scale guide (2 screws removed in step 2).
5. Affix the original size decal [G] on the scale guide.

NOTE: Place the decal along the rear edge, and the left side of the decal is flush with the scale paper guide [H], as shown.
6. Install the stud screws [I] and the grounding plate [J] for the DF on the copier.

Auto Reverse
Document
Feeder A661

INSTALLATION



7. Install the DF unit [A].
8. Slide the DF to the left, then secure the DF unit with 2 screws (M4 x 10).
9. Connect the I/F harness [B] to the copier.
10. Affix the original direction decal [C] on the DF table as shown.
11. Affix the glass cleaning decal [D] on the DF cover as shown, if necessary.
12. Turn the ac and main switches on. Then, ensure that the document feeder operates properly.

If the serial number of the base machine is A7626110001 or higher, the ARDF installation is completed. It is not necessary to perform the procedure listed below.

If the serial number is lower than A7626110001, continue with the installation procedure below.

The main ROM on the BICU board **MUST** be upgraded. Ricoh had previously shipped to each dealer one (1) set of the upgrade ROM's (revision "G") and one (1) EPROM PCB for use during the upgrade procedure. If the EPROM PCB or the upgraded ROM's are not available, both items can be purchased through normal channels.

To determine the revision level of the Main ROM, print a copy of the System Parameter and Data List; Log Data.

1. Enter the Service Program Mode as described on page 4-4 of the service manual.
2. Select the SP Mode 5-992, option 3 and print a copy of the System Parameter and Data List; Log data. Refer to the procedure listed on page 4-39 of the service manual. There will be an approximate 35 second delay before the list is printed.

If the revision of the Main ROM is "G" (or higher), no further action is required.

3. Install the upgrade ROM's in the EPROM PCB and perform the Program Download procedure as described on page 4-41 of the service manual.

The time duration of the download procedure is approximately 2.25 minutes.

4. On the completion of the download procedure, print another copy of the System Parameter Data List; Log data to confirm the Main ROM revision. Refer to the procedure listed above. Note that the ROM upgrade added another selection (4: All) to System Parameter Data List Menu.

If the revision of the Main Rom is not "G", repeat the download procedure listed above.

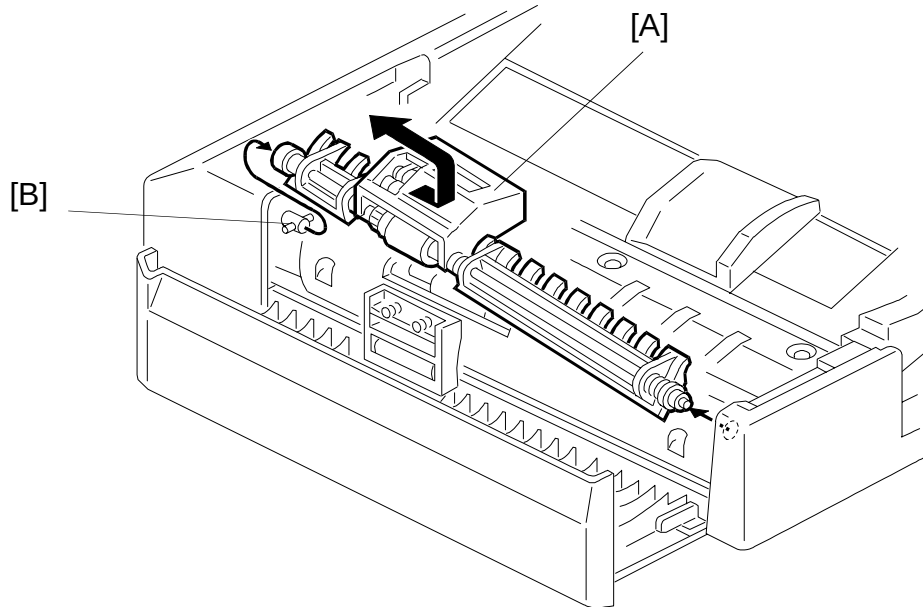
5. Test the ARDF unit to ensure that the document feeder operates properly.

4. PREVENTIVE MAINTENANCE

	EM	60K	120K	185K	240K	NOTE
AUTO REVERSE DOCUMENT FEEDER (for originals)						
Transport Belt	C	R	R	R	R	Alcohol
Separation Roller	C	R	R	R	R	Alcohol
Pick-up Roller	C	R	R	R	R	Alcohol
Stamper	I					Replace if necessary
White Plate	C					Alcohol
DF Exposure Glass	C					Alcohol
Platen Cover	C					Alcohol

5. REPLACEMENT AND ADJUSTMENT

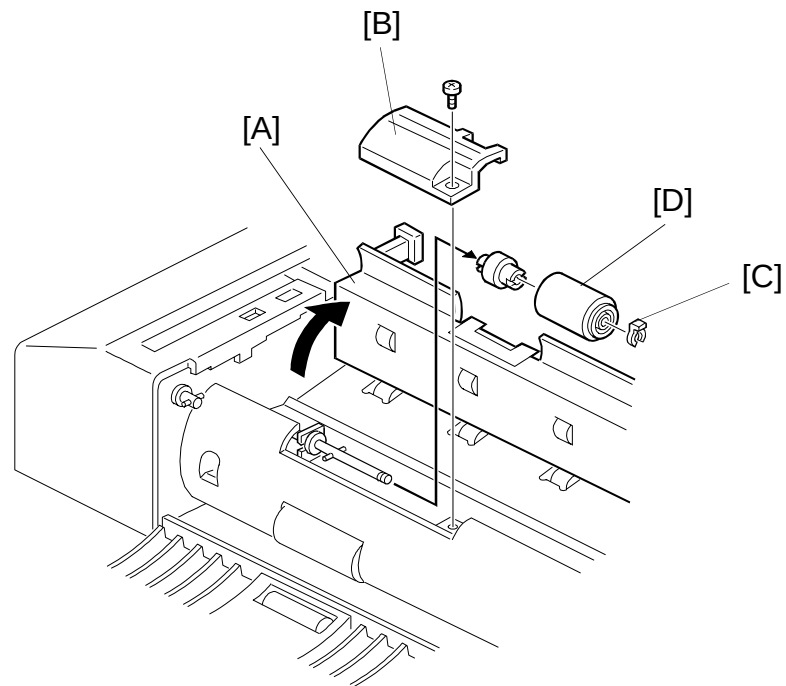
5.1 ORIGINAL FEED UNIT REMOVAL



1. Open the DF feed cover.
2. Push the original feed unit [A] to the front of the unit. Refer to the direction of the arrow.
3. Release the rear joint [B] of the original feed unit .
4. Remove the original feed unit.

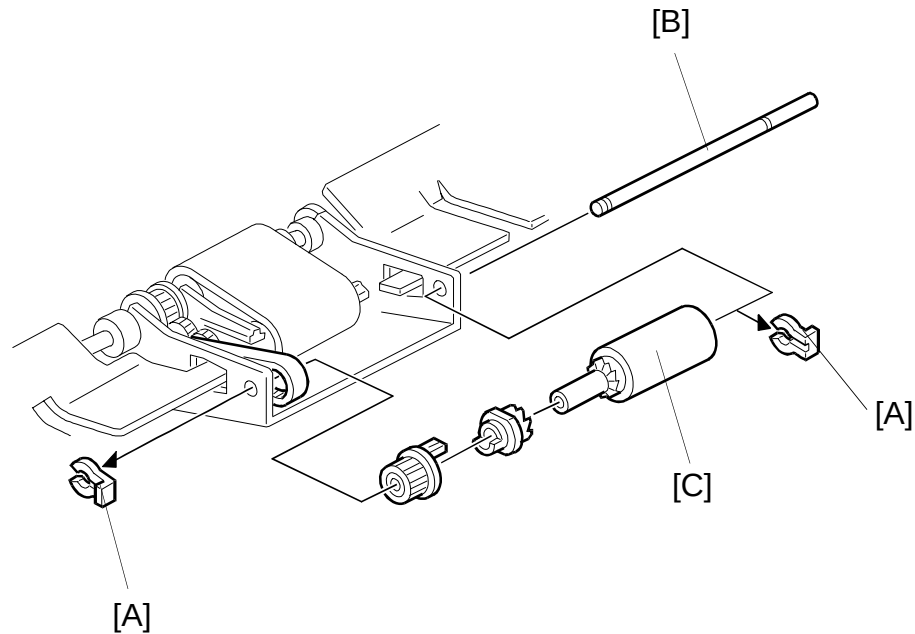
Auto Reverse
Document
Feeder A661

5.2 SEPARATION ROLLER REPLACEMENT



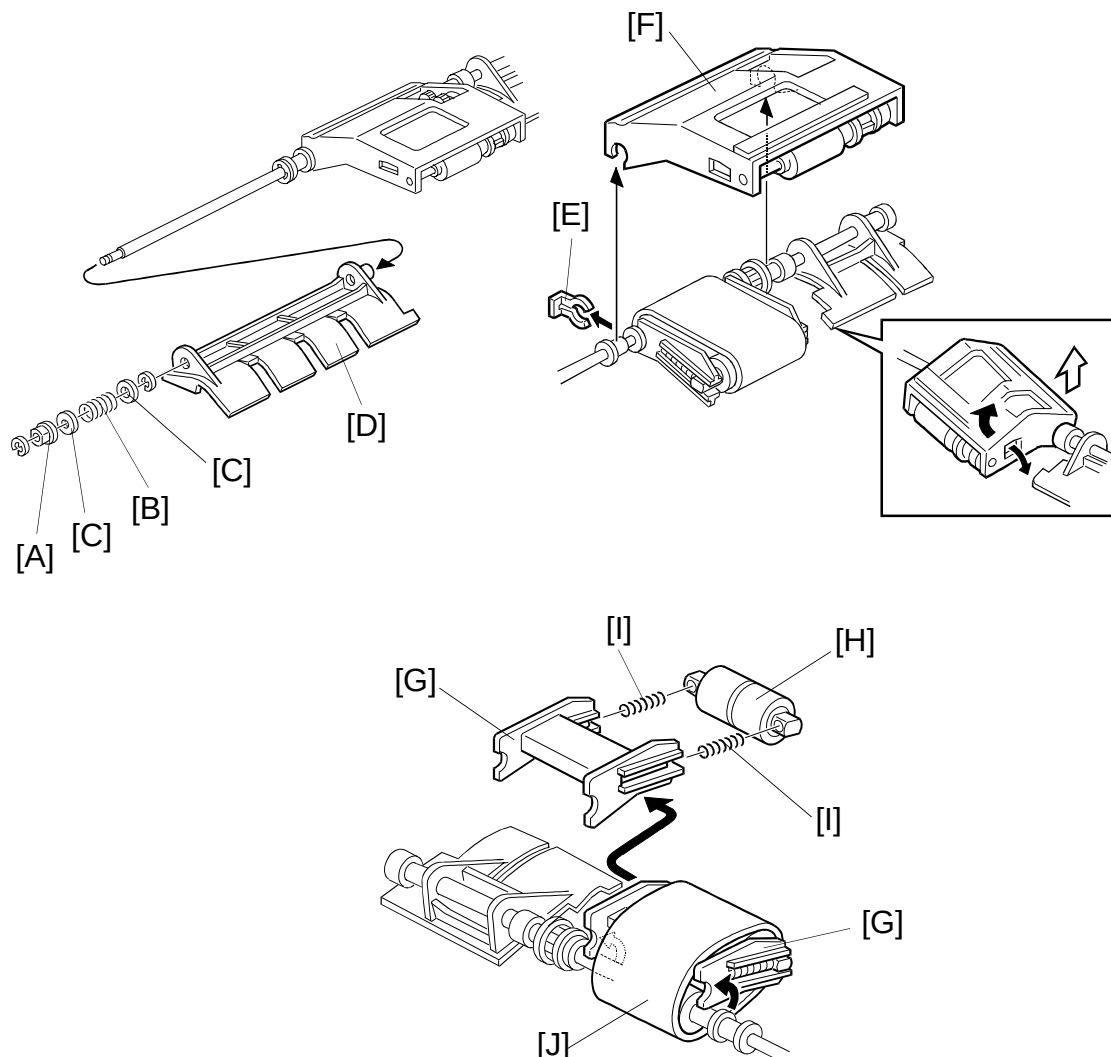
1. Remove the original feed unit.
2. Open the entrance guide [A].
3. Remove the support guide [B] (1 screw).
4. Remove the snap ring [C].
5. Replace the separation roller [D].

5.3 PICK-UP ROLLER REPLACEMENT



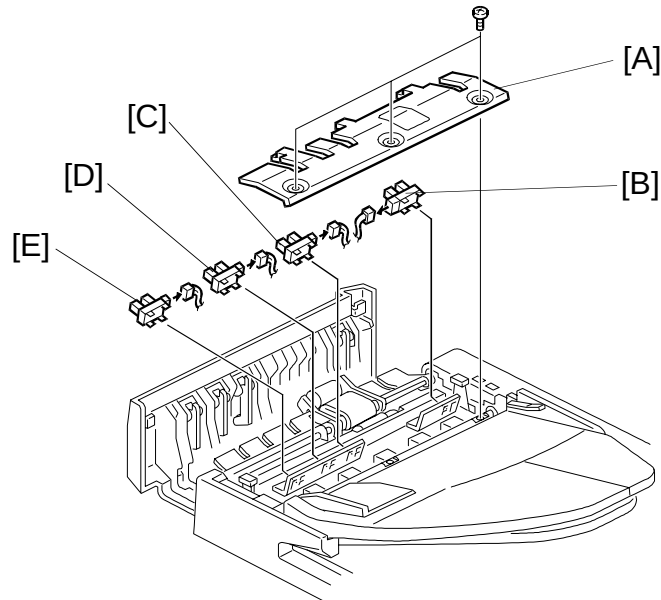
1. Remove the original feed unit.
2. Remove the two snap rings [A].
3. Pull out the pick-up roller shaft [B].
4. Replace the pick-up roller [C].

5.4 FEED BELT REPLACEMENT



1. Remove the original feed unit.
2. Remove the front bushing [A], spring [B], and washers [C] (2 E-ring).
3. Remove the original guide [D] (1 E-ring).
4. Remove the snap ring [E] and the pick-up roller unit [F].
5. Release the idle roller holder [G] from the drive roller shaft.
6. Remove the idle roller [H], idle roller holder [G], and 2 springs [I].
7. Replace the feed belt [J].

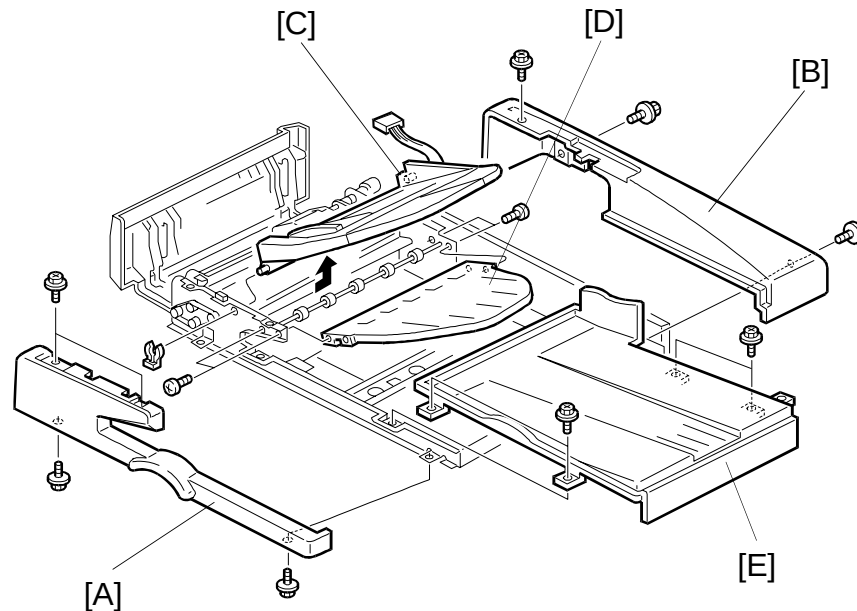
5.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT



1. Open the DF feed cover.
2. Remove the entrance guide [A] (3 screws).
3. Replace the following sensors.
 - Original Set Sensor [B]
 - Original Width Sensor 1 [C]
 - Original Width Sensor 2 [D]
 - Original Width Sensor 3 [E]

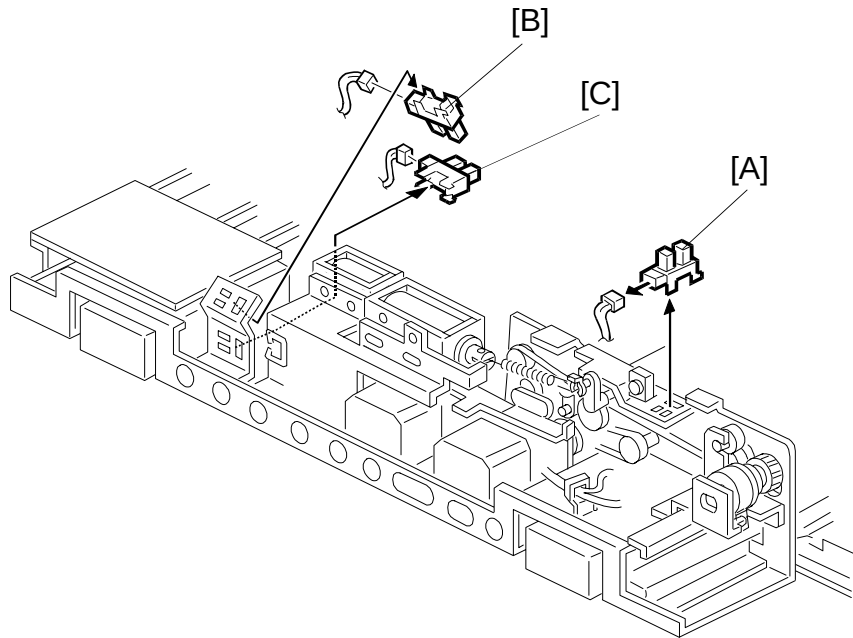
Auto Reverse
Document
Feeder A661

5.6 DF COVER REMOVAL



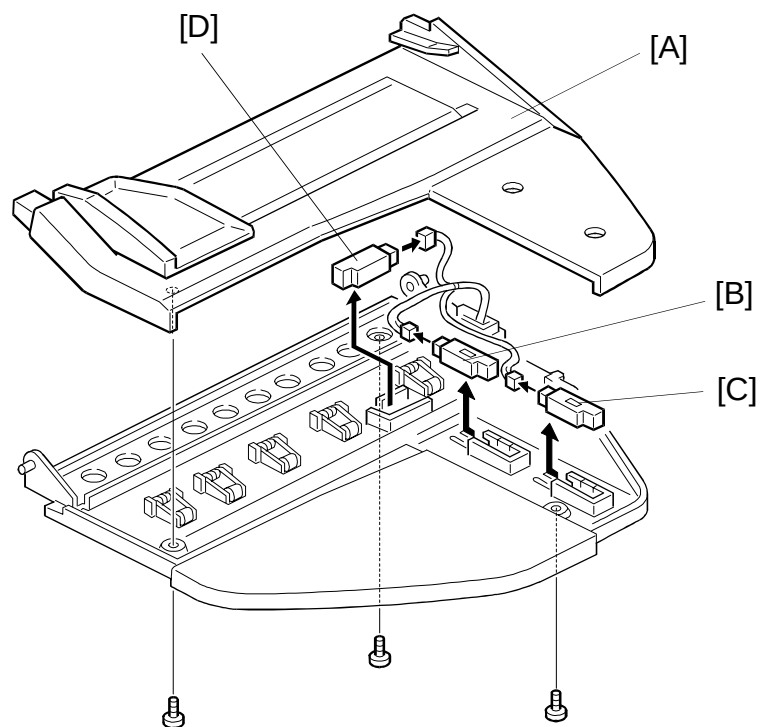
1. Open the DF feed cover.
2. Remove the front cover [A] (3 screws).
Remove the rear cover [B] (3 screws).
3. Remove the reverse table [D] (4 screws).
Remove the original table [C] (1 snap ring, 1 connector).
Remove the original exit table [E] (4 screws).

5.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT



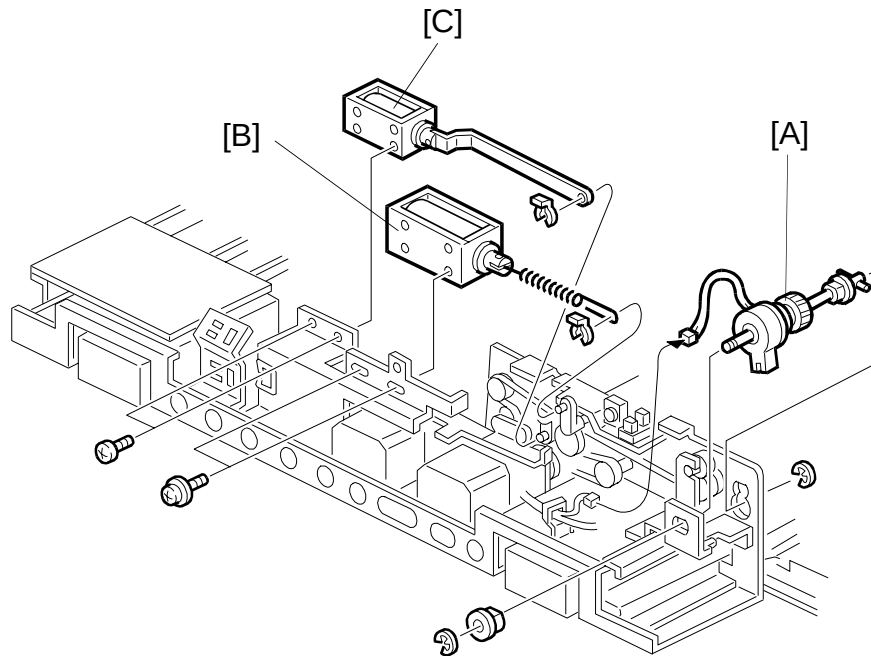
1. Remove the rear cover.
2. Replace the following sensors.
 - DF Feed Cover Open Sensor [A].
 - DF Position Sensor [B].
 - APS Start Sensor [C].

5.8 ORIGINAL LENGTH SENSOR REPLACEMENT



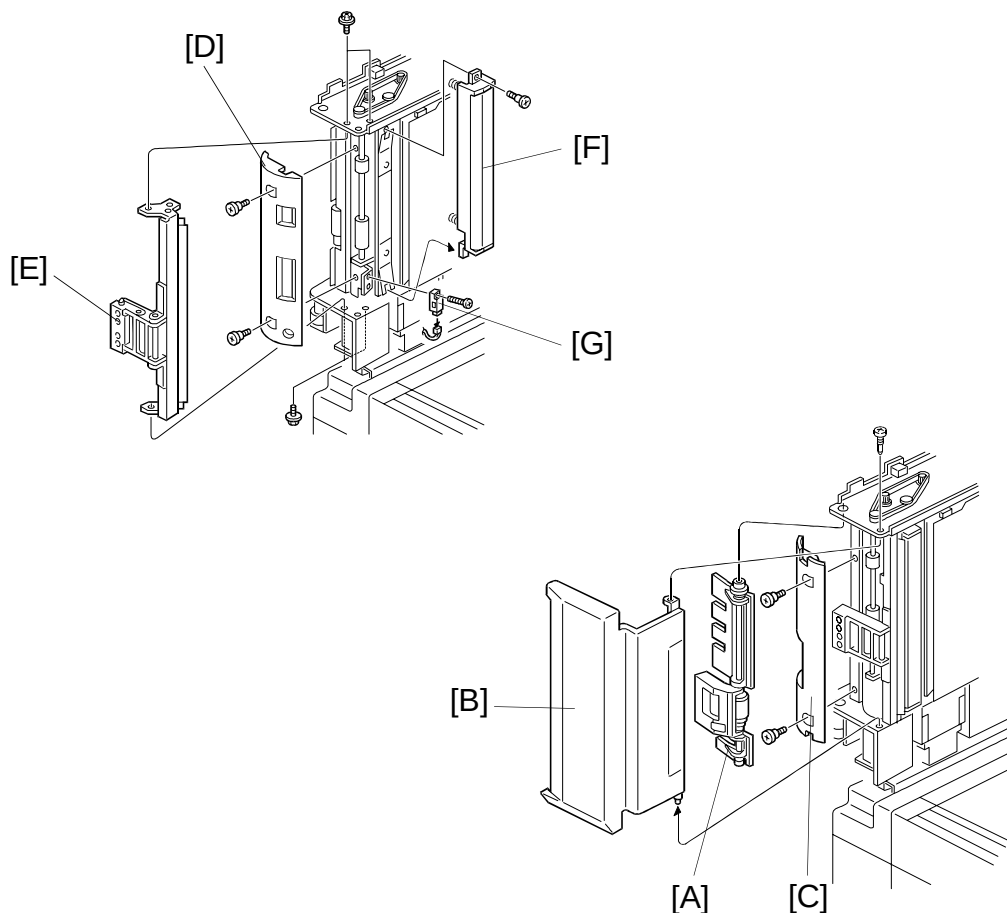
1. Remove the original table.
2. Remove the original guide [A] (3 screws).
3. Replace the following sensors.
 - Original Length Sensor 1 [B]
 - Original Length Sensor 2 [C]
 - Reverse Table Sensor [D]

5.9 DF FEED CLUTCH, DF PICK-UP SOLENOID, AND JUNCITON SOLENOID GATE REPLACEMENT



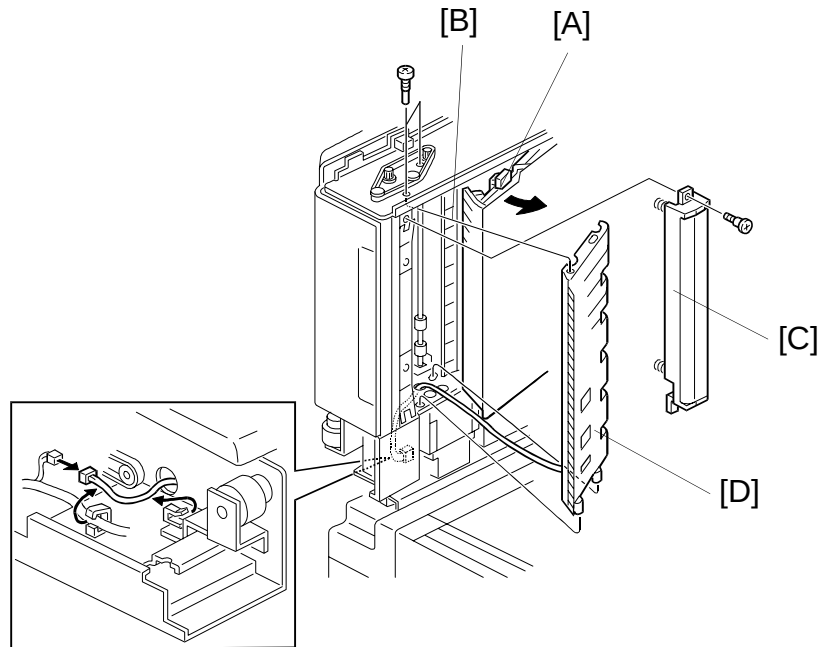
1. Remove the rear cover.
2. Replace the following clutch and solenoids.
 - DF Feed Clutch [A] (2 E-rings, 1 connector)
 - DF Pick-up Solenoid [B] (2 screws, 1 snap ring, 1 connector)
 - Junction Gate Solenoid [C] (2 screws, 1 snap ring, 1 connector)

5.10 REGISTRATION SENSOR REPLACEMENT



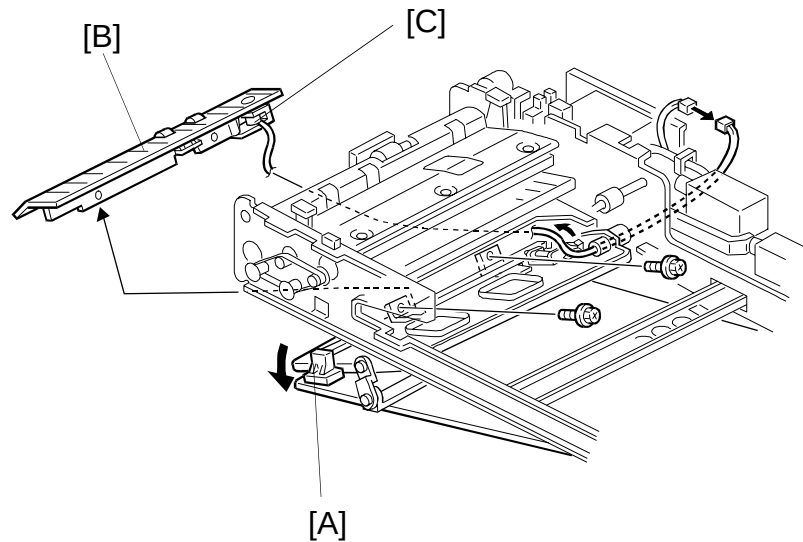
1. Remove the front and rear cover.
2. Remove the original feed unit [A].
3. Remove the DF feed cover [B] (1 screw).
4. Remove the upper transport guide [C] (2 screws).
5. Remove the lower transport guide [D] (2 screws).
6. Remove the idle roller unit [E] (4 screws).
7. Remove the original exposure guide [F] (1 screw).
8. Replace the registration sensor [G] (1 screw, 1 connector).

5.11 ORIGINAL EXIT SENSOR REPLACEMENT



1. Remove the front and rear cover.
2. Release the lever [A] and open the original guide [B].
3. Remove the original exposure guide [C] (1 screw).
4. Remove the upper original guide [D] (4 screws, 1 connector).
5. Replace the original exit sensor from the upper original guide (1 screw, 1 connector).

5.12 STAMPER SOLENOID REPLACEMENT



1. Remove the front cover, rear cover, original table, reverse table, and original exit tray.
2. Release the lever and open the original guide [A].
3. Remove the lower original guide [B] (2 screws).
4. Replace the stamper solenoid [C] (1 screws, 1 connector).

SECTION 12

FINISHER

SR210 (A666)

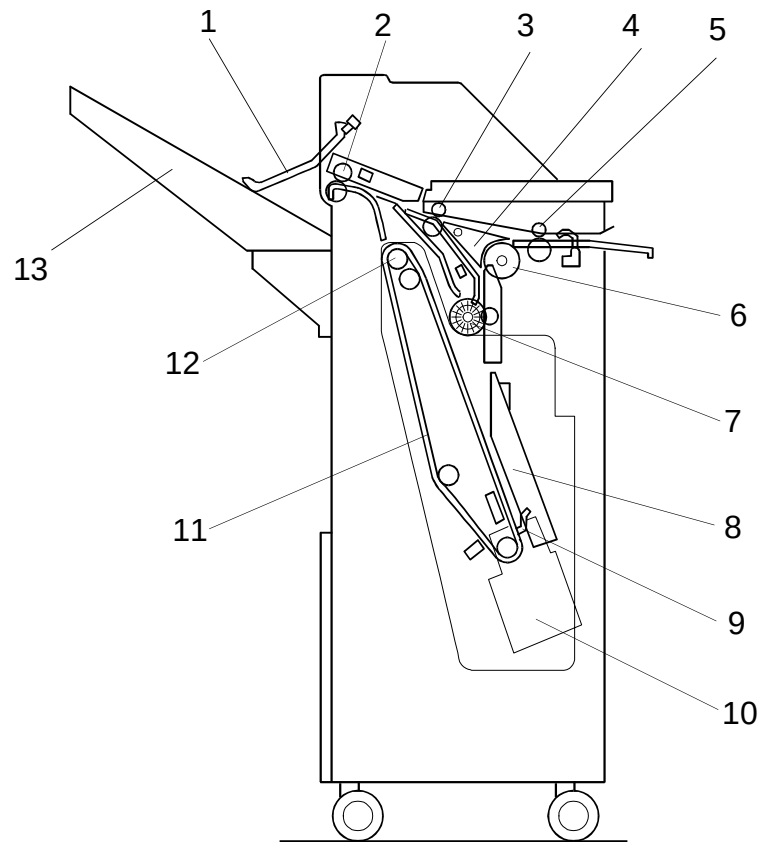
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Paper Size:	Standard copying/Stack mode Maximum: 11" x 17"/A3 Minimum: 5 1/2" x 8 1/2" (lengthwise)/A6 (lengthwise) Staple Mode 11" x 8 1/2" (sideways)/A4 (sideways)
Paper Weight:	Standard copying/Stack mode 14 lb. ~ 42 lb. /52 g/m ² ~ 157 g/m ² (face-up mode) 17 lb. ~ 28 lb. /64 g/m ² ~ 105 g/m ² (face-down mode) Staple Mode 17 lb. ~ 21 lb. /64g/m ² ~ 80g/m ²
Paper Capacity:	Standard copying/Stack mode 250 sheets (face-up mode) 1000 sheets : 8 1/2" x 11"/A4 or smaller (21 lb. / 80g/m ²)(face-down mode) 500 sheets : 8 1/2" x 14"/B4 or smaller (21 lb. /80g/m ²) (face-down mode) Staple Mode 30 sets (80 g/m, 20 pages per set)
Stapler Capacity:	2 to 20 sheets (21 lb. /80g/m ²)
Staple Position:	1 position (Oblique)
Staple Replenishment:	Cartridge exchange (2,000 staples/cartridge)
Power Source:	DC 24V, DC 5V (from the copier)
Power Consumption:	60W
Weight:	28 kg
Size:	520 x 550 x 750 mm

Finisher
SR210 (A666)

1.2 MECHANICAL COMPONENT LAYOUT



1. Stack Height Sensor Feeler

2. Exit Roller

3. Transport Roller

4. Junction Gate

5. Entrance Roller

6. Turn Roller

7. Alignment Roller

8. Jogger Unit Guide

9. Stack Stopper

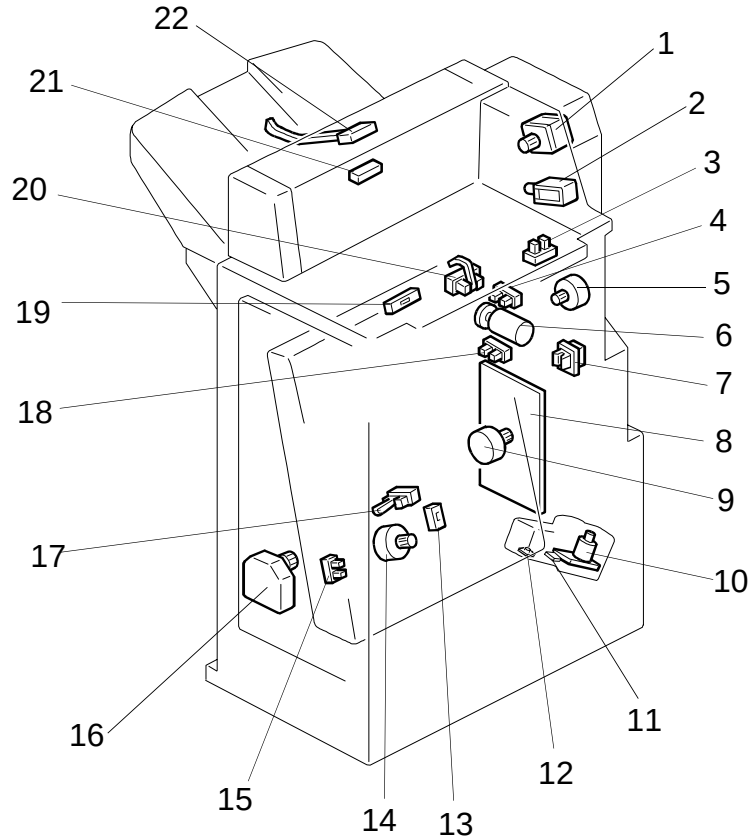
10. Stapler Unit

11. Feed-out Belt

12. Feed-out Roller Belt Drive

13. Shift Tray

1.3 ELECTRICAL COMPONENT LAYOUT



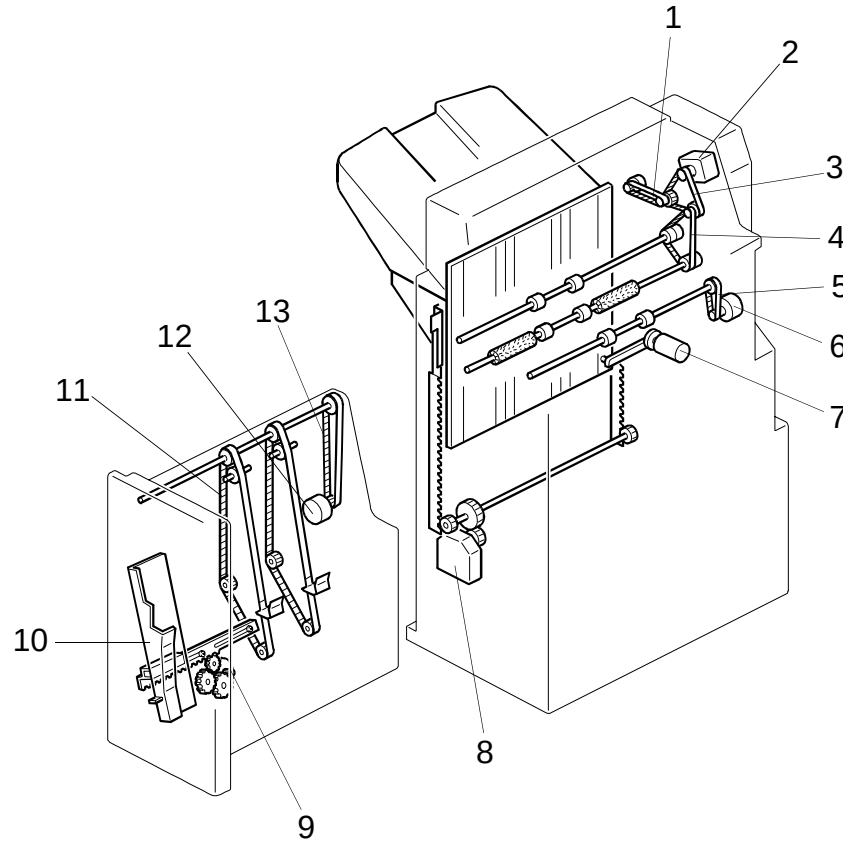
1. Transport Motor	12. Staple End Switch
2. Junction Gate Solenoid	13. Jogger Unit Paper Sensor
3. Upper Cover Open Sensor	14. Jogger Motor
4. Shift Tray Position Sensor	15. Jogger HP Sensor
5. Entrance Motor	16. Shift Tray Lift Motor
6. Shift Motor	17. Feed-out Belt HP Sensor
7. Jogger Unit Set Switch	18. Shift Tray Lower Limit Sensor
8. Finisher Drive Board	19. Inverter Sensor
9. Feed-out Motor	20. Entrance Sensor
10. Staple Motor	21. Exit Sensor
11. Staple Hammer HP Switch	22. Stack Height Sensor

Finisher
SR210 (A666)

1.4 ELECTRICAL COMPONENT DESCRIPTION

ID#	Symbol Name	Function	Index No.
Motors			
1	M1	Transport	Drives the transport rollers and the exit roller.
16	M2	Shift Tray Lift	Moves the shift tray up or down.
9	M3	Feed-out	Drives the feed-out belt.
14	M4	Jogger	Moves the jogger fence.
5	M5	Entrance	Drives the entrance roller.
6	M6	Shift	Moves the shift tray forward or rearward
10	M7	Staple	Drives the staple hammer.
Sensors			
20	S1	Entrance	Detects the copy paper entering the finisher and is used to detect misfeeds.
19	S2	Inverter	Detects the trailing edge of the paper to change the rotation direction of the transport motor
13	S3	Jogger Unit Paper	Detects the paper in the jogger unit and is used to detect misfeeds.
21	S4	Exit	Detects misfeeds in the exit area.
17	S5	Feed-out Belt HP	Detects the home position of the feed-out belt.
15	S6	Jogger HP	Detects the jogger home position.
18	S7	Shift Tray Lower Limit	Detects the lower limit position of the shift tray.
4	S8	Shift Tray Position	Detects the stop position of the shift motor.
22	S9	Stack Height	Detects when the copy stack is proper height.
3	S10	Upper Cover Open	Detects when the upper cover is opened.
Switches			
7	SW1	Jogger Unit Set	Cuts the +24V power within the finisher when the jogger unit is pulled out.
12	SW2	Staple End	Detects when the staples have run out.
11	SW3	Staple Hammer HP	Detects the home position of the staple hammer.
Solenoid			
2	SOL1	Junction Gate	Drives the junction gate.
PCBs			
8	PCB1	Finisher Drive	Controls overall finisher operation.

1.5 DRIVE LAYOUT



1. Exit Roller Drive Belt

2. Transport Motor

3. Transport Drive Belt

4. Inverter Drive Belt

5. Entrance Drive Belt

6. Entrance Motor

7. Shift Motor

8. Shift Tray Lift Motor

9. Jogger Motor

10. Jogger Fence

11. Stack Feed Belts (2)

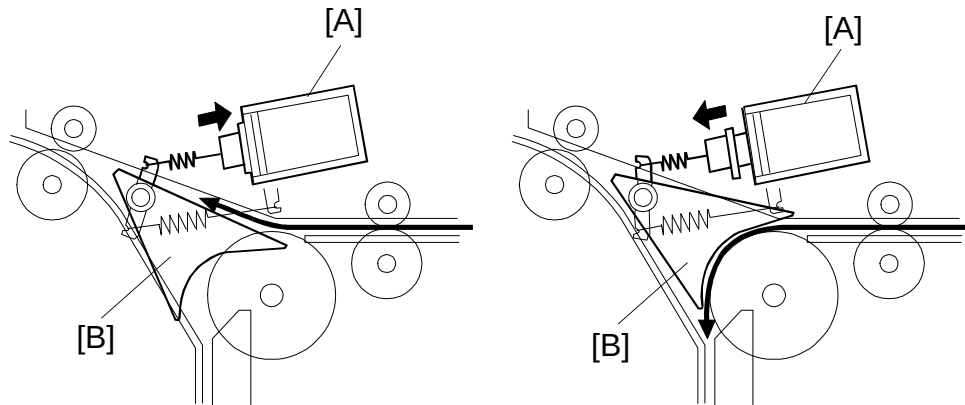
12. Feed-out Motor

13. Feed-out Drive Belt

Finisher
SR210 (A666)

2. DETAILED DESCRIPTIONS

2.1 JUNCTION GATE MECHANISM

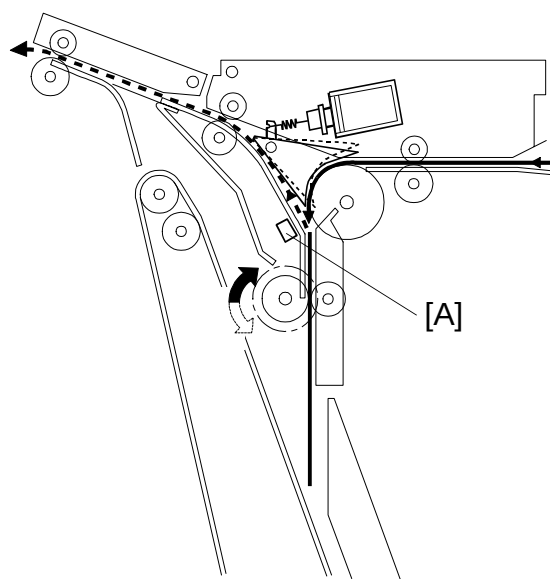


There are three (3) output modes of the finisher; the face-up, face-down and the staple mode. In the face-up mode, the paper is fed through the finisher and directly onto the shift tray (image up). In both the face-down mode and the staple mode, the paper is first fed downward into the finisher and then upward to the shift tray (image down).

In the face-up mode, when the entrance sensor (not shown) is activated, the paper will be transported directly onto the shift tray at its maximum speed of 180 mm/second.

In the face-up and staple modes, when the entrance sensor (not shown) is activated, the junction gate solenoid [A] will remain de-energized keeping the junction gate open. The paper will be transported downward into the finisher to the jogger unit.

2.2 PAPER REVERSING MECHANISM

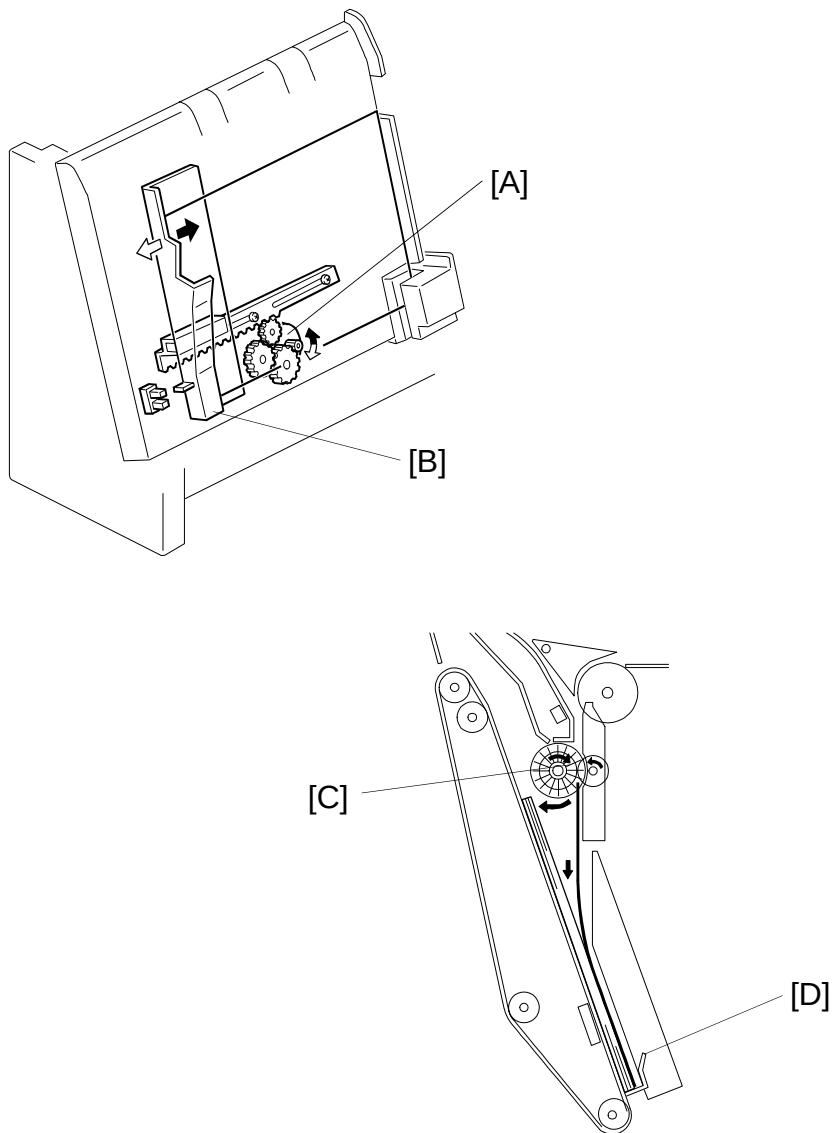


When the face-up mode is selected, the paper is sent downward into the finisher unit towards the staple unit. The paper is transported at 180mm/second until the trailing edge of the paper passes through the copier exit sensor (not shown). After the copier exit sensor is de-activated, the paper transport speed will be increased to 500 mm/second.

When the trailing edge of the paper passes through the inverter sensor [A], the transport motor will momentarily turn off. The transport motor will then turn on in the reverse direction to feed the paper upward to the shift tray (image down).

Finisher
SR210 (A666)

2.3 JOGGER UNIT PAPER POSITIONING MECHANISM

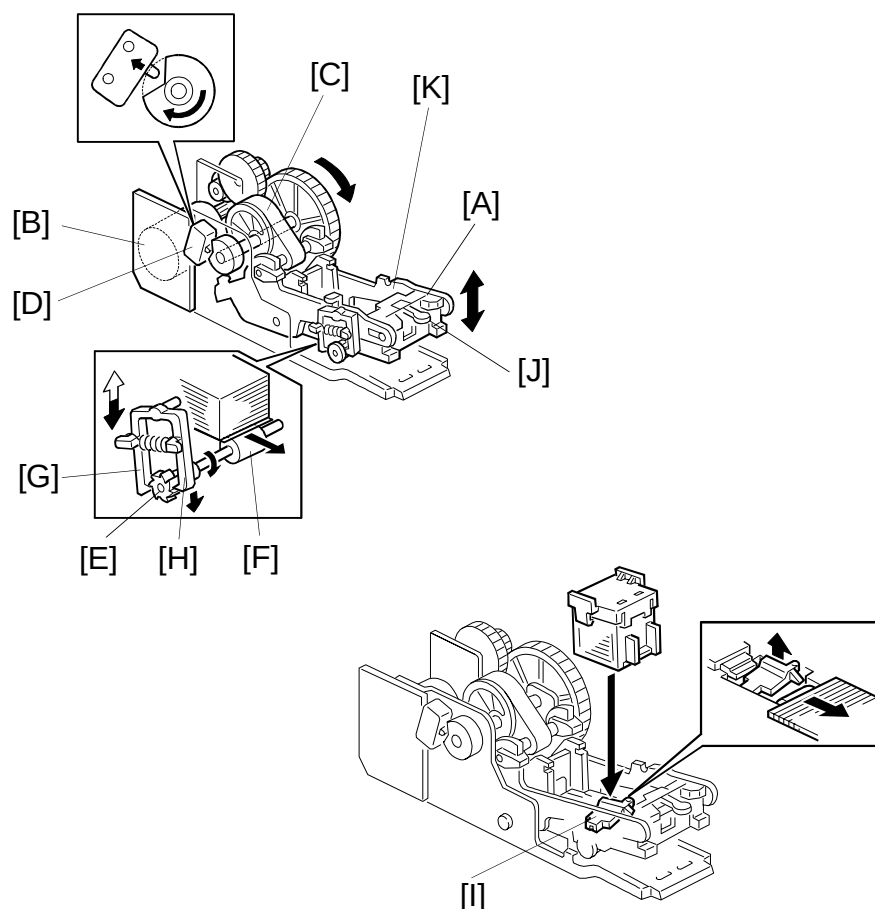


In the staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

For the horizontal alignment, the jogger motor [A] will turn on to move the front jogger fence [B] towards the stapler unit to align the copies.

For the vertical alignment, the brush roller [C] will push the trailing edge of the paper downward against the stack stoppers [D]. The start position of the stack stoppers depend on the paper size (LT or A4), and is changed by the feed-out motor.

2.4 STAPLER



The staple hammer [A] is driven by the stapler motor [B] via gears, the eccentric cam [C].

When the aligned copies are brought to the stapling position by the brush roller and jogger fence, the stapler motor [B] will turn on. When the cam [C] completes one rotation, the staple hammer home position switch [D] will open, detecting the end of the stapling operation. The staple motor will then turn off.

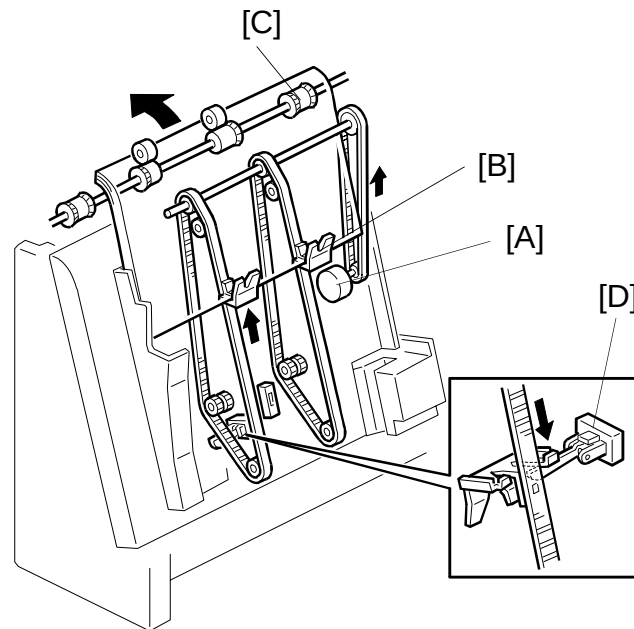
The feed gear [E] drives the staple feed roller [F] to feed a sheet of staples towards the staple hammer. The feed gear is driven by the long hook [G] when the hammer moves upward and by the short hook [H] when the hammer moves downward.

When there is only one sheet of staples left in the cartridge, the actuator [I] will move upward and the staple end switch will open.

When jammed staples are left in the staple unit, carefully release the blue latch [K] and lift the staple guide [J] to remove the jammed staples.

Finisher
SR210 (A666)

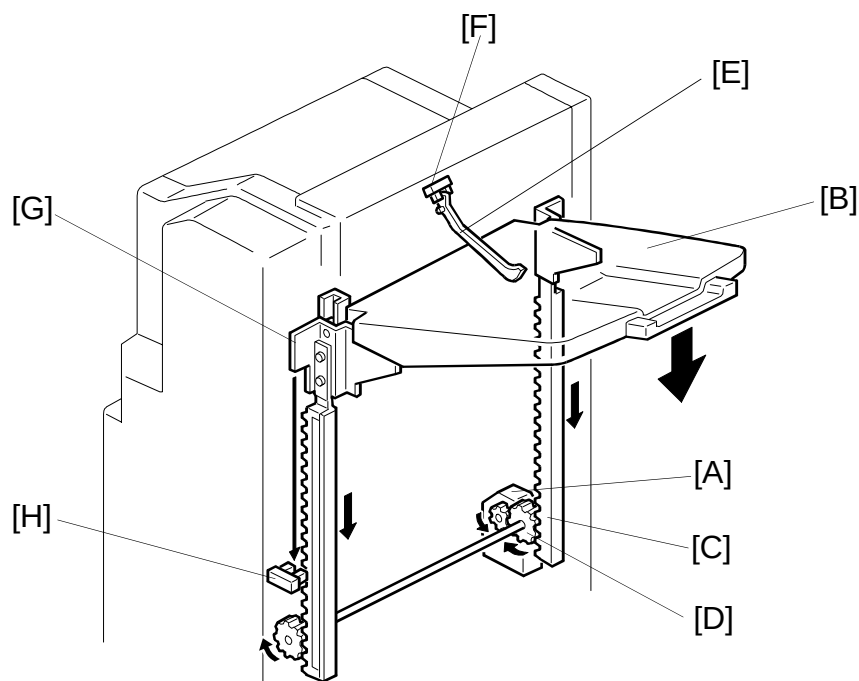
2.5 FEED OUT MECHANISM



After the copies have been stapled, the feed-out motor [A] will turn on to drive the feed out belts. The stack stoppers [B] on the feed-out belt transports the set of stapled copies upward, (speed 450 mm/s) and will feed the copies towards the shift tray. Approximately 500 ms after the feed-out motor had turned on, the motor will stop for 500 ms. At this moment, the exit roller [C] will catch the stapled copies to feed them out and onto the shift tray. Then, the feed-out motor will turn on again until the stack stopper activates the feed-out belt home position sensor [D].

The transport motor drives the brush roller and the exit roller [C] (speed 500 mm/s). The transport motor will turn on when the feed-out motor turns on, at the start of feed-out, to drive the brush roller. This will prevent the brush roller from disturbing the smooth upward passage of the leading edge of the copy set at the start of paper feed. After 200 ms, the transport motor will turn off and then turn on again in the reverse direction to feed out the set of stapled copies.

2.6 SHIFT TRAY UP/DOWN MECHANISM



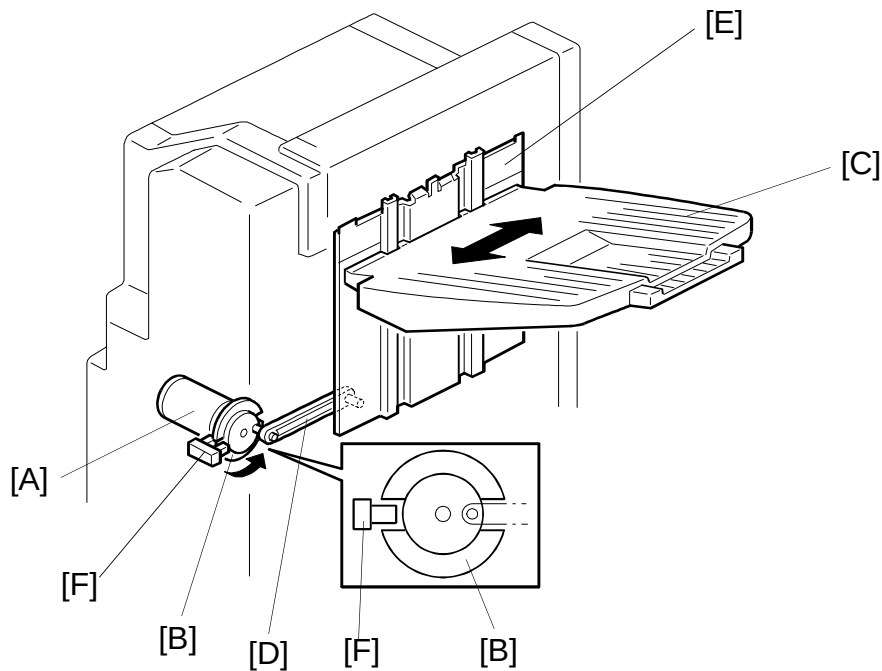
The shift tray lift motor [A] controls the vertical position of the shift tray [B] through the gears [C,D]. When the main switch is turned on, the tray is initialized at the upper position. The trays upper position is detected when the shift tray pushes up actuator feeler[E] until the actuator turns on the stack height sensor [F]. Then, the shift tray lift motor will turn in the reverse direction until the stack height sensor turns off.

During copying, the actuator feeler [E] will gradually rise as the copy stack grows. When the stack height sensor [F] turns on, the shift tray lift motor will lower the shift tray [B] until the sensor is turned off.

When the actuator [G] turns off the lower limit sensor [H], the copying process will stop. After the copying process ends, the machine had stopped and the copies are removed, the shift tray will rise until the stack height sensor [F] is turned on. Then, the shift tray lift motor will turn in the reverse direction until the stack height sensor turned off.

Finisher
SR210 (A666)

2.7 SHIFT TRAY SIDE-TO-SIDE MECHANISM

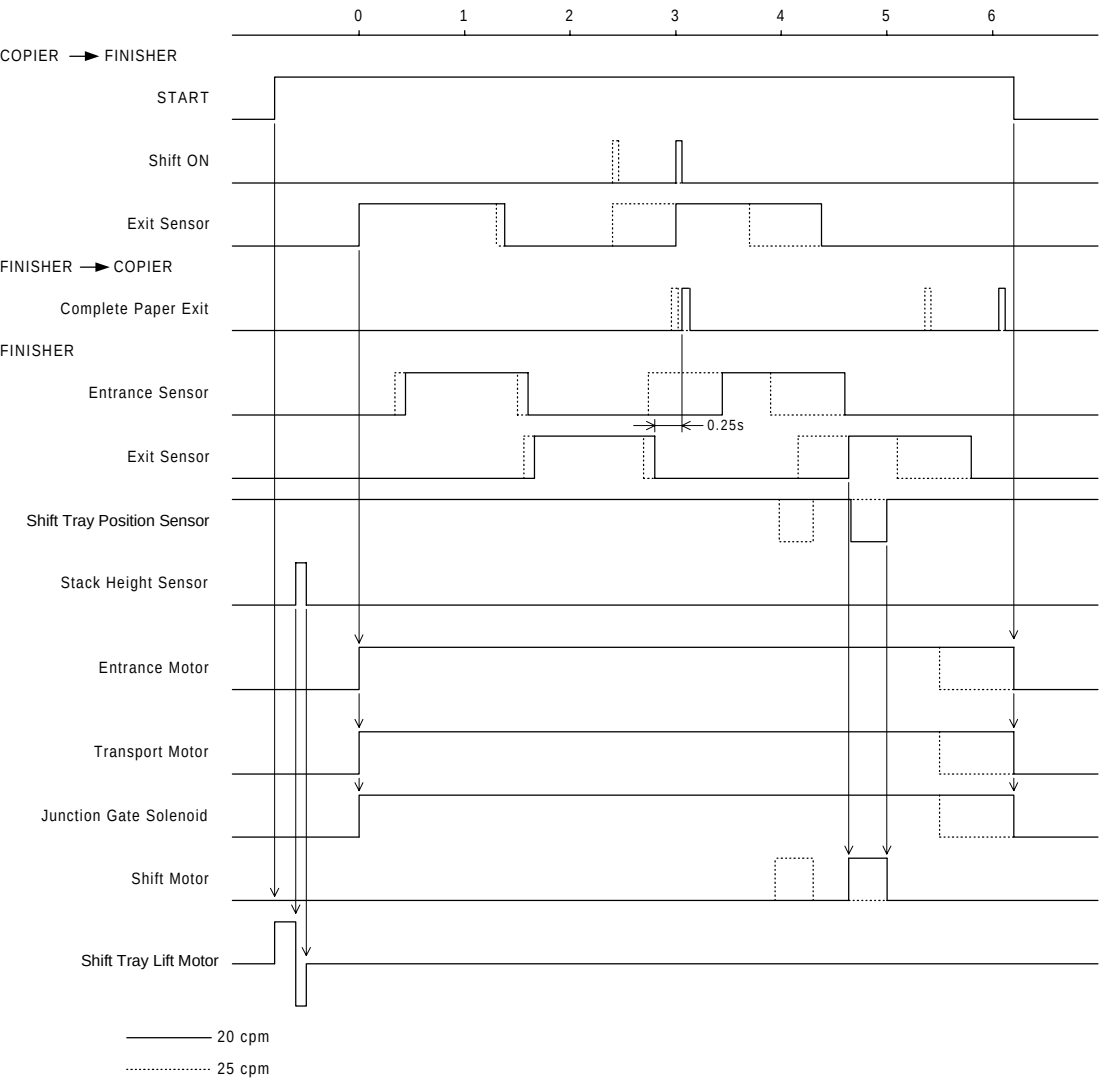


The horizontal position of the shift tray is controlled by the shift motor [A] and the shift motor disk [B]. After one set of originals is copied and delivered to the shift tray [C], the shift motor will turn on, driving the shift motor disk and the lever [D]. The shift tray base plate [E] is positioned by the lever, creating the side-to-side movement required to stagger the copies.

When the shift motor disk [B] has rotated 180 degrees (when the shift tray is fully shifted across), the cut-out in the shift motor disk will turn on the shift position sensor [F] and the shift motor [A] will stop. After the next set of copies is delivered, the motor will turn on, repeating the same process and moving the tray back to the previous position.

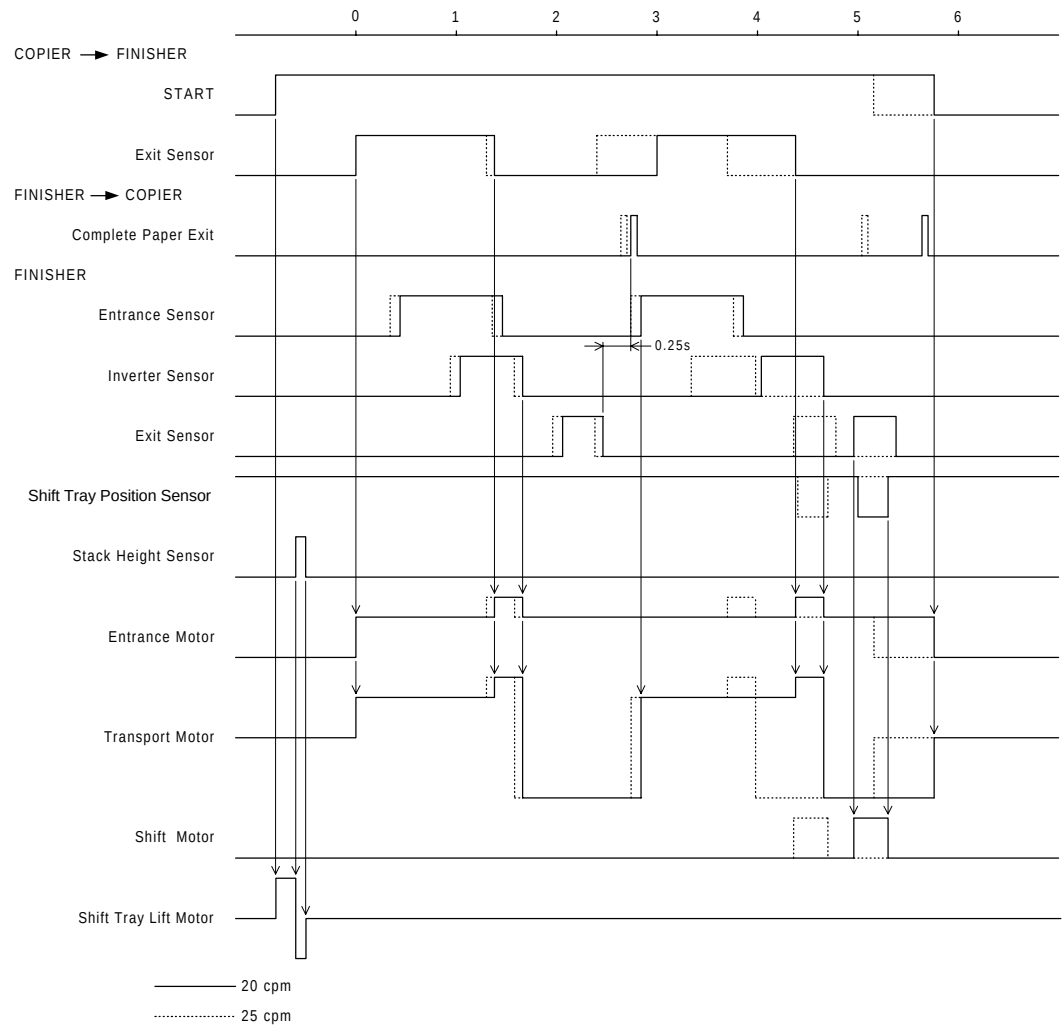
2.8 TIMING CHART

2.8.1 Face-up Mode (A4: 2 sheets)

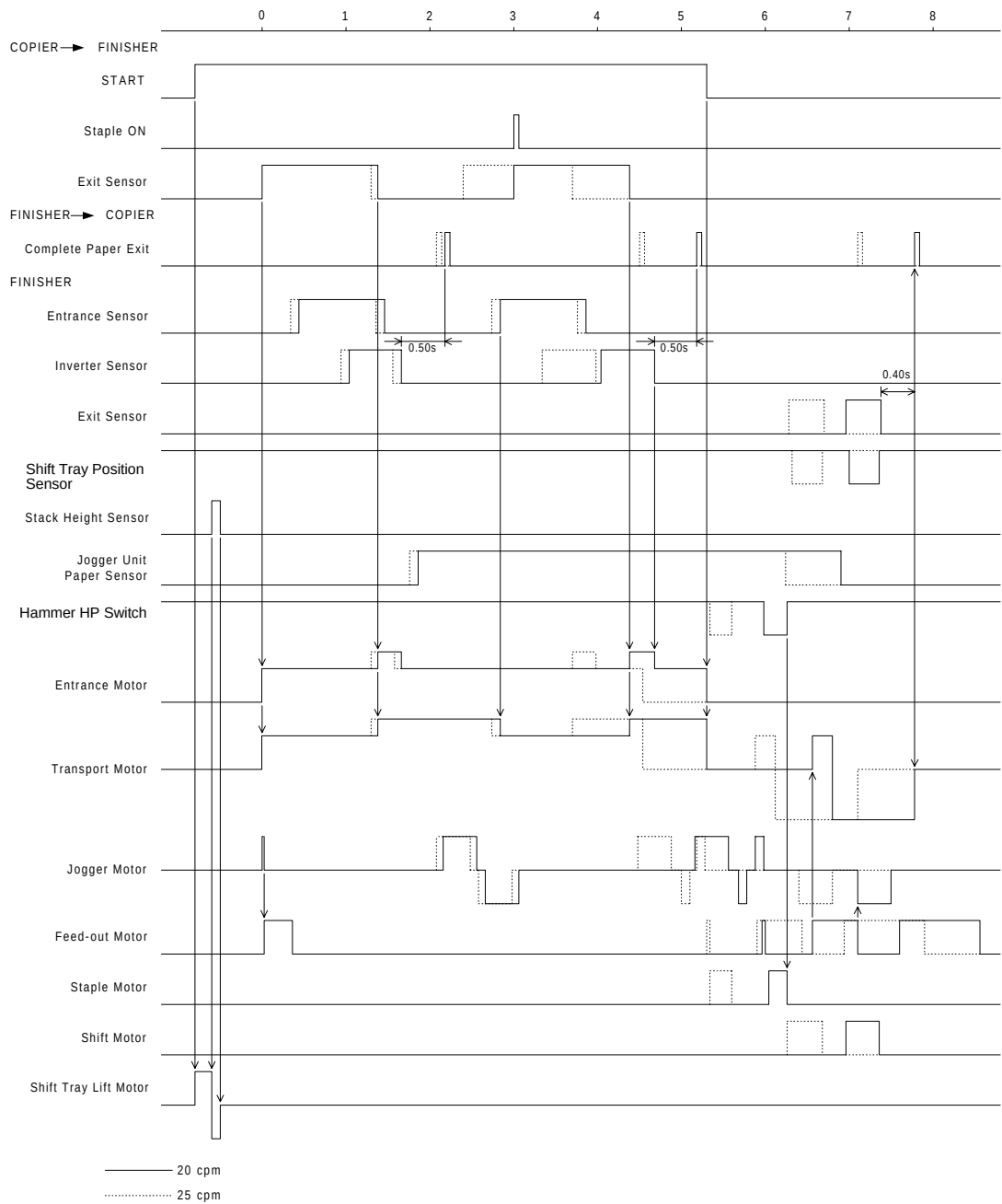


Finisher
SR210 (A666)

2.8.2 Face-down Mode (A4: 2 sheets)



2.8.3 Staple Mode (A4: 2 sheets)



Finisher
SR210 (A666)

2.8.4 Jam Detection

1. Face-up Mode

Jam 1: The entrance sensor stays on for 4.2 s.

Jam 2: The exit sensor stays off 3.5 s after the entrance sensor turns on.

Jam 3: The exit sensor stays on for 2.0 s.

2. Face-down Mode

Jam 1: The entrance sensor stays on for 4.2 s.

Jam 2: The inverter sensor stays off 1.5 s after the entrance sensor turns on.

Jam 3: The inverter sensor stays on for 4.2 s.

Jam 4: The exit sensor stays off 0.6 s after the inverter sensor turns off.

Jam 5: The exit sensor stays on for 1.2 s.

3. Staple Mode

Jam 1: The entrance sensor stays on for 2.5 s.

Jam 2: The inverter sensor stays off 1.5 s after the entrance sensor turns on.

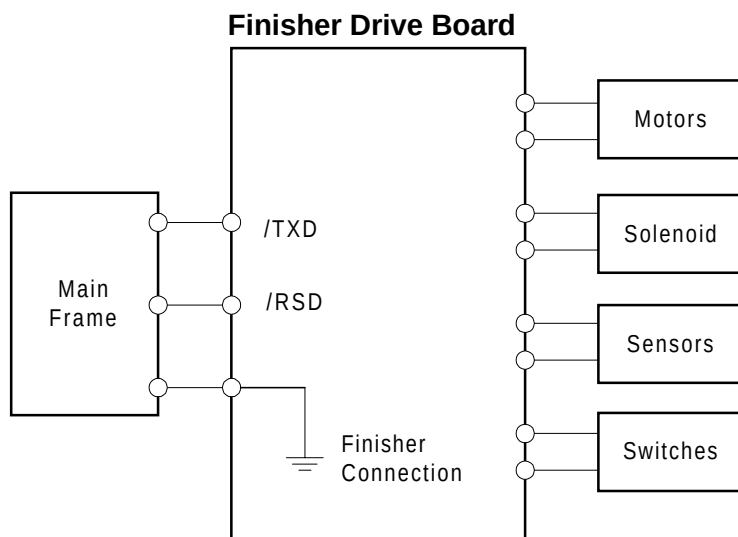
Jam 3: The inverter sensor stays on for 0.8 s.

Jam 4: The jogger unit paper sensor stays off 0.5 s after the inverter sensor turns off.

Jam 5: The exit sensor stays off 1.05 s after the feed-out motor turns on.

Jam 6: The exit sensor stays on for 0.85 s.

Staple Jam: The staple hammer HP switch stays off 0.48 s after the staple motor turns on.

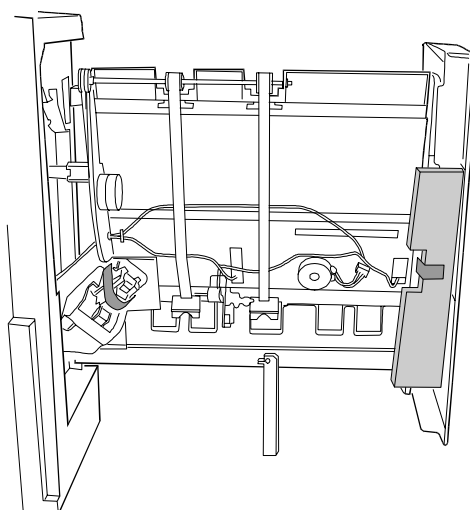
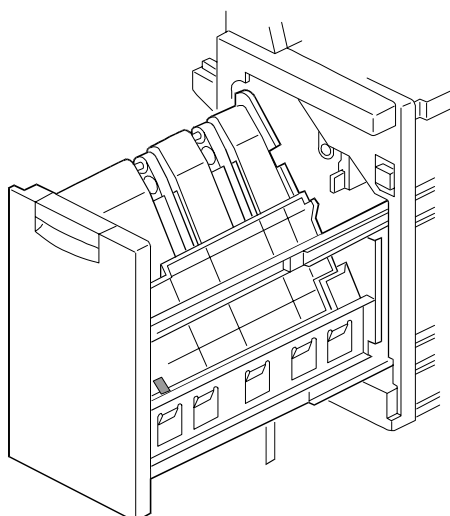
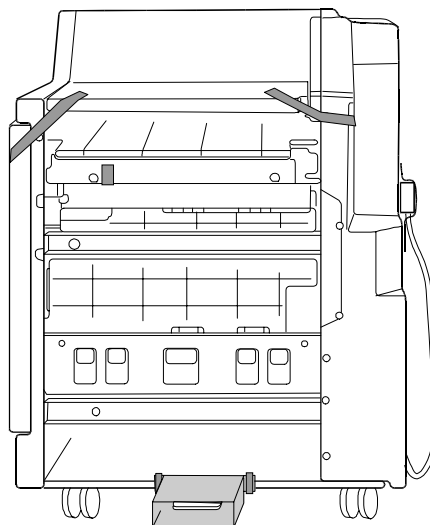
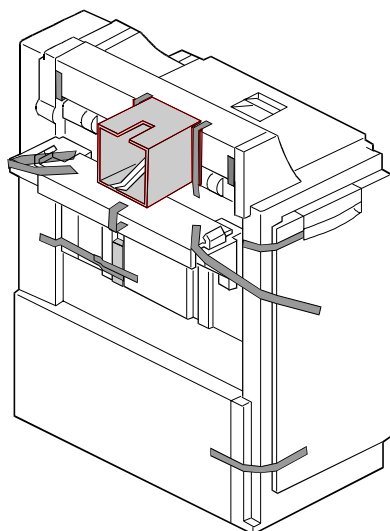


All components (motors, sensors, solenoid and switches) are controlled by the finisher drive board and the communication between the main frame and finisher uses a serial signal.

When the finisher is connected, the finisher connection signal (finisher set) to the main frame is grounded. Then, the main frame will detect that the finisher is connected.

Finisher
SR210 (A666)

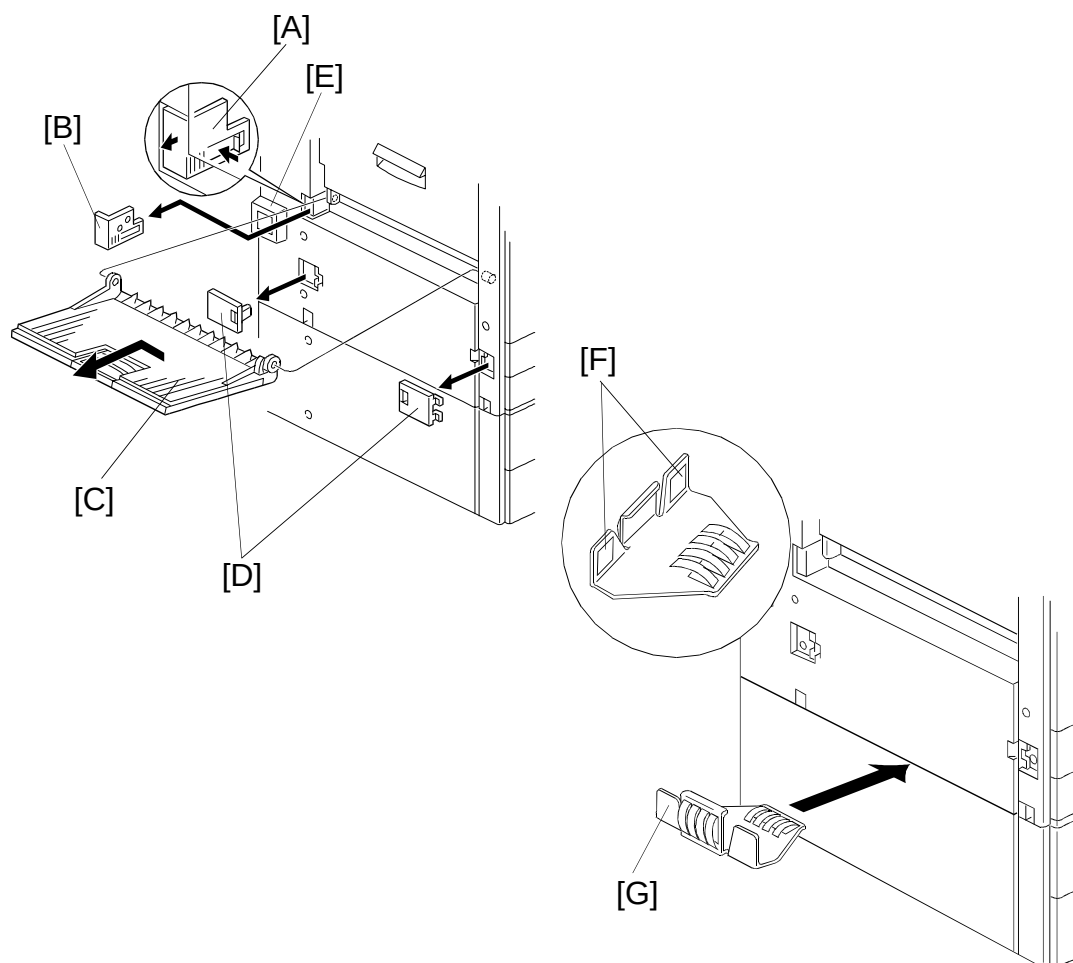
3. INSTALLATION PROCEDURE



⚠ CAUTION

Unplug the copier power cord and turn off the main switch before starting the following procedure.

1. Unpack the finisher, and remove all tapes and cushions.

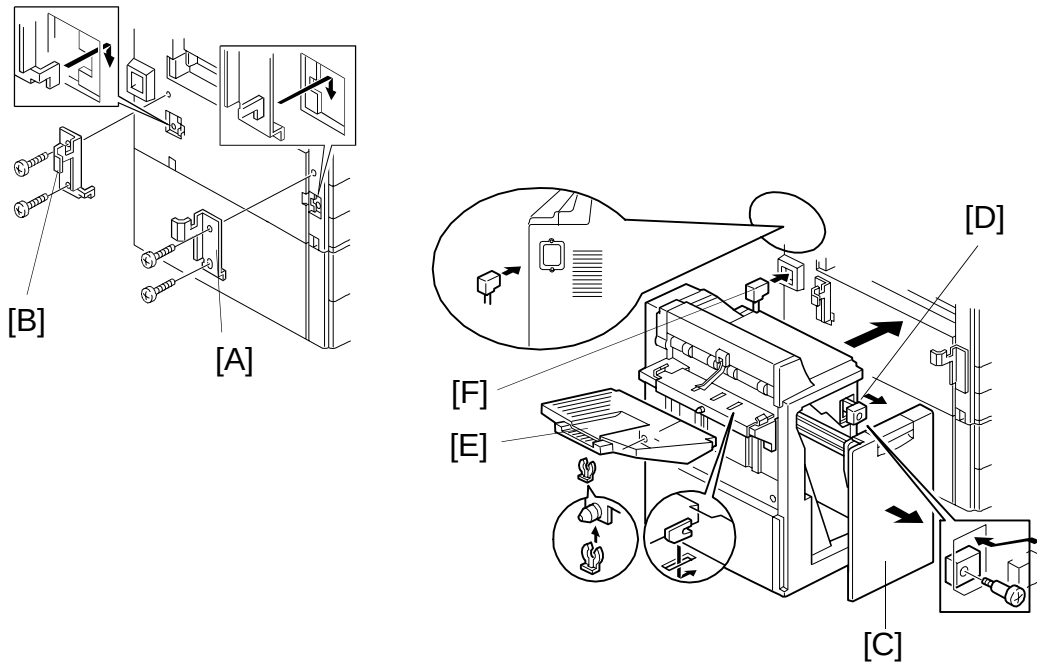


2. Push the hook [A] of the face-up tray shaft cover [B] and remove it.
3. Remove the face-up tray [C].
4. Remove the caps [D] and the connector cover [E].
5. Peel off the backing of the double sided tapes [F] of the grounding plate [G].
6. Peel off the protective seals from both side tapes [F] of the grounding plate [G]. Insert the grounding plate into the center position between the main unit and the optional paper tray unit.

⚠ CAUTION

Do not touch the copper contacts on the grounding plate.

Finisher
SR210 (A666)



7. Install the front [A] and rear [B] connecting bracket. (2 screws each)
8. Slide the stapler unit [C] out of the finisher unit and ensure that the locking lever [D] is in the unlock position (outward).

⚠ CAUTION:
Before attaching the finisher to a cabinet, ensure that the grounding plate area on the bottom side of the cabinet is paint free. If necessary, remove the paint from the area of the grounding plate to ensure a proper grounding connection. Do not touch the copper contacts on the grounding plate.

9. With extreme care, position the grounding plate located at the bottom of the finisher (not shown) under the optional paper tray unit (or cabinet).
10. Align and install the finisher to the connection brackets [A] and [B] and lock the finisher in place by sliding the locking lever [D] inward.
11. Secure the locking lever [D] (1 screw) and slide the staple unit into the finisher.
12. Install the shift tray [E] (1 snap ring).
13. Connect the cable [F] to the copier.
14. Plug in the copier power cord.
15. Turn the ac and main switches on and ensure that the document feeder works properly.

4. PREVENTIVE MAINTENANCE

NOTE: The amount listed in the PM interval indicate the number of prints.

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

ITEM	EM	100K	200K	300K	NOTE
Rollers	C	C	C	C	Alcohol or water
Bushings	I	I	I	I	Use Launa oil or equivalent
Sensors	C	C	C	C	Dry cloth

Finisher
SR210 (A666)

5. SERVICE TABLES

5.1 LED TABLE

LED No. 100	LED No. 101	FUNCTION
ON	OFF	When the entrance sensor is ON (Paper Detected)
OFF	ON	When the inverter sensor is ON (Paper Detected)
ON	ON	When the exit sensor is ON (Paper Detected)

NOTE: Check the sensors by setting DIP SW 100/101 to the Sensor Check Mode (section 5.3.2).

5.2 DIP SWITCH TABLE

5.2.1 Factory Setting

[0 : OFF 1 : ON]

DIP SW 100				DIP SW 101			
4	3	2	1	4	3	2	1
0	0	0	0	0	0	0	0

5.2.2 Stapling Position Adjustment

[0 : OFF 1 : ON]

DIP SW 100				DIP SW 101				STAPLING POSITION
4	3	2	1	4	3	2	1	
0	0	0	0	0	0	0	1	+ 1.0 mm (down)
0	0	0	0	0	0	1	0	+ 2.0 mm (down)
0	0	0	0	0	1	0	0	-1.0 mm (up)
0	0	0	0	1	0	0	0	-2.0 mm (up)

5.2.3 Sensor Check

[0 : OFF 1 : ON]

DIP SW 100				DIP SW 101			
4	3	2	1	4	3	2	1
1	0	0	0	0	0	0	0

When checking the sensors , refer the LED table (Section 5.1).

5.2.4 FREE RUN WITHOUT PAPER

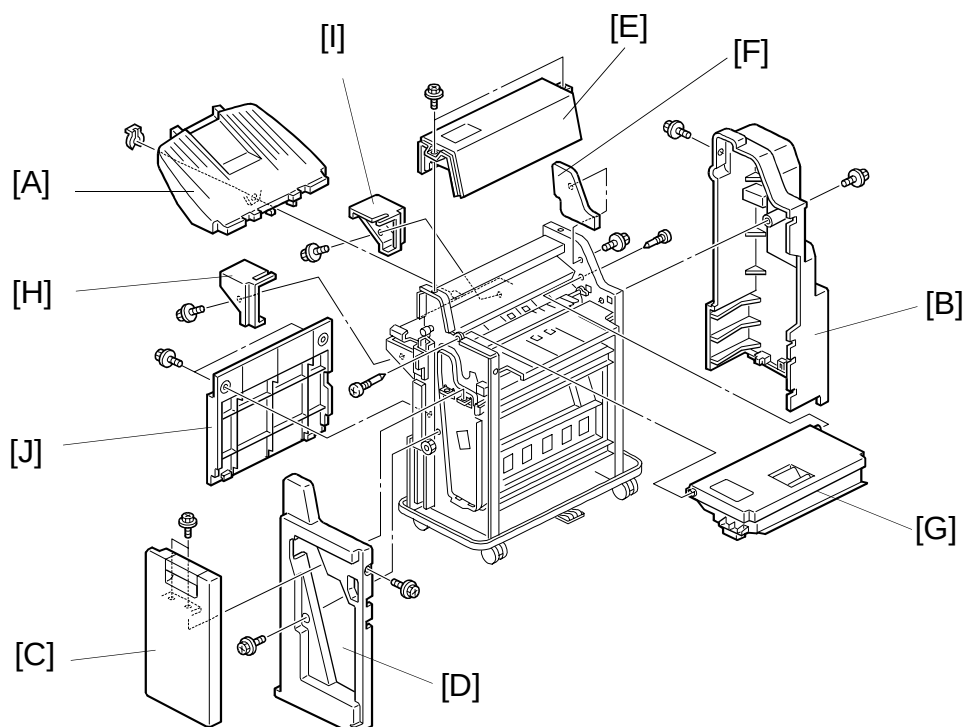
1. Turn off both the main and AC switches, and unplug the machine.
2. Select the free run mode with DIP switches (Refer to the chart below).
3. Disconnect connector CN102 on the finisher drive board.
4. Plug in the machine and turn on the power (AC and main switches).
5. To stop the free run modes, slide out the staple unit.

DIP SW 100				DIP SW 101				FUNCTION
4	3	2	1	4	3	2	1	
0	1	1	1	0	0	0	0	Staple Mode (2 Pages)
0	1	1	1	0	0	0	1	Staple Mode (5 Pages)
0	1	1	1	0	0	1	0	Staple Mode (10 Pages)
0	1	1	1	0	1	0	0	Staple Mode (15 Papers)
0	1	1	1	1	0	0	0	Staple Mode (20 Pages)
1	1	1	1	0	0	0	0	Face Down Mode (2 Pages)
1	1	1	1	0	0	0	1	Face Down Mode (5 Pages)
1	1	1	1	0	0	1	0	Face Down Mode (10 Pages)
1	1	1	1	0	1	0	0	Face Down Mode (15 Pages)
1	1	1	1	1	0	0	0	Face Down Mode (20 Pages)

Finisher
SR210 (A666)

6. REPLACEMENT AND ADJUSTMENT

6.1 EXTERIOR REMOVAL

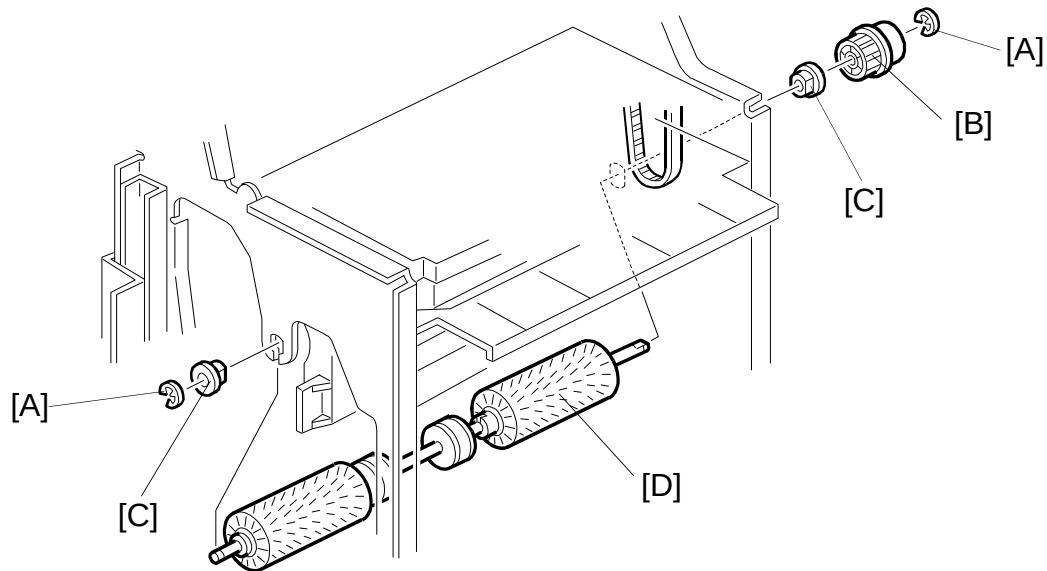


1. Remove the shift tray [A] (1 snap ring).

NOTE : The shift tray cannot be removed if the tray is at its uppermost position.

2. Remove the rear cover [B] (3 screws).
3. Remove the front cover [C] (2 screws).
4. Remove the front inner cover [D] (3 screws).
5. Remove the upper cover [E] (2 screws).
6. Remove the rear upper cover [F] (1 screw).
7. Remove the upper entrance cover [G] (2 screws).
8. Remove the front and rear tray covers [H,I] (2 screws)
9. Remove the left cover [J](2 screws).

6.2 ALIGNMENT BRUSH ROLLER REPLACEMENT

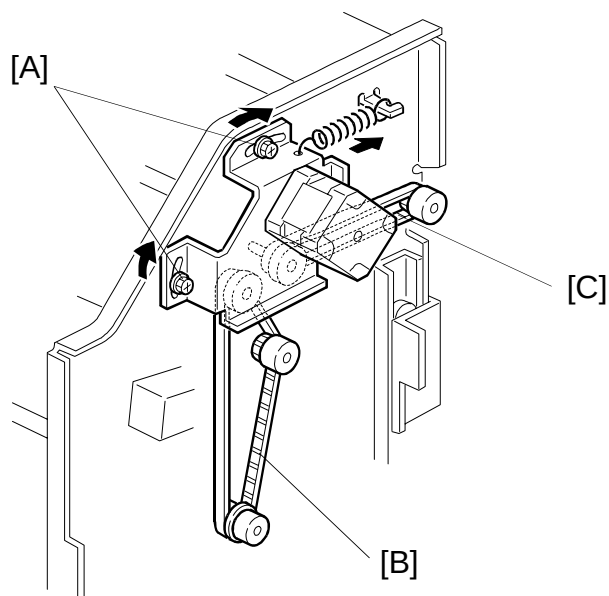


1. Remove the front and rear covers.
2. Pull out the jogger unit
3. Remove the E-ring [A], slide off the pulley [B], then remove 2 bushings [C].

- NOTE:** When reinstalling, the metal bushing goes at the front side.
4. Remove the alignment brush roller assembly [D].

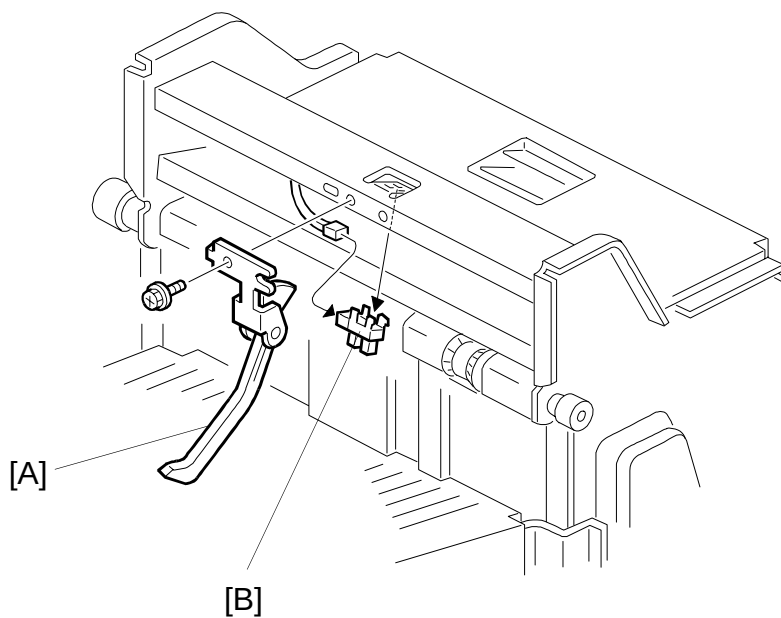
Finisher
SR210 (A666)

6.3 BELT TENSION ADJUSTMENT



1. Remove the rear cover.
2. Loosen the 2 screws [A] of the transport motor bracket and tighten them again to adjust the two tension belts [B,C].

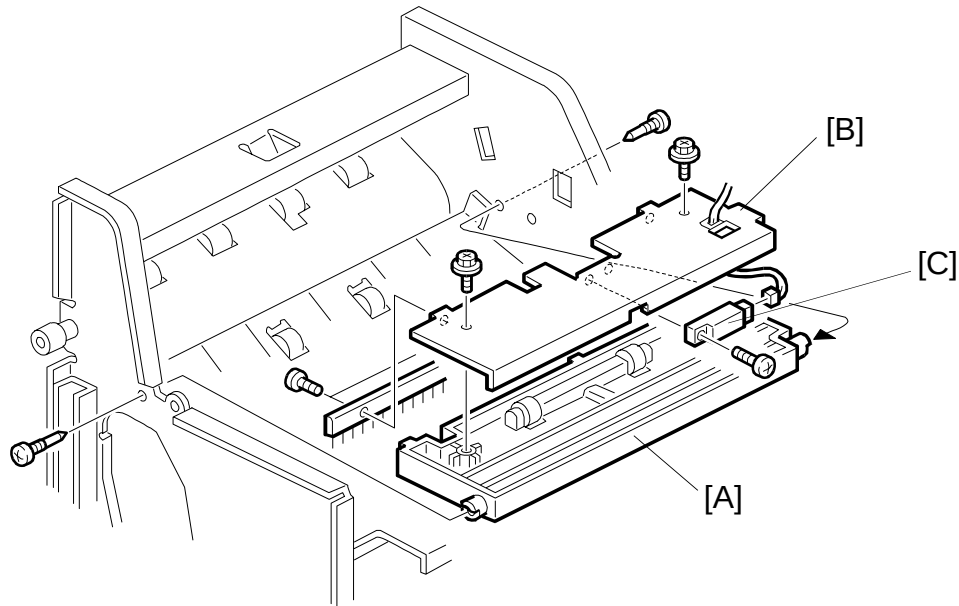
6.4 STACK HEIGHT SENSOR REPLACEMENT



1. Remove the front, rear, and upper covers.
2. Remove the stack height sensor actuator [A] (1 screw).
3. Replace stack height sensor [B] (1 connector).

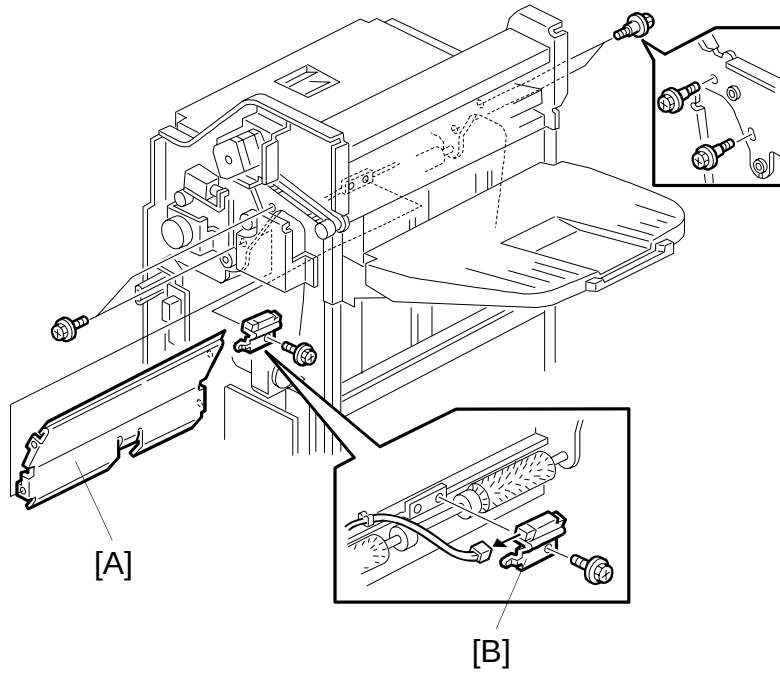
Finisher
SR210 (A666)

6.5 EXIT SENSOR REPLACEMENT



1. Remove the front, rear, and upper covers.
2. Remove the exit guide unit [A] (1 screw).
3. Remove the discharge brush and the exit guide plate [B] (2 screws).
4. Remove the exit sensor [C] (1 screw and 1 connector).

6.6 INVERTER SENSOR REPLACEMENT



1. Remove the front, front inner, and rear covers.
2. Slide out the jogger unit.
3. Remove the entrance guide plate [A] (4 screws).
4. Remove the inverter sensor ass'y [B] (1 screw and 1 connector).
5. Replace the inverter sensor.

Finisher
SR210 (A666)

SECTION 13

A224 COPIER

SERVICE MANUAL

The A224 copier is based on the A193 copier.

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

1. SPECIFICATIONS

OVERALL
MACHINE
INFORMATION

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

SPECIFICATIONS

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

Power Consumption:

- A193 -

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

- A224 -

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

Noise Emission:

- A193 -

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

- A224 -

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

SPECIFICATIONS

Copying Speed in Multicopy Mode:

- A193 -

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

- A224 -

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

Memory Capacity:

- A193 -

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

x: Not available O: Available

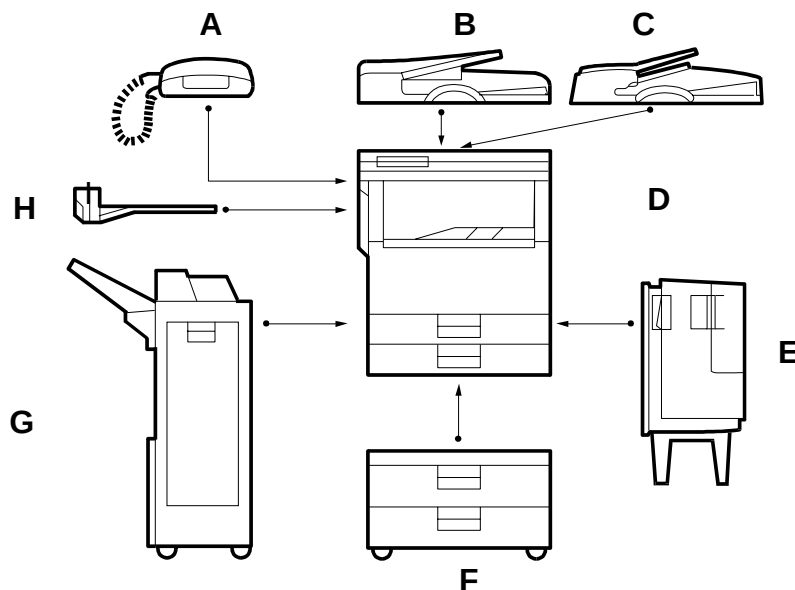
- A224 -

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

x: Not available O: Available

2. MACHINE CONFIGURATION

OVERALL
MACHINE
INFORMATION



Version	Item	Machine Code		No.
		A193	A224	
Copy	Copier	A193	A224	D
	ADF (Option)	A628		B
	ARDF (Option)	A661		C
	Platen Cover (Option)	A645		
	Paper Tray Unit (Option)	G697		F
	Duplex Unit	G694 (Option)	Standard	
	1-bin Sorter (Option)	A629		H
	Finisher (Option)	A666		G
	LCT	N/A	A667 (Option)	E
	Memory 4 MB	A642-01 (Option)	N/A	
	Memory 8 MB	A642-02 (Option)	Standard	
Fax	Fax Controller (Option)	A639 / A804	A804	
	Telephone (Option)	H160		A
	ISDN (Option)	A644		
	HDD (Option)	A641		
	Memory Card (Option)	H130-54		
	Function Card (Option)	H130-52		
	Page Memory (Option)	A640		
Printer	Printer Controller (Option)	A643-00 (115V) A643-01 (230V)	A805-00 (115V) A805-01 (230V)	
	PS (Option)	A643-02		
	HDD (Option)	A643-03		

3. ELECTRICAL COMPONENT DESCRIPTIONS

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

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

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

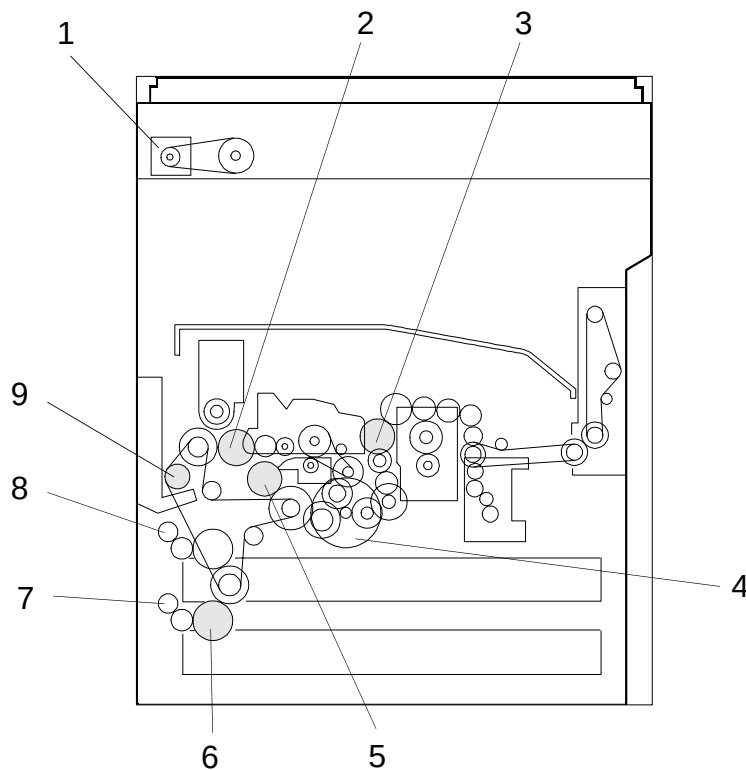
ELECTRICAL COMPONENT DESCRIPTIONS

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

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

OVERALL
MACHINE
INFORMATION

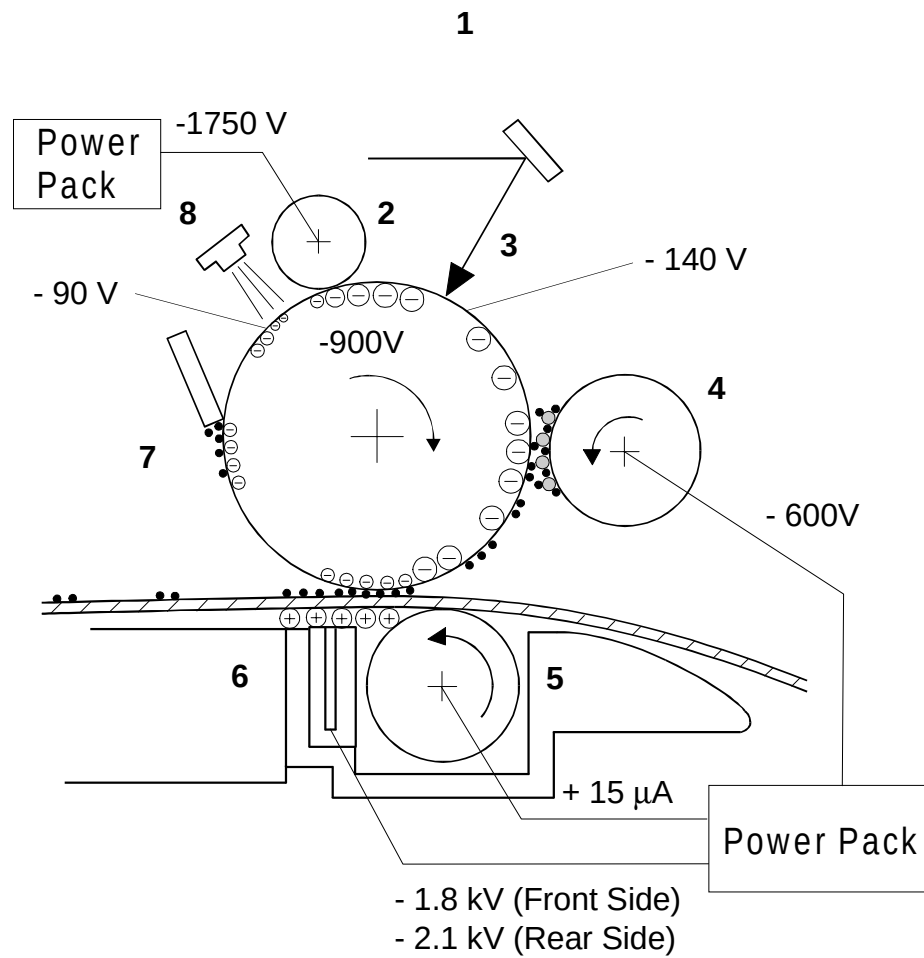
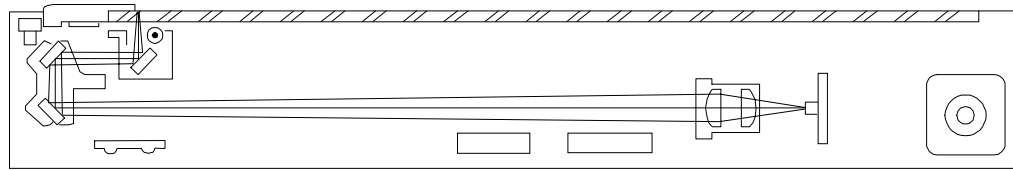
4. DRIVE LAYOUT



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

5. COPY PROCESS

5.1 OVERVIEW



The separation (discharge brush) voltage has been changed.

6. MAIN SCAN MAGNIFICATION/REDUCTION

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

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

7. LASER EXPOSURE

7.1 OVERVIEW

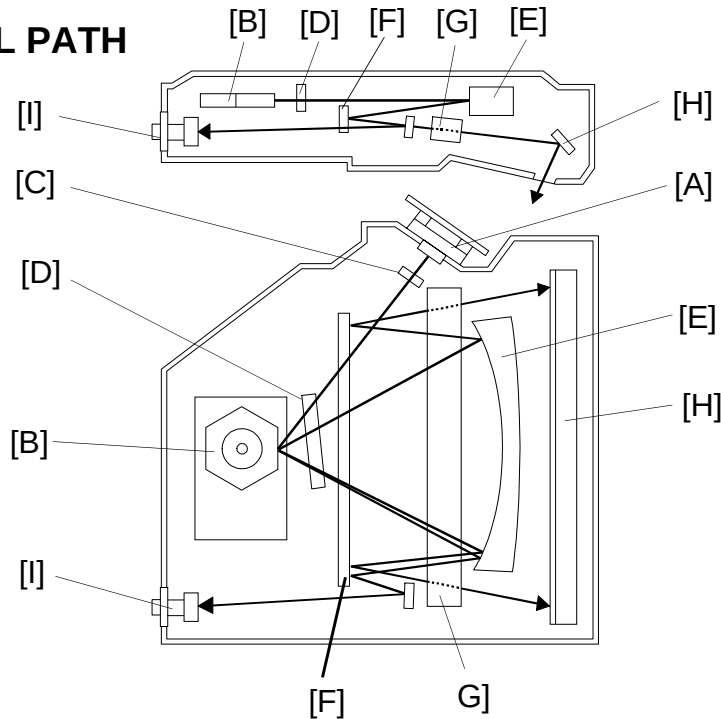
The strength of the beam is 0.6 mW on the drum surface (10 mW output from the LDDR board) at a wavelength of 780 nm.

The polygon motor speeds have been changed as follows:

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

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

7.2 OPTICAL PATH



The shield glass has been added.

[A]: LD Unit

[B]: Polygon Mirror

[C]: Cylindrical Lens

[D]: Shield Glass

[E]: F - Theta Mirror

[F]: 1st Mirror

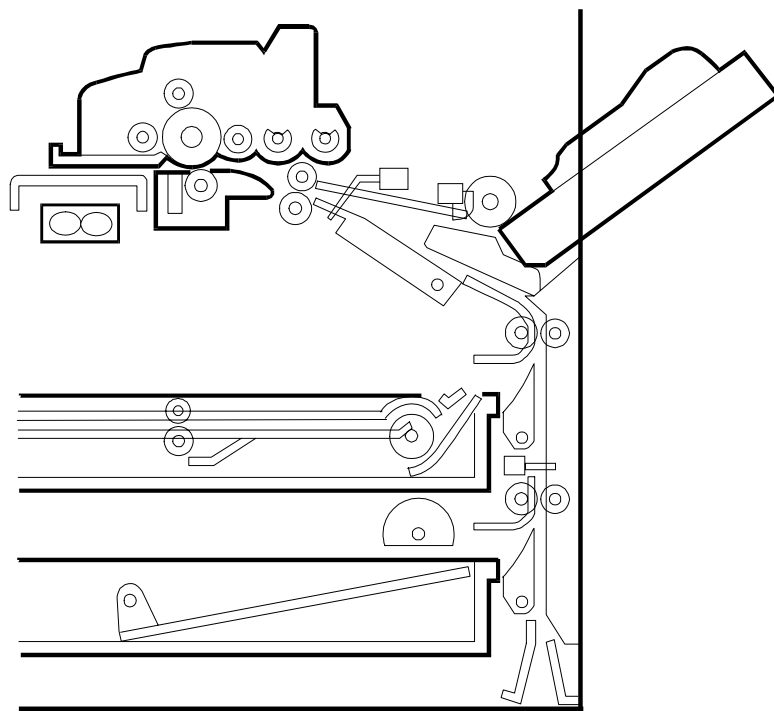
[G]: BTL

[H]: 2nd Mirror

[I]: Laser Synchronization Detector

8. PAPER FEED

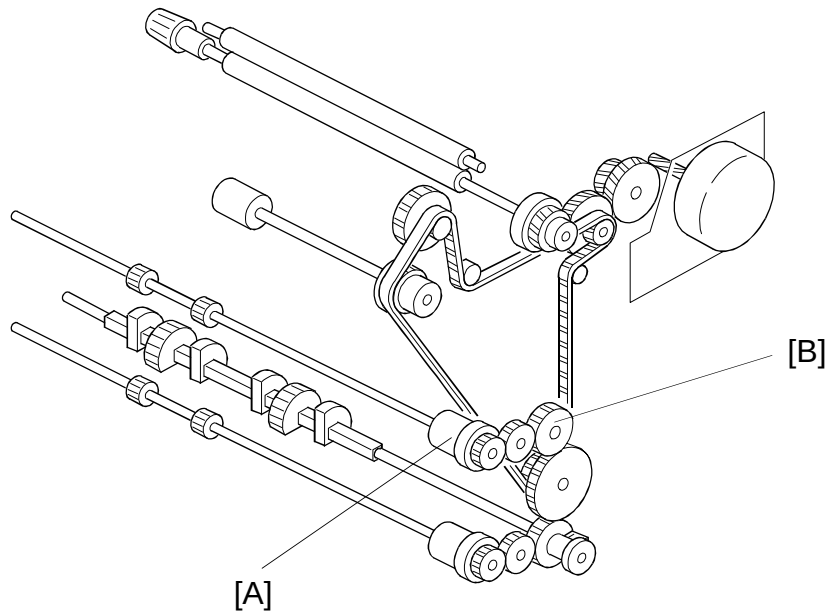
8.1 OVERVIEW



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

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

8.2 DRIVE MECHANISM



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

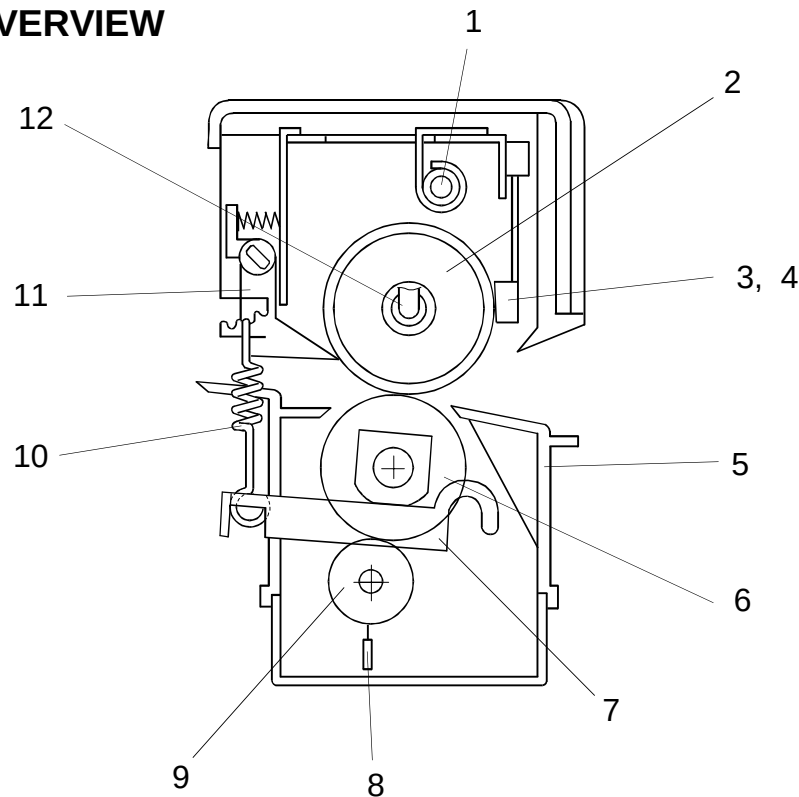
9. PAPER SEPARATION AND TRANSPORT

The voltage for the discharge brush has been changed.

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

10. IMAGE FUSING

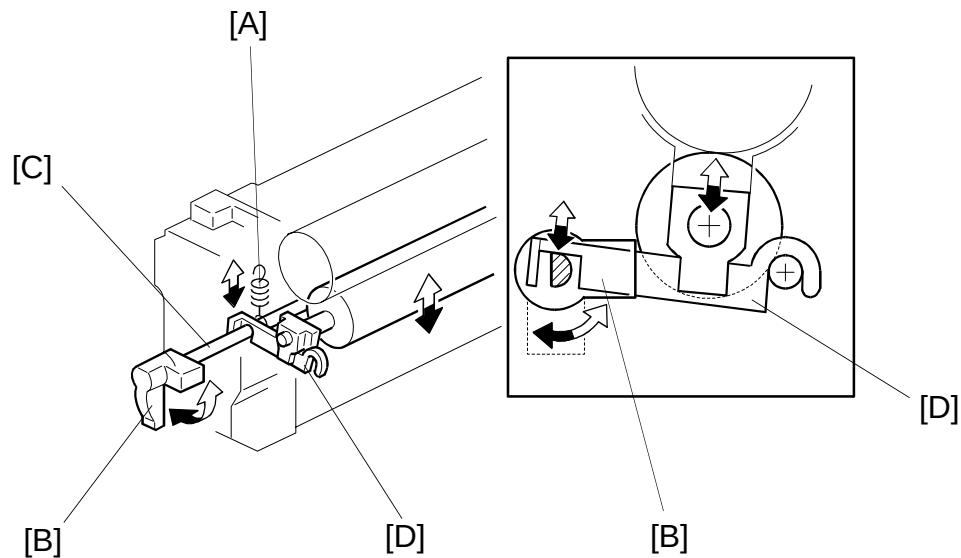
10.1 OVERVIEW



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

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

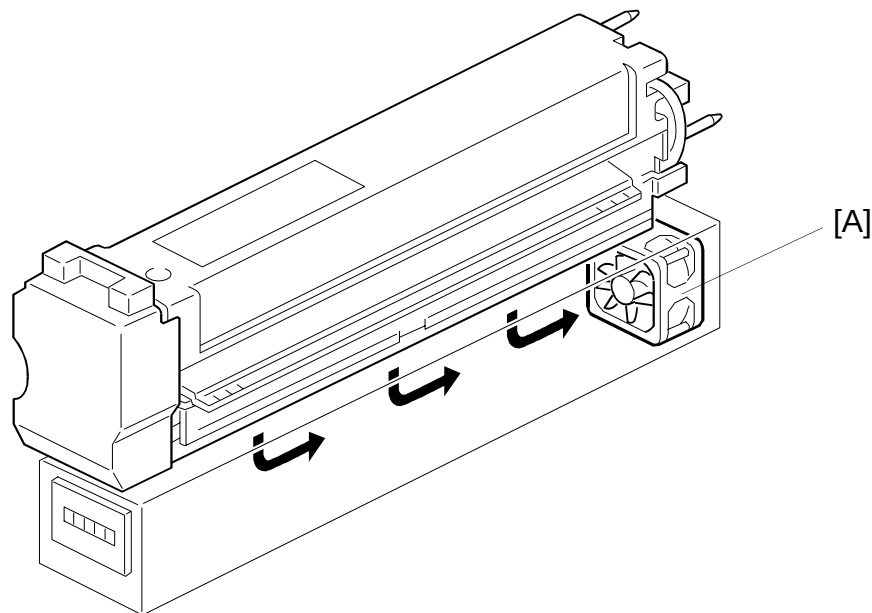
10.2 PRESSURE ROLLER



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

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

10.3 FUSING UNIT FAN

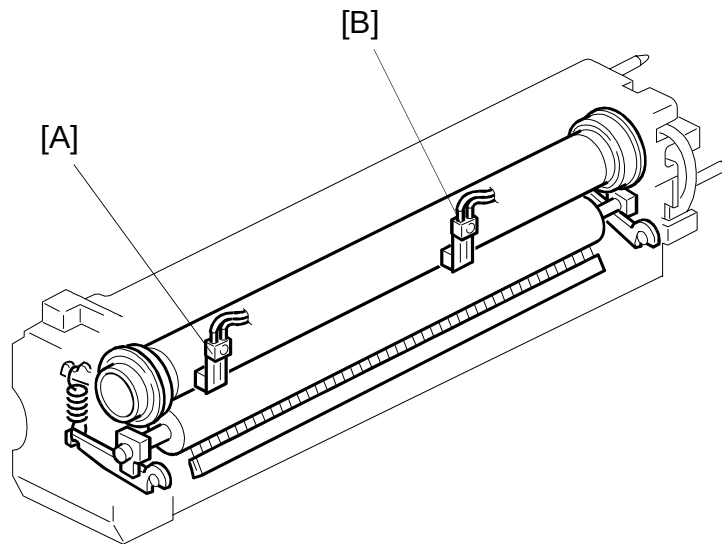


The fusing unit fan [A] has been added below the fusing unit. The fusing unit fan is necessary because the wattage of the fusing lamp is higher than in the A193 machine, as a result of the higher copy speed.

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

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

10.4 FUSING TEMPERATURE CONTROL AND OVERHEAT PROTECTION



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

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

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

11. ENERGY SAVER MODES

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

1. Fusing temperature in the energy saver level 2
80°C (230V machine)
2. The recovery time from energy saver level 2
30 s (230V machine)
3. When the auto shut-off timer runs out in the copier configuration (230V machine only)
When the auto shut-off timer runs out, the machine will enter the auto shut off mode and the **ac switch** will turn off automatically.

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

4. Power consumption in the copier configuration

⇒

Mode	AC Switch	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	On	165°C	On	The machine will return to standby mode if the DF is lifted or an original is placed in the ADF or ARDF.
Energy Saver Level 2	On	On	On	140°C (115 V) 80°C (230 V)	On	

12. SERVICE PROGRAM MODE TABLE

12.1 MAIN SP MODE TABLE

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

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-001 *	1	Leading Edge Registration (Normal copying, and duplex 1st side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 3±2 mm. See “Replacement and Adjustment - Copy Image Adjustments” for details.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
	2	Leading Edge Registration (Duplex: 2nd side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 3±2 mm. See “Replacement and Adjustment - Copy Image Adjustments” for details.</i>	+12.5 ~ -12.5 0.1 mm/step + 0.0 mm
1-002 *	1 #	Side-to-Side Registration (1st paper feed)	Adjusts the printing side-to-side registration from the 1st paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2 ±1.5 mm. See “Replacement and Adjustment - Copy Image Adjustments” for details.</i>	+9 ~ -9 0.1 mm/step + 0.0 mm
	2	Side-to-Side Registration (2nd paper feed)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the Trimming Area Pattern (SP5-902, No.10). <i>Use the ●/* key to toggle between + and -. The specification is 2±1.5 mm.</i>	+9 ~ -9 1 mm/step + 0.0 mm

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

SERVICE PROGRAM MODE TABLE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-104 *		Fusing Temperature Control	Selects the fusing temperature control mode.	0: On/Off 1: Phase
1-105 *	1	Fusing Temperature Adjustment (Operation)	Adjusts the fusing temperature in the operation mode.	100 ~ 200 1°C/step 180°C
	2	Fusing Temperature Adjustment (Energy Saver Level 2)	Adjusts the fusing temperature in the energy saver level 2 mode. <i>With a lower value, the machine takes more time to reach the ready condition.</i>	0 ~ 165 1°C/step 140°C (115V machine) 0°C (A193 - 230V machine) 80°C (A224 - 230V machine)
1-106		Fusing Temperature Display	Displays the fusing temperature. <i>Press the  key to exit the display.</i>	
1-901		Auto Restart Interval	Do not change the value.	
1-902		Fusing Control Frequency Display	Displays the fusing control frequency which is detected by the zero cross signal generator. <i>Around "50" equals 50 Hz. Around "60" equals 60 Hz.</i>	
1-903 *		Envelope Feeding	Adjusts the by-pass feed clutch on time when the paper is fed by the registration roller. <i>The by-pass feed clutch turns on again after paper buckling to help the registration roller to feed thick paper.</i>	0 ~ 10 1 mm/step 3 mm
2-001 *		Charge Roller Bias Adjustment	Adjusts the voltage applied to the charge roller. Do not change the value.	-1000 ~ -2500 1 V/step - 1750 V
2-101 *	1	Leading Edge Erase Margin (Printing)	Adjusts the leading edge erase margin. <i>The specification is 3±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 3.0 mm
	2	Trailing Edge Erase Margin (Printing)	Adjusts the trailing edge erase margin. <i>The specification is 2±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	0 ~ 9 1 mm/step 2.0 mm

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

SERVICE PROGRAM MODE TABLE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-801		TD Sensor Initial Setting	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 2.0 V. <i>After installing a new PCU, the machine performs this function automatically.</i> Do not use this SP mode.	0: No 1: Yes
2-901*	1	Separation Voltage Adjustment (Front side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the front side. <i>Increase if the paper is getting wrapped around the drum.</i>	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step - 1800 V
		Separation Voltage Adjustment (Front side - other areas)	Adjusts the discharge brush voltage on the front side except at the leading edge.	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step - 1800 V
	3	Separation Voltage Adjustment (Rear side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the rear side. <i>For the rear side in duplex mode, higher voltage is needed. The paper has more static on it, and there is toner on one side of the paper.</i>	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step - 2500 V (A193) - 2100V (A224)
		Separation Voltage Adjustment (Rear side - other areas)	Adjusts the discharge voltage on the rear side except at the leading edge.	-1000 ~ -4000 (A193) -1200~-4000 (A224) 1 V/step - 2500 V (A193) - 2100V (A224)
2-902*		FCI Smoothing (Letter Mode)	Selects whether the FCI smoothing function to remove jagged edges is enabled or disabled (this adjustment does not affect fax mode)	0: No (Disabled) 1: Yes (Enabled)
2-903*	1	LD PWM Laser Pulse Positioning (Independent Pixels)	Selects the laser pulse positioning type that is used for independent black or gray pixels (white pixels to left and right). <i>Item 3 is not used.</i>	0: Center 1: Right 2: Left 3: Concentrated

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

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

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

SERVICE PROGRAM MODE TABLE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-010 *		Leading Edge Registration (Scanning)	Adjusts the leading edge registration for scanning. <i>(-): The image moves in the direction of the leading edge</i> <i>Use the ●/* key to toggle between + and -.</i> <i>See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 2.0 ~ + 9.0 0.5 mm/step + 0.0 mm
		Side-to-side Registration (Scanning)	Adjusts the side-to-side registration for scanning. <i>(-): The image disappears at the left side.</i> <i>(+): The image appears.</i> <i>Use the ●/* key to toggle between + and -.</i> <i>See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 6.0 ~ + 6.0 0.1 mm/step + 0.0 mm
4-012 *	1	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge margin for scanning. <i>Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.</i>	0.0 ~ 9.0 0.1 mm/step 1.0 mm
	2	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge margin for scanning. <i>See the comment for SP 4-012-1.</i>	0.0 ~ 9.0 0.1 mm/step 1.0 mm
	3	Left Side Erase Margin (Scanning)	Adjusts the left side margin for scanning. <i>See the comment for SP 4-012-1.</i>	0.0 ~ 9.0 0.1 mm/step 1.0 mm
	4	Right Side Erase Margin (Scanning)	Adjusts the right side margin for scanning. <i>See the comment for SP 4-012-1.</i>	0.0 ~ 9.0 0.1 mm/step 1.0 mm
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp on. <i>After selecting "1", press Enter or  twice to start this feature. Press  to stop.</i>	0: No 1: Yes
4-015*	1	White Plate Scanning Start Position	Adjusts the scanning start position on the white plate for auto shading. <i>The default is 6 mm from the leading edge. The setting specifies how far scanning starts from the default position.</i>	- 3.0 ~ + 6.0 0.5 mm/step 0 mm
	2	White Plate Scanning Area	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading. <i>The default is 5 mm (for 41 - 400% reproduction ratios) or 6.5 mm (25 - 40%).</i> <i>The current setting specifies the difference from these defaults.</i>	- 3.0 ~ + 6.0 0.5 mm/step 0 mm

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

SERVICE PROGRAM MODE TABLE

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

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

SERVICE PROGRAM MODE TABLE

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

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

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

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

Mode No.		Function	Settings
Class 1 and 2	Class 3		
5-401*	1	User Code Mode (Copier) Selects whether the user code function is enabled in copy mode or not. <i>If this value is changed, the UP mode setting is also changed.</i>	0: No 1: Yes
	2	User Code Mode (Fax) Selects whether the user code function is enabled in facsimile mode or not. <i>If this value is changed, the UP mode setting is also changed.</i>	0: No 1: Yes
	3	User Code Mode (Printer) Selects whether the user code function is enabled in printer mode or not. <i>If this value is changed, the UP mode setting is also changed.</i>	0: No 1: Yes
5-501 *	1	PM Alarm Interval Sets the PM interval, with an alarm. The Auto Service Call feature of the fax option also refers to this setting. <i>When the setting is "0", this function is disabled.</i>	0 ~ 255 1k copies/step 100 k copies
	2	PM Alarm Selects whether the PM alarm is enabled or not. If this is "0", the Auto Service Call feature of the fax option is also disabled.	0: No 1: Yes
	3	PM Alarm (Original) Japanese version only. Do not change the value.	
5-504*		PM Alarm (Jam Alarm) Japanese version only. Do not change the value.	
5-507*	1	PM Alarm (Copy Size) Japanese version only. Do not change the value.	
	2	PM Alarm (Staple)	
	3	PM Alarm (Toner End)	
5-508*	1	CE Call (Jam Level 1) Japanese version only. Do not change the value.	
	2	CE Call (Jam Level 2)	
	3	CE Call (Door Open)	
5-801		Memory All Clear Resets all software counters. Also, returns all modes and adjustments to the default settings. See the "MEMORY ALL CLEAR" section for how to use this SP mode correctly. Normally, this SP mode should not be used. <i>It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.</i>	

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

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

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-945*		Memory Copy Priority	Selects whether or not the memory copy mode is selected when the main switch is turned on.	0: No 1: Yes
5-946*		Auto Shut-off Mode Disabling when there is paper in the 1-bin sorter	Selects whether the auto shut-off mode is disabled or not when there is paper in the 1-bin sorter. <i>When the machine enters the auto shut-off mode while there is paper in the 1-bin sorter, the sorter paper indicator will go off. If this is not acceptable, this SP mode should be set at "1"</i>	0: No 1: Yes
5-947* ##		Use of 25% Reduction Ratio in the Photo and Letter/Photo Modes	Determines whether a reduction ratio of 25% can be used in the Photo and Letter/Photo modes (binary picture mode).	0: No (50% - 400%) 1: Yes (25% - 400%)
5-948* ##		AC Switch Auto Shut Off	Selects whether the ac switch auto shut-off mode or not. <i>If at "1", the ac switch turns off automatically when entering the auto shut off mode.</i>	0: No (115V Machine) 1: Yes (230V machine)
5-991*		VRAM Data Download	This SP mode is only used by the designer. Do not change the value.	0: Off 1: On
5-992		System Parameter and Data List Printing	Prints the machine status history data list. See the "SYSTEM PARAMETER AND DATA LISTS" section for how to print the lists.	0: No Print 1: SP mode 2: UP mode 3: Log data
6-006 *	1	ADF Side-to-Side Registration	Adjusts the printing side-to-side registration in the ADF mode. <i>Use the ●/* key to toggle between + and -.</i>	-1.5 ~ +1.5 0.5 mm/step + 0.0 mm
	2	ADF Leading Edge Registration	Adjusts the leading edge registration in the ADF mode. <i>Use the ●/* key to toggle between + and -.</i>	-10 ~ +10 0.5 mm/step + 6.0 mm
	3	ADF Trailing Edge Margin	Adjusts the trailing edge erase margin in ADF mode. <i>Use the ●/* key to toggle between + and -.</i>	-3.0 ~ +3.0 0.1 mm/step + 0.0 mm
6-007*		ADF Sub-scan Magnification	Adjusts the magnification in the sub-scan direction for ADF mode. <i>Use the ●/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.</i>	- 4.0 ~ + 4.0 0.1 %/step 0.0 %
6-009		ADF Free Run	Performs an ADF free run. <i>To perform the free run, press 1 then press [F] twice. Press [C/⊗] to stop.</i>	0: No 1: Yes

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

SERVICE PROGRAM MODE TABLE

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

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-301*	1	Total Copies by Reproduction Ratio (25% ~ 49%)	Displays the total number of copies by reproduction ratio.	
	2	Total Copies by Reproduction Ratio (50% ~ 99%)		
	3	Total Copies by Reproduction Ratio (Full size)		
	4	Total Copies by Reproduction Ratio (101% ~ 200%)		
	5	Total Copies by Reproduction Ratio (201% ~ 400%)		
	6	Total Copies by Reproduction Ratio (Direct Mag.)		
	7	Total Copies by Reproduction Ratio (Direct Size Mag.)		
	8	Total Copies by Reproduction Ratio (Size Mag.)		

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

OVERALL
MACHINE
INFORMATION

SERVICE PROGRAM MODE TABLE

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

Rev. 03/99

OVERALL
MACHINE
INFORMATION

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

Mode No.		Function	Settings
Class 1 and 2	Class 3		
⇒ 7-808		Resets Counters (except for the total counter)	0: No 1: Yes
		Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the counter.</i>	
⇒ 7-810		User Code Number Reset	0: No 1: Yes
		Resets the user code numbers. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-901*		SC History Display	
⇒ 7-902		SC History Clear	0: No 1: Yes
		Clears the SC history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-903*		Copy Jam History Display	
⇒ 7-904		Copy Jam History Clear	0: No 1: Yes
		Clears the copy jam history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-905*		Original Jam History Display	
⇒ 7-906		Original Jam History Clear	0: No 1: Yes
		Clears the original jam history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
⇒ 7-907		Timer Counter Clear	0: No 1: Yes
		Clears the timer counter. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the counter.</i>	
7-908		PCU Counter Display	
7-909		PCU Counter Clear	
7-991		Timer Counter Display	0: No 1: Yes

12.1.1 Input Check (SP5-803)

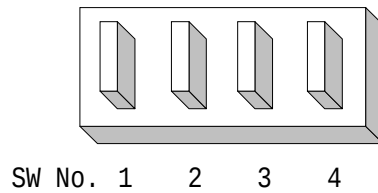
1. Access SP mode 5-803.
2. Select the number which will access the switch or sensor you wish to check (see the following table).
3. Check the status of the sensor or switch.
4. If you wish to check the signal during a copy cycle, select the required copy modes, then press the Start key. After that,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

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

SERVICE PROGRAM MODE TABLE

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

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

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

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

1: Pushed

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

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

12.1.2 Output Check (SP5-804)

```

[Serviceman P-Mode]
-----
Output Check
Code:  0 Data:  0
[↑Prev.] [↓Next] [OK] [Back]

```

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

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

- Output check table -

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

SERVICE PROGRAM MODE TABLE

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

13. PREVENTIVE MAINTENANCE SCHEDULE

13.1 PM TABLE

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

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

A224	EM	100K	200K	300K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		C	C	C	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
AROUND THE DRUM					
Transfer Roller		R	R	R	To clean, use a blower brush.
Quenching Lamp		C	C	C	Dry cloth
Discharge Brush		R	R	R	
PAPER FEED					
Registration Roller		C	C	C	Clean with water or alcohol.
Paper Feed Roller (By-pass feed table)	C	C	C	C	Clean with water or alcohol.
Registration Mylar		C	C	C	Clean with water or alcohol.
Relay Rollers		I	I	I	Clean/replace if necessary
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Paper Feed Rollers		R	R	R	
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
FUSING UNIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistors		I	I	I	Clean if necessary
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Alcohol
Hot Roller Strippers		R	R	R	

PREVENTIVE MAINTENANCE SCHEDULE

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

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

14. REPLACEMENT AND ADJUSTMENT

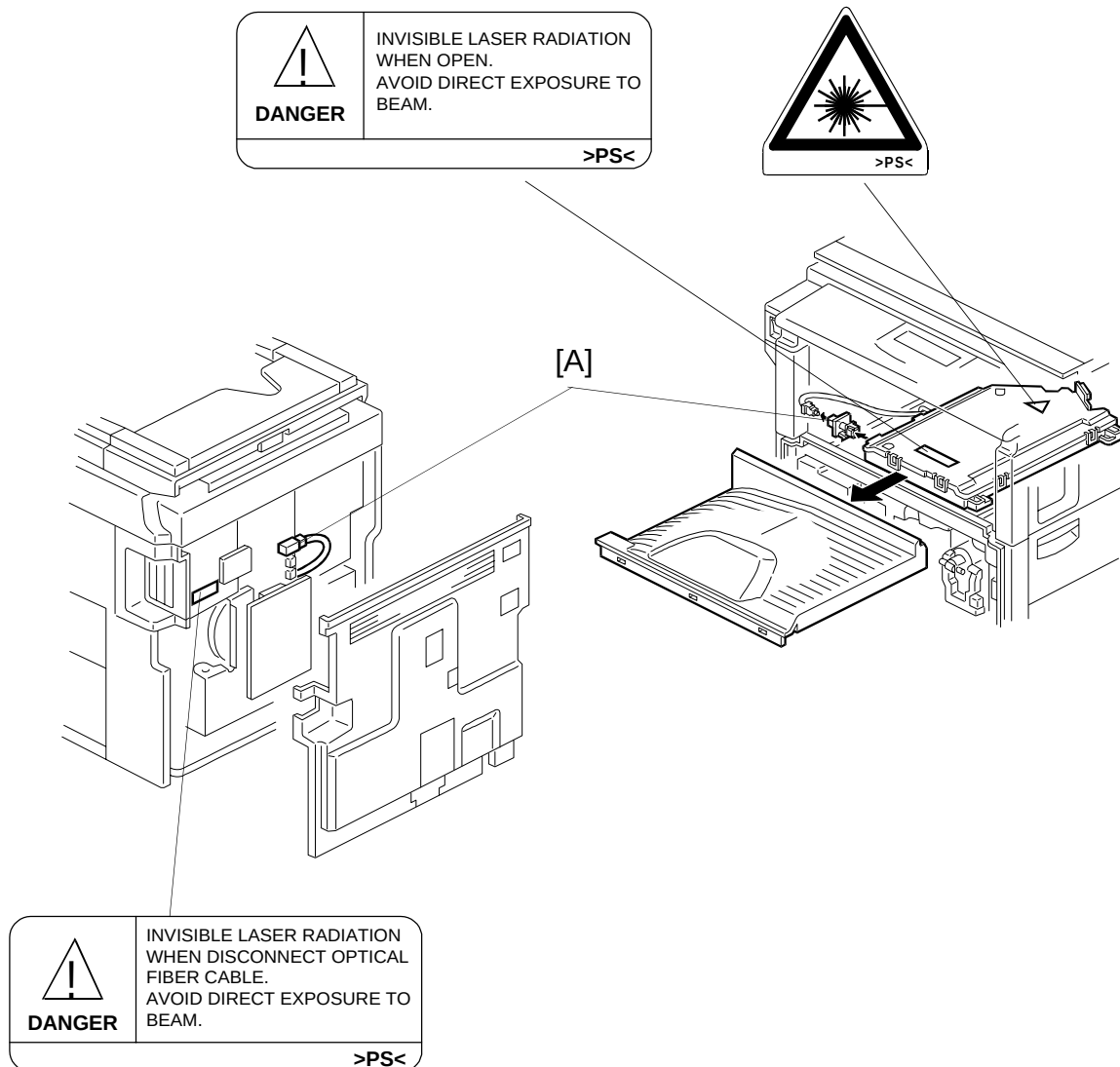
14.1 LASER UNIT

WARNING

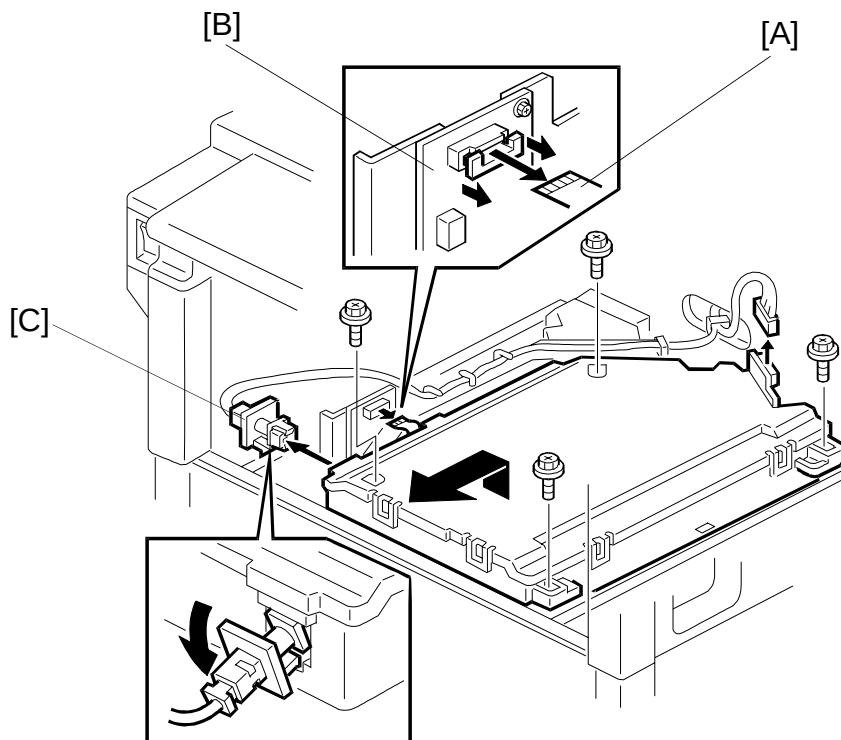
Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

- CAUTION DECALS -

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



14.2 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR

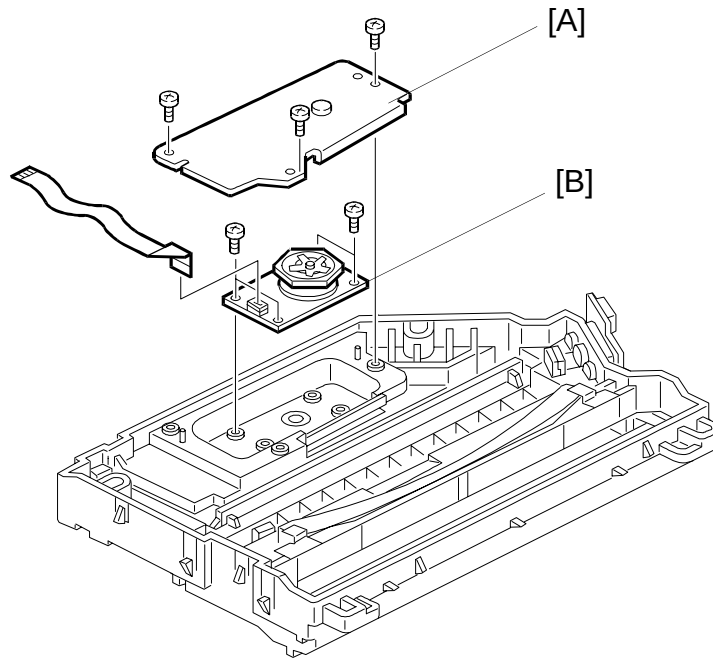


⚠ WARNING

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

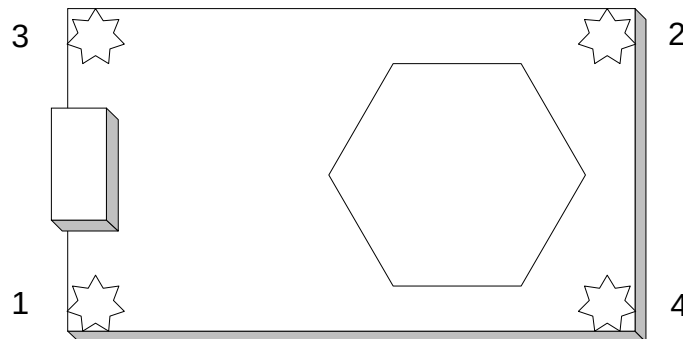
1. Remove the copy tray.
2. Disconnect the harness [A] from the polygon motor driver [B].
3. Remove the main scan synchronization detector [C].
4. Remove the laser unit (4 screws and 1 connector).

14.3 POLYGON MIRROR MOTOR

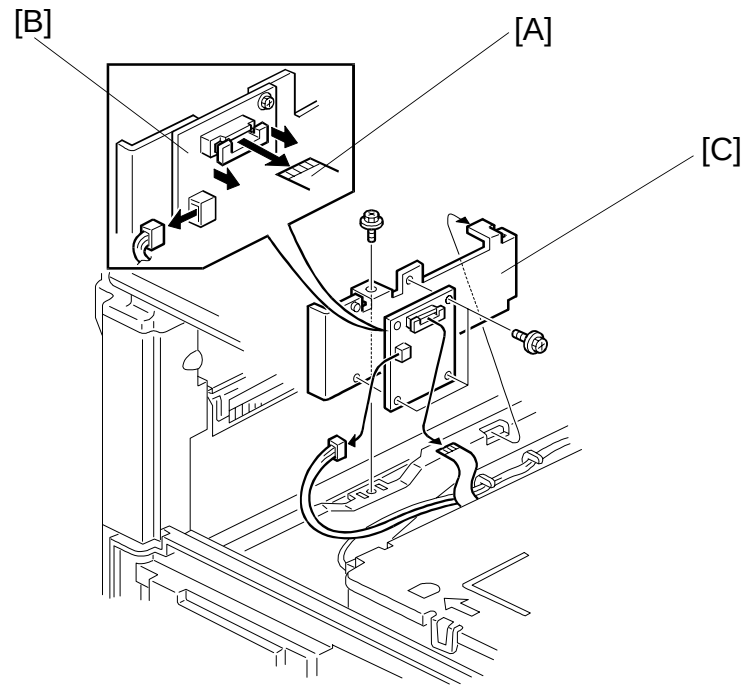


1. Remove the laser unit (see Laser Unit/Main Scan Synchronization Detector).
2. Remove the polygon motor cover [A] (3 screws).
3. Remove the polygon motor [B] (4 screws, 1 connector).

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

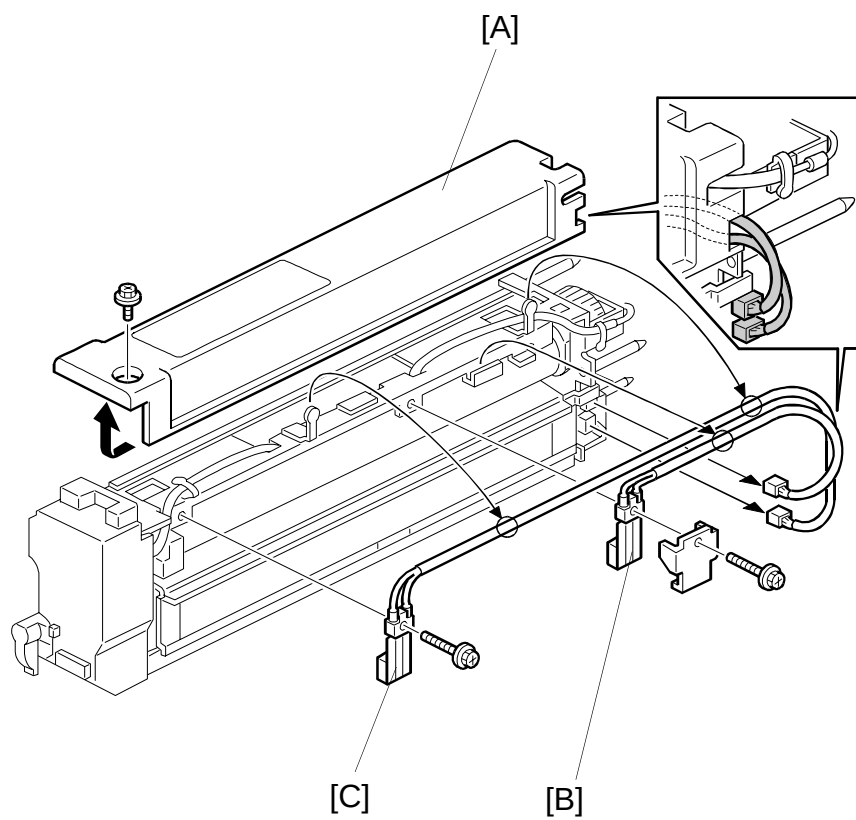


14.4 POLYGON MOTOR DRIVER



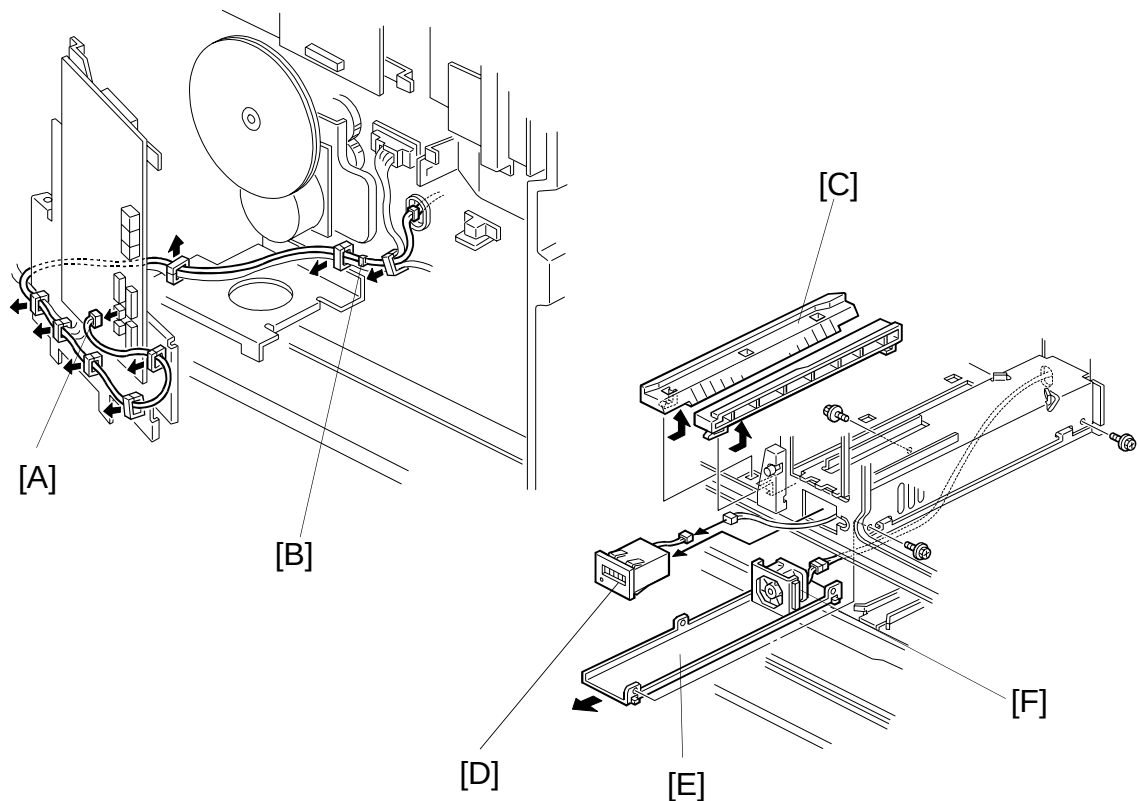
1. Remove the copy tray.
2. Disconnect two harnesses [A] from the polygon motor driver [B].
3. Remove the polygon motor driver bracket [C] (1 screw).
4. Remove the polygon motor driver [B] (3 screws).

14.5 FUSING THERMISTOR/FUSING EDGE THERMISTOR



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

14.6 FUSING UNIT FAN



1. Remove the front cover and rear cover.
2. Remove the PCU, transfer roller unit, fusing unit, duplex inverter unit, duplex unit, paper feed tray, and inner cover.
3. Remove the PSU.
4. Disconnect the fusing unit fan harness [A] and unclamp the harness from the harness clamps.
5. Cut the clamp [B].
NOTE: Take care not to cut the harnesses.
6. Remove the duplex entrance guide [C].
7. Remove the total counter [D] (1 connector).
8. Remove the fusing unit fan bracket [E] (3 screws).
9. Remove the fusing unit fan [F] (2 screws, 1 connector).

15. SERVICE CALL CONDITIONS

15.1 SUMMARY

There are 3 levels of service call conditions.

Level	Definition
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.
B	The SC can be reset by turning the main switch off and on if the SC was caused by a sensor error.
C	The copier can be operated as usual except for the unit related to the service call.

- NOTE:**
- 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
 - 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
 - 3) To reset a Level A SC, enter SP 5-810 (SC code reset) and select "1". Then hold down the Photo mode key and the  key at the same time for at least 3 seconds (this does not require the main switch to be turned off and on).
 - 4) When a Level A or B SC occurs while in an SP mode, the display will not indicate the SC number. If this occurs, check the SC number after leaving the SP mode.

16. SC CODE DESCRIPTIONS

SC101: Xenon lamp error (A193/A224)

- Definition - [B]

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

- Possible causes -

- Xenon lamp defective
- Xenon lamp harness defective
- SBU board defective
- SBU harness defective

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

-Definition- [B]

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

- Possible causes -

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

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

-Definition- [B]

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

- Possible causes -

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

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

-Definition- [B]

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

- Possible causes -

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

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

-Definition- [B]

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

- Possible causes -

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

SC192: Automatic SBU adjustment error (A193/A224)

-Definition- [B]

An error is detected during automatic SBU adjustment.

- Possible causes -

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

SC302: Charge roller current leak (A193/A224)

-Definition- [B]

A charge roller current leak signal is detected.

- Possible causes -

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

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

-Definition- [B]

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

- Possible causes -

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

SC320: Polygon motor error (A193/A224)

-Definition- [B]

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

- Possible causes -

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

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

NOTE: This SC code is only for copy mode.

- Definition- [B]

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

- Possible causes -

- BiCU board defective
- MSU board defective

SC322: Laser synchronization error (A193/A224)

-Definition- [B]

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

- Possible causes -

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

SC324: LD drive current over (A193/A224)

-Definition- [B]

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

- Possible causes -

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

SC390: TD sensor error 1 (A193/A224)

-Definition- [B]

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

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC391: Development bias leak (A193/A224)

-Definition- [B]

A development bias leak signal is detected.

- Possible causes -

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

SC393: TD sensor error 2 (A193/A224)

-Definition- [B]

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

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

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

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

-Definition- [B]

A transfer roller current leak signal is detected.

- Possible causes -

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

SC411: Separation bias error (A193/A224)

-Definition- [B]

A separation bias leak signal is detected.

- Possible causes -

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

SC500: Main motor lock (A193/A224)

-Definition- [B]

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

- Possible causes -

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

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

-Definition- [C]

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

- Possible causes -

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

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

-Definition- [C]

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

- Possible causes -

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

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

-Definition- [A]

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

- Possible causes -

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

SC543: Fusing overheat error (A193/A224)

-Definition- [A]

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

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC544: Fusing low temperature error (A193/A224)

-Definition- [A]

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

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC546: Fusing ready temperature malfunction (A193/A224)

-Definition- [A]

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

- Possible causes -

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

SC547: Zero cross signal malfunction (A193/A224)

-Definition- [A]

Zero cross signals are not detected within a certain period.

- Possible causes -

- Power supply board defective
- IOCSS defective
- BICU defective

SC548: Fusing edge temperature error 1 (A224)

- Definition - [A]

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

- Possible causes -

- Fusing edge thermistor defective
- PSU defective

SC549: Fusing edge temperature error 2 (A224)

- Definition - [A]

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

- Possible causes -

- Fusing edge thermistor defective
- PSU defective
- Poor connection of the fusing unit

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

-Definition- [B]

The IOCSS board cannot communicate with the duplex unit properly.

- Possible causes -

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

SC681: Fax option version error (A224)

- Definition - [C]

The machine detected that a A639 fax unit is installed.

- Possible causes -

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

SC682: Printer option version error (A224)

- Definition - [C]

The machine detected that a A643 printer controller is installed.

- Possible causes -

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

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

-Definition- [B]

The BiCU board cannot communicate with the fax controller properly.

- Possible causes -

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

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

-Definition- [B]

The BICU board cannot communicate with the printer controller properly.

- Possible causes -

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

SC696: Communication error between finisher and BiCU board (A193/A224)**- Definition - [B]**

The BiCU board cannot communicate with the finisher properly.

- Possible causes -

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

SC700: Finisher feed out error (A193/A224)**- Defenition - [B]**

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

- Possible causes -

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

SC701: Finisher inverter error (A193/A224)

- Defenition - [B]

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

- Possible causes -

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

SC702: Finisher staple error (A193/A224)

- Defenition - [B]

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

- Posible causes -

- Staple motor defective
- Finisher drive board defective

SC900: Total counter error (A193/A224)

-Definition- [C]

The total counter is not working properly.

- Possible causes -

- Total counter defective
- IOCSS board defective

SC920: MSU connection error (A193/A224)

-Definition- [B]

The MSU set signal is not detected

- Possible cause -

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

SC921: MSU hardware error (A193/A224)

-Definition- [B]

The hardware of the MSU is defective

- Possible cause -

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

SC980: Program loading error (A193/A224)

-Definition- [C]

The program cannot load properly.

- Possible cause -

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

SC981: NVRAM clear error (A193/A224)

-Definition- [C]

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

- Possible cause -

- NVRAM defective

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

-Definition- [B]

The BiCU board cannot communicate with the IOCSS board properly.

- Possible cause -

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

SC999: Program version error (A193/A224)

- Definition - [C]

Downloading the incorrect type of main software

- Possible cases -

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

17. ROM HISTORY

OVERALL
MACHINE
INFORMATION

A224 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
Version A, B, & C were for the pre-production machines.	A2245532D	1st Mass Production	1.18
- (New SP Mode) SP6-006-4: ARDF Main-Scan Registration of the rear side. - (Specification) When the paper cassettes do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected. (The previous version software stops the copy job when one of tray is empty). - The stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode. - When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper.	A2245532E	June '97	1.20
- New SP is added. SP5-949:1 = When one of the trays is empty, the paper end indicator (red LED) lights. - The DF Jam display is cleared by DF lifting up and down.	A2245532F	August '97	1.24
- (For USA only) New SP is added. SP5-950: LG size paper detection on the by pass tray. * When this function is selected and LT ☐ size is inserted in the by-pass tray, the machine detects it as LG ☐ size paper. - (For USA only) Correspond to the Energy Star standard. - After the fax transmission through ARDF with a stamper, the registration of the 1st copied paper by ARDF is delayed.	A2245532H	September '97	1.26

A224 ROM MODIFICATION HISTORY (Copier Section)																							
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																				
- Dirty background Problem Vt correction Mixing time - (New SP mode) •SP2-994: Vcont offset •SP9-999 -14: Additional Mixing time display	A2245532K	October '97	1.30																				
After initializing the developer, the transfer current is added til making a copy, turning off and on the manin switch, or oping the front cover.	A2245532L	November '97	1.32																				
-The table for VT correction & Mixing time have been changed. <table><tr><th>Remaining Mixing Time</th><th>VT Correction</th></tr><tr><td>100</td><td>0</td></tr><tr><td>200</td><td>0.1</td></tr><tr><td>400</td><td>0.4</td></tr><tr><td>450</td><td>0.6</td></tr></table> <table><tr><th>Pre. Vt-Latest VT</th><th>Mixing Time</th></tr><tr><td>~0.1</td><td>10</td></tr><tr><td>~0.2</td><td>30</td></tr><tr><td>~0.3</td><td>50</td></tr><tr><td>~0.4</td><td>300</td></tr></table>	Remaining Mixing Time	VT Correction	100	0	200	0.1	400	0.4	450	0.6	Pre. Vt-Latest VT	Mixing Time	~0.1	10	~0.2	30	~0.3	50	~0.4	300	A2245532M	February '98	1.33
Remaining Mixing Time	VT Correction																						
100	0																						
200	0.1																						
400	0.4																						
450	0.6																						
Pre. Vt-Latest VT	Mixing Time																						
~0.1	10																						
~0.2	30																						
~0.3	50																						
~0.4	300																						
-SC544 is sometime displayed when the machine shift to the night mode or the pre-heat mode. -When paper longer than A4 is fed at the toner near end condition, there is not enough of toner supplied.	A2245532N	September '98	1.34																				
Continued...																							

A224 ROM MODIFICATION HISTORY (Copier Section)																																																						
DESCRIPTION OF MODIFICATION		FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																																																		
(Continued form previous page.) -Copy Quality in duplex mode. When the quality of the rear copy is poor, the added transfer current must be decreased by SP2-301-3. The new table shows that transfer current can be set to a lower range.		A2245532N	September '98	1.34																																																		
Current Table (SP2-301-3) <table><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>14</td><td>16</td><td>18</td><td>20</td></tr><tr><td>250~275</td><td>16</td><td>18</td><td>20</td><td>22</td></tr><tr><td>200~250</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>~200</td><td>19</td><td>21</td><td>23</td><td>25</td></tr></table> Default Setting New Table (SP2-301-3) <table><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>8</td><td>11</td><td>14</td><td>16</td></tr><tr><td>250~275</td><td>10</td><td>13</td><td>16</td><td>18</td></tr><tr><td>200~250</td><td>12</td><td>15</td><td>18</td><td>20</td></tr><tr><td>~200</td><td>14</td><td>17</td><td>19</td><td>21</td></tr></table> Default Setting		Table No./ Paper width	0	1	2	3	275	14	16	18	20	250~275	16	18	20	22	200~250	18	20	22	24	~200	19	21	23	25	Table No./ Paper width	0	1	2	3	275	8	11	14	16	250~275	10	13	16	18	200~250	12	15	18	20	~200	14	17	19	21			
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200~250	12	15	18	20																																																		
~200	14	17	19	21																																																		
-White copy problem on 1st scanning. A. Two new SP modes have been added: 1. SP4-916-1: Scanner Lamp OFF counter default: 120min range: 0-300min 2. SP4-916-2 Scanner lamp warm-up time defalt: 200ms range:0-500ms If the scanner lamp remains off for 120min or longer in between the first and second scans of each job, the machine will allow the scanner 120ms for warm-up (default). B. When the scanner lamp is turned on for the first time after the main power switch has been turned on, the machine allows the scanner 300ms for warm-up.		A2245532Q	March '99	1.36																																																		

SECTION 14
LARGE CAPACITY TRAY
(A667)

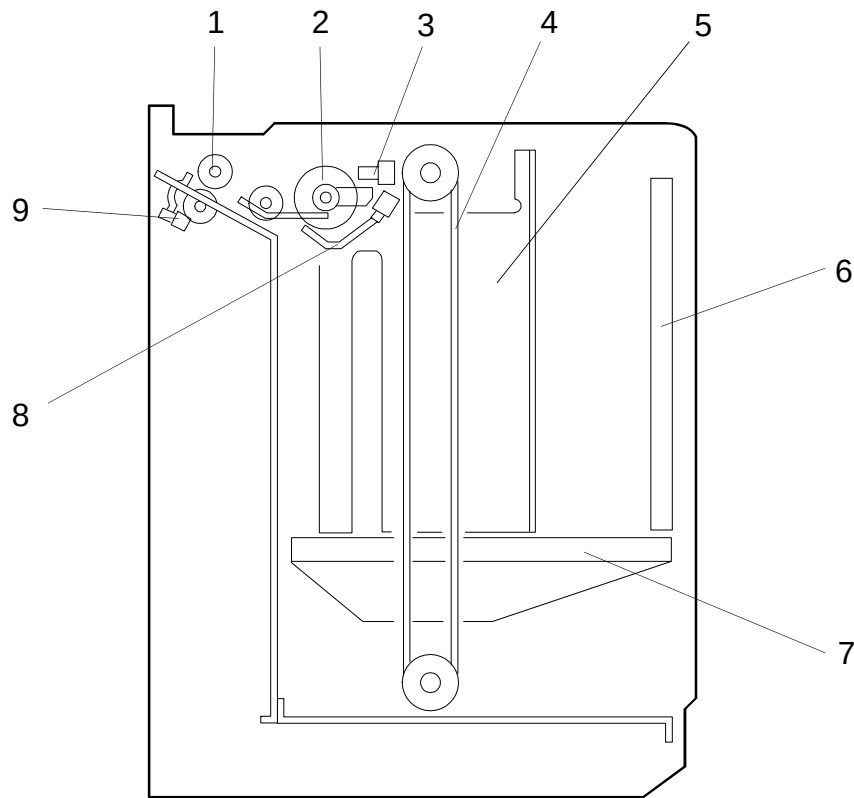
1. SPECIFICATIONS

Copy Paper Size:	A4 sideways or 11" x 8 1/2"
Copy Paper Weight:	60 g/m ² to 90 g/m ² (16 lb to 24 lb)
Tray Capacity:	Sheets: 1500 (80 g/m ²) or Stack height: Less than 180 mm (7")
Power Source	+ 24Vdc and +5Vdc from the main machine
Power Consumption:	22.1 W
Dimensions (W x D x H):	290 x 440 x 545 mm (11.4" x 17.3" x 21.5")
Weight:	13 kg (28.6 lb)

LARGE
CAPACITY
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2. COMPONENT LAYOUT

2.1 MECHANICAL COMPONENT LAYOUT



1. Relay Roller

2. Paper Feed Roller

3. Upper Limit Sensor

4. Timing Belt

5. Side Fence

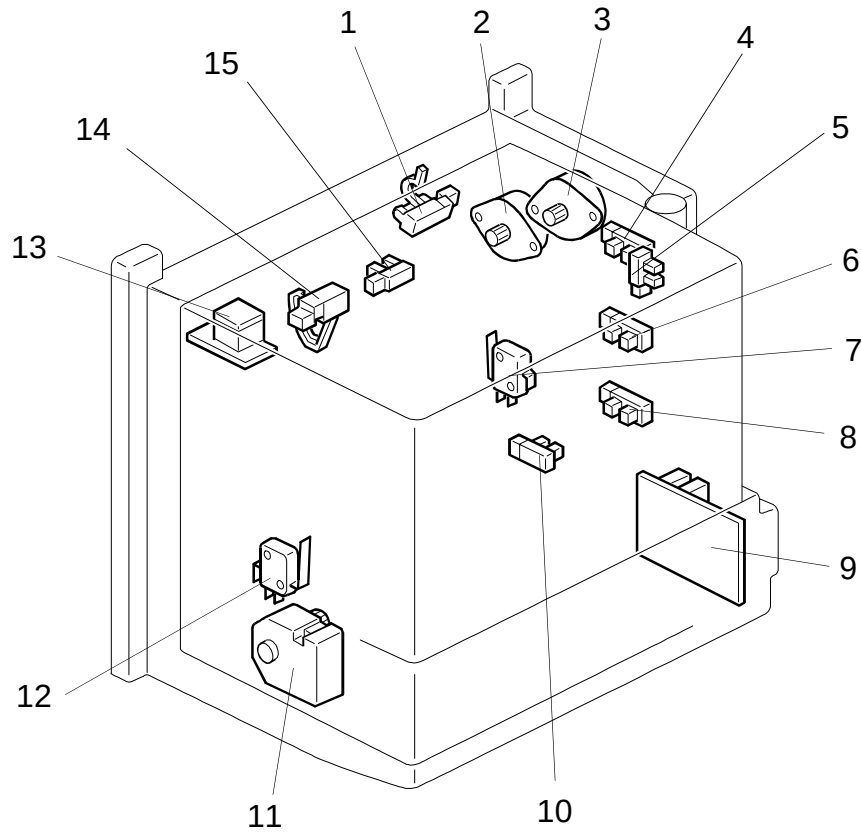
6. End Fence

7. Bottom Plate

8. Paper End Sensor

9. Relay Sensor

2.2 ELECTRICAL COMPONENT LAYOUT



LARGE
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TRAY
(A667)

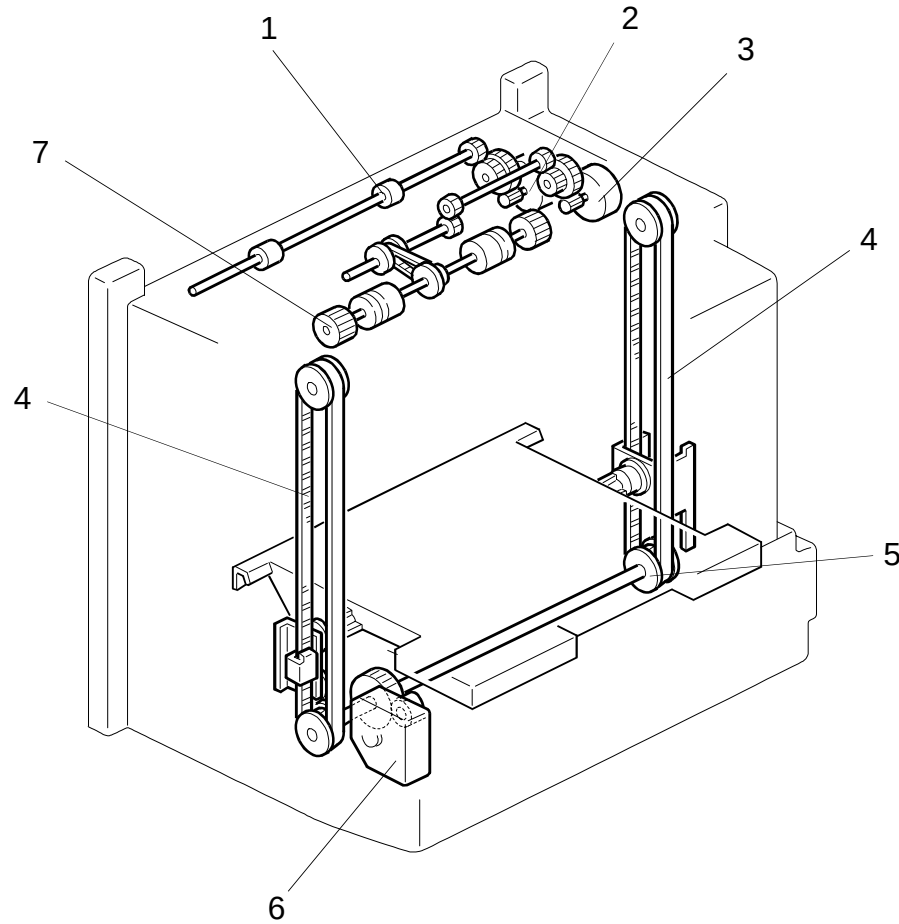
1. Relay Sensor	9. LCT Drive Board
2. Transport Motor	10. Lower Limit Sensor
3. Paper Feed Motor	11. Tray Lift Motor
4. Paper Near-End Sensor 3	12. LCT Cover Switch
5. Paper Size Sensor	13. Tray Down Switch
6. Paper Near-End Sensor 2	14. Paper End Sensor
7. Unit Set Switch	15. Upper Limit Sensor
8. Paper Near-End Sensor 1	

2.3 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the point-to-point diagram on the waterproof paper for the locations of these components.

Symbol	Index No.	Description	Notes
Printed Circuit Board			
PCB 1	9	LCT Drive	Interfaces the sensor signals with the main machine, and transfers the motor drive signals from the main machine.
Motors			
M 1	2	Transport	Drives the transfer roller.
M 2	3	Paper Feed	Drives the paper feed roller.
M 3	11	Tray Lift	Lifts up and lowers the bottom plate.
Sensors			
S 1	1	Relay	Detects the leading edge of paper to determine the paper feed motor stop timing. Also detects misfeeds.
S 2	8	Paper Near-end 1	Detects the amount of paper in the LCT. Note that these sensors may not be used, depending on the main machine.
S 3	6	Paper Near-end 2	
S 4	4	Paper Near-end 3	
S 5	5	Paper Size	Detects whether A4 size paper or Letter size paper is being used.
S 6	10	Lower Limit	Detects when the bottom plate is at its lowest position.
S 7	14	Paper End	Detects the paper end condition.
S 8	15	Upper Limit	Detects when the paper stack in the paper tray is at the correct height to stop the tray lift motor.
Switches			
SW 1	7	Unit Set	Cuts the dc power line when the LCT is open.
SW 2	12	LCT Cover	Cuts the dc power line of the lift motor when the LCT cover is open.
SW 3	13	Tray Down	Lowers the bottom plate.

2.4 DRIVE LAYOUT



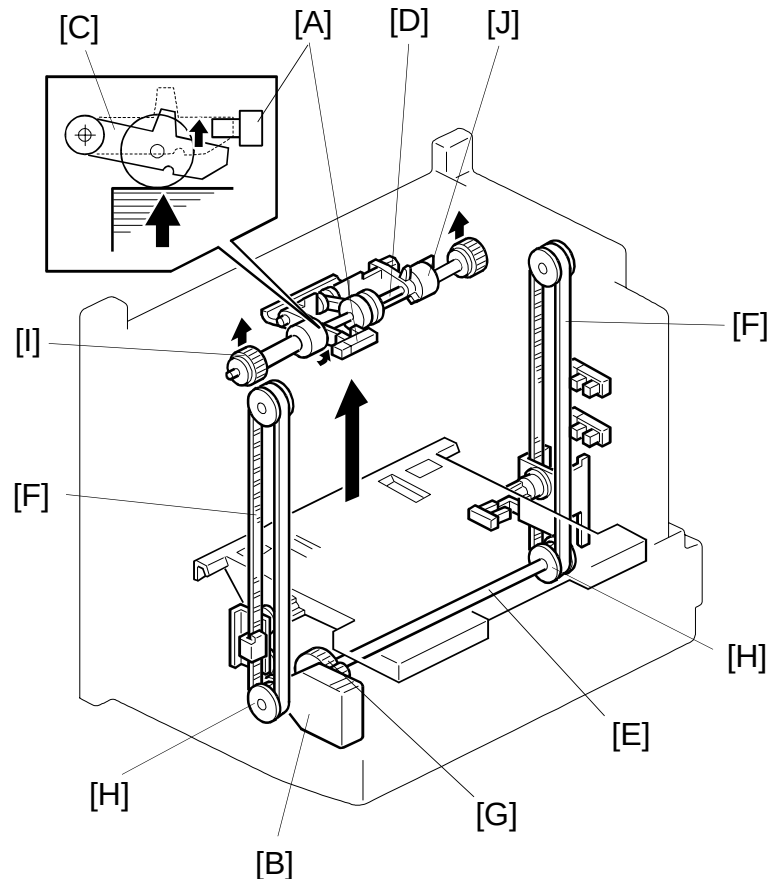
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- 1. Relay Roller
- 2. Transport Motor
- 3. Paper Feed Motor
- 4. Timing Belts

- 5. Drive Pulley
- 6. Tray Lift Motor
- 7. Paper Feed Roller

3. DETAILED SECTION DESCRIPTIONS

3.1 PAPER LIFT MECHANISM



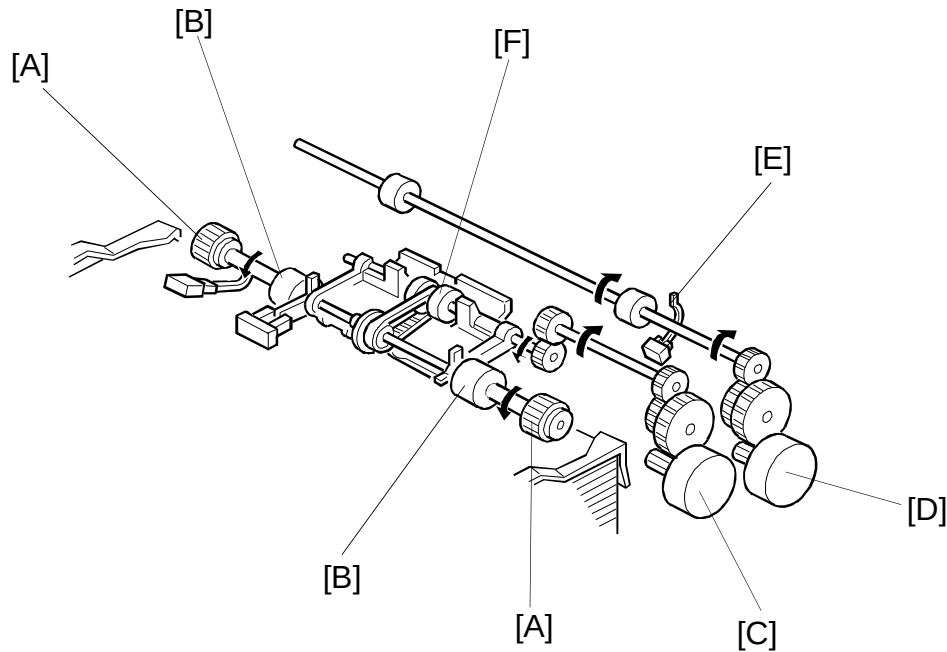
The upper limit sensor [A] controls the tray lift motor [B]. The actuator [C] for the sensors is on the feed roller shaft [D]. The tray lift motor drives the bottom plate [E] which is attached to the timing belts [F] through the gear [G] and the drive pulleys [H].

The paper feed rollers [I] are always lowered by the weights [J]. When the LCT cover is closed, the tray lift motor will start rotating and the bottom plate start lifting.

When the top sheet of the paper stack raises the paper feed roller, the upper limit sensor is activated and the tray lift motor will stop.

During copying, when the level of the paper stack has fallen past a certain point (when the actuator [C] exits the upper limit sensor), the tray lift motor will turn on to maintain the correct level for paper feed.

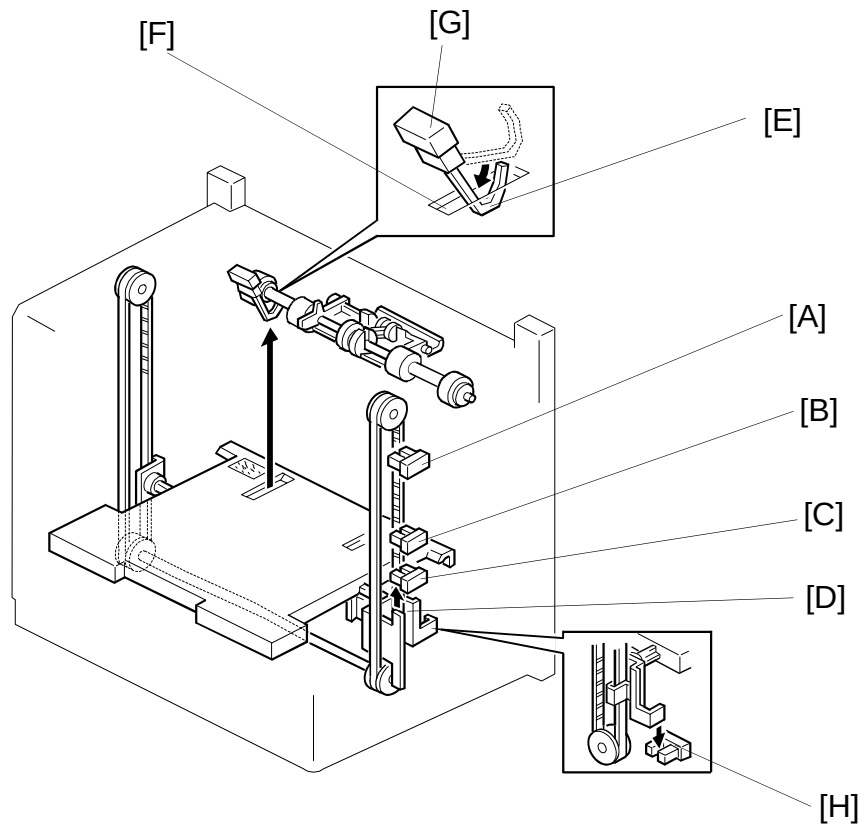
3.2 PAPER FEED MECHANISM



LARGE
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TRAY
(A667)

The LCT uses the corner separator system. The paper feed rollers [A] always contact the top of the paper stack because of the weights [B] on the paper feed shaft. When the LCT receives the paper feed start command, the paper feed motor [C] and the transport motor [D] will start to feed the paper. When the leading edge of the paper activates the relay sensor [E], the paper feed motor will stop but the transport motor will stay on to feed the paper continuously. At this time, the paper feed roller is also rotating to help feed the paper. The gear inside the one-way clutch [F] allows this movement. When the leading edge of the paper activates the registration sensor of the main machine, the transport motor will stop.

3.3 PAPER NEAR-END/END DETECTION



This LCT can detect four paper near-end condition levels (75%, 50%, 25% and Near End) and the paper end condition.

NOTE: The number of paper near-end detection levels actually used depends on the main machine.

The paper near-end condition is detected by three near-end sensors [A, B, and C] and the actuator [D] attached to the bottom plate. The elevation of the bottom plate varies with the amount of the paper remaining in the LCT. The actuator enters and leaves the sensors as the bottom plate moves up and down.

When the LCT runs out of paper, the paper end feeler [E] drops into the cutout [F] in the tray bottom plate and the paper end sensor [G] is activated. When a paper end condition occurs, the tray lift motor will lower the bottom plate. When the lower limit sensor [H] is activated by the bottom plate, the tray lift motor will stop.

The relationship between the sensors and the paper near-end/end level is as follows.

	Near-end Sn [C]	Near-end Sn [B]	Near-end Sn [A]	End Sn [G]
Paper tray full	OFF	OFF	OFF	OFF
75% full	ON	OFF	OFF	OFF
50% full	ON	ON	OFF	OFF
25% full	OFF	ON	OFF	OFF
Near-end (about 70 sheets remaining)	OFF	—	ON	OFF
Paper end	OFF	OFF	—	ON

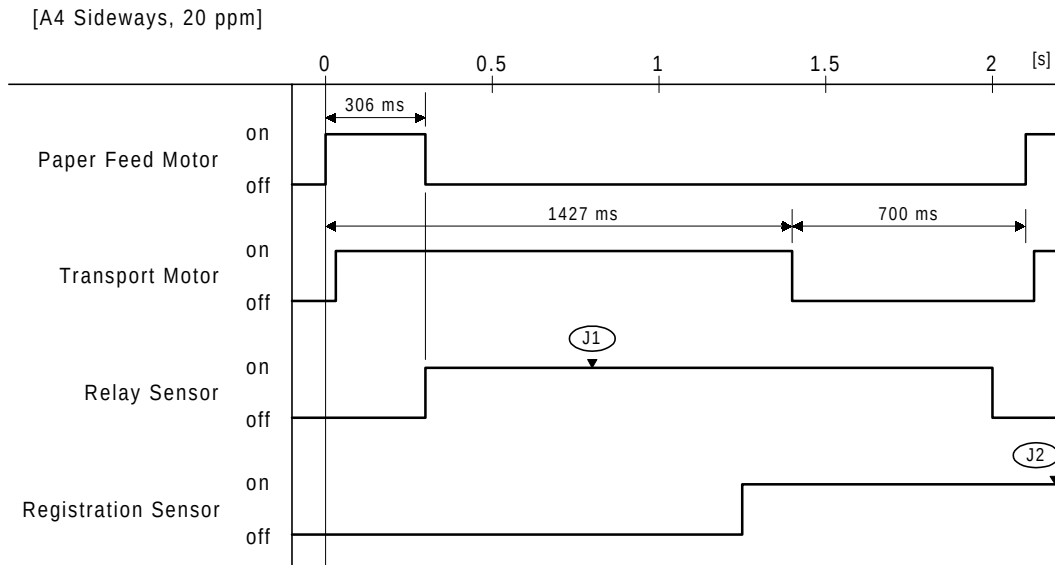
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ON: Activated (actuator inside the sensor)

OFF: Not activated

—:Not specified

3.4 PAPER FEED TIMING AND JAM DETECTION



- J1: Checks whether the relay sensor is activated within 0.8 seconds after the paper feed motor has been energized.
- J2: Checks whether the registration sensor is activated within 2.01 seconds after the relay sensor has been activated.

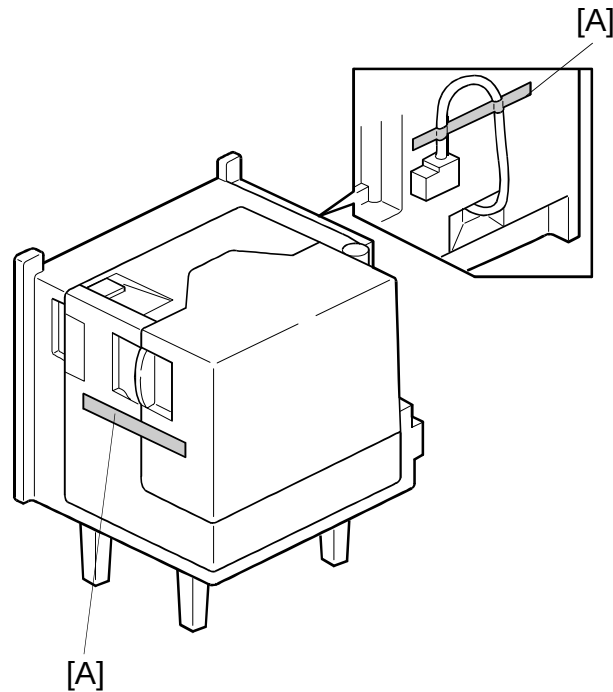
4. INSTALLATION

4.1 ACCESSORY CHECK

No.	Description	Q'ty
1	Philips Screw - M3x8	2
2	Stepped Screw - M3x6	2
3	Installation Procedure	1
4	NECR (Ricoh version only)	1

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TRAY
(A667)

4.2 INSTALLATION PROCEDURE



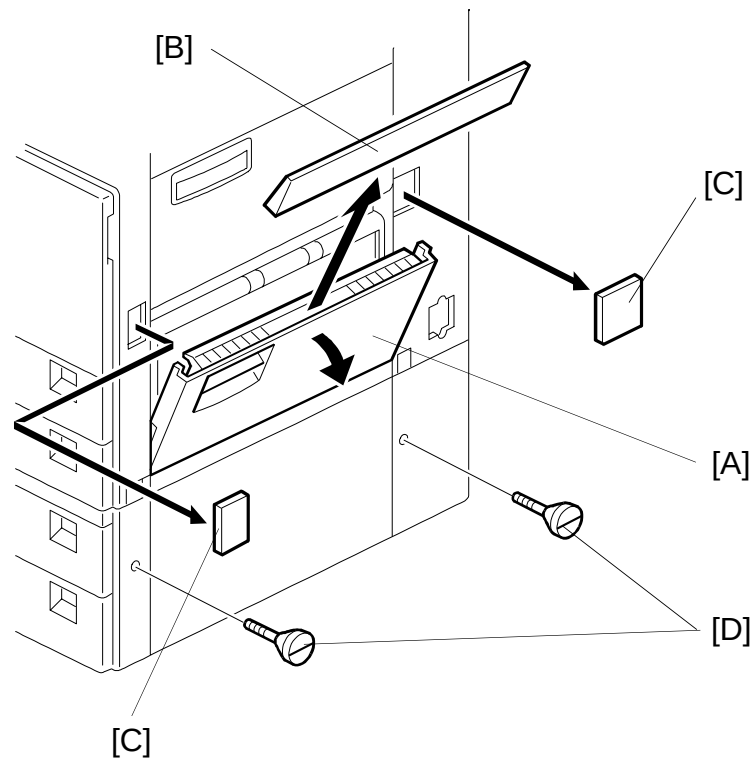
NOTE: The optional paper feed unit (G697) or the optional table must be installed before installing the LCT.

⚠ CAUTION

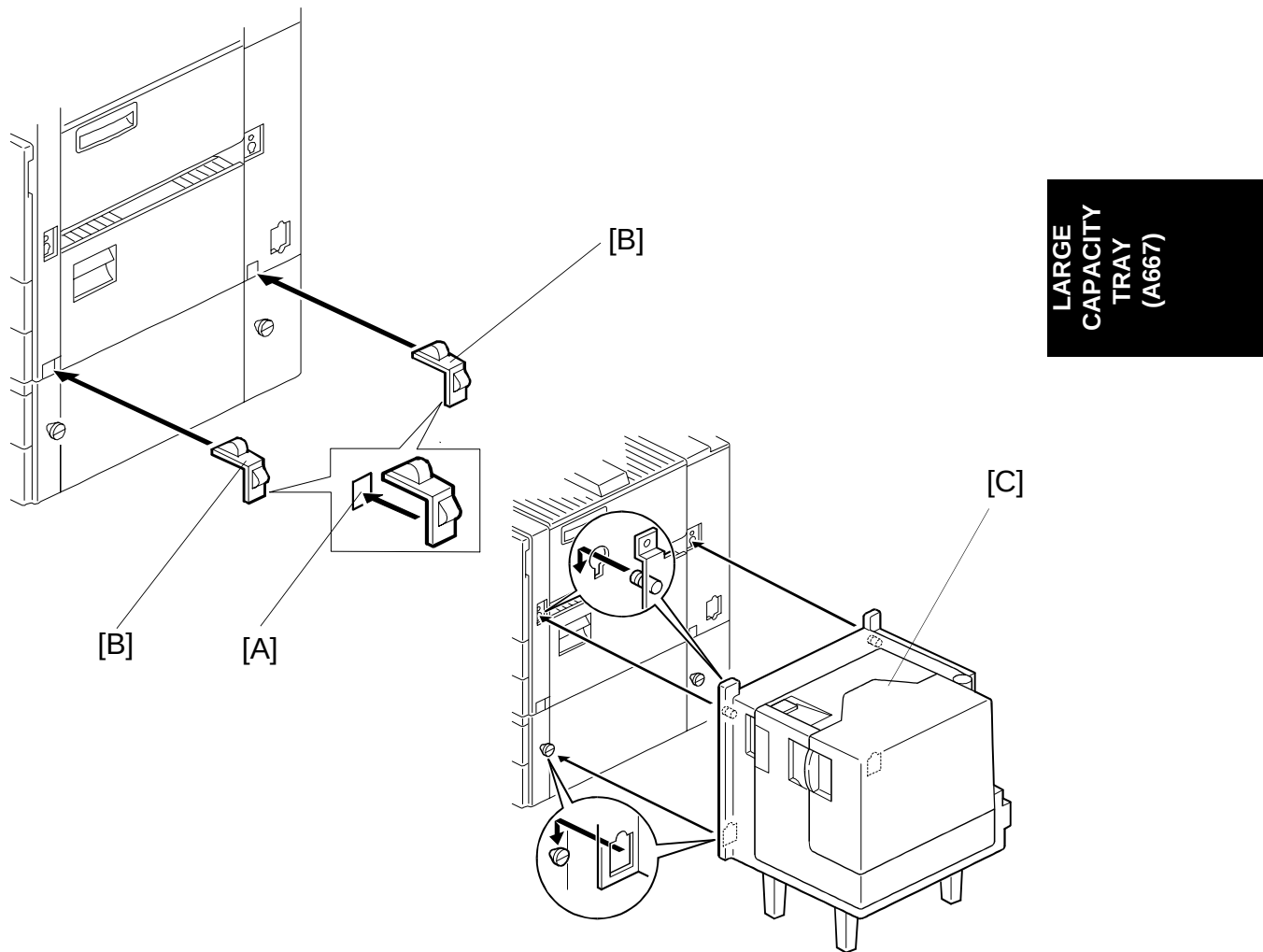
Unplug the main machine power cord before starting the following procedure.

1. Remove the two strips of tape [A].

INSTALLATION

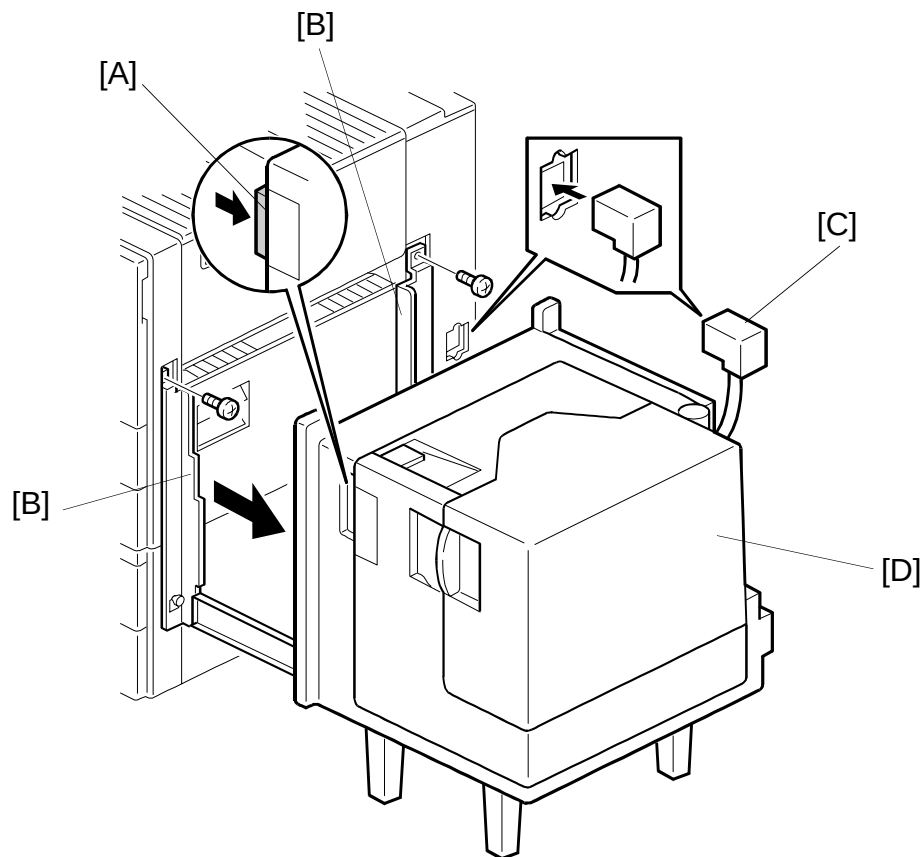


2. Open the right lower cover [A] of the main machine.
3. Remove the paper entrance cover [B] from the right lower cover [A].
4. Remove two caps [C].
5. Install two stepped screws [D] on either the optional paper feed unit or the optional table (long stepped screws for the optional paper feed unit, short stepped screws for the optional table).



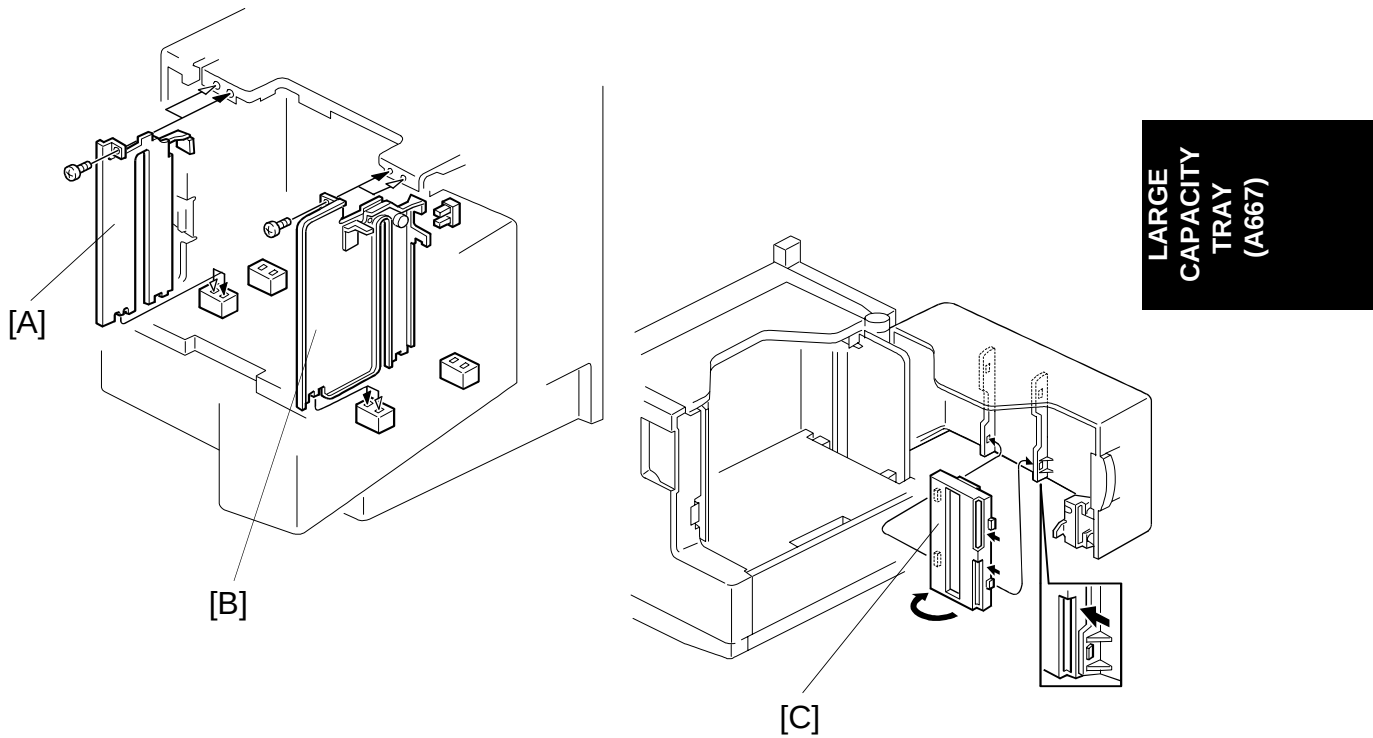
6. Peel off the backing [A] of the double side tape attached to the rear side of the bracket [B].
7. Install two brackets [B] in the area between the main machine and the optional paper feed unit or table, as shown.
8. Install the LCT [C], as shown.

INSTALLATION



9. Push the release lever [A] and slide the LCT to the right (front view), then secure the brackets [B] (2 screws).
10. Return the LCT to the previous position.
11. Connect the LCT cable [C] to the main machine.
12. Swing open the LCT cover [D] and load the paper.
13. Plug in the power cord and turn on the main switch, then check the LCT operation.

4.3 PAPER SIZE CHANGE



1. Open the LCT cover.
2. Move the front side plate [A] and rear side plate [B] to the appropriate position.
3. Move the end fence [C] to the appropriate size position (take the fence out and turn it around).

5. PREVENTIVE MAINTENANCE TABLE

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

Symbol Key: C: Clean, R: Replace,

Item	EM	200k	400k	600k	NOTE
Feed Roller		R	R	R	
Transport Roller	C	C	C	C	Dry cloth or water
Paper Bottom Plate Pad	C	C	C	C	Dry cloth or water

6. SERVICE TABLES

6.1 TEST POINT TABLE

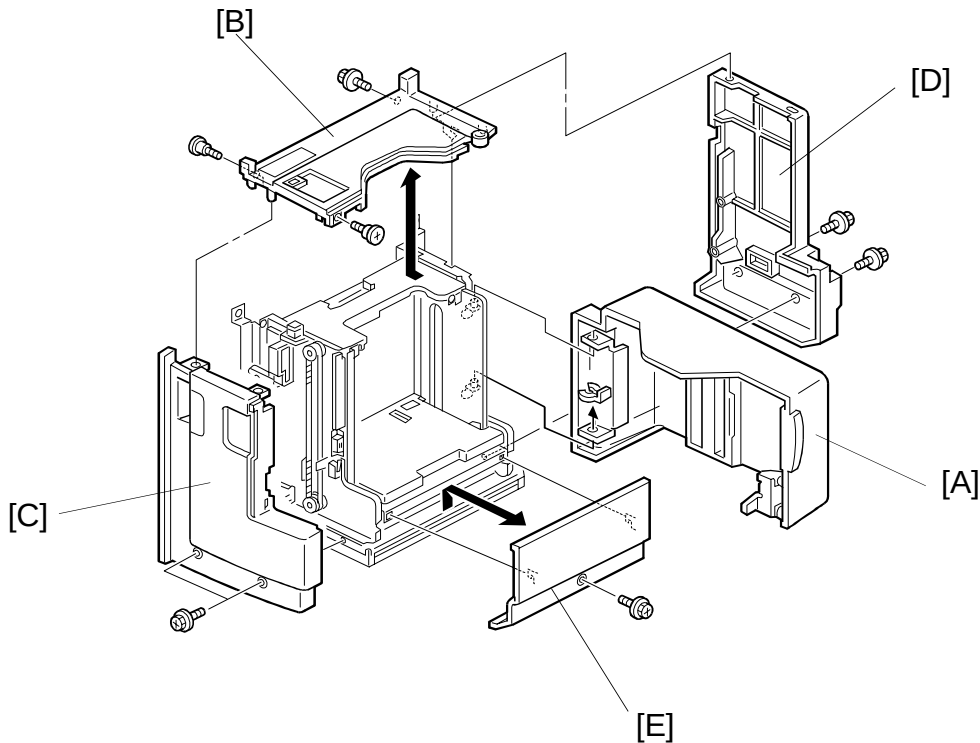
Number	Function
TP101	GND
TP102	+ 24V
TP103	+ 5V
TP104	GND

6.2 FUSE TABLE

Number	Rating	Function
FUSE 101	6.3A, 125V	Protects the +24V line.

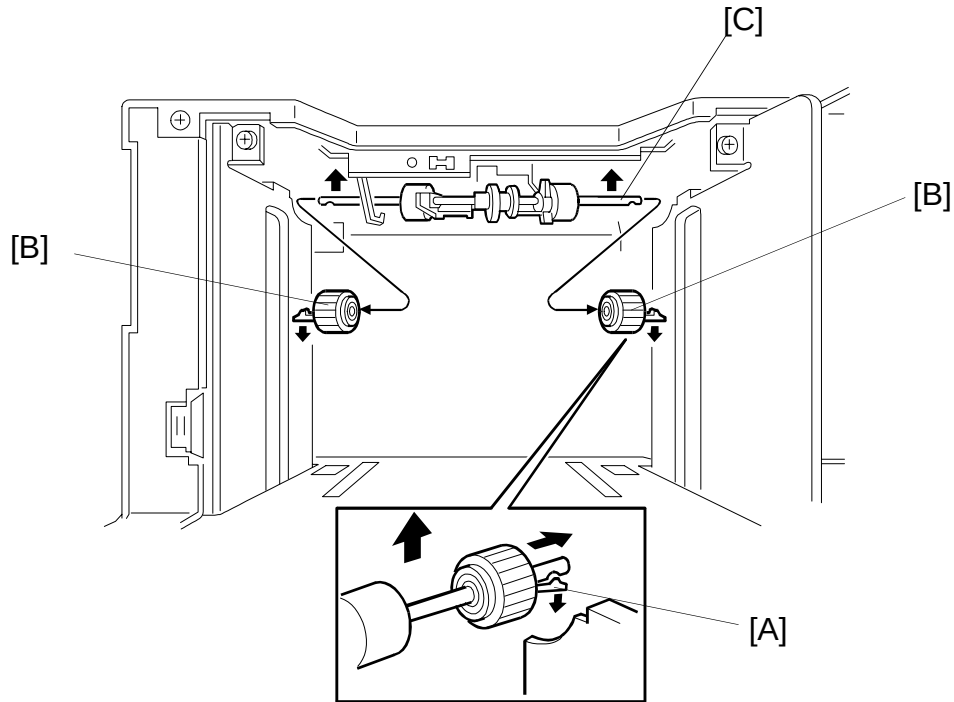
7. REPLACEMENT AND ADJUSTMENT

7.1 EXTERIOR COVER REMOVAL



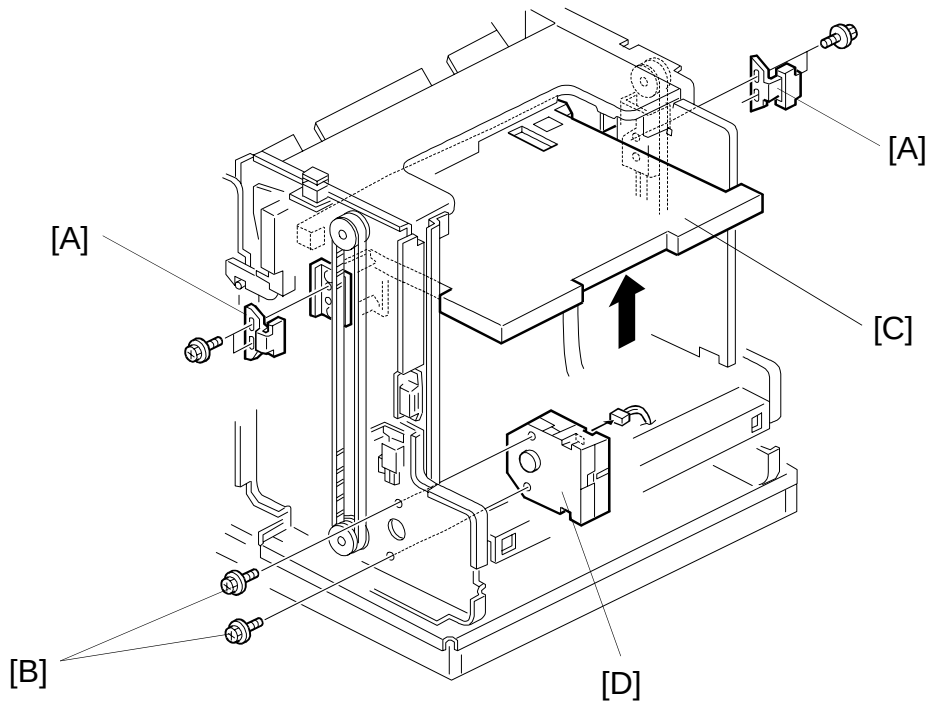
1. Top Cover
Open the LCT cover [A], then remove the top cover [B] (3 screws).
2. Front Cover
Remove the front cover [C] (2 screws).
3. Rear Cover
Remove the rear cover [D] (2 screws).
4. Right Cover
Open the LCT cover, then remove the right cover [E] (1 screw).
5. LCT Cover
Open the LCT cover, then remove the LCT cover [A] (1 clip).

7.2 PAPER FEED ROLLER REMOVAL



1. Open the LCT cover.
2. Release the hook [A] of the paper feed roller [B].
3. Lift up the paper feed roller shaft [C], then remove the paper feed roller.

7.3 TRAY LIFT MOTOR REMOVAL

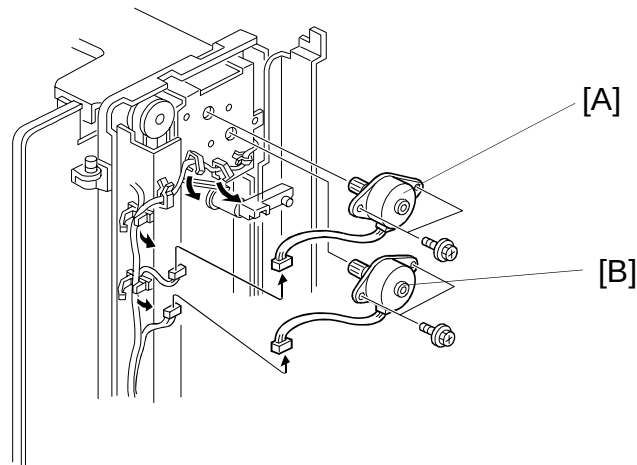


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1. Remove the top cover, front cover, and rear cover (see Exterior Cover Removal).
2. Remove the belt stoppers [A] (2 screws each).
3. Remove the two screws [B] holding the tray lift motor.
4. Lift up the bottom plate [C], then take out the tray lift motor [D] (1 connector).

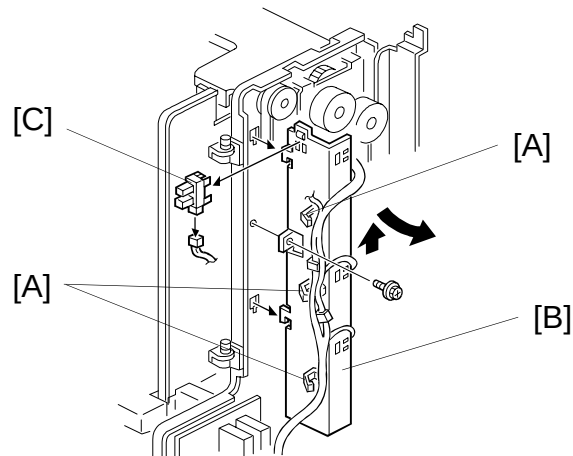
NOTE: Before reinstalling the belt stoppers [A], move the bottom plate to its lowest possible position.

7.4 PAPER FEED MOTOR AND TRNSPORT MOTOR



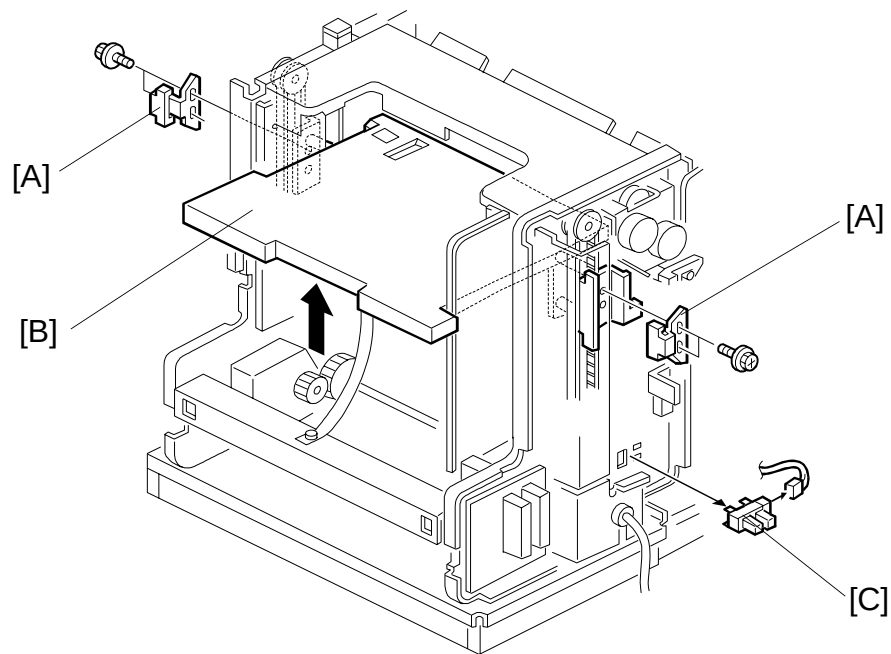
1. Remove the top cover and rear cover (see Exterior Cover Removal).
2. Remove the paper feed motor [A] (2 screws, 1 connector).
3. Remove the transport motor [B] (2 screws, 1 connector).

7.5 PAPER SIZE SENSOR



1. Remove the top cover and rear cover (see Exterior Cover Removal).
2. Unclamp the harnesses from the clamps [A] on the sensor bracket [B].
3. Remove the sensor bracket [B] (1 screw).
4. Remove the paper size sensor [C] (1 connector).

7.6 LOWER LIMIT SENSOR



1. Remove the top cover, front cover, and rear cover (see Exterior Cover Removal).
2. Remove the belt stoppers [A] (2 screws each).
3. Lift up the bottom plate [B], then remove the lower limit sensor [C] (1 connector).

NOTE: Before reinstalling the belt stoppers [A], move the bottom plate to its lowest possible position.

FAX UNIT (A639)

SECTION 1

OVERALL MACHINE INFORMATION

1. SPECIFICATIONS

Type Desktop type transceiver	Memory Capacity
Circuit PSTN, PABX, ISDN (optional)	ECM: 128 kbytes
Connection Direct couple	SAF: Standard: 1 Mbytes: 80 pages With 2 Mbyte option: 240 pages With 4 Mbyte option: 400 pages With 130 Mbyte HDD option: 1200 pages With 130 Mbyte HDD plus Function Upgrade Card: 3000 pages Measured using an ITU-T #1 test document (Slerexe letter)
Original Size (Book) Maximum Length: 432 mm Maximum Width: 297 mm	Compression MH, MR, EFC, MMR, SSC (MMR only with ECM and G4) SAF storage for memory tx: MMR and raw data
Original Size (ADF) Length: 105 - 1200 mm [4.1 - 47.2 ins] Width: 105 - 297 mm [4.1 - 11.7 ins] Thickness: 0.05 to 0.2 mm [2 to 8 mils] (equivalent to 40 - 90 g/m ²)	Protocol Group 3 with ECM Group 4 (ISDN G4 option required)
Note: The maximum original length varies in immediate tx mode, depending on the scan width and resolution. Refer to the "Video Data Path" later in this chapter for more details.	Modulation V.17(TCM), V.29 (QAM), V.27ter (PHM), V.21 (FM)
Scanning Method Flat bed, with CCD	Data Rate (bps) G3: 14400/12000/9600/7200/4800/2400, Automatic fallback G4 (option): 64 kbps/56 kbps
Scan Width 210 mm [8.64 ins] ± 1% (A4) 216 mm [8.5 ins] ± 1% (8.5" x 11") 256 mm [10.2 ins] ± 1% (B4) 279 mm [11.0 ins] ± 1% (11" x 17"r) 296 mm [12.2 ins] ± 1% (A3)	I/O Rate With ECM: 0 ms/line Without ECM: 2.5, 5, 10, 20, or 40 ms/line
Resolutions 8 x 3.85 lines/mm 8 x 7.7 lines/mm 8 x 15.4 lines/mm (G3 only) 16 x 15.4 lines/mm 200 x 100 dpi 200 x 200 dpi 400 x 400 dpi	Transmission Time G3: 6 seconds at 14400 bps; Measured with G3 ECM using memory for an ITU-T #1 test document (Slerexe letter) at 8 x 3.85 l/mm resolution G4 (option): 3 seconds at 64 kbps; Measured with an ITU-T #1 test document (Slerexe letter) at 200 x 200 dpi resolution
Note: To use the 8 x 15.4 lines/mm, 16 x 15.4 lines/mm and 400 x 400 dpi resolutions, an optional page memory card is required.	

2. FEATURES

2.1 FEATURES LIST

KEY:

O = Used, X = Not Used,

A = Optional memory 2M/4M required

B = Optional hard disk required

C = Optional page memory required

D = Optional function upgrade card required

E = Optional G4 kit required

Video Processing Features	
Automatic image density selection	O
Contrast	O
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction before tx (B4 -> A4)	O
Reduction before tx (A3 -> B4)	O
Reduction before tx (A3 -> A4)	O
Scanning Resolution - Standard	O
Scanning Resolution - Detail	O
Scanning Resolution - Fine	C
Scanning Resolution - Superfine	C
Smoothing to 400 x 400 dpi when printing	O

Communication Features - Automatic	
AI short protocol	O
Automatic fallback	O
Automatic redialing (Memory tx only)	O
Confidential reception	A or B
Dual Access	O
Substitute reception	O

Communication Features - User Selectable	
90° Image Rotation before tx	O
Action as a transfer broadcaster	A or B
AI Redial (last ten numbers)	O
Answering machine interface	X
Authorized Reception	O
Auto-answer delay time	X

Communication Features - User Selectable	
Automatic dialing (pulse or DTMF)	O
Auto Document	O
Automatic Voice Message	X
Batch Transmission	A or B
Book Original tx	O
Broadcasting	O
Chain Dialing	O
Communication Record Display	O
Confidential ID Override	O
Confidential Reception	A or B
Confidential Transmission	O
Direct Fax Number Entry	O
Economy Transmission	A or B
Fax on demand	X
Forwarding	A or B
Free Polling	O
Groups (9 groups)	O
Group Transfer Station	A or B
Hold	X
ID Transmission	O
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	O
Length Reduction	O
Memory transmission	O
Multi-step Transfer	A or B
Next Transfer Station	X
Non-standard original size specification	O
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O
Page separation mark	O
Parallel memory transmission	O
Personal Codes	O
Personal Codes with Conf. ID	X
Partial Image Area Scanning	X
Polling Reception	O
Polling Transmission	O
Polling tx file lifetime in the SAF	O
Quick Dial (Standard: 56 stations)	O

FEATURES

Overall
Machine
Information

Communication Features - User Selectable	
Reception modes (Fax, Tel)	O
Remote control features	X
Remote Transfer	X
Resolutions available for reception	
Standard	O
Detail	O
Fine (16 x 15.4 l/mm only)	C
Superfine	C
Restricted Access	O
Secured Polling	O
Secured Polling with Stored ID Override	O
Secure Transmission	X
Send Later	O
Silent ringing detection	X
Speed Dial (Standard: 100 stations)	O
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	O
Transmission Deadline (TRD)	O
Turnaround Polling	X
Two-step Transfer	X
Two in one	O
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Cable Equalizer	
PSTN	O
ISDN	E
Closed Network (rx)	O
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	O
Inch-mm conversion before tx	O
mm-inch selection when printing	O
Page retransmission times	O
Protection against wrong conn.	O
Resol'n stepdown override option	X
Short Preamble	X
Well log	O

Other User Features	
Area code prefix	X
Center mark	O
Checkered mark	O
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	A or B
Counters	O
Daylight Saving Time	O
Destination Check	X
Direct entry of names	O
File Retention Time	O
File Retransmission	O
Function Programs (F1 - F4)	O
Hard Disk Filing System	X
ID Code	O
Label Insertion ("To xxx")	O
Language Selection	SP mode
Manual service call	O
Memory Lock	A or B
Modifying a memory file (tx)	O
Multi Sort Document Reception	A or B
Own telephone number	O
Energy Saver (Night Timer and standby mode)	O
Print density control	O
Printing a memory file	O
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	O
Remaining memory indicator	O
Reverse Order Printing	A or B
RTI, TTI, CSI	O
Speaker volume control	O
Specified Cassette Selection	O
Substitute reception on/off	O
Telephone line type	O
Toner Saving Mode	X
TTI/CIL on/off	O
User Function Keys (4 keys)	O
User Parameters	O
Wild Cards	O

FEATURES

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	O
Confidential File Report	A or B
Error Report	O
Fax On Demand Report	X
Memory Storage Report	O
Mode Change Report	X
Polling Clear Report	O
Polling Reserve Report	O
Polling Result Report	O
Power Failure Report	O
TCR (Journal)	O
Toner Cassette Order Form	X
Transfer Result Report	A or B
Transmission Result Report	O

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

Service Mode Features	
Back-to-back test	O
Bit switch programming	O
Buzzer test	O
Cable equalizer	O
Comm. parameter display	O
Counter check	O
Country code	O
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	O
Error code display	O
Excessive jam alarm	O

Service Mode Features	
File Transfer	O
Hard Disk Utilities (Format etc.)	B
LCD contrast adjustment	SP mode
Line error mark	O
Memory file printout (all files)	O
Modem test	O
NCU parameters	O
Periodic service call	O
PM Call	O
Printing all communication records kept in memory	O
Programmable attenuation	X
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
RAM test	O
RDS	
- RAM read/write	O
- Dial data transfer (Quick/Speed)	O
- Software transfer	O
Ringer test	O
ROM version display	O
Serial number	O
Service monitor report	O
Service station number	O
Software Download	O
Software Upload	O
SRAM data download	O
System parameter list	O
Technical data on the TCR	O

2.2 CAPABILITIES OF PROGRAMMABLE ITEMS

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

Item	Standard	With function upgrade card
Maximum number of memory files plus polling rx files	200	1000
Maximum number of memory files	200	1000
Maximum number of destinations per file	200	200
Maximum number of destinations overall	500	2000
Maximum number of pages overall	1200	3000
Number of Quick Dials	56	56
Number of Speed Dials	100	1000
Number of Groups	9	30
Maximum number of destinations per Group	200	200
Maximum number of destinations dialed from the ten-key pad overall	100	1000
Maximum number of programs	56 (programmed in 56 Quick Dial keys)	56 (programmed in 56 Quick Dial keys)
Maximum number of destinations per program	200	200
Maximum number of destinations used for all programs	300	2000
Maximum number of Auto Documents	6 (programmed in 6 Quick Dial keys)	18 (programmed in 18 keys)
Maximum number of communication records for the TCR (Journal) stored in the memory	256	1000
Maximum number of addresses specified for features such as Authorized Reception and Specified Cassette Selection	30	50
Maximum number of personal codes	20	50

FEATURES

2.3 POSSIBLE COMBINATIONS OF OPTIONAL IC CARDS

The following table shows which optional IC cards can be or cannot be installed at the same time.

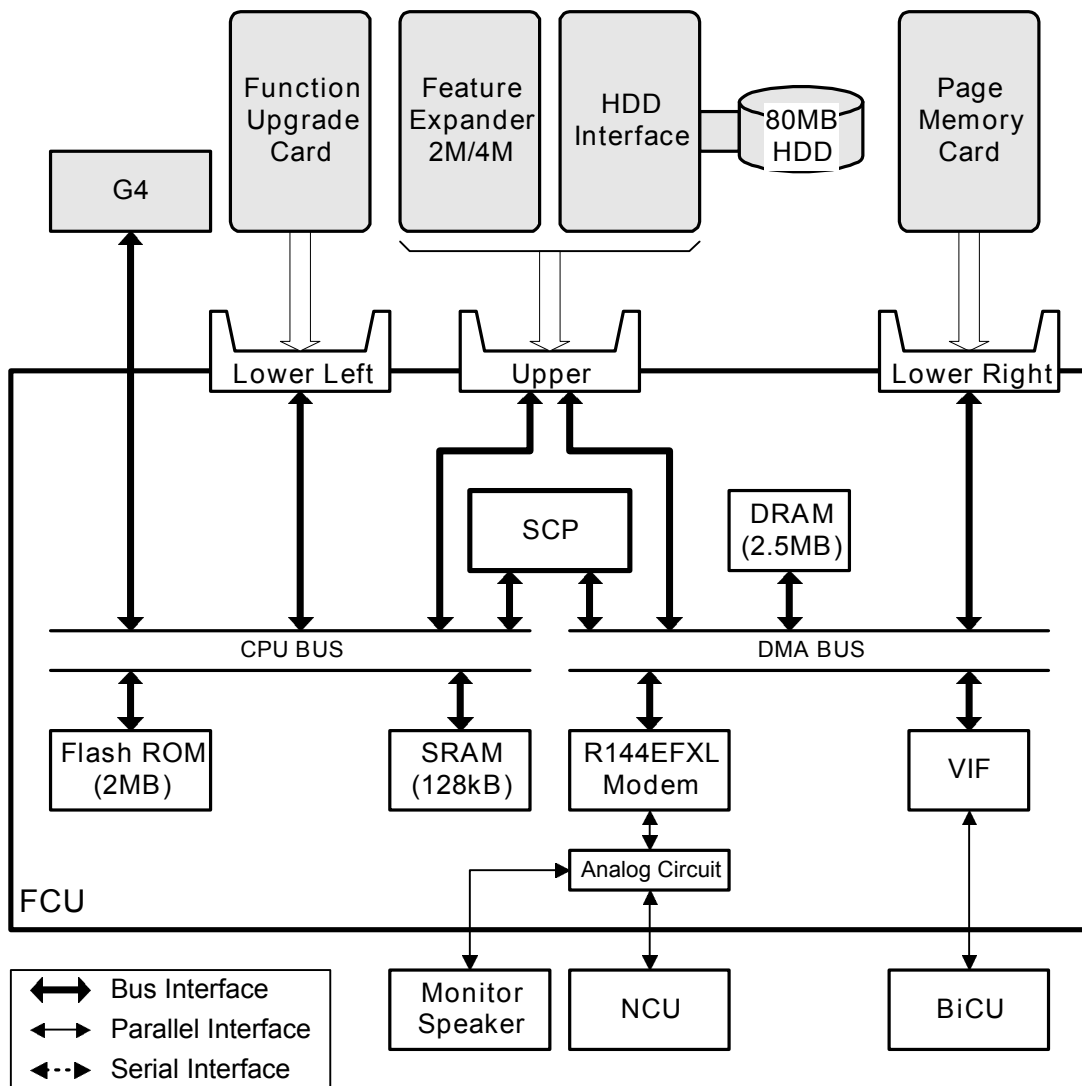
"Yes" in the table indicates that these two optional IC cards can be installed at the same time.

"No" in the table indicates that these two optional IC cards cannot be installed at the same time.

	A	B	C	D	E
A: Feature Expander 2M/4M		No	Yes	Yes	Yes
B: Feature Expander 80M (HDD)	No		Yes	Yes	Yes
C: Function Upgrade Card	Yes	Yes		Yes	No
D: Page Memory Card	Yes	Yes	Yes		Yes
E: Flash/SRAM Data Copy Tool (Service Tool)	Yes	Yes	No	Yes	

3. OVERALL MACHINE CONTROL

3.1 SYSTEM CONTROL



OVERALL MACHINE CONTROL

The basic Fax Unit consists of two PCBs: an FCU and an NCU.

The FCU controls all the fax communications and fax features, in cooperation with the base copier's main board, the BiCU. The NCU switches the analog line between the fax unit and the optional external telephone.

Fax Options

1. G4 unit: This allows the Fax Unit to communicate over an ISDN (Integrated Services Digital Network) line.
2. Function Upgrade Card: This expands the system's SRAM capacity to hold programmed telephone numbers, communication records, etc. Refer to page 1-5.
3. Feature Expander - 2M/4M: This expands the DRAM's capacity to hold up to 3MB or 5MB of received data or data for transmission. Also, some additional features become available when the Feature Expander is installed.
4. Feature Expander - Hard Disk: This extends the image data capacity to 80MB. Also, some additional features become available when the Feature Expander is installed.
5. Page Memory Card (High Resolution Card): This enhances the scan and receive resolutions to up to 400 x 400 dpi. Without this card, only 'Standard' and 'Detail' resolutions are available for both transmission and reception.

3.2 POWER DISTRIBUTION AND CONTROL

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

3.3 MEMORY BACK-UP

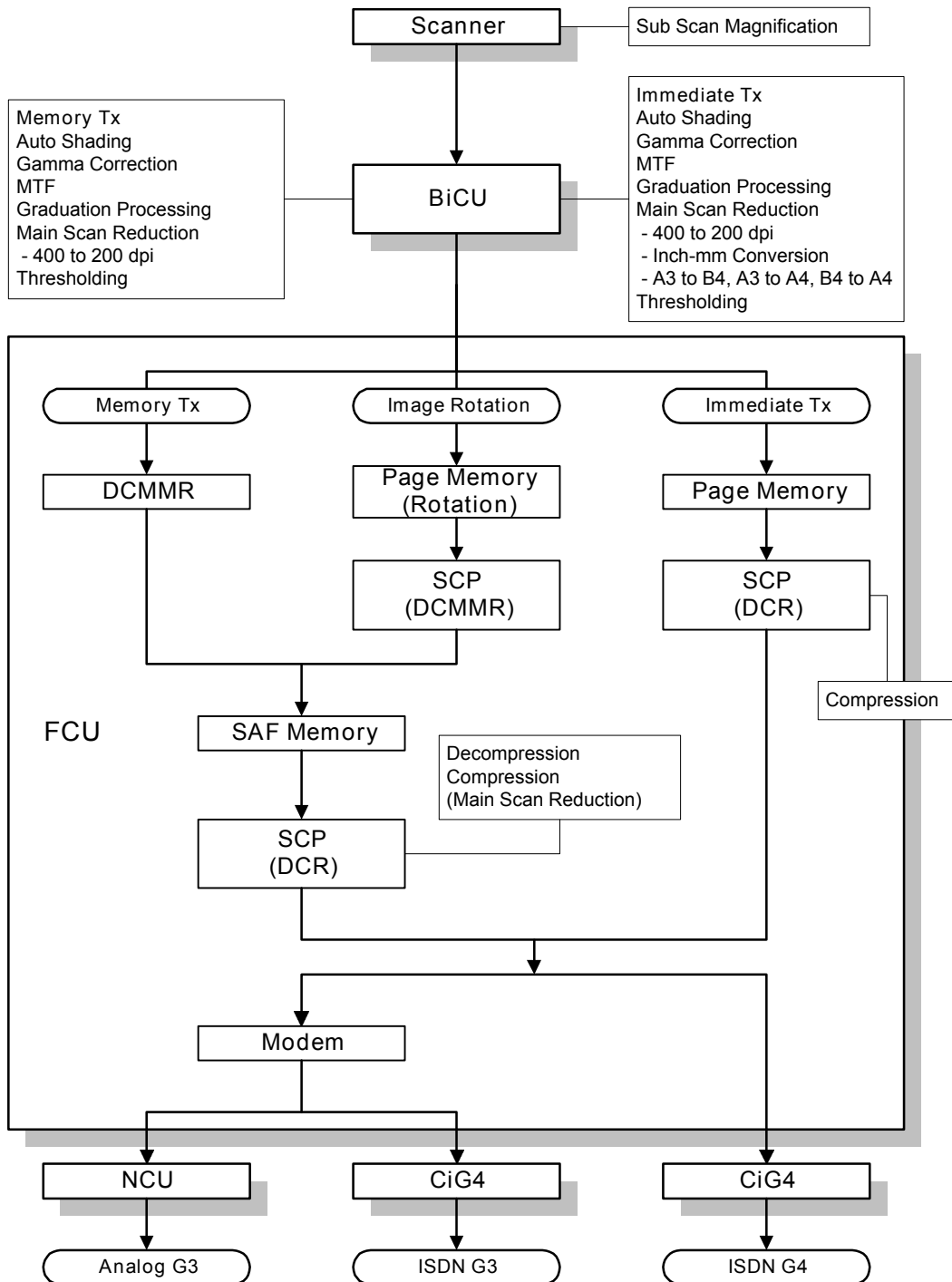
The system parameters and programmed items in the SRAM on the FCU and the SRAM on the Function Upgrade Card are backed up by a battery (long-term backup), in case the base copier's ac switch is turned off.

Note: The data in the SRAM is not guaranteed if the card is disconnected from the machine. Whenever the Function Upgrade Card needs to be removed, follow the instructions in the software upload and download procedures in the Service Level Functions section to avoid any data loss.

The SAF memory DRAM on the FCU board and the Feature Expander Card are backed up by a rechargeable battery for 1-hour.

4. VIDEO DATA PATH

4.1 TRANSMISSION



Memory Transmission and Parallel Memory Transmission

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

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

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

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

Immediate Transmission

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

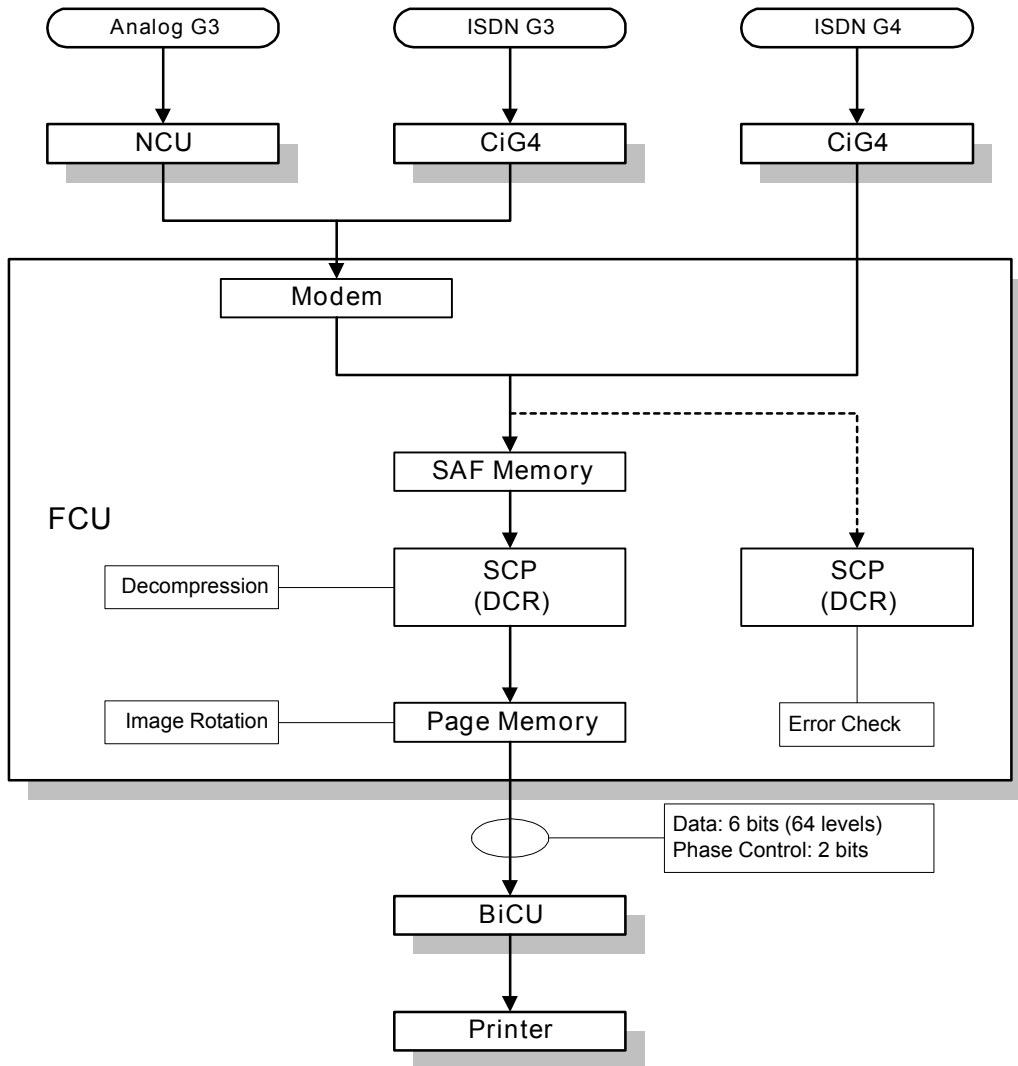
Note When scanning a fax original, the BiCU uses the MTF and Thresholding parameter settings programmed in the scanner bit switches, not the copier's SP modes.

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

The maximum transmittable page size for immediate transmission varies depending on the resolution selected and the size of page memory available. This is because the scanned data is stored in the page memory before transmission, not the SAF memory. Refer to the following table for details.

Width	Resolution	Without optional Page Memory card	With optional Page Memory card
A4 (210 mm)/ 8.5"	Standard	1200 mm (47.2")	1200 mm (47.2")
	Detail	600 mm (23.6")	1200 mm (47.2")
	Fine	Not usable	1200 mm (47.2")
	Superfine	Not usable	600 mm (23.6")
B4 (256 mm)/ 10.1"	Standard	1000 mm (39.4")	1200 mm (47.2")
	Detail	500 mm (19.7")	1200 mm (47.2")
	Fine	Not usable	1000 mm (47.2")
	Superfine	Not usable	500 mm (19.7")
A3 (297 mm)/ 11"	Standard	800 mm (31.5")	1200 mm (47.2")
	Detail	432 mm (17.0")	1200 mm (47.2")
	Fine	Not usable	800 mm (31.5")
	Superfine	Not usable	432 mm (17.0")

4.2 RECEPTION

Overall
Machine
Information

First, the FCU stores the data from either an analog line or an ISDN line to the SAF memory. (The data goes in parallel to the SCP, and is checked for error lines/frames.)

The FCU then decompresses the data and transfers it to page memory. If image rotation is possible, the image is rotated in page memory. The data is transferred to the BiCU in the 8-bit format (6-bits level/2-bits phase) used by the base copier's laser engine for printing.

SECTION 2

DETAILED SECTION DESCRIPTIONS

1. AUTOMATIC SERVICE CALLS

1.1 SERVICE CALL CONDITIONS

The fax unit makes an automatic service call when an SC code, other than the following, is informed from the base copier's BiCU.

Note The service station's fax number has to be programmed in advance, for the machine to make a service call.

Exceptions

Address (H)	Definition	Default	SC code
49FB64	1st SC code - High byte (BCD)	01	192
49FB65	1st SC code - Low byte (BCD)	92	SBU adjustment error
49FB66	2nd SC code - High byte (BCD)	01	193
49FB67	2nd SC code - Low byte (BCD)	93	APS sensor error
49FB68	3rd SC code - High byte (BCD)	03	390
49FB69	3rd SC code - Low byte (BCD)	90	TD sensor error 1
49FB6A	4th SC code - High byte (BCD)	03	393
49FB6B	4th SC code - Low byte (BCD)	93	TD sensor error 2
49FB6C	5th SC code - High byte (BCD)	06	691
49FB6D	5th SC code - Low byte (BCD)	91	BiCU/FCU communication error
49FB6E	6th SC code - High byte (BCD)	09	980
49FB6F	6th SC code - Low byte (BCD)	80	BiCU program load error
49FB70	7th SC code - High byte (BCD)	FF	Not programmed
49FB71	7th SC code - Low byte (BCD)	FF	
49FB72	8th SC code - High byte (BCD)	FF	Not programmed
49FB73	8th SC code - Low byte (BCD)	FF	
49FB74	9th SC code - High byte (BCD)	FF	Not programmed
49FB75	9th SC code - Low byte (BCD)	FF	
49FB76	10th SC code - High byte (BCD)	FF	Not programmed
49FB77	10th SC code - Low byte (BCD)	FF	

Detailed Descriptions

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

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

Manual Service Call

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

AUTOMATIC SERVICE CALLS

A Sample Auto Service Report Format

* * * Auto Service Report (Date and Time) * * *

Problem

S C

J A M

Reason of the call - "SC Code" or "PM Call"

Latest 10 copier's SC codes

BJ A M 2FEED SIZE005 0708

Last 4 digits of the total print counter

Paper Size Code

Paper Feed Station

Jam Location

Service Monitor Report Contents

System Parameter List Contents

Paper Size Code Table			
Code	Size	Code	Size
005	A4 sideways	038	8.5 x 11" sideways
006	A5 sideways	044	5.5 x 8.5" sideways
014	B5 sideways	160	11 x 17" lengthwise
031	Non-standard	164	8.5 x 14" lengthwise
132	A3 lengthwise	166	8.5 x 11" lengthwise
133	A4 lengthwise	172	5.5 x 8.5" lengthwise
141	B4 lengthwise		
142	B5 lengthwise		
159	Non-standard		

1.2 PERIODIC SERVICE CALL

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

Parameters		Address (H)
Call interval: 01 through 15 month(s) (BCD) 00: Periodic Service Call Disabled		480379
Date and time of the next call		
	Year: last two digits of the year (BCD)	48037A
	Month: 01 through 12 (BCD)	48037B
	Day: 01 through 31 (BCD)	48037C
	Hour: 00 through 23 (BCD)	48037D

Detailed
Descriptions

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

1.3 PM CALL

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

Cross reference

PM service call on/off: System switch 01, bit 0

PM alarm on/off: Copier SP mode 5-501-2 (default: enabled)

PM interval: Copier SP mode 5-501-1 (default: 45k prints)

1.4 EFFECTIVE TERM OF SERVICE CALLS

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

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

	Address (H)
Year: last two digits of the year (BCD)	480383
Month: 01 through 12 (BCD)	480384
Day: 01 through 31 (BCD)	480385

2. PARALLEL MEMORY TRANSMISSION

Using basic memory transmission, normally the machine starts dialing after the document has been completely scanned. Using Parallel Memory Transmission, the machine starts dialing at the same time the machine starts scanning. If the document has multiple pages, the machine scans them into memory and sends them while scanning continues.

Note This function is only usable when sending an original from the ADF.

The following table shows the differences between normal memory transmission and parallel memory transmission.

	Normal memory tx	Parallel memory tx
File Reserve Report	Printed, if automatic report printout is enabled.	Not printed.
If the other terminal is busy	Tries to resend the message later.	Continues scanning the document into memory, and tries to resend it later.
If transmission failed	Tries to resend the remaining pages later.	Tries to resend the remaining pages later.
If memory overflows during scanning	Stops scanning and erases all the scanned pages from memory, or sends all the scanned pages (user's choice).	Stops scanning and hangs up the communication when memory overflow is detected. Then erases all the scanned pages from memory without notifying the user.
If a document jam occurred during scanning	Stops scanning and deletes all the scanned pages from memory.	Stops scanning and hangs up the communication when a document jam is detected.
How and when the scanned message is erased from memory	The complete message is erased after all the pages have been sent.	Same as memory transmission.
Memory threshold to start scanning into memory	Depends on the setting of communication switch 0D. Default setting - 24kB	Depends on the setting of system switch 10. Default setting - 512 kB
Meaning of the stamp mark	Successfully stored.	Successfully stored.
Batch numbering (P. x/x)	Enabled	Not available unless the number of pages is programmed manually.
Including a sample of the image on reports	Possible	Possible

In the following cases, the machine uses normal memory transmission even if parallel memory transmission is enabled.

- Send later transmission
- Broadcasting
- Transmission of an Auto Document only
- Transfer request transmission
- When Image Rotation before Tx is enabled, and an A4 sideways or 8.5 x 11" sideways original is detected
- If the other terminal is busy
- If the external telephone connected to the machine is in use
- When communication switch 0A, bit 0 is set to 1, and the machine is using memory transmission when redialing
- When remaining memory space is less than the threshold for parallel memory transmission (default = 512 kB)
- When the original is located on the exposure glass

When using G4 transmission, parallel memory transmission is normally disabled, because transmission using G4 is much faster than scanning. As a result, G4 transmission using parallel memory transmission takes about twice as long as normal memory transmission (using an ITU-T #1 test chart).

If the document contains pages with complicated images or it is a photo document using halftone, parallel memory transmission may be faster than normal memory transmission. If the user commonly sends this type of fax message, enable parallel memory transmission for G4 transmission by changing system switch 11, bit 7 to 1.

Cross Reference

Parallel memory tx (G3) On/Off	- User parameter 07, bit 2
Parallel memory tx (G4) On/Off	- System switch 11, bit 7
Memory threshold for enabling parallel memory tx	- System switch 10, bits 0 to 7
Point of resumption of memory transmission upon redialing	- Communication switch 0A, bit 0

3. TRANSFER BROADCASTING

This machine uses a new algorithm to identify the requester's fax number to send back the transfer result report. Previously, the transfer result report did not sometimes reach the requester with the old algorithm.

In a transfer broadcasting operation, the transfer requester informs its own fax number to the transfer station. The transfer station uses that number to identify the requester's fax number, which the transfer station must dial to send the transfer result report back to the requester.

Transmission of the transfer result report and selection of the number to dial depends on the following three settings.

Setting	Switch
Conditions required for transfer result report transmission	Communication switch 0B, bit 3 0: Always 1: Only if there is an error
Action when there is no fax number in the programmed Quick/Speed dials which matches the requester's own fax number	Communication switch 0B, bit 5 0: Transfer is disabled 1: Transfer is disabled
Number of digits compared to find the requester's fax number from the programmed Quick/Speed dials.	Communication switch 0C, bits 0 to 4 (default setting = 5 digits)

The requester's fax number format is normally as follows.

[International access code] [Country code] [Area code] - [Local tel. no.]

A pause ("-") must be programmed between area code and local tel. no.

Before the machine transfers the message, the machine compares the last few digits of the requester's own fax number with all the programmed Quick/Speed Dials as shown in the following diagram. Starting from Quick Dial 01 to the end of the Speed Dial codes. (The default setting for the number of digits compared is 5; see the above table.)

If the machine finds a number in which the compared digits match those of the requester's own fax number, the machine chooses the number as the destination for sending the report back. However, depending on the number of digits compared, the machine may choose the wrong destination, as shown in the example diagram on the next page.

Note that the machine does not compare the following:

- Pause ("-")
- ISDN sub-address ("/aaaa", "aaaa" is a sub-address number)

With a G4 transfer request, the G4 and G3 own fax numbers are informed from the requester, then the machine compares the G4 number first, then the G3 number second.

Requester's Own Fax No.
0111201-2223456

Q01	071-441-3456
Q02	020-4773456
Q03	020-4776666
Q04	00-81454771748
Q05	2223456
Q06	00-4961969063456
Q07	0569723456
Q08	201-2223456
Q09	00-31204564569
Q10	013453456
⋮	⋮
Q56	0875558888

With
Function Upgrade Card

- If the requester is within the same area, Quick Dial 05 or Quick Dial 08 is the correct destination, depending on the required dialing method for numbers in the same country or area. The machine selects Quick Dial 05 if it compares from 5 to 7 digits, and selects Quick Dial 08 if it compares from 8 to 10 digits.
- If the requester is in another country, Speed Dial 07 is the correct destination. The machine selects this number if it compares 11 digits. Any setting higher than this will result in no match, due to the different international access codes at the start of the numbers.
- If the machine compares less than 4 digits, it selects Quick Dial 01.
- If the number of digits to compare is set to zero, the machine sends the report to the first Quick or Speed Dial number programmed in.

(A639)

TRANSFER BROADCASTING

When programming the machine to act as a Transfer Station, the combination of the communication switch 0C setting (number of digits) and the programmed location of the requester's fax number has to be considered carefully.

If the machine can not find the destination for the report, it either:

- Stops the transfer operation and prints a report locally (if bit 5 of communication switch 0B is 0).
- Or, continues the transfer operation and prints a result report locally after finishing all the transfer operations (if bit 5 of communication switch 0B is 1).

Cross Reference to other parameters

ID code programming	- Key operator mode
Use of economy transmission during a transfer operation to end receivers	- Communication switch 0B, bit 0
Use of economy transmission during a transfer operation to next transfer stations	- Communication switch 0B, bit 1
Use of label insertion for the end receivers in a transfer operation	- Communication switch 0B, bit 2
Printout of the message when acting as a transfer station	- Communication switch 0B, bit 4

4. ORIGINAL SCAN PROCESS

The machine scans at 400 dpi. The other end may have a different paper size or may not be able to print at 400 dpi. The base copier's scanner and BiCU work together to get the required resolution and size for transmission.

4.1 MAIN SCAN DIRECTION

The base copier's scanner always scans at 400 dpi (main scan direction). Then, the BiCU processes the scanned data to get the required resolution and data width. This is the same process as Reduction in copy mode.

dpi: dots per inch, dpm: dots per mm

Reduction	400 dpi	200 dpi	16 dpm	8 dpm
No reduction	100.0%	50.0%	101.5%	51.0%
A3 to B4	86.5%	43.0%	88.0%	44.0%
A3 to A4	70.5%	35.0%	71.5%	36.0%
B4 to A4	81.5%	41.0%	83.0%	41.5%

4.2 SUB SCAN DIRECTION

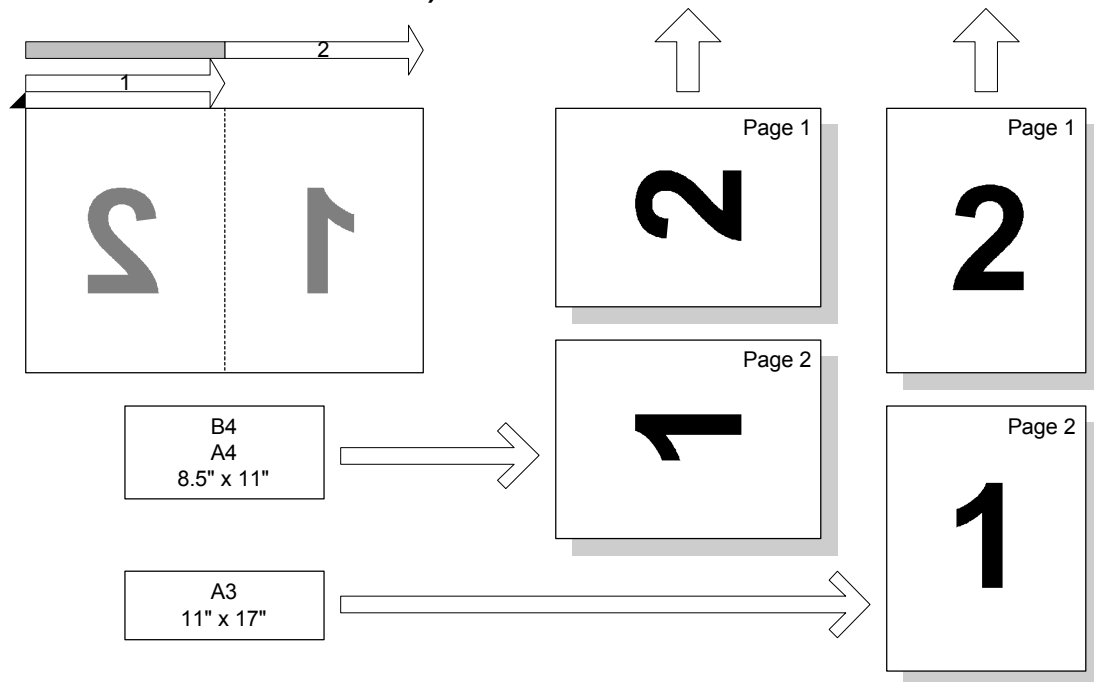
In the sub scan direction, the base machine's scanner changes the motor speed to get the required resolution. However, if the reduction rate requires a faster speed than the scanner motor's maximum (37% reduction rate when using the ADF), the scanner and the BiCU (IPU) work together to get the required resolution as shown in the second table below.

Reduction	400 lpi	200 lpi	100 lpm	15.4 lpm	7.7 lpm	3.85 lpm
No reduction	100.0%	50.0%	25.0% ²	97.8%	48.9%	24.5% ⁷
A3 to B4	86.5%	43.2%	21.6% ³	84.6%	42.3%	21.2% ⁸
A3 to A4	70.5%	35.2% ¹	17.6% ⁴	69.0%	34.5% ⁶	17.3% ⁹
B4 to A4	81.5%	40.8%	20.4% ⁵	79.7%	39.8%	19.9% ¹⁰

lpi: lines per inch, lpm: lines per mm

Notes	Mode	Reduction by Scanner	Reduction by BiCU
Case 1 (35.2%)		52.8%	66.7%
Case 2 (25.0%)	ADF	50.0%	50.0%
	Book	25.0%	
Case 3 (21.6%)		43.2%	50.0%
Case 4 (17.6%)		52.8%	33.3%
Case 5 (20.4%)		40.8%	50.0%
Case 6 (34.5%)		51.9%	66.7%
Case 7 (24.5%)	ADF	48.9%	50.0%
	Book	36.8%	66.7%
Case 8 (21.2%)		42.4%	50.0%
Case 9 (17.3%)		51.9%	33.3%
Case 10 (19.9%)		39.8%	50.0%

5. PAGE SPLIT TRANSMISSION (BOOK TRANSMISSION)



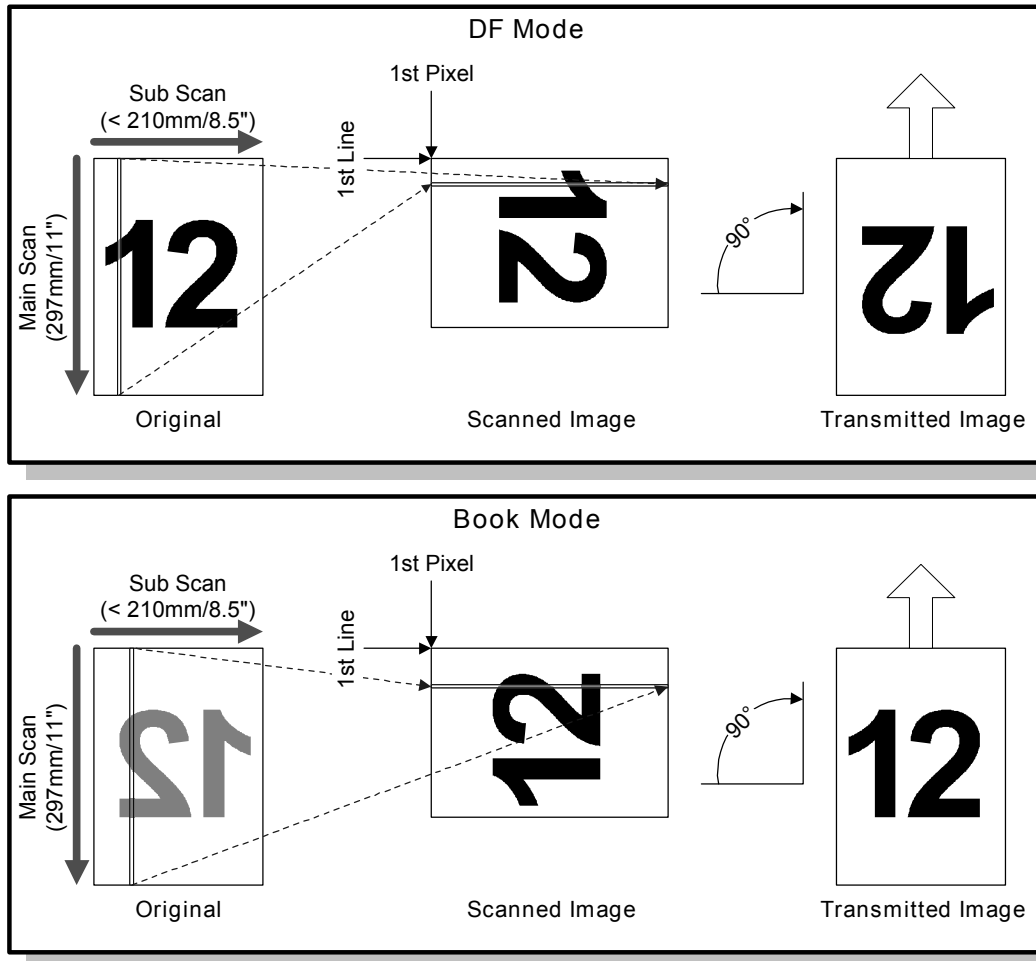
This function allows a B4, A4/8.5 x 11", or A3/11 x 17" size book original to be sent on two separate pages.

When this function is selected, the machine scans the original twice, and transmits the scanned pages in the same sequence as the pages were scanned.

In the above example, the page with number '2' is sent first, and the page with number '1' is sent next. To send page '1' first, the original should be placed so that page '1' is at the left.

- Notes
- Memory transmission is used whenever this function is selected.
 - This function is only possible when sending a book original from the exposure glass.
 - If this function is used for an A3 or 11 x 17" original, the pages may be transmitted in a lengthwise direction, depending on the setting of "Image Rotation before Transmission" (see the next page).

6. IMAGE ROTATION BEFORE TRANSMISSION



Detailed
Descriptions

This function avoids the unintentional reduction of an A3 or 11" width original. When the machine detects an A4 or 8.5 x 11" original placed sideways in the ADF or on the exposure glass, the fax unit rotates the scanned image clockwise by 90 degrees before transmission, as shown above.

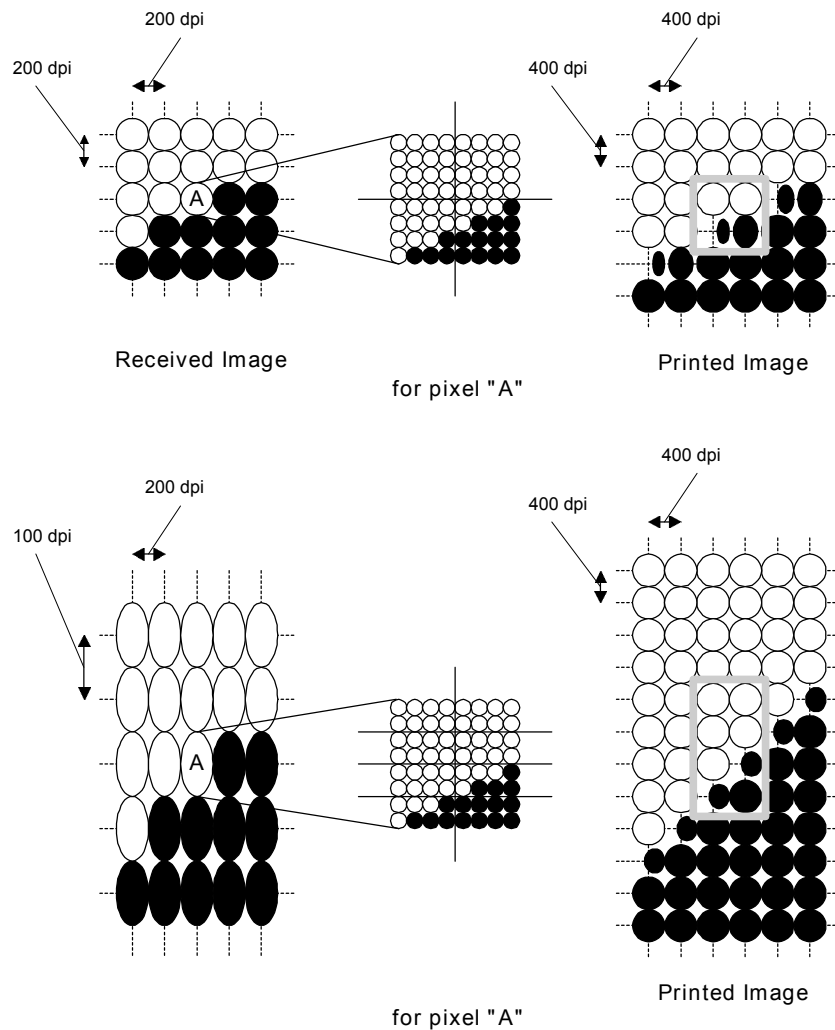
- Notes
- The orientations of the transmitted image from the ADF and from the exposure glass are different.
 - Even if Parallel Memory Transmission is enabled, the machine uses normal memory transmission to send an A4 or 8.5 x 11" sideways original.
 - If the machine carries out this function while printing, the machine stops printing until scanning is completed.

Cross Reference

Image rotation before tx on/off - Scanner switch 0F, bit 0

7. SMOOTHING

When the fax unit prints a received fax image, the FCU converts the data into either 400 x 400 dpi, 16 x 15.4 l/mm, or 15.4 x 16 l/mm (image rotation) resolution, and smooths the image. The FCU then sends the smoothed data to the printer in the 64 gradation levels + 3 laser pulse positions format used by the base copier.



Note The FCU does not smooth the received data in the following instances:

- Halftone data is received in NSF mode
- The data is received at 400 x 400 dpi or 16 x 15.4 l/mm resolution.
- When image rotation is done, if the received data is at 200 x 100 dpi, 200 x 200 dpi, 8 x 3.85 l/mm, or 8 x 7.7 l/mm.

8. PAPER SIZE SELECTION

This section explains how the FCU selects the appropriate paper size for printing a received fax image. Refer to the 'Paper Size Selection Priorities' tables at the end of this section for how the appropriate paper size is actually selected.

8.1 WIDTH PRIORITY AND LENGTH PRIORITY

When 'Width Priority' is selected, a paper size of the same width as the received fax image has a higher priority. The fax image may be printed on several pages.

When 'Length Priority' is selected, a paper size which has enough length to print the received fax image has higher priority. The fax image is printed on one sheet of paper, but the printed fax may have wide margins on the left and right.

Cross Reference

Paper selection priority - Printer switch 0E, bit 0 (Default: Width)

8.2 IMAGE ROTATION BEFORE PRINTING

If the machine has the same size of paper in a cassette as the received fax image size, but in the sideways orientation, the fax unit rotates the image by 90 degrees clockwise, and prints it on sideways paper.

This feature is only possible when the received fax image is one of the following sizes: A4 lengthwise, 8.5 x 11" lengthwise, B5 lengthwise

Note This function cannot be disabled.

8.3 SUB SCAN REDUCTION AND PAGE SEPARATION

Sub Scan Reduction Disabled

When Sub Scan Reduction is disabled, the received fax image is printed unreduced.

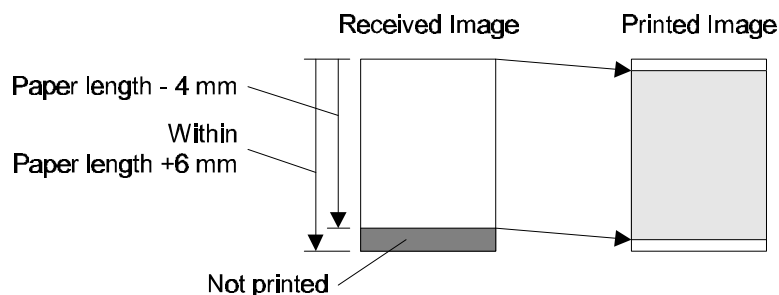
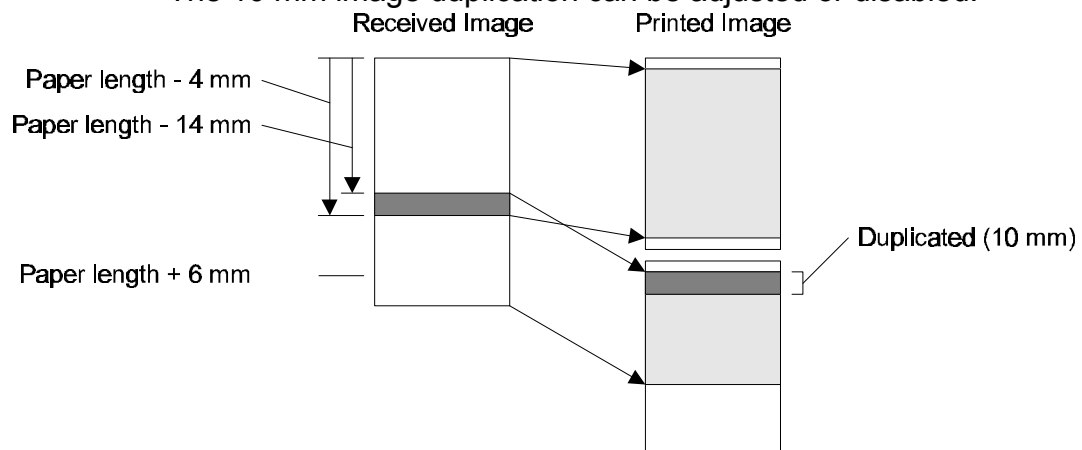
If the image is longer than the paper length + 6 mm, the image is separated onto two pages (see the top drawing below).

If the image is shorter than the paper length + 6 mm but longer than the paper length - 4 mm, the part of the image after paper length - 4 mm will be lost (see the bottom drawing below).

Note The page separation threshold is adjustable between 0 and 15 mm (the default is paper length + 6 mm). Refer to Printer Switch 03, bits 4 to 7 for more details.

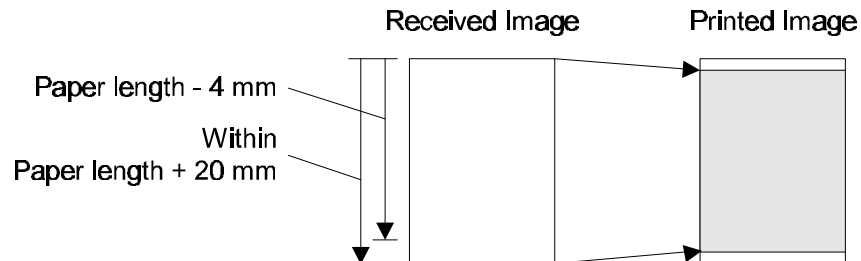
The 2 mm gaps at the leading and trailing edges depend on the leading and trailing edge margin settings.

The 10 mm image duplication can be adjusted or disabled.



Sub Scan Reduction Enabled

When Sub Scan Reduction is enabled, the received fax image is reduced in the page memory to fit on the selected paper, if the received image length is between [paper length - 4 mm] and [paper length + 20 mm]. See the drawing below.

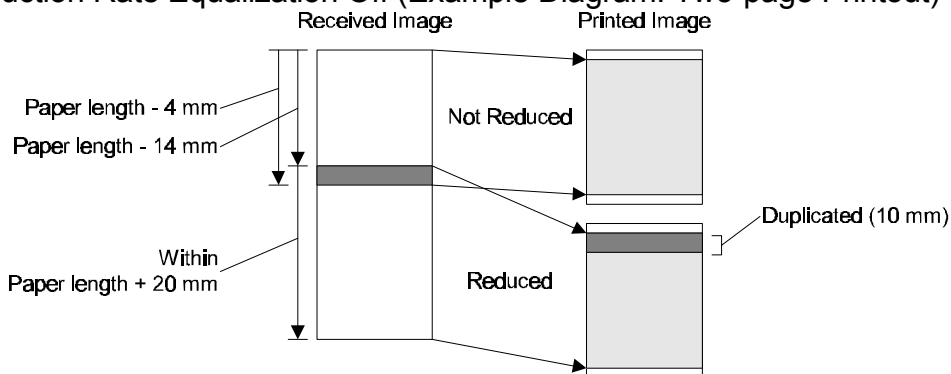


Detailed Descriptions

Note The upper limit (page length + 20 mm) is adjustable between 0 and 155 mm. Refer to Printer Switch 04, bits 0 to 4 for more details.

If the FCU detects that the image must be separated into more than one page after reduction, what happens to the data depends on the Reduction Rate Equalization setting (Printer Switch 0E, bit 7).

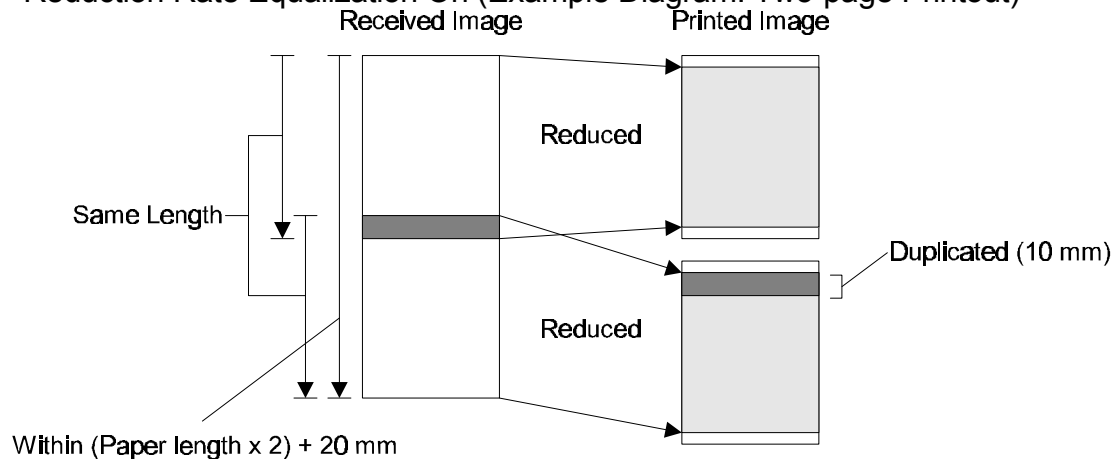
- Reduction Rate Equalization Off (Example Diagram: Two-page Printout) -



1. The data up to [page length - 4 mm] will be printed on page 1, without reduction.
2. The last 10 mm of this data will be repeated at the top of the next page (this length can be adjusted or repetition can be switched off).
3. The remaining data will be printed on page 2, with reduction, if it is within [paper length + 20 mm].
4. If it is longer than this, page separation is done again. Data up to [page length - 4 mm] will be printed on page 2, without reduction.
5. The process for page 3 and subsequent pages will repeat from step 2.

PAPER SIZE SELECTION

- Reduction Rate Equalization On (Example Diagram: Two-page Printout) -



1. The machine determines how many pages will be needed to print the message, taking the following into account:
 The final page (n) is such that the received image length is within (paper length x n) + 20 mm
 The data must be reduced to fit on pages of length (paper length - 4 mm), with an equal reduction rate for each page
 The last 10 mm of the previous page will be repeated at the top of the next page (this length can be adjusted or repetition can be disabled).
2. The machine prints all the pages, at the same reduction rate.

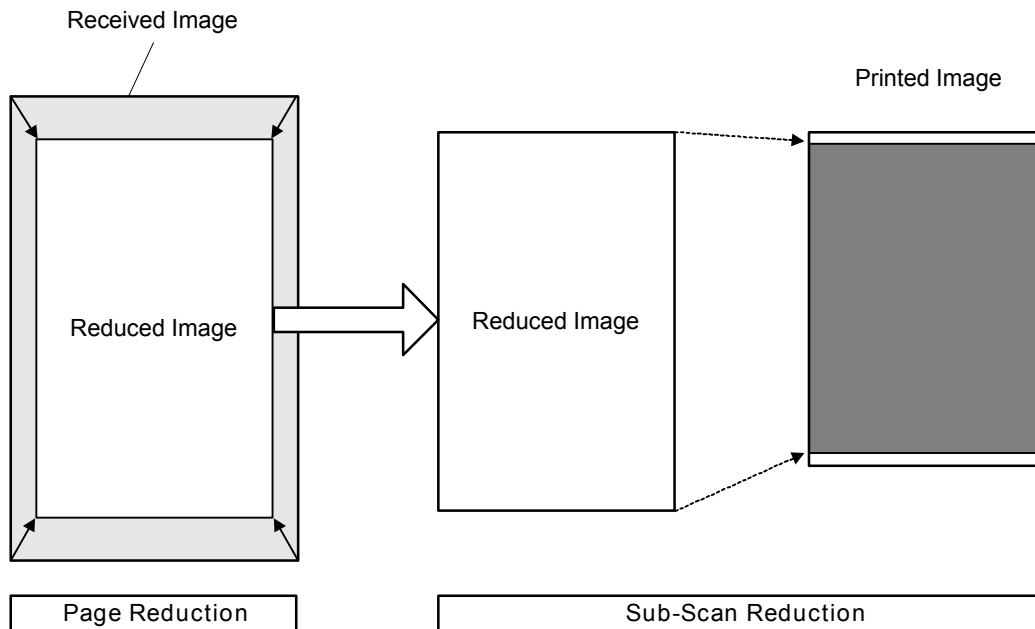
If the customer does not want to receive a fax message on separate pages, page separation can be disabled. However, once it has been disabled, the machine does not print the received fax message until a paper size which can hold the received fax image on one page is set in a cassette. Keep page separation enabled if the customer expects to receive a fax message that is longer than the copy paper.

Cross Reference

Parameter	Switch	Default Setting
Reduction in sub-scan direction on/off	Printer Switch 03, bit 0	Enabled (except Germany)
Equalizing reduction rate among separated pages	Printer Switch 0E, bit 7	Enabled
Page separation threshold when reduction is disabled	Printer Switch 03, bits 4-7	6 mm
Page separation threshold when reduction is enabled	Printer Switch 04, bits 0-4	20 mm
Page separation on/off	Printer Switch 0E, bit 2	Enabled
Page separation mark on/off	Printer Switch 00, bit 0	Enabled
Image duplication with page separation, on/off	Printer Switch 00, bit 1	Enabled
Length of the repeated image on the next page	Printer Switch 04, bits 5-6	10 mm

8.4 PAGE REDUCTION

This function allows a received fax image to be printed on paper which has less width than the fax image.



Detailed
Descriptions

First, the received image is reduced by a fixed reduction rate in the main and sub scan directions. The available reduction rates are as follows:

- 84% - A3 to B4 reduction
- 82% - B4 to A4 lengthwise reduction

Then, the reduced image is further reduced (if necessary) in the sub-scan direction so that it can be printed on one page. However, if the FCU detects that the image does not fit on one page after sub-scan reduction, the FCU cancels the page reduction, but uses normal sub-scan reduction on the received fax image.

Notes • Sub-scan reduction is automatically enabled when Page Reduction is enabled.

- A3 to A4 reduction is not available.

Cross Reference

Page reduction on/off - User parameter 10 (0A), bit 3 (Default: Disabled)

PAPER SIZE SELECTION

Examples

1. When printing a B4 size fax image on 8.5" x 11" lengthwise paper

- Fax image size: 256 x 364 mm (10.7 x 14.3")
- Paper size: 216 x 279 mm (8.5 x 11")
- Reduction rate used: 82%
- Page separation threshold: 20 mm

The received image is printed on one 8.5 x 11" sheet, because the image length after page reduction ($364 \text{ mm} \times 82\% = 298.5 \text{ mm}$) is shorter than the paper length (279 mm) plus 20 mm.

2. When printing a non-standard size (256 x 400 mm) fax image on 8.5 x 11" lengthwise paper

- Fax image size: 256 x 400 mm (10.7 x 15.7")
- Paper size: 216 x 279 mm (8.5 x 11")
- Reduction rate used: 82%
- Page separation threshold: 20 mm

The received fax image is printed on two 8.5 x 11" sheets after page separation and image rotation, because the image length after page reduction ($400 \text{ mm} \times 82\% = 328 \text{ mm}$) is longer than the paper length (279 mm) plus 20 mm.

Refer to the "Paper Size Selection Priorities" table later in this chapter.

8.5 TWO IN ONE

This function allows two small pages to be printed on one sheet of paper. However, this function only works when the machine does not have the following size of paper in the cassette.

- The same size of paper as the received image
- The paper which has the same width and sufficient length

Cross Reference

Two in one on/off - User parameter 10 (0A), bit 1 (Default: Disabled)

8.6 PAPER SIZE SELECTION PRIORITIES

Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Width

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	A3	A4	8.5x11"	8.5x11"	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	A3	A4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	11x17"	A4
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4	A4	8.5x11"
	6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	A4	8.5x11"
	7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3	F/F4	B4
	8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
	9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		F/F4	A5		11x17"	A3		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

 Sideways

Detailed Descriptions

PAPER SIZE SELECTION

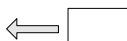
Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5		8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"		A4	8.5x11"		8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	8.5x11"	A4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4		8.5x11"
	6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
	7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3		B4
	8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
	9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"			8.5x14"	11x17"
	10		F/F4	A5		11x17"	A3		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

 Sideways

PAPER SIZE SELECTION

Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Length

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

Detailed
Descriptions

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	A3	B4	8.5x11"	8.5x11"	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	F/F4	B4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	A3	A3
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	11x17"	11x17"
	6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	B4	A4
	7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	8.5x14"	A4
	8	B4	8.5x11"	8.5x11"	B4	F/F4	A3	B4	8.5x11"	B4	A4	8.5x11"
	9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B4	8.5x14"	F/F4	11x17"	A4	8.5x11"
	10		F/F4	A5		11x17"	11x17"		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B5		B5	B5		B5
	12			B5			B5		B5	B5		B5

 Lengthwise

 Sideways

PAPER SIZE SELECTION

Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Length

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	11x17"	B4	8.5x11"	A4	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	8.5x11"	B4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	8.5x11"	A3
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	A3	11x17"
	6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	F/F4	A4
	7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	11x17"	A4
	8	B4	8.5x11"	8.5x11"	B4	F/F4	A3	B4	8.5x11"	B4	B4	8.5x11"
	9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B4	8.5x14"	F/F4	11x17"	8.5x14"	8.5x11"
	10		F/F4	A5		11x17"	11x17"		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B5		B5	B5		B5
	12			B5			B5		B5	B5		B5

 Lengthwise

 Sideways

PAPER SIZE SELECTION

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

Detailed
Descriptions

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A4	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
	3	B4	A4	F/F4	8.5x11"	B4	8.5x11"	B4	A4	A4	8.5x11"	A4
	4	A4	F/F4	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
	5	A4	8.5x14"	A3	A3	A4	A4	A4	8.5x11"	F/F4	A3	8.5x11"
	6	8.5x11"	A3	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
	7	8.5x11"	11x17"	8.5x11"	11x17"	8.5x11"	8.5x14"	8.5x11"	B4	A3	11x17"	B4
	8	F/F4	B5	B4	B4	F/F4	B5	F/F4	A3	B4	B4	A3
	9	8.5x14"	B5	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		8.5x11"	A5		11x17"	A3		A5	A5		A5
	11		8.5x11"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

 Sideways

PAPER SIZE SELECTION

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Length

 : Image Rotation

 : Half of the page is blank

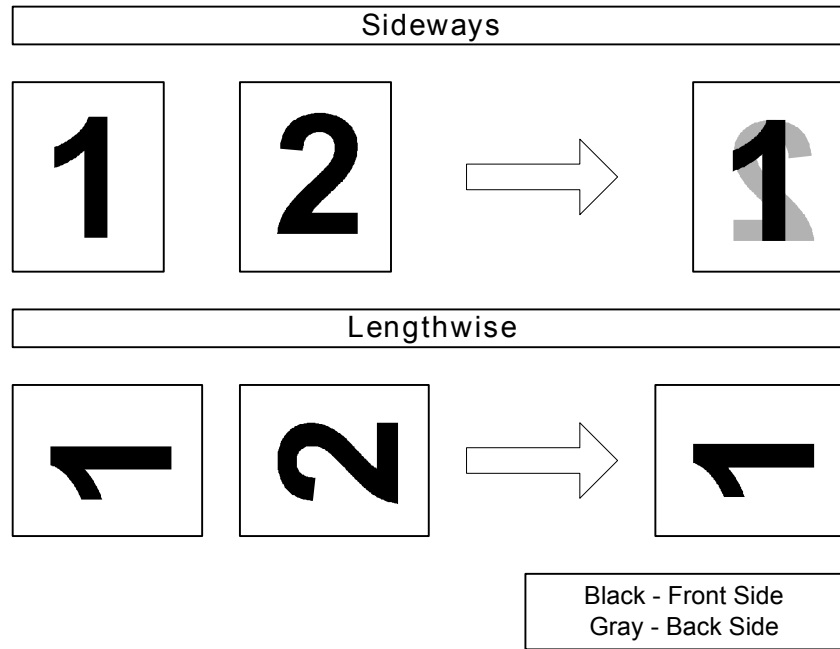
 : Page Reduction

		Received Image Size										
												
Paper Select Priorities	1											
	2			 	 	 				 	 	
	3	 			 		 				 	
	4	 	 		 			 		 	 	
	5	 	 	 	 	 	 	 	 			
	6	 	 		 	 		 	 		 	 
	7	 	 			 		 	 	 		 
	8	 	 	 	 	 	 	 	 	 	 	 
	9	 	 	 	 			 	 		 	 
	10		 						 	 		 
	11		 			 			 	 		 
	12			 			 		 	 		 

 Lengthwise

 Sideways

9. TWO-SIDED (DUPLEX) PRINTING



Detailed
Descriptions

When two-sided printing is enabled in fax mode, the machine prints two consecutive pages, which must be the same size and direction, onto both sides of the page.

As shown in the above diagram, the print results look different depending on the direction of the paper selected. When the machine selects a lengthwise (in paper feed direction) paper for printing, the back side of the paper is printed upside down.

To prevent this, carefully choose paper feed stations which the machine can print fax messages from using the Printer Switch 02.

- Notes:
- The optional duplex unit and SAF memory are required to enable two-sided printing.
 - The machine starts printing after all pages have been received.

Cross Reference

Duplex printing on/off for specific senders - Key operator mode 06

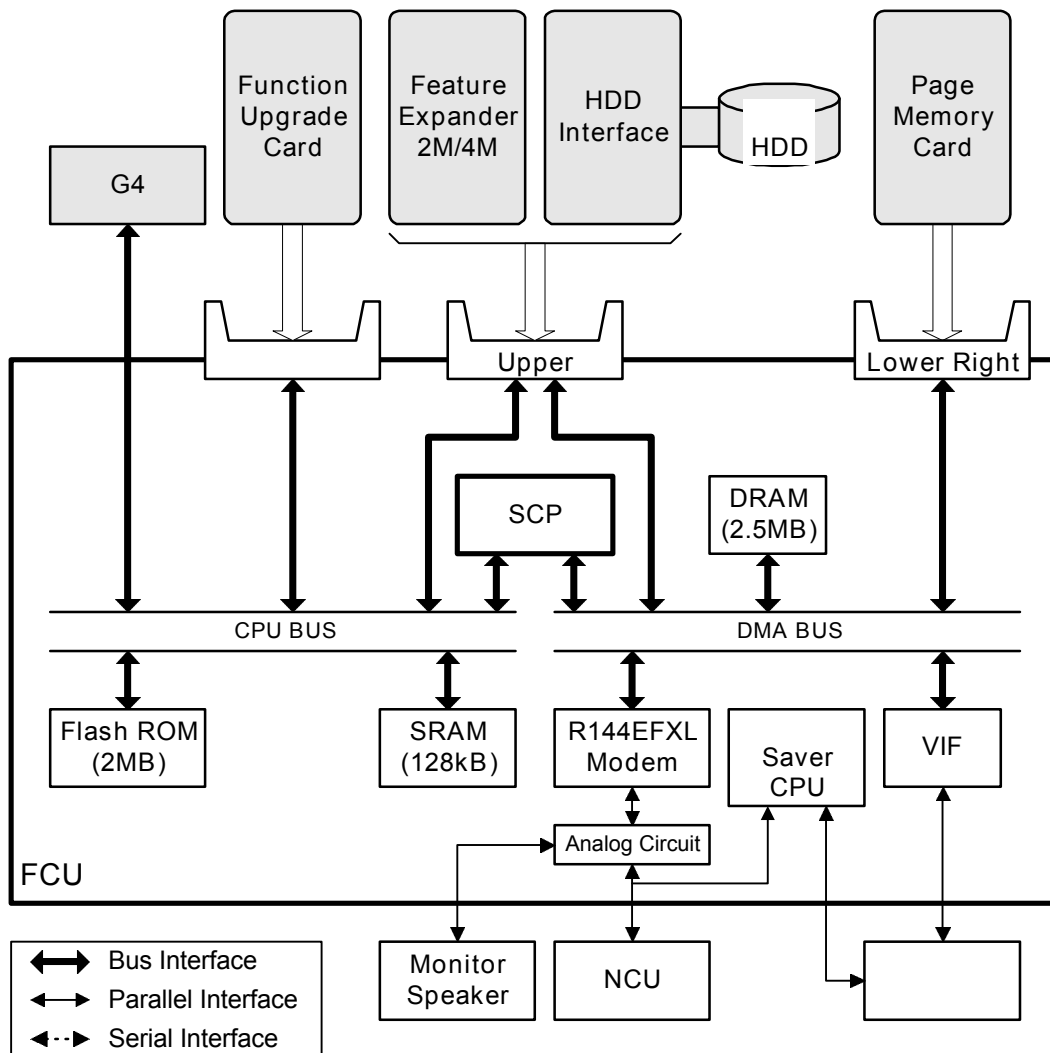
Duplex printing on/off for all received fax messages - Printer Switch 0F, bit 2

Wait time when duplex unit is in use - Printer Switch 0F, bits 6 and 7

Paper feed station selection for fax printing - Printer Switch 02, bits 0 to 3

10. PCBs

10.1 FCU



The FCU (Facsimile Control Unit) controls fax communication, the video interface to the base copier's engine, energy saver mode, and fax options.

1. SCP (System Control Processor)

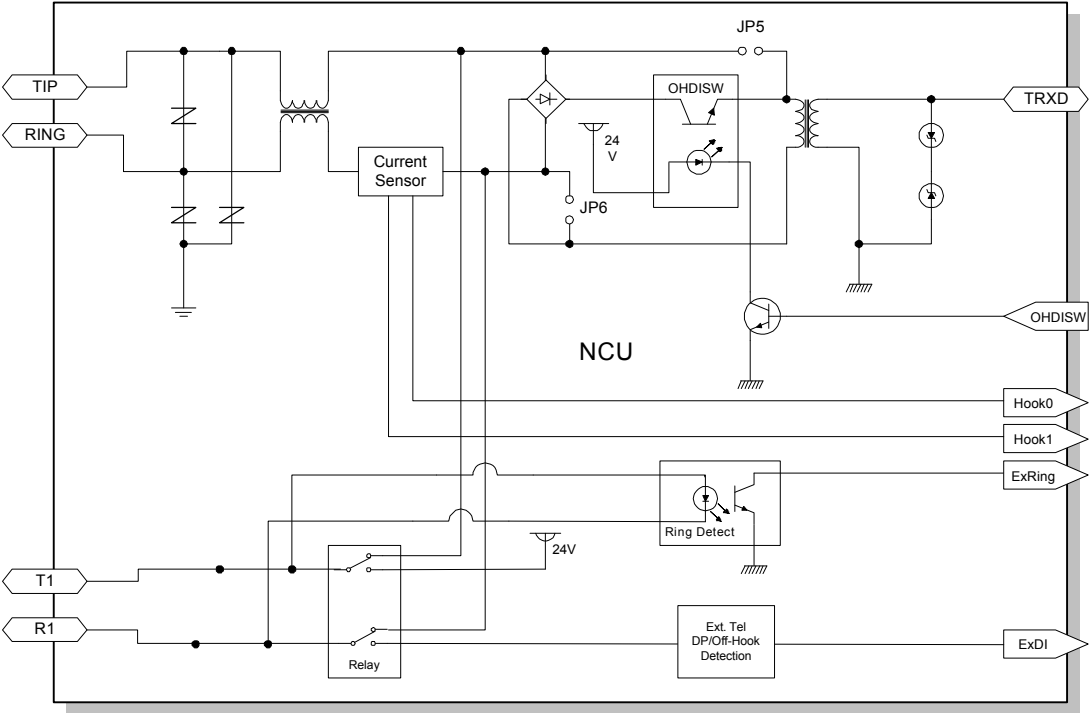
- CPU
- Data compression and reconstruction (DCR)
- MMR + raw data compression for SAF storage (DCMMR)
- DMA control
- Clock generation
- DRAM backup control
- Ringing signal/tone detection

2. VIF (Video InterFace)
 - Video and command interface to the BiCU
 - Smoothing
 - Sub scan reduction and page reduction
3. Modem (Rockwell R144EFXL)
 - V.21, V.27ter, V.29, and V.17
4. Energy Saver CPU
 - Power distribution control in energy saver mode
5. ROM
 - 2MB (16 Mbit) flash ROM for system software storage
6. DRAM
 - 2.5 MB DRAM shared between the buffer memory (384 kB), ECM Buffer (128 kB), Page Memory (1 MB), and SAF memory (1 MB)
 - 1 MB SAF memory, backed up by the rechargeable battery
7. SRAM
 - 128 kB SRAM for system and user parameter storage, backed up by the lithium battery
8. Oscillators
 - 42.20545 MHz oscillator for system clock generation
 - 32.768 MHz oscillator for the real time clock. This is backed up by the lithium battery
 - 38.00053 MHz oscillator for the R144EFXL modem
9. IC Card Slots
 - Upper slot for an optional Feature Expander or a hard disk interface (SAF memory)
 - Lower left slot for an optional Function Upgrade Card
 - Lower right slot for an optional page memory (4 MB). The total page memory capacity will be 4 MB with this option.
10. Jumpers, Switches, and Test Points

Item	Description
SW1	Switches the backup battery ON/OFF
SW2	Reset switch

Refer to page 4-8 for the re-set switch procedure.

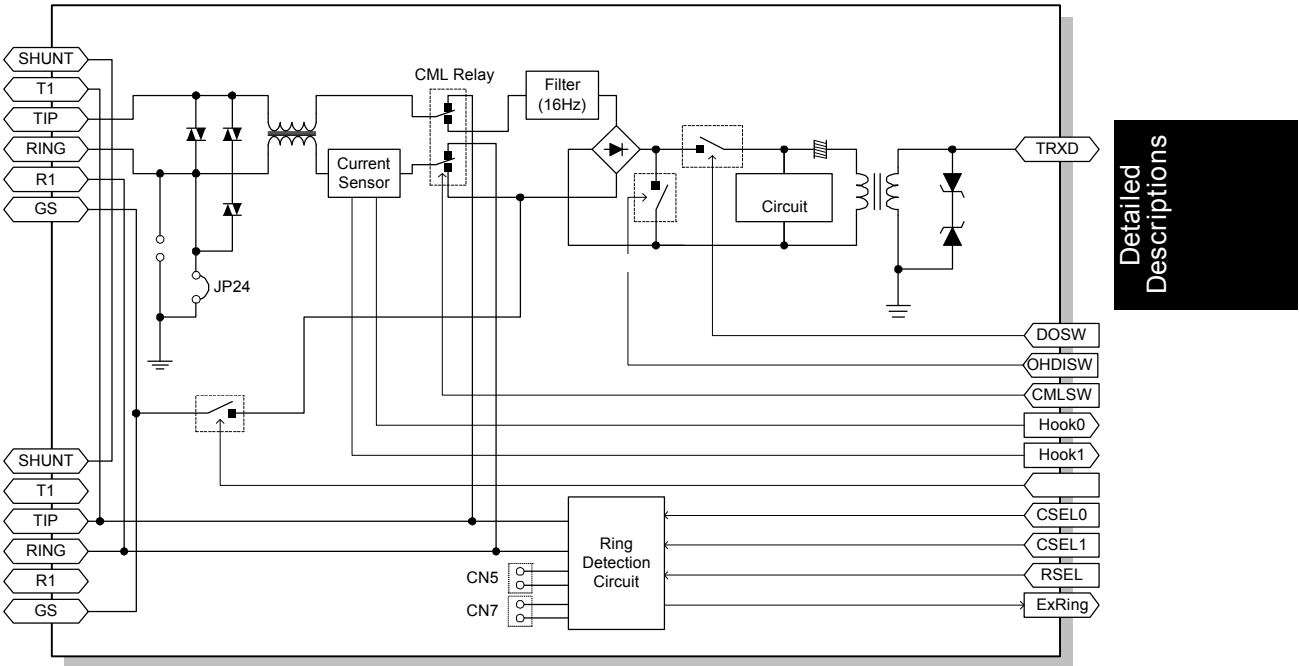
10.2 NCU (US)



Jumpers

Item	Description
JP5	These jumpers should be shorted when the machine is connected to a dry line.
JP6	

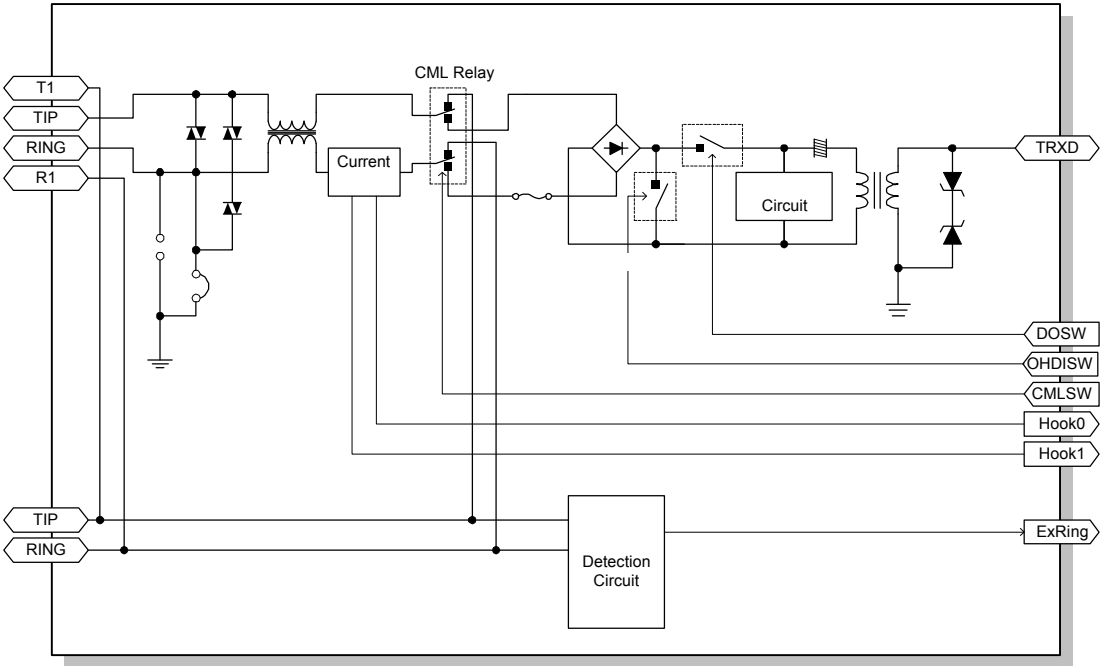
10.3 NCU (Europe/Asia)



Control Signals and Jumpers

	CSEL0	CSEL1	RSEL	JP24	CN5	CN7
Country	CN2-4	CN2-5	CN1-13			
Germany	L	H	H	S	O	O
Holland	L	H	H	S	O	O
Austria	L	H	H	S	O	O
Italy	L	L	L	S	O	O
Spain	L	L	L	S	O	O
Ireland	H	L	L	S	S	S
Finland	L	H	L	O	O	O
Switzerland	L	H	L	O	O	O
Other	L	H	L	S	O	O
L: Low, H: High				S: Short, O: Open		

10.4 NCU (France)



Jumper

Item	Description
JP24	Keep this shorted.

SECTION 3

INSTALLATION

1. FAX UNIT

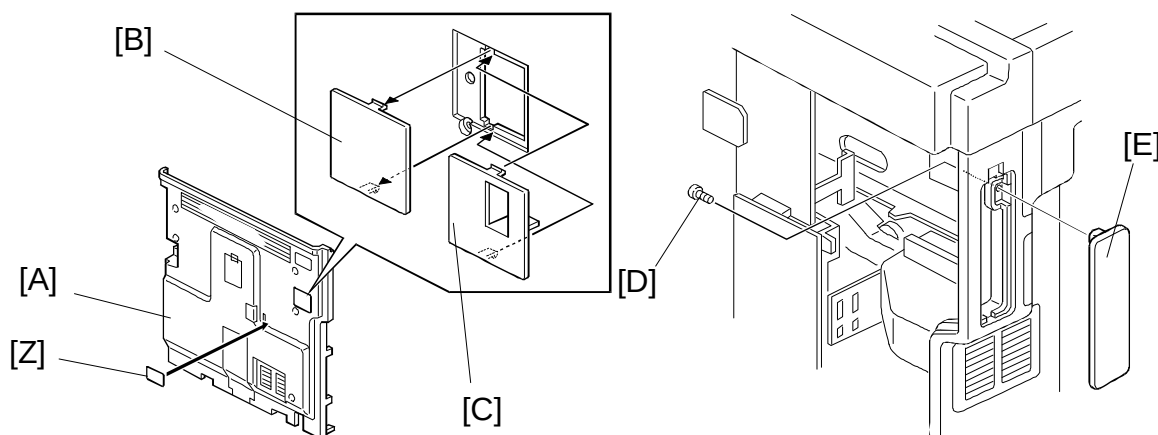
- NOTE:**
1. Never install telephone wiring during a lightning storm.
 2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
 3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 4. Use caution when installing or modifying telephone lines.
 5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
 6. Do not use the telephone to report a gas leak in the vicinity of the leak.

Installation

1.1 INSTALLATION PROCEDURE

CAUTION

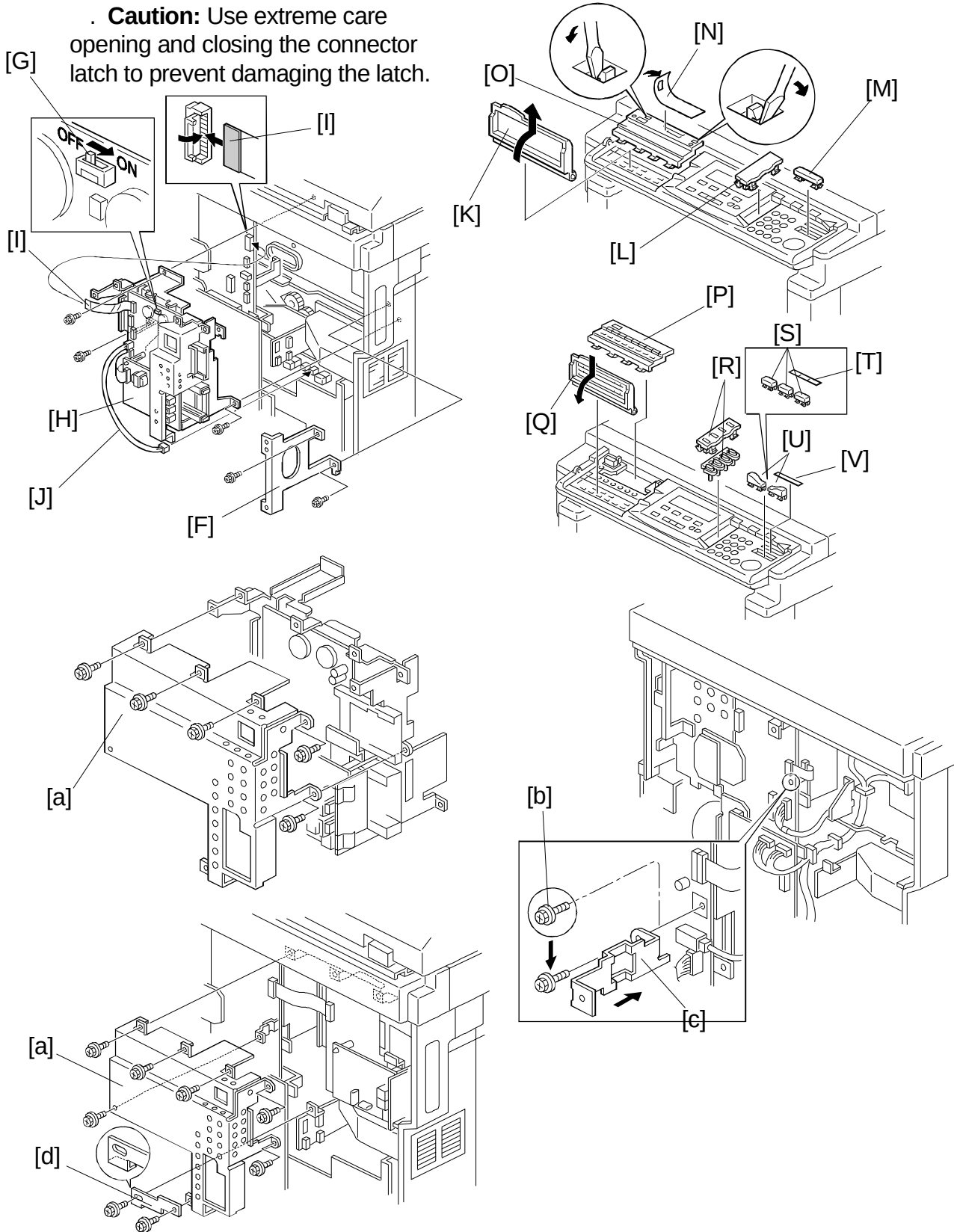
1. Before installing the fax unit, switch off the main and ac switches, and disconnect the power cord.
2. The fax unit contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions



1. Remove the rear cover [A] (6 screws), replace the current NCU cover [B] with the new NCU cover [C], affix the FCC/IC label (US only) or the BABT label (UK only) [Z].
2. Remove screw [D] and then remove the small cover [E].

FAX UNIT

Caution: Use extreme care opening and closing the connector latch to prevent damaging the latch.



NOTE: For European models only, perform steps a, b, and c.

- a. Remove bracket [a], from the fax unit.
- b. Remove screw [b] and install bracket [C] as shown.
3. Remove the inner bracket [F] (2 screws).
4. Turn on the battery switch [G]. Install the fax unit [H] (4 screws), as shown.

Caution: Use extreme care opening and closing the connector latch to prevent damaging the latch. Gently open the connector latch and insert the flat cable. Ensure that the cable is properly inserted before closing the latch.

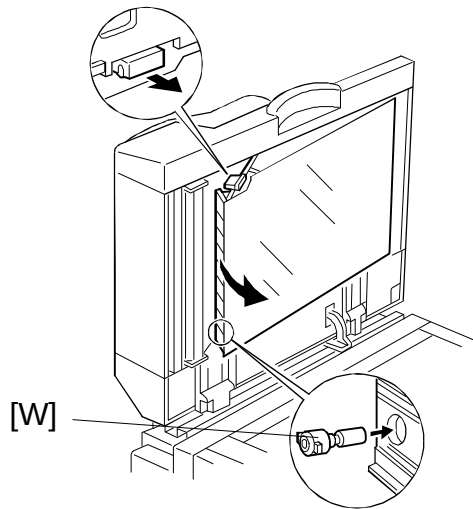
Installation

5. Connect the flat harness [I] to the BiCU (CN304), and connect the harness [J] to the PSU (CN288).
- c. Replace bracket [a] which was removed in step [a]; and install small bracket [d]

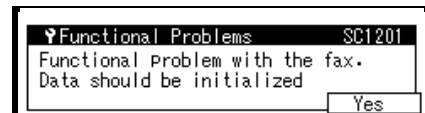
NOTE: Use a magnetic screwdriver to ensure that screws are not dropped inside the machine.

6. Replace the rear cover (5 screws).
7. Remove the parts [K], [L], and [M] from the operation panel.
8. Peel off the decal [N] as shown, then remove part [O].
9. Install each part, [P], [Q] and [R] on the operation panel, as shown.
10. If the machine has the printer controller option, install the keys [S] and the decal [T] as shown. The decal [T] has "Copy," "Printer," and "Facsimile" printed on it.
If the machine does not have the printer controller option, install the keys [U] and the decal [V] as shown. The decal [V] has "Copy" and "Facsimile" printed on it

FAX UNIT



11. Install the Stamper [W] into the ADF as shown.
12. Plug in the machine and turn on the ac and main switches.
13. Press the 'Facsimile' key and check that the facsimile LED lights. At this time, the following message should be shown:



NOTE: This is not a functional problem. The machine shows this message only when the fax unit is installed for the first time.

14. Press "Yes" to initialize the fax unit.
15. Connect the telephone cable to the "LINE" jack at the rear of the machine.
16. Set up and program the items required for fax communications, as shown below. If the user function keys (F1, F2, F3 and F4) need to be programmed, affix the enclosed label above the function keys.

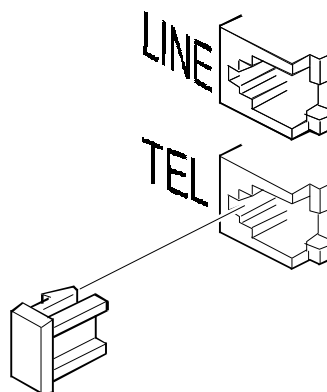
The default settings of the user function keys are as follows:

- F1 - Start Manual Rx
- F2 - TEL Mode
- F3 - Tx Result Display
- F4 - Not programmed

17. (US only) If the optional handset needs to be installed, refer to section 4 'HANDSET' for the installation procedure.

18. In European countries where the usage of RJ11 type 'TEL' jack is prohibited by local PTT, the plug [X] in the 'TEL' jack as shown.

- NOTE:**
- Be sure to set the clock (date and time).
 - Program the serial number into the fax unit (service function 10). The serial number can be found on the serial number label (which has been attached to the machine in step 12).



1.2 INITIAL PROGRAMMING

Key-operator Level

Clock	Key-operator mode 19
Transmit mode	Initial setup (Transmit)
Resolution	Initial setup (Transmit)
Photo original	Initial setup (Transmit)
Reception mode	Initial setup (Receive)
Auto image density	Initial setup (Receive)
ID code	Key-operator mode 01
ECM	Key-operator mode 02
Volume	Key-operator mode 09
TTI / RTI	Key-operator mode 11
Economy transmission	Key-operator mode 12
G3 setting(Analog line) (Line type/CSI/Own number)	Key-operator mode 14
User parameters	Key-operator mode 17

FAX UNIT

Service Level

NCU country code (NCU parameter C.C.)	Function 06 - 2
Bit switch country code (System switch 0F)	Function 01 - 1
Local dialing requirements (Communication switch 06)	Function 01 - 4
Local protocol requirements (G3 switch 0B)	Function 01 - 5
PBX access code (RAM address 4800BB)	Function 06 - 1
Machine's serial number	Function 10
Service station's fax number	Function 09
PM call (System switch 01- bit 0)	Function 01 - 1
Periodic service call (RAM address 480379 - 48037D)	Function 06 - 1

2. ISDN G4 UNIT

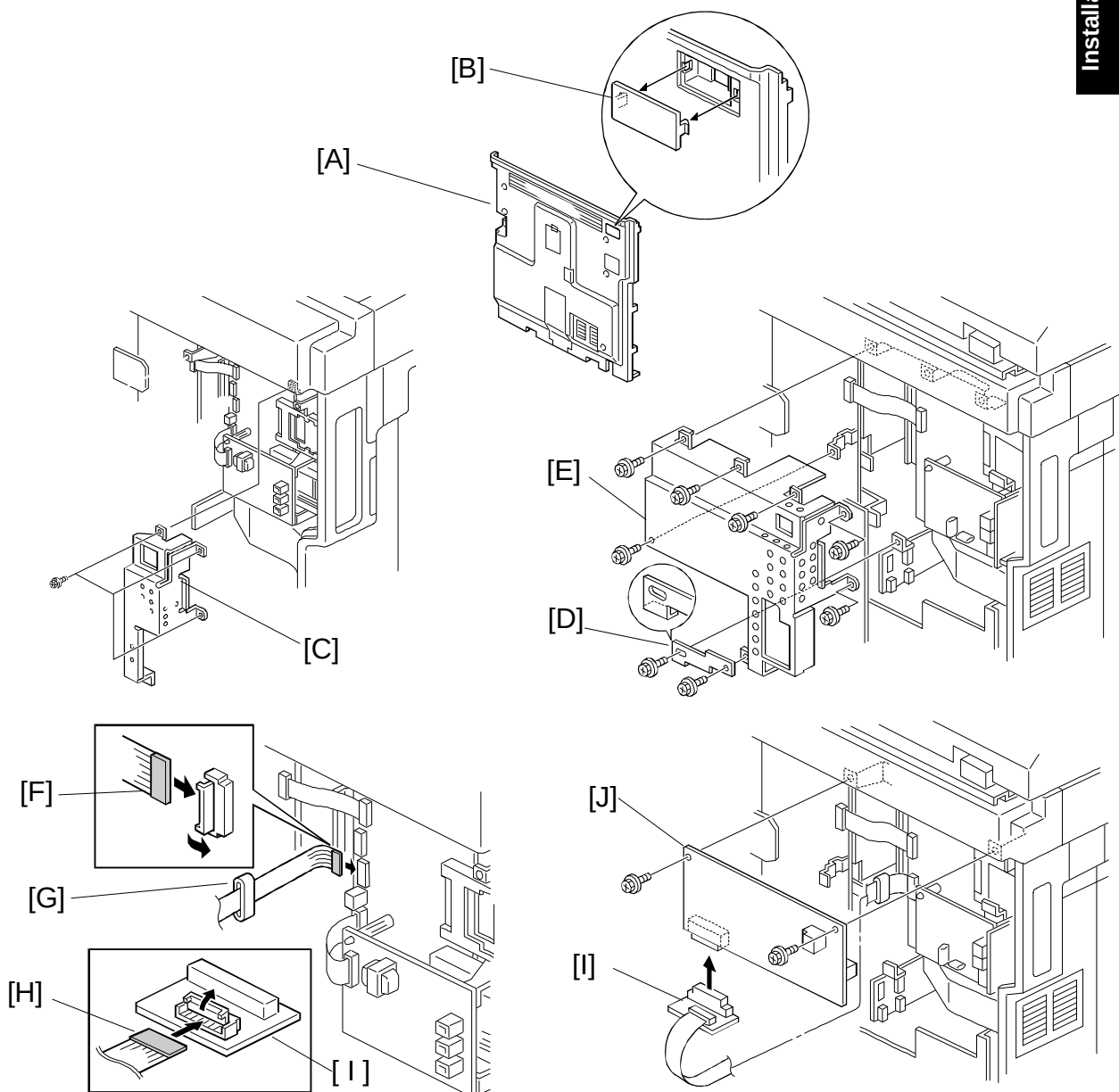
2.1 INSTALLATION PROCEDURE

⚠ CAUTION: Use extreme care opening and closing the connector latch to prevent damaging the latch.

Before installing an optional unit, perform the following:

1. Print out all messages stored in memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Switch off both the main and ac switches, then disconnect the power cord and the telephone cable.

Installation



1. Remove the rear cover [A] (6 screws). Then remove the cover [B] from the rear cover.
2. **[US model]** Remove the bracket [C] (3 screws).
[Europ/Asia model] Remove the bracket [D] (2 screws) and [E] (6 screws).

Caution: Use extreme care opening and closing the connector latch to prevent damaging the latch. Gently open the connector latch and insert the flat cable. Ensure that the cable is properly inserted before closing the latch.

3. Connect one end of the flat harness [F] to CN505 on the FCU, put the harness through the metal core [G], and other end of the flat harness [H] to the interface board [I].
4. Install the CiG4 board [J] onto the fax unit (2 screws).
5. Attach the interface board [I] to the CiG4 board [J].
6. **[US model]** Replace the bracket [C] (3 screws).
[Europ/Asia model] Replace the bracket [E] (6 screws) and [D] (2 screws) .
7. Replace the rear cover (6 screws).
8. Place the enclosed 'G4' label in the function key (F4) space.
 After G4 unit installation, this key is dedicated to switching between the G3 and G4 communication modes (note the user function key assignment table, below).

Function Key	Without G4 unit	With G4 unit
F1	Start Manual Rx	Manual reception
F2	TEL mode	TEL mode
F3	Tx result display	Tx result display
F4	Not programmed	G3/G4 communication mode selection

9. Plug in the machine and turn on the ac and main switches.
10. Connect the ISDN cable to the ISDN jack at the rear of the machine, and the analog telephone cable to the line jack.
11. Print the system parameter list and ensure that "G4" is listed as an option.
12. Set up and program the items required for ISDN communications, as shown on the following page.
 After setting up the ISDN parameters, be sure to turn the main and ac switches off and on.

2.2 INITIAL PROGRAMMING

Key-operator Level

Own ISDN - G4 number	Key-operator mode 16
G4 TID (Terminal ID)	Key-operator mode 16
ISDN - G3 CSI	Key-operator mode 15
Own ISDN - G3 number	Key-operator mode 15

Service Level

CiG4 Country Code (G4 Internal SW 00)	Service mode 01
ISDN international prefix	Service mode 12-1
Own ISDN-G4 number main/sub	Service mode 12-2, 3
Own ISDN-G3 number main/sub	Service mode 12-4, 5
G4 subaddress	Service mode 12-6
ISDN-G3 subaddress	Service mode 12-7
Line used for G3 transmission (System switch 0A- bit 6)	Service mode 01 - 1
Line used when the machine falls back to G3 from G4 (if the other machine is not a G4 machine) (System switch 0A- bit 7)	Service mode 01 - 1

Installation

- NOTE:**
1. After changing any parameter, be sure to turn off the ac and main switches, wait 5 or more seconds, then turn them back on. This ensures the new settings will take effect.
 2. Print the G4 system parameter list and make sure all parameters just programmed are listed.

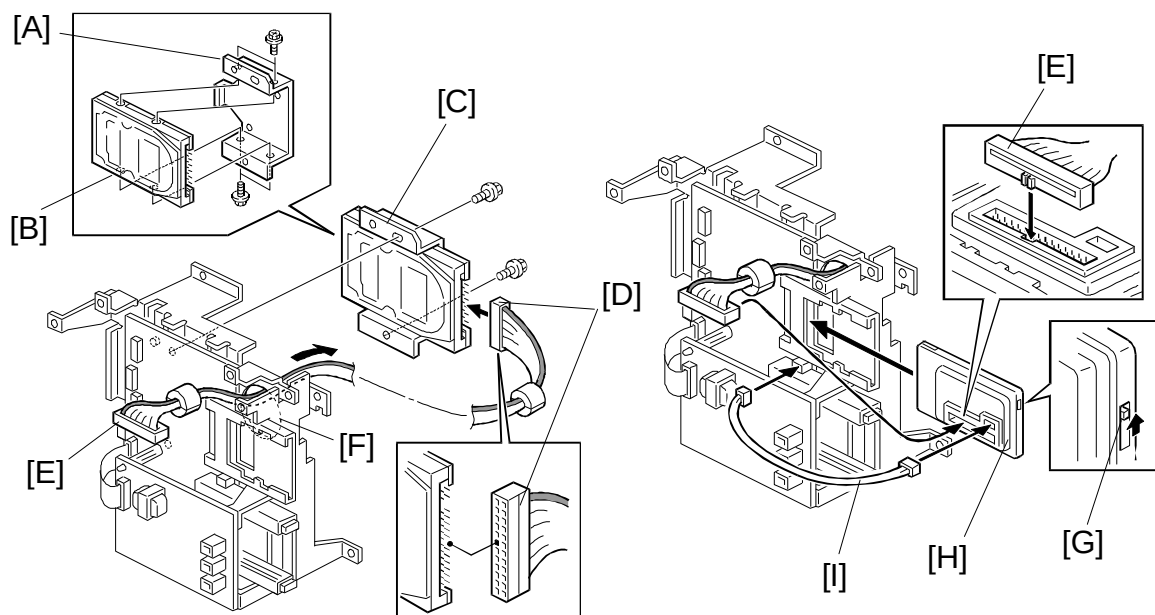
3. HARD DISK

3.1 INSTALLATION PROCEDURE

NOTE: If the fax unit is already installed, remove the fax unit before attempting to install the hard disk. Refer to "Removal and Replacement," later in this chapter.

⚠ CAUTION

1. Before installing an optional unit, perform the following:
 - 1) Print out all messages stored in the memory.
 - 2) Print out the lists of user-programmed items and the system parameter list.
 - 3) Switch off the main and ac switches, and disconnect the power cord and the telephone cord.
2. The hard disk interface card contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

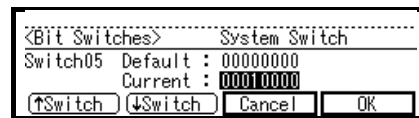


1. Attach the bracket [A] to the hard disk drive [B] (4 screws).
2. Attach the hard disk drive assembly [C] to the fax unit (2 screws).
3. Connect one end of the hard disk cable [D] to the hard disk drive, as shown, and run the other end [E] through the opening [F].
4. Turn on the battery switch [G] on the hard disk interface card [H].

5. Connect the hard disk cable [E] to the interface card, as shown. Insert the card into the upper slot.
6. Connect the harness [I] (FCU-CN513).
7. Install the fax unit (See procedure 1.1).
8. Replace the rear cover.
9. Plug in the machine and turn on the ac and main switches.

3.2 INITIAL PROGRAMMING

1. Enter the service mode, and set bit 4 of system switch 05 to "1".
2. Exit the service mode, then turn off the ac and main switches, wait 5 or more seconds, then turn them back on.
3. Enter the service mode and make sure that the data in the following RAM addresses are correct (service mode 06 - RAM).
If the data in these addresses do not match the following values, check the cable connections and the battery switch setting. Then check these addresses again. If the addresses are still incorrect, format the hard disk



Installation

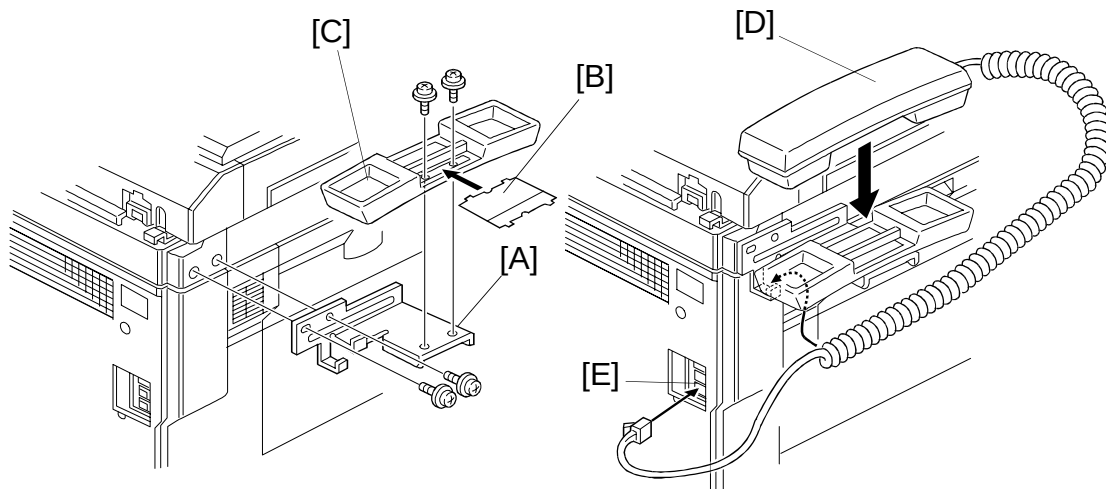
Address (H)	Data (H)
70001E	50
70001F	00
700020	00
700021	FF
700022	00
700023	50
700024	00
700025	80

- ⇒
4. Initialize the memory files (service mode 07 - File selection 2).
 5. Print the system parameter list and make sure that "HD" is listed as an option. Also check that the memory indicator shows "100%" in standby mode.
 6. Connect the telephone cord to the NCU.

4. HANDSET

4.1 INSTALLATION PROCEDURE

NOTE: The optional handset may not be available in some countries.



1. Install the bracket [A] (2 screws), as shown.

⇒ **NOTE:** The bracket [A] in the carton box of the Fax Unit Option Type 250.

2. Remove the label [B] from the handset cradle [C]. Install the cradle onto the bracket [A] (2 screws), then replace the label [B].

3. Install the handset [D], as shown. Connect the handset cord to the "TEL" jack [E] at the rear of the machine.

5. IC CARDS

5.1 INSTALLATION PROCEDURE

CAUTION

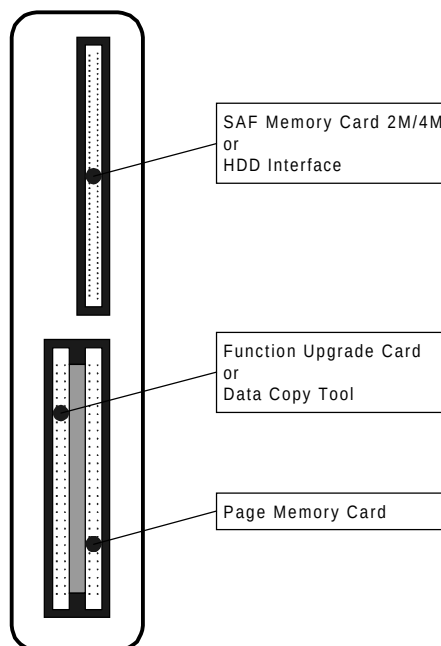
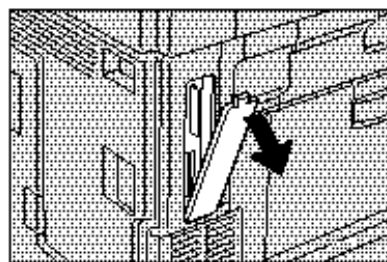
Before installing an optional unit, perform the following:

1. Print out all messages stored in the memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Switch off the main and ac switches, and disconnect the power cord and telephone cable.
4. Once a Function Upgrade Card has been installed, do not remove it. If removed, this will result in data being permanently lost.

Lithium Battery

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

1. Remove the IC card slot cover from the left side cover.
2. *Function Upgrade Card only:*
Install a lithium battery into the IC card.
(Refer to the IC card instruction manual.)
Then turn on the battery switch on the IC card.
3. Install the card, with the painted face on the left, into the appropriate slot, as shown.
4. Replace the IC card slot cover.
5. Turn on the machine's ac and main switches, then press the 'Facsimile' key.



6. *Function Upgrade Card only:*

The following message appears on the display:

Caution! Installing a function upgrade card causes data loss. Turn off the ac switch and remove it to avoid data loss.
To continue, press 'yes'.

Press 'Yes'.

7. Print the system parameter list. Check the following:

SAF memory card

"2M" or "4M" is listed as an option on the system parameter list, and that the remaining memory indicator shows 100%.

Page Memory Card (High Resolution Card)

"PM" is listed as an option on the system parameter list.

Function Upgrade Card

"Function Upgrade" is listed as an option on the system parameter list.

8. Connect the telephone cable to the NCU.

5.2 ITEMS INITIALIZED WHEN FUNCTION UPGRADE CARD IS INSTALLED OR REMOVED

Items initialized, at the function upgrade card installation, when the machine displays the following message:

Caution! Installing a function upgrade card causes data loss. Turn off the ac switch and remove it to avoid data loss.
To continue, press 'yes'.

- All SAF files and Polling Rx files
- All Auto Documents
- All Specified Addresses
- All Communication Records for TCR/Journal

Items initialized, at the function upgrade card removal, when the machine displays the following message:

Caution! Installing a function upgrade card causes data loss. Turn off the ac switch and remove it to avoid data loss.
To continue, press 'yes'.

- All SAF files and Polling Rx files
- All Keystroke Programs
- All Auto Documents
- Speed Dial 100 - 999 (these can no longer be used)
- Group 10 - 30 (these can no longer be used)
- 31st through 50th Personal Codes
- All Specified Addresses
- All Communication Records for TCR/Journal

SECTION 4

SERVICE TABLES

1. SERVICE LEVEL FUNCTIONS

1.1 HOW TO ENTER AND EXIT THE FAX SERVICE MODE

To Enter the Fax Service Mode:

1. Press the 'Facsimile' key, and make sure that the 'Facsimile' LED is on.
2. Press 'User Tools' **1** **9** **8** **8** **↕**
The service mode main menu appears.

Service Mode		Enter number
01 Bit Switches	02 System PaParameter	
03 Error Codes	04 Service Report	
↑Prev	↓Next	PrevMenu

Service Mode		Enter number
05 Protocol Dump	06 RAM	
07 RAM Clear	08 Hard Disk	
↑Prev	↓Next	PrevMenu

Service Mode		Enter number
09 ServiceStationNo.	10 Serial No.	
11 Tests	12 G4 Mode	
↑Prev	↓Next	PrevMenu

Service Mode		Enter number
13 File Printout	14 TCR Printout	
15 History Printout	16 Data Transfer	
↑Prev	↓Next	PrevMenu

To Exit Fax Service Mode:

1. Press 'OK' or 'PrevMenu' until the service mode main menu appears.
2. Press the 'User Tools' key twice.

Service
Tables

1.2 BIT SWITCH PROGRAMMING (FUNCTION 01)

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

<Bit Switches>		Enter number
1 System Switch	2 Scanner Switch	
3 Printer Switch	4 Communication Switch	
↑Prev	↓Next	PrevMenu

<Bit Switches>		Enter number
5 G3 Switch	6 G4_I Switch	
7 G4_P Switch		
↑Prev	↓Next	PrevMenu

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

Example:

1. Press **1**
2. Scroll through the bit switches.

<Bit Switches>		System Switch
Switch00	Default :	00000000
	Current :	00000000
↑Switch	↓Switch	Cancel OK

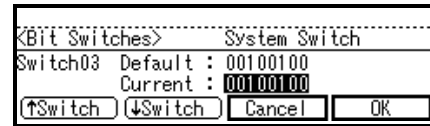
SERVICE LEVEL FUNCTIONS

To increment the bit switch number: press '↓ Switch'.

To decrement the bit switch number: press '↑ Switch'.

Example:

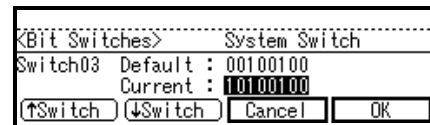
To display bit switch 03: Press '↓ Switch' 3 times.



3. Adjust the bit switch.

Example:

To change the value of bit 7, press 7.



4. To adjust more bit switches, go to step 2.
To finish, press 'OK' then press 'User Tools'.

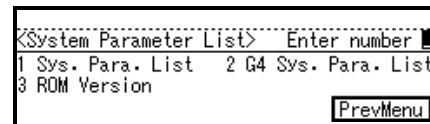
5. Exit the service mode.

NOTE: After changing any of the G4 bit switches, be sure to turn both of the ac switches off and back on, so that the new settings become effective.

1.3 SYSTEM PARAMETER LISTS (FUNCTION 02)

1. Enter the fax service mode.

2. Press **0** **2**



3. Press one of the following numbers, as required:

1 – G3 system parameter list

2 – G4 system parameter list

NOTE: An optional G4 interface is required to print the G4 system parameter list.

4. Press **◆**

5. Exit the service mode.

- An example of a G3 system parameter list

* * * SYSTEM PARAMETER LIST (Date and Time) * * *	
TTI	
Serial Number	- Copier's Serial number programmed by SP-Mode 5-811
Fax Serial Number	- Fax serial number programmed by function 10
FAX ROM VER.	[Version] [Software release no.] [Software release date]
FAX ROM NO.	[Software part no.] [Check sum values (total) (boot) (main)]
Bicu ROM Ver.	[Software part no.]
R T I	
T T I	
C S I	
Polling ID	
Conf.ID	
Number	
Own Number	
Own Number(ISDN G4)	
Own Number(ISDN G3)	
Service Number	
NCU Parameters	
Counter	
Option	
PM	- Optional page memory card installed
2MB, 4MB or HD	- Optional memory card or Hard Disk installed
Function Card	- Optional function upgrade installed
G4	- Optional ISDN G4 kit installed
BANK	- Optional paper feed unit installed
ADF	- Optional ADF installed
1-BIN	- Optional 1-bin tray installed
Service Switch (upper:Default lower:Current)	
(SWUSR) - User Parameter Settings	
Service Switch (upper:Default lower:Current)	
(SWSYS) - System Bit Switch Settings	
(SWSCN) - Scanner Bit Switch Settings	
(SWPLT) - Printer Bit Switch Settings	
(SWCOM) - Communication Bit Switch Settings	
(SWG3) - G3 Bit Switch Settings	

Service
Tables

SERVICE LEVEL FUNCTIONS

- An example of a G4 system parameter list

```
* * * G4 System Parameter List (Date and Time) * * *
                                     TTI
G4 ROM Data
FAX ROM VER.      [Version]  [Software release no.] [Software release date]
G4 ROM VER.      [Software release no.] [Software release date]
G4 Terminal Data
G4 Terminal ID    -=
ISDN_IP
G4 SN1 (main)
G4 SN2 (sub)
G4 Subaddress
G3 Terminal Data
G3 RTI
G3 ISDN CSI
G3 SN1 (main)
G3 SN2 (sub)
G3 Subaddress
G4 Internal Switch (upper:Default lower:Current)
[REDACTED]
G4 Parameter Switch (upper:Default lower:Current)
[REDACTED]
```

1.4 ROM VERSION DISPLAY (FUNCTION 02)

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

<ROM Version>	
P/N:A1945581	Date: 96-06-27
Ver: 00	Dver: Sys V1.08
Area: usa	Suffix: OK

1.5 ERROR CODE DISPLAY (FUNCTION 03)

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

<Error Codes>	
CODE= 00-07	01 JAN 08:58
CODE= 00-07	01 JAN 08:57
Prev	Next PrevMenu

1.6 SERVICE MONITOR REPORT (FUNCTION 04)

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

Service Monitor report	
Press Start to begin	
Cancel	

1.7 G3 PROTOCOL DUMP LIST (FUNCTION 05)

1. Enter the fax service mode.
2. Press **0** **5**
3. Press **1** then **◊**
4. Exit the service mode.

<Protocol Dump>		Enter number
1	G3 Protocol List	
2	G4 Protocol List	
		PrevMenu

1.8 G4 PROTOCOL DUMP LIST (FUNCTION 05)

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

1. Enter the fax service mode.
2. Press **0** **5**
3. Press **2**

<Protocol Dump>		Enter number
1	G3 Protocol List	
2	G4 Protocol List	
		PrevMenu

G4 Protocol List		Enter number
1	D+Bch	2 Dch
3	Bch1 LINK	4 Dch LINK
		PrevMenu

4. Press one of the following numbers as required:

- D + Bch
- Dch
- Bch1 Link
- Dch Link

5. Exit the service mode.

1.9 RAM DISPLAY AND REWRITE (FUNCTION 06)

1. Enter the fax service mode.
2. Press
3. Press
4. Enter the start address of the RAM area to be displayed, then press OK.
5. Move the cursor to the target address, using the arrow keys, then enter a new value.
6. To scroll the RAM address: press Prev. or Next.
To jump to an another address: press OK, and go back to step 4.
7. Exit the service mode.

1.10 NCU PARAMETERS (FUNCTION 06)

1. Enter the fax service mode.
2. Press
3. Press
4. Move the cursor to the target parameter, using the arrow keys, then enter a new value.
5. Exit the service mode.

1.11 RAM DUMP (FUNCTION 06)

1. Enter the fax service mode.
2. Press **0** **6**
3. Press one of the following numbers as required:
 - 3** – G3 memory dump list
 - 4** – G4 memory dump list

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

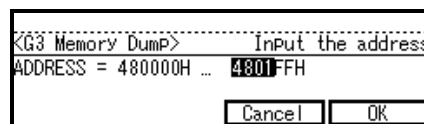
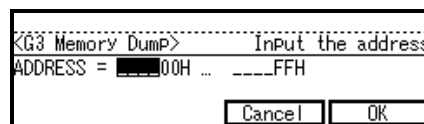
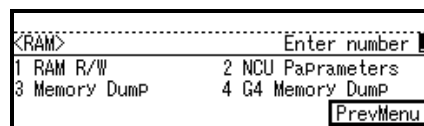
4. Enter the first four digits of the start and end addresses, then press **↩**

Example:

Start at 480000, end at 4801FF

4 **8** **0** **0**
4 **8** **0** **1**
↩

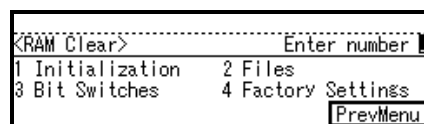
5. Exit the service mode.



Service
Tables

1.12 RAM CLEAR (FUNCTION 07)

1. Enter the fax service mode.
2. Press **0** **7**
3. Press one of the following numbers, as required:
 - 1** – Initializes the data in the SRAM, files in the SAF memory, and the clock.
 - 2** – Erases all the files stored in the SAF memory.
 - 3** – Resets the bit switches and the user parameters.
 - 4** – Initializes the data in the SRAM and files in the SAF memory. The machine automatically returns to standby mode after self-initialization.



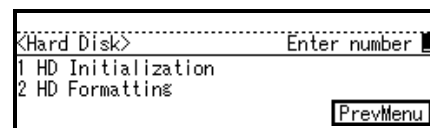
To initialize the fax unit without erasing files or resetting the switches, perform one of the following:

- Press the “Facsimile” key and make sure the Facsimile LED is on. Then, hold down the “Speed Dial” key for more than 10 seconds.
- Turn off the main and ac switches and turn them back on.
- Remove the rear cover, and press SW2 on the FCU.

1.13 HARD DISK (FUNCTION 08)

NOTE: To access this function, the hard disk option must be installed, and System Switch 05, bit 4 must be set to 1.

1. Enter the fax service mode.
2. Press
3. Press one of the following numbers, as required, then press
 - Erases everything stored on the hard disk
 - Low level hard disk formatting (requires over 45 min.)



NOTE: If there is an error during the test, the machine displays 'NG'.

4. Make sure that "OK" is displayed after the process, then exit the service mode.

1.14 SERVICE STATION FAX NUMBER (FUNCTION 09)

1. Enter the fax service mode.
2. Press
3. Enter the fax number of the service station that will receive Automatic Service Calls from this machine. To use a G4 number, press the 'F4' key.
4. Press OK.
5. Exit the service mode.



1.15 SERIAL NUMBER (FUNCTION 10)

1. Enter the fax service mode.
2. Press **1 0**
3. Enter the machine's serial number at the keypad, then press OK.
4. Exit the service mode.

1.16 MODEM TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press **1 1**
3. Press one of the following numbers:
 - 1** – Modem test on an analog line
 - 3** – Modem test on an ISDN line

NOTE: An optional G4 interface is required to test a modem on an ISDN line.
4. Press **1**
5. Choose a modem type at the keypad, then press **↕**. To stop, press **C/⊗**
6. Exit the service mode.

Service
Tables

1.17 DTMF TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press **1 1**
3. Press one of the following numbers:
 - 1** – DTMF test on an analog line
 - 3** – DTMF test on an ISDN line

NOTE: A G4 interface is required to test DTMF tones on an ISDN line.
4. Press **2**
5. Choose a DTMF signal type at the keypad, then press **↕**.
To stop the test, press **C/⊗**

1.18 MODEM SIGNAL DETECTION TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press **1 1**
3. Press one of the following numbers, as required:
 - 1** – Modem signal detection test on an analog line
 - 3** – Modem signal detection test on a digital (ISDN) line
- NOTE:** An optional G4 interface is required to test a modem signal on an ISDN line.
4. Press **3**
5. Choose the modem signal type to be detected at the keypad, then press **◊**
To stop the test, press **C/⊗**
6. Exit the service mode.

<Tests> Enter number	
1 G3 CCU Tests	2 Memory Tests
3 IG3 CCU Test	4 Stamp test
PrevMenu	

<G3 CCU Tests> Enter number	
1 Modem	2 DTMF
3 Detection	4 Ringer
PrevMenu	

<Detection> Enter number	
1 V21 300bps	2 V27 2400bps
3 V27 4800bps	4 V29 7200bps
Prev	Next
PrevMenu	

1.19 RINGER TEST (FUNCTION 11)

1. Enter the fax service mode.
2. Press **1 1**
3. Press **1**
4. Press **4** then **◊**
To stop the test, press **C/⊗**
5. Exit the service mode.

<Tests> Enter number	
1 G3 CCU Tests	2 Memory Tests
3 IG3 CCU Test	4 Stamp test
PrevMenu	

<G3 CCU Tests> Enter number	
1 Modem	2 DTMF
3 Detection	4 Ringer
PrevMenu	

<Ringer>	
Press the Start key to begin	
Cancel	

1.20 STAMP TEST

1. Enter the fax service mode.
2. Press **1 1**
3. Press **4** then **◊**
To stop the test, press **C/⊗**
4. Exit the service mode.

<Tests> Enter number	
1 G3 CCU Tests	2 Memory Tests
3 IG3 CCU Test	4 Stamp test
PrevMenu	

<Stamp>	
Press the Start key to begin	
Cancel	

1.21 G4 PARAMETER PROGRAMMING (FUNCTION 12)

NOTE: An optional G4 interface is required to access this function.

1. Enter the fax service mode.
2. Press **1 2**
3. Press one of the following numbers, as required:
 - 1** – ISDN IP (International Prefix)
 - 2** – G4 SN (Subscriber Number) Main
 - 3** – G4 SN (Subscriber Number) Sub
 - 4** – ISDN G3 SN (Subscriber Number) Main
 - 5** – ISDN G3 SN (Subscriber Number) Sub
 - 6** – G4 Subaddress
 - 7** – ISDN G3 Subaddress

<G4 Mode> Enter number

1 ISDN_IP	2 G4 SN (Main)
3 G4 SN (Sub)	4 G3 SN (Main)

↑Prev ↓Next PrevMenu

<G4 Mode> Enter number

5 G3 SN (Sub)	6 G4 Subaddress
7 G3 Subaddress	

↑Prev ↓Next PrevMenu

4. Program the selected item.
5. Exit the service mode.

NOTE: After changing any of the G4 parameters, be sure to turn both of the ac switches off and on, so that the new settings become effective.

1.22 FILE PRINTOUT (FUNCTION 13)

1. Enter the fax service mode.
2. Press **1 3** then **◊**
The machine prints all the files stored in the SAF memory, including confidential messages.

File Printout
Press Start to begin

Cancel

NOTE: Do not use this function, unless the customer is having trouble printing confidential messages or recovering from the memory lock status.

1.23 TCR/JOURNAL PRINTOUT (FUNCTION 14)

1. Enter the fax service mode.
2. Press **1 4**
3. Either:
Choose All - The machine prints all the communication records on the report.

To Print Journal, select mode and Press Start key.

All/Date: __/__/__

Cancel

SERVICE LEVEL FUNCTIONS

The maximum number of records is 256, without the optional Function Upgrade Card, or 1000 records, with the Card.

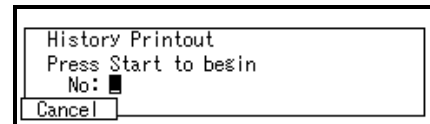
Specify a date - The machine prints all communication records after the specified date.

4. Exit the service mode.

1.24 USAGE LOG PRINTOUT (FUNCTION 15)

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

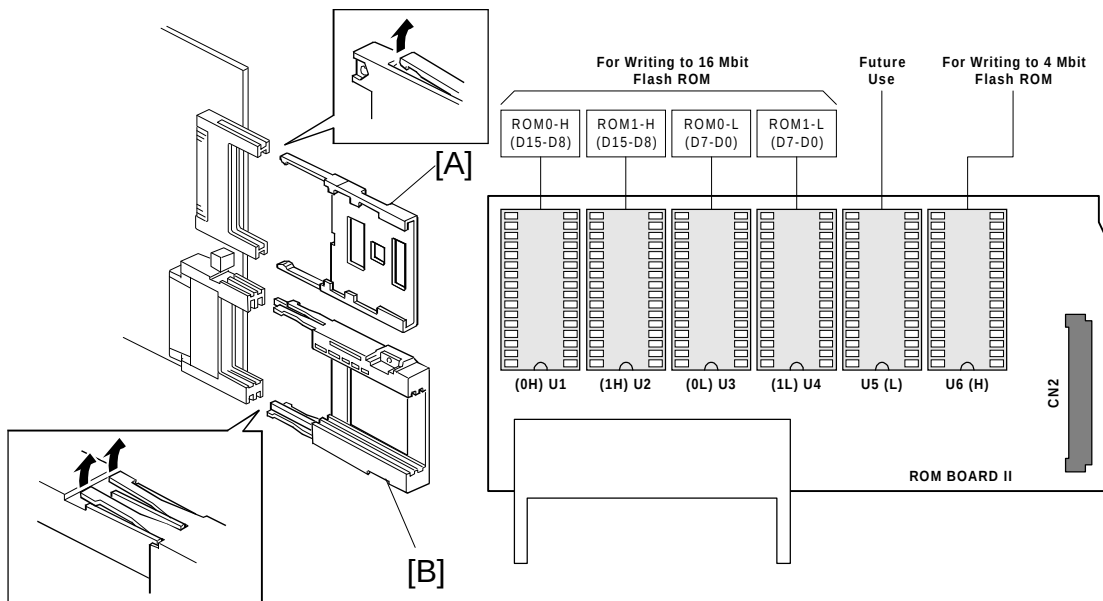
1. Enter the fax service mode.
2. Press **1 5**
3. Press one of the following numbers, as required, then press **◆**
 - 1** – Engine interface
 - 2** – Mailbox usage
 - 3** – Operation trace
 - 4** – Print log
 - 5** – SC history
 - 6** – File storage
 - 7** – Scanner
 - 8** – Job and SAF file creation
4. Exit the service mode.



1.25 SOFTWARE DOWNLOAD (FUNCTION 16)

This procedure copies the software from an external medium (such as an FCU board or an EPROM board), to the Flash ROM on the machine's FCU (target).

1. Turn off the machine's main and ac switches.
2. If the new software is downloaded from a FCU board, remove the IC card guiderails ([A] and [B]) in advance.



Service
Tables

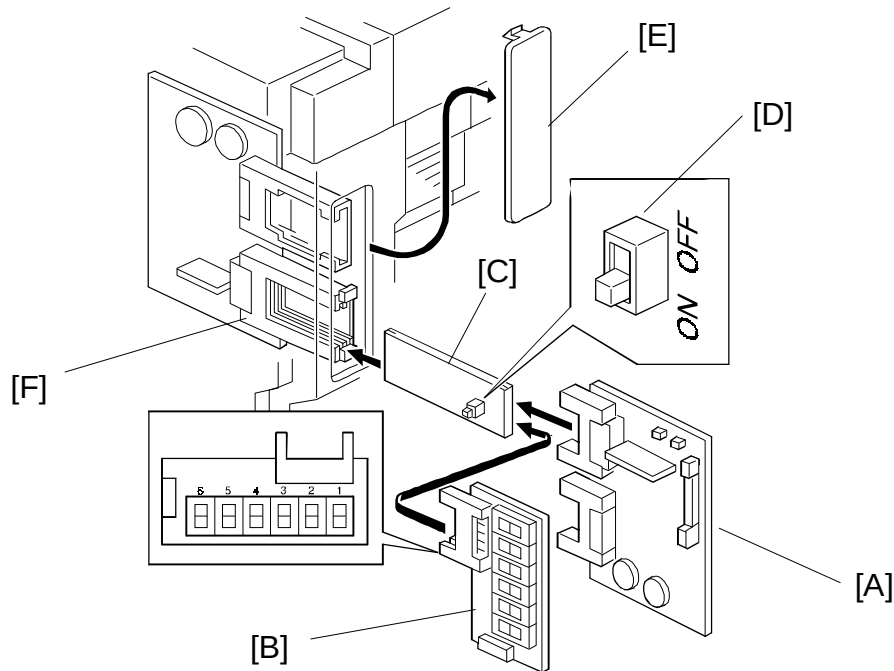
3. If the new software is downloaded from an EPROM board, mount the EPROMs in the correct ROM sockets as shown in the above diagram.

The EPROM board uses four 4Mbit EPROMs.
 Each EPROM must meet the following specifications:
 Size: 4 Mbits Data
 Data width: 8 bits
 Number of pins: 32
 Access speed: Faster than 150 ns.

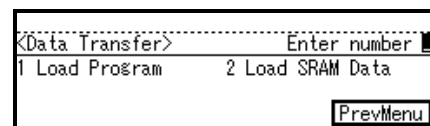
4. Connect the source EPROM board [A] or FCU board [B] to the data copy tool [C], and make sure that the switch [D] on the data copy tool is on.

⚠ CAUTION

If the machine has an optional Function Upgrade Card, change bit 7 of the System Switch 1E to "1", before removing the card, or the programmed data on the card may be lost. Reset the switch back to zero before step 11 below, otherwise the fax unit will not start up without the card installed.



5. Remove the cover [E], and insert the copy tool [C] in the lower left slot [F].
6. Turn on the machine's ac and main switches, then enter the fax service mode.
7. Press **1 6**
8. Press **1** then **◊**
If the software has been successfully downloaded, the machine displays 'OK'.
Otherwise, the machine displays 'NG'.
9. Exit service mode, then turn off the ac and main switches, and disconnect the tools.
10. **Note:** If the machine had a Function Upgrade Card before downloading the software, re-install the card back in the slot before switching the power on.
11. Turn the machine back on.
12. Erase the SAF memory data using service function 07 - 2.
13. Print the system parameter list to check the new ROM version.



1.26 SOFTWARE UPLOAD (FUNCTION 16)

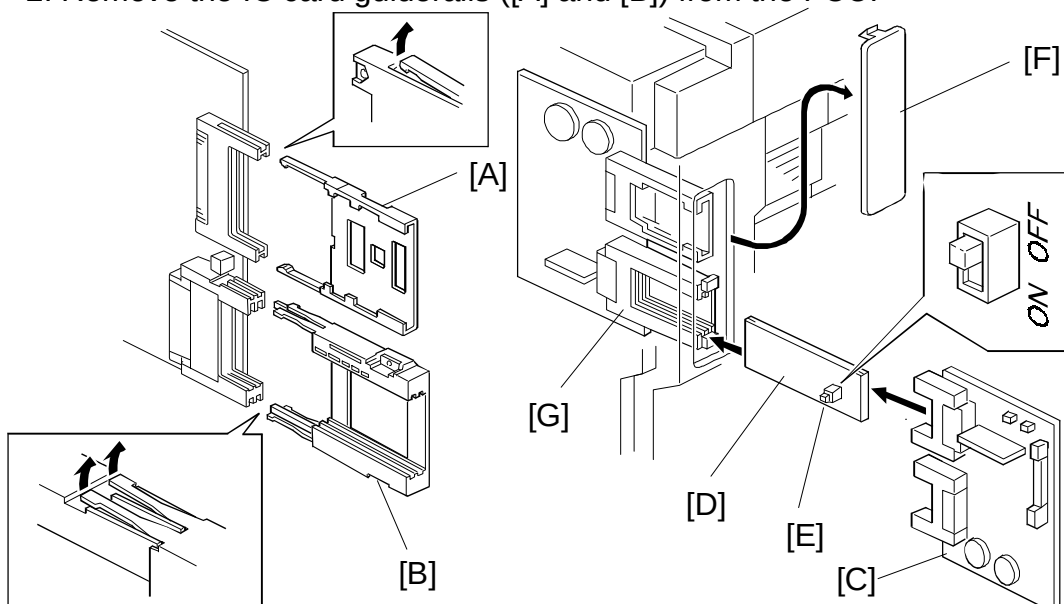
This procedure copies software from the FCU board inside the machine to an external FCU.

⚠ CAUTION

If the machine has an optional Function Upgrade Card, change bit 7 of the System Switch 1E to "1", before removing the card, or the programmed data on the card may be lost.

Re-set the switch back to zero before step 11 below, otherwise the fax unit will not start up without the card installed.

1. Turn off the machine's ac switch.
2. Remove the IC card guiderails ([A] and [B]) from the FCU.

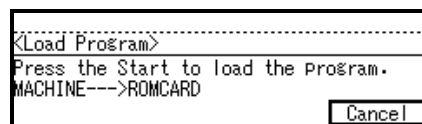
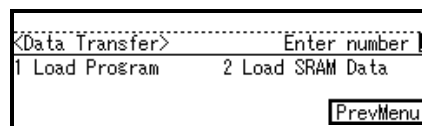


3. Connect the target FCU [C] to the data copy tool [D], and make sure that the switch [E] on the data copy tool [D] is off.
4. Remove the cover [F]. Insert the copy tool [D] in the lower left slot [G].
5. Turn on the machine's ac and main switches, then enter fax service mode.

6. Press **1** **6**

7. Press **1** then **⬠**

If the software has been successfully uploaded, the display shows 'OK'.
Otherwise, the display shows 'NG'.



Service
Tables

8. Exit the service mode.

9. Turn off the ac and main switches, then disconnect the tools.

Note: If the machine had a Function Upgrade Card before uploading the software, re-insert the card back in the slot before switching the power on.

10. Turn the machine back on.

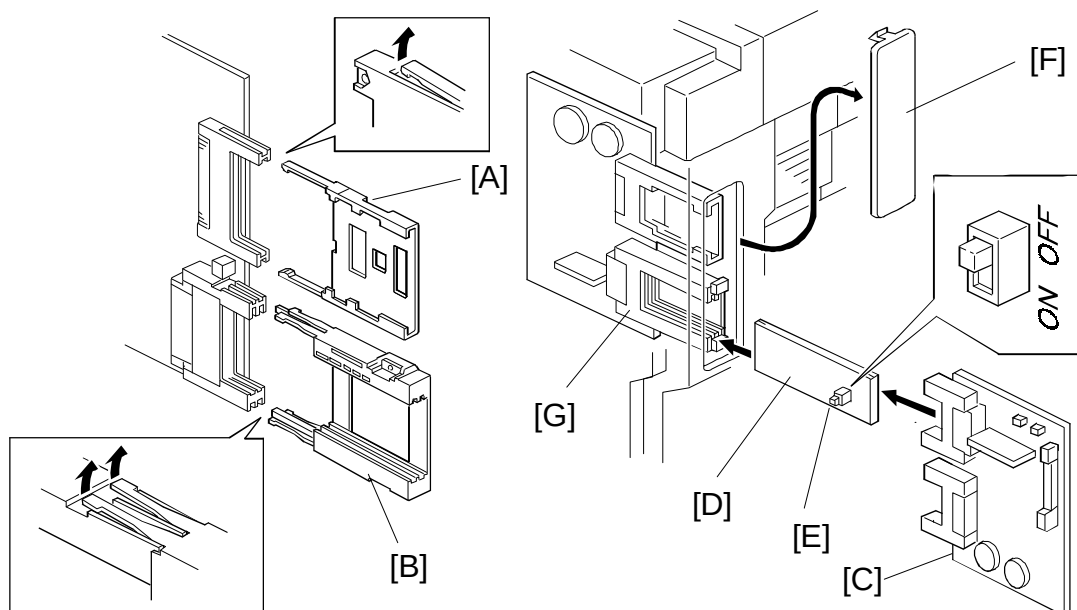
1.27 SRAM DATA DOWNLOAD (FUNCTION 16)

This procedure copies the SRAM data from an external FCU board to the machine's FCU board. Use this procedure after replacing the FCU, to save any previous settings.

⚠ CAUTION

If the machine has an optional Function Upgrade Card, change bit 7 of the System Switch 1E to "1", before removing the card, or the programmed data on the card may be lost.

Be sure to put it back to zero before step 10 below, otherwise the fax unit will not start up without the card installed.



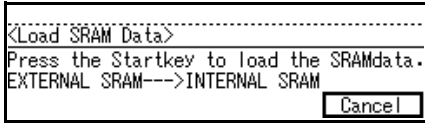
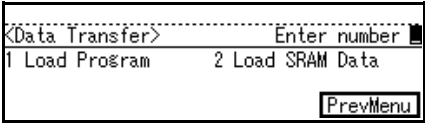
1. Turn off the machine's ac switch.

2. Remove the IC card guiderails ([A] and [B]) from the FCU.

3. Connect the old FCU [C] to the data copy tool [D], and make sure that the switch [E] on the data copy tool [D] is off.

3. Remove the cover [F], and insert the copy tool [D] in the lower left slot [G].

- 4. Turn on the machine's ac and main switches, then enter the fax service mode.
- 5. Press **1 6**
- 6. Press **2**
Then **#** and **◊** simultaneously
- If the software has successfully been downloaded, the display shows 'OK'.
Otherwise, the display shows 'NG'.
- 7. Exit the service mode.
- 8. Turn off the ac and main switches, then disconnect the tools.
- 9. **Note:** If the machine had a Function Upgrade Card, re-insert the card back in the slot before turning the power on.
- 10. Turn the machine back on.
- 11. Print the system parameter list to check if the previous settings have been successfully recovered.



Service
Tables

2. BIT SWITCHES

WARNING

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

Note: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

2.1 SYSTEM SWITCHES

System Switch 00		
No	FUNCTION	COMMENTS
0 1	Not used.	Do not change the settings.
2	Technical data printout on the TCR (Journal) 0: Disabled 1: Enabled	1: Instead of the personal code, the following data are listed on the TCR for each analog G3 communication. e.g. V33 14 01 03 00 02 First number: Final modem type used Second number: Final modem rate (for example, 14 means 14.4 kbps) Third and fourth numbers: Line quality data. Either a measure of the error rate or the rx level is printed, depending on the bit 3 setting below. (An M on the report indicates that it is error rate, and an L indicates Rx level.) The left hand figure is the low byte and the right hand figure is the high byte (refer to the following note for how to read the rx level). If it is a measure of the error rate; a larger number means more errors. Fifth number (rx mode only): Total number of error lines that occurred during non-ECM reception. Sixth number (rx mode only): Total number of burst error lines that occurred during non-ECM reception. The fifth and sixth numbers are fixed at 00 for transmission records and ECM reception records. How to calculate the rx level listed on the TCR (Journal) Example: V29 96 L <u>01</u> <u>A0</u> 00 00 The four-digit hexadecimal value (N) after "L" indicates the rx level. The <u>high</u> byte is given first, followed by the <u>low</u> byte. Divide the decimal value of N by -16 to get the rx level. In the above example, the decimal value of N (= 01A0 [H]) is 416. So, the actual rx level is 416/-16 = -26 dB

System Switch 00		
No	FUNCTION	COMMENTS
3	Line quality data output method 0: Measure of error rate (during image data transmission only) 1: Rx level	This bit determines the data type to be printed on the TCR (Journal) when technical data printout is enabled by bit 2 above.
4	Line error marks on received pages 0: Disabled 1: Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occurred in the data. Such errors are caused by a noisy line, for example.
5	G3/G4 Communication parameter display 0: Disabled 1: Enabled	This is a fault-finding aid. The LCD shows the key parameters (see the next 2 pages). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output after each communication 0: Off 1: On	This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing.
7	Amount of protocol dump data in one protocol dump list printout operation 0: Up to the limit of the memory area for protocol dumping 1: Last communication only	Change this bit to 1 if you want to have a protocol dump list of the last communication only.

BIT SWITCHES

G3 Communication Parameters

Modem rate	144: 14400 bps 120: 12000 bps 96: 9600 bps 72: 7200 bps 48: 4800 bps 24: 2400 bps
Resolution	S: Standard (8 x 3.85 dots per mm) D: Detail (8 x 7.7 dots per mm) F: Fine (8 x 15.4 dots per mm) SF: Superfine (16 x 15.4 dots per mm) - optional Page Memory card required. 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi) - optional Page Memory card required.
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Communication mode	ECM: With ECM SSC: Using SSC EFC: Using EFC NML: With no ECM, SSC, or EFC
Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction
I/O rate	0: 0 ms/line 25: 2.5 ms/line 5: 5 ms/line 10: 10 ms/line 20: 20 ms/line 40: 40 ms/line Note: "40" is displayed while receiving a fax message using AI short protocol.

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

(A639)	4-21	SM

BIT SWITCHES

System Switch 02		
No	FUNCTION	COMMENTS
0 to 5	Not used	Do not change the settings.
6	Memory read/write by RDS	(0,0): All RDS systems are always locked out. (0,1), (1,0): Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. (1,1): At any time, an RDS system can access the machine.
Bit 7	6	
	Setting	
7	0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	

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

System Switch 04		
No	FUNCTION	COMMENTS
0 to 2	Not used	Do not change the settings.
3	Printing dedicated tx parameters on Quick/Speed Dial Lists 0: Disabled 1: Enabled	1: Each Quick/Speed dial number on the list is printed with the dedicated tx parameters (8 bytes each). The first 8 bytes of data are the programmed dedicated tx parameters, even though 32 bytes of data are printed (the other 24 bytes have no use in the field).
4	Not used	Do not change the settings.

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

Service
Tables

System Switch 05		
No	FUNCTION	COMMENTS
0 1	Not used	Do not change the settings.
2	Display of both RTI and CSI on the LCD 0: Disabled 1: Enabled	1: An RTI will be displayed until phase B of the protocol sequence, and a CSI will be displayed after phase C.
3	Not used	Do not change the settings.
4	Hard disk option 0: Not installed 1: Installed	Change this bit to 1 when installing the hard disk option.
5 6 7	Not used	Do not change the settings.

BIT SWITCHES

System Switch 06 - Not used (Do not change the factory settings.)
System Switch 07 - Not used (Do not change the factory settings.)
System Switch 08 - Not used (Do not change the factory settings.)

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

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

Service
Tables

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

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

BIT SWITCHES

System Switch 0F			
No	FUNCTION	COMMENTS	
0 to 7	Country code for functional settings (Hex)	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. Cross reference NCU country code: Function 06, parameter C.C.	
	00: France		10: Not used
	01: Germany		11: USA
	02: UK		12: Asia
	03: Italy		13: Japan
	04: Austria		14: Hong Kong
	05: Belgium		15: South Africa
	06: Denmark		16: Australia
	07: Finland		17: New Zealand
	08: Ireland		18: Singapore
	09: Norway		19: Malaysia
	0A: Sweden		1A: China
	0B: Switz.		1B: Taiwan
	0C: Portugal		20: Turkey
	0D: Holland		21: Greece
	0E: Spain		
	0F: Israel		

System Switch 10		
No	FUNCTION	COMMENTS
0 to 7	Threshold memory level for parallel memory transmission	Threshold = N x 64 kbytes + 256 kbytes N can be between 00 - FF(H) Default setting: 04(H) = 512 kbytes

System Switch 11		
No	FUNCTION	COMMENTS
0	TTI printing position 0: Superimposed on the page data 1: Printed before the data leading edge	Change this bit to 1 if the TTI overprints information that the customer considers to be important (G3 transmissions).
1	TSI (G3) or CIL (G4) printing position 0: Printed before the data leading edge 1: Superimposed on the page data	Change this bit to 1 if the TSI (G3) or CIL (G4) overprints information that the customer considers to be important.
2 to 6	Not used	Do not change the factory settings.
7	Use of parallel memory transmission with G4 transmission 0: Disabled 1: Enabled	This determines whether parallel transmission can be used with a G4 transmission or not. Note that this bit is only effective if Parallel Memory transmission is enabled (User Parameter 07 - bit 2). Refer to Parallel Memory Transmission in section 2.

System Switch 12		
No	FUNCTION	COMMENTS
0 to 7	TTI/CIL printing position in the main scan direction CIL: Command Information Line (Group 4)	08 to 92 (BCD) mm. Input even numbers only. This setting determines the print start position for the TTI and CIL from the left edge of the paper. If the TTI is moved too far to the right, it may interfere with the file number which is on the top right of the page. On an A4 page, if the CIL is moved over by more than 60 mm, it may overwrite the page number.

System Switch 13 - Not used (do not change the settings)		
System Switch 14 - Not used (do not change the settings)		
System Switch 15 - Not used (do not change the settings)		
System Switch 16 - Not used (do not change the settings)		
System Switch 17 - Not used (do not change the settings)		
System Switch 18 - Not used (do not change the settings)		
System Switch 19 - Not used (do not change the settings)		
System Switch 1A - Not used (do not change the settings)		
System Switch 1B - Not used (do not change the settings)		
System Switch 1C - Not used (do not change the settings)		
System Switch 1D - Not used (do not change the settings)		

System Switch 1E		
No	FUNCTION	COMMENTS
0	Communication after the TCR (Journal) data storage area has become full 0: Possible 1: Impossible	0: If the buffer memory of the communication records for the TCR (Journal) has become full, fax communications are still possible. But the the machine will overwrite the communication records from the oldest. 1: If the buffer memory of the communication records for the TCR (Journal) has become full, fax communications will become impossible, in order not to overwrite the communication records before the machine prints them out. Number of communication records for TCR (Journal): 256 records (without function upgrade card) 1000 records (with function upgrade card)
1	Action when the SAF memory has become full while scanning 0: The page is erased. 1: The file is erased.	0: If the SAF memory becomes full while scanning, the successfully scanned pages are transmitted. 1: If the SAF memory becomes full while scanning, the file is erased and no pages are transmitted.
2	RTI/CSI display priority 0: RTI 1: CSI	This bit determines which identifier, RTI or CSI, is displayed on the LCD while the machine is communicating in G3 non-standard mode.

BIT SWITCHES

System Switch 1E		
No	FUNCTION	COMMENTS
3 to 5	Not used	Do not change the factory settings.
6	Changing communication mode of programmed Quick/Speed dials from G4 to G3 after a G4 to G3 fallback 0: Enabled 1: Disabled	0: When bit 0 of Communication Switch 07 is enabled, the machine falls back from G4 to G3 after it receives a CPS code preprogrammed as a condition for G4 to G3 fallback. If this happens, the machine permanently changes the communication mode of the Quick/Speed dial and Redials the number as G3. 1: The machine starts with G4 communication even if a G4 to G3 fallback has occurred in previous transmissions.
7	RAM initialization after a function upgrade card is installed or removed 0: Enabled 1: Disabled	When the machine detects that a function upgrade card has been installed or removed, the machine shows the following message on the display for the customer. <i>"CAUTION! Adding/Removing Memory Card results in data loss. Turn off the main switch and replace the card to cancel. If you want to continue, press Yes."</i> If Yes is pressed, the machine initializes the RAM to the "with" or "without card" configuration. However, changing this bit to '1' disables this initialization, even if Yes is pressed. Change this bit to 1 before doing any operations which require the function upgrade card to be removed. (e.g. FCU replacement, Software download, etc.) 0: When the above message is displayed, the machine initializes the RAM if Yes is pressed. The amount of data lost depends on whether the card is in or out (see Installation - IC Card). To avoid losing data, the user must switch off immediately and re-insert the card back into the machine. 1: When the above message is displayed, the machine does not initialize the RAM even if Yes is pressed. However, the fax unit cannot be used until the user turns the machine off, puts the card back in, then turn the machine back on. No data is lost.

System Switch 1F		
No	FUNCTION	COMMENTS
0 to 2	Not used	Do not change the settings.
3	Received fax print start timing (G3 reception) 0: After receiving each page 1: After receiving all pages	0: The machine prints each page immediately after the machine receives it. 1: The machine prints the complete message after the machine receives all the pages in the memory.
4	Received fax print start timing (G4 reception) 0: After receiving each page 1: After receiving all pages	
5 to 6	Not used	Do not change the factory settings.
7	Action when a fax SC has occurred 0: Automatic reset 1: SC code display	0: When the fax unit detects a fax SC code other than SC1201 and SC1701, the fax unit automatically resets itself. 1: When the fax unit detects any fax SC code, the fax unit displays the SC code and stops. Cross Reference Fax SC codes - See "Troubleshooting"

2.2 SCANNER SWITCHES

Scanner Switch 00		
No	FUNCTION	COMMENTS
0 to 3	Not used	Do not change the settings.
4	OR processing for immediate tx 0: Disabled 1: Enabled	This switch is only effective when the scanner and the IPU of the base copier machine work together to get a required resolution. 0: Every other line is skipped 1: Two consecutive lines are OR-processed Cross Reference See "Original Scan Process" in chapter 2.
5 to 7	Not used	Do not change the settings.

Scanner Switch 01		
No	FUNCTION	COMMENTS
0 to 4	Scan density step value (Text mode)	When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. For example, with the default settings (15), the threshold value changes as follows . +3 (Darkest) : 83 (=98 - 15) +2 : 98 (=113 - 15) +1 : 113 (=128 - 15) 0 (Normal) : 128 (Scanner Switch 02 setting) -1 : 143 (=128 + 15) -2 : 158 (=143 + 15) -3 (Lightest) : 173 (=158 + 15) The value can be between 00 and 1F (H) [= 31(D)]. For a darker threshold, input a lower value. Default setting - 15
5 to 7	Not used.	Do not change the settings.

Scanner Switch 02		
No	FUNCTION	COMMENTS
0 to 7	Binary picture processing: Threshold for Text mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text mode, when the scan density setting is at the center. The value can be between 00 and FF. For a darker threshold, input a lower value. Default setting - 90(H)=144(D) This setting is independent from the threshold setting specified by the copier's SP mode 4-418-1.

Scanner Switch 03		
No	FUNCTION	COMMENTS
0 to 7	Binary picture processing: Threshold for Text/Photo mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text/Photo mode, when the scan density setting is at the center. The value can be between 00 and 0F. For a darker threshold, input a lower value. Default setting - 26(H)=38(D) This setting is independent from the threshold setting specified by the copier's SP mode 4-418-2.

Service
Tables

Scanner Switch 04 - Not used (Do not change the settings).

Scanner Switch 05		
No	FUNCTION	COMMENTS
0 to 3	MTF setting (Text mode) The value can be between 0 and 11. Refer to the following diagram for how to adjust the setting. Default setting - 4 (Do not use the setting '5'.)	This setting is independent from the threshold specified by copier SP mode 4-407. Do not use this setting.
4 to 7	Not used	Do not change the settings.

BIT SWITCHES

Scanner Switch 06		
No	FUNCTION	COMMENTS
0 to 3	MTF setting (Text/Photo mode)	The value can be between 0 to 11. Refer to Scanner Switch 05 for how to adjust the setting. Default setting - 8 (Do not use the setting '5'.) This setting is independent from the threshold setting specified by the copier's SP mode 4-407-5.
4 to 7	Not used	Do not change the settings.

Scanner Switch 07		
No	FUNCTION	COMMENTS
0 to 3	MTF setting (Photo mode)	The value can be between 0 and 11. Refer to the diagram on the previous page for how to adjust the setting. Default setting - 1 (Do not use the setting '5'.) This setting is independent from the threshold setting specified by the copier's SP mode 4-407-6.
4 to 7	Not used	Do not change the settings.

Scanner Switch 08		
No	FUNCTION	COMMENTS
0 to 3	Scan margin setting (top and bottom margin in book scan mode, and top margin in ADF mode) The setting can be between 0 and F (H) (in mm). Default setting - 2 mm If the scanned image is not what you expect after adjustment, the base copier's SP mode settings may be incorrect. Check and adjust SP modes 4-012-1, 4-012-2, and 6-006-2.	
4 to 7	Scan margin setting (bottom margin in ADF mode) The setting can be between 0 and F (H) (in mm). Default setting - 2 mm If the scanned image is not what you expect after adjustment, the base copier's SP mode settings may be incorrect. Check and adjust SP mode 6-006-3.	

Scanner Switch 09 - Not used (do not change the settings)		
Scanner Switch 0A - Not used (do not change the settings)		
Scanner Switch 0B - Not used (do not change the settings)		

Scanner Switch 0C		
No	FUNCTION	COMMENTS
0	Action when an original jam has occurred while scanning the original into memory for memory tx 0: Continues scanning after recovery 1: Stops scanning and erases all scanned pages for that job.	This bit is only effective when parallel memory tx is disabled (user parameter 07 - bit 2). If parallel memory tx is enabled, the machine always erases the scanned pages when an original jam occurs. The machine then asks the user to retry from the first page, even if the parallel memory tx is not actually used. 0: The machine displays a message asking the user to put the jammed page back into the original stack, and continues scanning. The message is displayed for the time period specified by scanner switch 0E, bit 2. 1: The machine erases all the scanned pages and asks the user to retry from the first page.
1 to 7	Not used	Do not change the settings.

Scanner Switch 0D		
No	FUNCTION	COMMENTS
0	Scan magnification ratio fine tuning (Main scan direction)	
1	$\begin{pmatrix} 0 \\ 0 \end{pmatrix} = 0\%$, $\begin{pmatrix} 1 \\ 0 \end{pmatrix} = -0.5\%$, $\begin{pmatrix} 0 \\ 1 \end{pmatrix} = +0.5\%$, $\begin{pmatrix} 1 \\ 1 \end{pmatrix} =$ Do not use this setting The actual magnification ratio is the sum of the SP mode 4-008 setting and this setting.	
2	Scan magnification ratio fine tuning (Sub scan direction)	
3	$\begin{pmatrix} 0 \\ 0 \end{pmatrix} = 0\%$, $\begin{pmatrix} 1 \\ 0 \end{pmatrix} = -1.0\%$, $\begin{pmatrix} 0 \\ 1 \end{pmatrix} = +1.0\%$, $\begin{pmatrix} 1 \\ 1 \end{pmatrix} =$ Do not use this setting The actual magnification ratio is the sum of the SP mode 4-101 setting and this setting.	
4 to 6	Not used	Do not change the settings.
7	Scan width for A5 lengthwise or B5 lengthwise original 0: 210 mm (8.5") 1: Original width	0: The machine scans the original as 210 mm (8.5") width. The transmitted image has a blank area on the right. 1: The machine scans 148 mm (A5) or 182 mm (B5) and centers the scanned data on a 216 mm width transmitted image.

BIT SWITCHES

Scanner Switch 0E		
No	FUNCTION	COMMENTS
0	Wait time for the next page when scanning a book original into memory 0: 60 seconds 1: 30 seconds	This bit determines how long the machine waits for the next page when scanning a book original for memory transmission. If this timer expires, the machine transmits all the pages scanned so far as one document. Note: In immediate tx, the wait time for the next page is 15 seconds.
1	Scan resolution unit (except standard resolution in book scan mode) 0: mm 1: inch	This bit determines which resolution unit will be used for scanning a fax message. Default setting: mm
2	ADF jam alarm display time 0: 60 s 1: 30 s	The bit is only effective when bit 0 of scanner bit switch 0C is '0'. This bit determines how long the machine displays the ADF jam alarm after a jam has happened.
3	Scan resolution unit (standard resolution in book scan mode) 0: mm 1: inch	This bit determines which resolution unit will be used for scanning a fax message, when standard resolution is selected in book scan mode. Default setting: inch
4 to 7	Not used	Do not change the settings.

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

2.3 PRINTER SWITCHES

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

Service
Tables

Printer Switch 01		
No	FUNCTION	COMMENTS
0 1 2	Not used	Do not change the settings.
3 4	Maximum print width used in the setup protocol. $\begin{pmatrix} 0 \\ 0 \end{pmatrix} = \text{Not used}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 297 \text{ mm} \text{ } 11.7 \text{ inch}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} = 254 \text{ mm} \text{ } 10.1 \text{ inch}, \begin{pmatrix} 1 \\ 1 \end{pmatrix} = 216 \text{ mm} \text{ } 8.5 \text{ inch}$	
5 6	Not used	Do not change the settings.
7	Received message width restriction in the protocol signal to the sender 0: Disabled 1: Enabled	0: The machine informs the transmitting machine of the print width depending on the paper size available from the paper feed stations. Refer to the table on the next page for how the machine chooses the paper width used in the setup protocol (NSF/DIS). 1: The machine informs the transmitting machine of the fixed paper width which is specified by bits 3 and 4 above.

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

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

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

Printer Switch 03		
No	FUNCTION	COMMENTS
0	Length reduction of received data 0: Disabled 1: Enabled	0: Incoming pages are printed without length reduction. Cross reference Page separation threshold: Printer Sw. 03, bits 4 to 7. 1: Incoming pages are reduced in the length direction when printing. Cross reference Maximum reducible length: Printer Switches 04, bits 0 to 4 Page separation and data reduction: chapter 2.
1	Not used	Do not change the settings.
2		
3		

Printer Switch 03		
No	FUNCTION	COMMENTS
4	Page separation threshold (with reduction disabled in switch 03-0 above)	
to	If the incoming page is up to x mm longer than the the length of copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the length of copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits.	
7		
	Hex value of bits 4 to 7	x (mm)
	0	0
	1	1
	and so on until	
	F	15
	Default setting: 6 mm	
	Cross reference	
	Page separation and data reduction: section 2	
	Length reduction On/Off: Printer Switch 03, Bit 0	

Printer Switch 04		
No	FUNCTION	COMMENTS
0	Maximum reducible length when length reduction is enabled in switch 03-0 above.	
to	<Maximum reducible length> = <Paper length> + (N x 5mm)	
4	'N' is the decimal value of the binary setting of bits 0 to 4.	
	Bit	Setting
	4 3 2 1 0	
	0 0 0 0 0	0 mm
	0 0 0 0 1	5 mm
	0 0 1 0 0	20 mm (default setting)
	1 1 1 1 1	155 mm
	For A5 sideways and B5 sideways paper	
	<Maximum reducible length> = <Paper length> + 0.75 x (N x 5mm)	
5	Length of the duplicated image on the next page, when page separation has taken place.	
6	$\begin{pmatrix} 0 \\ 0 \end{pmatrix} = 4 \text{ mm}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 10 \text{ mm}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} = 20 \text{ mm}, \begin{pmatrix} 1 \\ 1 \end{pmatrix} = 40 \text{ mm}$	
7	Not used.	Do not change the setting.

BIT SWITCHES

Printer Switch 05 - Not used (do not change the settings)
Printer Switch 06 - Not used (do not change the settings)
Printer Switch 07 - Not used (do not change the settings)
Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)

Printer Switch 0E		
No	FUNCTION	COMMENTS
0	Paper size selection priority 0: Width 1: Length	0: A paper size which has the same width as the received data is selected first. 1: A paper size which has enough length to print all the received lines without reduction is selected first.
1	Paper size selected for printing A4 width fax data 0: 8 x 11" size 1: A4 size	This switch determines which paper size is selected for printing A4 width fax data, when the machine has A4 and 8" x 11" size paper at the same time.
2	Page separation 0: Enabled 1: Disabled	1: If all paper sizes in the machine require page separation to print a received fax message, the machine does not print the message (Substitute Reception is used). After a larger size of paper is set in a cassette, the machine automatically prints the fax message.
3 to 6	Not used	Do not change the settings.
7	Equalizing the reduction rate among separated pages (Page Separation) 0: Enabled 1: Disabled	0: All the pages are reduced with the same reduction ratio, when page separation has taken place. 1: Only the last page is reduced to fit the selected paper size when the page separation has taken place. Other pages are printed without reduction.

Printer Switches 0F		
No	FUNCTION	COMMENTS
0 1	Not used	Do not change the setting.
2	Duplex printing 0: Disabled 1: Enabled	1: The machine prints received fax messages in duplex printing mode. Cross Reference "Duplex Printing" in chapter 2
3	Not used	Do not change the setting.
4	Printing fax messages in Restricted Access mode 0: Enabled 1: Disabled	1: The machine holds the received fax messages until the machine exits the restricted access mode. If the machine enters the restricted access mode again while printing fax messages, the machine stops printing until the machine exits the mode again. Cross reference Restricted access on/off - Key operator mode 01-3
5	Not used	Do not change the setting.
6	Wait timer for Duplex Print Mode.	
7	$\begin{pmatrix} 0 \\ 0 \end{pmatrix} = \text{No limit}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 1 \text{ min.}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} = 3 \text{ min.}, \begin{pmatrix} 1 \\ 1 \end{pmatrix} = 10 \text{ min.}$ If copy job or printer controller is using the duplex unit when the fax unit is going to print a fax message in duplex mode, the fax unit waits until the duplex unit becomes available. The time period that the fax unit will wait can be specified, as shown above. If the timer expires, the message is printed on single sides.	

2.4 COMMUNICATION SWITCHES

Communication Switch 00		
No	FUNCTION	COMMENTS
0	Compression modes available in receive mode	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
1	Bit 1 0 Modes 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	
2	Compression modes available in transmit mode	
3	Bit 3 2 Modes 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	
4 to 6	Not used	
7	Closed network (reception) 0: Disabled 1: Enabled	1: Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode.

Communication Switch 01		
No	FUNCTION	COMMENTS
0	ECM 0: Off 1: On	If this bit is 0, ECM is switched off for all communications.
1	EFC during transmission 0: Off 1: On	If this bit is 0, EFC is switched off during transmission.
2	Wrong connection prevention method	(0,1) - The machine will disconnect the line without sending a fax message, if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. (1,0) - The same as above, except that only the last 4 digits are compared. (1,1) - The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. (0,0) - Nothing is checked; transmission will always go ahead. Note: This function does not work when dialing is done from the external telephone.
3	Bit 3 Bit 2 Setting 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	
4	Not used	
5	Not used	

Communication Switch 01			
No	FUNCTION		COMMENTS
6	Maximum printable page length available		The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).
7	Bit 7	Bit 6	
	0	0	
	0	1	
	1	0	
	1	1	
	Setting		
	No limit		
	B4 (364 mm)		
	A4 (297 mm)		
	A3 (432 mm)		

Communication Switch 02																			
No	FUNCTION		COMMENTS																
0	Burst error threshold 0: Low 1: High		If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. <table> <tr> <th>Resolution</th><th>100 dpi</th><th>200 dpi</th><th>400 dpi</th></tr> <tr> <td></td><td>3.85 l/mm</td><td>7.7 l/mm</td><td>15.4 l/mm</td></tr> <tr> <td>Low settings</td><td>3</td><td>6</td><td>12</td></tr> <tr> <td>High settings</td><td>6</td><td>12</td><td>24</td></tr> </table>	Resolution	100 dpi	200 dpi	400 dpi		3.85 l/mm	7.7 l/mm	15.4 l/mm	Low settings	3	6	12	High settings	6	12	24
Resolution	100 dpi	200 dpi	400 dpi																
	3.85 l/mm	7.7 l/mm	15.4 l/mm																
Low settings	3	6	12																
High settings	6	12	24																
1	Acceptable total error line ratio 0: 5% 1: 10%		If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end.																
2	Treatment of pages received with errors during G3 reception 0: Deleted from memory without printing 1: Printed		0: Pages received with errors are not printed.																
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission 0: No hang-up, 1: Hang-up		0: The next page will be sent even if RTN or PIN is received. 1: The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.																
4 to 7	Not used		Do not change the settings.																

BIT SWITCHES

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

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

Communication Switch 06		
No	FUNCTION	COMMENTS
0	Dialing requirements: Germany 0: Disabled 1: Enabled	These switches are automatically set to the settings required by each country after a country code (System Switch 0F) is programmed.
1	Dialing requirements: Austria 0: Disabled 1: Enabled	
2	Dialing requirements: Norway 0: Disabled 1: Enabled	
3	Dialing requirements: Denmark 0: Disabled 1: Enabled	
4	Dialing requirements: France 0: Disabled 1: Enabled	
5	Dialing requirements: Switzerland 0: Disabled 1: Enabled	
6	Not used	Do not change the settings.
7		

Communication Switch 07		
No	FUNCTION	COMMENTS
0	Fallback from G4 to G3 if the other terminal is not a G4 terminal 0: Disabled 1: Enabled	Also see System Switch 0A bit 7. Refer to the ISDN G4 option service manual (G4 Internal Switches 17, 18, 1A, 1B, and 1C) for the CPS code set (Cause Value set) to determine G4 to G3 fallback.
1	Not used	Do not change the setting.
2	Use of the date and time provided from the network for the CIL 0: Disabled 1: Enabled	0: The date and time programmed in the receiving terminal is used in the CIL. 1: The date and time informed in the document layer from the remote terminal (through the network) is used in the CIL.
3 to 7	Not used	Do not change the settings.

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

Communication Switch 0A		
No	FUNCTION	COMMENTS
0	Point of resumption of memory transmission upon redialing 0: From the error page 1: From page 1	0: The transmission begins from the page where transmission failed the previous time. 1: Transmission begins from the first page, using normal memory transmission.
1 to 6	Not used	Do not change the settings.
7	Emergency calls using 999 0: Enabled 1: Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the UK and some other countries.

Communication Switch 0B		
No	FUNCTION	COMMENTS
0	Use of Economy Transmission during a Transfer operation to end receivers 0: Disabled 1: Enabled	These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station.
1	Use of Economy Transmission during a Transfer operation to the Next Transfer Stations 0: Disabled 1: Enabled	
2	Use of Label Insertion for the End Receivers in a Transfer operation 0: Disabled 1: Enabled	This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station.
3	Conditions required for Transfer Result Report transmission 0: Always transmitted 1: Only transmitted if there was an error	0: When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. 1: The machine will only send back a Transfer Result Report if there were errors during communication so that one or more of the End Receivers could not be contacted.
4	Printout of the message when acting as a Transfer Station 0: Disabled 1: Enabled	When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal.

BIT SWITCHES

Communication Switch 0B		
No	FUNCTION	COMMENTS
5	Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number 0: Transfer is Disabled 1: Transfer is Enabled	After the machine receives a transfer request, the machine compares the last N digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. (N is the number programmed in communication switch 0C.) 0: If there is no matching number programmed in the machine, the machine rejects the transfer request. 1: Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal. Refer to "Transfer Broadcasting" in chapter 2 for more details.
6	Not used	Do not change the settings.
7		

Communication Switch 0C		
No	FUNCTION	COMMENTS
0 to 4	Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station	00 - 1F (0 to 31 digits) After the machine receives a transfer request, the machine compares the telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. This number determines how many digits from the end of the telephone numbers the machine compares. If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. Default setting - 05(H) = 5 digits Refer to "Transfer Broadcasting" in chapter 2 for more details.
5 to 7	Not used	Do not change the settings.

Communication Switch 0D		
No	FUNCTION	COMMENTS
0 to 7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 2 kbytes (e.g., 0C(H) = 24 kbytes) One page is about 24 kbytes. The machine refers to this setting before each fax reception. If the amount of remaining memory is below this threshold, the machine can not receive any fax messages. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory available. This will result in communication failure.

Communication Switch 0E		
No	FUNCTION	COMMENTS
0 to 7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F		
No	FUNCTION	COMMENTS
0 to 7	Minimum number of times that a destination will dialed when TRD is being used	01 - FF (Hex) times

Communication Switch 10		
No	FUNCTION	COMMENTS
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FF (Hex) times

Communication Switch 11 - Not used (do not change the settings.)		

Communication Switch 12		
No	FUNCTION	COMMENTS
0 to 7	Memory transmission: Interval between dialing attempts to the same destination	01 - FF (Hex) minutes

Communication Switch 13 - Not used (do not change the settings.)		

BIT SWITCHES

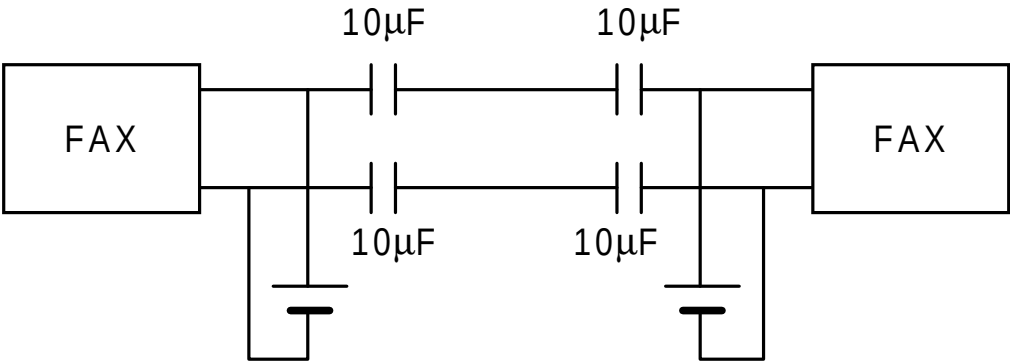
Communication Switch 14																	
No	FUNCTION	COMMENTS															
0	Inch-to-mm conversion during transmission 0: Disabled 1: Enabled	0: In immediate transmission, data scanned in inch format are transmitted without conversion. In memory transmission, data stored in the SAF memory in mm format are transmitted without conversion. Note: When storing the scanned data into SAF memory, the fax unit always converts the data into mm format. 1: The machine converts the scanned data or stored data in the SAF memory to the format which was specified in the set-up protocol (DIS/NSF) before transmission.															
1 to 5	Not used	Do not change the factory settings.															
6 to 7	Available unit of resolution in which fax messages are received <table> <tr> <th>Bit 7</th><th>Bit 6</th><th>Unit</th></tr> <tr> <td>0</td><td>0</td><td>mm</td></tr> <tr> <td>0</td><td>1</td><td>inch</td></tr> <tr> <td>1</td><td>0</td><td>mm and inch (default)</td></tr> <tr> <td>1</td><td>1</td><td>Not used</td></tr> </table>	Bit 7	Bit 6	Unit	0	0	mm	0	1	inch	1	0	mm and inch (default)	1	1	Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).
Bit 7	Bit 6	Unit															
0	0	mm															
0	1	inch															
1	0	mm and inch (default)															
1	1	Not used															

Communication Switch 15 - Not used (do not change the settings)
Communication Switch 16 - Not used (do not change the settings)
Communication Switch 17 - Not used (do not change the settings)
Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)
Communication Switch 1B - Not used (do not change the settings)
Communication Switch 1C - Not used (do not change the settings)
Communication Switch 1D - Not used (do not change the settings)
Communication Switch 1E - Not used (do not change the settings)
Communication Switch 1F - Not used (do not change the settings)

2.5 G3 SWITCHES

G3 Switch 00																	
No	FUNCTION	COMMENTS															
0	Monitor speaker during communication (tx and rx)	(0, 0): The monitor speaker is disabled all through the communication.															
1	<table><tr><td>Bit 1</td><td>Bit 0</td><td>Setting</td></tr><tr><td>0</td><td>0</td><td>Disabled</td></tr><tr><td>0</td><td>1</td><td>Up to Phase B</td></tr><tr><td>1</td><td>0</td><td>All the time</td></tr><tr><td>1</td><td>1</td><td>Not used</td></tr></table>	Bit 1	Bit 0	Setting	0	0	Disabled	0	1	Up to Phase B	1	0	All the time	1	1	Not used	(0, 1): The monitor speaker is on up to phase B in the T.30 protocol. (1, 0): Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
Bit 1	Bit 0	Setting															
0	0	Disabled															
0	1	Up to Phase B															
1	0	All the time															
1	1	Not used															
2	Monitor speaker during memory transmission 0: Disabled 1: Enabled	1: The monitor speaker is enabled during memory transmission.															
3 to 6	Not used	Do not change the settings.															
7	Back to back test 0: Disabled 1: Enabled	Set this bit to 1 when you wish to do a back to back test. 115 V model: Be sure to connect jumpers JP5 and JP6 on the NCU before doing the test. 220 V model: Be sure to apply dc voltage between wires L1 and L2 on the NCU.															

Service
Tables



Back-to-Back Connection:
The dc power supplies should be adjusted so that the line current to the NCU is about 30mA.

BIT SWITCHES

G3 Switch 01		
No	FUNCTION	COMMENTS
0 to 3	Not used	Do not change the settings.
4	DIS frame length 0: 6 bytes 1: 4 bytes	1: The 5th and 6th bytes in the DIS frame will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED transmission 0: Disabled 1: Enabled	Do not change this setting, unless the communication problem is caused by the CED transmission.
7	Not used	Do not change the setting.

G3 Switch 02		
No	FUNCTION	COMMENTS
0	G3 protocol mode used 0: Standard and non-standard 1: Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. 1: Disables NSF/NSS signals (these are used in non-standard mode communication)
1 to 4	Not used	Do not change the settings.
5	Use of modem rate history for transmission using Quick/Speed Dials 0: Disabled 1: Enabled	0: Communications using Quick/Speed Dials always start from the highest modem rate. 1: The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) 0: Disabled 1: Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble 0: Disabled 1: Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3 Switch 03		
No	FUNCTION	COMMENTS
0	DIS detection number (Echo countermeasure) 0: 1 1: 2	0: The machine will hang up if it receives the same DIS frame twice. 1: Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	Not used	Do not change the setting.
2		
3	ECM frame size 0: 256 bytes 1: 64 bytes	Keep this bit at "0" in most cases.
4	CTC transmission conditions 0: After one PPR signal received 1: After four PPR signals received (ITU-T standard)	0: When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the following condition is met in communications at 14.4, 12.0, 9.6, and 7.2 kbps. $\sqrt{N_{Transmit}} \leq N_{Resend}$ N _{Transmit} - Number of transmitted frames N _{Resend} - Number of frames to be retransmitted 1: When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs. PPR, CTC: These are ECM protocol signals.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) 0: No change 1: Fallback	1: The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6	Not used	Do not change the setting.
7		

G3 Switch 04		
	FUNCTION	COMMENTS
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded.
4 to 7	Not used	Do not change the settings.

BIT SWITCHES

G3 Switch 05		
	FUNCTION	COMMENTS
0 to 3	Initial Tx modem rate Bit 3 2 1 0 Setting (bps) 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12 k 0 1 1 0 14.4 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers.
4 to 5	Initial modem type for 9.6 k or 7.2 kbps. Bit 5 Bit 4 Setting 0 0 V.29 0 1 V.17 1 0 Not used 1 1 Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6 to 7	Not used	Do not change the settings.

G3 Switch 06		
	FUNCTION	COMMENTS
0 to 3	Initial Rx modem rate Bit 3 2 1 0 Setting (bps) 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12 k 0 1 1 0 14.4 k Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem rate for the machine in receive mode. Use a lower setting if high speeds pose problems during reception. The machine automatically determines whether to use TCM or not.
4 to 7	Modem types available for reception Bit 7 6 5 4 Setting 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29 0 1 0 0 V.27ter, V.29, V.17 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode.

G3 Switch 07			
	FUNCTION		COMMENTS
0	PSTN cable equalizer (tx mode)		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently.
1	Bit 1	Bit 0	
	0	0	
	0	1	
	1	0	
	1	1	
		Setting	
		None	
		Low	
		Medium	
		High	
2	PSTN cable equalizer (rx mode)		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently.
3	Bit 3	Bit 2	
	0	0	
	0	1	
	1	0	
	1	1	
		Setting	
		None	
		Low	
		Medium	
		High	
4 to 7	Not used		Do not change the settings.

G3 Switch 08 - Not used (do not change the settings)

G3 Switch 09			
	FUNCTION		COMMENTS
0	ISDN cable equalizer (tx mode)		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently.
1	Bit 1	Bit 0	
	0	0	
	0	1	
	1	0	
	1	1	
		Setting	
		None	
		Low	
		Medium	
		High	
2	ISDN cable equalizer (rx mode)		Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently.
3	Bit 3	Bit 2	
	0	0	
	0	1	
	1	0	
	1	1	
		Setting	
		None	
		Low	
		Medium	
		High	

BIT SWITCHES

G3 Switch 09		
	FUNCTION	COMMENTS
4 to 7	Not used	Do not change the settings.

G3 Switch 0A																	
	FUNCTION	COMMENTS															
0	Maximum allowable carrier drop during image data reception	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.															
1	<table><tr><td>Bit 1</td><td>Bit 0</td><td>Value (ms)</td></tr><tr><td>0</td><td>0</td><td>200</td></tr><tr><td>0</td><td>1</td><td>400</td></tr><tr><td>1</td><td>0</td><td>800</td></tr><tr><td>1</td><td>1</td><td>Not used</td></tr></table>		Bit 1	Bit 0	Value (ms)	0	0	200	0	1	400	1	0	800	1	1	Not used
Bit 1	Bit 0		Value (ms)														
0	0		200														
0	1		400														
1	0		800														
1	1	Not used															
2	Not used																
3																	
4	Maximum allowable frame interval during image data reception. 0: 5 s 1: 13 s																
5	Not used																
6	Reconstruction time for the first line in receive mode 0: 6 s 1: 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 seconds of CFR.															
7	Not used	Do not change the settings.															

G3 Switch 0B		
	FUNCTION	COMMENTS
0	Protocol requirements: Europe 0: Disabled 1: Enabled	The machine does not automatically reset these bits for each country after a country code (System Switch 0F) is programmed. Change the required bits manually at installation.
1	Protocol requirements: Spain 0: Disabled 1: Enabled	
2	Protocol requirements: Germany 0: Disabled 1: Enabled	
3	Protocol requirements: France 0: Disabled 1: Enabled	
4	PTT requirements: Germany 0: Disabled 1: Enabled	
5	PTT requirements: France 0: Disabled 1: Enabled	
6	Not used	Do not change the settings.
7		

G3 Switch 0C			
	FUNCTION		COMMENTS
0	Pulse dialing method		P = Number of pulses sent out, N = Number dialed.
	Bit 1 Bit 0 Setting		
1	0	0 Normal (P=N)	
	0	1 Oslo (P=10 - N)	
	1	0 Sweden (N+1)	
	1	1 Not used	
2 to 7	Not used		Do not change the settings.

G3 Switch 0D - Not used (do not change the settings)
G3 Switch 0E - Not used (do not change the settings)
G3 Switch 0F - Not used (do not change the settings)

3. NCU PARAMETERS

The following tables give the RAM addresses and units of calculation of the parameters that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (Function 06-1), but some can be changed using NCU Parameter programming (Function 06-2); if Function 06-2 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

Address	Function	Unit	Remarks		
480400	Country code for NCU parameters	Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 06-2 (parameter 00).			
		Country	Decimal	Hex	
		France	00	00	
		Germany	01	01	
		UK	02	02	
		Italy	03	03	
		Austria	04	04	
		Belgium	05	05	
		Denmark	06	06	
		Finland	07	07	
		Ireland	08	08	
		Norway	09	09	
		Sweden	10	0A	
		Switzerland	11	0B	
		Portugal	12	0C	
		Holland	13	0D	
		Spain	14	0E	
		Israel	15	0F	
		USA	17	11	
		Asia	18	12	
		Hong Kong	20	14	
		South Africa	21	15	
		Australia	22	16	
		New Zealand	23	17	
		Singapore	24	18	
		Malaysia	25	19	
		China	26	1A	
		Taiwan	27	1B	
		Turkey	32	20	
		Greece	33	21	
		480401	Line current detection time	20 ms	Line current is not detected if 480401 contains FF.
		480402	Line current wait time		
		480403	Line current drop detect time		

Address	Function	Unit	Remarks
480404	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480405	PSTN dial tone frequency upper limit (low byte)		
480406	PSTN dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480407	PSTN dial tone frequency lower limit (low byte)		
480408	PSTN dial tone detection time	20 ms	If 480408 contains FF, the machine pauses for the pause time (address 48040D / 48040E). See Note 2 (Italy).
480409	PSTN dial tone reset time (LOW)		
48040A	PSTN dial tone reset time (HIGH)		
48040B	PSTN dial tone continuous tone time		
48040C	PSTN dial tone permissible drop time		
48040D	PSTN wait interval (LOW)		
48040E	PSTN wait interval (HIGH)		
48040F	PSTN ringback tone detection time	20 ms	Detection is disabled if this contains FF.
480410	PSTN ringback tone off detection time	20 ms	
480411	PSTN detection time for silent period after ringback tone detected (LOW)	20 ms	
480412	PSTN detection time for silent period after ringback tone detected (HIGH)	20 ms	
480413	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480414	PSTN busy tone frequency upper limit (low byte)		
480415	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480416	PSTN busy tone frequency lower limit (low byte)		
480417	PABX dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480418	PABX dial tone frequency upper limit (low byte)		
480419	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
48041A	PABX dial tone frequency lower limit (low byte)		

NCU PARAMETERS

Address	Function	Unit	Remarks
48041B	PABX dial tone detection time	20 ms	If 48041B contains FF, the machine pauses for the pause time (480420 / 480421).
48041C	PABX dial tone reset time (LOW)		
48041D	PABX dial tone reset time (HIGH)		
48041E	PABX dial tone continuous tone time		
48041F	PABX dial tone permissible drop time		
480420	PABX wait interval (HIGH)		
480421	PABX wait interval (LOW)		
480422	PABX ringback tone detection time	20 ms	Detection is disabled if this contains FF.
480423	PABX ringback tone off detection time	20 ms	
480424	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	
480425	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	
480426	PABX busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480427	PABX busy tone frequency upper limit (low byte)		
480428	PABX busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480429	PABX busy tone frequency lower limit (low byte)		
48042A	Busy tone ON time: range 1	20 ms	
48042B	Busy tone OFF time: range 1		
48042C	Busy tone ON time: range 2		
48042D	Busy tone OFF time: range 2		
48042E	Busy tone ON time: range 3		
48042F	Busy tone OFF time: range 3		
480430	Busy tone ON time: range 4		
480431	Busy tone OFF time: range 4		
480432	Busy tone continuous tone detection time		
480433	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Bits 7, 6, 5, 4 - number of cycles required for cadence detection Bits 3 and 2 - Not used. Keep these bits at 0. Bits 1 and 0 - Tolerance (±) Bit 1 0 0 0 75% 0 1 50% 1 0 25% 1 1 12.5%		

Address	Function	Unit	Remarks
480434	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480435	International dial tone frequency upper limit (low byte)		
480436	International dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480437	International dial tone frequency lower limit (low byte)		
480438	International dial tone detection time	20 ms	If 480438 contains FF, the machine pauses for the pause time (48043D / 48043E). See Note 2 (Belgium).
480439	International dial tone reset time (LOW)		
48043A	International dial tone reset time (HIGH)		
48043B	International dial tone continuous tone time		
48043C	International dial tone permissible drop time		
48043D	International dial wait interval (HIGH)		
48043E	International dial wait interval (LOW)		
48043F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480440	Country dial tone upper frequency limit (LOW)		
480441	Country dial tone lower frequency limit (HIGH)		If both addresses contain FF(F), tone detection is disabled.
480442	Country dial tone lower frequency limit (LOW)		
480443	Country dial tone detection time	20 ms	If 480443 contains FF, the machine pauses for the pause time (480448 / 480449).
480444	Country dial tone reset time (LOW)		
480445	Country dial tone reset time (HIGH)		
480446	Country dial tone continuous tone time		
480447	Country dial tone permissible drop time		
480448	Country dial wait interval (LOW)		
480449	Country dial wait interval (HIGH)		
48044A	Time between opening or closing the DO relay and opening the OHDI relay	1 ms	See Notes 3 and 6. Function 06-2 (parameter 11).
48044B	Break time for pulse dialling	1 ms	See Note 3. Function 06-2 (parameter 12).
48044C	Make time for pulse dialling	1 ms	See Note 3. Function 06-2 (parameter 13).
48044D	Time between final OHDI relay closure and DO relay opening or closing	1 ms	See Notes 6. Function 06-2 (parameter 14).

NCU PARAMETERS

Address	Function	Unit	Remarks
48044E	Minimum pause between dialled digits (pulse dial mode)	20 ms	See Note 3. Function 06-2 (parameter 15).
48044F	Time waited when a pause is entered at the operation panel		Function 06-2 (parameter 16).
480450	DTMF tone on time	1 ms	Function 06-2 (parameter 17).
480451	DTMF tone off time		Function 06-2 (parameter 18).
480452	Tone attenuation level of DTMF signals while dialing	-dBm x 0.5	Function 06-2 (parameter 19). See Note 5.
480453	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-Nx0.5 (dB)	Function 06-2 (parameter 20). See Note 5.
480454	PSTN: DTMF tone attenuation level after dialling	-dBm x 0.5	Function 06-2 (parameter 21). See Note 5.
480455	ISDN: DTMF tone attenuation level after dialling	-dBm x 0.5	See Note 5
480456	Not used		Do not change the setting.
480457	Not used		Do not change the setting.
480458	Not used		Do not change the setting.
480459	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
48045A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
48045B	International dial access code (High)	BCD	For a code of 100: 48045B - F1 48045C - 00
48045C	International dial access code (Low)		
48045D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. Up to 7 of these can be input. If this address contains FF[H], the pause time stored in address 48044F is used.
48045E	Bits 7 to 5 - Progress tone detection level Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 1 0 0 -40.0 1 1 0 -49.0 Bits 4 and 3 - Not used Bit 2 - International dial tone detection method 0: Detect by time parameters 1: Detect by cadence parameters (Belgium - See Note 3) Bit 1 - Not used Bit 0 - PSTN dial tone detection method 0: Detect by time parameters 1: Detect by cadence parameters (Italy - See Note 3)		

Address	Function	Unit	Remarks
48045F	Bit 7 and 6 - Not used Bit 5 1: Polarity detection enabled for rx (detection time = 500 ms) Bit 4 1: Polarity detection enabled for tx (detection time = 500 ms) Bits 3 to 0 - Not used		
480460	Not used		Do not change the setting.
480461	Not used		Do not change the setting.
480462	Not used		Do not change the setting.
480463	Not used		Do not change the setting.
480464	Not used		Do not change the setting.
480465	Intercity dial prefix (HIGH)	BCD	For a code of 0: 480465 - FF 480466 - F0
480466	Intercity dial prefix (LOW)	BCD	
480467 to 480471	Not used		Do not change the settings.
480472	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 06-2 (parameter 02).
480473	Acceptable ringing signal frequency: range 1, lower limit		Function 06-2 (parameter 03).
480474	Acceptable ringing signal frequency: range 2, upper limit		Function 06-2 (parameter 04).
480475	Acceptable ringing signal frequency: range 2, lower limit		Function 06-2 (parameter 05).
480476	Number or rings until a call is detected	1	Function 06-2 (parameter 06).
480477	Minimum required length of the first ring	20 ms	See Note 4. Function 06-2 (parameter 07).
480478	Minimum required length of the second and subsequent rings	20 ms	Function 06-2 (parameter 06-2).
480479	Ringing signal detection reset time (LOW)	20 ms	Function 06-2 (parameter 09).
48047A	Ringing signal detection reset time (HIGH)		Function 06-2 (parameter 10).
48047B to 480480	Not used		Do not change the settings.
480481	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms

NCU PARAMETERS

Address	Function	Unit	Remarks
480482	Bits 0 and 1 - Handset off-hook detection time Bit 1 0 Setting 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time Bit 3 2 Setting 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
480483 to 4804A0	Not used		Do not change the settings.
4804A1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A2	Acceptable CED detection frequency upper limit (low byte)		
4804A3	Acceptable CED detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A4	Acceptable CED detection frequency lower limit (low byte)		
4804A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
4804A6	Acceptable CNG detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A7	Acceptable CNG detection frequency upper limit (low byte)		
4804A8	Acceptable CNG detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A9	Acceptable CNG detection frequency lower limit (low byte)		
4804AA	CNG detection time	20 ms ± 20 ms	Factory setting: 200 ms
4804AB	CNG on time	20 ms	Factory setting: 500 ms
4804AC	CNG off time	20 ms	Factory setting: 200 ms
4804AD	CNG On/Off time tolerance, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Bits 7, 6, 5, 4 - number of cycles required for cadence detection Bits 3 and 2 - Not used. Keep these bit at 0. Bits 1 and 0 - Tolerance (±) Bit 1 0 ON time tolerance OFF time tolerance 0 0 150% 75% 0 1 100% 50% 1 0 50% 25% 1 1 25% 12.5%		
4804AE	Not used		Do not change the settings.

Address	Function	Unit	Remarks
4804AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
4804B0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		If both addresses contain FF(F), tone detection is disabled.
4804B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(F), tone detection is disabled.
4804B2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		If both addresses contain FF(F), tone detection is disabled.
4804B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
4804B4	PSTN: Tx level from the modem	- dBm	Function 06-2 (parameter 01).
4804B5	PSTN: 1100 Hz tone transmission level	- N 4804B4 - 0.5N 4804B5 (dB)	
4804B6	PSTN: 2100 Hz tone transmission level	- N 4804B4 - 0.5N 4804B6 (dB)	
4804B7	PABX: Tx level from the modem	- dBm	
4804B8	PABX: 1100 Hz tone transmission level	- N 4804B7 - 0.5N 4804B8 (dB)	
4804B9	PABX: 2100 Hz tone transmission level	- N 4804B7 - 0.5N 4804B9 (dB)	
4804BA	ISDN: Tx level from the modem	- dBm	The setting must be between -12dBm and -15dBm.
4804BB	ISDN: 1100 Hz tone transmission level	- N 4804BA - 0.5N 4804BB (dB)	
4804BC	ISDN: 2100 Hz tone transmission level	- N 4804BA - 0.5N 4804BC (dB)	
4804BD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	N must be between 0 (00(H)) to 31 (1F(H)). Modem turn-off level is automatically set at -3dBm from the turn-on level.
4804BE to 4804D9	Not used		Do not change the settings.
4804DA	T.30 T1 timer	1 s	

Notes

1. If a setting is not required, store FF in the address.
2. Italy and Belgium only

RAM address 48045E: the lower four bits have the following meaning.

Bit 2 1: International dial tone cadence detection enabled (Belgium)

Bit 1 Not used

Bit 0 1: PSTN dial tone cadence detection enabled (Italy)

If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.

480408 (if bit 0 = 1) or 480438 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 480433.

48040B (if bit 0 = 1) or 48043B (if bit 2 = 1): on time, hex code (unit = 20 ms)

48040C (if bit 0 = 1) or 48043C (if bit 2 = 1): off time, hex code (unit = 20 ms)

3. Pulse dial parameters (addresses 48044A to 48044F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
The attenuation levels calculated from RAM data are:
High frequency tone: $-0.5 \times N_{480452/480454}$ dBm
Low frequency tone: $-0.5 \times (N_{480452/480454} + N_{480453})$ dBm
Note: N_{480452} , for example, means the value stored in address 480452(H)
6. 48044A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
48044D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing

4. DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has four bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

The programming procedure will be explained first. Then, the four bytes will be described.

4.1 PROGRAMMING PROCEDURE

1. Make sure the machine is in 'Facsimile' mode. Press 'User Tools' key then choose 'Fax'.
2. Press '1', then either choose 'Registering Quick Dial' or 'Registering Speed Dial'.

Example: Change the Parameters in Quick Dial 10.

4. Press Quick Dial key 10.

Note: The selected Quick or Speed Dial must be programmed beforehand.

5. When the programmed dial number is displayed, press the letters S - V - C using Quick Dial keys, then press 'Start'.
6. The settings for byte 0 are now displayed. Press a number from 0 to 7 corresponding to the bit that you wish to change.

Example: Change bit 7 to 1: Press 7

7. To scroll through the parameter bytes, either:
Select the next byte: press '↓ Switch'
or
Select the previous byte: press '↑ Switch'
until the correct byte is displayed. Then go back to step 6.
8. After the setting is changed, press OK.
9. To finish, press 'User Tools'.

4.2 PARAMETERS

The initial settings of the following parameters are all FF(H) - all the parameters are disabled.

Switch 01	
FUNCTION AND COMMENTS	
CCITT T1 time (for PSTN G3 mode) If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. Range: 1 to 127 seconds (01h to 7Fh) 00h or FFh - The local NCU parameter factory setting is used. Do not program a value between 80h and FEh.	

Switch 02		
	FUNCTION	COMMENTS
0 to 4	Tx level	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. When disabled, the NCU parameter 01 setting is used. Note: Do not use settings other than listed on the left.
	Bit 4 3 2 1 0 Setting	
	0 0 0 0 0 0	
	0 0 0 0 1 -1	
	0 0 0 1 0 -2	
	0 0 0 1 1 -3	
	0 0 1 0 0 -4	
	:	
	:	
	0 1 1 1 1 -15	
	1 1 1 1 1 Disabled	
5 to 7	Cable equalizer	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. Note: Do not use settings other than listed on the left.
	Bit 7 6 5 Setting	
	0 0 0 None	
	0 0 1 Low	
	0 1 0 Medium	
	0 1 1 High	
	1 1 1 Disabled	

Switch 03						
	FUNCTION					COMMENTS
0 to 3	Initial Tx modem rate					If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. Note: Do not use settings other than listed on the left.
	Bit 3	2	1	0	Setting (bps)	
	0	0	0	0	Not used	
	0	0	0	1	2,400	
	0	0	1	0	4,800	
	0	0	1	1	7,200	
	0	1	0	0	9,600	
	0	1	0	1	12,000	
	0	1	1	0	14,400	
	1	1	1	1	Disabled	
Other settings: Not used						
4 to 7	Not used					Do not change the settings.

Switch 04																	
	FUNCTION	COMMENTS															
0 1	Inch-mm conversion before tx <table> <tr> <th>Bit 1</th><th>Bit 0</th><th>Setting</th></tr> <tr><td>0</td><td>0</td><td>Inch-mm conversion available</td></tr> <tr><td>0</td><td>1</td><td>Inch only</td></tr> <tr><td>1</td><td>0</td><td>Not used</td></tr> <tr><td>1</td><td>1</td><td>Disabled</td></tr> </table>	Bit 1	Bit 0	Setting	0	0	Inch-mm conversion available	0	1	Inch only	1	0	Not used	1	1	Disabled	The machine uses inch-based resolutions for scanning. If "inch only" is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions.
Bit 1	Bit 0	Setting															
0	0	Inch-mm conversion available															
0	1	Inch only															
1	0	Not used															
1	1	Disabled															
2 3	DIS/NSF detection method <table> <tr> <th>Bit 3</th><th>Bit 2</th><th>Setting</th></tr> <tr><td>0</td><td>0</td><td>First DIS or NSF</td></tr> <tr><td>0</td><td>1</td><td>Second DIS or NSF</td></tr> <tr><td>1</td><td>0</td><td>Not used</td></tr> <tr><td>1</td><td>1</td><td>Disabled</td></tr> </table>	Bit 3	Bit 2	Setting	0	0	First DIS or NSF	0	1	Second DIS or NSF	1	0	Not used	1	1	Disabled	(0, 1): Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS.
Bit 3	Bit 2	Setting															
0	0	First DIS or NSF															
0	1	Second DIS or NSF															
1	0	Not used															
1	1	Disabled															
4	Not used	Do not change the settings.															
5	Compression modes available in transmit mode 0: MH only 1: All available compression modes	This bit determines the capabilities that are informed to the other terminal during transmission.															
6 7	ECM during transmission <table> <tr> <th>Bit 7</th><th>Bit 6</th><th>Setting</th></tr> <tr><td>0</td><td>0</td><td>Disabled</td></tr> <tr><td>0</td><td>1</td><td>Enabled</td></tr> <tr><td>1</td><td>0</td><td>Not used</td></tr> <tr><td>1</td><td>1</td><td>Disabled</td></tr> </table>	Bit 7	Bit 6	Setting	0	0	Disabled	0	1	Enabled	1	0	Not used	1	1	Disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting.
Bit 7	Bit 6	Setting															
0	0	Disabled															
0	1	Enabled															
1	0	Not used															
1	1	Disabled															

DEDICATED TRANSMISSION PARAMETERS

Switch 05 - Optional ISDN G4 kit required							
	FUNCTION						COMMENTS
0 to 3	Data rate						When disabled, the G4 parameter switch 2 (bits 0 and 1) setting is used.
	Bits	3	2	1	0	Setting	
		0	0	0	0	64 kbps	
		0	0	0	1	56 kbps	
		1	1	1	1	Disabled	
4 to 7	Not used						Do not change the settings.

Switch 06 - Optional ISDN G4 kit required							
	FUNCTION					COMMENTS	
0 to 3	Link Modules					When disabled, the G4 parameter switch 3 (bit 0) setting is used.	
	Bits	3	2	1	0		Setting
		0	0	0	0		Modulo 8
		0	0	0	1		Modulo 128
		1	1	1	1		Disabled
4 to 7	Not used					Do not change the settings.	

Switch 07 - Optional ISDN G4 kit required						
	FUNCTION					COMMENTS
0	Layer 3 protocol					When disabled, the G4 parameter switch 6 (bit 0) setting is used.
to	Bits	3	2	1	0	
3		0	0	0	0	
		0	0	0	1	
		1	1	1	1	
						Setting
						ISO 8208
						T.70 NULL
						Disabled
4	Packet modules					When disabled, the G4 parameter switch 6 (bit 4) setting is used.
to	Bits	3	2	1	0	
7		0	0	0	0	
		0	0	0	1	
		1	1	1	1	
						Setting
						Modulo 9
						Modulo 128
						Disabled

Switch 08 - Not used

5. SERVICE RAM ADDRESSES

CAUTION

Do not change the settings which are marked as “Not used” or “Read only.”

004000 to 004011(H) - ROM part number and suffix (ASCII)

004017 to 00402A(H) - ROM version and release date (ASCII)

348604 to 34A223(H) - Dedicated tx parameters for Speed Dial #100 - #999, when a Function Upgrade Card is used.

As explained in Dedicated Transmission parameters in section 4, each set of dedicated tx parameters consists of 8 bytes.

348604 to 34860B(H) - Dedicated tx parameters for Speed #100

34860C to 348613(H) - Dedicated tx parameters for Speed #101

348614 to 34861B(H) - Dedicated tx parameters for Speed #102



34A21C to 34A223(H) - Dedicated tx parameters for Speed #999

480001 to 480004(H) - ROM version (Read only)

480001(H) - Revision number (BCD)

480002(H) - Year (BCD)

480003(H) - Month (BCD)

480004(H) - Day (BCD)

480006 to 480015(H) - Machine's serial number (16 digits - ASCII)

480018(H) - Total program checksum (low)

480019(H) - Total program checksum (high)

48001A(H) - Boot program checksum (low)

48001B(H) - Boot program checksum (high)

48001C(H) - Main program checksum (low)

48001D(H) - Main program checksum (high)

480020 to 48003F(H) - System bit switches

480040 to 48004F(H) - Scanner bit switches

480050 to 48005F(H) - Printer bit switches

480060 to 48007F(H) - Communication bit switches

480080 to 48008F(H) - G3 bit switches

SERVICE RAM ADDRESSES

4800A0(H) - User parameter switch 00 (SWUER_00)

Bit 0: Stamp home position 0: Disabled, 1: Enabled

Bits 1 to 3: Scanning contrast home position

Bit	3	2	1	Setting
	0	0	0	Automatic
	0	0	1	Position 1 (Lightest)
	0	1	0	Position 2
	0	1	1	Position 3
	1	0	0	Position 4 (Medium)
	1	0	1	Position 5
	1	1	0	Position 6
	1	1	1	Position 7 (Darkest)

Bits 4 and 5: Scanning resolution home position

Bit	5	4	Setting
	0	0	Standard
	0	1	Detail
	1	0	Superfine
	1	1	Superfine

Bit 6: Transmission mode home position 0: Memory tx, 1: Immediate tx

Bit 7: Not used

4800A1(H) - User parameter switch 01 (SWUSR_01)

Bit 0: Label insertion home position 0: Disabled, 1: Enabled

Bit 1: ID transmission home position 0: Disabled, 1: Enabled

Bit 2: Automatic reduction (tx) home position 0: Disabled, 1: Enabled

Bits 3 and 4: Scanning mode LED home position

Bit	4	3	Setting
	0	0	Text
	0	1	Text/ Photo
	1	0	Photo
	1	1	Photo

Bit 5: TTI print home position 0: Disabled, 1: Enabled

Bit 6: Not used

Bit 7: Settings return to home position after scanning 0: Disabled, 1: Enabled

4800A2(H) - User parameter switch 02 (SWUSR_02)

Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled

Bit 1: Center mark printing on received copies 0: Disabled, 1: Enabled

Bit 2: Reception time printing 0: Disabled, 1: Enabled

Bit 3: TSI print on received messages 0: Disabled, 1: Enabled

Bit 4: Checkered mark printing 0: Disabled, 1: Enabled

Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled

Bit 6: TID printing (G4) 0: Disabled, 1: Enabled

Bit 7: Not used

4800A3(H) - User parameter switch 03 (SWUSR_03: Automatic report printout)

Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On

Bit 1: Not used

Bit 2: Memory storage report 0: Off, 1: On

Bit 3: Polling reserve report (polling reception) 0: Off, 1: On

Bit 4: Polling result report (polling reception) 0: Off, 1: On

Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On

Bit 6: Polling clear report 0: Off, 1: On

Bit 7: TCR (Journal) 0: Off, 1: On

4800A4(H) - User parameter switch 04 (SWUSR_04: Automatic report printout)

Bit 0: Automatic confidential reception report output 0: Off, 1: On

Bits 1 to 6: Not used

Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

4800A5(H) - User parameter switch 05 (SWUSR_05)

Bit 0: Substitute reception when the base copier is in SC condition 0: Off, 1: On

Bits 1 and 2: Condition for substitute rx when the machine cannot print messages (Paper end, Toner end, and Jam in 3.5W energy saver mode)

Bit	2	1	Setting
	0	0	The machine receives all the fax messages
	0	1	The machine receives the fax messages with RTI or CSI
	1	0	The machine receives the fax messages with the same ID code
	1	1	The machine does not receive anything.

Bit 3: Not used

Bit 4: Restricted Access using personal code 0: Off, 1: On

Bits 5 to 7: Not used

4800A6(H) - User parameter switch 06 (SWUSR_06)

Bit 0: Not used

Bit 1: G3/G4 LED home position 0: G3, 1: G4

Bit 2 to 7: Not used

4800A7(H) - User parameter switch 07 (SWUSR_07)

Bits 0 and 1: Not used

Bit 2: Parallel memory transmission 0: Off, 1: On

Bits 3 and 7: Not used

4800A8(H) - User parameter switch 08 (SWUSR_08)

Bit 0 and 1: Not used.

Bit 2: Authorized reception

0: Only faxes from senders whose RTIs/CSIs are specified for this feature are accepted.

1: Only faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.

Bits 3 to 7: Not used.

4800A9(H) - User parameter switch 09 (SWUSR_09)

Bits 0 to 7: Not used

4800AA(H) - User parameter switch 10 (SWUSR_0A)

Bit 0: Not used

Bit 1: 2 into 1 0: Off, 1: On

Bit 2: Not used

Bit 3: Page reduction 0: Off, 1: On

Bits 4 to 7: Not used

4800AB(H) - User parameter switch 11 (SWUSR_0B)

Bit 0: Not used

Bit 1: Method of transmitting numbers after the "Tone" mark over an ISDN line

0: UUI, 1: Tone

Bits 2 to 5: Not used

Bit 6: Printout of messages received while acting as a forwarding station 0: Off, 1: On

Bit 7: Polling Standby duration 0: Once, 1: No limit

SERVICE RAM ADDRESSES

4800AC(H) - User parameter switch 12 (SWUSR_0C)

Bits 0 and 2: Not used

Bits 3 and 4: Printout image density (Fax mode)

Bit	4	3	Setting
	0	0	Normal
	0	1	Lighten
	1	0	Darken
	1	1	Not used

Bits 5 to 7: Not used

4800AD(H) - PSTN access method (SWUSR_0D)

Bits 0 and 1: PSTN access method from behind a PABX

Bit	1	0	Setting
	0	0	PSTN
	0	1	Loop start
	1	0	Ground start
	1	1	Flash start

Bits 2 to 7: Not used

4800AE(H) - Function settings (SWUSR_0E)

Bit 0: Message printout while the machine is in Night Timer mode 0: On, 1: Off

Bit 1: Long original feed mode 0: Off, 1: On

Bit 2: Batch transmission 0: Off, 1: On

Bits 3 to 6: Not used

Bit 7: Manual service call (system parameter list tx) 0: Off, 1: On

4800AF(H) - Function settings (SWUSR_0F)

Bits 0, 1 and 2: Cassette for fax printout

Bit	2	1	0	Setting
	0	0	1	1st paper feed station
	0	1	0	2nd paper feed station
	0	1	1	3rd paper feed station
	1	0	0	4th paper feed station

Other settings Not used

Bits 3 and 4: Not used

Bit 5: Using the cassette specified by bits 0, 1 and 2 above only 0: On, 1: Off

Bits 6 and 7: Not used

4800B8(H) - Function settings (SWUSR_18)

Bits 0 and 1: File retention time

Bit	1	0	Setting
	0	0	Disabled
	0	1	24 hours
	1	0	Disabled
	1	1	72 hours

Bits 2 to 7: Not used

4800B9(H) - Function settings (SWUSR_19)

Bits 0 to 3: Not used

Bit 4: RDS operation 0: Not acceptable

1: Acceptable for the limit specified by system switch 03

Note: This bit is only effective when RDS operation can be selectable by user.

Bits 5 and 6: Not used

Bit 7: Daylight saving time 0: Disabled, 1: Enabled

4800BA(H) - Function settings (SWUSR_1A)

Bit 0: Not used

Bit 1: Dialing type

0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing

Bits 2 to 7: Not used

4800BB(H) - PSTN access number from behind PABX (SWUSR_1B)

Access number Hex value to program (BCD)

0 F0

↓ ↓

0 F0

00 00

↓ ↓

99 99

4800C0 to 4800CF(H) - G4 Parameter Switches

(Refer to the ISDN G4 option service manual for details.)

4800D0 to 4800EF(H) - G4 Internal Switches

(Refer to the ISDN G4 option service manual for details.)

4800F0 to 480103(H) - RTI (Max. 20 characters - ASCII) - See the following note.**480104 to 480117(H) - CSI (Max. 20 characters - ASCII)****480118 to 800137(H) - TTI (Max. 32 characters - ASCII) - See the following note.****480138(H) - Number of CSI characters (Hex)**

Note: If the number of characters are less than the maximum (20 for RTI, 32 for TTI), add a stop code (FF[H]) after the last character.

480139 to 480147(H) - Service station's fax number (Service mode 09)

See 48018F(H) for the type of network used for this number.

480157 to 480165(H) - Own fax number (PSTN)**480166 to 480174(H) - Own fax number (ISDN G4)****480175 to 480183(H) - Own fax number (ISDN G3)****480184(H) - ID code (low - Hex)****480185(H) - ID code (high - Hex)****480186(H) - Confidential ID (low - BCD)****480187(H) - Confidential ID (high - BCD)****480188(H) - Memory lock ID (low - Hex)****480189(H) - Memory lock ID (high - Hex)****48018F(H) - Network type used for the service station number**

00(H) - G3 (PSTN)

01(H) - G4 (ISDN)

480198 to 48019F(H) - Last power off time (Read only)

480198(H) - 01(H) - 24-hour clock, 00(H) - 12-hour clock (AM), 02(H) - 12-hour clock (PM)

480199(H) - Year (BCD)

48019A(H) - Month (BCD)

48019B(H) - Day (BCD)

48019C(H) - Hour

48019D(H) - Minute

48019E(H) - Second

48019F(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

SERVICE RAM ADDRESSES

4801AC(H) - Optional equipment (Read only)

Bit 0: Page memory card	0: Not installed, 1: Installed
Bit 1: SAF memory card 2M	0: Not installed, 1: Installed
Bit 2: SAF memory card 4M	0: Not installed, 1: Installed
Bit 3: Not used	
Bit 4: Hard disk	0: Not installed, 1: Installed
Bit 5: Function upgrade card	0: Not installed, 1: Installed
Bit 6: ISDN unit	0: Not installed, 1: Installed
Bit 7: Not used	

4801C0 to 4801C2(H) - Tx counter

Address	High	Low
4801C0(H)	Tens digit	Unit digit
4801C1(H)	Thousands digit	Hundreds digit
4801C2(H)	Hundred thousands digit	Ten thousands digit

4801C4 to 4801C6(H) - Rx counter (the format is the same as for the tx counter)

4802AE to 4802C5(H) - G4 terminal ID (ASCII - Max. 24 characters)

4802C6 to 4802D9(H) - ISDN G3 CSI (ASCII - Max. 20 digits)

4802DA(H) - Number of digits programmed in the ISDN G3 CSI (Hex)

4802DB to 4802DE(H) - ISDN IP

4802DF to 4802E2(H) - ISDN G3 sub-address

4802E3 to 4802E6(H) - ISDN G4 sub-address

4802E7 to 4802EB(H) - CiG4 board ROM information

4802E7(H) - Suffix
4802E8(H) - Version (BCD)
4802E9(H) - Year (BCD)
4802EA(H) - Month (BCD)
4802EB(H) - Day (BCD)

480300(H) - Number of copies for multi-sort document reception

480356(H) - Time for economy transmission (hour in 24h clock format - BCD)

480357(H) - Time for economy transmission (minute - BCD)

480372(H) - Transmission monitor volume 00 - 07(H)

480373(H) - Reception monitor volume 00 - 07(H)

480374(H) - On-hook monitor volume 00 - 07(H)

480375(H) - Dialing monitor volume 00 - 07(H)

480376(H) - Buzzer volume 00 - 07(H)

480379 to 48037D(H) - Periodic service call parameters (Refer to section 2.1.2 for details)

480383 to 480385(H) - Effective term of automatic service calls (Refer to section 2.1.4 for details)

480400 to 4804DA(H) - NCU parameters (Refer to section 4.3 for details)

492D00 to 4931DF(H) - Dedicated tx parameters for Quick Dial 01 - 56 and Speed Dial #00 - #99.

As explained in section 4.4, each set of dedicated tx parameters consists of 8 bytes.

492D00 to 492D07(H) - Dedicated tx parameters for Quick 01

492D08 to 492D0F(H) - Dedicated tx parameters for Quick 02

492D10 to 492D17(H) - Dedicated tx parameters for Quick 03

↓

492EB8 to 492EBF(H) - Dedicated tx parameters for Quick 56

492EC0 to 492EC7(H) - Dedicated tx parameters for Speed #00

492EC8 to 492ECFH(H) - Dedicated tx parameters for Speed #01

492ED0 to 492ED7(H) - Dedicated tx parameters for Speed #03

↓

4931D8 to 4931DF(H) - Dedicated tx parameters for Speed #99

49B9F6 to 49BB75(H) - Latest 64 error codes (Read only)

One error record consists of 6 bytes of data.

First error record start address - 49B9F6(H)

Second error record start address - 49B9FC(H)

Third error record start address - 49BA02(H)

: : :

64th error record start address - 49BB70(H)

The format is as follows:

1st byte - Minute (BCD)

2nd byte - Hour (BCD)

3rd byte - Day (BCD)

4th byte - Month (BCD)

5th byte - Error code (low) [If the error code is 1-23, 23 is stored here.]

6th byte - Error code (high) [If the error code is 1-23, 01 is stored here.]

49E976 to 49F055(H) - Latest 20 error communication records (Read only)

One error communication record consists of 88 bytes. The format is as follows:

1st byte - Header

Bit 0: Communication result 0: OK, 1: NG

Bit 1: Document jam 1: Occurred

Bit 2: Power down 1: Occurred

Bit 3: Not used

Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes

Bit 5: Type of technical data 0: Rx level, 1: Measure of error rate

Bit 6: Error report 0: Not printed, 1: Printed

Bit 7: Data validity 0: Not valid, 1: Valid

2nd byte - Not used

3rd to 6th bytes - Date and time when the communication started

3rd byte - Month (BCD)

4th byte - Day (BCD)

5th byte - Hour (BCD)

6th byte - Minute (BCD)

7th and 8th bytes - Communication time

7th byte - Minutes (BCD)

8th byte - Seconds (BCD)

SERVICE RAM ADDRESSES

9th and 10th byte - Number of pages transmitted or received

9th byte - Low byte (Hex)

10th byte - High byte (Hex)

11th and 12th bytes - Personal code or number of total/burst error lines

If bit 4 of the 1st byte is 0:

11th byte - Personal code (low - BCD)

12th byte - Personal code (high - BCD)

If bit 4 of the 1st byte is 1:

11th byte - Number of total error lines (Hex)

12th byte - Number of burst error lines (Hex)

13th byte - File number (low - Hex)

14th byte - File number (high - Hex)

15th and 16th bytes - Rx level or measure of error rate

If bit 5 of the 1st byte is 0:

15th byte - Rx level (low - Hex)

16th byte - Rx level (high - Hex)

If bit 4 of the 1st byte is 1:

15th byte - Measure of error rate (low - Hex)

16th byte - Measure of error rate (high - Hex)

17th byte - Final modem rate

Bits 0 to 2: Final modem speed

$$\begin{pmatrix} \text{Bit0} \\ \text{Bit1} \\ \text{Bit2} \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : 2.4k \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : 4.8k \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} : 7.2k \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} : 9.6k \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} : 12.0k \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} : 14.4k$$

Bit 3: Not used

Bits 4 to 6: Final modem type

$$\begin{pmatrix} \text{Bit4} \\ \text{Bit5} \\ \text{Bit6} \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : V.27ter \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : V.29 \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} : \begin{matrix} V.17 \\ (Long) \end{matrix} \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} : \begin{matrix} V.17 \\ (Short) \end{matrix}$$

Bit 7: Not used

18th to 20th byte - Not used

21st to 44th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

45th byte - Communication mode #1

Bits 0 - 1: Resolution used

$$\begin{pmatrix} \text{Bit0} \\ \text{Bit1} \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} : \text{Standard}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} : \text{Detail}, \begin{pmatrix} 1 \\ 1 \end{pmatrix} : \text{Fine}$$

Bit 2: Communication Protocol 0: G3, 1: G4

Bit 3: ECM 0: Off, 1: On

Bits 4 to 7: Communication mode used

$$\begin{pmatrix} \text{Bit4} \\ \text{Bit5} \\ \text{Bit6} \\ \text{Bit7} \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Normal}, \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Confidential}, \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{Polling}, \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{Transfer}$$

$$\begin{pmatrix} \text{Bit4} \\ \text{Bit5} \\ \text{Bit6} \\ \text{Bit7} \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{Forwarding}, \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \begin{matrix} \text{Automatic} \\ \text{Service Call} \end{matrix}$$

46th byte - Communication mode #2

Bit 0: Tx or Rx 0: Tx, 1: Rx

Bit 1: Reduction in Tx 0: Not reduced, 1: Reduced

Bit 2: Batch transmission 0: Not used, 1: Used

Bit 3: Send later transmission 0: Not used, 1: Used

Bit 4: Transmission from 0: ADF, 1: Memory

Bit 5: Not used

Bits 6 and 7: Network type used

$$\begin{pmatrix} \text{Bit6} \\ \text{Bit7} \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} : \text{PSTN}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} : \text{ISDN}$$

47th byte - Not used

48th byte - Number of errors during communication (Hex)

49th to 52nd byte - 1st error code and page number where the error occurred

49th byte - Page number where the error occurred (low - Hex)

50th byte - Page number where the error occurred (high - Hex)

51th byte - Error code (low - BCD)

52st byte - Error code (high - BCD)

53th to 56th byte - 2nd error code and page number where the error occurred

57th to 60th byte - 3rd error code and page number where the error occurred

61st to 64th byte - 4th error code and page number where the error occurred

65th to 68th byte - 5th error code and page number where the error occurred

69th to 72nd byte - 6th error code and page number where the error occurred

73rd to 76th byte - 7th error code and page number where the error occurred

77th to 80th byte - 8th error code and page number where the error occurred

81st to 84th byte - 9th error code and page number where the error occurred

85th to 88th byte - 10th error code and page number where the error occurred

SERVICE RAM ADDRESSES

49FB64 to 49FB77(H) - SC codes NOT for automatic service call

If the fax unit receives an SC code from the copier engine other than programmed in these addresses, the fax unit sends an automatic service call report to the programmed service station.

Six SC codes have already been programmed at default, as shown in the table below. Four more SC codes can be programmed, if required (If an address contains FF(H), a code is not programmed in it).

Program an SC code in four-digit BCD format as shown in the example below.

Example: SC code '192'

Address (High) - 01(BCD)

Address (Low) - 92 (BCD)

- Default settings -

High Address (H)	Data (BCD)	Low Address (L)	Data (BCD)	SC code
49FB64	01	49FB65	92	192
49FB66	01	49FB67	93	193
49FB68	03	49FB69	90	390
49FB6A	03	49FB6B	93	393
49FB6C	06	49FB6D	91	691
49FB6E	09	49FB6F	80	980
49FB70	FF(H)	49FB71	FF(H)	Hot Programmed
49FB72	FF(H)	49FB73	FF(H)	
49FB74	FF(H)	49FB75	FF(H)	
49FB76	FF(H)	49FB77	FF(H)	

70001E to 700025(H) - Hard disk information

If the data in these addresses do not match the following values after installing an optional hard disk, format the hard disk and check these addresses again.

70001E(H) - 50(H)

70001F(H) - 00(H)

700020(H) - 00(H)

700021(H) - FF(H)

700022(H) - 00(H)

700023(H) - 50(H)

700024(H) - 00(H)

700025(H) - 80(H)

6. SPECIAL TOOLS AND LUBRICANTS

- Flash/SRAM data copy tool (P/N: A193 9353)
- EPROM board (P/N: A193 9351)

Service
Tables

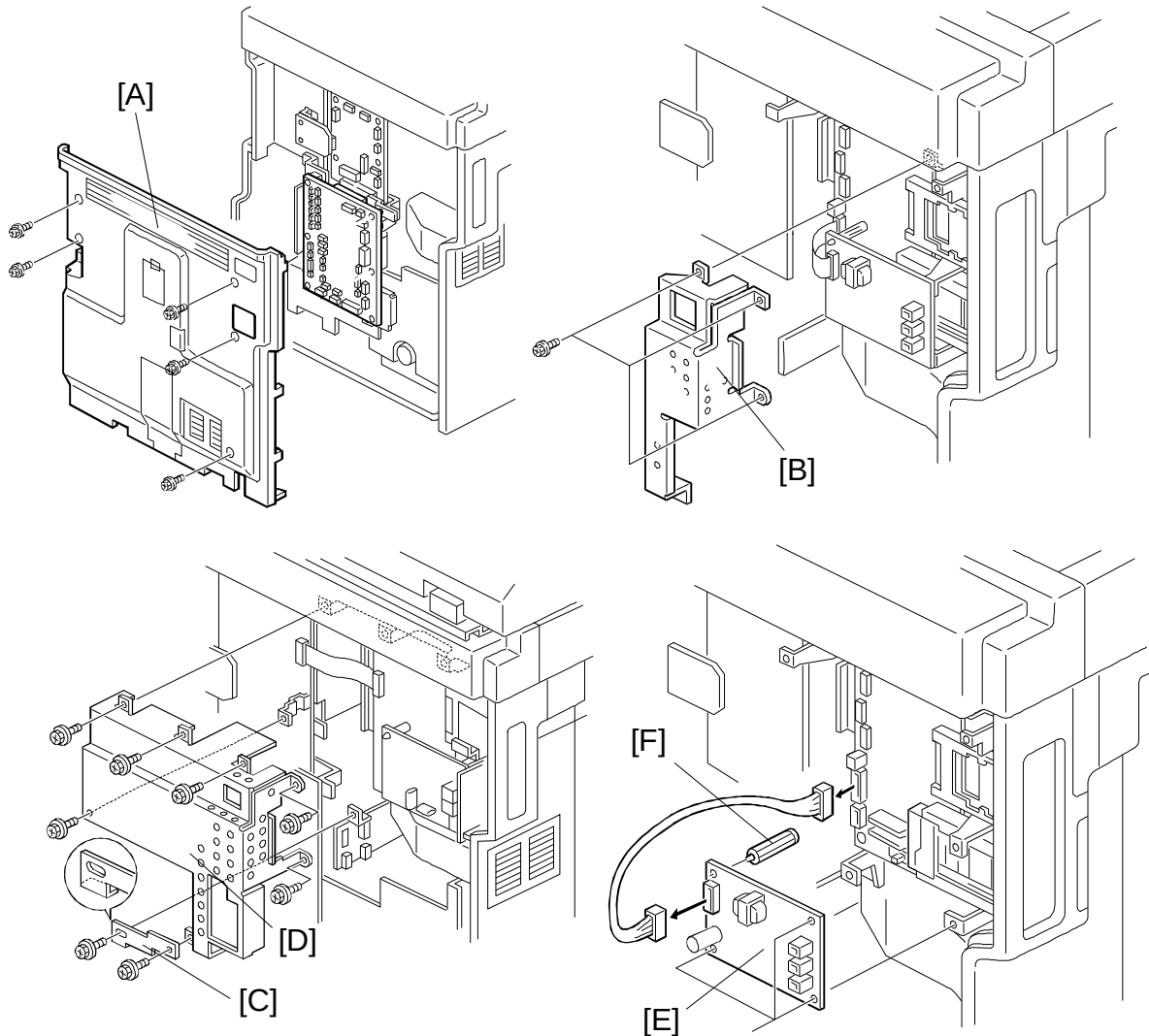
SECTION 5

**REPLACEMENT
AND ADJUSTMENT**

1. PRECAUTION

⚠ CAUTION
Before starting disassembly, be sure to print all message files in the SAF memory. Then, turn off both the main switch and the AC switch disconnect the power cord and telephone cable for safety.
Lithium Battery The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

2. NCU



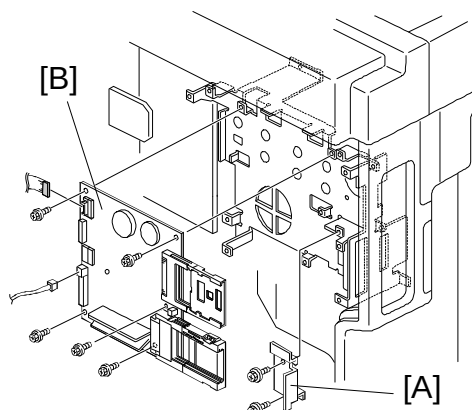
1. Remove the rear cover [A].
2. **[US model]** Remove the bracket [B] (3 screws).
[Europe/Asia model] Remove the brackets [C] (2 screws) and [D] (6 screws).
3. Remove the NCU [E] (3 screws, 1 harness - US; 2 harnesses - Europe/Asia).
4. Remove the spacer shaft [F] from the old NCU, and install it on the new NCU.
5. Install the new NCU (3 screws, 1 harness; US - 2 harnesses), then replace the bracket [B] and the rear cover [A].

3. FCU

CAUTION

If the machine has an optional Function Upgrade Card, change bit 7 of the System Switch 1E to "1" before performing the following procedure. This will prevent the data on the Function Upgrade Card from being erased.

Be sure to put the bit switch back to zero before step 18 below, otherwise the fax unit will not start up without the card installed. If the bit switch can not be changed, do not press "Yes" when the caution is displayed or data will be lost.



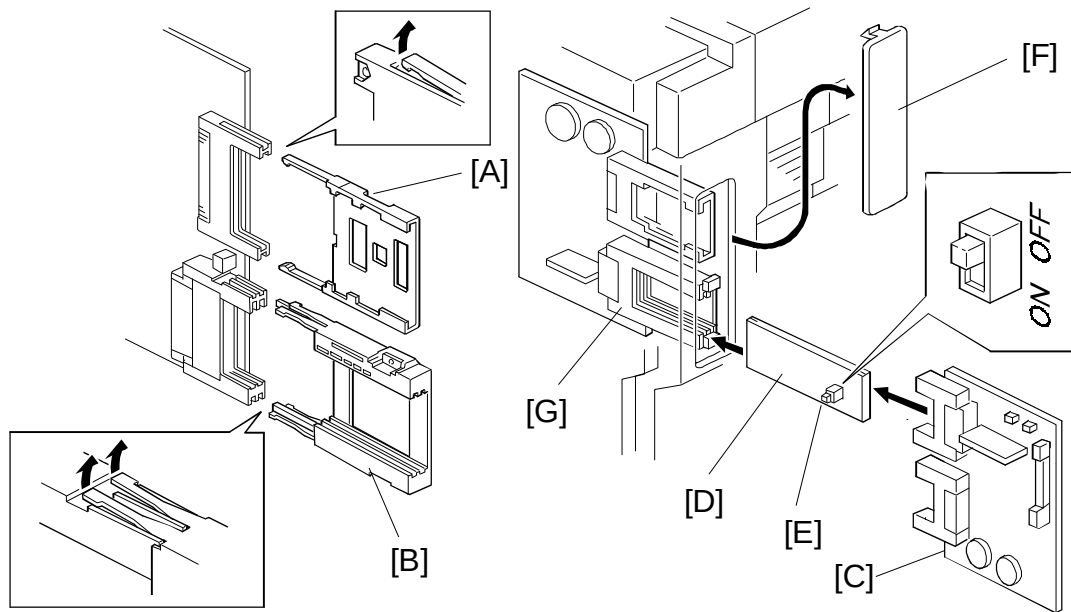
1. Follow steps 1 through 3 in the NCU removal section above.
2. Disconnect the harnesses from CN500, CN505 and CN5110 on the FCU.
3. Remove the bracket [A] (2 screws) and the FCU [B] (5 screws).

NOTE: If optional units, such as IC cards or the Hard Disk, are installed on the old FCU, remove the cards all and install them in the new FCU.

4. Turn on the new FCU's battery switch (SW1) and install it.

NOTE: The FCU's battery switch (SW1) must be turned on at installation. If the switch is not turned on, all data programmed in the SRAM will be erased when the ac switch is turned off or a power failure occurs.

5. Replace the bracket [A] and the NCU.
6. Turn on the ac and main switches. When the caution message ("Functional Problem - SC1201") is displayed, press, "Yes."
7. Turn off the main and ac switches.
8. Turn off the machine's ac switch.



9. Remove the IC card guide rails ([A] and [B]) from the old FCU.
10. Connect the target FCU [C] to the data copy tool [D], and make sure that the switch [E] on the data copy tool [D] is off.
11. Remove the cover [F]. Insert the copy tool [D] in the lower left slot [G].
12. Turn on the machine's ac and main switches, then enter fax service mode.

13. Press **1** **6**

14. Press **2** then **↩**

If the software has been successfully uploaded, the display shows 'OK'.

Otherwise, the display shows 'NG'.

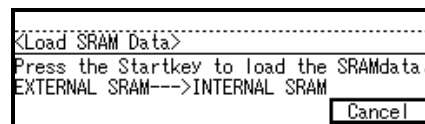
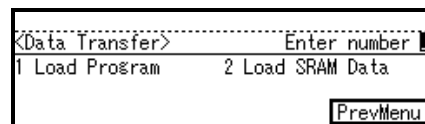
15. Exit the service mode.

16. Turn off the ac and main switches, then disconnect the tools.

NOTE: If the machine had a Function Upgrade Card before uploading the software, be sure to put the card back in the slot before switching on.

17. Turn the machine back on.

18. Print the system parameter list to check if the previous settings have been successfully recovered.



SECTION 6

TROUBLESHOOTING

1. ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that error codes 4-00, 01, 02, and 10 only appear in the error code display and on the service report.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 seconds of Start being pressed	Check the line connection. Check the NCU - FCU connectors. The machine at the other end may be incompatible. Replace the NCU or FCU. Check for DIS/NSF with an oscilloscope. If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	The other party is out of paper or has a jammed printer. The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	Check the line connection. Check the NCU - FCU connectors. Try changing the tx level and/or cable equalizer settings. Replace the FCU or NCU. The other terminal may be faulty; try sending to another machine. If the rx signal is weak or defective, there may be a bad line. Cross reference Tx level - NCU Parameter 01 (PSTN) Cable equalizer - G3 Switch 07 (PSTN) Dedicated Tx parameters - Section 4
0-05	Unsuccessful after modem training at 2400 bps	Check the line connection. Check the NCU - FCU connectors. Try adjusting the tx level and/or cable equalizer. Replace the FCU or NCU. Check for line problems. Cross reference See error code 0-04.
0-06	The other terminal did not reply to DCS	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. The other end may be defective or incompatible; try sending to another machine. Check for line problems. Cross reference See error code 0-04.

Trouble-
shooting

ERROR CODES

Code	Meaning	Suggested Cause/Action
0-07	No post-message response from the other end after a page was sent	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed or run out of paper. The other end user may have disconnected the call. Check for a bad line. The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed, or run out of paper or memory space. Try adjusting the tx level and/or cable equalizer settings. The other end may have a defective modem/NCU/FCU; try sending to another machine. Check for line problems and noise. Cross reference Tx level - NCU Parameter 01 (PSTN) Cable equalizer - G3 Switch 07 (PSTN) Dedicated Tx parameters - Section 4
0-14	Non-standard post message response code received	Check the FCU - NCU connectors. Incompatible or defective remote terminal; try sending to another machine. Noisy line: resend. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. Cross reference See error code 0-08.
0-15	The other end does not have the confidential or transfer function	The other terminal does not have the confidential rx or transfer function, or the other terminal's memory is full.
0-16	CFR or FTT not detected after modem training in confidential or transfer mode	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Try adjusting the tx level and/or cable equalizer settings. The other end may have disconnected, or it may be defective; try calling another machine. If the rx signal level is too low, there may be a line problem. Cross reference See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel or OPU.

Code	Meaning	Suggested Cause/Action
0-20	Facsimile data not received within 6 seconds of retraining	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Check for line problems. Try calling another fax machine. Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. Cross reference Reconstruction time - G3 Switch 0A, bit 6 Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 seconds of the previous EOL signal	Check the connections between the FCU, NCU, & line. Check for line noise or other line problems. Replace the NCU or FCU. The remote machine may be defective or may have disconnected. Cross reference Maximum interval between EOLs and ECM frames - G3 Bit Switch 0A, bit 4
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 0.2 s)	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try adjusting the acceptable modem carrier drop time. Cross reference Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1
0-23	Too many errors during reception	Check the line connection. Check the FCU - NCU connectors. Replace the NCU, FCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try asking the other end to adjust their tx level. Try adjusting the rx cable equalizer setting and/or rx error criteria. Cross reference Rx cable equalizer - G3 Switch 07 (PSTN) Rx error criteria - Communication Switch 02, bits 0 and 1
0-24	Printer failure occurred while the memory was full during non-ECM reception; negative response returned	There is no memory space available, or substitute reception is disabled. Try asking the user to add optional extra memory.
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. The other terminal may not be compatible. Cross reference Dedicated tx parameters - Section 4

ERROR CODES

Code	Meaning	Suggested Cause/Action
0-52	Polarity changed during communication	Check the line connection. Retry communication.
2-10	The modem cannot enter tx mode	Replace the FCU.
2-11	Only one V.21 connection flag was received	Change the FCU.
2-12	Modem clock irregularity	Replace the FCU.
2-20	Abnormal coding/decoding (cpu not ready)	Replace the FCU.
2-50	The machine reset itself	If this is frequent, replace the FCU.
3-00	G4 interface board reset	Replace the G4 interface board or FCU.
3-10	Disconnection during ISDN G3 communication	Check the other terminal and the ISDN line. The other terminal may have dialed a wrong number.
3-11	Disconnection during ISDN G4 communication	Check the other terminal and the ISDN line.
3-20	A CSA signal was received during ISDN G4 communication	The operator at the other terminal may have interrupted the communication.
3-21	A CSA was sent during ISDN G4 communication, because the Stop key was pressed	The local operator has interrupted the communication.
3-30	Mismatched specifications (rx capability)	Check the receive capabilities requested from the other terminal.
4-00	One page took longer than 8 minutes to transmit	Check for a bad line. Try the communication at a lower resolution, or without halftone. Change the FCU.
4-01	Line current was cut	Check the line connector. Check the connection between FCU and NCU. Check for line problems. Replace the FCU or the NCU.
4-02	The other end cut the received page as it was longer than the maximum limit.	Split the page into smaller pieces, or ask the other end to change their maximum receive length setting, then resend.
4-10	Communication failed because of ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	Get the ID Codes the same and/or the CSIs programmed correctly, then resend. The machine at the other end may be defective.
5-00	Data reconstruction not possible	Replace the FCU.
5-10	DCR timer expired	Replace the FCU.
5-20	Storage impossible because of a lack of memory	Temporary memory shortage. Test the SAF memory.
5-21	Memory overflow	Replace the FCU or optional IC card.

Code	Meaning	Suggested Cause/Action
5-22	Mode table overflow after the second page of a scanned document	Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	Test the SAF memory. Ask the other end to resend the message. Replace the FCU or IC memory card.
5-24	Memory overflow after the second page of a scanned document	Try using a lower resolution setting. Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	Replace the FCU, the IC memory card, or the hard disk.
5-30	Mode table for the first page to be printed was not effective	Replace the FCU, the IC memory card, the function upgrade card, or the hard disk.
6-01	G3 ECM - no V.21 signal was received	Try adjusting the rx cable equalizer. Replace the FCU or NCU.
6-02	G3 ECM - EOR was received	
6-03	G3 ECM - non-standard V.21 code received	The other terminal may be defective.
6-04	G3 ECM - RTC not detected	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 seconds of CFR, but there was no line fail	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU or NCU. Try adjusting the rx cable equalizer Cross reference Rx cable equalizer - G3 Switch 07 (PSTN)
6-06	G3 ECM - coding/decoding error	Defective FCU. The other terminal may be defective.
6-08	G3 ECM - PIP/PIN received in reply to PPS.NULL	The other end pressed Stop during communication. The other terminal may be defective.
6-09	G3 ECM - ERR received	Check for a noisy line. Adjust the tx levels of the communicating machines. See code 6-05.
6-10	G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps	Check for line noise. Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). Check the line connection. Defective remote terminal.
6-11	G3 ECM - printing impossible because of a missing first line in the MMR coding	Check for problems in the printer mechanism.

ERROR CODES

Code	Meaning	Suggested Cause/Action
6-21	V.21 flag detected during high speed modem communication	The other terminal may be defective or incompatible.
6-39	V.21 signal not stopped within 6 s	Replace the FCU.
9-30	HDD write error	Turn the main and ac switches off and on, to mark defective sectors as bad and to initialize the hard disk. Initialize the hard disk interface (service mode 08-1). Check the cable connections. Format the hard disk (service mode 08-2). Replace the hard disk interface card. Replace the hard disk.
9-31	HDD control error	
9-32	HDD read error	
9-33	HDD fatal error	Turn the main and ac switches off and on. Replace the hard disk.
9-40	CRC error while receiveing a frame	Check and adjust the host PC's RS232C port settings. Check if a proper cable is used and is connected securely. Check if the application is working correctly. If the problem persists, replace the FCU. Note: The optional RS232C interface may not be available in some countries.
9-41	Command 3rd try failed	
9-42	DCN received unexpectedly	
9-43	Unexpected frame received	
9-44	Response time over	
9-45	Frame transmission error	
21-00	BiCU communication error	Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
21-01	BiCU turned off	Check if the LED (+5V supply) on the BiCU is lit or not. Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
21-02	BiCU handshake error	Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
22-00	Original length exceeded the maximum scannable length	Divide the original into a few pages. Check the resolution used for scanning. Lower the scan resolution if possible. Add optional page memory.
22-01	Memory overflow while receiving	Wait for the files in the queue to be sent. Delete unnecessary files from memory. Transfer the substitute reception files to an another fax machine, if the machine's printer is busy or out of order. Add an optional SAF memory card or hard disk.

2. FAX SC CODES

When the FCU detects a Fax SC Code condition other than SC1201 and SC1701, it resets itself automatically (default setting). This initializes the FCU without erasing files in the SAF memory or resetting the switches.

Note For details on Fax SC Codes 1201 and 1701, refer to the following sections.

If bit 7 of System Switch 1F is changed to “1”, when the FCU detects a Fax SC Code condition, it displays the code on the display and stops working until the fax unit is initialized using one of the following methods:

- Press the “Facsimile” key and make sure the Facsimile LED is on. Then, hold down the “Speed Dial” key for more than 10 s.
- Turn off the main and ac switches and turn them back on.
- Remove the rear cover, and press SW2 on the FCU.

The fax unit cannot make automatic service calls in reaction to a Fax SC Code, because the fax unit cannot make fax communications in SC Code conditions.

2.1 SC1201

When the FCU detects an unrecoverable error in the SRAM, which requires a complete SRAM initialization, the fax unit displays this SC Code and stops. There is no way to recover from this error condition without a complete SRAM initialization (all the user and service programmed data will be erased).

The possible causes are:

- SRAM backup battery defect or SW1 on the FCU is at the “OFF” position
- SRAM or FCU physical defect
- IC card or Data Copy Tool connection was loose

2.2 SC1701

When the FCU detects a serious error in the print timing control signal, the fax unit displays this SC Code and stops.

To recover from this condition, turn the main and ac switches off and on, and check the physical connection between the FCU and BiCU.

If the problem still remains, replace the FCU or BiCU board.

2.3 FAX SC CODE TABLE

SC Code	Description	Suggested Action	When bit 7 of System Switch 1F = 0	When bit 7 of System Switch 1F = 1
1101	Handshake error with BiCU at start-up	Initialize the fax unit. (See the previous page for the initialization procedure)	Automatic reset	SC Code display
1102				
1103				
1111	Command tx/rx error to/from the BiCU			
1112	Base copier's engine was reset			
1120	Interface module error			
1201	Unrecoverable SRAM error	Refer to the previous page for details.	SC Code display	
1203	Software error	Initialize the fax unit. (See the previous page for the initialization procedure)	Automatic reset	
1204				
1205				
1206				
1251				
1252				
1253				
1290				
1301				
1302				
1303				
1304				
1305				
1306				
1307				
1308				
1401	DCMMR timed out	Initialize the fax unit, or replace the FCU.		
1402	DMA4 table creation timed out	Initialize the fax unit. (See the previous page for the initialization procedure)		
1501	Error in Quick Dial data storage area			
1701	FGATE monitor error	Refer to the previous page for details.	SC Code display	

A639 ROM MODIFICATION HISTORY (Fax Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
Version A & B were for the pre-production machines	A1945581 C	1	1st Mass Production	
Corrects the following: - If the G3 Reception(analog port) and the iG3 Transmission (digital port) have a conflict, the LED of the communicating turns on and is locked. - When the operator pick up the handset and dial by using a quick or a speed dial then hang up the handset during dialing, the display always shows "Handset Mode". ① - or - When the handset is hung on and up within 1 second after pressing Start key in the non-memory Tx mode, the display always shows "Handset Mode". ① If the operator performs the transmit operation or presses the Stop key, the display was locked. *If the handset is hung on and up under ① condition, The display is not locked. - When the ringing signal comes when going into the night mode, the machine goes into the night mode and goes back to Ready then the power failure report is printed out. (The file no. and communication mode on JOURNAL are wrong.) - New User Switch for the Forwarding UserSw 0E(SW14) - bit5 : 0 - Off (Default) 1 - On *All received files are forwarded to the transfer address. *On the user parameter list, the following description is not printed. "Forwarding all received files ON/OFF" - In the date input mode, the display shows "24hr format" instead of "12hr format". - The download and upload function from FCU board to FCU board with the feature card do not work.	A1945581 D	1	November '96	
Corrects the following: - When the handset is picked up at detecting of ringing signal, the reception is disconnected and the reception job is rarely remaining internally. In this case, the display is not going to the "Handset Mode" even if the handset is picked up. Or the "line is busy" is displayed at the direct tx by ADF.	A1945581 E	1	December '96	Continued...

Trouble-
shooting

A639 ROM MODIFICATION HISTORY (Fax Section)																													
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION																									
Corrects the following: - In manual tx mode by the handset, the operator presses the Start key and hangs up the handset at the same time. The transmission job is then remaining internally. In this case, neither transmission or reception are available and/or the "Handset mode" is always displayed. This problem can be solved by picking up and hanging up the handset again. - The chain dial function is not used by the on-hook or handset mode. - When the machine stores a letter size original by using image rotation, the compression does not succeed and the job is reset if the original is a complicated image which is scanned in photo mode. - After entering the personal code and going to the fax mode in the personal code transmission mode, if the programmed key (Quick dial) is used, the personal code is not printed on the JOURNAL report. - New Bit Switches are added for some reports. System SW 1F-Bit1 : When the memory over flow or the storing jam occurs, the Memory Storage Report and the Memory Transmission Report are not printed out. 0:OFF(Default)-Print 1:ON-No print User SW 03-Bit2 : Memory Storage Report is printed automatically. 0:OFF(Default) 1:ON-Print System SW 1E-Bit1 : The condition of the erasing the file at full-memory 0:Only a page is erased 1:The file is erased. *The combination of the above bit switches; <table border="1"> <tr> <td>User SW 03:</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr> <td>System SW 1F:</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr> <td>Memory Storage OK</td><td>X</td><td>O</td><td>X</td><td>O</td></tr> <tr> <td>Memory Storage NG</td><td>O</td><td>O</td><td>X</td><td>X</td></tr> <tr> <td>Continuing after the memory full (by SysSW 1E-Bit1)</td><td>O</td><td>O</td><td>X</td><td>X</td></tr> </table> O = Memory Storage Report is printed out.	User SW 03:	OFF	ON	OFF	ON	System SW 1F:	OFF	OFF	ON	ON	Memory Storage OK	X	O	X	O	Memory Storage NG	O	O	X	X	Continuing after the memory full (by SysSW 1E-Bit1)	O	O	X	X	A1945581 E	1	December '96	
User SW 03:	OFF	ON	OFF	ON																									
System SW 1F:	OFF	OFF	ON	ON																									
Memory Storage OK	X	O	X	O																									
Memory Storage NG	O	O	X	X																									
Continuing after the memory full (by SysSW 1E-Bit1)	O	O	X	X																									

A639 ROM MODIFICATION HISTORY (Fax Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
- In the G3or G4 receiving mode, when the memory is full at the first block of any page, a part of the previous page is missing. - Receiving error in G4 mode When it is waiting for RSSP (or RSSN) signal after sending "CONN" signal, the machine displays "communication error" if "DISC" signal comes. - The periodical auto service call function does not work.	A1945581 F	1	March '97	
The Two-in-one Function from HLT to LT size paper is not working. - (New System Switch) When the closed network is enabled and the ID is not programmed, all reception is not available (Specification). The System SW is added to protect this problem. Swsys -1E Bit 4. When the closed network is turned on and the ID is not set: 0: The closed network is not available. 1: Only the transmission is available. - The display of the remote terminal ID at AI redial: Swsys-1E Bit 5 0: RTI/CSI is displayed. 1: Input Fax Number is displayed. - LCT and Tray of the duplex unit are supported. - New HDD is supported. - NEST card option is supported.	A1945581 G	1	May '97	
The received files cannot be printed out from HDD. When a small amount of data (less than 2K Bytes) is received and the communication is finished before the writing job on the HDD is finished, the data is not completed on the HDD.	A1945581 H	1	August '97	

**Trouble-
shooting**

SECTION 7

FAX UNIT TYPE 250

- NEW -

(Machine Code: A804)

SERVICE MANUAL

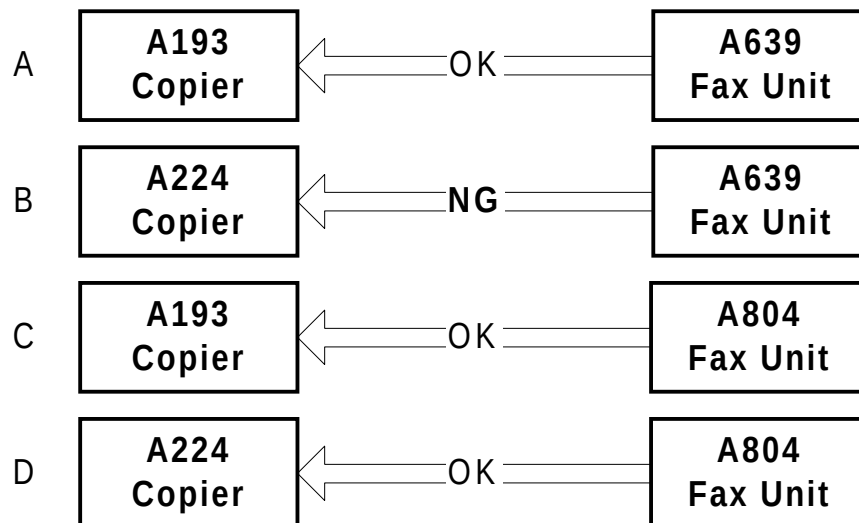
Important Notices
1. There are two types of FAX UNIT TYPE 250. The existing (machine code: A639) is only for the A193 copier, and the new (machine code: A804) is for the A193 and A224 copiers. To prevent the existing type of fax unit from being installed in the A224 copier, carefully check the machine codes of the copier and the fax unit before installation. 2. This manual describes only the differential information between the existing and new FAX UNIT TYPE 250, and information updated since the A639 Fax Unit was released.

1. OVERALL INFORMATION

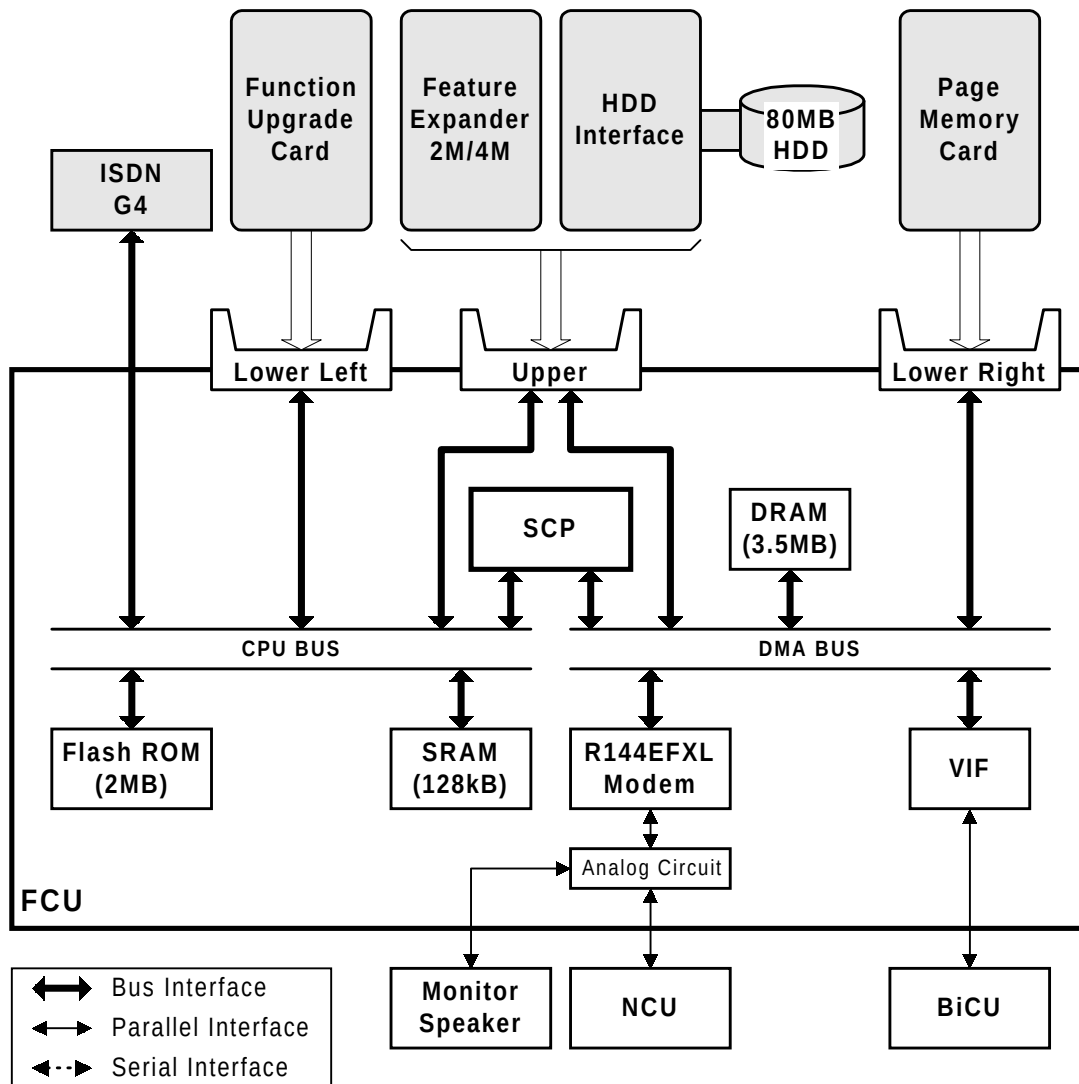
1.1 SPECIFICATIONS

	A639 (Existing Fax Unit)	A804 (New Fax Unit)
Base Copier to be used with	A193 Copier Refer to the diagram below for all possible combinations.	A193 and A224 Copiers
Original Scan Speed	Standard: 1.6 s Detail: 1.6 s Fine: 3.3 s	Standard: 1.3 s Detail: 1.3 s Fine: 2.6 s
SAF Memory Capacity (Measured using an ITU-T #1 Test Chart at Standard resolution)	Standard: 1MB (80 pages) With 2MB option: 3MB (240 pages) With 4MB option: 5MB (400 pages) With HDD option: 80MB (1200 pages)	Standard: 2MB (160 pages) With 2MB option: 4MB (320 pages) With 4MB option: 6MB (480 pages) With HDD option: 80MB (1200 pages)
Options	Feature Expander 2M/4M/80M Function Upgrade Card 400dpi Page Memory Card ISDN G4	Same as A639 Fax Unit.

Possible Combinations and Results



1.2 OVERALL MACHINE CONTROL



The system block diagram is the same as the current A639 Fax Unit, except for the following:

- The DRAM size is increased to 3.5MB (SAF - 2MB, Page Memory - 1MB, ECM - 128kB, and Buffer - 384kB)
- The clock speed used between VIF and BiCU is increased from 7.03MHz to 10.55 MHz.

2. DETAILED DESCRIPTIONS

2.1 DOUBLE-SIDED ORIGINAL TRANSMISSION

This function becomes available with both the A639 and A804 Fax Units if the optional Automatic Reverse Document Feeder (A661) is installed.

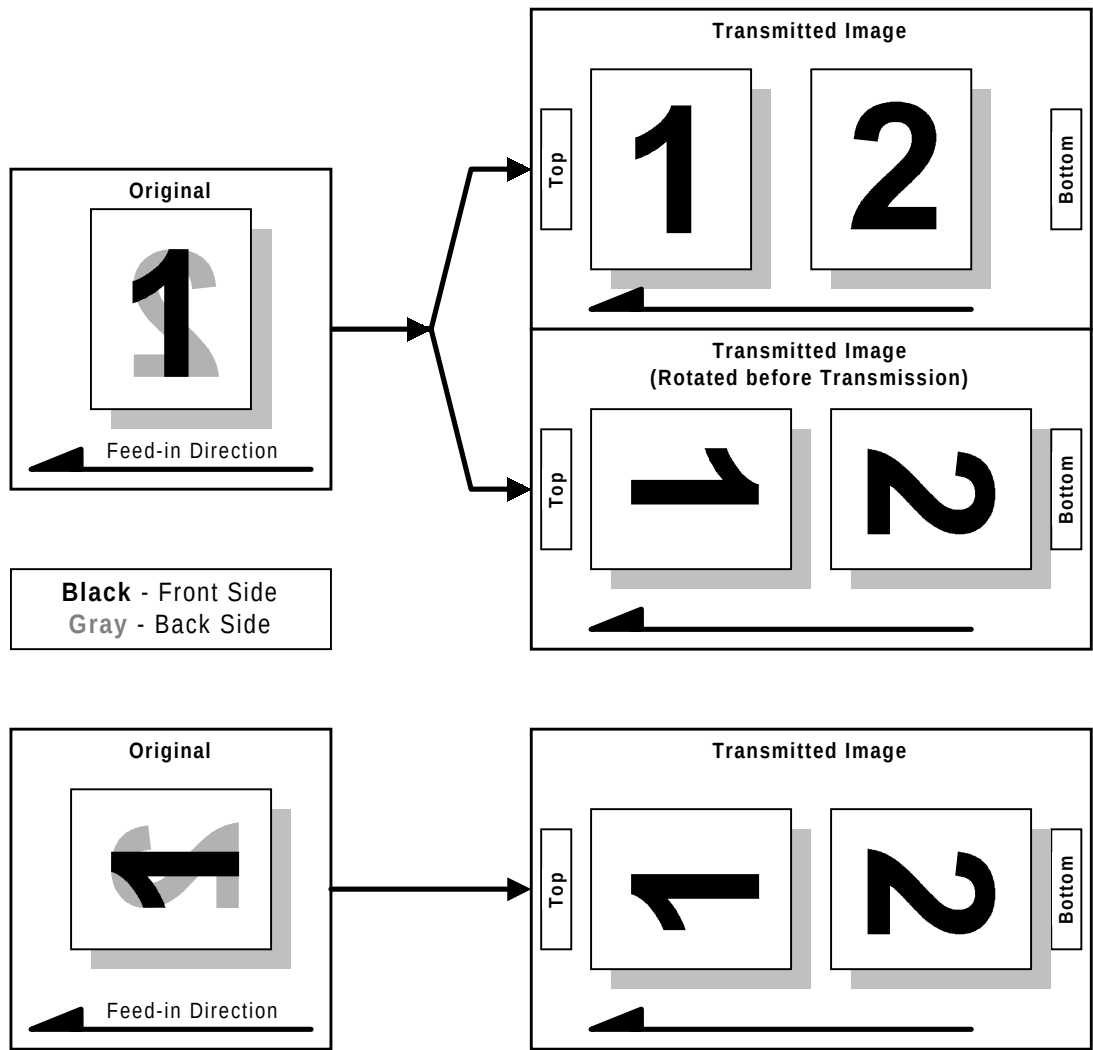
Using this function allows the machine to scan and transmit double-sided originals. However, in some cases, the transmitted image orientation may differ between odd and even number pages, because of the ARDF switch-back mechanism and the image rotation before transmission function.

The following diagrams show how the images are transmitted in various cases. However, the transmitted image may not be the same as the image printed at the other end due to the receiver's printing functions (e.g., image rotation printing).

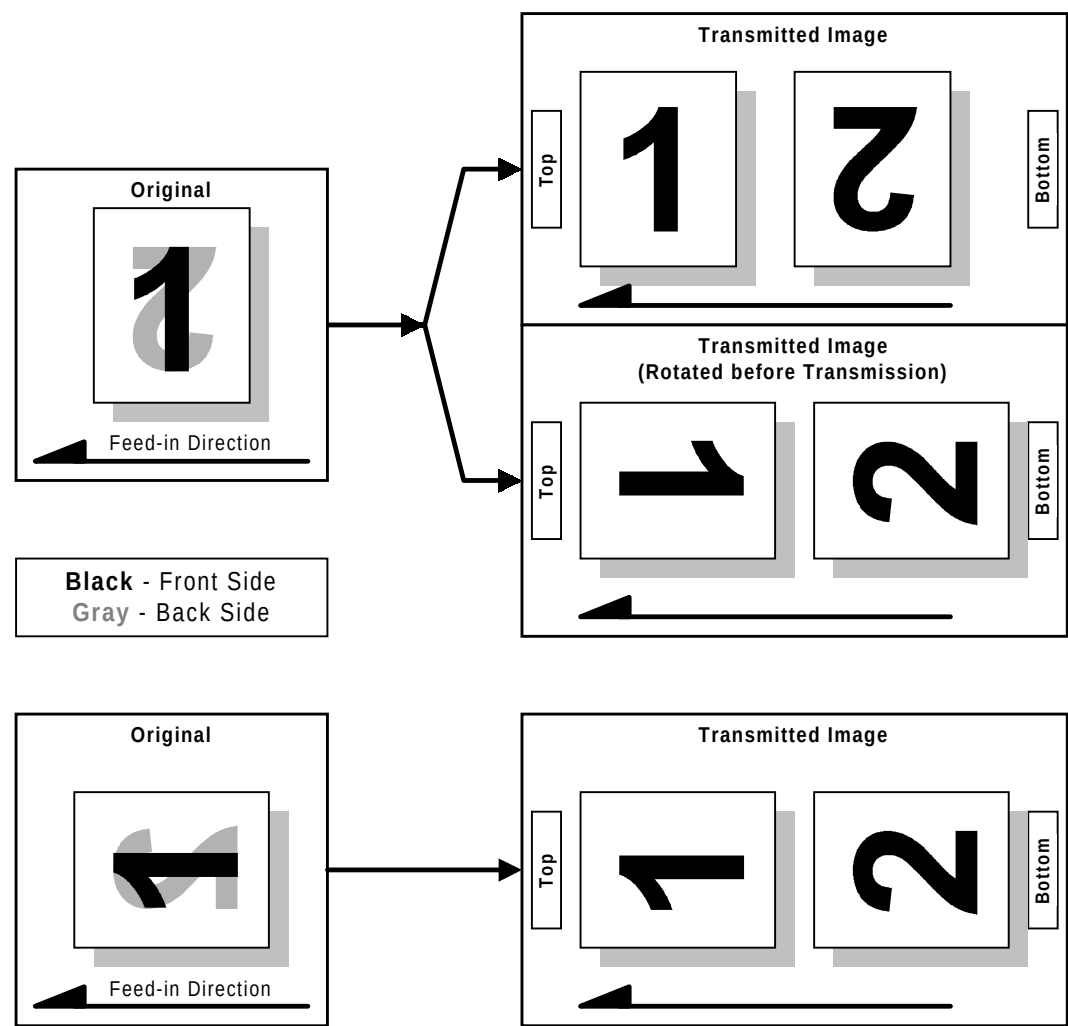
Cross Reference

Image Rotation On/Off - Scanner Switch 0F, bit 0

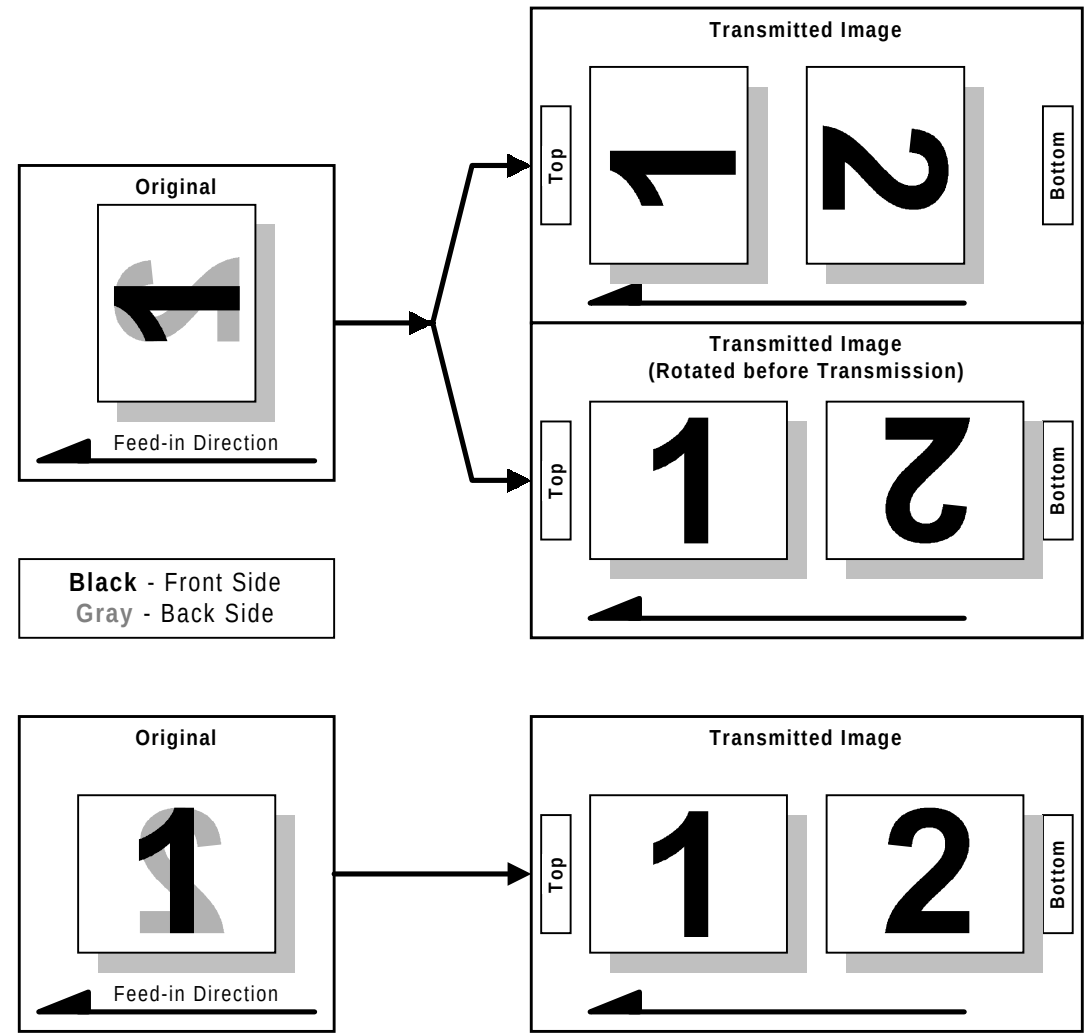
2.1.1 Portrait Original - Side Binding



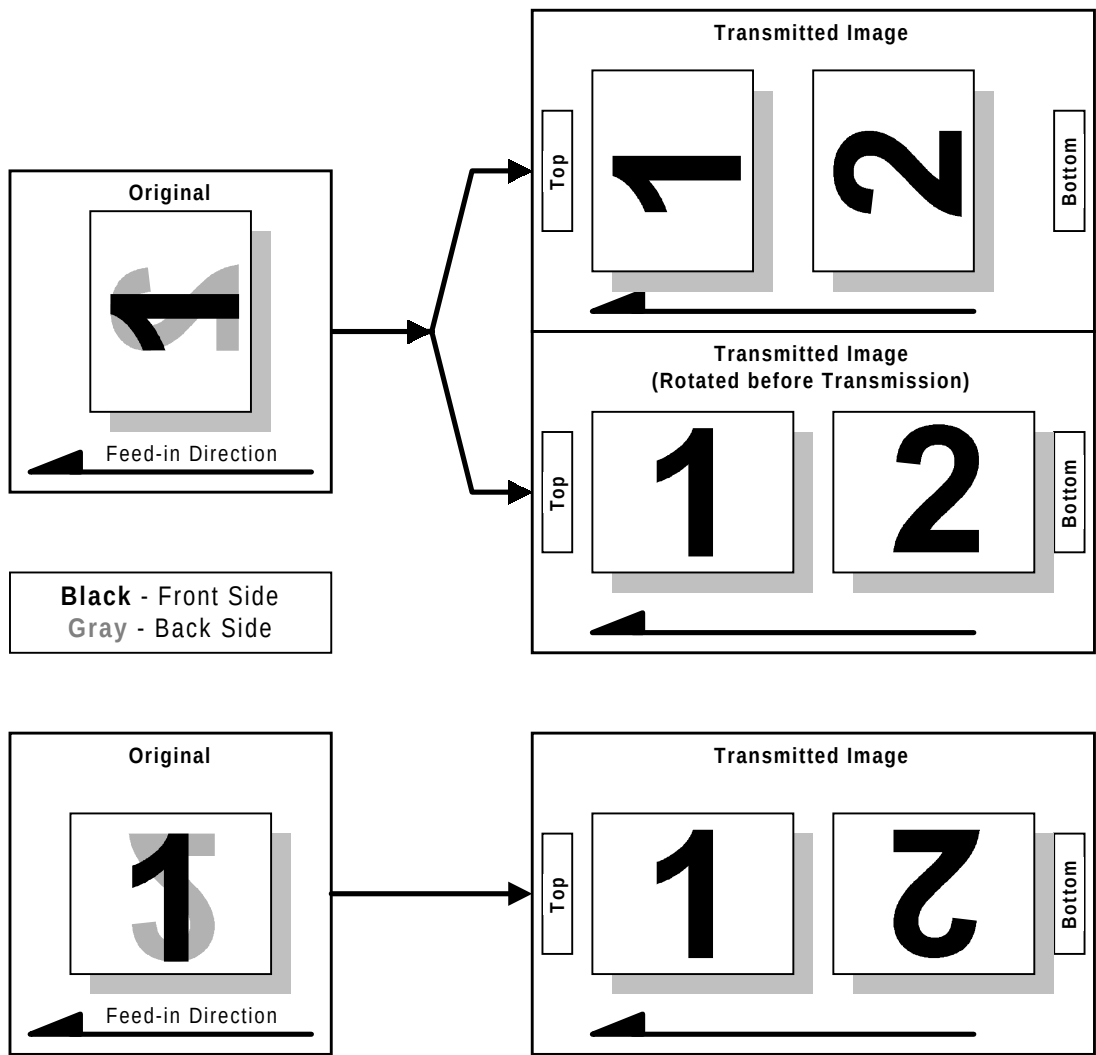
2.1.2 Portrait Original - Top Binding



2.1.3 Landscape Original - Side Binding



2.1.4 Landscape Original - Top Binding



2.2 PAPER SIZE SELECTION PRIORITIES

The following tables are updated from the A639 service manual.

Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Width

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	A3	A4	8.5x11"	8.5x11"	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	A3	A4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	11x17"	A4
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4	A4	8.5x11"
	6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	A4	8.5x11"
	7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3	F/F4	B4
	8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
	9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		F/F4	A5		11x17"	A3		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

 Sideways

DETAILED DESCRIPTIONS

Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

-  : Image Rotation
-  : Half of the page is blank
-  : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	8.5x11"	A4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4	A3	8.5x11"
	6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
	7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3	11x17"	B4
	8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
	9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		F/F4	A5		11x17"	A3		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

-  Lengthwise
-  Sideways

DETAILED DESCRIPTIONS

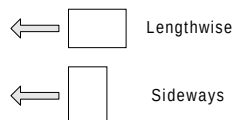
Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Length

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	A3	B4	8.5x11"	8.5x11"	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	F/F4	B4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	A3	A3
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	11x17"	11x17"
	6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	B4	A4
	7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	8.5x14"	A4
	8	B4	8.5x11"	8.5x11"	B4	F/F4	A3	B4	8.5x11"	B4	A4	8.5x11"
	9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B4	8.5x14"	F/F4	11x17"	A4	8.5x11"
	10		F/F4	A5		11x17"	11x17"		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B5		B5	B5		B5
	12			B5			B5		B5	B5		B5



DETAILED DESCRIPTIONS

Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Length

 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A3	A4	A4	B5	8.5x11"	11x17"	B4	8.5x11"	A4	8.5x14"
	3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	8.5x11"	B4
	4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	8.5x11"	A3
	5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	A3	11x17"
	6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	F/F4	A4
	7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	11x17"	A4
	8	B4	8.5x11"	8.5x11"	B4	F/F4	A3	B4	8.5x11"	B4	B4	8.5x11"
	9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B4	8.5x14"	F/F4	11x17"	8.5x14"	8.5x11"
	10		F/F4	A5		11x17"	11x17"		A5	A5		A5
	11		8.5x14"	B5		8.5x14"	B5		B5	B5		B5
	12			B5			B5		B5	B5		B5

 Lengthwise

 Sideways

DETAILED DESCRIPTIONS

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

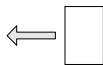
 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A4	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
	3	B4	A4	F/F4	8.5x11"	B4	8.5x11"	B4	A4	A4	8.5x11"	A4
	4	A4	F/F4	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
	5	A4	8.5x14"	A3	A3	A4	A4	A4	8.5x11"	F/F4	A3	8.5x11"
	6	8.5x11"	A3	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
	7	8.5x11"	11x17"	8.5x11"	11x17"	8.5x11"	8.5x14"	8.5x11"	B4	A3	11x17"	B4
	8	F/F4	B5	B4	B4	F/F4	B5	F/F4	A3	B4	B4	A3
	9	8.5x14"	B5	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		8.5x11"	A5		11x17"	A3		A5	A5		A5
	11		8.5x11"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

 Sideways

DETAILED DESCRIPTIONS

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

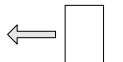
 : Image Rotation

 : Half of the page is blank

 : Page Reduction

		Received Image Size										
		A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
Paper Select Priorities	1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
	2	11x17"	A4	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
	3	B4	A4	F/F4	8.5x11"	B4	8.5x11"	B4	A4	A4	8.5x11"	A4
	4	A4	F/F4	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
	5	A4	8.5x14"	A3	A3	A4	A4	A4	8.5x11"	F/F4	A3	8.5x11"
	6	8.5x11"	A3	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
	7	8.5x11"	11x17"	8.5x11"	11x17"	8.5x11"	8.5x14"	8.5x11"	B4	A3	11x17"	B4
	8	F/F4	B5	B4	B4	F/F4	B5	F/F4	A3	B4	B4	A3
	9	8.5x14"	B5	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
	10		8.5x11"	A5		11x17"	A3		A5	A5		A5
	11		8.5x11"	B5		8.5x14"	B4		B5	B5		B5
	12			B5			11x17"		B5	B5		B5

 Lengthwise

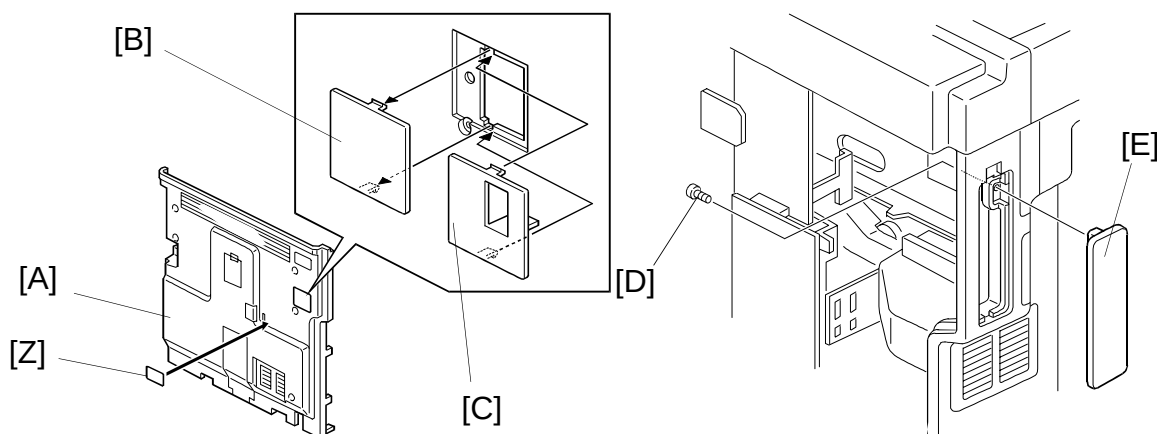
 Sideways

3. INSTALLATION

- NOTE:**
1. Never install telephone wiring during a lightning storm.
 2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
 3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 4. Use caution when installing or modifying telephone lines.
 5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
 6. Do not use the telephone to report a gas leak in the vicinity of the leak.

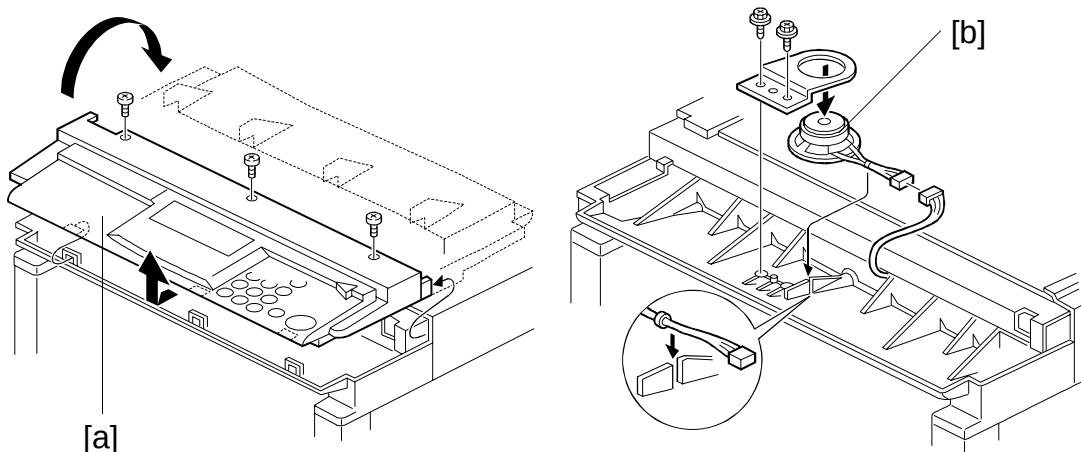
⚠ CAUTION

1. Before installing the fax unit, switch off the main and ac switches, and disconnect the power cord.
2. The fax unit contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions



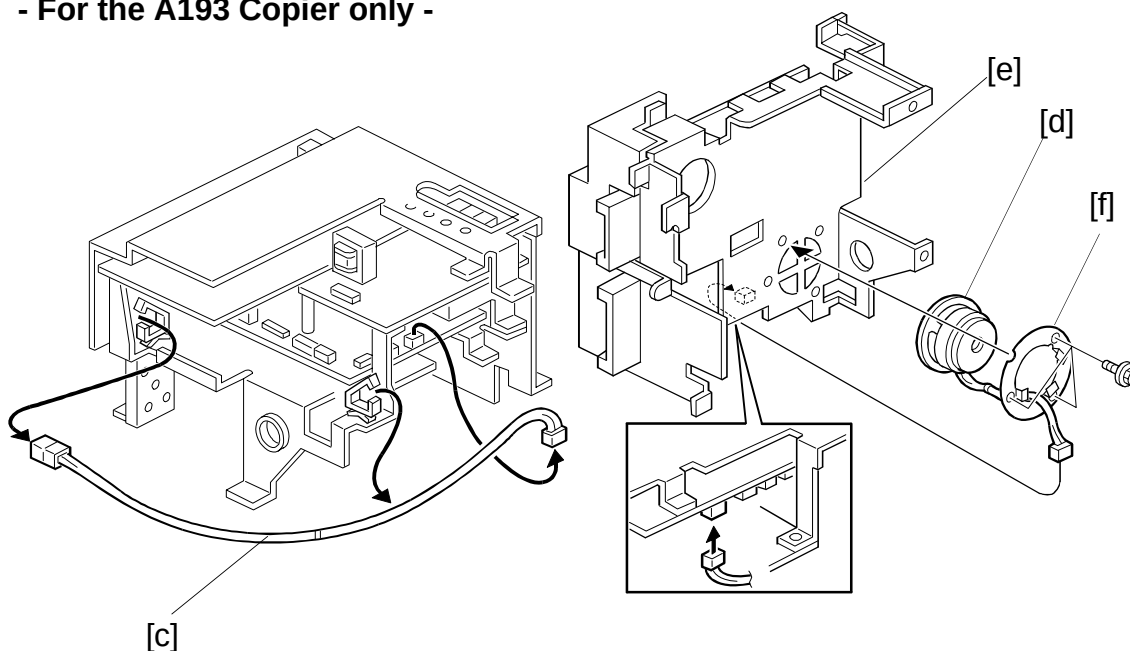
1. Remove the rear cover [A] (6 screws), replace the current NCU cover [B] with the new NCU cover [C], and attach the FCC/IC label (US only) or the BABT label (UK only) [Z].
2. Remove screw [D] then remove the small cover [E].

- For the A224 Copier only -



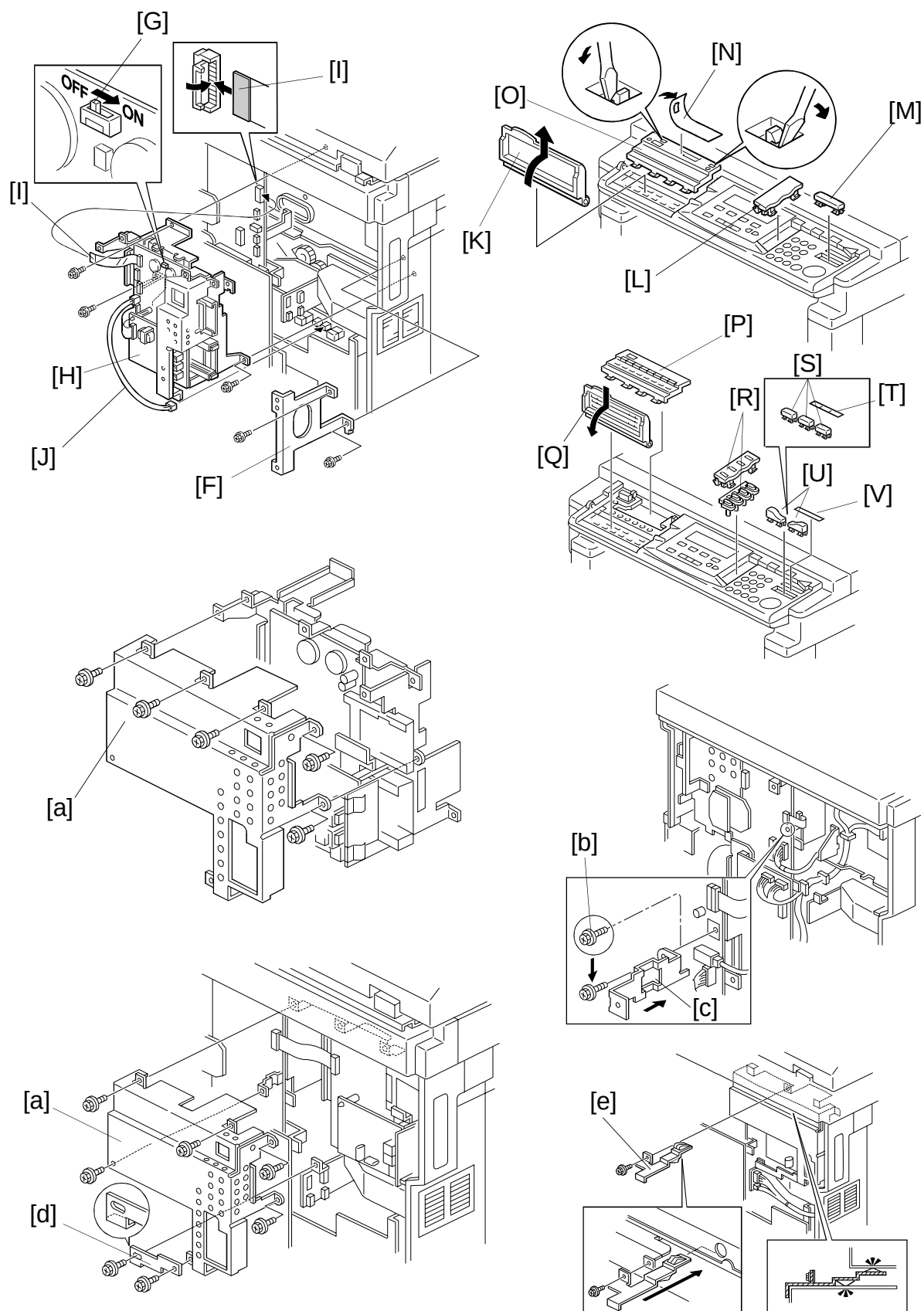
- a. Remove the operation panel [a] as shown (3 screws; 1 harness).
- b. Install the speaker unit [b] as shown (1 bracket with 2 screws; 1 harness).
- c. Reinstall the operation panel [a] (3 screws; 1 harness).

- For the A193 Copier only -



- a. Remove the harness [c] from the fax unit as shown.
- b. Install the speaker unit [d] in the fax unit [e] as shown (1 ring shaped bracket [f] with 3 screws; 1 harness).

INSTALLATION



NOTE: For European and Asian models only, perform steps a, b, and c.

- a. Remove bracket [a] from the fax unit.
- b. Remove screw [b] and install bracket [c] as shown.
3. Remove the inner bracket [F] (2 screws).
4. Turn on the battery switch [G]. Install the fax unit [H] (4 screws), as shown.

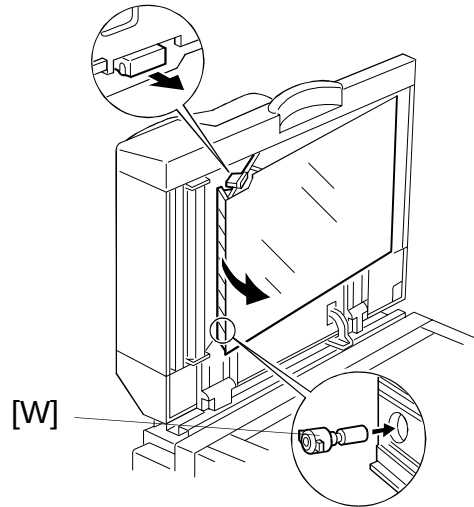
⚠ CAUTION

Use extreme care opening and closing the connector latch to prevent damaging the latch. Gently open the connector latch and insert the flat cable. Ensure that the cable is properly inserted before closing the latch.

5. Connect the flat harness [I] to the BiCU (CN304), and connect the harness [J] to the PSU (CN288).
- c. Replace bracket [a] which was removed in step [a]; and install small brackets [d] and [e].

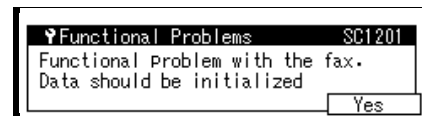
NOTE: Use a magnetic screwdriver to ensure that screws are not dropped inside the machine.

6. Replace the rear cover (5 screws).
7. Remove the parts [K], [L], and [M] from the operation panel.
8. Peel off the decal [N] as shown, then remove part [O].
9. Install each part, [P], [Q] and [R] on the operation panel, as shown.
10. If the machine has the printer controller option, install the keys [S] and the decal [T] as shown. The decal [T] has "Copy," "Printer," and "Facsimile" printed on it.
If the machine does not have the printer controller option, install the keys [U] and the decal [V] as shown. The decal [V] has "Copy" and "Facsimile" printed on it.



11. Install the Stamper [W] into the ADF as shown.
12. Open the bypass feeder and attach the enclosed serial number label on the metal frame.
13. Plug in the machine and turn on the ac and main switches.

14. Press the 'Facsimile' key and check that the facsimile LED lights. At this time, the following message should be shown:



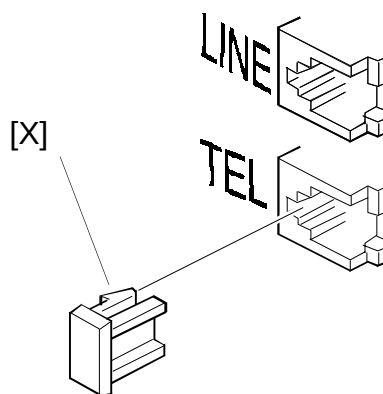
- NOTE:**
- 1) This is not a functional problem. The machine will show this message only when the fax unit is installed for the first time.
 - 2) If "SC681" is shown on the display instead of "SC1201", the old type of fax unit was installed in the A224 copier. Refer to section 5.1 for details.
15. Press "Yes" to initialize the fax unit.
 16. Connect the telephone cable to the "LINE" jack at the rear of the machine.
 17. Set up and program the items required for fax communications, as shown below. If the user function keys (F1, F2, F3 and F4) need to be programmed, affix the enclosed label above the function keys.

The default settings of the user function keys are as follows:

- F1 - Start Manual Rx
- F2 - TEL Mode
- F3 - Tx Result Display
- F4 - Not programmed

17. US only: If the optional handset needs to be installed, use the bracket and screws which are enclosed with the fax unit.

18. In European countries where the usage of the RJ11 type 'TEL' jack is prohibited by the local PTT, use the plug [X] in the 'TEL' jack as shown.



- NOTE:**
- Be sure to set the clock (date and time).
 - Program the serial number into the fax unit (service function 10). The serial number can be found on the serial number label (which has been attached to the machine in step 12).

3.1 INITIAL PROGRAMMING

Key-operator Level

Clock	Key-operator mode 19
Transmit mode	Initial setup (Transmit)
Resolution	Initial setup (Transmit)
Photo original	Initial setup (Transmit)
Reception mode	Initial setup (Receive)
Auto image density	Initial setup (Receive)
ID code	Key-operator mode 01
ECM	Key-operator mode 02
Volume	Key-operator mode 09
TTI / RTI	Key-operator mode 11
Economy transmission	Key-operator mode 12
G3 setting (Analog line) (Line type/CSI/Own number)	Key-operator mode 14
User parameters	Key-operator mode 17

Service Level

NCU country code (NCU parameter C.C.)	Function 06 - 2
Bit switch country code (System switch 0F)	Function 01 - 1
Local dialing requirements (Communication switch 06)	Function 01 - 4
Local protocol requirements (G3 switch 0B)	Function 01 - 5
PBX access code (RAM address 4800BB)	Function 06 - 1
Machine's serial number	Function 10
Service station's fax number	Function 09
PM call (System switch 01- bit 0)	Function 01 - 1
Periodic service call (RAM address 480379 - 48037D)	Function 06 - 1

4. SERVICE TABLES AND PROCEDURE

4.1 BIT SWITCHES

This section describes only the updated switches. The updated bits of the switches are marked with an asterisk.

4.1.1 System Switch

System Switch 1F (Bit 2 has been defined.)		
No	FUNCTION	COMMENTS
0 1	Not used	Do not change the settings.
2*	Printing a report after a jam or memory overflow occurred during memory tx 0: Enabled 1: Disabled	0: The machine prints a Memory Storage Report (Memory Tx) or a Transmission Result Report, if a jam or memory overflow occurred while storing a document into memory. 1: The machine does not print a report in the above conditions.
3	Received fax print start timing (G3 reception) 0: After receiving each page 1: After receiving all pages	0: The machine prints each page immediately after the machine receives it. 1: The machine prints the complete message after the machine receives all of the pages in the memory.
4	Received fax print start timing (G4 reception) 0: After receiving each page 1: After receiving all pages	
5 6	Not used	Do not change the factory settings.
7	Action when a fax SC has occurred 0: Automatic reset 1: SC code display	0: When the fax unit detects a fax SC code other than SC1201 and SC1701, the fax unit automatically reset itself. 1: When the fax unit detects any fax SC code, the fax unit displays the SC code and stop. Cross Reference Fax SC codes - See "Troubleshooting"

4.1.2 Printer Switch

Printer Switch 0E (Bit 3 has been defined additionally)		
No	FUNCTION	COMMENTS
0	Paper size selection priority 0: Width 1: Length	0: A paper size which has the same width as the received data is selected first. 1: A paper size which has enough length to print all the received lines without reduction is selected first.
1	Paper size selected for printing A4 width fax data 0: 8 x 11" size 1: A4 size	This switch determines which paper size is selected for printing A4 width fax data, when the machine has A4 and 8" x 11" size paper at the same time.
2	Page separation 0: Enabled 1: Disabled	1: If all paper sizes in the machine require page separation to print a received fax message, the machine will not print the message (Substitute Reception is used). After a larger size of paper is set in a cassette, the machine will automatically print the fax message.
3*	Type of image printed on reports 0: Upper half 1: 50% reduction	0: The upper half of the image is printed on the reports unreduced. 1: The image is printed reduced by 50% in the sub-scan direction. Note: Even if "50% reduction" is selected, the transfer result report will have the upper half of the image unreduced.
4 to 6	Not used	Do not change the settings.
7	Equalizing the reduction rate among separated pages (Page Separation) 0: Enabled 1: Disabled	0: All the pages are reduced with the same reduction ratio, when page separation has taken place. 1: Only the last page is reduced to fit the selected paper size when the page separation has taken place. Other pages are printed without reduction.

4.2 RAM ADDRESSES

4800AA(H) - User parameter switch 10 (SWUSR_0A)

Bit 0: Not used

Bit 1: 2 into 1 0: Off, 1: On

Bit 2*: Paper selection priority for A4 documents 0: A3, 1: B4

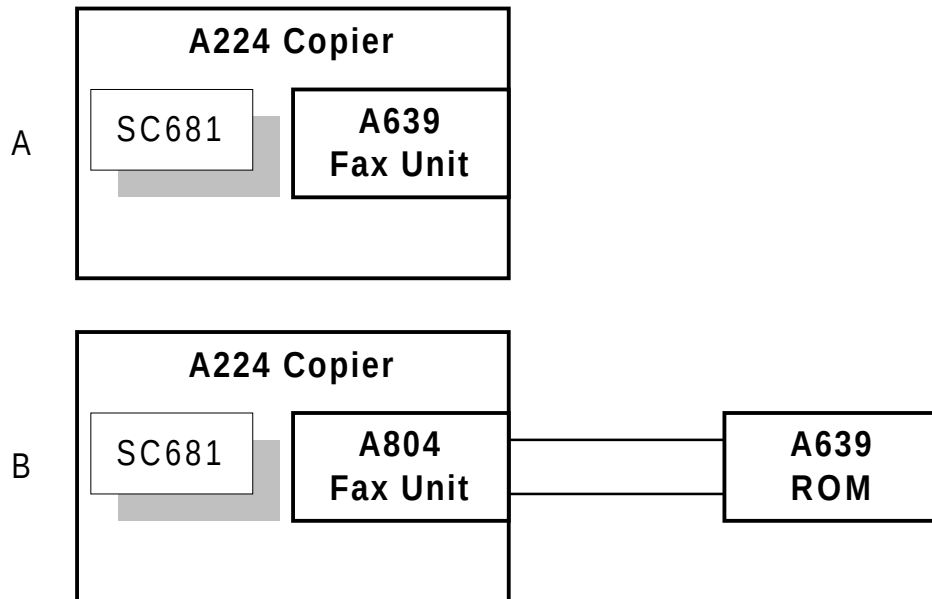
Bit 3: Page reduction 0: Off, 1: On

Bits 4 to 7: Not used

5. TROUBLESHOOTING

5.1 SC681 (A224 Copier only)

The copier shows “SC681” on the display in either of the following cases.



A. The A639 Fax Unit is installed in an A224 copier.

B. The A804 Fax Unit installed in the A224 copier is booted up from the external A639 ROMs.

In these cases, the A224 copier will show SC681 when A639 Fax software is detected at power-on. To fix this problem, turn off the machine and replace the A) Fax Unit or B) ROMs with correct one(s).

5.2 OTHER POSSIBLE CASES

5.2.1 Possible Cases and Results

Fax Unit	Installed Software	Base Copier	
		A193	A224
A639	A639	No problem	SC681 See section 5.1.
	A804	Fax Unit not detected. See section 5.2.2.	Fax Unit not detected. See section 5.2.2.
A804	A639	See section 5.2.3	SC681 See section 5.1.
	A804	No problem	No problem

5.2.2 When A804 Software is Downloaded to the A639 Fax Unit

Because the A804 software is not designed to work in the A639 Fax Unit, if it is downloaded to the A639 Fax Unit by mistake, the Fax Unit will not start up at power-on. So, the base copier machine cannot recognise the presence of the fax unit in this case. No fax functions are available.

To fix this problem, download the correct A639 software to the fax unit using the ROM board. All the programmed data remain the same as before after software download, because no RAM initialization was performed when the wrong software was downloaded.

5.2.3 When A639 Software is Downloaded to the A804 Fax Unit

The A639 software works in the A804 Fax Unit if the Fax Unit is installed in the A193 copier. However, the standard SAF memory capacity is limited to 1MB because of software limitations.

This does not look like a problem, but is not recommended. So, if A639 software was downloaded to an A804 Fax Unit by mistake, download the correct A804 software to the fax unit using the ROM board.

ISDN Unit (A644)

1. INSTALLATION PROCEDURE

Install the hardware as described in Chapter 3 of the host fax machine's service manual. Then program the following items.

1.1 USER LEVEL PROGRAMMING

The following items can be programmed with user function 61. Make sure that the items are programmed correctly.

Item	ISDN		PSTN	Remarks
	G4	G3	G3	
Own analog number			✓	Used for transfer operations in PSTN G3 communication
Own ISDN-G4 number	✓			Used for transfer operations in ISDN G4 communication.
Own ISDN-G3 number		✓		Used for transfer operations in ISDN G3 communication.
Polling ID	✓	✓	✓	Used for secured polling, transfer operations, and closed network.
Confidential ID	✓	✓	✓	Used for confidential reception. Optional SAF memory required.
Memory lock ID	✓	✓	✓	Used for memory lock. Optional SAF memory required.
RTI		✓	✓	Used to identify the terminal in G3 NSF/NSS communications.
TTI		✓	✓	Printed on each transmitted page in G3 communications.
G4_TID (Terminal ID)	✓			Used to identify the terminal in G4 communications.
CSI			✓	Used to identify the terminal in G3 DIS/DCS communications over PSTN.
IG3_CSI (ISDN G3 CSI)		✓		Used to identify the terminal in G3 communications over an ISDN.

ISDN
(A644)

1.2 SERVICE LEVEL PROGRAMMING

Item	Function No.	Remarks
System Switches	01 - 0	System Switch 0A - Network used for G3 transmission - Network used for G4-to-G3 fallback
Communication Switches	01 - 4	Communication Switch 07 - G4-to-G3 fallback On/Off
G4 internal switches	17 - 01	Change the country code, and reset the machine first. Then change any of the locally required settings and/or the following.
G4 parameter switches	17 - 02	Internal Switches 17, 18, 1A, 1B and 1C - G4 to G3 automatic fallback parameters Parameter Switch 01, bits 4 to 6 - Codec attenuation level
ISDN international prefix	17 - 03	Program the international access code.
G4 subscriber number - 1	17 - 04	When not using MSN* service: Program the ISDN subscriber number here. If an another terminal is on the same bus from the DSU, identify the terminals using a sub-address.
G4 subscriber number - 2	17 - 05	When using MSN* service: Program the dedicated ISDN number for the terminal as the 1st ISDN subscriber number. If the customer wishes the machine to answer the calls to a different number, program it as the 2nd subscriber number.
ISDN G3 subscriber number - 1	17 - 06	When not using MSN* service: Program the ISDN subscriber number here.
ISDN G3 subscriber number - 2	17 - 07	If an another terminal is on the same bus from the DSU, identify the terminals using a sub-address. When using MSN* service: Program the dedicated ISDN number for the terminal as the 1st ISDN subscriber number. If the customer wishes the machine to answer the calls to a different number, program it as the 2nd subscriber number.
G4 subaddress	17 - 08	Program a subaddress to identify the terminal, if two or more terminals answer the call to the subscriber number for G4 fax.
ISDN G3 subaddress	17 - 09	Program a subaddress to identify the terminal, if two or more terminals answer the call to the subscriber number for G3 fax.

* MSN = Multiple Subscriber Number; This is also referred to as "Direct Dialing In" in some countries

After changing any setting, make sure to turn off the machine, wait for 5 or more seconds, then turn it back on, so that the new settings take effect.

2. SWITCH SETTINGS

The following tables show the default settings of the Internal Switches and the Parameter Switches for each country setting.

2.1 INTERNAL SWITCHES

Switch No.	USA	Europe	Asia	Germany (1TR6)	France (CNET)
00 Country code	11(H)	European country code setting	Asian country code setting	01(H)	00(H)
01	00(H)	00(H)	00(H)	00(H)	00(H)
02	00(H)	00(H)	00(H)	00(H)	00(H)
03	00(H)	00(H)	00(H)	00(H)	00(H)
04	00(H)	00(H)	00(H)	20(H)	00(H)
05	00(H)	00(H)	00(H)	00(H)	00(H)
06	00(H)	00(H)	00(H)	00(H)	00(H)
07	00(H)	00(H)	00(H)	00(H)	00(H)
08	00(H)	00(H)	00(H)	00(H)	00(H)
09	00(H)	00(H)	00(H)	02(H)	00(H)
0A	00(H)	00(H)	00(H)	00(H)	00(H)
0B	00(H)	00(H)	00(H)	00(H)	00(H)
0C	00(H)	00(H)	00(H)	00(H)	00(H)
0D	00(H)	00(H)	00(H)	00(H)	00(H)
0E	00(H)	00(H)	00(H)	00(H)	00(H)
0F	00(H)	00(H)	00(H)	00(H)	00(H)
10	10(H)	10(H)	10(H)	10(H)	10(H)
11	00(H)	00(H)	00(H)	01(H)	00(H)
12	00(H)	00(H)	00(H)	00(H)	00(H)
13	00(H)	00(H)	00(H)	00(H)	00(H)
14	01(H)	00(H)	00(H)	00(H)	00(H)
15	00(H)	00(H)	00(H)	00(H)	00(H)
16	00(H)	00(H)	00(H)	01(H)	02(H)
17	00(H)	00(H)	00(H)	00(H)	00(H)
18	00(H)	00(H)	00(H)	00(H)	00(H)
19	01(H)	00(H)	00(H)	00(H)	00(H)
1A	00(H)	00(H)	00(H)	00(H)	00(H)
1B	00(H)	00(H)	00(H)	00(H)	00(H)
1C	00(H)	00(H)	00(H)	00(H)	00(H)
1D	00(H)	00(H)	00(H)	00(H)	00(H)
1E	00(H)	00(H)	00(H)	00(H)	00(H)
1F	00(H)	00(H)	00(H)	00(H)	00(H)

ISDN
(A644)

2.2 PARAMETER SWITCHES

Switch No.	USA	Europe	Asia	Germany (1TR6)	France (CNET)
00	00(H)	00(H)	00(H)	00(H)	00(H)
01	30(H)	21(H)	21(H)	30(H)	30(H)
02	01(H)	00(H)	00(H)	00(H)	00(H)
03	00(H)	00(H)	00(H)	00(H)	00(H)
04	07(H)	07(H)	07(H)	07(H)	07(H)
05	02(H)	02(H)	02(H)	06(H)	02(H)
06	00(H)	00(H)	00(H)	01(H)	00(H)
07	0B(H)	0B(H)	0B(H)	0B(H)	0B(H)
08	07(H)	07(H)	07(H)	07(H)	07(H)
09	00(H)	00(H)	00(H)	00(H)	00(H)
0A	01(H)	01(H)	01(H)	01(H)	01(H)
0B	0B(H)	0B(H)	0B(H)	07(H)	0B(H)
0C	01(H)	01(H)	01(H)	01(H)	01(H)
0D	00(H)	00(H)	00(H)	00(H)	00(H)
0E	B2(H)	B2(H)	B2(H)	B2(H)	B2(H)
0F	00(H)	00(H)	00(H)	00(H)	00(H)

1. SERVICE LEVEL FUNCTIONS

Refer to the “Fax Unit Type 250” service manual for how to enter service mode, and how to operate with functions.

Function Number	Description
01	Programming G4 International and Parameter switches
02	Printing G4 System Parameter List
05	G4 Protocol Dump Lists
06	G4 RAM read/write and printing G4 Memory Dump List
11	ISDN G3 CCU tests
12	Programming ISDN parameters

ISDN
(A644)

2. BIT SWITCHES

WARNING

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

Note: After changing any of the switches below, turn off the machine, wait for 5 seconds or more, and turn it back on, so that the new settings take effect.

2.1 G4 INTERNAL SWITCHES

Bit Switch 00					
	FUNCTION				
	COMMENTS				
0 to 7	Country code				
	Bit	4	3	2	1 0 Country
		0	0	0	0 0 France
		0	0	0	0 1 Germany (1TR6 mode)
		0	0	0	1 0 UK
		0	0	0	1 1 Italy
		0	0	1	0 0 Austria
		0	0	1	0 1 Belgium
		0	0	1	1 0 Denmark
		0	0	1	1 1 Finland
		0	1	0	0 0 Ireland
		0	1	0	0 1 Norway
		0	1	0	1 0 Sweden
		0	1	0	1 1 Switzerland
		0	1	1	0 0 Portugal
		0	1	1	0 1 Netherlands
		0	1	1	1 0 Spain
		0	1	1	1 1 Israel
		1	0	0	0 1 USA
		1	0	0	1 0 Asia
		1	0	0	1 1 Japan
		1	0	1	0 0 Hong Kong
		1	0	1	0 1 South Africa
		1	0	1	1 0 Australia
		1	0	1	1 1 New Zealand
		1	1	0	0 0 Singapore
		1	1	0	0 1 Malaysia
Note: In Germany, use the UK setting for the EuroISDN lines.					

Bit switches 01 and 02 are not used.

Bit Switch 03		
	FUNCTION	COMMENTS
0	Amount of protocol dump data in one protocol dump list 0: Last communication only 1: Up to the limit of the memory area for protocol dumping	Change this bit to 0 if you want to have a protocol dump list of the last communication only. This bit is only effective for the dump list #2 (D + Bch1).
1 to 7	Not used	Do not change the factory settings.

Bit Switch 04		
	FUNCTION	COMMENTS
0 to 4	Not used	Do not change the factory settings.
5	RCBCTR 0: Not valid 1: Valid	This bit is used in Germany; set it to 1 for German PTT approval tests. 1: RCBCTR counts consecutive R:RNR signals. If the counter reaches the value of N2, the link is disconnected.
6 to 7	Not used	Do not change the factory settings.

Bit Switch 05		
	FUNCTION	COMMENTS
0	Not used	Do not change the factory setting.
1	Logical channel number (LCN) 0: Not controlled 1: Fixed at 01	This bit is normally 0. However, some networks may require a fixed LCN. In such cases, this bit should be 1, and you may have to set a different value for the LCN using G4 Parameter Switch A.
2	Protocol ID check 0: Yes 1: No	The Protocol ID is in the CR packet.
3 to 7	Not used	Do not change the factory settings.

ISDN
(A644)

BIT SWITCHES

Bit Switch 06		
	FUNCTION	COMMENTS
0	Inclusion of the DTE address in the S:CR packet 0: No 1: Yes	When the CR packet format matches ISO8208 protocol, some networks may require this bit to be set at 1. This bit is only effective if bit 0 of G4 Parameter switch 6 is at 0.
1	Calling and called DTE addresses 0: Not used 1: Used	This is only for packet networks. The CR packet should contain the rx side's DTE address, but does not have to include the tx side's; it can include it as an option.
2 to 7	Not used	Do not change the factory setting.

Bit switch 07 and 08 are not used.

Bit Switch 09		
	FUNCTION	COMMENTS
0	Not used	Do not change the factory setting.
1	New session within the same call 0: Not accepted 1: Accepted	0: If a new R:CSS is received, the machine sends back S:RSSN. 1: If a new R:CSS is received, the machine sends back S:RSSP. Set this bit to 1 for German PTT approval tests.
2 to 7	Not used	Do not change the factory settings.

Bit switches 0A to 0F are not used.

Bit Switch 10 (Dch. Layer 1)		
	FUNCTION	COMMENTS
0	Connection detector 0: Disabled 1: Enabled	In most countries (including Europe), this should be disabled.
1	Layer 1 T3 timer Bit 2 1 Time	This should be kept at 5 s (both bits at 0) for normal operation. However, you may have to change this during PTT approval tests.
2	0 0 5 s 0 1 29 s 1 0 10 s 1 1 Not used	
3	Layer 1 T4 timer 0: Not used 1: Used	
4	Not used	
5		Do not change the factory settings.
6	INFO1 signal resend 0: Resend 1: No resend	0: Some DSUs may not reply to the INFO1 signal with INFO2, if there is noise in the INFO1 signal accidentally. Try changing this bit to 0, to resend INFO1 before the machine displays "CHECK INTERFACE".

Bit Switch 10 (Dch. Layer 1)		
	FUNCTION	COMMENTS
7	Loop back 4 mode 0: Disabled 1: Enabled	This is normally kept at 0. However, set it to 1 for British PTT approval tests.

Bit Switch 11 (Dch. Layer 2)		
	FUNCTION	COMMENTS
0	Not used	Do not change the factory setting.
1	Type of TEI used 0: Dynamic TEI 1: Static TEI	This is normally fixed at 0. However, some networks such as the Northern Telecom ISDN may require this bit to be set at 1 (see below). In this case, you may have to change the values of bits 2 to 7.
2 to 7	Static TEI value	This is used in the USA with the DMS100 (Northern Telecom ISDN) exchanger. Store the lowest bit of the TEI at bit 7 and the highest bit of the TEI at bit 2. Example: If the static TEI is 011000, set bits 3 and 4 to 1 and bits 2, 5, 6, and 7 to 0.

Bit switch 12 is not used. Do not change any of the factory settings.

Bit Switch 13: D channel layer 3 (Attachment IE in S: SETUP)		
	FUNCTION	COMMENTS
0	Not used	Do not change the factory settings.
1		
2	Attachment of calling ID 0: No 1: Yes	Normally, this bit should be at 0, because most networks add the calling ID to the SETUP signal to the receiver. However, some networks may require the machine to add this ID. Only in this case should this bit be at 1.
3	Attachment of the Lower Layer Capabilities 0: No 1: Yes	This bit determines whether Lower Layer Capabilities are informed in the [SETUP] signal or not. Keep this bit at 0 in most cases.
4	Attachment of the Higher Layer Capabilities 0: Yes 1: No	This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal or not. Keep this bit at 0 in most cases.
5 to 7	Not used	Do not change the factory settings.

ISDN
(A644)

BIT SWITCHES

Bit Switch 14: D channel layer 3 (Selection IE in S: SETUP)		
	FUNCTION	COMMENTS
0	ISDN G3 information transfer capability 0: 3.1 kHz audio 1: Speech	In tx mode, this determines the information transfer capability informed in the [SETUP] message. In rx mode, this determines the information transfer capability that the machine can use to receive a call. Refer to Appendix C for more details. Set this bit to 1 if the ISDN does not support 3.1 kHz audio. This bit is only used in the USA and the UK.
1	Not used	Do not change the factory settings.
2		
3 4	Channel selection in [SETUP] in tx mode Bit 4 3 Setting 0 0 Any channel 0 1 B1 channel 1 0 B2 channel 1 1 Not used	Any channel: When this is informed to the exchanger, the exchanger will select either B1 or B2.
5	Called ID mapping 0: Called party number 1: Keypad facility	0: Called ID is mapped to the called party number. 1: Called ID is mapped to the keypad facility. On the 5ESS network (USA), set it to 1.
6	Numbering plan for the called party number 0: Unknown 1: E.164	E.164: This may be used in Sweden if an AXE10 exchanger is fitted with old software, and in Australia. Unknown: This is the normal setting.
7	Subaddress coding type 0: IA5 (NSAP) 1: BCD (ISO8348)	This is normally kept at 0. However, some networks require this bit to be at 1.

Bit Switch 15: D channel layer 3 (Judgement R: MSG)		
	FUNCTION	COMMENTS
0	Action when receiving [SETUP] signal containing no called subaddress, if the subaddress was programmed in the dialed number 0: A reply is sent 1: No reply is sent	This bit depends on user requirements. If it is at 1, communication will be halted if the other terminal has not input the subaddress. Refer to Appendix C for more details.
1 to 4	Not used	Do not change the factory settings
5	Global call reference 0: Ignored 1: Global call number is used	Global call reference means 'call reference value = 0'. This bit determines how to deal with such an incoming call if received from the network. Keep this bit at 1 in France and Germany (1TR6), also in countries where the global call reference is used.
6 7	Not used	Do not change the factory settings.

Bit Switch 16: D channel layer 3 (Approval)		
	FUNCTION	COMMENTS
0	Answer delay time	In Germany (1TR6) and France (CNET), a time delay to answer a call is required.
1	Bit 1 0 Setting 0 0 No delay 0 1 1.0 s delayed (1TR6) 1 0 0.5 s delayed (CNET) 1 1 Not used	In other countries, use this switch as follows: If the machine is connected to the same bus from the DSU as a model K200 is connected, the machine receives most of the calls because the response time to a call is faster than the K200. If the customer wants the K200 to receive most of the calls, adjust the response time using these bits. If the customer does not want one machine to receive most of the calls, use subaddresses to identify each terminal.
2	Action when receiving [SETUP] signal containing user-specific callrd party subaddress 0: Ignores the call 1: Receives the call	Normally, the 3rd octet of called party subaddress information in the [SETUP] signal is set to NSAP. However, some networks may add "user-specific" subaddress to the [SETUP] signal (UK), and the result of this is that the machine won't answer the call if a subaddress is specified. So, change this bit to 1 to let the machine receive the call if the machine is connected to such a network.
3	Not used	Do not change the factory settings.
4		
5	Indicated bearer capabilities 0: 56 kbps 1: 64 kbps	1: 64 kbps calling is indicated in the Bearer Capabilities, but communication is at 56 k. Use this bit if the machine is connected to a network which does not accept a 56 kbps data transfer rate as a bearer capability.
6	Not used	Do not change the factory settings.
7		

Bit Switch 17: CPS Code Used for G4 to G3 Fallback - 1		
	FUNCTION	COMMENTS
0 to 6	Condition for fallback from G4 to G3 Bits 0 to 6 of bit switch 17 contain a CPS code, and bits 0 to 6 of bit switch 18 contain another CPS code. If a CPS code is received which is the same as either of these, communication will fall back from ISDN G4 mode to ISDN G3 mode. The CPS codes must be the same as those specified in table 4-13 of CCITT recommendation Q.931. Examples: Bit 6 5 4 3 2 1 0 1 0 0 0 0 0 1 CPS code 65 1 0 1 1 0 0 0 CPS code 88 For the codes in bits 0 to 6 of bit switches 17 and 18 to be recognized, bit 7 of bit switch 17 must be 1. Also, bit 0 of the Communication Switch 07 must be at 0, or Fallback from G4 to G3 will be disabled.	

ISDN
(A644)

BIT SWITCHES

Bit Switch 17: CPS Code Used for G4 to G3 Fallback - 1		
	FUNCTION	COMMENTS
7	This bit determines whether fallback from G4 to G3 occurs on receipt of one of the CPS codes programmed in bit switch 17 or 18, or on receipt of a certain standard code. 0: Fallback occurs on receipt of any of the following CPS codes: UK (EuroISDN mode) - #3, #18, #57, #58, # 63, # 65, #79, #88, and #127 Germany (1TR6 mode) - #3, #31, #53, #58, #62, #89, and #90 France - #3, #65, #88, and #113 Others - #3, #65, and #88 1: Fallback from G4 to G3 occurs on receipt any of above CPS codes or one of the CPS codes programmed in bit switch 17, 18, 1A, 1B, or 1C	

Bit Switch 18: CPS Code Used for G4 to G3 Fallback - 2		
	FUNCTION	COMMENTS
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	This bit helps to choose the CPS code set for G4 to G3 fallback. 0: Fallback occurs on receipt of the CPS code set which is specified by the country code setting. 1: Fallback occurs on receipt of the UK CPS code set (#3, #18, #57, #58, # 63, # 65, #79, #88, and #127) even if another counry code is programmed.	

Bit Switch 19		
	FUNCTION	COMMENTS
0	Permanence of the link 0: Set/released each LAPD call 1: Permanent	Keep this at 1 in the USA. In other areas, this bit is normally 0, depending on network requirements.
1	Channel used in ISDN L2 (64k) mode 0: B1 1: B2	When making an ISDN L2 back-to-back test, you can select either the B1 or B2 channel with this bit switch.
2 to 7	Not used	Do not change the factory settings.

Bit Switch 1A: CPS Code Used for G4 to G3 Fallback - 3		
	FUNCTION	COMMENTS
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit Switch 1B: CPS Code Used for G4 to G3 Fallback - 4		
	FUNCTION	COMMENTS
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit Switch 1C: CPS Code Used for G4 to G3 Fallback - 5		
	FUNCTION	COMMENTS
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit switches 1D to 1F are not used. Do not change any of the factory settings.

ISDN
(A644)

2.2 G4 PARAMETER SWITCHES

Parameter Switch 00		
	FUNCTION	COMMENTS
0	Network type	Do not change the default setting.
1	Bit 2 1 0 Type x 0 0 Circuit switched ISDN	
2	Other settings: Not used	
3 to 7	Not used	Do not change the default settings.

Parameter Switch 01		
	FUNCTION	COMMENTS
0	Voice coding 0: μ law 1: A law	0: This setting is used in Japan, Taiwan, and the USA. 1: This setting is used in Europe and Asia.
1	Action when [SETUP] signal without HLC is received 0: Respond to the call 1: Not respond to the call	If there are several TEs on the same bus and the machine responds to calls for another TE, the call may be without HLC information. Identify the type of calling terminal and change this bit to 1 if the caller is not a fax machine.
2	Not used	Do not change the default settings.
3		
4	Signal attenuation level for G3 fax signals received from ISDN line.	
5	If an analog signal comes over an digital line, the signal level after decoding by the TE	
6	is theoretically the same as the level at the entrance to the digital line. However, this sometimes causes the received signal level to be too high at the received end. In this case, adjust the decoded signal's attenuation level using these switches. The values in the "Codec" column below show the attenuation level at the G4 interface board. The values in the "Modem" column show the <u>actual attenuation level</u> at the modem, because the signal is attenuated again on the MFCE by -6dB.	
	Bit 6 5 4	Codec Modem (Actual attenuation level)
	0 0 0	-4.5dB -10.5dB
	0 0 1	-2.5dB -8.5dB
	0 1 0	-0.5dB -6.5dB
	0 1 1	+1.5dB -4.5dB (default setting)
	1 0 0	+3.5dB -2.5dB
	1 0 1	+5.5dB -0.5dB
	1 1 0	+7.5dB +1.5dB
	1 1 1	+9.5dB +3.5dB
7	Not used	Do not change the default settings.

Parameter Switch 02		
	FUNCTION	COMMENTS
0	Data rate (kbps)	Other settings: Not used
1	Bit 1 0 Setting 0 0 64 kbps 0 1 56 kbps	
2	Not used	
3		Do not change the default settings.
4	Transmission mode	
5	Bit 5 4 Mode 0 0 CS	Other settings: Not used
6	Not used	
7		

Parameter Switch 03		
	FUNCTION	COMMENTS
0	Link modulus 0: 8 1: 128	This setting determines whether protocol frame numbering is done using 3 bits (0 to 7 then start again at 0) or 7 bits (0 to 127 then start again at 0). Set this bit switch to match the network's specifications.
1 to 7	Not used	Do not change the default settings.

Parameter Switch 04 is not used. Do not change any of the default settings.

Parameter Switch 05		
	FUNCTION	COMMENTS
0	Link timer (D-channel layer 2 T1 timer)	The link timer is the maximum allowable time between sending a protocol frame and receiving a response frame from the remote terminal.
1	Bit 3 2 1 0 Value 0 0 0 0 0 s	
2	0 0 0 1 1 s 0 0 1 0 2 s	
3	and so on until 1 0 1 0 10 s	
4 to 7	Not used	

ISDN
(A644)

BIT SWITCHES

Parameter Switch 06		
	FUNCTION	COMMENTS
0	Layer 3 protocol 0: ISO8208 1: T.70NULL	Set this bit to match the type of layer 3 signalling used by the ISDN. The dedicated parameters have the same setting for specific destinations.
1	Not used	Do not change the default settings.
2		
3		
4	Packet modulus 0: 8 1: 128	Do not change the default setting, unless the machine is experiencing compatibility problems.
5	Not used	Do not change the default settings.
6		
7		

Parameter Switch 07		
	FUNCTION	COMMENTS
0	Packet size Bit 3 2 1 0 Value	This value is sent in the CR packet. This value must match the value stored in the other terminal, or communication will stop (CI will be returned). If the other end returns CI, check the value of the packet window size with the other party. Note that this value must be the same as the value programmed for the transport block size (G4 Parameter Switch B, bits 0 to 3). Normally, do not change the default setting.
1	0 1 1 1 128	
	1 0 0 0 256	
2	1 0 0 1 512	
	1 0 1 0 1024	
3	1 0 1 1 2048	Do not change the default settings.
4 to 7	Not used	

Parameter Switch 08		
	FUNCTION	COMMENTS
0	Packet window size Bit 3 2 1 0 Value	This is the maximum number of unacknowledged packets that the machine can send out before having to pause and wait for an acknowledgement from the other end. This should be kept at 7 normally. If the packet modulus (G4 Parameter Switch 6, bit 4) is 8, the packet window size cannot be more than 7. However, if the packet modulus is 128, the window size can be up to 15. Also, if the layer 3 protocol setting (G4 Parameter Switch 6, bit 0) is at IS8208, the packet window size cannot be more than 7.
1	0 0 0 1 1	
	0 0 1 0 2	
2	and so on until	
	1 1 1 1 15	
3		Do not change the default settings.
4 to 7	Not used	

Parameter Switch 09		
	FUNCTION	COMMENTS
0	LCGN	Keep the value of the LCGN at 0.
1	Bit 3 2 1 0 Value	
2	0 0 0 0 0	
3	0 0 0 1 1	
4	0 0 1 0 2	
5	and so on until	Do not change the default settings.
6	1 1 1 1 15	
7	Not used	

Parameter Switch 0A		
	FUNCTION	COMMENTS
0	LCN	Keep at the value of the LCN at 1.
1	Bit 7 6 5 4 3 2 1 0 Value	
2	0 0 0 0 0 0 0 1 1	
3	0 0 0 0 0 0 1 0 2	
4	0 0 0 0 0 0 1 1 3	
5	and so on until	
6	1 1 1 1 1 1 1 1 255	
7		

Parameter Switch 0B		
	FUNCTION	COMMENTS
0	Transport block size	This value must match the value set in the other terminal. Note that this value must be the same as the value programmed for the packet size (G4 Parameter Switch 7, bits 0 to 3). Also, the transport block size is limited by the amount of memory in the remote terminal.
1	Bit 3 2 1 0 Value	
2	0 1 1 1 128	
3	1 0 0 0 256	
4	1 0 0 1 512	
5	1 0 1 0 1024	Do not change the default settings.
6	1 0 1 1 2048	
7	Not used	

Parameter Switch 0C is not used. Do not change any of the default settings.

ISDN
(A644)

BIT SWITCHES

Parameter Switch 0D		
	FUNCTION	COMMENTS
0	Back-to-back test mode	When doing a back-to-back test or doing a demonstration without a line simulator, use these bits to set up one of the machines in TE mode, and the other in NT mode. After the test, return both bits to 0. See "Back-to-back Testing" in the Troubleshooting section for full details.
1	Bit 1 0 Setting	
	0 0 Off	
	0 1 Not used	
	1 0 ISDN L2 test mode (TE mode)	
	1 1 ISDN L2 test mode (NT mode)	
2 to 7	Not used	Do not change the default settings.

Parameter Switch E		
	FUNCTION	COMMENTS
0	Troubleshooting mode - real time status codes display 0: Off 1: On	If this is switched on, the status codes will be displayed in the lower two lines of the LCD. These codes are explained in the Troubleshooting section (G4CCU Status Codes). Change this bit back to 0 after testing.
1	Saving frames to the protocol dump list 0: Off 1: On	Keep this bit at 1 normally.
2 to 7	Not used	Do not change the default settings.

3. DEDICATED TRANSMISSION PARAMETERS

The following G4 communication parameter bytes have been added for each Quick Dial and Speed Dial. For how to program Dedicated Transmission Parameters, refer to the Service Manual for the base machine.

Switches 01 to 04 are for use with Group 3 communication and are explained in the Service Manual for the base machine. Switch 08 is not used.

Switch 05	
	FUNCTION
0	Data rate Bit 3 2 1 0 Setting
1	0 0 0 0 64 kbps
2	0 0 0 1 56 kbps
3	1 1 1 1 As in Parameter Switch 2, bits 0 and 1 Other settings: Not used
4	Not used
5	
6	
7	

Switch 06	
	FUNCTION
0	Link modulus Bit 3 2 1 0 Setting
1	0 0 0 0 Modulo 8
2	0 0 0 1 Modulo 128
3	1 1 1 1 As in Parameter Switch 3, bit 0 Other settings: Not used
4	Not used
5	
6	
7	

Switch 07	
	FUNCTION
0	Layer 3 protocol Bit 3 2 1 0 Setting
1	0 0 0 0 IS.8208
2	0 0 0 1 T.70 NULL
3	1 1 1 1 As in Parameter Switch 6, bit 0 Other settings: Not used
4	Packet modulus Bit 7 6 5 4 Setting
5	0 0 0 0 Modulo 8
6	0 0 0 1 Modulo 128
7	1 1 1 1 As in Parameter Switch 6, bit 4 Other settings: Not used

ISDN
(A644)

1. ERROR CODES

The tables on the following pages show the error codes that will be printed on the Service Monitor Report. See the Service Manual for the base machine for instructions on how to print this report.

The meaning of the numbers in the Action column is as follows.

1. Check Layer 1 signalling with a protocol analyzer to determine the cause of the problem. This may require assistance from a G4 specialist.
2. Repeat the communication. If the problem does not repeat itself, the problem was a temporary one caused by the user connecting the machine to another interface. However, if the problem remains, there is a network problem.
3. There is a network problem.
4. There is a network problem. Do the following:
 - Check the error bit rate of the network. If it is high, contact the network and ask them to improve the line.
 - Check the network speed (is it 56 or 64 kbps), and make sure that the bit switch setting is correct. You may also use the dedicated transmission parameters if this problem only occurs when dialling certain numbers.
 - Check that the user dialled the correct number.
5. There is a network problem, or a problem in the machine at the other end.
6. There is a problem in the machine at the other end; ask a technician to check it.
7. The machine at the other end is not a Group 4 fax terminal.
8. The machine is not compatible with the machine at the other end. A compatibility test is needed.

Error codes related with the errors detected by the FCU are listed in the Service Manual of the main body.

ISDN
(A644)

1.1. D-CHANNEL LAYER MANAGEMENT

Code	Probable Cause	Action
7-00	Link reset	2
7-01	Link set-up failed because of time-out.	2
7-02	Link release failed because of time-out.	2
7-03	Link set-up parameter error	2

1.2. D-CHANNEL, LAYER 1

Code	Probable Cause	Action
7-10	T3 timeout (layer 1 activation error)	1
7-11	No connection on the S0 interface	1
7-12	Deactivated	1

1.3. D-CHANNEL LINK LAYER

Code	Probable Cause	Action
7-20	At the start of link set-up, the machine received an unsolicited S (F=1).	2
7-21	At the start of link set-up, the machine received an unsolicited DM (F=1).	2
7-22	At TEI release, the machine received an unsolicited UA (F=1).	2
7-23	At the start of link set-up, the machine received an unsolicited DM (F=0).	2
7-24	At TEI release, the machine received an unsolicited UA (F=0).	2
7-25	SABME received at the start of network link set-up	No error
7-26	N200 retransmission error for SABME	2
7-27	N200 retransmission error for DISC	2
7-28	N200 retransmission error for situation enquiry (RR)	2
7-29	N(R) sequence number error	3
7-30	N(S) sequence number error	3
7-31	FRMR received	3
7-32	Non-standard frame received	3
7-33	Abnormal frame length	3
7-34	N201 error; information field N in the I frame exceeded N201	3
7-35	T201 timeout; timeout while waiting for checking	3
7-36	T202 timeout; timeout while waiting for ID assignment	3

1.4. D-CHANNEL NETWORK LAYER

Code	Probable Cause	Action
7-40	Insufficient mandatory information elements	3
7-41	Abnormal LI for a mandatory information element	3
7-42	T301 timeout; timeout while waiting for R:CONN	3
7-43	T303 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-44	T304 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-45	T305 timeout; timeout while waiting for R:REL	3
7-46	T308 timeout; timeout while waiting for R:REL-COMP	3
7-47	T310 timeout; timeout while waiting for R:ALERT etc.	3
7-48	T313 timeout; timeout while waiting for R:CONN-ACK	3
7-49	Internal error	3
7-51	Release call reference during communication	3

1.5. B-CHANNEL LINK LAYER

Code	Probable Cause	Action
7-60	T3 timeout; timeout while waiting for flag	4
7-61	T3 timeout; timeout while waiting for SABM during an incoming call	4
7-62	T1 timeout x N2; timeout while waiting for UA after sending SABM	5
7-63	T1 timeout x N2; timeout while waiting for a response to a transmitted S frame (P=1)	5
7-64	T1 timeout x N2; timeout while waiting for SABM or DISC after sending FRMR	5
7-65	T1 timeout x N2; timeout while waiting for a response to DISC	5
7-66	RNR x N2 (other end busy, RCB counter error)	5
7-67	Invalid (Ad) frame received	5
7-68	Invalid short frame received	5
7-69	Link reset error	5
7-70	FRMR received	5
7-71	Non-standard (Cn) frame received	5
7-72	An S or U frame having an information field was received	5
7-73	A frame longer than the maximum N1 length was received	5
7-74	An S or I frame having an N(R) error was received	5
7-75	CRC error	3

ISDN
(A644)

1.6. B-CHANNEL NETWORK LAYER

Code	Probable Cause	Action
7-80	A packet having an abnormal GFI was received	6
7-81	A packet was received that had a logical channel number different from the logical channel being used for the communication	6
7-82	A packet containing a format error was received	6
7-83	A packet containing an LI error was received	7
7-84	A CN packet was received that had a PID different from 02	7
7-85	Unsupported packet type received	7
7-86	Abnormal or unsupported facility received	7
7-87	P(s) sequence number error	6
7-88	P(r) sequence number error	6
7-89	A reset using S:RQ or R:RI occurred	6
7-90	A restart using S:RQ or R:SI occurred	6
7-91	Call set-up error; in reply to S:CR, R:CI was received to indicate rejection of the call	7
7-92	T20 timeout; timeout while waiting for an SF packet	6
7-93	T21 timeout; timeout while waiting for a CC packet	6
7-94	T22 timeout; timeout while waiting for an RF packet	6
7-95	T23 timeout; timeout while waiting for a CF packet	6
7-96	T10 timeout; timeout while waiting for the first frame	6

1.7. TRANSPORT LAYER

Code	Probable Cause	Action
8-00	Invalid block received	8
8-01	TCC block received	8
8-02	TBR block received	8
8-05	TCR block; block format error	8
8-06	TCR block; block size parameter LI error	8
8-07	TCR block; extended addressing LI error	8
8-08	TCR block; block size length error	8
8-10	TCA block; block format error	8
8-11	TCA block; Tx origin reference data in TCR disagreed with the address reference data in TCA	8
8-12	TCA block; octet 7 did not equal 0	8
8-13	TCA block; extended addressing LI error	8
8-14	TCA block; block size exceeded that set by TCR	8
8-15	TCA block; block size parameter LI error	8
8-20	TDT block; block format error	8
8-21	TDT block; octet 3 did not equal either 00 or 80(H)	8
8-22	TDT block; the end indicator was "Continue" even though there was no field data	8
8-23	TDT block; an end block with no field data was received after an end indicator of "End"	8
8-26	Timeout during state 0.2	8
8-27	Timeout during state 1.1	8

Code	Probable Cause	Action
8-28	Timeout during state 0.3	8

1.8. SESSION LAYER

Code	Probable Cause	Action
8-30	Invalid frame received	8
8-31	RSSN received	8
8-32	CSA received	8
8-34	Calling terminal identification error in CSS	8
8-35	Date and time error in CSS	8
8-36	Window size error in CSS	8
8-37	Service identification error in CSS	8
8-38	Session user data error in CSS	8
8-39	CSS rejected (new session rejected)	8
8-40	Called terminal identification error in RSSP	8
8-41	Date and time error in RSSP	8
8-42	Date and time in RSSP was not the same as that in CSS	8
8-43	Window size error in RSSP	8
8-44	Service identification error in RSSP	8
8-45	Session user data error in RSSP	8
8-47	Message synchronization error inside the CCU	8
8-48	Document task busy	8
8-50	Ti timeout; non-communication surveillance timer (T.62)	8
8-51	T2 timeout; timeout while waiting for a response (T.62)	8
8-52	T3 timeout; CSA timer timeout (T.62)	8
8-53	G4 board load timer timeout; calling side waited too long for a new session	8
8-54	G4 board load timer timeout; calling side waited too long for transport probability	8
8-55	G4 board load timer timeout; called side waited too long for S:RSSP	8
8-56	G4 board load timer timeout; document transmission surveillance timer timeout	8
8-57	G4 board load timer timeout; timeout while waiting for a user abort request after a provider fail	8

1.9. DOCUMENT LAYER

Code	Probable Cause	Action
8-60	T.62 coding format error (LI error)	8
8-61	A mandatory PI was absent, or the LI for a mandatory PI was 0	8
8-62	Calling/called terminal identification LI was different from that specified by F.184 (LI = 24)	8
8-63	The LI for session user data exceeded the maximum value (512)	8
8-64	The LI for CDUI was not 0	8
8-65	Checkpoint and document reference numbers LI error, or they were not in T.61 (ASCII) coding	8
8-66	The checkpoint reference number differed from the expected value	8

ISDN
(A644)

ERROR CODES

Code	Probable Cause	Action
8-70	RDGR received	8
8-71	A non-standard PDU was received while in calling mode	8
8-72	A non-standard PDU was received while in called mode	8
8-73	Abnormal PDU received while in calling state ds1	8
8-74	15 consecutive CDCL signals received	8
8-75	Session window size control error (size not equal to 0)	8
8-76	Internal error	8

1.10. PRESENTATION LAYER

Code	Probable Cause	Action
8-80	X.209 coding error in session user data (LI error)	8
8-81	PV error in session user data	8
8-82	PI error in session user data	8
8-83	The capabilities in the session user data of CDS/CDC were not the same as those in RDCLP	8
8-84	X.209 coding error in the DP (LI error)	8
8-85	X.209 coding error in the SLD (document descriptor/page descriptor) (LI error)	8
8-86	SLD object type absent	8
8-87	PI error in the SLD (document descriptor/page descriptor)	8
8-88	The capabilities in the SLD (document descriptor/page descriptor) are duplicated or are not the same as those in RDCLP	8
8-89	No document descriptor at the start of the document	8
8-90	No page descriptor at the start of the page	8
8-91	Page descriptor PV error	8
8-92	X.209 coding error in the TU (LI error)	8
8-93	The TU was absent	8
8-94	PV error in the TU	8
8-95	TI error	8
8-96	X.209 coding nest level > 8, or an LI form error	8
8-97	CDPB/CDE received while TU/TI not yet completed, or an unexpected PDU was received while analyzing an SLD	8

2. G4CCU STATUS CODES

The display of G4CCU status codes is affected by the Real Time Display On/off setting (G4 Parameter Switch E, bit 0).

- If Real Time Display is off (the bit is 0; this is the default setting), there is no indication on the operation panel.
- If Real Time Display is on (the bit is 1), the codes are fully displayed on the operation panel.

The codes are defined in the following pages.

2.1. LAYER 1 (PHYSICAL LAYER)

Code (H)	Status	Code (H)	Status
10	Ready	E0	R: [DISC]
01	S: [SETUP]	E1	S: [REL]
02	R: [CALL PROC]	E3	R: [REL COMP]
03	R: [CONN]	E4	R: [STAT]
04	S: [CONN ACK]	E5	R: [STAT ENQ]
05	R: [SETUP ACK]	F0	S: [DISC]
06	R: [ALERT]	F1	R: [REL]
11	R: [SETUP]	F2	S: [REL COMP]
12	S: [CALL PROC]	F3	S: [STAT]
13	S: [CONN]		
14	R: [CONN ACK]		

2.2. LAYER 2 (LINK LAYER)

Code (H)	Status	Code (H)	Status
20	S: SABM, or R: SABM	D0	S: DISC, or R: DISC
21	S: UA, or R: UA	D1	S: DM, or R: DM
22	S: FRMR, or R: FRMR		
28	S: SABME, or R: SABME		

ISDN
(A644)

2.3. NETWORK LAYER (LAYER 3)

Code (H)	Status	Code (H)	Status
30	S: CR	C2	S: SQ
31	R: CC	C3	R: SF
38	R: CN	CA	R: SI
39	S: CA	CB	S: SF
32	S: GF	C4	S: RQ
3A	R: GQ	C5	R: RF
3B	R: GF	CC	R: RI
C0	S: CQ	CD	S: RF
C1	R: CF	C6	R: IT
C8	R: CI	C7	R: IF
C9	S: CF	CE	R: DIAG

2.4. TRANSPORT LAYER (LAYER 4)

Code (H)	Status	Code (H)	Status
40	S: TCR, or R: TCR	42	S: TBR, or R: TBR
41	S: TCA, or R: TCA	43	S: TCC or R: TCC

2.5. SESSION LAYER, SESSION CONTROL LAYER (LAYER 5)

Code (H)	Status	Code (H)	Status
50	S: CSS, or R: CSS	56	S: RSUI, or R: RSUI
51	S: RSSP, or R: RSSP	A0	S: CSA, or R: CSA
52	S: RSSN, or R: RSSN	A1	S: RSAP, or R: RSAP
53	S: CSCC, or R: CSCC	A2	S: CSE, or R: CSE
54	S: RSCCP, or R: RSCCP	A3	S: RSEP, or R: RSEP

2.6. SESSION LAYER, DOCUMENT CONTROL LAYER (LAYER 5)

Code (H)	Status	Code (H)	Status
60	S: CDCL, or R: CDCL	90	S: CDE, or R: CDE
61	S: RDCLP, or R: RDCLP	91	S: RDEP, or R: RDEP
62	S: CDS, or R: CDS	92	S: CDD, or R: CDD
63	S: CDC, or R: CDC	93	S: RDDP, or R: RDDP
64	S: CDPB, or R: CDPB	94	S: CDR, or R: CDR
65	S: RDPBP, or R: RDPBP	95	S: RDRP, or R: RDRP
70	S: CDUI, or R: CDUI (Data phase - layer 6 and facsimile data)	96	S: RDGR, or R: RDGR
		97	S: RDPBN, or R: RDPBN

3. LEDs

There are six LEDs on the G4 Interface board, as shown below.

		LED 5	LED 6
LED 1	LED 2	LED 3	LED 4

These LEDs give the following information about the status of the machine.

O = ON, -- = OFF

Initial Settings				
Power-up/Reset			O	O
	--	--	--	--
Initial setting request from FCU			--	O
	--	--	--	--
Initial setting confirmation to FCU			--	--
	--	--	--	--
Communication				
Layer 1 activated			--	--
	O	--	--	--
Layer 2 set			--	--
	O	O	--	--
B channel connected (ISDN G4)			--	--
	O	O	O	--
B channel connected (ISDN G3)			--	--
	O	O	--	O
B channel released			--	--
	O	O	--	--
Layer 2 released			--	--
	O	--	--	--
Layer 1 deactivated			--	--
	--	--	--	--
The following will be displayed if bit 1 of G4 parameter switch E is at 1.				
B channel: send I frame (A blinks at this time if bit 1 of			--	A
G4 parameter switch E is at 1)	O	O	O	--
B channel: receive I frame (B blinks at this time if bit 1 of			B	--
G4 parameter switch E is at 1)	O	O	O	--

ISDN
(A644)

Note: At the start and end of communication, both A and B will blink.

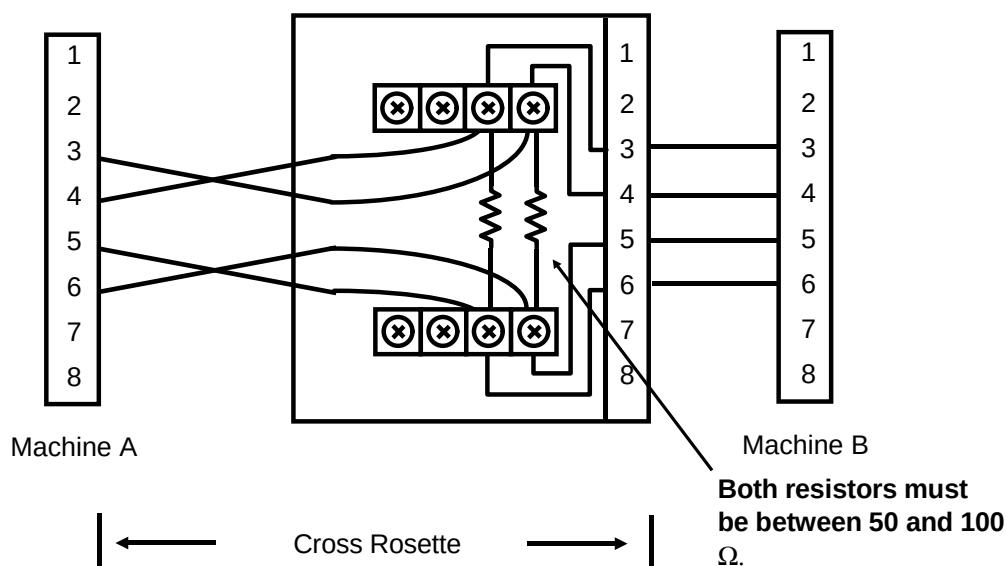
4. BACK-TO-BACK TEST

To make a back-to-back test, you need:

- Two machines (both of them must have CiG4 board)
- Cross rosette

The procedure is as follows.

1. Switch off the machines
2. Connect two machines back-to-back using the cross rosette as follows.



3. Make the following bit switch adjustments:
 - In the machine acting in NT mode, set bits 0 and 1 of G4 parameter switch 0D to 1.
 - In the machine acting in TE mode, set bit 0 of G4 parameter switch 0D to 0 and bit 1 to 1.
4. Reset the machine by switching it off, waiting a few seconds, then switching back on.
5. Place a document in one of the machines, dial a number, then press Start.
6. After you have finished the test, set bits 0 and 1 of G4 parameter switch 0D back to 0. then reset the machine.

Note: The following cannot be tested using this procedure:

- ISDN G3 communication
- P to M

APPENDIX A

1. D-Channel Layer 1 Dump List

1.1. How to Print the Dump List

Use this function to print the D-ch. Layer 1 dump list.

- 1. After entering the service mode,
press 06, then 4
- 2. Input the addresses 03B000 to 03B1FF:
Input 0 - 3 - B - 0 - 0 - 3 - B - 1 - ↻

List Sample

* * * G4 CCU MEMORY DUMP LIST (SEP. 25.1995 4.05PM) * * *																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
03B000	00	00	00	F2	10	1E	00	F3	01	1C	64	F4	10	12	00	F5
03B010	11	22	00	F6	10	36	00	F7	02	00	08	F7	20	A6	08	F7
03B020	03	81	00	F7	07	34	60	F7	10	32	00	F7	02	00	03	F7
03B030	20	29	03	F7	02	00	18	F7	20	A9	04	F7	20	AB	0B	F7
03B040	02	00	04	F7	20	AB	0C	F7	02	00	04	F7	02	00	08	F7
03B050	20	A9	04	F7	20	AB	0E	F7	02	00	04	F7	02	00	08	F7
03B060	20	A9	04	F7	20	00	03	F7	20	29	03	F7	10	02	7C	F3
03B070	10	3E	40	F3	10	1E	00	F3	FF	FF	FF	FF	00	00	FF	FF
03B080	FF	FF	00	00	00	00	FF	FF	FF	FF	00	00	00	00	FF	FF
03B090	FF	FF	00	00	00	00	FF	FF	-----							

Refer to “How to Read the Dump List” later in this chapter.

1.2. How to Read the Dump List

1.2.1. Data Format

The machine logs the details of layer 1 communication whenever a event has taken place. The event can be either a request from the machine, a request from the DSU, a transmission of a signal, or a reception of a signal.

Each log consists of 4 bytes. The first byte indicates the type of event, the second and the third bytes for optional data, which depends on the type of event, and the fourth byte indicates the layer 1 status. The following table explains all types of data formats.

1st byte	2nd byte	3rd byte	4th byte
00(H) : TE mode initialization request	00(H)	00(H)	Layer 1 status
01(H) : Layer 1 activation request	See note 1	See note 2	TE mode F1(H) : F1 status F2(H) : F2 status F3(H) : F3 status F4(H) : F4 status F5(H) : F5 status F6(H) : F6 status F7(H) : F7 status F8(H) : F8 status
10(H) : Layer 1 status has changed			
02(H) : Frame transmission request	00(H)	Number of transmitted data bytes (Max. 255 bytes)	NT mode C1(H) : G1 status C2(H) : G2 status C3(H) : G3 status C4(H) : G4 status
20(H) : Frame reception indication	See note 3	Number of received data bytes (Max. 255 bytes)	
03(H) : TEI assignment request	Assigned TEI value	00(H)	
04(H) : Layer 1 de-activation request	See note 4	See note 2	
05(H) : Loop back mode request	00(H)	00(H)	Refer to the “Layer 1 Activation/ Deactivation Procedure” later in this chapter.
06(H) : NT mode initialization request	00(H)	00(H)	
EE(H) : Communication error	See note 5	00(H)	

The data “FF FF FF FF” indicates the end of the data.

Notes

1. Status Register Value

Data (Hex)	Description
1E or 1C	Deactivated or standby
02 or 00	INFO0 signal received
0E or 0C	Not connected
1A or 18	Error status
12 or 10	Non-synchronized signal received
22 or 20	INFO2 signal received
32 or 30	Priority high
36 or 34	Priority low
3E or 3C	Terminated

2. Command Register Value

Data (Hex)	Description
00	No command requested
40	Standby request
44	Reset request
60	Priority change request (High priority)
64	Priority change request (Low priority)
7C	Termination request

3. Received Frame Status Register

Bit 7 - Not used
Bit 6 - 0: Normal, 1: Received data overflow
Bit 5 - 0: Normal, 1: CRC error
Bit 4 - 0: Normal, 1: Received frame aborted
Bits 3 to 0: Not used

4. Interrupt Status Register

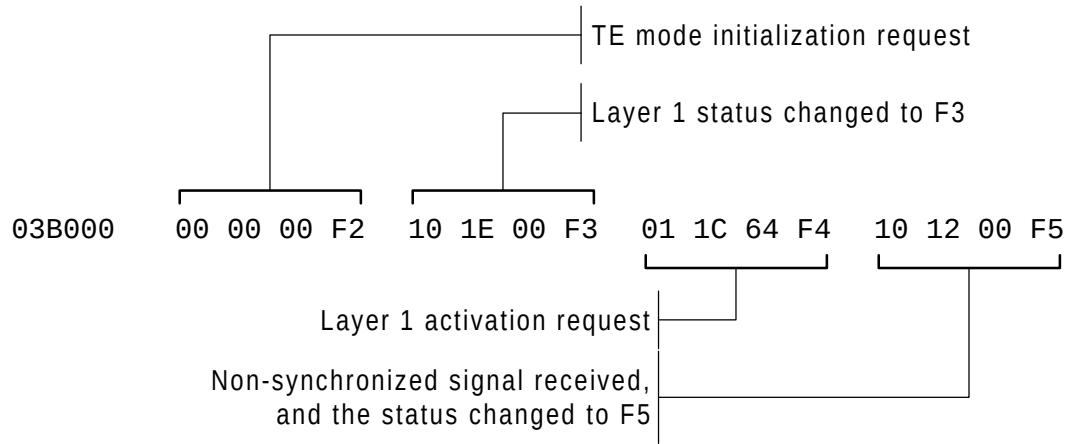
Bit 7 - 0: Normal, 1: Frame received
Bit 6 - 0: Normal, 1: Receive buffer full
Bit 5 - Not used
Bit 4 - 0: Normal, 1: Transmission buffer full
Bit 3 - Not used
Bit 2 - 0: Normal, 1: Layer 1 status has changed
Bit 1 - Not used
Bit 0 - 0: Normal, 1: Communication error

5. Communication Error Status Register

Bit 7 - 0: Normal, 1: Frame resend
Bit 6 - 0: Normal, 1: Transmission underrun
Bit 5 - Not used
Bit 4 - 0: Normal, 1: Transmission pool overflow
Bits 3 to 0 - Not used

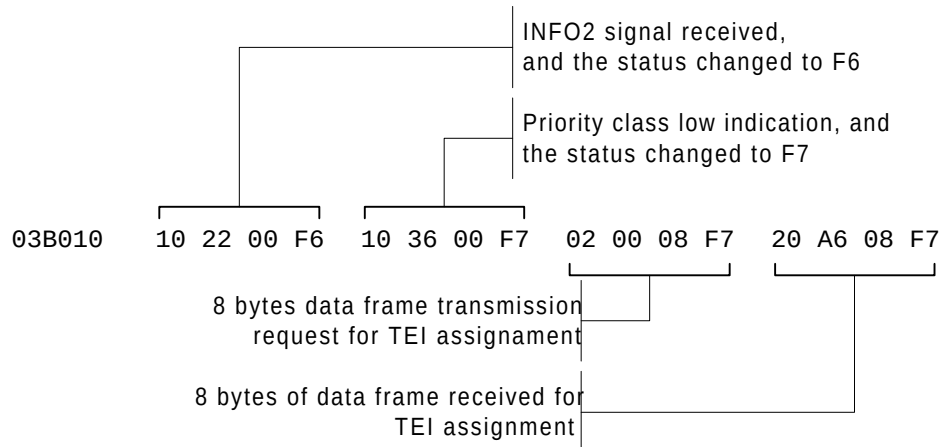
1.2.2. Reading the Sample Dump List

Line #1



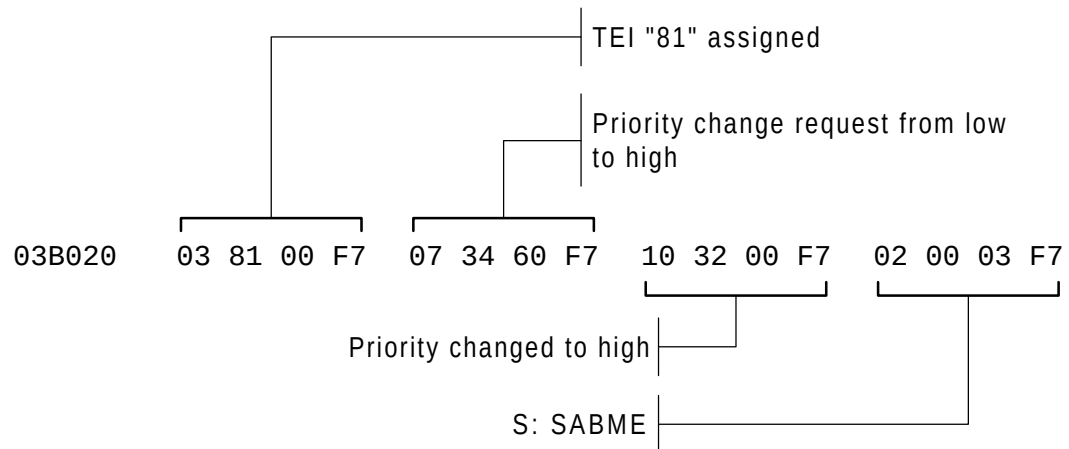
H143X502.wmf

Line #2



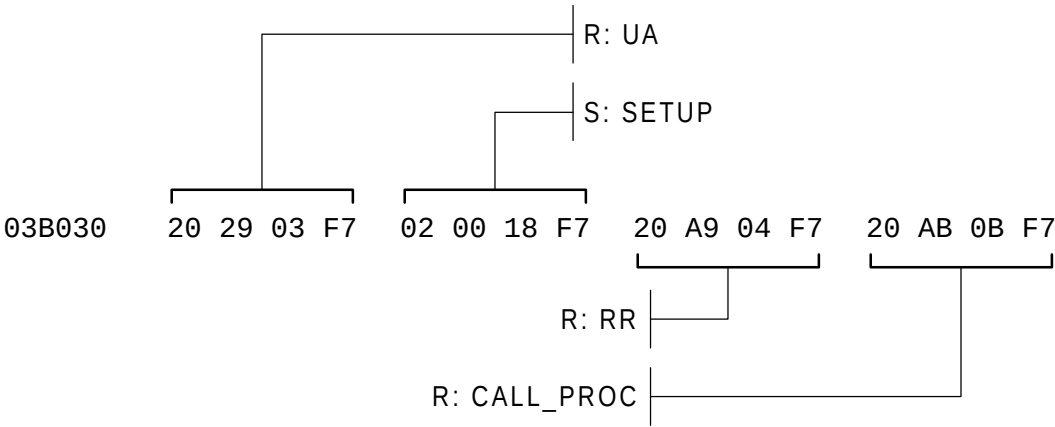
H143X503.wmf

Line #3



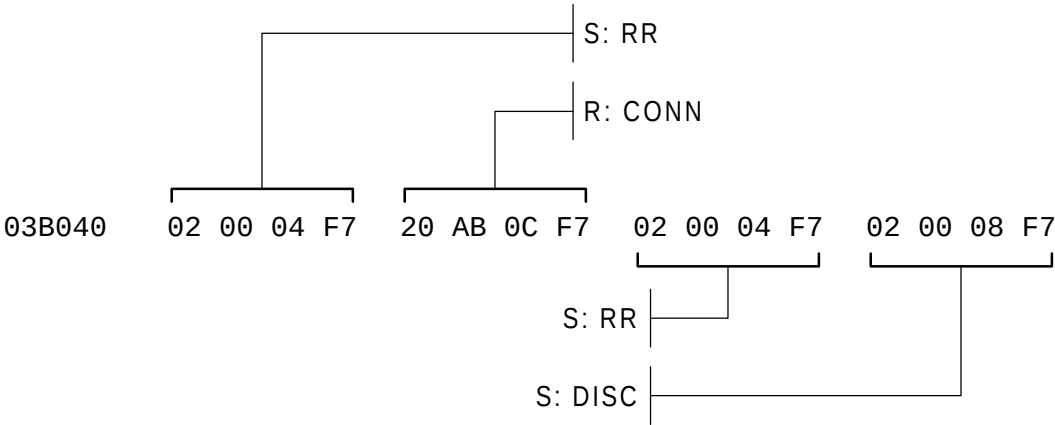
H143X504.wmf

Line #4



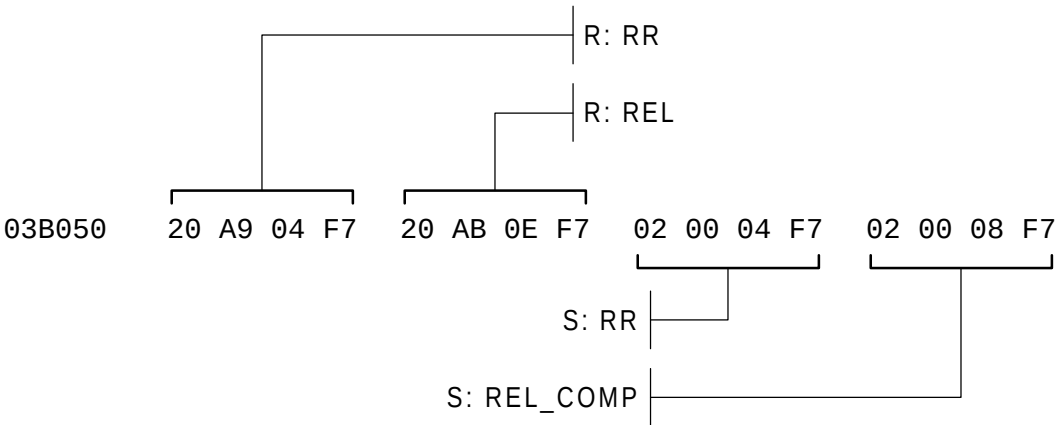
H143X505.wmf

Line #5



H143X506.wmf

Line #6



H143X507.wmf

APPENDIX
A, B & C

1.2.3. Layer 1 Status

The ITU-T I.430 recommendation (the basic user-network interface - Layer 1 specification) specifies layer 1 activation/deactivation procedures.

Before understanding the procedures, the status and INFO signals should be noted.

TE (Terminal Equipment) Status

Status	Description
F1	TE is turned off.
F2	TE is turned on, but no signal is exchanged.
F3	TE is stopped. No signal is exchanged between TE and NT.
F4	TE is waiting for the response to INFO1 signal from NT.
F5	TE is checking if the signal from the NT is INFO2 or INFO4.
F6	TE is waiting for signals from NT after receiving INFO2 signal.
F7	TE and NT are in synchronized condition.
F8	TE has failed to synchronize to NT, and waiting for the stop request from NT

NT (Network Termination) Status

Status	Description
G1	NT is stopped.
G2	NT is sending INFO2 signal.
G3	TE and NT are in synchronized condition.
G4	NT is terminating itself.

INFO Signals

NT to TE Direction		TE to NT direction	
INFO0	No signal (11111111...)	INFO0	No signal (11111111...)
INFO2	Activation signal in synchronized condition (B=0, D=0, E=0, A=0)	INFO1	Activation signal in non-synchronized condition (+0-0111111+0-0)
INFO4	Synchronized frame	INFO3	Synchronized frame

1. Activation Procedure from the TE

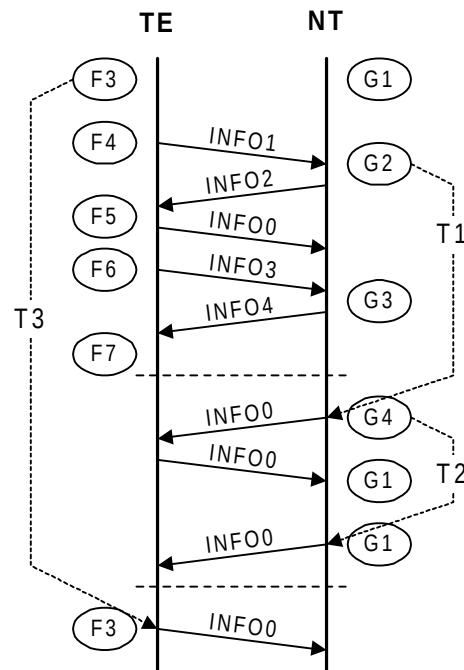
In idle “F3” status, the TE send the INFO1 signal to the NT and changes to “F4” status. The NT then changes to “G2” status and sends INFO2 signal to the TE.

The TE changes to “F5” status and stops sending signals to synchronize itself to the signal from the NT.

After the TE has synchronized to the signal, it sends INFO3 signal to the NT and changes to the “F6” status.

The NT then changes to “G3” status and sends INFO4 signal back to the TE to inform that a physical link has been established.

The timers T1, T2 and T3 are used to reset the TE or NT if a correct re-sponse has not received before the timers expire.



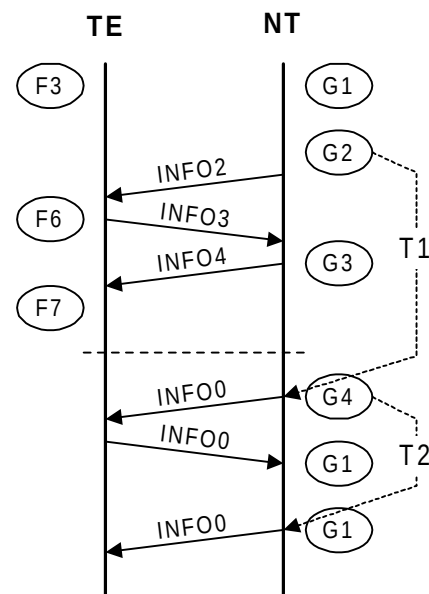
2. Activation ProcEDURE from the NT

The procedure starts from the NT by sending INFO2 signal to the TE.

After the TE has synchronized to the signal, it sends INFO3 signal to the NT and changes to the “F6” status.

The NT then changes to “G3” status and sends INFO4 signal back to the TE to inform that a physical link has been established.

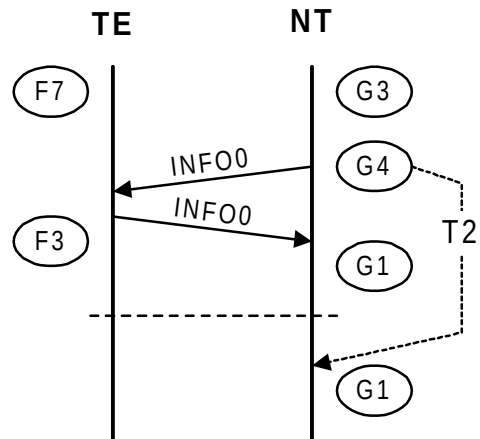
The timers T1 and T2 are used to reset the NT if a correct response has not received before the timers expire.



3. Termination Procedure from the NT

The termination procedure starts from synchronized status ("F7" status for the TE and "G3" status for the NT).

To terminate the physical connection, the NT just stops sending signals and changes to "G1" status. (The INFO0 signal means no signal is sent from the NT.) Then, the TE also stops sending signals and changes to "F3" status.



APPENDIX B

1. G4 Parameter Locations

1.1. Initial Programming Items Comparison List

Note: The model "CGO" is only for the US and Taiwan markets.

Item	CFO	LHO/CGO	FX4	Type 250
Country code	U: F-61	U: F-61		
Own analog number	U: F-61	U: F-61	U: F-61	U: Key Op.
Area code prefix	U: F-61	U: F-61		
Own ISDN-G4 number	U: F-61	U: F-61	U: F-61	U: Key Op.
Own ISDN-G3 number	U: F-61	U: F-61	U: F-61	U: Key Op.
Next transfer station	U: F-61	U: F-61		
G4 internal switches	S: F-18-01	S: F-18-01	S: F-17-01	S: F-01-6
G4 parameter switches	S: F-18-02	S: F-18-02	S: F-17-02	S: F-01-7
Data network international prefix	S: F-18-03	S: F-18-03		
ISDN international prefix	S: F-18-04	S: F-18-04	S: F-17-03	S: F-12-1
G4 subscriber number 1	S: F-18-05	S: F-18-05	S: F-17-04	S: F-12-2
G4 subscriber number 2	S: F-18-06	S: F-18-06	S: F-17-05	S: F-12-3
IG3 subscriber number 1	S: F-18-07	S: F-18-07	S: F-17-06	S: F-12-4
IG3 subscriber number 2	S: F-18-08	S: F-18-08	S: F-17-07	S: F-12-5
Internal Access Unit 1	S: F-18-09	S: F-18-09		
Internal Access Unit 2	S: F-18-10	S: F-18-10		
G4 subaddress	S: F-18-11	S: F-18-11	S: F-17-08	S: F-12-6
IG3 subaddress	S: F-18-12	S: F-18-12	S: F-17-09	S: F-12-7
G4 terminal ID	S: F-18-13	S: F-18-13	U: F-61	U: Key Op.
IG3 CSI	S: F-18-14	S: F-18-14	U: F-61	U: Key Op.
G4 dump 1 (RAM dump)	S: F-18-15	S: F-18-15	S: F-17-10	S: F-06-4
G4 dump 2 (Protocol dump)	S: F-18-16	S: F-18-16	S: F-17-11	S: F-05-2
G4 parameter list	S: F-18-17	S: F-18-17	S: F-17-12	S: F-02-2
Service level password	1991	1991	1995	1988-Start

U: User level function

S: Service level function

Key Op.: Key operator mode (User Tools - Fax - 6 - #)

1.2. Switch Locations Comparison List

Note: The model "CGO" is only for the US and Taiwan markets.

1. Communication Parameter Display

Model	Switch Location	Setting
CFO	Bit switch 00, bit 7	0: Off, 1: On
LHO/CGO	Bit switch 00, bit 7	0: Off, 1: On
FX4/Type 250	System switch 00, bit 5	0: Off, 1: On

2. Default Communication Mode

Model	Switch Location	Setting
CFO	000153(H), bit 2	0: G3, 1: G4
LHO/CGO	080053(H), bit 2	0: G3, 1: G4
FX4/Type 250	System switch 0A, bit 0	0: G3, 1: G4

3. Network Used for G3 Transmission

Model	Switch Location	Setting
CFO	000153(H), bit 3	0: PSTN, 1: ISDN
LHO/CGO	080053(H), bit 3	0: PSTN, 1: ISDN
FX4/Type 250	System switch 0A, bit 6	0: PSTN, 1: ISDN

4. Network Used for G3 transmission in G4-to-G3 Fallback

Model	Switch Location	Setting
CFO	000153(H), bit 3	0: PSTN, 1: ISDN
LHO/CGO	080053(H), bit 3	0: PSTN, 1: ISDN
FX4/Type 250	System switch 0A, bit 7	0: PSTN, 1: ISDN

5. Automatic G4-to-G3 Fallback

Model	Switch Location	Setting
CFO	00015C(H), bit 0	0: Enabled, 1: Disabled
LHO/CGO	08005C(H), bit 0	0: Enabled, 1: Disabled
FX4/Type 250	Communication switch 07, bit 0	0: Enabled, 1: Disabled

6. Specified Two Step Transfer

Model	Switch Location	Setting
CFO	00015C(H), bit 1	0: Disabled, 1: Enabled
LHO/CGO	08005C(H), bit 1	0: Disabled, 1: Enabled

FX4/Type 250	Function not available	

7. Cable Equalizer for ISDN Transmission

Model	Switch Location	Setting		
CFO	Bit switch 08, bits 6 and 7	Bit 7	Bit 6	Setting
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High
FX4/Type 250	G3 switch 09, bits 0 and 1	Bit 1	Bit 0	Setting
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High

8. Cable Equalizer for ISDN Reception

Model	Switch Location	Setting		
CFO	Bit switch 0A, bits 6 and 7	Bit 7	Bit 6	Setting
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High
FX4/Type 250	G3 switch 09, bits 2 and 3	Bit 3	Bit 2	Setting
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High

APPENDIX C

1. Conditions for Receiving a Call

BC: Bearer Capability

HLC: Higher Layer Compatibility

SA: Subaddress

Tx Terminal	Setup			Response	Condition
	BC	HLC	Called No./ Called SA		
				G4 reception	
				G4 reception	If called no. and called subaddress match the G4 subscriber no.
				No response	If called no. and called subaddress do not match the G4 subscriber no.
				G4 reception	If G4 Parameter Switch 01, bit 1 = 0.
				No response	If G4 Parameter Switch 01, bit 1 = 1.
				G4 reception	If called no. and called subaddress match the G4 subscriber no.
				No response	If called no. and called subaddress do not match the G4 subscriber no.

Tx Terminal	Setup			Response	Condition
	BC	HLC	Called No./ Called SA		
				G3 reception	
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
				G3 reception	If G4 Parameter Switch 01, bit 1 = 0.
				No response	If G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.

Conditions for Receiving a Call

Tx Terminal	Setup			Response	Condition
	BC	HLC	Called No./ Called SA		
				G3 reception	
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
				No response	If G4 Internal Switch 14, bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 0.
				G3 reception	If G4 Internal Switch 14, bit 0 = 1, and G4 Parameter Switch 01, bit 1 = 0
				No response	If G4 Internal Switch 14, bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, bit 0 = 1, and G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.

Tx Terminal	Setup			Response	Condition
	BC	HLC	Called No./ Called SA		
				No response	
				No response	
				No response	If G4 Internal Switch 14, bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 0.
				G3 reception	If G4 Internal Switch 14, bit 0 = 1, and G4 Parameter Switch 01, bit 1 = 0
				No response	If G4 Internal Switch 14, bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, bit 0 = 1, and G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
				No response	
				No response	
				G3 reception	If G4 Parameter Switch 01, bit 1 = 0.
				No response	If G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.

**PRINTER
CONTROLLER
(A643)**

1. OVERALL INFORMATION

1.1 INTRODUCTION

1.1.1 Hardware

The controller adds printer functions to the machine.

The controller has a PCL 5e command interpreter, and the optional printer enhancement unit has a PostScript Level 2 command interpreter.

A hard disk is also available as an optional device for the printer; it is used for storing the PostScript fonts (downloaded from a PC or Macintosh) and the print data for sorting print outs.

The controller has 2 slots for SIMM modules. Up to 32 MB (16 MB x 2) of memory can be installed to improve the printer performance. This will allow for faster image processing, and complex graphics printing without print over run errors.

1.1.2 Software

The following software (driver and utilities) are provided for controlling the printer.

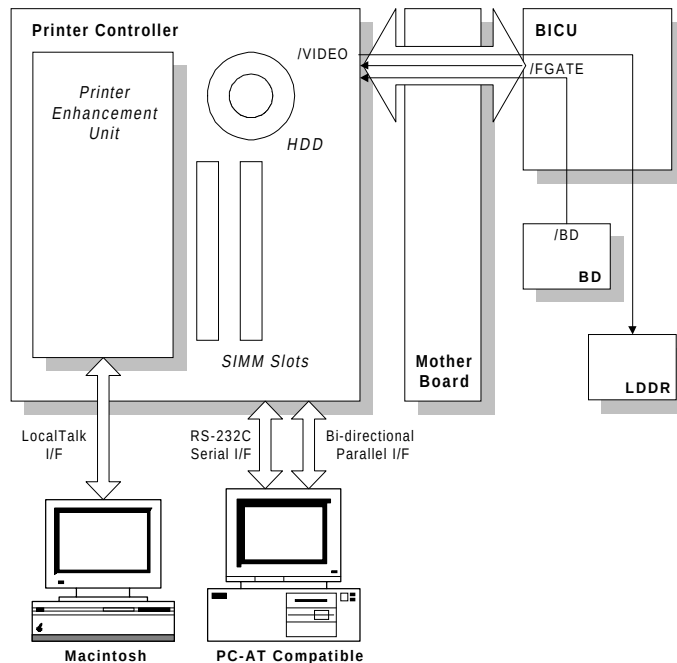
Software	Function
HostPanel for DOS	Gives the user a way to change printer settings, and a way to monitor the printer status under DOS on a PC.
WinPanel for Win 3.1, Win 95	Allows the user to monitor the printer status on a PC with Windows 3.1 or Windows 95 (two separate programs).
PCL driver for Win 3.1, Win 95	Printer driver for using the machine in PCL 5e emulation mode (two separate drivers).
PS2 Driver for Win 3.1, Win 95	Printer driver for using the machine in PostScript Level 2 emulation mode. (two separate drivers)
PPD file for Macintosh	PostScript Printer Description file.

1.2 CONTROLLER SPECIFICATIONS

Item	Specifications
Resolution	300 x 300 dpi, 600 x 600 dpi (selectable)
Smoothing	Yes
Toner Saving Mode	Yes
RAM Capacity	2 MB (Standard) 4 MB (with optional printer enhancement unit) 2 SIMM Slots for 1/2/4/8/16 MB
Emulation	Printer Controller: PCL 5e (LaserJet 4M+) Printer Enhancement Unit (option): PostScript Level 2 (LaserJet 4M+)
Resident Fonts	Printer Controller: 35 Intellifont fonts 10 True Type fonts 1 Bitmap font Printer Enhancement Unit (option): 35 Type 1 fonts
Paper Size	Available from paper cassette: 11" x 17" (L), 8 1/2" x 14" (L), 8 1/2" x 11" (L/S), Executive (L/S), A3 (L), B4 (L), A4 (L/S), B5 (L/S), A5 (S), Folio (L), Foolscap (L), F (L), Free Size (W: 182 - 297 mm/7.2 - 11.7", L: 148 - 432 mm/5.8 - 17") Available from bypass tray: 11" x 17" (L), 8 1/2" x 14" (L), 8 1/2" x 11" (L), 5 1/2" x 8 1/2" (L), Executive (L), A3 (L), B4 (L), A4 (L), B5 (L), A5 (L), Folio (L), Foolscap (L), F (L), Postcard (L), Double Postcard (L), Com 10Env (L), MonarchEnv (L), B5 Env (L), C5 Env (L), C6Env (L), DLEnv (L), Free Size (W: 90 - 297 mm/3.5-11.7", L: 148 - 432 mm/5.8 - 17") Available from duplex tray: 11" x 17" (L), 8 1/2" x 14" (L), 8 1/2" x 11" (L/S), Executive (L/S), A3 (L), B4 (L), A4 (L), B5 (L/S), A5 (S), Folio (L), Foolscap (L), F (L) Note: Duplex printing is not available if the bypass tray is selected.
Host Interface	Printer Controller: Bi-Centronics Parallel Interface x1 RS-232C Serial Interface x1 Printer Enhancement Unit (option): Local Talk Interface x1
Printer Controller Optional Units	Printer Enhancement Unit Hard Disk Drive (540 MB 2.5" IDE) Ethernet, Token Ring (IPX/SPX, TCP/IP)

2. DETAILED SECTION DESCRIPTIONS

2.1 BLOCK DIAGRAM (OVERALL)



PRINTER
CONTROLLER

The printer controller is located between the host PC and the machine, and performs the following functions.

Host Interface

- Receives data (consisting of image data and device control codes such as tray selection, duplex print, and resolution selection)
- Sends the machine status, such as error conditions and the paper size loaded in the trays, using the bi-directional parallel interface.
- Handshakes with the PC

NOTE: The printer status can be monitored only when the HostPanel or WinPanel utility is installed on the PC, and the controller and the PC are connected with a bi-centronics cable. If the utility is not installed, or the other interfaces (RS-232C or LocalTalk) are used for connection to the PC or Macintosh, this feature is not available.

Internal Controller

- Buffers data received from the PC
- Processes the data sent from the PC and converts the video data using the PCL or PostScript interpreter accordingly (toner saving and edge enhancement functions affect the data when processing.)
- Emulation switching (PS/PCL) if auto switching mode is selected when the printer enhancement unit is installed
- Auto input tray switching

Machine Interface

The function of these signals are as follows.

- Receives status data from the machine
- Receives timing signals for horizontal and vertical image synchronization
- Sends commands to the machine (e.g. tray selection, front panel display in printer mode)
- Sends the video data.

Note that the video data is sent through the BICU, and directly drives the laser diode. That is, all of the data processing is performed by the controller, and the BICU's processing functions are not used.

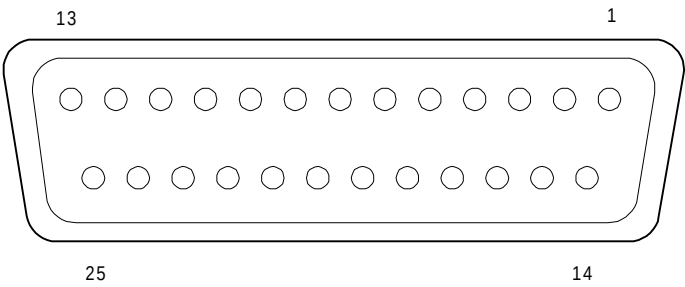
Bi-Directional Parallel Interface



The bi-directional parallel interface on the controller works in the 3 modes; compatible, nibble, and ECP modes (these modes are standardized by IEEE 1284).

SIGNAL PIN	SIGNAL NAME		
	STD (I/O)	NIBBLE (I/O)	ECP (I/O)
1	/STROBE (I)	/STROBE (I)	HostClk (I)
2-9	DATA1-8 (I)	NOT USED	DATA1-8 (I/O)
10	/ACK (O)	PtrClk (O)	PeriphClk (O)
11	BUSY (O)	PtrBusy (O)	PeriphAck (O)
12	PE (O)	AckDataReq (O)	/AckReverse (O)
13	SELECT (O)	Xflag (O)	Xflag (O)
14	/AUTOFEED (I)	HostBusy (I)	HostAck (I)
15	NC	<--	<--
16	GND	<--	<--
17	CHASSIS GND	<--	<--
18	NC	<--	<--
19-30	GND	<--	<--
31	/INIT (I)	/INIT (I)	/ReverseRequest (I)
32	/ERROR (O)	DataAvail (O)	/PeriphRequest (O)
33	GND	<--	<--
34	NC	<--	<--
35	+5V	<--	<--
36	/SELECTIN (I)	1284Active (I)	1284Active (I)

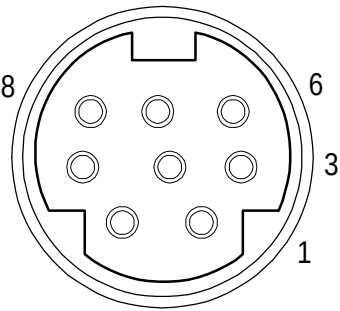
RS-232C Interface



A 25 pin D-SUB female connector (ISO 2110)

PIN NO.	SIGNAL NAME	DESCRIPTION
2	STXD	Serial transmit data
3	SRXD	Serial receive data
4	+10V	
6	SDSR	Data set ready
20	SDTR	Data terminal ready

LocalTalk interface



An 8 pin female connector (DIN-8).

PIN NO.	SIGNAL NAME	DESCRIPTION
1	GND	
2	HSK (I)	Handshake
3	TXD- (O)	Transmit data –
4	GND	Signal ground
5	RXD- (I)	Receive data –
6	TXD+ (O)	Transmit data
7	N.C.	No connection
8	RXD+ (I)	Receive data +

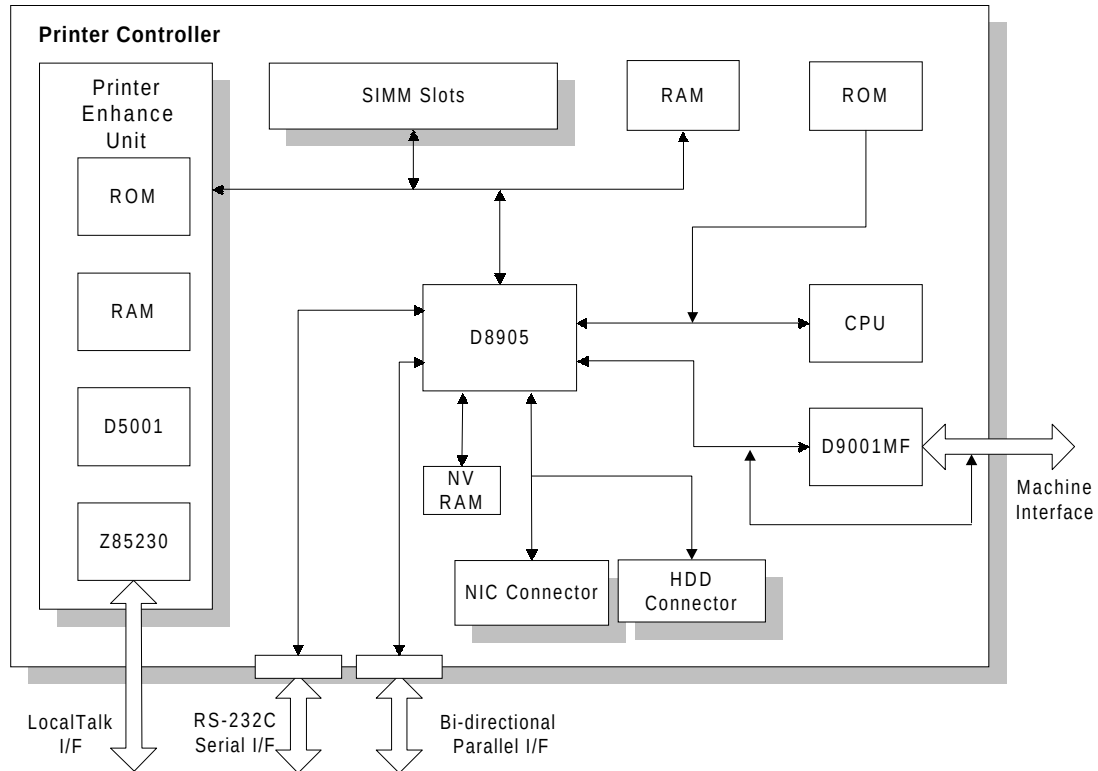
2.2.2 Machine Interface

The pin assignment of the interface is as follows.

PIN NO.	SIGNAL NAME	DESCRIPTION
A1	/EBD (I)	Beam detection signal sent from the machine. Used for line synchronization.
A2	EVDO (O)	Binary video data. Goes through the BICU to LDDR.
A3	/EVSYNC (I)	Vertical gate signal made by the BICU according to the selected paper size.
A4	/ESTS (I)	Status line from the machine.
A5	ECMD (O)	Command line to the machine.
A6-10	VCC	Power supply from the machine.
B1-3	N.C.	No connection
B4	/ESBSY (O)	Indicates that the controller can receive the status.

PRINTER
CONTROLLER

2.3 BLOCK DIAGRAM (INTERNAL)



2.3.1 Printer Controller

CPU

An Intel i960JF-25 RISC CPU is used. A 50Mhz oscillator is used as the clock source for both the i960JF-25 and D8905. However, the clock is used by the i960JF-25 after it is divided by 2 (25Mhz). The PST5920 is used to provide the system reset for the CPU and D8905.

D8905

The D8905 is an ASIC which contain the following functions.

- DRAM controller
- Video controller
- ROM and I/O interface
- Three I/O DMA channels
- Interrupt controller
- Rotator
- Bi-directional parallel interface
- Two UARTs
- Decoder

D9001MF

The D9001MF is an ASIC which has the following functions.

- Normal mode, to carry out edge smoothing on 600 dpi video data
- Adaptive mode, to convert 300 dpi data to 600 dpi and perform edge smoothing
- Converts data for toner saving

RAM

Two Mbytes of DRAM are provided on the board. It consists of 4 pieces of 4 Mbit fast page mode DRAM (256k x 16 DRAM).

NV RAM

The board contains a 512-byte NV RAM. It is used for holding parameters (such as the baud rate, the printer name, and the default mode setting), that must be kept after the machine is switched off.

ROM

Two ROM chips (1M x 16) are used for storing the PCL code and font data, test page data, and multi-language display message codes for the front panel (4 megabytes). Page mode ROMs are used for optimum performance.

SIMM Slots

Two SIMM slots are provided for RAM expansion. 1, 2, 4, 8, or 16 MByte standard SIMM modules can be installed. As a result, up to 32 Mbyte of RAM are installable (16 Mbyte x 2).

NOTE: An identical SIMM must be installed in the second slot.

Network Interface

One interface slot is provided for installing a network interface card (NIC).

Parallel Interface

The D8905 provides a bi-directional parallel interface (IEEE 1284). To protect parallel communication from noise, the circuit for control signals (like STROBE and AUTOFEED) uses Schmidt trigger TTL.

Serial Interface

RS-232C is supported, using the UART provided in the D8905.

IDE Hard Disk Interface

Chip select and address lines from the D8905 are used for providing the necessary signals to the hard disk. The 16-bit IDE data line is connected to the D8905 for the byte-to-word packing.

Engine Interface

a second UART unit in the D8905 is used for serial communication with the machine.

Jumpers (Printer Controller Board)

JP1:

Default is open (factory use only)

JP2, JP3:

Both jumpers (JP2, JP3) must be shorted when the printer controller is installed without the printer enhancement unit. Both jumpers must be opened when the printer enhancement unit is installed.

JP4:

Switches between ROM types.

Open: Normal (OTP) ROM

Short: Page Mode (mask) ROM

Note: Normal (OTP) ROM has a label on the top of the chip to distinguish it from page mode (mask) ROM (which has no label).

2.3.2 Printer Enhancement Unit

D5001

A D5001 ASIC is used in this unit. It performs the following functions.

- Data compression/reconstruction
- Halftone painting
- Horizontal line filling
- Right and left edge clipping
- Line drawing with or without pattern

PRINTER
CONTROLLER

Z85230

The Z85230 is an enhancement serial communication controller (ESCC).

ROM

Two Mbytes of ROM are used for storing the PostScript Level 2 code and the font data.

RAM

Two Mbytes of DRAM are provided on the board. It consists of 4 pieces of 4 Mbit fast page mode DRAM (256k x 16 DRAM) as well as the printer controller. Together with the 2 MB DRAM on the printer controller, a minimum 4 Mbytes of memory is available when the printer enhancement unit is installed.

2.4 Hard Disk Drive

Operation

The disk is formatted if the "HD initialize" function is used (this is a user function). It takes about 15 minutes. "Formatting HD" is indicated during formatting. Two partitions are made when formatting. The ratio of the first to the second is 1:4. The first partition is for the PostScript fonts (downloaded outline fonts and cached bitmap fonts) and the second partition is for the sorting function.

To maintain the reliability of the disk drive and the head, if the hard disk is not accessed for more than 10 minutes, the controller stops the disk motor and does a seek operation (park the mag head). If inoperation continues, the seek operation is Repeated every 10 minutes.

If any bad sectors are detected during hard disk operation, the sector will be skipped. The controller will find the next good sector.

If the hard disk fails, the sort function will disappear when the machine is switched off/on. Also, the "HDD Installed" message will disappear from the test page.

2.5 Features

2.5.1 Sorting Function

If "Sorting" is turned on and a multicopy job is printed, the rendered image of each page in the job is stored on the disk first. The controller then sends page images to the machine page by page until all copies in this job are printed out.

If the face up tray is selected as the output tray, the page order sent to the engine will be reversed (last page first).

Even if "Sorting" is set to on, there are two cases in which the print job does not go through the hard disk. One case is when there is only one page in the print job and the face up output tray is selected. The other case is when there is only one set of pages in the print job and the face down output tray is selected.

2.5.2 Duplex Printing

If there is enough memory to store the data of six pages and the controller can process the data faster than the printing speed (this depends on the processed data), the printing sequence is the three-sheet batch mode. The printing sequence in this mode is as follows:

2nd page/4th page/1st page/6th page/3rd page/8th page/5th page/10th page...

If the memory or the controller does not satisfy the above conditions, the controller automatically shifts down the printing speed to the two-sheet batch mode or the one-sheet batch mode. (For double letter and A3 size paper, only one-sheet mode is available.) Each printing sequence is as follows.

Two-sheet batch mode:

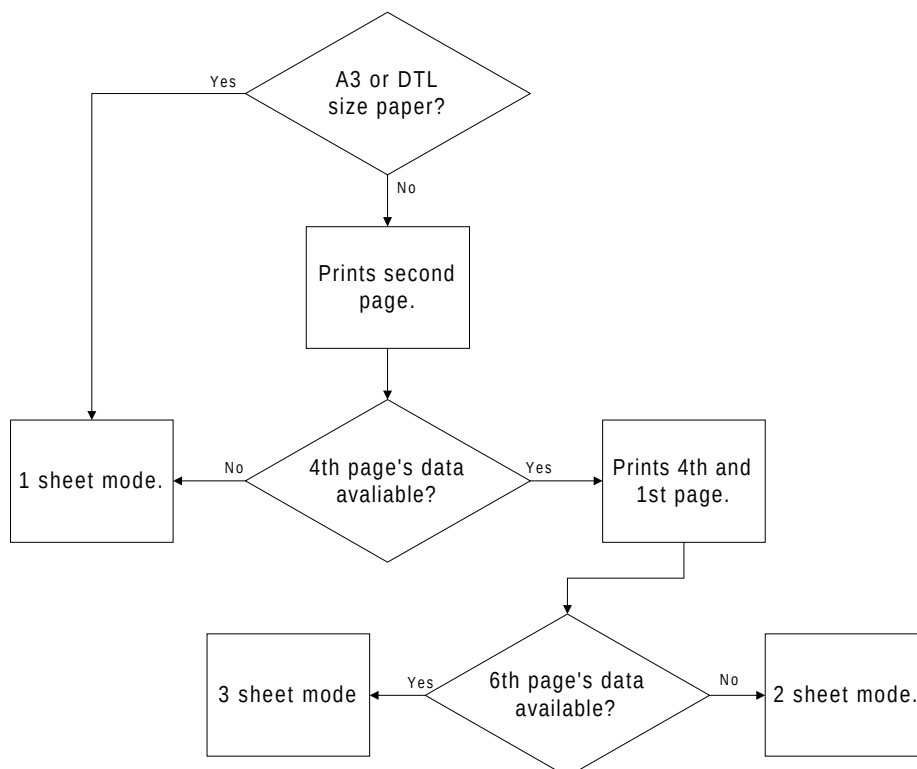
2nd page/4th page/1st page/3rd page/6th page/8th page/5th page/7th page/...

One-sheet batch mode:

2nd page/1st page/4th page/3rd page/6th page/5th page/...

NOTE: The printer controller goes through this determination sequence for each page, not just the first few. Therefore, the duplex batch mode may change several times during a single copy job, depending on the specific qualities of each page's data.

The following flow chart demonstrates this process for the first few pages.



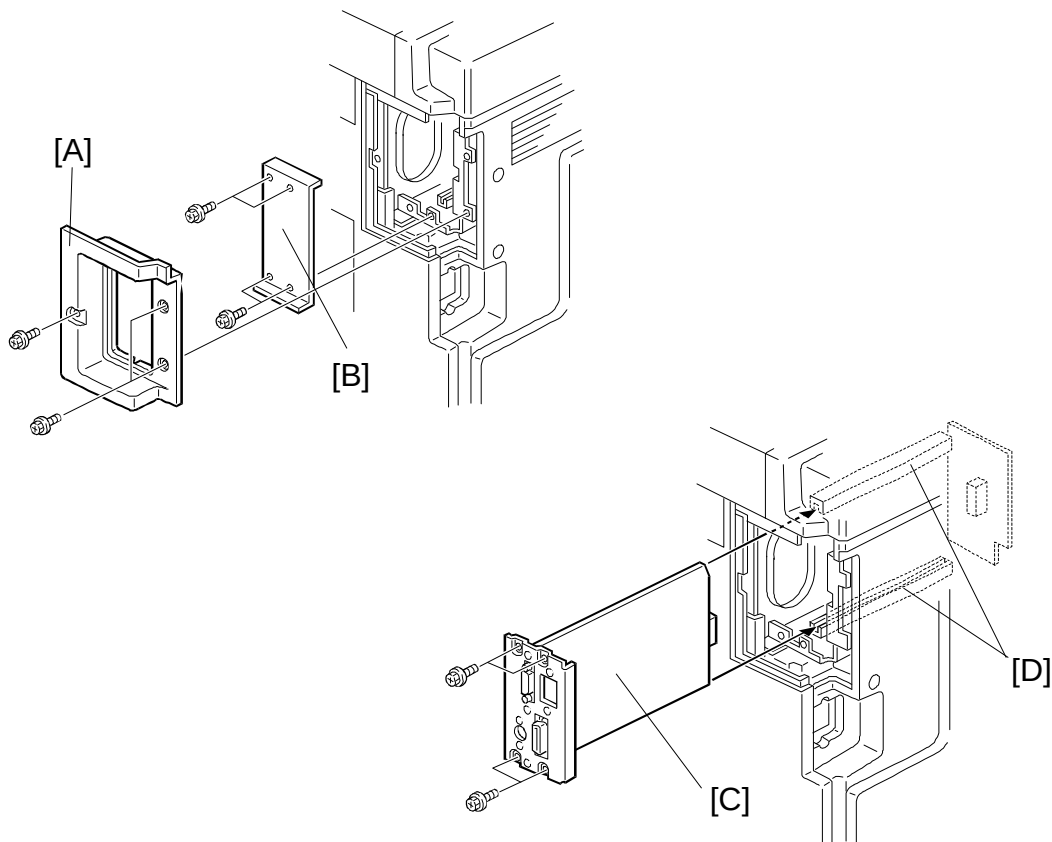
3. INSTALLATION

CAUTION

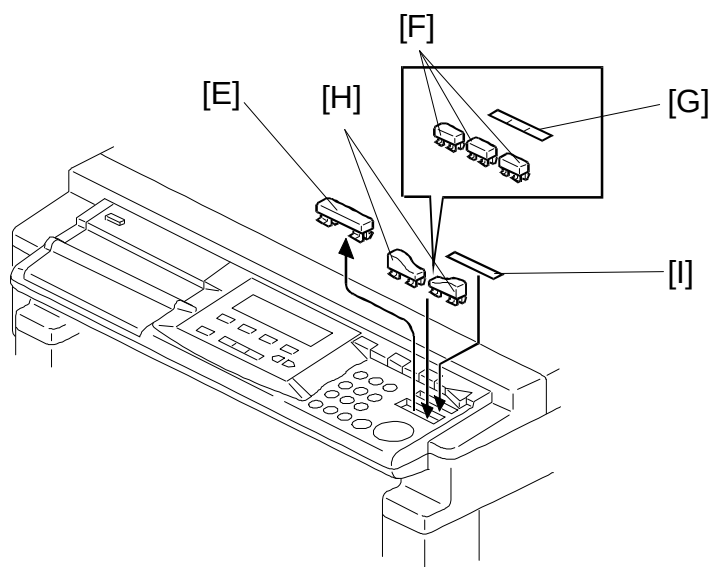
Before installing an optional unit, perform the following.

1. If a fax unit has been installed, print out all messages stored in the memory, the lists of user-programmed items, and the system parameter list.
2. Turn off the main and the ac switches, and disconnect the power cord.

3.1 PRINTER CONTROLLER



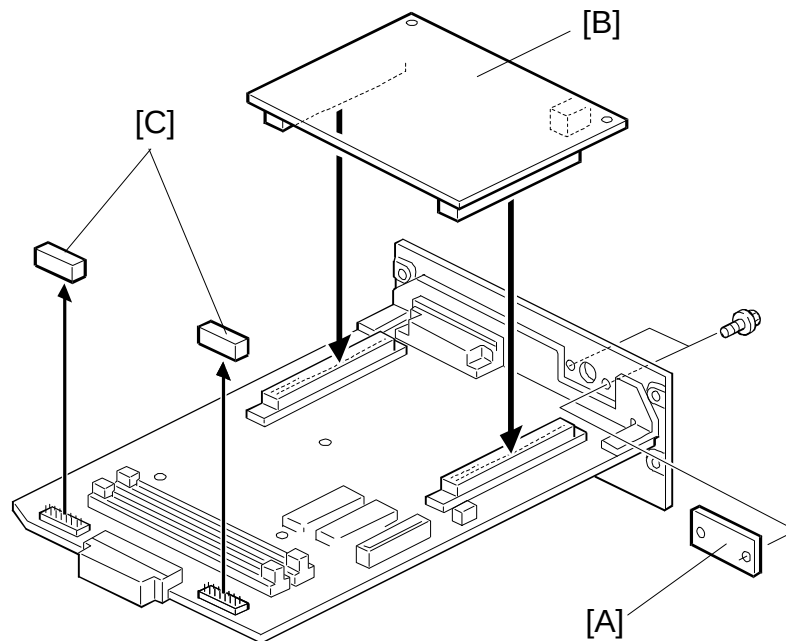
1. Remove the interface cover [A] (3 screws), and the inner cover [B] (4 screws).
2. Install the controller board [C] along the guides [D] (4 screws).
3. Replace the interface cover [A] (3 screws).



PRINTER
CONTROLLER

4. Remove the key [E].
5. If the machine has the facsimile option, install the three (3) $\frac{1}{3}$ size keys [F] and the decal [G] as shown. The decal [G] has "Copy", "Printer", and "Facsimile" printed on it. If the machine does not have the facsimile option, install the two (2) $\frac{1}{2}$ size keys [H] and the decal [I] as shown. The decal [I] has "Copy" and "Printer" printed on it.

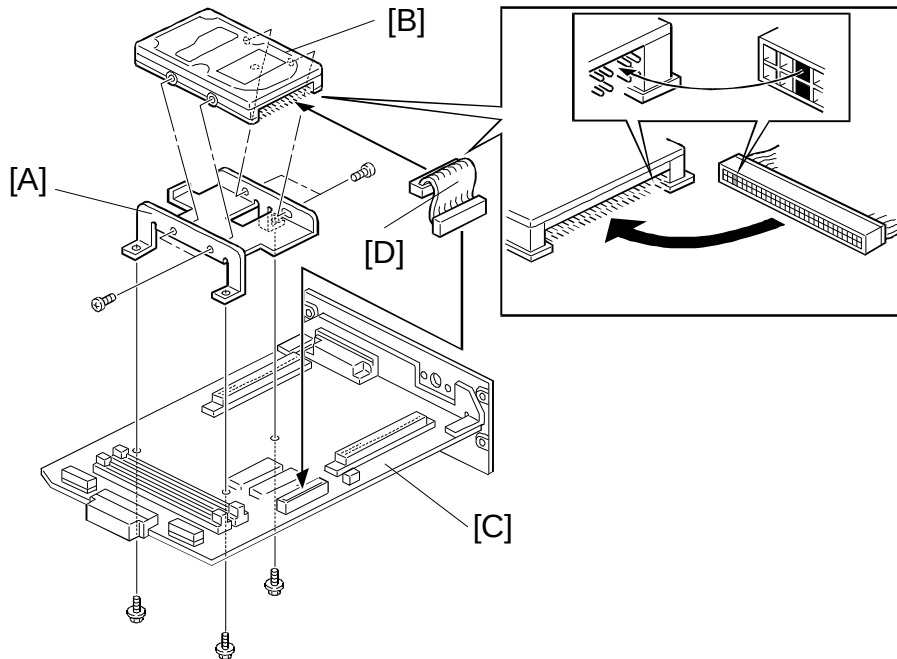
3.2 PRINTER ENHANCEMENT UNIT



NOTE: If the printer controller is already installed, remove the printer controller to install the printer enhancement unit option.

1. Remove the bracket [A] (2 screws).
2. Connect the printer enhancement unit [B] (2 connectors).
3. Remove the two short pins [C] from JP2 and JP3 on the printer controller board.
4. Install the printer controller along the guides (4 screws). (See 3.1. Printer Controller.)
5. Replace the interface cover (3 screws). (See 3.1. Printer Controller.)

3.3 HARD DISK DRIVE



PRINTER
CONTROLLER

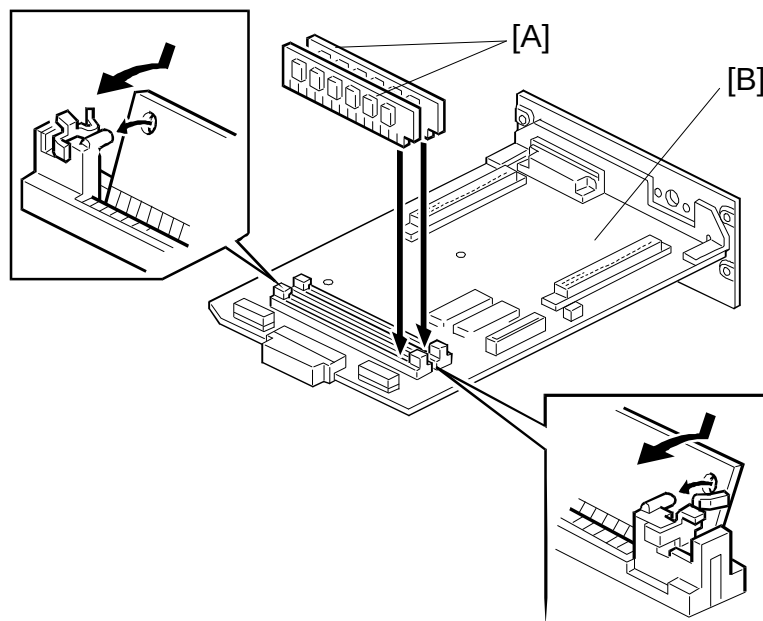
NOTE: If the printer controller is already installed, remove the printer controller to install the hard disk drive.

1. Attach the bracket [A] to the hard disk drive [B] (4 screws).
2. Attach the hard disk drive assembly to the controller board [C] (3 screws).
3. Connect the flat cable connector [D] from the hard disk drive assembly to the controller board.

NOTE: Two of the holes on one end of the cable connector are filled with pins. Connect this end of the cable to the Hard Disk Drive.

4. Install the printer controller assembly along the guides (see 3.1. Printer Controller).
5. Replace the interface cover (see 3.1. Printer Controller).

3.4 SIMM MODULE



- NOTE:** 1) If the printer controller is already installed, remove the printer controller to install the SIMM module.
- 2) Before install the SIMM module, confirm that it satisfies the requirements below.

SIMM Requirements

Type	PC Compatible
Number of pins	72
Access speed	70 ns or faster
Capacity	1, 2, 4, 8, or 16 MB
Parity	Any OK

1. Install the SIMM module(s) [A] in the slot(s) (J1, J2) on the printer controller [B].

NOTE: If you install only one SIMM module, it may be installed in either slot J1 or J2. If a second SIMM is installed, both SIMMs must be identical.

2. Install the printer controller along the guides (4 screws). (See 3.1. Printer Controller.)
3. Replace the interface cover (3 screws). (See 3.1. Printer Controller.)

3.5 CONNECTING THE INTERFACE CABLE

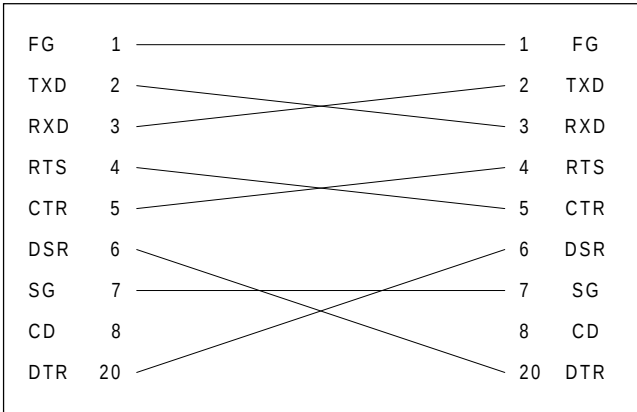
3.5.1 Parallel Interface

A bi-directional parallel cable is required to connect the printer controller to a host PC parallel port.

3.5.2 Serial (RS-232C) Interface

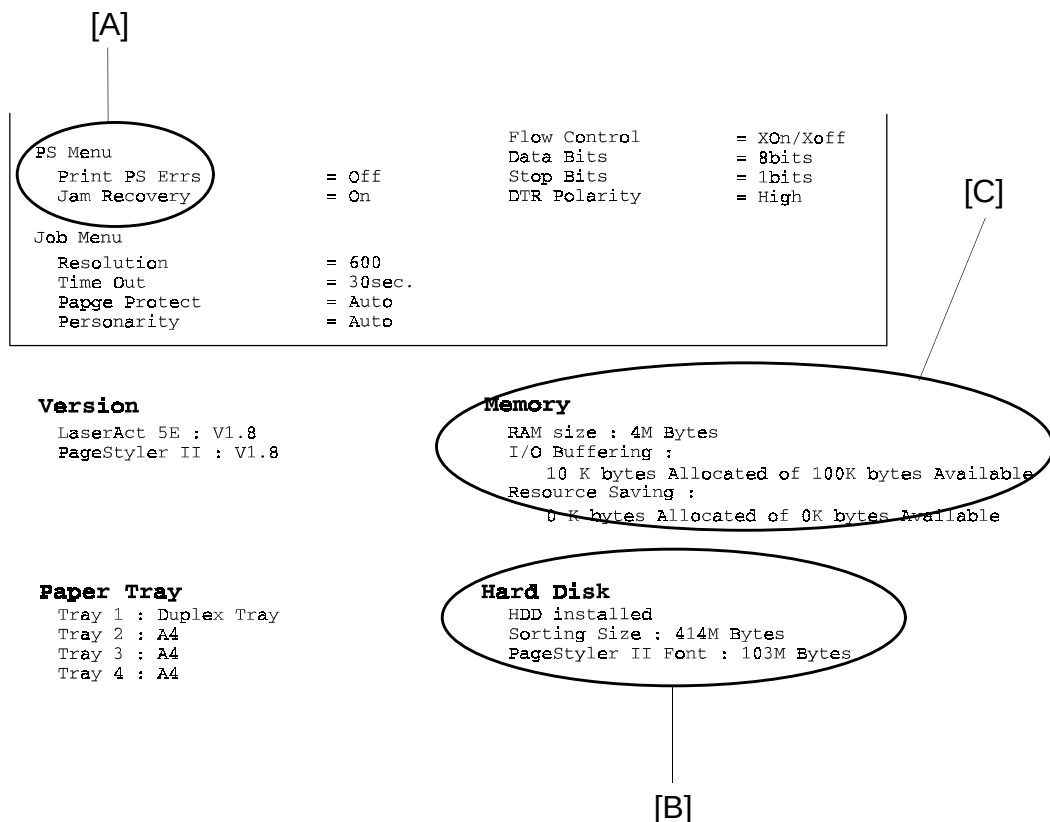
An RS-232C cross cable is required to connect the printer controller to a host PC serial port.

The figure below shows the wiring diagram of the RS-232C cross cable.



3.5.3 LocalTalk Interface

A LocalTalk cable is required to connect the Printer Enhancement Unit to a host Macintosh printer port.



Check the following:

- For the Printer Controller, confirm that the machine prints the test page
- For the Printer Enhancement Unit, confirm that the test page includes "PS Menu" [A] in the "Settings" box.
- For the Hard Disk Drive, confirm the test page includes "HDD installed" [B].
- For the SIMM Module, confirm that "RAM SIZE" [C] printed on the test page shows the size of the module just installed, plus 2 MBytes (without Printer Enhancement Unit), or plus 4 MBytes (with Printer Enhancement Unit)?

If any problems occur in the above steps, reinstall the printer controller and other options, then redo the tests.

3.6.2 Connection Between Printer Controller (Printer Enhancement Unit) and Host PC or Macintosh

Important:

It is not recommended for service technicians to operate the customer's computer. This is to avoid any liability of loss to the customer's data files.

The following procedures are explained only for testing purposes.

– DOS Based Computers –

1. Make sure that the printer cable is properly connected.
2. Turn on the machine, then turn on the computer.
3. Press the printer key to select the printer mode.
4. Make sure that the printer controller is online (indicating "Ready PCL" or "Ready Auto").
5. After DOS has started, type the following at the C:/> prompt:
 PRINT CONFIG.SYS (then return)
 The computer displays the following:
 NAME OF LIST DEVICE (PRN); (then return)
 Then, type the following:
 LPT1: (then return)
 The config.sys file will be printed from the machine.

2. Mac OS Computer

1. Make sure that the printer cable is properly connected.
2. Turn on the machine, then turn on the computer.
3. Press the printer key to select the printer mode.
4. Make sure that the printer controller is online (indicating "Ready Auto").
5. After Mac OS completes the initialization, make sure that LocalTalk is selected as a network connection method. (To check it, select "Apple Menu"/"Control Panel"/"Network".)
6. At the computer open the "Chooser" window in the "Apple Menu". Make sure that AppleTalk is active. Select the LaserWriter8 driver and the printer named "Aficio 200" .
7. Select the print screen in the file menu and click OK.
8. A hard copy of the screen will be printed.

PRINTER
CONTROLLER

4. SERVICE TABLES AND PROCEDURES

4.1 SERVICE REMARKS



GENERAL CAUTION

Do not turn off the machine or switch the controller off line when the data LED is blinking or is lit or the data which has been sent to the controller will be lost. If you need to do this, ask the customer for consent.

4.1.1 Hard Disk Initialization

The controller has a "HD initialize" function (if an optional hard disk is installed). If the "HD initialize" function is used, the downloaded fonts stored on the disk will be erased.

4.1.2 About Settings

- Even if you set the operation mode at the front panel, the software setting always overrides it. When you check the printer function by printing from the host, be sure that the appropriate setting has been made by the software.
- If you replace the controller or use the "Menu Reset" function, the settings will be reset to the factory defaults. So you need to print the test page before doing this to have a list of the current settings. Then set each menu item to the previous settings.

5. TROUBLESHOOTING

General Information

To solve a problem, you need to classify the cause of the problem into one of the following groups.

1. Operation

- a. Machine setting error
- b. User application setting error

2. Hardware

- a. Hardware error in the machine
- b. Hardware error in the controller (or the related options).

3. Software

- a. Controller (or printer enhancement unit) bug
- b. Printer driver bug
- c. Application software bug

4. Operating Condition

- a. Environment (power supply, temperature, humidity, dust, electrical noise, etc.)
- b. Supplies (e.g. paper)

You need to get the following information before troubleshooting each case.

- 1-a Test page and print sample
- 1-b. Application settings and print sample
- 2. Error code
- 3. Print sample and occurrence conditions
- 4. Operating conditions

5.1 ERROR MESSAGES

In the printer mode, the controller controls displays on the operation panel. The service call error messages generated by the printer controller and the related options shown below. When these errors occur, the printer error LED lights and the front panel displays an error message. Note that the panel indicates these errors only when the printer mode is selected. If HostPanel or WinPanel has been installed on a PC, the status can be monitored on the PC display.

CALL SERVICE ERRORS

- SC2100
Printer controller ROM checksum error
- SC2101
Printer controller RAM error
- SC2105
Printer controller NV RAM error
- SC2150
Printer controller CPU error
- SC2200
Printer SIMM module error (#1 slot)
- SC2201
Printer SIMM module error (#2 slot)
- SC2300
Printer enhancement unit ROM checksum error.
- SC2301
Printer enhancement unit RAM error.

5.2 HARDWARE ERRORS

If the machine indicates an error message in the printer mode, check and correct the following.

1. Does the machine work in copy mode?
2. Is the controller (or the related options) installed correctly?

If the problem still occurs, replace the unit that corresponds to the error.

5.3 CONNECTION ERRORS

If you have a problem regarding the controller connection with the machine or the host (hardware or software), you may have the following symptoms.

1. The online LED does not light.
2. The machine does not go into the printer mode if the printer key is pressed.
3. The data LED on the front panel does not light or blink.
4. The machine does not print, though the data LED lights or blinks.

Check and correct the following first.

1. Is the controller (or the related options) installed correctly?
2. Is the printer controller online?
3. Is the printer cable correctly connected?
4. Is the proper printer cable used?
5. Are the printer interface and the host's printer port set up correctly? (e.g. flow control, transfer speed, stop bit, etc.)
6. Does the emulation mode of the printer match the selected driver?

If the connection problem still occurs after correcting the above problems, replace the controller (if the parallel or the RS-232C interface is used) or the printer enhancement unit (if the LocalTalk interface is used).

5.4 IMAGE PROBLEMS

If you have a problem with the printed image, first check and correct the following items:

1. Is the printer cable correctly connected?
2. Is the proper printer cable used?
3. Does the image problem occur only in printer mode? (Is the image in copy mode OK?)
4. Does the emulation mode of the printer match the selected driver?
5. Is the same font used between the printer and the software?
6. Is toner saving mode on? (If so, turn it off and recheck.)

If the problem still occurs after correcting the above items, proceed as follows:

1. Does the problem occur only when printing a downloaded font?
→If yes, reinstall the font.
2. Is "Memory Overflow" or "Print Overrun" displayed during printing? (The printed image will be partially blank in this case.)
→If yes, more memory needs to be installed.
3. Does the problem occur when you print the PCL font list?
→If yes, replace the controller.
4. Does the problem occur when you print the PostScript font list?
→If yes, replace the printer enhancement unit.

PRINTER CONTROLLER (A643) ROM MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE	LOCATION
- 1st. Software Released.	1.03	1st Mass Production 12/05/96	U - 23 U - 24
- 2nd. Software Released.	1.06	12/17/96	U - 23 U - 24
- Printer hangs up when printing word data with lines shaded with colors as HP/GL. - Duplex printing, HP/GL mode and colored lines. - Paper jam in Duplex mode when the A4 size data is printed to the A3 paper. - Out put of Genoa FTS file is different from that of HP (*Genoa FTS file) - Page ordering is wrong. - Duplex printing, Inter leave is on and also execute interrupt copier. - Finisher is supported - Print overrun by the access time to HDD. - Band Buffer is increased from 660KB to 4MB. - If the controller has a HDD, the SIMM memory more than 4MB must be added. - General Protection Fault at the Landscape Printing in Raster mode. Hung-up when the job reset is pressed during storing the data. - Doggy Tail function of the finisher does not work in the energy save and night timer mode. - Demo page cannot be printed. - Hung Up occurs rarely during storing the printing data on HDD due to the sector control failure. - Memory overflow corrected.	1.26	06/10/97	U - 23 U - 24
- When printing Banner page with Staple job, Banner page is printed incorrectly. - Resource saving on Test Page indicate "1219 Kbytes Allocated of 1219 Kbytes Available." It should be "0 Kbytes Allocated of ..." - When printing with Raster mode and custom paper size setting, output is incorrect.	1.35	09/30/97	U - 23 U - 24

PRINTER
CONTROLLER

PRINTER CONTROLLER (A643) - DRIVER SOFTWARE MODIFICATION HISTORY - FOR WIN 3.1 / WIN 95		
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE
- 1st. Software Released.	1.00	1st Mass Production 12/05/96
The power point in win95 cannot print the Raster Image.	1.10	02/02/97
In Raster mode, a part of the graphic data cannot be printed correctly.	1.21	04/02/97
Finisher is supported.	1.30	05/19/97
- Even if setting True Type Mode to " Down Load as True Type ", it output as bit image. - When printing Hound.doc with Win 3.1, a part of Univers Font was printed incorrectly. - When setting B5 Env.to Bypass Tray, WinPanel shows "Add F4 paper into Bypass Tray." - When installing Win95 driver by Add Printer, Help File was not installed.	2.00	07/09/97

PRINTER CONTROLLER (A643) - HOST PANEL FOR DOS MODIFICATION HISTORY		
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE
- 1st. Software Released.	1.00	1st Mass Production 12/05/96
- N/A	1.01	04/02/97
- Profile which has the Host Panel setting information in Duplex mode cannot be opened correctly.	1.02	05/25/97

TECHNICAL SERVICE BULLETINS

BULLETIN NUMBER: AFICIO 200 - 001

01/08/97

APPLICABLE MODEL: DF65

SUBJECT: DF65 (ARDF) FLASH ROM UPDATE

SYMPTOM:

Erratic operation of the DF65 (ARDF).

CAUSE:

Software.

SOLUTION:

Install ROM upgrade (Revision G) to the Flash ROM on the BICU PCB.

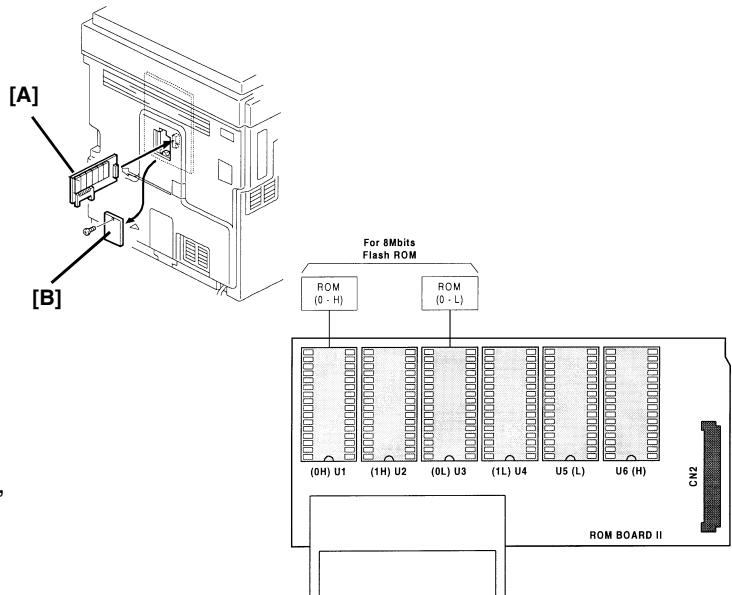
PROCEDURE:

1. Enter SP mode 5-992 and print the system Log Data (3). Keep data sheet for reference.
2. Reset SP mode 5-992.

3. Perform the Program Download as follows:

NOTE: This procedure copies the software from a ROM board to the Flash ROM on the BICU Board.

- 1) Turn OFF the Main Switch and AC Switches.
- 2) Mount the upgraded ROMs on the correct ROM sockets of the ROM board [A] as shown.
- 3) Remove the ROM cover [B].
- 4) Plug the ROM board into the connector on the BICU board.
- 5) Turn ON the AC and Main Switches, access SP5-932, select YES, and press the # key.
- 6) After completing the download, turn OFF the AC and Main Switches, then remove the ROM board.



4. Enter SP mode 5-992 and print the system Log Data (3). Compare Main ROM part number to the log data main ROM part number from step 1. If download was successful, the main ROM part number will end with the suffix "G". If not, repeat steps 2 through 4.

5. Install the ARDF and check for proper operation.

Continued...

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UNITS AFFECTED:

All Aficio 200 copiers manufactured prior to Serial Number A722611XXXX are susceptible to the above mentioned symptom.

ORDERING PROCEDURE:

One set of ROMs (2), one EPROM PCB Tool and one preliminary version of the DF65 Service Documentation will be automatically shipped to all servicing locations, based on Aficio 200 C.B.T. training packages shipped.

Any additional Tools will have to be purchased by the service location.

GENERAL:

The following list outlines the upgrades incorporated into the latest firmware:

Symptom Corrected	Revision
The Black Spots in the scanned image - The scanned low contrast image can be adjusted by the 7 notches. Each notch has the different gamma correct characteristic, MTF filter and threshold level by new AP mode (SP4-998,999).	G
The dirty background on the white image after the negative and positive reversing.	G
SC321 appears when the door is opened during the memory copying then the start key is pressed after closing the door.	G
The developing bias setting (SP2-201) is initialized by turning off the main switch.	G
SC921-Memory Access Error After the paper jam during memory output and opening the door.	F
SC101-It appears at night timer in and out after the IPU test pattern in SP mode.	F
Memory copy priority of SP5-945 is added to Salesman Program Mode.	F
SP-mode cannot be cleared at night timer in and out after going to the interrupt copy mode from SP mode.	F
While feeding out the original from ADF, "Start key" can be detected, Then the incorrect document size is detected.	E
ARDF is supported.	E

BULLETIN NUMBER: AFICIO 200 - 002

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: PARTS CATALOG CORRECTIONS

GENERAL:

The following Parts Catalog Corrections are being issued for all Aficio 200 Parts Catalogs. This information should be incorporated into all existing Parts Catalog documentation.

1. The following Part Numbers have been corrected.

				REFERENCE	
INCORRECT PART NO.	CORRECT PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0202742	G0202741	Upper Registration Roller	1	19	9
G0204482	G0204374	Middle Antistatic Brush - FD	1	39	32
H5213355	G0201160	C Ring - Paper Feed Roller	1	43	22
11027324	11027676	Connector Header - 16P		57	101
11027452	11027677	Connector DF11-22DP-2V		57	103
A1399351	A1939351	ROM Board 2	1	65	2

2. The following part is not used. Delete this item from your Parts Catalog.

			REFERENCE	
PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0202744	Gear - 40Z	1 → 0	19	20

3. The descriptions of the following items have been changed.

				REFERENCE	
PART NUMBER	INCORRECT DESCRIPTION	CORRECT DESCRIPTION	QTY	PAGE	ITEM
A1931853	Laser Unit (115V)	LD Unit Ass'y (115V)	1	27	3
A1931855	Laser Unit (230V)	LD Unit Ass'y (230V)	1	27	3
A1931861	LD Unit Ass'y (230V)	Laser Unit (115V)	1	27	4
A1931865	LD Unit Ass'y (230V)	Laser Unit (230V)	1	27	4

Continued...

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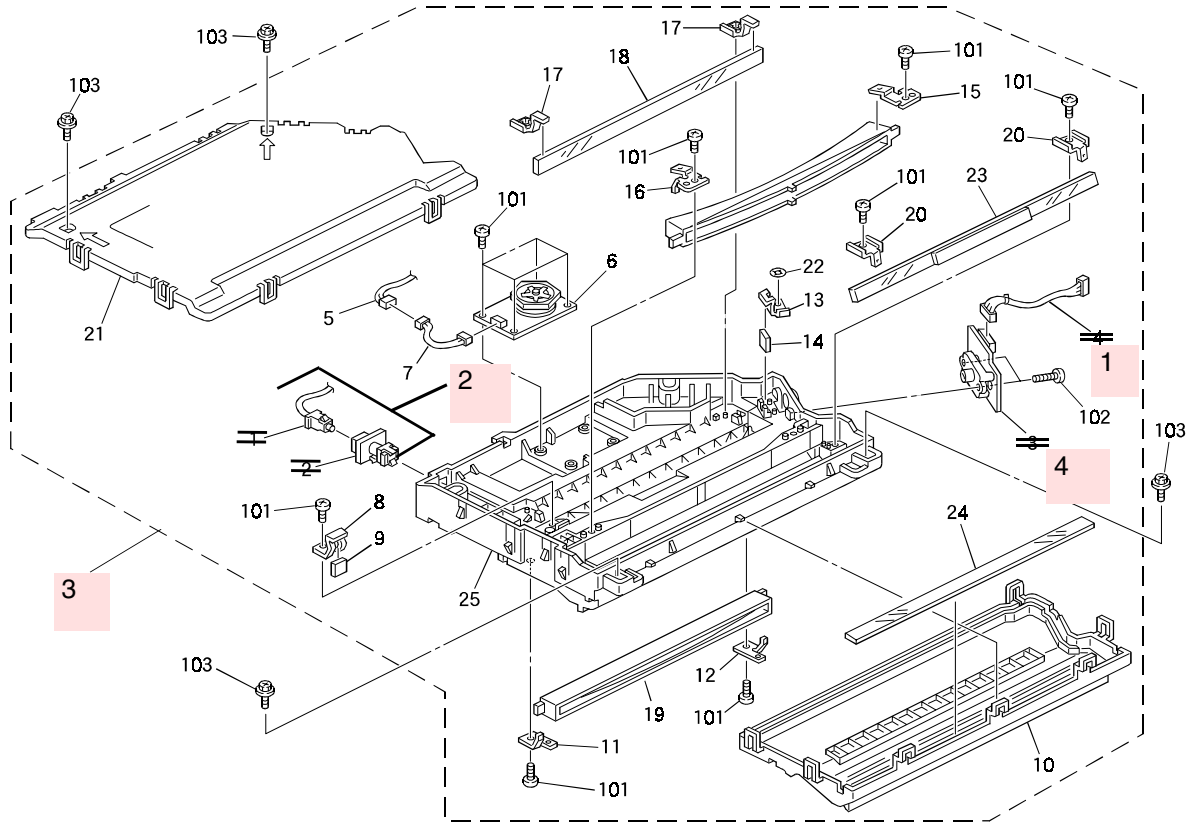
4. The following parts have been added.

			REFERENCE	
PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1935475	Harness - Key Counter (LAN)	1	45	18
G0203870	Discharge Brush	1	35	28

5. The following Part Numbers have been changed.

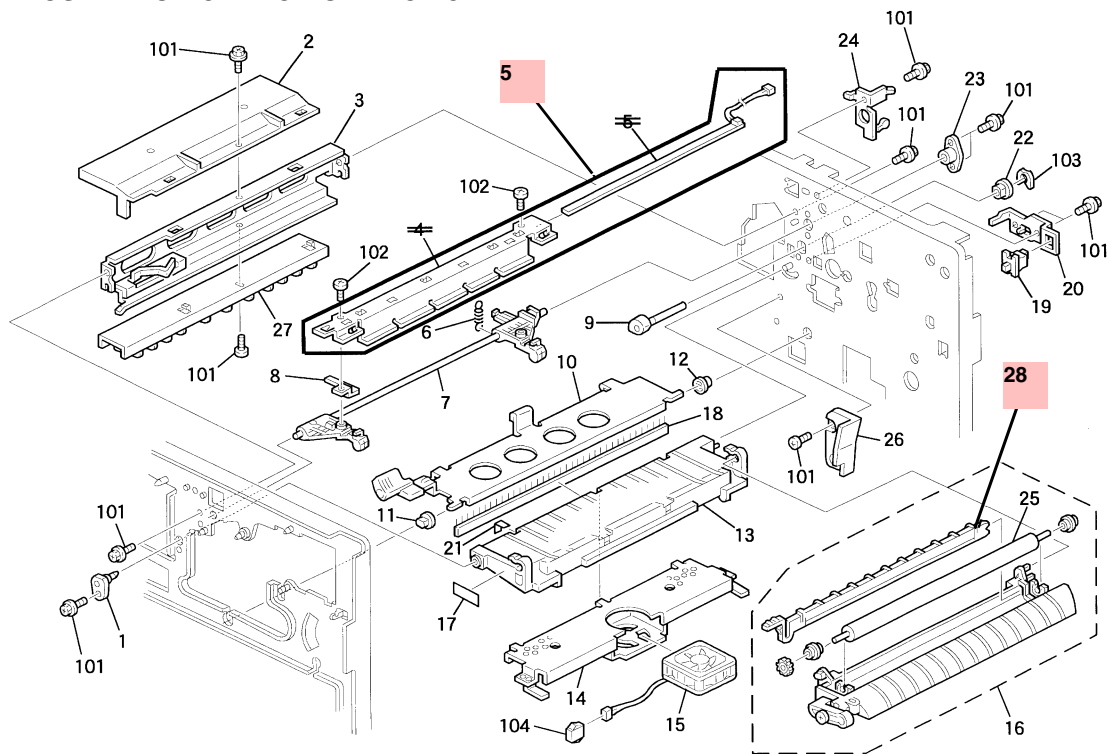
				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0202105		Bracket - Quenching Lamp	1	35	4
G0202104		Quenching Lamp	1	35	5
	G0202104	Quenching Lamp Assembly	1	35	5
G0204411		Paper Exit Pawl	1	39	12
	G0204454	Paper Exit Pawl	1	39	12
	G0204455	Spring	1	39	39

6. The index numbers of the following illustration have been changed as shown
(SECTION 11. LASER UNIT, Parts Catalog page 26)

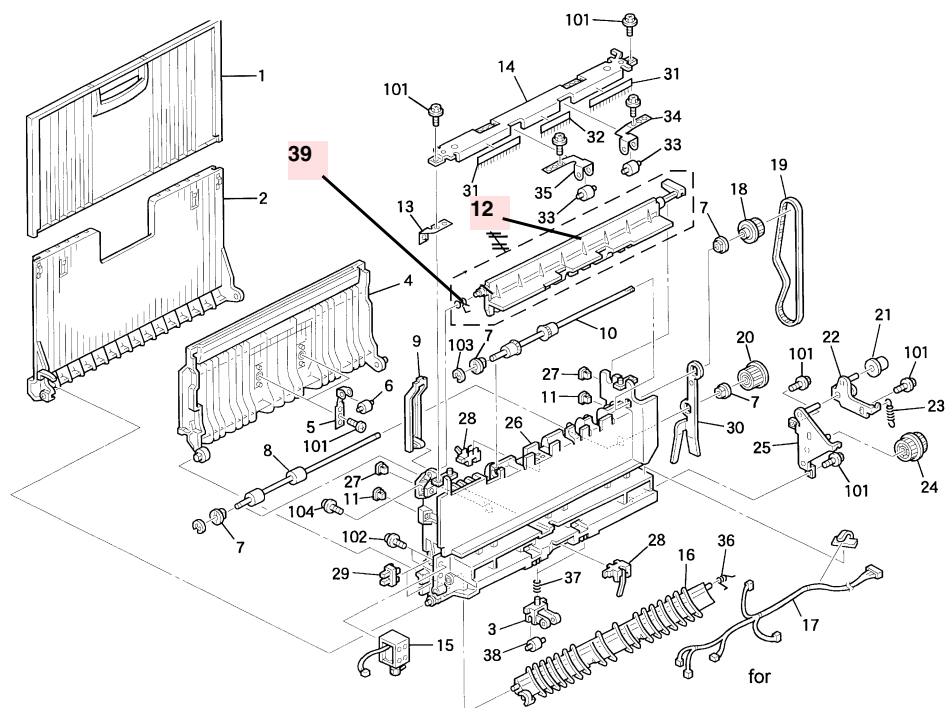


Continued...

7. ILLUSTRATION CHANGE ON PAGE 34

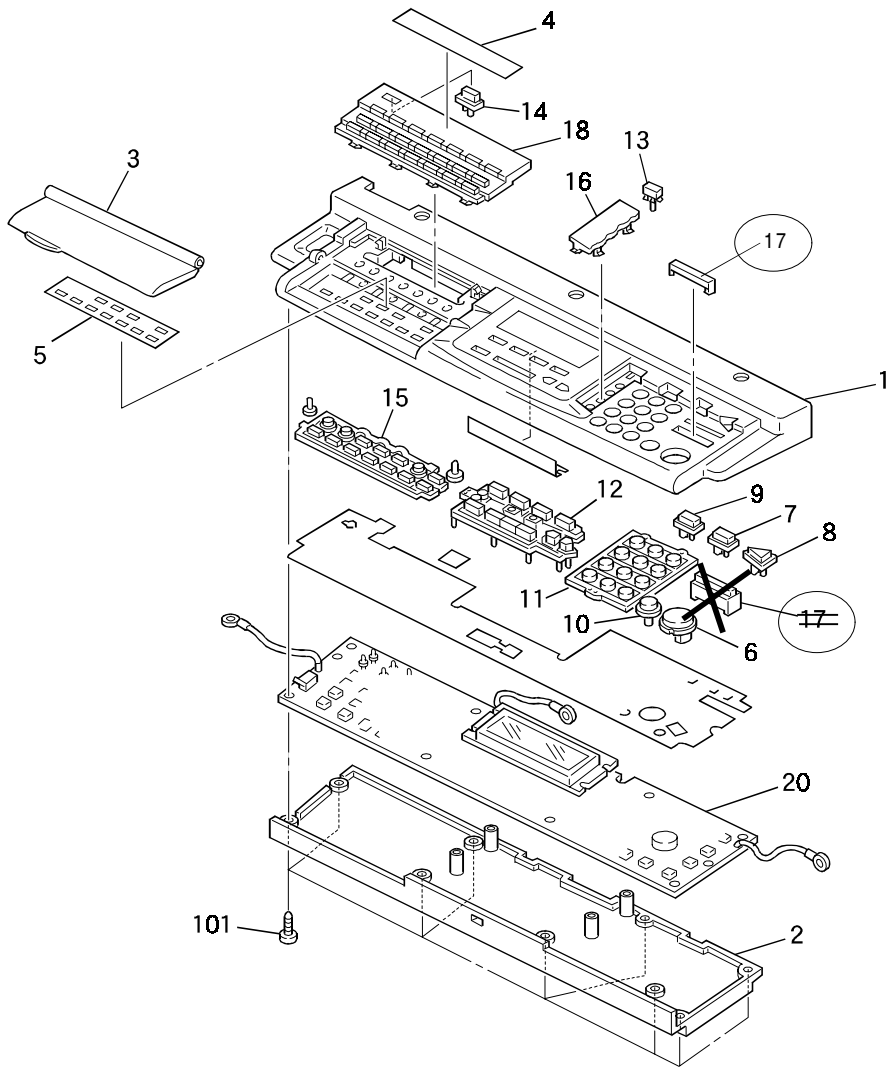


8. ILLUSTRATION CHANGE ON PAGE 38



Continued...

9. The following part has been deleted from the Parts Catalog and the illustration has been changed as shown below.



			REFERENCE	
PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1941483	Key Top - LCD	1 → 0	13	21

BULLETIN NUMBER: AFICIO 200 - 003

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

NOTE: The pages listed below apply to the **Copier Section** of the Service Manual.

- 1-2 Corrected Information
- 1-13 Corrected Information
- 2-4 Corrected Information
- 2-18 Corrected Information
- 2-57 Corrected Information
- 2-66 Corrected Information
- 2-70 Corrected Information
- 4-16 Corrected Information
- 4-45 Updated Information
- 5-36 Corrected Information

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BULLETIN NUMBER: AFICIO 200 - 004

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SC900 (TOTAL COUNTER ERROR)

SYMPTOM:

SC900 cannot be cleared by following the Troubleshooting Section of Service Manual.

CAUSE:

Blown Fuse (#5) on the Power Supply Unit.

NOTE: *The fuse may be blown if the connector of the Paper Tray Unit is disconnected while the power switch is "ON". Be sure to turn "OFF" the power switch before disconnecting the connector.*

SOLUTION:

Check/replace Fuse #5 of the Power Supply Unit. Fuse #5 is located at the upper left portion of the PSU board. The second of the 3 fuses is Fuse #5.

Add the reference to Fuse #5 of the Power Supply Unit to the SC900: Total Counter error
"- Possible cause -" section of the Service Manual (page 6-9).

SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

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• 6-9

Additional Information

Fuse #5 added to SC900 Troubleshooting Section

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BULLETIN NUMBER: AFICIO 200 - 005

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: TD SENSOR INITIAL SETTING

SYMPTOM:

1. Blank areas at 20 mm intervals on the the right side of copies (non-operator side)
2. Smear on copy image
3. Dirty background
4. SC 393

CAUSE:

1. The developer supply level in the development unit does not become uniform until approximately 30 seconds after mixing (installing the PCU).
2. The charged level (Q/M) of the developer does not become stable until running twenty 11 x 17 inch copies.
3. The detection of the TD sensor is unstable until the developer supply level in the development unit becomes uniform. By then, excessive toner supply has resulted.

SOLUTION:

If machine is set up in the field:

1. Before making copies, perform the TD Sensor Initial Setting by using SP-Mode 2-801. Refer to page 4-9 of the Service Manual (Copier Section).
2. After completing the TD Sensor Initial Setting, make twenty 11 x 17 inch size copies.

If machine is set up prior to delivering to customer (at shop):

1. Perform the TD Sensor Initial Setting by using SP-Mode 2-801 but, do not install the toner bottle. A maximum of 10 to 15 low density copies can be made to check the operation of the machine. All final adjustments can be done at the customer's location when the toner bottle has been installed.

OR

2. Use a "slave" or "shop" PCU to set the machines up and install the customers PCU on-site. If this is done, the TD initial setting (SP mode 2-801) should be performed when the new PCU is installed.

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BULLETIN NUMBER: AFICIO 200 - 006

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SC 120 (Scanner Home Position Error)

SYMPTOM:

SC120 occurs after:

1. The copier was transported
2. The scanner rear cover was removed and re-installed.

CAUSE:

1. When transporting the Aficio 200 with the scanner in the home position, the scanner may hit the HP Sensor causing the sensor to become unfastened.
2. If you happen to push the HP Sensor after the scanner rear cover has been removed, the sensor may become unfastened.

SOLUTION:

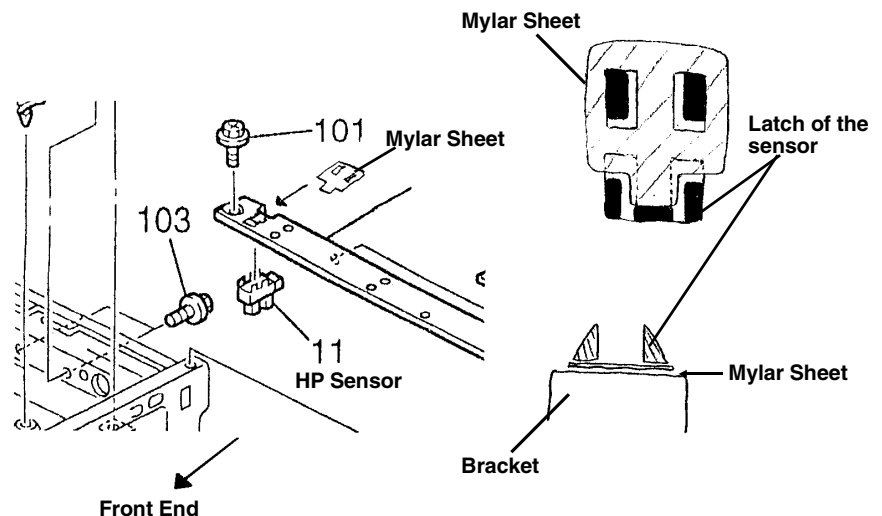
1. If this problem occurs, make sure that the sensor is properly fastened.
2. Insert an additional mylar sheet (A1931793) between the sensor latch and the bracket if necessary.

UNITS AFFECTED:

Not available at time of publication.

PROCEDURE:

Attach the mylar sheet as shown:



IMPORTANT

1. Attach the mylar sheet after the sensor is mounted on the bracket.
2. Make sure that the latch for the sensor is properly set into the hole on the mylar sheet.

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RICOH TECHNICAL SERVICE BULLETIN

CUSTOMER SERVICE GROUP

BULLETIN NUMBER: AFICIO 200 - 007

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: ROM BOARD

SYMPTOM:

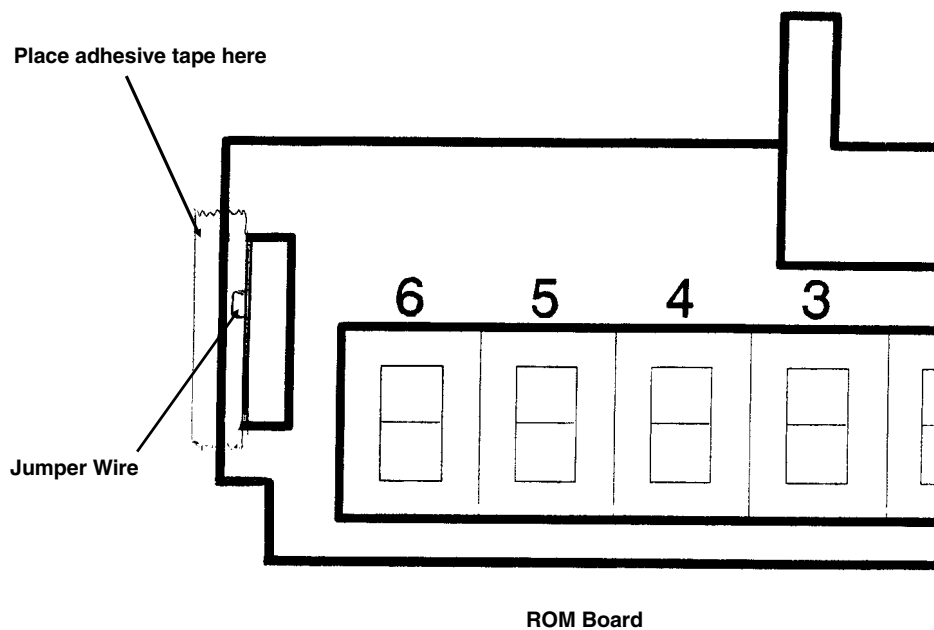
The jumper wire (shown below) of the ROM Board comes off.

CAUSE:

The jumper wires were not fixed securely by the resin adhesive on the ROM Board included with the first shipment.

SOLUTION:

If you find the one of the ROM Boards mentioned above, please apply tape as shown in the illustration below.



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BULLETIN NUMBER: AFICIO 200 - 008**02/28/97****APPLICABLE MODEL: AFICIO 200****SUBJECT: FALSE SC101 INDICATION****SYMPTOM:**

After turning the main switch "ON", an SC101 condition occurs when the Aficio 200 reaches a "Ready" condition. Neither the SC resetting procedures nor toggling the Main Power Switch will reset the SC101.

CAUSE:

The problem occurs after the following operations were performed on machines with the BiCU software revision "E" :

1. In SP mode 4-417 IPU "Test Pattern Print", one of the test patterns was selected.
2. The test pattern was printed with the Copy Mode Display.
3. The Main Power Switch was turned "OFF".

With the operations listed above, the SC101 occurs after the Main Power Switch is turned back "ON".

TEMPORARY SOLUTION:

Take either of the following actions to reset to the normal operating conditions.

1. By using SP mode 4-417, select the default setting of "0 : No Print"
2. Toggle the AC switch from "OFF" to "ON".

PERMANENT SOLUTION:

The BiCU software has been changed (revision "F") to prevent this problem.

Additional Information :

The SC101 is a new SC Code added to the original SC Codes from the BiCU software revision "E" to diagnose the following problem.

-Level of Service Call Condition : A

-Definition : The referenced white pattern wasn't detected properly.

-Possible Causes :

- defective Exposure Lamp
- defective Exposure Lamp Harness
- defective SBU
- defective SBU Harness

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BULLETIN NUMBER: AFICIO 200 - 009

02/28/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: DIRTY BACKGROUND/TONER SCATTER

SYMPTOM:

Dirty background appears on copies and/or toner scatters inside the machine.

CAUSE:

If the Aficio 200 copier is installed near a machine which uses ammonia (such as a diazo copy machine), its developer is affected by ammonia gas and dirty background or toner scatter may occur.

SOLUTION:

Ricoh is currently investigating the reason why the developer is affected by the ammonia gas so that an effective countermeasure can be found. For the time being and until a countermeasure is found, ask your customer to use the Aficio 200 in a location (room) with no influence of ammonia gas.

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RICOH TECHNICAL SERVICE BULLETIN

CUSTOMER SERVICE GROUP

BULLETIN NUMBER: AFICIO 200 - 010

03/13/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- 3-19 Updated Information
- 4-18 Updated Information

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☒ S M

☐ PARTS

☐ OTHER

BULLETIN NUMBER: AFICIO 200 - 011

04/14/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: BICU BOARD DAMAGE

SYMPTOM:

After performing a program download, the Operation Panel appears "dead" or the ROM upgrade was not accepted.

CAUSE:

Defective Flash ROM PCB (A1939450) or ROM(s) not inserted correctly.

SOLUTION:

1. Inspect the Flash ROM PCB for properly soldered sockets. If repairable, remove ROM(s) and re-solder socket(s).
2. Inspect ROM(s) for proper insertion. Repair or replace as necessary.
3. If un-repairable, discard Flash ROM PCB and order a new one.

NOTE: *The ROMs should be retained for use with the new PCB.*

IMPORTANT:

If a defective Flash ROM PCB is used to perform a program download, damage to the BICU PCB can result.

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☐ OTHER

BULLETIN NUMBER: AFICIO 200 - 012

03/14/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- Table of Contents vii (Copier Section)
- 6-14 (Copier Sec.) Additional Information (ROM Modification History added)
- Table of Contents iv (Fax Section)
- 6-9 (Fax Sec.) Additional Information (ROM Modification History added)

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☐ PARTS

☐ OTHER

AFICIO 200 ROM MODIFICATION HISTORY (Copier Section)

DESCRIPTION	RIC P/N		SERIAL NUMBER	LOCATION
- Version A, B & C were for the pre-production machines.	A1935532 D	1	1st Mass Production	
Corrects the following: - While feeding out the original from ADF, "Start key" can be detected, then the incorrect document size is detected. - ARDF is supported.	A1935532 E	1	November '96	
Corrects the following: - SC921-Memory Access Error After a paper jam during memory output and opening the door. - SC101- occurs at night timer in and out after the IPU test pattern in SP mode. - SP5-803: New PCU Detect is added for Input check. - Memory copy priority of SP5-945 is added to Salesman Program Mode. - SP-mode cannot be cleared at night timer in and out after going to the interrupt copy mode from SP mode. - Finisher is supported.	A1935532 F	1	December '96	
Corrects the following: - The Black Spots in the scanned image - The scanned low contrast image can be adjusted by 7 "notches." Each notch has the different gamma correct characteristic, MTF filter and threshold level by new SP mode(SP4-998,999). - The dirty background on the white image after the negative and positive reversing. - SC321 appears when the door is opened during the memory copying then the start key is pressed after closing the door. - The developing bias setting(SP2-201) is initialized by turning off the main switch.	A1935532 G	1	January '97	

AFICIO 200 ROM MODIFICATION HISTORY (Fax Section)				
DESCRIPTION	RIC P/N		SERIAL NUMBER	LOCATION
Version A & B were for the pre-production machines	A1945581 C	1	1st Mass Production	
Corrects the following: - If the G3 Reception(analog port) and the iG3 Transmission (digital port) have a conflict, the LED of the communicating turns on and is locked. - When the operator pick up the handset and dial by using a quick or a speed dial then hang up the handset during dialing, the display always shows "Handset Mode".① or When the handset is hung on and up within 1 second after pressing Start key in the non-memory Tx mode, the display always shows "Handset Mode".① If the operator performs the transmit operation or presses the Stop key, the display was locked. *If the handset is hung on and up under ① condition, The display is not locked. - When the ringing signal comes when going into the night mode, the machine goes into the night mode and goes back to Ready then the power failure report is printed out. (The file no. and communication mode on JOURNAL are wrong.) - New User Switch for the Forwarding UserSw 0E(SW14) bit5 : 0 - Off (Default) 1 - On *All received files are forwarded to the transfer address. *On the user parameter list, the following description is not printed. "Forwarding all received files ON/OFF" - In the date input mode, the display shows "24hr format" instead of "12hr format". - The download and upload function from FCU board to FCU board with the feature card do not work.	A1945581 D	1	November '96	
Corrects the following: - When the handset is picked up at detecting of ringing signal, the reception is disconnected and the reception job is rarely remaining internally. In this case, the display is not going to the "Handset Mode" even if the handset is picked up. Or the "line is busy" is displayed at the direct tx by ADF.	A1945581 E	1	December '96	Continued...

AFICIO 200 ROM MODIFICATION HISTORY (Fax Section)

DESCRIPTION	RIC P/N		SERIAL NUMBER	LOCATION																									
Corrects the following: - In manual tx mode by the handset, the operator presses the Start key and hangs up the handset at the same time. The transmission job is then remaining internally. In this case, neither transmission or reception are available and/or the "Handset mode" is always displayed. This problem can be solved by picking up and hanging up the handset again. - The chain dial function is not used by the on-hook or handset mode. - When the machine stores a letter size original by using image rotation, the compression does not succeed and the job is reset if the original is a complicated image which is scanned in photo mode. - After entering the personal code and going to the fax mode in the personal code transmission mode, if the programmed key (Quick dial) is used, the personal code is not printed on the JOURNAL report. - New Bit Switches are added for some reports. System SW 1F-Bit1 : When the memory over flow or the storing jam occurs, the Memory Storage Report and the Memory Transmission Report are not printed out. 0:OFF(Default)-Print 1:ON-No print User SW 03-Bit2 : Memory Storage Report is printed automatically. 0:OFF(Default) 1:ON-Print System SW 1E-Bit1 : The condition of the erasing the file at full-memory 0:Only a page is erased 1:The file is erased. ~~The combination of the above bit switches:~~ <table border="1"> <tr> <td>User SW 03:</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr> <td>System SW 1F:</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr> <td>Memory Storage OK</td><td>X</td><td>O</td><td>X</td><td>O</td></tr> <tr> <td>Memory Storage NG</td><td>O</td><td>O</td><td>X</td><td>X</td></tr> <tr> <td>Continueing after the memory full (by SysSW 1E-Bit1)</td><td>O</td><td>O</td><td>X</td><td>X</td></tr> </table> O = Memory Storage Report is printed	User SW 03:	OFF	ON	OFF	ON	System SW 1F:	OFF	OFF	ON	ON	Memory Storage OK	X	O	X	O	Memory Storage NG	O	O	X	X	Continueing after the memory full (by SysSW 1E-Bit1)	O	O	X	X	A1945581 E	1	December '96	
User SW 03:	OFF	ON	OFF	ON																									
System SW 1F:	OFF	OFF	ON	ON																									
Memory Storage OK	X	O	X	O																									
Memory Storage NG	O	O	X	X																									
Continueing after the memory full (by SysSW 1E-Bit1)	O	O	X	X																									

RICOH TECHNICAL SERVICE BULLETIN

CUSTOMER SERVICE GROUP

BULLETIN NUMBER: AFICIO 200 - 013

04/14/97

APPLICABLE MODEL: AFICIO 200

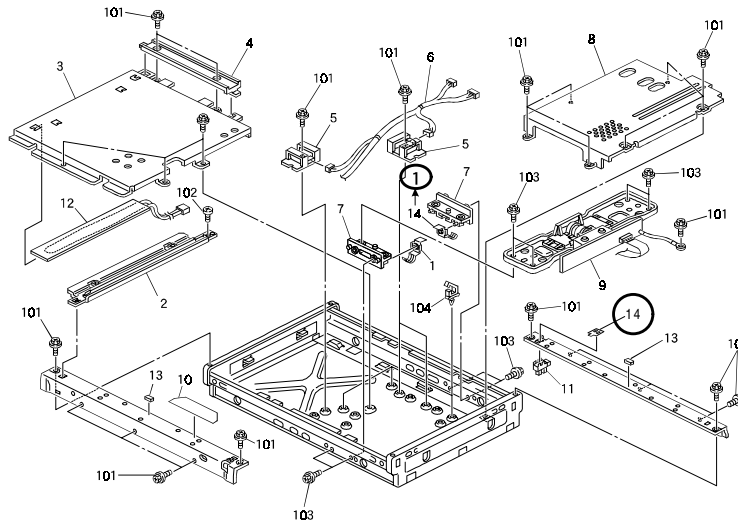
SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following Parts Updates are being issued for all AFICIO 200 Parts Catalogs. This information should be incorporated into all existing Parts Catalog documentation.

- **UPDATE NO. 1-** PARTS CATALOG CORRECTION / ADDITION - Make the following correction/addition to your parts catalog.

NOTE: The illustration for Optics Section 1, index No. 14 was changed to index No. 1



			REFERENCE	
PART NO.	DESCRIPTION	QTY	PAGE	ITEM
A1931790	Grounding Plate - Lens Block	1	23	1

- **UPDATE NO. 2-** PARTS CATALOG CORRECTION / ADDITION - Make the following correction/addition to your parts catalog.

			REFERENCE	
NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
A1931793	Scanner Home Sensor - Mylar Lock Sheet	0 → 1	23	14*
A1931796	Seal - Carriage	1	24	25

* DENOTES NEW ITEM

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BULLETIN NUMBER: AFICIO 200 - 014

04/14/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: PAPER FEED JAM, PAPER SKEW

SYMPTOM:

Paper jams, dog-ears or paper skew occur when paper is fed from a paper tray.

CAUSE:

Corner separator with burrs or scratches

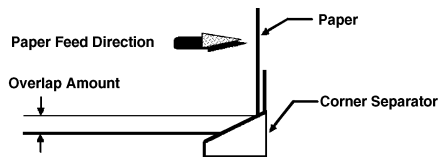
SOLUTION:

1. Remove burrs or scratches by filing the edge with sandpaper or replace the corner separator with a new one.
2. Check the amount of overlap between the corner separator and the paper as shown below.

Specifications :

The overlap amount must be:

- 5.7 ± 1.2 mm with the Aficio 200 Paper Tray
- 6.0 ± 1.2 mm with the Optional Paper Tray Unit (PS 330)



- 3) The difference in the amount of overlap between the front and rear of the corner separator must be within 1.5 mm. Depending on the conditions, the following problems may arise if there is a difference in the amount of overlap between the front and rear of the separators.

Paper Skew : Greater than 1.5mm.

Misfeed: When the amount of overlap is greater than the specification.

Double Feed: When the overlapped amount is less than the specifications.

NOTE: *If the overlap amount isn't within the above specifications, the corner separator may have been deformed. Reform the separator or replace if necessary.*

4. Check to see if the paper is damp.

If the paper is damp, install the Optional Tray Heater (A1939801). When installing the Bank Tray Heater (G6979800) in the Optional Paper Tray Unit (PS 330), remove the auto-shut-off control.

Auto-shut-off will deactivate the Optional Tray Heaters.

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BULLETIN NUMBER: AFICIO 200 - 015

06/13/97

APPLICABLE MODEL: AFICIO 200

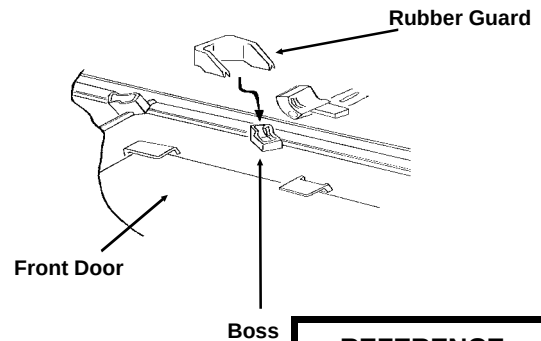
SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following Parts Updates are being issued for all AFICIO 200 Parts Catalogs. This information should be incorporated into all existing Parts Catalog documentation.

● **Update No. 1 -**

PARTS CATALOG CORRECTION / ADDITION -
A Rubber Guard has been added on the Boss on the Front Door to prevent the operator from injuring a finger.



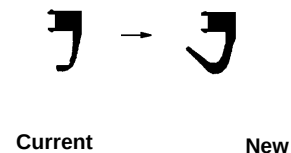
NEW PART NUMBER	DESCRIPTION	QTY	REFERENCE	
			PAGE	ITEM
G0201259	Rubber Guard	0 -1	6	22

UNITS AFFECTED:

Aficio 200 Serial Number cut-in is not available at time of publication.

● **Update No. 2 -**

PARTS CATALOG CORRECTION / ADDITION -
To prevent the Paper Exit Sensor from being dislogged while pulling out the jammed paper in the Fuser Unit, the shape of the Paper Exit Sensor has been changed.



OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	REFERENCE	
				PAGE	ITEM
G0204429	G0204472	Paper Exit Sensor	1-1	38	28
G0204490	G0204472	Paper Exit Sensor	1-1	36	16

UNITS AFFECTED:

Aficio 200 Serial Number cut-in is not available at time of publication.

Continued...

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- **Update No. 3 -** PARTS CATALOG CORRECTION / ADDITION - Delete Index number 181 on page 61A .

			REFERENCE	
PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1935823	Bracket - Finisher	1 -0	61	181

UNITS AFFECTED:

Aficio 200 Serial Number cut-in is not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

BULLETIN NUMBER: AFICIO 200 - 016

06/13/97

APPLICABLE MODEL: AFICIO 200

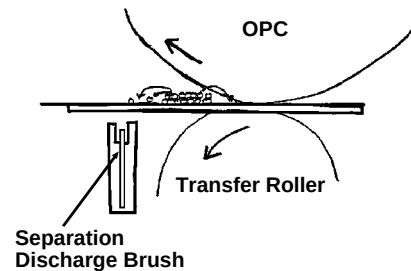
SUBJECT: TONER SCATTERING IN DUPLEX MODE

SYMPTOM:

Toner scattering around the halftone image on the rear side of the page in the duplex mode.

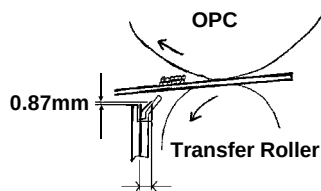
CAUSE:

After transferring the image from the OPC drum, there is an electrical potential difference between the white and black area on the copy. The toner scattering occurs before the image has reached the Discharge Brush.



SOLUTION:

The Shape of the Discharge Brush has been changed. The top of the new Discharge Brush is closer (0.87mm) to the Transfer Roller.



				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0203870	A1933870	Discharge Brush	1	35	28

UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A7226120001 will have the Discharge Brush installed during production.

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BULLETIN NUMBER: AFICIO 200 - 017

06/13/97

APPLICABLE MODEL: AFICIO 200

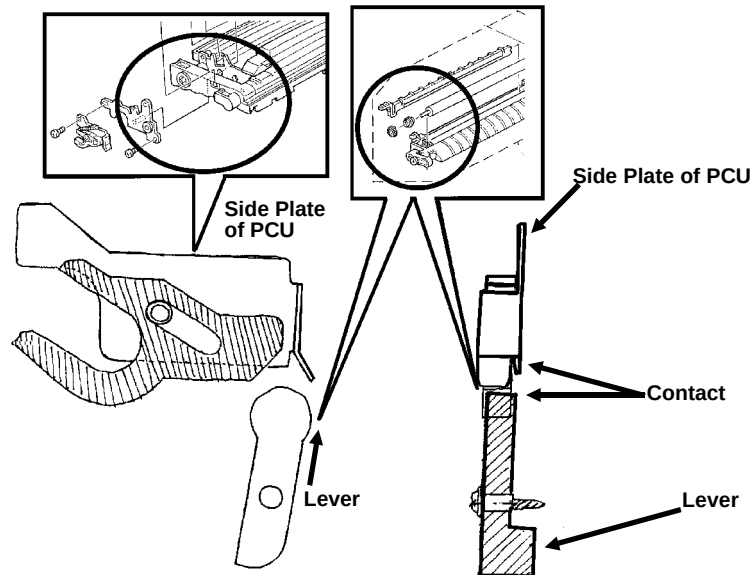
SUBJECT: LEVER IN THE TRANSFER UNIT

SYMPTOM:

The Transfer unit cannot be set.

CAUSE:

When the PCU is not set completely, the side plate is shifted to the front. This may cause the lever of the Transfer Unit, to come in contact with the side plate.



SOLUTION:

The corner of the Lever is cut to prevent the Lever from coming in contact with the side plate of the PCU.



NOTE: The Part Number Has Not Been Changed.

UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A7226110047 will have the Modification during production.

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BULLETIN NUMBER: AFICIO 200 - 018

06/13/97

APPLICABLE MODEL: AFICIO 200

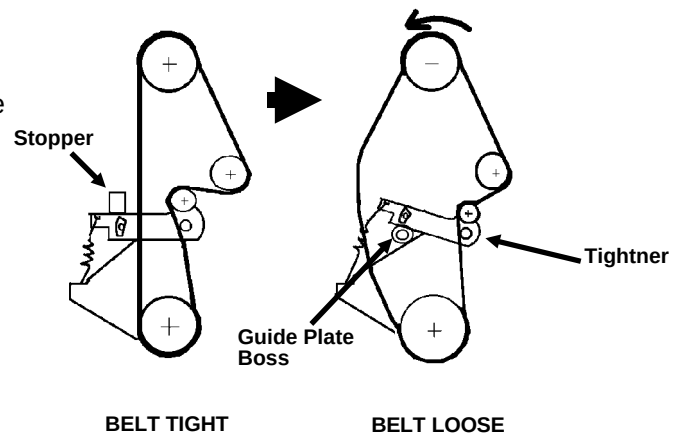
SUBJECT: NO DRIVE IN THE TRANSPORT SECTION

SYMPTOM:

The Timing Belt of the transport section is not driven.

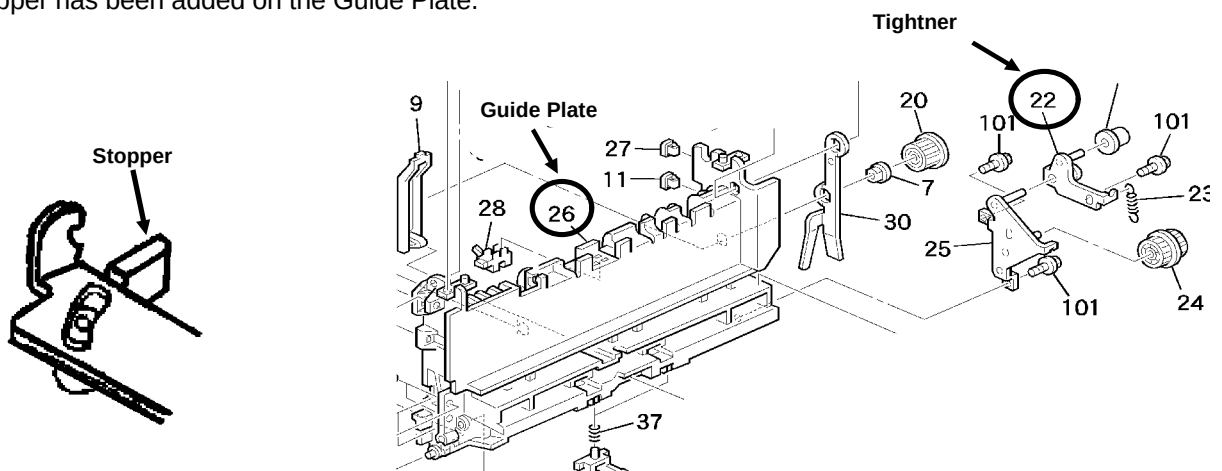
CAUSE:

When an operator removes jammed paper from the exit area of the of Transport Section, the Tightner (G0204333) may move off and over the boss on the Guide Plate (G0204409).



SOLUTION:

A Stopper has been added on the Guide Plate.



UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A7226110001 will have the new Guide Plate installed during production.

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☐ OTHER

BULLETIN NUMBER: AFICIO 200 - 019

06/13/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- 4-10 Updated Information
- 4-22 Updated Information
- 4-23 Updated Information
- 4-24 Updated Information

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BULLETIN NUMBER: AFICIO 200 - 020

7/29/97

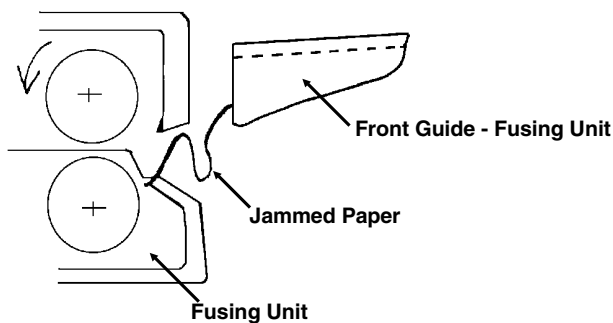
APPLICABLE MODEL: AFICIO 200

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following Parts Updates are being issued for all Aficio 200 Parts Catalogs. This information should be incorporated into all existing Parts Catalog documentation.

- **UPDATE No. 1 -** FRONT GUIDE - FUSING UNIT - To prevent Fusing area jams, the Fusing Unit Front Guide has been removed.



			REFERENCE	
PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0201088	Front Guide - Fusing Unit	1-0	35	27

UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A7227020001 will have the Fusing Unit Front Guide removed during production.

Continued...

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☐ OTHER

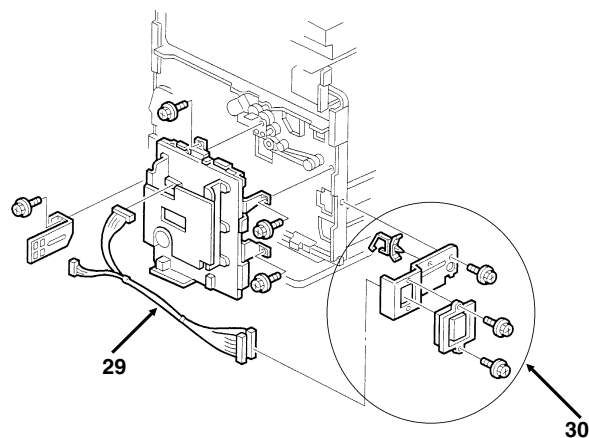
- **UPDATE No. 2 -** FRONT HOLDER - FUSING LAMP - To prevent the Front Fusing Cover from becoming hot, a shielding plate has been add to the Front Fusing Lamp Holder.

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
G0204161	G0204160	Front Holder - Fusing Lamp	1-1	1	33	27

UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A722612XXXX will have the new style Fusing Lamp Front Holder installed during production.

- **UPDATE No. 3 -** The harness and the bracket shown below have been added for the SR210 Finisher.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A1931319	A2241319	Operation Decal	1-1	1	7	21
A1931207	A2241207	Lower Left Cover	1-1	1	9	3
11050344		Clamp	1-0		61	178
	A1935497	Harness -Finisher	0-1		45	29
	A1935819	Bracket Assembly - Finisher	0-1		45	30

UNITS AFFECTED:

All Aficio 200 copiers manufactured after Serial Number A722612XXXX will have the above listed parts installed during production.

BULLETIN NUMBER: AFICIO 200 - 021**08/29/97****APPLICABLE MODEL: AFICIO 200****SUBJECT: TRANSFER AND SEPARATION UNIT****GENERAL:**

Due to part standardization, the Transfer and Separation Unit has been changed. This information should be incorporated into all existing Aficio 200 Parts Catalog documentation.

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6733880	A6733881	Transfer and Separation Unit	1	1	35	16

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

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CUSTOMER SERVICE GROUP

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: AFICIO 200 - 022

08/29/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: FIELD SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- 4-18 (Copier Section) Corrected Information
- 3-12 (Fax Section) Corrected Information

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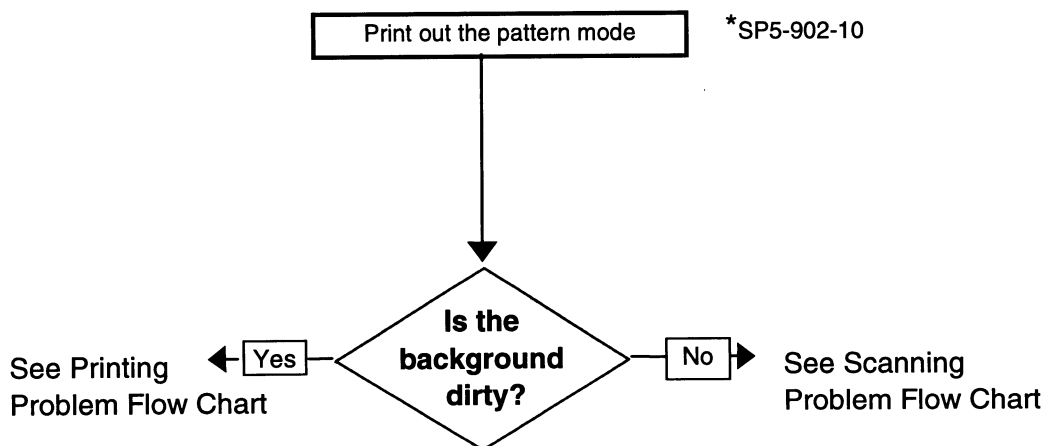
☐ OTHER

BULLETIN NUMBER: AFICIO 200 - 023**08/29/97****APPLICABLE MODEL: AFICIO 200****SUBJECT: AFICIO 200 COPY QUALITY TROUBLESHOOTING:****SYMPTOM 1:**

Dirty background or black spots appear on the background of the copy.

COUNTERMEASURE 1:

Confirm the problem is related to the printer or the scanning, follow the flowchart below.



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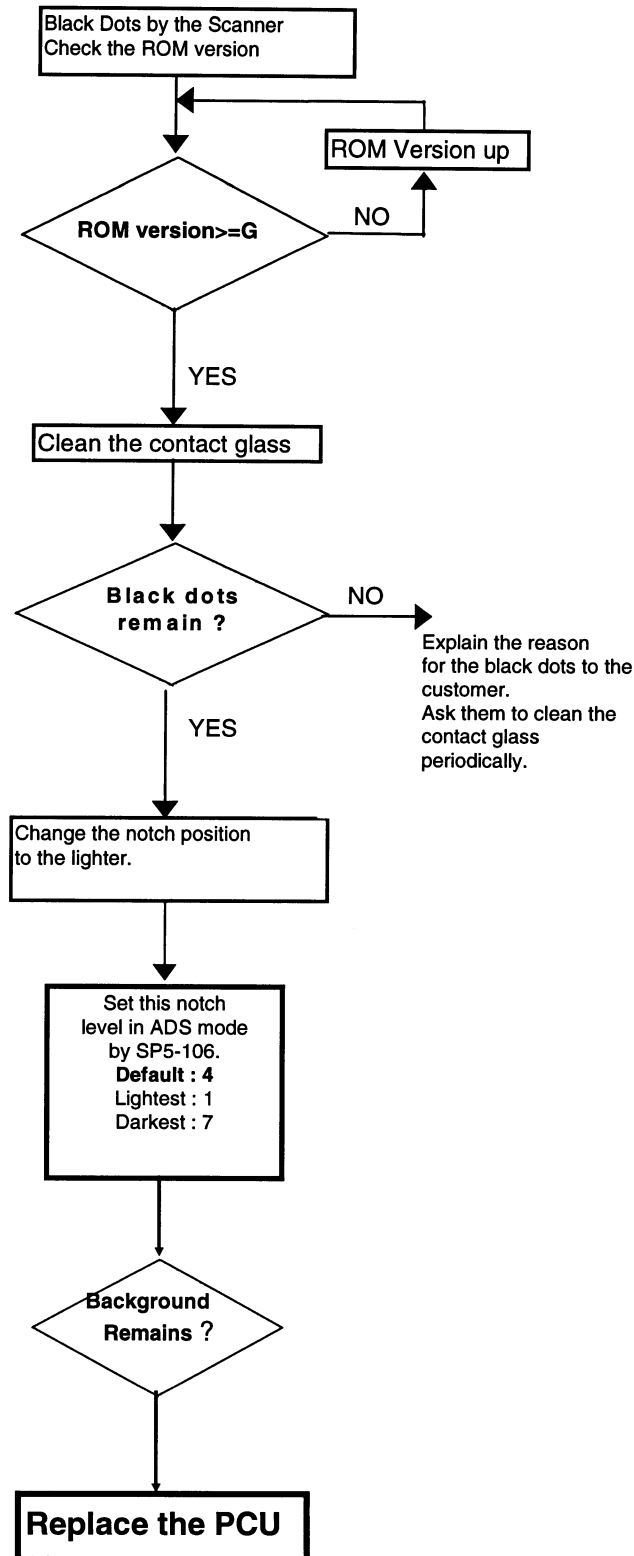
F S M

PARTS

OTHER

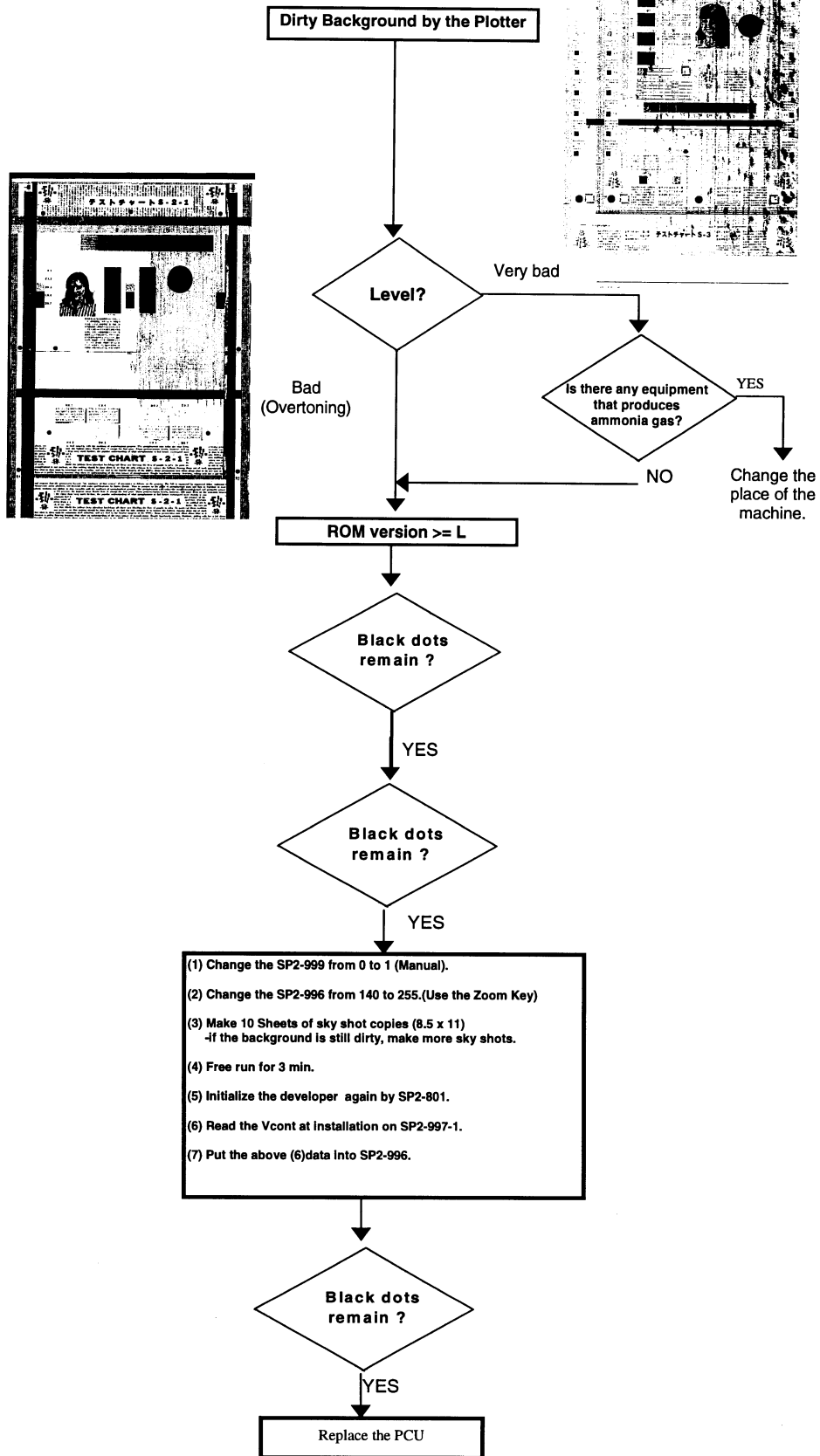
Continued...

SCANNING PROBLEMS



Continued...

SCANNING PROBLEMS





CUSTOMER SERVICE GROUP

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: AFICIO 200 - 024

10/17/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

• 4-18	Updated Information	Aficio 200 FSM SP Mode Table
• 5-15	Updated Information	Aficio 200 FSM Scanner Unit
• 3-11	Updated Information	Aficio 200 Fax Section

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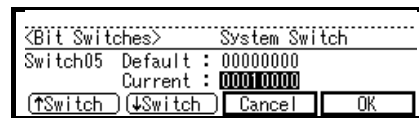
☐ PARTS

☐ OTHER

5. Connect the hard disk cable [E] to the interface card, as shown. Insert the card into the upper slot.
6. Connect the harness [I] (FCU-CN513).
7. Install the fax unit (See procedure 1.1).
8. Replace the rear cover.
9. Plug in the machine and turn on the ac and main switches.

3.2 INITIAL PROGRAMMING

1. Enter the service mode, and set bit 4 of system switch 05 to "1".



2. Exit the service mode, then turn off the ac and main switches, wait 5 or more seconds, then turn them back on.

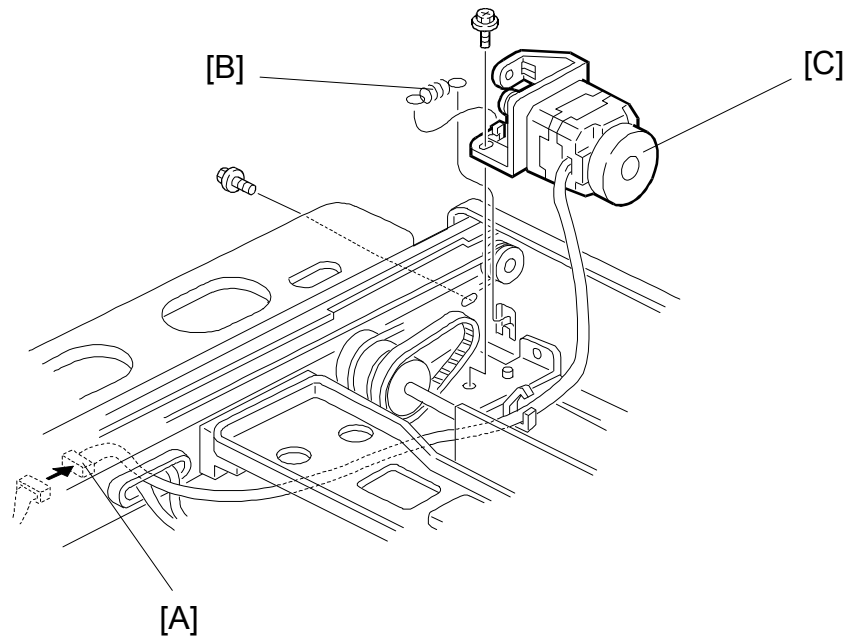
3. Enter the service mode and make sure that the data in the following RAM addresses are correct (service mode 06 - RAM).

If the data in these addresses do not match the following values, check the cable connections and the battery switch setting. Then check these addresses again. If the addresses are still incorrect, format the hard disk

Address (H)	Data (H)
70001E	50
70001F	00
700020	00
700021	FF
700022	00
700023	50
700024	00
700025	80

- ⇒
4. Initialize the memory files (service mode 07 - File selection 2).
 5. Print the system parameter list and make sure that "HD" is listed as an option. Also check that the memory indicator shows "100%" in standby mode.
 6. Connect the telephone cord to the NCU.

4.7 SCANNER MOTOR



1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Remove the scanner frames. (See Scanner Frame.)
4. Remove the harness [A].
5. Remove the tension spring [B].
6. Remove the motor bracket [C] (2 screws).
7. Secure the new motor with the tension spring.
- ⇒ 8. Perform the scanner and printer copy adjustments as described on page 5-39.

Replacement
Adjustment

BULLETIN NUMBER: AFICIO 200 - 025

11/21/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: AFICIO 200 FIRMWARE & SOFTWARE UPDATE

GENERAL:

In our continuing effort to provide excellent customer satisfaction, Ricoh is pleased to announce revisions to current firmware. The upgrade consists of the ROM's for the Aficio 200 copier engine and the Printer Interface Type 250. New print drivers are available on Ricoh's Web Site.

DISTRIBUTION METHOD:

Aficio 200 Copier Engine:

1 set of A1935532R ROM's will be shipped to each servicing location, based on Aficio 200 C.B.T. training packages shipped. This set consists of 2 ROM's, OH and OL, which are used in conjunction with the Flash ROM copy tool (P/N A1939450)

Printer Interface Type 250:

Firmware ROM's:

The ROM kit is available from NSPC by using normal parts ordering procedures.

- The Part Numbers For The ROM Kit Is: PI250135

Print Drivers Software:

The latest drivers Version 2.00 for windows 3.1x and Windows 95 are available for download on the World Wide Web at www.ricoh-usa.com.

Host Panel for DOS:

No changes.

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SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

• 6-14 ~ 16	Updated Information (ROM Modification History - Copier Section)
• 1-29 ~ 30	Updated Information (ROM & Software Modification History - Printer)
• 6-11	Updated Information (ROM Modification History - FAX Section)

AFICIO 200 ROM MODIFICATION HISTORY (Copier Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
- Version A, B & C were for the pre-production machines.	A1935532 D	1	1st Mass Production	
Corrects the following: - While feeding out the original from ADF, "Start key" can be detected, then the incorrect document size is detected. - ARDF is supported.	A1935532 E	1	A722611XXXX	
Corrects the following: - SC921-Memory Access Error After a paper jam during memory output and opening the door. - SC101- occurs at night timer in and out after the IPU test pattern in SP mode. - SP5-803: New PCU Detect is added for Input check. - Memory copy priority of SP5-945 is added to Salesman Program Mode. - SP-mode cannot be cleared at night timer in and out after going to the interrupt copy mode from SP mode. - Finisher is supported.	A1935532 F	1	A722612XXXX	
Corrects the following: - The Black Spots in the scanned image - The scanned low contrast image can be adjusted by 7 "notches." Each notch has the different gamma correct characteristic, MTF filter and threshold level by new SP mode(SP4-998,999). - The dirty background on the white image after the negative and positive reversing. - SC321 appears when the door is opened during the memory copying then the start key is pressed after closing the door. - The developing bias setting(SP2-201) is initialized by turning off the main switch.	A1935532 G	1	A722701XXXX	
- Dirty Background. 1) Toner Density (SP2-911) was changed from 2 to 3 (Lighter). 2) Free run time at the Installation of the PCU was changed from 1min. to 3min.	A1935532H	1	A722701XXXX	
- A blank sheet is printed out when the start key is pressed if the memory is full and the scanning restarted after printing the scanned image and then the first original jammed.	A1935532J	1	A722701XXXX	

AFICIO 200 ROM MODIFICATION HISTORY (Copier Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
- Toner scattering around the black image on the rear side in the duplex mode. The default of the separation output voltage was changed. - SP2-901-1→ -1800 - SP2-901-2→ -1800 - SP2-901-3→ - 2500 - SP2-901-4→ - 2500	A1935532K	1	A722702XXXX	
- When the RAM was cleared by SP5-801, the white level and the standard white plate density at the factory were erased.	A1935532L	1	A722703XXXX	
- Paper jam when paper is fed from the 3rd tray immediately after feeding the paper from the 4th tray.(A jam or Y jam) with the following papers. - 3rd Tray has the paper less than 288mm length (A4 ) - 4th Tray has the paper 289mm to 401mm length (A4 ) - If when the duplex copy is made with ADF, Duplex Unit and 12M Memory and the original is jammed, only the jammed original cannot be copied correctly at recovery copy.	A1935532M	1	A722705XXXX	
- (New SP Mode) - SP-006-4: ARDF Main-Scan Magnification of the rear side. - (Specification) - When the trays do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected.(The previous version software stops the copy job when one of tray is empty) - Stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode. - When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper. - SP5-808: The 3 languages cannot be selected on the previous software ver.N (Europe & Asia only)	A1935532N	1	A722706XXXX	

Trouble-
shooting

AFICIO 200 ROM MODIFICATION HISTORY (Copier Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
- New SP is added. SP5-945:1= When one of the trays is empty, the paper end indicator (red LED) lights. - The DF Jam display is cleared by DF lifting up and down	A1935532P	1	A722708XXXX	
-(For USA only) -New SP is added. SP5-950: LG size paper detection on the by pass tray. When this function is selected and LT size is inserted in the by-pass tray, the machine detects it as LG size paper.	A1935532R	1	A722709XXXX	

PRINTER CONTROLLER (A643) ROM MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE	LOCATION
- 1st. Software Released.	1.03	1st Mass Production 12/05/96	U - 23 U - 24
- 2nd. Software Released.	1.06	12/17/96	U - 23 U - 24
- Printer hangs up when printing word data with lines shaded with colors as HP/GL. - Duplex printing, HP/GL mode and colored lines. - Paper jam in Duplex mode when the A4 size data is printed to the A3 paper. - Out put of Genoa FTS file is different from that of HP (*Genoa FTS file) - Page ordering is wrong. - Duplex printing, Inter leave is on and also execute interrupt copier. - Finisher is supported - Print overrun by the access time to HDD. - Band Buffer is increased from 660KB to 4MB. - If the controller has a HDD, the SIMM memory more than 4MB must be added. - General Protection Fault at the Landscape Printing in Raster mode. Hung-up when the job reset is pressed during storing the data. - Doggy Tail function of the finisher does not work in the energy save and night timer mode. - Demo page cannot be printed. - Hung Up occurs rarely during storing the printing data on HDD due to the sector control failure. - Memory overflow corrected.	1.26	06/10/97	U - 23 U - 24
- When printing Banner page with Staple job, Banner page is printed incorrectly. - Resource saving on Test Page indicate "1219 Kbytes Allocated of 1219 Kbytes Available." It should be "0 Kbytes Allocated of ..." - When printing with Raster mode and custom paper size setting, output is incorrect.	1.35	09/30/97	U - 23 U - 24

PRINTER
CONTROLLER

PRINTER CONTROLLER (A643) - DRIVER SOFTWARE MODIFICATION HISTORY - FOR WIN 3.1 / WIN 95		
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE
- 1st. Software Released.	1.00	1st Mass Production 12/05/96
The power point in win95 cannot print the Raster Image.	1.10	02/02/97
In Raster mode, a part of the graphic data cannot be printed correctly.	1.21	04/02/97
Finisher is supported.	1.30	05/19/97
- Even if setting True Type Mode to " Down Load as True Type ", it output as bit image. - When printing Hound.doc with Win 3.1, a part of Univers Font was printed incorrectly. - When setting B5 Env.to Bypass Tray, WinPanel shows "Add F4 paper into Bypass Tray." - When installing Win95 driver by Add Printer, Help File was not installed.	2.00	07/09/97

PRINTER CONTROLLER (A643) - HOST PANEL FOR DOS MODIFICATION HISTORY		
DESCRIPTION OF MODIFICATION	VERSION	RELEASE DATE
- 1st. Software Released.	1.00	1st Mass Production 12/05/96
- N/A	1.01	04/02/97
- Profile which has the Host Panel setting information in Duplex mode cannot be opened correctly.	1.02	05/25/97

AFICIO 200 ROM MODIFICATION HISTORY (Fax Section)				
DESCRIPTION OF MODIFICATION	RICOH P/N	QTY	SERIAL NUMBER	LOCATION
- In the G3or G4 receiving mode, when the memory is full at the first block of any page, a part of the previous page is missing. - Receiving error in G4 mode When it is waiting for RSSP (or RSSN) signal after sending "CONN" signal, the machine displays "communication error" if "DISC" signal comes. - The periodical auto service call function does not work.	A1945581 F	1	March '97	
The Two-in-one Function from HLT to LT size paper is not working. - (New System Switch) When the closed network is enabled and the ID is not programmed, all reception is not available (Specification). The System SW is added to protect this problem. Swsys -1E Bit 4. When the closed network is turned on and the ID is not set: 0: The closed network is not available. 1: Only the transmission is available. - The display of the remote terminal ID at AI redial: Swsys-1E Bit 5 0: RTI/CSI is displayed. 1: Input Fax Number is displayed. - LCT and Tray of the duplex unit are supported. - New HDD is supported. - NEST card option is supported.	A1945581 G	1	May '97	
The received files cannot be printed out from HDD. When a small amount of data (less than 2K Bytes) is received and the communication is finished before the writing job on the HDD is finished, the data is not completed on the HDD.	A1945581 H	1	August '97	

**Trouble-
shooting**

BULLETIN NUMBER: AFICIO 200/250 - 026

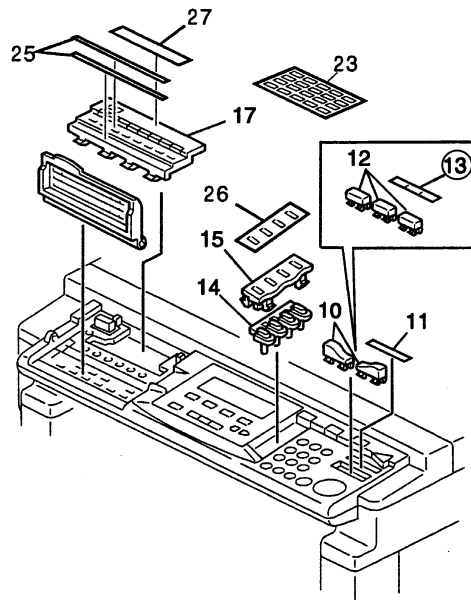
12/22/97

APPLICABLE MODEL: AFICIO 200

SUBJECT: PARTS CATALOG CORRECTION

GENERAL:

The following Parts Corrections are being issued for all Aficio 200 Parts Catalogs.



Note: This copy intended as master of original for reproduction of additional bulletins.

				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY.	PAGE	ITEM
A6931500	A6391500	Decal - Copy/Fax/Printer	1	3	13

☐ COPY QUALITY

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☐ ELECTRICAL

☐ PAPER PATH

☐ S M

☒ PARTS

☐ OTHER

BULLETIN NUMBER: AFICIO 200 - 027

1/20/98

APPLICABLE MODEL: AFICIO 200

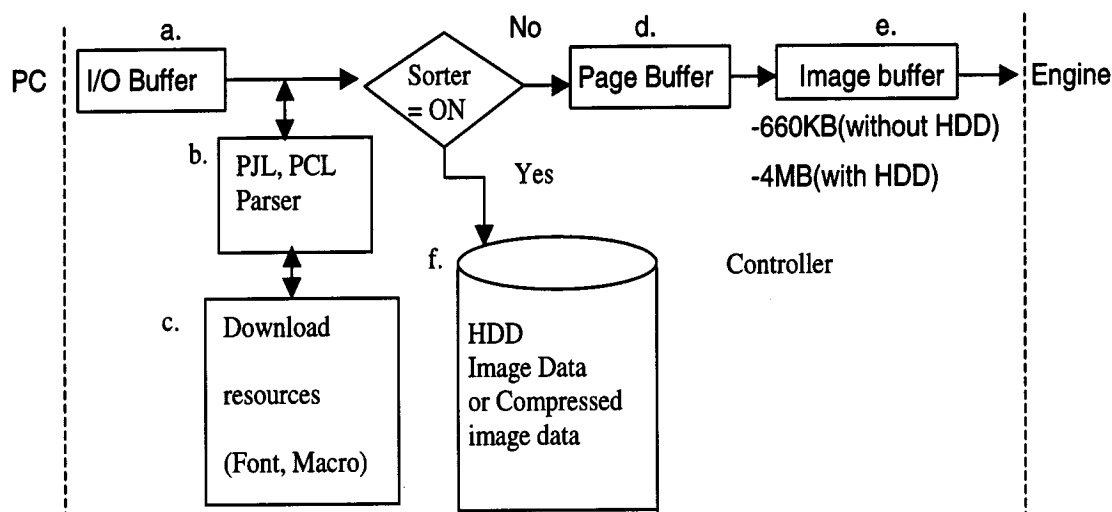
SUBJECT: PRINT OVERRUN AND MEMORY OVERFLOW PROBLEM

GENERAL:

This is an explanation of the Print Overrun and Memory Overflow problem on the printer controller type 250.

A. I/O Buffer for receiving and sending data.

1. Data flow in the controller unit



B. Stores the operation language software (such as PCL and PJP).

C. Manages downloaded resources (such as Font, Macro).

D. Hold and process data from incoming print jobs.

E. Image video buffer for sending video data to engine to print.

F. *When the HDD is installed, it is used only for data sorting functions.

If the sorting function is selected, the data is stored onto the HDD.

*When using the HDD, the SIMM memory must be more than 4MB with Ver.1.21 firmware.

2. Memory Overflow indication.

This means that the requested print job did not have sufficient Printer memory available.

If a user sends a large print job, which will use a lot of memory, it might cause "Memory Overflow."

"Memory overflow" might happen during steps B, C and D.

When "memory overflow" occurs the printer prints only a part of the page. This problem can be solved by adding more memory to the printer (8MB SIMM or more).

Continued...

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☐ PAPER PATH

☐ S M

☐ PARTS

☒ OTHER

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3. Print Overrun indication

This means that the data sent to the printer was too complex.

The printer is preparing image data and sending it to the engine at the same time. If the print job is too complex the printer will not complete the image for the engine and this will produce a Print Overrun indication.

(Case1: HDD Access Time)

If the data processing time is too long because of the limits of the HDD access time, it will cause an Access Time error. This problem with the HDD can be solved by updating the firmware to ver.1.21 and adding SIMM memory (more than 4MB). The printer will allocate 4MB for the Image Buffer (e) if the HDD is installed with firmware ver.1.21 or higher. After all of the pages for one job are stored on the hard disk, the printer will move image data from the hard disk to the image buffer until the image buffer is full and then tells the engine to go. Paper sizes smaller than A4 or LT should not cause this problem.

(Case2: HDD Reading Error)

The vibration from the Duplex unit may cause it to indicate a Reading Error problem.

To correct this condition, the bracket on HDD has been modified with 4 rubber cushions. When the HDD is installed on the controller, use the new brackets to prevent the HDD from vibrating.

ROJ will provide new brackets for all HDDs, which were shipped with old style brackets.

(Case3: HDD sector control failure)

The sector information is controlled by the firmware. This information is rarely affected by firmware bugs or Hang Up's.

This problem has been solved by using firmware ver.1.26.

If the finisher and the HDD are installed on the printer, use the following items

- * Firmware ver 1.26
- * Driver ver. 1.30
- * New bracket on HDD

BULLETIN NUMBER: AFICIO 200 - 027 REISSUE ★

02/10/98

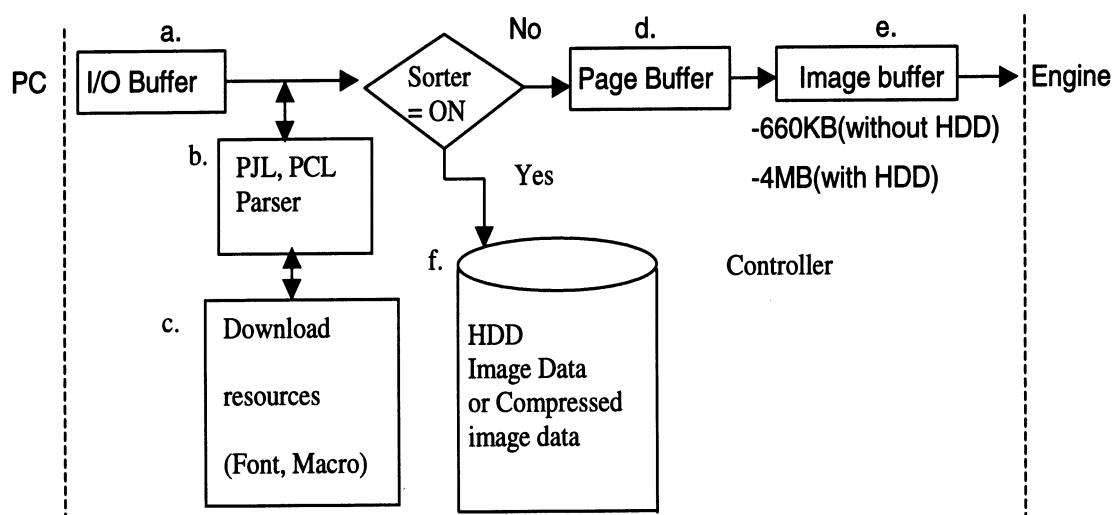
APPLICABLE MODEL: AFICIO 200

SUBJECT: PRINT OVERRUN AND MEMORY OVERFLOW PROBLEM

GENERAL:

This is an explanation of the Print Overrun and Memory Overflow problem on the printer controller type 250.

1. Data flow in the controller unit



- A. I/O Buffer for receiving and sending data.
- B. Stores the operation language software (such as PCL and P/L).
- C. Manages downloaded resources (such as Font, Macro).
- D. Hold and process data from incoming print jobs.
- E. Image video buffer for sending video data to engine to print.
- F. *When the HDD is installed, it is used only for data sorting functions.
If the sorting function is selected, the data is stored onto the HDD.
*When using the HDD, the SIMM memory must be more than 4MB with Ver.1.21 firmware.

2. Memory Overflow indication.

This means that the requested print job did not have sufficient Printer Memory available. If a user sends a large print job, which will use a lot of memory, it might cause "Memory Overflow."

"Memory Overflow" might happen during steps B, C and D.

When "Memory Overflow" occurs the printer prints only a part of the page. This problem can be solved by adding more memory to the printer (8MB SIMM or more).

Continued...

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COPY QUALITY MECHANICAL ELECTRICAL PAPER PATH S M PARTS OTHER

3. Print Overrun indication

This means that the data sent to the printer was too complex.

The printer is preparing image data and sending it to the engine at the same time. If the print job is too complex the printer will not complete the image for the engine and this will produce a Print Overrun indication.

(Case1: HDD Access Time)

If the data processing time is too long because of the limits of the HDD access time, it will cause an Access Time error. This problem with the HDD can be solved by updating the firmware to version 1.35 and adding SIMM memory (more than 4 MB) to the 2 Meg already in the controller. The printer will allocate 4 MB for the Image Buffer (E) if the HDD is installed with firmware ver.1.21 or higher. After all of the pages for one job are stored on the hard disk, the printer will move image data from the hard disk to the image buffer until the image buffer is full and then start the print operation. Paper sizes smaller than A4 or LT should not cause this problem.

(Case2: HDD Reading Error)

The vibration from the Duplex unit may cause it to indicate a Reading Error problem. To correct this condition, the bracket on HDD has been modified with 4 rubber cushions. When the HDD is installed on the controller, use the new brackets to prevent the HDD from vibration.

NOTE: Ricoh Corp. will provide new brackets for HDDs, which were shipped with old style brackets. *The bracket assembly is packaged as a kit (A6439909) and provided at no charge, to each dealership for 100% of the hard drives. This allocation is based on Ricoh's shipping records.*

(Case3: HDD sector control failure)

The sector information is controlled by the firmware. This information is rarely affected by firmware bugs or Hang Up's.

This problem has been solved by using firmware ver.1.26 through -ver 1.35

NOTE: *If the finisher and the HDD are installed on the printer, use the following items*

** Firmware version 1.26 through 1.35 PN P1250135*

** Driver version 1.30 through 2.0*

** New bracket on HDD – One set will be shipped for each HDD affected*

Firmware version 1.35 (PN P1250135) is recommended .

Driver version 2.0, also recommended is available from our Web page Ricoh-USA.com.

BULLETIN NUMBER: AFICIO 200/250 - 028

01/20/98

APPLICABLE MODEL: AFICIO 200/AFICIO 250

SUBJECT: CONTROLLER DIFFERENCES BETWEEN AFICIO 200 AND AFICIO 250

GENERAL: The Printer Controller (Type 251) has been developed as an optional device for the Aficio 250 by changing the video clock and the firmware of the Aficio 200 Controller (Type 250). The Type 251 Controller supports feeding 11x 8.5" and A4 paper from the LCT.

NOTE: The Controllers for Aficio 200 and Aficio 250 are **not** interchangeable. Both Controllers can be physically installed on either copier but they will not function correctly if installed in the wrong copier. If the incorrect Controller is installed in the copier the following image problems may result: printer side to side / lead edge registration shifted, abnormally enlarged or reduced printed images.

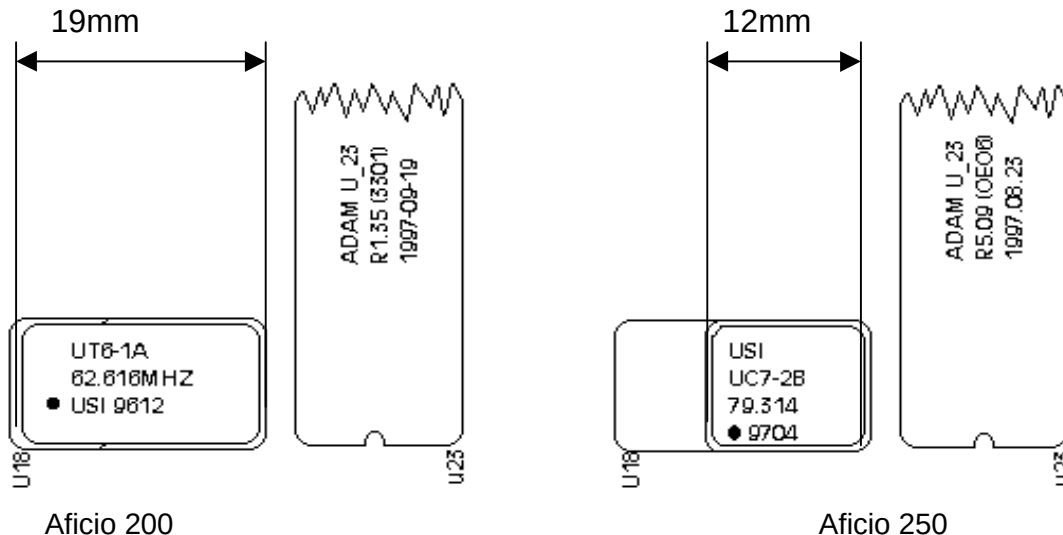
The service, installation, and troubleshooting procedures for the Type 251 Controller are the same as the Type 250 Controller. The other optional devices and software that are related to the Printer Controller (Printer Hard Disk, Network Print Servers, Printer Drivers, and Utilities) can be used in both machines.

Summary of Differences

	Aficio 200	Aficio 250
Item	Type 250 Controller	Type 251 Controller
Model Code	A643	A805
Maximum Print Speed	20 PPM	25 PPM
Firmware	Unique	Unique
Video Clock	62.616 MHz (19x12 mm, see Note2)	79.314 MHz (12x12 mm, see Note2)
LCT Feeding	Not supported see Note 1	Supported

NOTE 1: The Printer Driver can select the LCT, though it cannot be installed on the machine. If a user selects the LCT with the driver, paper will be fed from the default tray.

NOTE 2: To determine what type of Controller you have, by physically looking at the Controller, it would be the size of the Video Clock Oscillator that determines the difference. The difference in size of Video Clock Oscillators are shown below:



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☐ PARTS

☒ OTHER

BULLETIN NUMBER: AFICIO 200 - 029

1/20/98

APPLICABLE MODEL: PS330

SUBJECT: TRANSPORT ROLLER NOISE

SYMPTOM:

Noise comes from the Transport Roller (AF02 0377) bushings.

CAUSE:

The surface of the Transport Roller shaft is rough.

FIELD COUNTERMEASURE:

Lubricate the Transport Roller bushings to eliminate the noise.

PRODUCTION COUNTERMEASURE:

The Transport Rollers are being inspected and the bushings are being lubricated as of **March 1997 production**.

Caution:

*Do not use chemical oil. When this type of Oil is used, the same problem may occur.
Use machine oil (mineral oil) for this reason. This oil should be procured locally.*

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BULLETIN NUMBER: AFICIO 200/250 - 030

02/20/98

APPLICABLE MODEL: AFICIO 200/250

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- 13-19 Updated Information

Note: This copy intended as master of original
for reproduction of additional bulletins.

11. ENERGY SAVER MODES

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

1. Fusing temperature in the energy saver level 2
80°C (230V machine)
2. The recovery time from energy saver level 2
30 s (230V machine)
3. When the auto shut-off timer runs out in the copier configuration (230V machine only)
When the auto shut-off timer runs out, the machine will enter the auto shut off mode and the **ac switch** will turn off automatically.

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

4. Power consumption in the copier configuration

⇒

Mode	AC Switch	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	On	165°C	On	The machine will return to standby mode if the DF is lifted or an original is placed in the ADF or ARDF.
Energy Saver Level 2	On	On	On	140°C (115 V) 80°C (230 V)	On	

Model	ADF - 9920DP	Volt/Hz	Date of Modification	Serial Number
Modified Article		No serial number cut-in information		
Reason for Modification	Parts catalog correction			

The following should be corrected. Please correct your part catalog.

1. The following parts have been modified.

Old Part Number	New Part Number	Description	Q'ty	Index No.	Page
A6281236	A6281261	Original Entrance Guide	1	9	3
A6282167	A6281262	Pad - Original Entrance Guide	1	10	3
A6281217	A6281257	Original Feed Belt	1	18	5
AA063144	A6281596	Left Transport Roller Spring	4	38	5
A6281582		Rear Spring - Exit Roller	2 → 0	23	7
	G0101106	Spring - Interlock	2 → 4	40	7
A6281511	A6281512	Separation Roller	1	5	7
A6281572	A6281566	Rear Bushing - Exit Roller	2	22	7
A6281581	A6281585	Lower Exit Roller	2	24	7
A6281571	A6281565	Front Bushing - Exit Roller	2	25	7

2. The following parts have been added.

New Part Number	Description	Q'ty	Index No.	Page	Fig. no.
A6282170	Lock Lever - Left Cover	1	38	3	1
A6281174	Right Grounding Plate - Hinge Bracket	2	39	3	1
A6281177	Left Grounding Plate - Hinge Bracket	1	40	3	1
04504010B	Tapping Screw - MX10		101	3	1
A6281176	Grounding Plate - Base	1	42	9	2
A6281829	Collar - 9X15X3	1	43	9	2

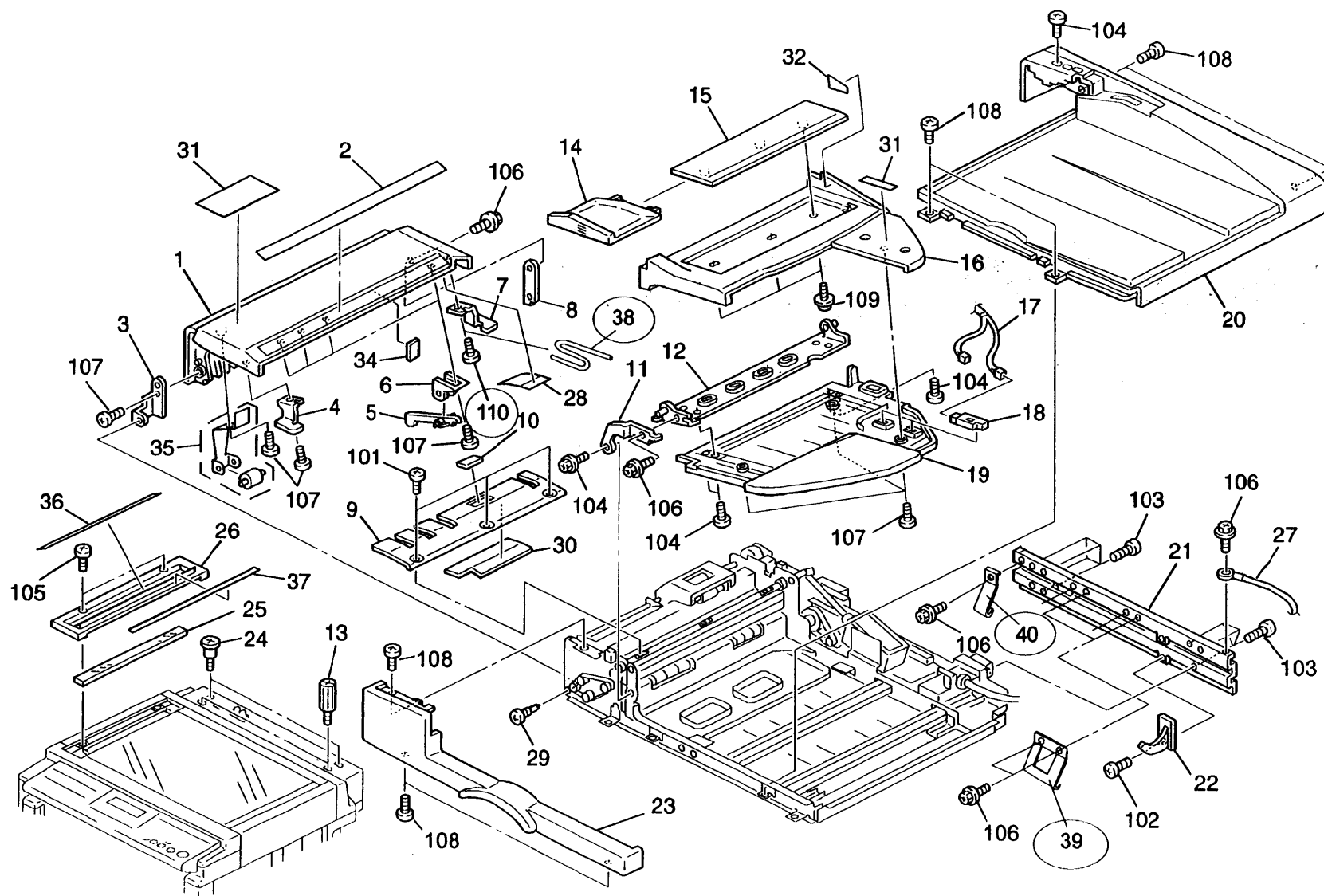


Fig. 1

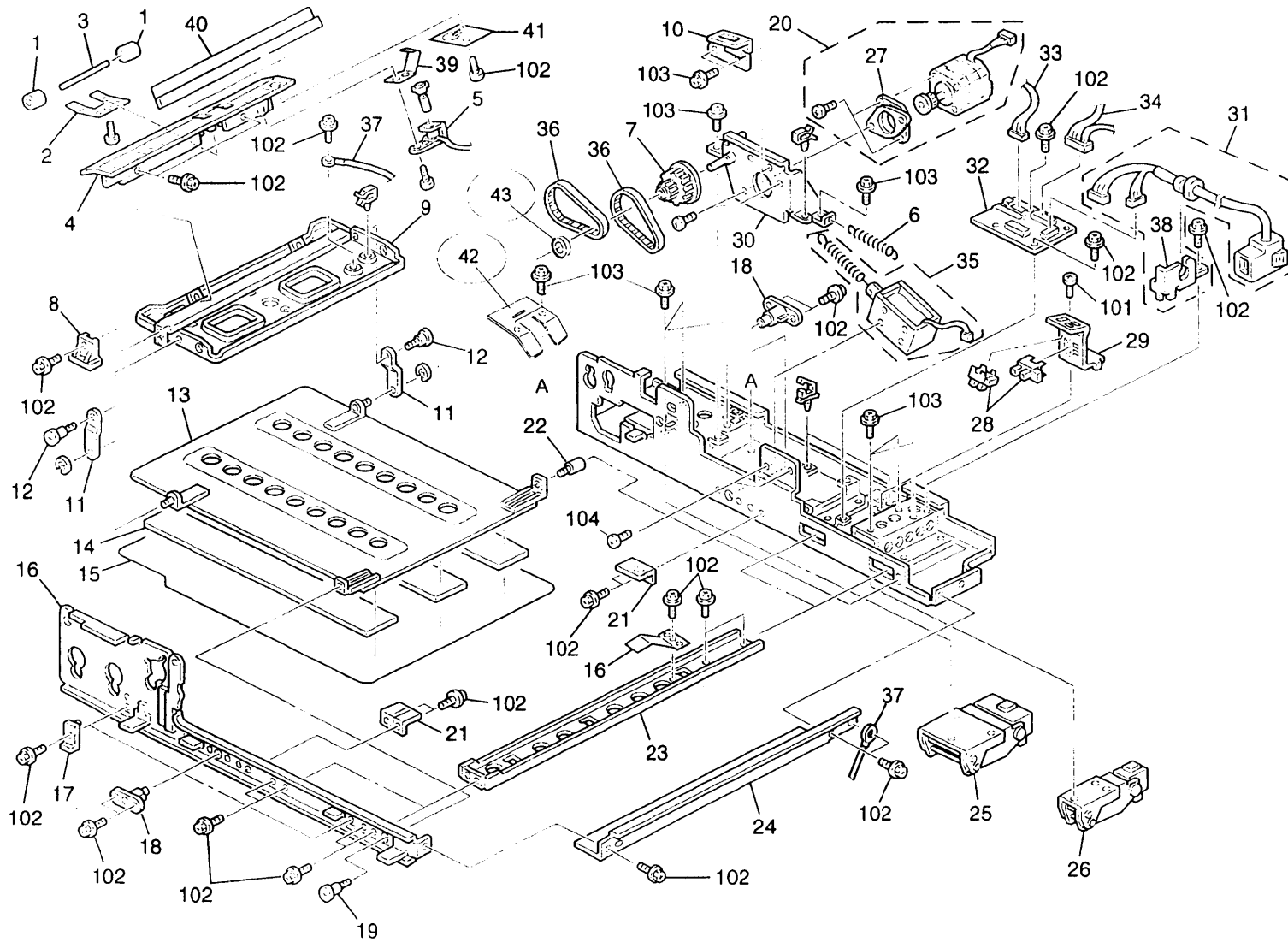


Fig. 2

Model	9920DP	Volt/Hz	Date of Modification	Serial Number
Modified Article		No serial Number cut-in information		
Reason for Modification	Parts catalog correction			

The following should be corrected. Please correct your part catalog.

1. The following part numbers have been corrected.

Wrong Part Number	Correct Part Number	Description	Q'ty	Index No.	Page
G0202742	G0202741	Upper Registration Roller	1	9	19
G0204482	G0204374	Middle Antistatic Brush - FD	1	32	39
H5213355	G0201160	C Ring - Paper Feed Roller	1	22	43
11027324	11027676	Connector Header - 16P		101	57
11027452	11027677	Connector DF11-22DP-2V		103	57
A1399351	A1939351	ROM Board 2	1	2	65

2. The following parts are not used. Delete these parts from your parts catalog.

Part Number	Description	Q'ty	Index No.	Page
G0202744	Gear - 40Z	1	20	19

3. The descriptions of the following parts have been changed.

Part Number	Wrong Description	Correct Description	Q'ty	Index No.	Page
A1931853	Laser Unit (115V)	LD Unit Ass'y (115V)	1	3	27
A1931855	Laser Unit (230V)	LD Unit Ass'y (230V)	1	3	27
A1931861	LD Unit Ass'y (230V)	Laser Unit (115V)	1	4	27
A1931865	LD Unit Ass'y (230V)	Laser Unit (230V)	1	4	27

4. The following parts have been added.

Part Number	Description	Q'ty	Index No.	Page
A1935475	Harness - Key Counter (LAN)	1	18	45
G0203870	Discharge Brush	1	28	35

5. The numbers used of the following parts have been changed

Old Part Number	New Part Number	Description	Q'ty	Index No.	Page	Fig. no.
G0202105		Bracket - Quenching Lamp	1	4	35	Fig.2
G0202104		Quenching Lamp	1	5	35	
	G0202104	Quenching Lamp Ass'y	1	5	35	
G0204411		Paper Exit Pawl	1	12	39	Fig.3
	G0204454	Paper Exit Pawl	1	12	39	
	G0204455	Spring	1	39	39	

6. The index numbers of the illustration have been changed as follows SECTION LASER UN

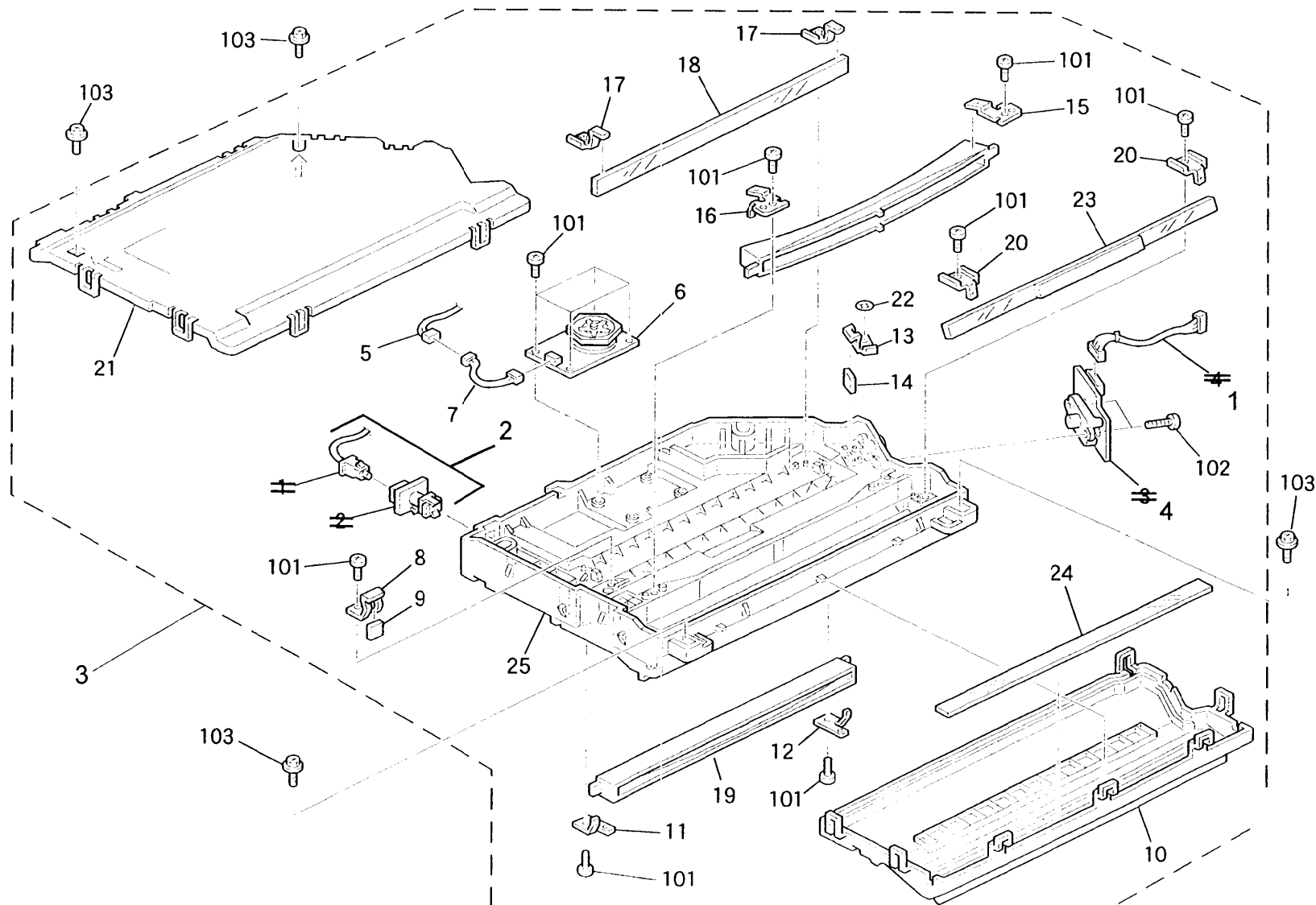


Fig. 1

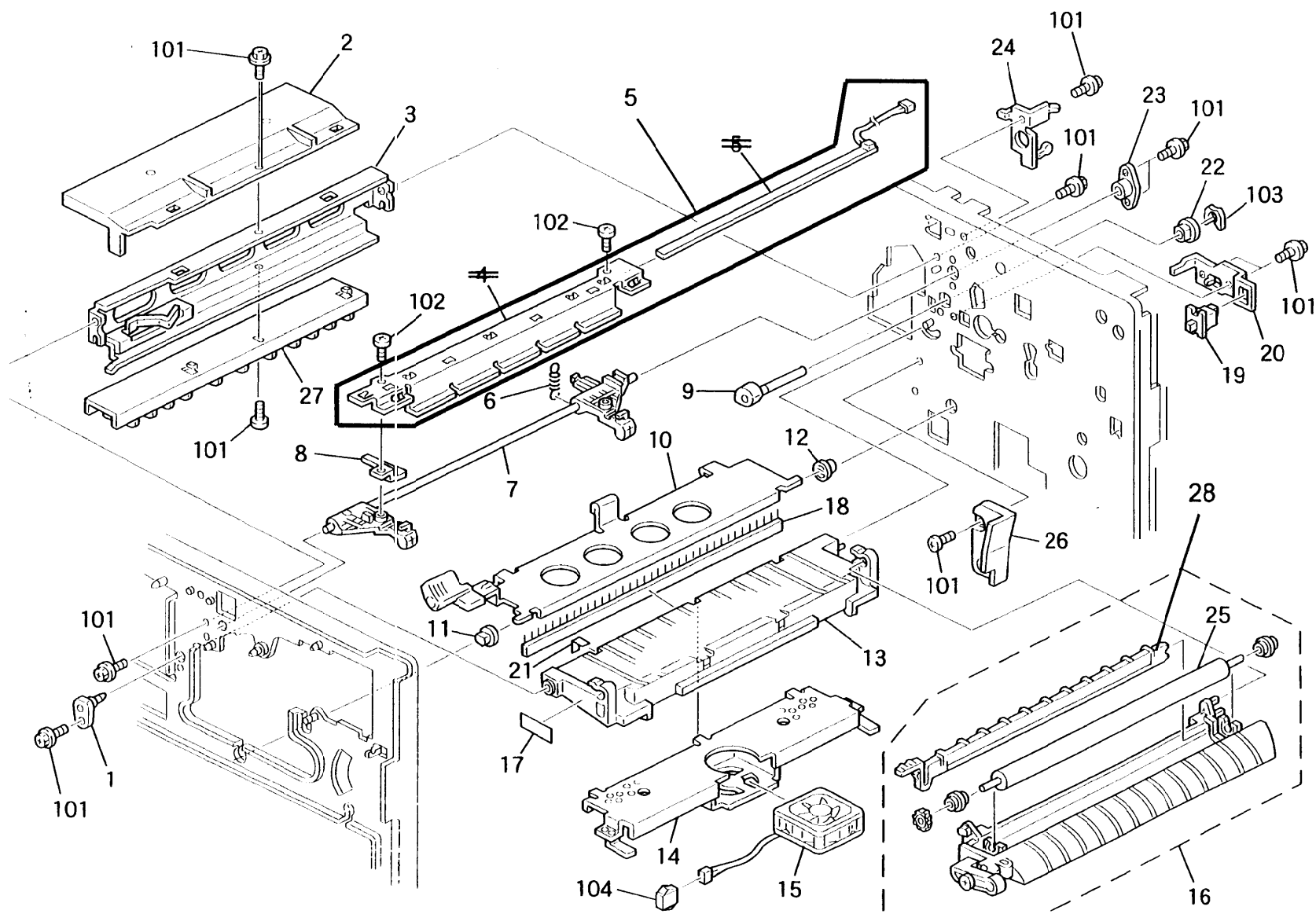


Fig. 2

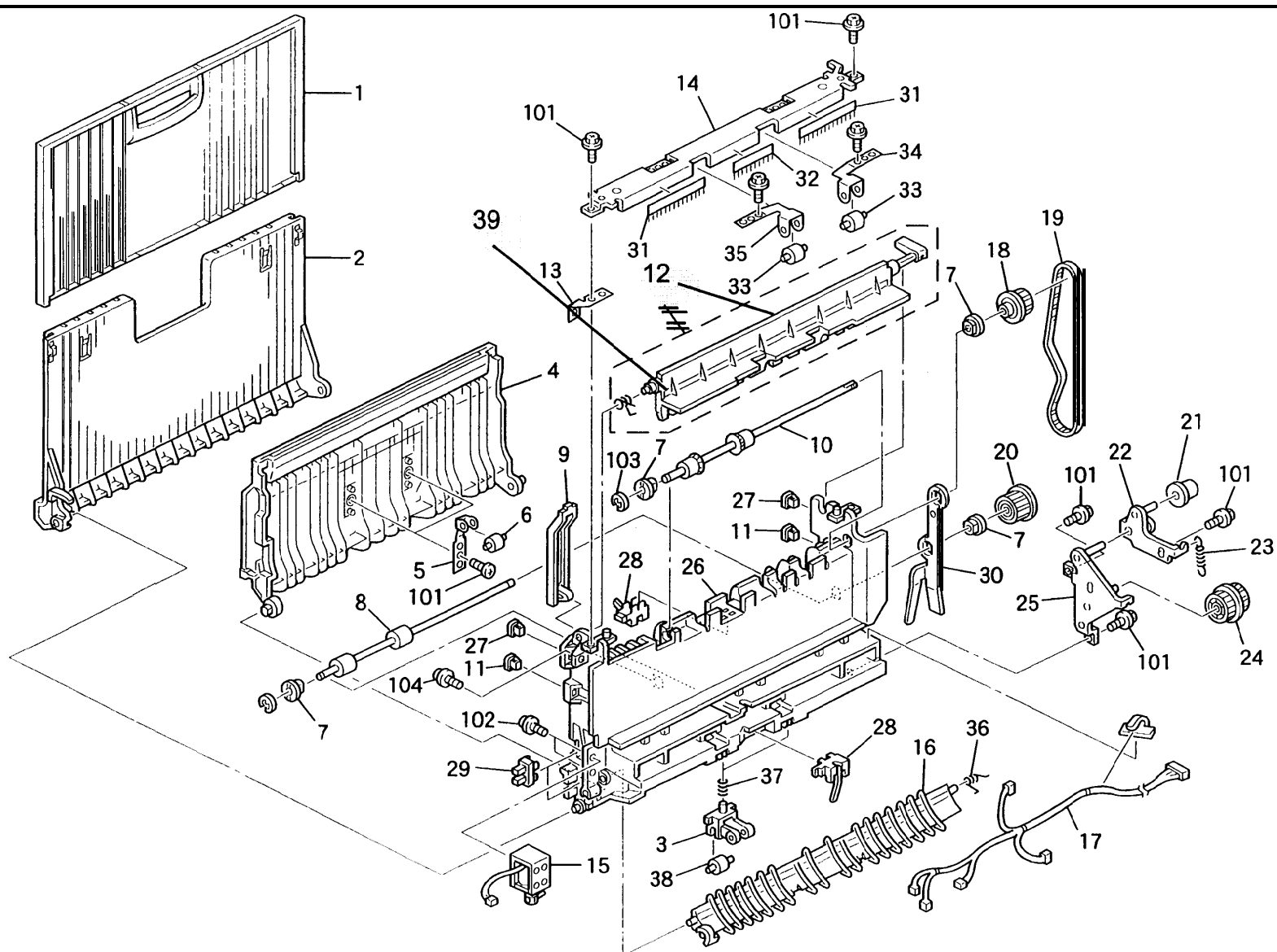


Fig 3



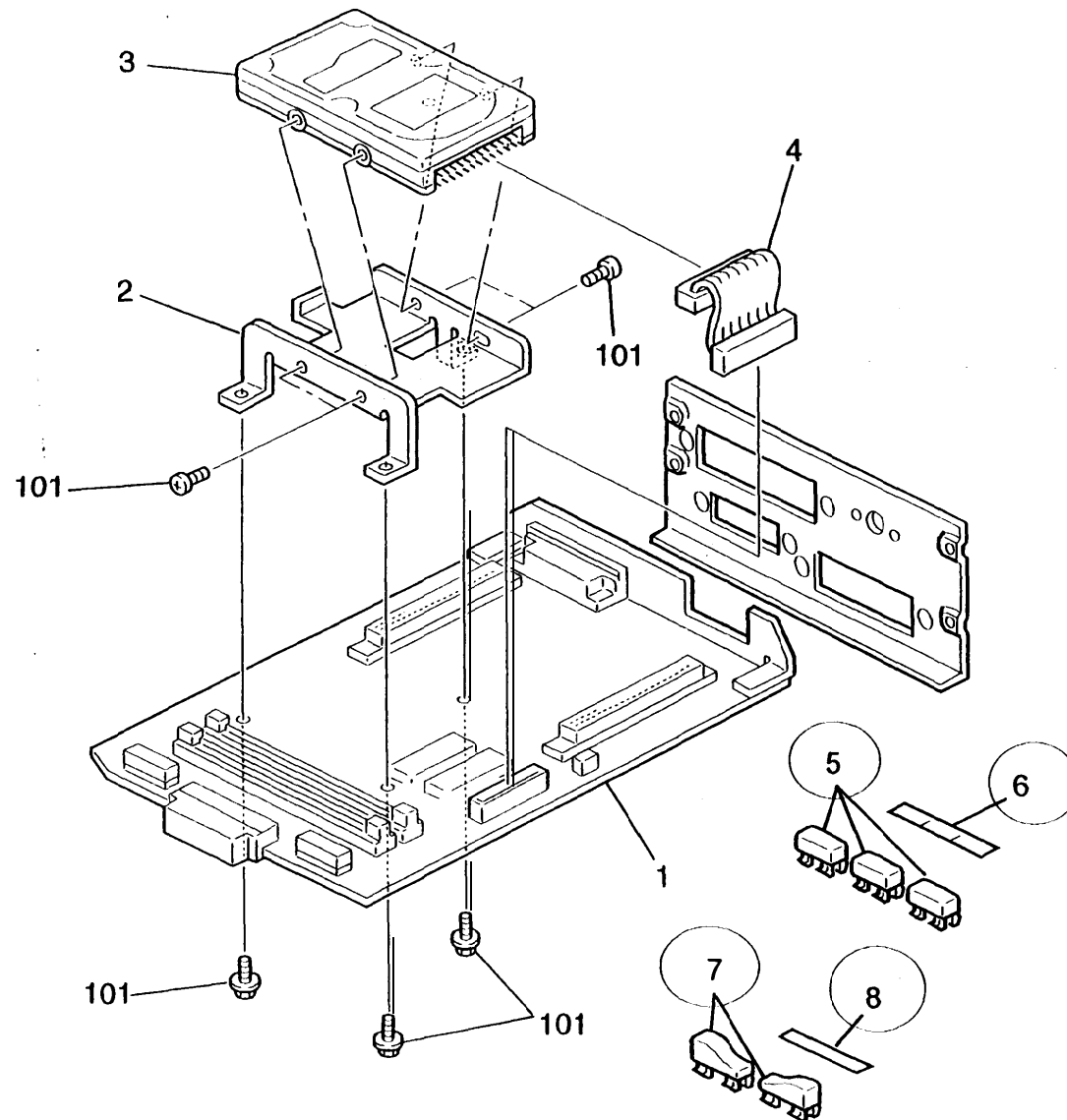
ISSUED ON: December 13, '96

Model	Printer Controller Type 250 - 9920DP	Volt/Hz	Date of Modification	Serial Number
Modified Article		No serial number cut-in information		
Reason for Modification	Parts catalog correction			

The following should be corrected. Please correct your part catalog.

1. The following parts have been added.

New Part Number	Description	Q'ty	Index No.	Page
A1961496	Keytop - Copy/Fax/Prn	1	5	25
A6391500	Decal - Copy/Fax/Prn	1	6	25
A1941496	Keytop - Copy/Prn	1	7	25
A6431493	Decal - Copy/Prn	1	8	25



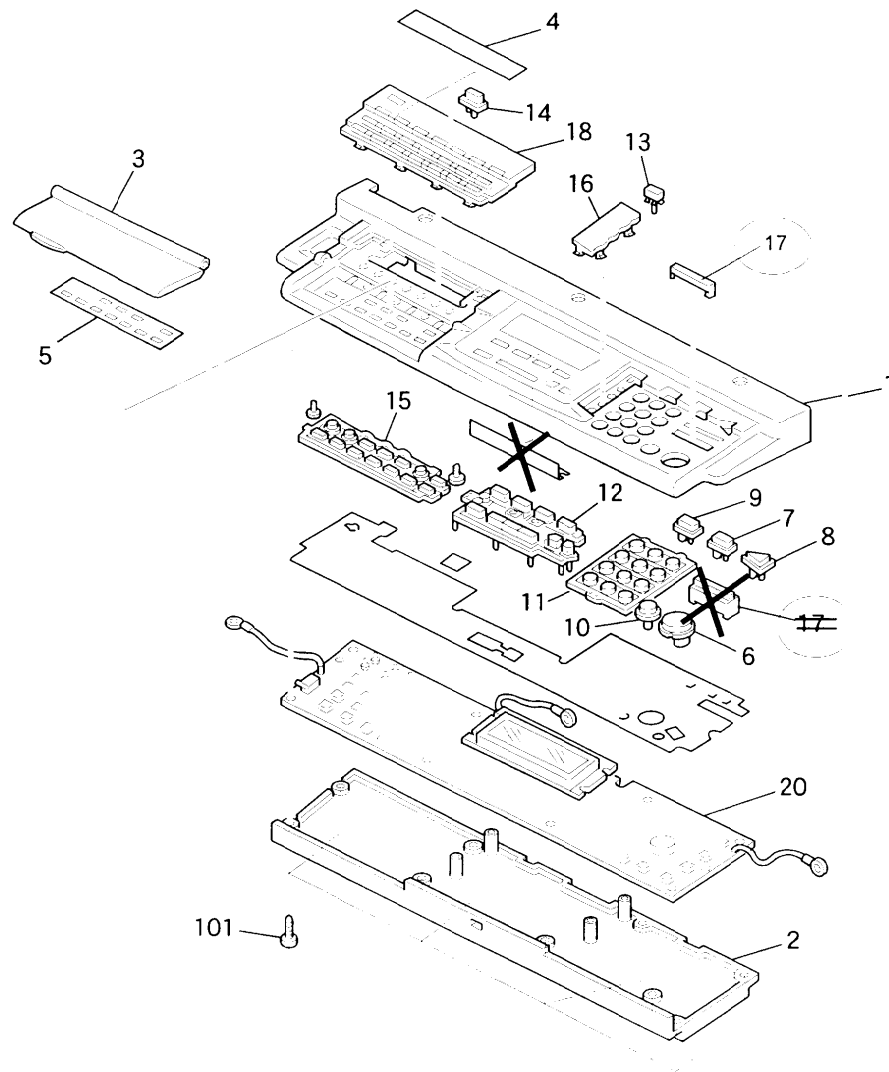
SAVIN.**MODIFICATION BULLETIN NO. 9920DP-005 PAGE 1 OF 2****ISSUED ON: January 15, '97**

Model	9920DP	Volt/Hz	Date of Modification	Serial Number
Modified Article	Noseal number cut-in information			
Reason for Modification	Parts catalog correction			

The following should be corrected. Please correct your part catalog.

1. The following part has been deleted and the illustration has been changed (refer to the attached illustration).

Old Part Number	New Part Number	Description	Qty	Index No.	Page
A1941483		Key Top - LCD	1	21	13

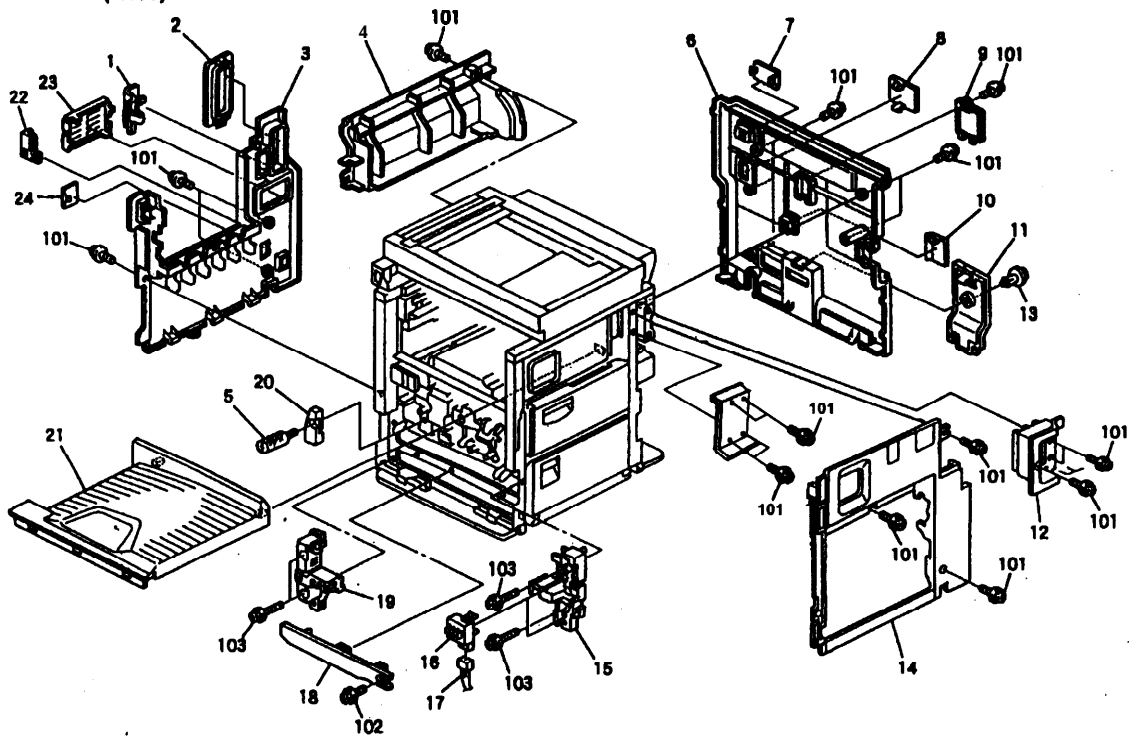


Model: 9920DP		Date: September 29, 1997		No: 9920 - 006	
Modified Article: Parts catalog correction				Serial Number:	
Reason for Modification:		☐ Parts catalog correction ☐ Vendor change ☐ To meet standards ☐ To facilitate assembly ☐ To improve reliability ☐ Part standardization ☐ Other			

1. The part number for the Shield Plate (A1935826) is reflected on page 61-1 index182, however there is no illustration for this part. The correct location for the illustration and the part number is reflected below.

Old part number	New part number	Description	Qty	Int	Page	Index	Note
-	A1935826	Shield Plate	1	-	9	20	

2. Exterior 2 (A193)



Model: 9920/9925DP		Date: March 26, 1998	No: 9920DP - 007 9925DP - 001
Modified Article: PARTS ADDENDA: PLATEN COVER			Serial Number:
Reason for Modification:	☒ Parts catalog correction ☐ Vendor change ☐ To meet standards ☐ To facilitate assembly ☐ To improve reliability ☐ Part standardization ☐ Other		

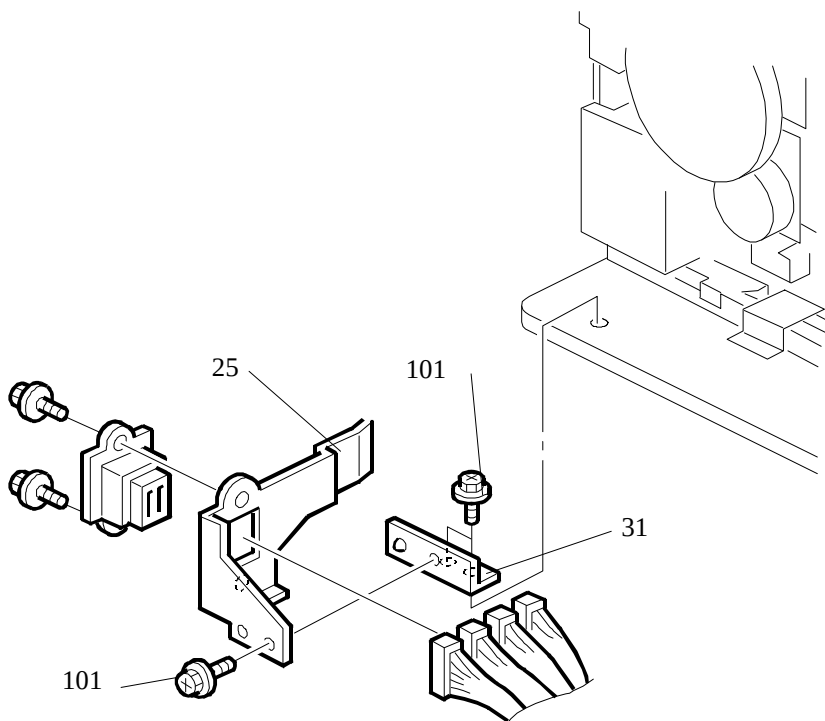
Please correct the following in your parts catalog:

9920DP / 9925DP

part number	Description	Qty	Int	Page	Old Index	New Index	Note
A1931317	Platen Cover Bracket	2		11	5	6	
A0531957	Flex Hinge - Platen Cover	1		11	6	5	

9925DP

Old part number	New part number	Description	Qty	Int	Page	Index	Note
G0202722	G0202723	By-pass Feed Shaft	1		23	29	
	A2245821	Base Connector Bracket - LCT	1		53	31	



A224.WMF

Model: 9920 Finisher		Date: March 26, 1998	No: 9920 - 008
Modified Article: MAIN CONTROL BOARD		Serial Number: 7A77040001	
Reason for Modification:	☐ Parts catalog correction ☐ Vendor change ☐ To meet standards ☐ To facilitate assembly ☐ To improve reliability ☐ Part standardization ☒ Other		

To prevent the MAIN CONTROL BOARD from being damaged when the power supply connector is plugged in or unplugged while the power is on, the zener diode on the MAIN CONTROL BOARD has been changed from P/N 14021061 to P/N 14021424. (Qty=2)

The two diodes maintain the voltage at the 5-volt line by quickly by-passing the rush current to ground.

Old part number	New part number	Description	Qty	Int	Page	Index	Note
A6665500	A6665510	Main Control Board	1→1	x/o	15	24	

V/Hz	Option for	JAPAN PRODUCTION	
		CODE	SERIAL NUMBER
115/60	U.S.A	A666-10	AH87040001
115/60	U.S.A,CANADA	A666-15	7A77040001
115/60	U.S.A,CANADA	A666-17	A7397040001
220/50	EUROPE	A666-26	3L60470001
115/60	U.S.A	A666-55	L0157040726



Modification Bulletin

PAGE: 1/1

Model: 9920DP		Date: April 14, 1998	No: 9920 - 009
Modified Article: PARTS CATALOG CORRECTION		Serial Number:	
Reason for Modification:	☒ Parts catalog correction ☐ Vendor change ☐ To meet standards ☐ To facilitate assembly ☐ To improve reliability ☐ Part standardization ☐ Other		

Please change the following in your Parts Catalog.

Old Part number	New Part number	Description	Qty	Page	Index
A139 9351	A193 9351	ROM Board 2	1	65	2

Model: 9920/9925DP		Date: March 26, 1998	No: 9920DP - 007 9925DP - 001
Modified Article: PARTS ADDENDA: PLATEN COVER			Serial Number:
Reason for Modification:	☒ Parts catalog correction ☐ Vendor change ☐ To meet standards ☐ To facilitate assembly ☐ To improve reliability ☐ Part standardization ☐ Other		

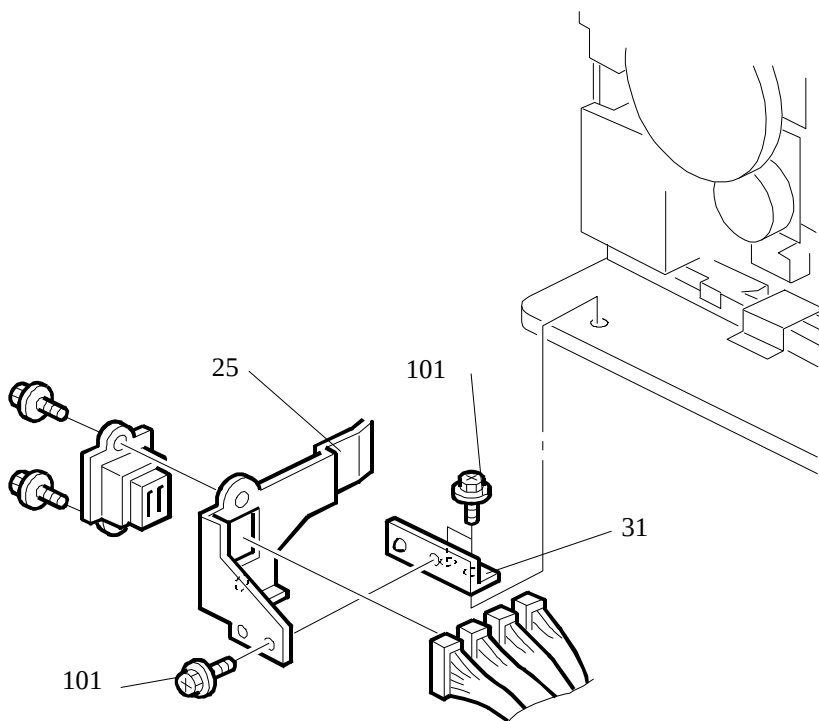
Please correct the following in your parts catalog:

9920DP / 9925DP

part number	Description	Qty	Int	Page	Old Index	New Index	Note
A1931317	Platen Cover Bracket	2		11	5	6	
A0531957	Flex Hinge - Platen Cover	1		11	6	5	

9925DP

Old part number	New part number	Description	Qty	Int	Page	Index	Note
G0202722	G0202723	By-pass Feed Shaft	1		23	29	
	A2245821	Base Connector Bracket - LCT	1		53	31	



A224.WMF



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-001 DATE 12/13/96

Subject: SERVICE MANUAL CORRECTION

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product I Serial Numbers Affected	Modification Schedule: ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☒ Next PM ☐ As Necessary Install Time _____
	9920DP	

The following parts of the service manual have been corrected.

1. Copying Speed in Multicopy mode, page I-2

- Wrong -

	A4 sideways/ 11 "x8 1/2"	A3/11 "x1 7"	B4/8 1/2"x14"
No optional memory	15	9	10
With 4MB or 8MB optional memory	20	11	12

- Correct -

	A4 sideways/ 11 "x8 1/2"	A3/11 "x1 7"	B4/8 1/2"x14"
Non-memory copy mode (1 to 1 copy)	15	9	10
Memory copy mode	20	11	12

2. COPY PROCESS, Overview, page I-12

The discharge brush bias has been changed from +2 kV to - 2 kV.

3. ORIGINAL SIZE DETECTION IN PLATEN MODE, page 2-4
Second paragraph from the bottom, second sentence

- Wrong -

This can cause excess toner to be transferred to the transfer roller, so users should be instructed to always set the paper lengthwise on the by-pass tray. This problem occurs for the first page only. The registration sensor detects the length of the first page, and will assume that the following sheets of copy paper are the same length.

- Correct -

However, in this machine, for each page, the data signal to the laser diode is stopped to match the copy paper length detected by the registration sensor.

4. LASER EXPOSURE, Overview, page 2-18
The polygon motor speed

	Resolution (dpi)	Modes
Wrong	400 dpi	Copy, Fax, and Printer
Correct	400 dpi	Copy and Printer

5. PAPER SEPARATION AND TRANSPORTATION, page 2-57
First paragraph, second sentence

- Wrong -

The high voltage supply board [B] applies a constant dc voltage, +2kV (When . . .). or +2.5kV (from . . .) to the discharge brush.

- Correct -

The high voltage supply board [B] applies a constant dc voltage, -2 kV (When . . .). or -2.5 kV (from. . .) to the discharge brush.

6. ENERGY SAVER MODE, COPIER/PRINTER, page 2-66
In the block diagram

- Wrong -

Auto Shut Off Mode
CPU/GAPD On

- Correct -

Auto Shut Off Mode
CPU/GAPD Off

Subject: SERVICE MANUAL CORRECTION - page 3

7. Power Consumption, page 2-70

Note column of the Night Mode Level 2

- Wrong -

If an incoming call (ringing signal) is detected, or if the user tries to send a fax, the machine goes into Night Mode Level 1.

- Correct -

If an incoming call (ringing signal) is detected, the machine goes into Night Mode Level 1.

8. SP mode no. 4-417, page 4-16

	Wrong	Correct
no. 7	SBU Test 1	No function
no. 8	SBU Test 2	
no. 9	SBU Test 3	
no. 9	SBU Test 3	

9. PM TABLE

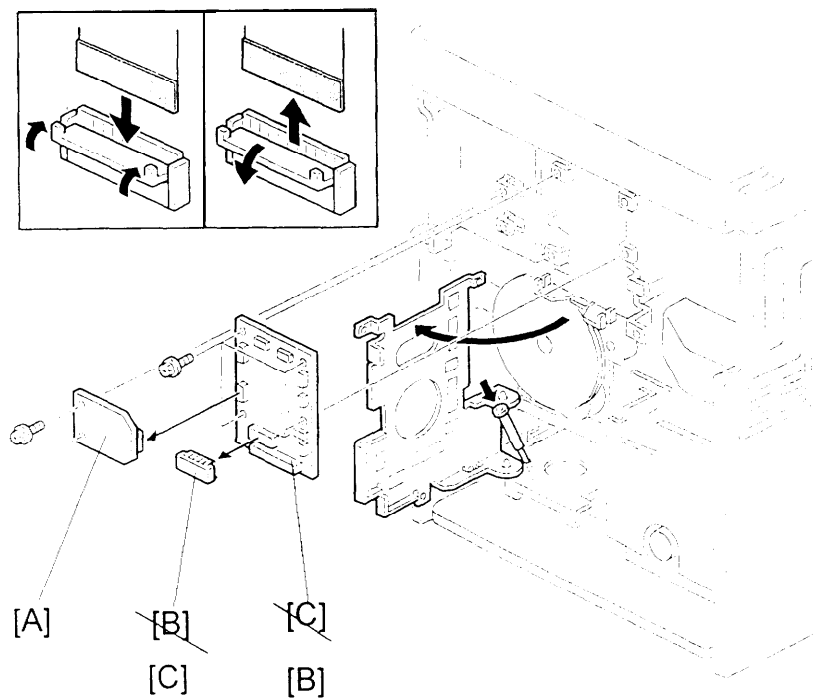
The discharge brush should be **as a** PM parts.

AROUND THE DRUM

	EM	100k	200k	300k	NOTE
Discharge Brush		R	R	R	

II. MSU BOARD/BICU BOARD, page 6-36

The call out should be corrected as follows.





Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-002 DATE 12/13/96

Subject: CAUTION NOT TO MIX DIFFERENT SIZE ORIGINALS WITH THE ADF

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product Serial Numbers Affected 9920DP 	Modification Schedule: ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time _____

Instruct customers not to mix different size originals when feeding them with the ADF.

Note :

The same width of originals, such as 8 1/2 x 11 and 11 x 17, can be mixed in facsimile mode only.

Reason:

With the ADF, the original size will be detected when it is placed on the original table. Therefore, when mixing different size originals on the table, the maximum size detection will be used.

Symptoms when mixing different original sizes:

In copying mode:

- It will select the copy paper size to match the maximum original size.
- In auto reduce/enlarge mode with the designated copy paper size, the reproduction ratio will be selected to match the maximum original size.

In facsimile mode:

- When mixing the same width of originals, the facsimile transmission will be made properly.
- If mixing originals with different width, the originals with a width smaller will be transmitted with a white margin on the left end as originals will be scanned with the maximum width.

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-003 DATE 12/13/96

Subject: BLACK DOT REPRODUCTION CAN BE REDUCED

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product / Serial Numbers Affected		Modification Schedule
	9920DP		☐ Mandatory
			☐ Scheduled Visit
			☐ Next Call
			☐ Next PM
			☐ As Necessary
			Install Time _____

If there are black dots on copy image, especially when making generation copies, take the following countermeasures.

Causes :

1. The scanner of AD-I is very sensitive, so it will reproduce tiny specks on the exposure glass or slight dots on a original onto its copy image.
2. When using the document feeder, the DF exposure glass may be a smudged from originals

Recommended Measures :

1. Change the setting of MTF filter and Threshold levels as follows.

	SP Mode	Default Setting	Recommended Setting as a Countermeasure
MTF Filter	4-407-2*	7	4
Threshold Level	4-418-1	48	55

* : With the new version of ROM, new MTF filters have been added for binary text mode (Black and White text original). Refer to "Additional information" of this FEB.

2. If you still find an unacceptable level of black dots on the copy, or poor reproduction of a low contrast original, such as one written in pencil, after changing MTF filter and Threshold level, take the following steps.

I) Change MTF filter and Threshold levels by referring to the following table. It indicates the value "0" for the recommended setting. (The value of the default setting is "+5".)

- Reducing this value will decrease the reproduction of black dots, and will reduce the reproduction of low contrast originals.
- Increasing this value will increase the reproduction of low contrast originals, but black dots reproduction will increase.

		(Weak) ← MTF Filter → (Strong)			
		0	4	7	6
(High) ↑ Threshold ↓ (Low)	64	-7	-5	-2	-1
	55	-6	0	+1	+3
	48	-4	+2	+5	+7
	40	-3	+4	+6	+8

3. If you find black dots when using the document feeder, clean the exposure glass.

Additional Information:

With the new ROM version (ROM version E for North American Model or D for European Model), the following two MTF filters have been added for binary text mode (designated for black/white text mode). The current filters of SP-Modes 4-407-l to 4 are for multi-valued text mode. Use these SP-Modes with the new ROM version for Black/White mode selection.

- 1) SP-Mode 4-407-8 : for the reproduction ratio of 25 % - 83%
- 2) SP-Mode 4-407-g : for the reproduction ratio of 84% - 400%



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-004 DATE 12/13/96

Subject: PERFORM TD SENSOR INITIAL SETTING (SP-MODE 2-801) AT INSTALLATION

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product / Serial Numbers Affected 9920DP 	Modification Schedule: ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time ____ - ____

At the installation of the **9920DP**, perform the TD Sensor Initial Setting as shown below before making copies.

Problems :

The following problems may occur when the TD Sensor Initial Setting is not done at the time of installation for the AD-I.

1. Blank areas at 20 mm intervals at the right end of copies (rear end of machine).
2. Smear on copy image
3. Dirty Background
- 4 SC 393

Causes :

1. The developer supply level in the development unit does not become uniform until about 30 seconds of mixing after setting the PCU.
2. The Q/M (charged level) of the developer does not become stable until running 20 A3 or 11 x 17 copies.
3. The detection of the TD sensor is unstable until the developer supply level in the development unit becomes uniform, causing excessive toner supply.

Measures:

1. Before making copies, perform the TD Sensor Initial Setting by using SP-Mode 2-801. Refer to page 4-9 of the Service Manual.
2. After completing the TD Sensor Initial Setting, make 20 copies of A3 or DLT size.



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-005 DATE 12/13/96

Subject: OPERATION PROCEDURES FOR THE TRANSMISSION OF FACSIMILES WHILE MAKING MEMORY COPIES.

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification 3 Safety Information ☒ Technical Information ☐ General Information	Model - Product Serial Numbers Affected	Modification Schedule
	9920DP	☐ Mandatory
		☐ Scheduled Visit
		☐ Next Call
		☐ Next P M
		☐ As Necessary
		Install Time _____

Instruct the customers to take the following steps to transmit facsimiles while making memory copies.

Problem :

Multiple copying with the memory copy operation will be suspended under the following sequence when transmitting facsimiles while copying.

1. Place the facsimile original to the document feeder.
2. Switch the mode to facsimile transmission.

Reason :

The 9920DP recognizes the original insertion into the feeder as a copying operation, so it then suspends the current memory copying.

Measure:

Instruct the customers to switch the mode to facsimile first, then place original onto the document feeder.



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-006 DATE 12/13/96

Subject: USE FACE UP TRAY FOR COPYING ON THICK PAPER, POST CARDS, LABELS, OR OHP SHEETS

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product! Serial Numbers Affected 9920DP 	Modification Schedule, ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next P M ☐ As Necessary Install Time _____

Instruct customers to use the Face Up Tray (external exit tray) when copying on Thick Paper (81 to 157 **g/m²** , or 21 to 42 lbs), Post Cards, Labels, or OHP sheets.

Note: This instruction is not written in the Operating Instructions. Instruct your customers at installation or at the next visitation.

Problem :

When copying those kinds of paper using the Face Down Tray, paper jams occur.

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-007 DATE 1115197

Subject: ROM Board

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product/ Serial Numbers Affected	Modification Schedule.
	9920DP	☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☒ Next PM ☐ As Necessary Install Time

<Symptom>

The jumper pins for the outside of the connectors (pin no.36 to 70) set to the BiCU come off.

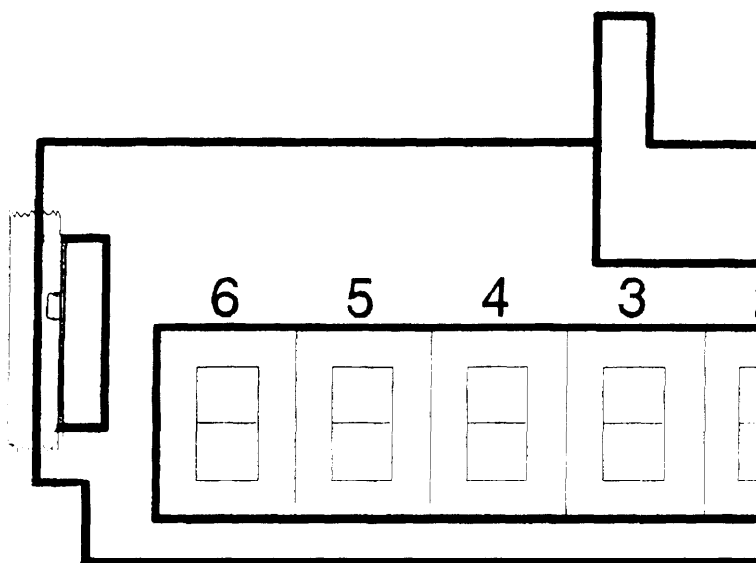
<Cause>

The jumper pins were not fixed securely by the resin adhesive on the ROM boards in the first shipment (28pcs+10pcs for RDG).

<Action required>

If you find one of the ROM boards mentioned above, please apply tape as shown in the illustration below.

(Illustration)



Subject: Installation Procedure for the paper end feeler

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☒ Safety Information ☒ Technical Information ☐ General Information	Model - Product / Serial Numbers Affected	Modification Schedule
	9920DP -- --	☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time

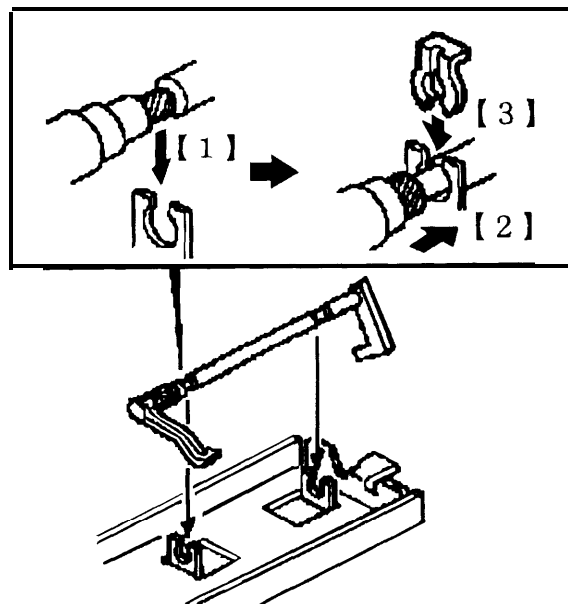
<Installation Procedure>

1. Set the thin part of the shaft (Illustration 1) into the holder.
2. Slide the paper end feeler to the rear and set the part of the shaft (Illustration 2).
3. Set the snap ring into the thin part of the shaft.

<Confirmation>

Pull the paper end feeler up slightly to confirm that it is securely in place.

<Illustration>





Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-009 DATE 1/15/97

Subject: Caution when feeding a folded or curled original

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product/ Serial Numbers Affected 9920DP - ADF	Modification Schedule ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time

Instruct customers to proceed in the following manner when feeding a folded or curled original.

Problem :

When feeding a folded or curled original,

1. Original jam condition may occur.
2. Set xxx paper in tray" or "Cannot detect org. size." message appears.

Causes :

1. A folded or curled original is being fed.
2. The tail end of originals is held up while pressing Start button.
3. The original length sensor is defective.

Reason :

When feeding a folded or curled original, the tail end of the original may not lay flat, leading to a gap between the original and the paper length sensor. In this condition, the length sensor cannot detect the original size correctly.

Measures :

1. When copying a folded or curled original,
-Use the platen cover instead of the document feeder, or
-Straighten the originals before setting them to the original table.



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-010 DATE 1 II 5197

Subject: Replacement of the Original Holder Sheet

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product/ Serial Numbers Affected 9920DP - ADF	Modification Schedule. ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time

When the original holder sheet (P/N A6281615) needs to be changed, paste a new sheet over the current one.

Note :

The maximum number of sheets that can be pasted on top of each other is limited to two (2) sheets. When it necessary to paste more sheets (1 original sheets and 2 pasted sheets), please replace the following 3 parts at the same time.

- Original Holder Bracket (AI 931613)
- Original Holder Pad (AI 931614)
- Original Holder Sheet (AI 931615)



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-011 DATE 11/5/97

Subject: Caution when setting up the copier

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product / Serial Numbers Affected 9920DP	Modification Schedule ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☒ Next PM ☐ As Necessary Install Time

Before installation of the 9920DP at the customer's office, please take the following precautions for the pre-installation.

1. Perform TD Sensor Initial Setting after removing the development unit sealing tape. Do not transport the copier without performing TD sensor initial setting when the seal is removed.
2. Do not set the toner bottle into the holder. Install it at your customer's office.
3. When you run test copies, make sure to run less than 10 copies. These test copies should not be high density copies, such as solid black copies.

Reason :

If the pre-cautions listed above are not complied with, toner will be supplied before the Q/M (charge level) of the developer has stabilized, causing the excessive toner supply and toner scattering may occur due to vibration during transportation.

If pre-cautions have not been followed,

-Clean up the scattered toner.

-You may find dirty background copier for several pages.



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-012 DATE 1/15/97

Subject: SC900 (Total Counter Error) caused by blown fuse (fuse #5 of PSU)

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	<table border="1"><thead><tr><th>Model - Product I Serial Numbers Affected</th></tr></thead><tbody><tr><td>9920DP</td></tr></tbody></table>	Model - Product I Serial Numbers Affected	9920DP	<table border="1"><thead><tr><th>Modification</th><th>Schedule</th></tr></thead><tbody><tr><td>☐ Mandatory</td><td></td></tr><tr><td>☐ Scheduled Visit</td><td></td></tr><tr><td>☐ Next Call</td><td></td></tr><tr><td>☐ Next PM</td><td></td></tr><tr><td>☐ As Necessary</td><td></td></tr><tr><td></td><td>Install Time</td></tr></tbody></table>	Modification	Schedule	☐ Mandatory		☐ Scheduled Visit		☐ Next Call		☐ Next PM		☐ As Necessary			Install Time
Model - Product I Serial Numbers Affected																		
9920DP																		
Modification	Schedule																	
☐ Mandatory																		
☐ Scheduled Visit																		
☐ Next Call																		
☐ Next PM																		
☐ As Necessary																		
	Install Time																	

When SC900 (Total Counter Error) occurs, check whether or not fuse #5 of the PSU has blown out. Add Fuse #5 of PSU has blown out into your service manual as one of the possible causes of SC900.

Fuse #5 is located at upper left portion of PSU board. The second of the 3 fuses is fuse #5.

Caution :

The fuse may be blown out if the connector of the paper tray unit is disconnected while the power switch is on. Be sure to turn off the power switch before disconnecting the connector.



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-013 DATE 1/15/97

Subject: **Black dot reproduction can be reduced**

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product / Serial Numbers Affected 9920DP	Modification Schedule ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time

If there are black dots on copy image, especially when making generation copies, take the following countermeasures.

Causes :

1. The scanner of the 9920DP is very sensitive, so it will reproduce tiny specks on the exposure glass or slight dots on an original onto its copy image.
2. When using the document feeder, the DF exposure glass may be smudged from originals.

Recommended Measures :

1. Change the setting of MTF filter and Threshold levels as follows.

	SP Mode	Default Setting	Recommended Setting as a Countermeasure
MTF Filter	4-407-2*	7	4
Threshold Level	4-418-1	48	55

* :The current MTF Filter from SP mode 4-407-1 to 4 are available for the grey scale mode and the binary mode. The fax mode always uses the binary mode (refer to page 13 on copy's operating instruction) and these filter has no influence for fax mode.

* : With the new version of ROM, new MTF filters have been added for binary text mode(Black and White text original) have been independent from the above filter. Refer to "Additional Information" of this RTB.

Subject: Black dot reproduction can be reduced - page 2 of 3

2. If you still find an unacceptable level of black dots on the copy, or poor reproduction of a low contrast original, such as one written in pencil, after changing MTF filter and Threshold level, take the following steps.

1) Change MTF filter and Threshold levels by referring to the following table. It indicates the value "0" for the recommended setting. (The value of the default setting is "+5".)

- Reducing this value will decrease the reproduction of black dots, and will reduce the reproduction of low contrast originals.
- Increasing this value will increase the reproduction of low contrast originals, but black dots reproduction will increase.

		(Weak)	← MTF Filter →		(Strong)
		0	4	7	6
(High)	64	-7	-5	-2	-1
Threshold	55	-6	0	+1	+3
(Low)	48	-4	+2	+5	+7
	40	-3	+4	+6	+8

3. If you find black dots when using the document feeder, clean the exposure glass.

ADDITIONAL INFORMATION:

With the new ROM version (ROM version E for North American Model or D for European Model), the following two MTF filters have been added for binary text mode (designated for black/white text mode). The current filters of SP-Modes 4-407-l to 4 are for only gray scale text mode. Use these SP-Modes with the new ROM version for the binary mode selection.

- 1) SP-Mode 4-407-8 : for the reproduction ratio of 25 % - 83% (Use the table below)
- 2) SP-Mode 4-407-g : for the reproduction ratio of 84% - 400% (Use the above table)

		(Weak)	← MTF Filter →		(Strong)
		2	0	4	7
(High)	64	-6	-4	-1	+1
Threshold	55	-5	0	+2	+4
(Low)	48	-3	+3	+6	+8
	40	-2	+5	+7	+9

The new ROM and the change of the default setting (described in “Recommended Measures”) have been incorporated into the production machines **as** follows.

Model Code	Model	Production Machine	Serial Number
A193-15	Savin	October	6A76100001



Field Engineering Bulletin Digital Series

TECHNICAL OPERATIONS

BULLETIN NO. **9920DP-014** DATE **03/06/97**

Subject: FLASH ROM UPDATE (BICU PCB)		
☐ Copy Quality ☒ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product/Serial Numbers Affected	Modification Schedule: ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time _____
	9920DP	

A revision "G" ROM upgrade is available to allow the installation and proper operation of the ARDF (DF65) on pre November production 9920DP's (S/N 6A76100040 and below).

To accomplish this upgrade, a ROM set (2 ROMs - P/N AI935532 OH & OL) and ROM PCB Tool (P/N AI 939351) are available, at no charge *for a 90 day period from the issue date of this*, from the Savin Support Helpdesk in Atlanta. Fill out the form on the reverse side of this FEB and forward / fax it to 770-448-0472.

Only one ROM set and one tool is required by each location to upgrade any number of machines.
Any additional tools will have to be purchased by the service location

The procedure to download the ROM data is on page 4-41 in the 9920 Technical Manual. Please note that there are six (6) available sockets on the ROM PCB Tool. The appropriate OH & OL sockets must be utilized to accomplish the download.

The following reflects additional changes that were incorporated in the "G" level ROM which was implemented beginning with November production units (S/N 6A76110001).

Symptom Corrected	Revision
Black Spots in the scanned image. The scanned low contrast image can be adjusted by the 7 notches. Each notch has a different gamma correct characteristic, MTF filter, and threshold level provided by the new AP mode (SP4-998,999).	G
Background on the white image after the negative and positive reversing.	G
SC321 occurs during memory copying when the Start key is actuated after opening and closing the door.	G
The development bias setting (SP2-201) is initialized by turning off the main switch.	G
SC921 (Memory Access Error) occurs after a paper jam during memory output.	F
SC101 occurs during night timer in and out after the IPU test pattern in SP mode	F
Memory Copy Priority of SP5-945 is added to Salesman Program Mode.	F
Cannot clear SP mode during night timer in / out after entering the interrupt copy mode from the SP mode.	F
The Start key is recognized if actuated while an original is feeding out of the ARDF. This results in an incorrect size detection.	E
The ARDF is supported.	E

Subject: FLASH ROM UPDATE (BICU PCB)9920 Flash ROM "G" Update Program*This program expires 90 days from the issue date of this FE~~E~~**6/6/97***

Dealer / Branch: _____

Address: _____

City / State / Zip: _____

Contact: _____

Phone / Fax#: _____

Dealer Account # _____

9920 S/Ns - S/N 6A76100040

Return fax this page to the Atlanta Training Center at 770-448-0472 **6/6/97**.



Field Engineering Bulletin Digital Series

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-015 DATE: 06102197

Subject: False SC101 Indication

☐ Copy Quality ☒ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☒ Technical Information ☐ General Information	Model - Product/Serial Numbers Affected 9920 	Modification Schedule ☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary Install Time _____

Symptom:

After turning the main switch on, a SC101 condition occurs when the 9920 reaches a Ready condition and cannot be reset.

Cause:

Improper White Plate Detection
E Level ROM conflicts on BICU.PCB

Solution:

Upgrade ROM Version (see FEB #9920-014)
Check the White Plate under Left Scale Plate
Check Exposure Lamp and Harness
Check SBU and Harness

Please add the SC101 Code to your service documentation

TECHNICAL OPERATIONS

BULLETIN NO. 9920DP-016 DATE: 06116197

Subject: FINISHER GROUNDING

☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☐ Technical Information ☐ General Information	Model - Product/Serial Numbers Affected	Modification Schedule
		☐ Mandatory
		☐ Scheduled Visit
		☐ Next Call ☐ Next PM ☐ As Necessary Install Time _____

Symptom:

If the Finisher is attached to a 9920DP that has a standard Console rather than the optional PFU, problems may occur with static discharge because of improper grounding.

Cause:

The Finisher has a grounding plate which slides under and clips to the PFU or console. Due to the console's painted and coated surface, proper ground is difficult to establish/maintain.

Note: The PFU is not painted underneath.

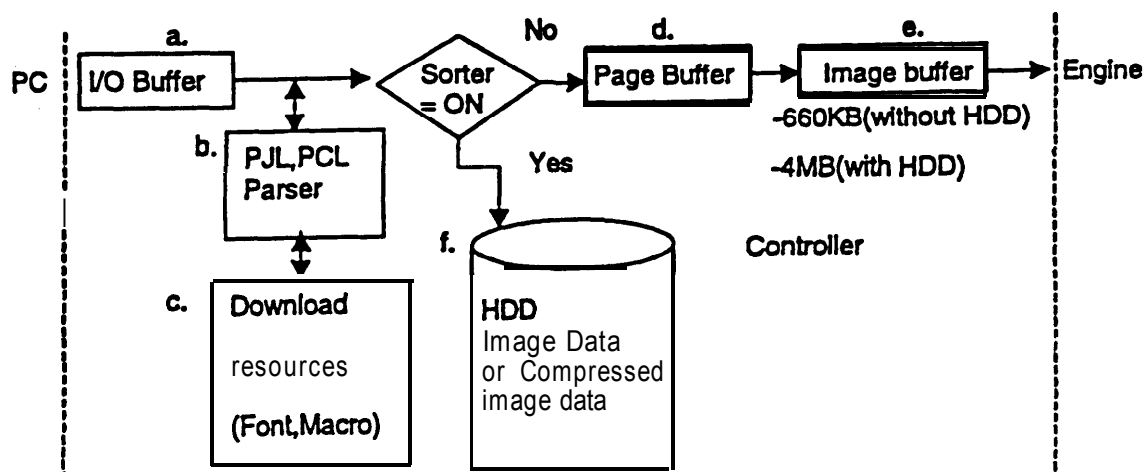
Solution:

Scrape away the coating and paint from the area on the console where the Finisher grounding clip makes contact.

Subject: PRINT OVERRUNMEMORY / OVERFLOW PROBLEM		
☐ Copy Quality ☐ Electrical ☐ Mechanical ☐ Modification ☐ Safety Information ☐ Technical Information ☐ General Information	Model - Product/Serial Numbers Affected	Modification Schedule
	9920	☐ Mandatory ☐ Scheduled Visit ☐ Next Call ☐ Next PM ☐ As Necessary ☐ Install Time

This bulletin is in reference to the mechanism & countermeasure for possible Print Overrun problems or Memory Overflow problems with the printer controller type 250.

1. Data flow in the controller unit:



- a. I/O Buffer for receiving and sending data.
- b. Stores the operation language software (such as PCL and PjL).
- c. Manages download resources (such as Font, Macro).
- d. Hold and process data from incoming print jobs.
- e. Image video buffer for sending video data to engine to print.
- f. *When the HDD is installed, it is used only for the sorting function.

If the sorting function is selected, the data is stored onto the HDD.

*With HDD, the SIMM memory must be more than 4MB (from Ver.1.21 firmware).

2. “Memory Overflow” mechanism:

“Memory Overflow” can occur if the printer does not have enough memory to complete the print job using the requested language (PCL or PJI).

If the user sends a print job which will use lots of memory, it might cause “Memory Overflow”. “Memory overflow” might happen as shown above in b, c, and d. When “memory overflow” happens and the user presses the continue key, the printer prints only part of the page. This problem can be solved by adding SIMM memory (8MB or more).

3. “Print Overrun” mechanism:

This means that the data sent to the printer was too complex. This will occur only while the printer is printing the data. “Printing” is the process of preparing image data and sending image data to the engine at the same time. If the print job is too complex, the printer may not complete sending the image to the engine.

(Case 1: HDD Access Time)

If the time to move the data is too long because of HDD access time, this error can happen. This problem (with the HDD) can be solved by updating the firmware to ver.1.21 or higher, and adding SIMM memory (more than 4MB). The printer will allocate 4MB for image buffer (e) if the HDD is installed with the firmware ver.1.21 or higher. After all of the pages of the job were stored on the hard disk, the printer will move image data from the hard disk to the image buffer until the image buffer is full, then tell the engine to go. Paper sizes smaller than A4 or LT should not have this problem.

(Case2: “HDD Reading” Error)

If a Reading error occurs on the HDD, this can happen. Vibration from the Duplex unit may cause this “reading error” problem. For this problem, 4 rubber cushions have been added to the bracket of the HDD. When the HDD is installed on the controller, use a new bracket to prevent the HDD from the reading error problem caused by the vibration.

(Case3: HDD sector control failure)

The sector information is controlled by the firmware. This information can be mis-handled because of a firmware bug, and this problem (or “Hang-Up” problem) may happen. This has been solved by the firmware ver. 1.26.

->If the finisher and the HDD are installed on the printer, use the following combination:

- Firmware ver 1.26 (or higher)
- Driver ver 1.30 (or higher)
- New bracket of HDD (kit# A6439900)



Field Engineering Bulletin

Digital Series

TECHNICAL OPERATIONS

BULLETIN NO: 9920 – 018 DATE: 12/5/97

Subject: REPLACEMENT OF THE ORIGINAL HOLDER SHEET

☐ Copy Quality	Model - Product/Serial Numbers Affected	Modification Schedule
☐ Electrical		☐ Mandatory
☒ Mechanical	9920DP	☐ Scheduled Visit
☐ Modification		☐ Next Call
☐ Safety Information		☐ Next PM
☐ Technical Information		☒ As Necessary
☐ General Information		Install Time _____

When the original holder sheet (P/N A6281615) requires replacement, install / adhere a new sheet over the current one.

Note :

The maximum number of sheets that can be installed on top of each other is limited to two (2) sheets. When exceeding this number, it is necessary to replace the following two parts to accommodate the additional sheet (three or more).

-Original Holder Bracket (**A6281613**)

-Original Holder Pad (**A6281614**)



Field Engineering Bulletin

Digital Series

TECHNICAL OPERATIONS

BULLETIN NO: **9920 – 019** DATE: 12/5/97

Subject: PAPER SEPARATORS

- ☐ Copy Quality
- ☐ Electrical
- ☐ Mechanical
- ☐ Modification
- ☐ Safety Information
- ☐ Technical Information
- ☐ General Information

Model - Product/Serial Numbers Affected

9920 / 6A76120001

Modification Schedule

- ☐ Mandatory
 - ☐ Scheduled Visit
 - ☐ Next Call
 - ☐ Next PM
 - ☐ As Necessary
- Install Time _____

SYMPTOM

- ①Dog – ear copy.
- ②Paper feed noise.

CAUSE

- ①Burrs on the paper separator(s).
- ②Noise created when the paper separator(s) and paper tray contact each other.

SOLUTION

- ①The burrs on the paper separator(s) have been removed during the manufacturing process.
- ②A sponge sheet has been added on the paper separator(s).

(Current)

(New)

G0202561 →

G0202573A

(Front Paper Separator)

G0202568 →

G0202558A

(Rear Paper Separator)



Field Engineering Bulletin

Copier Series

TECHNICAL OPERATIONS

9920 024 9925 001 4/24/98
BULLETIN NO: ~~9920 - 025~~ DATE: ~~3/26/98~~

Subject: PAPER FEED ROLLER (PAPER TRAY UNIT)

☐ Copy Quality

☐ Electrical

☐ Mechanical

☐ Modification

☐ Safety Information

☐ Technical Information

☐ General Information

Model - Product/Serial Numbers Affected

9920

9925

Modification Schedule

☐ Mandatory

☐ Scheduled Visit

☐ Next Call

☐ Next PM

☐ As Necessary

Install Time _____

SYMPTOM: Paper jam.

CAUSE: Paper skewing or no feed from the PS330 (Paper Tray Unit).

SOLUTION: The diameter of the paper feed roller has been modified from 30mm to 32mm to increase paper feed reliability. This change was implemented beginning with September 1997 production.

Note: 1) These new type 32mm rollers are packaged / provided as a set of 4 rollers (P/N G6979450). The rollers should be replaced as a set.

2) The old type roller P/N AF031033 has been replaced by P/N AF031056.

* AF031033 → AF031056
(Old) (New)



Field Engineering Bulletin Copier Series

TECHNICAL OPERATIONS

BULLETIN NO: **9925 002** DATE: **3/26/98**

Subject: FIRMWARE UPDATE / HISTORY

☐ Copy Quality

☐ Electrical

☐ Mechanical

☐ Modification

☐ Safety Information

☒ Technical Information

☒ General Information

Model - Product/Serial Numbers Affected

9925DP

Modification Schedule

☐ Mandatory

☐ Scheduled Visit

☐ Next Call

☐ Next PM

☐ As Necessary

Install Time _____

The current available firmware for the 9925DP copier engine is A2245532K / version 1.30. The revision history is outlined below.

Note: The "K" level ROMs (OL and OH) are included in the ROM set (P/N A1939455) that was detailed in FEB# 9920DP-xxx.

A2245532	File No. (A224uxx)	Version	Total C.SUM	SUM(OH)	SUM(OL)	Production
D	01	1.18	7766	6521	1245	1st Mass Prod.
E	02	1.20	01F7	98CE	6929	June Prod. '97
F	03	1.24	D441	9943	3AFE	August Prod. '97
H	04	1.26	C879	5895	6FE4	September Prod. '97
K	06	1.30	432E	144E	2EE0	October Prod. '97

Model: 9925DP	Date: March 26, 1998	No: 9925 - 002

Symptom Corrected	USA
Dirty background Problem (Refer to RTB42) -Vt correction -Mixing time	K
(New SP mode) •SP2-994: Vcont offset •SP9-999-14: Additional Mixing time display	K
(For USA only) New SP is added. SP5-950: LG size paper detection on the by pass tray. * When this function is selected and LT ☐ size is inserted in the by-pass tray, the machine detects it as LG ☐ size paper.	H
(For USA only) Correspond to the Energy Star standard.	H
After the fax transmission through ARDF with a stammer, the registration of the 1st copied paper by ARDF is delayed.	H
New SP is added. SP5-949:1= When one of the trays is empty, the paper end indicator (red LED) lights.	F
The DF Jam display is cleared by DF lifting up and down	F
(New SP Mode) SP6-006-4: ARDF Main-Scan Registration of the rear side.	E
(Specification) When the trays do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected.(The previous version software stops the copy job when one of tray is empty)	E
Stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode.	E
When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper.	E

A2245532	S/N CUT-IN
E	9A37060001~
F	9A37080001~
H	9A37090001~
K	TBA



E

C

S

EC NICAL PERA I NS

9920 2
 ULLE IN N : 992 003 A E: 4/3/9

S : PRIN ER LIM I A I NS

☐ Copy QualityM P /S N
A

Modification Schedule

☐ Electrical

9920

☐ Mandatory☐ Mechanical☐ Scheduled Visit☐ Modification

9925

☐ Next Call☐ Safety Information☐ Next PM☐ Technical Information☐ As Necessary☒ General Information

Install Time _____

9920 / 9925 printer controller limitations

No	Description	Recommendations/ Countermeasures	Note
1	There is no close button (X mark) on the upper-right corner of the task bar to close the printer properties window in the Print Setup.	* Press "OK" or "Cancel" button to close the printer properties window. * Click anywhere on the task bar , the close button (X mark) will appears on the right corner of the task bar.	
2	When Jam occurs in the Finisher at W1 or W2, the jam position is indicated in both of the WinPanel and the operation panel display only with W and does not specify whether it is W1 or W2.	Check both W1 and W2, in case of jammed at W position in the finisher.	The ADAM can recognize the jam at only the W position at W1 or W2 in the finisher.
3	The WinPanel does not indicate the Toner Near End status.		"Add Toner" message is shown on the WinPanel when toner ends.
4	If you perform the initialization to format the Hard Disk while Data-in (when Data-in indicator is blinking), 9925 printer "locks up".	Perform the Initialization of the Hard Disk to format while the printer is idle (no data in buffer).	It is generally regarded illegal to initialize HDD while Date-in.
5	When you print Photoshop file and if you choose "draft print" on the Photoshop application print setup window, blank page(s) will be printed.	Print the file to use "High", "Mid" or "Low" of print quality setting in the Photoshop printer setup. Do not choose "draft print" on the Photoshop application print setup window.	9925 Printer Driver is not supporting "draft print" of Photo shop application.
6	While printing (data in buffer to print job), if you make the printer off-line and try to print PCL fonts, the printer "locks up".	Print the PCL fonts list while the printer is idle (no data in buffer).	It is generally regarded illegal to print Printer Fonts while printing texts.

No	Description	Recommendations/ Countermeasures	Note
7	When you print with "Graphic Mode: Raster + Graphic Quality: Mid or Low", Freehand 5.0 file cannot be printed properly. Only a part of the image gets printed and the rest of the images are missing.	Print with Graphic Quality: High.	The limitation is unique for Freehand 5.0 and occurs with HP 5si as well. With Freehand 7.0, there is no such limitation. The default setting of the printer driver is "High".
8	When you print the Pagemaker file with "Graphic Mode: Raster + Graphic Quality: Mid or low" setting, the rotated word (letter) cannot be printed properly.	Print with Graphic Quality: High.	The default setting of the printer driver is "High".
9	When you print Pagemaker file on Windows 3.1 with "Graphic Mode: Raster + Graphic Quality: High, Mid or low", you will get horizontal black lines on the photographic images.	Print with Graphic Mode: HP/GL.	
10	The Acrobat 2.0 file cannot be printed more than 1 set even though you set multiple copies.	Upgrade the Acrobat 2.0 to 3.0.	The limitation is unique for the Acrobat 2.0. With Acrobat 3.0, there is no such limitation.



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EC NICAL PERA I NS

ULLE IN N : 992 004 A E: 4/14/9

S : R M IS R A P I N

☐ Copy Quality☐ Electrical☐ Mechanical☐ Modification☐ Safety Information☐ Technical Information☒ General InformationM P /S N
A

9925

Modification Schedule

☐ Mandatory☐ Scheduled Visit☐ Next Call☐ Next PM☐ As Necessary

Install Time _____

A2255581	File No. (A225uxx)	Version	Total C.SUM	SUM (OH)	SUM (OL)	SUM (1H)	SUM (1L)	Production
A	01	1.23	8BFA	1E6A	0E7F	8BEA	297B	1st Mass Prod.
B	02	1.42	5263	428B	6E43	AC89	D020	August Prod.'97

S	US
(For PTT Approval) 1. Dial pulse from other terminal was detected as a ringing signal. (France) 2. Busy tone cannot be rarely detected. It is solved by using 2 kinds of frequency , 400HZ and 900HZ. (New Zealand) 3. Interval between the dial pulse is out of specification. *Specification: 1000ms. (New Zealand)	—
The received files cannot be printed out from HDD. When a small amount of data (less than 2K Bytes) is received and the communication is finished before the writing job on the HDD is finished, the data is not completed on the HDD.	B
In ISDN G3 mode, when the call comes from PSTN G3 machine, the fax number of own dial 01 is displayed for a few seconds instead of the called terminal identification.	B
(Only for Netherlands) Dial Tone cannot be detected. When the dial tone frequency lower limit (PSTN: Address 480406 ~ 7, PABX: Address 480419 ~ A) is less than 255HZ, the problem has occurred. This problem happens on ver1.29 or higher.	—

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Customer Services

Issued By: John Molyneux, Director of Customer Services

November, 1996

Page 1 of 1

Advance Information Bulletin

3220/D420 SERVICE TRAINING PREPARATION

Gestetner will soon introduce the 3220/D420—a digital copier with facsimile and printer options. Service training for this product will include a **Computer Based Training (CBT)** program and an extensive workbook, which will require the completion of “hands-on” exercises at the machine. All dealerships and branches that will carry the 3220/D420 will need to have a computer available for technical training. Minimum system requirements will include Windows 3.1 or higher, a sound card, a CD-ROM drive, 12 Megabytes of RAM and a printer connected to the PC.

All dealerships/branches will be required to purchase the CBT training program. Using this training method will alleviate the need for classroom training at this time, which is costly and time consuming. No formal training is planned for this product.

The CBT will include introductory sections on computers and Local Area Network as well as produce specific information and an extensive section on the digital image formation process. A test segment at the end will assess the student's comprehension of the information in the previous sections. The student will not be able to take the test until they completed all of the CBT's informational sections. Upon successful completion of the test, a personalized certificate will be printed, which must be mailed to Gestetner for product certification.

The student will be tested on the workbook section of the program, as well as the Computer Based Training. The technicians **will be able** to successfully complete the testing, only after all of the reading and hands-on exercises in the workbook. Dealers should allocate a minimum of three days (or 24 hours) for training, to be sure that the technician has sufficient time to complete the entire program. Of course, it will be necessary for the technician to have full access to the product and the specified computer during this entire time.

We are confident that this method of training will enhance our abilities to prepare your technician to service and support this new multi-functional product effectively and efficiently. If you have any questions regarding this technical training package, please contact Jeff Goldsmith at Gestetner's Customer Service Department at (800) 759-4911.

Please note that hotline assistance for this product will only be given to certified technicians/dealers.

HEADQUARTERS		BRANCH		DEALERS	
				GESTETNER	NASHUATEC
☐ ACCT/FINANCE	☐ DISTRIBUTION	☒ TECH SERV. MGR.	☒ COPIER	☒ COPIER	☒ COPIER
☒ ADMINISTRATION	☒ MARKETING	☒ TECH SERV. REP	☐ COPYPRINTER	☐ COPYPRINTER	☐ COPYPRINTER
☒ CUSTOMER SERVICES	☐ MIS	☒ SALES MGR.	☐ DUPLICATOR	☐ DUPLICATOR	☐ DUPLICATOR
☐ DEALER DIVISION	☒ SENIOR MGMT.	☐ SALES REP	☒ FACSIMILE	☒ FACSIMILE	☒ FACSIMILE
		☒ TELEMARKETING MGR.	☐ ANCILLARY	☐ ANCILLARY	☐ ANCILLARY
		☐ TELEMARKETING REP	☐ ALL	☐ ALL	☐ ALL

Gestetner
nashuatec

Gestetner Corporation
103 B Fairview Park Drive
Elmsford, New York 10523

Tel: (914) 347-7756
Fax: (914) 347-7809

Customer Services

Issued By: Joe Cynulik, Manager, Service Support & Planning

March, 1997
Page 1 of 7

3220 Technical Bulletin/#2

MATERIAL SAFETY DATA SHEETS

Attached are the Material Safety Data Sheets for the 3220 toner and photoconductor unit.

Please keep these MSDS sheets on file. If you need to obtain additional copies, they can be retrieved from our "Fast Facts" information retrieval system. The document numbers are provided below:

DOCUMENT NAME

DOCUMENT NUMBER

3220 Black Toner Type 20D
3220 Photoconductor Unit Type 250

12960707
12960709

HEADQUARTERS		BRANCH		DEALERS	
				Gestetner	Nashuatec
ACCT/FINANCE	DISTRIBUTION	TECH.SERV.MNGR	COPIER	COPIER	
ADMINISTRATION	MARKETING	TECH.SERV.REP.	COPYPRINTER	COPYPRINTER	
CUSTOMER SERVICES	MIS	SALES MNGR.	DUPLICATOR	DUPLICATOR	
DEALER DIVISION	SENIOR MANAGEMENT	SALES REP.	FACSIMILE	FACSIMILE	
		TELEMARKT. MNGR	ANCILLARY	ANCILLARY	
		TELEMRKT. RE P.	ALL	ALL	

Gestetner
nashuatec

PRODUCT CODE 2960709

Page #1

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Section I. General Information

MSDS Identifier Code
Supplier ID: **GESTETNER 3220**

Identity: **PHOTOCONDUCTOR UNIT TYPE 250**

Manufacturer's Name and Address:	Distributor's Name and Address:
Ricoh Corporation	Gestetner Corporation
5 Dedrick Place	103B Fairview Park Drive
West Caldwell, NJ 07006	Elmsford, NY 10523

Emergency Telephone Number: (800) 336-6737

Telephone Number for Information: (914) 347-7749

Synonyms & Common Names: Gestetner G3220/Nashua D420 Photoconductor,
G3220/Nashua D420 Photoconductor Unit

Uses: G3220/Nashua D420

Chemical Formula: See Section II

Registry numbers

CAS Number: 0-00-0
RTECS Number: N/App

Date Prepared: 10/28/96 Filed/Prepared By: Ricoh CQA\EA Division

Section II. Hazardous Ingredients/Identity Information

Composition

Component	%	CAS #	OSHA Pel	ACGIH TLV
Al Substrate	98.9%	7429-90-5	N/App	N/App
Coating	1.1%	- -		
Polycarbonate	43.8%	25135-52-8	N/App	N/App
Stilben Derivative	30.7%	89114-91-0	N/App	N/App
Titanium Dioxide	19.5%	13463-67-7	10mg/m3	10mg/m3
Organic Pigment	0.5%	84809-01-B		

PRODUCT CODE 2960709

Page #2

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

is among those items which are dependent upon their shape and design during end use and do not release or otherwise result in exposure to a hazardous chemical under normal conditions of use. Therefore, it is exempt from CAS# disclosure.

- -
- -
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- -

THIS PRODUCT IS NON-HAZARDOUS

Exposure Limits (TLV/PEL)

OSHA: Titanium Dioxide
NIOSH: Not applicable
ACGIH: Titanium Dioxide
State: Not applicable
Other: None

----- Section III. Physical/Chemical Characteristics -----

Boiling Point: Not applicable Specific Gravity: N/App
Vapor Pressure: Not applicable % Volatile by Volume: Not applicable
Melting Point: Not applicable Vapor Density (Air=1): Not applicable
Evaporation Rate (n-BuAc=1): Not applicable

Solubility in Water: Negligible: less than 0.1%

Appearance and Odor: Dark green drum, no odor

----- Section IV. Fire and Explosion Hazard Data -----

Flash Point and Method: Not applicable

Explosive Limits: LEL N/App UEL NIAPP
Comments: Not applicable

Extinguishing Media: Water, foam or dry chemicals may be suitable.

Special Fire-Fighting Procedures: No special fire-fighting procedure is necessary.

Unusual Fire and Explosion Hazards: None

-----we- Section V. Reactivity Data -----

Stability: Stable

Conditions to Avoid: Not applicable

Incompatibility (Materials to Avoid): None

PRODUCT CODE 2960709

Page #3

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Hazardous Decomposition or Byproducts: Carbon monoxide and other decomposition products in the case of incomplete combustion.

Hazardous Polymerization: Will not Occur
Conditions to Avoid: Not applicable

Section VI. Health and Hazard Data

Routes of Entry: Not applicable

Health Hazards of Short-Term exposure (Acute)

Eyes: Not applicable

Skin: No corroding or irritating effects are expected from usual use as a photosensitive drum.

Inhalation: Not applicable

Ingestion: Not applicable

Health Hazards of Long-Term exposure (Chronic): Not applicable

Carcinogenicity: Not applicable

NTP? No IARC Monographs? No OSHA Regulated? No

Signs and Symptoms of Exposure: None under normal conditions of use.

Medical Conditions Generally Aggravated by Exposure: Will not occur

Emergency and First Aid Procedures

First Aid

Eyes: Not applicable

Skin: Wash thoroughly with soap and water.

Inhalation: Not applicable

Ingestion: Not applicable

Additional Information: None

Section VII. Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Not applicable

Waste Disposal Method: Used OPC drum should be disposed of in an

PRODUCT CODE 2960709

Page #4

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

environmentally safe manner and in accordance with governmental regulations. Disposal regulations vary from locality to locality, therefore, consult your local office of the EPA to determine proper method of disposal.

Precautions to Be Taken in Handling and Storing: Store in a cool, dry place. Keep out of reach of children. Keep from contact with oxidizing materials.

Other Precautions: None

Section VIII. Control Measures

Respiratory Protection: None required under normal conditions of use.

Ventilation

Local Exhaust: None required under normal conditions of use.

Special: None

Mechanical (general): Adequate ventilation

Other: None

Protective Gloves: None required under normal conditions of use.

Eye Protection: None required under normal conditions of use.

Other Protective Clothing or Equipment: None

Work and Hygienic Practices: Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work periods.

Section I. General Information
-----MSDS Identifier Code
Supplier ID: **GESTETNER 3220**Identity: **BLACK DEVELOPER**Manufacturer's Name and Address:
Ricoh Corporation
5 Dedrick Place
West Caldwell, NJ 07006Distributor's Name and Address:
Gestetner Corporation
103B Fairview Park Drive
Elmsford, NY 10523

Emergency Telephone Number: (800) 336-6737

Telephone Number for Information: (914) 347-7749

Synonyms & Common Names: Gestetner G3220/Nashua D420 Developer, G3220/Nashua D420 Developer

Uses: G3220/Nashua D420

Chemical Formula: Mixture

Registry numbers

CAS Number: 0-00-0

RTECS Number: N/App

Date Prepared: 10/28/96 Filed/Prepared By: Ricoh CQA\EA Division

Section II. Hazardous Ingredients/Identity Information

Composition

Component	%	CAS #	OSHA Pel	ACGIH TLV W _e
Iron Oxide	96.00	1317-61-g	N/App	N/App
Styrene Acrylic Polymer	<4.00	25036-19-5	N/App	N/App
Polyolefine	<4.00	9003-07-0	3.5mg/m3	3.5mg/m3
*Carbon Black	<4.00	1333-86-4	N/App	N/App
Polyester Resin (CAS# Confidential)	<4.00	0-00-0	N/App	N/App

*Carbon Black is listed on the	-	-		
Massachusetts Substance List. Carbon Black	-	-		
is listed on the IARC Monograph. The IARC	-	-		
has evaluated the evidence for the	-	-		
carcinogenicity of Carbon Black as inade-	-	-		
quate to determine a carcinogenic risk for	-	-		
humans,	-	-		

G3220/Nashua D420 Developer (209622-C) is	-	-		

contained in G3220/Nashua D420 PCU
(209622) .

- -
- -

THIS PRODUCT IS NON-HAZARDOUS

- -

All components of this mixture comply with
the United States TSCA.

- -
- -

Exposure Limits (TLV/PEL)

OSHA : See above
NIOSH: Not applicable
ACGIH: See above
State: Not applicable
Other: See above

Section III. Physical/Chemical Characteristics

Boiling Point: Not applicable Specific Gravity: Apprx. 4.6
Vapor Pressure: Not applicable % Volatile by Volume: Not applicable
Melting Point: Not applicable Vapor Density (Air=1): Not applicable
Evaporation Rate (n-BuAc=1): Not applicable

Solubility in Water: Negligible: less than 0.1%

Appearance and Odor: Black powder with slight plastic odor

Section IV. Fire and Explosion Hazard Data

Flash Point and Method: Not applicable

Explosive Limits: LEL N/App UEL N/App
Comments: Not applicable

Extinguishing Media: Foam, water spray(fog), dry chemicals or carbon dioxide
may be suitable.

Special Fire-Fighting Procedures: No special fire-fighting procedure is
necessary.

Unusual Fire and Explosion Hazards: Airborne dispersal of most finely divided
organic powders such as developer may form an explosive mixture. Do not
incinerate loose or spilled developer,

Section V. Reactivity Data

Stability: Stable

Conditions to Avoid: Not applicable

Incompatibility (Materials to Avoid) : Not applicable

Hazardous Decomposition or Byproducts: Carbon monoxide and other decomposition products in the case of incomplete combustion.

Hazardous Polymerization: Will not Occur

Conditions to Avoid: Not applicable

Section VI. Health and Hazard Data

Routes of Entry: Eyes, skin, inhalation

Health Hazards of Short-Term exposure (Acute)

Eyes: May cause temporary eye discomfort.

Skin: Non-irritant. No corrosive or irritating effects are expected from intended use as a developer.

Inhalation: Gasping

Ingestion: Acute oral toxicity: greater than 5g/kg bodyweight

Health Hazards of Long-Term exposure (Chronic): Not applicable

- Carcinogenicity: See Section II

NTP? No IARC Monographs? Yes OSHA Regulated? No

Signs and Symptoms of Exposure: None under normal conditions of use,

Medical Conditions Generally Aggravated by Exposure: Will not occur

Emergency and First Aid Procedures

First Aid

Eyes : Try to remove with eye drops or flush with water. If unsuccessful, get medical attention.

Skin: Wash thoroughly with soap a-n-d water.

Inhalation: Remove from exposure.

Ingestion: Dilute stomach contents with several glasses of water.

Additional Information: Ames test result: negative

Section VII. Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: If spilled, sweep

up using an approved toner vacuum cleaner with a .5 micron filter or smaller such as the Atrix AAA Toner Vacuum (Ricoh EDP Code: 342MIU). Use of a vacuum cleaner not rated for toner particulate could be a potential fire hazard and/or result in personal injury. Remove residue with soap and water.

Waste Disposal Method: Used developer should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Disposal regulations vary from locality to locality, therefore, consult your local office of the EPA to determine proper method of disposal. Do not incinerate loose or spilled developer. (See Section IV).

Precautions to Be Taken in Handling and Storing: Store in a cool, dry place. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work periods. Keep out of reach of children.

Other Precautions: Flying powder may enter eyes. Minimize inhalation of dust.

Section VIII. Control Measures

Respiratory Protection: None needed under normal conditions of use.

Ventilation

Local Exhaust: None needed

Special: None needed

Mechanical (general): Adequate ventilation

Other: None needed

Protective Gloves: None needed under normal conditions of use.

Eye Protection: None needed under normal conditions of use.

Other Protective Clothing or Equipment: None needed

Work and Hygienic Practices: Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work periods. Keep out of reach of children.

PRODUCT CODE 2960707

Page #1

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Section I. General Information

MSDS Identifier Code

Supplier ID: **GESTETNER 3220**

Identity: **BLACK TONER TYPE 20D**

Manufacturer% Name and Address:

Ricoh Corporation

5 Dedrick Place

West Caldwell, NJ 07006

Gestetner Corporation

103B Fairview Park Drive

Elmsford, NY 10523

Emergency Telephone Number: (800) 336-6737

Telephone Number for Information: (914) 347-7749

Synonyms & Common Names: Gestetner G3220/Nashua D420 Toner, G3220/Nashua D420 Toner

Uses: G3220/Nashua D420

Chemical Formula: Mixture

Registry numbers

CAS Number: 0-00-0

RTECS Number: N/App

Date Prepared: 10/28/96 Filed/Prepared By: Ricoh CQA\EA Division

Section II. Hazardous Ingredients/Identity Information

Composition

Component	%	CAS #	OSHA Pel	ACGIH TLV
Polyester/Styrene Acrylic Grafted Resin	85.00	149367-98-6	N/App	N/App
*Carbon Black	09.00	1333-86-4	3.5mg/m3	3.5mg/m3
Wax (4% made up of two wax substances)	04.00	8015-86-g	N/App	N/App
Wax		8016-60-2	N/App	N/App
Dye	02.00	31714-55-3	N/App	N/App

*Carbon Black is listed on the IARC Monograph and the Massachusetts Substance List. The IARC has evaluated the evidence for the carcinogenicity of Carbon Black as inadequate to determine a carcinogenic risk for humans.

All components of this mixture comply with the United States TSCA.

PRODUCT CODE 2960707

Page #2

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Exposure Limits (TLV/PEL)

OSHA : See above
NIOSH: Not applicable
ACGIH: See above
State: Not applicable
Other: Not applicable

Section III. Physical/Chemical Characteristics

Boiling Point: Not applicable Specific Gravity: 1.2
Vapor Pressure: Not applicable % Volatile by Volume: Not applicable
Melting Point: Not applicable Vapor Density (Air=1): Not applicable
Evaporation Rate (n-BuAc=1): Not applicable

Solubility in Water: Negligible: less than 0.1%

Appearance and Odor: Black powder with slight plastic odor

Section IV. Fire and Explosion Hazard Data

Flash Point and Method: Not applicable

Explosive Limits: LEL N/App UEL N/App
Comments: Not applicable

Extinguishing Media: Carbon dioxide, dry chemicals, foam or water spray may be suitable.

Special Fire-Fighting Procedures: No special fire-fighting procedure is necessary.

Unusual Fire and Explosion Hazards: Will not occur

Section V. Reactivity Data

Stability: Stable

Conditions to Avoid: Not applicable

Incompatibility (Materials to Avoid): Not applicable

Hazardous Decomposition or Byproducts: Carbon monoxide and other decomposition products in the case of incomplete combustion,

Hazardous Polymerization: Will not Occur
Conditions to Avoid: Not applicable

PRODUCT CODE 2960707

Page #3

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Section VI. Health and Hazard Data

Routes of Entry: Inhalation, ingestion, eyes

Health Hazards of Short-Term exposure (Acute)

Eyes: May cause temporary eye discomfort.

Skin: Mild irritation

Inhalation: Gasping

Ingestion: LD50>5000mg/kg bodyweight (rat)

Health Hazards of Long-Term exposure (Chronic): A Xerox sponsored chronic inhalations study in rats using a special test toner revealed there were no lung changes at all in the lowest exposure level (1mg/m³), the most relevant level to potential human exposures. A very slight degree of fibrosis was noted in 25% of the animals at the middle exposure level (4mg/m³), while a slight degree of fibrosis was observed at the highest exposure level (16mg/m³) in all animals. These findings are attributed to "Lung Overloading", a generic response to excessive amounts of any dust retained in the lungs for a prolonged interval. The special test toner was ten times more respirable than commercially available toner to comply with EPA testing protocol and would not function properly in xerographic equipment.

Carcinogenicity: See Section II (Carbon Black)

NTP? **No** IARC Monographs? Yes OSHA Regulated? No

Signs and Symptoms of Exposure: None under normal conditions of use.

Medical Conditions Generally Aggravated by Exposure: Will not occur

Emergency and First Aid Procedures

First Aid

Eyes: Try to remove with eye drops or flush with water. If unsuccessful, get medical attention.

Skin: Wash thoroughly with soap and water.

Inhalation: Remove from exposure.

Ingestion: Dilute stomach contents with several glasses of water.

Additional **Information:** Ames test result: negative

PRODUCT CODE 2960707

Page #4

Ricoh Corporation
MATERIAL SAFETY DATA SHEET

10/28/96

Section VII. Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: If spilled, sweep up using an approved toner vacuum cleaner with a .5 micron filter or smaller such as the ktrix AAA Toner Vacuum (Ricoh EDP Code: 342MIU). Use of a vacuum cleaner not rated for toner particulate could be a potential fire hazard and/or result in personal injury.

Remove residue with soap and water.

Waste Disposal Method: Used toner should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Do not incinerate loose or spilled toner. (See Section IV). Disposal regulations vary from locality to locality, therefore, consult your local office of the EPA to determine proper method of disposal.

Precautions to Be Taken in Handling and Storing: Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work periods. Keep out of reach of children.

Other Precautions: Do not handle in area where wind blows. Flying powder may enter eyes. Minimize inhalation of dust.

Section VIII. Control Measures

Respiratory Protection: None required under normal conditions of use.

Ventilation

Local Exhaust: None required under normal conditions of use.

Special: None needed

Mechanical (general): Adequate ventilation

Other: None needed

Protective Gloves: None required under normal conditions of use.

Eye Protection: None required under normal conditions of use.

Other Protective Clothing or Equipment: None needed

Work and Hygienic Practices: Minimize breathing dust. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of work periods.

Customer Services

Issued By: Joe Cyrulik, Manager. Service Support 8 Planning

March, 1997
Page 1 of 1

3220/D420 Technical Bulletin/#3

3220/D420 SERVICE & PARTS MANUAL ADDENDUM

There is a new addendum to the 3220/D420 Service Manual P/C 4300703. This addendum covers the ARDF (DF-65) and the soon to be released finisher (SR210) Service and Parts manual. This manual is to be used in conjunction with the 3220/D420 main manual (P/C 4300692).

If you have already purchased the training package (P/C 4300701), which includes the service manual, fax us a copy of the invoice to 914-347-7681 and we will send you the addendum at no charge. If you receive a training package after March 20, 1997, the addendum will be included in the package.

Please remember that if you order the 3220/D420 Service & Parts manual separately, you must also order the addendum to make a complete manual.

HEADQUARTERS		BRANCH		DEALERS	
ACCT/FINANCE	DISTRIBUTION	TECH.SERV.MNGR	COPIER	Gestetner	Nashuatec
ADMINISTRATION	MARKETING	TECH.SERV.REP.	COPYPRINTER	COPYPRINTER	COPYPRINTER
CUSTOMER SERVICES	MIS	SALES MNGR.	DUPLICATOR	DUPLICATOR	DUPLICATOR
DEALER DIVISION	SENIOR MANAGEMENT	SALES REP.	FACSIMILE	FACSIMILE	FACSIMILE
		TELEMARKT. MNGR	ANCILLARY	ANCILLARY	ANCILLARY
		TELEMRKT. REP.	ALL	ALL	ALL

Gestetner
nashuatec

Customer Services

Issued By Joe Cyrulik, Manager, Service Support & Planning

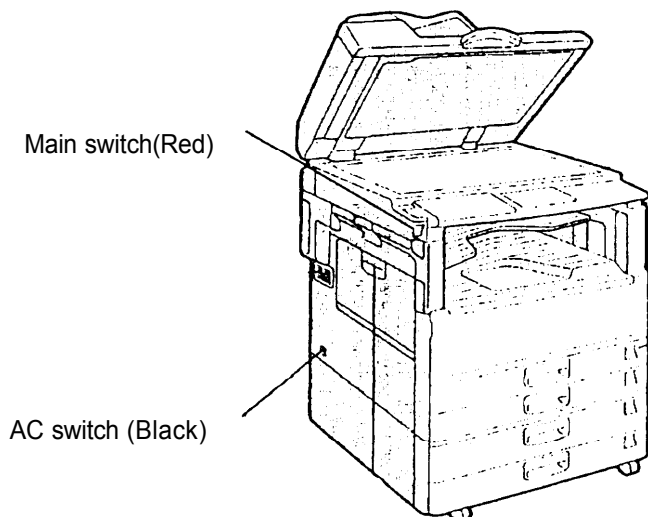
August, 1997
Page 1 of 1

3220/D420 Technical Bulletin # 4

installation precautions when installing the finisher SR210

The SR210 Finisher is now available and will only work on models with a serial number A106120001 or above.

Please make sure that both the main switch (red) and the AC switch (black) are turned off and the copier power cord is unplugged or damage to the Main Control Board may occur.



Note: It is a standard precaution to have the copier off and unplugged when installing any accessory or electrical device.

HEADQUARTERS		BRANCH		DEALERS	
				Gestetner	Nashuatec
ACCT/FINANCE	DISTRIBUTION	TECH.SERV.MNGR	COPIER	COPIER	
ADMINISTRATION	MARKETING	TECH.SERV.REP.	COPYPRINTER	COPYPRINTER	
CUSTOMER SERVICES	MIS	SALES MNGR.	DUPLICATOR	DUPLICATOR	
DEALER DIVISION	SENIOR MANAGEMENT	SALES REP.	FACSIMILE	FACSIMILE	
		TELEMARKT. MNGR	ANCILLARY	ANCILLARY	
		TELEMRKT REP	ALL	ALL	

Gestetner
nashuatec

BULLETIN NUMBER: A193/A224 - 001

04/23/98

APPLICABLE MODEL:
GESTETNER - 3225
RICOH - AFICIO 250
SAVIN - 9925DP

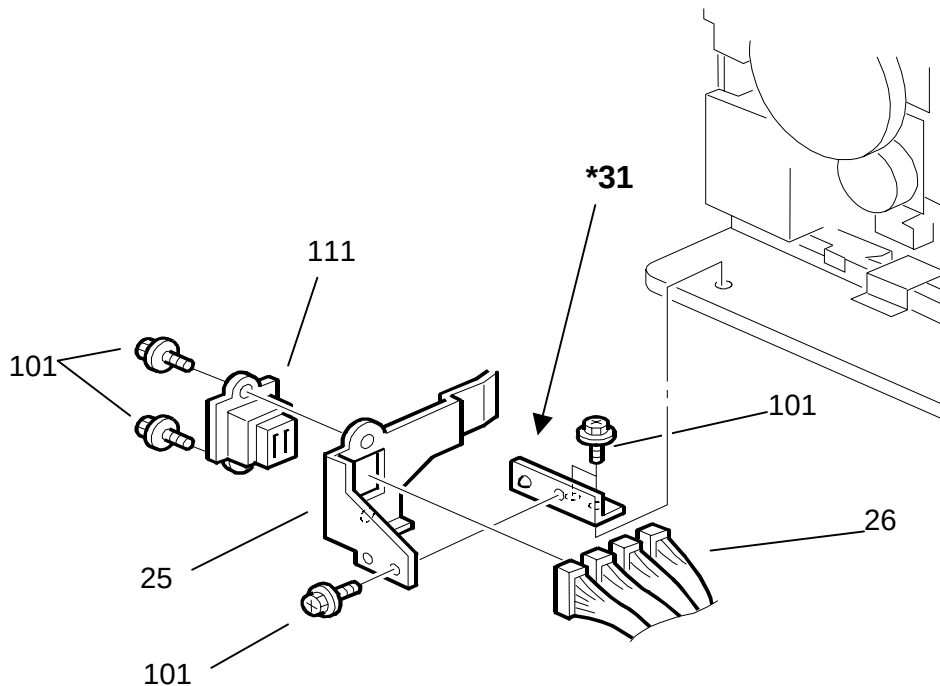
The chart listed below shows the Last Bulletin Number issued for the A193/A224 series.

Bulletin Cross Reference	
Ricoh Group Companies	Last Bulletin No.
Gestetner	007
Ricoh	030
Savin 9920DP	025
Savin 9925DP	004

SUBJECT: BASE CONNECTOR BRACKET - LCT

GENERAL:

The following Parts Catalog corrections are being issued for all A224 Parts Catalogs.



				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
C2242867	C2252867	Decal – Key Top Cover	1	7	24
G0202722	G0202723	By-pass Feed Shaft	1	23	29
	A2245821	Base Connector Bracket – LCT	1	53	31*

* DENOTES NEW ITEM.

BULLETIN NUMBER: A193/A224 - 002**04/23/98****APPLICABLE MODEL:****GESTETNER - 3220/3225****RICOH - AFICIO 200/AFICIO 250****SAVIN - 9920DP/9925DP****SUBJECT: PLATEN COVER BRACKET****GENERAL:**

The following Item Number corrections are being issued for all A193/A224 Parts Catalogs.

PART NO.	DESCRIPTION	QTY	PAGE	REFERENCE	
				OLD ITEM	NEW ITEM
A1931317	Platen Cover Bracket	2	11	5	6
A0531957	Flex Hinge – Platen Cover	1	11	6	5

NOTE: Item 5 and Item 6 were reversed in the original documentation.

Note: This copy is intended as a master original
for reproduction of additional bulletins.



■ PARTS

BULLETIN NUMBER: A193/A224 - 003

06/25/98

APPLICABLE MODEL:

GESTETNER - 3220

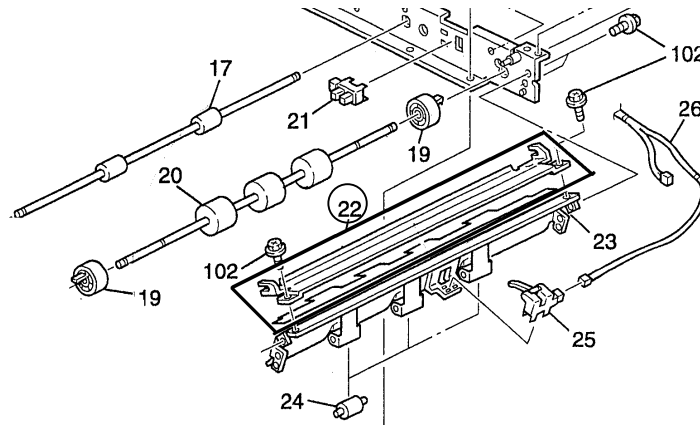
RICOH - AFICIO 200

SAVIN - 9920DP

SUBJECT: MYLAR - INVERTER GUIDE PLATE

GENERAL:

The Mylar for the Inverter Guide Plate is included with the Guide Plate. The following part correction is being issued for all G694 Parts Catalog Sections.



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■ PARTS

			REFERENCE	
PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G6944725	Mylar - Inverter Guide Plate	1	5	22

BULLETIN NUMBER: A193/A224 - 004
06/25/98
APPLICABLE MODEL:
GESTETNER - 3225
RICOH - AFICIO 250
SAVIN - 9925DP
SUBJECT: PARTS CATALOG CORRECTIONS
GENERAL:

The following parts corrections are being issued for all A224 Parts Catalogs.

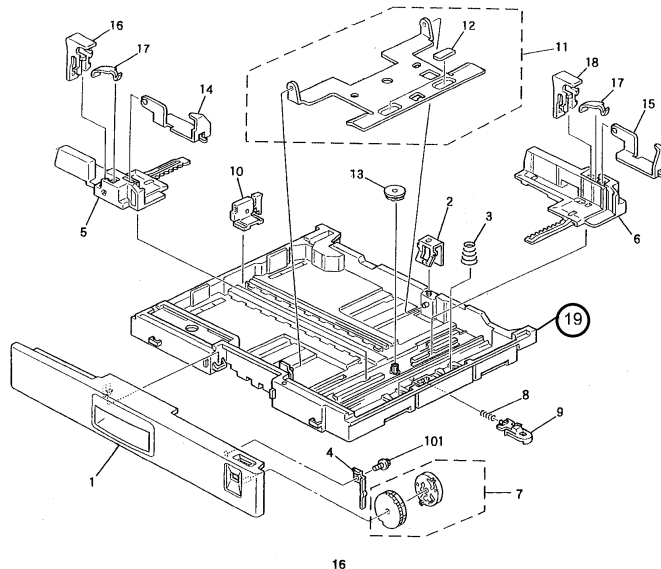
The following corrections should be made to the Parts Catalog.


PARTS

Note: This copy is intended as a master original for reproduction of additional bulletins.

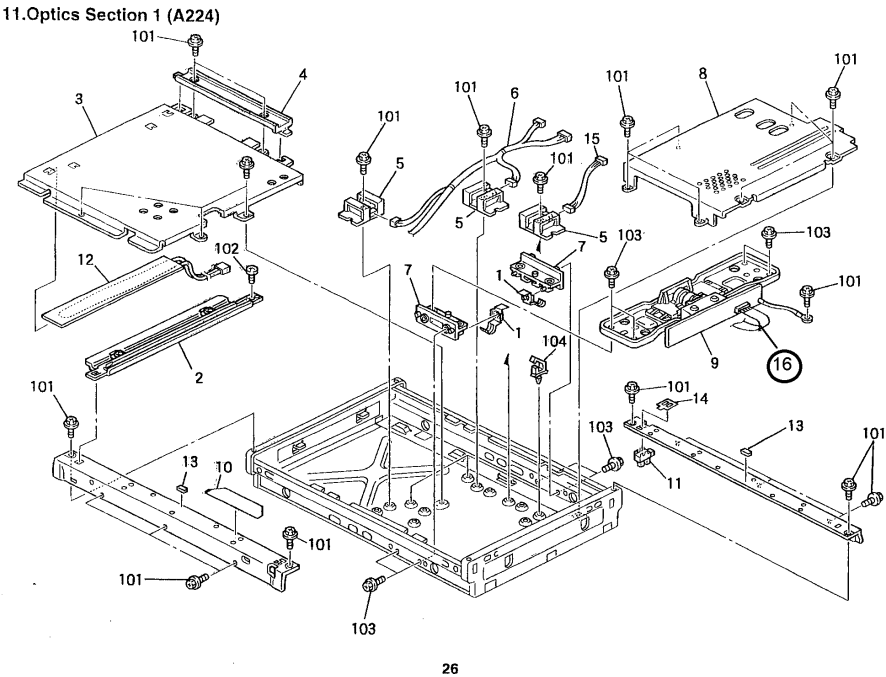
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	REFERENCE	
				PAGE	ITEM
G0202762		Lower Transport Guide	1→0	25	6
	G0202634	Cover – Vertical Transport	0→1	25	6
G0202613	G0202612	Vertical Relay Guide Ass'y	1	25	12
	G0202621	Mylar – Vertical Relay Guide	2	25	41

6. Paper Tray (A224)

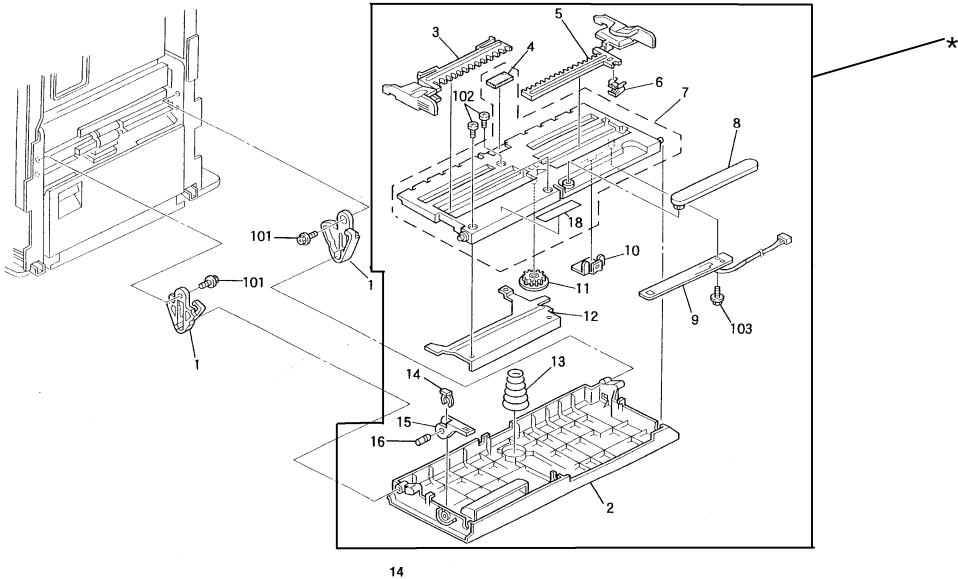


NEW PART NUMBER	DESCRIPTION	QTY	REFERENCE	
			PAGE	ITEM
G0202590	Paper Tray Base	1	17	19

Continued...



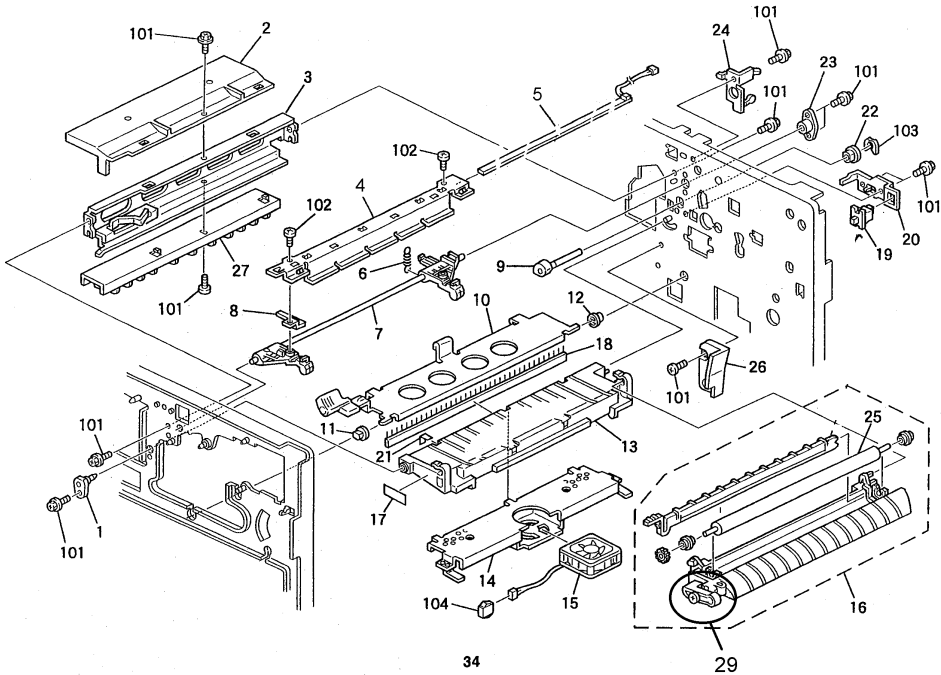
			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1935468	Harness – SBU	1	27	16



			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0202700	Bypass Feed Table Ass'y	1	15	*

Continued...

15. Paper Exit Section(A224)



			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0203865	Lever – Transfer unit	1	43	29

BULLETIN NUMBER: A193/A224 – 005
06/25/98
APPLICABLE MODEL:
GESTETNER – 3220
RICOH – AFICIO 200
SAVIN – 9920DP
SUBJECT: PARTS CATALOG CORRECTIONS
GENERAL:

The following parts corrections are being issued for all A193 Parts Catalogs.

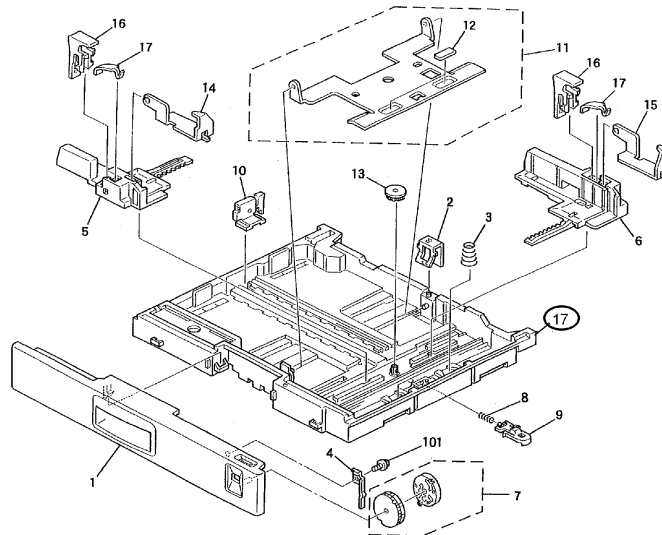
The following corrections should be made to the Parts Catalog.


PARTS

Note: This copy is intended as a master original for reproduction of additional bulletins.

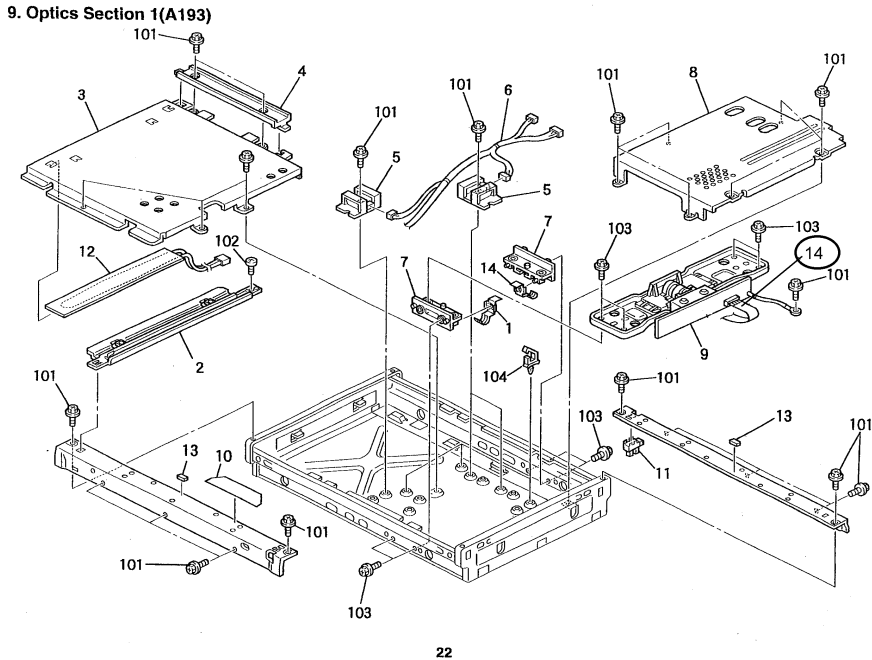
				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0202613	G0202612	Vertical Relay Guide Ass'y	1	21	12
	G0202621	Mylar – Vertical Relay Guide	2	21	36

6. Paper Tray (A193)

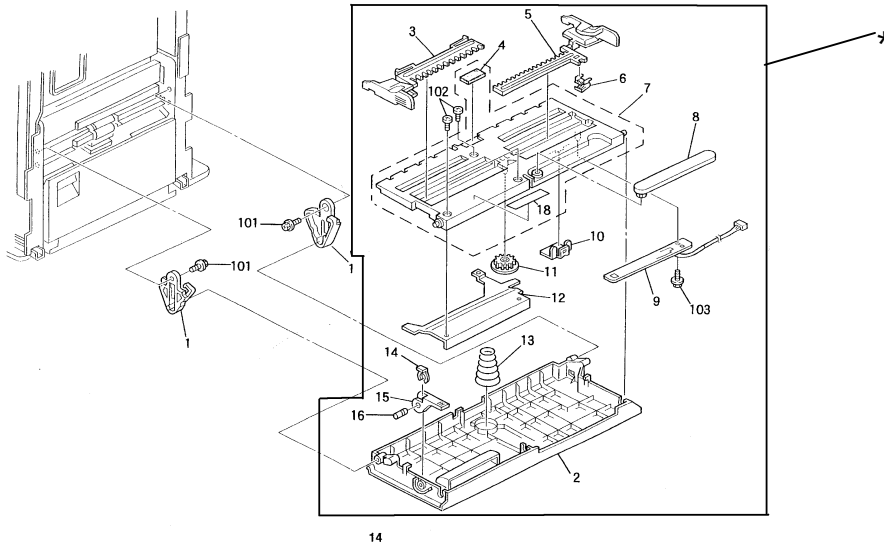


			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0202590	Paper Tray Base	1	17	17

Continued...



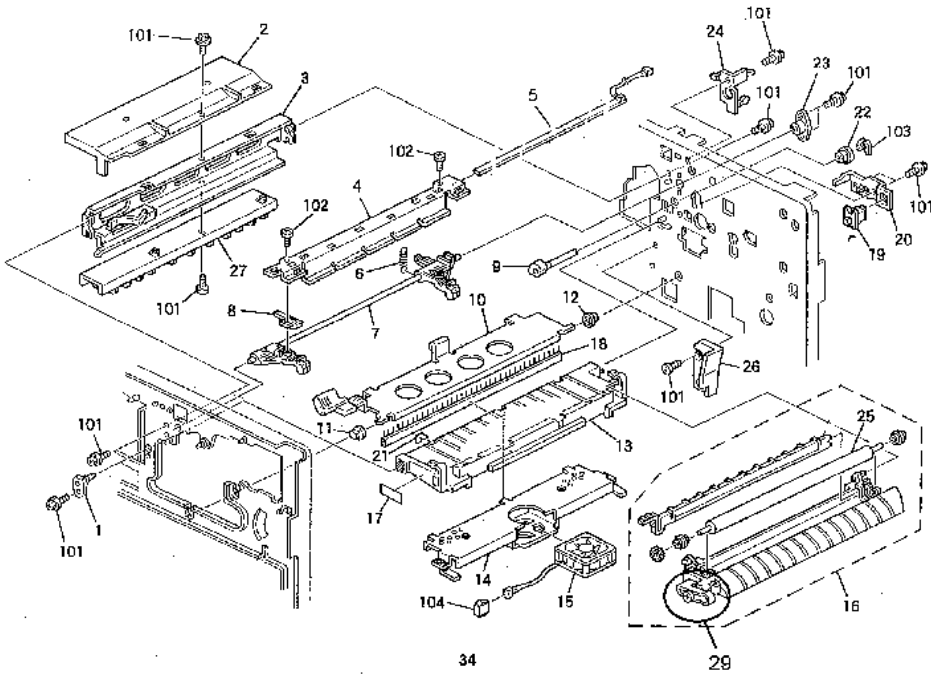
			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1935468	Harness – SBU	1	23	14



			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0202700	Bypass Feed Table Ass'y	1	15	*

Continued...

15. Paper Exit Section 1 (A193)



			REFERENCE	
NEW PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
G0203865	Lever – Transfer unit	1	35	29

BULLETIN NUMBER: A193/A224 - 006

07/22/98

APPLICABLE MODEL:

GESTETNER - 3220

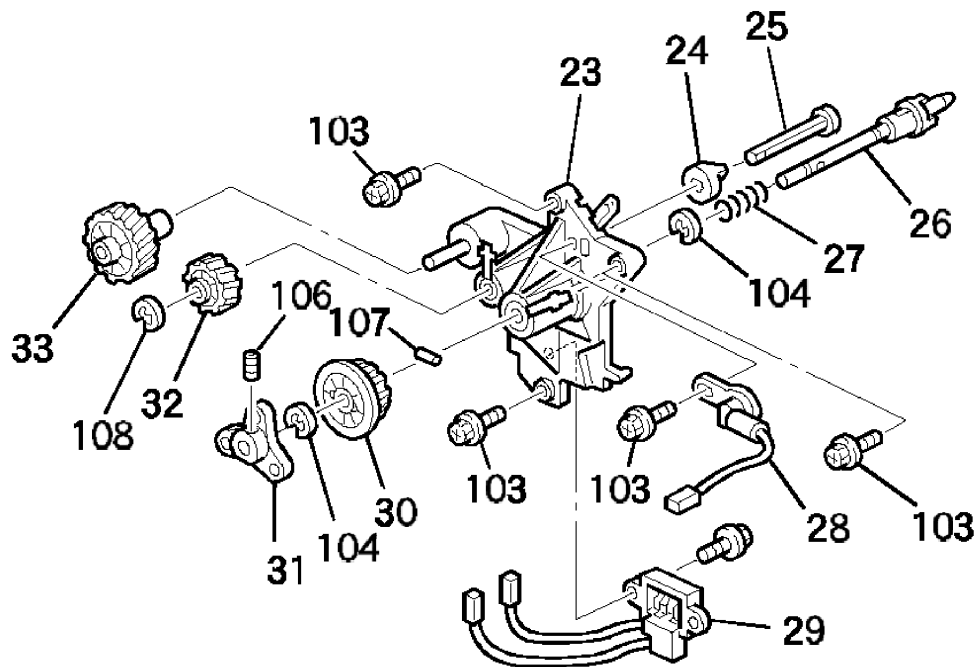
RICOH - AFICIO 200

SAVIN - 9920DP

SUBJECT: TIMING PULLEY

GENERAL:

The Timing Pulley (Item 30 P/N G0201178) was incorrectly listed as Timing Belt (P/N G0201187). The following parts correction is being issued for all A193 Parts Catalogs.



				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0201187		Timing Belt - S2M 158 mm	1→0	43	30
	G0201178	Timing Pulley - 51T	0→1	43	30



BULLETIN NUMBER: A193/A224 - 007

07/27/98

APPLICABLE MODEL:

GESTETNER - 3320/3225

RICOH - AFICIO 200/250

SAVIN - 9920DP/9925DP

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒

- 13-5 Updated Information

Note: This copy is intended as a master original
for reproduction of additional bulletins.



**SERVICE
MANUAL**

BULLETIN NUMBER: A193/A224 - 008**08/13/98****APPLICABLE MODEL:****GESTETNER – 3320/3225****RICOH – AFICIO 200/250****SAVIN – 9920DP/9925DP****SUBJECT: LIGHT COPY QUALITY****SYMPTOM:**

After making a continuous run of a few hundred copies, the image density will become lighter and lighter. This may occur with either internal or scanned printed images.

CAUSE:

Machines that make long copy runs, with firmware Level "T" Version 1.70 or higher for the A193 copier and Level "K" Version 1.30 or higher for A224 copier. This may exhibit light copies due to insufficient amount of toner supplied. **To obtain the ROM's for both machines use part number A1939455.**

SOLUTION:

If the monthly copy volume is **above** 3,000 copies, adjust the following SP modes to maintain image density.

1. To raise image density:
 - 1.1. Change SP 2-999 to one (1), for the manual mode.
 - 1.2. Input 100 into SP 2-996-1, (Adjust with the zoom up/down key).
 - 1.3. Make copies with a 7% original or equivalent until image density is recovered
 - 1.4. Confirm image density with an OS-A3 Test Chart.
 - 1.5. **Change SP 2-999, back to zero (0) the factory setting.**

CAUTION: Leaving SP 2-999 in the manual mode will cause OVERTONING.

2. To maintain the image density, do the following SP modes.
 - 2.1. Set SP 2-201, Development bias adjustment, to -700VDC.
 - 2.2. Set SP 2-994; Offset value for Vcont, to zero (0).
 - NOTE: SP 2-994 can not be accessed with earlier versions of firmware.**
 - 2.3. Set SP 2-911, Image density selection, to one (1) for dark.

If the monthly copy volume is **below** 3,000 copies, adjust the following SP modes to maintain image density.

3. To raise image density:
 - 3.1. Change SP 2-999 to one (1), for the manual mode.
 - 3.2. Input 100 into SP 2-996-1, (Adjust with the zoom up/down key).
 - 3.3. Make copies with a 7% original or equivalent until image density is recovered.
 - 3.4. **Change SP 2-999, back to zero (0), the factory setting.**

CAUTION: Leaving SP 2-999 in the manual mode will cause OVERTONING.

4. To maintain the image density, do the following SP modes.
 - 4.1. Set SP 2-201, Development bias adjustment, to -700VDC.
 - 4.2. Set SP 2-911, Image density selection, to 1 for dark.

Note: This copy is intended as a master original
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COPY QUALITY

BULLETIN NUMBER: A193/A224 - 009

09/28/98

APPLICABLE MODEL:

GESTETNER – 3320/3225

RICOH – AFICIO 200/250

SAVIN – 9920DP/9925DP

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

COPIER SECTION:

- v ~ xiii Updated Information (Table of Contents)
- 4-47 ~ 4-60 Service Program Mode Tables / Indexes

FAX SECTION:

- iv ~ v Updated Information (Table of Contents)
- 4-78 ~ 4-85 Service Program / Bit Switch Table Index

Note: This copy is intended as a master original
for reproduction of additional bulletins.



**SERVICE
MANUAL**

3. USER PROGRAM MODE	4-42
3.1 HOW TO ENTER AND EXIT UP MODE	4-42
4. SWITCHES/LEDS	4-44
4.1 SWITCHES	4-44
4.2 LEDS	4-44
4.3 TEST PIN	4-44
5. SPECIAL TOOLS AND LUBRICANTS	4-44
5.1 SPECIAL TOOLS	4-44
6. PREVENTIVE MAINTENANCE SCHEDULE	4-45
6.1 PM TABLE	4-45
⇒ 7. SERVICE PROGRAM MODE TABLE	4-47
7.1 SERVICE PROGRAM TABLE INDEX	4-47
7.2 COPIER USER TOOLS/PRINTER TOOLS/FAX SERVICE MODES	4-53

REPLACEMENT AND ADJUSTMENT (A193)

1. EXTERIOR	5-1
1.1 FRONT COVER/INNER COVER	5-1
1.2 REAR COVER	5-2
1.3 LEFT/RIGHT COVER	5-2
1.4 EXPOSURE GLASS/OPERATION PANEL/UPPER COVER	5-3
2. PHOTOCONDUCTOR UNIT (PCU)	5-4
2.1 PCU	5-4
2.2 DRUM CHARGE ROLLER UNIT	5-6
2.3 DRUM	5-7
2.4 CLEANING BLADE	5-8
3. TRANSFER UNIT	5-9
3.1 TRANSFER UNIT	5-9
3.2 TRANSFER ROLLER/SEPARATION UNIT	5-9
4. SCANNER UNIT	5-10
4.1 LENS COVER	5-10
4.2 SCANNER FRAME	5-11
4.3 ORIGINAL SIZE SENSOR	5-12
4.4 LENS BLOCK/SBU ASSEMBLY	5-12
4.5 XENON LAMP	5-13

4.6 SCANNER H. P. SENSOR/PLATEN COVER SENSOR	5-14
4.7 SCANNER MOTOR	5-15
4.8 SCANNER WIRE	5-16
5. LASER UNIT	5-18
5.1 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR	5-19
5.2 POLYGON MIRROR MOTOR	5-20
5.3 LD UNIT	5-21
5.4 LASER UNIT POSITIONING ADJUSTMENT	5-22
6. FUSING/EXIT	5-23
6.1 HOT ROLLER STRIPPERS	5-23
6.2 FUSING THERMISTOR/THERMOFUSE	5-23
6.3 HOT ROLLER/FUSING LAMP	5-24
6.4 PRESSURE ROLLER/CLEANING ROLLER	5-25
7. EXIT	5-26
7.1 EXIT UNIT	5-26
7.2 UPPER EXIT SENSOR/LOWER EXIT SENSOR	5-27
8. PAPER FEED/ REGISTRATION	5-28
8.1 BY-PASS FEED TRAY	5-28
8.2 BY-PASS FEED PAPER END SENSOR/REGISTRATION SENSOR	5-29
8.3 PAPER FEED ROLLER/FRICTION PAD	5-30
8.4 BY-PASS FEED PAPER WIDTH SENSOR	5-30
8.5 PAPER FEED ROLLERS/PAPER SIZE DETECTOR	5-31
8.5.1 Paper Feed Rollers	5-31
8.5.2 Paper Size Detector	5-31
8.6 PAPER END SENSORS	5-32
8.7 PAPER FEED CLUTCHES/RELAY CLUTCHES	5-33
8.8 RELAY SENSOR/RIGHT VERTICAL GUIDE SWITCH	5-34
9. OTHERS	5-35
9.1 IOCSS BOARD	5-35
9.2 MSU BOARD/BICU BOARD	5-36
9.3 PSU BOARD	5-37
10. STANDARD WHITE DENSITY ADJUSTMENT	5-38
11. COPY ADJUSTMENT PRINTING/SCANNING	5-39
11.1 PRINTING	5-39

11.1.1 Registration - Leading Edge/Side-to-Side	5-39
11.1.2 Blank Margin	5-40
11.1.3 Main Scan Magnification	5-40
11.1.4 Double Copy Registration	5-41
11.2 SCANNING	5-41
11.2.1 Registration: Platen Mode	5-41
11.2.2 Magnification	5-42
11.3 ADF IMAGE ADJUSTMENT	5-43
11.3.1 Registration and Blank Margin	5-43
11.3.2 Sub Scan Magnification	5-43

12. IMAGE DENSITY ADJUSTMENT BY KEY OPERATOR 5-44

TROUBLESHOOTING (A193)

1. SERVICE CALL CONDITIONS	6-1
1.1 SUMMARY	6-1
2. SC CODE DESCRIPTIONS	6-2
3. ELECTRICAL COMPONENT DEFECTS.....	6-11
3.1 SENSORS	6-11
3.2 SWITCHES	6-13
4. BLOWN FUSE CONDITIONS	6-13
5. ROM MODIFICATION HISTORY.....	6-14

OPTIONS

DOCUMENT FEEDER (A628)

1. SPECIFICATIONS	7-1
2. COMPONENT LAYOUT.....	7-2
2.1 MECHANICAL COMPONENT LAYOUT	7-2
2.2 ELECTRICAL COMPONENT LAYOUT	7-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	7-4
2.4 DRIVE LAYOUT	7-5
3. DETAILED DESCRIPTIONS	7-6
3.1 ORIGINAL SIZE DETECTION	7-6
3.2 PICK-OFF AND SEPARATION MECHANISM.....	7-8

3.3 ORIGINAL TRANSPORT AND EXIT MECHANISM	7-9
3.4 STAMP	7-10
3.5 TIMING CHARTS	7-11
3.5.1 A4 Lengthwise	7-11
3.5.2 A4 Sideways (Stamper Mode)	7-12
3.6 OVERALL ELECTRICAL CIRCUIT	7-13
4. REPLACEMENT AND ADJUSTMENT	7-14
4.1 ORIGINAL FEED UNIT REMOVAL	7-14
4.2 SEPARATION ROLLER REPLACEMENT	7-15
4.3 PICK-UP ROLLER REPLACEMENT	7-16
4.4 FEED BELT REPLACEMENT	7-17
4.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT	7-18
4.6 DF COVER REMOVAL	7-19
4.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT	7-20
4.8 ORIGINAL LENGTH SENSOR REPLACEMENT	7-21
4.9 DF FEED CLUTCH AND DF PICK-UP SOLENOID REPLACEMENT	7-22
4.10 REGISTRATION SENSOR REPLACEMENT	7-23
4.11 STAMPER SOLENOID REPLACEMENT	7-24
4.12 SP MODES	7-25

PAPER TRAY UNIT (G697)

1. SPECIFICATIONS	8-1
2. COMPONENT LAYOUT	8-2
2.1 MECHANICAL COMPONENT LAYOUT	8-2
2.2 ELECTRICAL COMPONENT LAYOUT	8-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	8-4
2.4 DRIVE LAYOUT	8-5
3. DETAILED DESCRIPTION	8-6
3.1 PAPER FEED AND TRAY LIFT/LOWER MECHANISM	8-6
3.2 TIMING CHART	8-7
3.3 OVERALL ELECTRICAL CIRCUIT	8-8
4. REPLACEMENT AND ADJUSTMENT	8-9
4.1 EXTERIOR COVER REMOVAL	8-9
4.2 PAPER FEED ROLLER REPLACEMENT	8-10
4.3 PAPER FEED AND RELAY CLUTCH REPLACEMENT	8-11

4.4 PAPER FEED MOTOR REPLACEMENT	8-12
4.5 LIFT MOTOR REPLACEMENT	8-12
4.6 PAPER END AND UPPER LIMIT SENSOR REPLACEMENT	8-13
4.7 UPPER RELAY SENSOR REPLACEMENT	8-14
4.8 LOWER RELAY SENSOR REPLACEMENT	8-15
4.9 PAPER SIZE SENSORS	8-16
4.10 TRAY COVER SWITCH REPLACEMENT	8-17

DUPLEX (G694)

1. SPECIFICATIONS	9-1
2. COMPONENT LAYOUT	9-2
2.1 MECHANICAL COMPONENT LAYOUT	9-2
2.2 ELECTRICAL COMPONENT LAYOUT	9-3
2.3 ELECTRICAL COMPONENT DESCRIPTION	9-4
3. DRIVE LAYOUT	9-5
4. BASIC OPERATION	9-6
4.1 A3 PAPER SIZE	9-6
4.2 SHORTER THAN A4 LENGTHWISE (MEMORY COPY) 8 Original (① ~ ⑧)	9-8
5. DETAILED DESCRIPTIONS	9-12
5.1 DUPLEX JUNCTION GATE MECHANISM	9-12
5.2 PAPER TRANSPORT AND FEED MECHANISM	9-13
5.3 TIMING CHARTS	9-14
5.3.1 A3 (without memory)	9-14
5.3.2 A4 sideways (Memory)	9-15
5.4 OVERALL ELECTRICAL CIRCUIT	9-16
6. DIP SWITCHES	9-17
6.1 DUPLEX CONTROL BOARD : DSW1	9-17
7. REPLACEMENT AND ADJUSTMENT	9-18
7.1 DUPLEX TRANSPORT UNIT REMOVAL	9-18
7.2 DUPLEX TRANSPORT AND FEED MOTOR REPLACEMENT	9-19
7.3 DUPLEX TURN AND DUPLEX EXIT SENSORS	9-19
7.4 DUPLEX JUNCTION GATE SOLENOID AND DUPLEX ENTRANCE SENSOR REPLACEMENT	9-20

1-BIN SORTER (A629)

1. SPECIFICATIONS	10-1
2. COMPONENT LAYOUT.....	10-2
2.1 MECHANICAL COMPONENT LAYOUT	10-2
2.2 ELECTRICAL COMPONENT LAYOUT	10-3
2.3 ELECTRICAL COMPONENT DESCRIPTION.....	10-4
2.4 DRIVE LAYOUT.....	10-5
3. DETAILED DESCRIPTIONS	10-6
3.1 BIN JUNCTION GATE AND PAPER TRANSPORT MECHANISM.....	10-6
3.2 DRIVE MECHANISM.....	10-7
3.3 TIMING CHART	10-8
3.4 OVERALL ELECTRICAL CIRCUIT	10-8
4. REPLACEMENT AND ADJUSTMENT	10-9
4.1 BIN JUNCTION GATE SOLENOID, TRANSPORT MOTOR AND SORTER DRIVE BOARD REMOVAL	10-9
4.2 BIN PAPER SENSOR AND INDICATOR REPLACEMENT	10-10

AUTO REVERSE DOCUMENT FEEDER (A661)

1. OVERALL MACHINE INFORMATION	11-1
1.1 SPECIFICATIONS	11-1
1.2 MECHANICAL COMPONENT LAYOUT	11-2
1.3 ELECTRICAL COMPONENT LAYOUT	11-3
1.4 ELECTRICAL COMPONENT DESCRIPTION.....	11-4
1.5 DRIVE LAYOUT.....	11-5
2. DETAILED DESCRIPTIONS	11-6
2.1 ORIGINAL SIZE DETECTION	11-6
2.2 PICK-OFF AND SEPARATION MECHANISM.....	11-8
2.3 ORIGINAL TRANSPORT AND EXIT MECHANISM	11-9
2.3.1 Single-sided Original.....	11-9
2.3.2 Double-sided Original	11-10
2.4 STAMP.....	11-12
2.5 TIMING CHARTS.....	11-13
2.5.1 LT Sideways (Single-sided Original Mode).....	11-13
2.5.2 LT Sideways-Stamper Mode (Single-sided Original Mode)	11-14
2.5.3 LT Sideways (Double-sided Original Mode)	11-15

2.5.4 LT Sideways-Stamper Mode (Double-sided Original Mode)	11-16
2.6 JAM DETECTION	11-17
2.7 OVERALL ELECTRICAL CIRCUIT	11-18
3. INSTALLATION	11-19
4. PREVENTIVE MAINTENANCE	11-22
5. REPLACEMENT AND ADJUSTMENT	11-23
5.1 ORIGINAL FEED UNIT REMOVAL	11-23
5.2 SEPARATION ROLLER REPLACEMENT	11-24
5.3 PICK-UP ROLLER REPLACEMENT	11-25
5.4 FEED BELT REPLACEMENT	11-26
5.5 ORIGINAL SET SENSOR AND WIDTH SENSOR REPLACEMENT	11-27
5.6 DF COVER REMOVAL	11-28
5.7 DF FEED COVER OPEN , DF POSITION, AND APS START SENSOR REPLACEMENT	11-29
5.8 ORIGINAL LENGTH SENSOR REPLACEMENT	11-30
5.9 DF FEED CLUTCH, DF PICK-UP SOLENOID, AND JUNCTION SOLENOID GATE REPLACEMENT	11-31
5.10 REGISTRATION SENSOR REPLACEMENT	11-32
5.11 ORIGINAL EXIT SENSOR REPLACEMENT	11-33
5.12 STAMPER SOLENOID REPLACEMENT	11-34

FINISHER SR210 (A666)

1. OVERALL MACHINE INFORMATION	12-1
1.1 SPECIFICATIONS	12-1
1.2 MECHANICAL COMPONENT LAYOUT	12-2
1.3 ELECTRICAL COMPONENT LAYOUT	12-3
1.4 ELECTRICAL COMPONENT DESCRIPTION	12-4
1.5 DRIVE LAYOUT	12-5
2. DETAILED DESCRIPTIONS	12-6
2.1 JUNCTION GATE MECHANISM	12-6
2.2 PAPER REVERSING MECHANISM	12-7
2.3 JOGGER UNIT PAPER POSITIONING MECHANISM	12-8
2.4 STAPLER	12-9
2.5 FEED OUT MECHANISM	12-10
2.6 SHIFT TRAY UP/DOWN MECHANISM	12-11
2.7 SHIFT TRAY SIDE-TO-SIDE MECHANISM	12-12

2.8 TIMING CHART	12-13
2.8.1 Face-up Mode (A4: 2 sheets)	12-13
2.8.2 Face-down Mode (A4: 2 sheets)	12-14
2.8.3 Staple Mode (A4: 2 sheets)	12-15
2.8.4 Jam Detection	12-16
2.8.5 Electrical Circuit	12-17
3. INSTALLATION PROCEDURE	12-18
4. PREVENTIVE MAINTENANCE	12-21
5. SERVICE TABLES	12-22
5.1 LED TABLE	12-22
5.2 DIP SWITCH TABLE	12-22
5.2.1 Factory Setting	12-22
5.2.2 Stapling Position Adjustment	12-22
5.2.3 Sensor Check	12-22
5.2.4 FREE RUN WITHOUT PAPER	12-23
6. REPLACEMENT AND ADJUSTMENT	12-24
6.1 EXTERIOR REMOVAL	12-24
6.2 ALIGNMENT BRUSH ROLLER REPLACEMENT	12-25
6.3 BELT TENSION ADJUSTMENT	12-26
6.4 STACK HEIGHT SENSOR REPLACEMENT	12-27
6.5 EXIT SENSOR REPLACEMENT	12-28
6.6 INVERTER SENSOR REPLACEMENT	12-29

A224 (AFICIO 250) COPIER

1. SPECIFICATIONS	13-1
2. MACHINE CONFIGURATION	13-5
3. ELECTRICAL COMPONENT DESCRIPTIONS	13-6
4. DRIVE LAYOUT	13-9
5. COPY PROCESS	13-10
5.1 OVERVIEW	13-10
6. MAIN SCAN MAGNIFICATION/REDUCTION	13-11
7. LASER EXPOSURE	13-12
7.1 OVERVIEW	13-12
7.2 OPTICAL PATH	13-12

8. PAPER FEED	13-13
8.1 OVERVIEW	13-13
8.2 DRIVE MECHANISM	13-14
9. PAPER SEPARATION AND TRANSPORT.....	13-14
10. IMAGE FUSING	13-15
10.1 OVERVIEW	13-15
10.2 PRESSURE ROLLER	13-16
10.3 FUSING UNIT FAN	13-17
10.4 FUSING TEMPERATURE CONTROL AND OVERHEAT PROTECTION. .	13-18
11. ENERGY SAVER MODES.....	13-19
12. SERVICE PROGRAM MODE TABLE	13-20
12.1 MAIN SP MODE TABLE	13-20
12.1.1 Input Check (SP5-803)	13-49
12.1.2 Output Check (SP5-804)	13-53
13. PREVENTIVE MAINTENANCE SCHEDULE.....	13-55
13.1 PM TABLE	13-55
14. REPLACEMENT AND ADJUSTMENT	13-57
14.1 LASER UNIT	13-57
14.2 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR	13-58
14.3 POLYGON MIRROR MOTOR	13-59
14.4 POLYGON MOTOR DRIVER.....	13-60
14.5 FUSING THERMISTOR/FUSING EDGE THERMISTOR	13-61
14.6 FUSING UNIT FAN	13-62
15. SERVICE CALL CONDITIONS	13-63
15.1 SUMMARY.....	13-63
16. SC CODE DESCRIPTIONS	13-64
17. ROM MODIFICATION HISTROY.....	13-77

LARGE CAPACITY TRAY (A667)

1. SPECIFICATIONS	14-1
2. COMPONENT LAYOUT.....	14-2
2.1 MECHANICAL COMPONENT LAYOUT	14-2
2.2 ELECTRICAL COMPONENT LAYOUT	14-3
2.3 ELECTRICAL COMPONENT DESCRIPTIONS.....	14-4
2.4 DRIVE LAYOUT.....	14-5
3. DETAILED SECTION DEACRIPTION.....	14-6

3.1 PAPER LIFT MECHANISM	14-6
3.2 PAPER FEED MECHANISM	14-7
3.3 PAPER NEAR END/END DETECTION	14-8
3.4 PAPER FEED TIMING AND JAM DETECTION	14-10
4. INSTALLATION	14-11
4.1 ACCESSORY CHECK	14-11
4.2 INSTALLATION PROCEDURE	14-11
4.3 PAPER SIZE CHANGE	14-15
5. PREVENTIVE MAINTENANCE TABLE	14-16
6. SERVICE TABLE	14-16
6.1 TEST POINT TABLE	14-16
6.2 FUSE TABLE	14-16
7. REPLACEMENT AND ADJUSTMENT	14-17
7.1 EXTERIOR COVER REMOVAL	14-17
7.2 PAPER FEED ROLLER REMOVAL	14-18
7.3 TRAY LIFT MOTOR REMOVAL	14-19
7.4 PAPER FEED MOTOR AND TRNSPORT MOTOR	14-20
7.5 PAPER SIZE SENSOR	14-20
7.6 LOWER LIMIT SENSOR	14-21

7.SERVICE PROGRAMS MODE TABLE

7.1 SERVICE PROGRAM TABLE INDEX

FUNCTION	MODE
A3/ 11 x 17 double count	5-104
AC switch auto shut off [250 only]	5-948
ADF sensor output display	6-901
ADF and printer free run	6-910
ADF free run	6-009
ADF original scanning method	6-902
ADF side to side & edge registration and trail erase	6-006
ADF sub scan mag.	6-007
ADF total original	7-205
ADS level selection	5-106
AGC default setting	4-410
All indicators on	5-001
APS sideways priority	5-911
APS mode	5-944
APS sensor check	4-301
APS small size originals	4-303
ARDF original buckle adj.	6-906
ARDF skew correction	6-905
Auto paper tray shift	5-103
Auto restart interval	1-901
Auto shut off	5-904
Auto shut-off mode disabling	5-946
Auto TD sensor initial setting mode	2-913
Binary processing mode [marker mode]	4-402
Binary processing mode [neg./pos.]	4-401
Binding hole range	6-911
Brand name and production name	5-907
Bypass feed paper size display	1-007
Charge roller bias adj.	2-001
Charge roller H.P. detection	5-943
Charge roller temp correction	2-912
Copy jam history clear	7-904
Copy jam history display	7-903

FUNCTION	MODE
Dev bias adj.	2-201
Display language	5-808
Dither pattern selection	4-421
Double copy registration	1-006
Duplex blank page	5-941
Edge margin - scanning	4-012
EDU text mode	4-909
Envelope feeding	1-903
Exhaust fan control timer setting	5-906
Exposure lamp on	4-902
Fax forwarding mode	5-930
FCI smoothing enable	2-902
Forced charge roller cleaning	2-909
Forced toner supply	2-908
Forced transfer roller cleaning	2-910
Free run	5-802
Fusing control freq. display	1-902
Fusing temp adj.	1-105
Fusing temp display	1-106
Fusing temperature control	1-104
Gradation Processing mode	4-403
Gradation type	2-905
Humidity sensor output display	2-980
ID adj. for Test pattern	2-106
ID adjustment	2-904
Image compression mode	5-942
Image density selection	2-911
Image rotation mode	5-940
Input check	5-803
IPU test pattern print	4-417
Jam counter clear	7-807

FUNCTION	MODE
Laser pulse positioning	2-907
LCD contrast	5-903
LD power adj.	2-103
LD PWM	2-903
Lead edge registration	1-001
Lead edge registration - scanning	4-010
Leading edge margin	2-101-1
Left margin	2-101-3
Main scan mag [printer]	2-998
Main scan mag [scanning]	4-008
Marker detection	4-406
Memory all clear	5-801
Memory copy mode	5-945
MTF filter selections	4-407
MTF filter selections binary mode	4-998
Number of copier after near toner end	2-213
Option counter type	5-113
Original jam history clear	7-906
Original jam history display	7-905
Original non waiting start	6-903
Original scanning interval	6-904
Output check	5-804
Paper feed timing	1-003
PCU alarm interval	5-912
PCU counter clear	7-909
PCU counter display	7-908
PM alarm	5-501
PM counter reset	7-804
PM counter display	7-803
Printer free run	5-901
Printer gamma table	2-916
Program download	5-932
RAM read	7-990
Resets counters	7-808
Right margin	2-101-4
ROM/CPU	7-801

FUNCTION	MODE
SBU auto adj.	4-908
SBU DC count adj.	4-905
SBU gain adj.	4-904
SBU offset value	4-907
SBU reference value adj.	4-906
SC code reset	5-810
SC history clear	7-902
SC history display	7-901
Scanner free run	4-013
Scanner motor control method	4-910
Separation voltage adj.	2-901
Service telephone #	5-812
Shading interval time in DF mode	4-913
Side to side reg. - scanning	4-011
Side to side registration	1-002
Stamp position adj.	6-010
Sub scan mag [scanning]	4-101
System parameter and data list printing	5-992
TD sensor control value display	2-995
TD sensor control value display	2-997
TD sensor control value selection	2-999
TD sensor control value setting	2-996
TD sensor initial setting	2-801
Test pattern printout	5-902
Threshold level - binary mode	4-999
Threshold level	4-418
Threshold level for marker mode	4-419
Timer counter clear	7-907
Timer counter display	7-991
Total copies by copy mode	7-304
Total copies by image	7-303
Total copies by reproduction ratio	7-301
Total copies by size	7-101
Total copy counter	7-003
Total copy jam counter	7-502
Total counter up timing	5-116
Total jam by location	7-504
Total jam counter	7-501
Total number of scans	7-201

FUNCTION	MODE
Total operation time	7-001
Total original counter	7-002
Total original jam counter	7-503
Total paper tray counter	7-204
Total SC counter	7-401
Trail edge margin	2-101-2
Transfer current	2-301
Use 25% reduction ratio in photo mode [250 only]	5-947
User code mode	5-401
User code number reset	7-810
User program mode data reset	5-913
Video data path	4-412
VRAM data download	5-991
VT display	2-220
White plate scanning area	4-015
White plate scanning start position	4-015
White value	4-912

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7.2 COPIER USER TOOLS/PRINTER TOOLS/ FAX SERVICE MODES

Rev. 09/98

Function	Effects	Group	Mode	Sub mode	Note
2 Sided Printing	F	Fax User Tools	4-Initial Setup Rx	6	
AID priority	C	Copier User Tools	Copy / General Features	2	
APS Priority	C	Copier User Tools	Copy / General Features	1	
Authorized reception condition	F	Fax User Parameter List	SW 08	bit 2	See User Parameters
Authorized Rx	F	Fax User Tools	4-Initial setup Rx	8	
Authorized Rx	F	Fax User Tools	6-Keyp op. settings (enter)	07	
Auto continue	P	Printer [Off Line]	4-Config	4	
Auto doc list	F	Fax User Tools	2-Reports/Lists	6	
Auto doc originals	F	Fax User Tools	2-Reports/Lists	7	
Auto energy saver	C/F/P	Copier User Tools	System	07	FSM Pg. 263-270
Auto image density	F	Fax User Tools	3-Initial setup Tx	4	
Auto power on reception	F	Fax User Parameter List	SW 14	bit 0	See User Parameters
Auto reduction	F	Fax User Parameter List	SW 01	bit 2	See User Parameters
Auto reduction in printing	F	Fax User Parameter List	SW 10	bit 3	See User Parameters
Auto reset	C/F/P	Copier User Tools	System	05	
Auto scanning the long doc in ADF	F	Fax User Parameter List	SW 14	bit 1	See User Parameters
Auto shut off timer	C/F/P	Copier User Tools	System	09	
Auto shut off	C/F/P	Copier User Tools	System	07	FSM Pg. 263-270
Auto tray switching	C	Copier User Tools	System	12	
Auto Tray switching	P	Printer [Off Line]	4-Config	1	
Batch Tx	F	Fax User Parameter List	SW 14	bit 2	See User Parameters
Bit switch programming (fax)	F	Fax service mode	Function 01		
By pass auto select	C	Copier User Tools	System	13	

Service
Tables

(A193)

4-53

SM

(A193)

4-54

SM

Function	Effects	Group	Mode	Sub mode	Note
Center mark	F	Fax User Tools	4-Initial setup Rx	3	
Center mark	F	Fax User Parameter List	SW 02	bit 1	See User Parameters
Character size (resolution)	F	Fax User Parameter List	SW 00	bit 5.4	See User Parameters
Checker mark	F	Fax User Parameter List	SW 02	bit 4	See User Parameters
Chequered mode	F	Fax User Tools	4-Initial setup Rx	2	
CIL print	F	Fax User Parameter List	SW 02	bit 5	See User Parameters
Clr function settings	C	Copier User Tools	System	02	
CLR warning	P	Printer [Off Line]	4-Config	3	
Com/IR sep line	C	Copier User Tools	Copy/Adj. image	6	
Combine auto eject	C	Copier User Tools	Copy / Input/output	2	
Confidential file report	F	Fax User Parameter List	SW 04	bit 0	See User Parameters
Contrast	C	Copier User Tools	System	16	
Copies	P	Printer [Off Line]	1-Basic	01	
Copy count display	C	Copier User Tools	System	04	
Counters	F	Fax User Tools	6-Keyp op. settings (enter)	16	
Date/Time	F	Fax User Tools	6-Keyp op. settings (enter)	15	
Daylight saving time	F	Fax User Parameter List	SW 25	bit 7	See User Parameters
Default tray	P	Printer [Off Line]	1-Basic	02	
Del auto doc	F	Fax User Tools	1-Register/Delete	10	
Del group dial	F	Fax User Tools	1-Register/Delete	04	
Del irreg. area	F	Fax User Tools	1-Register/Delete	12	
Del program	F	Fax User Tools	1-Register/Delete	08	
Del quick dial	F	Fax User Tools	1-Register/Delete	02	
Del speed dial	F	Fax User Tools	1-Register/Delete	06	

Rev. 09/98

Function	Effects	Group	Mode	Sub mode	Note
DTMF test (fax)	F	Fax service mode	Function 11		
Dup. copy sep line	C	Copier User Tools	Copy / Adj. image	5	
Duplex	P	Printer [Off Line]	1-Basic	05	
Duplex Auto eject	C	Copier User Tools	Copy / Input/output	1	
ECM	F	Fax User Tools	6-Keyp op. settings (enter)	02	
Economy Tx	F	Fax User Tools	6-Keyp op. settings (enter)	10	
Edge enhancements	P	Printer [Off Line]	1-Basic	09	
Energy saver mode	C/F/P	Copier User Tools	System	08	FSM Pg. 263-270
Erase border	C	Copier User Tools	Copy/Adj. image	1	
Erase center	C	Copier User Tools	Copy/Adj. image	2	
Error code display (fax)	F	Fax service mode	Function 03		
Fax Comm. mode	F	Fax User Parameter List	SW 06	bit 1	
Fax Service Mode	F	Fax User Tools	1988 hold Print		
File printout	F	Fax service mode	Function 13		
Font #	P	Printer [Off Line]	2-PCL menu	2	
Font pitch	P	Printer [Off Line]	2-PCL menu	3	
Font source	P	Printer [Off Line]	2-PCL menu	1	
Forwarding	F	Fax User Tools	6-Keyp op. settings (enter)	05	
Forwarding	F	Fax User Tools	4-Initial setup Rx	10	
Forwarding mark	F	Fax User Parameter List	SW 02	bit 0	
Function keys			5-User functions		
Function priority	C/F/P	Copier User Tools	System	01	
Function time out	C/F/P	Copier User Tools	System	06	

Function	Effects	Group	Mode	Sub mode	Note
G3 analog line	F	Fax User Tools	6-Keyp op. settings (enter)	12	
G3 protocol dump list (fax)	F	Fax service mode	Function 05-1		
G4 protocol dump list (fax)	F	Fax service mode	Function 05-2		
G4 param programming	F	Fax service mode	Function 12		
Group dial list	F	Fax User Tools	2-Reports/Lists	3	
HD initialize [start]	P	Printer [Off Line]	8-Refresh		
HD initialize (fax)	F	Fax service mode	Function 08-1		
HD formatting (fax)	F	Fax service mode	Function 08-2		
I/O buffer	P	Printer [Off Line]	5-Mem Configure	1	
ID code	F	Fax User Tools	6-Keyp op. settings (enter)	11	
ID TX	F	Fax User Parameter List	SW 01	bit 1	
Image contained in print report	F	Fax User Parameter List	SW 04	bit 7	
Image density adj. level home pos.	F	Fax User Parameter List	SW 00	bit 3.2.1	
K. program list	F	Fax User Tools	2-Reports/Lists	5	
Label insertion	F	Fax User Parameter List	SW 01	bit 0	
Left duplex margin	C	Copier User Tools	Copy / Adj. image	3	
Lines per page	P	Printer [Off Line]	2-PCL menu	5	
Local printing	F	Fax User Parameter List	SW 11	bit 6	
Lock	P	Printer [Off Line]	4-Config	2	
Manual feed	P	Printer [Off Line]	1-Basic	03	
Manual feed sizes	P	Printer [Off Line]	1-Basic	04	
Manual image density	F	Fax User Parameter List	SW 12	bit 4.3	

Function	Effects	Group	Mode	Sub mode	Note
Manual service report Tx	F	Fax User Parameter List	SW 14	bit 7	
Max copy Q'ty	C	Copier User Tools	Copy / General Features	5	
Memory lock	F	Fax User Tools	6-Keyp op. settings (enter)	03	
Memory storage report	F	Fax User Parameter List	SW 03	bit 2	
Menu reset [start]	P	Printer [Off Line]	8-Refresh		
Modem test (fax)	F	Fax service mode	Function 11		
Modem signal detect test (fax)	F	Fax service mode	Function 11		
Monitor vol.	F	Fax User Tools	6-Keyp op. settings (enter)	08	
Multi copy recp	F	Fax User Tools	4-Initial setup Rx	5	
Multi transfer	F	Fax User Tools	6-Keyp op. settings (enter)	04	
NCU param (fax)	F	Fax service mode	Function 06-2		
Number of rings (fax)	F	See fax service mode	Function 06-2-06[NCU Parm.]		
Orientation	P	Printer [Off Line]	1-Basic	08	
Original beeper	C	Copier User Tools	Copy / General Features	6	
Original count	C	Copier User Tools	Copy / input/output	3	
Original priority	C	Copier User Tools	Copy / General Features	3	
Original type home pos.	F	Fax User Parameter List	SW 01	bit 4.3	
Output tray	C/F/P	Copier User Tools	System	14	
Output tray	P	Printer [Off Line]	1-Basic	07	Set to system default
Page protect	P	Printer [Off Line]	3-Job	3	
Panel beeper	C	Copier User Tools	System	3	
Paper feed tray	F	Fax User Parameter List	SW 15	bit 2.1.0	
Paper feed tray selection	F	Fax User Parameter List	SW 15	bit 5	
Paper tray priority	C	Copier User Tools	System	11	

(A193)

4-58

SM

Function	Effects	Group	Mode	Sub mode	Note
Parallel	P	Printer [Off Line]	6-I/F	1	
PCL demo [Start}	P	Printer [Off Line]	7-Test		
PCL fonts [start]	P	Printer [Off Line]	7-Test		
Personal code	F	Fax User Tools	6-Kep op. settings (enter)	01	
Personal code access	F	Fax User Parameter List	SW 05	bit 4	
Photo mode	C	Copier User Tools	Copy / General Features	7	
Photo original	F	Fax User Tools	3-Initial setup Tx	3	
Polling clear report	F	Fax User Parameter List	SW 03	bit 6	
Polling file standby duration	F	Fax User Parameter List	SW 11	bit 7	
Polling reserve report	F	Fax User Parameter List	SW 03	bit 3	
Polling result report	F	Fax User Parameter List	SW 03	bit 4	
Pre feed	P	Printer [Off Line]	1-Basic	11	
Print Rx time	F	Fax User Parameter List	SW 02	bit 2	
Print Tx time	F	Fax User Tools	4-Initial setup Rx	4	
Print user param	F	Fax User Tools	6-Kep op. settings (enter)	14	
Quick dial list	F	Fax User Tools	2-Reports/Lists	2	
Quick memory Tx	F	Fax User Parameter List	SW 07	bit 2	
Ram display & rewrite (fax)	F	Fax service mode	Function 06-1		
RAM dump	F	Fax service mode	Function 06		
RAM clear	F	Fax service mode	Function 07		
RDS	F	Fax User Parameter List	SW 25	bit 4	
Receiving in SC condition	F	Fax User Parameter List	SW 05	bit 0	
Receiving when mach can't print	F	Fax User Parameter List	SW 05	bit 2.1	
Reception mode	F	Fax User Tools	4-Initial setup Rx	1	
Reg. auto doc	F	Fax User Tools	1-Register/Delete	09	

Rev. 09/98

(A193)

4-59

SM

Function	Effects	Group	Mode	Sub mode	Note
Reg. group dial	F	Fax User Tools	1-Register/Delete	03	
Reg. irreg. area	F	Fax User Tools	1-Register/Delete	11	
Reg. quick dial	F	Fax User Tools	1-Register/Delete	01	
Reg. speed dial	F	Fax User Tools	1-Register/Delete	05	
Resolution	P	Printer [Off Line]	3-Job	1	
Resolution	F	Fax User Tools	3-Initial setuTx	2	
Restricted access	C/F/P	Copier User Tools	System	18	
Returning mach. to initial setting	F	Fax User Parameter List	SW 01	bit 7	
Reverse printing	F	Fax User Tools	4-Initial setup Rx	7	
Ringer test (fax)	F	Fax service mode	Function 11		
Ringer vol.			See Monitor vol.		
Rotate sort	C	Copier User Tools	Copy / Input/output	5	
Rotate sort auto paper cont.	C	Copier User Tools	Copy / Input/output	6	
ROM ver (fax)	F	Fax service mode	Function 02-3		
RTI/TTI	F	Fax User Tools	6-Kep op. settings (enter)	09	
SADF auto reset	C	Copier User Tools	Copy / Input/output	4	
Self test [start	P	Printer [Off Line]	7-Test		
Serial	P	Printer [Off Line]	6-I/F	2	
Serial # (fax)	F	Fax service mode	Function 10		
Service monitor report (fax)	F	Fax service mode	Function 04		
Service station fax #	F	Fax service mode	Function 09		
Set user codes	C/F/P	Copier User Tools	System	17	
Show all keys	C	Copier User Tools	Copy / General Features	4	
Simultaneous print	C/F/P	Copier User Tools	System	15	
Software download	F	Fax service mode	Function 16		
Software upload	F	Fax service mode	Function 16		

Rev. 09/98

Service
Tables

(A193)

SM

Function	Effects	Group	Mode	Sub mode	Note
Sort copies	P	Printer [Off Line]	1-Basic	06	
Special paper sizes	C	Copier User Tools	System	10	
Special Rx #	F	Fax User Tools	6-Kep op. settings (enter)	06	
Speed dial list	F	Fax User Tools	2-Reports/Lists	4	
Special Rx #	F	Fax User Tools	4-Initial setup Rx	9	
SRAM data download	F	Fax service mode	Function 16		
Stamp home position	F	Fax User Parameter List	SW 00	bit 0	
Stamp test (fax)	F	Fax service code	Function 11		
Store message that couldn't be Tx	F	Fax User Parameter List	SW 24	bit 1.0	
Store prog	F	Fax User Tools	1-Register/Delete	07	
Symbol set	P	Printer [Off Line]	2-PCL menu	4	
System parameter list (fax)	F	Fax service mode	Function 02		
TCR	F	Fax User Tools	2-Reports/Lists	1	
TCR/Journal printout	F	Fax service mode	Function 14		
TCR printing automatic	F	Fax User Parameter List	SW 03	bit 7	
TID print	F	Fax User Parameter List	SW 02	bit 6	
Time out	P	Printer [Off Line]	3-Job	2	
Toner saving	P	Printer [Off Line]	1-Basic	10	
Top duplex margin	C	Copier User Tools	Copy / Adj. image	4	
Trans mode	F	Fax User Tools	3-Initial setuTx	1	
Transmission mode	F	Fax User Parameter List	SW 00	bit 6	
TSI print	F	Fax User Parameter List	SW 02	bit 3	
TTI print	F	Fax User Parameter List	SW 01	bit 5	
Two in one	F	Fax User Parameter List	SW 10	bit 1	
Tx result report (immed tx)	F	Fax User Parameter List	SW 03	bit 5	
Tx result report (mem tx)	F	Fax User Parameter List	SW 03	bit 0	
Usage log printout (fax)	F	Fax service mode	Function 15		
User parameters	F	Fax User Tools	6-Kep op. settings (enter)	13	
User code mode disable	C/F/P	Copier SP Modes	5-401		

Rev. 09/98

5. SERVICE RAM ADDRESSES	4-67
6. SPECIAL TOOLS AND LUBRICANTS	4-77
⇒ 7. SERVICE PROGRAM / BIT SWITCH TABLE INDEX.....	4-79

REMOVAL AND REPLACEMENT (A639)

1. PRECAUTION	5-1
2. NCU	5-2
3. FCU.....	5-3

TROUBLESHOOTING (A639)

1. ERROR CODES	6-1
2. FAX SC CODES.....	6-7
2.1 SC1201.....	6-7
2.2 SC1701.....	6-7
2.3 FAX SC CODE TABLE.....	6-8
3. ROM MODIFICATION HISTORY.....	6-9

FAX UNIT TYPE 250 (A804)

1. OVERALL INFORMATION	7-1
1.1 SPECIFICATIONS	7-1
1.2 OVERALL MACHINE CONTROL.....	7-2
2. DETAILED DESCRIPTIONS	7-3
2.1 DOUBLE-SIDED ORIGINAL TRANSMISSION	7-3
2.1.1 Portrait Original - Side Binding	7-4
2.1.2 Portrait Original - Top Binding	7-5
2.1.3 Landscape Original - Side Binding	7-6
2.1.4 Landscape Original - Top Binding	7-7
2.2 PAPER SIZE SELECTION PRIORITIES.....	7-8
3. INSTALLATION	7-14
3.1 INITIAL PROGRAMMING	7-19
4. SERVICE TABLES AND PROCEDURE	7-21
4.1 BIT SWITCHES	7-21
4.1.1 System Switch	7-21

4.1.2 Printer Switch	7-22
4.2 RAM ADDRESSES	7-22
5. TROUBLESHOOTING	7-23
5.1 SC681 (A224 Copier only)	7-23
5.2 OTHER POSSIBLE CASES.	7-24
5.2.1 Possible Cases and Results.	7-24
5.2.2 When A804 Software is Downloaded to the A639 Fax Unit	7-24
5.2.3 When A639 Software is Downloaded to the A804 Fax Unit	7-24
6.0 ROM MODIFICATION HISTORY	6-9

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⇒ 7. SERVICE PROGRAMS MODE TABLE

7.1 SERVICE PROGRAM / BIT SWITCH TABLE INDEX

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
1st paper feed for fax printing	Printer SW 02	4-36
2nd paper feed for fax printing	Printer SW 02	4-36
3rd paper feed for fax printing	Printer SW 02	4-36
4th paper feed for fax printing	Printer SW 02	4-36
Acceptable total error line ratio	Com SW 02	4-41
Action when no # is in Quick/ speed dials	Com SW 0B	4-44
Action when original jam has occurred while scanning	Scan SW 0C	4-33
Addition of image from confid. trans result report	Sys SW 09	4-24
ADF jam alarm display time	Scan SW 0E	4-34
AI short protocol	G3 SW 02	4-48
Auto error report printout	Sys SW 09	4-24
Available memory threshold for ringing detection	Com SW 0D	4-45
Available unit resolution in which fax message are received	Com SW 14	4-46
Back to back text	G3 SW 00	4-47
Binary pict. processing text	Scan SW 02	4-31
Binary pict. processing text/photo	Scan SW 03	4-31
Burst error threshold	Com SW 02	4-41
CED trans	G3 SW 01	4-48
CIL printing position	Sys SW 11	4-26
Closed network reception	Com SW 00	4-40
Comm mode - quick/speed G4 fallback	Sys SW 1E	4-28
Compression modes available in received mode	Com SW 00	4-40
Compression modes available in transmit mode	Com SW 00	4-40
Conditions required for transfer result report transmission	Com SW 0B	4-43

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
Continuous polling reception	Sys SW 0A	4-25
Country code	Sys SW 0F	4-26
CTC trans condition	G3 SW 03	4-49
Dialing on 10 key pad	Sys SW 0A	4-25
Dialing requirement	Com SW 06	4-42
DIS detection #	G3 SW 03	4-49
DIS frame length	G3 SW 01	4-48
Display of both RTI CSI on LCD	Sys SW 05	4-23
DTMF test-analog	SM 11-1-2	4-9
DTMF test-ISDN	SM 11-3-2	4-9
Duplex printing	Printer SW 0F	4-39
ECM	Com SW 01	4-40
ECM frame size	G3 SW 03	4-49
EFC during transmission	Com SW 01	4-40
Emergency calls using 999	Com SW 0A	4-43
Equalizing reduction rate among Sep pages	Printer SW 0E	4-38
Error code display	SM 03	4-5
External handset action	Sys SW 0E	4-25
Fall back from G4 to G3	Com SW 07	4-42
File printout	SM 13	4-11
G3 csi/g4 terminal id programming level	Sys SW 04	4-23
G3 fall back line	Sys SW 0A	4-25
G3 line for trans	Sys SW 0A	4-25
G3 protocol dump list	SM 05-1-print	4-5
G3 protocol used	G3 SW 02	4-48
G3/G4 communication parameter display	Sys SW 00	4-19
G4 parameter programming - G4 SN main	SM 12-2	4-11
G4 parameter programming - G4 SN Sub	SM 12-3	4-11
G4 parameter programming - G4 sub address	SM 12-6	4-11
G4 parameter programming - ISDN G3 SN main	SM 12-4	4-11

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
G4 parameter programming - ISDN G3 SN sub	SM 12-5	4-11
G4 parameter programming - ISDN G3 sub address	SM 12-7	4-11
G4 parameter programming - ISDN IP	SM 12-1	4-11
G4 protocol dump list	SM 05-2	4-5
Hang up decision when a negative code RTN or PIN is received	Com SW 02	4-41
Hard disk	Sys SW 05	4-23
Hard disk formatting	SM 08-2	4-8
Hard disk initialization	SM 08-1	4-8
Image rotation before trans	Scan SW 0F	4-34
Inch to mm conversion during trans	Com SW 14	4-46
Inclusion of comm. on TCR when no image data was exchanged	Sys SW 09	4-24
Initial modem type for 9.6 or 7.2 Kbps	G3 SW 05	4-50
Initial Rx modem rate	G3 SW 06	4-50
Initial TX modem rate	G3 SW 05	4-50
ISDN cable equalizer Rx	G3 SW 09	4-51
ISDN cable equalizer TX	G3 SW 09	4-51
Length of duplicated image with page Sep	Printer SW 04	4-37
Length reduction of received data	Printer SW 03	4-36
Line error marks on received pages	Sys SW 00	4-19
Line quality data output method	Sys SW 00	4-19
Max # of pages retain in G3 memory trans	Com SW 03	4-42
Max allowable carrier drop during image Rx	G3 SW 0A	4-52
Max allowable frame interval during image data Rx	G3 SW 0A	4-52
Max print width used in setup protocol	Printer SW 01	4-35

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
Max reducible length	Printer SW 04	4-37
Maximum printable page length available	Com SW 01	4-41
Memory file transfer operation	Sys SW 04	4-23
Memory trans - max # of dialing attempts to same destination	Com SW 10	4-45
Memory trans interval between dialing attempt to same destination	Com SW 12	4-45
Min # of times that a destination will dial when TRD is used	Com SW 0F	4-45
Min interval between auto dialing attempts	Com SW 0E	4-45
mm-inch recognition when printing	Printer SW 00	4-35
Modem signal detection test-analog	SM 11-1-3	4-10
Modem signal detection test-ISDN	SM 11-3-3	4-10
Modem test-analog	SM 11-1-1	4-9
Modem test-ISDN	SM 11-3-1	4-9
Modem types available for Rx	G3 SW 06	4-50
Modem rate used for next page after receiving a neg. code	G3 SW 03	4-49
Monitor speaker during comm. TX and RX	G3 SW 00	4-47
Monitor speaker during memory trans	G3 SW 00	4-47
MTF setting photo	Scan SW 07	4-32
MTF setting text	Scan SW 05	4-32
NCU parameters		4-54
Number of digits - quick/speed dial as transfer station	Com SW 0C	4-44
Number of rings until a call is detected		4-59
On hook dial	Sys SW 0A	4-25
OR processing for immed. TX	Scan SW 00	4-30
Page Sep	Printer SW 0E	4-38
Page Sep mark	Printer SW 00	4-35
Page sep threshold	Printer SW 03	4-37

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
Paper size selection for A4	Printer SW 0E	4-38
Paper size selection priority	Printer SW 0E	4-38
Parallel memory trans G4	Sys SW 11	4-26
PM call	Sys SW 01	4-21
Point of resumption of memory trans upon redial	Com SW 0A	4-43
Power failure report	Sys SW 09	4-24
Print out of the message when acting as a transfer station	Com SW 0B	4-43
Printing of error code on error report	Sys SW 09	4-24
Printing fax messages in restricted access mode	Printer SW 0F	4-39
Prints date and time on received fax	Printer SW 00	4-35
Protocol dump amount	Sys SW 00	4-19
Protocol dump list output after each communication	Sys SW 00	4-19
Protocol requirements	G3 SW 0B	4-53
PSTN cable equalizer RX	G3 SW 07	4-51
PSTN cable equalizer TX	G3 SW 07	4-51
Pulse dialing method	G3 SW 0C	4-53
Quick/speed dial list, printing dedicated TX param	Sys SW 04	4-22
Ram clear - bit Switches	SM 07-3	4-7
Ram clear - factory settings	SM 07-4	4-7
Ram clear - files	SM 07-2	4-7
Ram clear-initialization	SM 07-1	4-7
Ram display	SM 06-1	4-6
Ram dump G3	SM 06-3	4-7
Ram dump G4	SM 06-4	4-7
RAM initialization after function upgrade card	Sys SW 1E	4-28
Ram NCU parameters	SM 06-2	4-6
Ram rewrite	SM 06-1	4-6
RDS Memory read/write	Sys SW 01	4-22
RDS Switch on time length	Sys SW 03	4-22
Received fax print start timing G3	Sys SW 1F	4-29
Received fax print start timing G4	Sys SW 1F	4-29

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
Received message width restriction in protocol signal	Printer SW 01	4-35
Reconstruction time for the first line in Rx mode	G3 SW 0A	4-52
Remote term. ID priority	Sys SW 09	4-24
Repetition of data when received page is longer than printer pg.	Printer SW 00	4-35
Ringer test	SM 11-1-4-print	4-10
ROM version	SM 02-3	4-5
RTI/CSI display priority	Sys SW 1E	4-27
SAF memory full action	Sys SW 1E	4-27
SC action	Sys SW 1F	4-29
Scan density step value (text mode)	Scan SW 01	4-30
Scan mag ratio fine tune -main scan	Scan SW 0D	4-33
Scan mag ratio fine tune- sub scan	Scan SW 0D	4-33
Scan margin setting	Scan SW 08	4-32
Scan margin setting	Scan SW 08	4-32
Scan resolution unit	Scan SW 0E	4-34
Scan resolution unit	Scan SW 0E	4-34
Scan width for A5 or B5	Scan SW 0D	4-33
Serial number	SM 10	4-9
Service monitor report	SM 04-print	4-5
Service station fax number	SM 09	4-8
Short preamble	G3 SW 02	4-48
Software download	SM 16	4-13
Software upload	SM 16	4-15
SRAM data download	SM 16	4-16
Stamp test	SM 11-4-print	4-10
TCR data storage area full comm.	Sys SW 1E	4-27
TCR print out - tech data	Sys SW 00	4-18
TCR/journal printout	SM 14	4-11
Telephone line type program mode	Sys SW 04	4-23
Threshold memory level	Sys SW 10	4-26
Training error detection threshold	G3 SW 04	4-49
Treatment of pages received with errors during G3 recpt	Com SW 02	4-41
TSI printing position	Sys SW 11	4-26

SUBJECT	SERVICE MODE/ BIT SWITCH	REF. PAGE
TTI printing position	Sys SW 11	4-26
TTI/CIL printing position/ main scan	Sys SW 12	4-26
Usage log printout - engine interface	SM 15-1	4-12
Usage log printout - file storage	SM 15-6	4-12
Usage log printout - jod and SAF file creation	SM 15-8	4-12
Usage log printout - mailbox usage	SM 15-2	4-12
Usage log printout - operation trace	SM 15-3	4-12
Usage log printout - print log	SM 15-4	4-12
Usage log printout - SC history	SM 15-5	4-12
Usage log printout - scanner	SM 15-7	4-12
Use economy trans during a transfer operation to end receiver	Com SW 0B	4-43
Use economy trans during a transfer operation to next transfer	Com SW 0B	4-43
Use of date and time provided from network for the CIL	Com SW 07	4-42
Use of label insertion for the end receivers in a Transfer operation	Com SW 0B	4-43
Use of modem rate history for trans using Q/S dial	G3 SW 02	4-48
Wait time for book original	Scan SW 0E	4-34
Wait timer duplex print mode	Printer SW 0F	4-39
Wrong connection prevention method	Com SW 01	4-40

BULLETIN NUMBER: A193/A224 - 010

10/15/98

APPLICABLE MODEL:

GESTETNER - 3220/3225

RICOH - AFICIO 200/250

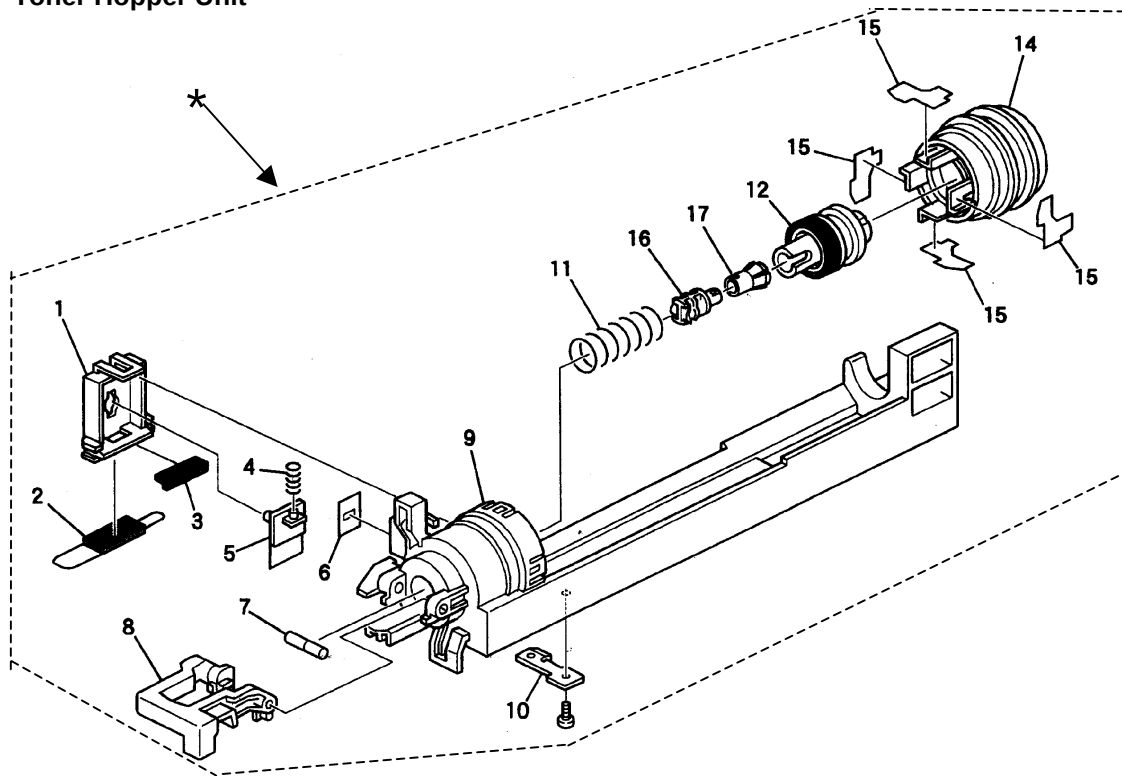
SAVIN - 9920DP/9925DP

SUBJECT: TONER HOPPER

GENERAL:

The part number for the Toner Hopper Unit has been made available. The following part update is being issued for all A193 and A224 Parts Catalogs.

Toner Hopper Unit



NEW PART NO.		DESCRIPTION	QTY	REFERENCE		
				PAGE		ITEM
A193	A224			A193	A224	
G0203030	A2243030	Toner Hopper Unit	1	29	33	*

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■ PARTS

BULLETIN NUMBER: A193/A224 - 011
11/06/98
APPLICABLE MODEL:
GESTETNER – 3220/3225
RICOH – AFICIO 200/250
SAVIN – 9920DP/9925DP
SUBJECT: TAPPING SCREW – M3x8
GENERAL:

The following parts updates are being issued for all A193 and A224 Parts Catalogs.

A193

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
08025255	04513008H	Tapping Screw – M3x8	1→1	0	7	101
					9	101
					49	102

A224

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
08025255	04513008H	Tapping Screw – M3x8	1→1	0	7	101
					9	101
					55	102

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

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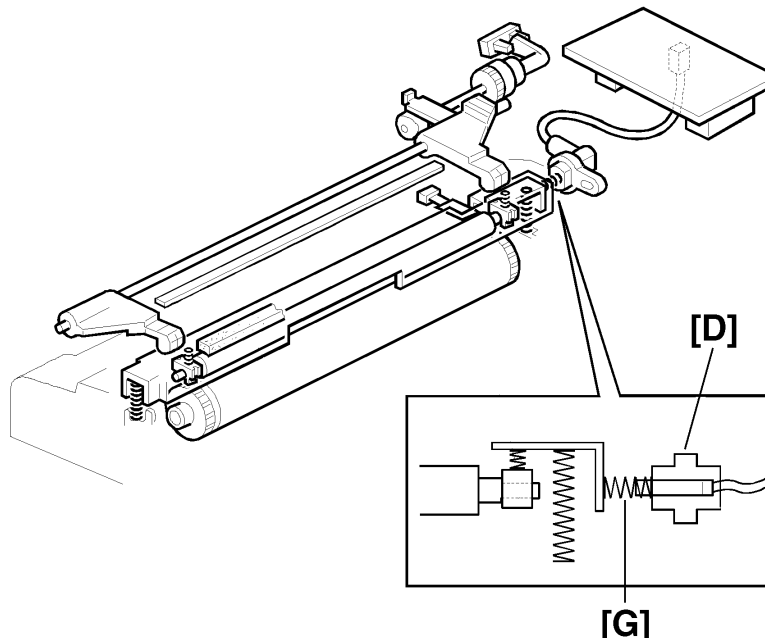
■ PARTS

BULLETIN NUMBER: A193/A224 - 012**01/22/99****APPLICABLE MODEL:****GESTETNER - 3320/3225****RICOH - AFICIO 200/250****SAVIN - 9920DP/9925DP****SUBJECT: ALL BLACK IMAGES****SYMPTOM:**

All black images in copy, fax, and printer modes.

CAUSE:

1. Charge Roller Contact Spring [G] has become dislocated.
2. Printer Interface Type 250/251 is defective. This causing a low level (black) image data signal to be sent. The data signal from the copy, fax, and printer goes into the same logical 'OR' processing thus all printed images become black.

**SOLUTION:**

1. Reattach Charge Roller Contact Spring [G] to Charge Roller Terminal [D] on inside rear frame of machine or replace the Charge Roller Terminal [D] Part Number G0202110.
2. Replace the defective Printer Interface.

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■ COPY QUALITY

BULLETIN NUMBER: A193/A224 - 013

01/22/99

APPLICABLE MODEL:

GESTETNER – 3320/3225

RICOH – AFICIO 200/250

SAVIN – 9920DP/9925DP

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 13-5 Updated Information

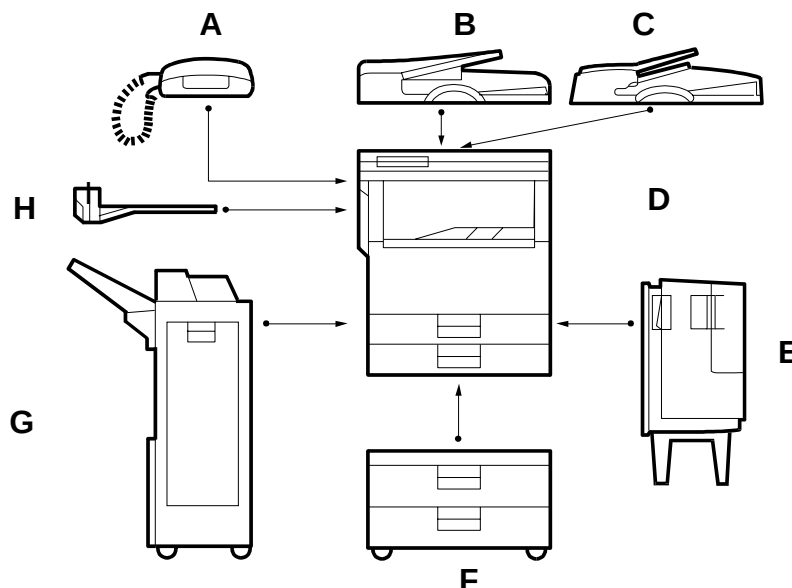
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**SERVICE
MANUAL**

2. MACHINE CONFIGURATION

OVERALL
MACHINE
INFORMATION



Version	Item	Machine Code		No.
		A193	A224	
Copy	Copier	A193	A224	D
	ADF (Option)	A628		B
	ARDF (Option)	A661		C
	Platen Cover (Option)	A645		
	Paper Tray Unit (Option)	G697		F
	Duplex Unit	G694 (Option)	Standard	
	1-bin Sorter (Option)	A629		H
	Finisher (Option)	A666		G
	LCT	N/A	A667 (Option)	E
	Memory 4 MB	A642-01 (Option)	N/A	
	Memory 8 MB	A642-02 (Option)	Standard	
Fax	Fax Controller (Option)	A639 / A804	A804	
	Telephone (Option)	H160		A
	ISDN (Option)	A644		
	HDD (Option)	A641		
	Memory Card (Option)	H130-54		
	Function Card (Option)	H130-52		
	Page Memory (Option)	A640		
Printer	Printer Controller (Option)	A643-00 (115V) A643-01 (230V)	A805-00 (115V) A805-01 (230V)	
	PS (Option)	A643-02		
	HDD (Option)	A643-03		

BULLETIN NUMBER: A193/A224 - 014

03/30/99

APPLICABLE MODEL:

GESTETNER – 3320/3225

RICOH – AFICIO 200/250

SAVIN – 9920DP/9925DP

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

• 4-18B	Updated Information
• 4-21	Updated Information
• 4-29~30	Updated Information
• 6-1	Updated Information
• 13-38	Updated Information
• 13-47~48	Updated Information

Note: This copy is intended as a master original
for reproduction of additional bulletins.



**SERVICE
MANUAL**

Mode No.		Function	Settings
Class 1 and 2	Class 3		
4-999*	4	Threshold level in Letter Mode - Binary Picture Mode for Notch 4	Selects the threshold level for Letter mode (binary picture mode) at notch 4 image density level. 0~255 1/step 45
	5	Threshold level in Letter Mode - Binary Picture Mode for Notch 5	Selects the threshold level for Letter mode (binary picture mode) at notch 5 image density level. 0~255 1/step 30
	6	Threshold level in Letter Mode - Binary Picture Mode for Notch 6	Selects the threshold level for Letter mode (binary picture mode) at notch 6 image density level. 0~255 1/step 30
	7	Threshold level in Letter Mode - Binary Picture Mode for Notch 7	Selects the threshold level for Letter mode (binary picture mode) at notch 7 image density level. 0~255 1/step 30
5-001*		All Indicators On	Trunes on all indicators on the operation panel Press # key to check. Press  to exit this SP mode.
5-103*		Auto Paper Tray Shift	Selects whether auto paper tray shift is done or not. 0: No 1: Yes
5-104*		A3/11x17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. If "YES" is selected the total counter (mechanical counter) and ther current user code counter counts up twice when a3/11"x17" paper is used. No Yes
5-106*		ADS Level Selection	Selects the image density level that is used in ADS mode. 1~7 1 notch/step 4
⇒ 5-113		Option Counter Type	Selects the optional counter type After installing the optional key counter, this value should be set to "1". Setting numbers from 2 to 4 are used in the Japanese version only.
			0: No 1: Key Counter 2: Key Card 3: Coin Rack 1 4: Coin Rack 2
5-116*		Total Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit. 0: Feed-in 1: Exit

Rev. 03/99

Mode No.		Function	Settings
Class 1 and 2	Class 3		
5-901		Printer Free Run Performs the printer free run. <i>To perform the free run, press 1 then press  twice. Press  to stop.</i>	0: No 1: Yes
5-902		Test Pattern Printouts Prints the test pattern. <i>See the "TEST PATTERN PRINTING" Page 4-32 for how to print a test pattern. Change to the copy mode display by pressing the "Interrupt" key, then print out the test pattern.</i>	
5-903*		LCD Contrast Adjustment Adjusts the contrast for the LCD on the operation panel. <i>Use the "Zoom" (+ or -) key to change the contrast. Press clear mode to exit.</i>	1 ~ 7 1/step 4
5-904*		Auto Shut Off Mode Timer Setting Inputs the auto off mode timer. <i>If "0" is selected, the auto timer function is disabled.</i>	0 ~ 120 1 min/step 15
5-905*		CSS 25H Off Detection Japanese version only. Do not change the value.	
5-906*		Fan Control Timer Setting Inputs the fan control timer in the energy saver mode <i>This time is for entering the fan motor control mode after the fusing lamp turns off or the main motor turns off.</i>	30 ~ 120 1 seconds / step 30
⇒ 5-907		Brand Name and Production Name Setting Selects the brand name and the production name for the Plug and Play function of Windows 95. The brand name and the production name for the Plug and Play function is registered in the NVRAM. If the NVRAM is defective, these names should be registered. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to register the setting.</i>	
5-911*		APS A4/LT Sideways Priority Specifies whether the machine selects LT sideways paper if the original is A4. If "Yes" is selected, LT sideways is selected automatically when the APS sensors detect an A4 sideways original. This feature does not work in reverse (A4 sideways paper is not selected for an LT sideways original).	0: No 1: Yes
5-912	1	PCU Alarm Interval Inputs the PCU alarm interval. <i>When the machine reaches the value, "Change Photoconductor Unit" will be displayed on the LCD to inform the user.</i>	1 ~ 255 1 k / Step 45 k
	2	PCU Alarm Mode Selects whether the PCU alarm function is performed or not.	0: No 1: Yes

Rev. 03/99

Mode No.		Function	Settings
Class 1 and 2	Class 3		
7-801	6	ROM/CPU Version (Printer Control)	Displays the ROM version. NOTE: Class 3 nos, 3, 7, and 8 are used only for the Japanese version.
	7	ROM/CPU Version (ANITA)	
	8	ROM/CPU Version (Scanner Control)	
	9	ROM/CPU Version (Stapler)	
7-803*		PM Counter Display	Displays the PM counter after the last PM.
⇒ 7-804		PM Counter Reset	Resets the PM counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>
⇒ 7-807		Jam Counter Clear	Resets the jam counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>
⇒ 7-808		Resets Counters (except for the total counter)	Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>
⇒ 7-810		User Code Number Reset (Access code)	Resets the user code numbers. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>
7-901*		SC History Display	Displays the SC codes that have occurred.
⇒ 7-902		SC History Clear	Clears the SC history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key to reset the counter.</i>
7-903*		Copy Jam History Display	Displays the copy jams that have occurred. Refer to section 2.2.5 later in this chapter.

Service
Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
⇒ 7-904		Copy Jam History Clear	Clears the copy jam history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
7-905*		Original Jam History Display	Displays the original jams that have occurred. See section 2.2.5 later in this chapter.	0: No 1: Yes
⇒ 7-906		Original Jam History Clear	Clears the original jam history. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
⇒ 7-907		Timer Counter Clear	Clears the timer counter. <i>Press and hold the "Photo mode" key and while holding "Photo mode" key then press the  key at the same time to reset the data.</i>	0: No 1: Yes
7-908		PCU Counter Display	Displays the number of copies that have been made using the current PCU.	
7-909		PCU Counter Clear	Japanese version only Do not use.	
7-990		RAM Read	Displays the data in the RAM.	
7-991		Timer Counter Display	Displays the time since the last time that the main switch was turned on.	

1. SERVICE CALL CONDITIONS

1.1 SUMMARY

There are 3 levels of service call conditions.

Level	Definition
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.
B	The SC can be reset by turning the main switch off and on if the SC was caused by a sensor error.
C	The copier can be operated as usual except for the unit related to the service call.

- NOTE:**
- 1) If the problem concerns electrical circuit boards, first disconnect and then reconnect the connectors before replacing the PCBs.
 - 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
 - 3) To reset a Level A SC, enter SP 5-810 (SC code reset) and select "1". Press and hold the "Photo mode" key and while holding "Photo mode" key then press "#" key to register setting.
 - 4) When a Level A or B SC occurs while in an SP mode, the display message will not indicate the SC number. If this occurs, check the SC number after leaving the SP mode.

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

Rev. 03/99

OVERALL
MACHINE
INFORMATION

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

Mode No.		Function	Settings
Class 1 and 2	Class 3		
⇒ 7-808		Resets Counters (except for the total counter)	0: No 1: Yes
		Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the counter.</i>	
⇒ 7-810		User Code Number Reset	0: No 1: Yes
		Resets the user code numbers. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-901*		SC History Display	
⇒ 7-902		SC History Clear	0: No 1: Yes
		Clears the SC history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-903*		Copy Jam History Display	
⇒ 7-904		Copy Jam History Clear	0: No 1: Yes
		Clears the copy jam history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
7-905*		Original Jam History Display	
⇒ 7-906		Original Jam History Clear	0: No 1: Yes
		Clears the original jam history. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the data.</i>	
⇒ 7-907		Timer Counter Clear	0: No 1: Yes
		Clears the timer counter. <i>Press and hold the the "Photo mode" key and while holding "Photo mode" key then press  key to reset the counter.</i>	
7-908		PCU Counter Display	
7-909		PCU Counter Clear	
7-991		Timer Counter Display	0: No 1: Yes

BULLETIN NUMBER: A193/A224 - 015

05/03/99

APPLICABLE MODEL:

GESTETNER - 3220/3225

RICOH - AFICIO 200/250

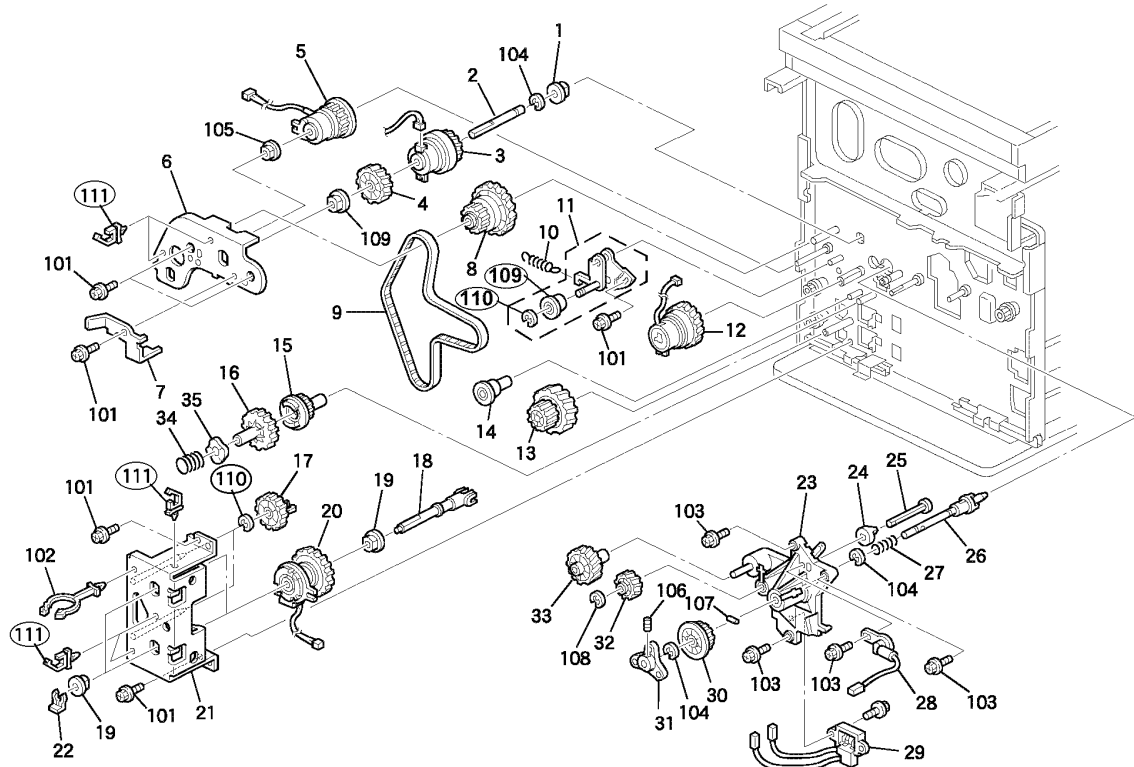
SAVIN - 9920DP/9925DP

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A193/A224 Parts Catalogs. Please update your Parts Catalog with the following information.

Drive Section 2



Note: This copy is intended as a master original for reproduction of additional bulletins.



PARTS

			REFERENCE		
PART NUMBER	DESCRIPTION	QTY	PAGE		ITEM
			A193	A224	
08053480	Bushing - 6mm	1	43	49	109 *
08050089	Retaining Ring - M4	1	43	49	110 *
11050291	Harness Clamp - LWS - 3S	1	43	49	111 *

* Denotes new item.

BULLETIN NUMBER: A193/A224 - 016
12/14/99
APPLICABLE MODEL:
GESTETNER - N3220/3225
RICOH - AFICIO 200/250
SAVIN - 9920DP/9925DP
SUBJECT: CONSTANT ADD TONER
SYMPTOMS:

- SC 990
- No power to machine or Fuse 4 on Power Supply Board open
- Constant Add Toner Indication
- No Toner Supply Motor Drive

CAUSE:

The Toner Supply Motor Shorts (Reads less than 100 ohms) which damages the IC-110 on the IOCSS PCB (A193 Models) or IC-112 (A224 Models). In some cases, the damage to the IOCSS PCB is visible in the form of a cracked IC-110 or IC-112. In some cases, there is no visible damage to the IC.

SOLUTION:

Replace the Toner Supply Motor and IOCSS PCB as a set.

PART NUMBER	DESCRIPTION	QTY	REFERENCE		
			PAGE		ITEM
			A193	A224	
G0201111	Toner Supply Motor	1	19	23	7
A1935105	IOCSS PCB (A193)	1	45	--	6
A2245105	IOCSS PCB (A224)	1	--	51	6

Note: This copy is intended as a master original for reproduction of additional bulletins.



■ PARTS



■ ELECTRICAL

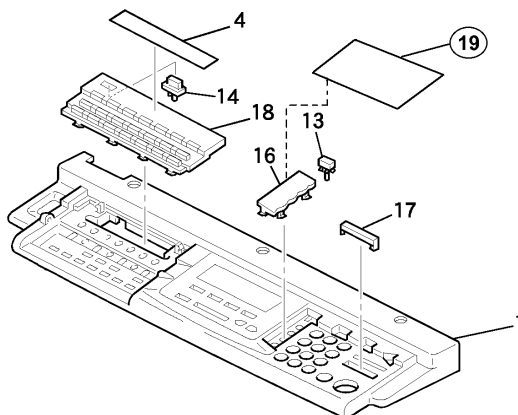
BULLETIN NUMBER: A193/A224 - 017
12/20/99
APPLICABLE MODEL:
GESTETNER – 3320/3225
RICOH – AFICIO 200/250
SAVIN – 9920DP/9925DP
SUBJECT: PARTS CATALOG UPDATES

- **UPDATE 1:** TRANSFER AND SEPARATION UNIT - Due to parts standardization the part number for the Transfer and Separation Unit has been updated. The following part update is being issued for all A193 Parts Catalogs. Please update your Parts Catalogs with the following information.

A193 Only

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6733881	A6733880	Transfer and Separation Unit	1	1	35	16

- **UPDATE 2:** LCD PANEL – The part description for the LCD Panel has been corrected. The following part correction is being issued for all A193 and A224 Parts Catalogs. Please update your Parts Catalogs with the following information.



			REFERENCE	
PART NUMBER	DESCRIPTION	QTY	PAGE	ITEM
A1931460	LCD Panel (LT)	1	13	19
A1931469	LCD Panel (A4)	1	13	19

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Note: This copy is intended as a master original for reproduction of additional bulletins.



PARTS

BULLETIN NUMBER: A193/A224 - 018

03/28/2000

APPLICABLE MODEL:

GESTETNER - 3320/3225

RICOH - AFICIO 200/250

SAVIN - 9920DP/9925DP

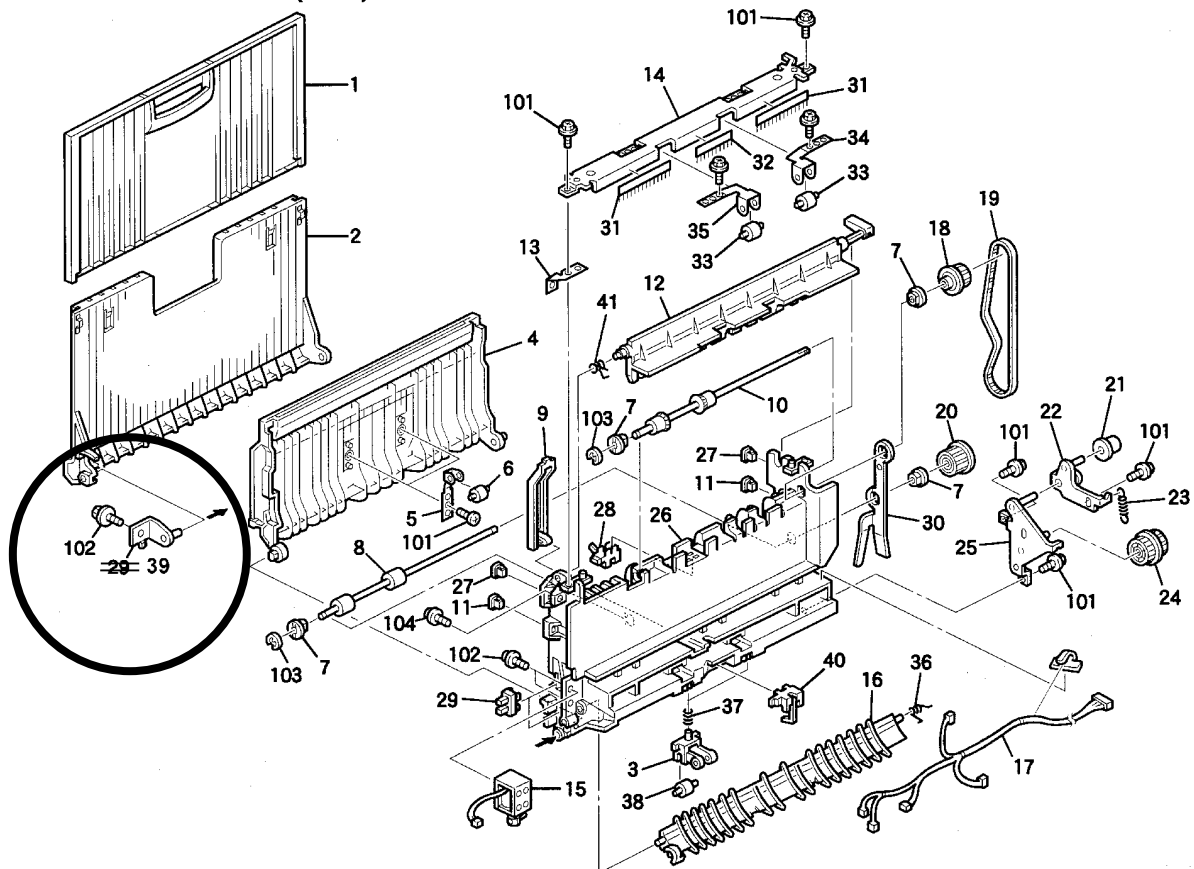
SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following part corrections are being issued for all A193 and A224 Parts Catalogs.

- **UPDATE 1:** **Exit Tray Holder** – There are two Items No. 29 in the “Paper Exit Section” illustration (page 38) for the A224 parts catalog. Please delete the Item No. 29 for the “Exit Tray Holder” and replace it with Item No.39 as shown below.

17. PAPER EXIT SECTION (A224)



Continued...



BULLETIN NUMBER: A193/A224 - 019

04/20/2000

APPLICABLE MODEL:

GESTETNER - 3320/3225

RICOH - AFICIO 200/250

SAVIN - 9920DP/9925DP

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied.
Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 6-14~18 Updated Information (A193 ROM Modification History)
- 13-77~79 Updated Information (A224 ROM Modification History)

Note: This copy is intended as a master original
for reproduction of additional bulletins.



⇒ 5. ROM HISTORY

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- Version A, B & C were for the pre-production machines.	A1935532D	1st Mass Production	1.16
Corrects the following: - While feeding out the original from ADF, "Start key" can be detected, then the incorrect document size is detected. - ARDF is supported.	A1935532E	November '96	1.23
Corrects the following: - SC921-Memory Access Error After a paper jam during memory output and opening the door. - SC101- occurs at night timer in and out after the IPU test pattern in SP mode. - SP5-803: New PCU Detect is added for Input check. - Memory copy priority of SP5-945 is added to Salesman Program Mode. - SP-mode cannot be cleared at night timer in and out after going to the interrupt copy mode from SP mode. - Finisher is supported.	A1935532F	December '96	1.31
Corrects the following: - The Black Spots in the scanned image - The scanned low contrast image can be adjusted by 7 "notches." Each notch has the different gamma correct characteristic, MTF filter and threshold level by new SP mode(SP4-998,999). - The dirty background on the white image after the negative and positive reversing. - SC321 appears when the door is opened during the memory copying then the start key is pressed after closing the door. - The developing bias setting(SP2-201) is initialized by turning off the main switch.	A1935532G	January '97	1.33
- Dirty Background. 1) Toner Density (SP2-911) was changed from 2 to 3 (Lighter). 2) Free run time at the Installation of the PCU was changed from 1min. to 3min.	A1935532H	January '97	1.35

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- A blank sheet is printed out when the start key is pressed if the memory is full and the scanning restarted after printing the scanned image and then the first original jammed.	A1935532J	January '97	1.36
- Toner scattering around the black image on the rear side in the duplex mode. The default of the separation output voltage was changed. SP2-901-1→ -1800 SP2-901-2→ -1800 SP2-901-3→ -2500 SP2-901-4→ -2500	A1935532K	February '97	1.38
- When the RAM was cleared by SP5-801, the white level and the standard white plate density at the factory were erased.	A1935532L	March '97	1.43
- Paper jam when paper is fed from the 3rd tray immediately after feeding the paper from the 4th tray.(A jam or Y jam) with the following papers. - 3rd Tray has the paper less than 288mm length (A4 ☐) - 4th Tray has the paper 289mm to 401mm length (A4 ☐) - If when the duplex copy is made with ADF, Duplex Unit and 12M Memory and the original is jammed, only the jammed original cannot be copied correctly at recovery copy.	A1935532M	May '97	1.48

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
- (New SP Mode) SP-606-6: ARDF Main-Scan Magnification of the rear side. - (Specification) When the trays do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected. (The previous version software stops the copy job when one of tray is empty) - Stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode. - When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper. - SP5-808: The 3 languages cannot be selected on the previous software ver.N (Europe & Asia only)	A1935532N	June '97	1.54
- New SP is added. SP5-945:1= When one of the trays is empty, the paper end indicator (red LED) lights. - The DF Jam display is cleared by DF lifting up and down	A1935532P	August '97	1.60
-(For U.S.A. only) -New SP is added. SP5-950: LG size paper detection on the by pass tray. When this function is selected and LT size is inserted in the by-pass tray, the machine detects it as LG size paper. -Correspond to the Energy Star standard. After the fax transmission through ARDF with the stamper, the registration of the 1st copied paper by the ARDF is delayed.	A1935532R	September '97	1.62

A193 ROM MODIFICATION HISTORY (Copier Section)																																																																
DESCRIPTION OF MODIFICATION		FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																																																												
-Dirty background problem -Vt Correction -Mixing time -(New SP Modes) SP 2-994: Vcount offset SP 9-999-14: Additional Mixing Time Display		A1935532T	October '97	1.70																																																												
-The table for VT correction & Mixing time have been changed. <table><tr><th>Remaining Mixing Time</th><th>VT Correction</th></tr><tr><td>100</td><td>0</td></tr><tr><td>200</td><td>0.1</td></tr><tr><td>400</td><td>0.4</td></tr><tr><td>450</td><td>0.6</td></tr><tr><td>500</td><td>0.8</td></tr></table> <table><tr><th>Pre. Vt-Latest VT</th><th>Mixing Time</th></tr><tr><td>~0.1</td><td>10</td></tr><tr><td>~0.2</td><td>30</td></tr><tr><td>~0.3</td><td>50</td></tr><tr><td>~0.4</td><td>300</td></tr><tr><td>0.5~</td><td>500</td></tr></table>		Remaining Mixing Time	VT Correction	100	0	200	0.1	400	0.4	450	0.6	500	0.8	Pre. Vt-Latest VT	Mixing Time	~0.1	10	~0.2	30	~0.3	50	~0.4	300	0.5~	500	A1935532V	February '98	1.72																																				
Remaining Mixing Time	VT Correction																																																															
100	0																																																															
200	0.1																																																															
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Pre. Vt-Latest VT	Mixing Time																																																															
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~0.3	50																																																															
~0.4	300																																																															
0.5~	500																																																															
-SC544 is sometime displayed when the machine shift to the night mode or the pre-heat mode. -When the longer paper than A4 is fed at the toner near end, the toner is not supplied enough. -Copy Quality in duplex mode. When the quality of the rear copy is poor, the added transfer current must be decreased by SP 2-301-3. The new table shows that transfer current can be set to a lower range. <table><tr><th colspan="5">Current Table (SP2-301-3)</th></tr><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>250~275</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>200~250</td><td>15</td><td>17</td><td>19</td><td>21</td></tr><tr><td>~200</td><td>15</td><td>17</td><td>19</td><td>21</td></tr></table> Default Setting <table><tr><th colspan="5">New Table (SP2-301-3)</th></tr><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>8</td><td>11</td><td>14</td><td>17</td></tr><tr><td>250~275</td><td>10</td><td>12</td><td>15</td><td>17</td></tr><tr><td>200~250</td><td>12</td><td>14</td><td>16</td><td>17</td></tr><tr><td>~200</td><td>14</td><td>15</td><td>16</td><td>17</td></tr></table> Default Setting		Current Table (SP2-301-3)					Table No./ Paper width	0	1	2	3	275	15	17	19	21	250~275	15	17	19	21	200~250	15	17	19	21	~200	15	17	19	21	New Table (SP2-301-3)					Table No./ Paper width	0	1	2	3	275	8	11	14	17	250~275	10	12	15	17	200~250	12	14	16	17	~200	14	15	16	17	A1935532W	September '98	1.73
Current Table (SP2-301-3)																																																																
Table No./ Paper width	0	1	2	3																																																												
275	15	17	19	21																																																												
250~275	15	17	19	21																																																												
200~250	15	17	19	21																																																												
~200	15	17	19	21																																																												
New Table (SP2-301-3)																																																																
Table No./ Paper width	0	1	2	3																																																												
275	8	11	14	17																																																												
250~275	10	12	15	17																																																												
200~250	12	14	16	17																																																												
~200	14	15	16	17																																																												

Troubleshooting

A193 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
-White copy problem on 1st scanning. A. Two new SP modes have been added: 1. SP4-916-1: Scanner Lamp OFF counter default: 120min range: 0-300min 2. SP4-916-2 Scanner lamp warm-up time default: 200ms range:0-500ms If the scanner lamp remains off for 120min or longer in between the first and second scans of each job, the machine will allow the scanner 120ms for warm-up (default). B. When the scanner lamp is turned on for the first time after the main power switch has been turned on, the machine allows the scanner 300ms for warm-up.	A1935532Y	March '99	1.75

17. ROM HISTORY

OVERALL
MACHINE
INFORMATION

A224 ROM MODIFICATION HISTORY (Copier Section)			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
Version A, B, & C were for the pre-production machines.	A2245532D	1st Mass Production	1.18
- (New SP Mode) SP6-006-4: ARDF Main-Scan Registration of the rear side. - (Specification) When the paper cassettes do not have the different direction papers (same size), the machine continues to print by sort function even if the Rotate Sort function is selected. (The previous version software stops the copy job when one of tray is empty). - The stapler may not work when the printer feeds out the paper with staple while feeding out the paper into the finisher in copy or fax mode. - When 2 sheets of paper remain in the Duplex Unit and the printer prints out the image in the duplex mode, the printer image will be printed on the rear side of the remaining paper.	A2245532E	June '97	1.20
- New SP is added. SP5-949:1 = When one of the trays is empty, the paper end indicator (red LED) lights. - The DF Jam display is cleared by DF lifting up and down.	A2245532F	August '97	1.24
- (For USA only) New SP is added. SP5-950: LG size paper detection on the by pass tray. * When this function is selected and LT ☐ size is inserted in the by-pass tray, the machine detects it as LG ☐ size paper. - (For USA only) Correspond to the Energy Star standard. - After the fax transmission through ARDF with a stamper, the registration of the 1st copied paper by ARDF is delayed.	A2245532H	September '97	1.26

A224 ROM MODIFICATION HISTORY (Copier Section)																							
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																				
- Dirty background Problem Vt correction Mixing time - (New SP mode) •SP2-994: Vcont offset •SP9-999 -14: Additional Mixing time display	A2245532K	October '97	1.30																				
After initializing the developer, the transfer current is added til making a copy, turning off and on the manin switch, or oping the front cover.	A2245532L	November '97	1.32																				
-The table for VT correction & Mixing time have been changed. <table><tr><th>Remaining Mixing Time</th><th>VT Correction</th></tr><tr><td>100</td><td>0</td></tr><tr><td>200</td><td>0.1</td></tr><tr><td>400</td><td>0.4</td></tr><tr><td>450</td><td>0.6</td></tr></table> <table><tr><th>Pre. Vt-Latest VT</th><th>Mixing Time</th></tr><tr><td>~0.1</td><td>10</td></tr><tr><td>~0.2</td><td>30</td></tr><tr><td>~0.3</td><td>50</td></tr><tr><td>~0.4</td><td>300</td></tr></table>	Remaining Mixing Time	VT Correction	100	0	200	0.1	400	0.4	450	0.6	Pre. Vt-Latest VT	Mixing Time	~0.1	10	~0.2	30	~0.3	50	~0.4	300	A2245532M	February '98	1.33
Remaining Mixing Time	VT Correction																						
100	0																						
200	0.1																						
400	0.4																						
450	0.6																						
Pre. Vt-Latest VT	Mixing Time																						
~0.1	10																						
~0.2	30																						
~0.3	50																						
~0.4	300																						
-SC544 is sometime displayed when the machine shift to the night mode or the pre-heat mode. -When paper longer than A4 is fed at the toner near end condition, there is not enough of toner supplied.	A2245532N	September '98	1.34																				
Continued...																							

A224 ROM MODIFICATION HISTORY (Copier Section)																																																						
DESCRIPTION OF MODIFICATION		FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION																																																		
(Continued form previous page.) -Copy Quality in duplex mode. When the quality of the rear copy is poor, the added transfer current must be decreased by SP2-301-3. The new table shows that transfer current can be set to a lower range.		A2245532N	September '98	1.34																																																		
Current Table (SP2-301-3) <table><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>14</td><td>16</td><td>18</td><td>20</td></tr><tr><td>250~275</td><td>16</td><td>18</td><td>20</td><td>22</td></tr><tr><td>200~250</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>~200</td><td>19</td><td>21</td><td>23</td><td>25</td></tr></table> Default Setting New Table (SP2-301-3) <table><tr><th>Table No./ Paper width</th><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>275</td><td>8</td><td>11</td><td>14</td><td>16</td></tr><tr><td>250~275</td><td>10</td><td>13</td><td>16</td><td>18</td></tr><tr><td>200~250</td><td>12</td><td>15</td><td>18</td><td>20</td></tr><tr><td>~200</td><td>14</td><td>17</td><td>19</td><td>21</td></tr></table> Default Setting		Table No./ Paper width	0	1	2	3	275	14	16	18	20	250~275	16	18	20	22	200~250	18	20	22	24	~200	19	21	23	25	Table No./ Paper width	0	1	2	3	275	8	11	14	16	250~275	10	13	16	18	200~250	12	15	18	20	~200	14	17	19	21			
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-White copy problem on 1st scanning. A. Two new SP modes have been added: 1. SP4-916-1: Scanner Lamp OFF counter default: 120min range: 0-300min 2. SP4-916-2 Scanner lamp warm-up time defalt: 200ms range:0-500ms If the scanner lamp remains off for 120min or longer in between the first and second scans of each job, the machine will allow the scanner 120ms for warm-up (default). B. When the scanner lamp is turned on for the first time after the main power switch has been turned on, the machine allows the scanner 300ms for warm-up.		A2245532Q	March '99	1.36																																																		

BULLETIN NUMBER: A193/A224 - 020

05/08/2000

APPLICABLE MODEL:

GESTETNER – 3320/3225

RICOH – AFICIO 200/250

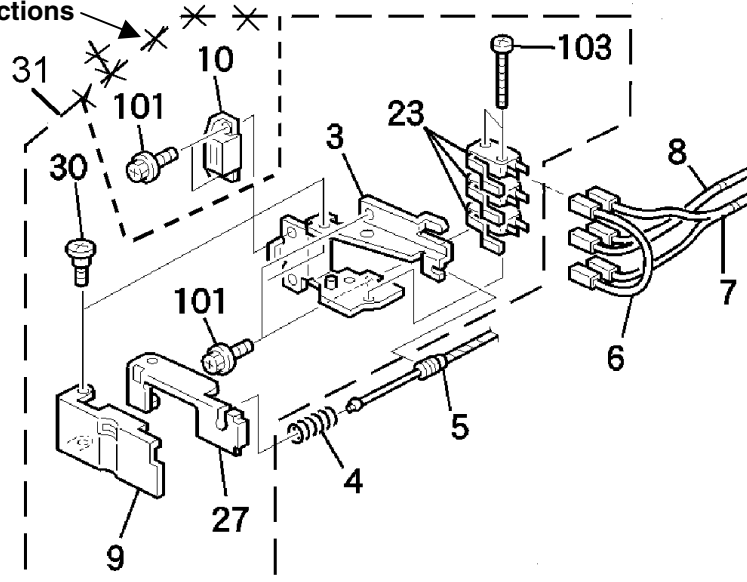
SAVIN – 9920DP/9925DP

SUBJECT: SAFETY SWITCH

GENERAL:

The illustration for the Safety Switch Assembly incorrectly indicated that the Magnet Catch (Item 10) was included. The following illustration correction is being issued for all A193/A224 Parts Catalogs. The following part updates are being issued for all A193/A224 Parts Catalogs.

Illustration Corrections



A193 Only

				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0205810	G0205808	Bracket – Safety Switch	1	49	3
G0205486	G0205807	Safety Switch Assembly	1	49	31

A224 Only

				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
G0205807	G0205808	Bracket – Safety Switch	1	55	3
G0205486	G0205807	Safety Switch Assembly	1	55	31

Note: This copy is intended as a master original for reproduction of additional bulletins.



PARTS