iR1600/iR2000/
iR1610/iR2010
SERIES
SERVICE
MANUAL

REVISION 0

Canon

MAR. 2002 FY8-13HS-000

 CANON iR1600/iR2000/iR1610/iR2010 SERIES REV.0 MAR. 2002 PRINTED IN JAPAN (IMPRIME AU JAPON)

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

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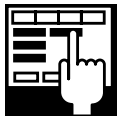
Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

1 Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
 Memo	Indicates an item intended to provide notes assisting the understanding of the topic in question.
 REF.	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.
	Refers to the Copier Basics Series for a better understanding of the contents.

2 Outline of the Manual

This Service Manual provides basic facts and figures needed to service the iR1600/iR2000. Of the machine's accessories, this manual covers the cassette unit and inner 2-way tray; for other accessories including the ADF, see its own Service Manual.

In this manual, the 1-Cassette Unit-F1, 2-Cassette Unit-G1 and 3-Cassette Unit-H1 are collectively called "cassette unit," and the Inner 2-Way Tray-B1 is referred to as the inner 2-way tray.

This Service Manual consists of the following chapters:

Chapter 1	Introduction:	features, specifications, operation, system construction, routine maintenance by the user, safety, reproduction processes
Chapter 2	Basic Operation:	basic operation, outline of electrical circuitry, basic sequence
Chapter 3	Image Reading/ Processing System:	principles of operation of the exposure system, principles of operation of the image processing system, timing of operation; disassembly/assembly and adjustment
Chapter 4	Laser Exposure System:	principles of operation of the image formation system, timing of operation; disassembly/assembly
Chapter 5	Image formation system:	standards, adjustments, troubleshooting tables
Chapter 6	Pickup/Feeding System:	principles of operation of the pickup/feeding system, timing of operation; disassembly/assembly and adjustment
Chapter 7	Fixing System:	principles of operation of the fixing system, timing of operation; disassembly/assembly and adjustment
Chapter 8	Externals and Auxiliary Control System:	principles of operation of the externals/auxiliary control system, timing of operation; disassembly/assembly and adjustment
Chapter 9	Cassette Unit:	principles of operation of the pickup system; disassembly/assembly and adjustments
Chapter 10	Inner 2-Way Tray:	principles of operation; disassembly/assembly and adjustment
Chapter 11	Installation:	site requirements and installation procedure
Chapter 12	Maintenance and Inspection:	table of periodically replaced parts, table of durables, scheduled servicing chart
Chapter 13	Troubleshooting:	maintenance and inspection, standards/adjustment, troubleshooting image faults/malfunctions; service mode, self diagnosis
Chapter 14	Version up:	version up
Appendix:		general timing chart, general circuit diagram

The descriptions are subject to change for product improvement, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to go through the contents of this Service Manual and Service Information bulletins and have a good understanding of the machine, readying themselves to promptly respond to the needs of the field (i.e., identifying and correcting faults).

The descriptions in this Service Manual are based on he following rules:

1. In each chapter, the uses of the function in question and its relationship to electrical and mechanical systems are discussed and the timing of operation of its associated parts is explained by means of outlines and diagrams.
   In the diagrams, the symbol ▬▮▮▬ represents a mechanical path, while the symbol ⟶ with a name next to it indicates the flow of an electric signal.
   The expression 'turn on the power" means turning on the power switch, closing the front door, and closing the delivery door so that the machine will be supplied with power.
2. In circuit diagrams (digital), a signal whose level is High is expressed as being '1', while a single whose level is Low is expressed as being '0'; the level of voltage, however, varies from circuit to circuit.
   The machine uses CPUs, whose internal mechanisms cannot be checked in the field, and, therefore, are not explained. In addition, the machine's PCBs are not intended for repairs at the user's and, therefore, are explained by means of block diagrams: two types are used, i.e., between sensors and inputs of PCBs equipped with a control or drive function and between outputs equipped with a control or drive function and loads; in addition, functional block diagrams are used at times.

Changes made to the machine for product improvement are communicated in the form of a Service Information bulletin as needed. All service persons are expected to go through all service documentation including the bulletins and be equipped to respond to the needs of the field (as by being able to identify possible causes of problems).

This service manual covers the models shown in the following table. Be sure to have a good understanding of the difference from model to model before referring to this manual.

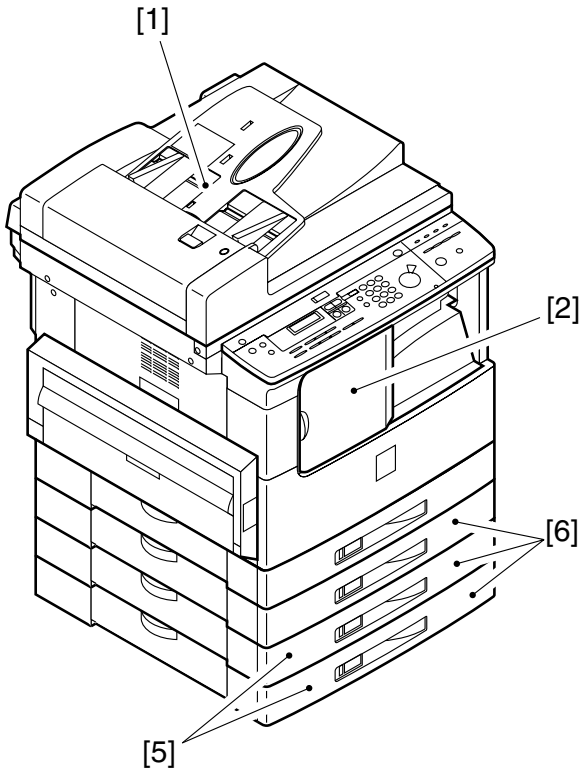
Model	ADF function	Fax function	Printer function	Cassette Type	Copying speed (cpm) at Direct
iR1600		*1		1-cassette	16cpm/LTR
iR2000		*1		2-cassette	20cpm/LTR
iR1610F	√	√		1-cassette	16cpm/LTR
iR2010F	√	√		2-cassette	20cpm/LTR

The notation "√" indicates that the item in question is available.

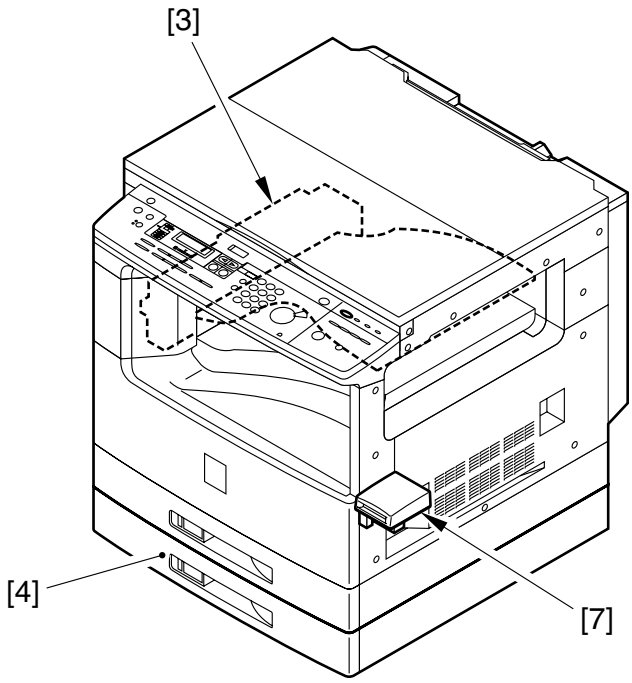
*1 : Fax function not supported.

System Configuration

1. The machine may be configured as follows with its accessories (except the printer/fax device):



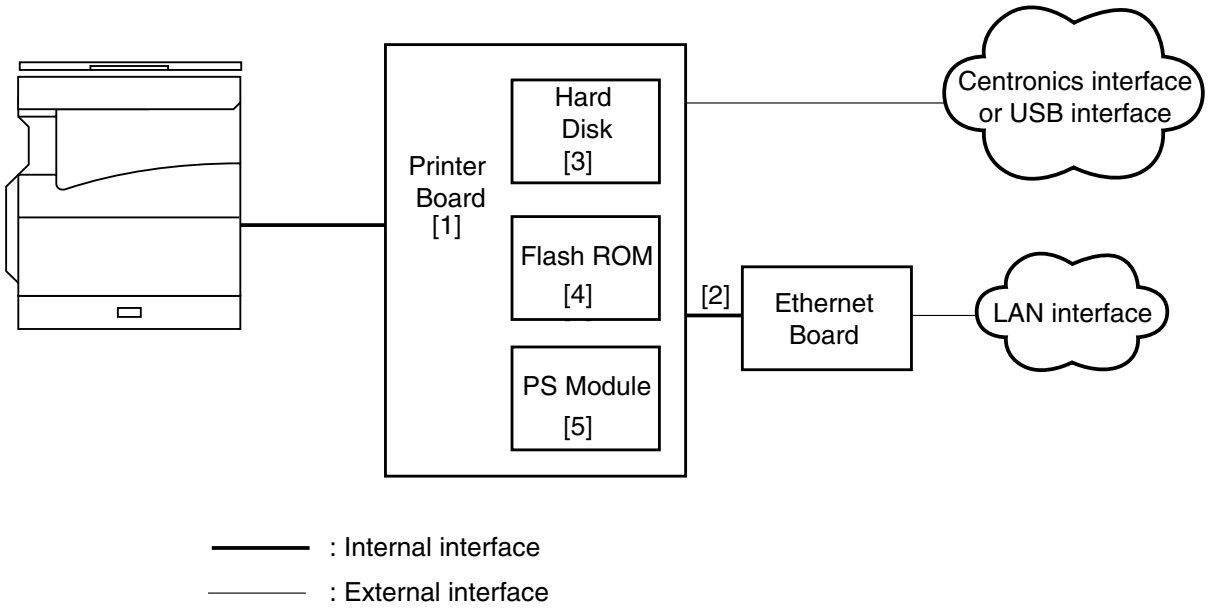
F1



F2

[1] ADF-J1 (iR1600/iR2000 only)
[2] Finisher-L1 (if PDL output, requires hard disk.)
[3] Inner 2-Way Tray-B1
[4] 1-Cassette Unit-F1 (16cpm model only)
[5] 2-Cassette Unit-G1 (20cpm model only)
[6] 3-Cassette Unit-H1 (16cpm model only)
[7] Card Reader-E1

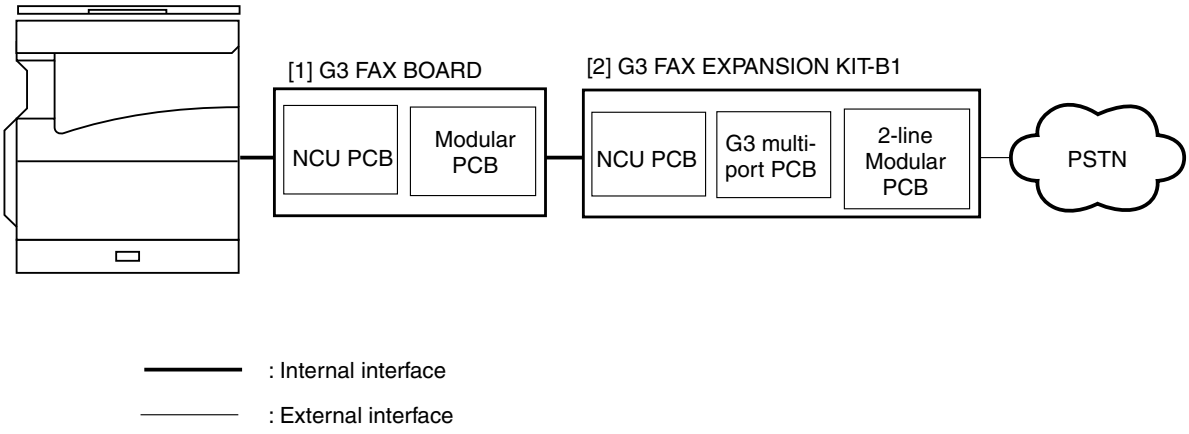
2. The machine may be configured with the following accessory boards:
   • Printer accessories



F3

[1] Printer Board-N1
[2] Ethernet Network Interface Adapter iN-E5
[3] Hard Disk HD-65
[4] Flash ROM Module FR-65
[5] PS Module-B1

• Fax accessories (iR1610F/iR2010F only)



F4

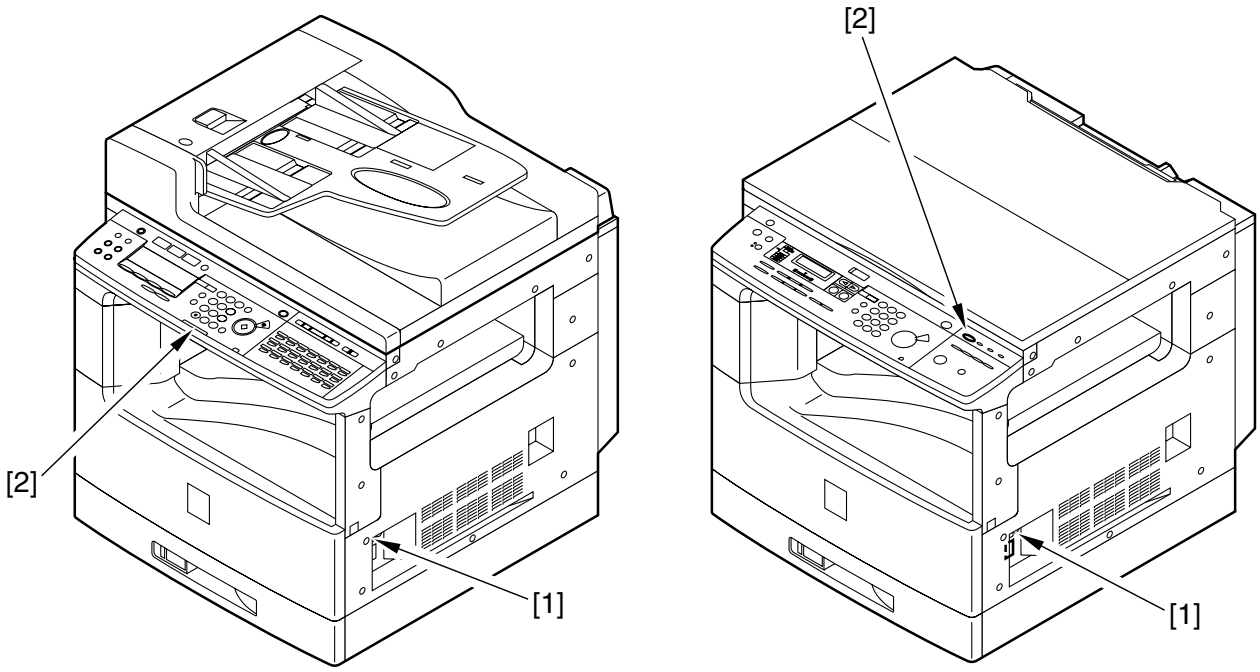
[1] G3 FAX BAORD*1
[2] G3 FAX EXPANSION KIT-B1*2

*1 : Standard (iR1610F/iR2010F)
*2 : iR1610F/iR2010F 120V only

<Points to Note When Turning Off the Power Switch>

Be sure to turn off the power switch and disconnect the power plug before starting disassembly/assembly work; further, keep the following in mind:

1. If you turn off the main power switch while a printer function is in use, the data being processed can be lost. Check to be sure that the online indicator in the control panel is OFF before operating the power switch.
2. Do not turn off the power switch while downloading is taking place; otherwise, the machine may fail to operate.
3. Remember that not all power will be removed in response to the opening of the front cover as long as the power switch remains ON.
4. Be sure to use SHUT DOWN MENU to shut down the printer if the Hard Disk HD-65 (accessory) has been installed.



F5

[1] Power switch
[2] Online indicator

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CHAPTER 8 EXTERNALS AND AUXILIARY CONTROL SYSTEM

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CHAPTER 12 MAINTENANCE AND INSPECTION

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CHAPTER 14 VERSION UP

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CHAPTER 1

INTRODUCTION

1 Features

1.1 Features

1. High-Speed, High Image Quality

Copying speed 16 copies/min (iR1600/iR1610F ; 1-to-N, from cassette)
20 copies/min (iR2000/iR2010F ; 1-to-No: from cassette)
Reading resolution : 600 dpi x 600 dpi
Printing resolution
Copying : 1,200 (equivalent) x 600 dpi
PDL output : 2,400 (equivalent) x 600 dpi

2. Large Paper Source

With the addition of accessories, as many as 1,100 sheets (80 g/m^2) may be accommodated.

Multifeeder : 100 sheets (A4R, A4, B5, B5R, A5, A5R; 80 g/m^2)

- 16cpm model Cassette
  Cassette 1 : 250 sheets
  1-cassette unit (accessory) : 250 sheets
  3-cassette unit (accessory) : 250 sheets x 3
- 20cpm model Cassette
  Cassette 1 : 250 sheets
  Cassette 2 : 250 sheets
  2-cassette unit (accessory) : 250 sheets x 2

3. Mixed Paper Sizes (of same configuration)

Installation of an ADF will enable mixing of different paper sizes (of the same configuration).

4. Networking

Mounting of a printer board and network interface board will enable the use of the machine as a network printer in an Ethernet environment.

5. Hard Disk

Installation of a hard disk (accessory) will enable storage of image data on the hard disk. Since the images will be read from the hard disk, multiple sets of copies may be obtained faster (RIP-once function).

6. Selection of a Delivery Tray

Installation of an inner 2-way tray (accessory) will enable the selection of trays separately for copier and printer output (in user mode).

7. Auto Start/Interrupt Copying

The existing models retains no more than one job. The machine, however, keeps jobs on queue, thus enabling auto-start/interrupt copying.

2 Specifications

2.1 Copier

2.1.1 Type

Item	Description
Body	Desktop
Copyboard	Fixed
Light source	LED
Lens	Rod lens array
Photosensitive medium	OPC (30-mm dia.)

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2.1.2 System

Item		Description
Copying		Indirect photoelectric reproduction
Charging		Roller charging
Exposure		Semiconductor laser
Copy density adjustment		Auto or manual
Development		Dry, 1-component toner projection
Pickup	Auto	Cassette
	Manual	Manual feed tray
Transfer		Roller charging
Separation		Curvature + static (static eliminator)
Cleaning		Rubber blade
Fixing		Heat roller (800 W for 120/230V)

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2.1.3 Functions

Item	Description
Original type	Sheet, book, 3-D (2 kg max.)
Maximum original size	A3/279.4 x 431.8mm (11" x 17")
Reproduction ratio	Direct (1:1)
4R4E	Reduce I (1:0.500), Reduce II (1:0.707)
	Reduce III (1:0.816), Reduce IV (1:0.865)
	Enlarge I (1:1.154), Enlarge II (1:1.224), Enlarge III (1:1.414)
	Enlarge IV (1:2.000)
4R3E	Reduce I (1:0.500), Reduce II (1:0.647), Reduce III (1:0.733)
	Reduce IV (1:0.786)
	Enlarge I (1:1.214), Enlarge II (1:1.294), Enlarge III (1:2.000)
4R2E	Reduce I (1:0.500), Reduce II (1:0.707)
	Enlarge I (1:1.414), Enlarge II (1:2.000)
	Zoom (1:0.500 to 2.00; 50% to 200%; 1%-increment)
Wait time	30 sec or less from power-on (at 20℃ room temperature)
First copy time	Less than 8.2 sec (from copier cassette; Direct, A4/LTR, non-AE)
Continuous copying	99 copies max.
Copy size	
Cassette	
	AB : A3 max.
	A5 min.
	Inch : 11x17 (279.4 x 431.8 mm) max.
	STMT min.
Multifeeder pickup	AB : A3 max.
	Postcard min.
	Inch 11x17 (279.4 x 431.8 mm) max.
	STMT min.

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Item		Description
Paper type		
Cassette		Plain paper (60 to 90 g/m^2), recycled paper (60 to 90 g/m^2), colored paper, label sheet
Multifeeder		Plain paper (60 to 90 g/m^2), thick paper (90 to 128 g/m^2), recycled paper (60 to 90 g/m^2), colored paper, transparency, postcard, double-postcard, envelope
Multifeeder		10 mm in height
Tray AB:		Plain paper, recycled paper, colored paper
		100 sheets if A4R, A4, B5, B5R, A5, A5R (80 g/m^2)
		50 sheets if A3, B4 (80 g/m^2)
		50 sheets if transparency, thick paper (90 to 128 g/m^2)
		10 sheets if envelope
		1 sheet if label sheet
	Inch:	Plain paper, recycled paper, colored paper
		100 sheets if LTR, LTRR, STMT, STMTR (80 g/m^2)
		50 sheets if transparency, thick paper (90 to 128 g/m^2)
		10 sheets if envelope
		50 sheets if 11x17 (279.4x431.8 mm), LGL
		1 sheet if label sheet
Cassette		25 mm in depth (250 sheets max. of 80 g/m^2)
Delivery		Face-down (250 sheets max. of 80 g/m^2)
Non-image width (if book copy)		
	Leading edge	3.0±2mm
	Trailing edge	3.0±2mm
	Left/right	3.0±2mm
Auto clear		Yes (2 min standard; may be changed between 0 and 9 min in 1-min increment)
Energy saver		Yes (15 min standard; may be changed between 3 and 30 min in 1-min increment)
Accessory		Cassette unit
		Finisher
		ADF
		Inner 2-way tray
		Card reader
		Hard disk
		Expansion RAM
		Flash ROM
		PS module
		Network interface board
		PCL printer board
		G3 expansion kit *1
		REMOTE DIAGNOSTIC DEVICE II

*1 : iR1610F/iR2010F 120V only

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2.1.4 Others

Item		Description
Operating environment		
Temperature range		15 to 30℃; 59 to 86℉
Humidity range		10% to 80%
Atmospheric pressure range		810.6 to 1013.3 hPa (0.8 to 1.0 atm)
Power supply		120V (60Hz), 230V (50/60Hz)
Power consumption		
Maximum		940W *1
Standby		30W (reference) *1
Continuous copying		900W (reference) *1
Energy saver	High	20W (reference) *1
	Low	4.8W (reference) *1
Noise		
Copying		66 dB or less
Standby		40 dB or less
Dimensions		iR 1600 615 (W) x 631 (D) x 560 (H) mm/24.0 (W) x 24.8 (D) x 22.0 (H) in. iR 2000 615 (W) x 631 (D) x 645 (H) mm/24.0 (W) x 24.8 (D) x 25.1 (H) in. iR1610F 615 (W) x 631 (D) x 662 (H) mm/24.0 (W) x 24.8 (D) x 25.9 (H) in. iR2010F 615 (W) x 631 (D) x 747 (H) mm/24.0 (W) x 24.8 (D) x 29.5 (H) in.
Weight		iR 1600 38.0kg/83.8 lb iR 2000 43.4kg/95.7 lb iR1610F 44.0kg/97.0 lb iR2010F 50.5kg/111 lb
Consumables		
Paper		Keep wrapped to avoid humidity.
Toner		Avoid direct sunshine, and keep at 40℃ (104℉) 85% or less.

*1 : In copyboard cover model; for rated power supply voltage in the absence of printer board.

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Reproduction ratio	Size	Paper size	Copies/min (1-to-N)	
			16cpm model	20cpm model
Direct	A3 (297 x 420mm)	A3	9	9
	A4 (297 x 420mm)	A4	16	20
	B4 (297 x 420mm)	B4	10	10
	B5 (297 x 420mm)	B5	16	20
	A4R (297 x 420mm)	A4R	12	15
	B5R (297 x 420mm)	B5R	13	16
	A5 (297 x 420mm)	A5	16	20

Auto paper select ON, Auto density adjustment ON, Non-sort, Pickup from cassette

T01-201-06

The above specifications are subject to change for product improvement.

Reproduction ratio	Size	Paper size	Copies/min (1-to-N)	
			16cpm model	20cpm model
Direct	279.4 x 431.8mm (11" x 17")	279.4 x 431.8mm (11" x 17")	9	9
	LTR	LTR	16	20
	LGL	LGL	10	10
	LTRR	LTRR	12	16
	STMT	STMT	16	20

Auto paper select ON, Auto density adjustment ON, Non-sort, Pickup from cassette

T01-201-07

The above specifications are subject to change for product improvement.

2.2 Cassette Unit

Item	Description
Pickup	Claw-less (retard) method
Paper type	Same as host.
Cassette	25 mm deep (250 sheets of 80 g/m^2 paper max.)
Serial Number	1-cassette type : XGQxxxxx XHVxxxxx
	2-cassette type : XGRxxxxx XHWxxxxx
	3-cassette type : XGSxxxxx XHXxxxxx
Dimensions	
1-cassette type	560 (W) x 564 (D) x 91 (H) mm
	22.0 (W) x 22.0 (D) x 3.54 (H) in.
2-cassette type	560 (W) x 564 (D) x 176 (H) mm
	22.0 (W) x 22.0 (D) x 6.79 (H) in.
3-cassette type	560 (W) x 564 (D) x 261 (H) mm
	22.0 (W) x 22.0 (D) x 10.2 (H) in.
Weight	
1-cassette type	6 kg/13.2 lb (approx.; including cassette)
2-cassette type	12 kg/26.5 lb (approx.; including cassette)
3-cassette type	18 kg/39.7 lb (approx.; including cassette)
Power supply	DC power from host
Operating environment	Same as host
Temperature range	
Humidity range	
Atmospheric pressure	

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The above specifications are subject to change for product improvement.

2.3 Inner 2-Way Tray

Item	Specifications
Number of bins	2 bins in total 1 bin (No. 2 delivery slot) Internal delivery tray of host (No. 1 delivery slot)
Stacking	Face-down
Type of paper in stack	Plain paper, recycled paper, colored paper (from 64g/m^2 to 90 g/m^2)
Size of paper in stack	A3/279.4 x 431.8mm (11 x 17) to A5/STMT
Height of stack	
Upper tray	100 sheets (A4, B5, LTR) 50 sheets (A3, B4, A4R, B5R, A5, A5R, 11x17, LGL, LTRR, STMT, STMTR)
Lower tray	same as host
Dimensions	149 (W) x 420 (D) x 254 (H) mm 5.9 (W) x 16.5 (D) x 9.8 (H) in
Weight	approx. 3.5kg/7.7Ib
Power supply	DC 24V/5V from host

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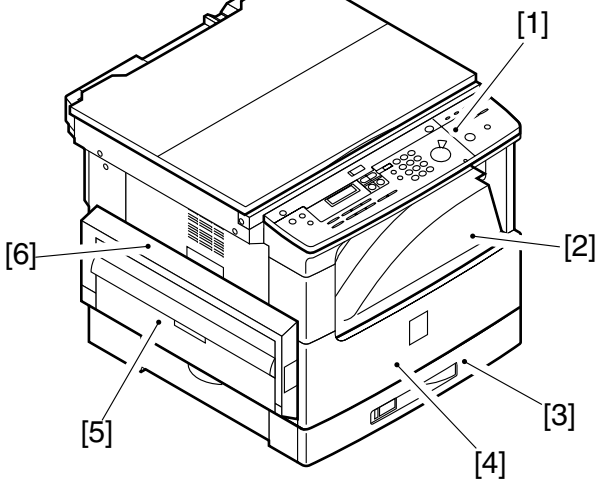
3 Names of Parts

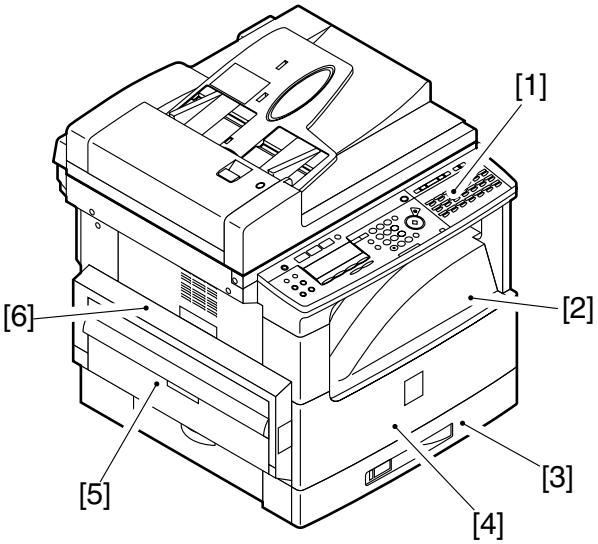
3.1 External View

3.1.1 Copier

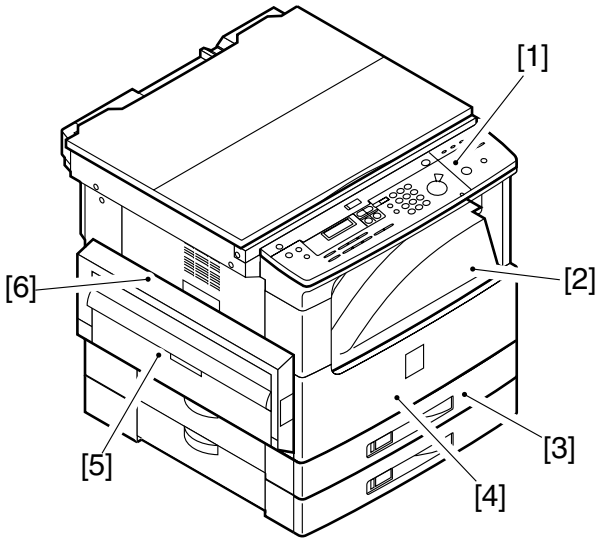
- iR1600



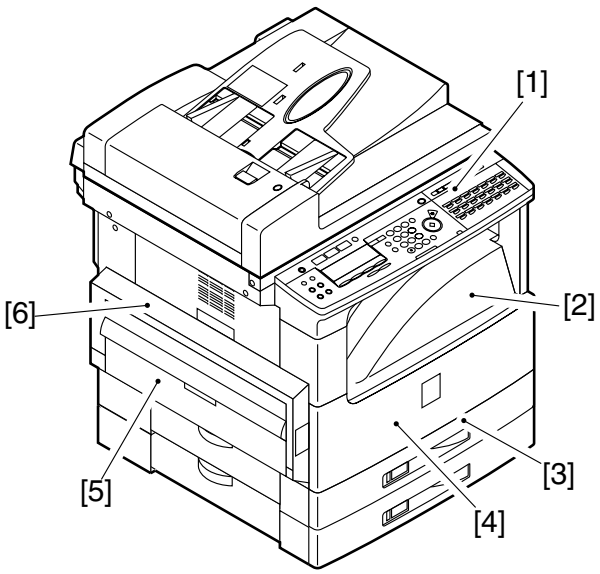
- iR1610F



- iR2000



- iR2010F



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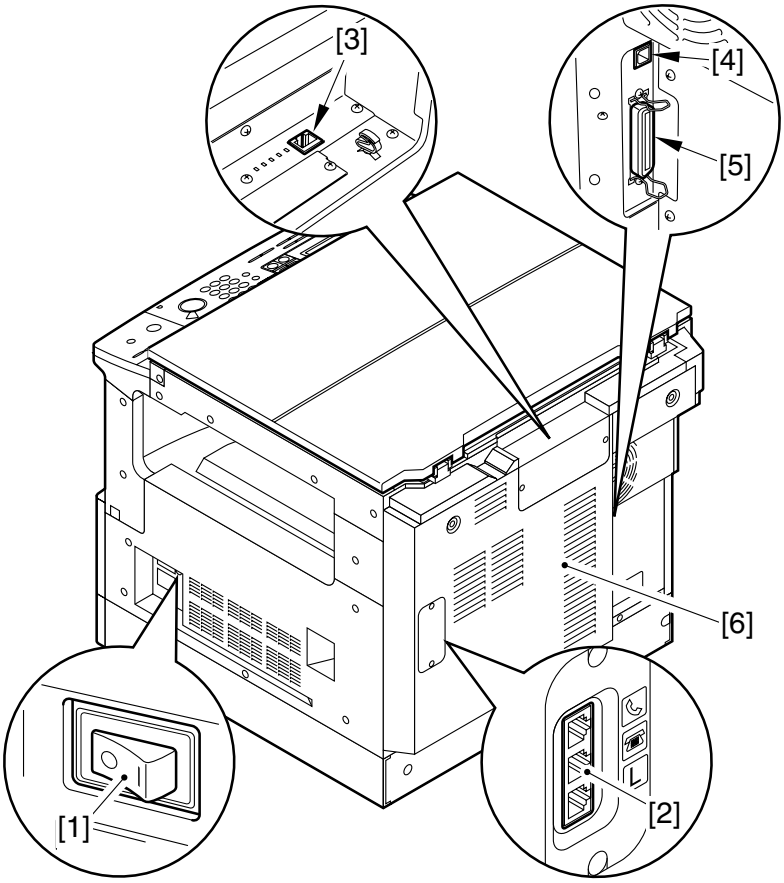
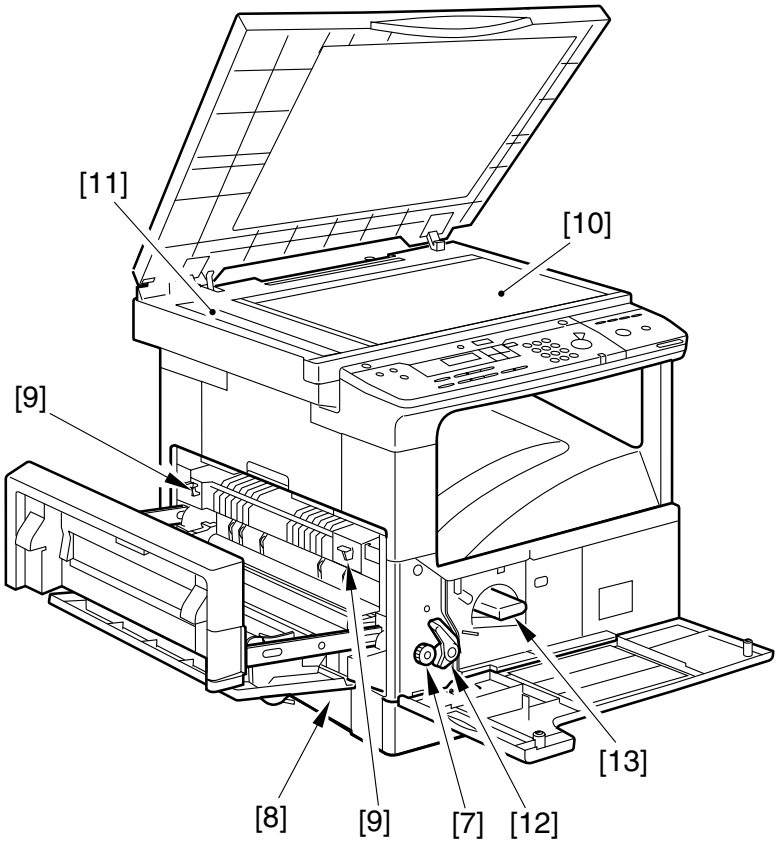
[1] Control panel
[2] Delivery tray
[3] Cassette
[4] Front cover
[5] Manual feed tray
[6] Left cover





[1] Power switch
[2] Modular jack *1
[3] 10BASE-T/100BASE-TX port *2
[4] USB connector *2
[5] Centronics connector *2
[6] Rear cover
[7] Paper feed knob
[8] Left lower cover
[9] Pressure release lever
[10] Copyboard glass
[11] Reading glass
[12] Developing assembly locking lever
[13] Toner cartridge

*1 : standard if fax model
*2 : if equipped with printer functions

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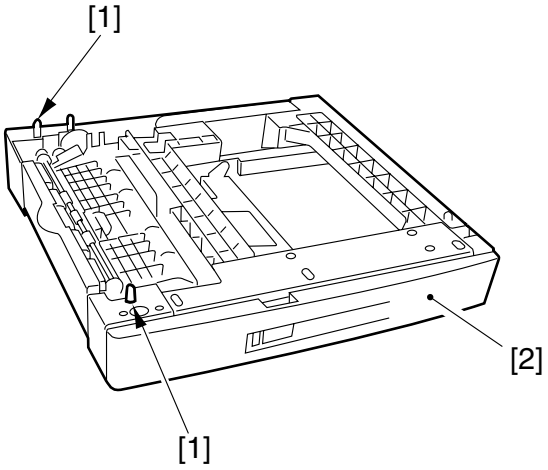
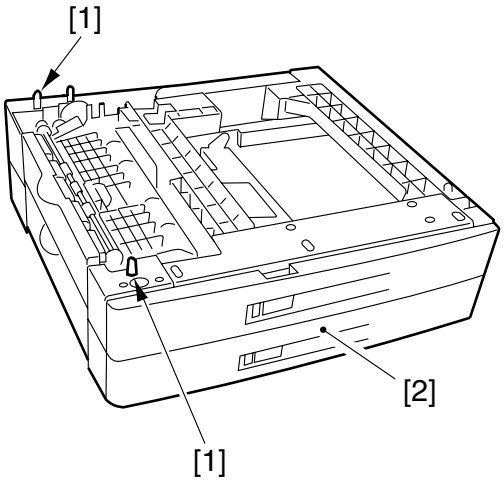
3.1.2 Cassette Unit

- 1-Cassette Type

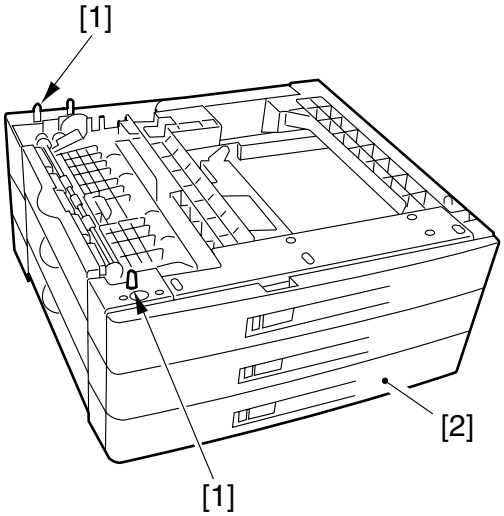


[1] Positioning pin
[2] Cassette

- 2-Cassette Type



- 3-Cassette Type



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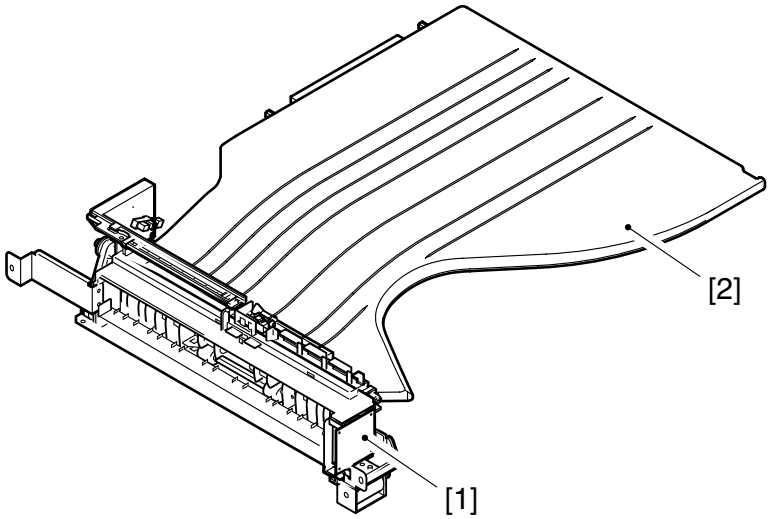
3.1.3 Inner 2-Way Tray



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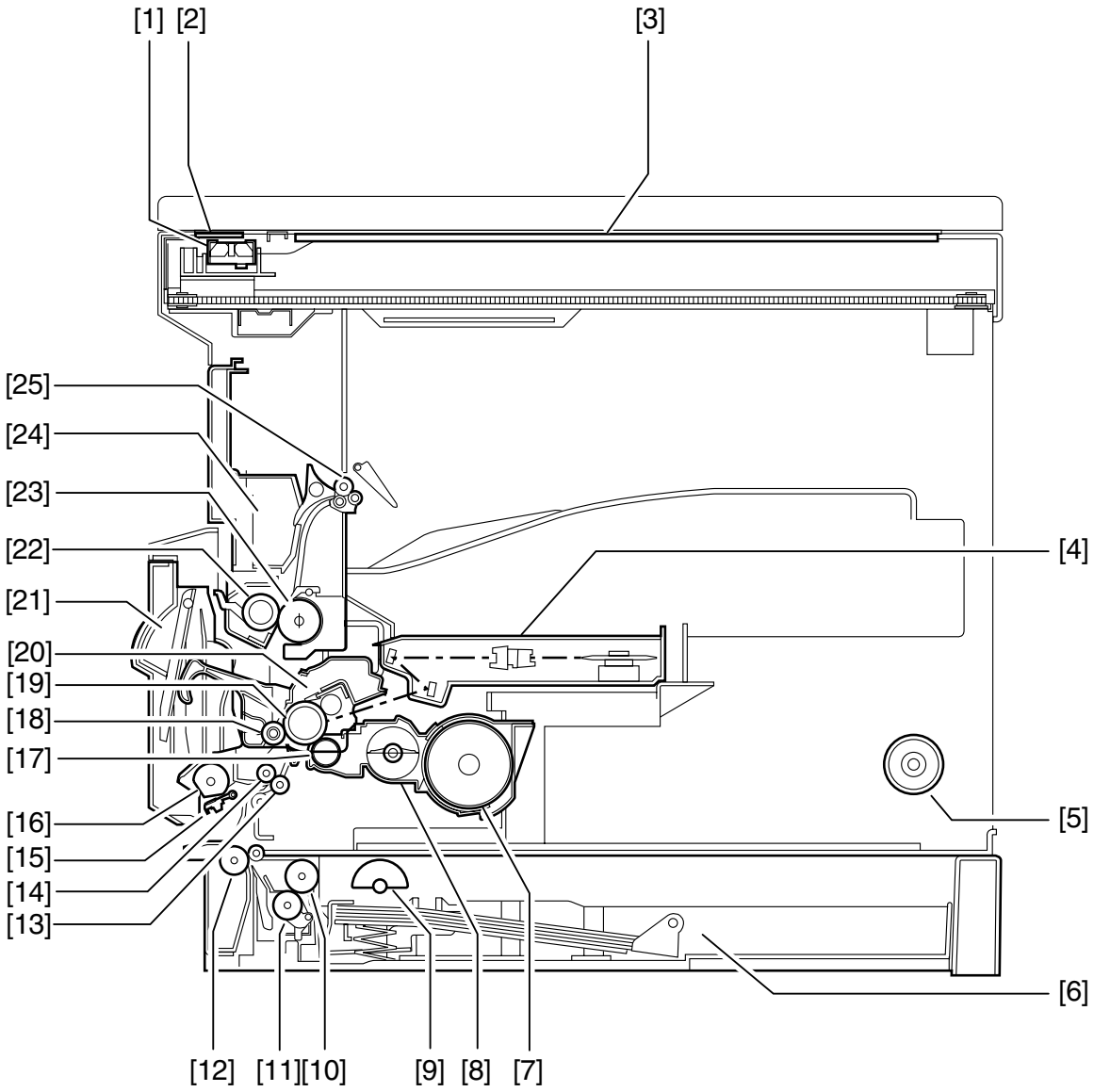
[1] Inner 2-way unit
[2] No. 2 delivery tray

3.2 Cross Section

3.2.1 Copier

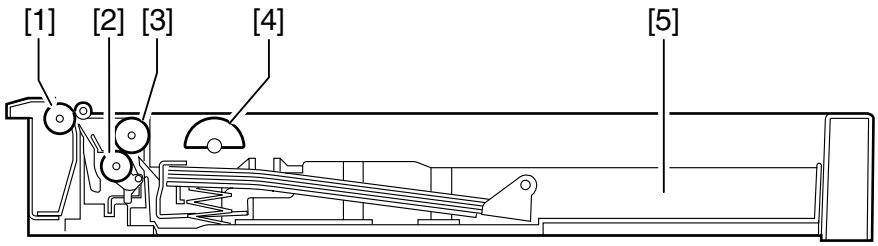


F01-302-01

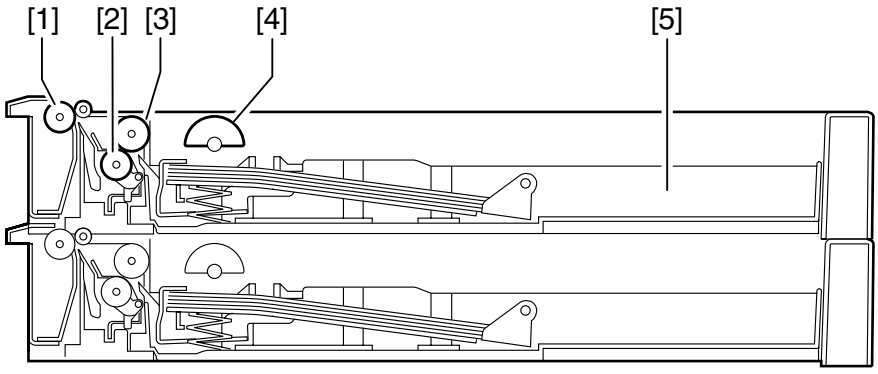
[1] CS unit
[2] ADF reading glass
[3] Copyboard glass
[4] Laser scanner unit
[5] Speaker
[6] Cassette
[7] Toner cartridge
[8] Developing assembly
[9] Pick roller
[10] Feeding roller
[11] Separation roller
[12] Vertical path roller
[13] Registration roller roll
[14] Registration roller
[15] Manual feed separation pad
[16] Manual feed pickup roller
[17] Developing cylinder
[18] Transfer charging roller
[19] Photosensitive drum
[20] Drum unit
[21] Multifeeder tray
[22] Fixing pressure roller
[23] Fixing roller
[24] Fixing assembly
[25] Delivery roller

3.2.2 Cassette Unit

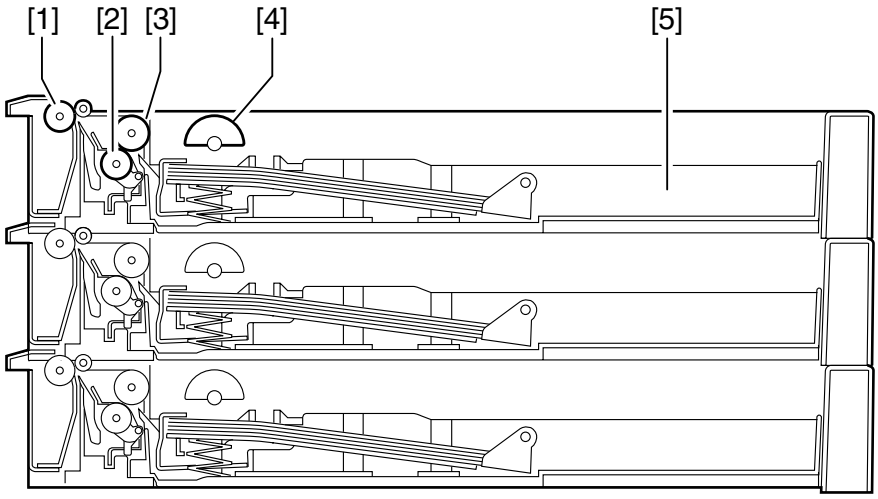
- 1-Cassette Type



- 2-Cassette Type



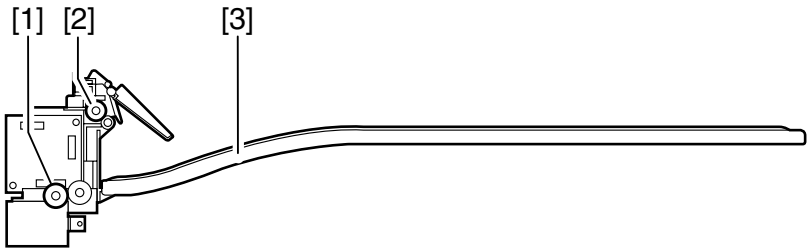
- 3-Cassette Type



F01-302-02

[1] Vertical path roller
[2] Separation roller
[3] Feeding roller
[4] Pickup roller
[5] Cassette

3.2.3 Inner 2-Way Tray



F01-302-03

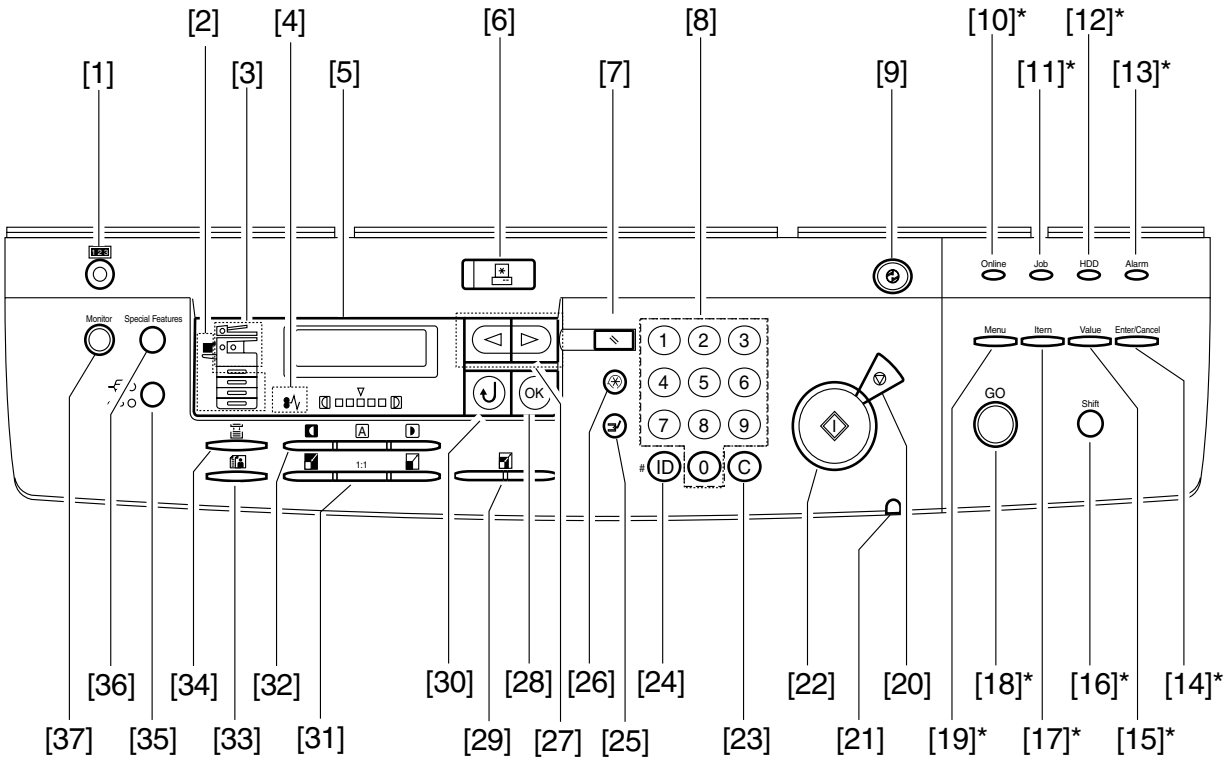
[1] Vertical path roller
[2] Delivery roller
[3] No. 2 delivery tray

4 Control Panel

4.1 Control Panel

4.1.1 Control Panel for a Non-Fax Model

The machine is equipped with one power switch, and the machine is supplied with power when the switch is turned on.



* Enabled only if the machine is equipped with a printer function.

F01-401-01

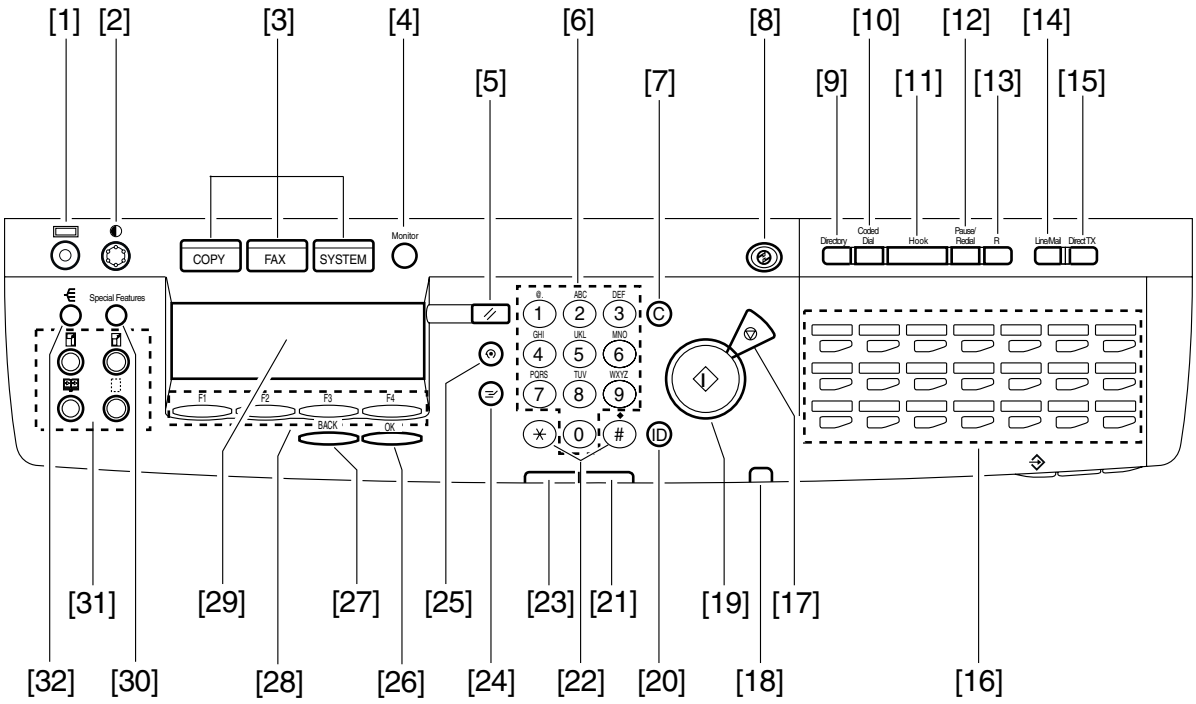
No.	Key/LED name	Description
[1]	Counter key	Press it to indicate the number of prints to make.
[2]	Paper Select indicator	Press it to indicate the selected cassette or stack bypass.
[3]	Jam Location indicator	Press it to indicate the location of a paper jam.
[4]	Jam indicator	Check it to see if a paper jam has occurred.
[5]	LCD display	Use it to bring up various settings screens.
[6]	System key and indicator	Press it to switch over printer functions; it remains ON when a printer function is in use.
[7]	Reset key	Press it to return the copying mode to default settings.
[8]	Numeric keypad	Use it to set how may copies to make.
[9]	Energy Saver key	Use it to end energy save mode.
[10]	On Line indicator*	Check it to see if the machine is in on-line state; it flashes while printing takes place.
[11]	Job indicator*	Check it to see if data reception is under way.
[12]	HDD indicator*	Check it to see if a hard disk is installed; it flashes while the hard disk is being accessed.
[13]	Alarm indicator*	Check it to see if an error has occurred.
[14]	Enter/Cancel key*	Press it to store/set a selected item.
[15]	Value key*	With an item name displayed, press the Value key to step through the item's values. Press Shift and Value keys to step through the values in reverse order. Some items have a large range of numbers from which to choose a value.
[16]	Shift key*	Press this key to scroll through menu or settings items in reverse order.
[17]	Item key*	With a menu name displayed, press the Item key to scroll through all the items on the menu and return to the first item. To scroll back through the items in the opposite direction, press the Shift and Item keys.
[18]	Go key*	Takes the printer off-line and brings it back on line. When the On Line indicator is on, the printer is ready to receive data and print. When the On Line Indicator is off, the printer is off-line, and you can use the other keys on the printer control panel to view and change settings.
[19]	Menu key*	With the printer off-line, press the Menu key to scroll through the menu names and return to the first menu name. To scroll back through the menu names in the opposite directin, press the Shift and Menu keys.
[20]	Stop key	Press it to stop copying operation.
[21]	Main Power indicator	Check it to see if the machine is ON.
[22]	Start key	Press it to start copying operation.
[23]	Clear key	Press it to clear registration/setting contents.
[24]	ID/#key	Press it when making settings in ID mode.
[25]	Interrrupt key	Use it to select/cancel interrupt mode.

[26]	Additional Function key	Use it to bring up the Additional Functions (user mode) Settings screen.
[27]	Cursor key	Use it to select an item when using menu settings.
[28]	OK key	Use it to set a mode or function.
[29]	Zoom key	Use it to make zoom settings.
[30]	Back key	Use it to return to the previous screen when making menu settings.
[31]	Reduce/Direct/Enlarge key	Use it to set Reduce, Dirt, or Enlarge copy settings.
[32]	Light/AE/Dark key	Use the AE key to register/set automatic exposure settings. Use the Light/Dark key to manually adjust the copy density.
[33]	Image Quality key	Use it to select a level of image quality from text, text/photo, and photo modes.
[34]	Paper Select key	Use it to select a cassette or stack bypass.
[35]	Finisher key	Use it to set a finisher function (collation, stapler).
[36]	Special Features key	Use it to set a special copying feature (page separation, frame erasing, binding margin, reduced page composition).
[37]	Monitor key	Use it to check the state of a copy job.

* Enabled only if the machine is equipped with a printer function.

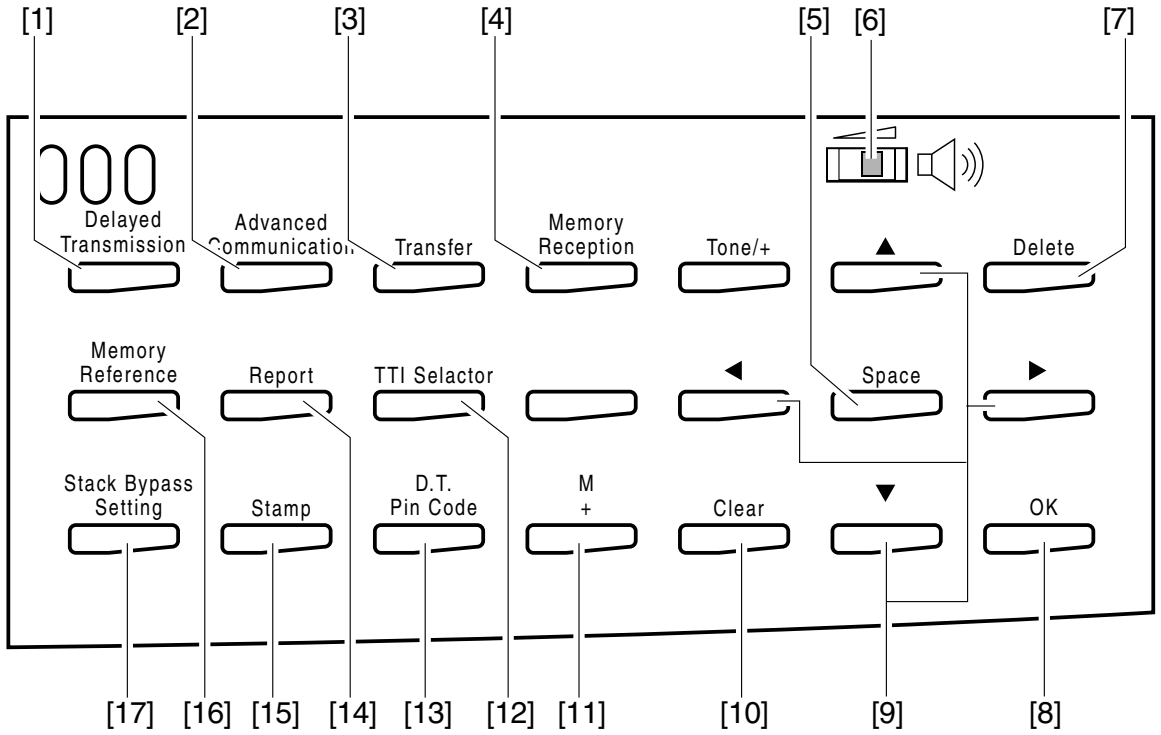
4.1.2 Control Panel for a Fax Model

The machine possesses a single power switch used to turn on or off the machine.



F01-401-02

No.	Key/LED name	Description
[1]	Counter key	Use it to check the counter status.
[2]	Contrast key	Use it to adjust the contrast of the control panel screen.
[3]	System switch key	Use it to switch the system.
[4]	Monitor key	Use it to check the communication status.
[5]	Reset key	Use it to use default copy mode settings.
[6]	Numeric keypad	Use it enter a telephone number, number of copies to make, or the like.
[7]	Clear key	Use it to clear registered items/settings.
[8]	Energy Save key	Use it to turn off the power save mode.
[9]	Directory key	Use it to call up a destination registered for one-touch or speed dialing.
[10]	Coded Dial key	Use it to access speed dialing.
[11]	Hook key	Use it to turn on the speaker.
[12]	Pause/Redial key	Use it to add a pause in a telephone number. Or, use it to dial the most recently dialed number.
[13]	Tone/R key	Use it as the R key on a 230V model; or, as the Tone key on a 120V model.
[14]	Line/Mail key	Use it to select a line.
[15]	Direct TX key	Use it to start direct transmission.
[16]	One-Touch panel	Use it for one-touch dialing.
[17]	Stop key	Use it to stop an ongoing transmission or copying operation.
[18]	Main Power LED	Use it to see if the main power is on.
[19]	Start key	Use it to start a transmission or copying operation.
[20]	ID key	Use it to make settings in ID mode.
[21]	Error indicator	Use it to see if any error has occurred on the printer.
[22]	*/# key	Use it to enter a fax telephone number or F code.
[23]	Communication Status LED	Use it to check access to the HDD (flashing) while the telephone line is in use or to see if memory reception is under way (remaining on).
[24]	Interrupt key	Use it to turn on or off interrupt copying.
[25]	Additional Functions key	Use it to bring up the User Mode Settings screen.
[26]	OK key	Use it to check registered items/settings.
[27]	Back key	Use it to return to the previous screen.
[28]	Screen Select key	Use it to select a function indicated on the display.
[29]	Control panel LCD	Use it to bring up various settings screens.
[30]	Special Features key	Use it to make settings for special features (page separation, frame erasing, binding margin, reduced page composition).
[31]	Copy Short-Cut key	Use it to select a registered copy short-cut function (default: 1, reduce; 2, enlarge; 3, page separate; 4, frame erase).
[32]	Sort key	Use it to turn on sort copy when making copies using an ADF.



F01-401-03

No.	Key name	Description
[1]	Delayed Transmission key	Use it to set a transmission item.
[2]	Advanced Transmission key	Use it to set an advanced transmission feature (polling, confidential, relay, general-purpose box, F code, password).
[3]	Transfer key	Use it to select the transfer function.
[4]	Memory Reception key	Use it to turn on or off the memory reception function.
[5]	Space key	Use it to add a space to a string of numerals or characters.
[6]	Speaker Volume key	Use it to adjust the level of sound from the speaker.
[7]	Delete key	Use it to delete a character input.
[8]	OK key	Use it to store registered items/settings.
[9]	Cursor key	Use it call up or check items/settings.
[10]	Clear key	Use it to delete registered items/settings.
[11]	+ key (if 120V model); M key (if UK)	Use it to add the + symbol to a telephone number. In the U.K., if you wish to use the UK Call, Global Call, and Day Call, and Day Call Services of Cable and Wireless Communication Ltd., use this key.

[12]	TTI Selector key	Use it to change the name of the sender.
[13]	PIN Code key (if 120V model); DTM key (if UK)	Use it to select a PIN code. Press this key to confirm the dial tone when dialing a number. (Not used in the UK, Ireland, Hong Kong, Australia, New Zealand, Singapole, or Malaysia)
[14]	Report key	Use it to generate various reports or lists.
[15]	Stamp key	Use it to add a stamp to originals to indicate that they have been read or sent.
[16]	Memory Reference key	Use it to check or delete the contents of memory.
[17]	Manual Feed Size Select key	Use it to select a manual feed size.

4.1.3 Master Password

Passwords include those required when changing ore deleting confidential mailboxes, memory boxes and mailbox settings as well as passwords used for system administrator information.

The master password, which is used in servicing and when the user has forgotten the password, is shown below.

The master password is to be used by service engineer only and must not be disclosed to the user.
Mater password: 0334559769

4.2 Basic Operation

4.2.1 Basic Operation for a Non-Fax Model

Operate the machine as follows when using its basic functions:

Key to use	Description
Zoom key	Use it to select a default ratio or a zoom ratio (between 50% an 200%).
Paper Select key	Use it to select a cassette as a source of paper.
Image Quality key	Use it to select a level of image quality (text, text/photo, photo).
Light/AE/Dark key	Use it to select a reading density (auto, F1 through F9).

T01-402-01

4.2.2 Basic Operation for a Fax Model

The machine functions as follows in response to a press on the Start key in the control panel:

Item	Description
ZOOM RATIO	Use it to select a default ratio or a zoom ratio (between 50% an 200%).
PAPER SELECT	Use it to select a cassette as a source of paper.
DENSITY	Use it to select a level of image quality (text, text/photo, photo).
IMAGEQUALITY	Use it to select a reading density (auto, F1 through F9).

T01-402-02

4.3 Extended Operation

4.3.1 Extended Operation for a Non-Fax Model

Press the Special Features key in the control panel to make use of the following functions:

Items	Description
2PG SET SETTING	Use it to select page separation in book mode (to copy left and right pages of spread book); specify open on left or right and original size.
MARGIN SETTING	Use it to create a binding margin on paper. Specify the location of margin (left, right, top, bottom) and the margin width (1 to 20 mm).
FRAME ERASE SETTING	Use it to specify the location of frame erasing.
DOC. FRAME ERASE	Use it to select frame erasing of the original.
BOOK FRAME ERASE	Use it to delete images of the sides and middle binding width of the original (e.g., book).
HOLE PUNCH ERASE	Use it to delete the image, if any, of holes in the original (on the left side) so that the copies will not show them.
2 ON 1 SETTING	Use it to enter an original size and paper size.

T01-403-01

4.3.2 Extended Operation for a Fax Model

Press the Special Features key in the control panel to make use of the following functions:

Items	Description
2-PG SEP	Use it to select page separation in book mode (to copy left and right pages of spread book); specify open on left or right and original size.
MARGIN	Use it to create a binding margin on paper. Specify the location of margin (left, right, top, bottom) and the margin width (1 to 20 mm).
FRAME ERASE	Use it to specify the location of frame erasing.
FRAME ERASE	Use it to select frame erasing of the original.
BOOK FR ERS	Use it to delete images of the sides and middle binding width of the original (e.g., book).
P/HOLE ERASE	Use it to delete the image, if any, of holes in the original (on the left side) so that the copies will not show them.
LAYOUT COPY	Use it to enter an original size and paper size; then to select 2-on-1 or 4-on-1 copying mode.

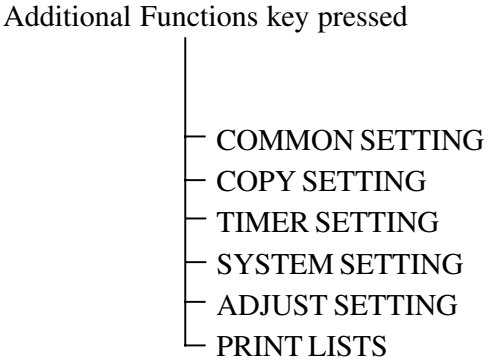
T01-403-02

4.4 User Mode

4.4.1 User Mode for a Non-Fax Model

A press on the Additional Functions key in the control panel will bring up the User Mode settings screen.

The user mode is structureed as follows:

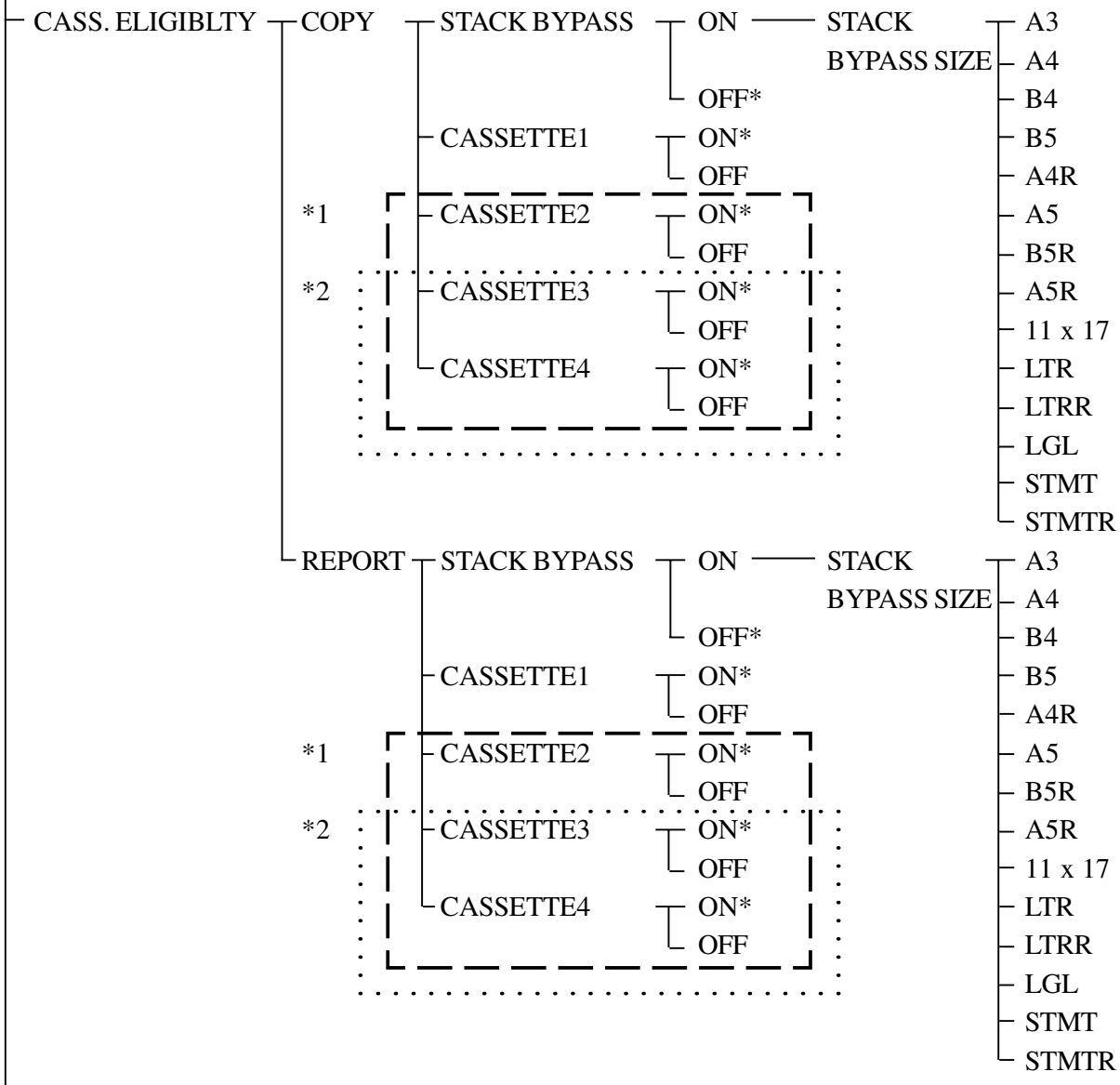


For sub items, see the pages that follow.

COMMON SETTINGS

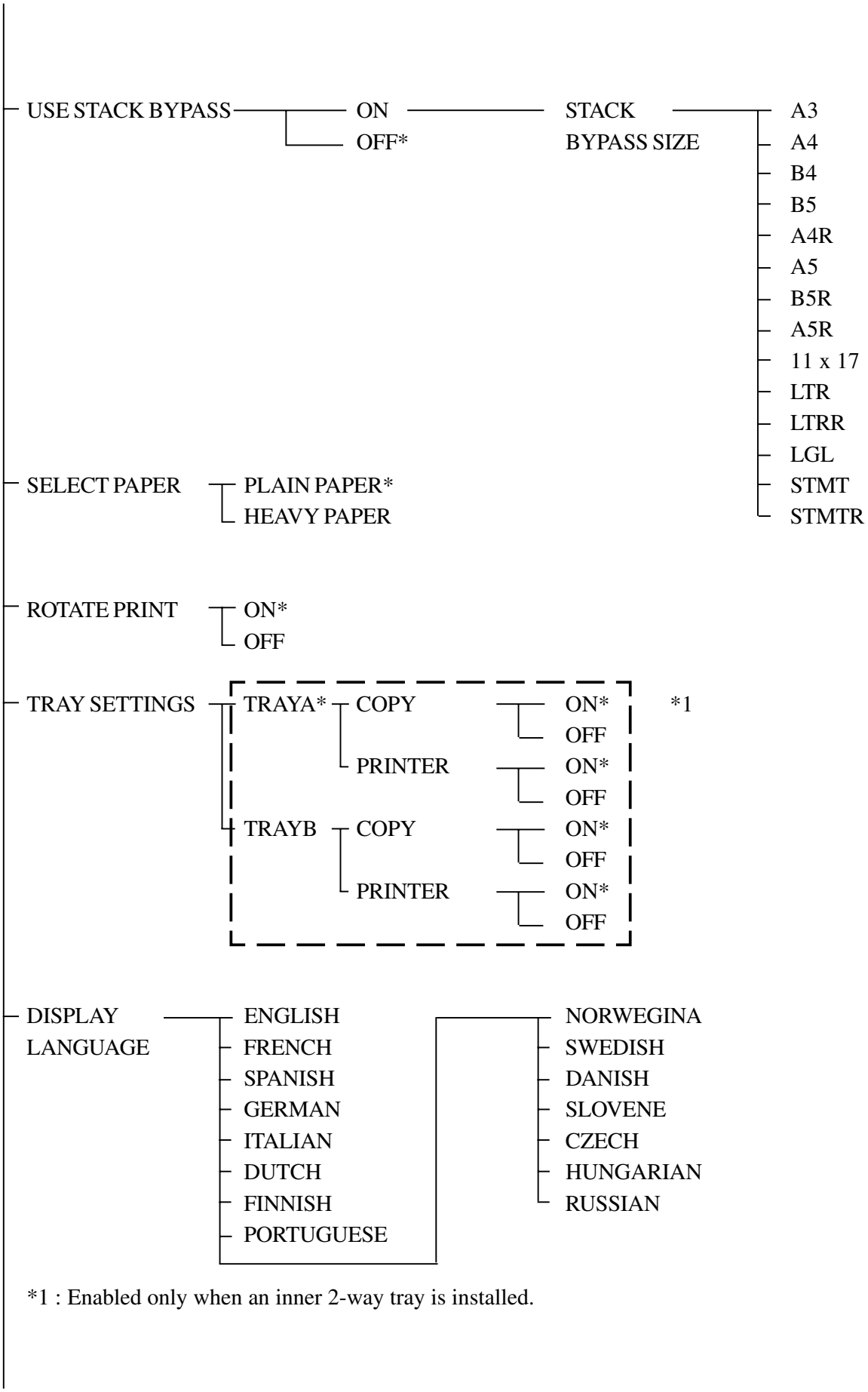
*, The notation within brackets <> indicates factory settings.

- VOLUME CONTROL
  - KEYPAD VOLUME
    - ON* (1-3)
    - OFF
  - ALARM VOLUME
    - ON* (1-3)
    - OFF
  - PRINTING END TONE
    - ON* (1-3)
    - ERROR (1-3)
    - ONLY*
    - OFF
  - SACANNING END TONE
    - ON* (1-3)
    - ERROR (1-3)
    - ONLY*
    - OFF
- ESS POWER LEVEL
  - LOW*
  - HIGH

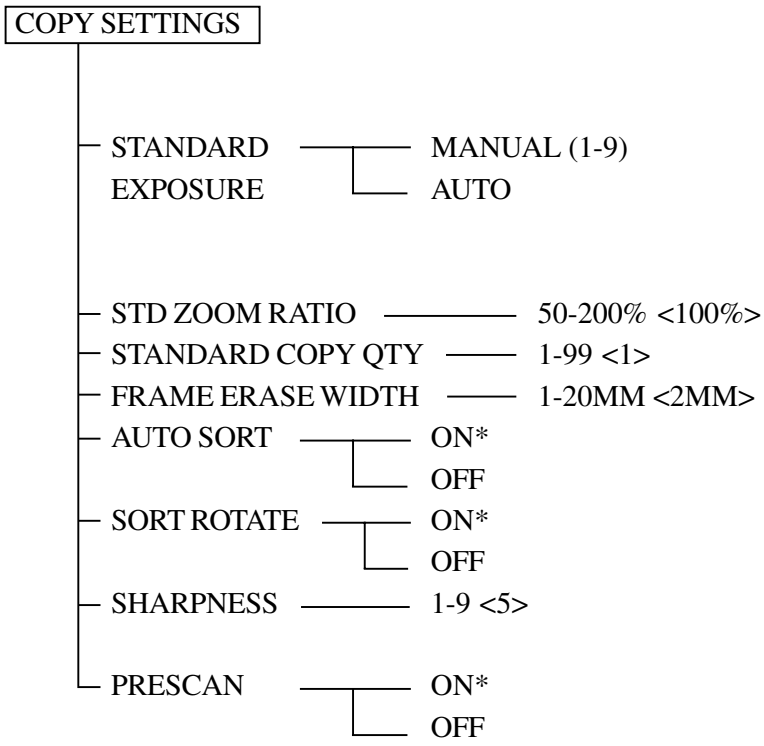


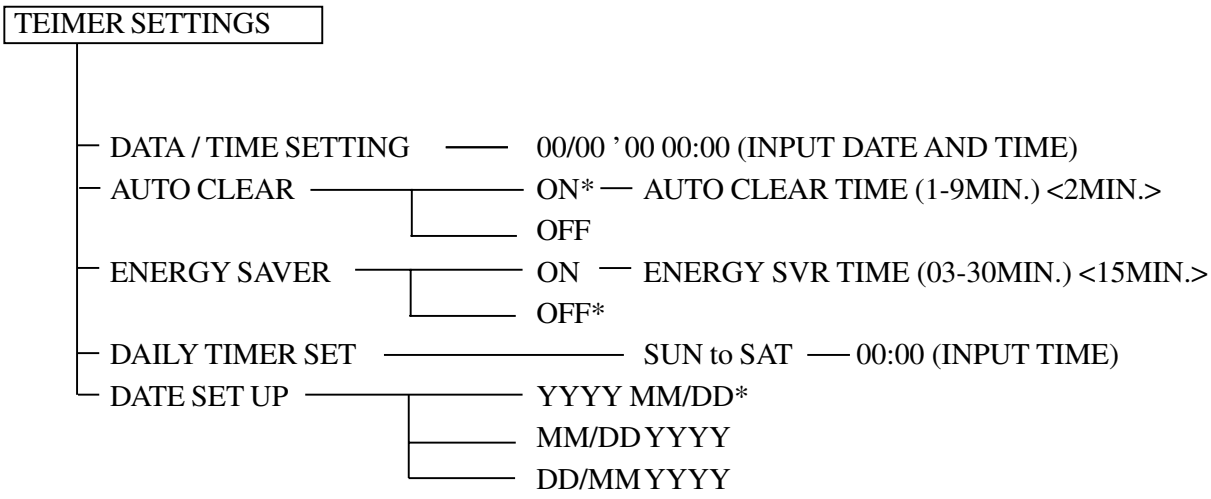
*1 : Enabled for the iR1600 and if equipped with a 1-/3-cassette unit.

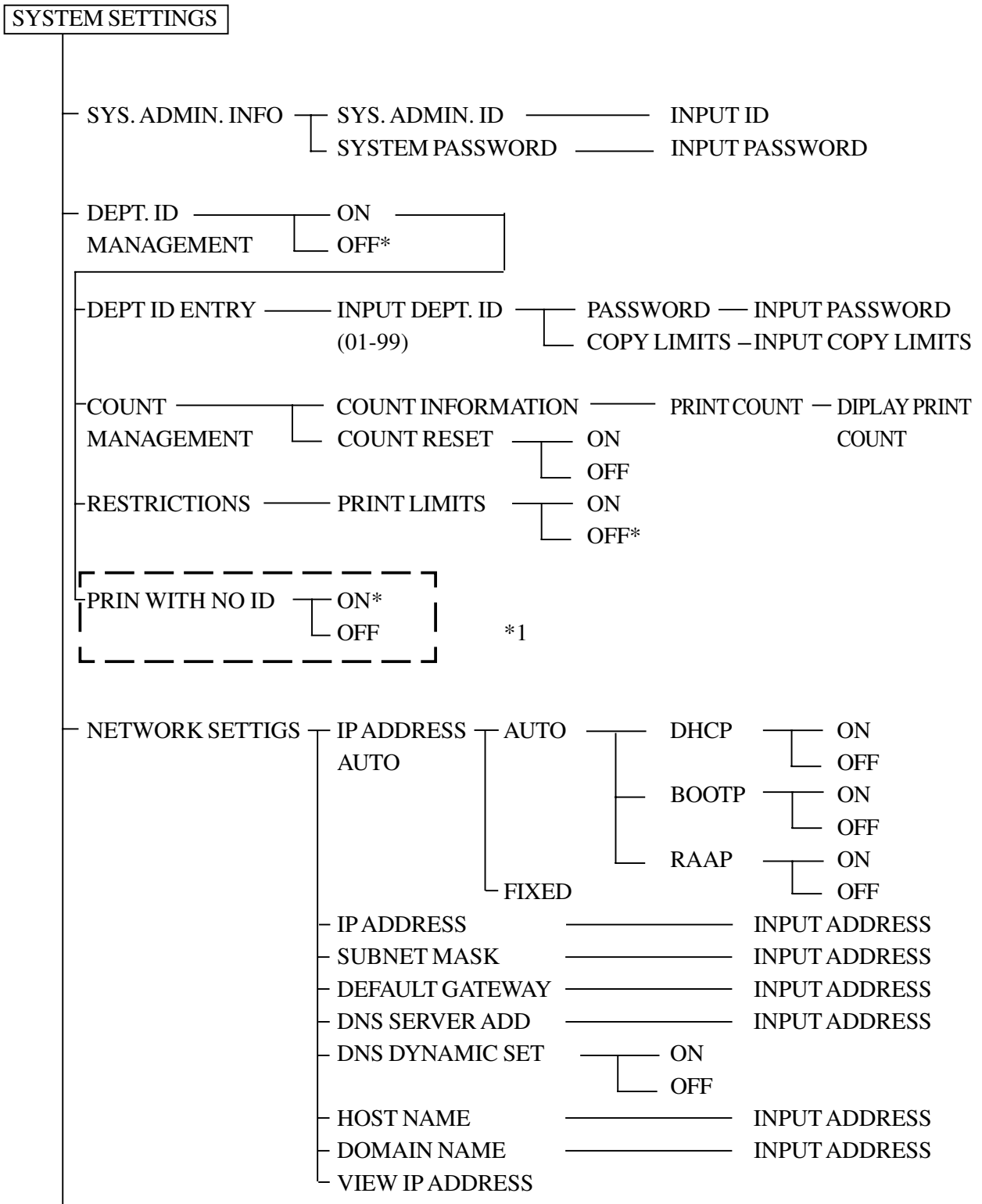
*2 : Enabled for the iR2000 and if equipped with a 2-cassette unit.



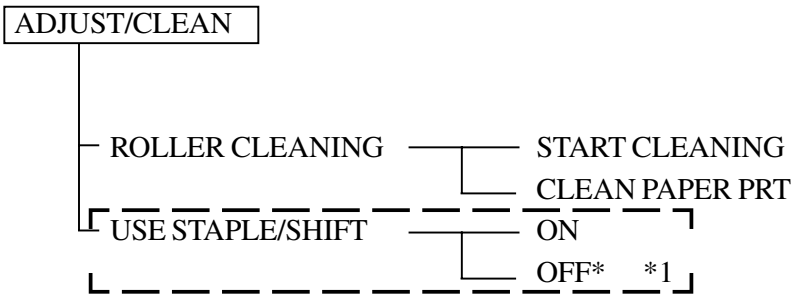
*1 : Enabled only when an inner 2-way tray is installed.



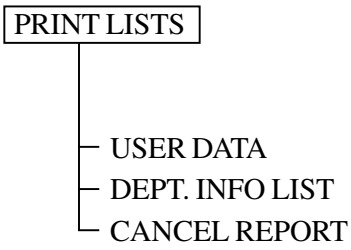

TEIMER SETTINGS
DATA / TIME SETTING
00/00 '00 00:00 (INPUT DATE AND TIME)
AUTO CLEAR
ON*
AUTO CLEAR TIME (1-9MIN.) <2MIN.>
OFF
ENERGY SAVER
ON
ENERGY SVR TIME (03-30MIN.) <15MIN.>
OFF*
DAILY TIMER SET
SUN to SAT
00:00 (INPUT TIME)
DATE SET UP
YYYY MM/DD*
MM/DD YYYY
DD/MM YYYY



*1 : Enabled only when a network printer function is used.



*1 : Enabled only when a finisher is installed.



4.4.2 User Mode for a Fax Model

A press on the Additional Functions key in the control panel will bring up the User Mode setting screen.

The user mode is structured as followes:

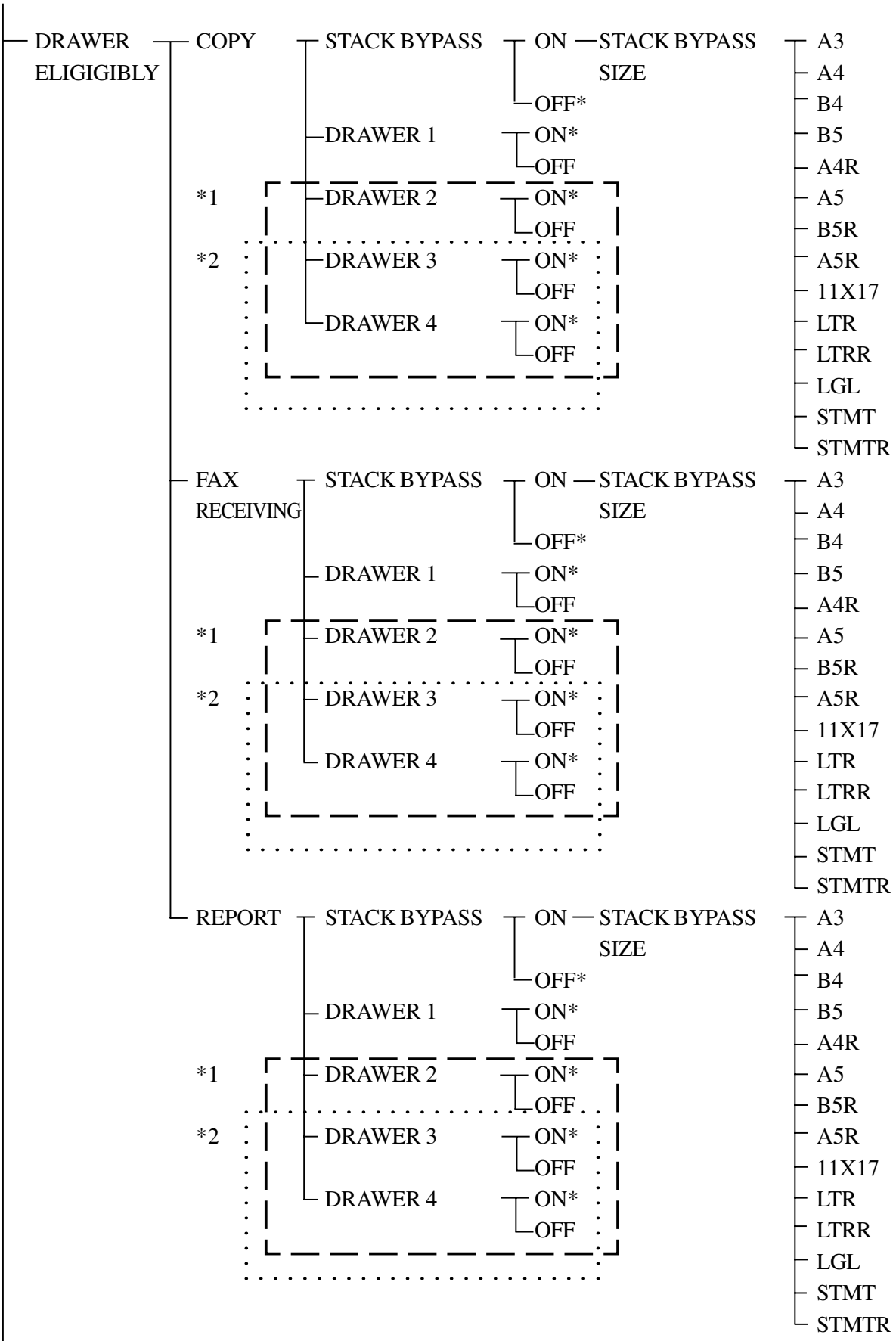
Additional Functions key preesed

- COMMON SETTIGS
- COPY SETTINGS
- FAX SETTINGS
- ADD. REGISTRATION
- TIMER SETTINGS
- SYSETM SETTINGS
- ADJUST/CLEAN
- PRINT LISTS

For sub items, see the pages that follow.

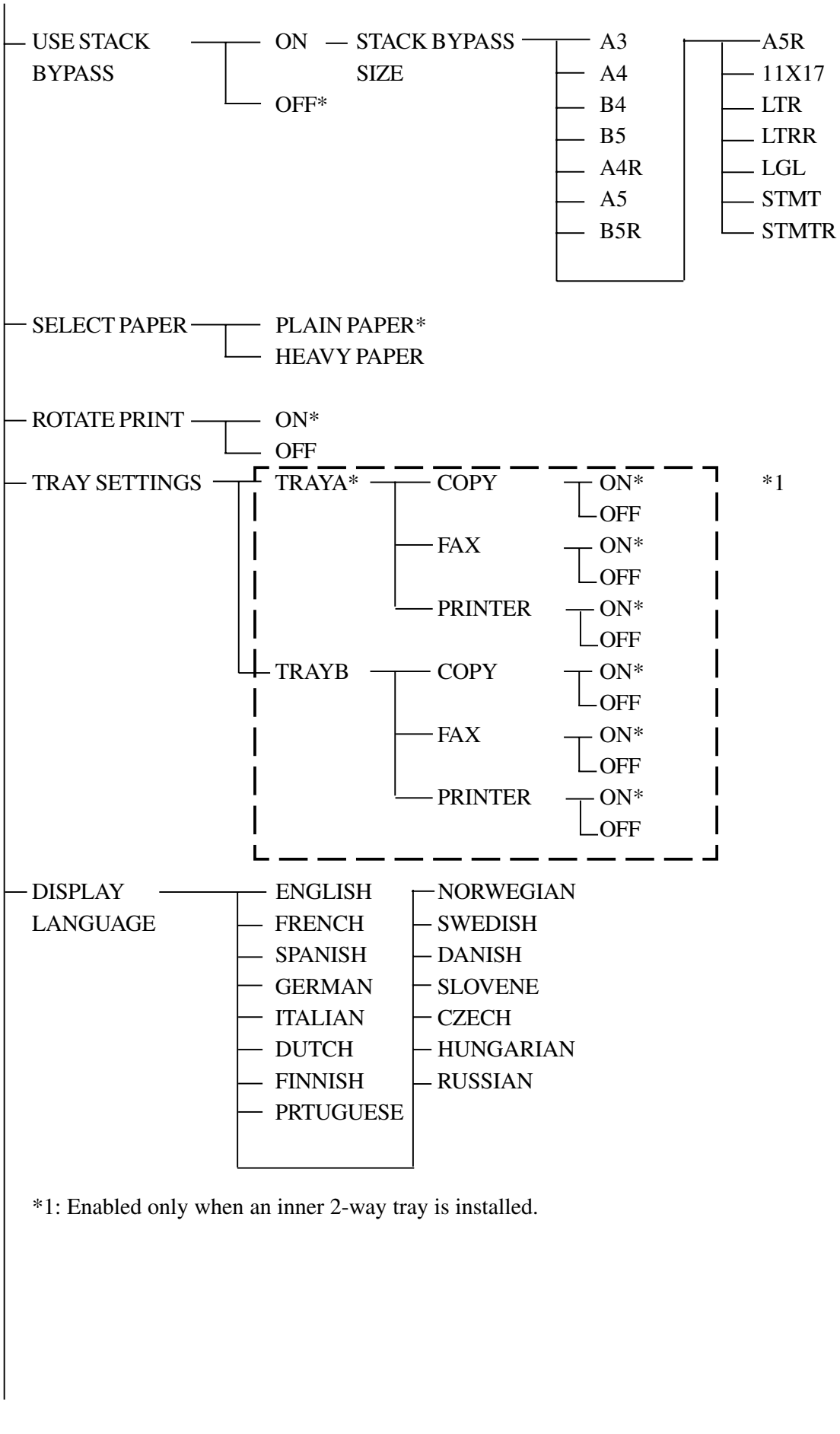
COMMON SETTINGS *,The notation within brackets<> indcates factory settings.

- DEFALT SETTINGS
  - COPY*
  - FAX
- SW AFTER AUTO CLEAR
  - RETURN TO DEFAULT*
  - DO NOT RTN TO DFLT
- VOLUME CONTROL
  - KEYPAD VOLUME
    - ON* (1-3)
    - OFF
  - ALARM VOLUME
    - ON* (1-3)
    - OFF
  - TX DONE TONE
    - ON (1-3)
    - ERROR ONLY* (1-3)
    - OFF
  - RX DONE TONE
    - ON (1-3)
    - ERROR ONLY* (1-3)
    - OFF
  - PRINTING DONE TONE
    - ON (1-3)
    - ERROR ONLY* (1-3)
    - OFF
  - SCANNING DONE TONE
    - ON (1-3)
    - ERROR ONLY* (1-3)
    - OFF
- ESS POWER LEVEL
  - LOW*
  - HIGH

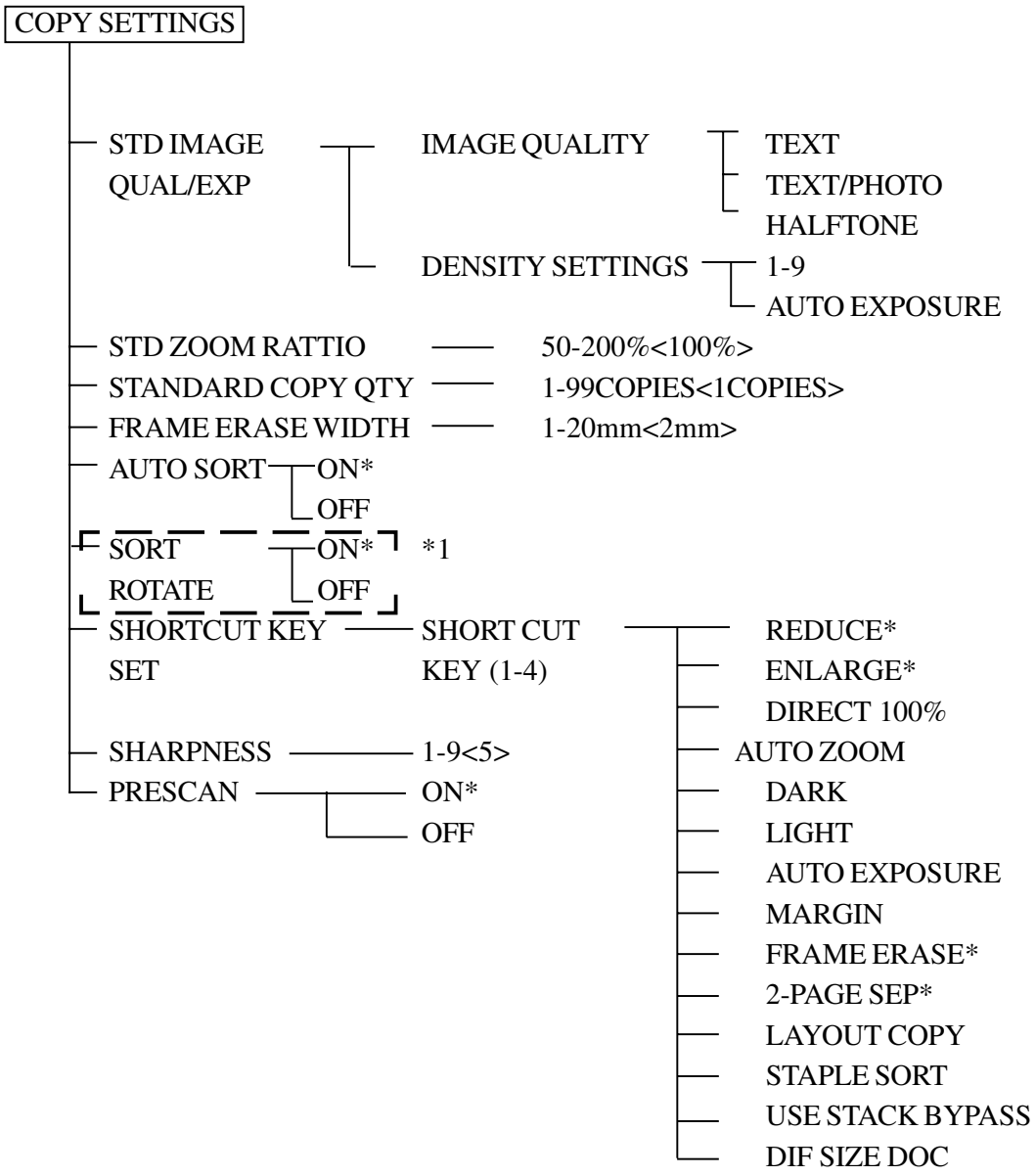


*1: Enabled for the 16cpm models if equipped with a 1-/3-cassette unit.

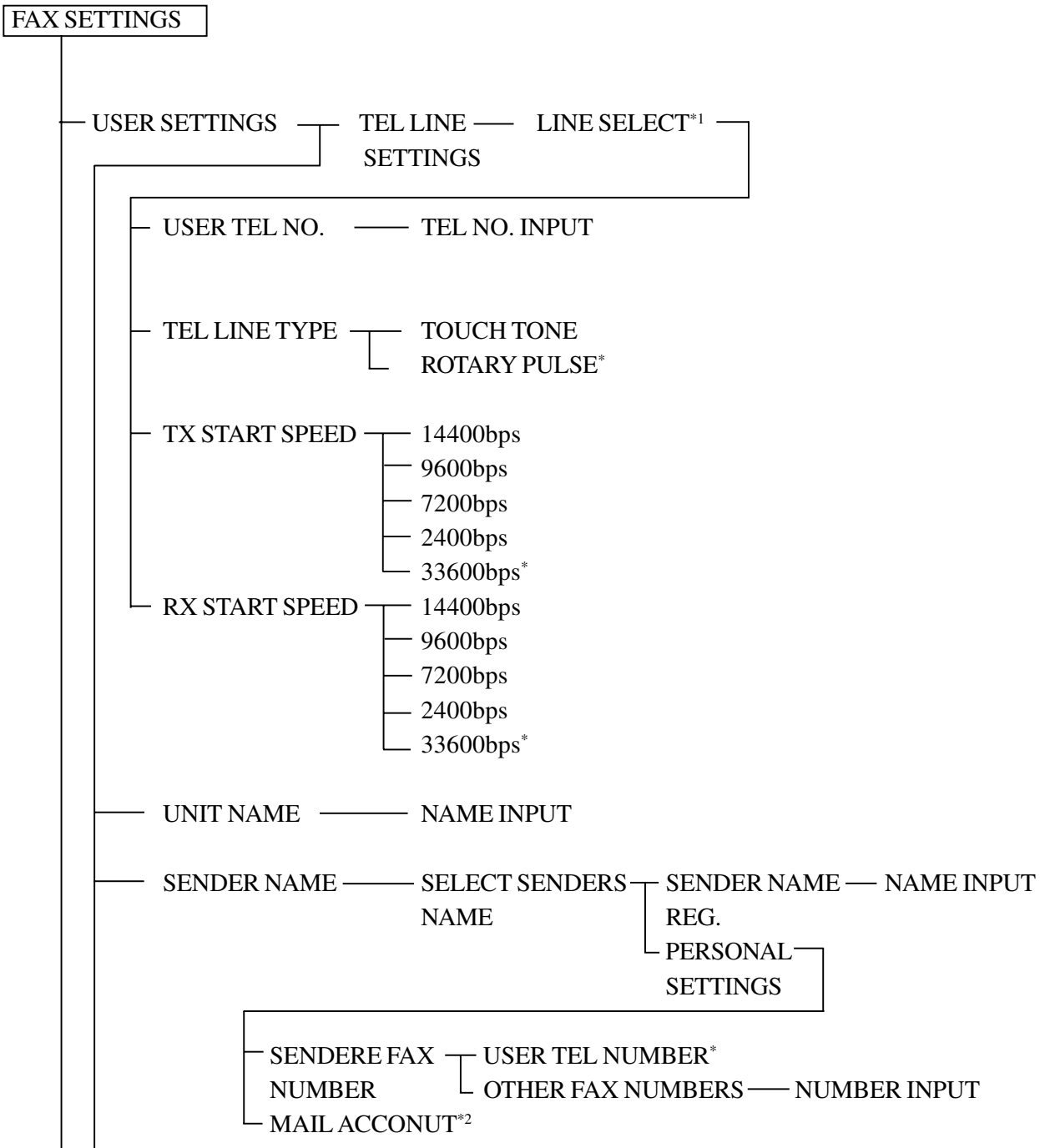
*2: Enabled for the 20cpm models if equipped with a 2-cassette unit.



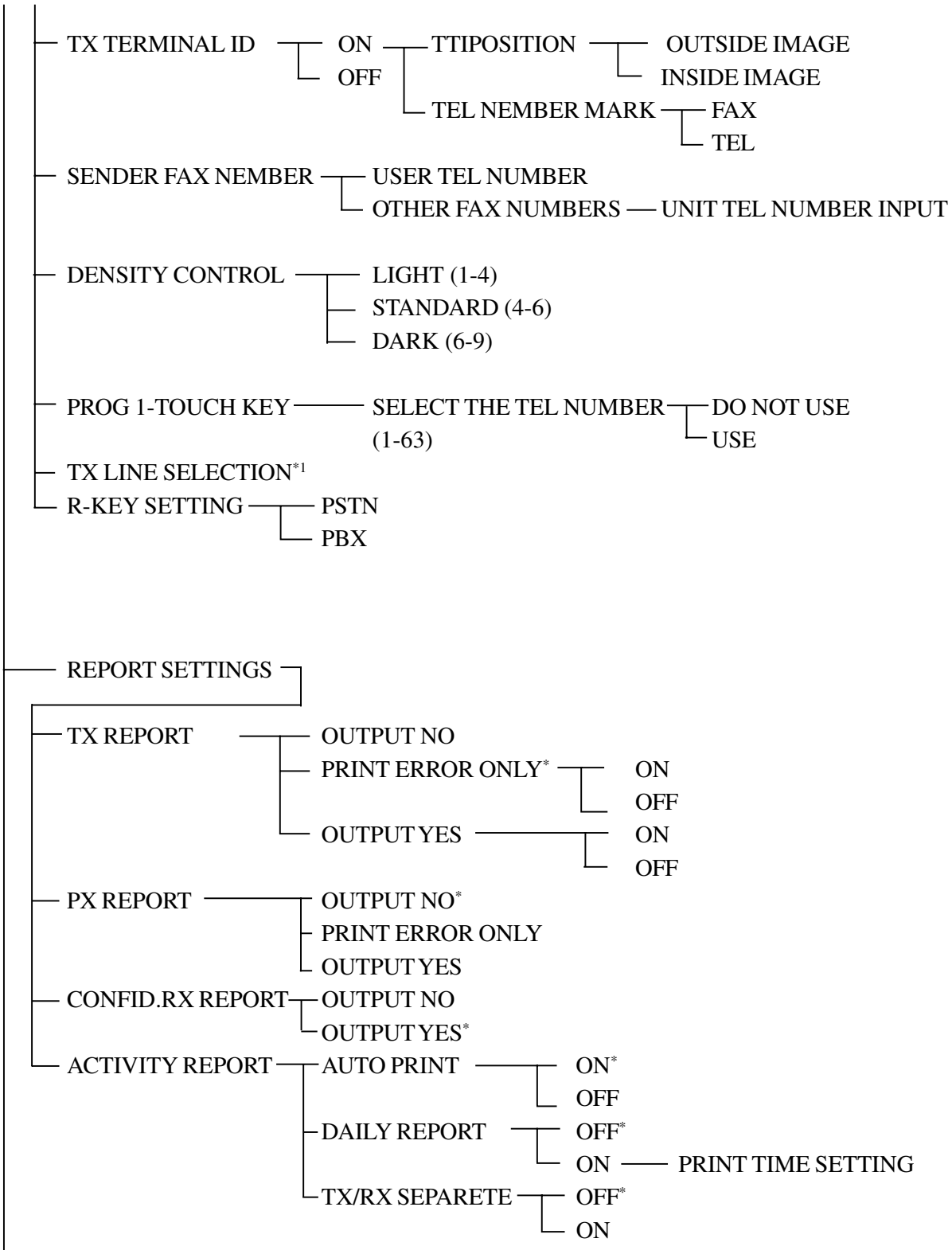
*1: Enabled only when an inner 2-way tray is installed.



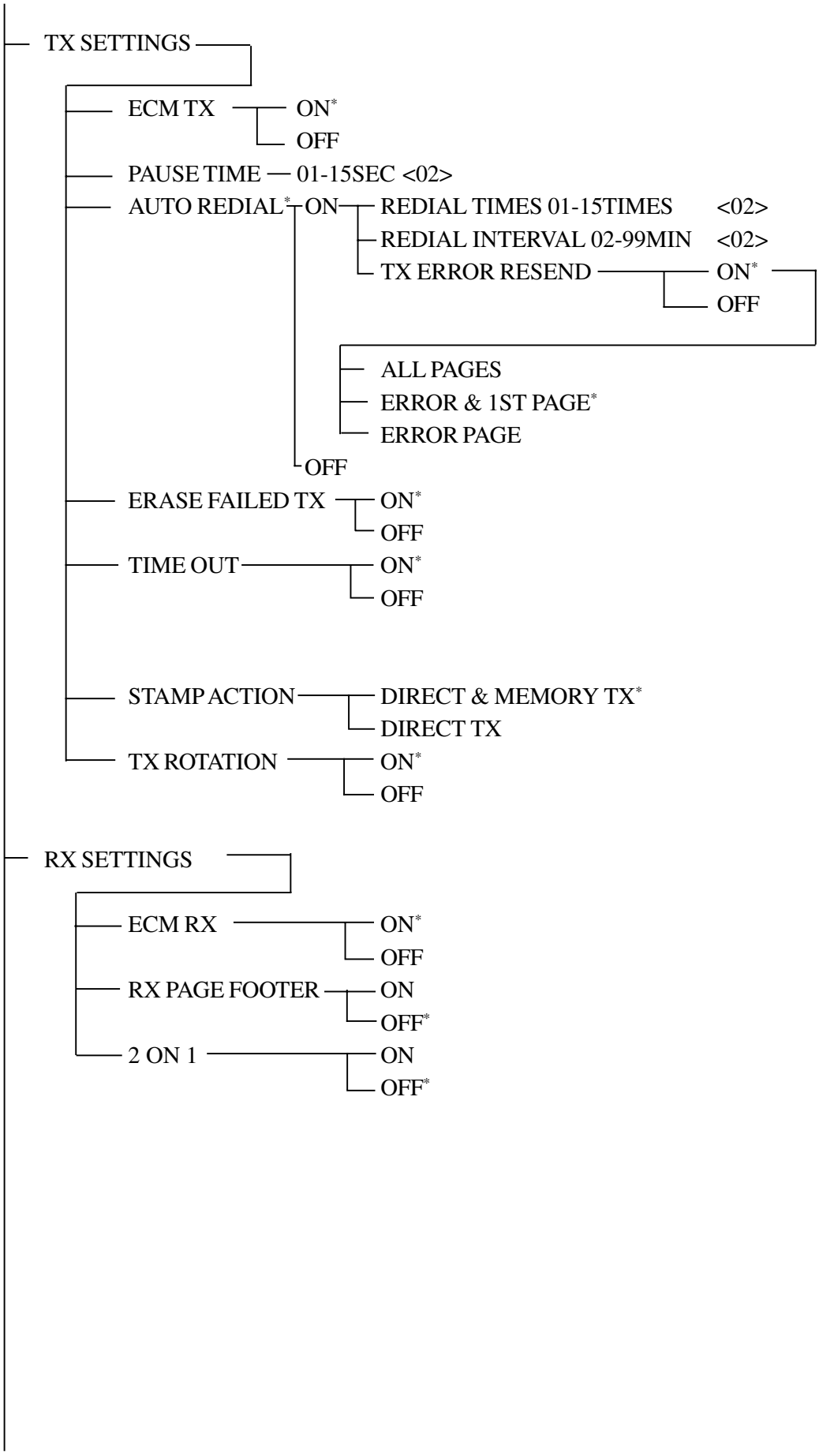
*1: FEnables only with expansion memory installed if equipped with a finisher.

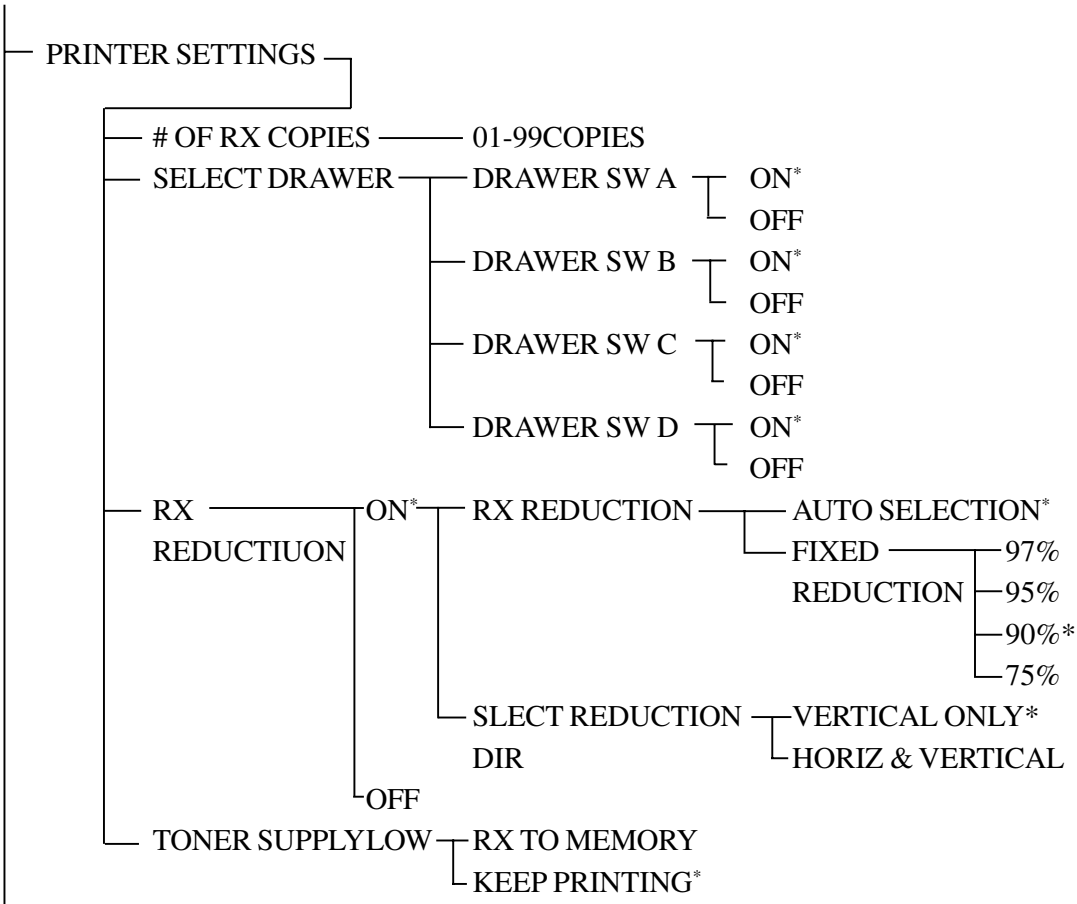


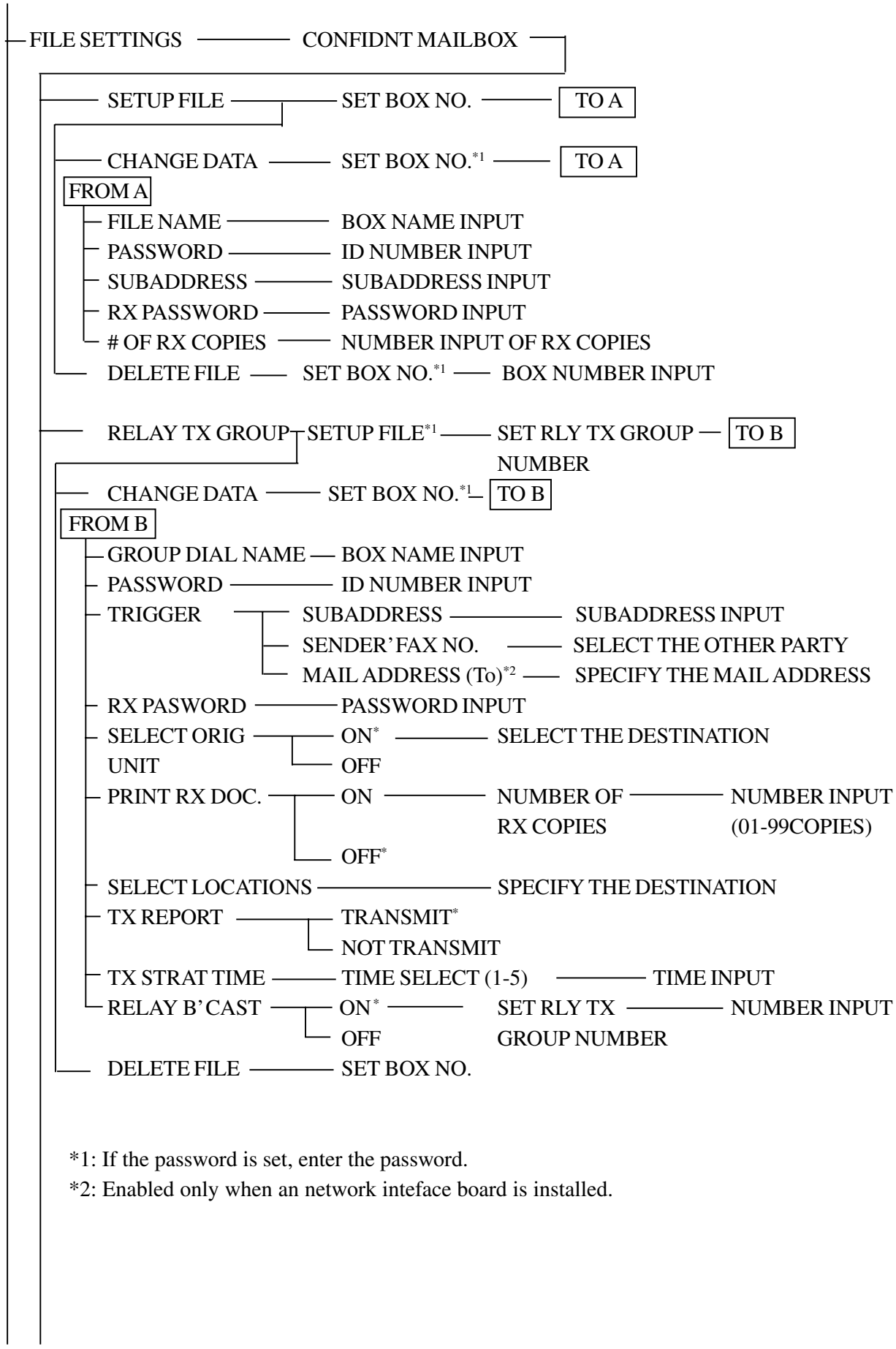
*1:If the G3 expansion kit is installed, the line1/line2 is dipalyed.
*2:Enabled only when an network inteface board is installed.



*1:displayed only when the G3 expansion kit is installed.

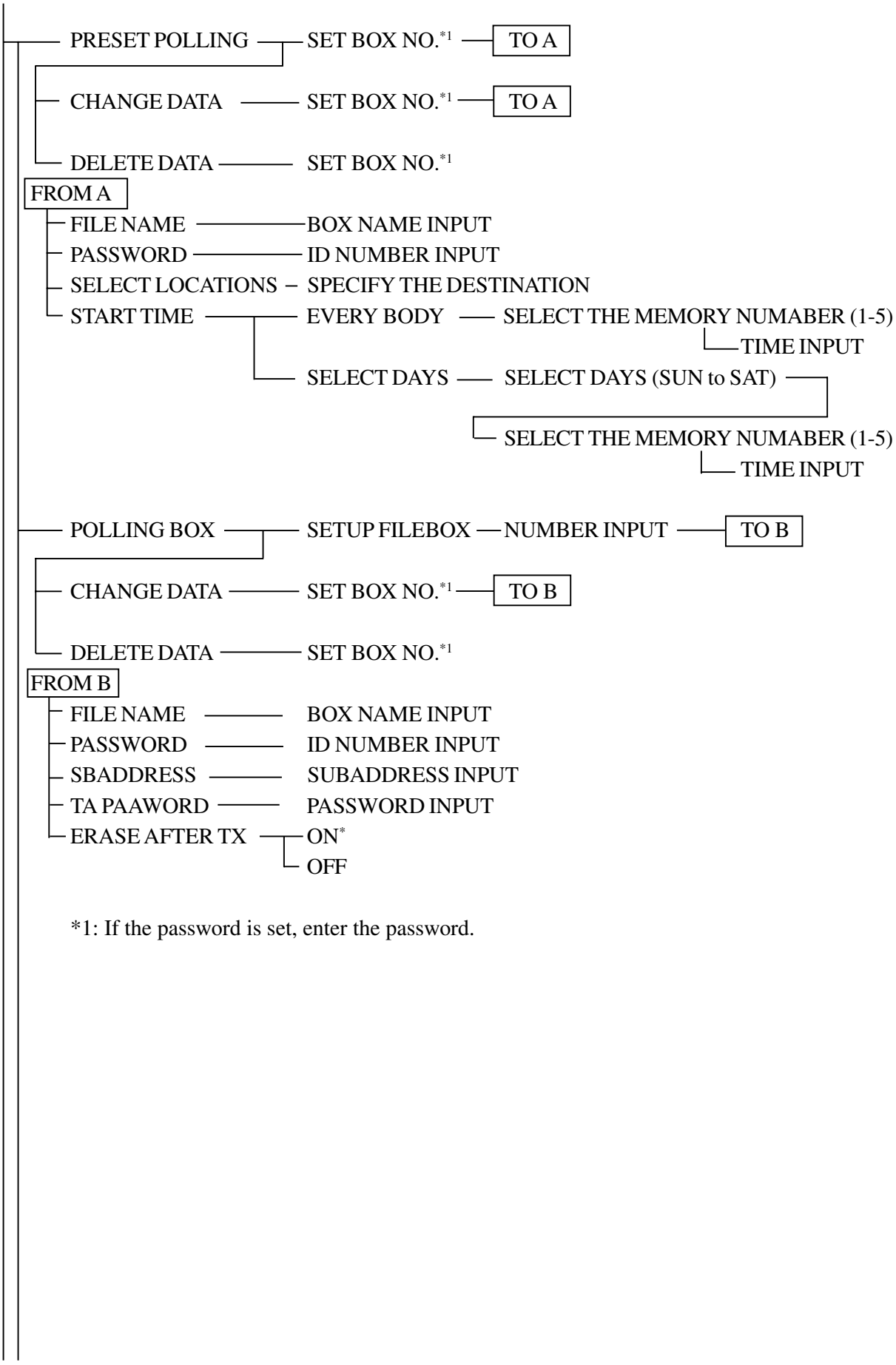

TX SETTINGS
ECM TX
ON*
OFF
PAUSE TIME
01-15SEC <02>
AUTO REDIAL*
ON
REDIAL TIMES 01-15TIMES <02>
REDIAL INTERVAL 02-99MIN <02>
TX ERROR RESEND
ON*
OFF
ALL PAGES
ERROR & 1ST PAGE*
ERROR PAGE
OFF
ERASE FAILED TX
ON*
OFF
TIME OUT
ON*
OFF
STAMP ACTION
DIRECT & MEMORY TX*
DIRECT TX
TX ROTATION
ON*
OFF
RX SETTINGS
ECM RX
ON*
OFF
RX PAGE FOOTER
ON
OFF*
2 ON 1
ON
OFF*



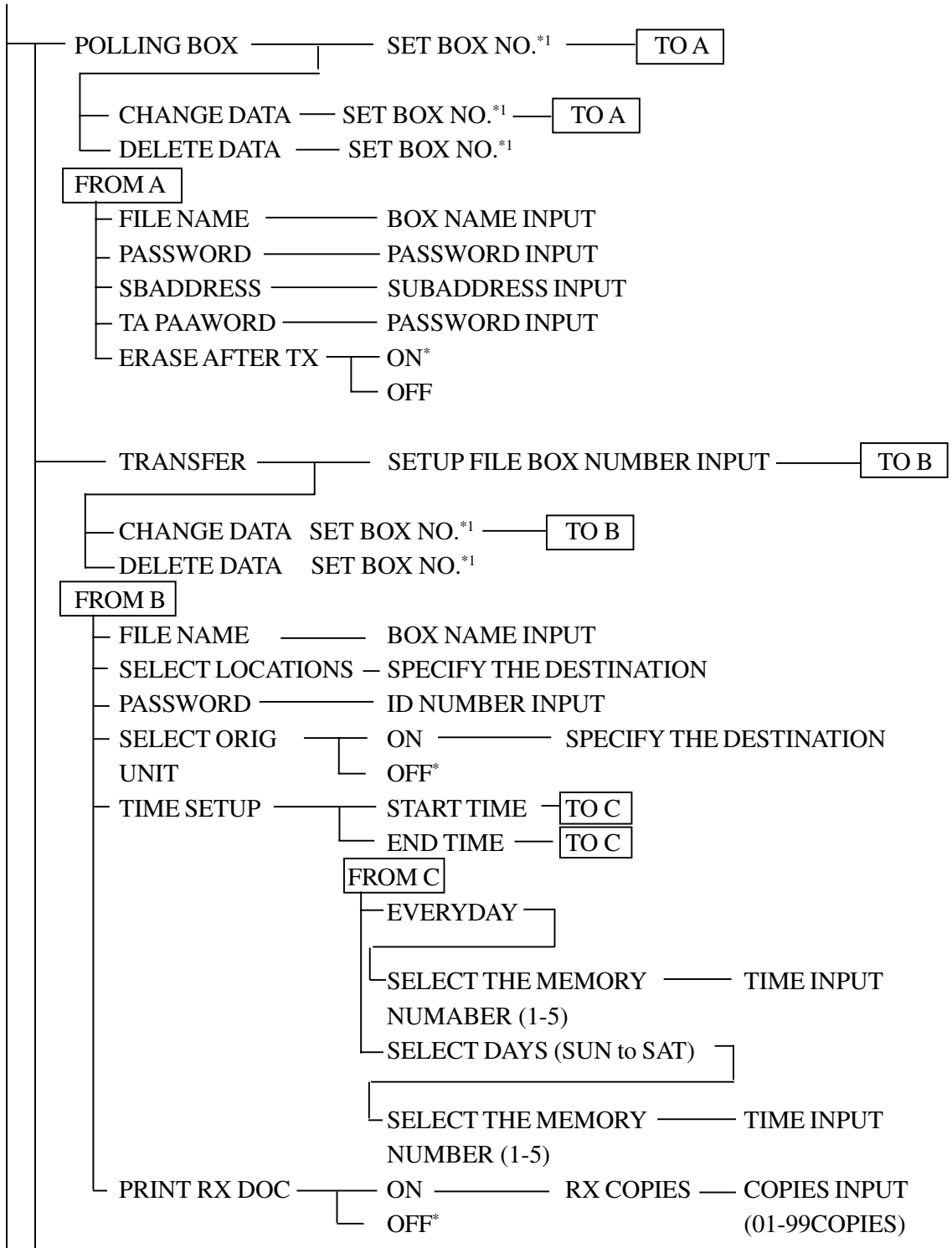


*1: If the password is set, enter the password.

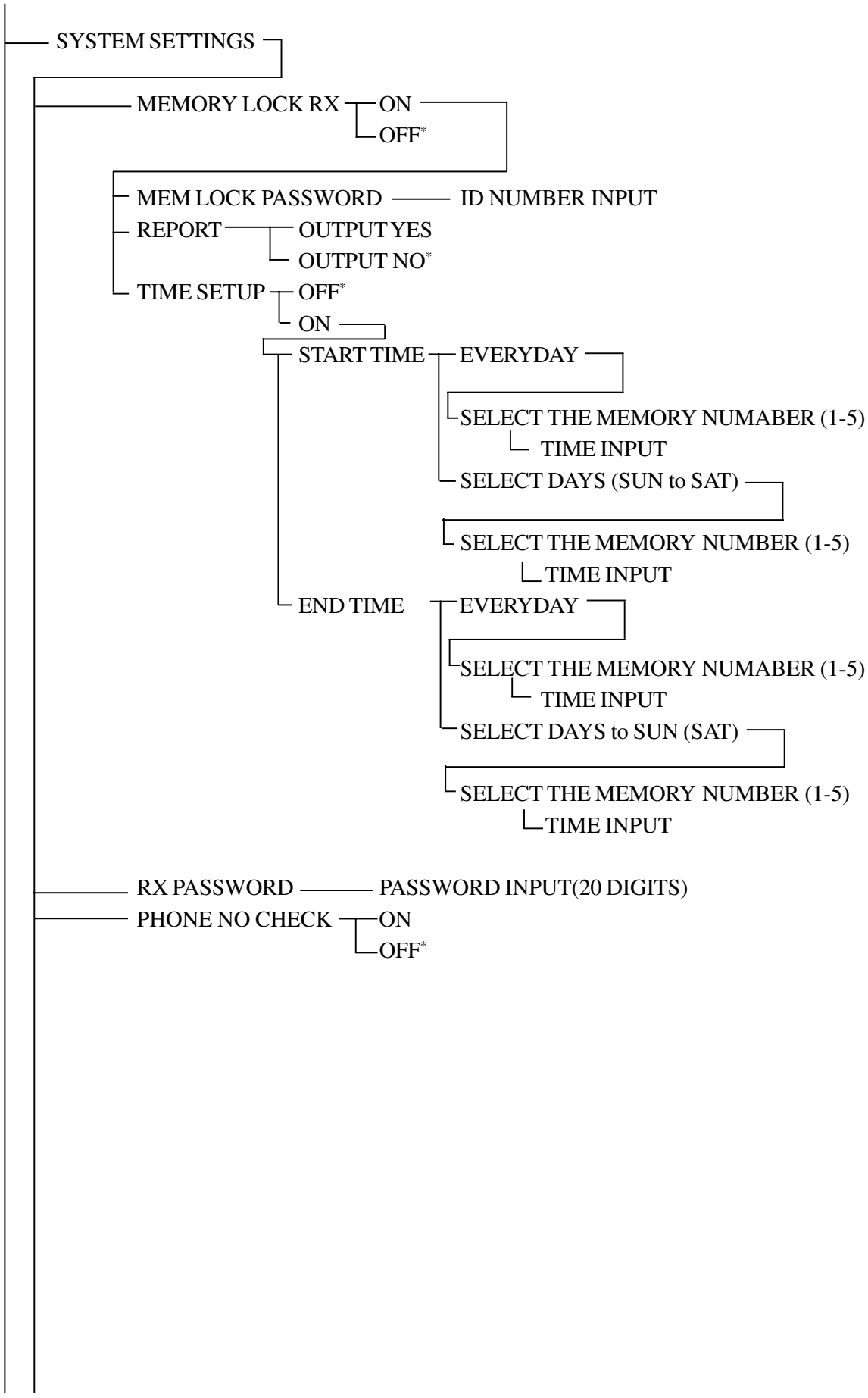
*2: Enabled only when an network inteface board is installed.

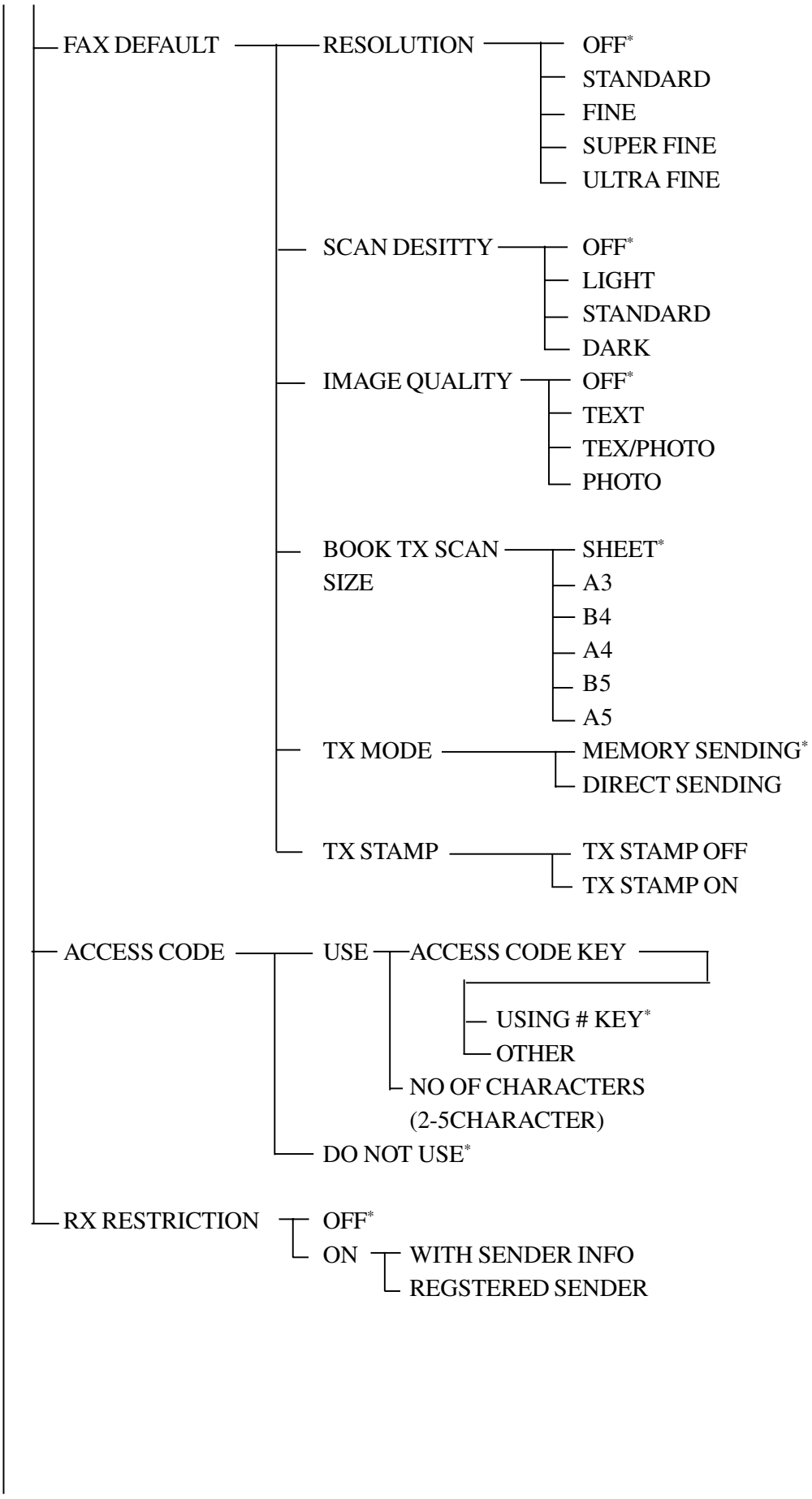


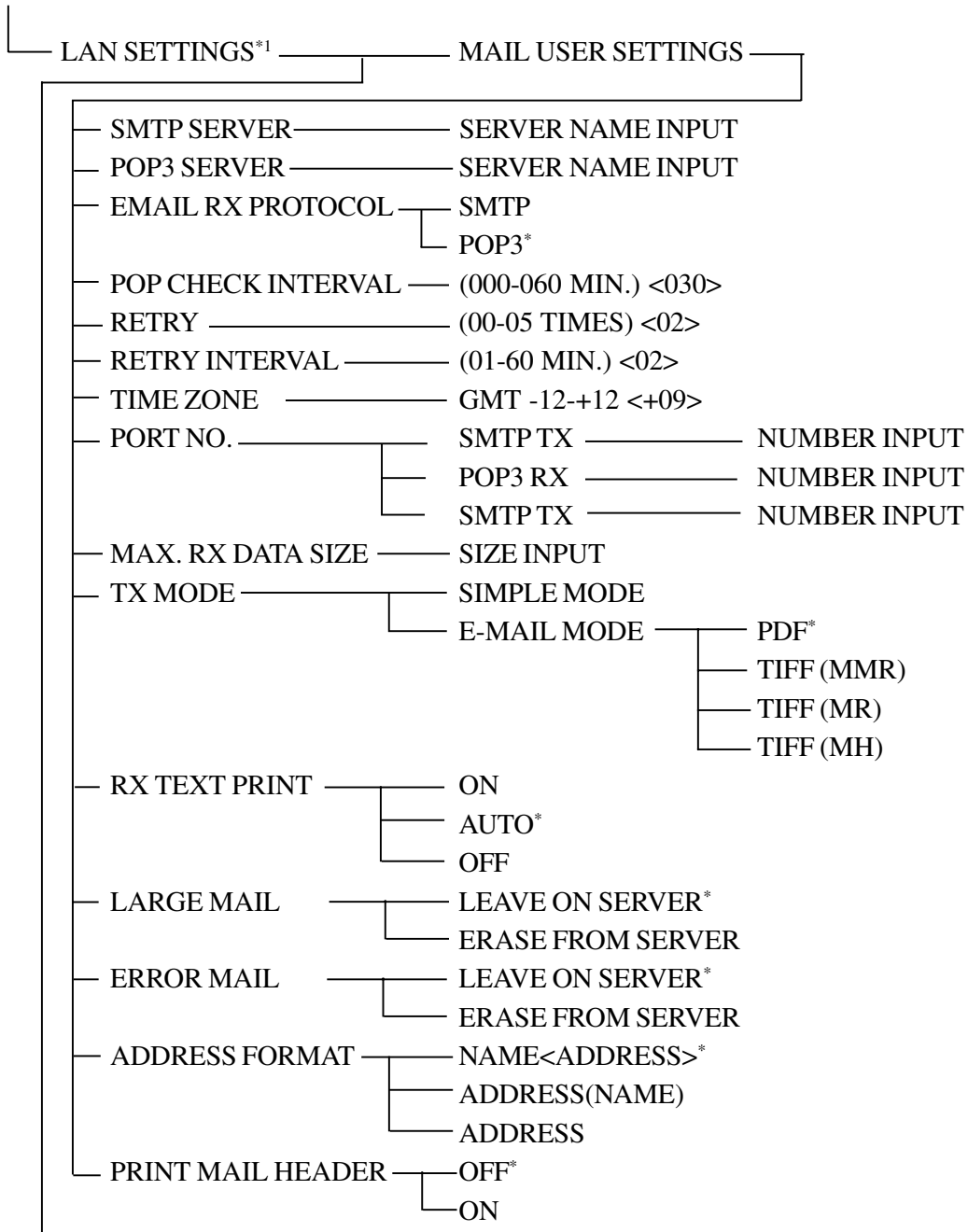
*1: If the password is set, enter the password.



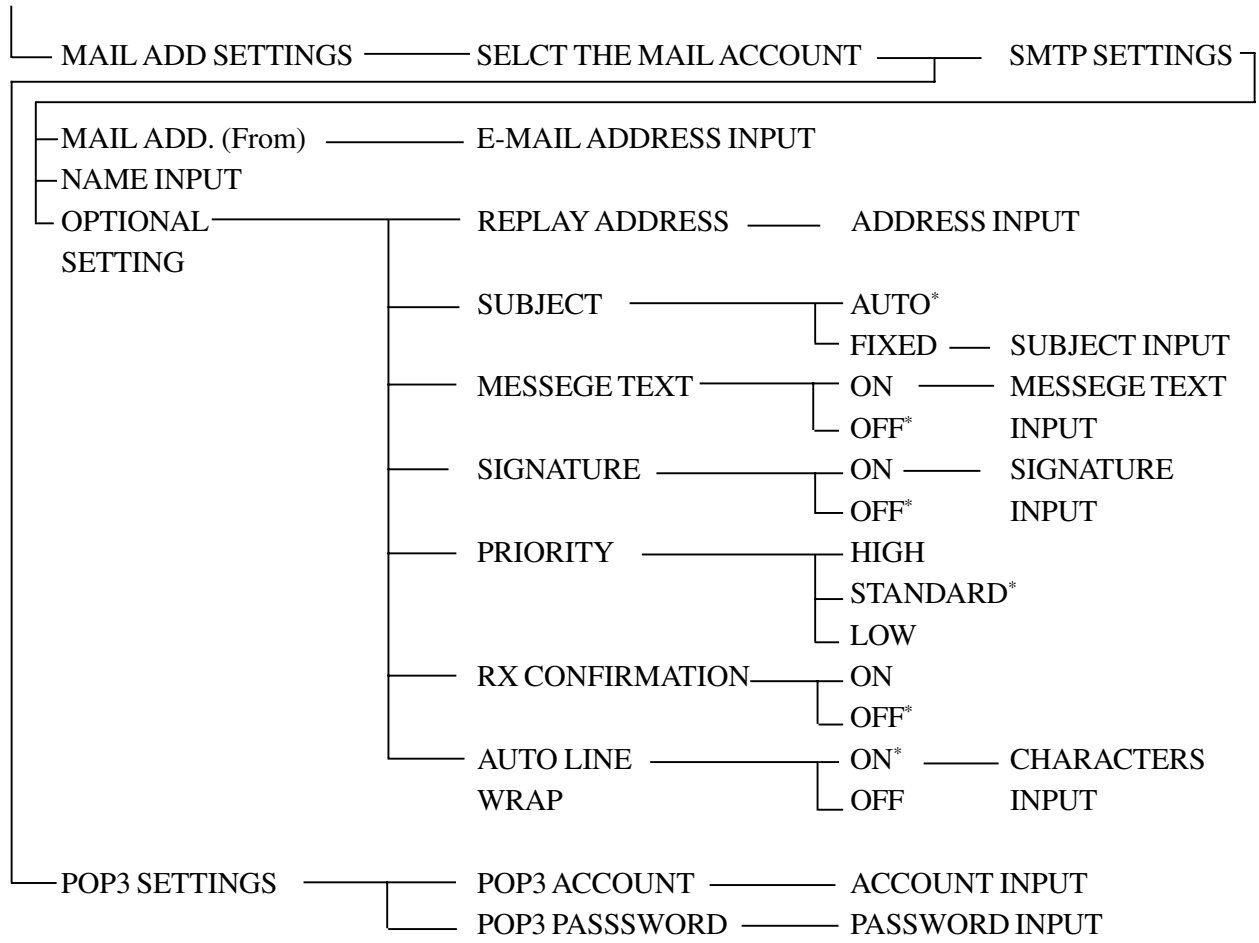
*1: If the password is set, enter the password.

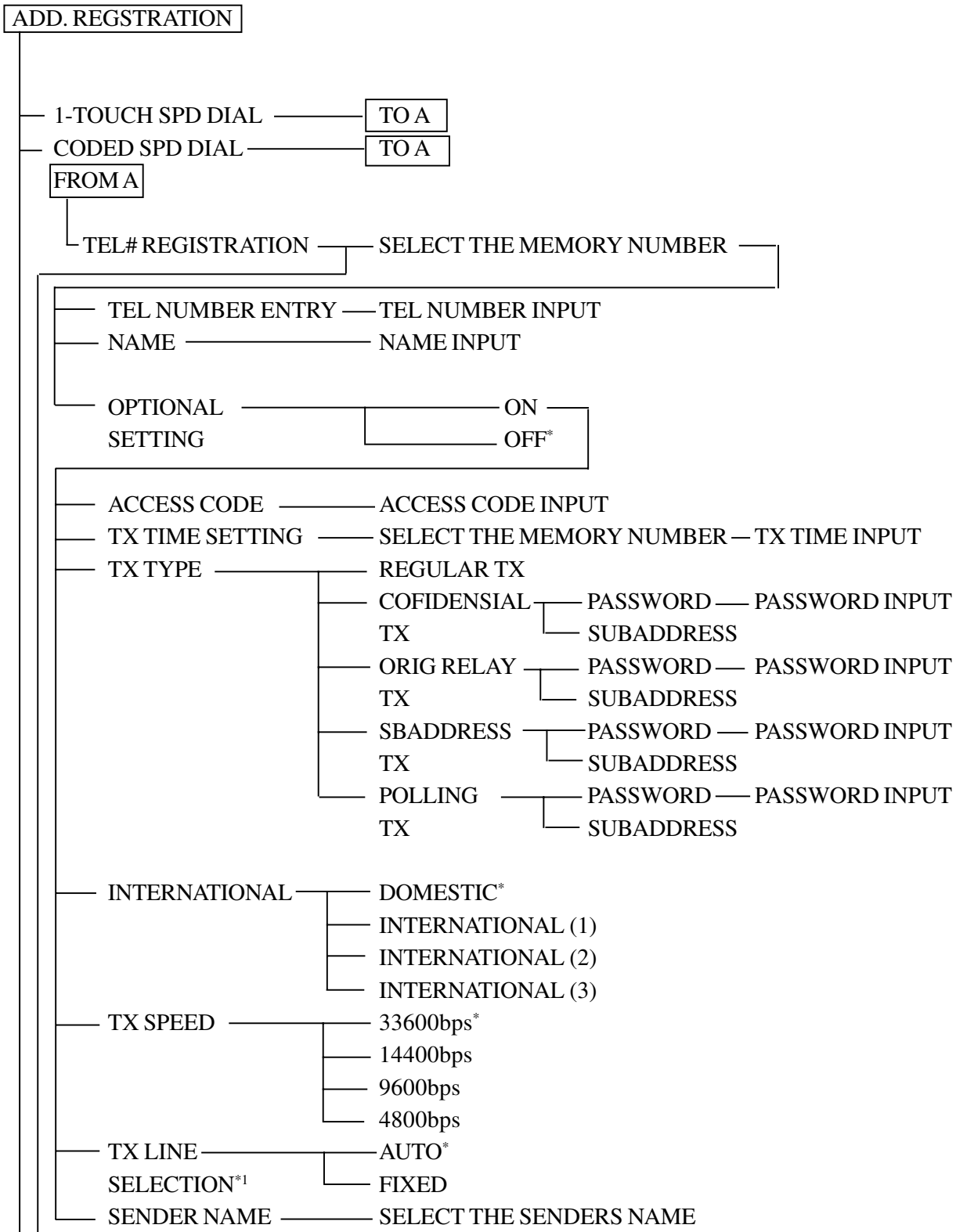



FAX DEFAULT
RESOLUTION
OFF*
STANDARD
FINE
SUPER FINE
ULTRA FINE
SCAN DESITTY
OFF*
LIGHT
STANDARD
DARK
IMAGE QUALITY
OFF*
TEXT
TEX/PHOTO
PHOTO
BOOK TX SCAN SIZE
SHEET*
A3
B4
A4
B5
A5
TX MODE
MEMORY SENDING*
DIRECT SENDING
TX STAMP
TX STAMP OFF
TX STAMP ON
ACCESS CODE
USE
ACCESS CODE KEY
USING # KEY*
OTHER
NO OF CHARACTERS (2-5CHARACTER)
DO NOT USE*
RX RESTRICTION
OFF*
ON
WITH SENDER INFO
REGSTERED SENDER

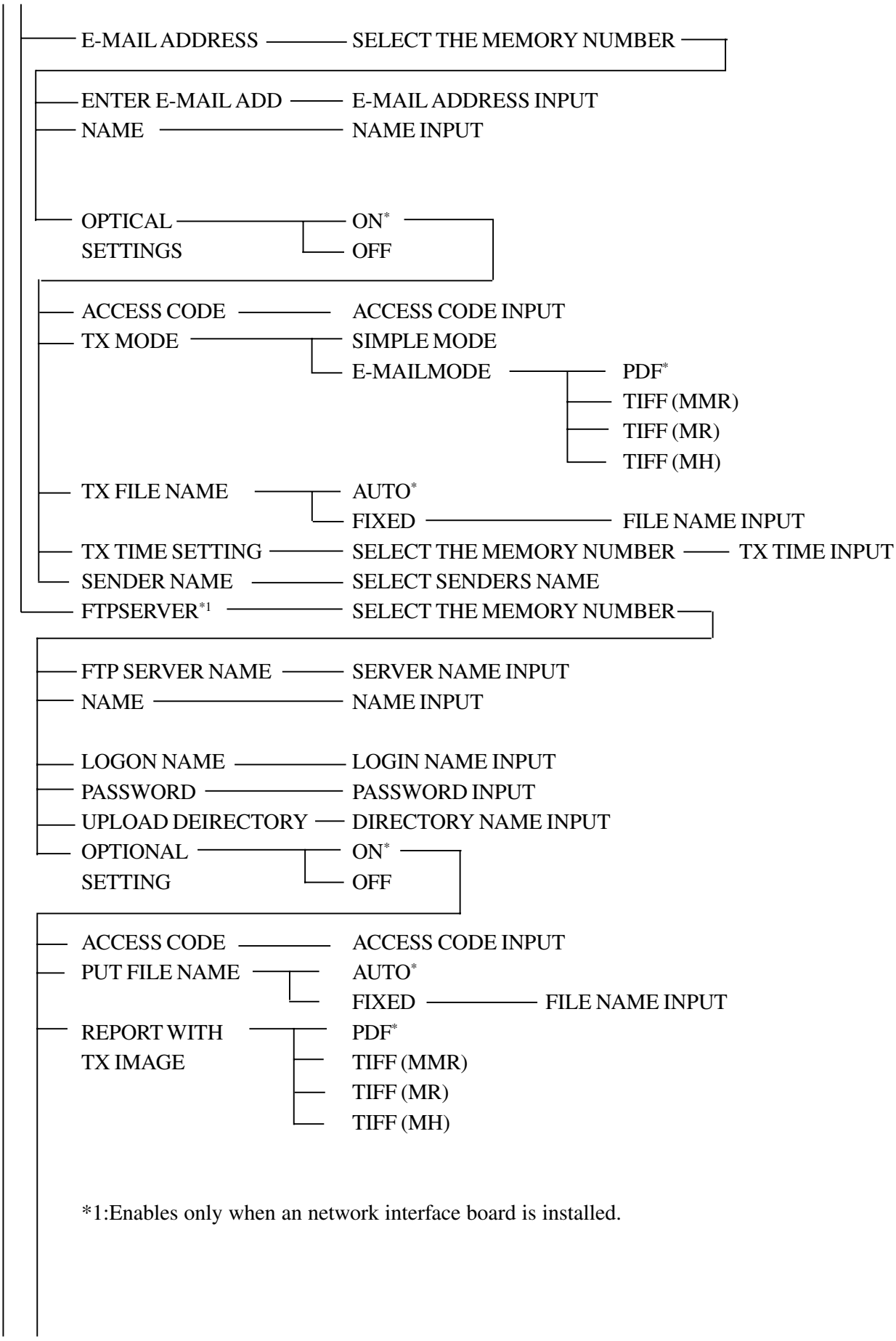


*1:Enabled only when an network inteface board is installed.

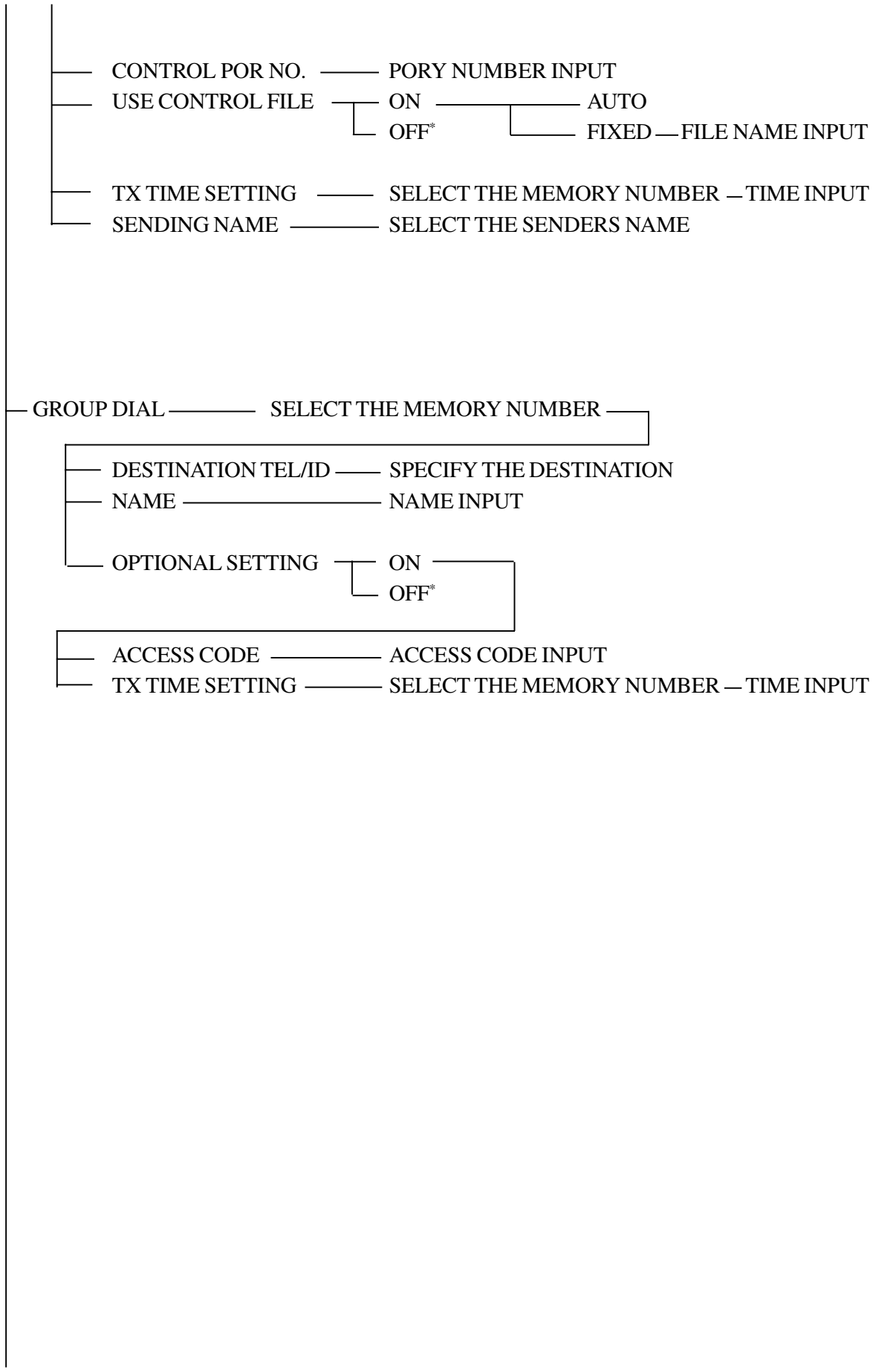

MAIL ADD SETTINGS
SELCT THE MAIL ACCOUNT
SMTP SETTINGS
MAIL ADD. (From)
E-MAIL ADDRESS INPUT
NAME INPUT
OPTIONAL SETTING
REPLAY ADDRESS
ADDRESS INPUT
SUBJECT
AUTO*
FIXED
SUBJECT INPUT
MESSEGE TEXT
ON
MESSEGE TEXT INPUT
OFF*
SIGNATURE
ON
SIGNATURE INPUT
OFF*
PRIORITY
HIGH
STANDARD*
LOW
RX CONFIRMATION
ON
OFF*
AUTO LINE WRAP
ON*
CHARACTERS INPUT
OFF
POP3 SETTINGS
POP3 ACCOUNT
ACCOUNT INPUT
POP3 PASSSWORD
PASSWORD INPUT

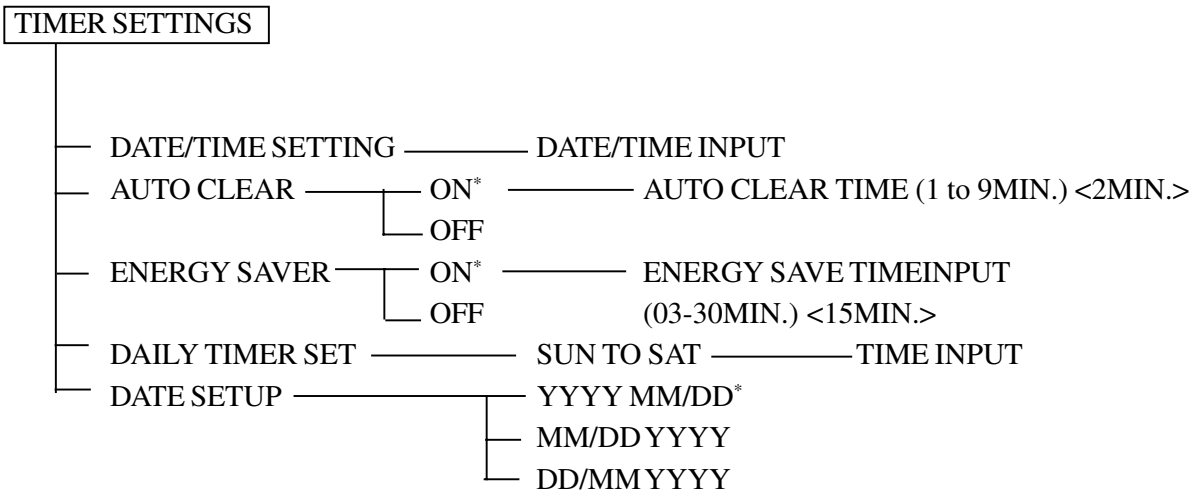


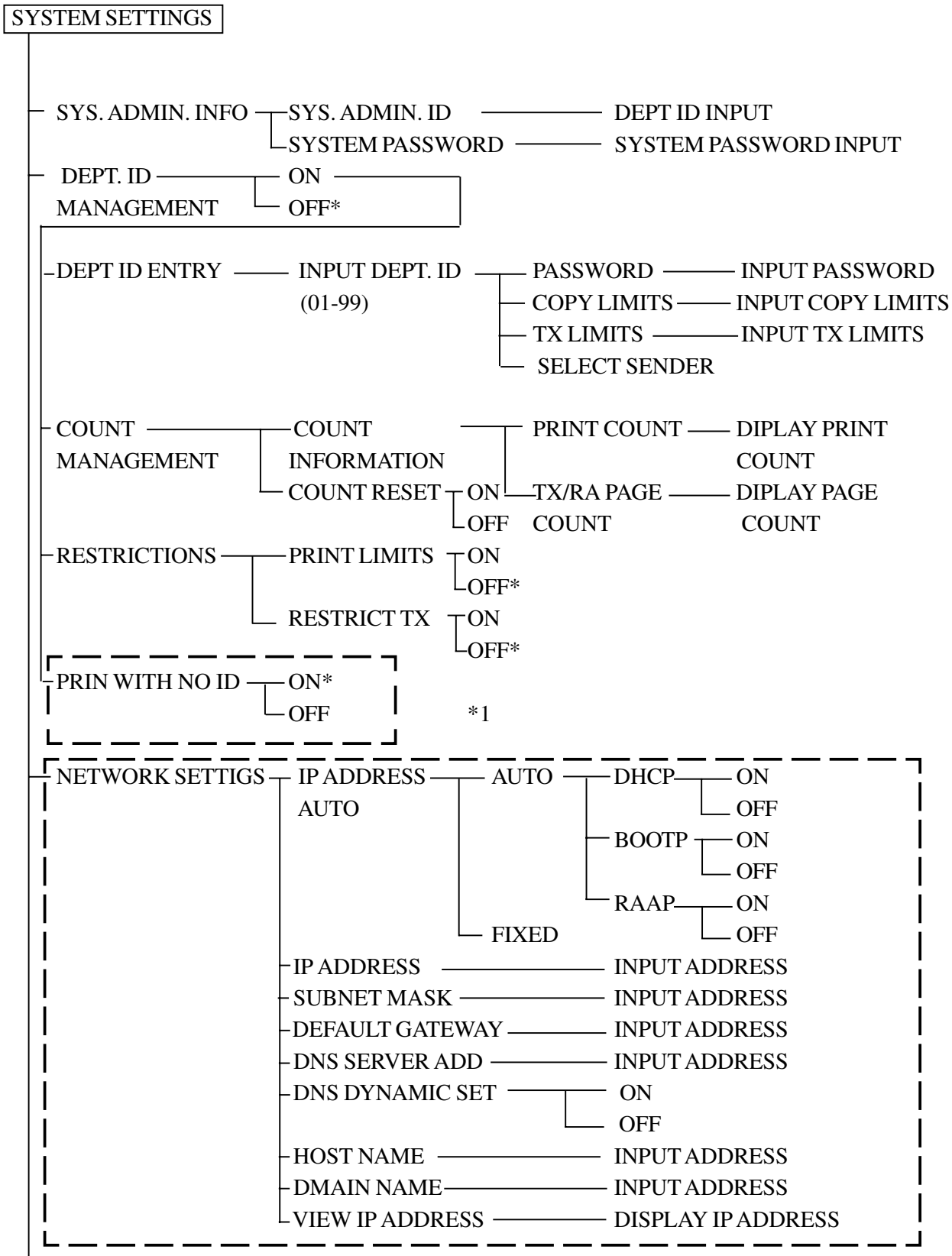
*1:Enables only when the G3 expansion kit is installed.



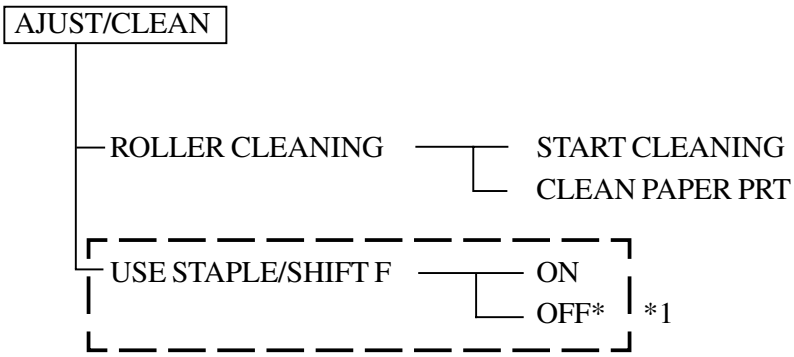
*1:Enables only when an network interface board is installed.



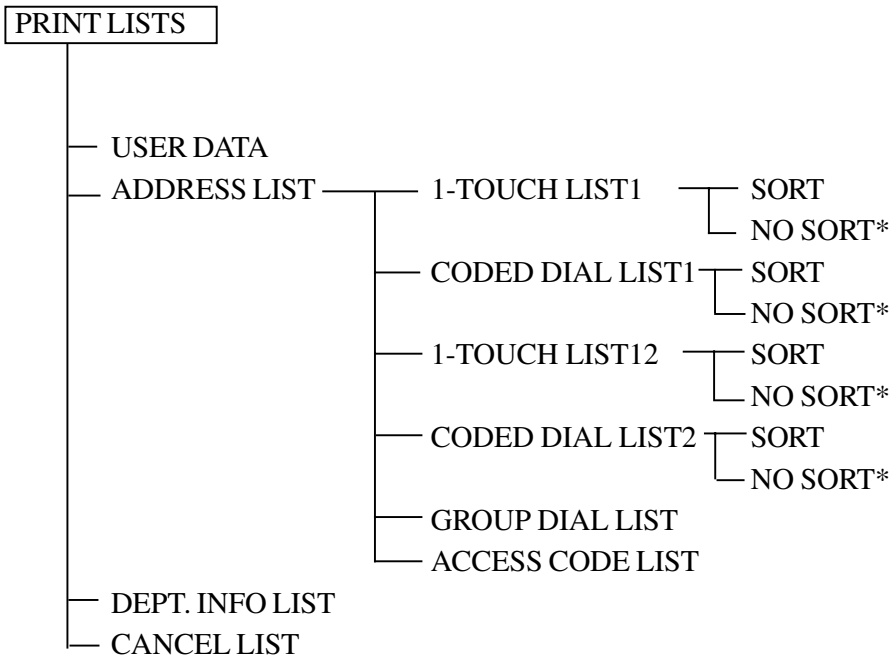

TIMER SETTINGS
DATE/TIME SETTING
DATE/TIME INPUT
AUTO CLEAR
ON*
AUTO CLEAR TIME (1 to 9MIN.) <2MIN.>
OFF
ENERGY SAVER
ON*
ENERGY SAVE TIMEINPUT
OFF
(03-30MIN.) <15MIN.>
DAILY TIMER SET
SUN TO SAT
TIME INPUT
DATE SETUP
YYYY MM/DD*
MM/DD YYYY
DD/MM YYYY



*1:Enabled only when an network inteface board is installed.



*1:Enabled only when an finisher is installed.



5 Cleaning by the User

5.1 Cleaning by the User

Instruct the user to provide the following maintenance on a regular basis, including the cleaning of the following once a month:

· Fixing roller
· Copyboard glass, reading glass, and copyboard cover

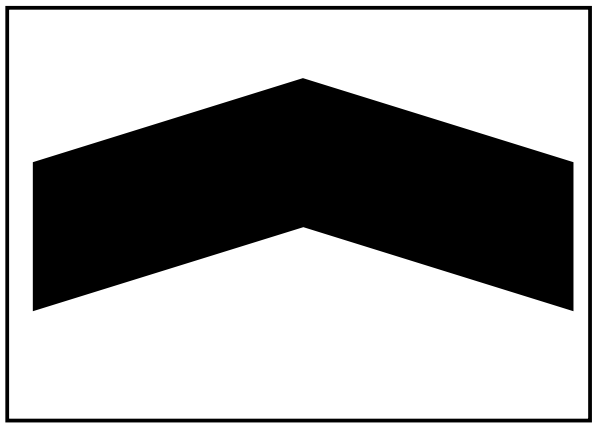
5.1.1 Cleaning the Fixing Roller

Advise the user to clean the fixing roller for the following:

· when the cartridge has been replaced.
· when black lines appear on printed paper.

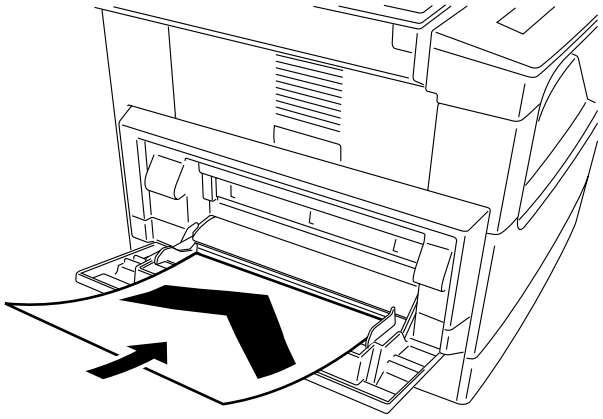
To clean, go through the following:

1) Place A4 or LTR paper in the cassette or manual feed tray.
2) Press the Additional Functions key to bring up the User Mode screen.
3) Using the cursor key, select "5. ADJUST/CLEAN", and press the OK key.
4) Using the cursor key, select "02 CLEAN PAPER PRT", and press the OK key so that the paper will automatically be picked up and the following output will be generated:



F01-501-01

5) Paying attention to the orientation of the output, place it as shown.



F01-501-02

6) Go though steps 2) through 3), and select '01 START CLEANING" using the cursor key; then press the OK key so that the cleaning paper will automatically be picked up and the fixing roller will be cleaned.

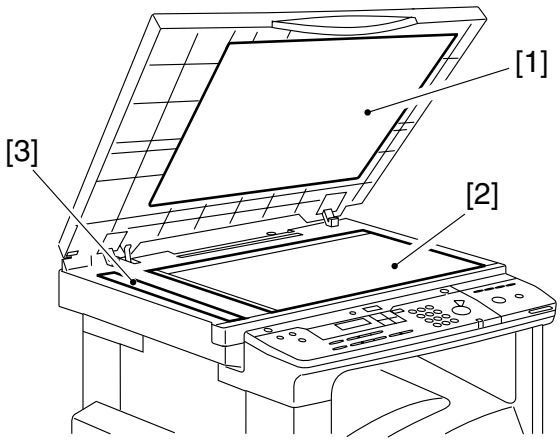
Memo

It takes about 3 min between when cleaning starts and when the cleaning paper is delivered to the delivery tray.

7) See that the cleaning paper has been delivered, indicating the end of cleaning.

5.1.2 Cleaning the Copyboard Glass, Reading Glass, and Copyboard Cover White Plate

1) Clean the copyboard over white plate [1], copyboard glass [2], and reading glass [3] with a cloth moistened with water (well wrung); then, dry wipe them.



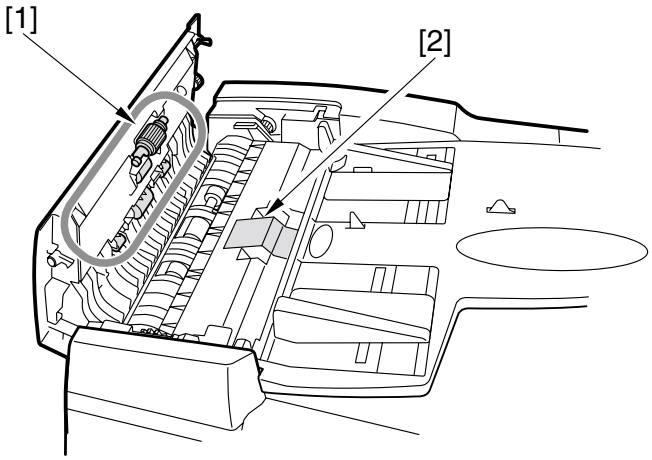
F01-501-03

5.1.3 Cleaning the ADF Roller/Guide Assembly

Advise the user to clean the ADF roller/film assembly for the following in addition to doing so as part of routine maintenance:

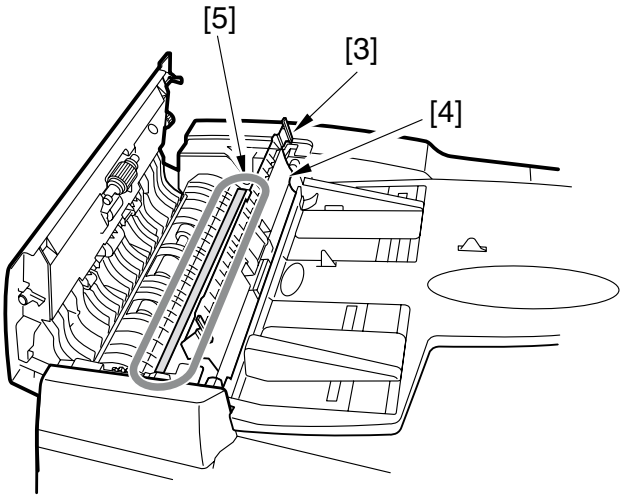
- The cartridge has been replaced.
- The paper printout is soiled.

1) Open the feeder cover of the ADF, and clean the 5 rollers [1] and the separation plate [2] with a moist cloth (moistened with water and then wrung well).



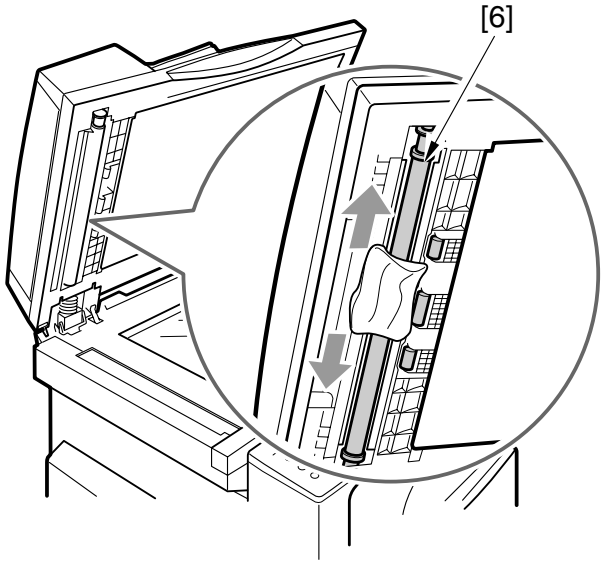
F01-501-04

2) Picking the tab [3] at the front, open the middle cover [4]; then, clean the guide assembly [5] with a moist cloth.



F01-501-05

3) Close the middle cover and the feeder cover.
4) Open the ADF, and clean the original feed roller [6] (platen roller) with a moist cloth (moistened with water and then wrung well).



F01-501-06

5) Close the ADF.

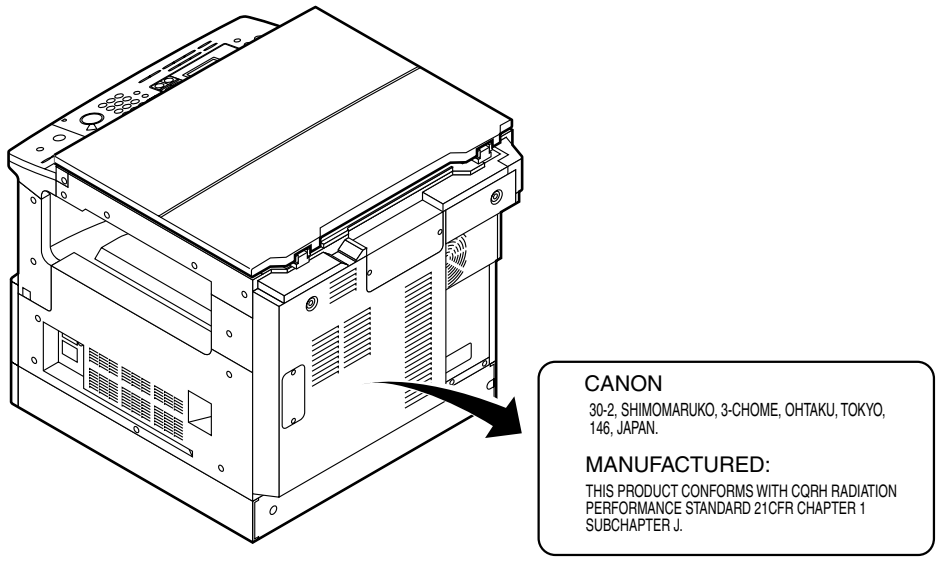
6 Safety and Warnings

6.1 Safety of Laser Light

The radiation from a laser until can be harmful to the human body. The machine's laser scanner unit is sealed by means of a protective housing and external covers, so that the light it produces will not escape outside, ensuring the safety of the user as long as the machine is used under normal conditions.

6.2 CDRH Requirements

The Center for Devices and Radiological Health (CDRH) of the US Department of Health and Human Services put into force a set of requirements with a view to regulating laser-related products on August 2, 1976. The requirements apply to laser products produced on August 1, 1996, or later, and all laser products must comply with them if they are to be marketed in the US. The following is the label that indicates the compliance with the CDRH requirements, and it must be attached to all laser products that are sold in the US.

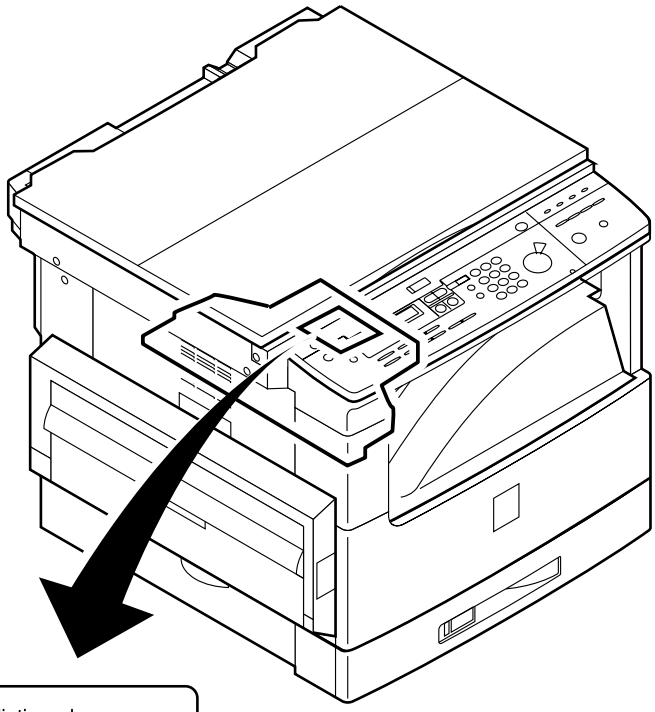


The text may differ from product to product or from model to model.

F01-602-01

6.3 Handling the Laser Unit

When servicing the area around the machine's laser optical unit, take full care not to put any tool with a high reflectance (e.g., screwdriver) into the laser path. Be sure also to remove any watch, ring, or the like, as they can reflect the laser beam to damage your eye. The machine's laser light is red, and its covers that can reflect the laser light are identified using the following label; take special care if you must service the area behind covers to which the label is attached. (The label is also attached on covers used to block out the laser light.)



F01-603-01

6.4 Safety of the Toner

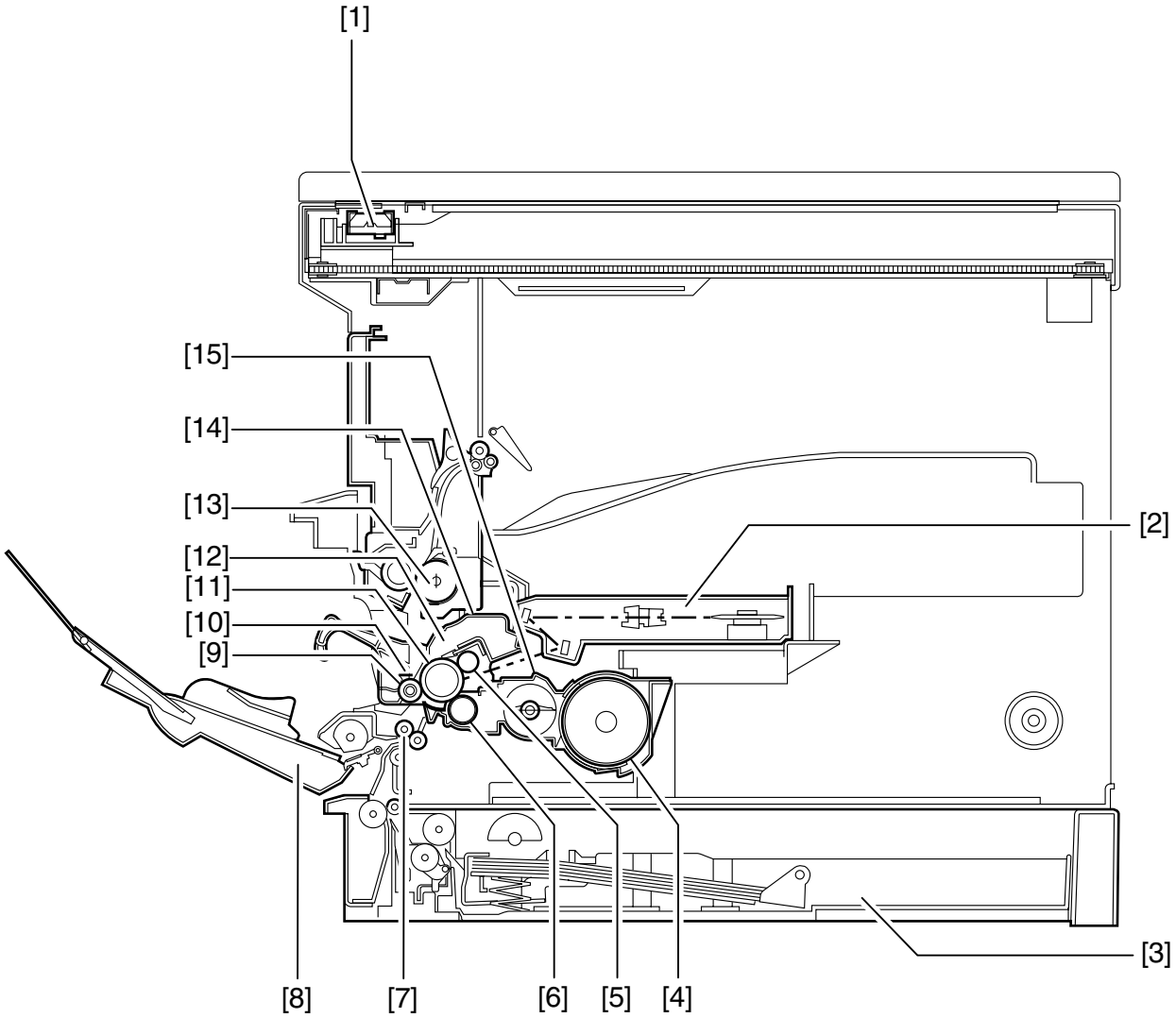
The machine's toner is a non-toxic material consisting of plastic, iron, and small amounts of dye. If toner came into contact with your skin or clothes, remove as much of it as possible with dry tissue, and wash with water. Do not use hot water, as it will turn the toner into a jelly and cause it to permanently fuse with the fibers of the clothes. Also, do not bring toner into contact with vinyl material, as they are likely to react against each other.

Do not throw toner into fire. It may explode.

7 Reproduction Processes

7.1 Outline

The machine uses an indirect photoelectronic reproduction method, and it has the following construction:



F01-701-01

[1] CS (contact sensor)
[2] Laser/scanner unit
[3] Pickup (cassette)
[4] Toner cartridge
[5] Primary charging roller
[6] Developing cylinder
[7] Registration roller
[8] Pickup assembly (manual feed tray)
[9] Transfer charging roller
[10] Static eliminator
[11] Drum
[12] Drum cleaner assembly
[13] Fxing assembly
[14] Drum unit
[15] Developing assembly

The machine is designed as a cartridge model, in which its drum, toner, primary charging assembly, developing assembly, and drum cleaner assembly are all constructed as a single entity.

The machine's image formation processes can be divided into the following 5 blocks (7 steps):

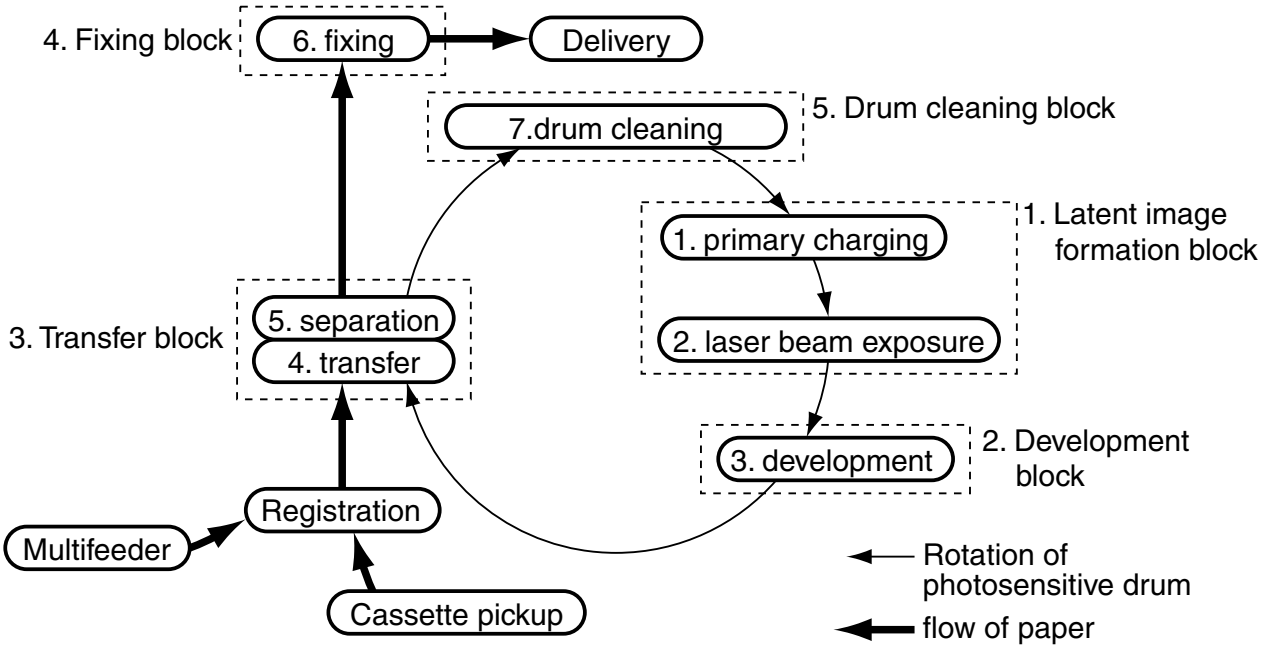
[1] Latent Image Formation Block
- Step 1 primary charging (AC + negative DC)
- Step 2 laser beam exposure

[2] Developing Block
- Step 3 development (AC + negative DC bias)

[3] Transfer Block
- Step 4 transfer (positive DC)
- Step 5 separation (grounding)

[4] Fixing Block
- Step 6 fixing

[5] Drum Cleaning Block
- Step 7 drum cleaning



F01-701-02

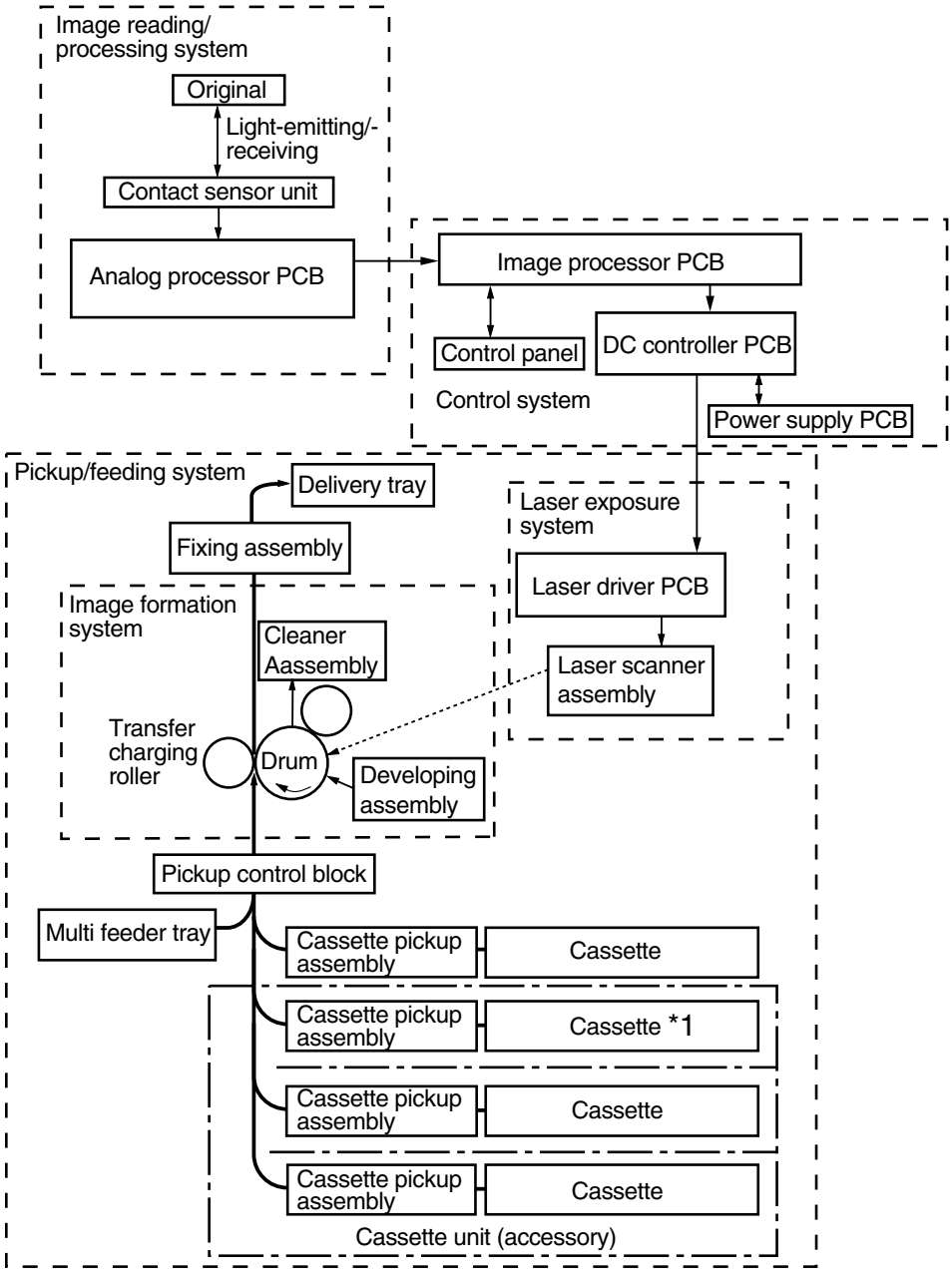
CHAPTER 2

BASIC OPERATION

1 Basic Operation

1.1 Functional Construction

The machine may be divided into the following 6 functional blocks: pickup/feeding system, original reading/processing system, laser exposure system, image formation system, communication system, control system.



*1 : standard if 20cpm model

F02-101-01

1.2 Outline of Electrical Circuitry

The PCBs used to control the machine's major electrical mechanisms are as follows:

1.2.1 Image Processor PCB

The image processor PCB controls the machine as a whole:

a. Drive Control Block

The drive control block uses a motor control IC and motor driver IC to control the reader motor of the reader unit.

b. Control Panel Control Block

The control panel control block uses a control IC and serial communications of the control PCB to transmit/receive data, to receive statuses of the control buttons and originals, and to send display signal to the control IC of the control panel PCB for indication by LEDs and LCD.

c. Reader Control Block

The reader control block processes image data read from the CS unit, and stores the result in the SDRAM by means of DMA (direct memory access).

d. Printer Control Block

The printer control block converts 600x600-dpi image data into print data. It then sends the resulting print data to the printer unit in the form of image signals (VDO*, VDO) in response to the horizontal synch signal (BDO*) coming from the printer unit.

e. Sensor Detection

The sensor checks mechanism monitors the state of the reader unit and ADF to monitor the drive mechanism.

f. Energy Save Control Mechanism

The energy save control mechanism controls the energy save function (ESS) used to decrease the power consumption while the machine remains in wait state.

g. Memory Function

1. Non-Fax Model

The SDRAM possessing 16MB of memory (as mounted) is capable of storing image data equivalent of as many as 200 sheets (about 3.2 MB; A4; with print ratio of 4%).

The 128KB SRAM is used to store settings data (user data, service data), and is backed up by a lithium battery (BAT1; as long as 5 years with power removed).

The image memory may be expanded by adding a 32MB RAM DIMM.

2. Fax Model

The 16MB (actual) SDRAM designed for the storage of image data is capable of storing image data equivalent of about 100 sheets (2MB ; A4 ; with print ratio of 4%).

The memory is backed up by a vanadium lithium battery (BAT2) so that its contents may remain intact for as long as 1 hr. The 128KB SRAM is used to store various registration data (i.e., user data, service data), and is backed up by means of a lithium battery (BAT1), capable of backing up the contents for as long as 5 yr.

The image memory may be expanded by adding the RAM DIMM (32MB x 2).

h. SEND Function (if equipped with a network board in fax models)

The SEND function uses a network to send image scanned by the reader unit to an external device.

i. Speaker

The machine allows the control of the sound generated by the speaker in response to an error or button operation (on/off) and of the volume of the sound.

To control the volume of the sound, change the settings in user mode.

1.2.2 DC Controller PCB

a. Fixing Heater Control Mechanism

The fixing heater control mechanism monitors the readings of the thermistor mounted to the fixing heater and the level of direct current from the power supply in relation to voltage, thereby causing the temperature of the fixing heater to reach a specific level. It also cuts off power to the fixing heater in response to an error in the heater temperature.

b. High Voltage Control Mechanism

The high voltage control mechanism is used to control the high voltage applied to the primary charging roller and developing cylinder of the toner cartridge and the transfer charging roller of the toner transfer assembly.

c. Drive Control Mechanism

The drive control mechanism is used to control the main motor, pickup solenoid, and delivery fan.

d. Sensor Detection Mechanism

The sensor detection mechanism is used to check the sensor state of the printer unit and pickup assembly to monitor the drive mechanism.

e. Image Processor PCB Interface Mechanism

The image processor PCB interface mechanism sends the horizontal sync signal (BDO*) to the image processor PCB. Also, it returns status signals in response to the command signal for serial communications coming from the image processor PCB to communicate the state of the printer unit to the image processor PCB.

f. Laser Control Mechanism

The laser control mechanism controls the drive of the laser diode of the laser scanner unit according to the print data from the image processor PCB. Also, it performs laser power auto control (auto power control) for each line of print data.

g. Horizontal Sync Signal Control Mechanism

When the laser beam reaches a print start point for horizontal direction, the BD input signal (BDI*) coming from the laser scanner unit is detected, and the horizontal sync signal (BDO*) is sent to the image processor PCB. Also, the output of the scanner motor is monitored in relation to the horizontal sync signal (BDO*).

e. Scanner Motor Control Mechanism

The scanner motor control mechanism is used to control the drive of the scanner motor so that the horizontal resolution of print images will be 600 dpi. Also, the BD input signal (*BDI) from the laser scanner unit is detected to monitor the rotation of the scanner motor.

f. Toner Level Detection Mechanism

The level of toner inside the developing assembly is monitored in relation to the toner level detection signal (TNRCHKT), which is the result of comparison between the cartridge antenna output and the developing bias when the developing AC bias is applied for normal rotation during the warm-up time.

1.2.3 Power Supply PCB

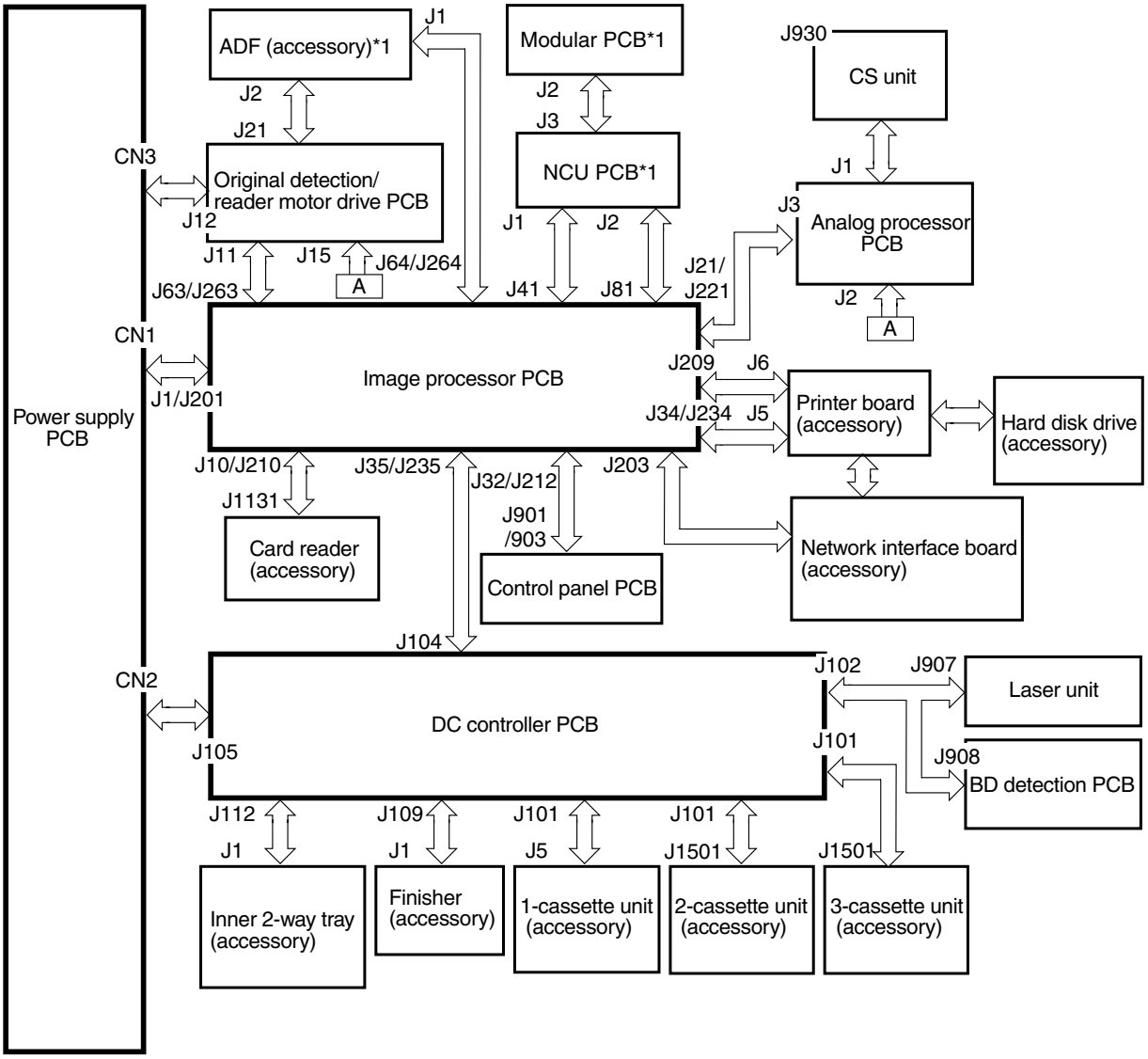
The following are generated from the common AC power for supply to various loads: full-time ON system, (DC +12VS, DC +5VS, DC +3VS1, DC +3VS2), remote ON/OFF system (DC +24VR1, DC +24VR2, DC +5VR, DC +3VR).

1.2.4 Analog Processor PCB

The analog data read of an original by the CS unit is converted into digital data for output to the image processor PCB.

1.3 Inputs to and Outputs from Electrical Components

1.3.1 Wiring Diagram of the Major PCBs

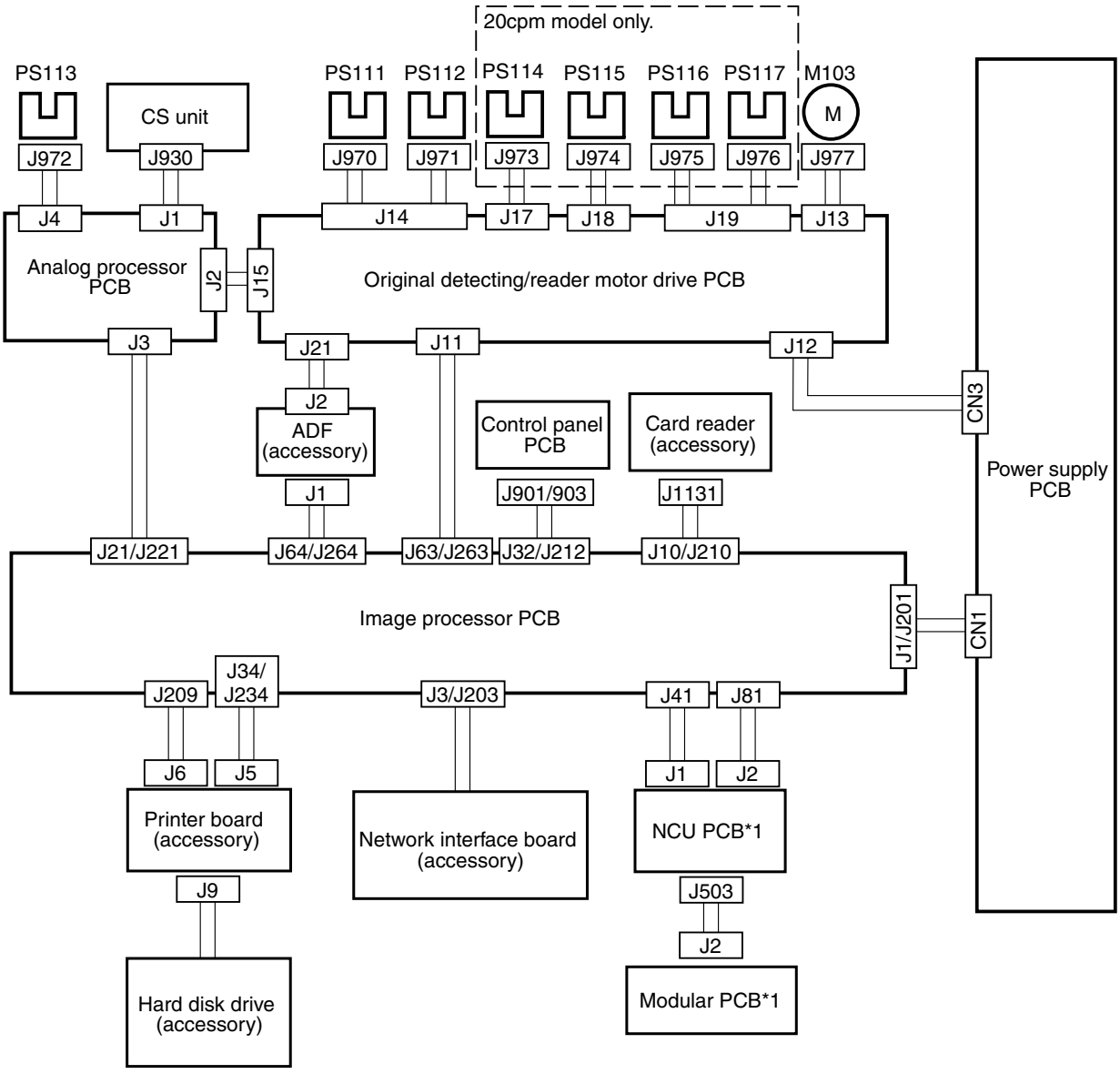


*1: standard if fax model.

Note: The symbol ⟺ in the diagram indicates a major connection, not the nature of a signal

F02-103-01

1.3.2 Wiring Diagram of the Electrical Components (1/2)

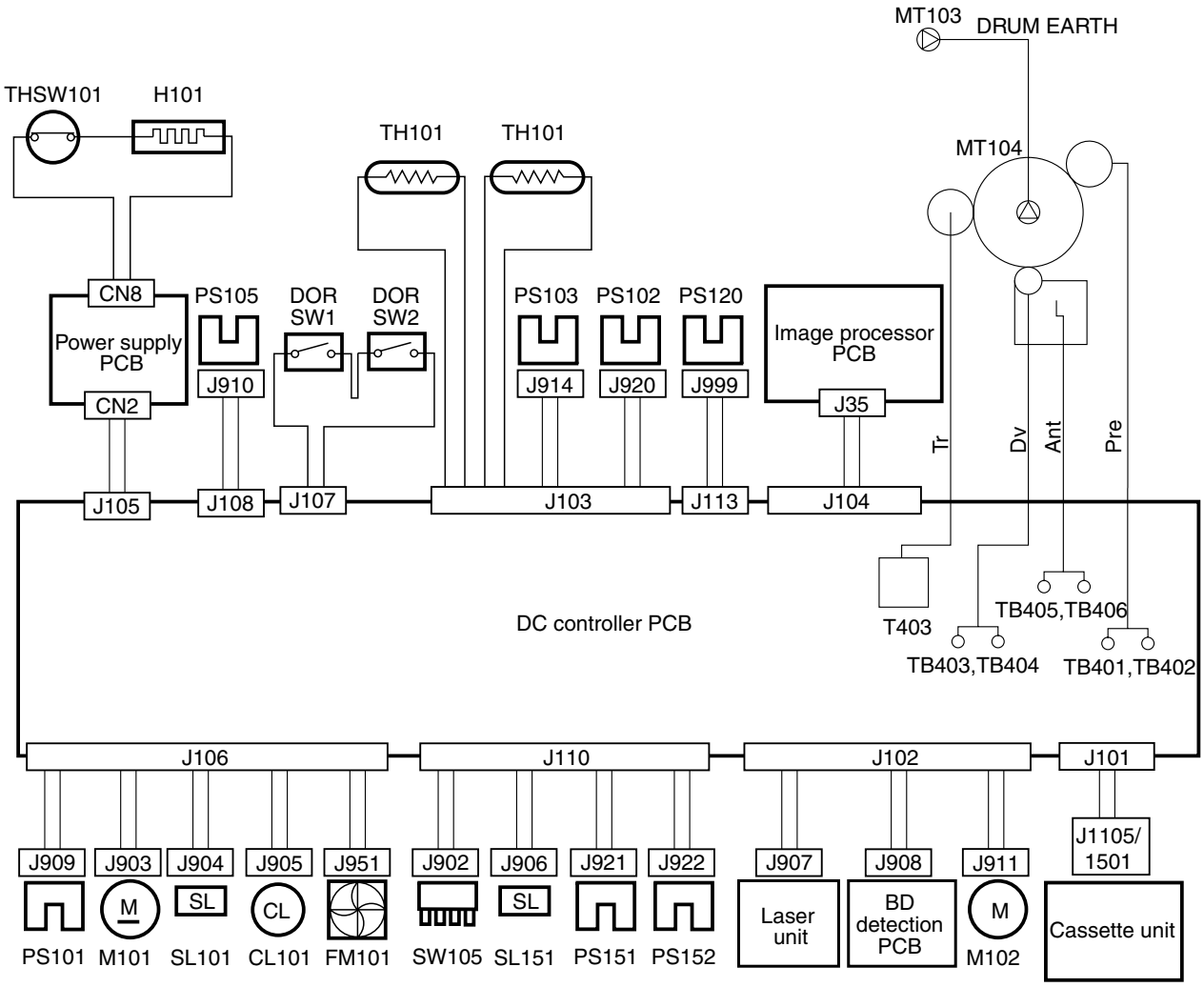


*1: standard if fax model.

F02-103-02

PS111 : copyboard cover open/closed sensor
PS112 : ADF open/closed sensor
PS113 : CS unit HP sensor
PS114 : original size sensor 1
PS115 : original size sensor 2
PS116 : original size sensor 3
PS117 : original size sensor 4
M103 : reader motor

1.3.3 Wiring Diagram of Electrical Components (2/2)



F02-103-03

PS101 : registration paper sensor
PS102 : paper full sensor
PS103 : delivery sensor
PS105 : multifeeder paper sensor
PS151 : cassette paper sensor
PS120 : waste toner case full sensor
PS152 : re-try sensor
SL101 : multifeeder pickup solenoid
SL151 : cassette pickup solenoid
CL101 : registration clutch

M101 : main motor
M102 : scanner motor
SW105 : paper size detecting switch
DORSW1 : front cover switch
DORSW2 : rear cover switch
TH101 : thermistor
THSW101 : thermal switch
H101 : fixing heater
FM101 : heat discharge fan

1.4 Basic Sequence of Operation

1.4.1 Outline

The machine stores the image data it collects by scanning an image in memory for printing (memory copying). The following are the conditions under which scanning or printing takes place in memory copying:

a. Scanner Start Condition

The Start key is enabled under the following condition so that the machine may start reading an original. However, the machine will not start printing until the printer start condition is met:

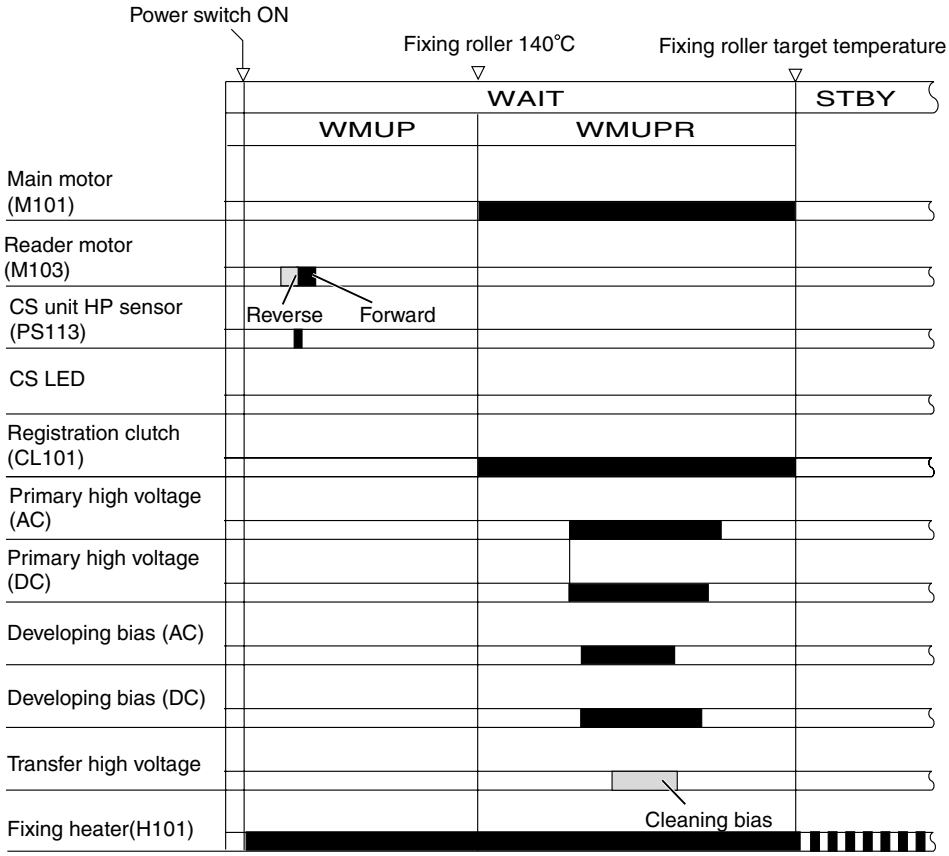
· The power switch is ON, and all external covers are closed.

b. Printer Start Condition

The machine is ready for printing when there is image data in page memory and the following condition is met:

· The surface temperature of the fixing roller has reached the target temperature (173℃ in plain paper mode).

1.4.2 Basic Sequence of Operation (power-on)

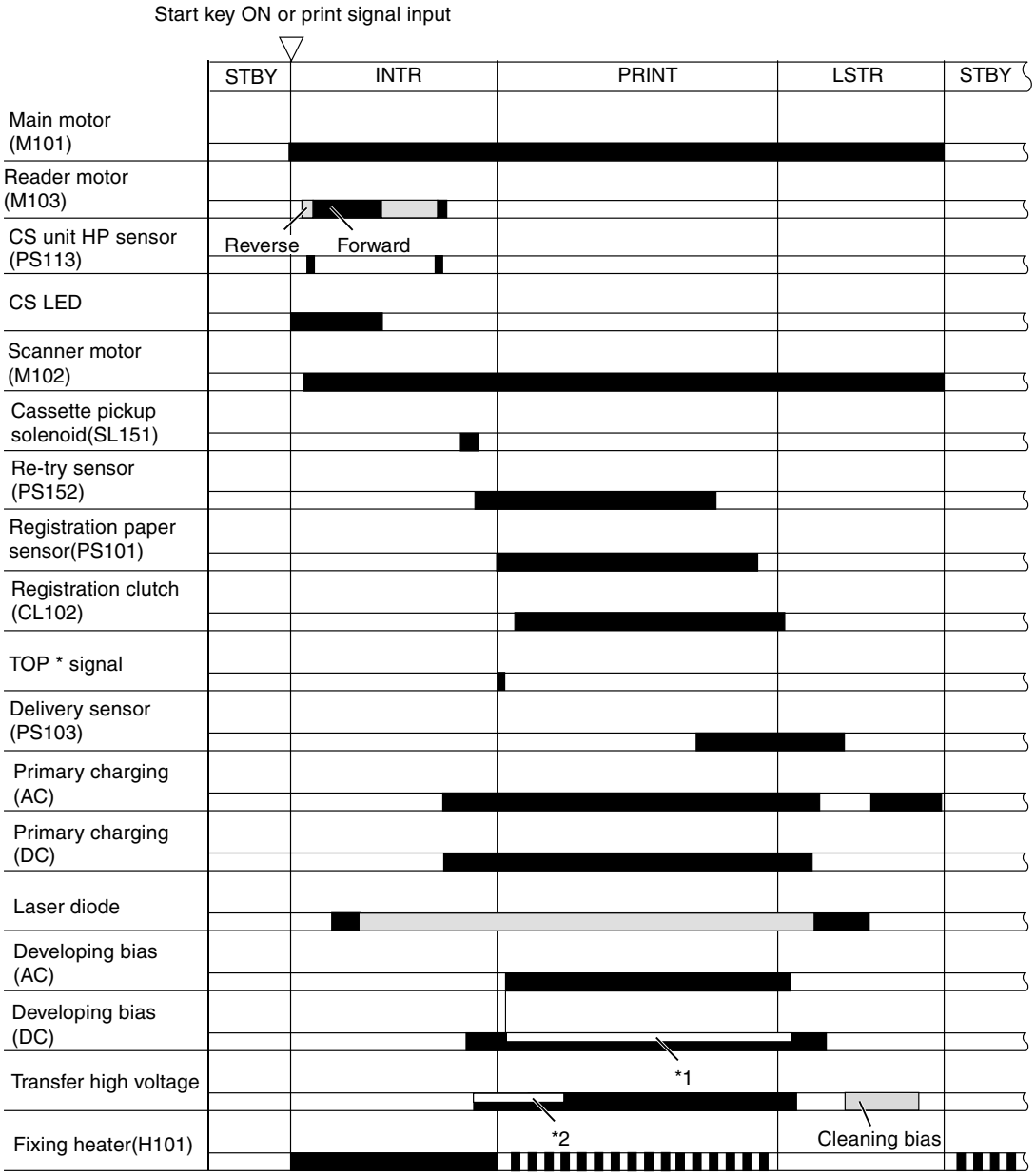


F02-104-01

Period	Description
WAIT (wait)	The machine shifts to standby state under the following conditions so as to reduce the wait time: · 25 sec passed and, in addition, the fixing roller surface temperature is 150℃ or higher. · 27 sec passed and, in addition, the fixing roller surface temperature is 145℃ or higher.
WMUP (warm-up)	From when the power switch is turned on unit the fixing roller surface temperature reaches 140℃.
WMUPR (warm-up rotation)	From when warm-up ends until the main motor is turned on and stopped.
STBY (standby)	From when WMUPR ends until the Start key is pressed or the power switch is turned off.

T02-104-01

1.4.3 Basic Sequence of Operation (printing)



*1: varies according to density setting. If PDL output, the copying is constant
*2: ATVC control.

F02-104-02

Period	Description
STBY (standby)	From when warm-up rotation ends, or last rotation ends, until when the start key ON signal or the print signal arrive from the image processor PCB.
INTR (initial rotation)	From when the print signal is generated by the image processor PCB until when paper reaches the registration roller.
PRINT (print)	From when paper is moved from the registration roller until toner is transferred to the paper.
LSTR (last rotation)	From when printing ends until when the main motor stops.

T02-104-01

1.5 Controlling the Main Motor (M101)

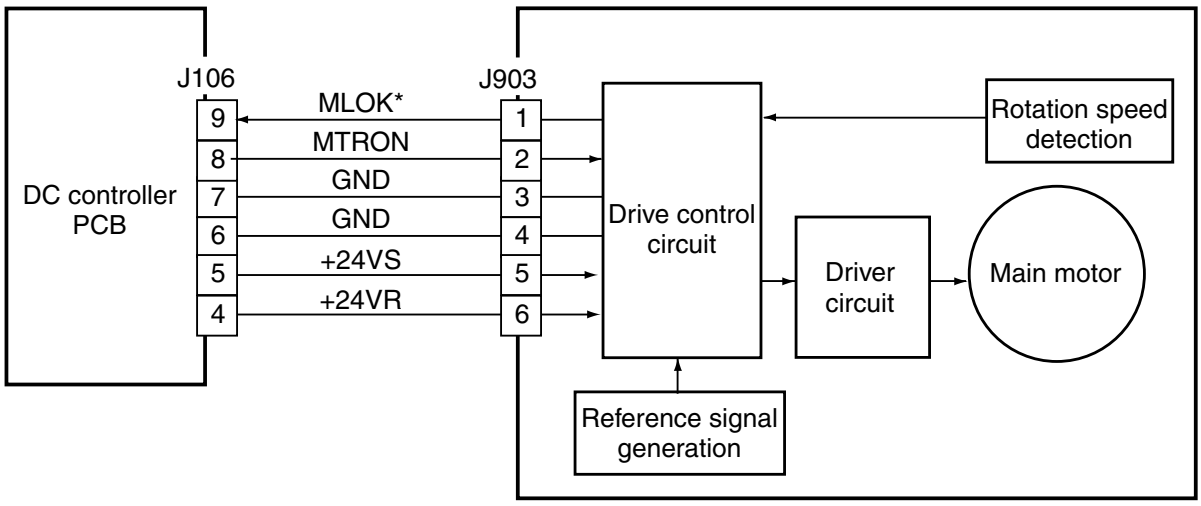
1.5.1 Outline

The following table shows the functions of the main motor control circuit, while the following mechanism diagram shows the construction of the circuit:

Item	Description
Power supply	24 V supplied from DC controller PCB
Drive signal	MTRON from DC controller PCB
Operation mechanism/ drive mechanism	Registration roller
	Multifeeder pickup assembly
	Cassette pickup assembly
	1-cassette unit pickup assembly
	Fixing roller drive assembly
	Image formation roller drive assembly
Control	ON/OFF control
	Constant speed control
Error detection	'E010'

T02-105-01

[1] When the main motor drive signal (MTRON) goes '1', the main motor starts to rotate.
[2] When the main motor has started to rotate and reached a specific revolution, the motor causes the main motor rotation detection signal (MLOK*) to go '0'. If the DC controller PCB detects an error in the rotation detection signal, it will indicate 'E010' in the control panel.



F02-105-01

CHAPTER 3

IMAGE READING/PROCESSING SYSTEM

1 Outline of Operation

1.1 Outline

The image reading/processing system has the following major functions:

Item	Description
Original exposure	Indirect exposure by LEDs (LEDs + photo conducting medium)
Original scanning Original size detection	Book mode: scanning by moving carriage ADF mode: stream reading by fixed carriage Book mode: detection by reflection type sensor (in models equipped with original size sensor) ADF mode: detection by ADF
Enlargement/ reduction (zoom)	Between 50% and 200% (in 1% increments) Main scanning direction : image processing by image processor Sub scanning direction : Book mode : by varying speed of carriage ADF mode : by varying speed of original
Lens	Rod lens array
Contact sensor	Number of lines : 1 (7084 pixels)
Contact sensor unit drive control	Maximum original reading width : 299.8 mm Control by reader motor (M103)
Contact sensor unit position detection	By CS unit HP sensor (PS113)
Shading correction	Reading in units of 10 bits, output in units of 8 bits Correction on all black/white pixels Executed at the start of a read job.
Auto density correction	By ABC (auto background control) Executed for every line in main scanning direction (Executes density correction for every line in main scanning direction, and consists in a single scan.)

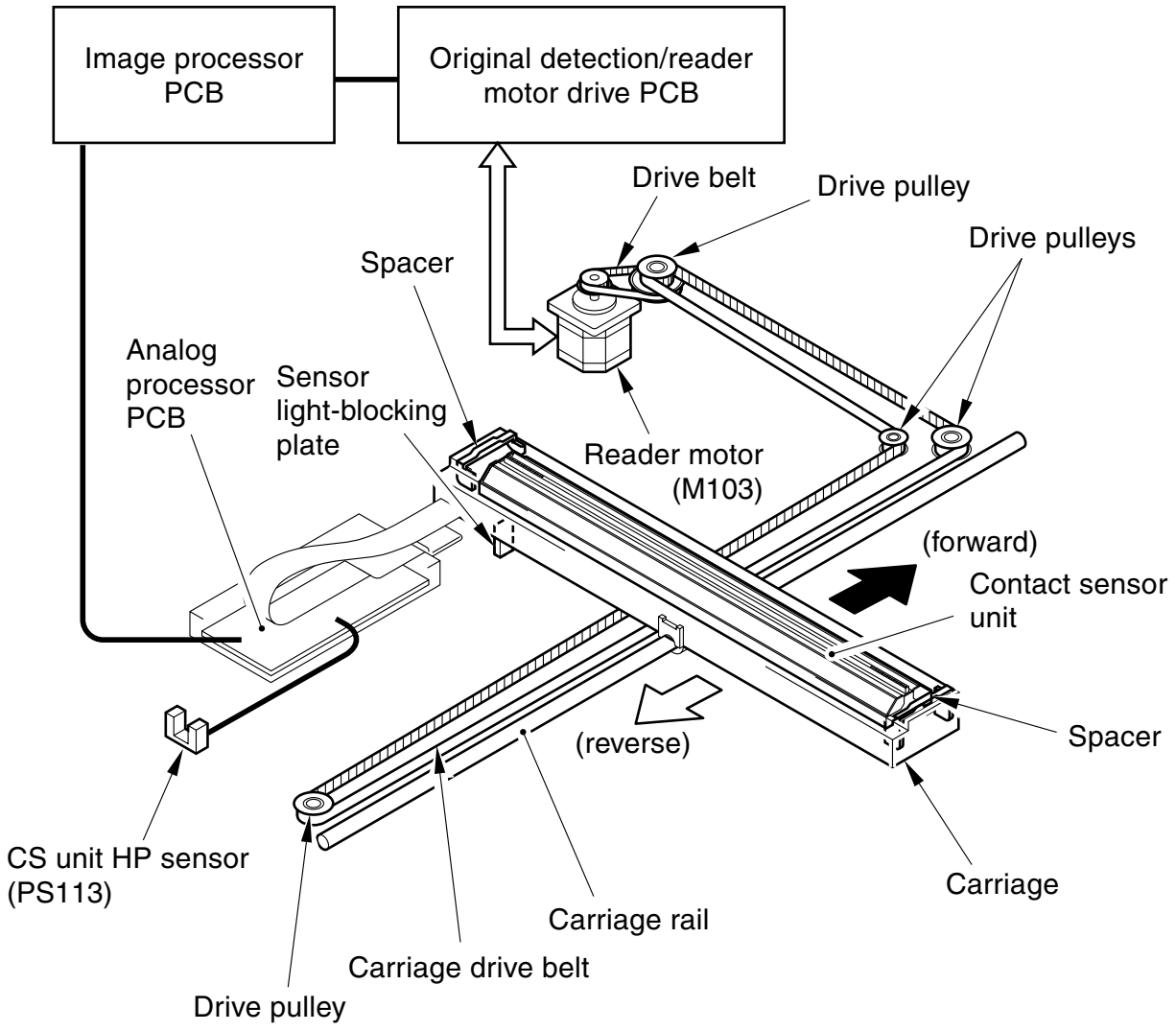
T03-101-01

2 Reader Drive System

2.1 Outline

The reader drive system consists of the following: reader motor, drive pulley, carriage, carriage rail, carriage drive belt.

The drive signal from the image processor PCB is sent to the reader motor (M103) by way of the driver circuit on the original detention/reader motor drive PCB. The drive from the reader motor is transmitted to the carriage by way of the drive pulley and drive belt to move the carriage forward or in reverse.

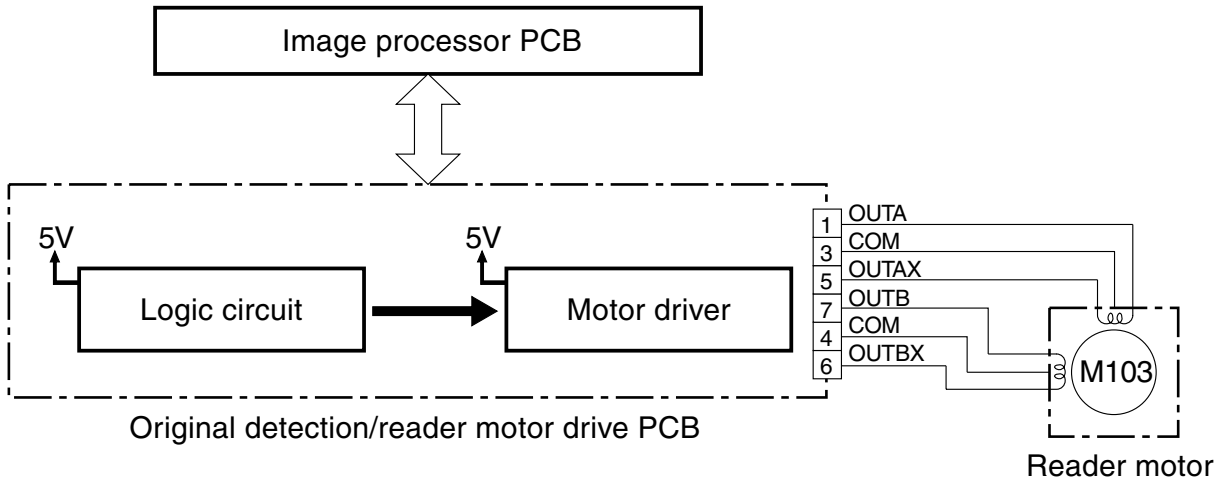


F03-201-01

2.2 Controlling the Reader Motor

The following shows the circuit used to control the reader motor, and the circuit has the following functions:

(1) Controlling the direction of rotation of the reader motor
(2) Controlling the speed of rotation of the reader motor
(3) Turning on/off the reader motor



F03-202-01

2.2.1 Moving the Carriage in Reverse After an Image Scan

The speed at which the carriage is moved in reverse (after an image scan) is constant, i.e., 50% of the speed used to move it in Reduce mode.

3 Detecting the Size of Originals

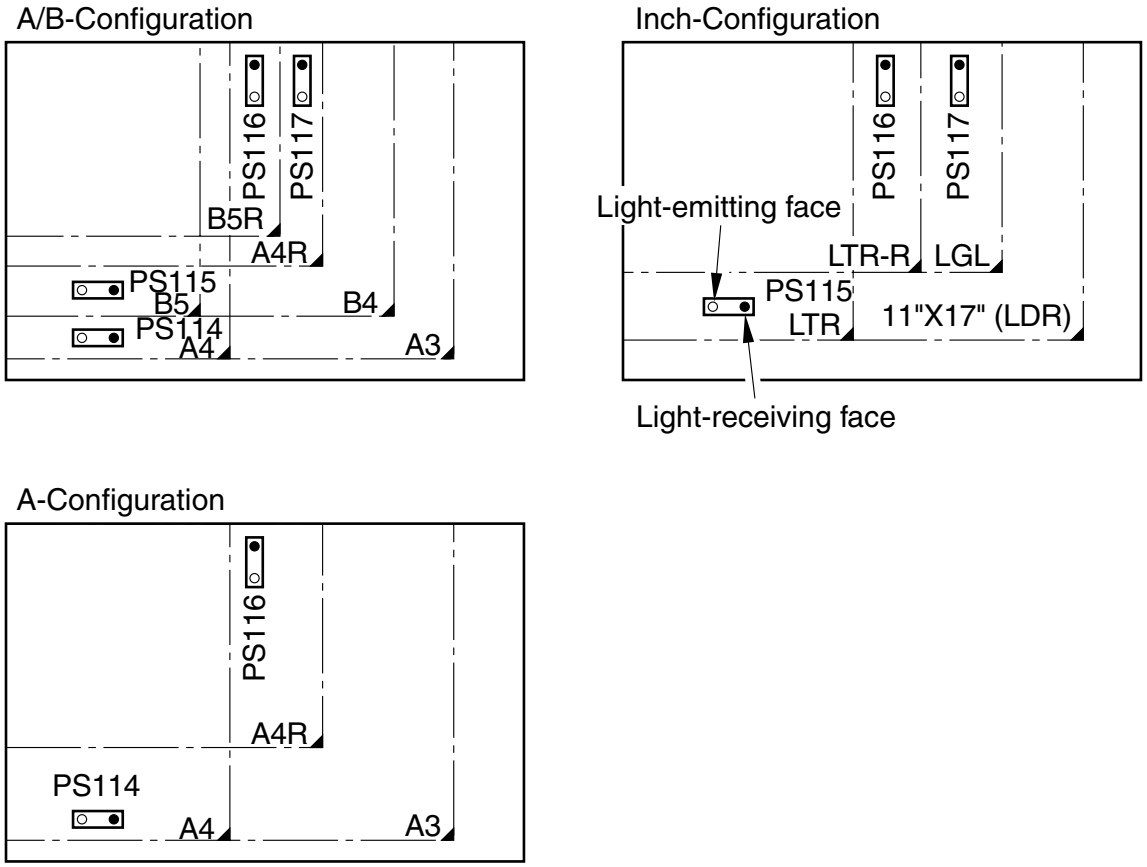
3.1 Outline

The machine detects the size of an original in either of the following two ways, and it uses the result of detection for auto paper selection (APS) and auto enlargement/reduction (AMS):

[1] Detection by original size sensors (in models equipped with original size sensor)
[2] Detection by feeder (in models equipped with ADF)

3.2 Detection by the Original Size Sensors

The machine uses the original size sensors to detect the size of an original placed on its copyboard glass (i.e., based on the combination of the output levels of the sensors).



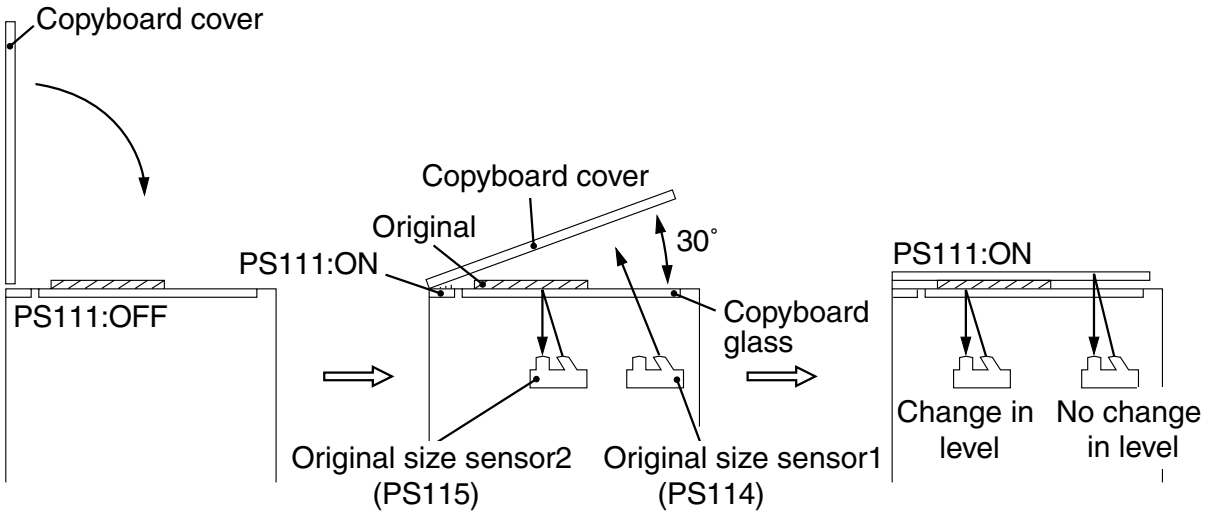
F03-302-01

#5 TYPE> (selecting the country/region)
The paper configuration detected by the original size sensors (A/B, Inch, A) is set automatically when a country of installation is selected.

When the copyboard cover is closed to about 30°, the copyboard cover open/closed sensor (PS111) goes ON. The original detection/reader motor drive PCB reads the output levels of the original size sensors at intervals of 0.125 sec for 15 sec after the copyboard cover open/closed sensor goes ON or between when the copyboard cover open/closed sensor goes ON and when the Start key is pressed. If it detects a change in the level, it identifies the condition as the absence of an original; if there is no change, it will identify the condition as the presence of an original. This way of identification enables the machine to detect the size of a black original.

In the case of conditions a and b in the following, the output level of the sensor remains unchanged, at times causing the machine to make the wrong detection. If, for condition c, i.e., A3 (11x17) is selected with priority and A3 (11x17) paper is absent, the cassette selected for standard mode will be selected.

a. A3 (11x17) Black Original
b. Book original (The thickness of the original prevents the copyboard cover from closing fully, making it difficult to detect a change in the sensor level.)
c. Copyboard cover (not closed)



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3.3 Detecting the Size of Originals

The machine uses combinations of states of original size sensors to detect the size of an original with reference to the following table:

- Unchanged : The machine reads the output levels of the sensors at intervals of 0.125 sec after the copyboard cover open/closed sensor goes ON, and there is no change in the output level (detecting an original).
- Changed : The machine reads the output levels of the sensors at intervals of 0.125 sec after the copyboard cover open/closed sensor goes ON, and there is change in the output level (not detecting an original).

A/B-Configuration

Original size	Original size sensor			
	PS114	PS115	PS116	PS117
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
B5R	Changed	Changed	Unchanged	Changed
None	Changed	Changed	Changed	Changed

Inch-configuration

Original size	Original size sensor		
	PS115	PS116	PS117
11"X17"	Unchanged	Unchanged	Unchanged
LGL	Changed	Unchanged	Unchanged
LTR-R	Changed	Unchanged	Changed
LTR	Unchanged	Changed	Changed
None	Changed	Changed	Changed

A-configuration

Original size	Original size sensor	
	PS115	PS116
A3	Unchanged	Unchanged
A4R	Changed	Unchanged
A4	Unchanged	Changed
None	Changed	Changed

T03-303-01

3.4 Detection by the ADF

The ADF uses the 2 sensors (length sensors) in its original tray and the 2 sensors (width sensor) to detect the size of originals. The ADF is capable of detecting the following sizes:

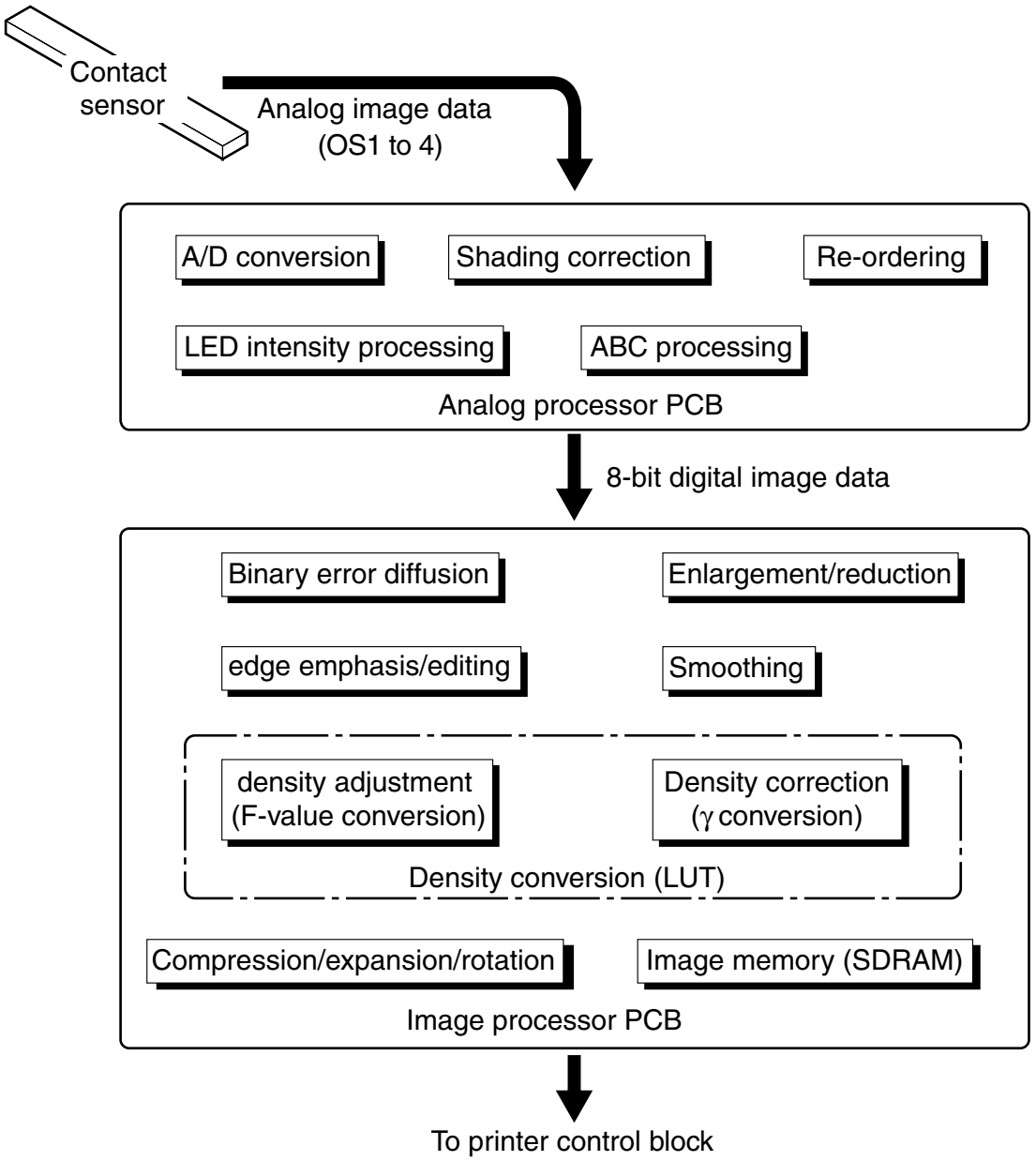
A-configuration : A5, A5R, A4, A4R, A3
B-configuration : B6, B5, B5R, B4
Inch-configuration : STMT, LTR, LTRR, LGL, 11" x 17" (LDR)

4 Image Processing

4.1 Outline

The machine performs image processing and correction in copier mode as shown in the following block diagram.

The image data (analog signals) read by the contact sensor is converted into digital signals by the analog processor PCB. The resulting image data is subjected to processing/correction by the analog processor PCB and image processor PCB.



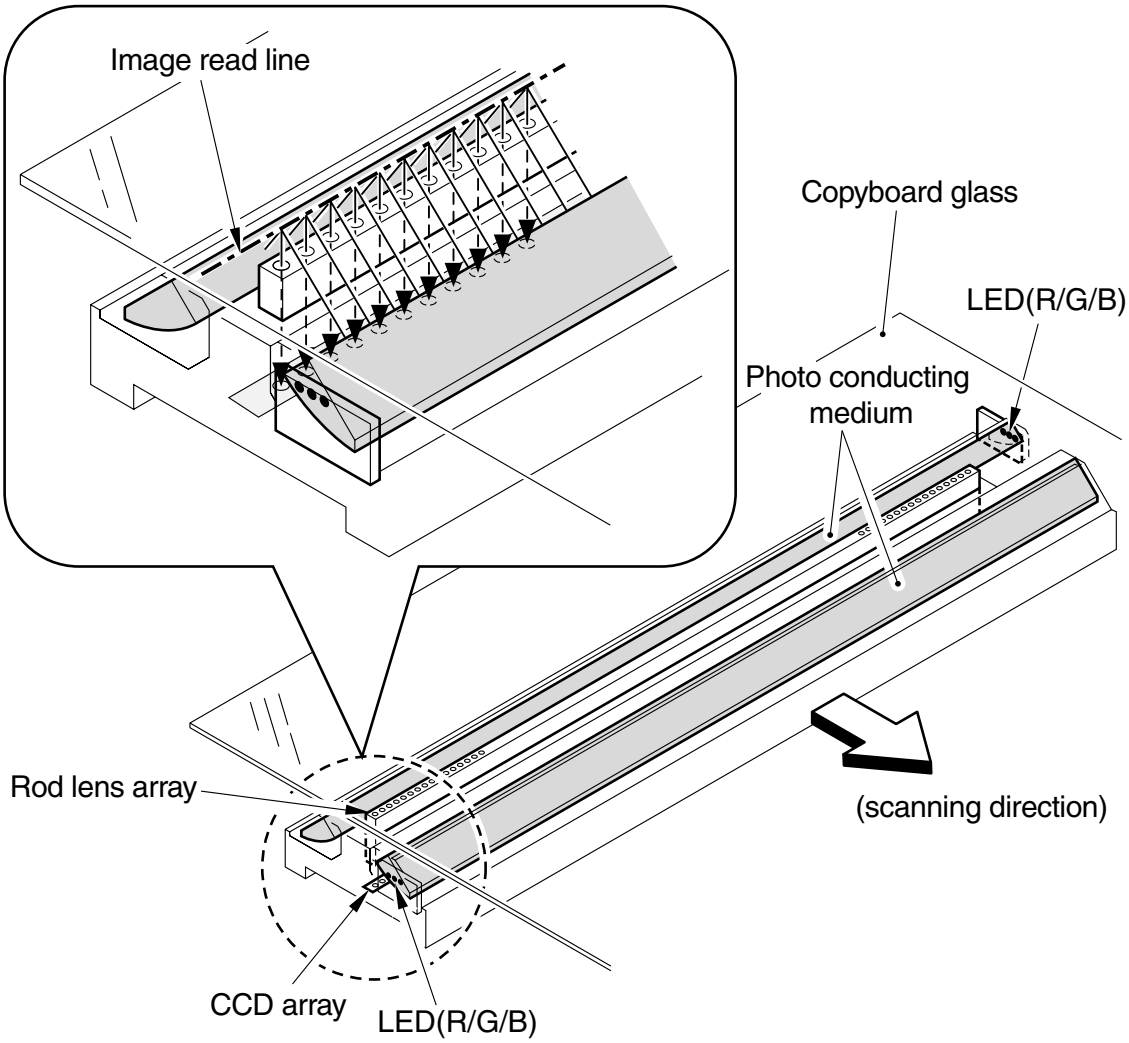
F03-401-01

4.2 Contact Sensor

4.2.1 Outline of the Contact Sensor

The machine uses a contact sensor (CS) for original exposure and original reading.

The CS is a single module consisting of the following, and is used to read images in lines: 2 sets of LEDs (R, G, B); photo conducting medium used to shine the light of the LEDs across a single image line of an original; rod lens array used to collected reflected light by the original; CCD array used to detect reflected light. It reads an image line by line.



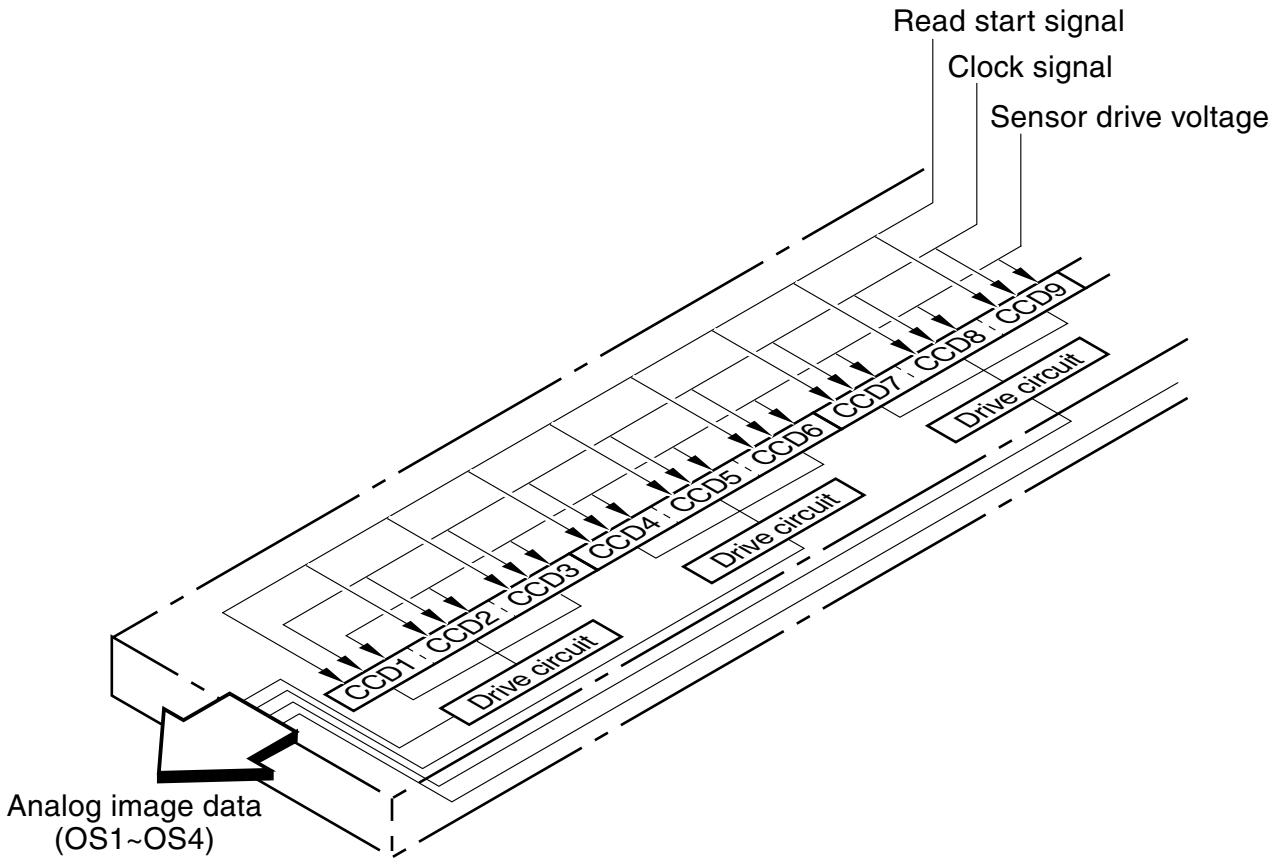
F03-402-01

4.2.2 Construction of the Contact Sensor (CS)

The CS has the following construction:

The LEDs used to expose an original are grouped in two (R, G, B), and are mounted to the edge of a photo conducting medium made of transparent glass. When an original is exposed, the LEDs (all three colors) go ON, and their light is directed to the original by way of the photo conducting medium. The light reflected by the original is collected by the rod lens array and detected by the CCD array, which will convert the light into electrical signals (photo-electric conversion) for output.

The CCD array is made up of 11 CCD device units, which are grouped into 4 systems in terms of control: 3 units x 3 systems and 2 units x 1 system; all systems are used to read an image or generate image signals at the same time, thus enabling high-speed operation.



F03-402-02

4.3 A/D Conversion

The image data (analog signals) from the CS are converted into 10-bit digital signals. At this time, gain adjustment is executed to increase the level of the input signals to suit conversion by the A/D converter.

The size of the increase at time of gain adjustment is determined when gain adjustment is executed in service mode. During gain adjustment, the CS unit shines LED light against the standard white plate to measure the density of the white plate. The data is subjected to computation, and the result is store in memory as the gain adjustment value.

TEST MODE > [2] CCD TEST > [8] (executing gain adjustment)
When adjustment ends normally, the display indicates 'OK'. If it indicates 'NG', check the following take appropriate action:
- Is the copyboard cover (ADF) closed?
- Is the copyboard glass mounted correctly? (Check the position of the standard white plate.)
- Is the standard white plate soiled
- Is the lens area of the CS lens soiled?

4.4 Shading Correction

The light reflected by an original and read by the CS, even if the original is completely uniform in density, will not necessarily be even in relation to image signals corresponding to pixels on the original for the following factors:

[1] The intensity of a specific LED is not the same as that of other LEDs.
[2] The intensity of reflected light collected by the rod lens array is not even.

Shading correction is executed to correct any discrepancy caused by these factors, and it may take the form of black shading correction or white shading correction.

4.4.1 Black Shading Correction

The input signal of the CS while the LEDs are kept OFF is read, and is subjected to A/D conversion (black correction), storing the result (digital signal) in memory.

When an image is read, the black correction value is subtracted from the value of the image signal read by each pixel of the CS by way of full pixel black shading correction.

4.4.2 White Shading Correction

The light of the LEDs is directed against the standard white plate, and the CS input signal is read. The result is subjected to A/D conversion (white correction), storing the result (digital signal) in memory.

The image data to which black shading correction was executed is then subjected to computation using the white correction value, thus executing full pixel white shading correction. As a result, the variation in LED intensify and in the intensity of the rod lens array are corrected, evening out the image density level.

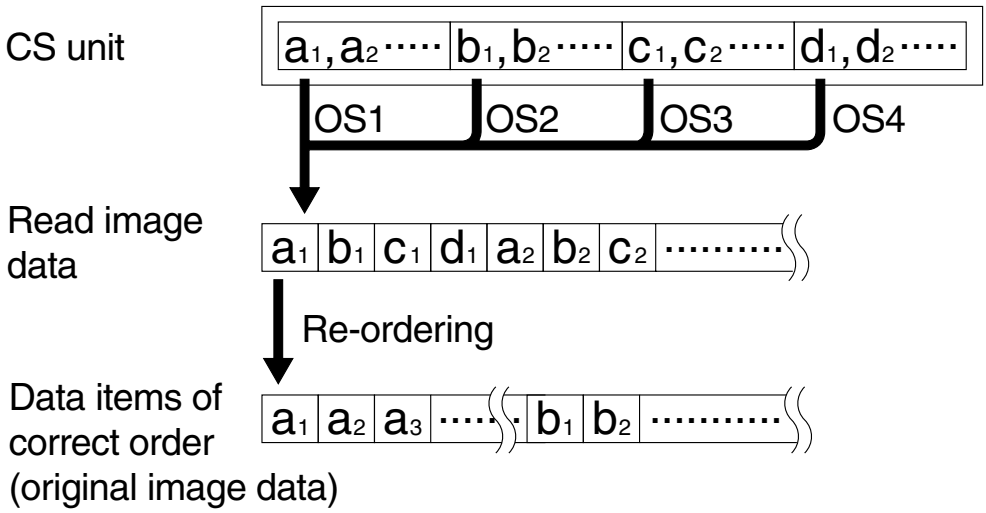
Shading correction is executed as follows:

· When the Start key is pressed.

The image data after shading correction is converted from 10-bit into 8-bit data.

4.5 Re-Ordering

The input signals from the CS consist of image data read simultaneously by each of the 4 systems of CCD device units; thus, they are not in the same sequence as the signals that represent the original image, re-ordering.



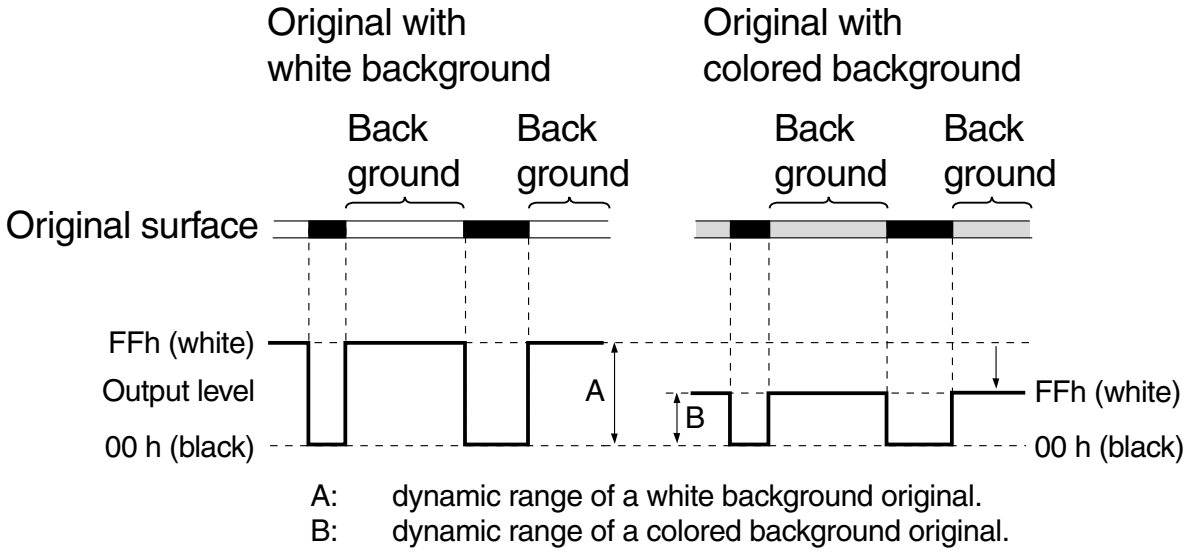
F03-405-01

4.6 ABC (auto background control)

The ABC function is used when the original has a dark background, not reproducing the color of the background while correctly reproducing the text and images of the original.

The machine's ABC function is enabled when the density adjustment function is set to 'auto' in copier mode; if selected, the ABC circuit is used for the work.

The digital image signals which are the result of A/D conversion are subjected to variation of dynamic range to suit the level of the background color of the original so that the machine will recognize the background to be "white."



F03-406-01

As shown, range A of a white background original is decreased like range B of a colored background original to remove the color from its background.

4.7 LED Intensity Adjustment

So that the image data read by the CS unit will always be optimum, the length of time during which the LEDs are ON when reading a single line is controlled.

In LED intensity adjustment, the light of the LEDs is directed to the standard white plate during pre-scanning, and the image data thus collected is evaluated to see if it is within a specific range; if, for instance, it is outside the range, the length of time is decreased.

4.8 Enlargement/Reduction

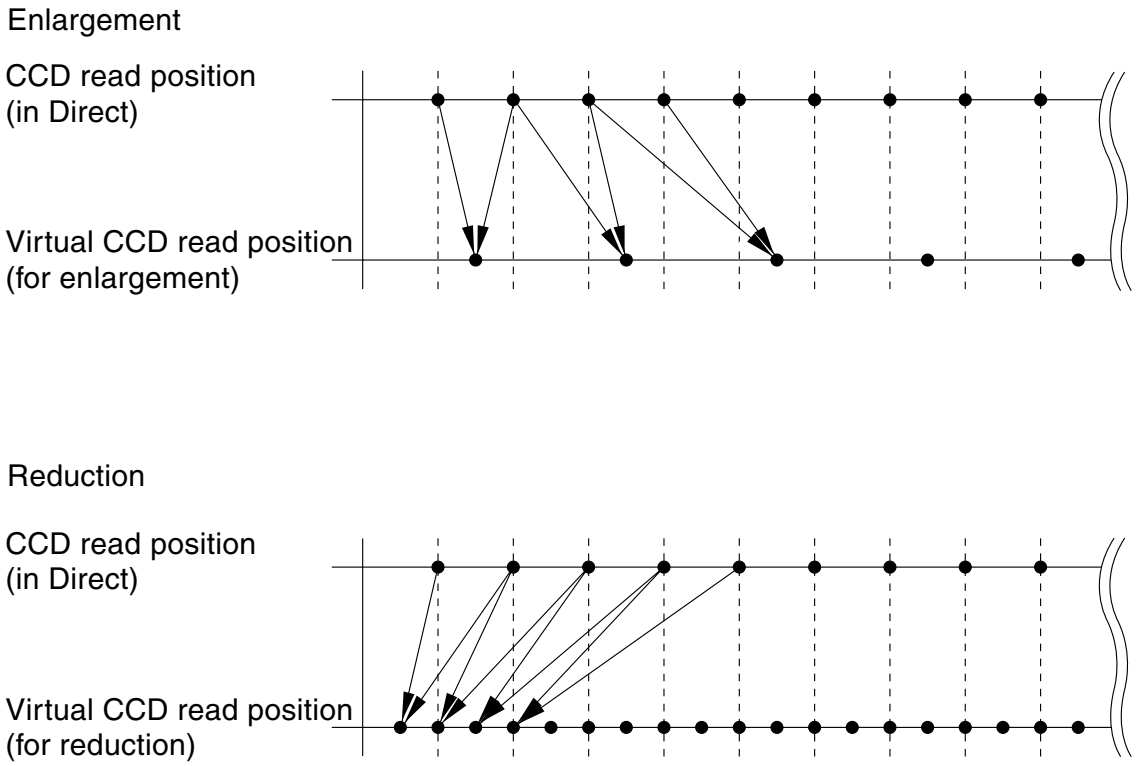
The machine allows enlargement/reduction between 50% and 200%, set in increments of 1%.

4.8.1 Enlargement/Reduction in Main Scanning Direction

The ratio in main scanning direction (drum axial direction) is changed as follows: in book mode and ADF mode, the original is read at 100%; thereafter, the collected data is subjected to processing by the image processor PCB to suit the selected reproduction ratio.

The machine varies the ratio based on a linear correction method.

The CCD inside the CS unit is fixed in position so that the position of each pixel within the image data generated by reading an original is also fixed in position. To vary the reproduction ratio, the position of each pixel, therefore, must be changed. However, since the CCD is not found at each specific position, the machine relies on computation to generate image data that expresses a selected ratio; specifically, the original image data items indicating the 2 points before and after a specific pixel are subjected to computation, with the result indicating pixels enlarged/reduced to a specific ratio.



F03-408-01

4.8.2 Changing the Reproduction Ratio in Sub Scanning Direction

The reproduction ratio in sub scanning direction (paper feed direction) is changed by controlling the speed at which the carriage is moved in book mode or the speed at which original is moved in ADF mode.

The speed at which the carriage is moved (the original is moved by the ADF) is increased for reduction or decreased for enlargement, thereby changing the width of the scanning line per pixel.

However, when FAX mode is combined with standard or fine mode, reading occurs at the speed used at 50% reduction, and then the image processor PCB processes the result so that the image will be of the desired size.

[1] enlargement

The speed at which the carriage is moved or the original is moved by the ADF is decreased in relation to Direct; e.g.,
for 200%, the speed is halved from 100%.

[2] 50% and 99%

The speed at which the carriage is moved or the original is moved by the ADF is increased in relation to Direct; e.g.,
for 50%, the speed is doubled from 100%.

4.9 Edge Emphasis

Edge emphasis prevents blurred or crushed outlines of images by enhancing the changes in density, bringing about well defined images and enabling faithful reproduction of characters in test mode.

4.10 Editing

The machine offers blanking/masking, negative/positive reversal, and the like as editing functions.

4.11 Density Conversion (LUT, i.e., look-up table processing)

In this block a data conversion table is used to convert intensity signals into density signals or to enable the best output density curve for each mode.

4.11.1 Density Adjustment (F-value conversion)

An F-value conversion table best suited to the copy density selected in the control panel is used to adjust density.

4.11.2 Density Correction (γ correction)

In γ correction, the contrast and the density of image data are corrected. When an image is read, the image data is subjected to conversion using a γ conversion table.

4.12 Binary Processing

The machine uses an error diffusion method to covert 8-bit (256-gradation) image data into 1-bit (binary) image data.

4.12.1 Error Diffusion

To convert 8-bit (256-gradation) image data into 1-bit (2-gradation) image data, the machine tries to find out whether the level of a specific image signal is higher or lower than a threshold level: 8-bit image data (0 through 255) into 2-bit image data (0, 1). At this time, the difference of the signal from the threshold level is "diffused" to its adjacent signals (pixels) to express the gradation (dark, light) of the original image.

4.13 Image Memory Control

The image memory is used as follows:

4.13.1 Compression/Expansion, Rotation, and Enlargement/Reduction

The machine uses image memory to subject binary image signals to compression/expansion, rotation, and the like.

4.13.2 SDRAM

The machine uses image memory to store image data for image memory functions.

The machine is designed for memory copying only (no direct copying). The machine stores the image data once in its memory before generating output, at times resulting in inadequate available space when continuous copying is under way with the ADF in use. In such an event, the machine will stop reading the original, generate copy output, and resume reading when adequate space has been created.
The machine generates sometimes a memory full error by the memory space. If the memory full error, divide the original into some stacks and scan them one by one.

4.14 Output Image Processing

The output image data sent to the printer unit is subjected to the following processing:

4.14.1 Smoothing

The machine uses smoothing to remove the jaggy edges from diagonal or curved lines of images, thus producing images consisting of smooth lines. Using smoothing, the machine can make moire associated with photo originals less conspicuous.

a. When Generating Read Images

The machine converts an 600x600-dpi input image into data of 1200 (equivalent) x 600 dpi by smoothing, which is carried out by relocating specific pixels in question.

b. When Generating Printer (PDL) Images

PDL data is subjected to appropriate smoothing, thus converting images of 600 x 600 dpi into images of 2400 (equivalent) x 600 dpi.

5 Disassembly and Assembly

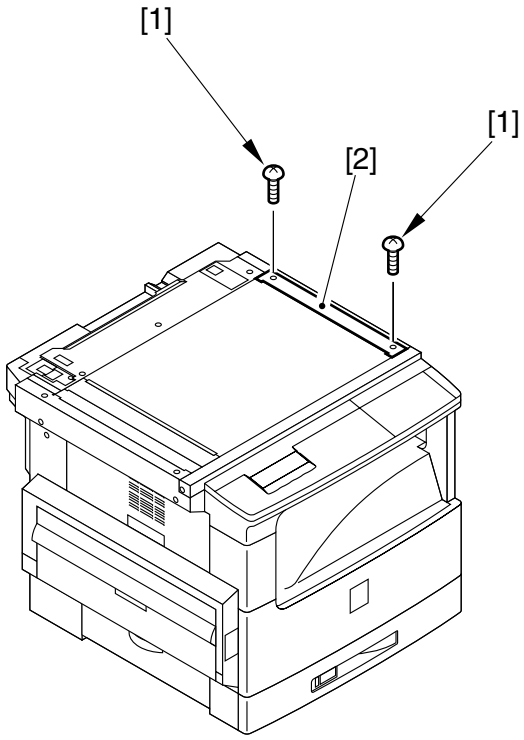
Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the drum unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

5.1 Copyboard Glass

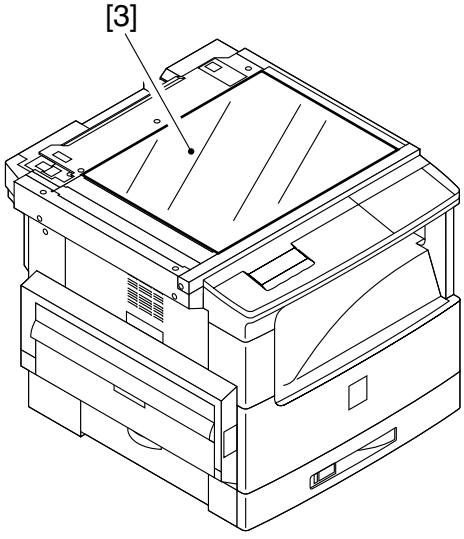
5.1.1 Removing the Copyboard Glass

1) Open the copyboard cover or the ADF.
2) Remove the 2 screws [1], and detach the copyboard glass retainer (right) [2].



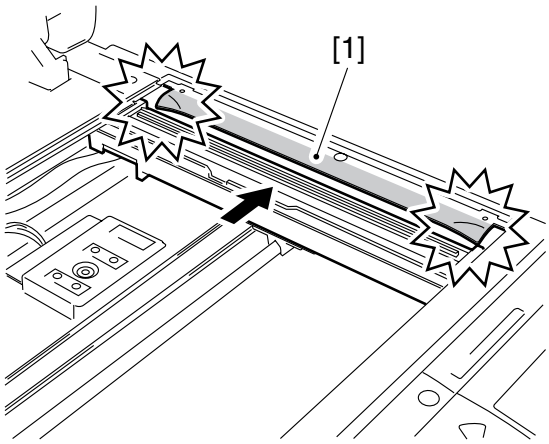
F03-501-01

3) Remove the copyboard glass [3].



F03-501-02

Take care not to deform the right upper frame [1] when you have removed the copyboard glass. If deformed, the frame will come into contact with the CS unit, damaging the latter.



F03-501-03

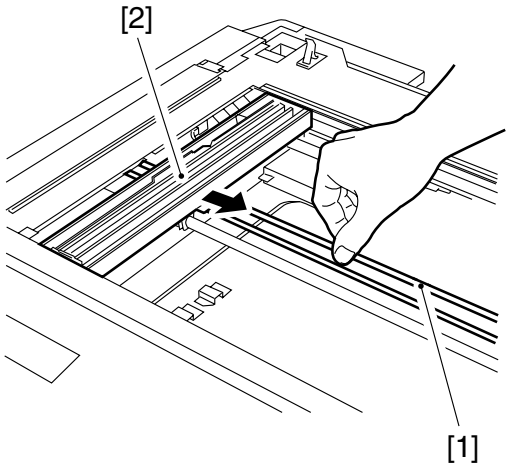
5.1.2 After Replacing the Copyboard Glass

If you have replaced the copyboard glass, be sure to perform 'gain adjust' in service mode. (Refer to 5.1.1)

5.2 CS Unit

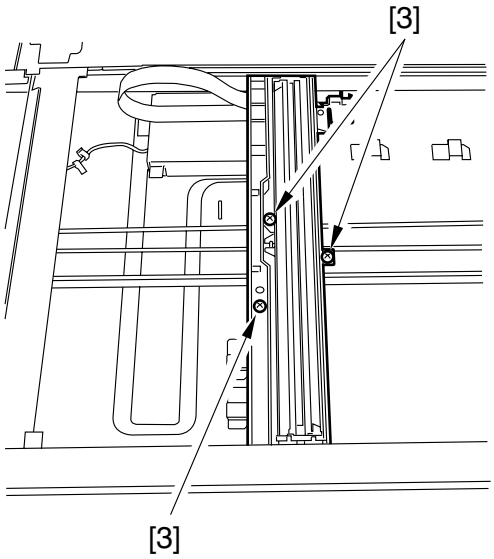
5.2.1 Removing the CS Unit

1) Remove the copyboard glass. (Refer to 5.1.1)
2) Move the belt [1] with your finger to move the CS unit [2] near the center of the copyboard.



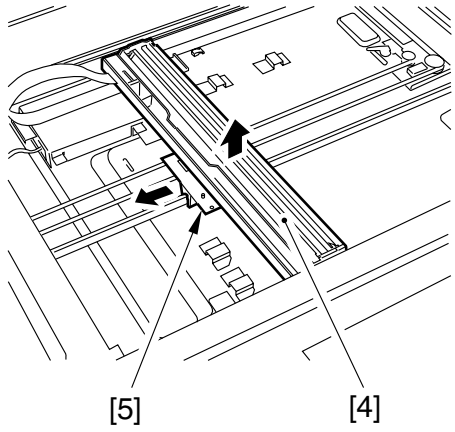
F03-502-01

3) Remove the 3 screws [3].



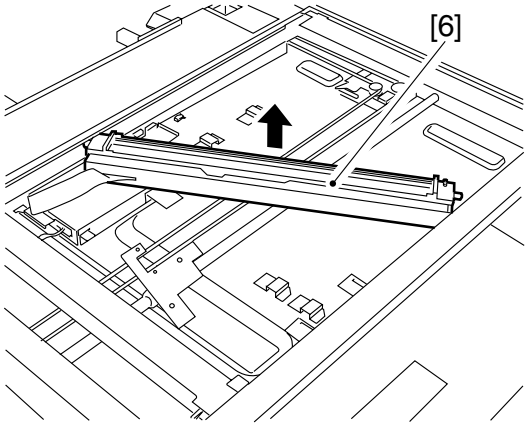
F03-502-02

4) While lifting the carriage [4] slightly, slide the rail guide [5] to detach the rail guide from the carriage.



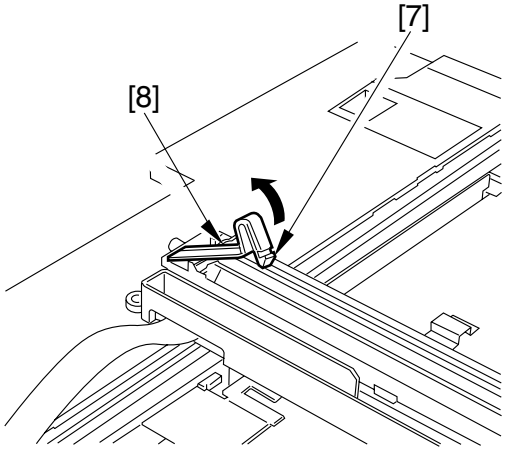
F03-502-03

5) Slant the carriage [6] so that the frame top is out the frame inside.



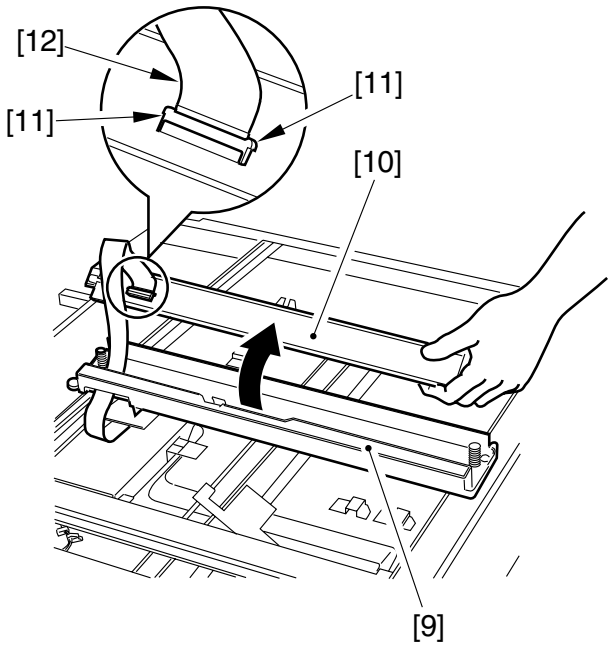
F03-502-04

6) Free the hook [7], and detach the flexible guide [8].



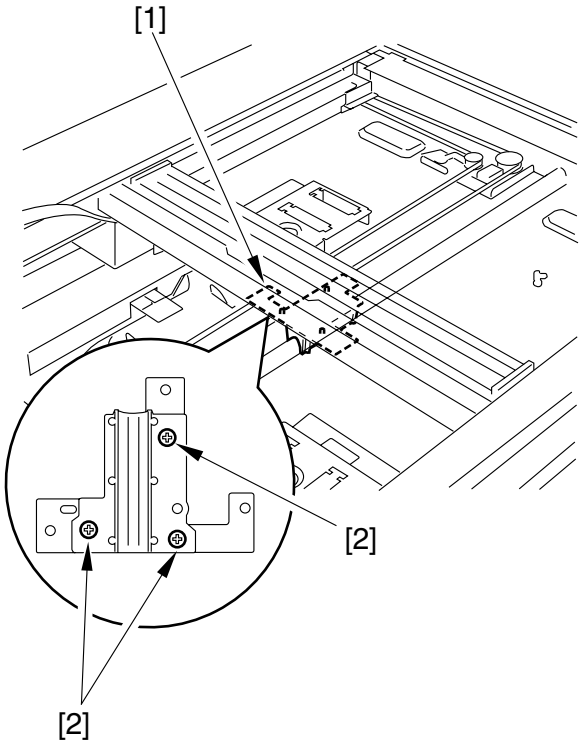
F03-502-05

7) Lift the CS unit [10] from the carriage [9] to free the lock [11] of the connector; then, detach the flexible cable [12], and detach the CS unit [10].



F03-502-06

Do not loosen or remove the 3 screws [2] found on the rail guide [1]. They are adjusted to high accuracy at the factory.

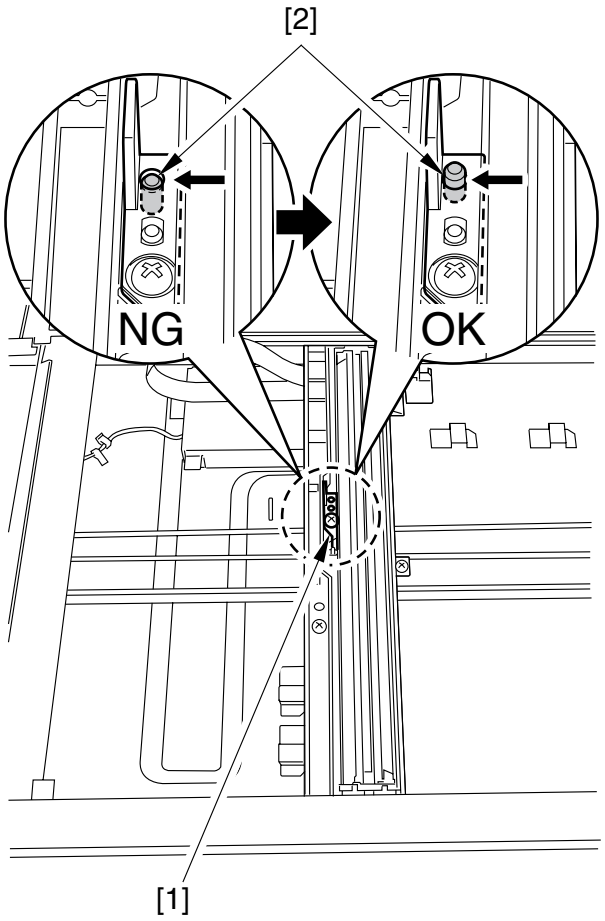


F03-502-07

After mounting the CS unit, do not turn on the power switch while the CS unit is at the left edge. Otherwise, the machine will not be able to detect home position normally, causing the reader motor to go out of sync.

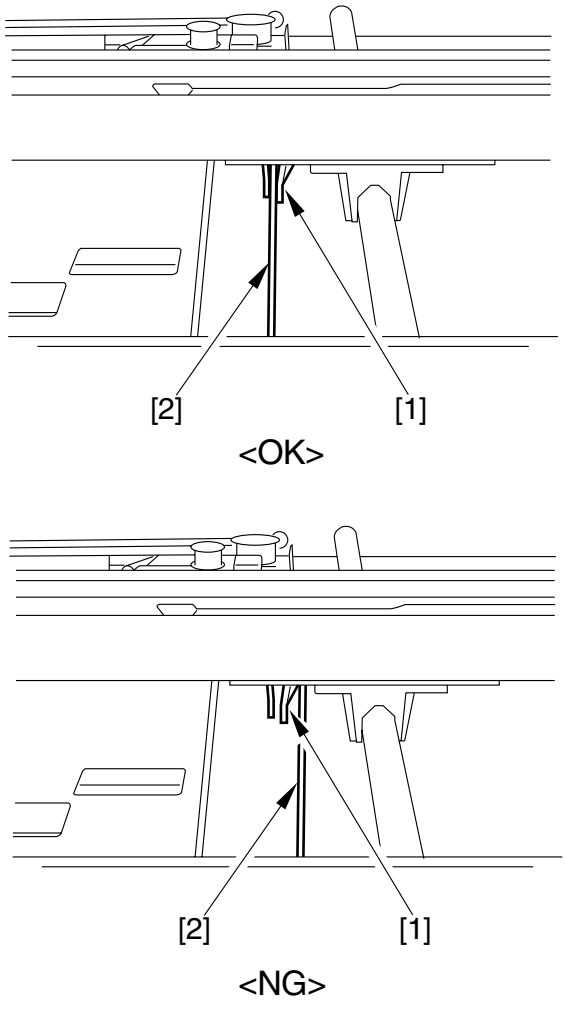
5.2.2 Points to Note When Mounting the CS Unit

When mounting the belt retainer [1], be sure that the boss [2] is securely fitted.



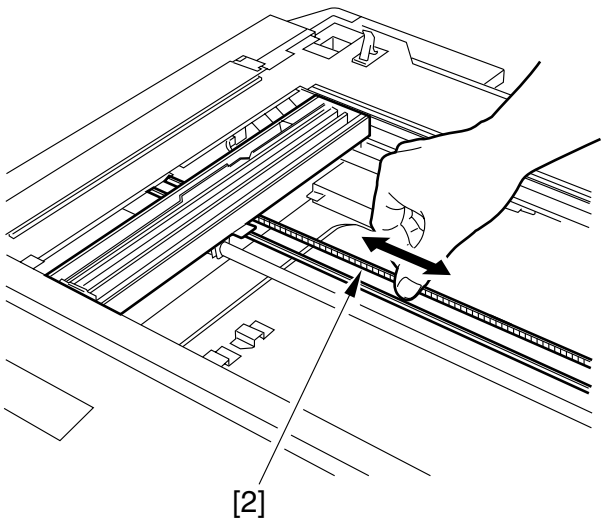
F03-502-08

When mounting the CS unit, check to make sure that the belt retainer [1] is keeping the drive belt [2] firmly in place.



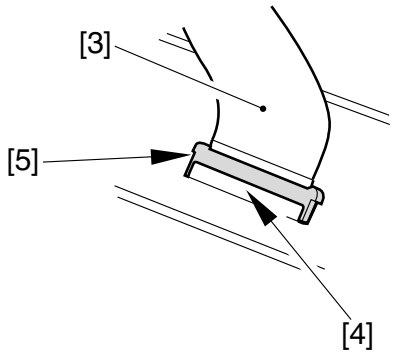
F03-502-09

After mounting the CS unit, move the drive belt [2] with your finger to make sure that the teeth will not skip.



F03-502-10

When mounting the CS unit, be sure to fit the flexible cable [3] fully straight in relation to the connector [4] and secure it in place using the lock [5].



F03-502-11

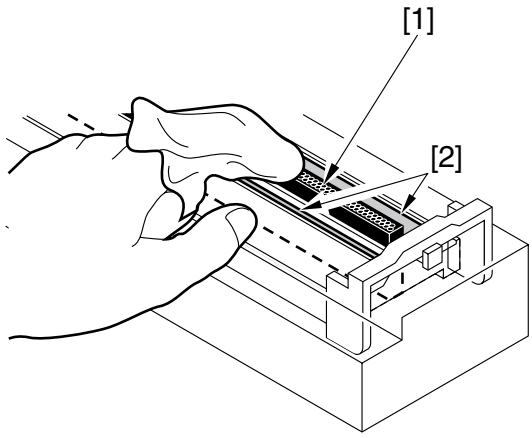
5.2.3 After Replacing the CS Unit

If you have replaced the CS unit, be sure to execute 'gain adjustment' and 'CS position auto adjustment for ADF' in service mode. (Refer to Chapter13)

5.2.4 Points to Note When Handling the CS Unit

The electrical elements in the CS unit are vulnerable to static charges. As such, be sure to free yourself of static charges before starting the work. Moreover, avoid working in an environment where static charges tend to occur.

When handling the CS unit, take care not to leave oils or dirt from your hands on the photo conducting medium and the lens assembly. In the case of the lens assembly [1], you may use a dry, soft cloth to wipe off dirt in gentle strokes. However, do not wipe or use alcohol on the photo conducting medium [2].



F03-502-12

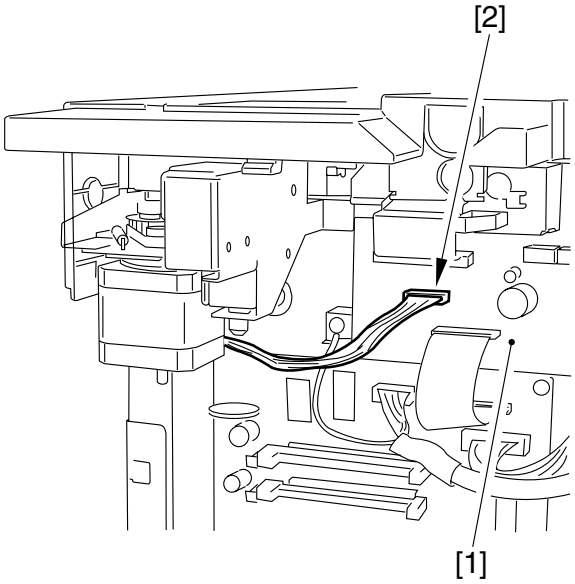
5.3 Reader Motor

5.3.1 Removing the Reader Motor

1) Remove the copyboard cover.
2) Remove the copyboard glass retainer (right).
3) Remove the rear cover.
4) Remove the right lower cover, right rear cover, and right rear upper cover.
5) Open the manual feed tray, and detach the left lower cover.
6) Remove the drum unit.

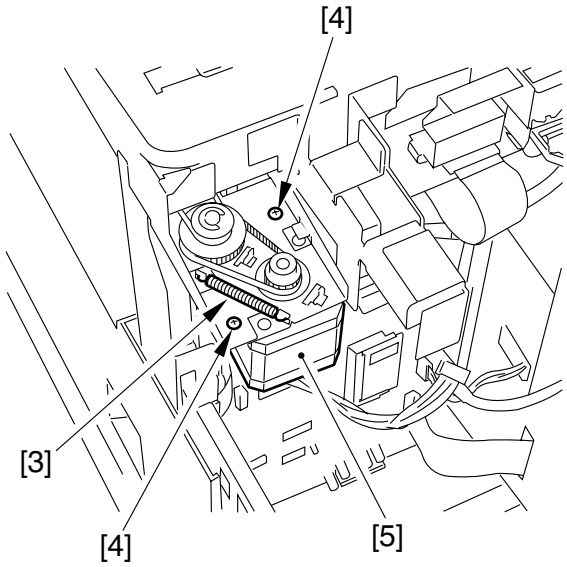
When you have removed the drum unit, wrap it in several sheets of copy paper to protect the drum from light.

7) Remove the left rear cover ant the left upper cover, and detach the rear upper cover.
8) Disconnect the connector J13 [2] from the original detection/reader motor drive PCB [1].



F03-503-01

9) Remove the tension spring [3] and the 2 screws [4]; then, detach the reader motor [5].

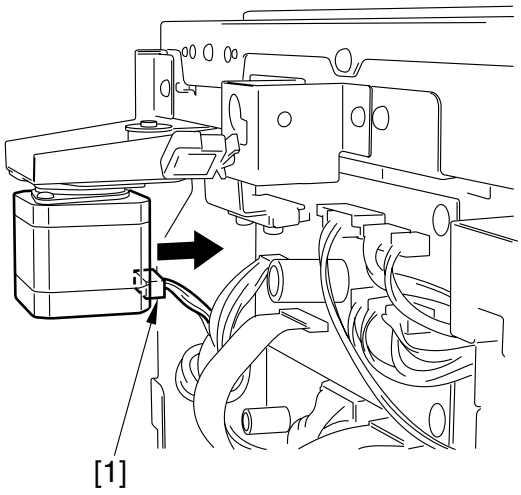


F03-503-02

5.3.2 Points to Note When Mounting the Reader Motor

When mounting the reader motor, be sure to hook the tension spring on the motor and the machine's mounting plate; then, secure it in place with screws. Otherwise, the belt will lack correct tension, leading to malfunction.

When mounting the reader motor, check to be sure that the connector [1] faces the machine; otherwise, the harness of the read motor can interfere with the edge of the plate and suffer a cut.



F03-503-03

CHAPTER 4

LASER EXPOSURE SYSTEM

1 Outline of Operation

1.1 Outline

The laser exposure system consists of the following: laser unit, which is the source of laser light; scanner motor, which is equipped with a 6-facet mirror for scanning; and BD PCB, which is used to control the laser light.

The video signals coming from the image processor PCB are sent to the laser driver PCB, which turns on and off the laser diode according to the video signals from the DC controller PCB to generate a modulated laser beam.

The modulated laser beam is converted into a parallel beam of light by a collimator lens and cylindrical lens. After conversion, it is directed to the 6-facet mirror, which is rotating at a specific speed. The laser beam reflected by the lens is then led to the imaging lens and reflecting mirror (arranged in front of the 6-facet mirror) to reach the photosensitive drum.

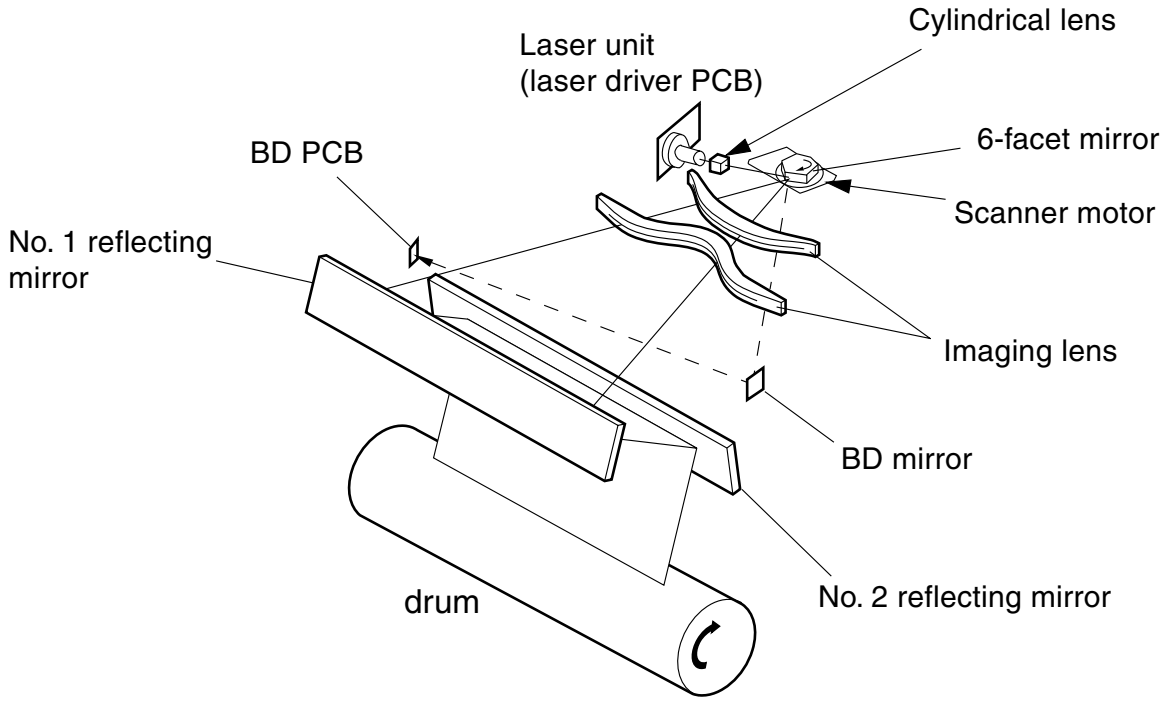
The laser beam scans the surface of the photosensitive drum at a specific speed as the 6-facet mirror rotates at a specific speed, forming an image on the surface of the drum.

The following are major items of control and methods of control used:

Items	Method
Laser intensity control	Auto control of the laser power (APC control)
Laser scanning	Scanning by a semi-conductor laser
Synchronization	Control by the BD signal (main scanning direction) Control by the TOP signal (sub scanning direction)
Scanner motor control	Constant speed rotation control

T04-101-01

The following shows the major components of the laser exposure system and its functions; the machine's laser scanning method is based on a 6-facet polygon mirror and a single beam:

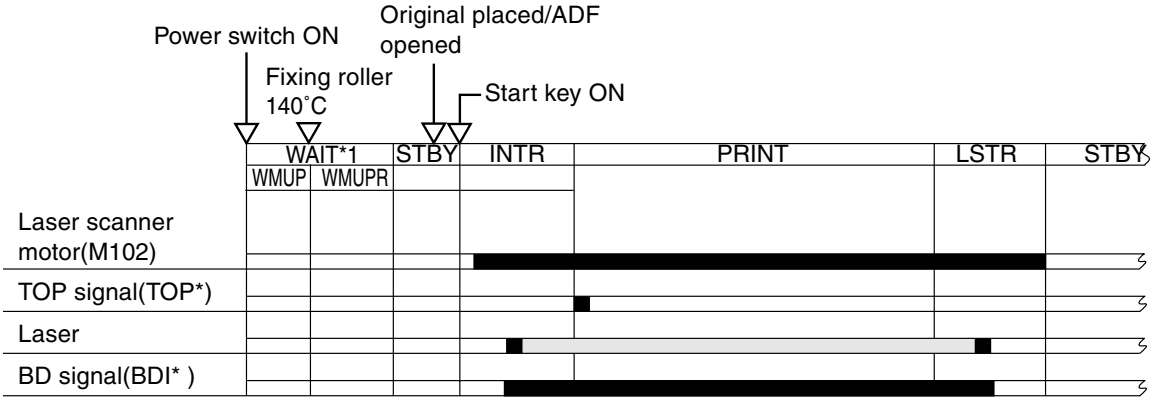


F04-101-01

Component	Description
Laser semi-conductor	Infrared light (about 785 nm), 1-beam
Scanner motor (M102)	DC brushless motor
Polygon mirror	6-faceted
BD mirror/BD PCB	Laser beam detection
Laser driver PCB	Laser emission control
DC controller PCB	Scanner motor rotation control

T04-101-02

1.2 Basic Sequence of Operation (laser exposure system)



*1: WAIT End Conditions:
: 25 sec or more passed after supplying power to the fixing assembly and, in addition, the fixing assembly temperature is 150 or higher.
: 27 sec or more passed after supplying power to the fixing assembly and, in addition, the fixing assembly temperature is 145 or higher.

F04-102-01

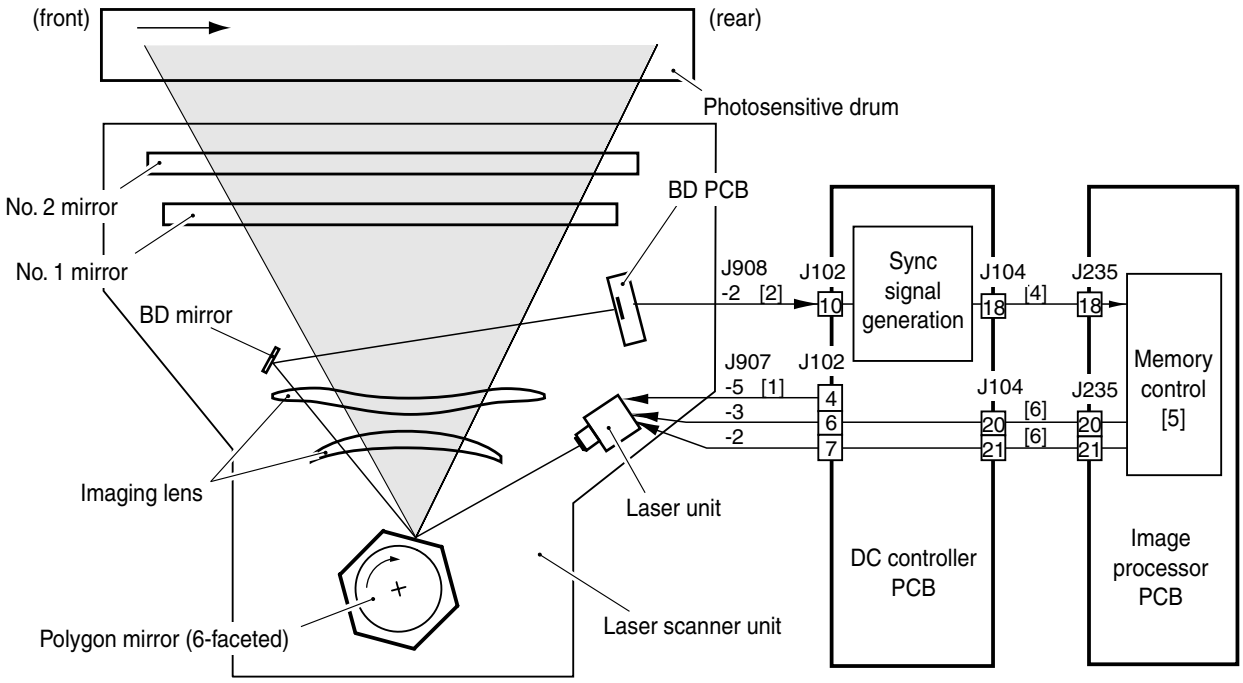
2 Generating the Horizontal Signal

2.1 Outline

The laser emission start signal (horizontal sync) is used to direct laser light to the photosensitive drum. The sync signal is generated by the BD PCB based on the laser beam reflected by the BD mirror mounted in the laser beam path.

2.2 Signals Used

[1] laser emission signal (LONO*). It is generated based on the BD input signal; laser is emitted when it goes '0'.
[2] BD input signal (BDIN*). It goes '0' upon detection of laser light.
[3] horizontal sync signal. It is generated based on the BD input signal.
[4] horizontal synch signal (BDO*). It is used to synchronize the video signals in laser scanning direction in laser scanning direction.
[5] image data. It is read from image memory with reference to the horizontal sync signal.
[6] video signal (VDO, VDO*). It is used to form an image on the photosensitive drum.



F04-201-01

Error

E100

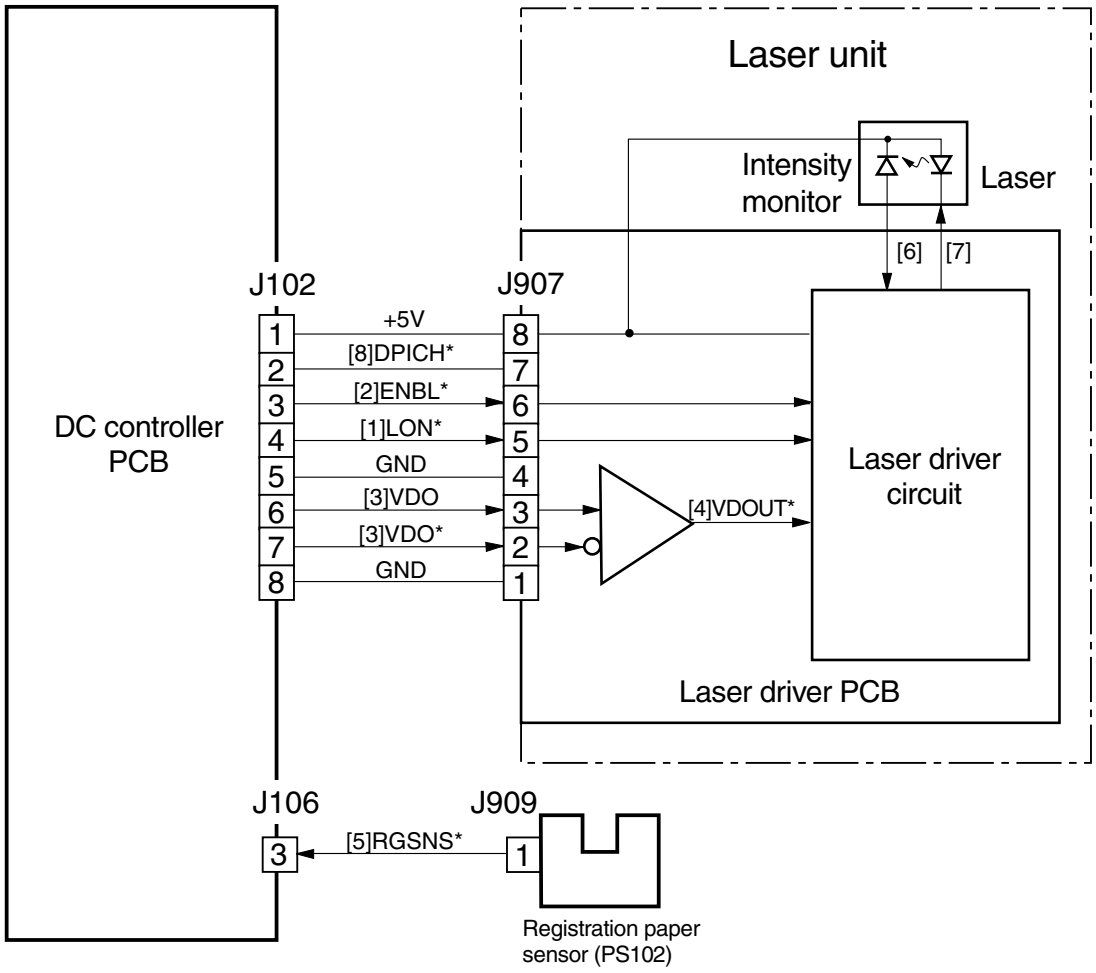
After laser light is turned on, the BD signal cannot be detected within a specific period of time.

3 Laser Driver Circuit

3.1 Laser Control

The laser driver circuit is used to drive the semiconductor laser according to the video signals from the image processor PCB.
The following items of control relate to the laser driver circuit:
1. Laser emission control
2. Laser power auto control (APC control)

The signals have the following functions:
[1] laser emission signal. It is generated based on the BD input signal; laser light is emitted when it goes '0'.
[2] image formation enable signal. It is used to control the output of the video signals; emission of laser light is enabled when it goes '0'.
[3] video signal: It is a low-amplitude (for noise suppression) drive signal.
[4] video out signal. It is a low voltage drive signal converted from a video signal. When the mage formation enable signal is '0', it turns on/off the laser light.
[5] registration signal. It generates the TOP signal when paper reaches the registration sensor (PS102) mounted to the front of the registration roller.
[6] The laser intensify is monitored when laser light is emitted, and a level suited to the intensity of the light is fed back to the laser drive circuit.
[7] The output is controlled so that the level arriving as feedback and the reference level from the DC controller are identical.
[8] laser intensity switch signal. It is used to switch the laser intensity between laser start-up and printing. During printing, it is fixed to '0'.



F04-301-01

Memo

The laser power is adjusted automatically whenever the laser unit is replaced.

4 Controlling the Scanner Motor

4.1 Outline

The following are items of control related to the scanner motor:

[1] scanner motor constant speed rotation

[2] scanner pre-rotation control

4.2 Controlling the Scanner Motor

The scanner motor is controlled as follows:

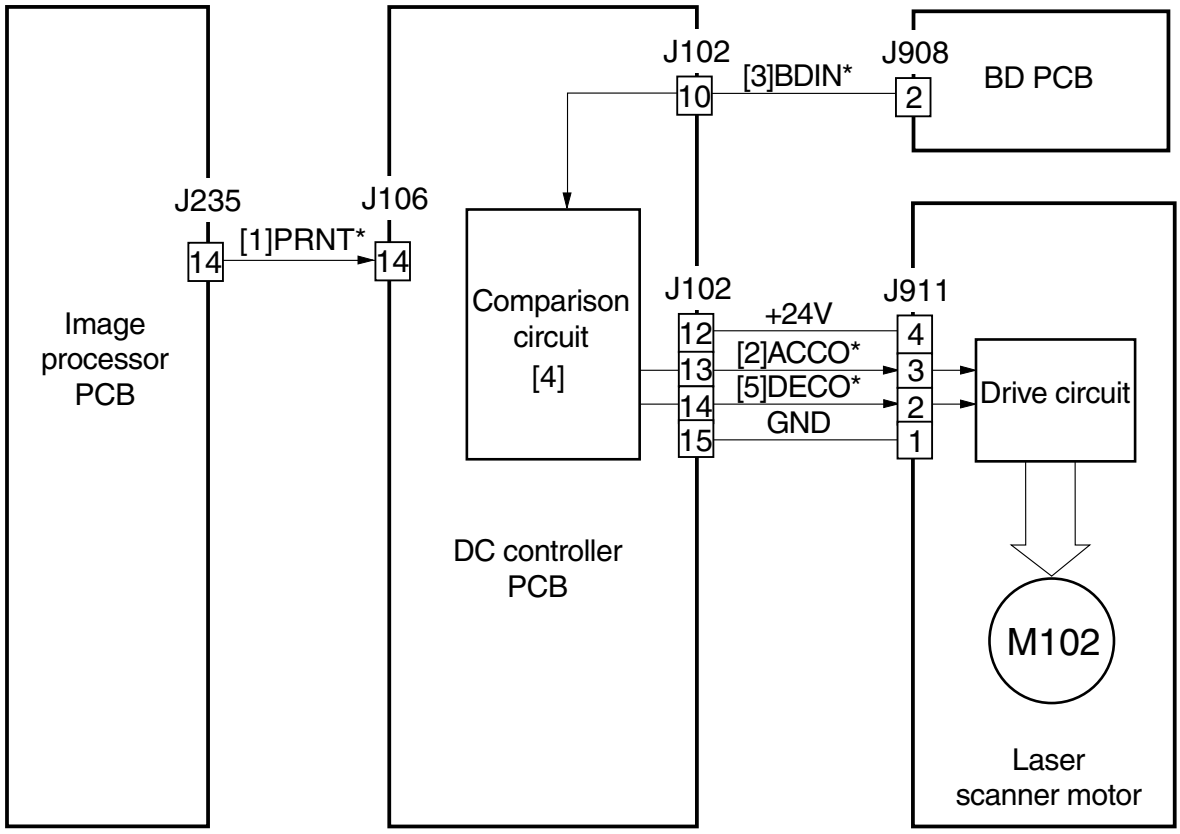
[1] When the print signal goes '0', printing is started or continued.

[2] When the scanner motor acceleration signal goes '0', the scanner motor goes ON.

[3] The BD input signal goes '0' when laser light is detected.

[4] The cycle of the BD input signal and the target cycle are compared, and the result is used to control the scanner motor.

[5] When the scanner motor deceleration signal goes '0', the scanner motor goes off.



F03-402-01

E100

Error

E100 is indicated under any of the following conditions:

1. When the scanner motor is started up, the BD input signal does not arrive within a specific period of time.
2. When the scanner motor is started up, the motor rotation is too fast, requiring deceleration; yet, it does not reach a specific revolution within 20 sec.
3. While the scanner motor is rotating at a constant speed, the cumulative period in which the cycle of the BD input signal exceeds a specific cycle by ± 2% is found to be 10 mm (equivalent of printing length).
4. While the scanner motor is rotating at a constant speed, the cycle of the BD input signal deviates from a specific cycle by ± 2% or more.
5. During the WMUPR period after the power switch has been turned on or the front cover/left cover has been opened/closed, the drum unit is absent.

4.3 Scanner Pre-Rotation

The machine sends the scanner pre-rotation command to rotate the scanner motor a specific period of time (depending on when image data is received) in advance of the pickup command (PRINT*) arriving at the DC controller PCB from the image processor PCB, thereby ensuring the correct image leading edge.

The machine sends the scanner pre-rotation command for the following:

For Copying : The ADF detects an original.
The copyboard cover is found to be opened/closed. However, for the first detection after copying, removal of an original will be assumed and, therefore, no scan pre-rotation will be executed.

For Printing : There is no previous image data and, in addition, paper is not being moved and no page is being delivered.

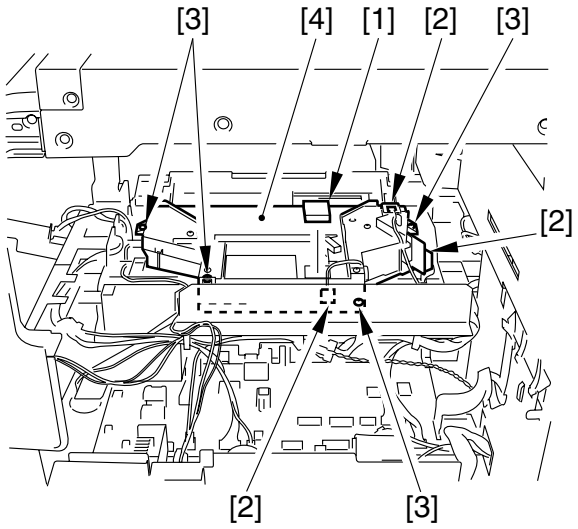
5 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the durm unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

5.1 Removing the Laser/Scanner Unit

1) Remove the fixing assembly. (3.1 of Chapter 7)
2) Remove the dust-proof sponge [1].
3) Disconnect the 3 connectors [2].
4) Remove the 4 screws [3], and detach the laser/scanner assembly [4].



F04-501-01

The inside of heater laser/scanner assembly cannot be adjusted in the field. Do not disassemble it.

CHAPTER 5

IMAGE FORMATION SYSTEM

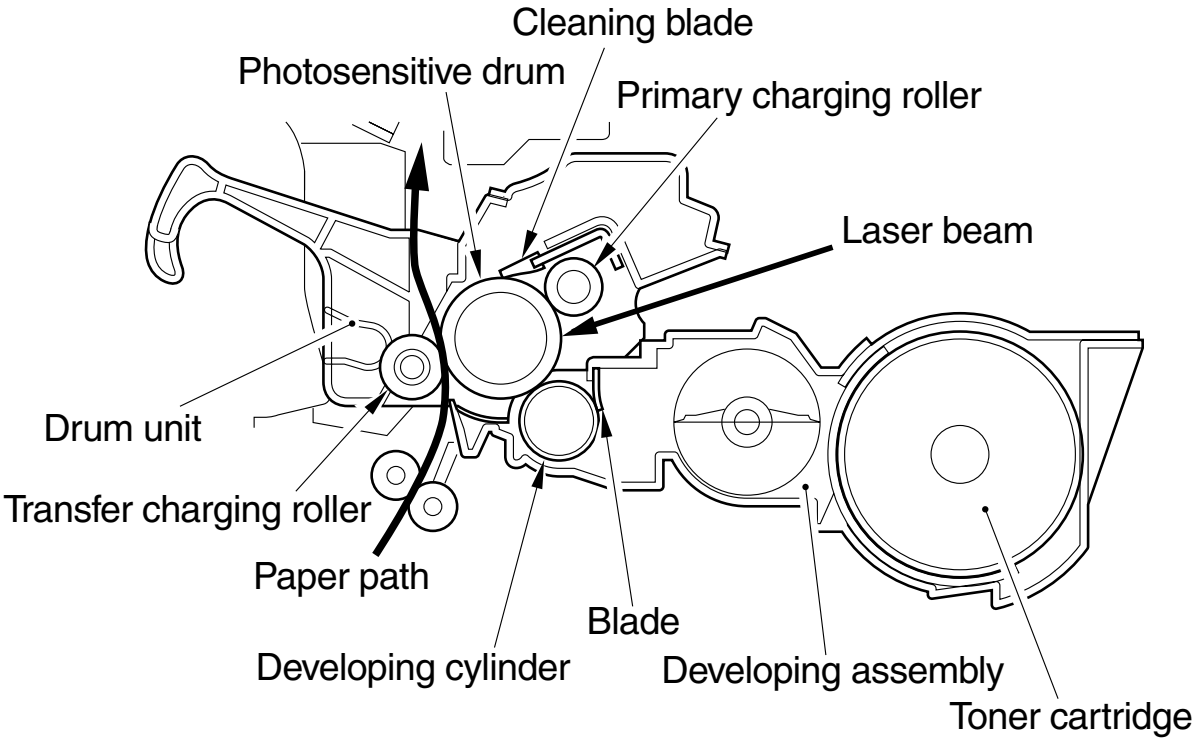
1 Outline of Processes

The image formation system has the following functions, and uses the following methods:

Item	Description
Photosensitive drum	OPC (30-mm dia.)
Drum cleaning	Cleaning blade
Developing cylinder	20-mm dia.
Toner	Dry, 1-component, toner projection
Toner	Negative toner
Primary charging roller bias control	AC constant current control (about 1110 μA; about 860 Hz) DC constant voltage control (plain paper mode; about -580 to -650 V)
Developing bias control	AC constant voltage control (about 1600 Vp-p; about 2200 Hz) DC constant voltage control (plain paper mode; image area, about -360 to -485 V; non-image area, about -495 to -570 V)
Transfer charging roller bias control	DC constant voltage control (about 5.76 KV max.; for cleaning bias, about -2.3 KV) DC constant current control (about 5 μA) voltage level correction control (ATVC)

T05-101-01

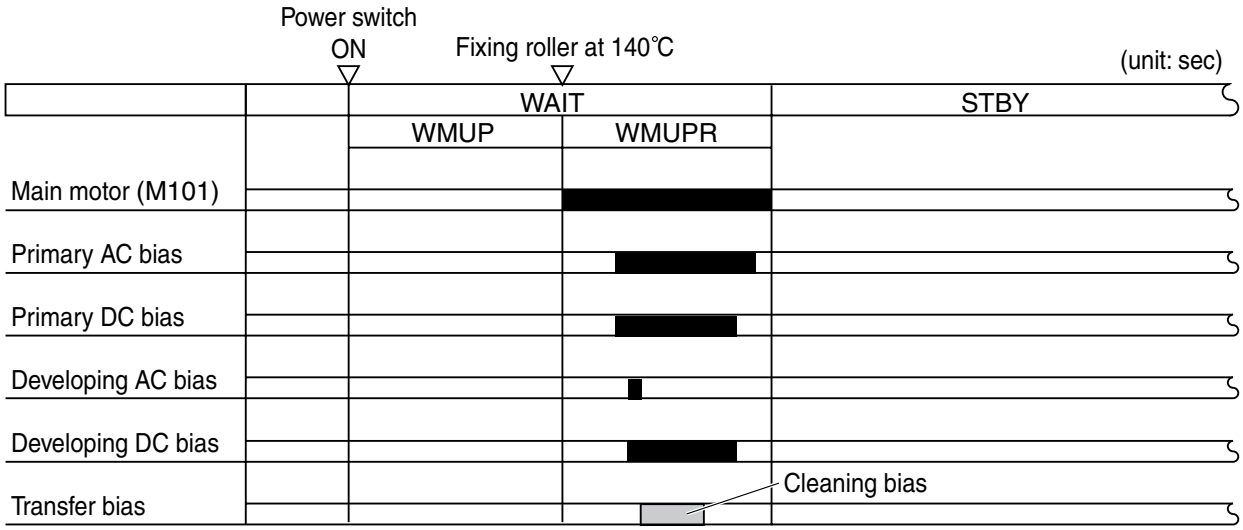
The image formation system consists of the following major components:



F05-101-01

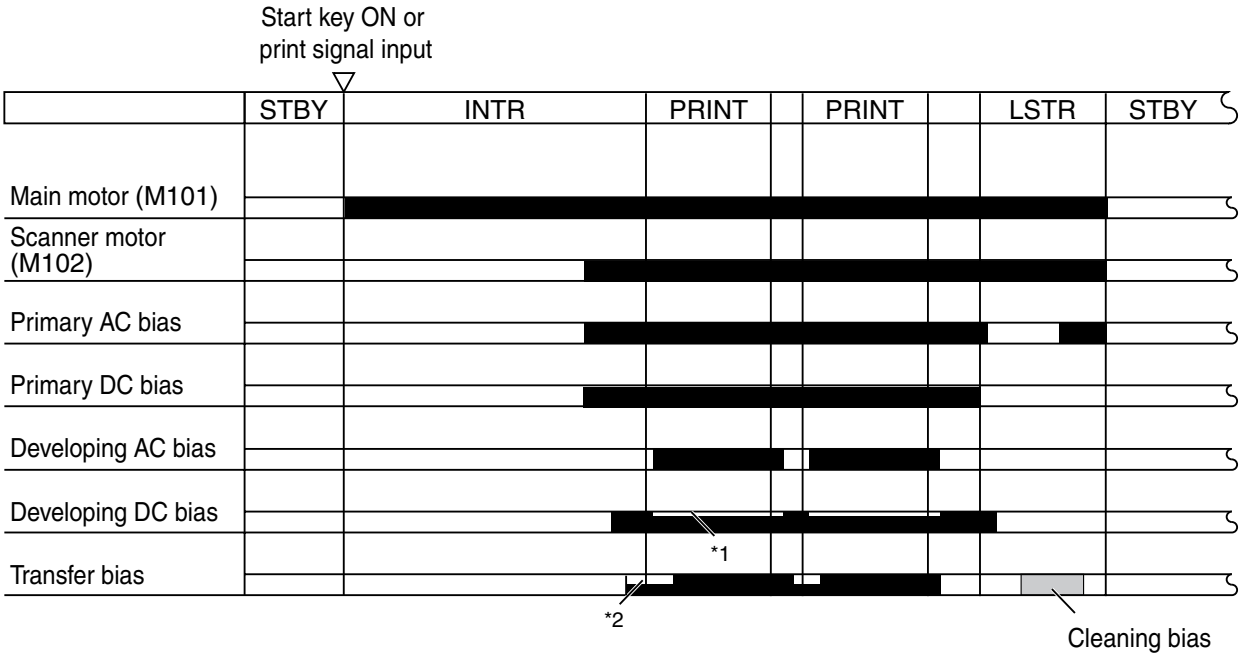
1.1 Sequence of Operation (image formation system)

- At Power-On



F05-102-01a

- During Printing (1 original, 2 copies, continuous)



*1 : varies depending on density setting. If PDL output,the copying is constant.
*2 : ATVC control.

F05-102-01b

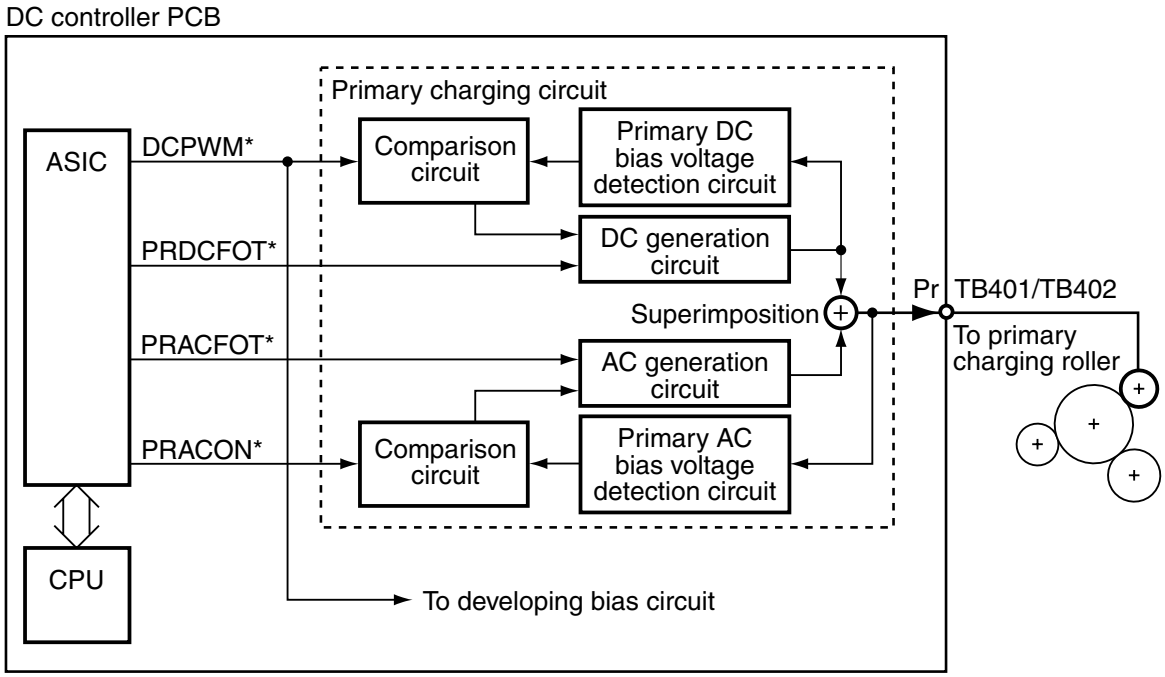
2 1 Controlling the Primary Charging Roller Bias

2.1 Outline

The machine uses a charging roller for primary charging (direct charging method), and it applies an AC bias to stabilize the charging in addition to the DC bias.

The following items of control are used in relation to the primary charging control system:
[1] turning on and of the bias.
[2] performing constant voltage control for the DC bias.
[3] performing constant current control for the AC bias.

The primary charging control system is constructed as shown in the following diagram:



F05-201-01

2.2 Turning On and Off the Bias

The primary charging roller bias is turned on and off as follows:

2.2.1 DC Bias

The DC bias is generated when the primary DC bias drive signal (PRDCFOT*) goes ON. The level of the DC bias is controlled by the primary/developing DC bias output level signal (DCPWM*).

2.2.2 AC Bias

The AC bias is applied when the primary AC bias drive signal (PRACFOT*) goes ON and the primary AC bias ON/OFF signal (PRACON*) goes '0'.

2.3 Bias Constant Voltage/Constant Current Control

The output levels of the DC and AC biases applied to the primary charging roller are controlled as follows:

2.3.1 DC Bias Constant Voltage Control

The output voltage level f the DC bias is detected by the bias voltage detection circuit, and is fed back to the DC generation circuit by way of the comparison circuit. The ASIC on the DC controller PCB varies the pulse width of the primary/developing DC bias output level signal as needed to ensure that the voltage of the DC bias remains at a specific level.

2.3.2 AC Bias Constant Current Control

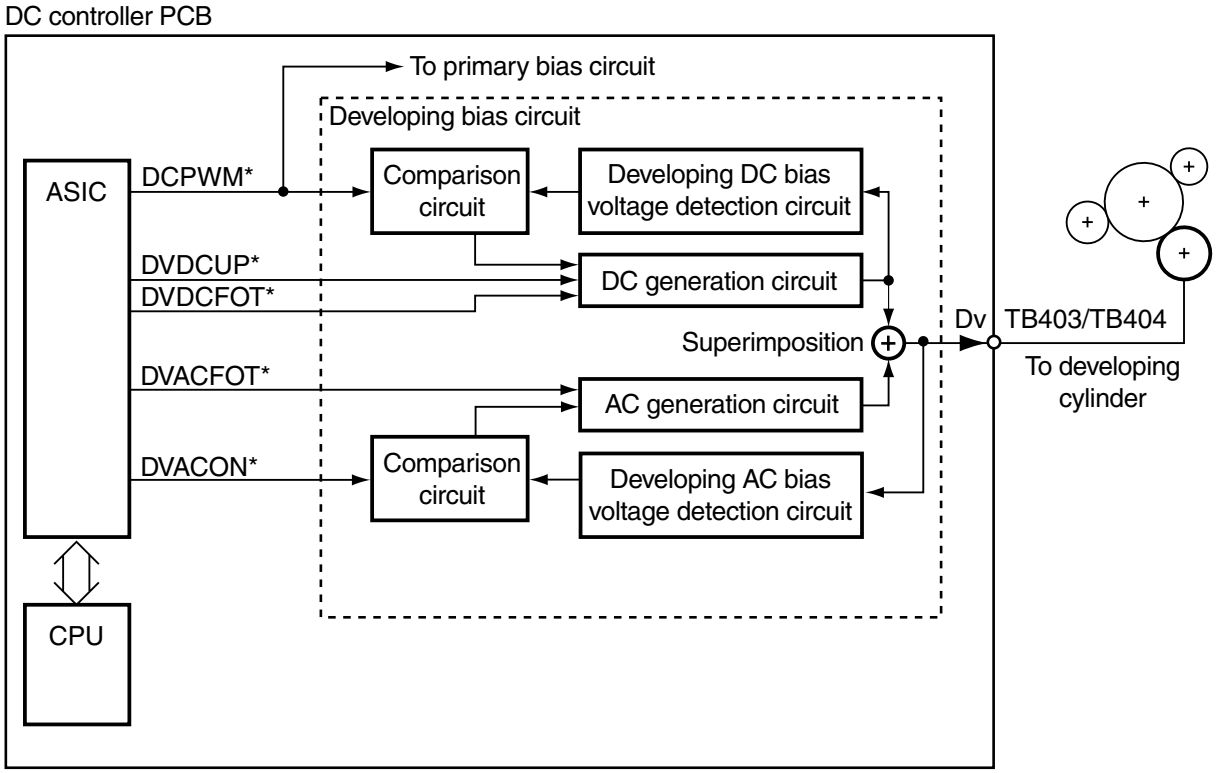
The output current level of the AC bias is detected by the primary AC bias current circuit, and is fed back to the AC generation circuit by way of a comparison circuit. The AC generation circuit varies the amplitude of the primary AC bias ON/OFF signal as needed to ensure that the current of the AC bias remains at a specific level.

3 Controlling the Developing Bias

3.1 Outline

A DC bias and an AC bias are applied to the developing cylinder, and the developing bias control system has the following functions:
[1] turning on and off the bias.
[2] controlling the developing DC bias to a constant voltage level.
[3] controlling the developing AC bias to a constant voltage level.
[4] controlling the voltage level of the developing bias.

The system used to control the developing bias control mechanism is constructed as follows:



F05-301-01

3.2 Turning On/Off the Bias

The developing bias is turned on/off as follows:

3.2.1 DC Bias

When the developing DC bias drive single (DVDCFOT*) goes ON, the DC bias is generated. The output level of the DC bias is controlled by the primary/developing DC bias output level signal (DCPWM*).

3.2.2 AC Bias

When the primary AC bias drive signal (DVACFOT*) goes ON and the developing AC bias ON/OFF signal (DVACON*) goes '0', the AC bias is generated.

To prevent stray toner inside the machine, the AC bias is also turned on for image areas and off for non-image areas.

3.3 Controlling the Bias to a Constant Voltage Level

The output level of the DC bias applied to the developing cylinder is controlled as follows:

3.3.1 Controlling the Developing DC Bias to a Constant Level

The output voltage level of the DC bias is detected by the developing DC bias voltage detection circuit, and is fed back to the DC generation circuit by way of the comparison circuit. The ASIC on the DC controller PCB varies the pulse width of the primary/developing bias output level signal as needed to keep the DC bias to a specific voltage level.

3.3.2 Controlling the Developing AC Bias to a Constant Voltage Level

The output voltage level of the AC bias is detected by the developing AC bias voltage detection circuit, and is fed back to the DC generation circuit by way of the comparison circuit. The ASIC on the DC controller PCB varies the amplitude of the developing AC bias ON/OFF signal as needed to ensure that the AC bias is kept to a specific level.

3.4 Controlling the Voltage Level of the Developing DC Bias

The voltage level of the developing DC bias is controlled by varying the pulse width of the primary/developing DC bias output level signal (DCPWM*) to suit such factors as the print density setting.

4 Controlling the Transfer Charging Roller Bias

4.1 Outline

The machine uses a charging roller for charging (direct charging method), and it applies a DC bias to the transfer charging roller.

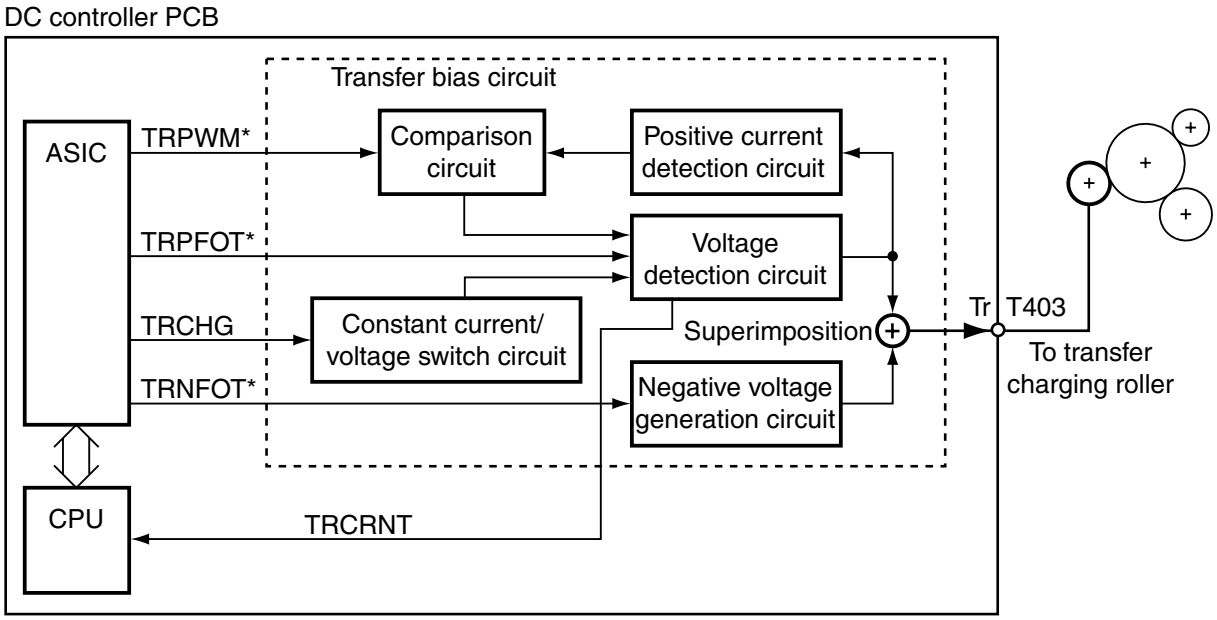
The machine's transfer charging mechanism is controlled for the following:

[1] turning on and off the bias.

[2] controlling the DC bias to a specific voltage/current level.

[3] correcting the voltage level (ATVC control)

The following shows the system used to control the transfer charging mechanism:



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4.2 Turning On and Off the Bias

The DC bias applied to the transfer charging roller may be a positive DC bias or a negative DC bias, each turned on or off as follows:

4.2.1 Turning On and Off the Positive DC Bias

When the transfer positive DC bias drive signal (TRPFOT*) goes ON and the constant current/voltage switch signal (TRCHG) goes '1', the positive DC bias is generated.

The output level of the DC bias is controlled by the transfer DC bias output level signal (TRPWM*). The positive DC bias is used for image transfer.

4.2.2 Turning On and Off the Negative DC Bias

When the transfer negative DC bias drive signal (TRNFOT*) goes ON, the negative DC bias is generated. The negative DC bias is used for the cleaning of the transfer charging roller.

4.3 Controlling the Bias to a Constant Current /Voltage Level

The output level of the DC bias applied to the transfer charging roller is controlled as follows:

4.3.1 Controlling the DC Bias to a Constant Current Level

The internal resistance of the transfer charging roller changes because of variation among parts and the changes occurring in the environment. When the positive DC bias drive signal (TRPFOT*) goes ON and the constant current/voltage switch signal (TRCHG) goes '0' during initial rotation, a specific level of current is generated, and the CPU measures the voltage level with reference to the transfer charging roller voltage detection signal (TRCRNT) to find out the changes in the internal resistance. It then corrects the DC bias based on the result of detection.

4.3.2 Controlling the DC Bias to a Constant Level

The output level of the DC bias is detected by the developing DC bias voltage detection circuit, and is fed back to the DC generation circuit by way of the comparison circuit. The ASIC on the DC controller PCB then varies the pulse width of the primary/developing DC bias output level signal to ensure that the DC bias is kept to a specific level.

4.4 Correcting the Voltage Level (ATVC control)

To make up for the changes occurring in transfer efficiency caused by changes in the environment or deterioration of the transfer charging roller, the level of application voltage of the transfer bias is controlled automatically during initial rotation and between sheets.

4.5 Controlling the Output According to Operation Mode

4.5.1 Type of Mode

The transfer charging output has the following mode item, each with different output levels:

a. Bias for Image Transfer

It is a bias used to transfer toner images from the photosensitive drum to paper, and is a positive voltage.

b. Cleaning Bias

It is a bias used to return toner from the transfer charging roller to the photosensitive drum, and is a negative voltage applied during initial rotation and last rotation.

c. Sheet-to-Sheet Bias

It is a bias with a lower level, used to prevent toner from adhering to the transfer charging roller in no-image area (between sheets) during continuous printing.

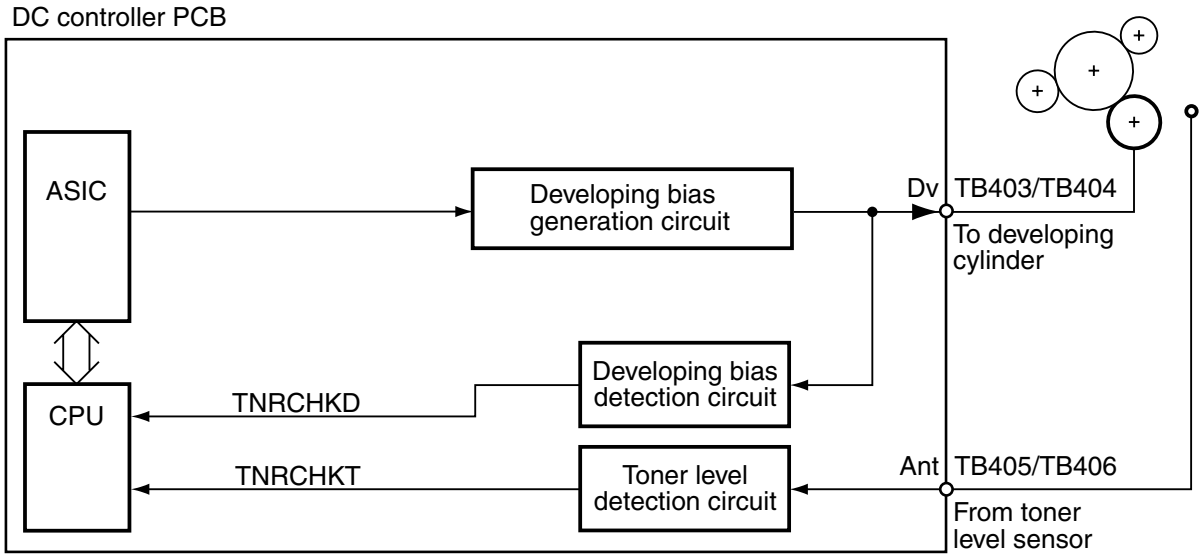
5 Detecting the Presence/Absence of a Cartridge and the Level of Toner

5.1 Outline

A toner level sensor is mounted inside the developing assembly.

The machine uses the output (Ant) of the toner level sensor inside the developing assembly and the output level (Dv) of the developing bias in various detection circuits for A/D conversion.

The CPU checks the difference in level between the cartridge detection signal (TNRCHKD) and the toner detection signal (TNRCNKT) after A/D conversion when the developing bias is applied, thus finding out the presence/absence of cartridge and the level of toner.

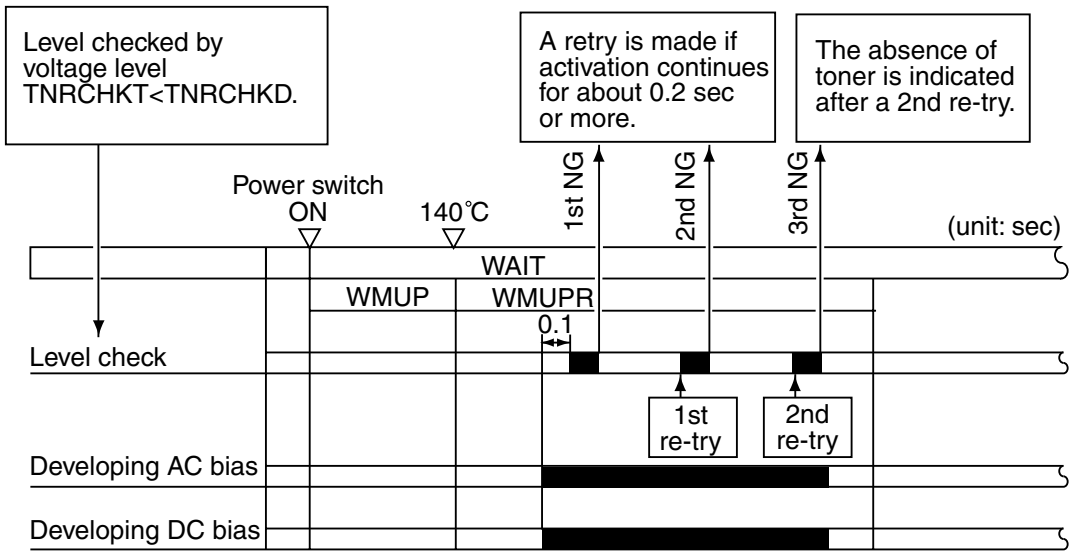


F05-501-01

5.2 Sequence of Detection (level of toner)

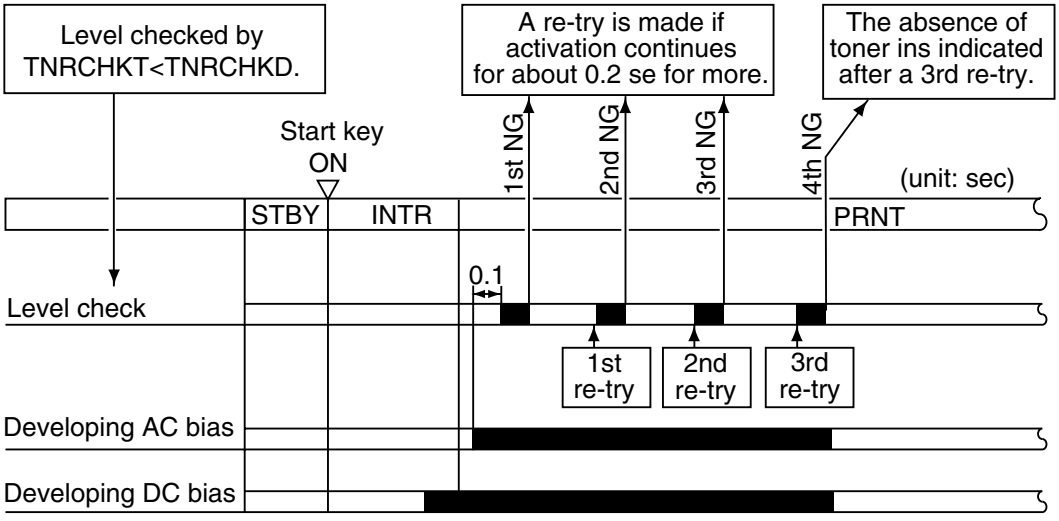
The level of toner is detected while the developing bias is applied during initial rotation and warm-up.

The following is the sequence used to detect the level of toner during warm-up:



F05-502-01

The following sequence is used to detect the level of toner during initial rotation:



F05-502-02

If the absence of toner is detected, the machine indicates the following message on its LCD: "Toner Empty/Replace Cartridge."

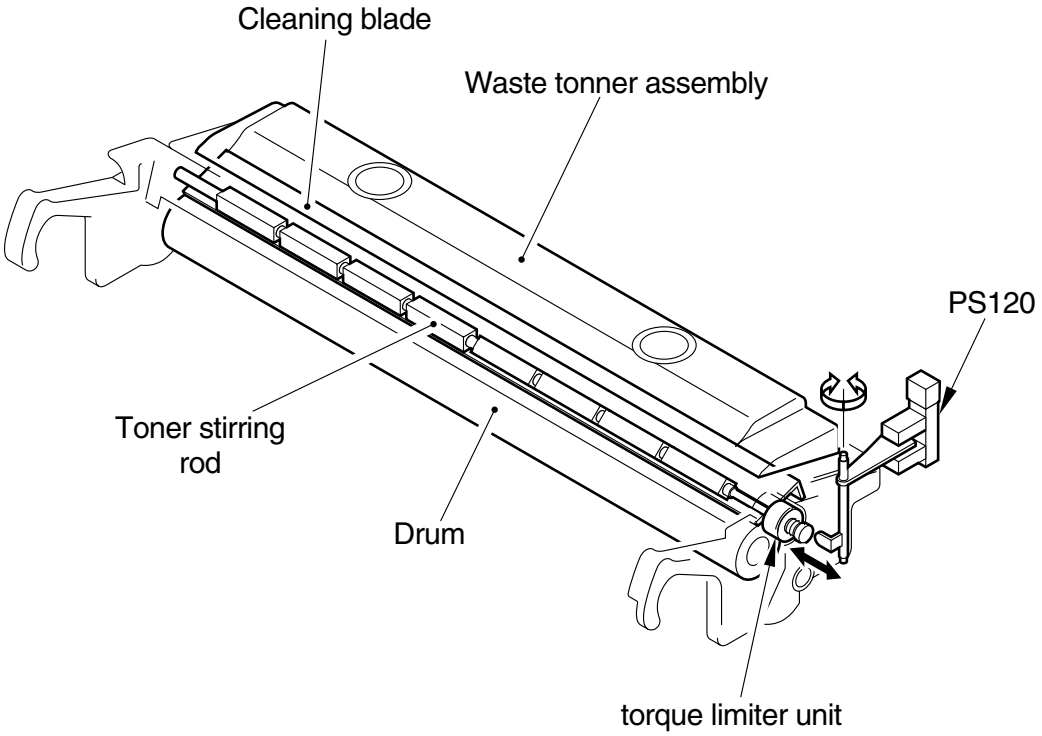
If detection is executed 3 times to find out the level of toner at power-on, a wait time of about 40 sec is needed.

6 Monitoring the Waste Toner Case

6.1 Outline

Waste toner is collected by the cleaning blade inside the drum, and is kept in the waste toner assembly.

The waste toner inside the waste toner assembly is constantly stirred by the stirring rod driven by the main motor. The tip of the stirring rod is equipped with a torque limiter unit, which goes ON when the waste toner assembly becomes full and the rod can no longer stir the waste toner; as a result, the sensor lever of the waste toner case full sensor (PS120) will be pushed, causing the machine to know that the waste toner case has become full.



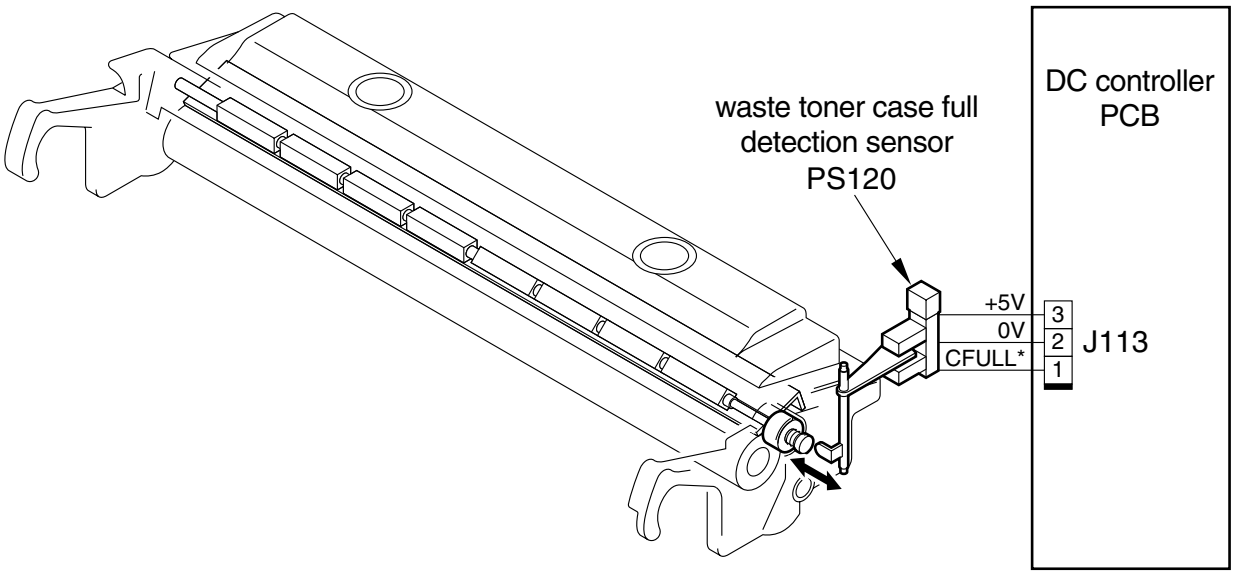
F05-601-01

6.2 Sequence of Operation

The machine monitors the waste toner assembly in 2 steps.

If the waste toner case full detection signal (CFULL*) is '0' for about 1.75 sec or more during initial rotation and during printing, the machine will identify the condition as indicating that the waste toner case is full, and communicate the fact to the image processor PCB, which in turn will indicate the messages 'WASTE TONER FULL' and 'PREPARE A NEW DRUM' in the control panel.

Thereafter, the machine is designed to stop when it has printed 200 page (cumulative). It is reset when initial rotation takes place occurring when the power is turned off and then on or the front cover is opened and then closed.



F05-602-01

Memo

The water toner case is capable of storing about 210 g of toner (about 23,000 pages of A4, at 3% print ratio).

7 Disassembly and Assembly

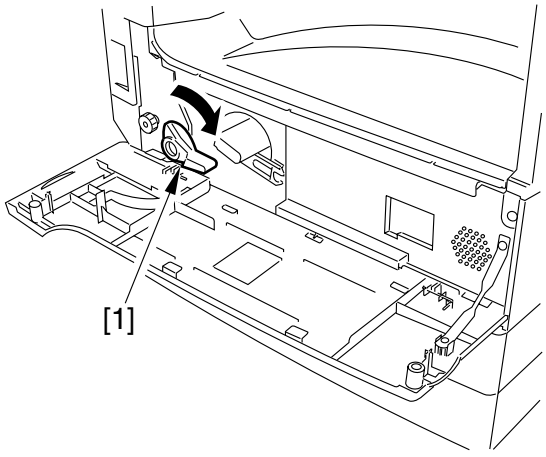
Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the drum unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

7.1 Photosensitive Drum

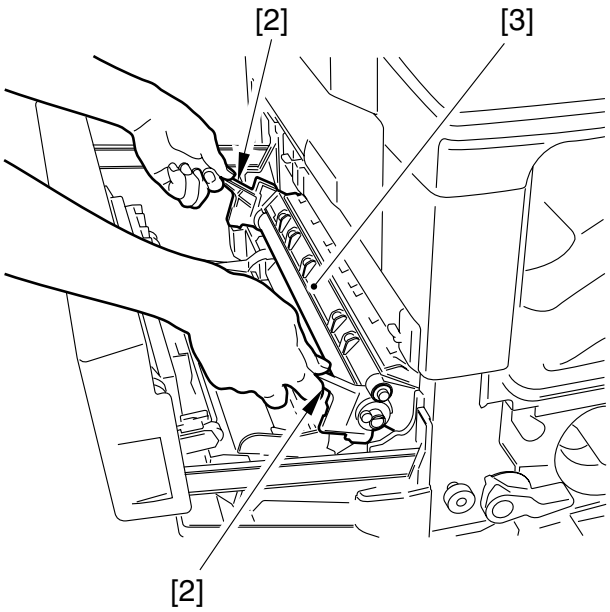
7.1.1 Removing the Drum Unit

1) Open the front cover.
2) Shift down the developing assembly locking lever [1] to unlock the developing assembly.



F05-701-01

3) Slide out the left cover.
4) Holding the grips [2], pull out the drum unit [3].



F05-701-02

When removing the drum unit, be sure to hold the grips and take care not to scratch or soil it.
Further, the photosensitive drum is highly sensitive to light. Whenever you have removed it, be sure to protect it against light.

7.1.2 Cleaning the Photosensitive Drum

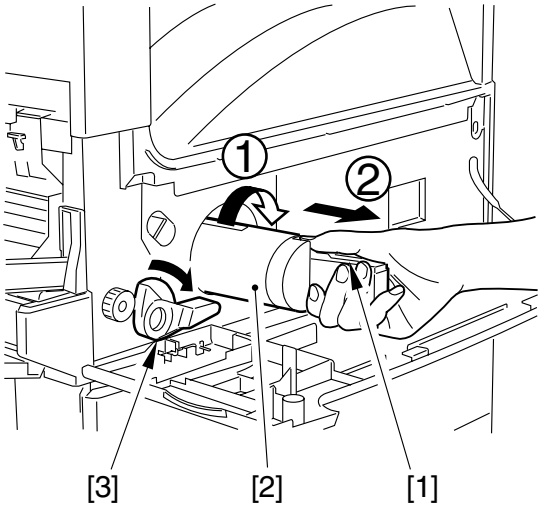
If the surface of the photosensitive drum is soiled, wipe it with a flannel cloth coated with toner. (Do not use paper, lint-free or otherwise).

Do not dry wipe it or do not use solvent. Moreover, do not use drum cleaning powder.

7.2 Developing Assembly

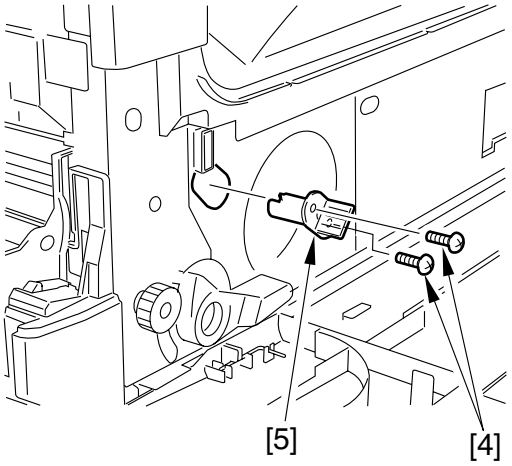
7.2.1 Removing the Developing Assembly

1) Remove the left cover.
2) Open the front cover, and shift down the developing assembly locking lever [1]. While pushing on the protrusion of the toner cartridge, turn the grip fully clockwise, and pull out the toner cartridge [2].
3) Turn the developing assembly locking lever [3] clock wise to unlock.



F05-702-01

4) Take out the drum unit (7.1.1 in Chapter 5)
5) Remove the multifeeder tray. (5.2.1 in Chapter 6)
6) Remove the two screws [4], and detach the shaft guide [5].



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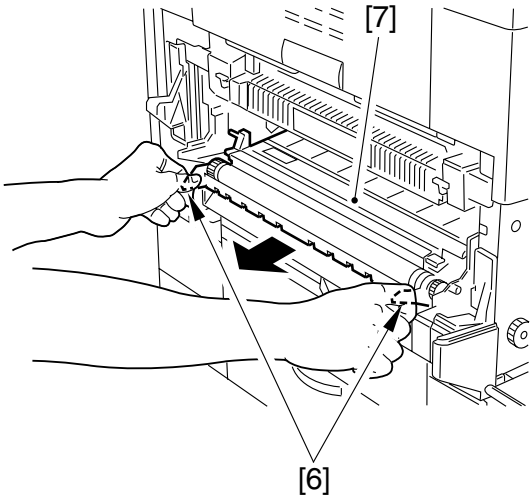
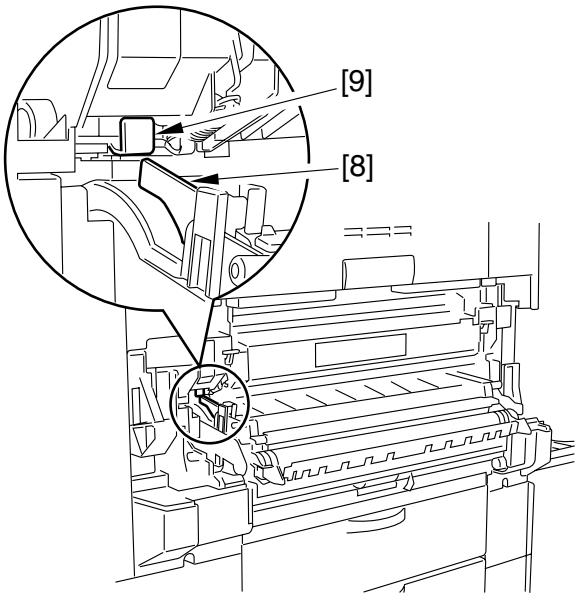
7) Holding the grips [6], slowly pull out the developing assembly [7].



F05-702-03

1. When you pull out the developing assembly, the lever [8] at the rear of the developing assembly will come into contact with the plate [9] of the fixing assembly. Be sure to work slowly and with care. When it comes into contact, try pushing the grips down slightly as you pull on them.
2. When you slide in the developing assembly, push it in so that it will slide along the rails. When the lever [8] comes into contact with the plate [9] of the fixing assembly, try to lift it slightly as you push it in.
3. When you are mounting the developing assembly, check to make sure that the shaft [10] of the developing sleeve is in contact with the electrode [11].
4. When mounting the developing assembly, be sure to fit the positioning pin [12] (at its rear) into the bushing [13].



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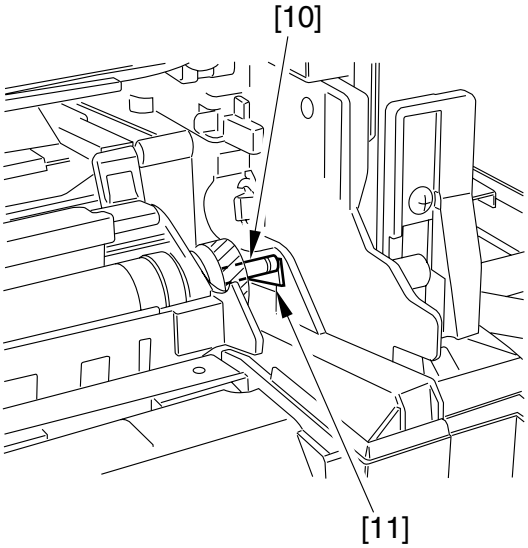

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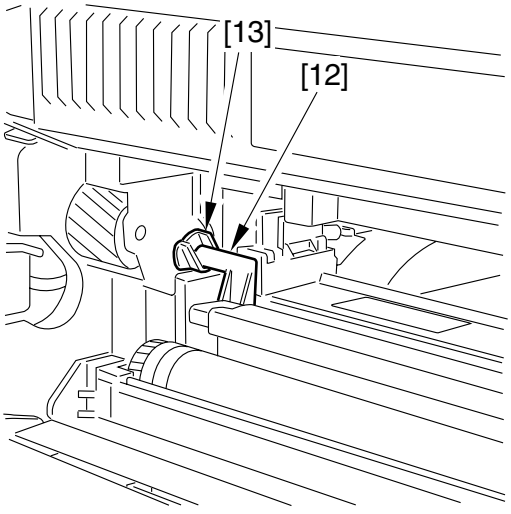
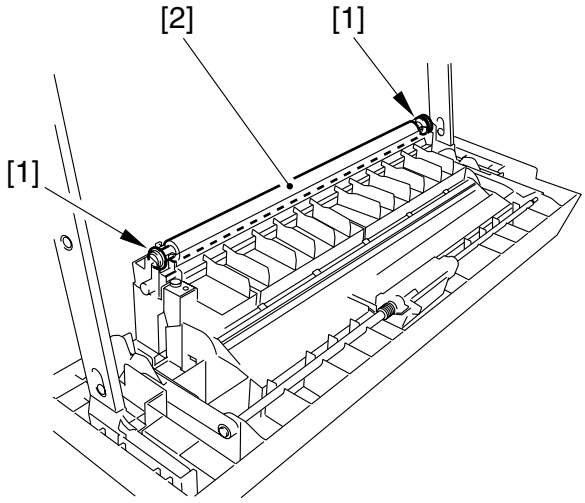


F05-702-06

7.3 Transfer Roller

7.3.1 Removing the Transfer Roller

1) Slide out the left cover to detach.
2) Holding the shaft assembly [1], remove the transfer charging roller [2].



F05-703-01

1. Do not hold the roller portion of the transfer charging roller. When cleaning it, take care not to touch the roller surface or leave solvents or oils.
2. To cleand the transfer charging roller, use lint-free paper (while making sure not to leave paper lint) to dry wipe it. Do not use water or solvent.
3. If white spots occur in the print images or soiling occurs on the back and, in addition, if the dirt of paper lint or toner cannot be removed using lint-free paper, or the roller is deformed, replace the transfer charging roller.

CHAPTER 6

PICKUP/FEEDING SYSTEM

1 Outline

1.1 Specifications and Constructions

This chapter explains the pickup mechanism using the 1-cassette (built into the machine) type. In the case of the 2-cassette type, refer to "Cassette Unit" in Chapter 9, as it will basically be a configuration based on the 1-cassette type to which a 1-cassette unit (accessory) is installed.

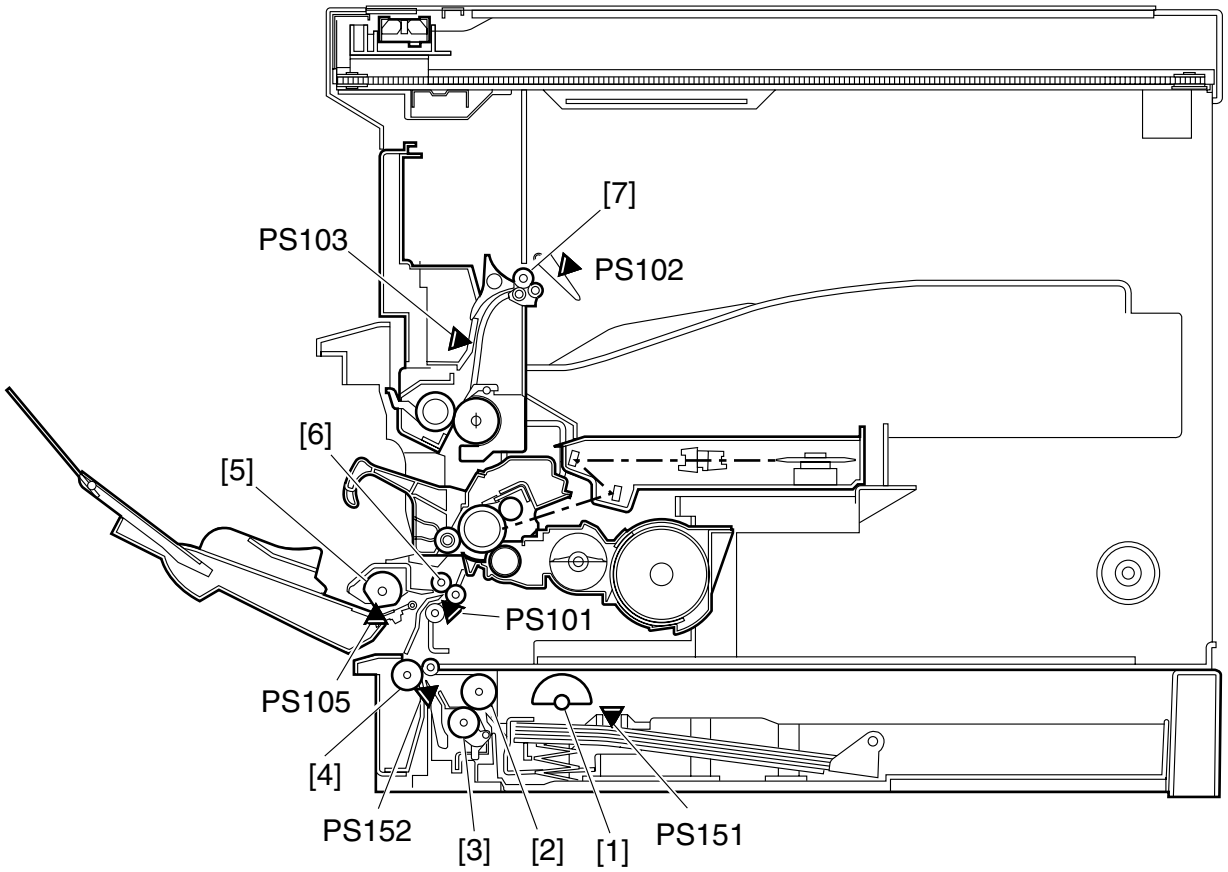
The pickup/feeding system has the following functions and uses the following methods:

Item	Description
Paper feed reference	Center
Paper stack	
Multifeeder	10 mm in height
Tray AB:	Plain paper, recycled paper, colored paper
	100 sheets if A4R, A4, B5, B5R, A5, A5R (80 g/m^2)
	50 sheets if A3, B4 (80 g/m^2)
	50 sheets if transparency, thick paper (90 to 128 g/m^2)
	10 sheets if envelope
	1 sheet if label sheet
Inch:	Plain paper, recycled paper, colored paper
	100 sheets if LTR, LTRR, STMT, STMTR (80 g/m^2)
	50 sheets if transparency, thick paper (90 to 128 g/m^2)
	10 sheets if envelope
	50 sheets if 11x17 (279.4x431.8 mm), LGL
	1 sheet if label sheet
Cassette	25 mm in depth (250 sheets max. of 80 g/m^2)
Paper size settingCassette: by user	
	Manual feed tray: by user
Related user mode	Paper size settings for manual feed tray

T06-101-01

1.2 Arrangement of Major Rollers and Sensors

The arrangement of the major rollers and sensors of the pickup/feeding system is as follows:



F06-102-01

Notation	Name
PS101	Registration paper sensor
PS102	Paper full sensor
PS103	Delivery sensor
PS105	Multifeeder paper sensor
PS151	Cassette paper sensor
PS152	Retry sensor
[1]	Pickup roller
[2]	Feeding roller
[3]	Separation roller
[4]	Vertical path roller
[5]	Manual feed pickup roller
[6]	Registration roller
[7]	Delivery roller

T06-102-01

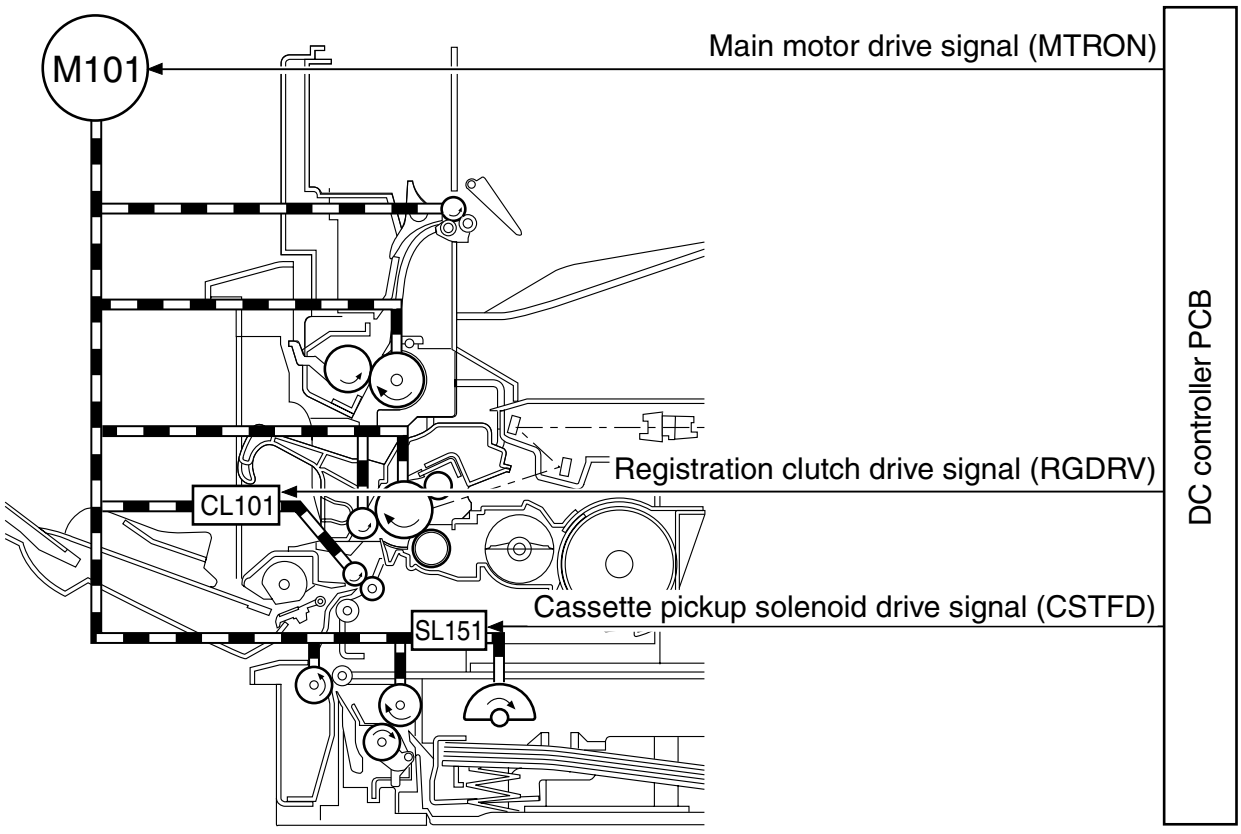
2 Controlling the Pickup Assembly

2.1 Controlling the Pickup from the Cassette

2.1.1 Outline

The paper picked up from the cassette is moved as far as the registration roller assembly by the work of the vertical path roller driven by the main motor. When the paper reaches the registration roller, the registration roller is at rest, causing the leading edge of the paper to butt against it to form an arch.

The DC controller PCB turns on the registration clutch (CL101) at specific timing to transmit the drive of the main motor to the registration roller, thereby moving the paper ahead. The paper reaches the delivery tray after moving through the transfer, separation, and fixing/delivery assemblies.



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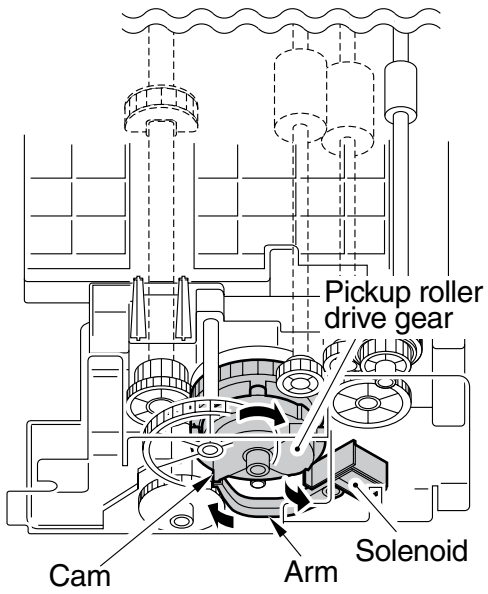
2.1.2 Pickup form the Cassette

The rotation of the pickup roller is controlled by the pickup roller drive gear used to transmit the drive of the main motor (M101) to the gear of the pickup drive shaft and the cassette pickup solenoid (SL101).

When the main motor rotates, the drive relay gear starts to rotate in response. At this time, the area of the pickup roller gear without a tooth is located at the relay gear; the absence of engagement between both gears prevents the drive from reaching the pickup roller shaft.

1. The DC controller PCB generates the cassette pickup solenoid drive signal (CSTFD) to turn on the solenoid; as a result, the control arm pushes the cam to rotate the pickup roller drive gear slightly.



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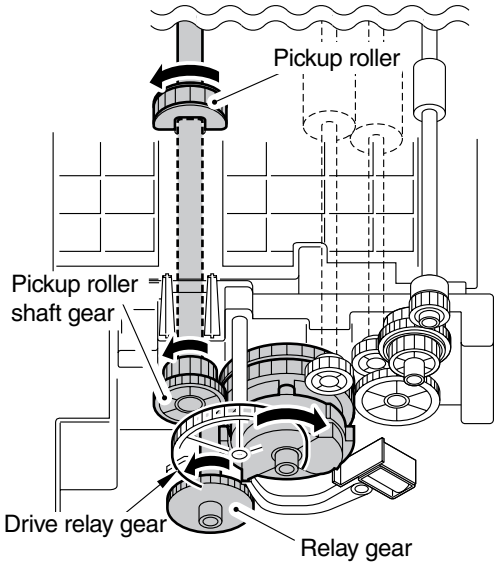
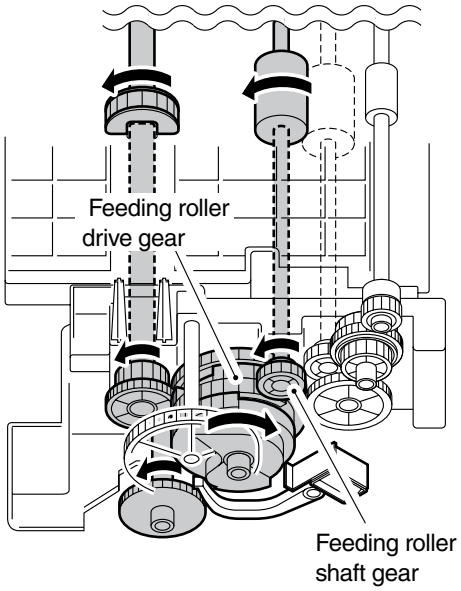
2. When the pickup roller drive gear and the pickup roller shaft gear engage, the drive reaches the pickup roller shaft gear to rotate the pickup roller.



F06-201-03

3. When the feeding roller drive gear and the feeding roller shaft gear engage, the drive reaches the feeding roller shaft gear to rotate the feeding roller.
4. When the pickup roller makes a single rotation, the area of the pickup roller drive without a tooth will be located at the relay gear, preventing the drive of the main motor from reaching the pickup roller and the feeding roller, stopping both rollers.
5. After pickup, the paper is moved under the vertical path roller and then to the registration roller assembly.



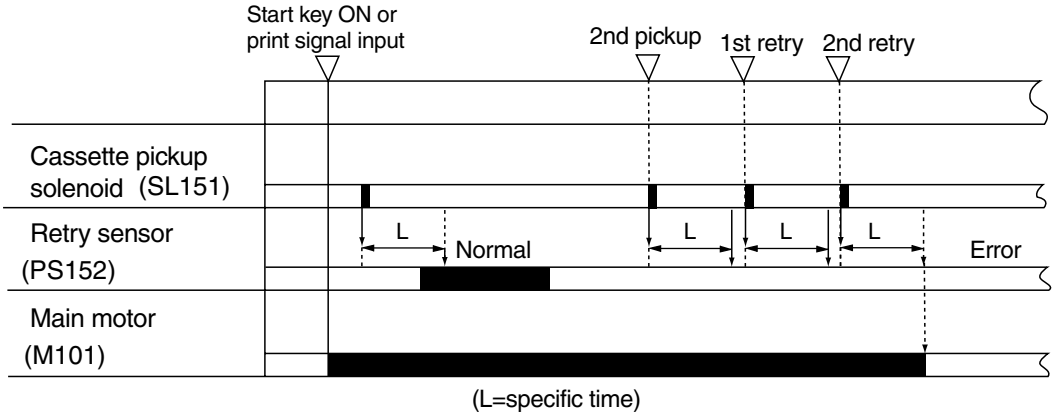
F06-201-04

2.1.3 Pickup Retry

If paper is not picked up despite the rotation of the pickup roller, the machine will execute a retry operation. The DC controller PCB keeps count of the time starting when the cassette pickup solenoid (SL151) goes ON. If the retry sensor (PS152) does not detect the leading edge of paper within a specific period of time, the machine will turn on the cassette pickup solenoid once again for a pickup retry.

If the retry sensor does not detect the leading edge of paper within a specific period of time after executing a retry pickup twice, the machine will identify the condition as a jam, and will indicate a jam message on the LCD in the control panel.

- Sequence of Operation for a Pickup Retry



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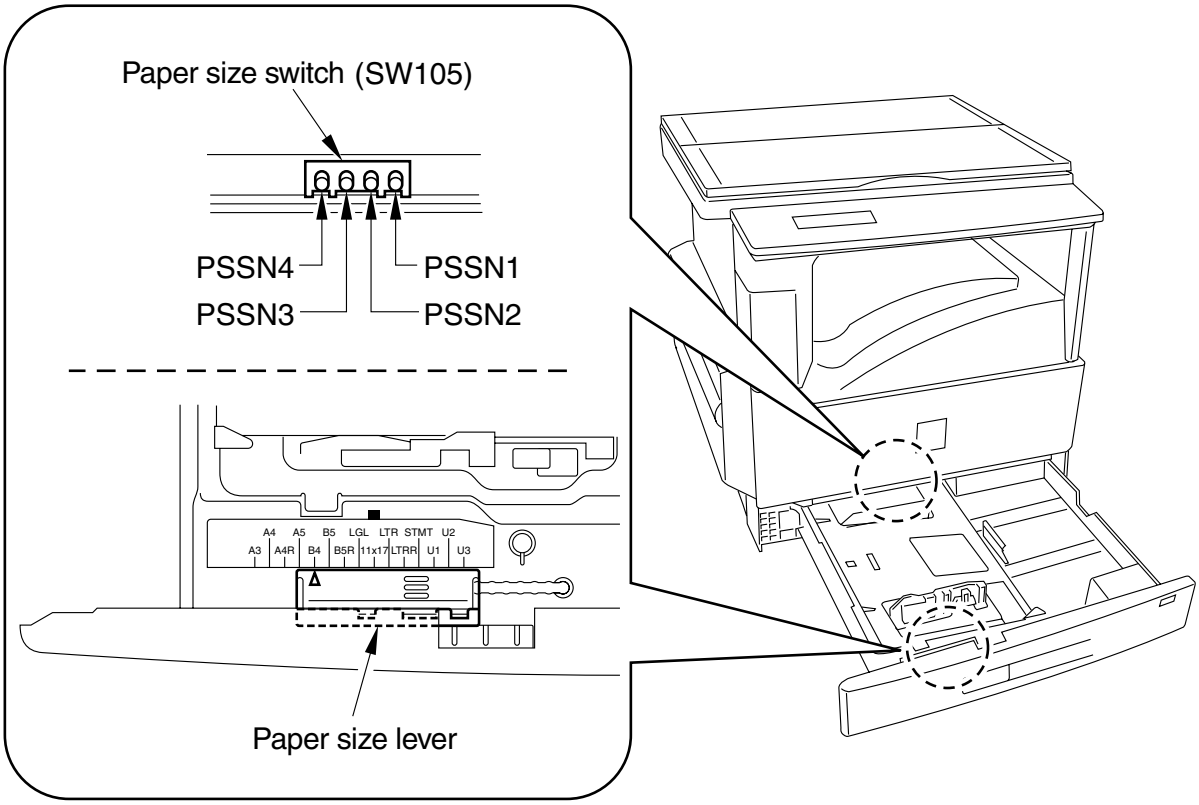
2.1.4 Detecting the Size of Paper in the Cassette

The size of paper inside the cassette is detected by the DC controller PCB in relation to the position of the paper size lever of the cassette set by the user.

When the cassette is fitted to the machine, the paper size lever pushes the paper size switch (SW105) found inside the machine, enabling the machine to detect the presence/absence of a cassette and the size of paper inside it.

The paper size switches are arranged as follows, and the combination of push switches pressed by the paper size lever is used to detect the size of paper.



F06-201-06

	A3	A4	A4R	A5	B4	B5	B5R	LGL	11x17	LTR	LTRR	STMT	U1*	U2*	U3*
PSSN 1	●	○	●	○	○	●	●	○	●	●	●	●	○	○	○
PSSN 2	○	●	○	●	○	○	●	●	○	●	●	●	●	○	○
PSSN 3	○	○	●	○	●	○	○	●	●	○	●	●	●	●	○
PSSN 4	○	○	○	●	○	●	○	○	●	●	○	●	●	●	●

● : push switch is pressed.

○ : push switch is not pressed.

＊ : used as a special default paper (Refer to 5.4.9 in Chapter13)

T06-201-01

2.2 Controlling the Pickup from the Multifeeder Tray

2.2.1 Outline

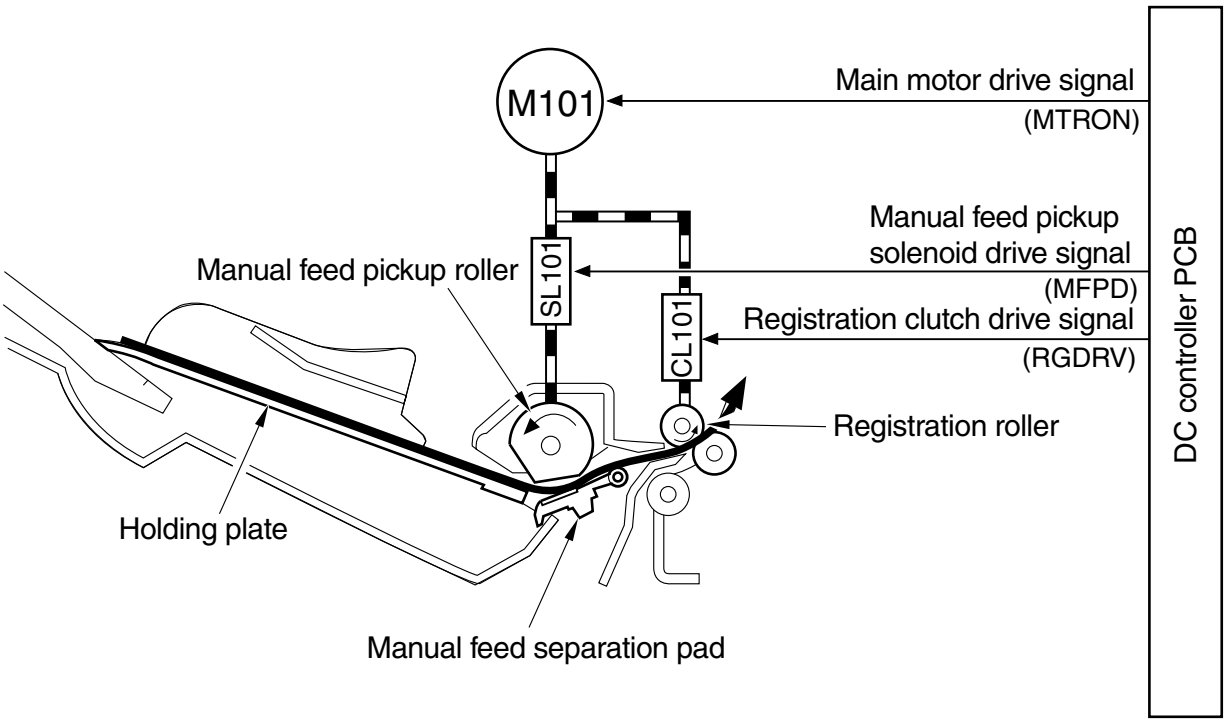
The manual feed pickup operation is designed to enable continuous pickup of sheets of paper stacked in the multifeeder tray.

The paper in the tray is held up by the holding plate, and is forced against the manual feed pickup roller. The drive of the manual pickup roller comes from the main motor (M101) by way of the manual pickup solenoid (SL101) and a gear.

The manual pickup roller and the manual pickup separation pad make sure that only one sheet of paper is picked and sent to the registration roller.

This series of operations is performed for each single sheet of paper.

The size of paper placed in the multifeeder tray is as selected by the user in the control panel.



F06-202-01

2.2.2 Pickup from the Multifeeder Tray

a. Movement of the Holding Plate

While in standby, the holding plate is at the bottom supported by the cams mounted to the front and rear of the manual feed pickup roller shaft.

When the pickup roller rotates, the cams start to rotate in response, causing the holding plate to move up so that the paper placed in the multifeeder comes into contact with the pickup roller.

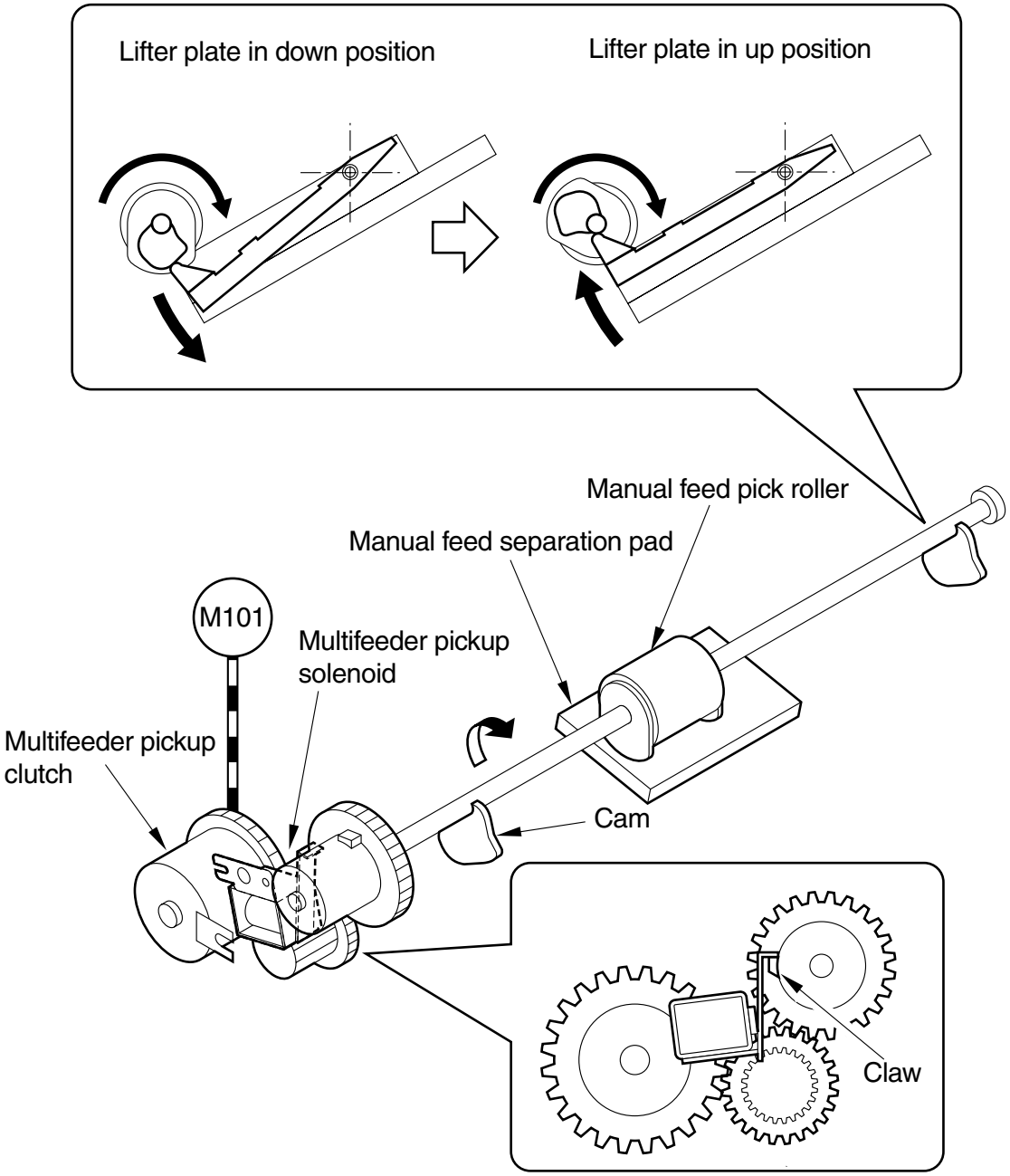
The separation pad is mounted opposite the pickup roller, serving to separate one sheet of paper and sending it to the inside of the machine.

b. Multifeeder Tray Pickup Drive Mechanism

The manual feed pickup roller rotates by the drive of the main motor reaching the gear of the manual feed tray pickup drive assembly. The timing at which paper is picked up is controller by the manual feed pickup solenoid drive signal (MFPD) from the DC controller PCB.

As soon as the main motor starts to rotate, its drive is transmitted to the pickup drive transmission gear.

When the DC controller PCB generates the manual feed pickup solenoid drive signal (MFPD) and the solenoid goes ON as a result, the stopper will be released so that the pickup roller stops to rotate.



F06-202-02

2.2.3 Multifeeder Retry Operation

If paper is not picked up when the manual pick roller has rotated, the machine will execute a retry pickup operation.

The DC controller PCB keeps count of time starting when the manual feed pickup solenoid goes ON. If the registration paper sensor (PS101) does not detect the leading edge of paper within a specific period of time, it turns on the pickup solenoid once again for a pickup operation. If the registration paper sensor still does not detect the leading edge of paper within a specific period of time after a second retry operation, the machine will execute a retry pickup operation once again. If paper still does not reach the registration paper sensor after a 3rd retry pickup operation, the machine will identify the condition as a jam, and will indicate a jam message on the LCD in the control panel.

2.2.4 Setting the Paper Size for the Multifeeder Tray (user mode)

The multifeeder tray may be set to a specific paper size, selected according to how it is used:

1. If a different size is used each time paper is supplied (default),
   Choose 'OFF' in user mode: 1 COMMON SETTINGS>4 USE STACK BYPASS.
2. If the same size is to be used at all times,
   Choose 'ON' in user mode, and select a specific size using the cursor key: 1 COMMON SETTINGS>4 USE STACK BYPASS.

If printing is executed while the selected size differs from the size of paper placed in the multifeeder tray, the machine will indicate a message at the end of printing on the 1st sheet, and will stop printing operation.

When fax reception data is to be printed on paper from the multifeeder tray, only the method under 2. above will be effective.

3 Controlling the Registration Roller

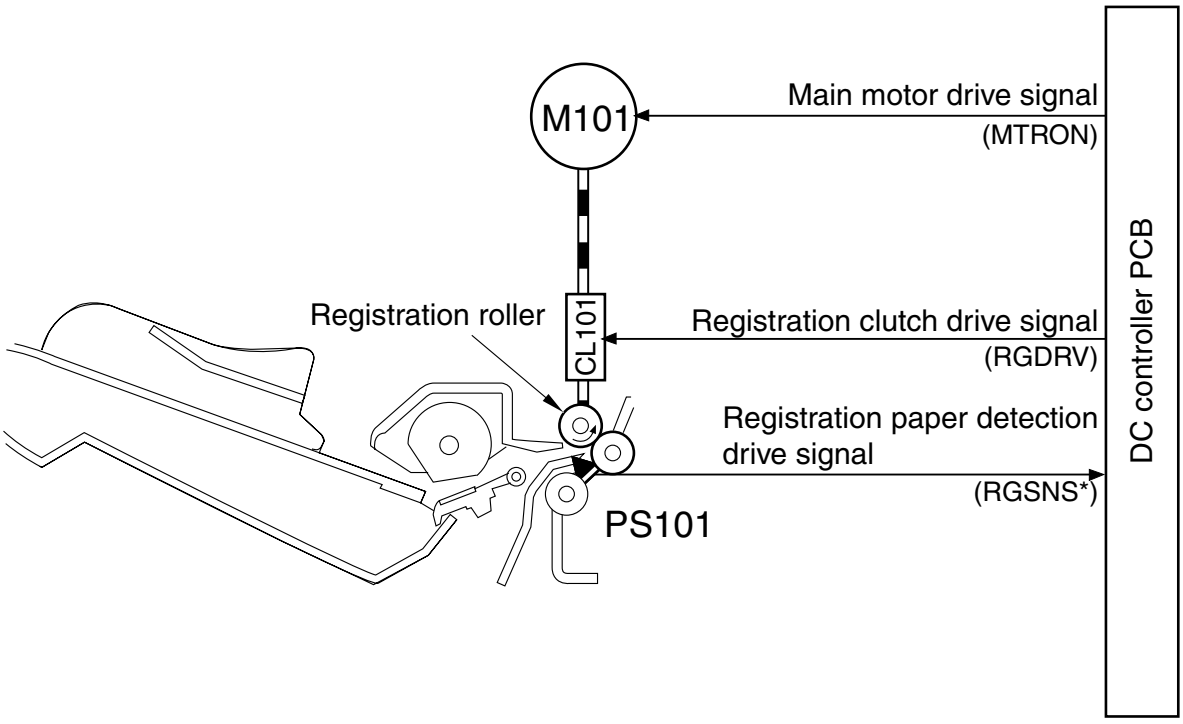
3.1 Detecting the Leading Edge of Paper

The paper coming from the pickup assembly is moved farther to the transfer assembly when the registration clutch (CL101) goes ON and the registration roller starts to rotate as a result.

The DC controller PCB sends the vertical sync signal (TOP*) to the image processor PCB when the registration paper sensor (PS101) detects the leading edge of paper.

A specific period of time after the image processor PCB receives the TOP* signal, video signals (VDO*, VDO) are sent so that the leading edge of the image on the photosensitive drum and the leading edge of paper will match. The paper is then moved through the transfer, separation, and fixing assemblies to reach the delivery tray.

The original leading edge margin adjustment volume (VR101) mounted on the DC controller PCB may be used to change the timing at which the registration clutch (CL101) goes ON, thereby increasing or decreasing the leading edge margin to suit the original.



F06-301-01

4 Detecting Jams

4.1 Outline

The machine is equipped with 3 jam sensors used to motor the movement of paper. In addition to these sensors, the machine is also provided with sensors to find out the presence/absence of paper in the cassette and manual feed tray (1 pc. each).

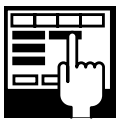
The presence/absence of paper or of a jam is checked at such times as programmed in advance in the CPU of the DC controller PCB and in relation to the presence/absence of paper over a specific sensor at a given time. If the machine detects a jam, it will turn off the main motor (M101), and will indicate a jam message in the control panel.

If a jam occurs while the machine is in copy mode, all images stored in memory will be lost, requiring the machine to start with the original for which a jam has occurred.

The following are the sensors used to monitor the movement of paper:

Notation	Name	Delay jam	Stationary jam	Stationary jam at power-on
PS101	Registration paper sensor	Present	Present	Present
PS102	Paper full sensor	Absent	Absent	Absent
PS103	Delivery sensor	Present	Present	Present
PS105	Multifeeder paper sensor	Absent	Absent	Absent
PS151	Cassette paper sensor	Absent	Absent	Absent
PS152	Retry sensor	Present	Present	Present

T06-401-01



You can check the condition of a sensor (presence/absence of paper or jam detection) by making the following selections; service mode>test mode>6: FACULTY TEST>6-3: SENSOR.

4.2 Sequence of Jam Detection

4.2.1 Delay Jam

a. Cassette Pickup Assembly

The machine will identify the following condition as a cassette pickup assembly delay jam: after the cassette pickup solenoid goes ON, the leading edge of paper does not reach the retry sensor within a specific period of time.

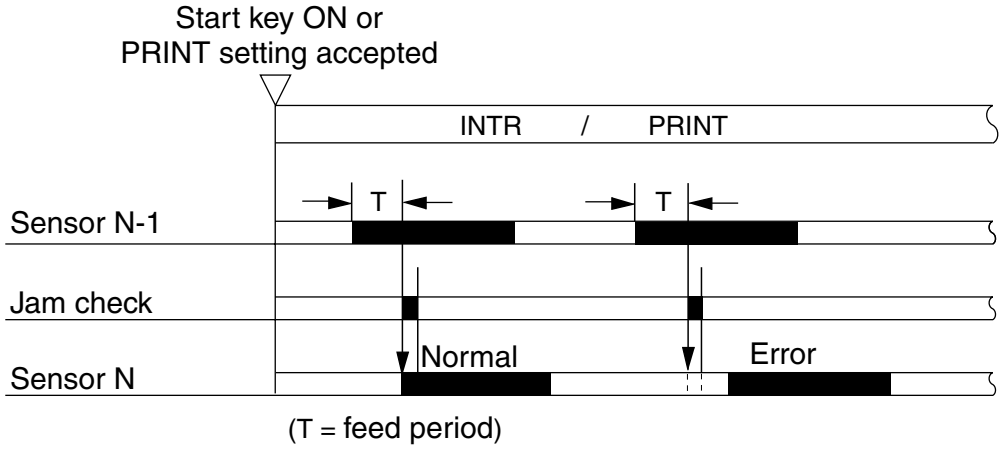
Pickup assembly	Motor	Sensor
Cassette	Cassette pickup solenoid (SL151)	Retry sensor (PS152)

T05-402-01

b. Other Delay Jams

A check is made for jams other than a cassette pickup assembly delay jam as follows:

The machine will identify the following condition as a delay jam: the time it takes for paper to move from the sensor N-1 to the delay jam sensor N in question is controlled in relation to the number of clock pulses from the main motor; the delay jam sensor N in question does not go ON within a specific period of time after the sensor N-1 goes ON.



F06-402-01

Notation	Name	Delay jam
PS101	Registration sensor	Present
PS102	Paper full sensor	Absent
PS103	Delivery sensor	Present
PS105	Multifeeder paper sensor	Absent
PS151	Cassette paper sensor	Absent

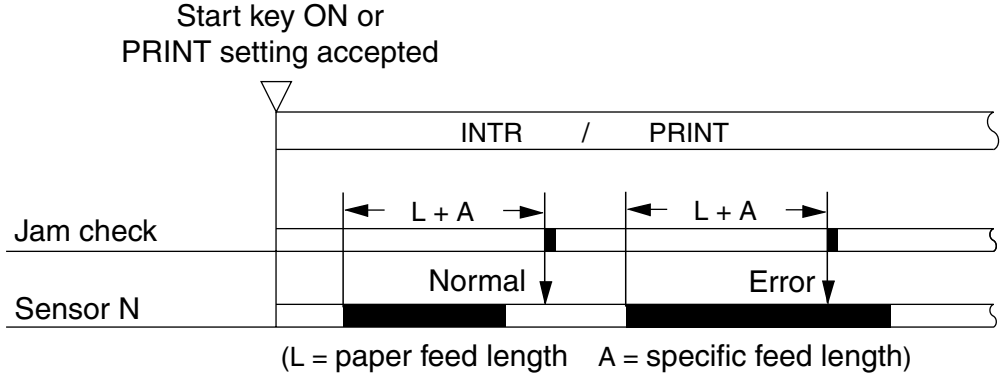
T06-402-02

4.2.2 Stationary Jams

a. Ordinary Stationary Jam

The machine checks for a stationary jam as follows:

The machine will identify the following condition as a stationary jam: the time it takes for paper to move from the stationary jam sensor N in question to the next sensor is controlled in relation to the number of clock pulses from the main motor; the sensor N does not go OFF within a specific period of time after the sensor N goes ON.



F06-402-02

b. Stationary Jam at Power-On

The machine will identify the following condition as a stationary jam: the delivery sensor (PS103) goes ON 1.4 sec after the initial rotation (INTR), or the registration sensor (PS101) goes ON at the start of initial rotation (INTR).

4.2.3 Cover Open Jam

If the front cover, left cover or left lower cover is opened while paper exits in the paper path, the machine will identify the condition as a cover open jam.

4.2.4 Jam History

The machine keeps a record of jams that have occurred. You can generate a service report to check the history or clear the history.

To indicate jam data,
Make the following selections in service mode: #10 REPORT > 07 JAM/ ERR LOG REPORT
To clear the jam history,
Make the following selections in service mode: #12 CLEAR > REPORT > JAM.

The machine retains the following data at time of a jam, automatically using them after removal of the jam:

- remaining number of prints to make
- printing mode

5 Disassembly and Assembly

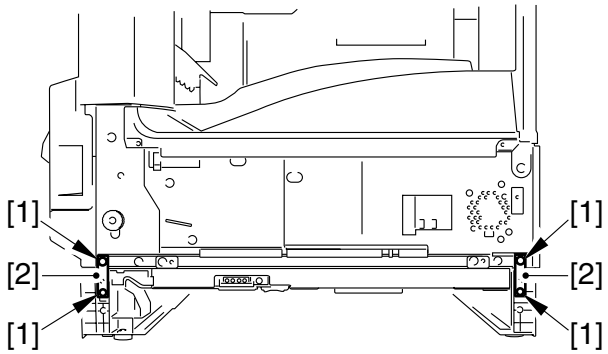
Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the drum unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

5.1 Cassette Pickup Assembly

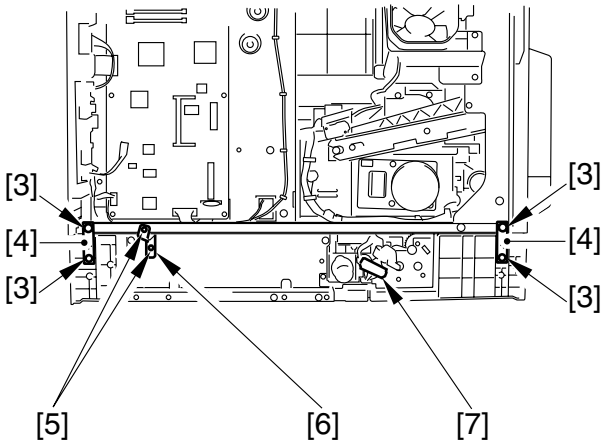
5.1.1 Remove the Cassette Pickup Assembly

1) Remove the front cover.
2) Slide out the cassette.
3) Remove the 4 screws [1], and detach the 2 fixing plate [2].



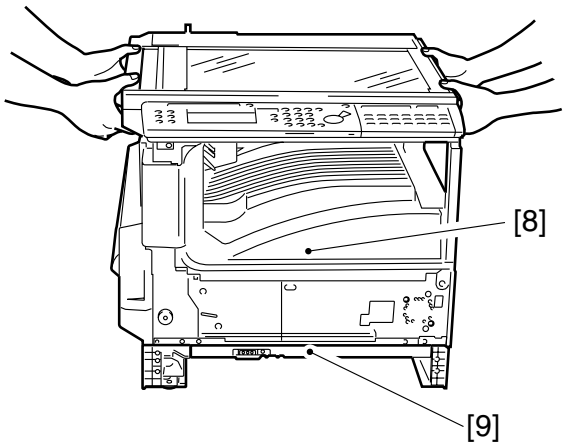
F06-501-01

4) Remove the rear cover and the cassette rear cover.
5) Remove the 4 screws [3], and detach the 2 fixing plate [4].
6) Remove the 2 screws (2/ washer) [5], and detach the leaf spring [6].
7) Disconnect the connector [7].



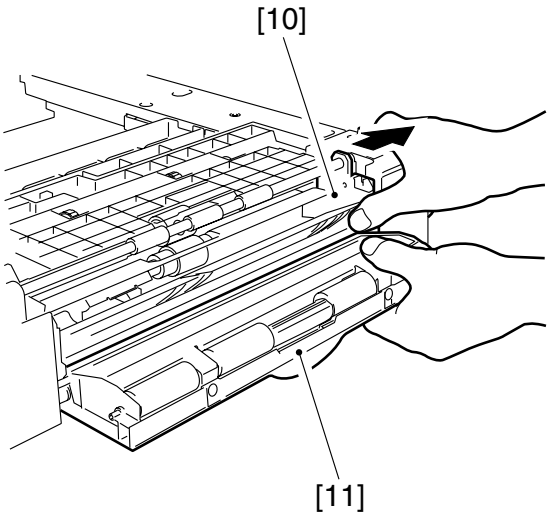
F06-501-02

8) Holding the cassette unit [9] as shown, separate it from the machine [8].



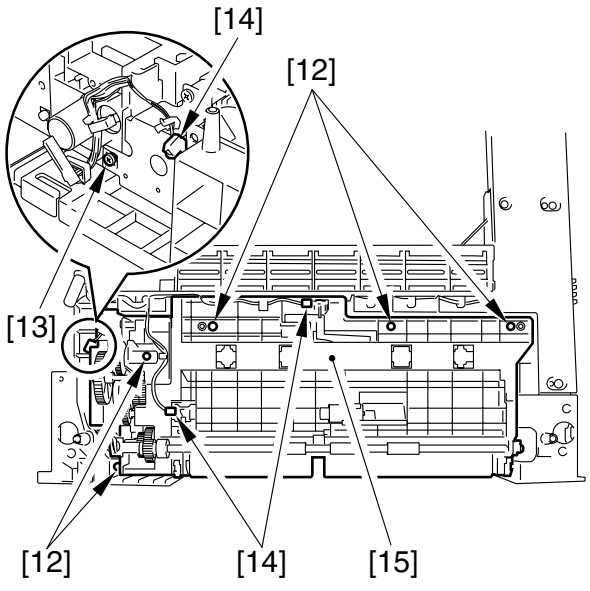
F06-501-03

9) Spread the support assembly [10] of the front/rear of the left lower cover with a little force, and detach the left lower cover [11].



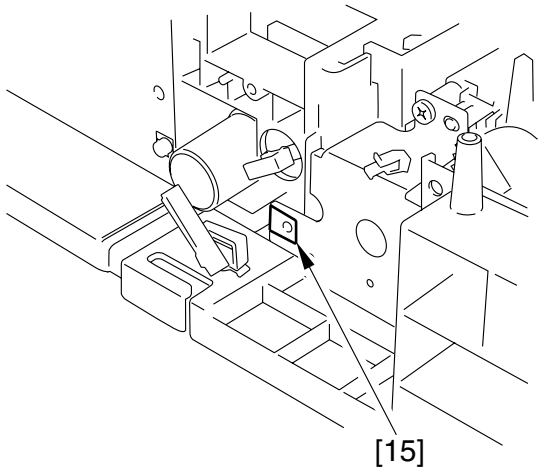
F06-501-04

10) Remove the 5 screws [12] and the screw (w/ washer) [13].
11) Disconnect the 3 connectors [14], and detach the cassette pickup assembly [15].



F06-501-05

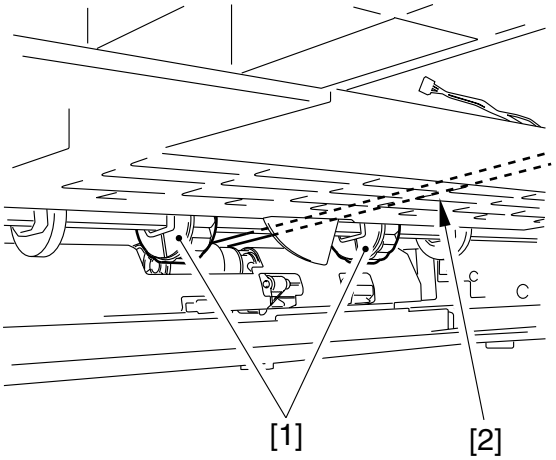
When mounting, make sure that the grounding plate [15] is on the outside as shown.



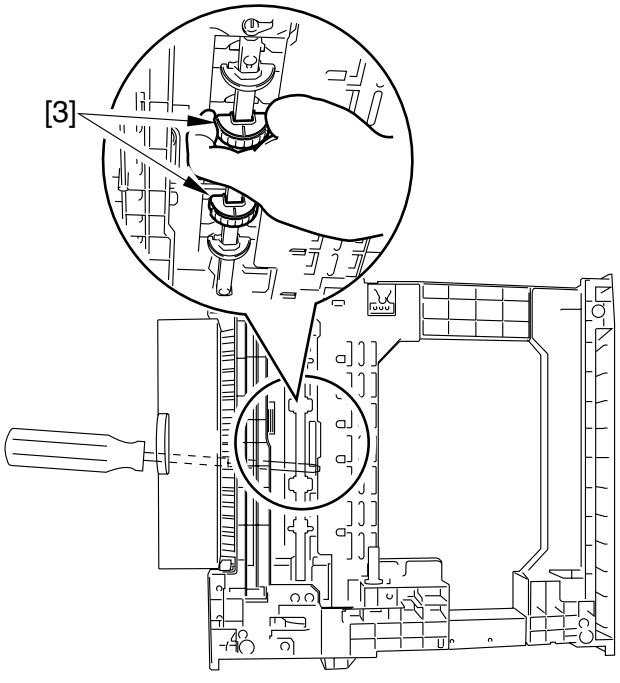
F06-501-06

5.1.2 Removing the Cassette Pickup Roller

1) Slide out the cassette.
2) Open the left lower cover.
3) Holding the pickup roller assembly [1] so that it faces downward, insert a screwdriver [2] or the like from the left side of the machine.
4) Grab the pickup roller [3], and detach it.



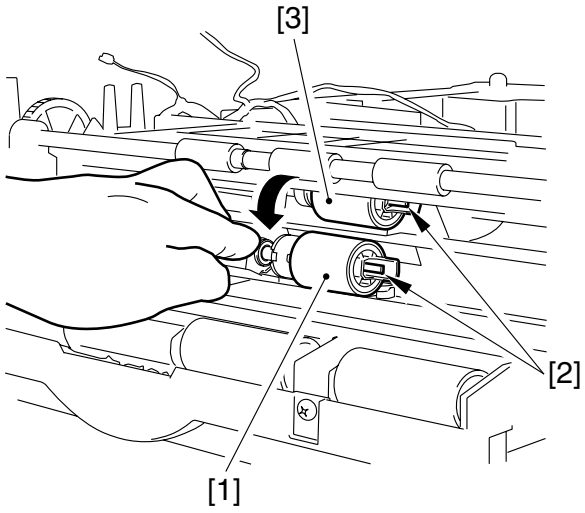
F06-501-07



F06-501-08

5.1.3 Removing the Feeding/Separation Roller

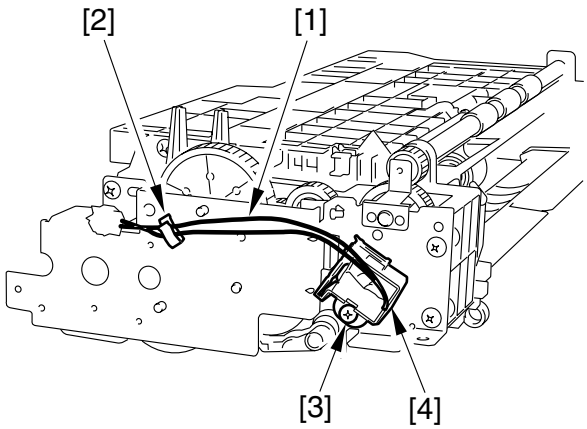
1) Slide out the cassette.
2) Open the left lower cover.
3) Push down the separation roller [1] as shown; then, pick the claw [2] of the roller collar, and detach the separation roller [1] and the feeding roller [3].



F06-501-09

5.1.4 Removing the Cassette Pickup Solenoid

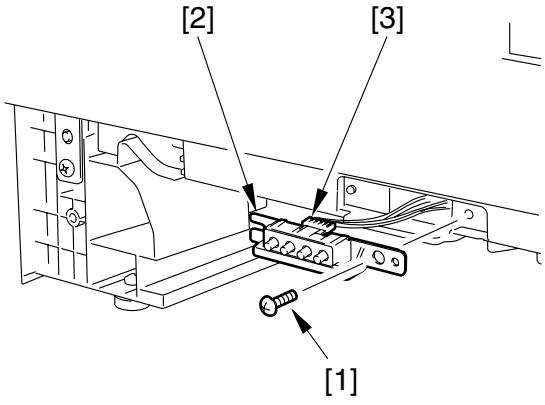
1) Remove the cassette pickup assembly (5.1.1 in Chapter6).
2) Free the harness [1] from the harness guide [2], and remove the screw [3]; then, detach the cassette pickup solenoid [4].



F06-501-10

5.1.5 Removing the Paper Size Detecting Switch

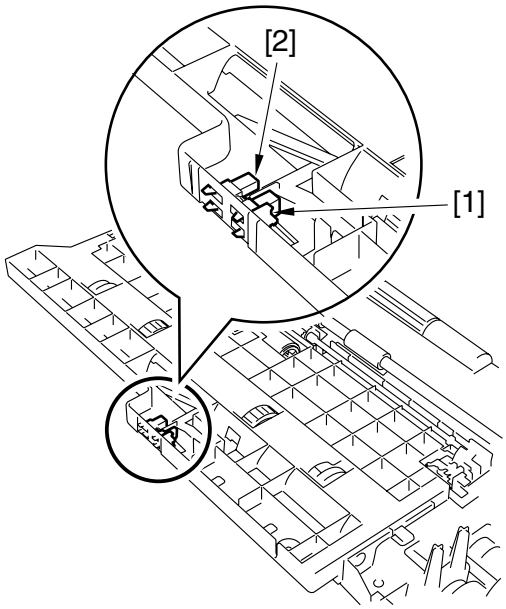
1) Remove the screw [1], and slide out the paper size detecting switch [2].
2) Disconnect the connector [3], and remove the paper size detecting switch [2].



F06-501-11

5.1.6 Removing the Cassette Paper Sensor

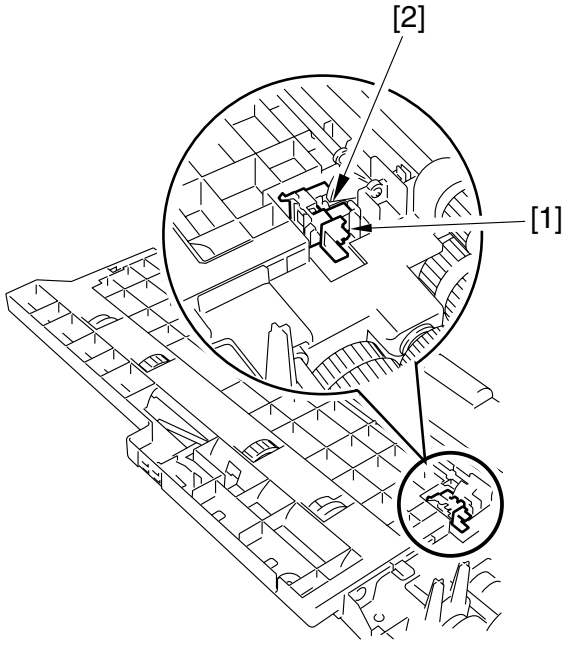
1) Remove the cassette pickup assembly (5.1.1 in Chapter6).
2) Disconnect the connector [1], and detach the cassette paper sensor [2].



F06-501-12

5.1.7 Removing the Retry Sensor

1) Remove the cassette pickup assembly (5.1.1 in Chapter6).
2) Disconnect the connector [1], and remove the retry sensor [2].



F06-501-13

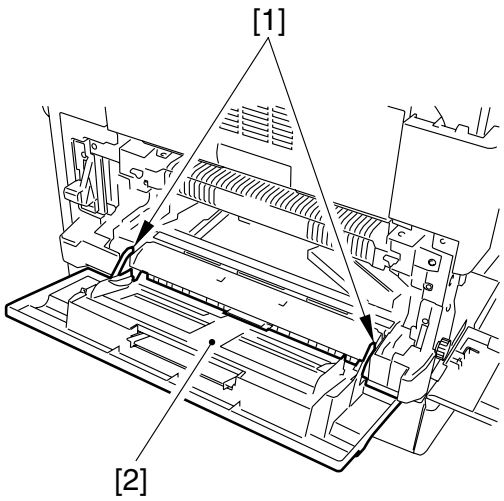
5.1.8 Removing the Pickup Motor (20 cpm model only)

See to 4.4.1 Removing the Pickup Motor in Chapter9.

5.2 Multifeeder Tray Assembly

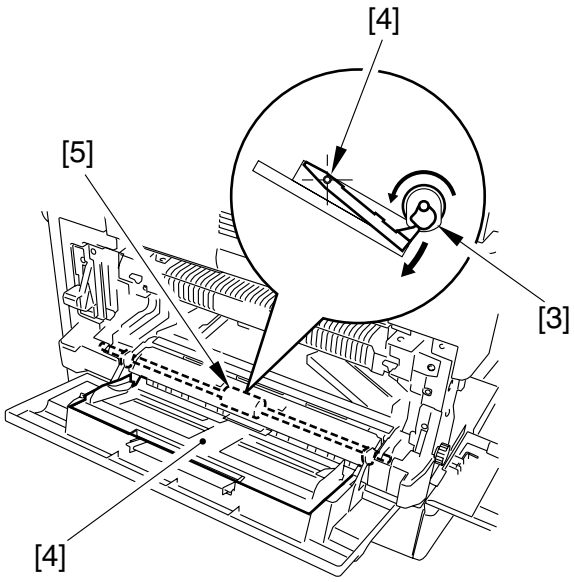
5.2.1 Removing the Multifeeder Tray

1) Remove the left cover.
2) Free the 2 hooks [1], and detach the multifeeder tray [2].



F06-502-01

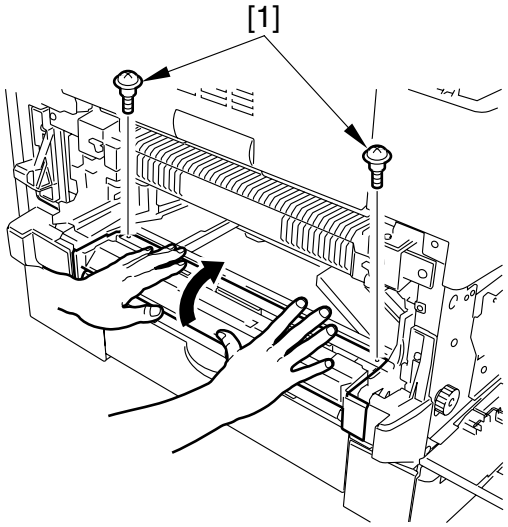
After mounting the multifeeder tray, check to make sure that the holding plate [4] is pushed down by the manual feed pickup roller cam [3].
· If the holding plate is up, push down the holding plate and, while doing so, rotate the manual feed pickup roller [5] using lint-free paper (so as not to come into direct contact with its surface) until the holding plate is in low position (by the manual feed roller cam).



F06-502-02

5.2.2 Removing the Multifeeder Pickup Roller

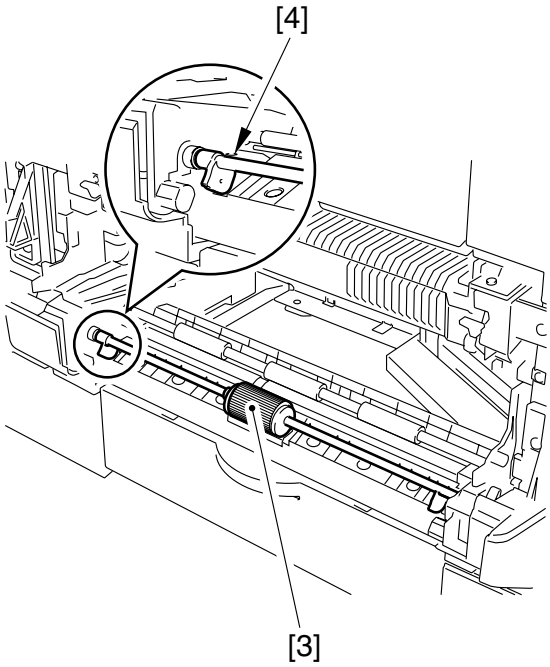
1) Remove the durm unit.
2) Remove the developing assembly (7.2.1 in Chapter5).
3) Remove the multifeeder tray.
4) Remove the 2 stepped screws [1] using a screwdriver; then, keeping your hands as shown, detach the pickup guide assembly [2] by lifting it upward to the front.



F06-502-03

5) Remove the manual feed pickup roller [3].

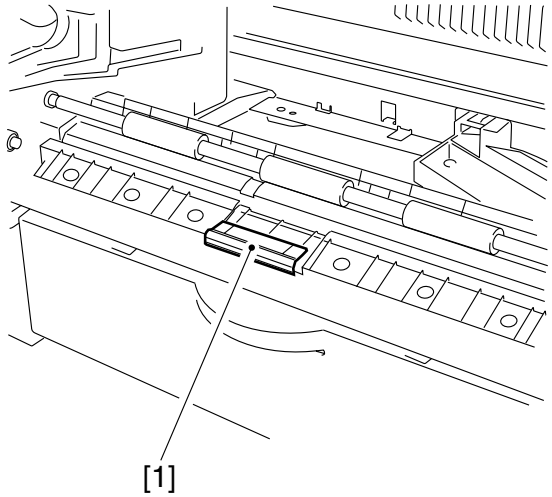
When Mounting
After mounting the multifeeder pickup roller, rotate the multifeeder pickup roller until it stops, and check to make sure that the cam [4] is as shown.



F06-502-04

5.2.3 Removing the Separation Pad

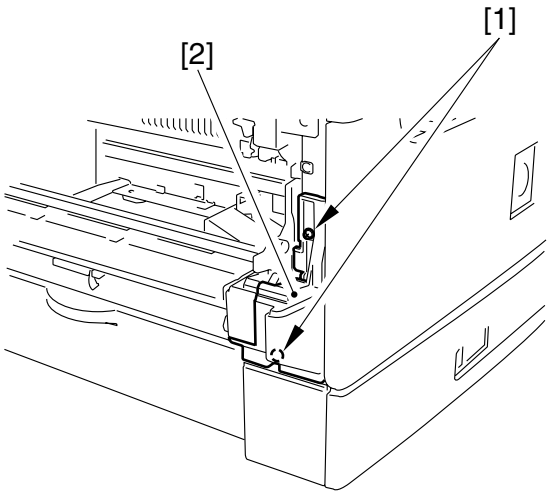
1) Remove the multifeeder pickup roller.
2) Remove the separation pad [1].



F06-502-05

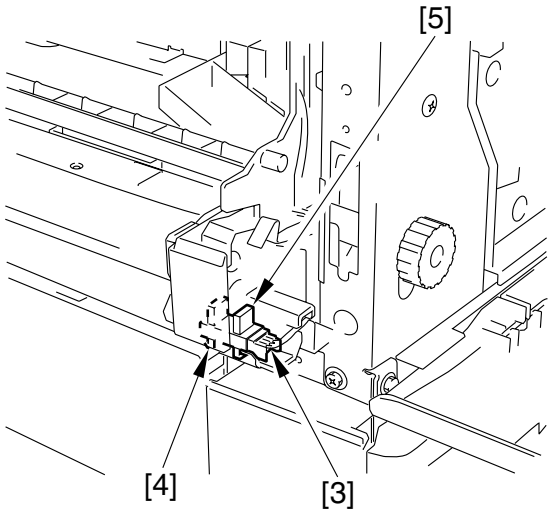
5.2.4 Removing the Multifeeder Paper Sensor

1) Remove the left cover and the multifeeder tray.
2) Remove the 2 screws [1], and detach the cover [2].



F06-502-06

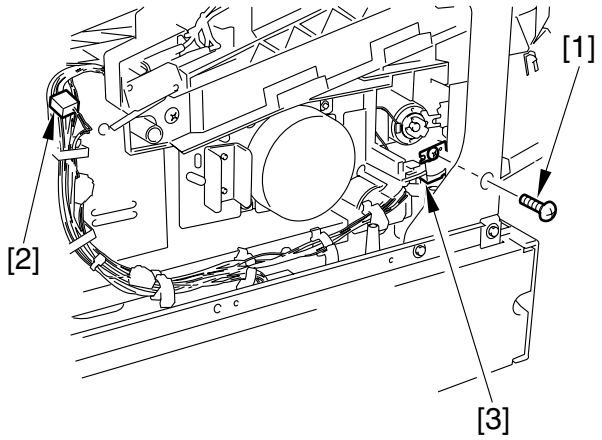
3) Disconnect the connector [3], and free the sensor hook [4]; then, detach the multifeeder paper sensor [5].



F06-502-07

5.2.5 Removing the Multifeeder Pickup Solenoid

1) Remove the rear cover and the left rear cover.
2) Remove the screw [1], and disconnect the connector [2].
3) Remove the multifeeder pickup solenoid [3].

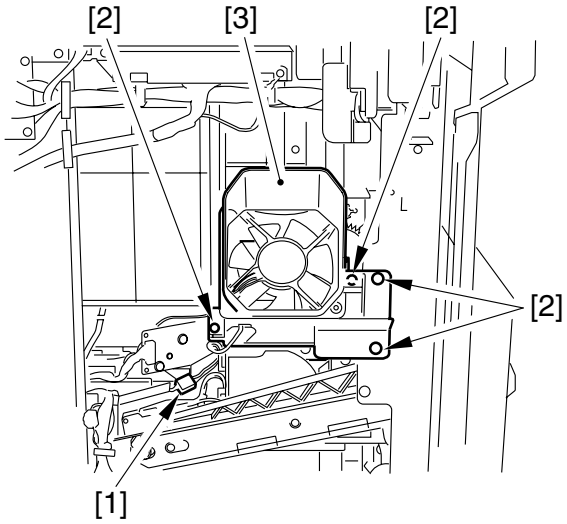


F06-502-08

5.3 Drive Assembly

5.3.1 Removing the Drive Assembly

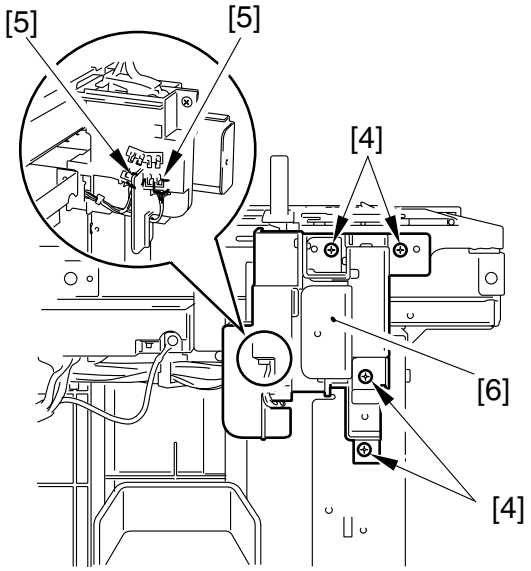
1) Remove the fixing assembly (3.1 in Chapter7).
2) Remove the multifeeder roller (5.2.2 in Chapter6).
3) Remove the rear cover.
4) Remove the right rear over.
5) Remove the right upper cover.
6) Remove the left rear cover.
7) Remove the left upper cover.
8) Remove the copyboard cover.
9) Remove the cassette rear cover.
10) Disconnect the connector [1], and remove the 2 screws [2]; then, detach the delivery fan assembly [3].



F06-503-01

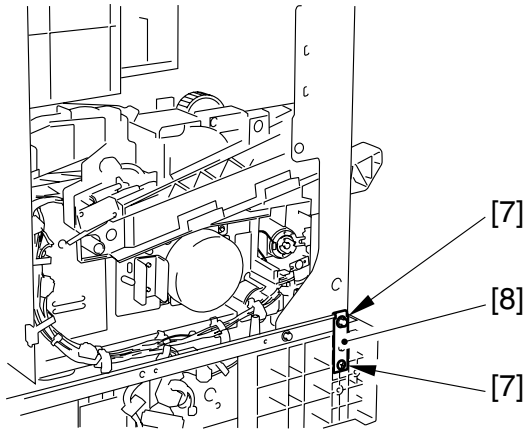
11) Remove the 4 screws [4], and disconnect the 2 connectors [5]; then, detach the copyboard cover open/closed detecting unit [6].

When mounting the copyboard open/closed detecting unit, be sure to use the black binding screw 3 mm in diameter. Take care not to use the wrong screw.



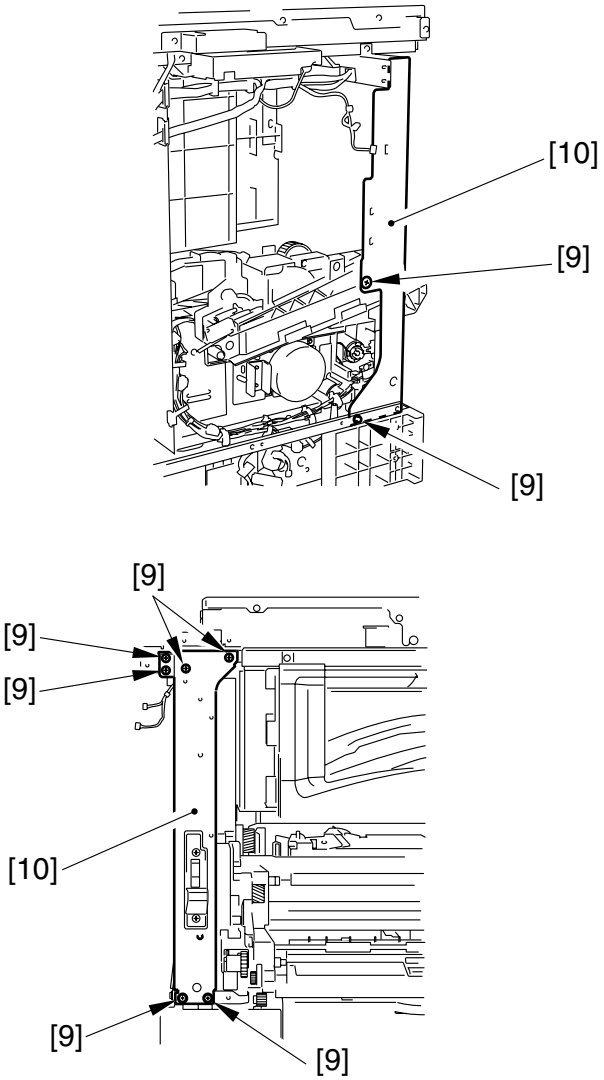
F06-503-02

12) Remove the 2 screws [7], and detach the fixing plate [8].



F06-503-03

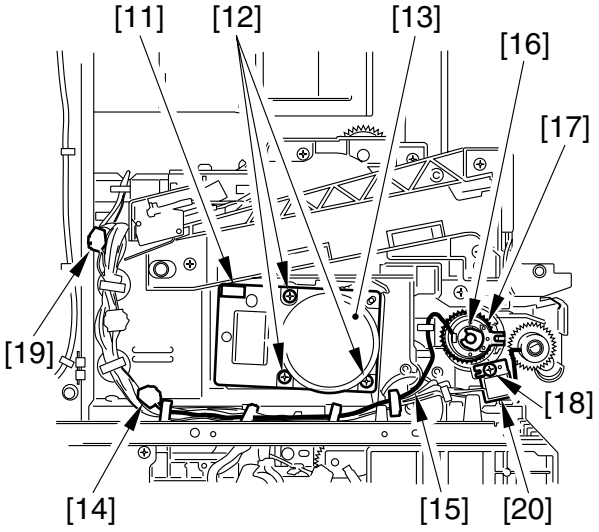
13) Remove the 8 screws [9], and detach the support plate [10].



F06-503-04

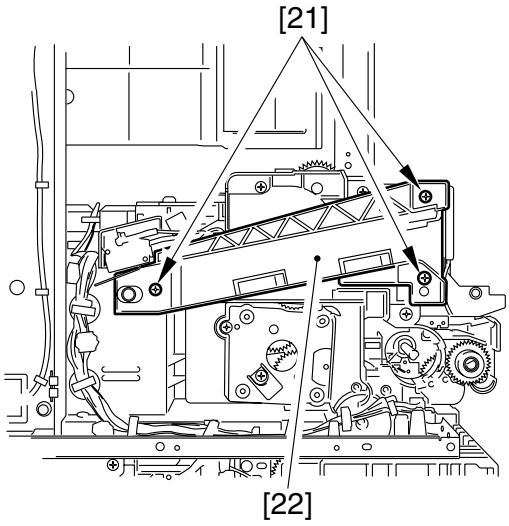
In the absence of the support, take care not to impose a load on the reader unit. Take care not to use the wrong screw: the 4 screws to be used at the top are 3 mm in diameter, while the 4 screws to be used at the bottom is 4 mm in diameter.

14) Disconnect the connector [11], and remove the 3 screws [12]; then, detach the main motor [13].
15) Disconnect the connector [14], and free the harness [15] from the harness guide.
16) Remove the resin E-ring [16], and detach the registration clutch [17].
17) Remove the screw [18], disconnect the connector [19]; then, remove the multifeeder pickup solenoid [20].



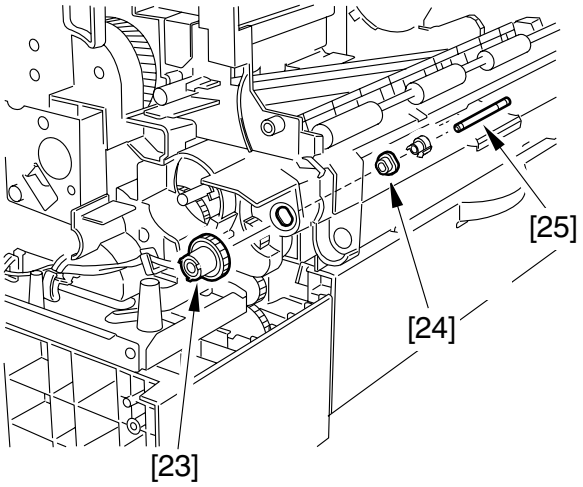
F06-503-05

18) Remove the 3 screws [21], and detach the left cover rail [22].



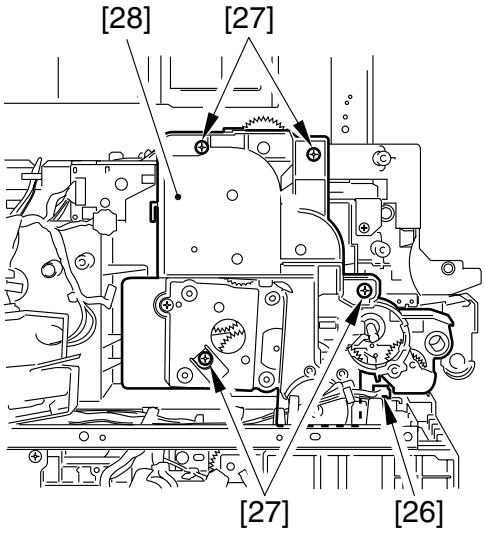
F06-503-06

19) Remove the shaft [25] and bushing [24] of the multifeeder pickup roller gear [23].



F06-503-07

20) Disconnect the connector [26] of the registration paper sensor.
21) Remove the 4 screws [27], and detach the drive assembly [28].

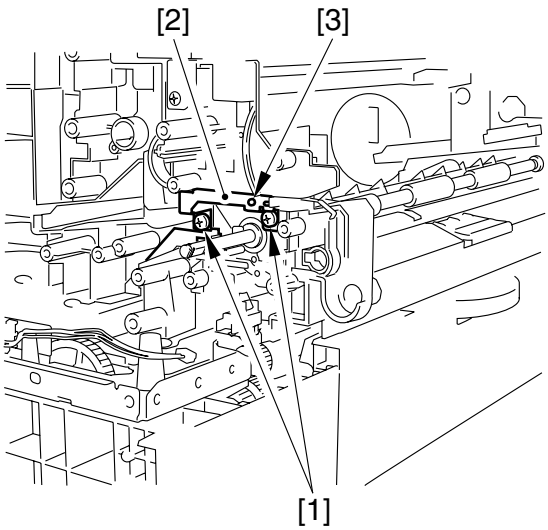


F06-503-08

5.4 Registration Roller Assembly

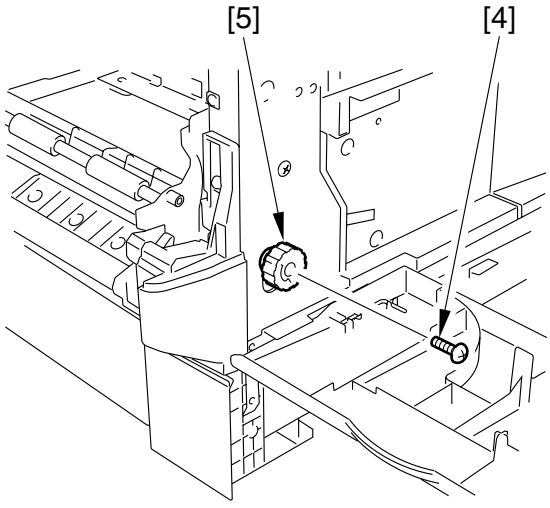
5.4.1 Removing the Registration Roller

1) Remove the drive assembly (5.3.1 in Chapter6).
2) Remove the 2 screws [1], and detach the leaf spring [2] from the boss [3].



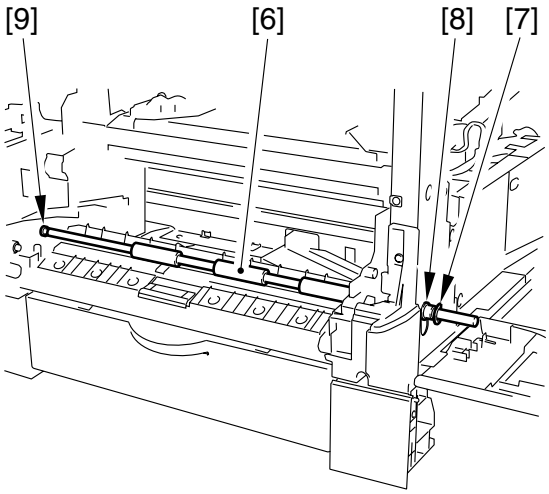
F06-504-01

3) Remove the screw [4], and detach the jam removing knob [5].



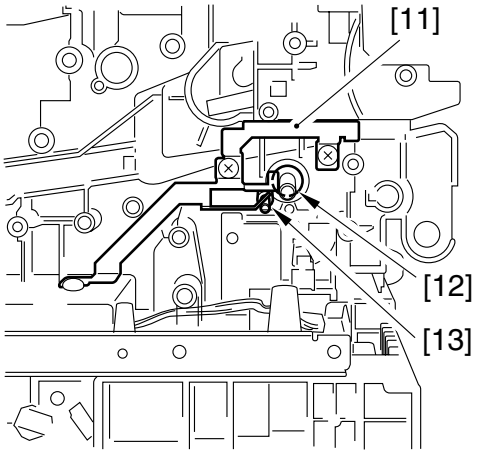
F06-504-02

4) Pull the registration roller [7] to the front, and detach the E-ring [7] and the bushing [8].
5) Remove the busing [9] at the rear, and detach the registration roller [6].



F06-504-03

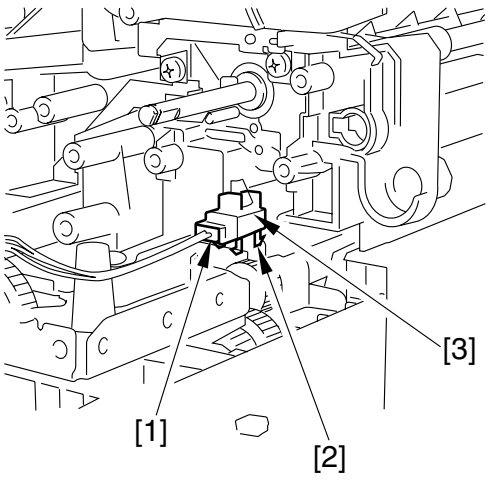
When mounting the registration roller, check to make sure that the grounding plate [11] is in contact with the bushing [12] of the registration roller and the shaft [13] under the registration roller.



F06-504-04

5.4.2 Removing the Registration Paper Sensor

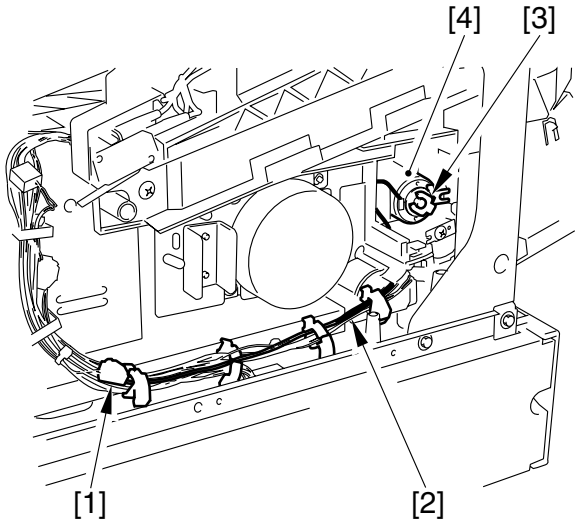
1) Remove the drive assembly (5.3.1 in Chapter6).
2) Disconnect the connector [1].
3) Free the 4 claws [2], and detach the registration paper sensor [3].



F06-504-05

5.4.3 Removing the Registration Clutch

1) Remove the rear cover and left rear cover.
2) Disconnect the connector [1], and free the harness [2] from the harness guide.
3) Remove the resin E-ring [3], and detach the registration clutch [4].



F06-504-06

CHAPTER 7

FIXING SYSTEM

1 Outline of Operation

1.1 Outline

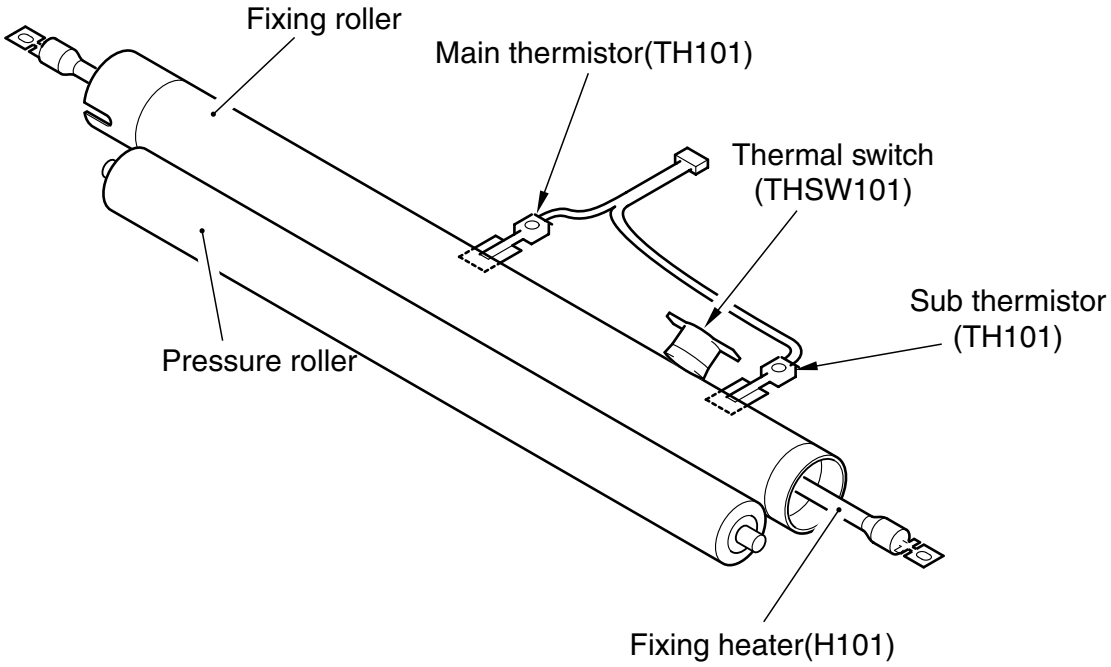
The fixing roller of the fixing assembly and the delivery roller are driven by the main motor. After it is removed from the photosensitive drum, the paper is moved to the inside of the fixing assembly, where the toner image is fused to the fibers of the paper by the work of the fixing roller and pressure roller; thereafter, the paper is delivered outside the machine.

The fixing system has the following functions and uses the following methods:

Item	Description
Fixing method	Roller fixing
Fixing drive	From main motor (M101)
Control temperature	Varied according to selected mode
Temperature detection	[1] By main thermistor (temperature control, error detection) [2] Sub thermistor (error detection) [3] Thermal switch (error detection)
Fixing temperature control	[1] Control in response to power switch operation [2] Control according to paper type [3] Control at time of down sequence [4] Control in ESS (energy save) mode
Pressure roller cleaning	By cleaning mode in user mode
Error detection	[1] By thermistor (overheating) [2] Thermal switch (overheating)

T07-101-01

The fixing system is constructed of the following components:



F07-101-01

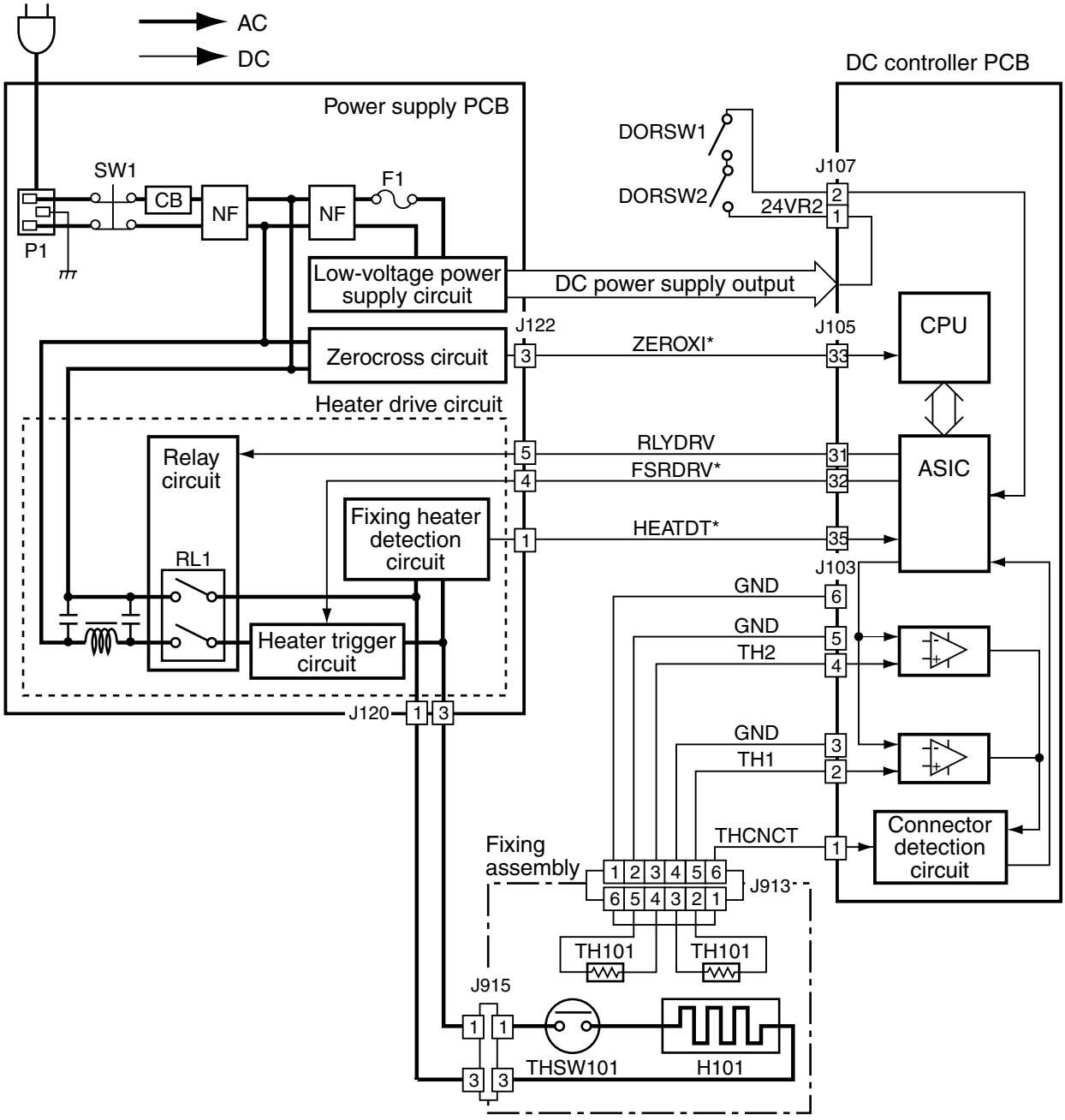
Component	Description
Fixing roller	31 mm in dia.
Pressure roller	25 mm in dia.
Fixing heater (H101)	Halogen heater (800 W)
Main thermistor (TH101)	Temperature control, error detection
Sub thermistor (TH101)	Error detection
Thermal switch (THSW101)	Error detection (230 ± 10℃)

T07-101-02

2 Controlling the Fixing Temperature

2.1 Outline

The mechanism related to the control of fixing temperature consists of the following:
[1] Controlling the fixing heater temperature
[2] Detecting a thermistor error

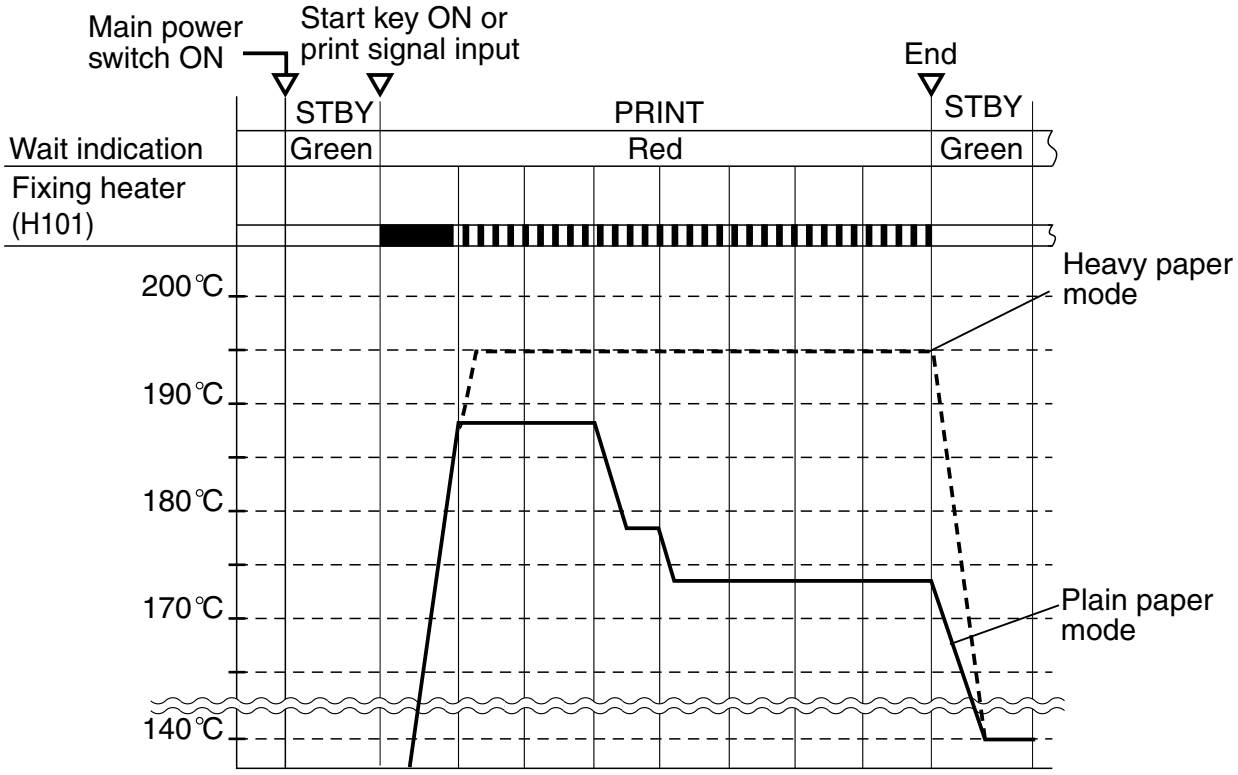


F07-201-01

2.2 Controlling the Temperature

The mechanism related to the control of fixing temperature consists of the following:
[1] Control in response to the operation of the power switch
[2] Control according to the type of paper
[3] Control at time of down sequence
[4] Control in ESS (energy save) mode

The sequence of control is as follows:



F07-202-01

2.2.1 Control at Time of Power-On

a. Conditions Ending the Wait Period

To decrease the length of the Wait period, the machine ends the period if any of the following conditions exits, thus shifting to standby state:

- 25 sec or more passes from the time when the fixing heater (H101) is first supplied with power and when the fixing temperature reaches 150ºC or higher.

- 27 sec passes from the time when the fixing heater (H101) is first supplied with power and when the fixing temperature reaches 145ºC or higher.
  However, to ensure good fixing immediately after the power switch is turned on, the fixing heater is continuously kept ON until the target temperature is reached even when the machine remains in standby state.

b. Controlling to the Target Temperature

To ensure fixing immediately after the power switch is turned on, a target temperature is used as a reference, as determined in relation to the fixing temperature at time of when the power switch is turned on and to the state of the printer.

- If the fixing temperature is lower than 80ºC when the power switch is turned on,
  For printing, a temperature higher than the control temperature is used (as determined by the selected mode). Printing is started when the target temperature is reached, and the target temperature is decreased in stages in relation to the passage of time (continuous printing) until the control temperature for a specific mode is reached.

- If the fixing temperature is 80ºC or higher when the power switch is turned on,
  For printing, the control temperature is used as the target temperature (as determined by the selected mode). Printing is started when the target temperature is reached, and the target temperature is decreased in stages in relation to the passage of time (continuous printing) until the control temperature for a specific mode is reached.

2.2.2 Control According to the Type of Paper

The machine uses the following modes to suit the selected type of paper:

Mode	Control temperature during printing	Control temperature in standby	Remarks
Plain paper mode (default)	173ºC	140ºC	Used when printing on plain paper.
Heavy paper mode	195ºC	140ºC	Used when printing on paper with a coarse surface or in a low temperature environment. To ensure good fixing, the initial rotation period is extended by 5 sec; for continuous printing, the distance between sheets is increased.

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2.2.3 Control at Time of Down Sequence

In continuous printing, the temperature of the area not in contact with paper as detected by the sub thermistor can be abnormally high. To prevent overheating, the machine increases the distance between sheets.

- Down sequence is started when the reading of the sub thermistor is 210℃.
- Down sequence is ended when continuous printing ends.

2.2.4 Control in ESS (energy save mode)

In ESS mode, the machine may be in one of two states, depending on the selection of 'power at time of energy save mode' ('high' or 'low <default>'); hereafter, the former is referred to as ESS1 and the latter, ESS2.

Control for ESS1:

When the machine is in ESS1 state, the control temperature of the fixing heater is lowered to 120ºC from 140ºC (standby temperature).

The target temperature at the end of ESS1 is determined in relation to the fixing temperature and the printer state, as in the case of temperature control used at power-on.

Control for ESS2:

When the machine is in ESS2 state, the fixing heater (H101) remains OFF.

The target temperrature at the end of ESS2 is determined in relation to the fixing temperature and the printer state, as in the case of temperature control at power-on.


Memo

The power save mode (energy save mode) for user mode at time of shipment from the factory is set to 15 min.

2.3 Detecting an Error

2.3.1 Outline

The machine checks for an error for the following in relation to fixing temperature control:

[1] Temperature error detection by main thermistor
[2] Temperature error detection by sub thermistor
[3] Temperature error detection by thermal switch

2.3.2 Control in Response to an Error

- If the machine detects an error in the fixing assembly, the DC controller PCB operates as follows:

[1] It causes the FSRDRV* signal to go '1' to cut power to the fixing heater.
[2] It causes the RLYDRV signal to go '0' to turn off RL1, and indicates 'E000' through 'E004' on the LCD in the control panel.

When 'E000' through 'E004' is indicated, the NVRAM on the DC controller PCB remembers an error in the fixing assembly even when the power switch is turned off and then on. After turning on the power, be sure to execute the following in service mode to remove the error information: #7 PRINTER > #4 PRINTER RESET > YES = (*).

2.3.3 Conditions for Error Detection

The machine will detect an error in response to any of the following:

a. Start-Up Error

A start-up error is identified for the following (reading of the main thermistor):

- It exceeds 40℃, but does not reach 60℃ in 10 sec.
- It exceeds 60℃, but does not reach 80℃ in 10 sec.
- It exceeds 80℃, but does not reach 100℃ in 10 sec.
- It exceeds 100℃, but does not reach 120℃ in 10 sec.
- It exceeds 120℃, but does not reach 140℃ in 10 sec.
- It exceeds 140℃, but does not reach 160℃ in 10 sec.
- It exceeds 180℃, but does no reach 195℃ in 10 sec.

b. Low Temperature Error

- The reading of the main thermistor does not reach 40℃ within 14 sec after the fixing heater goes ON.

c. Low Temperature Error at Time of Temperature Control

- After the end of the Wait period, the reading of the main thermistor is 100℃ or lower.
- At time of standby, the reading of the sub thermistor is 50℃ or lower.

d. High Temperature Error

- The reading of the main thermistor is 220℃ or higher.

e. Drive Circuit Error

- At time of initialization, the ZEROXI* signal of the power supply cannot be detected.
- The ZEROXI* signal does not arrive for 3 sec during temperature control.
- A triac short is detected (ASIC).

2.4 Protective Mechanism

The machine is equipped with the following protective mechanisms used to prevent malfunction of the fixing heater:

1. Thermistor High Temperature

The ASIC and the high temperature detection circuit on the DC controller monitor the voltage readings of the main thermistor and sub thermistor; if the main thermistor detects a voltage equivalent of the following temperature, the CPU will identify the condition as indicating overheating.

• 220℃ or higher (read by main thermistor TH101)

2. Thermistor Disconnection

The connector detection circuit on the DC controller PCB monitors the THCNCT signal, and the CPU will assume that the connector of the thermistor is disconnected if the signal is '0'.

3. Cutting Off the Power in Response to Overheating (as detected by the thermal switch)

If the internal temperature of the thermal switch (THSW101) exceeds about 230℃, the thermal switch will go OFF to cut the power to the fixing heater.

4. Detecting the Activation of the Fixing Heater

The fixing heater detection circuit on the power supply PCB causes the HEATDT* signal to go '0' if the FSRDRV* signal is '0' (fixing heater ON). As such, the ASIC will assume that the fixing heater activation is faulty (triac short circuit) if the HEATDT* signal goes '1'.

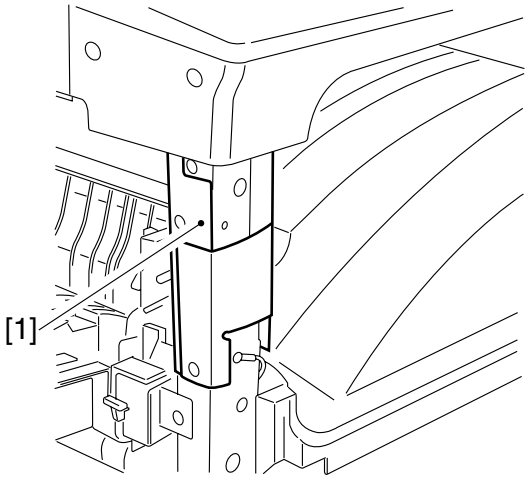
3 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the drum unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

3.1 Removing the Fixing Assembly

1) Remove the left cover.
2) Open the front cover.
3) Remove the drum unit (See to 7.1.1 in Chapter 5).
4) Remove the left front cover and the delivery upper cover.
5) Remove the right cover.
6) Remove the delivery cover.
7) Remove the fixing connector cover [1]. You will be using the cover once again; be sure to remove all glue.



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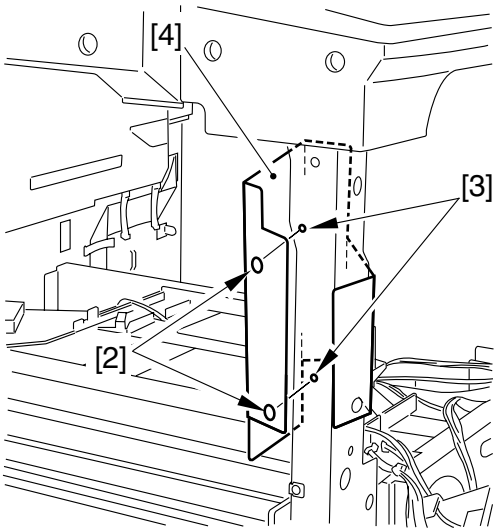
When mounting the fixing connector cover, match the 2 screw holes [3] against the 2 holes [2] in the fixing connector cover removed previously. And attach the fixing connector cover [4].



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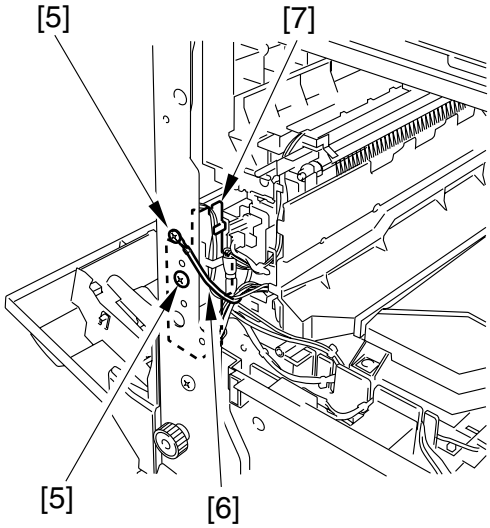
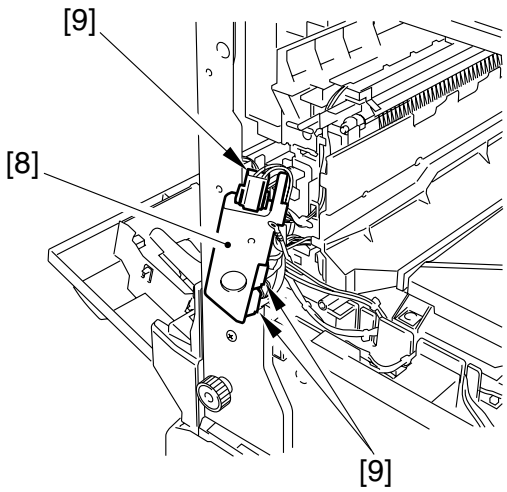
8) Remove the 2 screws [5]; then, remove the grounding wire [6] and the fixing connector fixing plate [7].



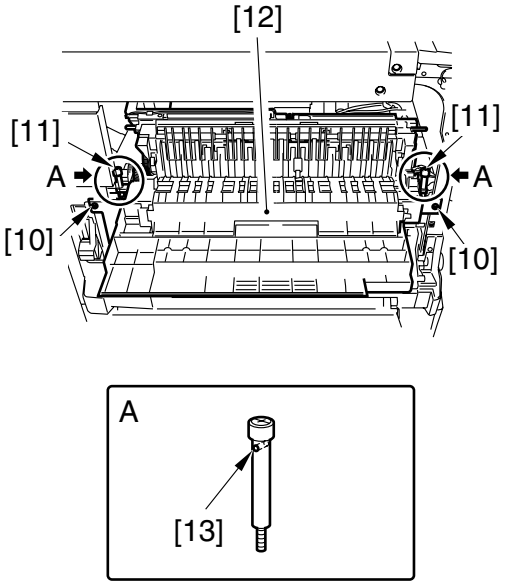
F07-301-03

9) Disconnect the 3 connectors [9] from the fixing connector fixing plate [8]; then, free the harness from the harness guide.



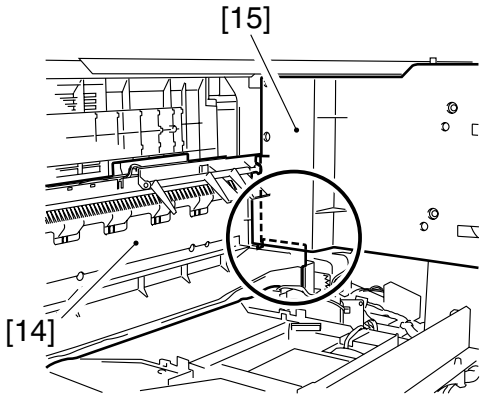
F07-301-04

10) Remove the 2 small stepped screws [10] and the 2 large stepped screws [11]. When removing the large stepped screws [12], be sure to insert a hex key (less than 2 mm in diameter) into the screw hole [13] and loosen them by turning the hex wrench.



F07-301-05

1. After mounting the fixing assembly, check to make sure that the delivery lower cover [14] is behind the rear cover [15] as shown.
2. When mounting the fixing assembly, you may find it difficult to engage the fixing roller gear. If such is the case, release the locking lever [16], to which the fixing roller gear is linked.



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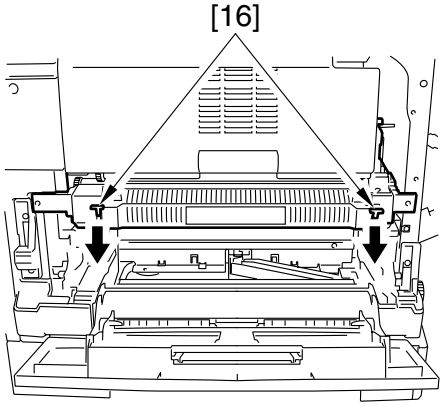


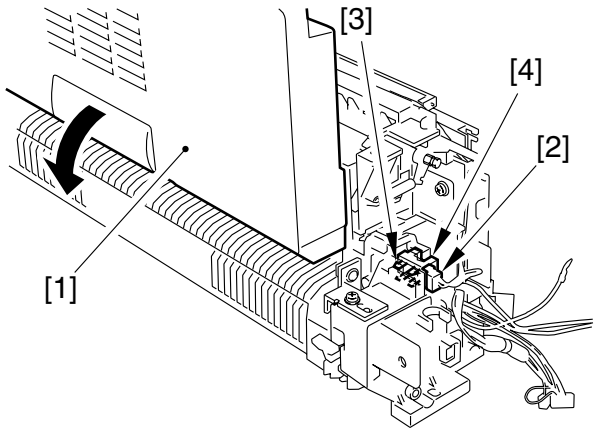
F07-301-07

3.2 Cleaning the Inside of the Fixing Assembly or Replacing Its Parts

Do not disassemble or clean the following parts found inside the fixing assembly in the field; a small inaccuracy in the torque or adjustment, or deformation by cleaning work, can cause smoking and flaming:
- Thermistor
- Thermal switch

3.3 Removing the Delivery Sensor

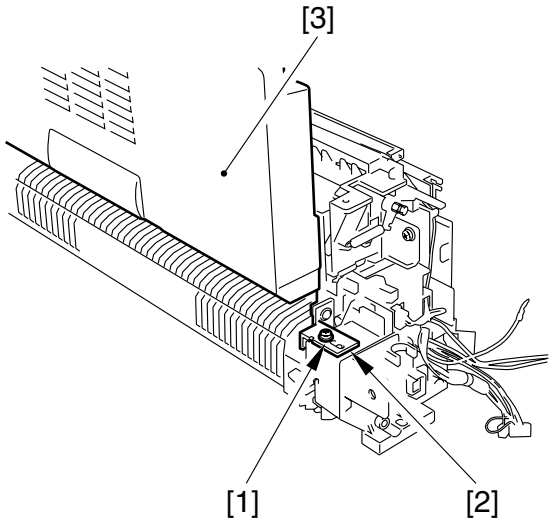
1) Remove the fixing assembly[1].
2) Disconnect the connector [2], and free the 4 claws [3]; then, detach the delivery sensor [4].



F07-303-01

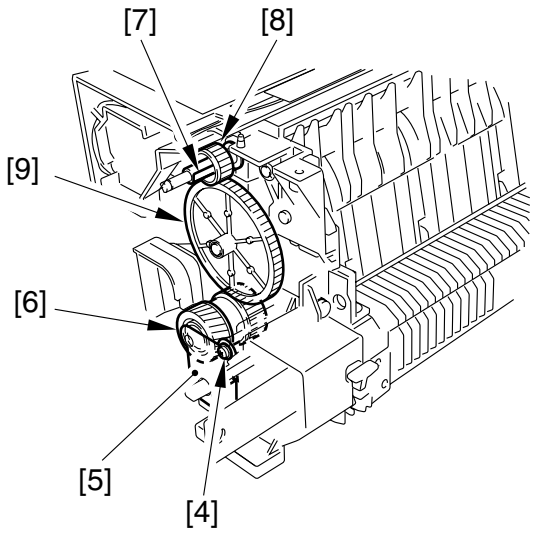
3.4 Removing the Pressure Roller

1) Remove the fixing assembly. (See 3.1 of Chapter 7.)
2) Remove the screw [1], and detach the support plate [2].
3) Remove the fixing cover [3].



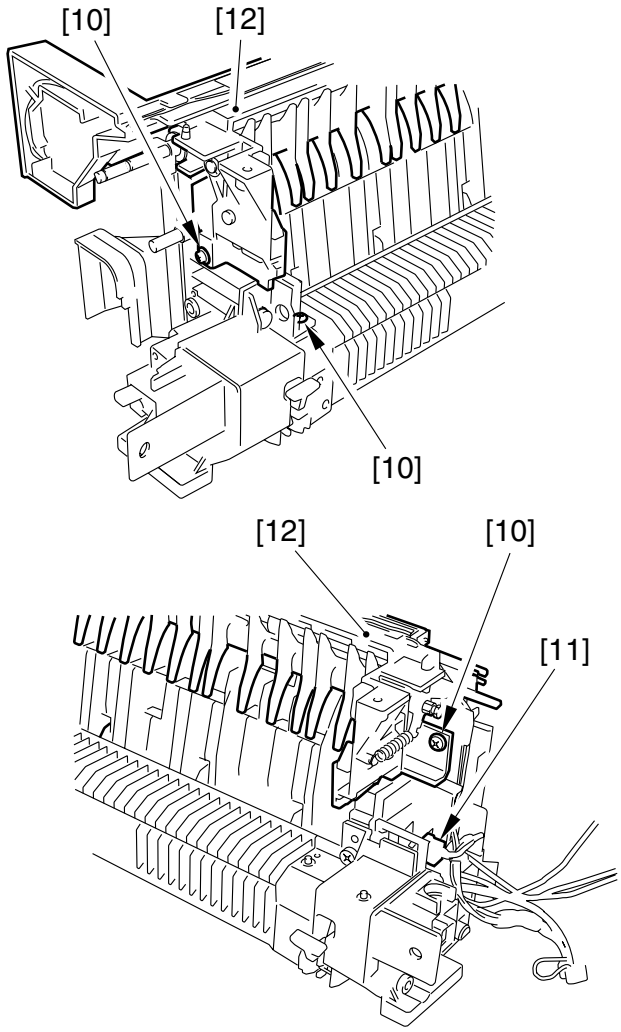
F07-304-01

4) Remove the screw [4], and detach the drive gear shaft plate [5] and the gear [6].
5) Free the claw [7], and detach the gear [8].
6) Remove the gear [9].



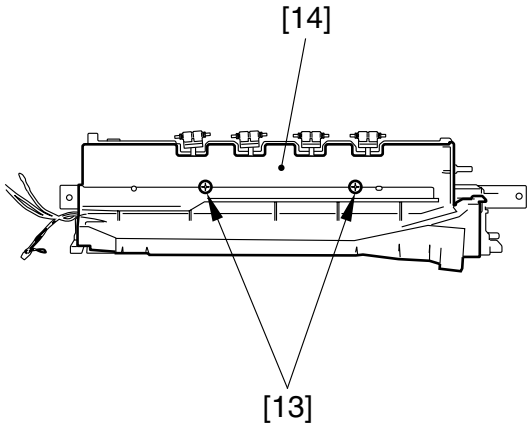
F07-304-02

7) Remove the 3 screws [10], and disconnect the connector [11]; then, detach the delivery roller unit [12].



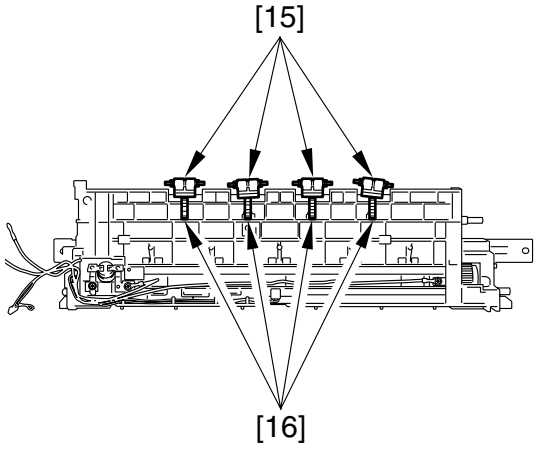
F07-304-03

8) Remove the 2 screws [13], and detach the delivery lower cover [14].



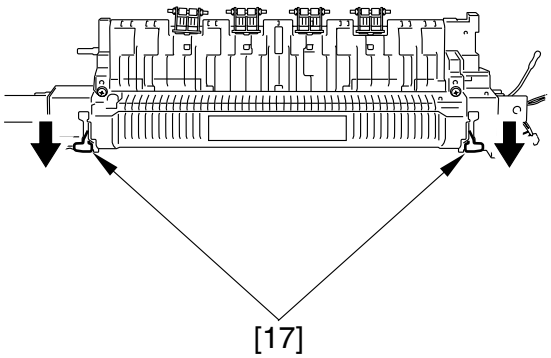
F07-304-04

The delivery roll [15] and the spring [16] tend to come off easily once the delivery lower cover has been removed. Take full care not to lose it.



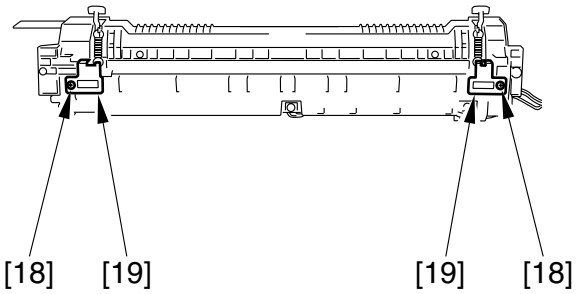
F07-304-05

9) Push down the pressure releasing lever [17] to remove the pressure.



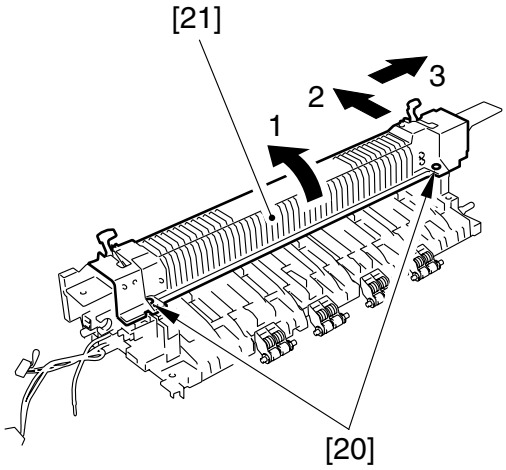
F07-304-06

10) Remove the 2 screws [18], and detach the 2 linking plates [19].



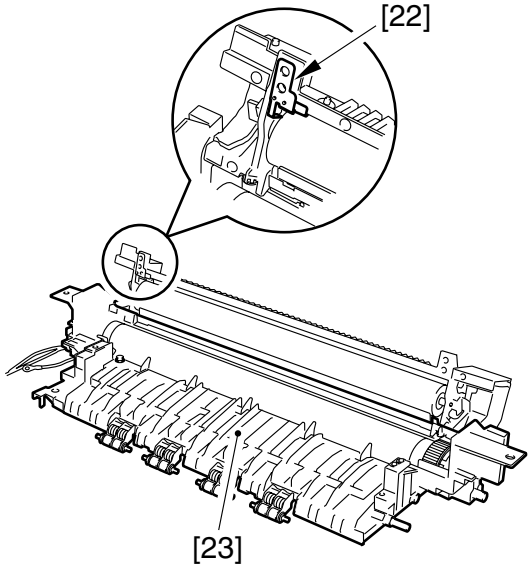
F07-304-07

11) Remove the 2 screws [20], and open the pressure roller assembly [21]; then, remove the D-cut shaft found on the right side.



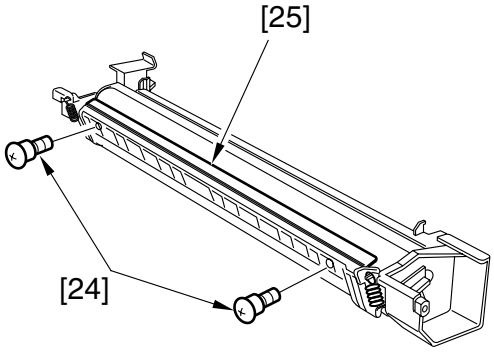
F07-304-08

1. The static eliminating brush [22] can come off. Take care not to lose it.
2. Do not tilt the fixing roller assembly [23]; otherwise, the fixing roller can come off the bushing. Be sure to place it on a flat surface.



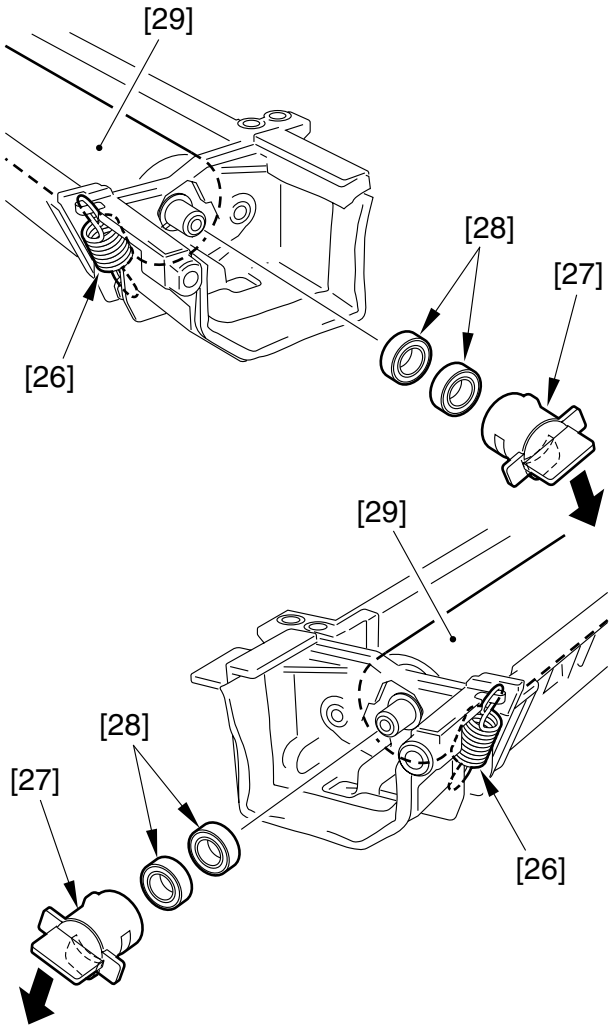
F07-304-09

12) Remove the 2 screws [24] for the pressure roller assembly, and detach the inlet guide [25].



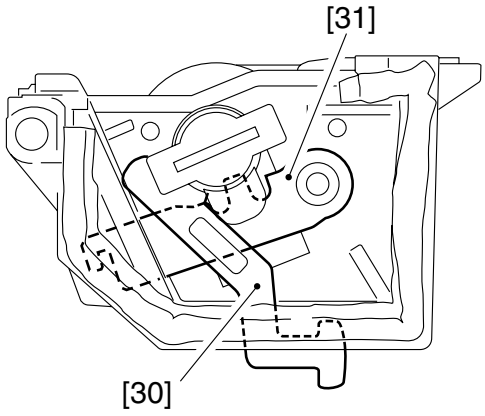
F07-304-10

13) Push down the pressure releasing lever to lock it in place.
14) Remove the left/right spring [26]; then, push down the 2 bushings [27] in the direction of the arrow to detach.
15) Remove the bearings [28] (2 each on left and right), and detach the pressure roller [29].



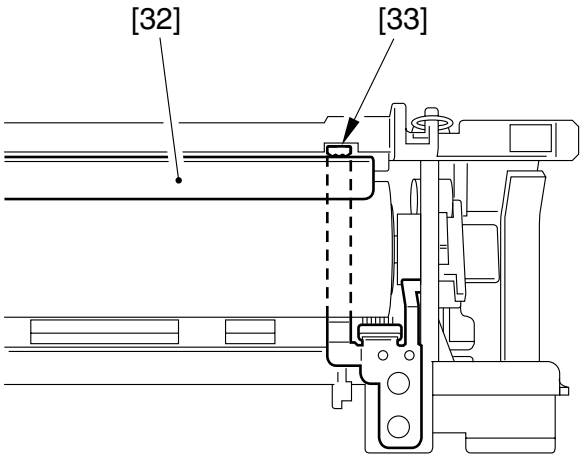
F07-304-11

If the pressure releasing lever [30] or the fixing shaft [31] has come off when the pressure roller is removed, be sure to mount them back as shown.



F07-304-12

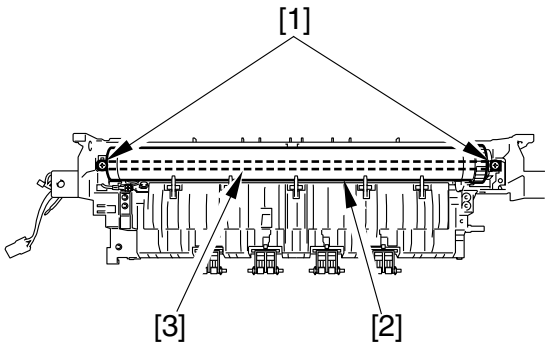
When mounting the pressure roller, check to make sure that the contact plate [32] is in contact with the inlet guide [33].



F07-304-13

3.5 Removing the Fixing Roller/Fixing Heater/Separation Claw

1) Remove the fixing assembly. (See 3.1 of Chapter 7.)
2) Remove the pressure roller assembly. (See 3.4 of Chapter 7.)
3) Remove the 2 screws [1] of the fixing roller assembly; then, detach the fixing roller [2] and the fixing heater [3].



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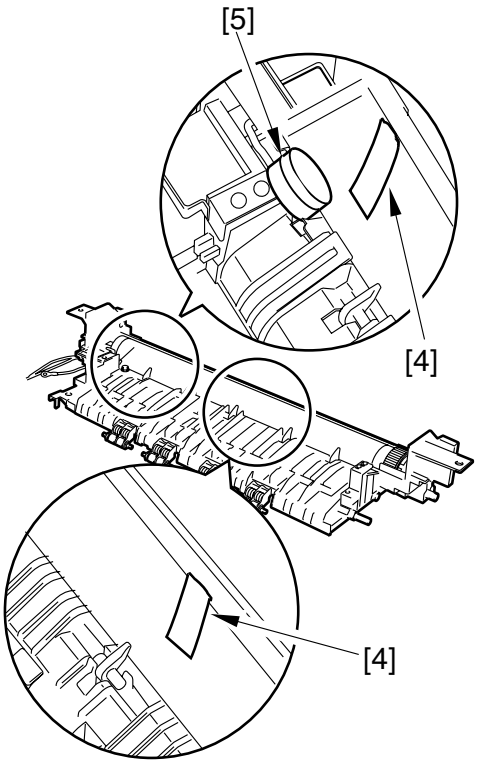
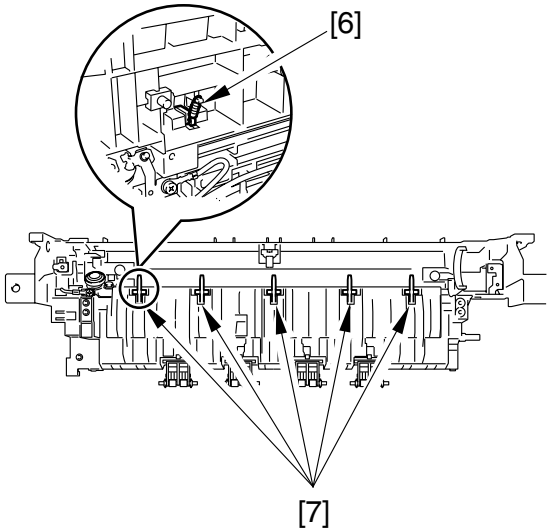
4) Check the thermistor [4] and the thermal switch [5] for scratches, dirt, and deformation. If any, replace the fixing assembly.



F07-305-02

Do not clean the thermistor [4] or the thermal switch [5].

5) Remove the spring [6], detach the separation claw [7].

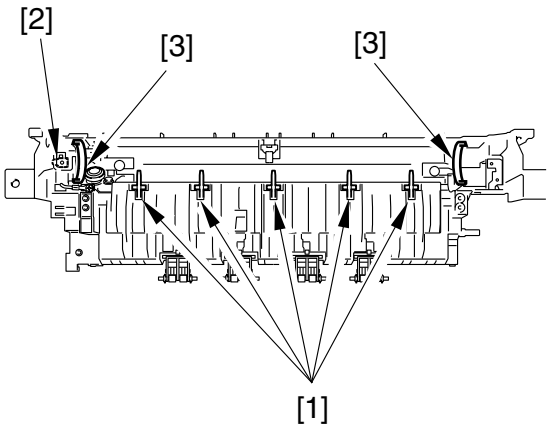


F07-305-03

3.6 Mounting the Fixing Roller/Fixing Heater/Separation Claw

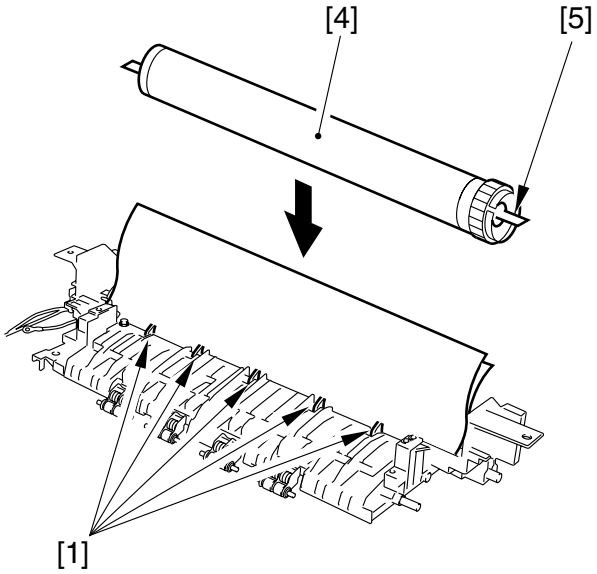
1) Mount the 5 separation claws [1] with the 5 springs.

Check to make sure that the contact plate [2] and bushing [3] is mounted.



F07-306-01

2) Open the separation claws [1] to insert the fixing roller [4]. Obtain a sheet of A3/11x17 white paper, fold it in 4, and fit it as shown.
3) With the fixing heater [5] fitted in the fixing roller [4], hold the fixing roller [4] in your hand.
4) With attention to the separation claws [1], force the fixing roller [4] against the paper and place it on the fixing assembly.



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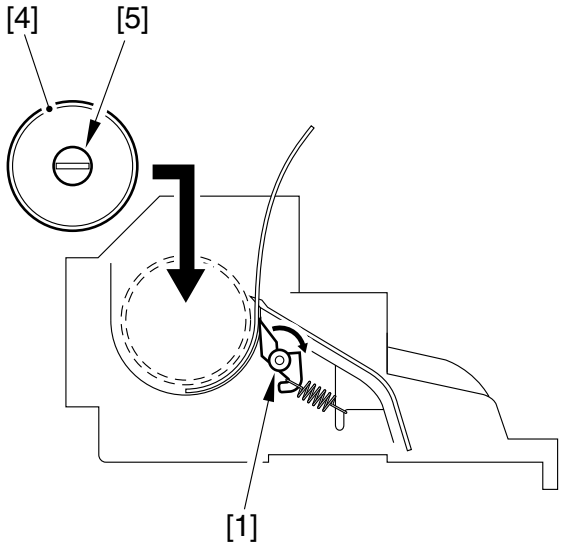
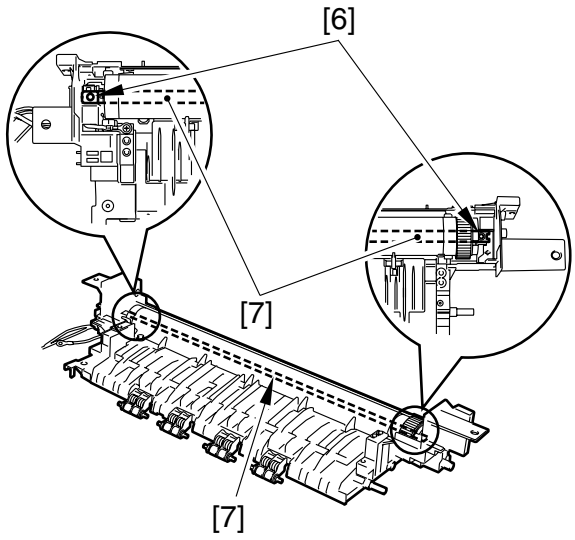


F07-306-03

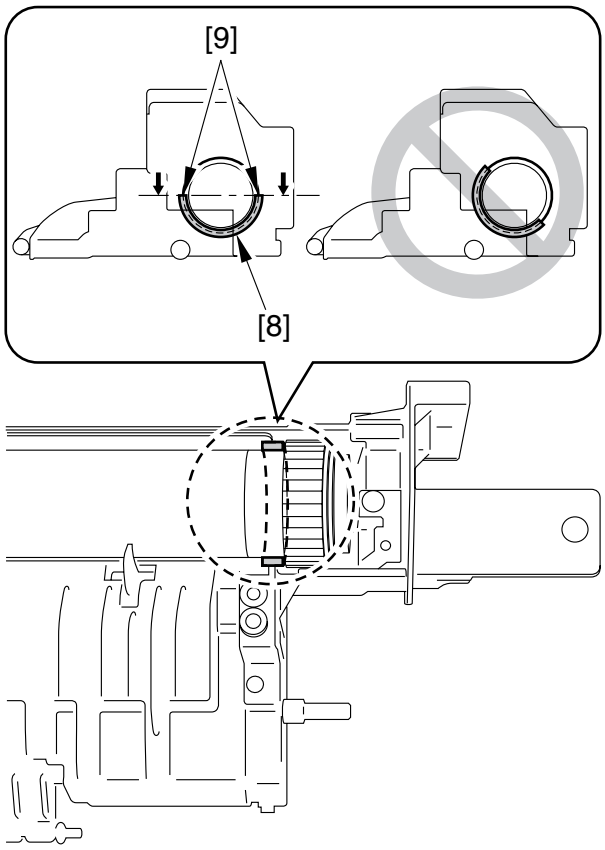
5) Remove the paper.
6) Mount the fixing heater[7] with two screws[6].

1. Be sure to mount the fixing heater so that its edge with print faces upward. Further, take care not to touch the glass portion of the fixing heater.
2. When mounting the fixing roller, take care not to scratch it by any of the separation claws.



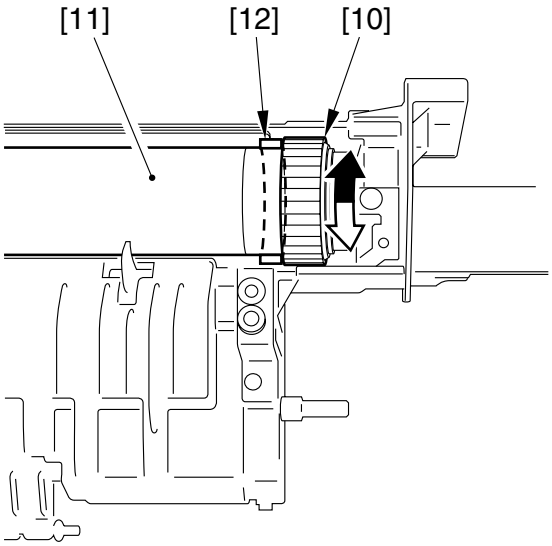
F07-306-04

Check to make sure that the bushing [8] is mounted as shown and that the side [9] on both ends of the bushing are parallel.



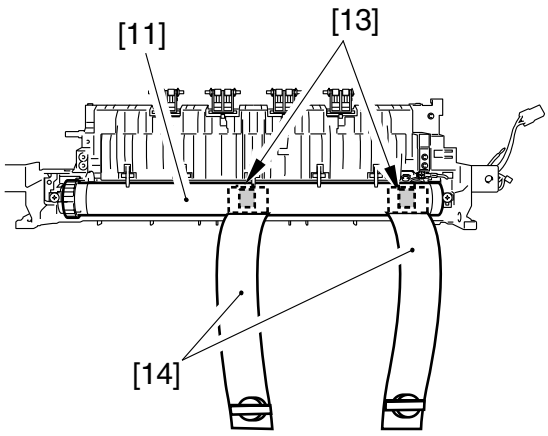
F07-306-05

Hold the fixing roller gear [10], and turn the fixing roller [11] to see if the rotation is smooth and that the busing [12] does not move.



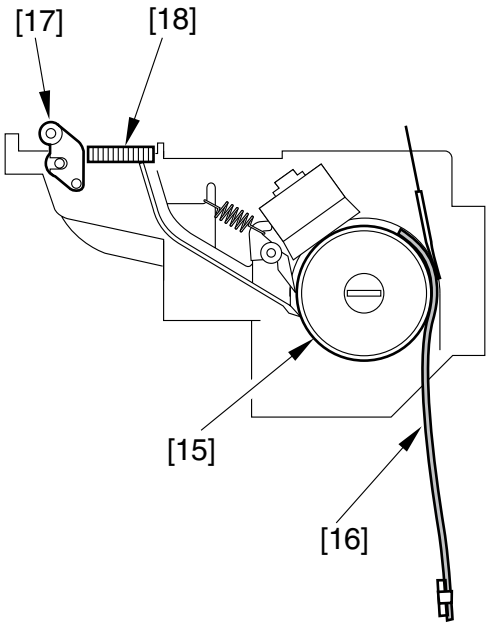
F07-306-06

7) Prepare a strip from a transparency (20cm in length and 20mm in width); then, attach a coin (about 5g) to the strip.
8) Insert the strip [14] between the thermistor [13] and the fixing roller [11].



F07-306-07

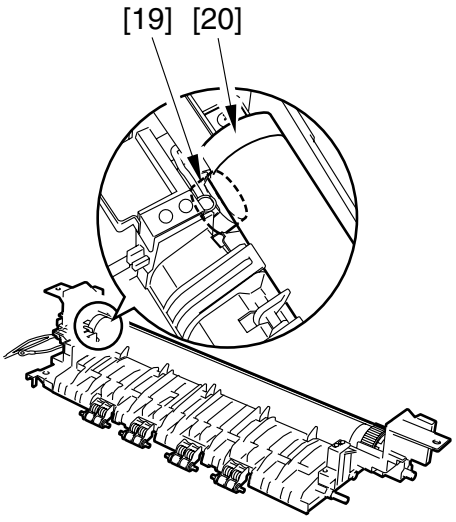
9) Using lint-free paper or the like, hold the fixing roller [15] avoiding direct contact; then, check to make sure that the strip [16] will not fall when the fixing roller is held as shown.



F07-306-08

The delivery roll [17] and the spring [18] tend to come off easily once the delivery lower cover has been removed. Take full care not to lose it.

10) While holding the fixing roller, remove the paper.
11) After mounting the fixing roller and the fixing heater, check to make sure the thermal switch [19] are correctly mounted by lightly pushing and then releasing the fixing aluminum core [20].

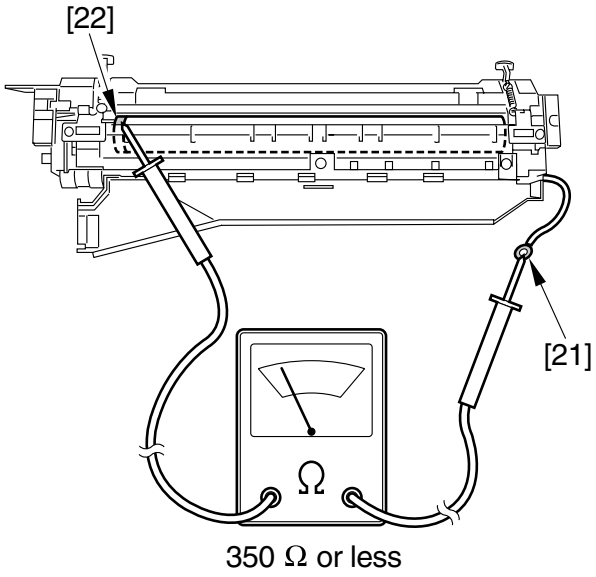


F07-306-09

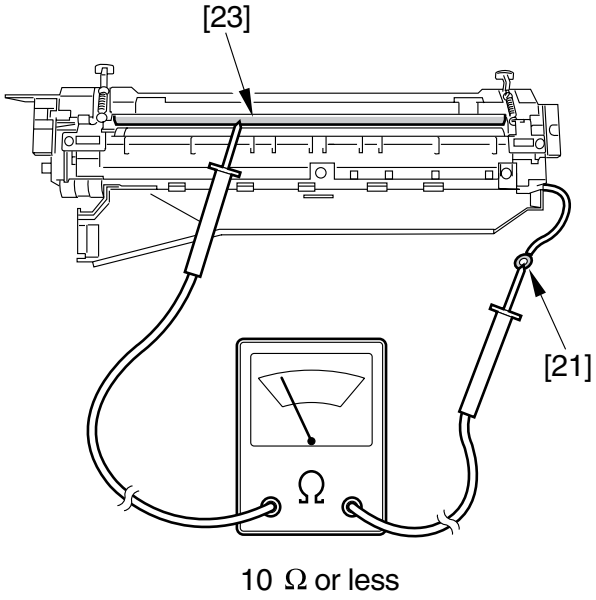
12) Hereafter, put back the fixing assembly by reversing the steps.

13) After putting back the fixing assembly, check the resistance using a meter:

a. between the earth contact [21] and the fixing roller core [22]
: it must be 350Ω or less



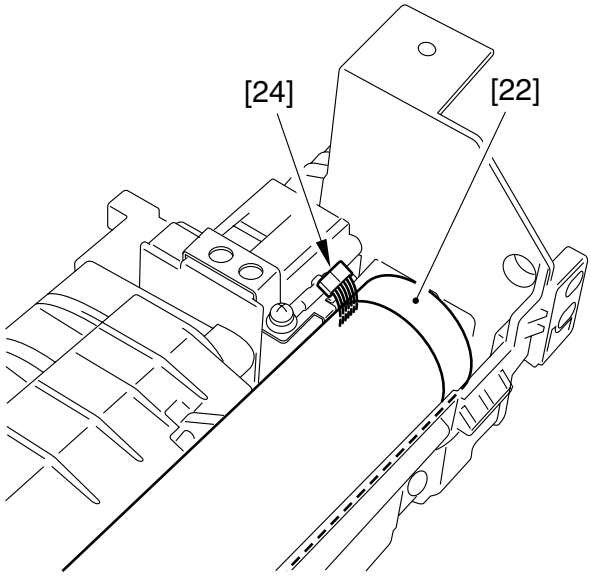
b. between the earth contact [21] and the inlet guide [20]
: it must be 10Ω or less



F07-306-10

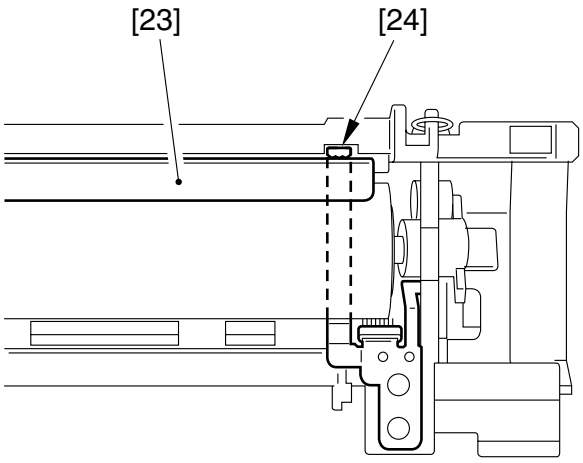
14) If the measurement is not as indicated, perform the following:

- If the resistance between the earth contact and the fixing roller core [22] is not as indicated, check to make sure that the static eliminating brush [24] is in contact with the fixing roller core [22].



F07-306-11

- If the resistance between the earth contact and the inlet guide [23] is not as indicated, check to make sure that the contact plate [24] is in contact with the inlet guide [23].



F07-306-12

15) After the checks, put back the fixing assembly by reversing the steps.

CHAPTER 8

EXTERNALS AND AUXILIARY CONTROL SYSTEM

1 Control Panel

1.1 The machine's control panel has the following construction

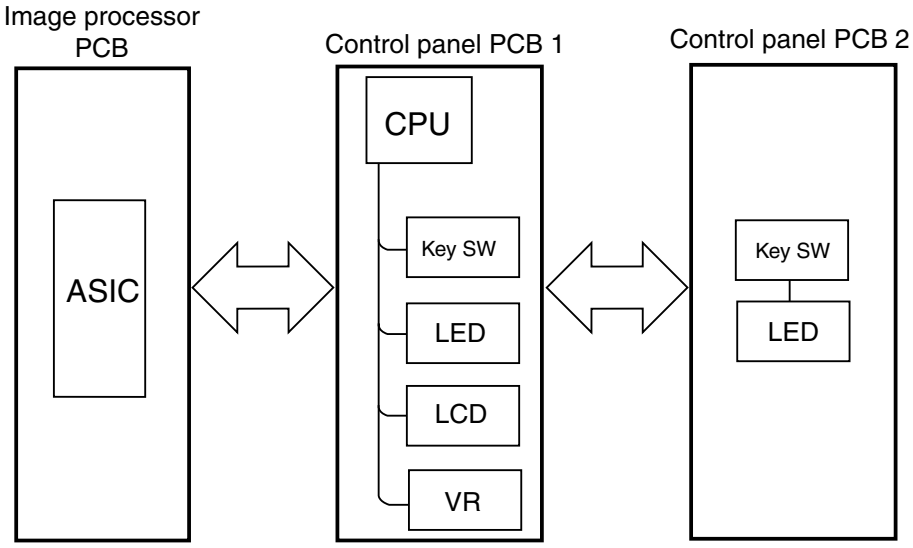
The circuitry of the control panel consists of two PCBs, and is controlled by the ASIC of the image processor PCB.

1. Non-Fax Model

The indication on the LCD is in 2 lines of 20 characters each.

2. Fax Model

The LCD consists of 80 x 320 dots.



F08-101-01

2 Power supply

2.1 Power Supply

2.1.1 Outline

The machine's DC power is generated by the AC power received by the power supply PCB. The generated DC power is converted into a full-time ON system (linked to the power switch) and a remote ON/OFF system (linked to control signals), and is supplied to each load.

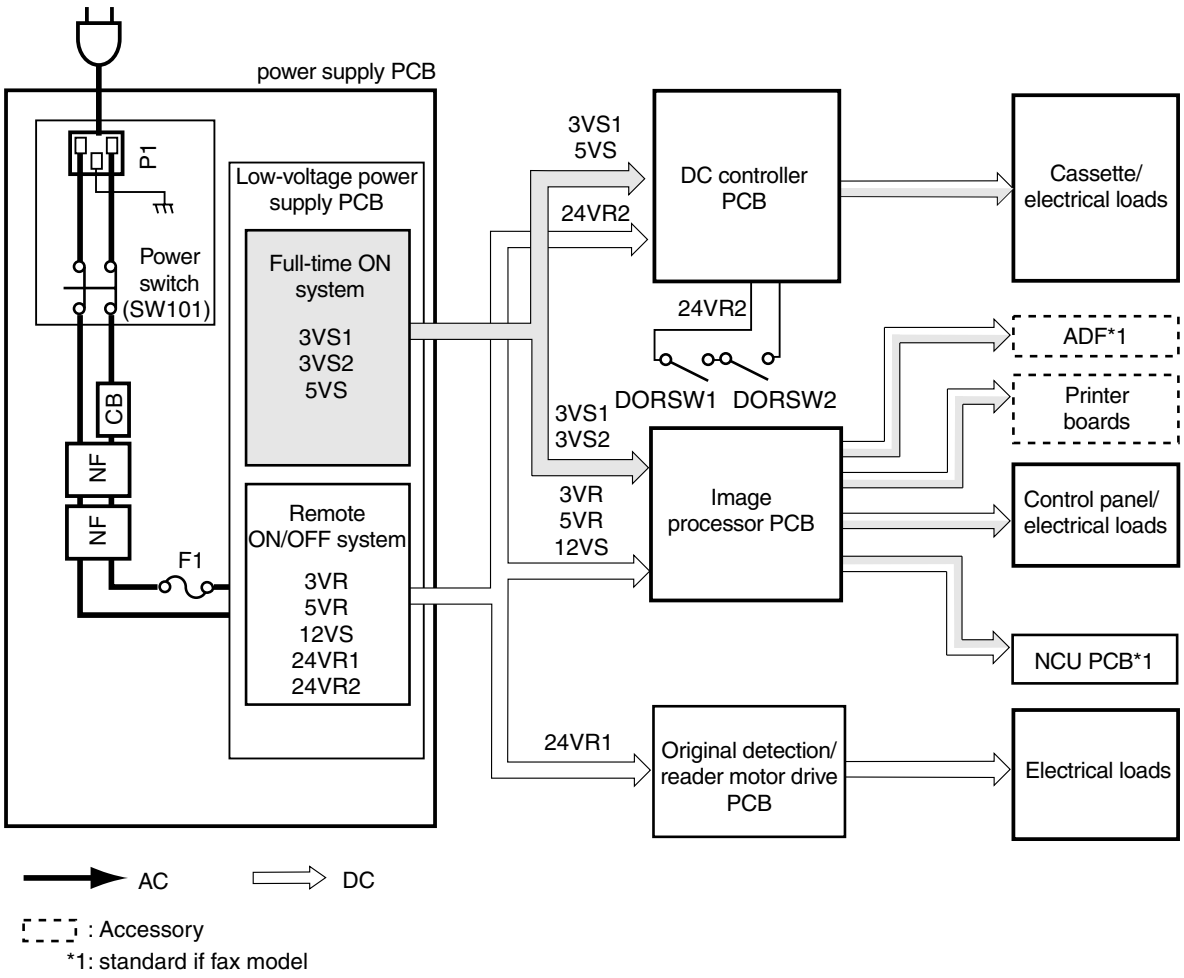
The output of the power supply PCB is controlled by the power switch (SW101) or signals from the printer board.

The names and functions of the parts associated with the power supply are as follows:

Name	Description
Power supply PCB	generates DC power from AC power
Power switch (SW101)	supplies AC power to the power supply PCB
Cover switch (DORSW1, DORSW2)	detects state (open/closed) of front cover and left cover cuts 24VR2 power to main motor

T08-201-01

The levels of outputs from the DC power supply of the full-time ON system are as follows:



F08-201-01

2.1.2 Rated Outputs from the Power Supply PCB

The levels of outputs form the DC power supply of the full-time ON system are as follows:

Output	3VS1	3VS2	5VS	12VS
Connector	CN1-11 CN1-13 CN2-8 CN2-9 CN5-5 CN5-6 CN5-8	CN1-15 CN1-17 CN1-19 CN1-20	CN2-12 CN2-13 CN5-11 CN5-12 CN5-13	CN1-1
Output voltage tolerance	±3%	±3%	±5%	±5%
Rated output voltage	3.45V	3.45V	5.05V	12V
Rated output current	4.3A	4.3A	1.9A	0.6A
Activation level of overcurrent protection mechanism	8.0A	8.0A	4.0A	3.0A

T08-201-02

The levels of outputs form the DC power supply of the remote ON/OFF system are as follows:

Output	3VR	5VR	24VR1	24VR2
Connector	CN1-7	CN1-6	CN3-1 CN3-2	CN2-18 | CN2-27
Output voltage tolerance	±5%	±5%	±5%	±5%
Rated output voltage	3.35V	5.05V	24V	24V
Rated output current	0.3A	1.0A	5.0A	5.0A
Activation level of overcurrent protection mechanism	4.0A	3.0A	8.0A	8.0A

T08-201-03

* The above levels apply when the AC input is between 85 and 135 V for the 120V model and between 187 and 264 V for the 230V model.

2.2 Protective Mechanisms

The power supply PCB is equipped with overcurrent/over-voltage protective mechanisms that will automatically cut off the output voltage to prevent faults in the power supply circuitry otherwise caused by a fault in any of the loads (e.g., short-circuit).

When the overcurrent/over-voltage protective mechanism has gone ON, correct the fault in the load, and turn on the power switch once again to reset the machine.

The circuitry is equipped with a fuse, which will blow to cut off the power in response to an overcurrent in the AC line.

2.3 High-Voltage Power Supply Circuit

The high-voltage output circuit is built into the DC controller PCB. The ASIC on the DC controller PCB sends the following commands for the generation of high voltage at such times as needed:

- primary charging roller application voltage (AC voltage + DC negative voltage)
- developing bias (AC voltage + DC negative voltage)
- transfer charging roller application voltage (DC positive voltage or DC negative voltage)

For the control of biases applied to each load, see "Image Formation System" in Chapter 5.

3 Control at Time of Energy Save Mode

3.1 Outline

The machine is equipped with energy save mode (hereafter, ESS) used to save on power the machine consumes in standby state.

The machine turns on the ESS mechanism for the following:

[1] When the machine has remained in standby for a specific period of time*.
- As determined in user mode. (standby time: 3 to 30 min; 15 min factory default)

[2] When the Energy Save key in the control penal is pressed.

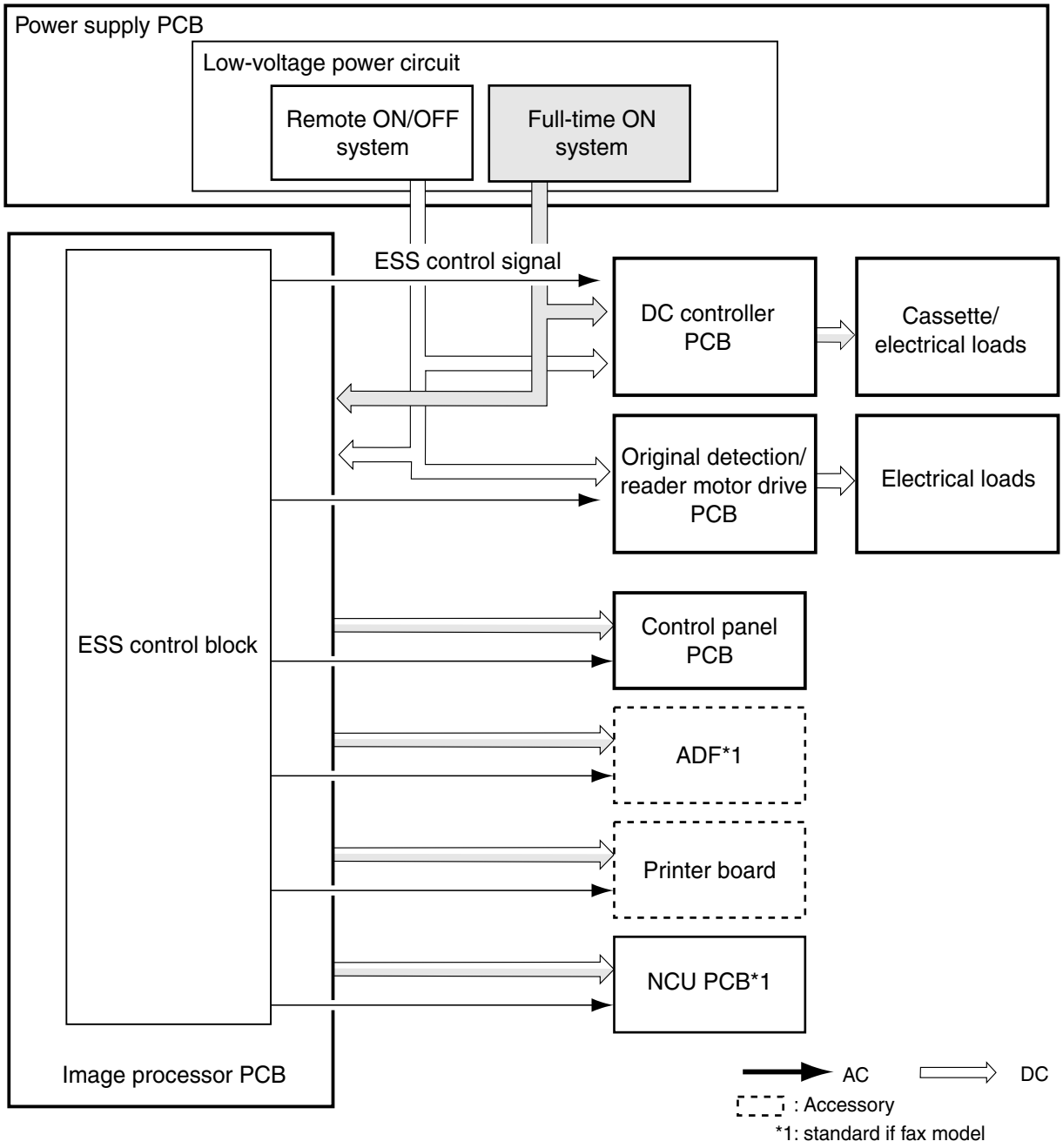
3.2 Control

The ESS mechanism is controlled by the image processor PCB, and is controlled as follows (for ESS1/ESS2 control, see 2.2.4 in Chapter 7):

[1] When the machine has remained in standby state for a specific period of time,
If the machine has remained in standby state for a specific period of time at the end of which the ESS mechanism is set to go ON (as set in user mode), the ASIC on the image processor PCB generates the ESS control signal, which is used to cut off the supply voltage sent to the remote ON/OFF system.
In ESS1 control, however, 24VR2 to the DC controller PCB is retained for control of the fixing heater.

[2] When the Energy Save key in the control panel is pressed,
If the Energy Save key on the control panel is pressed, the ESS input signal will be sent to the ASIC on the image processor PCB.
Based on the control signal, the ASIC sends the ESS control signal, which in return will be used to cut off the supply voltage to the remote ON/OFF control system.
In ESS1 control, however, 24VR2 to the DC controller PCB is retained for control of the fixing heater.

Power Consumption in Standby
Normal standby : about 30 W
ESS1 control : about 20 W
ESS2 control : about 4.8 W


Power supply PCB
Low-voltage power circuit
Remote ON/OFF system
Full-time ON system
ESS control signal
DC controller PCB
Cassette/ electrical loads
Original detection/ reader motor drive PCB
Electrical loads
ESS control block
Control panel PCB
ADF*1
Printer board
NCU PCB*1
Image processor PCB
AC
DC
: Accessory
*1: standard if fax model

F08-301-01

3.3 Operation

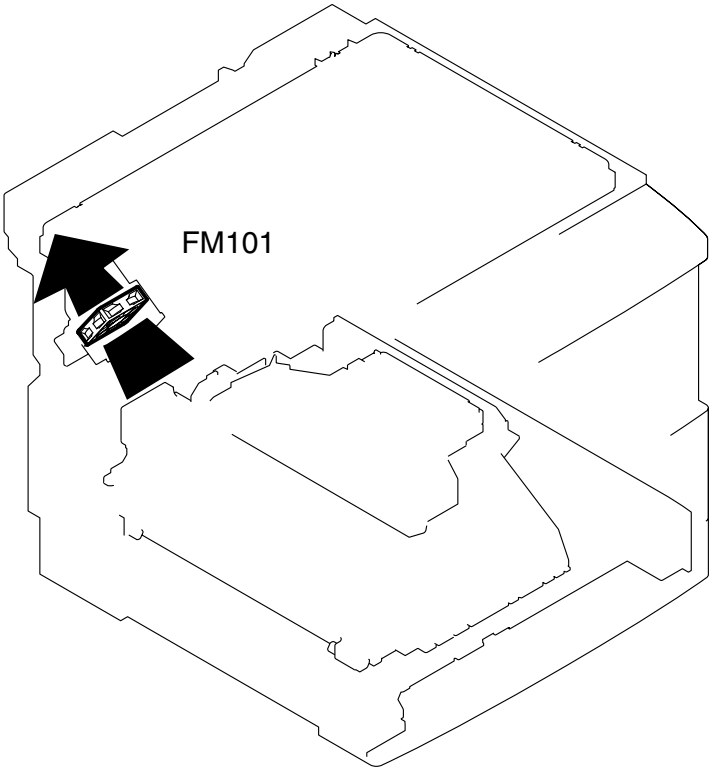
While the machine is in ESS mode, all but the LED indicator of the Energy Save key in the control panel remain OFF. The machine will not start ESS mode for the following:
[1] absence of paper, jam, absence of toner, service error (i.e., the Error lamp is ON)
[2] presence of original in ADF (accessory)
[3] shift to ESS disabled for printer board, network board (if mounted)
[4] If the image memory contains image data.
[5] If the communication is set to dial-in mode (on a fax model).

The machine ends ESS mode in response to anther press on the Energy Save key in the control panel; it will also end the mode for the following:
[1] presence of original in ADF (accessory)
[2] copyboard cover open
[3] print command from printer board (if mounted)
[4] print command or start-up command from network interface board (if mounted)
[5] If a fax arrives (on a fax model).
[6] If the machine is in off-hook state (on a fax model).
[7] If the report output time arrives (on a fax model).
[8] If the timer call time arrives (on a fax model).

4 Fan

4.1 Outline

The machine is equipped with a single fan for discharge of heat from inside it.



F08-401-01

4.2 Control

4.2.1 Controlling the Speed

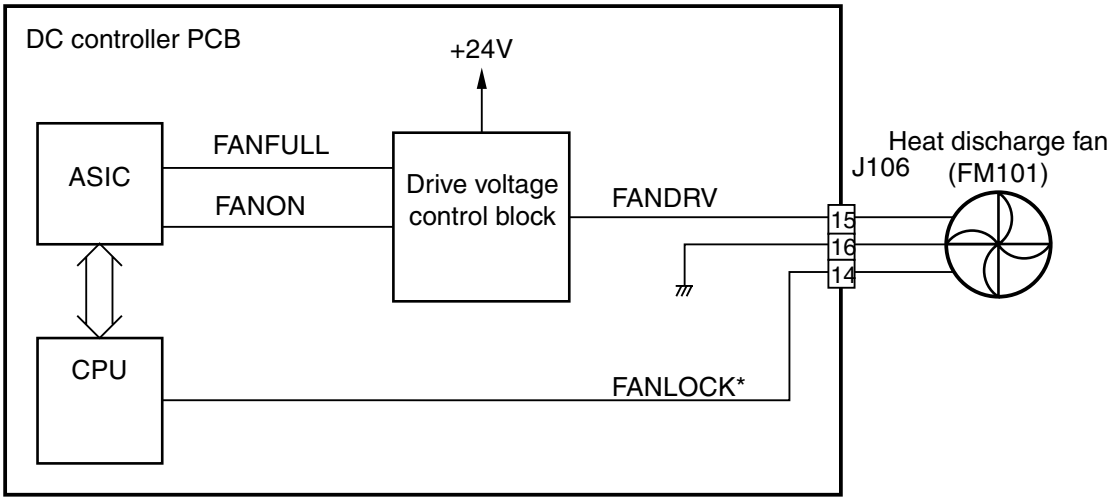
The machine's heat discharge fan (FM101) is subjected to 2-speed control (full-speed and half-speed) as follows:

[1] Full-Speed Control

When the ASIC on the DC controller PCB causes the fan ON signal (FANON) to go '1' and the fan full-speed rotation signal (FANFULL) to go '1', the drive voltage control block supplies fan drive voltage (FANDRV) of +24 V to rotate the heat discharge fan to rotate at full speed.

[2] Half-Speed Control

When the ASIC on the DC control PCB causes the fan ON signal (FANON) to go '1' and the fan full-speed rotation signal (FANFULL) to go '0', +16V fan drive voltage (FANDRV) is supplied to rotate the heat-discharge fan at half speed.

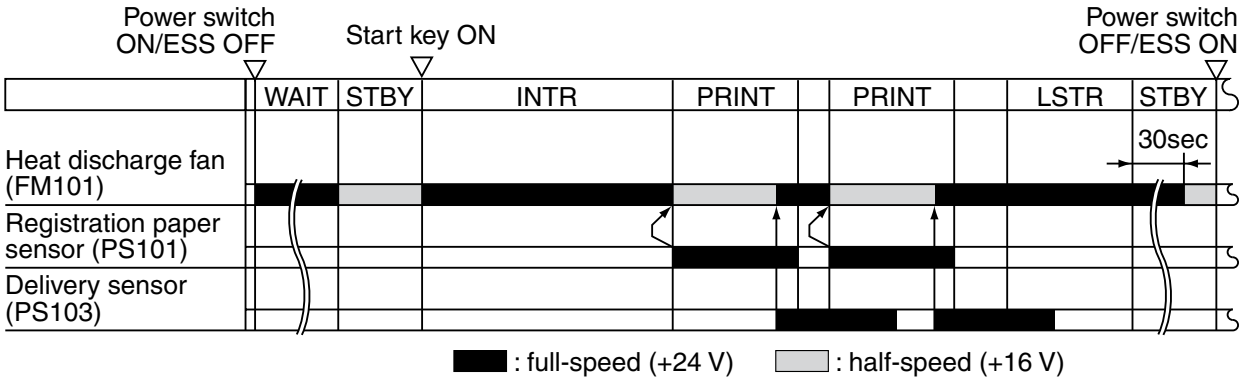


F08-402-01

4.2.2 Error Detection

As long as the heat discharge fan is rotating, the CPU on the DC controller PCB monitors the full-time fan lock detection signal (FANLOCK*); if the signal remains '0' for a specific period of time, it uses error code E805.

4.2.3 Sequence of Operation (fan drive)



F08-402-02

5 Back-Up Battery

5.1 Back-Up Mechanism

5.1.1 Outline

The machine's image processor is equipped with a lithium battery (BAT1) and a vanadium lithium secondary battery (BAT2) for data back-up, needed in the event of a power shortage or when the power switch is tuned off.

A : BAT2, however, is used to back up image data related to fax functions, and is used only in the fax model.

Do not throw the lithium battery and vanadium lithium secondary battery into fire. It contains lithium and organic solvent (highly combustible), and it can explode or burn with strong intensity in fire.
Also, do not disassemble it, as its organic solvent can harm your skin upon contact.
Take full care when handling the battery, and be sure to dispose of it according to appropriate regulations.

5.1.2 Vanadium Lithium Secondary Battery (BAT2)

The fax model is equipped with a vanadium lithium secondary battery (BAT2), mainly used to back up image data. The period of backing up data and the life of the battery are as follows:

Backup period : about 1 hr (machine's power switch kept ON for a day or longer under normal temperature and atmospheric pressure)

Life of battery : about 5 yr or charging/discharging 20 times (w/ 64MB expansion memory) to 50 times (w/ standard memory)

When the vanadium lithium battery (BAT2) reaches the end of its life, the display will indicate 'DATA ERROR' when the machine is turned on.

The machine does not allow replacement of BAT2 on its own. When it has become exhausted, be sure to replace the image processor PCB as a whole.

The data retained by the battery is image data resulting from fax transmission/reception, and the image data occurring in memory copying will not be retained.

The data retained in image memory will be lost when the aforementioned backup period passes. The image data will also be lost if the switch (JP2) on the image processor PCB is set to OFF. To prevent the loss of data during service work, be sure to print out the contents of the memory before starting the work.

Memo

Memory Clear List

If memory clear list is automatically printed when the machine is turned on, you may assume that the image data it indicates has been lost without backup. The image data storage status information is deleted as soon as the list has been printed; see the following for a sample of the memory clear list:

07/30/2001 17:52 FAX 001

****
*** MEMORY CLEAR REPORT ***
****

MEMORY FILES DELETED

TX/RX NO	MODE	DESTINATION TEL/ID	PGS.	SET TIME	ST. TIME
0002	DELAYED TX		1	07/30 13:51	13:59
0002	DELAYED TX		1	07/30 13:51	13:51
0002	MEMORY RX		1	07/30 13:53	-----
0002	MEMORY RX		1	07/30 13:54	-----

F08-501-01

5.1.3 Lithium Battery (BAT1)

The data backed up by BAT1 is control data on of user data or printer functions and service mode settings.

Battery life : 5 yr (approx.)

When the battery reaches the end of its life, the display will indicate 'DATA ERROR' when the power is turned on.

The battery cannot be replaced on its own. Upon exhaustion, the image processor PCB itself must be replaced.

If you disconnect the jumper plug (JP1/JP201) from the image processor PCB, and turn off the machine, all control data will be reset to default settings. If you must disconnect JP1/JP201, therefore, be sure to print out the control data, and enter the data after connecting JP1/JP201.


Memo

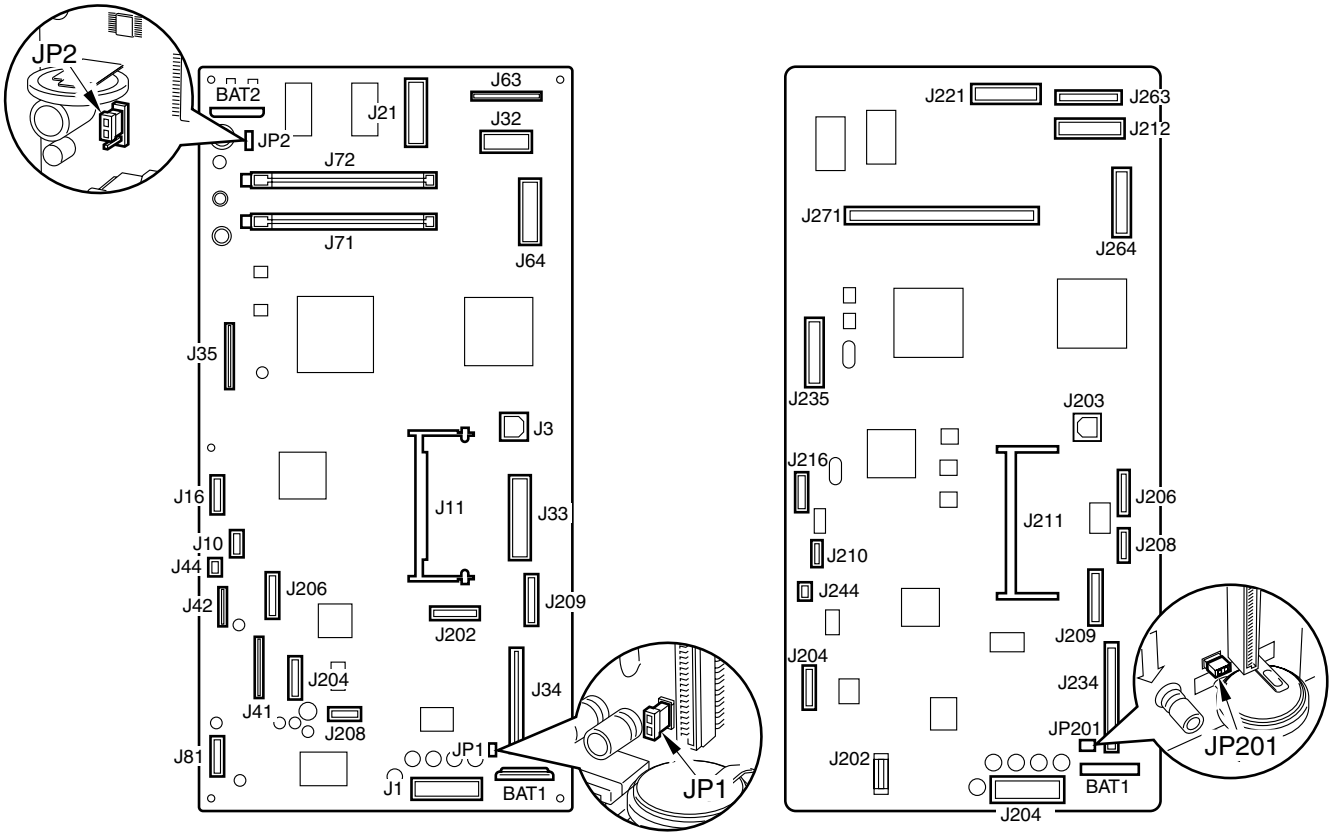
Points to Note When Replacing the Image Processor PCB

1. Before replacing the image processor PCB, print out all data.
2. Image Processor PCB as a Service Part

- The image processor PCB designed for the non-fax model does not come with a jumper plug (JP201), thus preventing possible exhaustion of the lithium battery; be sure to perform the following:
  1) Remove JP201 from the existing image processor PCB, and fit it to the new image processor PCB.
- The image processor PCB designed for the fax model comes with the switch (JP2) set to OFF to prevent the possible exhaustion of the lithium battery; it does not come with a jumper plug (JP1), requiring you to perform the following:
  1) Remove JP1 from the exiting image processor PCB, and fit it to the new image processor PCB.
  2) Shift JP 2 from OFF to ON.

3. If a few minute has passed before the machine is turned on, the display will indicate 'DATA ERROR'. If you press the OK key in the control panel, the data in control memory will be reset to factory settings, and the machine will enter standby state. If the display indicate 'SYSTEM ERROR E000"you will need to restart the machine.
4. Be sure to enter the data for control memory you printed before replacing the image processor PCB.

- Fax Model
- Non-Fax Model



F08-501-02

5.2 Back-Up Data

5.2.1 Types of Data

The lithium battery (BAT1, BAT2) on the image processor PCB serves to back up the following types of data. The items identified as a, b, and c below are data items (backed up by lithium battery BAT1), while d is a data item retained by the image memory (backed up by vanadium lithium secondary battery BAT2).

a. User Data

It is the type of data called into use by the Function keys in the control panel.

Item	Description
USER DATA LIST	1. various copy mode settings 2. various printer mode settings 3. various fax mode settings

T08-502-01

b. Service Mode Data

Item	Description	Remarks
#1. SSSW	error control, echo remedy, count size settings, etc.	
#2. MENU	NL equalizer, transmission level, etc.	
#3. NUMERIC Param.	FAX/TEL switch parameter, etc.	
#4A. SPECIAL	normally	
#4B. NCU	normally	
#4C. ISDN	normally	
#5. TYPE	not used normally	
#6. SCANNER	image position adjustment, etc.	
#7. PRINTER	reduction/cassette selection settings	
#8. PDL	not used normally	
#9. COUNTER	maintenance/parts replacement guides	
#10. REPORT	report output for various service data	
#11. DOWNLOAD	downloading to ROM on various PCBs	
#12. CLEAR	initializing various data to default settings	
#13. ROM	version indication	
#14.CS SET	malfunction	

T08-502-02

c. Control Data

Item	Description
communication control record	most recent 40 communications (reception/transmission)
system dump record	past communications state, error communication history, etc.

T08-502-03

d. Data Backed Up by BAT2

Item	Description
Transmission image	transmission (memory transmission, broadcast) timer transmission timer broadcast polling transmission relay broadcast transmission
reception image	memory reception

T08-502-04

5.2.2 Printing Out the Back-Up Data List

A list of data backed up in control memory may be printed out. Be sure to obtain a list of data before removing the jumper plug (JP1/JP201) from the image processor before replacing the image processor PCB. (You must turn off the power switch before doing so.)

a. User Data

Item	List
Settings mode data	User data list
Dial register mode	1-touch spd dial list
	1-touch spd dial list (detail)
	Coded speed dial list
	Coded speed dial list (detail)
	Group dial list

T08-502-05

b. Service Mode Data

Item	List
Service mode data	System data list or counter report

T08-502-06

System Data List
service mode #1 through #7, #13, start date output
Counter Report:
maintenance/part counter output
user data list, changes from defaults on system data list, system dump list (not used) output.

c. Control data

Item	List
Communication control record	Activity report
System dump record	System dump list

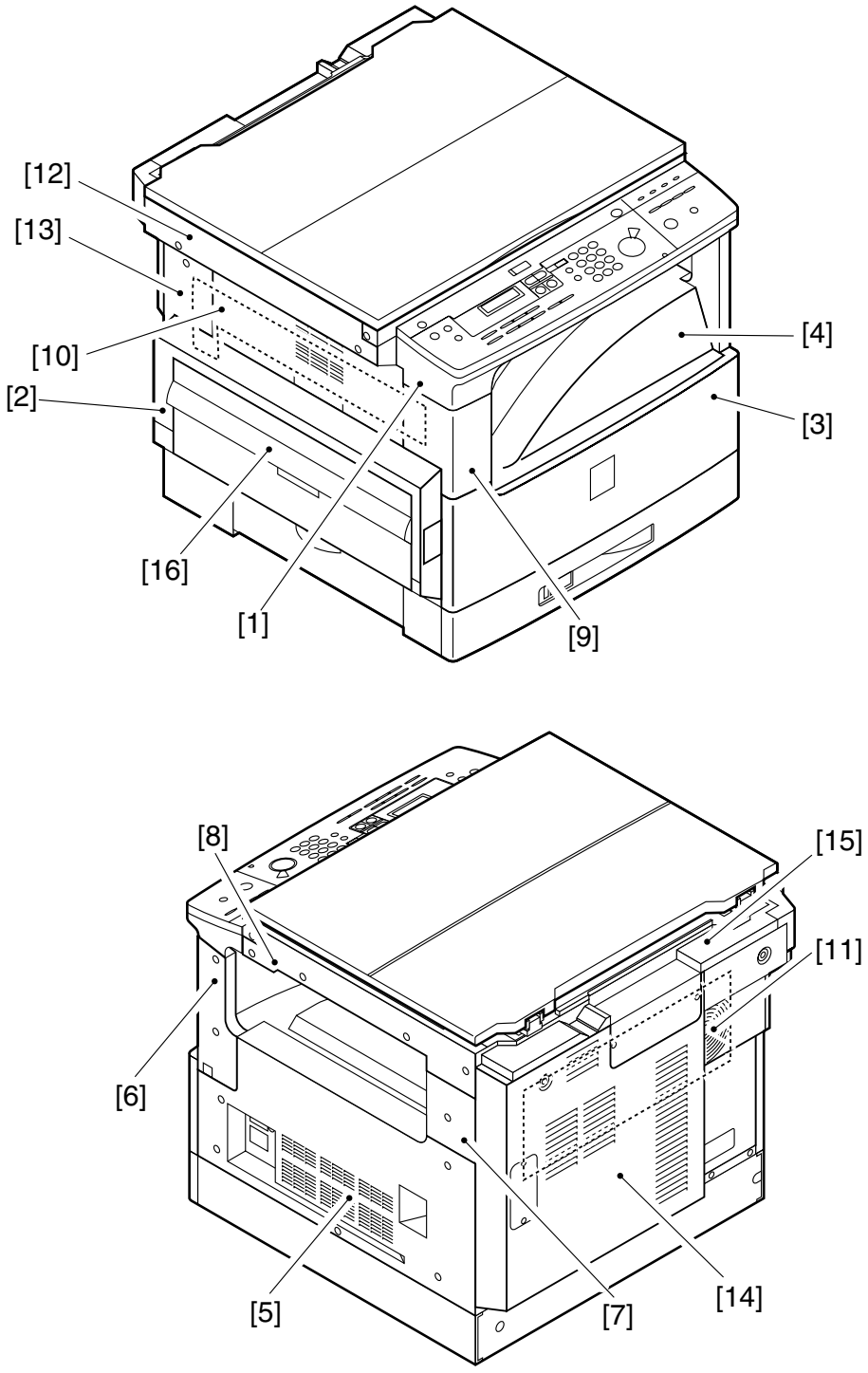
T08-502-07

6 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the drum unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

6.1 External Covers



F08-601-01

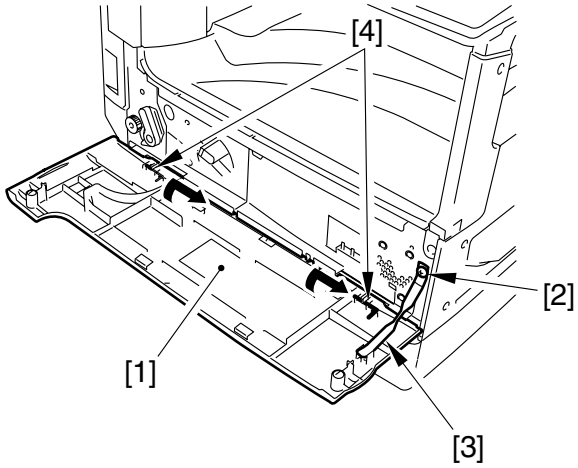
[1] Control panel lower cover (3 screws)
[2] Left cover
[3] Front cover (1 L-shaped pin and 1 screw)
[4] Delivery tray (2 screws)*
[5] Right cover (5 screws)
[6] Right support cover (2 screws)*
[7] Right rear cover (1 screw)
[8] Right upper cover (5 screws)
[9] Left front cover (2 screws)
[10] Delivery upper cover
[11] Delivery rear cover (4 screws)*
[12] Left upper cover (4 screws)
[13] Left rear over (3 screws)
[14] Rear cover (7 screws; however, 13 screws if printer board is mounted)
[15] Rear upper cover (3 screws)*
[16] Multifeeder tray
*Must be removed in specific sequence.

Remove the external covers in the following sequence:

Target cover	Cover to remove
[4] Delivery tray	[5] Right cover ← [10] Delivery upper cover ← [9] Left front cover
[6] Right support cover	[5] Right cover
[11] Delivery right cover	[4] Delivery tray ← [2] Right cover ← [10] Delivery upper cover ← [9] Left front cover
[13] Left rear cover	[16] Multifeeder tray
[15] Rear upper cover	[14] Rear cover ← [12] Left upper cover ← [8] Right upper cover ← ADF or copyboard cover

6.1.1 Removing the Front Cover

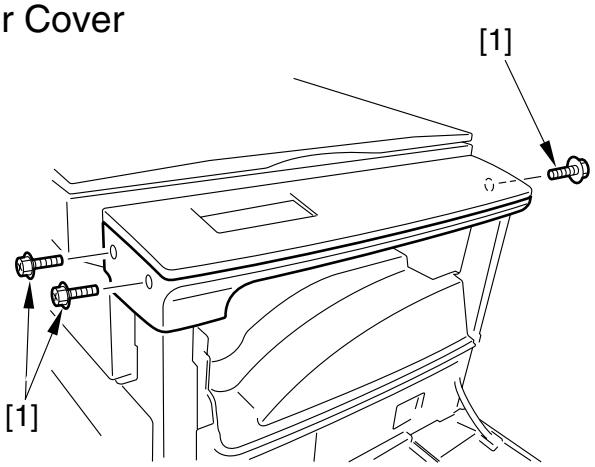
1) Open the front cover [1], and remove the screw [2]; then, remove the door tape [3].
2) Remove the 2 L-shaped pins [4], and detach the front cover [1].



F08-601-02

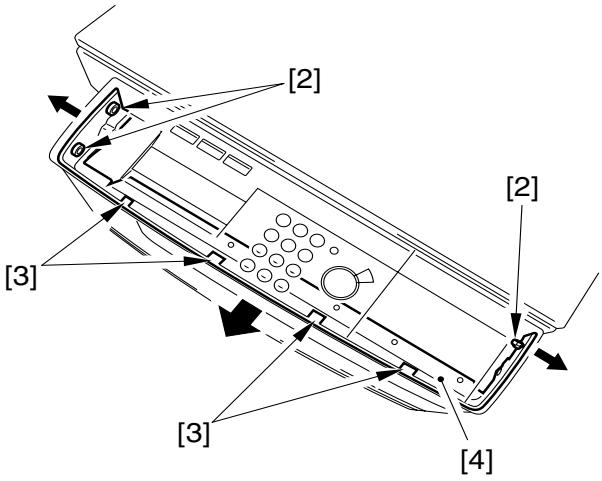
6.1.2 Removing the Control Panel Lower Cover

1) Remove the 3 screws [1].



F08-601-03

2) Remove the 3 bosses [2] on the left and right; then, free the 4 claws [3], and detach the control panel lower cover.

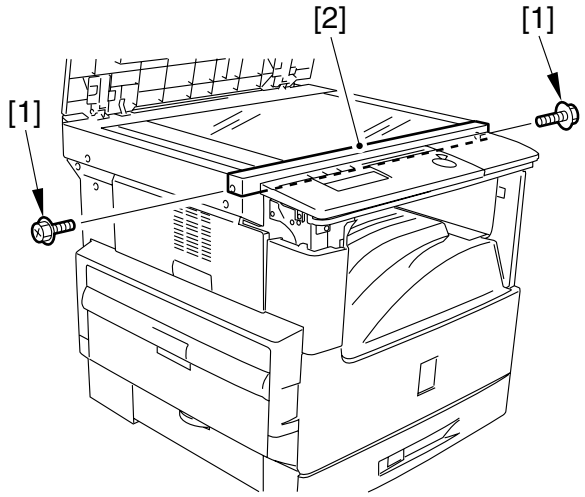


F08-601-04

6.2 Control Panel

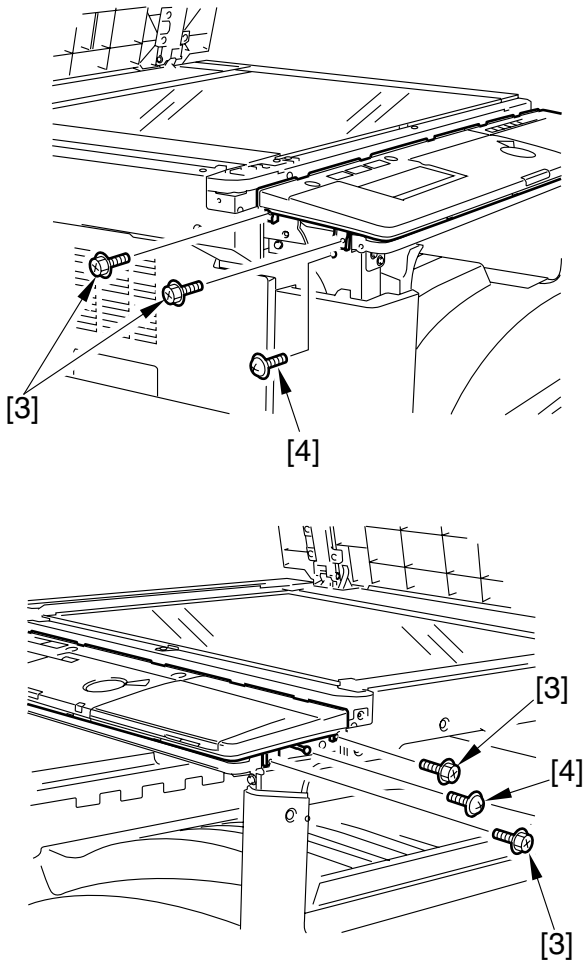
6.2.1 Removing the Control Panel

1) Remove the control panel lower cover. (See to 6.1.2)
2) Remove the 2 screws [1], and detach the control panel upper cover [2].



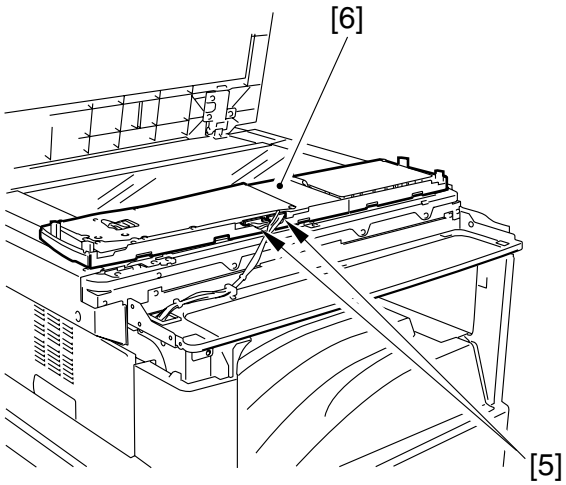
F08-602-01

3) Remove the 2 screws [3] each from the left and right, and 1 screw [4] each from the grounding wire on the left and right.



F08-602-02

4) Disconnect the 2 connectors [5] from behind the control panel, and detach the control panel [6].

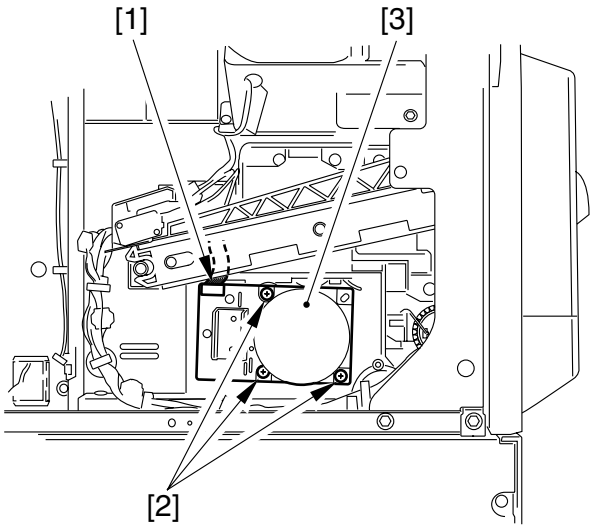


F08-602-03

6.3 Main Motor

6.3.1 Removing the Main Motor

1) Remove the rear cover.
2) Remove the printer board unit. (if equipped with printer functions; see 6.5.11)
3) Disconnect the connector [1].
4) Remove the 3 screws [2], and detach the main motor [3].

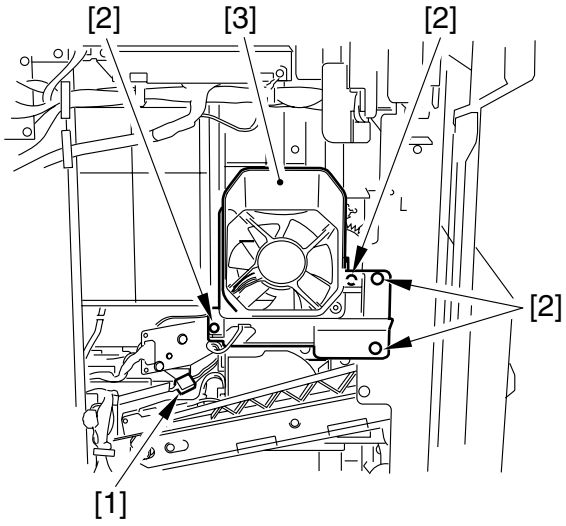


F08-603-01

6.4 Fan

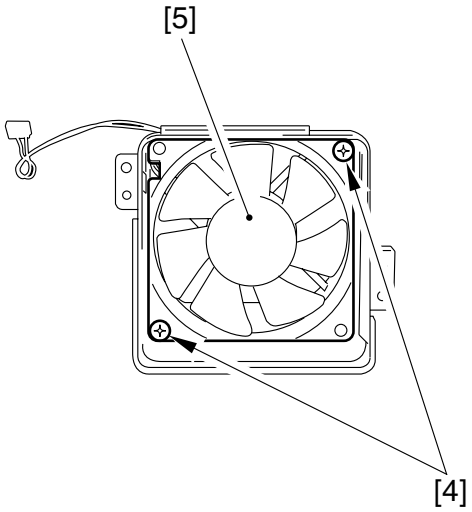
6.4.1 Removing the Heat Discharge Fan

1) Remove the rear cover.
2) Remove the printer board unit. (if equipped with printer functions; see 6.5.11)
3) Disconnect the connector [1].
4) Remove the 4 screws [2], and detach the heat discharge fan assembly [3].



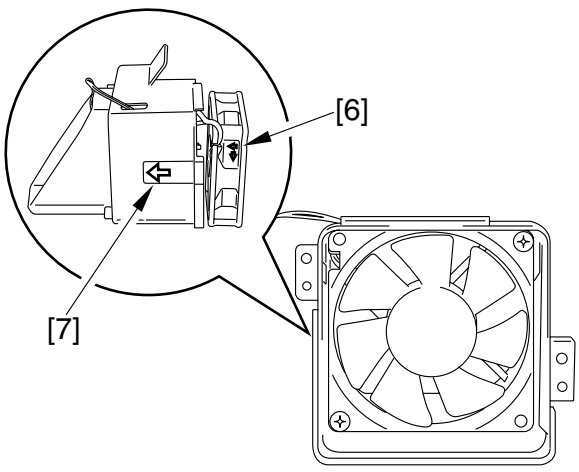
F08-604-01

5) Remove the 2 screws [4], and detach the heat discharge fan [5].



F08-604-02

When mounting the heat discharge fan, be sure to match the arrow [6] indicating the direction of air current and the arrow [7] on the hood.

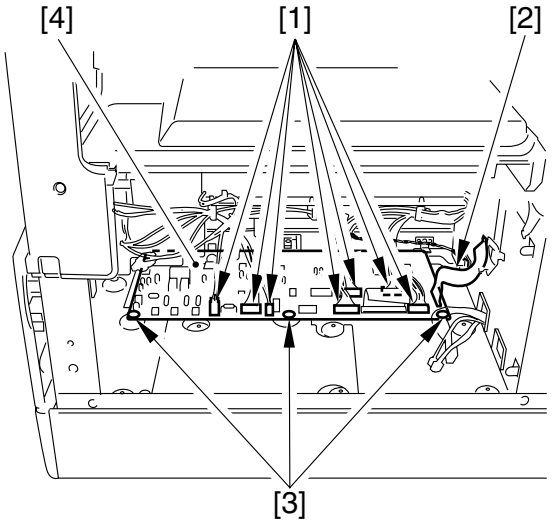


F08-604-03

6.5 PCBs

6.5.1 Removing the DC Controller PCB

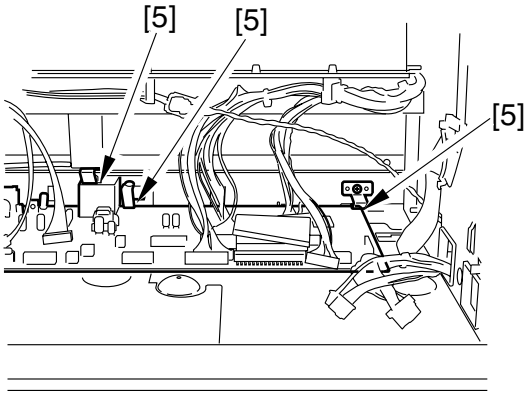
1) Remove the power supply PCB. (6.5.9 in Chapter8)
2) Disconnect all connectors [1] and the flexible cable [2] from the DC controller PCB.
3) Remove the 3 screws [3], and detach the DC controller PCB [4].



F08-605-01

When mounting the PCB, be sure that the 3 high-voltage contacts [5] are as indicated.

4) If you have replaced the PCB, go through the instructions given for replacement (See to 2.1.3 in Chapter 13).



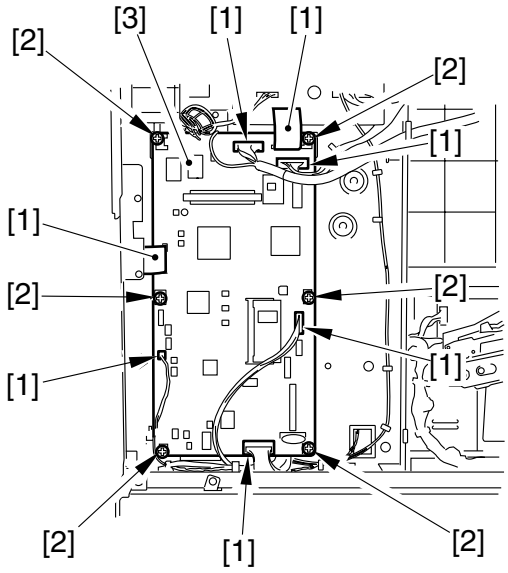
F08-605-02

6.5.2 After Replacing the DC Controller PCB

1) After replacing the PCB, go through the steps given under 2.1.3 of Chapter 13 to adjust the leading edge margin and to check if the image leading edge margin is as indicated.
2) If not, perform the steps so that the margin is as indicated.

6.5.3 Removing the Image Processor PCB

1) If you replace the PCB, go through the instructions given for replacement (See to 2.3.4 in Chapter13).
2) Remove the rear cover.
3) Disconnect all connectors and the flexible cable [1] from the image processor PCB.
4) Remove the 6 screws [2], and detach the image processor PCB [3].
5) If you have replaced the PCB, go through the instructions given for replacement (See to 2.3.4 in Chapter13).



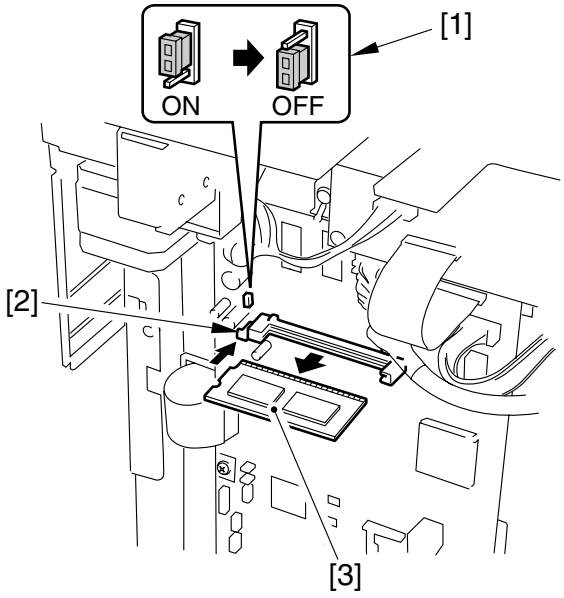
F08-605-03

6.5.4 When Replacing the Image Processor PCB

Go through the steps given for the replacement of the image processor in 2.3.4 of Chapter 13.

6.5.5 Removing the RAM DIMM

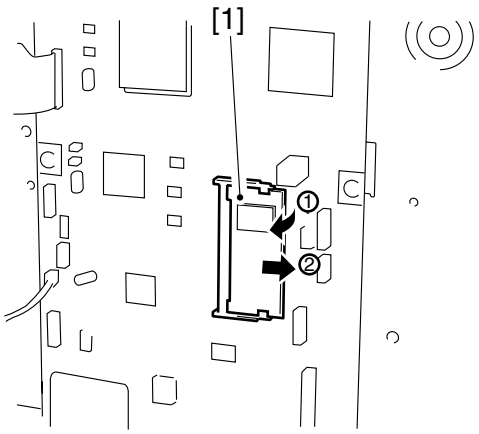
1) If equipped with fax functions, change the jumper plug [1] (JP2) to OFF.
2) Taking care not to touch the elements, push down the socket lever [2], and detach the RAM DIMM [3].
(The number of slots differs from model to model.)



F08-605-04

6.5.6 Removing the ROM DIMM

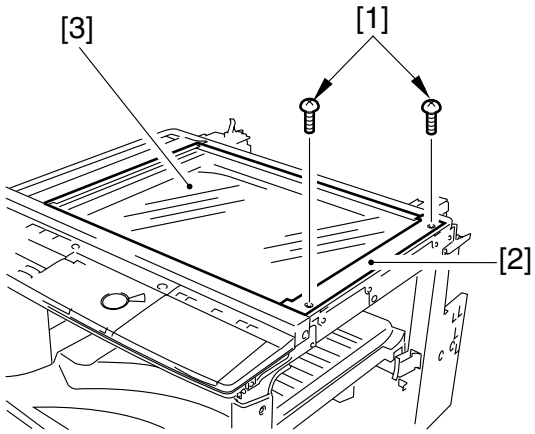
1) Holding the right edge of the ROM DIMM [1], pull it to the front and slide it to remove.



F08-605-05

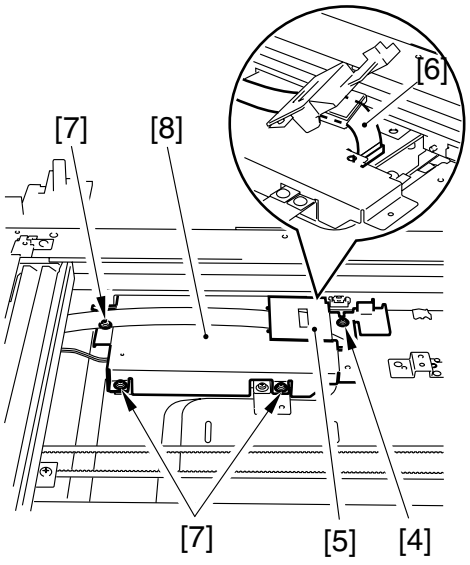
6.5.7 Removing the Analog Processor PCB

1) Remove the rear upper cover.
2) Remove the 2 screws [1], and detach the copyboard glass retainer (right) [2].
3) Remove the copyboard glass [3].



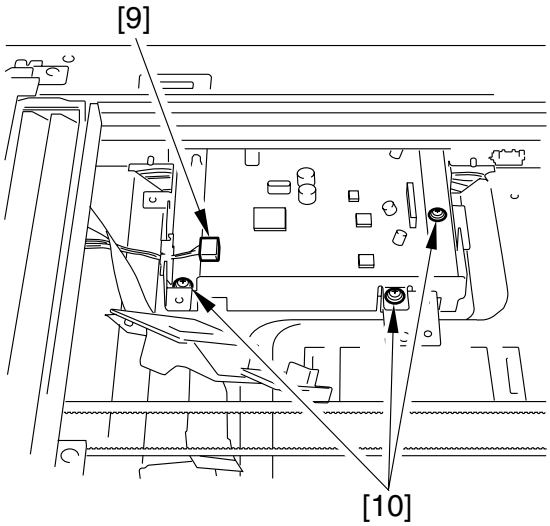
F08-605-06

4) Remove other screw [4], and detach the flexible cable retainer [5].
5) Remove the flexible cable [6].
6) Remove the 3 screws [7], and detach the protective panel [8].



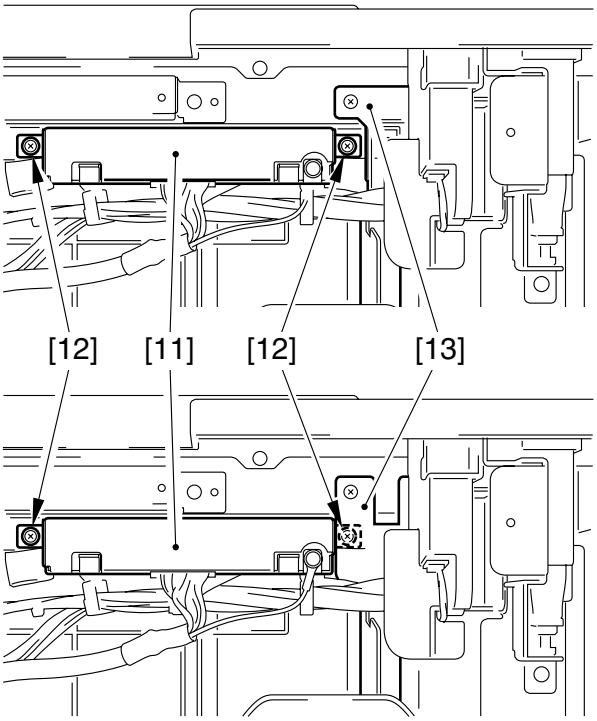
F08-605-07

7) Disconnect the connector [9], and remove the 3 screws [10].



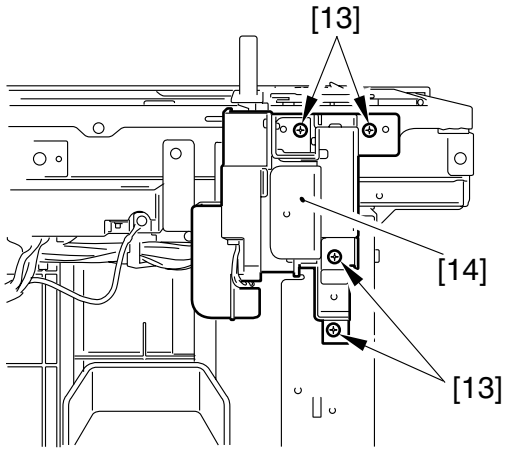
F08-605-08

8) Remove the printer board. (if equipped with printer functions; see to 6.5.11 in Chapter8)
9) If the mounting screw [12] of the analog processor PCB [11] is hidden behind the humidity preventing plate [13], perform the following:
If the screw [12] is not hidden, go to step 12).



F08-605-09

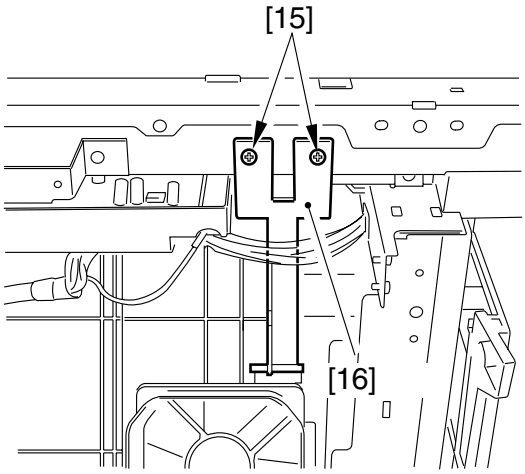
10) Remove the 4 screws [13], detach the copyboard cover open/closed detecting unit [14].



F08-605-10

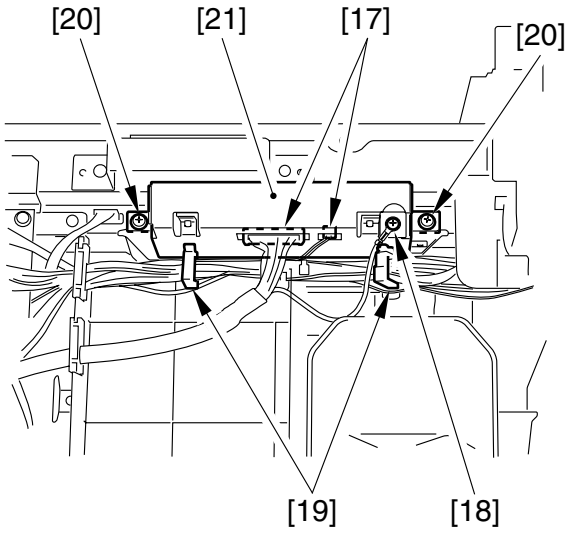
When mounting the copyboard open/closed detecting unit, be sure to use the black binding screw 3 mm in diameter. Take care not to use the wrong screw.

11) Remove the 2 screws [15], detach the humidity preventing plate[16].



F08-605-11

12) Disconnect the 2 connectors [17], and remove the screw [18] of the grounding wire; then, free the harness from the 2 clamps [19].
13) Remove the 2 screws [20], and pull the analog processor PCB [21] to the front to detach.
14) If you have replaced the PCB, go through the instructions given for replacement (See to 2.3.6 in Chapter13).



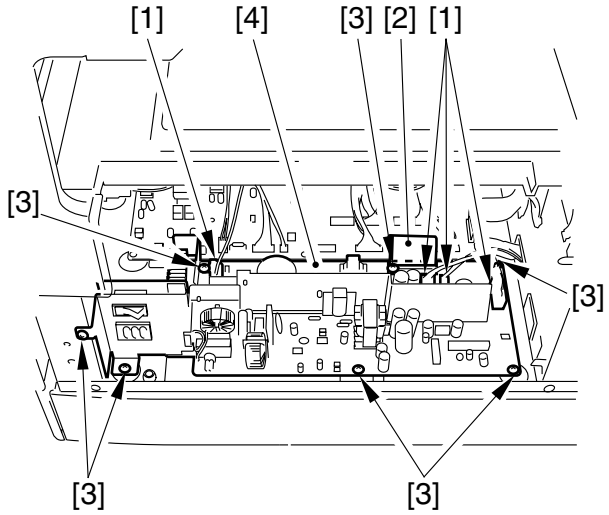
F08-605-12

6.5.8 After Replacing the Analog Processor PCB

Go through the instructions given for the replacement of the analog processor PCB in 2.3.6 of Chapter13.

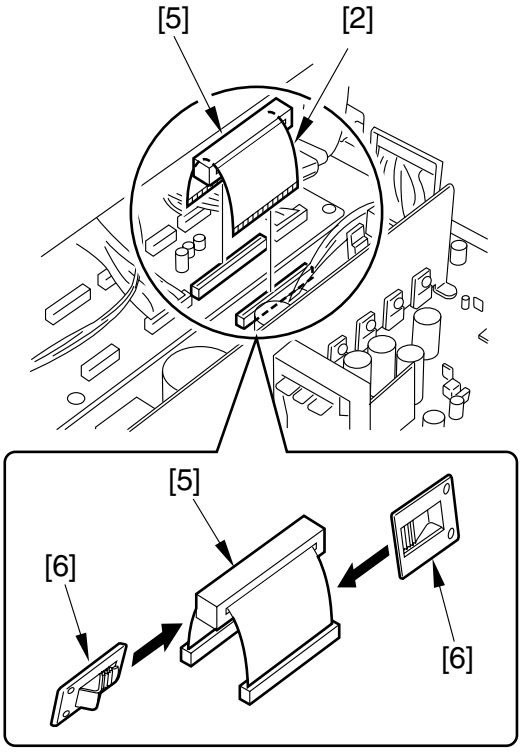
6.5.9 Removing the Power Supply PCB

1) Remove the right cover.
2) Disconnect the 4 connectors [1] and the flexible cable [2] from the power supply PCB.
3) Remove the 7 screws [3] from the power supply PCB, and detach the power supply PCB [4].



F08-605-13

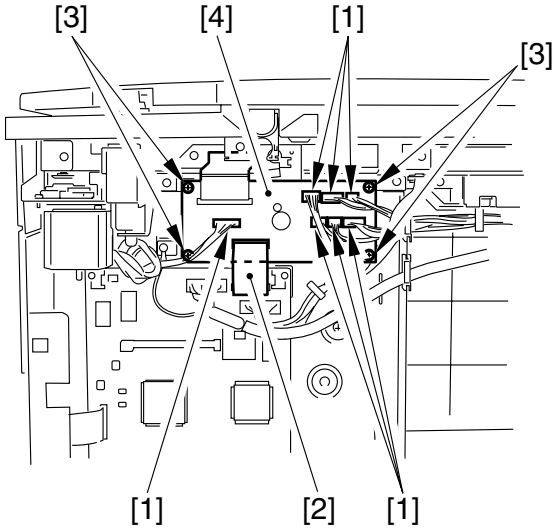
• If equipped with the core [5]. (difference from models)
When fitting the flexible cable [2], make sure that it is laid as shown in relation to the core [5]; then, fit the 2 clips [6] in front and at back of the core [5] (by reversing left and right) to secure the core [5] in place.



F08-605-14

6.5.10 Removing the Original Detection/Reader Motor PCB

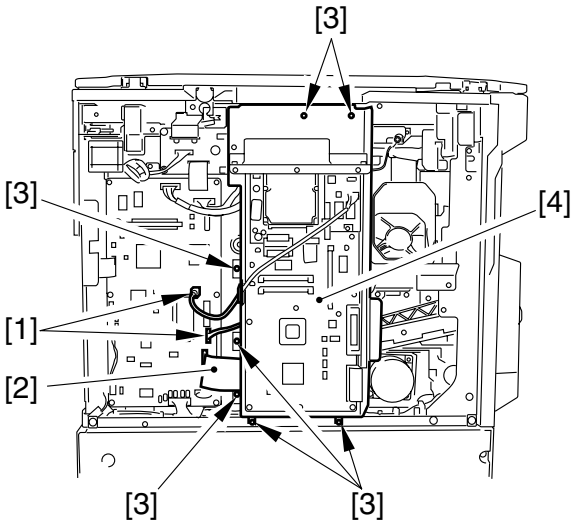
1) Remove the rear over.
2) Remove the printer board unit. (if equipped with printer functions; see to 6.5.11 in this chapter)
3) Disconnect the 7 connectors [1] and the flexible cable [2].
4) Remove the 4 screws [3], and detach the original detection/reader motor drive PCB [4].



F08-605-15

6.5.11 Removing the Printer Board Unit (if equipped with printer functions)

1) Remove the rear cover.
2) Disconnect the 2 connectors [1] and the flexible cable [2] from the image processor PCB.
3) Remove the 7 screws [3], and detach the printer board unit [4].



F08-605-16

6.5.12 Removing the Cassette controller PCB (20 cpm model only)

See to 4.3.1 in Chapter9.

CHAPTER 9

CASSETTE UNIT

1 Outline

1.1 Outline

The machine may be equipped with a 1-cassette, 3-cassette (for 16cpm model), or 2-cassette (for 20cpm model) feeding unit.

1.2 Specifications and Construction

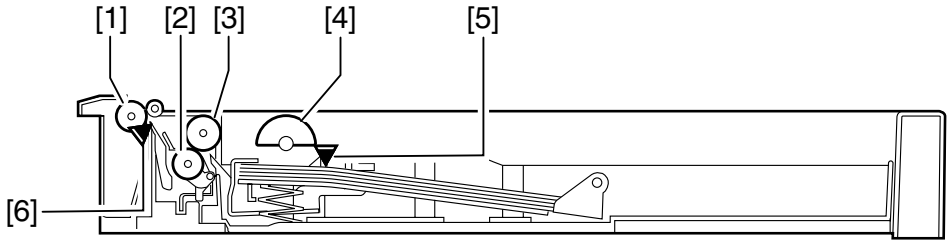
Item	Description
Pickup	Retard method
Paper stack	
1-cassette unit	250 sheets (80 g/m^2)
2-cassette unit	250 sheets x 2 (80/m^2)
3-cassette unit	250 cassette x 3 (80 g/m^2)
Paper size setting	By user
Paper type	Plain, recycled paper (60 to 90 g/m^2)
Paper size	A5/STMT to A3/11 x 17 (279mm x 432mm)
Pickup control	
1-cassette unit	1-cassette unit controller PCB
2-cassette unit	2/3-cassette unit controller PCB
3-cassette unit	2/3-cassette unit controller PCB
Drive source	
1-cassette unit	From main motor of host
2-cassette unit	From pickup motor of cassette unit
3-cassette unit	For cassette 1, from main motor of host; for 2/3 cassette, from cassette pickup motor mounted to 2nd cassette

T09-102-01

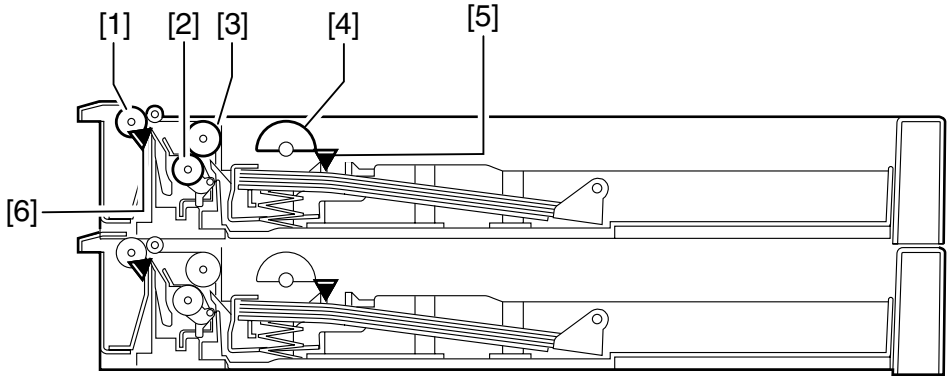
1.3 Arrangement of Major Rollers and Sensors

The major rollers and sensors are arranged as follows:

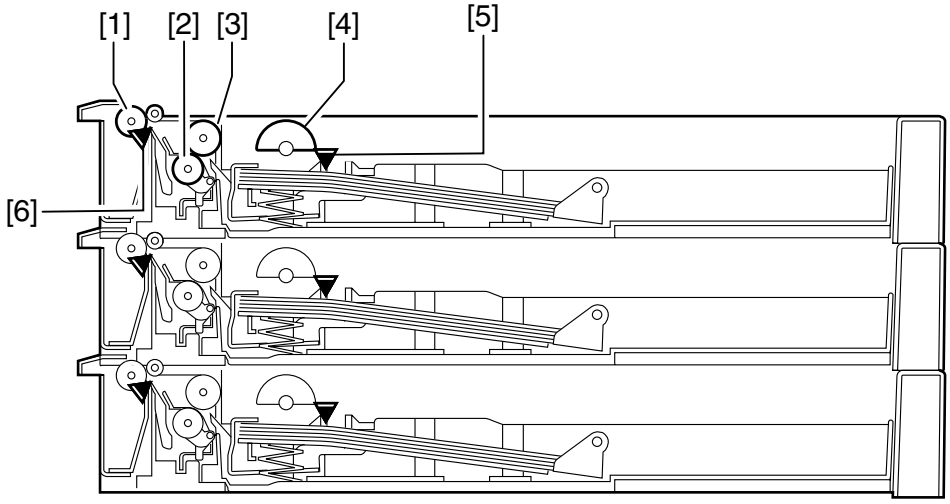
- 1-Cassette Unit



- 2-Cassette Unit



- 3-Cassette Unit



F09-103-01

Ref.	Name
[1]	Vertical path roller
[2]	Separation roller
[3]	Feeding roller
[4]	Pickup roller
[5]	Cassette paper sensor (PS151)
[6]	Re-try sensor (PS152)

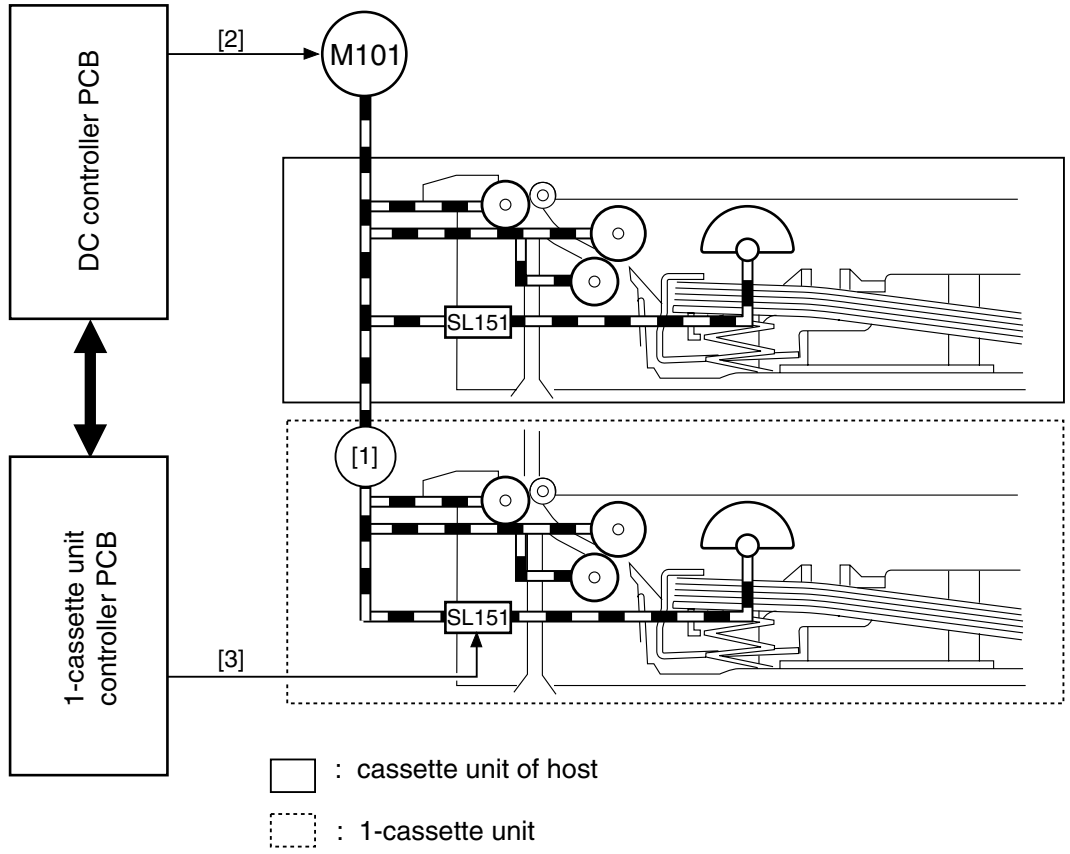
T09-103-01

2 Pickup Assembly

2.1 Pickup Control System

The following diagram shows the pickup control system:

- 1-Cassette Unit

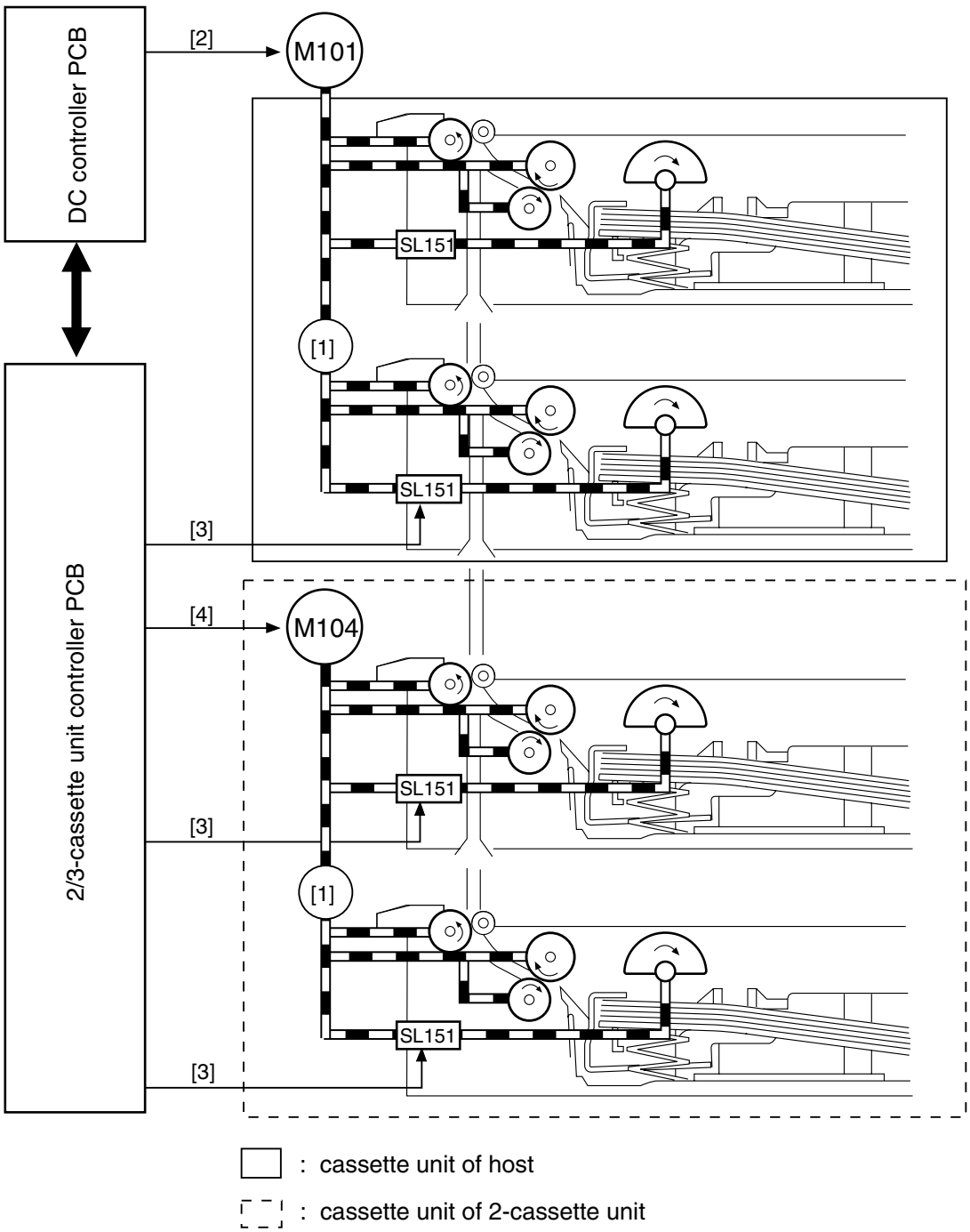


F09-201-01

Ref.	Name
[1]	Link gear
[2]	Main motor drive signal (MTRON)
[3]	Cassette pickup solenoid drive signal (CSTFD)

T09-201-01

- 2-Cassette Unit

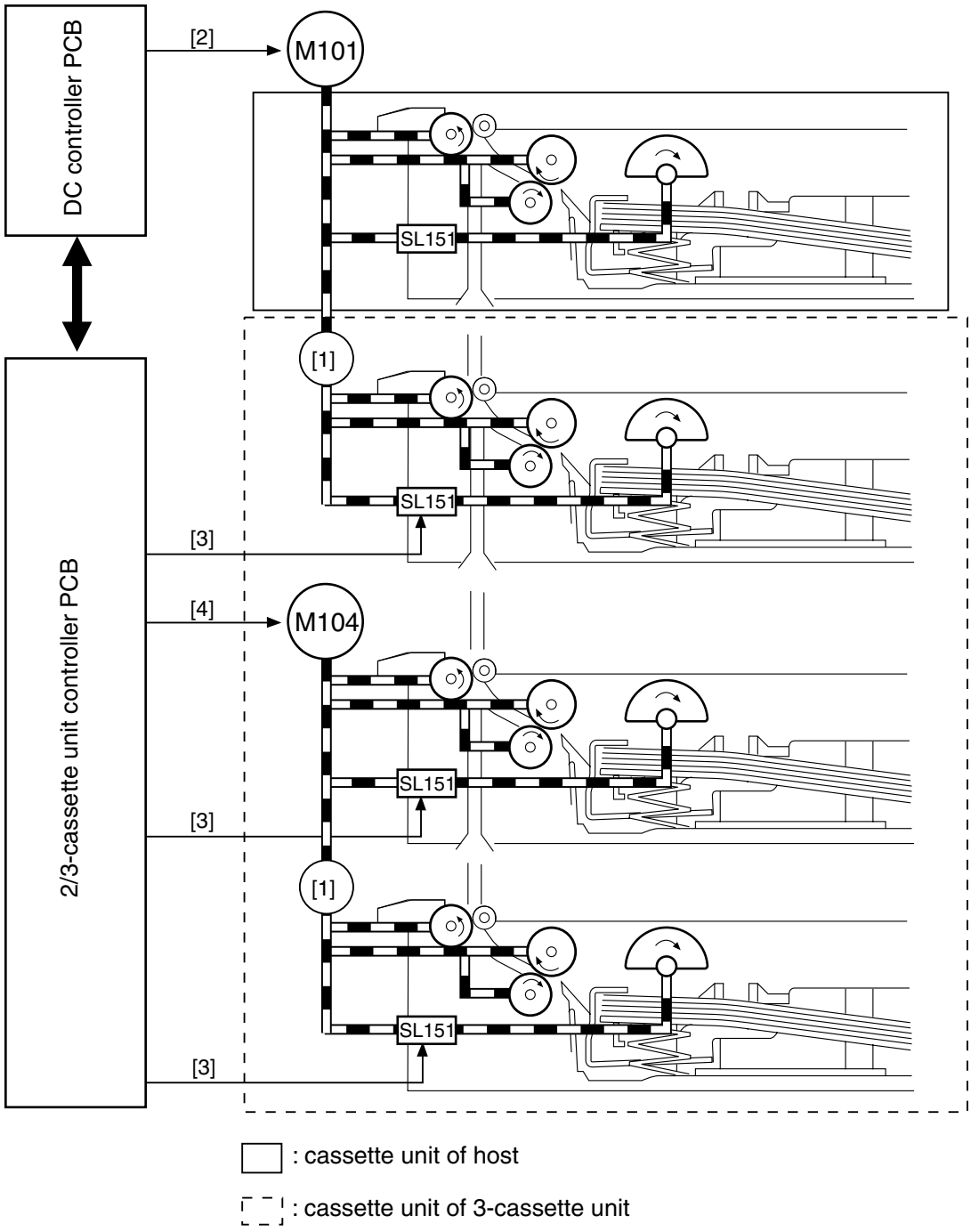


F09-201-02

Ref.	Name
[1]	Link gear
[2]	Main motor drive signal (MTRON)
[3]	Pickup solenoid drive signal (CSTFD)
[4]	Pickup motor drive signal (MTRON)

T09-201-02

- 3-Cassette Unit



F09-201-03

Ref.	Name
[1]	Link gear
[2]	Main motor drive signal (MTRON)
[3]	Pickup solenoid drive signal (CSTFD)
[4]	Pickup motor drive signal (MTRON)

T09-201-03

2.2 Pickup Control

See 2.1 of Chapter 6.

2.3 Cassette Pickup Operation

See 2.1 of Chapter 6.

2.4 Pickup Re-Try Operation

See 2.1 of Chapter 6.

2.5 Cassette Paper Size Detection

See 2.1 of Chapter 6.

3 Detecting Jams

3.1 Outline

The re-try sensor (PS152) mounted to the cassette unit is used to monitor the movement of paper, and the cassette paper sensor (PS151) is mounted to detect the presence/absence of paper inside the cassette.

The presence/absence of paper is checked at such times as programmed in the CPU of the cassette unit controller PCB; when a jam is detected, the CPU will immediately turn off the main motor (M101) and pickup motor (M104) for the host and indicate the Jam message on the control panel.

3.2 Sequence of Jam Detection

3.2.1 Delay Jam

See 4.2.1 of Chapter 6.

3.2.2 Stationary Jam

See 4.2.2 of Chapter 6.

3.2.3 Jam History

Se 4.2.4 of Chapter 6.

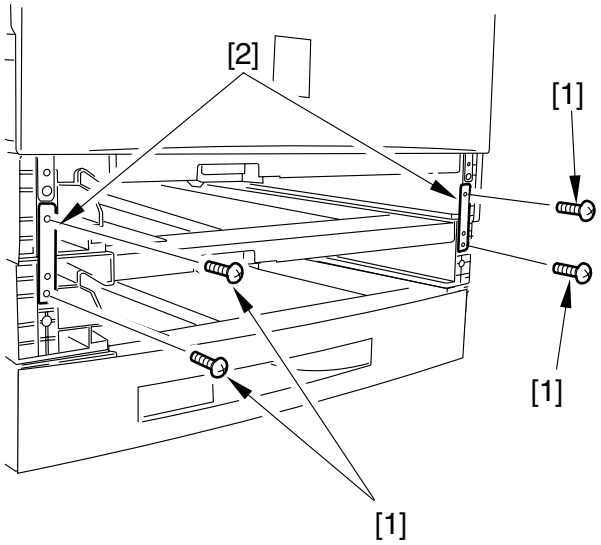
4 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the durm unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

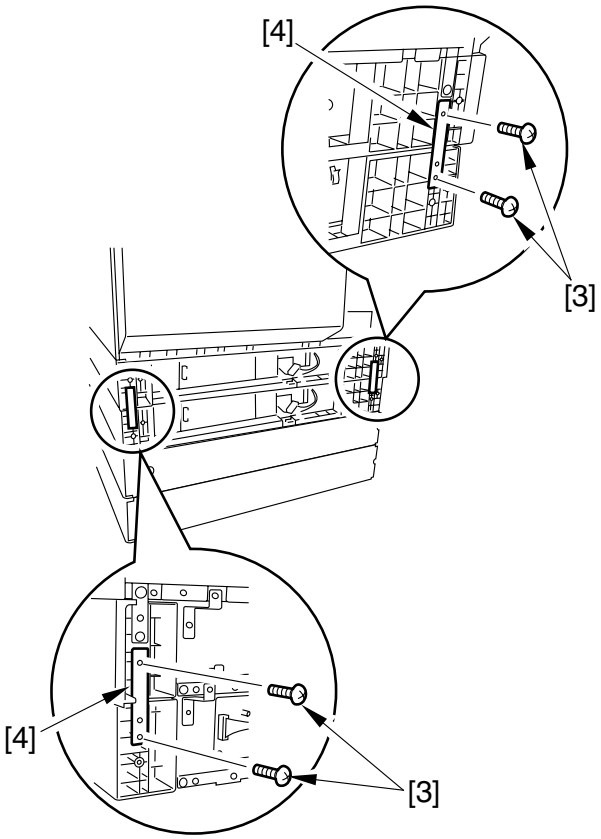
4.1 Removing the Cassette Unit

1) Remove the host cassette and the cassette under it.
2) Remove the 4 screws [1], and detach the 2 linking plates [2].



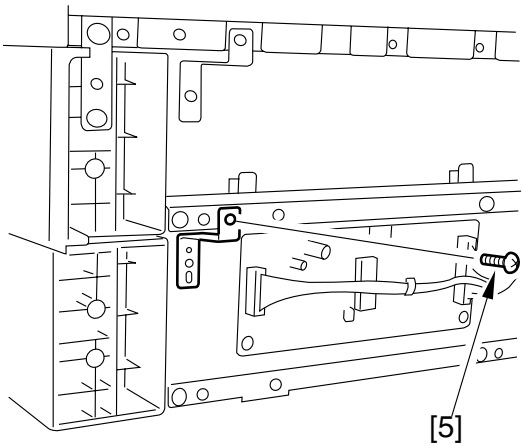
F09-401-01

3) Remove the cassette rear cover.
4) Remove the 4 screws [3] from the rear of the machine, and detach the 2 link plates [4].



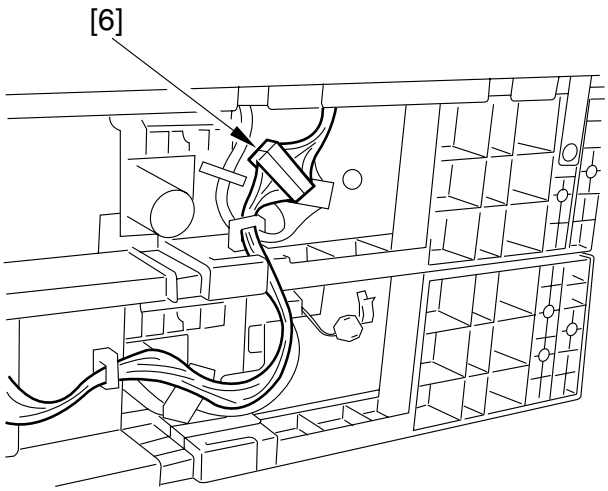
F09-401-02

5) Remove the washer screw [5].



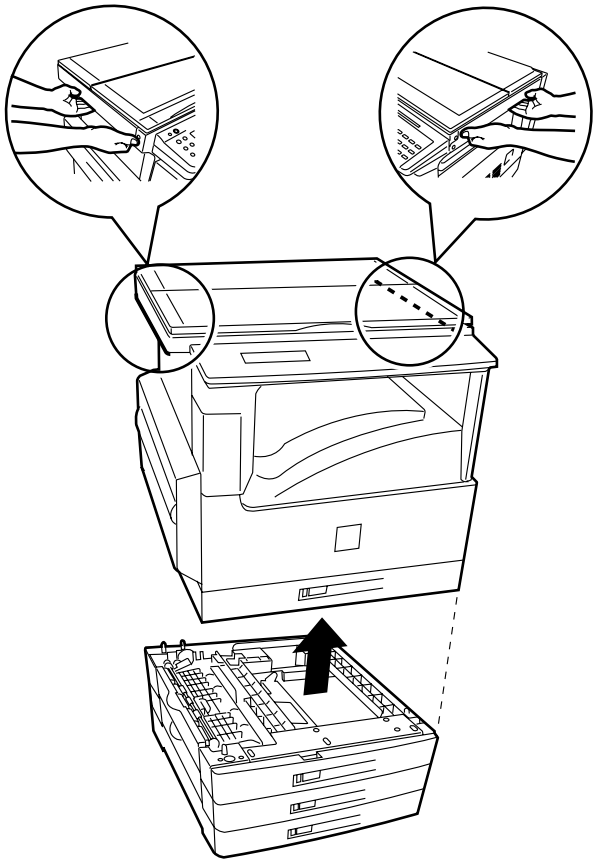
F09-401-03

6) Disconnect the connector [6], and free the harness from the guide.



F09-401-04

7) Keeping your hands as indicated, detach the host.



F09-401-05

4.2 Cassette Pickup Assembly

4.2.1 Removing the Cassette Pickup Assembly

See Chapter 6.

4.2.2 Removing the Cassette Pickup Roller

See Chapter 6.

4.2.3 Removing the Cassette Pickup Solenoid

See Chapter 6

4.2.4 Removing the Paper Size Switch

See Chapter 6

4.2.5 Removing the Cassette Paper Sensor

See Chapter 6

4.2.6 Removing the Re-Try Sensor

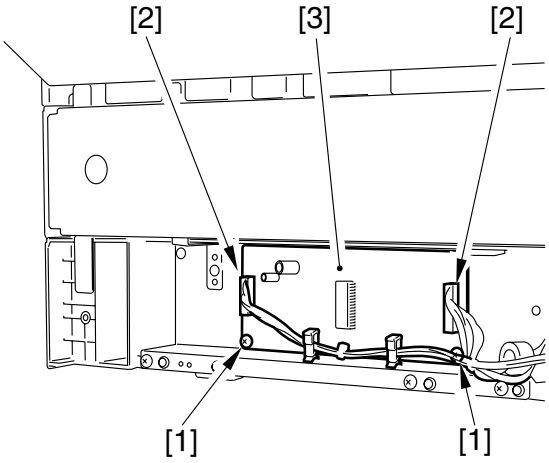
See Chapter 6.

4.3 PCBs

4.3.1 Removing the Cassette Unit Controller PCB

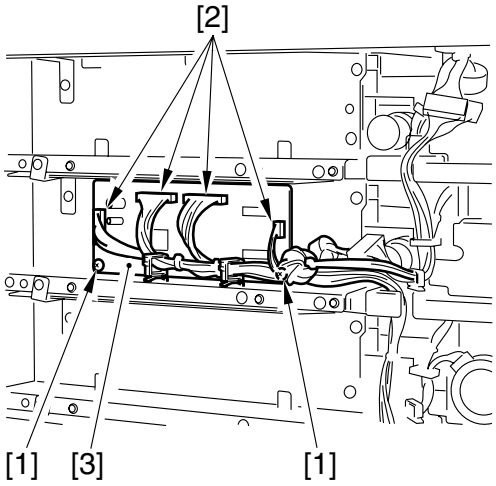
1) Remove the cassette rear cover.
2) Remove the 2 screws [1], and disconnect all connectors [2] from the PCB; then, detach the cassette unit controller PCB [3].

- 1-Cassette unit



F09-403-01

- 2/3-Cassette unit

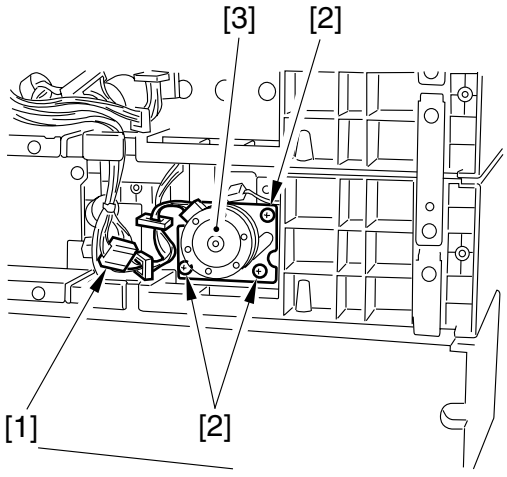


F09-403-02

4.4 Drive-Related Parts

4.4.1 Removing the Pickup Motor

1) Remove the cassette rear cover.
2) Remove the 4 screws [1], and disconnect the connector [2]; then, detach the pickup motor [3].



F09-404-01

CHAPTER 10

INNER 2-WAY TRAY

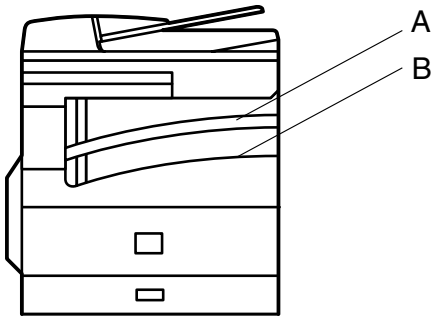
1 Specifications

1.1 System

Item	Description
Number of bins	2 in total 1 bin (No. 2 delivery slot) Host internal delivery tray (No. 1 delivery slot)
Stacking	Face-down
Paper type	Plain, recycled paper (from 60 to 90 g/m^2)
Paper size	A3/279.4 x 431.8mm (11x17 to A5/STMT)
Stack	
Upper tray	100 sheets (A4, B5, LTR) 50 sheets (A3, B4, A4R, B5R, A5, A5R, 11x17, LGL, LTRR, STMT, STMTR)
Lower tray	same as host
Power supply	DC24V/5V from host

T10-101-01

Names of Trays

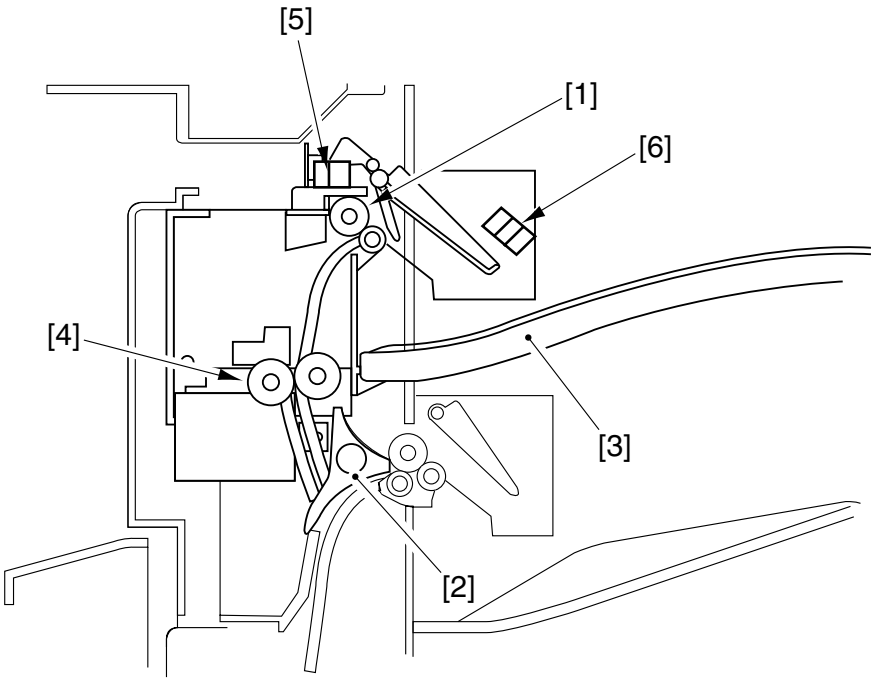


F10-101-01

tray A : No. 2 delivery slot
tray B : No. 1 delivery slot (host)

1.2 Arrangement of Rollers and Sensors

The major rollers and sensors of the inner 2-way tray are arranged as follows:



[1] No. 2 delivery roller
[2] Delivery flapper
[3] No. 2 delivery tray
[4] No. 2 delivery roller
[5] No. 2 delivery sensor
[6] No. 2 full detection sensor

F10-102-01

2 Controlling Delivery Operation

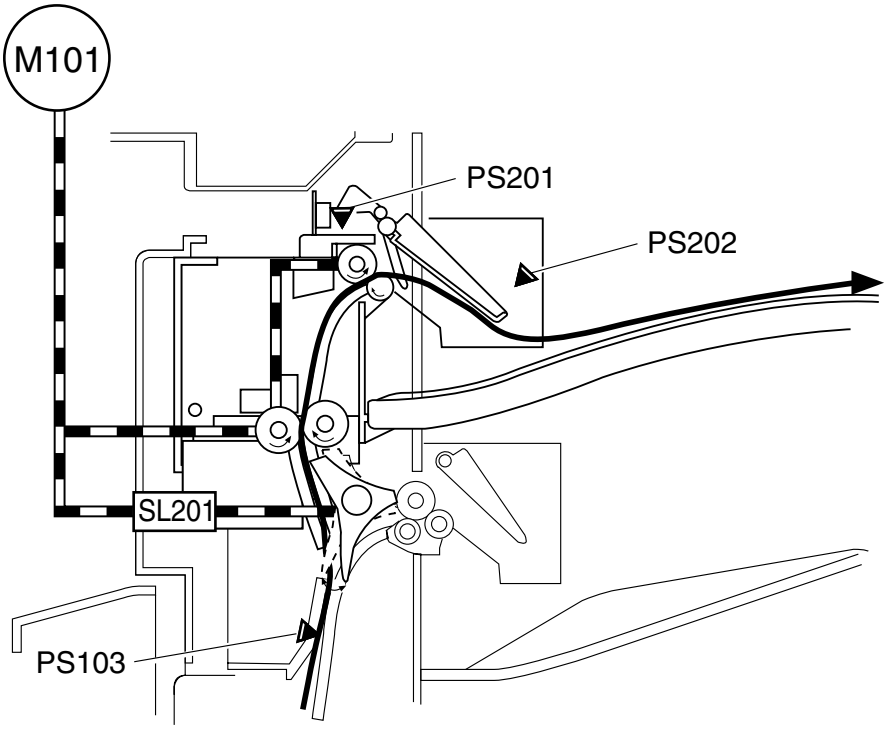
2.1 Controlling Delivery Operation

Paper is delivered to the No. 2 delivery slot as follows:

When paper is fed from the host's fixing assembly and its leading edge reaches the delivery sensor (PS103), the 2-way delivery solenoid (SL201) goes ON to switch the paper path to the No. 2 delivery slot.

The paper being moved is detected by the delivery sensor (PS201).

The volume of paper in the delivery tray is monitored by the No.2 full detection sensor (PS202).



F10-201-01

2.2 Selecting a Delivery Slot (user mode)

Delivery tray A or delivery tray B may be selected for a specific type of output (copies, prints) when installing the inner 2-way tray.

Memo

user mode>01 COMMON SETTINGS>07 TRAY SETTINGS>TRAY A, TRAY B

3 Detecting Jams

3.1 Outline

The No. 2 delivery sensor mounted to the inner 2-way tray is used to monitor the movement of paper.

The presence/absence of paper is checked in relation to the presence/absence of paper over a specific sensor at such times as programmed in the CPU of the DC controller PCB. If a jam is detected, the CPU will immediately turn off the host's main motor (M101) and indicate the Jam message in the control panel.

3.2 Sequence of Jam Detection

3.2.1 Delay Jam

See 4.2.1 of Chapter 6.

3.2.2 Stationary Jam

See 4.2.2 of Chapter 6.

3.2.3 Jam History

See 4.2.4 of Chapter 6.

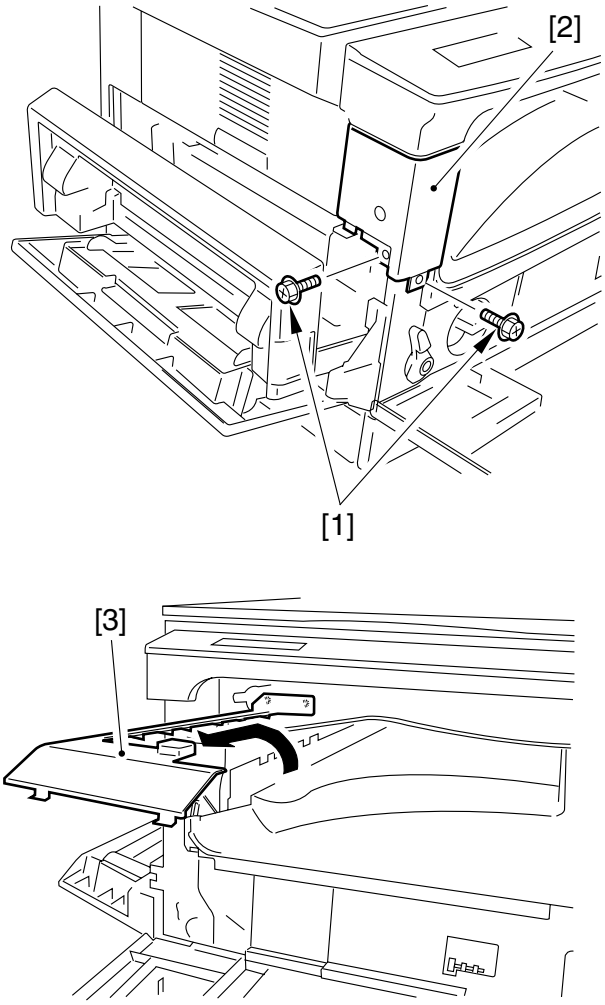
4 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug. Moreover, if you have removed the durm unit, be sure to keep it in a protective bag.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by type (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.

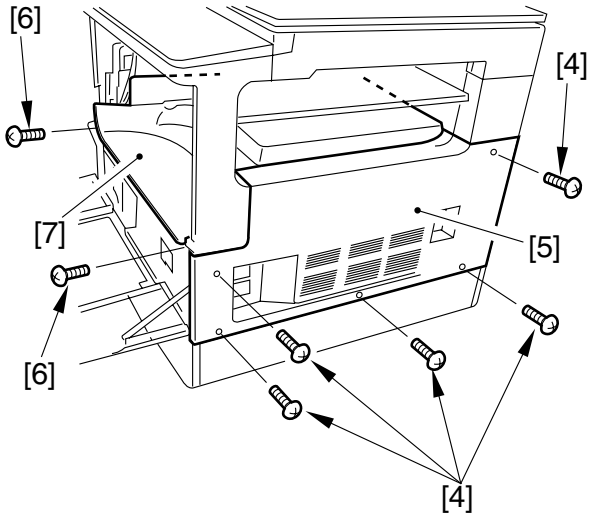
4.1 Removing the Inner 2-Way Unit

1) Remove the left cover.
2) Remove the drum unit (See to 7.1.1 in Chapter 5).
3) Remove the multifeeder tray.
4) Remove the left rear cover.
5) Remove the 2 screws [1], and detach the left front cover [2]; then, detach the inner deliver upper cover [3].



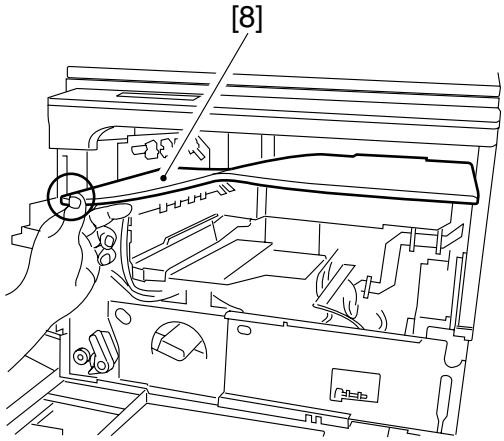
F10-401-01

6) Open the front cover, and remove the 5 screws [4]; then, detach the right cover [5].
7) Remove the 2 screws [6], and detach the delivery tray [7].



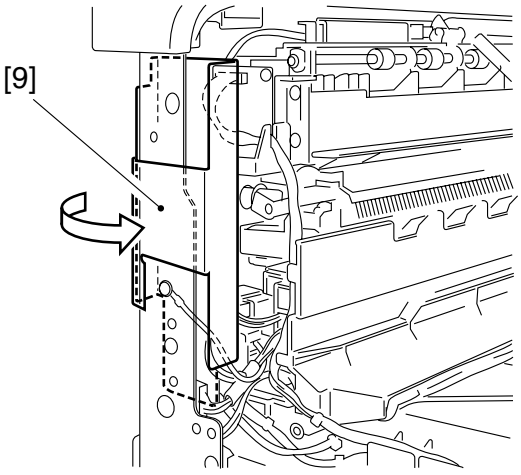
F10-401-02

8) Remove the inner delivery tray [8].



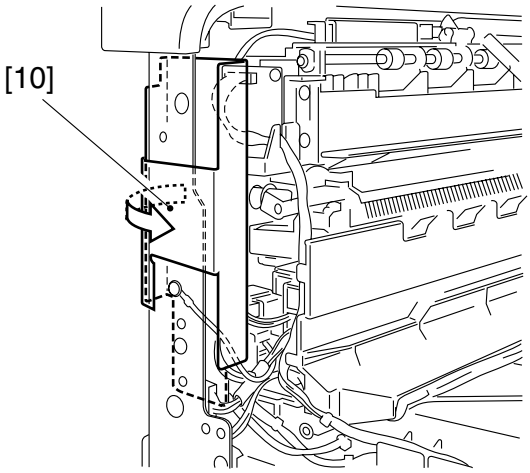
F10-401-03

9) Detach the fixing connector cover [9] as shown.



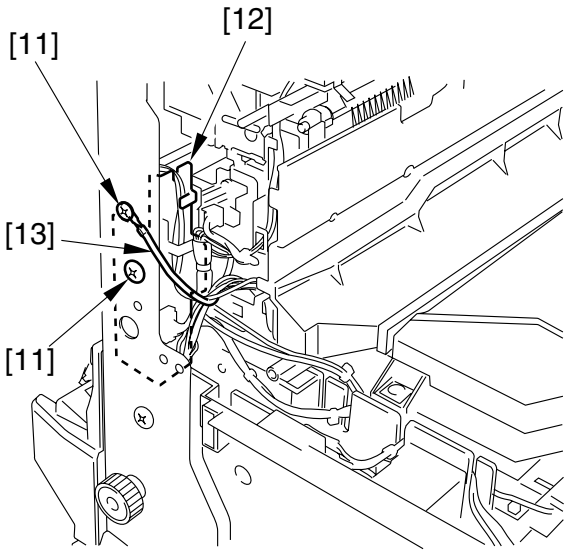
F10-401-04

10) Disconnect the connector [10] of the inner 2-way tray PCB; then, free the harness from the harness guide.



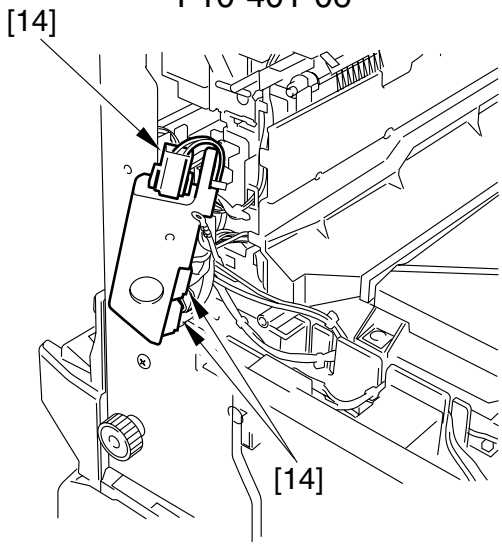
F10-401-05

11) Remove the 2 screws [11], and remove the fixing connector fixing plate [12] and the grounding wire [13].



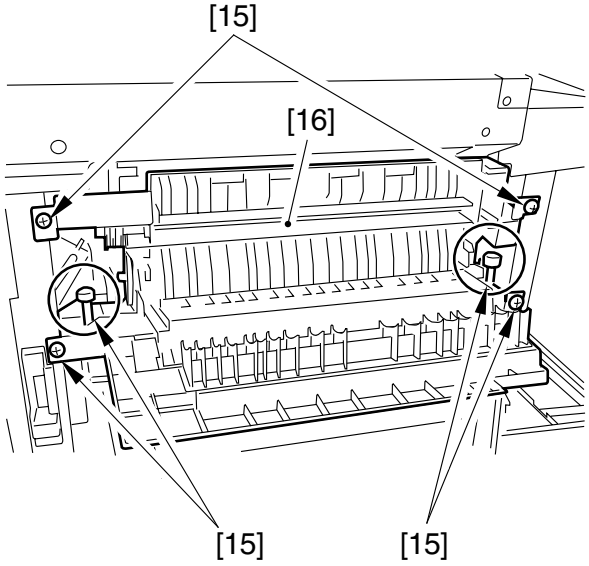
F10-401-06

12) Disconnect the 3 connectors [14] from the fixing connector fixing plate, and free the harness from the harness guide.



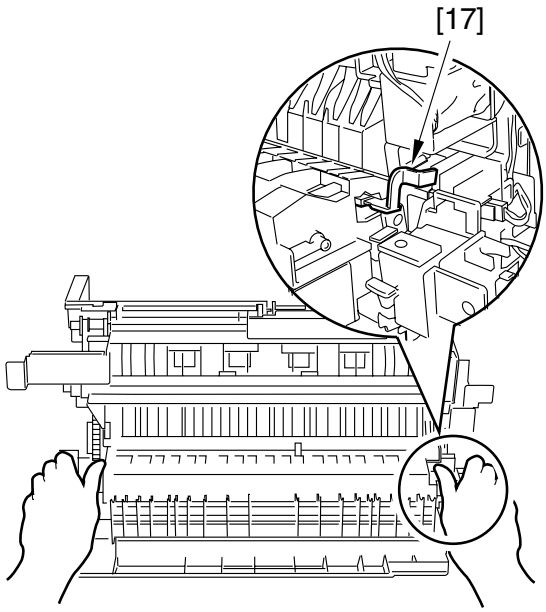
F10-401-07

13) Open the fixing cover, and remove the 6 screws [15]; then, detach the fixing unit [16].



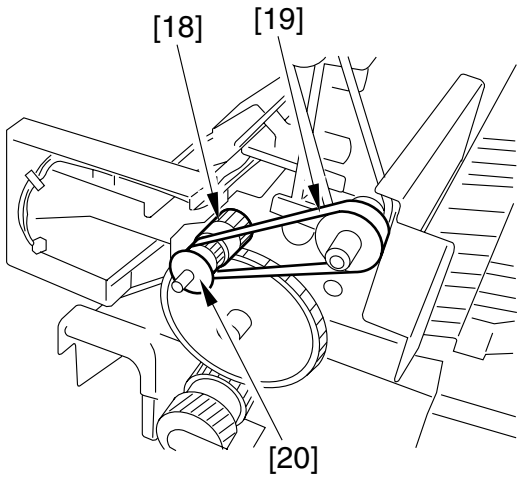
F10-401-08

1. For the screw inside the circle, be sure to use a hex wrench (less than 2 mm).
2. When removing the fixing assembly, be sure to hold it as shown. Be sure not to impose force on the sensor lever [17].



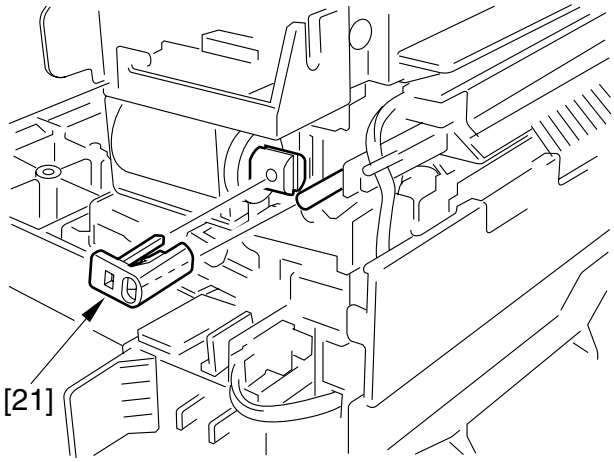
F10-401-09

14) Remove the inner delivery gear [18], feeding roller drive belt [19], and pulley flange [20] of the fixing assembly.



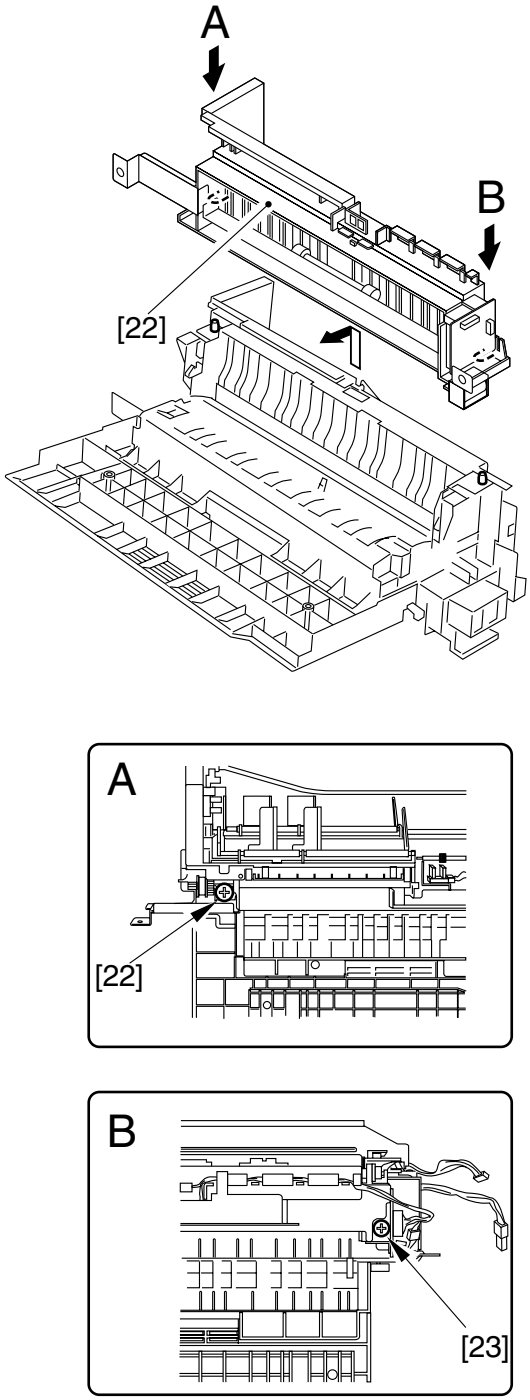
F10-401-10

15) Remove the solenoid pin [21] used to link the solenoid arm and the plunger.



F10-401-11

16) Remove the 2 screws [22], and detach the inner 2-way solenoid [23].



F10-401-12

CHAPTER 11

INSTALLATION

1 Selecting the Site of Installation

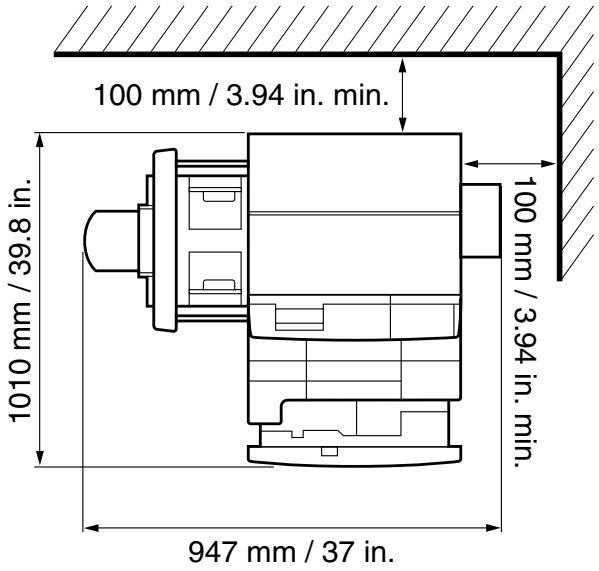
The site must meet the following requirements; if possible, visit the user's before the delivery of the machine:

1. There must be a power outlet that may be used exclusively for the machine and rated as indicated (±10%).

Do not use piping used for gas services to connect the grounding wire.

2. The site must be between 15° and 30°C (59° to 86°F) in temperature and between 10% and 80% in humidity. Avoid areas near a water faucet, water boiler, humidifier, and refrigerator.
3. Avoid areas near a source of fire or areas subject to dust or ammonium gas. If exposed to direct rays of the sun, provide curtains.
4. The level of ozone generated by the machine in sue should not affect the health of the individuals around it. Some, nevertheless, find the odor unpleasant, requiring adequate ventilation of the room.
5. The machine must remain level, its feet fully in contact with the floor.

6. The following are the spatial requirements, determined in view of maintenance work:



F11-101-01

7. The machine must be installed in a well-ventilated area. Be sure, however, not to install the machine near any air vent of the room.

2 Unpacking and Installing the Machine

2.1 Points to Note Before Starting the Work

Be sure to keep the following in mind for the work:

1. If machine is moved from a cold to warm place, condensation can develop in its pickup/feeding assembly. If such a possibility exits, leave the machine alone for 1 hr or longer, and start the work after it has become used to the temperature of the room.
   (The term condensation is used to refer to the development of droplets of water on the surface of a metal piece, occurring when it is brought from a cold to warm place because of the rapid cooling of the water vapor around the metal.)
2. Be sure to work as a group of two.

2.2 Installing the Machine

Install the machine in the following sequence; for details, see the e pages that follow:

1) unpacking and removing of the fixing members
2) removing the dummy drum
3) mounting the drum unit
4) mounting the toner cartridge
5) placing paper in the cassette
6) placing paper in the multifeeder tray
7) checking the copy images
8) selecting the country/region through service operation
9) setting the date/time
10) storing the specifications report
11) setting the fax functions (if equipped with fax functions)
12) checking the printer functions (if equipped with printer functions)

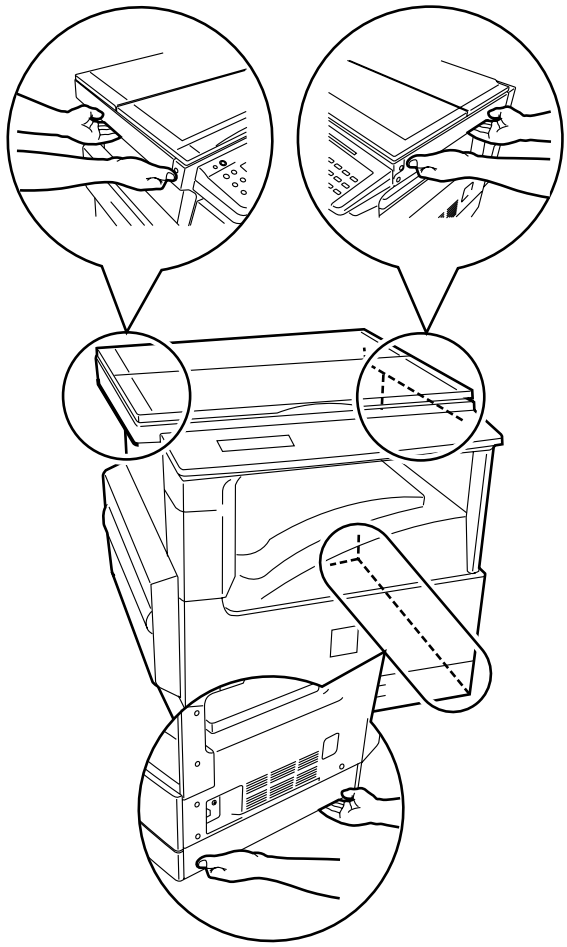
2.3 Unpacking and Removing the Fixing Members

1) Unpack the machine, and take out the attachments; check to be sure that none of the following is missing:
   - power cord
   - cassette size label
   - paper size indicating plate
   - warnings sheet
   - toner cartridge (May be packed separately depending on the destination.)
   - drum unit
   - User's Manual
   - Modular cord *1
   - Stamp *1
   - Destination label *1

   *1 : if fax model

2) Holding the grips on the left and right of the machine, take out the machine. (Be sure to work as a group of two.)

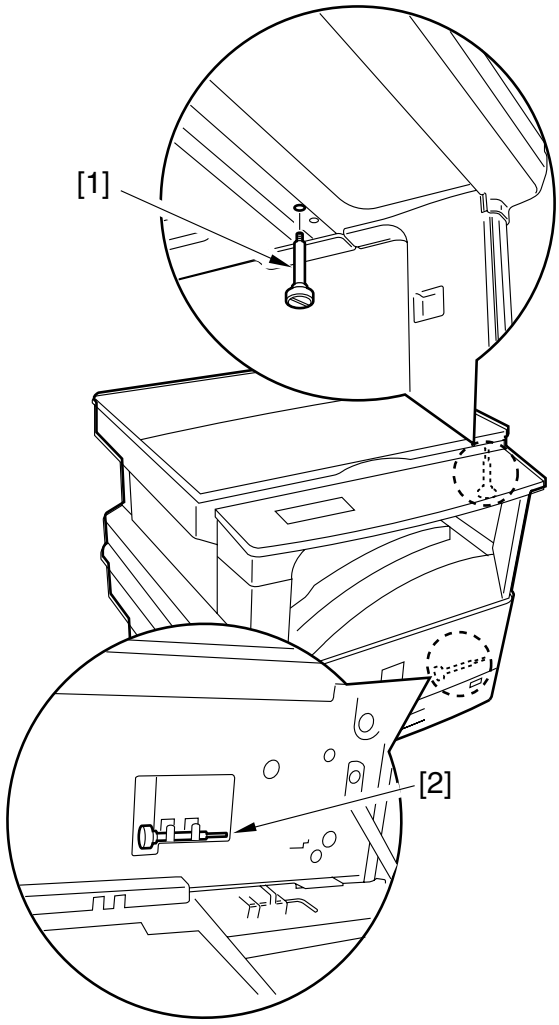
The right side of the machine may be supported on its top (bottom of the reader) and on its bottom (top of the machine proper). On the left side, be sure to support it at its top. (Supporting it at the bottom on the left side can cause damage/deformation of the left lower cover.)



F11-203-01

3) Unpack the machine, and remove the plastic cover, cushioning material, and tape.

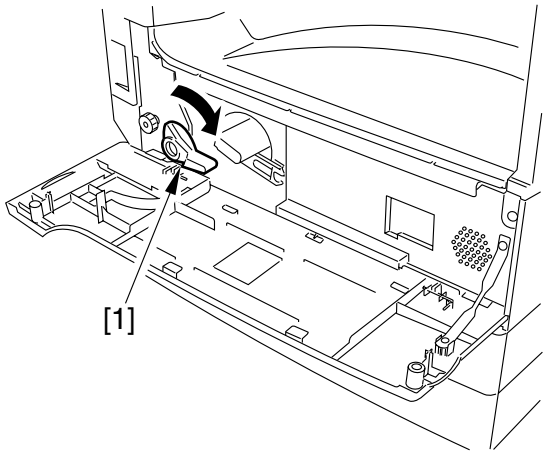
4) Remove the CS fixing screw [1]. Open the front cover, and store the removed screw [2] in the storage area.



F11-203-02

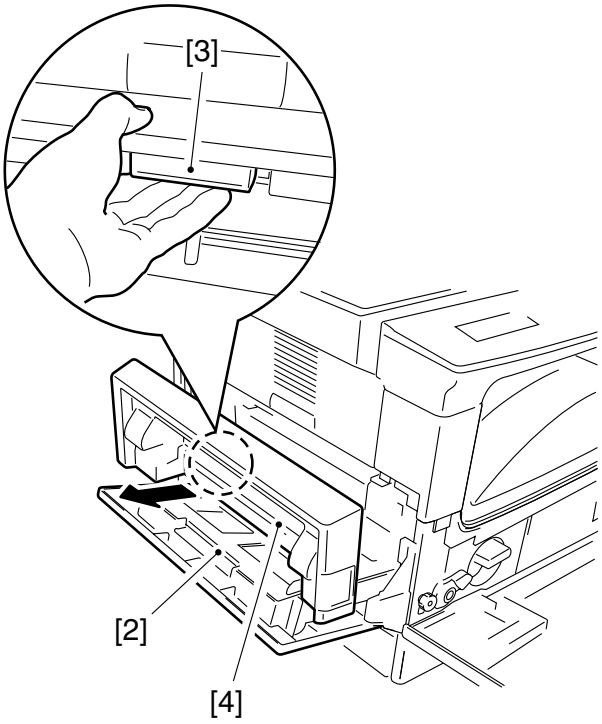
2.4 Removing the Dummy Drum

1) Open the front cover, and remove the tape.
2) Turn the developing assembly locking lever [1] clockwise to unlock.



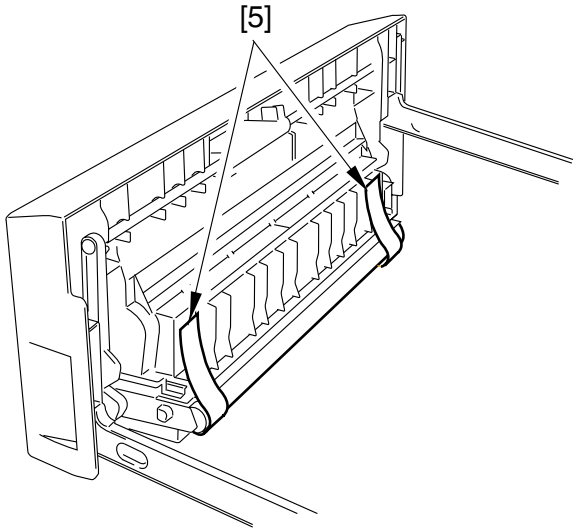
F11-204-01

3) Open the multifeeder tray [2], and pull the grip [3] to slide out the left cover [4].



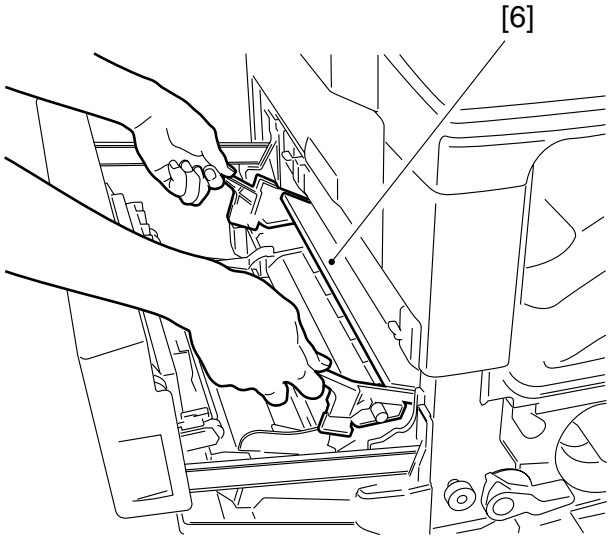
F11-204-02

5) Remove the tape [5] used to keep the transfer charging roller in place.



F11-204-03

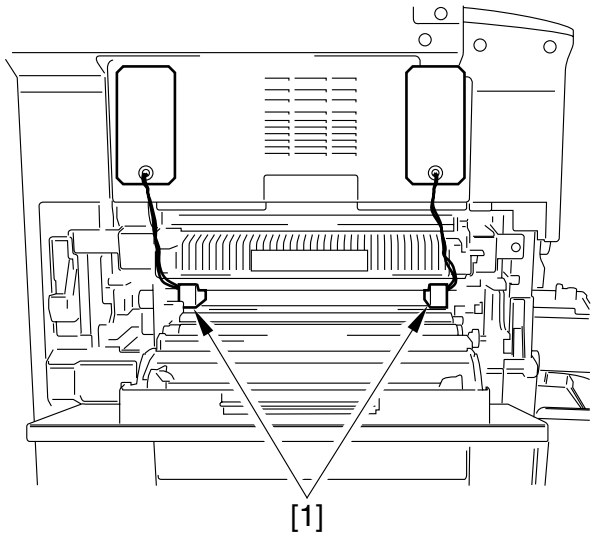
4) Remove the tape, and remove the dummy drum [6] fitted to the machine.



F11-204-04

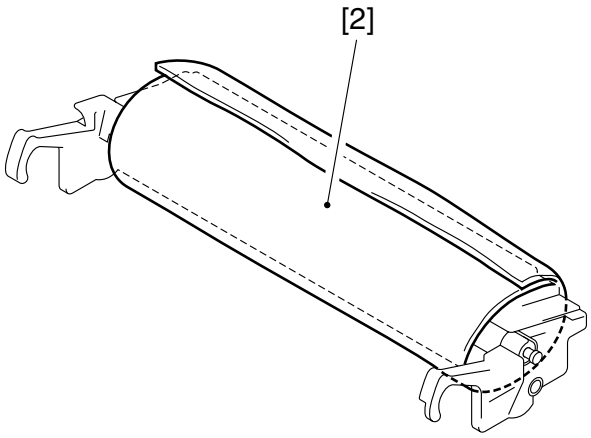
2.5 Mounting the Drum Unit

1) Remove the 2 fixing members [1] used to keep the developing assembly in place.



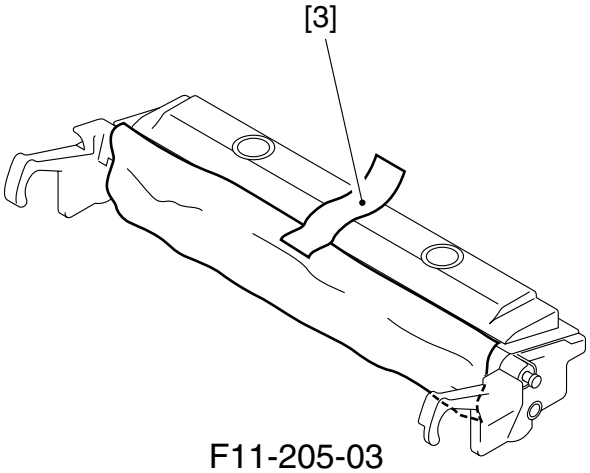
F11-205-01

2) Unpack the drum unit, and remove the air-bubble sheet [2].



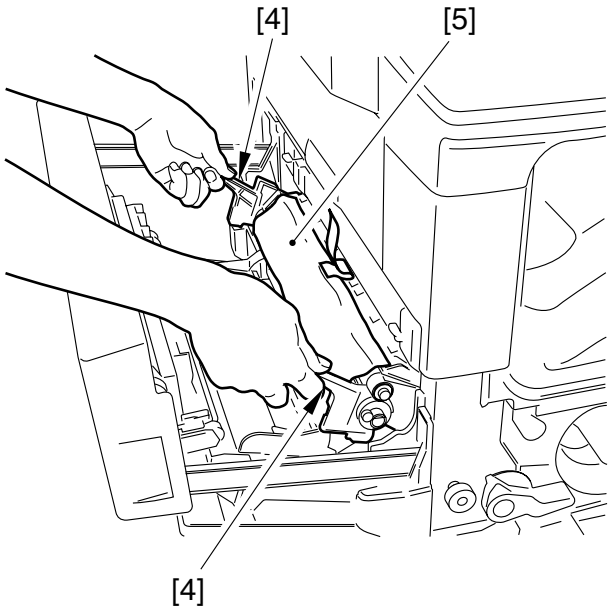
F11-205-02

At this time, do not remove the packing tape [3] used to protect the drum.



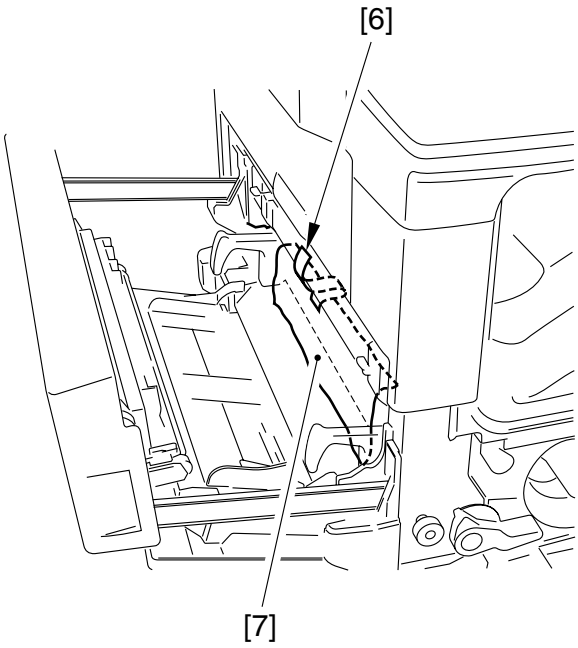
F11-205-03

3) Holding the grips [4] of the drum unit with both hands, fit the drum unit [5] into the machine.At this time, take the packing tape outside the machine.



F11-205-04

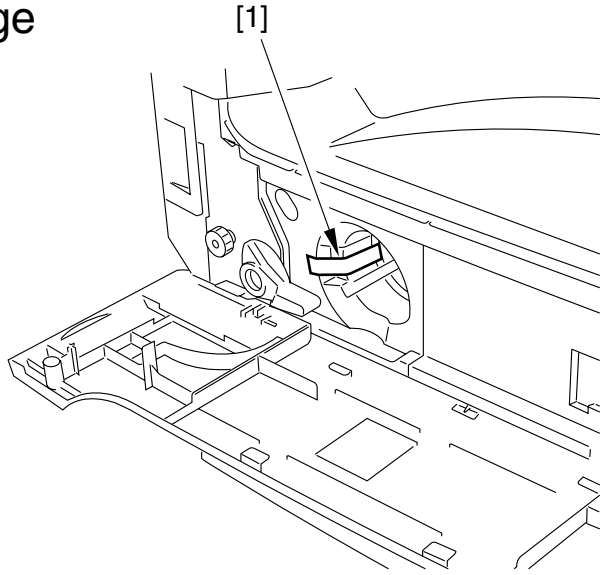
4) Then, remove the packing tape [6] of the drum protection sheet, and remove the drum protective sheet [7].



F11-205-05

2.6 Mounting the Toner Cartridge

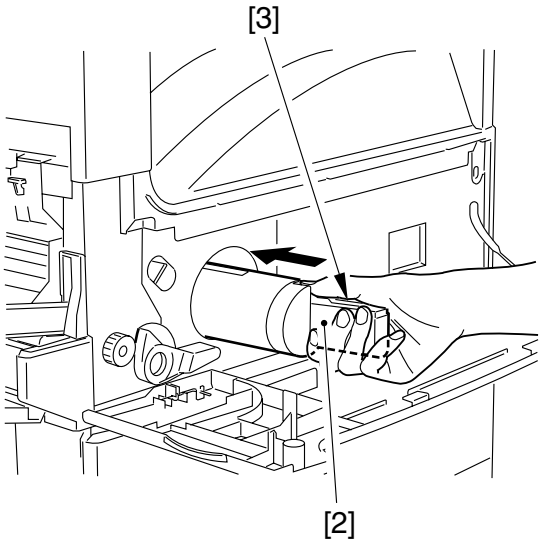
1) Remove the fixing tape [1] shown in the figure.



F11-206-01

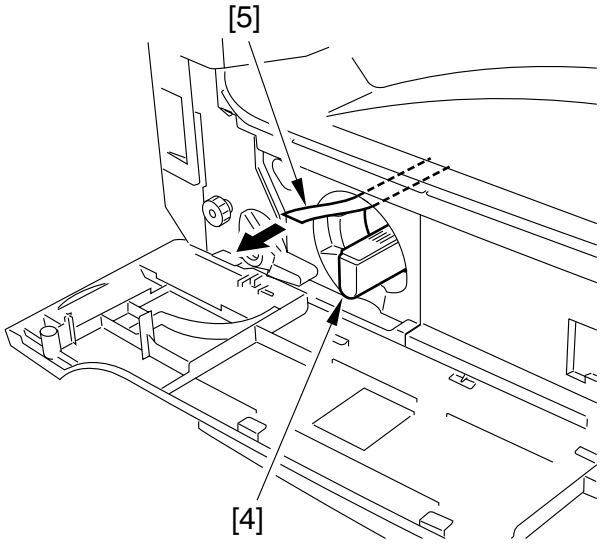
2) Unpack the toner cartridge.
3) Holding the grip [2] of the toner cartridge, fit it while holding down the lever [3] and keeping the taped face upward.

Check to be sure that it has been fully fitted into the machine.



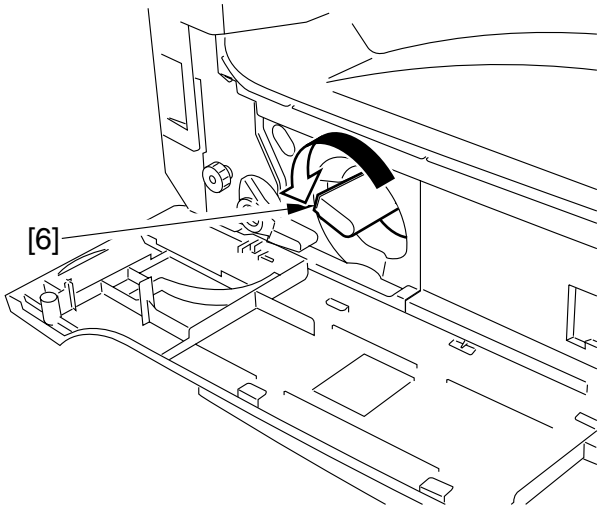
F11-206-02

4) Holding the grip [4] of the toner cartridge, pick the tab [5] of the tape, and pull the tape out horizontally.



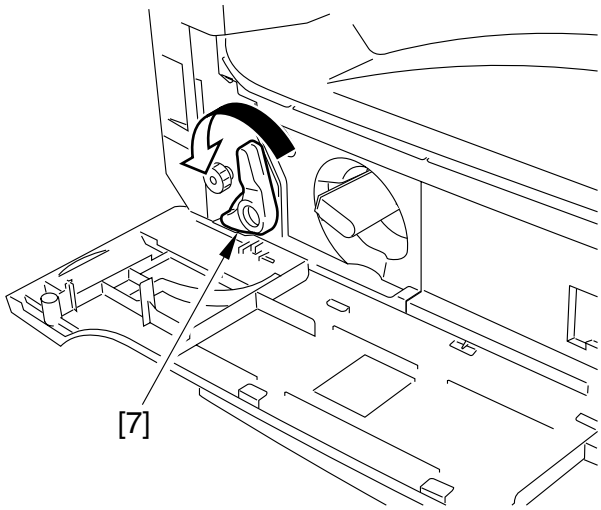
F11-206-03

5) While holding the grip lever [6], turn it counterclockwise.



F11-206-04

6) Turn the developing assembly locking lever [7] counterclockwise to lock it in place.

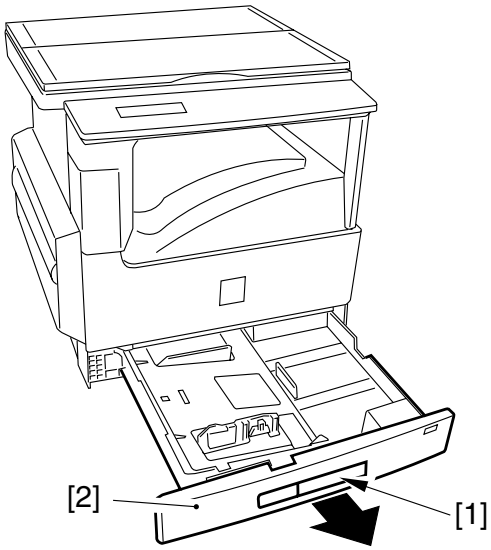


F11-206-05

7) Mount the left cover, and close the front cover.
8) Close the multifeeder tray.

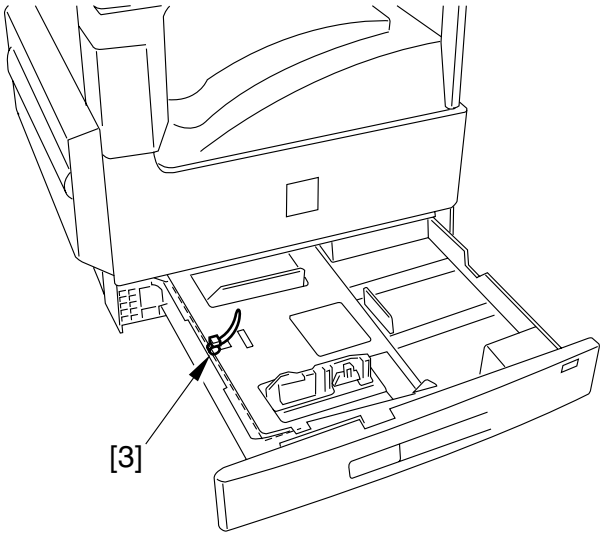
2.7 Putting Paper in the Cassette

1) Holding the grip [1] in the center of the cassette, slide out the cassette [2] until it stops.



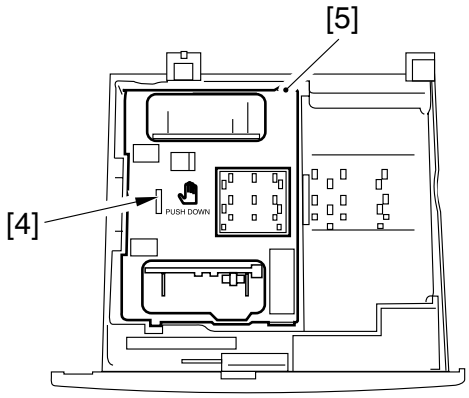
F11-207-01

2) Remove tapes and the cable band [3] used to keep the holding plate of the cassette in place.



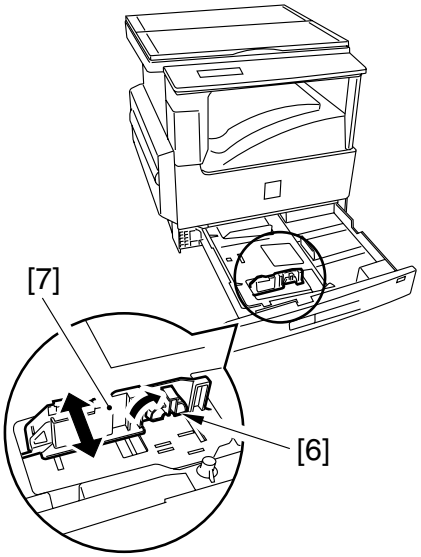
F11-207-02

3) Lightly press the area indicated with a marking [4] on the holding plate [5] of the cassette to lock the holing plate in place.



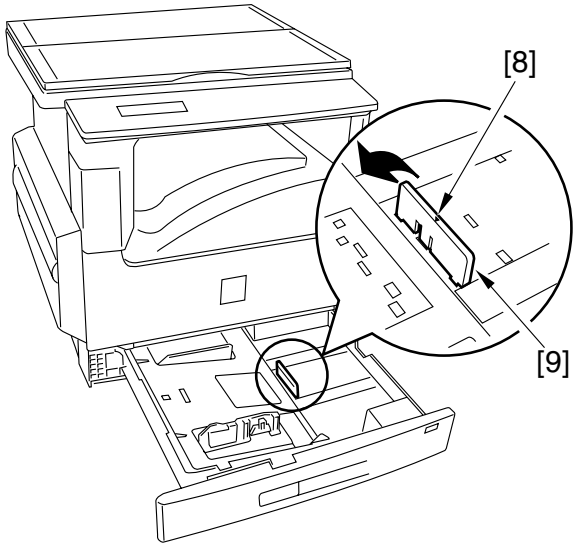
F11-207-03

4) Turn the tab [6] of the front of the paper width guide to release the lock; then, slide the guide [7] to suit the width of paper to use, and turn other tab once again to lock it in place.



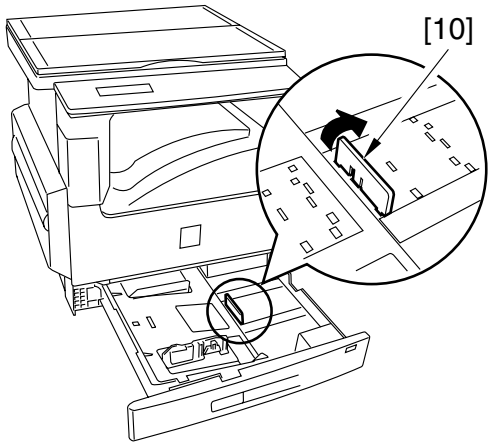
F11-207-04

5) Shift the paper trailing edge guide plate [9] to detach while referring to the △ marking [8] of the guide plate.



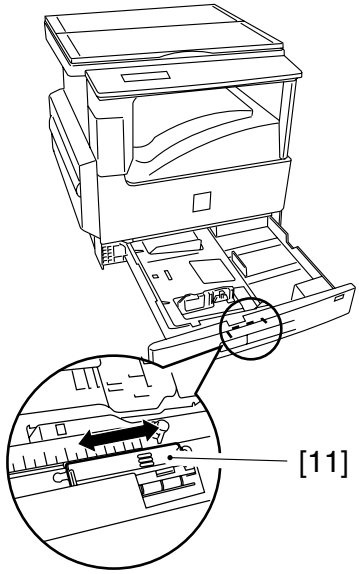
F11-207-05

6) As if to reverse the steps used for removal, fit the paper trailing edge guide plate [10] to suit the size of paper to use.



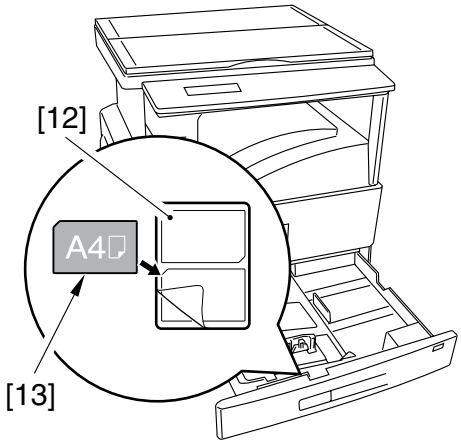
F11-207-06

7) Set the paper size detecting lever [11] to suit the size of paper to use.



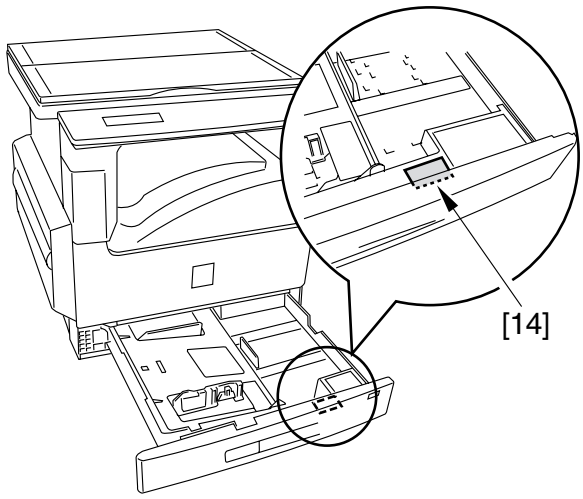
F11-207-07

8) Remove the plastic protective sheet of the paper size indicating plate [12], and attach the cassette size label [13] for the size of paper to use; then, set the indicating plate to the cassette.



F11-207-08

9) With the side indicating the language of choice in view, attach the warnings sheet [14].

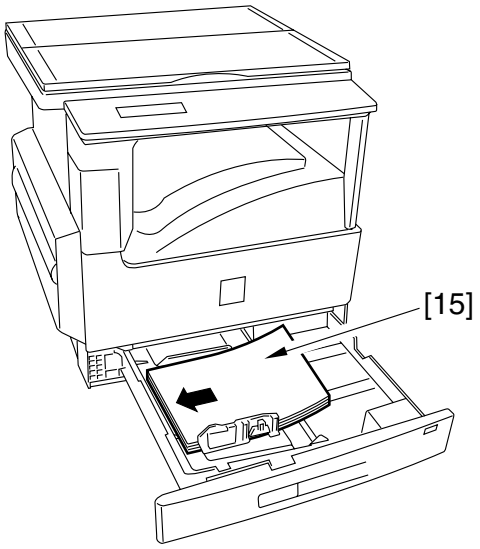


F11-207-09

10) Keeping the left/right and leading edges of the sheets [15] flush, place the stack of paper in the cassette.

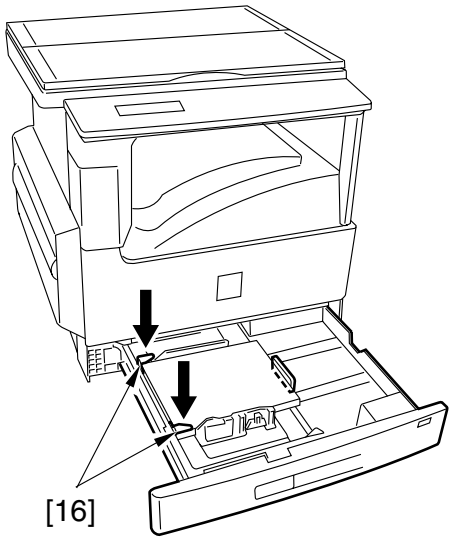
Memo

When the cassette is slid into the machine, the lock will automatically be released if its holding plate locked it. If the lock of the holding plate is released, press the marking PUSH DOWN lightly before placing paper.



F11-207-10

11) Check to make sure that the claws [16] of the cassette are positioned to retain both edges of the paper.

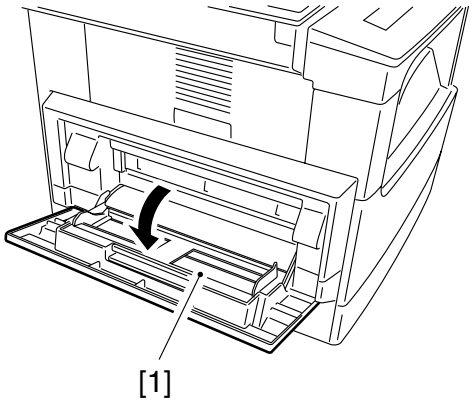


F11-207-11

12) Holding the grip in the middle of the cassette, fit the cassette in the machine until it sops, while taking care not to pushing one side of the cassette ahead of the other.

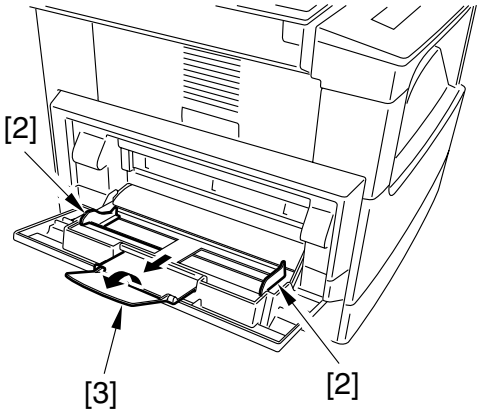
2.8 Placing Paper in the Multifeeder Tray

1) Open the multifeeder tray [1].



F11-208-01

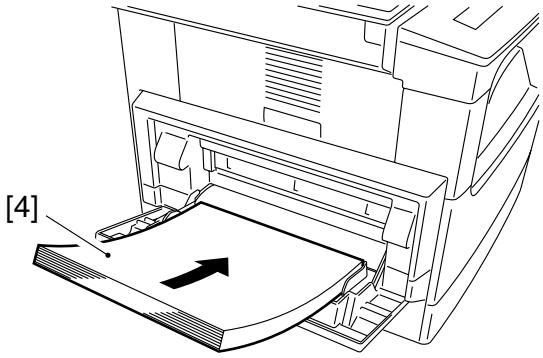
2) Set the paper width guide [2] and the auxiliary guide [3] to suit the width and the length of paper to use.



F11-208-02

3) Keeping the left and right edges of the sheets [4] flush, place the stack of paper in the multifeeder tray. Adjust the paper width guide to suit the width of paper.

Do not force the paper width guide against the paper.



F11-208-03

2.9 Checking the Copy Images

1) Connect the power cord to the AC outlet, and turn on the power.

The power supply must be as rated. (The voltage may be ± 10% of the rating, but it must have the rated amperage.)

2) Place an original on the copyboard glass, and make copies in cassette and manual feed modes; then, check the copy images. Also, make sure of the following:
   - There is no abnormal noise.
   - The image quality of copies made at each default ratio is normal.
   - As many copies as specified are made normally.

2.10 Selecting the Country/Region through Service Operation

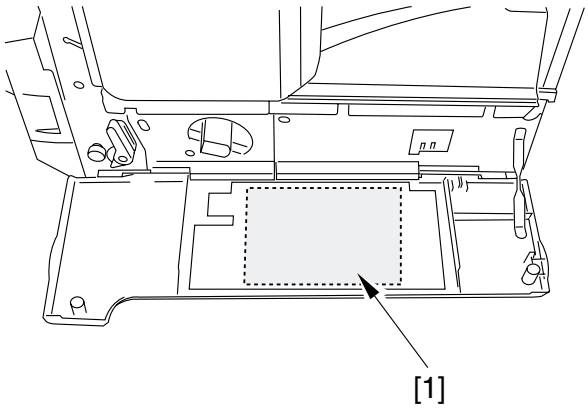
1) Press the Additional functions key and ID (#) key in sequence to bring up the Service Mode screen.
2) Using the cursor key, select '#5 TYPE', and press the OK key so that the #5 TYPE screen will appear.
3) Be sure to ensure that you set the country type to suit the communication standard used in your country/region using the cursor key.
4) Press the OK key so that the entered type settings will be stored.
5) Press the clear key to return the copying mode.

2.11 Setting the Date/Time (user mode)

1) Press the Additional Functions key to bring up the User Mode sceen.
2) Using the cursor key ◀ ▶, select '3. TIMER SETTINGS', and press the OK key.
3) Using the cursor key ◀ ▶, select '1. DATE/TIME SETTING', and press the OK key so the currently used date/time is indicated.
4) Enter the current date/time. Move the cursor key ◀ ▶ to the appropriate characters, and enter numerals.
5) Press the OK key so that the entered date/hour will be stored.
6) Press the clear key to return the copying mode.

2.12 Storing the Specifications Report

1) Press the Additional Functions key and the # or ID (#) key in sequence to bring up the Service Mode screen.
2) Using the cursor key ◀ ▶, select '#10 REPORT', and press the OK key so that the #10 REPORT screen will appear.
3) Using the cursor key ◀ ▶, select '8. PRINT SPEC REPORT', and press the OK key so that a specifications report will be generated.
4) Open the front cover, and fold the generated report [1]; then, store it away between the front cover and the jam removal instructions sheet. (Free the jam instructions sheet from the claw before fitting in the report.)



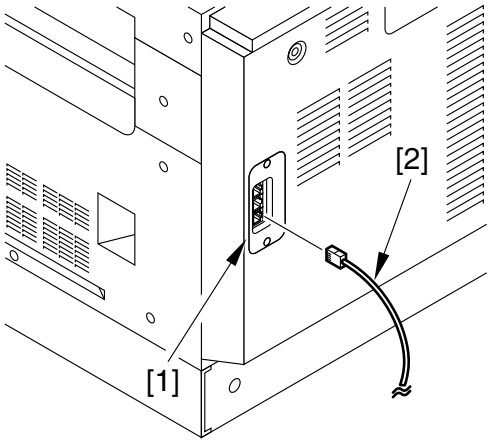
F11-212-01

5) Clean up the area around the machine.

2.13 Setting the Fax Functions (if equipped with fax functions)

2.13.1 Connecting the Line

1) Connect the modular cord [2] to the modular jack (bottommost) for the line on the back of the machine.



F11-213-01

2) Connect the other end of the modular cord to the modular jack of the line.

2.13.2 Setting the Dialing Method

1) Press the Additional Functions key to bring up the User Mode screen.
2) Using the cursor keys ▲/▼, select FAX SETTINGS, and press the OK key.
3) Using the cursor keys ▲/▼, select USER SETTINGS, and press the OK key.
4) Using the cursor keys ▲/▼, select TEL LINE SETTINGS, and press the OK key.
5) Using the cursor keys ▲/▼, select TEL LINE TYPE, and press the OK key.
6) Using the cursor keys ▲/▼, select TOUCH TONE or ROTARY PULSE, and press the OK key.

2.13.3 Communications Test

1) Press the FAX key in the control panel so that the machine will be in fax mode. Skip this step if the machine is already in fax mode.
2) Press the On-Hook key in the control panel, and check to make sure that the line tone is heard. Otherwise, check the connection of the line.
3) Send/receive an original to check the operation and the image quality.

2.14 Checking the Printer Functions (if equipped with printer functions)

1) Turn on the machine.
2) Press the System key in the control panel, and check to see that the LED of the key has gone ON. ('READY' will be indicated on the display; otherwise, check to be sure that the printer board has been mounted properly.)
3) Execute the 'TEST PRINT' as follows to make sure that printing is normal:
   - Non-Fax Model
     1. Press the System key in the control panel (so that the LED of the key goes ON).
     2. Press the GO key so that the machine will be in off-line state. ('PAUSE' will be indicated on the display.)
     3. Press the menu key. ('TEST MENU' will be indicated on the display.)
     4. Select 'TEST PRINT' using the Item key, and press the Enter key to start test printing.
   - Fax Model
     1. Press the Printer key in the control panel (so that the LED of the key goes ON).
     2. Press the OK key so that the machine will be in off-line state. ('PAUSE' will be indicated on the display.)
     3. Press the menu key (F1 key). ('TEST MENU' will be indicated on the display.)
     4. Select 'TEST PRINT' using the Item key (F2 key), and press the Enter key (F4 key) to start test printing.
4) Check to see that the name and the version of the printer board are indicated on the generated test print.
5) Turn off the machine, and connect the network cable.
6) Turn on the machine.
7) Inform the user's system administrator that the machine has been installed, and ask him/her to make network settings.

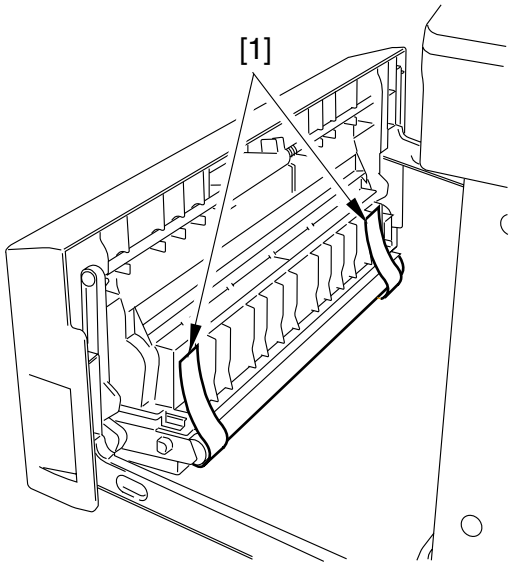
3 Relocating the Machine

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

1. Remove all paper from the cassettes.
2. Turn off the power, and disconnect the power plug from the power outlet.
3. Start service mode, and execute '#14 CS SET' so that the carriage moves to home position. Using the fixing screw stored on the front cover, secure the carriage in place from under the reader.

• Check to make sure that the carriage will not move.

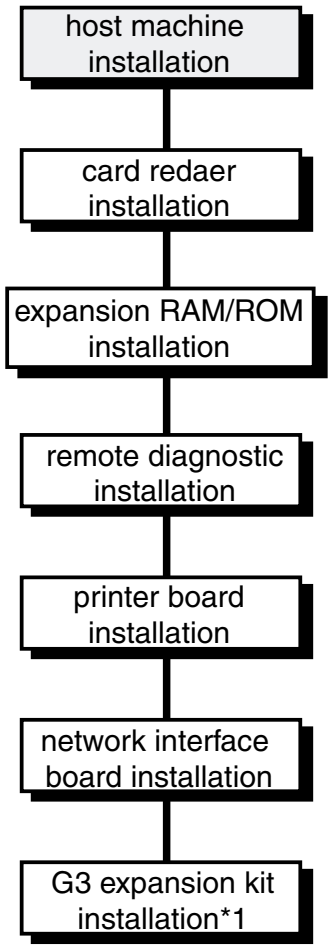
4. Take out the drum unit. Put the drum unit in a protective bag, and carry it separately.
5. Take out the developing assembly, and carry it separately.
6. The transfer charging roller can become displaced in transit. Be sure to fix it in place with tape [1] as shown. (At that time, wrap the gear assembly with lint-free paper to keep it from glue.)
7. Tape the covers and cassette in place.
8. If the machine is equipped with an ADF, place A3 or 11x17 copy paper on the copyboard glass, and tape the ADF in place.



F11-301-01

4 Flow of accessory installation

If you are going to install any accessory after installing the machine with a fax function, be sure to follow the following flow of work. (Note that the flow covers only those accessories that must be installed in a specific sequence.)



*1: iR1610F/iR2010F 120V only

F11-401-01

5 Installing the Card Readere-E1 (accessory)

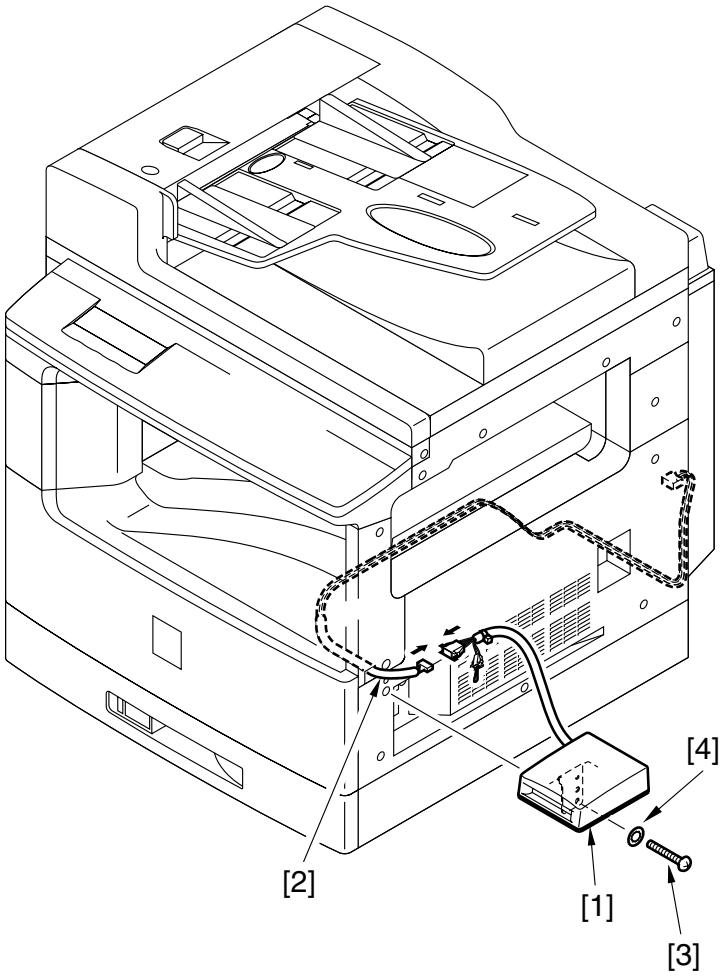
5.1 Points to Note for Installation

For installation, be sure to obtain the following:

1) Card Reader

Attachment

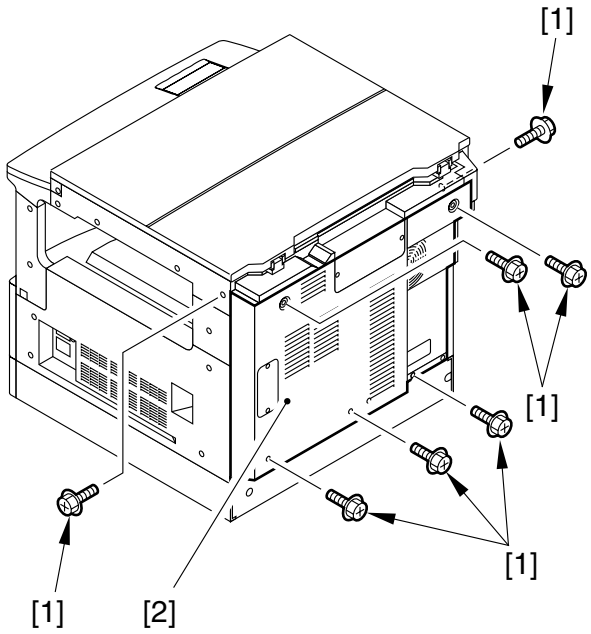
[1] Card reader
[2] Harness
[3] Screw
[4] Washer



F11-501-01

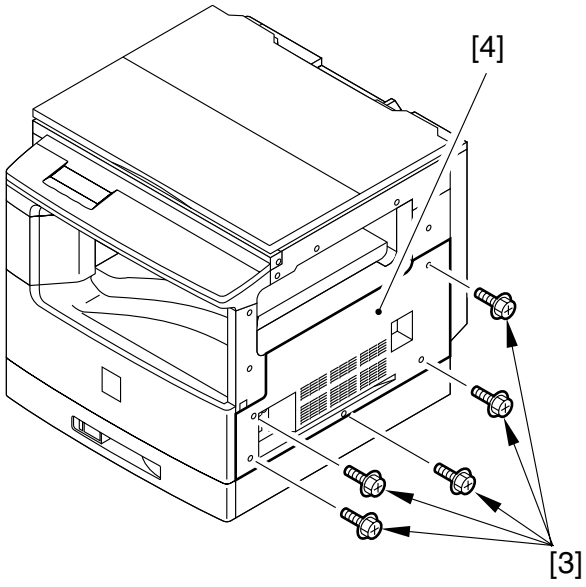
5.2 Installation

1) Remove the 7 screws [1], and detach the rear cover [2].



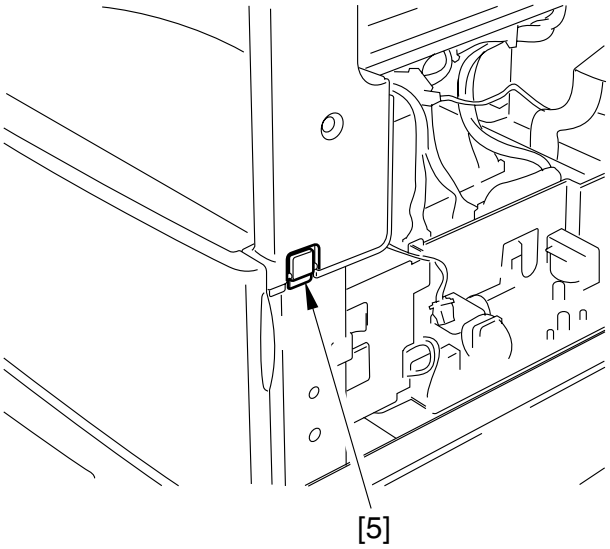
F11-502-01

2) Remove the 5 screws [3], and detach the right cover [4].



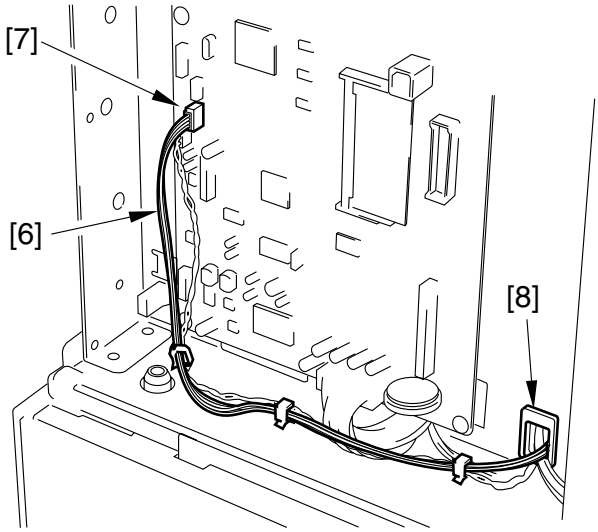
F11-502-02

3) Cut the dummy cover area [5] of the right front support with nippers.



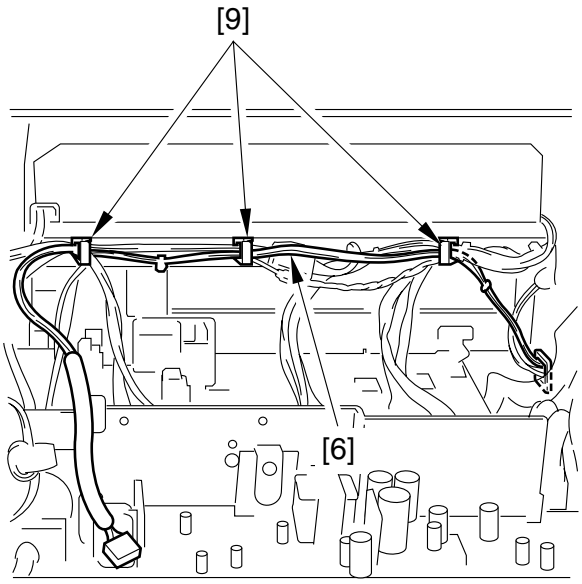
F11-502-03

4) Connect the connector [7] of the harness [6] that comes with the unit to J10/ J210 of the image processor PCB.
5) Route the harness [6] as indicated, and lead it through the opening [8].



F11-502-04

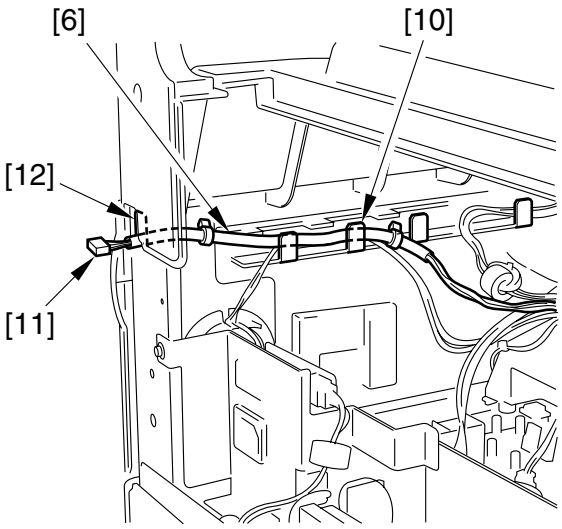
6) Pick the harness [6] that comes from the rear, and lead it through the 3 locking supports [9].



F11-502-05

7) Then, route the harness [6] along the guide rib [10] located second from the front.

Be sure to keep the connector [11] for the harness out of the hole [12] as indicated.



F11-502-06

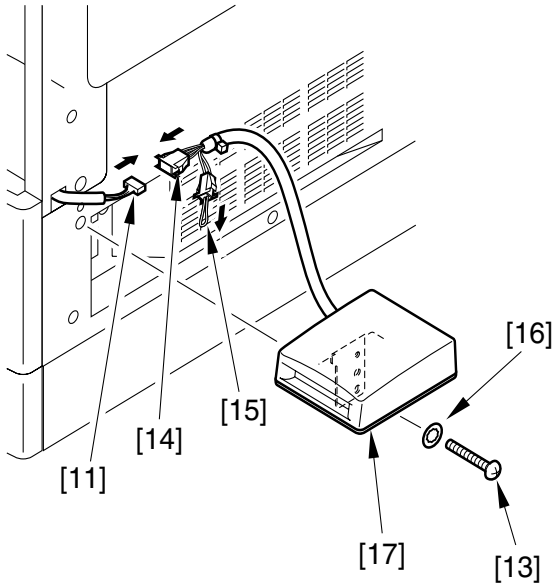
8) Mount the removed right cover, rear cover, and right rear cover. (At this time, do not tighten the screw at [13].)

When mounting the right cover, take care so that the connector of the harness will not be inside the machine.

9) Connect the connector [11] of the routed harness and the connector [14] of the card reader.
10) Remove the short connector [15].

Be sure to remove the shorting connector [15]; otherwise, an operation fault or error can occur.

11) Mount the card reader [17] in place using a washer [16] and a screw [13].



F11-502-07

5.3 Setting and Checking After Installation

At first, explain the user that the setting and checking procedure requires the control cards the user purchased, to burrow the cards on the assent by the user.

1) Turn on the power switch on the main body.
2) Insert the maintenance card into the card reader.
3) Enable the department-specific ID control function.
   User mode > System Settings > Dept ID Management > ON
4) Register the department ID of the user's choice.
   Department Code Setting > Enter the department code with a number from 00 to 99 > Enter the department ID.
5) Set up the password code, upper limit for printouts, upper limit for pages sent, and sender name, according to the user's wish.
6) After setting up all the items, remove the maintenance card from the card reader. Confirm that the operation panel displays the "Insert a control card" message.
7) Insert the department card that matches(*) the department ID you have registered into the card reader. Confirm that the operation panel restores the waiting status display.

* Every department card for common users is assigned with a fixed department ID, which is printed on the card.

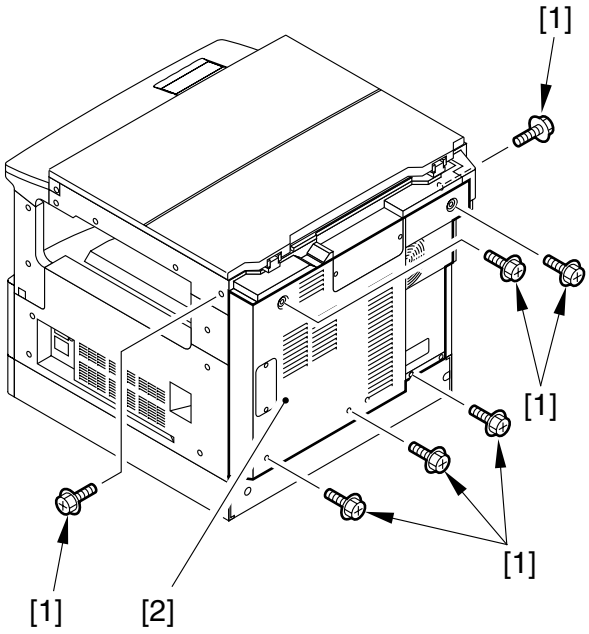
6 Installing the Image RAM (accessory)

You will have to use different sets of steps for a non-fax model and for a fax model.

6.1 Non-Fax Model

6.1.1 Installation

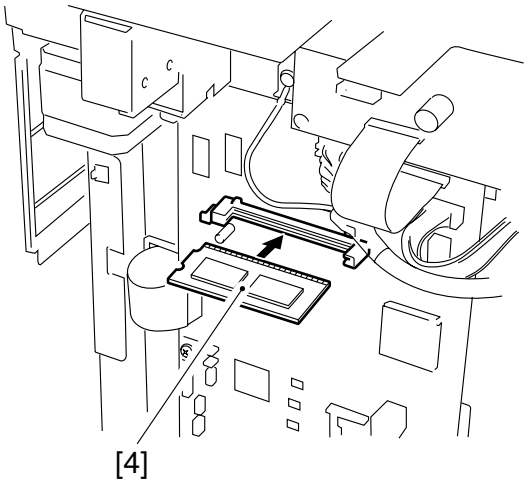
1) Remove the 7 screws [1], and detach the rear cover [2].



F11-601-01

2) Mount the RAM DIMM [4].

Take care not to damage the elements and the like.



F11-601-02

3) Mount the removed rear cover.
4) Press the Additional Functions key and the # keys in sequence to start service mode.
5) Using the cursor key ◀ ▶, select 'TEST MODE', and press the OK key to start test mode.
6) Press '1' on the keypad so that '1: D-RAM' is indicated.
7) Check to be sure that the LCD indicates the new RAM size.
8) Press the Stop key and then the Clear key to end test mode.

6.2 FAX Model

6.2.1 Before Starting the Work

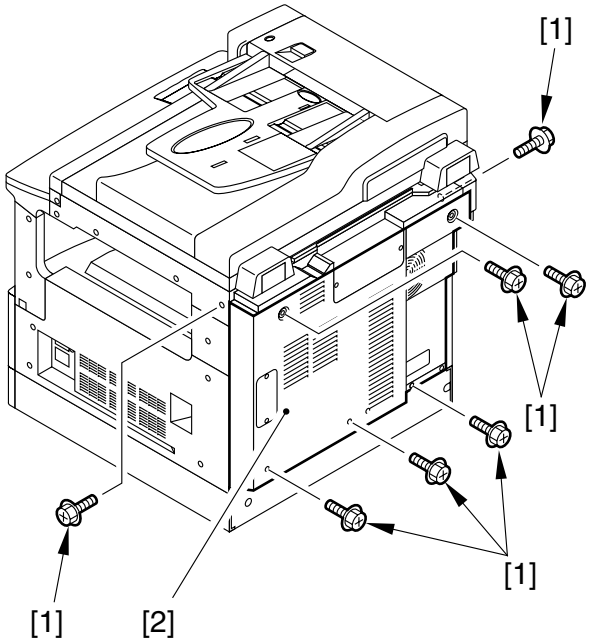
If you are trying to mount a RAM (expansion RAM DIMM) to a fax model, be sure of the following:

- Check to see that the memory does not contain any reception image before turning off the power switch. If any image remains, be sure to print it out.

If an expansion RAM DIM is used, you have to turn off the memory backup function, which will result in the loss of all its contents. Be sure to print out all image data.

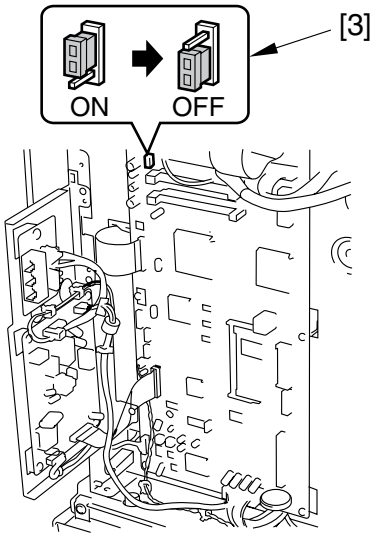
6.2.2 Mounting the RAM

1) Remove the 7 screws [1], and detach the rear cover [2].



F11-602-01

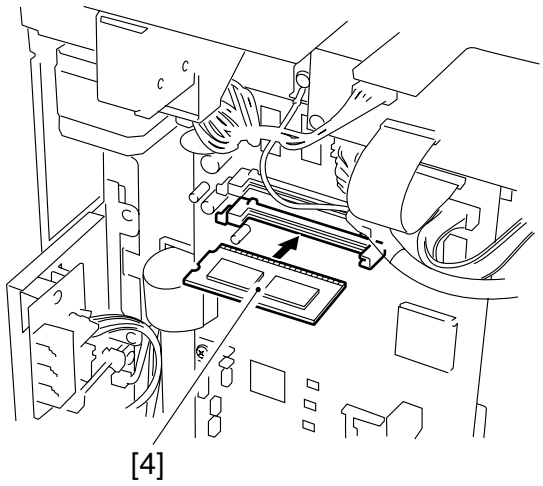
2) Change the jumper plug (JP2) [3] on the image processor PCB to OFF. Keep in mind that shifting the jumper plug (JP2) [3] to OFF will clear all the contents of the image memory.



F11-602-02

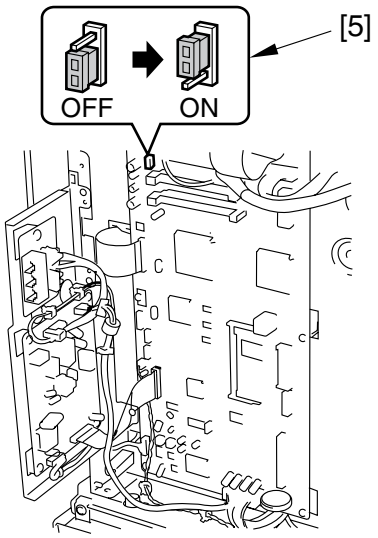
3) Mount the RAM DIMM [4]. You may use either J71 or J72 of the image processor PCB.

Take care not to damage the elements or the like.



F11-602-03

4) Change the jumper plug (JP2) [5] to ON.



F11-602-04

5) Attach the rear cover you removed previously.
6) While holding down the Stop key, turn on the power switch.
7) Press the User Mode key and the # key in sequence to start service mode.
8) Using the cursor keys ▲/▼, select TEST MODE: then, press the OK key to start test mode.
9) Press '1' on the keypad so that '1: D-RAM' is indicated.
10 Check to see that the reading on the LCD indicates the increase in RAM.
11) Press the Stop key and the Clear key in sequence to end test mode.

7 Installing the Remote Diagnostic Device II (accessory)

7.1 Parts to Procure

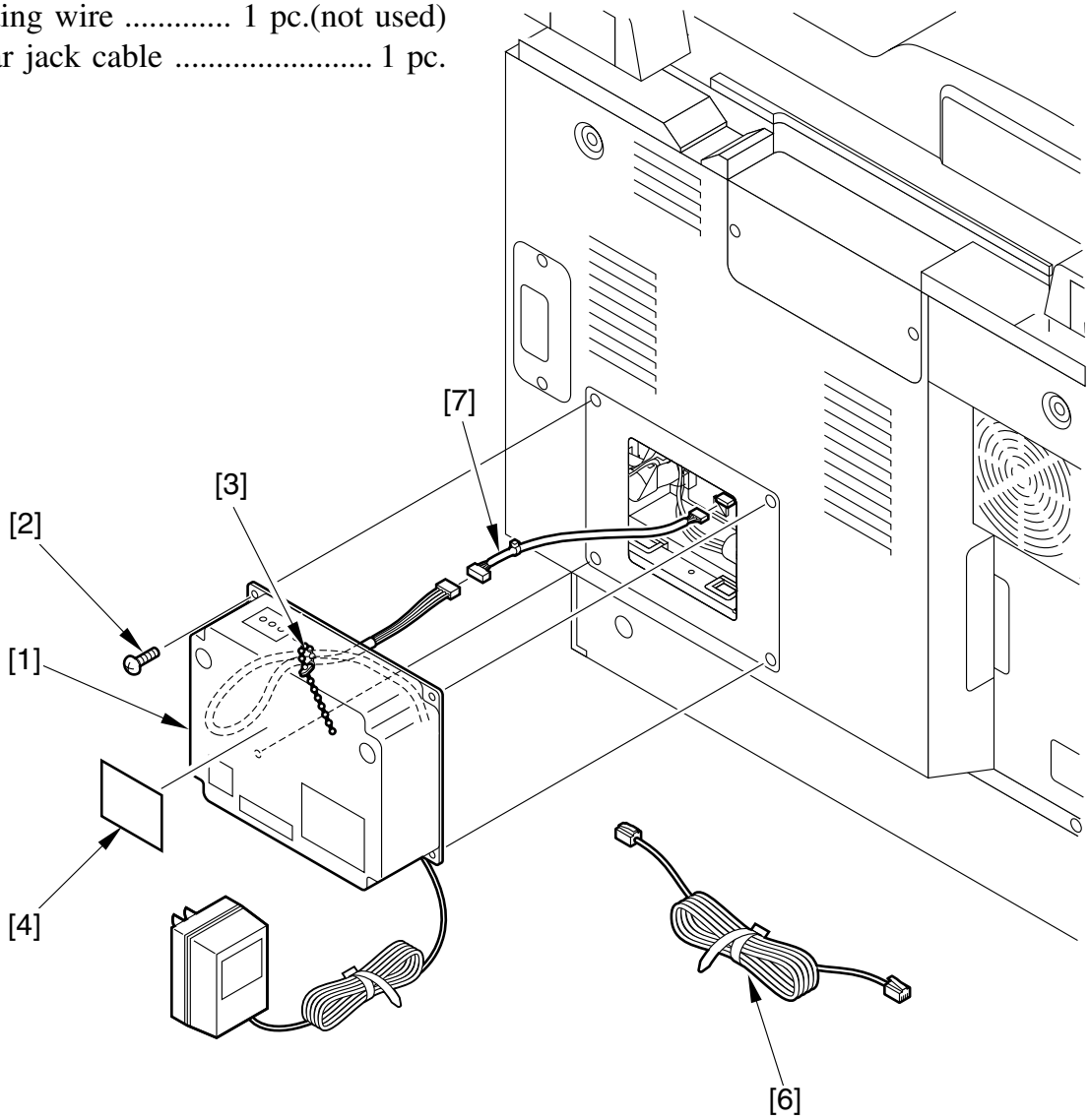
Procure the following parts before starting the work:

1. Mounting Kit (accessory)
You will need the kit when installing the RDD to a iR1600/iR2000 series.

7.2 Unpacking

A. RDD
[1] RDD ..... 1 unit
[2] Screw (M4X6) ..... 4 pcs.
[3] Harness band ..... 4 pcs.
[4] Switch setting label ..... 1 pcs.
[5] Grounding wire ..... 1 pc.(not used)
[6] Modular jack cable ..... 1 pc.

B. Mounting Kit
[7] Relay cable ..... 1 pc.



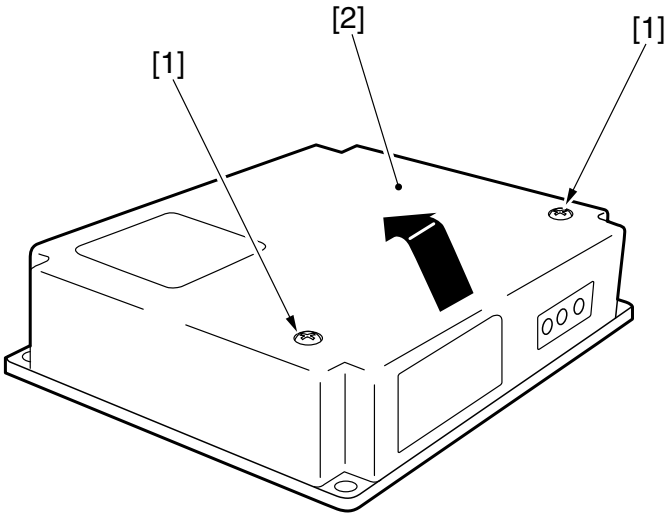
F11-702-01

7.3 Installation to the Copier

Keep the following in mind when installing the RDD to the copier:
1. This accessory is to be installed by a qualified personal.
2. Make sure the copier has been properly installed before starting the work.
3. Keep the copier's power cord disconnected during the work.
4. Be sure to use the appropriate screws (length, diameter).
5. Make sure the computer in the service station has been properly loaded with the RDD's settings data.

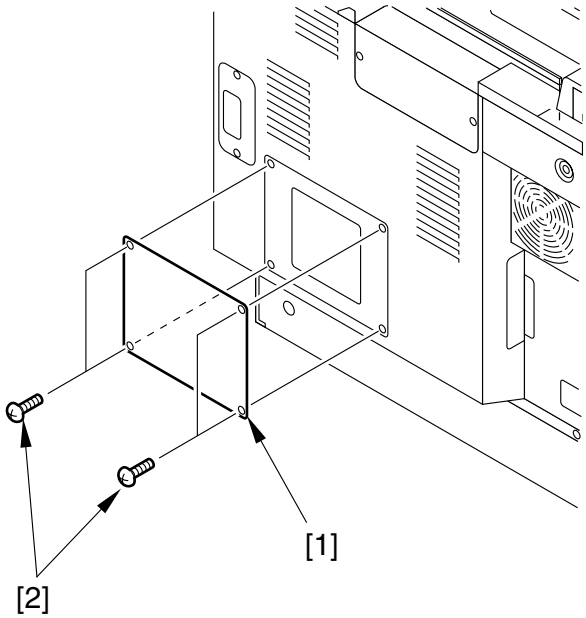
A. Installation

1) Remove the two screws [1] to detach the RDD's top cover [2].



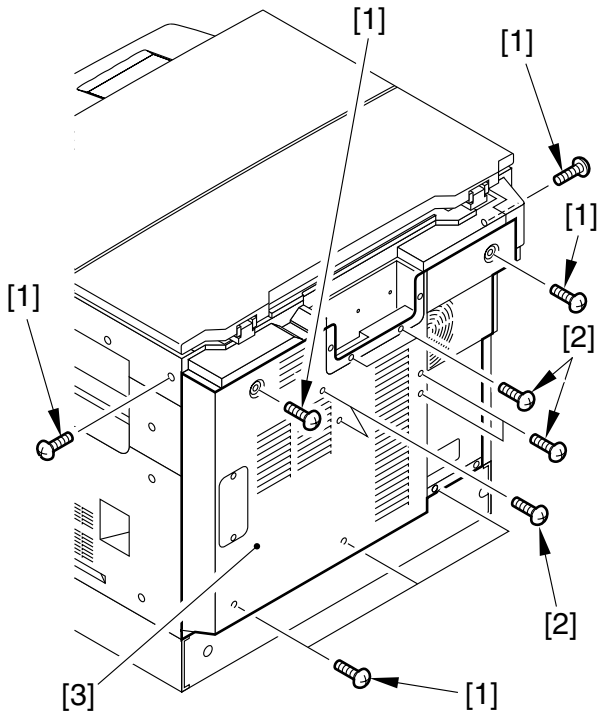
F11-703-01

2) Remove the four screws [2], and detach the face cover [1] from the copier's rear cover.



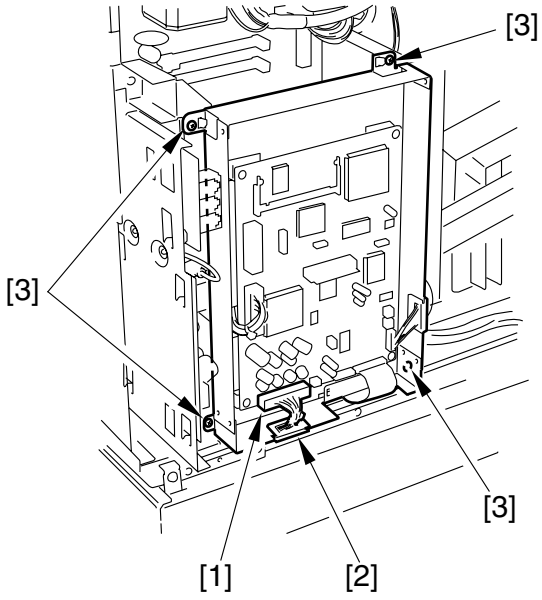
F11-703-02

3) If a G3 multiport has been installed, go through the following steps; otherwise, go to step 15):
4) Remove the 7 screws [1]; in the case of a printer model, remove the 6 more screws [2], and detach the rear cover [3].



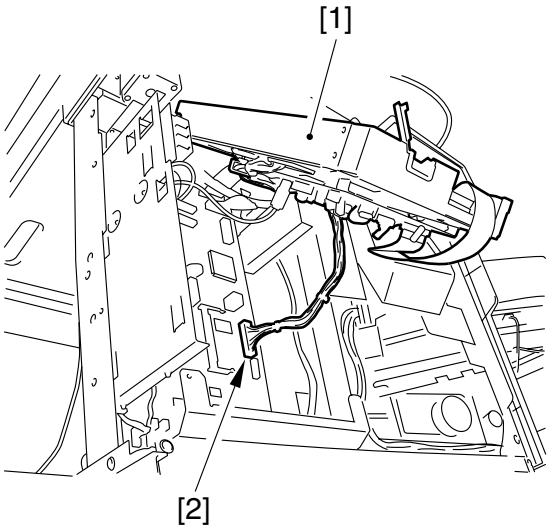
F11-703-03

5) Disconnect the connector (J104) [1] from the G3 multiport PCB, and free the harness from the edge saddle [2].
6) Remove the 4 screws [3].



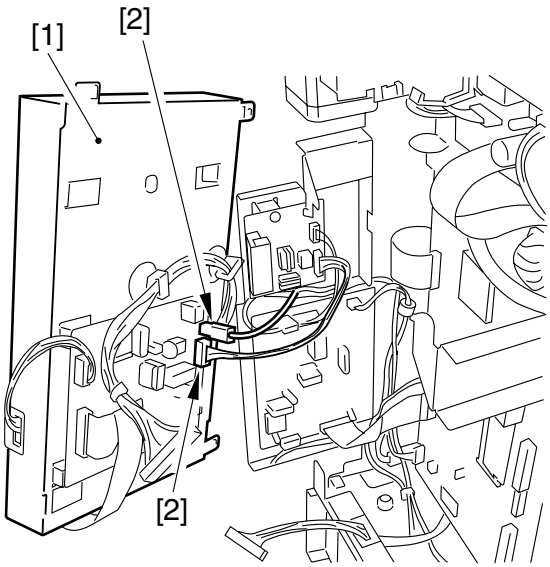
F11-703-04

7) With the G3 multiport [1] hooked in place, disconnect the connector (J33) [2] from the image processor PCB.



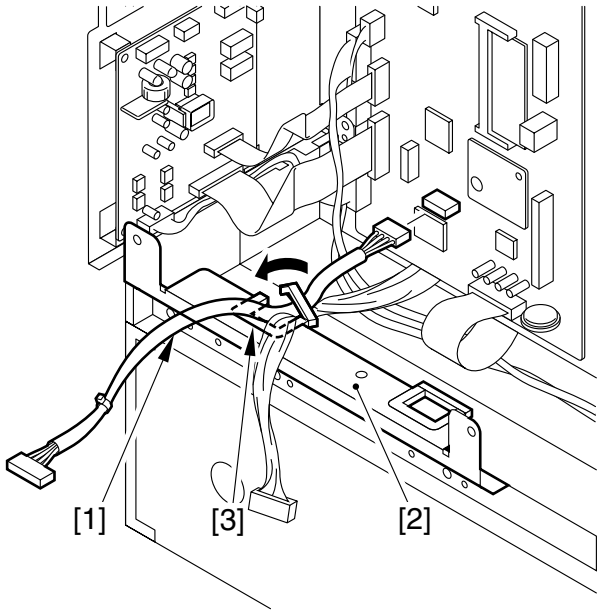
F11-703-05

8) Remove the multiport unit [1], and disconnect the 2 connectors [2] from the NCU PCB.
9) Remove the multiport unit [1].



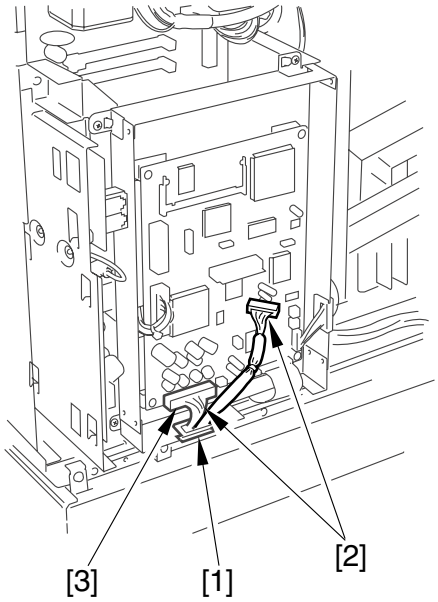
F11-703-06

10) Connect the connector of the relay cable [1] that comes with the kit to J208 of the image processor PCB.
11) Secure the relay cable [1] in place using the edge saddle [3] on the mounting base [2].



F11-703-07

12) Go through steps 5) through 9) in reverse to mount the multiport unit.
13) Secure two cables [2] in place using the edge saddle [1] on the multiport unit. Connect the connector [3] (J104) to the G3 multiport PCB.

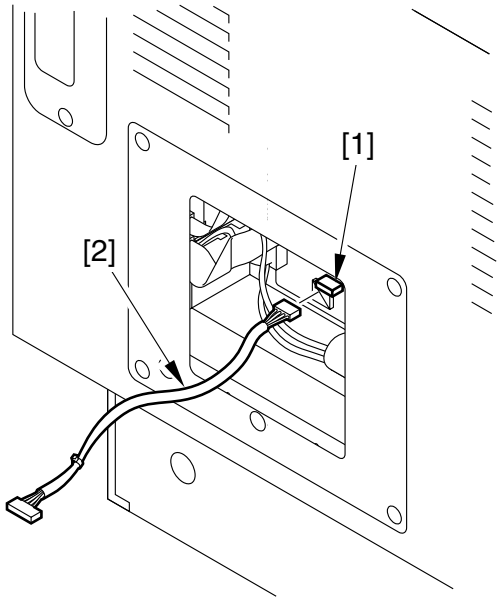


F11-703-08

14) Mount the rear cover; thereafter, go to step 16).

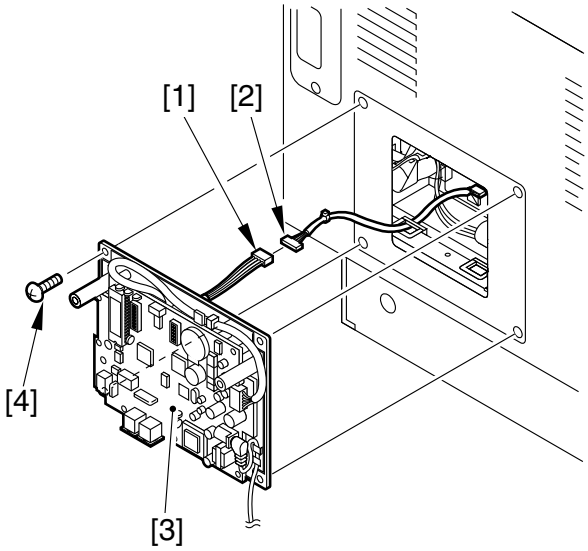
When installing the rear cover, take care not to damage the relay cable.

15) Connect the connector [1] of the relay cable [2] that comes with the kit to J208 of the image processor PCB.



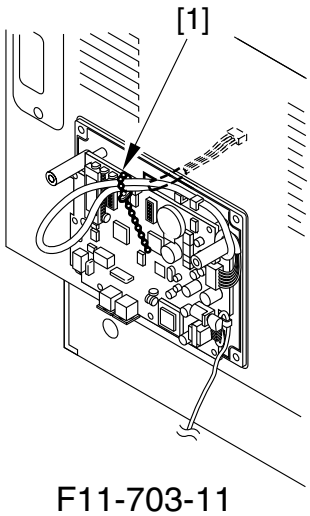
F13-703-09

16) Connect the RDD's connector [1] and the relay cable [2].
17) Fix the RDD [3] in place on the copier's rear cover with four screws [4]; use the screws that come with the RDD.



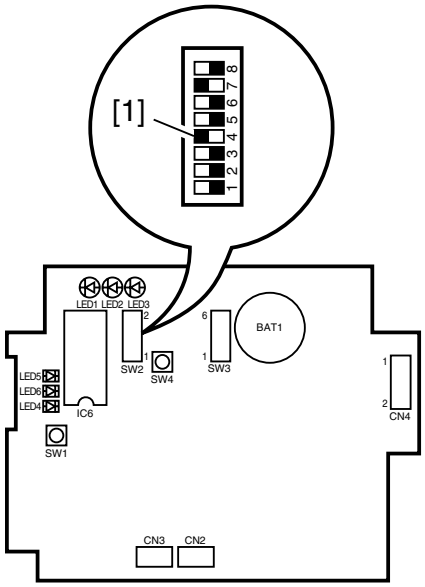
F11-703-10

18) Remove the slack from the cable between the copier and the RDD; keep the excess cable to the RDD using the harness band [1].



F11-703-11

19) Shift bit 4 of the DIP switch 2 [1] to ON so that the communication mode between the RDD and the copier is IPC mode.

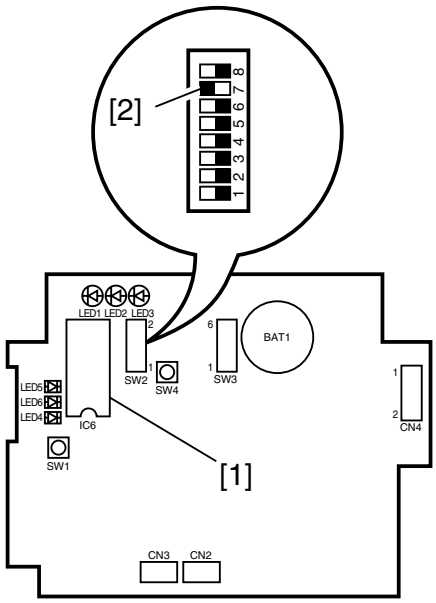


F11-703-12

20) If the ROM IC6 [1] is mounted on the RDD's PCB, shift bit 7 of the DIP switch 2 [2] to ON; otherwise, shift bit 7 of the DIP switch2 to OFF.

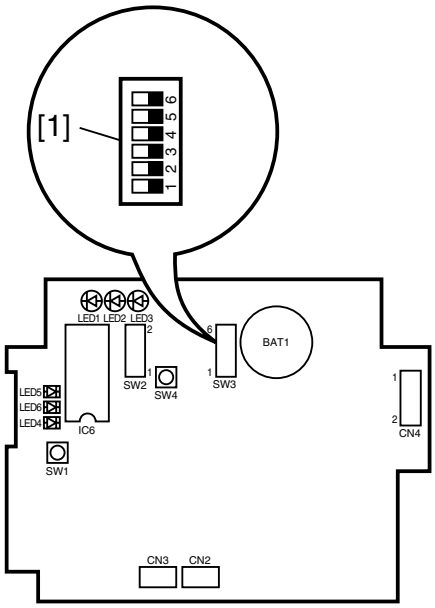
Memo

1. If the ROM (IC6; [1]) is not mounted, you need not mount it.
2. If you are mounting or replacing the ROM (IC6; [1]) for upgrading the RDD, be sure to shift bit 7 of the DIP switch 2 [2] to ON.



F11-703-13

21) Set the bits of the DIP switch 3 [1] on the RDD's PCB as indicated in the table.

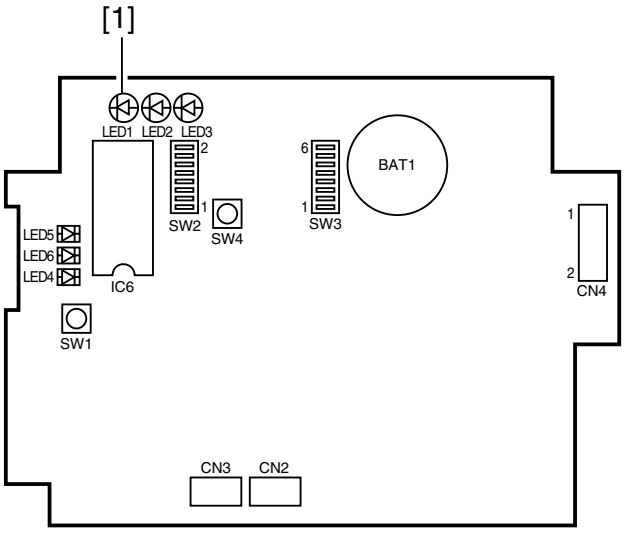


F11-703-14

Switch	Setting	Description
SW3-1	All	
SW3-2	OFF	
SW3-3	ON	
SW3-4	ON	selects push pulse for RDD circuit confihuration
	OFF	selects dial pulse for RDD circuit confihuration
SW3-5	ON	sets dial pulse speed to 20 PPS
	OFF	sets dial pulse speed to 10 PPS
SW3-6	-	reserved

T11-703-01

22) Fit the Power Supply Unit into the power plug, and check that LED 1 [1] (green) on the RDD's PCB comes on.

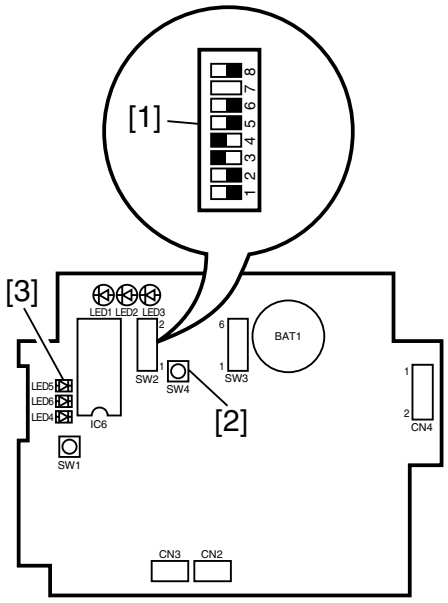


F11-703-15

23) Reset the RDD's RAM.
Set the bits on the DIP switch 2 [1] on the RDD's PCB as indicated in the table, and press the push switch 4 [2] to make sure that LED5 [3] (red) comes on.

bits on SW2	Setting
SW2-1	OFF
SW2-2	OFF
SW2-3	ON
SW2-4	ON
SW2-5	OFF
SW2-6	OFF
SW2-7	See step 20).
SW2-8	OFF

T11-703-02

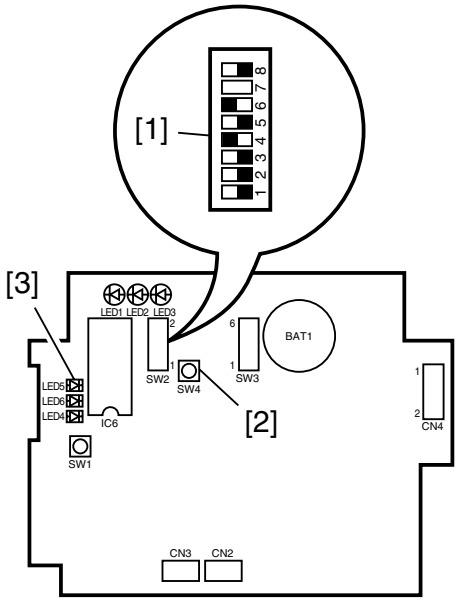


F11-703-16

24) After making sure that LED5 [3] (red) has come on, set the bits on the DIP switch 2 [1] on the RDD's PCB as indicated in the table, and press the push switch 4 [2] to make sure that LED5 [3] (red) goes out, indicating that the RAM has been reset.

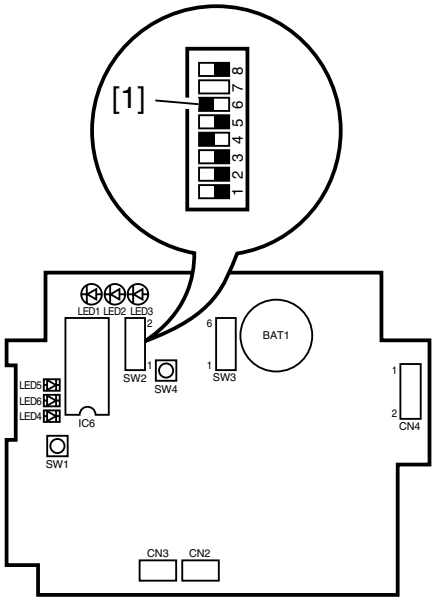
bits on SW2	Setting
SW2-1	OFF
SW2-2	OFF
SW2-3	OFF
SW2-4	ON
SW2-5	OFF
SW2-6	ON
SW2-7	See step 20).
SW2-8	OFF

T11-703-03



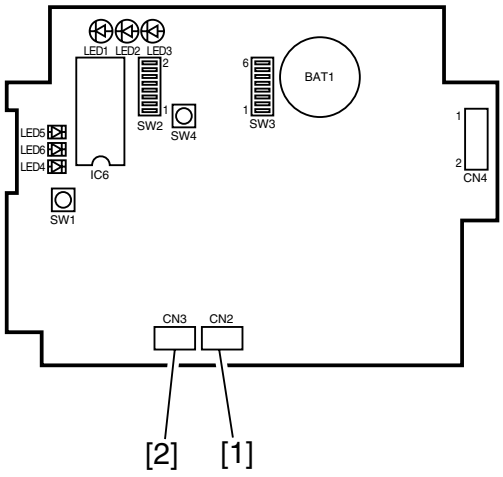
F11-703-17

25) Shift bit 6 of the DIP switch 2 [1] on the RDD's PCB to OFF.



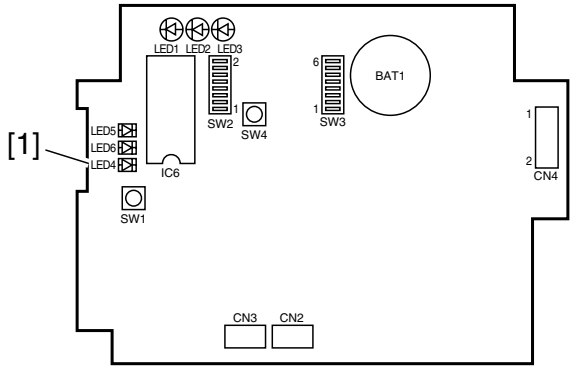
F11-703-18

26) Connect the RDD to the telephone line.
If you are connecting the RDD on its own, connect the modular jack cable to the RDD's connector [1] (LINE).
If you will be using the RDD's extra circuit, connect the existing telephone or fax machine to the RDD's connector [2] (TEL), and connect the telephone circuit to the RDD's connector [1] (LINE).



F11-703-19

27) Call up the service station, and request the RDD's initial settings. (LED 4 [1] (red) starts to flash upon receipt.)

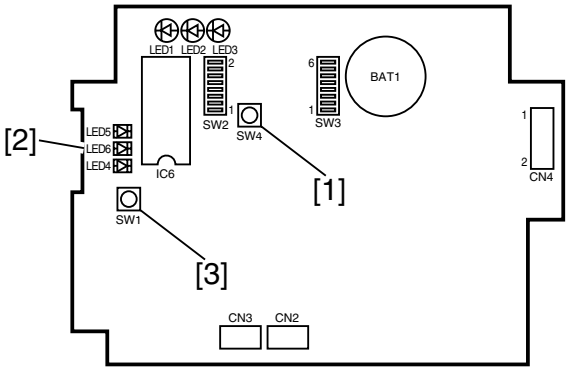


F11-703-20

28) Call all up the service station to check if the initial settings have been successfully made; if the attempt has failed, reset the RAM once again starting with step 23) through 25).

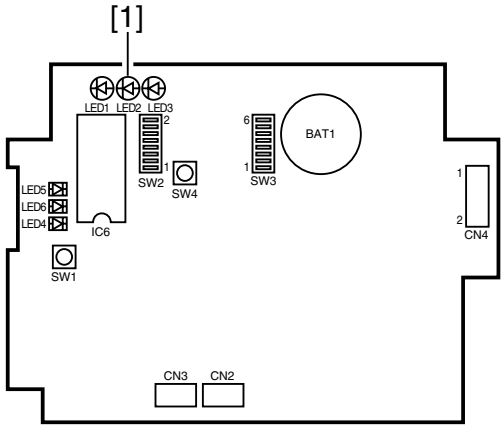
You must confirm that the RDD's settings are correct by calling the service station.

29) Check that you can place a telephone call from the RDD to the computer in the service station. Press the push switch 4 [1]. LED6 [3] (red) should come on; it will go out when transmission ends successfully, or will start to flash if transmission fails.
Retransmission is executed in response to a press on the push switch 4 [1] while LED6 [2] is flashing.
Transmission is canceled in response to a press on the push switch 1 [3] while LED6 [2] is flashing.



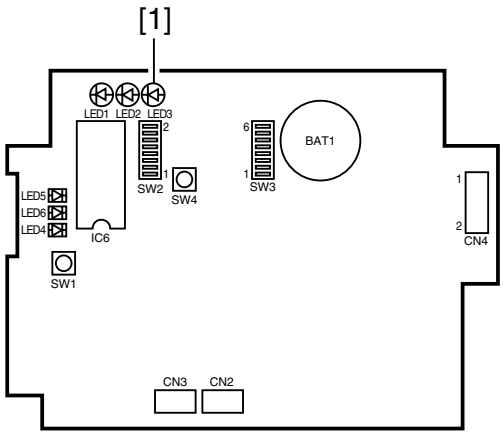
F11-703-21

30) Check that the communications between the RDD and the copier are executed normally. Connect the copier's power plug, and switch it on to make sure that LED 2 [1] (orange) flashes.



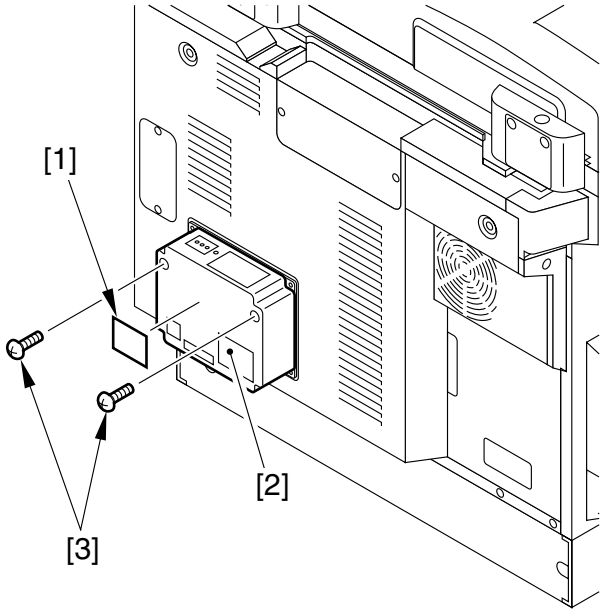
F11-703-22

31) Press the copier' COPY START key to make sure that LED3 [1] (pink) flashes each time a copy is delivered.



F11-703-23

32) Attach the Switch setting label [1], to the RDD's top cover [2]; then, record the setting of each switch on the label.
33) Fix the RDD's top cover [2] in place using two screws [3]. (Make sure that the Power Unit's cable is fixed in place on the cable guide inside the RDD and is not trapped by the top cover [2].



F11-703-24

CHAPTER 12

MAINTENANCE AND INSPECTION

1 Periodically Replaced Parts

Some parts of the machine require periodical replacement to ensure a specific level of machine performance (i.e., once they fail, the machine performance will be affected significantly).

If possible, plan the replacement to coincide with a scheduled service visit.

The data given is for reference only, and is subject to the site environment and characteristics of use.

1.1 Copier

The copier does not have parts that require periodical replacement.

1.2 Cassette Unit

The cassette unit does not have parts that require periodical replacement.

1.3 Inner 2-Way Tray

The inner 2-way tray does not have parts that require periodical replacement.

2 Guide to Durables

Some durables of the machine require replacement once or more over the life of the product because of wear or damage. Replace them when they fail.

2.1 Checking the Timing of Replacement

Check the timing of replacement in service mode as follows:

1) Start service mode, and make the following selections: #9 COUNTER>DRBL-1; then, press the OK key.
2) Select the appropriate item using the cursor key, and press the OK key to check the counter reading.

2.2 Copier

As of March 2002

No.	Parts name	Parts No.	Q'ty	Life	Remarks
1	Fixing roller	FB5-8132	1	150,000 copies	Actual copies made.
2	Pressure roller	FB6-1549	1	150,000 copies	Actual copies made.
3	Fixing roller bushing	FB6-1548	2	150,000 copies	Actual copies made.
4	Separation claw	FB5-8143	5	150,000 copies	Actual copies made.
5	Develping assembly	FG6-8413	1	150,000 copies	Actual copies made.
6	Transfer charging roller	FB5-8019	1	150,000 copies	Actual copies made.
7	Multifeeder separation pad	FB5-8028	1	50,000 copies	Actual copies made.
8	Multifeeder pickup roller	FF6-1671	1	50,000 copies	Actual copies made.

T12-202-01

2.3 Cassette Unit

The cassette unit does not have parts that are referred to as durables.

2.4 Inner 2-Way Tray

The inner 2-way tray does not have parts referred to as durables.

3 Basic Service Work

3.1 Basic Service Work

The machine does not have an item that requires periodical service. Nevertheless, the following work is recommended to ensure a longer product life.

As of March 2002

Work Procedure

1. Report to the person in charge, and check the general condition.
2. Correct any fault.
3. Make test copies, and check the following; if a fault is found, correct it:
   1) image density (against standard)
   2) background (for soiling)
   3) characters (for clarity)
   4) fixing, registration (for displacement), back (for soiling)
   5) margin (against standards; see the following)
4. Clean the parts (See to 4. of Chapter 12).
5. Make test copies.
6. Clean up the area around the machine.

Standards for Print Accuracy
Make test copies using plain paper, and check to make sure that the following are true:
image leading edge margin : 3.0 ± 1.5 mm
left margin : 3.0 ± 2.0 mm
right margin : 0.5 mm or more
If not, make adjustments by referring to 2 of Chapter 13.

4 Cleaning During a Visit

Perform the following during a visit to the user's:

1. Copyboard Glass, Reading Glass, and Back of the Copyboard Cover (retainer)

Open the copyboard cover, and wipe the parts with a cloth moistened with water (well wrung); then, wipe them with a soft, dry cloth.

2. Contact Sensor

Remove the 2 screws, and detach the copyboard glass; then, remove any dirt from the lens array of the contact sensor with a soft, dry cloth.

1. The contact sensor is vulnerable to static charges. Be sure to take preventive measures before cleaning it.
2. Do not touch or wipe the glass (photoconductor) around the lens assembly.
3. Do not use water or solvent.

3. Cassette Pickup Roller

1) Slide out the cassette, and open the left lower cover.
2) Turn the pickup roller by hand so that the roller faces downward; then, insert a screwdriver to the pickup roller shaft from the left lower cover side, and keep the roller in place.
3) Remove the pickup roller, clean it with lint-free paper. If the dirt is excessive, use alcohol.

4. Feeding Roller, Separation Roller, and Vertical Path Roller

1) Open the left lower cover, and clean the roller with lint-free paper while turning the roller by hand. If the dirt is excessive, use alcohol.

5. Multifeeder Pickup Roller

1) Open the manual feed tray, and remove the left cover.
2) Open the front cover, and release the developing assembly lever; then, detach the drum unit.
3) Remove the multifeeder tray and the pickup guide (2 screws); then, detach the multifeeder pickup roller.
4) Clean the roller with lint-free paper. If the dirt is excessive, use alcohol.

6. Multifeeder Separation Pad

1) Open the multifeeder tray, and detach the left cover.
2) Open the front cover, and release the developing assembly lever; then, detach the drum unit.
3) Remove the multifeeder tray and the pickup guide (2 screws); then, clean the multifeeder serration pad with lint-free paper.

7. Registration Roller

1) Open the multifeeder tray, and detach the left cover.
2) Open the front cover, and release the developing assembly lever; then, detach the drum unit.
3) Remove the multifeeder tray and the pickup guide (2 screw); then, clean the roller with lint-free paper while turning it by hand. If the dirt is excessive, use alcohol.

8. Transfer Charging Roller

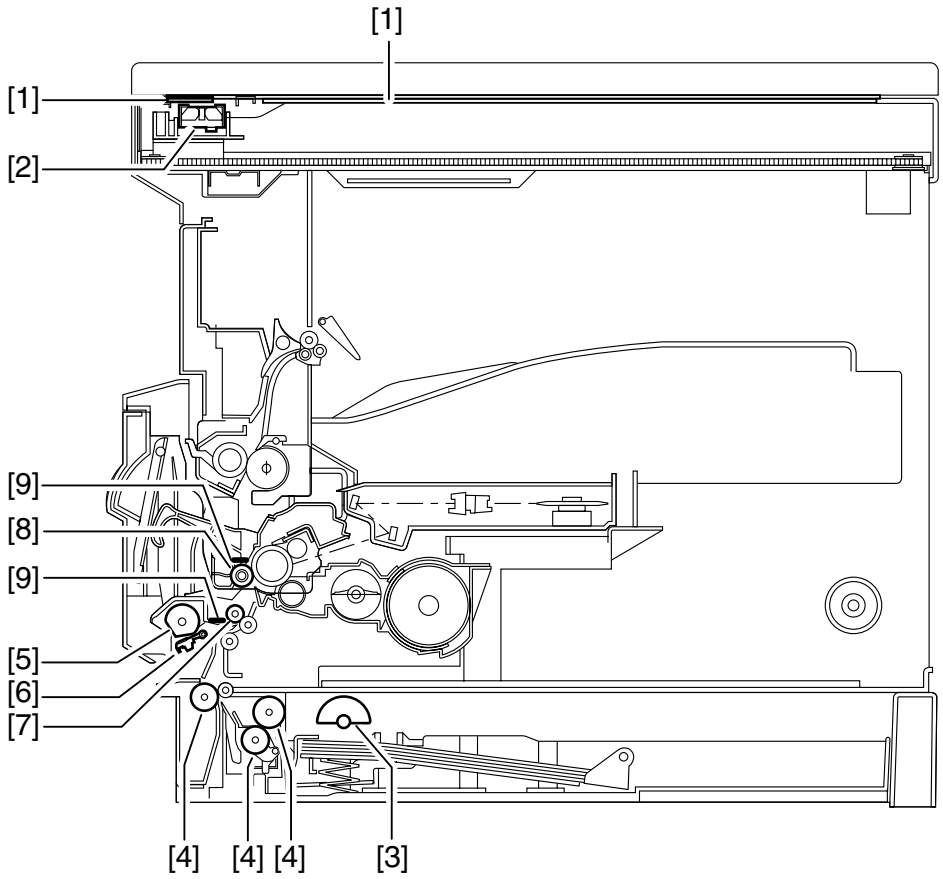
1) Open the multifeeder tray, and detach the left cover. While taking care not to touch the roller, turn the roller by hand while lightly wiping it with lint-free paper (not leaving paper lint).

Do not touch the roller. Or, do not use water or solvent to clean the roller.

9. Static Eliminator

1) Open the multifeeder tray, and detach the left cover. Clean the static eliminator of the transfer charging roller and the static eliminator of the pickup guide assembly with a blower brush or lint-free paper.

The following parts must be cleaned during a visit to the user's:



F12-401-01

[1] Copyboard glass, Reading glass, Copyboard cover back (original retainer)
[2] Contact sensor
[3] Cassette pickup roller
[4] Feeding roller, Separation roller, Vertical path roller
[5] Multifeeder pickup roller
[6] Multifeeder separation pad
[7] Registration roller
[8] Transfer charging roller
[9] Pre-transfer static eliminator, Transfer static eliminator

5 Points to Note When Storing/Handling the Drum Unit

5.1 Outline

Regardless of whether its packaging seal has been removed or not, or of whether or not it has been mounted inside the machine or not, the drum unit is subject to the effects of the environment and will change over time (independently of the number of pages it has been used for).

The rate of change is determined by the site or storage conditions, and is not the same for all cases, requiring full care when storing or handling the unit.

5.2 Storage and Handing After Removing the Packaging Seal

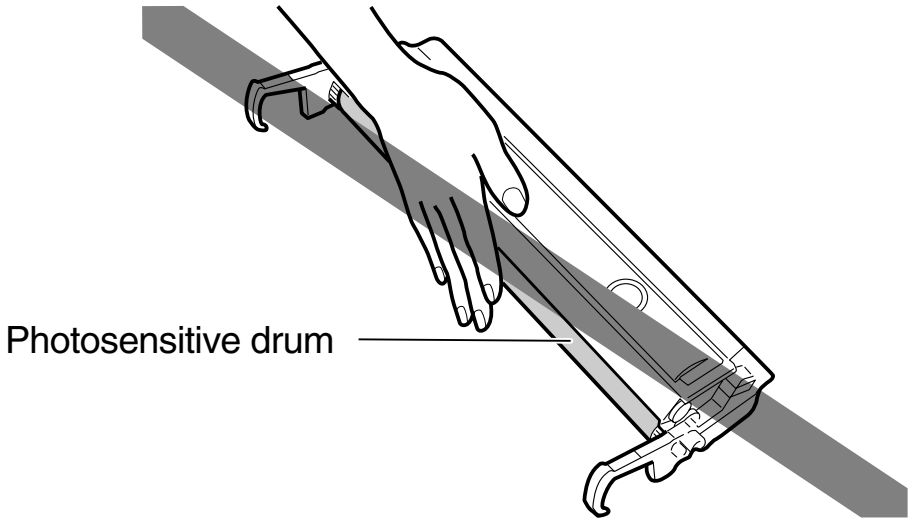
The photosensitive drum is an organic photo conducting (OPC) drum, which will deteriorate if exposed to strong light.

5.2.1 Storage After Removing the Packaging Seal

1) Be sure to store it in a protective bag.
2) Avoid areas subject to direct rays of the sun or bright areas (i.e., near a window). Do not leave it inside a car for a long time.
3) Avoid areas subject to high/low temperature/humidity or areas where temperature/humidity can change rapidly.
4) Avoid areas subject to a corrosive gas (insecticide) or where the air is briny.
5) Keep the drum unit where the temperature is between 0 and 35℃.
6) Keep the drum unit out of reach of children.

5.2.2 Points to Note When Handling the Drum Unit

1) The drum unit must be transported separately from the machine. Be sure to fix the transfer charging roller in place. (See 3. of Chapter 11.) Also, be sure to keep it in a protective bag, out of light.
2) The photosensitive drum is vulnerable to strong light. Do not subject it to direct rays of the sun or strong light (1500 lux or higher). If exposed, it can start to produce images with white spots or black bands.
   In the event images with white spots or black bands occur, leave the machine alone for a while; the faults may disappear. If the exposure is too long, however, the faults may not disappear.
3) Do not touch the surface of the photosensitive drum of the drum unit. Or, do not clean the photosensitive drum.



F12-502-01

4) Do not stand the drum unit upright or turn it over. Be sure that the side with the label faces upward.
5) Do not disassemble the drum unit.
6) Advise the user to send in used drum units to a designated address.

If exposed to light of 1500 lux in intensity (general lighting) for 5 min and then left alone in the dark for 5 min, the drum unit may recover to a degree which will not cause any practical problems. Nevertheless, avoid exposing it to direct sunshine.
The rays of the sun, in passing, is as strong as 10000 to 30000 lux in intensity.

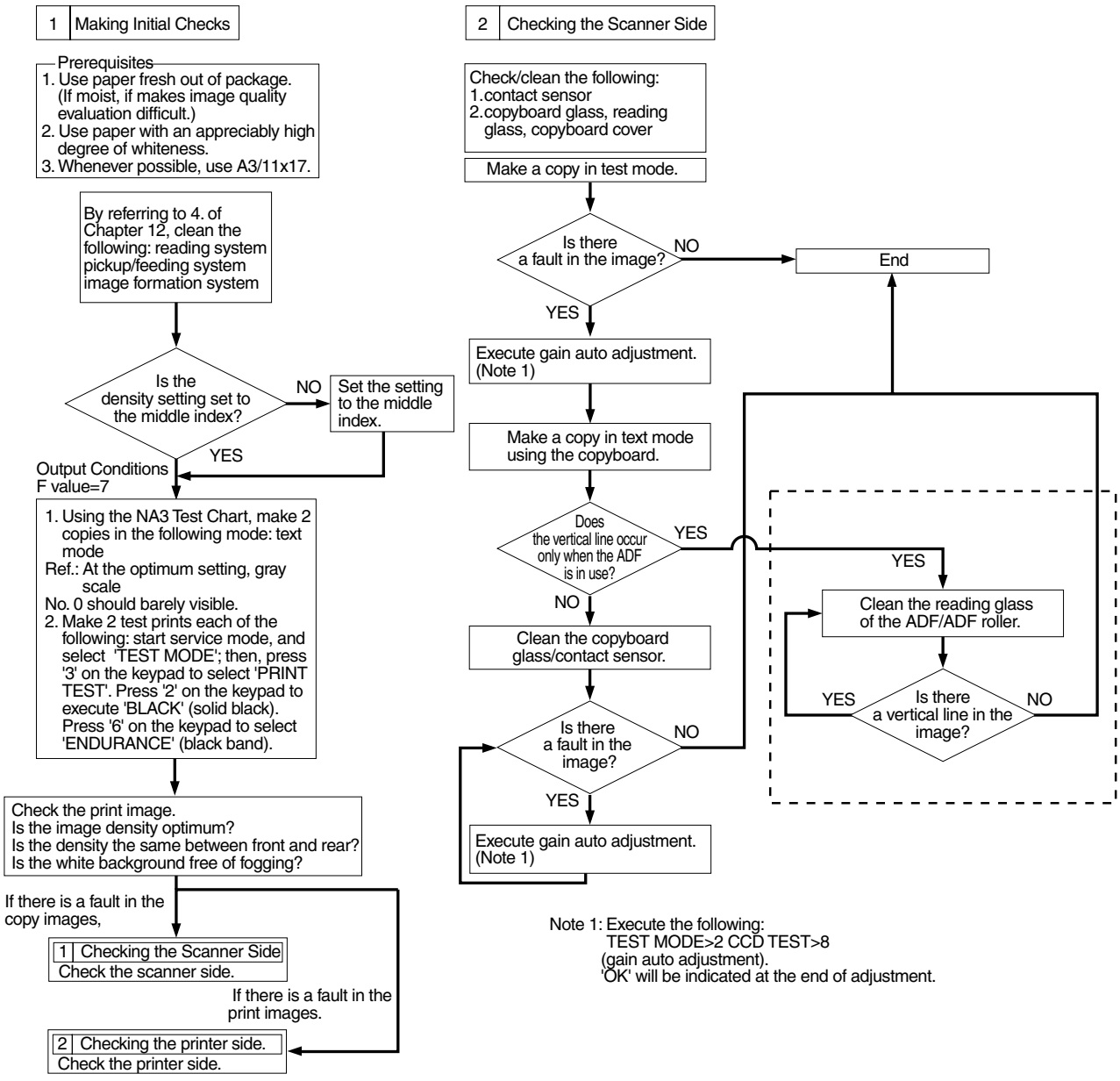
CHAPTER 13

TROUBLESHOOTING

1 Image Adjustment Basic Procedure

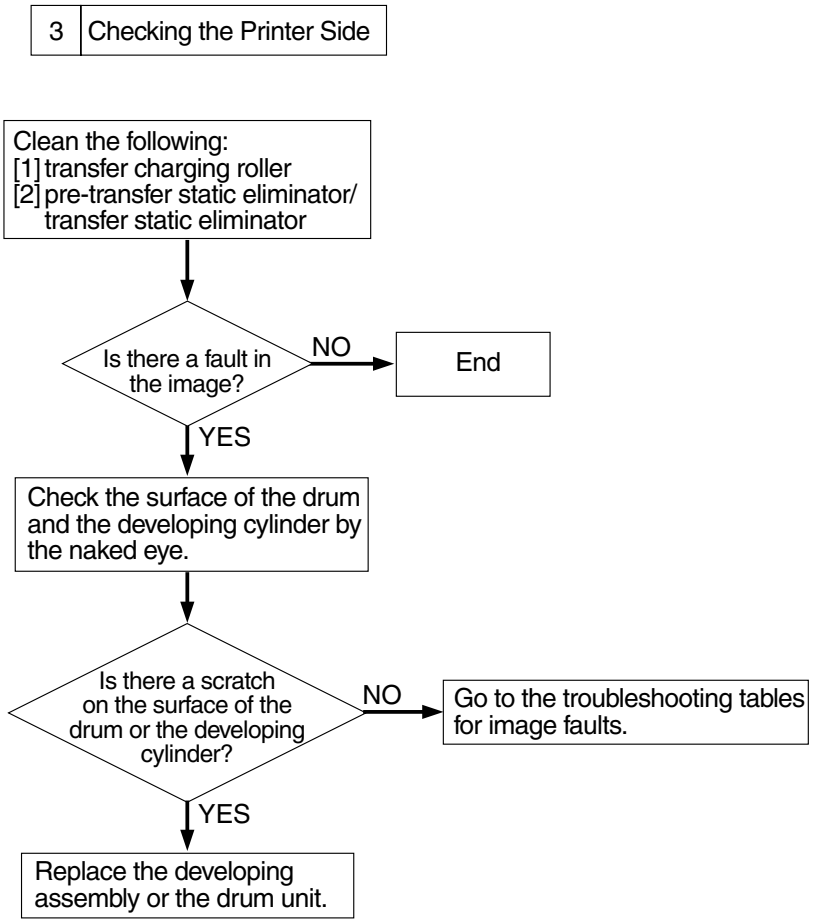
1.1 Image Adjustment Basic Procedure

Go through the following to make basic adjustments:



Note 1: Execute the following:
TEST MODE>2 CCD TEST>8
(gain auto adjustment).
'OK' will be indicated at the end of adjustment.

F13-101-01



F13-101-02

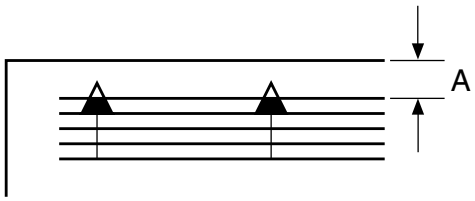
2 Standards and Adjustments

2.1 Image Adjustments

2.1.1 Standards for Image Position

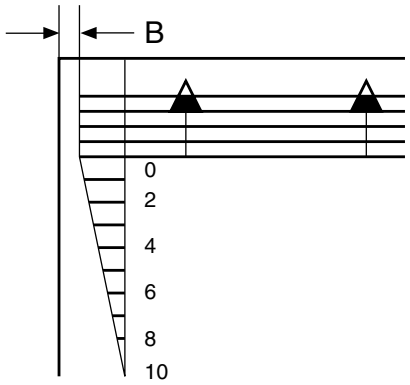
The image margin/non-image width on prints made in Direct must be as follows:
Image leading edge margin:

Image leading edge margin:
A = 3.0 ± 1.5mm.
Image trailing edge margin:
A = 3.0 ± 2.0mm. < 3.0 ± 1.5mm >
If B4 or larger, 4.0 ± 2.0mm.
< > : with ADF



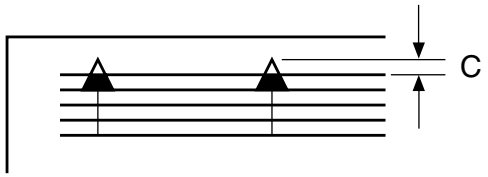
F13-201-01

Left image margin:
B = 3.0 ± 2.0mm.
Right image margin:
B = 0.5mm or more



F13-201-02

Leading edge non-image width:
C = 3.0 ± 2.0mm. < 2.5 ± 2.0mm >
Trailing edge non-image width :
C = 3.0 ± 2.0mm. < 2.5 + 1.9 / - 1.8mm >



F13-201-03

2.1.2 Adjusting the Image Position

Make 10 prints each from the following sources of paper, and check to see that the image margin and non-image width are as indicated:

- cassettes
- manual feed tray

If not, go through the following to adjust the image position:

(The machine is not equipped with separate adjustment mechanisms for its cassette pickup assembly and manual feed tray pickup assembly; be sure to make the following adjustments so that they both will be as indicated.)

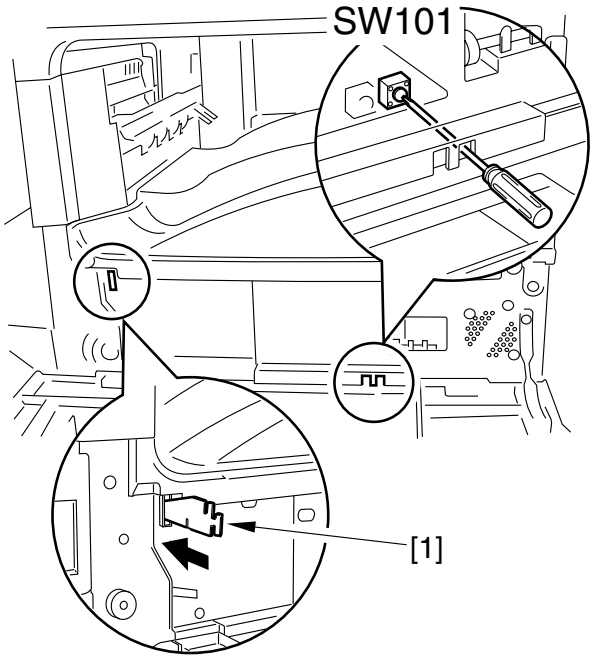
1) Adjusting the Leading Edge Margin for the Printer Assembly (if equipped with printer functions or fax functions)
   This is intended for printing that does not involve reading of an original, while 2 and 3 that follow involve reading an original.

2) Adjusting the Image Position for Copying
   1. image leading edge margin adjustment (read start position in main scanning direction)
   2. left/right image margin adjustment (read start position in sub scanning direction)
   3. leading edge non-image width (read ratio in sub scanning direction)

3) Adjusting the Image Position for ADF copying
   1. image leading edge margin adjustment (read start position in main scanning direction)
   2. left/right image margin adjustment (read start position in sub scanning direction)
   3. leading edge non-image width (read ratio in sub scanning direction)

2.1.3 Adjusting the Leading Edge Margin for the Printer Unit (if equipped printer functions)

1) Open the front cover, and detach the right cover.
2) Insert the door switch actuator [1] as shown.
3) Insert a precision screwdriver through the left opening of the inside cover, and press the test print switch (SW101) on the DC controller PCB to execute test printing.

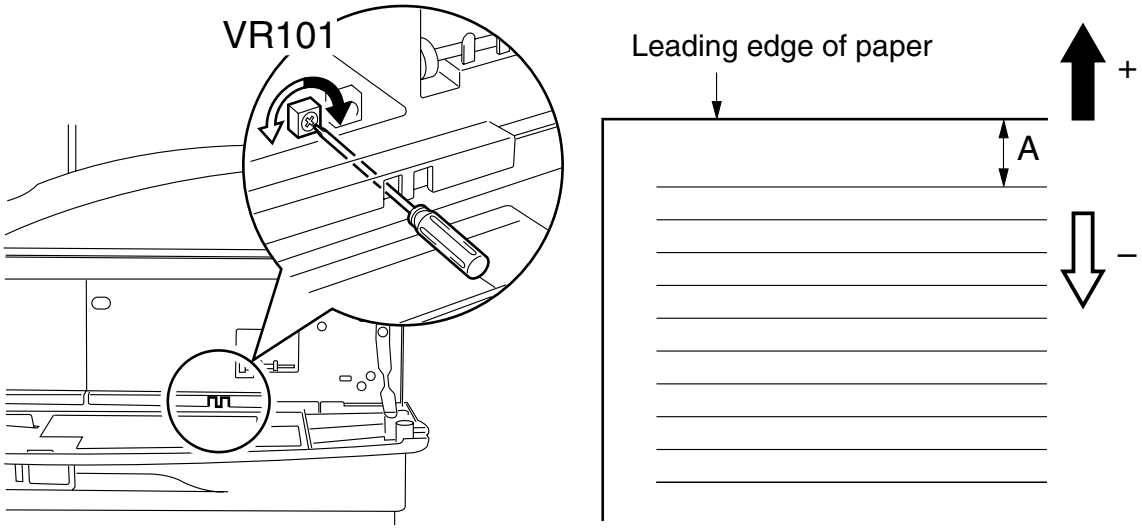


F13-201-04

4) Check to make sure that the leading edge of the generated image is 2.0 ±0.5 mm.
If not, insert a precision screwdriver, and turn the volume (VR101) so that it is as indicated.

If it is less than indicated, turn the volume counterclockwise.

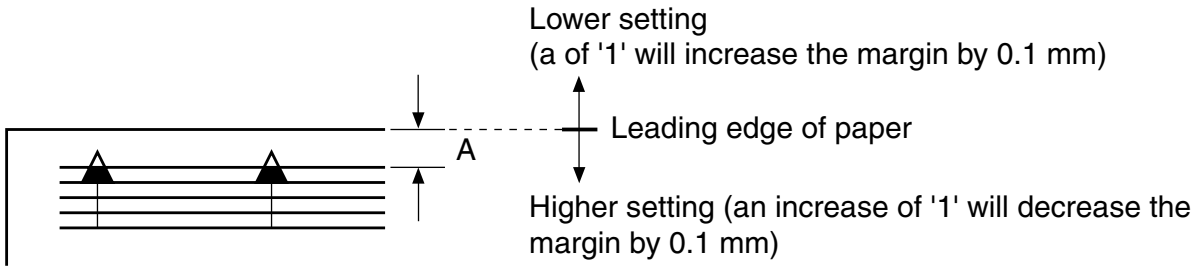
If it is more than indicated, turn the volume clockwise.



F13-201-05

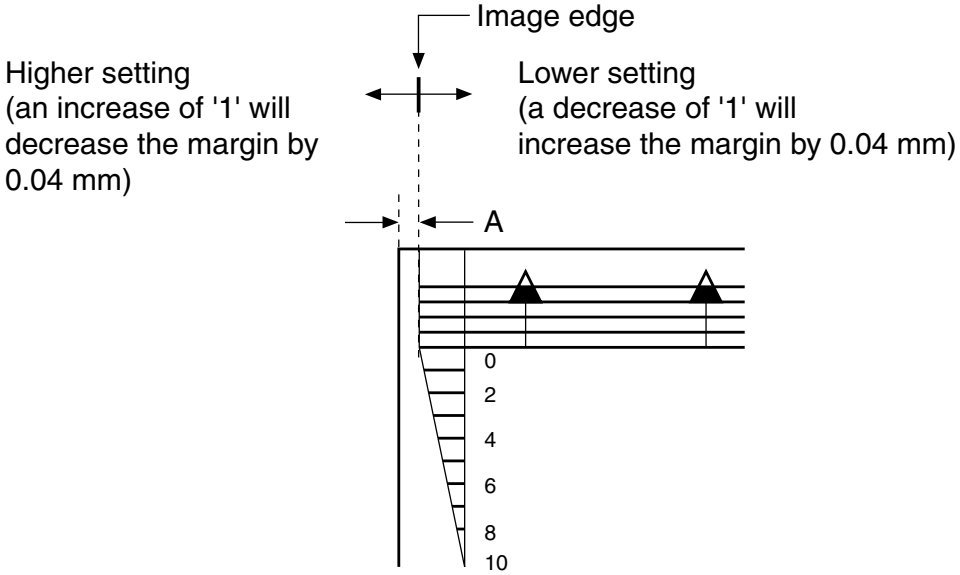
2.1.4 Adjusting the Image Position for Copying

1) Adjust the image leading edge margin by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 023.
   A higher setting will decrease the margin A.
   A lower setting will increase the margin A.
   Adjustment value of 1 = 0.1 mm (range of adjustment: 0 to 9999; default: 145)



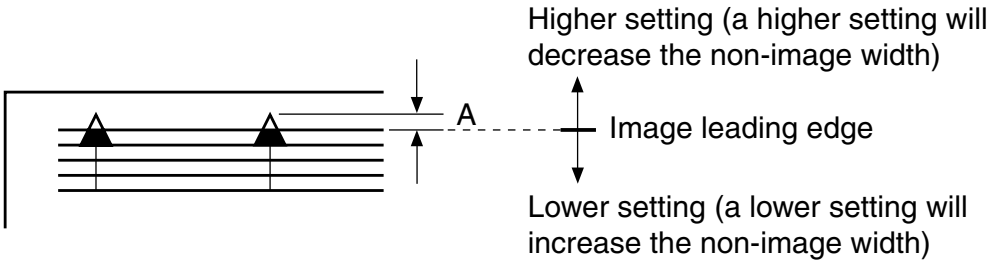
F13-201-06

2) Adjust the left/right image margin by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 021.
   A higher setting will decrease the margin A.
   A lower setting will increase the margin A.
   Adjustment value 1 = 0.04 mm (range of adjustment: 0 to 9999; default: 128)



F13-201-07

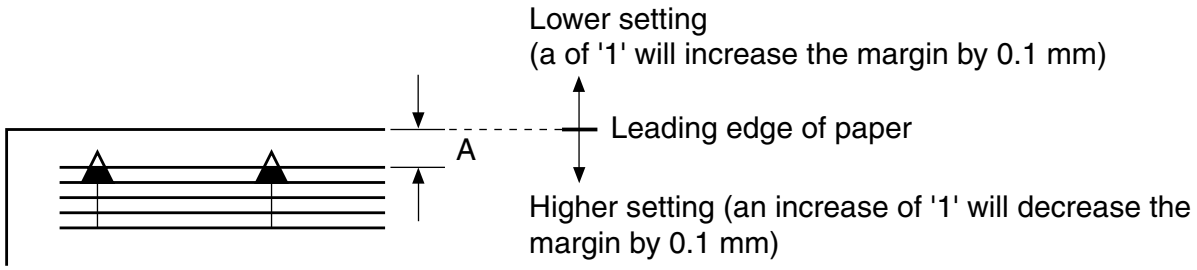
3) Adjust the leading edge non-image width by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 031.
Adjustment unit 1 = 0.1% (in positive direction; range of adjusmentd: 0 to 9999; default: 16)



F13-201-08

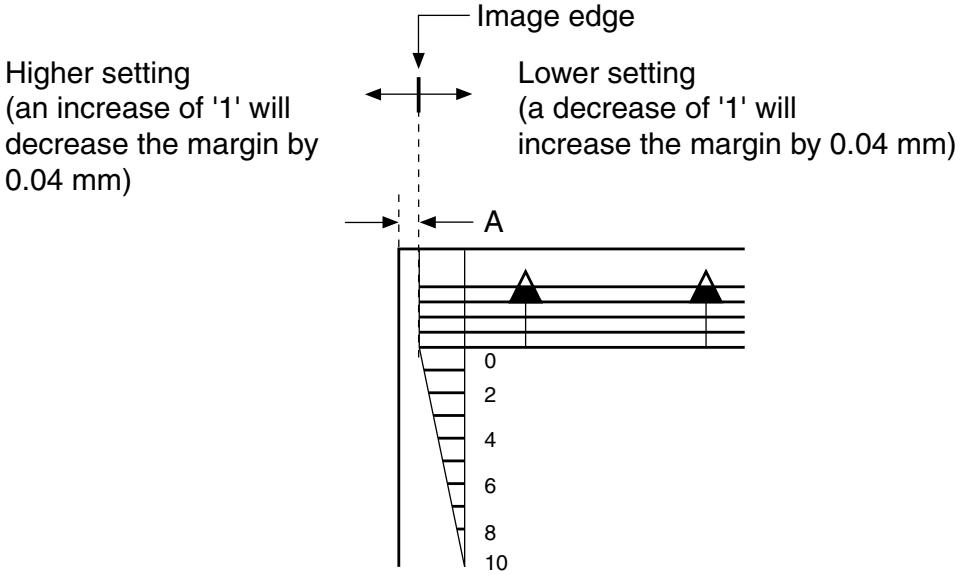
2.1.5 Adjusting the Image Position for ADF Copying

1) Adjust the image leading edge margin by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 024.
   A higher setting will decrease the margin A.
   A lower setting will increase the margin A.
   Adjustment value of 1 = 0.1 mm (range of adjustment: 0 to 9999; default: 235)



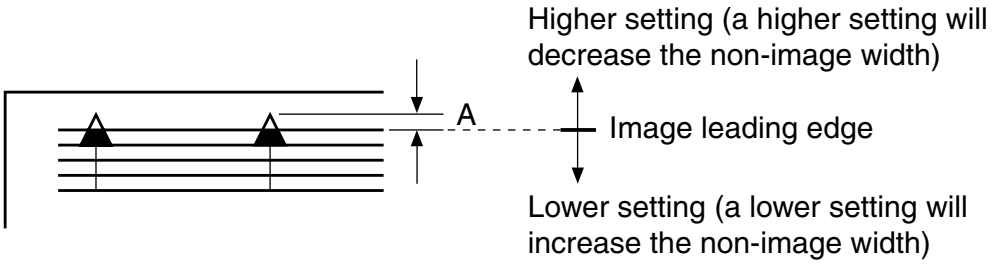
F13-201-09

2) Adjust the left/right image margin by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 022.
   A higher setting will decrease the margin A.
   A lower setting will increase the margin A.
   Adjustment value 1 = 0.04 mm (range of adjustment: 0 to 9999; default: 128)



F13-201-10

3) Adjust the leading edge non-image width by making the following selections in service mode: #6 SCANNER>7. CCD>parameter 032.
Adjustment unit 1 = 0.1% (in positive direction; range of adjusmentd: 0 to 9999; default: 16)



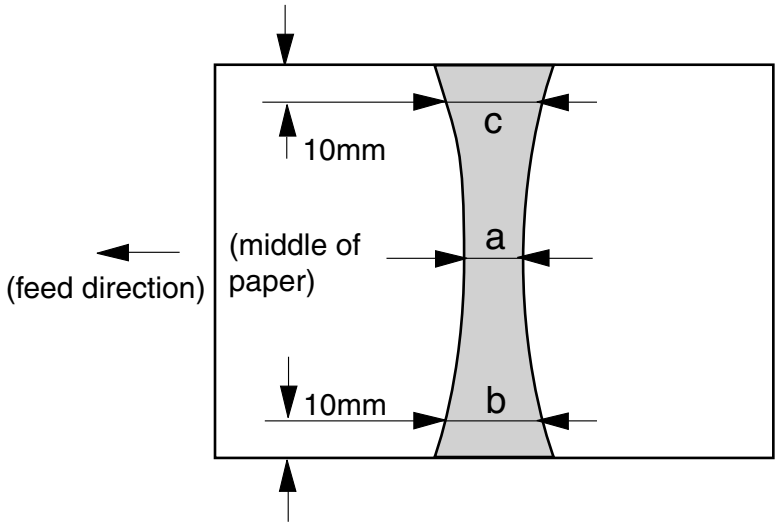
F13-201-11

2.2 Fixing System

2.2.1 Checking the Fixing Roller Pressure (nip)

The machine is not designed to allow adjustment of the nip, but an inappropriate nip can cause fixing faults; be sure to check the nip of the fixing assembly as follows:

1) Make a solid black copy on A3 or 11x17 paper.
2) Put the output in the multimeter tray with the black side facing up.
3) Press the Start key, and turn off the power switch as soon as the leading edge of paper reaches the delivery tray. About 10 sec thereafter, remove the paper from h machine.
4) Measure the width of the area indicated (where toner is glossy), and check to make sure that it is as indicated:
   - middle at a : 2.9 to 4.6 mm
   - left/right at b and c : 3.5 mm or more
   - left/right difference ($|b - c|$) : 0.5 mm or less
   - middle edge difference (b - a, c - a) : 0.5 mm or more



F13-202-01

2.3 Electrical Parts

2.3.1 When Replacing the Major Parts

Major part	Work
Contact sensor	gain adjustment
Image processor PCB	user data, service data settings
DC controller PCB	leading edge margin adjustment
Analog processor PCB	gain auto adjustment

2.3.2 Gain Auto Adjustment

1) Execute gain auto adjustment by making the following selections in service mode: TEST MODE> 2 CCD TEST> 8.
   At the end, 'OK' will be indicated. If 'NG' is indicated, check the following, and try once again:
   • Is the copyboard cover (ADF) closed properly?
   • Is the copyboard glass closed properly? (position of white plate)
   • Is the white plate free of dirt?
   • Is the lens area of the contact sensor free of dirt?

2.3.3 When Replacing the Contact Sensor

After replacing the PCB, go through the following:

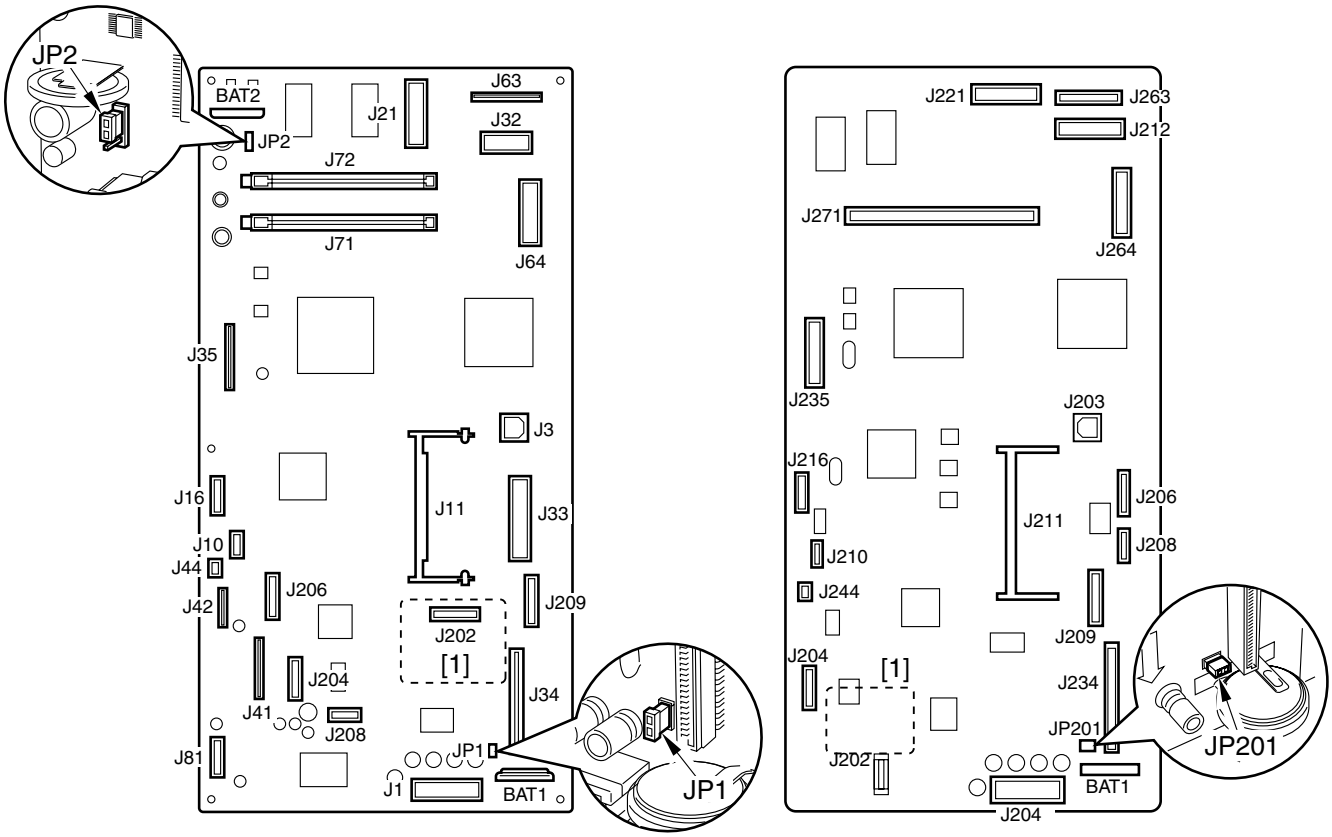
1) Execute gain auto adjustment by making the following selections in service mode: TEST MODE>2 CCD TEST>8.

2.3.4 When Replacing the Image Processor PCB

a. Before Starting the Work

1) If the machine is equipped with fax functions, print out a one-touch dial/speed dial/ group address list and communications control report.
2) If the machine is equipped with fax functions, print out all transmission/reception images.
3) Generate a counter report by making the following selections in service mode: #10 REPORT>COUNTER REPORT.
   The couther report provides a user data list, changes made to the default settings of the system data list, and system dump list.
4) Turn off the power switch, and disconnect the jumper plug (JP1/JP201) from the image processor PCB.
5) If the machine is equipped with a non-fax function and an expansion memory, remove the memory from the image processor PCB.
   If the machine is equipped with a fax function and an expansion memory, turn OFF the jumper plug (JP2) on the image processor PCB and then remove the memory.
6) Remove the ROM DIMM.
7) Remove the screw, and detach the counter PCB [1].

When the jumper plug (JP1/JP201) is removed, all data stored in the control memory will be lost. Be sure to check that the control data has been printed before removing the plug.
The data in the control memory includes the following:
user data : data set by the user by pressing the Additional function key in the control panel.
service mode data : service mode settings data
control data : communications control record; of previous 40 communications; system dump record



F13-203-01

b. After Replacement

1) Mount the counter PCB with a screw.
2) Mount the ROM DIMM.
3) Install the expansion memory. If the machine is equipped with a fax function, check to be sure that the jumper plug (JP2) on the image processor PCB is in OFF position. After installing the expansion memory, be sure to shift the jumper plug (JP2) to ON position.
4) Connect the jumper plug (JP1/JP201) disconnected from the PCB before replacement.
5) Turn on the power switch; when 'DATA ERROR' is indicated, press the OK key in the control panel.

After step 5), if the machine indicates 'system error E000', perform the following:

i) Turn OFF and then ON the machine's power switch.
ii) Make the following selections in service mode, and press the OK key: #8 CLEAR>COUNTER.

6) If you have replaced the image processor PCB of a machine equipped with an original detection sensor, make the following selections in service mode, and press the OK key to turn on the original detection function: #6 SCANNER>10. MODEL>'TYPE B'.
If the machine is not equipped with an original detection function, select 'TYPE A', and press the OK key to turn off the original detection function.
7) Enter the user data and service mode data.

2.3.5 When Replacing the DC Controller PCB

1) After replacing the PCB, adjust the leading edge margin for the printer unit. (See 2.1.3 in Chapter 13.)

2.3.6 When Replacing the Analog Processor PCB

1) After replacing the PCB, execute gain auto adjustment by making the following selections in service mode: TEST MODE>2 CCD TEST>8.

2.4 Checking the Sensors

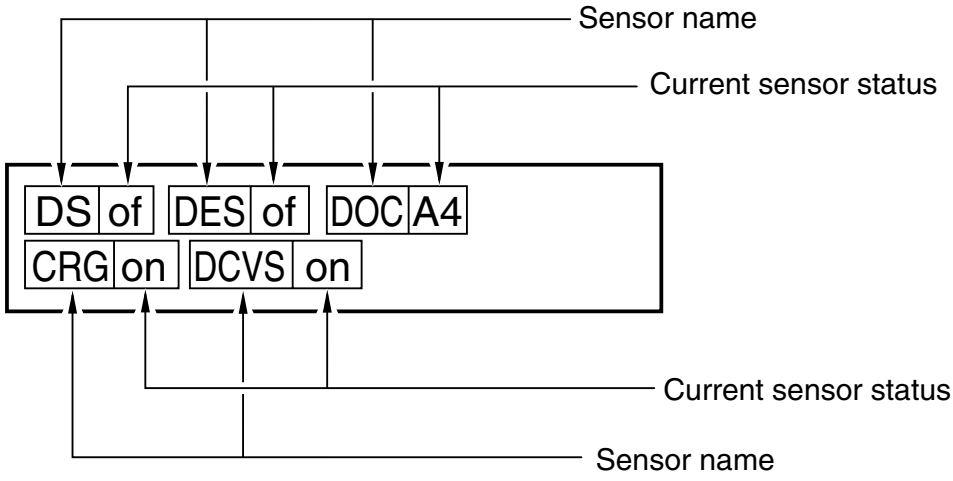
2.4.1 Checking the Sensors

To find out whether a photointerrupter is good or faulty, use 'SENSOR' under 'TEST MODE' in service mode as follows:

1) Press the additional function key and the # or ID (#) key in sequence to start service mode.
2) Using the cursor key, select 'TEST MODE'.
3) Press '6' on the keypad to select '6: FACULTY TEST'.
4) Press '3' on the keypad to start sensor check mode, indicated by the following screen:

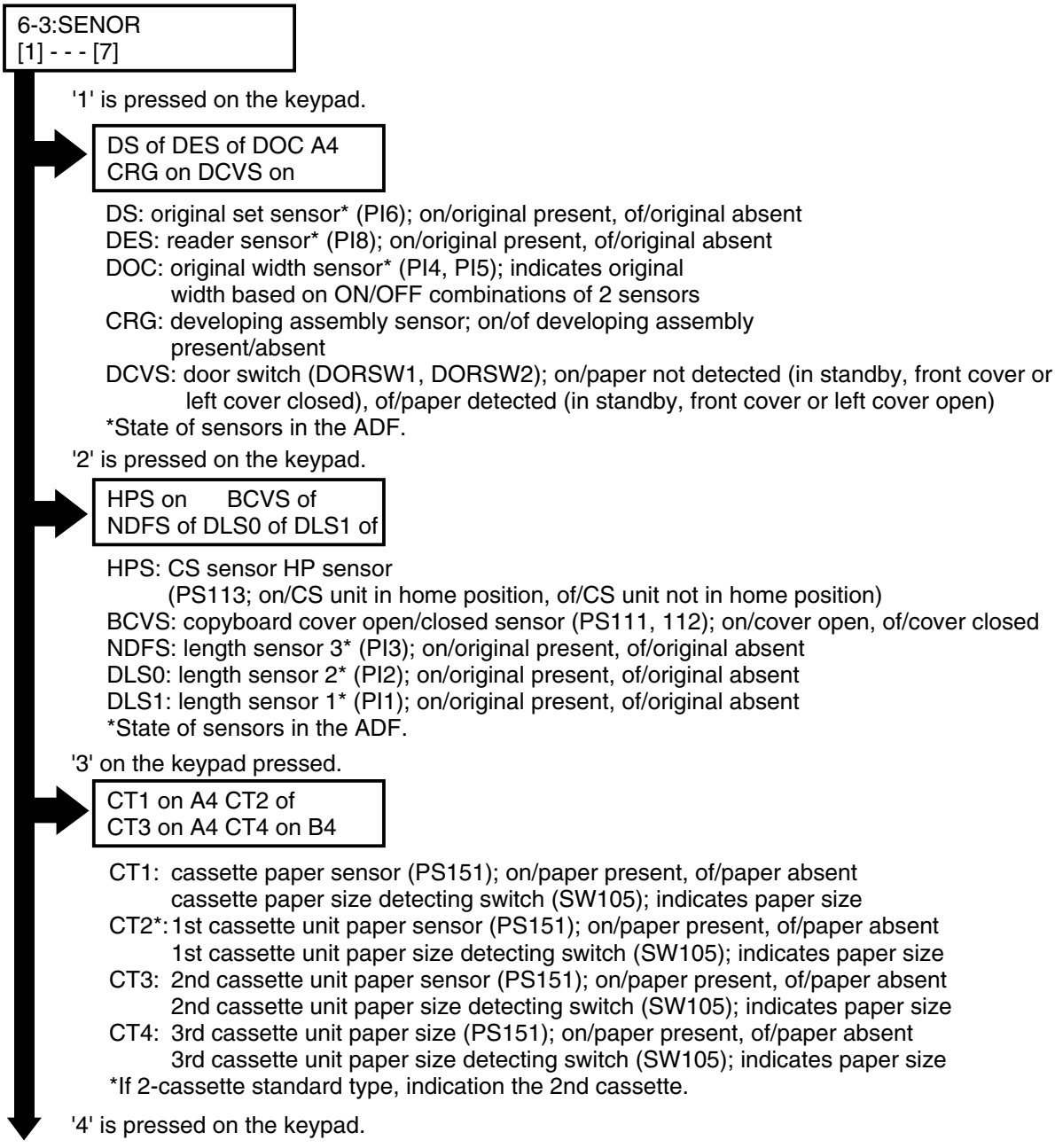
F13-204-01

5) While the above screen is indicated, press '1', '2', '3', '4', and '5' on the keypad so that the Status screen of each respective sensor will appear; for instance, when '1' is pressed on the keypad,

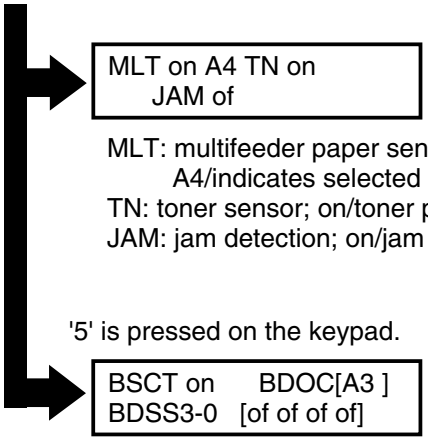


F13-204-02

6) Move the flag of the sensor to see that the indication alternates between 'of' and 'on', i.e., OFF and ON.
The following shows what will take place when '1' through '4' are pressed on the keypad, indicating the sensor name and the sensor status while machine is in standby:



F13-204-03



MLT: multifeeder paper sensor (PS105); on/paper present, of/paper absent
A4/indicates selected paper size
TN: toner sensor; on/toner present, of/toner absent
JAM: jam detection; on/jam detected, of/jam not detected

BSCT: copyboard cover open/closed sensor (PS113);
on/cover open, of/cover closed
BDOC: original size; indicates paper size based on
combinations of original size sensor states
BDSS: original size sensors (PS117, PS116, PS115, PS114);
on/original present, of/original absent

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3 Troubleshooting Image/Operation Faults

3.1 Making Initial Checks on Image Faults

3.1.1 Site of Installation

1) The voltage of the power source must be as rated (±10%). Be sure that the power plug remains connected day and night.
2) The machine must not be subjected to high temperature/humidity (near a water faucet, water boiler, humidifier). The machine must not be installed in a cold or dusty area or near a source of fire.
3) The machine must not be subjected to ammonium gas.
4) The machine must not be subjected to the direct rays of the sun. As necessary, curtains must be provided.
5) The machine must be installed in a well ventilated area.
6) The machine must be kept level.
7) The machine must be supplied with power night and day.

Check the sight against the above requirements.

3.1.2 Checking the Originals

Find out if the fault is caused by the original used or by the machine:

1) The copy density is optimum if set to 5 ±1 (density setting).
2) An original with a reddish background can cause poor contrast (as in sales slips).
3) The density of the original can significantly affect the output.

- A diazo copy used as an original or an original with transparency can produce copies that can be mistaken as being 'foggy."
- An original prepared in light pencil or with greenish characters can produce copies that can be mistaken for being 'too light."

3.1.3 Copyboard Cover and Copyboard Glass (standard white plate)

Check the copyboard cover and copyboard glass (standard white plate) for dirt and a scratch. If soiled, clean it with a solution of mild detergent or alcohol; if scratched, replace them.

3.1.4 Checking the Transfer Charging Roller/Static Eliminator

1) Check the transfer roller and the transfer/pre-transfer static eliminator for dirt and a fault (damage).
2) Check to make sure that the transfer roller and the transfer/pre-transfer static eliminator are mounted correctly.

3.1.5 Checking the Drum Unit

1) Check to be sure that the surface of the photosensitive drum is free of a scratch. Otherwise, replace the durm unit.

3.1.6 Checking the Paper

1) Check to see if paper of a recommended type is used. Advise the user that the use of paper not of a recommended type may not bring the best results.
2) Check to find out if the paper is moist. Try paper fresh out of package. Advise the user on the correct method of storing paper; moist paper will adversely affect transfer, causing poor images, separation faults, jams, or wrinkling.

3.1.7 Image Adjustment Basic Procedure

If the image is uneven in density (different between front and rear), is too light, or is foggy, go through the Image Adjustment Basic Procedure before referring to the tables that follow.

3.1.8 Others

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


Memo

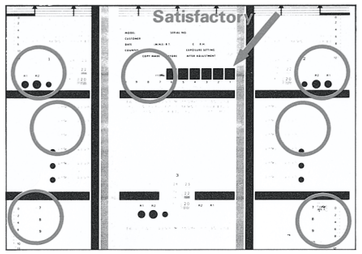
1) Condensation in the CS unit will generate darker images.
2) Condensation in the charging system will cause electrical leakage.
3) Condensation on the pickup/feed guide can cause paper feeding faults.
If condensation has developed, dry wipe the part, or leave the machine alone and powered for 60 min.

Blank Page

3.2 Image Faults Samples

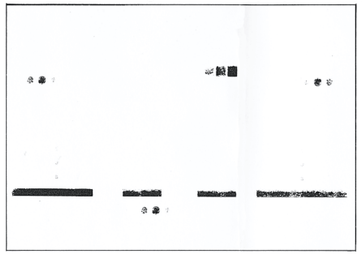
Note: The samples are made artificially to provide an idea of faulty copies, and may not represent actual faults. (The NA-3 Test Sheet was copied in DIRECT mode on A4 paper, and reduced for printing.)

1. The copy is too light (halftone only).



2. The copy is too light (both halftone and solid black).

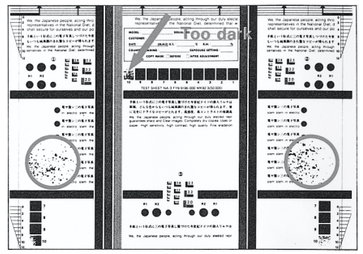
3. The copy is too light (entire copy, appreciably).



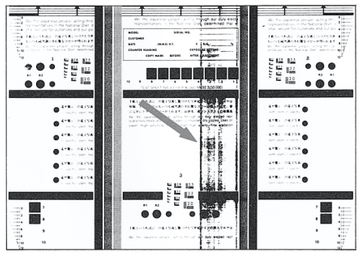
4. The copy has uneven density (darker along front).

5. The copy has uneven density (lighter along front).

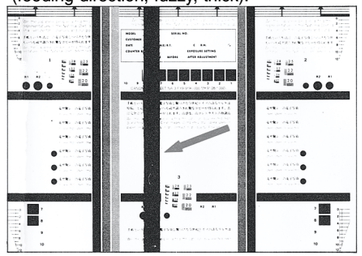
6. The copy is foggy (entire copy).



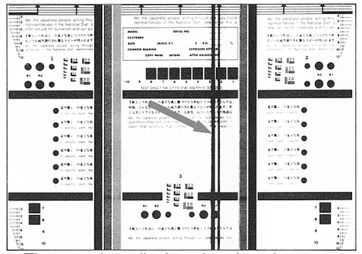
7. The copy is foggy (feeding direction).



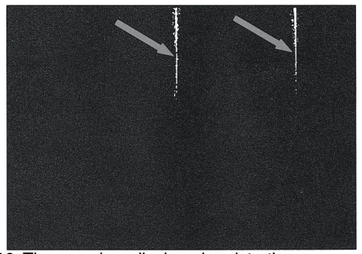
8. The copy has black lines (feeding direction, fuzzy, thick).



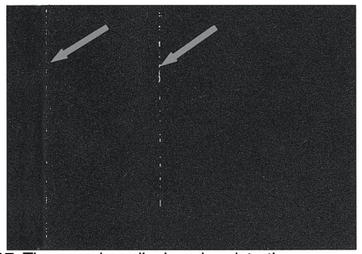
9. The copy has black lines (feeding direction, fine).



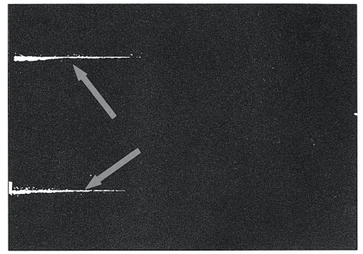
10. The copy has white strips (feeding direction).†



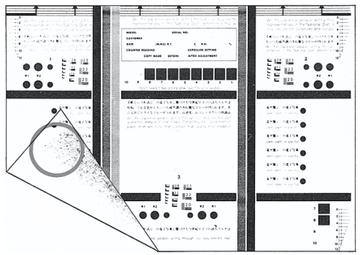
11. The copy has white lines (feeding direction).*



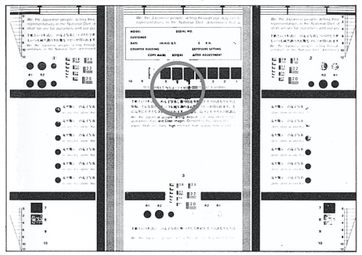
12. The copy has white strips (cross-feeding direction).



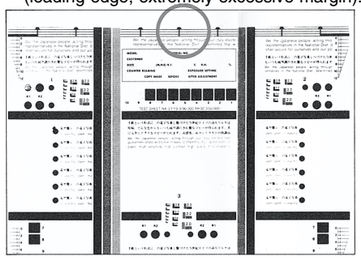
13. The back of the copy is soiled.



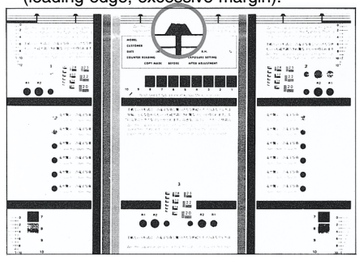
14. The copy has poor fixing.



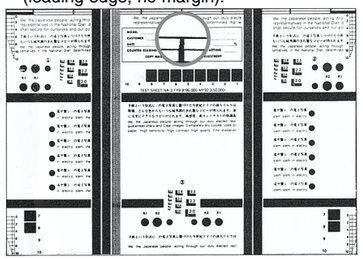
15. The copy has displaced registration (leading edge, extremely excessive margin).



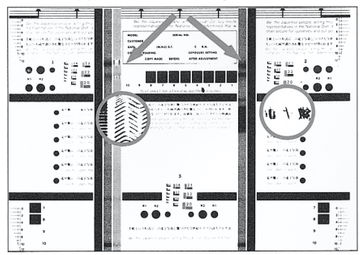
16. The copy has displaced registration (leading edge, excessive margin).



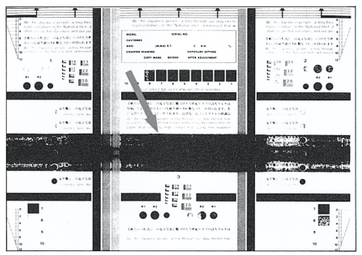
17. The copy has displaced registration (leading edge, no margin).



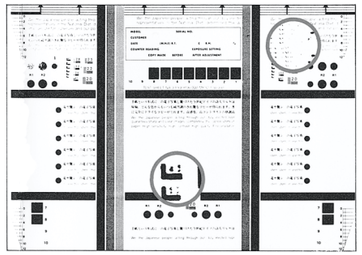
18. The copy has blurred images.



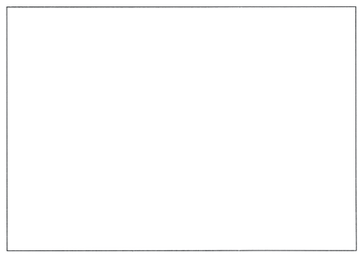
19. The copy is foggy (cross-feeding direction).



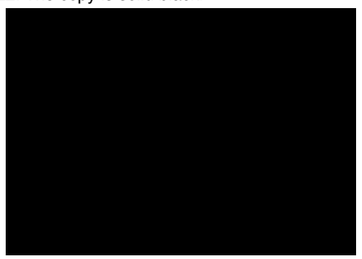
20. The copy has poor sharpness.



21. The copy is blank.



22. The copy is solid black.



* Copies made with the copyboard lifted; faults may also appear on normally made copies.
† Strips may vary in width.

3.3 Troubleshooting Image Faults

3.3.1 The copy is too light. (halftone only)
3.3.2 The copy is too light. (both halftone and solid black)
3.3.3 The copy is too light. (entire copy, appreciably)

Image density	**1) Is the image density setting appropriate?** NO: Correct the image density setting.
Paper	**2) Try paper fresh out of package. Is the fault corrected?** YES: 1. The paper may be moist. Advise the user on the correct method of storing paper. 2. Advise the user that the use of paper not of a recommended type may not bring the best results.
Machine state	**3) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 14.
Developing assembly	**4) Is the developing assembly firmly locked to the photosensitive drum? (Check to see that the rolls of the developing assembly are in firm contact.)** NO: Mount the developing assembly correctly.
Machine state	**5) Turn off the power switch in the middle of copying operation, and open the left cover. At this time, is the toner image on the surface of the photosensitive drum before transfer more or less normal?** YES: Go to step 12.
High-voltage contact (developing assembly and high-voltage leaf sprint)	**6) Is the high-voltage leaf spring used to supply high voltage to the developing assembly soiled? (Check by removing the developing assembly.)** YES: Clean the developing assembly.
High-voltage contact (high-voltage leaf spring and DC controller PCB)	**7) Is the connector between the high-voltage leaf spring and the DC controller PCB normal?** NO: Correct the connection. If the fault cannot be corrected, replace the faulty part.

Connector	**8) Is the connection between the connector (J102) on the DC controller PCB and the connectors (J907, J908) of the laser scanner unit normal?** NO: Correct the connection.
Drum unit	**9) Try replacing the drum unit. Is the fault corrected?** YES: End.
Developing assembly	**10) Try replacing the developing assembly. Is the fault corrected?** YES: End.
Laser scanner unit, DC controller PCB	**11) Try replacing the laser scanner unit. Is the fault corrected?** YES: End. NO: Replace the DC controller PCB.
High-voltage contact (transfer charging roller and high-voltage left spring)	**12) Is there high-voltage spring used to supply high voltage to the transfer charging roller soiled?** YES: Clean the leaf spring.
High-voltage contact (high-voltage leaf spring, DC controller PCB), Transfer charging roller	**13) Is the connection between the high-voltage leaf spring and the DC controller PCB normal?** YES: Replace the toner charging roller. NO: Correct the connection. If the fault cannot be corrected, replace the faulty part.
Contact sensor (rod lens array)	**14) Clean the rod lens array of the contact sensor. Is the problem corrected?** YES: End.
Gain auto adjustment	**15) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**16) Are the CS unit and the spacers mounted correctly? Also, are the spacers free of wear?** NO: Correct the mounting. If the fault cannot be corrected, replace the faulty part.

Connector	**17) Is the connection of the connectors (J1, J3) on the analog processor PCB and the connector (J21/J221) on the image processor PCB, and the connector (J30) on the contact sensor normal?** NO: Correct the connection. If the flexible cable has a scratch, replace it.
Contact sensor	**18) Try replacing the contact sensor. Is the fault corrected?** YES: End.
Analog processor PCB, Image processor PCB	**19) Try replacing the analog processor PCB. Is the problem corrected?** YES: End. NO: Replace the image processor PCB.

3.3.4 The copy has uneven density. (darker along front)
3.3.5 The copy has uneven density. (lighter along front)

Image density	**1) Is the image density setting appropriate?** NO: Correct the image density setting.
Machine state	**2) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 7.
Developing assembly	**3) Is the developing assembly locked to the photosensitive drum firmly? (Check to see if the rolls of the developing assembly are firmly in contact.)** NO: Mount the developing assembly correctly.
Transfer charging roller	**4) Clean the transfer charging roller. Is the fault corrected?** YES: End.
Transfer charging roller	**5) Try replacing the transfer charging roller. Is the fault corrected?** YES: End.
Drum unit	**6) Try replacing the drum unit. Is the fault corrected?** YES: End.
Contact sensor (rod lens array)	**7) Clean the rod les array of the contact sensor. Is the fault corrected?** YES: End.
Gain auto adjustment	**8) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**9) Are the CS unit an the spacers mounted correctly? Also, are the spacers free of wear?** YES: Replace the contact sensor. NO: Correct the fault. If the correction is not possible, replace the faulty part.

3.3.6 The copy is foggy. (entire copy)

Image density	**1) Is the image density setting appropriate?** NO: Correct the image density setting.
Machine state	**2) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 5.
Developing assembly	**3) Is the developing assembly locked to the photosensitive drum firmly? (Check to see if the rolls of the developing assembly are firmly in contact.)** NO: Mount the developing assembly correctly.
Drum unit, Developing assembly	**4) Is the drum grounding shaft of the drum unit free of dirt and deformation?** YES: Correct the fault. If the fault cannot be corrected, replace the drum unit. NO: Replace the developing assembly.
Contact sensor (rod lens array)	**5) Clean the rod les array of the contact sensor. Is the fault corrected?** YES: End.
Gain auto adjustment	**6) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**7) Are the CS unit an the spacers mounted correctly? Also, are the spacers free of wear?** YES: Replace the contact sensor. NO: Correct the fault. If the correction is not possible, replace the faulty part.

3.3.7 The copy is foggy. (feeding direction).
3.3.8 The copy has black lines. (feeding direction, fuzzy, thick)
3.3.9 The copy has black lines. (feeding direction, fine)

Machine state	**1) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 5.
Developing assembly	**2) Is the coating of toner on the developing cylinder even?** NO: Rotate the developing assembly cylinder to see if the coating becomes even. If not, replace the developing assembly.
Drum unit	**3) Is there a scratch or black line in the peripheral direction of the surface of the photosensitive drum?** YES: Replace the drum unit.
Fixing assembly	**4) Execute fixing roller cleaning in user mode. Is the fault corrected?** YES: End. NO: Replace the fixing assembly.
Contact sensor (rod lens array)	**5) Clean the rod lens array of the contact sensor. Is the fault corrected?** YES: End.
Gain auto adjustment	**6) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**7) Are the CS unit and the spacers mounted correctly? Also, are the spacers free of wear?** YES: Replace the contact sensor. NO: Correct the fault. If the fault cannot be corrected, replace the faulty part.

3.3.10 The copy has white strips. (feeding direction)
3.3.11 The copy has white lines. (feeding direction)

Machine state	**1) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 6.
Developing assembly	**2) Is the coating of toner on the developing cylinder even?** NO: Rotate the developing cylinder to see if the coating becomes even. If not, replace the developing assembly.
Drum unit	**3) Is there a scratch or black line in the peripheral direction of the surface of the photosensitive drum?** YES: Replace the drum unit.
Transfer charging roller, Pre-transfer static eliminator	**4) Is the transfer charging roller or the pre-transfer static eliminator coated with foreign matter?** YES: Clean the transfer roller or the transfer static eliminator. If the fault is not corrected, replace the transfer charging roller or the transfer static eliminator.
Fixing assembly	**5) Execute fixing roller cleaning in user mode. Is the fault corrected?** YES: End. NO: Replace the fixing assembly.
Gain auto adjustment	**6) Execute gain auto adjustment. Is the problem corrected? (See 2.3.2 of Chapter 13.)** YES: End.
Contact sensor, Standard white plate	**7) Clean the rod lens array of the contact sensor and the copyboard glass (standard white plate). Is the fault corrected?** YES: End.
Shading position correction	**8) For shading position correction in service mode, set a level between '90' and '72' for '6 SCANNER>7 CCD>parameter '19'. Is the fault corrected?** YES: End. NO: Replace the copyboard glass. If the fault cannot be corrected, go to step 9).
CS unit	**9) Are the CS unit and the spacers mounted correctly? Also, are the spacers free of water?** YES: Replace the contact sensor. NO: Correct the fault. If the fault cannot be corrected, replace the faulty part.

3.3.12 The output has white strips. (cross-feeding direction)

Paper	**1) Try paper fresh out of package. Is the problem corrected?** YES: 1. The paper may be moist. Advise the user on the correct method of storing paper. 2. Advise the user that the use of paper not of a recommended type may not bring the best results.
Machine state	**2) Execute 'PRINT'. Is the output image normal? (See 5.5.5 of Chapter 13.)** YES: Go to step 5.
Developing assembly	**3) Is there a scratch on the surface of the developing assembly?** YES: Replace the developing assembly.
Drum unit	**4) Is there a scratch in the surface of the photosensitive drum?** YES: Clean the drum. If the fault is not corrected, replace the drum unit.
Contact sensor	**5) Clean the rod lens array of the contact sensor. Is the fault corrected?** YES: End.
Gain auto adjustment	**6) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**7) Are the CS unit and the spacers mounted correctly? Also, are the spacers free of wear?** YES: Replace the contact sensor. NO: Correct the fault. If the fault cannot be corrected, replace the faulty part.

3.3.13 The back of the copy is soiled.

Paper, Selected mode

1) Is the selected fixing mode suited to the paper used?

YES: Select the appropriate mode.

Exposure system

2) Turn off the power switch immediately before the paper moves past the fixing assembly. Is the back of the paper soiled at this time?

NO: Go to step 4.

Registration roller, Transfer charging roller

3) Is the fault at specific intervals?

YES: If it is at intervals of about 50 mm, clean the registration roller.
If it is at intervals of about 55 mm, clean the transfer charging roller.
If the dirt cannot be removed, replace the roller.

NO: Clean the guide.

Fixing assembly

4) Execute fixing roller cleaning in user mode. Is the fault corrected?

YES: End.

NO: Replace the fixing assembly.

3.3.14 The copy has a poor fixing.

Paper	**1) Try paper fresh out of package. Is the fault corrected?** YES: 1. The paper may be moist. Advise the user on the correct method of strong paper. 2. Advise the user that the use of paper not of a recommend type may not bring the best results.
Paper, Selected mode	**2) Is the selected fixing mode suited to the paper used?** YES: Select the appropriate mode.
Pressure roller	**3) Is the roller pressure (nip) as indicated?** YES: End.
Fixing assembly	**4) Try replacing the fixing assembly. Is the fault corrected?** YES: Replacing the fixing assembly. NO: Replace the DC controller PCB.

3.3.15 The copy has displaced registration. (leading edge extremely excessive margin).
3.3.16 The copy has displaced registration. (leading edge, excessive margin)
3.3.17 The copy has displaced registration. (leading edge, no margin)

Original	**1) Is the original placed correctly?** NO: Place the original correctly.
ADF	**2) Is an ADF used?** YES: Adjust the leading edge for the ADF as instructed in the ADF Service Manual.
Pickup roller, Feed roller, Separation roller	**3) Try replacing the pickup, feeding, and separation roller of the source of paper (cassette). Is the problem corrected?** YES: Replace the roller in question.
Image position	**4) Try image position adjustment in service mode. Is the fault corrected? (See 2.1.2 of Chapter 13.)** YES: End.
Registration clutch, DC controller PCB	**5) Is the registration clutch operating normally?** YES: Replace the DC controller PCB. NO: Replace the registration clutch.

3.3.18 The copy has blurred images.

Machine state	**1) Execute 'PRINT'. Is the output image blurry? (See 5.5.5 of Chapter 13.)** YES: Go to step 5.
CS unit drive belt	**2) Is the drive belt wound around the drive pulley of the reader unit too taut or too loose?** YES: Correct the drive belt. If the fault cannot be corrected, replace the drive belt.
Carriage rail	**3) Move the carriage slowly by hand. Does it move smoothly?** NO: Clean the surface of the carriage rail with alcohol; then, apply a small amount of lubricant.
Rear motor, Original detection/Reader motor drive PCB, Image processor PCB	**4) Is the rear motor operating normally?** YES: Replace the original detection/reader motor drive PCB. If the fault is not corrected, replace the image processor PCB. NO: Replace the reader motor.
Feeding assembly	**5) Is there foreign matter or burrs on the feed guide?** NO: Correct the fault. If the fault cannot be corrected, replace the faulty part.
Photosensitive drum	**6) Does the fault occur at intervals of about 97 mm?** YES: Check the ends of the drum (area in contact with developing rolls) for a scratch and foreign matter.
Developing assembly, Drum unit	**7) Does the fault occur at intervals of about 50 mm?** YES: Check the developing assembly, and mount it correctly. If the fault cannot be corrected, replace the developing assembly. NO: Replace the drum unit.

3.3.19 The copy is foggy. (cross-feeding direction)

Machine state	**1) Make a copy in Direct. Does the fault occur in the same location?** YES: Go to step 3.
Wiring	**2) Is the wiring of the CS unit, original detection/reader motor drive PCB, and image processor PCB normal?** NO: Correct the wiring.
Photosensitive drum	**3) Does the fault occur at intervals of about 97 mm?** YES: Check the drum unit, and mount it correctly. If the fault is not corrected, replace the drum unit.
Developing assembly, Drum unit	**4) Does the fault occur at intervals of about 50 mm?** YES: Check the developing assembly, and mount it correctly. If the problem is not corrected, replace the developing assembly.
Reader unit, Feeding system	**5) Make a reduced copy (about 50% to 60%), and compare it against a copy made in Direct. Is the location of the fault different?** YES: Check the rear unit. NO: Check the feeding system.

3.3.20 The copy has poor sharpness.

Sharpness setting	**1) Is the sharpness setting of user mode correct?** NO: Set sharpness to a correct setting.
Copyboard glass	**2) Is the copyboard glass soiled with oil? Is there foreign matter on the copyboard glass stay?** YES: Clean the copyboard glass.
Contact sensor	**3) Clean the rod lens array of the contact sensor. Is the fault corrected?** YES: End.
Gain auto adjustment	**4) Execute gain auto adjustment. Is the fault corrected? (See 2.3.2 of Chapter 13.)** YES: End.
CS unit	**5) Are the CS unit and the spacers mounted correctly? Also, are the spacers free of wear?** NO: Correct the fault. If the fault is not corrected, replace the faulty part.
Transfer charging roller	**6) Try replacing the transfer charging roller. Is the problem corrected?** YES: End.
Developing assembly, Drum unit	**7) Try replacing the drum unit. Is the problem corrected?** YES: End. NO: Replace the developing assembly.

3.3.21 The copy is blank.

Developing assembly	**1) Is the developing assembly firmly locked against the photosensitive drum? (Check to see if the rolls of the developing assembly are in firm contact.)** NO: Mount the developing assembly correctly.
Laser shutter arm, Laser shutter	**2) Are the laser shutter arm and the laser shutter operating normally? Are they damaged?** YES: Replace the faulty part.
High-voltage leaf spring	**3) Is the connection between the contact of the high-voltage left spring and the developing assembly normal?** NO: Clean the contacts. If the fault is not corrected or deformation/damage is found, replace the faulty part. In the cassette of the leaf spring of the developing assembly, replace the developing assembly.
Drum unit	**4) Try replacing the drum unit. Is the fault corrected?** YES: End.
Developing assembly	**5) Try replacing the developing assembly. Is the fault corrected?** YES: End.
High-voltage leaf spring, DC controller PCB	**6) Is the connection between the contact for the developing bias on the DC controller PCB and the contact of the leaf spring for the developing bias normal?** YES: Replace the DC controller PCB. NO: Clean the contact. If the problem is not corrected, or deformation/damage is found, replace the faulty part.

3.3.22 The copy is solid black.

Machine state	**1) Execute 'PRINT'. is the output image normal? (See 5.5.5 of Chapter 13.)** NO: Go to sep 6.
Contact sensor	**2) Is the contact sensor ON during copying?** NO: See "The contact sensor fails to go ON."
Connector	**3) Is the connection of the connectors (J1, J3) on the analog processor PCB, the connector (J21/J221) on the image processor PCB, and the connector (J30) on the contact sensor normal?** NO: Correct the connection. If the flexible cable has a scratch, replace it.
Contact sensor	**4) Try replacing the contact sensor. Is the problem corrected?** YES: End.
Analog processor PCB, Image processor PCB	**5) Try replacing the analog processor PCB. Is the problem corrected?** YES: End. NO: Replace the image processor PCB.
High-voltage leaf spring	**6) Is the connection between the contact of the leaf spring for the primary charging bias and the contact of the developing assembly normal?** NO: Clean the contacts. If the problem is not corrected, or if the damage/deformation is found, replace the faulty part.
Drum unit	**7) Try replacing the drum unit. Is the problem corrected?** YES: End.
Developing assembly	**8) Try replacing the developing assembly. Is the problem corrected?** YES: End.
High-voltage leaf spring	**9) Is the connection between the contact for the primary charging bias on the DC controller PCB and the contact of the developing assembly normal?** YES: Replace the DC controller PCB. NO: Clean the contacts. If the fault is not corrected, or deformation/damage is found, replace the faulty part.

3.3.23 The copy has a black line (stream reading).

Reading glass, Dirt

1) Does the problem occur on the same position on all copies?

YES: Check the reading glass for dirt and a scratch.

NO: Paper lint (droppings) can be suspected. Clean the ADF roller, original path, and reading glass.

3.4 Troubleshooting Malfunctions

3.4.1 AC power is absent.

Initial checks	**1) Is the power plug connected to the power outlet?** **2) Is the rated AC voltage present at the power outlet?** **3) Does the power switch operate normally?**
Power supply PCB	**4) IS the fuse (F1) on the power supply blown?** YES: Remove the cause, and replace the power supply PCB.
Wring, Connector	**5) Is the wiring (continuity) and connection (connector contact) of the wiring of the connectors (CN1, CN2, CN3) on the power supply PCB normal?** NO: Correct the connection. If the flexible cable or the harness has a scratch, replace it. YES: Replace the power supply PCB.

3.4.2 DC power is absent.

AC power supply

1) Is AC voltage present?

NO: See 3.4.1 "AC power is absent."

Power supply PCB

2) Is the output voltage of each power supply PCB correct?

Connector		Output voltage
CN-11, 13	CN2-8, 9	3SV1
CN-15, 17, 19, 20		3SV2
CN2-12, 13	CN5-12, 13	5VS
CN1-1		12VS
CN1-7		3VR
CN1-6		5VR
CN3-1, 2		24VR1
CN2-18 to CN2-27		24VR2

YES: Check the wiring from each power supply PCB to each load.

NO: If a fault is found, replace the power supply PCB.

3.4.3 Pickup operation fails. (cassette)

Main motor (M101)	**1) Is 'E010' (fault in main motor) indicated?** YES: See the descriptions for 'E010' in 6.2.1.
Machine state	**2) Is the pickup roller rotating?** NO: Go to step 6.
Paper	**3) Is the cassette fitted correctly?** NO: Replace the cassette.
Pickup roller	**4) Is there wear or cracking in the surface of the pickup roller?** YES: Replace the pickup roller.
Pickup drive assembly gear	**5) Is there damage/foreign matter on the gear of the pickup roller drive assembly?** YES: If damage is found, replace the gear. If foreign matter is found, remove it.
Cassette pickup solenoid (SL: 151)	**6) Are the connection and the wiring between the connector (J906) of the cassette pickup sensor and the connector (J106) on the DC controller PCB normal?** NO: Correct the connection or the wiring.
Cassette pickup solenoid, DC controller PCB	**7) Does the cassette pickup solenoid operating normally?** NO: Replace the cassette pickup solenoid.
Cassette controller PCB (if 2-cassette type)	**8) Try replacing the cassette controller PCB. Is the fault corrected?** YES: End.
DC controller PCB, Image processor PCB	**9) Try replacing the DC controller PCB. Is the fault corrected?** YES: Replace the DC controller PCB. NO: Replace the image processor PCB.

3.4.4 Pickup operation fails. (multifeeder tray)

Main motor (M101)	**1) Is 'E010' (fault in main motor) indicated?** YES: See the descriptions for 'E010' in 6.2.1.
User mode setting	**2) Is multifeeder tray selected in the control panel?** NO: Select the multifeeder tray.
Paper	**3) Is paper placed correctly in the multifeeder tray?** NO: Place the paper correctly.
Holding plate lift mechanism	**4) Does the holding plate move up in keeping with pickup timing?** NO: Check the spring used to push up the holding plate.
Pickup roller	**5) Is there wear or cracking in the surface of the manual feed pickup roller?** YES: Replace the pickup roller.
Pickup drive assembly gear	**6) Is there damage/foreign matter on the gear of the pickup roller drive assembly?** YES: If damage is found, replace the gear. If foreign matter is found, remove it.
Multifeeder pickup solenoid (SL101)	**7) Is the connection between the connector (J904) of the multifeeder pickup solenoid and the connector (J106) on the DC controller PCB normal?** NO: Correct the connection.
Multifeeder pickup solenoid, DC controller PCB	**8) Does the multifeeder pickup solenoid operating normally?** YES: Replace the DC controller PCB. NO: Replace the multifeeder solenoid.

3.4.5 Pickup operation fails. (cassette unit)

Main motor (M101)	**1) Is 'E010' (main motor fault) indicated?** YES: See the descriptions for 'E010' in 6.2.1.
Machine state	**2) Is the pickup roller rotating?** NO: Go to step 5.
Paper	**3) Is the cassette fitted correctly.** NO: Fit the cassette correctly.
Pickup roller	**4) Is there wear, scratches, or cracks in the surface of the pickup roller?** YES: Replace the pickup roller.
Pickup drive assembly gear	**5) Is there damage/foreign matter in the pickup roller drive assembly?** YES: If damage is found, replace the damaged gear. If foreign matter is found, remove it.
Cassette pickup solenoid (SL151)	**6) Is the connection between the connector of the cassette pickup solenoid and the connector of the cassette unit controller PCB normal?** NO: Connect the connectors correctly.
Cassette pickup solenoid	**7) Does the cassette pickup solenoid operate normally?** NO: Replace the cassette pickup solenoid.
Pickup motor (M104; for 3rd/4th cassette)	**8) Does the pickup motor operate normally?** YES: Replace the pickup motor. NO: Replace the cassette pickup solenoid.
Cassette unit controller PCB/DC controller PCB	**9) Try replacing the cassette unit controller PCB. Is the fault corrected?** YES: Replace the cassette unit controller PCB. NO: Replace the DC controller PCB.

3.4.6 The vertical path roller fails to rotate.

Main motor (M101)	**1) Is 'E010' (fault in main motor) indicated?** YES: See the descriptions for 'E010' in 6.2.1.
Machine state	**2) Is the pickup roller rotating?** YES: Check the vertical path roller drive assembly for damage/foreign matter. If damage is found, replace the gear. If foreign matter is found, remove it. NO: See 'Pickup operation fails" for the source of paper used.

3.4.7 The registration roller fails to rotate.

Connector	**1) Is the connection between the connector (J905) of the registration clutch and the connector (J106) on the DC controller PCB normal?** NO: Correct the connection.
Registration clutch	**2) Try replacing the registration clutch. Is the problem corrected?** YES: Replace the registration clutch. NO: Replace the DC controller PCB.

3.4.8 The contact sensor fails to go ON.

Contact sensor	**1) Turn off the power switch, and disconnect the power plug from the power outlet. Is the contact sensor mounted corrected?** NO: Mount it correctly.
Analog processor PCB	**2) Is the connection between the connector (J10) on the analog processor PCB and the connector (J30) of the contact sensor normal?** NO: Correct the connection.
Image processor PCB	**3) Is the connection between the connector (J3) on the analog processor PCB and the connector (J21/J221) on the image processor PCB normal?** NO: Correct the connection.
Contact sensor, Analog processor PCB	**4) Try replacing the contact sensor. Is the problem corrected?** YES: End. NO: Replace the analog processor PCB.

3.4.9 The speaker fails to operate.

Volume setting	**1) Is the speaker volume setting in user mode correct?** YES: End.
Image processor PCB	**2) Is the connection of the connector (J44/J244) of the image processor PCB correct?** NO: Correct the correction.
Speaker, Image processor PCB	**3) Try replacing the speaker. Is the problem corrected?** YES: End. NO: Replace the image processor PCB.

3.4.10 The 'Add Toner' message fails to go OFF.

Developing assembly

1) Is the leaf spring of the contacts between the developing assembly and the machine soiled with toner or the like?

YES: Clean the contacts. If the leaf spring has a scratch or deformation, replace it.

DC controller PCB

2) Is the leaf spring of the high-voltage contact of the DC controller PCB deformed?

NO: Correct the fault. If the leaf spring has a scratch or deformation, replace it.

Developing assembly

3) Try replacing the developing assembly. Is the fault corrected?

YES: Replace it.

NO: Replace the DC controller PCB.

3.4.11 The 'Add Paper' message fails to go OFF. (machine and cassette unit)

Cassette	**1) Is the cassette fitted correctly?** NO: Fit the cassette correctly.
Paper size lever	**2) Is the paper size lever of the cassette displaced or damaged?** YES: Correct the fault. If damage is found, replace it.
Cassette holding plate lift mechanism	**3) Is the holding plate in up position when the cassette is fitted?** NO: Turn over the cassette, and check the holding plate retaining lever and the spring for damage.
Cassette paper sensor (PS151)	**4) Is the flag of the cassette paper sensor displaced or damaged?** YES: Replace the flag.
Connector	**5) Check the following for connection:** **• If the cassette is of the machine,** **J101 of the DC controller PCB** **• If the cassette is of the cassette unit,** **Is the connector of the cassette unit controller PCB in firm contact?** NO: Correct the connection.
Cassette paper sensor (PS151)	**6) Try replacing the paper sensor. Is the fault correct?** YES: End.
Paper detecting switch (SW105), DC controller PCB, Cassette unit controller PCB	**7) Try replacing the paper detecting switch. Is the problem corrected?** YES: End. NO: If the cassette is of the machine, replace the DC controller PCB; if the cassette is of the cassette unit, replace the cassette unit controller PCB.

3.4.12 The 'Add Paper' message fails to go OFF. (multifeeder tray)

Multifeeder paper sensor (PS105)	**1) Is the flag of the multifeeder paper sensor operating normally?** NO: Correct the fault. If damage is found, replace it.
Connector	**2) Is the connection of the connector J108 on the DC controller PCB normal?** NO: Correct the connection.
DC controller PCB	**3) Try replacing the multifeeder paper sensor. Is the problem corrected?** YES: Replace the multifeeder paper sensor. NO: Replace the DC controller PCB.

3.4.13 The 'Jam' message fails to go OFF.

Sensor flag	**1) Is the flag of the following sensors used to detect a jam damaged or displaced?** **• retry sensor (PS152)** **• registration paper sensor (PS101)** **• delivery sensor (PS103)** **• No. 2 delivery sensor (PS201; if equipped with inter 2-way tray)** YES: Correct the fault. If damage is found, replace it.
Sensor, DC controller PCB, Cassette unit controller PCB	**2) Check each sensor in test mode ('sensor test'). Is each of them normal?** NO: Replace any fault sensor. YES: Replace the DC controller PCB or the cassette unit controller PCB.

3.4.14 The 'Waste Toner Full' message does not go OFF.

Drum unit	**1) Is the drum unit full of waste toner?** YES: Replace the drum unit.
Connector connection, Wiring	**2) Are the connection and wiring of the connector J113 on the DC controller PCB and the connector J999 on the waste toner case full sensor normal?** NO: Correct the connector or wiring.
Waste toner case full sensor	**3) Try replacing the waste toner case full sensor. Is the fault corrected?** YES: End.
Drum unit, DC controller PCB	**4) Try replacing the drum unit. Is the problem corrected?** YES: End. NO: Replace the DC controller PCB.

3.4.15 The 'Controller Card Set' message does not go ON.
3.4.16 The 'Control Card Set' message does not go OFF.

Connector	**1) Is the connector (J10/J210) on the image processor PCB normal?** NO: Correct the connection.
Connector	**2) Is the dummy connector removed? It is expected to be removed at time of installation.** NO: Remove the connector.
DC controller PCB	**3) Try replacing the control card or the card reader. Is the fault corrected?** YES: Replace the control card or the card reader. NO: Replace the image processor PCB.

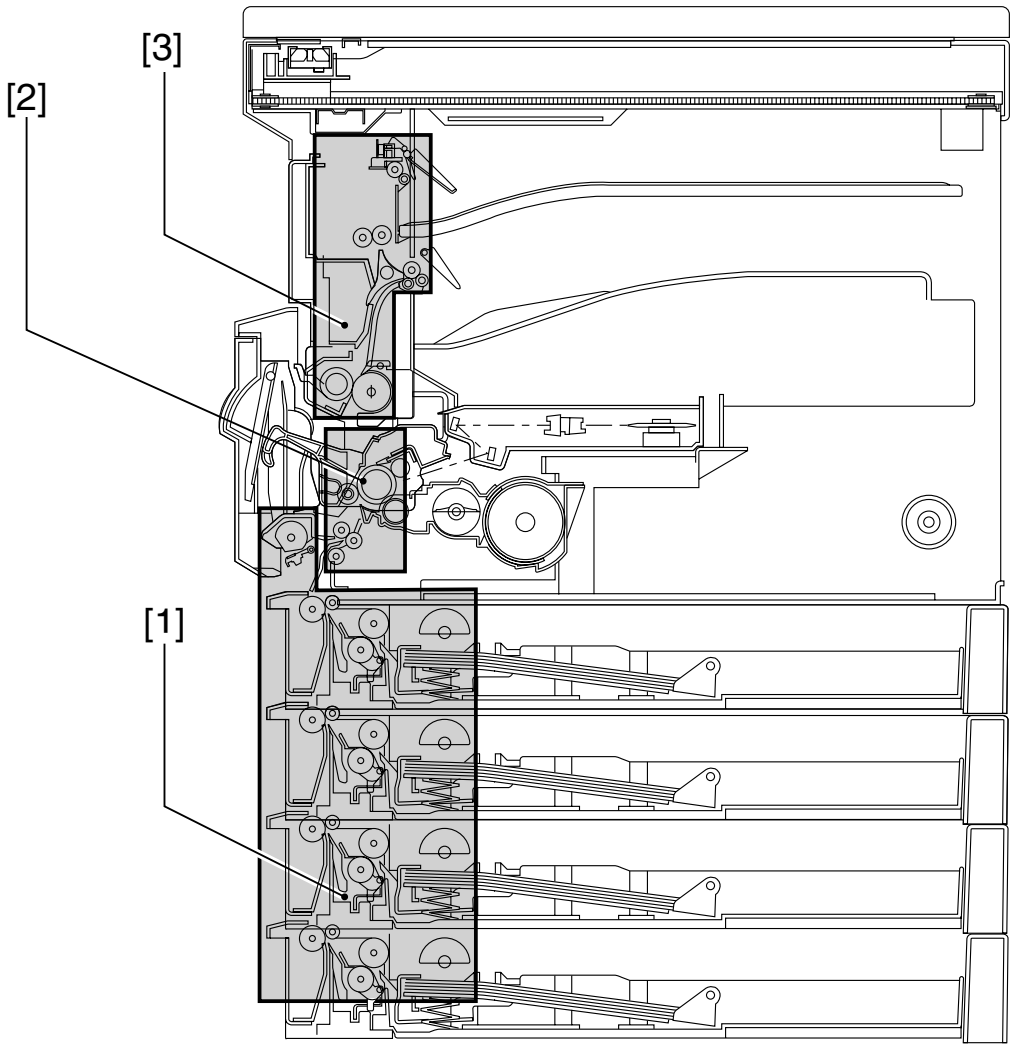
3.5 Troubleshooting Feeding Faults

3.5.1 Outline

A jam, if it occurs in the machine, tends to occur in any of the following locations:

1. pickup assembly
2. transfer/feeding assembly
3. fixing/delivery assembly

The tables that follow are arranged according to location; you can also find out the nature of any jam by making the following selections in service mode: #10 REPORT>JAM/ERR LOG REPORT.



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3.5.2 Pickup Assembly

Machine state	**1) Do the pickup roller of the selected paper source (cassette, manual feed tray) and the feed roller of the cassette rotate during printing?** NO: See "Pickup operation fails" for each source of paper.
Cassette	**2) Is the cassette fitted correctly?** **Is the paper size lever set correctly?** NO: Correct the fault.
Cassette	**3) Try a different cassette. Is the fault correct?** YES: Check the faulty cassette.
Paper	**4) Is the paper curled or wavy?** YES: Replace the paper. Advise the user on the correct method of storing paper.
Paper	**5) Try paper of a type recommended. Is the fault corrected?** NO: Advise the user to use recommeded paper.
Roller	**6) Is the surface of the pickup roller of the cassette and manual feed tray and the feeding roller of the cassette normal?** YES: Check the sensor lever of the retry sensor (PS152) and registration paper sensor (PS101). NO: Clean the rollers. If damage/deformation is found, replace it.

3.5.3 Transfer/Feeding Assembly

Paper	**1) Try paper of a recommended type. Is the fault corrected?** YES: Advise the user to use recommended paper.
Paper	**2) Is the paper curled or wavy?** YES: Replace the paper. Advise the user on the correct method of storing paper.
Feeding assembly	3) **Is there foreign matter/burrs in the feeding assembly?** YES: Remove it. Or, correct the fault.
Sensor	**4) Is there paper over any of the sensors used to detect a jam? Or, are the flag and the wiring of the sensor normal?** **• retry sensor (PS152)** **• registration paper sensor (PS101)** **• delivery sensor (PS103)** YES: Remove it. Or, correct the fault. If the fault cannot be corrected, replace the sensor.
Registration clutch (CL101)	**5) Check the wiring from the connector J106 on the DC controller PCB to the registration clutch (CL101). Is it normal?** NO: Correct the connection of the connectors.
Registration clutch	**6) Try replacing the registration clutch. Is the problem corrected?** YES: End. NO: Replace the DC controller PCB.

3.5.4 Fixing/Delivery Assembly

Machine state	**1) Is the machine equipped with an inner 2-way tray? Is the jam in the delivery tray A (No. 2 delivery slot)?** NO: Go to step 3.
2-way solenoid, wiring	**2) Are the 2-way solenoid and the wiring to the solenoid normal?** NO: Correct the fault.
Sensor	**3) Is there paper over any of the following sensors? Also, are the flag and wiring for the sensor normal?** **• retry- sensor (PS152)** **• registration paper sensor (PS101)** **• delivery sensor (P103)** **• No. 2 delivery sensors (PS201; for inner 2-way tray)** YES: Remove the paper. Or, correct the fault.
Fixing assembly	**4) Try replacing the fixing assembly. Is the problem corrected?** YES: End. NO: Replace the DC controller PCB.

3.5.5 Feeding Fault (double feeding)

Paper	**1) Is there more paper than allowed in the cassette (250 sheets)?** YES: Advise the user not to put more paper than allowed in the cassette.
Paper	**2) Is the paper curled or wavy?** YES: Replace the paper. Advise the user on the correct method of storing paper.
Machine state	**3) Does the fault occur when the cassette is used as the source of paper?** NO: Go to step 5.
Separation claw, Toque limiter	**4) Is the separation claw of the cassette deformed?** YES: Correct the fault. If the fault cannot be corrected, replace the separation roller. NO: Replace the torque limiter.
Multifeeder tray	**5) Is the manual feed separation pad worn?** YES: Replace the separation pad. NO: Replace the separation pad pressure spring.

3.5.6 Feeding Faults (wrinkling)

Pickup assembly	**1) Turn off the power while paper is moving through the feeding assembly. At this time, is the paper wrinkled? Or, is it moving askew?** YES: Check the rollers of the pickup assembly and the registration roller.
Paper	**2) Try paper fresh out of package. Is the fault corrected?** YES: The paper may be moist. Advise the user on the correct method of storing paper.
Paper	**3) Try paper of a recommended type. Is the problem corrected?** NO: Advise the user to use recommended paper.
Fixing assembly	**4) Execute fixing roller cleaning in user mode. Is the fault corrected?** YES: End. NO: Replace the fixing assembly.

4 Arrangement and Functions of Electrical Parts

4.1 Outline

4.1.1 Outline

This section provides a diagram showing the arrangement of the machine's and its accessories' electrical parts together with a listing.

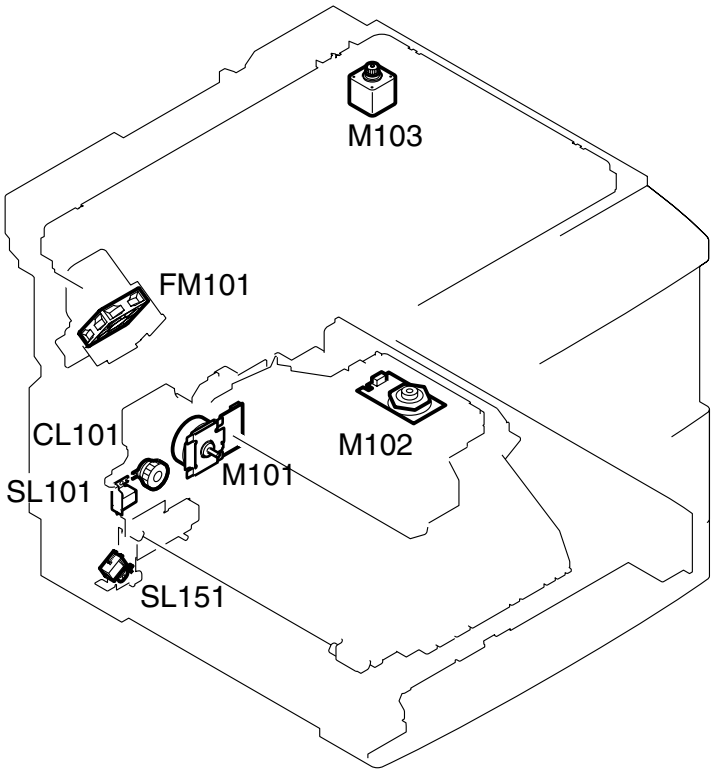
The machine comes in two types: 1-cassette type and 2-cassette type. The 2-cassette type is configured based on the 1-cassette type with the addition of a 1-cassette unit.

This section uses the 1-cassette type for discussions; for the 2-cassette type, see additionally the discussions for the 1-cassette unit.

4.1.2 Checking the Sensors

The photointerrupters may be checked using 'SENSOR' under 'TEST MODE' in service mode (6-3: SENSOR). (For specific instructions, see 5.5.7 of Chapter 13.)

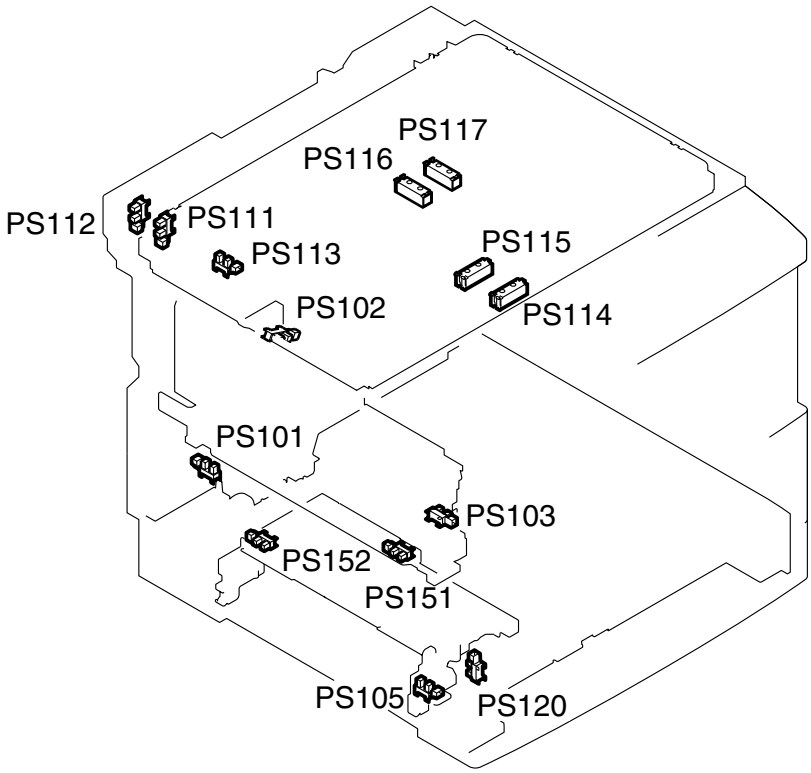
4.2 Clutches, Solenoids, Motors, and Fans



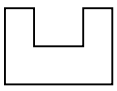
F13-402-01

Symbol	Name	Notation	Description
M	Motor	M101	Main motor
		M102	Scanner motor
		M103	Reader motor
CL	Clutch	CL101	Registration clutch
SL	Solenoid	SL101	Multifeeder pickup solenoid
		SL151	Cassette pickup solenoid
	Fan	FM101	Heat discharge fan

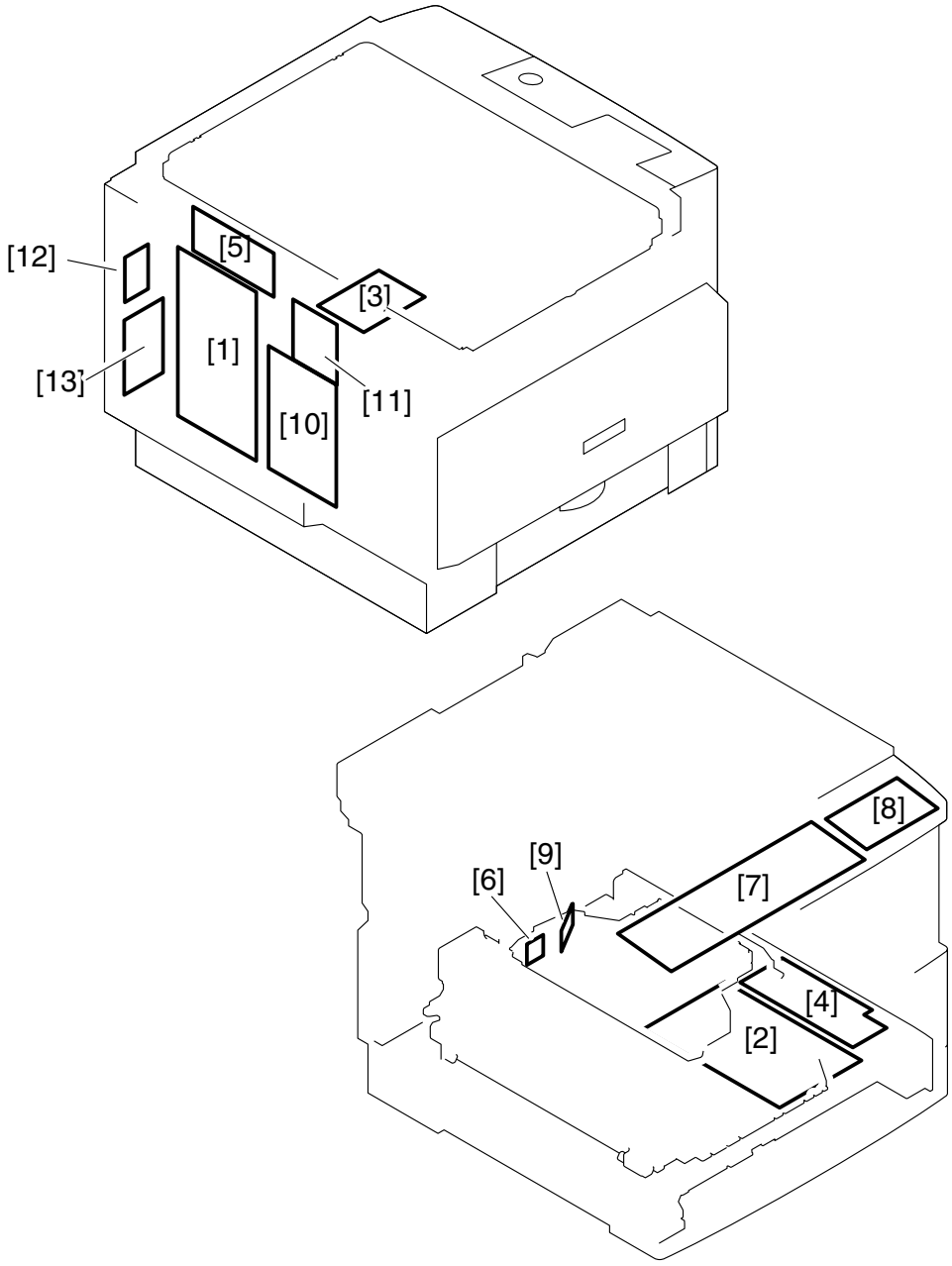
4.3 Sensors



F13-403-01

Symbol	Name	Notation	Function
	Sensor	PS101	Registration paper sensor
		PS102	Paper full sensor
		PS103	Delivery sensor
		PS105	multifeeder paper sensor
		PS111	Copyboard cover open/closed sensor
		PS112	ADF open/closed sensor
		PS113	CS unit HP sensor
		PS114	Original size sensor 1
		PS115	Original size sensor 2
		PS116	Original size sensor 3
		PS117	Original size sensor 4
		PS120	Waste toner case full sensor
		PS151	Cassette paper sensor
		PS152	Retry sensor

4.4 PCBs

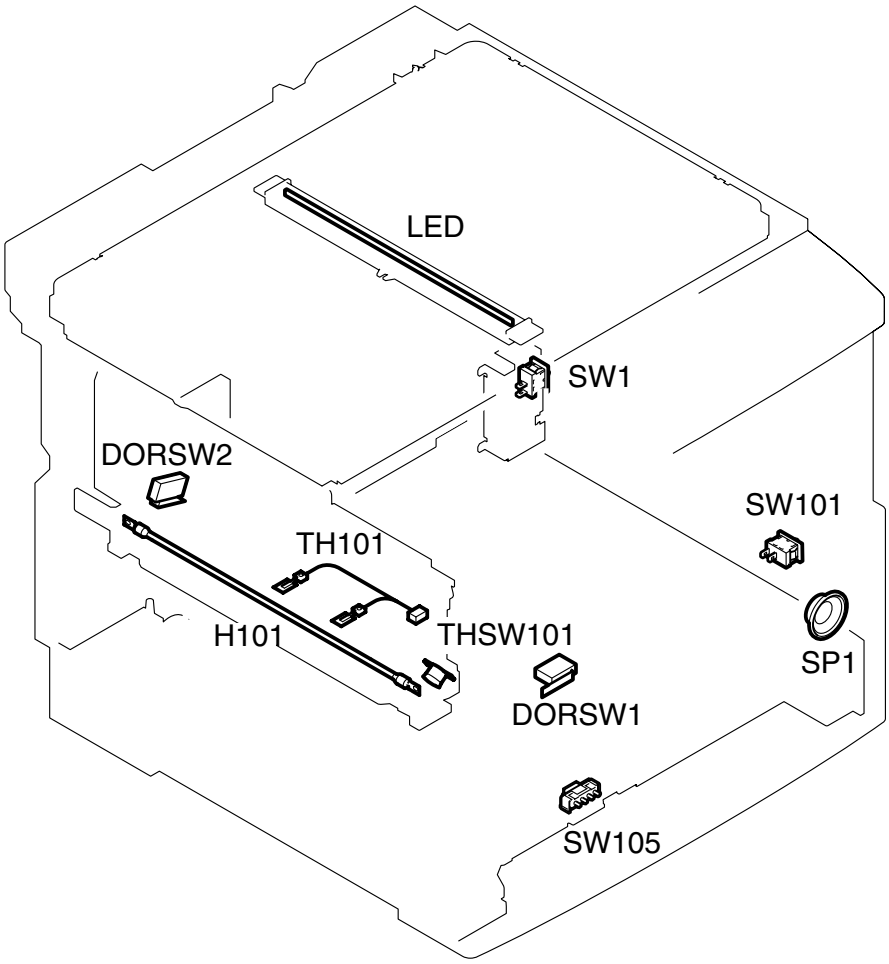


F13-404-01

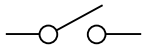
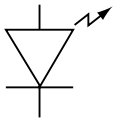
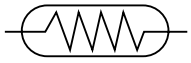
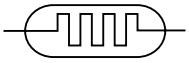
Symbol	Name	Description
[1]	Image processor PCB	Image processing, sequence control
[2]	DC controller PCB	DC load control, high voltage control
[3]	Analog processor PCB	CS unit control, image processing
[4]	Power supply PCB	DC power supply generation
[5]	Original detecting/ reader motor driver PCB	Original detection, motor drive
[6]	BD detection PCB	Laser beam detection
[7]	Control panel PCB 1	Control panel control
[8]	Control panel PCB 2	Control panel control
[9]	Laser unit	Laser drive
[10]	Printer board*1	Image processing/interface connection
[11]	Network interface board*1	Network connection
[12]	Modular jack PCB*2	Telephone line connection
[13]	NCU PCB*2	Fax communication control

*1: if equipped with printer functions.
*2: if equipped with fax functions.

4.5 Switches, Others

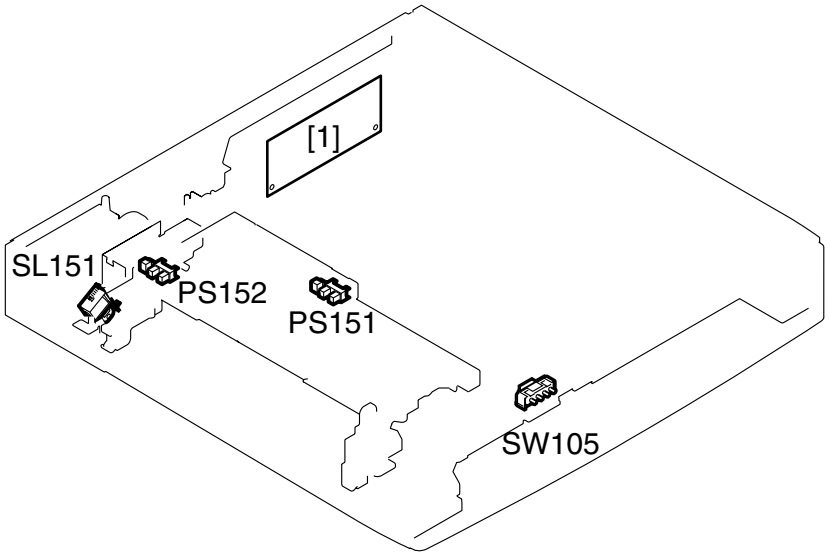


F13-405-01

Symbol	Name	Notation	Function
	Switch	SW101	Power switch
		SW105	Cassette paper size switch
		DORSW1	Front cover switch
		DORSW2	Left cover switch
	LED	LED	Contact sensor
	Thermistor	TH101	Thermistor
	Thermal switch	THSW101	Thermal switch
	Heater	H101	Fixing heater
	Speaker	SP1	Speaker

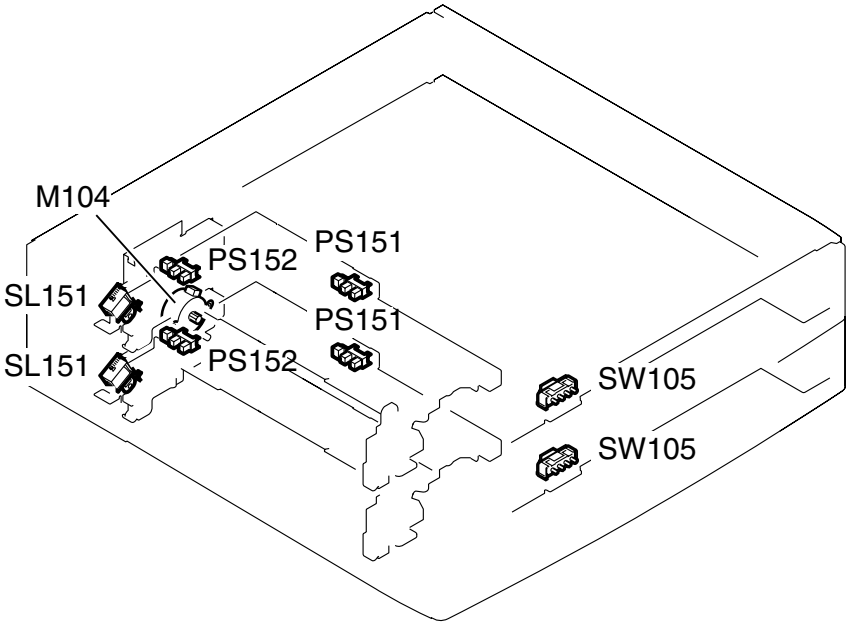
4.6 Cassette Unit

• 1-Cassette Unit



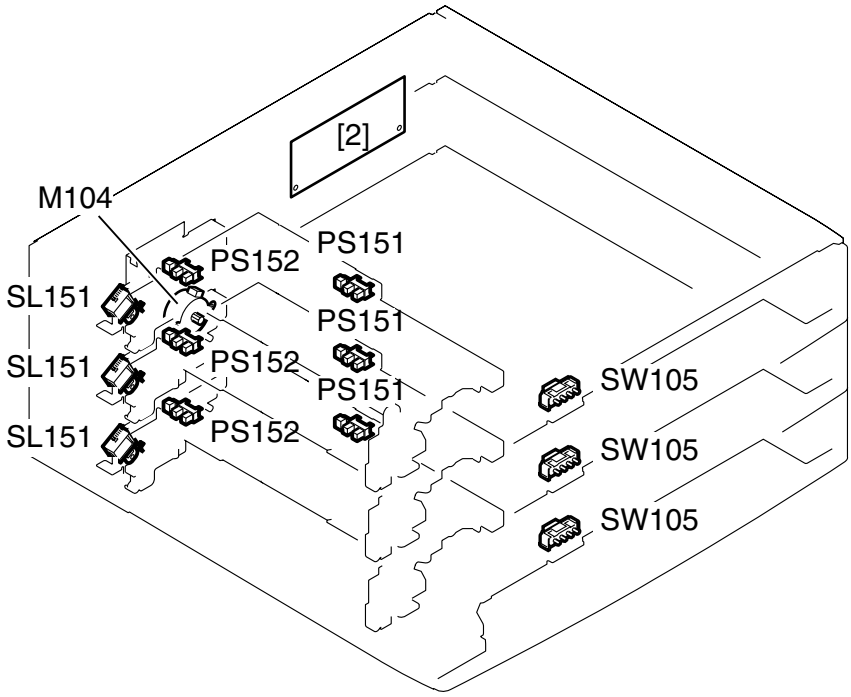
F13-406-01

• 2-Cassette Unit



F13-406-02

• 3-Cassette Unit

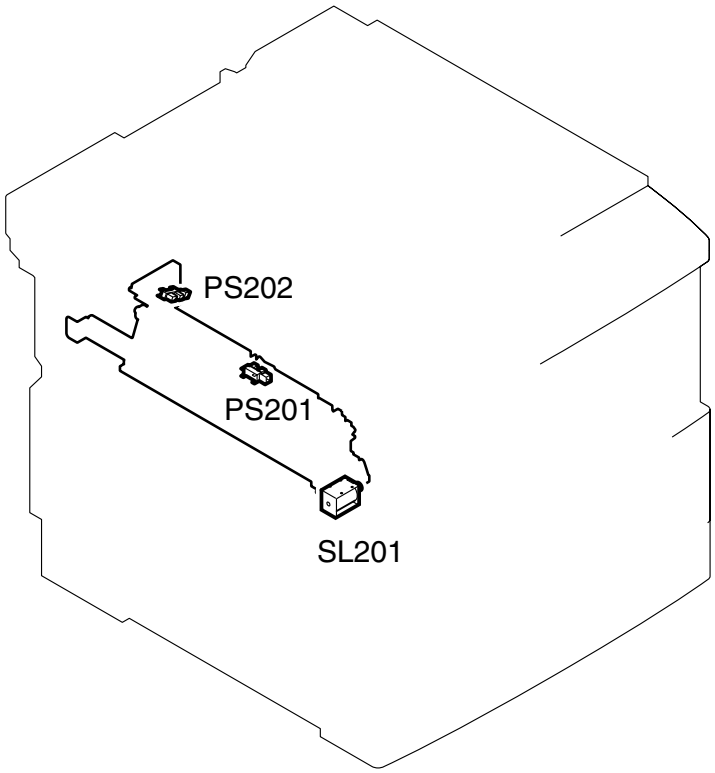


F13-406-03

Symbol	Name	Notation	Description
	Sensor	PS151	Cassette paper sensor
		PS152	Retry sensor
	Switch	SW105	Cassette paper size switch
SL	Solenoid	SL151	Cassette pickup solenoid
M	Motor	M104	Pickup motor

Ref.	Name	Description
[1]	1-cassette unit controller PCB	Sequence control
[2]	2/3-cassette unit controller PCB	Sequence control

4.7 Inner 2-Way Tray



F13-407-01

Symbol	Name	Notation	Description
	Sensor	PS201	No. 2 delivery sensor
		PS202	No. 2 full detection sensor
SL	Solenoid	SW105	No. 2 delivery solenoid

4.8 Variable Resistors (VR), Light-Emitting Diodes (LED), and Check Pins

Of the VRs, LEDs, and switches found in the machine, those used in the machine are discussed.

1. Some of the LEDs emit dim light when they are off because of leakage current; this is a normal condition, and must be kept in mind.
2. VRs that may be used in the field

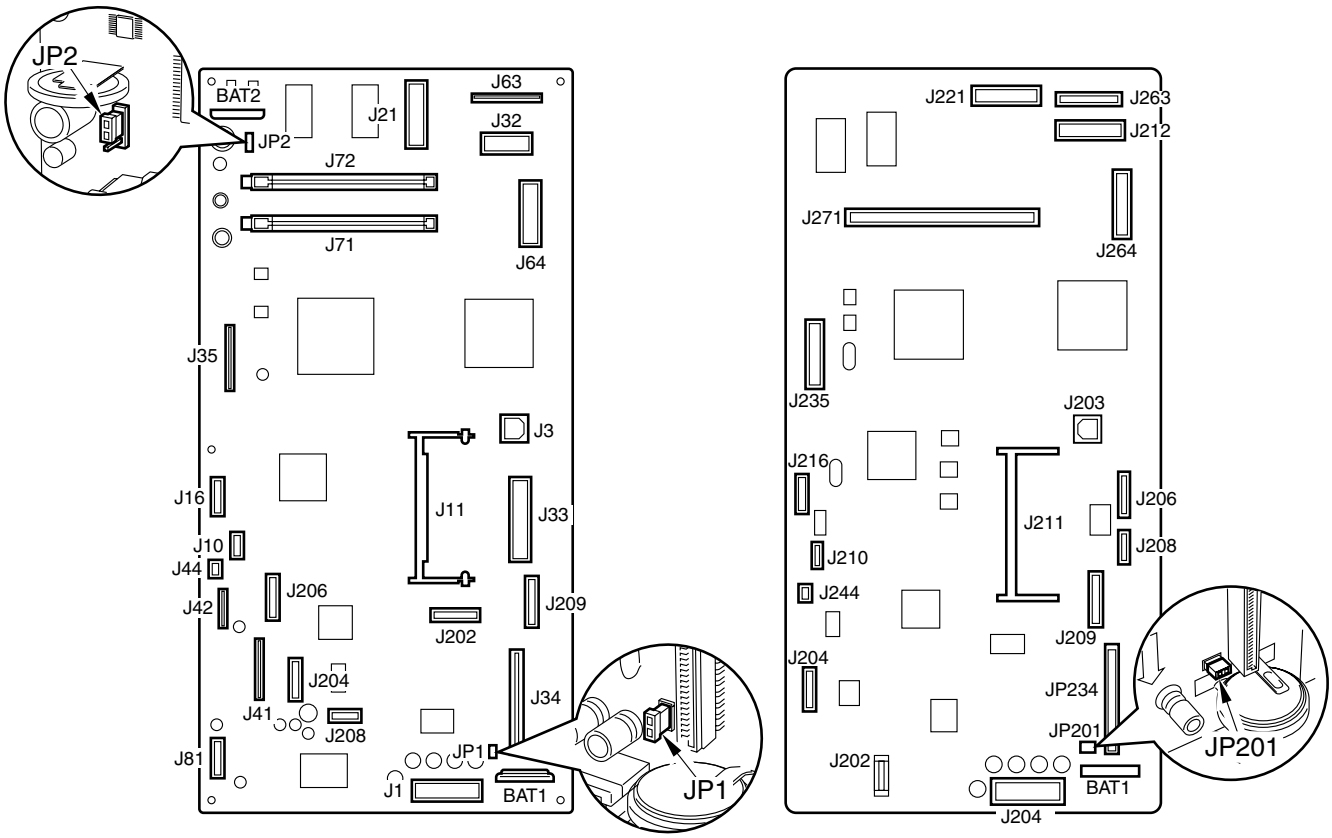
   : 

   VRs that must not be used in the field

   : 

Those VRs and check pins not discussed herein are for use at the factory only, and must not be used in the field, as they require special tools and high precision.

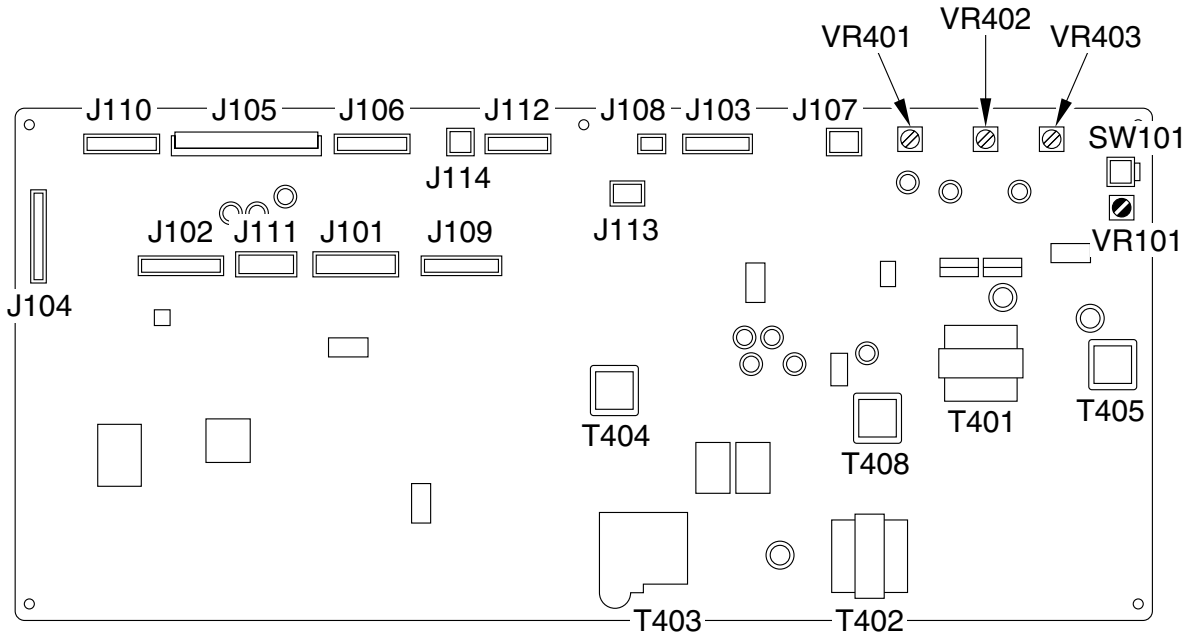
4.8.1 Image Processor PCB



F13-408-01

JP1/JP201 : jumper for power to the battery (BAT1) used for memory backup of control data (user data, service data).
JP2 : jumper plug for power to the battery (BAT1) used for image memory backup.
BAT1 : battery used for memory backup of control data (service mode data, user mode data).
BAT2 : battery for memory backup of fax communication images.

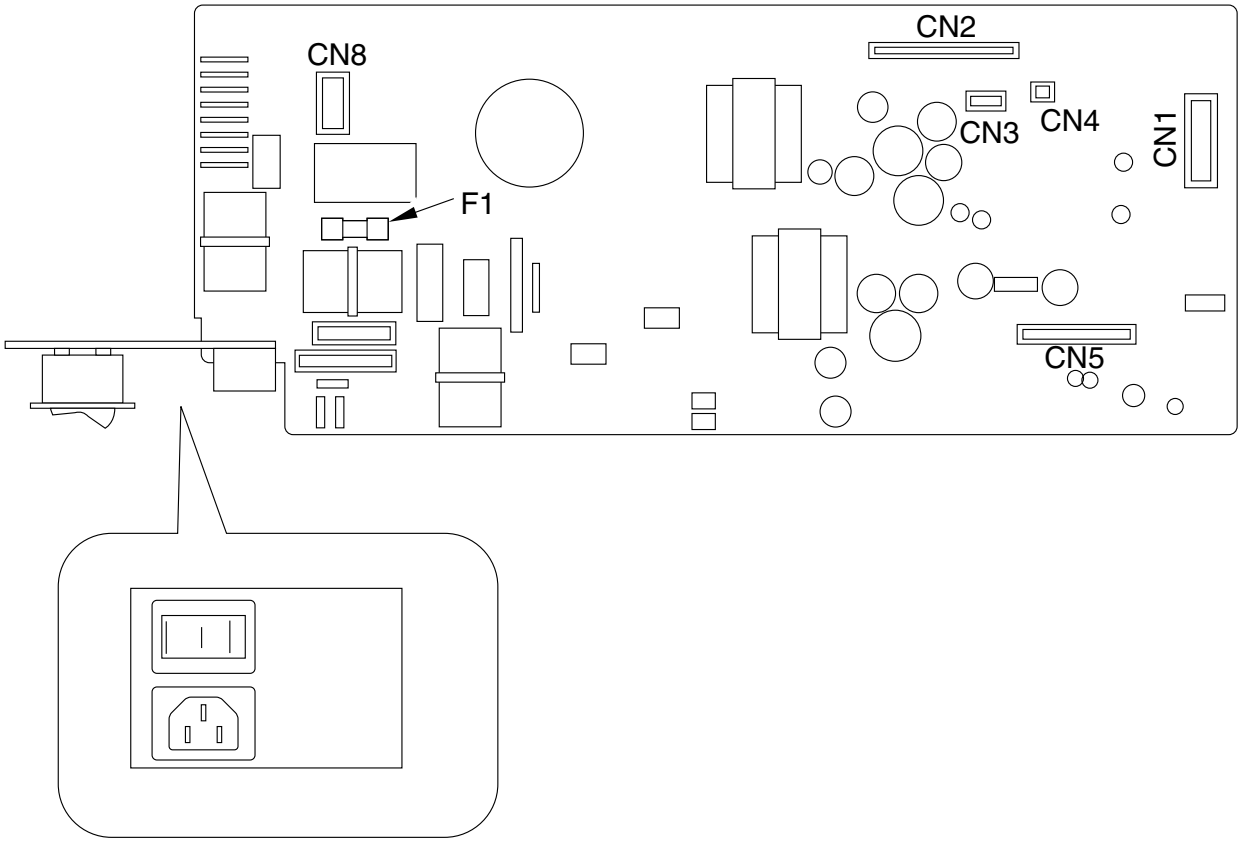
4.8.2 DC Controller PCB



F13-408-02

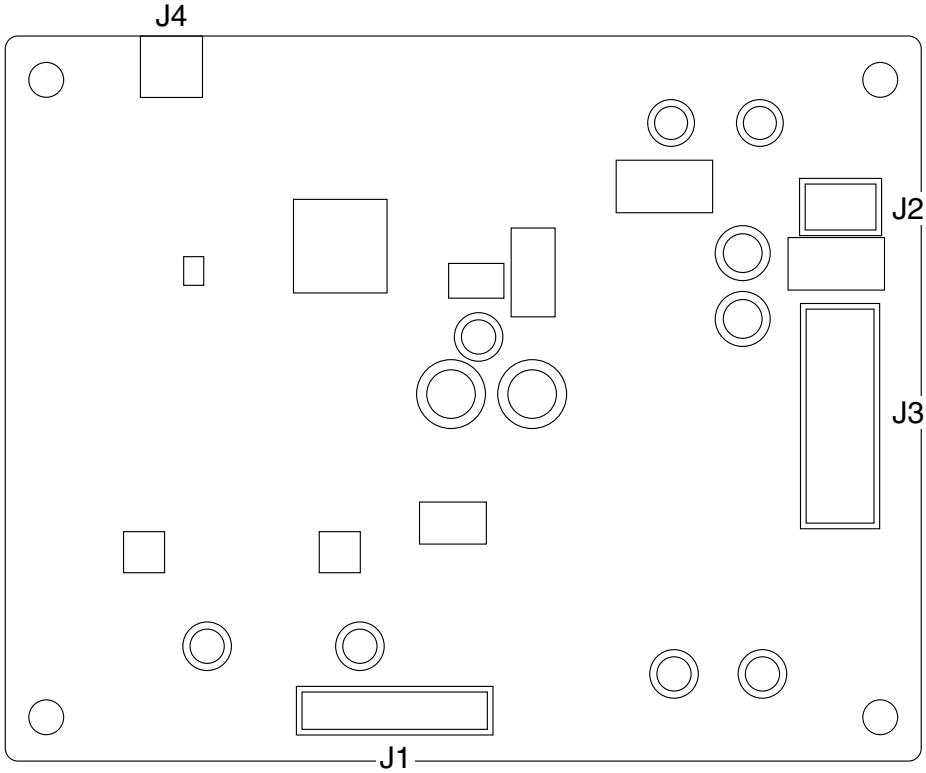
VR101 : volume for adjustment of leading edge
VR401 : for factory (volume for adjusting high-voltage power supply reference voltage)
VR402 : for factory (volume for adjusting toner level detection reference)
VR403 : for factory (volume for adjusting toner level detecting antenna)
SW101 : test print switch

4.8.3 Power Supply PCB



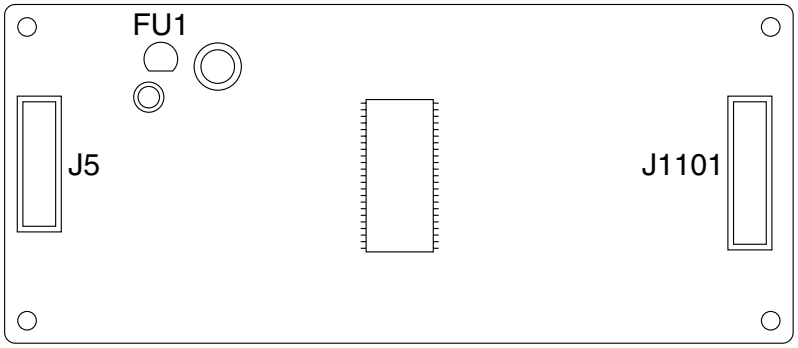
F13-408-03

4.8.4 Analog Processor PCB



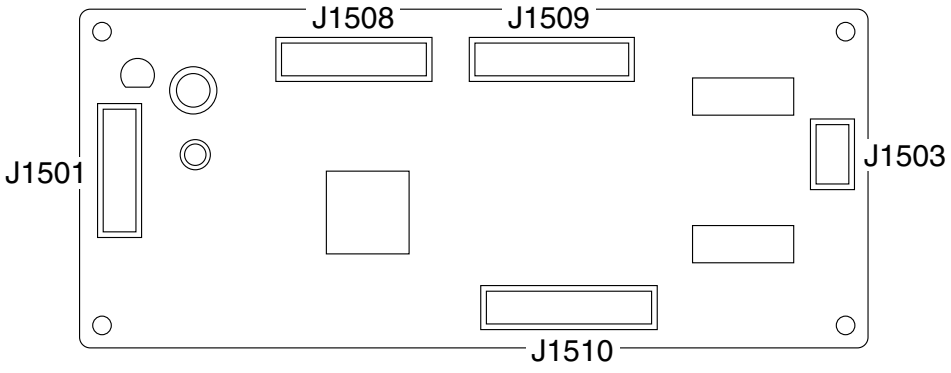
F13-408-04

4.8.5 1-Cassette Unit Controller PCB



F13-408-05

4.8.6 2/3-Cassette Unit Controller PCB



F13-408-06

5 Service Mode

5.1 Outline

The items that follow may be checked/set using the machine's service mode, which is designed the way the service mode used in fax machines is designed in terms of contents and operation. The machine's service mode consists of the following 14 blocks.

As many as 15 items (#1 through #14) are offered, including test mode (TEST MODE).

#1 SSSW: service soft switch
Use it to register/set basic fax functions (e.g., error control, echo remedy, communication error correction).
Use it to make settings related counter functions.

#2 MENU: menu switch settings
Use it to register/set items related to functions needed at time of installation (e.g., NL equalizer, transmission level).

#3 NUMERIC Param: numerical parameter settings
Use it to enter a numerical parameter for various functions related to the FAX/TEL switch-over.

#4A SPECIAL: Do not change.

#4B NCU: Do not change.
This item is set in conjunction with the setting of #5 TYPE so that the settings will comply with the communications standards of a specific country/region.

#5 TYPE : country/region setting
Use it to make collective settings realted to user data and service mode (#1 SSSW, #4 NCU.) to suit the country/region of installation indicated on the display.

#6 SCANNER : (partly available in service mode)
Do not use it except for '7: CCD' at time of adjusting image position; a change to the setting can adversely affect the read image quality.

#7 PRINTER : printer settings
Use it to make registration/settings related to basic printer functions.

#8 PDL : PDL setting
A service menu is offered for printer function settings and printer board:

#9 COUNTER : counter indication
Use it to check estimates for maintenance/parts replacement.

#10 REPORT : report output
Use it to generate reports on various service data.

#11 DOWNLOAD : download
Use it to download firmware to the ROM of a PCB in question.

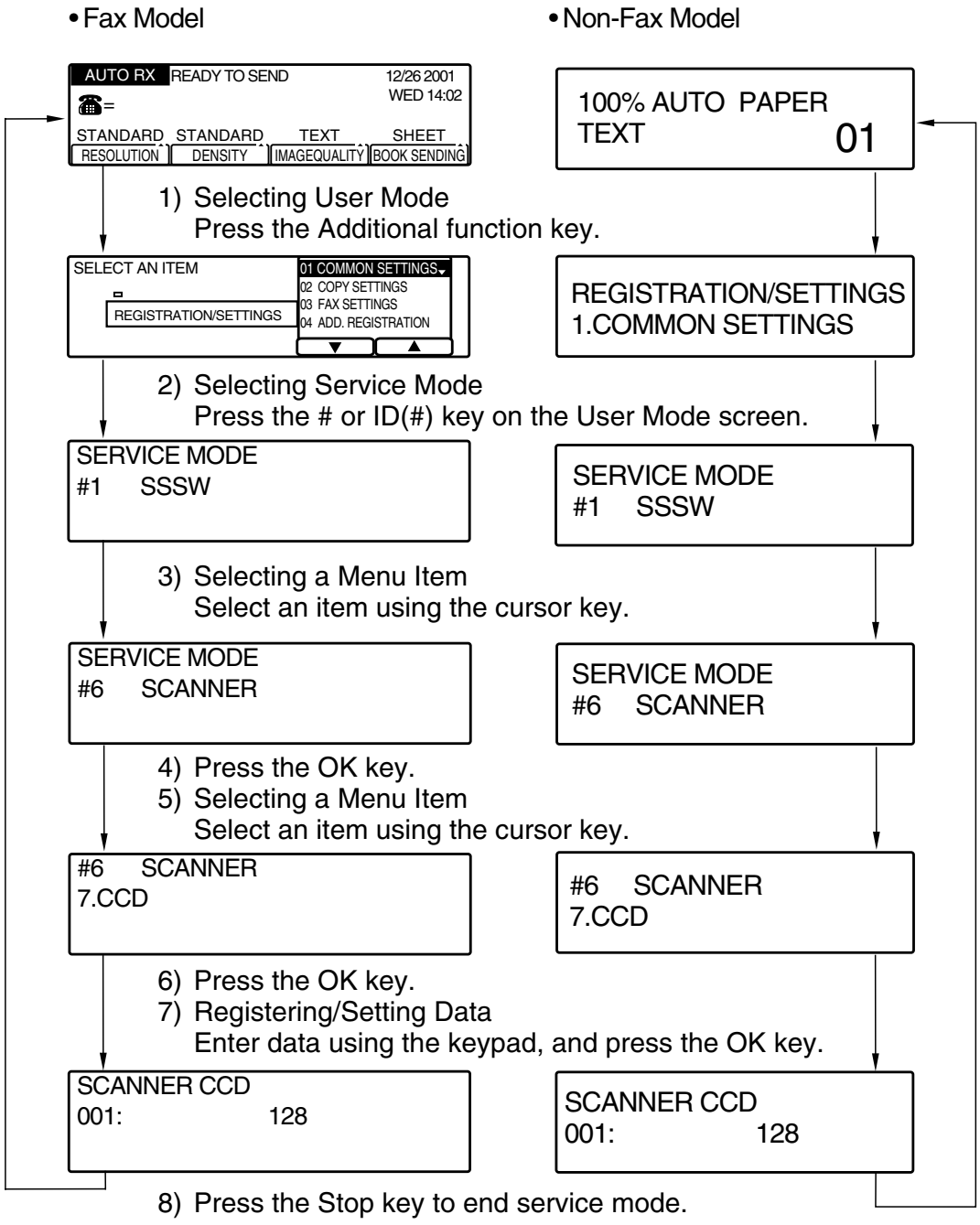
#12 CLEAR : data initialization mode setting
Use it to reset various data to initial settings.

#13 ROM : ROM control
Use it to check the version of the CPU and the ROM DIMM on a PCB in question.

#14 CS SET : CS unit position
Use it to change the CS unit back to its position at time of shipment.

5.2 Using the Mode

To use a service mode item, go through the following flow of operation:



F13-502-01

5.3 Service Mode Menus

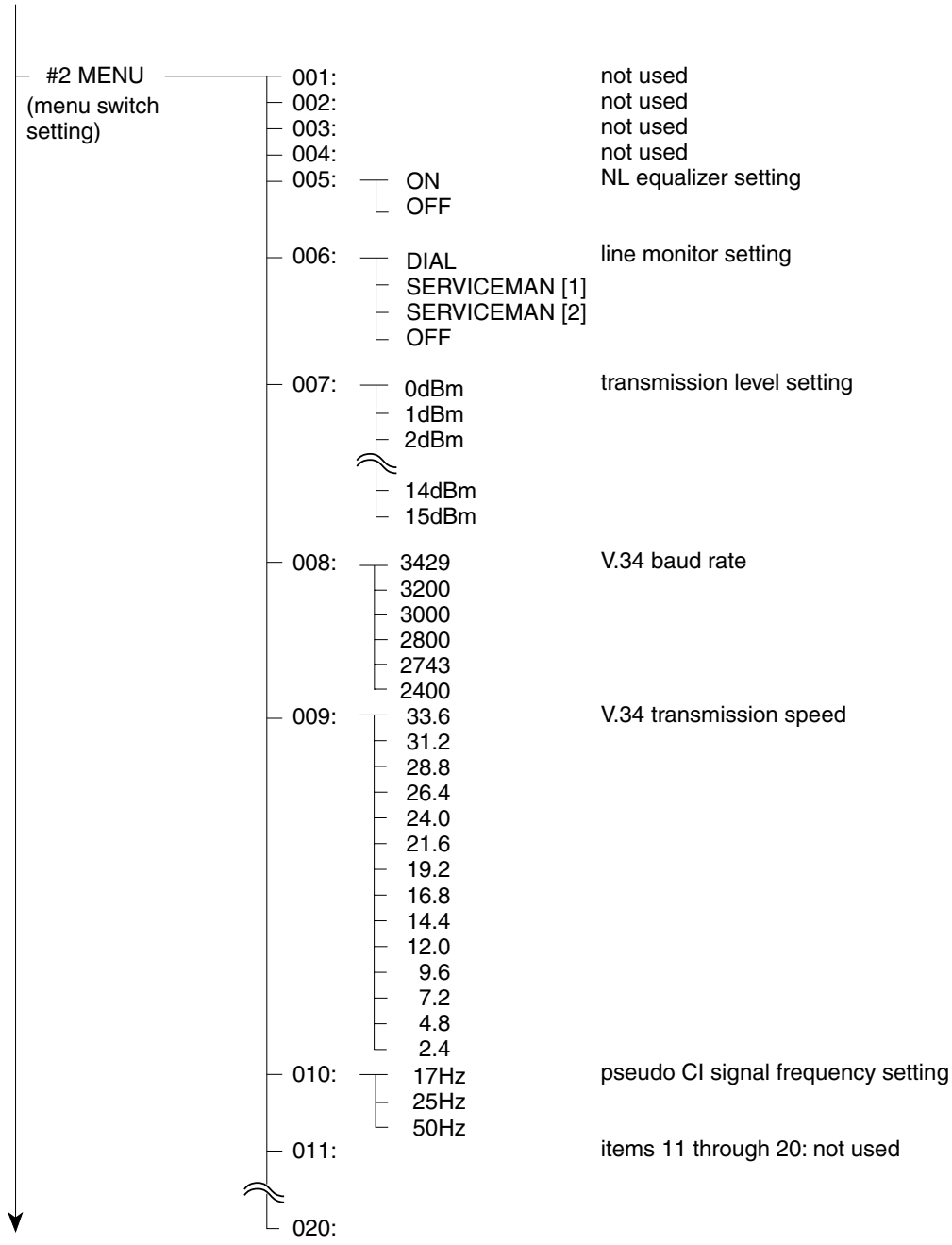
service data

#1 SSSW (service soft switch settings)

SW01	00010000	error/copy control
SW02	10000000	network connection setting
SW03	00000000	echo remedy setting
SW04	10000000	communication fault remedy setting
SW05	00000000	standard function (DIS signal) setting
SW06	10001000	read conditions setting
SW07	00000000	not used
SW08	00000000	not used
SW09	00000000	communications result display function settings
SW10	00000000	remote control operating setting
SW11	00000000	2-port function settings
SW12	00000010	1-page timer setting
SW13	00000000	relay, transfer function settings
SW14	00000000	by default paper type; metric/inch switch-over
SW15	00000000	not used
SW16	00000011	settings for a no paper display
SW17	00000000	not used
SW18	00000000	communication fault remedy setting
SW19	00000000	not used
SW20	00000000	not used
SW21	00000000	not used
SW22	00000000	fault remedy setting
SW23	00000000	transmission function setting
SW24	00000000	not used
SW25	00000000	report indication function setting
SW26	00000000	transmission function setting
SW27	00000000	not used
SW28	00000000	V.8/V.34 protocol settings
SW29	00000001	not used
SW30	00000000	not used
SW31	00000000	not used
SW32	01000000	not used
SW33	00000000	counter related
≀	≀	≀
SW50	00000000	not used

F13-503-01

Do not change the following, reserved for the future; SW7, 8, 13, 15, 17, 19 through 21, 24, 27, 29 through 32, 34 through 50.



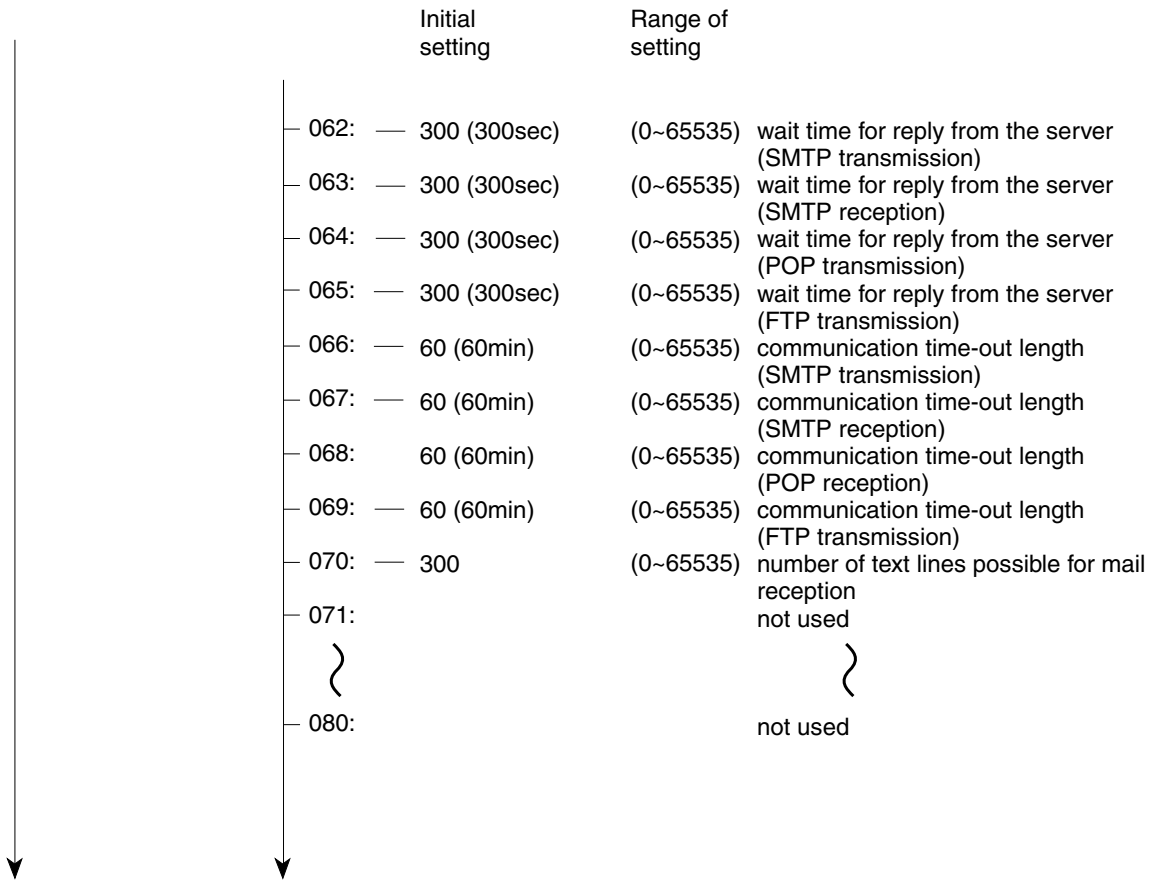
F13-503-02

Do to change the following, reserved for the future: No. 001 through 004, 011 through 020.

		Initial setting	Range of setting	
#3 NUMERIC Param. (numerical parameter setting)	001:			not used
	002:	10 (10%)	(1~99)	RTM signal transmission condition (1) setting
	003:	15 (15times)	(2~99)	RTM signal transmission condition (2) setting
	004:	12 (12lines)	(1~99)	RTM signal transmission (3) setting
	005:	4 (4sec)	(1~60)	NCC pause time (pre-ID code) setting
	006:	4 (4sec)	(1~60)	NCC pause time (post-ID code) setting
	007:			not used
	008:			not used
	009:	6(6 digits)	(0~20)	direct mail prevention function: telephone number cross-check, number of digits
	010:	5500 (55sec)	(0~9999)	T0 timer
	011:	3500 (35sec)	(0~9999)	T1 timer
	012:			not used
	013:	1300 (13sec)	(500~3000)	T30 EOL timer
	014:			not used
	015:	120 (1200ms)	(0~999)	hooking detection time setting
	016:	4 (4sec)	(0~9)	fax/tel switch-over function: between line acquisition and pseudo RBTtransmission
	017:	100 (1000ms)	(0~999)	pseudo RBT signal pattern: ON time setting
	018:	0 (0ms)	(0~999)	pseudo RBT signal pattern: OFF time (short) setting
	019:	200 (2000ms)	(0~999)	pseudo RBT signal pattern: OFF time (long) setting
	020:	100 (1000ms)	(0~999)	pseudo CI signal pattern: ON time setting
	021:	0 (0ms)	(0~999)	pseudo CI signal pattern: OFF time (short) setting
	022:	200 (2000ms)	(0~999)	pseudo CI signal pattern: OFF time (long) setting
	023:			not used
	024:	20 (-20dBm)	(0~20)	pseudo RBT signal transmission level setting
	025:	60 (60sec)	(0~999)	answering phone connection function: signal monitor length setting
	026:			not used
	027:	0	(0~20)	V21 low-speed flag preamble detection length setting
	028:	3 (3sec)	(1~60)	menu pop-up time setting
	029:			not used
	≀			≀
	055 :			not used
	056 :	101	(101)	total 1 indication
	057 :	103	(0~999)	total (L) indication
	058 :	201	(0~999)	copy (total 1) indication
	059 :	203	(0~999)	copy (L) indication
	060 :	0	(0~999)	no indication
	061 :	0	(0~999)	no indication

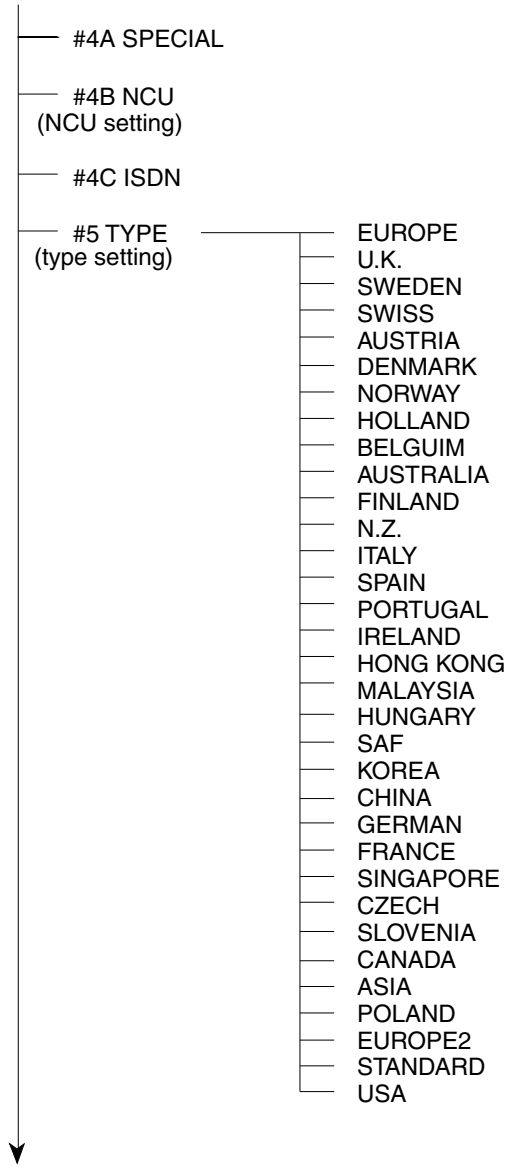
F13-503-03

Do not change the following, reserved for the future; No. 001, 007, 008, 012, 014, 023, 026, 029 through 061.



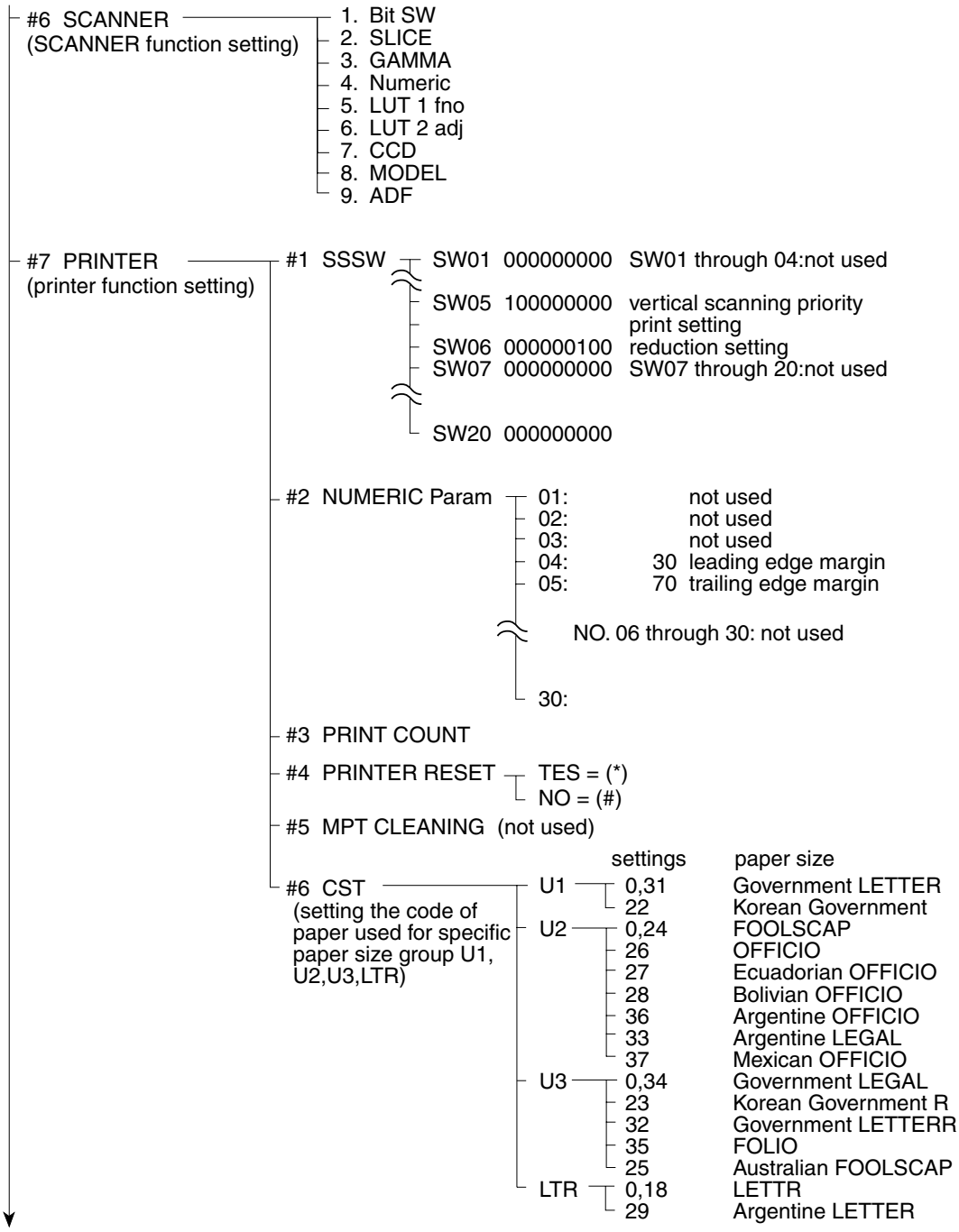
F13-503-04

Do not change the following, reserved for the future; No. 071 through 080.



F13-503-05

#4 : do not change; it is not used.
#5 TYPE : Use it to select a specific country from the list so that the settings under #1 through #4 will comply with the communications standards of the selected country.

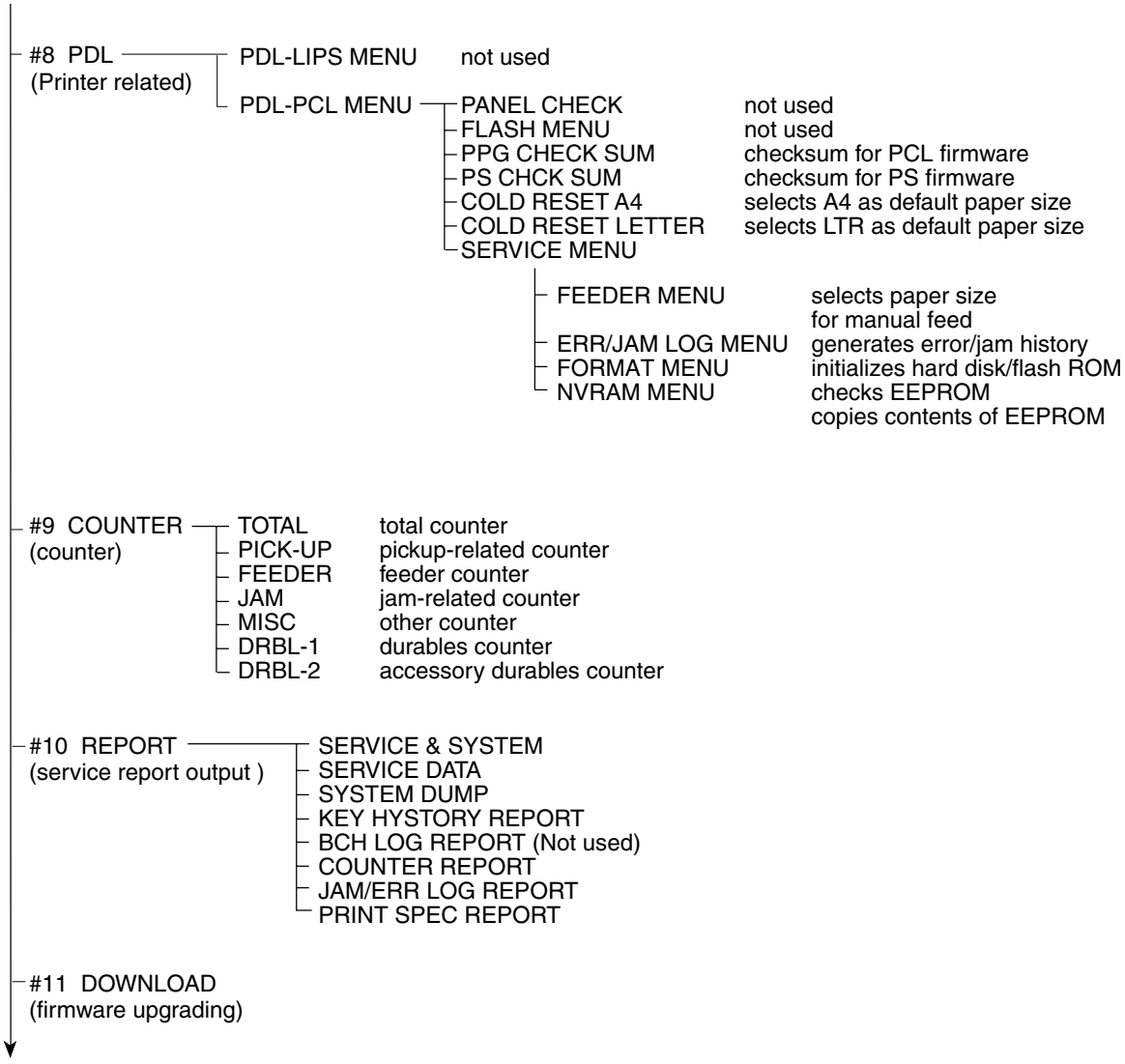


F13-503-06

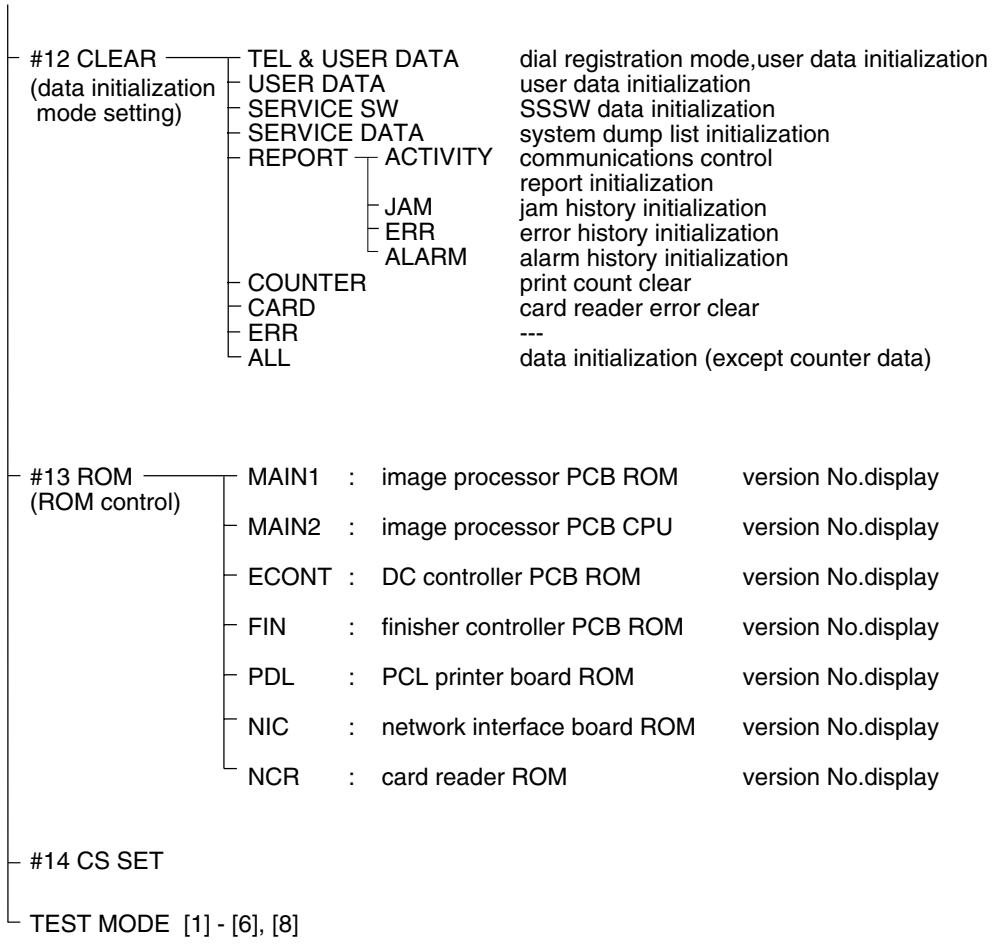
#6 SCANNER (scanner function settings)

The setting of this item can adversely affect the read image quality. '7. CCD' is changed when adjusting the image position and '8. MODEL' is changed when replacing the image processor PCB; otherwise, this item must not be changed.

Do not change the settings, as they are not in use: #7 PRINTER (printer function setting); #1 SSSW: SW01 through 04, 07 through 20 and #2 NUMERIC Param: No.01 through 03, 06 through 30.



F13-503-07


#12 CLEAR
(data initialization mode setting)
TEL & USER DATA
dial registration mode,user data initialization
USER DATA
user data initialization
SERVICE SW
SSSW data initialization
SERVICE DATA
system dump list initialization
REPORT
ACTIVITY
communications control
report initialization
JAM
jam history initialization
ERR
error history initialization
ALARM
alarm history initialization
COUNTER
print count clear
CARD
card reader error clear
ERR

ALL
data initialization (except counter data)
#13 ROM
(ROM control)
MAIN1 : image processor PCB ROM version No.display
MAIN2 : image processor PCB CPU version No.display
ECONT : DC controller PCB ROM version No.display
FIN : finisher controller PCB ROM version No.display
PDL : PCL printer board ROM version No.display
NIC : network interface board ROM version No.display
NCR : card reader ROM version No.display
#14 CS SET
TEST MODE [1] - [6], [8]

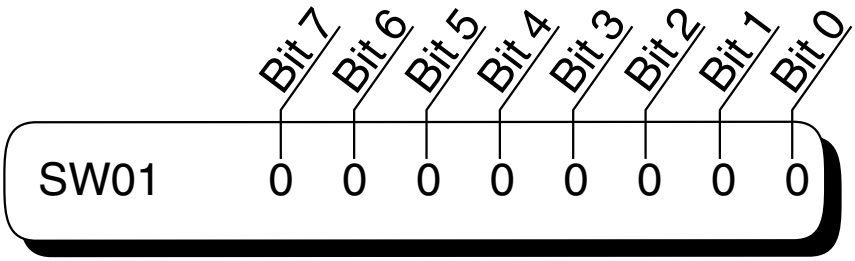
F13-503-08

5.4 Setting the parameters

5.4.1 Registering the Bit Switch (#1 SSSW)

Each item of registration/setting of this switch is based on the position of its 8 bits. It is indicated as shown below, and each bit is either '0' or '1'.

Do not use service data indicated as 'not used', since it must be used as it is initially set.



F13-504-01

#1 SSSW-SW01 (service soft switch 01: error/copy control)

Bit	Function	1	0	Factory setting
0	Service error code	Output	Not output	0
1	Error dump list	Output	Not output	0
2	Enter password at confidential Rx image data transfer	No	Yes	0
3	Not used	-	-	
4	Not used	-	-	
5	Not used	-	-	
6	Not used	-	-	
7	User setting restriction	do not impose	impose	0

[Bit 0]
Selects whether or not service error codes are output. When "Output" is selected, service error codes are displayed and in reports.

[Bit 1]
Selects whether or not error dump lists are output. When set to '1', an error dump list will be attached to an error TX report or a RX report generated in the event of an error.

[Bit 2]
Allows selection of whether to enter password at confidential Rx image data transfer.

[Bit 7]
Use it to impose or not impose restrictions on user settings. If set to '0', certain items cannot be set by the user, depending on the country setting. If set to '1', on the other hand, all items may be set by the user, regardless of the country setting.

SSSW-SW02: network connection setting

Bit	Function	1	0	Factory setting
0	start-up at memory clear list output fault	prohibit	do not prohibit	0
1	not used	-	-	
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
Use it to specify whether or not to put the machine in standby state if the memory clear list is not generated when the power is turned on after an error has occurred (e.g., running out of paper).
If set to '1', the machine will generate a memory clear list and enters standby state when the image data is cleared and the power is turned on.

If set to '1', moreover, the following takes place:
1. The alarm sounds, and the machine waits for correction; specifically,
   a. The LCD indicates 'CHECK PRINTER'.
   b. The machine will not start reception operation in response to arrival of data.
2. When an appropriate correction is made, the machine will automatically generate a memory clear list. If an error (e.g., jam) occurs during output, the machine goes back to 1.above.

If set to '0', on the other hand, the machine will sound the alarm and enters standby state.

SSSW-SW03: echo solution setting

Bit	Function	1	0	Factory setting
0	not used	-	-	0
1	Echo protect tone for high-speed transmission	Transmitted	Not transmitted	0
2	not used	-	-	0
3	not used	-	-	0
4	Transmission mode; long distance (1)	Yes	No	0
5	Transmission mode; long distance (2) or long distance (3)	Yes	No	0
6	Transmission mode	Long distance (3)	Long distance (2)	0
7	Tonal signal before CED signal transmission	Transmitted	Not transmitted	0

[Bit 1]
Selects whether or not the echo protect tone is transmitted for high-speed transmission (9600 or 7200 bps).
If errors due to line conditions occur frequently during fax transmission, select "Transmitted".
When "Transmitted" is selected, a non-modulated carrier is transmitted as a synchronization signal before the image transmission.

Codes for errors that can occur during transmission because of line conditions:
##100, ##104, ##281, ##282, ##283, ##750, ##755, ##760, ##765

[Bit 7]
Selects whether or not a 1080-Hz tone signal is transmitted before the CED signal is transmitted. If errors due to echoes occur frequently during reception, select "Transmitted" to transmit the tonal signal before transmitting the CED signal.

Codes for errors that can occur during reception because of echo:
##005, ##101, ##106, ##107, ##114, ##200, ##201, ##790

[Bit 4, 5, 6]
Select the transmission mode, long distance (1), long distance (2), or long distance (3). If errors due to echo occur frequently in transmission to overseas, set the transmission mode with the dial registration or service soft switch.


Memo

Codes for errors that can occur during transmission because of echo:
##005, ##100, ##101, ##102, ##104, ##201, ##280, ##281, ##283, ##284, ##750, ##760, ##765, ##774, #779, #784, ##794

TEL registration:
Set "Long distance (1)" when registering the one-touch speed dialing and coded speed dialing transmission mode. If errors do not disappear, try "Long distance (2)" and "Long distance (3)".
The transmission mode set in one-touch speed dialing and coded speed dialing registration takes priority over the one set with the service soft switch.
These bit switches are applicable to manually dialed numbers only. Look at the following table and set "Long distance (1)". If errors persist, try "Long distance (2)" or "Long distance (3)".

Bit / TX mode	7	6	5	4	3	2	1	0
Long distance (1)	*	0	0	1	0	0	*	0
Long distance (2)	*	0	1	0	0	0	*	0
Long distance (3)	*	1	1	0	0	0	*	0

* : 0 or 1 (depending on the respective setting)

Long distance (1) ignores the first DIS signal sent by the other fax.
Long distance (2) sends an 1850-Hz tonal signal when the DIS signal is transmitted.
Long distance (3) sends a 1650-Hz tonal signal when the DIS signal is transmitted.

#1 SSSW-SW04: communication fault remedy setting

Bit	Function	1	0	Factory setting
0	Monitor loop current	Yes	No	0
1	Check CI frequency	Yes	No	0
2	number of last flag sequence for procedure signal	2	1	0
3	reception mode after transmission of CFR signal	high-speed	high-speed/ low-speed	0
4	length of time during which to ignore low-speed signal after transmission of CFR signal	1500ms	700ms	0
5	not used	-	-	0
6	CNG signal for manual transmission	do not transmit	transmit	0
7	CED signal for manual reception	do not transmit	transmit	1

[Bit 0]
Selects whether or not to monitor loop current. When 'Yes' is selected, if loop current cannot be detected before dialing, or if the loop current is cut during or transmission, the line is released.

[Bit 1]
In automatic recieving, CI frequency check can be selected. If 'Yes' is selected, the upper and lower limits of the CI frequency are checked, and automatic recieving can only go ahead if both values meet German regulations.

[Bit 2]
Use it to specify the number of last flag sequences for the procedure signal (300 bps). Select '2' if the other party fails to receive the procedure signal transmitted by the machine normally.


Memo

The following error code are associated with transmission:
##100, ##280, ##281, ##750, ##753, ##754, ##755, ##758, ##759, ##760, ##763, ##764, ##765, ##768, ##769, ##770, ##773, ##775, ##778, ##780, ##783, ##785, ##788

[Bit 3]
Use it to select reception to use after transmission of the CFR signal.
If an error occurs often because of the line condition at time of reception, set it to '1' and, at the same time, set 'ECM RX' to 'OFF' for user data.


Memo

Codes for errors that can occur during reception because of line conditions:
##106, ##107, ##114, ##201
When "High speed" is selected, this fax only receives high-speed (image) signals after transmitting the CFR signal.

[Bit 4]
The length of the period of ignoring low speed signals after CFR output can be selected.
In cases where poor line conditions (echo, etc) mean that the fax cannot easily go into image signal reception, set the length of the period of ignoring low speed signals is "1500 ms".

[Bit 6]
Selects whether or not to transmit CNG signal during manual transmission.
In manual transmitting to a fax with the FAX/TEL switching mode, if there are frequent errors due to failure to switch to fax mode, select "Transmitted" for the CNG signal.

[Bit 7]
Selects whether or not to transmit CED signals during manual reception.
If the other fax does not transmit even when you start manual reception, select "Transmitted" for the CED signal.

#1 SSSW-SW05: standard function <DIS signal> setting

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	execute inch/metric conversion (text mode)	execute	do not execute	0
2	execute inch/meter conversion (text/photo, photo mode)	execute	do not execute	0
3	transmit bit 33 and thereafter for DIS signal	prohibit	do not prohibit	0
4	Recording paper length availability declared in DIS signal	A4 size	Arbitrary size	0
5	LTR/LGL declaration for DIS	do not declare	declare	0
6	not used	-	-	
7	not used	-	-	

[Bit 1]
Use it to specify inch/meter conversion in sub scanning direction for images read in text mode.
If set to '1: execute', the following takes place for binary image data:

- Inch-configured image data stored in memory is converted to metric-configured image data for transmission to a metric-configured fax machine (e.g., G3 transmission).
- Metric-configured image data stored in memory is converted into inch-configured image data for transmission to an inch-configured fax machine.

The direction of scanning for conversion is in keeping with the setting of bit 2 of SW14.


Memo

The machine uses inch-configured reading; however, if bit 4 of SSW14 is set to '1: yes', it will use metric-configured reading.

[Bit 2]
Use it to specify inch/meter conversion in sub scanning direction for images read in text/photo and photo mode.
If bit 1 of SW5 is set to '1: execute metric/inch conversion for binary image data' and, in addition, if this switch is set to '1: execute ', the following takes place for halftone image data (text/photo, photo mode):

- Inch-configured image data stored in memory is converted to metric-configured image data for transmission to an metric-configured fax machine (e.g., for G3 transmission).
- Metric-configured image data stored in memory is converted to inch-configured image data for transmission to an inch-configured fax machine.

The direction of scanning for conversion is in keeping with the setting of bit 2 of SW14.

[Bit 3]
Use it specify whether or not to transmit bit 33 and thereafter for the DIS signal.
If 'prohibit' is selected, Super Fine reception from a non-Canon machine can no longer be used.

If 'prohibit' is selected, Super Fine reception from a non-Canon machine can no longer be used.

[Bit 4]
Selects whether or not the recording paper length declared in the DIS signal is A4 size.
When receiving documents made up of long pages, to have the document divided into two pages at the transmitting fax, select "A4 size".

When "A4 size" is selected, this fax uses the DIS signal to tell the transmitting fax that it is equipped with A4 size recording paper.
The transmitting fax that receives this DIS signal divides long pages into A4 size pages before transmitting it to the receiving fax.
Some fax models do not so divide long documents.

[Bit 5]
Use it to disable LT/LGL declaring as a remedy against a communication fault when the LTR/LGL cassette is used. If 'declare' is selected, the use of LTR or LGL is declared for the DIS signal when the LTR/LGL cassette is fitted.

#1 SSSW-SW06: read condition setting

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	not used	-	-	
2	Document length restriction	Not restricted	1m (39.37") max.	0
3	not used	-	-	
4	original read width	LTR	A4	0
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 2]
Selects document length restriction. To copy or transmit pages more than 1m (39.37") long, select "Not restricted".

[Bit 4]
Use it to select a read width for originals.
If 'LTR' is selected, the machine will read LTR originals at LTR width (214mm).

#1 SSSW-SW09: communications result display function settings

Bit	Function	1	0	Factory setting
0	Not used	-	-	
1	Not used	-	-	
2	Not used	-	-	
3	Not used	-	-	
4	Not used	-	-	
5	Continuous polling reception	Yes	No	0
6	Not used	-	-	
7	Not used	-	-	

[Bit 5]
Selects whether or not to continuously carry out polling reception.
If this bit is set to "Yes", calling is repeated indefinitely.

#1 SSSW-SW10: remote control setting

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	not used	-	-	
2	not used	-	-	
3	No. of remote reception ID digits	3digits	2digits	0
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 3]
Use it to select the number of digits for remote reception IDs; 2 digits or 3 digits.

#1 SSSW-SW11: 2-port function settings

Bit	Function	1	0	Factory setting
0	Enable Access Codes	Yes	No	0
1	not used	-	-	
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
When two lines are connected, you can select whether to specify the lines used for calling.
When "Yes" is selected, ACCES CODE SETING is displayed in User Data.

#1 SSSW-SW12: page timer setting

Bit	Function	1	0	Factory setting
0	1-page time-out length for transmission	1	0	0
1		1	0	1
2	1-page time-out length for transmission (HT transmission)	1	0	0
3		1	0	0
4	1-page time-out length for reception	1	0	0
5		1	0	0
6	not used	-	-	0
7	page timer setting by transmission/ reception	set	do not set	0

The machine is designed to stop communication when transmission/reception of a single page takes 32 min or more. To set a time-out length, refer to the next page.
If '1' is selected for bit 7, the 1-page time-out length will be as set by bit 0 and bit 1.

Time-Out Length for Transmission/reception

Time-out time \ Bit	7	6	5	4	3	2	1	0
8 min.	0	*	*	*	*	*	0	0
16 min.	0	*	*	*	*	*	0	1
32 min.	0	*	*	*	*	*	1	0
64 min.	0	*	*	*	*	*	1	1

Time-Out Length for Transmission (text mode)

Time-out time \ Bit	7	6	5	4	3	2	1	0
8 min.	1	*	*	*	*	*	0	0
16 min.	1	*	*	*	*	*	0	1
32 min.	1	*	*	*	*	*	1	0
64 min.	1	*	*	*	*	*	1	1

Time-Out Length for Transmission (image mode other than text mode)

Time-out time \ Bit	7	6	5	4	3	2	1	0
8 min.	1	*	*	*	0	0	*	*
16 min.	1	*	*	*	0	1	*	*
32 min.	1	*	*	*	1	0	*	*
64 min.	1	*	*	*	1	1	*	*

Time-Out Length for Reception

Time-out time \ Bit	7	6	5	4	3	2	1	0
8 min.	1	*	0	0	*	*	*	*
16 min.	1	*	0	1	*	*	*	*
32 min.	1	*	1	0	*	*	*	*
64 min.	1	*	1	1	*	*	*	*

#1 SSSW-SW13: Frelay, transfer function settings

Bit	Function	1	0	Factory setting
0	-	-	-	
1	-	-	-	
2	use metric/inch conversion for transmission of received image	Yes	No	0
3	-	-	-	
4	-	-	-	
5	-	-	-	
6	-	-	-	
7	-	-	-	

[Bit 2]
If metric/inch conversion of binary image data is enabled, i.e., bit 1 of SW05 is set to '1: yes' and, in addition, if this switch is set to '1: yes', the following takes place for a received image for its transmission (relay, transfer):

- Inch-configured image data received and stored in memory is converted to metric-configured image data for transmission to a metric-configured fax machine.
- Metric-configured image data received and stored in memory (e.g., in G3), is converted to inch-configured image data for transmission to an inch-configured fax machine.

The direction of scanning for conversion is in keeping with the setting of bit 2 of SW14.

#1 SSSW-SW14: inch/meter resolution setting

Bit	Function	1	0	Factory setting
0	paper size identification	1	0	0
1	paper size identification	1	0	0
2	inch/meter resolution conversion scanning direction	main/sub scanning	sub scanning only	1
3	not used	-	-	
4	declare inch resolution	declare	do not declare	0
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0, 1]
Use it to select an original reading size (default paper); the selection will be as follows based on the combination of bit 0, bit 1, and SW06 bit 4 settings:

Bit 0	Bit 1	
0	0	A/B original
0	1	inch original
1	0	A original
1	1	A/B original

Mode	SW06		SW14			Paper configuration
	BIT4		BIT1	BIT0		
Copy	0	A4	0	0	AB	AB
	1	Letter				AB
	0	A4	0	1	inch	inch
	1	Letter				inch
	0	A4	1	0	A	A
	1	Letter				A
	0	A4	1	1	AB	AB
	1	Letter				AB
FAX	0	A4	0	0	AB	AB
	1	Letter				inch
	0	A4	0	1	inch	AB
	1	Letter				inch
	0	A4	1	0	A	A
	1	Letter				inch
	0	A4	1	1	AB	AB
	1	Letter				inch

[Bit 2]
The direction of scanning may be set for binary image data if bit 1 of SW05 is set to '1: yes' for the use of metric/inch conversion. This switch also affects halftone images if bit 2 of SW05 is set to '1: yes' for inch/metric conversion of halftone images (text/photo, photo mode).
If '0: only for main scanning or sub scanning direction' is selected, the following will take pale:

- Conversion will take place only in sub scanning direction in the case of conversion from inch to metric (e.g., for G3 transmission).
- Conversion will take place only in main scanning direction in the case of conversion from metric to inch.

[Bit 4]
Use it to specify whether or not to declare an inch resolution to the other party at time of G3 communication.
If set to '1', a declaration will be made using the DIS, DCS, or DTC signal to the effect that the machine is designed to read and record images at an inch resolution.


Memo

The type of image and the direction of scanning for inch/meter resolution conversion are determined by combinations of bits 1 and 2 of SW05 and bit 2 of SW14 of #1 SSSW as well as the type of dialing used.

#1 SSSW-SW15: dial-in fax/tel switch-over function

Bit	Function	1	0	Factory setting
0	Not used	-	-	
1	timing for storing polarity in memory	telephone line	after CI detection	0
2	Not used	-	-	
3	Not used	-	-	
4	Not used	-	-	
5	Not used	-	-	
6	Not used	-	-	
7	Not used	-	-	

[Bit 1]
When a dial-in fax/tel switch-cover takes place, the polarity of the telephone line is stored in memory for detection of reversal of the polarity of the telephone line. The timing may be set so that it is either after detection of CI or after release of the telephone line.
Some switchboards are known to wrongly store the polarity, which can further cause the machine to enter standby state when the telephone line is released, thus disabling communication with the other party. If such is the case, be sure to select 'after release of telephone line'.

If the switch is set to 'after release of telephone line', the reversal of the polarity cannot be detected from when CI is detected to when the telephone line is released.

#1 SSSW-SW16: settings for a No Paper display

Bit	Function	1	0	Factory setting
0	No Paper display conditions	Same size fax paper	Either one All fax paper	1
1	Check side cassette paper at No Paper display	Do not check	Check	1
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
Selects a No Paper display for when; either the fax paper cassette or multitray is empty, or for when the same size paper is all used up.

[Bit 1]
Selects whether to check the side cassette when checking if the same size paper is all used up.

#1 SSSW-SW18: remedies for communication faults (2)

Bit	Function	1	0	Factory setting
0	detection of carrier between DCS and TCF	detect	do not detect	0
1	wait time for carrier between DCS and TCF	600msec	300msec	0
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
For reception, the absence of the carrier between DCS and TCF may be detected. If the machine returns FTT while the other party (PC-FAX in particular) is sending TCF to cause a reception error, be sure to set the bit to '1'. If the error still occurs, set bit 1 of #1 SSSW SW18 to '1'. This function is valid only when the machine uses an R288F modem.

[Bit 1]
For reception, the length of time during which the absence of the carrier is detected between DCS and TCF may be set. This bit is valid when '1' is set to bit 0 of #1 SSSW SW18.

#1 SSSW-SW22: fault remedy setting

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	not used	-	-	
2	not used	-	-	
3	Prohibit manual polling	Yes	No	0
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 3]
Selects whether to prohibit by manual polling (off hook key + start key).

#1 SSSW-SW23: transmission functions

Bit	Function	1	0	Factory setting
0	A5R original rotation transmission	transmit	do not transmit	0
1	B5R original rotation transmission	transmit	do not transmit	0
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
Normally, A5R originals are excluded from rotation transmission regardless of the setting made in user data. If 'transmit' is selected here, however, rotation transmission will also be enabled for A5R originals.

[Bit 1]
Normally, B5R originals are excluded from rotation transmission regardless of the setting made in user data. If 'transmit' is selected here, however, rotation transmission will also be enabled for A5R originals.

#1 SSSW-SW25: report display function settings

Bit	Function	1	0	Factory setting
0	Transmission telephone numbers displayed on reports from CSI	Other fax number	Called number	0
1	not used	-	-	
2	not used	-	-	
3	Menu display of message language	Display	Do not display	0
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
Selects the transmission telephone number displayed on reports after the completion of transmission.
When "Called number" is selected, the telephone number the fax called is displayed on reports.
When "Other fax number" is selected, the telephone number sent from the other fax (the CSI signal data) is displayed on reports.

[Bit 3]
When "Display" is selected, adds a Message Language menu to the user data "System Setting". This allows selecting different languages which to show displays and reports.

#1 SSSW-SW26: transmission function setting

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	not used	-	-	
2	broadcast transmission confirmation	ask	do not ask	0
3	broadcast transmission prohibition	ask	do not ask	0
4	not used	-	-	
5	not used	-	-	
6	other party at time of broadcast transmission suspension	single party	all parties	0
7	error TX report at time of transmission suspension	do not generate	generate	0

[Bit 2]
Use it to specify whether or not to indicate a confirm message to prevent the user from making a broadcast by mistake when entering an address for a broadcast transmission.

[Bit 3]
Use it to specify whether or not to use broadcast transmission to prevent the user from making a broadcast by mistake when entering an address for a broadcast transmission.

[Bit 6]
Use it to specify whether or not to suspend a communication to all parties when a broadcast transmission is suspended.

[Bit 7]
Use it to specify whether or not to generate an error TX report when a transmission is suspended by pressing the Stop key.

#1 SSSW-SW28: V.8/ V.34 protocol settings

Bit	Function	1	0	Factory setting
0	Caller V.8 protocol	No	Yes	0
1	Called party V.8 protocol	No	Yes	0
2	Caller V.8 protocol late start	No	Yes	0
3	Called party V.8 protocol late start	No	Yes	0
4	V.34 reception fallback	Prohibited	Not prohibited	0
5	V.34 transmission fallback	Prohibited	Not prohibited	0
6	not used	-	-	
7	not used	-	-	

[Bit 0]
Select whether to use the V.8 protocol when calling. If NO is selected, the V.8 protocol is inhibited at calling and the V.21 protocol is used.

[Bit 1]
Select whether to use the V.8 protocol when called. If NO is selected, the V8 protocol is inhibited when called and the V.21 protocol is used.

[Bit 2]
If ANSam signal is not received during transmission (mainly manual transmission), select whether to use the V.8 protocol when the other fax machine declares the V.8 protocol in DIS signal. If NO is selected, the CI signal is not transmitted and the V.8 protocol is not used even if the DIS that specifies the V.8 protocol is received.

[Bit 3]
Select whether to declare the V.8 protocol in DIS signal for reception (mainly caller manual transmission). If NO is selected, the V.8 protocol cannot be used because it is not declared in DIS signal.

[Bit 4]
Select whether the receiver falls back during V.34 reception. If "Prohibit" is selected, the receiver does not fall back.

[Bit 5]
Select whether the transmitter falls beck during V.34 transmission. If "Prohibit" is selected, the transmitter does not fall back.

#1 SSSW-SW33:counter-related

Bit	Function	1	0	Factory setting
0	count B4 as large size	Yes	No	0
1	indicate serial No. on counter check screen	Yes	No	0
2	no used	-	-	
3	no used	-	-	
4	no used	-	-	
5	no used	-	-	
6	no used	-	-	
7	not used	-	-	

[Bit 0]
Use it to specify whether B4 paper should be counted as large-size paper.
If 'yes' is selected, B4 paper will be counted as large-size paper. If 'no' is selected, on the other hand, B4 paper will be counted as small-size paper.

[Bit 1]
Use it to specific whether to indicate the machine serial No. on the Counter Check screen, appearing when the Counter key is pressed.
If 'yes' is selected, the serial No. will be indicated. If 'no' is selected, on the other hand, the serial No. will not be indicated.

5.4.2 Menu Switch Setting (#2 MENU)

No.	Function	Range of settings
005	NL equalizer	ON/OFF
006	telephone line monitor	DIAL/SERVICEMAN [1]/ SERVICEMAN [2]/OFF
007	transmission level (ATT)	from 8 to 15
008	V.34 modulation speed upper limit	3429, 3200, 3000, 2800, 2743, 2400
009	V.34 data speed upper limit	from 2.4 to 33.6 kbps
010	Frequency of pseudo signal	50Hz, 25Hz, 17Hz

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[No.005] NL equalizer
Use it to enable-disable the NL equalizer.
If errors occur often during communication because of the condition of the line, enable (ON) the NL equalizer.

Any of the following error codes may be indicated at time of transmission because of the line condition:
##100, ##101, ##102, ##104, ##201, ##281, ##282, ##283, ##750, ##755, ##765, ##774, ##779, ##784, ##789
Any of the following error codes may be indicated at time of transmission because of the line condition:
##103, ##107, ##114, ##201, ##790, ##793

[No.006] telephone line monitor
Use it to s the telephone line monitor function:
DIAL: generate the monitor sound of the telephone line using the speaker from the start of transmission to DIS.
SERVICEMAN [1]: generate the monitor sound of the telephone line using the speaker from the start of communication to the end of it.
SERVICEMAN [2]: generate the monitor sound of the telephone line2 (Option).
OFF: do not generate the monitor sound of the telephone line using the speaker.

[No.007] ATT transmission level
Use it to set the transmission level (ATT).
Raise the transmission level if errors occur frequently at time of communication because of the condition of the line. (It means close to 8)


Memo

Any of the following error codes may be indicated at time of transmission because of the line condition:
##100, ##101, ##102, ##104, ##201, ##280, ##281, ##282, ##283, ##284, ##750, ##752, ##754, ##755, ##757, ##759, ##760, ##762, ##764, ##765, ##767, ##769, ##770, ##772, ##774, ##775, ##777, ##779, ##780, ##782, ##784, ##785, ##787, ##789
Any of the following error codes may be indicated at time of reception because of the line condition:
##103, ##106, ##107, ##201, ##793

[No.008] V.34 modulation speed upper limit
Use it to set an upper limit to the modulation speed (baud rate) for the V.34 primary channel.

[No.009] V.34 data speed upper limit
Use it to set an upper limit to the data transmission speed for the V.34 primary channel between 2.4K and 33.6K bps in increments of 2400 bps. (0: 2.4K to 13: 33.6K bps).

[No.010] Frequency of the pseudo CI signal
You may select a frequency for the pseudo CI signal.
Some types of external telephones do not ring when the fax/tel switch-over function is ON. To sound the ring, change the pseudo CI signal.

5.4.3 Setting Numeric Parameters (#3 NUMERIC Param.)

Use it to change the contents/settings of the display items of the soft counters, which may be checked in the control panel by pressing the Counter key (by the user).

No.	Function	Range of settings	Initial	Remarks
02	RTN transmission condition (1)	1 to 99%	10	
03	RTN transmission condition (2)	2 to 99 times	15	
04	RTN transmission condition (3)	1 to 99 lines	12	
05	NCC pause length (pre-ID code)	1 to 60 sec	4	
06	NCC pause length (post-ID code)	1 to 60 sec	4	
09	number of digits of telephone numbers in comparison between transmitting and receiving machine	0 to 20 digits	6	
10	line connection identification time length	0 to 9999 (10ms)	5500	
11	T.30 T1 timer (for reception)	0 to 9999 (10ms)	3500	
13	T30.EOL timer	500 to 3000 (10ms)	1300	
15	hooking detection time length	0 to 999 (10ms)	120	
16	time to tentative response at time of fax/tel switch-over	0 to 9 sec	4	
17	pseudo RBT signal pattern ON length	0 to 999 (10ms)	100	
18	pseudo RBT signal pattern OFF time length (short)	0 to 999 (10ms)	0	
19	pseudo RBT signal pattern OFF time length (long)	0 to 999 (10ms)	200	
20	pseudo CI signal pattern ON time length	0 to 999 (10ms)	100	
21	pseudo CI signal pattern OFF time length (short)	0 to 999 (10ms)	0	
22	pseudo CI signal pattern OFF time length (long)	0 to 999 (10ms)	200	
24	fax/tel switch-over pseudo RBT transmission level	0 to 20 dBm	20	
25	answer telephone CNG motor time length	0 to 999 sec	60	
27	V21 low-speed flag preamble detection time length	1 to 99 (*10ms)	3	
28	menu selection screen display time length	1 to 60 sec	3	
56	count type select 1	101	101	total 1
57	count type select 2	0 to 999	103	total (L)*
58	count type select 3	0 to 999	201	copy (total 1)
59	count type select 4	0 to 999	203	copy (L)*
60	count type select 5	0 to 999	0	-
61	count type select 6	0 to 999	0	-

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*indicates large size (B4 or larger).

No.	Function	Range of settings	Initial	Remarks
62	wait time for reply from the server (SMTP transmission)	0 to 65535 sec	300	
63	wait time for reply from the server (SMTP transmission)	0 to 65535 sec	300	
64	wait time for reply from the server (POP reception)	0 to 65535 sec	300	
65	wait time for reply from the server (FTP transmission)	0 to 65535 sec	300	
66	communication time-out length (SMTP transmission)	0 to 65535 min	60	
67	communication time-out length (SMTP reception)	0 to 65535 min	60	
68	communication time-out length (POP transmission)	0 to 65535 min	60	
69	communication time-out length (FTP transmission)	0 to 65535 min	60	
70	number of text lines possible for mail reception	0 to 65535 lines	300	

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[No. 02. 03, 04]
Use it to set conditions for RTN signal transmission. If an error occurs often when the RTN signal is transmitted at time of reception, increase the parameters to loosen the RTN signal transmission conditions.


Memo

The following error codes are associated with the transmission of the RTN signal at time of reception:
##104, ##107, ##114, ##201
The RTN signal transmission condition (1) is the ratio of the number of error lines in relation to the total number of lines per page of reception images.
The RTN signal transmission condition (2) is the reference value[*2] for burst errors[*1].
The RTN signal transmission condition (3) is the number of errors not reaching the reference value for burst errors.
*1: transmission errors spanning several lines.
*2: If set to '15', a transmission error spanning 5 consecutive lines is identified as a burst error.
If any of these conditions is detected while an image signal is being revised, the RTN signal will be transmitted after receiving the procedure signal from the transmitting machine. A higher parameter will make the transmission of the RTN signal more difficult.

[No. 05]
Use it to set the length of item (pause) automatically put between the access code an the ID code when a number is dialed on an NCC (new common carrier) line.

[No. 06]
Use it to set the length of time (pause) automatically put between the ID code and the telephone number of the other party when a number is dialed on an NCC (new common carrier) line.

[No. 09]
Use it to set the number of TSI comparison digits (last XX digits) for a telephone number cross check.

[No. 10]
Use it to set the length of time for line connection identification. If an error occurs often because of the line condition at time of a communication, increase the parameter.


Memo

The line condition detection time length refers to the length between when the dial signal is transmitted and when the line condition is cut in relation to the transmitting side, while it is the length between when the DIS signal is transmitted and when the line is cut in relation to the receiving side.

[No. 11]
The setting of the T1 timer varies from country to country (PTT). The T1 timer is variable.

[No. 13]
If the length of data for a single line is too long (e.g., computer fax), increase the 1-line transmission time for possible reception to prevent a reception error.

[No. 15]
Use it to set the hooking detection time.

[No. 16]
Use it to set the time length between when the line is acquired and when the pseudo RBT is transmitted when making a fax/tel switch-over.

[No. 17, 18, 19]
Use it to set a pattern of the pseudo RBT signal transmitted when making a fax/tel switch-over.

[NO. 20, 21, 22]
Use it to set the pattern of the pseudo CI signal transmitted when making a fax/tel switch-over.

[No. 24]
Use it to set the pseudo RBT transmission level used when making a fax/tel switch-over.

[No. 25]
Use it to set the length of time during which the absence of sound on the line, 2nd NSS signal, or CNG signal transmitted by the other party is monitored after the answering phone acquires the telephone line when answering machine mode is selected.

[No. 27]
Use it to change the detection evaluation time. (Command analysis is started when the V.21 low-speed command preamble is detected continuously for a specific period of time.)

[No. 28]
Use it to set the length of time during which the Menu Select screen is indicated on the LCD.

[No. 56 through 61]
Use it to confirm the count type indicated on the Counter Check screen, which appears in response to a press on the Counter key.
When '0' is selected, count type will not be indicated.
No. 56 : fix to total 1 (101) for the counter 1 reading.
No. 57 : use it to select a count type for the counter 2 reading.
No. 58 : use it to select a count type for the counter 3 reading.
No. 59 : use it to select a count type for the counter 4 reading.
No. 60 : use it to select a count type for the counter 5 reading.
No. 61 : use it to select a count type for the counter 6 reading.
If above selections have been made, the counters will be displayed in order of counter numbers.

<Soft Counter Specifications>
The soft counters are classified as follows according to input numbers:
100s : total
200s : copy
300s : print
500s : scan
700s : received print
800s : report print

Guide to the Table
√ : available for the machine.
large size (B4 or larger)
small size (smaller than B4)
total 1 (all sizes as 1)
total 2 (large sizes as 2)
1 or 2 under "Counter": count increments for large-size paper

To make a change so that B4 and larger papers will be counted as large-size, use service mode: make the following selections, and change bit 0 to '1': #1SSSW>SW33.

Setting			Basic counter									
			Copy		PDL print		Received print		Report print		Scan	
			Large	Small	Large	Small	Large	Small	Large	Small	Large	Small
total	total 1	101	√	√	√	√	√	√	√	√		
	total 2	102	√	√	√	√	√	√	√	√		
	large	103	√		√		√		√			
	small	104		√		√		√		√		
copy	total 1	201	√	√								
	total 2	202	√	√								
	large	203	√									
	small	204		√								
print	total 1	301			√	√			√	√		
	total 2	302			√	√			√	√		
	large	303			√				√			
	small	304				√				√		
PDL	total 1	331			√	√						
	total 2	332			√	√						
	large	333			√							
	small	334				√						
received print												
	total 1	701					√	√				
	total 2	702					√	√				
	large	703					√					
	small	704						√				
report print												
	total 1	801							√	√		
	total 2	802							√	√		
	large	803							√			
	small	804								√		
scan	total 1	505									√	√
	total 2	506									√	√
	large	507									√	
	small	508										√

[No. 062]
For SMTP transmission, the length of time during which the machine waits for a reply from the server may be changed. If a communication error occurs because the wait time is too long, be sure to raise the parameter.

[No. 063]
For SMTP reception, the length of time during which the machine waits for a reply from the server may be changed. If a communication error occurs because the wait time is too long, be sure to raise the parameter.

[No. 064]
If a communication error occurs because the time for the reply to arrive is too long, be sure to raise the parameter.

[No. 065]
For FTP transmission, you can change the length of time during which the machine waits for a reply from the server. If a communication error occurs because the wait time is too long, be sure to raise the parameter.

[No. 066]
You can change the communication time for SMTP transmission.

[No. 067]
You can change the communication time for SMTP reception.

[No. 068]
You can change the communication time for POP reception.

[No. 069]
You can change the communication time for FTP transmission.

[No. 070]
You can change the number of text lines that may be received for mail reception. If a mail containing excess lines arrives, the machine will stop communication on account of error #835.

5.4.4 SPECIAL Setting (#4A SPECIAL)

Do not change the setting; otherwise, the machine may malfunction.

5.4.5 NCU Setting (#4B NCU)

The settings of this item are collectively set in relation to the setting of #5 TYPE so that all values will comply with the communications standards of a specific country.

5.4.6 ISDN Setting (#4C ISDN)

Not used.

5.4.7 Selecting the Country/Region of Installation (#5 TYPE)

When you select a country of installation from the list indicated on the display, the appropriate service mode settings (#1 SSSW, #4 NCU) and the user data standard settings will collectively be selected.

5.4.8 Setting Original Read Functions (#6 SCANNER)

Item	Description
1. Bit SW	Do not change. A change to the setting can adversely affect the read image quality.
2. SLICE	
3. GAMMA	
4. Numeric	
5. LUT 1 fno	
6. LUT 2 adj	
7. CCD	Some settings may be changed.
8. MODEL	Used to turn on/off the original detection function.
9. ADF	Used to set the size of a special paper type not recognized by ADF.

#6 SCANNER-7

No.	Function	Range Unit	Default
0 to 17	Do not change.	-	-
18	CS read start adjustment (for ADF read)	0 to 9999 unit : 0.1mm	470
19	shading position adjustment	0 to 9999 unit : 0.1mm	90
20	CS wobble correction distance (for ADF read)	0 to 9999 unit : 0.1mm	40
21	main scanning direction image read start position adjustment (for book read)	0 to 9999 unit : 0.04mm	128
22	main scanning direction image read start position adjustment (for ADF read)	0 to 9999 unit : 0.04mm	128
23	sub scanning direction image read start position adjustment (for book read)	0 to 9999 unit : 0.1mm	145
24	sub scanning direction read start position adjustment (for ADF read)	0 to 9999 unit : 0.1mm	235
25	sub scanning direction image read end position correction (for copy)	0 to 9999 unit : 0.1mm	52
26	read end position correction for sub scanning image (for Super Fine)	0 to 9999 unit : 0.1mm	60
27	read end position correction for sub scanning image (for Fine)	0 to 9999 unit : 0.1mm	68
28	read end position correction for sub scanning image (for Standard)	0 to 9999 unit : 0.1mm	68
29	main scanning direction image read ratio correction (for book read)	0 to 9999 unit : 0.1%	16
30	main scanning direction image read ratio correction (for ADF reading)	0 to 9999 unit : 0.1%	16
31	sub scanning direction image read ratio correction (for book read)	0 to 9999 unit : 0.1%	16
32	sub scanning direction image read ratio correction (for ADF read)	0 to 9999 unit : 0.1%	16
34	feed motor speed adjustment (for ADF read)	0 to 9999 unit : 0.1%	50

[No. 18, 20, 34]
Do to use in the field. However, if you are replacing the image processor PCB, be sure to enter the value used at the factory.

[No. 19]
Use it to adjust the shading position correction to set a level between '90' and '72'when the output has white lines (vertical).

[No. 21]
Use it to adjust the image read start position in main scanning direction for book read mode. A higher setting will decrease the margin on the left.

[No. 22]
Use it to adjust the image read start position in main scanning direction for ADF read mode. A higher setting will decrease the margin on the left.

[No. 23]
Use it to adjust the image read start position in sub scanning directing for book read mode. A higher setting will decrease the margin along the image leading edge.

[No. 24]
Use it to adjust the image read start position in sub scanning direction for ADF read mode. A higher setting will decrease the margin along the image leading edge.

[No. 25]
Use it to correct the image read end position in sub scanning direction for copy mode. A higher setting will decrease the margin along the image trailing edge.

[No. 26]
If Super Fine is selected for resolution when reading a fax original, the read end position for sub scanning images is corrected. A higher setting will decrease the margin along the trailing edge of the images.

[No. 27]
If Fine is selected for resolution when reading a fax original, the read end position for sub scanning images is corrected. A higher setting will decrease the margin along the trailing edge of images.

[No. 28]
If Standard is selected for resolution when reading fax originals, the read end position for sub scanning images is corrected. A higher setting will decrease the margin along the trailing edge of images.

[No. 29]
Use it to correct the image read ratio in main scanning direction for book mode. A higher setting will lengthen the image in main scanning direction.

[No. 30]
Use it to correct the image read ratio in main scanning direction for ADF mode. A higher setting will lengthen the image in main scanning direction.

[No. 31]
Use it to correct the image read ratio in sub scanning direction for book mode. A higher setting will lengthen the image in sub scanning direction.

[No. 32]
Use it to correct the image read ratio in sub scanning direction for ADF mode. A higher setting will lengthen the image in sub scanning direction.

#6 SCANNER-8 MODEL

If you select 'TYPE A' for '8. MODEL', the original size detecting function will note be used; if you select 'TYPE B' on the other hand, the original size detection function will be used.

If you replaced the image processor PCB of a model equipped with an original detection function, be sure to select 'TYPE B' for '10. MODEL'. Otherwise, you will not be able to use the original size detection function when the machine is in book mode. If the machine is not equipped with an original detection function, on the other hand, check to make sure that the selection is 'TYPE A'.

#6 SCANNER-9 ADF

Use it to set the size of a special paper type not recognized by ADF.

• ORG-LGL

Use it to set the size of a special paper type not recognized by the ADF. (when LEGAL is recognized incorrectly in Inch system)

Settings

0: LEGAL (default) 5: G_LEGAL
1: FOOLSCAP 6: A_OFFICIO
2: M_OFFICIO 7: B_OFFICIO
3: A_FOOLSCAP 8: A_LEGAL
4: FOLIO

• ORG-B5

Use it to set the size of a special paper type not recognized by the ADF. (when B5 is recognized incorrectly in AB-Inch system)

Settings

0: B5 (default) 1: K_LEAGAL

• ORG-LTRR

Use it to set the size of a special paper type not recognized by the ADF. (when LTR-R is recognized incorrectly in Inch system)

Settings

0: LTRR (default) 2: OFFICIO
1: FOOLSCAP 3: E_OFFICIO

• ORG-LTR

Use it to set the size of a special paper type not recognized by the ADF. (when LTR is recognized incorrectly in Inch system)

Settings

0: LTR (default) 2: EXECUTIVE
1: G_LTR 3: A_LTR

5.4.9 Setting the Printer Parameters (#7 PRINTER)

Item	Description
#1 SSSW	Use it to select a cassette and make reduction settings.
#2 NUMERIC Param	Use it to set the margin for paper.
#3 PRINT COUNT	Use it to indicate the number of prints.
#4 PRINTER RESET	Use it to reset the machine at time of an error in the fixing assembly, thereby claring the error.
#6 CST	Use it to set the special default paper settings

#7 PRINTER-#1 SSSW-SW05 (cassette selection, reduction settings)

Bit	Function	1	0	Factory setting
0	not used	-	-	
1	not used	-	-	
2	not used	-	-	
3	not used	-	-	
4	not used	-	-	
5	not used	-	-	
6	not used	-	-	
7	print with sub scanning priority	do not print	print	1

[Bit 7]
Use it to enable or disable printing with sub scanning priority.

'enable': if B4 and A4R sheets are available, printing will be on B4 sheets when an A4 extra-length* image is received.
'disable': if B5 horizontal and A4R sheets are available, printing will be on B5 horizontal sheets (after division) when B4 images are received.
* : Shorter than B4 and when reduction will not enable printing on A4R.

#7 PRINTER-#1 SSSW-SW06 (reduction setting)

Bit	Function	1	0	Factory setting
0	reduce in image division	prohibit	do not prohibit	0
1	Drop outs for printed image when long image received	Drop out	Do not drop out	0
2	not used	-	-	
3	priority selection of B5	enable	do not enable	0
4	priority selection of B5 for image reduction	enable	do not enable	0
5	not used	-	-	
6	not used	-	-	
7	not used	-	-	

[Bit 0]
You can decide whether the received extra-length image should be reduced if it may be printed after reduction to the maximum reduction ratio (70%) and division.

'prohibit': divide and print on the next page (Direct). For instance, if an extra-length original (2.5 times the length of A4R) is received, it will be printed after being divided it into 3 A4R sheets. The images will be in Direct.
'do not prohibit': reduce for division for printing within the page. For instance, if an extra-length original (2.5 times the length of A4R) is received, it will be printed on 2 A4R sheets after reduction to 70%.

[Bit 1]
You can select whether or not to drop out the trailing edge when printing copied or received long images. If you do not want to drop out the trailing edge of copied or received images that are longer than the effective printing length, select 'Do not drop out'.
When you select 'Do not drop out', this machine does not use automatic reduction.

[Bit 3]
You can decide whether B5 sheets (of A4R, B5, B4) should be given priority for printing when A5 images are received.

[Bit 4]
You can decide whether B5 sheets (of B5 and A5) should be given priority for printing by division when an extra-length original (of A configuration) is received.

#7 PRINTER-#2 NUMERIC Param. (setting numerical parameters)

No.	Function	Range Unit	Factory
0 to 3	not used	-	-
4	leading edge margin	0 to 9999 unit : 0.1mm	30
5	trailing edge margin	0 to 9999 unit : 0.1mm	70
6 to 30	not used	-	-

[No. 4]
Use it to set the margin along the leading edge of paper.

[No. 5]
Use it to set the margin along the trailing edge of paper.

#7 PRINTER-#3 PRINT COUNT
Use it to indicate the number of prints and the total number of prints.

#7 PRINTER-#4 PRINT RESET
Use it to reset the machine if 'E000' through 'E004' (error in fixing assembly) is indicated, thus clearing the error.

#7 PRINTER-#6 CST special default paper

If this setting is enabled, the following functions become available for use:
- Copier Mode
  The auto enlarge/reduce mode may be used in combination with the ADF (except in book copy mode).
- Fax Mode
  A specific type of paper may be selected for reception.
  Reading may occur in combination with the ADF.

1. If paper of a special configuration is used as a default paper, be sure to make the appropriate settings.
2. To enable the settings, be sure to turn OFF and then ON the power switch after making a change.

The settings, names, and display notations for paper size groups (U1 through U3; LTR) are as follows; for U1 through U3 and LTR, the default settings are '0'.

Group	settings	Paper name	LCD notation
U1	31	Government LETTER	LTR
	22	Koran LEGAL	LGL
U2	24	FOOLSCAP	FLSC
	26	OFFICIO	OFI
	27	Ecuadorian OFFICIO	OFI
	28	Bolivian OFFICIO	OFI
	33	Argentine LEGAL	LGL
	36	Argentine OFFICIO	OFI
	37	Mexican OFFICIO	OFI
U3	34	Government LEGAL	LGL
	23	Korean LEGAL R	LGL
	32	Government LETTERR	LTR
	35	FOLIO	FOLI
	25	Australian FOOLSCAP	FLSC
LTR	18	Argentine LETTER	LTR
	29	Argentine LETTER-R	LTR

5.4.10 PDL (#8 PDL)

See to PCL printer board service manual.

5.4.11 Counters (#9 COUNTER)

The machine is equipped with counters for periodically replaced parts and durables (DRBL-1/DRBL-2), providing estimates of when to replace the durables.

Small-size paper is counted for '1', while large-size paper is counted for '2'.

The following are items under COUNTER:

Level 1	Level 2	Level 3	Description
COUNETR			
	TOTAL	(total counter)	
		SERVICE1	total counter 1 for service
		SERVICE2	total counter 2 for service
		TTL	total counter
		COPY	total copy counter
		PDL-PRT	PDL print counter
		FAX-PRT	fax reception print counter
		RPT-PRT	report print counter
		SCAN	scanner counter
	PICK-UP	(pickup-related counter)	
		C1	cassette 1 pickup counter
		C2	cassette 2 pickup counter
		C3	cassette 3 pickup counter
		C4	cassette 4 pickup counter
		MF	multifeeder tray pickup counter
	FEEDER	(feeder-related counter)	
		FEED	feed pickup total counter

Level 1	Level 2	Level 3	Description
COUNETR			
	JAM	(jam counter)	
		TTL	total jam counter for machine
		FEEDER	jam counter for feeder (ADF)
		SORTER	jam counter for sorter (finisher)
		MF	multifeeder tray jam counter
		C1	cassette 1 jam counter
		C2	cassette 2 jam counter
		C3	cassette 3 jam counter
		C4	cassette 4 jam counter
	MISC	(waste toner counter)	
		WST-TNR	waste toner counter
	DRBL-1	(machine durables)	
		FX-UNIT	fixing assembly paper passage counter
		TR-ROLL	transfer charging roller paper passage counter
		DV-UNT-C	developing assembly paper passage counter
		M-SP-RL	multifeeder pickup roller paper passage counter
		M-SP-PD	multifeeder separation pad paper passage counter
	DRBL-2	(accessories durables)	
		FIN-STPR	finisher operation counter

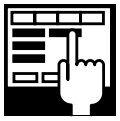
a. Clearing the Counter

- All Clear of Maintenance/Parts Counter

Execute the following in service mode to clear all maintenance/parts counter readings: #12 CLEAR>COUNTER.

- Clearing Counter Readings When Replacing Parts

Indicate the counter reading of the part you have replaced, and press the Clear key (individual clearing).



Generating a Counter Report
You can generate a counter report by executing the following in service mode: #10 REPORT>COUNTER REPORT.

5.4.12 Generating a Report (#10 REPORT)

Any of the following report may be generated:

Report	Description
SERVICE & SYSTEM	service data list, system dump list
SERVICE DATA	service mode #1 through #7, #13, start data.
SYSTEM DUMP	number of communications, number of receptions, number of recording sheets, number of errors
KEY HISTORY REPORT	1800 key presses since most recent report.
BCH LOG REPORT	Not used.
COUNTER REPORT	maintenance/parts counter readings. changes to user data/service data defaults. system dump list
JAM/ERR LOG REPORT	jam, error, alarm histories
PRINT SPEC REPORT	TYPE settings, memory size, ROM indications, adjustment data

5.4.13 Downloading (#11 DOWNLOAD)

The machine allows upgrading of the following parts using the Service Support Tool (SST) for downloading; for details, see Chapter 14.

Machine:
- ROM DIMM and CPU on image processor PCB

Accessories:
- ROM on finisher controller PCB
- ROM DIMM on G3 multiport PCB

5.4.14 Clear (#12 CLEAR)

The following items may be used in clear mode:

Item	Level 2	Description
TEL & USER DATA		Use it to clear all areas under user registration/setting.
USER DATA		Use it to clear the user data. The SSSW settings and TEL registration data will not be cleared.
SERVICE SW		Use it to clear the settings of SSSW. The usr data will not be cleared.
SERVICE DATA		Use it to clear the counters (numerator), date, and start data form the system dump list.
REPORT		
	ACTIVITY	Use it to clear the contents of the communications control report.
	JAM	Use it to clear the contents of the jam history.
	ERR (E-CODE)	Use it to clear the contents of the error (E code) history.
	ALARM	Use it to clear the contents of the alarm history.
COUNTER		Use it to clear the maintenance/parts counter data.
CARD		Use it to clear the card reader error data.
ERR	E355-CLR	---
	E717-CLR	Use it to clear the remote diagnostic device error data.
ALL		Use it to clear all settings/registration data except the counter (denominator, numerator).

5.4.15 ROM Indication (#13 ROM)

The following items/settings may be sued in ROM indication mode:

Item	Description
MAIN	Use it to indicate the version of the ROM on the image processor PCB.
MAIN2	Use it to indicate the version of the CPU on the image processor PCB.
ECONT	Use it to indicate the version of the ROM on the DC controller PCB.
OPT	Use it to indicate the version of the ROM on the G3 multiport PCB.
PDL	Use it to indicate the version of the printer board.
NIC	Use it to indicate the version of the ROM on the network interface board.
FIN	Use it to indicate the version of the ROM on the finisher controller PCB.
NCR	Use it to indicate the version of the ROM on the card reader.

5.4.16 Resetting the CS Unit Position (#14 CS SET)

When you execute this mode, the CS unit moves to its position used at time of shipment. You may move the CS unit to a position where it is to be secured (right side) with the CS fixing screw.

5.5 Test Mode (TEST MODE)

5.5.1 Outline

Be sure to follow how menu items are indicated on the display when making use of test mode; the test mode menu items are grouped into 5 blocks:

1. D-RAM Test (1: DRAM)

Use it to find out whether data may be written to or read from the D-RAM normally.

2. CCD Test (2: CCD TEST)

Use it to correct variation in sensitivity among photo cells of the CCD.

3. PRINT Test (3: PRINT)

Use it to print 8 types of patterns within the print area in Fine mode.

4.MODEM NCU Test (4: MODEM NCU)

Use it to execute a relay operation test or modem DTMF and total signal transmission/reception tests.

5.AGING Test (5: AGING TEST)

Not used.

6. FACULTY Test (6: FACULTY TEST)

Use it to check the operation of the micro switches, sensors, speakers, and ADF functions.

7. BOOK Test (8: BOOK TEST)

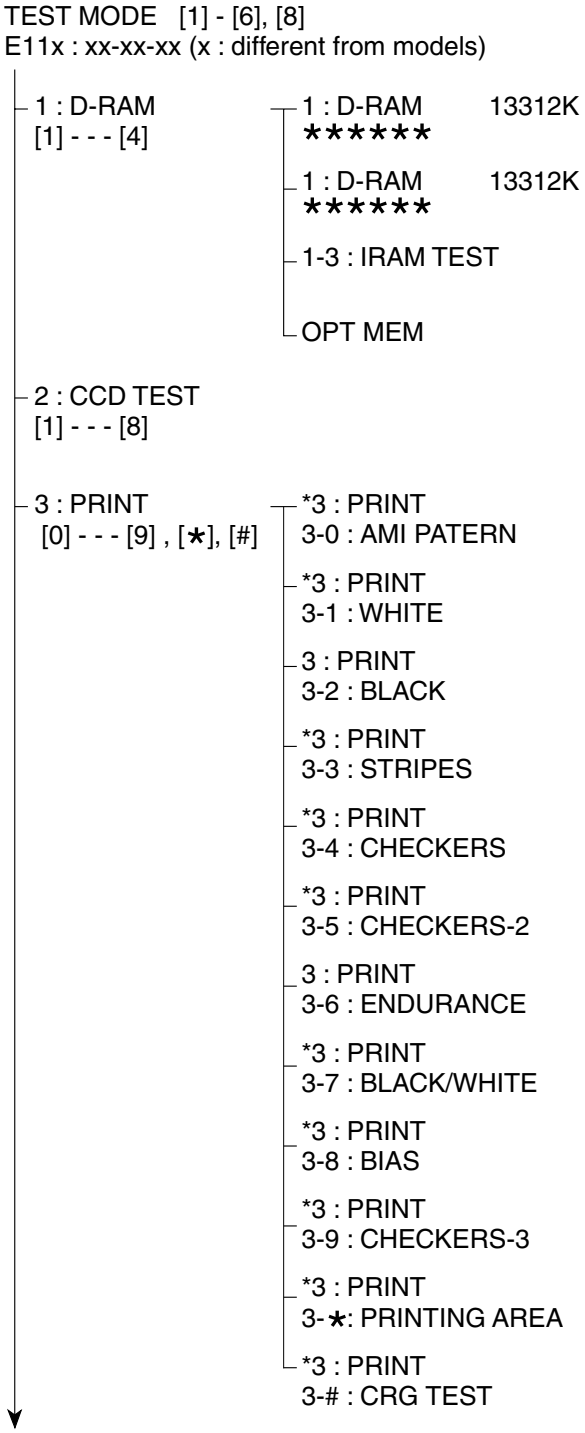
Use it to turn on the contact sensor or to initialize the book reading position parameter.

5.5.2 Test Mode Menu

To start test mode, press the User Mode key and then the # or ID(#) key; select 'SERVICE MODE', and select 'TEST MODE' using the cursor key ◀ / ▶, and press the OK key.

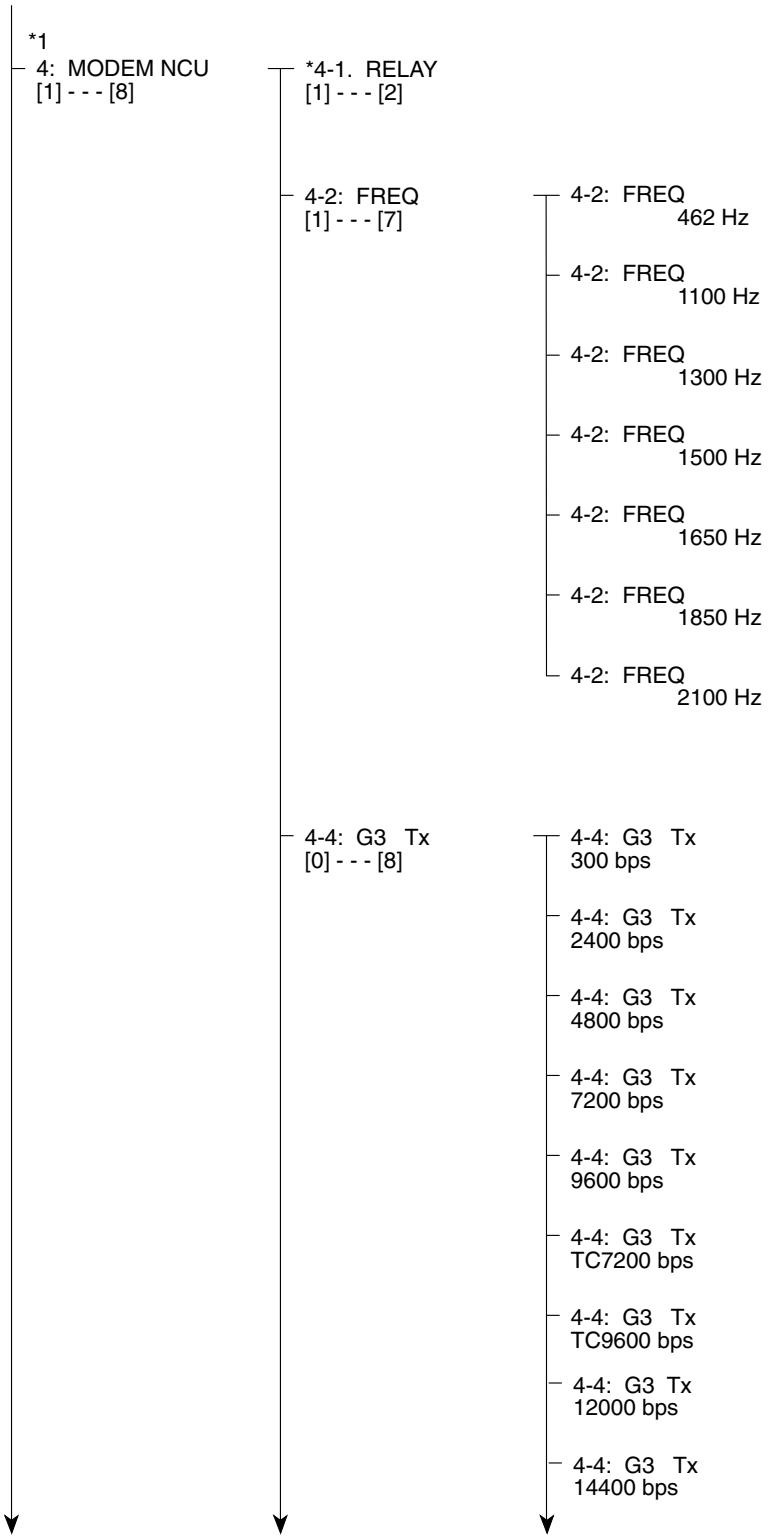
To end test mode, press the Stop key and then the Clear key.

*Not used.



F13-505-01

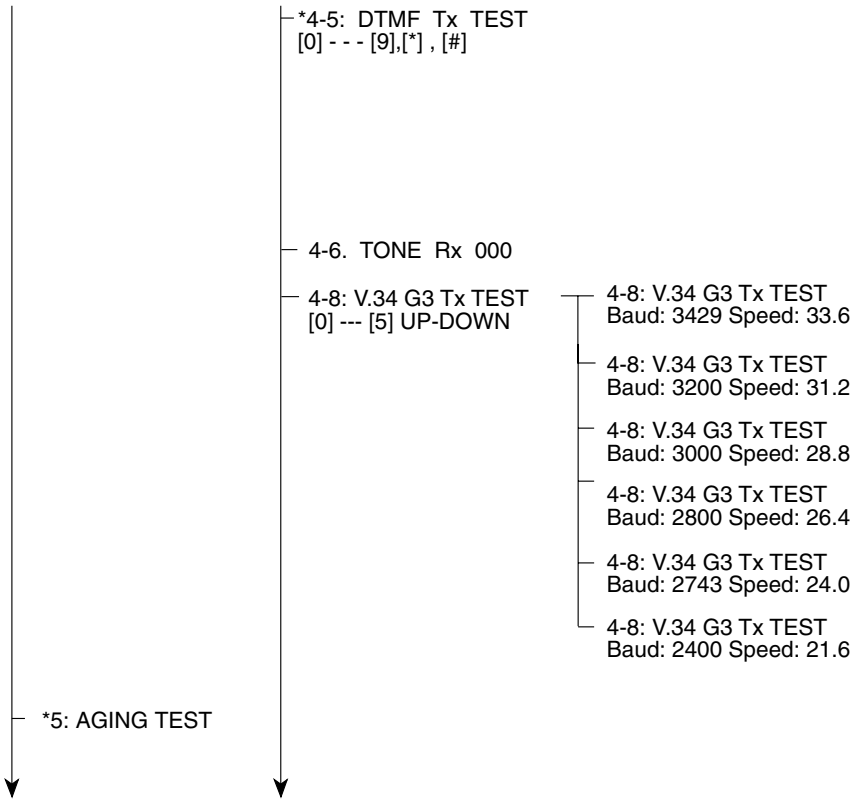
*Not used.



*1: if the machine is equipped with a fax function.

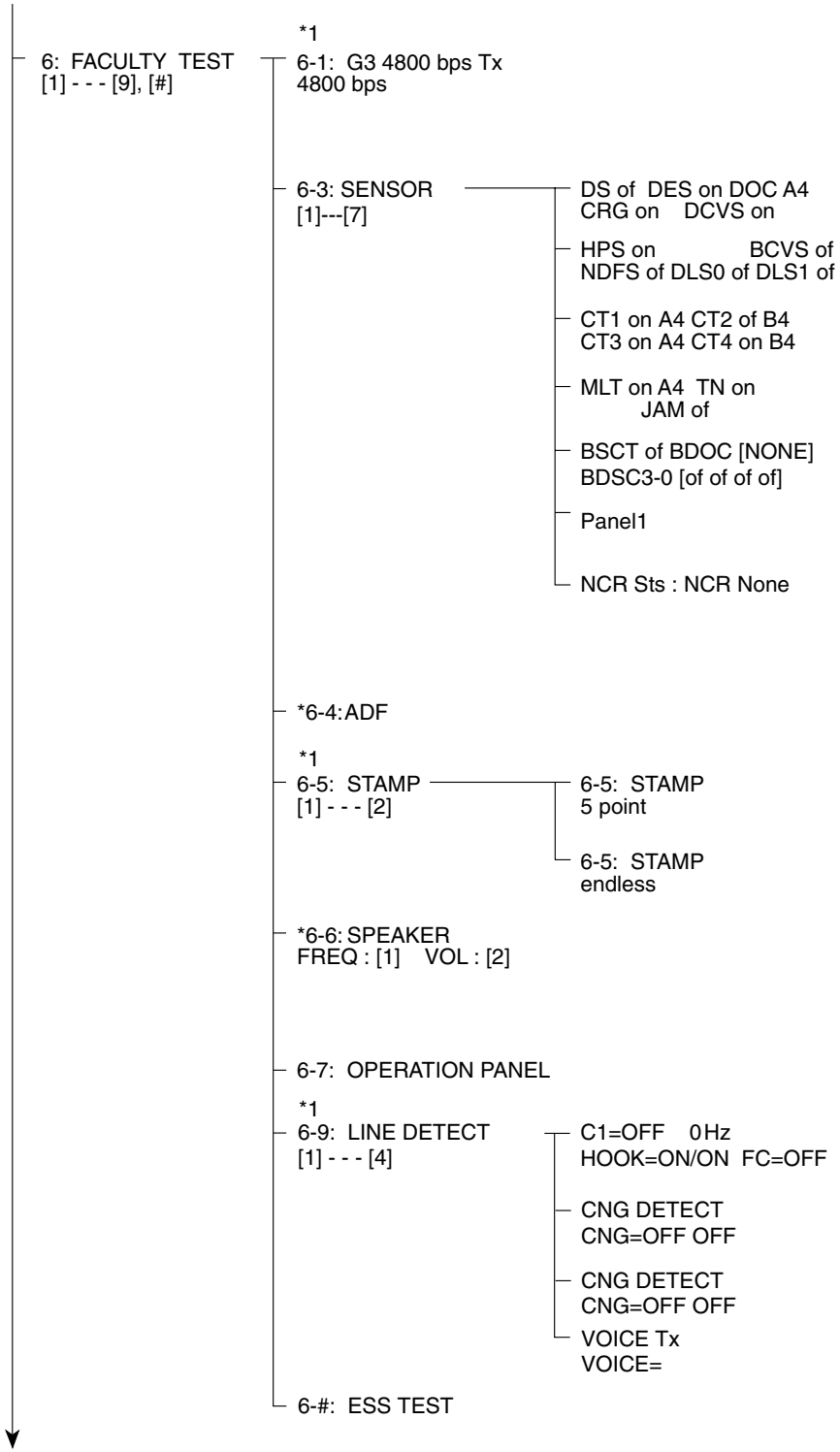
F13-505-02

*Not used.



F13-505-03

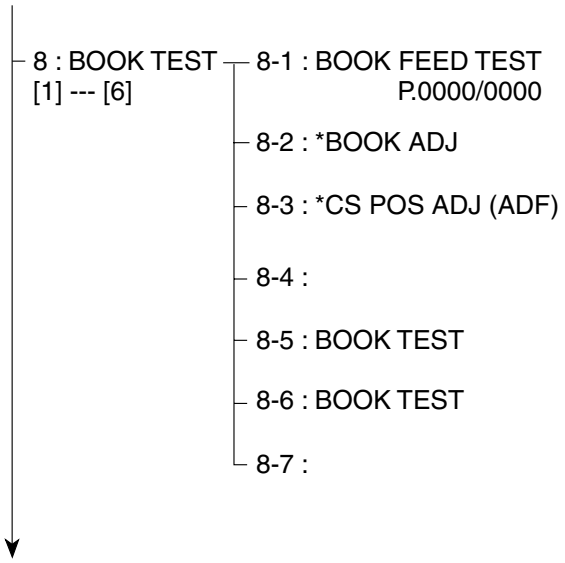
*Not used.



*1: if the machine is equipped with a fax function.

F13-505-04

*Not used.



F13-505-05

5.5.3 D-RAM Test (1: D-RAM)

Press '1' on the keypad while the Test Mode menu is indicated to select D-RAM Test mode. Press '1' through '4' on the keypad in D-RAM Test mode for the following:

'1' on Keypad

Use it to check data write/read operations for the entire area of the D-RAM.

If an expansion memory (option) is mounted, its area will also be checked. If an error occurs during a check, the testing will be suspended, and an error will be indicated on the display.

'2' on Keypad

Use it to check data read operations for the entire area of the D-RAM.

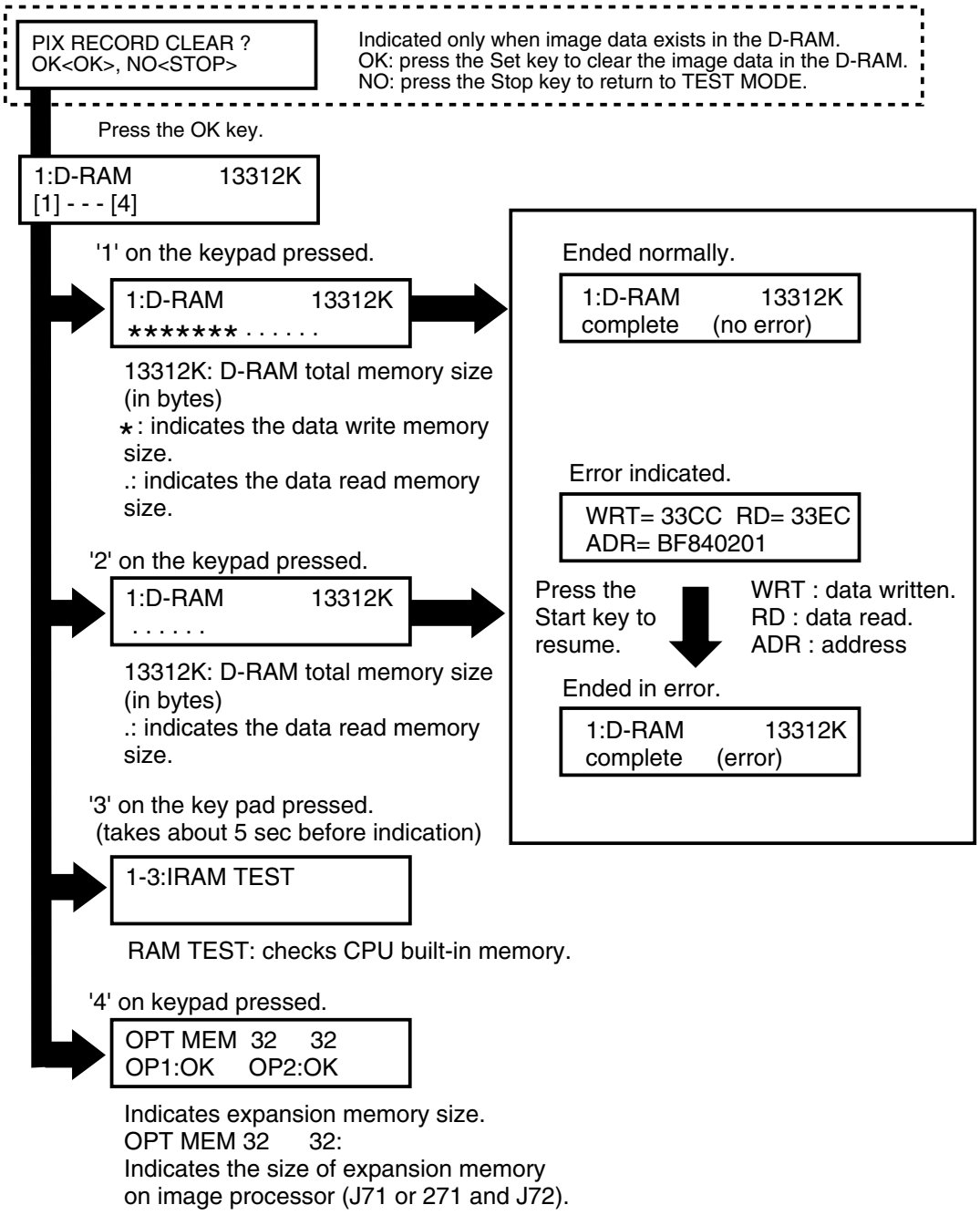
If an expansion memory (option) is mounted, its area will also be checked. If an error occurs during a check, the testing will be suspended, and an error will be indicated on the display.

'3' on Keypad

Use it to check data read/write operations for the built-in RAM of the CPU.

'4' on Keypad

Use it to check data write/read operations for the expansion memory in the expansion slot (J71/J72 or J271); memory size indication, for RAM area.



F13-505-06

5.5.4 CCD Test (2: CCD TEST)

A press on '2' on the keypad while the Test Mode menu is indicated will select CCD Test mode. Press '4', '7', or '8' on the keypad in test mode for the following; do not use other mode items, as they are for the factory/R&D:

'4' on Keypad

Use it to initialize the ADF read position parameter.

The settings will affect the following: service mode>#6 SCANNER>7. CCD>parameter 20, 22, 24 through 28, 30, 32, 34.

'7' on Keypad

Use it to initialize CS-related parameters.

The setting will affect the following: service mode>#6 SCANNER>7. CCD> parameters 1 through 8, 12.

'8' Keypad

Use it to execute gain auto adjustment, automatically correcting the CS output and setting the CS parameters. (For details, see 2.4.2 of Chapter 13.)

5.5.5 PRINT Test (3: PRINT)

Press '3' on the Test Mode menu to select PRINT TEST. Press '2' or '6' in the test mode to generate the following test patterns; do not use other than these 2 types, as the rest are for the factory/R&D:

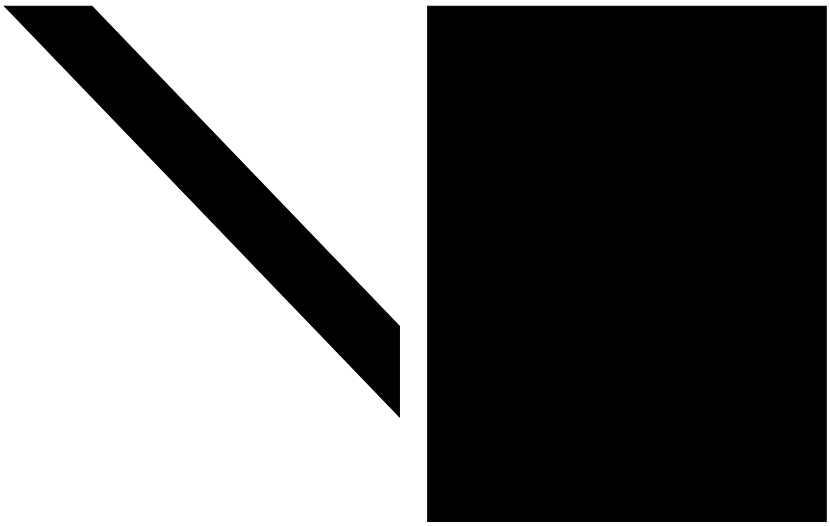
'2' on Keypad

3-2: BLACK (totally black image)

'6' on Keypad

3-6: ENDURANCE (black band)

To stop test printing, press the Stop key.



Use it to make sure that the print pattern does not have contraction/ elongation of an image or dirt/black lines.

Use it to make sure that the print pattern does not have white lines or uneven image.

F13-505-07

5.5.6 MODEM NCU Test (4: MODEM NCU)

Use it to execute a transmission test for MODEM NCU. In a modem test, you can make sure that the signals from the modem are transmitted normally by listening to the sound of signals from the speaker.

You can also use it to make sure that the received total signal and DTMF signal are correctly detected by the modem. To end the test, press the Stop key.

Type	Description
Frequency test	The modem sends tone signals from the modular jack and the speaker.
G3 signal transmission test	Use it to generate the G3 signal coming from the modem using the telephone line terminal and the speaker.
Tonal signal reception test	Use it to monitor a specific frequency and the DTMF signal received from the telephone line terminal by causing them to be indicated on the LCD (i.e., the presence/absence as detected). The reception signal is generated by the speaker.
V.34 G3 signal transmission test	The modem sends V.34 G3 signals from the modular jack and the speaker.

a. Frequency Test

A press on '2' on the keypad from the MODEM NCU Test menu selects the frequency test. In this test, signals of the following frequencies from the modem are transmitted using the telephone line terminal and the speaker. To select a different frequency, use the keypad.

Keypad	Frequency
1	462 Hz
2	1100 Hz
3	1300 Hz
4	1500 Hz
5	1650 Hz
6	1850 Hz
7	2100 Hz

The frequency and the output level of individual frequencies are in keeping with the output level set in service mode.

b. G3 Signal Transmission Test

A press on '4' on the keypad from the MODEM NCU Test menu selects the G3 signal transmission test. In this test, the following G3 signals from the modem are transmitted using the telephone line terminal and the speaker. To select a different transmission speed, use the keypad.

Keypad	Transmission speed
0	300 bps
1	2400 bps
2	4800 bps
3	7200 bps
4	9600 bps
5	TC7200 bps
6	TC9600 bps
7	12000 bps
8	14400 bps

The output level of individual signals is in keeping with the setting made in service mode.

c. Tonal/DTMF Signal Reception Test

A press on '6' on the keypad from the MODEM NCU Test menu selects the tonal signal/DTMF signal reception 0 test. In this signal, the tonal signal/DTMF signal received from the telephone line terminal can be checked to find out if it was detected by the modem.

Tonal signal reception test

```
4-6 : TONE  Rx          000
```

0 0 0
- changes from '0' to '1' in response to detection of a signal of 462 ± 25 Hz.
- changes from '0' to '1' in response to detection of a signal of 1100 ± 30 Hz.
- changes from '0' to '1' in response to detection of a signal of 2100 ± 25 Hz.

DTMF signal reception test

```
4-6 : TONE  Rx          000
      1 2 3 4 5 6 7 8 9 0
```

The received DTMF signals are indicated starting from the right using the 2nd character of the display.

F13-505-08

d. V.34 G3 signal transmission test

The V.34 G3 signal transmission test menu is selected by pressing the 8 key from the MODEM NCU test menu. The V.34 G3 signals below are sent from the modem using the modular jack and the speaker by pressing the start key.

The Baud rate can be changed with the numeric keys, and the Speed can be changed with the cursor key ▲▼.

Numeric key	Baud rate
0	3429 baud
1	3200 baud
2	3000 baud
3	2800 baud
4	2743 baud
5	2400 baud

Cursor key	Speed
	2400 bps
	4800 bps
	7200 bps
	9600 bps
▲	12000 pbs
	14400 bps
	16800 bps
	19200 bps
	21600 bps
▼	24000 bps
	26400 bps
	28800 pbs
	31200 bps
	33600 bps

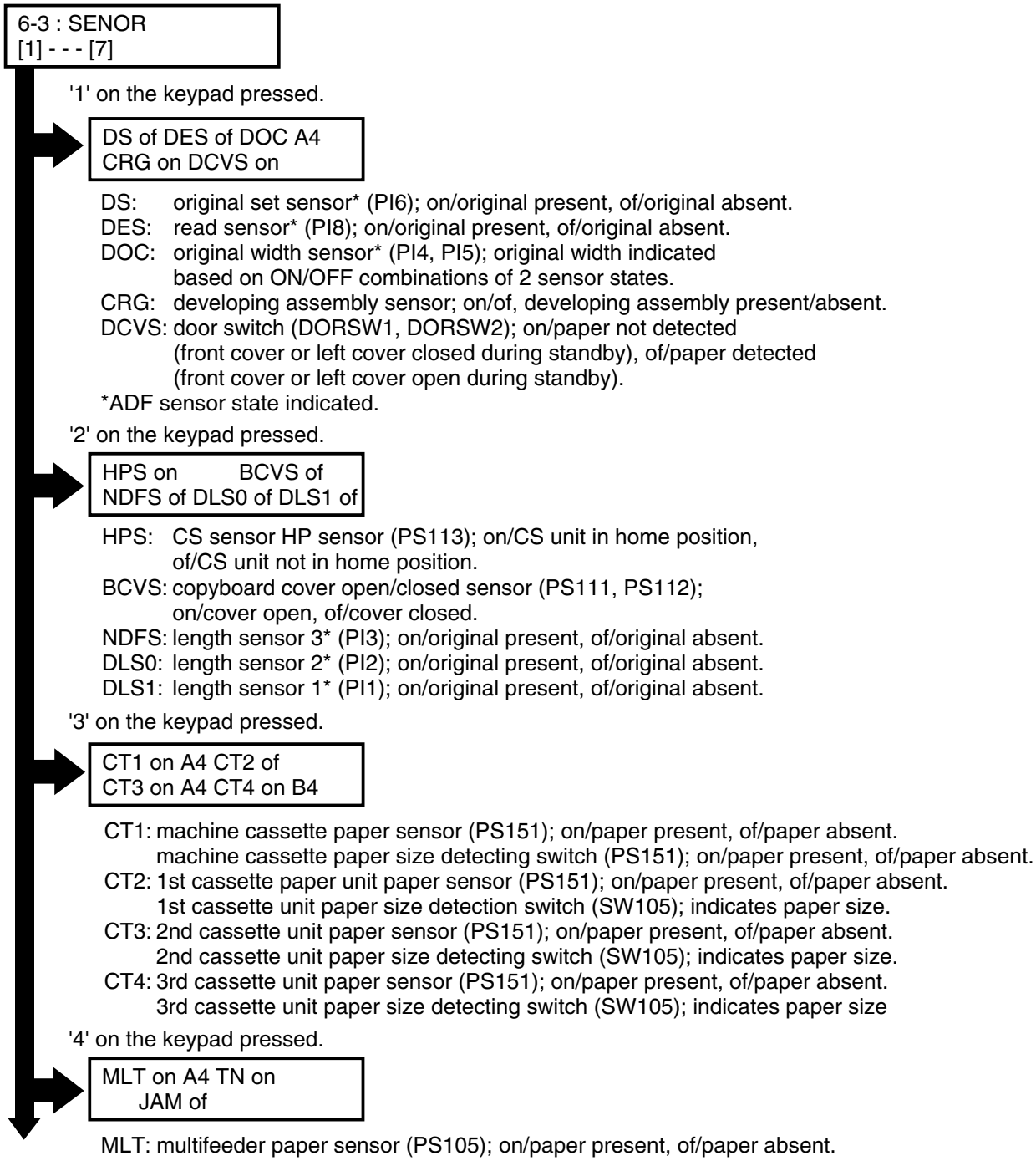
5.5.7 Faculty Test (6: FACULTY TEST)

Press '6' on the keypad while the Test Mode menu is indicated to select Faculty Test. Press '3', '5', '7', '9', or 'C' in test mode to select the following menu:

Keypad	Item	Description
3	sensor test	sensor operation test
5	Stamp test	Tests whether the stamp function is operatingcorrectly.
7	control panel test	control panel key operation test
9	Live Connection Reception Test	Executes an operation test on the signal sensor on the NCU board and the frequency counter.
C (clear key)	ESS test	ESS (energy save mode) operation test

Sensor Test (6-3: SENSOR)

Use it to check the state of the machine's sensor by referring to the display. Press '3' on the keypad while the Faculty test menu is indicated to select this mode; the display indication changes as each sensor is turned off/on.


6-3 : SENOR
[1] - - - [7]
'1' on the keypad pressed.
DS of DES of DOC A4
CRG on DCVS on
DS: original set sensor* (PI6); on/original present, of/original absent.
DES: read sensor* (PI8); on/original present, of/original absent.
DOC: original width sensor* (PI4, PI5); original width indicated based on ON/OFF combinations of 2 sensor states.
CRG: developing assembly sensor; on/of, developing assembly present/absent.
DCVS: door switch (DORSW1, DORSW2); on/paper not detected (front cover or left cover closed during standby), of/paper detected (front cover or left cover open during standby).
*ADF sensor state indicated.
'2' on the keypad pressed.
HPS on BCVS of
NDFS of DLS0 of DLS1 of
HPS: CS sensor HP sensor (PS113); on/CS unit in home position, of/CS unit not in home position.
BCVS: copyboard cover open/closed sensor (PS111, PS112); on/cover open, of/cover closed.
NDFS: length sensor 3* (PI3); on/original present, of/original absent.
DLS0: length sensor 2* (PI2); on/original present, of/original absent.
DLS1: length sensor 1* (PI1); on/original present, of/original absent.
'3' on the keypad pressed.
CT1 on A4 CT2 of
CT3 on A4 CT4 on B4
CT1: machine cassette paper sensor (PS151); on/paper present, of/paper absent.
machine cassette paper size detecting switch (PS151); on/paper present, of/paper absent.
CT2: 1st cassette paper unit paper sensor (PS151); on/paper present, of/paper absent.
1st cassette unit paper size detection switch (SW105); indicates paper size.
CT3: 2nd cassette unit paper sensor (PS151); on/paper present, of/paper absent.
2nd cassette unit paper size detecting switch (SW105); indicates paper size.
CT4: 3rd cassette unit paper sensor (PS151); on/paper present, of/paper absent.
3rd cassette unit paper size detecting switch (SW105); indicates paper size
'4' on the keypad pressed.
MLT on A4 TN on
JAM of
MLT: multifeeder paper sensor (PS105); on/paper present, of/paper absent.
indicates A4 or selected size.
TN: toner sensor; on/toner present, of/toner absent.
JAM: jam sensor; on/jam detected, of/jam not detected.

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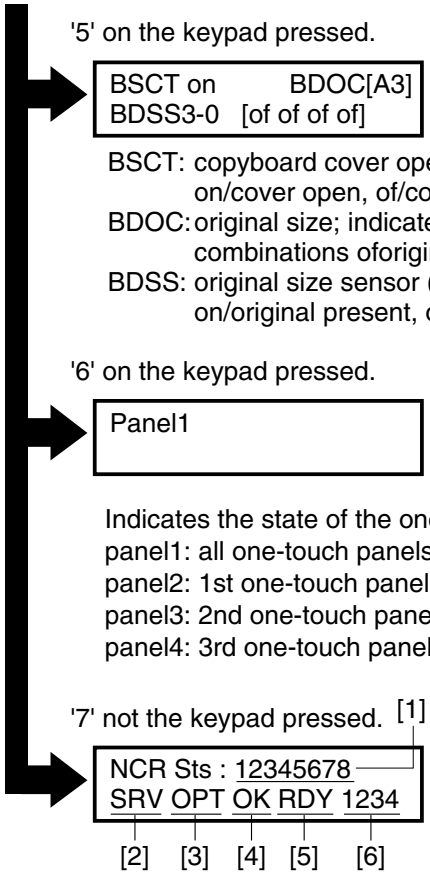


BSCT: copyboard cover open/closed sensor (PS113);
on/cover open, of/cover closed.
BDOC: original size; indicates paper size based on
combinations oforiginal size detecting sensor states.
BDSS: original size sensor (PS117, PS116, PS115, PS114);
on/original present, of/original absent.

Indicates the state of the one-touch panel:
panel1: all one-touch panels are closed.
panel2: 1st one-touch panel is opened.
panel3: 2nd one-touch panel is opened.
panel4: 3rd one-touch panel is opened.

[1] Indicates the presence/absence of the card reader/card.
if a card is present, the 8-digit card ID.
if no card is present, 'Card None'.
If the card reader is absent, 'NCR None'.
[2] Indicates the type of card and the state of the card reader.
DPT : group card.
PRC : unit price setting card.
MAX : upper limit setting card.
ERS : erase card.
SRV : service card.
(no indication): card absent.
[3] Indicates the type of card.
MGN : magnetic card.
OPT : optical card.
[4] Indicates the status of reading.
OK : normal reading.
ERR : error reading.
NG : non-standard card.
[5] Indicates the state of mode.
INI : in initialization.
RDY : ready.
[6] Indicates the version of the card reader.
4-digit number.

F13-505-10

Stamp Test (6-05: STAMP)

Use this mode to check the operation of the stamping mechanism.

A press on '5' in the FACULTY TEST menu selects stamp testing, which consists of the following two modes:

• Test Menu 1

A press on '1' on the keypad in the stamp test menu selects test menu 1. If an original is set in the ADF in this condition, the machine feeds it 20 mm form the read position, stamps it 5 times at intervals of 10 mm starting at that position, and delivers the original.

• Test Menu 2

A press on '2' on the keypad in the stamp test menu selects test menu 2. If an original is set in the ADF in this condition, the machine feeds it 20 mm from the read position, and stamps it continuously at intervals of 10 mm starting at that position until the original set sensor (DS) goes off.

Control Panel Test (6-7: OPERATION PANEL)

Use it to check the operation of the control panel.

Press '7' on the keypad while the Faculty Test menu is indicated to select the Operation Panel Test menu, thereby executing the following:

a. Control Panel Test for a Fax Model

• Display Test

Press the Start key while the operation Panel Test menu is indicated to select Display Test Mode. In this mode, the display indicates the character.

Another press on the Start key will cause the display to be entirely black.

• LED Lamp Test

At the end of Display Test mode, press the Start key to select LED Lamp Test mode.

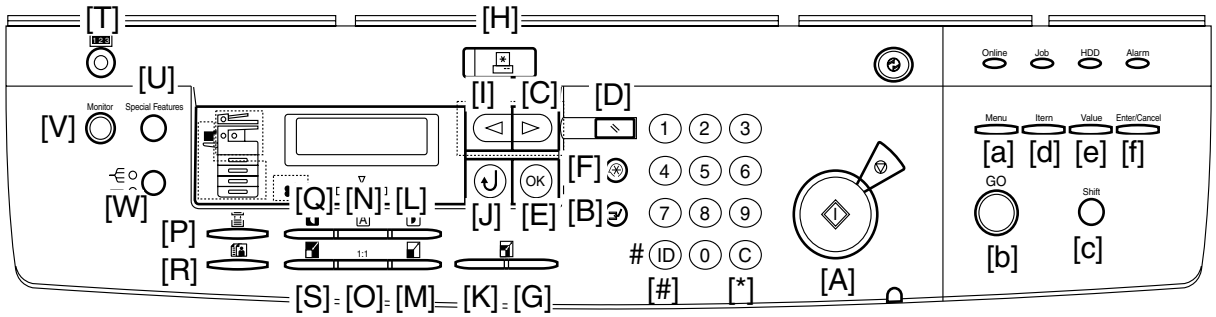
A press on the Start key will cause all lamps in the control panel to go ON.

• Control Key Test

At the end of LED LAMP Test mode, press the Start key to select the test for a specific key. Press the key corresponding to the character indicating on the display; the indication will go OFF if the key is normal.

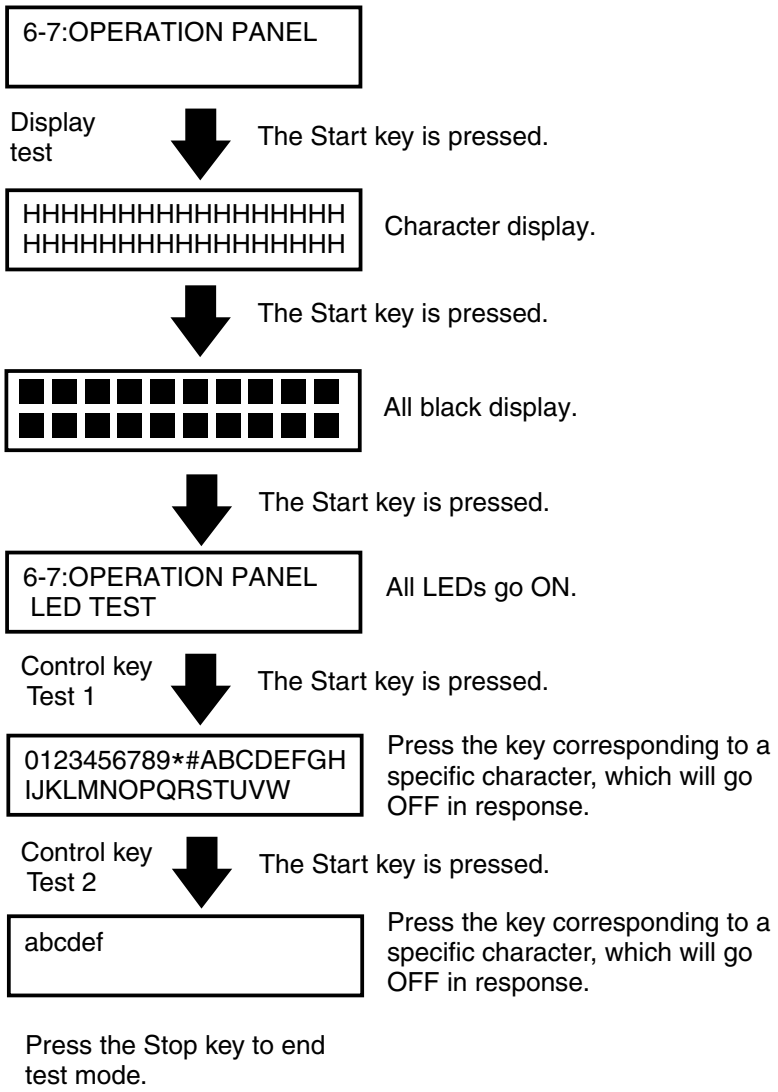
When all character indications have gone OFF, test mode for the one-touch dial keys will start. Press each one-touch dial key so that its corresponding character will disappear from the display.

LED Lamp Test and Control Key Test (correspondence between characters and keys)



F13-505-11

Go through the following flow of work when testing the control panel:



F13-505-12

b. Control Panel Test for a Non-Fax Model

• Display Test

A press on the Start key in the OPERATION PANEL test menu selects the display test, in which the notation 'ADJUST LCD CONTRAST' is indicated on the display. Another press on the Start key will cause the display to turn full black and full white and then to show the outside frame and a checker.

• LED Lamp Test

When the Start key is pressed after the display test, the LED lamp test will be selected. A press on the Start key will turn off all lamps in the control panel.

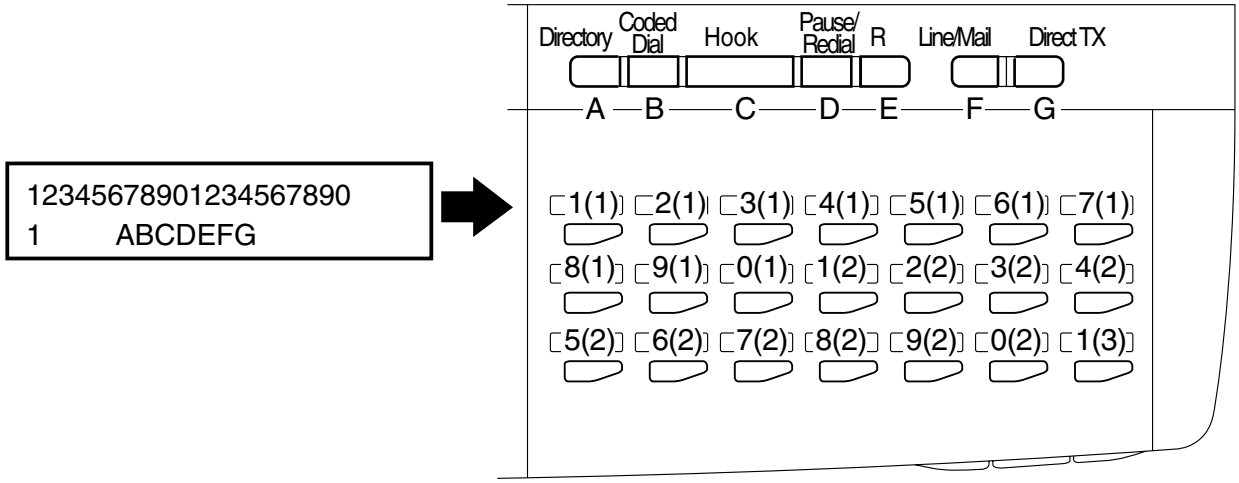
• Control Key Test

When the Start key is pressed following the LED lamp test, the key test will be selected. The operation is normal if the corresponding characters go off when keys are pressed on the display. When a one-touch dial key is pressed, its corresponding character will go off on the display.

Correspondence Between the Characters and the Keys in the LED Lamp Test

Character	Operation key	Character	Operation key
0 ~ 9, #, *	Keypad	N	F2 key
B	Sort key	O	F3 key
C	Reduce key	P	F4 key
D	Page separate key	Q	Back key
E	Special features key	R	OK key
F	Enlarge key	S	Reset key
G	Frame erase key	T	Additional functions key
I	Copy key	U	Interrupt key
J	Fax key	V	Clear key
K	System key	W	ID key
L	Monitor key	X	Energy save key
M	F1 key	Y	Counter key

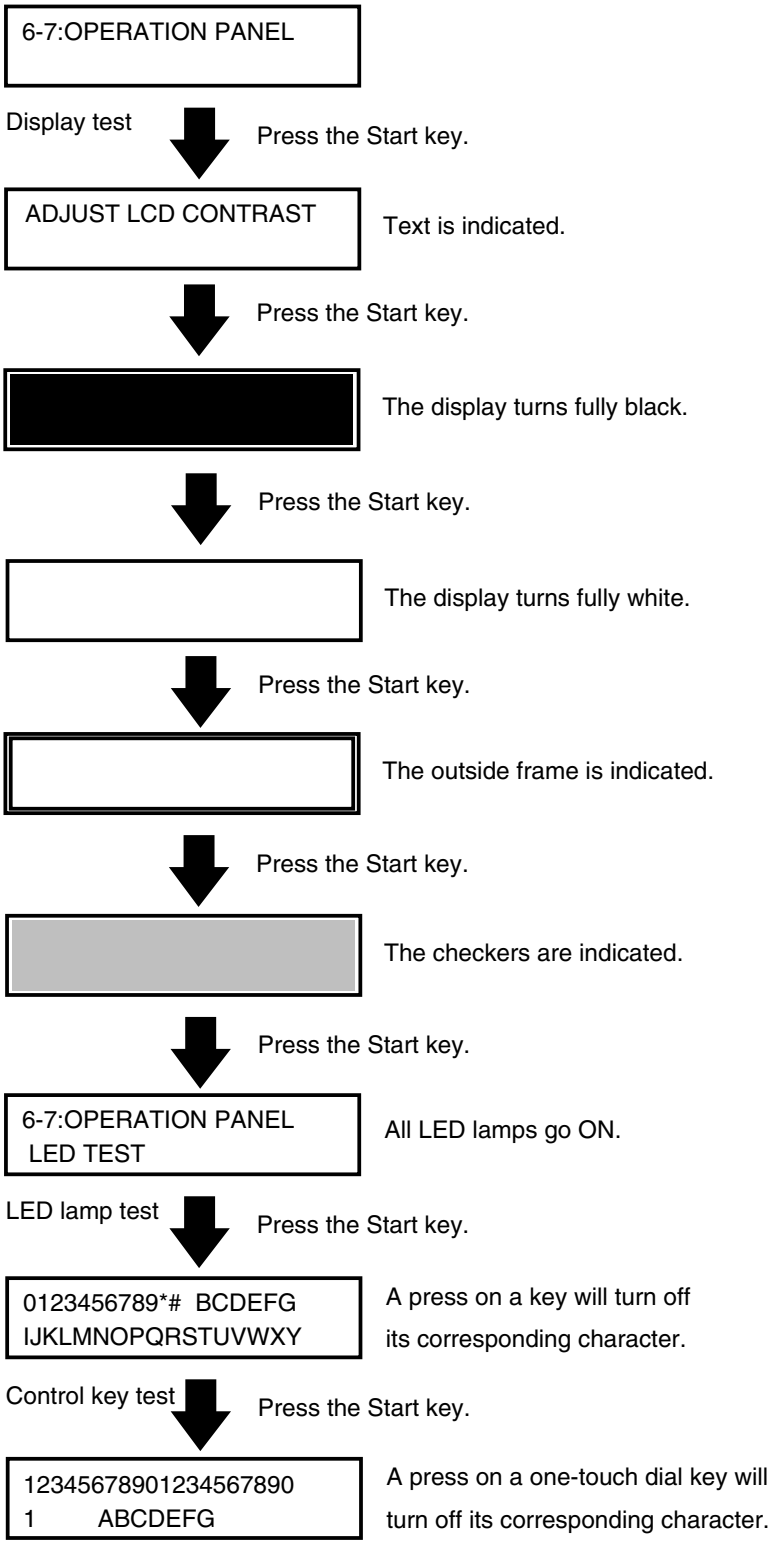
Correspondence Between Characters and Keys for Testing the Control Keys



The numbers in parentheses indicate the sequence of indication.

F13-505-13

The following is a diagram of the flow of operation used when testing the control panel:



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Line Signal Reception Test (6-9: LINE DETECT)

A press on '9' on the keypad in the FACULTY TEST menu selects the LINE DETECT test. Use test menu 1 to check the state of the external telephone, C1, and FC or to find out whether signals are correctly detected in NCU packages.

• Test Menu 1

A press on '1' on the keypad in the LINE DETECT menu selects test menu 1, in which the indication on the display will change from 'OFF' to 'ON' when the eternal telephone is identified as being in off-hook state. It also checks C1 and FC from the telephone line terminal.

• Test Menu 3

A press on '3' on the keypad in the LINE DETECT menu selects test menu 3, in which the indication on the display changes from 'OFF' to 'ON' when CNG is detected from the telephone line terminal.

• Test Menu 4

A press on '4' on the keypad in the LINE DETECT menu selects test menu 4, in which the operation of the answering message may be checked. A press on '0' or '1' on keypad will send 2 types of answering messages to the telephone line and the speaker.

ESS test (6-#: ESS TEST)

A press on the # key in the FACULTY TEST executes the ESS (power save mode) test so that the machine will enter ESS mode, turning off all but the ESS key in the control panel. ESS mode may be turned off when the following takes place:

- The ESS key is pressed.
- An original is set in the ADF.
- A fax message arrives.
- The machine goes off-hook.
- The report output time arrives.
- The timer ring time arrives.

5.5.8 Book Read Test (8: BOOK TEST)

Press '8' on the keypad while the Test Mode menu is indicated to select book test mode. Press on '4', '5', or '6' in test mode for the following:

'4' on Keypad

Press it to initialize the book read position parameter. The setting will affect the following in service mode: #6 SCANNER>7. CCD>parameters 21, 23.

'5' on Keypad

Press it to find out whether the contact sensor goes ON.

'6' on Keypad

Press it to initialize the book read position parameter. The setting will affect the following in service mode: #6 SCANNER>7. CCD> parameters 19 through 21, 23, 29, 31.

5.6 Report

5.6.1 User Report

a. Manually Generated Reports

The following reports are generated by the user:

Type of report	Operation
1-TOUCH LIST1*1 CODED DIAL LIST1*1 1-TOUCH LIST2*1 CODED DIAL LIST2*1 GROUP DIAL LIST*1 ACCESS CODE LIST*1	Start user mode, and select '08 PRINT LISTS'. Using the cursor keys ▲▼, select '02 ADDRESS LIST'; then, select the report to print, and press the OK key.
DEPT. INFO LIST USER DATA	Start user mode, and select '08 PRINT LISTS'; then, select the report to print, and press the OK key.
ACTIVITY REPORT*1 ADDRESS LIST*1 DOC. MEMORY LIST*1 CONF. MAILBOX LIST*1	Press the Report key while the machine is in fax mode; then, select the report to print, and press the OK key.

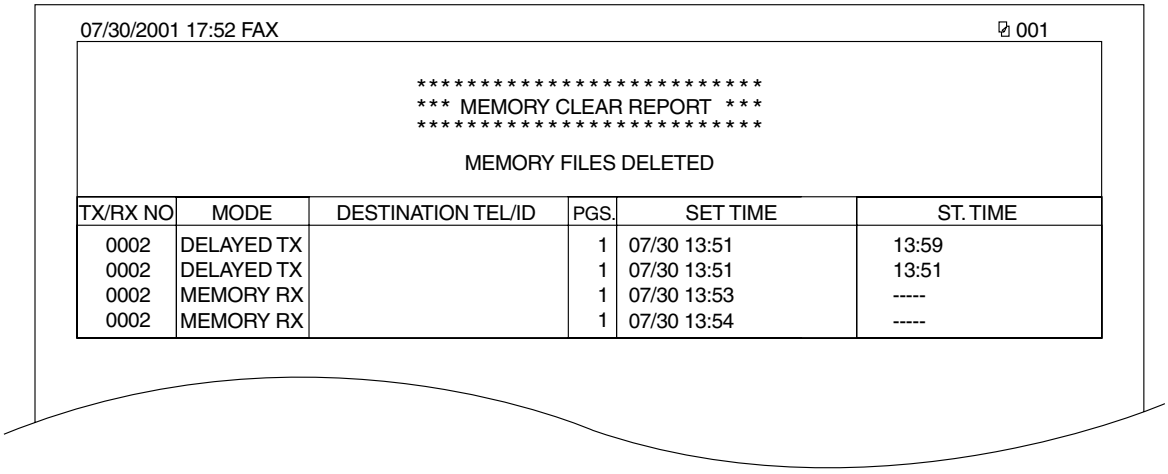
*1 : Only if the machine is equipped with fax functions.

b. Automatically Generate Reports (if equipped with fax functions)

The following reports are automatically generated according to the settings made in user mode:

Type of report	Operation
ACTIVITY REPORT TX REPORT RX REPORT ACTIVITY REPORT ERROR TX REPORT	Enable the generation of the report in user mode (report setting menu).
MULTIPLE ACTIVITY REPORT	Set the report settings menu in user mode so that the transmission results report will be generated. Thereafter, if broadcasting is used, the report will be generated in place of the transmission results report.
RELAY BROADCAST RESULTS REPORT	Set the report settings menu in user mode so that the transmission results report will be generated. Thereafter, it will be generated in place of the transmission results report when a relay broadcast transmission is used.
MEMORY CLEAR LIST	As when images remain in memory and the machine is turned off, the images will be generated automatically as soon as the battery BAT1 is exhausted (i.e., if the machine remains turned OFF for about 1 hr or more).

- Memory Clear List



07/30/2001 17:52 FAX 001

****
*** MEMORY CLEAR REPORT ***
****

MEMORY FILES DELETED

TX/RX NO	MODE	DESTINATION TEL/ID	PGS.	SET TIME	ST. TIME
0002	DELAYED TX		1	07/30 13:51	13:59
0002	DELAYED TX		1	07/30 13:51	13:51
0002	MEMORY RX		1	07/30 13:53	-----
0002	MEMORY RX		1	07/30 13:54	-----

F13-506-01

TX/RX NO :	4-digit indication
MODE :	transmission, delayed transmission, or reception
DESTINATION TEL/ID :	one-touch dial/speed dial number, abbreviation of other party
PGS. :	number of pages stored
SET TIME :	date/time (in 24-hr notation)
ST. TIME :	start of storage (in 24-hr notation)

5.6.2 Service Report

You can make service mode settings to generate the following reports: service mode settings report, communications history report, detailed error information report. The type of reports used for servicing the machine are as follows:

a. Manually Generated Reports

The notations and particulars of the various reports under #10 REPORT in service mode are as follows:

1. System Data List and System Dump List

Indication : SERVICE&SYSTEM
Type : service mode #1 through #7 , #13, start date, system dump list output

2. System Data List

Indication : SERVICE DATA
Type : service mode #1 through #7, #13, start date output

3. System Dump List

Indication : SYSTEM DUMP
Type : record of communications, error communications output

4. Key History Report

Indication : KEY HISTORY REPORT
Type : 1800 key press made since most recent generation of history

5. Counter Report

Indication : COUNTER REPORT
Type : maintenance/parts counter output
changes made to the defaults of user data list and system data list;
system dump list
(for particulars of maintenance/parts counters, see 5.4.11 of Chapter 13)

6. Jam/Error Log Report

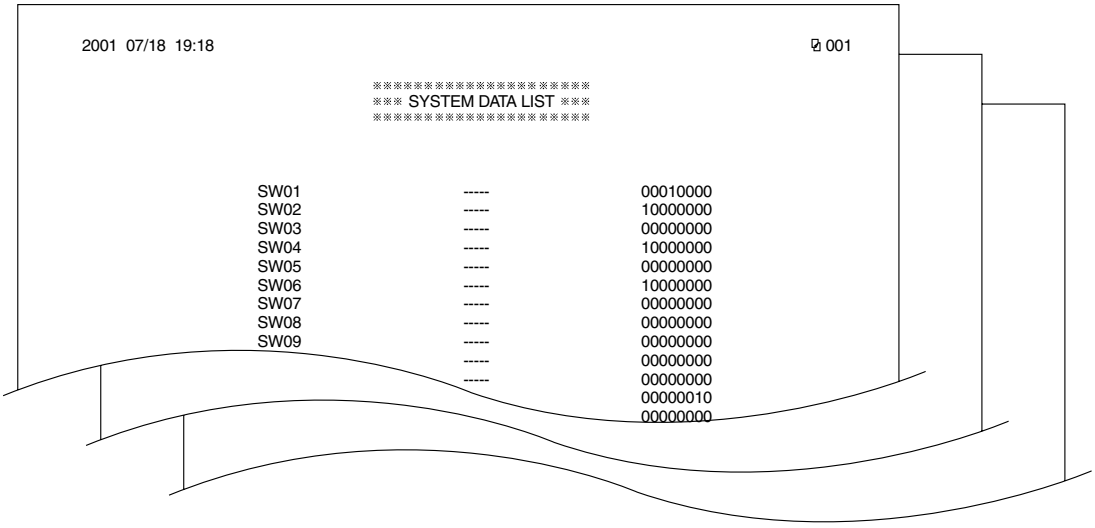
Indication : JAM/ERR LOG REPORT
Type : jam, error, alarm history

7. Specifications Report

Indication : PRINT SPEC REPORT
Type : TYPE settings, memory size, ROM indication, adjustment data

2. System Data List

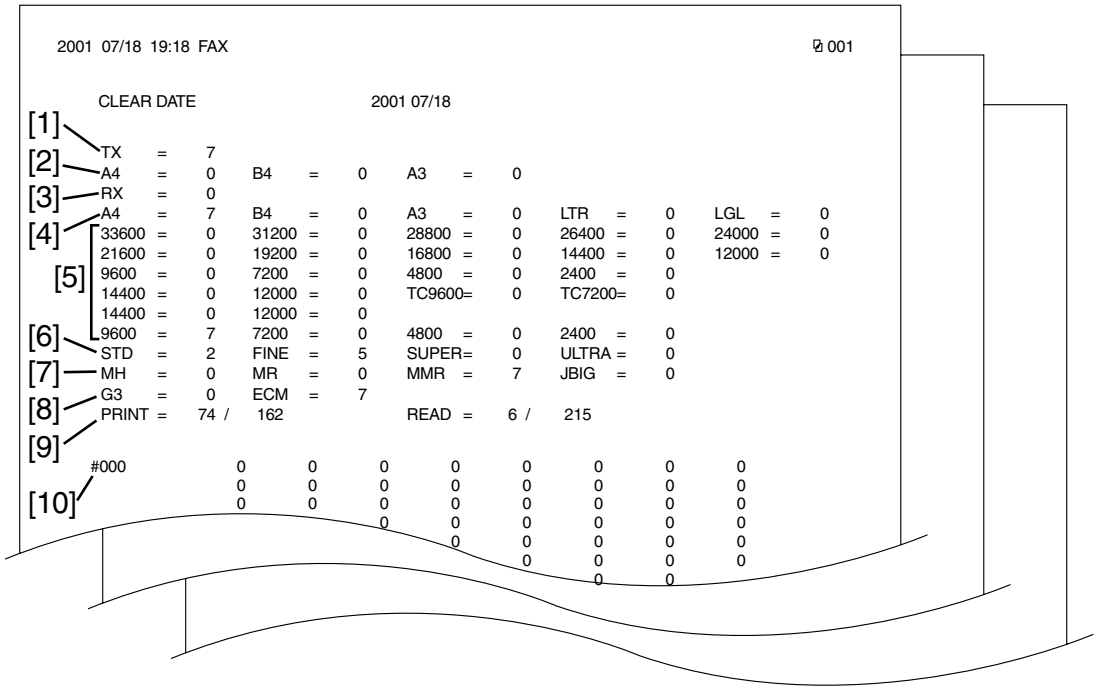
Use it to check the service soft switch settings and service parameters.



F13-506-02

3. System Dump List

The following shows a record of communications and error communications:



F13-506-03

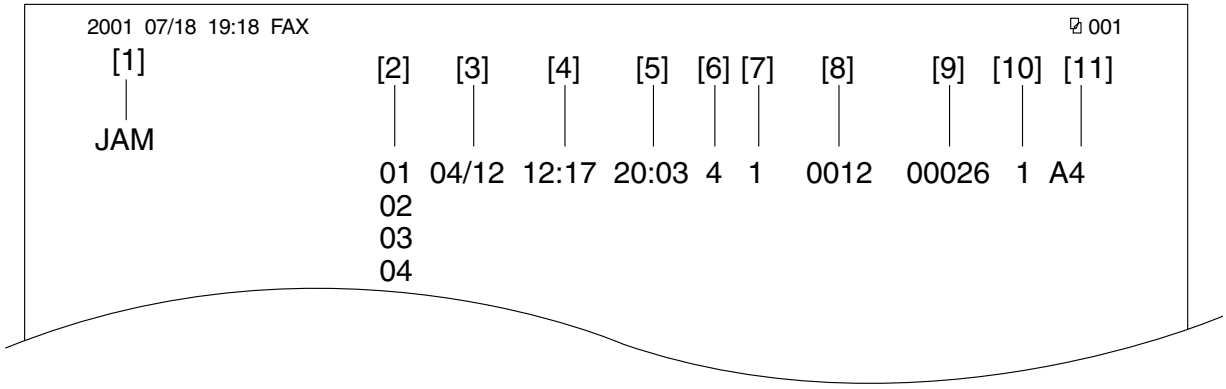
[1] TX; total number of transmitted pages.
[2] number of transmitted pages by original size.
[3] RX; total number of received pages.
[4] number of received pages by original size.
[5] number of transmitted/received pages by modem speed.
[6] number of transmitted/received pages by mode (Standard, Fine, Super Fine, Ultra Fine).
[7] number of transmitted/received pages by coding method.
[8] number of transmissions/receptions by mode.
[9] number of prints, total number of prints; number of pages read, total number of pages read.
[10] number of occurrences of specific error codes.

Guide to Indication

##000	1	7	3	0	0
	Number of ##000 errors	Number of ##001 errors	Number of ##002 errors		

6. Jam/Error Log Report

Guide to a Jam History



F13-506-04

[1] jam history
[2] sequence of jams (higher, more recent)
[3] date of occurrence
[4] time of occurrence
[5] recovery time
[6] approximate location (3: machine; 4: ADF; 5: finisher)
[7] location block (0: machine; 1: ADF; 5: finisher)
[8] jam code

The following is a list of codes and the types of jams corresponding to them:

Code	Jam type
0101	pickup assembly delay jam
0202	pickup assembly stationary jam
0105	delivery assembly delay jam
0206	delivery assembly stationary jam
1020	stationary jam
1121	front cover/left cover open jam
010a	No. 2 delivery slot delivery delay jam
0207	No. 2 delivery slot delivery stationary jam
020d	fixing assembly wrap jam

The following is a list of ADF codes and the types of jams corresponding to them:

Code	Jam type
0001	pickup jam
0003	read sensor delay jam
0004	read sensor stationary jam
0007	small sheet-to-sheet jam
0009	book over open error
000a	ADF cover open error
000b	residual original at start (registration sensor or read sensor)
000c	jam at memory full
0011	original pull-out
0012	jam at suspension
0013	jam at initialization
0016	other

The following is a list of finisher codes and the types of jams corresponding to them:

Code	Jam type
0021	delivery (finisher inlet) delay jam
0022	delivery (finisher inlet) stationary jam
0023	staple jam
0024	power-on jam
0025	stack delivery jam
0026	return jam
0027	stack retainer jam

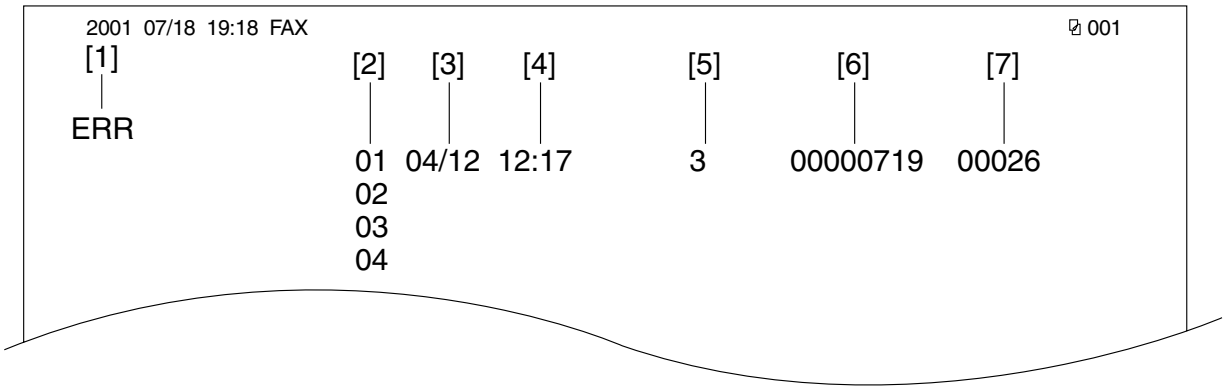
[9] total counter reading (6 digits)

[10] paper source <1> 0 : manual feed tray
<2> 1 : cassette 1
<3> 2 : cassette 2
<4> 3 : cassette 3
<5> 4 : cassette 4

If the version of the ROM on the image processor PCB is previous to 'EC30-01', intended for EC, the indication is within brackets.

[11] paper size

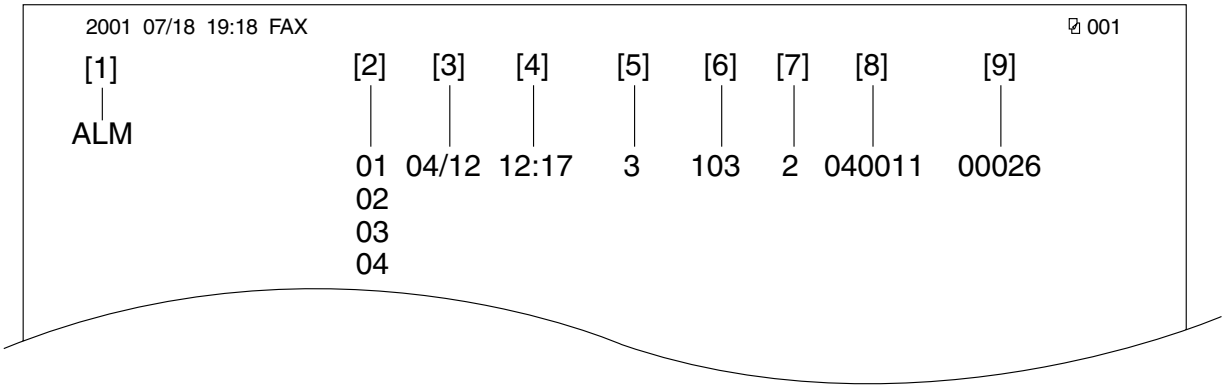
Guide to an Error History



F13-506-05

[1] error history
[2] sequence of errors (higher, more recent)
[3] date of occurrence
[4] time of occurrence
[5] approximate location (3: machine; 5: finisher)
[6] error code (in 8 digits, with rightmost 3 indicating the code on the LCD; for codes, see 6.2 of Chapter 13)
[7] total counter (6 digits)

Guide to an Alarm History



F13-506-06

[1] alarm history
[2] sequence of alarms (higher, the more recent)
[3] date of occurrence
[4] time of occurrence
[5] approximate location (3: machine; 5: pickup assembly)
[6] location 103 : cassette 1
104 : cassette 2
105 : cassette 3
106 : cassette 4
113 : multifeeder tray
[7] alarm bell (for machine, '2' only)
[8] alarm code (6 digits)

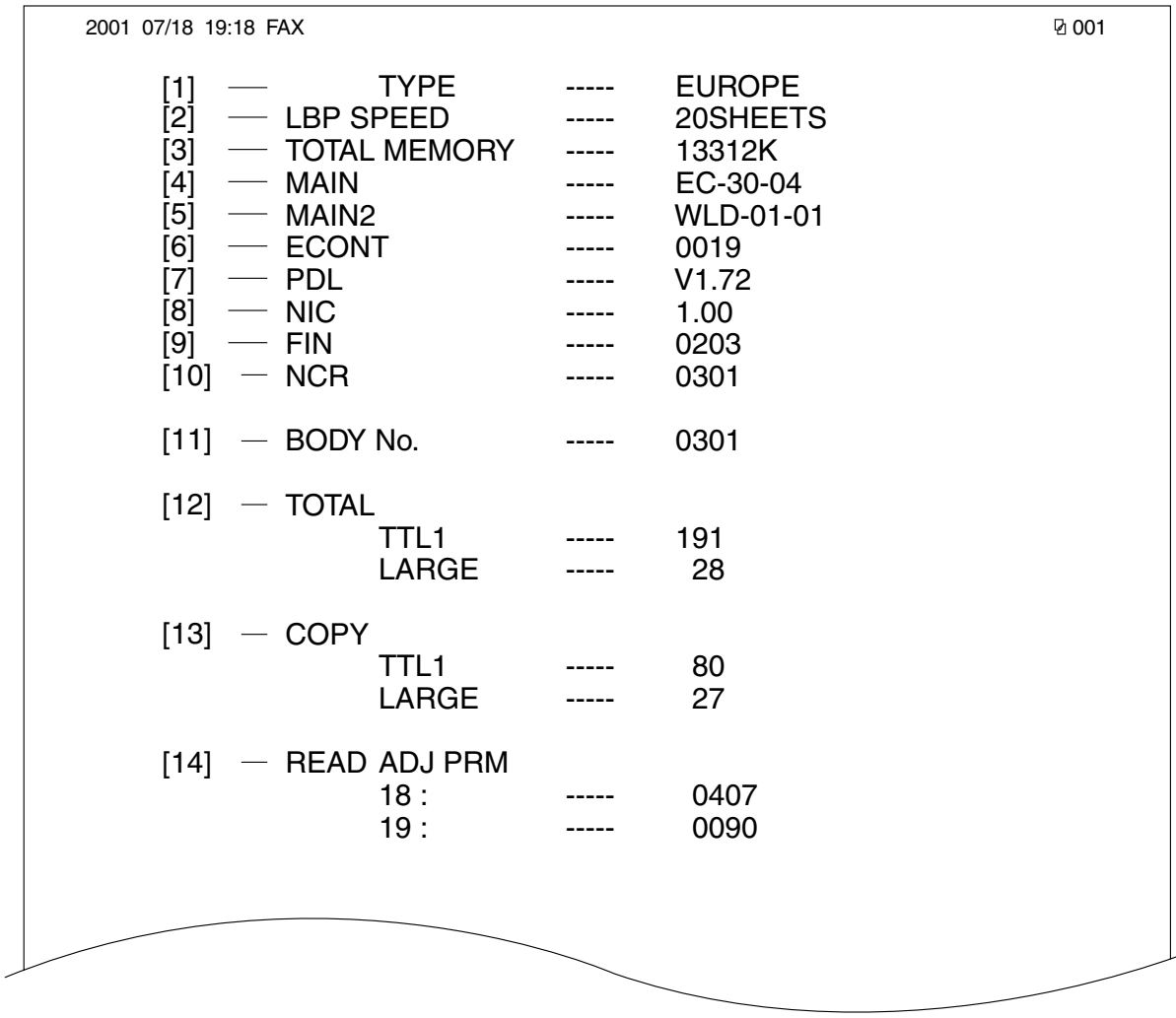
The following is a list of alarm codes and the type of alarms corresponding to them:

Code	Alarm type
040011	cassette 1 retry alarm
040012	cassette 2 retry alarm
040013	cassette 3 retry alarm
040014	cassette 4 retry alarm
040017	multifeeder retry alarm

[9] total counter (6 digits)

7. Specifications Report

The following items are used:



F13-506-07

[1] TYPE indicates the country setting under '#5 TYPE' in service mode.
[2] LBP SPEED indicates the copying speed.
[3] TOTAL MEMORY indicates the total memory size.
[4] MAIN indicates the version of the ROM on the image processor PCB.
[5] MAIN2 indicates the version of the CPU on the image processor PCB.
[6] ECOUNT indicates the version of the ROM on the DC controller PCB.
[7] PDL* indicates the version of the ROM on the printer board.
[8] NIC* indicates the version of the ROM on the network interface board.
[9] FIN* indicates the version of the ROM on the finisher controller PCB.
[10] NCR* indicates the version of the ROM on the card reader.
[11] BODY No. indicates the serial number of the machine.
[12] TOTAL
TTL1 indicates the reading of total 1.
LARGE indicates the reading of large size.
[13] COPY
TTL1 indicates the number of copies.
LARGE indicates the number of large-size prints in copier mode.
[14] READ ADJ PRM indicates the adjustment items and settings for the service mode item #6 SCANNER>7. CCD.

*Only if the respective accessory is installed.

b. Automatically Generated Reports

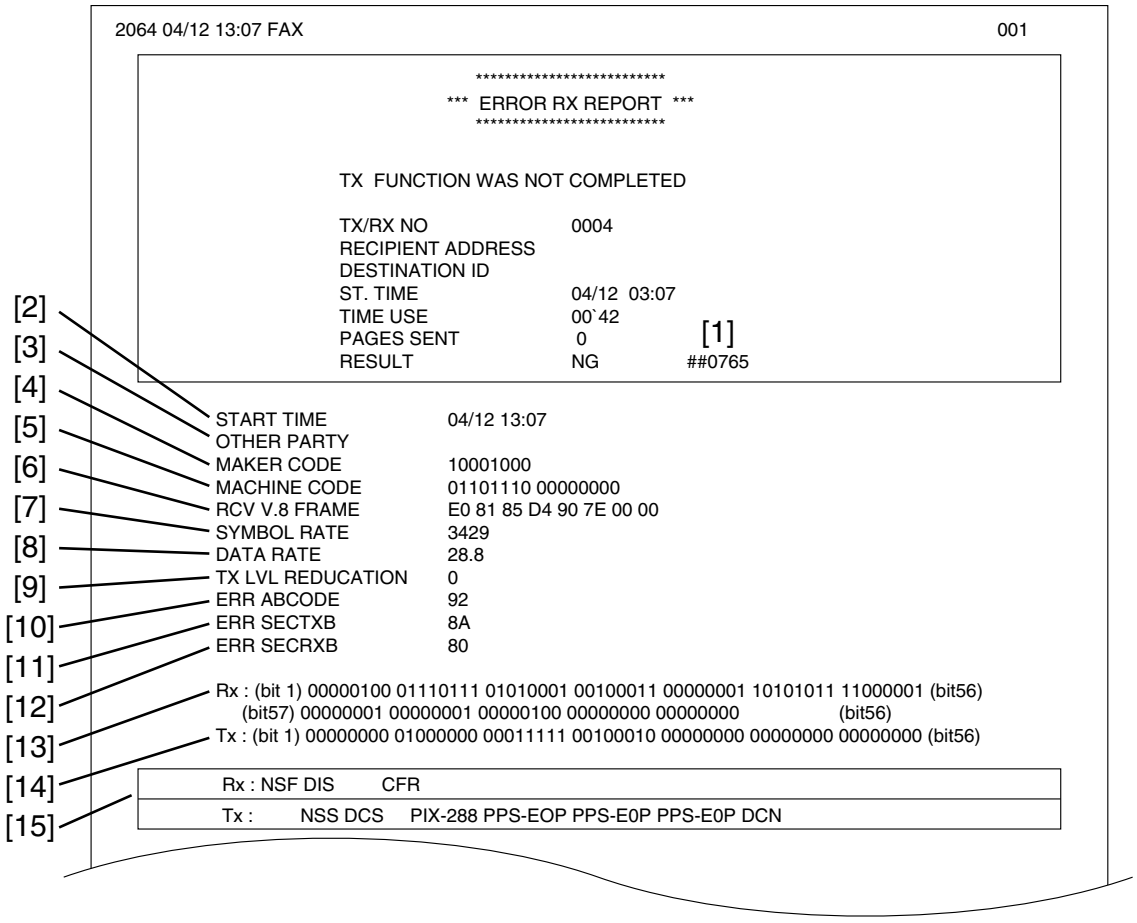
The following reports are generated automatically:

Type of report	Operation
Error TX report (w/ error code list, dump list)	Enable automatic generation on the report settings menu in user mode menu (i.e., use bits 0 and 1 of SW01 of service data #1 SSSW).
RX report (w/ error code list, dump list)	Enable automatic generation on the report settings menu in user mode menu (i.e., use bits 0 and 1 of SW01 of service data #1 SSSW).

Error Transmission Report/Reception Results Report (for service)

A service error code and error dump lists may be attached to the error transmission report or the reception results report.

To attach the lists, user service mode (SSSW-SW01). The following is an example of attachment using an error transmission report:



F13-506-09

[1] service error code
[2] START TIME (data and time; in 24-hr notation)
[3] OTHER PARTY (telephone number sent from the other party)
[4] MAKER CODE (manufacturer's code)
[5] MACHINE CODE (model-by-model code)
[6] nature of the V.8 signal received from the other party
[7] symbol speed used in the primary channel
[8] data speed used in the primary channel
[9] 0 (fixed)

[10] code generated by the modem in the event that the communication ends in error (not used in service)
[11] transmission status of the modem in the event that the communication ends in error (not used in service)
[12] reception status of the modem in the even that the communication ends in error (not used in service)
[13] bits 1 through 56 or 96 of received DIS, DCS, or DTC.
[14] bits 1 through 56 or 96 of transmitted DIS, DCS, or DTC
[15] RX = procedure signal received
TX = procedure signal transmitted

6 Self Diagnosis

6.1 Outline

The machine is equipped with a mechanism to check its own condition, issuing an error code on the LCD of the control panel upon detection of a fault.

Each of the error codes of the machine is indicated in any of the following two ways:
- copier-related error code: EXXX
- fax-related error code: #XXXX or ##XXXX (only if equipped with fax functions)

The history of copier-related error cedes may be checked by generating a report by making the following selections in service mode: #10 REPORT>JAM/ERR LOG REPORT.

The history of fax-related error codes may be checked by setting '1' to bit 0 under #1 SSSW SW01 of service mode; if the communication ends in error, the appropriate service error code will be indicated in the communications control report, reception result report, and error transmission report.

6.2 Error Codes

The following are the possible error codes and causes of errors that can occur in the machine:

6.2.1 Error Codes Used for the Machine

E000	The main thermistor reading does not reach 40ºC 14 sec after the fixing heater goes ON. (fixing low temperature error)
E001	The main thermistor reading reaches 220ºC or higher. (fixing high temperature error)
E002	A start-up fault is detected under any of the following conditions of the main thermistor (start-up detection fault): after exceeding 40ºC, it fails to reach 60ºC within 10 sec. after exceeding 60ºC, it fails to reach 80ºC within 10 sec. after exceeding 80ºC, it fails to reach 100ºC within 10 sec. after exceeding 100ºC, it fails to reach 120ºC within 10 sec. after exceeding 120ºC, it fails to reach 140ºC within 10 sec. after exceeding 140ºC, it fails to reach 160ºC within 10 sec. after exceeding 160ºC, it fails to reach 180ºC within 10 sec. after exceeding 180ºC, it fails to reach 195ºC within 10 sec.
E003	After the end of the WAIT period, the main thermistor reading is 100ºC or lower. In standby, the sub thermistor reading is 50ºC or lower. (low temperature error in fixing temperature control)

E004

At time of initialization, the ZEROXI* signal of the power supply is not detected.
During temperature control, the ZEROXI* signal does not arrive for 3 sec continuously.
A short circuit is detected in the triac (ASIC; fixing temperature control drive circuit error).

Possible cause

Fixing assembly is faulty. (The main thermistor has an open circuit. The sub thermistor has an open circuit. The fixing heater has an open circuit. The power supply PCB is faulty. The DC controller PCB is faulty.)

Note

To reset the error, execute the following in service mode, and turn off the and then on the power switch.
#7 PRINTER>#4 PRINTER RESET>YES=(*)

Remedy

1) Wiring
Is the connection of the connector (CN8) on the power supply PCB and the connector (J103) on the DC controller PCB and the wiring to the fixing assembly normal?
NO : Correct the connection and wiring.

2) Fixing assembly
Try replacing the fixing assembly. Is the fault corrected?
YES : End.

3) Power supply PCB, DC controller PCB
Try repacking the power supply PCB. Is the fault corrected?
YES : End.
NO : Replace the DC controller PCB.

4) Error
With the power switch ON, clear E000 through E004; then, turn off and then on the power switch.

If E000 through E004 is indicated, the RAM on the image processor will retain the error memory of the fixing assembly after the power switch has been turned off an then on. Execute the following in service mode, and turn off and then on the power switch to clear the memory: #7 PRINTER>#4 PRINTER RESET>YES=(*).

E010

A specific revolution is not detected from the main motor rotation detection signal (MLOK*), causing the signal to go '1'. (main motor fault)

Possible cause: The main motor (M101) is faulty. The controller PCB is faulty.

Remedy:

1) Connector
Is the connection of the connector (J903) of the main motor and the connector (J106) on the DC controller PCB normal?
NO : Correct the connection.

2) Main motor (M101), DC controller PCB
Try replacing the main motor. Is the fault corrected?
YES : Replace the main motor.
NO : Check the wiring; if normal, replace the DC controller PCB.

E100

When the scanner motor is started up, the BD input signal does not arrive within a specific period of time.
When the scanner motor is started up, the motor rotation is too fast, and fails to reach a specific revolution within 20 sec at time of deceleration.
While the scanner motor is rotating at a specific speed, the BD input signal cycle is not within a specific range (±2%) for an equivalent of 10 mm (print distance).
While the scanner motor is rotating at a specific speed, the BD input signal cycle is not as indicated (±2%).
During the WMUPR period after the power switch has been turned on or the front cover/left cover has been opened/closed, the drum unit is absent.

Possible cause: The wiring is faulty (short circuit, open circuit). The laser scanner unit is faulty. The DC controller PCB is faulty. The drum unit is not installed.

Remedy:

1) Drum unit
Is the drum unit installed in host machine?
NO : Install the drum unit.

2) Connection
Is the connection of the connector (J908) on the BD detection PCB, connector (J907) of the laser unit, and connector (J102) on the DC controller PCB normal?
NO : Correct the connection.

3) Laser/scanner unit, DC controller PCB
Try replacing the laser/scanner unit. Is the fault corrected?
YES : End.
NO : Replace the DC controller PCB.

E716

The communication between the cassette unit and the DC controller PCB is disrupted.

Possible cause: The wiring is faulty (short circuit, open circuit). The cassette unit controller PCB is faulty.
The DC controller PCB is faulty.

Remedy:

1) Connector
Is the connection and the wiring for the connector on the cassette unit controller PCB and the connector on the DC controller PCB normal?
NO : Correct the connection.

2) Cassette unit controller PCB
Try replacing the cassette unit controller PCB. Is the fault corrected?
YES : End.
NO : Replace the DC controller PCB.

E717

The communication between the RDD (Remote diagnostic device) and the image processor PCB is disrupted.

Possible cause: The wiring is faulty (short circuit, open circuit). The RDD is faulty.
The image processor PCB is faulty.

Note: Be sure to clear the error in service mode : #12 CLEAR>ERR>E717-CL.

Remedy:

1) Connector
Is the connection and the wiring for the RDD's connector and the connector (J208) on the image processor PCB normal?
NO : Correct the connection.

2) Image processor PCB
Try replacing the image processor PCB. Is the fault corrected?
YES : End.
NO : Replace the RDD.

If E717 is indicated, the fault in communication is retained by the RAM on the image processor even when the power switch has been turned off and then on; be sure to execute #12 CLEAR>ERR>E717-CLR in service mode before making corrections.

E719

The communication between the card reader and the image processor PCB is disrupted.

Possible cause: The wiring is faulty (short circuit, open circuit). The card reader is faulty. The image processor PCB is faulty.

Note: Be sure to clear the error in service mode : #12 CLEAR>CARD.

Remedy:

1) Connector
Is the connection and the wiring for the connector (J1131) of the card reader and the connector (J10/J210) on the image processor PCB normal?
NO : Correct the connection.

2) Image processor PCB
Try replacing the card reader. Is the fault corrected?
YES : End.
NO : Replace the image processor PCB.

If E719 is indicated, the fault in communication is retained by the RAM on the image processor even when the power switch has been turned off and then on; be sure to execute #12 CLEAR>CARD in service mode before making corrections.

E733

The communication between the DC controller PCB and the image processor PCB is disrupted.

Possible cause: The flexible cable is faulty (short circuit, open circuit). The DC controller PCB is faulty.
The image processor PCB is faulty.

Remedy:

1) Connector
Is the connection and the flexible cable for the connector (J104) on the DC controller PCB and the connector (J35/J235) on the image processor PCB normal?
NO : Correct the connection

2) DC controller PCB
Try replacing the DC controller PCB. Is the fault corrected?
YES : End.
NO : Replace the image processor PCB.

E805

After the heat discharge fan drive signal is generated, the fan lock detection signal does not arrive for a specific period of time.

Possible cause

The fan wiring is faulty (short circuit, open circuit). The heat discharge fan (FM101) is fautly. The DC controller PCB is faulty.

Remedy

1) Foreign matter
Is there foreign matter that prevents the rotation of the fan?
YES : Remove the foreign matter.

2) Wiring, Connector
Is the connection and wiring of the connector (J951) of the heat discharge fan (FM101) and the connector (J106) on the DC controller PCB normal?
NO : Correct the wiring.

3) Heat discharge fan (FM101), DC controller PCB
Try replacing the heat discharge fan (FM101). Is the fault corrected?
YES : End.
NO : Replace the DC controller PCB.

6.2.2 Finisher Error Codes

E500

An error has occurred in the communication between the machine and the finisher twice continuously.

Possible cause: The harness to the finisher is faulty (disconnected connector, open circuit). The finisher controller PCB or the DC controller PCB is faulty.

Remedy:

1) Power switch
Try turning off and then on the power switch. Is the fault corrected?
YES : End.

2) Wiring
Is the wiring from the finisher controller PCB to the DC controller PCB normal?
NO : Corrected the wiring.

3) Finisher controller PCB, DC controller PCB
Try replacing the finisher controller PCB. Is the fault corrected?
YES : End.
NO : Replace the DC controller PCB.

E514

The stack delivery belt does not reach home position when the stack handling motor (M2) is driven for a specific time (CW; if the same condition occurs during stack delivery, a jam will be identified).

Possible cause: The stack handling motor (M2) is faulty. The stack delivery home position sensor (S8) is faulty. The connector is disconnected or has an operation circuit. The stack handling motor relay harness is faulty. The stack delivery belt is faulty. The finisher controller PCB is faulty.

Remedy:

1) Stack handling motor drive belt
Is the tension of the drive belt appropriate?
NO : Loosen the screw on the tension to correct the tension.

2) Wiring
Is the wiring between the finisher controller PCB and the harness handling motor (M2) normal?
NO : Correct the wiring.

3) Sensor flag
Are the sensor flag spring and the flag normal?
NO : Correct the spring or the flag.

4) Stack delivery lever home position sensor (S8)
Check the stack delivery lever home position sensor (S8). Is the sensor normal?
NO : Replace the sensor.

5) Stack handling motor (M2), Finisher controller PCB
Try replacing the stack handling motor (M2). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E530

The rear aligning plate does not reach home position when the rear alignment motor (M4) has been driven for a specific time.

The rear aligning plate does not reach home position when the rear alignment motor (M4) has been driven for a specific time.

Possible cause

The rear alignment motor (M4) is faulty. The rear aligning plate home position sensor (S7) is faulty. The sensor connector is disconnected or has an open circuit. The rear alignment motor relay harness is faulty. The rear aligning plate is subjected to an abnormal load. The finisher controller PCB is faulty.

Remedy

1) Rear aligning plate home position sensor (S7)
Check the rear aligning plate home position sensor (S7). Is the sensor normal?
NO : Replace the sensor.

2) Wiring
List the wiring between the finisher controller PCB and the rear alignment motor (M4).
NO : Correct the wiring.

3) Rear aligning plate
Is the rack riding cover the collar of the roll?
YES : Correct it.

4) Rear alignment motor (M4), Finisher controller PCB
Try replacing the rear alignment motor (M4). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E531

The stapler does not leave the stapling home position sensor (S13) within 0.5 sec after the stapler motor (M6) is rotated CW.
The stapler does to return to the home position sensor (S13) within 0.5 sec after the stapler motor (M6) is driven CW and, in addition, it does not return to the sensor within 0.5 sec after the motor is driven CCW thereafter.

Possible cause

The stapler motor (M6) is faulty. The stapler home position sensor (SW1) is faulty. The stapler harness is faulty. The finisher controller PCB is faulty.

Remedy

1) Wiring
It the wiring between the stapler unit and the finisher controller PCB normal?
NO : Correct the wiring.

2) Stapler unit, Finisher controller PCB
Try replacing the stapler unit. Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E537

The front aligning plate does not reach home position when the front aligning motor (M3) is driven for a specific time.
The front aligning plate does not leave home position when the front alignment motor (M3) is driven for a specific time.

Possible cause

The front alignment motor (M3) is faulty. The front aligning plate home position sensor (S6) is faulty. The sensor connector is disconnected or has an open circuit. The front alignment motor relay harness if faulty. The front aligning plate is subjected to an abnormal load. The finisher controller PCB is faulty.

Remedy

1) Front aligning plate home position sensor (S6)
Check the front aligning plate home position sensor (S6). Is the sensor normal?
NO : Replace the sensor.

2) wiring
Is the wiring between the finisher controller PCB and the front alignment motor (M3) normal?
NO : Correct the wiring.

3) Front aligning plate
Is the rack riding over the collar of the roll?
YES : Correct it.

4) Front alignment motor (M3), Finisher controller PCB
Try replacing the front alignment motor (M3). Is the problem corrected?
YES : End.
NO : Replace the finisher controller PCB.

E551

The delivery fan rotation signal (FNALCOK) does not arrive within 1 sec when the heat discharge fan drive signal (FANON) is sent.

Possible cause

The heat discharge fan (FM1) is faulty. The heat discharge fan relay harness is faulty. The heat discharge fan is subjected to an abnormal load. The finisher controller PCB is faulty.

Remedy

1) Wiring
Is the wiring between the heat discharge fan and the finisher controller PCB normal?
NO : Correct the wiring.

2) Heat discharge fan (FM1), Finisher controller PCB
Try replacing the heat discharge fan (FM1). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E577

The return roller does not reach home position when the delivery motor (M1) is driven for a specific time. (If the same condition is detected while alignment takes place in the direction of feed, a jam will be identified.)

Possible cause

The delivery motor (M1) on the finisher controller PCB is faulty. The return roller home position sensor (S3) is faulty. The connector is discontented or has an open circuit. The delivery motor relay harness is faulty. The return roller is faulty. The finisher controller PCB is faulty.

Remedy

1) Delivery motor (drive mechanism)
Is the return roller rotation when the motor is rotating CCW?
NO : Correcting the drive mechanism.
Is the return roller displaced?
NO : Correct the return roller spring.
Is the tension of the delivery motor drive belt appropriate?
NO : Loosen the screw, and correct the tension.

2) Return roller home position sensor (S3)
Check the return roller home position sensor (S3). Is the sensor normal?
NO : Replace the sensor.

3) Delivery motor (M1), Finisher controller PCB
Try replacing the delivery motor (M1). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E580

The stack tray upper limit sensor (S1) goes ON while the stack tray up/down motor (M5) is in operation.
The clock signal of the stack tray up/down clock sensor (S9) is not detected 15 times or more within 0.8 sec while the stack tray up/down motor (M5) is in operation.
It does not reach the stack tray paper height sensor (S10) 2 sec after the stack tray up/down motor (M5) rotates for ascent.
It does not leave the stack tray power height sensor (S10) 2 sec after the stack tray up/down motor (M5) starts to rotate for descent.

Possible cause

The stack tray up/down motor (M5) is faulty. The stack tray paper height sensor (S10) is faulty. The sensor connector is disconnected or has an open circuit. The stack tray up/down clock sensor (SW9) is faulty. The sensor connector is disconnected or has an open circuit. The stack tray up/down motor is subjected to an abnormal load. The finisher controller PCB is faulty.

Remedy

1) Stack tray up/down motor (encoder)
Try turning the encoder of the stack tray up/down motor by hand. Does it rotate smoothly?
NO : Correct the mechanical mechanism.

2) Wiring
Is the wiring between the finisher controller PCB and the stack tray up/down motor (M5) normal?
NO : Correct the wiring.

3) Tray phase
Is the left/right phase of the stack tray normal?
NO : Correct the phase.

4) Stack tray up/down lock sensor (S9)
Check the stack tray up/down clock sensor (S9). Is the sensor normal?
NO : Replace the sensor.

5) Stack tray paper height sensor (S10)
Check the stack tray paper height sensor (S10). Is the sensor normal?
NO : Replace the sensor.

6) Stack tray paper limited sensor (S1), Stack tray lower limit sensor (S12)
Check the stack tray upper limit sensor (S1) and the stack tray lower limit sensor (S12). Are the sensors normal?
NO : Replace the sensors.

7) Stack tray up/down motor (M5), Finisher controller PCB
Try replacing the stack tray up/down motor (M5). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

E585

The stack retaining lever does not reach home position when the stack handling motor (M2) has been driven for a specific time (at the start of motor CCW rotation). (If the same condition is detected during stack delivery, a jam will be identified.)

Possible cause

The stack handling motor (M2) is faulty. The stack delivery lever home position sensor (S8) is faulty. The sensor connector is disconnected or has an open circuit. The stack handling motor relay harness is faulty. The stack retaining lever is faulty. The finisher controller PCB is faulty.

Remedy

1) Stack holding motor drive belt.
Is the tension of the drive belt appropriate?
NO : Loosen the screw, and correct the tension.

2) Stack handling motor (drive mechanism)
Is the return roller rotating while the motor is rotating CCW?
NO : Correct that drive mechanism.

3) Wiring
Is the wiring between the finisher controller PCB and the stack handling motor (M2) normal?
NO : Correct the wiring.

4) Stack retaining lever home position sensor (S4)
Check the stack retaining lever home position sensor (S4). Is the sensor normal?
NO : Replace the sensor.

5) Stack handling motor (M2), Finisher controller PCB
Try replacing the stack handling motor (M2). Is the fault corrected?
YES : End.
NO : Replace the finisher controller PCB.

6.3 Fax Error Code

6.3.1 Service Error Code Output

If '1' is set to service data #1 SSSW SW01 bit 0, an appropriate service error code will be indicated on the following reports if a communication ends in error: communication control report, reception result report, error transmission report.

When an error occurs, you can generate a system dump list in service mode to check the code.

6.3.2 Error Codes

The error codes used in the machine are defined as follows:

1. Transmission Level (ATT): No.07 of Service Soft Switch #2 MENU

- Increase the transmission level:

  Increase the setting so that it is closer to -8 dBm. (At -8 dBm, the LCD indicates '8'.)

- Decrease the transmission level:

  Decrease the setting so that it is closer to -15 dBm. (At -15 dBm, the LCD indicates '15'.)

2. NL Equalizer: No.05 of Service Soft Switch #2 MENU

- Adjust the NL equalizer:

  Select 'ON'.

3. Transmission Page Timer: SW12 of Service Soft Switch #1 SSSW

- Increase the page timer setting:

  To set both transmission and reception to the same time-out length, set SW12 as follows:

  8 min: bit 7, bit 1, bit 0 = 0, 0, 0
  16 min: bit 7, bit 1, bit 0 = 0, 0, 1
  32 min: bit 7, bit 1, bit 0 = 0, 1, 0
  64 min: bit 7, bit 1, bit 0 = 0, 1, 1

  If you want to set transmission and reception to different time-out lengths, or use different time-out lengths according to different image modes, you will have to set all bits (from 7 through 0) accordingly.

4. T0 Timer: No.10 of Service Soft Switch #3 NUMERIC param.

- Increase the T0 timer setting:

  Increase the setting of No.10.

  The T0 timer is used to set the period of time in which a line connection is recognized for transmission, i.e., in which the machine waits for a significant signal from the other party after dialing. The line will be disconnected if no significant signal is received during the period.

5. T1 Timer: No.11 of Service Soft Switch #3 NUMERIC param.

• Increase the T1 timer setting:

Increase the setting of No.11.

The T1 timer is used to set the period of time in which a line connection is recognized for reception, i.e., in which the machine waits for a significant signal from the other party after transmission of DIS. The line will be disconnected if no significant signal is received during the period.

6. RTN Signal Transmission Condition: No. 02, 03, and 04 of Service Soft Switch #3 NUMERIC param.

• Loosen the RTN signal transmission condition:

Increase the settings of No.02, 03, and 04.

No.02 is used to set the ratio of the number of error lines to the total number of lines per page (1% to 99%).

No.03 is used to set the burst error (number of successive error lines identified as an errors) ; (2 to 99 lines).

No.04 is used to set the number of errors falling short of a burst error (1 to 99 times).

7. Echo Remedy

• A remedy against echoes may be implemented on the transmission side or the reception side

Remedy 1 for Echo (on the transmission side; relates to international communications settings)

By the User:

Choose the appropriate international transmission settings when setting auto-dial numbers (one-touch dialing, speed dialing).

If international transmission 1 is selected, the 1st DIS from the other party will be ignored.

If international transmission 2 is selected, a 1850Hz tonal signal will be transmitted when the other party sends DIS.

If international transmission 3 is selected, a 1650Hz tonal signal will be transmitted when the other party sends DIS.

By the Service Person:

All transmissions may be e set to accommodate international transmission using bits 6, 5, and 4 of #1 SSSW SW03 (service soft switch):

international transmission 1: (bit 6, bit 5, bit 4) = (0, 0, 1)

international transmission 2: (bit 6, bit 5, bit 4) = (0, 1, 0)

international transmission 3: (bit 6, bit 5, bit 4) = (1, 1, 0)

Remedy 2 for Echo (on reception side; addition of 1080-Hz tonal signal before CED transmission)

Set '1' to bit 7 of SW03 of #1 SSSW (service soft switch) so that a 1080Hz tonal signal will be transmitted before CED transmission.

Remedy 3 for Echo (on reception side; change made to the time during which low-speed signals are ignored after CFR transmission)

Set '1' to bit 4 of SW04 of #1 SSSW (service soft switch) so that the time during which low-speed signals are ignored after CFR transmission will be longer (instead of 700 msec, it will be 1500 msec).

8. Echo Protect Tone: SW03 bit 1 of Service Soft Switch #1 SSSW

• Add an echo protect tone to the V.29 modem signal for transmission:

When SW03 bit 1 is set to '1', an echo protect tone will be added to high-speed transmission V.29 (at 9600 or 7200 bps) for transmission.

9. Number of Final Flag Sequences: SW04 bit 2 of Service Soft Switch #1 SSSW

• Increase the number of final flag sequences:

When SW04 bit 2 is set to '1', the number of final flag sequences will be increased from 1 to 2 for a procedure signal (transmitted at 300 bps).

10. Subaddress

A subaddress is used to indicate the location of a memory box in the other party (e.g., confidential mailbox, polling box), and it consists of 20 or fewer characters (numerals, *, #, space). As log as the other party complies with the International Standards of ITU-T, the machine can communicate with it by means of subaddresses.

At times, an ID number (referred to as a "password") is used to restrict access to a location indicated by a subaddress.

With some models, polling based on subaddresses is called "selective polling", and a subaddress used at time of polling is called a "selective polling address".

11. Password

A password used by a Canon facsimile machine may be any of the following:

Password for Subaddress Communications:

This is an ID number used for a subaddress communication and, as in the case of a subaddress, it consists of 20 or fewer characters (numerals, *, #, space).

Communication Password:

This is an ID number used for a password communication. Some models use 4 decimal characters (0000 through 9999), while some use 3 decimal characters (000 through 255).


Memo

Password Used When Making Settings:
A password may also be used for memory lock Rx, call restriction, and other functions. Such a password consists of 4 decimal characters (0000 through 9999), and it is important to remember that these passwords are used inside the machine and are not intended for communication procedures.

12. Signals

Tonal Signal:

A tonal signal consists of sinusoidal waves of a specific frequency, and may be thought of as a sound carrying a meaning. CNG, CED, and ANSam are tonal signals.

Binary Signal:

A binary signal is used to indicate the meaning of a procedure. It is either '1' or '0', modulated according to frequency, and is used as G3 procedure signals.

Procedure Signal:

It is a generic term for a tonal signal and a binary signal.

Preamble:

It is a signal attached to the beginning of a binary signal, and is used to synchronize modem signals for a procedure signal.

Image Signal:

Of procedure signals, it is used for actual transmission of image data.

Significant Signal:

It is a signal whose significance can be understood by a facsimile machine that receives it, and it is free of a transmission error.

13. Timer

T0 Timer:

It indicates the period of time in which a line connection is recognized during transmission; specifically, the machine waits for a significant signal from the other party after dialing.

T1 Timer:

It indicates the period of time in which a line connection is recognized during reception; specifically, the machine waits for a significant signal from the together party after transmission of DIS.

T5 Timer:

It is the period of time in which RR/RNR is transmitted during an ECM communication.

6.3.3 Causes and Remedies for User Error Codes

The causes and remedies for individual user error codes are as follows:

#0001 [TX] Document has jammed

Cause:	The original is trapped in the feeder
Remedy:	Remove the document, and try again.
Cause:	The original is not of a standard size or thickness.
Remedy:	(1) Make a copy on A4/LTR paper in book mode, and transmit the output. (2) If the original is too thin or too small, transmit it in book mode.
Cause:	Internal Fault
Remedy:	(1) Check the connection of the DS sensor (original paper sensor; PI6), DES sensor (read sensor; PI8), and ADF driver PCB (J5). (2) Check the connection of the ADF driver PCB (J1) and image processor PCB (J64/J264). (3) Check the following to see if they operate normally: DS sensor (original sensor), DES senor (registration sensor). (See 5.5.7 "Faculty Test (6:FACULTY TEST)" in Chapter 13.) (4) Replace the DS sensor (original paper sensor; PI6) and the DES sensor (read sensor; PI8). (5) Check the connection between the ADF motor and ADF driver PCB (J4). (6) Make copies to find out if the ADF motor is operating normally. (7) Replace the ADF motor. (8) Replace the ADF driver PCB. (9) Replace the image processor PCB.

#0003 [TX/RX] Document is too long, or page time-over

Cause:	The length of a single page is too long.
Remedy:	(1) Make copies in book mode, and transmit the original in several divisions. (2) In case of a copy, make a copy in copy mode.
Cause:	The data of a single page is too large, exceeding the time allowed for transmission.
Remedy:	(1) Decrease the reading resolution when transmitting. (2) If the original is too long and, thus, results in a large amount of data, make copies in book mode, and transmit the original in several divisions. (3) If halftone transmission is used, the original is of a default size, and the data is too large, increase the setting of the page timer.
Cause:	The data of a single page is too large, exceeding the time allowed for reception.
Remedy:	(1) Ask the operator of the other party to decrease the reading resolution and transmit. (2) Ask the operator of the other party to divide the original and transmit. (3) Increase the setting of the page timer. (4) Ask the operator of the other party to find out the cause.

Cause: An internal mechanism is faulty.

Remedy:
(1) Check the connection of the DS sensor (original paper sensor; PI6), DES sensor (read sensor; PI8), and ADF driver PCB (J5).
(2) Check the following to see if they operate normally: DS sensor (original sensor), DES senor (registration sensor). (See 5.5.7 'Faculty Test (6:FACULTY TEST)"in Chapter 13.)
(3) Replace the DS sensor (original paper sensor; PI6) and the DES sensor (read sensor; PI8).
(4) Check the connection between the ADF motor and ADF driver PCB (J4).
(5) Make copies to find out if the ADF motor is operating normally.
(6) Replace the ADF motor.
(7) Replace the ADF driver PCB.
(8) Replace the image processor PCB.

#0005 [TX/RX] Initial identification (T0/T1) time-over

Cause: The tone/pulse setting is wrong.

Remedy: Make the correct tone/pulse setting.

Cause: The time it takes to connect to the other party's line is too long.

Remedy:
(1) When registering an auto-dial number, put a relatively long pause after the telephone number to delay the T0 timer start mechanism.
(2) In service mode, increase the T0 timer length using '10' of #3 Numeric param. so that a time-cover condition will not occur. (for transmission)
(3) In service mode, increase the T1 timer length using '11' of #3 Numeric param. so that a time-over condition will not occur. (for reception)

Cause: The other party does not respond.

Remedy: Contact the operator of the other party, and find out the cause.

Cause: The other party's communication mode (G2, G3, etc.) does not match.

Remedy: The communication mode depends on each specific model, and no remedy can be offered.

Cause: During transmission, the other party malfunctioned because of an echo.

Remedy:
(1) Provide echo remedy 1.
(2) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dial number.
(4) Ask the operator of the other party to provide echo remedy 2.
(5) Ask the operator of the other party to decrease the transmission level.

Cause: During reception, the machine malfunctioned because of an echo.

Remedy: Provide echo remedy 2.

#0008 [TX] Password does not match for polling transmission

Cause:	During polling that uses a subaddress, the password of the machine and that of the other machine do not match.
Remedy:	Match the password of the machine and that of the other party.

#0009 [RX] Paper has jammed or the paper has run out

Cause:	The paper is trapped.
Remedy:	Remove the trapped paper.
Cause:	The paper has run out.
Remedy:	Set new paper.
Cause:	The paper cassette is not set correctly.
Remedy:	Set the paper cassette.
Cause:	An internal mechanism is faulty.
Remedy:	Correct it. (See 3.5 “Troubleshooting Feeding Faults”in Chapter 13.)

#0011 [RX] Polling reception error

Cause:	There is no document in the other party.
Remedy:	Ask the operator of the other party to set the document correctly.
Cause:	Transmission was attempted, and polling reception was started because the doc ment was not set correctly.
Remedy:	Set the document correctly to transmit.

#0012 [TX] The other party has run out of paper

Cause:	The other party has run out of recordingpaper.
Remedy:	Ask the operator of the other party to set paper.

#0018 [TX] Auto dialing transmission error

Cause:	The tone/pulse setting is wrong.
Remedy:	Make the correct tone/pulse setting.
Cause:	The connection time for the line is too long.
Remedy:	(1) When registering an auto-dial number, put a relatively long pause at the end of the telephone number to delay the start of the T0 timer. (2) Increase the T0 timer setting to prevent a time-over condition.
Cause:	The line of the other party was engaged.
Remedy:	Start a call once again.
Cause:	The other party is not connected to the line, or is not turned on so that the transmission did not arrive.
Remedy:	Ask the operator of the other party to find out the cause.
Cause:	The other party is not a facsimile machine.
Remedy:	Check the number of the other party, and start a call once again.

Cause:	The other party ran out of paper so that the line was disconnected during the pre-procedure.
Remedy:	Ask the operator of the other machine to set paper.
Cause:	The machine was disconnected from the line using an unidentified reason code.
Remedy:	(1) Wait for a while, and start a call once again. (2) Check to make sure that the other party is tuned on.
Cause:	(1) The other party did not respond. (2) The other party is out of order. (3) The other party is out of use for some reason. (4) The exchange is congested. (5) There is no line/channel that is available at present. (6) The requested line/channel cannot be used on the side of the other party. (7) Calls crashed. (8) Communication is not possible at present by reason of terminal management.
Remedy:	Ask the operator of the other party to find out the cause.

#0021 [RX] The other party has rejected the machine during polling reception

Cause:	When starting a call, a subaddress, or a subaddress and a password, was not specified.
Remedy:	Specify a subaddress, or a subaddress and a password, when starting a call.

#0022 [TX] Call fails

Cause:	The data for an auto-dial number used when selecting a party was deleted.
Remedy:	Register the telephone number of the other party as an auto-dial number, and transmit once again.

#0025 [TX/RX] Auto-dial setting is wrong

Cause:	The settings require registration of a subaddress for auto-dialing; however, a call was attempted without registering a subaddress.
Remedy:	If auto-dialing is of a type requiring registration of a subaddress, register a subaddress.
Cause:	A confidential setting and a relay setting were combined for auto-dialing, and an attempt was made for transmission.
Remedy:	Make correct auto-dial settings.

#0033 [TX] Confidential transmission cannot be used

Cause:	The other party does not have a function that supports subaddress mode.
Remedy:	Confidential transmission is not possible. Try a direct mode of transmission.

#0034 [TX] Transmission to the confidential mailbox of the other party cannot be made in confidential transmission

Cause:	The other party does not have the selected confidential mailbox.
Remedy:	Check the number of the confidential mail-box of the other party, and try again.
Cause:	The memory of the other party is full.
Remedy:	Ask the operator of the other party to delete image data that is no longer needed.

#0035 [TX] Relay control transmission cannot be used

Cause:	The other party does not have a function that supports subaddress mode.
Remedy:	Relay control transmission cannot be made. Transmit directly to the final destination.

#0036 [TX] Relay control transmission cannot be made

Cause:	The relay control source has not been registered as part of auto-dialing of the relay machine.
Remedy:	Ask the operator of the relay machine to register the telephone number of the relay control source as part of auto-dialing.
Cause:	The relay control source is wrongly registered as part of auto-dialing of the relay machine.
Remedy:	Ask the operator of the relay machine to correct the telephone number of the relay control source as part of auto-dialing.
Cause:	The relay switch of the relay station is OFF.
Remedy:	Ask the operator of the relay station to turn on the relay switch.
Cause:	The memory of the relay station is full.
Remedy:	Ask the operator of the relay station to delete image data that is no longer needed.

#0037 [RX] Memory has overflowed when receiving images

Cause:	The image memory overflowed during reception.
Remedy:	Delete image data that is no longer needed, and ask the operator of the other party to transmit once again.

#0059 [TX] Dialed number and the connected number (CSI) do not match

Cause:	The user telephone number is not registered correctly on the receiving side.
Remedy:	(1) Ask the operator of the receiving side to register the user telephone number correctly. (2) Use manual transmission; then, after making sure that a connection has been made, transmit once again.
Cause:	The exchange malfunctioned, and the machine is not connected to the dialed party.
Remedy:	Have the exchange checked.

#0080 [TX] The other party is not equipped with an ITU-T-compliant subaddress reception function

Cause: Bit 49 of DIS received from the other party is '0'.

Remedy:
(1) Transmit to a fax machine equipped with a subaddress function.
(2) Use normal G3 transmission.

#0081 [TX] The other party is not equipped with an ITU-T-compliant password reception function

Cause: Bit 50 of DIS received from the other party is '0'.

Remedy:
(1) Transmit to a fax machine equipped with a password function.
(2) Use subaddress transmission that does not use a password.
(3) Use normal G3 transmission.

#0082 [RX] The other party is not equipped with an ITU-T-compliant selective polling transmission function

Cause: Bit 47 of DIS received from the other party is '0'.

Remedy: Ask the operator to set normal polling transmission, and use polling reception.

#0083 [RX] Selective polling address or the password does not match during ITU-T-compliant selective polling reception

Cause: The selective polling address or the password of the machine does not match that of the other machine.

Remedy: Match the selective polling address and the password of the machine with that of the other party.

#0084 [RX] The other party is not equipped with a password function for ITU-T-compliant selective polling reception

Cause: Bit 50 of DIS received from the other party is '0'.

Remedy: Use selective polling that does not use a password.

#0102 [TX/RX] Subaddress or password does not match during an ITU-T-compliant subaddress communication

Cause:	The subaddress and the password of the machine do not match that of the other party.
Remedy:	Match the subaddress and password of the machine with those of the other party.
Cause:	An appropriate subaddress and password are not set on the other party.
Remedy:	Ask the operator of the other party to set an appropriate subaddress and password.
Cause:	In the case of transmission, the image memory of the party is full.
Remedy:	Ask the operator of the other party to delete image data that is no longer needed, and transmit once again.

#0995 [TX/RX] Memory transmission reservation clear/memory reception image clear

Cause:	In the case of transmission, the user canceled the memory transmission reservation.
Remedy:	Transmit once again.
Cause:	In the case of reception, the user deleted the image that had been received in memory reception.
Remedy:	Ask the operator of the other party to transmit once again.

6.3.4 Causes and Remedies for Service Error Codes

The causes and remedies for service error codes are as follows:

##0100 [TX] The number allowed for retransmission of the procedure signal was exceeded during transmission

Cause :	The transmission level is too low, and the other party cannot receive NSS, TSI, DCS, TCF, or the training signal correctly.
Remedy :	Increase the transmission level so that the other party may receive the signal correctly.
Cause :	After transmission of TCF immediately before the image signal, the other party malfunctioned because of an echo.
Remedy :	(1) Ask the operator of the other party to provide echo remedy 3. (2) Using a manual call, press the Start button after hearing the 1st DIS from the other party. (3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
Cause :	After transmission of the Q signal following the image signal, the line condition became poor so that the other party cannot receive the image signal or the Q signal correctly.
Remedy :	(1) Increase the transmission level so that the other party may service the image signal or the Q signal correctly. (2) crease the transmission start speed. (3) Adjust the NL equalizer so that the other party may receive the image signal or the Q signal correctly. (4) Add an echo protect tone to the V.29 modem signal for transmission. (5) Increase the number of final flag sequences for the procedure signal so that the other party may receive the procedure signal correctly.

##0101 [TX/RX] The modem speed of the machine does not match that of the other party

Cause : The modem speed of the machine does not match that of the other machine.

Remedy : The modem speed is part of machine specifications, and there is no remedy.

Cause : In the case of transmission, the speed for fallback does not match that of the other party.

Remedy :
(1) Increase the transmission level so that the other party may receive TCF correctly.
(2) Adjust the NL equalizer so that the other party may receive TCF correctly.
(3) Provide echo remedy 1 or 2.
(4) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(5) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(6) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0102 [TX] Fallback is not possible

Cause : The line condition is poor, and the other party cannot receive TCF correctly.

Remedy :
(1) Increase the transmission level so that the other party may receive TCF correctly.
(2) Adjust the NL equalizer so that the other party may receive TCF correctly.

Cause : An echo has caused a malfunction.

Remedy :
(1) Provide echo remedy 1.
(2) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(4) Ask the operator of the other party to provide echo remedy 2.
(5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0103 [RX] EOL cannot be detected for 5 sec (15 sec if CBT)

Cause : The line condition is poor, and the image signal cannot be received correctly.

Remedy :
(1) Ask the operator of the other party to increase the transmission level so that the image signal may be received correctly.
(2) Ask the operator of the other party to decrease the transmission start speed.
(3) Adjust the NL equalizer so that the image signal may be received correctly.

Cause : The machine malfunctioned because of an echo of CFR.

Remedy :
(1) Provide echo remedy 3.
(2) Decrease the transmission level so that an echo of transmitted CFR will not be received.

##0104 [TX] RTN or PIN has been received

Cause : The line condition is poor so that the other party cannot receive the image signal correctly.

Remedy :
(1) Increase the transmission level so that the other party may receive the image signal correctly.
(2) Decrease the transmission start speed.
(3) Adjust the NL equalizer so that the other party may receive the image signal correctly.
(4) Add an echo protect tone to the V.29 modem signal for transmission.
(5) Ask the operator of the other party to loosen the RTN transmission conditions so that the other party will not transmit RTN.

Cause : The machine malfunctioned because of an echo.

Remedy :
(1) Provide echo remedy 1.
(2) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(4) Ask the operator of the other party to provide echo remedy 2.
(5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0106 [RX] The procedure signal cannot be received for 6 sec while in wait

Cause : The line condition is poor, and the procedure signal from the other party cannot be received correctly.

Remedy :
(1) Ask the operator of the other party to increase the transmission level so that the procedure signal may be received correctly.
(2) Adjust the NL equalizer so that the procedure signal may be received correctly.

Cause : The line condition is poor, and the other party cannot receive the signal.

Remedy :
(1) Increase the transmission level so that the other party may receive the signal correctly.
(2) Adjust the NL equalizer so that the other party may receive the signal correctly.

Cause : The machine malfunctioned because of an echo.

Remedy :
(1) Provide echo remedy 2.
(2) Decrease the transmission level so that an echo of transmitted signal will not be received.

##0107 [RX] The transmitting machine cannot use fallback

Cause : The line condition is poor, and the signal from the other party cannot be received correctly even at 2400 bps.

Remedy :
(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.
(2) Adjust the NL equalizer so that the signal may be received correctly.
(3) Loosen the RTN transmission conditions so that RTN will not be transmitted.

Cause : The machine malfunctioned because of an echo.

Remedy :
(1) Provide echo remedy 2.
(2) Decrease the transmission level so that an echo of the transmitted signal will not be received.

##0109 [TX] After transmitting DCS, a signal other than DIS, DTC, FTT, CFR, and CRP was received, exceeding the permitted number of transmissions of the procedure signal

Cause : The procedure signal is faulty.

Remedy : Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0111 [TX/RX] Memory error

Cause : While printing data stored in the image memory, the effects of noise caused a data error.

Remedy : Print out all image data and system data, and execute all-clear; then, store the system data once again.

Cause : Noise started wrong dialing.

Remedy : Replace the image processor PCB.

##0114 [RX] RTN was transmitted

Cause : The line condition is poor, and the image signal from the other party cannot be received correctly.

Remedy :
(1) Ask the operator of the other party to increase the transmission level so that the image signal may be received correctly.
(2) Ask the operator of the other party to decrease the transmission start speed.
(3) Adjust the NL equalizer so that the image signal may be received correctly.
(4) Loosen the RTN transmission conditions so that RTN will not be transmitted.

Cause : The machine malfunctioned because of an echo of CFR.

Remedy :
(1) Provide echo remedy 3.
(2) Decrease the transmission level so that an echo of transmitted CFR will not be received.

##0200 [RX] During image reception, a carrier is not detected for 5 sec

Cause :	The line condition is poor, and the image signal cannot be received.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the image signal may be received correctly. (2) Ask the operator of the other party to decrease the transmission start speed.
Cause :	The training signal cannot be received because of an echo of CFR, causing a timeover condition.
Remedy :	(1) Provide echo remedy 3. (2) Decrease the transmission level so that an echo of transmitted CFR will not be received.

##0201 [TX/RX] DCN was received through a non-normal procedure

Cause :	The other party is not ready for reception (e.g., out of paper).
Remedy :	Ask the operator of the other party to set the machine for reception (as by setting paper).
Cause :	The user telephone number has not been registered (if the receiving machine is a RICOH 3000L).
Remedy :	Register the user telephone number.
Cause :	During reception, a talk reservation was made; however, a call was not answered.
Remedy :	Contact the other party by telephone.
Cause :	In polling transmission, document is not placed.
Remedy :	Place a document, and ask the operator of the other party to make a call once again.
Cause :	The other party transmitted, but there is no paper.
Remedy :	Set the paper.
Cause :	The line condition is poor, and the other party cannot receive the procedure signal correctly.
Remedy :	(1) Increase the transmission level so that the other party may receive the procedure signal correctly. (2) Adjust the NL equalizer so that the other party may receive the procedure signal correctly.
Cause :	The machine malfunctioned because of an echo.
Remedy :	(1) Provide echo remedies 1, 2, or 3. (2) Decrease the transmission level so that an echo will not be received.
Cause :	The image signal or the Q signal cannot be received, and the other party suffered an excess number of re-transmissions of the procedure signal.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Adjust the NL equalizer so that the signal may be received correctly. (3) Ask the operator of the other party to decrease the transmission start speed.
Cause :	The line condition is poor, anad the other party (transmitting machine) cannot use fall-back.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Adjust the NL equalizer so that the signal may be received correctly. (3) Loosen the RTN transmission conditions so that RTN will not be transmitted.

##0220 [TX/RX] System error (main program may have gone away)

Cause :	Noise caused the CPU to malfunction.
Remedy :	Turn off and then on the power.

##0223 [TX] The line was disconnected during communication

Cause :	The Stop key was pressed during image transmission.
Remedy :	Transmit once gain.

##0224 [TX/RX] Fault occurred in the communication procedure signal

Cause :	The document on the transmitting party is not correctly fed, forcing polling mode to start (i.e., DCN was received in response to DIS).
Remedy :	(1) Check to make user that the document is placed correctly. (2) If the feeding roller is worn, replace it.
Cause :	In a memory full condition, a call arrived when a document was set (i.e., DCN was received in response to DIS).
Remedy :	If any image received in memory reception remains in the memory, print out the image and empty the memory. Also, avoid leaving a document in the document tray unless the machine is in transmission mode.
Cause :	The procedure signal is faulty.
Remedy :	Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0229 [RX] The recording system became locked for 1 min

Cause :	Not identified.
Remedy :	Correct the locking, and press the Start key to print out the image.

##0232 [TX] The unit used to control the encoder is faulty

Cause :	The operation of the IC used to control the encoder did not end normally.
Remedy :	Replace the unit (image processor PCB) used to control the encoder.

##0237 [RX] The IC used to control the decoder malfunctioned

Cause :	The operation of the IC used to control the decoder did not end normally.
Remedy :	Replace the unit (image processor PCB) used to control the decoder.

##0238 [RX] The unit used to control recording malfunctioned

Cause :	The operation of the IC used to control recording did not end normally.
Remedy :	Replace the unit (DC controller PCB) used to control recoding.

##0261[TX/RX] System error occurred between the modem and system control board

Cause :	An internal unit is faulty (when RS is set to '1', CS fails to go '1').
Remedy :	Replace the image processor PCB (modem faulty).

##0280 [TX] The number of re-transmissions of the procedure signal has been exceeded

Cause :	The line condition is poor, and the appropriate signal from the other party cannot be received correctly after transmission of TCF.
Remedy :	(1) Increase the transmission level so that the other party may receive TCF correctly. (2) Ask the other party to increase the transmission level so that the appropriate signal may be received correctly.
Cause :	The other party malfunctioned because of an echo.
Remedy :	(1) Using a manual call, press the Start button after hearing the 1st DIS from the other party. (2) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number. (3) Ask the operator of the other party to provide echo remedy 2. (4) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.
Cause :	The telephone line has a faulty connection.
Remedy :	Check to see that the telephone line is connected correctly.
Cause :	During a communication, the telephone line was disconnected.
Remedy :	Avoid disconnecting the telephone line while a communication is under way.

##0281 [TX] The number of re-transmissions of the procedure signal has been exceeded

Cause :	The line condition is poor, and the appropriate signal from the other party cannot be received correctly after transmission of EOP.
Remedy :	(1) Increase the transmission level so that the other party may receive EOP correctly. (2) Decrease the transmission start speed. (3) Adjust the NL equalizer so that the other party may receive EOP correctly. (4) Add an echo protect tone to the V.29 modem signal for transmission. (5) Ask the operator of the other party to increase the transmission level so that the appropriate signal may be received correctly.

##0282 [TX] The number of re-transmissions of the procedure signal has been exceeded

Cause : The line condition is poor, and the appropriate signal from the other party cannot be received correctly after transmission of EOM.

Remedy :
(1) Increase the transmission level so that the other party may receive EOM correctly.
(2) Decrease the transmission start speed.
(3) Adjust the NL equalizer so that the other party may receive EOM correctly.
(4) Add an echo protect tone to the V.29 modem signal for transmission.
(5) Ask the operator of the other party to increase the transmission level so that the appropriate signal may be received correctly.

##0283 [TX] The number of re-transmissions of the procedure signal has been exceeded

Cause : The line condition is poor, and the appropriate signal from the other party cannot be received correctly after transmission of MPS.

Remedy :
(1) Increase the transmission level so that the other party may receive MPS correctly.
(2) Decrease the transmission start speed.
(3) Adjust the NL equalizer so that the other party may receive MPS correctly.
(4) Add an echo protect tone to the V.29 modem signal for transmission.
(5) Ask the operator of the other party to increase the transmission level so that the appropriate signal may be received correctly.

##0284 [TX] DCN has been received after transmission of TCF

Cause : The other party is not ready for reception (e.g., out of paper).
Remedy : Ask the operator of the other party to set the machine for reception (as by setting paper).
Cause : The user telephone number has not been registered (if the receiving machine is a RICOH 3000L).
Remedy : Register the user telephone number.
Cause : The other party cannot receive TCF correctly.
Remedy : Increase the transmission level so that the other party may receive TCF correctly.
Cause : The other party malfunctioned because of an echo.
Remedy :
(1) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(2) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(3) Ask the operator of the other party to provide echo remedy 2.
(4) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.
Cause : Relay control was sent to the other party, but the other party is in the middle of relay broadcasting.
Remedy : Start communication once again after a while.

##0285 [TX] DCN has been received after transmitting EOP

Cause : The Stop key was pressed during a communication.
Remedy : Transmit once again.

##0286 [TX] DCN has been received after transmitting EOM

Cause : The Stop key was pressed during a communication.
Remedy : Transmit once again.

##287 [TX] DCN has been received after transmitting MPS

Cause : The Stop key was pressed during a communication.
Remedy : Transmit once again.

##288 [TX] After transmitting EOP, a signal other than PIN, PIP, MCF, RTP, or RTN was received

Cause : The procedure signal has a fault.
Remedy : Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0289 [TX] After transmitting EOM, a signal other than PIN, PIP, MCF, RTP, or RTN was received

Cause :	The procedure signal has a fault.
Remedy :	Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0290 [TX] After transmitting MPS, a signal other than PIN, PIP, MCF, RTP, or RTN was received

Cause :	The procedure signal has a fault.
Remedy :	Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0670 [TX] In V.8 late start, the V.8 ability was detected in DIS from the other party and, in response, CI was transmitted; however, the procedure failed to advance, causing a T1 time-over condition

Cause :	CI was transmitted, but the other party failed to receive it correctly and disconnect the line.
Remedy :	(1) Increase the transmission level so that the other party may receive CI correctly. (2) Prohibit the V.8/V.34 procedure.
Cause :	ANSam or DIS from the other party cannot be received correctly.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0671 [RX] In V.8 call arrives, the procedure fails to advance to phase 2 after CM detection, causing a T1 time-over condition

Cause :	In phase 1, the other party cannot receive the signal correctly and disconnect the line.
Remedy :	(1) Increase the transmission level so that the other party may receive the signal correctly. (2) Prohibit the V.8/V.34 procedure.
Cause :	In phase 1, the signal from the other party cannot be received correctly.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0672 [TX] In V.34 transmission, the procedure fails to move from phase 2 to phase 3 and later, causing a T1 time-over condition

Cause :	In phase 2, the other party cannot receive the signal correctly, and disconnect the line.
Remedy :	(1) Increase the transmission level so that the other party may receive the signal correctly. (2) Prohibit the V8./V.34 procedure.
Cause :	In phase 2, the signal from the other party cannot be received correctly.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0673 [RX] In V.34 reception, the procedure fails to move from phase 2 to phase 3 and later, causing a T1 time-over condition

Cause :	In phase 2, the other party cannot receive the signal correctly, and disconnect the line.
Remedy :	(1) Increase the transmission level so that the other party may receive the signal correctly. (2) Prohibit the V.8/V.34 procedure.
Cause :	In phase 2, the signal from the other party cannot be received correctly.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0674 [TX] In V.34 transmission, the procedure fails to move from phase 3 or phase 4 to a control channel or later, causing a T1 time-over condition

Cause :	In phase 3 or phase 4, the other party cannot receive the signal correctly, and disconnect the line.
Remedy :	(1) Increase the transmission level so that the other party may receive the signal correctly. (2) Prohibit the V.8/V.34 procedure.
Cause :	In phase 3 or phase 4, the signal from the other party cannot be received correctly.
Remedy :	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0675 [RX] In V.34 reception, the procedure fails to move from phase 3 or phase 4 to a control channel or later, causing a T1 time-over condition

Cause:	In phase 3 or phase 4, the other party cannot receive the signal correctly, and disconnect the line.
Remedy:	(1) Increase the transmission level so that the other party may receive the signal correctly. (2) Prohibit the V.8/V.34 procedure.
Cause:	In phase 3 or phase 4, the signal from the other party cannot be received correctly.
Remedy:	(1) Ask the operator of the other party to increase the transmission level so that the signal may be received correctly. (2) Prohibit the V.8/V.34 procedure.

##0750 [TX] In ECM transmission, no significant signal can be received after transmission of PPS-NULL, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive PPS-NULL correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-NULL correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-NULL correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0752 [TX] In ECM transmission, DCN was received after transmission of PPS-NULL

Cause:	The line condition is poor, and the other party cannot receive PPS-NULL correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-NULL correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-NULL correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0753 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of PPS-NULL

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of PPS-NULL and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0754 [TX] In ECM transmission, the allowed numberb of procedure signal re-transmissions was exceeded after transmission of PPS-NULL

Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-NULL and then CTC was transmitted, the other party could not receive it correctly.
Remedy:	Increase the transmission level so that the other party may receive CTC correctly.
Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-NULL and then CTC was transmitted, no significant signal was received correctly thereafter.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0755 [TX] In ECM transmission, no significant signal can be received after transmission of PPS-MPS, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive PPS-MPS correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-MPS correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-MPS correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0757 [TX] In ECM transmission, DCN was received after transmission of PPS-MPS

Cause:	The line condition is poor, and the other party cannot receive PPS-MPS correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-MPS correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-MPS correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0758 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of PPS-MPS

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of PPS-MPS and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0759 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded after transmission of PPS-MPS

Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-MPS and then CTC was transmitted, the other party could not receive it correctly.
Remedy:	Increase the transmission level so that the other party may receive CTC correctly.
Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-MPS and then CTC was transmitted, no significant signal was received correctly thereafter.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0760 [TX] In ECM transmission, no significant signal can be received after transmission of PPS-EOM, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive PPS-EOM correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-EOM correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-EOM correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0762 [TX] In ECM transmission, DCN was received after transmission of PPS-EOM

Cause:	The line condition is poor, and the other party cannot receive PPS-EOM correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-EOM correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-EOM correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0763 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of PPS-EOM

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of PPS-EOM and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0764 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded after transmission of PPS-EOM

Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-EOM and then CTC was transmitted, the other party could not receive it correctly.
Remedy:	Increase the transmission level so that the other party may receive CTC correctly.
Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-EOM and then CTC was transmitted, no significant signal was received correctly thereafter.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0765 [TX] In ECM transmission, no significant signal can be received after transmission of PPS-EOP, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive PPS-EOP correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-EOP correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-EOP correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0767 [TX] In ECM transmission, DCN was received after transmission of PPS-EOP

Cause:	The line condition is poor, and the other party cannot receive PPS-EOP correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive PPS-EOP correctly. (2) Adjust the NL equalizer so that the other party may receive PPS-EOP correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0768 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of PPS-EOP

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of PPS-EOP and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0769 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded after transmission of PPS-EOP

Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-EOP and then CTC was transmitted, the other party could not receive it correctly.
Remedy:	Increase the transmission level so that the other party may receive CTC correctly.
Cause:	The line condition is poor; as such, although PPR was received 4 times after transmission of PPS-EOP and then CTC was transmitted, no significant signal was received correctly thereafter.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0770 [TX] In ECM transmission, no significant signal can be received after transmission of EOR-NULL, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive EOR-NULL correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive EOR-NULL correctly. (2) Adjust the NL equalizer so that the other party may receive EOR-NULL correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0772 [TX] In ECM transmission, DCN was received after transmission of EOR-NULL

Cause:	The line condition is poor, and the other party cannot receive EOR-NULL correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive EOR-NULL correctly. (2) Adjust the NL equalizer so that the other party may receive EOR-NULL correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0773 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of EOR-NULL

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of EOR-NULL and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0774 [TX] In ECM transmission, ERR was received after transmission of EOR-NULL

Cause:	The line condition is poor, and the other party cannot often receive the image signal correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive the image signal correctly. (2) Adjust the NL equalizer so that the other party may receive the image signal correctly.
Cause:	The other party malfunctioned because of an echo.
Remedy:	(1) Provide echo remedy 1. (2) Using a manual call, press the Start button after hearing the 1st DIS from the other party. (3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number. (4) Ask the operator of the other party to provide echo remedy 2. (5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0775 [TX] In ECM transmission, no significant signal can be received after transmission of EOR-MPS, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive EOR-MPS correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive EOR-MPS correctly. (2) Adjust the NL equalizer so that the other party may receive EOR-MPS correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0777 [TX] In ECM transmission, DCN was received after transmission of EOR-MPS

Cause: The line condition is poor, and the other party cannot receive EOR-MPS correctly.

Remedy:
(1) Increase the transmission level so that the other party may receive EOR-MPS correctly.
(2) Adjust the NL equalizer so that the other party may receive EOR-MPS correctly.
(3) Add an echo protect tone to the V.29 modem signal for transmission.

Cause: The Stop key was pressed during a communication.

Remedy: Transmit once again.

##778 [TX] In ECM transmission, the allowed number of procedure signal retransmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of EOR-MPS

Cause: The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of EOR-MPS and then RR was transmitted, no significant signal was received correctly thereafter.

Remedy:
(1) Start G3 mode, and transmit once again (Prohibit the ECM mode).
(2) Decrease the transmission start speed.
(3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0779 [TX] In ECM transmission, ERR was received after transmission of EOR-MPS

Cause: The line condition is poor, and the other party cannot often receive the image signal correctly.

Remedy:
(1) Increase the transmission level so that the other party may receive the image signal correctly.
(2) Adjust the NL equalizer so that the other party may receive the image signal correctly.

Cause: The other party malfunctioned because of an echo.

Remedy:
(1) Provide echo remedy 1.
(2) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(4) Ask the operator of the other party to provide echo remedy 2.
(5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0780 [TX] In ECM transmission, no significant signal can be received after transmission of EOR-EOM, and the allowed number of procedure signal re-transmissions was exceeded

Cause:	The line condition is poor, and the other party cannot receive EOR-EOM correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive EOR-EOM correctly. (2) Adjust the NL equalizer so that the other party may receive EOR-EOM correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The line condition is poor, and the significant signal cannot be received correctly.
Remedy:	Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0782 [TX] In ECM transmission, DCN was received after transmission of EOR-EOM

Cause:	The line condition is poor, and the other party cannot receive EOR-EOM correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive EOR-EOM correctly. (2) Adjust the NL equalizer so that the other party may receive EOR-EOM correctly. (3) Add an echo protect tone to the V.29 modem signal for transmission.
Cause:	The Stop key was pressed during a communication.
Remedy:	Transmit once again.

##0783 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of EOR-EOM

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of EOR-EOM and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0784 [TX] In ECM transmission, ERR was received after transmission of EOR-EOM

Cause: The line condition is poor, and the other party cannot often receive the image signal correctly.

Remedy:
(1) Increase the transmission level so that the other party may receive the image signal correctly.
(2) Adjust the NL equalizer so that the other party may receive the image signal correctly.

Cause: The other party malfunctioned because of an echo.

Remedy:
(1) Provide echo remedy 1.
(2) Using a manual call, press the Start button after hearing the 1st DIS from the other party.
(3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number.
(4) Ask the operator of the other party to provide echo remedy 2.
(5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0785 [TX] In ECM transmission, no significant signal can be received after transmission of EOR-EOP, and the allowed number of procedure signal re-transmissions was exceeded

Cause: The line condition is poor, and the other party cannot receive EOR-EOP correctly.

Remedy:
(1) Increase the transmission level so that the other party may receive EOR-EOP correctly.
(2) Adjust the NL equalizer so that the other party may receive EOR-EOP correctly.
(3) Add an echo protect tone to the V.29 modem signal for transmission.

Cause: The line condition is poor, and the significant signal cannot be received correctly.

Remedy: Ask the operator of the other party to increase the transmission level so that the signal may be received correctly.

##0787 [TX] In ECM transmission, DCN was received after transmission of EOR-EOP

Cause: The line condition is poor, and the other party cannot receive EOR-EOP correctly.

Remedy:
(1) Increase the transmission level so that the other party may receive EOR-EOP correctly.
(2) Adjust the NL equalizer so that the other party may receive EOR-EOP correctly.
(3) Add an echo protect tone to the V.29 modem signal for transmission.

Cause: The Stop key was pressed during a communication.

Remedy: Transmit once again.

##0788 [TX] In ECM transmission, the allowed number of procedure signal re-transmissions was exceeded or a T5 time-over (60 sec) condition occurred after transmission of EOR-EOP

Cause:	The page buffer of the other party is full or is engaged; as such, although RNR was received after transmission of EOR-EOP and then RR was transmitted, no significant signal was received correctly thereafter.
Remedy:	(1) Start G3 mode, and transmit once again (Prohibit the ECM mode). (2) Decrease the transmission start speed. (3) Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0789 [TX] In ECM transmission, ERR was received after transmission of EOR-EOP

Cause:	The line condition is poor, and the other party cannot often receive the image signal correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive the image signal correctly. (2) Adjust the NL equalizer so that the other party may receive the image signal correctly.
Cause:	The other party malfunctioned because of an echo.
Remedy:	(1) Provide echo remedy 1. (2) Using a manual call, press the Start button after hearing the 1st DIS from the other party. (3) To prevent response to the 1st DIS from the other party, put a relatively long pause to the telephone number when registering an auto-dialing number. (4) Ask the operator of the other party to provide echo remedy 2. (5) Ask the operator of the other party to decrease the transmission level so that the other party will not receive an echo.

##0790 [RX] In ECM reception, ERR was transmitted after reception of EOR-Q

Cause:	The line condition is poor, and the image signal cannot often be received correctly.
Remedy:	(1) Ask the operator of the other party to increase the transmission level so that the image signal may be received correctly. (2) Adjust the NL equalizer so that the image signal may be received correctly.
Cause:	The mac hine malfunctioned because of an echo.
Remedy:	(1) Provide echo remedy 2. (2) Decrease the transmission level so that an echo is not received.

##0791 [TX/RX] During an ECM mode procedure, a signal other than a significant signal was received

Cause:	The procedure signal is faulty.
Remedy:	Record the protocol on a DAT or MD, and have it analyzed by the local Canon office and/or Technical Center.

##0792 [RX] In ECM reception, PPS-NULL between partial pages cannot be detected

Cause:	The line condition is poor, and PPS-NULL cannot be received.
Remedy:	(1) Ask the operator of the other party to increase the transmission level so that PPS-NULL may be received correctly. (2) Adjust the NL equalizer so that PPS-NULL may be received correctly.

##0793 [RX] In ECM reception, no effective frame was detected while signals were received at high speed, and a time-over condition occurred

Cause:	The line condition is poor, and the other party cannot receive CFR correctly.
Remedy:	(1) Increase the transmission level so that the other party may receive CFR correctly. (2) Adjust the NL equalizer so that the other party may receive CFR correctly.
Cause:	The line condition is poor, and the image signal cannot be received correctly.
Remedy:	(1) Ask the operator of the other party to increase the transmission level so that the image signal may be received correctly. (2) Ask the operator of the other party to decrease the transmission start speed.
Cause:	An echo of CFR prevents reception of the training signal.
Remedy:	(1) Provide echo remedy 3. (2) Decrease the transmission level so that an echo of the transmitted CFR will not be received.

##0795 [TX/RX] A fault occurred in decoding process during a communication

Cause:	The communication CODEC is busy.
Remedy:	(1) Turn off and then on the power. (2) Replace the image processor PCB.

CHAPTER 14

VERSION UP

1 Upgrading

1.1 Outline

The machine or its accessory is upgraded by downloading firmware from a PC or by replacing the ROM DIMM.

The firmware that may be upgraded is either of the following 3 types:

- System software (machine; ROM DIMM on image processor PCB)
- G3 multiport firmware (accessory; ROM DIMM on G3 multiport PCB)
- Finisher-L1 (accessory; ROM DIMM on finisher controller PCB)

Downloading of the system software and the G3 multiport firmware are done by way of the USB port of the image processor PCB.

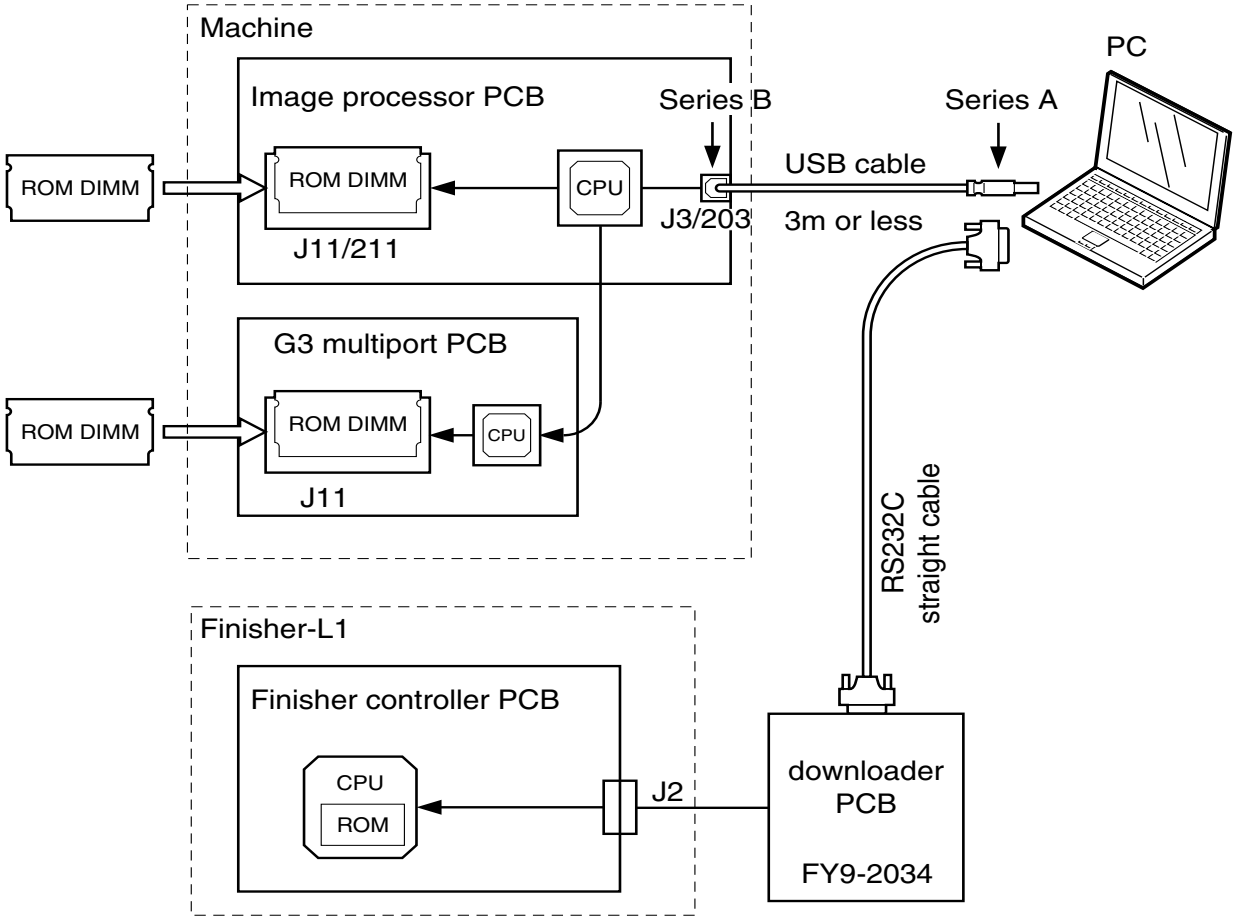
The ROM DIMM is made available as a service part, and upgrading may take place by replacing the ROM DIMM.

Downloading of the Finisher-L1 is done by connecting a PC to the finisher controller PCB by way of downloader PCB.

The ROM is built into the CPU, which is directly soldered to the finisher controller, and cannot be replaced in the filed.

Upgrading by replacing the ROM DIMM

Upgrading by downloading



F14-101-01

2 Upgrading by Downloading

2.1 Before Starting the Work

Prepare the following:

- PC to which the Service Support Tool (version 1.31E or later) has been installed.
  Downloading will be by way of a USB port; be sure that its OS supports SUB (Windows 98/98SE/2000).
  You cannot use Windows 95 or Windows NT, as they do not support USB.

- Firmware for downloading
  The firmware for the machine will be offered in compressed form (self-decompressing).
  USB cable

- USB cable (connector type: Series A - SeriesB)
  You will need a USB cable for downloading the system software.

- Downloader PCB (FY9-2034)
  You will need the downloader PCB for downloading for the Finisher-L1.

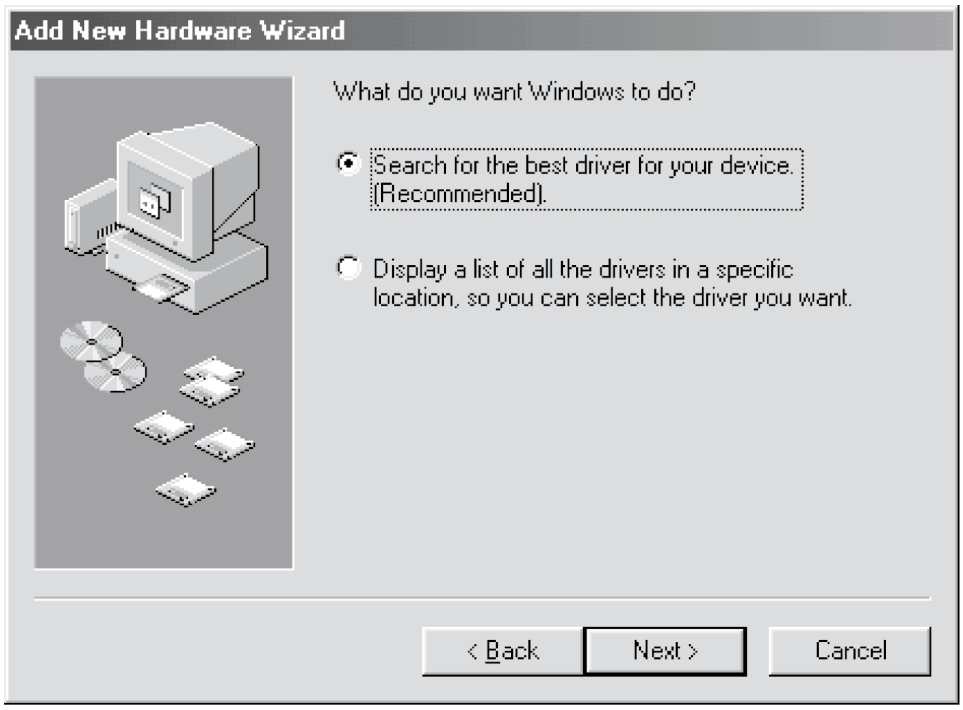
2.2 Installing the USB Driver (only if Windows 98 or Windows 98SE)

To connect the machine to a PC, you must install a USB driver to the PC. (This is required when you first connect the machine to a PC running on Windows 98 or 98SE. Once done, it need not be done for a second time. You may also skip it if Windows 2000 is used.)

1) Connect the PC to which the Service Support Tool (Ver. 1.31E or later) has been installed to the machine using a USB cable.
2) Turn on the PC and the machine in sequence.
3) When [Add New Hardware Wizard] has started up, click 'Next'.

F14-202-01

4) Select 'Search for the best driver for your device. (Recommended)', and click 'Next'.



F14-202-02

5) Select 'Specify a location', and click 'Browse'; then, select 'C:\ProgramFiles\ServiceSupportTool\inf\usbprint', and click 'Next'.

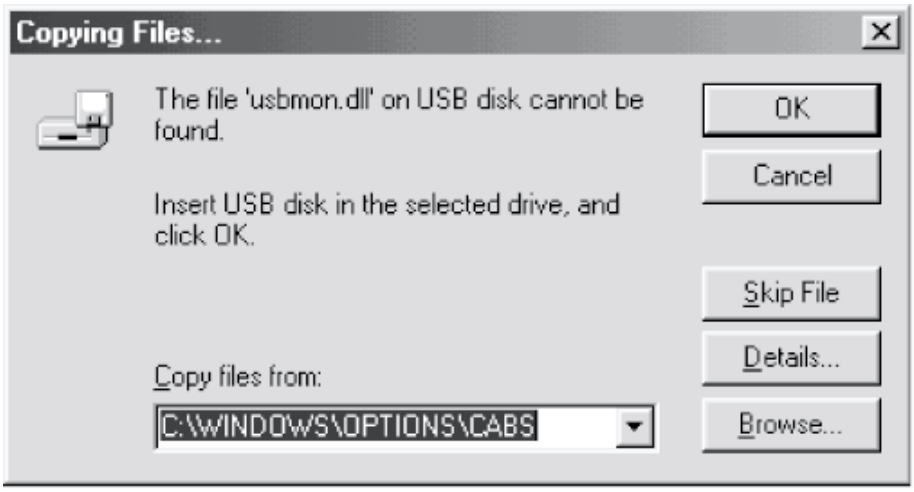
F14-202-03

After step 5), the following message box may appear.

F14-202-04

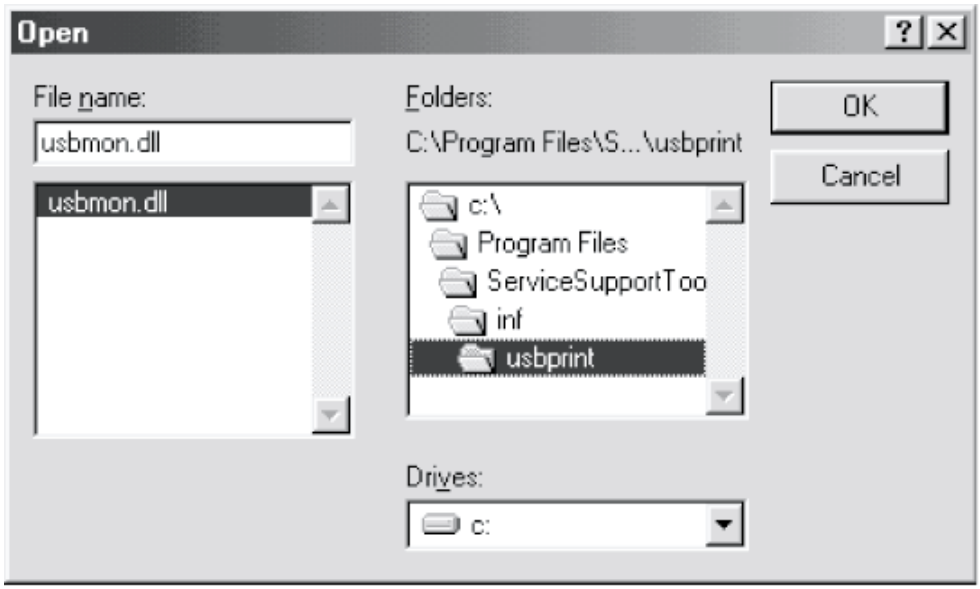
If the box appears, click the OK button; then, be sure to perform steps i) through iii). Otherwise, you may not be able to register a USB driver in the future.

i) Click the 'Browse' button.



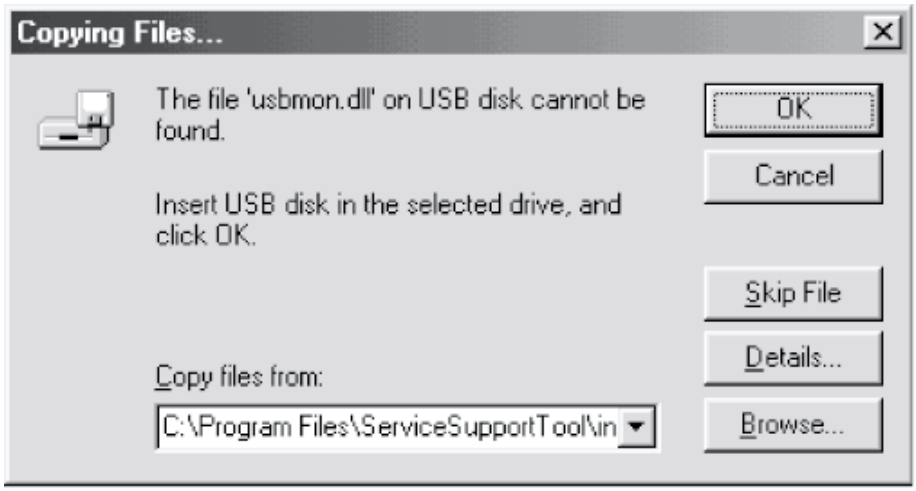
F14-202-05

ii) Move to 'C:\Program Files\service support tool\inf\usbprint', and check that the 'usbmon.dll' file has been selected. Then, press the OK button.



F14-202-06

iii) Click the OK button.



F14-202-07

6) When the screen indicates the end of installation, click 'Finish'.

F14-202-08

7) Click 'Yes' to re-start the PC.

F14-202-09

Memo

If You Cannot Install the USB Driver

You will not be able to install the USB driver to a PC (Windows 98/98SE) if you stopped the installation in the middle. (Thereafter, if you connect the PC and the machine with a USB cable and turn on the machine, you will not be able to start up the 'Add New Hardware Wizard, thus not being able to move on.)

To avoid the problem, be sure to go through steps 1 through 5 shown below. If you deleted the registry information other than the information indicated, you may not be able to start up Windows. Be sure to take full care.

1. Perform the following to back up the registry information.

1) From the Start menu, select "Run...", and type "regedit"; then, click the OK button.

2) When the Registry Editor has started up, execute "Export Registry File..." from the File menu, and store all registry files.
To return the registry files, execute " Import Registry File..." from the File menu.

2. Delete the registry information.
If any of the following registry keys exist, delete it; some PCs may not have some of these registry keys:

- "HKEY_LOCAL_MACHINE\Enum\USB\VID_04A9&PID_0000"
- "HKEY_LOCAL_MACHINE\Enum\USBPRINT\CanonCFYSA"
- all registry keys located in layers under "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\DeviceClasses\{28d78fad-5a12-11d1-ae5b-0000f803a8c2}"
- all registry keys located in layers under "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\DeviceClasses\{a5dcbf10-6530-11d2-901f-00c04fb951ed}"
- all registry keys named "USBXXX" located in layers under "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Print\Ports" (The notation "XXX" stands for any 3 numerals.)
- of the registry keys referring to printer names located in layers under "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Print\Printers", those whose port variable is "USBXXX."

3. Delete the files.
If any of the following files exist on the PC, delete them; some PCs many not have some of these files:

- "C:\Windows\INF\OTHER\Canonusbprint.inf"
- "C:\Windows\INF\DrvData.bin"
- "C:\Windows\INF\Drvidx.bin"

4. Re-start the PC.
5. Connect the PC and the machine using a USB cable, and turn on the machine's power switch. When the "Add New Hardware Wizard" has started up, start installing the USB driver.

2.3 Installing the Firmware

To start downloading, you need to install the firmware in question to the Service Support Tool; the individual pieces of firmware will be installed under the following names:

Firmware Built into the Machine
Model name:
iR1600 (if iR1600/iR2000)
iR1600US (iR1600/iR2000 120V for USA)
iR1610 (if iR1610E//iR2010)
iR1610US (iR1610F/iR2010F 120V for USA)
Unit name
Image processor PCB : System
G3 multiport PCB : G3FAX

Finisher-L1
Model name : Fin-L1
Unit name
Finisher controller PCB : CPU

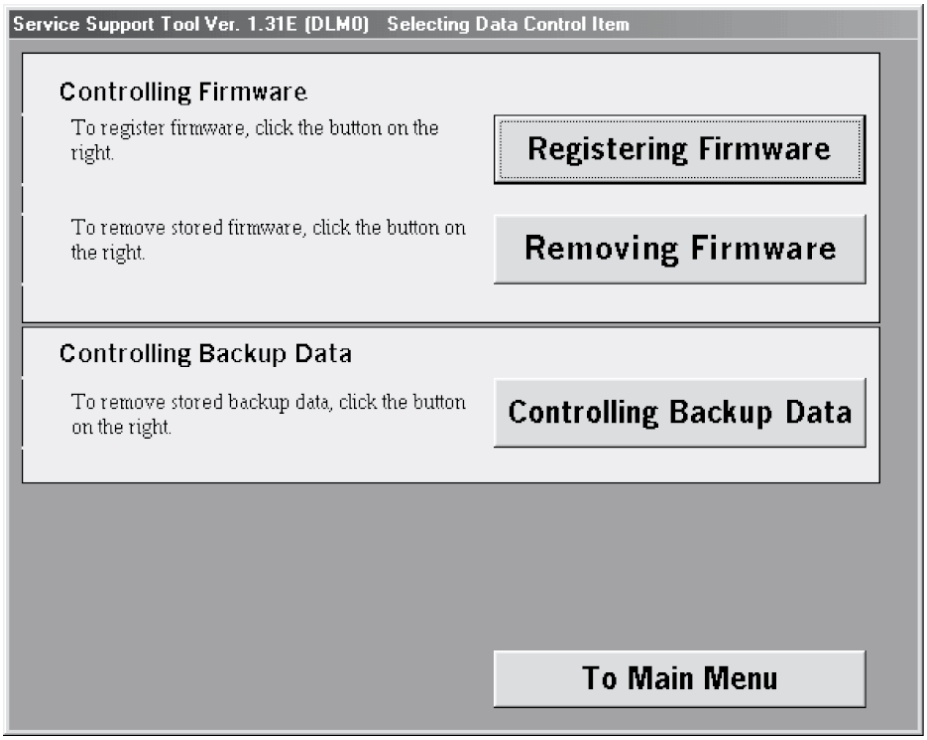
The iR1600 group (iR1600/iR2000) and the iR1610 group (iR1610F/iR2010F) use different firmware items.

When downloading firmware, select the model name for Service Support Tool as follows.

For iR1600/iR2000, select iR1600.
For iR1600/iR2000 (120V for USA), select iR1600US.
For iR1610F/iR2010F, select iR1610.
For iR1610F/iR2010F (120V for USA), select iR1610US.

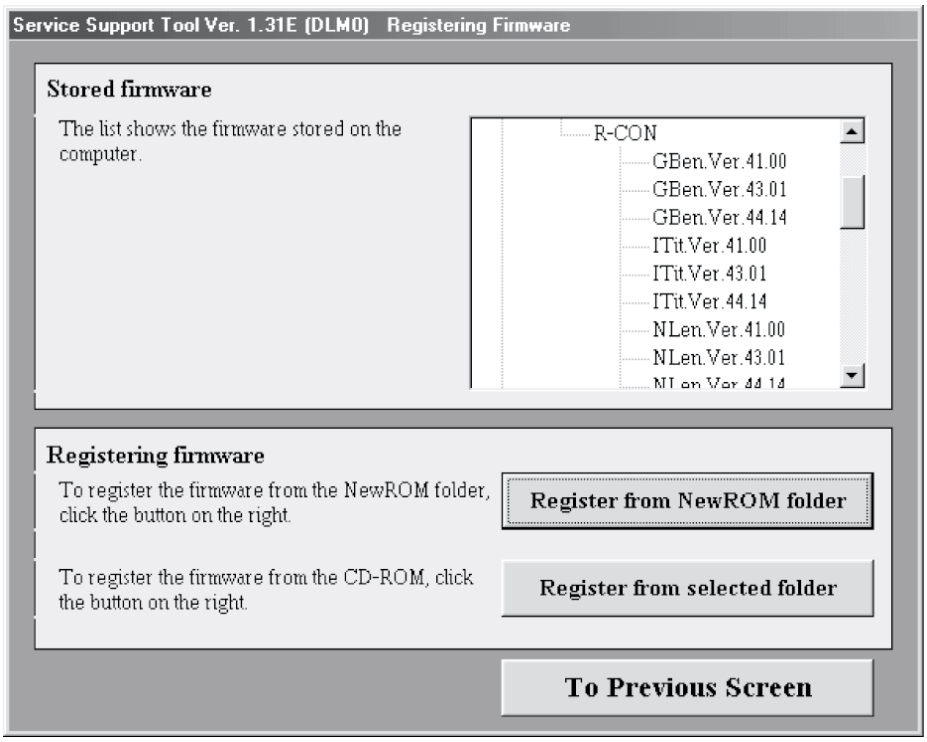
To install the system software, for example, go through the following:

1) Decompress the firmware, and store it in the NewROM folder.
   The firmware is offered in self-decompression form. Click the file (obtained using Explorer) so that it will decompress on its own.
   Its destination will be the following folder, which is created when the Service Support Tool is installed using default settings:
   C:\ServTool\NewROM
2) Start up the Service Support Tool.
3) Click 'To Next' under [Controlling Data].
4) Click 'Registering Firmware'.



F14-203-01

5) Click 'Register from NewROM folder'.



F14-203-02

6) Check to see that the firmware in question has been added to the list of firmware.

2.4 Downloading the System Software

a. Before Mounting

If you are upgrading the machine (i.e., replacing the ROM DIMM or downloading from a PC), you will have to execute 'ALL CLEAR' after mounting. Be sure to print out the stored data before you start installation or upgrading.

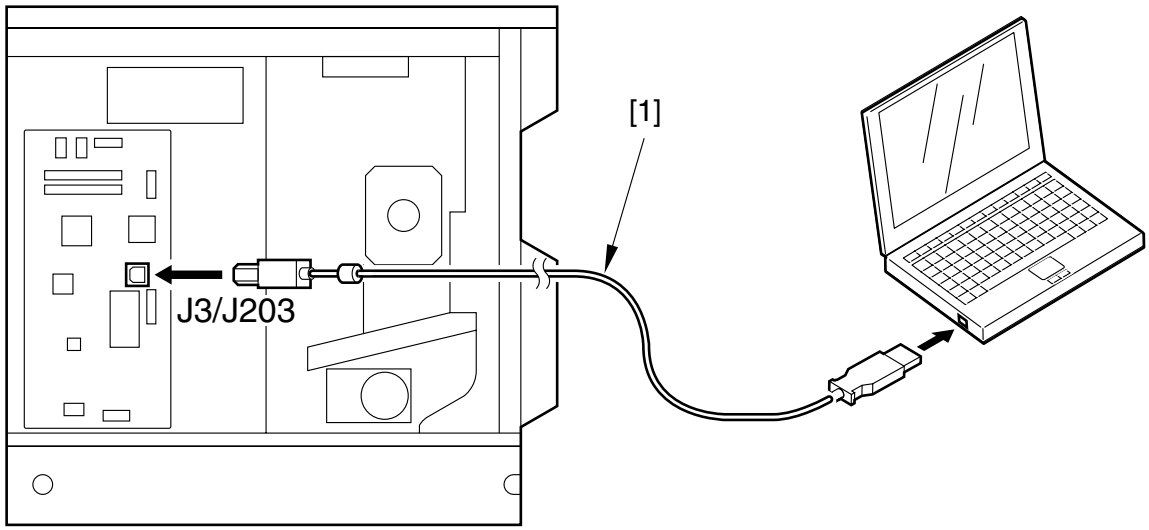
· Printing Out the Stored Data

1) If the machine is equipped with fax functions, print out a one-touch dial/speed dial/ group address list and communications control report.
2) If the machine is equipped with fax functions, print out all transmission/reception images.
3) Generating a Counter Report
   In service mode, make the following selections: #10 REPORT>COUNTER REPORT.
   The Counter Report provides the following contents:
   1. various counter data
   2. data produced as the result of changes made to factory settings (user data/service data)
   3. system dump list

b. Making Connections

To download using a USB connection, go through the following:

1) Turn off the machine.
2) Remove the rear cover, and connect the USB connector (J3/J203) on the image processor PCB and the PC using a USB cable. If a network interface board is mounted, disconnect the USB cable from the board.



F14-204-01

3) Turn on the PC, and start up the Service Support Tool.
4) Turn on the machine.

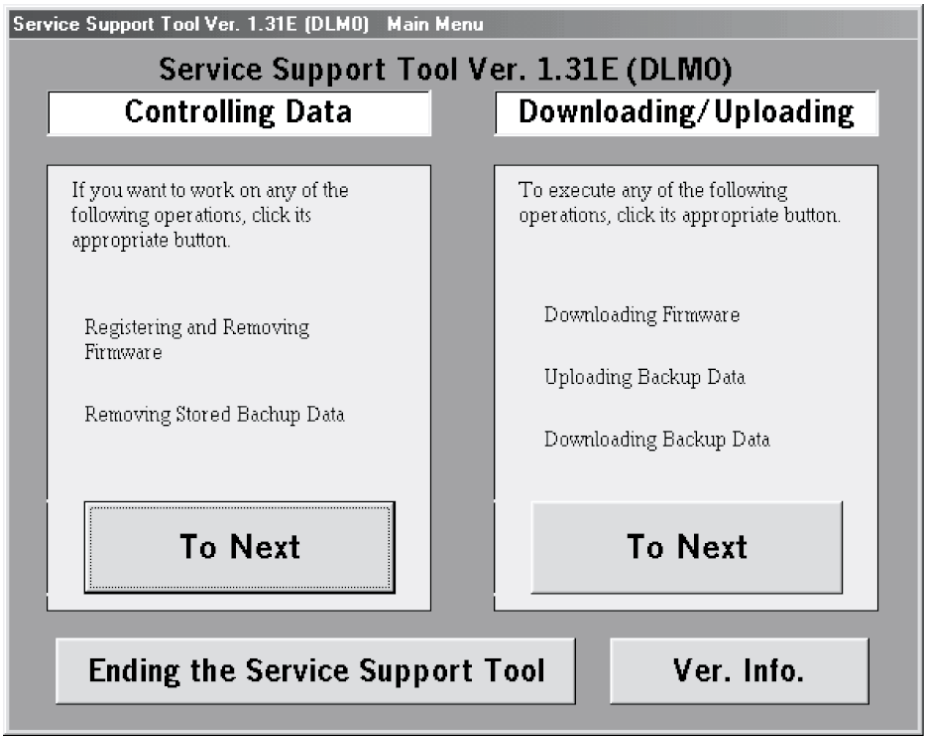
c. Downloading

The procedure of upgrading iR1600 is explained below. Note that different files must be selected for different models.

1) Turn on the power switch so that [Add New Hardware Wizard] appears; click 'Cancel'.

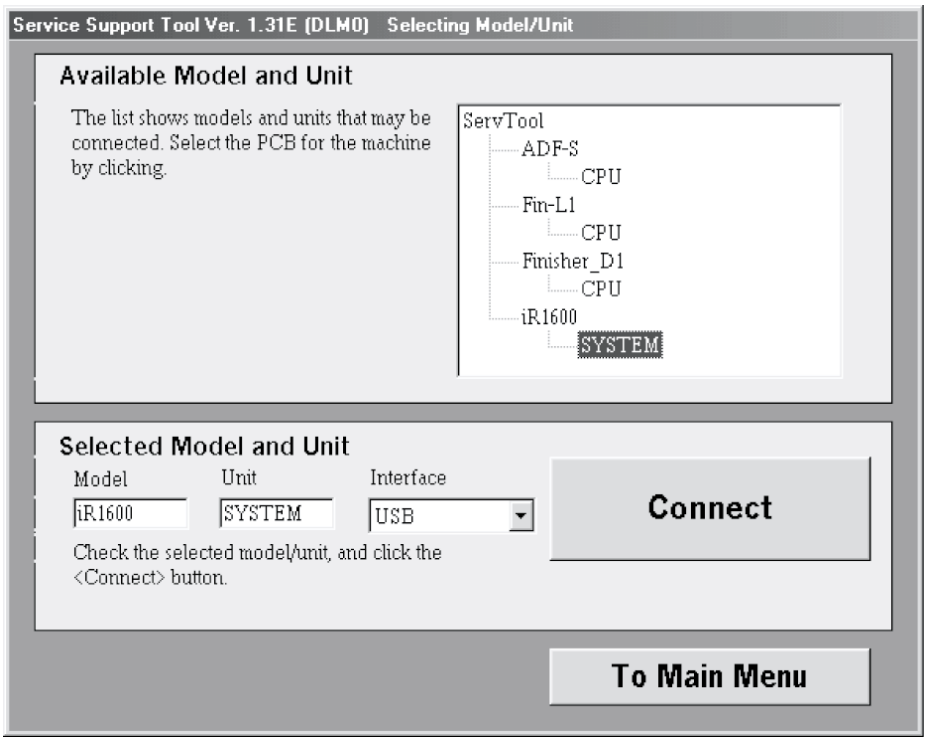
F14-204-02

2) Click 'To Next' under [Downloading/Uploading].



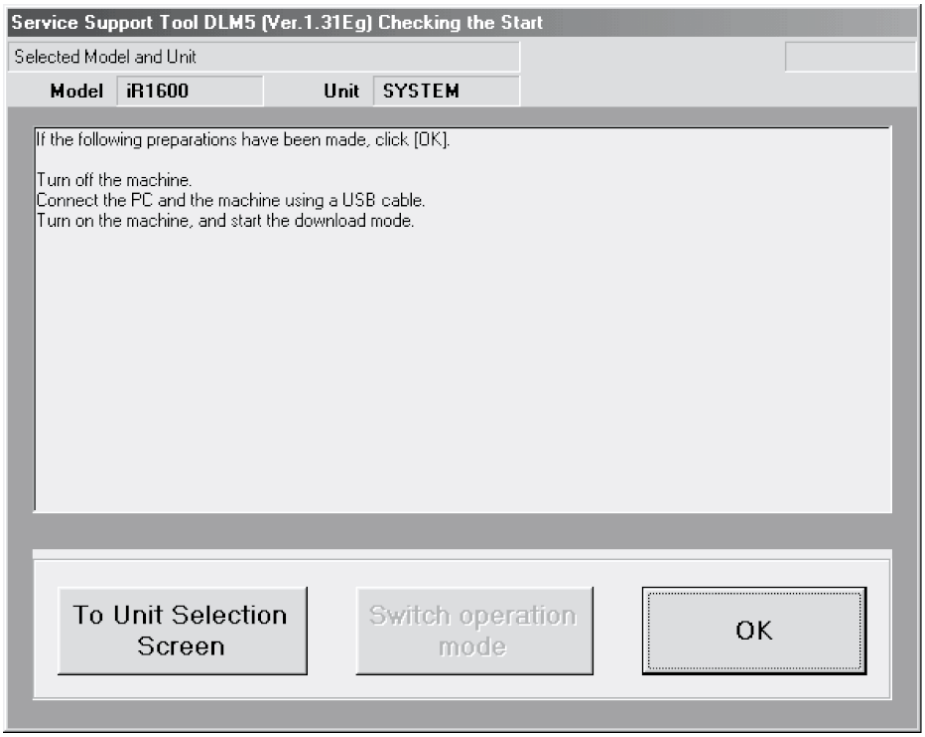
F14-204-03

3) Press the User Mode key and the # key in the control panel to start service mode.
4) Using the cursor key ◀ / ▶, select '#11 DOWNLOAD'.
5) Click 'OK' so that the machine will be in download standby mode (indicating 'DOWNLOAD CONNECTED').
6) Select 'iR1600 SYSTEM' on the PC's screen, and click 'Connect'. The discussions that follow assume the use of 'iR1600 SYSTEM' as a model.



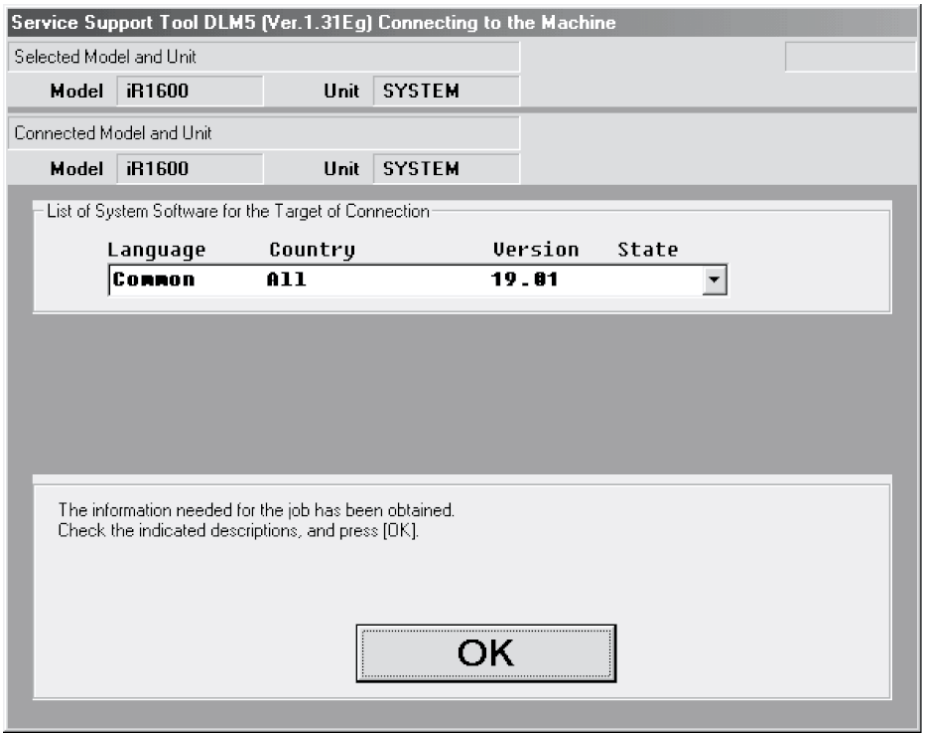
F14-204-04

7) Click 'OK' to start the connection.



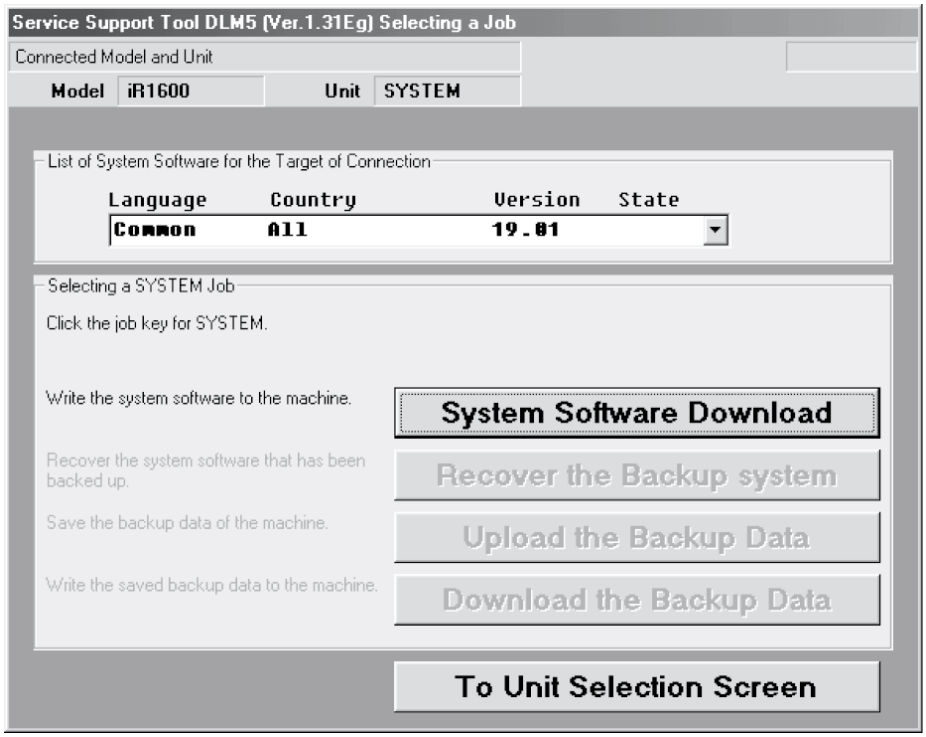
F14-204-05

8) When the connection is made, the following screen will appear; click 'OK'.



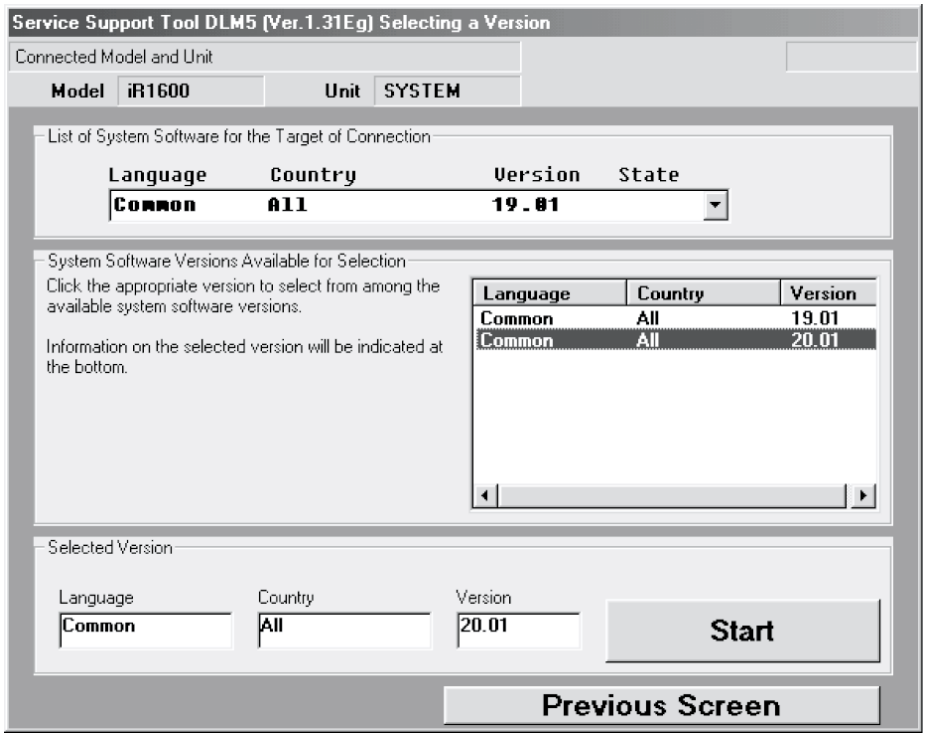
F14-204-06

9) Click 'System Software Download'.



F14-204-07

10) Select the system software to download from the list, and click 'Start' so that downloading will start.



F14-204-08

11) See that some LEDs of the machine remain ON while downloading is taking place.

Do not turn off the power or disconnect the cable while downloading from the PC is taking place. Otherwise, the ROM DIMM will no longer be usable, requiring replacement.

12) See that the machine re-starts automatically at the end of downloading. When [Add New Hardware Wizard] has started up, click 'Cancel'.

Do not turn off the power even when the transfer of firmware has ended from the PC to the machine, as the machine is likely to be deleting/writing ROM DIMM programs. If done at the wrong timing, the programs will be incomplete, preventing the machine from starting up.

13) Wait for a couple of minutes until 'OK' is displayed the display as judgment, then click the OK button.

This model urges caution to keep the power switch on while erasing or writing ROM data, by the following functions. (The indication changes depending on which of the system or G3fax firmware downloaded.)

SYSTEM: LEDs on the operator panel lights.
G3FAX: The LCD on the operator panel displays 'Don't turn off SW'.

c. After Finishing Downloading

1) Turn off the power switch of the machine.
2) Turn off the PC.
3) Disconnect the USB cable from the PC and the machine.
4) (If a network interface board is mounted, connect the USB cable to the network interface able.) Mount the rear cover.
5) Turn on the power switch of the machine.
6) Press the User Mode key and the # key in the control panel to start service mode.
7) Using the cursor key select '#13 ROM', and click 'OK'.
8) Using the cursor key check the version indicated under 'MAIN'.
9) Execute the following in service mode: #12 CLEAR>ALL.
10) Enter the following in service mode: #5 TYPE.
11) Be sure to ensure that you set the country type to suit the communication standard used in your country/region using the cursor key.
12) Press the OK key so that the entered type settings will be stored.
13) Press clear key to return the copying mode.
14) Store the data that has been cleared and data which has been returned to factory settings.

Executing 'ALL CLEAR' will not clear the various counter data and the data stored under #6 SCANNER>7 CCD in service mode; i.e., you need not store them newly.

2.5 Downloading for G3 FAX

To download G3 multiport firmware, use the steps given for downloading the system software; however, you must select the following on the Unit Select screen:

G3 multiport: G3FAX

Do not turn off the power switch before the machine automatically re-starts at the end of downloading. Otherwise, the machine will fail to start up, requiring you to replace its ROM DIMM.

Memo

As soon as the firmware has been transferred from the PC to the machine, the Result column of the Service Support Tool screen will indicate 'OK'; thereafter, the machine will start deleting/writing the programs in the ROM DIMM. Do not turn off the machine while it deletes/writes programs; otherwise, the machine will not be able to start up because of the incomplete programs.

The machine indicates the following while it deletes/writes the data in ROM to alert the operator (with the message varying depending on the firmware being downloaded):

G3FAX : "Don't Turn Off SW" (in the control panel)

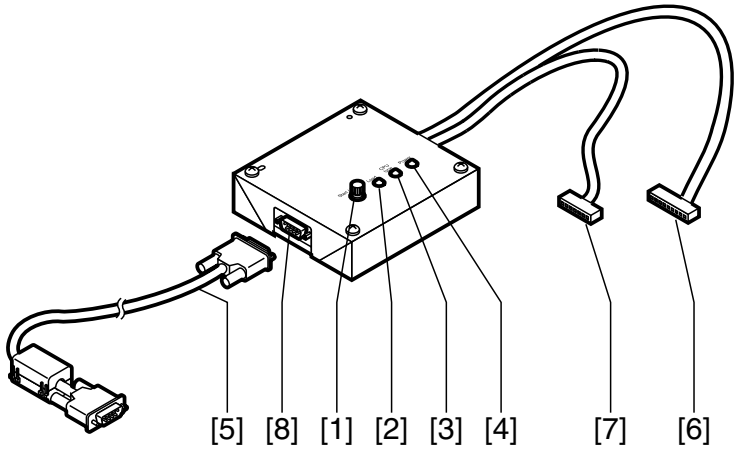
When the download ends, check the version in service mode: 'OPT' under '#13 ROM'.

2.6 Downloading for the Finisher-L1

2.6.1 Outline

To upgrade the Finisher-L1 (accessory) by upgrading the ROM on the controller PCB, use a downloader PCB (FY9-2034).

Names and Functions



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Component names and functions

Ref.	Name	Description
[1]	Start/Stop button	Press it to start/end downloading.
[2]	Load LED	Remains ON while downloading is possible.
[3]	CPU type indicator LED	Not used.
[4]	Power LED	Remains ON when the downloader PCB is supplied with power by the accessory.
[5]	RS-232C cable (straight, full-wire; 9-pin)	Used to connect the downloader PC and a PC. Be sure to connect it so that its ferrite core is on the PC side.
[6]	Cable A (9-pin; about 70 cm long)	Not used in the machine.
[7]	Cable B (7-pin; about 50 cm long)	Used to connect the downloader PCB and the controller PCB of the accessory.
[8]	RS-232C connector	Used to connect the RS-232C cable to the downloader PCB.

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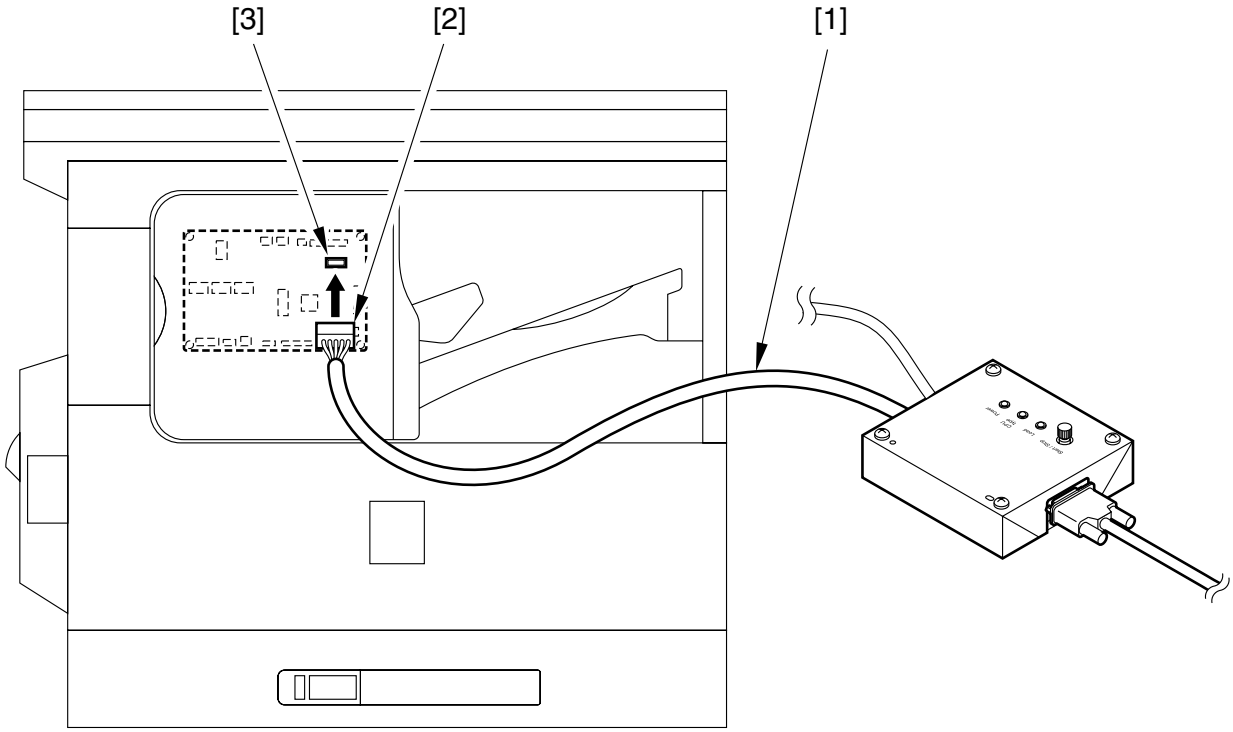
2.6.2 Downloading

a. Connecting to the Finisher

1) Turn off the power switch of the machine.
2) Remove the left front cover of the machine and the front cover of the finisher.
3) Connect the 7-pin connector [2] of the cable B [1] to the connector J2 [3] of the finisher controller PCB.

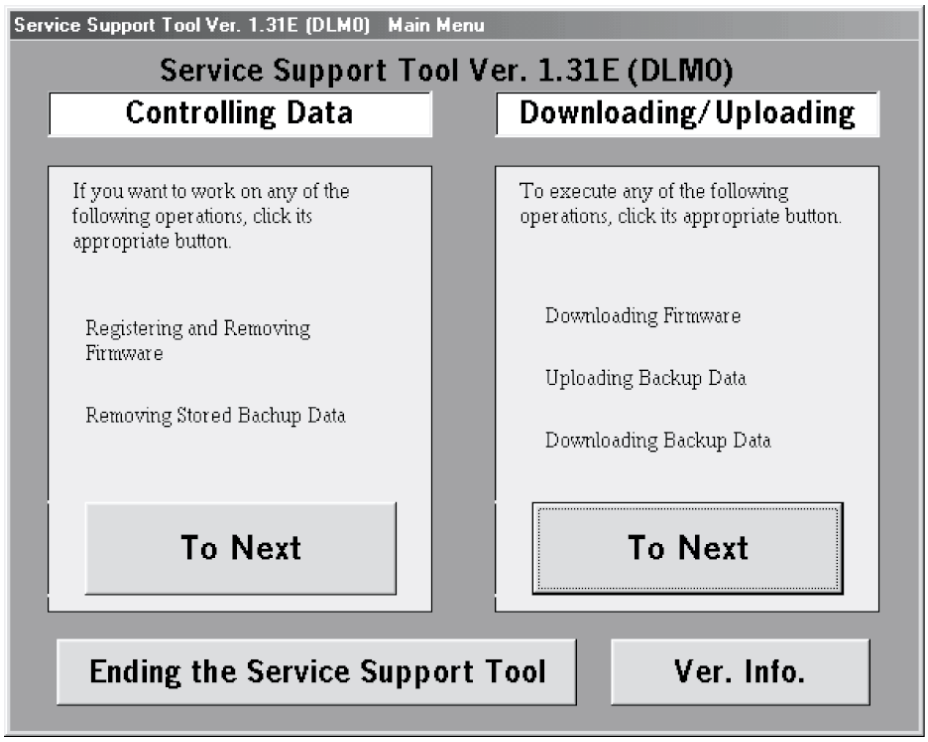


F14-206-02

4) Connect the RS-232C cable to the downloader PCB and the RS-232C connector of the PC. At this time, be sure that the ferrite core of the cable is on the PC side.
5) Turn on the PC and the machine in sequence.
6) When [Add New Hardware Wizard] has started up, click 'Cancel'.
7) Press the User Mode key and then the # key in the control panel to start service mode.
8) Using the cursor key ◀ / ▶, select '#11 DOWNLOAD'.
9) Click 'OK' so that the machine will be in download standby mode (indicating 'DOWNLOAD CONNECTED').

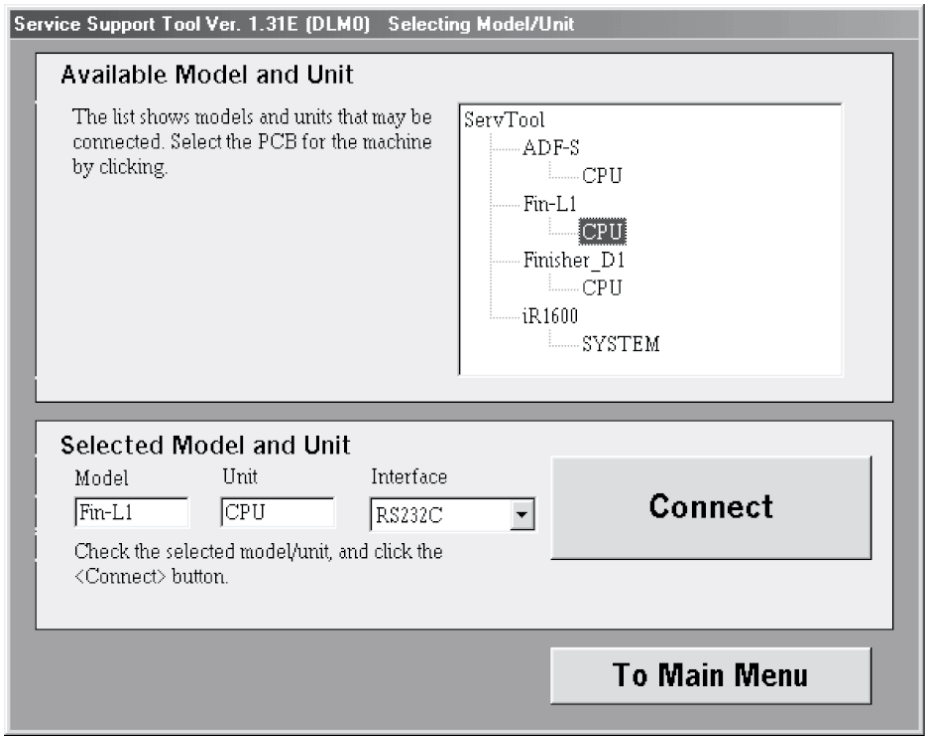
b. Downloading for the Finisher

1) Start up the Service Support Tool.
2) Click 'Next' under [Downloading/Uploading].



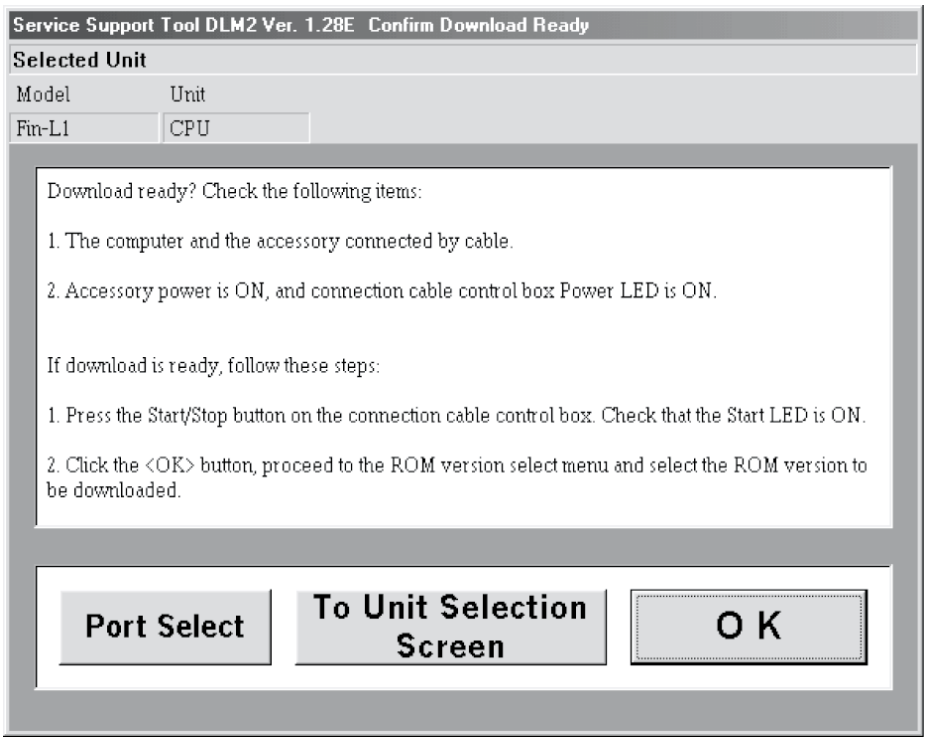
F14-206-03

3) Shift the 'Start/Stop' button on the download PCB to ON position so that the download indicator LED goes ON.
4) Select 'CPU' under 'Fin-L1' to highlight, and click 'Connect'.



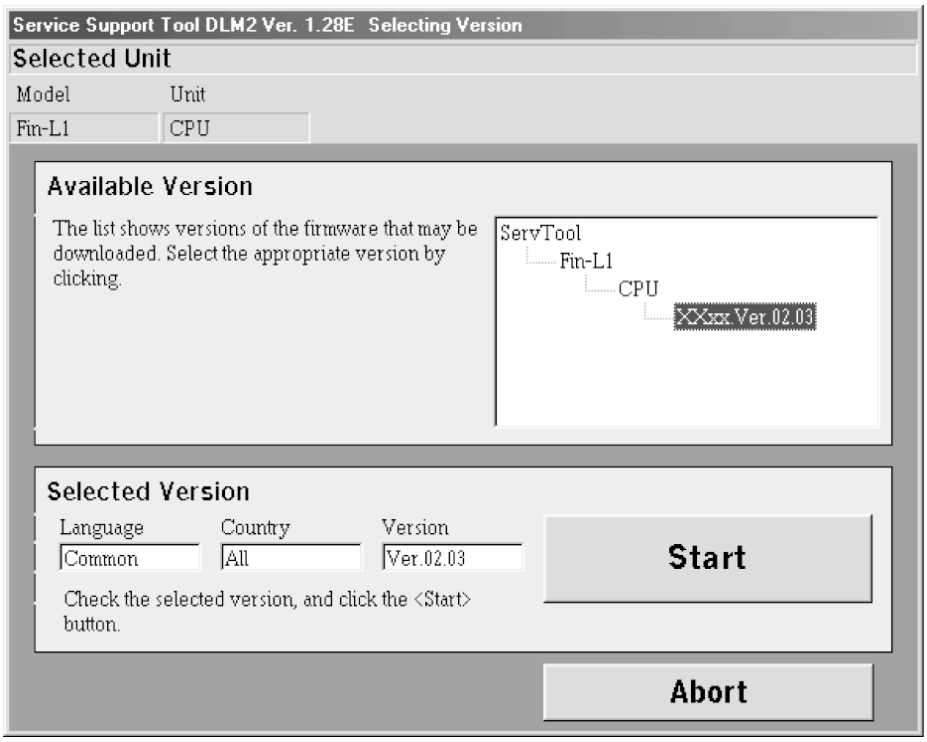
F14-206-04

5) Follow the instructions on the screen to prepare for downloading.
Check that the download indicator LED is ON, and click 'OK' to move to the next screen.



F14-206-05

6) Click the ROM version to download.



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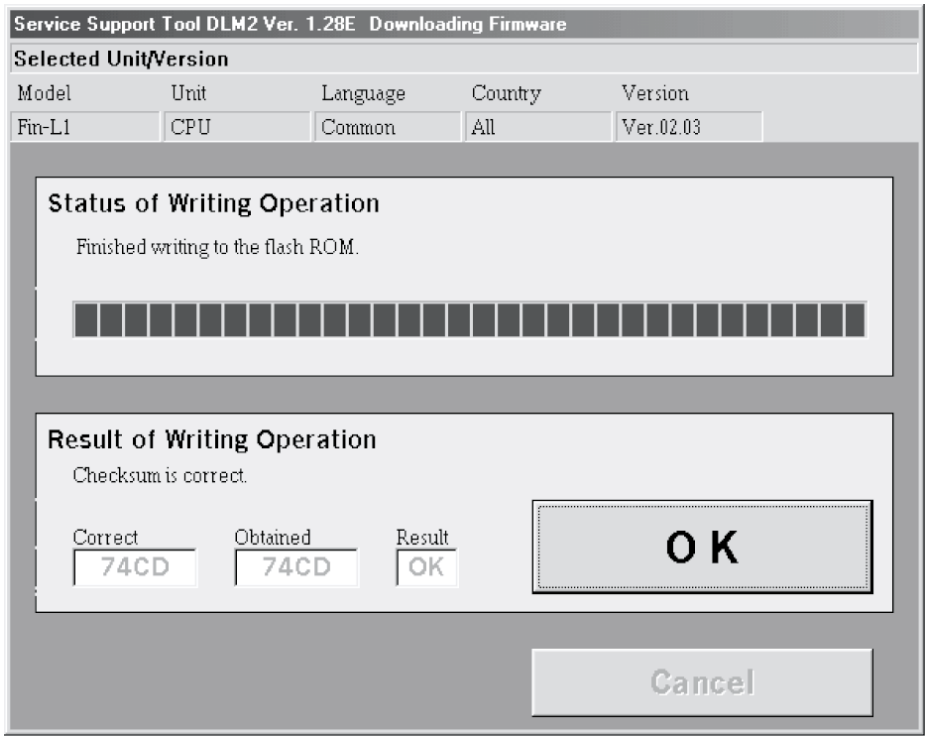
7) Click 'Start' so that the PC will start downloading programs through the downloader PCB.
8) When downloading ends, click 'OK'.



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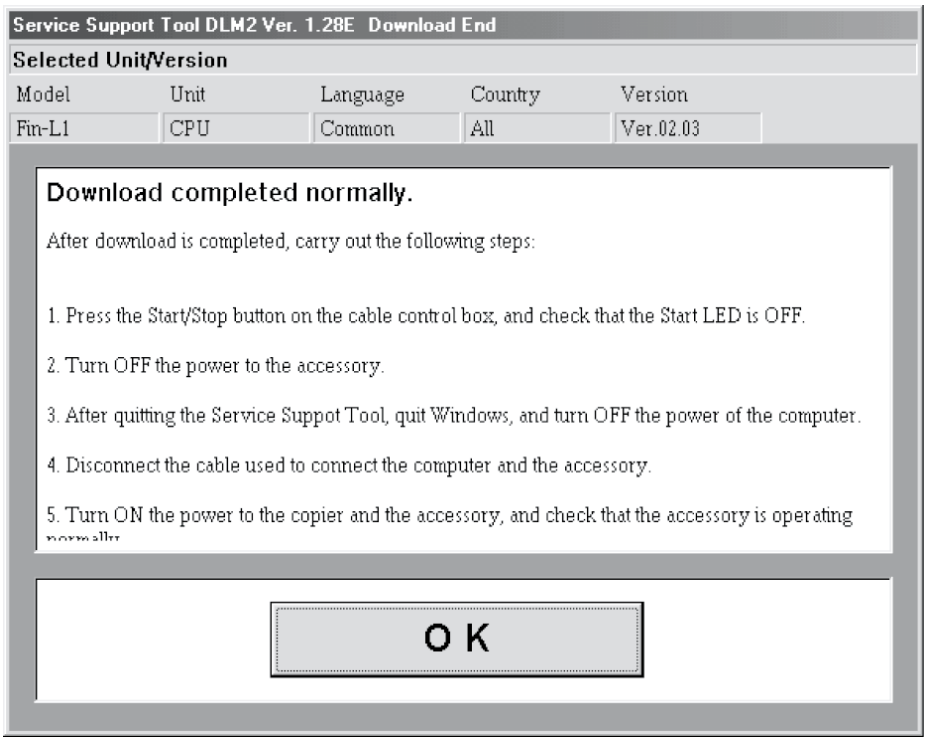
9) Go through the instructions on the screen to end the work.



F14-206-08

c. Making Checks After Downloading

1) Press the 'Start/Stop' button on the downloader PCB so that the download indicator LED goes OFF.
2) Turn off the power switch of the machine.
3) Disconnect the cable B (7-pin connector) form the connector J2 of the finisher controller PCB.
4) Mount the front cover of the finisher and the left front cover of the machine.
5) Turn on the power switch of the machine.
6) Press the Additional function key and the ID (#) key in the control panel to start service mode.
7) Using the cursor ◀ / ▶,select '#13 ROM'.
8) Using the cursor ◀ / ▶,check the version indicated under [FIN].

3 Back Up Data

3.1 Outline

Using the Service Support Tool, you can back up the data of the SRAM mounted to the image processor PCB.

The SRAM contains the following items of data:

- Service mode settings
- User mode settings (include the dial register if equipped with a fax function)
- Various machine data

Once you have backed up the data, you may write it to the main image processor PCB after replacing the PCB; or, you can simplify the work involved in entering service mode or user mode settings.

It is recommended to back up the data whenever possible using the Service Support Tool when you have updated the service mode settings or the user mode settings.


Memo

Conditions for Using the Backup Data Upload/Download Function
- The Service Support Tool installed to the PC must be 1.41E or later.
- The version of the machine system is XX-34-YY* or later.

* The notation "XX" stands for EC or US, while the notation "YY" are any 2 numerals.

3.2 Backing Up Data

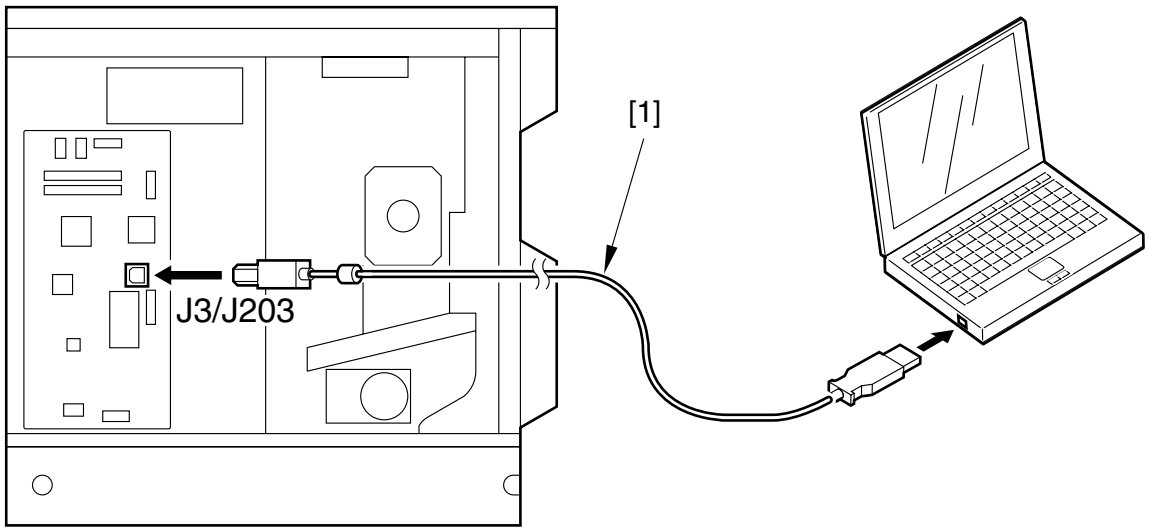
3.2.1 Making Preparations

- Install the system software to the Service Support Tool, making sure that its version is the same as that of the machine in question.
- Check to make sure that the machine's online indicator is OFF.
- Turn off the machine's main power switch, and disconnect the power plug; as necessary, disconnect the network cable.

3.2.2 Making Connections

To download using a USB connection, go through the following:

1) Turn off the machine.
2) Remove the rear cover, and connect the USB connector (J3/J203) on the image processor PCB and the PC using a USB cable. If a network interface board is mounted, disconnect the USB cable from the board.

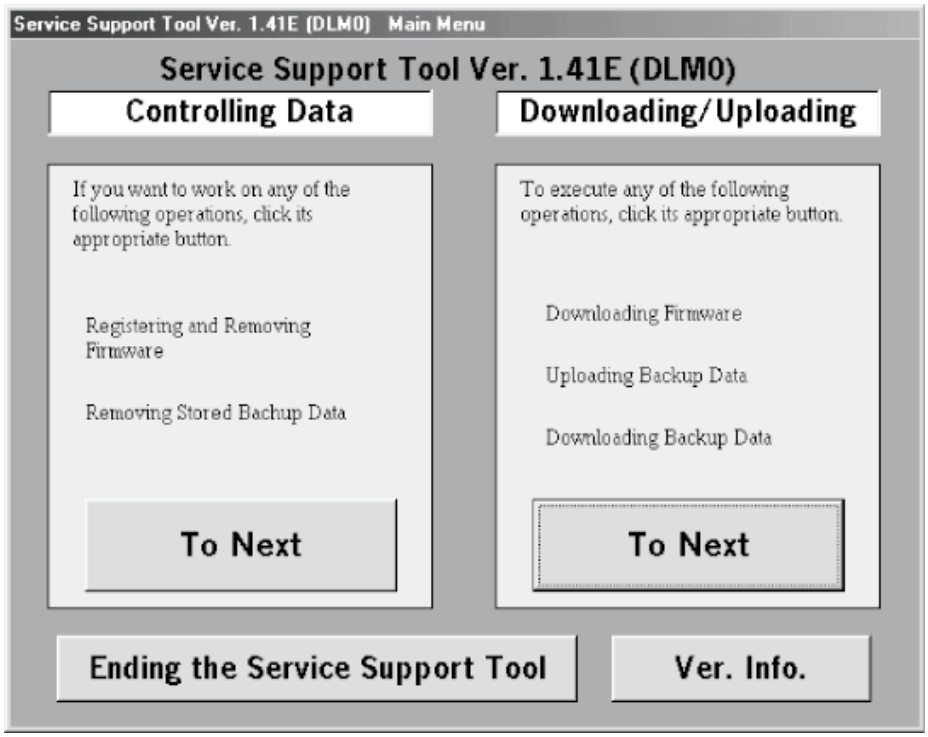


F14-302-01

3) Turn on the PC, and start up the Service Support Tool.
4) Turn on the machine.
5) Press the Additional Functions key and the #/ID(#) key in the control panel to start service mode.
6) Using the cursor key, select '#11 DOWNLOAD'.
7) The machine will be in download standby mode (indicating 'DOWNLOAD CONNECTED').

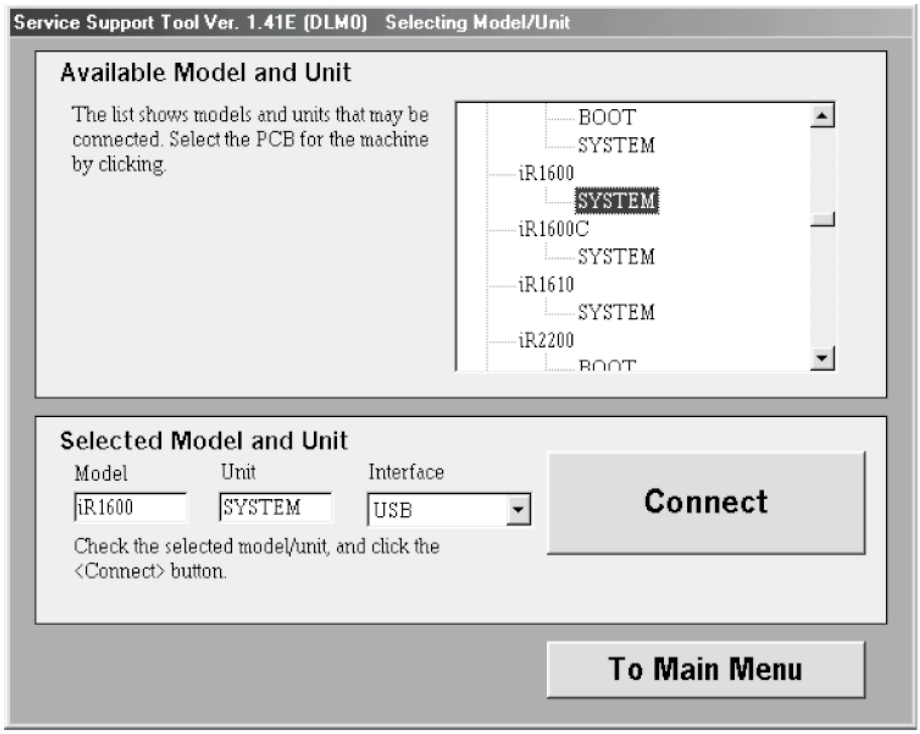
3.2.3 Backing Up Data

1) Under 'Downloading/Uploading', select 'To Next'.



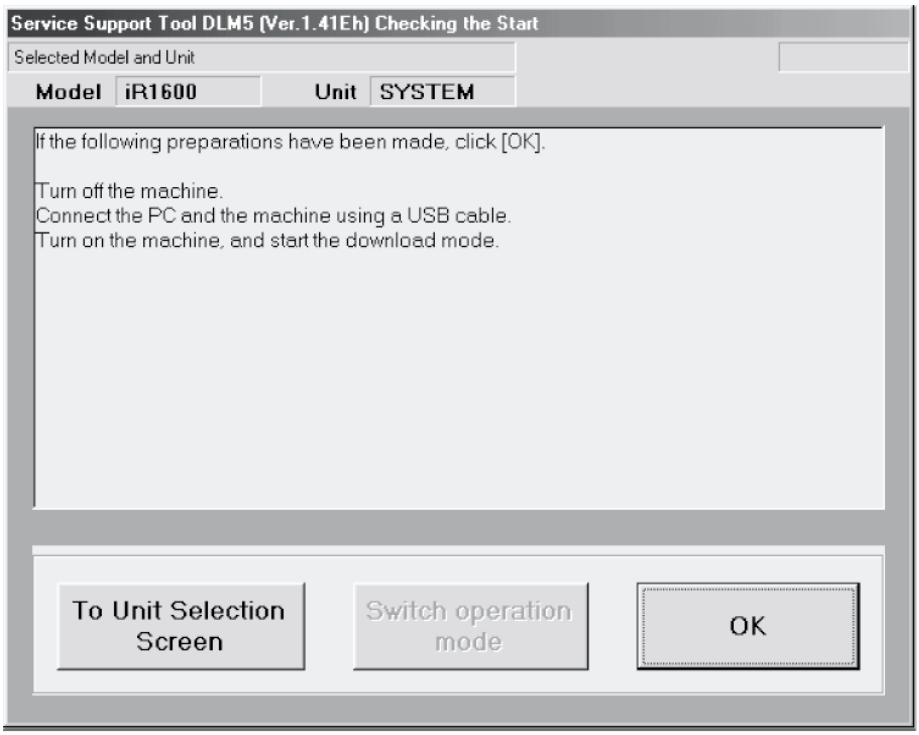
F14-302-02

2) Select 'SYSTEM', and select 'Connect'.



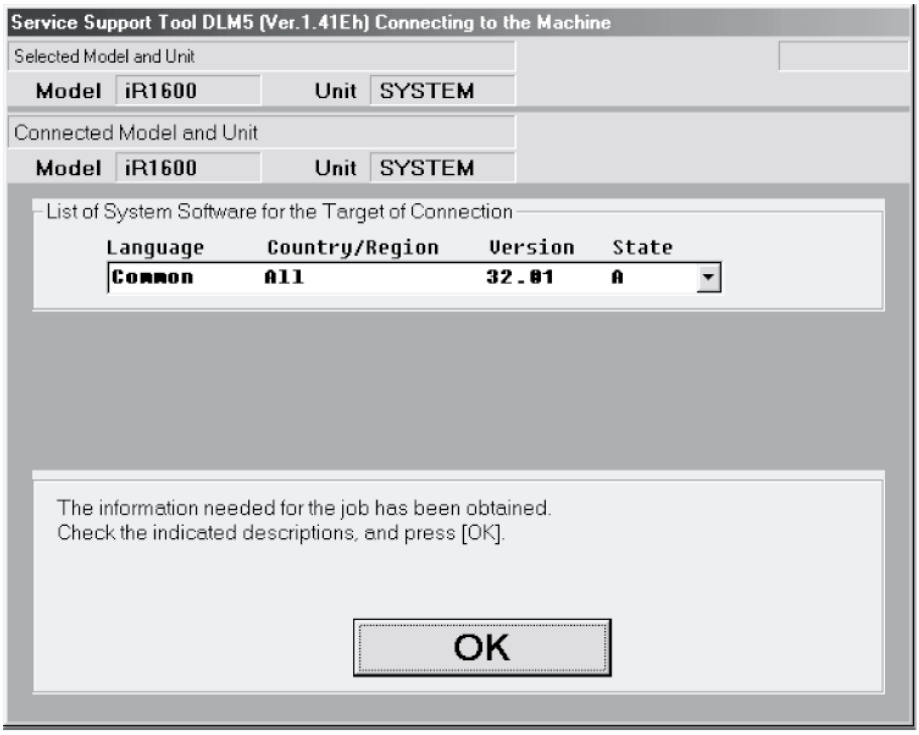
F14-302-03

3) Click 'OK' to start connection.



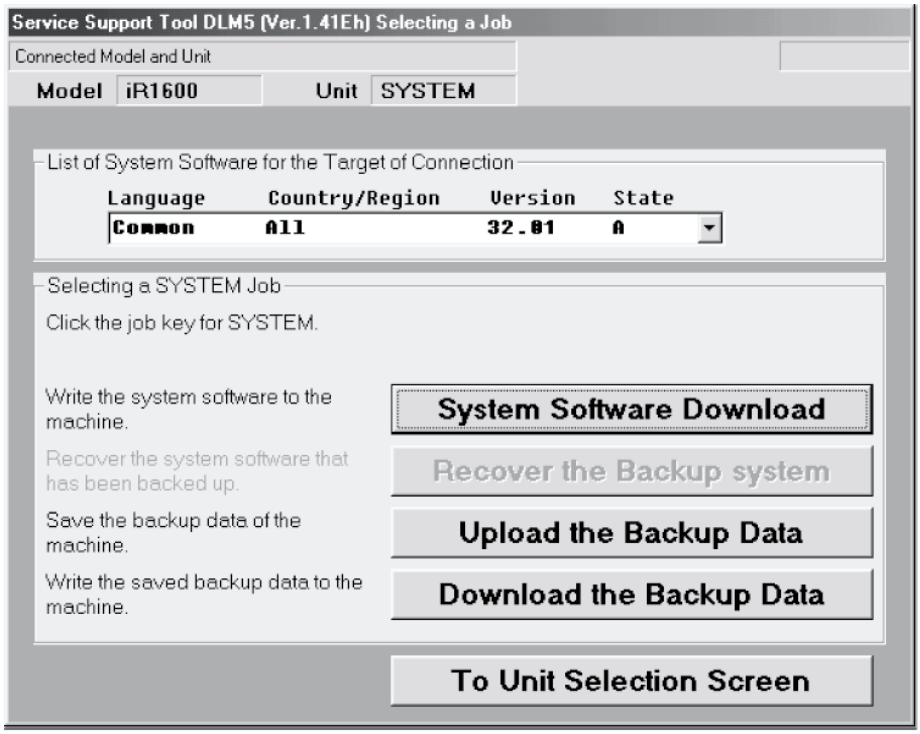
F14-302-04

4) When connection is done, the following screen appears. Click 'OK'.



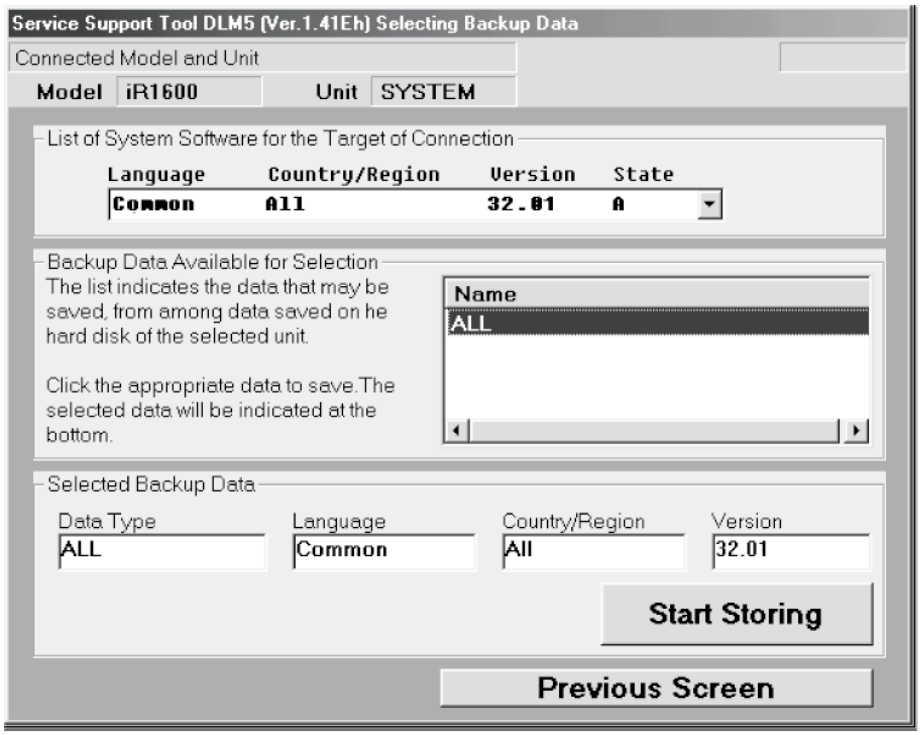
F14-302-05

5) Select 'Upload the Backup Data' on the Service Support Tool screen.



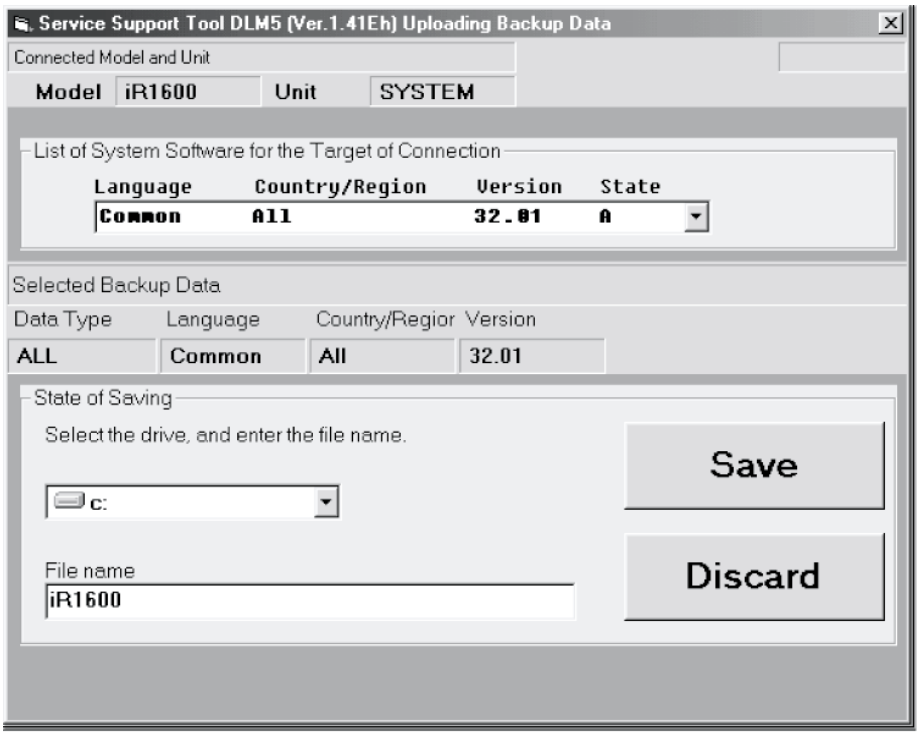
F14-302-06

6) Select 'ALL', and select 'Start Storing'.



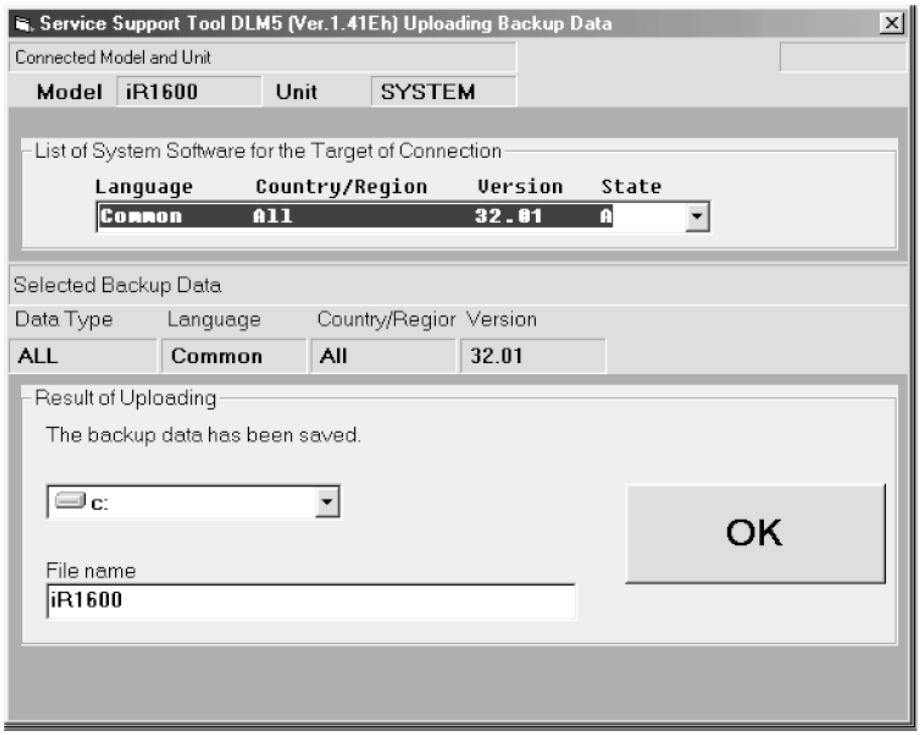
F14-302-07

7) See the progress bar, indicating the progress of the save operation.
8) Select the drive to save the data to, and enter the file name; the, select 'Save'.



F14-302-08

9) When the selected file has been stored on the selected drive, the following screen will appear; make the following selections to end the Service Support Tool:
OK>To Unit Selection Screen>OK>To Main Menu>Ending the Service Support Tool>End.

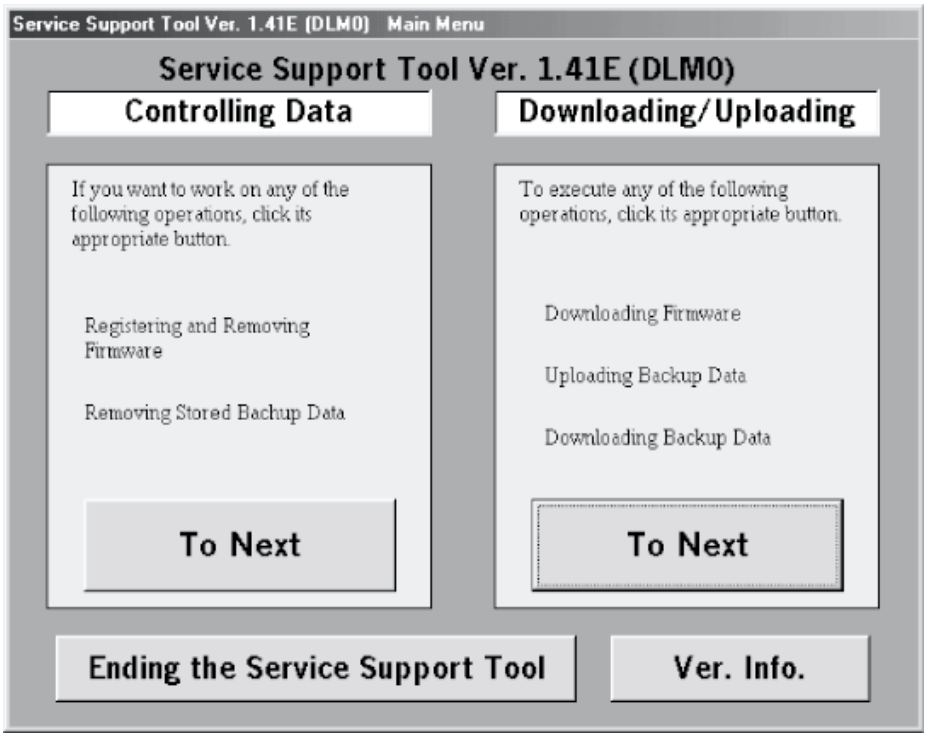


F14-302-09

10) Press the stop key or the reset key to start standby mode.

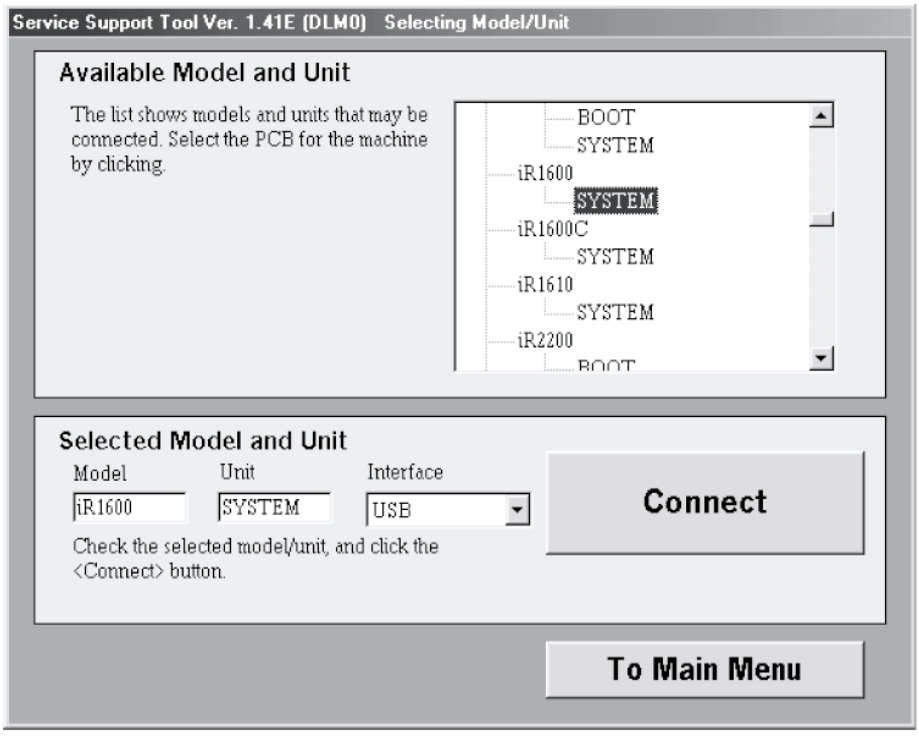
3.2.4 Downloading Backup Data

1) Under 'Downloading/Uploading', select 'To Next'.



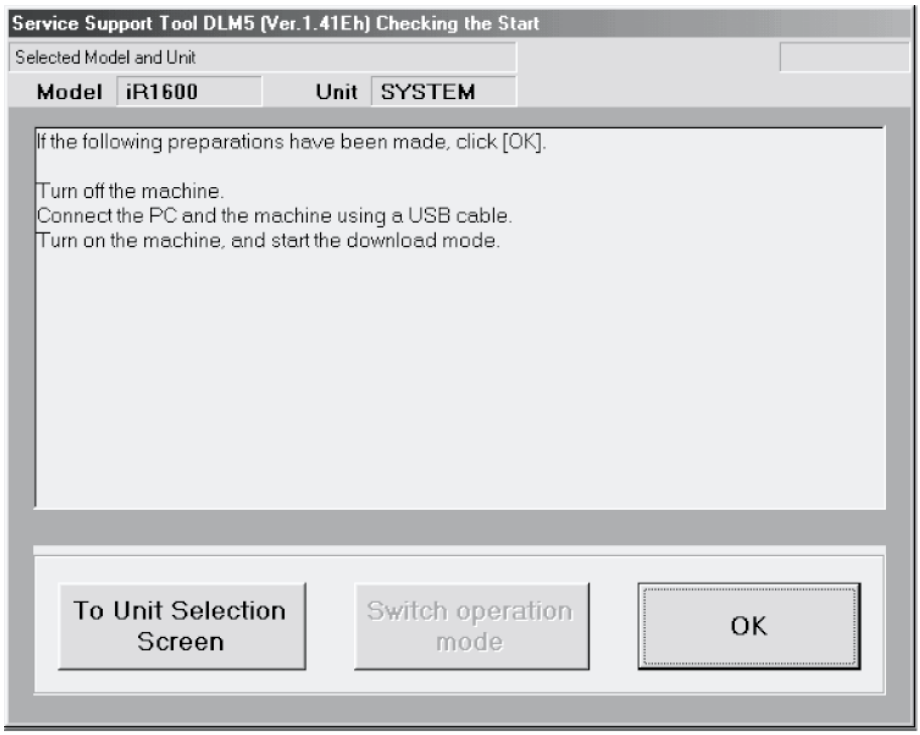
F14-302-10

2) Select 'SYSTEM', and select 'Connect'.



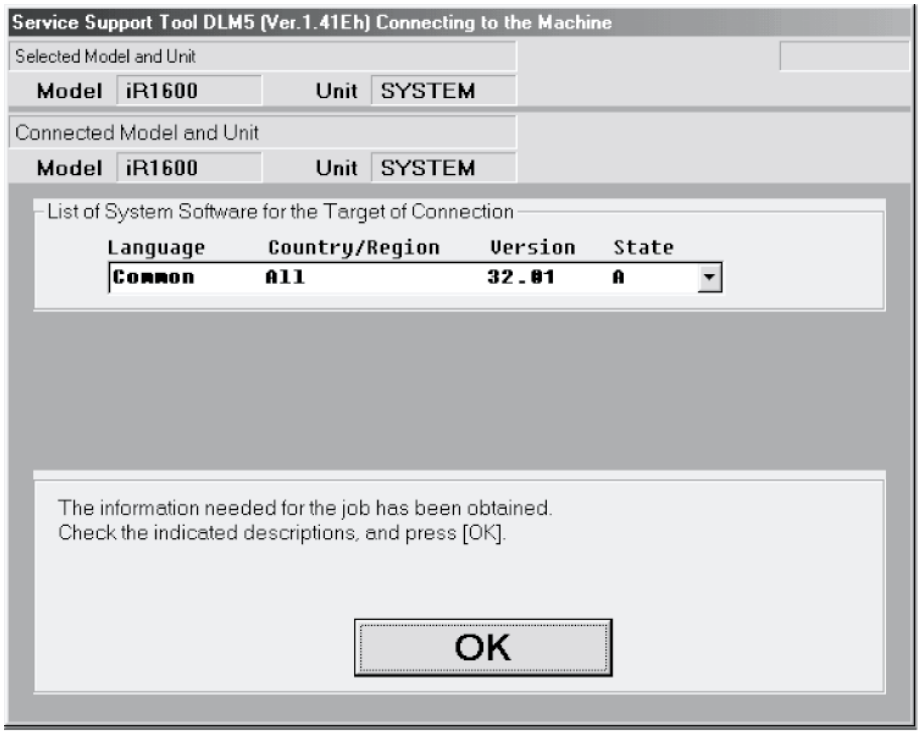
F14-302-11

3) Select 'OK', and start connection.



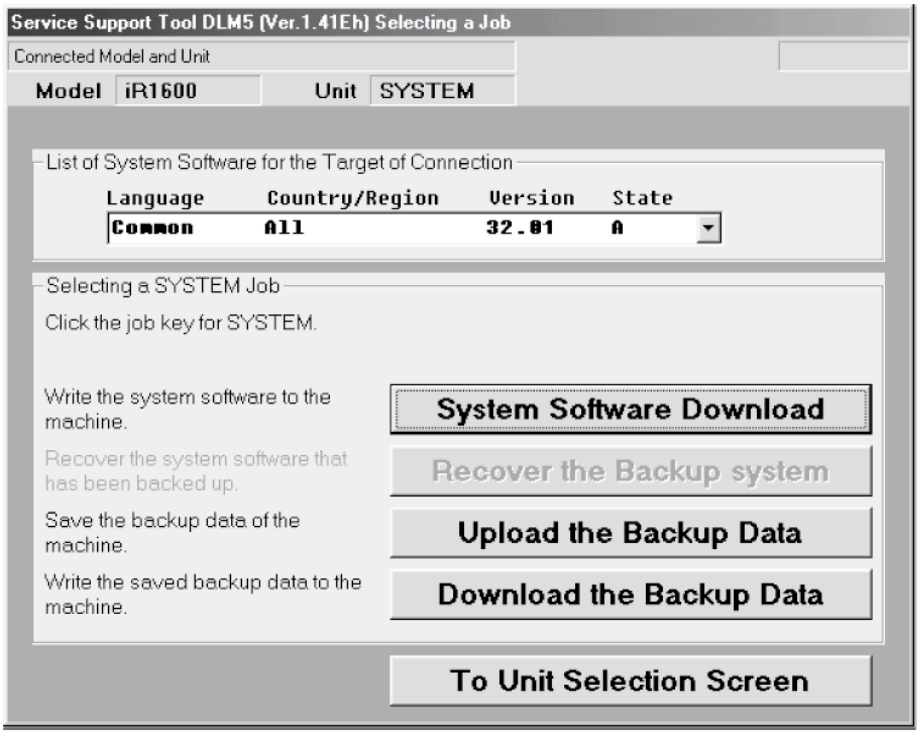
F14-302-12

4) When connection is done, the following screen appears. Click 'OK'.



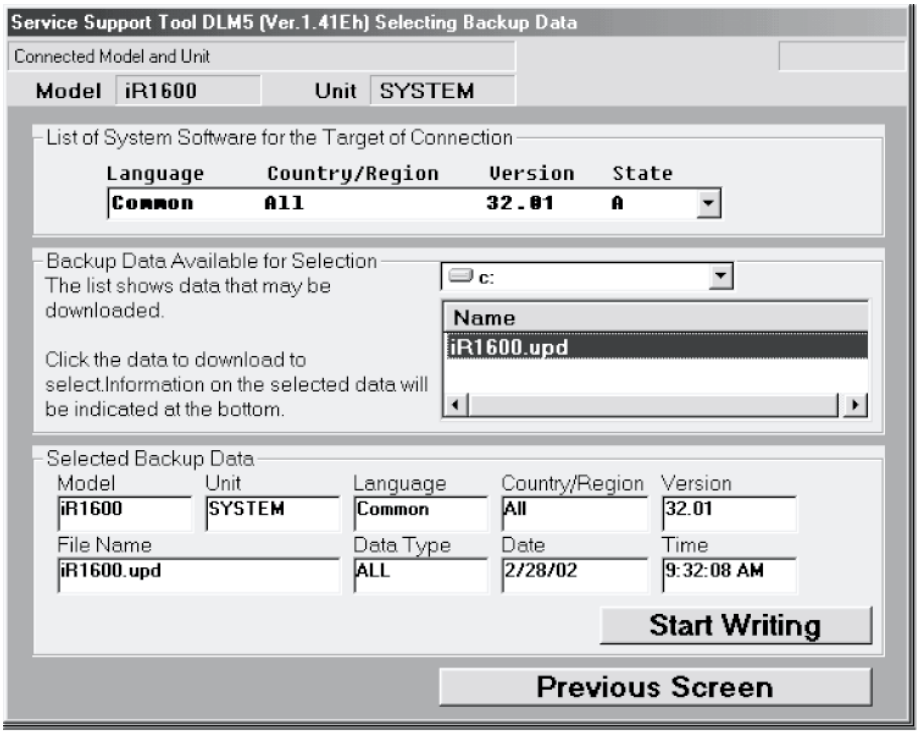
F14-302-13

5) Select 'Download the backup Data'.



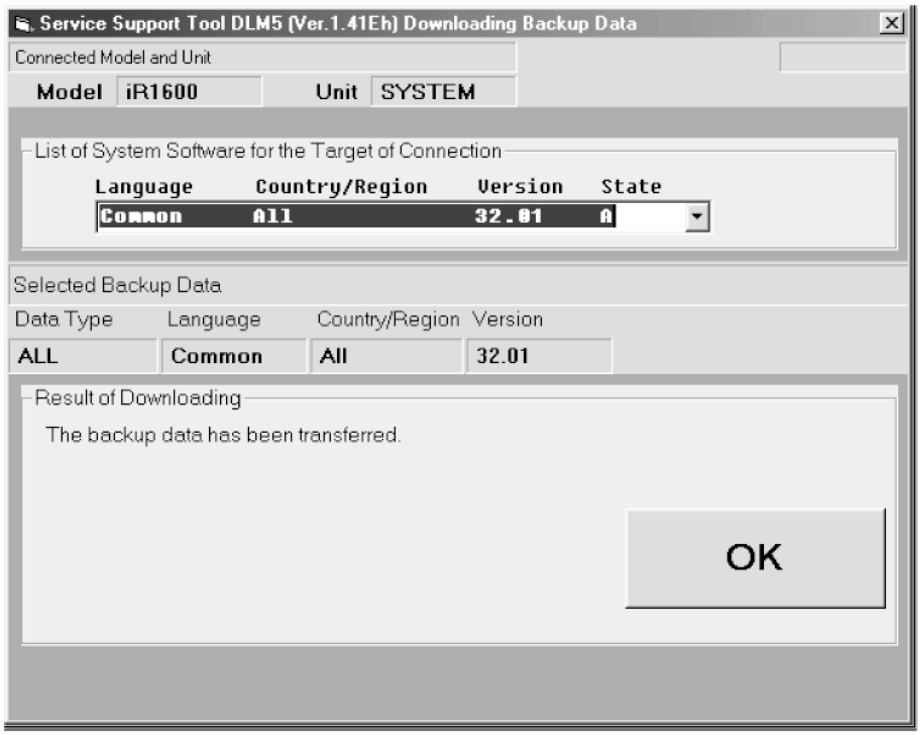
F14-302-14

6) Select the file to download, and select 'Start Writing'.



F14-302-15

7) See the progress bar, indicating the progress of the downloading operation. At the end, the following screen will appear. Select 'OK'.



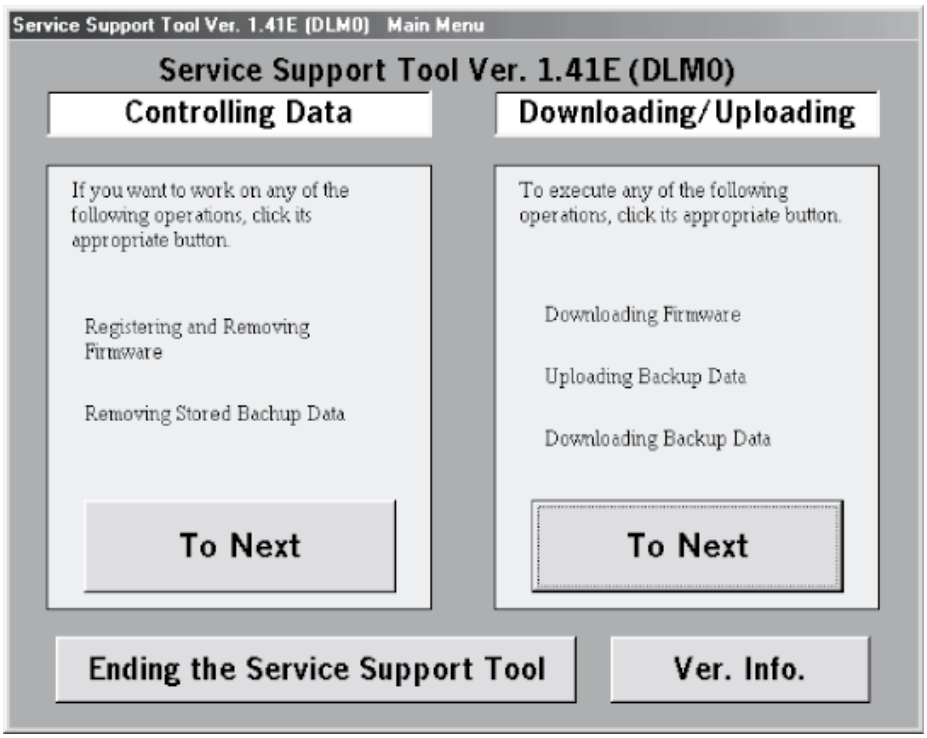
F14-302-16

8) Make the following selections to end the Service Support Tool:
To Unit Selection Screen>OK>To Main Menu>Ending the Service Support Tool>End.
9) Press the stop key or the reset key to start standby mode.

3.2.5 Managing Backup Data

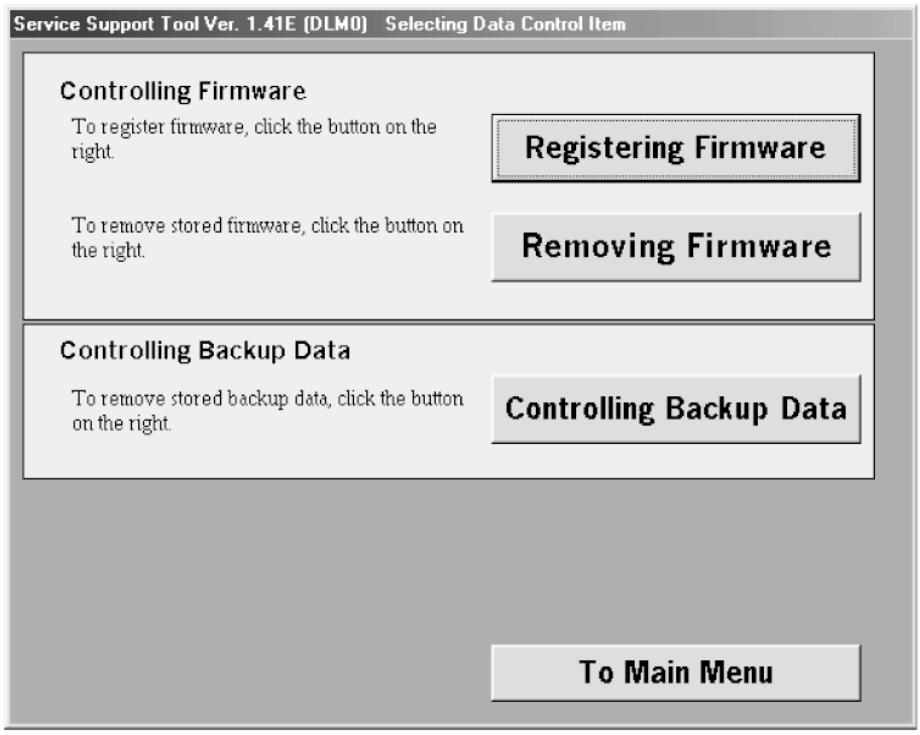
You can delete backup data that has become obsolete as follows:
You need not connect a PC to the machine to do so.

1) Under 'Controlling Data', select 'To Next'.



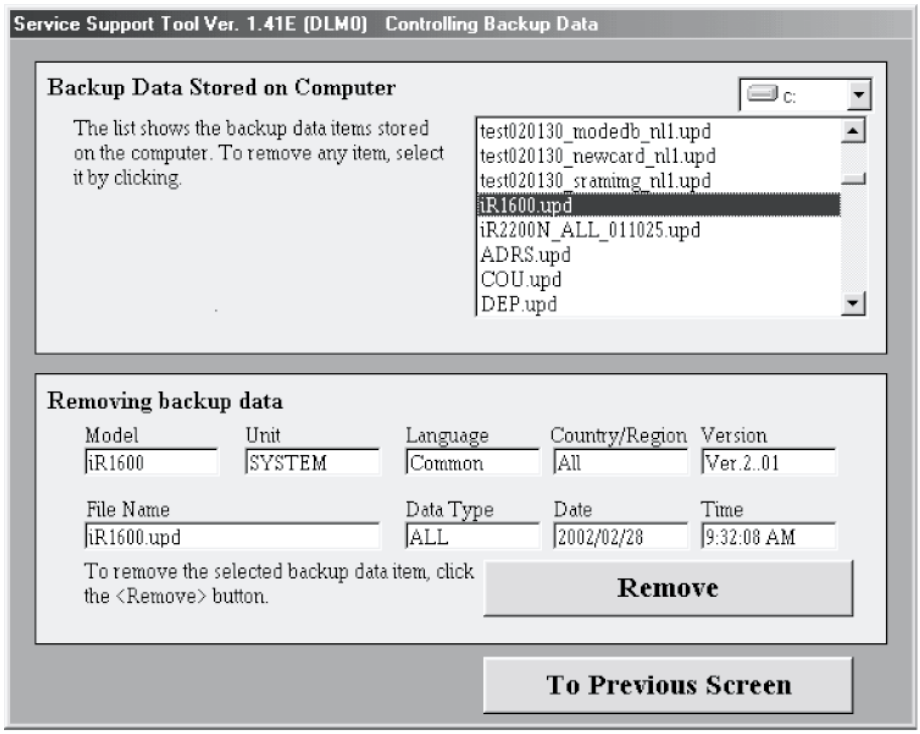
F14-302-17

2) Select 'Controlling Backup Data'.



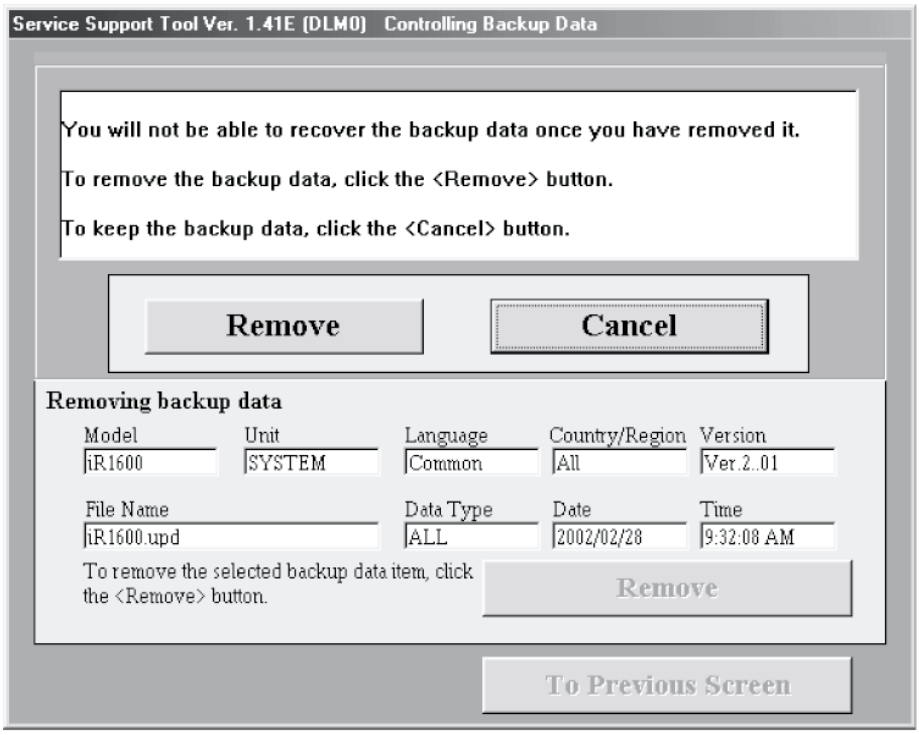
F14-302-18

3) Select the file to delete from the list of 'Backup Data Stored on Computer'; then select 'Remove'.



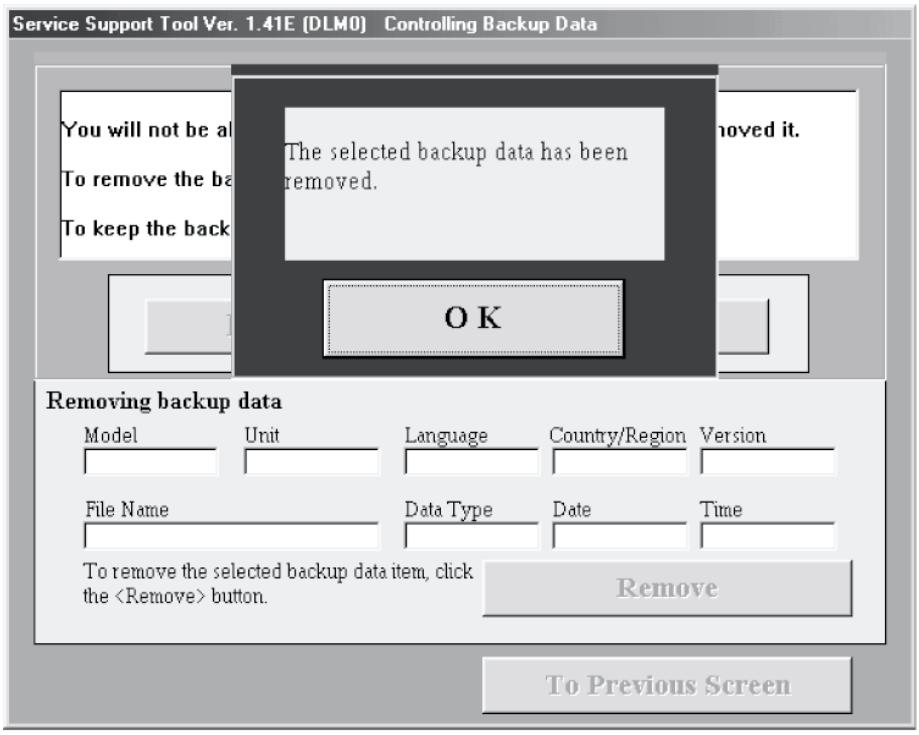
F14-302-19

4) When the Delete Check screen appears, check the description for the selected file, and select 'Remove'.



F14-302-20

5) When the Delete Finish screen appears, click 'OK'. Make the following selections to end the Service Support Tool: Return to Previous Screen>Return to Main Menu>Ending the Service Support Tool>End.

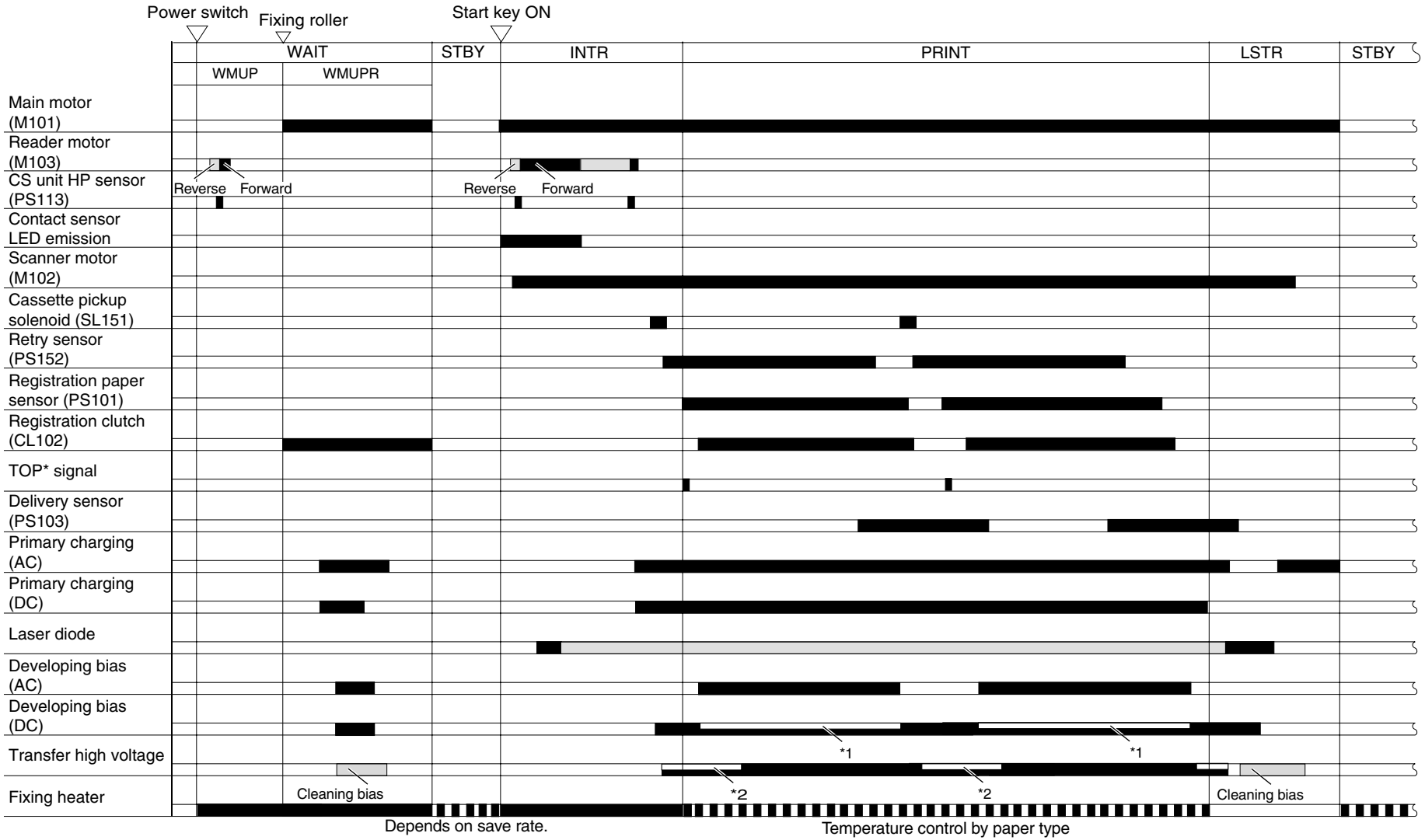


F14-302-21

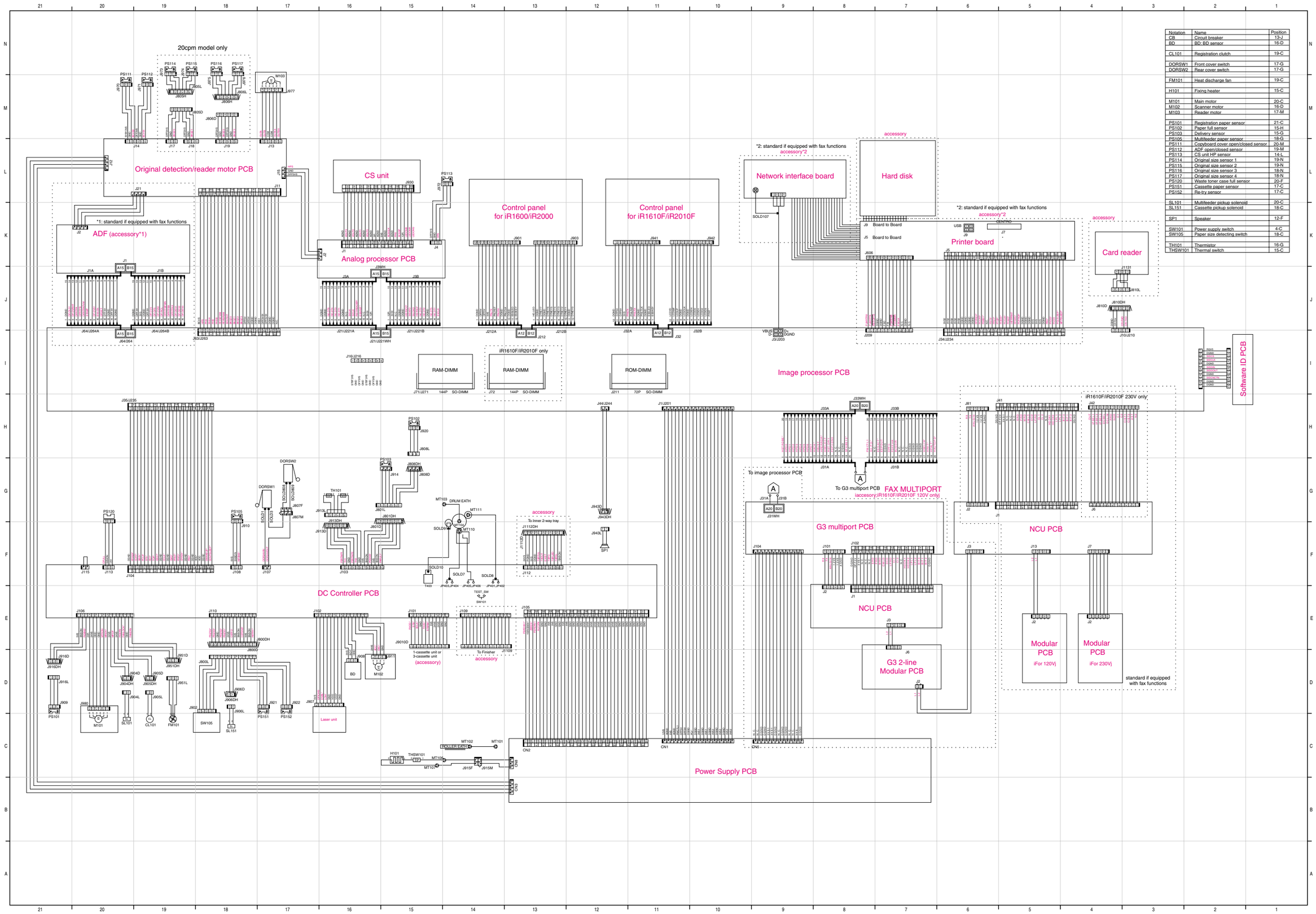
APPENDIX

A General Timing Chart

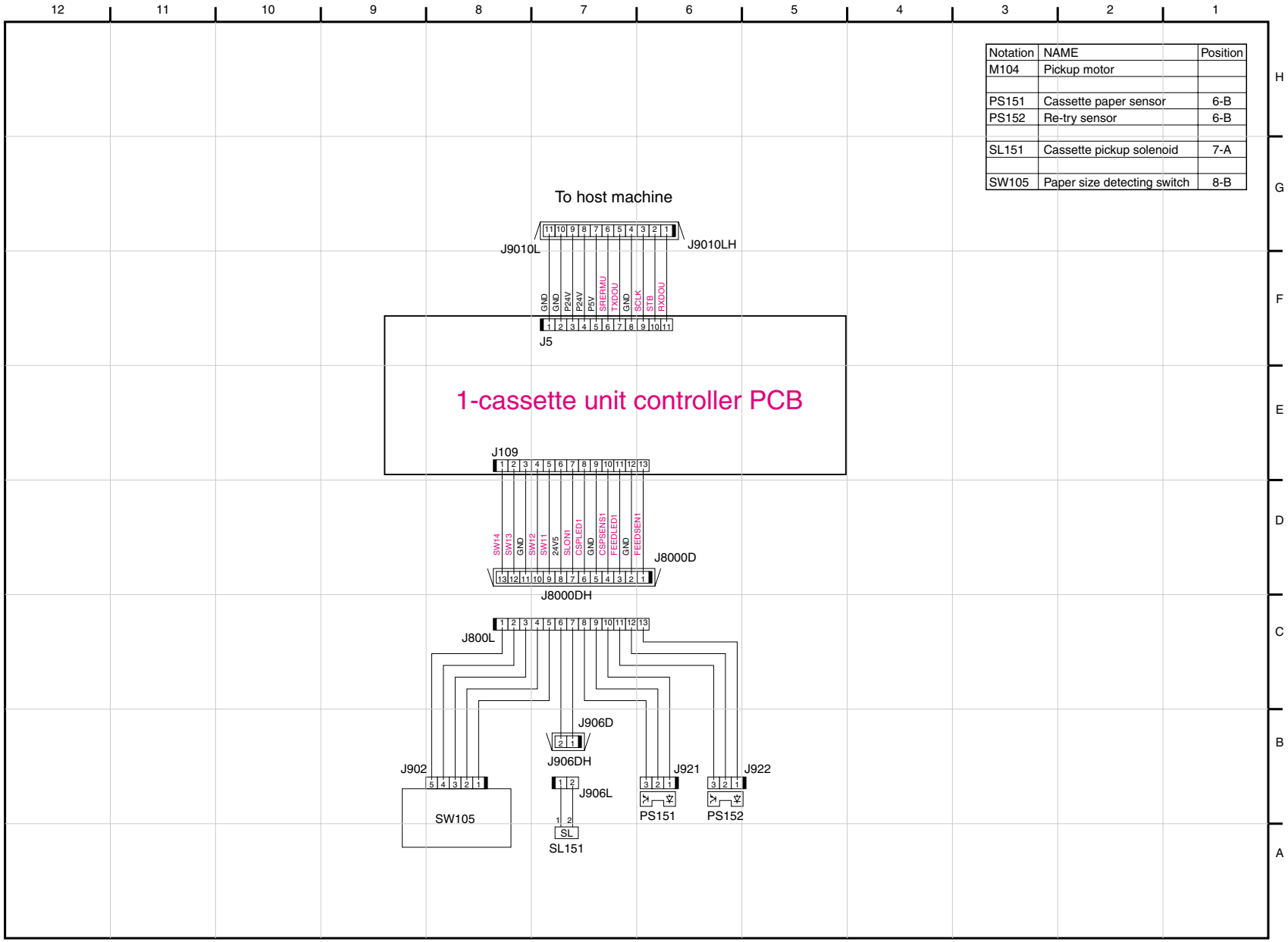
Book copy, A4 paper, Machine cassette, 2 Prints



*1 : varies depending on the temperature setting. If PDL output, the copying is constant.
*2 : ATVC control.

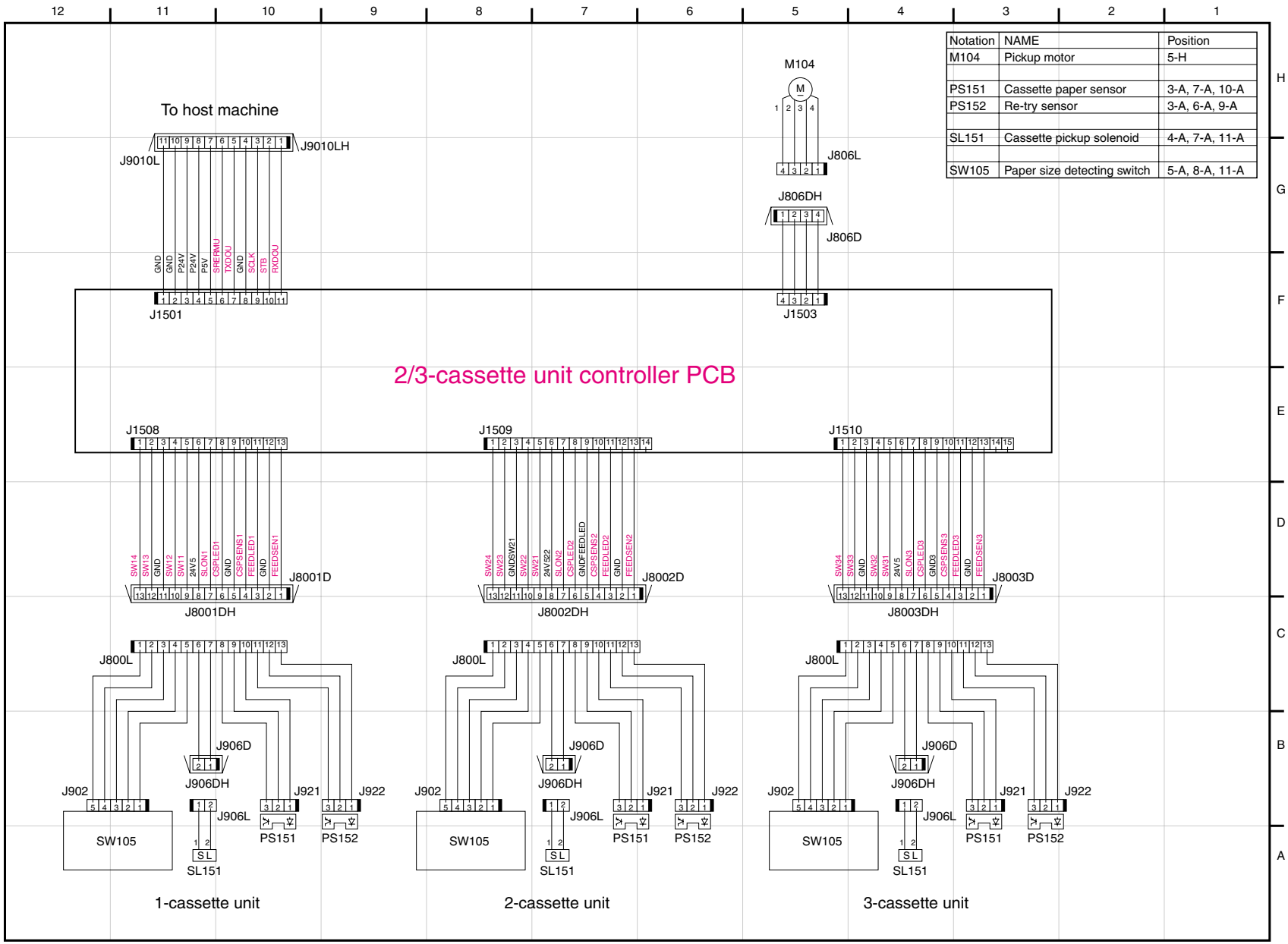


Notation	Name	Position
CB	Circuit breaker	13-J
BD	BD: BD sensor	16-D
CL101	Registration clutch	19-C
DORSW1	Front cover switch	17-G
DORSW2	Rear cover switch	17-G
FM101	Heat discharge fan	19-C
H101	Fixing heater	15-C
M101	Main motor	20-C
M102	Scanner motor	16-D
M103	Reader motor	17-M
PS101	Registration paper sensor	21-C
PS102	Paper full sensor	15-H
PS103	Delivery sensor	15-G
PS105	Multifeeder paper sensor	18-G
PS111	Copyboard cover open/closed sensor	20-M
PS112	ADF open/closed sensor	19-M
PS113	CS unit HP sensor	14-L
PS114	Original size sensor 1	19-N
PS115	Original size sensor 2	19-N
PS116	Original size sensor 3	18-N
PS117	Original size sensor 4	18-N
PS120	Waste toner case full sensor	20-F
PS151	Cassette paper sensor	17-C
PS152	Re-try sensor	17-C
SL101	Multifeeder pickup solenoid	20-C
SL151	Cassette pickup solenoid	18-C
SP1	Speaker	12-F
SW101	Power supply switch	4-C
SW105	Paper size detecting switch	18-C
TH101	Thermistor	16-G
THSW101	Thermal switch	15-C



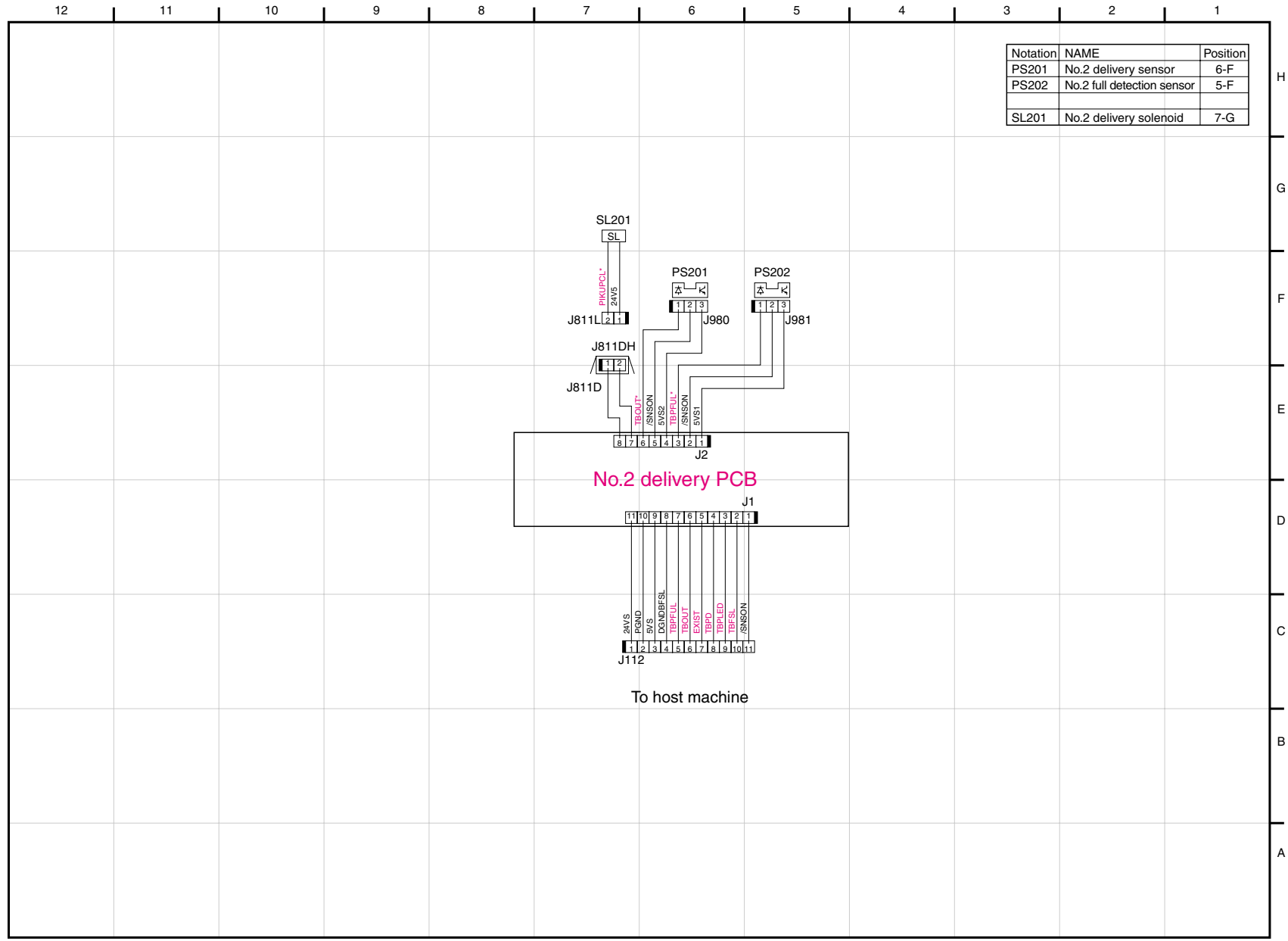
Notation	NAME	Position
M104	Pickup motor	
PS151	Cassette paper sensor	6-B
PS152	Re-try sensor	6-B
SL151	Cassette pickup solenoid	7-A
SW105	Paper size detecting switch	8-B

D 2/3-cassette unit



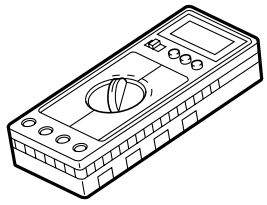
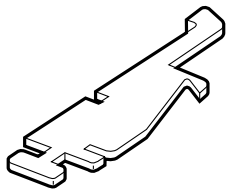
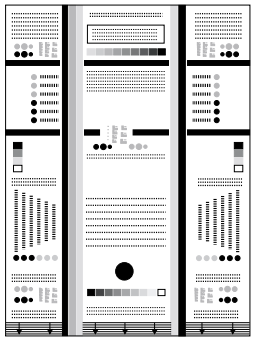
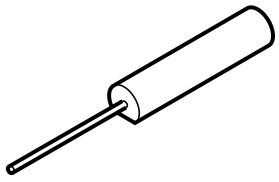
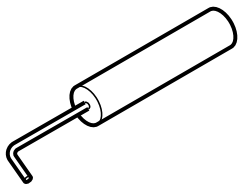
E Inner 2-way tray

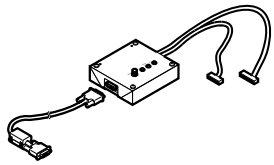
Notation	NAME	Position
PS201	No.2 delivery sensor	6-F
PS202	No.2 full detection sensor	5-F
SL201	No.2 delivery solenoid	7-G



F Special Tools

In addition to the standard tools set, you will need the following special tools when servicing the machine in the field:

No.	Tool name	Tool No.	Appearance	Rank	Uses/remarks
1	Digital multimeter	FY9-2002		A	For making electrical checks.
2	Door switch	TKN-0093		A	
3	NA-3 Test Sheet	FY9-9196		A	For making image adjustments/checks.
4	Meter extension pin	FY9-3038		A	For making electrical checks.
5	Meter extension pin (L-shaped)	FY9-3039		A	For making electrical checks.

No.	Tool name	Tool No.	Appearance	Rank	Uses/remarks
6	Downloader PCB	FY9-2034		C	For Finisher-J1.

Ranking:

A : Each service person is expected to carry one.

B : Each group of about 5 service persons is expected to carry one.

C : Each workshop is expected to carry one.

G Solvents and Oils

No.	Name	Uses	Composition	Remarks
1	Alcohol	Cleaning: e.g., glass, plastic, rubber; external cover.	Alcohol, Surface activating agent, Water	Do to bring near fire. Procure locally. IPA (isopropyl alcohol) may be substituted.
2	Solvent	Cleaning: e.g., metal; oil, toner.	Fluorine-family hydrocarbon, Chlorine-family hydrocarbon, Alcohol	Do not bring near fire. Procure locally. MEK
3	Lubricant		Mineral oil (paraffin-family)	Tool No.: CK-0524 (100 cc)
4	Lubricant	Drive parts, friction parts; carriage rail.	Silicone oil	Tool No.: CK-0551 (20 g)

FAX BOARD

SERVICE MANUAL

REVISION 0

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

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Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

1 Outline of the Manual

This Service Manual contains basic facts and figures used in the field when servicing the G3 FAX Board designed for installation to the iR1610F/iR2010F/iR2010E. For operation, see the Service Manual for the host machine.

This Service Manual consists of the following chapters:

Chapter 1	Introduction	outline, specifications
Chapter 2	Basic Operation	functional construction, outline of electrical circuitry
Chapter 3	Troubleshooting	troubleshooting procedures

The descriptions in this Service Manual are subject to change for product improvements or the like, and major changes will be communicated in the form of a Service Information bulletin.

All service persons are encouraged to go through the contents of this Service Manual and Service Information bulletins for a good, full understanding of the machine, thus equipping themselves with the knowledge and skill to maintain the quality and performance of the machine by promptly identifying any faults.

This Service Manual does not offer detailed information on how to operate the Board or how to generate user reports. See the separately available Guide as necessary. For detailed information on SSSWs or error codes, see the Service Manual of the host machine.

Contents

CHAPTER 1 INTRODUCTION

CHAPTER 2 BASIC OPERATION

CHAPTER 3 TROUBLESHOOTING

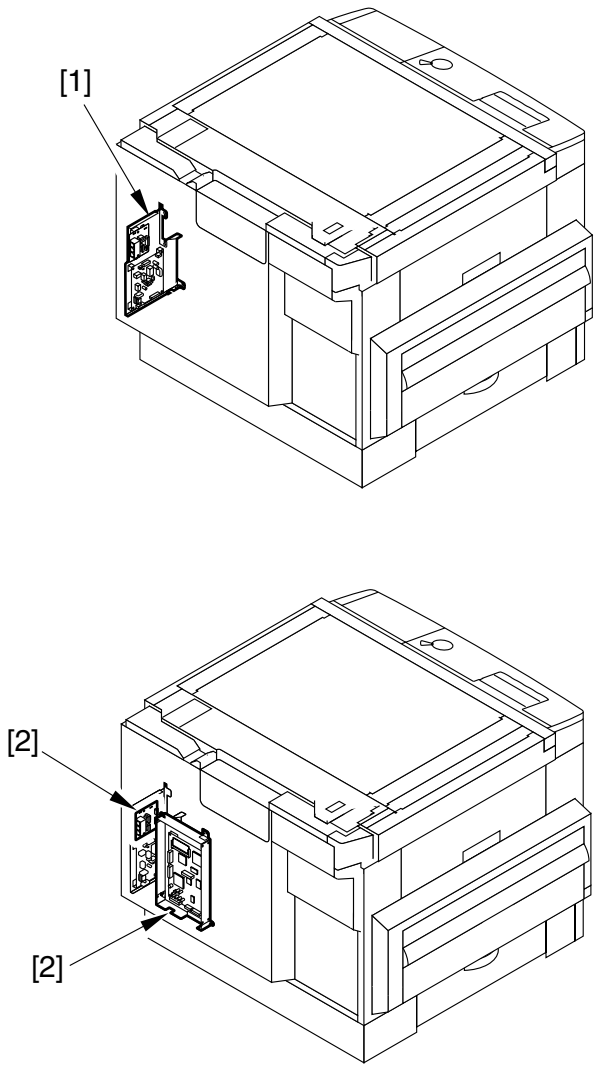
CHAPTER 1

INTRODUCTION

1 Introduction

The Board is designed to enable a digital copier to serve as a high-performance fax copier (G3; 2 lines) and, thus, is equipped with various image processing functions and communication functions (for telephone lines).

It communicates at 33.6 kbps, and it allows connection of 2 telephone lines when a G3 multiport is mounted.



[1] G3 FAX BOARD (built in)
[2] FAX MULTIPORT-B1 (for 120V)

F01-101-01

2 Specifications

Supported Lines

- Subscriber line (PSTN)
- Terminal under Facsimile Communications Network Type 1 Subscription Class 2 may be connected (support of 16 Hz)

Method of Modulation

G3 image signal	ITU-T V. 27ter (2.4Kbps, 4.8Kbps)
	ITU-T V. 29 (7.2Kbps, 9.6Kbps)
	ITU-T V. 17 (TC 7.2Kbps, TC 9.6Kbps, 12Kbps, 14.4Kbps)
	ITU-T V. 34 (2.4Kbps, 4.8Kbps, 7.2Kbps, 9.6Kbps, 12Kbps, 14.4Kbps, 16.8Kbps, 19.2Kbps, 21.6Kbps, 24Kbps, 26.4Kbps, 28.8Kbps, 31.2Kbps, 33.6Kbps)
G3 protocol signal	ITU-T V. 21 No.2 (300bps)
	ITU-T V. 8, V34 (300bps, 600bps, 1200bps)

Speed of Transmission

33.6Kbps, 31.2Kbps, 28.8Kbps, 26.4Kbps, 24Kbps, 21.6Kbps, 19.2Kbps, 16.8Kbps, 14.4Kbps, 12Kbps, TC9.6Kbps, TC7.2Kbps, 9.6Kbps, 7.2Kbps, 4.8Kbps, 2.4Kbps,
Equipped with auto fall-back function

Coding Method

G3 : MMR, MR, MH, JBIG

G3 Independent Abbreviation Procedure

None

Modem IC

CONEXANT FM336

Error Correction

ITU-T ECM method

Specifications for the Reader Unit

Size of Original for Transmission

A3, A4, A4R, A5, A5R, B4, B5, B5R
LTR, LTRR, LGL, 11 x 17, STMT
If equipped with ADF : original of 297 mm wide and 1000 mm long

For each transmission method, you may not change the resolution of the original or use originals of different sizes.

Density of Scanning Lines

Standard	8dot/mm x 3.85 lines/mm (G3 : 200 x 100dpi)
Fine	8dot/mm x 7.7 lines/mm (G3 : 200 x 200dpi)
Super Fine	8dot/mm x 15.4 lines/mm (G3 : 200 x 400dpi)
Ultra Fine	16dot/mm x 15.4 lines/mm (G3 : 400 x 400dpi)

Halftone

256-gradation error diffusion method

DONE Stamp

If equipped with ADF, yellow ink (SHACHIHATA X STAMPER Y30) may be switched between SENT and READ

Specifications for Recording Unit

Maximum reception size A3 (297mm x 420mm)
Density of scanning lines 600 x 600dpi

Specifications for Memory

Image memory	Standard memory : 2 MB (about 100 pages) (about 2 MB; Canon FAX Standard Chart No. 1) Expansion memory : 64 MB (+32+32 MB) Maximum memory : 80 MB (about 1500 pages) (about 57 MB)


Memo

The area of image memory in the expansion memory used for the 1st page is 23 MB; the remaining 9 MB is used by the system area.

Back-Up Memory for Power Shortage

Method	vanadium lithium secondary battery
Length of back-up	1 hr (approx.; however, after being kept powered for 1 day or more)
Retention	image data, work area
Storage method	: JBIG

Other Specifications

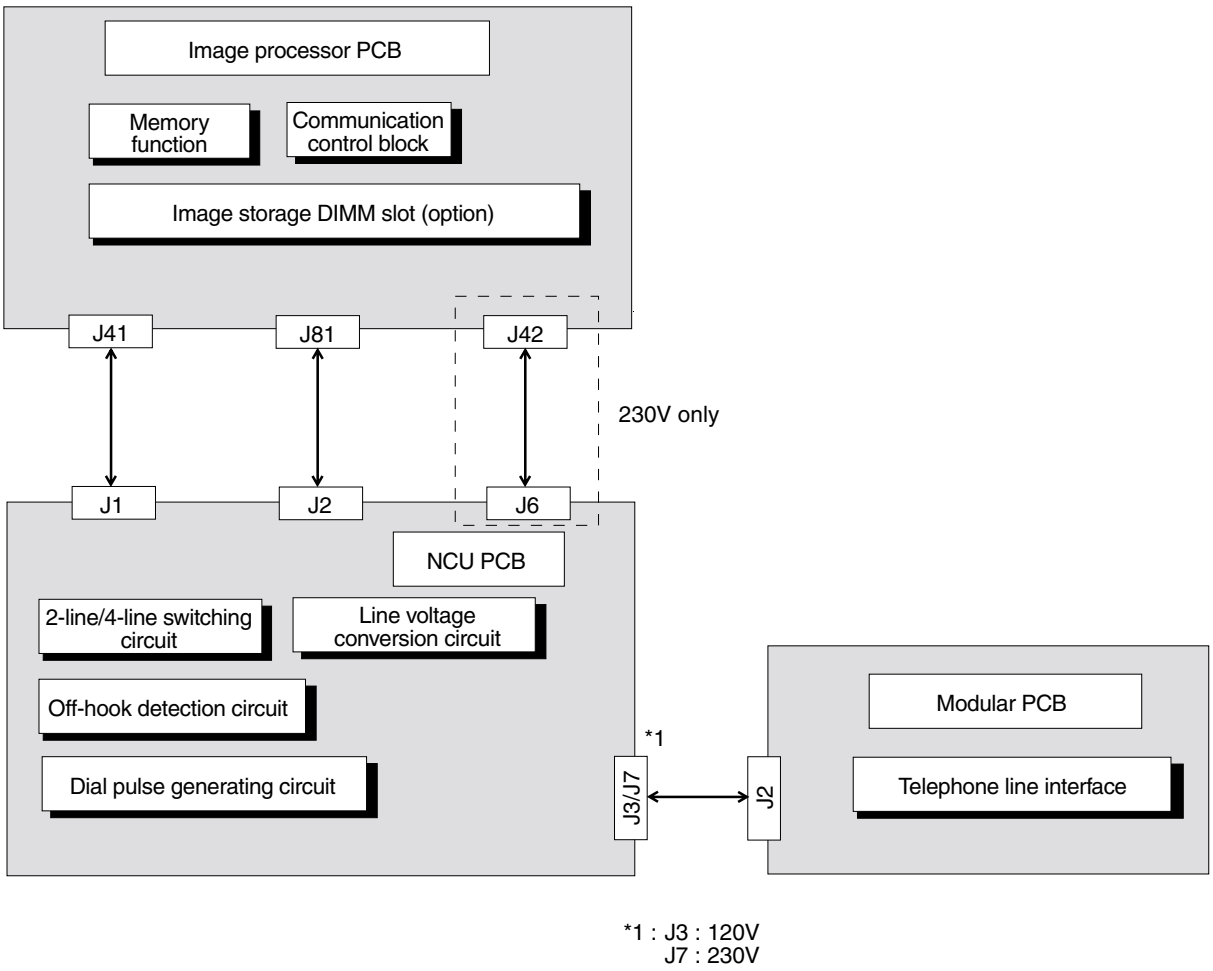
ECM function	yes
Polling	yes (F code)
Memory box	yes (confidential, relay, polling at fixed time, polling, etc.)
Transfer	yes
Quick memory transmission	no
Rapid transmission	no
Direct mail shut-out function	no
Bundle transmission function by destination	no
Timer transmission	yes (210 destinations max.; 70 items max.)
Telephone number notification function (its own)	yes

CHAPTER 2

BASIC OPERATION

1 Outline of Electrical Circuitry

1.1 Block Diagram of the G3 Fax Function



F02-101-01

1.2 Functions

a. Image Processor PCB

Communication Control Block

The communication control block is designed to detect circuit signals (e.g., CNG, DTMF). It also uses the main CPU on the image processor PCB to control the 33.6kbps modem, thus modulating or demodulating transmission/reception data.

Memory Function

The 16MB (as mounted) SDRAM used for storage of image data is capable of holding image data equivalent to about 100 pages (about 2 MB) of Canon FAX Standard Chart No. 1. The image data will also be backed up for about 1 hr by the vanadium lithium secondary battery in the event of a power shortage. The 128KB SRAM, on the other hand, is designed to store registered data (e.g., user data, service data), and the data will be backed up by means of a lithium battery when the machine is turned off (for about 5 yr).

Image Storage DIMM Slot (option)

The RAM-DIMM (32MB x 2) fitted to the slot is used for storage of image data for transmission and reception.

b. NCU PCB

2-line/4-line Conversion Circuit

The signal from a 2-line type telephone line is converted into transmission signals and reception signals (4 lines). It also prevents transmission signals from the modem from coming into the reception circuit.

Dial Pulse Generating Circuit

The dial pulse generating circuit is designed to generate dial pulses by turning on and off the relay inside the circuit in response to the control signal from the image processor PCB, thus sending the dial signals from the fax using the telephone line.

Off-Hook Detection Circuit

When the telephone line connected to the telephone terminal or the handset (option) is in off-hook state, the direct current flowing to the circuit is detected to find out that the system is in off-hook state.

Line Voltage Conversion Circuit

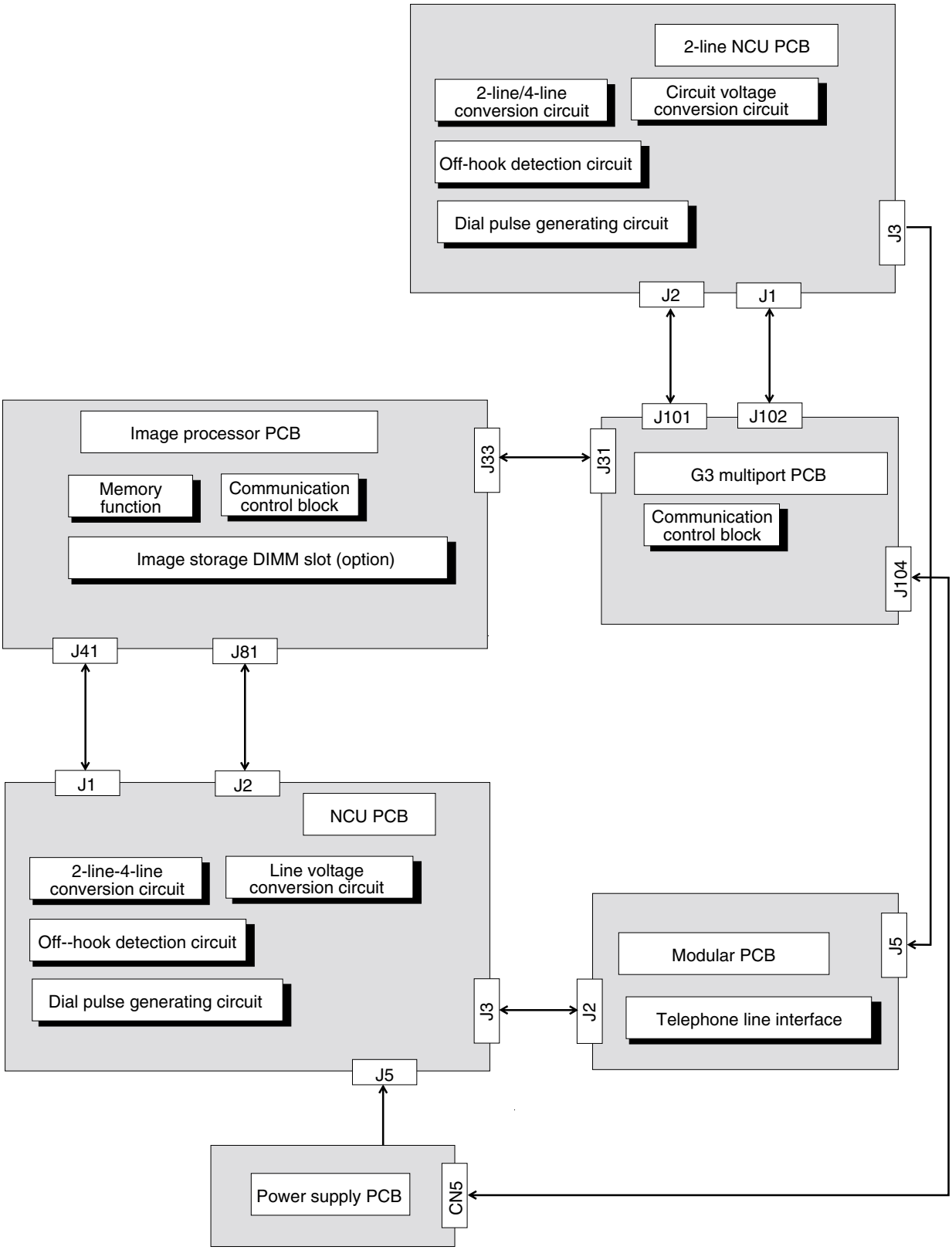
The primary side of the NCU PCB is controlled by a +48V DC circuit voltage; its direct component is cut using a capacitor so that only the voice signal is connected into a modem-level voltage.

c. Modular PCB

Telephone Line Interface

The signals from the 3 modular jacks (for telephone line, for telephone connection, for option handset) is forwarded to the line voltage conversion circuit of the NCU PCB for communication of signals from a fax to the telephone line.

1.3 Functional Diagram of the G3 Multiport



F02-103-01

1.4 Functions

a. G3 Multiport PCB

Communication Control Block

The communication control block is designed to detect circuit signals (e.g., CNG, DTMF). It also uses the CPU on the image processor PCB to control the 33.6Kbps modem, thus modulating or demodulating transmission/reception data.

Memory Function

The 16MB (as mounted) SDRAM used for the storage of image data is capable of storing image data equivalent of about 100 pages (about 2 MB) of Canon FAX Standard Chart No. 1. The image data is backed up by a vanadium lithium secondary battery for as long as 1 hr in the event of a power shortage. The 128KB SRAM, on the other hand, is used to back up registered data (user data, service data), and its contents are backed up by means of a lithium battery when the machine is turned off (as long as 5 yr).

Image Storage DIMM Slot (option)

The RAM-DIMM (32MB x 2) fitted to the slot is used for storage of data for transmission and reception.

b. NCU PCB

2-line/4-line Conversion Circuit

The 2-line signal from the telephone line is converted into 4-line signals (transmission signal and reception signal): it also prevents the transmission signals from the modem from coming into the reception circuit.

Dial Pulse Generating Circuit

The dial pulse generating circuit is designed to generate dial pulses by turning on and off the relay in the circuit, thus detecting dial signals from the fax over the telephone line.

Off-Hook Detection Circuit

When the telephone connected to the telephone terminal or the handset (option) is in off-hook state, the direct circuit flowing to the circuit is detected to find out if the system is in off-hook state.

Line Voltage Conversion Circuit

The primary side of the NCU PCB is controlled by a circuit voltage of +48 VDC; its DC component is cut, and only the voice signals are converted to modem-level voltages.

c. Modular PCB

Telephone Line Interface

The signals from the 3 modular jacks (for telephone line, for telephone connection, for option handset) is forwarded to the line voltage conversion circuit of the NCU PCB, thereby communicating the signals from the fax to the telephone line.

2 Communication System

2.1 Line Selection (if equipped with G3 multiport)

The line for calling is selected according to the settings made when the transmission line is selected as part of 2-line settings:

- If transmission is with priority on line 1, the line connected to line 1 will be used.
- If transmission is with priority on line 2, the line connected to line 2 will be used.
- If transmission is prohibited on line 1, the line connected to line 1 will not be used fro calling.
- If transmission is prohibited on line 2, the line connected to line 1 will not be used for calling.

2.1.1 Line Selection Number

If the first numerals of the calling number fully match any of the 5 line selection numbers that have been selected, the call will be made on the selected line.


Memo

- If bit 0 of SSSW SW11 is set to '1', the line selection number will be indicated to the user mode.
- A calling number made up of a non-numerical character will be excluded from matching.
- Regardless of the settings made for the selection of a transmission line (priority/prohibition), a line that has been registered as part of line selection number settings will be selected.
- A call in response to the On-Hook button/telephone receiver will not activate this function.
- If the same number or a number that holds the same numerals is registered, the lower of the numbers will be used (01 > 05).

Registered Settings

01	line selection number	0041
	number of calls	line 2
	line selection number transmission	yes
02	line selection number	004
	number of calls	line 1
	line selection number transmission	yes

Call Number (one-touch/abbreviated dialing)

0041p123456 → sent by line 2

Likewise, a calling number made up of 0p0p4p1123456 will also be sent on line 2.

2.1.2 List of Functions

	Line 1	Line 2
Memory transmission	yes	yes
Manual transmission	yes	no
Manual reception	yes	no
Telephone	yes	no
FAX/TEL switching	yes	no
Dial-in FAX/TEL switching	yes	no
Answering mode	yes	no
Remote reception	yes	no
Fax communication network	16Hz	16Hz

CHAPTER 3

TROUBLESHOOTING

If an error code is indicated in the event of a fault, refer to the appropriate section of Chapter 13 in the Service Manual for the host machine. Likewise, to check error codes, refer to the same section (generating a report on error codes).

1 Points to Note When Troubleshooting

Keep the following in mind when troubleshooting the Board:

1.1 When Turning Off the Main Power

The Board is equipped with a back-up function so that no data will be erased in the event of a power shortage or when the main power is tuned off (for a specific period of time).

The back up battery is either a lithium battery or a vanadium lithium secondary battery, the latter of which can back up the image data for about 1 hr (provided that the main power has been kept ON for 1 day or more continuously in a normal temperature/humidity environment). If the data cannot be retained for more than half of this period of time, suspect that the battery has come to the end of its life.

The secondary battery exhaust itself when it has been charged and discharged (100%) 40 times or more (at 25°). The image date will be lost when the indicated period passes.

The lithium battery lasts for about 5 yr. Also, keep in mind that the image data backed up by the secondary battery will be lost if the jumper plug (JP2) is shifted from ON to OFF position on the image processor PCB.

Both lithium battery and vanadium lithium secondary battery contain combustible materials (e.g., lithium, organic solvent), and are likely to start explosion or combustion when thrown into fire. Moreover, disassembling the batteries can lead to inflammation of the skin upon contact with the organic solvent. Be sure to take appropriate measures when disposing of the batteries, as by treating them separately from other waste matter.

2 Faults at Time of Installation

The G3 FAX Board is not recognized (i.e., data registration cannot be performed).

Cause	The image processor PCB automatically recognizes by communicating with the G3 fax control PCB when the power is turned on. The cable may not be connected.
Measures	Check to make sure that the cable is correctly connected between the image processor PCB and the G3 fax control PCB.

3 General Faults

No communication can be made.

Cause	The telephone line is not connected to the modular jack for line connection.
Measures	Connect the telephone line to the modular jack for line connection.

No call can be made.

Cause	The type of line selected (tone or dial) is not the type of line connected.
Measures	Make sure that the type of line selected is the type of line connected.

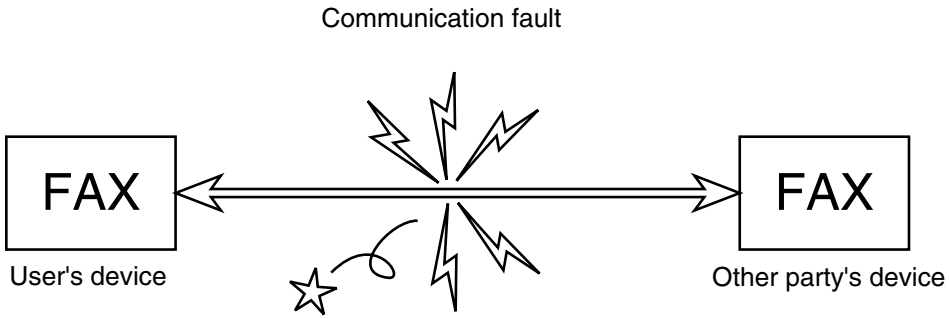
No sound is generated by the speaker.

Cause	The speaker is not correctly connected.
Measures	Check the connection between the image processor PCB and the speaker cable. Replace the speaker. Replace the image processor PCB.

4 Correcting Communication Faults

4.1 Initial Identification of a Fault

A fax mechanism is a means of transmitting image data, and requires a transmitting device, receiving device, and a telephone line. A fault in any of these 3 devices can prevent normal transmission of an image.



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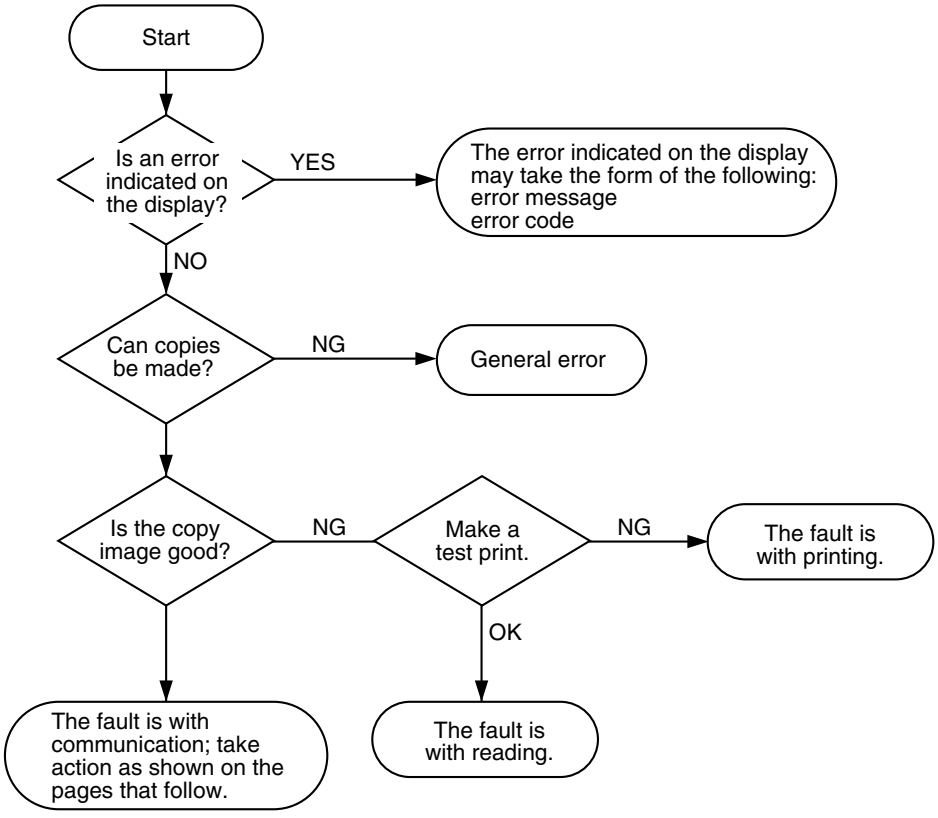
To correct a communication fault, it is important first to narrow down on the cause. To that end, make checks according to the following flow chart:



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4.2 Correcting Communication Faults

If you found out that the fault is with communication after going through the flow chart on the preceding page, go through the following:

4.2.1 Correcting Faults

1) Obtain the details of the fault.
   a. operation preceding the fault
      number of originals, transmission mode, timing of error (e.g., before transmission), use of auto dialing.
   b. faulty image sample (if in reception)
   c. LCD indications at time of the fault
   d. communications control report at time of the fault
   e. user's abbreviation, telephone number, fax number, model name
   f. other party's user name, telephone number, fax number, model name
   g. frequency and type of error for the fault
   h. other party's fax condition
      number of pages transmitted/received, auto or manual, error or successful, reception condition

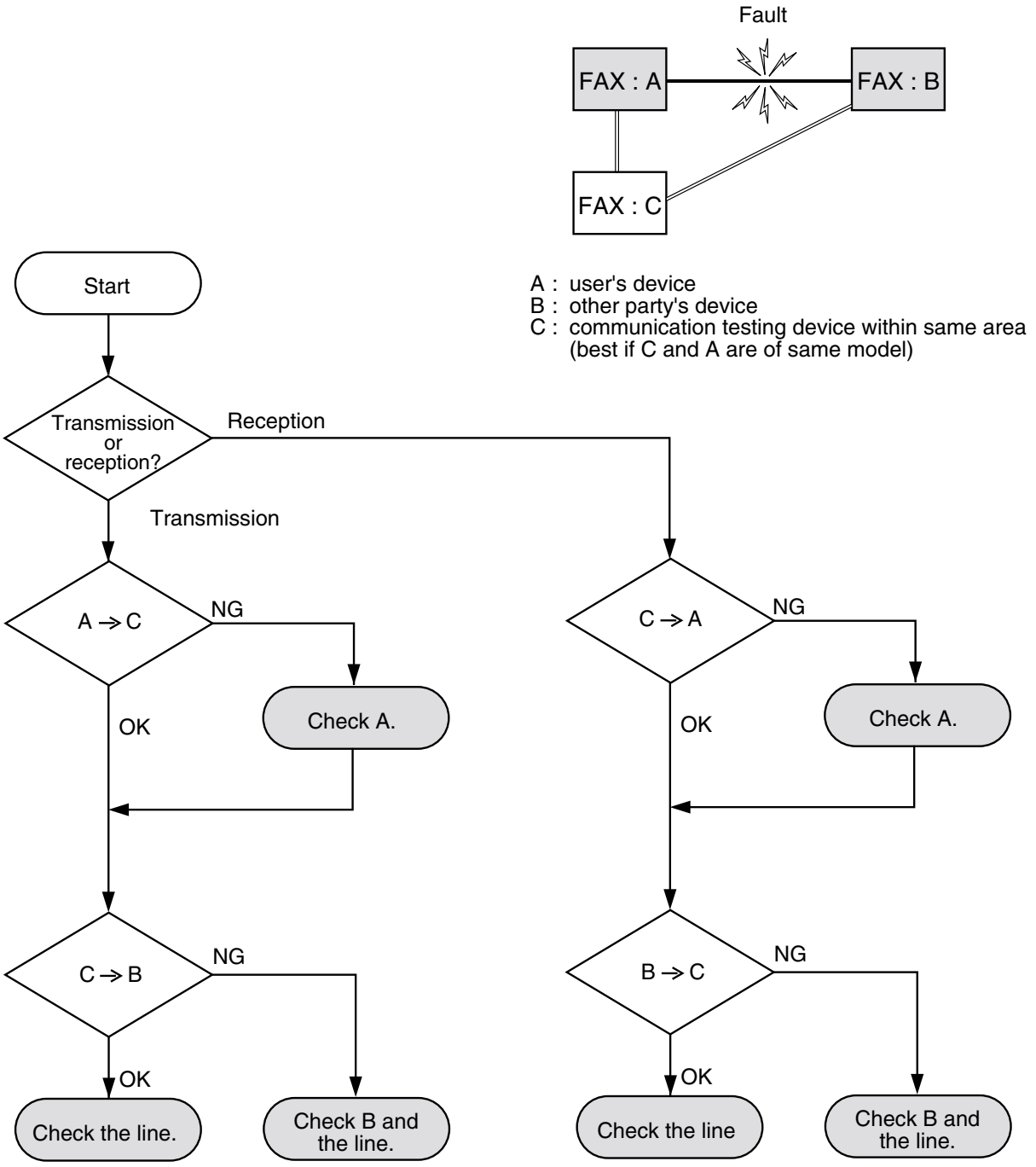
If you are visiting the user in response to a call, generate a system dump list for a. and g.

2) Perform communications testing according to the flow chart shown on the next page.
   - Perform the testing several times using the actual line for each item; then, check the symptoms, and record them.

3) Evaluate the fault based on the details you have obtained, and take appropriate action.

If the other party is a non-Canon device, and the use's machine is free of indefinable faults, have the device of the other party checked by informing the user as such.

- Correcting a Fault with a Canon Device
  Use a 3-point communication as indicated to correct the fault:



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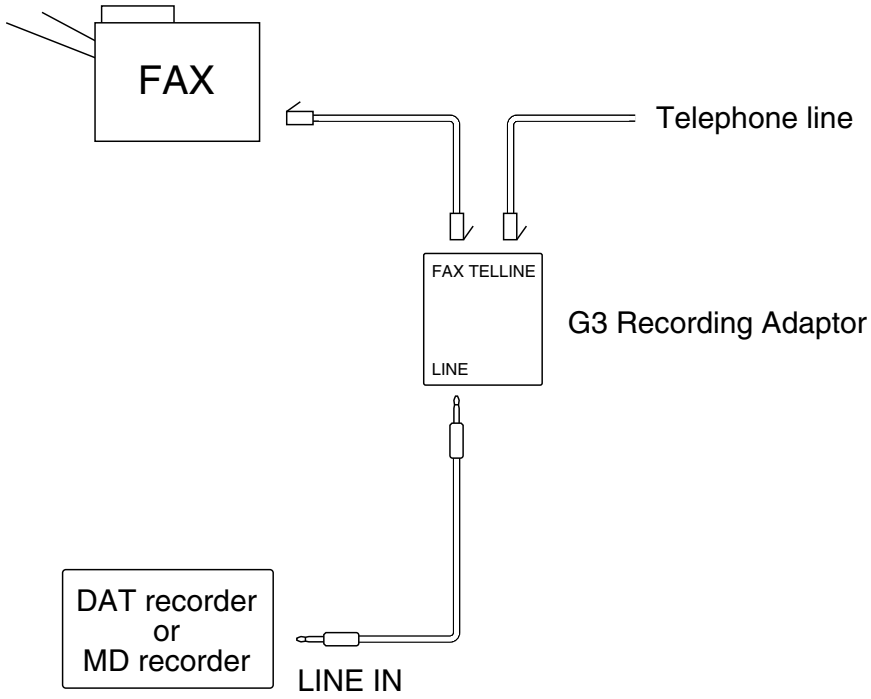
4.3 Recording the Sound of the Communications Procedure

If the Service Manual for the host machine instructs you to "record the sound of the communications procedure on a DAT or MD, ask the Technical Center for analysis," refer to the following (for a common way of connection):



F03-403-01

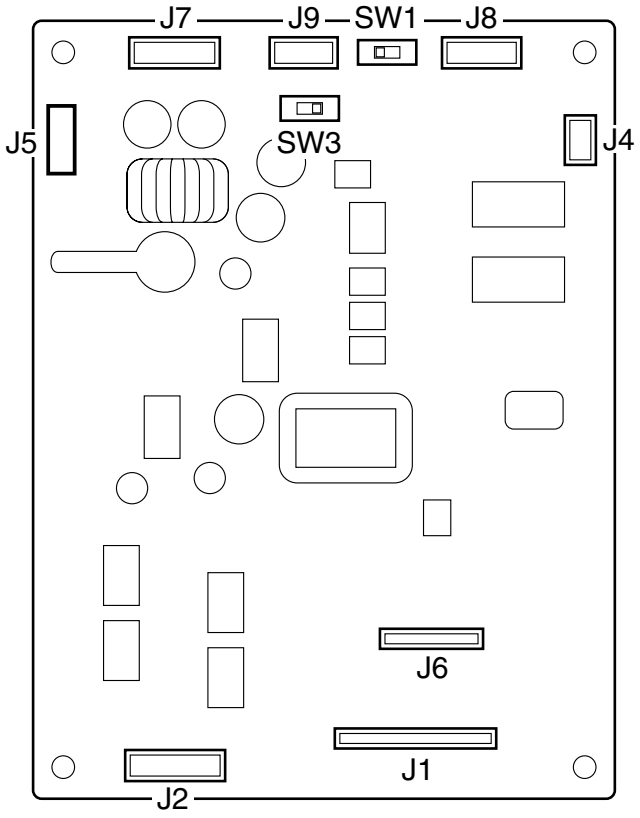
5 Upgrading

For descriptions of how to upgrade the board, see Chapter 14 of the Service Manual for the host machine.

6 Service Switch

6.1 Hardware Switch (230V model)

The NCU PCB for the 230V model of the iR1610F/iR2010F is equipped with a switching mechanism to enable compliance with the communications standards of various countries. The following is a list of settings:



F03-601-01

Destination	SW1	SW3
General	A	A
U.K., FRN	B	B

T03-601-01

Printer Board-N1/Ethernet
Network Interface Adapter iN-E5

SERVICE MANUAL

REVISION 0

MAR. 2002

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

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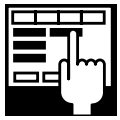
Copyright

Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

1 Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
	Indicates an item intended to provide notes assisting the understanding of the topic in question.
	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.
	Refers to the Copier Basics Series for a better understanding of the contents.

2 Outline of the Manual

This Service Manual provides basic facts and figures about the Printer Board-N1/Network Interface Board iN-E5 that may be used when servicing the Board in the field.

This Service Manual consists of the following:

Chapter 1 Introduction:	product outline, features, specifications, operation
Chapter 2 Operation:	functional blocks of the board, upgrading
Chapter 3 Disassembly/Assembly:	disassembly/assembly procedure
Chapter 4 Troubleshooting:	service mode, self diagnosis
Appendix:	list of special tools

The descriptions in this manual are subject to change, and major changes will be communicated in the form of Service Information bulletins.

The service persons are expected to be fully familiar with the contents of this manual and the service information bulletins so as to equipped themselves with the ability to respond to the needs of the field, i.e., isolating and correcting faults.

Contents

CHAPTER 1 INTRODUCTION

CHAPTER 2 OPERATION

CHAPTER 3 DISASSEMBLY/ASSEMBLY

CHAPTER 4 TROUBLESHOOTING

APPENDIX

CHAPTER 1
INTRODUCTION

1 Outline

1.1 Outline

The names and the functions of the accessories configured in a system are as follows:

Printer Board-N1

When built inside the host machine, it enables the host to function as a printer.

With an Adobe PS3 Module-B1 mounted to the expansion ROM slot of the printer board, the host can serve as a PS printer.

Addition of a Flash ROM Module FR-65, moreover, will enable downloading of fonts and macros.

Ethernet Network Interface Adapter iN-E5

Built into the host machine together with a Printer Board-N1, it enables the host to function as a network printer.

Hard Disk HD-65

Built into the host machine together with a Printer Board-N1, it will enable PDL data or data that has undergone RIP processing.

2 Specifications

2.1 Printer Board-N1

CPU	Power PC (200 MHz)
ROM	8 MB
RAM	Standard : 8 MB (72 MB max.)
Interface	Parallel (IEEE1284), USB
Page description language	PCL 5e, PCL-XL 2.0
OS	Windows 2000/NT4.0/Me/98/95 MAC OS (8.5/8.6 or later)
	45 scalable fonts as standard (MicroType fonts); 32 TrueType fonts, 9 bitmap fonts
Accessory	Adobe PS3 Module-B1 (includes a total of 136 fonts)
	Flash ROM Module FR-65

2.2 Ethernet Network Interface Adapter iN-E5

Interface	10Base-T, 100Base-TX
CPU	RISC CPU (100 MHz)
Protocol	IPX/SPX, TCP/IP, AppleTalk, NetBIOS/NetBEUI
Print service	Bindery PServer, NDS PServer, NDPS, LPD, Port9100, IPP,
	CAP (Canon AppleTalk PrintServer)

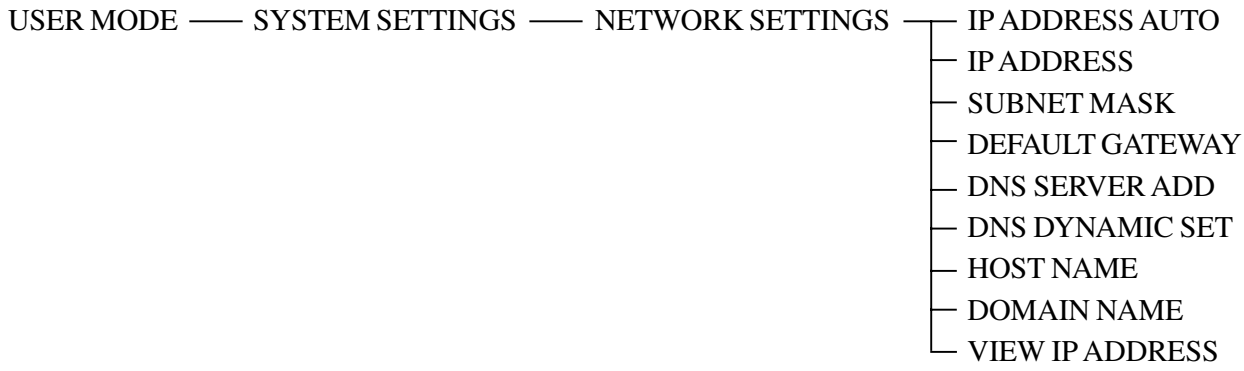
2.3 Hard Disk HD-65

Capacity	10 GB
Interface	ATA-3

3 Operation

3.1 Making Network Settings

The Board's network settings are made in user mode, and the settings are layered as shown in the following diagram; for details, see the Network Guide.



3.2 Making Printer Settings

The Board's printer settings are made from a PC or the host's control panel. The following shows how settings may be made from the control panel and the layers into which the settings are grouped; for details on making settings from a driver, see the Printer Guide:

Making Settings

The keys to use on the control panel vary depending on the host model (whether or not equipped with a fax function). The indications within parentheses refer to the control panel keys of a host model equipped with a fax function.

1) Press the System key (Printer key) so that 'READY' appears and the machine enters printer mode.
2) Press the Go key (OK key) so that 'PAUSED' appears and the machine goes off-line.
3) Press the Menu key (F1 key) to select the desired menu.
4) Press the Item key (F2 key) to select the desired item.
5) Press the Value key (F3 key), select a setting, and press the Enter key (F4 key) to store.

Hierarchy of the Settings

Menu Name	Description
SECURED JOB MENU	
ENTER PASSWD	Prompts you to enter the password required for printing the selected job.
COPIES	Sets the number of copies to print for the secured print job.
INVALID PASSWD REENTER	Asks whether or not you want to reenter the password.
SHUTDOWN MENU	
SHUT DOWN	Shuts down the printer.
TEST MENU	
SHOW PAGE CONT	Displays the number of pages printed.
TEST PRINT	Prints the Test Print page.
PRINT PCL FONTS	Prints the PCL Font list.
PRINT PS FONTS *1	Prints the PS Font list.
PRINT JOB LOG	Prints the job log.
CONTINUOUS TEST	Prints the Test Print page continuously.
PRINT EN CONFIG	Prints the Ethernet configuration page.
PCL MENU	
RESOLUTION	Displays the resolution used for printing.
COPIES	Sets the number of copies to print.
PAGESIZE	Sets the default paper size to use when printing from the printer.
ORIENTATION	Sets the paper orientation.
FORM	Sets the number of lines on a page.
FNTSRC	Sets the font source.
FONTNUM	Sets the font number.
PT. SIZE	Sets the default point size.
PITCH	Sets the default pitch.
SYMSET	Sets the default symbol set.
AUTO CR	Turns auto carriage return on or off.
WIDE A4	Turns wide A4 on or off.
OVERRIDE	Turns override on or off.
PS MENU *1	
RESOLUTION	Displays the resolution used for printing.
COPIES	Sets the number of copies to print.
PRINT ERRS	Specifies whether or not to print PS print errors.
FEED MENU	
FEED	Sets the paper source to use when printing.
TRAY SWITCH	Enables the printer to switch to Stack Bypass if the selected drawer is empty.

CONFIG MENU	
JAM RECOVERY	Enables the printer to resume printing once a paper jam has been cleared.
AUTOCONT	Turns the Automatic Continue function, for error handling, on or off.
DENSITY	Sets the relative darkness of the printouts.
ECONOMY MODE	Turns Economy Mode, for reducing toner usage, on or off.
REFINE	Enables the printer to enhance the quality of the printouts.
JOB CONTROL MENU	
JOB SECURING TIME	Sets the length of time a secured job is held on the printer.
PARALLEL MENU	
PERSONALITY	Set the default print personality for the parallel interface.
BIDIRECTION	Specifies whether or not to use bidirectional control.
I/O TIMEOUT	Sets the timeout interval for print jobs received via the parallel interface.
USB MENU	
PERSONALITY	Sets the default print personality for the USB interface.
I/O TIMEOUT	Sets the timeout interval for print jobs received via the USB port.
ETHERNET MENU *2	
PERSONALITY	Sets the default print personality for the optional network interface board.
I/O TIMEOUT	Sets the timeout interval for the optional network interface board.
LANGUAGE MENU	
LANG	Sets the default language for the LCD display on the printer.
REST MENU	
RESET	Resets the selected settings to their default values.
JOB LOG MENU	
AUTO PRINT LOG PER 50/30 JOBS	Specifies whether or not to automatically print the job log.
AUTO CLEAR LOG EVERY 50/30 JOBS	Specifies whether or not to automatically clear the job log.
JOB LOG FULL	Sets the default action for when the job log becomes full.
GMT DIFFERENTIAL TIME	Displays the time difference from Greewich Mean time.
DAYLIGHT SAVING TIME	Displays whether or not to use daylight saving time.

*1: displays only after the Adobe PS3 Module-B1 has been installed.
*2: displays only after the network interface board has been installed.

CHAPTER 2

OPERATION

1 Construction

1.1 Outline

The three Boards described in this manual are designed for the following functions:

- Printer Board
  Develops print data written in PCL.
- Network Interface Board
  Connects the host machine with a network.
- Hard Disk (HDD)
  Stores print data and log data.

1.2 Function of the Printer Board

1.2.1 Functional Blocks of the Printer Board

The printer board is divided into the following functional blocks:

a. CPU

It is equipped with a Power PC (200 MHz), and it processes data as instructed by the program contained in the built-in RAM in the CPU.

[1] Controls the SDRAM.
[2] Controls the ROM.
[3] Controls the printer board interface, hard disk interface, and network board interface.
[4] Communicates with the host machine.
[5] Controls the IEEE1284 parallel port interface.
[6] Controls compression/expansion of image data.

b. ASIC

The ASIC controls the workings of the printer board as instructed by the control program stored in the ROM. Its main functions are as follows:

[1] Performs image smoothing.
[2] Performs EEPROM control.

c. DRAM

The DRAM possesses 8 M bytes of memory as standard, and functions as follows:
[1] Stores print data entered from an external device (reception buffer).
[2] Stores code data or pattern data resulting from conversion of image data.
[3] Stores fonts processed by the printer board.

The Board is equipped with a single slot, and addition of a 32 MB or 64 MB expansion RAM DIMM will enable storage of up to 72 M bytes of data.

d. Built-In Program ROM

The built-in program ROM offers 8 MB of memory, and holds a translator used to translate PCL into an internal processing language and then into image data; it also is used to control the printer board and stores fonts.

e. Expansions ROM DIMM (J1, J2, J3)

The expansion ROM DIMM may be a ROM DIMM for upgrading, accessory PS module, and flash ROM DIMM (3 pc. max.; any slots may be used).

f. EEPROM (IC4, IC5)

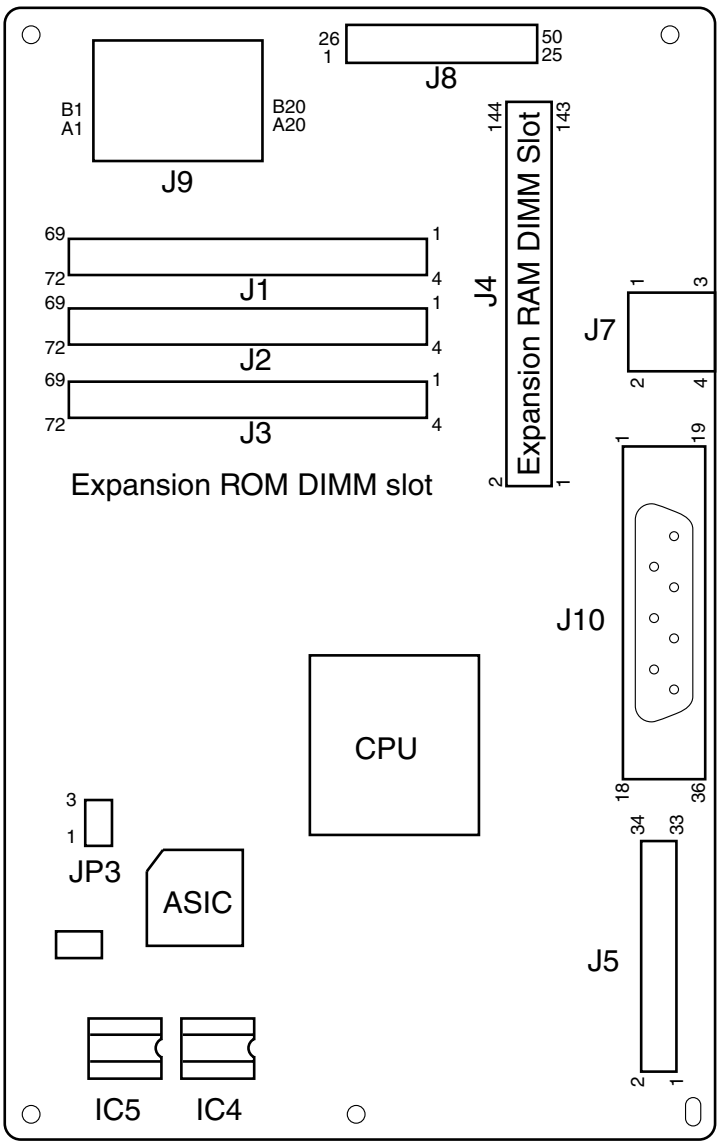
The EEPROM is a memory capable of electrically deleting or writing data. It offers 32 K bits of memory, and is used to retain data in the absence of power (data including printing environment, number of prints).

g. Interface

As its interface, a USB connector (Series B; J7) comes as standard, and a parallel connector (J10) comes as standard for printing.

h. Image Processing

At a resolution of 600 dpi, processing is executed so that multivalue (2-bit) output image data is converted into binary image data, thereby generating data at 2400 dpi in main scanning direction and at 600 dpi in sub scanning direction.



F02-102-01

JP3 : Do not use. (Be sure to keep 1 and 2 shorted.)

1.2.2 Upgrading

Mount the ROM DIMM designed for upgrading to a slot (J1, J2, or J3) so that the functions of the existing built-in program ROM will be stopped, and its contents will be replaced with the contents of the newly mounted ROM DIMM. At this time, you need not remove the existing built-in program ROM.

When you have removed the ROM DIMM from the slot, the contents of the built-in program ROM will take over.

1.3 Functional Block (network interface board)

The following is a functional block of the network interface.

a. Interface

A RJ-45 connector for 10/100Base-T comes as standard for an Ethernet configuration. (The board uses 100Base-TX as standards it supports for 100Base.) The network interface board is equipped with an automatic function to switch between 10Base-T and 100Base-TX, so that it supports a network on which these 2 different speeds exist by automatic detection and switching.

b. Transmission Function (if equipped with fax functions)

When the network interface board is mounted, images scanned by the reader unit of the host machine may be transmitted to an external device over a network.

- E-mail/i FAX

  An image that has been scanned may be sent as an attached file of an e-mail to a PC or an i-fax connected to the same network.

An e-mail may be in simple mode or in e-mail mode.

In the case of simple mode, the format of the attached image will always be TIFF (MH).

In the case of e-mail mode, on the other hand, the format of the attached image may be any of 4: TIFF (MMR, MR, MH), PDF.

- FTP

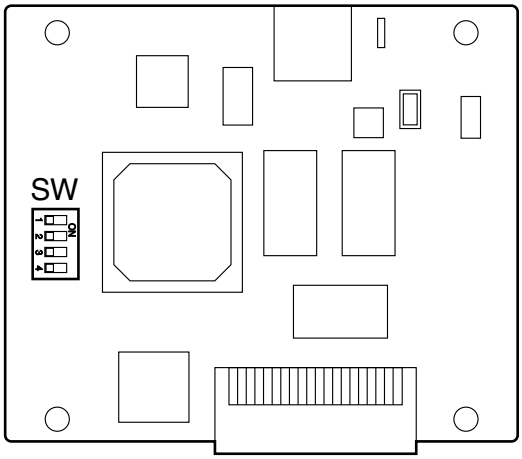
  An image that has been scanned may be transmitted to an FTP server for uploading.

Setting the Network Interface Board

At time of shipment, the network interface board is set so that the speed of transmission and transfer of 10BASE/100BASE is detected automatically.

If a fault occurs frequently in communication with the host machine on the LAN, change the setting of the DIP switch.

Be sure to turn off the machine before changing the settings of the DIP switch.



F02-103-01

DIP SW	Item	Default
SW1	fixed to OFF	OFF
SW2	auto (ON)/fixed (OFF)	ON
SW3	100 Mbps (ON)/10 Mbps (OFF)	OFF
SW4	full duplex (ON)/half-duplex (OFF)	OFF

Memo

Full-Duplex Using a conversion hub, 2 points are selected for connection (nodes of the LAN) for simultaneous transmission and reception of data packets.

Half-Duplex At any time, data may only be transmitted in one direction for transmission or reception of data packets, i.e., transmission and reception cannot take place at the same time.

CHAPTER 3

DISASSEMBLY/ASSEMBLY

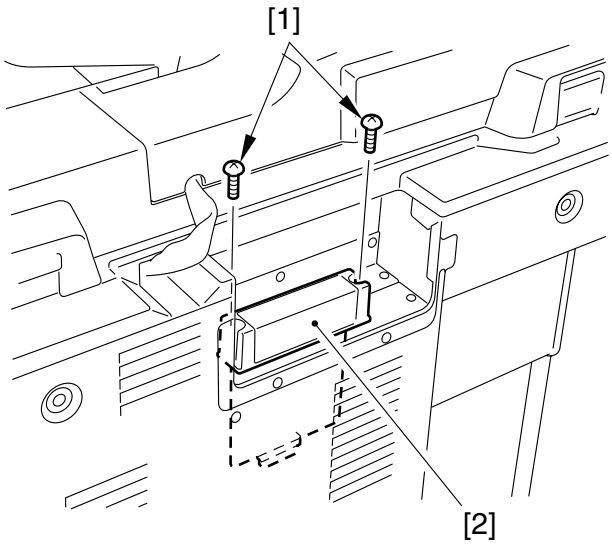
1 Disassembly and Assembly

Here, instructions on how to disassemble/assemble the machine are given together with explanations of its mechanical characteristics; be sure to keep the following in mind when going through the work:

1. ⚠ Before starting the work, be sure to disconnect the power plug.
2. Unless otherwise specially indicated, reverse the steps used to disassemble the machine when assembling it.
3. Identify the screws by types (length, diameter) and location.
4. To ensure electrical continuity, the mounting screws used for the grounding wire and arrestors are equipped with toothed washers. Do not leave them out when assembling the machine.
5. ⚠ As a rule, do not operate the machine with any of its parts removed.
6. Be sure to use SHUT DOWN MENU to shut down the printer if the Hard Disk HD-65 (accessory) has been installed.

1.1 Removing the Hard Disk

1) Remove the 2 screws [1], and detach the hard disk [2].

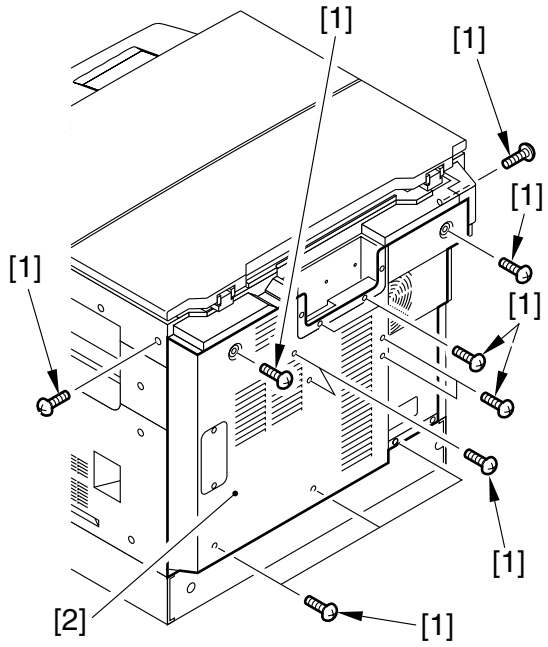


F03-101-01

1.2 Removing the Network Interface Board

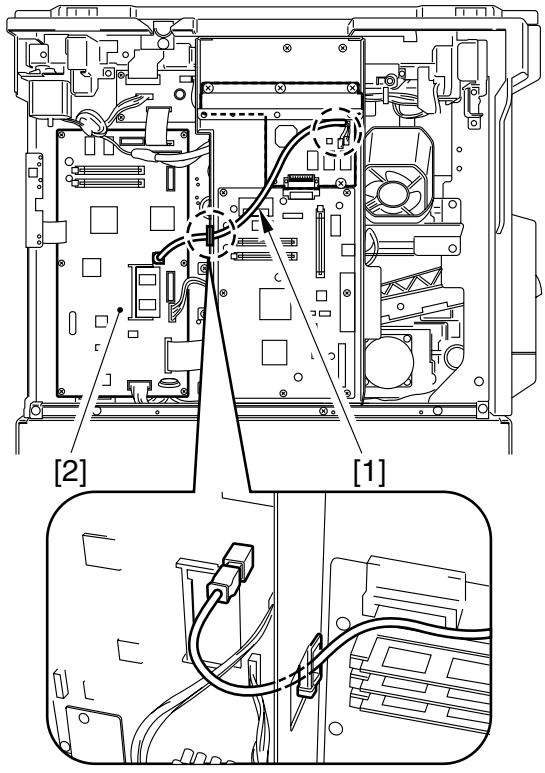
If a hard disk exists, be sure to remove it in advance.

1) Remove the 13 screws [1], and detach the rear cover [2].



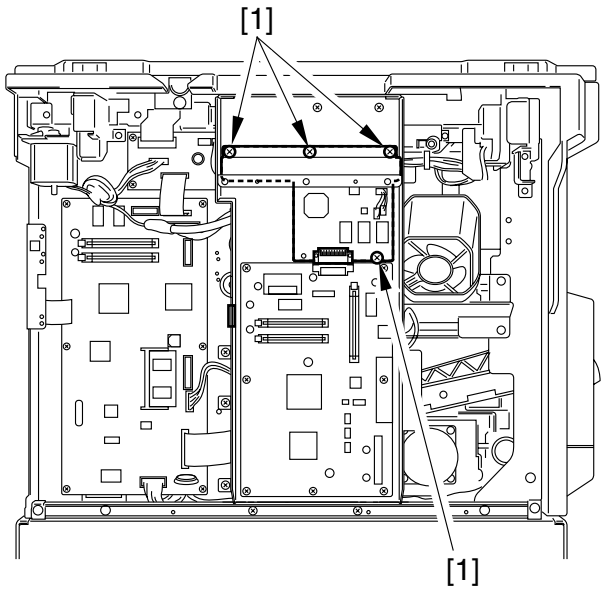
F03-102-01

2) Remove the USB cable [1] from the image processor PCB [2].



F03-102-02

3) Remove the 4 screws [1], and detach the network interface board.



F03-102-03

1.3 Removing the Printer Board

1.3.1 Before Starting the Work

If you have replaced the Printer Board with a new one, execute the following steps.

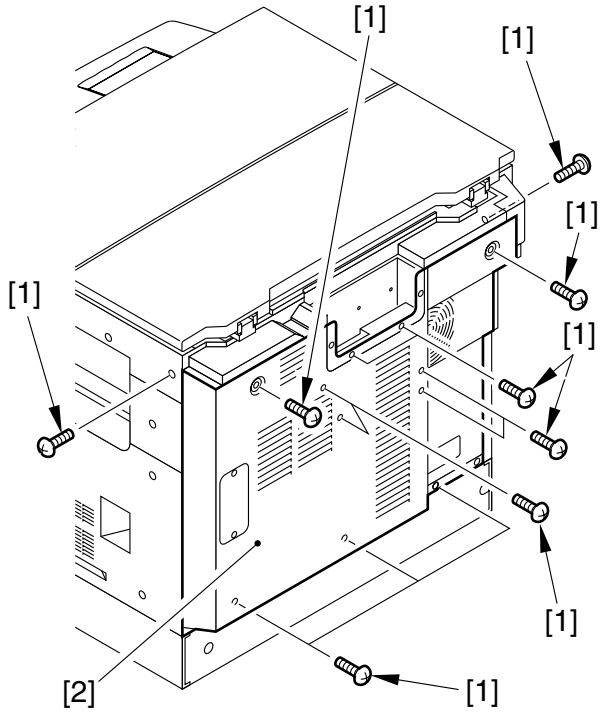
1) Go to User Menu to TEST MENU, run TEST PRINT to output a test print.
2) If the machine has the network interface board, go to User Menu to TEST MENU, run PRINT EN CONFIG to output the Ethernet configuration page.

1.3.2 Removing the Printer Board

1) Turn off the power switch.

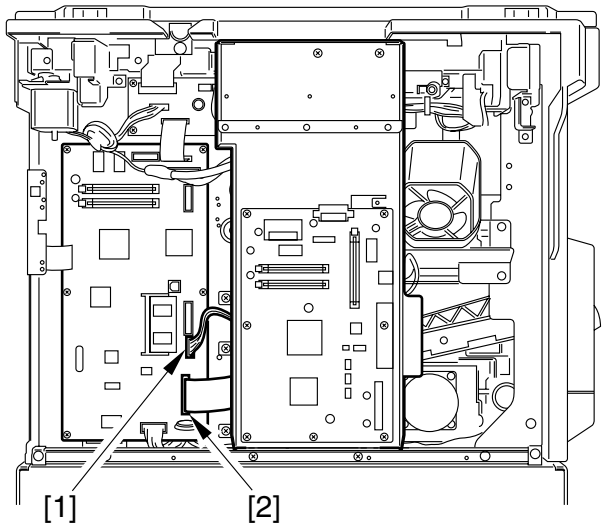
If a hard disk or a network interface board exists, be sure to remove it in advance.

2) Remove the 13 screws [1], and detach the rear over [2].



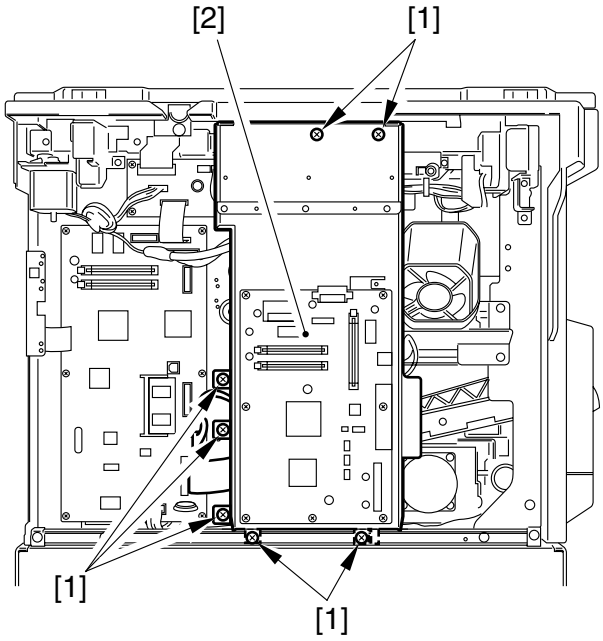
F03-103-01

3) Disconnect the connector [1], and detach the flexible cable [2].



F03-103-02

4) Remove the 7 screws [1], and detach the printer board [2].



F03-103-03

5) If you are replacing the existing printer board with a new one, be sure to perform the following to make printer settings.

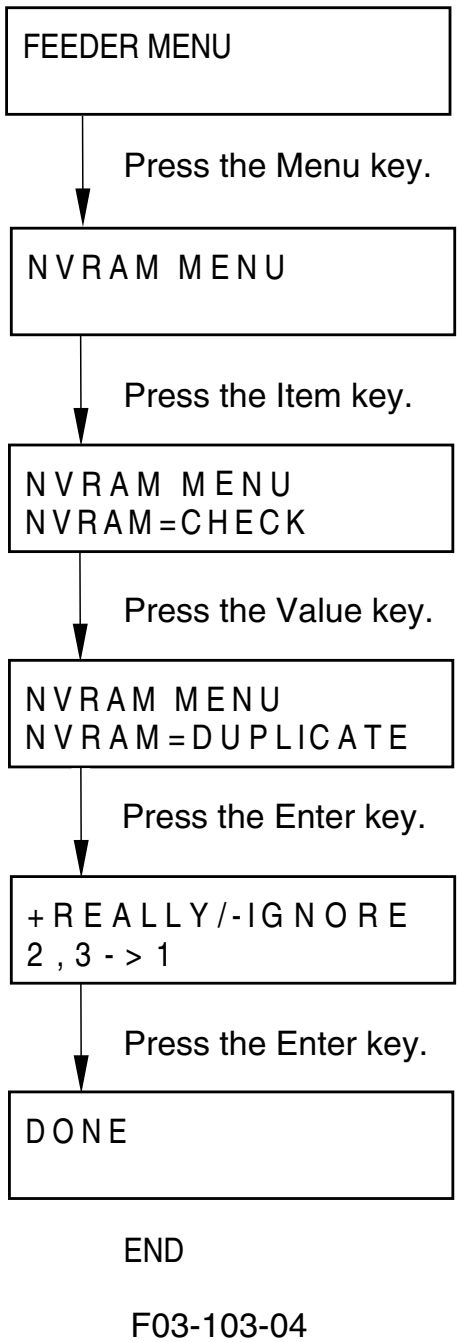
1.3.3 After Replacement

a. Transfer the Printer Settings

1) Remove the RAM DIMM/ROM DIMM/EEPROM (IC4, 5) from the existing printer board, and mount them to the same locations on the new printer board.

If a ROM DIMM designed for upgrading exists on the old printer board, be sure that the built-in ROM or the upgrading ROM on the new printer board are of the latest version.

2) Press the Additional Functions key and then the #/ID (#) key in the control panel to start service mode.
3) Using the cursor key, select #8 PDL (printer-related service mode).
4) Using the cursor key, select PDL-PCL MENU, and press the OK key.
5) Using the cursor key, select SERVICE MENU, and Press the OK key.
6) If equipped with fax functions, press the printer key to enter the printer service menu.
7) Go through the steps in F03-103-04.



F03-103-04

8) Press the Go/OK key to end service menu.

b. Setting the COLD RESET A4/LTR

Execute the following steps to register the default paper size.

1) Press the additional functions key and then the #/ID (#) key to set the machine to the service mode.
2) Select #8 PDL with the cursor key and press the OK key.
3) Select PDL-PCL MENU with the cursor key and press the OK key.
4) When the default paper is A4, select COLD RESET A4 with the cursor key and press the OK key. When it's Letter, select COLD RESET LETTER and press the OK key.
   After about 45 sec, the printer mode will return to the READY status.

If the setting is incorrect, it will be impossible to generate the test print etc.

5) Press the Go/OK key to end service mode.
6) Turn off the power.
7) Mount the hard disk (option) and the network board (option).
8) Turn on the power switch.
9) Enter necessary settings referring to the TEST PRINT output in Steps 1) and 2) and the Ethernet configuration page (for machines with the network board only).
10) Turn off the power switch with the shutdown menu.
11) End.

CHAPTER 4

TROUBLESHOOTING

1 Service Mode

1.1 Outline

You can use the host machine's service mode to make printer-related service mode settings as follows:

Making Settings

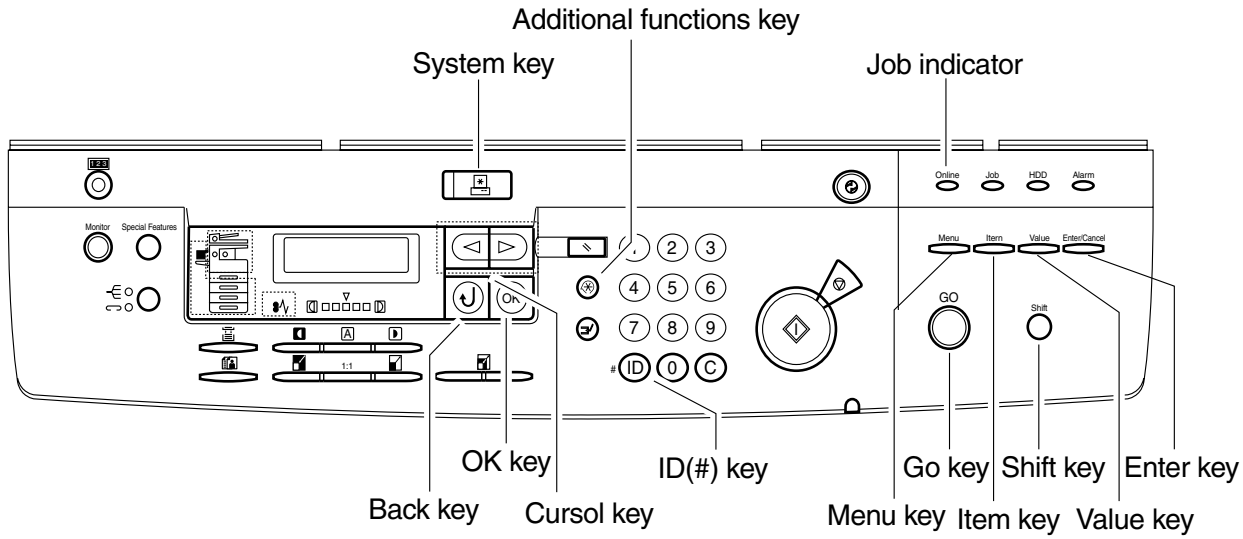
The keys to use on the control panel vary depending on the host model (whether or not equipped with a fax function). The indications within parentheses refer to the control panel keys of a host model equipped with a fax function.

1) Press the Additional Functions key and then the ID (#) key in the control panel to start service mode.
2) Using the cursor key, select #8 PDL (printer-related service mode).
3) Using the cursor key, select PDL-PCL MENU, and press the OK key.
4) Using the cursor key, select MENU, and press the OK key.

If you have selected SERVICE MENU, go through the following:

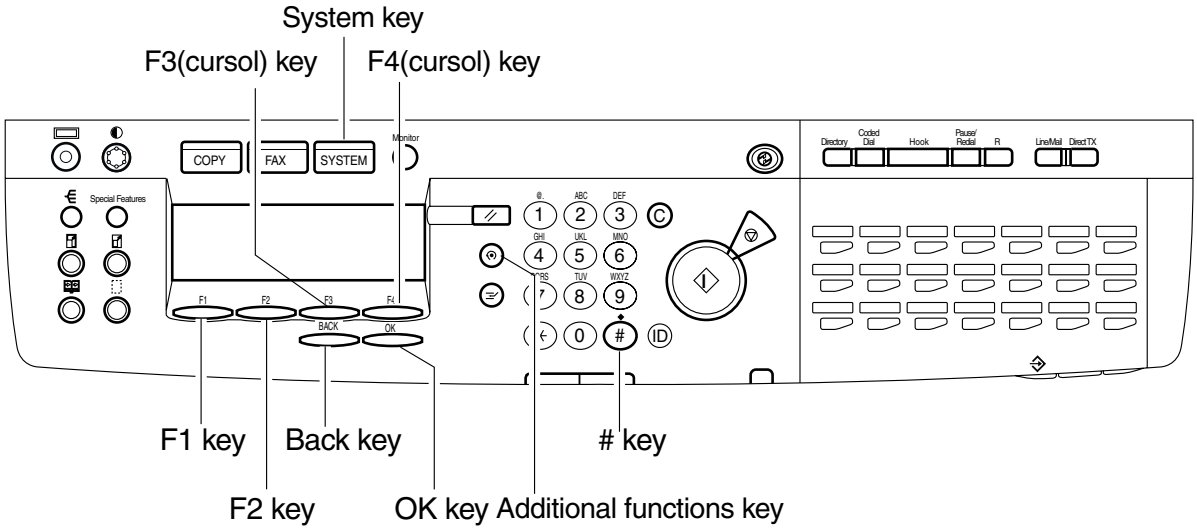
5) If the fax function model, press the printer key to enter the printer mode.
6) Using the MENU (F1) key, select the desired menu.
7) Using the ITEM (F2) key, select the desired item.
8) Using the VALUE (F3) key, select the desired setting.
9) Press the ENTER (F4) key to store the setting.
10) Press the Go (OK) key to end service mode.

• For non-fax model



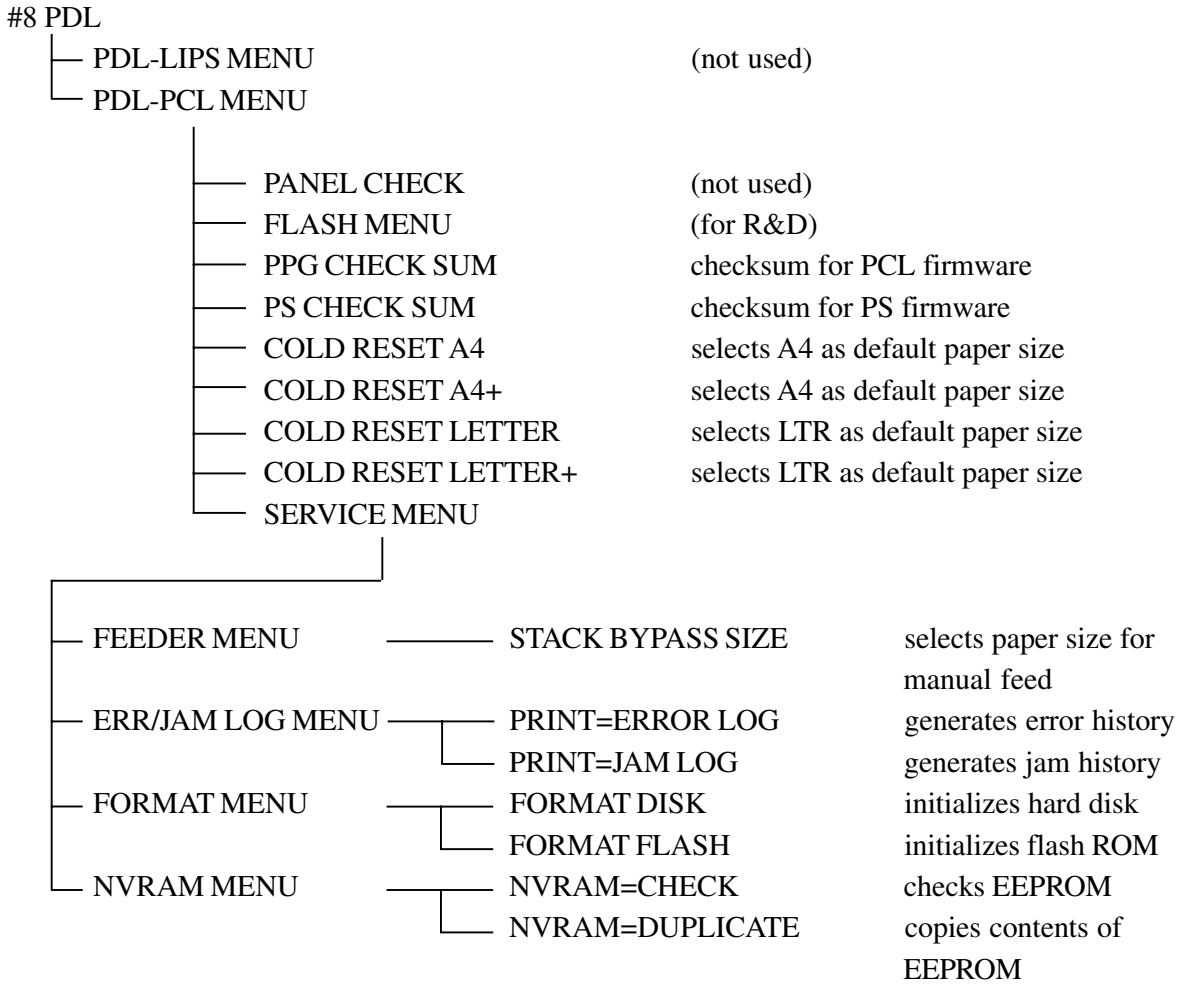
F05-101-01

• For fax model



F05-101-02

The following is the menu items for service mode:



1.2 Functions of Service Mode

The functions of each service mode item are as follows:

PPG CHECK SUM/PS CHECK SUM

The host machine performs a check sum operation on the requested ROM bank. The calculated Check Sum is displayed on the LCD.

COLD RESET A4/LETTER

The host machine sets the default to the selected paper size (A4/LTR), and resets it to zero, if the page count is less than 50.

COLD RESET A4+/LETTER+

The host machine sets the default to the selected paper size (A4/LTR), and resets its to zero, if the page count is less than 50, and then feeds the paper without the paper size for manual feed.

FEEDER MENU

You may select any of the following paper sizes for manual feed:
ANY*1, A4, LETTER, LEGAL, A5, B5-JIS, COM10, MONARCH, C5, DL, A3, B4, 11x17, CUSTOM, STATEMENT, B5-ISO.

*1: displayed only if the host machine is set COLD RESET A4+ or COLD RESET LETTER+

SERVICE MENU

ERR/JAM LOG MENU

· PRINT=ERROR LOG
Indicates the times, codes, and locations of the most recent 20 errors.
· PRINT=JAM LOG (jam history output)
Indicates the times, codes, and locations of the most recent 20 jams.

FORMAT MENU

· FORMAT DISK (displayed only if equipped with a hard disk.)
Initializes the hard disk.
· FORMAT FLASH (displayed only if equipped with a flash ROM.)
Initializes the flash ROM.

NVRAM MENU

· NVRAM=CHECK
Indicates the counter readings of the 3 NVRAMs on the printer board.
NVRAM1=built-in NVRAM, NVRAM2=IC4, NVRAM3=IC5
· NVRAM=DUPLICATE
Copies the contents of the existing NVRAM (EEPROM) at time of printer board replacement.
The NVRAM contains the following data: page counter readings of the printer, panel settings of the printer, error/jam history, serial number.

2 Self Diagnosis

2.1 Outline

When the host machine is turned on, the printer unit runs its self diagnostic program for hardware, thereby checking the Board, expansion ROM, expansion RAM, and expansion I/O port. If a fault is detected as a result, the host will indicate the following in its control panel: warming message, NORMAL ERROR, or SERVICE CALL ERROR.

2.2 Warning Messages

A warning message may be may be any of the following; take the action given to suit each message:

Message	Meaning	Action
MEMORY OVERFLOW	A memory overflow has occurred.	The printer has received more data than it can hold in the available memory on the printer board. If AUTOCONT is ON (CONFIG MENU), the print job will be put back online after 10 sec. If AUTOCONT is OFF, the printer will go offline. Press the Go key and the print job will continue printing, although data may be lost. Simplify the print job by deleting unnecessary fonts or macros from the printer memory, or add additional memory to the printer.
FLASH OVERFLOW	A memory overflow has occurred in the optional Flash ROM.	The printer has received more font and macro data than it can hold in the available memory of the Flash ROM. The printer will go offline. Press the Go button to put the printer back online. Format the Flash ROM or delete font and macro data to create more space.
MRT COMPRESSION	The printer is processing complex data.	The printer is using MRT Compression because the page is too complex. Wait a moment for the operation to complete.
DISK ALMOST FULL	The optional hard disk is 70% or more full.	Delete any font or macro files that are no longer needed to increase the amount available disk space.
DISK FULL	The optional hard disk is 95% full, and the printer will go offline.	The printer will be put back online after 10 sec, if AUTOCONT is ON (CONFIG MENU). Delete any fonts or macro files that are no longer needed to increase the amount of available disk space.
READY JOB LOG FULL	The amount of stored job logs will exceed the maximum limit.	Delete unnecessary job logs from the hard disk.
READY NEAR STORE LIMIT	The number of stored print jobs will exceed the maximum of 9500.	Delete unnecessary print jobs from the hard disk.

2.3 Normal Error

A normal error indication may be any of the following; take the action given to suit each indication:

Message	Meaning	Action
AUTHENTICATION ERROR	Invalid password	Enter the correct password.
EXCEEDS STORE LIMIT	Unable to save a print job on the printer hard disk.	There is not enough available free space on the hard disk. Delete unnecessary print jobs from the hard disk, and then, press the Go key on the printer.
PS OPTION ERROR	An option PS module error occurred.	An option ROM has failed the startup checksum. Replace the option ROM.
OPTION RAM ERROR	An option RAM error occurred.	An option RAM has failed the startup diagnostic. Replace the option RAM.
OPTION ROM ERROR	An option ROM error occurred.	An option ROM has failed the startup checksum. Replace the option ROM.
FLASH ERROR	The Flash ROM error occurred.	Replace the Flash ROM.
WRITING DISK ERROR	Unable to write to the printer hard disk.	Make sure that the hard disk is installed correctly. Turn off the printer, and the turn it on again. If the warning persists, format the hard disk.
READING DISK ERROR	Unable to read the printer hard disk.	Make sure that the hard disk is installed correctly. Turn off the printer, and then turn it on again. If the warning persists, format the hard disk.
MEM ALLOC ERROR	Not enough memory to process the data and print the page.	If AUTOCONT is ON (CONFIG MENU), the printer will be put back online after 10 sec. If AUTOCONT is OFF, press the GO key to put the printer back online. Check the printed page to ensure that the print job is complete.

PARALLEL INTERFACE ERROR	A parallel port error occurred.	Correct the connection after checking the connector. Then, restart the printer. If the warning persists, replace the printer board.
USB INTERFACE ERROR	A USB port error occurred.	Correct the connection after checking the connector. Then, restart the printer. If the error persists, replace the printer board.
ETHERNET OPTION ERROR	A network interface board error occurred.	Restart the printer after checking the installation of the network interface board. If the error persists, replace the network interface board.
JOB STORING REJECTED	The receiving print job will stop.	The mount of the stored job logs will exceed the maximum limit. Delete unnecessary job logs from the hard disk.

2.4 Service Call Error

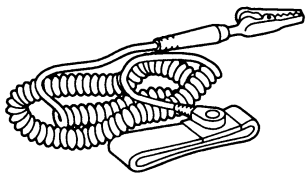
A service call error may be any of the following; take the action given to suit each indication:

Message	Meaning	Action
E676 CALL FOR SERVICE	A communication error occurred between the host machine and the printer board.	Restart the printer. If the error persists, replace the printer board. If the error persists, replace the image processor PCB.
E677/6F-7A CALL FOR SERVICE	An SRAM error occurred in the ASIC.	Restart the printer. If the error persists, replace the printer board.
E677/6F-61 CALL FOR SERVICE	An internal ROM check error occurred.	Restart the printer. If the error persists, replace the printer board.
E677/6F-63 CALL FOR SERVICE	An internal RAM error occurred.	Restart the printer. If the error persists, replace the printer board.

APPENDIX

1 Special Tools

You will need the following tools in addition to the standard tools set to service the Board:

No.	Tool name	Tool No.	Appearance	Rank	Remarks
1	Wrist strap	CK-0534-000		A	

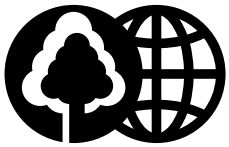
REF.

Rank
A : Each service person is expected to carry one.
B : Each group of 5 service persons is expected to carry one.
C : Each workshop is expected to carry one.

Prepared by
Office Imaging Products Quality Assurance Center
CANON INC.
Printed in Japan

REVISION 0 (MAR. 2002) (30359/29685)

5-1, Hakusan 7-chome, Toride-shi, Ibaraki 302-8501 Japan



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