CP660 IR

SERVICE MANUAL

REVISION 0

Canon

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INTRODUCTION

This Service Manual contains basic data and figures on the reader unit of the color copier needed for servicing in the field.

The machine consists of the following system units:

1. Reader unit
2. Editor
3. Original holder

For the printer unit, duplexing unit, R cassette, and PS/PCL board, refer to their respective Service Manuals. This manual covers the reader unit, editor, and original holder, and consists of the following chapters:

Chapter 1 General Description introduces the machine's features and specifications and shows how to operate the machine.

Chapter 2 Basic Operation provides outlines of the machine's various mechanical workings.

Chapter 3 Exposure System discusses the principles of operation used for the machine's lens drive unit and scanner drive unit. It also explains the timing at which these drive units are operated, and shows how they may be disassembled/assembled and adjusted.

Chapter 4 Image Processing System discusses the CCD mechanism and the principles of how analog/digital images are processed. It also explains the timing at which the various units may be disassembled/assembled and adjusted.

Chapter 5 Externals/Auxiliary Mechanisms shows the machine's external parts, and explains the principles used for the machine's various control mechanisms in view of the functions of electrical and mechanical units and in relation to their timing of operation. It also shows how these units may be disassembled/assembled and adjusted.

Chapter 6 Installation introduces requirements for the site of installation, and shows how the machine may be installed using step-by-step instructions.

Chapter 7 Maintenance and Servicing provides tables of periodically replaced parts and consumables/durables and scheduled servicing charts.

Chapter 8 Troubleshooting provides tables of maintenance/inspection, standards/adjustments, and problem identification (image fault/malfunction).

Appendix contains a general timing chart and general circuit diagrams.

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The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.
   In the diagrams, ▬▮▮▮▬ represents the path of mechanical drive—where a signal name accompanies the symbol ⟶, the arrow indicates the direction of the electric signal.
   In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High," while '0' is used to indicate "Low." (The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.
   The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.
2. In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

Reference:

Printer unit, duplexing unit, R cassette Service Manual: FY8-13FJ-000
PS/PCL board Service Manual: FY8-13FK-000

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System Configuration

This machine is designed to accommodate the following accessories:

- Editor-G1 *1
- DADF-C1 *2
- Document Tray-E1 *1
- Card Reader-B1 (requires the Copy Data Controller-A1) *2
- Copy Data Controller-A1 *2
- Control Card IV C *2
- Rack-A1 (when installing the machine to the Rack-A1)

*1: Covered in this Service Manual.
*2: Covered in a separate Service Manual.

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CHAPTER 1 GENERAL DESCRIPTION

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CHAPTER 6 INSTALLATION

CHAPTER 7 MAINTENANCE AND SERVICING

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APPENDIX

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CHAPTER 1

GENERAL DESCRIPTION

This chapter provides specifications of the copier, instructions on how to operate the machine, and an outline of copying process.

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I. FEATURES

1. It uses a newly designed engine consisting of separate reader and printer units, helping to enable sharp images at 600 dpi × 600 lpi.

2. It turns out 6 full-color copies (A4, 2-page mode; approx.) per minute, or 24 monocolor copies (A4, 2-page mode; approx.) per minute.

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II. SPECIFICATIONS

A. Reader Unit

1. Type

Body	Desk-top
Copyboard	Fixed
Light source	Fluorescent lamp
Lens	Array of lenses
Image reader	Photocells (RGB 3-line CCD)

2. Performance

Original type		Sheet, book, 3-D object (2 kg max.)
Maximum original size		A3/11 × 17
Reproduction ratio		Default:direct (±0.5%), enlarge/reduce (±1.0%; Table 1-201) Zoom: 25% to 400% (±1.0%)
Resolution	Main scanning direction	600 dpi
	Sub scanning direction	600 lpi
Continuous copying		100 copies max.
Auto clear		Yes (2 min standard; may be varied in user mode, may be disabled)
Auto color select		Yes (identifies color original to select 4-color copy or black mono-color)
AE		Yes
Auto paper select		Auto zoom
One-touch adjust		Yes (nuance, highlight reproduction, aging-effect black-and-white)
Color adjust		Yes (color balance, density range YMCBk adjustment)
Sharp		Yes
Auto power save		Yes (30 min standard; may be varied in user mode, may be disabled)
Low power		Yes (1 hr standard; may be varied in user mode)
Original mode		Yes (text/photo/map, print photo, photo, black-and-white text)
Frame erase		Yes
Bind margin		Yes
Auto gradation correction		Yes

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3. Others

Operating environment	Temperature range: See Figure 6-101. Humidity range: See Figure 6-101. Atmospheric pressure: 810.6 to 1013.3 hPa	
Power supply (voltage ±10%)	Rating	Serial No.
	120V(USA)	NLP*****
	120V(TWN)	NLR*****
	230V(KOR)	PLB*****
	230V(Others)	PLD*****
	230V(UK)	QLB*****
	230V(CA)	RLB*****
	230V(FRN)	SLN*****
	230V(GER)	TLN*****
	230V(AMS)	ULN*****
	230V(ITA)	PLQ*****
Power consumption* (reader unit + printer unit)	1.5 kW or less (max.)	
Noise* (reader unit + printer unit)	74 dB (copying) 62 dB (standby)	Sound power level by ISO method
Ozone* (reader unit + printer unit)	0.05 ppm or less (max.) 0.02 ppm or less (average)	
Dimensions* (reader unit + printer unit)	Width:650 mm Depth:781 mm Height:1074 mm (w/ rack)	
Weight* (reader unit + printer unit)	158.3 kg (reader unit: 36 kg; printer unit: 91.6 kg; rack: 30.7 kg)	

*Includes the printer unit, as the reader unit is not likely to be used apart from the printer unit.

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Area	Reduction		Enlargement	
Japan (6R5E)		0.250	B4→A3	
	A3→A4R B4→B5R	0.707	B5R→A4R B5→A4	1.153
	B4→A4R	0.815	A4R→B4, A5→B5	1.223
	A3→B4 A4R→B5R	0.865	A4R→A3 B5R→B4	1.414
	A3→A5	0.500	A5→A3	2.000
	A3→B5	0.611		4.000
North America/Central-South America (5R4E)		0.250	LGL→11x17	1.214
		0.500		
	11x17→LTRR	0.647	LTRR→11x17	1.294
	11x17→LGL	0.733	MINIT→LTRR	2.000
	LGL→LTRR	0.786	MIRITR→11x17	4.000
Europe (3R3E)		0.250	A4R→A3	1.414
	A3→A4R	0.707	A5→A3	2.000
	A3→A5	0.500		4.000
Asia, Oceania, South America (6R5E) 6R5E		0.250	B4→A3	
		0.500	B5R→A4R	
	A3→B5	0.611	B5→A4/LTR	
	A3→A4R/LTRR B4→B5R	0.707	A4R/LTRR→B4 A5→B5	1.223
			A4R/LTRR→A3 B5R→B4	1.414
	B4→A4R/LTRR	0.815		
	A3→B4 A4R/LTRR→B5R	0.865		2.000
				4.000

Table 1-201 Default Ratios

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		4-color	Mono-color (YMCK)
Plain paper	A4/LTR	34	18
Thick paper	A4/LTR	50	35
Transparency	A4/LTR	57	41

Table 1-202 First Copy Time (in sec, min.)*

*A4, Direct, cassette 1, face-up delivery, no pre-scanning; for face-down delivery, add 3 sec for plain paper, 6 sec for thick paper, and 7 sec for transparencies.

	Source	Size	4-color	Mono-color (YMCK)
Plain paper	Cassette Multifeeder	A3/B4/A4R/B5/A4R 11 x 17/LGL/LTRR	3	12
		A4/LTR	6	24
Thick paper	Multifeeder	A3/1117	1.2	1.7
		A4/LTR	2.4	3.4
Transparency	Multifeeder	A4/LTR	2.1	2.8

Table 1-203 Copying Speed (copies/min)

The above specifications are subject to change for product improvement.

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III. SAFETY OF LASER LIGHT

Radiation of laser light can be hazardous to human beings. To ensure safety, the copier's laser scanning system is sealed inside a protective housing and external covers, preventing leakage of laser light to the outside so that the user cannot be exposed to the copier's laser light as long as the copier is used normally.

The copier is certified as a Class I product under 1040.10 of Title 21 of the Code of Federal Regulations (USA) and a Class 1 laser product under IEC825.

Figure 1-301 shows the label attached to products certified to comply with the foregoing standards (120-V model).

Warning:

Do not insert a screwdriver or other tools with a high reflectance into the laser path when servicing areas around the laser scanning system.

Be sure to remove watches, rings, and the like before starting to service the machine. The eye, if exposed to laser light, can suffer permanent damage.

The copier's laser light is a visible light. However, the following label is attached to covers that may reflect laser light. Pay special attention whenever servicing areas behind such covers.

Figure 1-301

This label is attached to those covers of the copier's laser scanning system which are used to protect against laser light.

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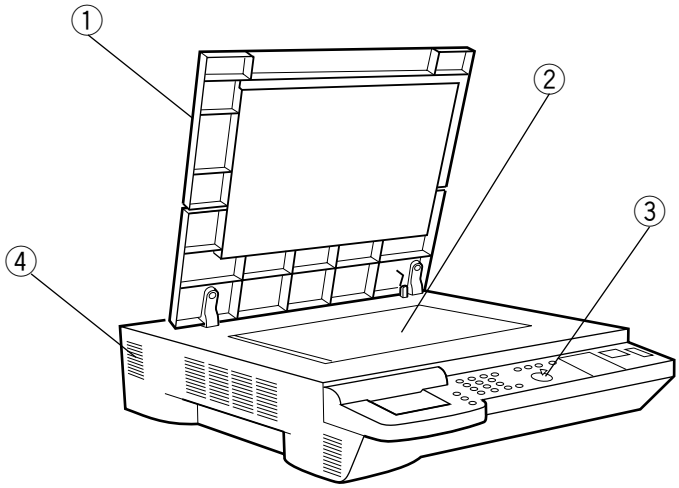
IV. NAMES OF PARTS

A. External View

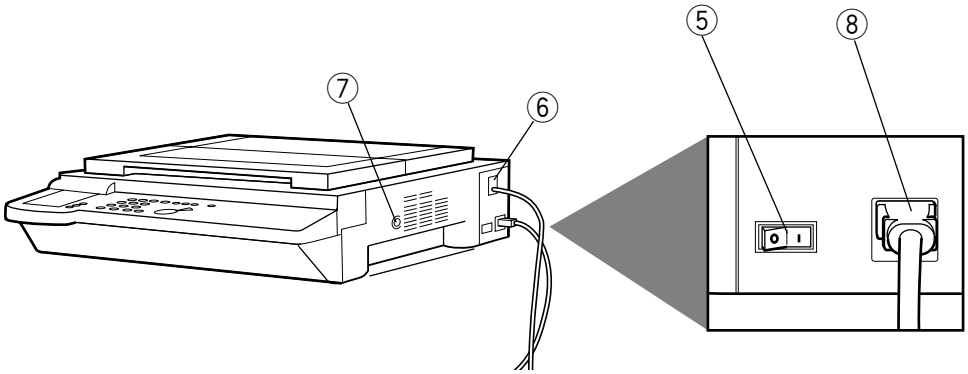
• Front Left



① Copyboard cover
② Copyboard glass
③ Control panel
④ Power supply cooling fan air inlet

Figure 1-401

• Front Right



⑤ Reader unit rear power switch
⑥ Power supply cord connector (reader unit)
⑦ Control key switch
⑧ Printer power cord connector

Figure 1-402

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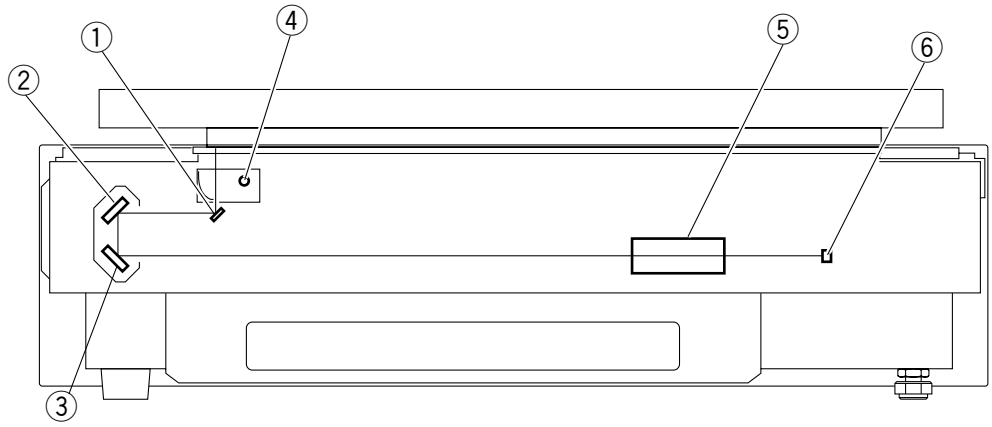
B. Cross Section

• Reader Unit



① No. 1 mirror	④ Scanning lamp
② No. 2 mirror	⑤ Lens
③ No. 3 mirror	⑥ CCD

Figure 1-403

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V. OPERATING THE COPIER

A. Control Panel

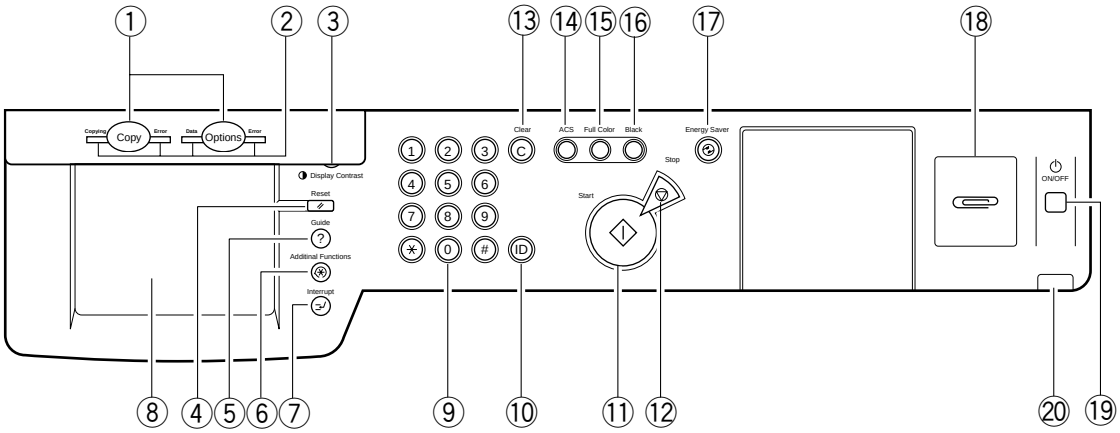

Figure 1-501

	Name			Description	Remarks
①	System switch			Use it to switch between the coper's systems.	Use it to reset the printer when an error has occurred in the printer.
②	Status indicator lamp	Copying	Copying	Glows green to indicate that copying is under way.	
			Error	Flashes in orange to indicate the absence of paper, paper jam, or absence of toner. Glows orange to indicate the presence of a fault.	
		Expansion	Data	Glows green to indicate that data is being output.	
			Error	Flashes in orange to indicate a printer error, the absence of paper, paper jam, or absence of toner.	
③	Screen Contrast dial			Use it to adjust the brightness of the screen.	Turn it clockwise to darken or counterclockwise to brighten the screen.
④	Reset key			Use it to return to standard copying mode.	
⑤	Guide key			Use it to display instructions according to purpose (functions, how to operate).	
⑥	User mode key			Use it to start or end user mode.	Use it to check common settings, copier settings, timer settings, adjust/clean settings, and counter readings.
⑦	Interrupt key			Use it to make an interrupt copy.	
⑧	Touch panel display			Use it to display settings screen according to system functions.	Use the system switch key to switch between functions.
⑨	Keypad			Use it to enter a numerical value (e.g., copy count).	
⑩	ID key			Use it to start ID mode.	To store an ID No., user mode -> common settings -> ID control by group.
⑪	Start key			Use it to start copying.	
⑫	Stop key			Use it to stop continuous copying.	
⑬	Clear key			Use it to initialize numeric values (e.g., copy count).	
⑭	ACS key			Use it to enable/disable black-and-white/color auto identification.	Upon automatic detection of a black-and-white/color original, the LED for a full-color original or the LED for a black-and-white original turns on.
⑮	Full-Color key			Use it to select 4-full color mode.	
⑯	Black key			Use it to select black mono-color mode.	
⑰	Save Power key Clip holder			Use it to enable/disable power save mode. Use it to keep clips or the like.	When enabled, the temperature of the fixing assembly is lowered to reduce power consumption.
⑱	Control Panel Power			Use it to turn on/off the power on	
⑲	soft switch Pilot lamp			the control panel (reader unit). Turns on when the power is on.	When the power is turned off on the control panel, auto reception output by the printer unit is not possible.
⑳					Does not turn on if the power soft switch on the control panel is off.

Table 1-501

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B. Extension Mode

Mode	Description
Auto Paper Select	Selects copy paper of the best size to suit the size of the original and the selected reproduction ratio.
Auto Enlarge/Reduce	Enlarges/reduces to suit the selected paper size.
Full Image	Reduces images in slightly in reference to the size of paper to avoid a missing area.
Zoom	Enlarges/reduces images according to the size of the original and the size of the copy specified in mm.
X/Y Zoom	Enables specification of different ratios for X and Y directions in %.
Enlarged Page Separation	Divides an image into several pages for output (as when the output size upon enlargement is larger than A3).
Text/Photo/Map	Adjusts copy image quality according to the image quality of the original. • text/photo/map • print photo • photo • black-and-white text
Auto Start	Starts copying automatically at the end of the wait period if the Start key is pressed during the wait period immediately after power-on or jam removal.
Double-sided (needs duplexing unit)	Makes double-sided copies of two one-sided copies or make double-sided copies of the left and right pages of an original (page separation).
Interrupt copying	Allows making a separate copy by interrupting continuous copying.
Color auto recognition (ACS)	Automatically identifies a color or a black-and-white original.
Page Separate	Makes left and right pages of a book, for example, on separate sheets of copy paper.
Book Frame Erase	Erases the shadow along the sides and the middle of a copy of, for example, a book.
Original Frame Erase	Erases the shadow and frames along the sides and the middle of a copy larger than the original.
Hole Image Erase	Erases the shadow of holes on a copy.
Block See-Through	Blocks the image on the back of a double-sided original on a copy.
Shift	Shifts images to the center (or corner) of a copy.
Bind Margin	Shifts the image of the original to create a blank width along the side of the copy (0 to 20 mm). (left/right/top/bottom bind)
Sheet Frame Erase	Creates a blank width (7 mm) along the sides of a copy to prevent soiling or line images on the copy.
Reduce Page Compose	Requires a feeder.
Enlarge Page Compose	Divides the image of a single original into several copies. (1 to 2, or 1 to 4)
ID	Enables copying only in response to an appropriate ID number.

Table 1-502

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C. User Mode

Types of User Mode

The copier provides four types of user mode, in which the user may freely adapt the copier functions to suit his/her needs.

1. Common settings
2. Copier settings
3. Timer settings
4. Adjustment/cleaning

In addition, the copier allows the user to check the readings of six software counters on the control panel display.

1. Common Settings

Name	Description	Remarks
Buzzer	Enables/disables the input sound, alarm sound, or job sound. ON: enable. OFF: disable.	Factory setting:ON
Cassette Auto Select	Enables/disables auto selection (auto paper selection and auto cassette change) for each cassette (including the multifeeder). ON: enable. OFF: disable.	Factory setting: cassette 1/2, ON; multifeeder, OFF
Black Text Auto Density Adjust	In black text mode, selects 'priority on image quality', in which pre-scanning is executed, or 'priority on speed' in which pre-scanning is not executed.	Factory setting: priority on speed.
Priority on Photo/Text in Black Mode for Text/Photo/Map	In black mode of text/photo/map mode, selects 'text original' or 'photo original' for image quality. In 'priority on text original', text (characters) will be reproduced more faithfully. In 'priority on photo original,' photos are reproduced more faithfully.	Factory setting: priority on photo original.
Save Power	Selects a rate of saving for the copier in power save mode. -10%: saving at 10% -25%: saving at 25% -50%: saving at -50% No recovery time: no saving.	The "rate of saving" is the rate of saving in relation to the copier's total power consumption. Factory setting:-10%
Inch Input	Enables/disables input in inches on screens designed for metric inputs (shift width or bind width). ON: enable. OFF: disable.	Factory setting:OFF.

Table 1-503 (a)

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Name	Description	Remarks
Delivery Tray	Selects face-down or face-up delivery: Face-Down: face down delivery. Face-Up: face-up delivery.	Factory setting: face-down delivery.
Paper Icon	Assigns an icon to the cassette keys indicated for selection of paper.	Factory setting: none.
System Control ID No.	Specifies a type of user ID No. or ID. • ID by group • system control ID No.	Factory setting: none.
ID by Group	Controls ID No. and ID or mode of management (by group). • add group ID and ID No. • remove group ID and ID No. • check count. • remove counter.	Factory setting: none.
Common Settings Reset	Initializes the items of common settings to factory settings.	

Table 1-503 (b)

2. Copier Settings

Name	Description	Remarks
Preference Key 1/2	Displays commonly used keys on the Basic screen as preference keys: • keys on Extended screen. • mode memory in storage. • color balance in storage.	Factory settings: none.
Standard Mode	Stores copier standard mode settings selected at power-on or in response to a press on the Reset key.	Factory setting: coy count: 1 paper select: auto density: auto original type: text/photo/map
Settings Reset	Initializes the items of the copier settings to factory settings.	

Table 1-504

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3. Timer Settings

Name	Description	Remarks
Auto Clear Time	The auto clear function automatically returns the touch panel display to standard mode if no operation takes place for a specific time after the end of key operation. The time may be set between 0 and 9 min in 1-min increments.	Factory setting: 2 min.
Auto Save Power Time	The auto save power function automatically puts the copier into save power mode if no operation takes place for a specific time after the end of copying or key operation. The time may be changed to 1, 2, 5, 10, 20, 30 min or between 1 and 8 hr (in 1-hr increments).	Factory setting: 30 min
Shift to Low Power Time	The shift to low power function automatically puts the copier into low power mode if no operation takes place for a specific time after the end of copying or key operation. The time may be 30 min or 1 to 8 hr (in 1-hr increments).	Factor setting: 1 hr. Note that in low power mode, the fixing assembly is deprived of power in specific intervals.
Auto Power-Off Time	The auto power-off function automatically turns off the copier if no operation takes place after the end of copying or key operation. The time may be changed between 1 and 24 hr (in 1-hr increments).	Factory setting: 2 hr.

Table 1-505

4. Adjustment/Cleaning

Name	Description	Remarks
Zoom Fine Adjust	Use it to make fine adjustments as when a small discrepancy is noted between the original image and the copy image made in Direct. For X (left/right) and Y (top/bottom), adjustment is possible between -1.0% and +1.0%.	Factory setting: 0
Correct Density	Use it to correct differences in density between the original image and the copy image made with the manual density control set at the standard (median) value. The density correction may at any of five settings.	Factory setting: standard (median).
Correct Auto Gradation	Use it to correct poor color balance caused by fine discrepancies in fine adjustment or density adjustment.	See the next page.

Table 1-506

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Executing Auto Gradation Adjustment

Press the ( ) key and select 'adjust/clean' -> 'correct auto gradation' in sequence and follow the flow chart:

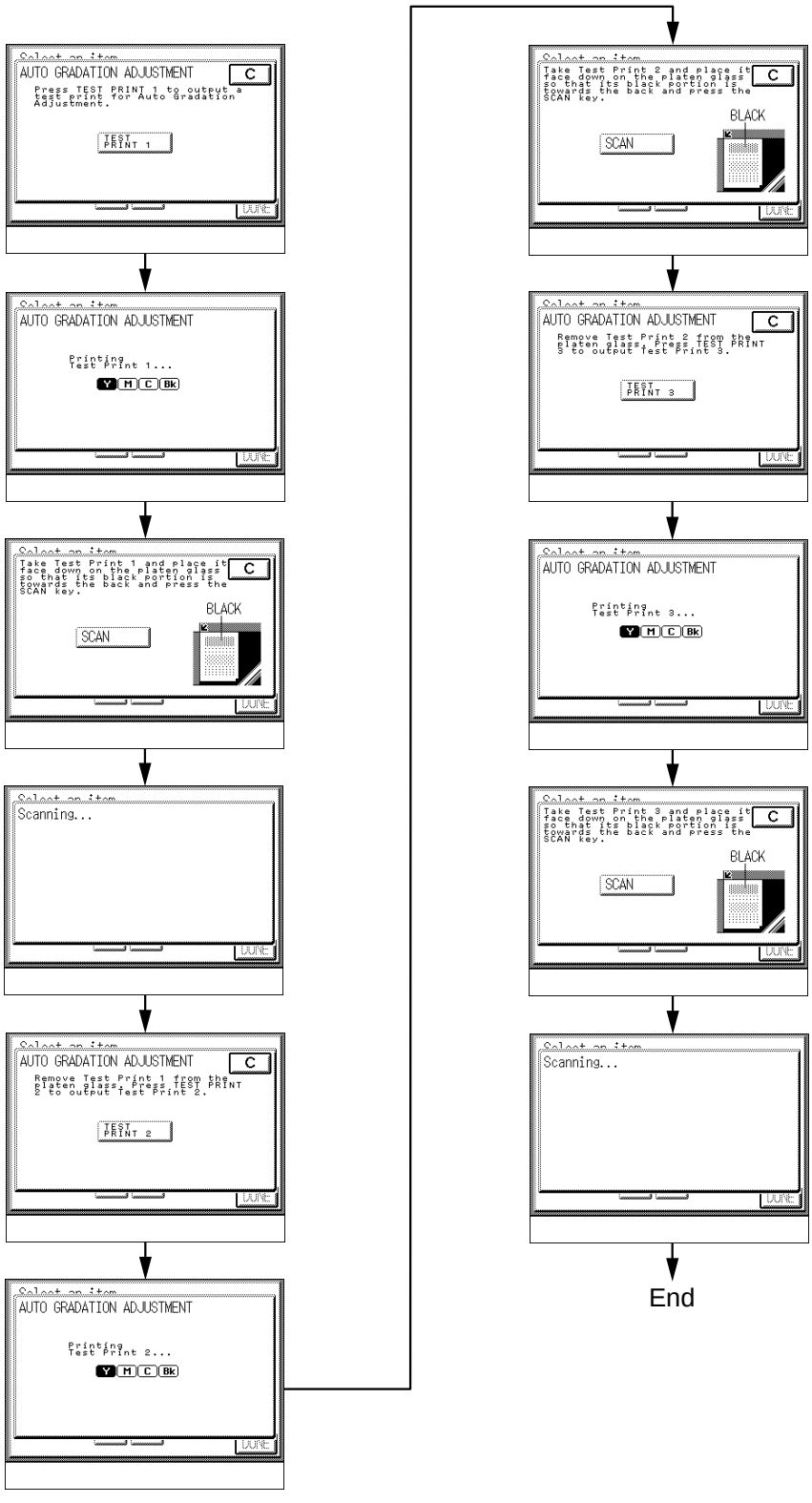

Figure 1-502

VI.ROUTINE MAINTENANCE BY THE USER

Instruct the user to clean the following parts at least once a week or as necessary as when copy images are soiled.

■ Copyboard Glass

Wipe it with a cloth moistened with water or solution of mild detergent; then, dry wipe it.

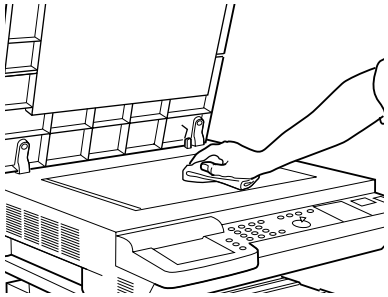

Figure 1-601

■ Copyboard Cover

Wipe the sheet surface with a cloth moistened with water or solution of mild detergent; then, dry wipe it.

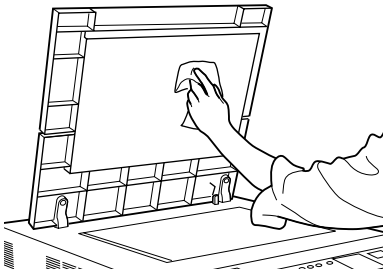

Figure 1-602

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VII.POINTS TO NOTE (FOR THE USER)

1. The user must turn off the control panel power soft switch for safety when the copier is not expected for use (e.g., at night).

If the copier is expected to be left alone for a long time (as during holidays) the user must turn off the reader unit rear power switch and disconnect the power plug. (However, the reader unit rear power switch must be turned off and the power plug disconnected about 30 min after the control panel power soft switch is turned off. This is important in preventing caking of toner otherwise caused by the heat of the fixing assembly.)

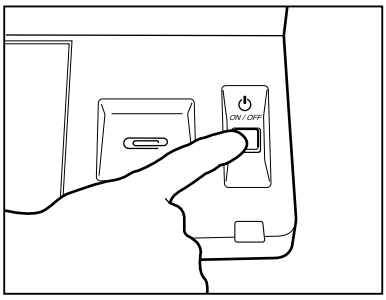

Figure 1-701 Control Panel Power Soft Switch

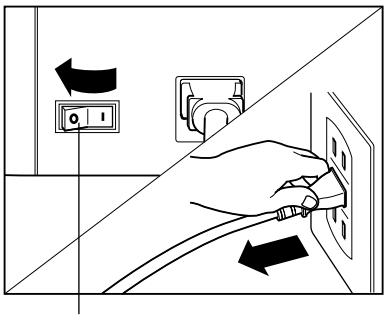

Figure 1-702 Reader Unit Rear Power Switch/Power Plug

2. The user must contact the service person if the copier needs to be relocated.
3. The user must not turn off the control panel power soft switch or the reader unit rear power switch or open the front door while the copier is in operation.

CHAPTER 2

BASIC OPERATION

This chapter provides descriptions on basic operations, functions of each operation, relationships between electrical and mechanical systems, and timing at which each associated part is turned on.

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I. BASIC OPERATION

A. Functional Construction

The copier may be divided into two functional blocks: control system and exposure system.

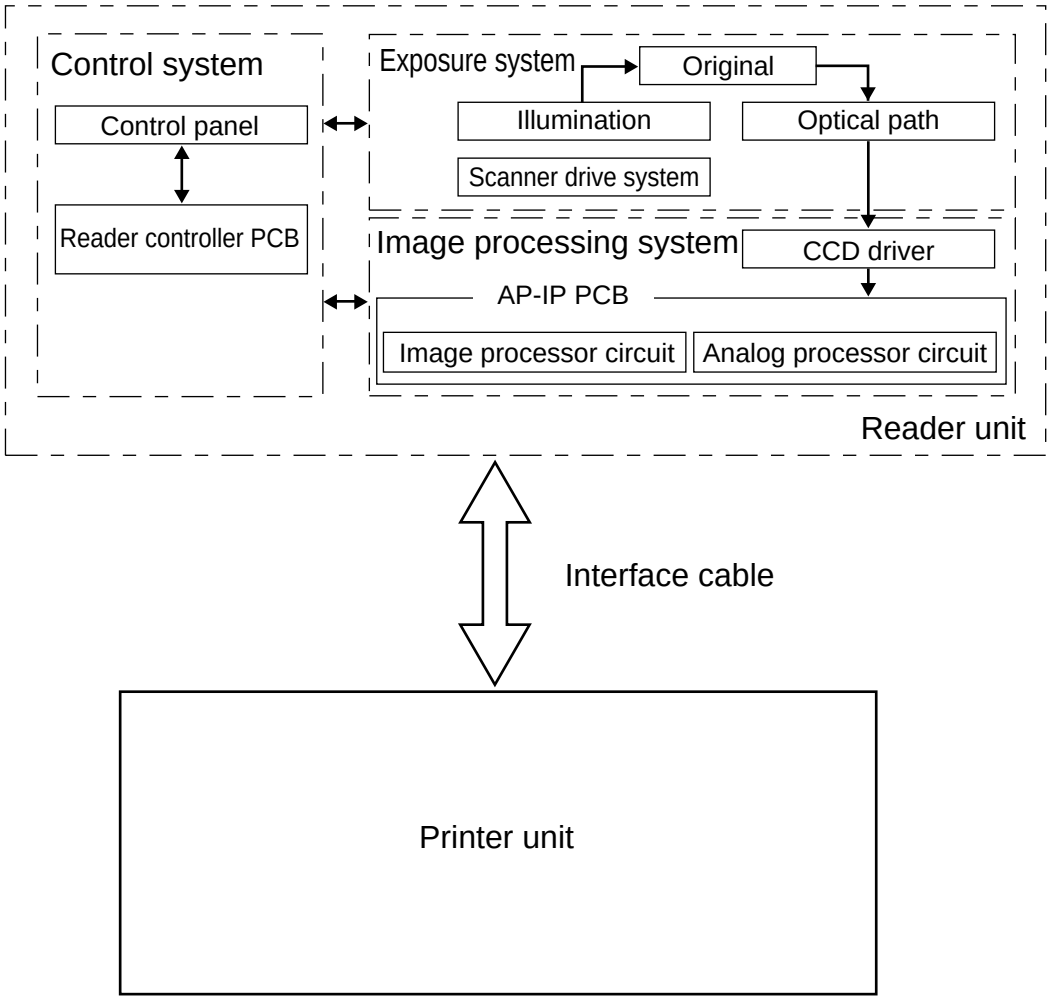

Figure 2-101

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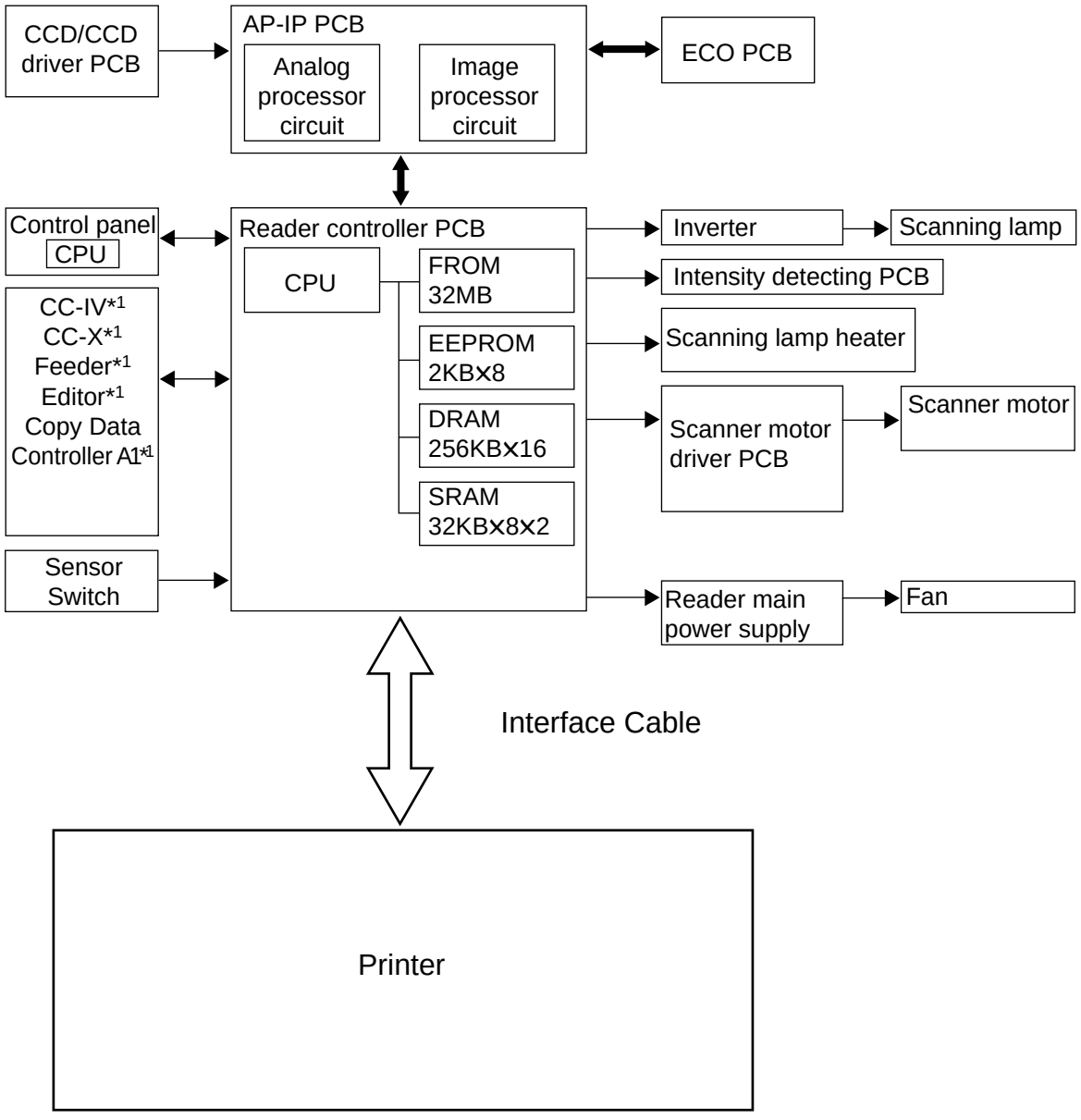
B. Outline of Electrical Circuitry

The copier's main electrical mechanisms are controlled by the CPU on the reader controller PCB. The reader controller PCB is equipped with a lithium battery for backing up important data. The control panel is equipped with its own CPU for control of keys, LEDs, and LCD.



*1: Accessory.

Figure 2-102

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C. Inputs to and Outputs from the Major PCBs

1. Inputs to and Outputs from the Reader Controller PCB (1/3)

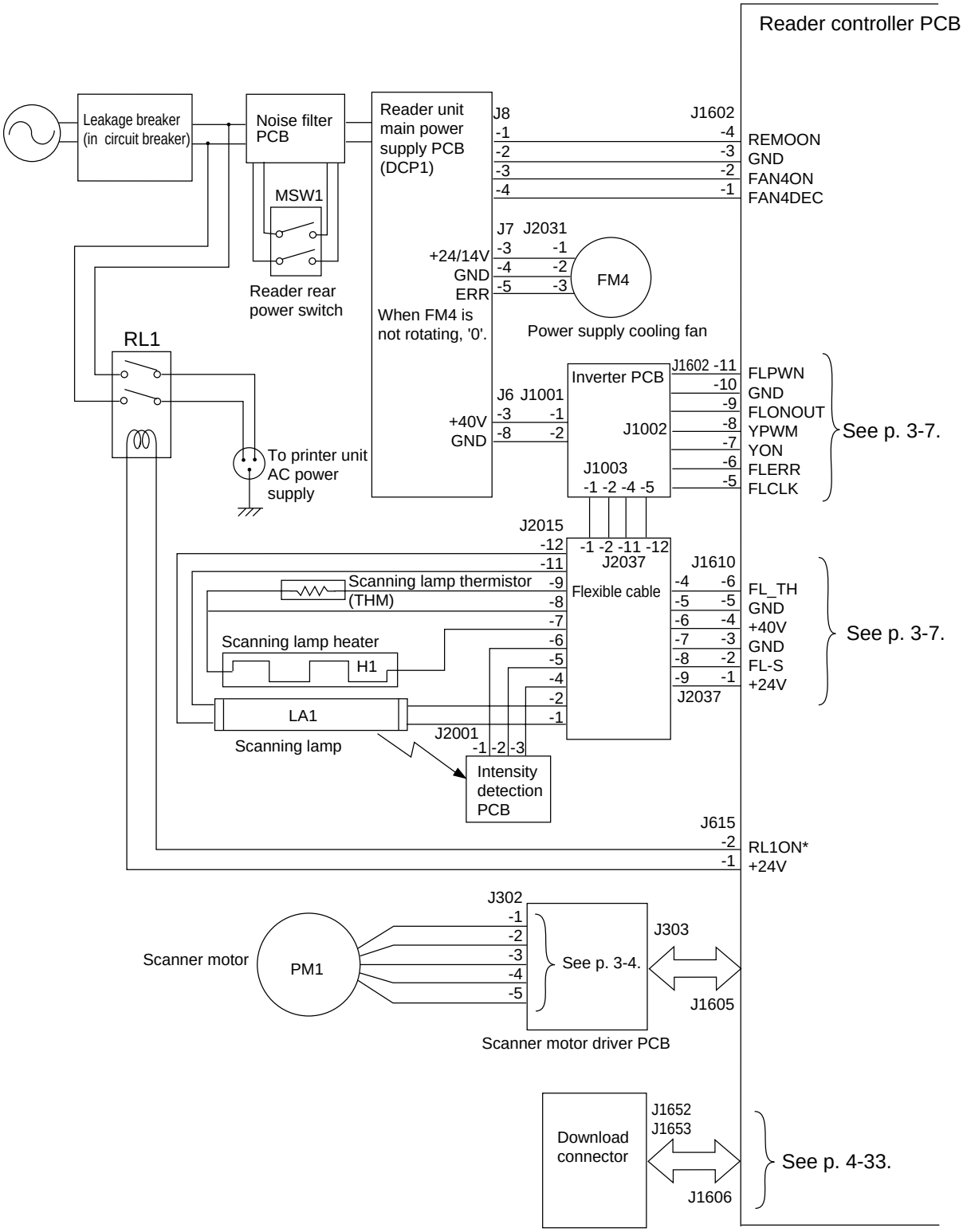

Figure 2-103

Inputs to and Outputs from the Reader Controller PCB (2/3)

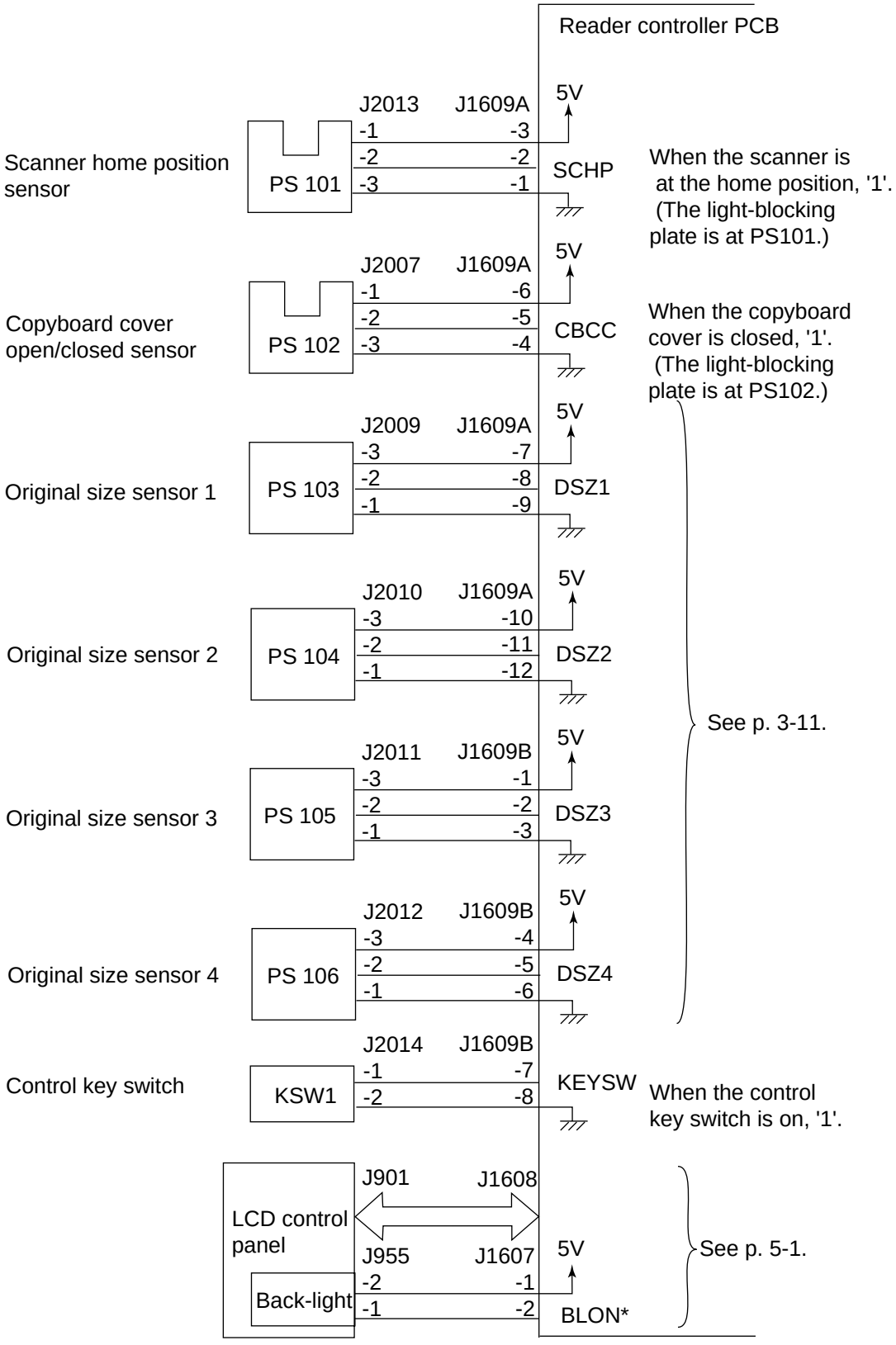

Figure 2-104

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Inputs to and Outputs from the Reader Controller PCB (3/3)

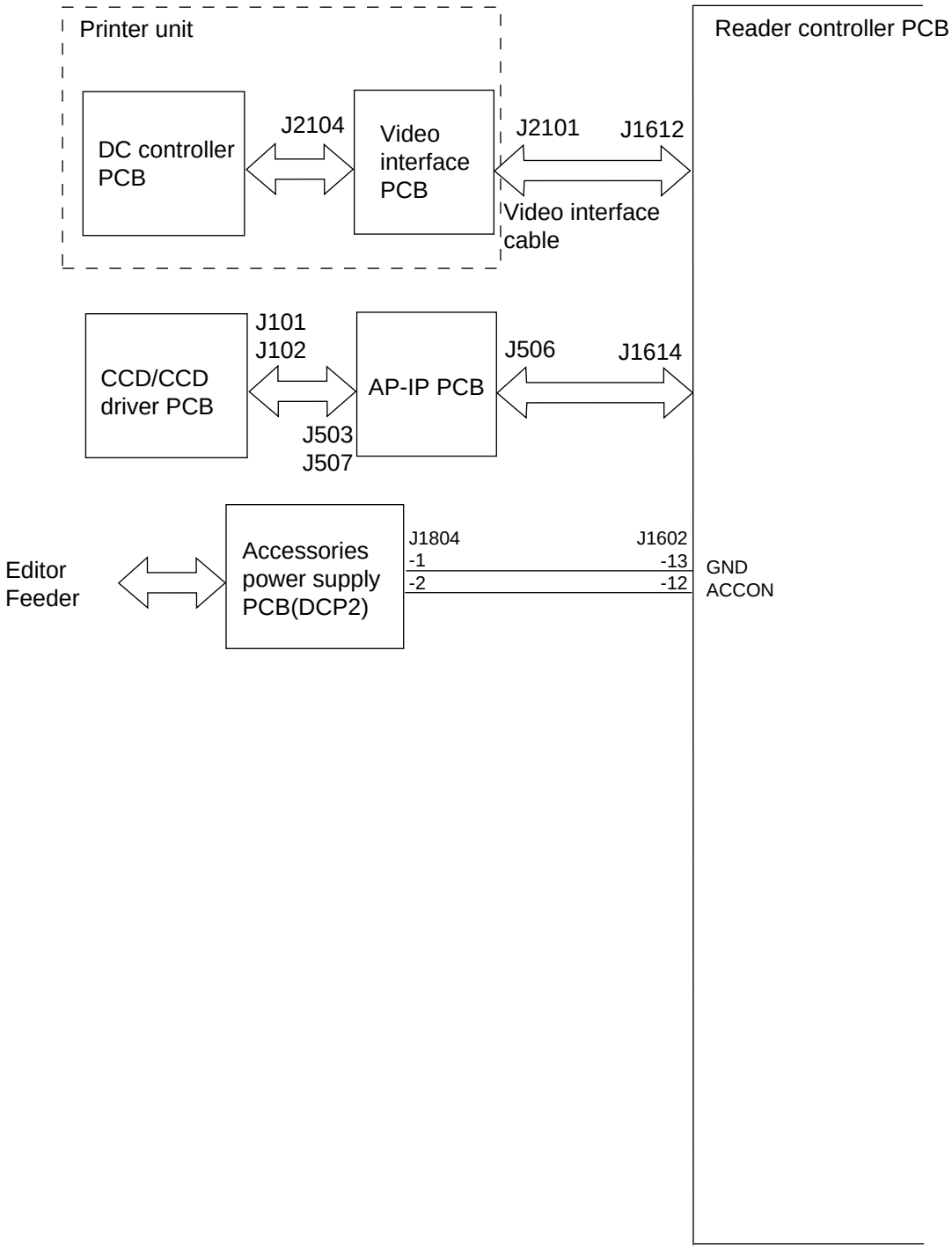

Figure 2-105

D. Basic Sequence of Operations

1. At Power-On

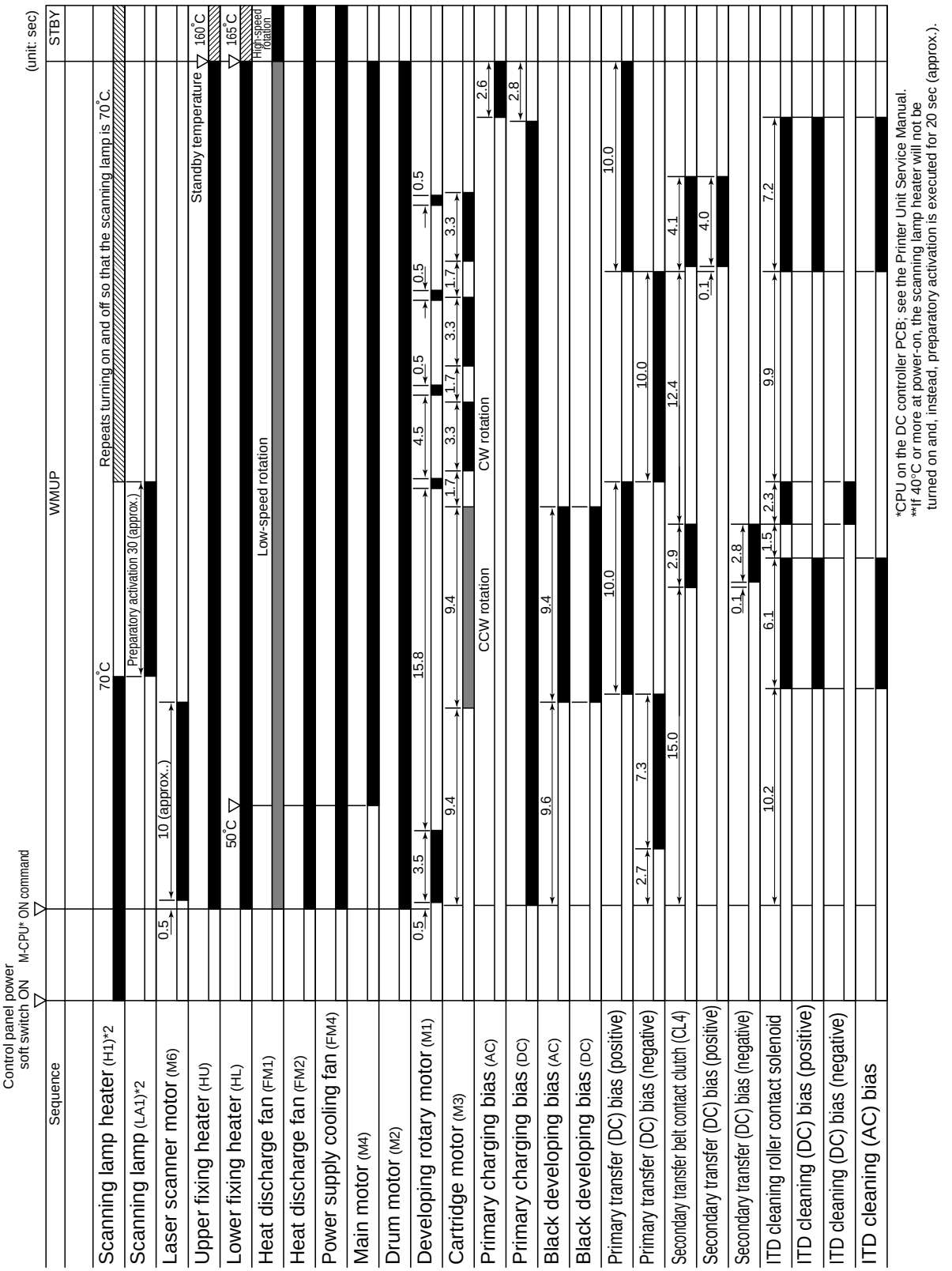

Figure 2-106

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Item	Period	Purpose	Remarks
WMUP (warm-up)	From when the control panel power soft switch is turned on until the surface temperature of the upper fixing roller reaches 160°C and that of the lower fixing roller reaches 165°C.	To heat the fixing roller and to put the copier into standby state.	During this period, the copier checks for residual paper and the presence/absence of the toner cartridge, and executes correction for stable reproduction of images
STBY (standby)	From when WMUP ends until the Copy Start key is turned on or the power switch is turned off.	To wait for a press on the Copy Start key or other key.	

Table 2-101

Caution:

The reader unit is not likely to be used on its own, and the sequence of operations is discussed in terms of a combination of the reader unit and the printer unit.

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2. During Copying

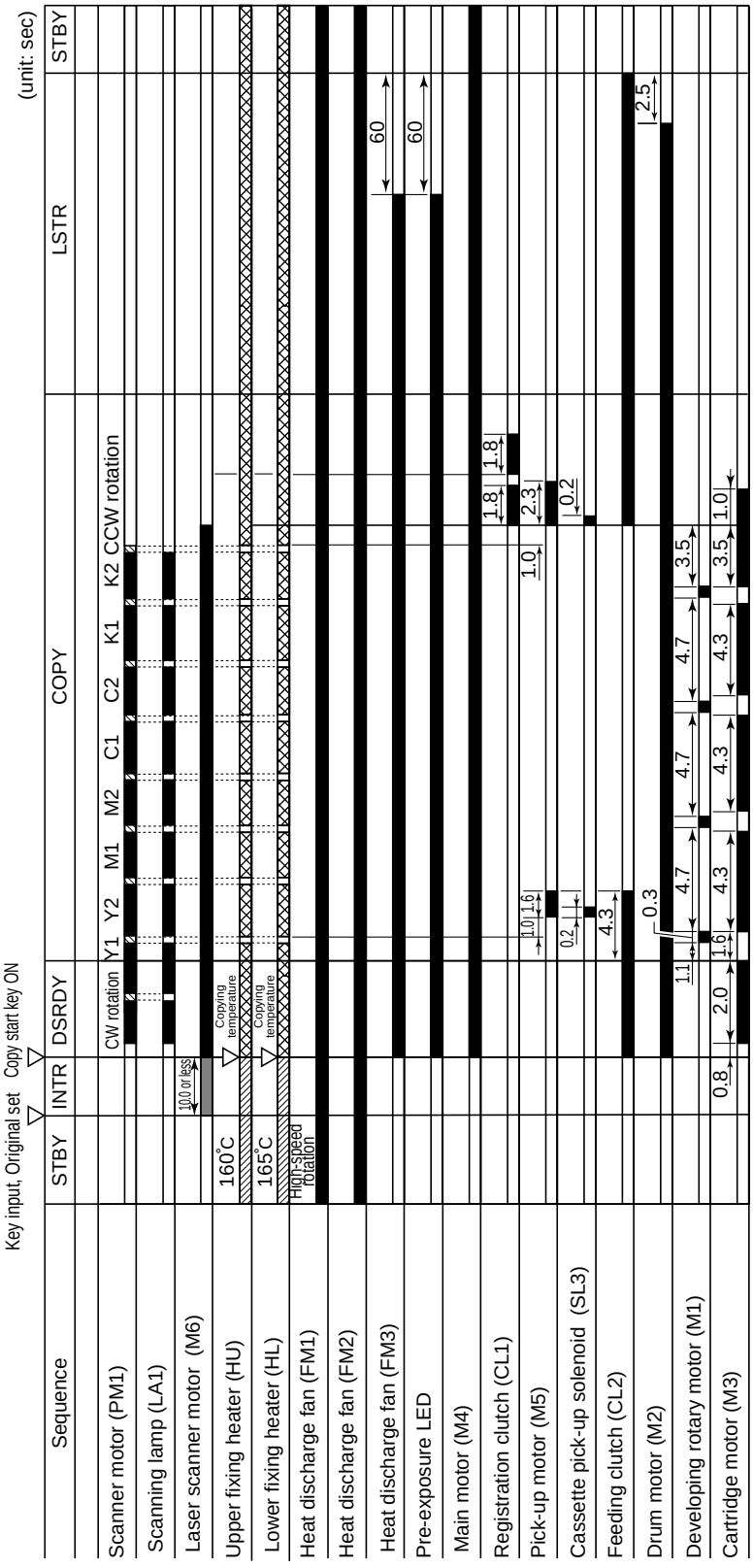

Figure 2-107 (A4, LTR, 2 copies, 4-color, Direct, cassette 1)

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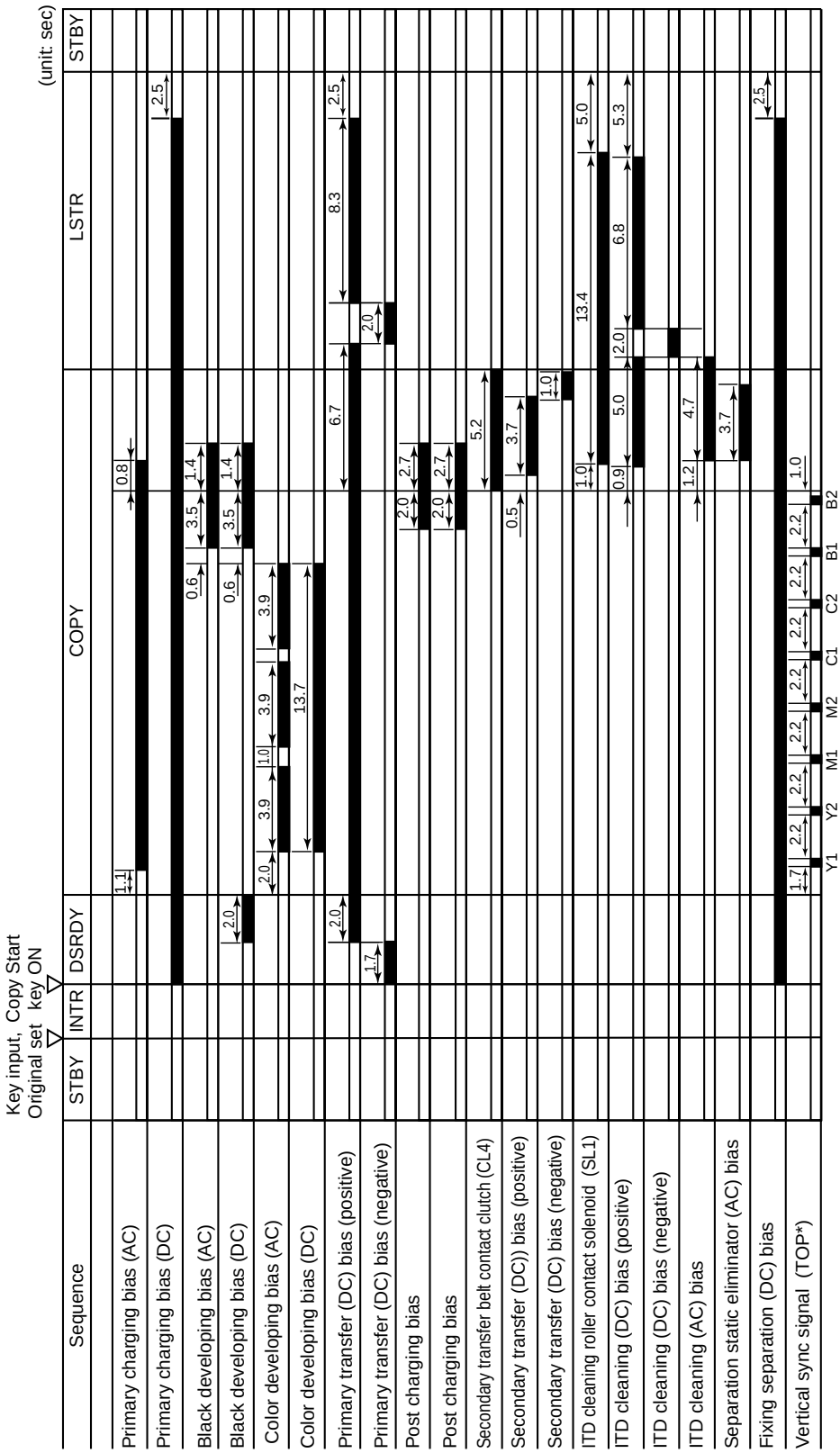

Figure 2-108 (A4/LTR, 2 copies, 4-color, Direct, cassette 1)

Item	Period	Purpose	Remarks
INTR (initial rotation)	From when a key input is made or an original is set until the Copy Start key is pressed.	To rotate the laser scanner motor, thereby stabilizing the sensitivity of the photosensitive drum.	
DSRDY (scanning preparation)	From when the Copy Start key is pressed until the point of rotation of the intermediate transfer drum reaches the leading edge of the 1st color.	To turn on and off the laser beam using video signals so as to form an image on the photosensitive drum; thereafter, to turn the toner image into a visible image and transfer the result to copy paper.	
COPY (copy)	From when control rotation ends until all toner has been transferred to the copy paper.		
LSTR (last rotation)	From when COPY ends until the main motor stops.	To discharge copy paper. In addition, to clean the intermediate transfer drum.	The intermediate transfer drum is cleaned for each copy. (In the case of continuous copying, cleaning is also executed during COPY.)

Table 2-102

Caution:

The reader unit is not likely to be used on its own, and the sequence of operations is discussed in terms of a combination of the reader unit and the printer unit.

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CHAPTER 3

EXPOSURE SYSTEM

This chapter provides descriptions on the operations and the functions of the scanner drive mechanism and the original detection mechanism, relationship between electrical and mechanical systems, and timing at which each associated part is turned on.

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I. OUTLINE

A. Outline

The exposure system includes functions used to expose an original and direct the reflected optical image to a CCD. Figure 3-101 is a cross section of the exposure system, while Figure 3-102 is a diagram of its external view.

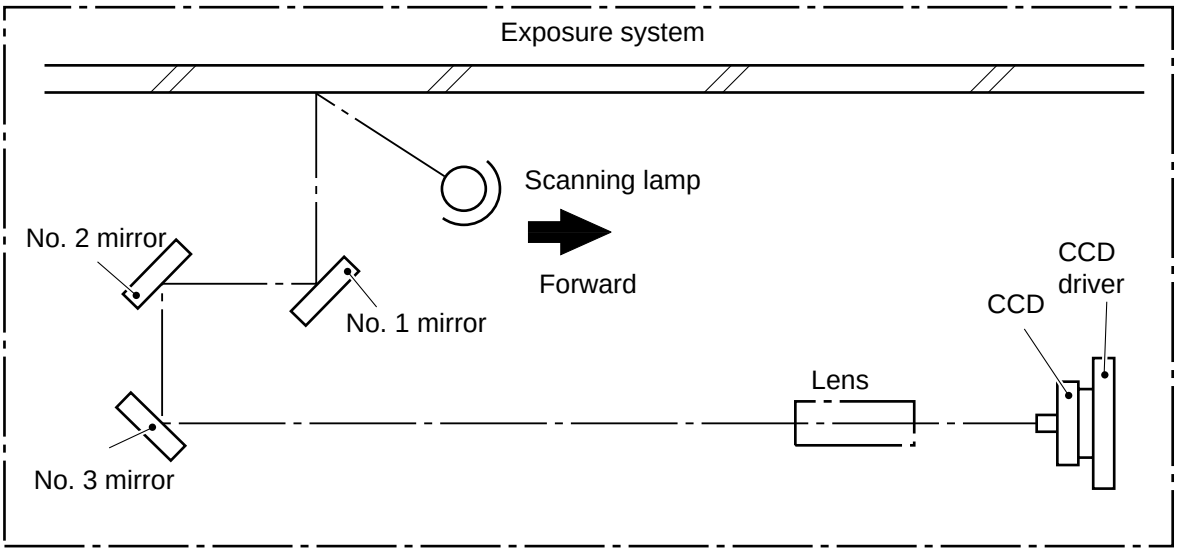

Figure 3-101

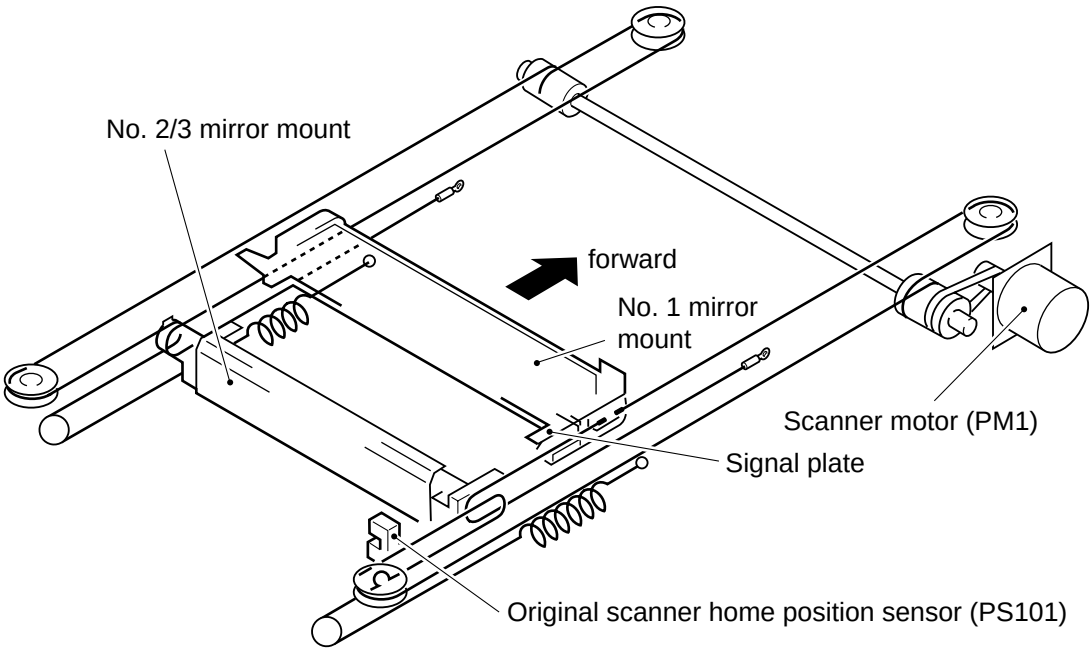

Figure 3-102

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II. BASIC SEQUENCE OF OPERATIONS

A. Basic Sequence of Operations

1. Basic Sequence of Operations

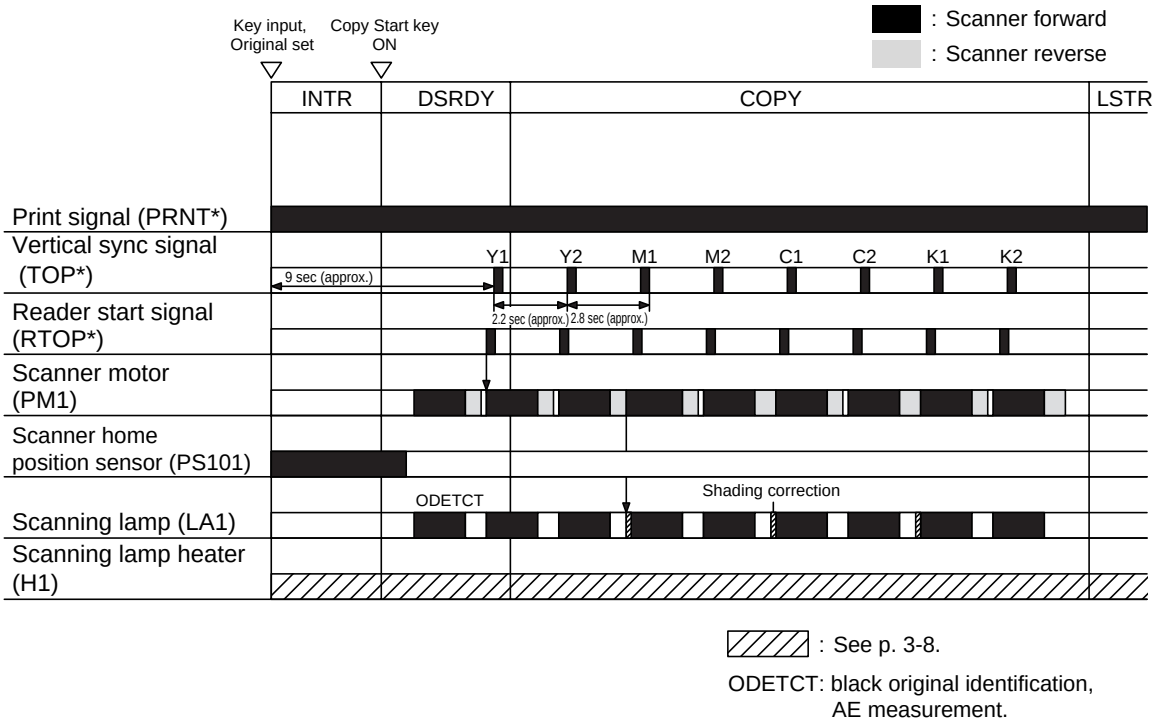

Figure 3-201 (A4/LTR, 2 copies, 4-color, Direct, cassette 1)

2. Scanner Home Position Sensor and Operation

	Scanner motor		Operation
	Forward	Reverse	
Scanner home position sensor			Switches to forward movement.
			Moves 1 mm forward, and stops. (The point at which it stops is its home position.)

Table 3-201

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The scanner home position sensor operates at the following timing:
- When the power is turned on.
- When the Copy Start key is pressed.
- When all originals are read.
- While the CCD is being adjusted (in service mode).

The sensor does not turn on during continuous copying. If it should turn on because of an error, scanning would be stopped immediately. Figure 3-202 shows the movement of the scanner during copying. (The start position is about 5 mm forward of the home position in Direct.)

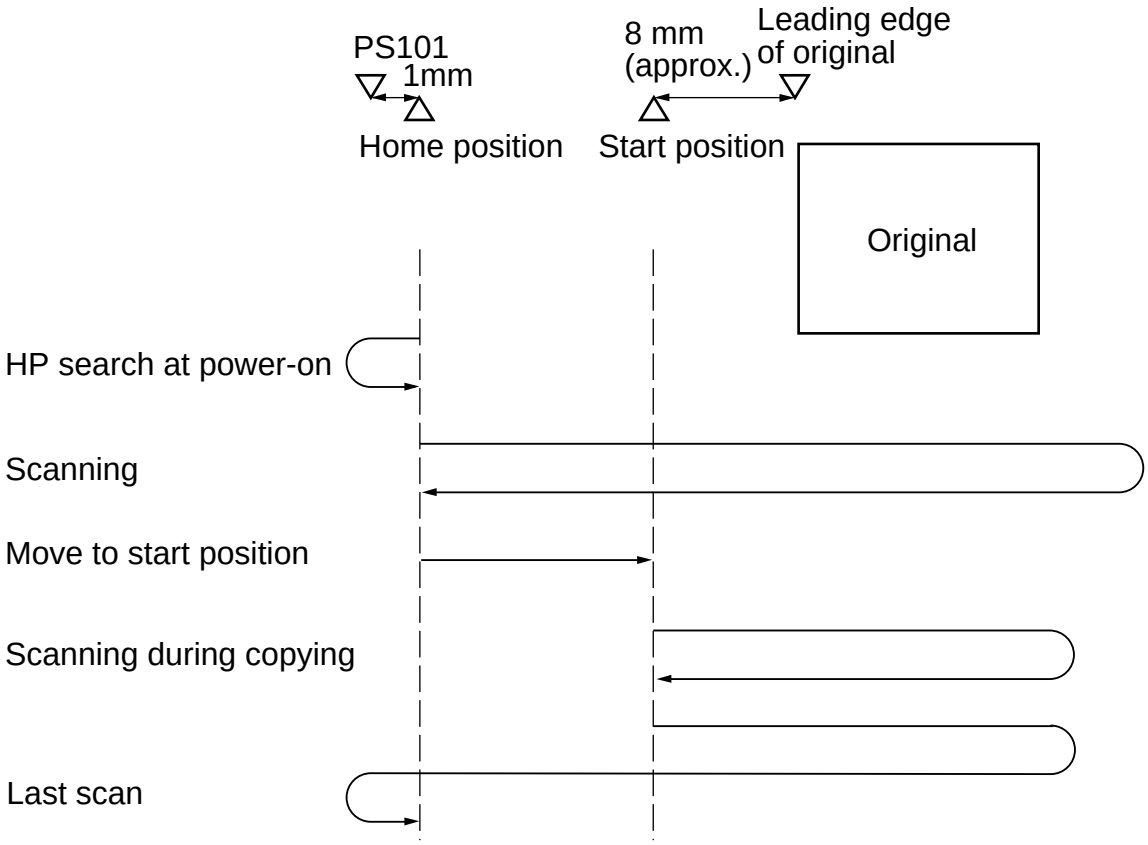

Figure 3-202

III. SCANNER MOTOR

1. Outline

Figure 3-301 shows the circuit used to control the scanner motor, and it has the following functions:

① Controls the direction of rotation of the scanner motor.
② Controls the speed of rotation of the scanner motor.

The scanner motor changes its direction of rotation when moving the scanner forward and in reverse. On the other hand, the speed of its rotation (i.e., during scanning) varies according to the selected reproduction ratio.

The speed of rotation when moving the scanner in reverse, further, is in any of the following four categories, with the values in parentheses indicating comparisons against the speed used to move the scanner forward in Direct (approx.):

- 1-page mode (7.7 times as fast)
- The reverse distance of the No. 1 mirror mount is 105.1 mm or more (16.4 times as fast).
- The reverse distance of the No. 1 mirror mount is 70.1 mm or more and less than 105.1 mm (9.3 times as fast).
- The reverse distance of No. 1 mirror mount is less than 70.1 mm (5.7 times as fast).

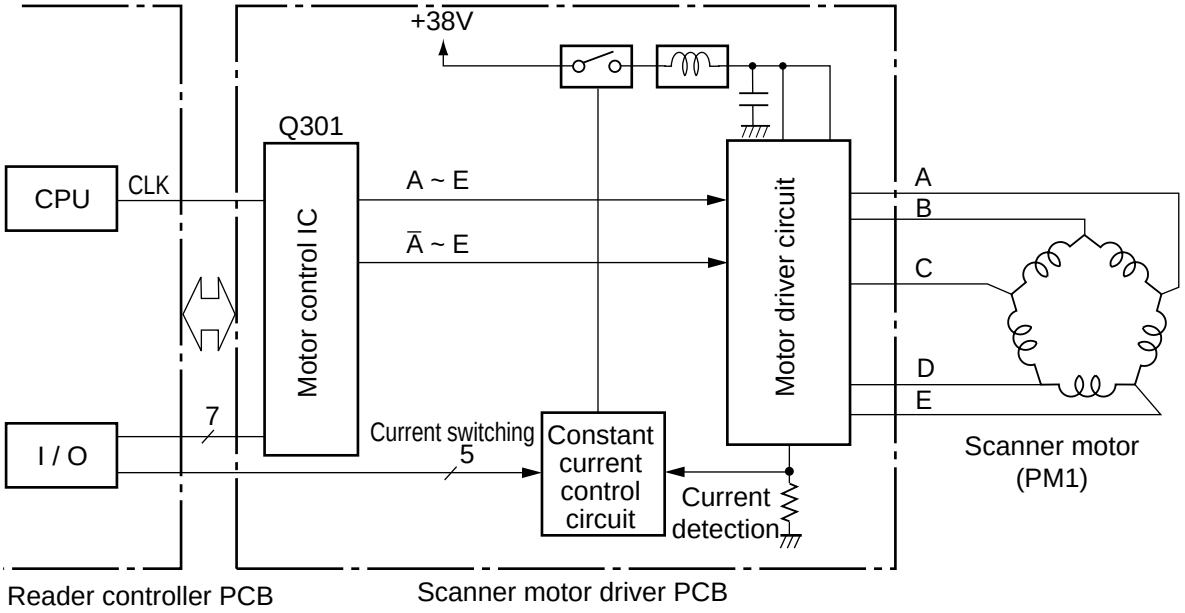

Figure 3-301

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2. Operation

The reader controller PCB sends the MTCLK* signal, CW/CCW* signal, and STEP_ANGLE)* through STEP_ANGLE3* signals to the scanner motor driver PCB to suit the scanning mode, distance, and reproduction ratio.

In response, the motor control IC (Q301) on the scanner motor driver PCB generates motor drive pulses (SPA to SPE, SNA to SNE) to drive the scanner motor. The scanner motor is a 5-phases stepping motor, and controls the direction and speed of scanning by varying the sequence and frequency of the motor drive pulses (SPA through SPE and SNA through SNE).

The constant current control circuit controls the current flowing to the motor to a specific level to suit the speed of motor rotation.

When the motor remains at rest in standby, the current flowing to the motor is cut in response to the MOVE* signal so as to prevent heating of the motor.

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IV. CHANGING THE REPRODUCTION RATIO

The reproduction ratio in main scanning direction (drum axial direction) is changed by skipping image signals when writing them into the line memory (reduction) or by reading the same image signals when reading them from the line memory (enlargement).

The reproduction ratio in sub scanning direction is changed by moving the mirror mount faster (reduction) or slower (enlargement).

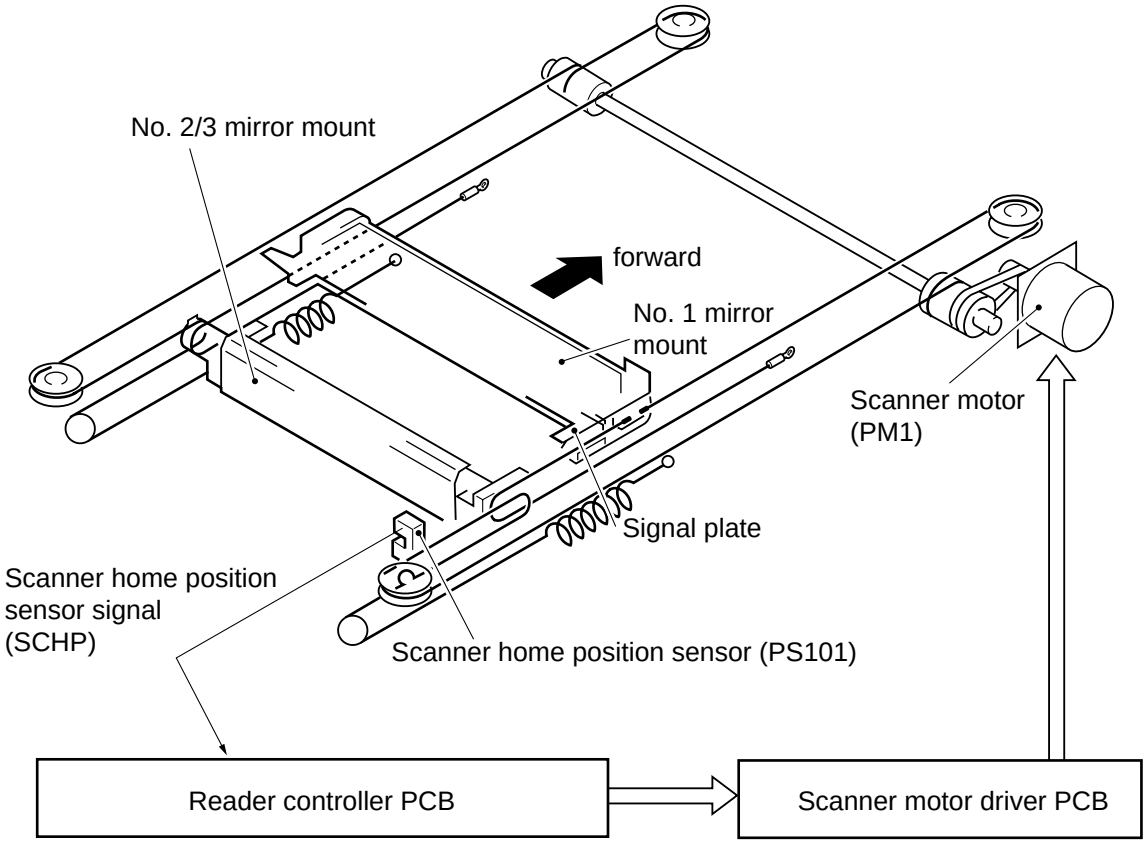

Figure 3-401

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V. CONTROLLING THE SCANNING LAMP

A. Outline

The copier's scanning lamp is a fluorescent lamp. The lamp is turned on and off by the inverter PCB according to the reader controller PCB; the mechanisms involved are as follows:

- Controls the scanning lamp preheating mechanism.
- Turns on and off the scanning lamp.
- Controls the intensity of the scanning lamp.
- Controls the temperature of the scanning lamp heater.
- Checks the condition (deterioration) of the scanning lamp.
- Detects errors.

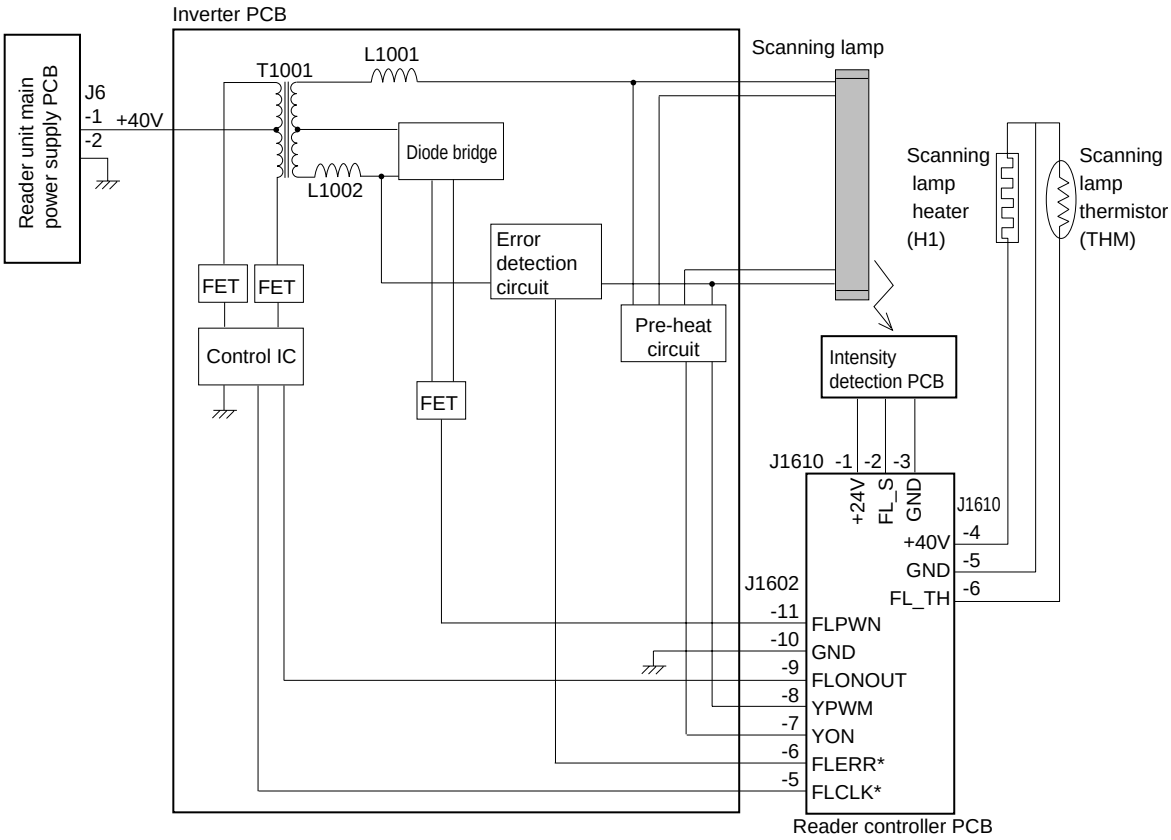

Figure 3-501

B. Controlling the Pre-Heating Mechanism of the Scanning Lamp

To reduce the time over which the scanning lamp reaches its optimum intensity after a press on the Copy Start key, the filament of the scanning lamp is supplied with power. This mechanism is called "pre-heating," and it may be standby pre-heating, pre-activation pre-heating, or activation pre-heating.

1. Standby Pre-Heating

The filament is supplied with a voltage of 2.9 ±0.25 V after power-on, during initial rotation, and after copying. If the lamp turns on and then off at the end of copying, standby pre-heating is ended and it will be started as soon as the lamp heater turns on next time. Thereafter, standby pre-heating remains on until the next time the lamp turns on.

2. Pre-Activation Pre-Heating

The filament is supplied with a voltage of 4.35 ±0.45 V 1.5 sec before the scanning lamp is turned on for copying.

3. Activation Pre-Heating

The filament is supplied with a voltage of 3.8 ±0.4 V during copying. Thereafter, a voltage determined based on the intensity duty value read while the scanning lamp is on will be applied.

C. Turning On and Off the Scanning Lamp

The scanning lamp is turned on and off by the scanning lamp on signal (FLPWM), scanning lamp clock signal (FLCLK*), and scanning lamp ON signal (FLONOUT) from the reader controller PCB.

D. Controlling the Intensity of the Scanning Lamp

The FLPWM signal is a pulse signal, and the intensity of the scanning lamp is controlled so that it remains a constant level by changing the duty ratio of the signal according to the scanning lamp intensity signal (FL_S) detected by the intensity detection PCB and the scanning lamp VR setting.

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E. Controlling the Temperature of the Scanning Lamp Heater

The copier uses a scanning lamp heater to speed up the preparation of the scanning lamp. Normally, the scanning lamp heater is set to 70 ±5°C, and its temperature is monitored by the scanning lamp thermistor. The temperature of the scanning lamp is controlled as follows:

- If the scanning lamp is less than 40°C at power-on, the filament of the scanning lamp is supplied with power for 120 sec by way of standby pre-heating. Thereafter, the intensity duty ratio is made 10%, and minimum current preparatory activation is executed for 120 sec, during which time the scanning lamp heater is controlled to 70°C. The scanning lamp heater is not turned on unless the scanning lamp is turned on as part of preparatory activation.
- If the temperature is 40°C or more at power-on, the copier will assume that the power has been turned on immediately after it was turned off, and will not turn on the scanning lamp heater but will start preparatory activation (about 20 sec).
- After preparatory activation, the temperature of the scanning lamp is controlled so that it remains the selected level (about 70°C). When the temperature falls below the selected level, the copier turns on the scanning lamp heater; if it rises above the selected level, on the other hand, the copier will turn off the scanning lamp heater.

F. Checking the Condition (wear) of the Scanning Lamp

The condition of the scanning lamp is checked at such times as follows:

1. The intensity duty value while the scanning lamp remains on is read every 100 msec (approx.), and the value is found to be higher than a specific level.
2. The temperature of the scanning lamp while it remains on is detected by the scanning lamp thermistor, and the value is found to be higher than the selected level (130°C).
3. The time taken by the scanning lamp to reach a specific level is monitored each time the lamp tuns on, and it does not reach a specific level within a specific time (2 sec, approx.).
4. When the luminous distribution of the scanning lamp lowers, and the deterioration can possibly fall outside the compensated range by shading correction.

If any of the above four conditions is detected, the copier assumes the end of the scanning lamp, and indicates a message under COPIER>DISPLAY>MISC>**FL-LIFE** in service mode. (For replacement of the scanning lamp, see p. 8-10.)

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G. Detecting Errors

Table 3-501 shows the types of errors that are related to the scanning lamp/scanning lamp heater.

Code	Cause	Description
E211	The scanning lamp thermistor has an open circuit.	The temperature has fallen below a specific level while it was controlled to 70°C.
E215	The scanning lamp thermistor has a short circuit.	When the FLONOUT signal is off (including at time of power-on), the thermistor of the scanning lamp heater has detected 170°C or more.
E216	The scanning lamp daoes not turn on in 15 sec.	The intensity sensor does not detect light from the scanning lamp in 15 sec.
E217	The scanning lamp heater is out of order.	While the scanning lamp is controlled to a specific temperature by the scanning lamp heater, its temperature does not exceed the selected level after supplying the lamp heater with power for 3 min or more.
E218	The scanning lamp is out of order.	The scanning lamp is not installed (as after replacement work). Or, the filament of the lamp is broken.
E219	The scanning lamp has reached the end of its life.	While the scanning lamp is on, the thermistor of the scanning lamp heater has detected 150°C or more.

Table 3-501

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VI.IDENTIFYING THE SIZE OF ORIGINALS

1. Outline

The copier identifies the size of an original in reference to an original placed on the copyboard glass, and turns on the following functions based on the identified size:

- Automatic paper selection
- Automatic ratio selection

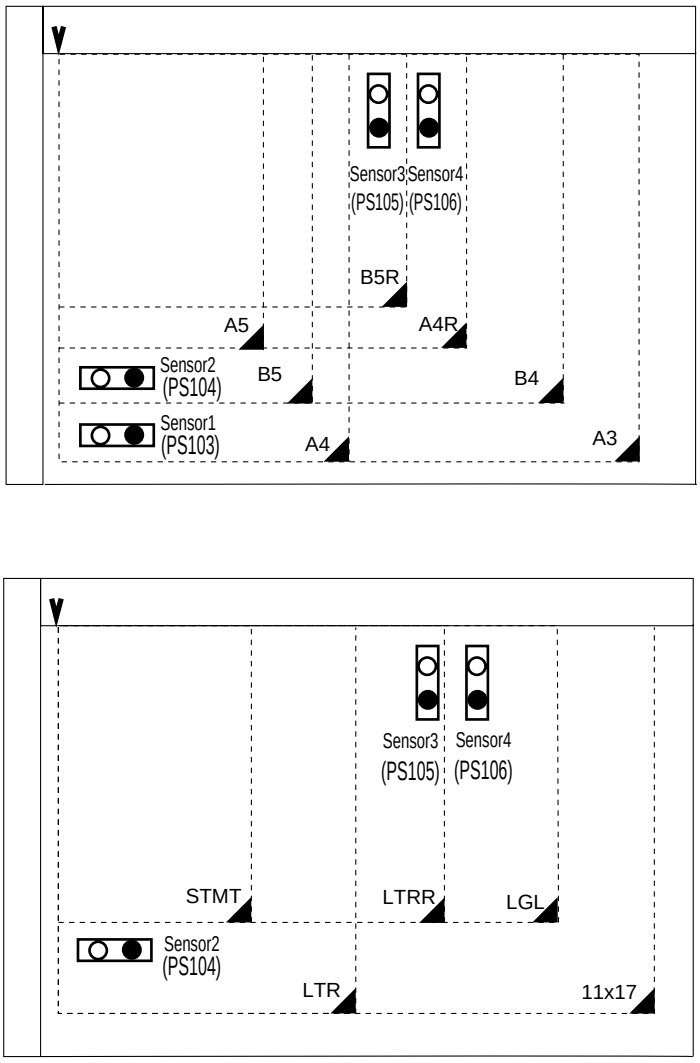

Figure 3-601

2. Original Size Sensors

The original size sensors are of a reflecting type and are mounted under the copyboard glass to identify the size of originals placed on the copyboard glass.

When the copyboard glass cover is brought down to about 30°, the photointerrupter (PS102) turns on (i.e., the light-blocking plate blocks PS102). For 15 sec after PS102 turns on, or until the Copy Start key is pressed, the output level of each sensor is read at intervals of about 0.1 sec. If the level of the output remains the same during the period, the copier will assume the presence of an original over the sensor in question, and will identify the size of the original as shown in Tables 3-601 and -602. This way, the copier is also capable of identifying the size of a black original.

The level of the output of a sensor will not change under conditions a and b below; in the case of c, on the other hand, the copier will show a screen on the control panel in response to a press on the Copy Start key (for selecting a cassette in the case of auto paper selection or for selecting an original size in the case of auto ratio selection):

a. A3 black original
b. Book original (The thickness prevents a change in the sensor level.)
c. Copyboard cover in open state (PS102 is off.)

Reference:

In the case of a, b, or c above, the copier can wrongly identify the size of the original.

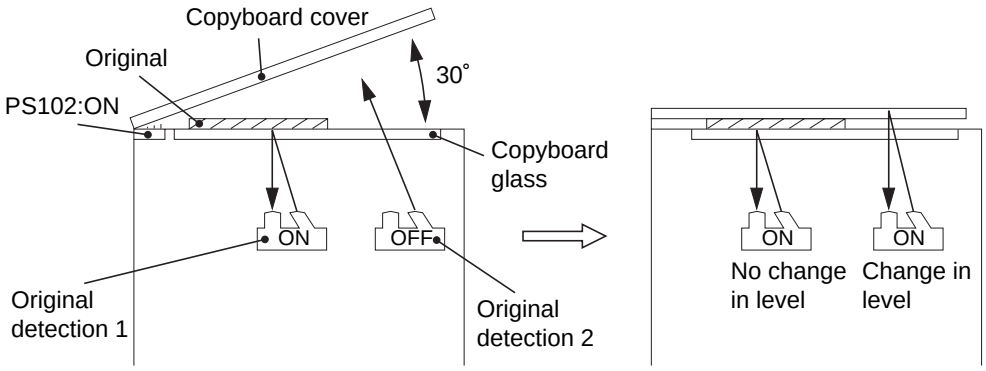

Figure 3-602

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3. Identifying the Size of Originals

The reader controller PCB identifies the size of an original based on the state of signals indicating the presence/absence of an original (Tables 3-601 and -602).

Unchanged: The output of the sensor is read about every 100 msec after the copyboard cover open/closed sensor turns on. The notation "unchanged" means that the sensor output remained unchanged, detecting the presence of an original.

Changed: The output of the sensor is read about every 100 msec after the copyboard cover open/closed sensor turns on. The notation "changed" means that the sensor output has changed, detecting the absence of an original.

Original size	Original size sensor			
	1	2	3	4
A3	unchanged	unchanged	unchanged	unchanged
B4	changed	unchanged	unchanged	unchanged
A4R	changed	changed	unchanged	unchanged
A4	unchanged	unchanged	changed	changed
B5	changed	unchanged	changed	changed
BR	changed	changed	unchanged	changed
	changed	changed	changed	changed

Table 3-601 (A/B-configuration)

Original size	Original size sensor		
	2	3	4
1117	unchanged	unchanged	unchanged
LGL	changed	unchanged	unchanged
LTRR	changed	unchanged	changed
LTR	unchanged	changed	changed

Table 3-602 (Inch-configuration)

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VII.DISASSEMBLY/ASSEMBLY

Make sure of the following when disassembling or assembling the machine:

1. ⚠ When the control panel soft switch (front of the reader unit) is turned off, the fans will operate for about 30 min to cool the machine (so as to prevent caking of toner). Be sure to perform either of the following in addition to disconnecting the power plug:
   • Wait for 30 min after turning off the control panel power soft switch (right of the reader unit control panel); or
   • Turn off the control panel soft switch and the reader unit rear power switch (right of the reader unit rear), and remove the fixing assembly of the printer unit.
2. Assemble the parts by reversing the steps used to disassemble them, unless otherwise mentioned.
3. Identify the screws by type (length, diameter) and location.
4. Do not leave out the toothed washer that comes with one of the mounting screws on the rear cover to protect against static electricity.
5. Do not leave out the washer that comes with the screw used for the grounding wire and the varistor to ensure electrical continuity.
6. Do not operate the machine with any of its parts removed, unless otherwise mentioned.
7. Touch the copier's metal section before starting the work to discharge the build-up of static electricity so as to prevent static damage before handling any PCBs.

Note:

All illustrations in this chapter assume that the reader assembly is mounted on its rack.

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A. Reader Unit External Covers

① Lower front cover
② Upper right over
③ Upper rear cover
④ Upper left cover
⑤ Rear cover
⑥ Upper front cover

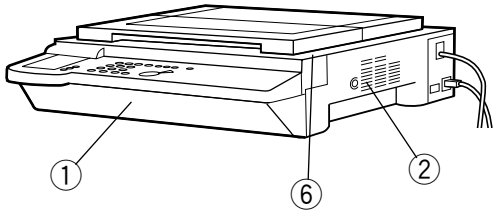

Figure 3-701

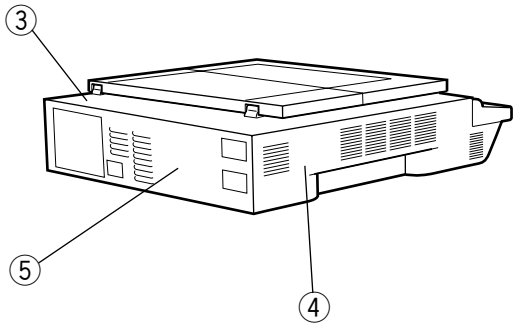

Figure 3-702

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1. Removing the Lower Front Cover

1) Remove the two screws and face plates, and detach the lower front cover.

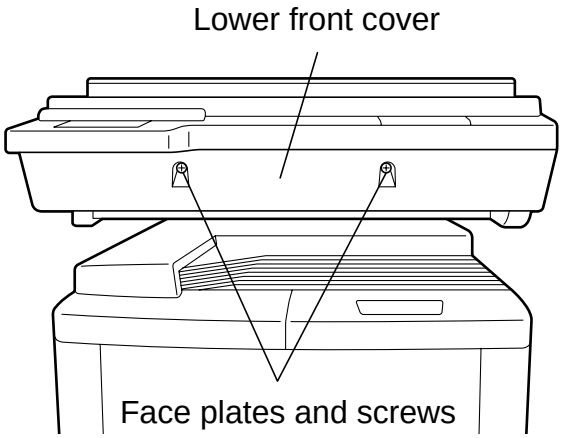

Figure 3-703

2. Removing the Upper Right Cover

1) Remove the four screws, and detach the upper right cover.

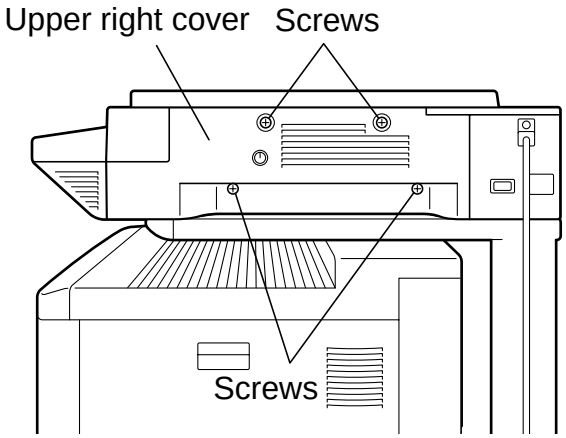

Figure 3-704

3. Removing the Upper Rear Cover

1) Remove the five screws and three face plates, and detach the upper rear cover.

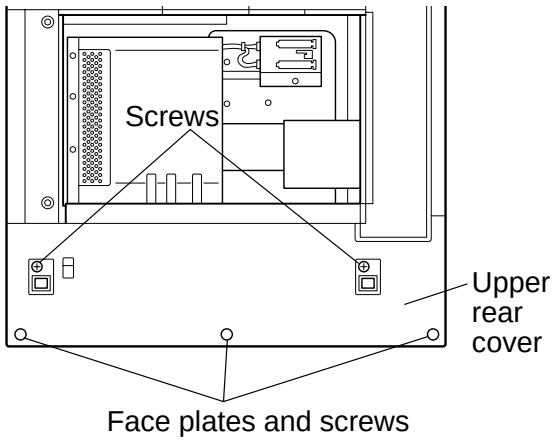

Figure 3-705

4. Removing the Upper Left Cover

1) Remove the upper rear cover.
2) Remove the five screws, and detach the upper left cover.

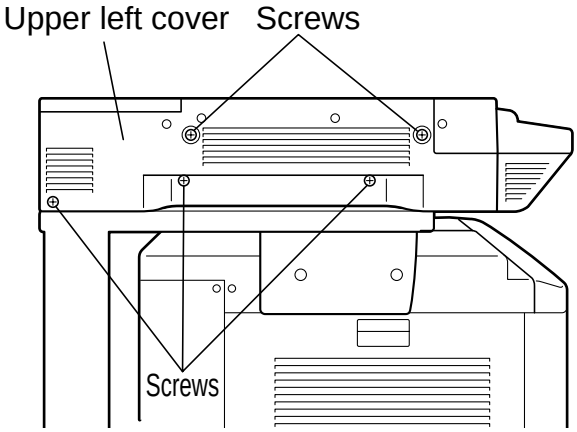

Figure 3-706

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5. Removing the Rear Cover

1) Remove the upper rear cover.
2) Remove the upper left cover.
3) Remove the three screws, and detach the rear cover.

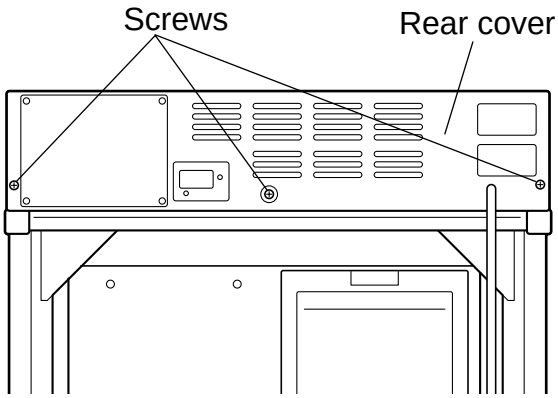

Figure 3-707

6. Removing the Upper Front Cover

1) Remove the lower front cover. (p. 3-16)
2) Remove the control panel. (p. 5-16)
3) Remove the four face plates and four screws, and detach the upper front cover.

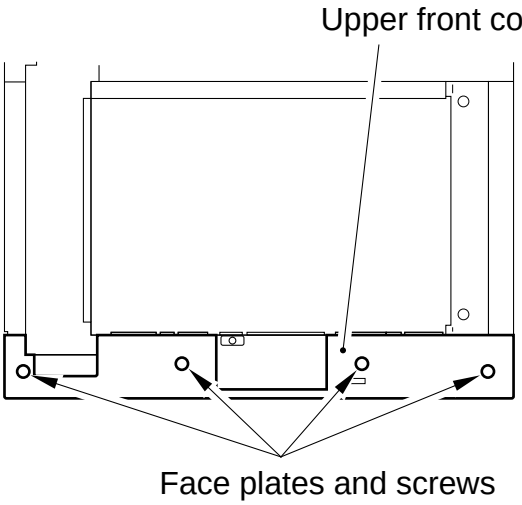

Figure 3-708

B. Scanner Drive Assembly

1. Removing the Scanner Motor

1) Remove the lower front cover. (p. 3-16)
2) Remove the control panel. (p. 5-16)
3) Disconnect the connector, and remove the three screws; then, detach the scanner motor together with its support plate. (Pay attention to the drive belt.)

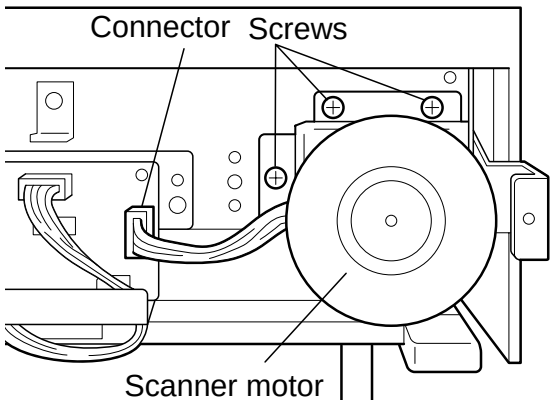

Figure 3-709

4) Remove the three screws, and detach the scanner motor from its support plate.

2. Adjusting the Tension of the Drive Belt (when mounting the scanner motor)

1) Move the scanner motor (w/ support plate) to the right, and tighten the screws in place. (Refer to the initial screw position.)

3. Removing the Scanner Motor Driver PCB

1) Remove the lower front cover.
2) Disconnect the three connectors, and remove the two screws; then, free the cable from the cable clamp, and detach the scanner motor driver PCB.

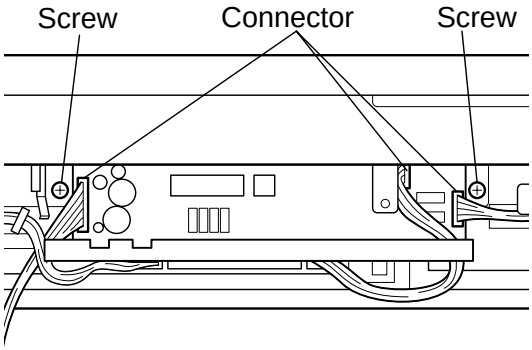

Figure 3-710

4. Routing the Scanner Drive Cable

You will need a mirror positioning tool (FY9-3040-000) when mounting the scanner drive cable.

1) Remove the copyboard cover.
2) Remove the two screws, and detach the right glass retainer cover.

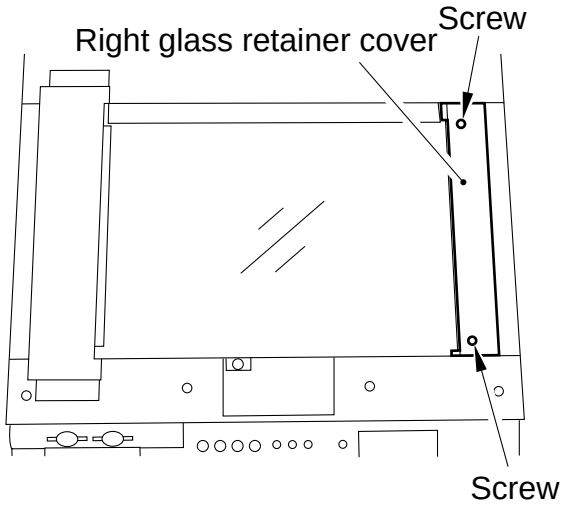

Figure 3-711

3) Remove the copyboard glass.
4) Remove the lower front cover. (p. 3-16)
5) Remove the control panel. (p. 5-16)
6) Remove the upper front cover. (p. 3-17)
7) Remove the upper rear cover. (p. 3-16)
8) Remove the standard white plate cover. (p. 3-26)

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9) Remove the four screws, and detach the right reinforcing stay.

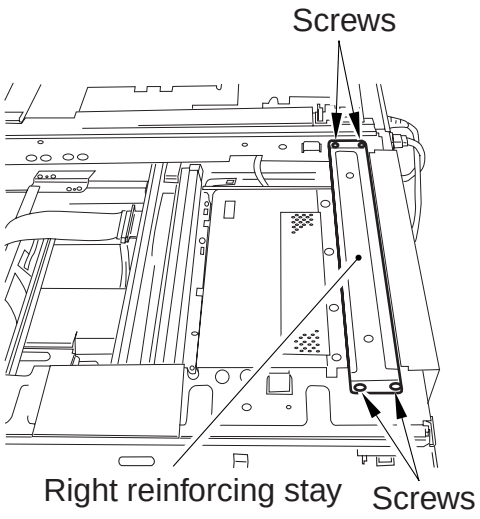
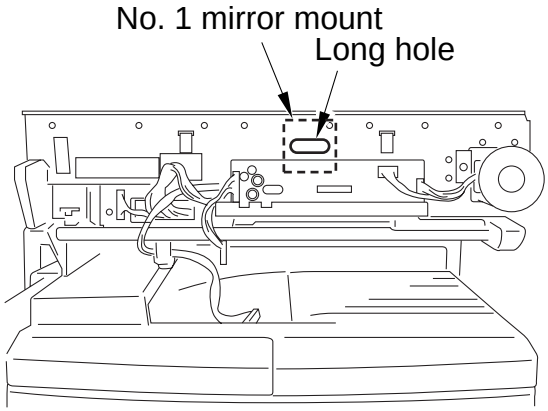


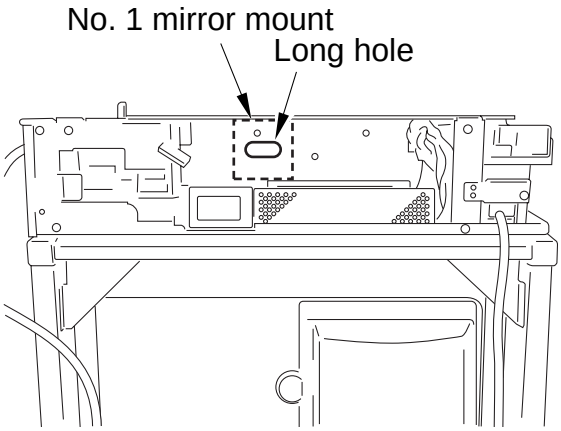
Figure 3-712

10) Remove the upper left cover. (p. 3-16)
11) Remove the rear cover. (p. 3-17)
12) Remove the reader unit main power supply PCB. (p. 5-18)

13) Shift the No. 1 mirror mount so that the cable metal fixing of the No. 1 mirror is in view through the long hole in the side plate.



(front)



(rear)

Figure 3-713

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14) Engage the scanner cable on the pulley and the hook as shown.

Caution:

Take care not to damage the cable by the edge of the metal plates.

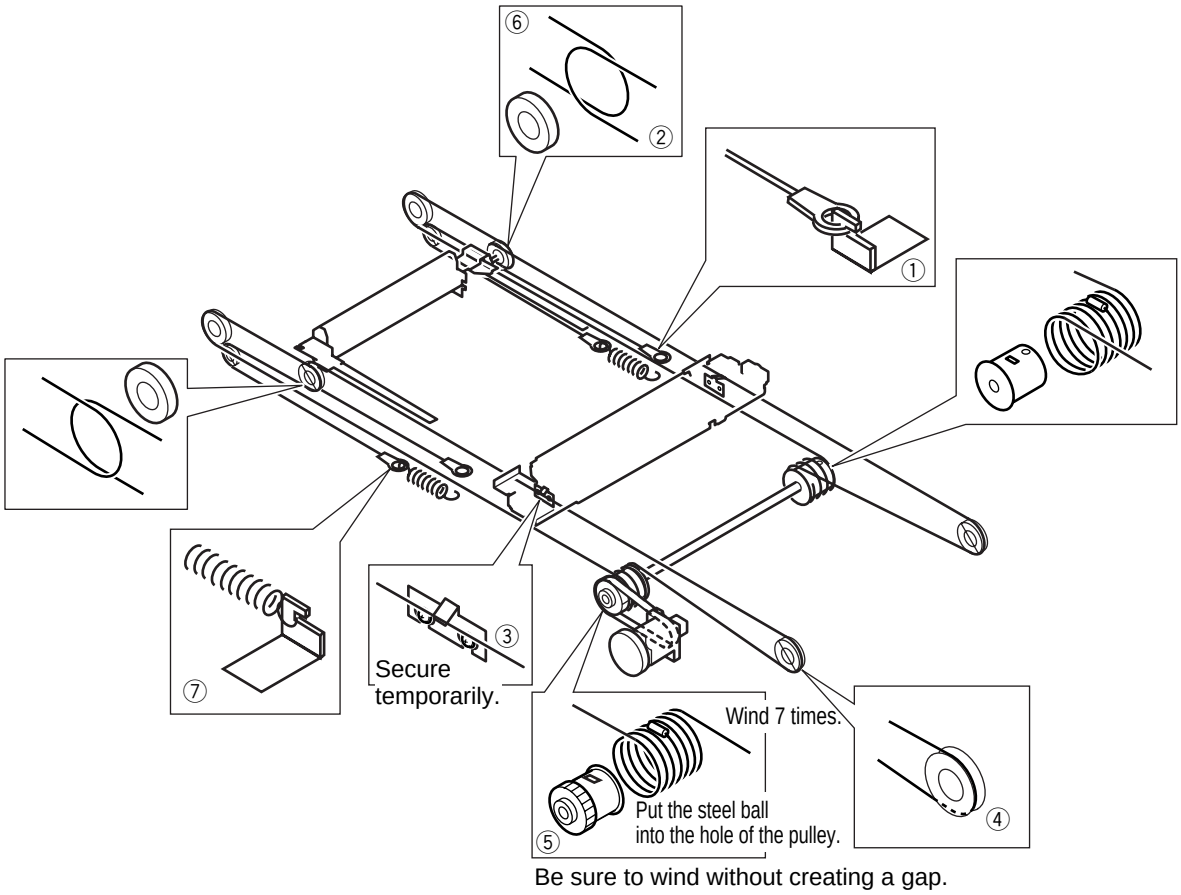

Figure 3-714

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15) Loosen the screws on the mirror positioning tool (FY9-3040-000), and contract the arms fully.

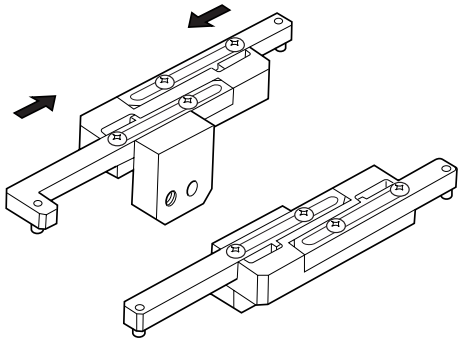

Figure 3-715

16) Fit the mirror positioning tool between the No. 1 mirror mount and the No. 2 mirror mount, and insert the pin that comes with the positioning tool.

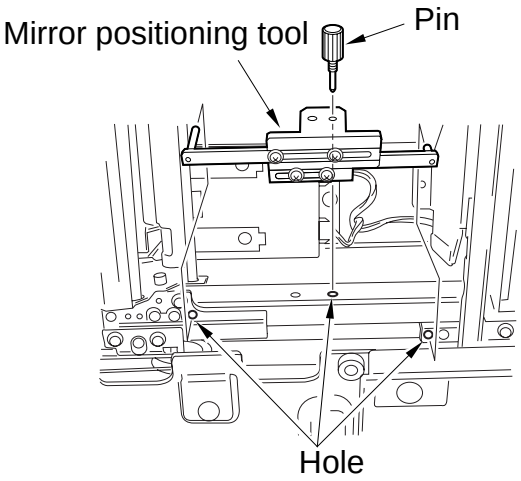

Figure 3-716

17) Secure the cable metal fixing temporarily secured in 3 of step 14) with two screws inside the long hole of the side plate.

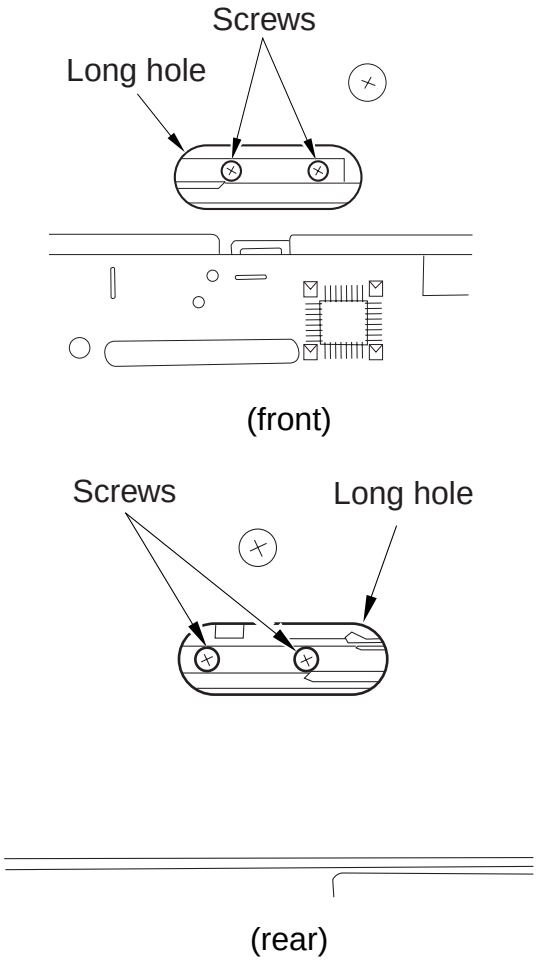

Figure 3-717

18) Detach the mirror positioning tool.
19) Perform steps 1) through 2) in reverse.

Reference:

The copier doe not require adjustment of cable tension.

5. Points to Note When Handling the Flexible Cable

Do not disconnect the connector of the flexible cable connected to the No. 1 mirror mount except when replacing the No. 1 mirror mount. (The mirror must be cleaned without disconnecting the cable.)

Removing the Flexible Cable

1) Remove the two screws, and detach the right glass retainer cover.

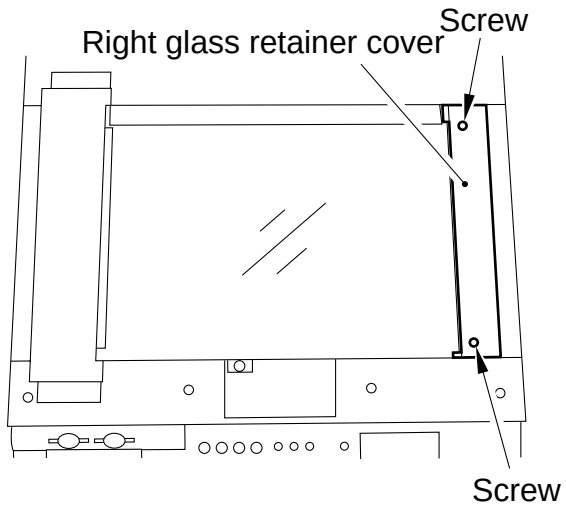

Figure 3-718

2) Remove the copyboard glass.
3) Shift the No. 1 mirror mount to the center.

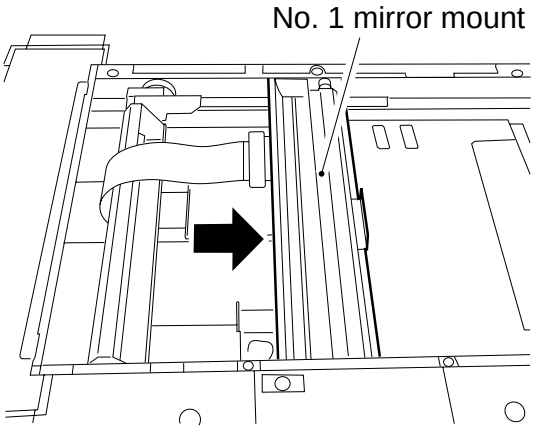

Figure 3-719

4) Peel the warning label from the flexible cable.

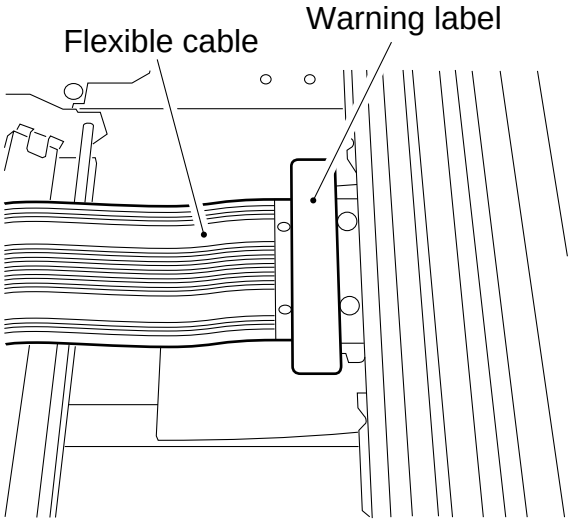

Figure 3-720

5) Push in the claws inside, and release the connector to the flexible cable.

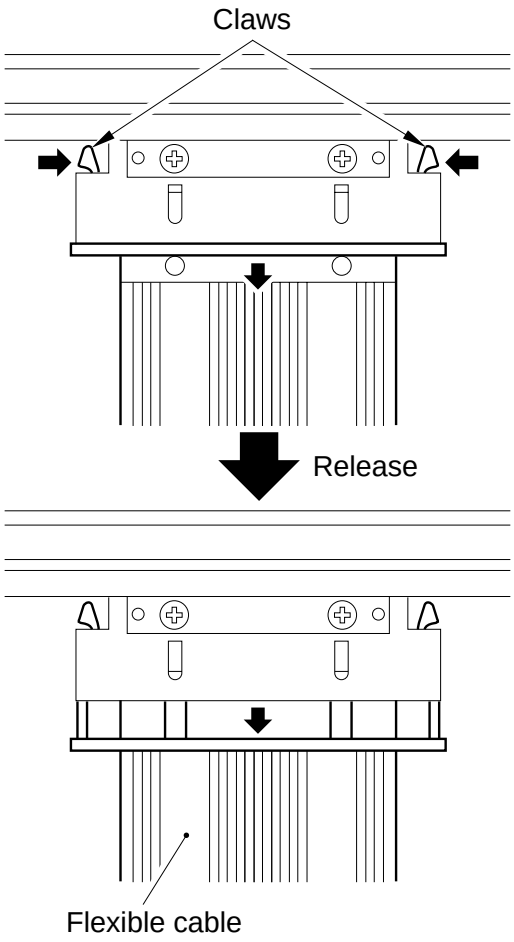

Figure 3-721

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6) Using a small screwdriver, push the two tables holding the flexible cable in place to disconnect the flexible cable from the connector.

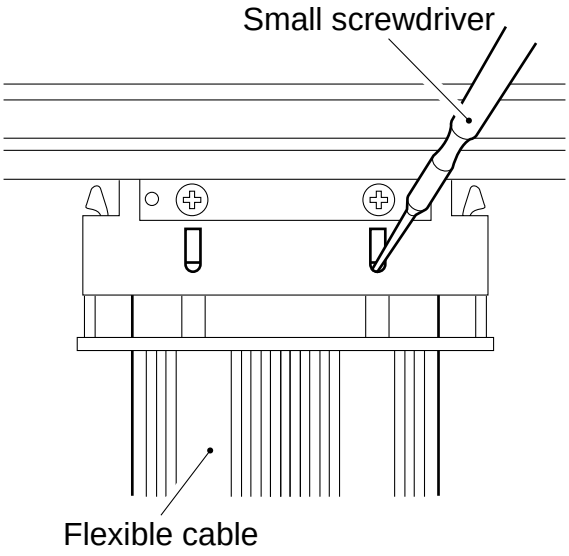

Figure 3-722

Caution:

When connecting the flexible cable to the connector, make sure that the metal area of the cable does not have metal powder or dust. Clean it as necessary.

C. Exposure System

1. Removing the Scanning Lamp/Scanning Lamp Heater

1) Remove the two screws, and remove the right glass retainer cover. (p. 3-18)
2) Remove the copyboard glass.
3) Remove the screw, and detach the scanning lamp cover.

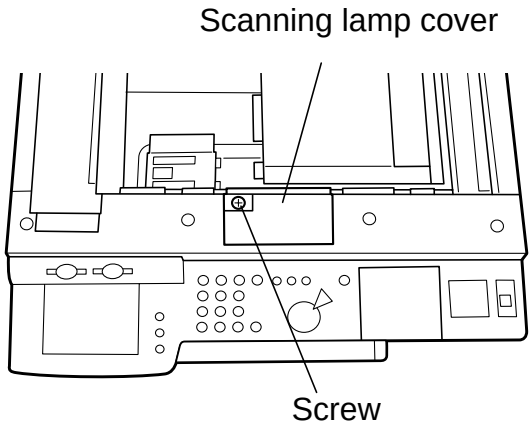

Figure 3-723

4) Remove the two screws, and detach the scanning lamp inside cover.

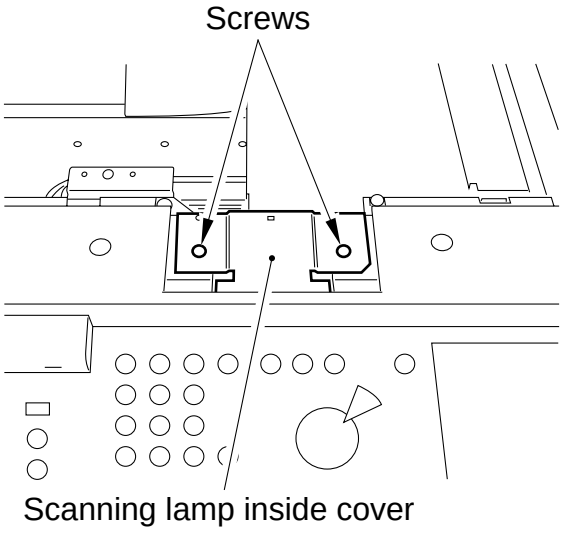

Figure 3-724

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5) Put the No. 1 mirror mount where the scanning lamp cover has been removed.
6) Remove the two screws, and detach the anti-reflecting plate.

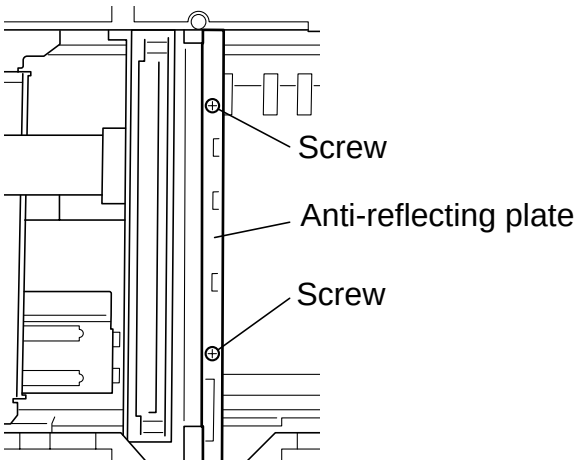

Figure 3-725

Caution:

When mounting the anti-reflecting plate, be sure to fit the anti-reflecting plate into the cut-off (front, rear) in the No. 1 mirror mount securely. Further, be sure to fit the connector of step 7) to the anti-reflecting plate.

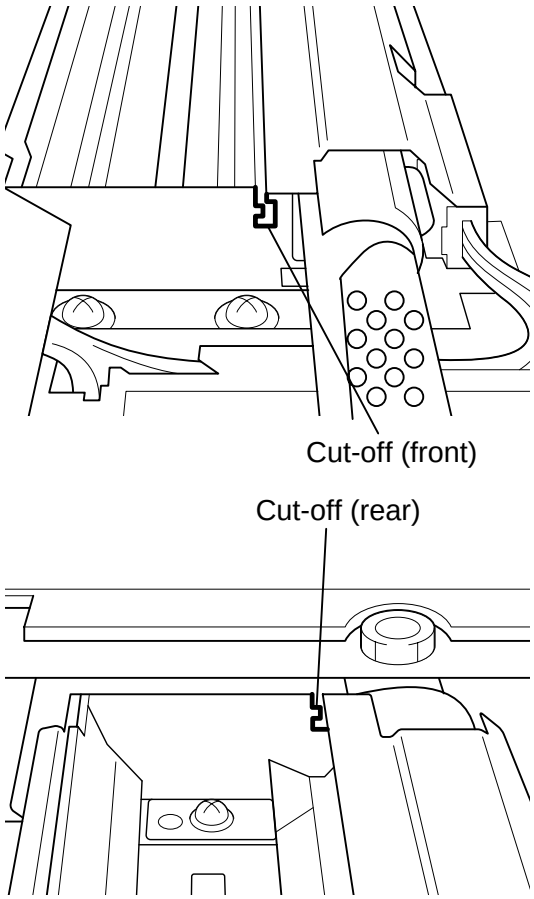

Figure 3-726

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7) Disconnect the connector, and remove the two screws; then, detach the scanning lamp from the electrode plate (front).

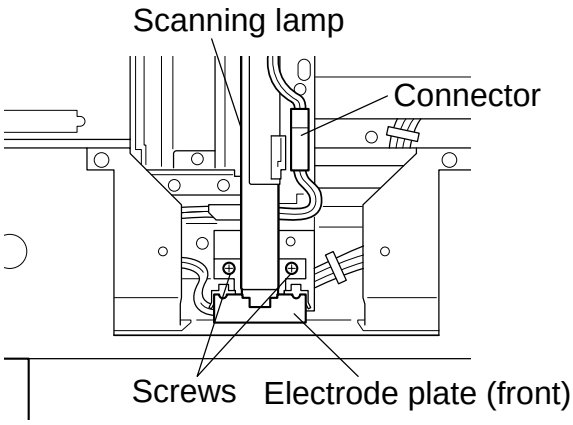

Figure 3-727

8) Remove the scanning lamp (w/ scanning lamp heater) to the front.

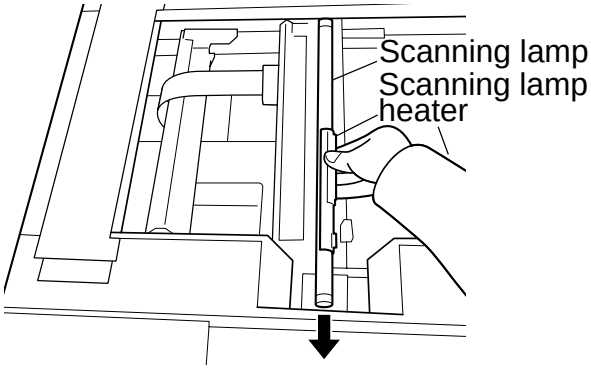

Figure 3-728

9) Remove the scanning lamp heater and the heater ring (front; rear; 2 pc.) from the scanning lamp.

2. Points to Note When Replacing the Scanning Lamp

- Do not work when the surface of the scanning lamp is hot.
- Do not leave fingerprints on the surface of the scanning lamp.
- If the surface of the scanning lamp is soiled, dry wipe it.
- When mounting the scanning lamp heater to the scanning lamp, be sure to match the reference points. (The connector of the scanning lamp heater is toward the front.)

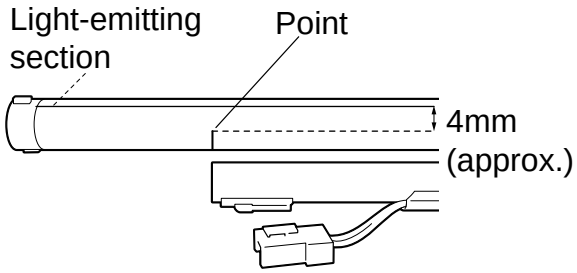

Figure 3-729

- When mounting the scanning lamp to the copier, take care not to touch the light-emitting section.
- When mounting the scanning lamp, be sure that the text/marking is toward the copier's upper front.

• When mounting the heater ring, be sure to locate it about 4 to 8 mm from the light-emitting section.

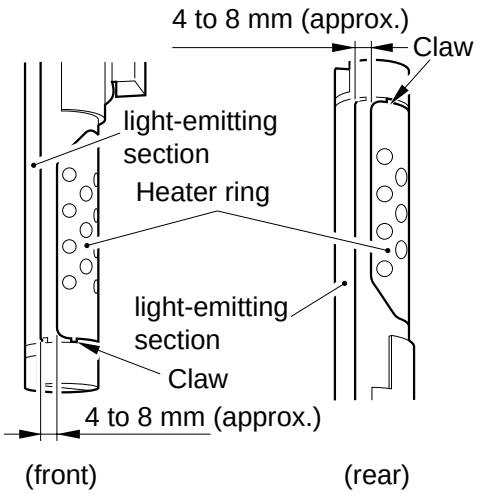

Figure 3-730

• When mounting a new scanning lamp, or when removing and then mounting back the existing lamp, be sure to make the necessary adjustments. (pp. 8-10, -11)

3. Removing the Standard White Plate Cover

1) Remove the two screws, and detach the right glass retainer cover.
2) Remove the copyboard glass.
3) Remove the standard white plate small cover (1 each from front and rear) using a flat-blade screwdriver.

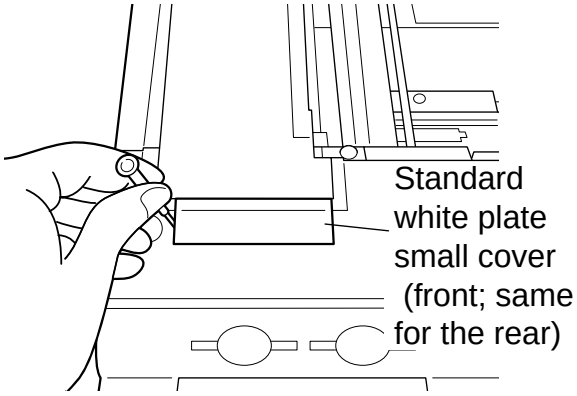

Figure 3-731

4) Remove the four screws, and detach the standard white plate cover (standard white plate).

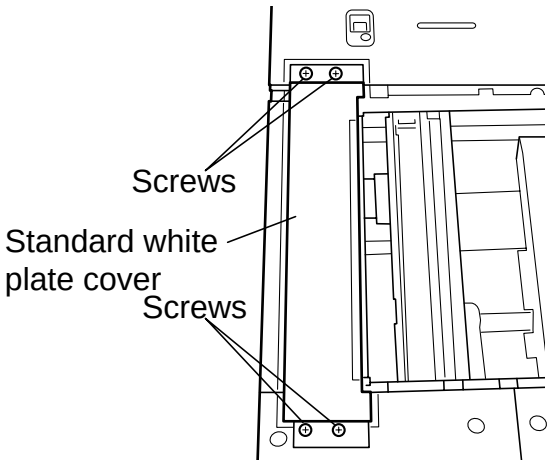

Figure 3-732

Caution:

When replacing the standard white plate cover (standard white plate), see p. 8-12.

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D. PCBs

1. Removing the Intensity Detection PCB

1) Remove the two screws, and detach the right glass retainer cover.
2) Remove the copyboard glass.
3) Remove the screw, and detach the claws while pushing them down.

Figure 3-733

4) Disconnect the connector (J2001), and remove the screw; then, detach the intensity detection PCB.

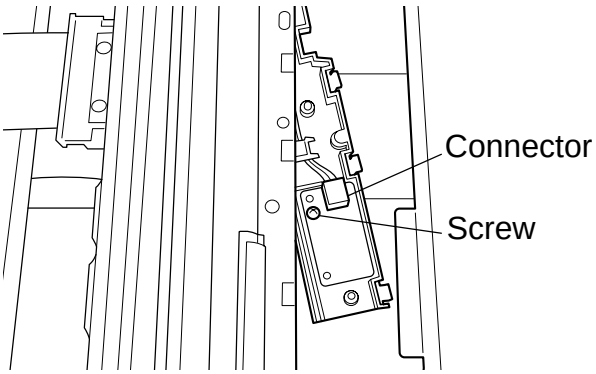

Figure 3-734

2. Removing the Inverter PCB Unit

1) Remove the reader unit main power supply PCB. (p. 5-22)
2) Disconnect the three connectors, and remove the two screws; then, remove the inverter PCB unit.

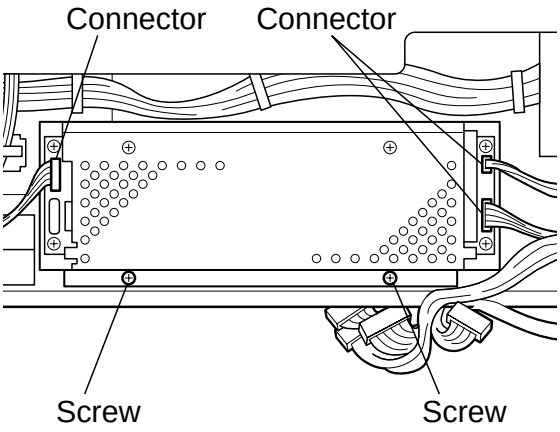

Figure 3-735

CHAPTER 4

IMAGE PROCESSING SYSTEM

This chapter provides outlines of the CCD/CCD PCB and analog/digital image processing.

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I. OUTLINE

The image processing system consists of a CCD, CCD driver PCB, and AP-IP PCB, and serves to convert optical images from the scanning system into electrical signals and send the result to the laser exposure system of the printer unit after correction and processing.

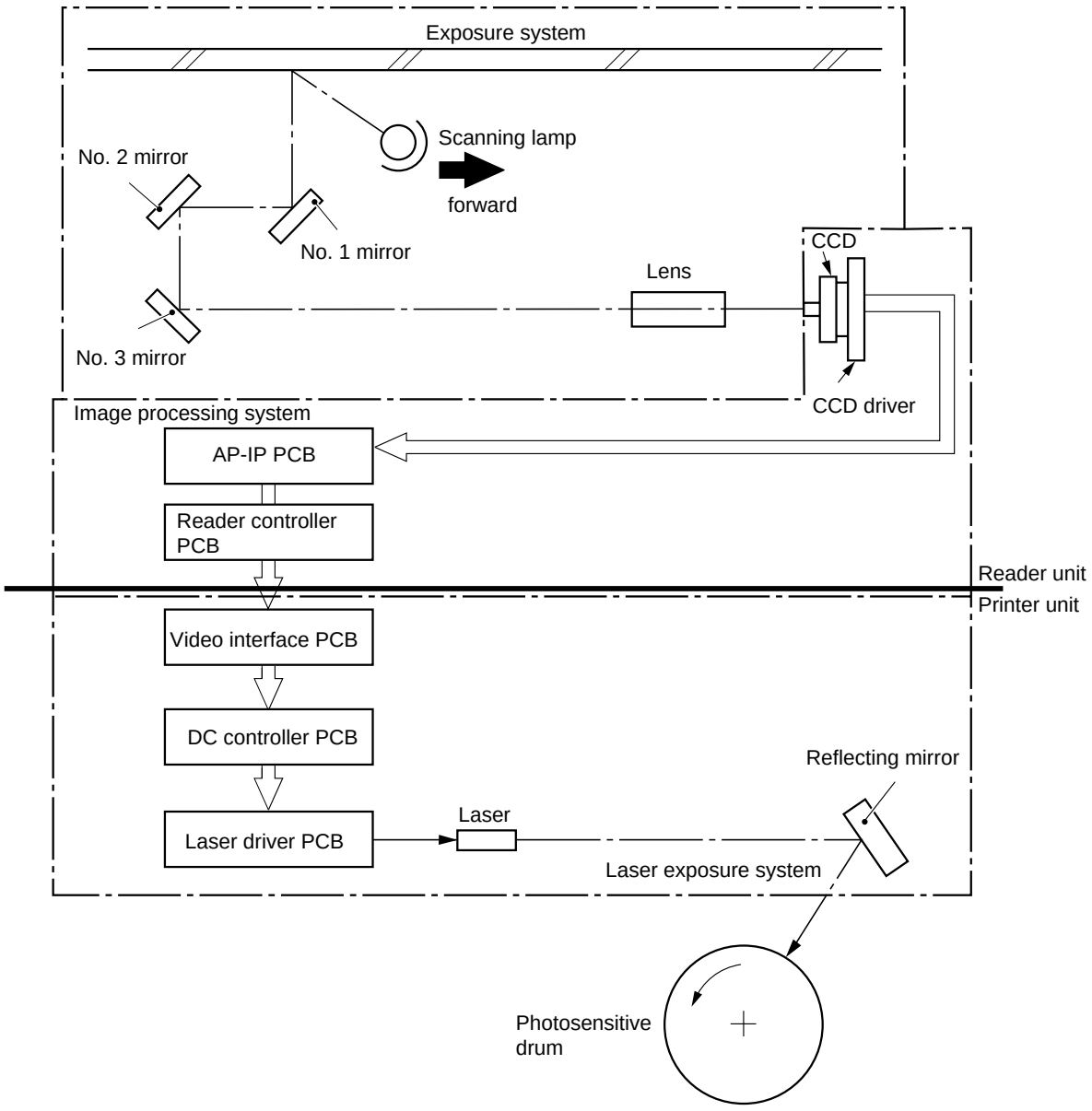

Figure 4-101

II. CCD/CCD DRIVER

A. CCD

The CCD (charge-coupled device) consists of a 3-line CCD composed of about 7,500 photocells, and each CCD line is covered with a B, G, or R filter.

Each CCD line, further, consists of a transfer block and an output block, and the output of the odd-numbered photocells and the output of the even-numbered photocells are sent out by output blocks A and B, respectively. As such, the copier's CCD sends out image signals simultaneously in six channels.

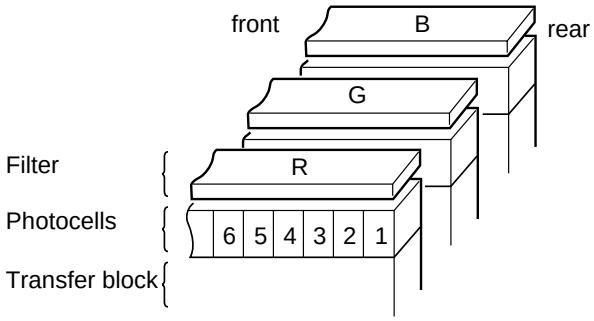

Figure 4-201

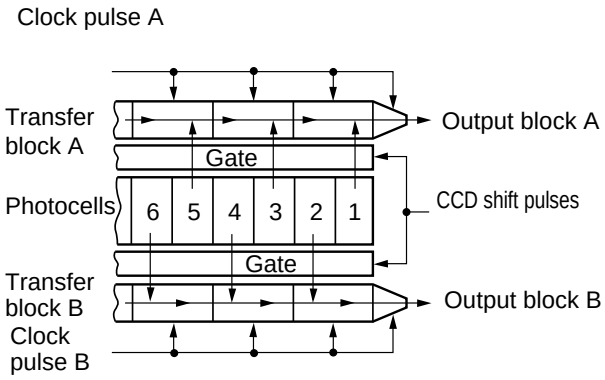

Figure 4-202

B. CCD Driver

The image signals generated by the CCD are sent through a buffer (low-impedance circuit) for reduction of impedance and then to the AP-IP PCB.

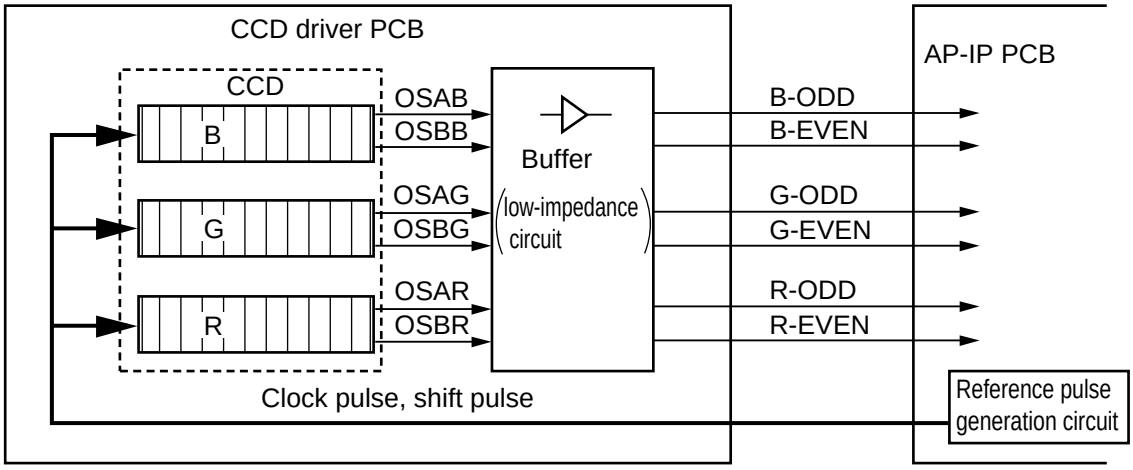

Figure 4-203

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III. ANALOG IMAGE PROCESSING

1. Outline

The analog image processing circuit processes the output from the CCD for the following:

- Odd-/even-number bit synthesis
- BGR level matching
- A/D conversion circuit
- ABC circuit

The image signals coming in six channels (by even-/odd-number bit) are held for sampling by the sample hold signals (SH1 through SH4) for extracting signal components.

Thereafter, BGR signal levels are matched according to the BGR gain and offset signals for correction of photoconversion efficiencies (of the B, G, and R CCD lines); then, the results are synthesized into B, G, and R image signals according to the select signal (SEL).

The A/D conversion circuit operates in response to the ADCLK signal, and serves to convert B, G, and R image signals into 8-bit digital signals for input to the image processor block.

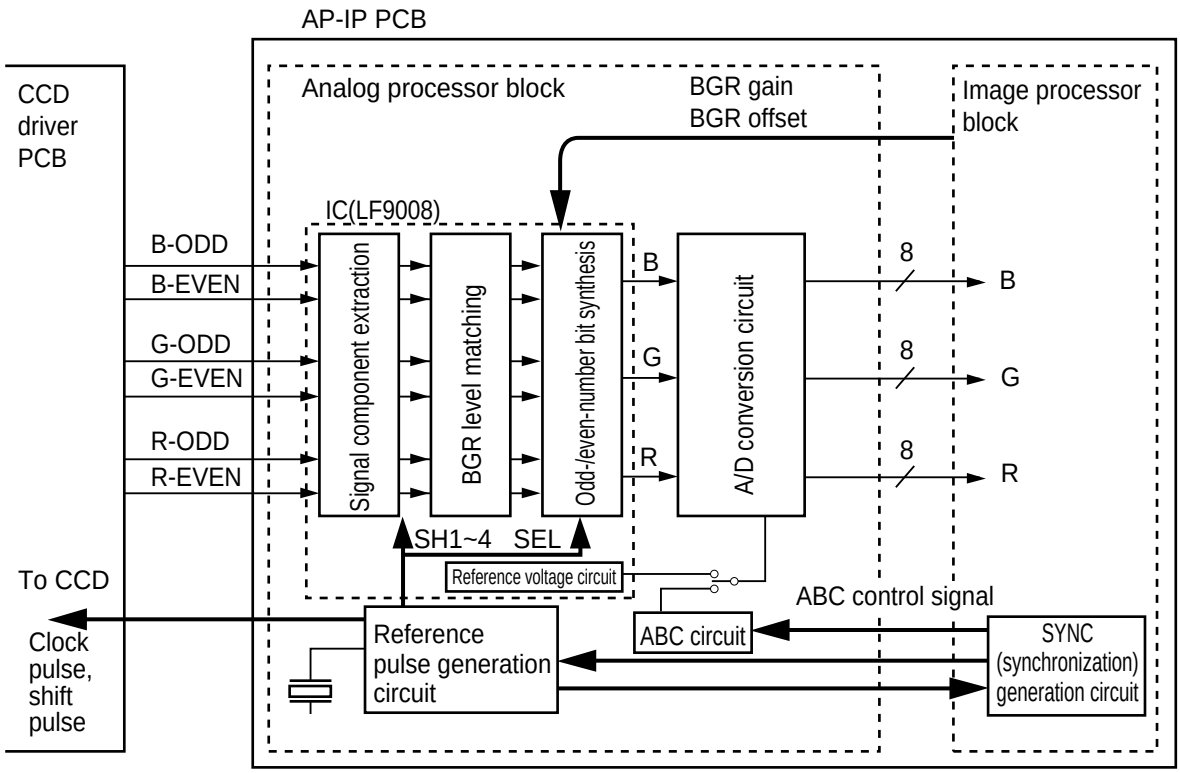

Figure 4-301

2. ABC (Auto Background Control) Circuit

a. AE Mode

The machine's AE mode (in black-and-white text mode) may be either of the following two:

- priority on speed (factory setting)
- priority on image quality

In general, "priority on speed" is used in AE for originals mostly of text, and turns out first prints in a short time owing to the absence of pre-scanning.

On the other hand, "priority on image quality" is used in AE for originals mostly of images. In this mode, the copier uses different density correction curves according to types of originals, and performs pre-scanning over the entire face of an original to take measurements of the density.

When "priority on speed" is selected, the ABC circuit turns on to execute the following functions:

b. ABC Circuit

The A/D conversion circuit converts BGR analog image signals representing each single line in main scanning direction from the CCD in to 8-bit digital image signals for B, G, and R. The circuit operates in reference to reference voltage.

The range (i.e., difference between maximum output level and minimum output level) increases and decreases in response to increases/decreases in the reference voltage, affecting the level of signals after A/D conversion. In auto background control (ABC), the range of the reference voltage is varied according to the A/D conversion circuit output signal level to vary the background level of an original so as to enable adjustment of the density of the background.

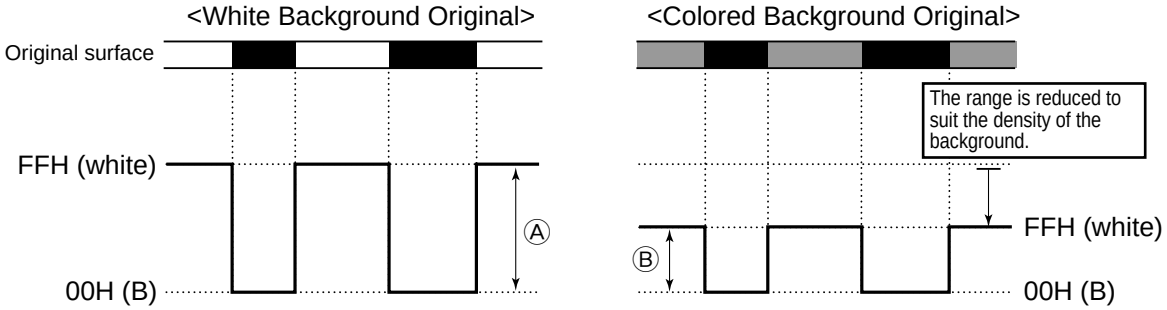

Figure 4-302 G Image Signal

As shown in the figure, the range Ⓐ of a white background original is varied (as in the case of the range Ⓑ of a colored background original) to "white out" a colored background.

In addition, the ABC circuit is designed to return image signals resulting from A/D conversion to the ABC circuit for identification of the level of the A/D conversion circuit output signals; the result of identification (reference voltage) is sent to the A/D conversion circuit. (Figure 4-301)

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IV. DIGITAL IMAGE PROCESSING

1. Outline

The machine's digital image processing is performed by the PCBs shown in Table 4-401, and these PCBs make up the machine's image processor block.

The BGR image signals from the analog image processing block are converted into CMYK image signals into the digital image processing block. At the same time, individual data units are subjected to data conversion for various image processing specified on the control panel. At the end of data conversion, the image data is sent to the printer unit in the form of 8-bit image signals.

PCB	Functions
AP-IP PCB	Shading correction, 3-line position matching, sensor color correction, background cancellation, logarithmic correction, text identification, pre-enlargement/-reduction processing, enlargement/reduction and image processing, density processing, anti-counterfeit processing, black text generation (black extraction, etc.)
ECO PCB	Assists AP-IP PCB

Table 4-401

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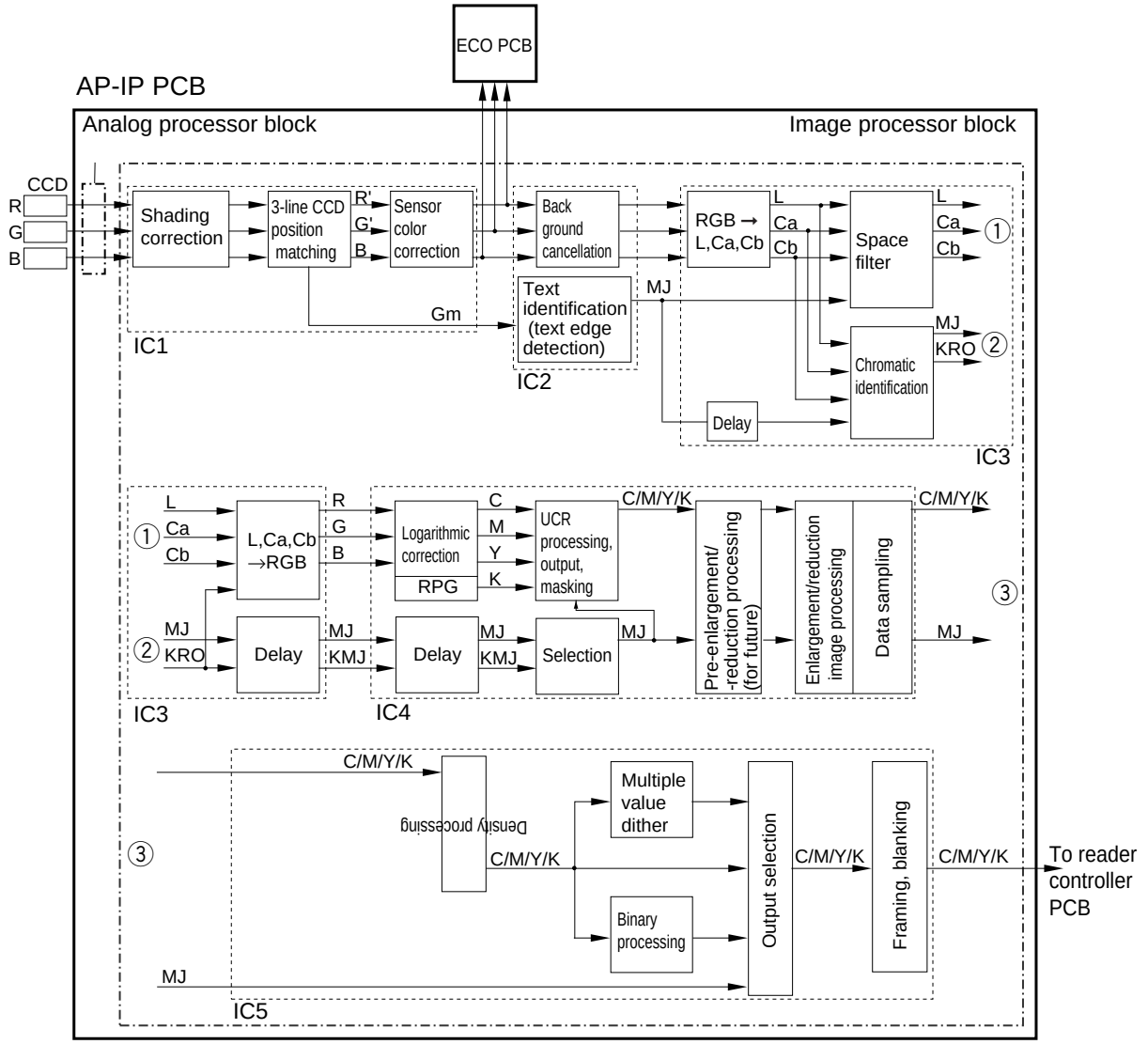

Figure 4-401

Gm : G image signal for text detection
MJ : Text detection signal
KRO : Black pixel signal
KMJ : Black text identification signal
L : Luminous component signal
Ca : Color component signal
Cb : Color component signal

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2. Shading Correction

The output of the CCD is not necessarily uniform even when the light it receives is from an original perfectly uniform in density for the following reasons:

- The sensitivity of each CCD pixel is different.
- The level of lens transmission differs between the lens middle and ends.
- The intensity of the scanning lamp differs between the lamp middle and ends.
- The scanning lamp deteriorates over time.

Shading correction is performed to make up for these discrepancies.

- Shading Correction

a. The correction target value indicated by a bar code is entered in the machine's memory at time of shipment. (The value printed under the bar code must be entered in service mode only if the standard white plate has been replaced.)
b. The CCD measures the intensity of the light reflected by the standard white plate to collect and generate data.

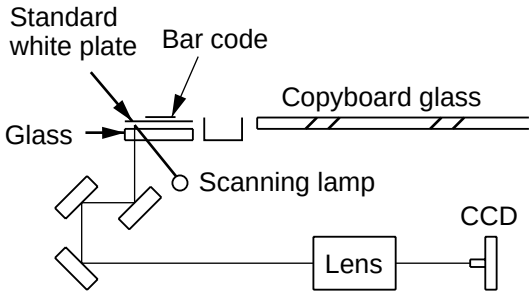

Figure 4-402

c. The shading correction circuit compares the measurement data from b. above and the target value from a. above, and stores the result in memory as the shading correction value.

The shading correction value is used to correct the data collected from scanning an original. The machine's takes measurements for correction each time its Copy Start key is pressed.

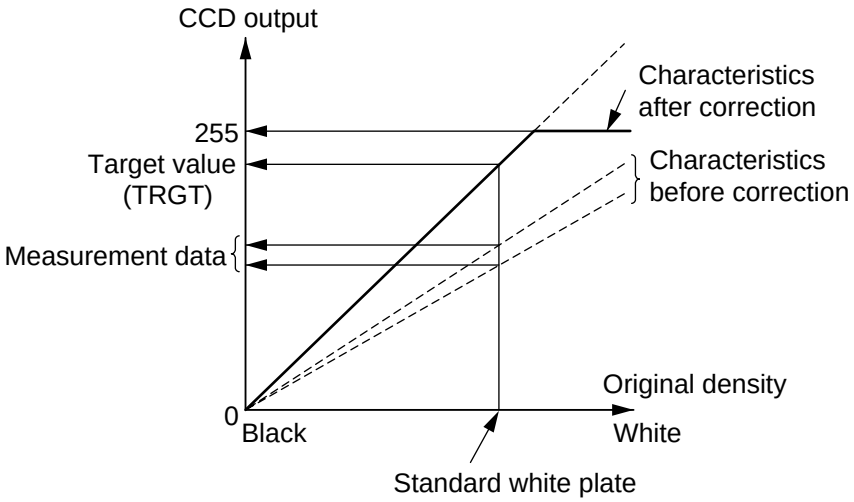

Figure 4-403

Reference:

1. The color balance of light areas may be adjusted in service mode (ADJUST>COLOR>**OFST-Y/M/C/K**).
2. Shading correction tends to be stronger over areas where scratches or dirt exists, leading to vertical white lines on prints.
   If such a problem occurs and cannot be corrected after cleaning the standard white plate, replace the plate.

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3. CCD 3-Line Position Matching

The copier's CCD consists of three CCDs, each covered with an R, G, or B filter. The line image from any CCD at any point in time, therefore, is subject to a discrepancy of about 0.33 mm (12-line equivalent) in reference to the copyboard glass. To correct these discrepancies, the R and G image signals are first stored in the line memory temporarily, and are sent out after synchronization with the B image signals.

Reference:

The delay in the B image signal is maximum at 400% enlargement, requiring a 96-line delay of the R image signal and a 48-line delay of the G image signal.

For instance, at 320% enlargement, the R image signal must be delayed by 51.2 lines.

To enable the delay, the following correction will be performed using the data of adjacent pixels:

pixel data of the 76.8th line

= 0.2 x (pixel data of the 76th line)

+ 0.8 x (pixel data of the 77th line)

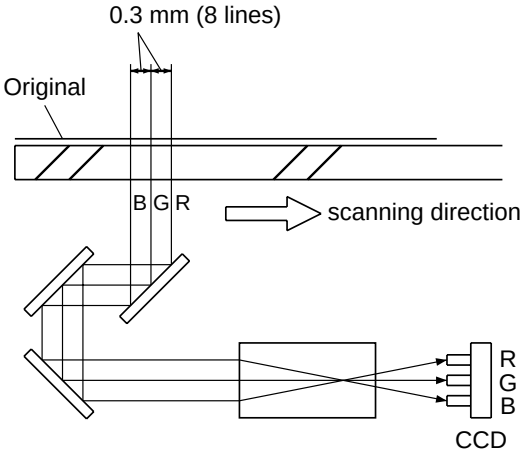

Figure 4-404

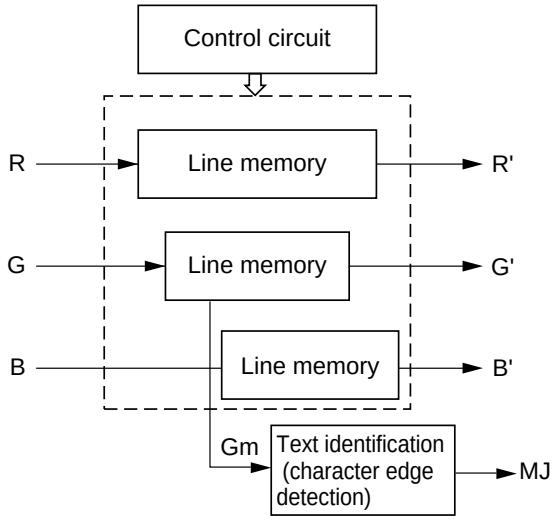

Figure 4-405

4. Text Identification (character edge detection)

As shown in Figure 4-401, the text identification block identifies the edges of characters according to the Gm signal of the G image signal. It compares the Gm signal of the pixel in question and multiple pixels adjacent to it to detect the edge component; it then identifies whether the pixel in question is part of the edge of a character or not based on the size of the edge component and the distribution of edge components. When the machine's identifies it as part of an edge, it generates the MJ signal (text detection signal).

The MJ signal, however, will suffer a delay of 12 lines in the text identification block, requiring that the Gm image signal be advanced by 12 lines in relation to the G' image signal. The machine generates the Gm image signal ahead of time by 12 lines so that the MJ signal (text detection signal) from the text identification block will match the R'/G'/B' image signal. In other words, the line image at this point in time would be as follows:

R'/G'/B' image signal = MJ signal (text detection signal)

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5. Sensor Color Correction Block

The sensor color correction block consists of a circuit used to correct the transmission characteristics of the R, G, and B filters of the CCD.

Ideally, each filter should let through light of specific wavelengths and block out light of all other wavelengths. In reality, however, each lets through light of wavelengths outside a specific range, requiring color correction.

In the case of the G filter,

Ideally, the G filter should let through 100% of light with wavelengths of between 500 and 600 nm (green), and should block out light with wavelengths of 500 nm or less or 600 nm or more.

In reality, it lets through light of wavelengths falling within a and b and blocks out light of wavelengths falling within b (Figure 4-406).

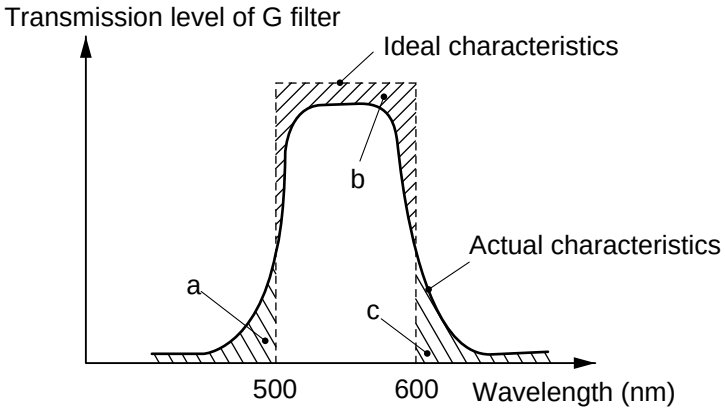

Figure 4-406

The following computations are made so as to correct the actual characteristics and bring them closer to the ideal characteristics.

$$\begin{bmatrix} R\ out \\ G\ out \\ B\ out \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

- R, G, B: input signal to the color correction circuit.
- Rout, Gout, Bout: output signals from the color correction circuit.
- a_{11} to a_{33}: correction coefficients.

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6. Background Cancellation (background level adjustment)

When reading the light reflected by an original, the CCD also reads the color data of the surface (background) of the paper. To correct the image signal, the background cancellation block sets aside background data or correction of the image signal, preventing fogging and improving the level of reproduction.

The pixels are identified as representing the background of an original if the level of each frequently appearing R, G, and B signal is 200 or higher (Figure 4-407).

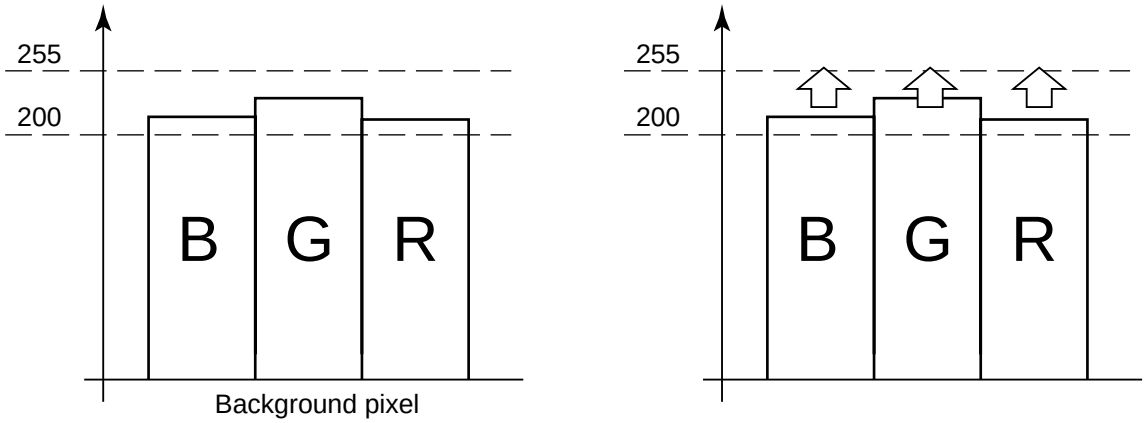

Figure 4-407

The collection of extended modes (image adjustment; see the User's Manual) provides two modes, each with a different method of correction:

In "background omission mode," the level of RGB signal of the background pixels is corrected to 255 to remove the specified background color.

In "anti-see-through mode," on the other hand, the RGB signal of the background pixels are removed from the image data for the entire image area so as to remove the image on the other side of the original.

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7. R/G/B->L/Ca/Cb Conversion, L/CaCb->R/G/B Conversion

As shown in Figure 4-401, in the R/G/B->L/Ca/Cb conversion block, the RGB image signal is converted to chromatic spaces of L (light area component) and Ca/Cb (color component).

- L=(R+2G+B)/4
- Ca=(R-G)/2
- Cb=(R+G-2B)/4

Using L/Ca/Cb, the copier performs spatial filter processing and chromatic identification. After spatial filter processing and chromatic identification, the machine then performs L/Ca/Cb->R/G/B conversion.

- R=(4L+5Ca+2Cb)/4
- G=(4L-3Ca+2Cb)
- B=(4L+Ca-6Cb)/4

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8. Spatial Filter Processing/Chromatic Identification

The machine performs spatial filter processing based on the edge component computed from the L (luminous component) signal and the Ca/Cb (chromatic component) signal component and the MJ (text detection) signal from the text identification block. During spatial filter processing, the copier performs computations so as to generate images which are sharp or soft according to the printing modes selected on the control panel or the setting of sharpness mode.

If image data as shown in Figure 4-408 is input and "sharpness weak" is selected, the output level will be as shown in Figure 4-409.

In "sharpness weak," the variations in density of an image are evened out to produce a soft image.

In "sharpness strong," on the other hand, the contrast of an image is emphasized to produce a crisp image.

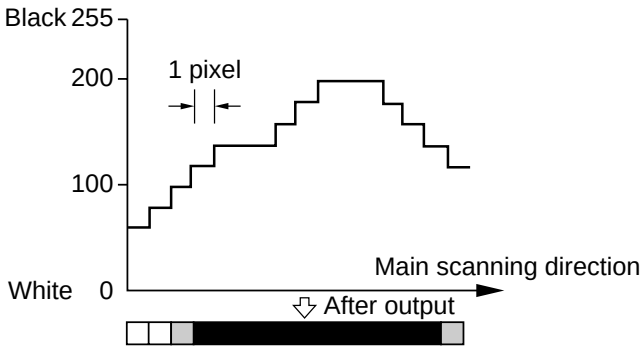

Figure 4-408 Input Level

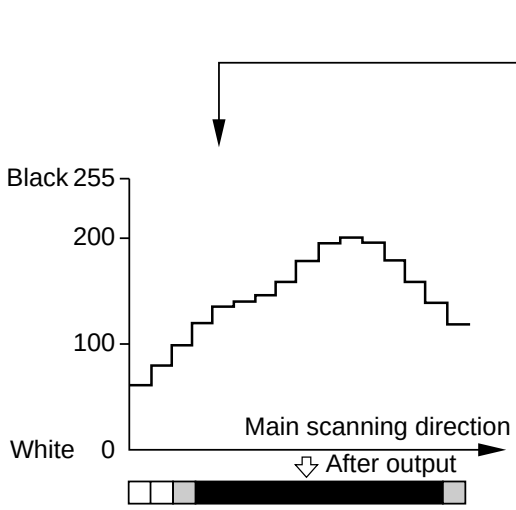

Figure 4-409 Sharpness Weak

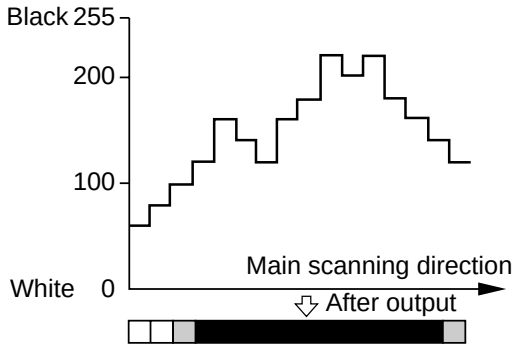

Figure 4-410 Sharpness Strong

The machine also performs chromatic identification (ACS, black text identification) based on the L (luminous component) signal and the Ca/Cb (chromatic component) signal. After chromatic identification, the machine generates the KMJ signal in the form of a 1-bit black text identification signal using logical integration on the results of computation on the achromatic (KRO) signal, and the MJ signal.

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9. Logarithmic Correction and BGR->YMC Conversion

a. Logarithmic Correction

The output of the CCD has linear characteristics in relation to the light reflected by an original. However, the density perceived when looking at an original does not necessarily have linear characteristics. Figure 4-411 shows the relationship between the density of an original perceived by the eye and the output of the CCD.

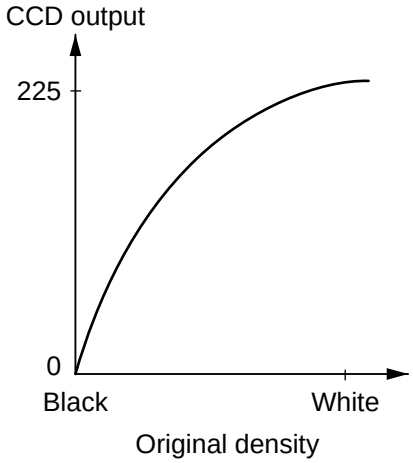

Figure 4-411

To correct the discrepancy, the copier performs level conversion as shown in Figure 4-412.

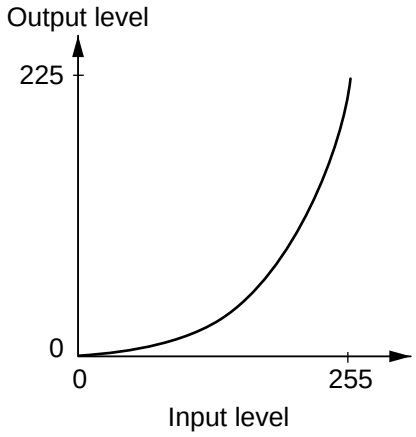

Figure 4-412

b. BGR->YMC Conversion

The machine generates YMC signals taking advantage of the fact that BGR chromatic components are in a complementary relationship to YMC toners (reflected light).

Toner / Chromatic light	Y	M	C
B	Absorbs	Reflects	Reflects
G	Reflects	Absorbs	Reflects
R	Reflects	Reflects	Absorbs

Table 4-402

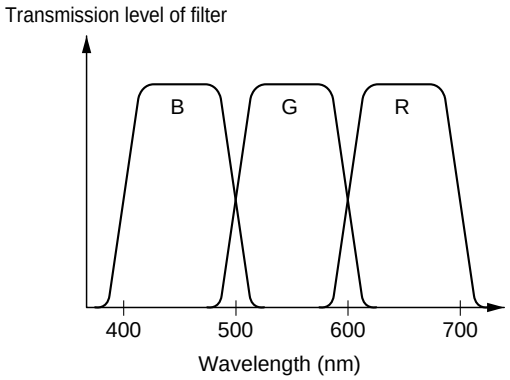

Figure 4-413

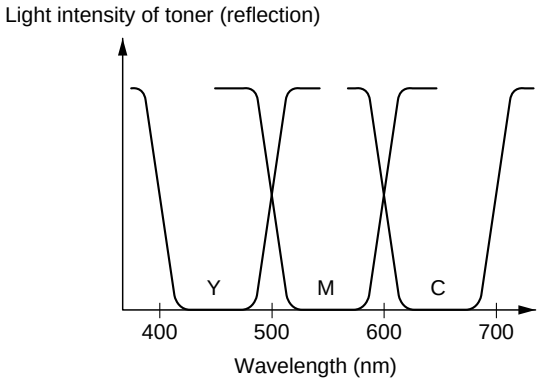

Figure 4-414

The level of transmission of each filter (B, G, R) of the CCD and the density (Y, M, C) of the original are in a complementary relationship; level conversion is performed as in Figure 4-415 to generate the Y, M, and C signals.

BGR->YMC Conversion

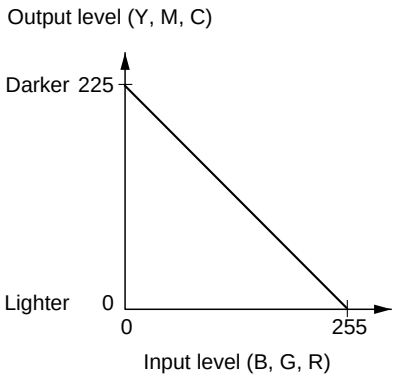

Figure 4-415

Reference:

$Y = \overline{B}$, $M = \overline{G}$, $C = \overline{R}$

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10. UCR (Under Color Removal) Processing

In theory, when equal parts of Y, M, and C toners are mixed, black will be generated (absence of all light). However, since no toner possesses pure chromatic absorption characteristics, mixing the three colors (as in YMC conversion) in equal parts will not produce a pure black.

In this block, the Bk signal is generated using the Y, M, and C signals and text signals for addition to the Y, M, and C signals, with the aim of improving black reproduction.

Specifically, the Bk signal is generated as follows:

The gray component of the YMC signal is as shown in Figure 4-417.

The gray component is removed, and is replaced with the Bk signal. The size of the component that has been replaced is referred to as "UCR amount," and it is 100% in the case of Figure 4-417. Such, however, would mean that Bk toner is used on the entire image, causing soiling in light areas.

The UCR amount, therefore, is increased or decreased in relation to the text signal, limiting it to less than 100%. This processing is performed for each pixel.

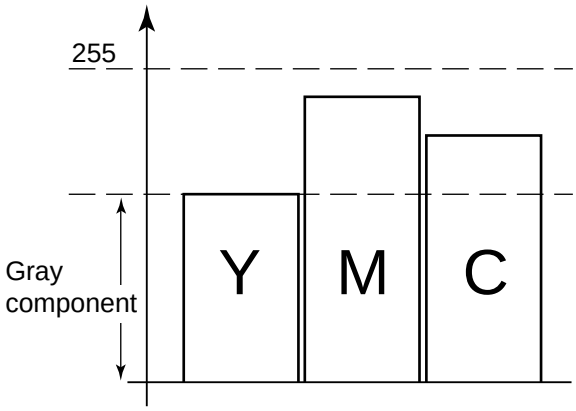

Figure 4-416

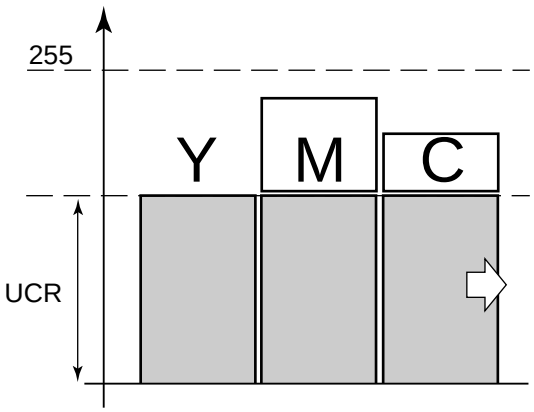

Figure 4-417

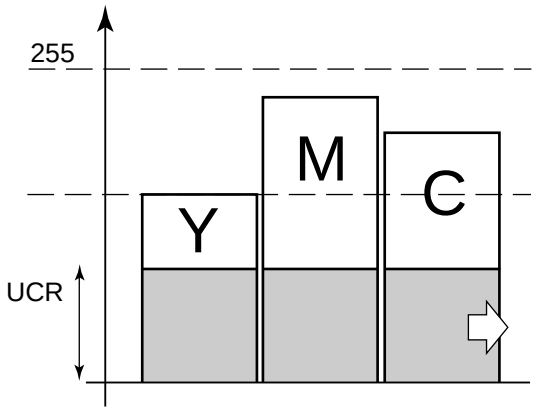

Figure 4-418

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11. Output Masking

A color image is reproduced using color toners since the Y toner absorbs only B components, the M toner absorbs only the G component, and the C toner absorbs only the R component.

In reality, however, no toner possesses chromatic absorption characteristics as depicted in Figure 4-419. In general, Y toner possesses good absorption characteristics: however, M toner is affected by B components, while C toner is affected by G and B components (see circled areas). In other words, M toner has a chromatic reproduction quality that includes Y components, while C toner has a chromatic reproduction quality that includes M and Y components.

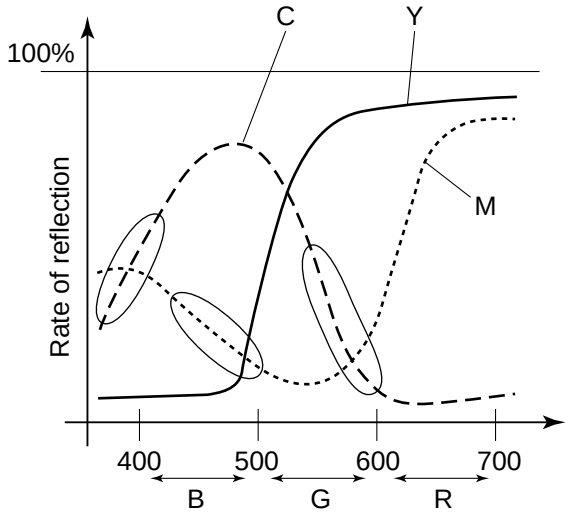

Figure 4-419

If Y and M toners were mixed in an attempt to reproduce red, therefore, the Y component of the M toner would cause the result to have a reddish tinge, requiring removal (masking) of the Y component form the Y toner in advance.

In this block, the excess component of each toner is corrected by means of masking.

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12. Enlargement/Reduction and Image Processing

a. Enlargement/Reduction

① Horizontal Reproduction Ratio (main scanning direction)

Data units may be skipped when they are written into the memory (reduction) or read multiple times from the memory (enlargement).

② Vertical Reproduction Ratio (sub scanning direction)

The scanner is moved at different speeds, thereby changing the width of scanning a single pixel on an original.

Figure 4-420 describes how the copier enlarges or reduces an image.

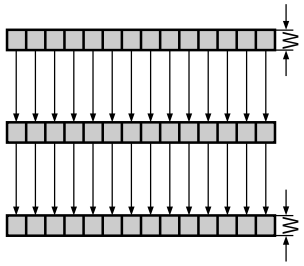
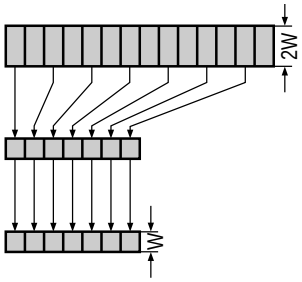
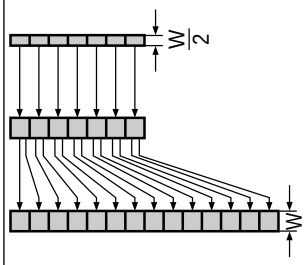
	Direct	Reduce	Enlarge
Original (image data) (writing) Line memory (reading) Copy			
Reproduction in scanning direction	All data units are written into or read from the memory as they are.	To reduce in 1/2, every other data unit is written into the memory.	To enlarge by 200%, all data units are written into the memory as they are, but each data unit is read twice.
Reproduction in sub scanning direction		The scanner is moved faster to increase the width of scanning a single pixel on an original.	The scanner is moved slower to decrease the width of scanning a signal pixel on an original.

Figure 4-420

b. Enlargement Correction

In enlargement, the image data is corrected so that the difference in density between pixels will not vary excessively. Figure 4-421 shows the image data of an original, image data in enlargement, and image data after enlargement correction.

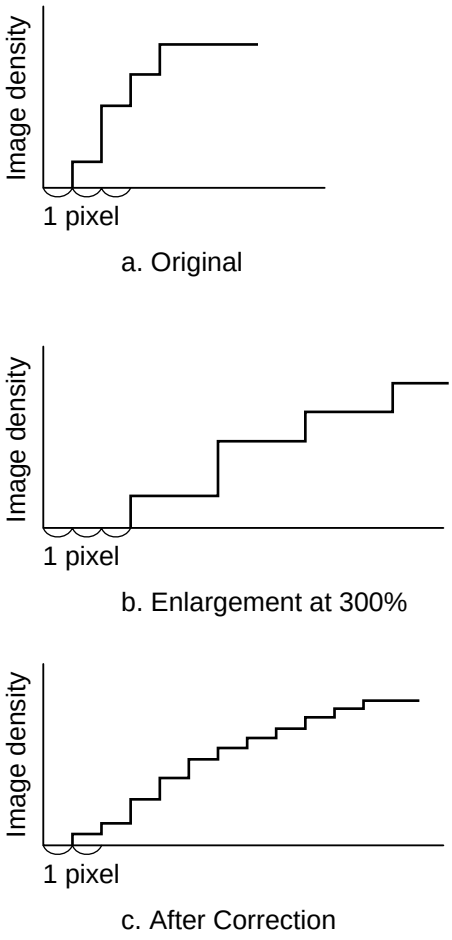


Figure 4-421

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c. Shift

The following diagrams provide an outline of the principles of how an image is shifted in main and sub scanning directions.

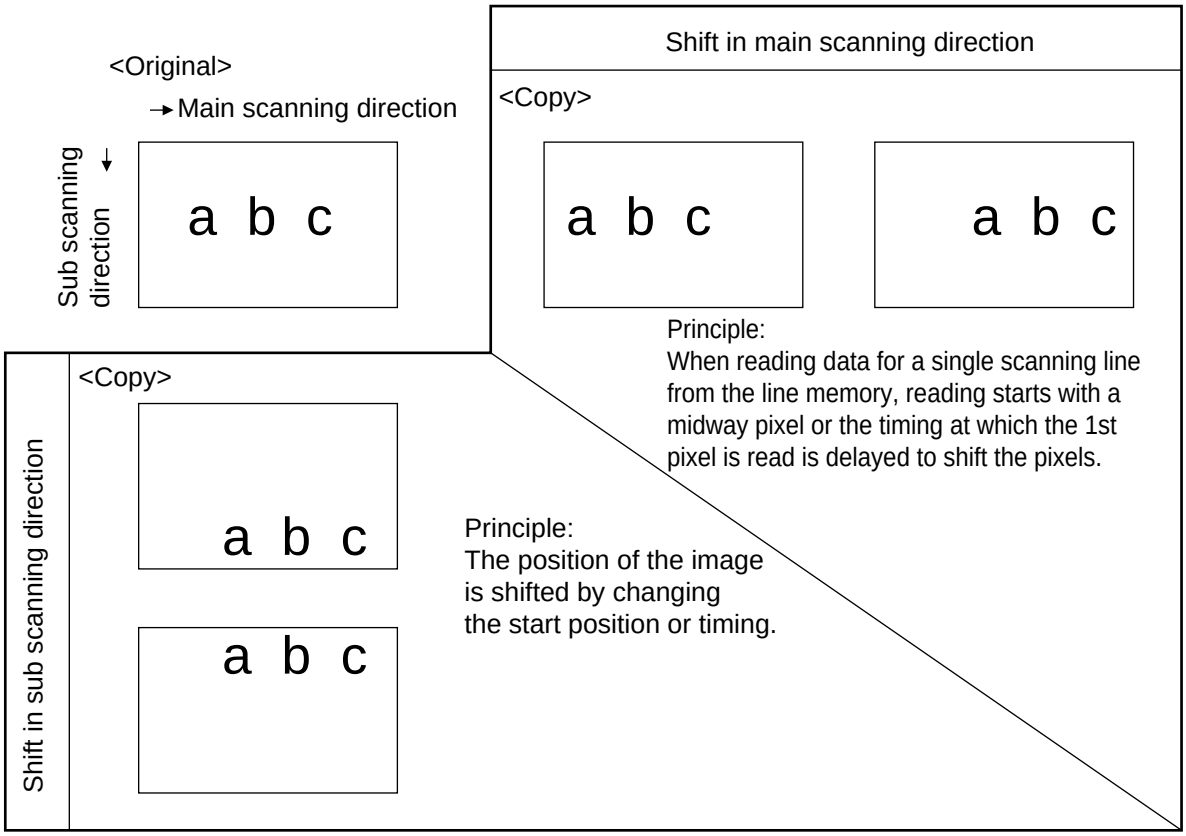

Figure 4-422

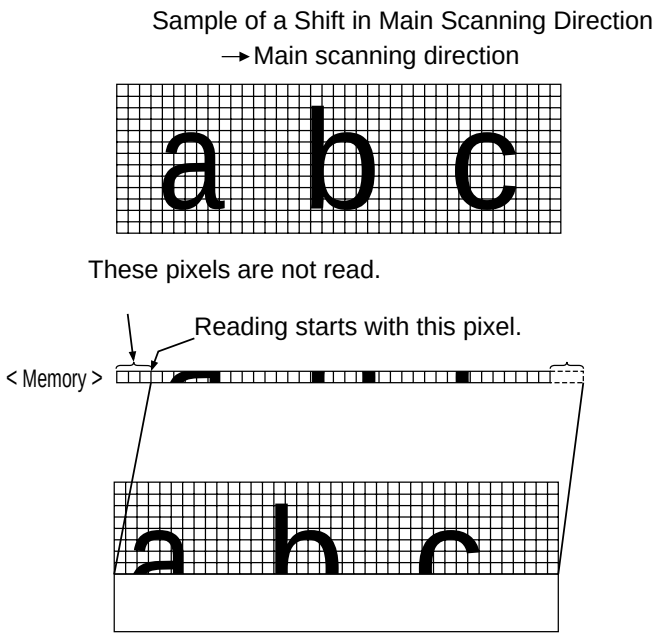

Figure 4-423

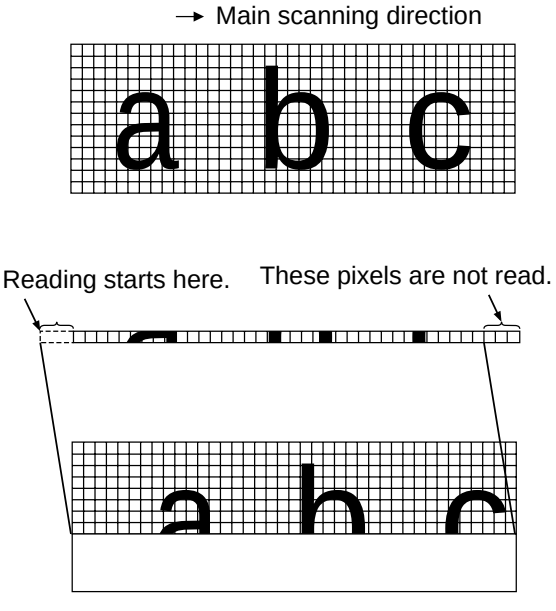

Figure 4-424

The position of an original may be shifted as follows by combining a shift in main scanning direction and a shift in sub scanning direction:

① Center Shift

The copier computes the coordinates (Xm, Ym) of a corner which make the top/bottom and left/right margins of the copy equal, based on the size of the area to be moved and the size of the copy paper; then, it moves X1 and Y1 to the corner.

② Left/Right Bind and Top/Bottom Bind

The copier shifts the entire image of the original to create a margin (for binding).

③ Selective Shift

The copier shifts the image over a selected distance.

Reference:

$$\frac{Xmax - (X_2 - X_1)}{2}$$

$$\frac{Ymax - (Y_2 - Y_1)}{2}$$

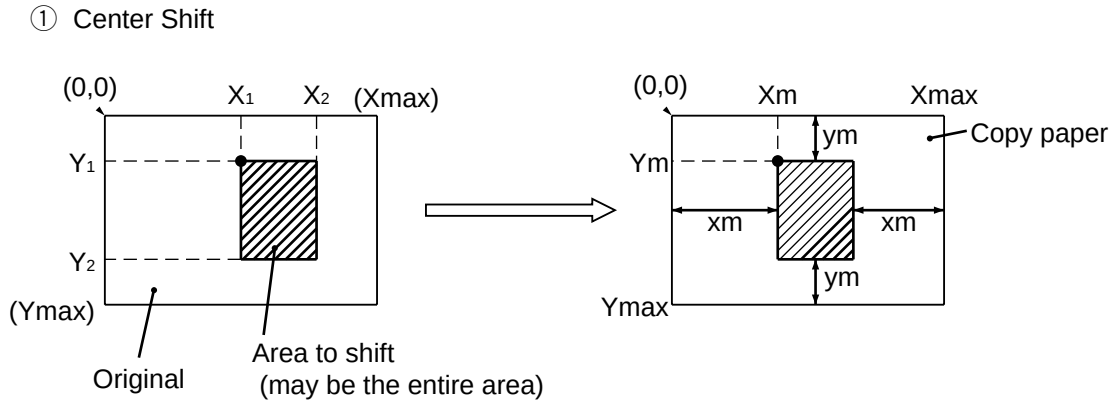

Figure 4-425 Center Shift

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d. Mirror Image

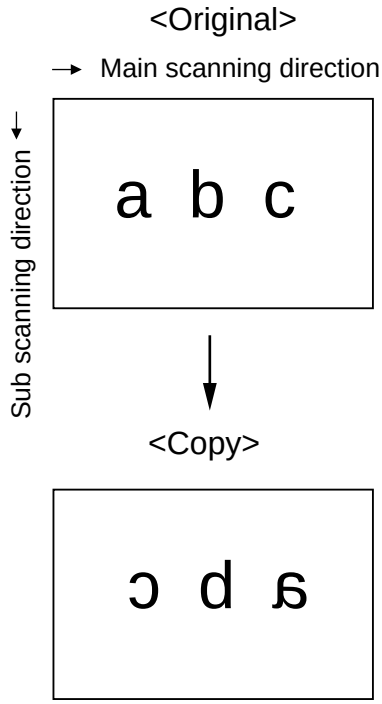

Figure 4-426

Principle

When reading data for a single scan from the RAM, reading is started in reverse direction, thereby creating a mirror image in relation to main scanning direction.

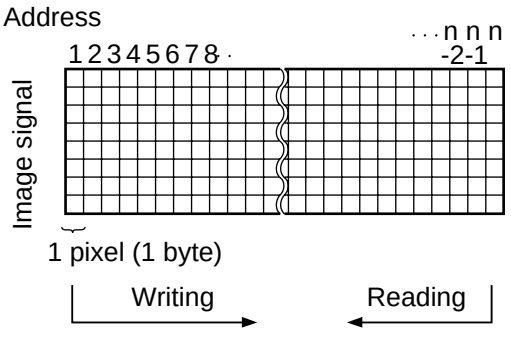

Figure 4-427

e. Image Repeat

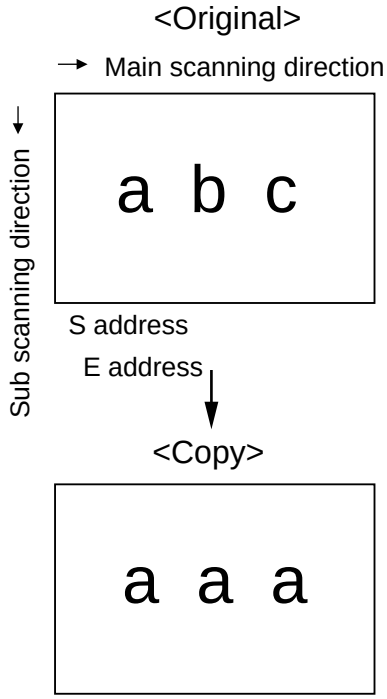

Figure 4-428

Principle

When reading data for a single scan from the RAM, an S address (read start address) and an E address (read end address) are specified. Then, reading is started with the S address and, upon reaching the E address, reading is continued while returning to the S address. A repeat image is created by repeating this operation.

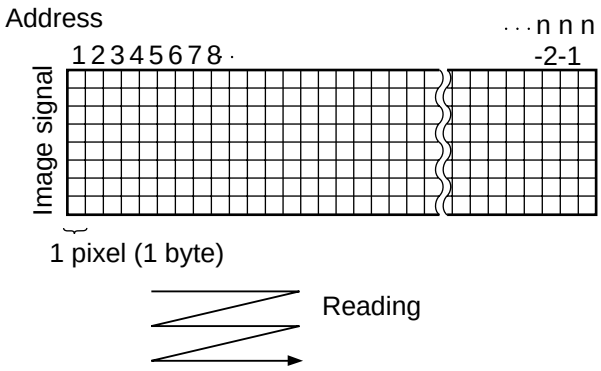

Figure 4-429

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f. Slant

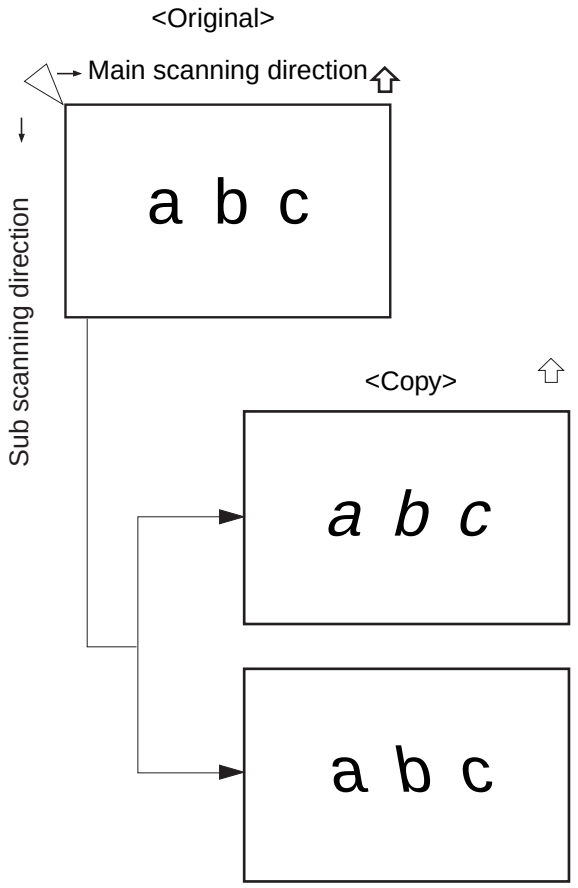

Figure 4-430

Principle

When reading data for a single scan from the RAM, the starting address (S address) is shifted by an n number of lines for slant processing.

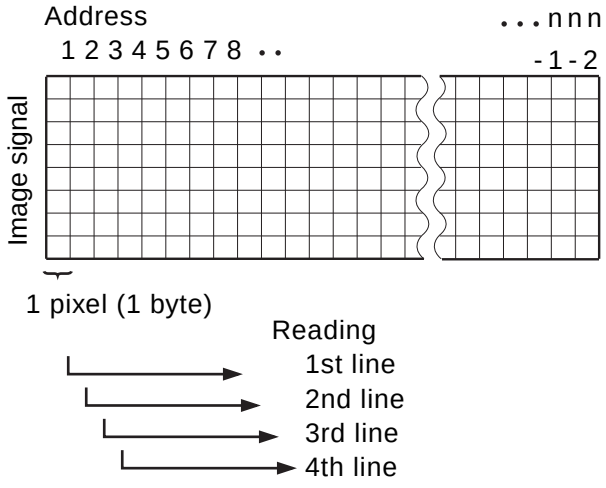

Figure 4-431

13. Density Processing

The correction curve for density processing varies in relation to the following:

a. Setting of the Copy Density key on the control panel
b. Setting of color balance (control panel)
c. Setting of color balance (service mode; COPIER>ADJUST>COLOR>ADJ-Y/M/C/K)
d. Adjusting the Light Area Density and Color Balance in Service Mode COPIER>ADJUST>COLOR>OFST-Y/M/C/K
e. Black-and-White Text Mode

As shown in Figure 4-432, the dark or the light curve is selected to suit items a. through d.

In the case of black-and-white text mode (item e.), the curve shown in Figure 4-433 will be selected so as to produce a copy free of image, yet with dark text characters.

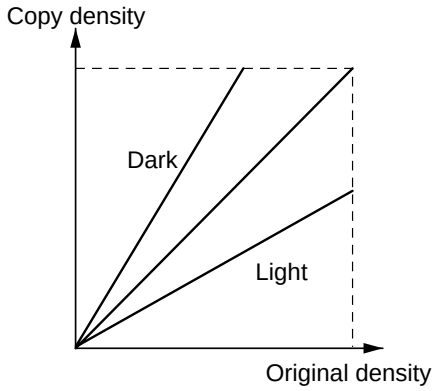

Figure 4-432

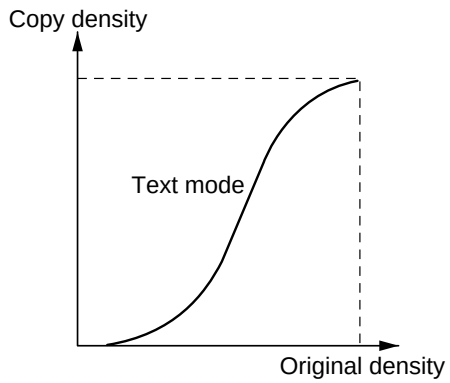

Figure 4-433

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14. Framing/Blanking

For framing and blanking, as many as four areas and as many as 10 points may be selected.

■ Framing

The signals representing areas outside the selected areas of an original are forced to represent white.

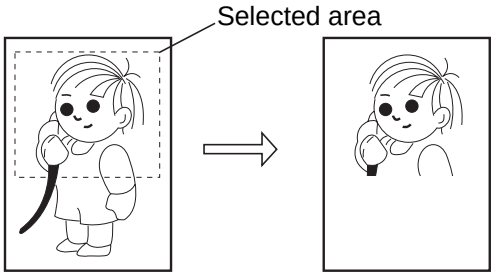

Figure 4-434 Framing

■ Blanking

As opposed to framing, the signals representing the selected area of an original are forced to represent white.

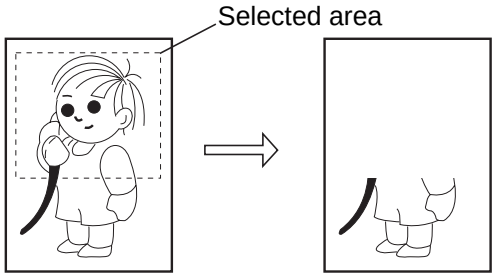

Figure 4-435 Blanking

15. Anti-Counterfeit Processing

The machine is equipped with the following two functions designed to prevent counterfeiting of bank notes or securities certificates.

a. Tracking Function

The machine's unique ID number (stored in its memory) is printed on all copies (invisible to the eye) so that any counterfeit of a bank note or a securities certificate produced by the machine can be traced to the machine.

b. Bank Note Detection Function

- If the machine judges an original to be a bank note (registered in its memory), it produces a solid blank print.
- If an original is replaced in continuous printing mode with an original judged to be a bank note, the machine will produce a solid blank print for the original.

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V. DISASSEMBLY/ASSEMBLY

Make sure of the following when disassembling or assembling the machine:

1. ⚠ When the control panel soft switch (front of the reader unit) is turned off, the fans will operate for about 30 min to cool the machine (so as to prevent caking of toner in the toner cartridge of the printer unit). Be sure to perform either of the following in addition to disconnecting the power plug:
   - Wait for 30 min after turning off the control panel power soft switch (right of the reader unit control panel); or
   - Turn off the control panel soft switch and the reader unit rear power switch (right of the reader unit rear), and remove the fixing assembly of the printer unit.
2. Assemble the parts by reversing the steps used to disassemble them, unless otherwise mentioned.
3. Identify the screws by type (length, diameter) and location.
4. Do not leave out the toothed washer that comes with one of the mounting screws on the rear cover to protect against static electricity.
5. Do not leave out the washer that comes with the screw used for the grounding wire and the varistor to ensure electrical continuity.
6. Do not operate the machine with any of its parts removed, unless otherwise mentioned.
7. Touch the copier's metal section before starting the work to discharge the build-up of static electricity so as to prevent static damage before handling any PCBs.
8. For removal of the external covers of the reader unit, see A. "Reader Unit External Covers" under VII in Chapter 3.

Note:

All illustrations in this chapter assume that the reader assembly is mounted to the rack.

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A. CCD Unit

1. Removing the Lens Mount Cover/CCD Unit

1) Remove the two screws, and detach the right glass retaining cover.
2) Remove the copyboard glass.
3) Remove the ten screws, and detach the lens mount cover.

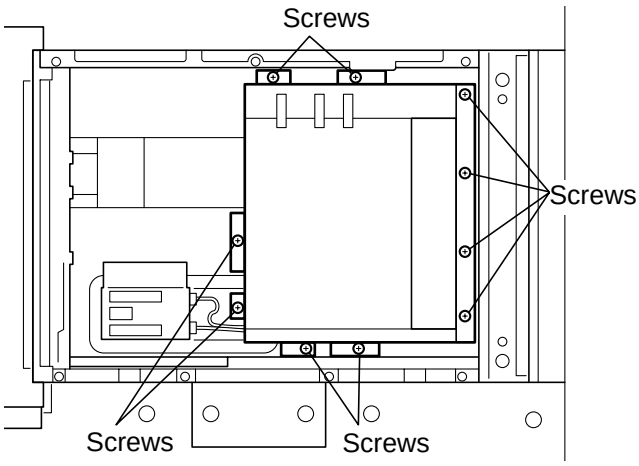


Figure 4-501

4) Remove the four screws, and detach the CCD unit retaining spring and the cable retaining metal plate.

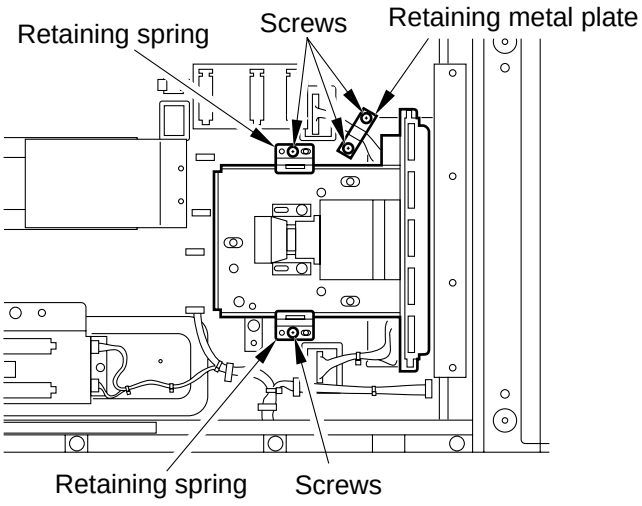


Figure 4-502

5) Remove the cable clamp from the copier, and disconnect the two connectors (J101, J102); then, detach the CCD unit.

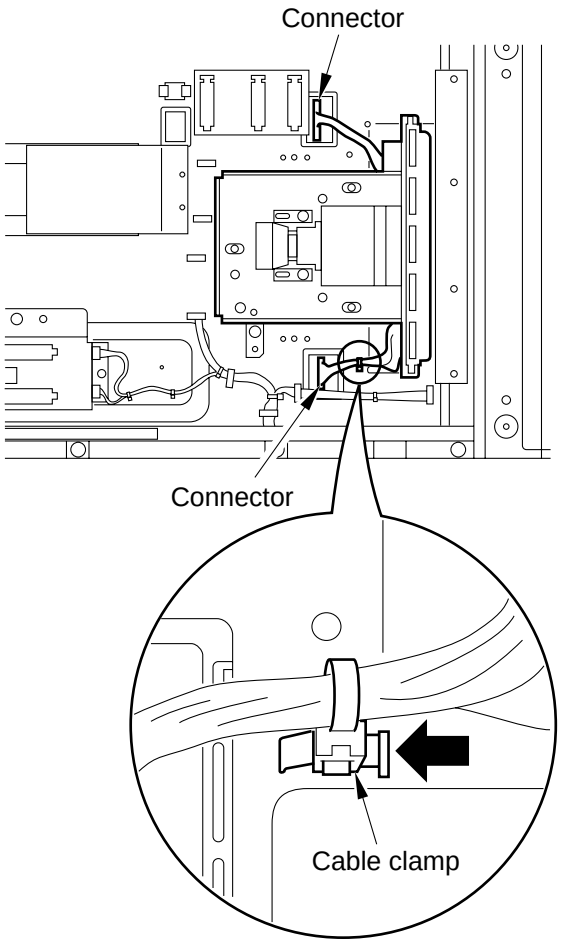


Figure 4-503

Caution:

Do not move the No. 1 mirror mount to the left or right or turn on the power to make copies; or, the leaf spring on the CCD unit will hit against the No. 1 mirror mount, damaging the leaf spring.

B. PCBs

1. Removing the Reader Controller PCB

1) Remove the reader unit lower front cover.
2) Disconnect the three connectors, and remove the two screws; then, detach the scanner motor driver PCB. (p. 3-18)
3) Remove the two screws, and disconnect the eight connectors.

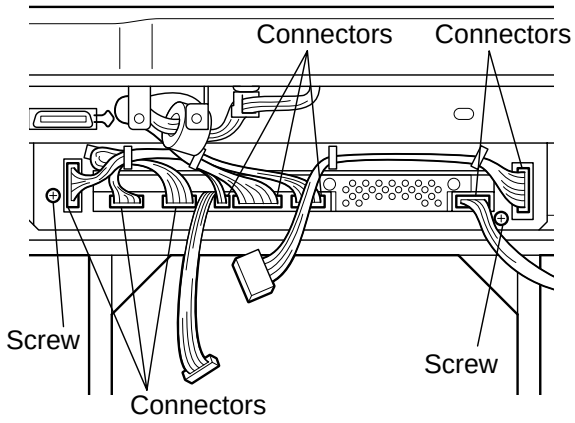


Figure 4-504

4) Remove the two screws, and detach the right glass retaining cover.
5) Remove the copyboard glass.
6) Remove the ten screws, and detach the lens mount cover.
7) Remove the screw, and disconnect the three connectors.

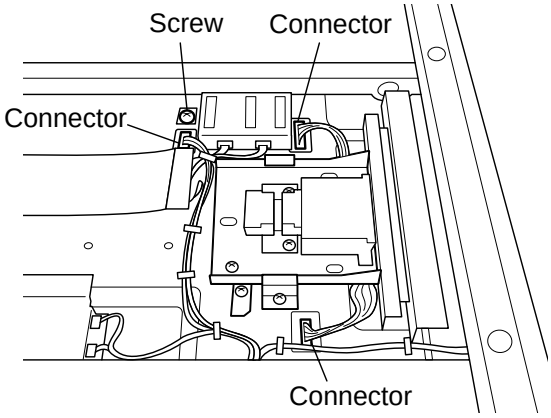
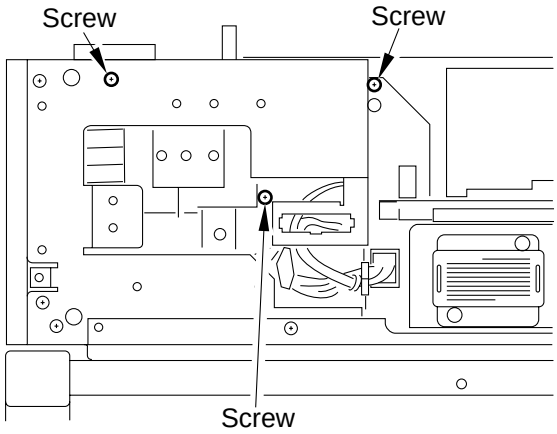


Figure 4-505

8) Remove the copyboard cover, reader unit upper rear cover, upper left cover, and rear cover in the order indicated.
9) Remove the seven screws.



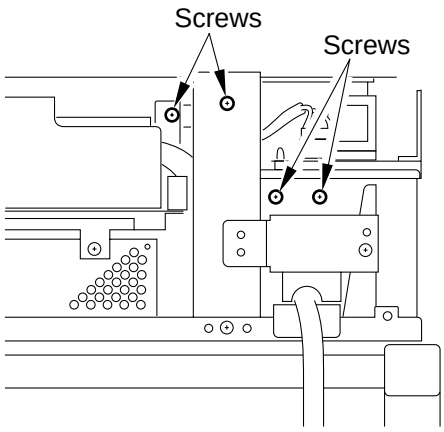


Figure 4-506

10) Pull out the electric unit to the rear as shown.

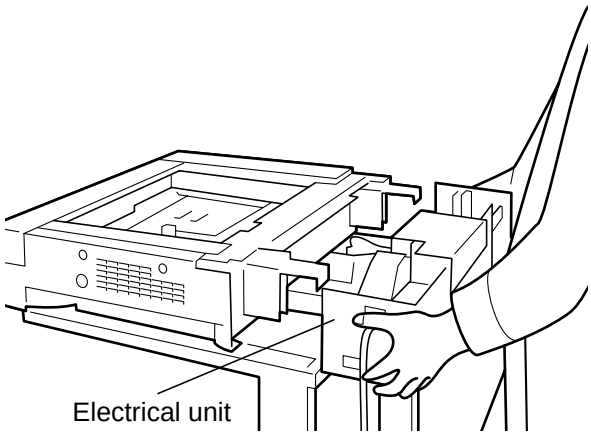


Figure 4-507

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Caution:

When pulling out the electrical unit to the rear, you may hear some rough noise caused by friction of plastic film against a metal plate. You may ignore the noise.
When putting the electrical unit back into the machine, take care of the cable and connectors at the front.

Holding the Electrical Unit

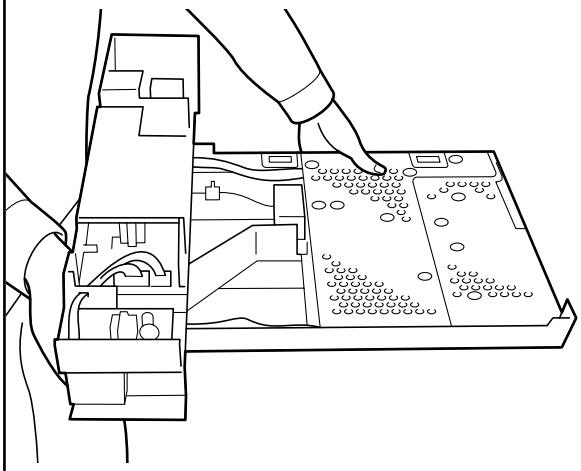

Figure 4-508

11) Remove the seven screws, and detach the electrical unit cover.

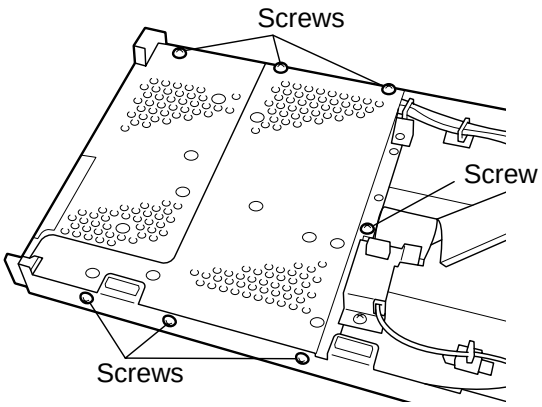

Figure 4-509

12) Disconnect the eight connectors and the six screws; then, detach the reader controller PCB.

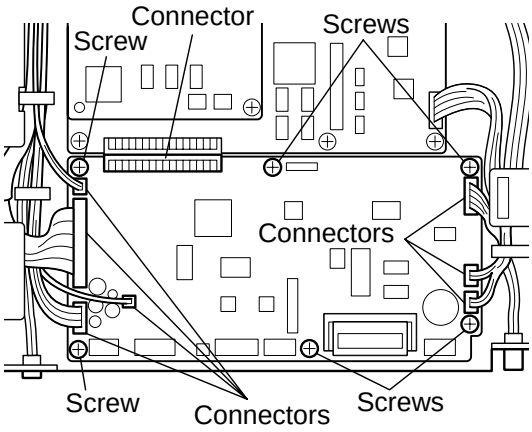

Figure 4-510

2. Replacing the Reader Controller PCB

See p. 8-4.

3. Replacing the ECO PCB

1) Perform the work up to step 11) provided for the removal of the reader controller PCB.
2) Remove the two screws, and detach the ECO PCB from the two PCB supports.

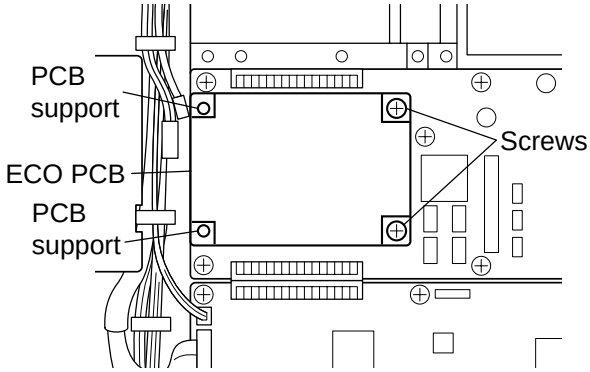

Figure 4-511

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4. Replacing the AP-IP PCB

1) Remove the ECO PCB.
2) Disconnect the three connectors, and remove the seven screws; then, detach the AP-IP PCB.

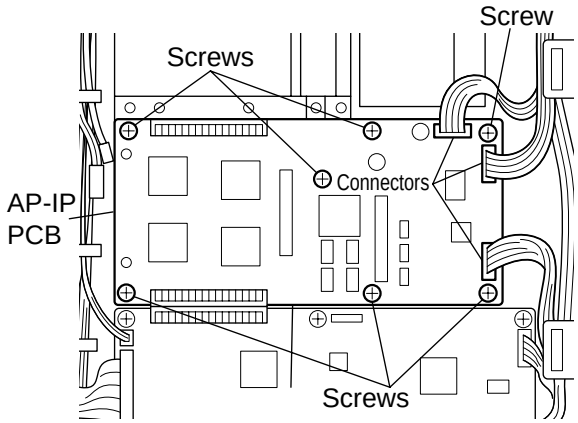

Figure 4-512

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VI.UPGRADING

The machine's reader unit may be upgraded by either of the following methods:

- Replacing the DIMM on the reader controller PCB.
- Replacing the contents of the DIMM by downloading data from a computer.

A. Replacing the DIMM on the Reader Controller PCB

1. Removing the ROM DIMM (on the reader controller PCB)

1) Remove the lower front cover.
2) Disconnect the three connectors, and remove the two screws; then, detach the scanner motor driver PCB.
3) Remove the two screws, and detach the ROM DIMM cover.

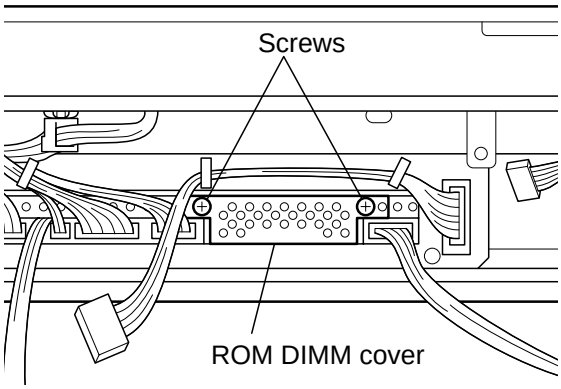

Figure 4-601

4) While opening the claws of the slot, lift and detach the ROM DIMM.

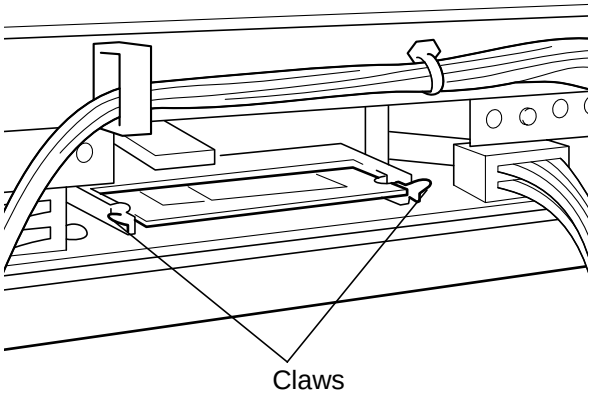

Figure 4-602

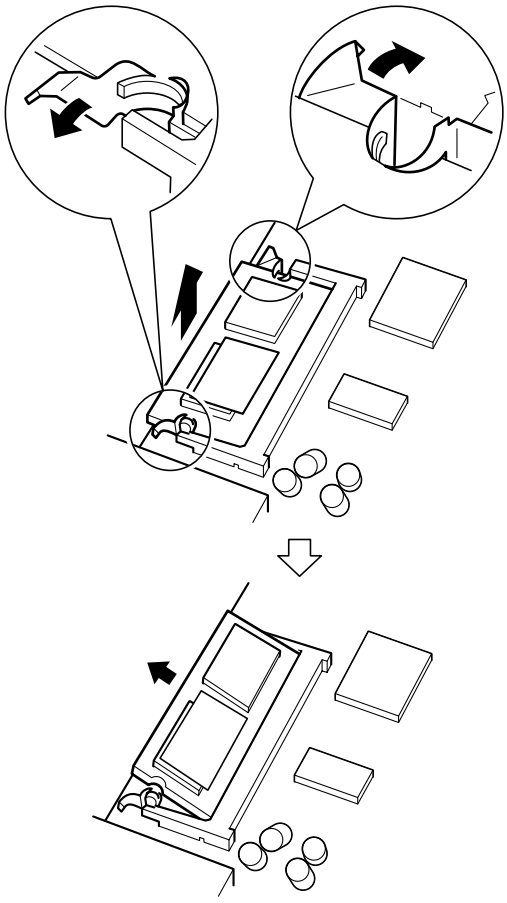

Figure 4-603

2. Mounting the ROM DIMM (on the reader controller PCB)

1) Insert the ROM DIMM into the slot at an angle.

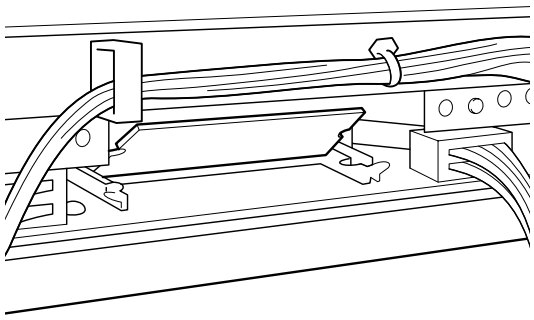

Figure 4-604

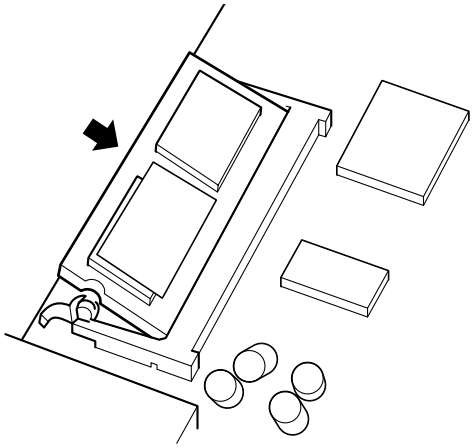

Figure 4-605

2) Shift down the ROM DIMM.
   - Shift the ROM DIMM in the direction of the arrow until a click is heard.

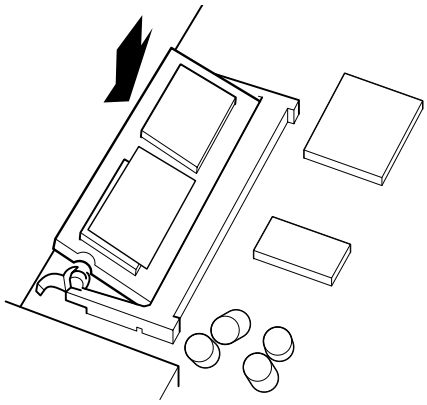

Figure 4-606

Caution:

Do not force the ROM DIMM. It can crack.

Reference:

After replacing the ROM DIMM, perform the following:

1. COPIER>FUNCTION>CLEAR>R-CON
2. COPIER>ADJUST>LAMP, ADJ-XY, CCD, PASCAL (Enter the value indicated on the service label.)
3. COPIER>FUNCTION>MISC-R>USE-LAMP
4. COPIER>FUNCTION>CCD>CCD-ADJ
5. Turn off and then on the power.
6. Execute auto gradation correction in user mode.

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B. Updating the DIMM by Downloading Data from a Computer

1. Preparatory Work (tools)

- A personal computer (Install the Download Tool available as a copier service tool in advance.)
- Bi-Centronics cable (IEEE 1284 Std-compliant)

2. Downloading Operation

a. Making Connections

1) Turn off the power soft switch on the machine's control panel, turn off the reader unit rear power switch, and disconnect the power plug.
2) Remove the reader unit lower front cover.
3) Connect the copier (connector for downloading) and the PC with a bi-Centronics cable.
   - The PC must remain off.
   - The 25-pin connector of the bi-Centronics cable must be connected to the PC, while the 36-pin connector must be connected to the copier.

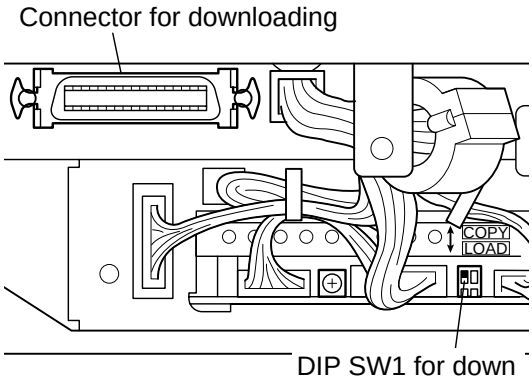

Figure 4-607

4) Slide the DIP switch (SW1; Figure 4-607) to the LOAD position.
5) Turn on the PC, and start the copier service support tool.
6) Connect the machine's power plug to the power outlet, and turn on the power switch and the control panel power soft switch.

b. Downloading

1) Select "To Main Menu" on the Start-Up Screen of the copier service support tool.
2) Select "To Next" under "Downloading/Upload."
3) Select the model and the PCB for downloading, and select "Start Connection."
4) Follow the instructions on the PC screen to download the flash ROM data.
5) When downloading has ended, turn off the PC as follows:
   OK → Return to PCB Selection Menu → Return to Main Menu → End Copier Service Support Tool → End.

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c. After Downloading

1) Turn off the machine's control panel power soft switch and the reader unit rear power switch; then, disconnect the power plug.
2) Remove the bi-Centronics cable from the PC and the copier.
3) Slide the DIP switch (SW1) to the COPY position.

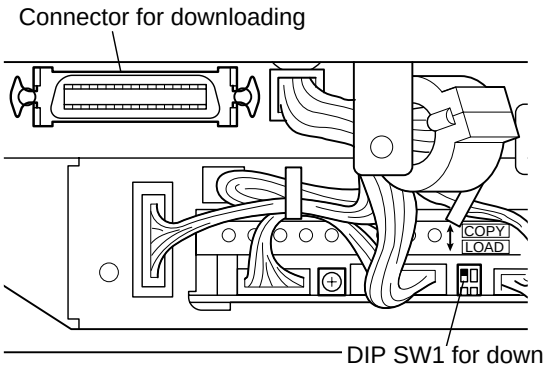

Figure 4-608

4) Connect the machine's power plug to the power outlet, and turn on the reader unit rear power switch and the control panel soft switch.
5) Start service mode, and check the ROM version.
   COPIER>DISPLAY>VERSION
6) After a check, mount the lower front cover.

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CHAPTER 5

EXTERNAL/AUXILIARY MECHANISMS

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I. CONTROL PANEL

A. Outline

The copier's control panel consists of the PCBs shown in Figure 5-101 and a liquid crystal display (LCD) capable of displaying images in 320 x240 dots, and has the following functions:

1. **Data communication**
2. **LCD processing**
3. **LCD contrast adjustment**
4. **Touch switch input processing**

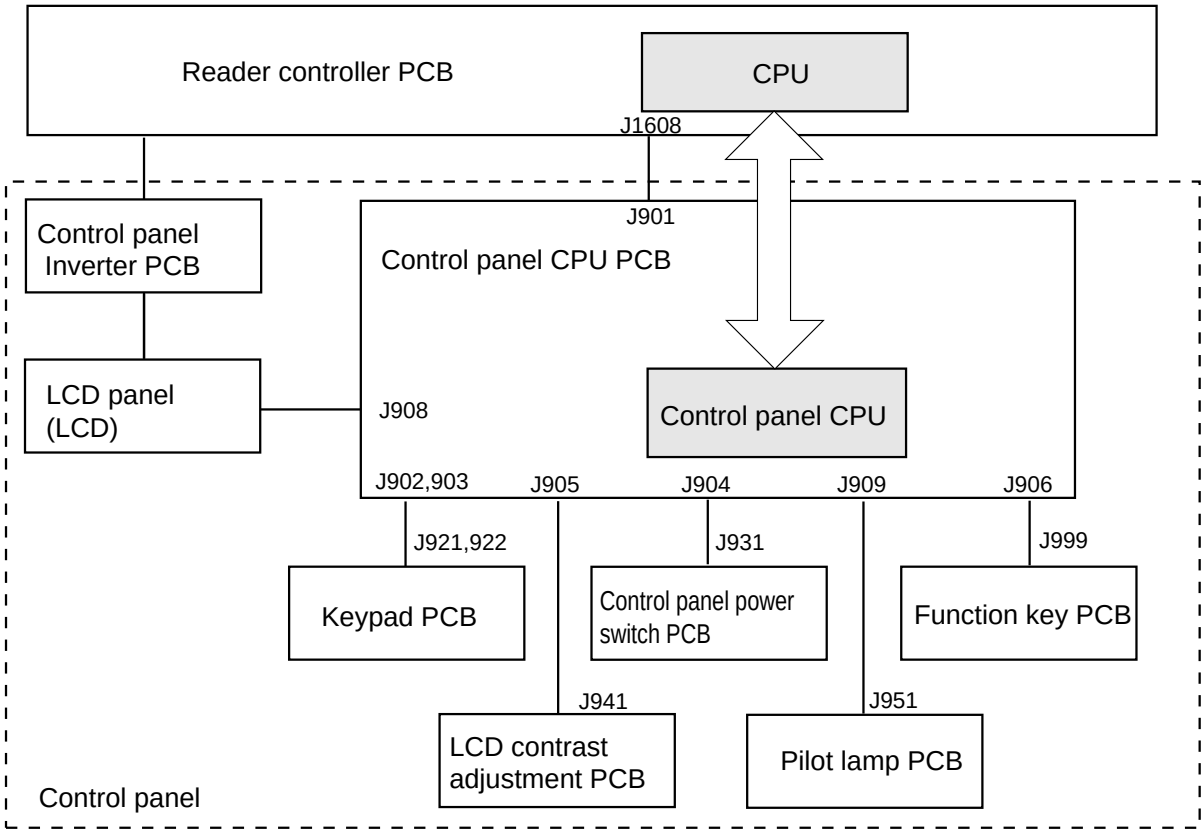

Figure 5-101

B. Operation

1. Data Communication

The communication of data is controlled by the CPU on the reader controller PCB.

2. LCD Processing

The CPU on the reader controller PCB provides the control panel CPU PCB with data (display data) as instructed by the program. The data is moved through the control panel CPU PCB to the LCD panel.

3. LCD Contrast Adjustment

The copier's control panel is equipped with a dial to enable the user to adjust the contrast of the LCD. The user may turn the dial to adjust the contrast to suit his/her preference.

4. Control Panel CPU

The control panel CPU has the following functions:

- Monitoring the key inputs. (Communicates the keypad and function key inputs to the CPU on the reader controller PCB.)
- Controlling the buzzer sound.
- Turning on and off the control panel LEDs.

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II. EDITOR

A. Outline

The copier's editor is a pressure-sensitive editor, and consists of tablets* and an editor pen. The editor is powered by the copier.

*One each for the horizontal (X) direction and the vertical (Y) direction.

The editor controller PCB inside the editor is a CPU, and it reads points pressed by the editor pen on the flat resistor according to instructions programmed in advance, and sends the result to the copier in serial mode of communication at such times as needed.

B. Basic Construction

Figure 5-201 is a diagram of the pressure-sensitive tablet, having a layer construction consisting (from top to bottom) of a protective sheet, X-plane resistor, Y-plane resistor, and fixed plate.

The Y-plane resistor is equipped with bosses called dot spacers. These dot spacers are arranged over the entire surface of the Y-plane resistor, and serve to prevent contact of the Y-plane resistor with the X-plane resistor in the absence of force on the tablet.

The editor controller PCB reads points selected (pressed) by the editor pen as representing settings or function key data of a specific area.

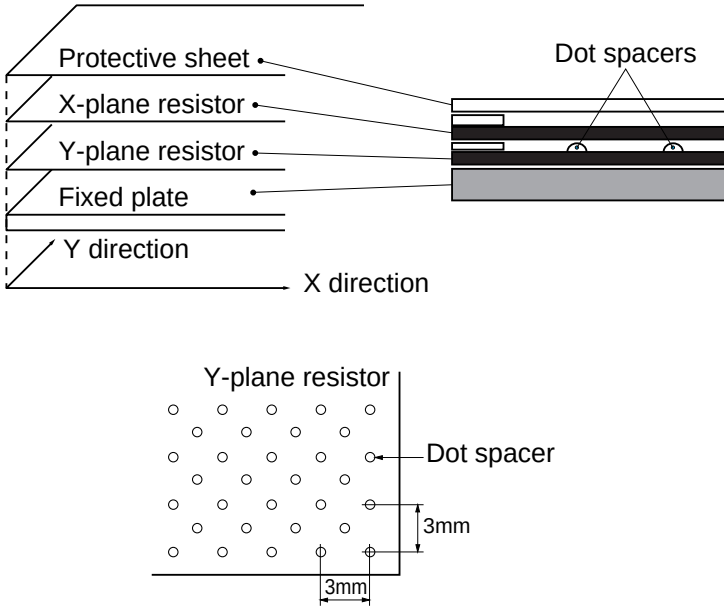

Figure 5-201

C. Reading Pen Inputs

An editor of a pressure-sensitive type detects a press by an editor pen as follows:

Figure 5-202 shows the comparator circuit of the comparator block on the editor controller PCB. (SW1 is ON; SW2 through SW4 are OFF.)

A voltage divided between the resistors Ra, Rb, and Rc is entered on the negative side of the comparator (Rc indicating contact resistance).

On the other hand, the reference value of the comparator is divided between the resistors R1 and R2 and entered on the positive side.

When the tablet is pressed under a force of specific value or greater and, as a result, the contact resistance rc decreases, the voltage to the negative side of the comparator will increase.

This condition causes the output V0 of the comparator to change from "H" to "L," causing the CPU on the editor controller PCB to assume that a press was made by the editor pen.

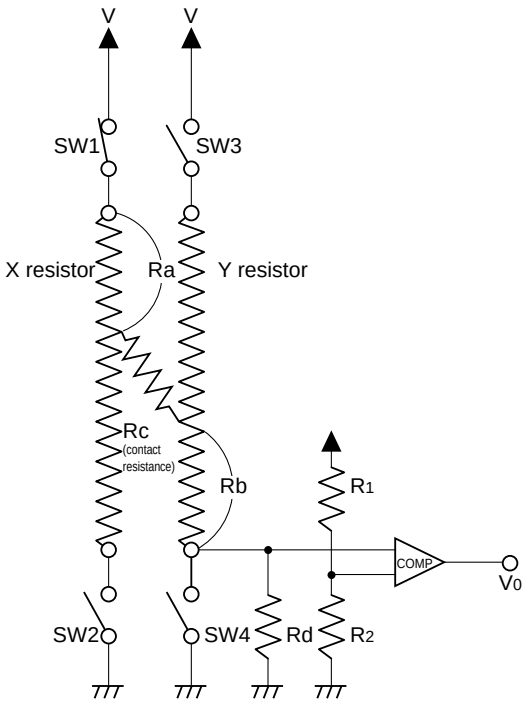

Figure 5-202 Comparator Equivalent Circuit

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D. Reading X Coordinates

Figure 5-203 shows the equivalent circuit of the tablet. (SW1 and SW2 are ON, while SW3 and SW4 are OFF.)

The switches are shifted as in Figure 5-203 to lead the result of division by the resistors Ra and Rb to the A/D converter, to enable the CPU to read the X coordinates.

Since the input impedance of the A/D converter is relatively large, the change in Rc (contact resistance) will not affect the X coordinates.

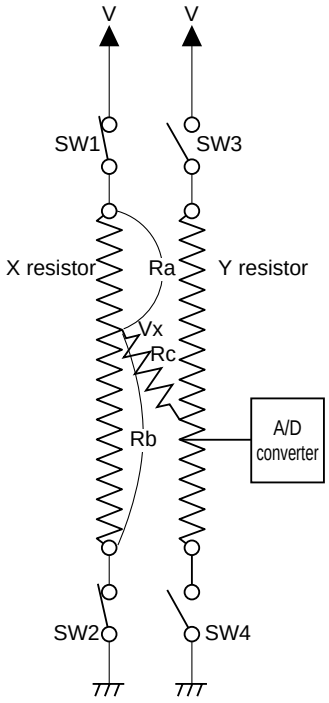

Figure 5-203 Equivalent Circuit When Reading X Coordinates

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E. Reading Y Coordinates

The switches are shifted as shown in Figure 5-204, and Y coordinates are read as when reading X coordinates. (SW1 and SW2 are ON, while SW3 and SW4 are OFF.)

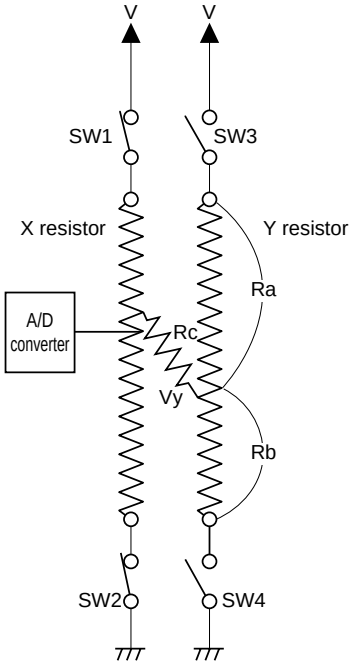

Figure 5-204 Equivalent Circuit When Reading Y Coordinates

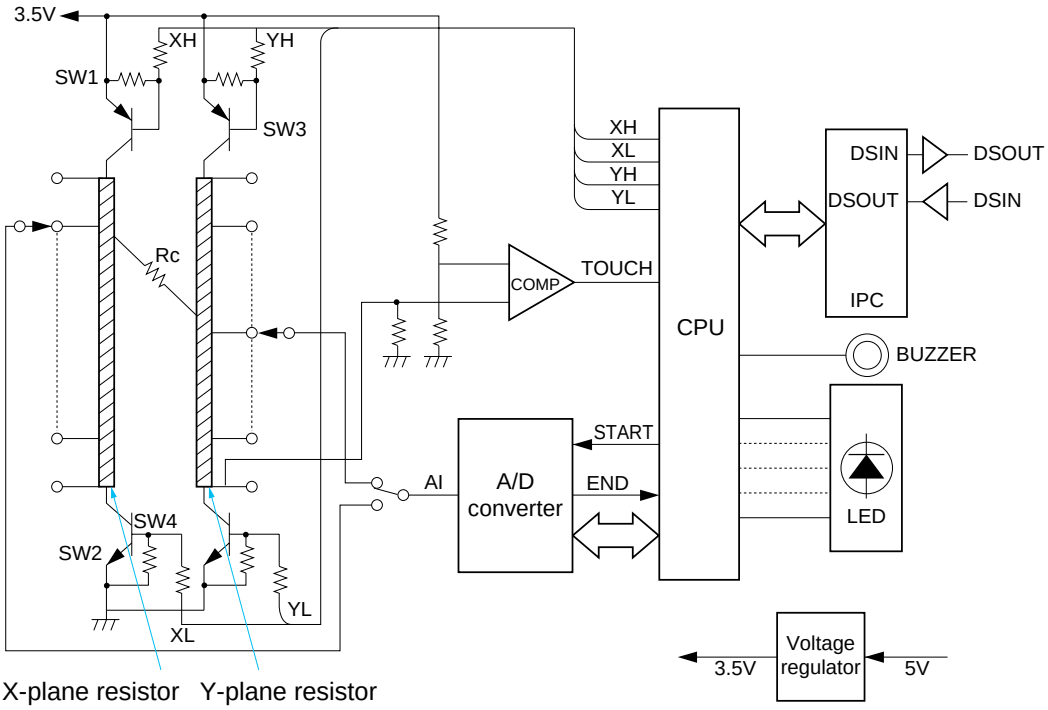

Figure 5-205 Tablet and Editor Controller Circuit

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III. FAN

The reader unit is equipped with a single fan to cool the reader unit. Figure 5-301 shows the location of the fan, and Table 5-301 shows its function, filter, direction, and associated error code. Figure 5-302 shows when the fan is turned on.

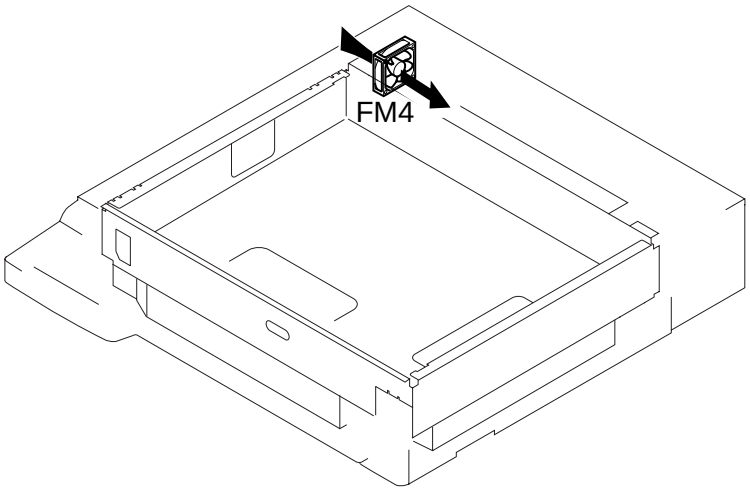

Figure 5-301

Notation	Name	Filter	Function	Error code
FM4	Power supply cooling fan	Air	Cools the power supply unit (reader until).	E809

Table 5-301

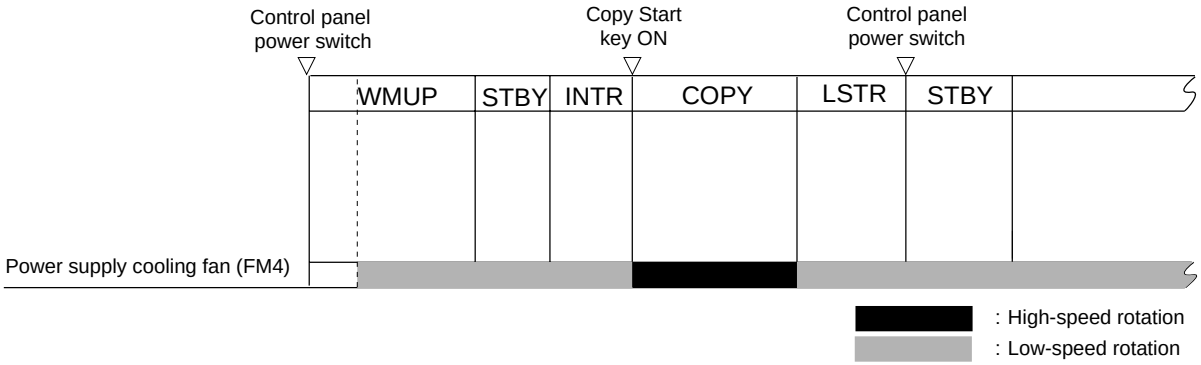

Figure 5-302

Caution:

The power supply cooling fan (FM4) does not stop when the control panel power soft switch is turned off, and is designed to turn off when the reader unit rear power supply switch is turned off. (This is to prevent overheating of the reader unit.)

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IV. POWER SUPPLY

A. Power Supply

Figures 5-401, -402, and -403 show the distribution of power inside the copier.

The AC power sent to the reader unit main power supply is turned on and off by the reader unit rear power switch (MSW1). When the reader unit main power supply PCB is supplied with AC power, +5 V is generated. When the control panel power supply soft switch is turned on, the power cut relay ON signal (RL1ON) is sent through the reader controller PCB to turn on the power cut relay, thereby supplying the printer unit with AC power.

The reader unit main power supply PCB generates +5 V, +5 VA, +5.2 V, -12 V, +15 V, +24 V, and +40 V.

B. Power Saving Function

The copier is provided with "low power mode" and "auto power save mode."

State of power	Reader unit rear power switch	Control panel power soft switch	Fixing assembly
Low-power mode	ON	ON	OFF
Auto power save mode	ON	ON	Pre-heat temperature control

Table 5-401

1. Low Power Mode

In low power mode, the fixing assembly is turned off to reduce power consumption.

2. Auto Power Save Mode

In auto power save mode, the fixing assembly remains on; however, the temperature control target is lowered to reduce power consumption.

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C. Protective Function

The copier's reader unit main power supply PCB is equipped with an overcurrent protective function and an overvoltage protective function which will automatically shut off power to prevent damage to the power supply circuit if an overcurrent or an overvoltage occurs as a result of a fault in any of the loads (e.g., short circuit).

To reset the copier, turn off the control panel power supply soft switch, turn off the reader unit rear power switch, disconnect the power plug, remove the cause of activation, and turn on the power once again. The protection circuit may be reset by turning off the reader unit rear power switch, leaving the machine alone for about 3 min, and turning on the reader unit rear power switch/control panel power soft switch.

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• Switches

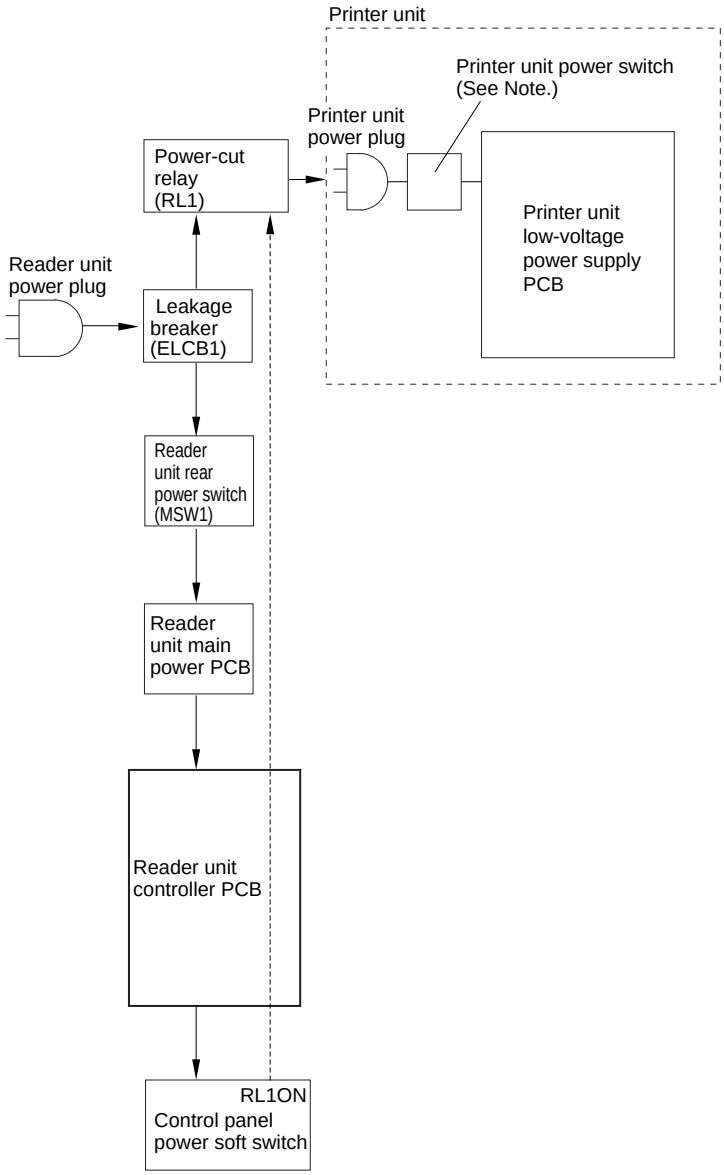

Figure 5-401

Caution:

- The machine's power supply is under the control of the reader unit rear power supply switch and the control panel power soft switch. Be sure to mount the switch cover that comes with the reader unit after turning on the power switch upon installation of the reader unit.
- Be sure to connect the power cord of the printer unit only to the outlet of the reader unit. (In other words, do not connect the power cord of the printer unit to an external power outlet.)
- Do not disconnect/connect cables (lattice connectors) used to connect accessories (e.g., editor) and connectors used to connect various units while the copier remains powered (i.e., the reader unit rear power switch is on) to prevent blowing the protective fuse on the secondary side of the power supply.

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• Reader Unit

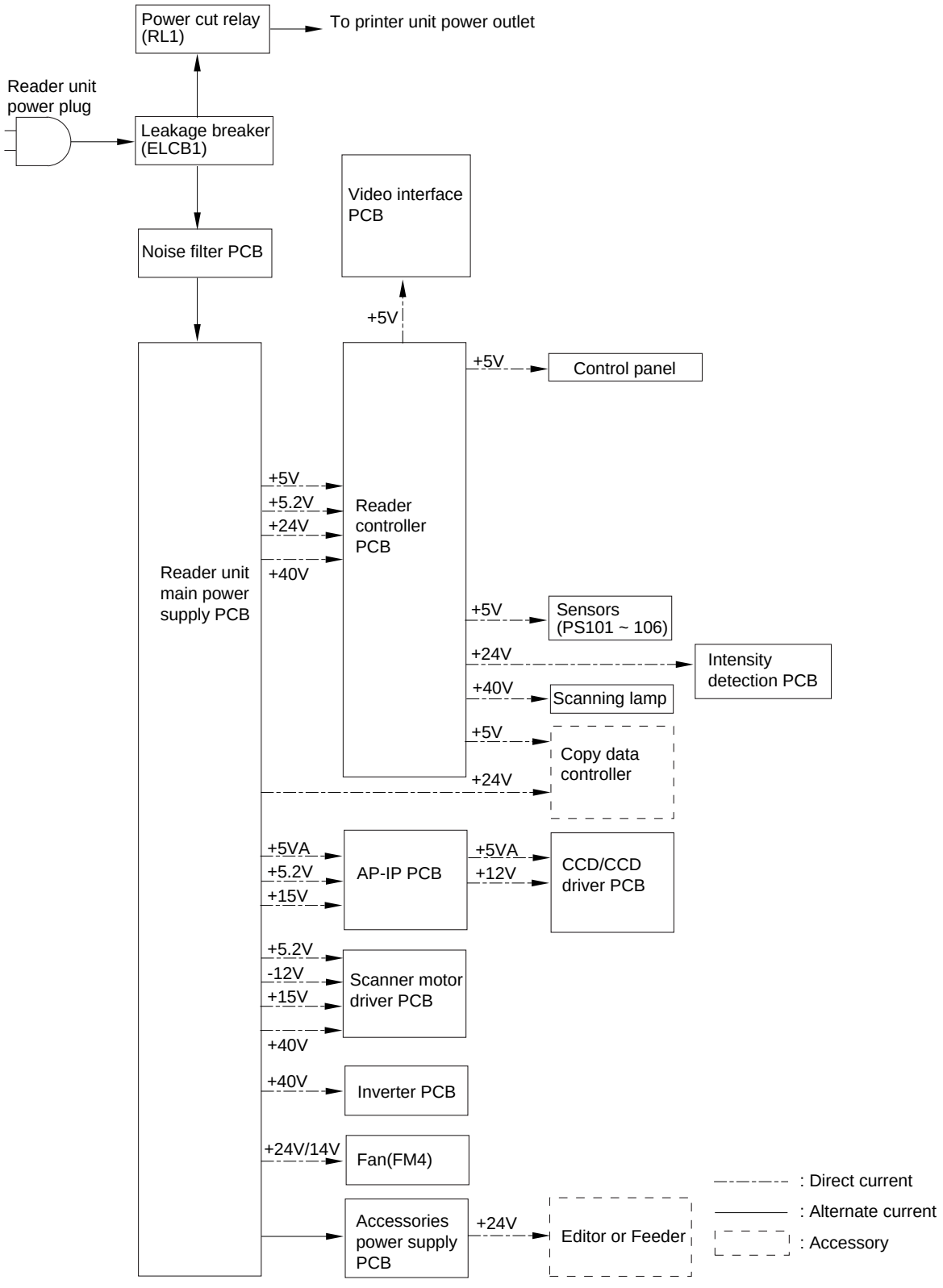

Figure 5-402

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D. Accessories Power Supply PCB

The copier is equipped with an accessory power supply PCB for the editor and the feeder (Figure 5-401). The accessories power supply PCB receives DC power from the reader unit main power supply PCB (after AC activation); +24 V is sent to each load (editor and feeder) in response to the remote signal from the reader controller PCB.

As in the case of the reader unit main power supply PCB and the printer unit low-voltage power supply PCB, the accessories power supply PCB is equipped with an overcurrent protective function and an overvoltage protective function to automatically cut off the output voltage to prevent damage to the power supply PCB in the event of an overcurrent or an overvoltage.

To reset the copier, turn off the control panel power soft switch, turn off the reader unit rear power switch, disconnect the power plug, remove the cause of activation, and then turn on the power once again.

To reset, turn off the control panel power soft switch, turn off the reader unit rear power supply switch, disconnect the power plug, remove the cause of activation, and turn on the power once again.

To reset the protection circuit, turn off the reader unit rear power switch, leave the machine alone for about 3 min, and turn on the reader unit rear power supply/control panel power soft switch once again.

Caution:

Do not disconnect/connect cables (lattice connectors) used to connect accessories (e.g., editor) and connectors used to connect various units while the machine remains powered (i.e., the reader unit rear power switch is on) to prevent blowing the protective fuse on the secondary side of the power supply.

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Reference:

The ratings of the fuses used on the secondary side of the reader unit main power supply and the accessories power supply are as follows:

Reader Unit Main Power Supply

Signal	Rating
FU1501, FU1505, FU1514	1A, 60V
FU1506, FU1512, FU1518	2A, 60V
FU1516, FU1517	0.25A, 60V
FU1502, FU1503, FU1504, FU1519	0.4A, 60V
FU1507	4A, 60V
FU1515	0.5A, 60V
FU1511, FU1513	5A, 60V
FU1509	0.63A, 60V
FU1508	7A, 60V

Reader Unit Main Power Supply

Signal	Rating
F1	10A, 125CV
F12, F18	1A, 60V
F19, F20, F24, F28	2A, 60V
F29, F30	0.25A, 60V
F11, F13, F14, F15, F17	0.4A, 60V
F27	4A, 60V
F16	0.5A, 60V
F21, F23	5A, 60V
F25	0.63A, 60V
F26	7A, 60V

Accessories Power Supply (secondary side)

Signal	Rating
FU1801	10A, 60V
FU1802	1A, 60V

Table 5-402

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V. DISASSEMBLY/ASSEMBLY

Make sure of the following when disassembling or assembling the machine:

1. ⚠ When the control panel soft switch (front of the reader unit) is turned off, the fans will operate for about 30 min to cool the machine (so as to prevent caking of toner in the toner cartridge of the printer unit). Be sure to perform either of the following in addition to disconnecting the power plug:
   - Wait for 30 min after turning off the control panel power soft switch (right of the reader unit control panel); or
   - Turn off the control panel soft switch and the reader unit rear power switch (right of the reader unit rear), and remove the fixing assembly of the printer unit.
2. Assemble the parts by reversing the steps used to disassemble them, unless otherwise mentioned.
3. Identify the screws by type (length, diameter) and location.
4. Do not leave out the toothed washer that comes with one of the mounting screws on the rear cover to protect against static electricity.
5. Do not leave out the washer that comes with the screw used for the grounding wire and the varistor to ensure electrical continuity.
6. Do not operate the machine with any of its parts removed, unless otherwise mentioned.
7. Touch the copier's metal section before starting the work to discharge the build-up of static electricity so as to prevent static damage before handling any PCBs.
8. For removal of the external covers of the reader unit, see A. "Reader Unit External Covers" under VII in Chapter 3.

Note:

All illustrations in this chapter assume that the reader assembly is mounted to the rack.

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A. Control Panel

1. Removing the Control Panel

1) Remove the reader unit lower front cover.
2) Disconnect the two connectors, and free the cable from the cable saddle. Further, free the scanner motor cable from the wire saddle.

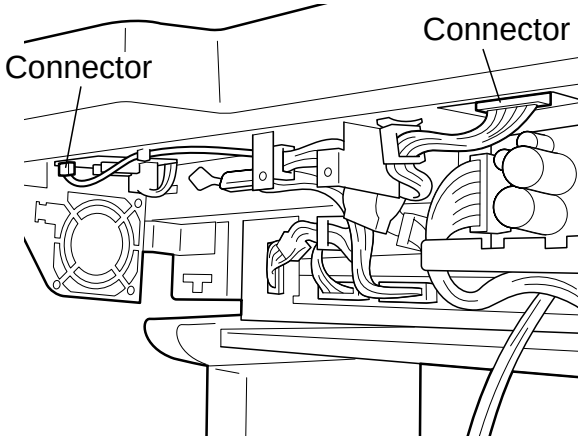

Figure 5-501

Caution:

When securing the cable, be sure to fit it in the wire saddle, preventing it from contact with metal plates.

3) Remove the four screws, and detach the control panel.

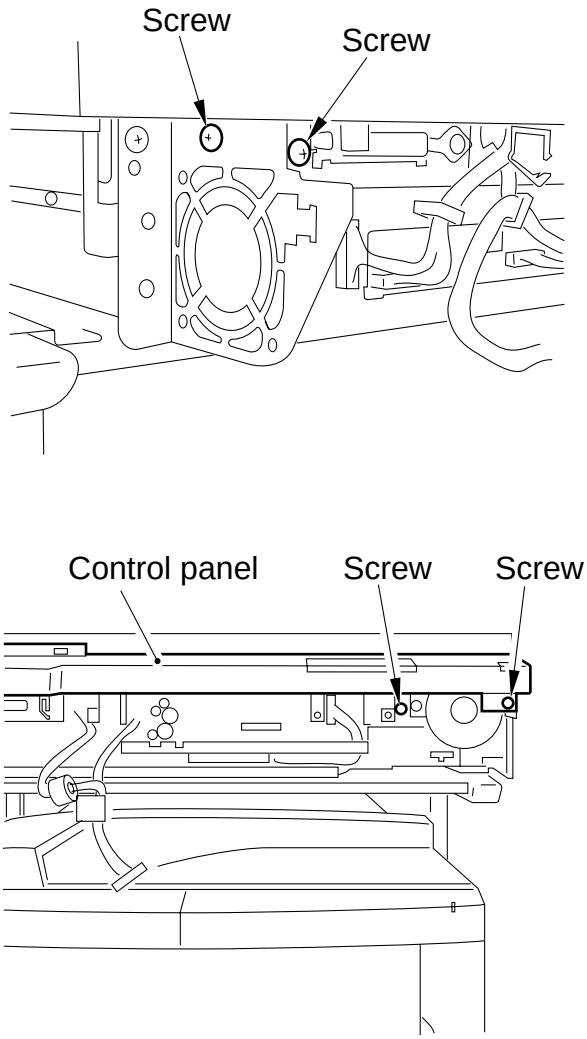

Figure 5-502

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2. Removing the LCD Assembly

1) Remove the control panel.
2) Disconnect the connector, and remove the 11 screws to detach the metal plate.

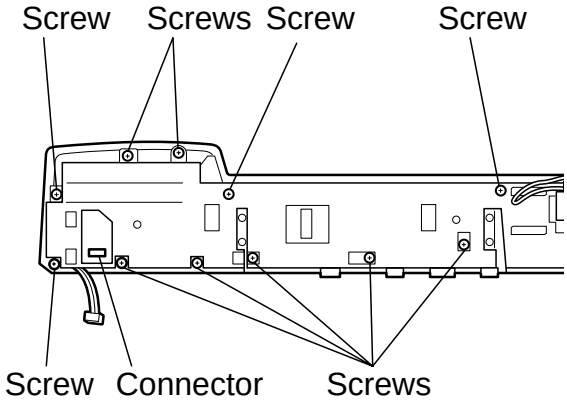

Figure 5-503

3) Disconnect the three connectors, and remove the four screws; then, detach the LCD assembly.

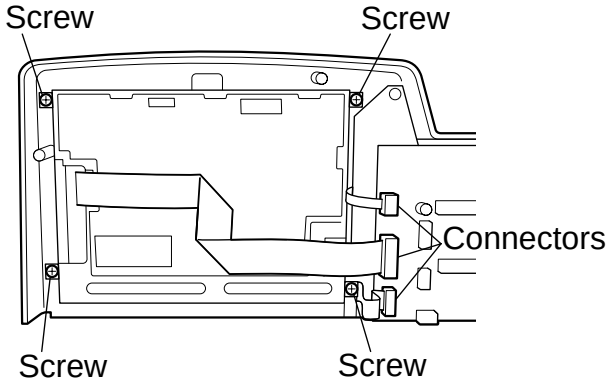

Figure 5-504

B. Fan

1. Removing the Power Supply Cooling Fan (FM4; reader unit)

1) Remove the reader unit upper rear cover, upper left cover, and rear cover in the order indicated.
2) Disconnect the connector, and remove the two screws; then, detach the fan.

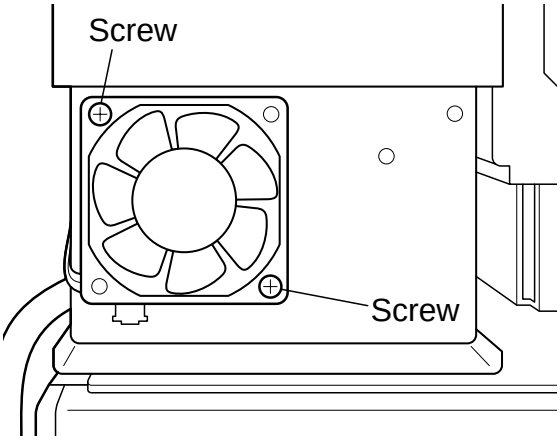

Figure 5-505

Caution:

When mounting the fan (FM4), be sure that the arrow on the fan is toward the inside (so that the wind blows inside).

C. Power Supply

1. Removing the Reader Unit Main Power Supply PCB (DCP1)

1) Remove the reader unit upper rear cover, upper left cover, and rear cover in the order indicated.
2) Disconnect the nine connectors, and remove the five screws; then, detach the reader unit power supply PCB unit.

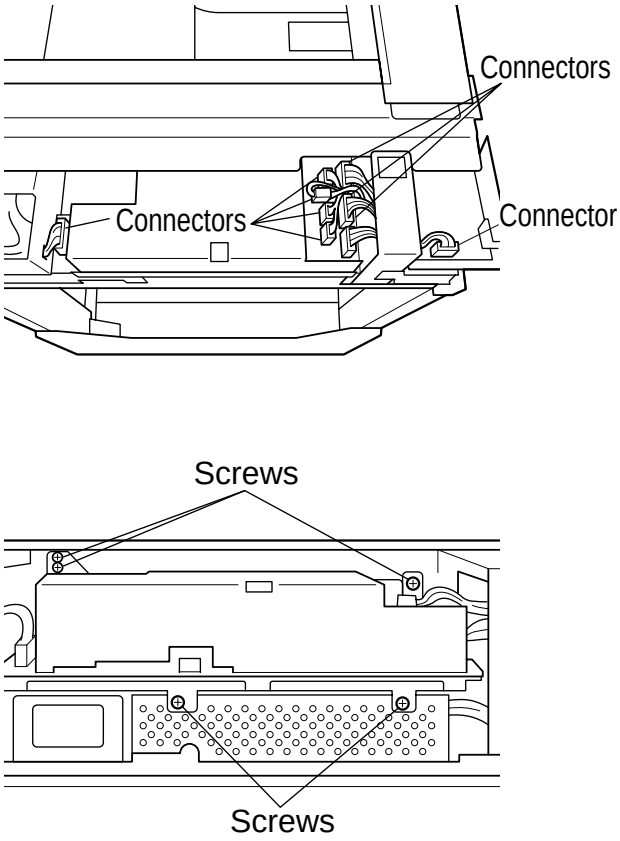

Figure 5-506

3) If the accessories power supply PCB is attached, disconnect the AC cable.

2. Removing the Accessories Power Supply PCB (DCP2)

1) Remove the reader unit upper left cover, upper rear cover, and rear cover.
2) Disconnect the connector (J1801), and remove the three screws.

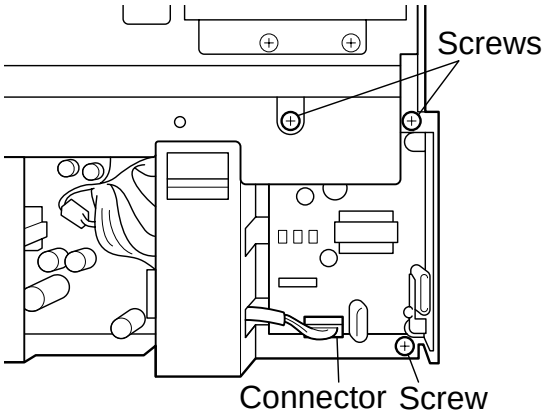

Figure 5-507

3) Disconnect the two connectors (J1802, J1804), and detach the accessory power supply PCB unit.

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CHAPTER 6

INSTALLATION

This chapter provides instructions on how to install the machine and its accessories.

Caution:

The instructions in this chapter cover the reader unit, printer unit, rack, duplexing unit, R cassette, and copyboard; however, they touch on the following for the benefit of some areas with different product composition:

- Standard configuration, in which the reader unit and the printer unit are mounted on a rack
- Duplexing unit
- Vertical feed pick-up cassette
- Copyboard

Refer to the appropriate instructions for installation.

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I. SELECTING THE SITE

The site of installation must meet the following requirements; if possible, pay a visit to the user's before the delivery of the machine.

1) There must be a power outlet that provides the rated voltage (±10%) and that may be used exclusively by the machine.

Note that sharing a power outlet with an electric appliance that repeatedly turns on and off (e.g., refrigerator) will affect the image quality because of fluctuations in voltage.

2) The temperature and humidity of the site must be as indicated in Figure 6-101. In particular, avoid areas near water faucets, water boilers, humidifiers, and refrigerators.

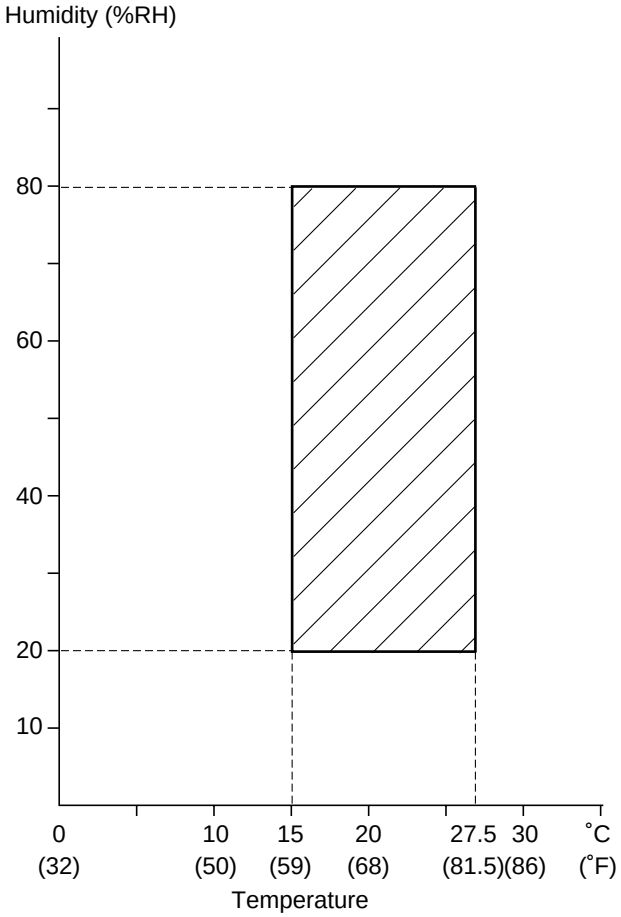

Figure 6-101 Site Environment

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3) The site must not be near a source of fire or an area subject to ammonium gas, dust, or direct sunshine. As necessary, provide curtains to avoid direct rays of the sun.

4) The site must be in a well-ventilated room.

Note:

The level of ozone generated by the copier will not affect the health of the individuals around it. Some, however, may find the odor unpleasant. Be sure that the room will remain properly ventilated to maintain a good working environment.

5) The site must ensure that the copier will remain level, with its feet in contact with the floor.

6) There must be adequate space for maintenance work.

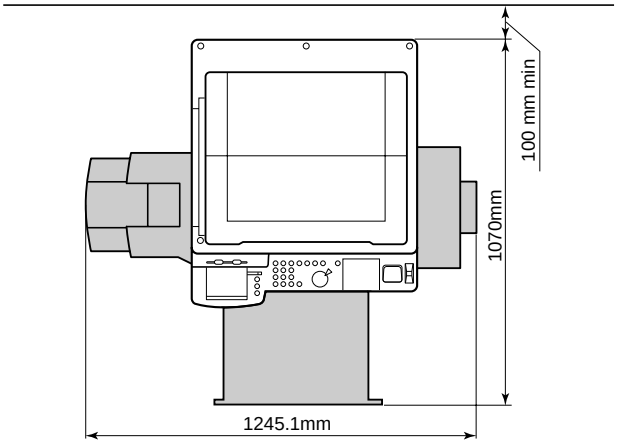

Figure 6-102

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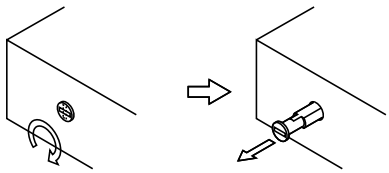
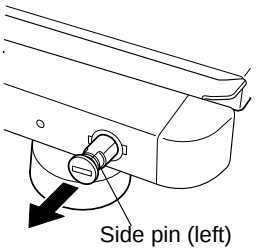
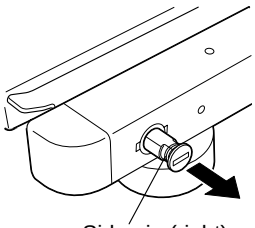
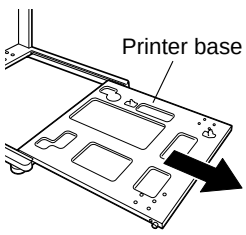
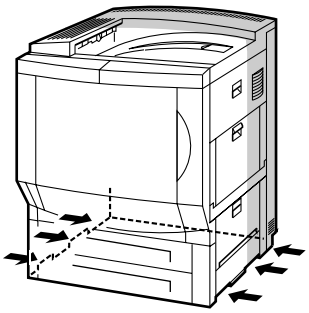
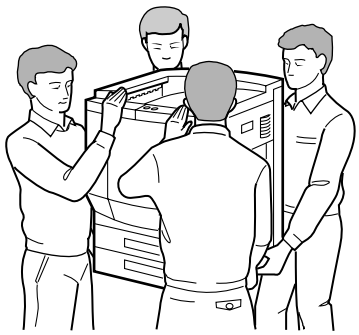
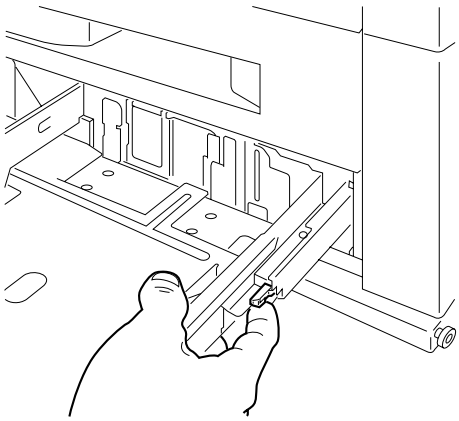
II. UNPACKING AND INSTALLATION

Bringing a piece of metal from a cold to warm place can cause droplets of water to form on its surface. This phenomenon is known as *condensation*, and a machine suffering from condensation can generate blank prints.

If the machine has just been brought in from a cold place, leave it alone for one hour or more before starting the installation work.

A. Unpacking and Mounting to the Rack

No.	Work	Remarks
1	Unpack the reader unit, printer unit, and rack.	
2	Remove the plastic bags from the reader unit, printer unit, and rack.	
3	Move the rack to the site of installation. (Thereafter, shift down the four adjusters of the rack.)	
4	Remove all attachments, fixing members, and tape from the rack.	
5	Pull the side pins halfway out (left/right, 2 pc.; Warning label); then, slide out the printer base to the front. Remove the shipping tags. Shipping Tag Caution:When placing the printer unit on the rack, turn the side pin as shown using a coin or the like; and pull halfway out the pin to slide out the printer base.  **Caution:** Before pulling the pin halfway out, be sure to turn the pin so that it is as shown. 	 Side pin (left)  Side pin (right)  Printer base

No.	Work	Remarks
6	**Caution:** The printer unit weighs about 83 kg. Be sure to work in a group of four persons and with care. The back of the printer tends to be heavier. Take care not to lose balance.	
	Lift the body as shown with four persons holding on to the grips at the side bottom when placing it on the rack.	
	Slide out the cassette 2. While shifting up the blue lever, lift the cassette 2 slightly to remove.	

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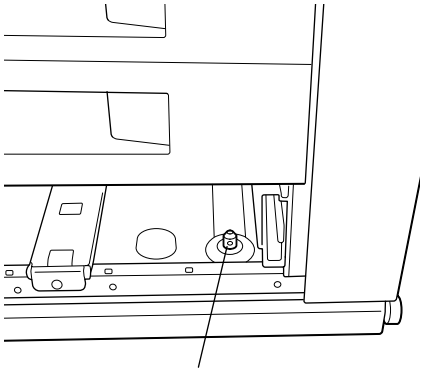
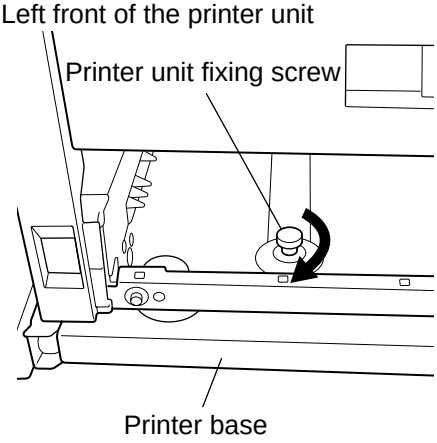
No.	Work	Remarks
	At this time, check to make sure that the pins (front, rear; 2 pc.) of the printer base are in the printer unit through the opening vacated by the cassette 2.	Right front of the printer unit 
7	Turn the printer unit fixing screw clockwise to secure the printer unit to the base.	Left front of the printer unit 
8	Slide the cassette 2 (bottom cassette) into the machine.	

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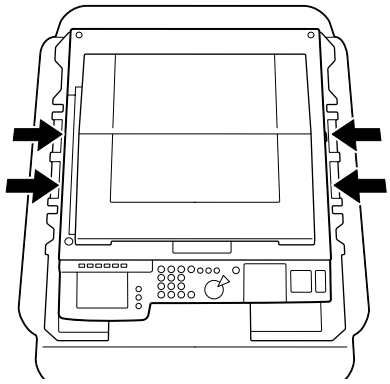
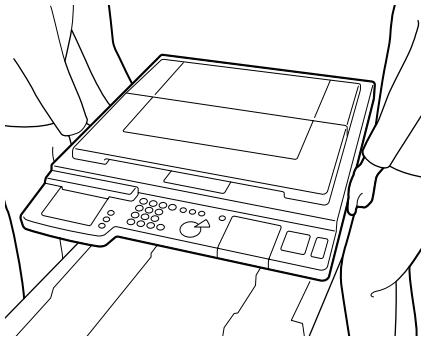
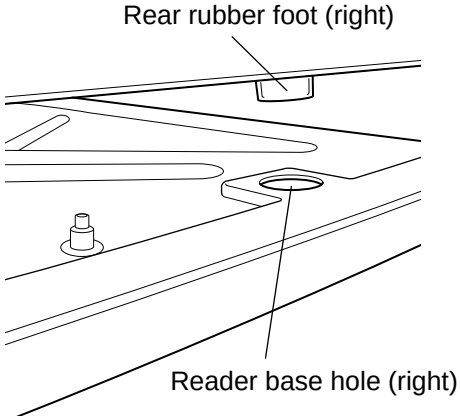
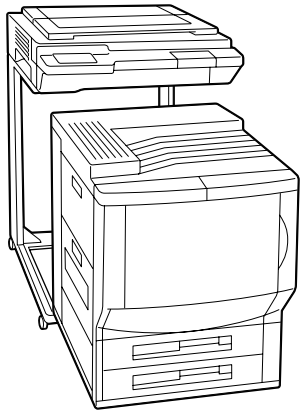
No.	Work	Remarks
9	**Caution:** The reader unit weighs about 30 kg. Be sure to work in a group of two and with care. **Caution:** Place the reader unit on the reader base. • Place the reader unit while fitting the rear rubber feet (left, right) into the holes of the reader base. • When placing the reader unit, take care not to trap the cable. • A wrench is packaged with the reader unit. Do not lose it. • When holding the reader unit, be sure to keep the hands as shown. Do not hold its control panel. See the diagram for the configuration.	   

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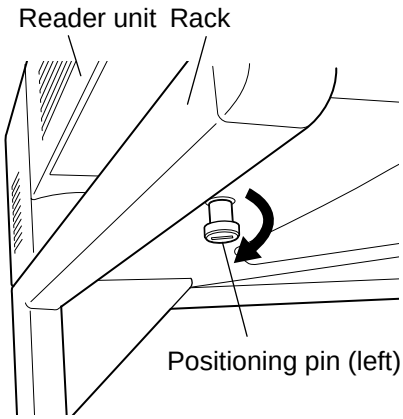
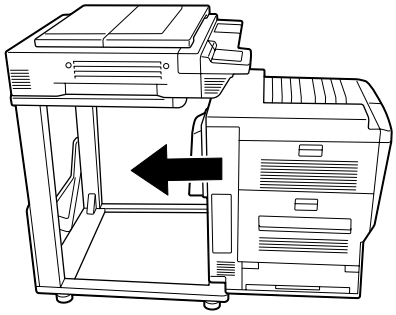
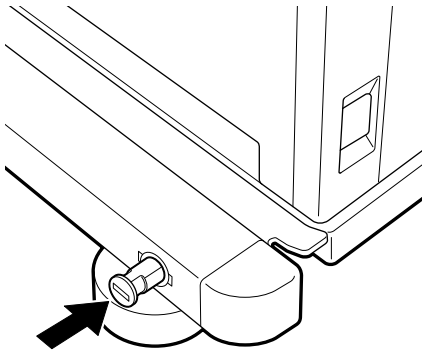
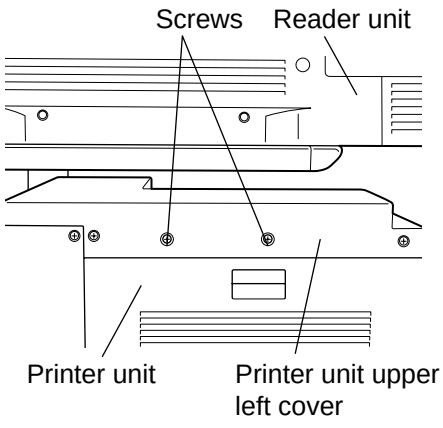
No.	Work	Remarks
10	Turn the positioning pins (left, right; 2 pc.) on the bottom of the reader base clockwise (viewing from the bottom) to secure the reader unit and the base.	
11	Push in the printer unit into the rack, and push in the side pins (left, right; 2 pc.).	 
12	Remove all tape from the external covers of the printer unit.	
13	Remove the two screws (to be used later) from the upper left cover of the printer unit.	

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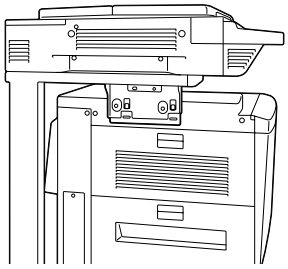
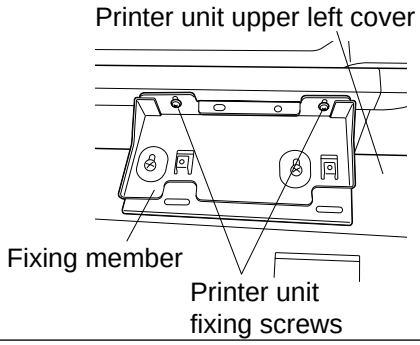
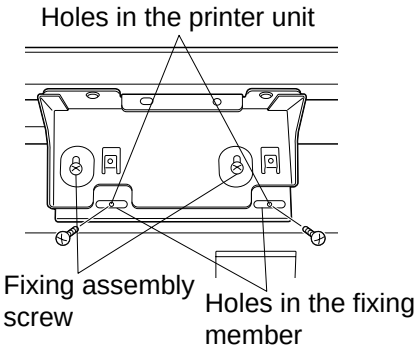
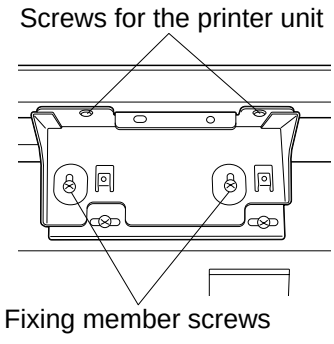
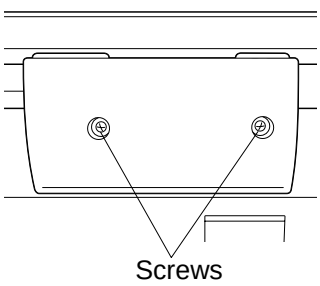
No.	Work	Remarks
14	Secure the fixing member temporarily to the left side of the rack with two printer unit fixing screws.	 
15	Loosen the fixing member screws and match the holes in the fixing member and the holes in the printer unit; then, secure the two in place using the two screws removed in step 13. **Caution:** The height of the copier will change when the adjusters are shifted down; loosen the fixing member screws, and tighten them again as necessary.	
16	Tighten the four screws fully.	
17	Mount the fixing member cover with two screws over the fixing member 1/2.	

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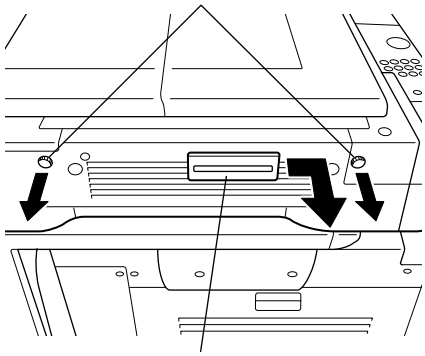
B. Installing the Reader Unit

No.	Work	Remarks
1	Remove the shipping tape from the reader unit, and remove the protective sheet from the copyboard glass.	
2	Removing the Scanner Metal Fixing Remove the two orange screws used to keep the scanner in place (by turning them counterclockwise); then, slide the scanner metal fixing to the right to remove it to the front. **Caution:** The scanner fixing screws and the scanner metal fixing will be used when the copier must be relocated. Store them away.	Scanner fixing screws  Scanner metal fixing

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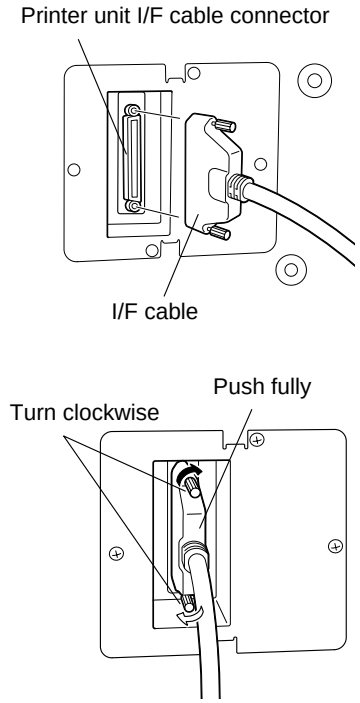
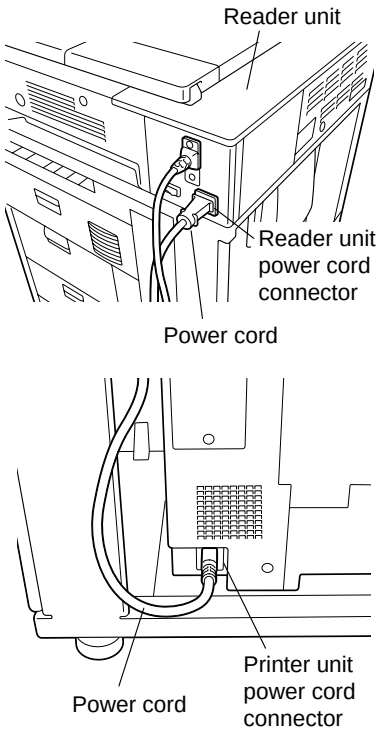
C. Connecting the Cables

No.	Work	Remarks
1	Connect the I/F cable from the reader unit to the I/F cable connector on the rear left of the printer unit.	
2	Secure the I/F cable in place with the wire saddle found at the rear of the rack.	
3	Connect the power cord that comes with the printer unit to the reader unit power cord connector (rear right) and the printer unit power cord connector (bottom, rear left).	

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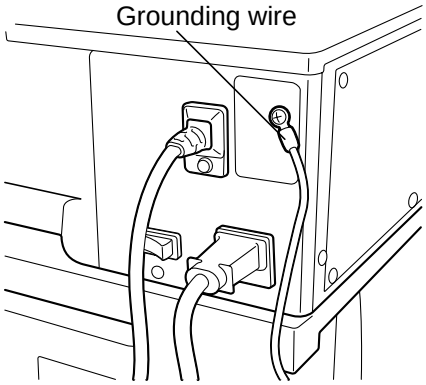
No.	Work	Remarks
4	Secure the power cord in place using the wire saddle found at the rear of the rack.	
5	If the machine must be moved to its site of installation, shift up the adjusters on the rack, and move it to the site; thereafter, shift down the adjusters.	
6	Connect the grounding wire. (reader unit only)	

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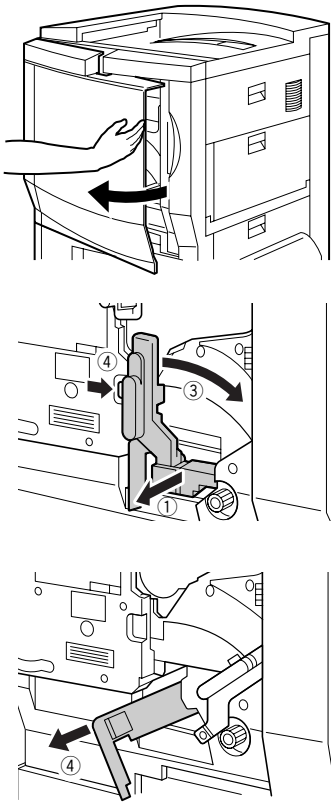
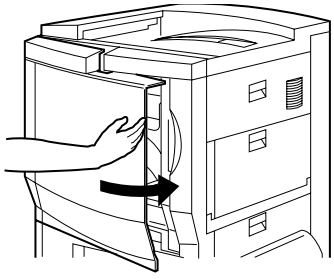
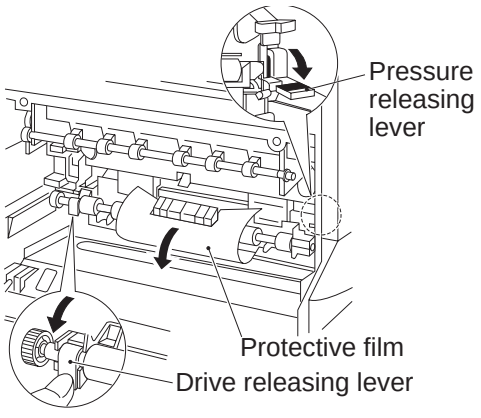
D. Installing the Printer Unit

No.	Work	Remarks
1	Open the front door, and remove the orange stopper 1. Then, while pushing the white button 2, open the green releasing lever 3, and remove the spacer 4. **Caution:** The orange stopper 1 will be needed when relocating the machine Store it away.	
2	Shift the green releasing lever back into its initial position, and close the front door.	
3	Shift down the drive releasing lever found to the lower left of the fixing assembly in the direction of the arrow; then, pull out the protective film. Thereafter, shift down the pressure releasing lever in the direction of the arrow.	

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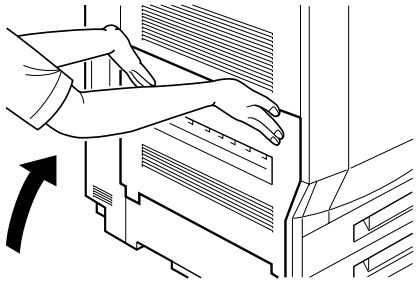
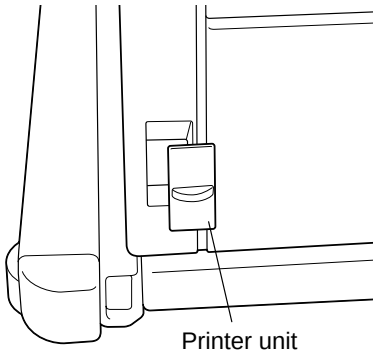
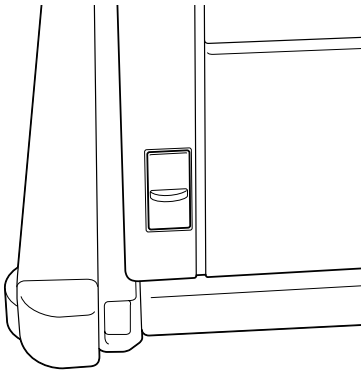
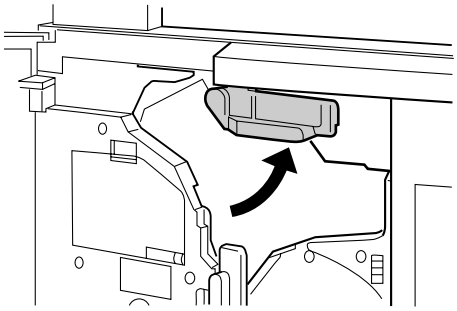
No.	Work	Remarks
4	Close the delivery cover of the printer unit.	
5	Connect the power plug from the reader unit to the power outlet.	
6	Push in the power switch found to the lower left of the print unit so that it is in ON position. Then, attach the printer unit switch cover over it. (The switch must not be touched after installation of the machine.)	 
7	Open the front door, and shift up the blue releasing lever in the direction of the arrow.	

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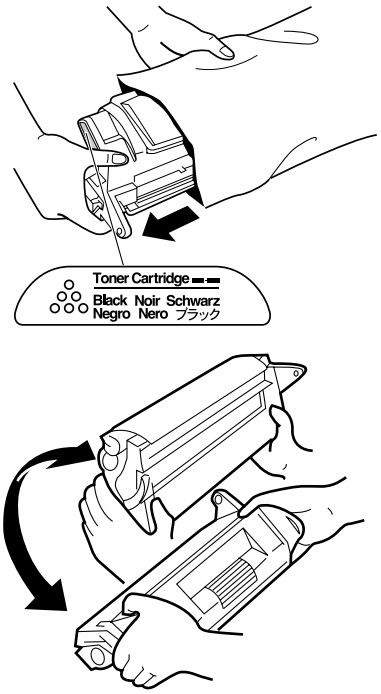
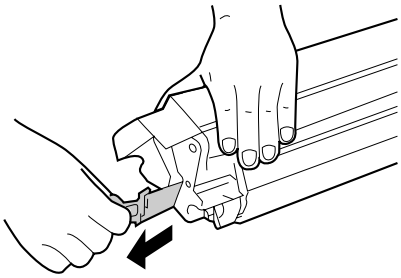
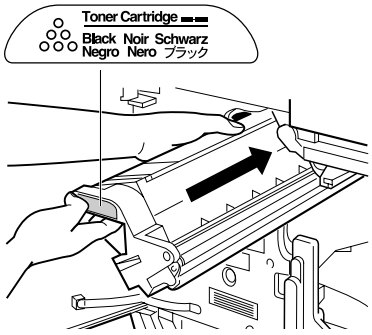
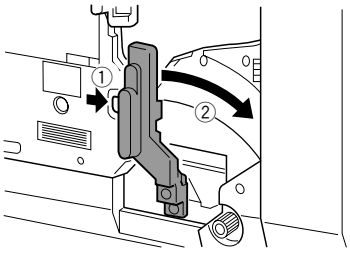
No.	Work	Remarks
8	Take out the black toner cartridge carefully from the protective bag. Holding it as shown, shake it slowly five to six times to even out the toner inside it.	
9	Place the black toner cartridge on a level surface. While holding the cartridge in place, pull out the sealing tape.	
10	While holding the black toner cartridge lever as shown, match it against the guide inside the slot, and push it fully inside.	
11	While pushing the white button 1, open the green releasing lever 2.	

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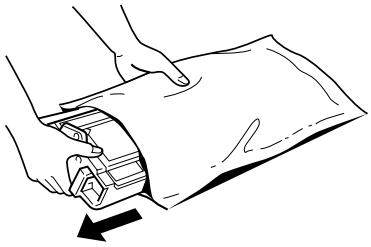
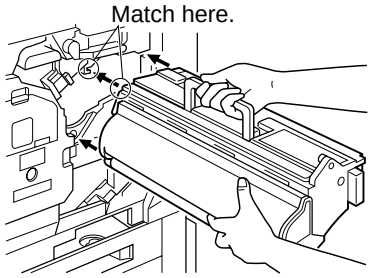
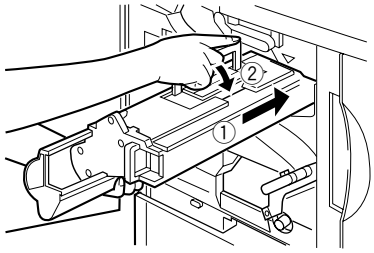
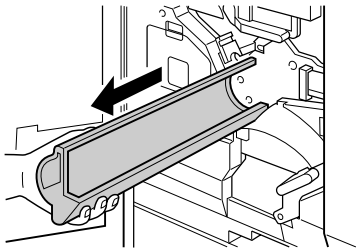
No.	Work	Remarks
12	Take the drum cartridge from the protective bag.	
13	Shift up the handle of the cartridge, and mach it against the drum slot as shown.	
14	While holding the protective cover in place, shift the handle back to its initial position; then, insert the drum cartridge straight into the copier slowly.	
15	After fully inserting the drum cartridge, remove the protective cover. **Caution:** The protective cover is needed when relocating the copier or whenever removing the drum out of the machine. Store it away.	
16	Shift the green releasing lever back to its initial position; then, shift the blue releasing lever back to its initial position.	

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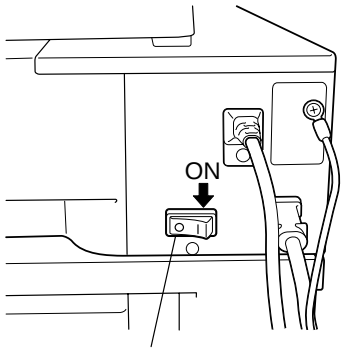
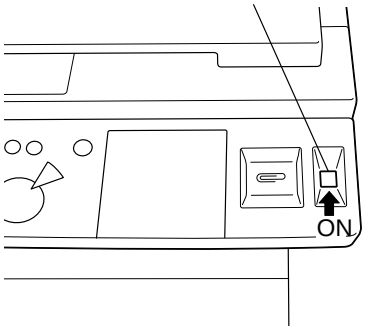
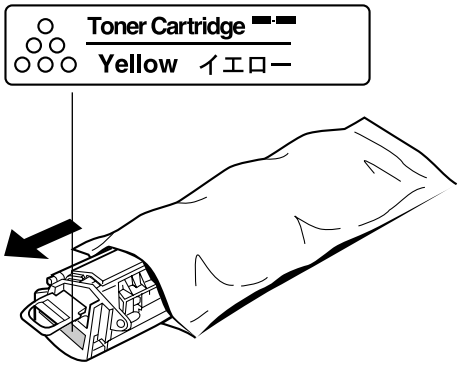
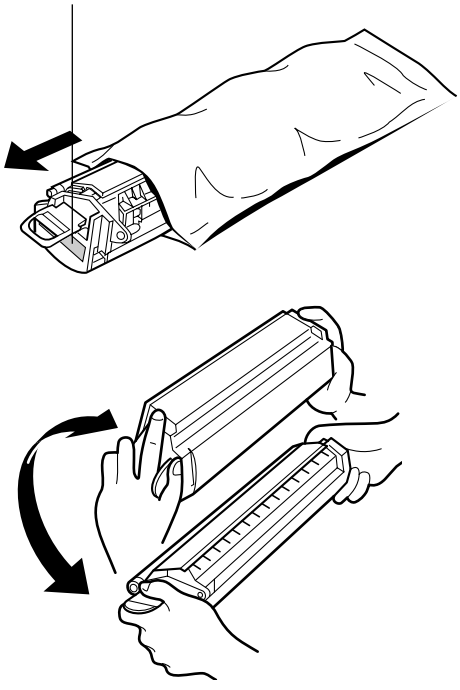
No.	Work	Remarks
17	Turn on the reader unit rear power switch, and turn on the control panel power soft switch.	 Reader unit rear power switch Control panel power soft switch 
18	Insert the control key.	
19	Take the yellow color toner cartridge out of the protective bag carefully. While holding it as shown, shake it five to six times slowly to even out the toner inside it.	 

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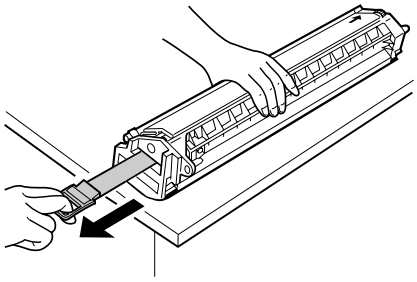
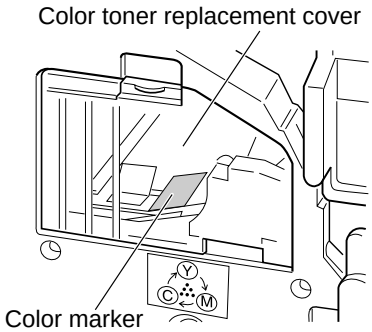
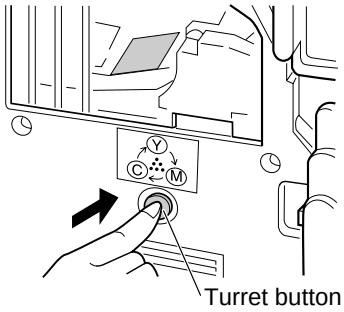
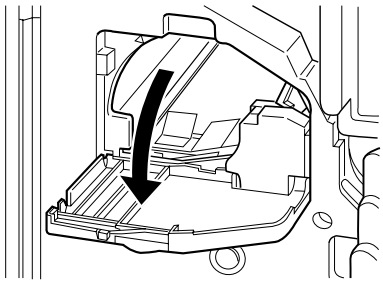
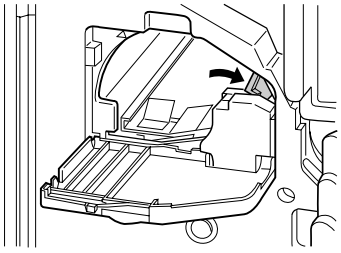
No.	Work	Remarks
20	Place the yellow color toner cartridge on a level surface; while holding the cartridge in place, pull out the sealing tape.	
21	Look into the color toner replacement cover to make sure that the color marker is yellow. (Otherwise, push the turret button to make sure it is yellow.)	 
22	Open the color toner replacement cover, and shift the blue locking lever on the right of the turret to the right.	 

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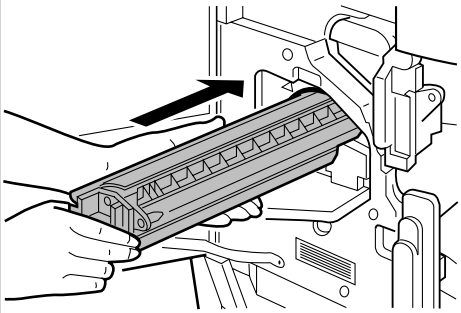
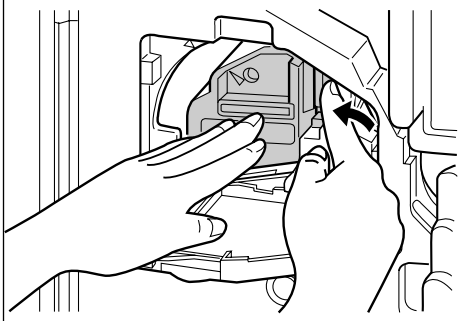
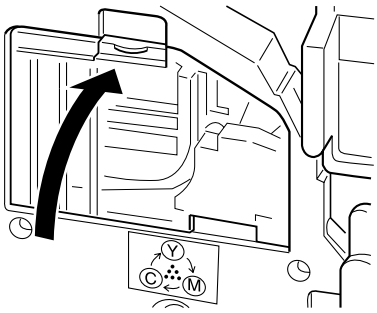
No.	Work	Remarks
23	While holding the yellow toner cartridge level as shown, push it fully inside.	
24	While forcing the yellow color toner cartridge against the rear, shift the locking lever back to its initial position to secure the cartridge in place.	
25	Close the color toner replacement cover.	
26	By performing the foregoing steps, install the magenta and cyan color toner cartridges (in the order indicated). Pressing the turret button once will change the color from yellow to magenta; another press will change it to cyan.	
27	Close the front door.	

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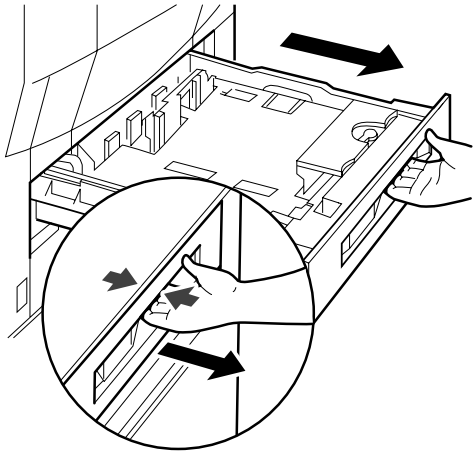
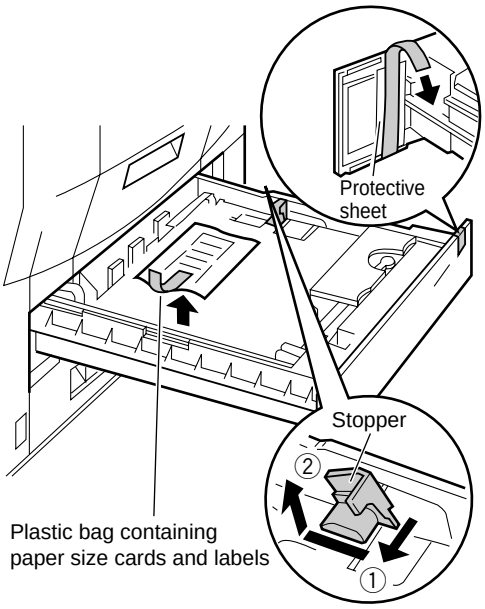
E. Checking the Settings, Images, and Operations

No.	Work	Remarks
1	Slide out the cassette 1 fully.	
2	Remove the stopper and the protective sheet from inside the pick-up cassette; then, take out the plastic bag containing paper size cards and labels.	

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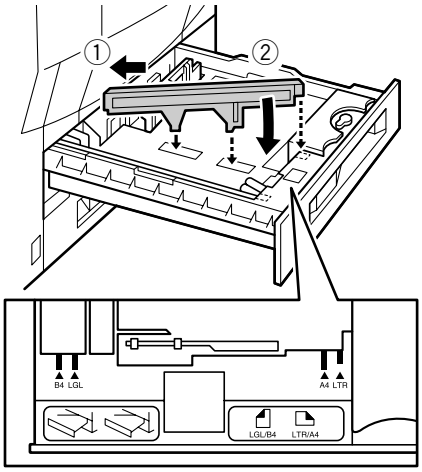
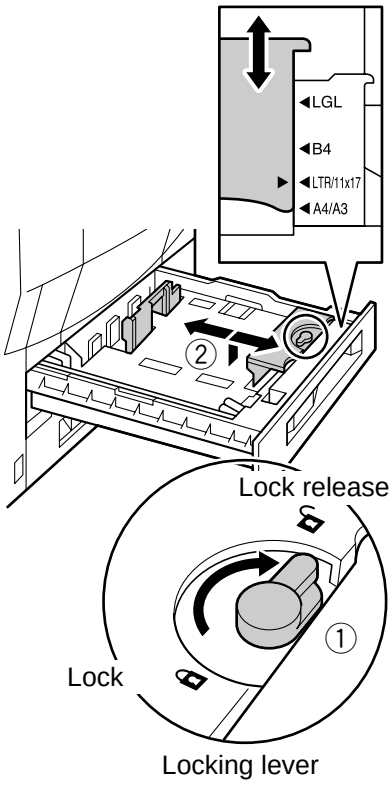
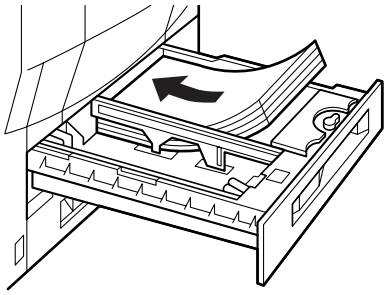
No.	Work	Remarks
3	Adjust the paper guide to the size of paper selected according to the needs of the user. The pick-up cassette is equipped with paper guides on the left end and the font/rear on the right side. Lift the front of the paper guide on the left end to remove; then, position it to suit the size of the paper. Turn the locking lever of the paper guide on the right to release position ① to remove; then, reposition it to suit the size of the paper. Thereafter, turn the locking lever to lock position to secure it in place.	 
4	Place paper against the paper guides on the left and the rear.	

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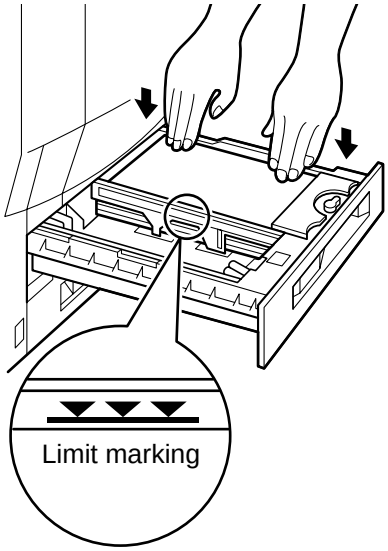
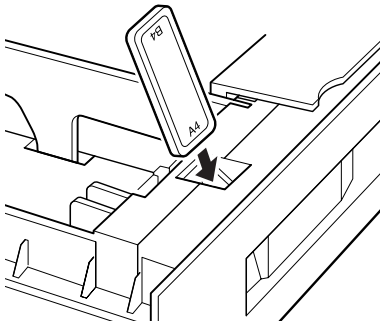
No.	Work	Remarks
5	While holding the right side o the paper down, check to make sure that the stack is not in excess of the stacking limit indicated on the paper guide.	
6	Attach the size label indicating the size of the paper set in the cassette to the paper size card; then, fit the card into the paper size indicator on the front left of the pick-up cassette.	
7	Push the cassette 1 fully inside, and work on the cassette 2. • Check to make sure that the Add Paper indicator turns off. • Press the keys other than the Copy Start key on the control panel to make sure that operations are normal.	
8	Execute auto gradation correction in user mode.	
9	Start service mode, and select COPIER>OPTION>USER>S/U-SW. If the copier is to be serviced by a service person in the US, set the item to '0'. In non-US areas, if the copier is to be maintained by the user, set the item to '1'.	

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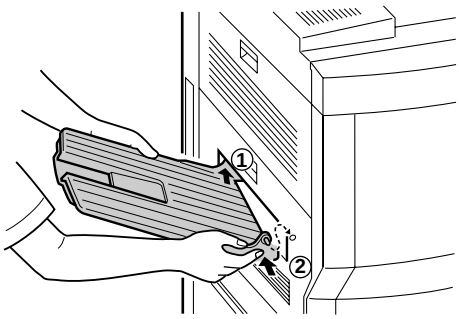
No.	Work	Remarks
10	Place the Test Chart on the copyboard, and make copies using all cassettes to check the image quality. • Make sure no abnormal noise is heard. • Check the printing operation and image quality for each default ratio. • Make sure as many prints as specified are made normally.	
11	If the user desires face-up delivery, select 'side tray delivery' in user mode, and mount the face-up tray. (At the factory, 'center tray', i.e., face-down delivery' is selected.	
12	Check the external covers to make sure that they are free of scratches and deformation.	
13	Clean up the area around the copier.	
14	Fill out the Service Sheet.	

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F. Selecting the Type of Message for the Printer Unit

If you have installed the PS/PCL Board to the printer unit, you must select the type of message appearing on its control panel.

- EUROPE for service maintenance
- JAPAN not used
- UNITED STATES for user maintenance
- UNKNOWN not used
- EUROPE2 not used
- JAPAN2 not used
- UNITED STATES2 for service maintenance

The default setting is UNITED STATES (i.e., for user maintenance).

To change the type of message, perform the following:

No.	Work	Remarks
1	Turn off the printer unit.	
2	Check to make sure that the jumper head is fitted to J27 of the PS/PCL Board.	
3	Install the PS/PCL Board to the printer unit.	
4	While holding down the Menu and ∨ key on the control panel of the printer unit, turn on the printer unit. At this time, be sure to hold down the two keys until the message 'START SELF-TEST' appears.	
5	Wait until the printer unit has run self diagnosis, and indicates the message 'VERSION INFO'	If the printer unit has started without displaying the message, turn it off, and start with step 4.
6	Press the Menu key several times so that the message 'CHANGE DEFAULT LOCALE:' appears.	
7	Press the Enter key.	
8	When 'DEFAULT LOCALE:' has appeared, select the item that indicates the site of installation using the ∧ or ∨ key. (The currently selected item is indicated by the asterisk * on the last digit.)	• EUROPE for service maintenance • JAPAN not used • UNITED STATES for user maintenance • UNKNOWN not used • EUROPE2 not used • JAPAN2 not used • UNITED STATES2 for service maintenance The default setting is UNITED STATES (i.e., for user maintenance).

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No.	Work	Remarks
9	After making the selection, press the Enter key. The message 'LOCALE STORED' will appear and remain for about 1 sec, to be replaced by the message 'CHANGE DEFAULT LOCALE:'.	
10	Turn off the printer unit, and remove the PS/PCL Board from the printer unit.	
11	Detach the jumper head J27 of the PS/PCL Board, and install the PS/PCL Board to the printer unit once again.	Be sure to detach the jumper head from J27, and store away the head for future use.
12	Turn on the printer unit.	

■ Making Sure of the Change

- You can start the printer unit and print a start page. (Check the name of the product, which differs according to the site of installation.)
- While the machine is in ready state, remove the photosensitive drum unit, and close the front door. If 'INSTALL DRUM CARTRIDGE' appears on the control panel of the printer unit, the machine is set for user maintenance; if 'SERVICE CALL E810' appears, it is set for service maintenance.

Caution:

- If the jumper head is not fitted to J27, the menu for 'CHANGE DEFAULT LOCALE:' will not appear during the above procedure.
- Do not change any items except 'CHANGE DEFAULT LOCALE:'.

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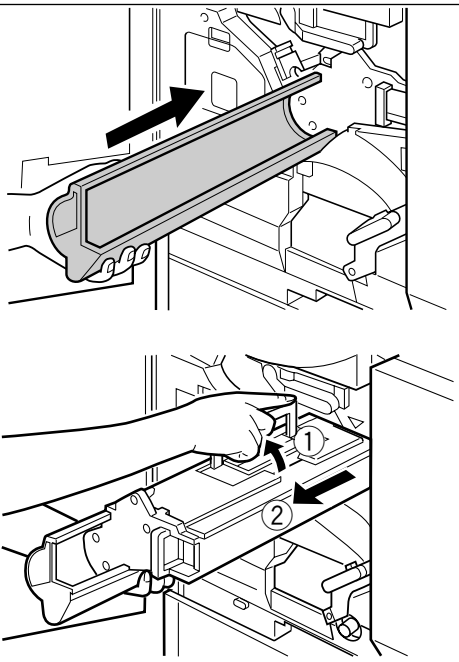
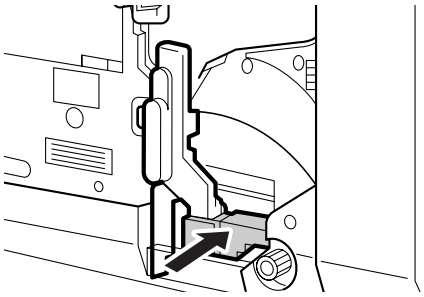
III. RELOCATING THE MACHINE

If the machine must be relocated by truck or other means of transportation after installation, perform the following:

Note that the machine's fan is designed to operate for 30 min after the control panel power soft switch is turned off to prevent its inside from overheating. Be sure to turn off the reader unit rear power switch after making sure that the fan has stopped operating.

No.	Work	Remarks
1	Take out the toner cartridges (Y, M, C, and Bk) from the machine.	
2	Prepare the drum cover (MF4-0106) removed at time of installation, and set it as shown. Then, take out the drum cartridge.	
3	Mount the orange secondary transfer belt fixing member.	
4	Shift up the adjusters (front, rear; 4 pc.) of the rack.	

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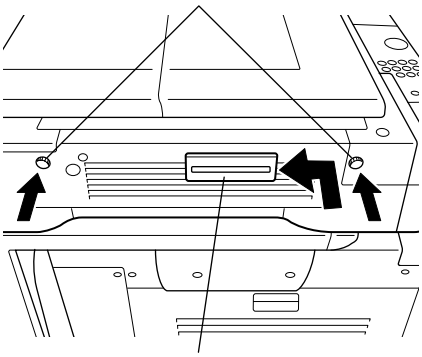
No.	Work	Remarks
5	Disconnect the power plug from the power outlet, and remove the interface cable used to connect the reader unit and the printer unit.	
6	Mounting the Reader Unit Scanner Metal Fixing Fit the two orange scanner fixing screws removed at time of installation. Fit the scanner metal fixing into the hole, and slide it from the front to the rear to secure the scanner mirror mount in place. Then, tape the metal fixing in place.	Scanner fixing screws  Scanner metal fixing

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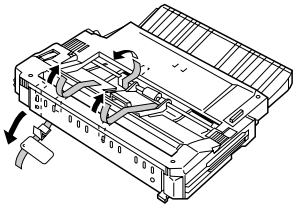
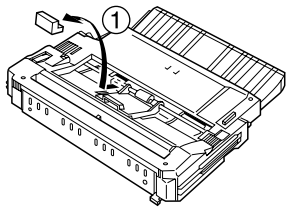
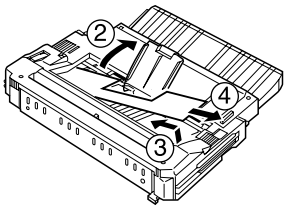
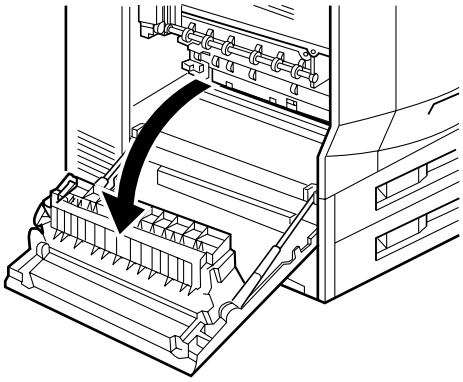
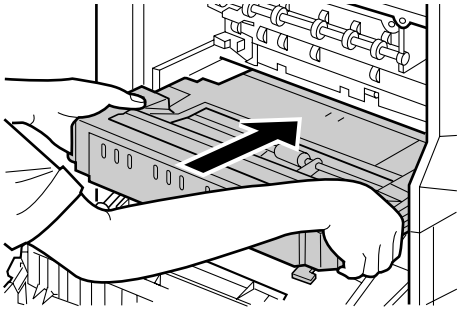
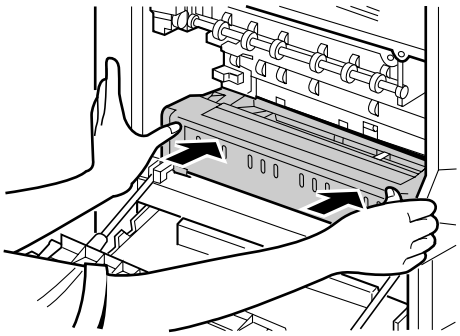
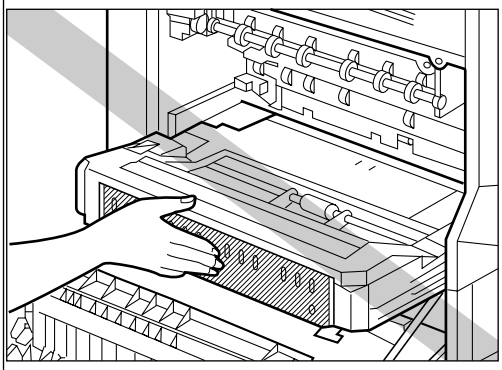
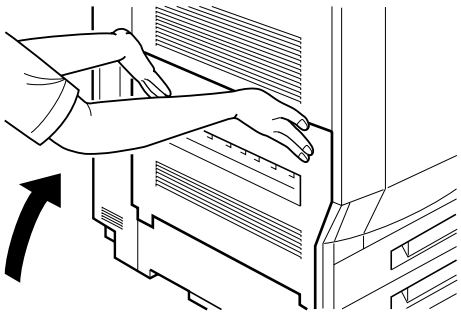
IV. MOUNTING THE DUPLEXING UNIT

No.	Work	Remarks
1	Turn off the control panel power soft switch, and turn off the reader unit rear power switch.	
2	Unpack the duplexing unit.	
3	Remove the tape, stopper, and spacers from the duplexing unit.	 Remove the tape.  Remove the stopper.  Remove the spacers.
4	Open the printer unit delivery cover. **Caution:** The fixing assembly behind the printer unit delivery cover and the areas around the delivery assembly become extremely hot during printing operation, enough to cause burns. If the machine has been used, turn off the power and leave it alone for a while before starting to mount the duplexing unit. (Check to make sure it has cooled.)	

No.	Work	Remarks
5	While holding the duplexing unit as shown, insert it into the duplexing unit slot. (After sliding the duplexing unit halfway, hook the thumbs on both sides of the unit, and push in the unit until a click is heard.) **Caution:** Do not push on the metal plate on the back of the duplexing unit as shown. The metal plate can deform to cause faults and paper jams.	  
6	Close the printer unit delivery cover. (Be sure to close it firmly until a click is heard.)	

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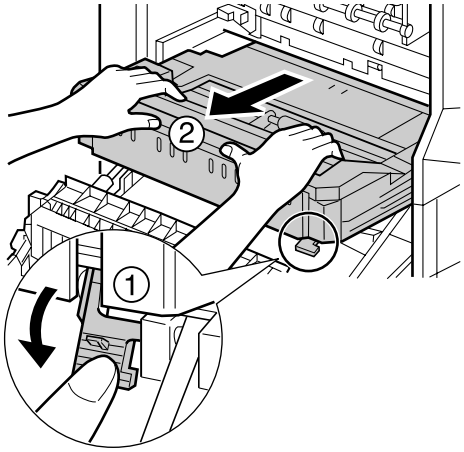
No.	Work	Remarks
7	When removing the duplexing unit, push down the locking lever found to the lower right of the duplexing unit; then, using both hands, slide it out carefully. **Caution:** Do not push on the metal plate on the back of the duplexing unit as shown. The metal plate can deform to cause faults and paper jams.	 Locking lever

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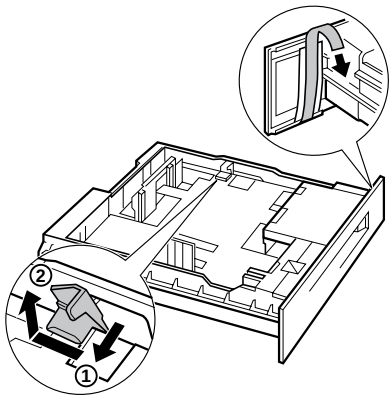
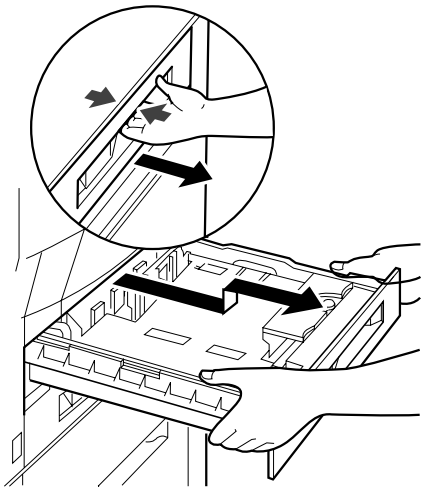
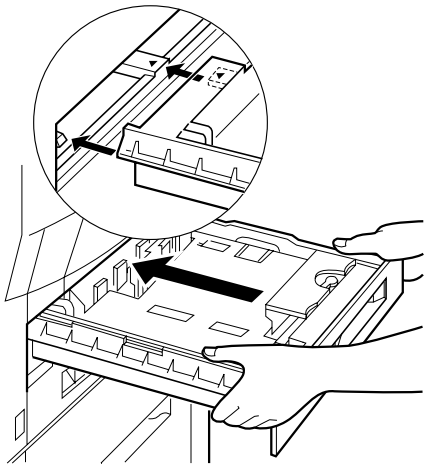
V. INSTALLING THE VERTICAL FEEDING CASSETTE (A4R, LTRR, B5R, A5R)

No.	Work	Remarks
1	Unpack the vertical feeding cassette.	
2	Remove the stopper and the protective sheet from inside the vertical feeding pick-up cassette.	
3	Hold the handle on the front of the cassette 1 (standard) as shown, and pull on the locking lever at the rear. When the cassette 1 stops, lift it, and pull it to remove.	
4	Match the groove in the bottom of the vertical feeding cassette and the guide on the printer unit, and fit the cassette in the copier. **Caution:** The vertical feeding cassette is designed for installation in the cassette 1 holder. Take care not to force it inside at an angle.	 Match the triangle marking on the printer and the triangle marking on the pick-up cassette; then, place the left end of the pick-up cassette on the guide.

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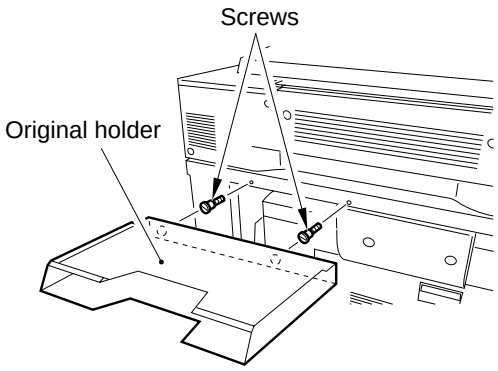
VI.MOUNTING THE ORIGINAL HOLDER

No.	Work	Remarks
1	Unpack the copyboard.	
2	Mount the original holder to the machine's left side (rack) as shown in the diagram using stepped screws.	

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VII. MOUNTING THE CONTROL CARD-IV

Caution:

- Be sure to disconnect the power plug before starting the mounting work.

1) Remove the two screw covers, and remove the two screws; then, detach the lower front cover of the reader unit.

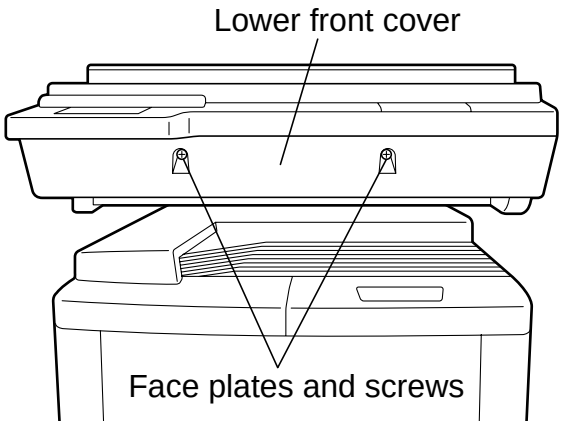

Figure 6-701

2) Remove the face plate ① from the slot of the control card cable. (Use pliers or a screwdriver to detach the face plate ①.)

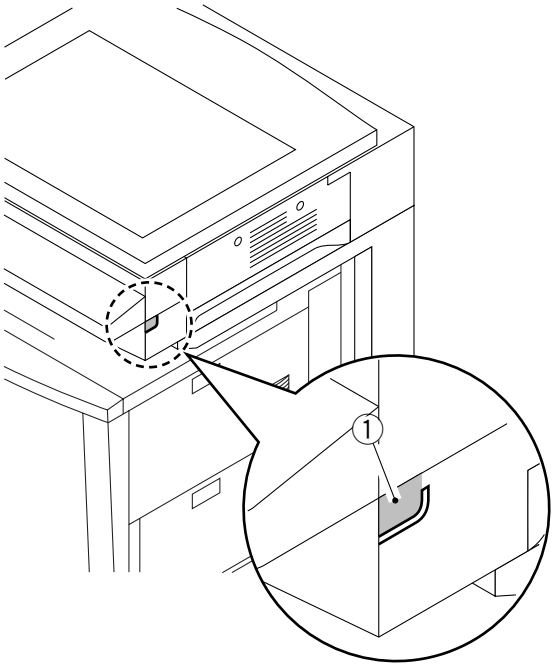

Figure 6-702

3) Free the harness ② from the clamp ③.

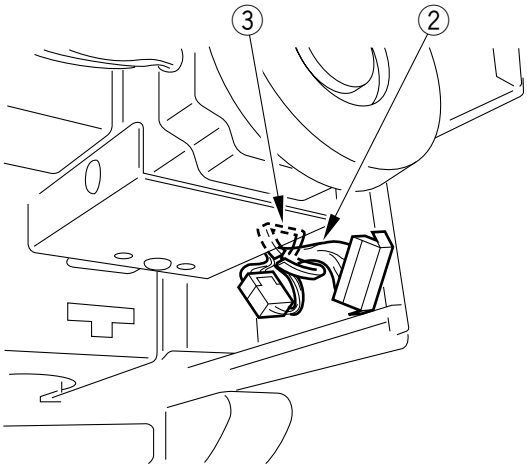

Figure 6-703

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4) Disconnect the shorting connector ④ from the back of the control panel.

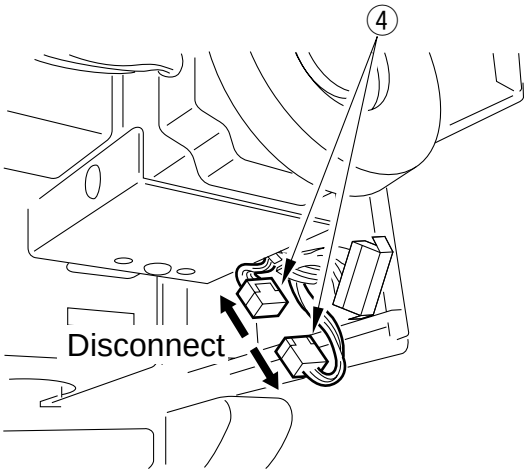

Figure 6-704

5) Secure the Control Card-IV ⑤ in place with a screw ⑥(M4x12); When doing so, be sure to match the hole in the mount for the Control Card-IV with the boss ⑦.

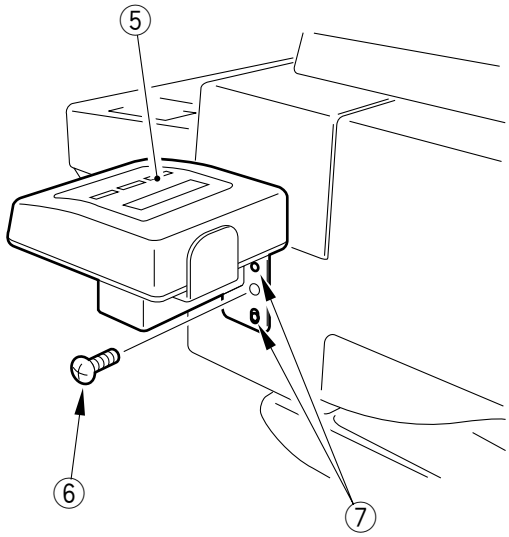

Figure 6-705

6) Mount the grounding wire ⑧ of the Control Card-IV with a screw ⑨ that comes with the unit.

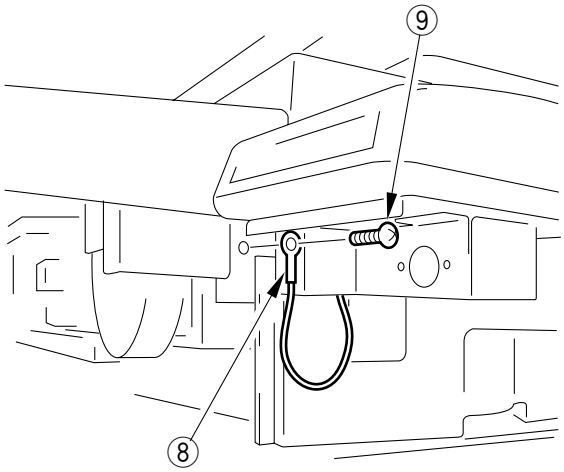

Figure 6-706

7) Connect the 4P cable ⑩ of the Control Card-IV to the 4P connector ⑪ of the reader unit.

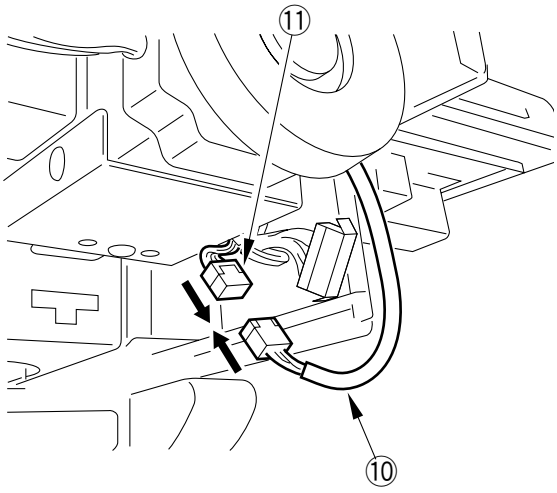

Figure 6-707

8) Connect the power plug of the machine, and turn on the power switch to check the operation of the Control Card-IV.
9) Mount the lower front cover of the reader unit.

VIII. MOUNTING THE CARD READER-B1

Caution:

- The Card Reader-B1 is enabled when the Copy Data Controller-A1 is installed.
- Be sure to disconnect the power plug before starting the mounting work.

1) Remove the two screw covers, and remove the two screws; then, detach the lower front cover of the reader unit.

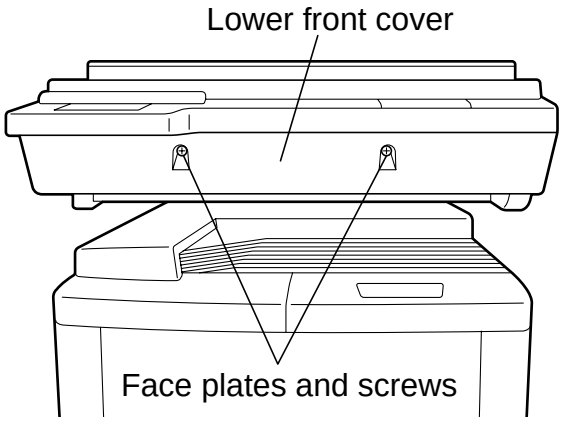

Figure 6-801

2) Remove the face plate ① from the slot of the control card cable. (Use pliers or a screwdriver to detach the face plate ①.)

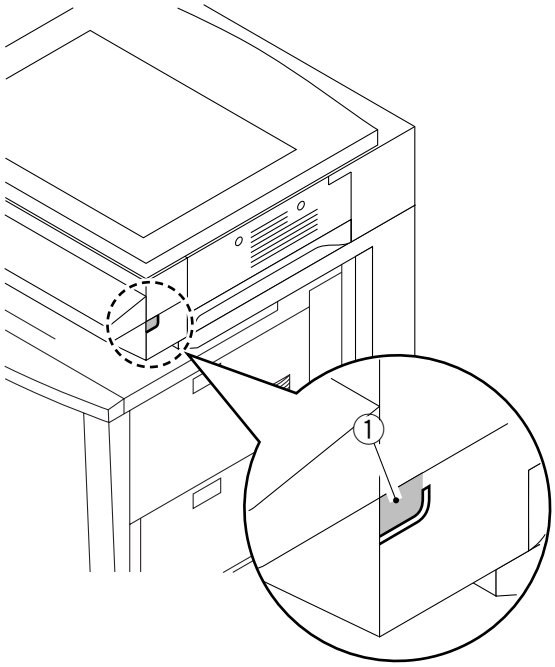

Figure 6-802

3) Secure the Card Reader-B1 ② in place with a screw ③ (M4x12); When doing so, be sure to match the hole in the mount for the Card Reader-B1 with the boss ④.

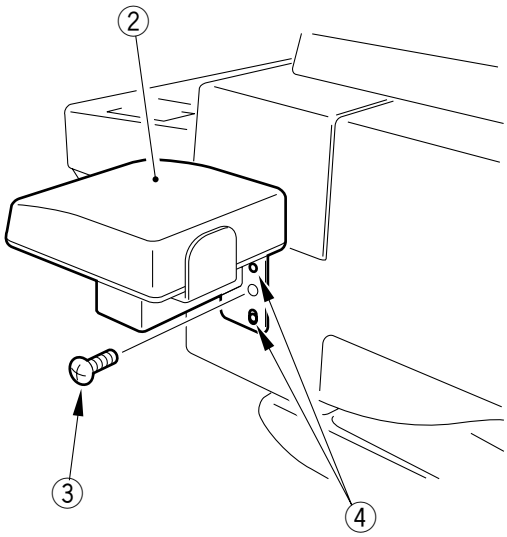

Figure 6-803

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4) Mount the grounding wire ⑤ of the Card Reader-B1 with a screw ⑥ that comes with the unit.

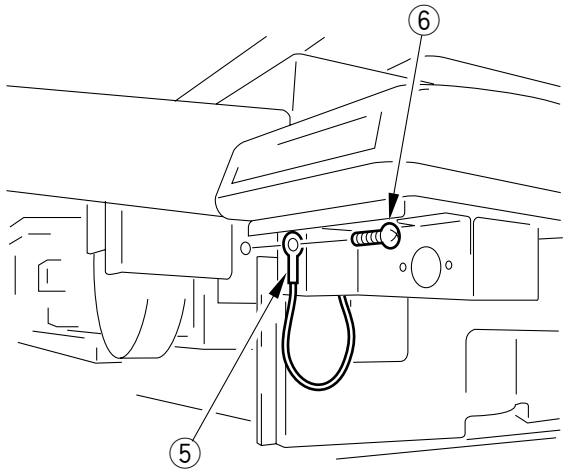

Figure 6-804

5) Connect the 9P cable ⑦ of the Card Reader-B1 to the 9P connector ⑧ of the reader unit.

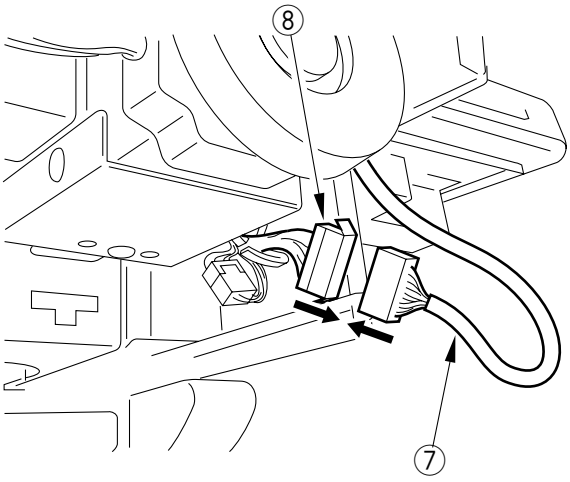

Figure 6-805

6) Connect the power plug of the machine, and turn on the power switch to check the operation of the Card Reader-B1.
7) Mount the lower front cover of the reader unit.

IX. INSTALLING THE COPY DATA CONTROLLER-A1

A. Setting the Board

1) Remove the two screws ②, and detach the cover ① of the controller.

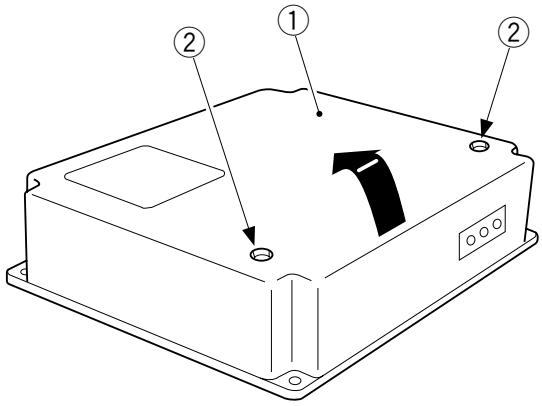

Figure 6-901

2) Set the DIP switches SW1 and SW5 on the controller to suit the needs of the user.

2.1) Set SW1-4 of the DIP switch to suit the type of the host copier.

2.2) Set SW5-2 DIP switch to suit the appropriate paper size if group control is planned.
To use AB papers (A3, A4, B4, B5), keep the bit to OFF.
To use Inch papers (11x17, LTR, LGL, STMT), keep it to ON.

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	bit	Position	Description	Remarks
SW1	1~3	OFF	For normal operation.	
	4	OFF	For serial communication.	NP6030, NP6060, NP8530, NP9800
		ON	For IPC communication.	Other than above.
	5	ON	For use of a central control device.	Requires the Interface Board-B1.
		OFF	For normal operation or for remote control using a commercially available modem.	For remote control using a commercially available modem, requires a modem and the Interface Board-B1.
	6	ON	For RAM clear.	
		OFF	For normal operation.	
SW5	1	ON	For factory adjustment.	
		OFF	For normal operation.	
	2	ON	For control of Inch papers (11x17, LTR, LGL, STMT).	For controlling paper other than those on the left, make settings in service mode. See C.10. “Checking the Operation.”
		OFF	For control of AB papers (A3, A4, B4, B5).	
	3	ON	For service mode.	
		OFF	For normal operation.	
	4	ON	For group control.	*1
		OFF	For no group control.	
	5,6	OFF	Not used.	

*1:Set SW5-4 (DIP switch) to OFF if the Control Card-V is used or remote control only by the Copy Data Controller-A1 is used (i.e., not using ID input, paper size control, toner color control, copy mode control, paper type control).

Table 6-901

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2.3) If group control is not used, shift SW5-4 (DIP switch) to OFF.
To install the Interface Board-B1, Communication Control Board-A1, or Interface Board-A1, see the descriptions under "Setting the Board" in their respective Installation Procedures.

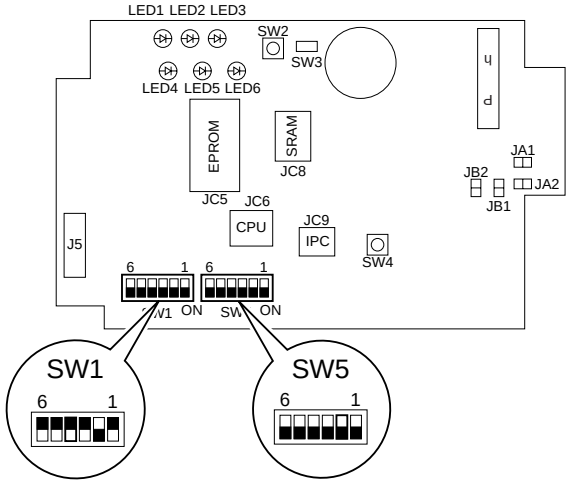

Figure 6-902

3) Set the jumper connectors (JA1, JA2, JB1, JB2) on the controller to suit the needs of the user.

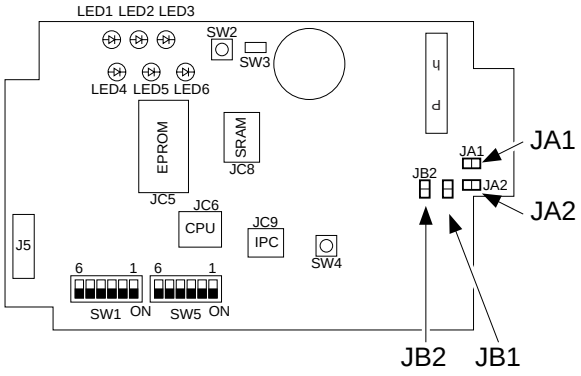

Figure 6-903

A: If the Communication Control Board-A1 or the Interface Board-B1 is to be connected (requiring the Power Supply-A1),

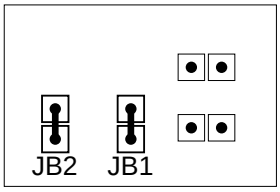

Figure 6-904

B: If the Communication Control Board-A1 or the Interface Board-B1 is not to be connected (not requiring the Power Supply-A1),

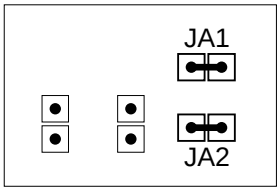

Figure 6-905

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B. Installing to the Copier

Keep the following in mind for the installation:

1. Observe all applicable regulations of the country.
2. Check to make sure that the host copier has been properly installed.
3. Disconnect the copier's power plug before starting the work.
4. Identify the screws by type (length, diameter) and location.
5. Prepare the computer at the service station with the necessary settings.

1) Remove the four screws ②, and detach the face plate ① of the copier's rear cover.

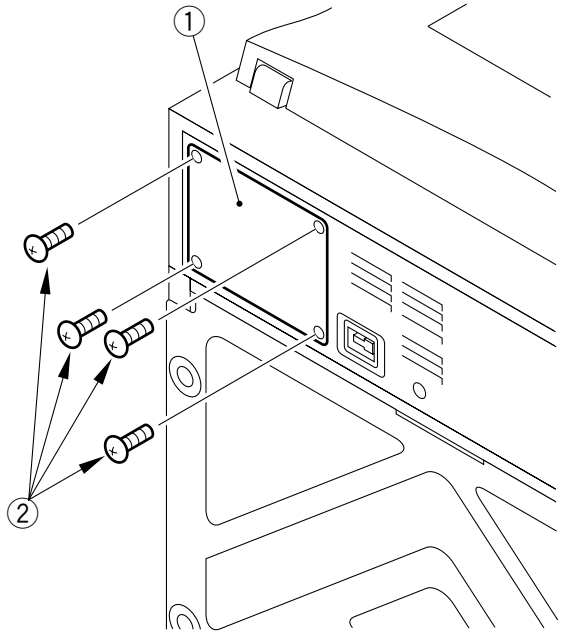

Figure 6-906

2) It moves the 8P connector ③ and the 9P relay connector ④ to the right.

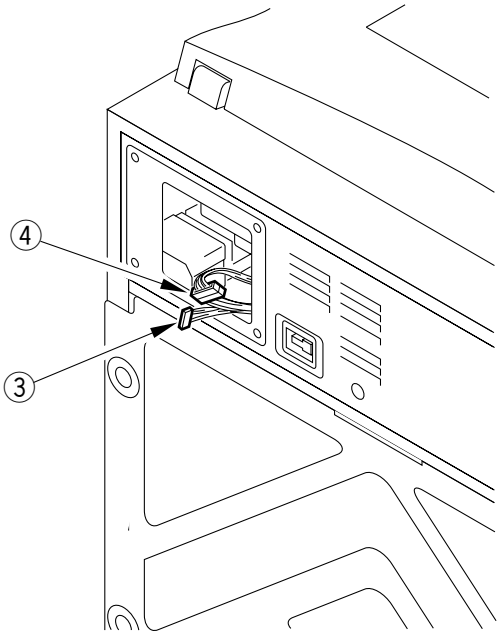

Figure 6-907

3) Remove the 9P connector ⑤ (blue) from the 9P relay connector ④.

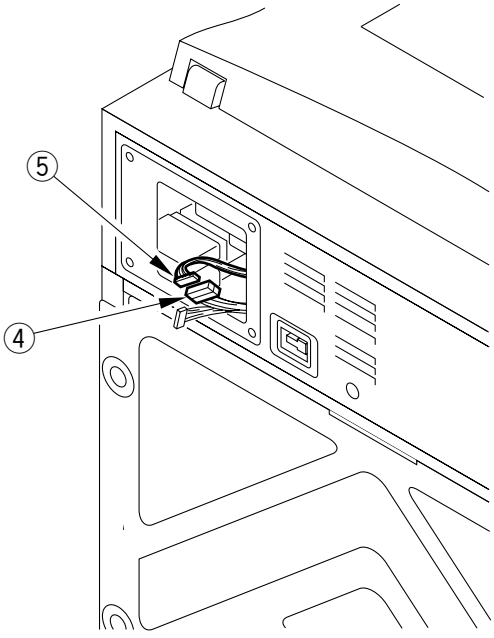

Figure 6-908

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4) When mounting the Card Reader-B1, connect the 9P cable ⑥ for the card reader (that comes with the Copy Data Controller-A1) to J4 of the Copy Data Controller.

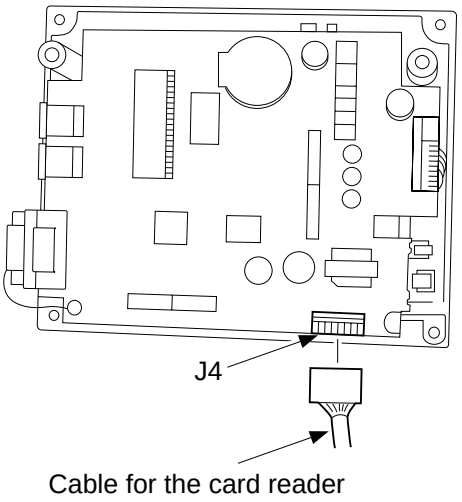

Figure 6-909

5) Connect the 9P cable ⑦ for the card reader to the 9P relay connector ④ disconnected in step 3).

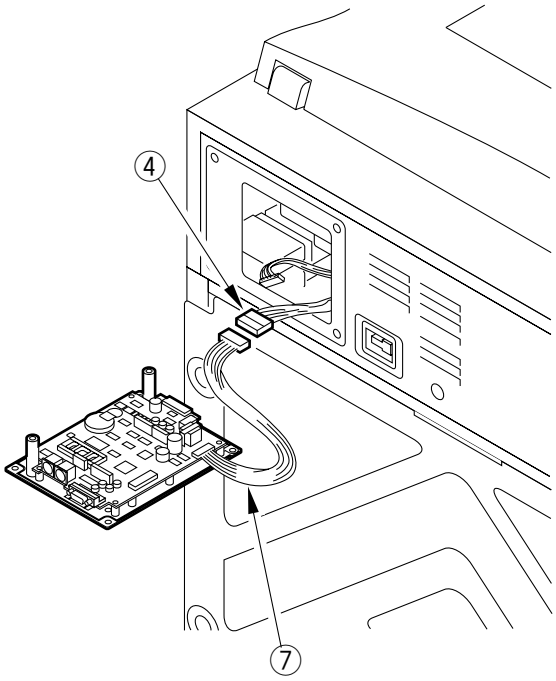

Figure 6-910

6) Connect the 8P connector ⑧ of the controller and the 8P connector ⑨ of the copier's DC controller.

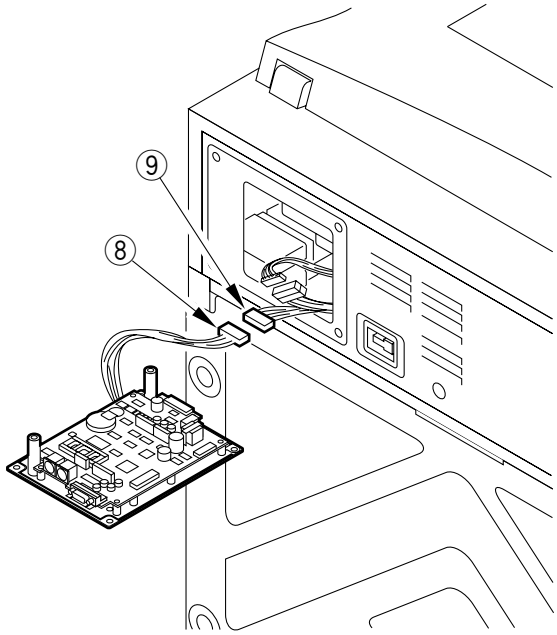

Figure 6-911

7) Secure the controller ⑩ to the copier's rear cover with four screws ⑪. (Use the screws that come with the unit.)

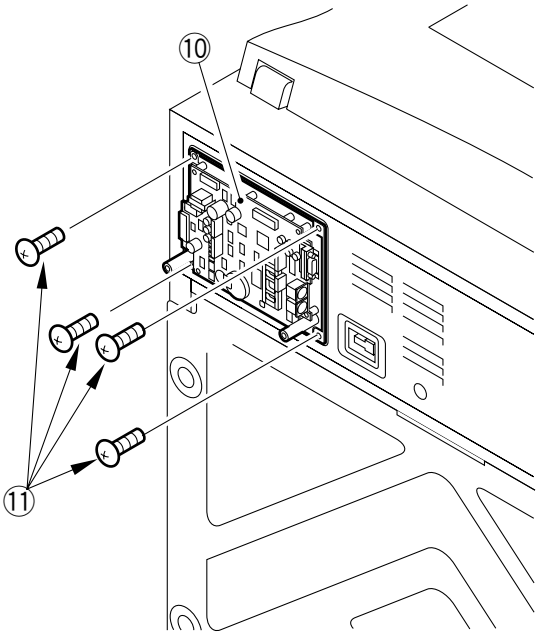

Figure 6-912

C. Checking the Operation

1) If the Communications Control Board-A1 or the Interface Board-B1 is not to be connected (not requiring the Power Supply-A1), go to step 4).
Connect the connector ① of the power supply to the connector ② of the controller securely as shown.
Check to make sure that the cord is in the groove of the board.

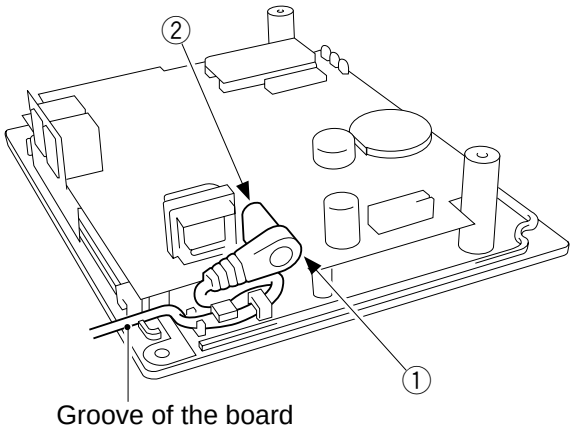

Figure 6-913

2) Connect the power supply to the power plug, and check to make sure that LED1 of the controller turns on.

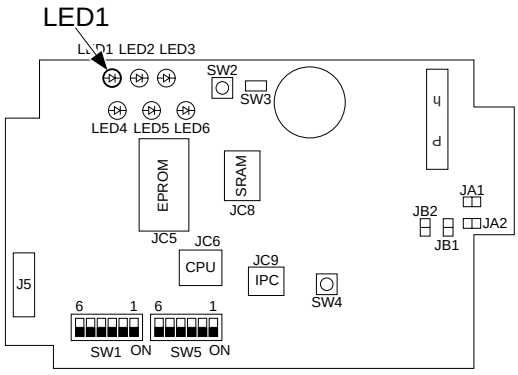

Figure 6-914

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3) Turn on the copier's main switch, and check to make sure that LED2 of the controller flashes.
Make a copy, and check to make sure that LED3 flashes during copying operation.

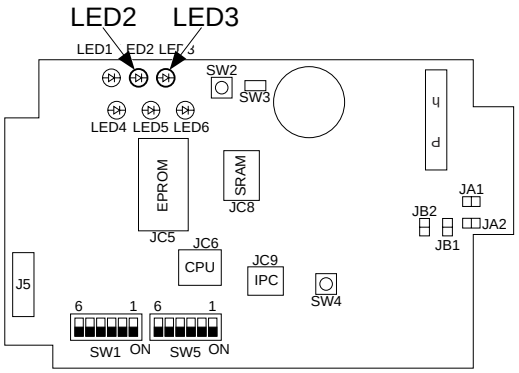

Figure 6-915

4) If the Communications Board-A1 or the Interface Board-B1 is to be connected (requiring the Power Supply-A1), go to 5).
Turn on the copier's main switch, and check to make sure that LED1 of the controller turns on and LED2 turns off.
Make a copy, and check to make sure that LED3 flashes during copying operation.

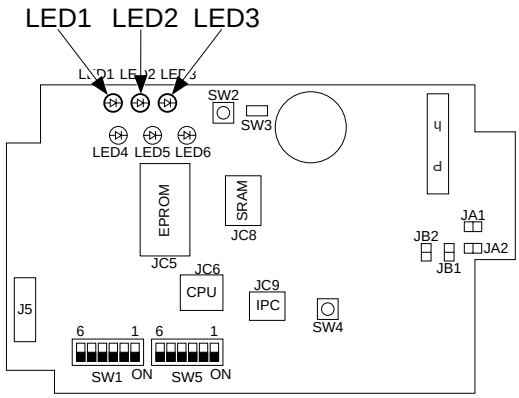

Figure 6-916

5) If group control is not planned, go to step 11).
If group control is planned, set the input method, control mode, and paper size to suit the needs of the user.
Shift SW5-3 of the DIP switch of the controller to ON.

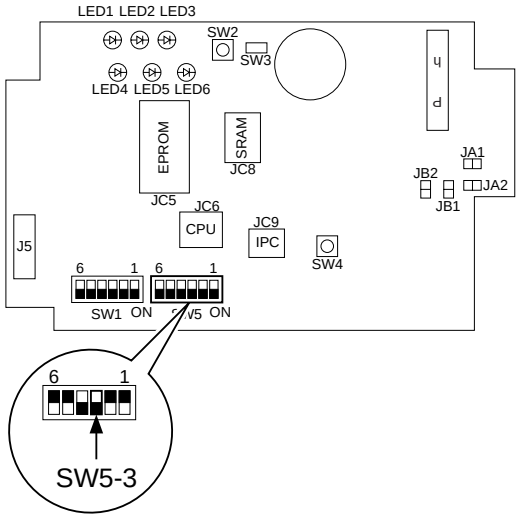

Figure 6-917

6) Connect the connector ③ of the Numeric Keypad-A1 to the connector J3 ④ of the controller.

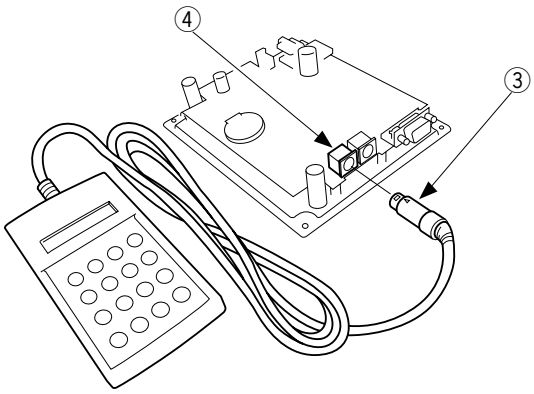

Figure 6-918

7) Press the switch (SW2) on the controller to start service mode.

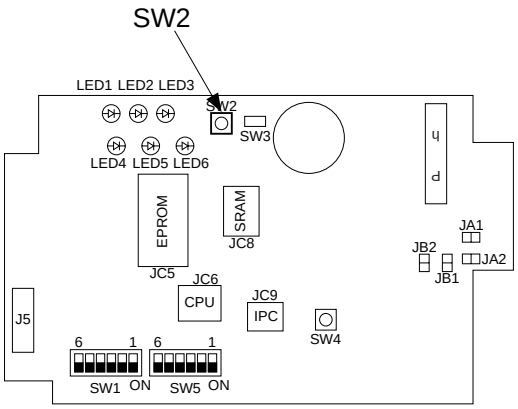

Figure 6-919

8) Select the appropriate input method:

8.1) Input by keys on the Numeric Keypad-A1 for "card" or "ID" (initially, "card").

8.2) To change from "card" to "ID," perform the following using the keys on the keypad:
To change "ID" to "card," on the other hand (requiring the Card Reader-A1), go to 8-4).
MANAGE-CARD is indicated.

8.3) Press the "2" key, and press the ENT key.
MANAGE-ID is indicated.

8.4) To change to card input,
When MANAGE-ID is indicated, press the "1" key, and then press the ENT key.
MANAGE-CARD will be indicated.

Code	Input method
1	Card
2	ID

Table 6-902

Caution:

1. If SW5-4 of the DIP switch on the controller is set to OFF, group control is disabled, and the following is indicated:

Figure 6-920

2. If the copier's memory is used for ID input (using the copier on its own), the exiting ID Nos. may be used for the controller. Perform the following:

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■ Drawing the ID Nos.

a) Set the DIP switch (SW1) of the controller as following:

b) Press the switch SW4 on the controller.
In response, LED5 turns on momentarily.

c) Check LED5; it should turn on to indicate that the data has been drawn.
Otherwise, LED5 will flash. Press the switch SW4 once again, and see that LED5 turns on.
The copier cannot discharge paper while data is being drawn.

d) Set the DIP switch (SW1) on the control as follows (LED5 should turn off):

	bit	Position
SW1	1,2	ON
	3	OFF

Table 6-903

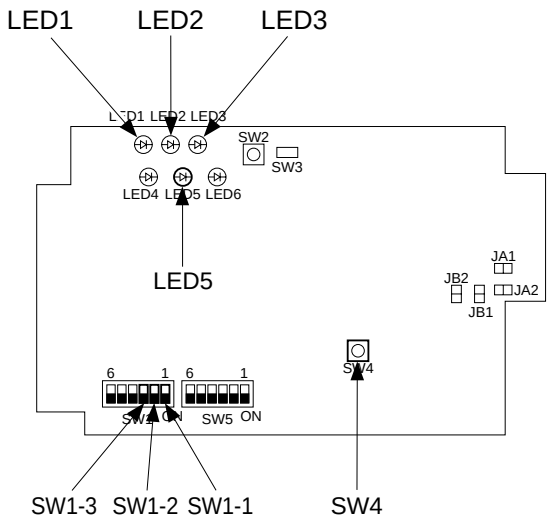

Figure 6-921

	bit	Position
SW1	1,2,3	OFF

Table 6-904

9) Select the appropriate control mode as follows:

9.1) Select the appropriate control mode using the Numeric Keypad-A1.
Use ▽/△ so that FORMAT=1 is indicated.

9.2) Select the appropriate control No. to suit the host copier and the needs of the user (initially, "1").

9.3) For example, to select "3",

1. FORMAT=1 is indicated. To change the initial setting "1" to "3",
Press the "3" key.
To clear the input, press the "c" key for retry.
To cancel, press the ESC key.
2. When FORMAT=3- is indicated, press the ESC key.
3. FORMAT=3- is indicated, and the cursor flashes for a while to indicate that formatting is taking place. When the cursor stops to flash, the control mode is set to "3".

Caution:

When the control mode has been changed, the unit price, upper limit, counter reading, and ID Nos. are initialized, requiring in put of the appropriate settings once again.

10) Select the paper size for control as follows:

10.1) As needed, change the paper size for control using the DIP switch on the controller and the Numeric Keypad-A1. To use the existing size, go to step 11).

10.2) Use the ▽/△ key to scan through the paper sizes. (Note that control paper size 5 "OTH" cannot be changed and, therefore, is not indicated).

EX 1:

1. [SIZE 1=A3] is indicated.
2. Press the ▽ key.
3. [SIZE 2=A4] is indicated.
4. Press the ▽ key.
5. [SIZE 3=B4] is indicated.
6. Press the ▽ key.
7. [SIZE 4=B5] is indicated.
8. Press the △ key.
9. [SIZE 3=B4] is indicated.
10. Press the △ key.
11. [SIZE 2=A4] is indicated.

EX 2:

1. Press the ▽ / △ key to indicate [SIZE 3=B4]
2. Find the size of LGL form the conversion code tables (Table 5-506), and press "1" and "3".
3. [SIZE 3=13] is indicated.
4. Press the [ENT] key.
5. [SIZE 3=LGL] is indicated.

Caution:

1. For SIZE 1 through 4, the same paper size code cannot be used more than once.
2. The counter readings will not be cleared by changing the size.

10.3) Conversion Code Table

Size	Code	Size	Code
B5	1	Postcard(Jpn)	25
FOOLS	2	U LARGE2	26
A4	3	GLTR	27
B4	5	10X8	28
A3	7	GLGL	29
U SMALL(US)	8	KLGL	33
STMT	9	OFFICIO	35
U LARGE(UL)	10	EOFFICIO	36
LTR	11	AOFFICIO	37
LGL	13	BOFFICIO	38
LDR(11X7)	15	ALT R	39
A5	17	ALGL	41
AFOOLS	18	12X18	48
A6	19	B3	49
FOLIO	21	A2	50
COMPUTER	23	17X22	51
U SMALL 2	24	18X24	52

Table 6-905

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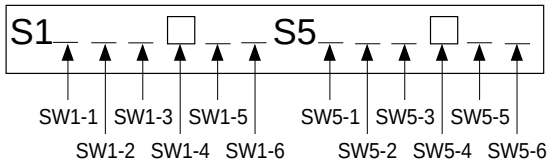
11) Check the DIP switch settings as follows:

11.1) Set SW5-3 (DIP switch) of the controller to OFF.

11.2) Using the ▽/△ key, indicate the settings of the DIP switches (SW1, SW5) of the controller.



□ : bits are at ON.

__ : bits are at ON.

Figure 6-922

11.3) Check the settings of the DIP switches (SW1, SW5) of the controller. (See Table 11-A601.)
If the settings are wrong, go back to "Setting the Board" to make the appropriate settings.
If you are setting the Interface Board-B1, Interface Board-A1, or Communications Control Board-A1 (accessories), see their respective Installation Procedure.

11.4) Press the switch (SW2).

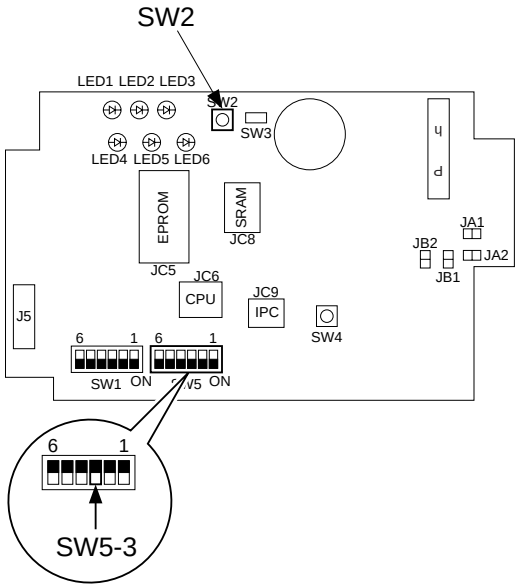


Figure 6-923

11.5) Check to make sure that the Numeric Keypad-A1 indicates the following; then, disconnect the keypad.

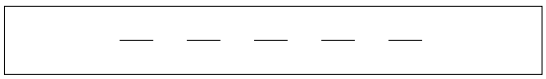


Figure 6-924

12) Attach the switch settings label ⑥ to the cover ⑤ of the controller, and record the latest switch settings on the label.

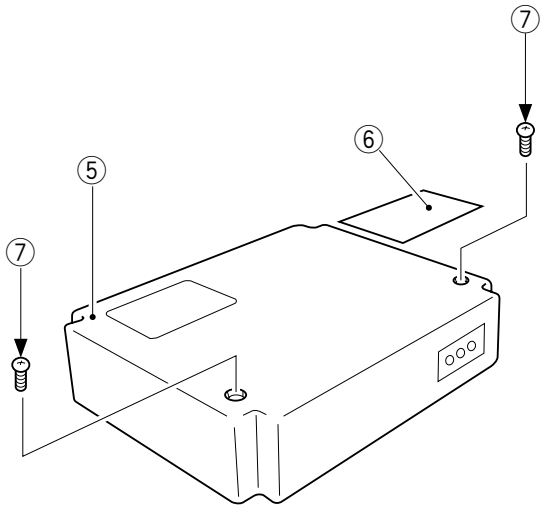


Figure 6-925

13) Secure the cover of the controller with two screws ⑦. When doing so, check to make sure that the cable of the power supply unit is fitted to the cable guide and is not trapped by the upper cover.

14) To Connect the Control Cad Printer-A1, connect it to the connector J4 of the controller. (As necessary, use a relay cable.)

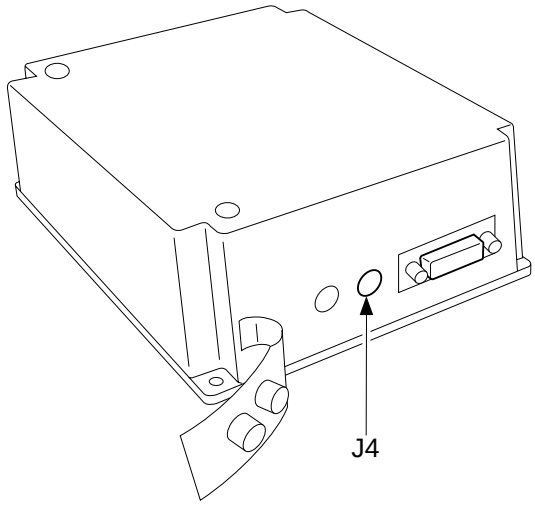


Figure 6-926

15) If the cable is all inside the controller, end the work by attaching the petty-pull ⑧ to the lower right of the copier's back.

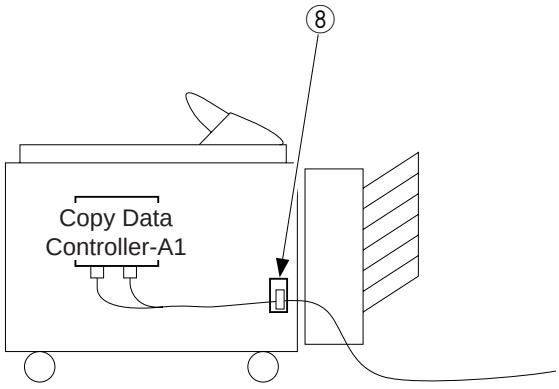


Figure 6-927

16) Fit the cable used to Connect the controller to the petty-pull.
17) Check to make sure that no cord is trapped by the copier or the sorter casters.

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CHAPTER 7

MAINTENANCE AND SERVICING

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I. PERIODICALLY REPLACED PARTS

The machine does not have parts that require replacement on a periodical basis.

II. CONSUMABLES AND DURABLES

As of December 31, 1998

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Scanning lamp (fluorescent lamp)	FH7-3336-000	1	500 hr	About 75,000 copies (period of activation). See Note 1 for replacement; see Note 2 for warning indication.
2	Power supply cooling fan (FM4)	FH-1462-0000	1	30,000 hr	Based on the period of operation.
3	Control panel (back-light)	FG6-0365-000	1	10,000 hr	Based on the period of operation.

The values in the table are estimates only, and are subject to change based on future data.

Note:

1. Be sure to perform the following when replacing the scanning lamp. (For details, see p. 8-10.)
   - Clean the No. 1/2/3 mirror, reflecting shade, and standard white plate.
   - Clean/lubricate the scanner rail.
   - Execute scanning lamp intensity adjustment in service mode (FUNCTION>MISC-R>LAMP>ADJ).
   - Execute CCD adjustment in service mood (FUNCTION>CCD>CCD-ADJ).
2. Make checks in service mode (DISPLAY>MISC>FL-LIFE).
3. For the periodically replaced parts and consumables/durables of the printer unit, see the Printer Unit Service Manual.

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III. SERVICING CHART

The machine does not have parts requiring maintenance on a periodical basis. However, to prolong the service lives of the parts and the product, it is recommended that the following be performed at time of a visit (as for replacing durable parts).

No.	Work	Checks	Remarks
1	Report to the person in charge.	Check the general condition.	
2	Record the counter reading.	Check the faulty copies.	
3	Make test copies in Direct, Reduce, and Enlarge.	a. Image density b. White area for soiling c. Characters for clarity d. Margin along the leading edge e. Margin on the left/right f. Margin along the trailing edge g. Fixing, registration for displacement, back for soiling h. Abnormal noise i. Counter operation	Standard: 5.0 ±2.0 mm (Direct) Standard: 5.0 ±2.0 mm (Direct) Standard: 5.0 ±2.0 mm (Direct)
4	Clean any parts inside the machine that are soiled. (See the next page.)		
5	Make test copes.		
6	Execute auto gradation correction control in user mode.		
7	Make sample copies.		
8	Put the sample copies in order. Clean up the area around the machine.		
9	Record the latest counter reading.		
10	Fill out the Service Sheet, and report to the person in charge.		

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Items of Cleaning

Item	Parts	Remarks
Externals	Copyboard glass	Use lint-free paper or alcohol.
	Copyboard cover	
	No. 1 through No. 3 mirrors	Use a blower brush.*
	Reflecting shade (scanning lamp)	
	Scanner rail	Clean with alcohol, and apply lubricant.
	Lens CCD	Use a blower brush.*
	Standard white plate	Use lint-free paper or alcohol.

*Do not touch the mirrors and lenses; moreover, do not subject the CCD to dust.

Caution:

For cleaning items of the printer unit, see the Printer Unit Service Manual.

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CHAPTER 8

TROUBLESHOOTING

This chapter provides standards/adjustments, instructions on how to troubleshoot malfunctions and faulty parts, and descriptions on service mode and self diagnostic mechanisms.

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Guide to Tables

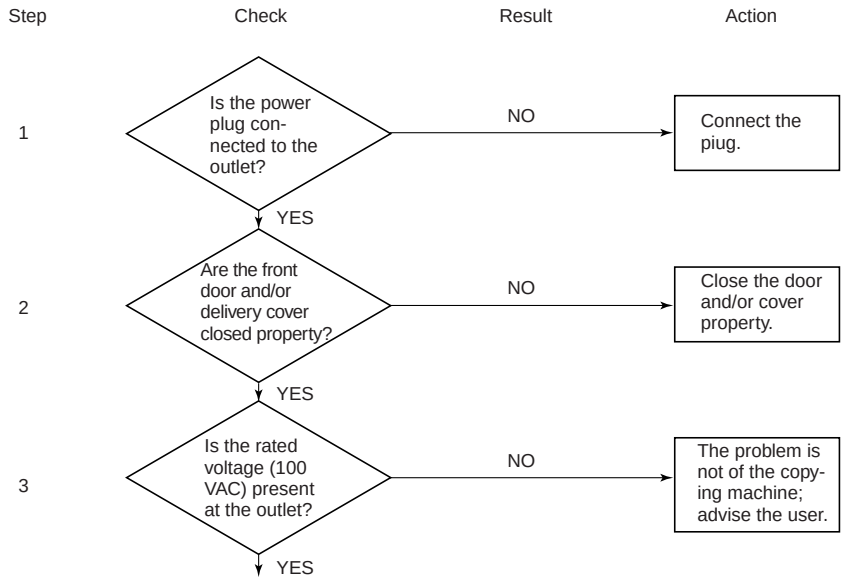
The tables used in this Service Handbook have been prepared from flow charts; study the sample table below.

AC power is absent.

Cause	Step	Check	Yes/No	Action
Power plug	1	Is the power plug connected to the outlet?	NO	Connect the plug.
Covers	2	Are the front door and/or delivery cover closed properly?	NO	Close the door and/or cover properly.
Power source	3	Is the rated voltage (100 VAC) present at the outlet?	NO	The problem is not of the copying machine; advise the user.
	4	Is the rated voltage present between J 1-1 and J 1-2?	YES	Check step 6) and onward.

■ To find the cause (faulty part) for a single problem, see the items under “Cause.” For “AC power is absent,” the cause may be the power plug, covers, or power source.

■ To find checks to make or actions to take for a single problem, make checks in the order given, answer the question Yes or No, and take the action given; move onto the next step as necessary.



■ Checks on the voltage using a tester call for special note; the description “Check the voltage between J 109-1 (+) and J 109 (-) on the DC controller PCB” means that the positive probe of the tester should be connected to J 109-1 (+) and the negative probe, to J 109-2 (-).

■ The left door switch goes OFF and, at the same time, the laser shutter closes as soon as the front left door is opened; as such, put the door switch actuators into left door switch and laser shutter if the machine needs to be opened with its front left door open. DO NOT BLOCK THE LASER PATH WITH LIGHT REFLECTING OBJECTS.

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I. STANDARDS AND ADJUSTMENTS

A. Mechanical

1 Non-Image Width

The non-image width is correct if it is as follows (on copies made in Direct).

Leading edge: 5.0 ±2.0 mm
Left/right: 5.0 ±2.0 mm
Trailing edge: 5.0 ±2.0 mm

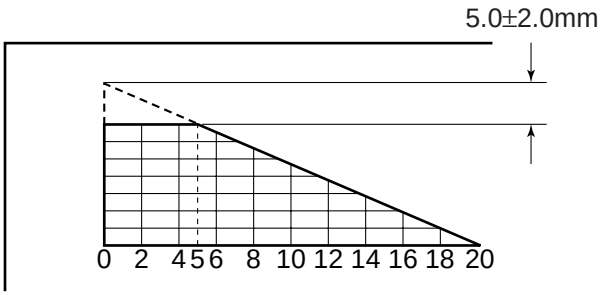

Figure 8-101 Non-Image Width on the Leading Edge

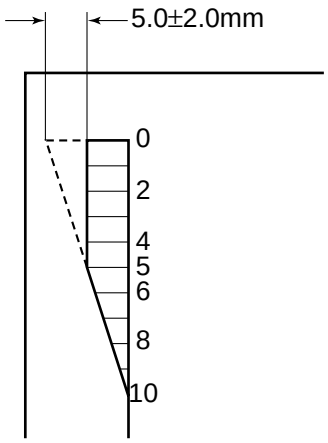

Figure 8-102 Non-Image Width on the Left/Right

2 Image Margin

The image margin is correct if it is as follows (on copies made in Direct):

Leading edge: 5.0 ±2.0 mm
Left/right: 5.0 ±2.0 mm
Trailing edge: 5.0 ±2.0 mm

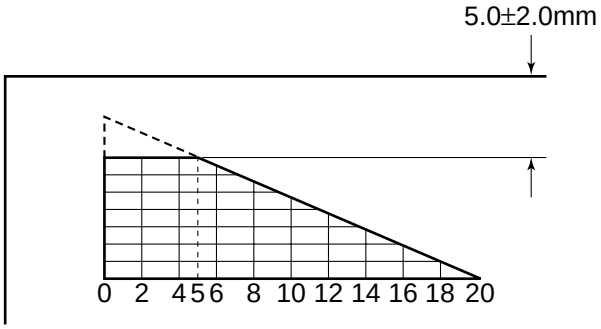

Figure 8-103 Image Margin on the Leading Edge

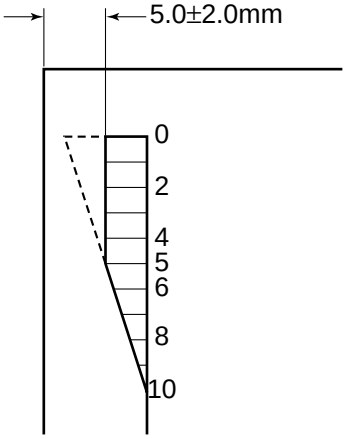

Figure 8-104 Margin on the Left/Right

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3 Adjusting the Non-Image Width and Margin

Make adjustments in the following order:
- Adjusting the registration for leading edge margin adjustment (COPIER>ADJUST>FEED-ADJ>**REGIST, REGIST2**)

Caution:

Keep in mind that the new settings will become effective when the machine has been turned off and on.

- Adjusting the image left/right margin (COPIER>ADJUST>BLANK>**BLANK-L/R**)
- Adjusting the leading/trailing edge non-image width (COPIER>ADJUST>BLANK>**BLANK-T, B**)
- Adjusting the image read start (COPIER>ADJUST>ADJ-XY>**ADJ-X, Y**)
- Checking the image margin

For detects, see "D. Adjustment Mode (ADJUST)" under VI. in Chapter 8.

4 Adjusting the Reader Unit Horizontal Registration

If the lines of a grid pattern do not cross at a right angle or are distorted, adjust the horizontal registration as follows for the reader unit. (Normally, such a problem is not likely, as adjustments are made at the factory.)

1) Enter '6' under COPIER>TEST>PG>TYPE in service mode, and make a test print (grid).
2) Make a copy of the test print (grid).
3) If the lines are distorted, adjust the horizontal registration for the reader unit as shown in the figure. (Use the adjustment wrench FY9-1027-000).

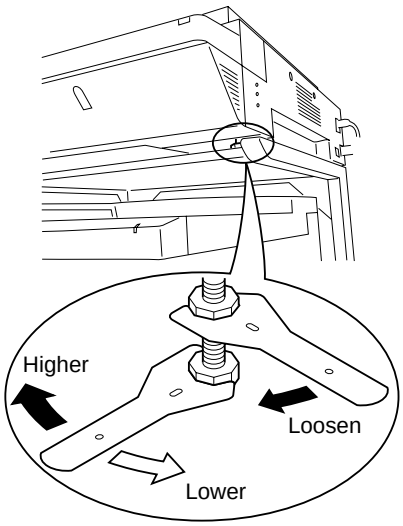

Figure 8-105

4) Make a test print once again to end the work.

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5 Routing the Scanner Drive Cable

For routing the scanner drive cable, see VII.B.4. "Routing the Scanner Drive Cable" in Chapter 3.

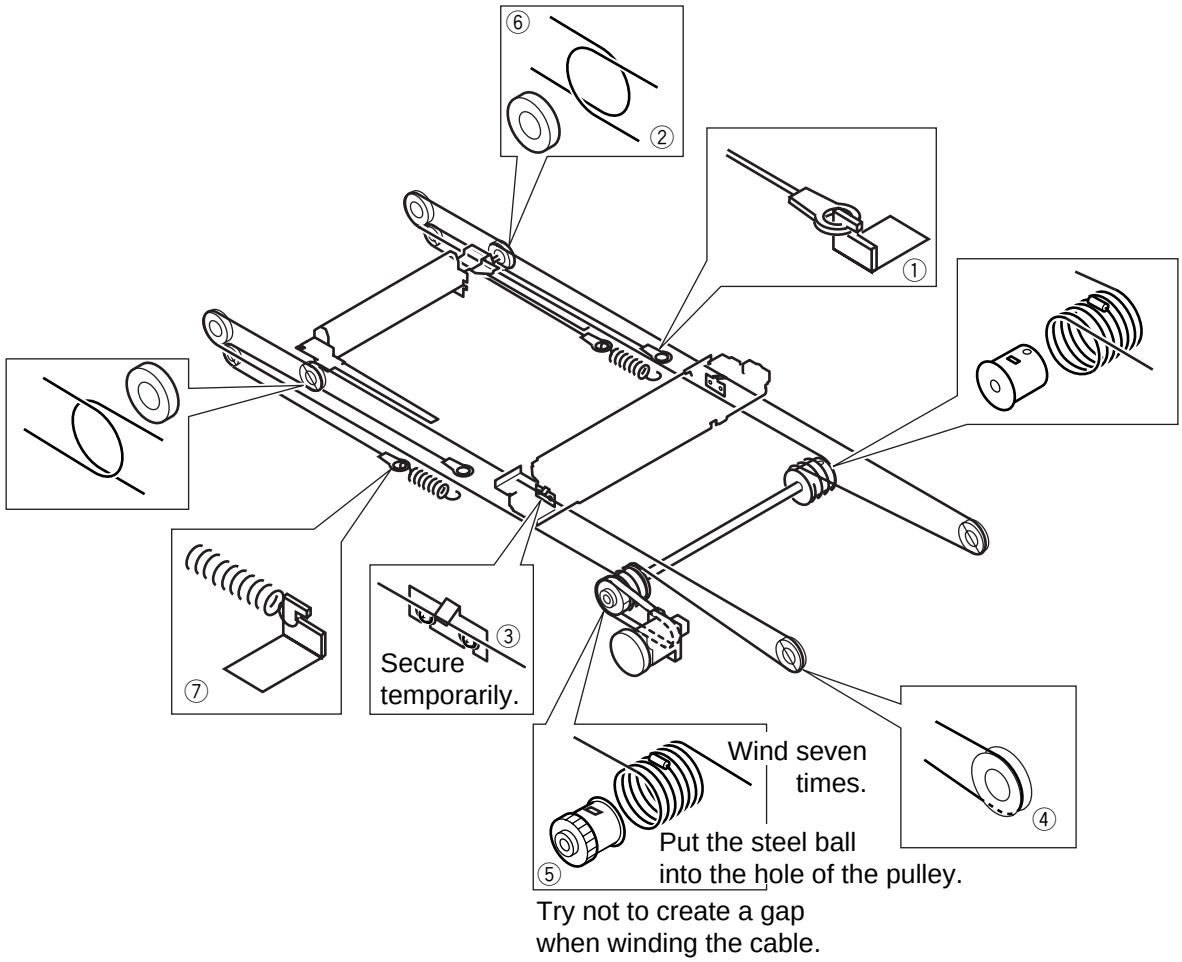

Figure 8-106

Caution:

1. Check to make sure that the scanner drive cable is not twisted and it has not ridden over the pulley.
2. Move the No. 1 mirror mount and the No. 2 mirror mount by hand to make sure that it moves smoothly. At this time, take care not to touch the reflecting plate.
3. Take care not to damage the cable with the edge of the metal plate.

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B. Electrical

1 When Replacing the Reader Controller PCB

Caution:

Do not mount a reader controller PBC equipped with an EEPROM to a different machine.

1) Remove the two screws, and remove the two face plates; then, detach the reader unit lower front cover.
2) If you can make a check in service mode,
   • Record the settings of the items (15 in total) shown in service mode on the reader unit service label, and go to step 3). (You will have to remove the reader unit lower front cover.)
   If you cannot make a check in service mode,
   • Go to step 3).
3) Remove the reader controller PCB as shown in V.B.1. "Removing the Reader Controller PCB" in Chapter 4. Then, detach the EEPROM from the old reader controller PCB.
4) Mount the EEPROM removed in step 3) to the new reader controller PCB.

Caution:

Be sure to use the EEPROM removed in step 3).

5) Mount back the parts except the cover removed in step 1).
6) Connect the reader unit power plug to the power outlet, and turn on the rear power switch and the control panel power soft switch in the order indicated.
   At this time, the control panel will indicate 'E353' (mismatch of serial Nos. between the rear controller PCB and the EEPROM).
7) Under OPTION>USER>**SERIAL** in service mode, enter the five-digit serial No. of the reader unit using the keypad, and press the OK key.
8) See that the copier will automatically turn off and then on.
   • If you entered the wrong EEPROM serial No., the control panel will indicate 'E353' (mismatch of serial Nos. between the rear controller PCB and the EEPROM). If so, enter the correct reader unit serial No. once again in service mode (OPTION>USER>**SERIAL**).
9) Initialize the RAM on the reader controller PCB in service mode (FUNCTION>CLEAR>**R-CON**).
10) Enter the settings you recorded on the reader unit service label in service mode (COPIER>ADJUST>**ADJ-XY**, **CCD**; the same settings entered in step 2); thereafter, be sure to press the OK key).
    If you did not make a check in service mode in step 2), enter the settings indicated on the service mode.
11) Select COPIER>FUNCTION>MISC-R>**USE-LAMP** in service mode.
12) Turn the scanning lamp adjusting VR clockwise/counterclockwise until a beep is heard; then, press the OK key on the control panel.
    (See II.B.7. "When Replacing the Intensity Detection PCB" in Chapter 12.)
13) Select COPIER>FUNCTION<**CCD-ADJ** in service mode.

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14) See that **CCD-ADJ** is highlighted. Press the OK key on the control panel to start CCD auto adjustment.
15) See that END is indicated to indicate that CCD auto adjustment has ended. (The notation at the top of the screen will change as follows: READY>SERVICE>READY.)
16) Mount the lower front cover (with the service label) removed in step 1).
17) Turn off and then on the reader unit rear power switch, and turn on the control panel power soft switch.
18) Execute auto gradation correction in user mode.
19) End.

2 Upgrading the Reader Unit

The reader unit may be upgraded by replacing the ROM DIMM on the reader controller PCB or replacing the contents of the ROM DIMM by downloading.

a. Replacing the ROM DIMM on the Reader Controller PCB

1. Removing the ROM DIMM
Remove the ROM DIMM as shown in VI.A.1. "Removing the ROM DIMM (on the Reader Controller PCB)" in Chapter 4.

2. Mounting the ROM DIMM
1) Mount the ROM DIMM as shown in VI.A.2. "Mounting the ROM DIMM (on the Reader Controller PCB)" in Chapter 4.
2) Mount back the parts.
3) Go to step 8) of the previous section 1. "When Replacing the Reader Controller PCB."

b. Replacing the Contents of the DIMM by Downloading

Note:
You will need the following for downloading operation:
- Utility program for upgrading and a PC to which the contents for the DIMM have been stored
- Bi-Centronics cable (IEEE 1284 Std-compliant).

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■ Making Connections

1) Turn off the copier's control panel power soft switch and the reader unit rear power switch.
2) Remove the reader unit lower front cover, and the anti-noise plate on the switch.
3) Connect the copier (downloading connector) and the PC with a bi-Centronics cable.
   - Be sure that the PC is off.
   - Be sure to connect the 25-pin connector of the bi-Centronics cable to the PC, and the 36-pin connector to the copier.
4) Slide the switch shown in the figure to LOAD position.

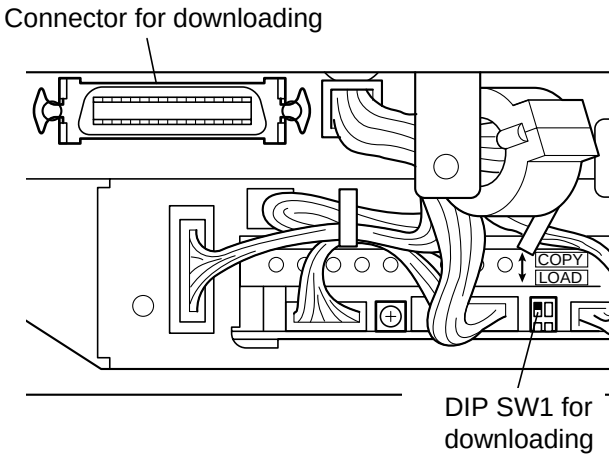

Figure 8-107

5) Turn on the PC, and start the copier service support tool.
6) Connect the copier's power plug to the power outlet, and turn on the reader unit rear power switch and the control panel power switch.

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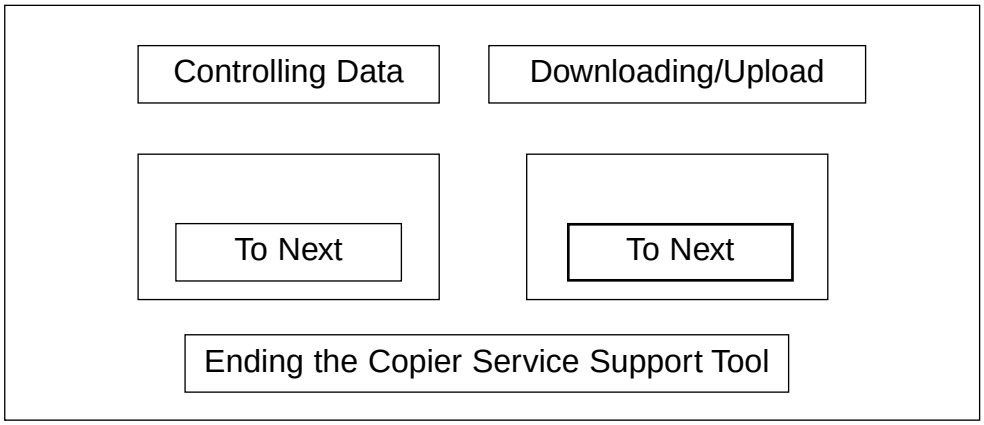
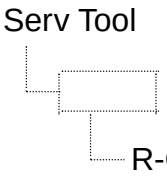
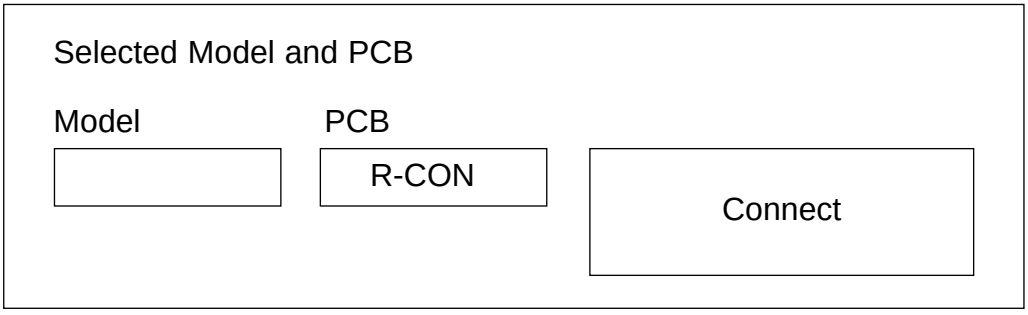
■ Downloading

1) Select 'To Main Menu' on the start-up menu (copier service support tool).
2) Select 'To Next' under 'Downloading/Upload'.



3) Select the model and the PCB for downloading, and select 'Connect'.





4) Follow the instructions on the PC screen to download the contents to the flash ROM.
5) When downloading has ended, turn off the PC as follows:
OK>To PCB Select Menu>To Main Menu>End Copier Service Support Tool>End

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■ After Downloading

1) Turn off the machine's control panel power soft switch and the reader rear power switch, and disconnect the power plug.
2) Disconnect the bi-Centronics cable from the PC and the machine.
3) Slide the downloading switch (DIP SW1) to COPY position.

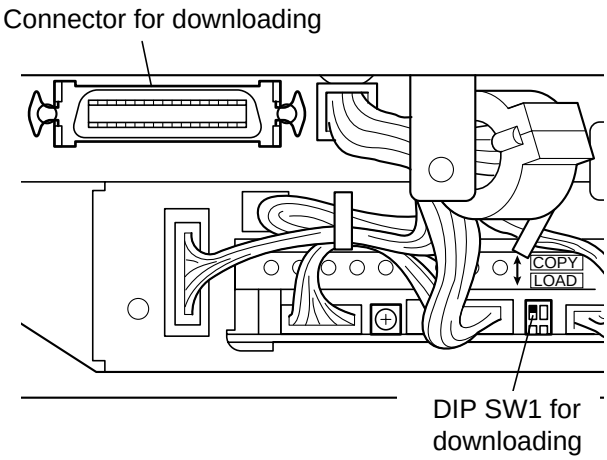

Figure 8-108

4) Connect the machine's power plug to the power outlet, and turn on the reader unit rear power switch and the control panel power soft switch.
5) Start service mode, and check the ROM version.
COPIER>DISPLAY>**VERSION**
6) After a check, mount the anti-noise plate and the lower front cover.

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3 When Replacing the DC Controller PCB

1) Remove the DC controller PCB as shown in the Printer Unit Service Manual.
2) Mount the new DC controller PCB.
3) Mount back the parts. (However, do not mount the printer unit rear cover until you have made sure that the machine operates normally.)
4) Connect the power plug to the power outlet, and turn on the reader rear power switch and the control panel power soft switch in the order indicated.
5) Select COPIER>FUNCTION>MISC-P>**DC-LOAD** in service mode to highlight, and press the OK key.
6) End service mode, and turn off and then on the control panel power soft switch to load the data (all items of ADJUST>IMG-REG, FEED-ADJ, HV-TR) backed up on the reader controller PCB to the DC controller PCB.
7) Check to make sure that settings have been entered under ADJUST>IMG-REG, FEED-ADJ, HV-TR in service mode. If settings are missing, go back to step 5); if settings are still missing, enter the values indicated on the printer unit service label for ADJUST>IMG-REG, FEED-ADJ, and enter the standard value for ADJUST>HV-TR.
8) Execute auto gradation correction in user mode.
9) End.

4 When Replacing the CCD Unit

1) Record the values (**AL-RG, AL-GB**) shown on the CCD unit to the service label attached to the reader unit lower front cover.
2) Turn off the copier, and mount the new CCD unit to the copier.
3) Turn on the copier.
4) Enter the new settings in ADJUST>CCD>**AL-RG, AL-GB** in service mode.
5) Execute CCD auto adjustment in FUNCTION>CCD>**CCD-ADJ** in service mode.
6) Mount the reader unit lower front cover.
7) Execute auto gradation correction in user mode.
8) End.

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5 When Replacing the Scanning Lamp

1) Replace the scanning lamp as shown in VII.C.1. "Removing the Scanning Lamp/Scanning Lamp Heater" in Chapter 3; then, mount back the parts.
2) Turn on the rear power switch/control panel power soft switch.
3) Remove the two face covers and two screws; then, detach the reader unit lower front cover.
4) Turn on the control panel power soft switch, and wait about 5 min (so that the scanning lamp warms).
5) Select COPIER>FUNCTION>MISC-R>**LAMP-ADJ** in service mode, and press the OK key. (The notation at the top will be 'SERVICE'.)
6) When the scanning lamp has turned on, turn the scanning lamp adjusting VR clockwise/counterclockwise until a beep is heard.

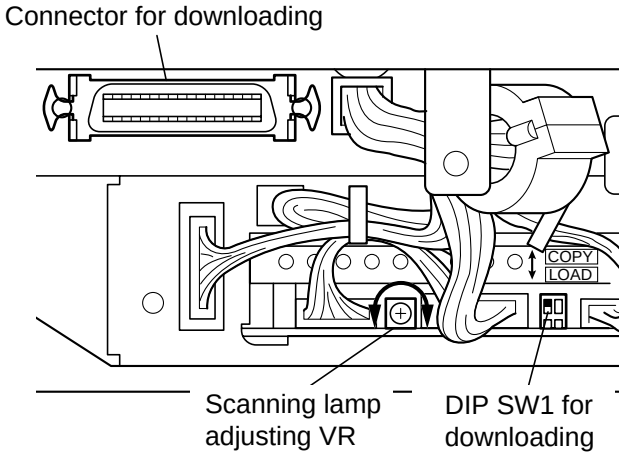

Figure 8-109

7) Press the OK key on the control panel screen. (The notation at the top will be 'READY'.)
8) Select COPIER>FUNCTION>CCD>**CCD-ADJ** in service mode.
9) When '**CCD-ADJ**' is highlighted, press the OK key on the control panel screen to start CCD auto adjustment.
10) See that 'END' has appeared on the screen to indicate that CCD auto adjustment has ended. (The notation at the top will be 'READY', 'SERVICE', and then 'READY'.)
11) Mount the lower front cover removed in step 3).
12) Execute auto gradation correction in user mode.
13) End.

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6	When Removing/Mounting the Scanning Lamp or When Replacing the Intensity Detection PCB

1) Mount back the removed scanning lamp. Or, replace the intensity detection PCB as shown in VII.D.1. "Removing the Intensity Detection PCB" in Chapter 3, and mount back the parts.
2) Turn on the rear power switch/control panel power soft switch.
3) Remove the two face covers and the two screws; then, detach the reader unit lower front cover.
4) Turn on the control panel power soft switch, and wait about 5 min (so that the scanning lamp warms up).
5) Select COPIER>FUNCTION>MIS-R>**USE-LAMP**, and press the OK key. (The notation at the top will be 'SERVICE'.)
6) When the scanning lamp has turned on, turn the scanning lamp adjusting VR clockwise/counterclockwise until a beep is heard.

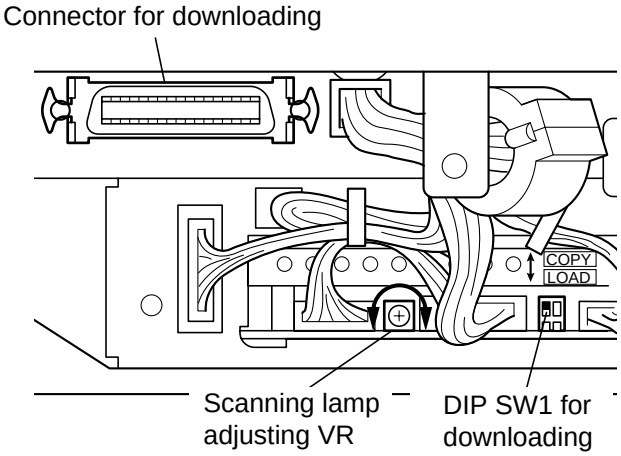

Figure 8-110

7) Press the OK key on the control panel screen. (The notation at the top will be 'READY'.)
8) Select COPIER>FUNCTION>**CCD>CCD-ADJ**.
9) When 'CCD-ADJ' is highlighted, press the OK key on the control panel screen to start CCD auto adjustment.
10) See that 'END' has appeared on the screen to indicate that CCD auto adjustment has ended. (The notation at the top will be 'READY', 'SERVICE', and then 'READY'.)
11) Mount the lower front cover removed in step 3).
12) Execute auto gradation correction in user mode.
13) End.

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7 When Replacing the Standard White Plate

1) Select COPIER>ADJUST>CCD in service mode to bring up the input screen.
2) Enter the settings shown on the new standard white plate in COPIER>ADJUST>CCD>**W-PLT-X, W-PLT-Y, W-PLT-Z** in service mode, and press the OK key.

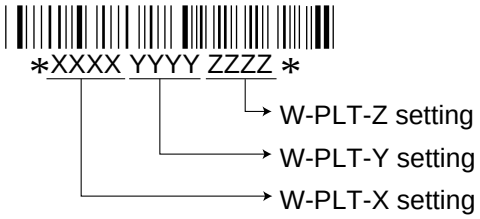

Figure 8-111

3) Turn off the control panel power soft switch and the rear power switch, and mount the new standard white plate to the copier.
4) Turn on the rear power switch, and then turn on the control panel power soft switch.
5) Select COPIER>FUNCTION>CCD>**CCD-ADJ** in service mode.
6) When '**CCD-ADJ**' is highlighted, press the OK key on the control panel screen to start CCD auto adjustment.
7) See that 'END' has appeared on the screen to indicate that CCD auto adjustment has ended. (The notation at the top will be 'READY', 'SERVICE', and then 'READY'.)
8) Execute auto gradation correction in user mode.
9) End.

8 When Replacing the AP-IP PCB

1) Select COPIER>FUNCTION>CCD>CCD-ADJ in service mode.
2) When 'CCD-ADJ' is highlighted, press the OK key on the control panel screen to start CCD auto adjustment.
3) See that 'END' has appeared on the screen to indicate that CCD auto adjustment has ended. (The notation at the top will be 'READY', 'SERVICE', and then 'READY'.
4) Execute auto gradation correction in user mode.
5) End.

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9 Checking the Photointerrupters

In addition to using a conventional meter to check the photointerrupers, you can use the machine's service mode to find out the condition of the photointerrupers.

a. Using a Meter
1) Set the meter range to 30 VDC.
2) Connect the - probe of the meter to GND of the DC controller PCB (printer unit) or the reader controller PCB.
3) Connect the + probe of the meter to the terminals (on the DC controller PCB or the reader controller PCB) indicated in the pages that follow.
4) Make checks as instructed.

b. Using Service Mode
1) Start service mode.
2) Press COPIER>I/O>DC-CON or R-CON in sequence so that the screen will be as shown in Figure 8-112.
3) Make checks as instructed.

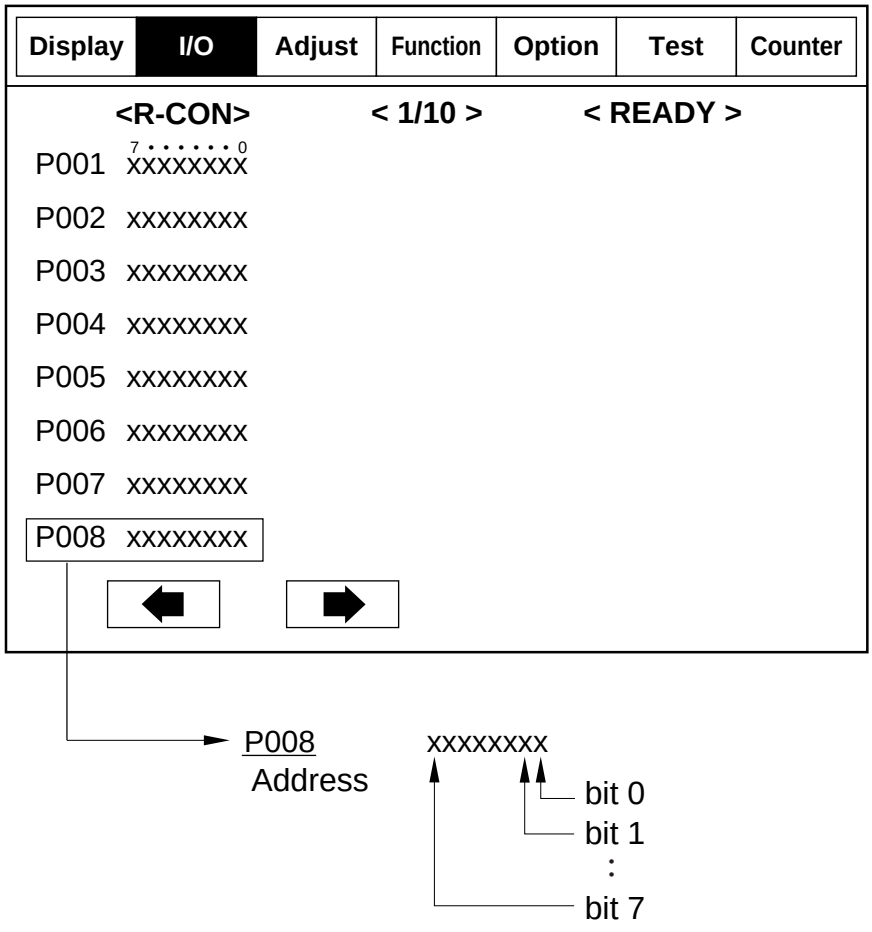

Figure 8-112

Notation	PS1	PS3[*1]	PS5
Name	Registration paper sensor	Developing rotary position sensor	Separation sensor
+ probe	J212-10	J207-5	J212-7
Service mode	DC-CON, P001 bit 0	——	DC-CON, P001 bit 2
Checks (normal if as indicated)	While in standby, when the detecting lever • is pushed, '0'. • is not pushed, '1'.	While in standby, press the turret button; when the color cartridge • is stationary (Y color), '1'. • is otherwise, '0'.	While in standby, when the detecting lever • is pushed, '0'. • is not pushed, '1'.

Notation	PS10	PS11	PS17
Name	Face-down tray full sensor	Face-down tray delivery sensor	Pick-up assembly paper sensor
+ probe	J220-A3	J220-B4	J210-8
Service mode	——	DC-CON, P001 bit 4	DC-CON, P001 bit 1
Checks (normal if as indicated)	While in standby, when the light-blocking plate • is moved over PS10, '1'.	While in standby, when the light-blocking plate • is put over PS11, '1'.	While in standby, when paper • is moved over PS17, '0'.

Notation	PS18	PS19[*2]	PS23
Name	Pick-up unit cover sensor	Multifeeder tray last paper sensor	Duplexing feeding roller 1 home position sensor
+ probe	J210-16	J208-3	J2007-6[*3]
Service mode	——	DC-CON, P002 bit 0	——
Checks (normal if as indicated)	While in standby, when the pick-up unit cover • is opened, '0'. • is closed, '1'.	While in standby, the roller under PS19 • is turned, alternately '0' and '1'.	While in standby, remove the duplexing unit, move the light-blocking plate over the sensor, and mount back the duplexing unit. When the light-blocking plate • is moved over the sensor, '1'. • is not moved over the sensor, '0'.

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Notation	PS24	PS25	PS26
Name	Duplexing unit paper sensor	Horizontal registration guide home position sensor	Reversal paper sensor
+ probe	J2008-3*3	J2006-3*3	J2007-3*3
Service mode	DC-CON, P002 bit 4	——	DC-CON, P002 bit 5
Checks (normal if as indicated)	While in standby, when paper • is put over PS24, '0'.	While in standby, remove the duplexing unit, move the light-blocking plate over the sensor, and mount back the duplexing unit. When the light-blocking plate • is moved over the sensor, '1'. • is not moved over the sensor, '0'.	While in standby, when paper • is put over PS26, '0'.

Notation	PS30	PS101*4	PS102*4
Name	Upper left cover sensor	Original scanner home position sensor	Copyboard cover open/closed sensor
+ probe	J220-A4	J1609-A2	J1609-A5
Service mode	——	Display>SENSOR>SC-HP	R-CON, P004 bit 0
Checks (normal if as indicated)	While in standby, when the upper left cover • is opened, '0'. • is closed, '1'.	While in standby, move the No. 1 mirror mount. When the light-blocking plate • is moved over PS101, '1'.	While in standby, the copyboard cover • is opened, '0'. • is closed, '1'.

Notation	PS1201	PS1202
Name	Cassette 2 sensor	Cassette 1 sensor
+ probe	J210-10	J210-6
Service mode	——	——
Checks (normal if as indicated)	While in standby, when the cassette 2 • is slid out, '0'. • is slid in, '1'.	While in standby, when the cassette 1 • is slid out, '0'. • is slid in, '1'.

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Notation	PS1203	PS1204
Name	Cassette 2 paper lever sensor 2	Cassette 2 paper level sensor 1
+ probe	J210-12	J210-13
Service mode	——	——
Checks (normal if as indicated)	While in standby, when the cassette 2 containing one sheet of copy paper • is slid in, J210-12 is '0' and J210-13 is '1'. When the cassette 2 containing about 100 sheets of copy paper • is slid in, J21-12 is '1' and J210-13 is '1'. When the cassette 2 containing about 500 sheets of copy paper • is slid in, J210-12 is '0' and J210-13 is '0'.	

Notation	PS1205	PS1206	PS1207
Name	Cassette 1 paper level sensor 2	Cassette 1 paper level sensor 1	Cassette 2 paper absent sensor
+ probe	J210-14	J210-15	J210-11
Service mode	——	——	DC-CON, P002 bit 3
Checks (normal if as indicated)	While in standby, when the cassette 1 containing one sheet of copy paper • is slid in, J210-14 is '0' and J210-15 is '1'. When the cassette 1 containing about 100 sheets of copy paper • is slid in, J210-14 is '1' and J210-15 is '1. When the cassette 1 containing about 500 sheets of copy paper • is slid in, J210-14 is '0' and J210-15 is '0'.		While in standby, when the cassette 2 • contains paper, '0'. • does not contain paper, '1'.

Notation	PS1208	PS1301	PS1302*2
Name	Cassette 1 paper absent sensor	Multifeeder tray power sensor	Holding plate position sensor
+ probe	J210-5	J213-7	J213-6
Service mode	DC-CON, P002 bit 1	——	——
Checks (normal if as indicated)	While in standby, when the cassette 1 • contains paper, '0'. • does not contain paper, '1'.	While in standby, the multifeeder • holds paper, '0'. • does not hold paper, '1'.	While in standby, when PS1302 • is blocked by the light-blocking plate, '0' (when the cam gear is turned so that the holding plate is down).

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*1 Normally, remove the video interface cable and the video interface PCB before connecting the tester probe to the DC controller PCB of the printer unit. However, when checking the developing rotary position sensor (PS3), do not remove either of them. (For removal, see the Printer Unit Service Manual.)
*2 Open the right cover, and use the door switch actuator. (For details, see the Printer Unit Service Manual.)
*3 Found on the duplexing unit driver PCB. (For removal, see the Printer Unit Service Manual.)
*4 For the original scanner home position sensor (PS101) and the copyboard cover open/closed sensor (PS102), connect the probe to the reader controller PCB, requiring removal of the reader unit lower front cover and checking the operation from the copier's front.

Note:
For details on the DC controller PCB, see the Printer Unit Service Manual.

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II. TROUBLESHOOTING IMAGE FAULTS

A. Making Initial Checks

1. Site Environment

a. The voltage must be as rated (±10%).
b. The copier must not be in a high-temperature/-humidity environment (near water faucet, water boiler, humidifier), or it must not be in a cold place. There must not be a source of fire nearby, and the copier must not be subjected to excess dust.
c. The copier must not be subjected to ammonium gas.
d. The copier must not be exposed to direct sunshine. As necessary, curtains must be provided.
e. The room must be well ventilated.
f . The copier must be kept level.
g. **The power plug of the printer unit must be connected to the reader unit, and the power plug of the readar unit must be connected to the power outlet.**

2. Checking the Originals

Check the problem to find out whether it owes to the original or the copier.

a. Checking the Density of the Original
A diazo original or an original with a high transparency can produce copies that can be mistakenly thought of as being "foggy."
An original prepared in light pencil can produce copies that can be mistakenly thought of as being "too light."

3. Checking the Parts

Check the copyboard cover, copyboard glass, and standard white plate for dirt and scratches.
If soiled, clean them with a moist cloth; if scratched, replace them.

4. Checking the Assemblies

a. Check the secondary pre-transfer assembly and separation static eliminator for dirt and faults (scratches, deformations).
b. Clean the charging wires of the secondary pre-transfer charging assembly and separation static eliminator. Further, clean the density sensor and the pre-exposure LEDs.
c. Check the intermediate transfer drum unit, fixing assembly, intermediate transfer drum cleaning roller, secondary transfer belt assembly, toner cartridge, and drum cartridge to make sure that they are properly mounted.

5. Checking the Paper

a. Is the paper of a type recommended by Canon?
b. Is the paper most? Try paper fresh out of package.

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6. Placement of Copy Paper

a. Copy paper must be placed in the cassette or the multifeeder tray in an appropriate volume and in correct orientation.
b. Transparencies must be placed on the multifeeder tray in the correct orientation.

7. Checking the Durable Parts

a. Check with the consumables table, and replace parts that reached the end of their lives.

8. Others

In winter, bringing a copier from a cold to warm place can cause condensation inside the machine, leading to various problems.

a. Condensation in the original exposure system or the drum exposure system (6-facet mirror, reflecting mirror, lens) can produce light images.
b. Condensation in the charging system can cause leakage.
c. Condensation on the pick-up/feeding guide can cause feeding faults.
d. When cold, the photo-conducting layer of the photosensitive drum inside the drum cartridge tends to have a high resistance, causing poor contrast on copies.
e. Condensation on the surface of the intermediate transfer drum can cause ITD cleaning faults.
   If condensation is found, dry wipe the parts, or leave the copier powered for 10 to 20 min. Opening a toner cartridge immediately after brining it in from a cold place will also cause condensation. Instruct the user to make sure that the cartridges have become used to the room temperature by leaving them alone (1 to 2 hr) before opening them.

Note:
If uneven density (difference in density between front and rear), light images, or fogging is noted, execute auto gradation correction in user mode first.

B. Standard Images

What is referred to as a "standard" image satisfies the following when the CANON CA-1 Test Sheet is copied in full 4-color mode (for gray scale, color patch, and 3-color gradation scale):

1. Gray Scale

No. 1 (dark area) must be more or less black, and the image must become lighter in order of Nos. with No. 9 being barely visible and No. 9 being white.

The halftone color must be more or less gray, and must not be appreciably yellowish or bluish.

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2. Color Patches

Each color must be distinct, and must not be appreciably different from the color of the original (Test Sheet).

3. Photo

The photo must not be appreciably different in respect of color balance.

4. 3-Color Gradation Scale

No. 8 must be barely visible, and No. 9 must be white.

5. Halftone Bands

The color of the bands must not be appreciably different from the color of the original (Test Sheet). Further, the bands must not be appreciably uneven, and must not be appreciably different between left and right in color. (It must show a moire pattern.)

6. Fogging

The white background of the Test Sheet, when copied, must not be foggy.

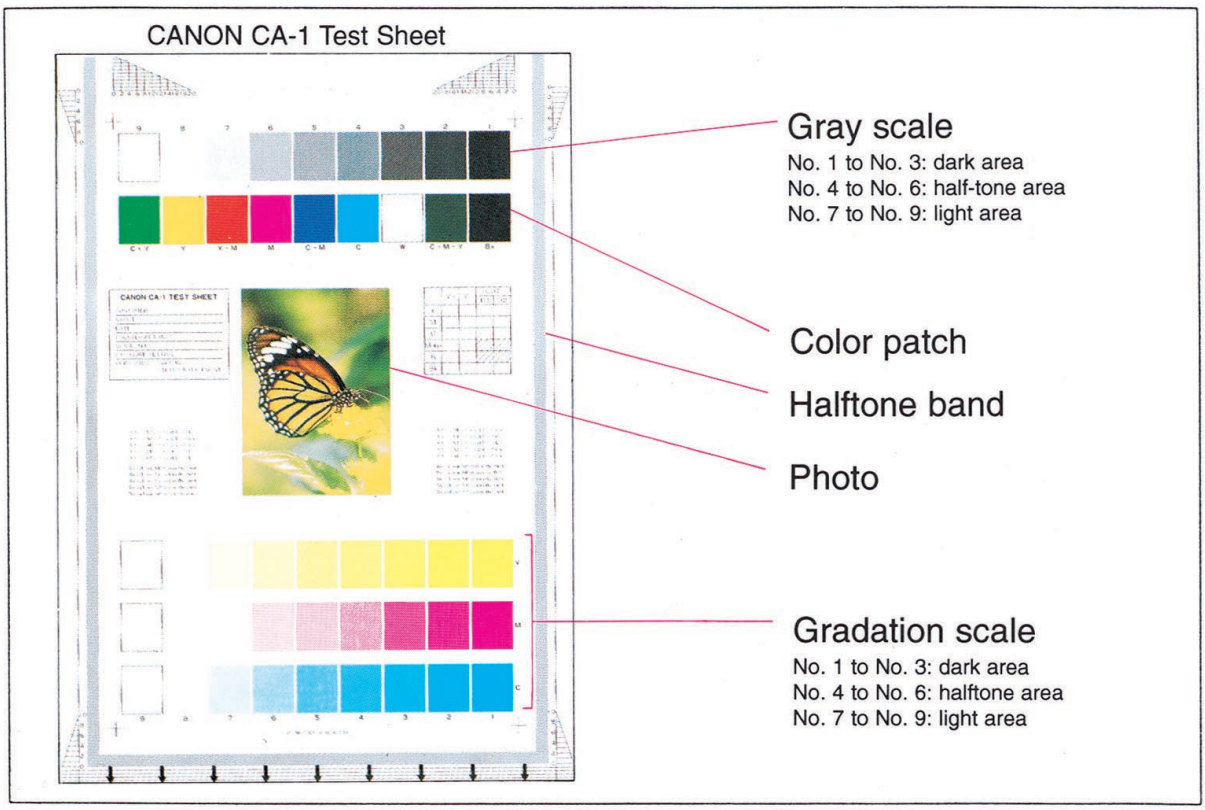

Figure 8-201

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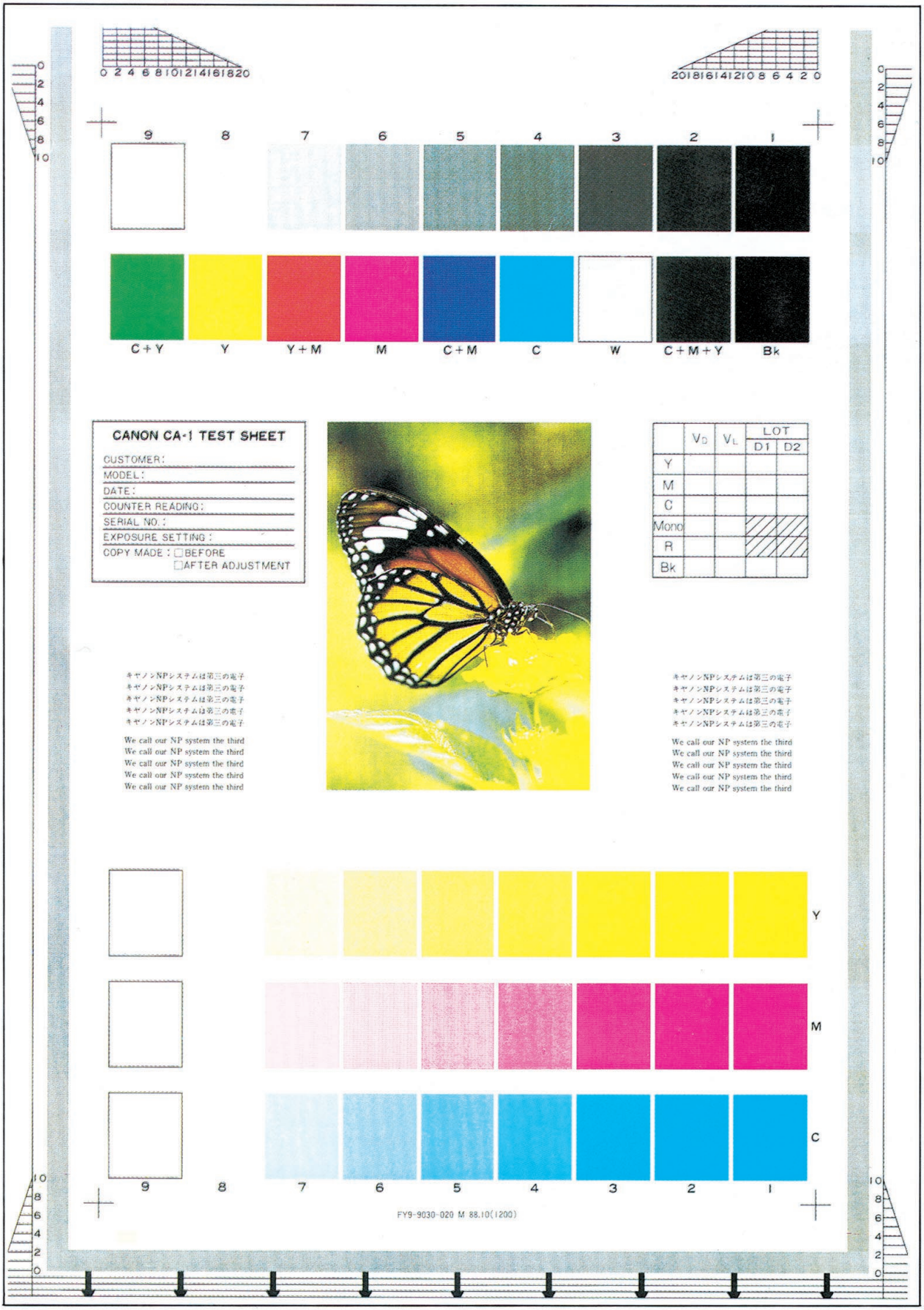

Figure 8-202 Standard Image Sample

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C. Test Print

The machine has 12 types of test print patterns, each one enabling identification of a fault in the image. If faults on normal copies are not found on a test print, the cause may be assumed to be in the original exposure system, CCD, or AP-IP system of the reader unit.

1. Selecting a Test Pattern

1) Set the print count, print size, and color mode*.
   *Effective if TYPE=3, 4, 5, or 6.
2) Start service mode (⊛ →2, 8→⊛)
3) Press 'COPIER'.
4) Press 'TEST' 'PG'.
5) Select 'TYPE'.
6) Enter the TYPE number on a keypad, and press the OK key.
7) Press the Copy Start key.

• Setting the Test Print Density (DENS-Y, -M, -C, -K)

This is effective when TYPE=5 is selected.
1) Set the density under TEST>PG>DENS-Y/M/C/K.

TYPE	Remarks		TYPE	Remarks
0	Image from the CCD (normal copying)		10	YMCK horizontal stripe (laser FF ON)
1	For R&D		11	For R&D
2	256 colors		12	YMCK 64 gradations
3	256 gradations		13	BGR 64 gradations
4	16 gradations		14	Full-color 16 gradations (YMCK)
5	Full face halftone		15	Full-color light area 16 gradations (YMCK)
6	Grid		16	YMCK horizontal stripe (laser A0 ON)
7 to 9	For R&D			

Table 8-201

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2. Horizontal Stripe Test Print (TYPE=10, 16)

Use the horizontal test print to check the dark area density of each color, balance between colors, and white lines caused during development.

a. Dark Area Density of Each Color and Balance between Colors
The density must not be appreciably low (light image).
If the density of one color is low (light image), the light-color toner cartridge is likely to be faulty.
If the density of all colors is low (light image), primary transfer/secondary transfer is likely to be faulty.

b. White Lines Caused during Development
If white lines are found in the cyan area of the copy, the cyan toner cartridge is likely to be faulty.

c. Uneven Density between Left and Right
If the right/left density is uneven for all colors, the drum cartridge, secondary pre-transfer charging assembly, or secondary transfer belt assembly of the printer unit is likely to be faulty.

d. Left/Right Image Position
If the image read start position (ADJ-X/Y) is faulty, the left/right position will be displaced, eliminating the non-image width. Such a condition can cause toner to fly astray and soil the inside of the machine.

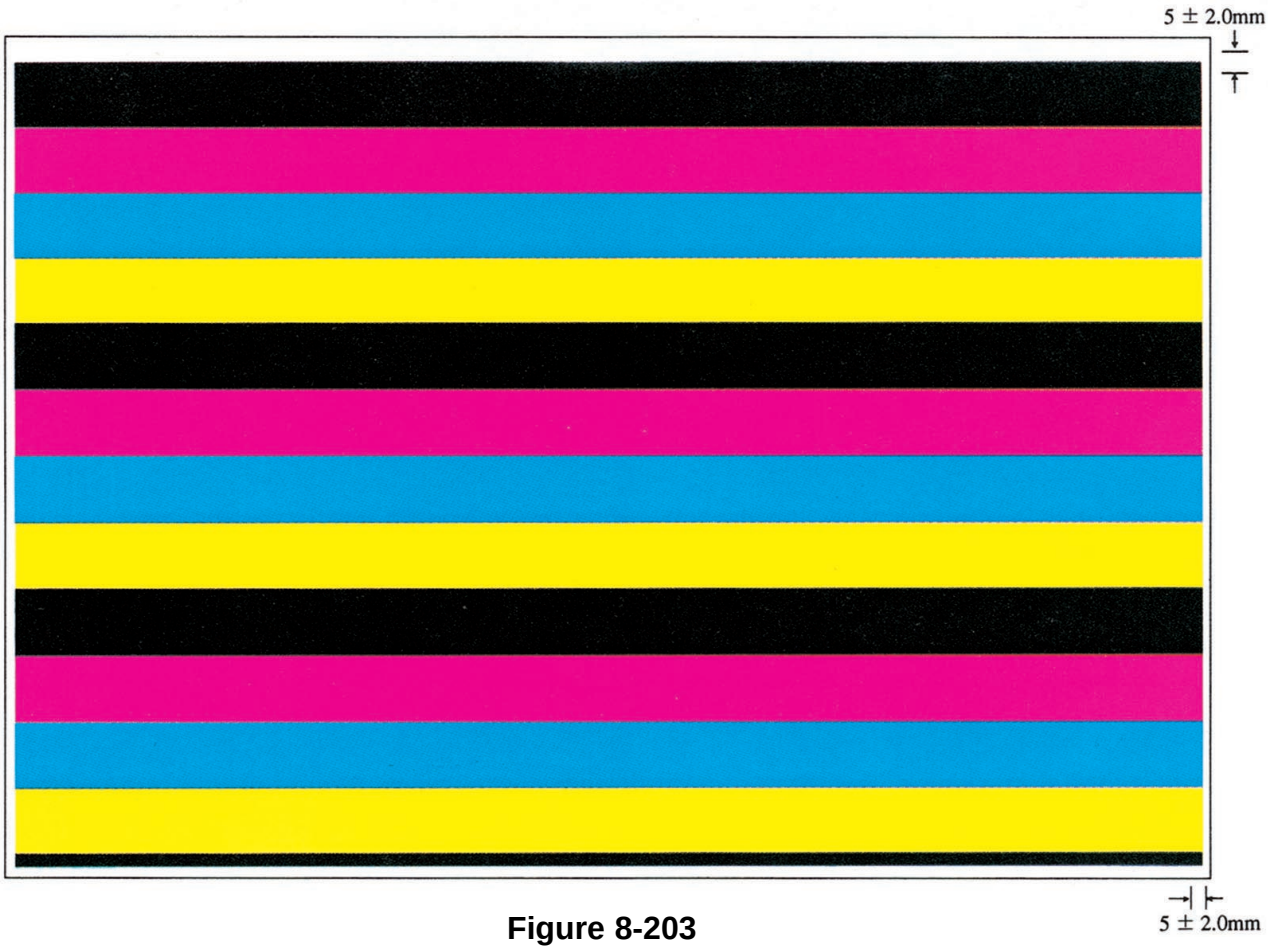

Figure 8-203

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3. 256-Color Test Print (TYPE=2)

Use the 256-color test print to check the hues.
The 256-color test print shows 256 colors in 16x16 frames arranged from the leading edge of copy appear (the pattern is repeated).

a. Hue of the 256 Colors
If a hue is wrong, the toner cartridge or the drum cartridge of the printer unit is likely to have deteriorated.

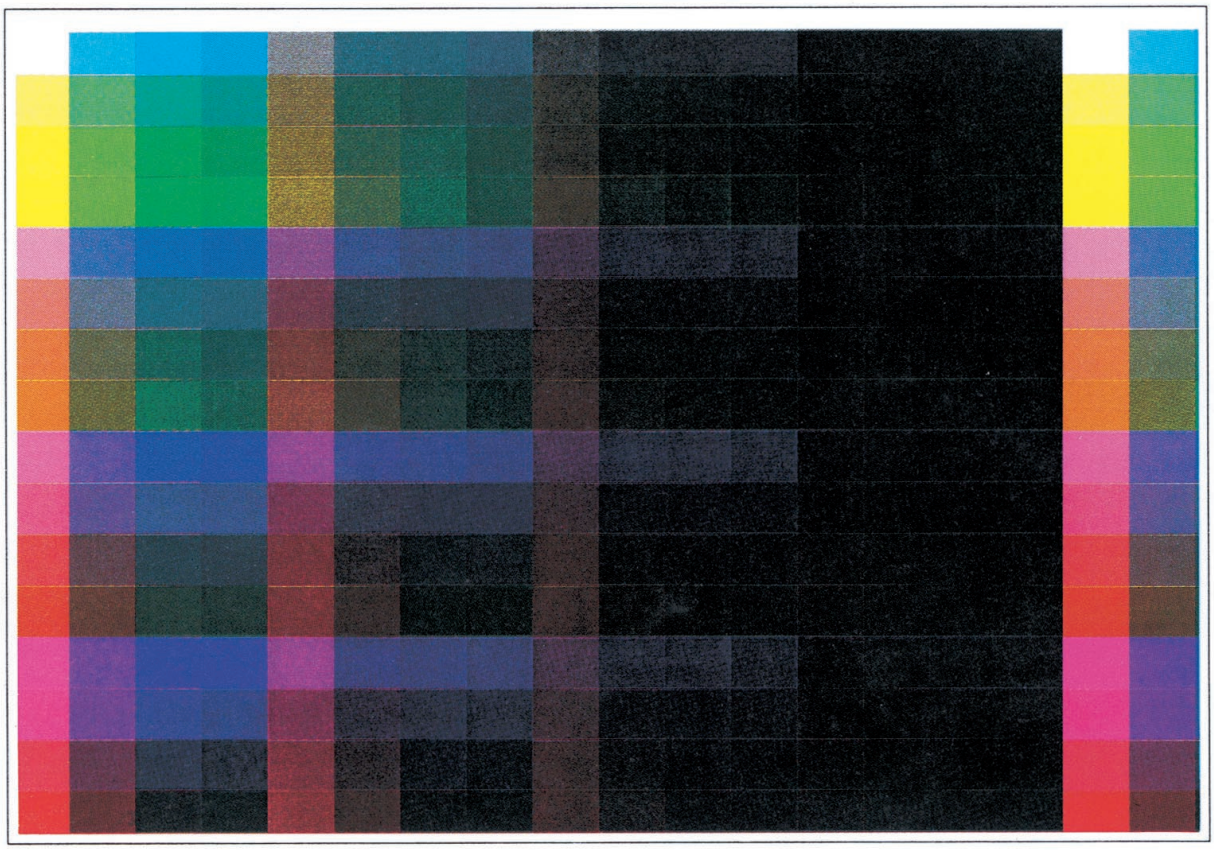

Figure 8-204

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4. 256-Gradation Test Print (TYPE=3)

Use the 256-radiation test print to check gradation and balance among colors.

a. Gradation
Check the full gradation between density 0 and density 255.

b. Balance between Specified Colors
Check the color balance by printing in mono color or in two colors.

Caution:
A color may be specified in service mode (TEST>PG>COLOR-Y/M/C/K). Do not specify three colors, as doing so can cause a fixing fault and, ultimately, soil the fixing assembly.

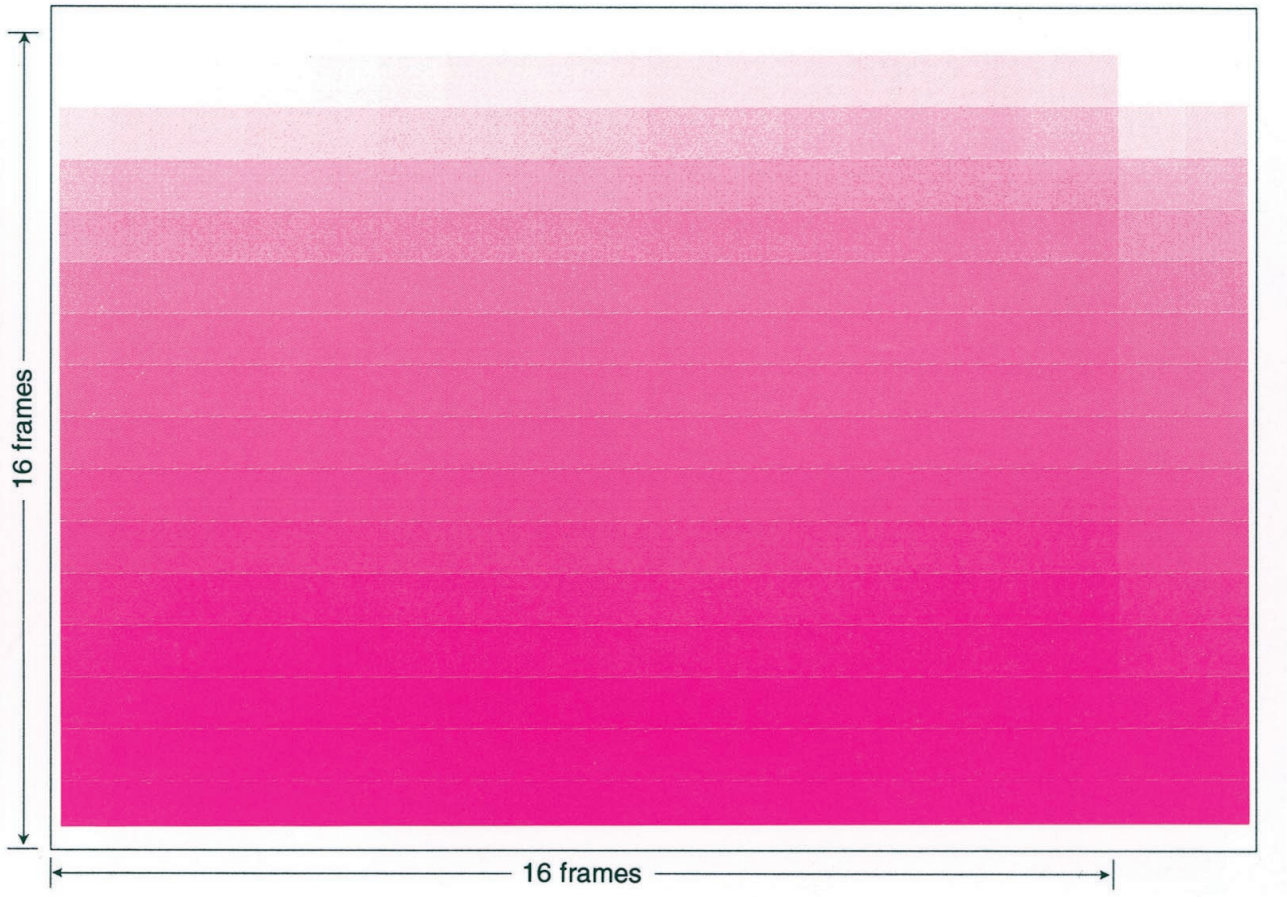

Figure 8-205

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5. 16-Gradation Test print (TYPE=4)

Use the 16-gradation test print to check the gradation, fogging, white lines, density between left and right, and balance between colors.

a. Gradation
If the density is not expressed in 16 gradations, the laser system of the printer unit is most likely to be faulty.

c. White Lines
If white lines occur in the image, the toner cartridge of the printer unit is likely to be faulty.

d. Uneven Density between Left and Right
If the density is uneven between left and right, the drum cartridge, secondary pre-transfer charging assembly, or secondary transfer belt assembly is likely to be faulty.

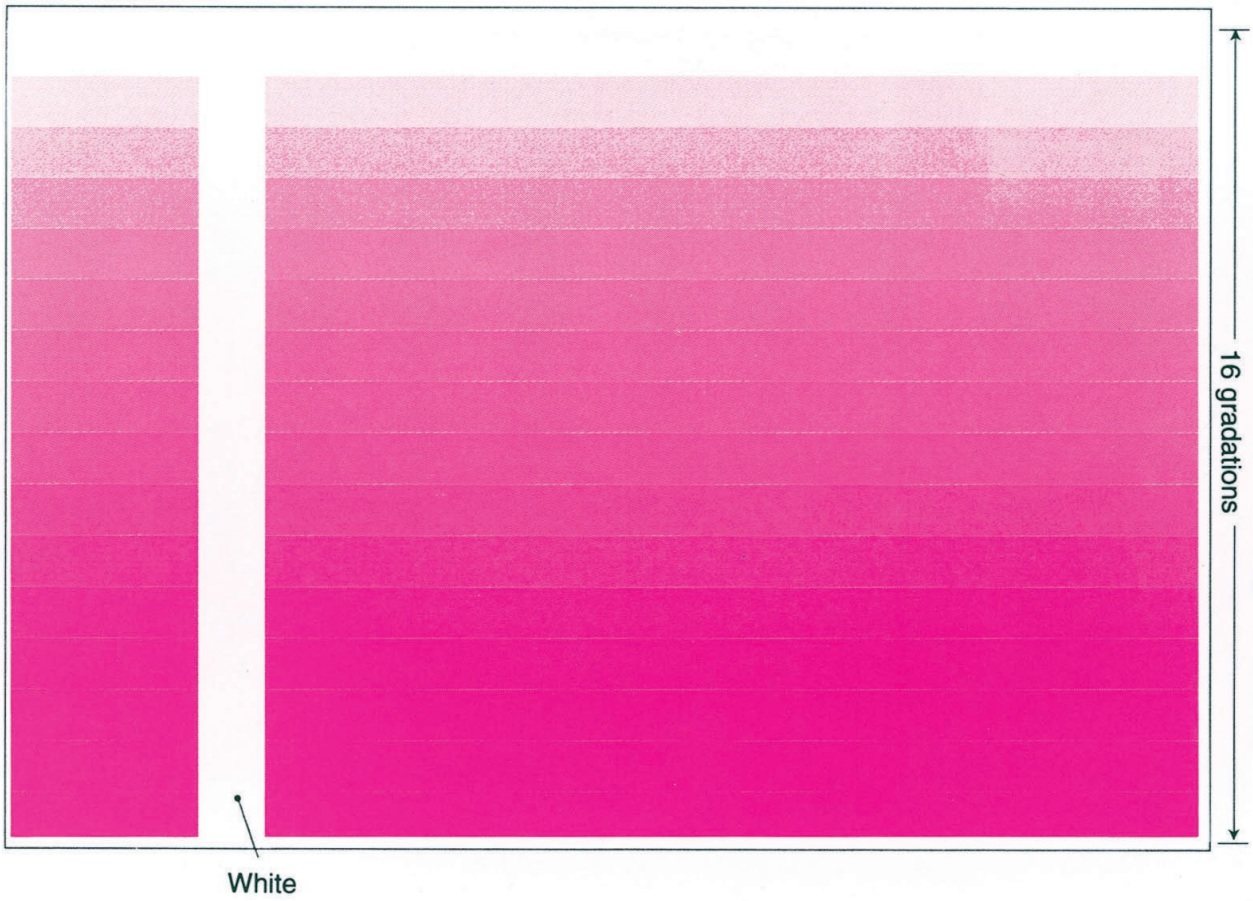

Figure 8-206

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6. Halftone Test Print (TYPE=5)

Use the halftone test print to check transfer faults, black lines, white lines, and uneven intervals.

a. Transfer Faults
If transfer faults occur, the intermediate transfer drum unit or the secondary transfer belt assembly of the printer unit is likely to be faulty.

b. Black Lines
If black lines occur, the photosensitive drum inside the drum cartridge of the printer unit is likely to have scratches or the primary charging roller is likely to be soiled.

c. White Lines
If white lines occur at the same position in all colors, the intermediate transfer drum or the secondary belt assembly of the printer unit is likely to be faulty. If they occur at different positions or in one color, the toner cartridge of the printer unit is likely to be faulty.

d. Uneven Intervals
If uneven intervals occur, suspect the following:
- if at 0.5-mm intervals, the scanner*.
- if at 66-mm intervals, the developing cylinder.
- if at about 52-mm intervals, the registration roller.

*Will not occur on a test print.

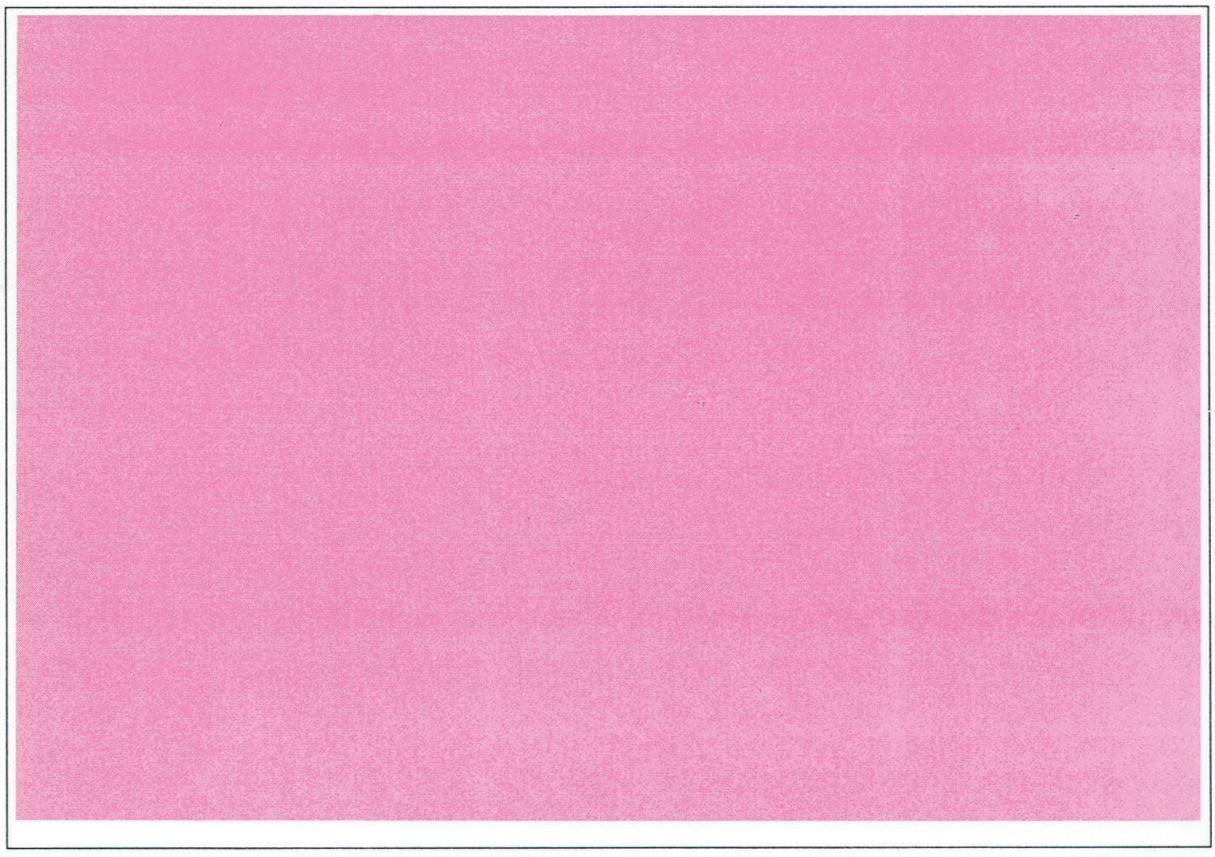

Figure 8-207

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7. Grid Test Print (TYPE=6)

Use the grid test print to check color displacement, angles, and straight lines.

a. Color Displacement
If color displacement occurs, the intermediate transfer drum or the secondary transfer belt assembly of the printer unit is likely to be faulty.
Often, color displacement can occur on a test print but not on copies made ordinarily, owing to black text processing. If color displacement is absent on copies, the copier may be judged to be normal. Use the test print to check the position of and the color affected by displacement if the problem is noted on copies.

b. Angles and Straight Lines
If angles or straight lines are not correct, the beam of the laser light or the height of the reader unit is likely to be wrong.

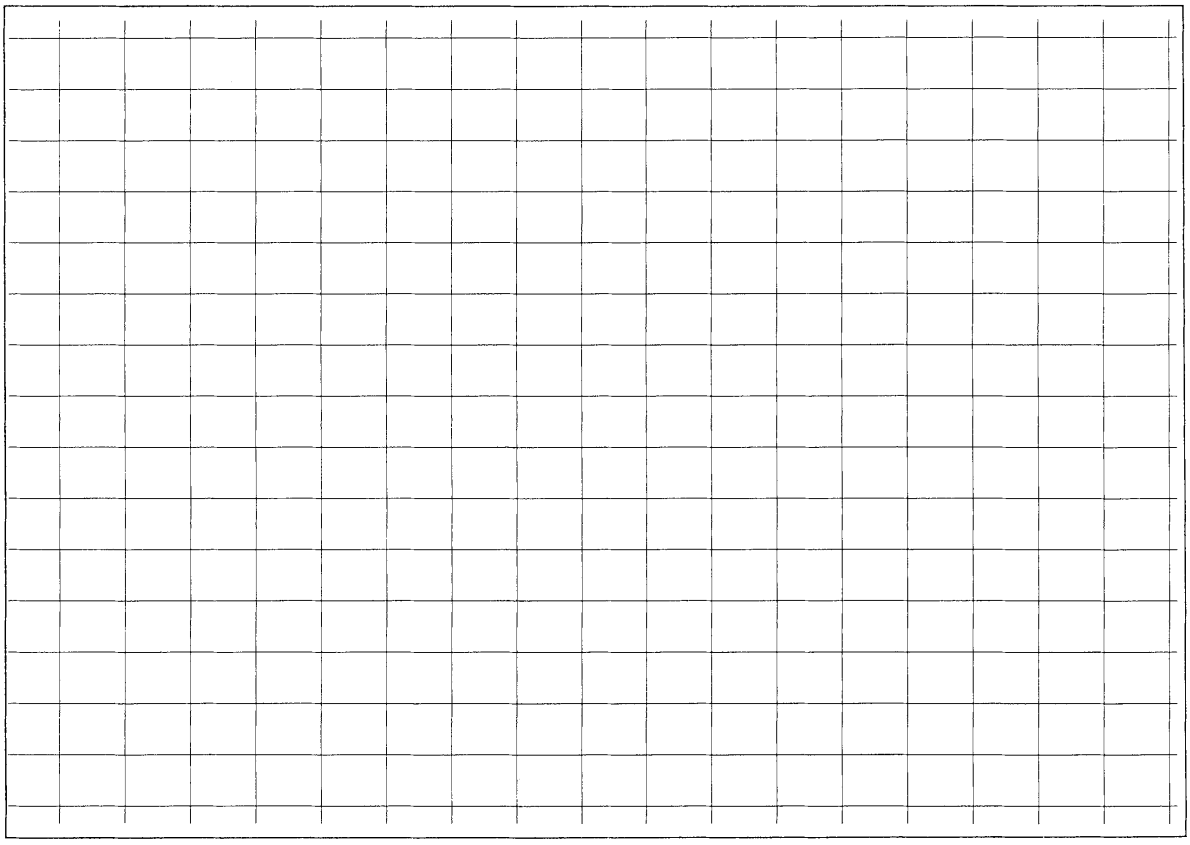

Figure 8-208

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8. YMCK 64-Gradation Test Print (TYPE=12)

Use the YMCK 64-gradation test print to check the gradation of all colors (YMCK) at a glance.

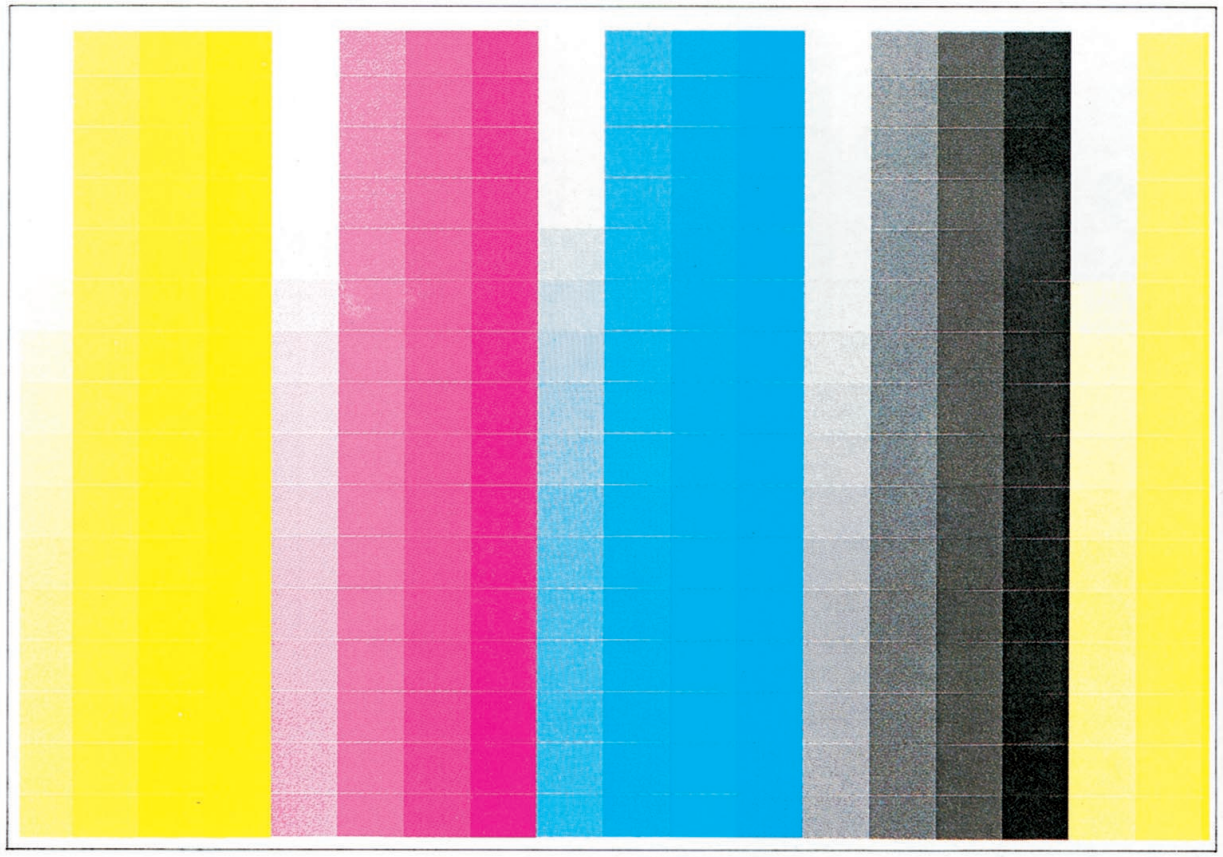

Figure 8-209

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9. BGR 64-Gradation Test Print (TYPE=13)

Use the BGR 64-gradation test print to check the gray color balance and the gradation in 2-color mode (BGR).

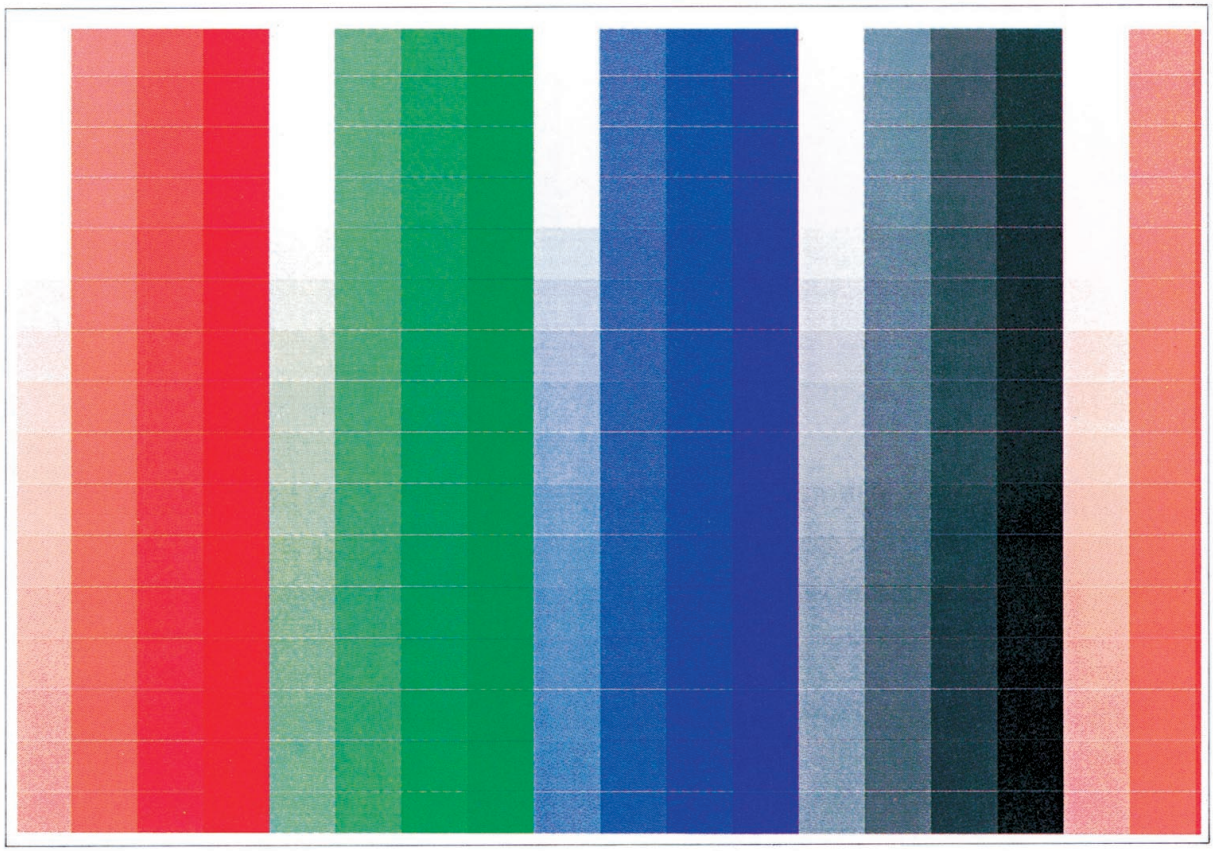

Figure 8-210

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10. Full-Color 16-Gradation (YMCK) Test Print (TYPE=14)

Use the full-color 16-gradation (YMCK) test print to check the gray balance, gradation of each color (YMCK), and fogging.

a. Gray Balance
Check to find out if the gray scale is even for all colors.

b. Gradation
Check the gradation and the difference in density of each color (YMCK).

c. Fogging
If the white area is foggy, the photosensitive drum inside the drum cartridge or the laser system of the printer unit is likely to be faulty.

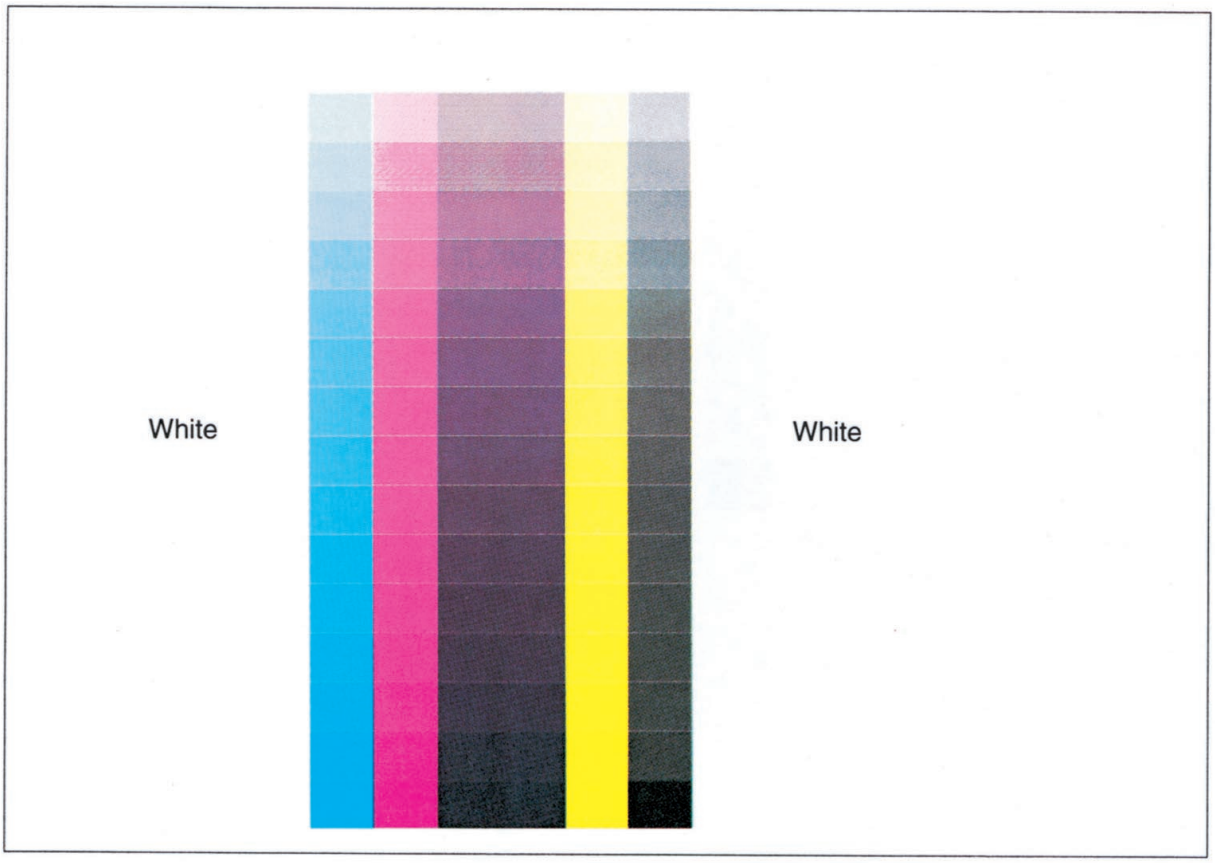

Figure 8-211

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11. Full-Color Light Area 16-Gradation (YMCK) Test Print (TYPE=15)

Use the full-color light area 16-gradation (YMCK) test print to check the gray balance and the gradation of each color (YMCK) of light areas. Compared with a TYPE=14 test print, this test pattern makes checks easier.

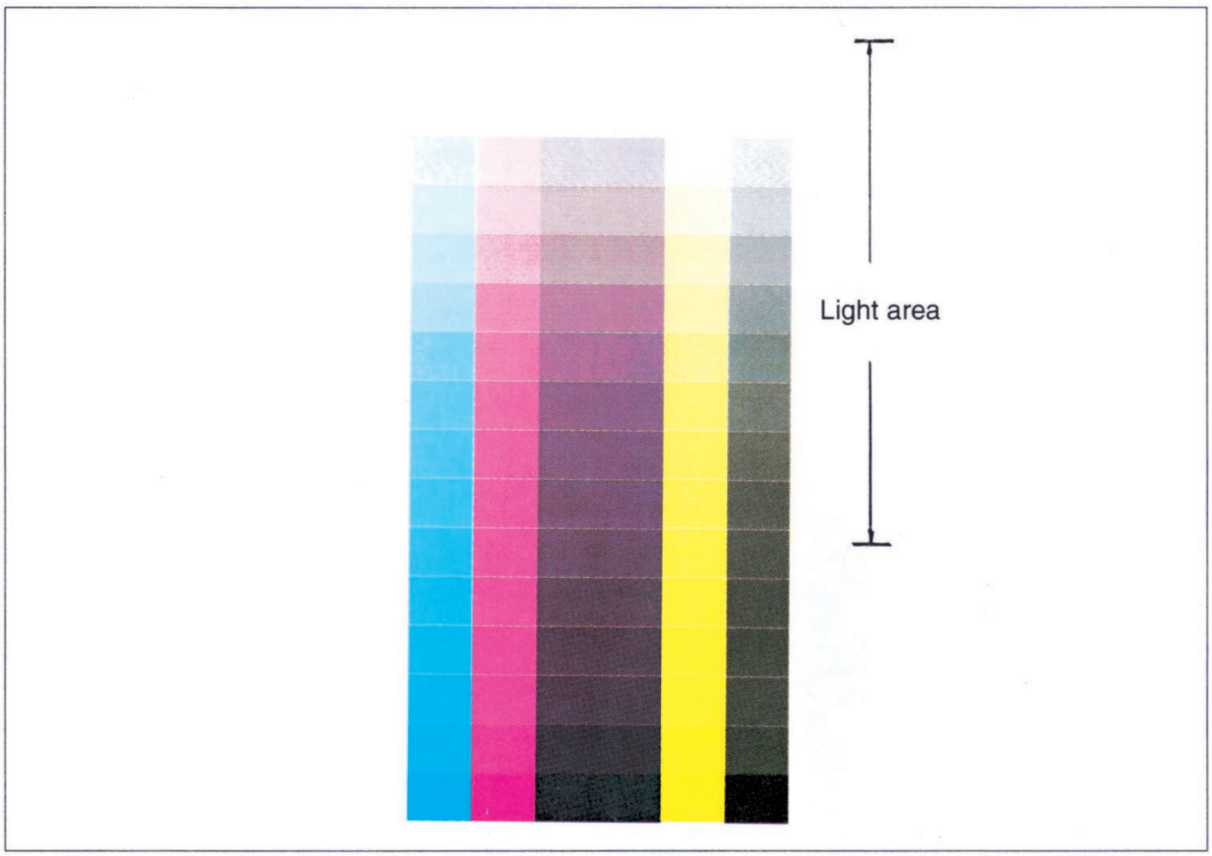

Figure 8-212

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D. Troubleshooting Image Faults

No.	Item	Remarks	Page
1	Light	The output image is undoubtedly too light.	8-34
2	Dark	The output image is undoubtedly too dark.	8-36
3	Blank	The copier fails to generate images.	8-36
4	Solid black/solid color	The copier generates a solid black or an image in solid color.	8-37
5	Soiled image/soiled back	The face/back of copy paper is soiled.	8-39
6	Vertical band/vertical line (sub scanning direction)	The copy has vertical lines (sub scanning direction).	8-41
7	White bands/white lines (vertical; sub scanning direction)	The copy has white vertical lines (sub scanning direction).	8-41
8	Horizontal bands/horizontal lines (main scanning direction)	The copy has vertical lines (main scanning direction).	8-42
9	White bands/white lines (horizontal; main scanning direction)	The copy has white vertical lines (main scanning direction).	8-43
10	Absence of specific color	The copy has a missing color (specific color).	8-44
11	White spot	The copy has white spots.	8-44
12	Fixing fault	The copy has an inadequately fused toner image.	8-45
13	Distorted image/displaced color	The copy has a distorted or color-displaced image.	8-45
14	Uneven image	The copy has smudged or uneven image.	8-46
15	Dots	The copy has an image with dots.	8-47
16	Ghost	The copy has a (positive) ghost image.	8-47
17	Soiling (double-sided copy)	The face/back of copy paper is soiled (when made in double-sided copying mode).	8-47
18	Reader unit faulty image troubleshooting	The problem is not noted on a test print, and is obviously a problem with the reader unit.	8-48

Table 8-202

Caution:

The troubleshooting procedures that follow cover faults originating in the printer unit. For disassembly/assembly work, be sure to refer to the Printer Unit Service Manual.

1 The print is too light.

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a test print in service mode (TEST>PG>TYPE=14), and find the color that is light on the copy. Is the color on the test print?	NO	The problem is with the reader unit. Go to step 2.
				YES	If the color is black only, go to step 3.
		2	See 16. "Troubleshooting Reader Unit Image Faults."		
Printer	Black toner cartridge	3	Is the contact of the black toner cartridge (for black developing bias) or the contact for black developing bias of the printer unit soiled?	YES	Clean the contact. If it is deformed, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 1 (inadequate black developing bias output)	4	Open the front cover while black toner is being developed on the photosensitive drum (about 30 sec after the start of test printing), and take out the black toner cartridge. Then, take out the black toner cartridge, and check the toner image on the photosensitive drum. Is the black toner image fully developed on the surface of the photosensitive drum?	NO	Replace the high-voltage PCB 1.
	Secondary pre-transfer charging assembly	5	Is the charging wire of the secondary pre-transfer charging assembly inside the intermediate transfer drum unit broken?	YES	Replace the secondary pre-transfer charging assembly.
	Intermediate transfer drum unit	6	Is the contact of the intermediate transfer drum unit (for secondary pre-transfer charging bias) or the contact for the secondary pre-transfer charging bias of the printer unit soiled?	YES	Clean the contact. If it is soiled or damaged, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 2 (inadequate pre-transfer charging bias output)	7	Replace the high-voltage PCB. Is the problem corrected?	NO	Replace the DC controller PCB.
				YES	End.

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Unit	Cause	Step	Checks	Yes/No	Action
Printer	Contact (for color developing bias)	8	Is the contact for the color developing bias for the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 1 (inadequate color developing bias output)	9	Open the front cover while toner is being developed on the photosensitive drum (about 20 sec after the start of test printing), and take out the black toner cartridge. Then, take out the drum cartridge, and check the toner image on the surface of the photosensitive drum. Is the color toner image fully developed on the surface of the photosensitive drum?	NO	Replace the high-voltage PCB 1.
				YES	Replace the DC controller PCB.
		10	Open the right cover of the printer unit, and fit the door switch actuator. Make a copy, and check the toner image on the surface of the intermediate transfer drum. Is the toner image fully developed on the surface of the intermediate transfer drum?	NO	Go to step 11.
				YES	Go to step 13.
	Intermediate transfer drum	11	Is the contact of the intermediate transfer drum unit (for primary transfer bias) or the contact of the primary transfer bias for the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 1 (inadequate primary transfer bias output)	12	Replace the high-voltage PCB 1. Is the problem corrected?	YES	End.
				NO	Go to step 13.
	Secondary transfer belt assembly	13	Is the contact of the secondary transfer belt assembly (for secondary transfer bias) or the contact of the secondary transfer bias for the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. also, check for a displaced contact.
	High-voltage PCB 2	14	Replace the high-voltage PCB 2. Is the problem corrected?	YES	End.
				NO	Replace the DC controller PCB.

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2 The print is too dark.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Density sensor	1	Is the lens of the density sensor soiled?	YES	Clean the lens with a special brush.
	Grounding wire contact (drum cartridge)	2	Is the contact of the grounding wire of the drum cartridge or the contact of the drum grounding wire for the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact.
	Contact (drum cartridge; for primary charging bias)	3	Is the contact of the drum cartridge (for primary charging bias) or the contact for primary charging of the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact
	High-voltage PCB1 (inadequate primary charging bias)	4	Replace the high-voltage PCB1. Is the problem corrected?	YES	End.
				NO	Replace the DC controller PCB.

3 The print is blank.

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a horizontal stripe test print (TYPE=10, 16). Is the image normal?	YES	Is the wiring of the following PCBs normal? • AP-IP PCB • CCD driver PCB
Printer	Laser shutter	2	Is the boss for opening/closing the laser shutter on the front cover or the right cover of the printer unit damaged?	YES	Replace the front cover or the right cover.
		3	Does the laser shutter arm and the laser shutter move smoothly?	NO	Replace the problem part.
	High-voltage PCB 1	4	Are the connectors J5001 and J226 on the high-voltage PCB 1 connected securely?	NO	Connect them securely.
	High-voltage PCB 1 (no color/black developing bias output)	5	Replace the high-voltage PCB 1. Is the problem corrected?	YES	Replace the high-voltage PCB 1.

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Unit	Cause	Step	Checks	Yes/No	Action
Printer	Connector (cartridge motor drive)	6	Are the connectors J5001 and J5003 on the high-voltage PCB 1 and the connector J226 on the DC controller PCB connected securely?	NO	Connect them securely.
	Cartridge motor (M3)	7	Turn on the reader unit rear power switch and the control panel power soft switch. Is the voltage between the connector J5003-1 (+24 UH) on the high-voltage PCB 1 and the nearby GND 24 V?	YES	Replace the cartridge motor.
	High-voltage PCB 1	8	Replace the high-voltage PCB 1. Is the problem corrected?	YES	End.
	DC controller PCB			NO	Replace the DC controller PCB.

4 The print is solid black/solid color.

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a horizontal stripe test print (TYPE=10, 16). Is the problem corrected?	YES	Go to step 5.
Printer	Drum cartridge	2	Is the contact of the drum cartridge (for primary charging bias) or the contact for primary charging of the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact.
		3	Replace the drum cartridge (primary charging roller). Is the problem corrected?	YES	Replace the drum cartridge.
	High-voltage PCB 1 (for primary charging bias)	4	Replace the high-voltage PCB 1. Is the problem corrected?	YES	End.
				NO	Replace the DC controller PCB.
Reader	Scanning lamp	5	Does the scanning lamp turn on?	NO	See "The scanning lamp fails to turn on."
	Anti-counterfeit mechanism	6	Does the problem occur when a bank note is copied?	YES	The anti-counterfeit mechanism has turned on. Inform the user that copying a bank note is an illegal act.

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Unit	Cause	Step	Checks	Yes/No	Action
Reader	Anti-counterfeit mechanism (original exposure system)	7	Does the problem occur when an original identical to a bank note was copied?	YES	Check the exposure system. If the problem is not corrected, inform the user that the anti-counterfeit mechanism has turned on.
	Connector, Wiring	8	Are the connection of the connectors and wiring between the following PCBs correct? • AP-IP PCB • CCD driver PCB	NO	Connect them correctly.
	DC power supply	9	Is DC power present at the following terminals of the AP-IP PCB? • J502-8: +5.2 V • J502-6: +5 V • J502-5: +5 V • J502-1: 1+5 V	NO	See "DC power is absent in the reader unit."
	CCD unit, AP-IP PCB			YES	Try replacing the following in turns. • CCD unit • AP-IP PCB

Checking the Original Exposure System

1) Check to find out if the copyboard glass has not overridden a foreign object.
2) Clean the scanning lamp, reflecting plate, No. 1/2/3 mirror, standard white plate, and copyboard glass; then, execute FUNCTION>CCD>**CCD-ADJ** in service mode. Is the problem corrected?

Caution:

If you have replaced the scanner parts of the reader unit (scanning lamp, mirror, CCD unit), be sure to execute CCD adjustment in FUNCTION>CCD>**CCD-ADJ**.
Further, if you have removed and then mounted back the scanning lamp, be sure to execute intensity adjustment in service mode (FUNCTION>MISC-R>**USE-LAMP**).

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5 The print has a soiled image/soiled back.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Cassette pick-up roller, Registration roller, Lower fixing roller, Feeding roller 1/2, Etc.	1	Does the soiling have a specific interval (as of the diameter of the cassette pick-up roller, registration roller, lower fixing roller, feeding roller 1/2, etc.)?	YES	See Table 8-303. Identify the soiled roller, and clean it. If the dirt cannot be removed, replace it.
	Secondary transfer belt assembly, Fixing inlet guide, Fixing/separation lower guide, Separation guide	2	Is the secondary transfer belt assembly, fixing assembly inlet guide, fixing/separation lower guide or separation guide soiled?	YES	Clean the soiled part. If the dirt cannot be removed, replace the part.
	ITD cleaning	3	Are there scratches or dirt in the peripheral direction of the ITD cleaning roller?	YES	Replace the ITD cleaning roller.
		4	Is the contact of the ITD cleaning roller (for ITD cleaning bias) or the contact for the ITD cleaning mechanism of the printer unit soiled?	YES	Clean the contact. If it is damaged, replace the problem part. Also, check for a displaced part.
		5	Does the problem occur in a high humidity environment?	YES	Wipe the surface of the intermediate transfer drum with a moistened flannel cloth; then, dry wipe it with lint-free paper.
	Fixing assembly	6	Is the contact of the fixing assembly (for fixing bias) or the contact for the fixing/separation bias of the printer unit soiled?	YES	Clean the contact. If it is damaged, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 2 (ITD cleaning bias or fixing/separation bias output absent)	7	Replace the high-voltage PCB 2. Is the problem corrected?	YES	Replace the PCB.

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Unit	Cause	Step	Checks	Yes/No	Action
Printer	ITD cleaning roller drive assembly	8	Is the drive gear or the like used to transmit locking/unlocking drive of the ITD cleaning roller worn or cracked?	YES	Replace the worn or cracking part.
		9	Is the cam used to lock/unlock the ITD cleaning roller worn or cracked?	YES	Replace the worn or cracking part.
	ITD cleaning roller locking/unlocking solenoid (SL1)	10	Are the connector J674 on the sub relay PCB and the connector J227 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
		11	Disconnect the connector J674 of the solenoid, and measure the voltage between the connectors J674-1 (CLNRON) and J674-2 (+24 UH) on the harness side. Is it about 85 Ω?	NO	Replace the ITD cleaning roller locking/unlocking (SL21) solenoid.
	DC controller PCB	12		YES	Replace the DC controller PCB.

Problem part	Diameter* (mm)	Image interval* (mm)	Development			
			Soiling	White spot	Soiled back	Faulty fixing
Cassette pick-up roller	24	75			✓	
Separation roller	24	75	✓			
Feeding roller 1	24	75			✓	
Feeding roller 2	38	119			✓	
Multifeeder pick-up roller	30	94	✓			
Registration roller	16	52	✓		✓	
Primary charging roller	14	44		✓		
Photosensitive drum	62	195	✓	✓		
Developing cylinder	21	66	✓			
Upper fixing roller	46	144	✓			✓
Power fixing roller	46	144			✓	✓
ITD cleaning roller	18	57	✓			

* approximate.

Table 8-203

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6 The print has vertical bands/lines (sub scanning direction).

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a halftone test print (TYEP=5). Does it have vertical bands/lines?	NO	Go to step 2.
				YES	Go to step 4.
	Optical path	2	Is the scanning lamp, reflecting plate, No. 1/2/3 mirror, standard white plate, or copyboard glass soiled?	YES	Clean the soiled part. If the dirt cannot be removed, replace the part.
		3	Remove the CCD cover, and clean the surface of the CCD with a blower brush. Is the problem corrected?	YES	End.
				NO	Replace the CCD unit.
Printer	Photosensitive drum	4	Are there scratches in the peripheral direction (sub scanning direction) of the photosensitive drum?	YES	Replace the photosensitive drum cartridge.
	Upper fixing roller	5	Are there scratches in the peripheral direction (sub scanning direction) of the upper fixing roller?	YES	Replace the upper fixing roller.

7 The print has white bands/lines (vertical; sub scanning direction).

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a halftone test print (TYPE=5). Does it have vertical white bands/lines?	NO	Go to step 2.
				YES	Go to step 4.
	Optical path	2	Is the scanning lamp, reflecting plate, No. 1/2/3 mirror, standard white plate, or copyboard glass soiled?	YES	Clean the soiled part. If the dirt cannot be removed, replace the part.
		3	Remove the CCD cover, and clean the surface of the CCD with a blower brush. Is the problem corrected?	YES	End.
				NO	Replace the CCD unit.
Printer		4	Make a vertical stripe test print (TYPE=10). Do the white bands/lines occur in a specific color only?	YES	Replace the toner cartridge of the color.
	Fixing/separation upper guide	5	Is the fixing/separation upper guide coated with toner?	YES	Clean the fixing/separation upper guide.
	Photosensitive drum unit	6	Are there scratches in the peripheral direction (sub scanning direction) of the photosensitive drum?	YES	Replace the photosensitive drum cartridge.

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Unit	Cause	Step	Checks	Yes/No	Action
Printer	Laser optical path	7	Is the laser emission opening of the printer unit coated with foreign matter?	YES	Remove the foreign matter.
	Printer unit laser scanner/scanner assembly	8	Is any of the mirrors of the laser/scanner assembly soiled?	YES	Replace the laser/scanner assembly.
	Intermediate transfer drum unit	9	Are there scratches in the peripheral direction (sub scanning direction) of the intermediate transfer drum?	YES	Replace the intermediate transfer drum unit.
	Upper fixing roller	10	Are there scratches in the vertical direction (sum scanning direction) of the upper fixing roller?	YES	Replace the upper fixing roller.

Caution:

If you have replaced the scanner parts of the reader unit (scanning lamp, mirror, CCD unit), be sure to execute CCD adjustment in FUNCTION>CCD>**CCD-ADJ**.
Further, if you have removed and then mounted back the scanning lamp, be sure to execute intensity adjustment in service mode (FUNCTION>MISC-R>**USE-LAMP**).

8 The print has horizontal bands/lines (main scanning direction).

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a halftone test print (TYPE=5). Does it have horizontal bands/lines?	NO	Go to step 2.
				YES	Go to step 6.
	Optical	2	Is the scanning lamp, reflecting plate, No. 1/2/3 mirror, standard white plate, or copyboard glass soiled?	YES	Clean the soiled part. If the dirt cannot be removed, remove the part.
	Power supply voltage, Scanning lamp, Inverter PCB	3	Does the scanning lamp flicker?	YES	1. Check the power supply voltage for fluctuation. 2. Check the scanning lamp and the Inverter PCB; if faulty, replace the part.
	Original exposure system	4	Does the No. 1/No. 2 mirror mount move smoothly on the rail?	NO	Remove the cause that hinders smooth movement.
	CCD unit	5	Remove the CCD cover, and clean the surface of the CCD with a blower brush. Is the problem corrected?	YES	End.
				NO	Replace the CCD unit.

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Unit	Cause	Step	Checks	Yes/No	Action
Printer	Photosensitive unit	6	Are there scratches in the horizontal direction (main scanning direction) of the photosensitive drum?	YES	Replace the photosensitive drum cartridge.
	Upper fixing roller	7	Are there scratches in the horizontal direction (main scanning direction) of the upper fixing roller?	YES	Replace the upper fixing roller.

9 The print has white bands/lines (horizontal; main scanning direction).

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Make a halftone test print (TYPE=5). Does it have white bands/lines?	NO	Go to step 2.
				YES	Go to step 4.
	Optical path	2	Is the scanning lamp, reflecting plate, No. 1/No. 2/ No. 3 mirror, standard white plate, or copyboard glass soiled?	YES	Clean the soiled part. If the dirt cannot be removed, replace the part.
	Original exposure system	3	Does the No. 1/No. 2 mirror mount move smoothly on the rail?	NO	Remove the cause that hinders smooth movement.
				YES	Check the cable of the original exposure system.
Printer	Photosensitive drum unit	4	Are there scratches in the horizontal direction (main scanning direction) of the photosensitive drum?	YES	Replace the photosensitive drum.
	Intermediate transfer drum unit	5	Are there scratches in the horizontal direction (main scanning direction) of the intermediate transfer drum?	YES	Replace the intermediate transfer drum unit.

Caution:

If you have replaced the scanner parts of the reader unit (scanning lamp, mirror, CCD unit), be sure to execute CCD adjustment in FUNCTION>CCD>**CCD-ADJ**.
Further, if you have removed and then mounted back the scanning lamp, be sure to execute intensity adjustment in service mode (FUNCTION>MISC-R>**USE-LAMP**).

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10 The print has a missing color (specific).

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Toner cartridge	1	Remove the toner cartridge, and turn on the power. If the machines starts up normally, check each of the toner cartridges in question. Is it faulty?	YES	Replace the problem cartridge.
	Toner level detection	2	Is the missing color black?	YES	See III.B.19. "The black toner cartridge is empty."
				NO	See III.B.17 "The color toner cartridge is empty."

11 The print has white spots.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Toner cartridge	1	Does any of the developing cylinders of the toner cartridge have a fault?	YES	Replace the problem cartridge.
	Photosensitive drum unit	2	Does the photosensitive drum or the primary charging roller have a fault?	YES	Replace the photosensitive drum cartridge.
	Secondary transfer belt assembly	3	Does the unlocking mechanism of the secondary transfer belt assembly have a fault?	YES	Replace the problem part.
	Intermediate transfer drum unit	4	Is the intermediate transfer drum unit deformed or is soiled with oil?	YES	Replace the intermediate transfer drum unit.
	Secondary transfer belt assembly	5	Is the contact of the secondary transfer belt assembly (for secondary transfer bias) or the contact for secondary transfer bias of the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace the problem part. Also, check for a displaced contact.
	High-voltage PCB 2 (inadequate transfer bias output)	6	Replace the high-voltage PCB 2. Is the problem corrected?	YES	Replace the high-voltage PCB 2.
	DC controller PCB			NO	Replace the DC controller PCB.

Note:

See Table 8-203.

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12 The print has poor fixing.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Fixing assembly	1	Is the upper/lower fixing roller scratched or deformed?	YES	Replace the upper/lower fixing roller or the fixing assembly.
		2	Is the upper/lower fixing thermistor soiled?	YES	Clean the upper/lower fixing thermistor.
	DC controller PCB			NO	Replace the DC controller PCB.

Note:

See Table 8-203.

13 The print has a distorted image/displaced color.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Drum motor drive assembly	1	Is the drive gear between the drum cartridge and the drum motor or between the intermediate transfer drum and the drum motor worn/cracked?	YES	Replace the worn/cracking gear.
	Laser/scanner assembly	2	Are the connectors J1001, J2, and J901 of the laser/scanner assembly connected securely?	NO	Connect them securely.
		3	Replace the laser/scanner assembly. Is the problem corrected?	YES	Replace them.
	DC controller PCB	4	Are the connectors J205 and J211 on the DC controller PCB connected securely?	NO	Connect them securely.
				YES	Replace the DC controller PCB.

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14 The print has an uneven image.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Separation sensor	1	Is the movement of the lever of the separation sensor poor?	YES	Replace the sensor lever.
	Fixing assembly	2	Is the fixing assembly inlet guide soiled? Or, is the contact of the upper fixing roller (for fixing/separation bias) or the contact for fixing/separation bias of the printer unit soiled?	YES	Clean the contact. If it is deformed or damaged, replace it. Also, check for a displaced contact.
	High-voltage PCB 2	3	Are the connectors J5005 and J5006 on the high-voltage PCB 2 connected securely?	NO	Connect them securely.
		4	Replace the high-voltage PCB 2. Is the problem corrected?	YES	Replace the high-voltage PCB 2.
	Fixing assembly	5	Is the upper fixing cover fitted to the fixing assembly securely?	NO	Fit the cover securely.
	Registration roller, Feeding roller 2	6	Is the drive gear of the registration roller or the feeding roller worn?	YES	Replace the worn gear.
	Separation static eliminator	7	Is the charging wire of the separation static eliminator broken?	YES	Replace the separation static eliminator.
	Separation static eliminating bias PCB	8	Are the connectors J5600, J5601, and J5602 on the separation static eliminating bias PCB connected securely?	NO	Connect them securely.
		9	Replace the separation static eliminator PCB. Is the problem corrected?	YES	End.
	DC controller PCB			NO	Replace the DC controller PCB.

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15 The print has dots.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Secondary transfer belt assembly	1	Is the charging roller of the secondary transfer belt deformed or worn?	YES	Replace the secondary transfer charging roller.
	Separation static eliminator	2	Is the charging wire of the separation static eliminator broken?	YES	Replace the separation static eliminator.
	Separation static eliminator bias PCB	3	Are the connectors J5600, J5601, and J5602 on the separation static eliminating bias PCB connected securely?	NO	Connect them securely.
		4	Replace the separation static eliminating bias PCB. Is the problem corrected?	YES	End.
	DC controller PCB			NO	Replace the DC controller PCB.

16 The print has a ghost image.

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Connector, Wiring	1	Are the connector J681 of the pre-exposure LED assembly, relay connectors J74 and J18, connectors J645 and J647 on the main relay PCB, and connector J227 on the DC controller PCB connected securely?	NO	Connect them securely.
	Pre-exposure LED assembly	2	Replace the pre-exposure LED assembly. Is the problem corrected?	YES	Replace the pre-exposure LED assembly.
	DC controller PCB			NO	Replace the DC controller PCB.

17 The print is soiled (in double-sided copying mode).

Unit	Cause	Step	Checks	Yes/No	Action
Printer	Duplexing unit	1	Is the duplexing feeding roller 1 soiled?	YES	Clean the roller.
		2	Is the feeding guide soiled?	YES	Clean the guide.
		3	Is the reversing roller or the duplexing feeding roller 2 soiled?	YES	Clean the roller.
				NO	Replace the duplexing unit.

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18 Troubleshooting Reader Unit Image Faults

Unit	Cause	Step	Checks	Yes/No	Action
Reader		1	Has the copyboard glass overridden over a foreign objet?	YES	Remove the foreign object.
		2	Execute auto gradation correction in user mode. Is the problem corrected?	YES	End.
		3	Does the No. 1/No. 2 mirror mount move smoothly on the rail?	NO	Remove the cause that hinders smooth movement.
		4	Clean the standard white plate, No. 1/No. 2/No. 3 mirror, reflecting plate, and copyboard glass; then, execute FUNCTION>CCD>CCD-ADJ. Is the problem corrected?	YES	End.
	Service mode	5	Compare the values indicated on the service label of the reader unit and the values indicated under ADJUST in service mode. Are they identical or more or less identical?	NO	Enter the values indicated on the service label.
	Scanning lamp	6	Remove the scanning lamp, and clean it. Then, mount back the lamp, and execute FUNCTION>MISC-R>USE-LAMP. Is the problem corrected?	YES	End.
	CCD/CCD unit	7	Remove the CCD cover, and clean the surface of the CCD with a blower brush. Is the problem corrected?	YES	End.
		8	Is the contact of the CCD/CCD driver proper?	NO	Connect it properly.
		9	Replace the CCD/CCD driver. Is the problem corrected?	YES	End.
				NO	Check to find out if the connectors on the AP-IP PCB are connected securely; if normal, replace the AP-IP PCB.

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III. TROUBLESHOOTING MALFUNCTIONS

Caution:

1. If you are measuring the voltage at a specified terminal of a connector, be sure that the connector is connected securely.
2. If you are handling a PCB, be sure to touch the machine's metal area before starting the work to discharge the build-up of static electricity.
3. If you are replacing the DC controller PCB of the printer unit, see p. 8-9.
4. Do not disassemble the scanner/laser assembly or the intermediate transfer drum (ITD) of the printer unit. (They cannot be adjusted in the field. However, the secondary pre-transfer charging assembly inside the intermediate transfer drum may be replaced.)
5. For disassembly/assembly of the printer unit, see the Printer Unit Service Manual. The descriptions on the printer unit error codes are for reference only.

A. Error Codes

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1 E000/E003 (printer unit)

Cause	Step	Checks	Yes/No	Action
Upper thermistor (open circuit)	1	Remove the fixing assembly, and measure the resistance between the connectors J26F-A4 (FXTHU) and J26F-A3 (GND) on the fixing assembly side. Is it between 250 KΩ and 600 KΩ (normal temperature)?	NO	Check the wiring from the connector J222 on the DC controller PCB to the upper thermistor; if normal, replace the upper thermistor.
Lower thermistor (open circuit)	2	Measure the resistance between the connectors J26F-A2 (FXTHL) and J26F-A1 (GND) on the fixing assembly side. Is it between 250 KΩ and 600 KΩ (normal temperature)?	NO	Check the wiring from the connector J222 on the DC controller PCB to the lower thermistor; if normal, replace the lower thermistor.
Upper fixing heater, Upper thermal switch (open circuit)	3	With the fixing assembly removed, is there electrical continuity between the connectors J27F-3 (HTUH) and J27F-4 (HTUC) on the fixing assembly side?	NO	Check the upper fixing heater and the thermal switch. Replace any problem parts.
Lower fixing heater, Lower thermal switch (open circuit)	4	Is there electrical continuity between the connectors J26F-3 (HTLH) and J26F-4 (HTLC) on the fixing assembly side?	NO	Check the lower fixing heater and the lower thermal switch. Replace any problem parts.
Upper/Lower thermistor	5	Is the upper/lower thermistor in even contact with the upper/lower fixing roller?	NO	Mount the thermistor properly.
Upper/lower thermistor	6	Is the upper/lower thermistor soiled?	YES	Clean the area of contact with the upper/lower fixing roller.
Connector	7	Are the connector J222 on the DC controller PCB and the connector J26 of the fixing assembly connected securely?	NO	Connect the connectors securely.
Power supply (printer unit)	8	Replace the power supply of the printer unit. Is the problem corrected?	YES	End.
			NO	Replace the DC control PCB.

Caution:

If E001 or E003 is indicated, be sure to discharge the error memory capacitor (C259) on the DC controller PCB after troubleshooting the problem, as it may contain error memory. (Short JP201 on the DC controller PCB to discharge C259; see the Printer Unit Service Manual.)

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2 E001 (printer unit)

Cause	Step	Checks	Yes/No	Action
Upper thermistor (short circuit)	1	With the fixing assembly removed, measure the resistance between the connectors J26F-A4 (FXTHU) and J26F-A3 (GND) on the fixing assembly side. Is it 2 KΩ or less?	YES	Check the wiring from the connector J222 on the DC controller PCB to the upper thermistor; if normal, replace the upper thermistor.
Lower thermistor (short circuit)	2	Measure the resistance between the connectors J26F-A2 (FXTHL) and J26F-A1 (GND) on the fixing assembly side. Is it 2 KΩ or less?	YES	Check the wiring from the connector J222 on the DC controller PCB to the lower thermistor; if normal, replace the lower thermistor.
Power supply (printer unit)	3	Replace the power supply unit of the printer unit. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

Caution:

If E001 or E003 is indicated, be sure to discharge the error memory capacitor (C259) on the DC controller PCB after troubleshooting the problem, as it may contain error memory. (Short JP201 on the DC controller PCB to discharge C259; see the Printer Unit Service Manual.)

3 E004 (printer unit)

Cause	Step	Checks	Yes/No	Action
Upper fixing heater/Upper thermal switch (open circuit)	1	With the fixing assembly removed, is there electrical continuity between the connectors J27F-3 (HTUH) and J27F-4 (HTUC) on the fixing assembly side?	NO	Check the upper fixing heater and the upper thermal switch. Replace the problem parts
Lower fixing heater, Lower thermal switch (open circuit)	2	Is there electrical continuity between the connectors J26F-3 (HTLH) and J26F-4 (HTLC) on the fixing assembly side?	NO	Check the lower fixing heater and the lower thermal switch. Replace the problem parts.
Connectors	3	Are the connector J222 on the DC controller PCB, connector J26 of the fixing assembly, and connector J101 of the printer unit power supply connected securely?	NO	Connect the connectors securely.
Power supply (printer unit)	4	Replace the power supply of the printer unit. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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4 E009 (printer unit)

Cause	Step	Checks	Yes/No	Action
Fixing assembly	1	Does the rated voltage of the fixing assembly match the machine's voltage?	NO	Check the parts number; if necessary, replace the fixing assembly or the printer unit power supply.
Connectors	2	Are the connectors J222 on the DC controller PCB and the connectors J26 of the fixing assembly connected securely?	NO	Connect the connectors.
			YES	Replace the DC controller PCB.

5 E010/E011 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector	1	Are the connector J219 on the DC controller PCB and the relay connector J1 connected securely?	NO	Connect the connectors securely.
Main motor	2	Does the voltage between the connector J219-4 (MON*) on the DC controller PCB and the connector J219-5 (GND) change from about 5 to 0 V when the power is turned on?	YES	Replace the main motor.
			NO	Replace the DC controller PCB.

6 E013 (printer unit)

Cause	Step	Checks	Yes/No	Action
Waste toner case	1	Is the photosensitive drum cartridge full of waste toner?	YES	Replace the photosensitive drum cartridge.
			NO	Replace the DC controller PCB.

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7 E019 (printer unit)

Cause	Step	Checks	Yes/No	Action
Waste toner detection window	1	Is the waste toner detection window of the photosensitive drum soiled?	YES	Wipe the waste toner detection window with a cry cloth.
Connectors	2	Are the connector J21 on the DC controller PCB, connectors J631 and J633 of the waste toner sensor, and the relay connector J71 connected securely?	NO	Connect the connectors securely.
Waste toner detecting block (light-emitting/-receiving section; printer unit)	3	Is the light-emitting/-receiving section of the waste toner detection block of the printer unit soiled?	YES	Dry wipe the light-emitting/receiving section of the waste toner detection block with a dry cloth.
Waste toner detection block (printer unit)	4	Replace the waste toner detection block of the printer unit. Is the problem corrected?	YES	End.
			NO	Replace the photosensitive drum unit. If the problem cannot be corrected, replace the DC controller PCB.

8 E020 (printer unit)

Cause	Step	Checks	Yes/No	Action
Density sensor (light-emitting/-receiving section)	1	Is the density sensor soiled?	YES	Clean the density sensor with the special brush.
Connector (density detection PCB)	2	Are the connector J1101 on the density detection PCB, relay connectors J75 and J46, and connector J206 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Density detection PCB	3	Is the voltage between the connectors J206-5 (+24 UH) on the density detection PCB and GND 24 V when the copier is turned on?	NO	Replace the density detection PCB.
			YES	Replace the DC controller PCB.

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9 E021 (printer unit)

Cause	Step	Checks	Yes/No	Action
Toner cartridge	1	Is the shutter of each toner cartridge open properly (as it is set in the copier)?	NO	Replace the toner cartridge whose shutter is not open.
Developing rotary motor drive assembly	2	Close the toner cartridge cover, and turn off then on the power. Is the developing rotary stopper arm still holding the developing rotary assembly in place?	YES	Go to step 6.
			NO	Go to step 3.
Connector (developing rotary drive assembly)	3	Are the connectors J704 and J706 on the developing rotary motor PCB and the connector J220 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
5 V supply line (developing rotary position sensor)	4	Are the connector J43 of the developing rotary position sensor, relay connector J42, and connector J207 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Developing rotary position sensor	5	Replace the developing rotary position sensor. Is the problem corrected?	YES	End.
Developing rotary stopper	6	Is the operation of the developing rotary stopper arm normal? Disconnect the connector J705 of the developing rotary stop solenoid (SL5); then, measure the resistance between connectors J605-10 and J605-12 on the harness side and between J705-11 and J705-12. Is it about 30 to 60 ?	NO	Replace the developing rotary stopper solenoid.
Developing rotary motor PCB	7	Does the voltage between the connectors J220-A6 (RLSROT) and J220-B5 (GND) on the DC controller PCB change from about 0 to about 3.5 V immediately after the copier is turned on?	YES	Replace the developing rotary motor PCB.
Fuse (developing rotary motor PCB)	8	Is the fuse (FU701, FU702) on the developing rotary motor PCB blown?	YES	Replace the fuse.
			NO	Replace the developing rotary motor. If the problem cannot be corrected, replace the DC controller PCB.

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10 E040 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors	1	Are the connector J213 on the DC controller PCB, connectors J641, J642, J643, and J647 on the printer side main relay PCB, connectors J671 and J672 on the sub relay PCB, connector J1302 of the holding plate solenoid, and connector J102 of the power supply connected securely?	NO	Connect the connectors.
Multifeeder tray PCB	2	Does the voltage between the connectors J1301-2 (+24 UH) and J1301-1 (GND) on the multifeeder tray PCB change from 0 to 24 V?	YES	Replace the multifeeder tray PCB.
+24 UH	3	Is +24 UH present on the multifeeder tray PCB and the holding plate solenoid?	NO	See B.5. “+24 UH is absent.”
Holding plate solenoid	4	Disconnect the connector J1302 of the holding plate solenoid from the multifeeder tray PCB. Measure the resistance between the connectors J1302-1 (MPTSLD*) and J1302-2 (+24 UH) on the harness side. Is it about 160 Ω?	NO	Replace the holding plate solenoid.
			YES	Replace the DC controller PCB.

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11 E054 (printer unit)

Cause	Step	Checks	Yes/No	Action
Duplexing feeding roller 1 home position sensor lever	1	Is the duplexing feeding roller 1 home position sensor lever damaged?	YES	Replace the lever.
Duplexing feeding roller drive gear	2	Is the drive gear of the duplexing feeding roller worn/cracked?	YES	Replace the worn/cracking gear.
Duplexing driver PCB	3	Are the connectors J2003, J2004 and J2007 on the duplexing driver PCB connected securely?	NO	Connect the connectors securely.
Duplexing feeding roller 1 home position sensor (PS23)	4	Replace the duplexing feeding roller 1 home position sensor. Is the problem corrected?	YES	Replace the sensor.
Duplexing feeding clutch (CL5)	5	Disconnect the connector J2003 of the duplexing feeding clutch, and measure the resistance between the connectors J2003-1 and J2003-2 on the harness side. Is it about 140 Ω?	NO	Replace the dupliexing feeding clutch.
Duplexing motor (M8)	6	Replace the duplexing motor. Is the problem corrected?	YES	Replace the duplexing motor.
Duplexing driver PCB			NO	Replace the duplexing driver PCB.

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12 E055 (printer unit)

Cause	Step	Checks	Yes/No	Action
Horizontal registration guide	1	Is the horizontal registration guide mounted correctly?	NO	Mount the guide correctly.
Horizontal registration guide home position sensor (PS25) lever	2	Is the horizontal registration guide home position sensor lever damaged?	YES	Replace the lever.
Horizontal registration guide drive gear	3	Is the horizontal registration guide drive gear worn/cracked?	YES	Replace the worn/cracked gear.
Duplexing driver PCB	4	Are the connectors J2006 and J2005 of the duplexing driver PCB connected securely?	NO	Connect the connectors securely.
Horizontal registration guide home position sensor (PS25)	5	Replace the horizontal registration guide home position sensor (PS25). Is the problem corrected?	YES	Replace the sensor.
Horizontal motor (M7)	6	Replace the horizontal registration motor. Is the problem corrected?	YES	Replace the horizontal registration motor.
Duplexing driver PCB			NO	Replace the duplexing driver PCB.

13 E066 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (temperature/ humidity sensor)	1	Are the connectors J801 on the temperature/humidity sensor and connector J206 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Temperature/ humidity sensor	2	Replace the temperature/humidity sensor. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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14 E100 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (laser driver signal line)	1	Are the connector J1001 on the laser driver PCB and connector J205 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Connectors (BD line)	2	Are the connector J2 on the BD PCB, relay connector J40, and connector J211 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Laser scanner unit	3	Is the voltage between the connectors J211-1 (+5 V) on the DC controller PCB and J211-3 (GND) 5 V immediately after the copier is turned on?	YES	Replace the laser scanner unit.
			NO	Replace the DC controller PCB.

15 E110 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector	1	Are the connectors J901 on the laser scanner motor PC, relay connector J40, and connector J211 on the DC controller PCB connected securely?	NO	Connect the connectors.
Laser scanner motor	2	Does the voltage between the connectors J211-7 (SCND) on the DC controller PCB and J211-6 (GND) change from 0 to 17 V or more when the copier is turned on?	YES	Replace the laser scanner motor.
			NO	Replace the DC controller PCB.

16 E196/E197/E198 (printer unit)

Cause	Step	Checks	Yes/No	Action
DC controller PCB	1	Turn off and then on the copier. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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17 E202 (The scanner home position is not detected.)

In response to this code, the control panel keys will lock, and the “Wait” message will appear.

This code is indicated only on the Error History screen in service mode.

Cause	Step	Checks	Yes/No	Action
	1	Is the scanner at home position when E202 is indicated?	NO	See “The scanner fails to move forward/in reverse.”
Original scanner home position sensor (PS101)	2	Does J1609A-2 on the reader controller PCB generate 5 VDC when the scanner is at PS101?	NO	Check the wiring from the reader controller PCB to PS101; if normal, replace PS101.
Wiring	3	Is there any fault in the wiring from J1605 on the reader control PCB to J303 and J302 on the scanner motor driver PCB?	YES	Connect the wiring correctly.
Scanner motor driver PCB	4	Replace the scanner motor driver PCB. Is the problem corrected?	YES	End.
Scanner motor (PM1)	5	Replace the scanner motor (PM1). Is the problem corrected?	YES	End.
			NO	Replace the reader controller PCB.

18 E203

Cause	Step	Checks	Yes/No	Action
	1	Does the scanner move until ‘E203’ is indicated?	NO	See B.7. “The scanner fails to move forward/in reverse.”
Scanner motor driver PCB/Scanner motor	2	Does the voltage between the connectors J303-B1 (RST) on the scanner motor driver PCB and J303-B4 (GND) and between connectors J303-B2 (MOVE*) and J303-B4 (GND) change from 5 to 0 V?	YES	Replace the scanner motor driver PCB. If the problem cannot be corrected, replace the scanner motor.
Reader controller PCB			NO	Replace the reader controller PCB.

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19 E211/E215

Cause	Step	Checks	Yes/No	Action
	1	Disconnect the connector J1610 of the reader controller PCB, and measure the resistance between the connectors J1610-5 (GND) and J1610-6 (FL_TH) on the harness side. Is it 100 Ω or less or 100 K Ω or more?	NO	The reader controller PCB is faulty. Go to step 4.
			YES	Go to step 2.
Lamp heater	2	Disconnect the connector J2039 of the lamp heater, and measure the resistance between the connectors J2039-2 (GND) and J2039-3 (FL_TH). Is it 100 Ω or less or 100 K Ω or more?	YES	Replace the lamp heater.
Flat cable (between J2037 and J2015) and connectors	3	Are the connector J1610, connectors J2037 and J2015 of the flat cable, and connector J2039 of the lamp heater connected securely?	NO	Connect the connectors securely.
			YES	Replace the flat cable. Or, check each of the connectors.
Reader controller PCB	4	Is the voltage between the connectors J1611-1 (GNDU) and J1611-2 (+38 V) on the harness side of the reader controller PCB 38 V?	NO	See B. 2. “DC power is absent in the reader unit.”
			YES	Replace the reader controller PCB.

20 E216/E219

Cause	Step	Checks	Yes/No	Action
Fluorescent lamp	1	Replace the fluorescent lamp. Is the problem corrected?	YES	End.
Inverter PCB	2	Replace the inverter PCB. Is the problem corrected?	YES	End.
Reader controller PCB			NO	Replace the reader controller PCB.

21 E217

Cause	Step	Checks	Yes/No	Action
Lamp heater	1	Replace the lamp heater. Is the problem corrected?	YES	End.
Reader controller PCB			NO	Replace the reader controller PCB.

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22	E218

Cause	Step	Checks	Yes/No	Action
Scanning lamp	1	Is the scanning lamp mounted properly?	NO	Mount the lamp properly. (See Note.)
	2	Replace the scanning lamp. Is the problem corrected?	YES	Replace the lamp.
Inverter PCB	3	Are the connectors J1002 and J1003 on the inverter PCB and connector J1602 on the reader controller PCB connected securely?	NO	Connect the connectors securely.
			YES	Replace the Inverter PCB.

Note:
- If you have removed and then mounted back the scanning lamp, be sure to execute intensity adjustment in service mode (FUNCTION>MIS-R>USE-LAMP).
- If you have mounted a new scanning lamp, be sure to execute intensity adjustment and CCD adjustment in service mode (FUNCTION>MIS-R>LAMP-ADJ and FUNCTION>CCD>CCD-ADJ, respectively).

23	E240

Cause	Step	Checks	Yes/No	Action
Interface cable	1	Is the interface cable use to connect the reader unit and the printer unit connected securely?	NO	Make the connections secure, and turn on the reader unit.
Video interface PCB, Reader controller PCB		Further, are the reader unit power cord and the printer unit power cord connected securely?	YES	Replace the video interface PCB or the reader controller PCB.
PS/PCL board	2	If the printer unit is equipped with a PS/PCL board,	NO	Replace the PS/PCL board.
DC Controller PCB		Remove the PS/PCL board, and turn on the printer unit/reader unit as one (as a copier). Is E240 indicated?	YES	Replace the DC controller PCB.

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24 E243

Cause	Step	Checks	Yes/No	Action
Connectors	1	Are the connector J901 on the control panel CPU PCB and connector J1608 on the reader controller PCB connected securely?	NO	Connect the connectors securely.
Control panel CPU PCB	2	Replace the control panel CPU PCB. Is the problem corrected?	YES	End.
Reader controller PCB			NO	Replace the reader controller PCB.

25 E351

Cause	Step	Checks	Yes/No	Action
Power supply	1	Are the PCBs and connectors connected securely? (If the power supply is cut abnormally, the copier can indicate 'E351' when it warms up. If such occurs, turn off and then on the copier to reset.)	NO	Make the connections secure, and turn off and then on the copier.
ECO PCB/AP-IP PCB	2	Are the ECO PCB and AP-IP PCB connected securely?	NO	Connect the PCBs securely.
			YES	Replace the parts in the order indicated: • ECO PCB • AP-IP PCB

26 E353

E353 is indicated in response to a mismatch of the serial number of the reader controller PCB and that of the EEPROM while the reader controller PCB is being replaced. See "When Replacing the Reader Controller PCB" on p. 8-4.

27 E355

E355 is indicated in response to a mismatch of the serial number of the reader unit, that of the reader controller PC, and that of the EEPROM while the reader controller PCB is being replaced (as when the wrong serial number is entered). If this code appears, enter the correct serial number of the reader unit using OPTION>USER>SERIAL in service mode.

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28 E401/E402/E403/E404/E411/E712

See the Feeder Service Manual.

29 E545/E546

See the Sorter Service Manual.

30 E677/E678/E679

Cause	Step	Checks	Yes/No	Action
Accessories power	1	Are the power cables of the accessories and the communication cable to the printer unit connected securely?	NO	Turn off and then on the power.
Accessories			YES	Replace the ACC controller PCB.

31 E710/E711

Cause	Step	Checks	Yes/No	Action
Reader unit	1	Turn off and then on the reader unit rear power switch; then, turn on the control panel power soft switch. Is the problem corrected?	YES	End.
Reader controller PCB	2	Replace the reader controller PCB. Is the problem corrected?	YES	End.
Accessories (connected to the reader unit)			NO	Refer to the Service Manual of the accessory in question connected to the reader unit.

32 E717

This error occurs when the reader unit is started after disconnecting the copy data control without canceling the open circuit detection mechanism of the reader unit.

If this error has occurred, execute error clear and set COPIER>OPTION>INTFACE>B-CLR in service mode to '0', and then disconnect the copy data controller.

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33 E805 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors (heat discharge fan 1 drive assembly)	1	Are the connectors J702 and J706 on the developing rotary motor PCB and the connector J220 on the DC controller PCB connected securely?	NO	Connect the connectors.
Connectors (24 V for heat discharge fan 1 drive)	2	Are the connector J701 on the developing rotary motor PCB, connectors J648 and J641 on the main relay PCB, and J102 on the DC power supply connected securely?	NO	Connect the connectors.
Heat discharge fan 1	3	Does the voltage between the connectors J702-3 (FAN1ON) on the developing rotary motor PCB and J702-1 (GND) change to about 24 V?	YES	Replace the heat discharge fan 1.
Developing rotary motor PCB	4	Does the voltage between the connectors J701-1 (+24 VB) and J701-2 (GND) on the developing rotary motor PCB change to about 24 V immediately after the copier is turned on?	YES	Replace the developing rotary motor PCB.
Main relay PCB	5	Does the voltage between the connectors J641-1 (+24 VB) and J641-4 (GND) on the main relay PCB change to 24 V immediately after the copier is turned on?	YES	Replace the main relay PCB.
DC power	6	Is the DC power present?	NO	See B.4 “DC power is absent in the printer unit.”
			YES	Replace the DC controller PCB.

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34 E806 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors	1	Are the connectors J603 and J706 on the developing rotary motor PCB and the connector J220 on the DC controller PCB connected?	NO	Connect the connector.
Connectors (24 V for heat discharge 2 drive)	2	Is the connector J701 on the developing rotary motor PCB, connectors J648 and J641 on the main relay PCB, and connector J102 on the DC power supply connected securely?	NO	Connect them securely.
Heat discharge fan 2	3	Does the voltage between the connector J703-3 (FAN2ON) and J703-1 (GND) on the developing rotary motor PCB change to about 24 V immediately after the copier is turned on?J702-1 (GND) change to about 24 V?	YES	Replace the heat discharge fan 2.
Developing rotary motor PCB	4	Does the voltage between the connector J701-1 (+24 VB) on the developing rotary motor PCB and J701-2 (GND) on the developing rotary motor PCB change to 24 V immediately after the copier is turned on?	YES	Replace the developing rotary motor PCB.
Main relay PCB	5	Does the voltage between the connectors J641-1 (+24 VB) on the main relay PCB and J641-4 (GND) change to 24 V immediately after the copier is turned on?	YES	Replace the main relay PCB.
DC power supply (printer unit)	6	Is DC power present in the printer unit?	NO	See B.4. “DC power is absent in the printer unit.”
			YES	Replace the DC controller PCB.

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35 E807 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors (heat discharge fan 3 drive assembly)	1	Are the connectors J681 and J682 on the pre-exposure LED relay PCB and relay connectors J18 and J17, connectors J645 and J647 on the main relay PCB, and connector J227 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Connectors (24 V for heat discharge fan 3 drive)	2	Are the connectors J641 on the main relay PCB and J102 of the DC power supply connected securely?	NO	Connect them securely.
Heat discharge fan 3	3	Does the voltage between the connectors J645-3 (FAN3ON) on the main relay PCB and J645-1 (GND) change to about 24 V immediately after the copier is turned on?	YES	Replace the heat discharge fan 2.
Main relay PCB	4	Does the voltage between the connectors J641-1 (+24 VB) and J641-4 (GND) change to 24 V immediately after the copier is turned on?	YES	Replace the main relay PCB.
DC power (printer unit)	5	Is DC power present in the printer unit?	NO	See B.4. “DC power absent in the printer unit.”
			YES	Replace the DC controller PCB.

36 E808 (printer unit)

Cause	Step	Checks	Yes/No	Action
Fixing assembly	1	Replace the fixing assembly. Is the problem corrected?	YES	End.
Power supply (printer unit)	2	Replace the power supply on the printer side. Is the problem corrected? (The fixing heater drive circuit or the fixing heater safety circuit is faulty.)	YES	End.
			NO	Replace the DC controller PCB.

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37 E809 (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors (power supply cooling fan drive assembly)	1	Are the relay connector J2031, connectors J7 and J8 on the reader unit main power supply PCB, and connector J1602 on the reader controller PCB connected securely?	NO	Connect the connectors securely.
Power supply cooling fan)	2	Does the voltage between the connectors J7-3 (+24 VB) on the reader unit main power supply PCB and J7-4 (GND) change to 24 V immediately after the copier is turned on?	YES	Replace the power supply cooling fan.
DC power	3	Is DC power present in the reader unit?	NO	See B. 2. “DC power is absent in the reader unit.”
			YES	Replace the reader controller PCB.

38 E810 (printer unit)

Cause	Step	Checks	Yes/No	Action
Drum cartridge	1	Is the drum cartridge set in the copier correctly?	NO	Set the cartridge correctly, and turn off and then on the copier.
Drum cartridge switching lever	2	Check the drum cartridge switching lever on the printer side. Is it displaced or cracked?	YES	Set the lever to the correct position. If it is cracked, replace it.
Drum cartridge switching guide	3	Is the drum cartridge switching guide deformed?	YES	Replace the drum cartridge.
Connector (memory inside the drum cartridge)	4	Are the connector J209 on the DC controller PCB and relay connectors J47 and J48 connected securely?	NO	Connect the connectors securely.
Memory (inside the drum cartridge)	5	Replace the drum cartridge. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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39 E812 (printer unit)

Cause	Step	Checks	Yes/No	Action
Intermediate transfer drum (ITD), Density sensor	1	Is the intermediate transfer drum (ITD) set in the machine properly?	NO	Set the drum properly, and turn off and then on the power.
			YES	See 8. “E020.”

40 E813 (printer unit)

Cause	Step	Checks	Yes/No	Action
Fixing assembly	1	Is the fixing assembly set in the machine properly?	NO	Set the fixing assembly properly, and turn off and then on the power.
Connector (fixing assembly)	2	Is the connector J26 of the fixing assembly connected securely?	NO	Connect the connector properly.
Connector (DC controller PCB)	3	Is the connector J222 on the DC controller PCB connected securely?	NO	Connect the connector.
			YES	Replace the DC controller PCB.

41 E814 (printer unit)

Cause	Step	Checks	Yes/No	Action
Drum cartridge	1	Replace the drum cartridge. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

42 E903

See the Paper Deck Service Manual.

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B. Faults Not Identified by Error Codes

No.	Item	Page	No.	Item	Page
1	AC power is absent in the reader unit.	8-70	14	The multifeeder paper width is wrong.	8-80
2	DC power is absent in the reader unit.	8-71	15	The color toner cartridge is absent.	8-80
3	AC power is absent in the printer unit.	8-72	16	The color toner cartridge is not set properly.	8-81
4	DC power is absent in the printer unit. (+5 V, +24 VB)	8-73	17	The color toner cartridge is empty.	8-81
5	+24 UH is absent.	8-74	18	The black toner cartridge is absent.	8-82
6	+24 VAR is absent.	8-75	19	The black toner cartridge is empty.	8-82
7	The scanner fails to move forward/in reverse.	8-76	20	The waste toner case is full.	8-83
8	The transparency sensor 1/2 is faulty.	8-77	21	The duplexing unit fails to turn on.	8-83
9	The face-down tray full sensor is faulty.	8-77	22	The horizontal registration motor is faulty.	8-83
10	The pick-up paper size is wrong.	8-78	23	The duplexing motor is faulty.	8-84
11	The cassette is absent.	8-78	24	The reversing roller releasing solenoid is faulty.	8-84
12	The cassette is empty.	8-79	25	The duplexing flapper solenoid is faulty.	8-84
13	The multifeeder is empty.	8-79			

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1 AC power is absent in the reader unit.

Cause	Step	Checks	Yes/No	Action
Power plug	1	Is the power plug connected to the power outlet?	NO	Connect the power plug.
Main power source	2	Is the rated AC voltage present at the power outlet?	NO	The problem is not of the copier. Advise the user.
	3	Is the rated voltage present between J1101-1 and J1101-3?	YES	Go to step 7.
Leakage breaker (ELCB1)	4	Is the switch of the leakage breaker in the reader unit at OFF (LOAD) position?	YES	Check the AC power system unit and line; if faulty, replace the part. If normal, shift the switch of the leakage breaker to ON (LINE) side. (See Notes 1 and 2.)
Leakage breaker (ELCB1)	5	Is the resistance between both terminals of the leakage breaker (ELCB1) 0 Ω?	NO	Turn on and off (shifting to LINE and LOAD) the switch of the leakage breaker, and check it for electrical continuity. If not 0 Ω still, replace the leakage breaker. (See Note 2.)
Power cord, Noise filter PCB	6	Replace the power cord or the noise filter PCB. Is the problem corrected?	YES	Replace the problem part.
Reader unit rear power switch (MSW1)	7	Connect the probes to both terminals of the reader unit rear power switch (MSW1). Does the resistance change to ∞ Ω when the switch is turned on?	NO	Replace the reader unit rear power switch (MSW1).
Wiring			YES	Check the AC power line and connectors.

Note:

1: The machine's leakage breaker has two functions, servicing as a circuit breaker and cutting of power in response to leakage. Be sure to make line-to-line and line-to-chassis checks for short circuits even in the absence of a faulty in the leakage breaker.

2: See Figure 8-301.

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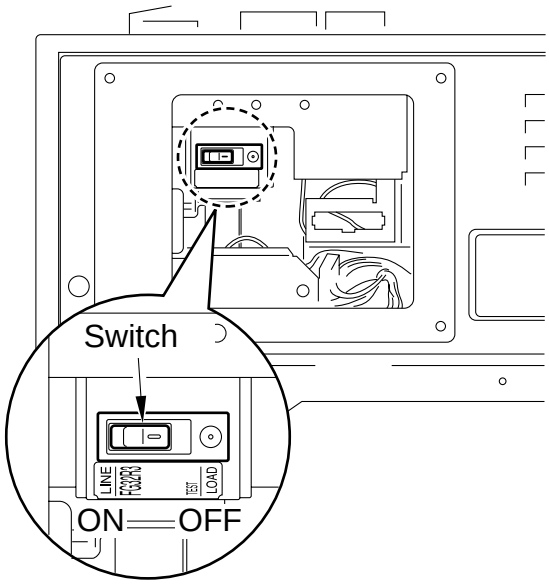

Figure 8-301

2	DC power is absent in the reader unit.

Cause	Step	Checks	Yes/No	Action
AC power	1	Is AC power present between J1-1 and J1-9 on the reader unit main power PCB?	NO	See 1. “AC power is absent in the reader unit.”
Overcurrent/overvoltage (protection circuit activation)	2	Turn off the reader unit rear power supply switch, and disconnect the power plug. After 3 min, connect the power plug to the power outlet, and turn on the reader unit power switch. Does the copier operate normally?	YES	The reader unit main power supply PCB is normal; however, the protection circuit on the PCB is likely to have activated. Remove the cause, and turn on the power once again.
Reader unit main power supply PCB			NO	Replace the reader unit main power supply PCB.

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3 AC power is absent in the printer unit.

Cause	Step	Checks	Yes/No	Action
Reader unit	1	Disconnect the power plug of the printer unit from the connector of the reader unit, and connect it directly to the power outlet. Is the printer unit supplied with AC power?	YES	See 1. "AC power is absent in the reader unit."
Circuit breaker (printer unit)	2	Remove the power supply of the printer unit, and measure the resistance between both terminals of the circuit breaker. Is it 0 Ω?	NO	Press the button of the circuit breaker, and check for electrical continuity once again; if not 0 Ω, replace the circuit breaker. (See Note 1.)
Printer unit power switch (SW1; Note 2)	3	Remove the power supply of the printer unit, and connect the probes to both terminals of the power supply switch. Is the resistance 0 Ω when the printer unit power switch (Note 2) is turn on and ∞ Ω when it is turned off?	NO	Replace the printer unit power switch (SW1).
Power supply (printer unit)			YES	Check the AC power line and connectors for poor contact; if normal, replace the printer unit power supply.

Note:

1: Be sure to wait 60 sec after the circuit breaker has turned on before turning it back on. Be sure to turn on the power switch and check the AC line for a short circuit and the condition of the circuit breaker (continuity, and contact resistance) with a meter before connecting the printer unit power plug to the power outlet.

2: The printer unit power switch (SW1) is blocked by a face cover after turning on the copier at time of installation. Do not touch unless this step must be performed. Be sure to turn it on, and attach the face cover after the work.

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4	DC power is absent in the printer unit. (+5V, +24 VB)

Cause	Step	Checks	Yes/No	Action
AC power (printer unit)	1	Disconnect the power plug from the printer unit, and connect it to the power plug directly. Is AC power present?	NO	See 3. “AC power is absent in the printer unit.”
Overcurrent/overvoltage (protection circuit activation)	2	Turn off the printer unit power switch (Note 1), and disconnect the reader unit power plug. In about 2 min, connect the reader unit power plug, and turn on the printer unit power switch. Is the operation normal?	YES	The reader unit main power supply PCB is normal; however, the protective circuit on the PCB has activated. Remove the cause of activation, and turn on the power once again.
Power supply fuse (printer unit)			NO	Replace the power supply fuse of the printer unit.
Power supply (printer unit)	3	Turn off the printer unit power switch (Note 1), and disconnect the connector J204 from the DC controller PCB. Connect the printer unit power plug to the power outlet directly, and turn on the printer unit power switch. Is DC power (+5 V) present at the connector J204-1? (See Note 1.)	NO	Replace the printer unit power supply.
Wiring/DC load, DC controller PCB			YES	Check the wiring from the DC controller PCB; if normal, replace the DC controller PCB.

Note:

The printer unit power switch (SW1) is blocked by a face cover after turning on the machine at time of installation. Do not touch unless this step must be performed. Be sure to turn it on, and attach the face cover after the work.

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5 +24 UH is absent. (printer unit)

Cause	Step	Checks	Yes/No	Action
DC power (printer unit)	1	Disconnect the printer unit power plug from the reader unit connector, and connect it to the power plug directly. Is DC power present in the printer unit?	NO	4. "DC power is absent in the printer unit."
Connectors	2	Are the connectors J641 through J643 and J6476 of the main relay PCB, connectors J671 and J673 on the sub relay PCB, connector J102 of the power supply, and connector J227 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Right cover switch (main relay PCB)	3	Is there electrical continuity between the connectors J641-1 (+24 VB) and J642-3 (PMP) on the main relay PCB when the right cover switch (SW641) is turned on?	NO	Replace the right cover switch on the main relay PCB.
Delivery cover/front cover switch (sub relay PCB)	4	Is there electrical continuity between the connectors J671-1 (PMP) and J671-2 (PFUFR) on the sub relay PCB when the delivery cover/front cover switch (SW761) is turned on?	NO	Replace the delivery cover/front cover switch on the sub relay PCB.
Power supply (printer unit)	5	Disconnect the printer unit power plug from the reader unit, and connect it to the power outlet directly. Turn on the printer unit power switch (Note 1), and measure the voltage between the connectors J641 (+24 VB) on the main relay PCB and J641-4 (GND). Is it 24 V?	NO	Replace the printer unit power supply.
Main relay PCB	6	Disconnect the printer unit power plug from the reader unit, and connect it to the power outlet directly. Turn on the printer unit power switch (Note 1), and measure the voltage between the connectors J647-B11 (+24 UH) on the main relay PCB and J647-A1 (GND). Is it 24 V?	NO	Replace the main relay PCB.
			YES	Replace the DC controller PCB.

Note:

The printer unit power switch (SW1) is blocked by a face cover after turning on the copier at time of installation. Do not detach the cover unless this step must be performed. Be sure to turn it on, and attach the face cover after the work.

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6	+24 VAR is absent. (printer unit)

Cause	Step	Checks	Yes/No	Action
DC power supply (printer unit)	1	Disconnect the power plug from the printer unit, and connect it to the power outlet directly. Is DC power present in the printer unit?	NO	See 4. “DC power is absent in the printer unit.”
Connectors	2	Are the connector J701 on the developing rotary motor PCB, connectors J641, J642, J644, and J648 on the main relay PCB, connector J672 on the sub relay PCB, and connector J102 of the power supply connected securely?	NO	Connect the connectors securely.
Right cover switch (main relay PCB)	3	Is there electrical continuity between the connectors J641-1 (+24 VB) and J642-3 (PMP) on the main relay PCB when the black toner cartridge switch (SW644) is turned on?	NO	Replace the right cover switch on the main relay PCB.
Black toner cartridge switch	4	Is there electrical continuity between the connectors J644-1 (PBK) and J644-2 (PMP) on the main relay PCB when the black toner cartridge detecting switch (SW644) is turned on?	NO	Replace the black toner cartridge (SW644).
Toner cartridge cover switch (SW6772)	5	Is there electrical continuity between the connectors J642-1 (PYMC) and J642-2 (PBK) on the sub relay PCB when the toner cartridge cover switch (SW762) is turned on?	NO	Replace the toner cartridge cover switch (SW672) on the sub relay PCB.
Drum cartridge switch (SW642)	6	Is there electrical continuity between the connectors J642-1 (PYMC) and J648-1 (+24 VAR) on the main relay PCB when the drum cartridge switch (SW642) is turned on?	NO	Replace the drum cartridge switch (SW642) on the main relay PCB.
Main relay PCB	7	Disconnect the printer unit power plug from the reader unit, and connect it to the power outlet directly. Is the voltage between the connectors J648-1 (+24 VAR) and J648-3 (GND) on the main relay PCB 24 V when the printer unit power switch (Note 1) is turned on?	NO	Replace the main relay PCB.
			YES	Replace the DC controller PCB.

Note:

The printer unit power switch (SW1) is blocked by a face cover after turning on the copier at time of installation. Do not detach the cover unless this step must be performed. Be sure to turn it on, and attach the face cover after the work.

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7 The scanner motor fails to move forward/in reverse.

Cause	Step	Checks	Yes/No	Action
Cable	1	Is the drive cable routed correctly?	NO	Route the cable correctly.
Rail	2	Is the rail free of dirt? Doe it move smoothly when moved by hand?	NO	Check the surface of the rail for dirt and foreign matter or an obstacle; clean, lubricate, or correct as necessary. If the rail is soiled, clean it with alcohol, and apply a small amount of lubricant.
Scanner home position sensor (PS101)	3	If the scanner home position sensor (PS101) normal? See the instructions on how to check the photointerrupers.	NO	Check the wiring and light-blocking plate; if normal, replace the sensor.
Connectors, Wiring	4	Are the connector J301 on the scanner motor driver PCB and connectors J3, J5, and J6 on the reader unit main power supply PCB connected securely?	NO	Connect the connectors securely.
Reader unit DC power supply	5	Measure the voltage between the following terminals of the scanner motor driver PCB. Is it as indicated? • J301-9 and -8: about +5.2 V • J301-7 and -6: about +15 V • J301-5 and -6: bout -12 V • J301-4 and -2: about +38 V • J301-3 and -1: bout 38 V	NO	See 30. “DC power supply is absent in the reader unit.”
Scanner motor driver PCB	6	Replace the scanner motor driver PCB. Is the problem corrected?	YES	End.
Scanner motor (PM1)			NO	Replace the scanner motor.

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8 The transparency sensor 1/2 is faulty.

Cause	Step	Checks	Yes/No	Action
Transparency sensor 1/2 (PS1801/ PS1802)	1	Is the detecting window of the transparency sensor 1/2 (PS1801/PS1802) soiled?	YES	Clean the detecting window.
+5 V supply line	2	Are the connectors J1801 and J1802 of the transparency sensor 1/2, connector J214 on the DC controller PCB, and relay connector J17 connected securely?	NO	Connect the connectors securely.
Transparency sensor 1/2 (PS1801/ PS1802)	3	Replace the transparency sensor 1/2 (PS1801/PS1802). Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

9 The face-down tray full sensor is faulty.

Cause	Step	Checks	Yes/No	Action
Lever (face-down tray full sensor PS10)	1	Is the lever of the face-down tray full sensor (PS10) damaged/deformed? Is the lever displaced?	YES	Replace or reposition the lever.
Face-down tray full sensor (PS10)	2	Replace the face-down tray full sensor (PS10). Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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10 The pick-up paper size is wrong. (printer unit)

Cause	Step	Checks	Yes/No	Action
Size detecting switch lever (cassette 1/2)	1	Is the size detecting switch lever of the cassette 1/2 deformed/damaged? Or, is the spring of the switch lever displaced?	YES	Replace the size detecting lever of the cassette 1/2, or position it correctly.
Contact (size detection PCB of the cassette 1/2)	2	Is the switch contact of the size detection PCB of the cassette 1/2 deformed/damaged?	YES	Replace the switch contact of the size detection PCB of the cassette 1/2.
+5 V supply line	3	Are the connectors J1601 on the cassette 1/2 size detection PCB and the connector J218 on the DC controller PCB connected securely?	NO	Connect the connectors.
Cassette 1/2 size detection PCB	4	Replace the cassette 1/2 size detection PCB. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

11 The cassette is absent. (printer unit)

Cause	Step	Checks	Yes/No	Action
Cassette 1/2 sensor lever	1	Is the cassette 1/2 sensor lever damaged/deformed? Is the spring displaced?	YES	Replace the cassette 1/2 sensor lever, or position the spring correctly.
+5V supply line	2	Are the connectors J1201 on the pick-up PCB and the connector J210 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Cassette 1/2 sensor	3	Replace the cassette 1/2 sensor. Is the problem corrected?	YES	Replace the sensor.
Pick-up PCB, DC controller PCB	4	Replace the pick-up PCB. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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12 The cassette is empty.

Cause	Step	Checks	Yes/No	Action
Cassette 1/2 lifter (paper level sensor lever)	1	Is the cassette 1/2 lifter (paper level sensor lever) damaged/deformed? Is the lifter spring displaced?	YES	Replace the cassette 1/2 lifter (paper lever sensor lever). Position the spring correctly.
+5 V supply line	2	Are the connectors J1201 on the pick-up PCB and the connectors J210 on the DC controller PCB connected securely?	NO	Connect the connectors.
Cassette 1/2 paper level sensor	3	Replace the cassette 1/2 paper level sensor. Is the problem corrected?	YES	Replace the sensor.
Pick-up PCB, DC controller PCB	4	Replace the pick-up PCB. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

13 The multifeeder is empty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Multifeeder tray paper sensor lever	1	Is the multifeeder tray paper sensor lever or the spring damaged/deformed? Is the lever or the spring displaced?	YES	Replace the multifeeder tray power sensor lever or the spring. Position them correctly.
+5V supply line	2	Are the connector J1301 on the multifeeder tray PCB and connector J213 on the DC controller PCB connected securely?	NO	Connect the connectors securely.
Multifeeder tray power sensor	3	Replace the multifeeder tray power sensor. Is the problem corrected?	YES	Replace the sensor.
Multifeeder tray PCB, DC controller PCB	4	Replace the multifeeder tray PCB. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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14 The multifeeder paper width size is wrong.

Cause	Step	Checks	Yes/No	Action
Connectors	1	Are the connectors on the DC controller PCB, relay connector J33, and connector J34 of the multifeeder paper width sensor connected securely?	NO	Connect the connectors securely.
Paper width detecting mechanism	2	Is there a faulty part inside the multifeeder tray?	NO	Replace the problem part.
Multifeeder paper width sensor	3	Replace the multifeeder paper width sensor. Is the problem corrected?	YES	Replace the sensor.
DC controller PCB			NO	Replace the DC controller PCB.

15 The color toner cartridge is absent. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector	1	Are the connector J221 on the DC controller PCB, connector J621 of the color toner level sensor, and relay connector J70 connected securely?	NO	Connect the connectors securely.
Color toner sensor, DC controller PCB	2	Replace the color toner sensor. Is the problem corrected?	YES	End.
			NO	Replace the DC controller PCB.

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16 The color toner cartridge is not set properly. (printer unit)

Cause	Step	Checks	Yes/No	Action
Cartridge locking lever (printer unit)	1	Is the cartridge locking lever of the printer unit displaced or cracked?	YES	If the lever is displaced, position it correctly. If it is cracked, replace it.
Connectors	2	Are the connector J1902 of the cartridge locking lever sensor, connector J207 on the DC controller PCB, and connectors J675 and J676 on the sub relay PCB connected securely?	NO	Connect the connectors securely.
Cartridge locking lever sensor	3	Replace the cartridge locking lever sensor. Is the problem corrected?	YES	Replace the sensor.
DC controller PCB			NO	Replace the DC controller PCB.

17 The color toner cartridge is empty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connectors	1	Are the connector J621 of the color toner level sensor, connector J227 on the DC controller PCB, connectors J643 an J647 on the main relay PCB, and connectors J673 and J675 on the sub relay PCB connected securely?	YES	Connect the connectors.
Color toner level sensor	2	Replace the color toner level sensor. Is the problem corrected?	YES	Replace the sensor.
DC controller PCB			NO	Replace the DC controller PCB.

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18 The black toner cartridge is absent. (printer unit)

Cause	Step	Checks	Yes/No	Action
Black toner cartridge	1	Is the black toner cartridge set in the machine properly?	NO	Set the cartridge properly, and turn off and on the power.
Black toner cartridge switch lever (printer unit)	2	Is the black toner cartridge switch lever of the printer unit damaged/deformed? Is the lever displaced?	YES	Replace the lever, or position it correctly.
Boss (black toner cartridge)	3	Is the boss of the black toner cartridge deformed/damaged?	YES	Replace the black toner cartridge.
Connector (black toner cartridge detection)	4	Are the connector J227 on the DC controller PCB and connector J647 on the main relay PCB connected securely?	NO	Connect the connectors.
Black toner cartridge switch (SW644)	5	Is there electrical continuity between connectors J644-1 (PBK) and J644-2 (PMP) on the main relay PCB when the black toner cartridge switch (SW644) is turned on?	NO	Replace the black toner cartridge switch (SW644).
			YES	Replace the DC controller PCB.

19 The black toner cartridge is empty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (black toner level detection signal)	1	Are the connector J226 on the DC control PCB and connector J5001 on the high-voltage PCB 1 connected securely?	YES	Connect the connectors securely, and turn off and then on the power.
Contact (black toner cartridge for toner level detection), Contact (printer side toner level detection)	2	Are the contact of the black toner cartridge (for toner level detection) and the contact of the printer side toner level detection deformed/damaged?	YES	Replace the problem part. (If the problem part is on the black toner cartridge side, replace the black toner cartridge.)
			NO	Replace the DC controller PCB.

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20 The waste toner case is full. (printer unit)

Cause	Step	Checks	Yes/No	Action
Drum cartridge	1	Replace the drum cartridge? Is the problem corrected? (The rotating mechanism of the stirring plate inside the drum cartridge may be faulty.)	YES	Replace it.
Drum drive assembly	2	Is any part of the drum drive assembly of the printer unit faulty?	YES	Replace the problem part.

21 The duplexing unit fails to turn on.

Cause	Step	Checks	Yes/No	Action
Duplexing unit	1	Is the duplexing unit set properly in the printer unit?	NO	Set it properly.
Connector (24V supply line)	2	Is the connector J2001 on the duplexing driver PCB connected securely?	NO	Connect the connector securely.
Duplexing driver PCB			YES	Replace the duplexing driver PCB.

22 The horizontal registration motor is faulty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (horizontal registration motor drive signal line)	1	Is the connector J2005 on the duplexing driver PCB connected securely?	NO	Connect the connector securely.
Horizontal registration motor (M7)	2	Replace the horizontal registration motor. Is the problem corrected?	YES	Replace it.
Duplexing driver PCB			NO	Replace the duplexing driver PCB.

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23 The duplexing motor is faulty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (duplexing motor drive signal line)	1	Is the connector J2004 on the duplexing driver PCB connected securely?	NO	Connect it securely.
Duplexing motor (M8)	2	Replace the duplexing motor. Is the problem corrected?	YES	Replace the motor.
Duplexing driver PCB			NO	Replace the duplexing driver PCB.

24 The reversal roller releasing solenoid is faulty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (reversing roller releasing solenoid drive signal line)	1	Is the connector J2009 on the duplexing driver PCB connected securely?	NO	Connect the connector securely.
Reversing roller releasing solenoid (SL7)	2	Disconnect the connector J2009 of the reversing roller releasing solenoid, and measure the resistance between the connectors J2009-1 and J2009-2 on the harness side. Is it about 50 Ω?	NO	Replace the reversing roller releasing solenoid.
Duplexing driver PCB			YES	Replace the duplexing driver PCB.

25 The duplexing flapper solenoid is faulty. (printer unit)

Cause	Step	Checks	Yes/No	Action
Connector (duplexing flapper solenoid drive signal line)	1	Is the connector J2002 on the duplexing driver PCB connected securely?	NO	Connect the connector securely.
Duplexing flapper solenoid (SL6)	2	Disconnect the connector J2002 of the duplexing flapper solenoid, and measure the resistance between the connectors J2002-1 and J2002-2 on the harness side. Is it about 130 Ω?	NO	Replace the duplexing flapper solenoid.
Duplexing driver PCB			YES	Replace the duplexing driver PCB.

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IV. TROUBLESHOOTING FEEDING PROBLEMS

A. Paper Jams

Inside the copier, jams tend to be limited to the following locations:
① Multifeeder pick-up assembly
② Cassette pick-up assembly
③ Transfer/fixing assembly
④ Delivery assembly
⑤ Duplexing unit

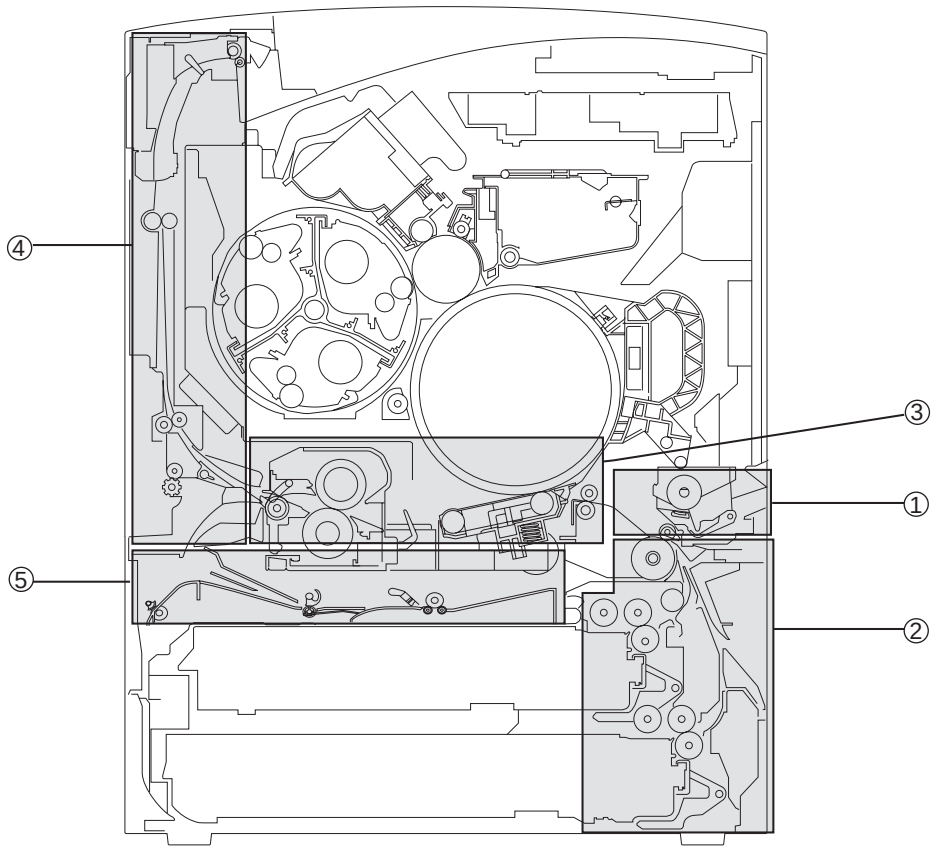

Figure 8-401

The troubleshooting procedures that follow are arranged according to location of jams. To find out the location of a specific jam and its type (most recent 50 jams), select DISPLAY>JAM in service mode (for details of location and type, see p. 8-115.)

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1 Multifeeder Pick-Up Assembly

Cause	Step	Checks	Yes/No	Action
Multifeeder pick-up roller	1	Is the multifeeder pick-up roller soiled, worn, or deformed?	YES	Clean or replace the roller.
Drive gear	2	Remove the multifeeder pick-up assembly, and check the drive gears. Is there any damaged part?	YES	Replace the damaged part.
Multifeeder pick-up clutch (CL3)	3	Disconnect the connector J1303 of the multifeeder pick-up clutch from the multifeeder tray PCB, and measure the resistance between the connectors J1303-1 (MPTCLD*) and J1303-2 (+24 UH) on the harness side. Is it about 160 Ω?	NO	Replace the multifeeder pick-up clutch.
Multifeeder tray paper sensor (PS1301)	4	Is the multifeeder tray paper sensor lever or spring damaged/deformed? Are they positioned correctly?	NO	Replace the multifeeder tray sensor lever and the lever. Position them correctly.
Multifeeder paper sensor (PS1301)	5	Replace the multifeeder tray paper sensor. Is the problem corrected?	YES	Replace the sensor.
Holding plate position sensor (PS1302)	6	Is the holding plate position sensor lever or spring damaged/deformed? Are they positioned correctly?	NO	Replace the holding plate position sensor lever or spring. Position them correctly.
Holding plate position sensor (PS1302)	7	Replace the holding position sensor. Is the problem corrected?	YES	Replace the sensor.
Connectors (holding plate solenoid SL4 drive; 24 V supply line)	8	Are the connector J213 on the DC controller PCB, connectors J641 through J643 and J647 on the main relay PCB, connectors J671 and J673 on the sub relay PCB, connector J1302 of the holding plate solenoid, and connector J102 of the power supply connected securely?	NO	Connect them securely.
Holding plate solenoid (SL4)	9	Disconnect the connector J1302 of the holding plate solenoid from the multifeeder tray PCB, and measure the resistance between the connectors J1302-1 (MPTSLD*) and J1302-2 (+24 UH) on the harness side. Is it about 160 Ω?	NO	Replace the holding plate solenoid.
Multifeeder PCB	10	Replace the multifeeder tray PCB. Is the problem corrected?	YES	Replace the PCB.
DC controller PCB			NO	Replace the DC controller PCB.

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2 Cassette Pick-Up Assembly

Cause	Step	Checks	Yes/No	Action
Cassette pick-up roller, feeding roller 1	1	Is the cassette pick-up roller or the feeding roller 1 worn/deformed?	YES	Replace the parts. Be sure to replace both separation roller and feeding roller 1 at the same time.
Drive gear	2	Remove the pick-up assembly, and check the drive gears and springs. Is there any damaged/worn part? Is any spring displaced?	YES	Replace the damaged/worn part. Position the spring correctly.
Paper detecting mechanism (in the pick-up assembly)	3	Is the lever or the spring of the pick-up assembly paper sensor (PS17) damaged/deformed? Is any spring displaced?	YES	Replace the damaged/worn part. Position the spring correctly.
Pick-up paper sensor (PS17)	4	Replace the pick-up paper sensor. Is the problem corrected?	YES	Replace the sensor.
Connector (pick-up motor (M5) drive)	5	Are the connectors J210 on the DC controller PCB and connectors J1201 and J1202 on the pick-up PCB connected securely?	NO	Connect the connectors securely.
Pick-up motor (M5)	6	Replace the pick-up motor. Is the problem corrected?	YES	Replace the motor.
Feeding roller 2	7	Is the feeding roller 2 worn, deformed, or soiled?	YES	If worn or deformed, replace the roller. If soiled, clean it.
Connector (feeding clutch CL2 drive supply line)	8	Is the connector J1204 of the feeding clutch connected securely?	NO	Connect the connector.
Feeding clutch (CL2)	9	Disconnect the connector J1204 of the feeding clutch, and measure the resistance between the connectors J1204-2 (+24 UH) and J1204-1 (FEDCLD*) on the harness side. Is it about 210 Ω?	NO	Replace the feeding clutch.
Pick-up PCB	10	Replace the pick-up PCB. Is the problem corrected?	YES	Replace the pick-up PCB.
DC controller PCB			NO	Replace the DC controller PCB.

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3 Transfer/Fixing Assembly

a. After executing test copying in service mode, a jam occurs without the leading edge of copy paper reaching the secondary transfer belt assembly.

Cause	Step	Checks	Yes/No	Action
Registration roller	1	Is the registration roller worn, deformed, or soiled?	YES	If damaged or worn, replace it. If soiled, clean it.
Connector (registration clutch CL1 drive 24 V supply line)	2	Are the connectors J212 on the DC controller PCB and the connector J37 on the relay PCB connected securely?	NO	Connect the connector.
Registration clutch (CL1)	3	Disconnect the connector J37 of the registration clutch, and measure the resistance between the connectors J37-1 (+24 UH) and J37-2 (REG-CLD*) on the harness side. Is it about 210 Ω?	NO	Replace the registration clutch.
Registration paper sensor PS1 (detection mechanism)	4	Is the registration paper sensor (PS1) lever damaged or worn? Is there any displaced spring?	YES	Replace the damaged or worn part. Position the spring correctly.
Registration paper sensor (PS1)	5	Replace the registration paper sensor. Is the problem corrected?	YES	Replace the sensor.
DC controller PCB			NO	Replace the DC controller PCB.

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b. After executing test print in service mode, the leading edge of copy paper reaches the secondary transfer belt assembly. Or, the copy paper is wrapping around the intermediate transfer drum.

Cause	Step	Checks	Yes/No	Action
Secondary transfer belt locking/unlocking drive gear	1	Is the drive gear used to transmit locking/unlocking drive of the secondary transfer belt worn or cracked?	YES	Replace the worn or cracked part.
Secondary transfer belt locking/unlocking drive cam	2	Is the drive cam used to transmit locking/unlocking drive of the secondary transfer belt worn or cracked?	YES	Replace the worn or cracked part.
Connector (secondary transfer belt locking/unlocking clutch CL4)	3	Are the connectors J212 on the DC controller PCB and the relay connector J36 connected securely?	NO	Connect the connector.
Secondary transfer belt locking/unlocking clutch (CL4)	4	Disconnect the connector J212 of the secondary transfer locking/unlocking clutch, and measure the resistance between the connectors J212-1 (STRCLD*) and J212-2 (+24 UH) on the harness side. Is it about 130 Ω?	NO	Replace the secondary transfer belt locking/unlocking clutch.
Connector (drum motor M2)	5	Is the connector J224 on the DC controller PCB connected securely?	NO	Connect the connector securely.
Drum motor (M2)	6	Replace the drum motor (M2). Is the problem corrected?	YES	End.
DC controller PCB			NO	Replace the DC controller PCB?

Caution:

If the cause of the jam is the drum motor, the intermediate transfer drum can lock during initial rotation and trigger abnormal noise.

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c. After executing test printing in service mode, the leading edge of copy paper jams at a location after the secondary transfer belt.

Cause	Step	Checks	Yes/No	Action
	1	Does the leading edge of copy paper reach the fixing roller?	NO	Go to step 2.
			YES	Go to step 4.
Separation sensor (PS5)	2	Is the separation sensor lever or spring damaged or deformed? Is the spring of the sensor lever displaced?	YES	If damaged or deformed, replace the lever or the spring. Position the spring correctly.
Separation sensor (PS5)	3	Replace the separation sensor. Is the problem corrected?	YES	Replace the sensor.
Fixing roller drive gear	4	Is the fixing roller drive gear worn or cracked?	YES	Replace the worn or cracked drive gear.
Fixing assembly inlet guide, Fixing/separation upper guide, Fixing/separation lower guide	5	Is the fixing assembly inlet guide, fixing/separation upper guide, or fixing/separation lower guide soiled, scratched, or coated with toner?	YES	Clean the parts as necessary.
Upper fixing roller, Lower fixing roller	6	Is the upper fixing roller or the lower fixing roller soiled or coated with toner?	YES	Clean the upper fixing roller or the lower fixing roller.
Upper fixing roller, Lower fixing roller	7	Is the upper fixing roller or the lower fixing roller deformed or damaged?	YES	Replace the rollers as necessary.
Fixing/delivery sensor (PS1903) lever	8	Is the fixing/delivery sensor damaged or worn? Is the spring of the sensor lever displaced?	YES	Replace the damaged or worn lever. Position the spring correctly.
Fixing/delivery sensor (PS1903)	9	Replace the fixing/delivery sensor. Is the problem corrected?	YES	Replace the sensor.
Fixing delivery roller			NO	If the fixing /delivery roller is worn, replace it.

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4 Delivery Assembly

Cause	Step	Checks	Yes/No	Action
Face-up flapper	1	Is the face-up flapper soiled, scratched, or coated with toner?	YES	Clean the flapper
Face-up/face-down delivery roller	2	Is the face-up/face-down delivery roller worn?	YES	Replace the worn roller.
	3	Does the face-up/face-down delivery roller rotate smoothly?	NO	Check the gear for wear and deformation. Position the sensor lever correctly.
Face-down tray delivery paper sensor (PS11)	4	Is the face-down tray delivery paper sensor lever damaged or deformed? Is the sensor level displaced?	YES	Replace the damaged or deformed lever. Position the sensor lever correctly.
5-V line (face-down tray delivery paper sensor PS11)	5	Are the connectors J220 on the DC controller PCB, connector J10 of the face-down tray delivery paper sensor, relay connector J12, and connectors J705 and J706 on the developing rotary CB connected securely?	NO	Connect the connectors securely.
Face-down tray delivery paper sensor (PS11)	6	Replace the face-down tray delivery sensor. Is the problem corrected?	YES	Replace the sensor.
Face-down tray full paper sensor (PS10)	7	Is the face-down tray full paper sensor lever damaged or deformed? Is the sensor lever displaced?	YES	Replace the damaged or deformed lever. Position the sensor lever correctly.
Face-down tray full paper sensor (PS10)	8	Replace the face-down tray full paper sensor. Is the problem corrected?	YES	Replace the sensor.
Duplexing flapper	9	Does the duplexing flapper move smoothly? Is it damaged?	NO	Position the flapper correctly. If damaged, replace it.
DC controller PCB			YES	Replace the DC controller PCB.

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5 Duplexing Unit

Cause	Step	Checks	Yes/No	Action
Rollers (duplexing unit)	1	Are the rollers inside the duplexing unit coated with paper lint or dust?	YES	Remove the paper lint and dust.
Feeding guide	2	Are there foreign mater or burrs on the feeding guide?	YES	Remove any foreign matter. If burrs are found, replace the feeding guide.
Reversing roller, Duplexing feeding roller	3	Is the reversing roller or the duplexing feeding roller worn or deformed?	YES	If worn or deformed, replace the roller.
Drive gear	4	Is the drive gear worn or cracked?	YES	Replace the worn or cracked gear.
Sensor lever	5	Is any sensor lever damaged or deformed?	YES	Position the sensor lever correctly so that it moves smoothly. If damaged or deformed, replace it.
			NO	Replace the duplexing unit.

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B. Faulty Feeding

1 Double Feeding

Cause	Step	Checks	Yes/No	Action
	1	Does the problem occur when the source is a cassette?	YES	Go to step 2.
			NO	If the source is the multifeeder, go to step 5.
Separation roller	2	Is the separation roller worn or deformed?	YES	Replace the separation roller.
Spring	3	Is the spring used to pull the separation roller normal?	NO	Replace the spring.
Separation roller	4	Is the torque limiter of the separation roller normal?	NO	Replace the torque limiter.
Multifeeder separation pad	5	Is the surface of the multifeeder separation pad worn?	YES	Replace the multifeeder separation pad.
Spring	6	Is the spring used to push up the multifeeder separation pad normal?	NO	Replace the spring.

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2 Wrinkles/Bending (leading edge)

Cause	Step	Checks	Yes/No	Action
	1	Execute test printing in service mode; then, open the front cover before the copy paper enters the fixing assembly. At this time, is the copy paper wrinkled or its leading edge bent?	NO	Go to step 2.
			YES	Go to step 8.
Fixing assembly inlet guide	2	Is the fixing assembly inlet guide soiled?	YES	Clean the fixing assembly inlet guide.
Lower fixing roller	3	Is the lower fixing roller soiled?	YES	Replace the lower fixing roller.
	4	Is the lower fixing roller scratched/deformed?	NO	Replace the lower fixing roller.
Upper fixing roller	5	Is the upper fixing roller soiled?	YES	Clean the upper fixing roller.
	6	Is the upper fixing roller scratched/deformed?	NO	Replace the upper fixing roller.
Face-down delivery roller, Face-up delivery roller	7	Is the face-down delivery roller or the face-up delivery roller coated with foreign matter or dirt?	YES	Clean the problem delivery roller.
Paper guide, Secondary transfer belt, Feeding roller, Registration roller	8	Is the paper guide, secondary transfer belt, feeding roller, or registration roller coated with foreign matter or dirt?	YES	Check the paper path, and clean the problem part.

3 Skew

Cause	Step	Checks	Yes/No	Action
Feeding roller, Registration roller, Separation guide	1	Is the feeding roller, registration roller, or separation guide coated with paper lint or dust?	YES	Clean the problem part.
Registration roller	2	Is the spring of the registration roller deformed? Is the spring displaced?	YES	If the spring is deformed, replace it. If it is displaced, position it correctly.

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4 Wrinkles (duplexing mode)

Cause	Step	Checks	Yes/No	Action
Feeding roller assembly, Horizontal registration guide	1	Is the feeding roller assembly or the horizontal registration guide coated with paper lint or dust?	YES	Clean the problem part.
Roller (inside the duplexing unit)	2	Is any of the rollers inside the duplexing unit worn or deformed?	YES	Replace any worn or deformed roller.
Paper guide	3	Check the paper feeding path. Is the paper guide scratched or deformed?	YES	Replace the scratched or deformed guide.

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V. ARRANGEMENT AND FUNCTIONS OF THE ELECTRICAL PARTS

A. Sensors

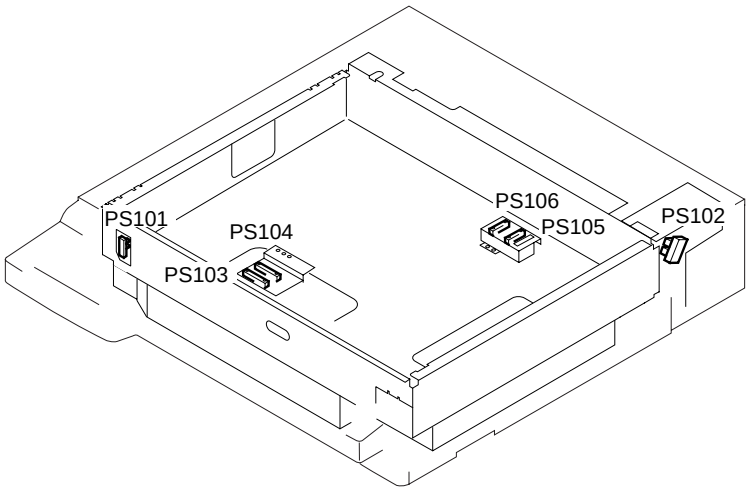

Figure 8-501

Symbol	Name	Notation	Description
	Photo-interrupter Photosensor	PS101	Scanner home position sensor
		PS102	Copyboard cover open/closed sensor
		PS103	Original size sensor 1
		PS104	Original size sensor 2
		PS105	Original size sensor 3
		PS106	Original size sensor 4

Table 8-501

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B. Thermistors, Lamp, and Heaters

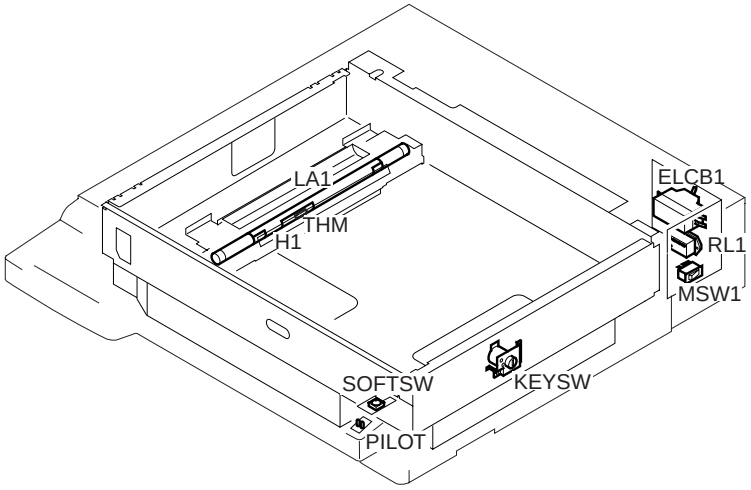

Figure 8-502

Symbol	Name	Notation	Description
	Thermistor	THM	Scanning lamp thermistor
	Lamp	LA1	Scanning lamp
	Heater	H1	Scanning lamp heater
	Relay	RL1	Power cut relay
	Leakage breaker	ELCB1	Leakage breaker
		MSW1	Reader unit rear power switch
		KEYSW	Key switch

Table 8-502

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C. Fans, Motors, and Heaters

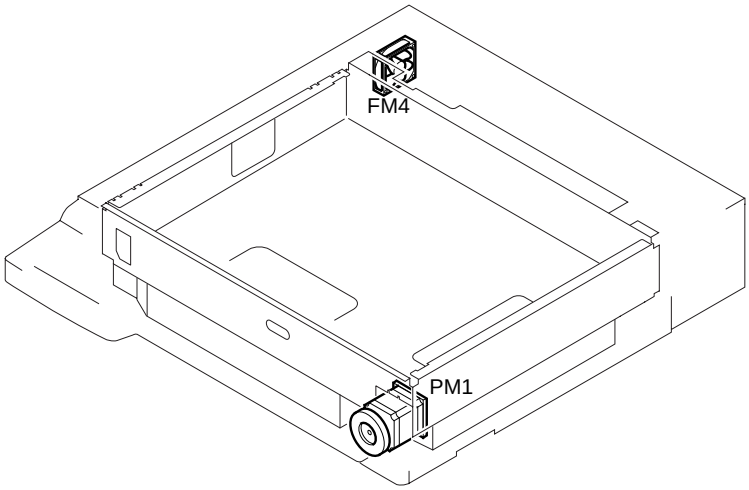

Figure 8-503

Symbol	Name	Notation	Description
	Fan	FM4	Power supply cooling fan
	Motor	PM1	Scanner motor

Table 8-503

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D. PCBs

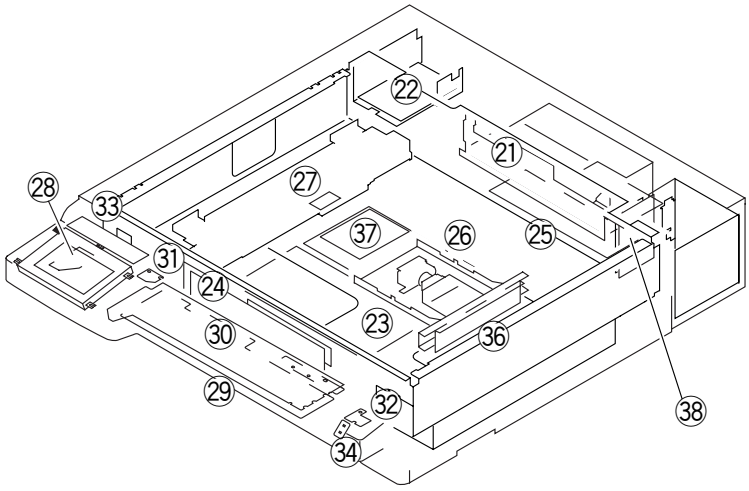

Figure 8-504

Ref.	Name	Description
㉑	Reader unit main power supply PCB	Supplies power to the reader unit.
㉒	Accessories power supply PCB	Supplies power to the accessories.
㉓	Reader controller PCB	Controls the reader unit operation sequence.
㉔	Scanner motor driver PCB	Controls the scanner motor drive.
㉕	Inverter PCB	Dives the scanning lamp.
㉖	AP-IP PCB	Controls analog/digital image processing.
㉗	Intensity detection PCB	Checks the intensity of the scanning lamp.
㉘	Control panel inverter PCB	Controls display indications.
㉙	Control panel CPU PCB	Controls the control panel operation sequence.
㉚	Keypad PCB	Controls the keypad.
㉛	LCD contrast adjustment PCB	Controls the screen contrast.
㉜	Control panel soft switch PCB	Controls the control panel soft switch.
㉝	Functions key PCB	Controls the functions key.
㉞	Control panel pilot lamp PCB	Controls the pilot lamp.
㊱	CCD/CCD driver PCB	Drives the CCD.
㊲	ECO PCB	Controls digital image processing.
㊳	Noise filter PCB	Removes noise from the power line.

Table 8-505

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E. Variable Resistors (VR), Light-Emitting Diodes (LED), and Check Pins by PCB

Of the variable resistors (VR), light-emitting diodes (LED), and check pins used in the copier, those that are used in the field are discussed.

Caution:

Do not touch VRs and check pins that are not discussed herein. They are for factory use and require special tools and highly accurate adjustment.

Note:

1. Some LEDs emit dim light even when off. This is a normal condition, and must be kept in mind.
2. VRs that may be used in the field… 
   VRs that must not be used in the field … 

1. Reader Controller PCB

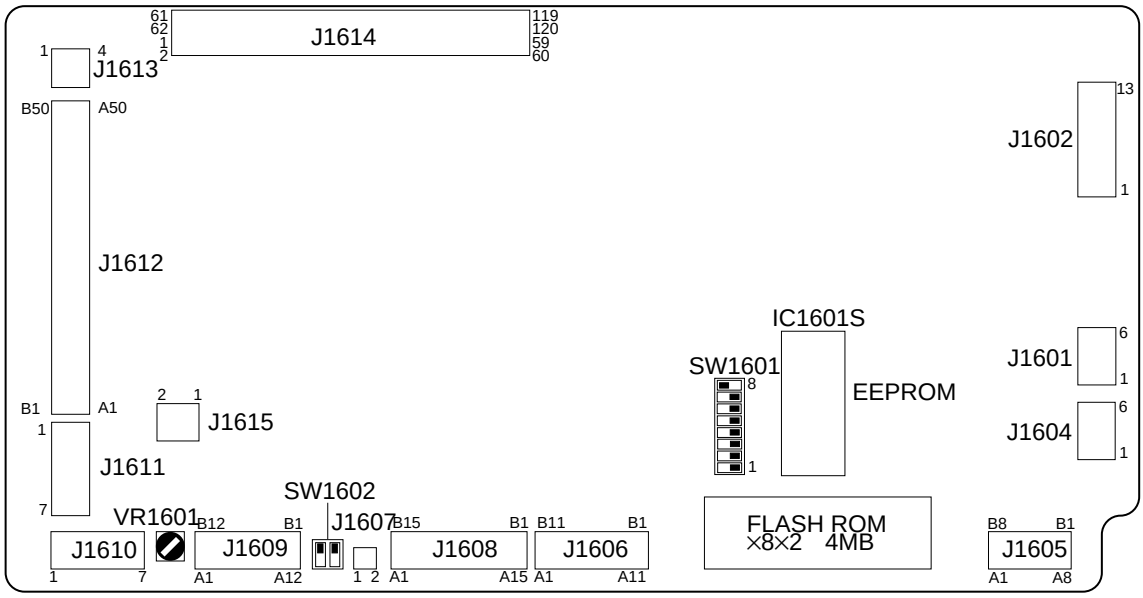

Figure 8-505

Notation	Name	Description
VR1601	VR for scanning lamp adjustment	Use it when replacing the scanning lamp, intensity detection PCB, or standard white plate.
SW1601	DIP SW for settings	See next page.
SW1602	DIP SW for downloading	Shift the left DIP SW up (COPY) for normal copying mode. Shift the left DIP SW down (LOAD) for downloading mode. Do not touch the right DIP SW. It is for factory use only.

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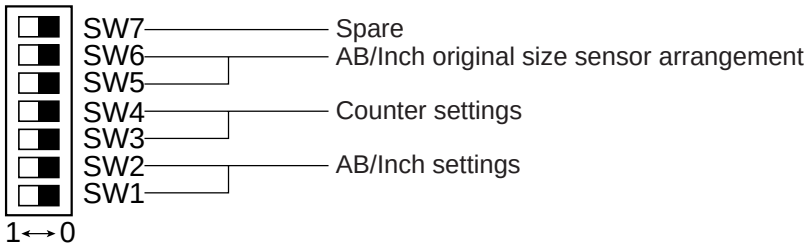
Details of SW1601

SW1601



• AB/Inch Settings

Configuration	SW1	SW2
AB	0	0
Inch	1	0
A	0	1
AB/Inch	1	1

• Counter Settings

Country	SW3	SW4
Japan	0	0
USA	1	0
TWN, Others	0	1
UK, CA, FRN, GER, AM, ITA	1	1

• AB/Inch Original Size Sensor Arrangement

Configuration	SW5	SW6
AB	0	0
Inch	1	0
A	0	1
None	1	1

• Spare (default)

SW7
0

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2. AP-IP PCB

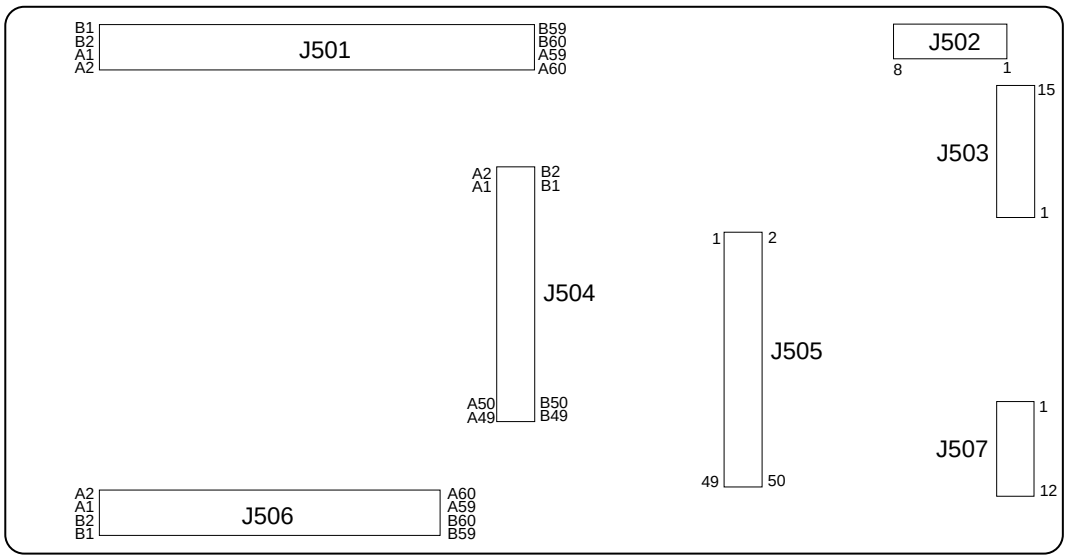

Figure 8-506

3. Scanner Motor Driver PCB

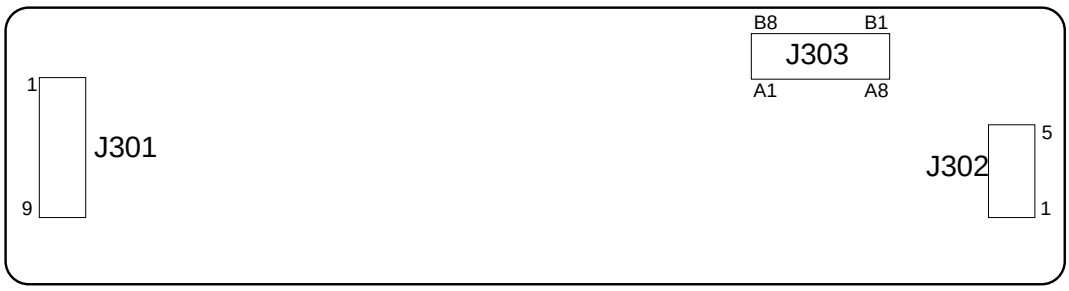

Figure 8-507

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VI.SERVICE MODE

Caution:

You cannot start service mode when the User screen indicates the "Wait" message after turning on the power. Start service mode when the "Wait (Select Auto Start)" or "Enter Group ID and ID No." message has appeared.

A. Outline

The copier's service mode is divided into the following two major items, each with its own Initial screen:

No.	Initial item	Mode
1	COPIER	Copier
2	FEEDER	Feeder

Table 8-601

Each of these major items, further, consists of the following seven sub-items indicated on the Initial screens.

No.	Level 1 item	Mode
1	DISPLAY	Control Display mode
2	I/O	I/O mode
3	ADJUST	Adjust mode
4	FUNCTION	Run/Check mode
5	OPTION	Settings mode
6	TEST	Test Print mode
7	COUNTER	Counter mode

Table 8-602

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1. Starting Service Mode and Making Selections

1) Press the User Mode key on the control panel.
2) Press the '2' and '8' on the keypad at the same time.
3) Press the User Mode key on the control panel.
   • The display changes to the screen shown in Figure 8-601.
4) Select an item on the touch panel.
   • The screen for the selected item will appear.

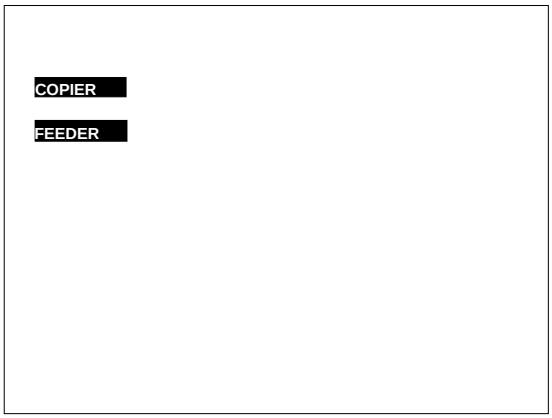

Figure 8-601

2. Ending Service Mode

A press on the Reset key will bring up the Service Mode Initial screen (Figure 8-601). Another press will end service mode, and the User screen will return.

3. Backing Up the RAM

Figure 8-602 shows the label attached behind the lower front cover (reader unit) and at the top of the inside cover (printer unit).

Each machine is adjusted at the factory, and the adjustment settings are recorded on these labels.

You must perform the following whenever you have replaced the reader controller PCB, replaced the DIMM, initialized the RAM, or replaced the DC controller PCB:

a. If you have replaced the reader controller, see p. 8-4.
b. If you have replaced the DIMM of the reader controller PCB, see p. 8-5.
c. If you have replaced the DC controller PCB, see p. 8-9.

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COPIER/ADJUST		Factory	1	2	3	4	5
ADJ-XY	ADJ-X						
	ADJ-Y						
CCD	W-PLT-X						
	W-PLT-Y						
	W-PLT-Z						
	A-RG						
	B-RG						
	A-GB						

COPIER/ADJUST		Factory	1	2	3	4	5
CCD	B-GB						
	AL-RG						
	AL-GB						
Body No.		Date.			FB4-0866		

Service Label (inside the lower front cover of the reader unit)

COPIER/ADJUST		Fact.	1	2	3	4
IMG-REG	REG-V-Y					
	REG-V-C					
	REG-V-K					
	REG2-V-Y					
	REG2-V-C					
	REG2-V-K					
FEED-ADJ	REGIST					
	ADJ-C1					
	ADJ-C2					
	ADJ-MF					
	REGIST2					
Body No.		Date.				

Service Label (top of the inside cover 1 of the printer unit)

Figure 8-602

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4. Basic Operation

The screens are arranged in layers: Level 1/Level 2 screen and Level 3 screen.

a. Initial Screen

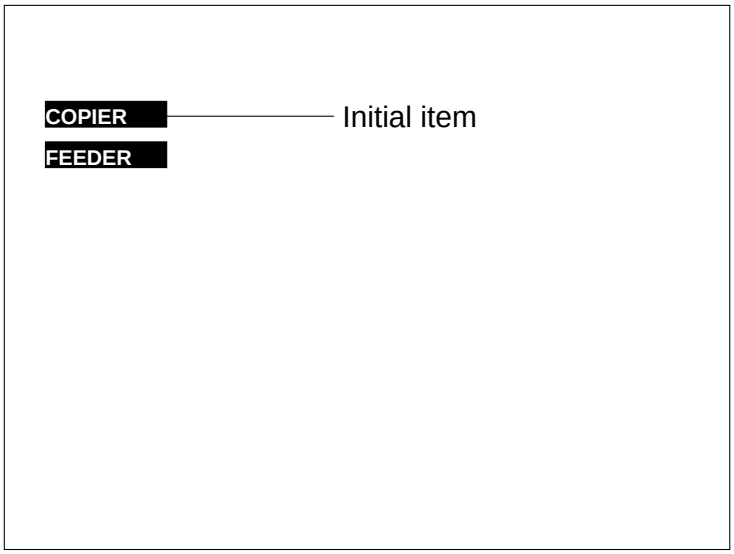

Figure 8-603

- To select an initial item, press the item (white text on a black background).

b. Level 1/Level 2 Item Screen

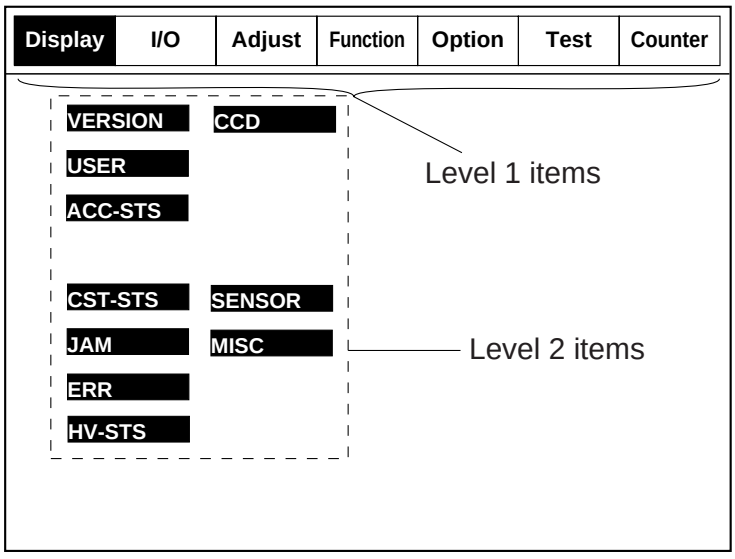

Figure 8-604

- To select a Level 1 item, press an item shown across the top of the screen.
- To select a Level 2 item, select an item shown as white text on a black background.

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c. Level 3 Item Screen

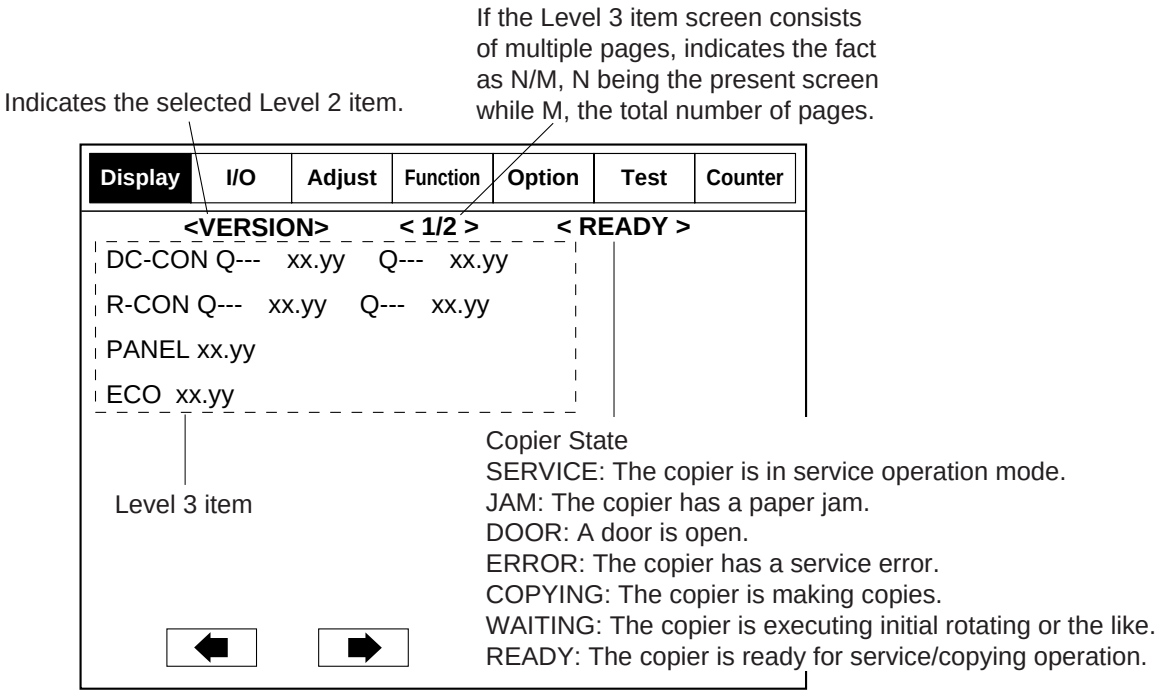

Figure 8-605

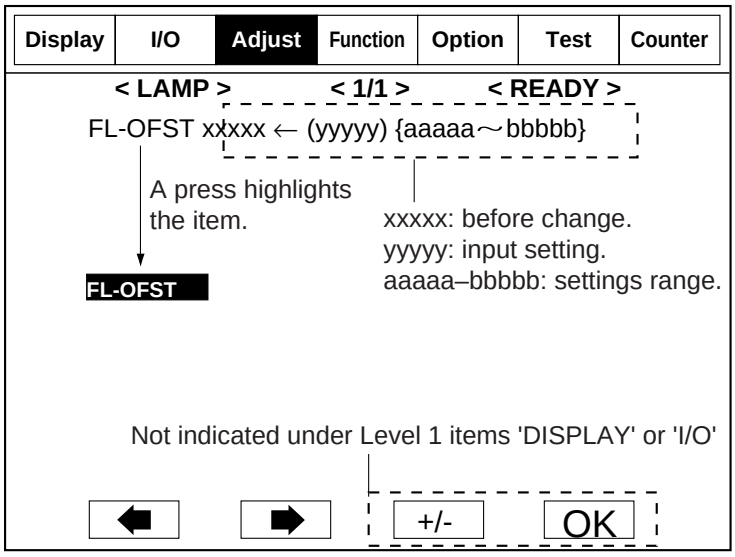

Figure 8-606

• To select a Level 3 item, press an item to highlight.

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d. Selecting a Screen

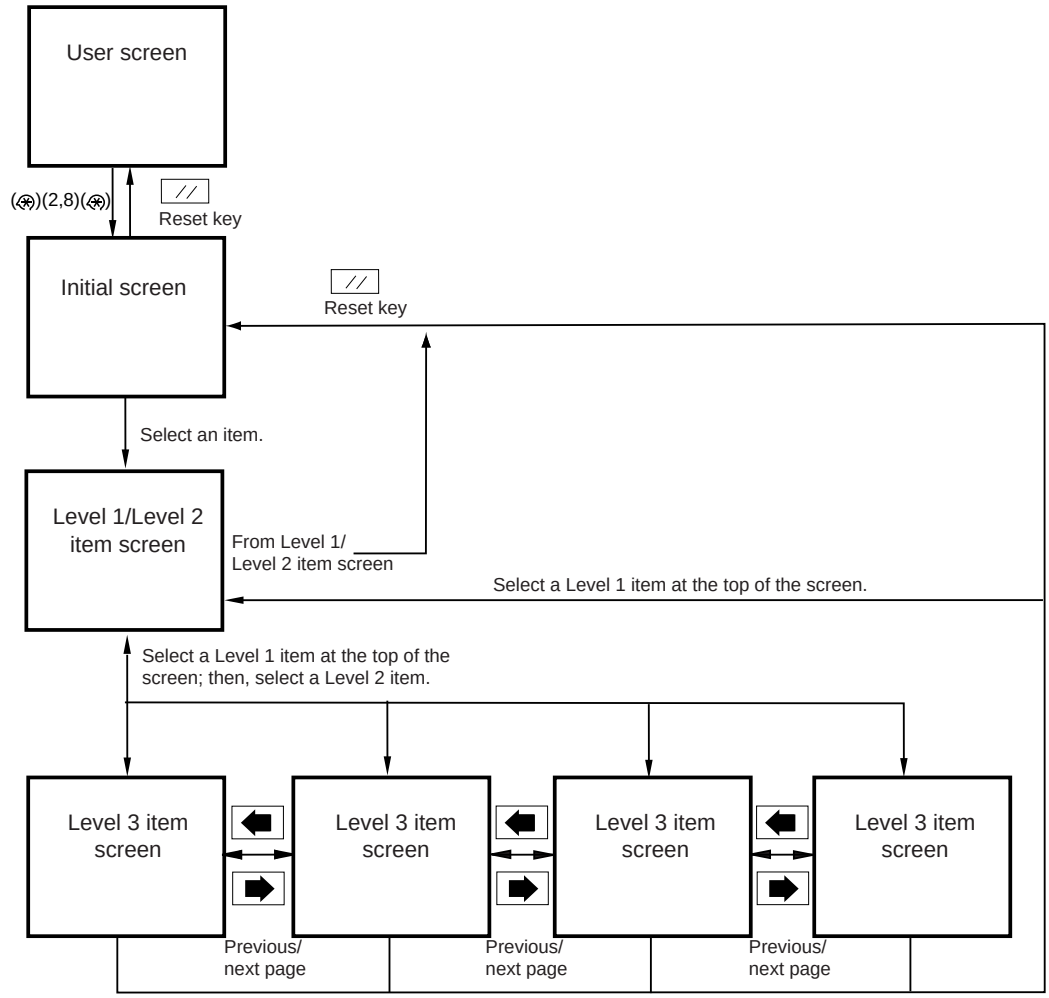

Figure 8-607

e. Keys

1. Keypad : Use it to enter a setting (0 through 9).
2. User Mode key : Use it to start service mode.
3. Reset key : Use it to end service mode.
4. Stop key : Use it to stop the ongoing operation.
5. Clear key : Use it to enter a setting or soft counter reading in service mode.
6. Copy Start key : Use it to make copies without leaving service mode after making adjustments.
7. ◀ Previous Page key : Use it to move back to the previous page.
8. ▶ Next Page key : Use it to move to the next page.
9. +/- +/- key : Use it to switch between + and -.
10. OK OK key : Use it to store a new setting.

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B. Display Mode (DISPLAY)

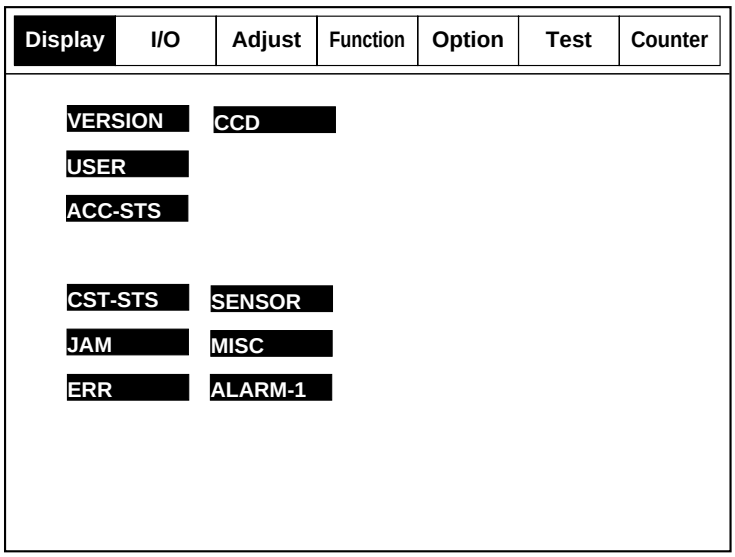

Figure 8-608

1	VERSION	Indicates the ROM versions of the PCBs used in the machine and accessories.
2	USER	Indicates items related to the User screen and the user.
3	ACC-STS	Indicates the state of connection of accessories (only if installed).
4	CST-STS	Indicates the state of use of cassettes and multifeeder.
5	JAM	Indicates jam data.
6	ERR	Error code/alarm code
7	CCD	Indicates measured readings of the CCD.
8	SENSOR	Indicates the state of sensors (important to servicing work).
9	MISC	Others
10	ALARM-1	Indicates the latest alarm for the feeder.

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Level 2 item	Level 3 item	Outline
VERSION	DC-CON	Indicates the ROM version of the DC controller PCB.
	R-CON	Indicates the DIMM version of the reader controller PCB.
	PANEL	Indicates the ROM version of the control panel controller PCB.
	ECO	Indicates the ROM version of the ECO PCB.
	FEEDER	Indicates the ROM version of the feeder PCB.
	SORTER	Indicates the ROM version of the sorter driver PCB.
	DECK	Indicates the ROM version of the deck driver PCB (if installed).
	OP-CON	Indicates the ROM version of the accessories controller PCB.
USER	LANGUAGE	Indicates the selected language.
ACC-STS	FEEDER	Indicates the state of connection of the feeder.
	SORTER	Indicates the state of connection of the sorter.
	DECK	Indicates the state of connection of the paper deck.
	EDITOR	Indicates the state of connection of the editor.
	CARD	Indicates the state of connection of the control card.
	DATA-CON	Indicates the state of connection of the copy data controller.
	PCB	Indicates the state of connection of various boards.
CST-STS	WIDTH-C1	Indicates the width of paper in the cassette 1 in terms of paper size.
	WIDTH-C2	Indicates the width of paper in the cassette 2 in terms of paper size.
	WIDTH-C3	Indicates the width of paper in the cassette 3 in terms of paper size.
	WIDTH-C4	Indicates the width of paper in the cassette 4 in terms of paper size.
	WIDTH-MF	Indicates the width of paper in the multifeeder in terms of paper size.
	WIDTH-DK	Indicates the width of paper in the deck in terms of paper size.
JAM		Indicates the jam history.
ERR		Indicates the error history.
CCD	TARGET-B	Indicates the shading target value for blue.
	TARGET-G	Indicates the shading target value for green.
	TARGET-R	Indicates the shading target value for red.
	BOF-B	Indicates the blue CCD output (for when the scanning lamp is off).
	BOF-G	Indicates the output value of the green CCD (for when the scanning lamp is off).
	BOF-R	Indicate the output value of the red CCD (for when the scanning lamp is off).

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Level 2 item	Level 3 item	Outline
CCD	OFST-OB	Indicates the offset level (SH-SW=0) of blue for CCD odd-numbered bits.
	OFST-OG	Indicates the offset level (SH-SW=0) of green for CCD odd-numbered bits.
	OFST-OR	Indicates the offset level (SH-SW=0) of red for CCD odd-numbered bits.
	OFST-EB	Indicates the offset level (SH-SW=0) of blue for CCD odd-numbered bits.
	OFST-EG	Indicates the offset level (SH-SW=0) of green for CCD odd-numbered bits.
	OFST-ER	Indicates the offset level (SH-SW=0) of red for CCD odd-numbered bits.
	GAIN-OB	Indicates the offset level (SH-SW=0) of blue for CCD odd-numbered bits.
	GAIN-OG	Indicates the offset level (SH-SW=0) of green for CCD odd-numbered bits.
	PGAIN-OR	Indicates the offset level (SH-SW=0) of red for CCD odd-numbered bits.
	GAIN-EB	Indicates the offset level (SH-SW=0) of blue for CCD even-numbered bits.
	GAIN-EG	Indicates the offset level (SH-SW=0) of green for CCD even-numbered bits.
	GAIN-ER	Indicates the offset level (SH-SW=0) of red for CCD even-numbered bits.
	POFST-OB	Indicates the offset level (SH-SW=1) of blue for CCD odd-numbered bits.
	POFST-OG	Indicates the offset level (SH-SW=1) of green for CCD odd-numbered bits.
	POFST-OR	Indicates the offset level (SH-SW=1) of red for CCD odd-numbered bits.
	POFST-EB	Indicates the offset level (SH-SW=1) of blue for CCD even-numbered bits.
	POFST-EG	Indicates the offset level (SH-SW=1) of green for CCD even-numbered bits.
	POFST-ER	Indicates the offset level (SH-SW=1) of red for CCD even-numbered bits.
	PGAIN-OB	Indicates the offset level (SH-SW=1) of blue for CCD odd-numbered bits.
	PGAIN-OG	Indicates the offset level (SH-SW=1) of green for CCD odd-numbered bits.
	PGAIN-OR	Indicates the offset level (SH-SW=1) of red for CCD odd-numbered bits.
	PGAIN-EB	Indicates the offset level (SH-SW=1) of blue for CCD even-numbered bits.
	PGAIN-EG	Indicates the offset level (SH-SW=1) of green for CCD even-numbered bits.
	PGAIN-ER	Indicates the offset level (SH-SW=1) of red for CCD even-numbered bits.
	CCD-TYPE	Indicates CCD or analog processor. (0: CCD, 1: analog processor)
	TAR2-B	Indicates the shading target value for blue.
	TAR2-G	Indicates the shading target value for green.
	TAR2-R	Indicates the shading target value for red.

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Level 2 item	Level 3 item	Outline
SENSOR	SC-HP	Indicates the output of the scanner home position sensor. (0: HP, 1: non-HP)
	W-TONER	Indicates that the waste toner case is about to become full (0: normal, 1: full warning)
	DOC-SZ	Indicates the original size detected by the original size sensor.
	DRUMLIFE	Indicates the life of the drum cartridge. (0: normal, 1: warning 1 (70%), 2: warning 2 (100%), 4: memory error)
MISC	DSNS-ALM	Indicates that the value is outside the stable image guarantee range for the printer unit. (0: normal, 1: error)
	Y-OUTRNG	Indicates that the value is outside the stable Y image guarantee range for the printer unit. (0: normal, 1: error)
	M-OUTRNG	Indicates that the value is outside the stable M image guarantee range for the printer unit. (0: normal, 1: error)
	C-OUTRNG	Indicates that the value is outside the stable C image guarantee range for the printer unit. (0: normal, 1: error)
	K-OUTRNG	Indicates that the value is outside the stable K image guarantee range for the printer unit. (0: normal, 1: error)
	ENV-DENS	Indicates the site environment (for density control). (0: N/N, 1: H/H, 2: N/L, 3: L/L)
	ENV-TR	Indicates the site environment (for transfer control). (0: H/H, 2: N/L, 3: L/L)
	FL-LIFE	Indicates the life of the scanning lamp. (0: normal, 1: end of life)
ALARM-1	DF	Indicates the latest alarm of the feeder.

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1. VERSION (ROM versions of the PCBs of the machine and accessories)

Items	Description	Remarks
DC-CON	Indicates the ROM version of the DC controller PCB. 'DC-CON xx.yy/XX.YY' 'xx.yy' Indicates the version of the ROM which controls the communication between the video controller (LIPS, PS/PCL) PCB on the DC controller PCB, controls high voltage, and controls some loads. 'XX.YY' Indicates the version of the ROM which controls loads on the DC controller PCB (mechanical workings).	xx: version number yy: R&D number XX: version number YY: R&D number
R-CON	Indicates the version of the ROM on the reader controller PCB. 'R-CON: xx.yy'	xx: version number yy: R&D number
PANEL	Indicates the version of the ROM on the control panel controller PCB. 'PANEL xx.yy'	
ECO	Indicates the version of the ROM on the ECO PCB. 'ECO xx.yy'	
FEEDER	Indicates the version of the ROM on the feeder controller PCB. 'FEEDER xx.yy'	
SORTER	Indicates the version of the ROM on the sorter driver PCB. 'SORTER xx.yy'	
DECK*	Indicates the version of the ROM on the deck driver PCB. 'DECK xx.yy'	
OP-CON	Indicates the version of the ROM on the ACC controller PCB. 'OP-CON xx.yy'	

* DECK may be the 2×500 Sheet Paper Deck-C1, 2000 Sheet Paper Deck-N1, or 1000 Sheet Paper Deck-D1, and the indication represents the version of the driver PCB of the installed deck.

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2. USER (User-screen and user-related items)

Items	Description	Remarks
LANGUAGE	Indicates the selected language: 'LANGUAGE xx.yy,zz,aa' xx (first 2 digits): country code yy (last 2 digits): language code zz: destination code aa: series code	For the country code, see Table 8-603. For the language code, see Table 8-604. For the destination code, see Table 8-605. For the series code, see Table 8-606.

Country Code

Code	Country
JP	Japan
TW	Taiwan
KR	Korea
IT	Italy
US	North America
SG	General
GB	United Kingdom
AU	Australia
FR	France
DE	Germany
NL	Europe

Table 8-603 (by JIS)

Language Code

Code	Language
JA	Japanese
EN	English
FR	French
DE	German
IT	Italian

Table 8-604 (by ISO639)

Destination Code

Code	Destination
00	CANON
01	Others

Table 8-605

Configuration Code

Code	Configuration
00	AB
01	Inch
02	A
03	All configurations

Table 8-606

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3. ACC-STS (state of connection of accessories)

Items	Description	Remarks
FEEDER	Indicates the state of connection of the feeder.	0: Not connected, 1: connected.
SORTER	Indicates the state of connection of the sorter.	
DECK	Indicates the state of connection of the deck.	
PRJ	Indicates the state of connection of the projector.	
EDITOR	Indicates the state of connection of the editor.	
CARD	Indicates the state of connection of the control card.	
DATA-CON	Indicates the state of connection of the copy data controller.	
PCB	Indicate the state of connection of various boards.	4: PS/PCL Board. 9: Accessories control PCB.

4. CST-STS (state of use of cassettes and multifeeder)

Items	Description	Remarks
WIDTH-C1	Indicates the width of paper in the cassette 1 in terms of a converted value or paper size.	
WIDTH-C2	Indicates the width of paper in the cassette 2 in terms of a converted value or paper size.	
WIDTH-C3	Indicates the width of paper in the cassette 3 (top of a 2-cassette feeding unit) in terms of a converted value or paper size.	Supports only the following: 2x500-Sheet Paper Deck and 200-Sheet Paper Deck.
WIDTH-C4	Indicates the width of paper in the cassette 4 (bottom of a 2-cassette feeding unit) in terms of a converted value or paper size.	Support only the following: 2000-Sheet Paper Deck.
WIDTH-MF	Indicates the width of paper in the multifeeder in terms of a converted value or paper size.	
WIDTH-DK	Indicates the width of paper in the deck (if installed) in terms of a converted value or paper size.	Support only the following: 1000-Sheet Paper Deck.

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5. JAM (jam data)

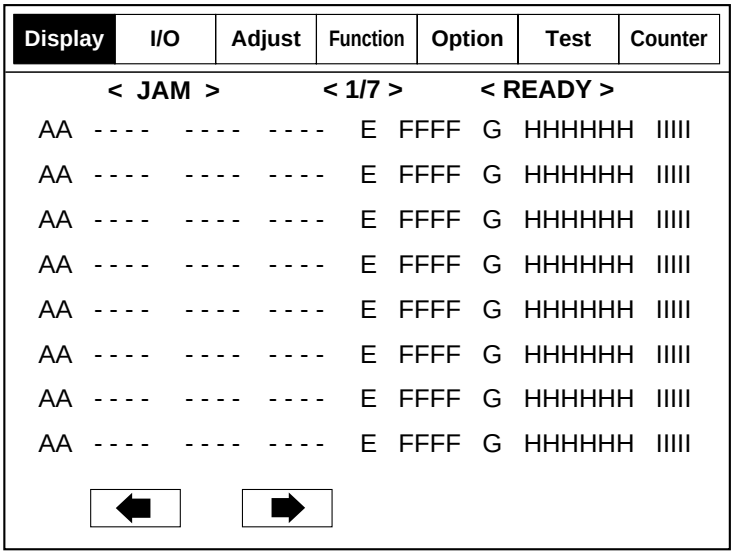

Figure 8-609

Items	Description
AA	1 through 50 (A higher number indicates an older jam.)
E	Location 0: copier, 1: feeder, 2: sorter
FFFF	Jam code first 2 digits: indicates the type of jam. (Table 8-607) last 2 digits: indicates the sensor that detected the jam. (Table 8-608)
G	Indicates the location of pick-up. (Table 8-609)
HHHHHH	Indicates the soft counter reading of the source of paper.
IIIII	Indicates the paper size.

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First 2 Digits of FFFF (type of jam)

Code	Description
01	Delay jam
02	Stationary jam
10	Residual jam at power-on
11	Door open/close during copying

Table 8-607

Last 2 Digits of FFFF (jam sensor)

Code	Description	Notation
01	Registration paper sensor	PS1
02	Separation sensor	PS5
03	Face-down tray delivery sensor	PS11
04	Pick-up assembly paper sensor	PS17
05	Transparency sensor 1/2	PS1801, PS1802
06	Fixing delivery sensor	PS1903
07	Duplexing unit paper sensor	PS24
08	Reversal paper sensor	PS26
10	Separation sensor, face-down tray delivery sensor, pick-up assembly paper sensor, or fixing delivery sensor.	PS5, PS11, PS17, or PS1903
11	Registration paper sensor, separation sensor, face-down tray delivery sensor, pick-up assembly paper sensor, transparency sensor 1/2, or fixing delivery sensor.	PS1, PS, PS11, PS17, PS1801, PS1802, or PS1903

Table 8-608

G (pick-up position)

Code	Description
1	Cassette 1
2	Cassette 2
3	Cassette 3 *1
4	Cassette 4 *2
8	Multifeeder
9	Duplexing unit (accessory)

Table 8-609

The machine distinguishes 14 types of jams (including jams in the duplexing unit). See Table 8-610 for combination of codes.

First 2 digits	Last 2 digits	Jam type
01	01	Pick-up delay jam 2
	02	Intermediate transfer drum jam
	03	Face-down delivery outlet delay jam
	04	Pick-up delay jam 1
	06	Fixing delivery delay jam
	07	Duplexing feeding assembly delay jam
	08	Reversing assembly delay jam
01	01	Delivery long-length paper jam
	03	Face-down delivery outlet stationary jam
	05	Non-default size paper feeding jam
	06	Fixing delivery stationary jam
	08	Reversing assembly stationary jam
10	10	Internal residual jam
11	11	Door open jam

Table 8-610

*1: Supports the 2x500-Sheet Paper Deck and 2000-Sheet Paper Deck.
*2: Supports the 2x500-Sheet Paper Deck.

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6. ERR (error codes)

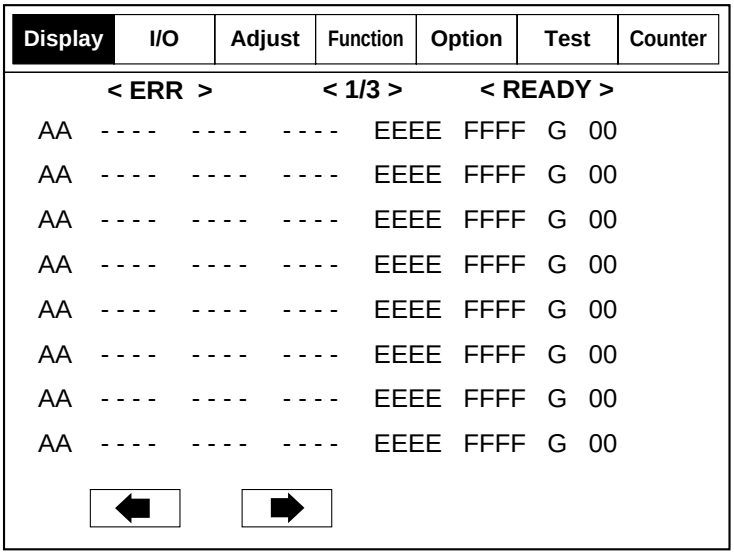

Figure 8-610

Items	Description
AA	1 through 20 (A higher number indicates an older error/alarm.)
EEEE	Indicates an error code. 'Exxx'
FFFF	Indicates a detail code. (If not available, '0000'.)
G	Indicates the location. (0: copier, 1: feeder, 2: sorter)

EEEE: For codes, see VII. "Self Diagnosis."

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7. CCD (CCD-related measured readings)

Items	Description	Remarks
TARGET-B	Indicates the shading target value for blue.	
TARGET-G	Indicates the shading target value for green.	
TARGET-R	Indicates the shading target value for red.	
BOF-B	Indicates the output value of the blue CCD for when the scanning lamp if off. 'BOF-B xx/yy'	xx: odd-numbered bit. yy: even-numbered bit.
BOF-G	Indicates the output value of the green CCD for when the scanning lamp is off. 'BOF-G xx/yy'	
BOF-R	Indicates the output value of the red CCD for when the scanning lamp is off. 'BOF-R xx/yy'	
OFST-OB	Indicates the offset level adjustment value of blue for CCD odd-numbered bits.	When '0' is set to COPIER>OPTION>BODY>SH-SW.
OFST-OG	Indicates the offset level adjustment value of green for CCD odd-numbered bits.	
OFST-OR	Indicates the offset level adjustment value of red for CCD odd-numbered bits.	
OFST-EB	Indicates the offset level adjustment value of blue for CCD even-numbered bits.	
OFST-EG	Indicates the offset level adjustment value of green for CCD even-numbered bits.	
OFST-ER	Indicates the offset level adjustment value of red for CCD even-numbered bits.	
GAIN-OB	Indicates the gain level adjustment value of blue for CCD odd-numbered bits.	
GAIN-OG	Indicates the gain level adjustment value of green for CCD odd-numbered bits.	
GAIN-OR	Indicates the gain level adjustment value of red for CCD odd-numbered bits.	
GAIN-EB	Indicates the gain level adjustment value of blue for CCD even-numbered bits.	
GAIN-EG	Indicates the gain level adjustment value of green for CCD even-numbered bits.	
GAIN-ER	Indicates the gain level adjustment value of red for CCD even-numbered bits.	

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Items	Description	Remarks
POFST-OB	Indicates the offset level adjustment value of blue for CCD odd-numbered bits.	When '1' is set to COPIER>OPTION>BODY>SH-SW.
POFST-OG	Indicates the offset level adjustment value of green for CCD odd-numbered bits.	
POFST-OR	Indicates the offset level adjustment value of red for CCD odd-numbered bits.	
POFST-EB	Indicates the offset level adjustment value of blue for CCD even-numbered bits.	
POFST-EG	Indicates the offset level adjustment value of green for CCD even-numbered bits.	
POFST-ER	Indicates the offset level adjustment value of red for CCD even-numbered bits.	
PGAIN-OB	Indicates the gain level adjustment value of blue for CCD odd-numbered bits.	
PGAIN-OG	Indicates the gain level adjustment value of green for CCD odd-numbered bits.	
PGAIN-OR	Indicates the gain level adjustment value of red for CCD odd-numbered bits.	
PGAIN-EB	Indicates the gain level adjustment value of blue for CCD even-numbered bits.	
PGAIN-EG	Indicates the gain level adjustment value of green for CCD even-numbered bits.	
PGAIN-ER	Indicates the gain level adjustment value of red for CCD even-numbered bits.	
CCD-TYPE	Distinguishes between CCD and analog processor.	0: old version 1: new version Standard: 1
TAR2-B	Indicates the shading target value for blue.	Needed when '1' is set to COPIER>OPTION>BODY>SH-SW, i.e., when the lamp intensity is decreased.
TAR2-G	Indicates the shading target value for green.	
TAR2-R	Indicates the shading target value for red.	

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8. SENSOR (state of sensors needed for servicing work)

Items	Description	Remarks
SC-HP	Indicates the output of the scanner home position sensor.	0: home position 1: non-home position
W-TONER	Indicates that the waste toner case inside the drum cartridge is about to become full (when full, 'E013').	0: normal 1: full warning
DOC-SZ	Indicates the size of the original detected by the original size sensor.	xxxx: A4, A3, B4, B5, etc.
DRUMLIFE	Indicates the life of the photosensitive drum inside the drum cartridge (at 126%, 'E814'). Note that '2: warning 2 (100%)' indicates that the copier may not be able to ensure a normal level of quality.	0: normal 1: warning 1 (70%) 2: warning 2 (100%) 4: drum cartridge memory error

9. MISC (others)

Items	Description	Remarks
DSNS-ALM	Indicates the lamp density sensor is faulty on the printer side.	0: normal 1: error In response, check the sensors and the condition of the intermediate transfer drum. (If the warning remains, density control will fail, bringing about gradual deterioration of image quality.)
Y-OUTRNG	Indicates that the value is outside the stable Y image guarantee range on the printer side.	
M-OUTRNG	Indicates that the value is outside the stable M image guarantee range on the printer side.	
C-OUTRNG	Indicates that the value is outside the stable C image guarantee range on the printer side.	
K-OUTRNG	Indicates that the value is outside the stable B image guarantee range on the printer side.	
ENV-DENS	Checks the environment (temperature, humidity) inside the printer, and indicates the environment range for transfer control.	0: normal temperature/normal humidity 1: high temperature/high humidity 2: normal temperature/low humidity 3: low temperature/low humidity
ENV-TR	Checks the environment (temperature/humidity) inside the printer unit, and indicates the environmental range for density control.	
FL-LIFE	Indicates that the scanning lamp is approaching the end of its life. (When the end is reached, 'E219' will be indicated.)	0: normal 1: warning (For replacement, see p. 8-10.)

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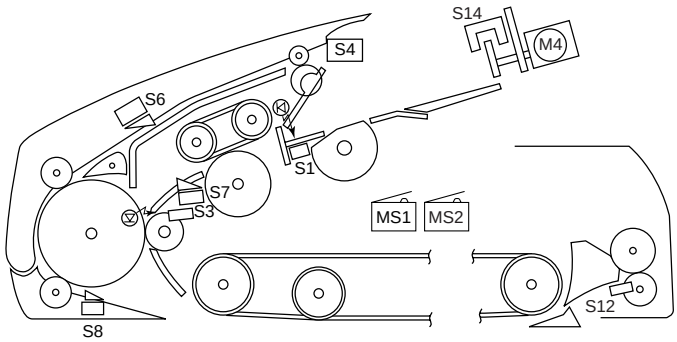
10. ALARM-1 (latest feeder alarm)

Use it to indicate the latest feeder alarm.

Items	Description	Remarks
DF	Indicates the feeder latest alarm. If none, indicates '00'. For DADF alarms, see the following diagram.	

■ Detecting Jams in the DADF



S1 ....Original tray paper sensor
S3 ....Registration paper sensor
S4 ....Upper cover sensor
S6 ....Delivery sensor 1
S7 ....Pick-up sensor
S8 ....Reversal sensor
S12 ..Delivery sensor 2
S14 ..Re-circulation sensor
MS1..RF switch
MS2..Upper cover switch

Figure 8-610

	Type of original jam1	Sensor	Description	Code
Pick-up	Original extraction	S1, S7	The sensor S7 does not detect the leading edge of an original 1500 msec after pick-up motor M1 has turned on and, in addition, the sensor S1 does not detect an original.	0001
	Pick-up delay	S7	The sensor S7 does not detect the leading edge of an original 1500 msec after the pick-up motor M1 has turned on.	0002
	Registration delay	S3, S7	The sensor S3 does not detect the leading edge of an original 350 msec after the sensor S7 has detected the leading edge of an original.	0003

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Original placement	Sensor	Description	RF operation	Code
Re-circulation lever idle rotation	S1	The re-circulation lever rotates idly without coming into contact with an original immediately after the re-circulation motor (M4) turns on.	Stops operating upon detection.	01
Pick-up failure	S7	The sensor S7 does not detect the leading edge of an original in 1500 msec during pick-up.	The separation belt, feeding roller, and pick-up roller stop immediately. The DADF stops after discharging the preceding originals.	03
Paper overriding the stopper plate	S7	The original has overridden when placed.	Stops operating upon detection.	05
Different number of originals after jam removal	S3	The number of originals placed on the original tray has changed as follows*: [Number at end of copying] > [Number set on original tray]	Stops operating upon detection.	11
Unidentified number of originals	S3	The re-circulating bar does not fall below the original tray, not enabling the detection of the last original. Reference: Normally, the original tray is capable of holding 50 sheets of A5, STMT, A4, B5, or LTRR; 25 sheets of A3, B4, 279x432mm (11”x17”), or LGL.	Stops operating after counting up to 100 sheets.	12
Original extraction	S14	The re-circuiting drops on the original tray while an original is being processed.	Stops operating upon detection.	13
Wrong original size	S3	The size of the original which is picked up is not of a default size.	Stops operating upon detection.	14
Wrong original size or mixed original sizes in reduced page composition (Note 1)	S3	1. The original which has been picked up is not of a size supported by reduced image composition mode. 2. The size of the original which has been picked up is of a size different from the first original.	Stops operating upon detection.	15

Note1: To reset, remove the originals from the original tray, and open the DADF.

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C. I/O Mode (I/O)

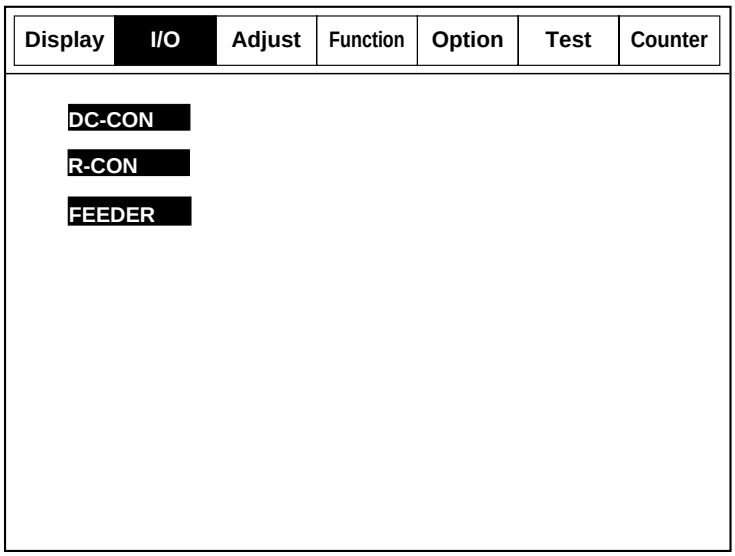

Figure 8-611

1	DC-CON	Indicates the input/output state of the CPU on the DC controller PCB.
2	R-CON	Indicates the input/output state of the CPU on the reader controller PCB.
3	FEEDER	Indicates the state of the CPU on the feeder controller PCB.

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1. DC-CON (input/output state of the DC controller PCB)

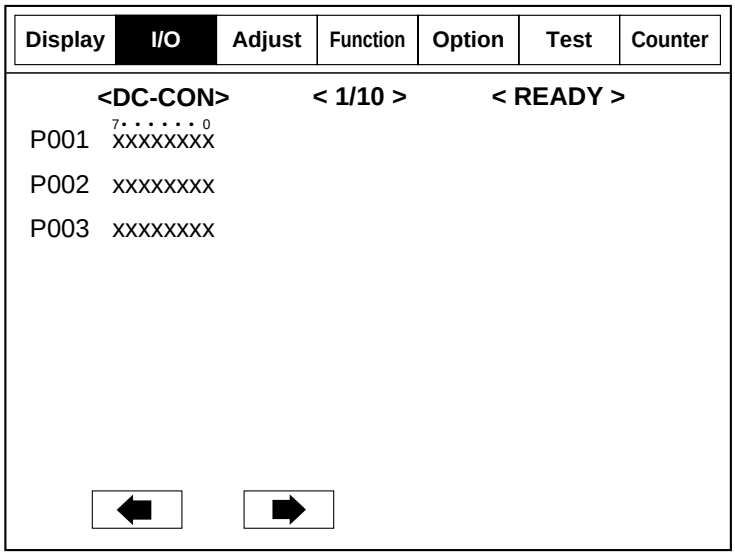
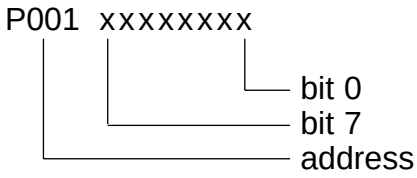


Figure 8-612

Items	Description	Remarks
P001 to P003	Indicates the input ports of the DC controller PCB.	

Guide to the Screens



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Of all the addresses, those needed in the field are shown in Table 8-611.

Address		Item	Description	Remarks
P001	4	FDOUT*	Face-down tray delivery paper sensor (PS11)	When paper is detected, '1'.
	3	FXOUTS	Fixing delivery sensor (PS1903)	When paper is detected, '1'.
	2	SEPS*	Separation sensor (PS5)	When paper is detected, '1'.
	1	FEEDS*	Pick-up paper sensor (PS17)	When paper is detected, '1'.
	0	REGS*	Registration paper sensor (PS1)	When paper is detected, '1'.
P002	5	SWBKS*	Duplexing unit reversal paper sensor (PS26) (See Note.)	When paper is detected, '1'.
	4	DUPPS*	Duplexing unit paper sensor (PS24) (See Note.)	When paper is detected, '1'.
	3	LDECKS*	Cassette 2 paper sensor (PS1207) (See Note.)	When paper is detected, '1'.
	1	UPDECKS*	Cassette 1 paper absent sensor(PS1208) (See Note.)	When paper is detected, '1'.
	0	MPDFS*	Multifeeder tray last paper sensor (PS19)	When no more than one sheet is set, '1'.
P003	1	TMPSNS	Temperature humidity sensor X X bit 0 bit 1 00: normal temperature/normal humidity, 01: high temperature/ high humidity, 10: normal temperature/low humidity, 11: low temperature/low humidity	
	0	HUMSNS		

Table 8-611

Note: For bits 4 and 5 of P002, the door must not be "open." Use the door switch actuator to simulate the closed state of the door.

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2. R-CON (input/output state of the reader controller PCB)

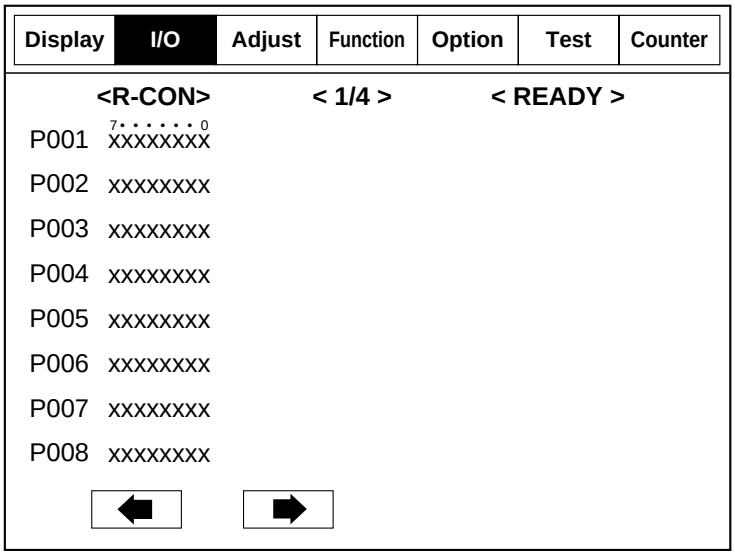
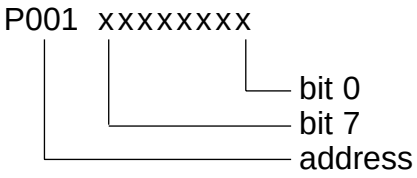


Figure 8-613

Items	Description	Remarks
P001 to P030	Indicates the input ports of the reader controller PCB.	

Guide to the Screens



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Of all the addresses, those needed in the field are shown in Table 8-612.

Address		Item	Description	Remarks
P001	6	–	SW7 of SW1601	See p. 8-101.
	5	–	SW6 of SW1601	
	4	–	SW5 of SW1601	
	3	–	SW4 of SW1601	
	2	–	SW3 of SW1601	
	1	–	SW2 of SW1601	
	0	–	SW1 of SW1601	
P002	7	DSZ4	Original size sensor 4 (PS106)	See p. 3-11.
	6	DSZ3	Original size sensor 3 (PS105)	
	5	DSZ2	Original size sensor 2 (PS104)	
	4	DSZ1	Original size sensor 1 (PS103)	
P003	5	FLPWN	Scanning lamp activation	
P004	7	FLERR	Scanning lamp error signal	If error, '1'.
	3	CCIVCONE*	Control card connected signal	When connected, '1'.
	1	FM4DEC	Power supply fan locked signal	When locked, '1'.
	0	CBCC	Copyboard cover open/close sensor (PS102)	When closed, '1'
P005	2	KEYSW	Control key switch signal	When ON, '1'.
P006	7	ACCON	Accessories power supply connected signal	When connected, '1'.
	6	YON	Scanning lamp pre-heat ON signal	–
	5	FLONOUT	Scanning lamp ON signal	–
	1	MMIRST	LCD control panel rest signal	–
P008	4	LPHTON	Scanning lamp heater ON signal	–
	1	FM4ON	Power supply fan (FM4) drive signal	When rotating, '1'.
	0	BLON*	LCD control panel back-light ON signal	When ON, '0'.
P009	2	ASTCNT	Copy data control counter signal	–
	1	CCIVCNT	Control card counter signal	–
P013	0	FL_TH	Scanning lamp thermistor signal	–
P022	2	SOFSWON	Power soft switch ON signal	When ON, '1'.

Table 8-612

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3. FEEDER (input/output state of the feeder controller PCB)

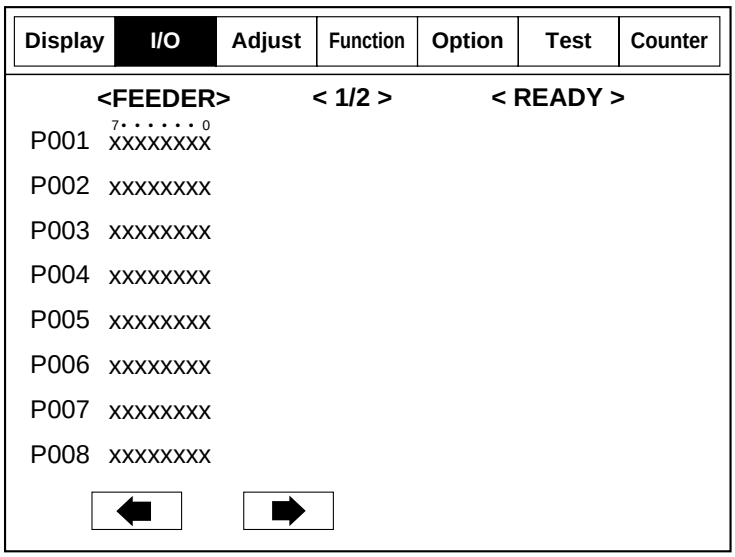
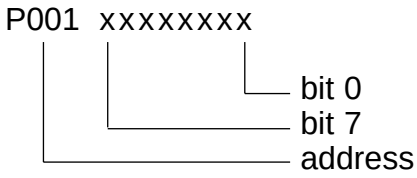


Figure 8-614

Items	Description	Remarks
P001 to P010	Indicates the input ports of the feeder controller PCB.	

Guide to the Screens



Of all the addresses, those needed in the field are shown in Table 8-613.

Address		Item	Description	Remarks
P001	3	BDIR	Belt motor (M3) rotation direction signal	When in right delivery mode, '1'.
	2	SMPSL	Stamp solenoid (SL4) drive	When '1', ON.
	1	FLPSL1	Paper deflecting plate solenoid (SL3) drive	When '1', ON.
	0	STPSL	Stopper plate solenoid (SL1) drive	When '1', ON.
P002	2	SPRS	Pick-up sensor (S7)	When paper is present, '1'.
	1	EJTS1	Delivery sensor 1 (S6)	When paper is present, '1'.
	0	TLIRNS	Reversal sensor (S8)	When paper is present, '1'.
P003	5	RSS	Re-circulation sensor (S14)	When paper is present, '1'.
P004	4	DCTS	Pick-up roller sensor (S13)	When at the home position, '1'.
	3	ECLK	Delivery motor clock sensor (S13)	While rotating, alternates '0' and '1'.
	2	RCLK	Registration roller clock sensor (S11)	While rotating, alternates '0' and '1'.
	1	BCLK	Belt motor clock sensor (S10)	While rotating, alternates '0' and '1'.
	0	FCLK	Feeder motor clock sensor (S9)	While rotating, alternates '0' and '1'.
P006	7	SMON	Pick-up motor (M1) drive signal	When '1', ON.
	6	SMPWM	Pick-up motor (M1) speed signal	'0' or '1' according to speed.
	4	FMPWM	Feeding motor (M2) speed signal	'0' or '1' according to speed.
	3	BMON	Belt motor (M3) drive signal	When '1', ON.
	2	BMPWM	Belt motor (M3) speed signal	'0' or '1' according to speed.
P007	7	WGTSL	Paper holding plate solenoid (SL2)	When '1', ON.
	6	CL	Clutch (CL) drive	When '1', ON.
	5	BK	Brake (BK) dive	When '1', ON.
	3	ORGLED	Original indicator LED (LED101, LED102)	When '0', ON.
	2	RSDRV	Re-circulation motor (M5) drive signal	When '1', ON.
	1	SDIR	Pick-up motor (M1) direction signal	When in top separation mode, '1'.
	0	EMPWM	Delivery motor (M5) speed signall	'0' or '1' according to speed.
P008	7	–	SW1 on feeder controller PCB	When pushed, '1'.
	6	–	SW2 on feeder controller PCb	When pushed, '1'.
	5	–	SW3 on feeder controller PCB	When pushed, '1'.
	4	EJTS2	Delivery sensor 2 (S12)	When paper is present, '1'.
	3	UPCC1, CVRSW	Upper cover switch (MS2) Upper cover sensor (S4)	When the upper cover is opened, '0'.
	2	RFC	Feeder switch (MS1)	When the feeder is opened, '0'.

Table 8-613(a)

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Address		Item	Description	Remarks
P009	7	–	LED2 on feeder controller PCB	When '0', ON.
	6	–	LED1 on feeder controller PCB	When '0', ON.
P010	7	–	DSW1-1 on feeder controller PCB	When '1', ON.
	6	–	DSW1-2 on feeder controller PCB	When '1', ON.
	5	–	DSW1-3 on feeder controller PCB	When '1', ON.
	4	–	DSW1-4 on feeder controller PCB	When '1', ON.
	3	–	DSW1-5 on feeder controller PCB	When '1', ON.
	2	–	DSW1-6 on feeder controller PCB	When '1', ON.
	1	–	DSW1-7 on feeder controller PCB	When '1', ON.
	0	–	DSW1-8 on feeder controller PCB	When '1', ON.

Figure 8-613(b)

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D. Adjust Mode (ADJUST)

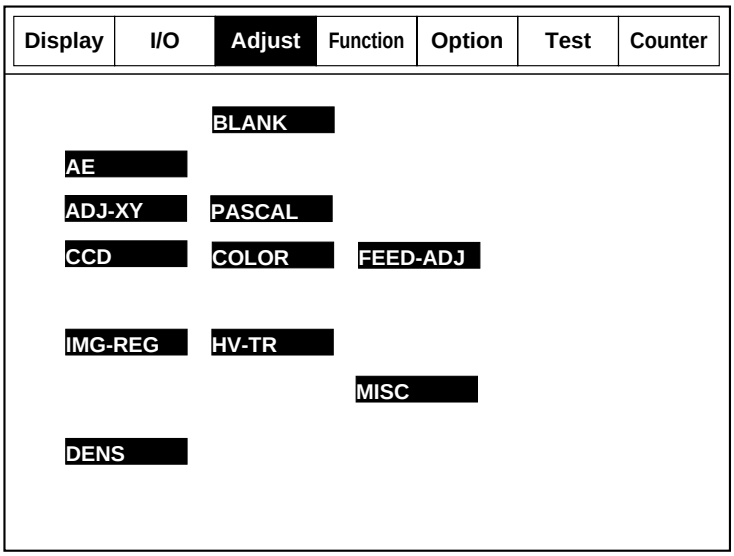

Figure 8-615

1	AE	Use it to adjust AE mode.
2	ADJ-XY	Use it to adjust the image read start position.
3	CCD	Use it to adjust CCD-/shading-related items.
4	IMG-REG	Use it to correct color displacement.
5	DENS	Use it to adjust developing density-related items.
6	BLANK	Use it to adjust the image leading edge/trailing edge margin.
7	PASCAL	Use it to execute auto gradation correction control.
8	COLOR	Use it to adjust color balance.
9	HV-TR	Use it to adjust transfer charging bias output by condition.
10	FEED-ADJ	Use it to adjust feeder-related items.
11	MISC	Others

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Level 2 item	Level 3 item	Range	Outline
AE	AE-TBL	+1~+9	Use it if the text is too light with priority on speed in AE mode (black-and-white text mode only).
	BE-TBL	+1~+9	Use it if the text is too light with priority on image in AE mode (black-and-white text mode only).
ADJ-XY	ADJ-X	0~+32	Use it to adjust the image area start position (X direction).
	ADJ-Y	0~+255	Use it to adjust the image read start position (Y direction).
CCD	W-PLT-X	+2000	Standard white plate X signal data
	W-PLT-Y	to	Standard white plate Y signal data
	W-PLT-Z	+11997	Standard white plate Z signal data
	A-RG	-9~+9	Use it to correct color displacement in sub scanning direction dependent on R-G ratio.
	B-RG	-9~+9	Use it to correct color displacement in sub scanning direction not dependent on R-G ratio.
	A-GB	-9~+9	Use it to correct color displacement in sub scanning direction dependent on G-B ratio.
	B-GB	-9~+9	Use it to correct color displacement in sub scanning direction not dependent on G-B ratio.
	AL-RG	-9~+9	Use it to correct color displacement in sub scanning direction dependent on R-G ratio for the lens unit.
	AL-GB	-9~+9	Use it to correct color displacement in sub scanning direction dependent on G-B ratio for the lens unit.
IMG-REG	REG-V-Y	-7~+8	Use it to adjust the Y pattern start position (1st page, sub scanning direction) when M is the color of reference.
	REG-V-C	-7~+8	Use it to adjust the C pattern start position (1st page, sub scanning direction) when M is the color of reference.
	REG-V-K	-7~+8	Use it to adjust the K pattern start position (1st page, sub scanning direction) when M is the color of reference.
	REG2-V-Y	-7~+8	Use it to adjust the Y pattern start position (2nd page, sub scanning direction) when M is the color of reference.
	REG2-V-C	-7~+8	Use it to adjust the C pattern start position (2nd page, sub scanning direction) when M is the color of reference.
	REG2-V-K	-7~+8	Use it to adjust the K pattern start position (2nd page, sub scanning direction) when M is the color of reference.
DENS	DM-FIX-Y	-7~+8	Use it to adjust Y density (toner deposit) for the printer unit to correct fixing faults.
	DM-FIX-M	-7~+8	Use it to adjust M density (toner deposit) for the printer unit to correct fixing faults.
	DM-FIX-C	-7~+8	Use it to adjust C density (toner deposit) for the printer unit to correct fixing faults.
	DM-FIX-K	-7~+8	Use it to adjust K density (toner deposit) for the printer unit to correct fixing faults.
	DM-TR-Y	-7~0	Use it to adjust Y density (toner deposit) for the printer unit to correct transfer faults.
	DM-TR-M	-7~0	Use it to adjust M density (toner deposit) for the printer unit to correct transfer faults.
	DM-TR-C	-7~0	Use it to adjust C density (toner deposit) for the printer unit to correct transfer faults.
	DM-TR-K	-7~0	Use it to adjust K density (toner deposit) for the printer unit to correct transfer faults.

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Level 2 item	Level 3 item	Range	Outline
BLANK	BLANK-T	0~+65535	Use it to adjust the leading edge non-image width.
	BLANK-L	0~+65535	Use it to adjust the left margin.
	BLANK-R	0~+65535	Use it to adjust the right margin.
	BLANK-B	+118~+65535	Use it to adjust the trailing edge non-image width.
PASCAL	LUT-P-Y	-4~+3	Use it to fine-adjust the gradation control level (correction table) for Y.
	LUT-P-M	-4~+3	Use it to fine-adjust the gradation control level (correction table) for M.
	LUT-P-C	-4~+3	Use it to fine-adjust the gradation control level (correction table) for C.
	LUT-P-K	-4~+3	Use it to fine-adjust the gradation control level (correction table) for K.
	LUT-P-1	-4~+3	Use it to fine-adjust the gradation control level (correction table, image processing pattern A).
	LUT-P-2	-4~+3	Use it to fine-adjust the gradation control level (correction table, image processing pattern B).
	LUT-P-3	-4~+3	Use it to fine-adjust the gradation control level (correction table, image processing pattern C).
COLOR	ADJ-Y	-8~+8	Use it to adjust the color balance for Y for the user.
	ADJ-M	-8~+8	Use it to adjust the color balance for M for the user.
	ADJ-C	-8~+8	Use it to adjust the color balance for C for the user.
	ADJ-K	-8~+8	Use it to adjust the color balance for K for the user.
	OFST-Y	-8~+8	Use it to adjust the color balance and the density of light areas of Y.
	OFST-M	-8~+8	Use it to adjust the color balance and the density of light areas of M.
	OFST-C	-8~+8	Use it to adjust the color balance and the density of light areas of C.
	OFST-K	-8~+8	Use it to adjust the color balance and the density of light areas of K.

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Level 2 item	Level 3 item	Range	Outline
HV-TR	TR-N1M	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.
	TR-N1H	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.
	TR-N1L	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.
	TR-N2M	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.
	TR-N2H	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.
	TR-N2L	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.
	TR-N1N/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.
	TR-N2N/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.
	TR-TSM	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for thick, small-size paper.
	TR-TSH	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for thick, small-size paper.
	TR-TSL	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for thick, small-size paper.
	TR-TSN/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for thick, small-size paper.
	TR-TLM	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for thick, large-size paper.
	TR-TLH	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for thick, large-size paper.
	TR-TLL	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for thick, large-size paper.
	TR-TLN/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for thick, large-size paper.
	TR-OSM	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for a small-size transparency.
	TR-OSH	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for a small-size transparency.
	TR-OSL	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for a small-size transparency.
	TR-OSN/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for a small-size transparency.
	TR-OLM	0~+15	For a N/N environment, use it to adjust the secondary transfer bias for a large-size transparency.
	TR-OLH	0~+15	For a H/H environment, use it to adjust the secondary transfer bias for a large-size transparency.
	TR-OLL	0~+15	For a L/L environment, use it to adjust the secondary transfer bias for a large-size transparency.
	TR-OLN/L	0~+15	For a N/L environment, use it to adjust the secondary transfer bias for a large-size transparency.

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Level 2 item	Level 3 item	Range	Outline
FEED-ADJ	REGIST	0~+52	Use it to adjust the timing at which the registration clutch turns on (1st sheet).
	ADJ-C1	1~+62	Use it to adjust the image write start position in main scanning direction for the cassette 1.
	ADJ-C2	1~+62	Use it to adjust the image write start position in main scanning direction for the cassette 2.
	ADJ-MF	1~+62	Use it to adjust the image write start position in main scanning direction for the multifeeder.
	REGIST2	0~+52	Use it to adjust the timing at which the registration clutch turns on (2nd and subsequent sheets).
MISC	SEG-ADJ	-4~+4	Use it to adjust the degree of distinction between text and photo in text/photo/map mode.
	K-ADJ	-3~+3	Use it to adjust the degree of black for black text identification.
	ACS-ADJ	-3~+3	Use it to adjust the area of color recognition for ACS.
	ACS-EN	-2~+2	Use it to make adjustments for ACS identification for ACS.
	ACS-CNT	-2~+2	Use it to adjust the area in which pixels are counted for identification of chromatic components for ACS.

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1. AE (AE mode)

Items	Description	Remarks
AE-TBL	Use it if the density of text is too low (light) when AE mode is used with priority on speed (black-and-white text mode only).	A higher setting makes prints darker. Settings: +1 to +9 Standard: +5
BE-TBL	Use it if the density of text is too high (dark) when AE mode is used with priority on image quality (black-and-white text mode only).	

2. ADJ-XY (image read start position)

Items	Description	Remarks
ADJ-X	Use it to adjust the image read start position (X direction).	Unit: mm (See Caution.) Settings: 0 to +32
ADJ-Y	Use it to adjust the image read start position (Y direction).	Unit: mm (See Caution.) Settings: 0 to +255

Caution:

These items will return to the standard settings when the reader controller PCB is replaced, the RAM on the reader controller PCB is initialized, or the DIMM is replaced, requiring you to enter the settings newly. Be sure to record any new settings on the service label on the reader unit if you have changed the settings.

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3. CCD (CCD-/shading-related items)

Items	Description	Remarks
W-PLT-X	Use it to set standard white plate X signal data.	Settings: +2000 to +11997 (See Caution.)
W-PLT-Y	Use it to set standard white plate Y signal data.	
W-PLT-Z	Use it to set standard Z signal data.	

Caution:

These items will require you to enter the values indicated on the bar code of the new standard white plate if you have replaced the plate (p. 8-12). Enter the value in service mode, and record the value on the service label on the reader unit.

Items	Description		Remarks
A-RG	Use it to correct displacement of color in sub scanning direction caused by the scanner by compensating R-G and G-B of the 3-line CCD sensor.	Use it to correct color displacement in sub scanning direction dependent on R-G ratio.	Settings: -9 to +9
B-RG		Use it to correct color displacement in sub scanning direction not dependent on R-G ratio.	
A-GB		Use it to correct color displacement in sub scanning direction dependent on G-B ratio.	
B-GB		Use it to correct color displacement in sub scanning direction not dependent on G-B ratio.	
AL-RG		Use it to correct color displacement in sub scanning direction dependent on R-G ratio for the lens unit.	
AL-GB		Use it to correct color displacement in sub scanning direction dependent on G-B ratio for lens unit.	

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4. IMG-REG (color image color displacement)

Items	Description	Remarks
REG-V-Y	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a Y pattern with M as reference. (1st sheet of 1-/2-sheet retention).	Unit: 1 pixel A higher setting will move the pattern toward the rear. Setting: -7 to +8 Reference: 0 1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute.
REG-V-C	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a C pattern with M as reference (1st sheet of 1-/2-sheet retention).	
REG-V-K	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a K pattern with M as reference (1st sheet of 1-/2-sheet retention).	
REG2-V-Y	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a Y pattern with M as reference (2nd and subsequent sheets of 1-/2-sheet retention).	
REG2-V-C	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a Y pattern with M as reference (2nd and subsequent sheets of 1-/2-sheet retention).	
REG2-V-K	Use it to fine-adjust the write start position in sub scanning direction on the intermediate transfer drum for a Y pattern with M as reference (2nd and subsequent sheets of 1-/2-sheet retention).	

Caution:

If you are replacing the DC controller PCB, all settings must be saved on the reader controller PCB and downloaded to the new DC controller as follows:
1) Start service mode.
2) Select FUNCTION>MISC-P>DC-SAVE.
3) Press the OK key to save all settings to the reader controller PCB.
4) End service mode, and turn off the power.
5) Mount the new DC controller PCB.
6) Turn on the power, and start service mode.
7) Select FUNCTION>MISC-P>DC-LOAD.
8) Press the OK key so that all settings will be downloaded to reader controller PCB.
9) End.

However, you must enter a setting once again if the DC controller PCB is faulty. If you changed the setting, be sure to record the new setting on the service label of the printer unit.

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5. DENS (developing density)

Items	Description	Remarks
DM-FIX-Y	Use it to fine-adjust the Y color density (toner deposit) for the printer unit (effective for fixing faults).	Settings: -7 to +8 Reference: 0 A higher setting increases the toner deposit, and vice versa. Effective only during copying operation.
DM-FIX-M	Use it to fine-adjust the M color density (toner deposit) for the printer unit (effective for fixing faults).	
DM-FIX-C	Use it to fine-adjust the C color density (toner deposit) for the printer unit (effective for fixing faults).	
DM-FIX-K	Use it to fine-adjust the K color density (toner deposit) for the printer unit (effective for fixing faults).	
DM-TR-Y	Use it to fine-adjust the Y color density (toner deposit) for the printer unit (effective for fixing faults).	Settings: -7 to +8 Reference: 0 A higher setting increases the toner deposit, and vice versa. Effective only during copying operation.
DM-TR-M	Use it to fine-adjust the M color density (toner deposit) for the printer unit (effective for transfer faults).	
DM-TR-C	Use it to fine-adjust the C color density (toner deposit) for the printer unit (effective for transfer faults).	
DM-TR-K	Use it to fine-adjust the K color density (toner deposit) for the printer unit (effective for transfer faults)	

Reference:

These items are adjusted by varying the amount of toner deposit, i.e., the developing contrast potential is varied in reference to the result of adding a specific value to the developing bias and the primary bias determined by "image density correction control," performed in the printer unit.

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6. BLANK (image leading edge/trailing edge margin)

Items	Description	Remarks
BLANK-T	Use it to adjust the leading edge non-image width. A higher setting will increase the non-image width.	Settings: 0 to +65535 Unit: 4.2 mm = 100
BLANK-L	Use it to adjust the left margin. A higher setting will increase the margin.	
BLANK-R	Use it to adjust the right margin. A higher setting will increase the margin.	
BLANK-B	Use it to adjust the trailing edge non-image width. A higher setting will increase the non-image width.	Settings: +118 to +65535 Unit: 4.2 mm = 100

7. PASCAL (auto gradation correction control)

Items	Description	Remarks
LUT-P-Y	The density of Dhalf after auto gradation correction control and the density of Dhalf during image gradation correction control are compared to adjust the LUT gain for correction of each color.	Settings: -4 to +3 Standard: 0
LUT-P-M		
LUT-P-C		
LUT-P-K		
LUT-P-1	The density of Dhalf after auto gradation correction control and the density of Dhalf during image gradation correction control are compared to adjust the LUT gain for image processing patterns A, B, and C. (The image processing patterns A, B, and C correspond to Test Prints 1, 2, and 3 used in auto gradation correction control.)	
LUT-P-2		
LUT-P-3		

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8. COLOR (color balance)

Items	Description	Remarks
ADJ-Y	Use it to adjust the color balance for Y for the user.	A higher setting will make the images darker and vice versa. Settings: -8 to +8 Standard: 0
ADJ-M	Use it to adjust the color balance for M for the user.	
ADJ-C	Use it to adjust the color balance for C for the user.	
ADJ-K	Use it to adjust the color balance for K for the user.	
OFST-Y	Use it to adjust the color balance and the density of light areas of Y.	A lower setting will decrease fogging. Settings: -8 to +8 Reference: 0
OFST-M	Use it to adjust the color balance and the density of light areas of M.	
OFST-C	Use it to adjust the color balance and the density of light areas of C.	
OFST-K	Use it to adjust the color balance and the density of light areas of K.	

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9. HV-TR (transfer charging bias output by condition)

Items	Description	Remarks
TR-N1M	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.	Settings: 0 to +15 Standard: 8 1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute. Adjustment in the field is not usually needed.
TR-N1H	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.	
TR-N1L	For a L/L environment (low humidity), use it to adjust the secondary transfer bias for single-sided printing or first side printing of double-sided printing on plain paper.	
TR-N2M	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.	
TR-N2H	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.	
TR-N2L	For a L/L environment, (low humidity), use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.	
TR-N1N/L	For a N/L environment, use it to adjust the secondary transfer bias for single-sided printing and first side printing of double-sided printing on plain paper.	
TR-N2N/L	For a N/L environment, use it to adjust the secondary transfer bias for second side printing of double-sided printing on plain paper.	
TR-TSM	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for thick, small-size paper.	
TR-TSH	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for thick, small-size paper.	
TR-TSL	For a L/L environment (low humidity), use it to adjust the secondary transfer bias for thick, small-size paper.	
TR-TSN/L	For a N/L environment, use it to adjust the secondary transfer bias for thick, small-size paper.	

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Items	Description	Remarks
TR-TLM	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for thick, large-size paper.	Settings: 0 to +15 Standard: 8 1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute. Adjustment in the field is not usually needed.
TR-TLH	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for thick, large-size paper.	
TR-TLL	For a L/L environment (low humidity), use it to adjust the secondary transfer bias for thick, large-size paper.	
TR-TLN/L	For a N/L environment, use it to adjust the secondary transfer bias for thick, large-size paper.	
TR-OSM	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for a small-size transparency.	
TR-OSH	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for a small-size transparency.	
TR-OSL	For a L/L environment (low humidity), use it to adjust the secondary transfer bias for a small-size transparency.	
TR-OSN/L	For a N/L environment, use it to adjust the secondary transfer bias for a small-size transparency.	
TR-OLM	For a N/N environment (normal humidity), use it to adjust the secondary transfer bias for a large-size transparency.	
TR-OLH	For a H/H environment (high humidity), use it to adjust the secondary transfer bias for a large-size transparency.	
TR-OLL	For a L/L environment (low humidity), use it to adjust the secondary transfer bias for a large-size transparency.	
TR-OLN/L	For a N/L environment, use it to adjust the secondary transfer bias for a large-size transparency.	

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Caution:

If you are replacing the DC controller PCB, all settings must be saved on the reader controller PCB and downloaded to the new DC controller as follows:

1) Start service mode.
2) Select FUNCTION>MISC-P>DC-SAVE.
3) Press the OK key to save all settings to the reader controller PCB.
4) End service mode, and turn off the power.
5) Mount the new DC controller PCB.
6) Turn on the power, and start service mode.
7) Select FUNCTION>MISC-P>DC-LOAD.
8) Press the OK key so that all settings will be downloaded to reader controller PCB.
9) End.

However, you must enter a setting once again if the DC controller PCB is faulty. If you changed the setting, be sure to record the new setting on the service label of the printer unit.

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10. FEED-ADJ (feeding system)

Items	Description	Remarks
REGIST	Use it to adjust the timing at which the registration clutch turns on (1st page of 1-page mode and 1st page of 2-page mode only). A higher setting will decrease the leading edge margin.	Settings: 0 to +52 Standard: +18 1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute.
ADJ-C1	Use it to adjust the image start position in main scanning direction when the cassette 1 is used.	Settings: 1 to +62 Standard: +32 Unit: 0.17 mm 1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute.
ADJ-C2	Use it to adjust the image start position in main scanning direction when the cassette 2 is used.	
ADJ-MF	Use it to adjust the image start position in main scanning direction when the multifeeder is used.	
REGIST2	Use it to adjust the timing at which the registration clutch turns on (2nd and subsequent pages in 1-page mode or 2nd and subsequent pages in 2-page mode). A higher setting will decrease the leading edge margin.	1. Enter a setting, and press the OK key. 2. Select FUNCTION>MISC-P>DC-LOAD; then, press the OK key. 3. Turn off and then on the control panel power soft switch to execute.

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Caution:

If you are replacing the DC controller PCB, all settings must be saved on the reader controller PCB and downloaded to the new DC controller as follows:

1) Start service mode.
2) Select FUNCTION>MISC-P>DC-SAVE.
3) Press the OK key to save all settings to the reader controller PCB.
4) End service mode, and turn off the power.
5) Mount the new DC controller PCB.
6) Turn on the power, and start service mode.
7) Select FUNCTION>MISC-P>DC-LOAD.
8) Press the OK key so that all settings will be downloaded to reader controller PCB.
9) End.

However, you must enter a setting once again if the DC controller PCB is faulty. If you changed the setting, be sure to record the new setting on the service label of the printer unit.

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11. MISC (others)

Items	Description	Remarks
SEG-ADJ	Use it to adjust the degree of distinction between text and photo in text/photo/map mode +: tends to identify as a photo –: tends to identify as text.	Settings: -4 to +4 Standard: 0
K-ADJ	Use it to adjust the degree of black identification for black text processing. A higher setting tends to identify text as black.	Settings: -3 to +3 Standard: 0
ACS-ADJ	Use it to adjust the degree of color identification for ACS. +: tends to identify as a black original. –: tends to identify as a color original.	Settings: -3 to +3 Standard: 0
ACS-EN	When an image is being read for ACS, a large area of displaced color in a leading edge/trailing edge/side width (main scanning direction) can cause wrong identification. Use it to limit the area of ACS: +: increases the area (affected more by color displacement). –: decreases the area (affected less by color displacement).	Settings: -2 to +2 Standard: 0
ACS-CNT	Use it to adjust the area in which pixels are counted for ACS (for identification of chromatic pixels): +: increases the area. (Fine colored lines may be identified as part of a color original, but identification is affected more by color displacement.) –: decreases the area. (The absence of chromatic pixels in a wide area of an original will prevent identification of the original as being colored, but identification is affected less by color displacement.)	Settings: -2 to +2 Standard: +1

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E. Run/Check Mode (FUNCTION)

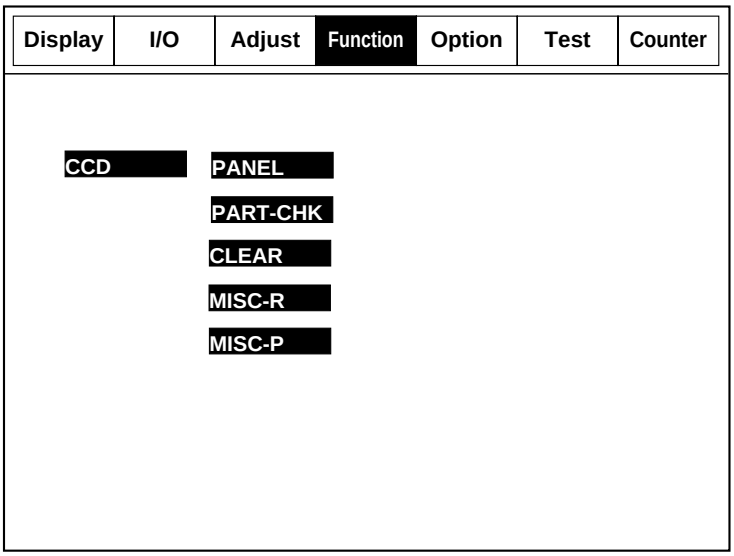

Figure 8-616

1	CCD	Use it to execute automatic adjustment of CCD-/shading related items.
2	PANEL	Use it to check the control panel.
3	PART-CHK	Use it to check the various electrical parts.
4	CLEAR	Use it to initialize RAM and jam/error code histories.
5	MISC-R	Use it to check the reader unit.
6	MISC-P	Use it to check the printer unit.

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Level 2 item	Level 3 item	Outline
CCD	CCD-ADJ	Use it to execute shading adjustment.
	FILT-B	Use it to make sure that the B signal is generated by the CCD correctly.
	FILT-G	Use it to make sure that the G signal is generated by the CCD correctly.
	FILT-R	Use it to make sure that the R signal is generated by the CCD correctly.
PANEL	LCD-CHK	Use it to check the control panel LCD for missing dots.
	LED-CHK	Use it to check the LEDs on the control panel.
	LED-OFF	Use it to turn off the LEDs on the control panel.
	KEY-CHK	Use it to check the keys on the control panel.
	TOUCHCHK	Use it to adjust the position of coordinates on the analog touch panel.
PART-CHK	FAN-ON	Use it to start the fan (power supply cooling fan FM4 only).
CLEAR	ERR	Use it to initialize error codes.
	R-CON	Use it to initialize the RAM on the reader control PCB.
	JAM-HIST	Use it to initialize the jam history.
	ER-HIST	Use it to initialize the error codes.
	CNT-ERR	–
	CNT-CLR	–
	E354-CLR	–
MISC-R	SCANLAMP	Use it to check the activation of the scanning lamp.
	SC-MOVE	Use it to check the scanner.
	LAMP-ADJ	Use it to adjust the intensity of light of the new scanning lamp.
	USE-LAMP	Use it to adjust the intensity of light when replacing the rear controller PCB/light intensity detection PCB.
MISC-P	IP-CHK	Use it to run self diagnosis on the AP-IP PCB.
	POWEROFF	Use it to check operation of the auto power-off mechanism.
	DEV-DRV	Use it to drive the developing rotary and the sleeve motor for a specific time.
	PPR-FEED	Use it to run paper feeding test.
	MAIN-DRV	Use it to drive the intermediate transfer drum and the photosensitive drum for a specific time.
	DC-SAVE	Use it to save settings (high-voltage) to the reader controller when replacing the DC controller PCB.
	DC-LOAD	Use it to load the settings (high-voltage) from the reader controller PCB when replacing the DC controller.

The state of the machine will be indicated in the upper right corner of the screen. Take note of the indications. While this mode is being executed, the indications will be as follows:

<READY> The machine is ready for servicing/printing operations.

<SERVICE> The machine is executing servicing operations (as when a check is made on operation run ins service mode).

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1. CCD (CCD-/shading-related items; automatic)

Items	Description		Remarks
CCD-ADJ	Use it to start auto adjustment.		Press the item to highlight; then, press the OK key to start execution. At the end of automatic adjustment, the notation 'END' will appear on the screen.
FILT-B	Use it to start the CCD output for R, G, and B.	Use it to generate images expressed by blue signals using cyan only (of all the CCD output signals).	Press the items to highlight; then, place a color original on the copyboard, and press the OK key to make CCD outputs (R, G, and B) using cyan only.
FILT-G		Use it to generate images expressed by green signals using cyan only (of all the CCD output signals).	
FILT-R		Use it to generate images expressed by red signals using cyan only (of all CCD output signals).	

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2. PANEL (control panel)

Items	Description	Remarks
LCD-CHK	Use it to check the LCD for missing dots. (The entire face of the LCD will turn white for several seconds, and blue for several seconds. This sequence is repeated to enable a check.)	Press the item to highlight; then, press the OK key to execute the operation. To stop the operation, press the Stop key.
LED-CHK	Use it to start a check on the LEDs on the control panel.	Press the item to highlight; then, press the OK key to execute the operation so that the LEDs will turn on in sequence.
LED-OFF	Use it to end a check on the control panel LEDs.	
KEY-CHK	Use it to start key inputs. (To select a different item, press the highlighted notation KEY-CHK once again.)	The number/name of the input key will be indicated. For details, see Table 8-614.
TOUCHCHK	Use it to adjust coordinates on the control panel touch panel, i.e., to match the points pressed and the coordinates indicated on the LCD. (To select a different item, press the highlighted notation TOUCHCHK once again.)	Press the + marking on the LCD so that the next + marking will appear. This sequence will be repeated nine times.

Key	Notation on the screen	key	Notation on the screen	Key	Notation on the screen
Copy	COPY	Interrupt	INTERRUPT	Full Color	F-COLOR
Extend	ETC	0~9, #, *	0~9, #, *	Black	BLACK
Reset	RESET	Clear	CLEAR	Start	START
Guide	?	ID	ID	Stop	STOP
Use Mode	M	ACS	ACS	Save Power	STAND BY

Table 8-614

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3. PART-CHK (checks on various electrical parts)

Items	Description	Remarks
FAN-ON	Use it to start the power supply cooling fan (FM4).	Press the item to highlight; then, press the OK key so that the fan will switch from half-speed to high-speed rotation. Press the OK key once again to return it to half-speed rotation.

4. CLEAR (RAM and jam/error code initialization)

Items	Description	Remarks
ERR	Use it to initialize error codes (E000, E001, E003, E004, E009, E211, E215, E217, E717, E808).	Press the item to highlight; then, press the OK key, and turn off and then on the main power switch manually.
R-CON	Use it to initialize the RAM on the reader controller PCB (except some) or the control panel CPU PCB (user mode).	Press the item to highlight; then, press the Ok key to initialize.
JAM-HIST	Use it to initialize the jam history.	
ERR-HIST	Use it to initialize the error code history.	
CNT-ERR	–	
CNT-CLR	–	
E354-CLR	–	

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5. MISC-R (reader unit)

Items	Description	Remarks
SCANLAMP	Use it to start a check on the scanning lamp.	Press the item to highlight; then, press the OK key so that the lamp will turn on for 1 sec.
SC-MOVE	Use it to check the scanner. Indication Operation 1: HP → A 2: HP → B 3: HP → C 4: HP	Press the item to highlight; then, press the OK key to execute '1. HP->A'. Press the OK key once again to execute '2. HP->B'. This sequence will be repeated for 3. and 4.
LAMP-ADJ	Use it to adjust the intensity of light of the new scanning lamp.	Press the item to highlight; then, press the OK key to turn on the scanning lamp. When the scanning lamp replacement VR is turned slowly, a beep will be heard when the optimum intensity is approached. Press the OK key in response to the beep to end the work.
USE-LAMP	Use it to adjust the intensity of the scanning lamp after removing and then mounting the lamp back or when replacing the reader controller PCB or the light intensity detection PCB.	

Caution:

Be sure to wait until the intensity of the lamp has stabilized (about 5 min) before adjusting it (LAMP-ADJ, USE-LAMP).

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6. MISC-P (printer unit)

Items	Description	Remarks
IP-CHK	Use it to run self diagnosis on the AP-IP PCB.	Press the item to highlight; then, press the OK key to start operation. At the end of self diagnosis, 'OK' or 'NG' will appear to the right of 'IP-CHK'.
POWEROFF	Use it to check the auto power-off mechanisms.	Press the item to highlight; then, press the OK, and turn off and then on the power to start the mechanism.
DEV-DRV	Use it to drive the developing rotary and the sleeve motor or about 25 sec.	Press the item to select; then, press the OK key, and turn off and then on the power to start the mechanism.
PPR-FEED	Use it to run a paper feeding test. Select the source of paper (cassette 1/2, multifeeder) and mode of delivery (face-up, face-down) in user mode.	Press the item to highlight, and select face-up or face-down delivery. Press the OK key, and turn off and then on the power to start the mechanisms.
MAIN-DRV	Use it to drive the intermediate transfer drum and the photosensitive drum for about 10 sec.	Press the item to highlight; then, press the OK key, and turn on and then off the power to start the mechanism.
DC-SAVE DC-LOAD	Use it to save the registration settings and high-voltage settings* of the old DC controller PCB to the reader controller PCB when replacing the DC controller PCB. Thereafter, load the settings from the reader controller PCB to the new DC controller PCB. *See Note. Steps 1) Press 'DC-SAVE' to highlight; then, press the OK key. 2) Turn off the power, and mount the new DC controller PCB. 3) Turn on the power, and start service mode once attain. 4) Press 'DC-LOAD' to highlight; then, press the OK key. 5) Check to make sure that the settings have been stored on the DC controller PCB.	For instructions on how to replace the DC controller PCB, see p. 8-9.

Note:

Registration Settings
- All items under ADJUST>IMG-REG
- All items under ADJUST>FEED>ADJ

High-Voltage Settings
- All items under ADJUST>HV-TR

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F. Machine Settings (OPTION)

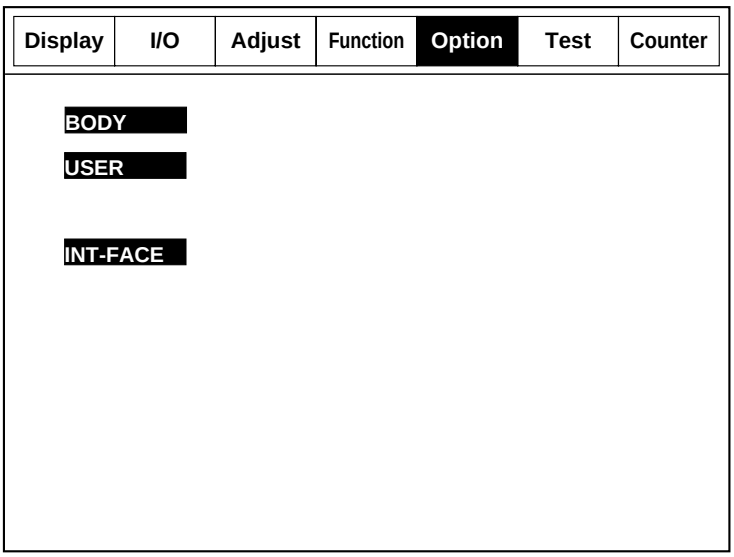

Figure 8-617

1	BODY	Use it to make settings related to the copier.
2	USER	Use it to make settings related to user mode under 'BODY'.
3	INT-FACE	Use it to set conditions for connection of an external controller.

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Level 2 item	Level 3 item	Outline
BODY	MODEL-SZ	Use it to switch between AB and Inch. (0: AB, 1: Inch, 2: A, 3: AB/Inch)
	FIX-TEMP	Use it to enable/disable the fixing improvement mechanism for black halftone. (0: off, 1: on)
	PASCAL	Use it to enable/disable contrast potential/gradation correction data. (0: disable, 1: enable)
	PLT-TYPE	Use it to switch between the standard white plate and white paper. (0: standard white plate, 1: white paper)
	SH-SW	Use it to select the method of shading. (0: standard white plate, 1: white paper)
	DH-SW	Use it to switch modes for image gradation correction control. (0: OFF, 1: as needed, 2: execute, 3: reserved)
	DM-MODE	Use it to enable/disable Dmax control for auto gradation correction. (0: disable, 1: enable)
	ITD-CLN	Use it to enable/disable ITD cleaning rotation insertion mode. (0: disable for all modes, 1: enable for enlarge page separation/page separation, 2; enable for all modes)
	SP-1-SW	Use it to enable/disable separation static elimination for 1st side printing (0: disable, 1: enable)
	SP-2-SW	Use it to enable/disable separation static elimination for 2nd side printing (0: disable, 1: enable)
	TR-ON-SW	Use it to adjust the timing at which secondary transfer bias is turned on, thereby preventing separation faults as when paper wraps around the intermediate transfer drum.
	RE-TR-SW	Use it to select a re-transfer fault correction mode for a high-humidity environment. (0: disable remedy, 1: enable remedy in H/H; 2: enable remedy in H/H and N/N
	EC-GLASS	Use it to specify the use of EC-coat glass. (0: not used, 1: used)
USER	COPY-LIM	Use it to change the print count upper limit. (1 to 100)
	SERIAL	Use it to enter the serial No. indicated on the Soft Counter screen.
	TX-PT-ON	Use it to enable indication of text/photo items when text/photo/map is selected on the User screen. (0: do not indicate 'text/photo', 1: indicate 'text/photo')
	COUNTER1	Use it to set the soft counter 1 indication.
	COUNTER2	Use it to set the soft counter 2 indication.
	COUNTER3	Use it to set the soft counter 3 indication.
	COUNTER4	Use it to set the soft counter 4 indication.
	COUNTER5	Use it to set the soft counter 5 indication.
	COUNTER6	Use it to set the soft counter 6 indication.
	CONTROL	Use it to enable copying, printing, or scanning without the control key, control card, or ID No.
	S/U-SW	Use it to switch between user maintenance or service maintenance. (0: service, 1: user)
INT-FACE	B-CLR	Use it to indicate connection/disconnection of a copy data controller. (0: not connected, 1: connected)

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1. BODY (copier-related machines)

Items	Description	Remarks
MODEL-SZ	Use it to select paper configuration.	0: B 1: Inch 2: A 3: AB/Inch
FIX-TEMP	Use it to enable/disable copy down sequence for the fixing assembly. (Set it to '1' to improve fixing of black halftone. However, note that doing so will increase the first copy time by about 45 sec.)	0: disable 1: enable Standard: 0 For the fixing temperature at OFF, see the printer unit service manual.
PASCAL	Use it to enable/disable the use of gradation correction data obtained by auto gradation correction control.	0: disable 1: enable Standard: 1
PLT-TYPE	Use it to switch between the standard white plate and the aluminum while plate. (The setting need not be changed in the field.)	0: standard white plate 1: aluminum plate Standard: 0
SH-SW	Use it to select the method of shading when the standard white plate is used. (The setting need not be changed in the field.)	0: standard white plate 1: standard while plate with a different hue Standard: 0
DH-SW	Use it to switch modes for image gradeation correction control to suit the needs of the user for image quality. Executing image gradation correction control ensures good gradation of images. When making a decision, keep in mind that both “image density correction control” and “image gradation correction control” require about one minute each.	0: OFF 1: execute after image gradation correction control as needed 2: execute after image gradation correction control always 3: reserved Standard: 0
DM-MODE	Use it to execute image density correction for auto gradation correction. Image density correction control is executed during PG output of auto gradation correction; auto gradation correction is executed with the adjusted image density correction value servicing as the copier's density control standard, thereby improving the accuracy of gradation control. The images are likely to improve, but the auto gradation correction time will increase appreciably.	0: disable 1: enable Standard: 0

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<table>
<tr><th>Items</th><th>Description</th><th>Remarks</th></tr>
<tr><td>ITD-CLN</td><td>Use it to execute ITD cleaning rotation insertion mode as when correcting ITD cleaning faults.
Normally, Y1 → M1 →, C1 → K1 → Y2 → M2 → C2 → K2 → cleaning rotating
When enabled, Y1 → M1 → C1 → K1 cleaning rotation → Y2 → M2 → C2 → K2 → cleaning rotation
(Use it if the image of a 1st page is found conspicuously on a 2nd page as when printing in enlargement page separation/page separation.)</td><td>0: disable
1: enable in enlargement page separation/page separation
2: enable for all modes
Standard: 1</td></tr>
<tr><td>SP-1-SW</td><td>Enable separation static elimination if claw-like lines* or tread-like lines** occur because of low humidity when generating (copying/printing) a 1st page in a normal temperature/normal humidity environment.
<table>
<tr><th></th><th>H/H</th><th>N/N</th><th>N/L</th><th>L/L</th></tr>
<tr><td>1st page</td><td>OFF</td><td>Enable/ disable using this mode.</td><td>ON</td><td>ON</td></tr>
</table></td><td>0: disable.
1: enable.
Standard: 0</td></tr>
<tr><td>SP-2-SW</td><td>Enable/disable separation static elimination if brush-like lines*** occur on some types of paper when copying/printing a 2nd side in double-sided mode using auto/multifeeder mode in a high-temperature/high-humidity environment or when copying/printing a 2nd side in double-sided mode using auto/multifeeder mode in a high-temperature/high-humidity environment.
<table>
<tr><th></th><th>H/H</th><th>N/N</th><th>N/L</th><th>L/L</th></tr>
<tr><td>Auto double-sided</td><td rowspan="2">For these three items enable/ disable the mechanism using this mode.</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Manual double-sided</td><td></td><td>ON</td><td>ON</td></tr>
</table></td><td>0: disable (if brush-like occur)
1: enable (if claw-like lines occur)
Standard: 1</td></tr>
<tr><td>TR-ON-SW</td><td>Use it to set the secondary transfer bias application timing if paper wraps around the intermediate transfer drum or separation faults occur.</td><td>Settings: 0 to +3
Standard: 1</td></tr>
</table>

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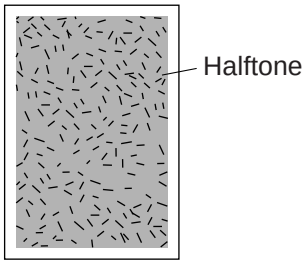
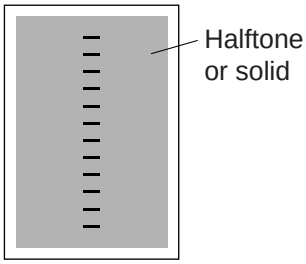
Items	Description	Remarks
RE-TR-SW	Use it to enable/disable the use of a remedy against re-transfer occurring in a high humidity environment. The Dmax control parameter will change, consequently changing the primary charging bias and the primary transfer bias to the appropriate settings. Steps 1) Enter the setting in service mode. 2) End service mode, and turn off and then on the control panel power soft switch. 3) Execute auto graduation correction in user mode. 4) End.	0: disable remedy. 1: enable remedy in H/H. 2: enable remedy in H/H and N/N. Standards: 0
EC-GLASS	Use it to specify the use of EC coated glass.	0: not used. 1: used. Standard: 1

*Claw-like lines



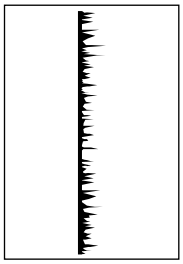
Numerous claw-like lines occur in a halftone image.

**Tread-like lines.



Tread-like lines occur in a halftone or solid image at intervals equal to the ribs on the feeding guide (in the secondary transfer belt assembly).

***Brush-like lines.



Distorted black lines and text occur across the paper.

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2. USER (machine settings related to user mode under BODY)

Items	Description	Remarks
COPY-LIM	Use it to change the copy count upper limit.	Settings: 1 to 100 (unit: pages) Standards: 100
SERIAL	Use it to enter the 5-digit serial No. of the reader unit when replacing the reader controller PCB.	
TX-PT-ON	Use it to disable indication of 'text/photo'.	0: enable indication. 1: disable indication. Standard: 0
COUNTER1	Use it to set the soft counter 1 for the User Mode screen. (Table 8-615)	Settings: 0 to +95 Standard: depends on country. (Table 8-616)
COUNTER2	Use it to set the soft counter 2 for the User Mode screen. (Table 8-615)	
COUNTER3	Use it to set the soft counter 3 for the User Mode screen. (Table 8-615)	
COUNTER4	Use it to set the soft counter 4 for the User Mode screen. (Table 8-615)	
COUNTER5	Use it to set the soft counter 5 for the User Mode screen. (Table 8-615)	
COUNTER6	Use it to set the soft counter 6 for the User Mode screen. (Table 8-615)	

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<table>
<tr><th>Items</th><th>Description</th><th>Remarks</th></tr>
<tr><td>CONTROL</td><td>Use it to enable copying, or printing with conditions by changing the last 3 digits of the appropriate input in the absence of the control key, control card, or ID No.
• In Place of the Control Key
<table>
<tr><th>1st digit of CONTROL</th><th>Black-and-white copy</th><th>Black-and-white print</th><th>Color print</th></tr>
<tr><td>0</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>2</td><td>X</td><td>O</td><td>O</td></tr>
<tr><td>3</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>4</td><td>O</td><td>O</td><td>O</td></tr>
</table>
• In Place of a Control Card
<table>
<tr><th>2nd digit of CONTROL</th><th>Black-and-white copy</th><th>Black-and-white print</th><th>Color print</th></tr>
<tr><td>0</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>2</td><td>X</td><td>O</td><td>O</td></tr>
<tr><td>3</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>4</td><td>O</td><td>O</td><td>O</td></tr>
</table>
• In Place of an ID No.
<table>
<tr><th>3rd digit of CONTROL</th><th>Black-and-white copy</th><th>Black-and-white print</th><th>Color print</th></tr>
<tr><td>0</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>2</td><td>X</td><td>O</td><td>O</td></tr>
<tr><td>3</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>4</td><td>O</td><td>O</td><td>O</td></tr>
</table>
O: enable. X: disable
• If '2' is set to CONTROL, black-and-white/color printing will be possible without the control key; without a control card and a control card, none is allowed.
• If '421' is set to CONTROL, all will be prohibited without the control key; black-and-white/color printing will be allowed without a control card; and black-and-white copying/black-and-white/color printing will be possible without an ID No.</td><td>Settings: 0 to 4
(for each)
Standard: 0 (for each)
Guide to Indication
CONTROL XXX
1st digit
2nd digit
3rd digit</td></tr>
<tr><td>S/U-SW</td><td>Use it to switch between user maintenance or service maintenance at time of installation. (The User screen will differ depending on the method of maintenance).
0: service maintenance.
1: user maintenance.</td><td>Settings: 0, 1
Standards: 1 (US)
0 (non US)</td></tr>
</table>

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• Soft Counter Specifications

No.	Counter	Function	Color	Paper size	Count for double-sided	Count for large-size
0	None					
1	Total counter 1	C+P	All	M	–	1
2	Total counter 2	C+P	All	M	–	2
3	Total counter (full color 1)	C+P	4C	M	–	1
4	Total counter (full color 2)	C+P	4C	M	–	2
5	Total counter (mono color)	C+P	Mono	M	–	1
6	Total counter (black-and-white 1)	C+P	Bk	M	–	1
7	Total counter (black-and-white 2)	C+P	Bk	M	–	2
8	Total counter (large-size)	C+P	All	L	–	1
9	Total counter (small size)	C+P	All	S	–	–
10	Copy counter 1	C	All	M	–	1
11	Copy counter 2	C	All	M	–	2
12	Copy counter (full color 1)	C	4C	M	–	1
13	Copy counter (full color 2)	C	4C	M	–	2
14	Copy counter (mono color 1)	C	Mono	M	–	1
15	Copy counter (mono color 2)	C	Mono	M	–	2
16	Copy counter (black-and-white 1)	C	Bk	M	–	1
17	Copy counter (black-and-white 2)	C	Bk	M	–	2
18	Copy counter (full color, large-size)	C	4C	L	–	1
19	Copy counter (full color, small-size)	C	4C	S	–	–
20	Copy counter (mono color, large-size)	C	Mono	L	–	1
21	Copy counter (mono color, small-size)	C	Mono	S	–	–
22	Copy counter (black-and-white, large-size)	C	Bk	L	–	1
23	Copy counter (black-and-white, small size)	C	Bk	S	–	–
24	Copy counter (full color, large-size, double-sided)	C	4C	L	O	1
25	Copy counter (full color, small-size, double-sided)	C	4C	S	O	–
26	Copy counter (mono color, large-size, double-sided)	C	Mono	L	O	1
27	Copy counter (mono color, small-size, double-sided)	C	Mono	S	O	–
28	Copy counter (black-and-white, large-size, double-sided)	C	Bk	L	O	1
29	Copy counter (black-and-white, small-size, double-sided)	C	Bk	S	O	–
30	Print counter 1	P	All	M	–	1
31	Print counter 2	P	All	M	–	2
32	Print counter (full color 1)	P	4C	M	–	1
33	Print counter (full color 2)	P	4C	M	–	2
34	Print counter (mono color 1)	P	Mono	M	–	1
35	Printer counter (mono color 2)	P	Mono	M	–	2
36	Print counter (black-and-white 1)	P	Bk	M	–	1
37	Print counter (black-and-white 2)	P	Bk	M	–	2

Table 8-615(a)

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No.	Counter	Function	Color	Paper size	Count for double-sided	Count for large-size
38	Print counter (full color, large-size)	P	4C	L	–	1
39	Print counter (full color, small-size)	P	4C	S	–	–
40	Print counter (mono color, large-size)	P	Mono	L	–	1
41	Print counter (mono color, small-size)	P	Mono	S	–	–
42	Print counter (black-and-white, large-size)	P	Bk	L	–	1
43	Print counter (black-and-while, small-size)	P	Bk	S	–	–
44	Print counter (full color, large-size, double-sided)	P	4C	L	O	1
45	Print counter (full color, small-size, double-sided)	P	4C	S	O	–
46	Print counter (mono color, large-size, double-sided)	P	Mono	L	O	1
47	Print counter (mono color, small-size, double-sided)	P	Mono	S	O	–
48	Print counter (black-and-white, large-size, double-sided)	P	Bk	L	O	1
49	Print counter (black-and-white, small-size, double-sided)	P	Bk	S	O	–
54	Copy scan counter (full color, large-size)	S	4C	L	–	1
55	Copy scan counter (full color, small-size)	S	4C	S	–	–
56	Copy scan counter (black-and-white, large-size)	S	Bk	L	–	1
57	Copy scan counter (black-and-white, small-size)	S	Bk	S	–	–
58	Copy + print (full color, large-size)	C+P	4C	L	–	1
59	copy + print counter (full color, small-size)	C+P	4C	S	–	–
60	Copy + print counter (black-and-white, large-size)	C+P	Bk	L	–	1
61	Copy + print counter (black-and-white, small-size)	C+P	Bk	S	–	–
62	Copy + print counter (black-and-white 2)	C+P	Bk	M	–	2
63	Copy + print counter (black-and-white 1)	C+P	Bk	M	–	1
64	Copy + print counter (full color + mono color, large-size)	C+P	4C+Mono	L	–	1
65	Copy + print counter (full color + mono color, small-size)	C+P	4C+Mono	S	–	–
66	Copy + print counter (full color + mono color 2)	C+P	4C+Mono	M	–	2
67	Copy + print counter (full color + mono color 1)	C+P	4C+Mono	M	–	1
68	Copy counter (full color + mono color, large-size)	C	4C+Mono	L	–	1
69	Copy counter (full color + mono color, small-size)	C	4C+Mono	S	–	–
70	Copy counter (full color + mono color 2)	C	4C+Mono	M	–	2
71	Copy counter (full color + mono color 1)	C	4C+Mono	M	–	1
72	Print counter (full color + mono color, large-size)	P	4C+Mono	L	–	1
73	Print counter (full color + mono color, small-size)	P	4C+Mono	S	–	–
74	Print counter (full color + mono color 2)	P	4C+Mono	M	–	2
75	Print counter (full color + mono color 1)	P	4C+Mono	M	–	1
76	Copy + print counter (large-size)	C+P	All	L	–	1
77	Copy + print counter (small-size)	C+P	All	S	–	–
78	Copy + print counter 2	C+P	All	M	–	2
79	Copy + print counter 1	C+P	All	M	–	1

Table 8-615(b)

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No.	Counter	Function	Color	Paper size	Count for double-sided	Count for large-size
80	Copy counter (large-size)	C	All	L	–	1
81	Copy counter (small-size)	C	All	S	–	–
82	Print counter (large-size)	P	All	L	–	1
83	Print counter (small-size)	P	All	S	–	–
84	Total counter (mono color, large-size)	C+P	Mono	L	–	1
85	Total counter (mono color, small-size)	C+P	Mono	S	–	–
86	Total counter (black-and-white, large-size)	C+P	Bk	L	–	1
87	Total counter (black-and-white, small-size)	C+P	Bk	S	–	–
88	Copy scan counter (full color)	S	4C	M	–	–
89	Copy scan counter (black-and-white)	S	Bk	M	–	–
90	Copy scan counter (large-size)	S	All	L	–	–
91	Copy scan counter (small-size)	S	All	S	–	–
92	Copy scan counter (total)	S	All	M	–	–
93	Copy scan counter (large-size 4)	S	All	L	–	–
94	Copy scan counter (small-size 4)	S	All	S	–	–
95	Copy scan counter (total 4)	S	All	M	–	–

Table 8-615(c)

Model	Model No.	Counter 1	Counter 2	Counter 3	Counter 4	Counter 5	Counter 6
120V(USA)	F13-5731	1	6	68	69	72	73
120V(TWN)	F13-5701	1	6	58	59	5	0
230V(Others)	F13-5741	1	6	58	59	5	0
230V(UK)	F13-5751	1	64	65	77	60	61
230V(CA)	F13-5761	1	6	68	69	72	73
230V(FRN)	F13-5771	1	64	65	77	60	61
230V(GER)	F13-5781	1	64	65	60	61	95
230V(AMS)	F13-5791	1	6	68	69	72	73
230V(ITA)	F13-5721	1	6	68	69	72	73

Table 8-616

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Guide to Terms

• Functions
C stands for copying; P, for printing; and S, for scanning.

• Color
4C standards for 4 full colors; MONO, for yellow, magenta, cyan, blue, green, red, and brown; BK, for black; ALL, for 4C, MONO, BK.

• Paper Size
L stands for large-size (larger than B4); S, for small-size (smaller than B4); M, for large- and small-sizes.

• Count for Double-Sided
O: by a signal count (by 1).
–: as in normal copying.

• Count for large-Size
1: by a single count (by 1).
2: by a double count (by 2).

3. INT-FACE (conditions for settings when a connection is mode to an external controller)

Items	Description	Remarks
B-CLR	Clearing E717 1) Install the copy data control. 2) Turn on the power, and execute error clear in service mode. 3) Set B-CLR to '0'. You can "disconnect" the copy data controller temporarily by performing these steps.	0: not connected. 1: connected.

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G. Test Print Mode (TEST)

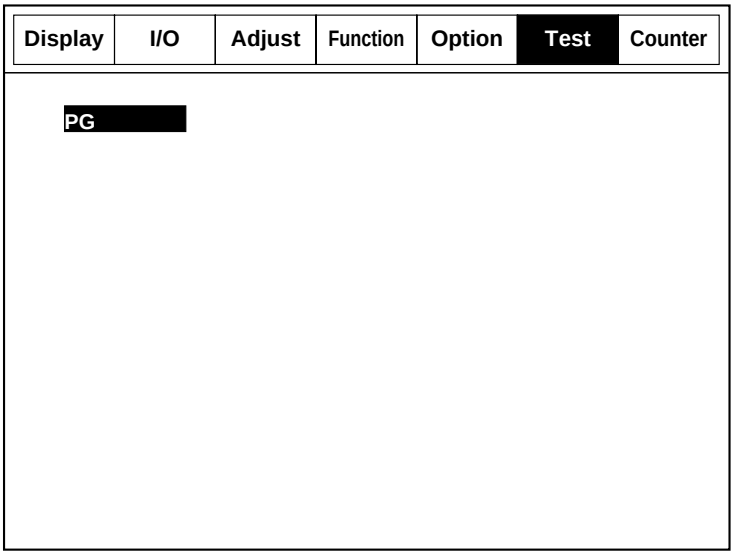

Figure 8-618

1	PG	Use it to select a type of test print, and generate it.

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1. PG (test print type selection and generation)

Items	Description	Remarks
TYPE	Use it to enter a number. Then, press the Copy Start key to generate a test print.	For the test print No., see table 8-617.
TXPH	Use it to switch between text mode and photo mode.	3: text/photo/map. 4: film photo. 5: printed photo. 6: text/photo. 7: black-and-white text. Note that these settings are effective in test print mode only.
THRU	Use it to enable/disable the use of the gate array of the laser controller PCB.	0: disable gate array. 1: enable gate array. These settings are effective in test print mode only.
DENS-Y	Use it to adjust the density of Y at TYPE=5.	Settings: 0 to +255 These settings are effective in test print only.
DENS-M	Use it to adjust the density of M at TYPE=5.	
DENS-C	Use it to adjust the density of C at TYPE=5.	
DENS-K	Use it to adjust the density of K at TYPE=5.	
COLOR-Y	Use it to enable/disable generation of Y for each TYPE.	0: disable. 1: enable. These settings are effective in test print only.
COLOR-M	Use it to enable/disable generation of M for each TYPE.	
COLOR-C	Use it to enable/disable generation of C for each TYPE.	
COLOR-K	Use it to enable/disable generation of K for each TYPE.	
F/M-SW	Use it to switch between full color and mono color for PG generation. Fo mono color, set '1', and select the output color under 'COLOR-Y/M/C/K'.	0: full color 1: mono color

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No.	Test print
00	Image from the CCD (normal coping)
01	For R&D
02	256 colors
03	256 gradations
04	16 gradations
05	Entire face in halftone
06	Grid
07	For R&D
08	Fro R&D
09	For R&D
10	YMCK horizontal stripe (laser FF activation)
11	Fro R&D
12	YMCK 64 gradations
13	BGR 64 gradations
14	Full-color 16 gradations
15	Full-color light area 16 gradations
16	YMCK horizontal stripes (laser A0 activation)

Table 8-617

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H. Counter Mode (COUNTER)

1	TOTAL	Total counter
2	SCANNER	Scan counter
3	PICK-UP	Pick-up counter
4	FEEDER	Feeder counter
5	JAM	Jam counter

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1. TOTAL (total counter)

Items	Description	Remarks
SERVICE1	Total counter 1 for servicing	After '99999999', returns to '00000000'. *Only when the printer board (PS/PCL) is installed.
SERVICE2	Total counter 2 for servicing	
TTL	Total counter (copy + print* + combination)	
L-TTL	Large-size total counter (copy + print* + combination)	
S-TTL	Small-size total counter (copy + print* + combination)	
C-L-TTL	Color large-size total counter (copy + print* + combination)	
C-S-TTL	Color small-size total counter (copy + print* + combination)	
K-L-TTL	Black large-size total counter (copy + print* + combination)	
K-S-TTL	Black small-size total counter (copy + print* + combination)	
COPY	Total copy counter	
L-COPY	Large-size total copy counter	
S-COPY	Small-size total copy counter	
C-L-COPY	Color large-size total copy counter	
C-S-COPY	Color small-size total copy counter	
K-L-COPY	Black large-size total coy counter	
K-S-COPY	Black small-size total copy counter	
PRNT	Total print counter*	
L-PRNT	Large-size total print counter*	
S-PRNT	Small-size total print counter*	
C-L-PRNT	Color large-size total print counter*	
C-S-PRNT	Color small-size total print counter*	
K-L-PRNT	Black large-size total print counter*	
K-S-PRNT	Black small-size total printer counter*	
4C-TTL	4-color total copy counter	
Y-COPY	Y mono copy counter	
M-COPY	M mono copy counter	
C-COPY	C mono copy counter	
K-COPY	K mono copy counter	

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2. SCANNER (scanner-related counter)

Items	Description	Remarks
SC-TTL	Scanner total scan counter	After '99999999', returns to '00000000'.
SC-COPY	Scan counter for copying	

3. PICK-UP (pick-up-related counter)

Items	Description	Remarks
C1	Cassette 1 pick-up total counter	After '99999999', returns to '00000000'.
L-C1	Large-size cassette 1 pick-up total counter	
S-C1	Small-size cassette 1 pick-up total counter	
C2	Cassette 2 pick-up total counter	
L-C2	Large-size cassette 2 pick-up total counter	
S-C2	Small-size cassette 2 pick-up total counter	
C3*1	Cassette 3 pick-up total counter	
L-C3*1	Large-size cassette 3 pick-up total counter	
S-C3*1	Small-size cassette 3 pick-up total counter	
C4*2	Cassette 4 pick-up total counter	
L-C4*2	Large-size cassette 4 pick-up total counter	
S-C4*2	Small-size cassette 4 pick-up total counter	
MF	Multifeeder pick-up total counter	
L-MF	Large-size multifeeder pick-up total counter	
S-MF	Small-size multifeeder pick-up total counter	
DK*3	External paper deck pick-up total counter	
L-DK*3	Large-size external paper deck pick-up total counter	
S-DK*3	Small-size external paper deck pick-up total counter	
2-SIDE	2nd side in double-sided mode total counter	
L-2-SIDE	Large-size 2nd side in double-sided mode total counter	
S-2-SIDE	Small-size 2nd size in double-sided mode total counter	

*1: For the 2×500 Sheet Paper Deck, 2000 Sheet Paper Deck.
*2: For the 2×500 Sheet Paper Deck.
*3: For the 1000 Sheet Paper Deck.

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4. FEEDER (feeder-related counter)

Items	Description	Remarks
FEED	Feeder pick-up total counter	After '99999999', returns to '00000000'.
L-FEED	Large-size original feeder pick-up total counter	
S-FEED	Small-size original feeder pick-up total counter	
PICKUP-L	Left pick-up total counter	

5. JAM (jam-related counter)

Items	Description	Remarks
TOTAL	Indicates the total number of jams in the copier.	After '99999999', returns to '00000000'. *Only when the printer board (PS/PCL) is installed.
PRINT*	Indicates the total number of print jams in the copier.	
FEEDER	Indicates the total number of jams in the feeder.	
SORTER	Indicates the total number of jams in the sorter.	

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I. FEEDER

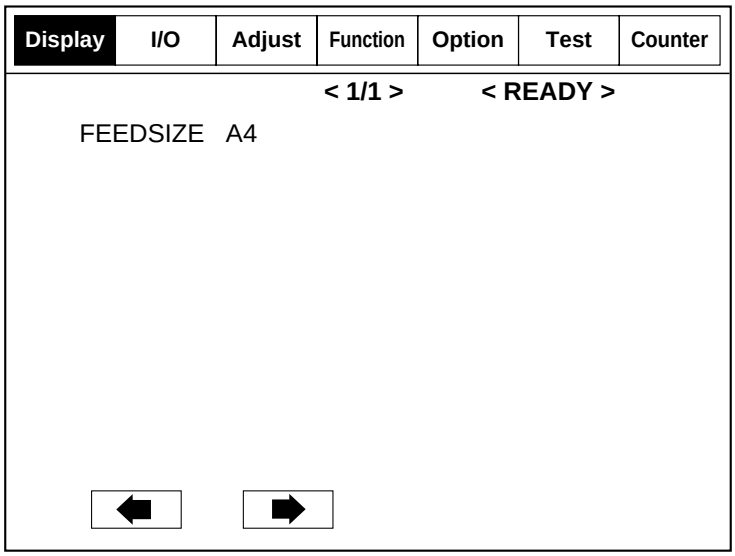

Figure 8-619

Level 1 item	Level 3 item	Outline
DISPLAY	FEEDSIZE	Use it to indicate the size of the original detected by the feeder.
ADJUST	DOCST	Use it to adjust the original stop position for top pick-up mode.
	DOCST-RP	—
	P-INTL-U	Use it to adjust the sheet-to-sheet distance for top pick-up mode.
	P-INTL-D	—
FUNCTION	SENS-INT	Use it to adjust the ADF sensor auto sensitivity (initialization).
	UBLT-CLN	Use it to execute separation belt cleaning mode for top pick-up for the DADF.
	DBLT-CLN	—
OPTION	SIZE-SW	Use it to enable/disable the size mix mechanism (AB-/Inch-size originals).
	DOC-DELI	—

Note:
For FEEDER items, I/O, Test, or Counter modes are not used.

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<DISPLAY>

Items	Description	Remarks
FEEDSIZE	Use it to indicate the size of the original detected by the feeder in terms of paper sizes; e.g., A, LTR.	

<ADJUST>

Items	Description	Remarks
DOCST	Use it to adjust the original stop position for top pick-up mode. After selecting this mode, place an original on the DADF original tray, and press the OK key. When the original has been fed, open the feeder, and check the position of the original stopped on the copyboard glass. If it is to the left of the V marking, increase the setting. If it is to the right of the V marking, decreases the setting.	Unit: 0.5 mm
DOCST-RP	—	
P-INTL-U	Use it to adjust the sheet-to-sheet distance for top pick-up. 1) Select the mode, and place two originals on the original tray. 2) Press the OK key so that the original will be picked up and stopped on the copyboard glass. 3) Adjust the sheet-to-sheet distance. If it is small, increase the setting. If it is large, decrease the setting.	Unit: 0.5 mm
P-INTL-D	—	

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<FUNCTION>

Items	Description	Remarks
SENS-INT	Use it to adjust the feeder sensor auto sensitivity (initialization). Execute this mode if you have replaced the feeder controller PCB, original tray paper sensor (S1), or registration sensor (S3). However, keep in mind that you must perform additional steps if you have replaced the DADF controller PCB. The contents of this adjustment are the same as making adjustments using the DIP switch on the feeder controller PCB. 1) Remove the feeder controller cover, and check the position of LED1/2. 2) Select this mode, and press the OK key. 3) See that the copier executes the mode and stops automatically.	See "Standards and Adjustments" in the Feeder Service Manual.
UBLT-CLN	Use it to execute separation belt cleaning mode for feeder top pick-up mode. ■ Steps 1) Select 'UBLT-CLN' to highlight. 2) Moisten the center of paper with solvent, and set it on the original tray of the feeder. 3) Press the OK key so that the paper will be picked up and then stopped in the middle, and the top pick-up separation belt rotates idly. 4) Press the OK key to stop the operation. 5) Open the upper cover of the feeder, remove the paper, and close the upper cover.	
DBLT-CLN	—	

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<OPTION>

Items	Description	Remarks
SIZE-SW	Use it to enable detection of a mix of AB- and Inch-size originals. 0: disable detection. 1: enable detection.	Standard: 0
DOC-DELI	—	

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VII. SELF DIAGNOSIS

The AP-IP PCB and the microprocessor on the DC controller PCB of the printer unit are quipped with a self diagnostic mechanism which checks the condition of the copier (in particular, condition of the sensors). The mechanism runs a check as needed and, upon detection of an error, will indicate an error code on the machine's control panel.

A. Copier

Code	Cause	Description
E000	The fixing assembly warm-up is faulty.	When the time taken to reach the standby temperature from 20°C after the fixing heater has been turned on is longer than the reference time.
E001	The fixing assembly has overheated.	The fixing temperature during stand-by or copying exceeds about 230°C.
E003	The fixing temperature is abnormally low.	The fixing assembly temperature drops below 120°C after it has reached the target value.
E004	The upper/lower fixing heater has an open circuit.	A check is made for an open circuit at the start of temperature control. The AC current expected in the fixing heater is absent.
E009	The fixing assembly type is wrong.	The rated voltage of the copier's power supply and that of the fixing assembly do not match.
E010	The main motor start-up is faulty.	The revolution of the main motor fails to reach a specific value.
E011	The main motor rotation is faulty.	The revolution of the main motor deviates from a specific value.
E013	The waste toner case is full.	A specific number of copies have been made after the waste toner case full warning has been issued (DISPLAY>SENSOR>W-TONER).
E019	The waste toner detection assembly operation is faulty.	At time of power-on or while the drum motor is rotating during printing operation, the light-receiving cell of the waste toner sensor does not detect light for a specific time even when the waste toner case is not full.
E020	The density sensor is faulty.	During image stabilization correction control, the LED intensity signal (LEDCNT) is not generated or, if generated, is not received by the diode 1/2 normally.

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Code	Cause	Description
E021	The developing rotary assembly is faulty.	• The developing rotation position sensor (PS3) does not detect the rotation position flag even when the developing rotary motor has rotated for a specific time. • The developing rotary position sensor (PS3) detects a faulty or wrong rotation position flag width.
E032 *1	The counter for the copy data controller fails to operate.	The illegal prevention bit of the control device goes '0' when the open circuit detection mechanism is not disabled.
E040	The holding plate lifter (multifeeder) is faulty.	During multifeeder pick-up, the holding plate position sensor (PS1302) does not detect the holding plate even when the DC controller PCB has generated the holding plate solenoid (SL4) ON signal.
E054	The duplexing roller of the duplexing unit drive mechanism is faulty. (The duplexing unit is an accessory.)	The duplexing feeding roller 1 home position sensor (PS23) does not detect the home position of the duplexing feeding roller 1 when copy paper is being fed to the duplexing unit.
E055	The horizontal registration guide mechanism of the duplexing unit is faulty. (The duplexing unit is an accessory.)	The duplexing driver PCB has detected that the horizontal registration guide has moved in excess of the maximum distance from when the home position has been detected.
E066	The temperature/humidity sensor is faulty.	During image stabilization control, the DC controller PCB cannot detect the temperature sensor signal (TMPSNS) or the humidity sensor signal (HUMSNS).
E100	The laser of the scanner unit is faulty.	The DC controller PCB detects BDERR for 2.5 sec or more after the scanner motor has rotated at a specific speed.
E110	The laser scanner motor is faulty.	• The scanner motor fails to reach a specific revolution within 10 sec after it has started to rotate. • The BD PCB detects an error within 2.5 sec after the scanner motor has rotated at a specific revolution.
E196	The EEPROM on the DC controller PCB is faulty.	The EEPROM (IC212) on the DC controller PCB has an error.

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Code	Cause	Description
E197	The internal communication has an error.	A machine internal communication error occurs more than once. Or, the reception interruption on the DC controller side does not occur for a specific time for internal communication.
E198	The IC on the DC controller PCB has an error.	The IC on the DC controller PCB has an error.
E202 • No code is indicated. • The control panel keys lock.	The scanner home position cannot be detected: • The scanner home position sensor (PS101) is faulty. • The scanner motor (PM1)/scanner motor driver PCB is faulty.	The scanner does not return to the home position when it has been started.
E203	The scanner motor driver PCB or the scanner motor is faulty.	• The scanner home position is detected during back-scanning (not requiring return to the scanner home position sensor). • A deviation occurs during back-scanning (returning to the scanner home position sensor).
E211	The thermistor of the scanning lamp (fluorescent lamp) has an open circuit.	• The temperature does not reach 10°C after supplying the scanning lamp heater with power for 2 min (starting at 0°C or less). • The temperature drops to 0°C or less during temperature control.
E215	The scanning lamp (fluorescent lamp) thermistor has a short circuit.	The thermistor of the scanning lamp detects 170°C or more when the florescent lamp ON signal (FLON) is off (including power-on).
E216	The scanning lamp (fluorescent lamp) fails to turn on when the power has been turned off and then on.	The intensity sensor does not detect light from the scanning lamp in 15 sec.
E217	The scanning lamp heater is out of order.	The temperature does not exceed the setting when the lamp heater is powered for 3 min or more while the scanning lamp heater is put through constant temperature control.
E218	• The scanning lamp (fluorescent lamp) is absent. • The inverter PCB (reader unit) is faulty.	• Activation is attempted when the scanning lamp is not mounted. • The filament of the lamp is broken.
E219	The scanning lamp (fluorescent lamp) has reached the end of its life.	The thermistor of the scanning lamp detects 150°C or more while the scanning lamp is on.

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Code	Cause	Description
E240	• The communication between the DC controller PCB and the reader controller PCB is faulty. • The communication between the DC controller PCB and the PS/PCL board or between the reader controller PCB and the PS/PCL board is faulty	• The DPPRDY signal is not sent for 0.25 sec or more from the reader controller to the DC controller PCB after the DC controller PCB is supplied with power. • The signals between the PS/PCL board and the DC controller PCB or between the PS/PCL board and the reader controller PCB cannot be exchanged for a specific time after the PS/PCL board is supplied with power.
E243	The control panel CPU has a communication error.	The communication between the control panel CPU PCB and the reader controller PCB is not possible 20 sec or more after power-on.
E351	• The ECO PCB is faulty. • The power is shut off abnormally.	The power is shut off abnormally at power-on.
E353	The serial No. of the EEPROM on the reader controller PCB and that of the SRAM ON the reader controller PCB do not match.	A mismatch was detected at power-on.
E355	The serial Nos. of the reader unit, reader controller PCB (SRAM), and EEPROM do not match.	When the serial No. of the reader unit is entered in service mode and the OK key is pressed, it is found that the serial Nos. of the reader unit, reader controller PCB (SRAM), and EEPROM do not match.
E401 *2	• The pick-up motor (M1) fails to rotate. • The pick-up roller sensor (S5) is faulty.	A flag is attached to the spindle of the pick-up motor (M1), and the rotation of the motor is checked in reference to the flag blocking the pick-up roller sensor (S5). This error is identified when the sensor does not turn on and off twice or more within 1 sec.
E402 *2	• The belt motor (M3) fails to rotate. • The belt motor clock sensor (S10) is faulty.	The number of belt motor clock pulses within 200 msec is less than a specific value.
E403 *2	• The feeder motor (M2) fails to rotate. • The feeder motor clock sensor (S9) is faulty.	The number of feeder motor clock pulses within 200 msec is less than a specific value.
E404 *2	• The delivery motor (M5) fails to rotate. • The delivery motor clock sensor (S13) is faulty.	The number of feeder motor clock pulses within 200 msec is less than a specific value.
E411 *2	• The original tray paper sensor (S1) is faulty. • The registration sensor (S3) is faulty.	The sensor output is 2.3 V or more in the absence of paper.

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Code	Cause	Description
E545 *4	The bin flapper 1 of the sorter-H1 is faulty.	The bin flapper solenoid sensor (PI12) does not detect solenoid operation even when the solenoid (SL3) is driven during initialization or face-down delivery. Or, the bin flapper sensor remains on even when the solenoid has stopped operation.
E546 *4	The bin flapper 2 of the Sorter-H1 is faulty.	The bin flapper solenoid sensor (PI12) does not detect solenoid operation even when the solenoid (SL4) is driven during initialization or face-down delivery. Or, the bin flapper sensor remains on even when the solenoid has stopped operation.
E677 *3	The initial communication between the ACC controller PCB and an accessory has an error.	• The ACC controller PCB and the accessory fail to become ready for communication in 4 sec (possibly, a problem in the power supply). • An initial communication error with each accessory has occurred.
E678 *3	The communication between the ACC controller PCB and an accessory has been interrupted.	• The accessory is turned off in the middle of communication. • The cable of the accessory has been disconnected in the meddle of communication.
E679 *3	The protocol used for communication between the ACC controller PCB and an accessory has an error.	The read/write/parity check of data is faulty, and communication fails to end within a specific time.
E710	The IPC (initialization) error has occurred.	The IPC sync register for the reader unit and the reader unit-related accessories fail to go '1' within a specific time (3 sec).
E711	The IPC (initialization) error has occurred.	In the communication between the reader unit and the reader unit-related accessories, data has been written 10 times or more to the error register within as specific time (1.5 sec).
E712 *3	The IC for communication on the feeder side is faulty.	The communication with the reader unit has been interrupted for 5 sec or more.
E717 *1	The IC for communication on the copy data controller side is faulty.	• The communication is not resumed in a specific time (3 sec). • The device is removed and the copier is started without disabling open circuit detection.
E805	The heat discharge fan 1 (FM); used for the fixing assembly and area near the feeding assembly) is faulty.	The motor lock signal (FAN1LK) goes '1' for 1.5 sec or more while the fan is rotating.

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Code	Cause	Description
E806	The heat discharge fan (FM2; used for the area around the intermediate transfer drum) is faulty.	The fan motor lock signal (FAN2LK) goes '1' for 1.5 sec or more while the fan is rotating.
E807	The heat discharge fan (FM3; used for the area around the scanner) is faulty.	The fan motor lock signal (FAN3LK) goes '1' for 1.5 sec or more while the fan is oration.
E808	The fixing drive circuit/power unit is faulty.	The fixing heater safety circuit has detected a fault in the upper/lower fixing heater.
E809	The power supply cooling fan (FM4; used for the area around the reader unit main power supply) is faulty.	The fan error signal (FANERR) goes '0' for 1.5 sec or more while the fan is rotating.
E810	The drum cartridge is absent.	The drum cartridge detecting switch does not turn on at power-on or when the cover is opened/closed.
E812	The intermediate transfer drum (ITD) is absent.	The intermediate transfer drum (ITD) home position is not detected within a specific time (about 10 sec).
E813	The fixing assembly is absent.	Both the upper fixing roller temperature detection signal (FXTHU) and the lower fixing roller temperature detection signal (FXTHL) indicate -10°C or less.
E814	The photosensitive drum in the drum cartridge has reached the end of its life.	A specific number of copies have been counted after issuing the photosensitive drum end of life warning.
E903 *5	The paper deck lifter is faulty.	• An error has been detected of the paper deck lifter motor. • The lifter upward movement takes longer than a specific time. • The paper level change time is in excess of a specific value while the lifter is moving up.

Note:

For troubleshooting faults related to the printer unit, see IV. "Troubleshooting Malfunctions" in Chapter 8; however, for disassembly/assembly, see the Printer Unit Service Manual.

*1: See the Copy Data Controller Service Manual.
*2: See the Feeder Service Manual.
*3: See the ACC Controller Service Manual.
*4: See the 7-Bin Sorter Service Manual.
*5: See the Paper Deck Service Manual.

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Caution:

1. When the self diagnosis mechanism has turned on, the copier may be reset by turning it off and then on. However, perform the following if E000, E001, E003, E004, E009, E211, E215, E217, E717, or E808 is indicated:

   1) Select FUNCTION>CLEAR in service mode.
   2) Press 'ERR' to highlight.
   3) Press the OK key, and turn on and off the rear power switch manually; then, turn on the control panel soft switch to clear the E code.
   4) See that the message on the control panel has disappeared and the Copy Mode screen has appeared.

2. For E000, E001, E003, E004, E009, and E808, the copier will turn off in 20 sec after detection of the error.

3. If E001 or E003 has occurred, the error data may be retained in the error memory capacitor (C259) the DC controller PCB of the printer unit. Be sure to discharge the capacity after removing the cause. (To do so, short JP201 on the DC controller PCB; for details, see the Printer Unit Service Manual.)

4. Select DISPLAY>ERR to check the error history.

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APPENDIX

Caution:

- The reader unit is not used on its own, and the basic sequences of operations are provided in terms of its printer functions used as a copier.
- For the signal names, general circuit diagrams, special tools, and solvents/oils, see the Printer Unit Service Manual.
- For the timing charts when it is used as printer, see the Printer Unit Service Manual.

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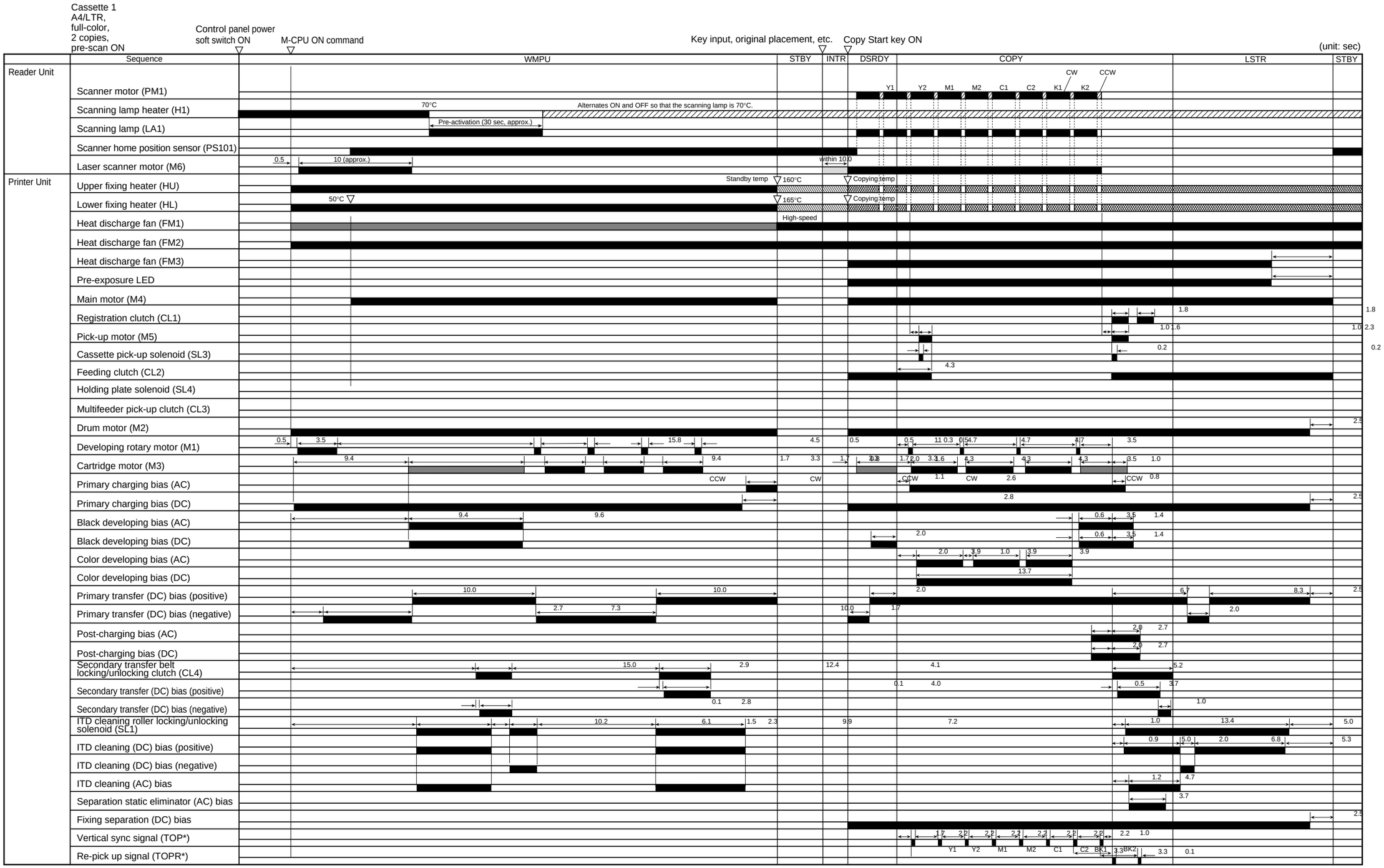
A. GENERAL TIMING CHART



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B. SIGNALS AND ABBREVIATIONS

A. Input/Output Signals (reader controller PCB)

Connector	Pin	Abbreviation	Signal name
J1602	1	FM4DEC	Power supply cooling fan locked signal
	2	FM4ON	Power supply cooling fan drive signal
	4	REMOON	
	5	FLCLK*	Scanning lamp clock signal
	6	FLERR*	Scanning lamp error signal
	7	YON	Pre-heat ON signal
	8	YPWM	Pre-heat PWM signal
	9	FLONOUT	Scanning lamp ON signal
	11	FLPWN	Scanning lamp activation signal
	12	ACCON	Accessories power ON signal
J1604	3	ASTCNT	Copy data controller counter signal
	4	AST_TXD	Copy data controller transmission data signal
	5	AST_RXD	Copy data controller reception data signal
J1607	2	BLON*	DC control panel back light ON signal
J1608	A2	MMIRST	DC controller panel reset signal
	A4	SOFSWON*	Power soft switch ON signal
	A6	CP	
	A9	UD0	
	A10	UD1	
	A12	UD2	
	A14	UD3	
	B2	MMITXD*	DC control panel transmission data signal
	B4	MMIRXD*	DC control panel reception data signal
	B6	LCDENB	
	B8	M	
	B10	FLM	
	B12	LP	
J1609	AS	SCHP	Scanner home position sensor signal
	A5	CBCC	Copyboard cover open/closed sensor signal
	A8	DSZ1	Originals size detection signal 1
	A11	DSZ2	Original size detection signal 2
	B2	DSZ3	Original size detection signal 3
	B5	DSZ4	Original size detection signal 4
	B7	KEYSW	Control key switch signal
J1610	2	FL_S	Scanning lamp intensity signal
	6	FL_TH	Scanning lamp thermistor signal
J1613	1	CCIVCNT	Control card counter signal
	21	CCIVCONE*	Control card connection signal
J1615	2	RL1ON*	Power cut relay (RL1) ON signal

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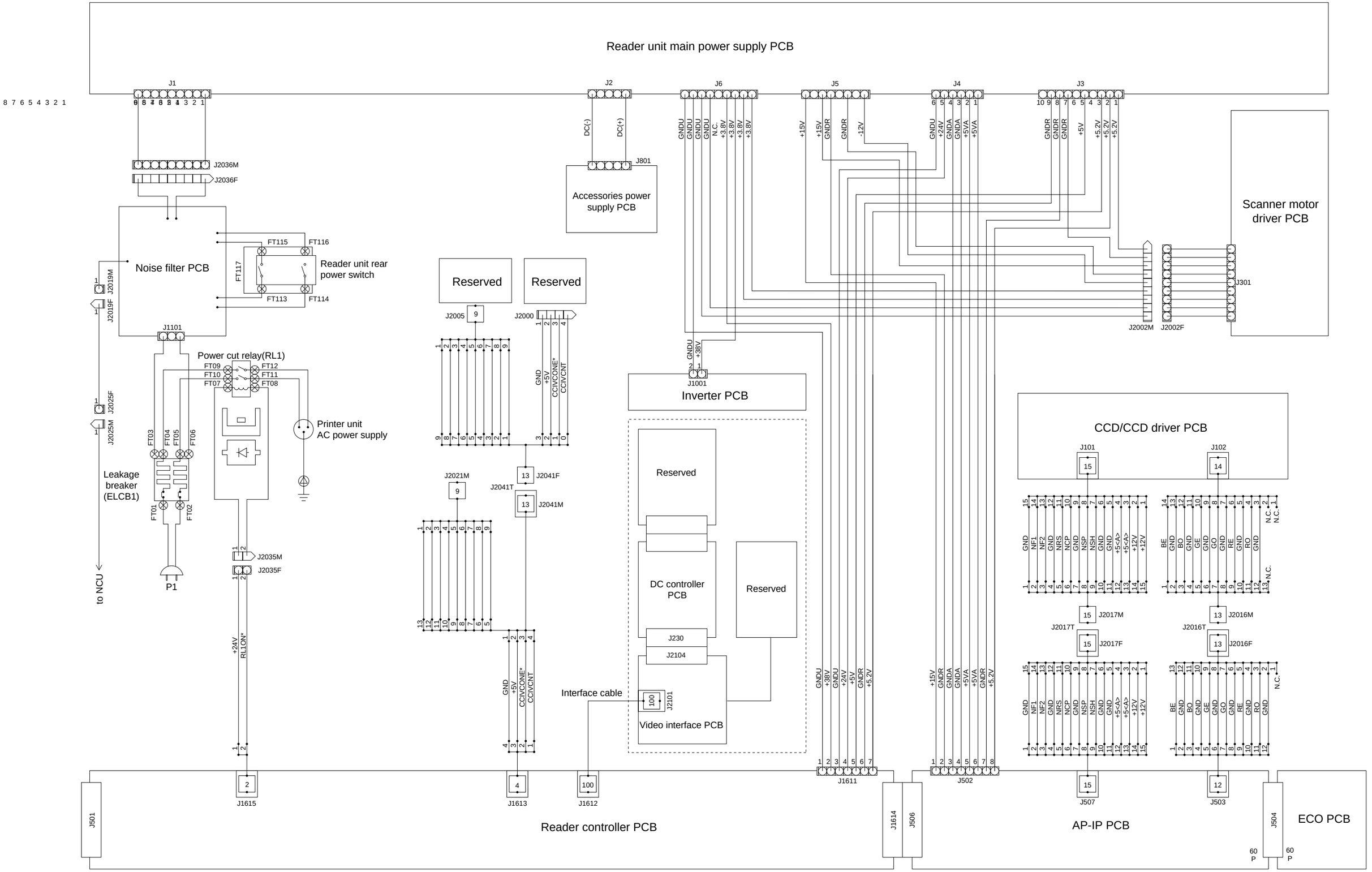

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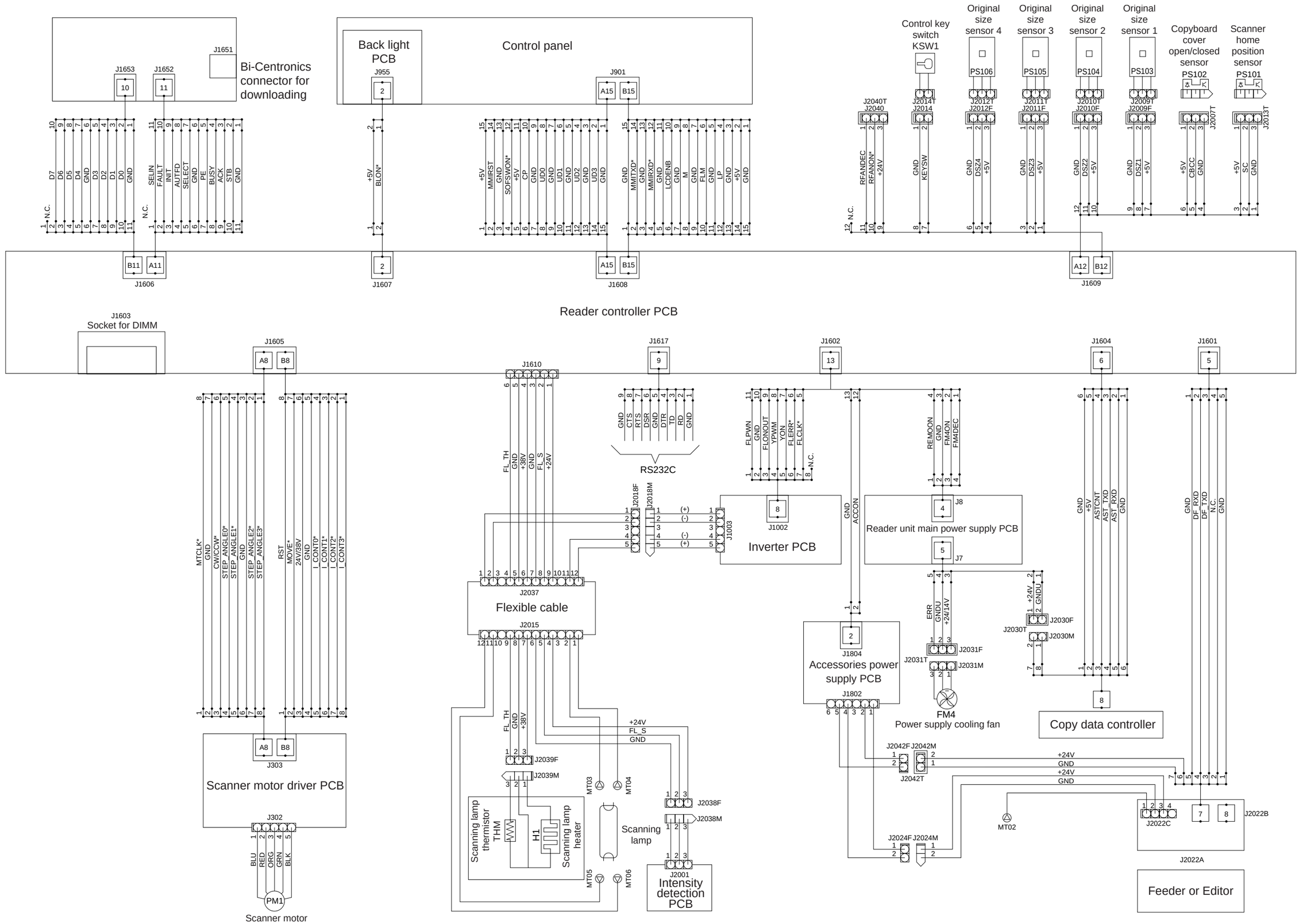
READER UNIT (2/2)



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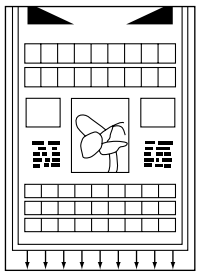
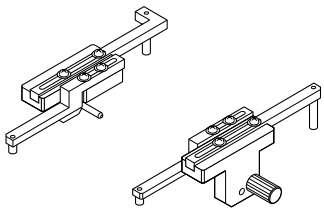
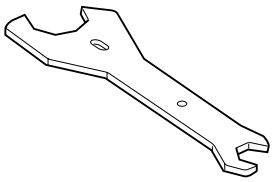
D. SPECIAL TOOLS

You will need the following special tools in addition to the standard tools set:

No.	Tool name	Tool No.	Composition	Rank*	Remarks
1	CAI test sheet	FY9-9030-000		A	For checking/adjusting images.
2	Mirror positioning tool (front, rear)	FY9-3040-000		B	For adjusting the position of the No. 1/No. 2 mirror; used in pairs.
3	Adjusting spanner	FY9-1027-000		B	For adjusting reader unit to maintain it level.

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E. SOLVENTS AND OILS

No.	Name	Use	Composition	Remarks
1	Alcohol	Cleaning; e.g., glass, plastic (Note), and rubber parts and external covers.	Carbon hydrogen of fluorine family Alcohol Surface activating agent Water	CI, IPA (isopropyl alcohol)
2	Solvent	Cleaning; e.g., metal parts; removing oil or toner.	Carbon hydrogen of fluorine family Alcohol Carbon hydrogen of chlorine family	MEK
3	Lubricant	Lubricating; e.g., scanner rail.	Mineral oil (paraffin family)	CK-0451
4	Lubricant	Lubricating; e.g., between gear and shaft.	Mineral oil of petroleum family.	CK-8003
5	Lubricant	Lubricating; e.g., gears.	Special oil Special sold lubricating agent Lithium soap	HY9-0007
6	Lubricant	Lubricating; e.g., drive parts.	Silicone oil	CK-0551 (20 g)

Note:

To clean the external covers, use a moist (well-wrung) cloth.

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