# ScanFront 220/220P

# SERVICE MANUAL

## FIRST EDITION

Canon

JULY 2007 MY8-13AC-00D

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

***COPYRIGHT © 2007 CANON ELECTRONICS INC.***

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

# PREFACE

This Service Manual describes necessary basic information for field service and maintenance for maintaining the product quality and functions of this machine.

## Contents

**Chapter 1: General description**
Product specifications, name of parts, operation method

**Chapter 2: Functions and operation**
Description of operation of machine system and electrical system by function

**Chapter 3: Disassembly and reassembly**
Disassembly method, reassembly method

**Chapter 4: Installation and maintenance**
Installation method, maintenance method

**Chapter 5: Troubleshooting**
Error display and troubleshooting

**Appendix: General diagram etc.**

Information in this manual is subject to change. Notification of such changes will be given in Service Information Bulletins.

Thoroughly read the information contained in this Service Manual and the Service Information Bulletins to gain a correct and deeper understanding of the machine. This is one way of fostering response for ensuring prolonged quality and function, and for investigating the cause of trouble during troubleshooting.

“ScanFront 220” is abbreviated to SF-220 and “ScanFront 220P” is to SF-220P in this manual.

Quality Assurance Center
Canon Electronics Inc.

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# CONTENTS

## CHAPTER 1 GENERAL DESCRIPTION


I. PRODUCT OUTLINE ..... 1-1
1. Features ..... 1-1
2. Specifications ..... 1-2
3. Precautions ..... 1-8
II. NAME OF PARTS ..... 1-9
1. Name of Parts ..... 1-9
III. USER OPERATION ..... 1-10
1. Preparation ..... 1-10
2. Flow of Scanner Operations ..... 1-12
3. Web Menu ..... 1-13


## CHAPTER 2 FUNCTIONS & OPERATION


I. OUTLINE ..... 2-1
1. System Configuration ..... 2-1
2. Main Configuration ..... 2-2
3. Motor Drive ..... 2-3
4. Electrical Circuits ..... 2-4
5. Timing Chart ..... 2-5
II. NETWORK ..... 2-6
1. Basic Knowledge ..... 2-6
2. Terminology ..... 2-10
III. READING SYSTEM ..... 2-15
1. Reading Unit ..... 2-15
2. Shading ..... 2-17
IV. FEED SYSTEM ..... 2-18
1. Feeding Mechanism ..... 2-18
2. Feed Error Detection ..... 2-20
V. CONTROL SYSTEM ..... 2-22
1. Motherboard ..... 2-22
2. Scanner PCB ..... 2-24
3. LCD Relay PCB ..... 2-25
4. Fingerprint Authentication ..... 2-26
5. Image Processing Control ..... 2-27
VI. POWER SUPPLY ..... 2-29
1. Outline ..... 2-29
2. Lithium Battery ..... 2-30
VII. ELECTRICAL PARTS LAYOUT ..... 2-31
1. Upper Unit ..... 2-31
2. Lower Unit ..... 2-32
VIII. PARTS LAYOUT ON EACH PCB ..... 2-33
1. Motherboard ..... 2-33
2. Scanner PCB ..... 2-34
3. LCD Relay PCB ..... 2-35


## CHAPTER 3 DISASSEMBLY & REASSEMBLY


I. USER REPLACEABLE PARTS ..... 3-1
1. Retard Roller ..... 3-1
2. Feed Roller ..... 3-1
3. Document Holding Guide ..... 3-2
II. EXTERNAL COVERS ..... 3-3
1. Eject Tray ..... 3-3
2. Left Cover ..... 3-3
3. Right Cover ..... 3-4
4. Rear Cover ..... 3-4
5. Rear Plate ..... 3-5
6. Pickup Tray ..... 3-5
III. UPPER UNIT ..... 3-6
1. Upper Cover Assembly ..... 3-6
2. LCD Relay PCB ..... 3-7
3. Fingerprint Sensor PCB ..... 3-8
4. Fingerprint Sensor Unit ..... 3-9
5. LCD Unit ..... 3-9
6. Touch Panel ..... 3-11
7. Upper Cover ..... 3-11
8. Upper Reading Unit ..... 3-12
9. Upper Reading Holder ..... 3-13
10. Upper Frame Assembly ..... 3-14
11. Follower Roller ..... 3-15
12. Retard Roller Cover ..... 3-16
13. Static Eliminator Brush ..... 3-16
IV. LOWER UNIT ..... 3-17


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

1. Scanner PCB Mounting Plate..... 3-17
2. Feed Motor Unit..... 3-18
3. Belts..... 3-18
4. Eject Drive Roller..... 3-19
5. Registration Drive Roller ..... 3-20
6. Pickup Motor Unit ..... 3-22
7. Feed Roller Shaft ..... 3-22
8. Lower Reading Unit..... 3-23
9. Lower Reading Holder..... 3-24
10. Document Guides ..... 3-25
11.Feed Roller Cover ..... 3-26
V. ELECTRICAL PARTS (PCB, ETC.) ..... 3-27
1. Bottom Box Assembly ..... 3-27
2. Motherboard ..... 3-28
3. Lithium Battery ..... 3-29
4. Scanner PCB..... 3-29

# CHAPTER 4 INSTALLATION & MAINTENANCE

I. INSTALLATION ..... 4-1
1. Unpacking..... 4-1
2. Checking the Supplied Accessories ... 4-2
3. Removing the Packing Materials..... 4-3
4. Attaching the Feed Roller..... 4-4
5. Connecting Cables ..... 4-6
6. Turning the Machine ON and OFF ..... 4-7
7. Configuring the Scanner Settings ..... 4-8
II. PARTS REPLACEMENT..... 4-13
1. Periodically Replaced Parts ..... 4-13
2. Consumable Parts..... 4-13
3. Major Parts List..... 4-14
III. MAINTENANCE ..... 4-15
1. User Maintenance ..... 4-15
2. Service Maintenance..... 4-18

# CHAPTER 5 TROUBLESHOOTING

I. OUTLINE..... 5-1
1. Outline and Categories..... 5-1
II. USER INFORMATION PROTECTION.... 5-2
1. Outline ..... 5-2
2. Backup/Restore ..... 5-2
3. Initialize..... 5-4
III. ERROR DISPLAY ..... 5-5
1. Machine's Screen ..... 5-5
2. Web Menu ..... 5-6
IV. SERVICE MODE..... 5-8
A. Introduction ..... 5-8
1. Outline ..... 5-8
2. Starting Up Service Mode..... 5-9
3. Exiting Service Mode..... 5-10
B. Scanner Adjustment..... 5-12
1. Selection Screen ..... 5-12
2. Regist Adjustment..... 5-12
3. Light Adjustment..... 5-14
4. All Adjustment..... 5-16
5. Dcon Check ..... 5-17
6. Check Device ..... 5-19
7. Counter..... 5-20
8. About ..... 5-21
9. Touch Panel Adjustment..... 5-21
C. Test Scan ..... 5-23
1. Outline ..... 5-23
2. Operation Procedure ..... 5-25
D. Update..... 5-27
1. Outline ..... 5-27
2. Operation Procedure ..... 5-28
V. NETWORK FUNCTION CHECK..... 5-29
1. Outline ..... 5-29
2. Preparation ..... 5-29
3. Network Setting for the Machine ..... 5-30
4. Network Setting for Computer ..... 5-31
5. Creating a User ..... 5-33
6. Creating a Shared Folder ..... 5-37
7. Sending Image Data..... 5-39
8. Initialization..... 5-39
9. Web Menu Check..... 5-40
VI. OTHER OPERATIONS ..... 5-42
1. BIOS Settings..... 5-42

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

2. Hardware Check ..... 5-43
3. Reinstallation ..... 5-45
VII. AFTER REPLACING PARTS ..... 5-47

# APPENDIX

I. GENERAL DIAGRAM .....A-1
II. LIST OF SPECIAL TOOLS .....A-2

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# CHAPTER 1

# GENERAL DESCRIPTION


I. PRODUCT OUTLINE .....1-1
II. NAME OF PARTS .....1-9
III. USER OPERATION .....1-10


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. PRODUCT OUTLINE

## 1. Features

1) Compact design
   Dimensions (Tray fully closed): 310(W) x 234(D) x 158(H) mm

2) Scanning speed (200dpi, A4-size, standard settings)
   B&W (G4): Simplex 26ipm, Duplex 35ipm
   Grayscale (JPEG): Simplex 23ipm, Duplex 23ipm
   Color (JPEG): Simplex 9ipm, Duplex 9ipm *ipm=image per minute

3) Document feed path
   Straight-path only, No U-turn path
   Plastic cards can be fed in landscape orientation

4) Easy operation
   8.5-inch liquid crystal display (LCD) and Touch panel

5) Interface
   USB2.0 Host (Hi-speed) x2 ports
   LAN (10Base-T/100Base-TX)
   PS/2 mouse port, PS/2 keyboard port

6) High-grade model: SF-220P
   Fingerprint authentication, Ultrasonic double-feed detection

“Windows” is a trademark of Microsoft Corporation in the U.S. and other countries.
Other company names and product names mentioned in this document are registered trademarks or trademarks of the respective companies.

## 2. Specifications

1) Appearance/Installation

| No. | Item | Specifications |
|---|---|---|
| 1 | Type | Desktop type network sheet-fed scanner |
| 2 | Power supply | 1) 100V model: 100VAC, 50/60Hz<br>2) 120V model: 120VAC, 60Hz<br>3) 200V model: 220-240VAC, 50/60Hz<br>*AC adapter is compatible with any voltage. |
| 3 | Power rating | 1) AC adapter:<br>Input: 100-240V 50/60Hz 83-108VA<br>100-240V 50/60 Hz 0.83-0.45A<br>Output: 16VDC 2.6A<br>2) Main body:<br>Input: 16VDC 2.1A |
| 4 | Rated power consumption | 1) Operating: 26W<br>2) Display off mode: 10W<br>3) Power switch OFF: 0.5W (100V/120V), 0.8W (200V) |
| 5 | Operating environment | 10 to 32.5°C (50 to 90.5°F), 20 to 80%RH<br>*No condensation allowed. |
| 6 | Noise | 1) Stand by: 40dB or less<br>2) Operating: 68dB or less (impulse mode)<br>*Sound power level |
| 7 | Dimensions<br>* Details are given later. | Tray closed: 310(W) × 234(D) × 158(H) mm<br>Tray opened: 310(W) x 545(D) x 220(H) mm |
| 8 | Weight | Main body: 3.4kg, AC adapter: 0.35kg |
| 9 | Output interface | 1) USB2.0 Host (Hi-speed) x2 ports<br>*Used for USB memory, USB keyboard, and others<br>2) LAN (10Base-T/100Base-TX)<br>3) PS/2 mouse port<br>4) PS/2 keyboard port |
| 10 | Expected product life<br>(In-house information) | One of the following two items, whichever comes first.<br>1) 5 years<br>2) Sheets fed: 500,000 sheets (A4-size copier paper)<br>*There are parts needed to replace.<br>*Duty cycle is 1,000 sheets/day. |
| 11 | Installation | By users |
| 12 | Consumable parts<br>(commercial goods) | Exchange roller kit<br>(feed roller/retard roller, document holding guide)<br>*Expected life 30,000 sheets. |
| 13 | Option | None |

**Table 1-101**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

* Dimensions (in mm)

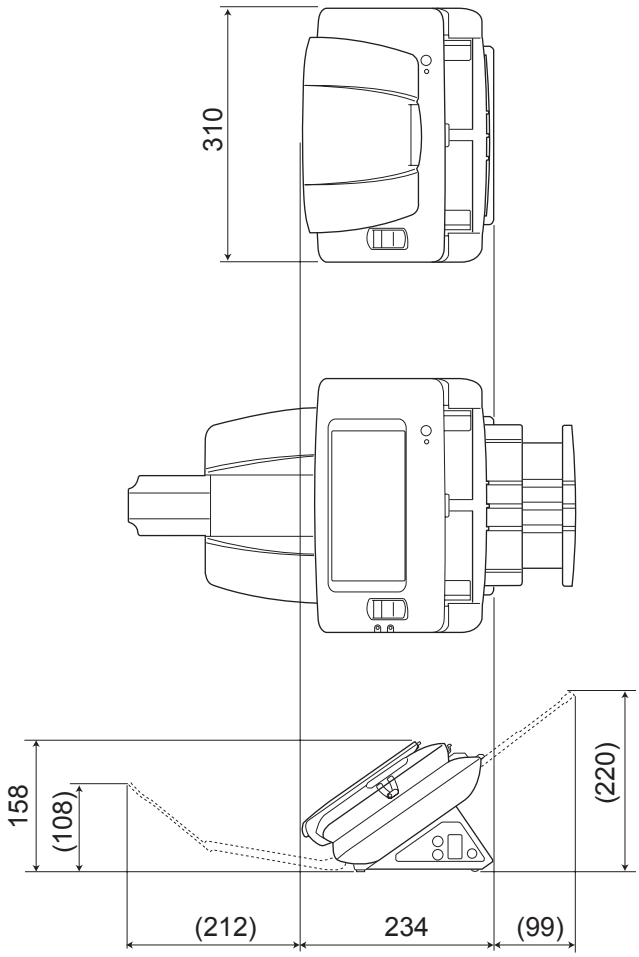



**Figure 1-101**

2) Controller / Network

| No. | Item | Specifications |
|---|---|---|
| 1 | OS | Windows CE 5.0 |
| 2 | CPU | AMD GeodeLX 500MHz |
| 3 | Memory | 1) DIMM for image processing and image data storing: 512MB<br>2) Flash memory for OS and setting data: 128MB |
| 4 | Operation and Display | 1) 8.5-inch TFT-WIDE VGA LCD display (800x480 pixels)<br>2) Touch panel |
| 5 | Fingerprint sensor<br>*SF-220P only | 1) Method: Optical sweep type<br>2) Resolution: 600dpi, 1 line<br>3) Reading width: 10.8mm |
| 6 | Sending function | 1) E-mail<br>2) Shared folder<br>3) FTP-server<br>4) USB memory |
| 7 | Image display | 1) In scanning<br>2) Before sending<br>3) Pre-scan image |
| 8 | Setting way | 1) Operation panel on main body<br>2) Web menu on network computer |
| 9 | Display language | Japanese, English, French, Italian, German, Spanish, Dutch |
| 10 | Address book | 1) Shared address book<br>2) My address book<br>3) LDAP address book<br>*LDAP=lightweight directory access protocol |
| 11 | Maximum number of registered items | 1) User: 100<br>2) Each address: 1,000<br>3) Total of each user's addresses and shared addresses: 4,200 |
| 12 | Job button setting numbers | 1,056 items at maximum |
| 13 | User authentication | 1) Device authentication<br>2) Server authentication<br>User name and password, or fingerprint input can be used for above each.<br>*Fingerprint input can only be used for device authentication for SF-220P. |

**Table 1-102**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

3) Document feed

| No. | Item | Specifications | | |
|---|---|---|---|---|
| 1 | Document feed path | Straight path | | |
| 2 | Document size (paper) | 1) Width | 50.8 to 216mm | |
| | | 2) Length | 53.9 to 355.6mm | |
| | | 3) Weight (thickness) | 1) Separation pickup<br>52 to 128 g/m$^2$ (0.06 to 0.15mm)<br>2) Non-separation pickup<br>42 to 157 g/m$^2$ (0.05 to 0.20mm) | |
| 3 | Document limitation | 1) Pressure-sensitive paper: Can be fed with limitation of direction.<br>2) Carbon-backed paper: Cannot be fed.<br>3) Perforated paper for binder: Can be fed with limitation of holes.<br>4) Curled paper: Can be fed only if curl is 5mm or less.<br>5) Creased paper: Can be fed, but creases must be straightened before being fed. | | |
| 4 | Card | 1) Size: 53.9 x 85.5 x 0.76mm<br>2) Feeding direction: Landscape<br>3) Embossed card: Available<br>* Scan one card at a time with non-separation feeding. | | |
| 5 | Document storage (Pickup, Eject) | 1) Normal copy paper:<br>50 sheets or less, or 5mm or less including curls.<br>2) Others:<br>10 sheets or less of such as paper with high/low elasticity or with high coefficient of friction. | | |
| 6 | Feeding speed | Resolution | Binary, Grayscale | Color |
| | | 100dpi | 152.29mm/sec | 152.29mm/sec |
| | | 150dpi | 152.29mm/sec | 101.53mm/sec |
| | | 200dpi | 152.29mm/sec | 76.15mm/sec |
| | | 300dpi | 152.29mm/sec | 50.76mm/sec |
| | | 400dpi | 57.11mm/sec | 19.04mm/sec |
| | | 600dpi | 38.07mm/sec | 12.69mm/sec |
| 7 | Double-feed detection | 1) Length detection sensor (registration sensor)<br>2) Ultrasonic sensor<br>*Ultrasonic sensor is for SF-220P only. | | |

**Table 1-103**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

4) Document reading

| No. | Item | Specifications | | | |
|---|---|---|---|---|---|
| 1 | Type of sensor | Contact Image Sensor (CIS) | | | |
| 2 | Picture element | Density of element: 600dpi,<br>Effective elements: 5107 (216mm) | | | |
| 3 | Light source | 3-color (RGB) LED, Single-side illumination | | | |
| 4 | Background color | White | | | |
| 5 | Reading side | Simplex (Front), Duplex, Blank skip | | | |
| 6 | Reading size | 1) Typical: A4/A5/A5-R/A6/A6-R, B5/B6/B6-R, LGL/LTR<br>2) Auto size detection | | | |
| 7 | Output mode | 1) Binary (Black&White, Error diffusion, Text enhance)<br>*"Text enhance" means Text enhancement II.<br>2) Grayscale (8bit)<br>3) Color (24bit) | | | |
| 8 | Output resolution | 100x100dpi, 150x150dpi, 200x200dpi,<br>300x300dpi, 400x400dpi, 600x600dpi | | | |
| 9 | Reading speed (standard settings) | A4 size document *ipm=image per minute | | | |
| | | Mode | Resolution | Simplex | Duplex |
| | | Black&White (TIFF: G4) | 150dpi | 26ipm | 52ipm |
| | | | 200dpi | 26ipm | 35ipm |
| | | | 300dpi | 18ipm | 17ipm |
| | | | 600dpi | 5.2ipm | 4.3ipm |
| | | Grayscale (JPEG) | 150dpi | 26ipm | 37ipm |
| | | | 200dpi | 23ipm | 23ipm |
| | | | 300dpi | 12ipm | 10ipm |
| | | | 600dpi | 3.3ipm | 2.8ipm |
| | | Color (JPEG) | 100dpi | 26ipm | 32ipm |
| | | | 150dpi | 16ipm | 16ipm |
| | | | 200dpi | 9.2ipm | 9.0ipm |
| | | | 300dpi | 4.2ipm | 4.0ipm |
| | | | 600dpi* | 1.2ipm | 0.6ipm |
| | | The numbers above may differ depending on the function settings and other conditions. | | | |

**(Continued)**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

<table>
<tr><th>No.</th><th>Item</th><th colspan="3">Specifications</th></tr>
<tr><td rowspan="13">10</td><td rowspan="13">Maximum number of scanned images per one batch<br>(For reference)</td><td colspan="3">Standard A4-size document with standard compression rate</td></tr>
<tr><td>Mode</td><td>Resolution</td><td>Maximum number (For reference)</td></tr>
<tr><td rowspan="4">Black&White<br>(TIFF: G4)</td><td>200dpi</td><td>300images</td></tr>
<tr><td>300dpi</td><td>300images</td></tr>
<tr><td>400dpi</td><td>300images</td></tr>
<tr><td>600dpi</td><td>300images</td></tr>
<tr><td rowspan="4">Grayscale (JPEG)</td><td>200dpi</td><td>300images</td></tr>
<tr><td>300dpi</td><td>300images</td></tr>
<tr><td>400dpi</td><td>200images</td></tr>
<tr><td>600dpi</td><td>40images</td></tr>
<tr><td rowspan="4">Color (JPEG)</td><td>200dpi</td><td>200images</td></tr>
<tr><td>300dpi</td><td>100images</td></tr>
<tr><td>400dpi</td><td>10images</td></tr>
<tr><td>600dpi</td><td>5images</td></tr>
<tr><td colspan="3">The numbers above may differ depending on the image data size. In actual scanning, a message will be displayed and scanning will stop at the point when the machine runs out of memory.</td></tr>
<tr><td>11</td><td>Brightness adjustment</td><td colspan="3">9 steps, back side individual setting</td></tr>
<tr><td>12</td><td>Contrast adjustment</td><td colspan="3">7 steps, back side individual setting</td></tr>
<tr><td>13</td><td>Image processing</td><td colspan="3">Auto-size detection, Deskew, Bleed-through reduction, character-orientation detection</td></tr>
<tr><td>14</td><td>Color drop-out,<br>Color enhance</td><td colspan="3">Available: R/G/B, front/back side each</td></tr>
<tr><td>15</td><td>Counter</td><td colspan="3">Total scanning count, Roller exchange count</td></tr>
</table>

**Table 1-104**

The specifications above are subject to change for improvement of the product.

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Precautions

This section describes items that require particular care, for example, regarding human safety.

These precautions must be observed. The user should be explained the items that relate to user safety and instructed to take appropriate actions.

1) Power OFF in emergency
   If such abnormal conditions as extraordinary noise, smoke, heat and odor occur, immediately unplug the power cord.
   Be careful not to get clothing (ties, long hair, etc.) caught in the machine as it may cause injury. Should this occur, immediately unplug the power cord. Do not insert fingers in the feed section while moving the rollers.

2) Power OFF on disassembling
   When disassembling and assembling are performed, unplug the power cord.

3) Prohibition of modify
   This machine must not arbitrarily be modified or remade. If it is, use may be forcibly suspended.
   To change the specifications or disassemble and reassemble this machine, follow the instructions described in this manual and the service information.

4) Electromagnetic wave interference
   This machine complies with some standards regarding electromagnetic wave interference, such as VCCI and FCC. However, the user may have to take countermeasures if the machine causes electromagnetic wave interference.

5) “User Manual”
   Read each “User Manual” thoroughly prior to use of this machine.

6) Disposal
   Follow local regulations when disposing of the product and parts. This product is subject to the WEEE Directive in Europe.
   A lithium battery is installed on the motherboard inside the machine.
   Before disposing, make sure that the user has initialized (deleted) the user data saved in the machine’s memory.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# II. NAME OF PARTS

## 1. Name of Parts

The names of parts are as follows.

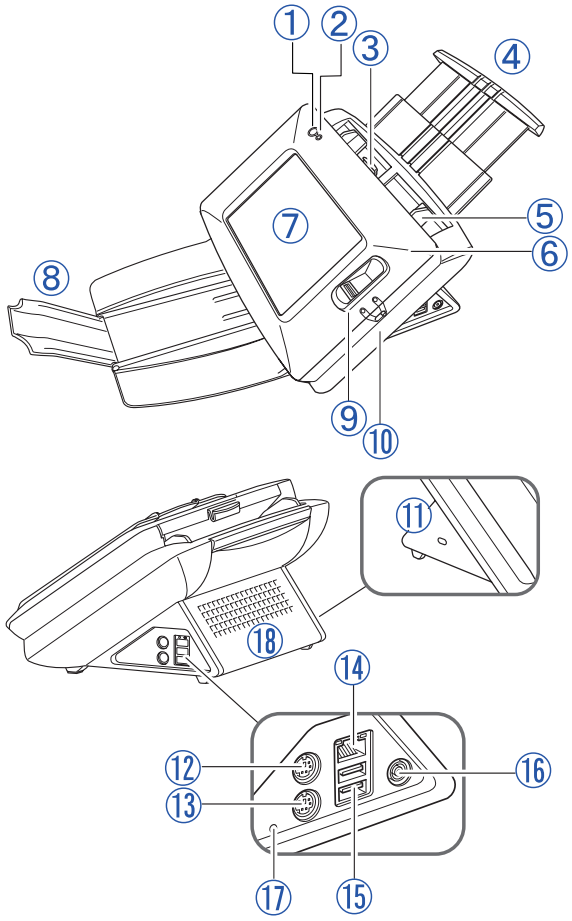



**Figure 1-201**

① Power switch
② Power indicator
③ Lock lever
④ Document feed tray
⑤ Document guides
⑥ Panel unit (Upper unit)
⑦ Touch panel
⑧ Document eject tray
⑨ Fingerprint sensor (SF-220P only)
⑩ Feed selection lever
⑪ Kensington slot
⑫ PS/2 connector (Green) for mouse
⑬ PS/2 connector (Purple) for keyboard
⑭ LAN port (RJ-45)
⑮ USB ports
⑯ Power connector (16VDC)
⑰ Service switch (Boot switch)
⑱ Ventilation holes

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# III. USER OPERATION

For details, refer to the “User Manual” of this machine.

For installation and maintenance, refer to “CHAPTER 4 INSTALLATION & MAINTENANCE”.

## 1. Preparation

◆ Tray

Make preparations of the trays to suit the document and, as necessary, of the eject tray extension.

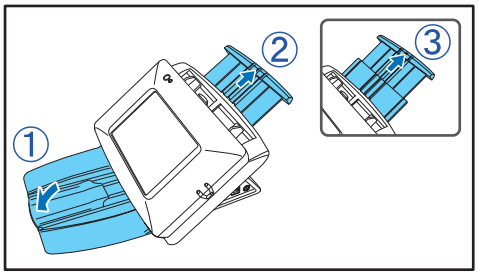



**Figure 1-301**

◆ Feed selection lever

Switch the feed selection lever depending on the feeding method.

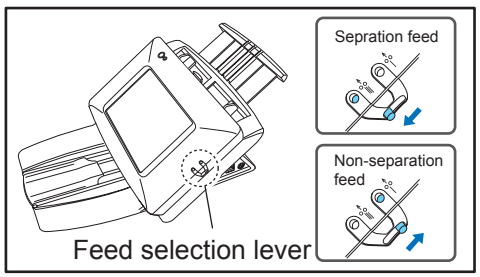



**Figure 1-302**

◆ USB ports

Connect a USB memory as necessary, making sure to turn off its write protection. Make sure to turn on the machine before inserting a USB memory.

Also, a USB keyboard or mouse can be connected here.

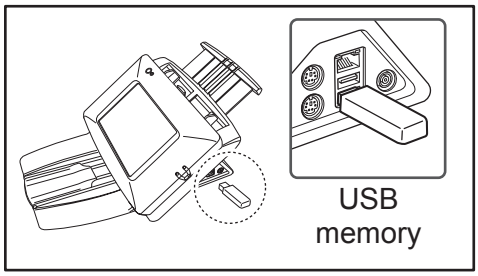



**Figure 1-303**

◆ PS/2 keyboard and mouse

Connect a keyboard and a mouse as necessary. Make sure to turn off the machine before plugging and unplugging them.

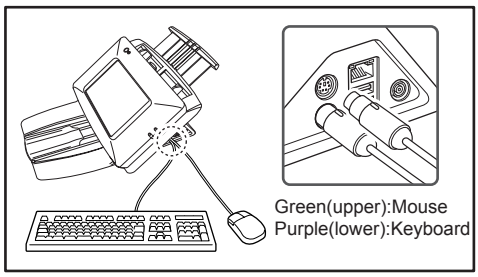



**Figure 1-304**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ Document

After flipping through document, load it face down and upside down.

Adjust the document guides to fit the document width.

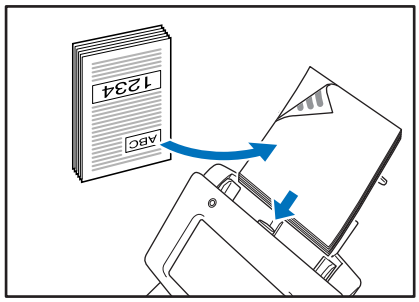



**Figure 1-305**

◆ Card

Load cards in landscape orientation.

Adjust the document guides to fit the card width, then load cards.

Make sure to switch the feed selection lever to the up position (non-separation).

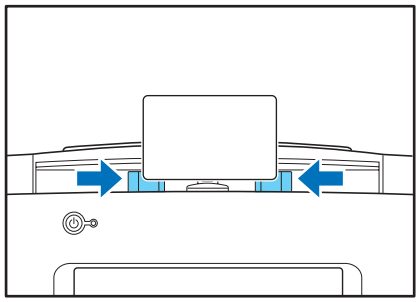


**Figure 1-306**

◆ Turning on the machine

Press the power switch to turn on the machine. The power indicator will be lit and the [Home] screen or the login screen will be displayed.

Each setting can be configured from this screen.

**Note:** For “Web menu”, refer to the corresponding section.

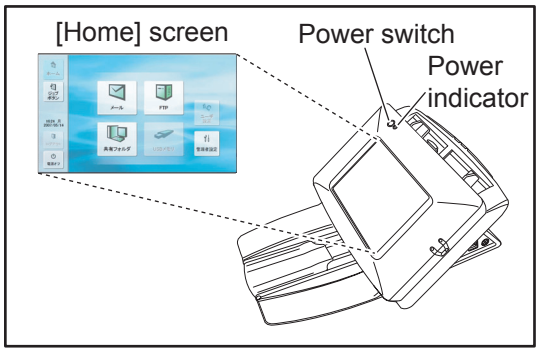



**Figure 1-307**

◆ Turning off the machine

Press [Power off] displayed at the lower left of the screen to turn off the machine.

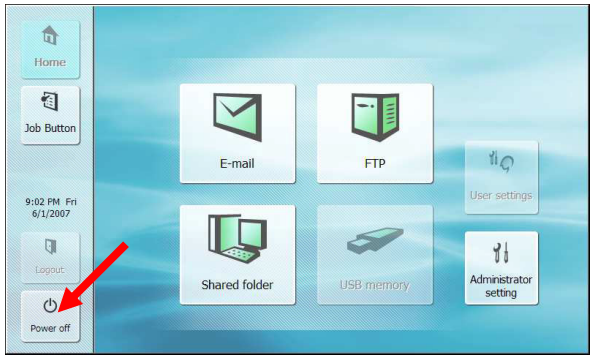



**Figure 1-308**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Flow of Scanner Operations

The procedure and screen transitions for the process from turning the machine ON to sending an image file are as follows.

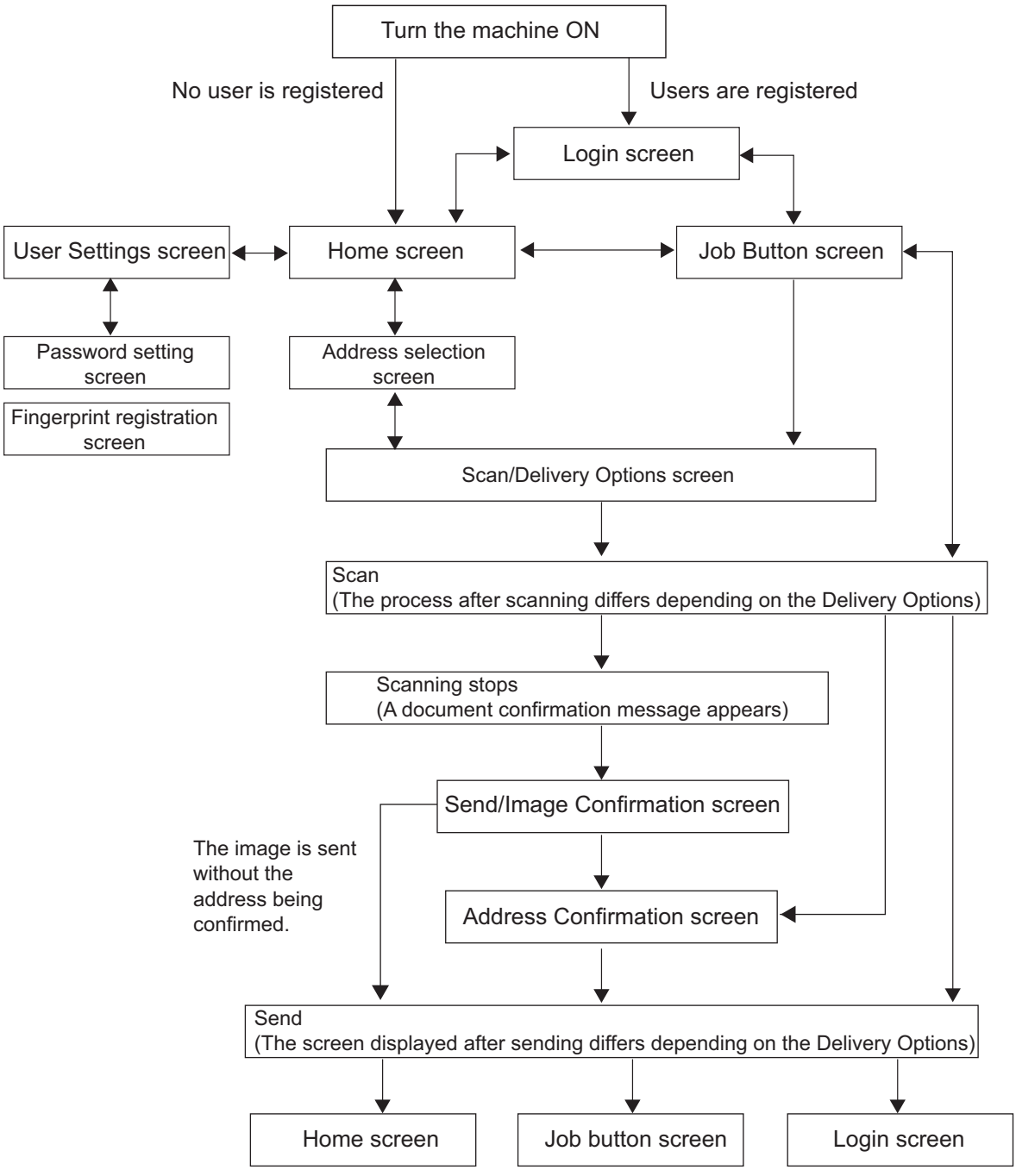



**Figure 1-309**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Web Menu

The Web menu function enables you to access and configure the machine from the Web browser of a remote computer.

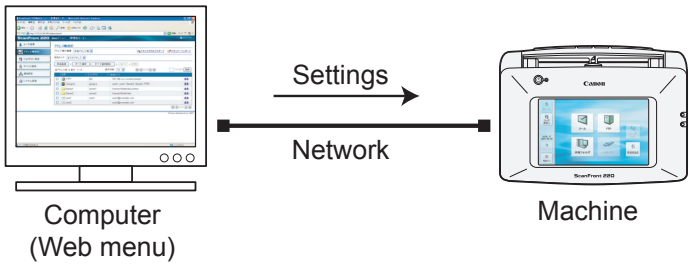



**Figure 1-310**

◆ Login screen

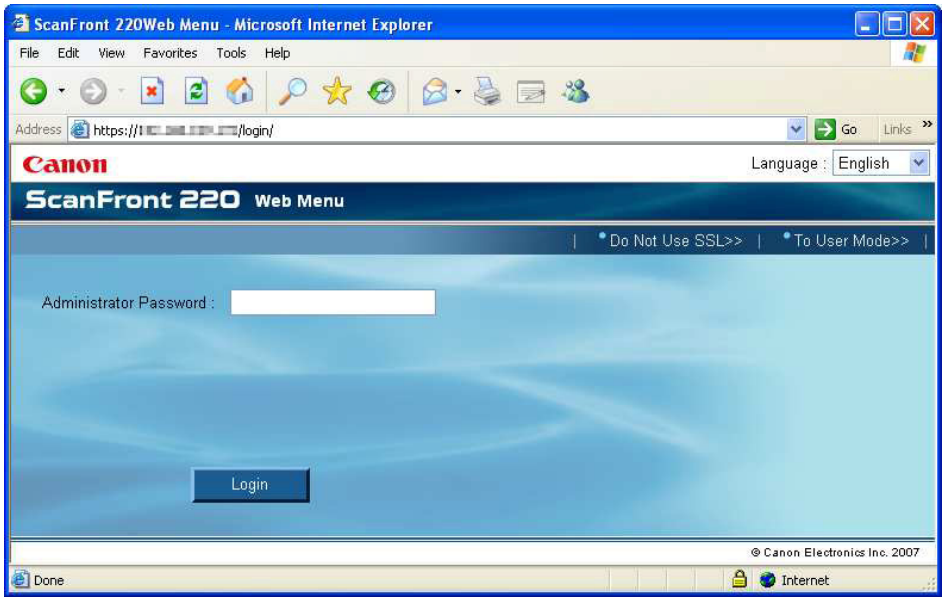



**Figure 1-311**

◆ Administrator mode screen

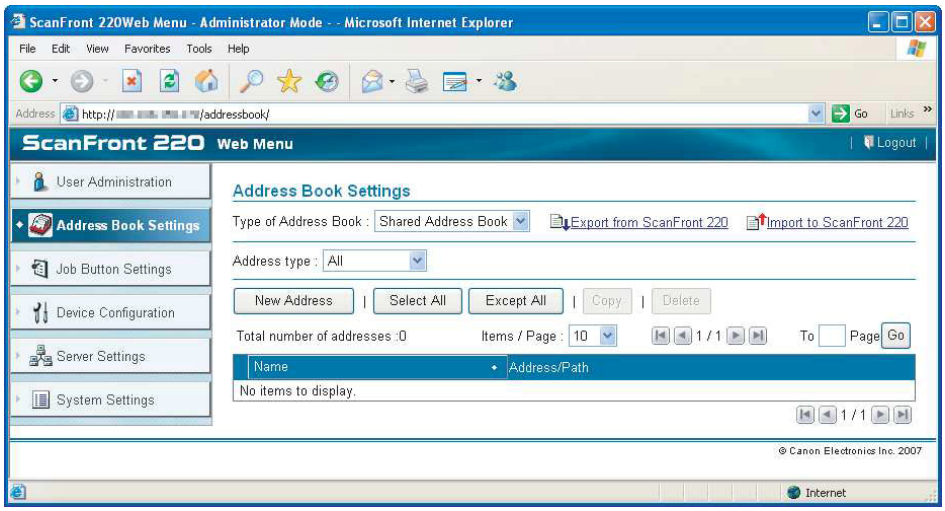



**Figure 1-312**

◆ User mode screen

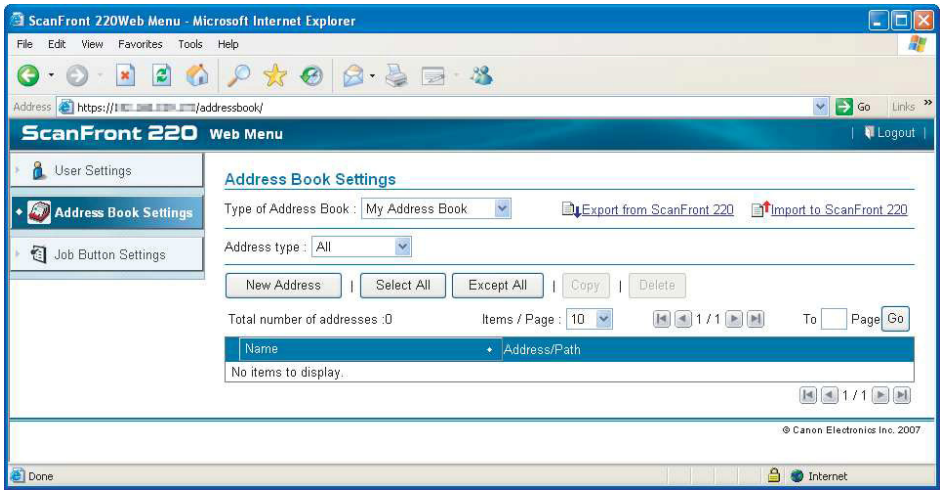



**Figure 1-313**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# CHAPTER 2

# FUNCTIONS & OPERATION


I. OUTLINE....2-1
II. NETWORK....2-6
III. READING SYSTEM....2-15
IV. FEED SYSTEM....2-18
V. CONTROL SYSTEM....2-22
VI. POWER SUPPLY....2-29
VII. ELECTRICAL PARTS LAYOUT....2-31
VIII. PARTS LAYOUT ON EACH PCB....2-33


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. OUTLINE

## 1. System Configuration

This machine is a network document scanner, which makes it possible to transfer scanned image data to a shared folder on file servers or client computers on the network, to transfer them to an FTP server, or to distribute them via e-mail. Also it is possible to save image data on a USB memory connected to this machine.

The system configuration of this machine is shown below.

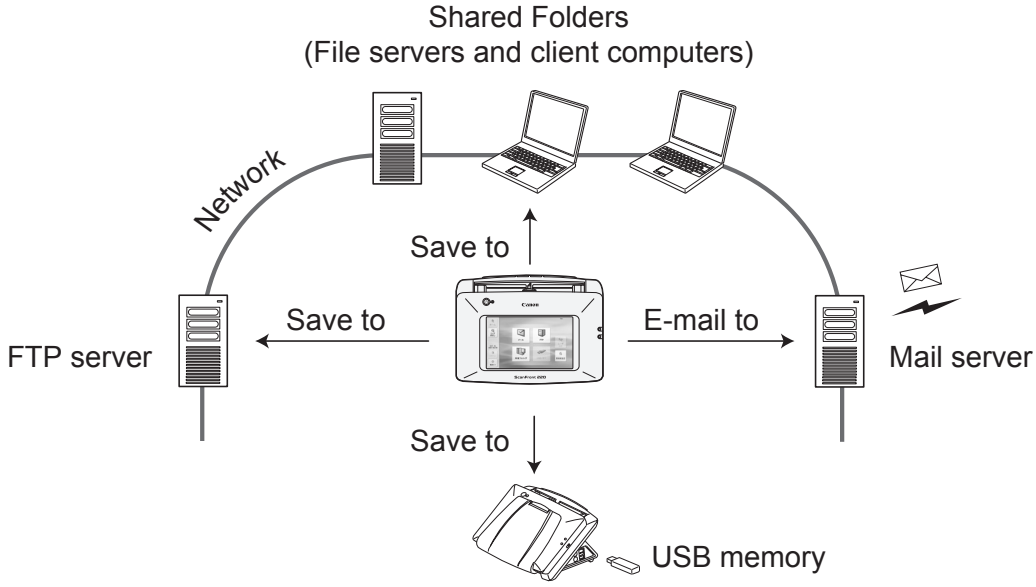



**Figure 2-101**

◆ **Major Network Environment for the Machine**

| | Item | Description |
|---|---|---|
| 1 | Main system | Microsoft Windows Network |
| 2 | Protocol | TCP/IP |
| 3 | IP address | Auto (DHCP) or Fixed |
| 4 | Interface | 10Base-T/100Base-TX |

**Table 2-101**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Main Configuration

Figure 2-102 shows the main configuration of this machine.

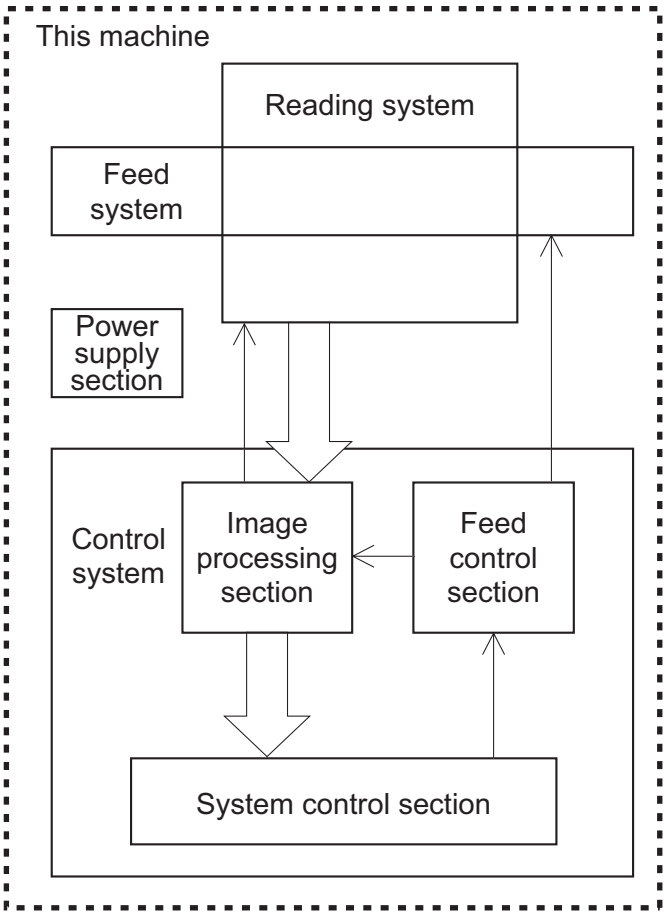



**Figure 2-102**

1) Reading system
This system reads image data from image sensors.

2) Feed system
This system performs from document pickup to document ejection.

3) Control system
This system is comprised of an image processing section, a feed control section, and a system control section.
The image processing section controls the reading system, and processes the read image data.
The feed control section controls the feed system.
The system control section controls the machine's internal system and communicates with the network.

4) Power supply section
This section supplies DC power, converted from AC power with the AC adaptor, to the machine motherboard.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Motor Drive

This machine has the pickup motor (M1) for picking up documents and the feed motor (M2) for feeding documents.

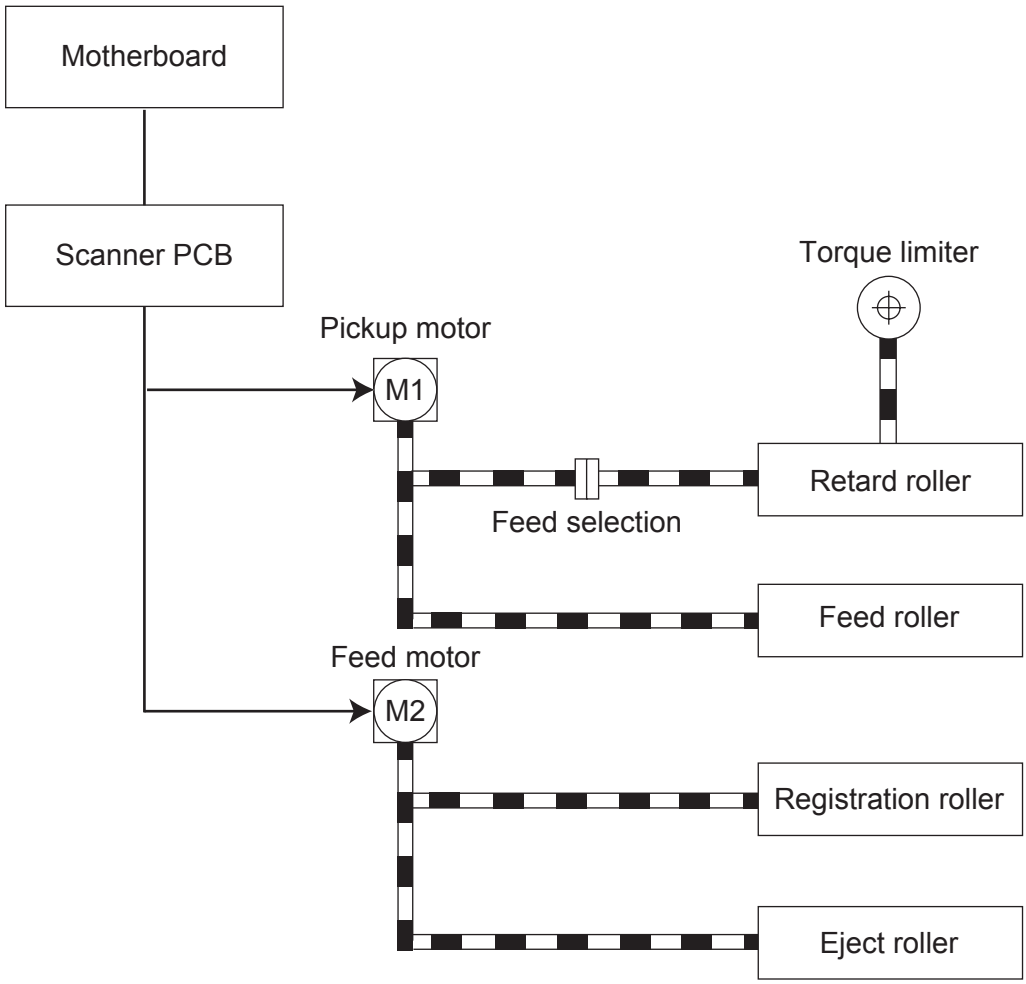



**Figure 2-103**

## 4. Electrical Circuits

An overview of the electrical circuits block diagram of this machine is shown below.

The overall system is controlled by the motherboard and the scanning system is by the scanner PCB.

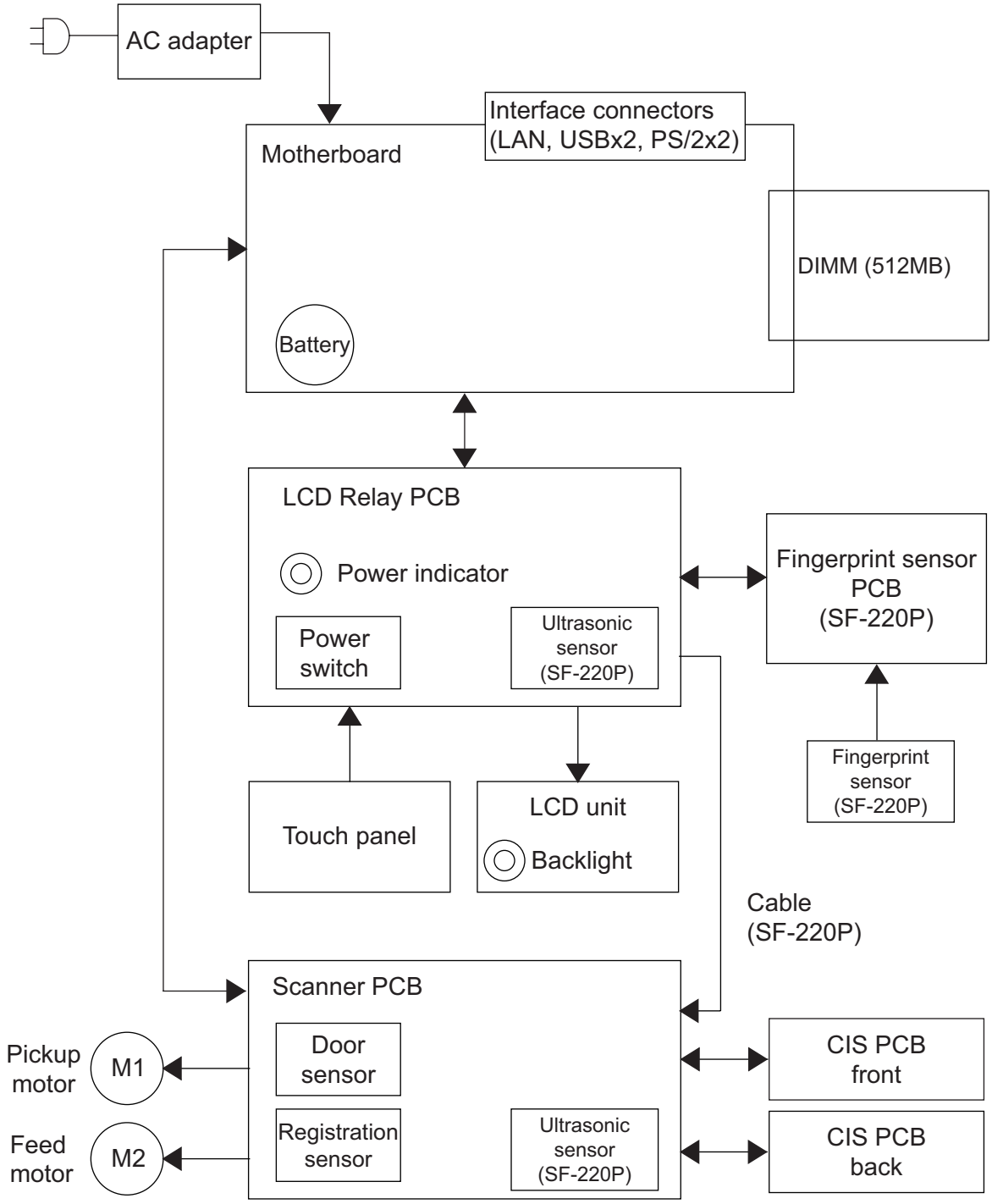


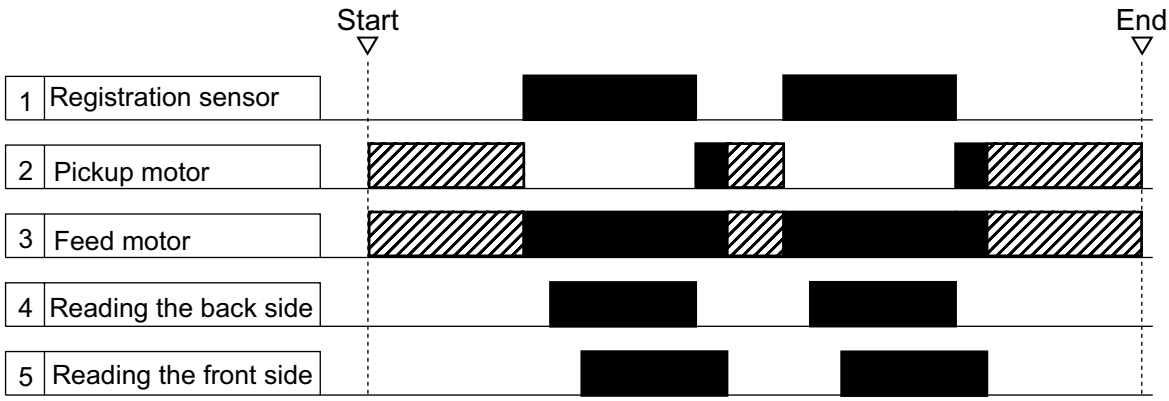

**Figure 2-104**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 5. Timing Chart

The timing chart when you separately pickup 2 sheets of document without temporarily suspending the machine is shown below.

Once the machine starts scanning, it activates the pickup motor and the feed motor to feed the document.




Note: ▨ indicates the feeding state at the maximum speed.

**Figure 2-105**

# II. NETWORK

## 1. Basic Knowledge

This machine transmits scanned image data over a network as well as saving it on a USB memory connected to the machine. Since the network itself belongs to the user, you don't know its configuration. Before checking operations of the machine, obtain necessary information from the user or the network administrator. The personal information such as a password must be input by the user or the network administrator.

The service technicians need the network knowledge for their tasks. The basics of network are explained in this section. For the terminology, refer to the next section. For further information on network, participate training courses provided by each sales company.

1) Network connection

An example of the network connection is shown below.

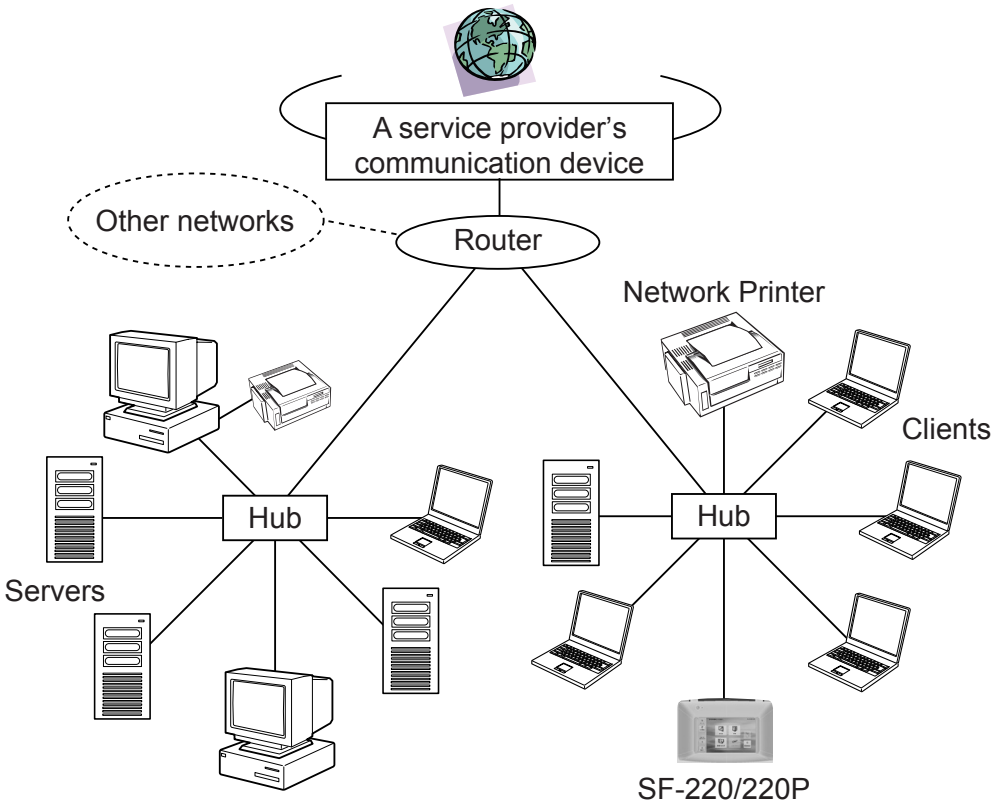



**Figure 2-201**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

The connection diagram on the previous page shows a client-server model where each device is connected by LAN cables. This example network contains 2 hubs and a router. The router is connected to the Internet via a communication device provided by a service provider. This machine can be considered as either a client or a Web server which is USB-connected to a scanner.

The actual networks have various sizes and configuration types. It could be a peer-to-peer model instead of a client-server model, or could use a switching hub instead of a hub.

This machine does not support a wireless LAN that can be connected only to computers with its driver installed. Any applications cannot be added to this machine. For details on network environments for this machine, refer to the user manual.

2) Protocol

The standard protocol in network (data communication procedure) is “TCP/IP”. TCP/IP has a hierarchical structure based on the “OSI reference model”. Each layer covers a different function and uses a different protocol.

| OSI model | TCP/IP protocol |
|---|---|
| Application layer | HTTP, SMTP, POP FTP, DHCP, etc. |
| Presentation layer | |
| Session layer | |
| Transport layer | TCP, UDP, etc. |
| Network layer | IP, AppleTalk, etc. |
| Data Link layer | PPP, FTTH, ADSL Ethernet Token ring, etc. |
| Physical layer | |

**Table 2-201**

“Physical layer” defines physical specifications of devices such as circuits, connectors, or interfaces, and also data conversions of electrical signals in circuits.

“Data Link layer” defines configurations or detection methods of packets to transmit data between connected devices.

“Network layer” defines address controls and routings of computers connected to the network.

“Transport layer” defines transmission qualities and transmission data controls.

“Session layer” defines transmission connections/disconnections and line status controls.

“Presentation layer” defines methods of converting sending data to a common format, and of restoring receiving data to its original format.

“Application layer” defines specific applications of data transmitted on the network such as file transferring or message transferring.

3) IP addresses

Data transferring on the network requires the equivalent of a residential address to identify its destination. This “residential address” for the network could be a sequence of numbers called address or strings called name depending on which protocol to use and what for. The data is sent with the information of its source and destination.

One of the familiar addresses is an “IP address”. An “IP address” is an identification number used on the TCP/IP protocol network where all computers must be assigned unique IP address for each.

An IP address consists of 32 bits, which

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

can form about 4.3 billions patterns, often shown as 4 octets of numbers represented in decimal form. An example is shown below.

◆ IP address 192.168.128.5

| 0 | 8 | 16 | 24 | 31 |
|---|---|---|---|---|
| 192 | 168 | 128 | 5 | |

11000000 10101000 10000000 00000101

An IP address consists of the Network address section and the Host address section. The term “Host” here refers to each computer, and “Network” refers to a network to which those computers are connected. For example, the Network address can be compared to an apartment address and the Host address can be to a room number of the apartment.

This addressing facilitates routing to the destination. If the destination has the same Network address as the sender, it means both are connected to the same network.

Depending on the number of hosts, the boundary of Network address and Host address is changed. Recently, this boundary can be changed flexibly according to the situation. The display methods are two types: the one suffixed with / (slash) and the other represented using the subnet mask. An example of IP address whose top 24 bits are assigned as the Network address is as follows:

◆ IP address 192.168.128.5

◆ / (slash) 192.168.128.5/24

◆ subnet mask 255.255.255.0

| 0 | 8 | 16 | 24 | 31 |
|---|---|---|---|---|
| 192 | 168 | 128 | 5 | |
| 11000000101010001000000 [1] indicates the Network address. 11111111111111111111111 | | | 00000101 00000000 | |
| 255 | 255 | 255 | 0 | |

In the example above, 8 bits in the IP address can be assigned for the Host address. Note that a value of 0 represents the network default, and 255 represents a unique address, often referred as the broadcast address, that can broadcast to the entire network. Therefore the number of hosts in the network is up to 254.

To configure the IP address of the target host (computer), on the network configuring screen, input the IP address provided from the network administrator. Recently, however, the auto configuration with a DHCP server is often used to prevent input errors and to improve conveniences. When receiving a DHCP request from the client computer, the DHCP server identifies the computer by its MAC address to assign the available IP address to it, while assigning the subnet mask, the default gateway address, and the DNS server address to it as well.

4) Domain name

An IP address explained in the previous section, however, is not human-legible, since it’s just a sequence of numbers. It is difficult even to remember the IP address of your own computer.

Therefore, the computers are identified by names. This name is referred as the computer name or the host name, while the one for this machine is called the device name since it is not a computer.

As the number of the computers increases, it gets more difficult to name them without overlapping. Therefore computers on the network are grouped by domain to be easily identified. A system called DNS relates an IP address to a


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

domain name, and a server called DNS server provides an IP address corresponding to the domain name requested by a client. The DNS server is located on each domain.
For example, the domain name for CANON ELECTRONICS INC. is “canon-elec.co.jp”, which consists of the organization name, the generic code, and the region code.
A “workgroup”, instead of a “domain”, can be used to group computers.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Terminology

| No. | Term | Description |
|---|---|---|
| 1 | 10Base-T<br>100Base-TX<br>1000Base-T | Standards for LAN connections using IEEE-standardized twisted pair cable.<br>The transmission speed for each differs; 10Mbps for 10Base-T, 100Mbps for 100Base-TX, and 1000Mbps for 1000Base-T. |
| 2 | ADSL | A technology for high-speed data communication using telephone lines. Clients can communicate faster when receiving data rather than sending data. |
| 3 | AppleTalk | A network layer protocol developed by Apple Inc., provided with Mac OS. |
| 4 | DHCP | An abbreviation of Dynamic Host Configuration Protocol.<br>A protocol to automatically assign an IP address and other parameters to computers and devices connected to the network.<br>A DHCP server uses this protocol to execute the above tasks. |
| 5 | DNS | An abbreviation of Domain Name System.<br>A system providing a domain name to computers on the network, and relates the domain name to its IP address. |
| 6 | DNS server | A server returning an IP address corresponding to the domain name requested by a client. This server is placed on each domain. All of the information is not held by a single DNS server but distributed to other DNS servers. When receiving a DNS request containing other than its own domain name, the DNS server inquires to an upper-level DNS server to gain access to the destination DNS server. |
| 7 | Ethernet | An IEEE communication standard for LAN, which is widely used for network using LAN cable. It is implemented at the physical layer of the seven-layer OSI model. |
| 8 | FTP | An abbreviation of File Transfer Protocol.<br>A protocol to transfer files. |
| 9 | FTTH | A technology for data communication using optical fiber cables. Generally, it refers to a high-speed internet connection service using optical fiber. It is implemented at the physical layer of the seven-layer OSI model. |
| 10 | HDLC | An abbreviation of High-level Data Link Control.<br>A data link layer protocol . |
| 11 | HTTP | An abbreviation of HyperText Transfer Protocol.<br>A protocol to transmit and receive data between a WWW server (or called “Web server”) and a client. |
| 12 | IP | An abbreviation of Internet Protocol.<br>A network layer protocol to transmit and receive data without confirming the receiver or sender to achieve high-speed data transfer. |

**(Continued)**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

| No. | Term | Description |
|---|---|---|
| 13 | IP address | An identification number used on the TCP/IP network, also called Internet address.<br>It is comprised of 4 sets of numbers that range from 0 to 255.<br>Example: 192.168.128.5 |
| 14 | LAN | An abbreviation of Local Area Network.<br>A network connecting computers within limited area such as the inside of the same building. |
| 15 | LAN cable | A cable, also called network cable, which connects computers and peripheral devices to construct a LAN. The specification is standardized. This machine uses 10Base-T or 100Base-TX cable with RJ-45 connectors.<br>A “crossover cable” inside which the wiring is reversed is used when two computers are connected directly. |
| 16 | LDAP | An abbreviation of Lightweight Directory Access Protocol.<br>A protocol for accessing to directory services available on networks. |
| 17 | MAC address | A Unique number assigned to all devices such as computers and other optional interfaces intended to be connected to the network.<br>MAC address is not changeable unlike IP address.<br>It is also called Ethernet address or Physical address.<br>Generally, it is expressed as six groups of two hexadecimal digits.<br>Example : 00-00-85-BF-63-9F |
| 18 | NetWare | A network operating system developed by Novell, Inc.<br>Lately few people uses Netware since most of the recent operating systems already contain a network function. |
| 19 | NIC | An abbreviation of Network Interface Card.<br>An expansion card to connect a computer to the network. This card is connected into a computer bus to transmit data.<br>It is also called network card, network adapter or LAN card. |
| 20 | OSI | An abbreviation of Open Systems Interconnection.<br>A protocol, advocated by ISO in 1977, to connect systems having different devices and applications. The OSI protocols are divided into seven layers. Hardware devices and software applications conform to the OSI model. |
| 21 | POP | An abbreviation of Post Office Protocol.<br>A protocol to receive E-mail.<br>A POP server uses this protocol to execute the above tasks. |
| 22 | PPP | An abbreviation of Point-to-Point Protocol.<br>A protocol to perform user authentication and also assign a data compaction method, a protocol to use, and an IP address used for dial-up access. |
| 23 | RJ-45 | A type of modular connectors attached to cables such as LAN cable. |
| 24 | SMTP | An abbreviation of Simple Mail Transfer Protocol.<br>A protocol to send and receive e-mail. |

**(Continued)**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

| No. | Term | Description |
|---|---|---|
| 25 | SMTP server | A server to send and receive e-mail. However, it may be called a transmission server because clients use it only when sending e-mail. |
| 26 | TCP | An abbreviation of Transmission Control Protocol.<br>A transport layer protocol to transmit and receive data confirming the receiver or sender.<br>This protocol is an upper layer protocol of IP, covering the IP function to achieve more reliable communications. |
| 27 | TCP/IP | An abbreviation of Transmission Control Protocol / Internet Protocol.<br>A communication protocol normally used on the network, consisting of two protocols TCP and IP. Using two protocols achieves reliable and efficient transmission/reception.<br>It is also known as a general term for protocol systems in which TCP and IP are used combined with other protocols. |
| 28 | UDP | An abbreviation for User Datagram Protocol.<br>A transport layer protocol to transfer data.<br>Compared with TCP, the reliability is low but the data transfer rate is high. |
| 29 | URL | An abbreviation of Uniform Resource Locator.<br>A string to locate a resource on the Internet. It consists of the information such as protocol name, domain name, and directory name and those are separated with separator. |
| 30 | WAN | An abbreviation of Wide Area Network.<br>A network connecting a LAN to another LAN such as head office LAN and branch office LAN of a company. |
| 31 | Web | Refer to “WWW”. |
| 32 | WINS | An abbreviation of Windows Internet Naming Service.<br>A service to provide a name used on Windows. WINS converts a domain name into an IP address and assigns it automatically. |
| 33 | WWW | An abbreviation of World Wide Web, also called WEB.<br>A system to access to HTML files on WWW server through a Web browser to search information. |
| 34 | Account | A user identification or user name to access to network or computers.<br>Usually a password is also required to authenticate a user. |
| 35 | Active directory | A name of the directory service employed in Windows 2000 or later.<br>Managing multiple domains in a tree structure makes it easier to use. |
| 36 | Application layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 37 | Internet | A network in which computers are interconnected on worldwide scale through TCP/IP protocol. |

**(Continued)**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

| No. | Term | Description |
|---|---|---|
| 38 | Client | A computer or device that requests and receives a service from a server on the network. |
| 39 | Server | A computer that provides particular services such as file sharing and e-mail on the network. |
| 40 | Subnet mask | A number to separate an IP address into Network address and Host address.<br>Example : 255.255.255.0 |
| 41 | Switch | One of the relay devices on the network, which is usually a hardware device that performs a relaying function traditionally performed by software. |
| 42 | Switching hub | A hub identifying the destination of incoming data to send the data to its destination only. This method enhances the efficiency and also prevents collisions of data signals. |
| 43 | Session layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 44 | Data link layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 45 | Default gateway | A device that forwards data to another network. An IP address of this device is called Default gateway address. |
| 46 | Directory service | A system to reference the information of computers and other devices on network. It allows to find network addresses from computer names, and e-mail addresses from user names. |
| 47 | Token ring | A LAN technology using the token passing mechanism. The transmission speed is not so fast, but it is used for large-scale LAN. |
| 48 | Domain name | A name of a host computer on the Internet, which is human-legible grouped-strings translated from IP address. It consists of organization name, generic code, and region code.<br>For example, the domain name of CANON ELECTRONICS INC. is “canon-elec.co.jp”. |
| 49 | Transport layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 50 | Narrowband | A low-speed internet connection service such as Dial-up access or ISDN. |
| 51 | Network | A data communication network among computers. |
| 52 | Network card | Refer to “NIC”. |
| 53 | Network cable | Refer to “LAN cable”. |
| 54 | Network layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 55 | Node | A general term for computers and other devices connected to the network. |

**(Continued)**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

| No. | Term | Description |
|---|---|---|
| 56 | Packet | A technology to send data after dividing it into small segments. Or it refers to a divided data segment itself. This method utilizes network lines efficiently. When data is divided into packets to be sent, the information required to restore the data on the receiver is attached to the packets. |
| 57 | Hub | A device connecting more than two LAN cables.<br>Installing hubs increases the number of LAN ports. Some hubs have more functions. |
| 58 | Peer-to-Peer model | A model for a small-scale network in which each computer receives services equally without using a server. |
| 59 | Firewall | A system monitoring data transmitted between computers and the Internet to prevent computer virus from infecting the computer, or an unauthorized user from accessing or stealing data. |
| 60 | Physical layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 61 | Bridge | One of relay devices on the network, which extends LAN by dividing it into groups.<br>It identifies MAC address to use for routing unlike a router. |
| 62 | Presentation layer | One of the seven layers of the OSI model.<br>Refer to “2) Protocol” in the previous section. |
| 63 | Broadband | A high-speed Internet connection service such as FTTH (Fiber-optic communication) or ADSL. |
| 64 | Protocol | A set of rules governing communication between computers. |
| 65 | Provider | In this guide, refers to “Internet service provider”. It may be abbreviated to “IPS”<br>A business or organization that provides Internet-related services. |
| 66 | Host | A computer may be called host. Otherwise, a computer that focuses on processing requests on the network connecting more than two computers may particularly be called a host computer. |
| 67 | Repeater | One of relay devices on the network, which amplifies attenuations of signals through LAN cable, so that the signal can cover longer distances. |
| 68 | Router | A device that connects a LAN to another LAN or to the Internet. It identifies IP address to use for routing. |

**Table 2-202**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# III. READING SYSTEM

## 1. Reading Unit

The configuration of the reading system is shown below.

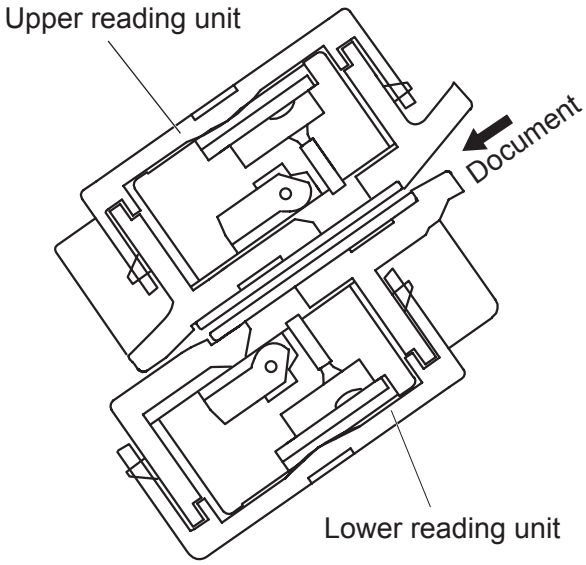



**Figure 2-301**

The upper reading unit reads the back side of the documents and the lower reading unit reads the front side of the documents. This configuration enables the machine to read both front and back sides of a document using a single scan.

The read image data are sent to the image processing section of the scanner PCB.

The sectional view of the lower reading unit is shown below. The upper and lower reading units have the same configuration but the different holder shapes.

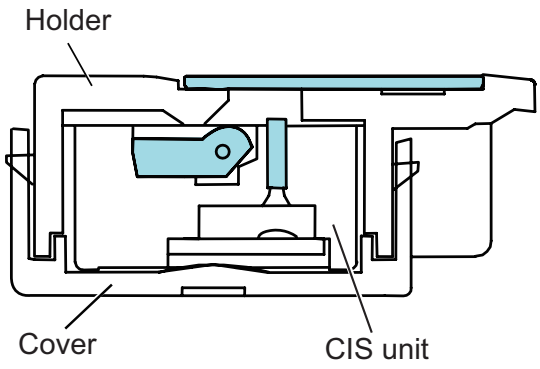



**Figure 2-302**

The scanning unit consists of CIS unit, holder, and cover.

The CIS unit consists of CIS PCB, lens array, LED (R/G/B), light guide, and case.

The scanning glass and white reference sheet are mounted on the holder.

Photosensitive pixels are mounted on the CIS PCB with a density of 600 dpi in a line. The effective reading width is 216 mm, and the number of effective picture elements is 5107.

A set of three basic color LEDs, red, green, and blue (RGB), is mounted only on the one side. This single-side illumination causes a shadow on a document, which may effect on the image data quality.

In the binary or grayscale modes, image data are read with composite light generated by lighting the RGB LEDs simultaneously. In the color mode, the LED is successively lit, and reads image data with each color. As documents are being fed at regular speed while image data are read, the reading positions of RGB are shifted slightly.

In the color dropout mode, only the LED of a designated color lights. In the

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

color emphasis mode, the LED of a color other than a designated color lights.


COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Shading

This section explains the reading mechanism of the white reference sheet for determination of the shading correction value.

The sectional view of the reading unit is shown below.

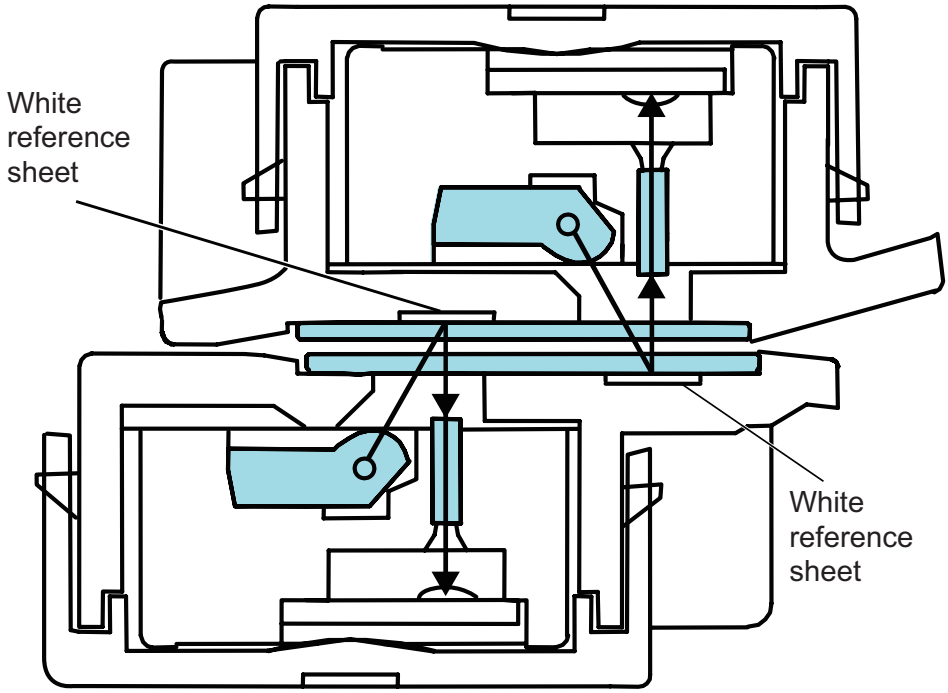



**Figure 2-303**

This machine can read the white reference data at the document reading position, unlike other scanners having the black background color, since its background color is white. Therefore, there is neither need to feed the shading sheet nor to move the internal shading sheet or the reading units.

For example, when the lower reading unit reads the white reference data, the LED emitted from the lower unit is reflected from the white reference sheet on the upper unit to be input to the sensor on the CIS PCB.

Since the white reference sheet is placed under the scanning glass, feeding document does not cause smudges on it.

When this machine is turned on or starts scanning, it reads the white reference data to determine the shading correction value.

However, the slightly different optical paths to the light receiving element are used for the actual document and the white reference sheet. Therefore this machine needs fine adjustment of the shading correction value using the service mode. This fine adjustment is necessary after replacing the reading unit or after replacing the motherboard recording the shading correction value.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# IV. FEED SYSTEM

## 1. Feeding Mechanism

The sectional view of the feed system is shown below.

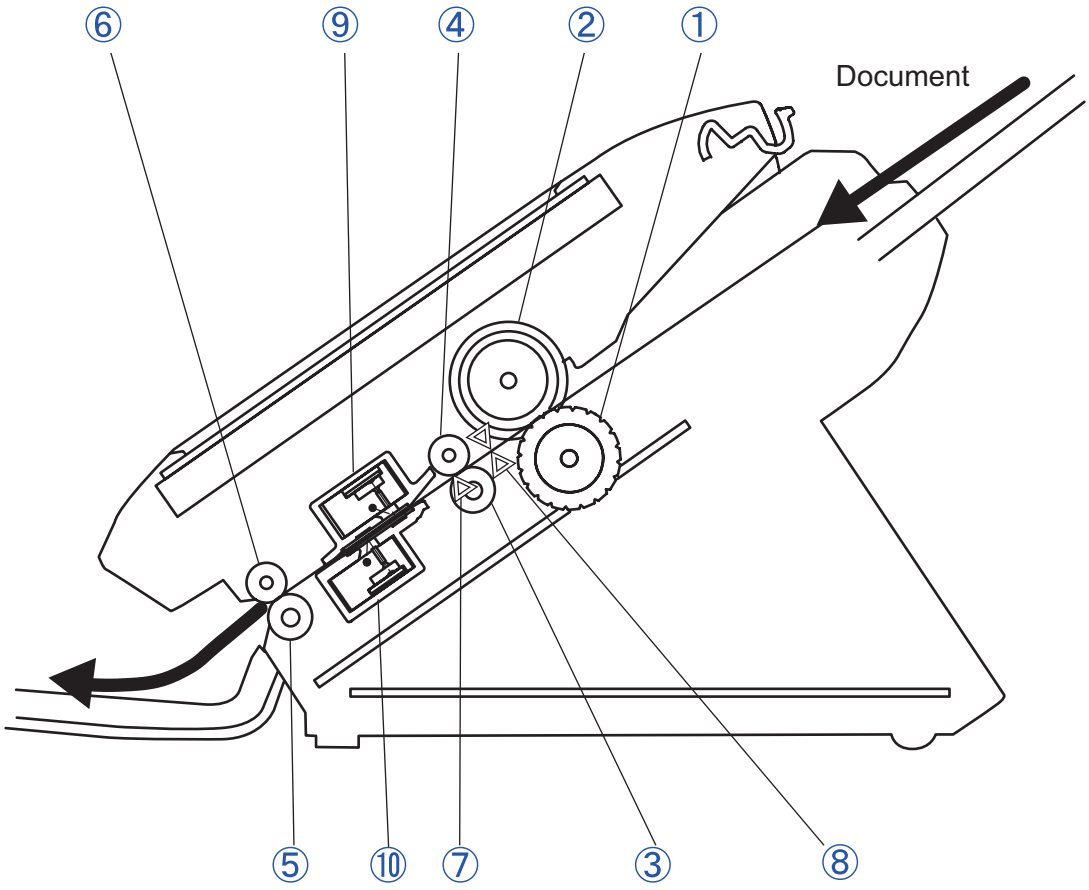



**Figure 2-401**

① Feed roller
② Retard roller
③ Registration roller (drive)
④ Registration roller (follower)
⑤ Eject roller (drive)
⑥ Eject roller (follower)
⑦ Detection point of Registration sensor
⑧ Detection point of Ultrasonic sensor
⑨ Upper reading unit
⑩ Lower reading unit


COPYRIGHT © 2007 CANON ELECTRONICS INC.

1) Feed path

The feed path of this machine is a straight path tilting at an angle of 35 degrees. The pickup roller is not mounted.

The leading edge of the loaded document touches the feed roller and the retard roller. Once the machine starts scanning, it activates the rollers to feed the document. The document is ejected to the eject tray passing through the registration roller, the reading units, and the eject roller.

Once the document pushed out by the eject roller touches the eject tray, it is bent along the eject tray surface.

Cards fed in portrait orientation hit against the eject tray. This may deform or stop the cards. Therefore make sure to load cards in landscape orientation. Loading cards in portrait orientation are not allowed.

2) Drive

The pickup motor drives the feed roller and the retard roller, and the feed motor drives the registration roller and the feed roller.

The scanning condition determines each drive speed.

3) Separation

Separation of the documents is performed by the retard roller.

Since the torque limiter is built in the retard roller, when the outside pressure on the roller exceeds the specified value into the feed direction, the roller begins to rotate in the same direction.

As shown in Figure 2-402-a, when overlapped documents enter into the clearance between the feed roller and the retard roller, the document in contact with the feed roller is fed in the feed direction, and the retard roller rotates in the opposite direction so that the document in contact with the retard roller is not pushed in.

As shown in Figure 2-402-b, once a single document remains, the feed roller and the document add torque on the retard roller. When this torque exceeds the retard roller torque, the retard roller rotates in the direction to feed the document due to the torque limiter.

If the feed selection lever is switched to non-separation position, the retard roller rotation becomes free and the separation function becomes invalid.

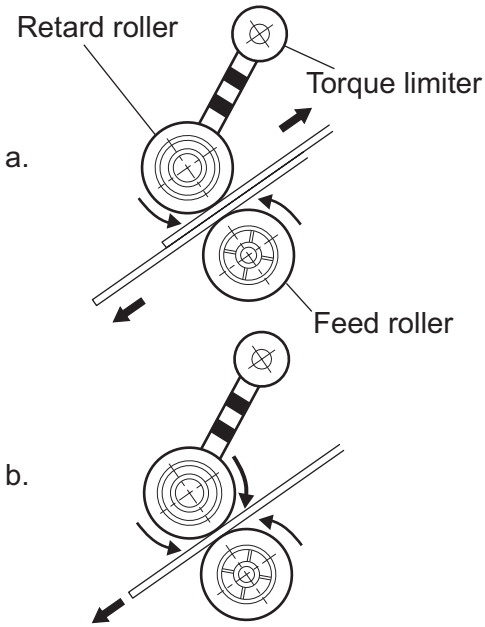



**Figure 2-402**

4) Sensor

The registration sensor lever for document detection is mounted with the registration roller (drive). The sensor itself is mounted on the scanner PCB.

For SF-220P, besides the registration sensor, the ultrasonic sensor (emitter/detector) for double feed detection is mounted near the registration roller.

## 2. Feed Error Detection

1) Jam Detection

Document jams are detected by the registration sensor. The types of the document jams are described as follows.

a) Pickup Delay Jam (Pickup Error)

The leading edge of the document was not detected by the registration sensor within the specified time after the machine starts scanning.

**Note:** Since this machine does not have a document sensor, this status is not detected as an error. All pages of the document are considered to be scanned.

b) Early Reach Jam

The leading edge of the following document was detected after the trailing edge of the document was detected by the registration sensor before the document has been fed for a specified length.

c) Residual Jam

The trailing edge of the document was not detected even though the document has been fed for the maximum specified length after the leading edge of the document was detected by the registration sensor.

d) Fast Feed Jam

The trailing edge of the document was detected after the leading edge of the document was detected by the registration sensor before the document has been fed for the minimum specified length.

e) Non-removal Jam

The machine starts scanning while the document is detected by the registration


COPYRIGHT © 2007 CANON ELECTRONICS INC. 

sensor and still remains inside this machine.

2) Double Feed Detection

There are 2 double feed detection methods : the document length detection by the registration sensor and the document overlapping detection by the ultrasonic sensor.

However the ultrasonic sensor is available only for SF-220P.

The registration sensor uses the first document length of the scanned batch as a reference to detect the document length. The 35 mm or more difference from the standard is interpreted as a double feed.

The ultrasonic drive sensor transmits the ultrasonic and the ultrasonic receive sensor receives the ultrasonic signal to gain a specific signal level. When overlapping documents are fed, the signal level is different from when properly feeding a single document. This machine interprets this difference as a double feed.

**Note:** The double feed detection by ultrasonic may not work if the document overlapping width is 50 mm or less. Further, the machine does not execute the double feed detection for the area of 10 mm from the leading and trailing edges of the document.

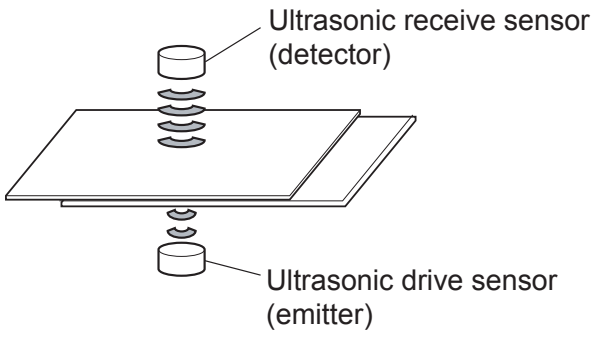



**Figure 2-403**

# V. CONTROL SYSTEM

## 1. Motherboard

The overall system of the machine including scanning and networking systems is controlled by the motherboard. The OS and application software are installed on the NAND Flash Memory (IC115). The parts number of the motherboard differs between SF-220 and SF-220P because their contents on the flash memories are different. Also, the capacity of SO-DIMM for processing and saving image data differs between SF-220 and SF-220P.

The block diagram and the function list of major ICs are shown below.

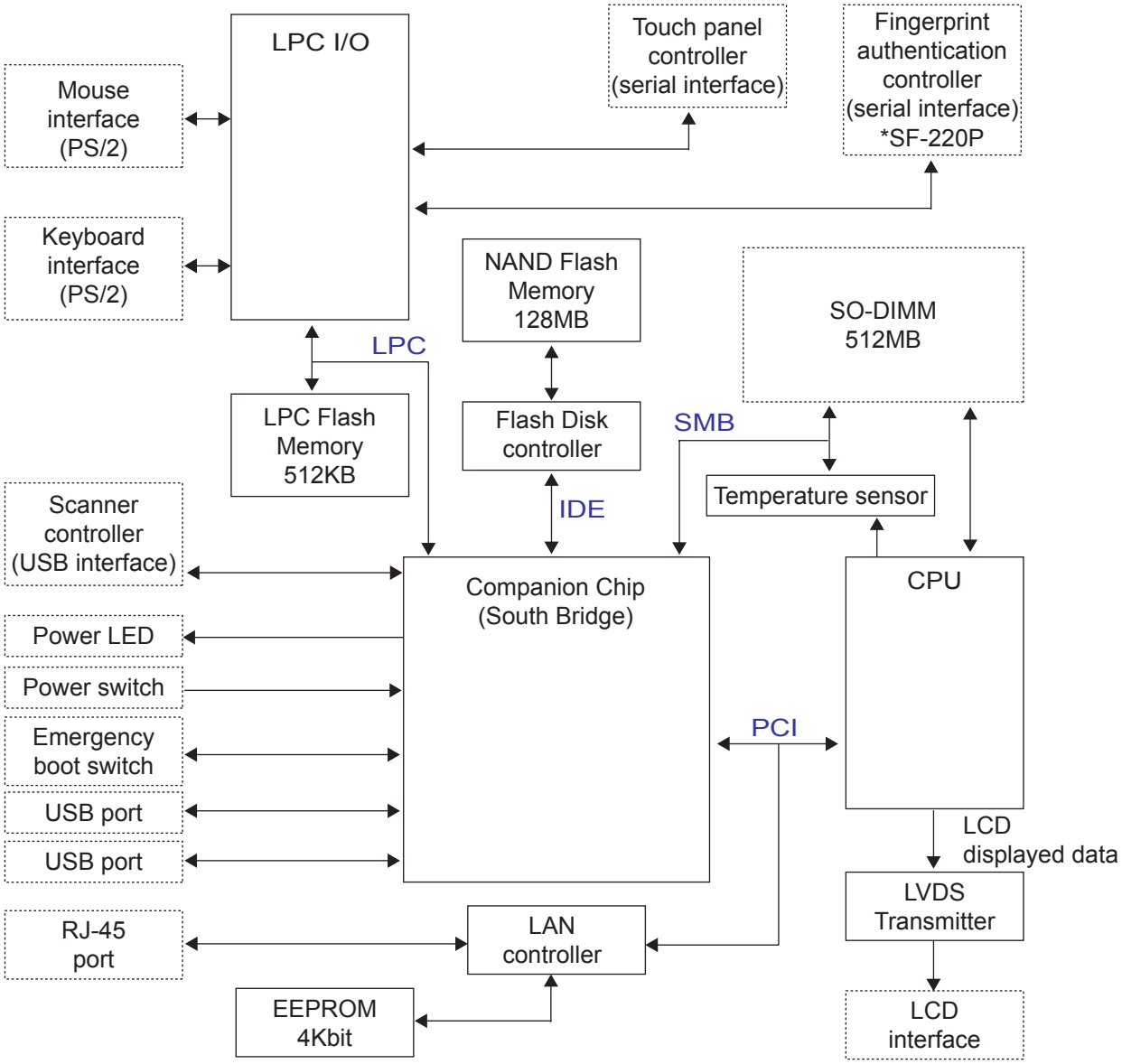



**Figure 2-501**


COPYRIGHT © 2007 CANON ELECTRONICS INC.

◆ Function list of major Ics

| IC No. | Name | Function |
|---|---|---|
| IC101 | CPU | Controls the overall system and high-speed interfaces (x86 CPU + North Bridge) |
| IC102 | Companion Chip | Controls low-speed interfaces (South Bridge) |
| IC111 | LPC Flash Memory | Stores BIOS |
| IC113 | LPC I/O | CPU extended input-output |
| IC114 | Flash Disk Controller | Controls NAND Flash Memory drive |
| IC115 | NAND Flash Memory | Stores OS, application data, and user data |
| IC116 | LAN controller | Controls LAN |
| IC127 | EEPROM | Stores LAN settings such as MAC address |
| IC124 | LVDS Transmitter | Transmits image data |
| SR101 | Temperature sensor | Monitors the temperature inside the CPU |
| --- | SO-DIMM | Processes and stores image data |

**Table 2-501**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Scanner PCB

This PCB controls scanning system, which is equivalent to the control PCB on the DR scanner. SF-220P mounts the ultrasonic sensor. The block diagram and the function list of major ICs are shown below.

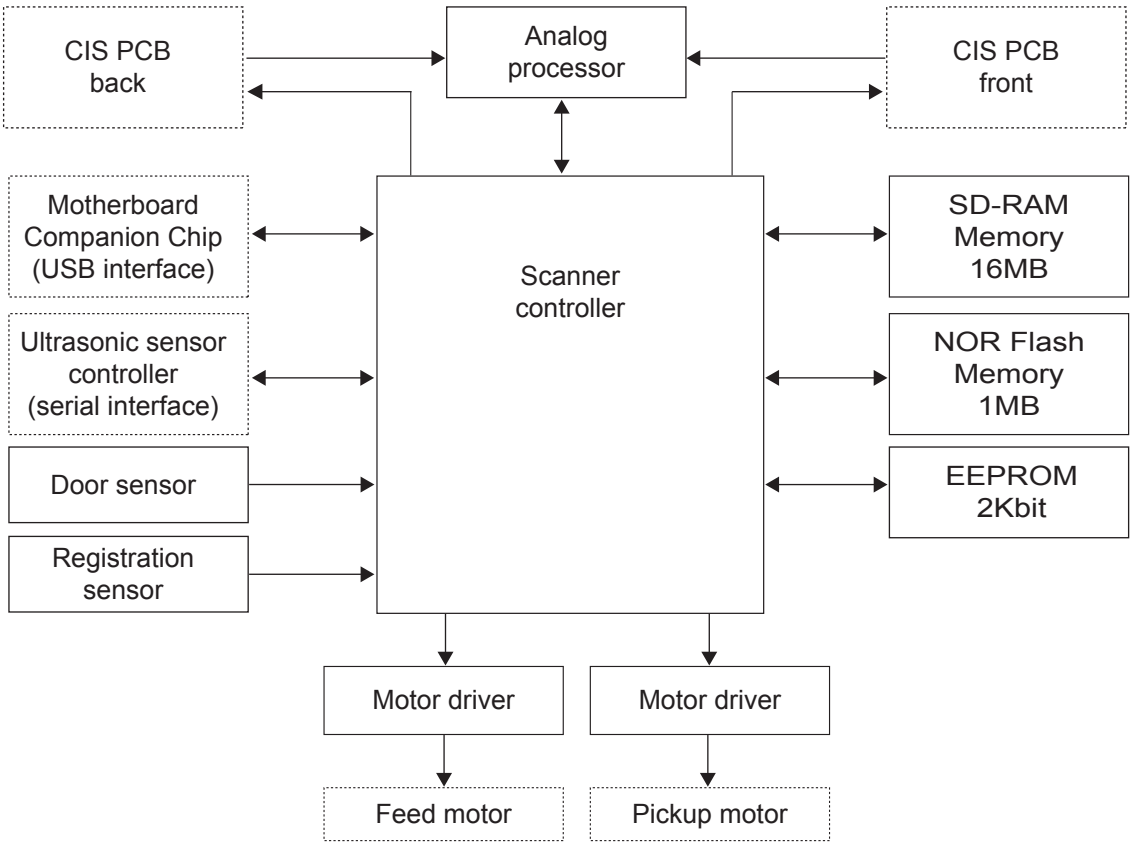



**Figure 2-502**

◆ Function list of major ICs

| IC No. | Name | Function |
|---|---|---|
| IC201 | Scanner Controller | Controls scanning system |
| IC111 | Analog processor | Performs analog gain, offset adjustment, and A/D conversion |
| IC114 | EEPROM Memory | Stores each setting |
| IC115 | SD-RAM Memory | Stores image data temporarily, and serves as a work memory for the Scanner Controller |
| IC117 | NOR Flash Memory | Stores firmware |
| IC402 | Motor driver | Drives the pickup motor |
| IC403 | Motor driver | Drives the feed motor |

**Table 2-502**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. LCD Relay PCB

This PCB relays the LCD display signals, controls the touch panel, and so on. SF-220P mounts the ultrasonic sensor. The block diagram and the function list of major ICs are shown below.

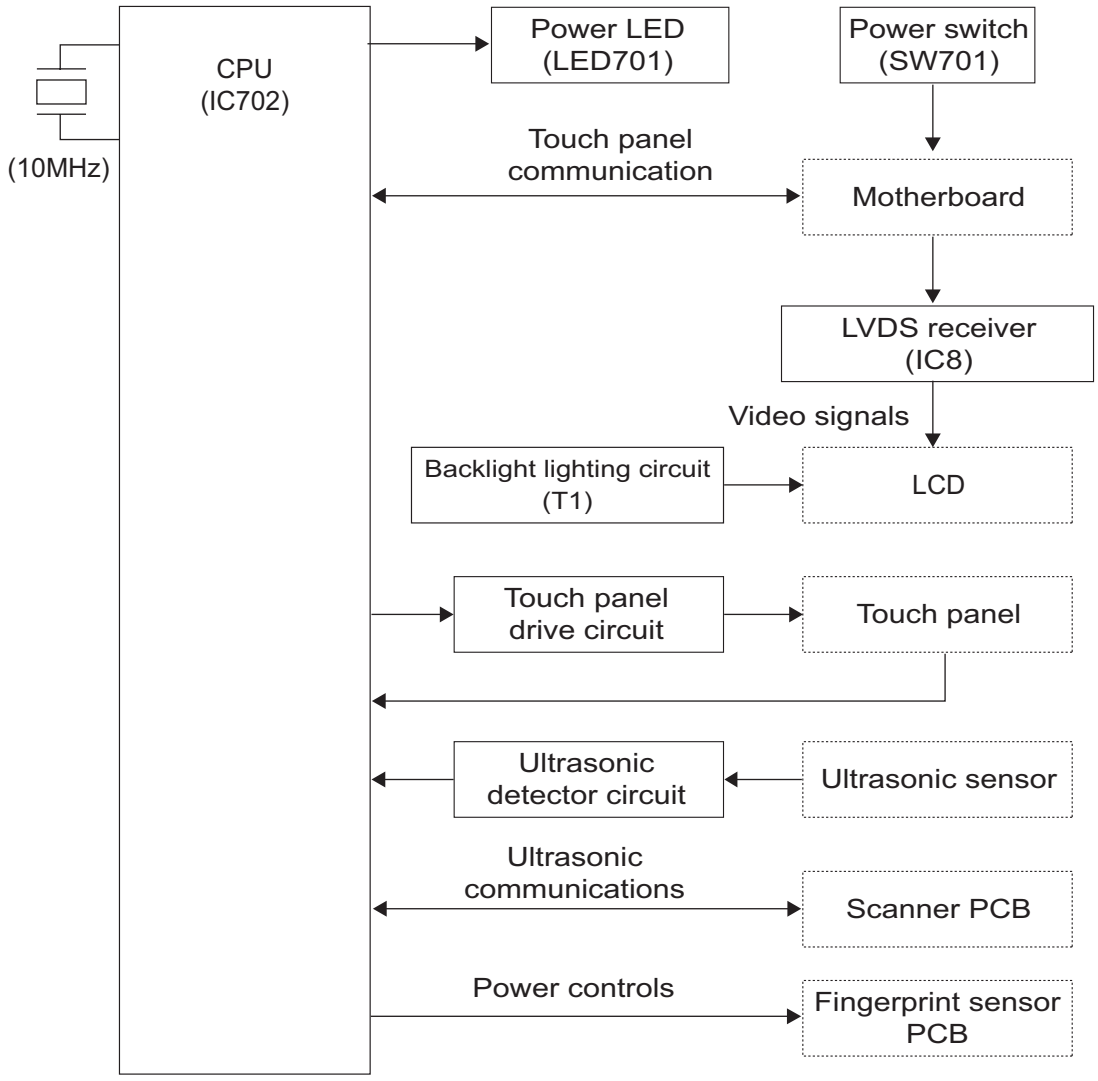



**Figure 2-503**

◆ Function list of major ICs

| IC No. | Name | Function |
|---|---|---|
| IC702 | CPU | Controls the touch panel, and processes the ultrasonic signals |
| IC8 | LVDS receiver | Receives video signals |

**Table 2-503**

## 4. Fingerprint Authentication

SF-220P mounts the fingerprint sensor, which authenticates the user by reading the fingerprint touched on the sensor instead of using ID number or password.

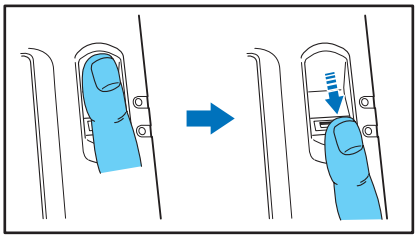


**Figure 2-504**

The structure of the fingerprint sensor is shown below.

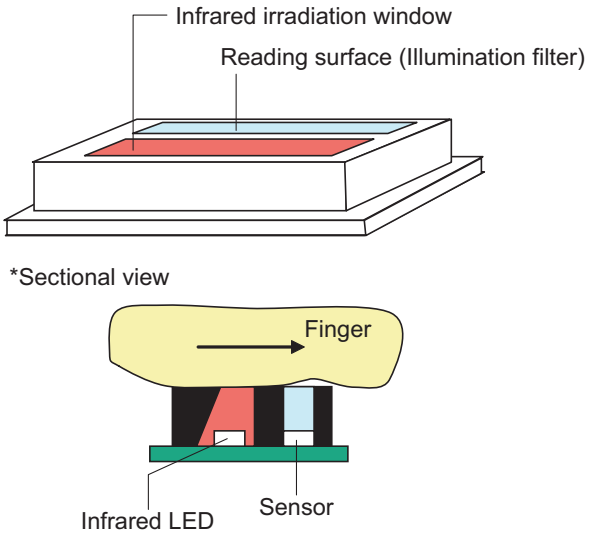



**Figure 2-505**

The light source (Infrared LED) emits near-infrared light to the finger. The emitted light is diffused inside the finger and reflected as scattered light from the fingerprint ridges. The photo sensor detects this light and processes to identify the fingerprint.

The figure below simulates how the light is emitted to the sensor though the finger.

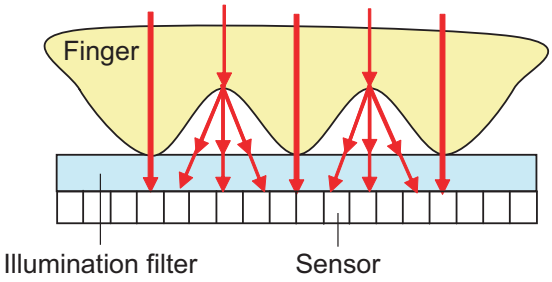



**Figure 2-506**

The fingerprint ridges (salient points) emit the strong light to the sensor, since they are directly touched on the illumination filter. The fingerprint troughs (reentrant points), however, emit the weaker lights to the sensor, since the air layer between the fingerprint troughs and the illumination filter scatters the light. Based on this mechanism, the machine identifies fingerprints.

Therefore, the dirt on the finger or the contact surface causes incorrect reading.

When the machine is switched to the fingerprint identify mode, the fingerprint sensor goes into standby. Placing the finger on the reader triggers the normal infrared irradiation.

The main specification of the fingerprint sensor is shown below.

| Item | Description |
|---|---|
| Reading method | Optical sweep-type / Interdigital scattered light method |
| Resolution | 600dpi |
| Reading width | 10.8mm (256 pixels) |
| Light source | Infrared LED |
| Authentic method | Minutiae matching method |

**Table 2-504**


COPYRIGHT © 2007 CANON ELECTRONICS INC.

## 5. Image Processing Control

The block diagram of the image processing in the main body is shown below.

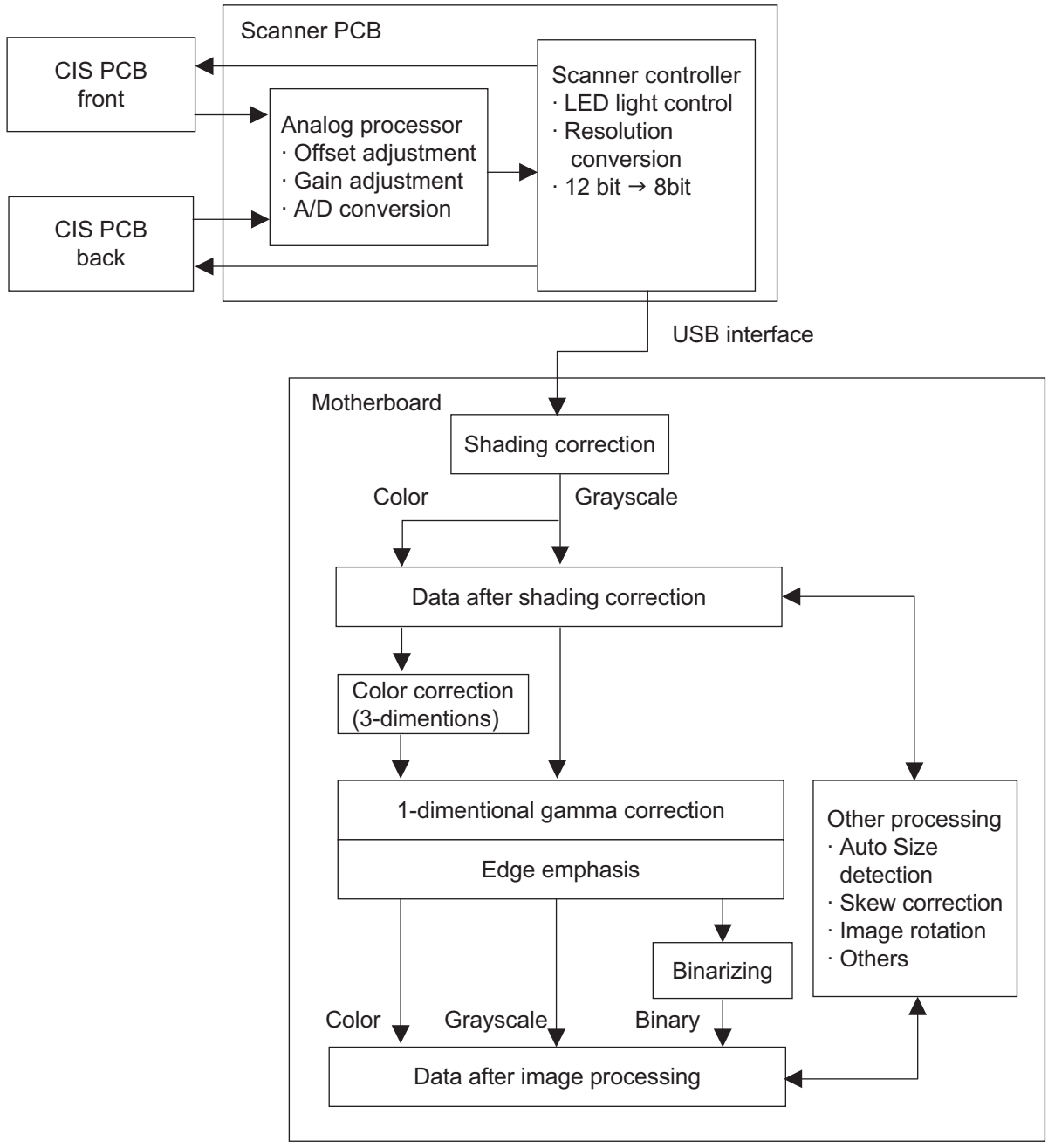



**Figure 2-507**

Analog signals proportionate to the density of each picture element are output to the analog processor on the scanner PCB from the CIS PCB. The resolution of the output data is either 300 dpi or 600 dpi according to the user settings.

The analog processor carries out offset adjustment, gain adjustment, and A/D conversion. Analog signals are converted into 12bit digital signals in the analog processor. Then the image data is transferred to the scanner controller and the resolution is converted from 12 bits to 8 bits.

After that, the image data is output to the motherboard through USB interface.

The motherboard performs the image processing according to the user settings after the shading correction.

Since this machine has a white background, the processing methods of auto size detection and skew correction are different from conventional methods. A conventional machine with a black background uses its background color to detect the edges of document. This machine, however, reads changes in data to detect the edges of document.

Black border removal and binder hole removal are not necessary since the background color is white.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# VI. POWER SUPPLY

## 1. Outline

This machine runs on the AC adapter, whose rated input voltage is 100-240VAC 50/60Hz and whose output is +16VDC. Use the AC adapter bundled with this machine.

Plugging the AC adapter to the machine activates the monitoring system on the power switch. When the power switch is ON, the CPU is powered on and supplies the power to each PCB.

The motherboard generates +5V and +3.3V from the input-voltage of +16V and additionally generates +2.5V and +1.25V from +5V. The motherboard supplies +16V, +5V, and +3.3V to the Scanner PCB and the LCD Relay PCB.

The LCD Relay PCB has an inverter circuit for the LCD backlight. Since the LCD Relay PCB is supplied high voltage, it is indicated with the “HIGH VOLTAGE” label.

In case of excess voltage or current applied to the AC adapter output, the safety system cuts the power. In this case, unplug the AC plug. After about 10 minutes, the machine recovers automatically. After removing the cause, plug it back.

For power saving, the display off mode can be configured by the user.

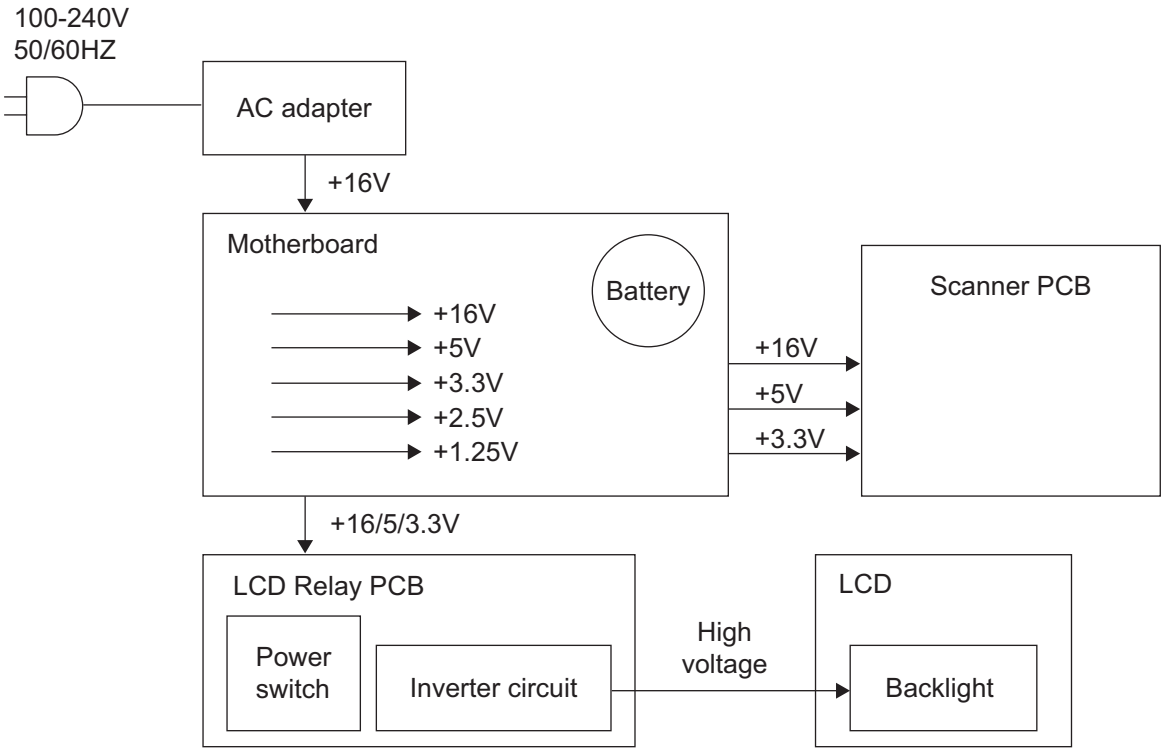



**Figure 2-601**

## 2. Lithium Battery

The motherboard of the machine mounts a lithium battery to maintain the real-time clock and to save BIOS setting data. The battery specification is as follows:

Manufacturer:
Matsushita Electric Industrial Co., Ltd.
Model: BR-2032/B
Supply voltage: 3V
Capacity: 190mAH

However, as long as the AC adapter is plugged to the machine, these functions are maintained by the power supplied from the AC adapter not from the lithium battery.

When the battery has run out, the clock and BIOS settings are disabled. The re-configurations are necessary after replacing the battery. For BIOS reconfiguration, refer to the section regarding to the BIOS settings in "CHAPTER 5 TROUBLE-SHOOTING" in this manual. The clock needs to be reconfigured from the Web menu. The reconfigurations are also necessary when the battery is removed temporarily.

For replacing the battery, refer to the "CHAPTER 3 DISASSEMBLY & REASSEMBLY". The battery is not specified as a service part. Purchase the same or equivalent battery as described above.

◆ **Notes on lithium battery**

Improper installation may cause an explosion. Make sure that the direction of the battery is correct when installing. Use the same or equivalent battery as described above. Do not attempt to recharge or disassemble it. Do not throw it in the fire. Store it out of the reach of children.

Follow battery manufacturer's instructions or local regulations when disposing a used battery or a PCB mounting a battery.

◆ **For California, USA Only**

Included battery contains Perchlorate Material - special handling may apply.
See
http://www.dtsc.ca.gov/hazardouswaste/perchlorate/
for detail.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# VII. ELECTRICAL PARTS LAYOUT

## 1. Upper Unit

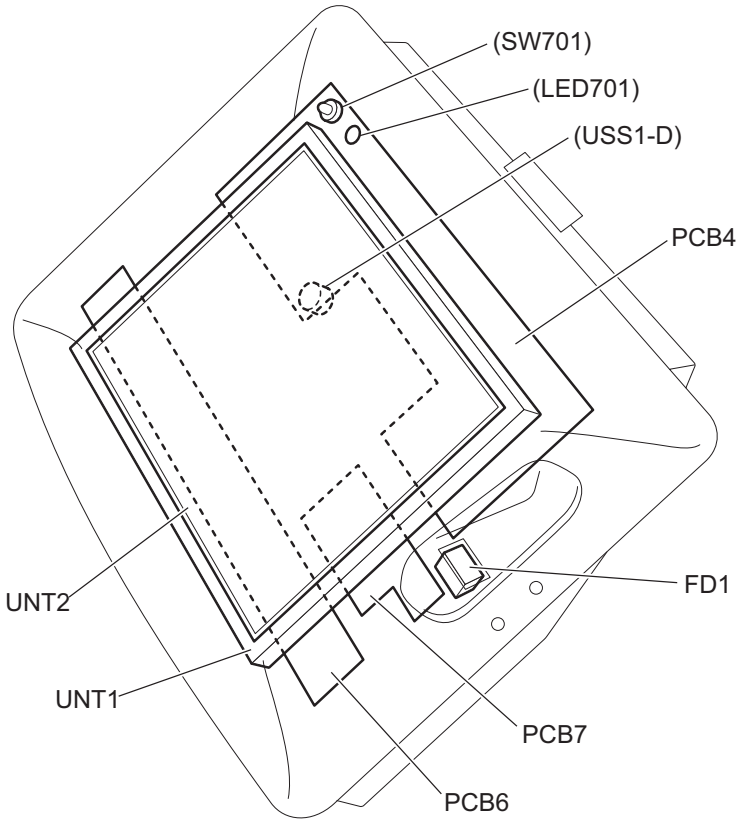



**Figure 2-701**

| Category | Name | Symbol |
|---|---|---|
| Switch | Power switch | SW701 |
| Lamp | Power indicator | LED701 |
| Sensor | Ultrasonic sensor (detector) | USS1-D |
| | Fingerprint sensor | FD1 |
| PCB | LCD Relay PCB | PCB4 |
| | CIS PCB back | PCB6 |
| | Fingerprint sensor PCB (SF-220P only) | PCB7 |
| Unit | LCD | UNT1 |
| | Touch panel | UNT2 |

**Note:** The power switch, power indicator, and ultrasonic sensor are mounted on the LCD Relay PCB.

**Table 2-701**

## 2. Lower Unit

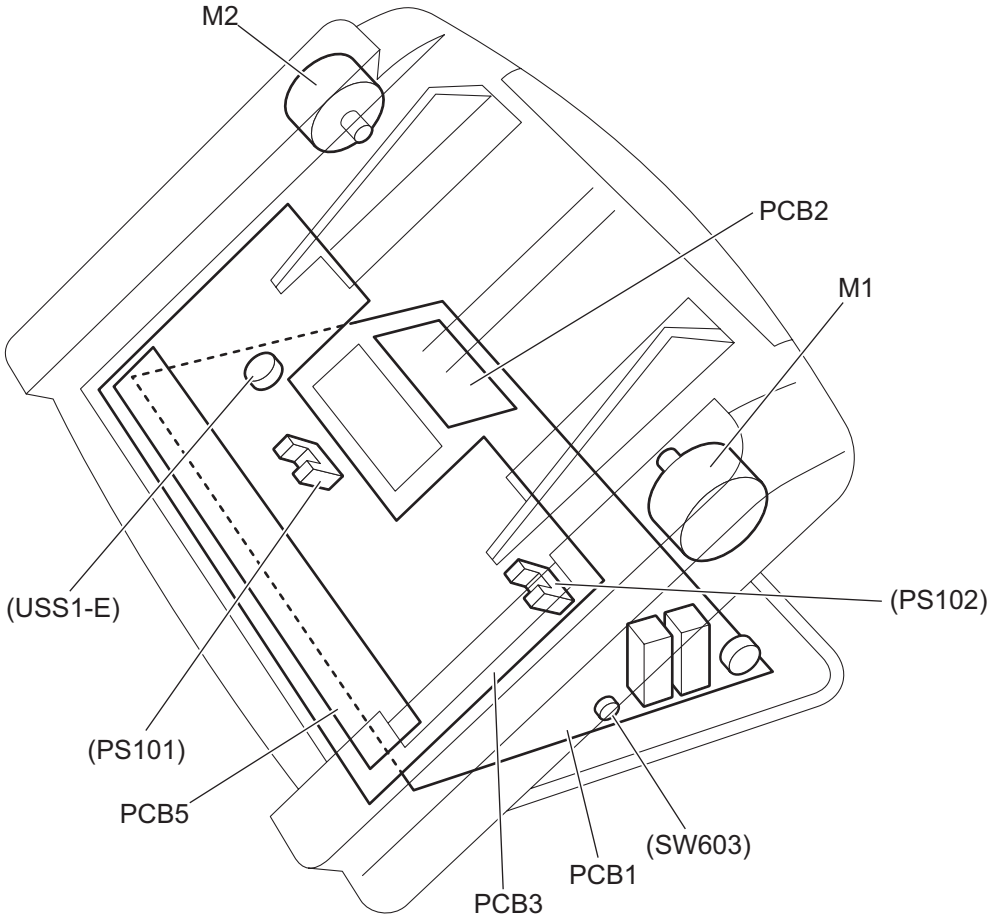



**Figure 2-702**

| Category | Name | Symbol |
|---|---|---|
| Switch | Boot switch | SW603 |
| Sensor | Registration sensor | PS101 |
| | Door sensor | PS102 |
| | Ultrasonic sensor (Emitter) | USS1-E |
| Motor | Pickup motor | M1 |
| | Feed motor | M2 |
| PCB | Motherboard | PCB1 |
| | DIMM (memory) | PCB2 |
| | Scanner PCB | PCB3 |
| | CIS PCB front | PCB5 |

**Note:** The boot switch is mounted on the motherboard, and 3 sensors are on the Scanner PCB. DIMM is connected to the connector on the motherboard.

**Table 2-702**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# VIII. PARTS LAYOUT ON EACH PCB

## 1. Motherboard

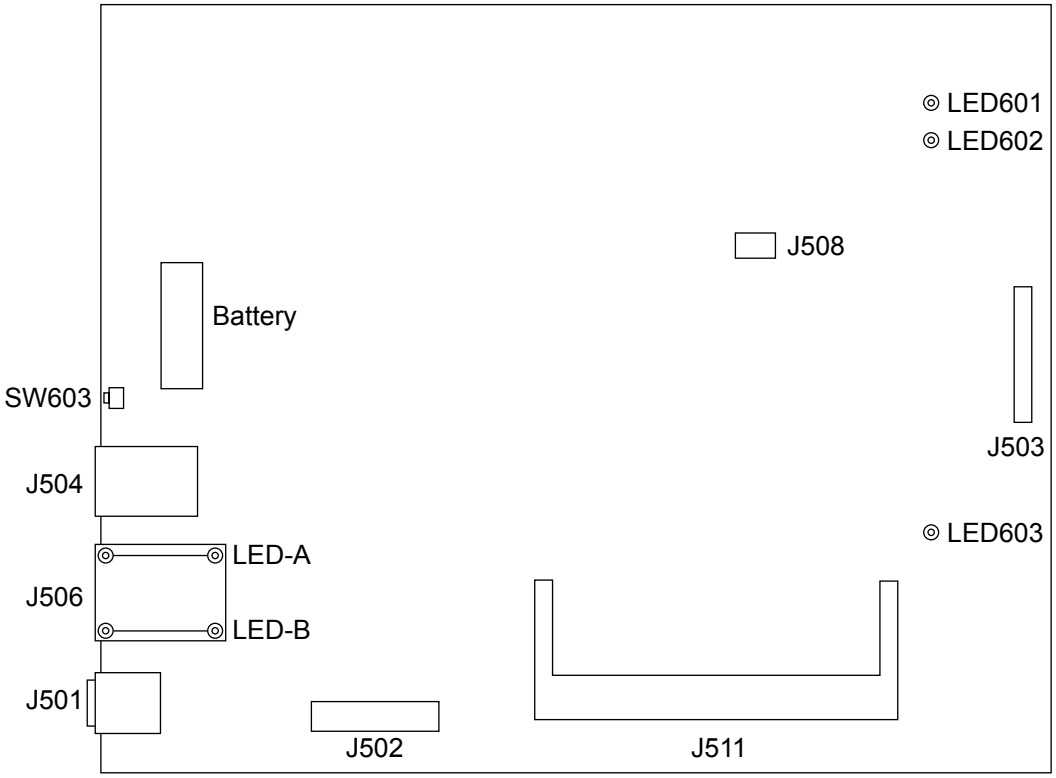



**Figure 2-801**

| Connector | | Description |
|---|---|---|
| J501 | -- | AC adapter connecter |
| J502 | 10P | Scanner PCB (Power) |
| J503 | 31P | LCD Relay PCB |
| J504 | -- | PS/2 connector (x2) |
| J506 | -- | USB connector (x2), LAN connector |
| J508 | 6P | Scanner PCB (USB) |
| J511 | -- | SO-DIMM |

**Table 2-801**

| Symbol | Description |
|---|---|
| SW603 | Emergency boot switch |
| LED601 | +16VDC supply: lights |
| LED602 | +5/3.3VDC supply: lights |
| LED603 | CPU power supply (+2.5/1.25VDC): lights |
| LED-A | Network connection<br>10Base: green,<br>100Base: orange |
| LED-B | Network communication: blinks |

**Table 2-802**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Scanner PCB

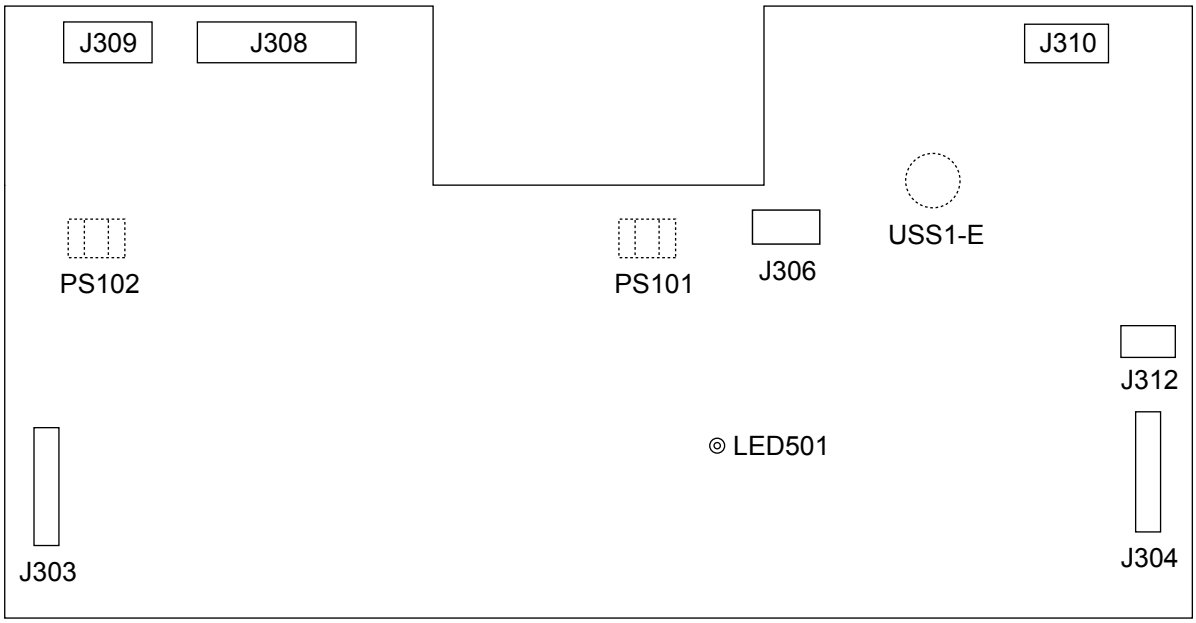



**Figure 2-802**

| Connector | | Description |
|---|---|---|
| J303 | 12P | CIS PCB front |
| J304 | 12P | CIS PCB back |
| J306 | 6P | Motherboard (USB) |
| J308 | 11P | Motherboard (Power) |
| J309 | 3P | Pickup motor |
| J310 | 3P | Feed motor |
| J312 | 5P | LCD Relay PCB (SF-220P) |

**Table 2-803**

| Symbol | Description |
|---|---|
| PS101 | Registration sensor |
| PS102 | Door sensor |
| USS1-E | Ultrasonic sensor (Emitter) |
| LED501 | CPU operation: blinks |

**Table 2-804**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. LCD Relay PCB

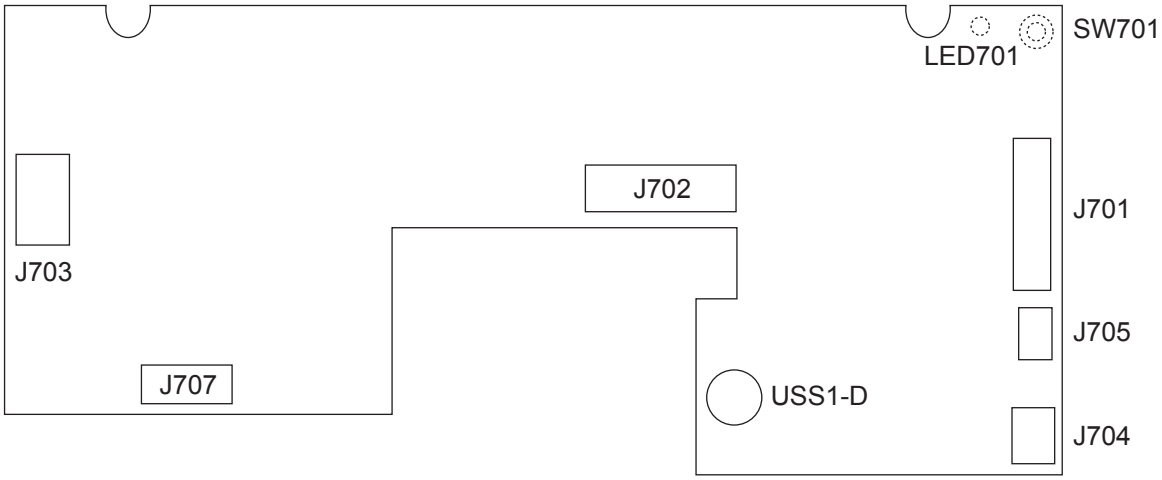



**Figure 2-803**

| Connector | | Description |
|---|---|---|
| J701 | 31P | Motherboard |
| J702 | 40P | LCD |
| J703 | 2P | Backlight (LCD) |
| J704 | 4P | Touch panel |
| J705 | 5P | Scanner PCB (SF-220P) |
| J707 | 6P | Fingerprint sensor PCB (SF-220P) |

**Table 2-805**

| Symbol | Description |
|---|---|
| SW701 | Power switch |
| LED701 | Power indicator |
| USS1-D | Ultrasonic sensor (Detector) |

**Table 2-806**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# CHAPTER 3

# DISASSEMBLY & REASSEMBLY


I. USER REPLACEABLE PARTS .....3-1
II. EXTERNAL COVERS .....3-3
III. UPPER UNIT.....3-6
IV. LOWER UNIT.....3-17
V. ELECTRICAL PARTS (PCB, ETC.) .....3-27


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. USER REPLACEABLE PARTS

## 1. Retard Roller

1) Open the roller cover.

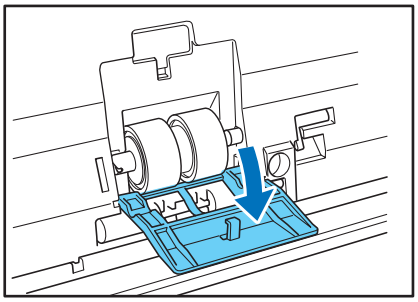


**Figure 3-101**

2) Lift up the roller lock lever ①, then slide it in the direction of the arrow ②.

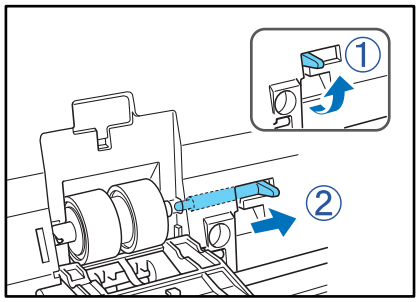



**Figure 3-102**

3) Move the retard roller to the right, then remove it from the shaft.

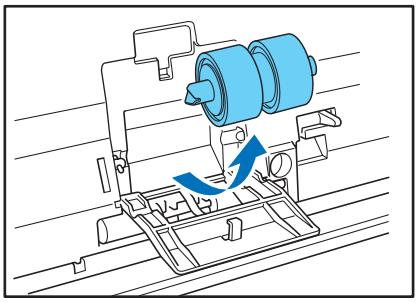


**Figure 3-103**

## 2. Feed Roller

1) Open the roller cover.

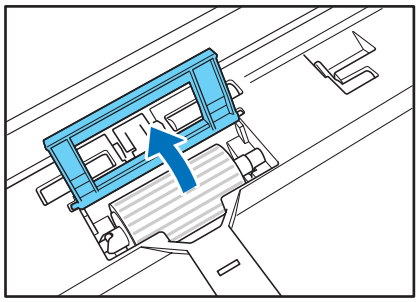


**Figure 3-104**

2) Lift up the roller lock lever ①, then slide it in the direction of the arrow ②.

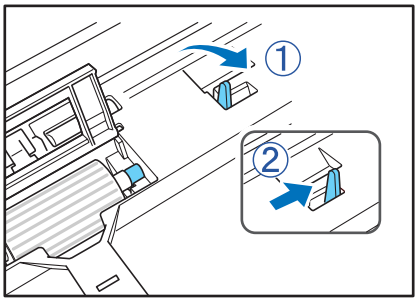



**Figure 3-105**

3) Move the feed roller to the right, then remove it from the shaft.

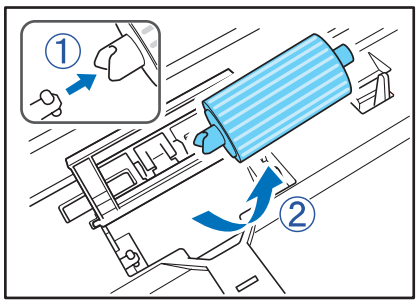



**Figure 3-106**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 3. Document Holding Guide

1) Open the roller cover, then remove the document holding guide by sliding it up.

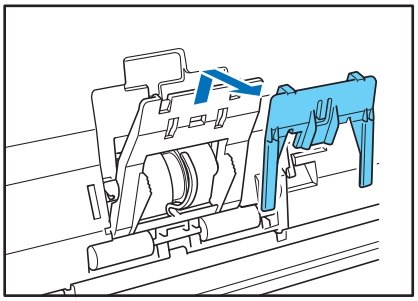


**Figure 3-107**

◆ **Notes on assembling**

Hook the new document holding guide (four hooks) onto the roller cover, and slide it down to set it in place.

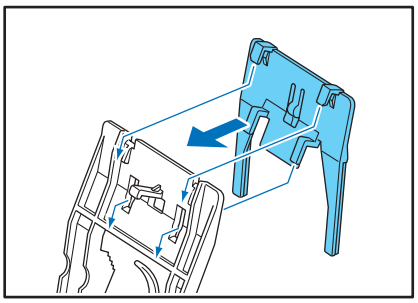


**Figure 3-108**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# II. EXTERNAL COVERS

## 1. Eject Tray

1) Upright the main body, bend the arms ① on the left and right sides to unhook the fitting parts, then remove the eject tray ②.

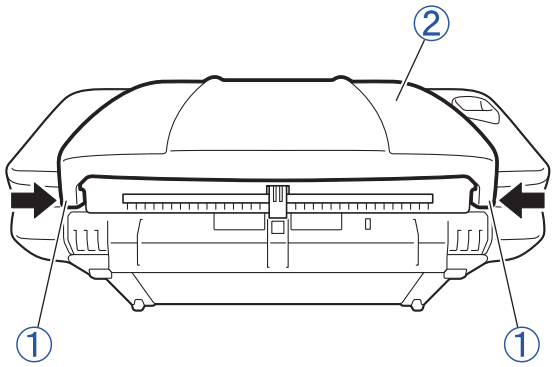



**Figure 3-201**

**Note:** Removing the eject tray first makes it easier to disassemble the machine. You may remove the eject tray even if the procedures do not indicate it.

## 2. Left Cover

1) Insert a tool into the openings ① (2x2 places) on the top and the bottom, then unhook the fitting parts to remove the left cover ②.

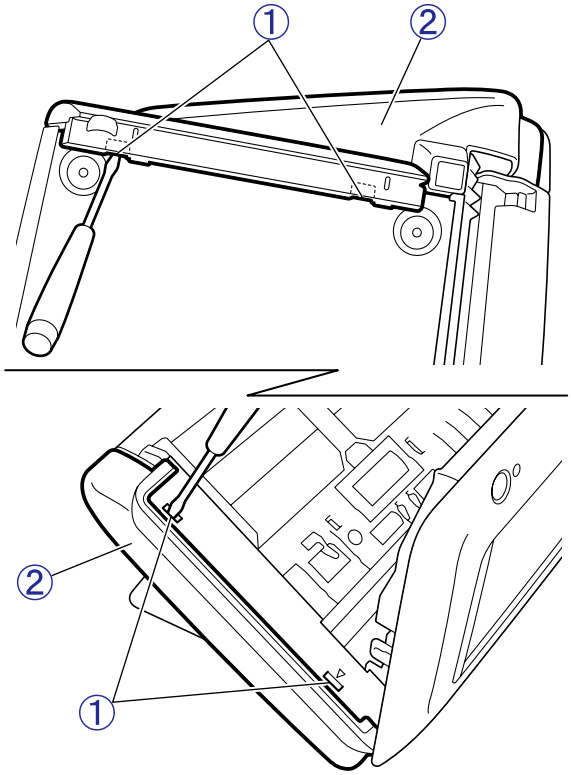



**Figure 3-202**

◆ **Notes on assembling**

Do not to get the cables (FFCs) and the shield plate caught in parts.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 3. Right Cover

1) Insert a tool into the openings ① (2x2 places) on the top and the bottom, then unhook the fitting parts to remove the right cover ②.

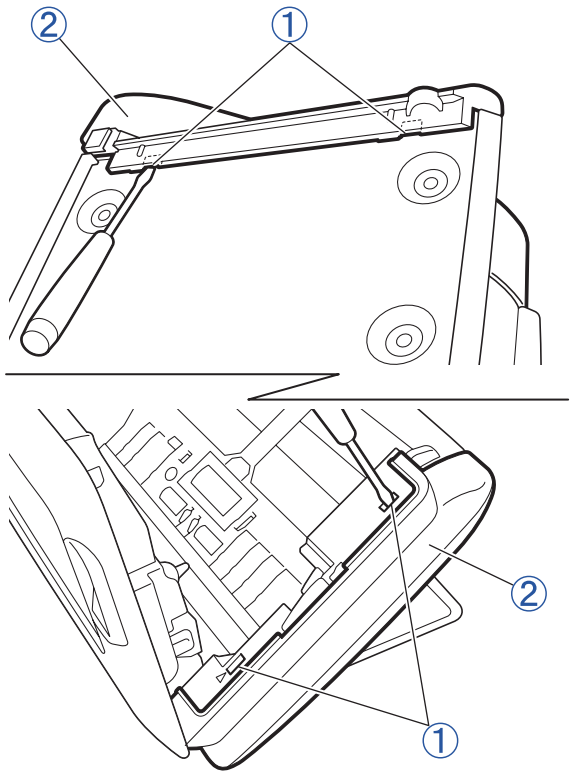



**Figure 3-203**

◆ **Notes on assembling**

Do not get the shield plate caught in parts.

## 4. Rear Cover

1) Remove 2 screws ①, then unhook the fitting parts of the right and left covers to remove the rear cover ②.

**Note:** If it is difficult to remove the rear cover, remove the right and left covers first.

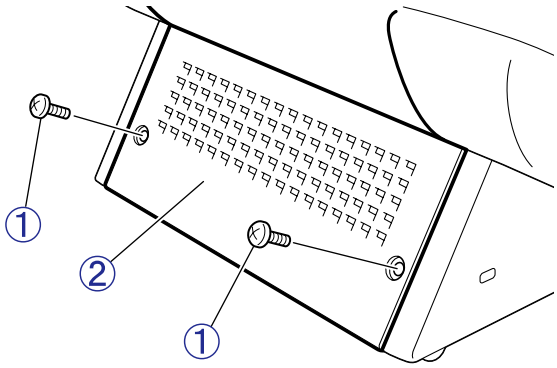



**Figure 3-204**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 5. Rear Plate

1) Remove the rear cover.
2) Remove 7 screws ①, then remove the rear plate ②.

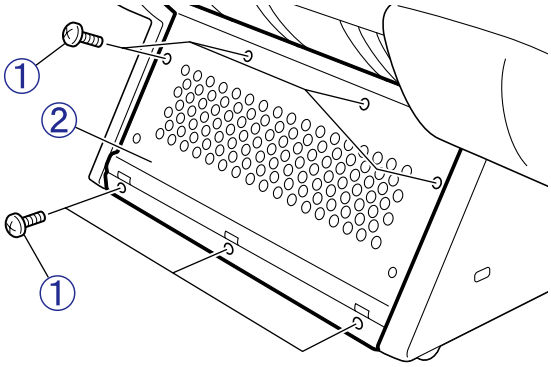



**Figure 3-205**

## 6. Pickup Tray

1) Pull the pickup tray ①.

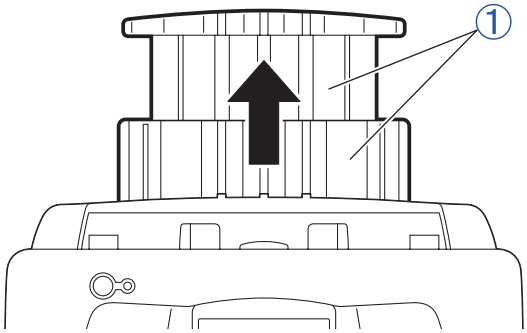



**Figure 3-206**

2) Bend the pickup tray ① slightly, then unhook one side of the tray to remove it.

**Note:** Since the fitting parts are located on the inside, bending the tray makes it easier to unhook the fitting parts.

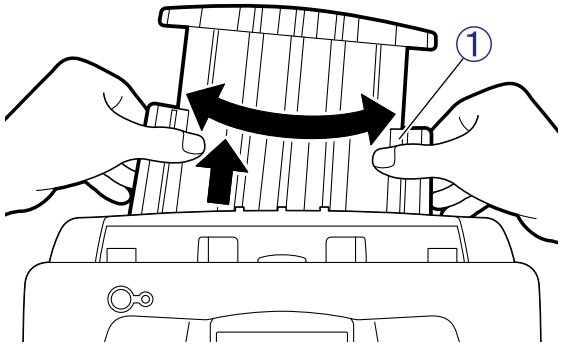



**Figure 3-207**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# III. UPPER UNIT

## 1. Upper Cover Assembly

1) Open the upper unit.
2) While holding the upper cover assembly ① with a hand, unhook 4 pairs of fitting parts ② to remove the upper cover assembly.

**Note:** Unhook the hooks on the upper side by pressing them downward, and unhook the hooks on the lower side by pressing them upward.

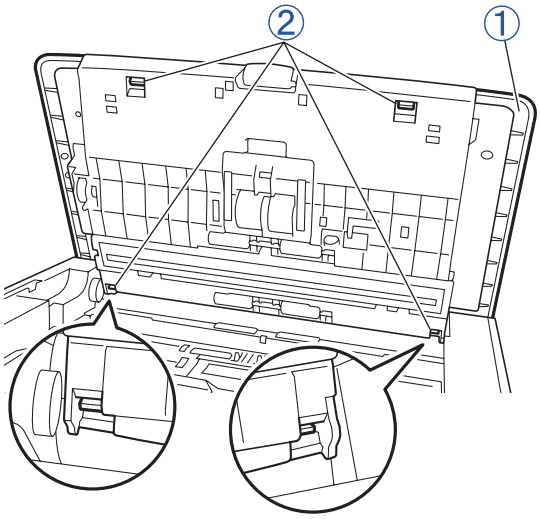



**Figure 3-301**

3) Remove 2 cables ①. For SF-220, remove the upper cover assembly ② after that. For SF-220P, go to the following step 4 to remove the upper cover assembly.

**Note:** The connector (*) of the cable for LCD display data has locks. Push the levers on both sides to remove this connector.

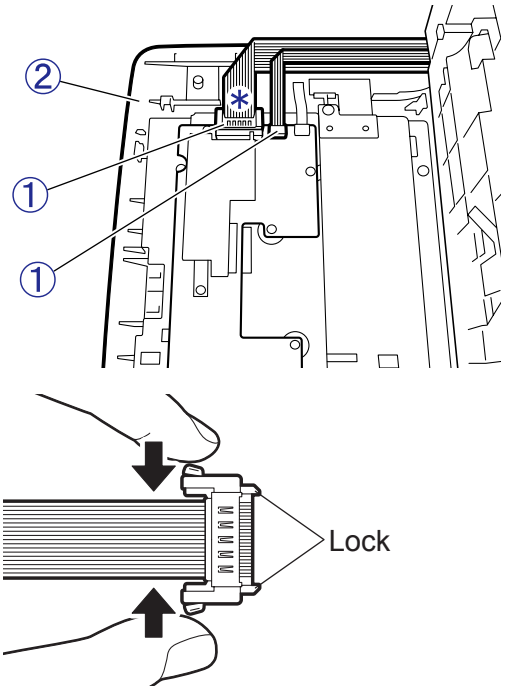



**Figure 3-302**

4) For SF-220P, after removing the fingerprint sensor PCB and the core mounting plate, remove the upper cover assembly.
(Page 3-8, Page 3-9)


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ **Notes on assembling**

Align the hooks ① on the lower side into the proper positions first. Make sure that the FFCs do not stick out, then fit the hooks on the lower and upper sides.

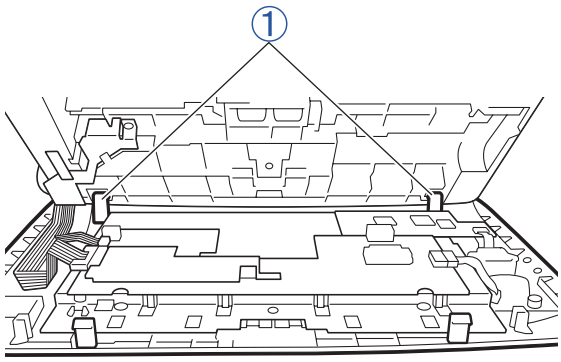



**Figure 3-303**

## 2. LCD Relay PCB

1) Remove the upper cover assembly. (Page 3-6)
2) For SF-220P, remove the connector ① for the fingerprint sensor PCB.

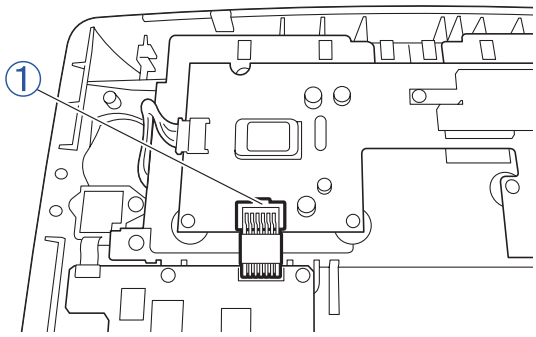



**Figure 3-304**

3) Remove 3 cables ①. And remove 6 screws ② (M2.5x4), then remove the shield plate ③ and the LCD relay PCB ④.

**Note:** The connector (*) of the cable for the LCD unit has a lock. This lock has a special structure, therefore refer to the following illustration to lock and release it.

**Note:** The position setters are provided for 2 screw fix positions (x) on the upper side.

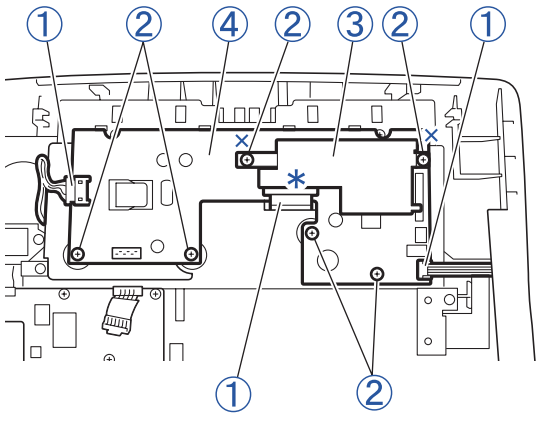



**Figure 3-305**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

Connector (*)
Open the lock carefully so as not to damage it.

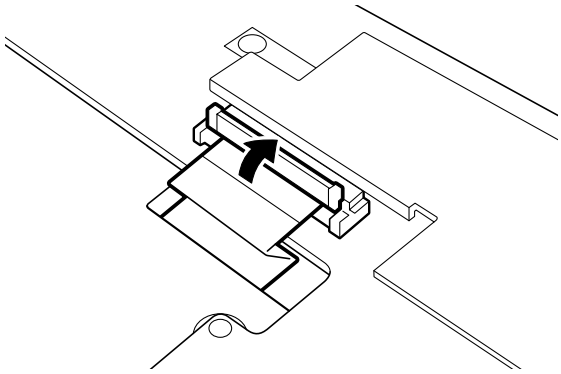


**Figure 3-306**

**Note:** Since the switch and the LED are mounted on the back surface of the PCB, handle the PCB with care.

◆ **Notes on assembling**

Make sure to mount the shield plate and to connect the cables for the LCD unit.
When assembling the PCB, align 2 screw fix positions into their position setters.

## 3. Fingerprint Sensor PCB

* SF-220P only

1) Remove the upper cover assembly. (Page 3-6)
2) Remove 2 cables ①. Remove 3 screws ② (M2.5x4), then remove the fingerprint sensor PCB ③.

**Note:** When disconnecting the cable for the LCD relay PCB, remove the connector (*) attached on the LCD relay PCB. The connector attached on the fingerprint sensor PCB cannot be disconnected.

**Note:** The position setters are provided for 2 screw fix positions (x) on the upper side.

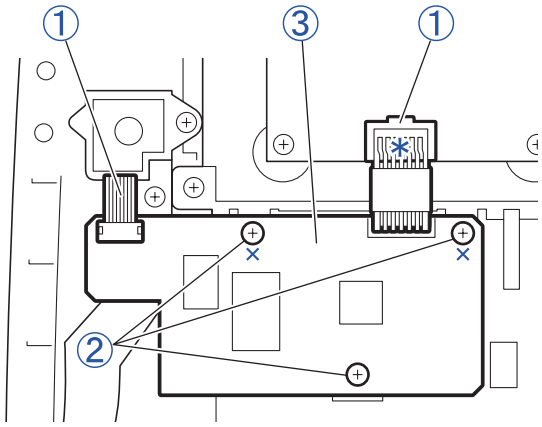



**Figure 3-307**

◆ **Notes on assembling**

When assembling the PCB, align 2 screw fix positions into their position setters.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 4. Fingerprint Sensor Unit

* SF-220P only

1) Remove the fingerprint sensor PCB.
(Page 3-8)
2) Remove 2 screws ① (self-tapping, M3x6). And remove the core mounting plate ②, the core ③, and the shield plate ④.

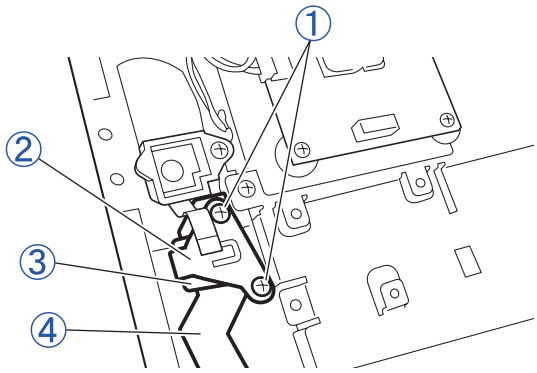



**Figure 3-308**

3) Remove the screw ① (self-tapping, M3x6), then remove the fingerprint sensor unit ②.

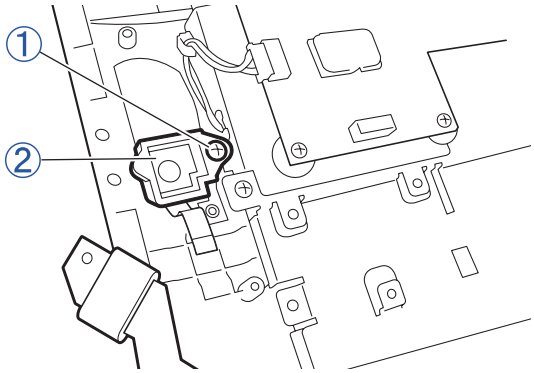



**Figure 3-309**

## 5. LCD Unit

1) Remove the upper cover assembly.
(Page 3-6)
2) For SF-220P, remove the fingerprint sensor PCB and the fingerprint sensor unit.
(Page 3-8, Page 3-9)
3) Remove the LCD relay PCB.
(Page 3-7)
4) Remove the screw ① (self-tapping, M3x6), then remove the ground plate ②.

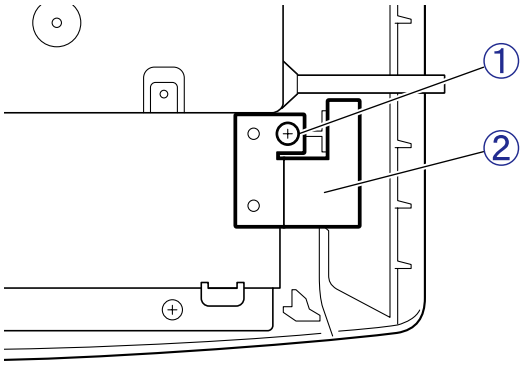



**Figure 3-310**

5) Remove 5 screws ① (self-tapping, M3x6), then remove the LCD unit ② with the mounting plate.

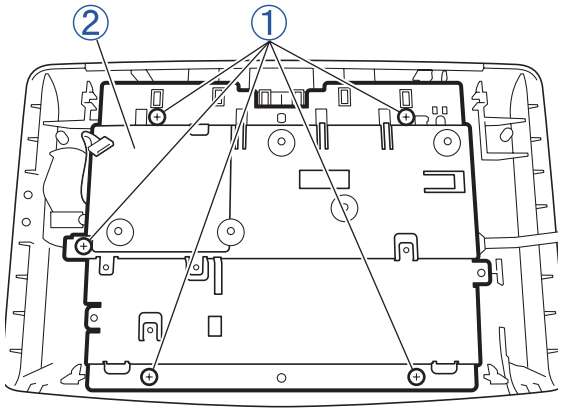



**Figure 3-311**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

6) Remove 2 screws ① (M2.5x4). And remove the cable ② from the cable holder to remove the LCD unit ③.

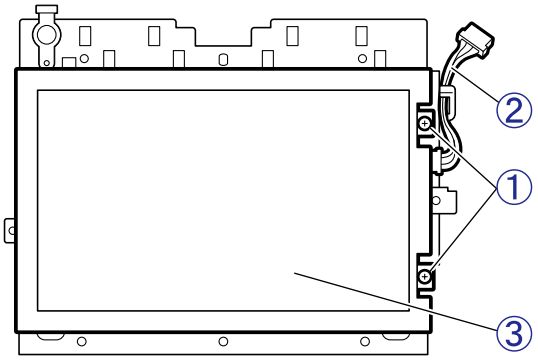



**Figure 3-312**

7) Remove the FFC ① on the back side as necessary.

**Note:** The connector has a lock. This lock has a special structure, therefore refer to the following illustration to lock and release it. Open the lock carefully so as not to damage it.

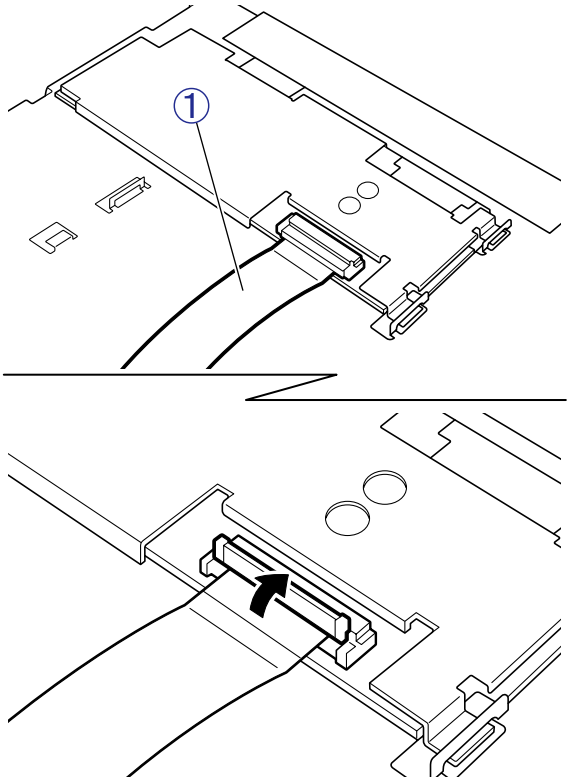



**Figure 3-313**

◆ **Notes on assembling**

Before assembling the LCD unit, clean the display surface of the LCD. Also clean the inner surface of the touch panel.

Before assembling the LCD unit to the mounting plate, put the FFC through the appropriate hole of the mounting plate, then place the LCD unit inside the mounting plate guides ①.

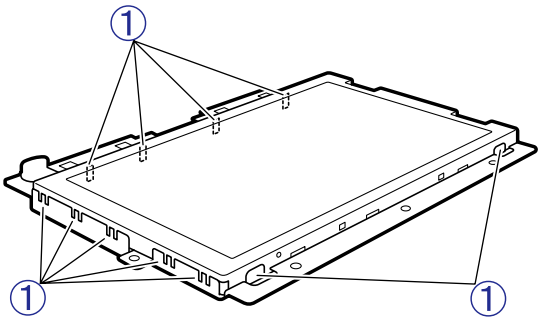



**Figure 3-314**

Also, when assembling the LCD unit with the mounting plate to the upper cover, align the LCD unit with the mounting plate on the upper cover, the power switch button ①, and the LED light guide ② into their position setters.

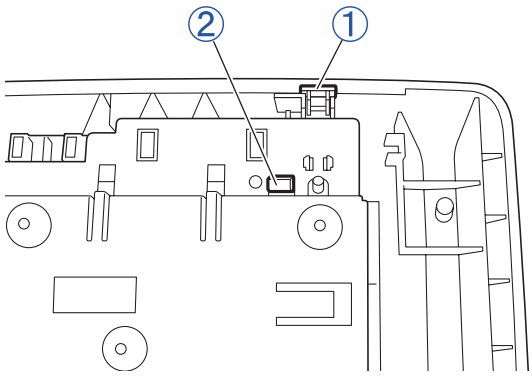



**Figure 3-315**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 6. Touch Panel

1) Remove the LCD unit.
(Page 3-9)
2) While holding the FFC ①, remove the touch panel ②.

**Note:** Four touch panel guides ③ can also be removed.

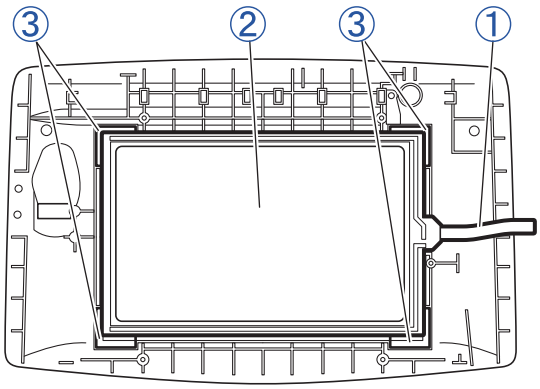



**Figure 3-316**

◆ **Notes on assembling**

Before assembling the LCD unit, clean the display surface of the LCD. Also clean the inner surface of the touch panel.

Do not mount the touch panel inside-out. Make sure that the white side of the FFC is facing up as shown above.

Align the corners of the touch panel to four touch panel guide plates, then press the panel down firmly to assemble it.

After the assembling is complete, clean the front surface of the touch panel.

## 7. Upper Cover

1) Remove the LCD unit.
(Page 3-9)
2) Remove the touch panel.
(Page 3-11)
3) Remove 4 touch panel guides ① and the LED light guide ②, then remove the upper cover ③.

**Note:** The LED light guide is squeezed into the upper cover. The tightness of fitting varies; it may be difficult or easy to detach them.

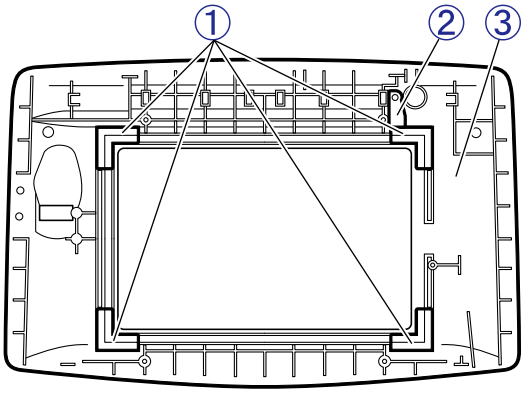



**Figure 3-317**

◆ **Notes on assembling**

Do not forget to assemble the LED light guide.

Make sure that the touch panel guide is not placed inside-out. Make sure that the surface with a dent for the touch panel is facing up as shown above.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 8. Upper Reading Unit

**Note:** The reading holder shapes for the upper reading unit and the lower reading unit differs.

1) Remove the upper cover assembly. (Page 3-6)
2) Remove the screw ① (self-tapping, M3x6). And peel off the lower part of the holding plate ②, then remove the shield plate ③.

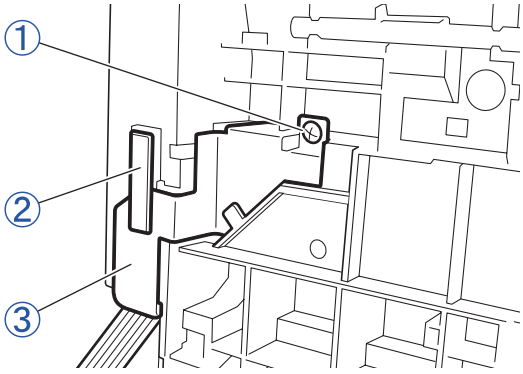



**Figure 3-318**

3) While pressing the reading unit, remove the FFC ①.

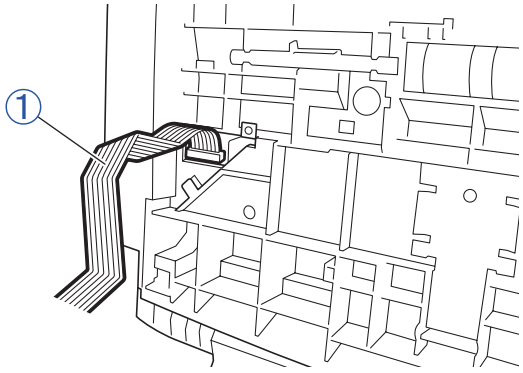



**Figure 3-319**

4) While pulling the reading unit ① slightly, slowly open the guide plate ② outward until 2 protrusions ③ on the reading unit are unhooked.

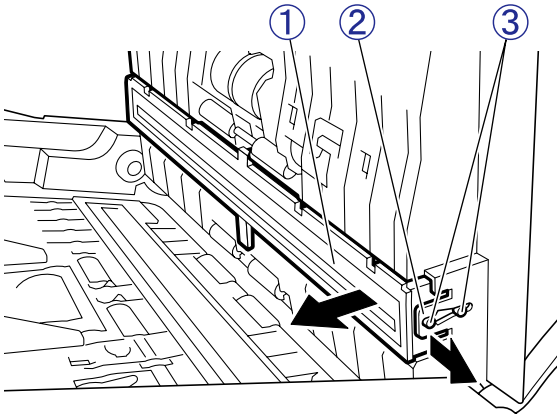



**Figure 3-320**

5) Slide the reading unit ① at a slight slant to unhook the protrusions on the other side, then remove the reading unit.

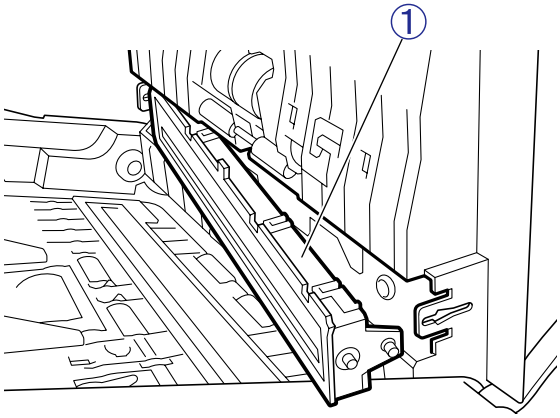



**Figure 3-321**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ **Notes on assembling**

Insert the FFC and the shield plate into the cable holder ① on the main body. Also, put the holding plate ② to hold it.

After the assembling is complete, clean the front surface of the scanning glass.

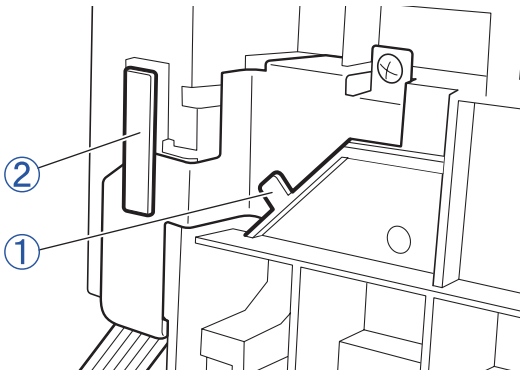



**Figure 3-322**

## 9. Upper Reading Holder

**Note:** This part includes the scanning glass and the shading sheet. Disassembling this part may cause the inside of the reading unit to get dusty. Do not disassemble it unless necessary.

When disassembling, be careful with dusts and do not touch the inner surface of the glass or the surface of the lens array.

1) Remove the upper reading unit. (Page 3-12)
2) With a tool with a thin and flat tip, unhook 8 pairs of fitting parts ① (4x2) to remove the reading holder ②.

**Note:** Be careful not to damage the hooks when unhooking the fitting parts. The CIS unit is removed when the reading holder is removed.

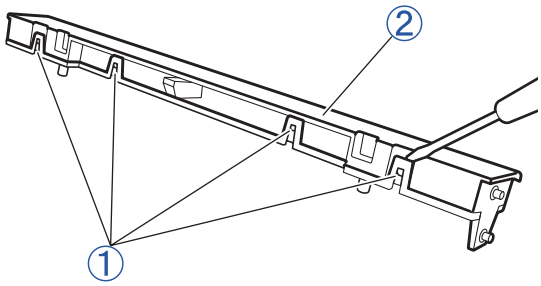



**Figure 3-323**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 10. Upper Frame Assembly

1) Remove the upper cover assembly. (Page 3-6)
2) Remove the left and right covers. (Page 3-3, Page 3-4)
3) Remove the screw ① (self-tapping, M3x6). And peel off the lower part of the holding plate ②, then remove the shield plate ③.

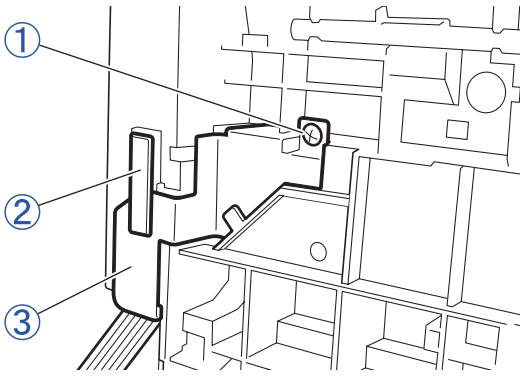



**Figure 3-324**

4) While pressing the reading unit, remove the FFC ①.

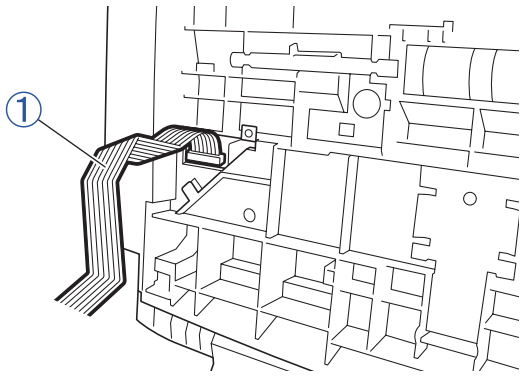



**Figure 3-325**

5) While the upper frame assembly ① is closed, remove the screw ② (self-tapping, M3x14) and the screw ③ (self-tapping, M3x8), then remove the dumper unit ④.

**Note:** The longer screw ② is a rotation stopper. Use it on the appropriate place. If the upper frame assembly is opened fully without removing this screw, the rotation stopper will be damaged.

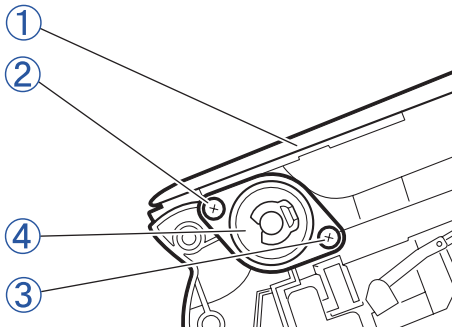



**Figure 3-326**

6) Open the upper frame assembly ①, then unhook it by setting the position of the fitting parts ②. Unhook the fitting parts on the other side, then remove the upper frame assembly.

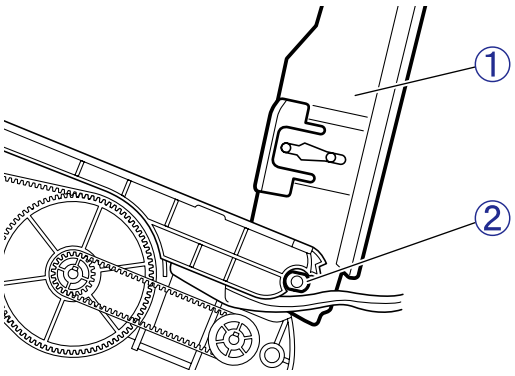



**Figure 3-327**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 11. Follower Roller

**Note:** The method to disassemble the follower rollers for the registration rollers and the eject rollers is the same. The parts for each are also the same.

1) Remove the upper cover assembly. (Page 3-6)
2) While holding the roller with a hand to prevent it from falling out, unhook 2 pairs of fitting parts ① on the back side, then remove the stopper ②, the roller ③, and the roller shaft ④.

**Note:** The spring is mounted under the roller shaft. The parts will fall out if the roller is not held with a hand.

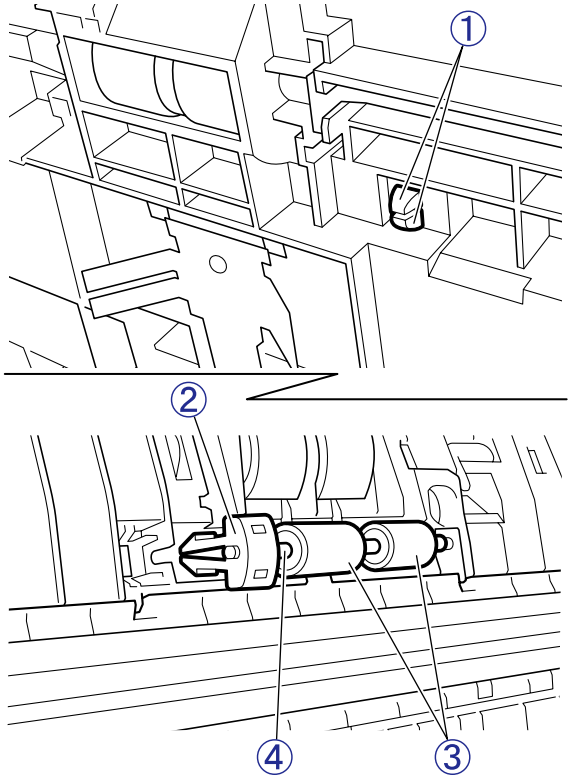



**Figure 3-328**

◆ **Notes on assembling**

Assemble the coil spring first.

Set the roller position to its housing on the main body to assemble it.

Insert the plain-cut end ① of the roller shaft into the stopper. Insert the other end (circular-shaped) of the roller shaft into the hole on the main body.

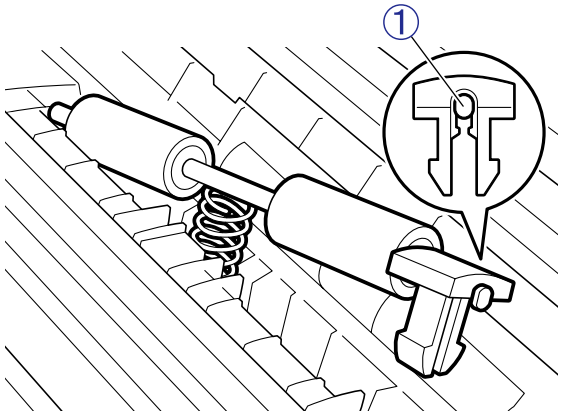



**Figure 3-329**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 12. Retard Roller Cover

1) Remove the document holding guide. (Page 3-2)
2) Open the retard roller cover ① fully, then slowly unhook two pairs of fitting parts ②.

**Note:** You cannot unhook the fitting part unless the cover is fully opened.

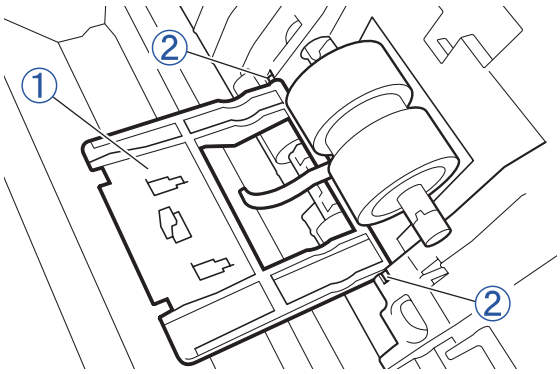



**Figure 3-330**

## 13. Static Eliminator Brush

**Note:** This part is attached on the upper frame. Remove this only when necessary. When replacing the upper frame, prepare and attach a new static eliminator brush.

1) Peel off a corner of the static eliminator brush ①, then remove it.

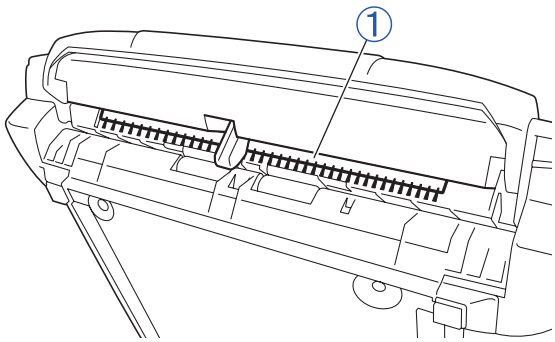



**Figure 3-331**

◆ **Notes on assembling**

Align the corners of the silvery sheet of the static eliminator brush into the corners of the upper frame to attach the brush horizontally.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# IV. LOWER UNIT

## 1. Scanner PCB Mounting Plate

1) Remove the bottom box assembly. (Page 3-27)
2) While unhooking the hook ①, slide the FFC holder ② to remove.

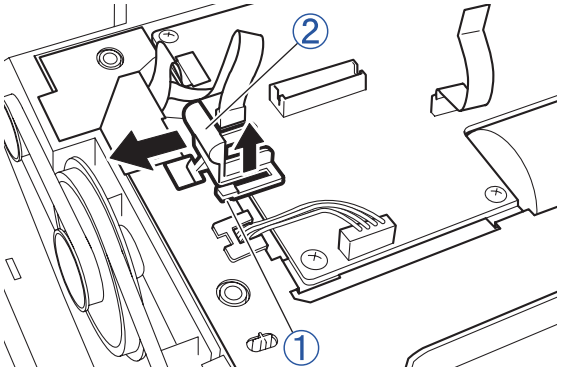



**Figure 3-401**

3) Remove the scanner PCB. (Page 3-29)
4) Remove two screws ③ (self-tapping, TP-head), which attach the left and right shield plates ① to the scanner PCB mounting plate ②. And remove two cables ④ from clamps, then remove the scanner PCB mounting plate.

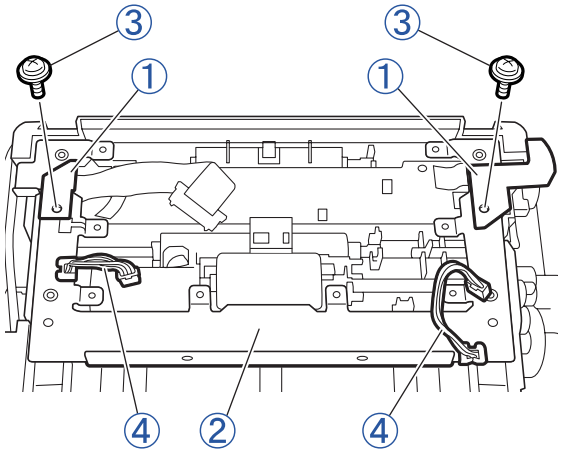



**Figure 3-402**

◆ **Notes on assembling**

Pay attention to the cable wiring so as not to get the cables caught in other parts. If the coating of the cable is peeled off, it shorts out when contacting with the mounting board. And align the position setters to assemble the mounting plate.

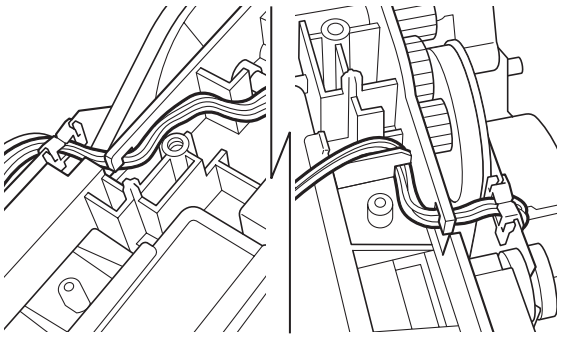


**Figure 3-403**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Feed Motor Unit

1) Remove the scanner PCB.
(Page 3-29)
2) Remove 3 screws ① (self-tapping, TP-head), then remove the feed motor unit ②.

**Note:** Do not remove 2 screws ③ on the motor. You cannot remove the motor by removing these screws.

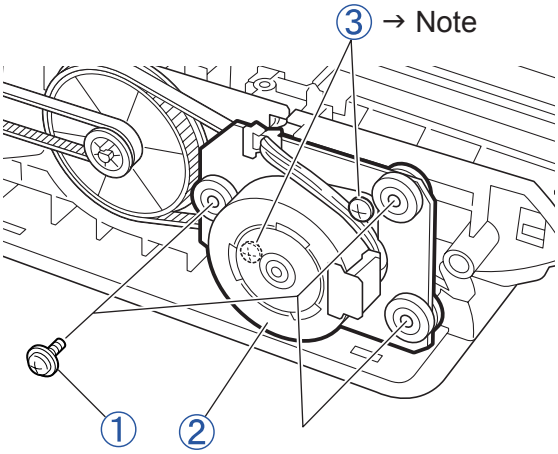



**Figure 3-404**

◆ **Notes on assembling**

Put the belt on the pulley on the back side, then assemble the motor unit.

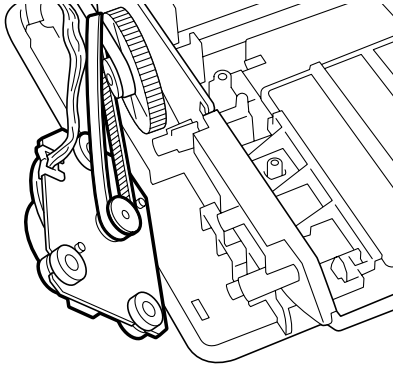


**Figure 3-405**

## 3. Belts

1) Remove the pickup motor unit.
(Page 3-22)
2) Remove the small belt ①, then remove the large belt ②.

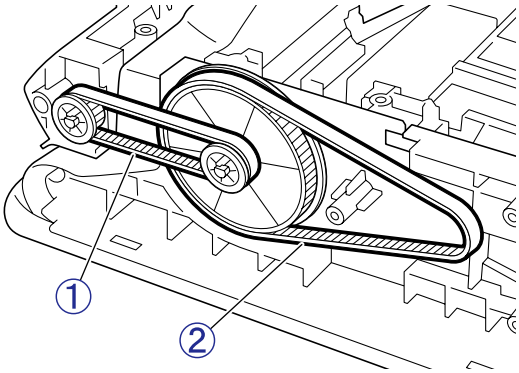



**Figure 3-406**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 4. Eject Drive Roller

1) Remove the scanner PCB mounting plate.
(Page 3-17)
2) Remove the small belt ①. Then unhook the hook ② to remove the pulley ③.

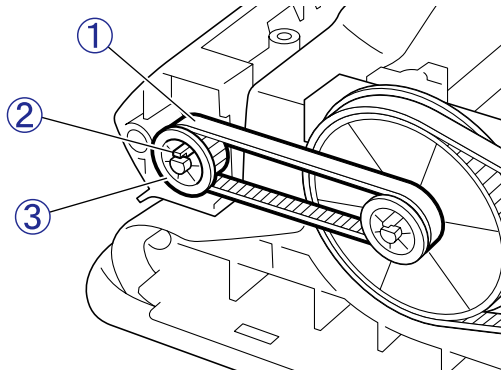



**Figure 3-407**

3) Unhook the hook ① to remove the shaft cover ②.

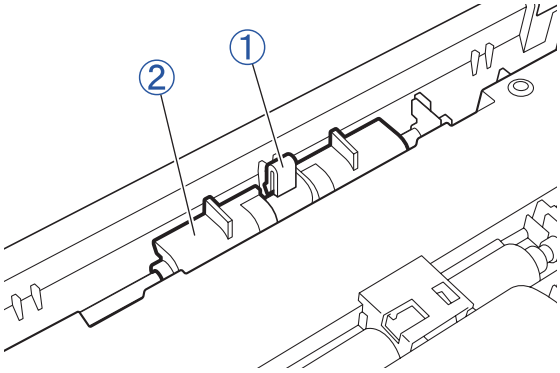



**Figure 3-408**

4) Pinch the plane part of the shaft support ① with longnose pliers, then while unhooking the fitting part by slightly tilting the pliers along the arrow direction, pull up the one end of the eject drive roller ② with the shaft support.

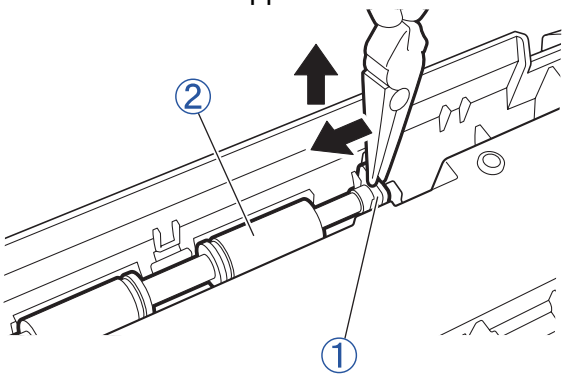



**Figure 3-409**

5) While tilting the eject drive roller ① slightly, slide the roller in the arrow direction to remove it.

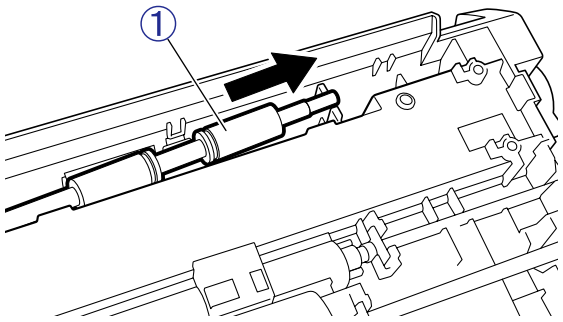



**Figure 3-410**

◆ **Notes on assembling**

Push the shaft support until it fits completely to the fitting part.

## 5. Registration Drive Roller

1) Remove the scanner PCB mounting plate.
(Page 3-17)
2) Remove the small belt ① and the large belt ② from the large pulley ③. Then unhook the hook ④ to remove the large pulley.

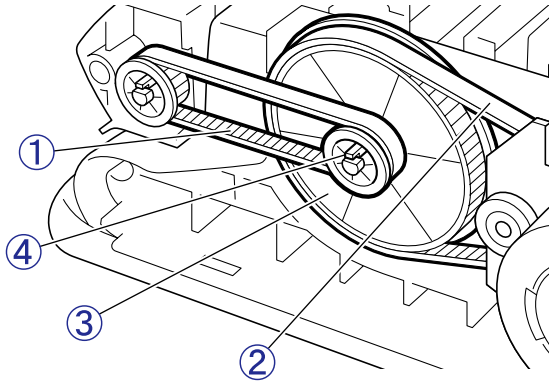



**Figure 3-411**

3) While holding up the right upper part of the shaft cover ①, unhook 4 pairs of fitting parts ② to remove the shaft cover.

**Note:** If the fitting is tight, push the fitting part from the back side to remove it.

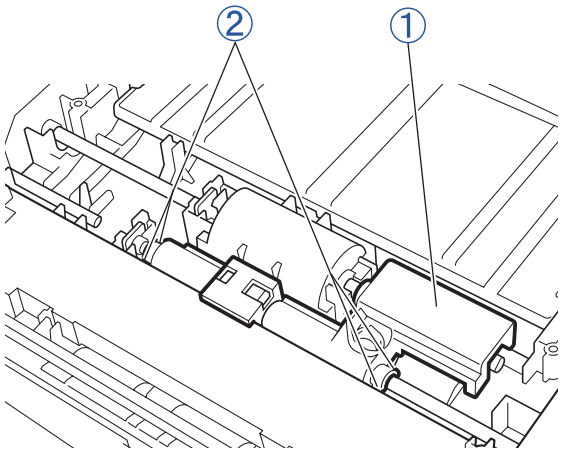



**Figure 3-412**

4) Insert a tool with a thin and flat tip into the left and right fitting parts ① from the back side to unhook them, then remove the sensor holder ②.

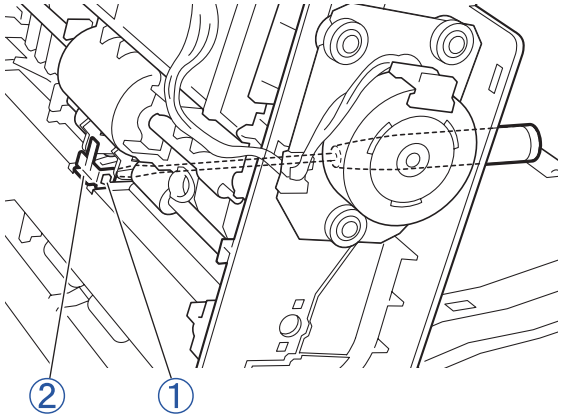



**Figure 3-413**

5) After rotating the sensor lever ① slightly, carefully pull it up, then unhook 2 pairs of fitting parts ② to remove the sensor lever.

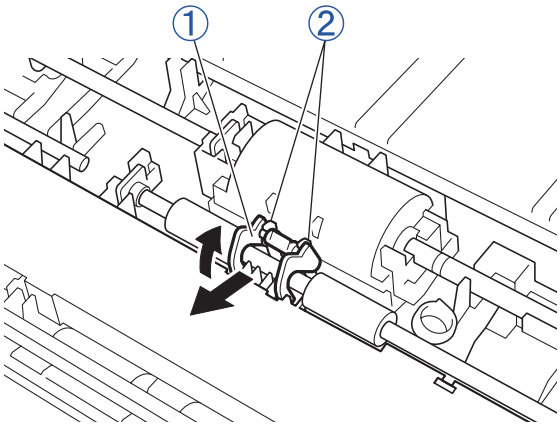



**Figure 3-414**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ **Note on disassembling**

The holding part of the sensor holder ① is deformed when removed. Before assembling it, straighten the holding part as shown below. Make sure that the holding part is straight or bent slightly downward. If it is bent upward, the registration sensor does not detect correctly.

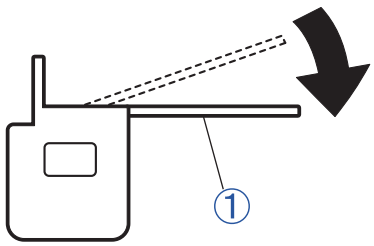



**Figure 3-415**

6) Pinch the plane part of the shaft support ① with longnose pliers. Then while unhooking the fitting part by slightly tilting the pliers along the arrow direction, pull up the one end of the registration drive roller ② with the shaft support.

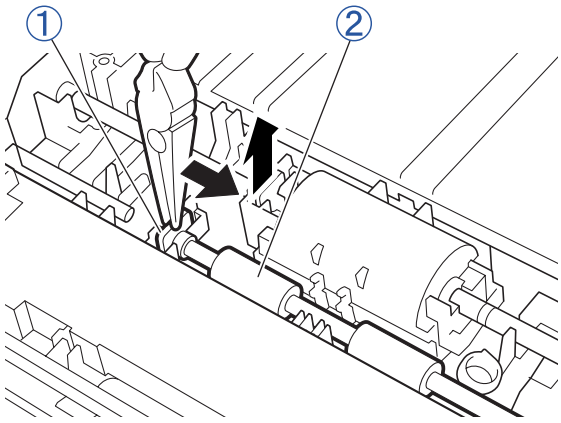



**Figure 3-416**

7) While tilting the registration drive roller ① slightly, slide the roller in the arrow direction to remove it.

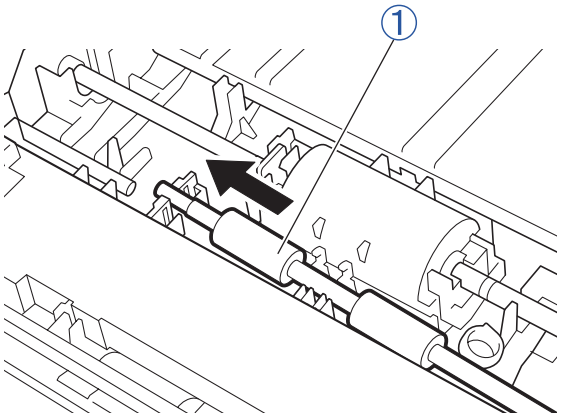



**Figure 3-417**

◆ **Notes on assembling**

Push the shaft support until it fits completely into the fitting part.

Be careful when pushing the sensor lever into the fitting part.

Make sure that the holding part of the sensor holder is straight, then push it until it fits completely into the fitting part.

After the assembling is complete, confirm that the sensor lever moves properly. If the holding part of the sensor holding is deformed, the registration sensor does not detect correctly.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 6. Pickup Motor Unit

1) Remove the scanner PCB mounting plate.
(Page 3-17)
2) Remove 3 screws ① (self-tapping, TP-head), then remove the pickup motor unit ②.

**Note:** Do not remove 2 screws ③ on the motor. You cannot remove the motor by removing these screws.

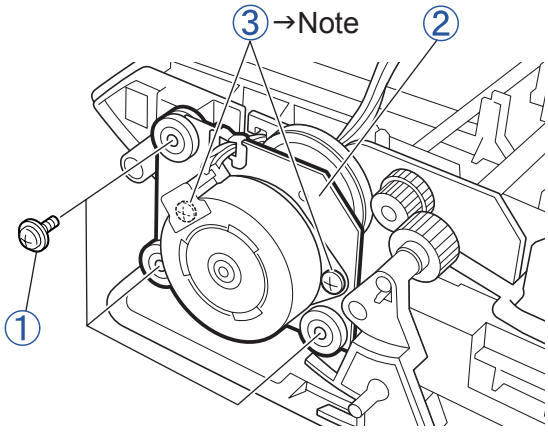



**Figure 3-418**

◆ **Notes on assembling**

Make sure that the timing belt ② is put around the pulley ① on the back side. Make sure that the teeth of the gears ③ are engaged, then assemble the motor unit.

Hook the cable in the cable holder on the main body.

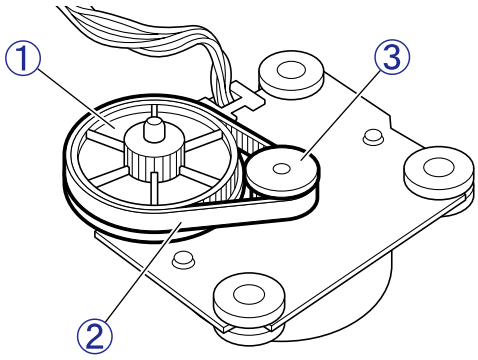



**Figure 3-419**

## 7. Feed Roller Shaft

1) Remove the scanner PCB mounting plate.
(Page 3-17)
2) Remove the feed roller.
(Page 3-1)
3) Open the upper unit.
4) While unhooking the hooks ①, remove the selection lever ②. Then remove the one-way gear ③.

**Note:** The gear may fall out due to the loose fitting of the bearing. In this case, refer to “Notes on assembling” to assemble the bearing.

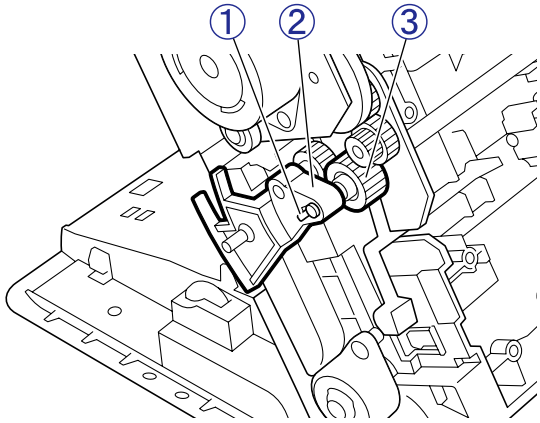



**Figure 3-420**

5) Unhook 2 pairs of fitting parts ①, then remove the side shaft support ②.

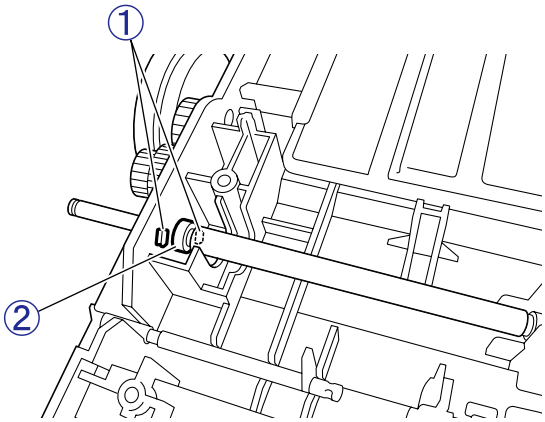



**Figure 3-421**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

6) Slide the feed roller shaft ① outward, then pinch the plane part of the shaft support ② with longnose pliers. While unhooking the fitting part by slightly tilting the pliers along the arrow direction, remove the feed roller shaft with the shaft support.

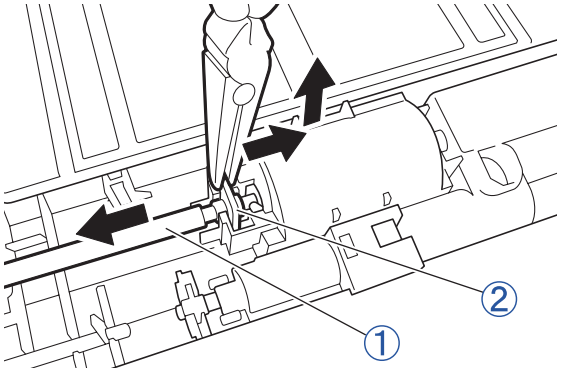



**Figure 3-422**

◆ **Notes on assembling**

Push the shaft support and the side shaft support until they fits completely into the fitting parts.

Assemble the bearing of the one-way gear with the surface engraved with the arrow facing outward.

With engraving

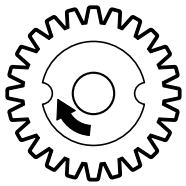


**Figure 3-423**

## 8. Lower Reading Unit

**Note:** The reading holder shapes for the upper reading unit and the lower reading unit differ.

1) Remove the scanner PCB mounting plate.
(Page 3-17)

2) While opening the hook ① on the right side, push the position setter ② on the back side with a tool with a thin tip to remove the one side of the reading unit ③.

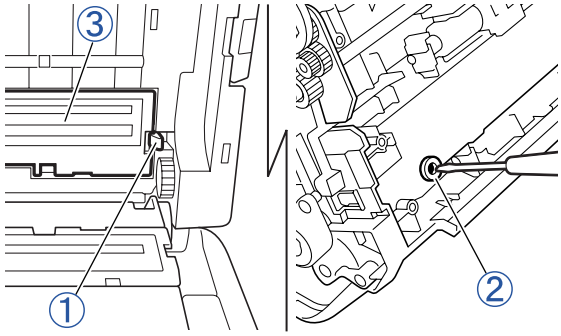



**Figure 3-424**

3) While tilting the reading unit ①, unhook the fitting part on the other side to remove the reading unit. Then remove the cable.

**Note:** The cable is connected to the back side of the reading unit.

If it is difficult to remove the reading unit, perform this step after removing the upper frame assembly.

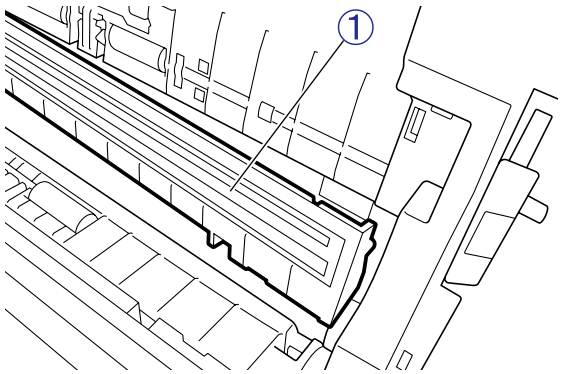



**Figure 3-425**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

◆ **Notes on assembling**

After connecting the cable to the reading unit and putting it through the hole on the main body, assemble the reading unit.

After the assembling is complete, clean the front surface of the scanning glass.

## 9. Lower Reading Holder

**Note:** This part includes the scanning glass and the shading sheet. Disassembling this part may cause the inside of the reading unit to get dusty. Do not disassemble it unless necessary.

When disassembling, be careful with dusts and do not touch the inner surface of the glass or the surface of the lens array.

1) Remove the lower reading unit. (Page 3-23)
2) With a tool with a thin and flat tip, unhook 8 pairs of fitting parts ① (4x2) to remove the reading holder ②.

**Note:** Be careful not to damage the hooks when unhooking the fitting parts. The CIS unit is removed when the reading holder is removed.

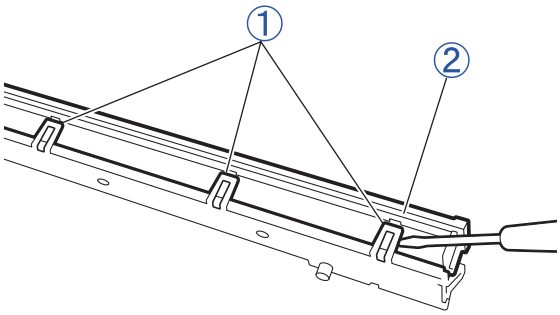



**Figure 3-426**

**Note:** The shapes of the upper reading holder and the lower reading holder differ.

After the assembling is complete, clean the front surface of the scanning glass.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 10. Document Guides

1) Remove the scanner PCB mounting plate.
(Page 3-17)
2) Pull the pickup tray assembly ①, then unhook the internal fitting parts by tilting it slightly to remove the pickup tray assembly.

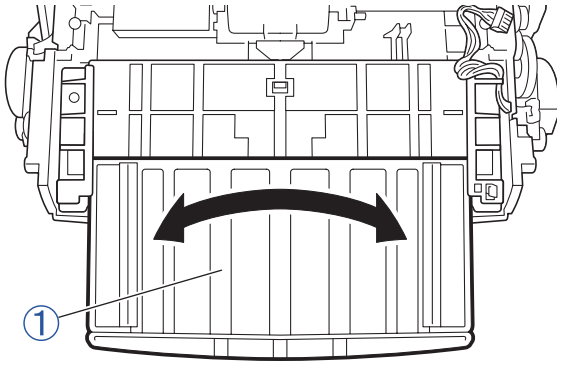



**Figure 3-427**

3) Unhook the cable ① for the motor from the tray guide. Unhook 3 pairs of fitting parts ② to remove the tray guide ③.

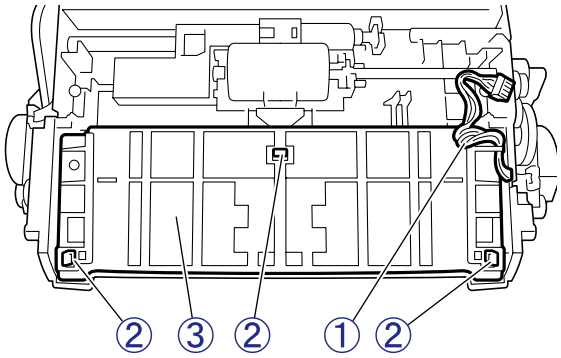



**Figure 3-428**

4) Remove the screw ① (self-tapping, M3x6), then remove the guide holding plate ②.

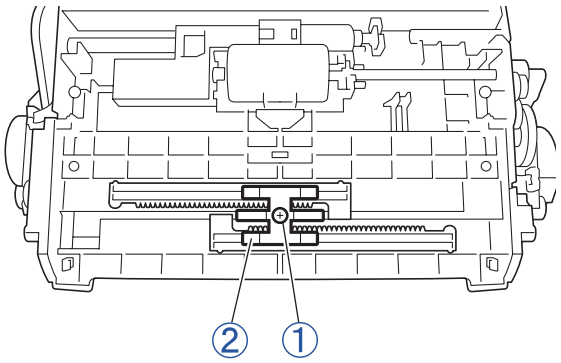



**Figure 3-429**

5) Slide the left and right document guides ① outward. Remove each document guide from the hole on each side of the main body.

**Note:** Make sure to flip the lock lever (green) for the feed roller down. If not, it may disrupt sliding of the document guides. The gears engaged to the document guides may fall out. In this case, assemble the gears back to the original position.

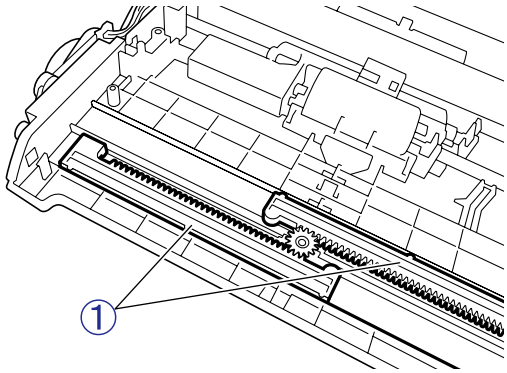



**Figure 3-430**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

◆ **Notes on assembling**

When fixing the guide holding plate, slide the left and right document guides fully extended, then fit the gears, so that both guides maintain the same distance from the center.

When assembling the tray guide, close the document guides. If the document guides are fully extended, they hit the tray guide.

## 11. Feed Roller Cover

1) Open the feed roller cover ① fully, then unhook the fitting part on the one side.

**Note:** You cannot unhook the fitting part unless the cover is fully opened.

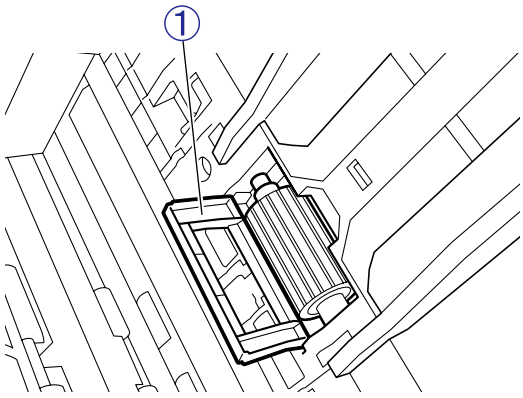



**Figure 3-431**

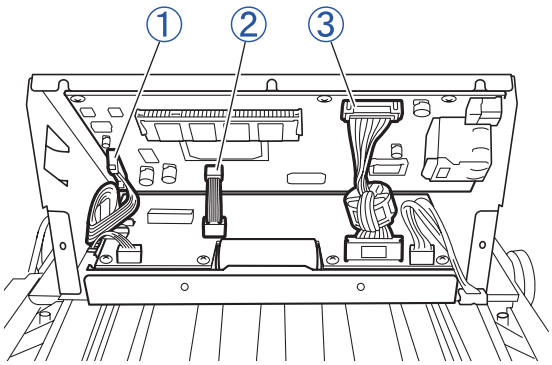

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# V. ELECTRICAL PARTS (PCB, ETC.)

## 1. Bottom Box Assembly

1) Remove the left and right covers.
(Page 3-3, Page 3-4)
2) Remove the rear cover.
(Page 3-4)
3) Remove the rear plate.
(Page 3-5)
4) Disconnect the cables ① / ② / ③.

**Note:** The cable ① for the LCD has locks. Disconnect it from the connector while releasing its lock.




* Cable ①

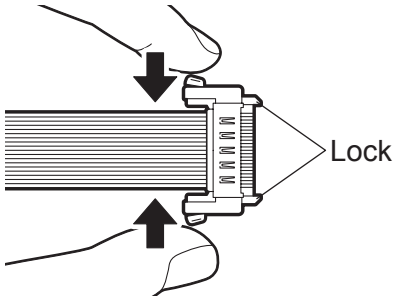



**Figure 3-501**

5) Remove 4 screws ① (self-tapping, M3x8) on the left and right sides, then remove the bottom box assembly ②.

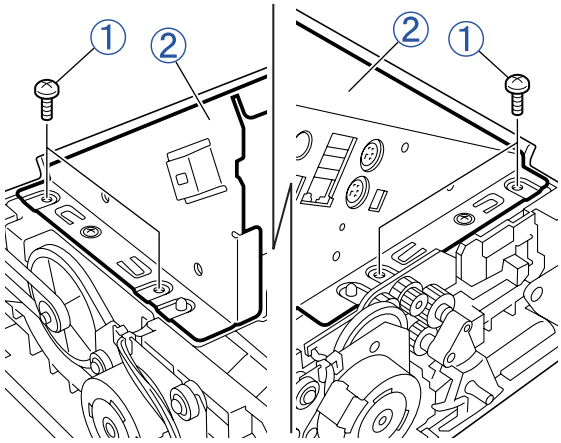



**Figure 3-502**

◆ **Notes on assembling**

Before fixing the bottom box assembly, connect three cables. Do not get the rear cables caught in parts.

Insert the cable ① for the LCD into the clearance between the FFC holder ② and the side plate so that the cable contacts with the side plate.

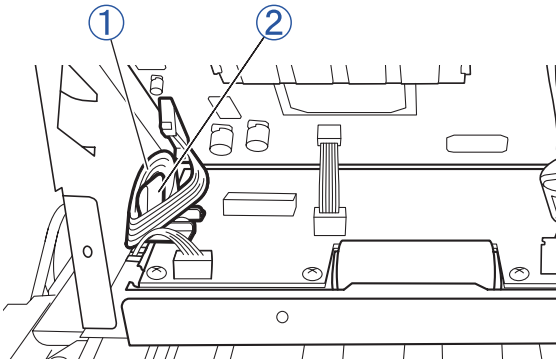



**Figure 3-503**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Motherboard

1) Remove the bottom box assembly. (Page 3-27)
2) Remove 5 screws ① (round-head), then remove the motherboard ②.

**Note:** The position setters are provided for 2 screw fix positions (*) on the left side.

**Note:** When removing the motherboard, the ground plate may also be removed.

**Note:** Since elements are mounted on the both surfaces of the motherboard, handle the motherboard with care.

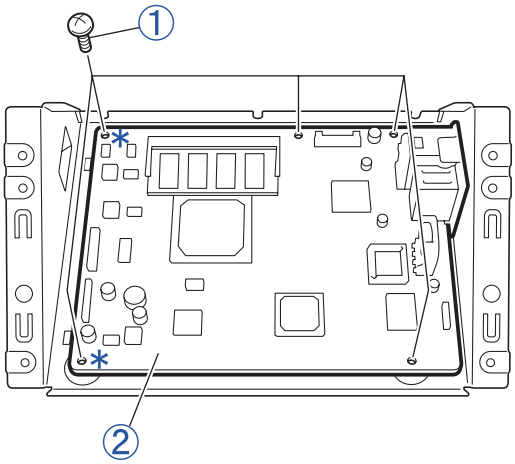



**Figure 3-504**

3) Open the right and left levers ①, then pick up the DIMM ② to remove it from the connector.

**Note:** The DIMM is not a component of the motherboard, but specified as a service part individually. SF-220 and SF-220P mounts the different DIMMs.

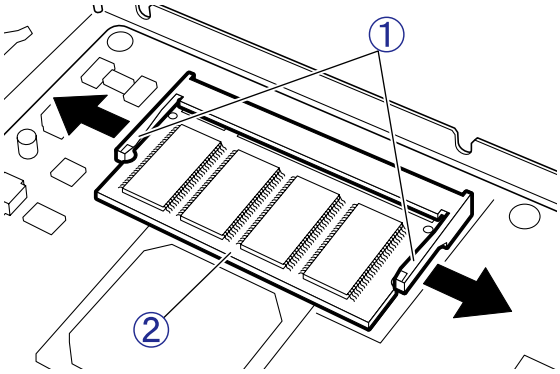



**Figure 3-505**

◆ **Notes on assembling**

After aligning the positions of the power and interface connectors, align 2 screw fix positions to their position setters, then assemble the motherboard.

For assembling the ground plate ① for the connector, refer to the figure below.

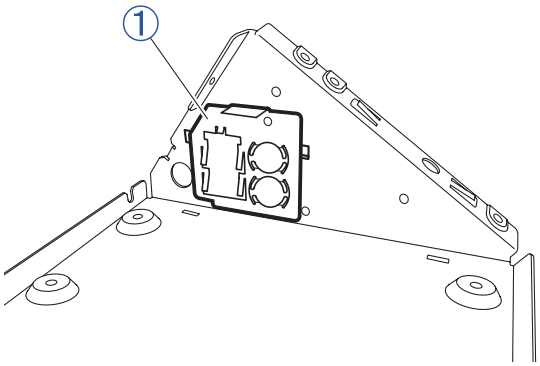



**Figure 3-506**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Lithium Battery

**Note:** Although a lithium battery is a component of the motherboard, it may need to be disposed and replaced. Follow the instructions below to remove the battery. Do not, however, remove the battery unless necessary. Removing the lithium battery disables the BIOS settings.

1) Remove the bottom box assembly. (Page 3-27)

**Note:** It is possible to remove the lithium battery after removing the rear cover and the rear plate. However, when replacing the battery, remove the bottom box assembly since the work space is too small.

2) Push the Lithium battery ① downward, then pull it toward you to remove it from its housing.

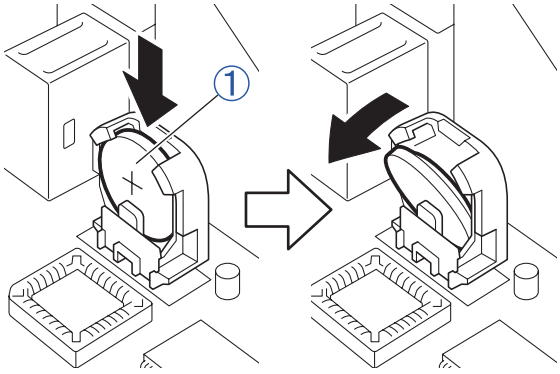



**Figure 3-507**

**Note:** Make sure that the positive electrode (+) of the lithium battery faces outward when installing it. The polarity is indicated on the battery. Be careful not to short out the battery.

For further information, refer to the section regarding to the lithium battery disposal and the BIOS reconfiguration in this manual.

## 4. Scanner PCB

1) Remove the bottom box assembly. (Page 3-27)

2) Remove 7 cables ① and 8 screws ② (M3x4), then remove the scanner PCB ③.

**Note:** The connectors of the cables with ferrite core have locks.

**Note:** Be careful not to lose the cables with * mark since they can be removed completely.

**Note:** Since elements are mounted on the both surfaces of the PCB, handle the PCB with care.

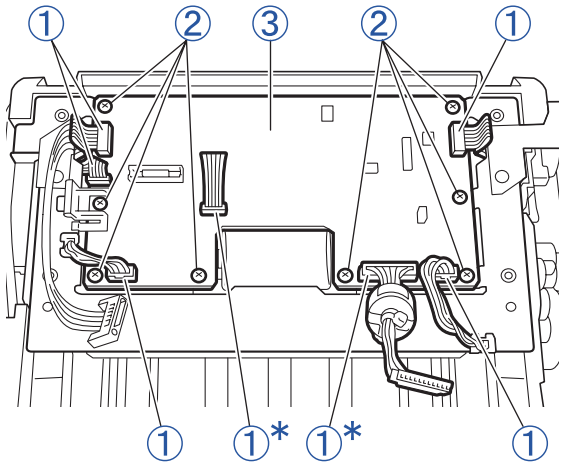



**Figure 3-508**

◆ **Notes on assembling**

When putting the PCB back, be careful not to get the cables caught in the case.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# CHAPTER 4

# INSTALLATION & MAINTENANCE


I. INSTALLATION .....4-1
II. PARTS REPLACEMENT.....4-13
III. MAINTENANCE .....4-15


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. INSTALLATION

This machine is installed by the user. The user should be advised to install the scanner by reading the “Setup Guide” thoroughly.

This machine includes 2 printed manuals; the “Setup Guide” and the “Operation Guide.” In addition, the CD-ROM contains the “Instructions” electronic manual data with these manuals.

This section presents an outline of the procedures and important matters.

## 1. Unpacking

Open the package, and take out the machine and its accessories. The accessories are contained in the accessory box placed under the machine.

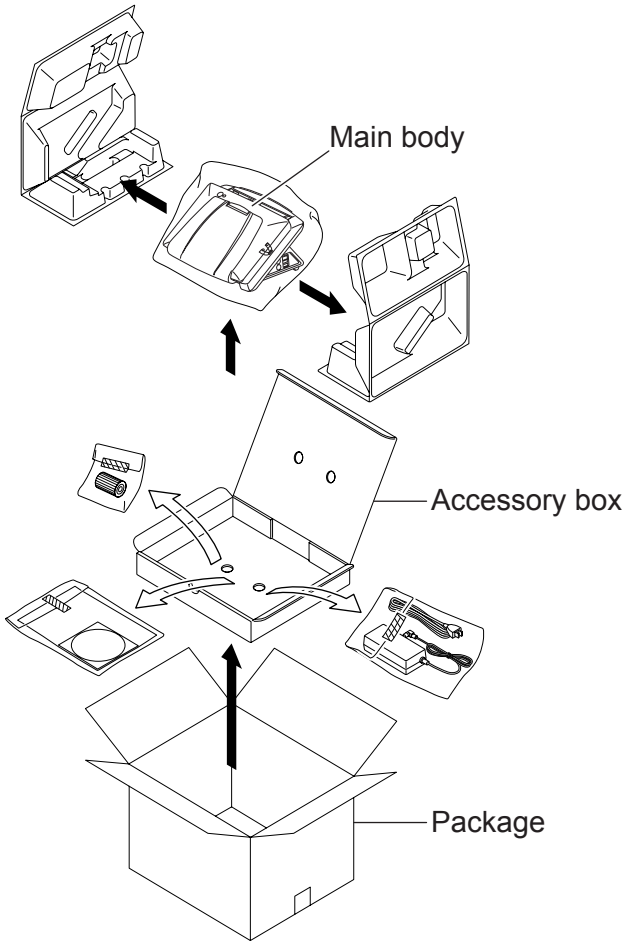
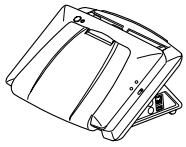
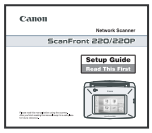
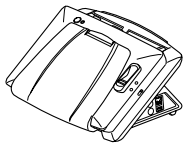
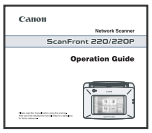
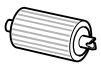
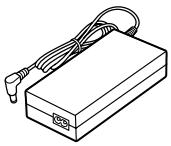
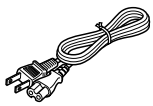
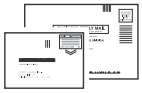



**Figure 4-101**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Checking the Supplied Accessories

Check if any of the machine and accessories are not missing or damaged.

| | | | |
|---|---|---|---|
|  | ScanFront 220<br>(standard model) |  | Setup guide |
|  | ScanFront 220P<br>(model with fingerprint sensor) |  | Operation Guide |
|  | Feed roller<br>* The feed roller must be attached to the scanner during installation. | | INSTRUCTIONS CD-ROM<br>(A set of user manuals) |
|  | AC adaptor<br>(Cord length: 1.5 m) | | Warranty Card<br>(U.S.A. and Canada only) |
|  | Power cord<br>(Cord length: 1 m) |  | Registration Card<br>(U.S.A. and Canada only) |

* Make sure to use the AC adapter and power cord supplied with the machine.

**Figure 4-102**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Removing the Packing Materials

1) Remove the orange tape and the protective sheet securing the outer case.

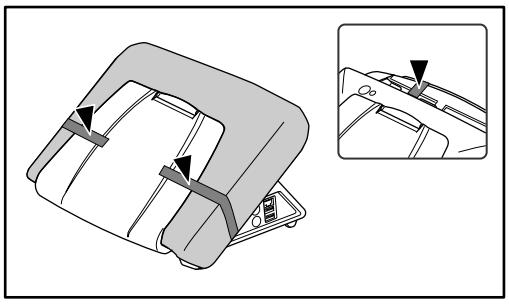


**Figure 4-103**

2) Gently open the document eject tray.

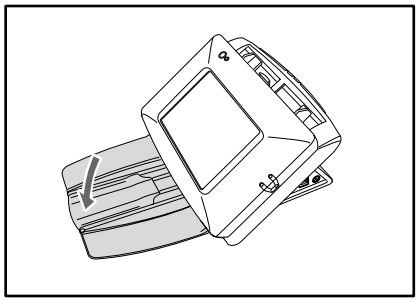


**Figure 4-104**

3) Pull the lock lever toward you, then fully open the panel unit (upper unit).

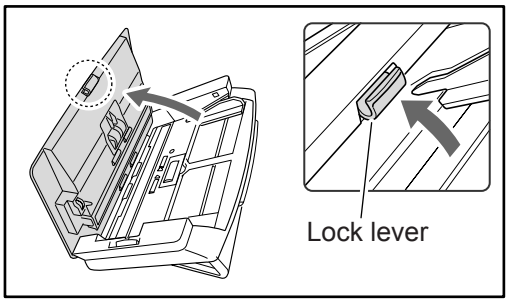



**Figure 4-105**

**Note:** The open/close movement of the panel unit is linked to the up/down movement of the document eject tray. Do not press on the document eject tray when you open the panel unit.

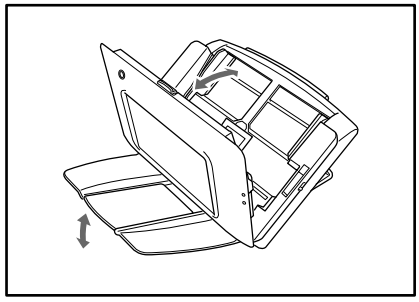


**Figure 4-106**

4) Remove the orange tape securing the roller covers.

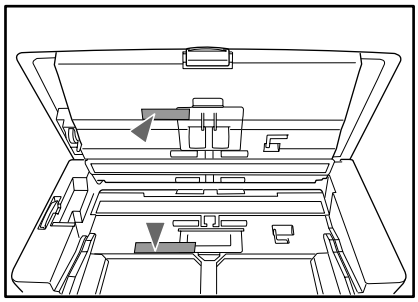


**Figure 4-107**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 4. Attaching the Feed Roller

1) Open the roller cover for the feed roller.

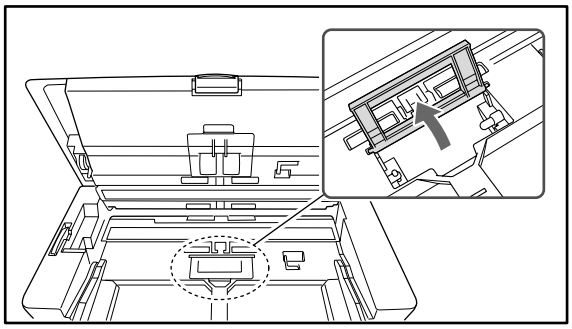


**Figure 4-108**

2) Lift up the lock lever ①, then slide it in the direction of the arrow ②.

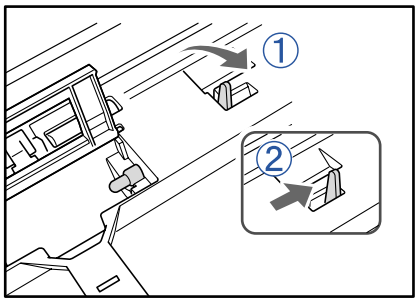



**Figure 4-109**

3) Align the notch in the shaft of the roller with the shaft of the machine, then place the feed roller into position.

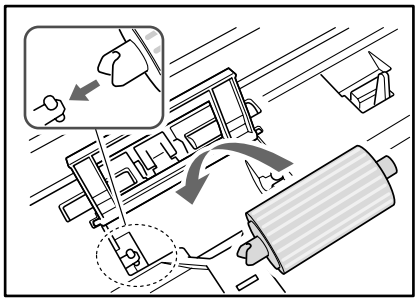


**Figure 4-110**

4) Move the lock lever in the direction of the arrow, then insert it into the hole in the feed roller.

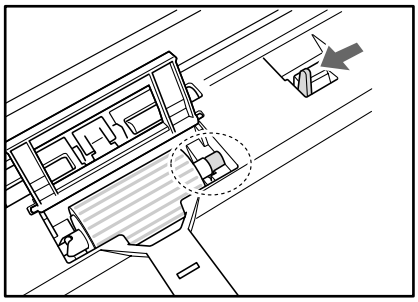


**Figure 4-111**

5) Lower the lock lever to lock the feed roller into position.

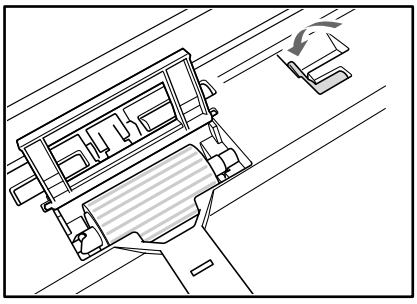


**Figure 4-112**

6) Close the roller cover. Make sure you hear a click, which indicates the cover has returned to its original position.

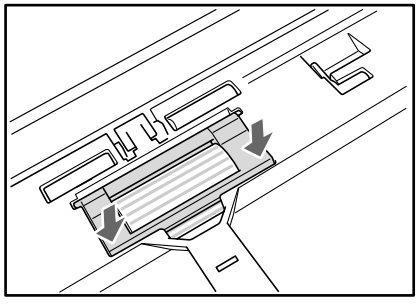


**Figure 4-113**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

7) Gently close the panel unit. And press on both sides of the unit until you hear a click, which indicates the unit is locked.

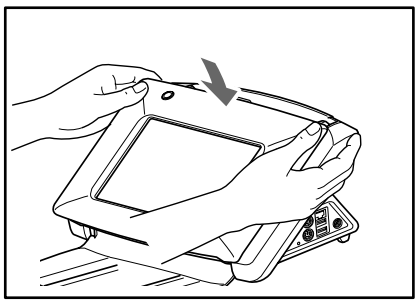


**Figure 4-114**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 5. Connecting Cables

1) Connecting the AC adapter.
Follow the procedure below to connect the supplied AC adapter.

**Note:** Make sure to use the AC adapter and power cord supplied with the machine.

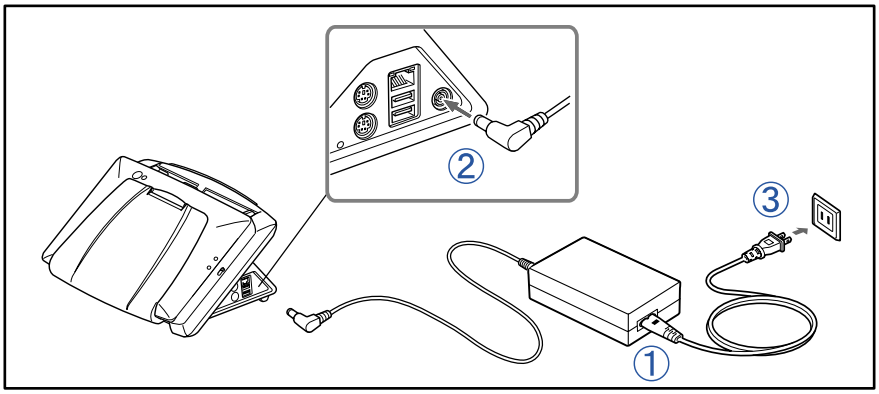



**Figure 4-115**

① Connect the power cord and AC adapter.
② Insert the plug of the AC adapter into the power connector.
③ Connect the power cord to the wall outlet.

2) Connecting the network cable.
Insert the network cable connector (RJ-45) into the LAN port.

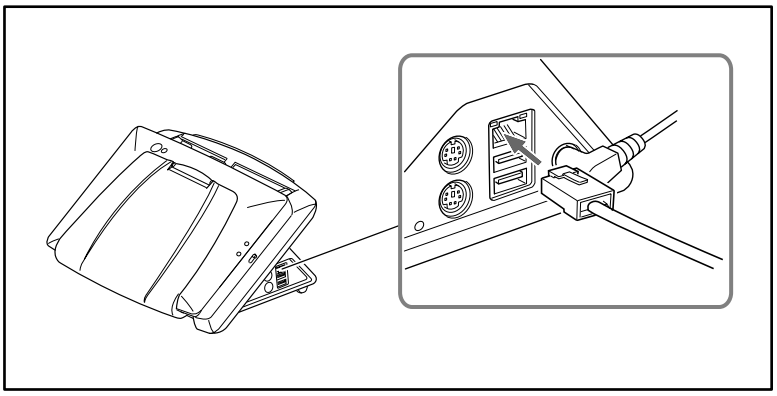


**Figure 4-116**


COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 6. Turning the Machine ON and OFF

1) Turning the machine ON

Press the power switch to turn the machine ON. The power indicator lights, and the [Home] screen appears.

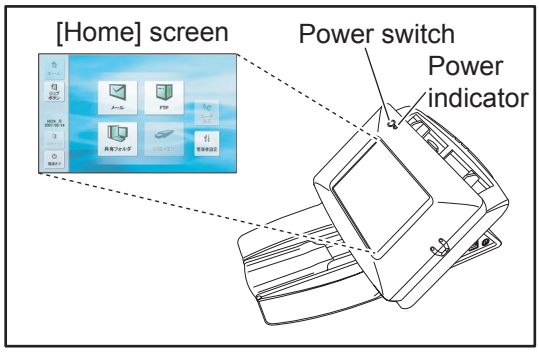



**Figure 4-117**

**Note:** It takes approximately 40 seconds for the [Home] screen to appear after the power switch is pressed.

2) Turning the machine OFF

Press [Power off] displayed at the bottom left of the screen to turn the machine OFF.

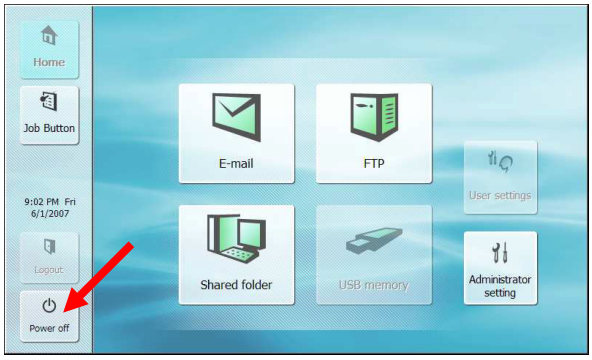



**Figure 4-118**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 7. Configuring the Scanner Settings

To set up the machine, configure each setting on [Administrator setting] on the machine or on the Web menu (Administrator Mode).

This section describes how to configure the network settings on [Administrator setting] on the machine, and how to confirm and configure date/time and time zone on the Web menu (Administrator Mode).

For details and for other settings, refer to the “Setup” section in the user manual.

Some of the setting items are listed below. The necessary configuration differs depending on the scale and configuration of the user’s network. To use the machine with the minimum required settings, you must register addresses to [Shared Address Book] in addition to configuring [Network setting].

| Setting Item | Description | Administrator setting | Web menu (Administrator Mode) |
|---|---|---|---|
| Network setting | Set the Device Name and IP Address. | Yes | Yes |
| Administrator password | Set the password required to log in to [Administrator setting] and the Web menu. | Yes | Yes |
| Login type | Select the log in screen that appears when users log in. | Yes | Yes |
| Register user | Register users who will use the machine. | No | Yes |
| Register Shared Address Book | Register entries in the Shared Address Book available to all users. | No | Yes |
| Register Shared Job Button | Register the Shared Job Button available to all users. | No | Yes |
| Device Configuration | Set the basic operations of the machine (including network settings). | No | Yes |
| E-mail server settings | Set the SMTP server to be used for sending e-mail. | No | Yes |
| Authentication server settings | Set a domain server that can search users with Active Directory. | No | Yes |
| Address book server settings | Set an LDAP server that can search e-mail address books. | No | Yes |

**Table 4-101**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ Network Settings

Confirm and configure the device name and IP address to connect the machine to a network.

**Note:** Since the configuration procedure differs depending on the user's network environment, the user administrator of the machine must ask the network administrator about the network configuration.

**Note:** The device name is used to identify the machine on the network and is set by default to 14 alphanumeric characters consisting of "SF" + its MAC address. When changing this setting, make sure to select a unique name that is different from those of all other devices.

**Note:** Under default settings, the IP address is assigned automatically by the DHCP server. When a DHCP server is not used, clear the [DHCP server Enable] check box, and enter a fixed address.

**Note:** The IP address is used as the URL when accessing the Web menu.

1) On the [Home] screen, press [Administrator setting].

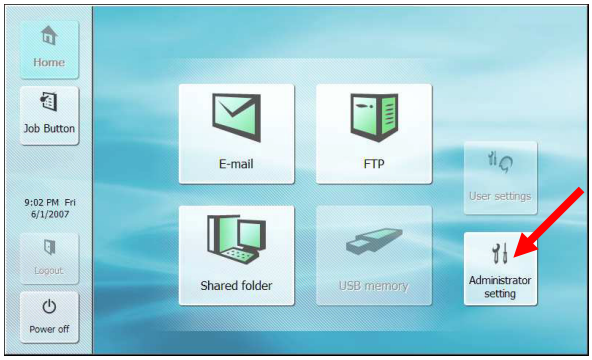



**Figure 4-119**

2) Press [OK] to display the [Administrator setting] screen.

**Note:** No administrator password is set by default.

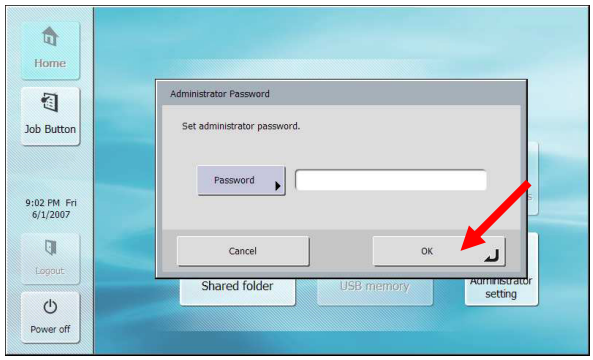



**Figure 4-120**

3) Press [Network setting].

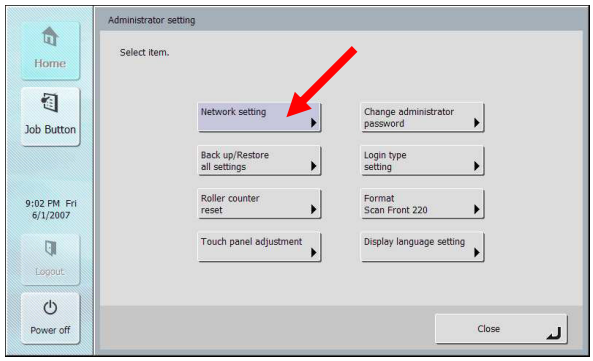
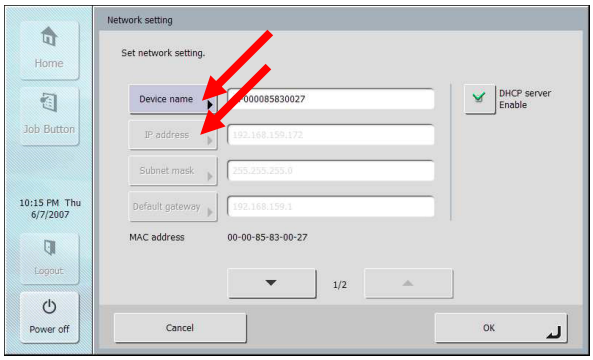



**Figure 4-121**

4) Confirm and configure [Device name], [IP address], and other settings.

**Note:** The network address is usually assigned automatically.



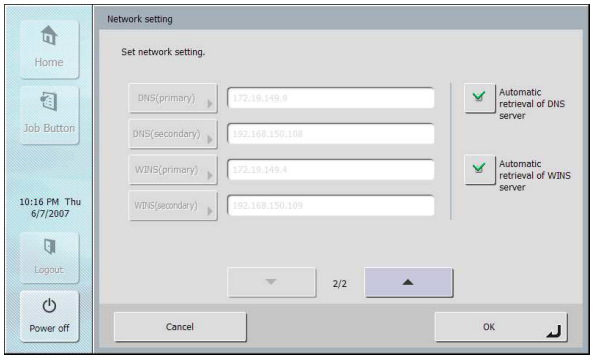




**Figure 4-122**

5) Press [Device name] (or [IP address]). A keyboard entry screen appears.

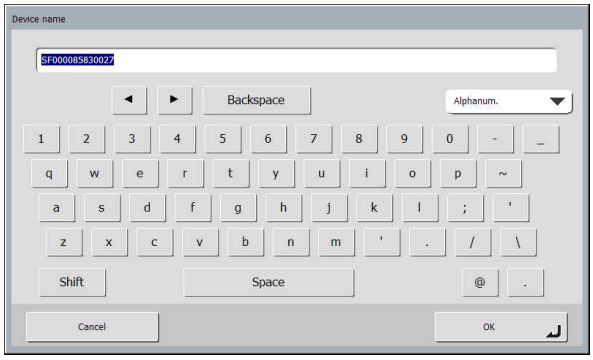



**Figure 4-123**

Press [Shift] to switch to the entry screen of capital letters.

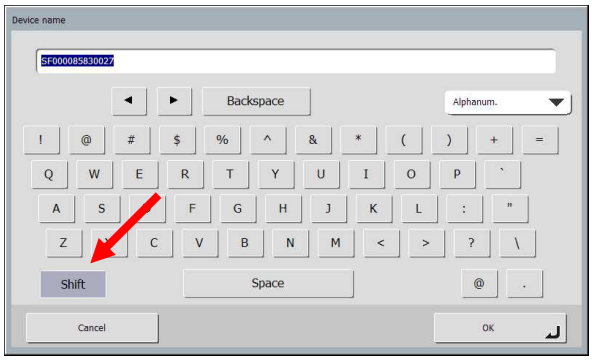



**Figure 4-124**

6) Enter the new device name (or IP address), and press [OK].

**Note:** The device name must be up to 15 characters long, containing a combination of characters, numbers, and hyphens (-). Do not use hyphen (-) as the last character.

7) Confirm the new device name and IP address, and press [OK].

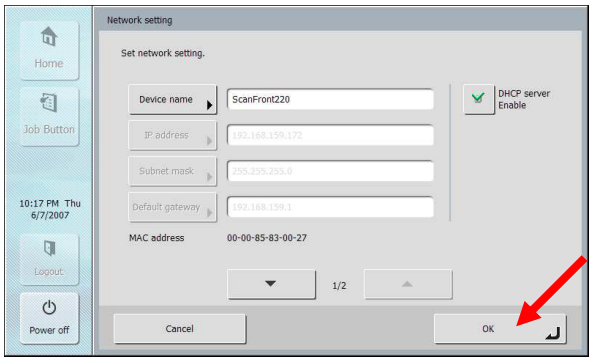



**Figure 4-125**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

◆ Confirming and configuring date/time and time zone

When you finish configuring the network settings, log in to the Web menu to confirm and configure date/time and time zone.

**Note:** Confirm that the date/time and time zone settings are correct. If not, change the settings.

1) Confirm the IP address on [Administrator setting] of the machine.
2) Launch the Web browser on the computer.
3) Enter the machine IP address as the URL to open the Web menu.
   Ex.) http://172.19.xxx.xxx

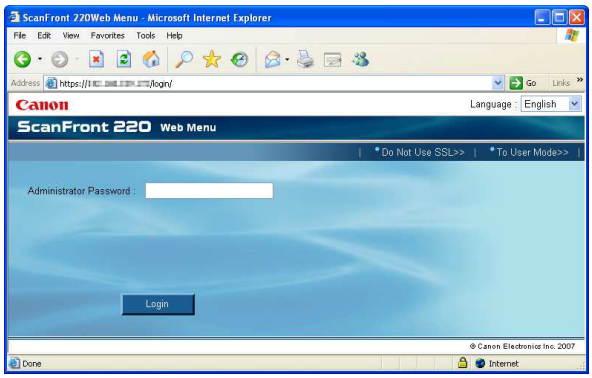



**Figure 4-126**

**Note:** Select a desired language in [Language].

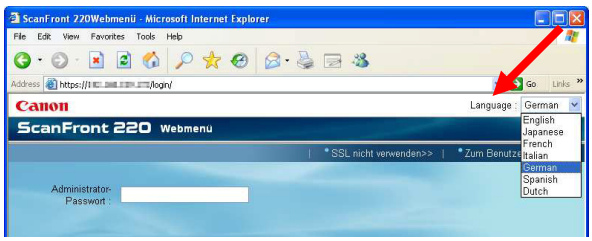



**Figure 4-127**

4) Click [Login] to log in to the Web menu (Administrator Mode).

**Note:** If an administrator password has already been set, input the password to log in.

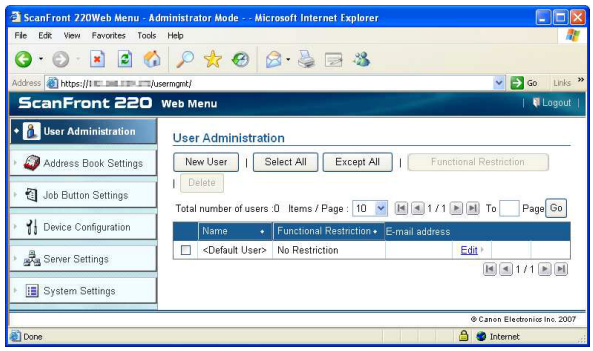



**Figure 4-128**

5) Click [Device Configuration].

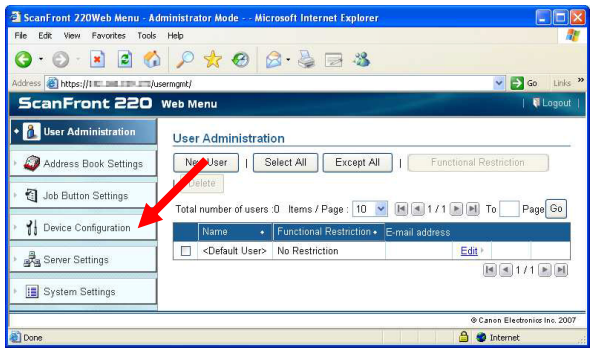



**Figure 4-129**

6) Check the [Language/Timezone] setting.

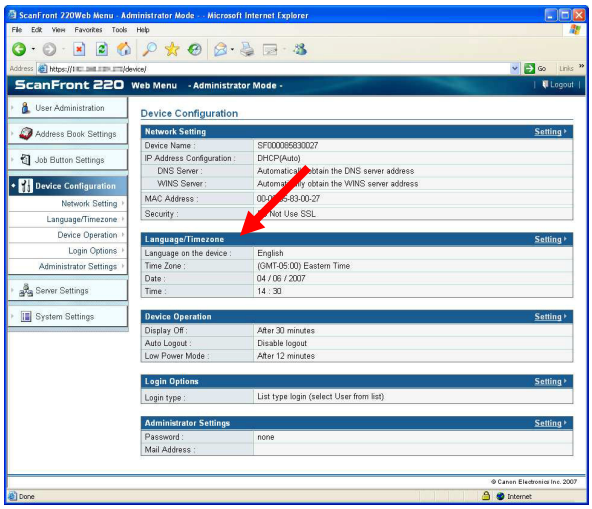



**Figure 4-130**

**Note:** To change the setting, click [Language/Timezone] or [Setting] to change it.

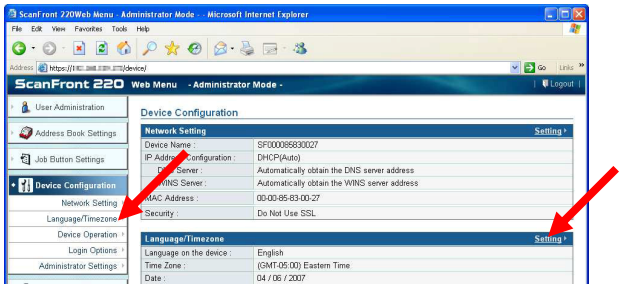



**Figure 4-131**

Language/Timezone Setting Screen

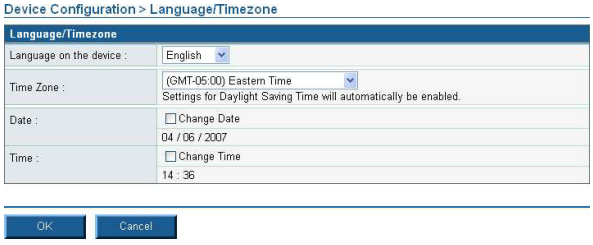



**Figure 4-132**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# II. PARTS REPLACEMENT

## 1. Periodically Replaced Parts

This machine does not have any periodically replaced parts.

## 2. Consumable Parts

1) Replaced by users

| No. | Parts name | Parts number | Expected life | Remarks |
|---|---|---|---|---|
| 1 | Feed roller | MA2-7996-000 | 30,000 sheets | Because of the worn rollers, it is necessary to replace when the pickup failures or the document jams are occurred after cleaning. |
| 2 | Retard roller | MF1-4200-000 | | |
| 3 | Document holding guide | MF1-4481-000 | | |

**Note:** The items above are assigned as service parts and an exchange roller kit is assigned as commercially available products for a set.

**Table 4-201**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 3. Major Parts List

The list below shows the major service parts, except for user replaceable parts. Refer to the “Parts Catalog” for the details.

| No. | Parts name | Parts number | Q’ty | | Remarks |
|---|---|---|---|---|---|
| | | | SF-220 | SF-220P | |
| 1 | PCB ASSEMBLY, MOTHER | MG1-4145-000 | 1 | 1 | |
| 2 | PCB ASSEMBLY, SCANNER, 220P | MG1-3972-000 | | 1 | |
| 3 | PCB ASSEMBLY, SCANNER | MG1-4019-000 | 1 | | |
| 4 | PCB ASSEMBLY, LCD RELAY, 220P | MG1-3973-000 | | 1 | |
| 5 | PSB ASSEMBLY, LCD RELAY | MG1-3993-000 | 1 | | |
| 6 | READING UNIT, UPPER | MG1-8281-000 | 1 | 1 | |
| 7 | READING UNIT, LOWER | MG1-8282-000 | 1 | 1 | |
| 8 | TOUCH PANEL | MH6-0032-000 | 1 | 1 | |
| 9 | DISPLAY, LCD | MH6-0033-000 | 1 | 1 | |
| 10 | MOTOR UNIT, STEPPING, PICKUP | MG1-4009-000 | 1 | 1 | |
| 11 | MOTOR UNIT, STEPPING, FEED | MG1-4010-000 | 1 | 1 | |
| 12 | SENSOR, FINGER PRINT | MG1-4004-000 | | 1 | |
| 13 | PCB ASSEMBLY, FINGER SENSOR | MG1-3974-000 | | 1 | |
| 14 | ADAPTER, AC | MG1-4147-000 | 1 | 1 | |
| 15 | ROLLER, FOLLOWER | MA2-6476-000 | 4 | 4 | |
| 16 | ROLLER, REGISTRATION | MA2-7966-000 | 1 | 1 | |
| 17 | ROLLER, EJECT | MA2-7967-000 | 1 | 1 | |

**Table 4-202**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# III. MAINTENANCE

## 1. User Maintenance

Refer to the user manual for details.

1) List

[▲: Cleaning, ●: Replace]

| No. | Location/Parts | Intervals | | Details |
|---|---|---|---|---|
| | | As necessary | 30,000 sheets | |
| 1 | Main body | ▲ | | Use a cloth slightly dampened with water and well wrung out to remove any dirt, and then use a clean, dry cloth to wipe the main body. |
| 2 | Touch panel | ▲ | | Use a soft, dry cloth to gently wipe the surface of the panel. |
| 3 | Fingerprint sensor (SF-220P) | ▲ | | Use a soft, clean, and dry cloth to wipe off any dirt. |
| 4 | Scanning glass | ▲ | | |
| 5 | Document holding guide | ▲ | ● | Use a cloth slightly dampened with water and well wrung out to remove any dirt, and then use a clean, dry cloth to wipe the main body. |
| 6 | Retard roller | ▲ | ● | |
| 7 | Feed roller | ▲ | ● | |
| 8 | Other rollers | ▲ | | |
| 9 | Feed path | ▲ | | Use such as commercially available air blowers to remove any dust and paper particles that have accumulated on the feed. |

**Table 4-301**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

2) Locations to be cleaned

- Main body

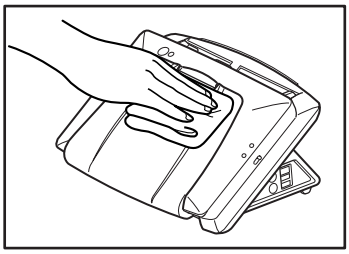


**Figure 4-301**

- Touch panel

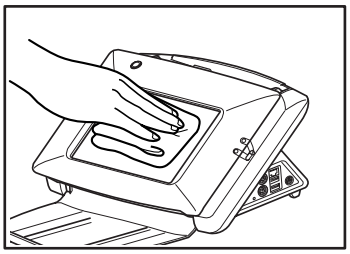


**Figure 4-302**

- Fingerprint sensor

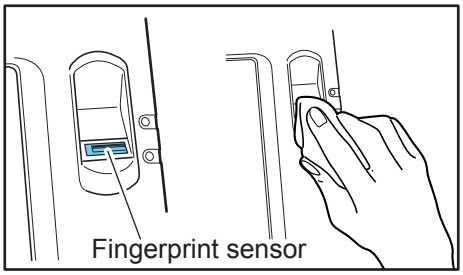



**Figure 4-303**

- Scanning glass

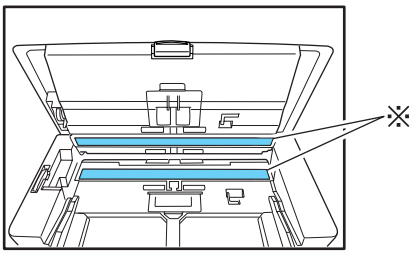



**Figure 4-304**

- Document holding guide

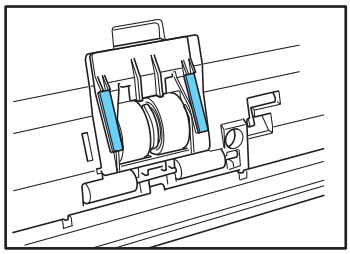


**Figure 4-305**

- Retard/Feed rollers

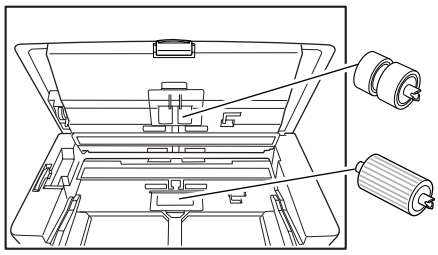


**Figure 4-306**

- Other rollers

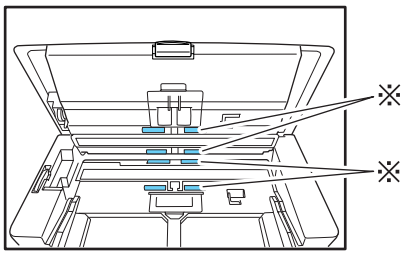



**Figure 4-307**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

3) Roller counter

Check the page count on the [Roller Counter Reset] screen of the [Administrator setting] screen on the machine.

Also, instruct users to reset the counter whenever rollers are replaced.

- Press [Roller counter reset] to display the [Roller counter reset] screen.

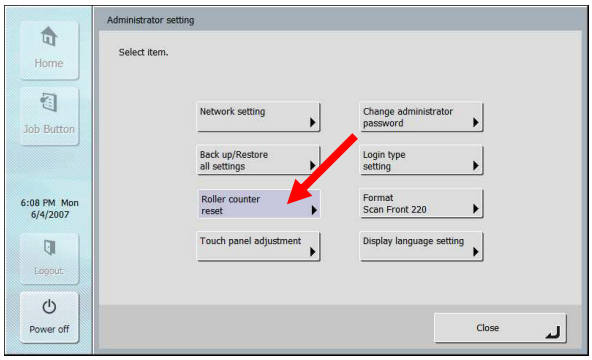



**Figure 4-308**

- [Roller counter reset] screen

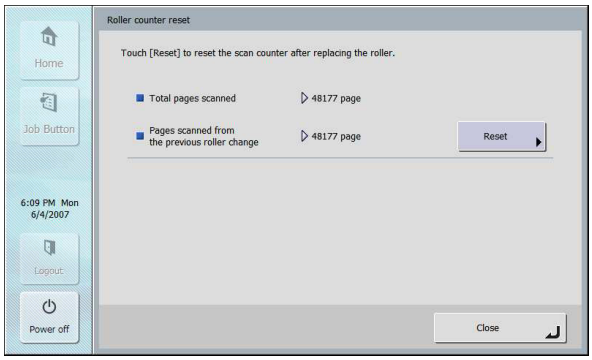



**Figure 4-309**

■ **Total pages scanned:**

This counter is for the total number of document pages fed by the machine.

■ **Pages scanned from the previous roller change:**

This counter is for the number of document pages fed by the machine since the counter was reset.

- After replacing rollers, press [Reset] to reset the counter.

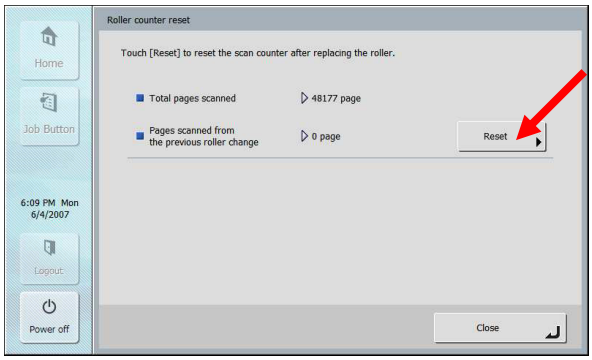



**Figure 4-310**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 2. Service Maintenance

For this machine, no periodical maintenance item by the service technicians is specified.

However, when visiting a user, check whether the scanning glasses and the rollers are dirty. If they are very dirty, instruct the user to follow the “user maintenance” procedures. Recommend the user to replace consumable parts if necessary.


COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# CHAPTER 5

# TROUBLESHOOTING


I. OUTLINE.....5-1
II. USER INFORMATION PROTECTION.....5-2
III. ERROR DISPLAY .....5-5
IV. SERVICE MODE.....5-8
V. NETWORK FUNCTION CHECK.....5-29
VI. OTHER OPERATIONS .....5-42
VII. AFTER REPLACING PARTS .....5-47


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. OUTLINE

## 1. Outline and Categories

This machine has both scanner function and network function unlike conventional DR scanners. Therefore, it is important to determine which function, scanner or network, causes the trouble. The troubleshooting for scanner issues is basically the same as those for conventional DR scanners.

Also, the troubleshooting for network issues is roughly categorized into machine's network function issues, user's network setting issues, and user's network system issues. Therefore, to determine whether the machine's network function itself works properly, the method using LAN cable with cross connections (also called crossover cable) is described in the following section.

When handling the machine, including when troubleshooting, make sure to protect user information such as user password, network information, and mail address. Make absolutely sure neither to delete nor to leak user information. The details will be discussed in the next section.

The categories of troubleshooting issues are described below. Understand these basics to troubleshoot.

◆ Categories of the root causes of the troubles

1) Scanner issues
   → Basically same as DR scanners
2) Network issues
   → Machine's network function
   → User's network setting
   → User's network system

◆ Categories of troubles

1) Power trouble (Cannot turn on the machine)
2) Feeding trouble
3) Image trouble
4) Sending trouble
5) Operation trouble (machine freeze)
6) Software bugs

◆ Categories of solutions

1) User manual
2) Error display
3) Cleaning
4) Cable connection check
5) Parts assembly check
6) Parts replacement
7) Service mode
   → Operation check on parts
   → Reading unit adjustment
   → Test scan
   → Software change
8) Operation check with crossover cable
9) Reinstallation by emergency boot up
10) BIOS reconfiguration

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# II. USER INFORMATION PROTECTION

## 1. Outline

Recently, the demands on “personal information protection” increase. This machine stores user information such as user password and address. These are considered to be subjects of personal information protection. The deletion or leak of such user information will be a big problem. Service technicians must as well be careful with this during their work including troubleshooting.

Never obtain user information without the user’s permission. When performing maintenance in user’s presence, ask the user to input user information. Also, if you need to bring the machine back, ask the user administrator to backup and initialize user data.

If you need to bring back the machine which is not operable, tell the user that the user information may be deleted. When the machine becomes able to display user information after you have brought it back, inform the user of that and ask the user what to do with user information.

The motherboard is an FRU (Refurbishing and Repair Unit). In the factory, the motherboard is initialized forcibly and returned.

The procedure below describes how to backup, initialize and restore. For details, refer to the user manual.

## 2. Backup/Restore

Perform backup and restoration from the machine’s screen or the Web menu. Here is described how to perform them on the machine’s screen.

1) On the [Home] screen, press [Administrator setting].

**Note:** If you have logged in as the user, press [Logout] before performing this procedure.

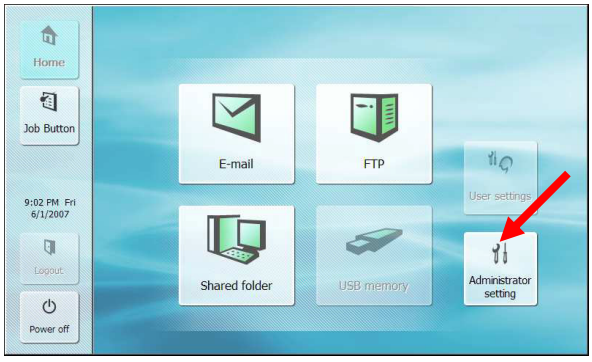



**Figure 5-201**

2) After inputting password, press [OK].

**Note:** No password is set by default.

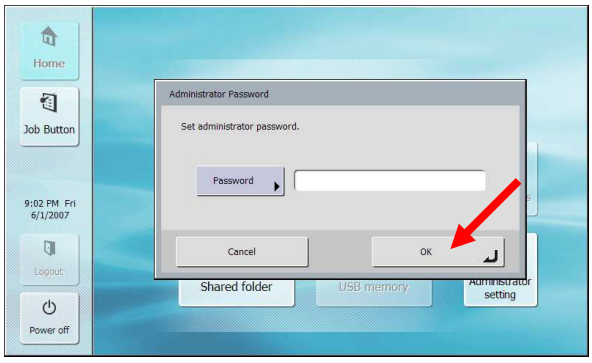



**Figure 5-202**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

3) Press [Back up/Restore].

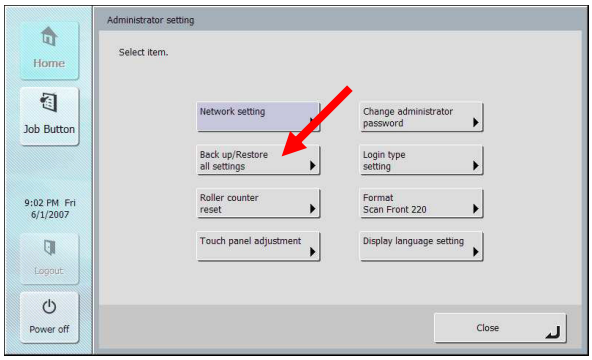



**Figure 5-203**

4) Press [Back up] or [Restore].

**Note:** The color of a selected button changes. The following screen shows when [Back up] is selected.

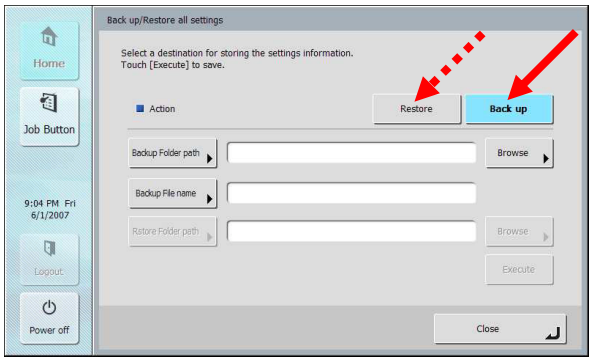



**Figure 5-204**

5) If you select [Back up], input the backup folder path and the backup file name, then press [Execute].
If you select [Restore], input the restore folder path, then press [Execute].

**Note:** You cannot press [Execute] unless each data is input.

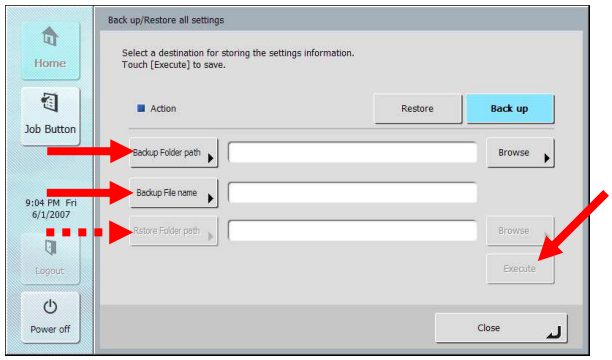



**Figure 5-205**

## 3. Initialize

Perform initialization from the machine's screen. This cannot be performed from the Web menu.

1) On the [Home] screen, press [Administrator setting].

**Note:** If you have logged in as the user, press [Logout] before performing this procedure.

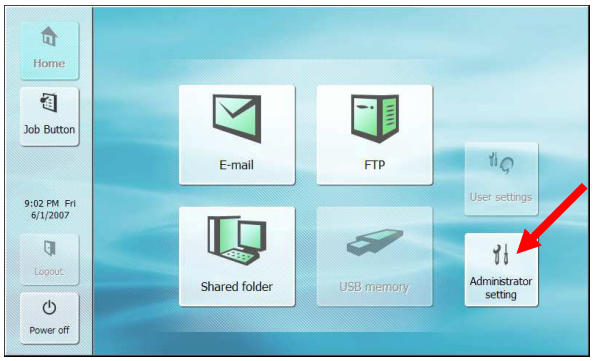



**Figure 5-206**

2) After inputting password, press [OK].

**Note:** No password is set by default.

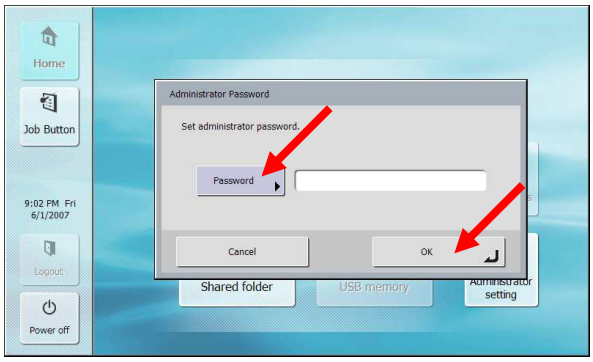



**Figure 5-207**

3) Press [Format].

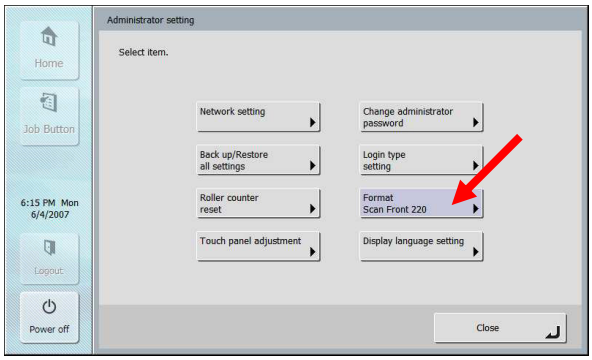



**Figure 5-208**

4) Confirm the message on the [Caution] screen, then press [Yes].

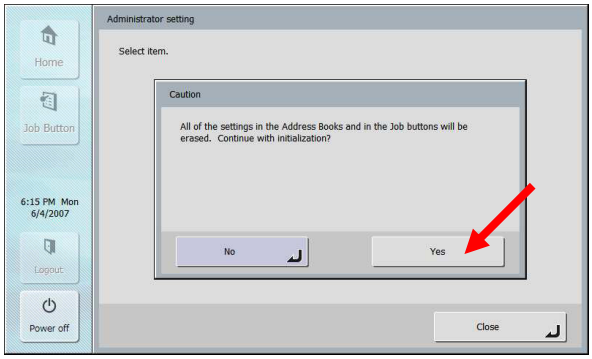



**Figure 5-209**

5) After that, the [Caution] screen will appear twice. Confirm each message on those screens, then press [Yes] on each.

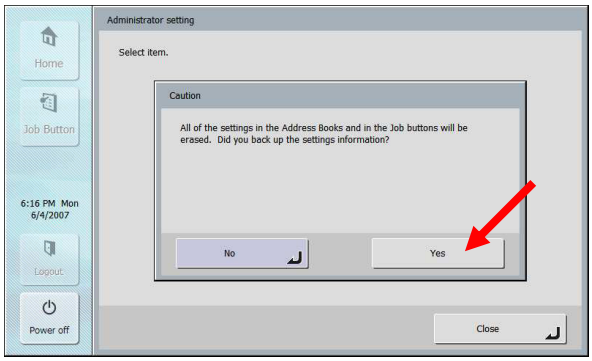



**Figure 5-210**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# III. ERROR DISPLAY

Error messages will be displayed on the machine or the Web menu. Basically, these errors are caused by improper use or document jams. Users take action according to error message contents.

The lists described on the user manual are the following.

## 1. Machine's Screen

| | | |
|---|---|---|
| Failed to connect FTP server. | Cause | The settings of the registered FTP server are incorrect. |
| | Solution | Check the settings of the FTP server. |
| Failed to connect FTP server. | Cause | The computer that is being used as the FTP server is not running. |
| | Solution | Check the computer that is being used as the FTP server. |
| Please set SMTP server address. | Cause | The mail server settings have not been registered, or have been deleted. |
| | Solution | Contact the administrator of the ScanFront, and check the settings of "Mail Server" in the Web menu. |
| This is restricted item. | Cause | The administrator has set send restrictions for the selected e-mail address. |
| | Solution | Contact the administrator of the ScanFront. |
| Paper JAM occurred. Remove the paper. | Cause | The rollers are dirty or worn out. |
| | Solution | Clean the rollers. If the problem is not resolved by cleaning the rollers, replace the rollers. |
| A double paper-feed has occurred. | Cause | The pages of the document are sticking together because of, for example, static electricity, too many documents were loaded, the rollers are dirty, etc. |
| | Solution | Fan the documents before you load them, and reduce the number of pages that you load at times when double feeding occurs repeatedly. |
| You cannot paste the copied address to the different address type. | Cause | The copy source and the paste address are of a different type. |
| | Solution | Make sure the copied address and paste address are of the same type. |

**(Continued)**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

| | | |
|---|---|---|
| Restricted address is included. | Cause | The job button settings include an address that has been restricted by the administrator. |
| | Solution | Contact the administrator of the ScanFront. |
| Confirm Password doesn't match. (New password and confirmation password do not match.) | Cause | The new password and confirmation password do not match. |
| | Solution | Enter the same password for the new password and the confirmation password. |
| Password is incorrect. | Cause | The password that was entered is incorrect. |
| | Solution | Enter the uppercase and lowercase letters for the password correctly. |
| There is no file name specified. Enter a file name or enable the 'Auto file name' setting. | Cause | A file name was not entered and "Auto file name" is set to [None]. |
| | Solution | Enter a file name or set "Auto file name" to other than [None]. |
| Log in failed. Settings may currently be in the process of being edited via the Web. | Cause | User settings are being edited via the Web menu. |
| | Solution | Contact the administrator of the ScanFront. |
| Log in failed. A version upgrade may currently be in the process of being executed. | Cause | The version of the ScanFront is being updated via the Web menu. |
| | Solution | Contact the administrator of the ScanFront. |
| Cannot write logfile. Sending files will be aborted. | Cause | Write permission has not been granted for the shared folder specified as the save destination of the log file. |
| | Solution | Check the settings and access permissions of the shared folder. |

**Table 5-301**

## 2. Web Menu

| | | |
|---|---|---|
| Same Username exists. Please change Username, and try again. | Cause | A user that has the same name as the user name to be registered is already registered. |
| | Solution | Check the user name prior to registration. |
| Blank field exists. | Cause | An operation such as address book/job button importing, restoring, or version updating was executed without specifying the setting file to be loaded on the ScanFront. |
| | Solution | Specify the setting file and then execute the operation. |
| The scanner is busy. Please try again. | Cause | The ScanFront is being used. |
| | Solution | End use of the ScanFront and then try again. |

**(Continued)**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

| | | |
|---|---|---|
| Settings cannot be changed or stored. A user may be logged in to the device. Check the status of the device. | Cause | Modifying settings and registration are not possible because a user is logged in. |
| | Solution | Try again after the user logs off. |
| Settings cannot be changed. The device may currently be displaying an administrator settings page. Check the status of the device. | Cause | The ScanFront is being used. |
| | Solution | End use of the ScanFront and then try again. |
| Maximum address has been registered. You can't register any more. | Cause | The limit for the number of addresses has been exceeded. |
| | Solution | Delete addresses that are no longer used and then try again. |
| Maximum Job Buttons has been registered. You can't register any more. | Cause | The limit for the number of job button registrations has been exceeded. |
| | Solution | Delete job button registrations that are no longer used and then try again. |
| Maximum users has been registered. You can't register any more. | Cause | The limit for the number of user registrations has been exceeded. |
| | Solution | Delete user registrations that are no longer used and then try again. |
| Password is not registered. OK to proceed? | Cause | A password has not been set for the user to be registered. |
| | Solution | Check the password prior to registration. |
| When the Color Mode is selected, resolutions of 400 and 600 cannot be selected. | Cause | The resolution becomes 300 dpi or less when the mode of the ScanFront 220 is set to [Color]. |
| | Solution | Set the resolution to 300 dpi or less. |
| You can't choose TIFF when Gray or Color is selected. | Cause | The scanner cannot be used with the selected mode and file format combination. |
| | Solution | Check which mode and file format combinations can be used. |
| You can't choose JPEG when Binary Mode is selected. | Cause | The scanner cannot be used with the selected mode and file format combination. |
| | Solution | Check which mode and file format combinations can be used. |
| User is now operating the device. Please try again after the user completes operations. | Cause | The ScanFront is being used. |
| | Solution | Try again after the ScanFront has finished being used. |
| A user has logged in. Operation is invalid. | Cause | Modifying settings is not possible because a user is logged in. |
| | Solution | Make the user log off and then try again. |

**Table 5-302**

# IV. SERVICE MODE

## A. Introduction

### 1. Outline

The service mode of this machine is executed by starting up the service mode software installed in this machine. Most of the displayed messages are in English.

The list of the service modes is shown below.

| Level-1 | Level-2 | Level-3 | Description |
|---|---|---|---|
| Adjust | Regist Adjustment | | Performs the registration adjustment. |
| | Light Adjustment | | Performs the light adjustments. |
| | All | | Performs registration adjustment and light adjustment. |
| | Touch Panel Adj. | | Adjusts the touch panel position. |
| | About | | Displays the software version. |
| | Dcon Check | Sensor | Checks operations of the sensor. |
| | | Motor | Checks operations of the motor. |
| | | LED | Checks operations of the LED for the reading unit. |
| | | USS | Checks operations of the double-feed sensor. |
| | Check Device | MAIN | Displays the main body version. |
| | | DFD | Displays the double-feed detection version. |
| | | Finger | Displays the fingerprint detection version |
| | Counter | ADF | Checks the total scanning count. |
| | | P01 Jam | Checks the total number of P01 jams. |
| | | P02 Jam | Checks the total number of P02 jams. |
| | | Replacement | Checks the scanning count after roller replacement. |
| Test scan | Scan condition | Mode | Selects a scan mode (B&W, Gray-scale, Color, ---) |
| | | Resolution | Selects a scan resolution (100, 150, 200, -----). |
| | | Side | Selects simplex or duplex scanning. |
| | Image display | ← ↑ ↓ → | Moves a displayed area. |
| | | Zoom | Selects enlargement/reduction. |
| Version up | | | Changes the software. |

**Table 5-401**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 2. Starting Up Service Mode

1) Power the machine ON to display the [Home] screen. If other screen is already displayed, return to the [Home] screen.
2) Press [Power off].

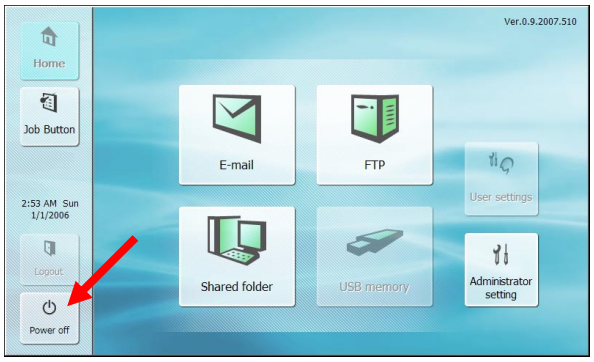



**Figure 5-401**

3) On the [Caution] screen, press the left side of the screen TWICE, press the right side ONCE, then press the left side ONCE.

**Note:** If the next screen is not displayed, press [No], then perform this procedure again.

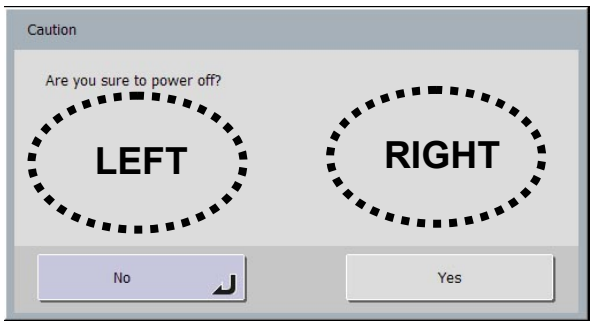



**Figure 5-402**

4) On the [Service Password] screen, press [Password].

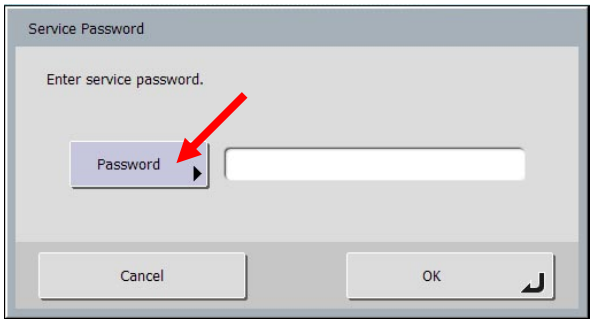



**Figure 5-403**

5) On the [Password] screen displaying the keyboard, input the 6 letters “market”, then press [OK].

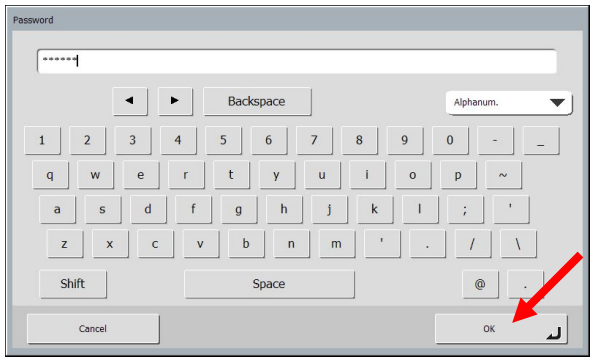



**Figure 5-404**

6) On the [Service Password] screen, press [OK].

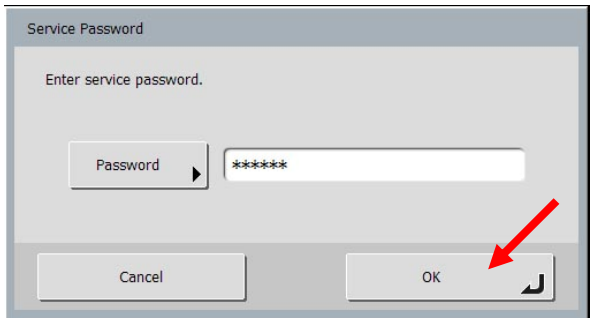



**Figure 5-405**

7) Confirm that the [Service mode's Home] screen is displayed.

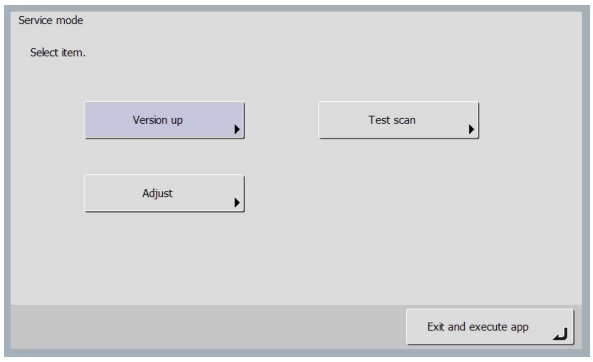



**Figure 5-406**

## 3. Exiting Service Mode

In normal cases, follow the below procedure to return to the user's [Home] screen from the service mode. For special modes, follow the procedure described on each section.

1) On the displayed screen, press [Close].

**Note:** Pressing [Close] allows you to return to the previous screen. You may press [Close] again depending on which screen is displayed. Here is an example:

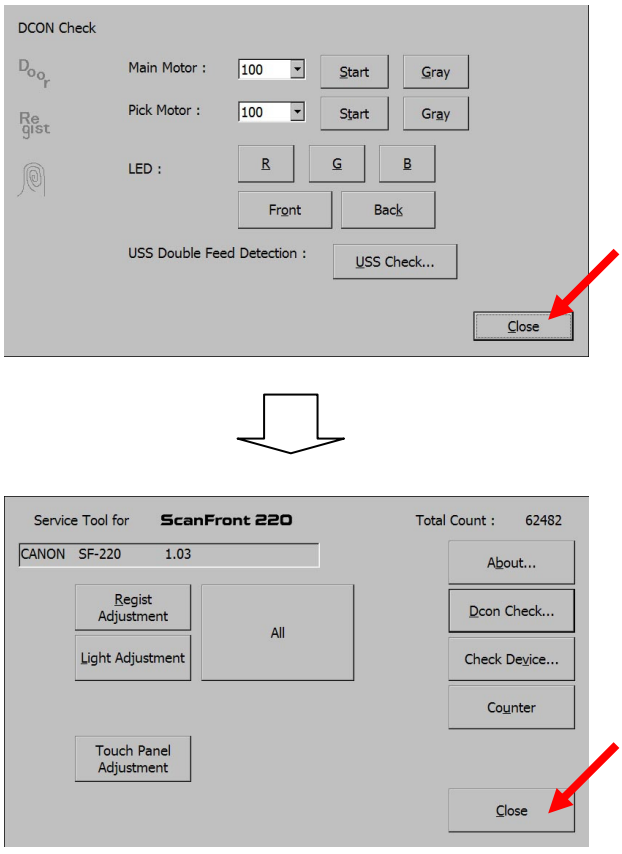



**Figure 5-407**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

2) On the confirmation screen, press [Yes].

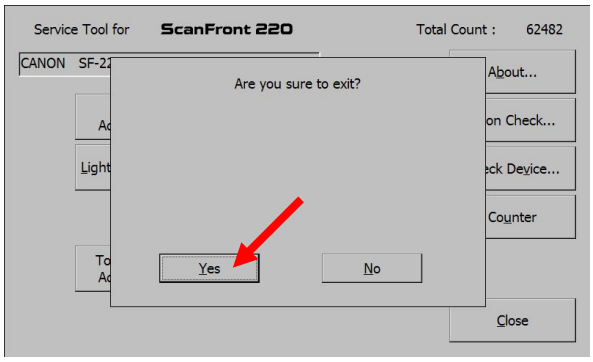



**Figure 5-408**

3) Return to the [Service mode's Home] screen, then press [Exit and execute app].

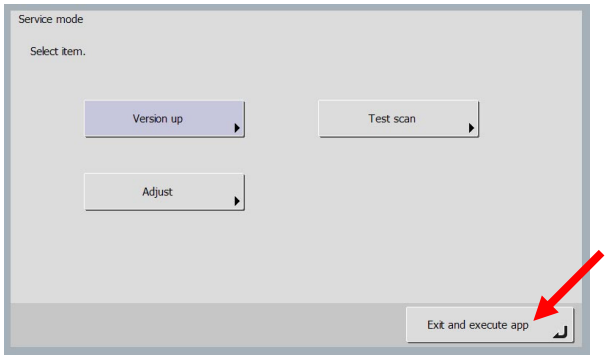



**Figure 5-409**

4) The product name screen is displayed, then the user's [Home] screen is displayed.

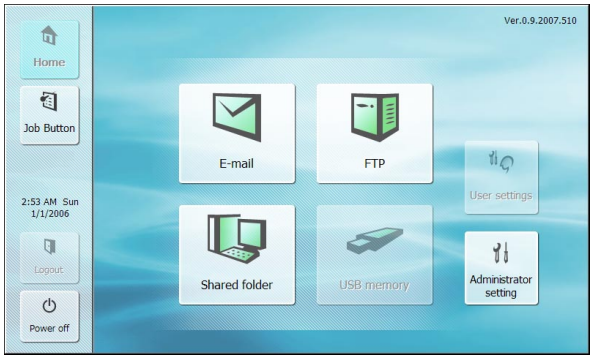



**Figure 5-410**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# B. Scanner Adjustment

## 1. Selection Screen

The scanner adjustment modes are contained under [Adjust]. The basic selection screen is shown below.

1) On the [Service mode's Home] screen, press [Adjust].

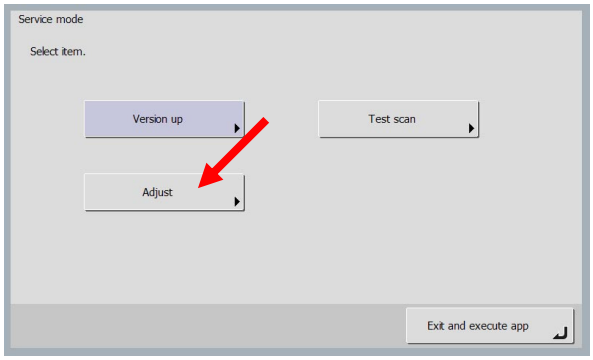



**Figure 5-411**

2) Confirm that the adjustment home screen is displayed. Select a menu to execute on this screen.

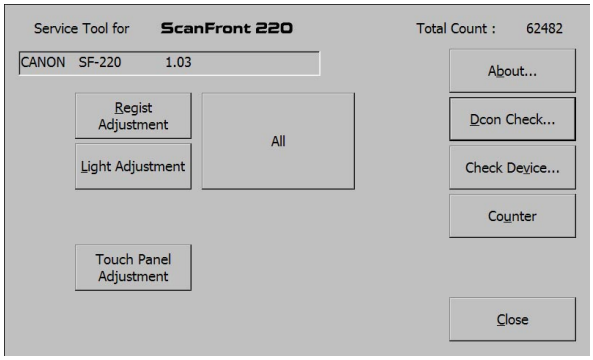



**Figure 5-412**

This adjustment home screen displays the main body firmware version on the left-upper and the total scanning count on the right-upper as well as menu item buttons.

## 2. Regist Adjustment

This mode performs adjustments on a reading-start position and reading-end position for feeding.

If the leading- and trailing-edge positions of a scanned image are improper, perform this adjustment.

Also perform this adjustment after replacing or reassembling a registration-related part such as the reading unit or the registration sensor lever or after replacing the scanner PCB recording the adjustment data.

This mode and the [Light Adjustment] mentioned on the next section can be performed at the same time. For details, refer to "All" (Adjustment).

◆ Registration sheet

The special sheet is required to execute this mode. However, you can create the sheet by drawing a black line on general copier paper, so it is not specified as a service tool. Prepare it for yourself. The sheet is required:

1) To be a piece of white copier paper or recycled paper.
2) To have the black leading edge and the white trailing edge, whose width is 2 mm or more.
3) To be a half of A4- or Letter-size. Otherwise, it should be within the following range:
   Width: 200 to 220 mm; Length: 130 to 200 mm.
   However, the length can be up to 297 mm (equivalent to A4-length).
4) To cause neither jams nor skews.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

Example1: Cut a piece of A4- or Letter-sized paper in half, then blacken its leading edge with a black pen.
Use the sheet after the ink has dried.
Do not use a pencil.

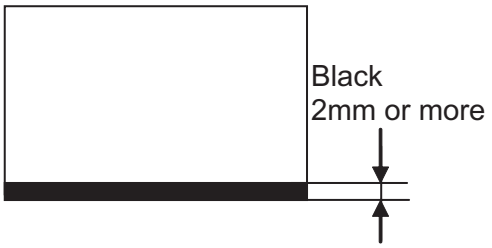



**Figure 5-413**

Example2: Copy or print a whole black image with white margins. Then cut it in half.
The margins should be 2 mm or more.

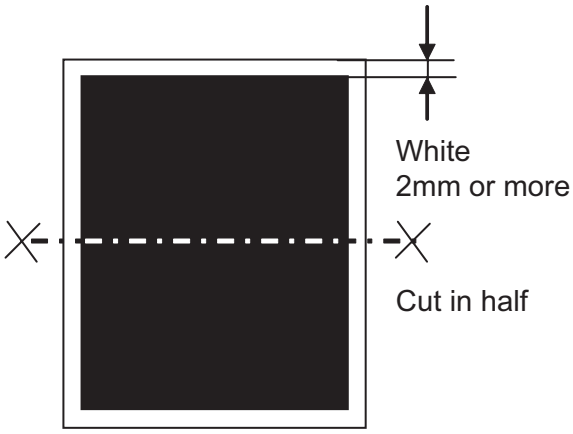



**Figure 5-414**

◆ **Operation Procedure**

1) Clean the feed path, the rollers, and the scanning glasses.
2) Load a piece of the registration sheet you prepared. Make sure to set the document guides to fit the sheet to prevent skews.

**Note:** The black edge needs to be detected as the leading edge of the sheet with the front side sensor. Load the sheet with the black-lined side facing down, considering this black edge of the sheet is the top of feed.

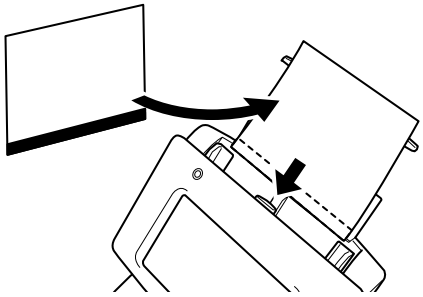


**Figure 5-415**

3) On the adjustment home screen, press [Regist Adjustment].

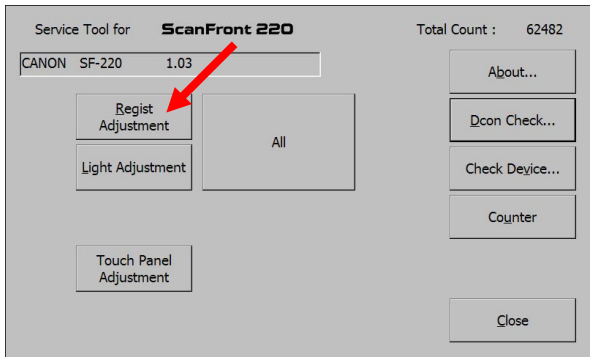



**Figure 5-416**

4) The adjustment starts automatically. Progress screens are displayed. One of them is shown below as an example.

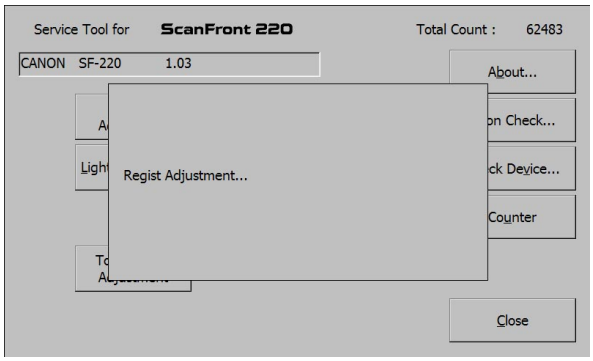



**Figure 5-417**

5) The sheet is fed. After the adjustment is complete, the progress screen disappears and the screen returns to the adjustment home screen. When the data is acquired, the green circle mark will appear next to the button.

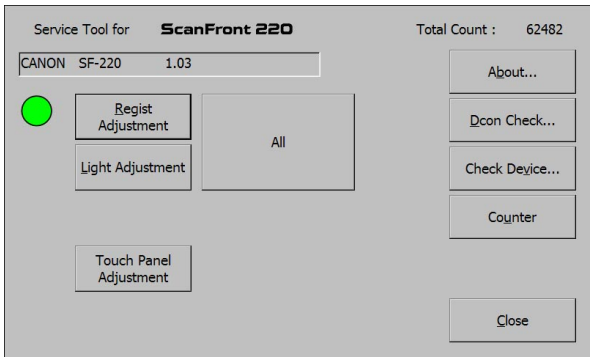



**Figure 5-418**

6) Confirm the image referring to “Test scan”. For detailed instructions, refer to “Test scan”.

## 3. Light Adjustment

This mode performs fine adjustments on the shading correction values since the reading point differs between the shading sheet inside of the reading unit and the actual document.

If the scanned image quality is degraded, perform this adjustment.

Also perform this adjustment after replacing the reading unit or after replacing the motherboard recording the adjustment data.

This mode and the [Regist Adjustment] mentioned on the previous section can be performed at the same time. For details, refer to “All” (Adjustment).

◆ Shading sheet

The special sheet is required to execute this mode. Use the same shading sheet as the DR-2050 series; TKM-0326 which is the same or equivalent sheet as the one bundled with the DR-2050 series, or TKM-0332 which is a longer sheet.

Do not use a sheet with any dirt or creases.

◆ Operation Procedure

1) Clean the feed path, the rollers, and the scanning glasses.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

2) Open the document guides fully extended, then load a shading sheet you prepared to fit the width between the document guides.

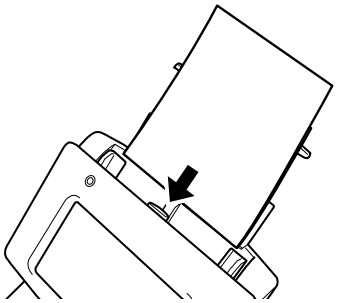


**Figure 5-419**

3) On the adjustment home screen, press [Light Adjustment].

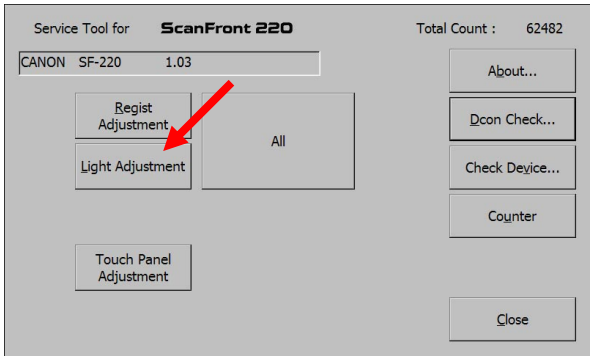



**Figure 5-420**

4) The adjustment starts automatically. The progress screen is displayed.

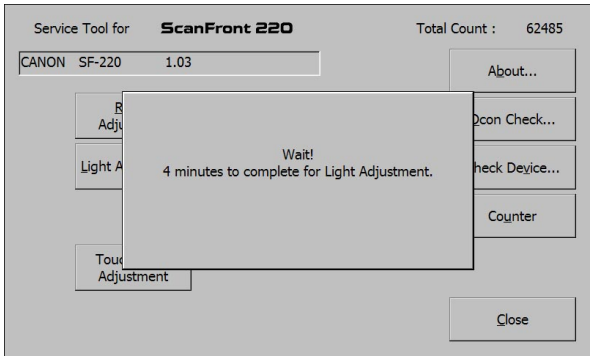



**Figure 5-421**

5) The sheet is fed. Even after the sheet has been ejected, the machine may be processing the data.
6) After the adjustment is complete, the progress screen disappears and the screen returns to the adjustment home screen. The adjustment takes about 4 minutes. When the data is acquired, the green circle mark will appear next to the button.

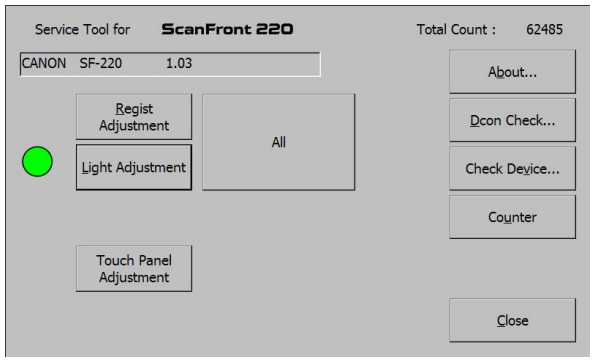



**Figure 5-422**

7) Confirm the image referring to “Test scan”. For detailed instructions, refer to “Test scan”.

## 4. All Adjustment

Perform this adjustment, the regist adjustment, and the light adjustment simultaneously. The purpose and timing to perform each adjustment are discussed in the corresponding section below.

◆ Adjustment sheet

As the shading sheet and the regist adjustment sheet, use sheets described in the previous section. Make sure that the width of the registration sheet is the same 219 mm as that of the shading sheet to prevent skews.

◆ Operation procedure

1) Clean feed path, roller, and scanning glass.
2) Open the document guides fully extended, then load a prepared regist adjustment sheet as the first sheet and a prepared shading sheet as the second. Load them correctly to prevent skews.

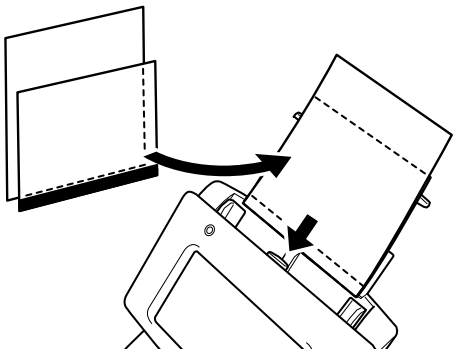


**Figure 5-423**

3) On the adjustment home screen, press [All].

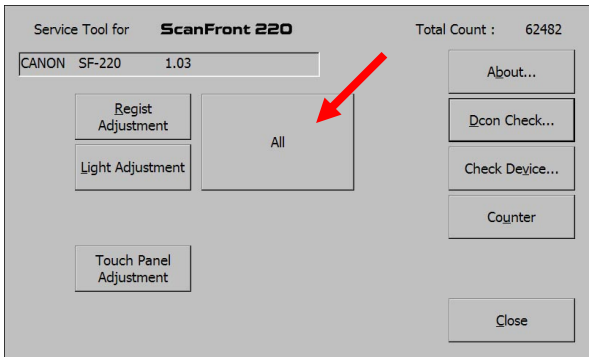
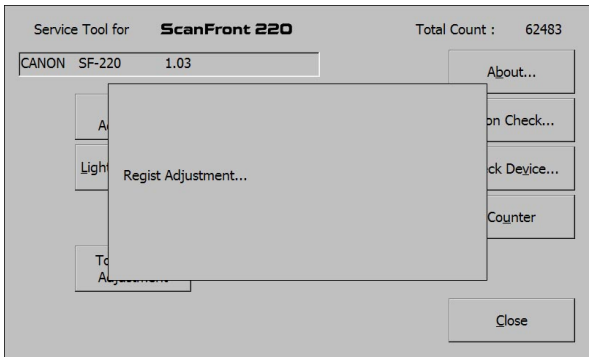



**Figure 5-424**

4) The adjustment starts automatically. The progress screens for the regist adjustment and the light adjustment are displayed.



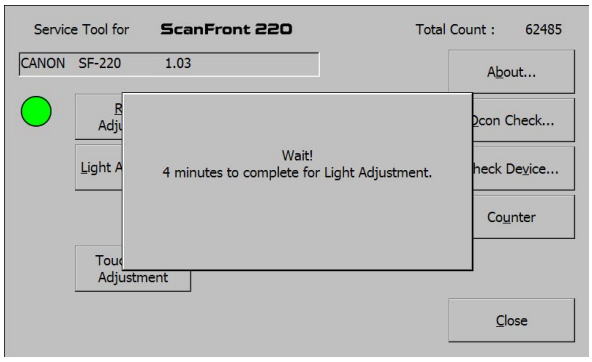




**Figure 5-425**

5) Even after the shading sheet has been ejected, the machine may be processing the data.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

6) After the adjustment is complete, the progress screen disappears and the screen returns to the adjustment home screen. The adjustment takes about 4 minutes. When the data is acquired, the green circle marks will appear next to the [Regist Adjustment] and [Light Adjustment] buttons.

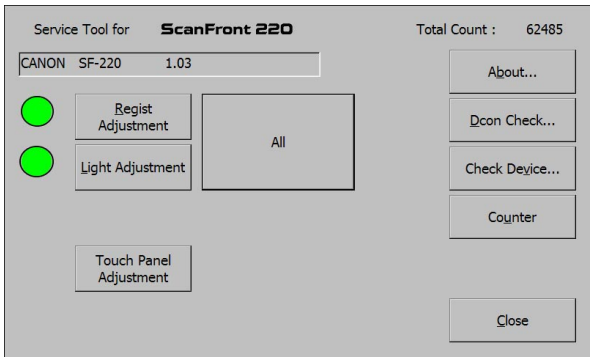



**Figure 5-426**

7) Confirm the image referring to “Test scan”. For detailed instructions, refer to “Test scan”.

## 5. Dcon Check

This mode checks operations of each hardware inside of the machine.

◆ Basic screen

1) On the adjustment home screen, press [Dcon Check].

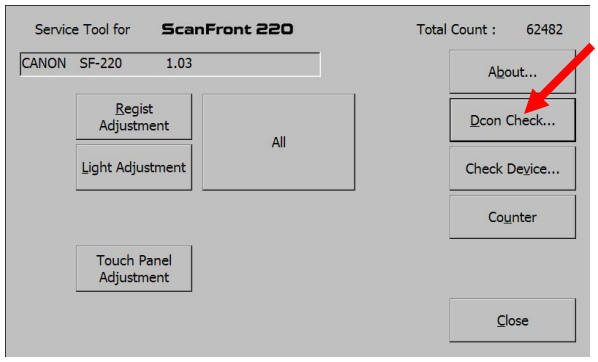



**Figure 5-427**

2) Confirm the [DCON Check] screen is displayed.
Select a menu to execute on this screen.

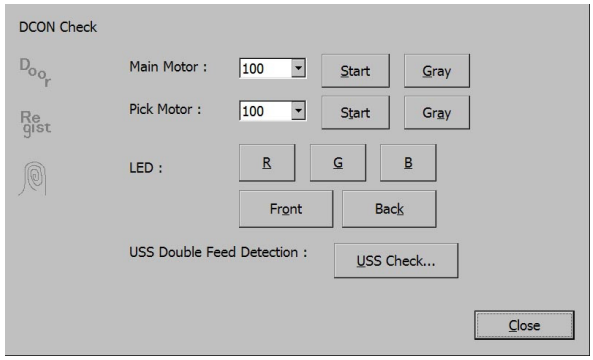



**Figure 5-428**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

a. Sensors

When the sensor detects its target, the corresponding mark lights. The contents of marks are shown below. The “Door sensor” mark shown below is in the detection state.

| Mark | Sensor name | Lighting state |
|---|---|---|
| | Door sensor | The upper unit is open. |
| | Registration sensor | The registration sensor detects a document. |
| | Fingerprint sensor | The fingerprint sensor detects a finger. |

**Table 5-402**

b. Motor

Select a resolution and a reading mode, then press [Start] to make the motor turn at the speed that meets the condition. Press [Stop] to stop the motor.

- [Main Motor]: Feed motor
- [Pick Motor]: Pickup motor

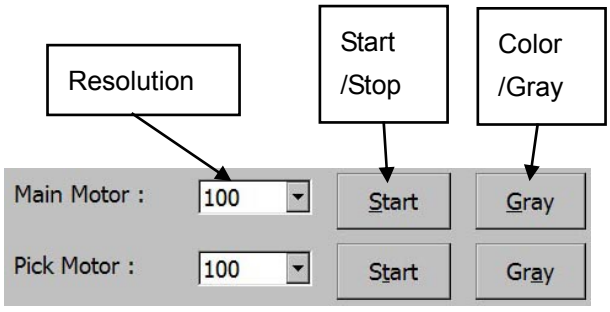



**Figure 5-429**

c. CIS unit LED

When the corresponding LED button is pressed, the LED lights. Make sure to open the upper unit fully before pressing the button. Press the button again to turn off the LED.

- [Front]
  LED for front-side scanning (located on the lower unit)
- [Back]
  LED for back-side scanning (located on the upper unit)

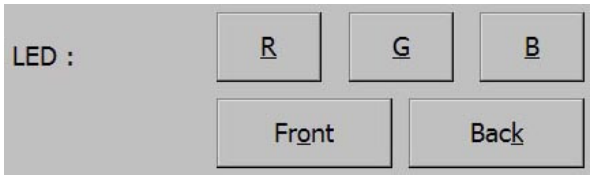



**Figure 5-430**

d. Ultrasonic sensor

On the [DCON Check] screen, press [USS Check] to display the [USS] screen.

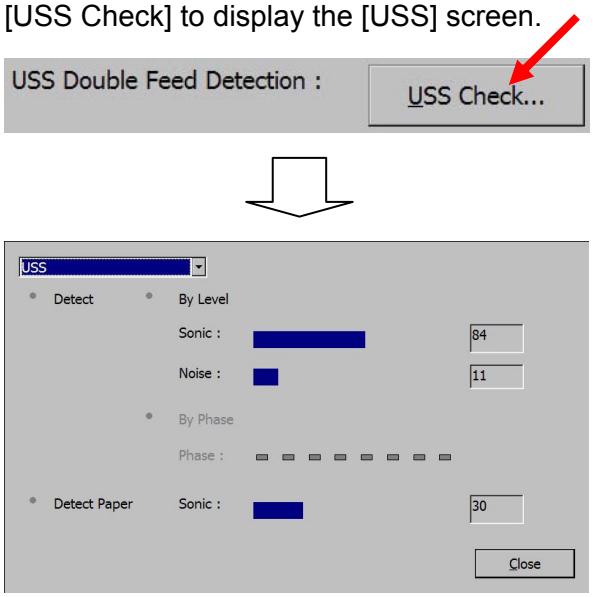



**Figure 5-431**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

Placing a single sheet of paper on the ultrasonic sensor turns on the document detection lamp in red. Placing overlapping paper on the sensor turns on the double-feed detection lamp in red. The screen when double-feeding is detected is shown below.

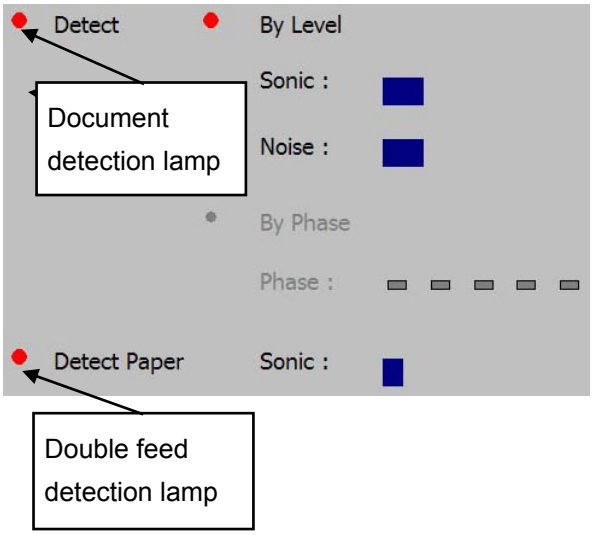



**Figure 5-432**

## 6. Check Device

This mode displays versions of the main body firmware and the internal devices of this machine.

On the adjustment home screen, press [Check Device] to display the [Check Devices] screen.

- [MAIN]
  Scanner main body firmware
- [DFD SUB]
  Ultrasonic sensor
- [Finger Print]
  Fingerprint sensor
- [OSVersion]
  Windows CE
- [ApplicationVersion]
  All execute files except for the above.

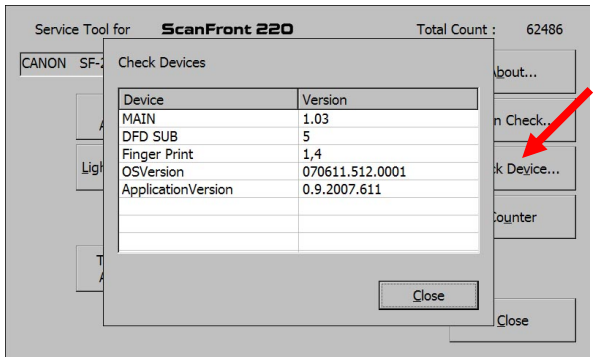



**Figure 5-433**

**Note:** Version of each device can also be confirmed on the user's screen. Version of "Application" is displayed at the upper right of the machine's screen. Versions of devices other than "DFD SUB" are displayed on the system settings screen of the Web menu (Administrator mode).

## 7. Counter

This mode is used to display/change the scanning count and the number of document jams.

a. Display

On the adjustment home screen, press [Counter] to display the [Counters] screen.

- [ADF Count]
  The total scanning count
- [P01 Jam Count]
  The number of pickup delay jams; but invalid for this machine since this machine does not have a document sensor.
- [P02 Jam Count]
  The number of jams
- [Replacement1 Count]
  The scanning count at time of last roller replacement (counter resetting)

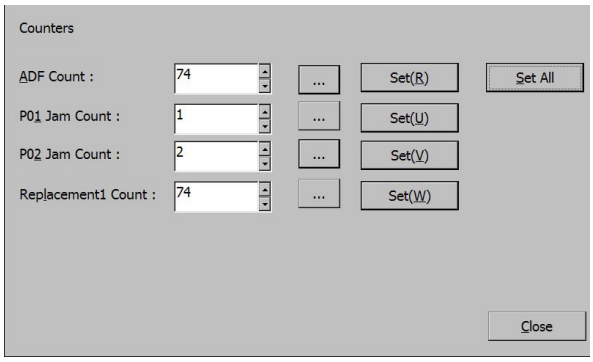



**Figure 5-434**

b. Change

These values are changed when the scanner PCB is replaced. After the replacing the scanner PCB, input the same values as before the replacement. If you don't know the values before the replacement, input the estimated values.

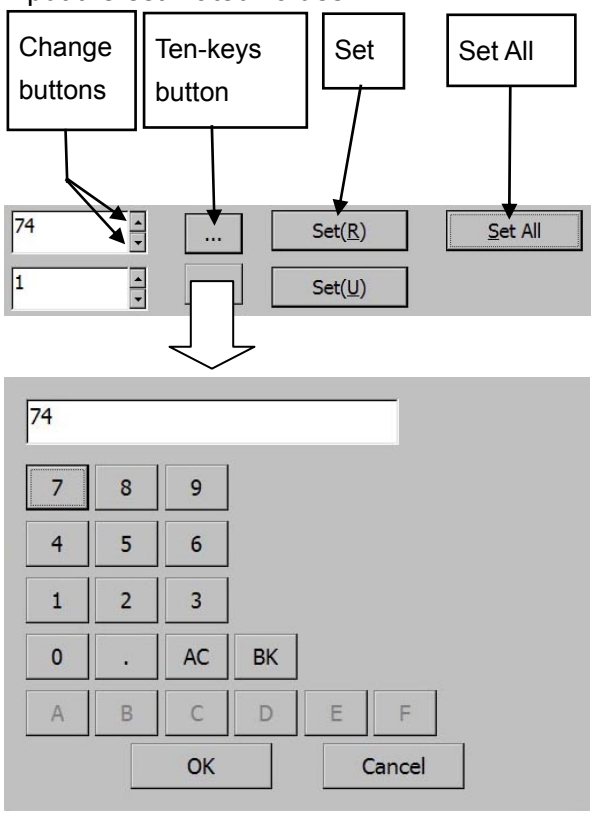



**Figure 5-435**

Press the corresponding change button or the ten-keys button to change the value. Pressing the ten-keys button displays the ten-keys keypad screen.

After changing the value, press [Set] or [Set All] to finalize it. Pressing [Set] finalizes a value for each item, and pressing [Set All] finalizes values for all items.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 8. About

This mode displays a detailed version of the scanner adjustment software.

On the adjustment home screen, press [About] to display the version screen.

Press [OK] to close the version screen.

**Figure 5-436**

## 9. Touch Panel Adjustment

Although this mode is not related to scanner adjustment, it is contained under [Adjust]. This adjusts the touch panel position. This can also be performed from the user's [Administrator setting] screen. This adjustment is usually be performed by users as needed.

When the initialization of user information or the software reinstallation is performed, the touch panel position adjustment data is restored to default. Perform this adjustment, when these are performed. Even when performing other service works, if you suspect a gap between the actual position and the adjustment data is produced, also perform this adjustment.

◆ Touch panel pen

To adjust the position precisely, a commercially available touch panel pen or the equivalent is needed to perform this adjustment. Since the precise adjustment cannot be performed by touching with a finger, you may have to input endlessly if you use a finger instead of a touch panel pen.

◆ Operation procedure

1) Press [Touch Panel Adjustment] on the adjustment home screen.

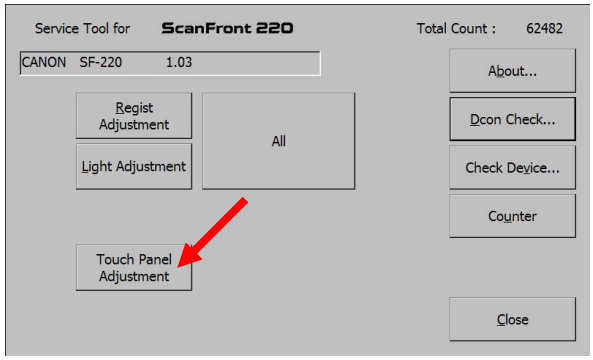



**Figure 5-437**

2) Confirm the adjustment screen of the touch panel is displayed.

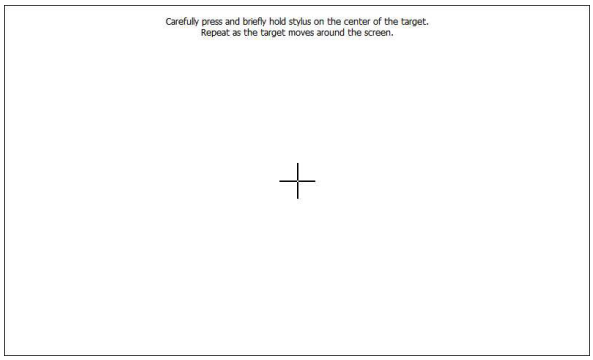



**Figure 5-438**

3) Press the center of the displayed targets (+) with the touch-panel pen in the order of ① to ⑤.

**Note:** Touch the center of each target. Otherwise, you will have to repeat the operation.

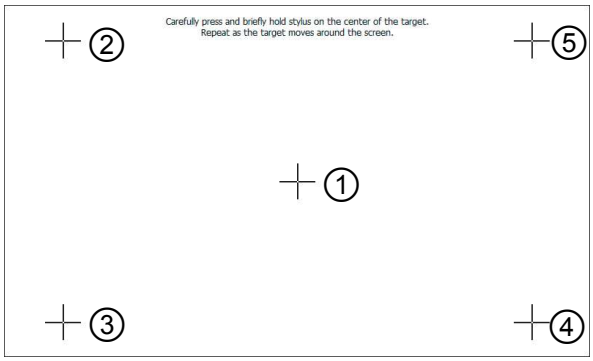



**Figure 5-439**

4) After you finish adjustment, tap the touch panel to exit the touch panel adjustment.

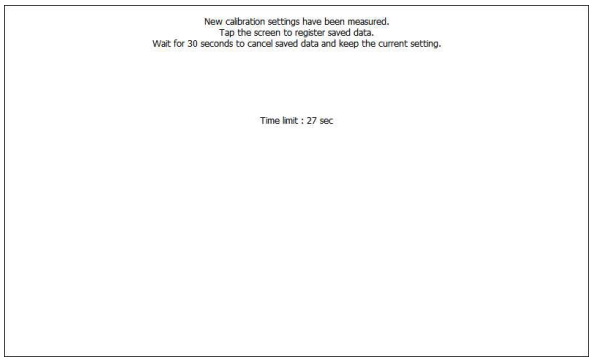



**Figure 5-440**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# C. Test Scan

## 1. Outline

This mode is used to check the scanning functions.

You can start up this mode from the service mode, not from the user's normal screen, so that checking scanning operations and scanned images is possible without user's help.

Also, the network is not involved in these tests. So you can determine whether the malfunction of the machine scanning function causes the trouble or whether the settings or network functions configured by users cause it.

◆ Basic screen

1) On the [Service mode's Home] screen, press [Test scan].

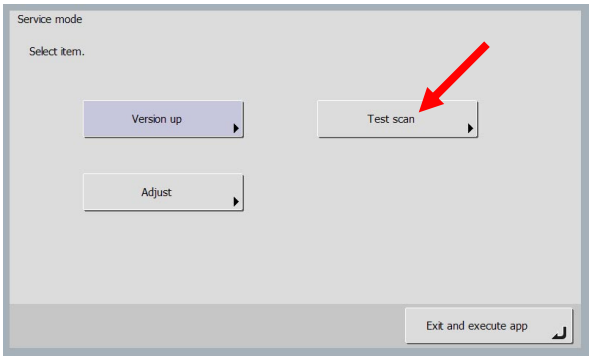



**Figure 5-441**

2) Confirm that the [Test scan] screen is displayed.
Select a menu to execute on this screen.

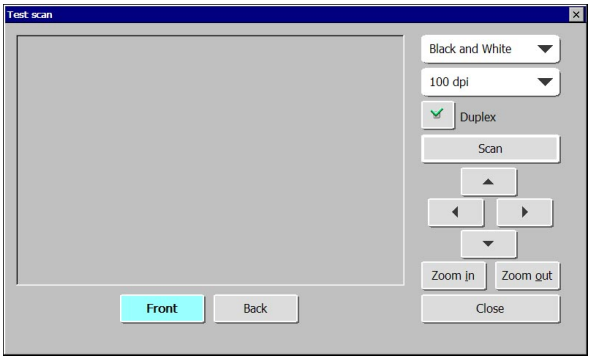



**Figure 5-442**

◆ Image display

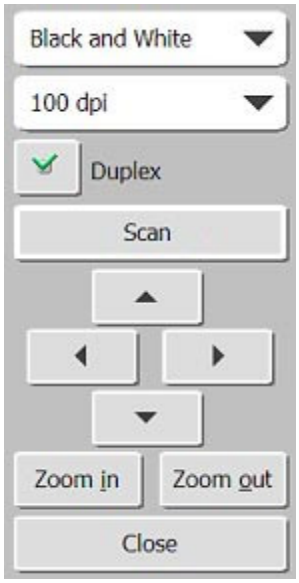
A scanned image is displayed here. Press [Front] or [Back] to switch a front-side image or a back-side image to display. The selected button turns blue.

**Note:** When Simplex is selected, only [Front] is available.

**Figure 5-443**

◆ Operation buttons

These buttons are used to select scan conditions and to check scanned images. The function of each button is shown below.




→Mode
→Resolution
→Scanning side
→Start
→Up
→Left/Right
→Down
→Enlarge/Reduce
→Close

**Figure 5-444**

- Mode

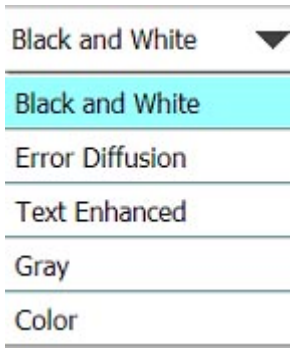



**Figure 5-445**

- Resolution

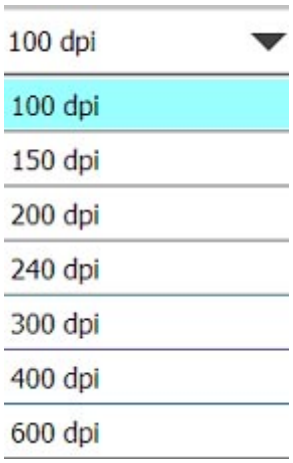
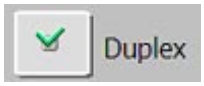



**Figure 5-446**

- Scanning side

→Simplex (Front side only)




→Duplex

**Figure 5-447**

**Note:** The scanning size is set to maximum, and the brightness and the contrast is set to standard.
For SF-220P, setting to "[Color] / [600 dpi] / [Duplex]" causes insufficient memory since the scanning size is set to maximum.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 2. Operation Procedure

Load a document, then press [Scan] to start scanning. The scanned image is displayed.

a. Scan documents

1) Load one or more sheets of document.

2) Select scan conditions.

3) Press [Scan].

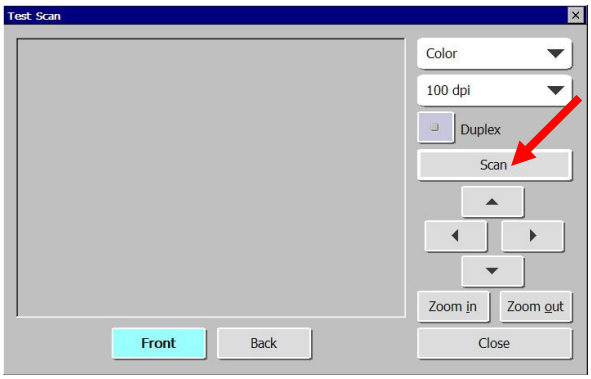



**Figure 5-448**

4) Confirm that the scanned image is displayed.

**Note:** When several documents are loaded, the last scanned document is displayed.

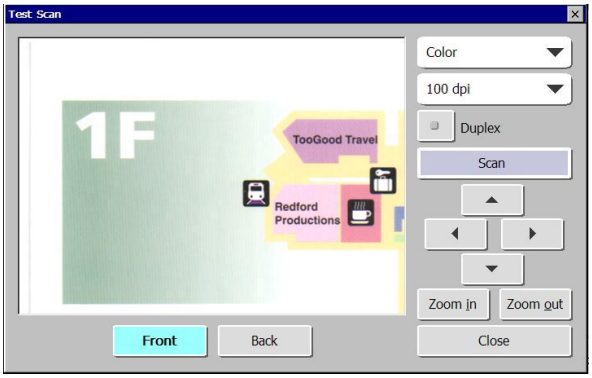



**Figure 5-449**

b. Check scanned image

- Move

  Use the arrow buttons to move a displayed area. For example, pressing [▶] changes the displayed image as shown below.

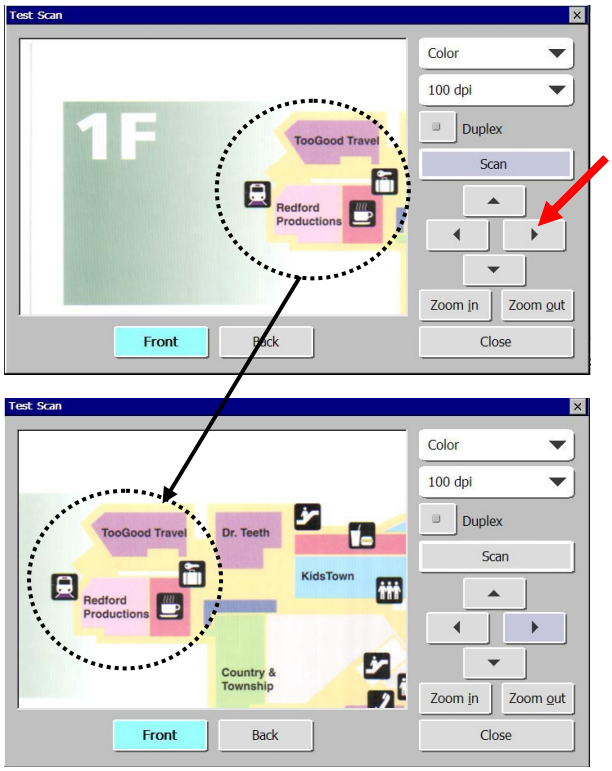



**Figure 5-450**

- Enlarge

  Press [Zoom in] to enlarge an image.

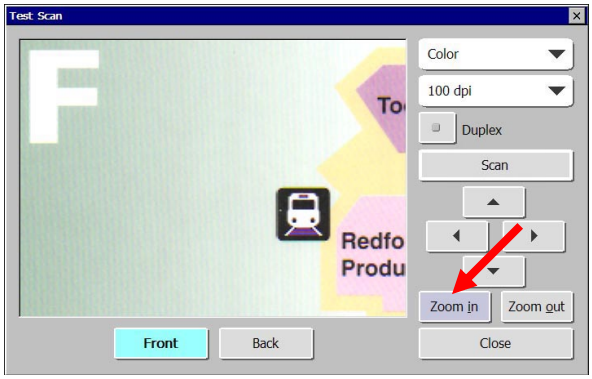



**Figure 5-451**

- Reduce
  Press [Zoom out] to reduce an image.

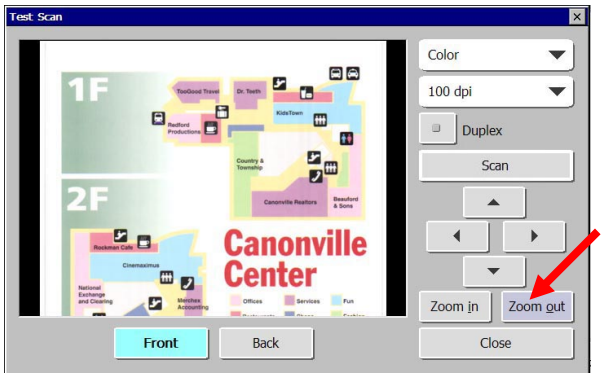



**Figure 5-452**

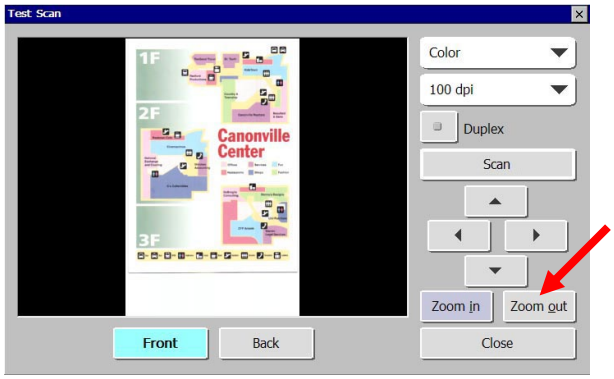



**Figure 5-453**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# D. Update

## 1. Outline

This mode is used to update the software of the machine to the latest version.

Save new software files to a USB memory, then connect it to the machine to overwrite the old software in the machine.

Software cannot revert back to older versions with this mode. To do that, perform “reinstallation” using the boot switch explained in another section.

◆ Saving to USB memory

You can download original update files using the service route (such as service information) as well as in the same way as users do.

Save an update file to the root directory (top level directory) of the USB memory. If it is saved to sub directories or folders, it may not be detected by the machine.

The file name should be like this:

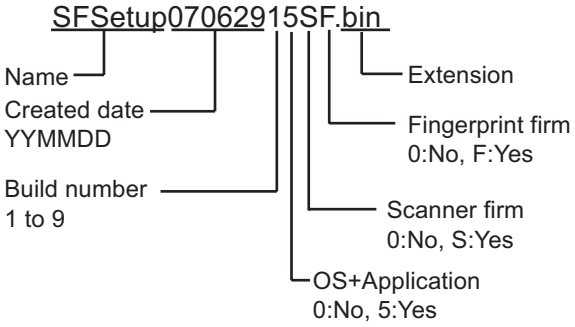



**Figure 5-454**

Here is an example of USB memory directories. If more than one update files exist under the root directory, the newer one will be detected.

The file size is 30 to 35 MB.

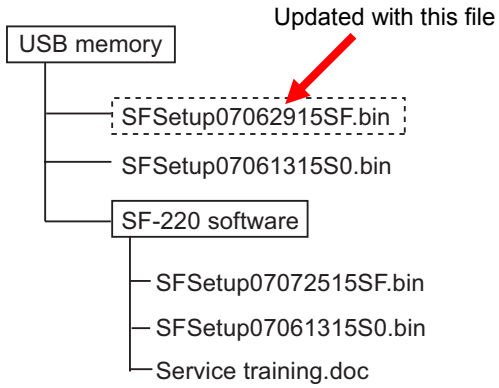



**Figure 5-455**

**Note:** Update proceeds automatically. This automatic update procedure includes backup and restoration of the user data.

**Note:** For a user, a series of numbers called the Product key is needed to download update files. The Product key is printed on the rating label located on the bottom of the main body.

## 2. Operation Procedure

1) Prepare a USB memory containing the necessary file.

**Note:** Use a USB memory without any special functions such as security function. Special USB memories are not compatible.
For saving update file on the USB memory, refer to the previous section.

2) Start the service mode.
3) Press [Check Device] on [Adjust] to confirm the current version number.
4) Connect the prepared USB memory to the machine's USB port.
5) Press [Version up] on the [Service mode's Home] screen.

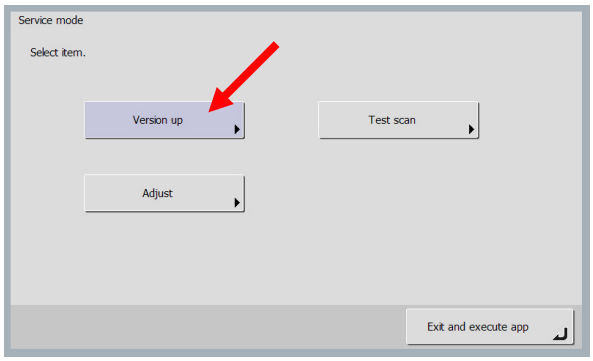



**Figure 5-456**

6) The update proceeds automatically while the progress screens are displayed. Some of them are shown below.

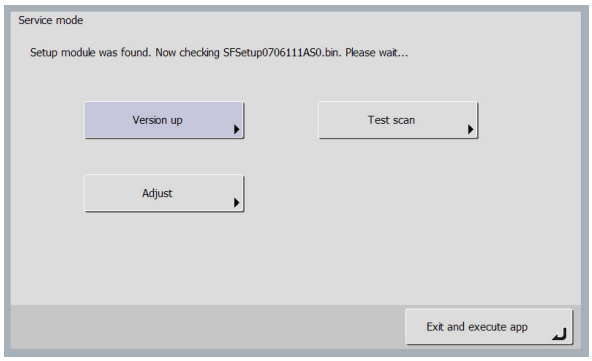



**Figure 5-457**

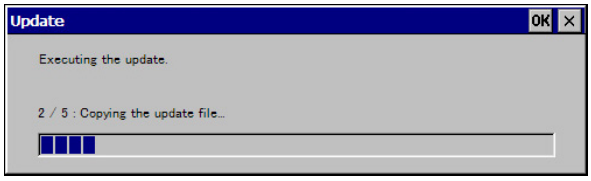



**Figure 5-458**

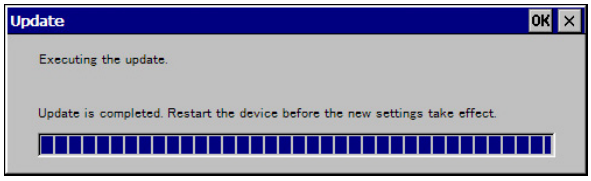



**Figure 5-459**

7) When update is complete, the machine is restarted automatically.
8) After the machine has been restarted, the user's initial screen is displayed.
9) On [Check Device] in the service mode, confirm the updated version number.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# V. NETWORK FUNCTION CHECK

## 1. Outline

To check the machine's network function without using the user's network system, connect this machine and a computer for service works with LAN cable with cross connections, and then send image data to a shared folder on the computer.

◆ Outline steps

1) Preparation
2) Network setting for the machine
3) Network setting for computer
4) Creating a user
5) Creating a shared folder
6) Sending image data
7) Initialization

**Note:** The user data is highly confidential. You have to ask the user to backup the user data and execute an initialize before this operation. And before you will return the machine to the user, you have to execute the initialize. For details, refer to "USER INFORMATION PROTECTION" in this chapter or the user manual.

**Note:** This machine is compatible with Windows 2000/XP/Vista operating systems. In here, Windows 2000 is used. Since the operations and screens differ depending on the operation system, take steps appropriate to the operating system to perform this procedure.

## 2. Preparation

1) Necessaries

- Computer:
  Windows 2000/XP/Vista
  TCP/IP protocol available
- LAN cable:
  Cross connection
  Hereafter referred to as crossover cable

2) Confirmation

Confirm the user that the user data has been backup and initialized.

3) Connection

Connect the machine and the computer with crossover cable.

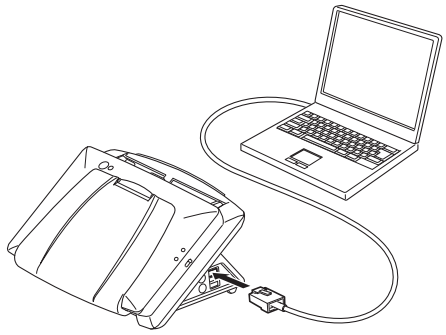


**Figure 5-501**

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

## 3. Network Setting for the Machine

◆ Purpose

Set the network settings for the machine.

Set the same network address part in the IP address on the machine and the computer.

1) Turn on the machine to display the [Home] screen. And press [Administrator settings].

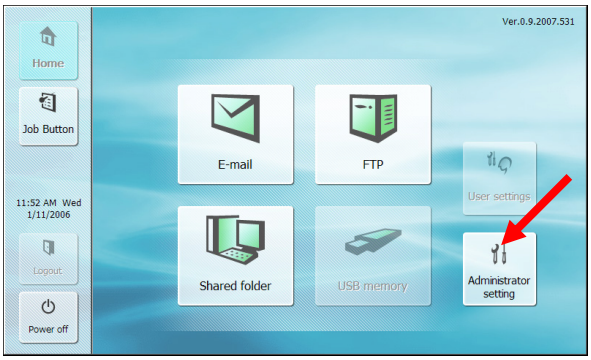



**Figure 5-502**

2) The [Administrator Password] screen is displayed. Press [OK] without inputting a password.

**Note:** When the user has initialized, you don't need to input any password.

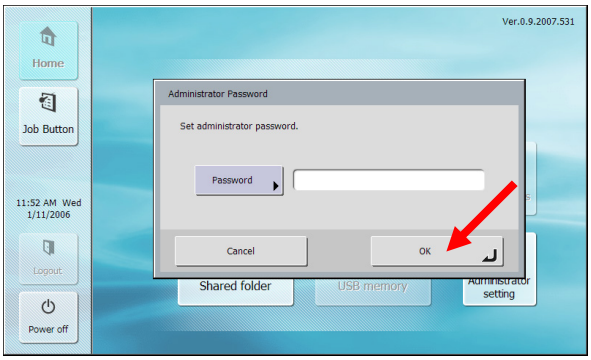



**Figure 5-503**

3) On the next screen, press [Network setting].

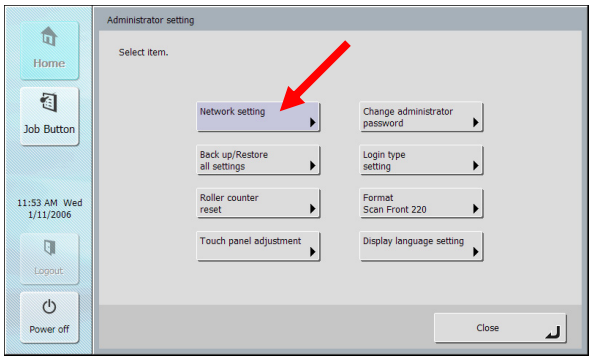



**Figure 5-504**

4) On the next screen, disable the DHCP server, and then input a suitable address. For the IP address for the machine and the computer, the network address should be the same but the host address should be different.

After that, press [OK].

The example, assuming the computer's IP address is [1.1.1.1], is shown below.

- IP address: 1.1.1.2
- Subnet mask: 255.255.255.0
- Default gateway: 1.1.1.1
- DNS (primary): 1.1.1.1
- WINS (primary): 1.1.1.1

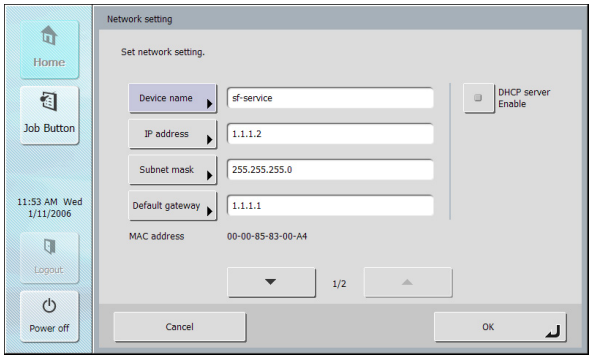



**Figure 5-505**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

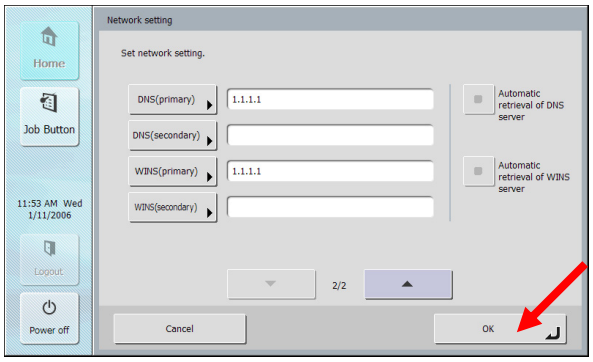



Figure 5-506

## 4. Network Setting for Computer

◆ Purpose

Set the network setting for the computer to be consistent with the machine.

1) Click [Network and Dial-up Connections] in Control Panel.

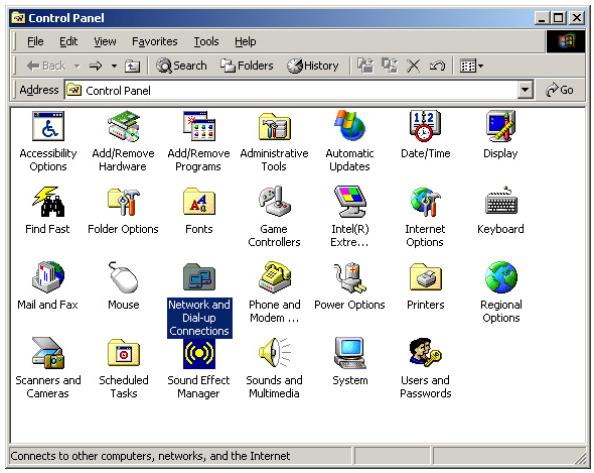



Figure 5-507

2) On the next screen, right-click [Local Area Connection], then click [Properties].

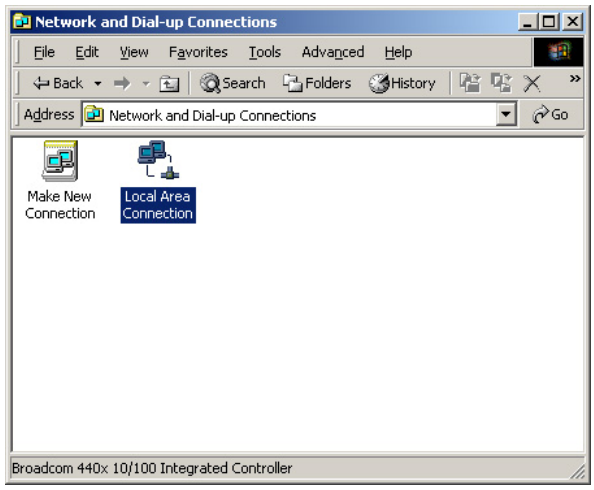



Figure 5-508

3) On the next screen, select [Internet Protocol (TCP/IP)], then click [Properties].

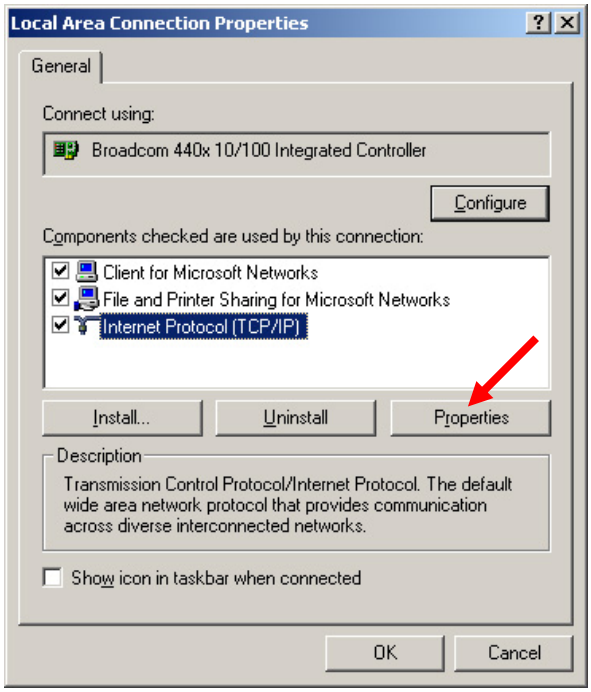



**Figure 5-509**

4) On the next screen, input each address.
They should be consistent with the addresses input at the previous section for the machine.
After that, click [OK].
The input data in this example is as follows.

- IP address: 1.1.1.1
- Subnet mask: 255.255.255.0
- Default gateway: 1.1.1.1
- Preferred DNS server: 1.1.1.1

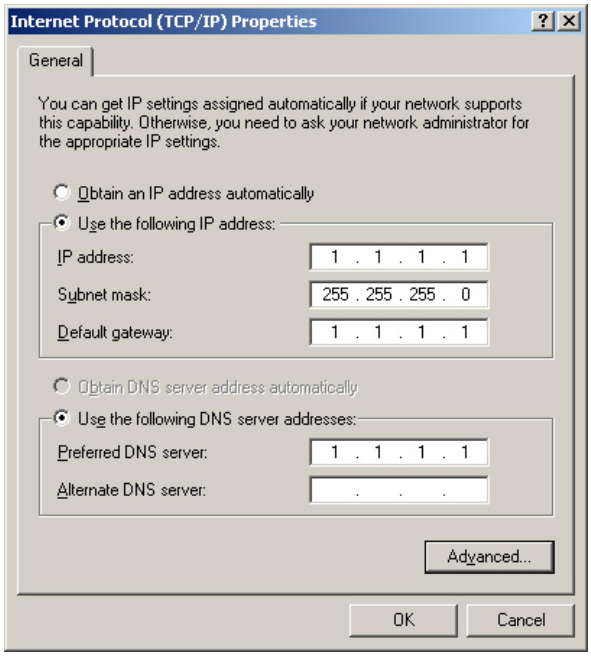



**Figure 5-510**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 5. Creating a User

◆ Purpose

Create a user account with administrative rights to access a shared holder. You can use any existing user account if you know its password; otherwise you need to create a new user.

1) Click [Users and Passwords] in Control Panel.

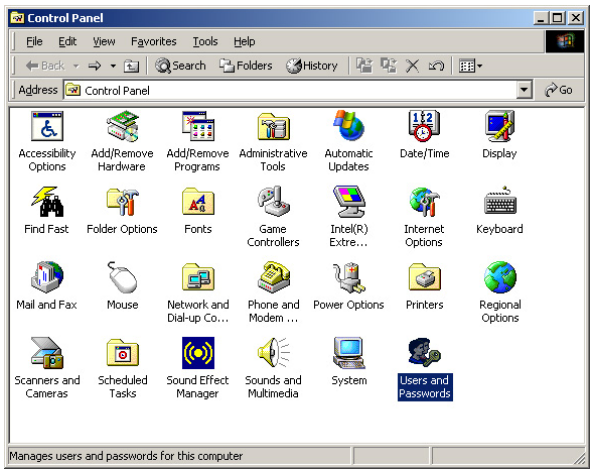



**Figure 5-511**

2) On the next screen, click the [Advanced] tab.

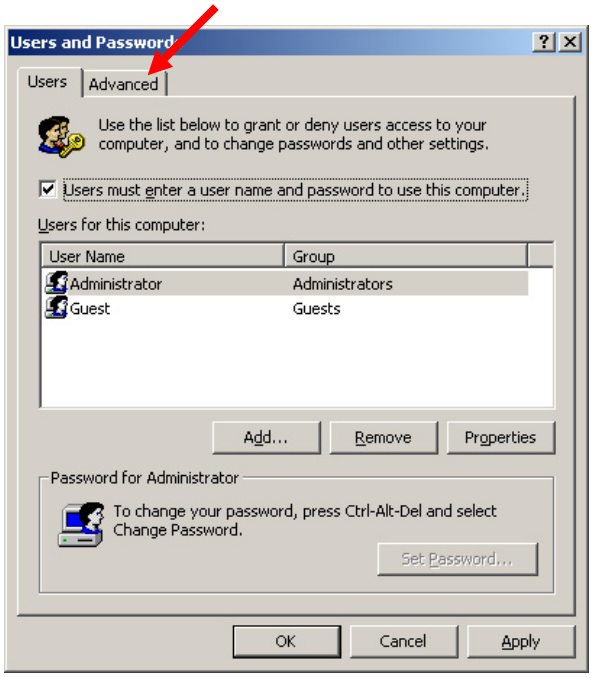



**Figure 5-512**

3) On the next screen, click [Advanced].

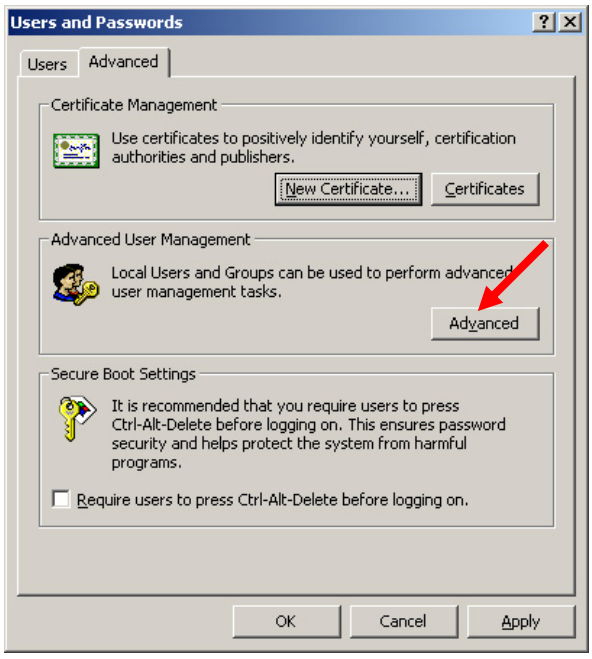



**Figure 5-513**

4) On the next screen, right-click [Users].

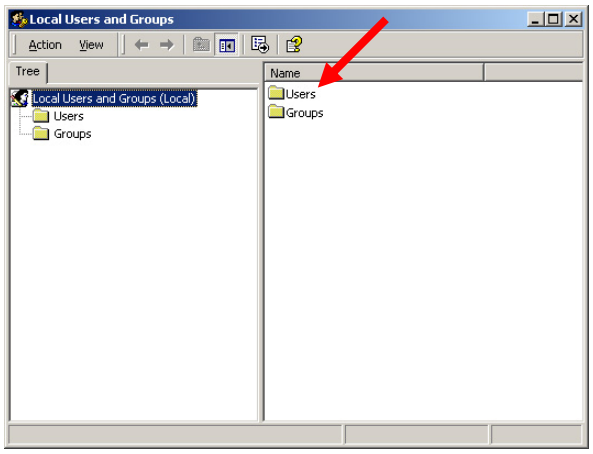



**Figure 5-514**

5) On the displayed menu, click [New User].

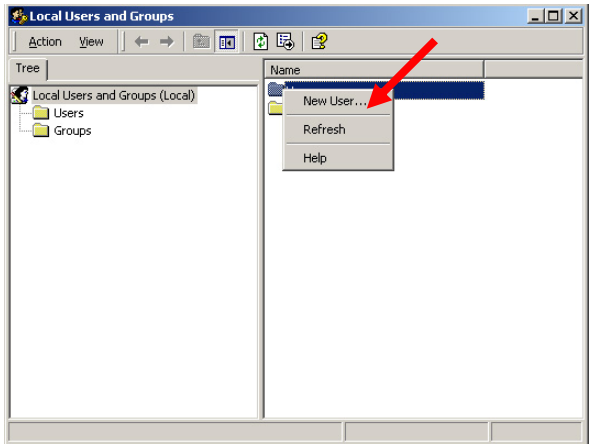



**Figure 5-515**

6) On the next screen, input any text in [User name] and [Password]. In here, the following is input.

- User name: sf
- Password: sf

And click to clear the [User must change password at next logon] check box.

After that, click [Create].

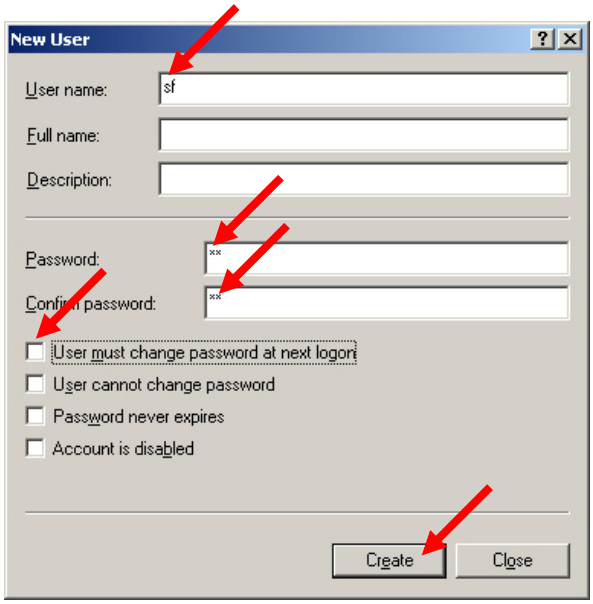



**Figure 5-516**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

7) When it is completed, the input data is cleared. And then click [Close].

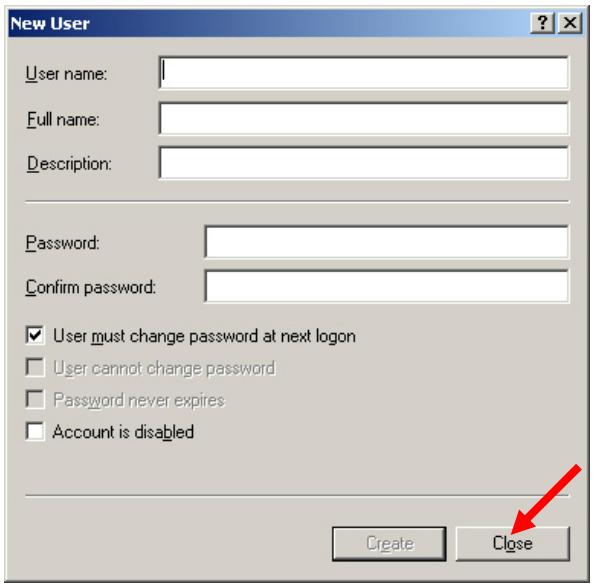



**Figure 5-517**

8) The previous screen is displayed. And then double-click [Users] to open it.

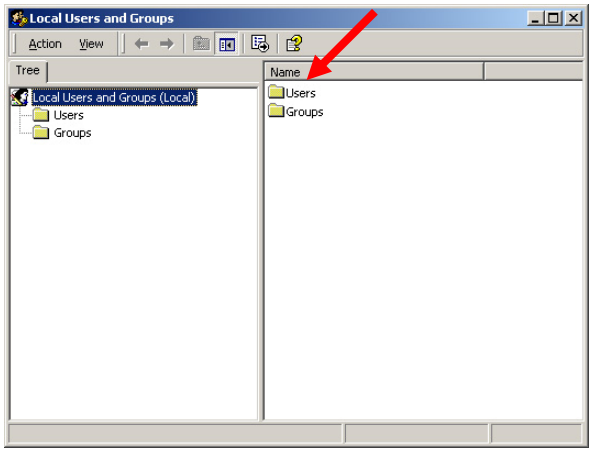



**Figure 5-518**

9) On the next screen, right-click [sf] which has been created at the previous section.

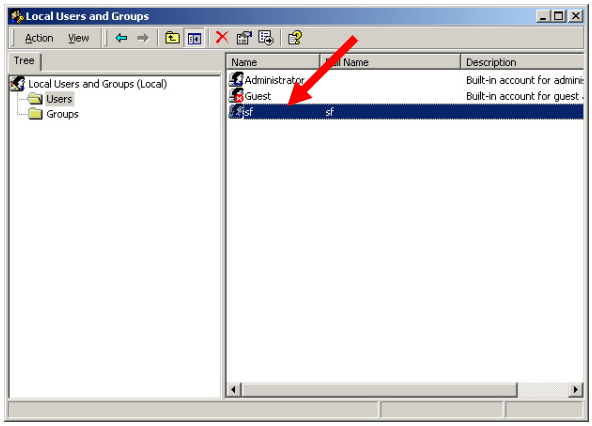



**Figure 5-519**

10) On the displayed menu, click [Properties].

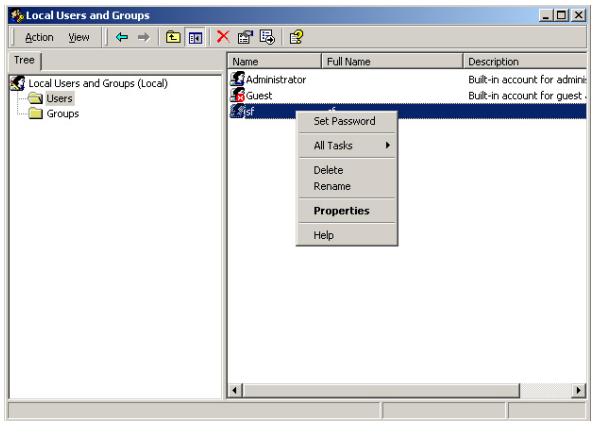



**Figure 5-520**

11) On the next screen, click the [Member Of] tab.

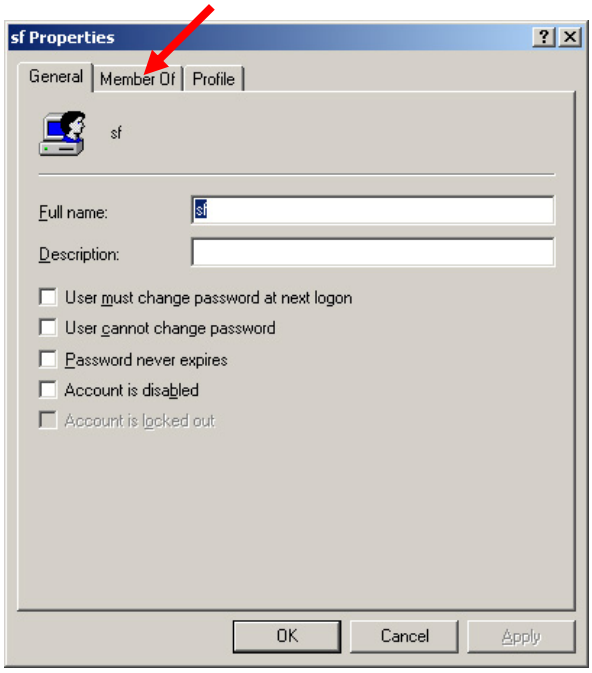



**Figure 5-521**

12) On the next screen, click [Add].

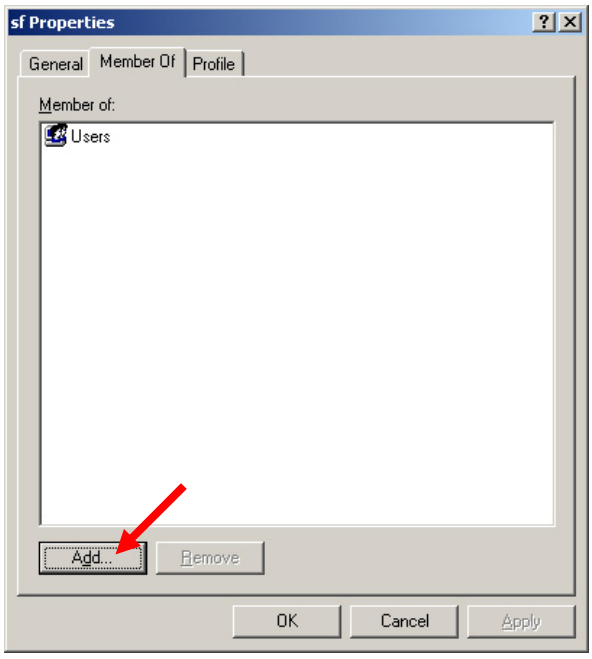



**Figure 5-522**

13) On the next screen, select [Administrators], then click [Add].

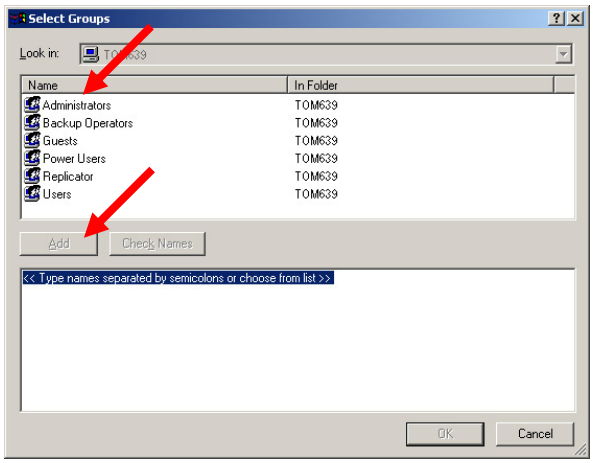



**Figure 5-523**

14) After [Administrators] has been added, click [OK].

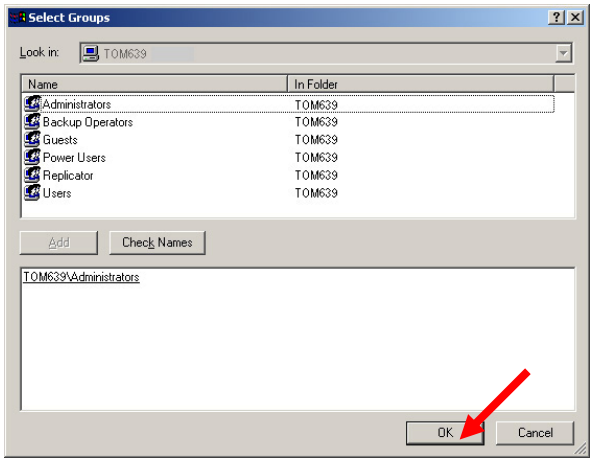



**Figure 5-524**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

15) On the next screen, confirm [Administrators] is displayed, then click [OK].

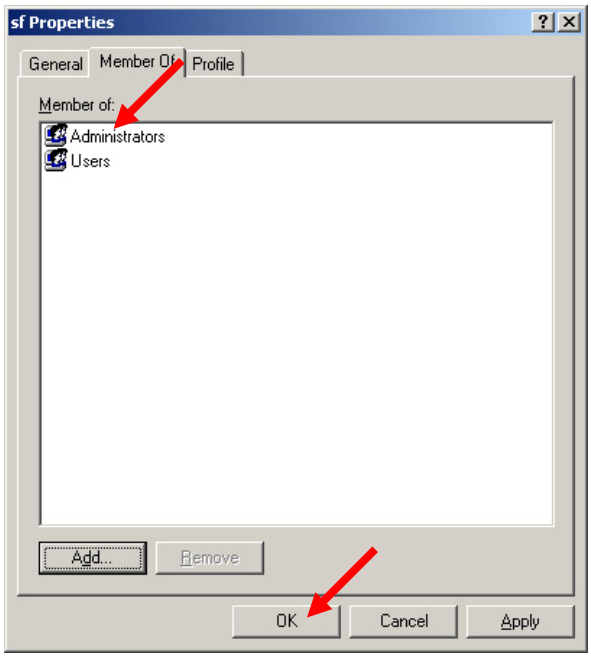



**Figure 5-525**

## 6. Creating a Shared Folder

◆ Purpose

To send image data, create a shared folder. And then add the permission to access the folder to the user account created at the previous section.

1) Create a new folder in any directory.
In here, a folder named [sf] is created on Desktop.

**Note:** Make sure that no other shared folder has the same name.

2) Open [Properties] of the folder, then click the [Sharing] tab.

**Figure 5-526**

3) On the next screen, select [Share this folder], and then click [Permissions].

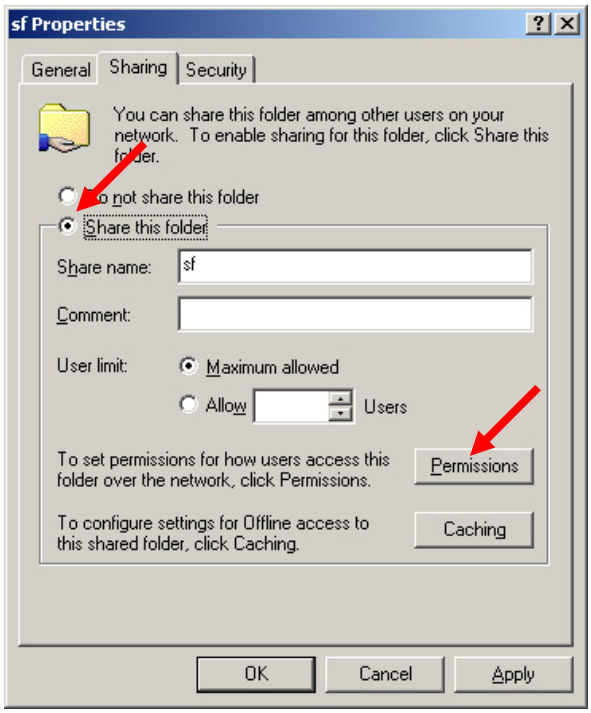



**Figure 5-527**

4) On the next screen, click [Add].

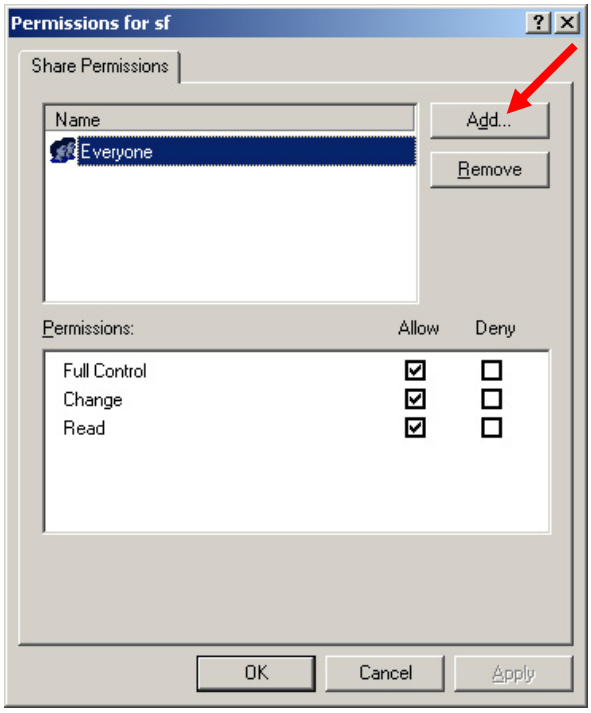



**Figure 5-528**

5) On the next screen, select the user name created at the previous section: [sf] in here, then click [Add]. After that, click [OK].

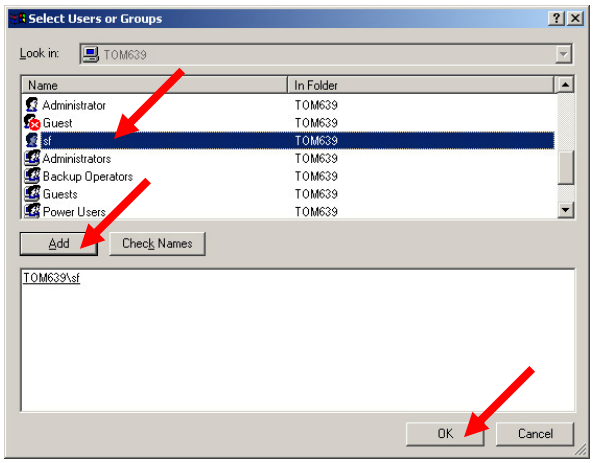



**Figure 5-529**

6) On the next screen, select the user name: [sf] in here, then select the [Allow] check box for [Full Control]. After that, click [OK].

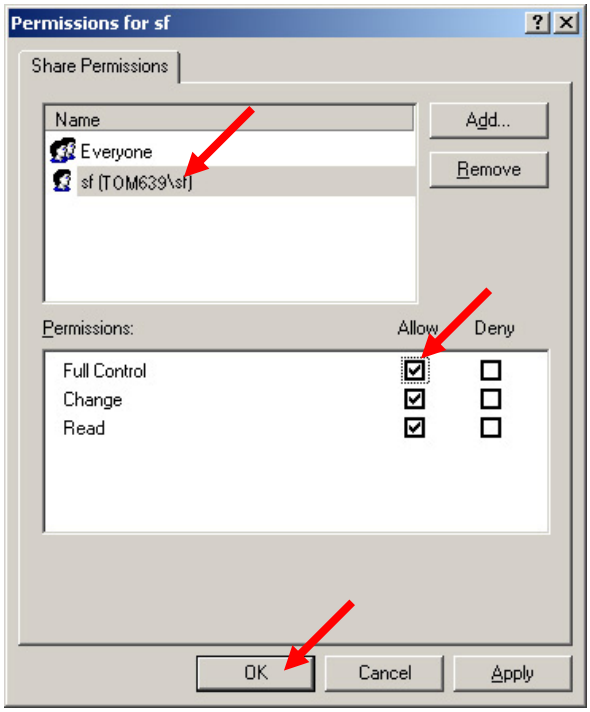



**Figure 5-530**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

7) The first screen is displayed. Click [OK].

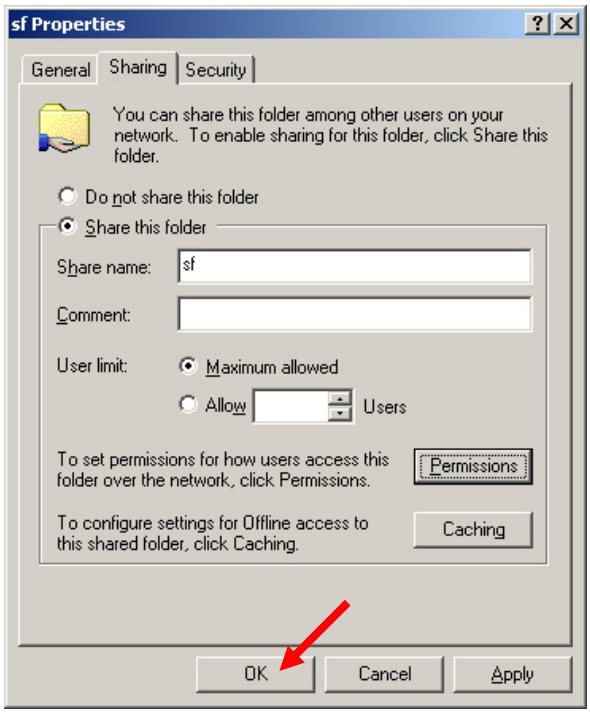



**Figure 5-531**

## 7. Sending Image Data

Refer to the user manual for details.

**Note:** On the [Shared folder] screen, you need to input [User name] and [Password] of the shared folder, then click [Browse].

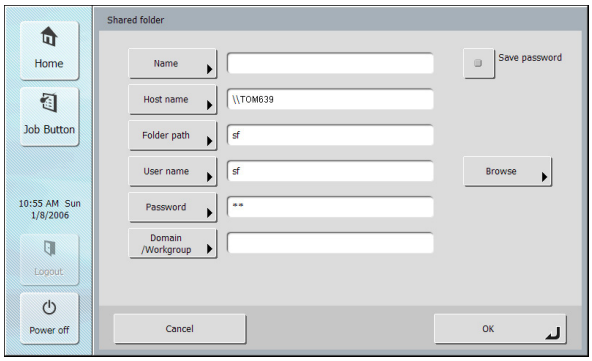



**Figure 5-532**

## 8. Initialization

Initialize the machine before returning it to the user.

And restore the TCP/IP setting of the computer.

## 9. Web Menu Check

In the previous section, the method to check the network function by sending image data to a shared folder with cross-over cable is described. Here is described how to check the Web menu function using some steps of this method.

◆ Outline steps

1) Preparation
2) Network settings for the machine
3) Network settings for computer
4) Internet settings for computer
5) Checking the Web menu function
6) Initialize

This section describes only “4) Internet settings for computer”. For step 1 to 3 and 6, refer to the previous section. For step 5, refer to the user manual.

◆ Internet settings for computer

Purpose: Disable the use of proxy server.

1) Click [Internet Options] in Control Panel.
2) On the next screen, click the [Connections] tab.

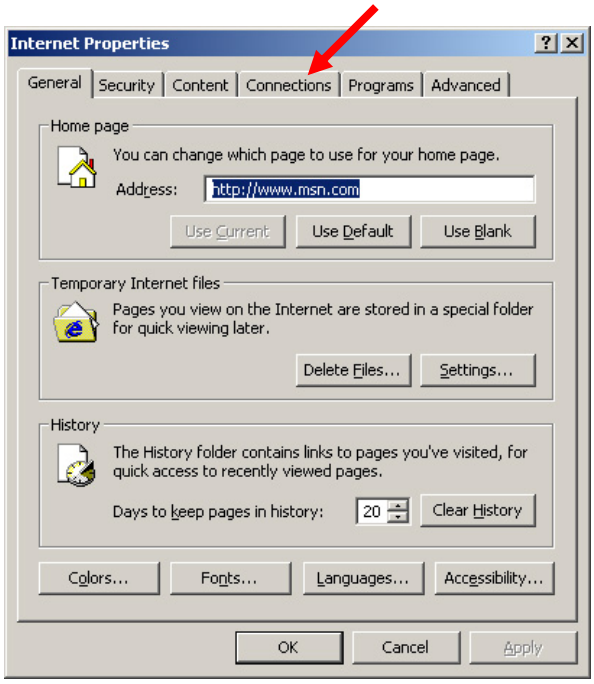



**Figure 5-533**

3) On the next screen, click [LAN Settings].

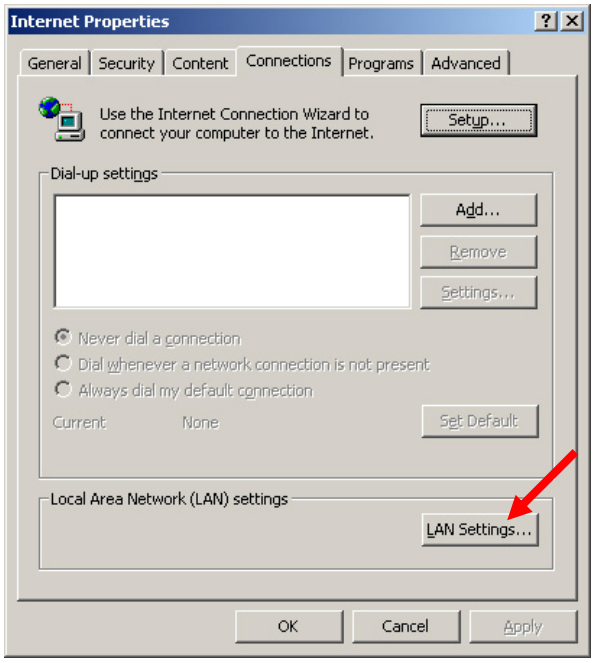



**Figure 5-534**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

4) On the next screen, clear the [Use a proxy server] check box.

**Note:** However, if you don't want to delete the current [Address] and [Port] settings of proxy server, there is another way. Perform the next step instead of this.

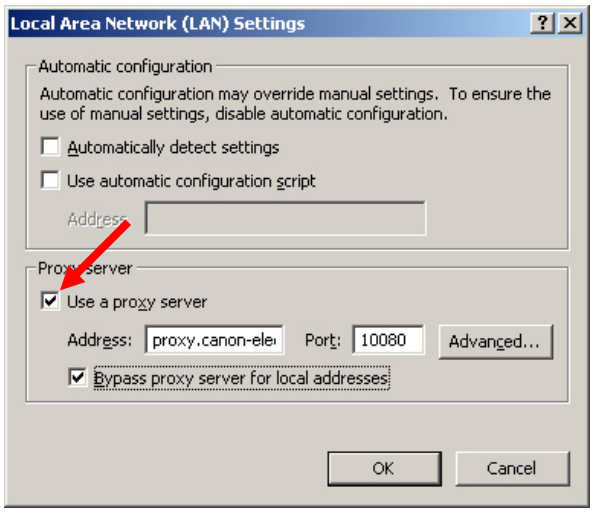



**Figure 5-535**

4') On the next screen, click [Advanced].

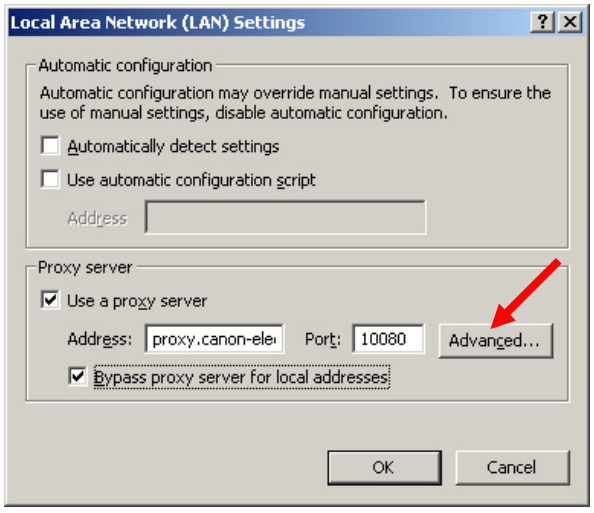



**Figure 5-536**

5') On the next screen, input the machine's IP address in [Exceptions]. Here, "1.1.1.2" is input as configured at the previous section.

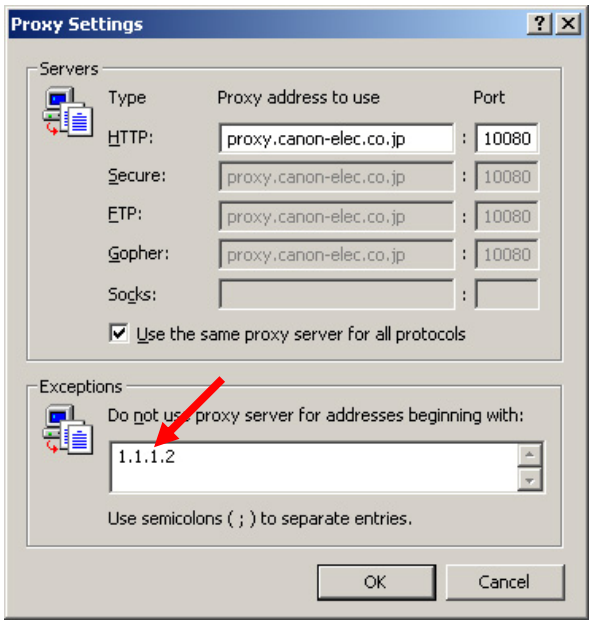



**Figure 5-537**

After the above setting is complete, start up "Microsoft Internet Explorer" on the computer. Then, input the machine's IP address to open the Web menu.

**Note:** Internet Explorer version must be 6.0 or later.

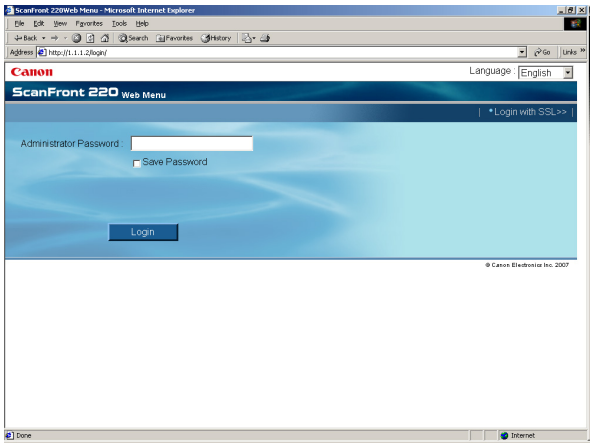



**Figure 5-538**

# VI. OTHER OPERATIONS

## 1. BIOS Settings

In case that the machine stops at start-up due to BIOS failure, use this procedure to reconfigure the BIOS settings.

After replacing the lithium battery for backup or after removing it once, this operation is necessary.

◆ Necessaries

Keyboard (PS/2 or USB type)

◆ Stop screen

The screen displayed when the machine stops due to BIOS failure is shown below. This is the [Phoenix-AwardBIOS] screen.

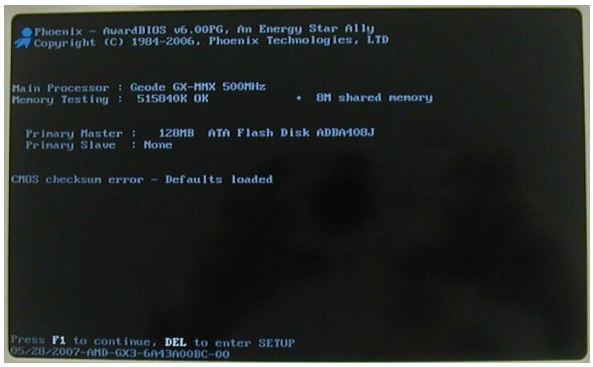



**Figure 5-601**

◆ Operation Procedure

1) If the machine stops at the above screen, hold down the power switch for about 4 seconds to turn the machine off.
2) Connect the prepared keyboard to the machine.
3) Turn the machine on.
4) When the machine stops at the above screen again, press the [DEL(Delete)] key.
5) When the [Setup Utility] screen is displayed, select [Load Optimized Defaults] with arrow keys.

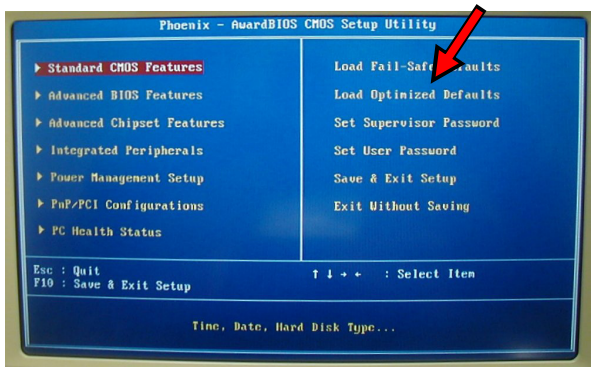



**Figure 5-602**

6) While [Load Optimized Defaults] is selected, press the [Enter] key. When the confirmation screen is displayed, press the [Y] key, then press the [Enter] key.

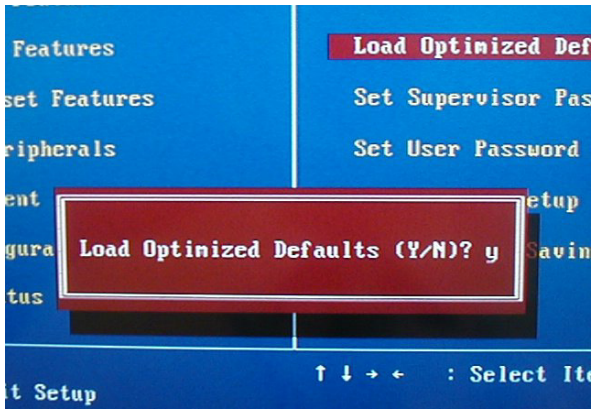



**Figure 5-603**


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

7) Next, select [Save & Exit Setup], then press the [Enter] key. The confirmation screen will be displayed. Confirm that [Y] on the screen is blinking, then press the [Enter] key.

**Note:** You can also press the [F10] key instead of selecting [Save & Exit Setup].

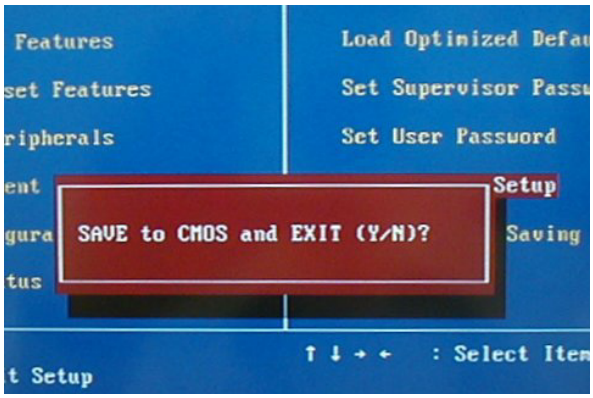



**Figure 5-604**

8) The screen proceeds automatically. The normal user's initial screen will be displayed.
9) If you use a PS/2-type keyboard, turn off the machine, then unplug the keyboard.
10) The reconfiguration is needed, since the time data is restored to default.

## 2. Hardware Check

This operation is performed to check whether the PCBs are working properly.

Check whether each PCB works properly when troubles such as the following occur:

- The machine cannot be turned on even though the AC adapter works properly.
- The machine shuts down during startup or starting document feed.
- The machine cannot scan image.

◆ Prepare

Disassemble the machine so that you can see the motherboard and the scanner PCB.

1) Unplug the AC adapter to cut the power supply.

**Note:** Even if the machine is off, the power keeps to be supplied to the machine as long as the plug is connected. Therefore, make sure to unplug it.

2) Remove the rear cover and the rear plate.

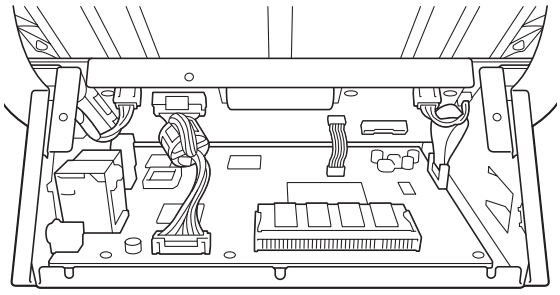


**Figure 5-605**

◆ Check LED on PCB

The defect parts are detected by checking the status of LEDs on PCBs.

1) After preparation is complete, plug the AC adapter.

**Note:** Since the power will be supplied to the PCB, do not touch electrical parts inside machine.

2) Check if LED601 (16V) or LED602 (5/3.3V) at the rear right of the motherboard are lit.
   If they are, the power supply is normal.
3) Next, press the power switch.
   Right after pressing it, check if LED603 (2.5/1.25V) at the front right of the motherboard is lit.
   This LED indicates the power supply for CPU. If it is lit, the motherboard CPU is working normally (however, there are some exceptions).
4) After a few seconds after pressing the power switch, check if LED501 (CPU operation) at the rear center of the scanner PCB is lit. If it is, the scanner PCB CPU is working normally.

◆ Check with simulation mode
The mode, called simulation mode, starts up the machine while the motherboard and scanner PCB are separated electrically.
This mode enables to detect which, the scanner PCB or the motherboard, causes the problem.

1) After preparation is complete, disconnect one connector of each of the following cables connecting the motherboard and the scanner PCB.
   ① Motherboard J502: power supply

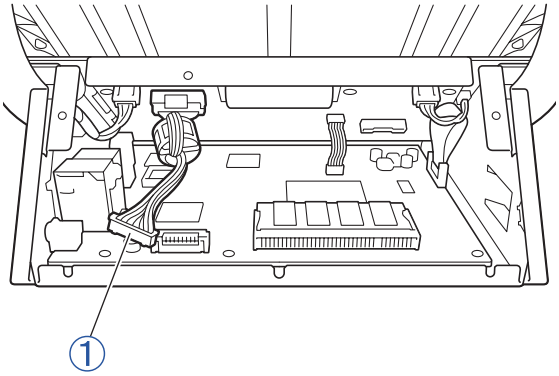



**Figure 5-606**

2) Plug the AC adapter, then press the power switch.
3) If the motherboard works properly, the machine starts up normally.
4) The machine displays the error screen at startup.
5) Press [OK], then the normal initial screen will be displayed.
6) Turn off the machine.

**Note:** If the machine does not start up normally, the problem is caused by the motherboard. If it does, the problem is caused by the scanner PCB.


COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

## 3. Reinstallation

This operation is used to reinstall the software in case that the machine becomes inoperable due to such as OS failure.

You can write files saved on the USB memory to the machine. The same USB memory and update files as used in “D. Update” are used in this operation.

◆ Operation procedure

1) Prepare a USB memory containing the necessary file.
2) The boot switch is located behind the small hole on the right side of the main body. While pressing the boot switch with a thin tool inserting into this hole, press the power switch.

**Note:** Although you cannot see the boot switch from outside, make sure to feel a click of the switch. Keep pressing the boot switch even after releasing the power switch.

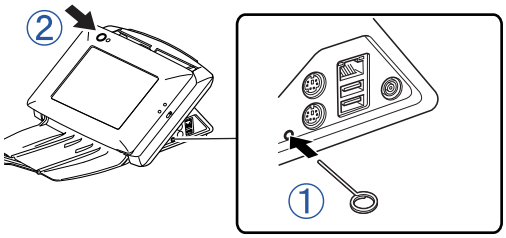



**Figure 5-607**

3) Confirm that, after the product name screen and the black screen are displayed, the following text screen is displayed, then release the boot switch.
“Please connect the USB memory to the device. If it is not recognized, please connect it again.”

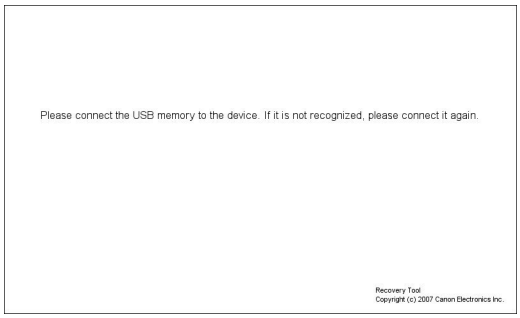



**Figure 5-608**

4) Plug the prepared USB memory to the machine’s USB port.
5) When the USB memory is detected, the operation proceeds automatically while some progress screens are displayed. One of them is shown below.

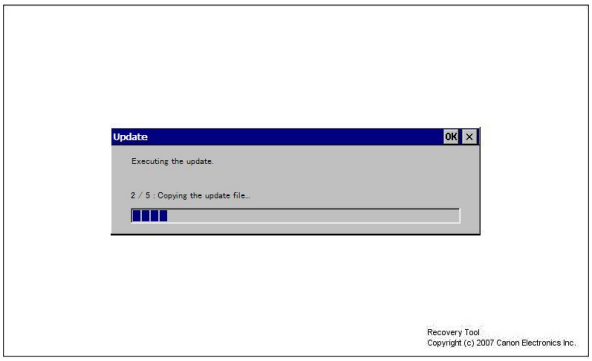



**Figure 5-609**

6) After reinstallation is complete, the machine is restarted automatically.
7) After the machine has been restarted, the user’s initial screen will be displayed.
8) Confirm the installed version number on [Check Device] on the service mode. Also check if user settings such as language

and time, or user data such as password are carried over.

**Note:** Although it depends on troubles, normally previous user settings and user information are carried over.


COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# VII. AFTER REPLACING PARTS

Some of the parts used in this machine require adjustments and settings after being replaced or disassembled/reassembled. The list is the following.

| Parts | Light Adjust. | Regist Adjust. | Software Update | Data Restore | BIOS settings | Counter reset |
|---|---|---|---|---|---|---|
| Motherboard | Execute | | Execute*1 | Execute*2 | | |
| Scanner PCB | | Execute | Execute*1 | | | |
| Reading unit | Execute | Execute | | | | |
| Regist related | | Execute | | | | |
| Fingerprint sensor PCB | | | Execute*1 | | | |
| Lithium battery | | | | | Execute | |
| Consumable parts replaced by users | | | | | | Execute*3 |

**Table 5-701**

*1: Software update
Confirm the version after replacement, then execute if necessary.

*2: Data restoration
Ask the user to restore or reconfigure data.

*3: Counter resetting
When the user replaces an exchange roller kit, the user resets the counter.
When the service technician replaces it, ask the user to reset the counter.

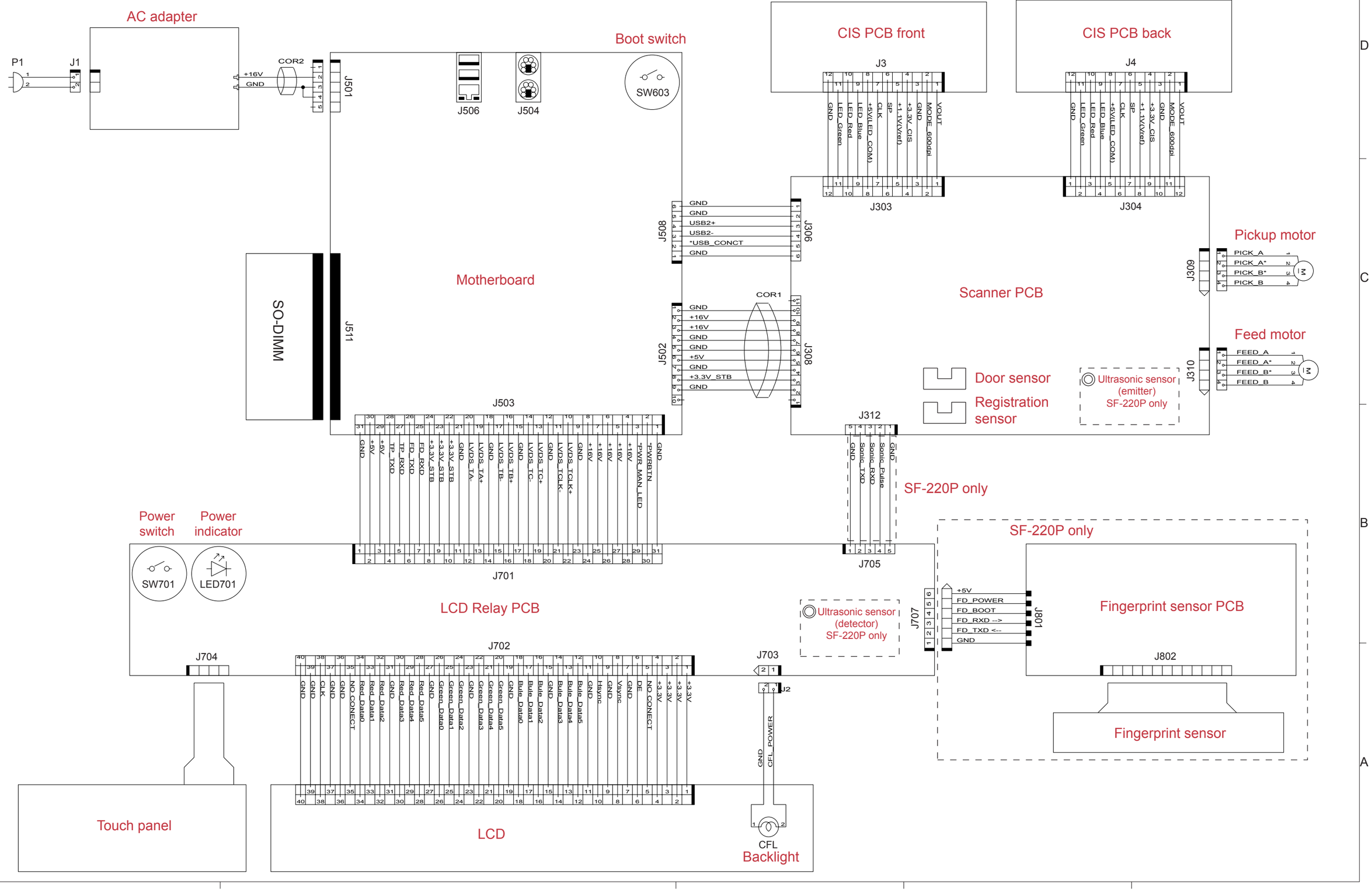
COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# APPENDIX

I. GENERAL DIAGRAM ..... A-1 | II. LIST OF SPECIAL TOOLS..... A-2

COPYRIGHT © 2007 CANON ELECTRONICS INC. CANON SF-220/220P FIRST EDITION JULY 2007

# I. GENERAL DIAGRAM




COPYRIGHT © 2007 CANON ELECTRONICS INC. 

# II. LIST OF SPECIAL TOOLS

The list of special tools needed for service works of this machine is the following.

However, these are the same as used for other machines or commercially available.

| No. | Tool name | Tool number | Rank | Usage/Remarks |
|---|---|---|---|---|
| 1 | Shading sheet | TKM-0326<br>TKM-0332 | B | For the light adjustment<br>Same as used for DR-2050C |
| 2 | Regist adjustment sheet | | B | For the regist adjustment<br>Created of copier paper by service technicians |
| 3 | Computer | Commercial | B | For checking each setting<br>Windows, network compatible |
| 4 | Crossover cable | Commercial | B | For checking each setting<br>LAN cable with cross connections |
| 5 | USB memory | Commercial | B | For software update<br>With no security function |
| 6 | Keyboard | Commercial | B | For BIOS settings<br>PS/2 or USB interface |

**Figure A-201**

**Note:** Rank symbol

A: Each service technician must have one.

B: A group of five technicians must have one.

C: A workshop must have one.

COPYRIGHT © 2007 CANON ELECTRONICS INC. 

**Prepared by**

**Quality Assurance Center**
**Canon Electronics Inc.**

**3-17-7 Shibaura, Minato-ku**
**Tokyo 108-0023, Japan**

**FIRST EDITION: JULY 2007 (63999)**

Canon

0707AB