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# GP160F/160DF/160

# SERVICE MANUAL

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**FEB. 1999**

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# INTRODUCTION

This service manual provides basic information required for performing field service to maintain the product quality and functions of the this machine. The structure of the manual is as described below.

Material Name	Content
Main unit service manual	The main unit and cassette feeder's; functions, mechanism, disassembly, assembly, adjustment methods, etc.
G3 FAX manual	The main unit's G3 facsimile functions.
ADF	The functions, mechanism, disassembly, assembly, adjustment method, etc. of the main unit's ADF.

Each chapter consists of the following sections.

Chapter 1, "Introduction," : Features, specifications, operation methods, copying process.

Chapter 2, "Basic operation," : Explanation of the machine's basic operations

Chapter 3, "Exposure system," : Explanation of the exposure system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 4, "Image processing system," : Explanation of the CCD, analogue / digital image processing, disassembly, assembly and adjustment methods.

Chapter 5, "Laser exposure system," : Explanation of the laser exposure system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 6, "Image formation system," : Explanation of the image formation system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 7, "Pick-up / Feed system," : Explanation of the pick-up / feed system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 8, "Fixing system," : Explanation of the fixing system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 9, "Outer cover / auxiliary control system," : Explanation of the outer cover / auxiliary control system's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 10, "Cassette feeder," : Explanation of the cassette feeder's mechanical / electrical system operating principles, timing, disassembly, assembly and adjustment methods.

Chapter 11, "Installation," : Conditions relating to the place of installation, and the installation procedures.

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Chapter 12, "Maintenance and Inspection," : Table of periodic replacement parts and consumables replacement targets, periodic service list and parts to be cleaned during a customer service call.

Chapter 13, "Troubleshooting," : Standards / adjustments, operation failure countermeasures and delivery failure countermeasures

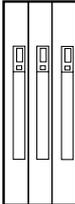
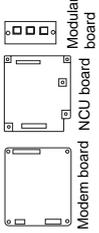
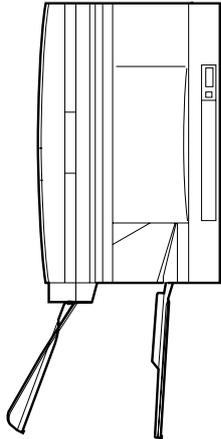
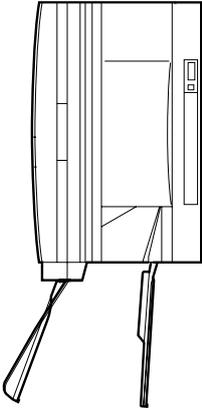
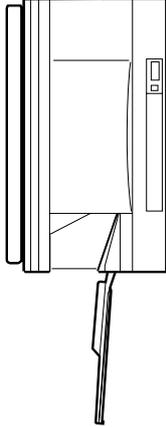
Appendix : General timing chart, general circuit diagram, etc..

The explanations in this manual are based on the following principles.

1. Each chapter gives an overview of each function's purpose, role and the connection between the electrical and mechanical systems as well as the operation timing of each part.  
In the outline diagram, the  signal shows the mechanical drive transmission. When the  signal is shown with a signal name, it indicates the electric signal flow.  
In the explanation of this unit's digital circuit, "1" is indicated when the signal's voltage level is high, and "0" is indicated when it is low. However, the voltage value will differ depending on the electrical circuit. Furthermore, the \* in the signal value [DRMD\*] shows the DRMD signal is "0" and ON.  
In each chapter, [Power supply ON] indicates the power supply SW has been turned "ON", the front door, etc., has been shut, and power is being supplied to the copier.
2. This unit utilizes micro processors, however, due to the impossibility of checking the micro processor's internal operation, an explanation of the micro processor's operation has been omitted. Furthermore, assuming that internal repair of the print circuit board will not take place on the customer's premises, the explanation of the circuit in the print circuit board's circuit is limited to an outline explanation using a block diagram. Consequently, the electrical circuit explanations consist of 2 types, from the sensors to the main circuit board's input section, and from the main circuit board's output section to the load, and block diagrams by function.

Changes of the contents made for the sake of product improvements will be notified in Service Information (Technical Information).

Gaining a sound and thorough understanding of the copier through careful reading of this service manual and the subsequently issued Service Information (Technical Information) bulletins is the only way to develop the technical skill necessary to prolong product quality and functionality and the practical ability to be able to determine the cause of breakdowns.

Main unit configuration			
<b>System configuration</b>  ADF-H1  Cassette Unit D1  Cassette unit E1  Modem board NCU board Modular board Super G3 FAX board  8MB expanded memory	<b>GP160F</b>  Digital black and white copier and facsimile <b>Standard equipment</b> Option Option <b>Standard equipment</b> Option	<b>GP160DF</b>  Digital black and white copier (with ADF) <b>Standard equipment</b> Option Option Option Option	<b>GP160</b>  Digital black and white copier (Copy board cover model) Option Option Option Option Option



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# CHAPTER 1

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## INTRODUCTION

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This chapter provides an overview of the unit's specifications, operating method and copying process.

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# I. FEATURES

## < Copy function >

- 1200 equivalent × 600dpi high resolution copy
- Due to a new engine, high image quality printing with minute particle super fine toner (diameter 5 microns) has been made possible.
- Due to the integrated drum, toner cassette, the print inner assembly is refreshed when the cartridge is replace.
- 256 gradation readings, and realistic half tone rendering.
- Max. 5 way / max. 1100 sheets large volume multi-level pick-up.
- Dual operation - allows copying during fax transmission.

## < Fax function >

- High speed Super G3 Fax 2 second transmission (33.6kbps) provided as standard for ordinary telephone lines.
- Able to send and receive A3 size direct copy.
- 400dpi scanning resolution ultra high image quality (ultra fine mode).
- 600dpi recording resolution ultra high image quality, standard mode 600dpi printing.
- Standard 1megabyte memory (roughly 64 sheets), possibility to expand to maximum 9 megabytes (roughly 576 sheets).

## II. SPECIFICATIONS

### 1. Type

Item	Specifications
Main unit	Desk top
Copyboard	Fixed
Light source	Xenon lamp
Lens	Fixed focal lens
Photosensitive medium	OPC ( $\phi$ 30)

### 2. Method

Item	Specifications	
Copying	Indirect electrostatic copying method	
Charging	AC roller charging method	
Exposure	Semiconductor laser	
Copy density adjustment	Automatic or manual	
Developing	Dry single component jumping method (single unit drum cartridge)	
Pick-up	Automatic	Cassette
	Manual	Multi-feeder
Transfer	Roller charging method	
Separation	Electrostatic separation (static charge elimination) + curvature separation	
Cleaning	Rubber blade	
Fixing	SURF Fixing	

### 3. Functions

Item		Specifications
Types of document		Sheet, book, three dimensional objects (up to max. 2kg)
Max. document size		A3 / 11 × 17
Wait time		15 seconds or less from power ON (20°C)
		7 seconds or less from the energy saver mode being cancelled
First copy time		12 seconds or less (main unit cassette pick-up, 1-to-1 copy, A4, no AE)
Continuous copying		1 to 99 sheets
Pick-up capacity		Each cassette 250 sheets *1, multi-feeder 100 sheets (80g/m <sup>2</sup> )
Delivery tray capacity		100 sheets *2
Copy size	Cassette pick-up	Max. : A3 / 11 × 17 Min. : A5
	Multi-feeder pick-up	Max. : A3 Min. : A5
Types of copy paper	Cassette pick-up	Plain paper 64 to 90g/m <sup>2</sup> , recycled paper 64 to 90g/m <sup>2</sup> , tracing paper (GNT-80) *1
	Multi-feeder pick-up	Plain paper 64 to 128g/m <sup>2</sup> , tracing paper (SM-1) labels, recycled paper 64 to 128g/m <sup>2</sup> , OHP *2, tracing paper (GNT-80)*3
Cassette specifications		With tab, universal
Non image width	Leading edge	4.0 ± 2.0mm
	Trailing edge	2.5 ± 2.0mm
	Front	2.5 ± 2.0mm
	Rear	2.5 ± 2.0mm
Auto clear		Yes (Standard 2 min., possible to change in units of 1 min. between 0 to 9 min)
Energy saver		Yes (Standard 3 min., possible to change in units of 1 min. between 3 to 30 min)
Option *4		Cassette feeder (1 step type / 3 step type), 8MB expanded memory, ADF, FAX board

\*1: 50 or less sheets of tracing paper (GNT-80) by cassette.

\*2: 50 or less sheets of OHP sheets by cassette (designated paper).

\*3: 1 or less sheets of tracing paper (GNT-80) by multi-feeder.

\*4: Differs depending on the main unit configuration.

4. Other

Item		Specifications
Operating environment	Temperature range	5 to 35°C
	Humidity range	10 to 90% RH
	Atmospheric pressure range	709 to 1013hpa
Power supply	Main unit	
	GP160	GP160DF
	• 230V(ITA): PNSxxxxx	• 230V(ITA): PHLxxxxx
	• 230V(UK): QCTxxxxx	• 230V(UK): QCLxxxxx
	• 230V(FRN): SBTxxxxx	• 230V(FRN): SBRxxxxx
	• 230V(GER): TBTxxxxx	• 230V(GER): TBQxxxxx
• 230V(AMS): UEHxxxxx	• 230V(AMS): UEFxxxxx	
• 230V(CA): RCXxxxxx		
• 230V(Others):PHXxxxxx		
GP160F		
• 230V(ITA): PHTxxxxx		
• 230V(UK): QCMxxxxx		
• 230V(FRN): SBSxxxxx		
• 230V(GER): TBRxxxxx		
• 230V(AMS): UEGxxxxx		
• 230V(CA): RCWxxxxx		
• 230V(Others):PHMxxxxx		
	Cassette Feeding Module-D1	Supplied by main unit : ZCRxxxxx
	Cassette Feeding Module-E1	Supplied by main unit : ZHRxxxxx
Power consumption	Maximum	Approx. 800W
	Standby	Approx. 20W
	Energy saving mode	Approx. 14W
Operating noise	When in operation	66dB or less
	Standby	40dB or less
Dimensions	Width	616 (mm) / 24.25"
	Depth	640 (mm) / 25.20"
	Height	427 (mm) / 16.81" (Including ADF)
Mass		48.8kg 107.59 lb
Storage of consumable items	Copy paper	Store with the package closed and avoid humidity
	Cartridge	Refer to page 12-3

## 5. Copy speed

Reproduction mode	Size	Copy paper size	No. of copies / minute
Direct copy	A4 (210 × 297mm)	A4	16
	A3 (297 × 420mm)	A3	9
	B4 (257 × 364mm)	B4	10
	A4R (297 × 210mm)	A4R	9
	B5 (182 × 257mm)	B5	16
	B5R (257 × 182mm)	B5R	12
	A4 (148.5 × 210mm)	A5	12
	LTR (216 × 279mm)	LTR	16
	LTRR (279 × 216mm)	LTRR	9
	LGL (216 × 356mm)	LGL	9
	11 × 17 (279 × 432mm)	11 × 17	9

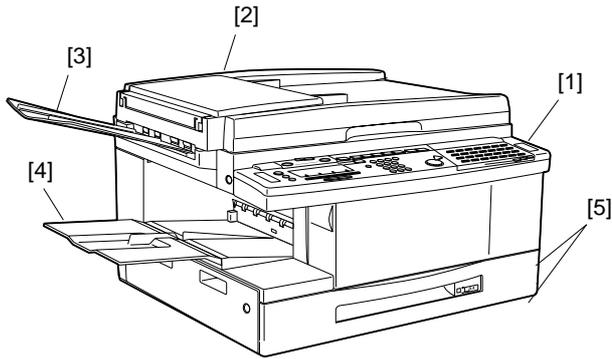
Specifications are subject to change for the sake of product improvements.

### III. NAMES OF PARTS

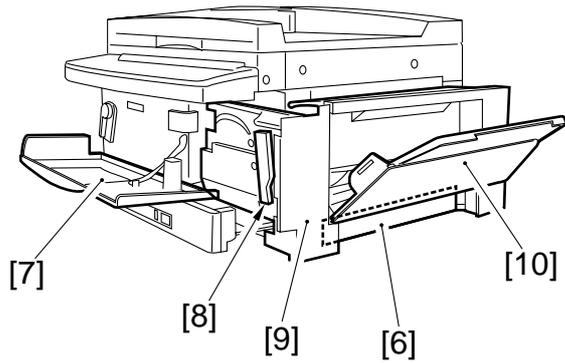
#### A. External view

##### Main unit

ADF standard equipment model

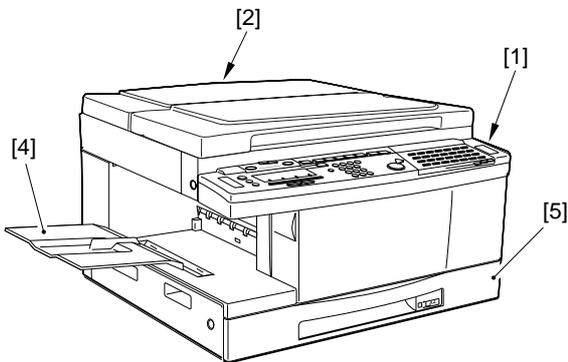


**Figure 1-301**

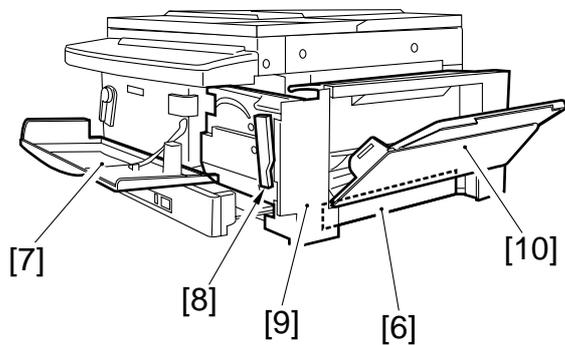


**Figure 1-302**

Copyboard cover model

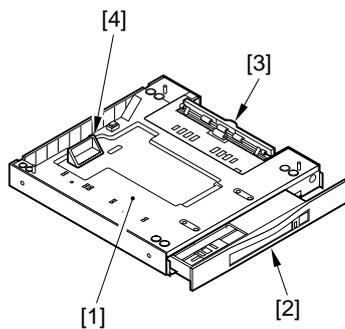


**Figure 1-303**



**Figure 1-304**

Cassette feeder (accessory)



**Figure 1-305**

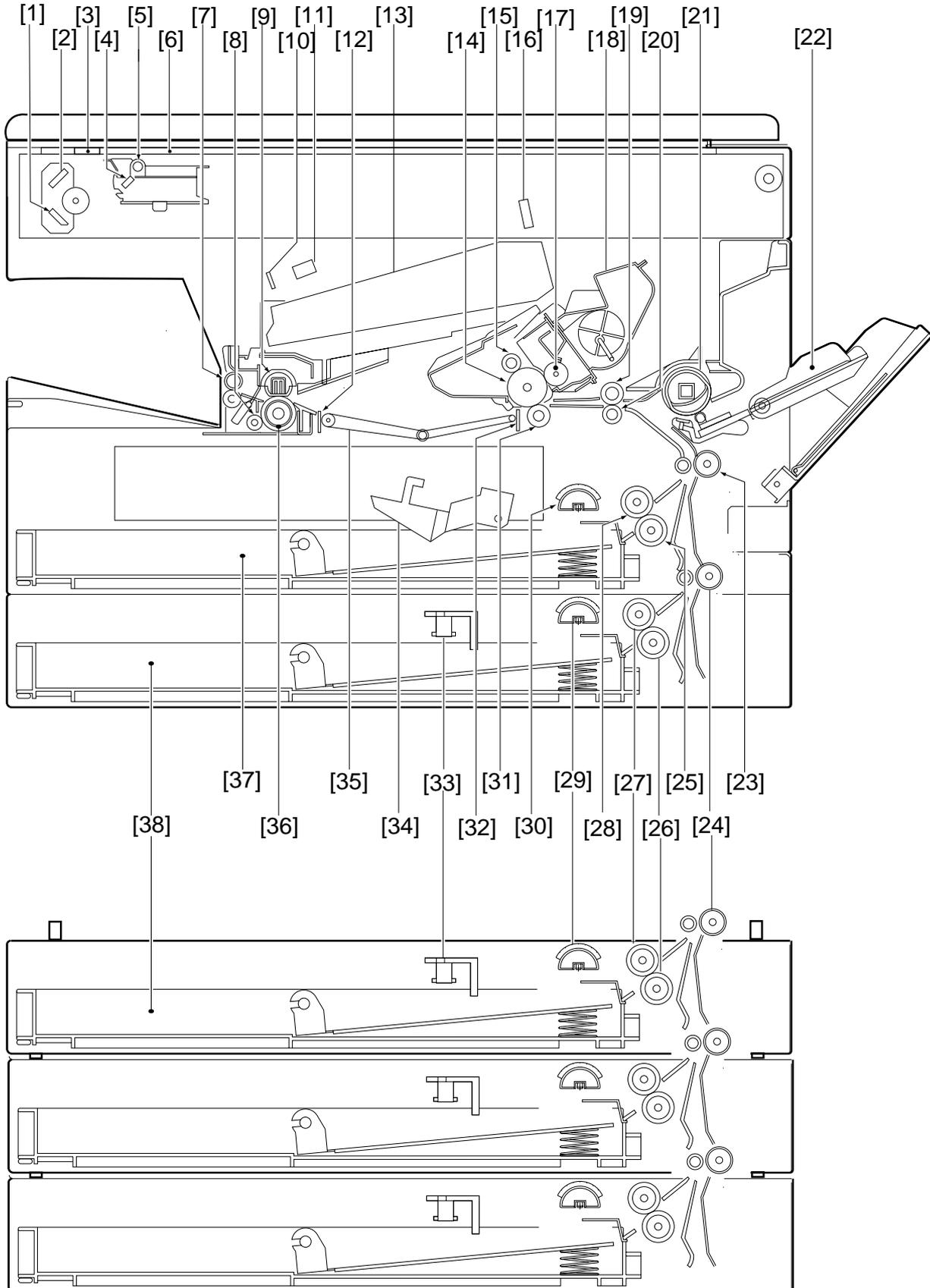
**Main unit**

- |                            |                                 |
|----------------------------|---------------------------------|
| [1] Control panel          | [6] Right lower cover           |
| [2] ADF                    | [7] Front cover                 |
| [3] Document delivery tray | [8] Printer unit release handle |
| [4] Delivery tray          | [9] Printer unit                |
| [5] Cassette               | [10] Multi feeder tray          |

**Cassette feeder (accessory)**

- [1] Cassette feeder
- [2] Cassette
- [3] Right door
- [4] Feeder lifting handle

**B. Cross sectional diagram**



**Figure 1-306**

- [1] Mirror 3
- [2] Mirror 2
- [3] White reference assembly
- [4] Mirror 1
- [5] Document scanning lamp
- [6] Copyboard glass
- [7] Fixing delivery roller
- [8] Cleaning roller
- [9] Fixing film
- [10] CCD
- [11] Lens
- [12] Charge eliminator
- [13] Laser scanner unit
- [14] Photosensitive drum
- [15] Primary charging roller
- [16] Mirror 4
- [17] Developing cylinder
- [18] Cartridge
- [19] Registration pressure roller
- [20] Registration roller
- [21] Multi-feeder pick-up roller
- [22] Multi-feeder tray
- [23] Vertical path roller (Main unit pick-up assembly)
- [24] Vertical path roller (Cassette feeder)
- [25] Separation roller (Main unit pick-up assembly)
- [26] Separation roller (Cassette feeder)
- [27] Feed roller (Cassette feeder)
- [28] Feed roller (Main unit pick-up assembly)
- [29] Pick-up roller (Cassette feeder)
- [30] Pick-up roller (Main unit pick-up assembly)
- [31] Transfer charging roller
- [32] Separation static charge elimination
- [33] Paper sensor lever (Cassette feeder)
- [34] Paper sensor lever (Main unit pick-up assembly)
- [35] Feed assembly
- [36] Fixed pressure roller
- [37] Paper cassette (Main unit)
- [38] Paper cassette (Cassette feeder)

# IV. OPERATION EXPLANATION

## A. Control panel

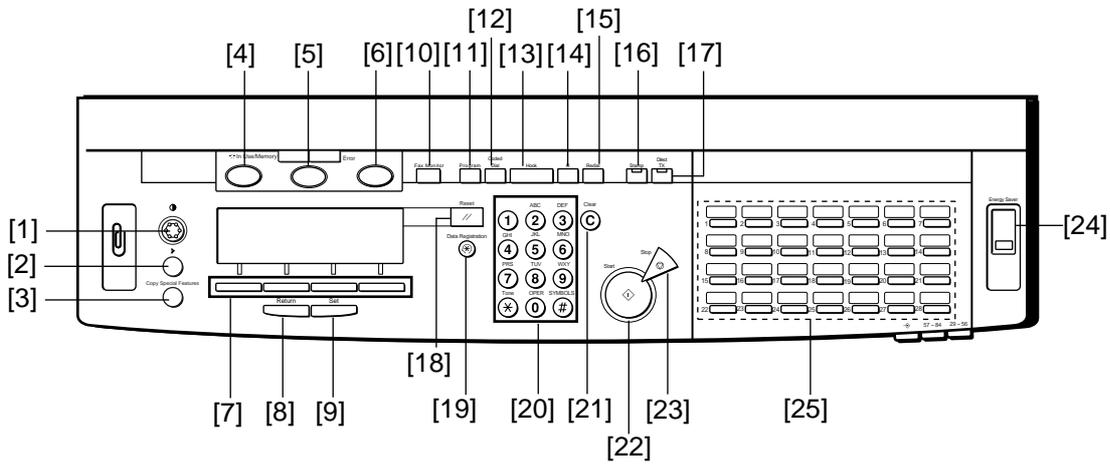


Figure 1-401

No.	Key name	Function outline
[1]	Display contrast VR	Adjusts the control panel contrast.
[2]	Collate key	Performs sort copying when copying with the ADF.
[3]	Copy special features	Performs frame erasing, margin, transferring and 2 in 1 copying.
[4]	COPY	Changes over to the copy mode.
[5]	FAX*	Changes over to the fax mode.
[6]	PRINT/SCAN*	Changes over to the printer mode.
[7]	Display selection	Selects functions shown in the display.
[8]	Return	Returns to the previous display.
[9]	Set	Confirms the registration/setting.
[10]	Fax Monitor*	Confirms the transmission conditions, clears transmission reservations.
[11]	Program*	Registers a single operation that can be selected by simply pushing this key.
[12]	Coded Dial*	Uses speed dial.
[13]	Hook*	Ability to listen to the other party's response through the speaker.
[14]	R*	Press to dial an outside telephone number, or an extension number, when the fax is connected through a switchboard (PBX).
[15]	Redial*	Redials the last number dialed.
[16]	Stamp*	Stamps a completed transmission.
[17]	Direct TX*	Executes direct transmission.
[18]	Reset	Resets the copy mode.
[19]	Data registration	Calls up the user mode setting display.
[20]	Numeric key	Dials the telephone number, sets the number of copies, etc..
[21]	Clear	Clears the registration/setting.
[22]	Start	Starts transmission / copying.
[23]	Stop	Stops transmission / copying.
[24]	Energy saver	Clears the energy saver mode.
[25]	One touch panel*	One touch dial key.

\*: Not available on copiers not equipped with the fax function

\*\* : Not available on copiers not equipped with the printer function

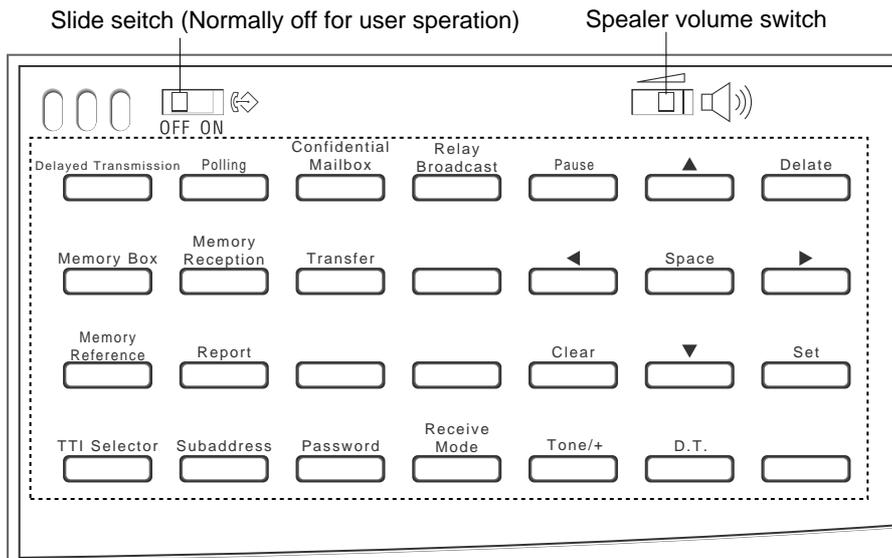


Figure 1-402

Key name	Function outline
Delayed Transmission*	Designates the sending time of the transmission.
Polling*	Designates polling transmission.
Confidential Mailbox*	Designates confidential transmission.
Relay Broadcast*	Designates relay origination transmission.
Delete*	Deletes the input characters.
Pause	Inserts a pause in the telephone number.
Memory Box*	Prints documents when they have been stored in the Memory box, or when a document has been reception by the memory box.
Memory Reception*	Receives in memory and designates the printing of reception documents.
Transfer*	Designates the transfer of reception documents to other faxes.
Memory Reference*	Designates the confirmation or deletion of memory contents.
Report*	Designates the output of each kind of report and list.
Clear	Designates the deletion of registration/setting.
Set	Designates the confirmation of registered/set contents.
TTI Selector*	Used when changing the senders name.
Subaddress*	Used when performing a subaddress transmission.
Password*	Used when transmitting with a fax standard password.
Receive mode*	Designates switching to receive mode.
Tone/+	Connects to information services that accept tone dialing only, even if you are using a rotary pulse line or enters a plus sign in a fax number. And enters a plus sign when registering your fax number.
DT	Press to confirm the dial tone when registering a telephone number.
Space*	Creates a space between rows of numbers or characters.
Shift key	Use to selecting items on the control panel.

\*: Not available on copiers not equipped with the fax function

## B. Basic operation

The basic operations of the copy keys on the operation panel are listed below.

Key name	Details
Reproduction ratio key	Selects fixed ratio change (2R2E) or zoom (50 to 200%).
Paper selection key	Selects the pick-up cassette.
Scanning mode key	Selects the scanning density (automatic, F1 to F9) and the image quality (character, character/photo, photo).

**Table 1-401**

## C. Advanced features

The basic operations of the advanced copy feature keys on the operation panel are listed below.

Key name	Details
Page separation	Performs left/right page separation copy in the book mode. Sets the left and right margins and designates the 2-page spread copy size.
Binding margin	Creates a binding margin on the paper. Sets the margin position (left margin, right margin, top margin, bottom margin) and also the margin width (1 to 10mm).
Frame erasing	Sets the frame erasing position.
Document frame erasing	Copies with document frame erasing.
Sheet frame erasing	Creates a margin around the outside of the document and copies.
Book frame erasing	When copying books, etc., the surrounding and center margins are deleted.
Punch hole erasing	Erases punch holes from the left margin of copied documents.
2 in 1 copy	Inputs the document size and paper size and designates 2 in 1 copying.

**Table 1-402**

## D. User mode

When the registration/setting key is pressed on the control panel, the user mode setting screen is displayed.

The construction of the user mode is shown below.

### 1. User mode for copies equipped with the fax function

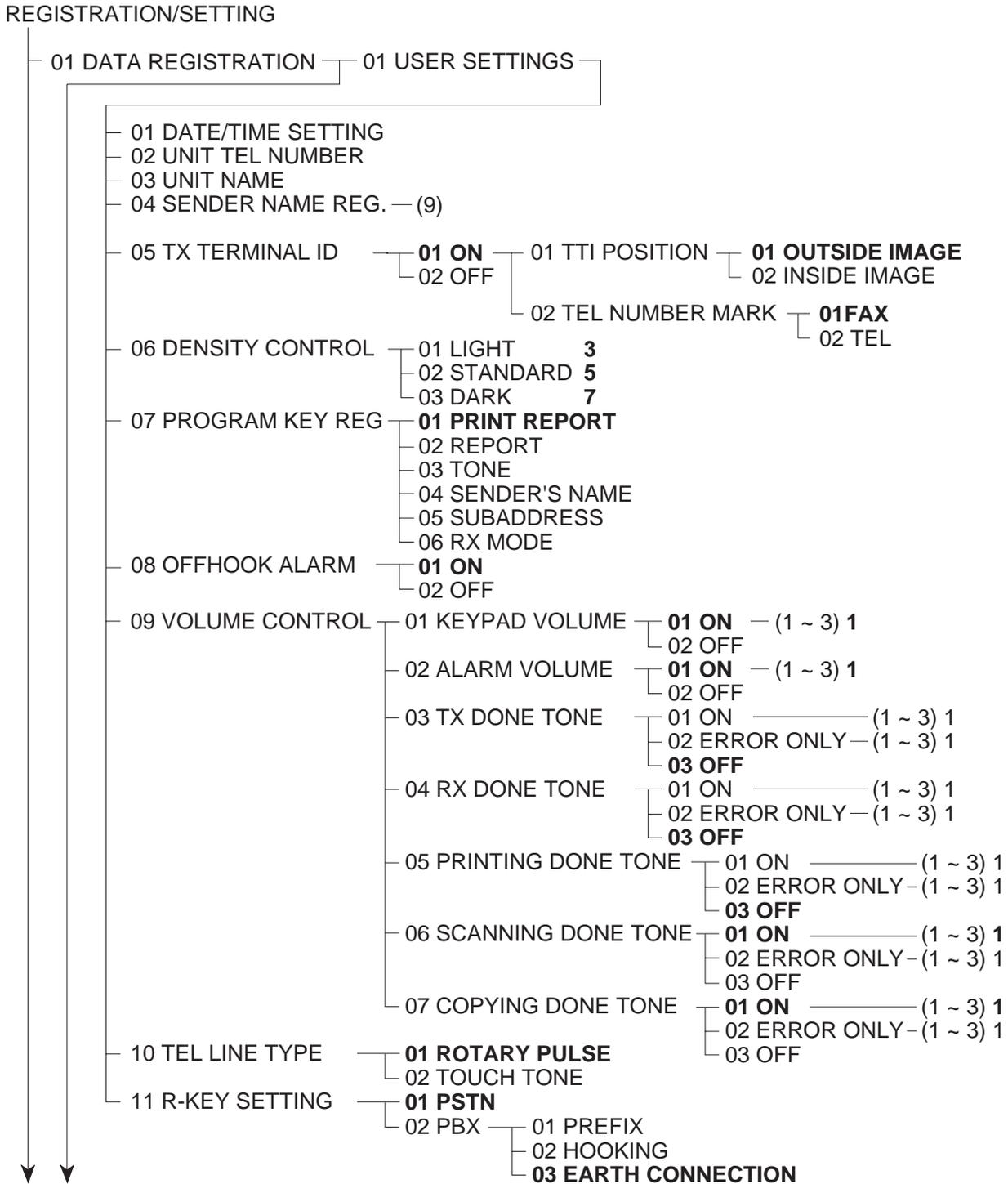


Figure 1-403

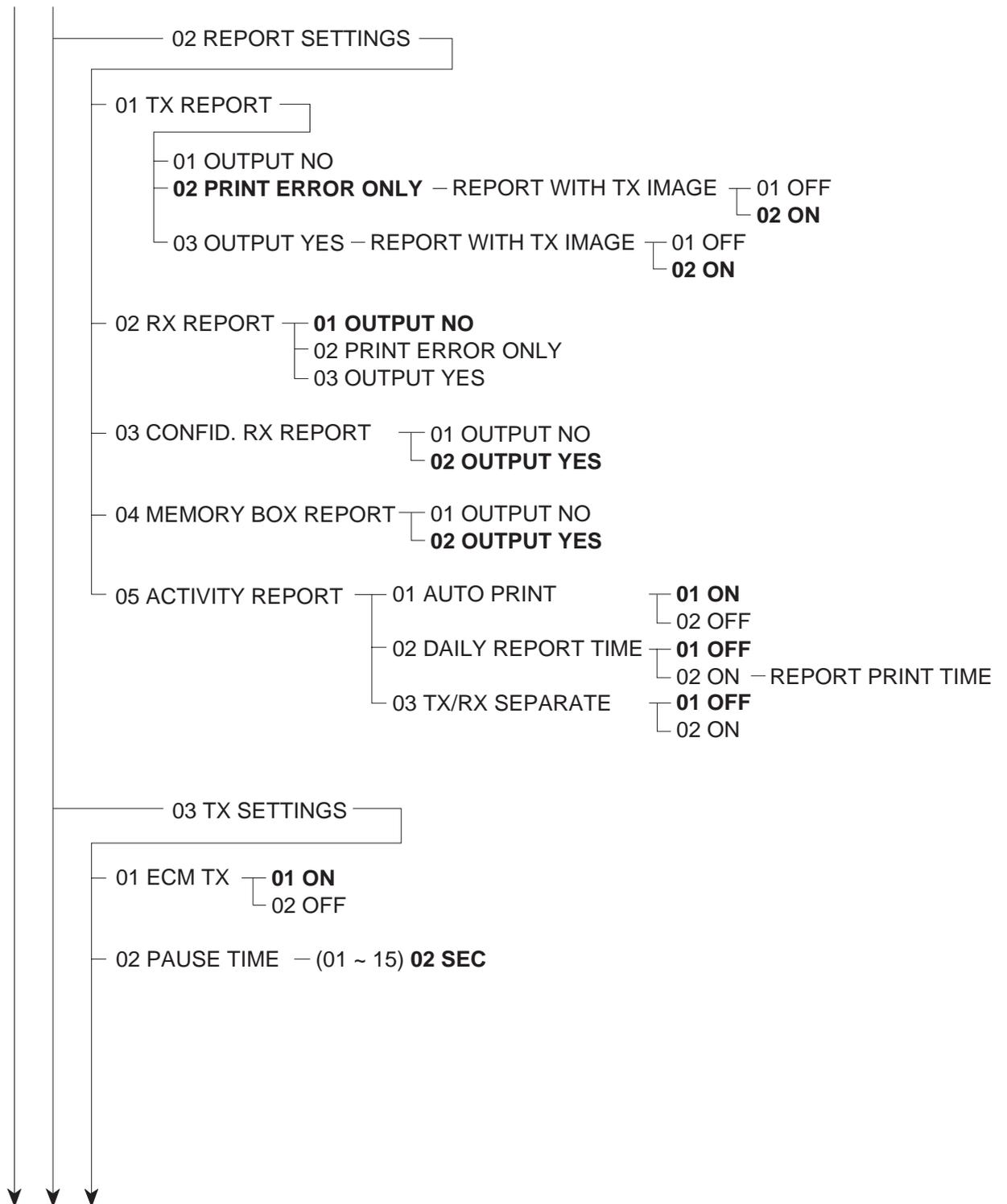


Figure 1-404

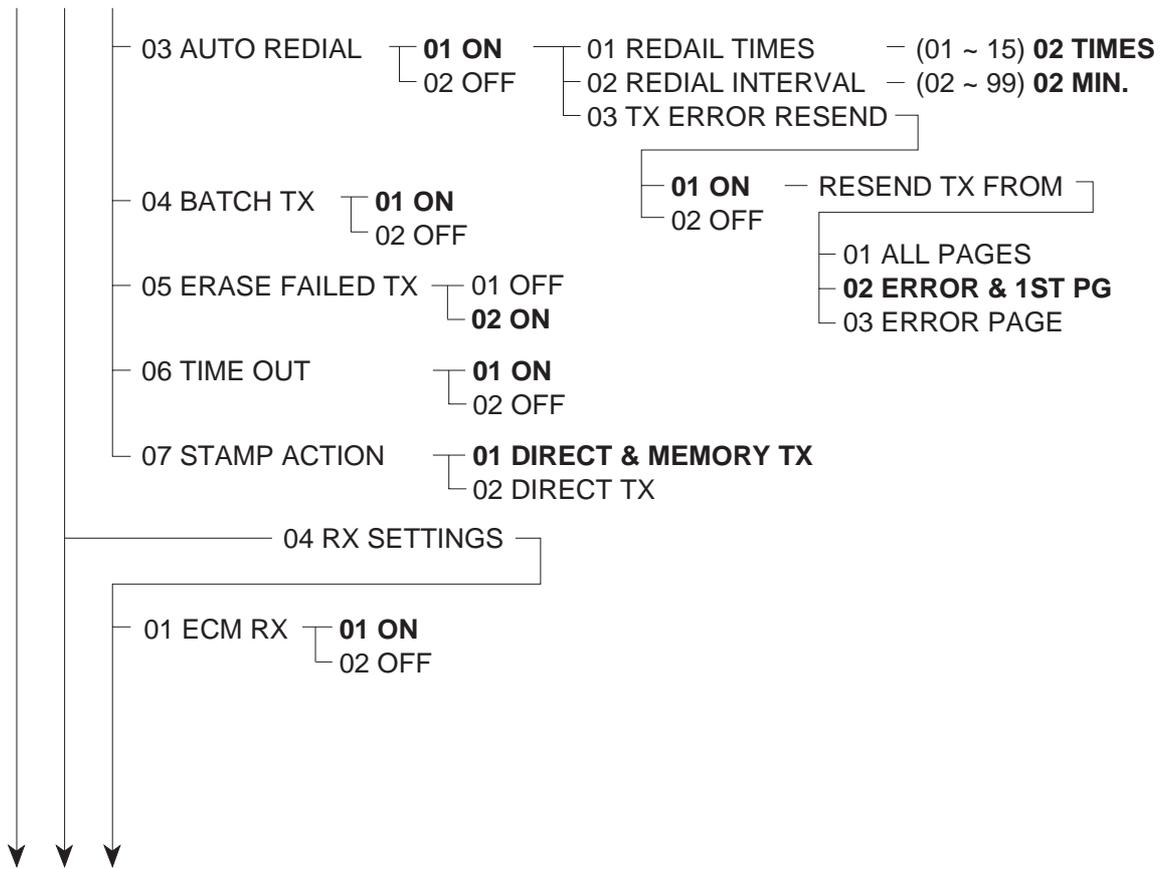


Figure 1-405

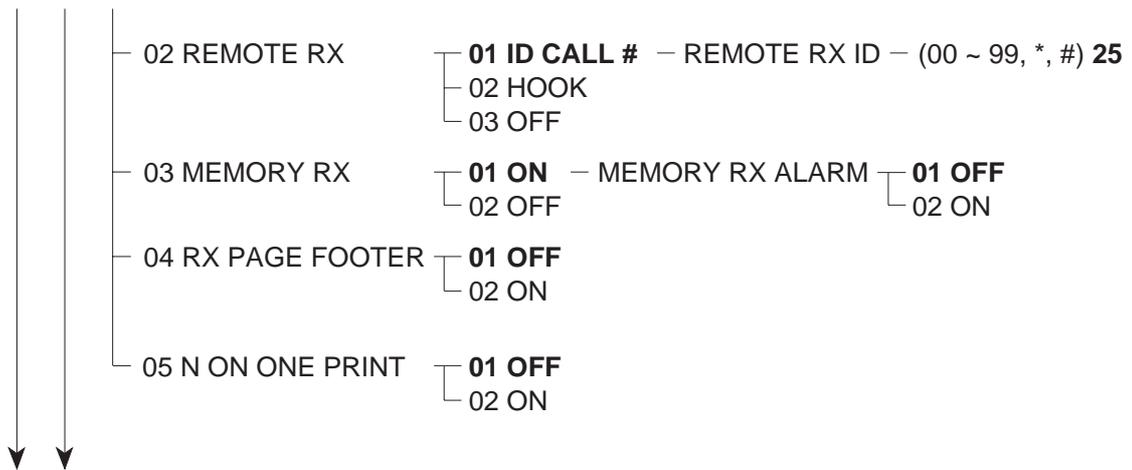


Figure 1-406

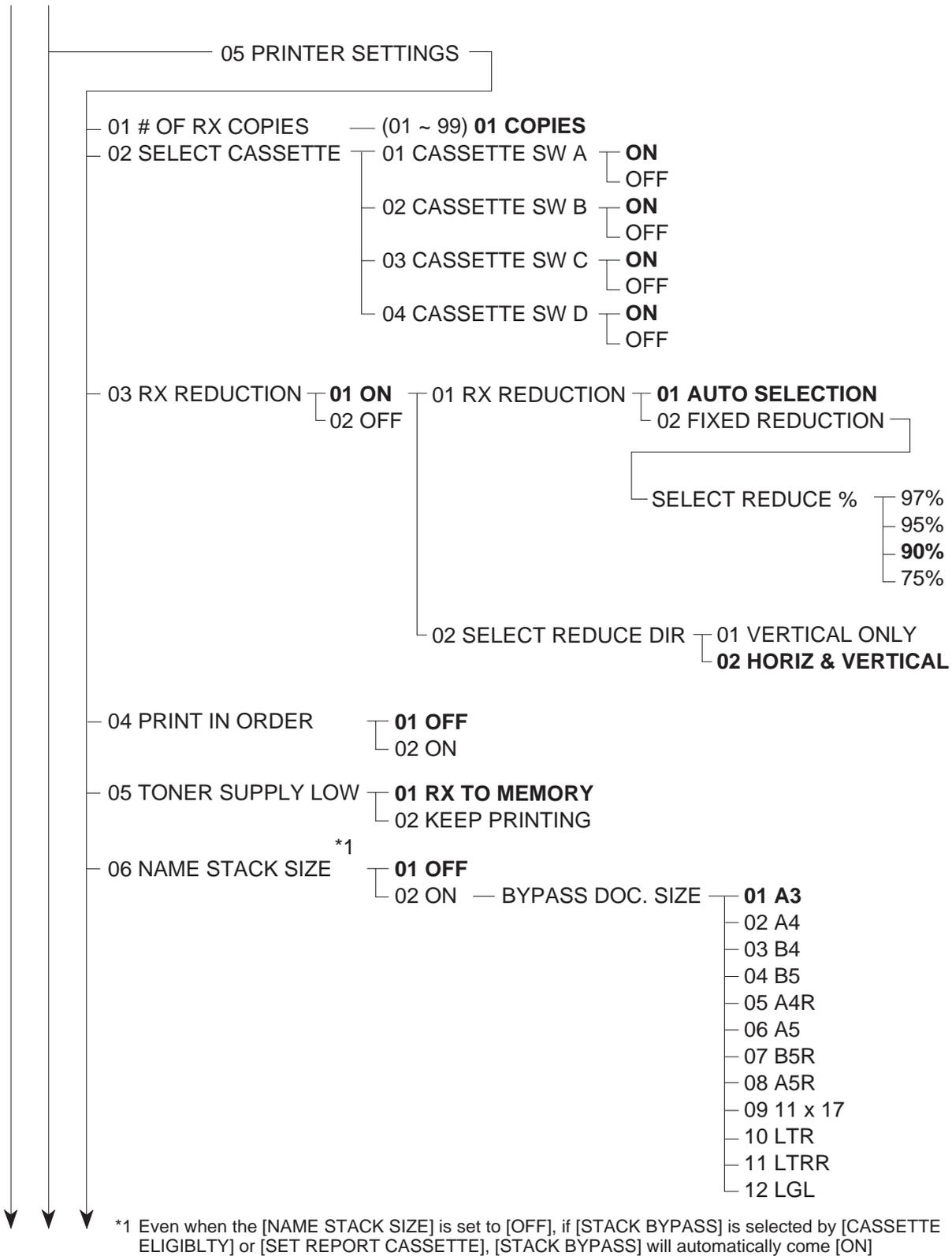


Figure 1-407