LASER CLASS® 9000 / 9500
PLAIN PAPER FACSIMILE

LASER CLASS® 8500
PLAIN PAPER FACSIMILE

SERVICE MANUAL

REVISION 2

LASER CLASS 9000	H12-0672	120V
LASER CLASS 9500	H12-0912	120V
LASER CLASS 8500	H12-1012	120V
FXL-CASSETTE FEEDER 5	H12-3152	120V
OPTION MEMORY VII (2MB)	H12-4711	
OPTION MEMORY VII (4MB)	H12-4721	
VERIFICATION STAMP UNIT 1	H12-3162	
HANDSET KIT 2	H12-3042	120V

Canon

HY8-19AB-020

JULY 1997

 CANON LASER CLASS 9000/9500/8500 JULY 1997 PRINTED IN JAPAN (IMPRIME AU JAPON)

Application

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

Corrections

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

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DTP System

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I. MEANINGS OF MARKS

The marks used in this manual have the following meanings.

Mark	Meaning
	States a precaution to be taken to prevent danger to personnel, damage to the product, or damage to electronic components by discharge of static electricity. for example.
	States a precaution to be taken to prevent damage to electronic components by electrostatic discharge.
	Informs you of fire-related cautions.
	Informs you that the plug must be removed from the power outlet before starting an operation.
 NOTE	Gives useful information to understand descriptions.
 REFERENCE	Indicates sections to be read to obtain more detailed information.

II. ABOUT THIS MANUAL

This manual is divided into five parts, and contains information required for servicing the product.

Each of the above parts is further divided into the following five chapters:

Chapter 1: Safety and Precautions

This part explains how to service the unit safely. It is very important, so please read it.

Chapter 2: Operating Instructions

This part explains how to operate the unit properly. Information required about installation, service operations and service switches.

Chapter 3: Technical Reference

This part explains the product specifications and the technical theory of the product.

Chapter 4: Maintenance and Service

This part explains how to maintain the products for adjustment and troubleshooting.

Chapter 5: Appendices

This part explains the informations of the optional products.

- For more details of user operations and user reports, see the separate volume of USER'S GUIDE.
- Procedures for assembly/disassembly and greasing points are not given in this manual. See the illustrations in the separate volume of PARTS CATALOG.
- Detailed description of each SSSW/parameter is not given in this manual except the new SSSWs/parameters added to this model. See G3 Facsimile Service Data Handbook (supplied separately) for details of them.
- See the G3 Facsimile Error Code Handbook for details of the error codes not shown in this manual.

III. REVISION HISTORY

REVISION	CONTENT
0	Original
1	LASER CLASS 8500 added Error correction
2	LASER CLASS 8500 included in header

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Chapter 4: Maintenance and Service

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Chapter 1

Safety and Precautions

Safety and Precautions

1. DANGER TO PERSONNEL

1.1 Electric Shock

Precautions
Before disassembling the fax, carry out the following to prevent electric shock:

(1) Disconnect the power cord from the outlet.
(2) Disconnect the modular jack cord (telephone line) from the fax.

Precautions when servicing the fax with the power on
When you must service the fax with the power cord plugged in, you must not ground your body with grounding wrist straps.
This is to prevent electricity passing to your body.

1.1.1 AC line (AC 120V household current)

Power supply unit (primary side)

The AC 120V is supplied to the primary side of the power supply unit when the power cord is plugged in.

1.1.2 Telephone line

NCU board (primary side)

When connected to the telephone line, a line voltage of approx. DC 48V is supplied to the fax from the telephone line.

And when the ringing signal is received, approx. AC 90Vrms is supplied.

1.1.3 Printer high voltage terminal

When the printer cover sensor lever and the cartridge sensor lever are pressed with the right cover and exit paper cover closed, voltage of approx. 1200 VDC maximum is supplied to the printer high voltage terminal. When you press the printer cover sensor lever and the cartridge sensor lever, be careful not to touch the high voltage terminal.

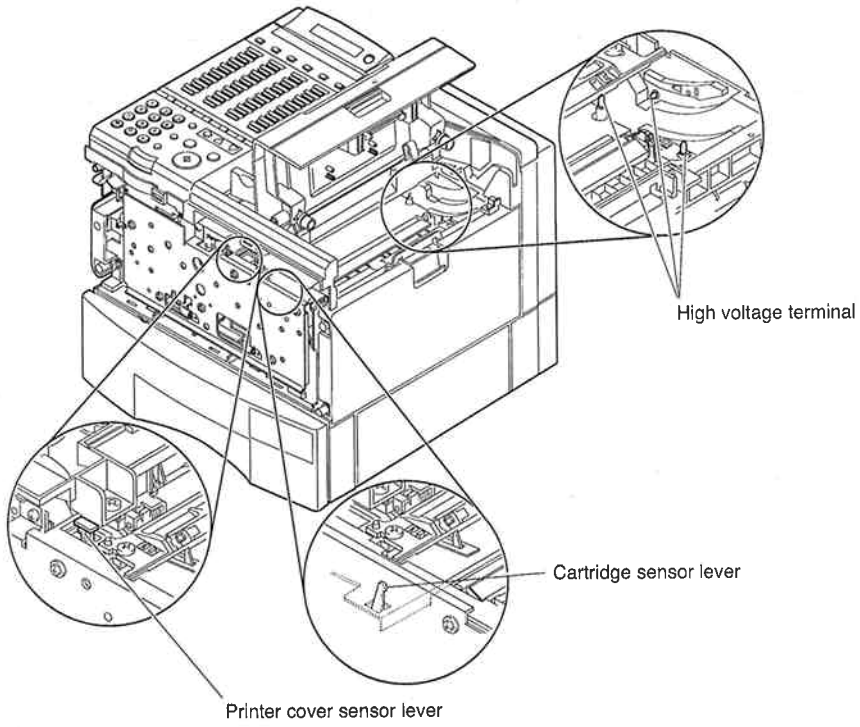

Figure 1-1 Printer High Voltage Terminal

1.2 High Temperature Parts

Precautions

To prevent burns while disassembling the fax, disconnect the power cord at least 10 minutes before starting disassembly, to allow high temperature parts to cool down.

How to treat burns

Heat of about 122°F (50°C) or more causes burns. Also, the longer the contact, the more severe the burn.

When treating a burn, the first minute after receiving the burn is the most important. Cool the burn immediately with cold running water. In the case of a serious burn, seek medical attention immediately.

The temperatures of the parts shown below become more than 50°C during operation.

Be Careful not to burn yourself on any of these parts during servicing.

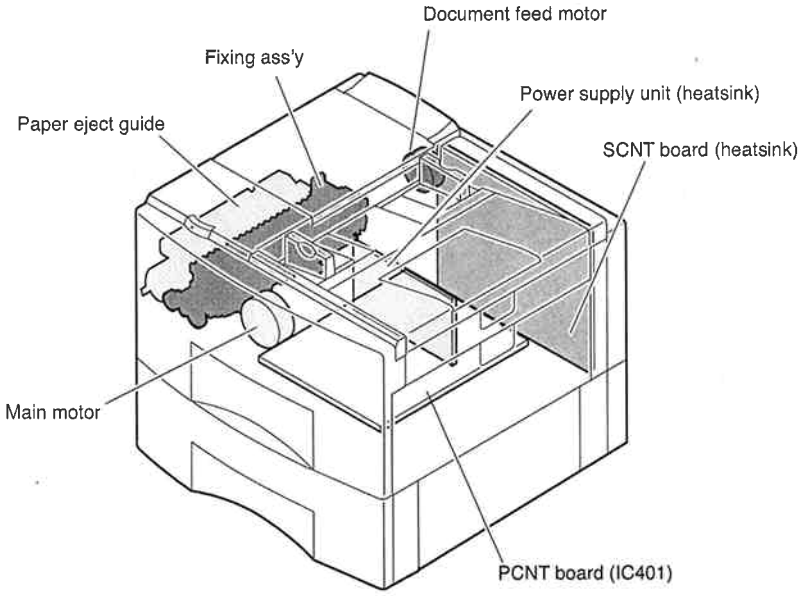

Figure 1-2 High Temperature Parts

1.3 Fire

Danger
Do not throw lithium battery into fire.

Lithium battery
Lithium battery contain lithium, organic solvents and other combustible substances. If lithium battery is thrown into fires, it may rupture and burn fiercely.

Follow local applicable laws and regulations when disposing of the lithium battery from the SCNT board.

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1.4 Moving and Rotating Parts

Precautions

To prevent accidents involving moving or rotating parts during servicing, that disconnect the power cord before starting disassembly.

When you must service the fax with the power cord plugged in, you must not wear bracelets, necklaces, neckties, or other objects. Also, take care to prevent hair and other articles of clothing from becoming entangled.

The fax is provided with a protection function which stops moving and rotating parts in the printer, when the exit paper cover, printer cover, right cover or feeder right cover is opened during operation. However, if these sensors have to be moved when carrying out servicing with the power cord plugged in, moving and rotating parts will operate even with these covers open.

NOTE

Since this fax does not have a sensor to detect when the front cover or rear cover is removed, even if you open the front cover or rear cover while this fax is operating, the gears and rollers continue to move.

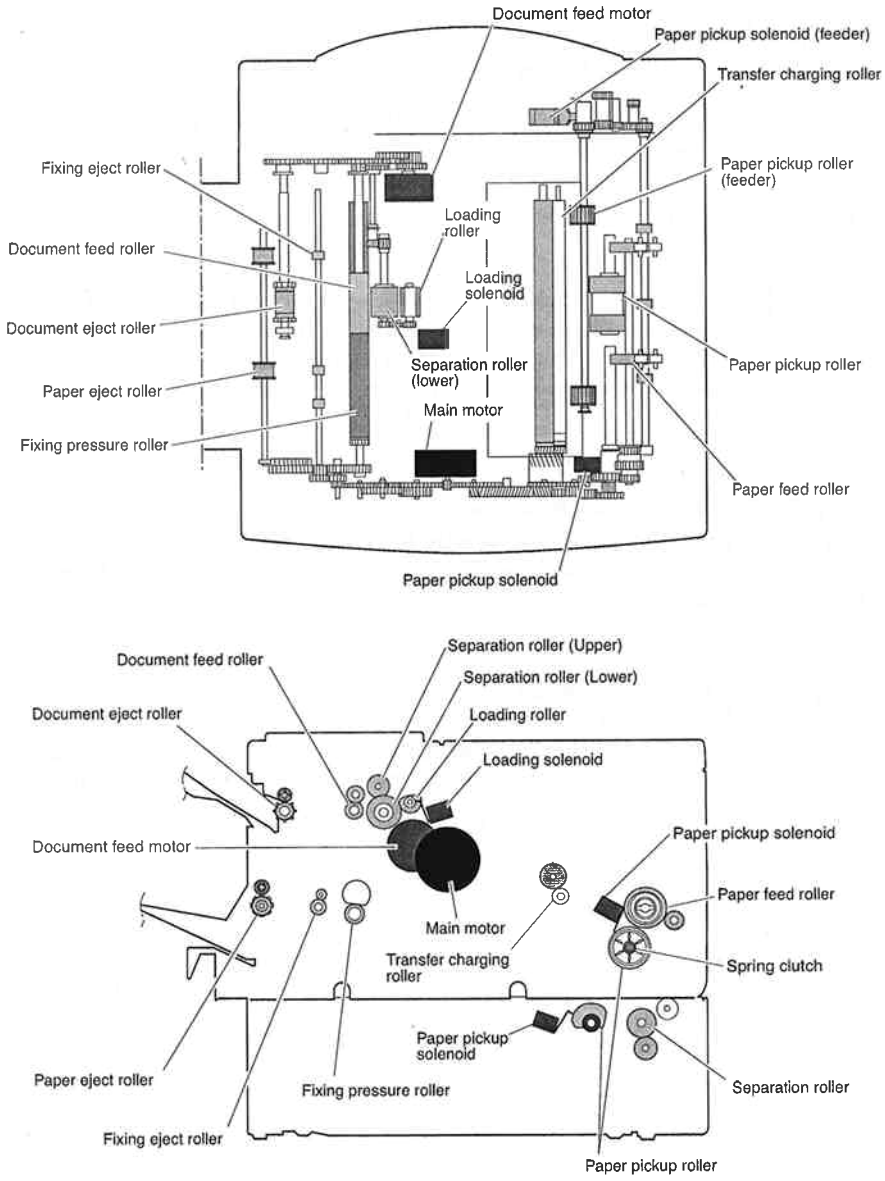


Figure 1-3 Moving and Rotating Parts

1.5 Laser Beams

This fax complies with 21 CFR Chapter 1 Subchapter J as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the fax does not produce hazardous laser radiation. However, observe the precautions below to avoid radiation by laser beams during servicing involving disassembly.

Warning

If the laser light gets in your eyes, it will damage the retina. Always remain within the contents of this manual when servicing, and do not carry out any other maintenance. Within the range of service work in this manual, you will not be exposed to dangerous laser light.

Disassembly Prohibited

Never disassemble or alter the printer section laser/scanner unit. There is no servicing that requires you to disassemble the laser/scanner unit.

NOTE

Safety Mechanism

This fax is designed with a structure such that the laser shutter only opens when the toner cartridge has been inserted into this fax. This keeps the laser from operating other than during normal operations.

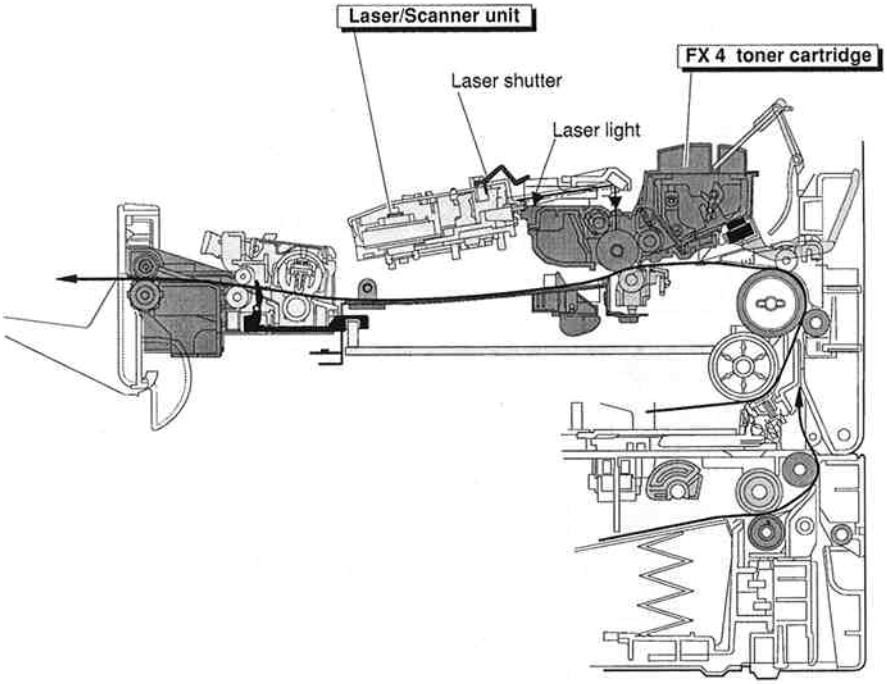
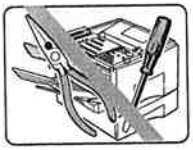


Figure 1-4 Laser Shutter

2. DANGER TO EQUIPMENT

2.1 Handling the FAX

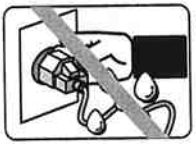
General Precautions



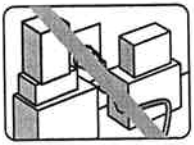
- TO AVOID SERIOUS INJURY, NEVER DISASSEMBLE THE FAX. EXPOSED POWER POINTS INSIDE THE FAX CAN CAUSE ELECTRICAL SHOCK IF YOU TOUCH THEM.

- After you unplug the fax unit, always wait at least 5 seconds before you plug it in again. Always unplug before you move the fax.

- During electrical storms, disconnect the plug from the power outlet. The fax can hold documents in the memory for up to 12 hours.

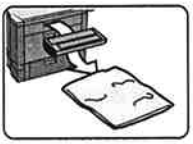


- Before you attach or remove the plug from the power outlet, make sure your hands are dry.



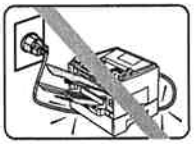
- Do not stack boxes or furniture around the power outlet. Keep the area open so you can reach the outlet quickly. If you notice anything unusual (smoke, strange odors, noises) around the fax, turn the fax off immediately and unplug it. Call for service.

Figure 1-5 Precautions 1

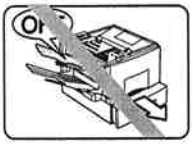


- Before you transport the fax, remove the cartridge. To protect the cartridge from bright light, cover it with its original protective bag or a cloth.

- Keep liquids, cleaners, and other solvents away from the fax unit. Keep metal pins, paper clips, staples and other objects away from the fax. If something falls into the fax unit, remove the plug from the power outlet, and call for service.



- Do not set the fax unit, other equipment, or furniture on the power cord. Never knot the power cord or wrap it around another object.



- To avoid paper jams, never unplug the power cord, open the printer cover or remove a paper cassette during printing.

- When you lift the fax, hold it by the front and back sides. Never try to lift the fax by gripping the side paper cassette and the feeder right cover.
- When you lift the fax unit, tilt it back slightly to prevent the front cassette from sliding out of the fax unit.
- Never grip and lift the fax by the feeder right cover. Always grip and lift by the front and back sides as shown in the illustration.

Figure 1-6 Precautions 2

2.2 Storage and Handling of Toner Cartridge

The FX 4 cartridge is constantly affected by the environment as sealed in the package or installed on fax. It changes with time regardless of the number of sheets printed. Since the progress of aging depends on the installation and storage environments, no general rule is available. The FX 4 cartridge should be carefully stored and handled.

2.2.1 Storing a sealed FX 4 cartridge package

When storing an FX 4 cartridge in a warehouse or workshop, use the range shown in the table. Also note the following:

a) Avoid any areas exposed to direct sunlight.
b) Do not place the package in any location which are subject to severe vibration.
c) Do not bump or drop the package.
d) Avoid any environments which are subject to high-temperature. Keep the package below 95°F (35°C).

Temperature	Normal (total storage time × 9/10)		32 to 95°F (0 to 35°C)
	Severe (total storage time × 1/10)	High	95 to 104°F (35 to 40°C)
		Low	–36 to 32°F (–20 to 0°C)
	Temperature change (within 3 minutes or so)		104 °F→ 59°F (40°C → 15°C) –36°F → 77°F (–20°C → 25°C)
Relative humidity	Normal (total storage time × 9/10)		35 to 85% RH
	Severe (total storage time × 1/10)	High	85 to 95% RH
		Low	10 to 35% RH
	Air pressure		613 to 1013 hPa (460 to 760 mmHg)

Table 1-1 Temperature and Humidity/Storage Conditions

2.2.2 Storing an unsealed FX 4 cartridge package

The organic photoconductor (OPC) is used in the photosensitive drum. Intense light damages the photosensitive drum. And the toner is also contained in the FX 4 cartridge. It is very important to fully explain the various points regarding storing and handling an opened package to customers.

a) Avoid any areas which are exposed to direct sunlight and any bright areas such as a window side. Avoid leaving the package in a car for an extended period of time since the temperature inside a car may become very hot.
Even when the package is kept in a storage box, it is still important to avoid any areas which are directly exposed to sunlight or leaving the package in a car for an extended period of time.
b) Avoid environments subject to high-temperature and high-humidity, or low-temperature and low-humidity. Also avoid any areas which are subject to abrupt changes in the temperature or humidity such as near an airconditioner.
c) Avoid any dusty areas or any locations which are subject to ammonia gas or organic solvent gas.
d) Keep the FX 4 cartridge below 95°F (35°C).
e) Avoid placing the package near a CRT, disk drive unit, or floppy disk.

2.2.3 Notes on handling

Do not place the cartridge in fire. Toner powder is flammable.

a) Before installing a new FX 4 cartridge in the fax, hold the FX 4 cartridge horizontally as shown below, and slowly shake it approx. 5 times at a 45 degree angle in both directions to even the toner. Do not shake the FX 4 cartridge in any other manner, since the toner may leak from the developing and cleaner unit.
   To be sure that an output image is not soiled by a toner leak, print 3 to 5 sheets of test patterns after setting the FX 4 cartridge in the fax.
b) If blank spots do occur in some areas of the output image during printing due to an uneven distribution of toner in the cartridge, shake the FX 4 cartridge as indicated in 1) above to evenly distribute the toner.
c) Do not place the FX 4 cartridge in an upright position or turn it upside down as shown below. Do not swing the cartridge.
d) Do not open the protective shutter of the photosensitive drum. And never touch the drum surface. If the drum surface is dirty, replace the FX 4 cartridge.
e) Never disassemble the FX 4 cartridge.
f) Do not subject the FX 4 cartridge to vibration or shock.
g) The photosensitive drum can be easily damaged by intensive light. If it is exposed to strong light, blank spots or black stripes may appear on the print image.
   Faulty print images such as blank spots or black stripes can be corrected by stopping the print operation. However, if the drum is exposed to light for an extended period time, the blank spots and black stripes may remain even after stopping the print operation.
   To prevent this, be sure to always place the FX 4 cartridge into an original protective bag or keep it covered. Do not leave unprotected the FX 4 cartridge removed from the fax.

If the FX 4 cartridge is irradiated by ordinary light for five minutes and then left in a dark area for five minutes, it will be possible to correct the print quality to virtually allowable level. However, do not expose the FX 4 cartridge to direct sunlight.

2.3 Precautions when Servicing

2.3.1 Damage due to ESD (ElectroStatic Discharge)

This fax contains contact sensor and printed circuit boards that use many electrical components such as ROM, RAM and custom ICs. A static charge can damage these components, so, care must be taken to prevent damage caused by electrostatic discharge when disassembling the fax.

Static electricity

Electrostatic discharge damages electronic components and alters their electrical characteristics. Even plastic tools and hands without grounding wrist straps will generate enough static electricity to damage electronic components.

The following equipment is needed to prevent electrostatic discharge damage:

- An earthed conductive mat
- Grounding wrist straps
- Crocodile clip cable for earthing metal parts on the fax

Carry out the following countermeasures if the above equipment is not available, for example, when travelling to a remote site to service a fax:

- Use an grounding bag for storing or carrying printed circuit boards or electronic devices.
- Avoid wearing silk or polyester clothing, or leather-soled shoes. Wear cotton clothing and rubber-soled shoes.
- Avoid servicing the fax in carpeted rooms.
- Before starting servicing, touch grounded earth terminals to discharge any static electricity charges.
- Wear grounding wrist straps, and earth metal parts on the machine.
- Handle printed circuit boards and electronic devices by their edges and packages. Do not directly touch electronic devices with your fingers.

Electric shock when carrying out work with the fax turned on

When you must service the fax with the power cord plugged in, you must not ground your body with grounding wrist straps. This is to prevent electricity passing to your body and causing electric shock.

2.3.2 Lubrication points

Do not touch the greased parts. If you do, the grease (applied for smooth operation of the printer mechanism) will come off.

Use only specified grease.
If you use other grease, the grease may oxidize, and weaken plastic parts.

REFERENCE

If you accidentally touch a greased part and grease comes off, reapply the grease, *see the PARTS CATALOG (supplied separately).*

2.3.3 Scanner section

a) Contact sensor

Handle the contact sensor carefully to avoid scratching or dirtying its scanning surface. Scratches or dirt on the scanning surface can cause vertical stripes or other defects to appear in the scanned image.
Also, if the contact sensor scanning section is exposed to external light for prolonged periods, its characteristics deteriorate, resulting in blackish scanned images. During servicing, do not expose the contact sensor scanning section to external light for prolonged periods.

b) Auto document feeder (ADF) rollers

Handle the ADF section rollers to avoid scratching or dirtying them. If they are scratched or dirtied, vertical stripes or other defects may occur in the scanned image and the document may jam.
If the roller is dirtied, clean it with a soft, dry cloth.

2.3.4 Printer section

a) Transfer charging roller

If skin, oil or, the like, gets on the sponge section of the transfer charging roller, the rear side of the recording paper can be soiled, and blank patches can occur in printing.

During disassembly, hold the transfer charging roller by the shaft and gears at both ends.

b) Fixing ass'y

If you get skin, oil, or the like, on the internal fixing film or pressure roller surface, the front or rear of the recording paper may be soiled, and fixing defects, and jams can occur.

During disassembly, hold the fixing ass'y by the plastic sections. Hold the pressure roller by the shaft, at both ends of the rollers.

c) Mirror

Do not touch the mirror. Doing so can cause vertical stripes in copied or received images.

REFERENCE

Cleaning method

For details of how to clean these parts, see *Chapter 4: Maintenance and Service.*

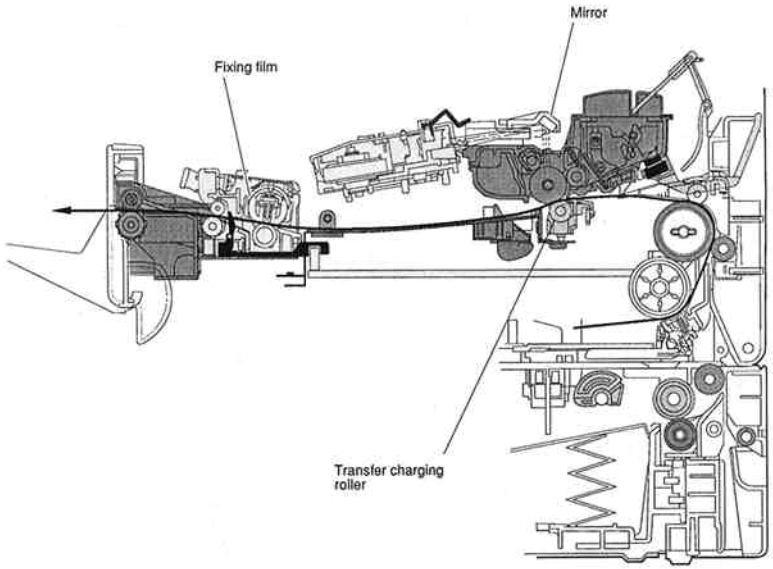


Figure 1-7 Printer Section

2.3.5 Paper load section

a) Lifting Arm Position

When having assembled the separation ass'y after parts replacement, before setting the side cassette, install the toner cartridge, close the printer cover, connect the power cord, and the lifting arm moves automatically to its initial position.

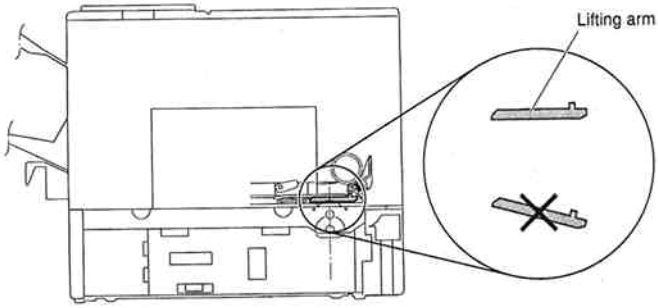


Figure 1-8 Lifting Arm Initial Position

b) Pickup Roller Position

When having assembled the paper pickup roller after parts replacement, before setting the front cassette, install the toner cartridge, close the printer cover, connect the power cord, and the pickup roller moves automatically to its initial position.

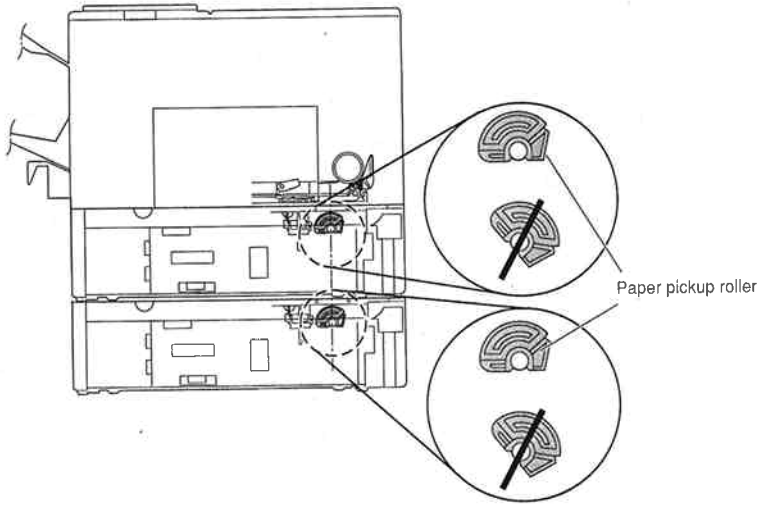


Figure 1-9 Pickup Roller Initial Position

2.3.6 Control boards

a) SCNT board

Jumper plug J6 is for factory check only. Service personnel must not remove it.

SCNT board data

User data, service data are stored in memory on the SCNT board. If the SCNT board is replaced, these data will be lost. Therefore, these data must be printed out before replacing the SCNT board.

For details, *see page 1-21, 3. PRECAUTIONS FOR DATA PROTECTION.*

b) Power supply unit

Trimmer volume control VR101, VR261 is for factory adjustment only. Service personnel must not change its setting.

2.3.7 Replacing ROM

Observe the following precautions when replacing the ROM on the SCNT board, for example, when replacing a defective ROM or when upgrading the software.

a) Preparation

Print out all battery backed up data.

Reception image data in image memory is erased approx. 12 hour after power is turned off.

REFERENCE

For details on battery backed up data, *see page 1-21, 3. PRECAUTIONS FOR DATA PROTECTION.*

b) Replacement

(1) Make sure that the power cord and the telephone line are disconnected.
(2) Put on the grounding wrist straps to counter electrostatic discharge.
(3) Remove the rear cover, and shield cover *referring to the "Parts Catalog" (supplied separately).*
(4) Remove the ROM mounted on the SCNT board using the ROM extractor etc..
(5) Insert the new ROM, making sure that the notches on the ROM package and IC socket are aligned.

c) After replacement

(1) When a defective ROM is being replaced with a new ROM, turn the power on after mounting on the SCNT board. This completes replacement.
(2) When the ROM is replaced for upgrading the software and upgrading involves changing software switch settings such as service data, you must perform the following operation.
- Perform All Clear operation. After you perform All Clear operation, register the backed up data referring the list you printed out earlier.

When the LASER CLASS 8500 is installed in Canada, set the country type to CANADA for the #5 TYPE setting after performing an All Clear operation, then register the backup data.

3. PRECAUTIONS FOR DATA PROTECTION

3.1 Battery-backed up Data

The SCNT board is provided with a function for backing up data in control / image processing memory (SRAM) and image storage memory (DRAM) by lithium battery, and rechargeable battery, even if a power interruption occurs, or the power cord is disconnected by accident.

The power need not be turned off when clearing document jams and recording paper jams.
When servicing requires that fax power be turned off for more than 12 hours, stored reception image data must be printed out before the power is turned off. If the reception image data cannot be printed out due to printer engine trouble, transfer the stored reception image data to another fax. For details, *see page 1-23 b) Reception image data transfer.*

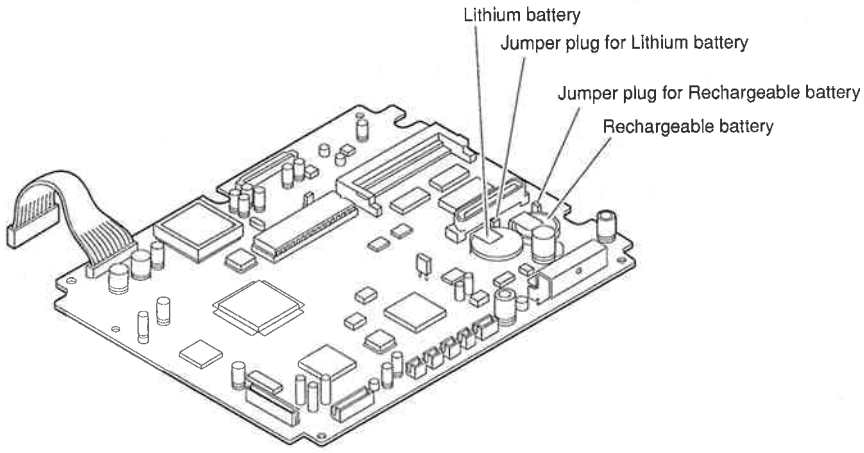


Figure 1-10 Lithium / Rechargeable Battery and Jumper Plugs

3.1.1 Backed up by rechargeable battery

Transmitted and reception image data stored in the DRAM, on the SCNT board, are backed up for approx. 12 hours by the rechargeable vanadium-lithium secondary battery.

a) Data backed up by rechargeable battery

Image data stored in the DRAM:

Image	Mode
Transmission images	Memory sending
	Sequential broadcasting
	Delayed (broadcast) sending
	Confidential transmission
	Polling transmission
	Relay control transmission
	Relay broadcast transmission
Reception images	Memory reception
	Confidential reception


NOTE

Memory clear list

If the power is turned on after the rechargeable battery backup time has been exceeded, the memory clear list is automatically printed out. The memory clear list is a list of image data that have been cleared from memory. If the memory clear list cannot be printed due to printer engine trouble or run out of paper, the fax sounds alarm, information for managing the storage status of image data is erased from memory, then goes on standby. The operation that is carried out when the memory clear list cannot be printed can be altered by changing the setting of SSSW SW02 bit 0. For details, *see "G3 Facsimile Service Data Handbook (Rev. 0)" (supplied separately).*

After the memory clear list is printed out, information for managing the storage status of image data is automatically erased from memory.

Conditions for image backup

1) Reception images

If power is interrupted during reception, only pages that have completely been received are backed up, and the page that was in the process of being received during the power interruption is deleted.

2) Transmission images

Only memory transmission images (including during standby for redial) are backed up, and direct transmission is canceled.

REFERENCE

For a sample printout of the memory clear list, *see page 2-8.*

b) Reception image data transfer

Reception image data can be transferred to another fax, and printed out by using the MEMORY REFERENCE function. "MEMORY REFERENCE" is a function for transferring reception image data to another fax when the reception image data cannot be printed out due to printer engine trouble.

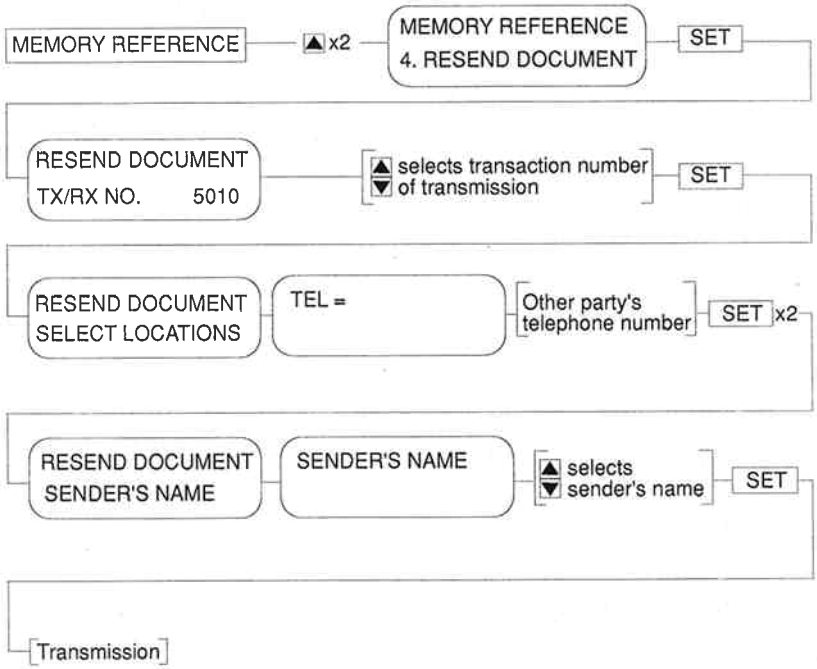


Figure 1-11 Reception Image Data Transfer Method

3.1.2 Backed up by lithium battery

The lithium battery backs up control data registered in the SRAM on the SCNT board for five years with the power turned off.

a) Data backed up by the lithium battery

a-1) User data

Data input by the user with the DATA REGISTRATION button on the operation panel.

Item	Description
TEL REGISTRATION	One-touch dial, Coded SPD dial, Group dial
USER SETTINGS	Date/time, user telephone registration, etc.
REPORT SETTINGS	Activity report, etc.
TX SETTINGS	ECM, automatic redial, etc.
RX SETTINGS	ECM Rx, remote reception, etc.
PRINTER SETTINGS	Recording paper selection, reception image reduction, etc.
FILE SETTINGS	Confid. mailbox, memory box, etc.
SYSTEM SETTINGS	Rx restriction, display language, etc.

a-2) Dialling data

Dialling data input by the user with the numeric button on the operation panel.

a-3) Service data

Data input by the service personnel with the DATA REGISTRATION button, and # button, on the operation panel.

Item	Description
#1. SSSW	Error management, echo counter measures, etc.
#2. MENU	NL equalizer, transmission level, etc.
#3. NUMERIC Param.	RTN signal transmission condition, etc.
#4. NCU	Normally not used
#5. TYPE	Normally not used
#6. GENESIS (UHQ)	Normally not used
#7. PRINTER	Reception picture reduction conditions, etc.
#8. CLEAR	The total number of pages printed/scanned

a-4) Management data

Data automatically stored as a record of the operating status.

Item	Description
Communications management records	Transmission/Reception records for last 40 communictions
Communications analysis list	Result of latest communications

NOTE

Printing data

User data, service data and management data stored to control memory described in this chapter can be printed out. For details on how to print out these data, *see page 2-7, 2.1 Report Output Function.* Other service data cannot be printed out.

When data have been erased or initialized

When backed up user or service data have been erased or initialized, the registered data are erased, and the data item is set to its factory setting.

b) Printing the lithium battery backup data list

The following data are backed up by lithium battery and can be printed out as a list.

When to print out

Make sure that you print out a list of the following data before replacing the lithium battery, or before removing the jumper plug (JP2) from the SCNT board with the power turned off.

How to print data

For details on how to print out the following lists, *see page 2-7, 2.1 Report Output Function.*

b-1) User data

Item	List Name
USER'S DATA	User data list
TEL REGISTRATION	1-Touch list 1, 2
	Coded dial list 1, 2
	Group dial list

b-2) Service data

Item	List Name
Service data	Service data list

b-3) Management data

Item	List Name
Activity management data	Activity report
System dump data	System dump list

Jumper plug caution

The lithium battery backup function works when jumper pin JP 2 on the SCNT board is shorted by a jumper plug. This means that registered data will be erased when the power cord is disconnected with the jumper plug removed.
Before removing the jumper plug, make sure that you print out all registered data. The fax is shipped from the factory with the jumper pin shorted by the jumper plug.

Cautions when replacing the SCNT board

Before replacing the SCNT board during servicing, make sure that you print out all registered data.

The SCNT board in the service parts is not provided with a jumper plug (JP2), in order to prevent battery discharge. Therefore, use the jumper provided on the SCNT board that is to be replaced.

When you turn the power on after replacing the SCNT board, "DELETE FILE PRESS SET KEY" will be displayed. When you press the SET button with "DELETE FILE PRESS SET KEY" displayed, the image management data in the SRAM is cleared. Then "DATA ERROR PRESS SET KEY" will be displayed. When you press the SET button with "DATA ERROR PRESS SET KEY" displayed, the user and service data in SRAM will be initialized to their original factory settings. Next, register the data from the old SCNT board, referring to the print out.

Lithium battery replacement cycle

The life of the lithium battery is five years with the power turned off.
When the lithium battery reaches the end of its life, "DELETE FILE PRESS SET KEY" or "DATA ERROR PRESS SET KEY" will be displayed after a power interruption, or when the power is turned on. If this happens, replace the lithium battery.
When you replace the lithium battery, all the backed up data will be erased and there will be nothing to print out.

When you turn the power on after replacing the lithium battery, "DELETE FILE PRESS SET KEY" will be displayed. When you press the SET button with "DELETE FILE PRESS SET KEY" displayed, the image management data in the SRAM is cleared. Then "DATA ERROR PRESS SET KEY" will be displayed. When you press the SET button with "DATA ERROR PRESS SET KEY" displayed, the user and service data in SRAM will be initialized to their original factory settings.

c) Data clear using service data

This fax can initialize individual data items with Service Data #8 Clear.
Below are the data items which can be initialized.

When to print out

Before carrying out this operation, make sure that you make print out a list of backed up data.

Operation

For details on the following items, *see page 2-34, 2.3 Service Data Setting.*

Service Item	Description
TEL	Dialing data
USER SW	User data, Service data #1 to #3
SERVICE SW	User data, Service data #1 to #3, #6, #7
NCU	Service data #4
SERVICE DATA	Data on system dump list
REPORT	Data on activity report
COUNTER	Total number of pages printed and scanned
ALL	All user data, service data, activity management data and image data (except COUNTER)

3.2 What to do when a Problem Occurs (All clear)

Very rarely, during use, the display may go out, all the buttons may stop working, or some other trouble may occur because of strong electrical noise or large amount of static. If such trouble occurs, perform All clear operation.

During installation, we recommend that you perform All clear operation. Below is the procedure for performing All clear.

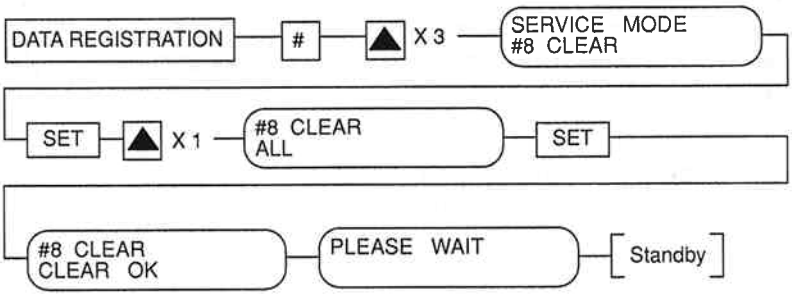


Figure 1-12 All Clear

4. PROTECTIVE FUNCTIONS

4.1 Reception Image Data Transfer Function

Reception image data can be transferred to another fax if the image data cannot be printed out due to printer engine trouble.

Reception image data transfer

For details on the transfer of image data, *see page 1-23 b) Reception image data transfer.*

4.2 Data Battery Backup Function

The SCNT board is provided with a function for backing up data in control / image processing memory (SRAM), and data stored to image memory (DRAM), by lithium battery and rechargeable battery, even if power is interrupted, or the power cord is disconnected by accident.

For details on backed up data, *see page 1-21 3. PRECAUTIONS FOR DATA PROTECTION.*

4.3 Built-in Safety Measures

4.3.1 Overcurrent protection

This fax is provided with an overcurrent protection circuit with built-in fuse, to prevent abnormal rises in temperature if an overcurrent flows to the motors and power supply due to driver IC trouble, software lockup and short circuits.

Protected Parts	Safety Measures
Document feed motor	IC protector (FU2) on SCNT board
Document loading solenoid	IC protector (FU3) on SCNT board
Stamp unit (option)	IC protector (FU4) on SCNT board
Pickup solenoid (side cassette)	Fuse (ICP1 (50V, 0.4A)) on PCNT board
Pickup solenoid (upper feeder)	Fuse (ICP2 (50V, 0.4A)) on PCNT board
Pickup solenoid (lower feeder)	Fuse (ICP3 (50V, 0.4A)) on PCNT board
Power supply unit	Glass-tube current fuse (FU101 (125V, 4A), FU102 (125V, 4A)), overcurrent protection circuit
Fixing heater	Thermal fuse (420°F/216°C), thermistor

4.3.2 Lightning protection

This fax is provided with a function for protecting electronic components from abnormal voltage caused by lightning.

Protected Parts	Safety Measures
NCU board ass'y	Arrestors (AR1, AR2) located at the primary side of the NCU board discharge a voltage of more than DC 400V via the power cord.
Power supply unit	Varistor (VZ101) located at the primary side of the power supply unit discharge a voltage of more than 270V.
PCNT board ass'y	Varistor (VZ101) on PCNT board protect against destruction of PCNT board electrical parts when abnormal voltage occurs.

NOTE

When protection is not possible

The NCU board sometimes may not be protected even by the protection circuits if lightning strikes the telephone line.

4.3.3 Power leakage protection

The AC line, telephone line and metal parts of this fax are completely insulated. This fax provides a grounding type (three-wire) power supply cable to prevent electrical shock. Even if electrical leakage should occur, use this fax only with a properly grounded electrical outlet of the correct voltage.

Chapter 2

Operating Instructions

Operating Instructions

1. NAMES OF PARTS AND THEIR FUNCTIONS

1.1 Main Unit Overview

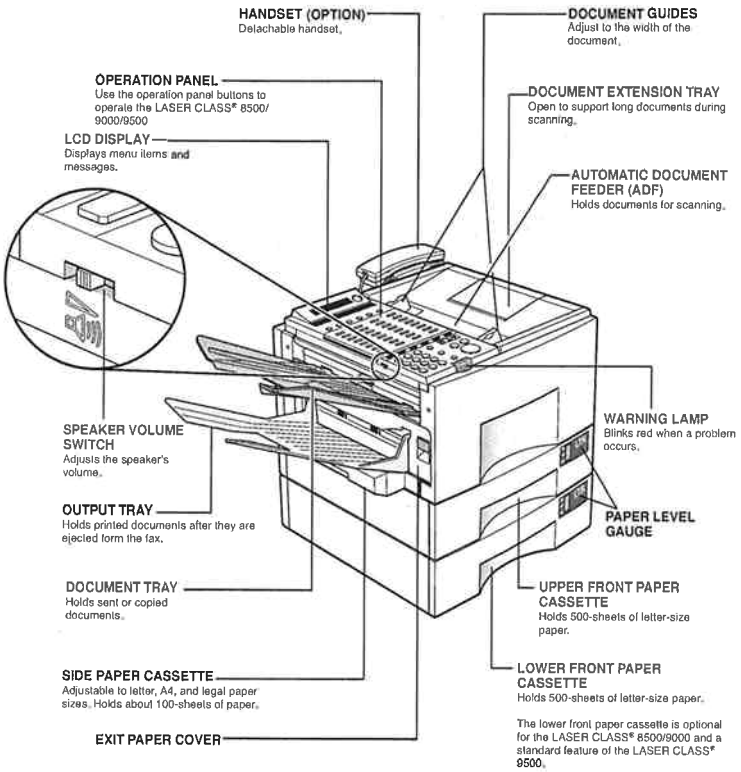


Figure 2-1 Front View

NOTE

This fax does not have a power switch.

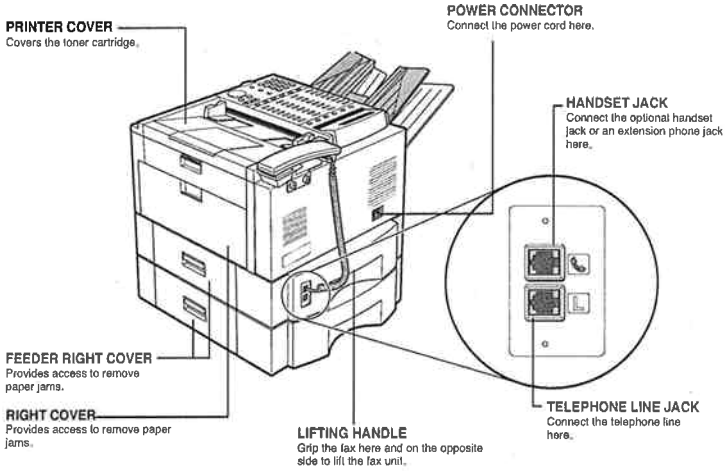


Figure 2-2 Rear View

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1.2 Operation Panel

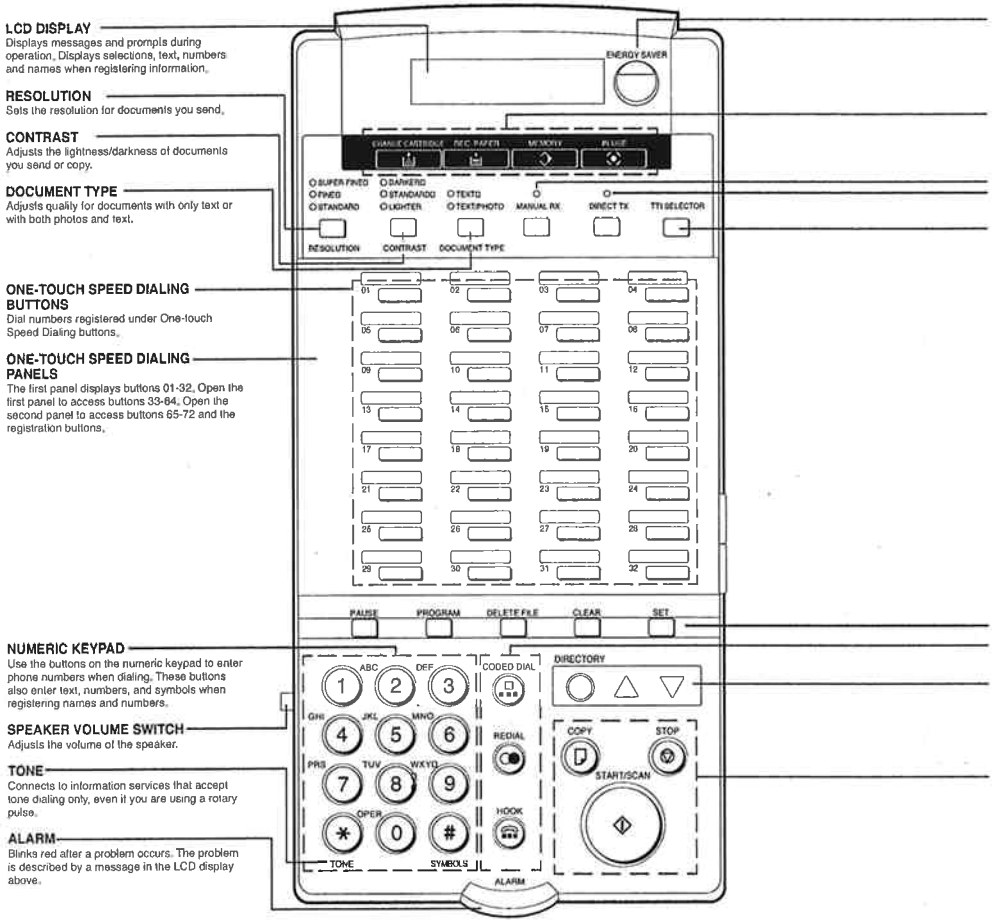


Figure 2-3 Operation Panel 1

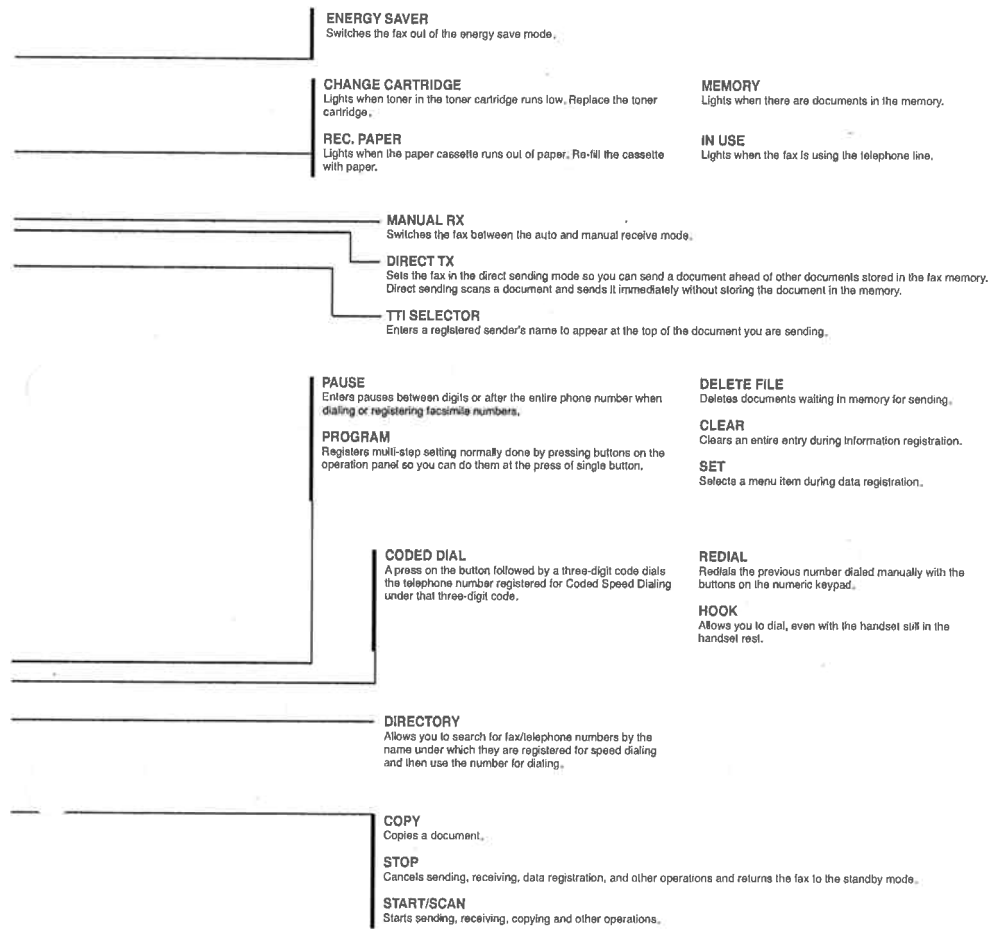
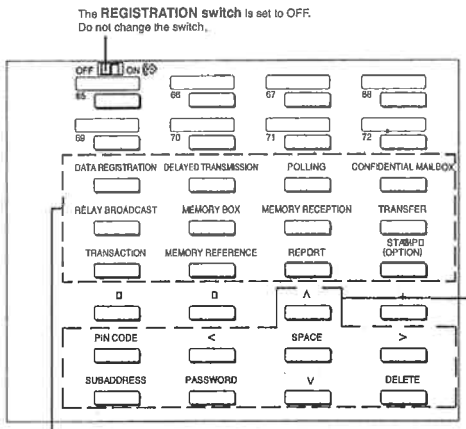


Figure 2-4 Operation Panel 2



PIN CODE
Displays the PIN code message so you can enter the PIN code for dialing through a PBX.

SUBADDRESS
Allows you to enter an ITU-T subaddress so you can send a document with a subaddress.

PASSWORD
Allows you to enter an ITU-T password so you can send a document with a password.

∧ ∨ Search buttons
Scrolls the display so you can see other options and selections in the menus during data registration.

< > Cursor buttons
moves the cursor left or right during data registration.

SPACE
Enters a space between letters and numbers on the LCD display when you are registering information

DELETE
During a step when you are registering or entering a number, press this button to delete the number from the right digit. (This button deletes number entries only).

DATA REGISTRATION
Starts data registration for speed dialing, sender information, and other important settings for sending and receiving.

DELAYED TRANSMISSION
Sets a time for delayed sending.

POLLING
Sets a document for polling sending, and also used for polling receiving.

CONFIDENTIAL MAILBOX
Sets a document for sending to a confidential mailbox so you can print documents received in the mailbox.

RELAY BROADCAST
Sets a document to be sent to another fax for relay sending.

MEMORY BOX
Sets a document to be stored in a memory box, or opens a memory box so you can print documents received in the memory box.

MEMORY RECEPTION
Switches the fax in and out of the memory lock mode. In the memory lock mode, the fax stores all documents it receives in the memory.

TRANSFER
Switches the fax in and out of transfer mode. In the transfer mode the fax unit sends all documents it receives to another fax machine at your home or another office.

TRANSACTION
Displays information about previous sending and receiving transactions.

MEMORY REFERENCE
Performs operations with documents currently stored in the memory, including printing a list of documents, printing a documents, sending a document to another destination, or deleting a document.

REPORT
Prints reports about information registered in the fax.

STAMP (option)
Switches the fax in and out of the stamp mode. In the stamp mode, the fax marks all documents scanned for sending in memory mode or direct sending mode. If you want to use the stamp feature, call your authorized Canon dealer and request installation of this option.

Figure 2-5 Operation Panel 3

2. SERVICE OPERATION FUNCTIONS

2.1 Report Output Function

2.1.1 User report output functions

The fax can output user reports manually by user operation, or automatically, according to user data settings.

a) Manual output of reports by user operation

Report type	Operations
One-touch dial list 1 One-touch dial list 2 Coded speed dial list 1 Coded speed dial list 2 Group dial list	Press REPORT key, select the report type, and press SET key.
User data list Sender name list	
Activity report Document memory list Confidential mailbox report Received memory box list	

b) Reports output automatically by user data settings

Each report written below can be automatically output by specifying "REPORT SETTINGS" in user data.

Transmission report
Reception report
Multi-transaction report
Confidential reception report
Memory box report
Relay broadcast report
Activity Management Report

For samples of user reports, *see the user's guide.*

c) Reports output automatically

Memory clear list

The fax automatically outputs a memory clear list when the power is turned on after a power cut, and the image memory backup time (approx. 12 hour) has been exceeded.

12/11/96 11:41 FAX 001

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

MEMORY FILES DELETED

TX/RX NO	MODE	CONNECTION TEL/ID	PGS.	SET TIME	ST. TIME	SENDER NAME
0001	DELAYED TX	0337686736	1	12/09 13:12	20:11	

Figure 2-6 Memory Clear List

TX/RX NO	: Indicates four digits of the transaction number
MODE	: Indicates, TRANSMISSION, or MEMORY RX
CONNECTION TEL	: Number sent from the other party or number dialled
PAGES	: Number of pages are stored in memory
SET TIME	: Time when data is stored in memory
START TIME	: Planned transmission start time (24-hour display.)
SENDER NAME	: Sender name appended to transmission (up to 24 characters)

2.1.2 Service report output functions

The fax outputs service data setting status, past communications history reports.

a) List of service reports

The fax outputs the service reports shown below.

Report type	Operations
Service data list System dump list	In the service mode, press the REPORT key and the desired numeric button 1 to 3. Pressing buttons 2 to 3 and SET key outputs the respective service reports on the left. When pressing button 1 and SET key, both are output.
Service activity report (with service error code and dump list)	If you set bits 0 and 1 of #1 SSSW SW01 in the service mode, the service error code and dump list are indicated on the activity report (sending/receiving).

a-1) System data list

This list shows service data #1~#5, #7, #9 setting statuses.
The following is a sample list for the LASER CLASS 9000/9500. (The list for the LASER CLASS 8500 does not contain V.8/V.34-related items.)

12/09/98 13:09 FAX 001

****
*** SYSTEM DATA LIST ***
****

#1 SSSW

SW01	-----	00000000
SW02	-----	00100000
SW03	-----	00000000
SW04	-----	10000000
SW05	-----	00000000
SW06	-----	10010000
SW07	-----	00000000
SW08	-----	00000000
SW09	-----	00000000
SW10	-----	00000000
SW11	-----	00000000
SW12	-----	00000010
SW13	-----	00000000
SW14	-----	00000000
SW15	-----	00000000
SW16	-----	00000011
SW17	-----	00000010
SW18	-----	00000000
SW19	-----	00000000
SW20	-----	00000000
SW21	-----	00000000
SW22	-----	00000000
SW23	-----	00000000
SW24	-----	00000000
SW25	-----	00000000
SW26	-----	00000000
SW27	-----	00000000
SW28	-----	00000000
SW29	-----	00000000
SW30	-----	00000000

#2 MENU

05:	-----	OFF
06:	-----	DIAL
07:	-----	10
08:	-----	3429
09:	-----	33.6
10:	-----	25Hz

#3 NUMERIC Param.

02:	-----	10
03:	-----	15
04:	-----	12
05:	-----	4
06:	-----	4
09:	-----	6
10:	-----	3500

Figure 2-7 System Data List (1/6)

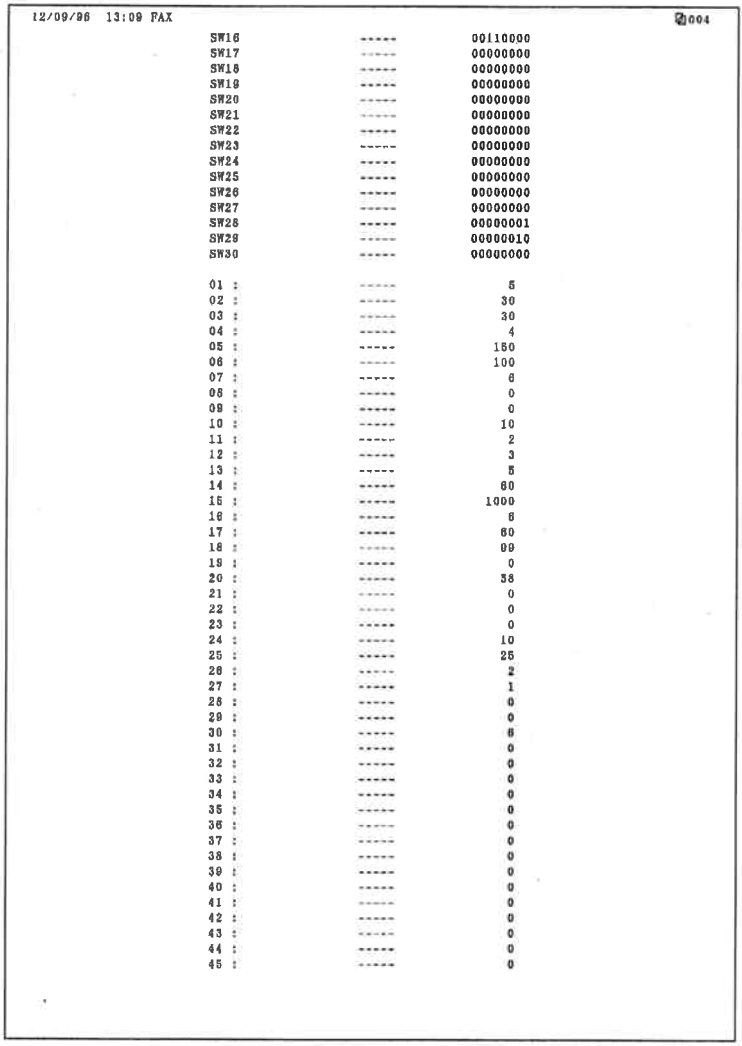
```
12/09/96  13:09 FAX                                                          002
                  11:                  -----                3500
                  15:                  -----                 120
                  16:                  -----                   4
                  17:                  -----                 100
                  18:                  -----                   0
                  19:                  -----                 200
                  20:                  -----                 100
                  21:                  -----                   0
                  22:                  -----                 200
                  23:                  -----                   4
                  24:                  -----                  20
                  25:                  -----                  60
                  26:                  -----                   4
                  30:                  -----                   0

            #4 NCU
               1.TONE / PULSE
                1.TONE
                  01 :                 -----              90
                  02 :                 -----             180
                2.PULSE                -----           DP(N)
                  01 :                 -----             100
                  02 :                 -----             200
                  03 :                 -----              40
                  04 :                 -----             780

               2.DIAL TONE                             00000000
                  01 :                 -----             350
                  02 :                 -----              90
                  03 :                 -----              10
                  04 :                 -----               0
                  05 :                 -----               0
                  06 :                 -----               0
                  07 :                 -----               5
                  08 :                 -----               0

               3.2nd DIAL TONE                         10000000
                  01 :                 -----            4000
                  02 :                 -----               3
                  03 :                 -----              25
                  04 :                 -----               5
                  05 :                 -----              25
                  06 :                 -----               0
                  07 :                 -----               5
                  08 :                 -----               5

               4.BUSY TONE 0                           00000000
                  01 :                 -----            1000
                  02 :                 -----              40
                  03 :                 -----              60
                  04 :                 -----              40
                  05 :                 -----              60
                  06 :                 -----               1
                  07 :                 -----               5
                  08 :                 -----               3

               5.BUSY TONE 1                           00000000
                  01 :                 -----             500
                  02 :                 -----              40
                  03 :                 -----              60
                  04 :                 -----              40
                  05 :                 -----              60
```

Figure 2-8 System Data List (2/6)

12/09/96 13:09 FAX 005

06 :	-----	1
07 :	-----	5
08 :	-----	3
6.REORDER TONE		10000000
01 :	-----	0
02 :	-----	18
03 :	-----	32
04 :	-----	18
05 :	-----	82
06 :	-----	2
07 :	-----	5
08 :	-----	3
7.MULTI		
01 :	-----	5
02 :	-----	10
03 :	-----	300
04 :	-----	0
8.AUTO RX		
01 :	-----	15
02 :	-----	60
03 :	-----	10
04 :	-----	120
05 :	-----	1100
06 :	-----	0
07 :	-----	2
08 :	-----	10
09 :	-----	20
9.CNG DETECT		
01 :	-----	40
02 :	-----	60
03 :	-----	0
04 :	-----	0
05 :	-----	0
06 :	-----	65
07 :	-----	40
08 :	-----	60
09 :	-----	5
10 :	-----	0
11 :	-----	2
12 :	-----	70
10.SPECIAL		
SW01	-----	00000000
SW02	-----	00000000
SW03	-----	00000000
SW04	-----	00000100
SW05	-----	00000000
SW06	-----	00000000
SW07	-----	00000000
SW08	-----	00000000
SW09	-----	00000000
SW10	-----	00000000
SW11	-----	00000000
SW12	-----	00000000
SW13	-----	00000000
SW14	-----	00000000
SW15	-----	00000000

Figure 2-9 System Data List (3/6)



12/09/96 13:09 FAX 004

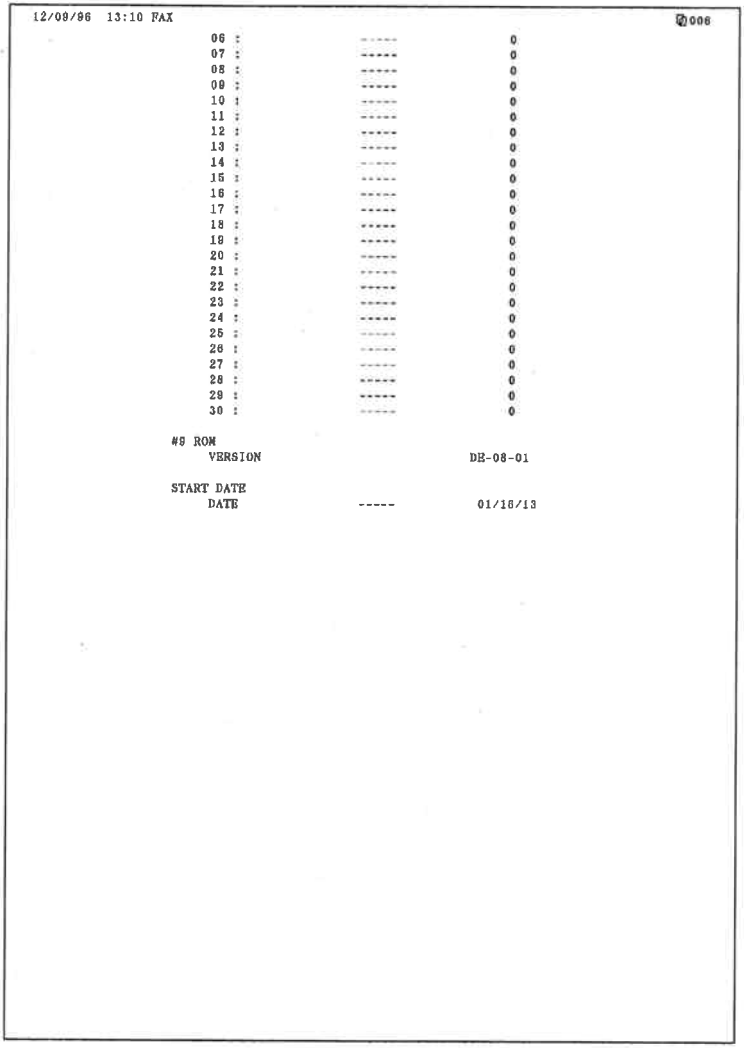
SW16	-----	00110000
SW17	-----	00000000
SW18	-----	00000000
SW19	-----	00000000
SW20	-----	00000000
SW21	-----	00000000
SW22	-----	00000000
SW23	-----	00000000
SW24	-----	00000000
SW25	-----	00000000
SW26	-----	00000000
SW27	-----	00000000
SW28	-----	00000001
SW29	-----	00000010
SW30	-----	00000000
01 :	-----	5
02 :	-----	30
03 :	-----	30
04 :	-----	4
05 :	-----	150
06 :	-----	100
07 :	-----	6
08 :	-----	0
09 :	-----	0
10 :	-----	10
11 :	-----	2
12 :	-----	3
13 :	-----	5
14 :	-----	60
15 :	-----	1000
16 :	-----	6
17 :	-----	60
18 :	-----	99
19 :	-----	0
20 :	-----	38
21 :	-----	0
22 :	-----	0
23 :	-----	0
24 :	-----	10
25 :	-----	25
26 :	-----	2
27 :	-----	1
28 :	-----	0
29 :	-----	0
30 :	-----	6
31 :	-----	0
32 :	-----	0
33 :	-----	0
34 :	-----	0
35 :	-----	0
36 :	-----	0
37 :	-----	0
38 :	-----	0
39 :	-----	0
40 :	-----	0
41 :	-----	0
42 :	-----	0
43 :	-----	0
44 :	-----	0
45 :	-----	0

Figure 2-10 System Data List (4/6)

12/09/96 13:10 FAX 005

46 :	-----	0
47 :	-----	0
48 :	-----	0
49 :	-----	0
50 :	-----	0
11.RKEY		
01 :	-----	0
02 :	-----	0
03 :	-----	0
12.PBX DIAL TONE		00000000
01 :	-----	350
02 :	-----	90
03 :	-----	10
04 :	-----	0
05 :	-----	0
06 :	-----	0
07 :	-----	5
08 :	-----	0
13.PBX BUSY TONE		00000000
01 :	-----	1000
02 :	-----	40
03 :	-----	60
04 :	-----	40
05 :	-----	60
06 :	-----	1
07 :	-----	5
08 :	-----	3
#5 TYPE		
TYPE	-----	U.S.A.
#7 PRINTER		
SW01	-----	00000000
SW02	-----	00000000
SW03	-----	00000000
SW04	-----	00000000
SW05	-----	00000000
SW06	-----	00000100
SW07	-----	00000000
SW08	-----	00000000
SW09	-----	00000000
SW10	-----	00000000
SW11	-----	00000000
SW12	-----	00000000
SW13	-----	00000000
SW14	-----	00000000
SW15	-----	00000000
SW16	-----	00000000
SW17	-----	00000000
SW18	-----	00000000
SW19	-----	00000000
SW20	-----	00000000
01 :	-----	15
02 :	-----	0
03 :	-----	0
04 :	-----	2
05 :	-----	7

Figure 2-11 System Data List (5/6)



12/09/96 13:10 FAX 006

06 :	-----	0
07 :	-----	0
08 :	-----	0
09 :	-----	0
10 :	-----	0
11 :	-----	0
12 :	-----	0
13 :	-----	0
14 :	-----	0
15 :	-----	0
16 :	-----	0
17 :	-----	0
18 :	-----	0
19 :	-----	0
20 :	-----	0
21 :	-----	0
22 :	-----	0
23 :	-----	0
24 :	-----	0
25 :	-----	0
26 :	-----	0
27 :	-----	0
28 :	-----	0
29 :	-----	0
30 :	-----	0

#8 ROM
VERSION DE-08-01

START DATE
DATE ----- 01/16/13

Figure 2-12 System Data List (6/6)

NOTE

"START DATE" records the date when the fax performs its first operation, after shipment from the factory.

a-2) System dump list

This list shows the past communications statuses and error communications history.

The following is a sample list for the LASER CLASS 9000/9500. (The list for the LASER CLASS 8500 does not contain V.8/V.34-related items.)

12/11/96 11:06 FAX 001

CLEAR DATE 11/26/96

TX =	275								
A4 =	235	B4 =	0	A3 =	0				
RX =	95								
A4 =	125	B4 =	0	A3 =	0	LTR =	0	LGL =	0
33600 =	7	31200 =	167	28800 =	102	26400 =	3	24000 =	2
21600 =	3	19200 =	1	16800 =	10	14400 =	1	12000 =	0
9600 =	0	7200 =	1	4800 =	1	2400 =	0		
14400 =	40	12000 =	0	TC9600=	1	TC7200=	0		
14400 =	0	12000 =	0						
9600 =	0	7200 =	0	4800 =	0	2400 =	1		
STD =	242	FINE =	38	SUPER =	22	ULTRA =	58		
MH =	11	MR =	9	MMR =	10	JBIG =	330		
G3 =	0	ECM =	360						
PRINT =	856143 / 68959			READ =	53277 /196301				

#000	0	4	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	10	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	10	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0		
##100	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	0	0
	0							
##200	0	2	0	0	0	0		
##220	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	1	0				
##280	2	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	
##670	0	0	9	1	8	0		
##750	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	16
	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	12
	15	0	0	0	0	0	0	0
	0	0						

Figure 2-13 System Dump List (1/2)

CLEAR DATE : Date on which data was initialized with service data #8 CLEAR, ALL

RX/TX : Total number of pages received/transmissions

A4/B4/A3/LTR/LGL : Total number of pages transmitted and received for each document size

33600bps~2400bps : Total number of pages transmitted and received for each modem speed

STD/FINE/SUPER/ULTRA : Total number of pages transmitted and received for each mode

MH/MR/MMR/JBIG : Total number of pages transmitted and received for each coding method

G3/ECM : Total number of pages transmitted and received in each mode

PRINT/READ : Total number of pages printed/scanned

[Display example]

PRINT = 30*/100** READ = 30*/100**

* Indicates the value input with Service Data #8 CLEAR, COUNTER.

** Indicates the value counted since shipment from the factory.

#000~##750 : Total number of occurrences for each error code

[Display example]

##280	1	7	3	0	0
	##280 errors	##281 errors	##282 errors		

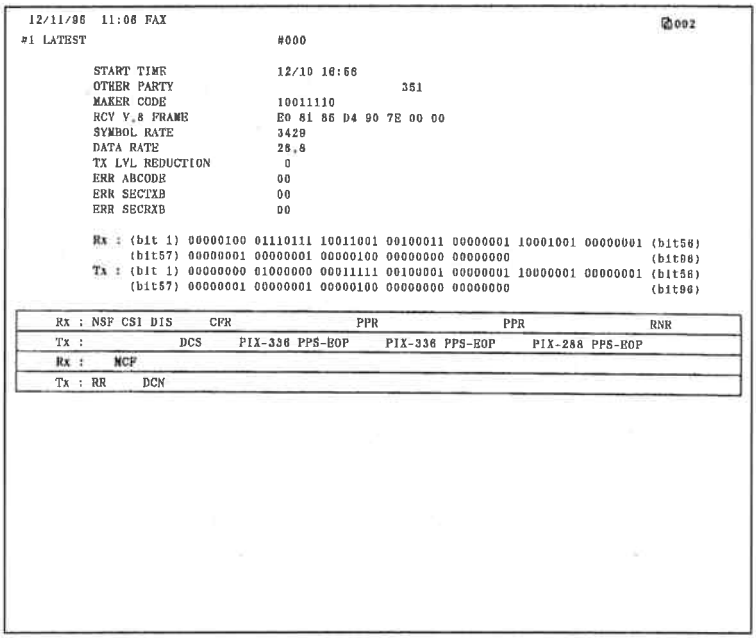


Figure 2-14 System Dump List (2/2)

##nnn	: Service error code
START TIME	: Communication start date and time (on 24 hour clock)
OTHER PARTY	: Telephone number sent from other party
MAKER CODE	: Maker code (For details, *see page 5-66 Figure 5-41 MAKER CODE*)
[1000 1000] upper lower nibble nibble	: Indicates a Canon fax
RCV V.8 FRAME	: Received V.8 protocol signal
SYMBOL RATE	: Symbol rate used for the primary channel
DATA RATE	: Transmission speed used for the primary channel
TX LVL REDUCTION	: 0 (Fixed)
ERR ABCODE	: Code output by the modem when an error occurred (Not used in the field)
ERR SECTXB	: Transmit status of the modem when an error occurred (Not used in the field)
ERR SECRXB	: Receive status of the modem when an error occurred (Not used in the field)
RX/TX	: Received/transmitted protocol signal bit 1 to bit 96 of received/transmitted DIS, DCS, or DTS

a-3) Service activity report

The following is a sample report of transmission on V.8/V.34 protocol for the LASER CLASS 9000/9500.

```
12/10/96  14:39 FAX                                                            001

                         ******************************
                         ***   ERROR TX REPORT    ***
                         ******************************

          TX FUNCTION WAS NOT COMPLETED

          TX/RX NO                 0124
          CONNECTION TEL                          351
          SUBADDRESS
          CONNECTION ID
          ST. TIME                 12/10 14:38
          USAGE T                  00'37
          PGS. SENT                 0
          RESULT                   NG          STOP

     START TIME             12/10 14:38
     OTHER PARTY                          351
     MAKER CODE             10001000
     MACHINE CODE           11001010 00000000
     RCV V.8 FRAME          E0 81 85 D4 90 7E 00 00
     SYMBOL RATE            3429
     DATA RATE              31.2
     TX LVL REDUCTION        0
     ERR ABCODE             00
     ERR SECTXB             00
     ERR SECRXB             00

     Rx : (bit 1) 00000100 01110111 00010101 00100011 00000001 10101001 00000001 (bit56)
          (bit57) 00000001 00000001 00011110 00000000 00000000                   (bit96)
     Tx ; (bit 1) 00000000 01000000 00011111 00100001 00000001 00100001 00000001 (bit56)
          (bit57) 00000001 00000001 00000010 00000000 00000000                   (bit96)

  Rx : NSF DIS          CFR                 MCF
  Tx :          NSS DCS       PIX-312 PPS-NUL      PIX-312 DCN
```

Figure 2-15 Service Error Activity Report

Header	: OK, NG messages
TX/RX NO	: Indicates four digits of the transaction number
CONNECTION TEL (OTHER PARTY)	: Number sent from the other party or number dialled (lower 20 digits)
SUBADDRESS	: Subaddress number sent from the other party
CONNECTION ID	: ID sent from the other party, if the other party is a Canon fax
START TIME	: Communication start date and time (on 24-hour display)
USAGE TIME	: Communication time (in minutes and seconds)
PAGES	: Number of pages for which transmission was complete (For details, *see User's manual*)
RESULT	: "NG" display with number of pages for which transmission was fault, and service error code
MAKER CODE	: Maker code (For details, *see page 5-66*)
[1000 1000] upper nibble lower nibble	: Indicates a Canon fax
RCV V.8 FRAME	: Received V.8 protocol signal
SYMBOL RATE	: Symbol rate used for the primary channel
DATA RATE	: Transmission speed used for the primary channel
TX LVL REDUCTION	: 0 (Fixed)
ERR ABCODE	: Code output by the modem when an error occurred (Not used in the field)
ERR SECTXB	: Transmit status of the modem when an error occurred (Not used in the field)
ERR SECRXB	: Receive status of the modem when an error occurred (Not used in the field)
RX/TX	: Received/transmitted protocol signal bit 1 to bit 96 of received/transmitted DIS, DCS, or DTS

NOTE

The V.8/V.34-related items (RCV V.8 FRAME to ERR SECRXB) are not printed on the Normal G3 Service Activity Report.

2.2 User Data

Press the DATA REGISTRATION to access User menu. Figures in boldface indicate the default setting.

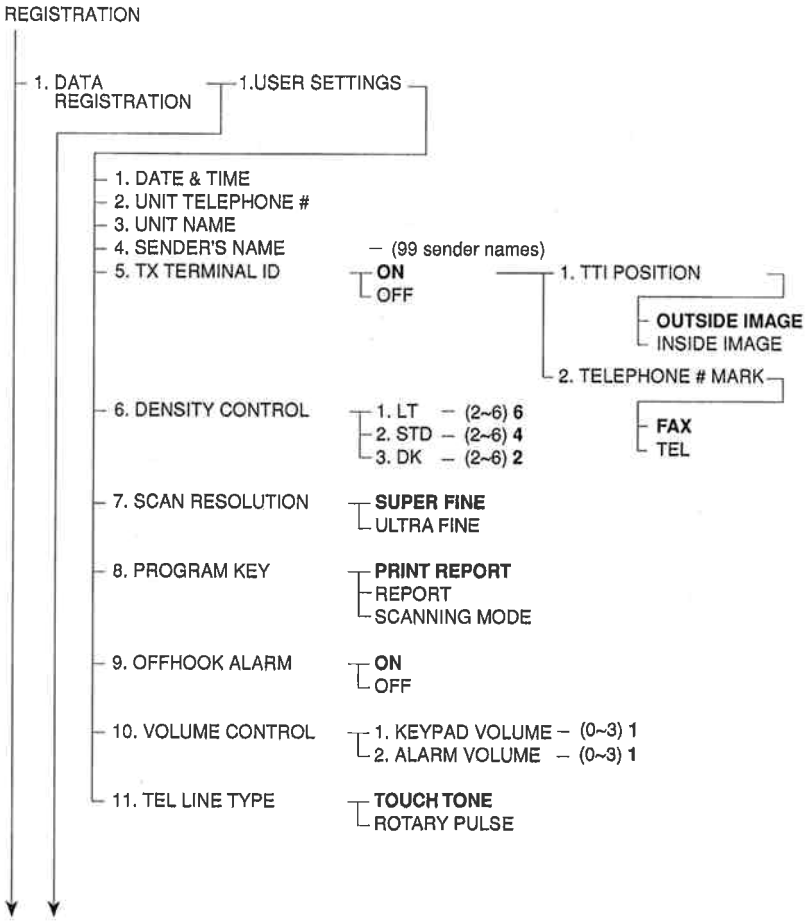


Figure 2-16 User Menu Settings (1/13)

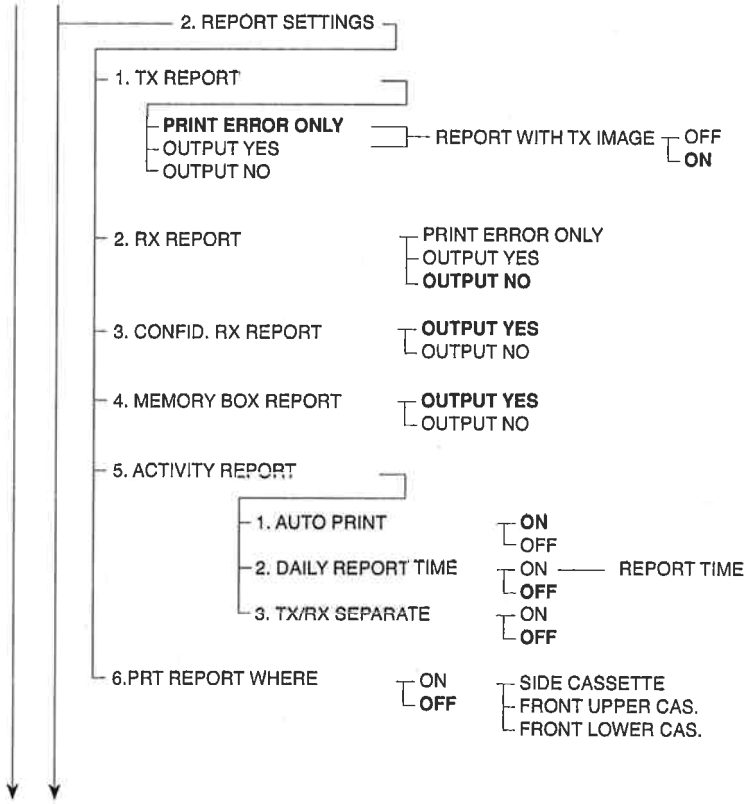


Figure 2-17 User Menu Settings (2/13)

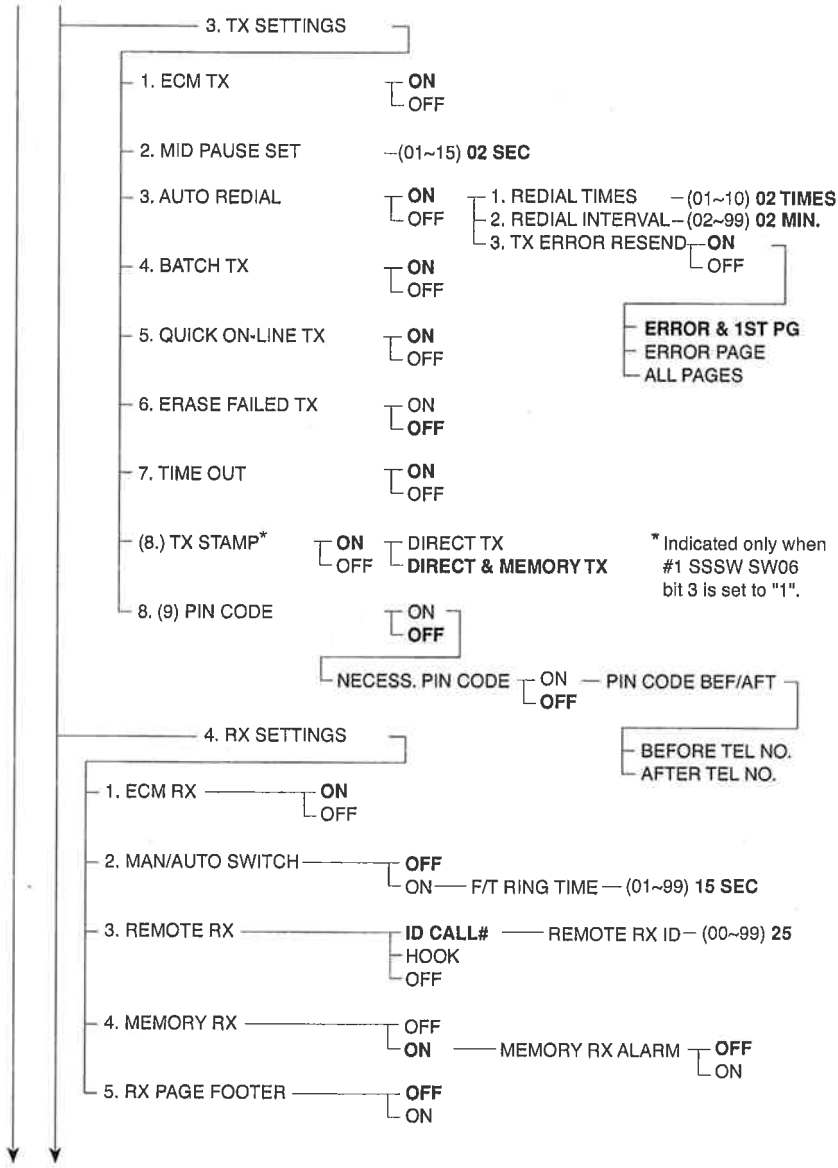


Figure 2-18 User Menu Settings (3/13)

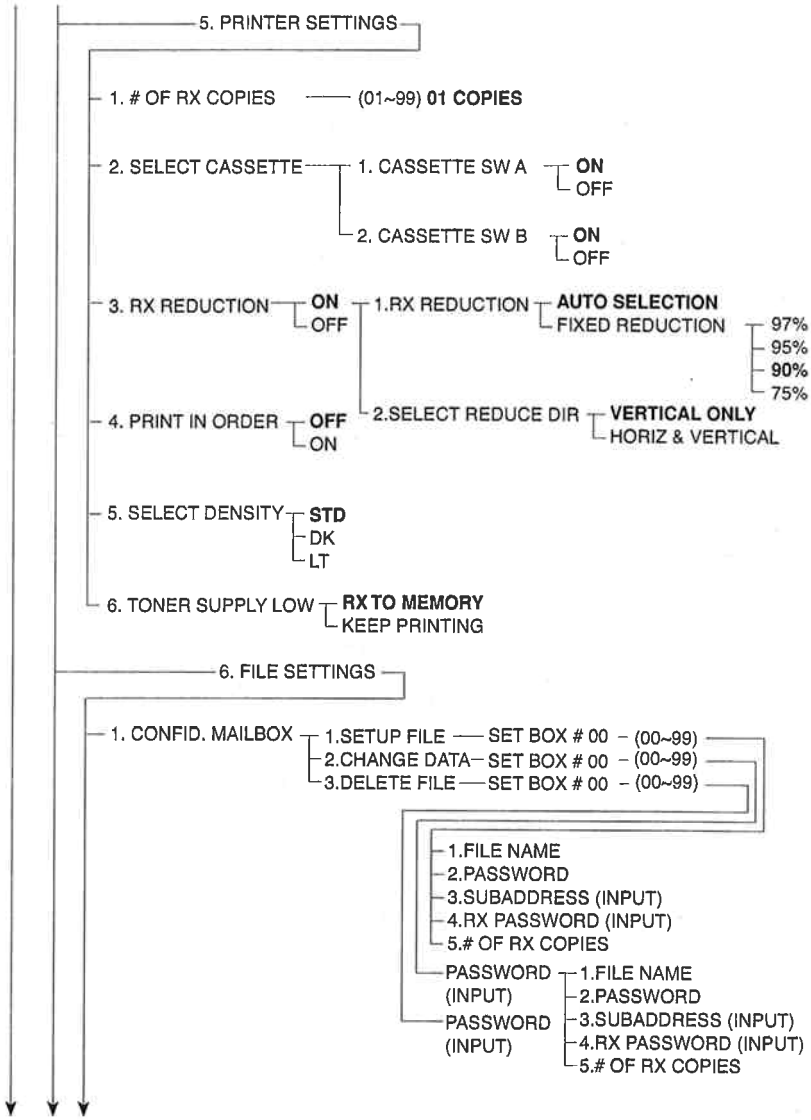


Figure 2-19 User Menu Settings (4/13)

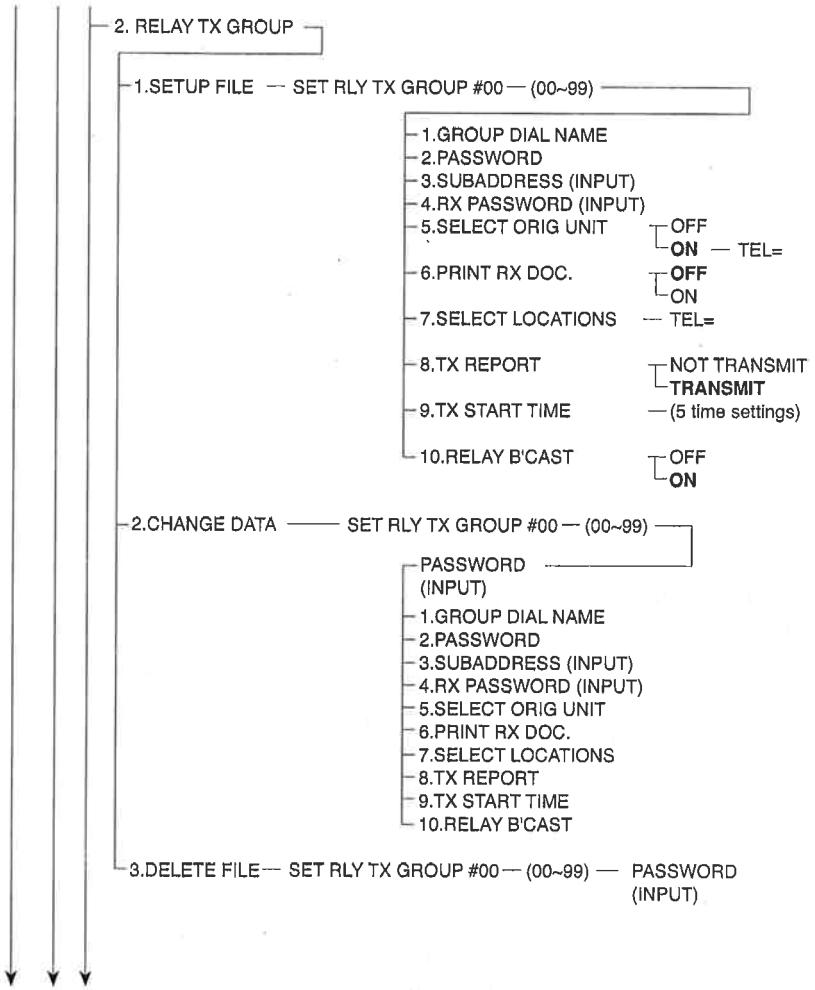


Figure 2-20 User Menu Settings (5/13)

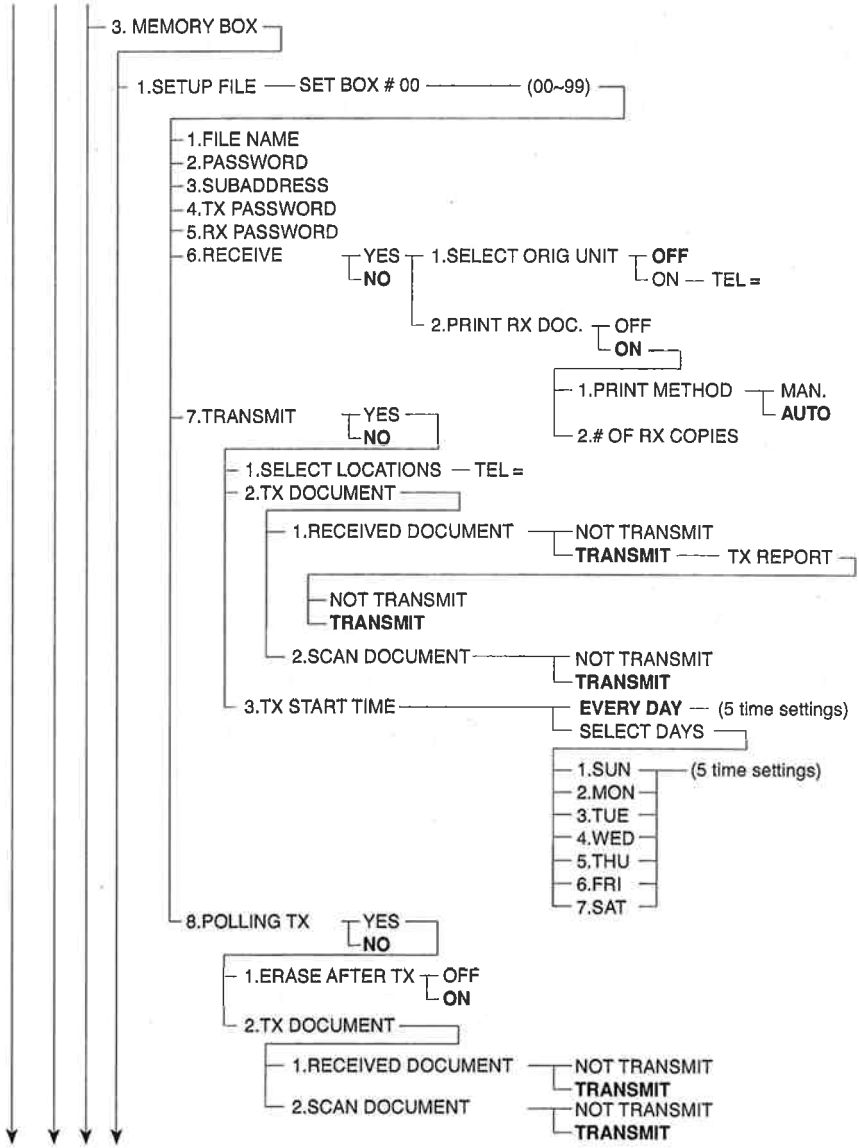


Figure 2-21 User Menu Settings (6/13)

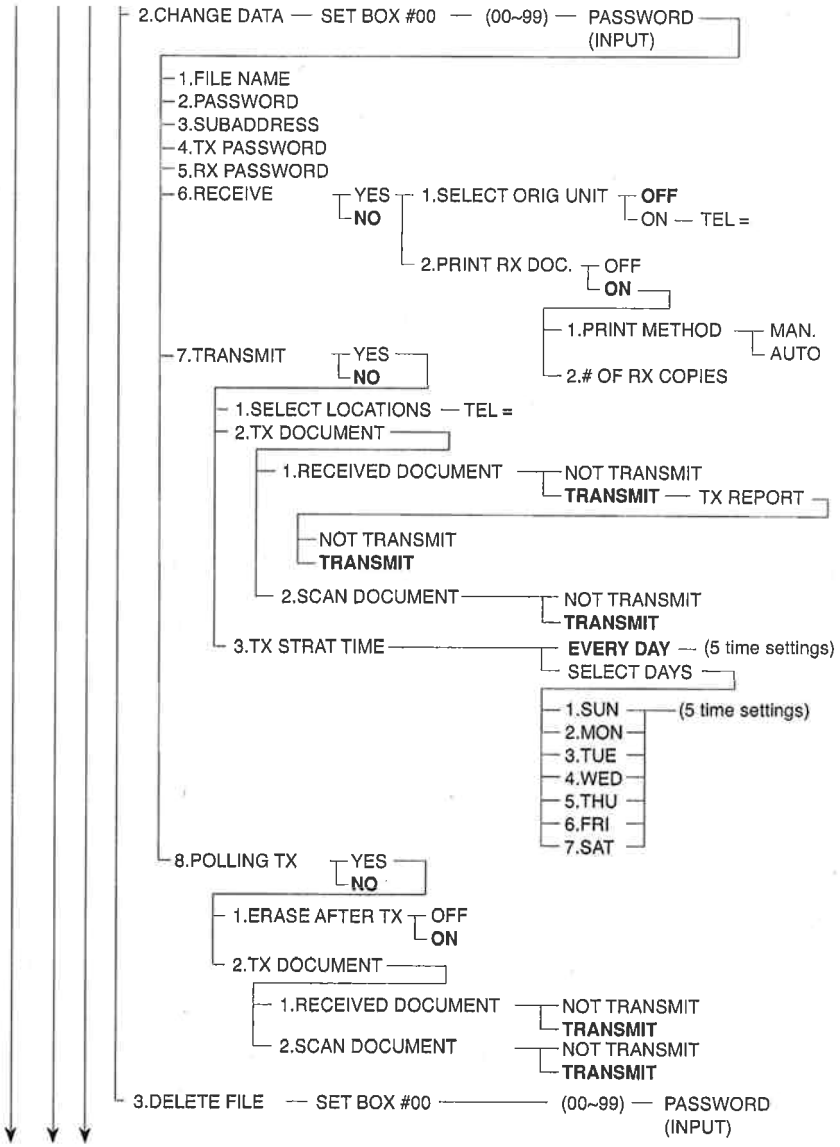


Figure 2-22 User Menu Settings (7/13)

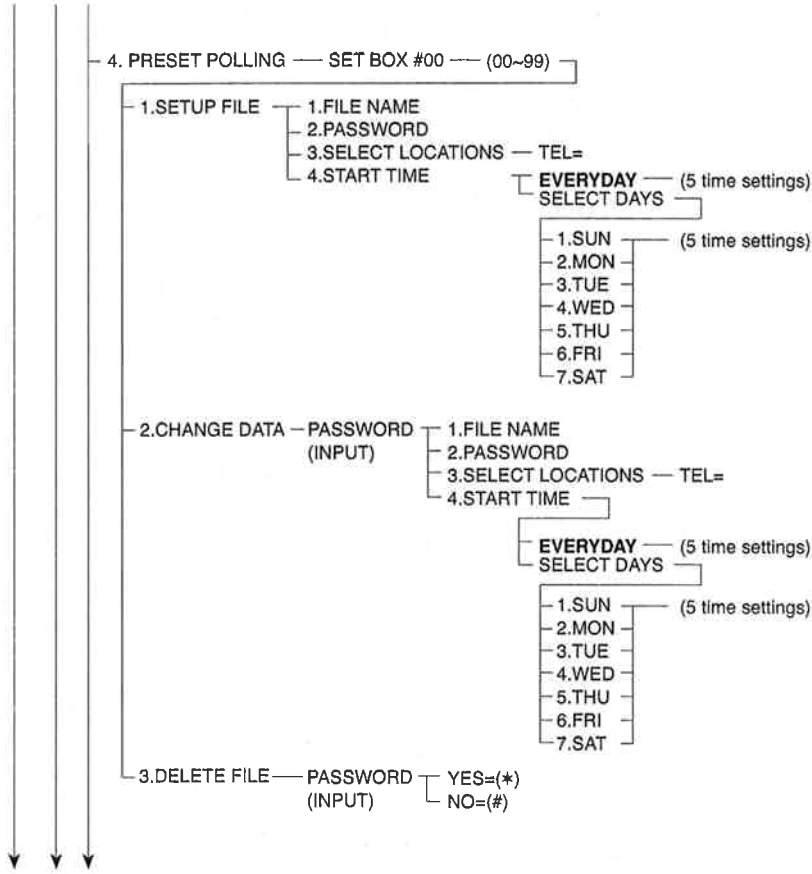


Figure 2-23 User Menu Settings (8/13)

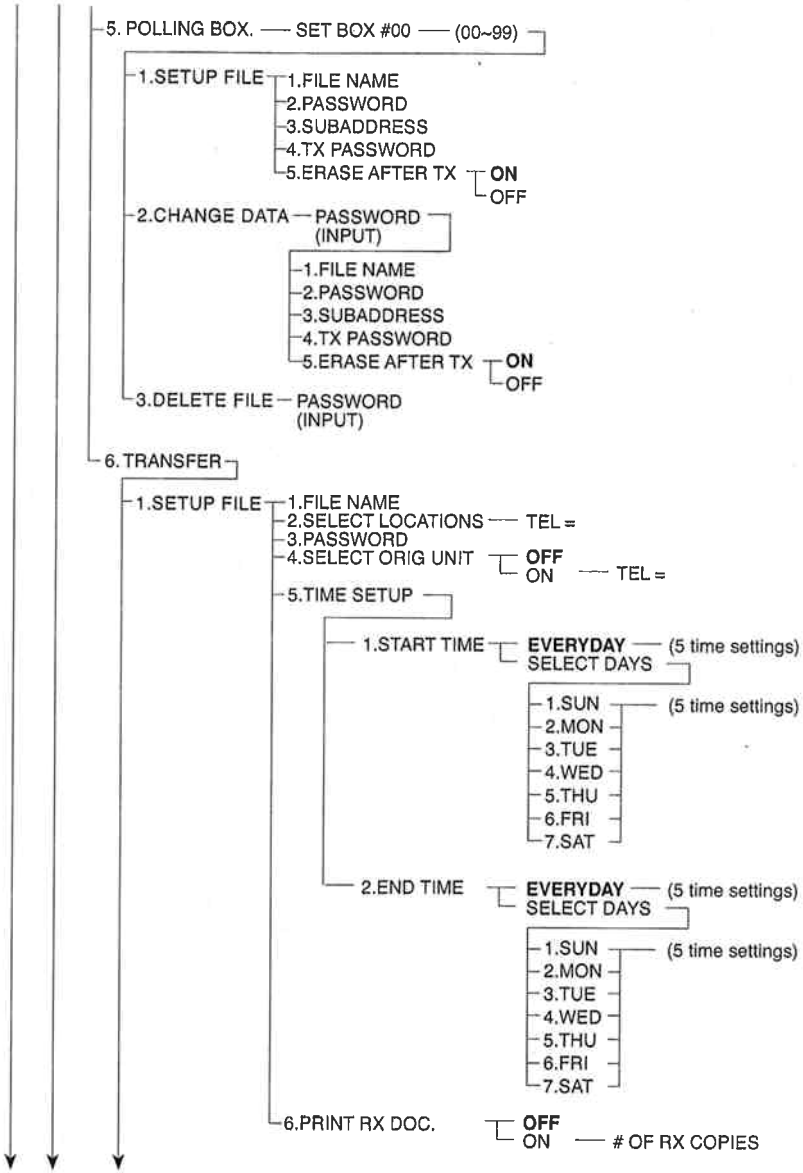


Figure 2-24 User Menu Settings (9/13)

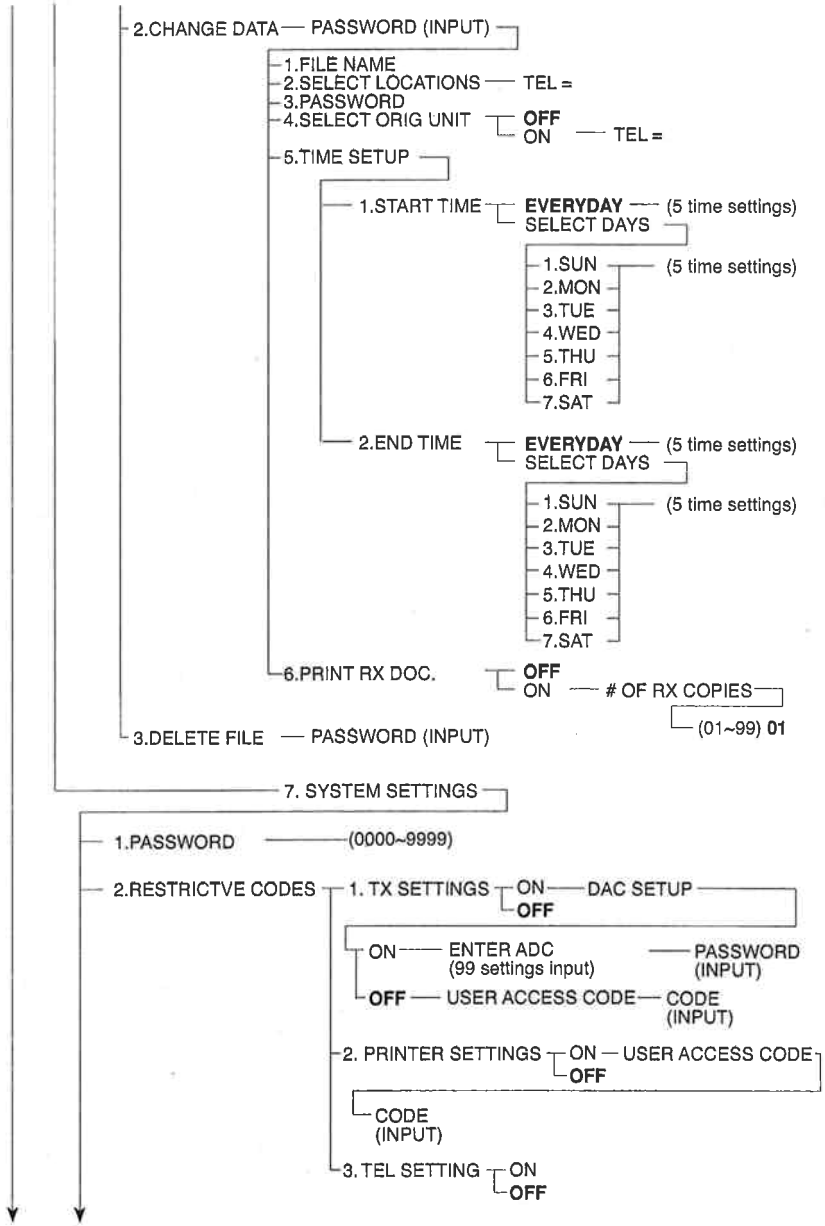


Figure 2-25 User Menu Settings (10/13)

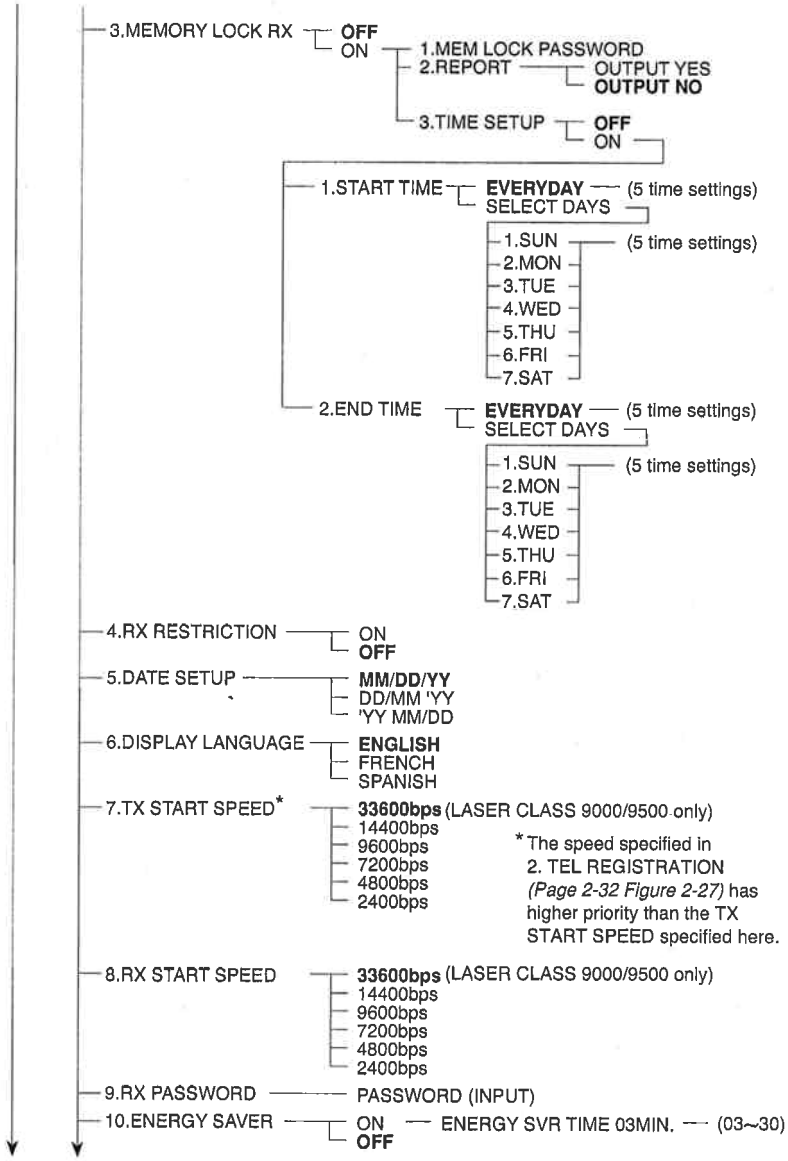


Figure 2-26 User Menu Settings (11/13)

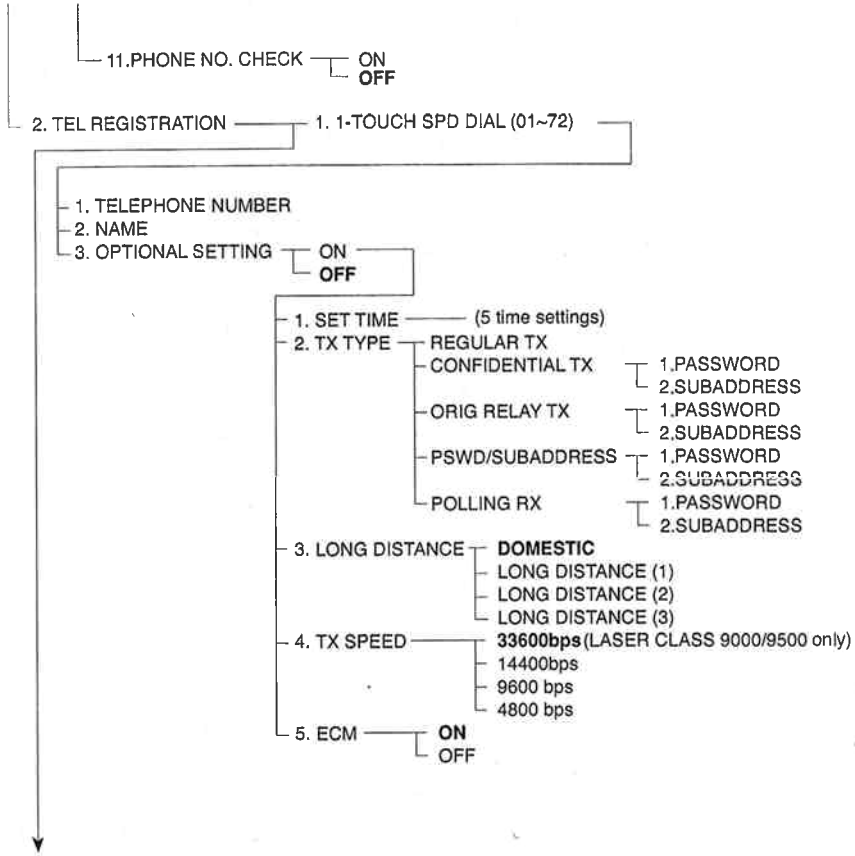


Figure 2-27 User Menu Settings (12/13)

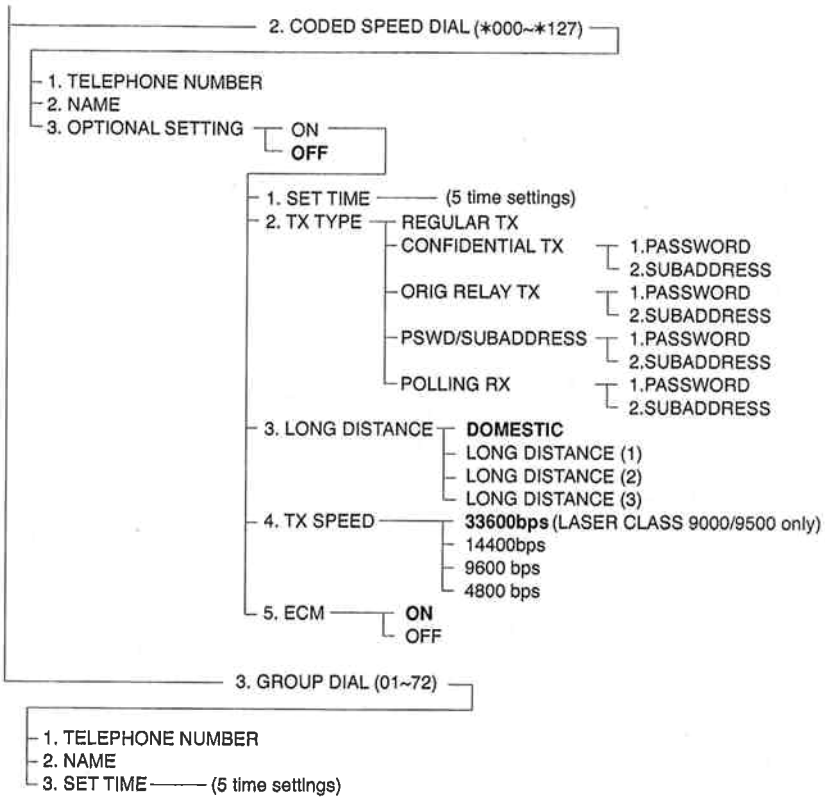


Figure 2-28 User Menu Settings (13/13)

2.3 Service Data Setting

Service data can be checked and changed with items on display menus. The effective SSSWs/parameters and their default values in this fax machine are shown in *2.3.3 Service data settings* in this manual. Detailed description of each SSSW/ parameter is not given in this manual except the new SSSWs/parameters added to this model. *See "G3 Facsimile Service Data Handbook (Rev. 0)" (supplied separately)* for details of them. The new switches for this model are described in *2.3.5 New SSSWs/parameters added to this model.*

2.3.1 Service data overview

The service data menu items are divided into the following nine blocks.

#1 SSSW (Service Soft Switch Settings)

These setting items are for basic fax service functions such as error management, echo countermeasures, and communication trouble countermeasures.

#2 MENU (MENU switch settings)

These setting items are for functions required during installation, such as NL equalizer and transmission levels.

#3 NUMERIC Param. (NUMERIC parameter settings)

These setting items are for inputting numeric parameters such as the various conditions for the RTN signal transmission.

#4 NCU (NCU settings)

These setting items are for telephone network control functions such as the selection signal transmission conditions and the detection conditions, for the control signals sent from the exchange.

#5 TYPE (TYPE setting)

The type setting makes the service data conform to a specific country communications standards. The type setting is required only when installing the LASER CLASS 8500 in Canada.

#6 GENESIS (UHQ function setting)

These setting items are for scanned image processing such as edge enhancement and error diffusion processing.

#7 PRINTER (PRINTER function settings)

These setting items are for basic printer service functions such as the reception picture reduction conditions. Also there is an item for resetting the printer section without switching the power off-on.

#8 CLEAR (data initialization mode)

Various data are initialized by selecting one of these setting items. There is a setting item for checking/inputting the total number of pages printed and total number of pages scanned by this fax.

#9 ROM (ROM management)

ROM data such as the version number and checksum are displayed.

2.3.2 Service data registration/setting method

Service data can be registered/set by the following operations:

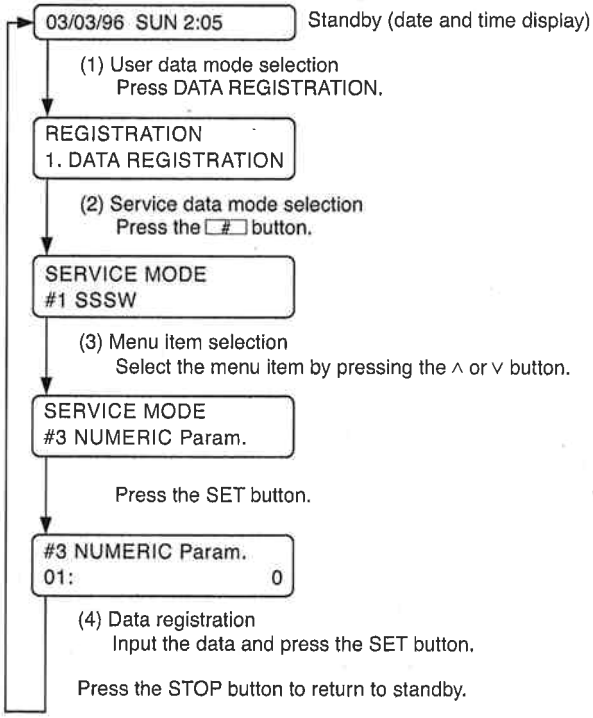


Figure 2-29 Service Data Setting Method

2.3.3 Service data settings

Service menu

#1 SSSW
(Service soft switch setting)

< ⟷ >

Bit	7	6	5	4	3	2	1	0	
SW01	0	0	–	0	0	0	0	0	Error management
SW02	–	–	–	–	–	–	–	0	Memory clear list output setting
SW03	0	0	0	0	–	–	0	–	Echo solution setting
SW04	1	0	0	0	0	0	0	0	Communication trouble solution settings
SW05	–	–	0	0	0	–	–	–	Standard function (DIS signal) setting
SW06	1	0	0	1	0	0	0	0	Scan condition settings
SW07	0	0	–	–	–	–	–	–	Closed network function settings
SW08	0	0	0	0	0	0	0	0	Closed network ID setting
SW09	–	–	0	–	–	–	0	0	Communications result display function settings
SW10	–	–	–	–	–	–	–	–	Not used
SW11	–	–	–	–	–	–	–	–	Not used
SW12	0	–	0	0	0	0	1	0	Page timer settings
SW13	–	–	–	–	–	–	0	0	Relay transfer function settings
SW14	–	–	–	–	–	–	–	–	Not used
SW15	–	–	–	–	–	–	–	–	Not used
SW16	–	–	–	–	–	–	1	1	Settings for a No Paper display
SW17	–	–	–	–	–	–	–	–	Not used
SW18	–	–	–	–	–	–	–	–	Not used
SW19	–	–	–	–	–	–	–	–	Not used
SW20	–	–	–	–	–	–	–	–	Not used
SW21	–	–	–	–	–	–	–	–	Not used
SW22	–	–	–	–	–	–	–	–	Not used
SW23	–	–	–	–	–	–	–	–	Not used
SW24	–	–	–	–	–	–	–	–	Not used
SW25	–	–	–	–	–	–	0	0	Report display function settings
SW26	0	0	–	–	–	–	–	0	Transmission function settings
SW27	–	–	–	–	–	–	–	–	Not used
SW28	–	–	–	0	0	0	0	0	V.8/V.34 protocol settings (LASER CLASS 9000/9500 only)
SW29	–	–	–	–	–	–	–	–	Not used
SW30	–	–	–	–	–	–	–	–	Not used

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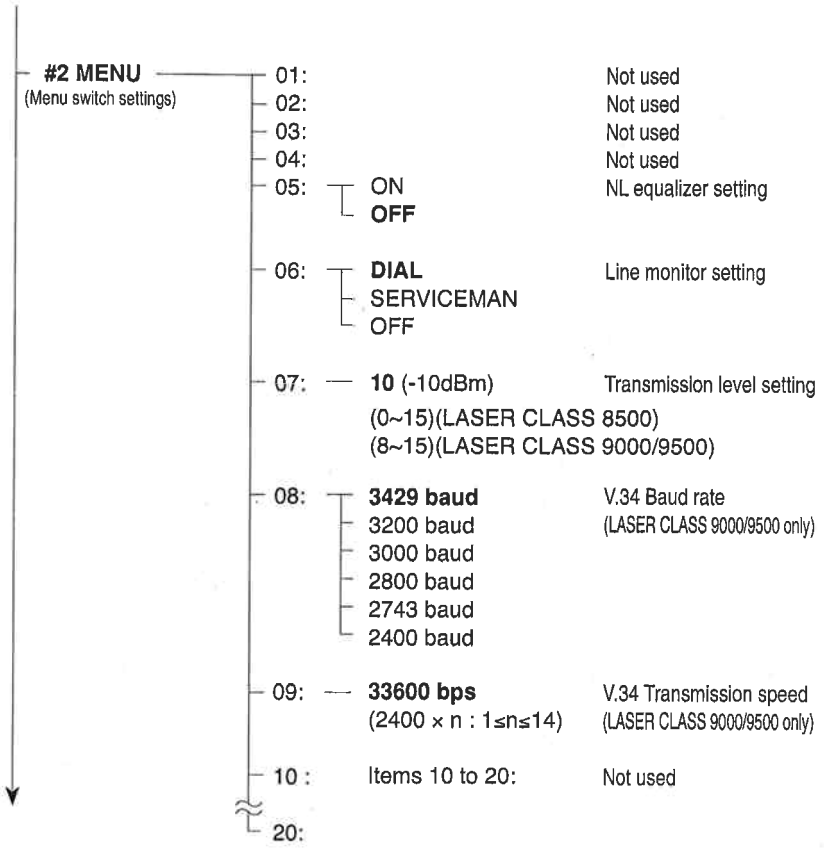
Figure 2-30 Service Data (page 1)

The switches marked "–" are not used. Do not change their settings.



Figures in boldface indicate the default setting.

Figure 2-31 Service Data (page 2)

No. 01 to 04, 10 to 20 are not used. Do not change their settings.

Do not set the Parameter No.07 for the LASER CLASS 9000/9500 to -7dB or higher.

#3 NUMERIC Param.
(Numeric parameter settings)

	Default	Range	
01:	0		Not used
02:	10 (10%)	(1~99)	RTN signal transmission condition (1)
03:	15 (15 times)	(2~99)	RTN signal transmission condition (2)
04:	12 (12 lines)	(1~99)	RTN signal transmission condition (3)
05:	4		Not used
06:	4		Not used
07:	2		Not used
08:	2		Not used
09:	6 (6 digits)	(1~20)	The number of digits in telephone number compared against TSI signal to be matched for restricted receiving function
10:	5500 (55 seconds)	(0~9999)	T0 Timer
11:	3500 (35 seconds)	(0~9999)	T1 Timer (Rx)
12:	0		Not used
13:	1300 (13 seconds)	(500~3000)	Maximum time allowed to receive one line of image data
14:	0		Not used
15:	120 (1200 ms)	(0~999)	Hooking detection time
16:			
≈	Items 16 to 30:	Not used	
30:			

Figure 2-32 Service Data (page 3)

No. 01, 05 to 08, 12, 14, and 16 to 30 are not used. Do not change their settings

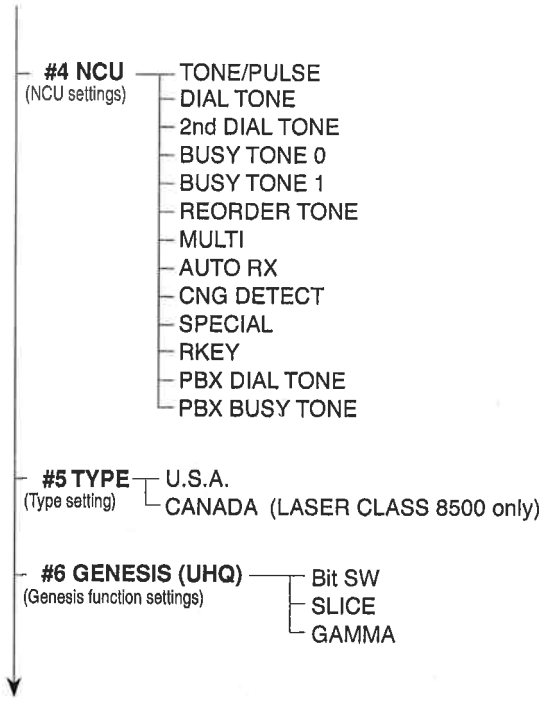


Figure 2-33 Service Data (page 4)

#4 NCU (NCU settings)
The values of these items are all set to match a specific nation's communications standards by the #5 TYPE setting. Do not change these settings.

#6 GENESIS (UHQ function settings)
Tampering with this setting may cause the scanned image quality to deteriorate.
Do not change these settings.

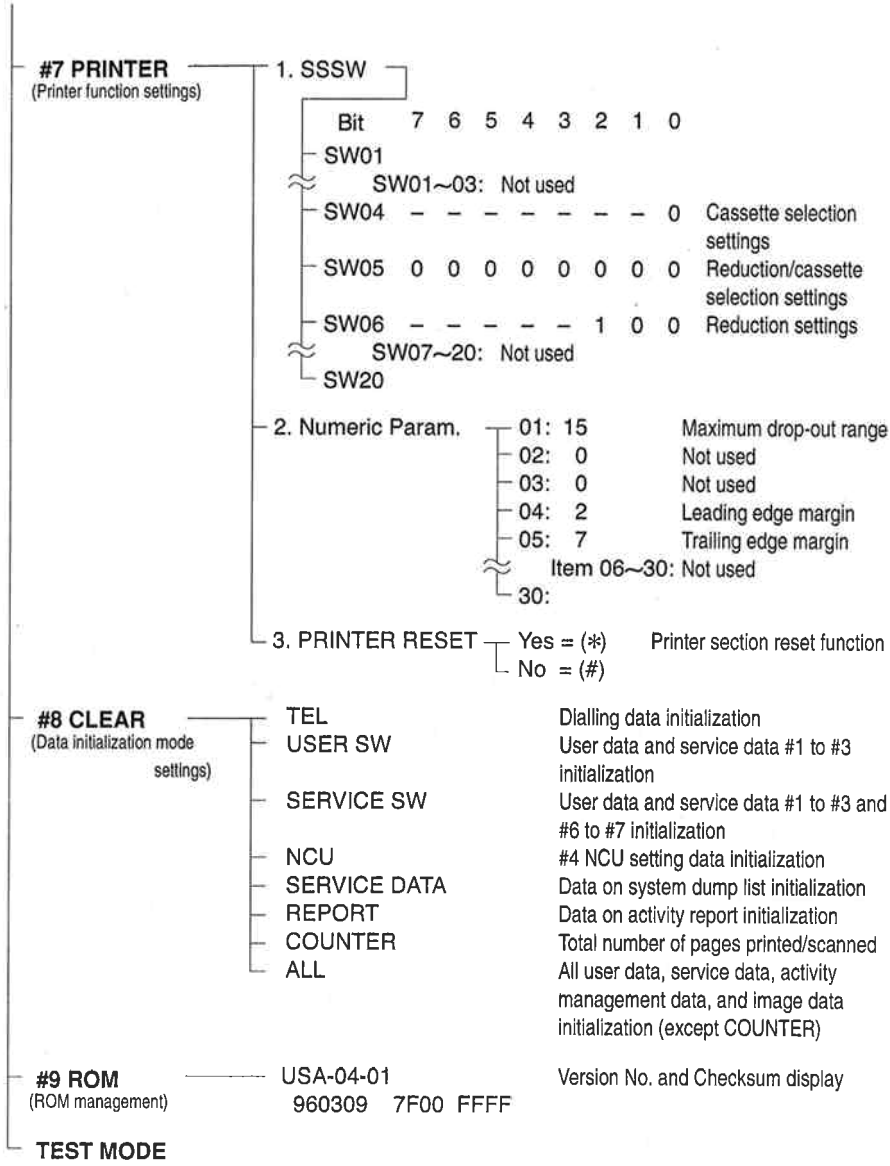


Figure 2-34 Service Data (page 5)

REFERENCE

For details on test mode, *see page 2-48 2.4 Test Functions.*

2.3.4 Explanation of SSSW (Service Soft Switch Settings)

The items registered and set by each of these switches comprise 8-bit switches. The figure below shows which numbers are assigned to which bits. Each bit has a value of either 0 or 1.

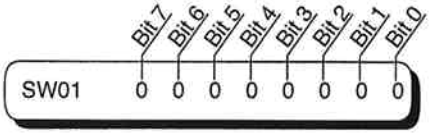
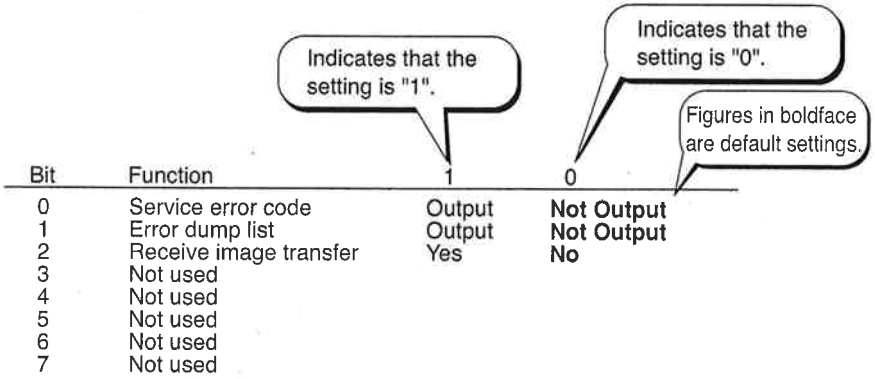


Figure 2-35 Bit Switch Display

See the chart in the service menu shown in Section 2.3.3 Service data settings to see effective bits and their default values. The meanings (functions) of the bits are not described in this manual except the new switches added to this model. See *"G3 Facsimile Service Data Handbook (Rev. 0)" (supplied separately)* for details of the switches.

Below are examples showing how to read bit switch tables.



Bit	Function	1	0
0	Service error code	Output	**Not Output**
1	Error dump list	Output	**Not Output**
2	Receive image transfer	Yes	**No**
3	Not used		
4	Not used		
5	Not used		
6	Not used		
7	Not used		

Figure 2-36 How to Read Bit Switch Tables

2.3.5 New SSSWs/parameters added to this model

#1 SSSW

SW05 (service soft switch 05: standard function <DIS signal> settings)

Bit	Function	1	0
0	Not used		
1	Not used		
2	Not used		
3	Send DIS signal bits 33 and over	No	**Yes**
4	Recording paper length availability declared in DIS signal	A4 size	**Arbitrary size**
5 (New)	Declare LTR/LGL in DIS signal	No	**Yes**
6	Not used		
7	Not used		

[Bit 5]

Select whether to declare LTR or LGL in DIS signal when the LTR or LGL recording paper is used. The recording paper is selected according to the setting of #7 printer SW04 bit 0.

#1 SSSW

SW06 (service soft switch 06: scan condition settings)

Bit	Function	1	0
0	Document feed after DES on	No feed	**Feed**
1	Prescan for document scanning	No prescan	**Prescan**
2	Document length restriction	Not restricted	**39.37" (1 m) max.**
3 (New)	Stamp option	Yes	**No**
4	Document scan width	**LETTER**	A4
5	Recording paper output for long image copy	First page only	**Divided onto multiple pages**
6	Copy function resolution	Variable	**Always fine mode**
7	Superfine mode setting when AUTO key selected	Set	**Not set**

[Bit 3]

If a stamp unit option is installed, set this switch to 1. If it is set to 1, the stamp key on the operational panel becomes effective and the "TX STAMP" setting menu appears as user's data.

#1 SSSW

(The switch shown on this page is valid for the LASER CLASS 9000/9500 only.)

SW28 (service soft switch 28: V.8/V.34 protocol settings)

Bit	Function	1	0
0 (New)	Caller V.8 protocol	NO	**YES**
1 (New)	Called party V.8 protocol	NO	**YES**
2 (New)	Caller V.8 protocol late start	NO	**YES**
3 (New)	Called party V.8 protocol late start	NO	**YES**
4 (New)	V.34 reception fallback	Prohibited	**Not prohibited**
5	Not used		
6	Not used		
7	Not used		

[Bit 0]

Select whether to use the V.8 protocol when calling. If NO is selected, the V.8 protocol is inhibited at calling and the V.21 protocol is used.

[Bit 1]

Select whether to use the V.8 protocol when called. If NO is selected, the V8 protocol is inhibited when called and the V.21 protocol is used.

[Bit 2]

If ANSam signal is not received during transmission, select whether to use the V.8 protocol when the other fax machine declares the V.8 protocol in DIS signal. If NO is selected, the CI signal is not transmitted and the V.8 protocol is not used even if the DIS that specifies the V.8 protocol is received.
The V.8 late start is not executed during manual transmission regardless of this setting.

[Bit 3]

Select whether to declare the V.8 protocol in DIS signal for reception. If NO is selected, the V.8 protocol cannot be used because it is not declared in DIS signal.
The V.8 late start is not executed during manual reception regardless of this setting.

[Bit 4]

Select whether the receiver falls back during V.34 reception. If Prohibited is selected, the receiver does not fall back.

#2 MENU

(The switch shown on this page is valid for the LASER CLASS 9000/9500 only.)

No.	Function	Selection range	Default setting
08	V.34 max. baud rate	2400~3429	3429 (3429 baud)
09	V.34 max. transmission speed	2400~33600	33600 (33600 bps)

[No. 08]

Select the maximum baud rate for V.34 transmission: 3429, 3200, 3000, 2800, 2743, and 2400.

[No.09]

Select the maximum transmission speed for V.34 transmission: 2400 to 33600 bps (2400 × n: $1 \leq n \leq 14$).

NOTE

This model cannot use 2800 baud due to its modem specification. If it is set to 2800 baud, the maximum baud rate is 2743 baud.

#3 NUMERIC PARAM. (numeric parameter settings)

No.	Function	Selection range	Default setting
10	T0 Timer	0~9999	5500 (55 second)
11	T1 Timer (Rx)	0~9999	3500 (35 second)
13	Maximum time to receive one line of image data	500~3000	1300 (13 second)

[No.10]

The "wait time after transmission of a dialing signal ends until a significant signal is detected in transmission" was set as T1 timer with parameter 10. However, ITU-T recommends that it should be set as T0 timer, so parameter 10 has been renamed to T0 timer and the default time-out time has been changed from 35 to 55 seconds.


NOTE

The T1 timer for the transmitter (wait time after a CED, V21 flag, or ANSam significant signal is detected until the next significant signal is detected) is fixed at 35 seconds.

[No.11]

Set the T1 timer for the receiver (wait time after DIS transmission starts until a significant signal is received).
If frequent errors occur during reception because of line connection conditions, raise the value of this parameter.

[No.13]

Set the maximum time to receive one line of image data when image data is received.
If the other party is a computer fax and the time to receive one line of image data is long, raise the value of this parameter to increase the maximum reception time.

#7 PRINTER
Service soft switch settings

SW04 (switch 04: reduction/cassette selection settings)

Bit	Function	1	0
0 (New)	When LTR/LGL specification is received by DCS, the cassette is selected according to the specification.	No	**Yes**
1	Not used		
2	Not used		
3	Not used		
4	Not used		
5	Not used		
6	Not used		
7	Not used		

[Bit 0]
Selects whether or not the recording paper is selected according to the DCS specification when the other fax machine specifies LTR or LGL in DCS signal during reception. If it is 0, the specified recording paper is used regardless of the paper length. If it is 1, the receiving station selects the recording paper. This switch is valid when #1 SSSW SW05 bit 5 is 0.

2.4 Test Functions

The fax functions for testing individual operations, such as below.
See *page 2-35* for details of entering the test mode. To leave the test mode, press the CLEAR key.

2.4.1 Test mode overview

Test mode can be executed by following the menu items from the display.

a) DRAM tests

Writes data to DRAM image storage areas and reads that data to check operations.

b) Print test

Prints nine different patterns within the print area.

c) Modem, NCU tests

The frequency test, G3 signal transmission test, and Tonal and DTMF signals reception tests, and V.34 G3 signal transmission test.

d) Faculty tests

Test the operation of operation panel, sensor functions, and stamp function.

2.4.2 Test mode flowchart

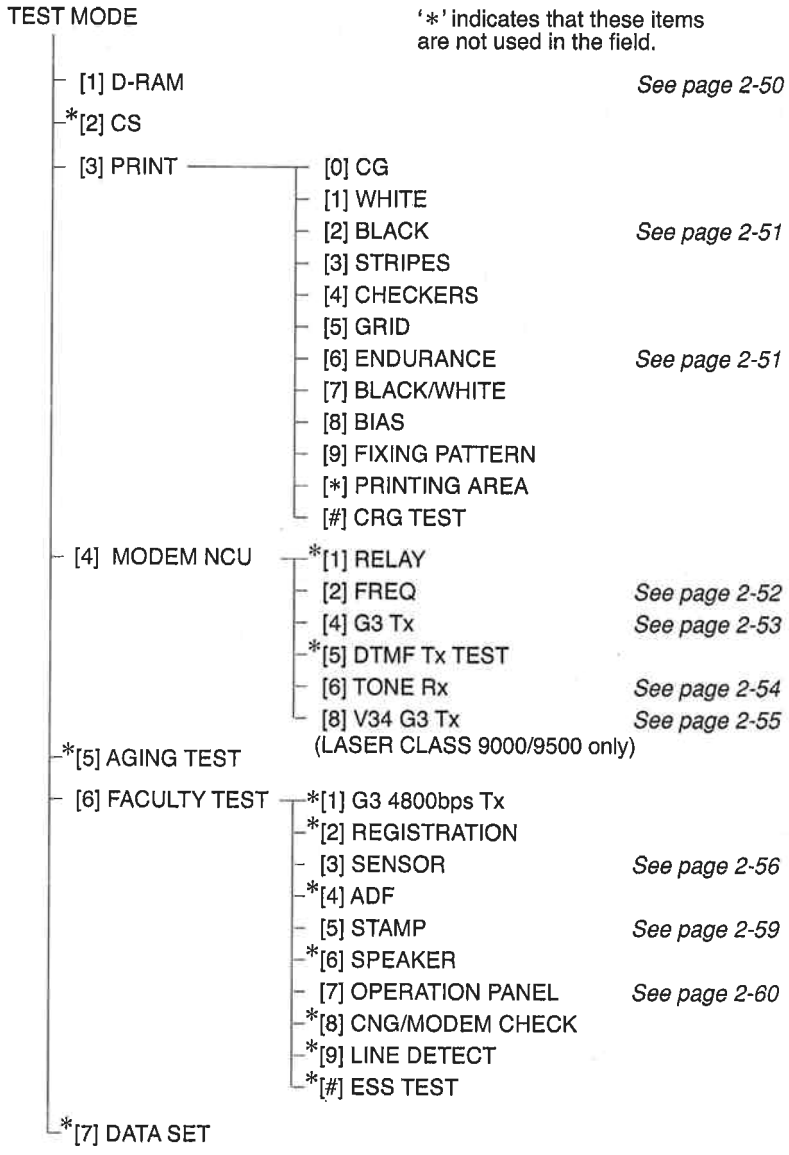


Figure 2-37 Test Mode

2.4.3 D-RAM tests

Pressing the 1 key from the test mode menu selects the D-RAM tests. D-RAM Test 1 writes data to the entire D-RAM region and reads it out to check that operations are correct. D-RAM Test 2 just reads data at high speed. This test can be used to check operations when optional memory has been added.

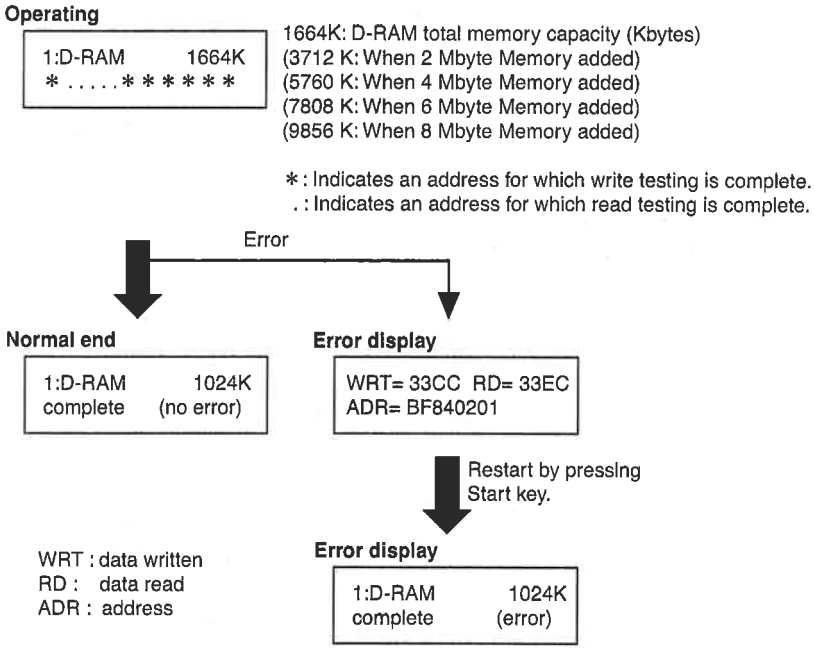


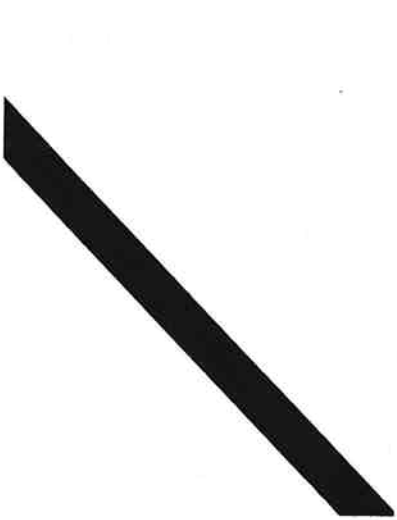
Figure 2-38 D-RAM Test

Before D-RAM test, output all image data in image memory.
When D-RAM test is performed, all image data are cleared.

2.4.4 Print test

a) Test mode print test

The Print Test menu is selected by pressing the 3 key from the test mode menu. In this test, various print patterns are output from the printer. As service print patterns, press the 2 key from the Print Test menu to select **"3-2: Black"** or press the 6 key to select **"3-6: Endurance"**. Do not use the other patterns. They are for development and factory use.
Check the following for the print pattern.



Check for image shrinking, stretching, soiling, and black stripes.
"3-6: Endurance"

Check for white stripes and unevenness.
"3-2: Black"

Figure 2-39 Print Pattern Check

NOTE

After completion of the print test, if the printing was normal, copy a document. If there is any defect in the copied image, there is a defect in the scan section.

2.4.5 Modem and NCU tests

These tests test modem and NCU transmission and reception. The modem tests check whether signals are sent correctly from the modem by comparing the sound of the signals from the speaker with the sounds from a normal modem. Also, you check on the display whether or not the modem correctly detected received tone signals and DTMF signals.
End this test by pressing the STOP key.

Modem test type	Overview
Frequency test	The modem sends tone signals from the modular jack and the speaker.
G3 signal transmission test	The modem sends G3 signals from the modular jack and the speaker.
Tonal signal reception tests	The modem detects specific frequencies and DTMF signals received from the modular jack.
V.34 G3 signal transmission test (LASER CLASS 9000/9500 only)	The modem sends V.34 G3 signals from the modular jack and the speaker.

a) Frequency test

The frequency test menu is selected by pressing the 2 key from the MODEM NCU test menu. Signals of the frequencies below are sent from the modem using the modular jack and the speaker. The frequency can be changed with the numeric keys.

Numeric key	Frequency
1	462 Hz
2	1100 Hz
3	1300 Hz
4	1500 Hz
5	1650 Hz
6	1850 Hz
7	2100 Hz

b) G3 signal transmission test

The G3 signal transmission test menu is selected by pressing the 4 key from the MODEM NCU test menu. The G3 signals below are sent from the modem using the modular jack and the speaker. The Speed can be changed with the numeric keys.

Numeric key	Speed
0	300 bps
1	2400 bps
2	4800 bps
3	7200 bps
4	9600 bps
5	TC7200 pbs
6	TC9600 bps
7	12000 bps
8	14400 bps

NOTE

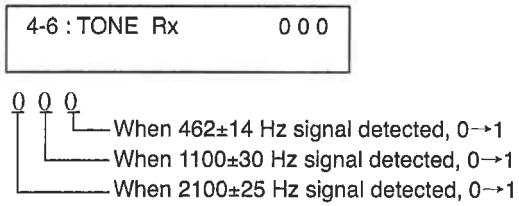
The transmission level for each frequency follows the service data.

c) Tonal and DTMF signal reception tests

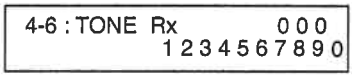
The tonal and DTMF signal reception test is selected by pressing the 6 key from the MODEM NCU test menu. In these tests, you can check whether the tonal signals and DTMF signals received from the modular jack are detected by the modem.

The 462 ±14 Hz test is included because the modem has a 462±14 Hz detection function.

Tonal signal reception test



DTMF signal reception test



The received DTMF signals are displayed in order from the right on the second line of the display.

Figure 2-40 Tonal and DTMF Signal Reception Tests

d) V.34 G3 signal transmission test

The V.34 G3 signal transmission test menu is selected by pressing the 8 key from the MODEM NCU test menu. The V.34 G3 signals below are sent from the modem using the modular jack and the speaker by pressing the start key. The Baud rate can be changed with the numeric keys, and the Speed can be changed with the search keys.

Numeric key	Baud rate
0	3429 baud
1	3200 baud
2	3000 baud
3	2800 baud
4	2743 baud
5	2400 baud

Search key	Speed
	2400 bps
	4800 bps
	7200 bps
^	9600 bps
	12000 pbs
	14400 bps
	16800 bps
	19200 bps
	21600 bps
	24000 bps
v	26400 bps
	28800 pbs
	31200 bps
	33600 bps

NOTE

The transmission level for each frequency follows the service data.

2.4.6 Faculty tests

The faculty tests are selected by pressing the 6 key from the test mode menu. These tests test the following faculties of this fax.

Test type	Overview
Sensor tests	Test whether the sensors are operating correctly.
Operation panel test	Tests whether the key switches on the control panel are operating correctly.
Stamp test	Tests whether the stamp function is operating correctly.

a) Sensor tests

The sensor test is selected by pressing the 3 key from the faculty test menu. In this test, you can check the status of each sensor of this fax in items 1-3 on the display.

You can also check if sensors that use actuators and microswitches are operating correctly by moving the actuator or microswitch.

Items 4-5 are not used in the field.

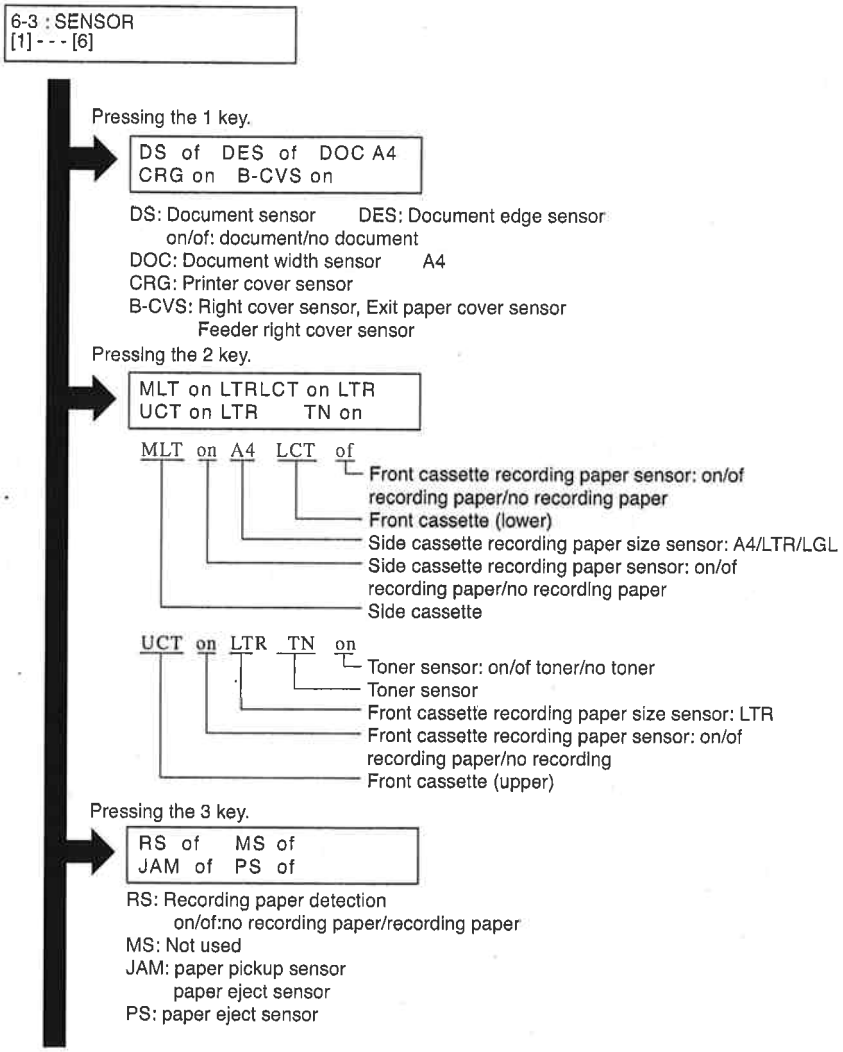


Figure 2-41 Sensor Tests

a-1) Toner sensor test check method

Use the following methods to test "TN on",and "TN of".

- **"TN on" check**

(1) Open the printer cover.
(2) Insert a cartridge containing toner into the fax.
(3) Close the printer cover.

- **"TN of" check**

a) When an empty cartridge is available.

(1) Open the printer cover.
(2) Insert the empty cartridge into the fax.
(3) Close the printer cover.

b) When no empty cartridge is available.

(1) Open the printer cover.
(2) Press the cartridge sensor lever down, in order to simulate the presence of a cartridge, and fix the lever down with tape.

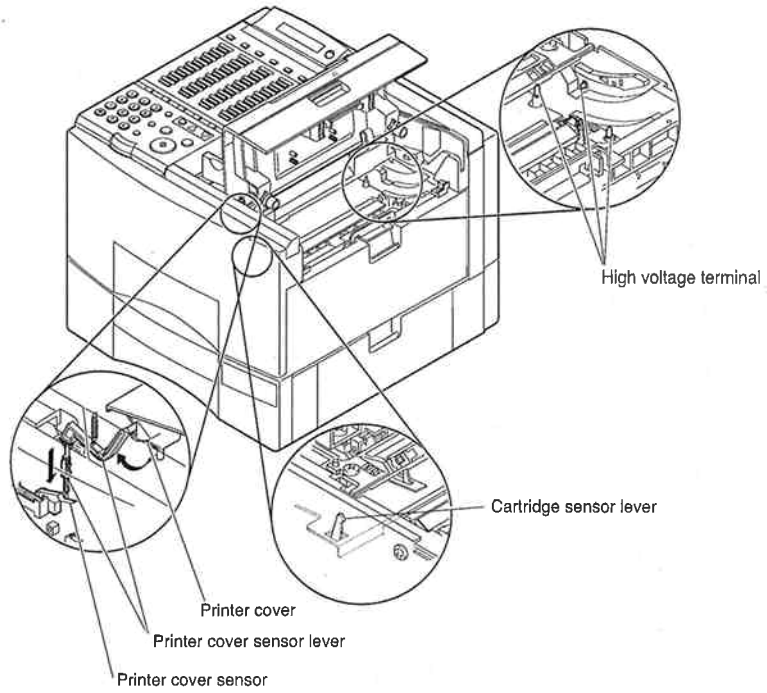


Figure 2-42 Sensor Lever

(3) Close the printer cover.

If the printer cover is closed without a cartridge being inserted, there will be no "TN of" display, and this will not count as a sensor malfunction.

If the printer cover sensor lever is pressed while the cartridge sensor lever is being pressed, high voltage will be applied to the high voltage terminals.

b) Stamp test

The stamp test is selected by pressing the 5 key from the faculty test menu. In this test, check if the stamp function operates correctly. The stamp test can test the following 2 operations.

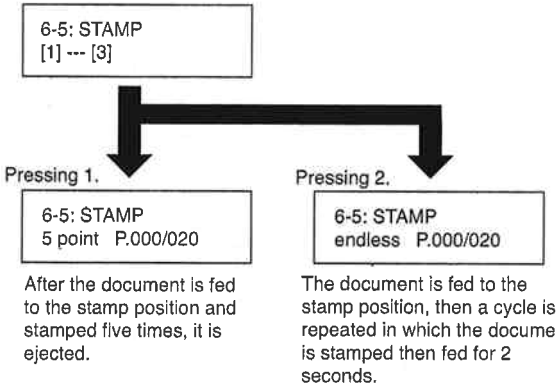


Figure 2-43 Stamp Test

NOTE

The above tests are carried out until the document sensor (DS) goes off.

c) Operation panel tests

The operation panel test is selected by pressing the 7 key from the faculty test menu. In this test, check that the display, LED lamps, and keys on the operation panel are operating correctly.

c-1) Display test

Pressing the START key from the operation panel menu, "**H**" is displayed 20 characters by 2 lines. The next time the START key is pressed, all the LCD dots are displayed. Check for any LCD dots in the display that are not displayed.

c-2) LED lamp test

The LED lamp test is selected by pressing the START key after the display test.

When the START key is pressed, all the lamps on the operation panel light. Check for any LED that does not blink during the test.

c-3) Operation key test

The Operation key test is selected by pressing the START key after the LED lamp test.

In this test, you press the key corresponding to the displayed character to put it out. The table giving the correspondence between the characters and the keys is below. When the LEDs for the character for the SUPER FINE-FINE-STANDARD key, the DARKER-STANDARD-LIGHTER key, or the TEXT-AUTO key are all lit up, the display goes out.

Character	Operation key	Character	Operation key
1-#	Numeric keys	M	Delete file key
E	Set key	/	Program key
L	Clear key	$	Super Fine-Fine-Standard key
P	Pause key	U	Darker-Standard-Lighter key
R	Redial key	A	Text-Auto key
C	Copy key	&	Manual Rx key
O	Hook key	?	TTI selector key
D	Coded dial key	%	Direct Tx key
Y	Directory key	!	Energy saver key
<	Down cursor key	>	Up cursor key

When all the characters displayed have gone out, the system next starts the one-touch speed dialing key test. The letters a-F are displayed, corresponding to one-touch speed dialing keys 01-72. Each letter displayed goes out when its corresponding one-touch speed dialing key is pressed.

In this test, check for operation keys whose corresponding character or letter does not go out when the key is pressed.

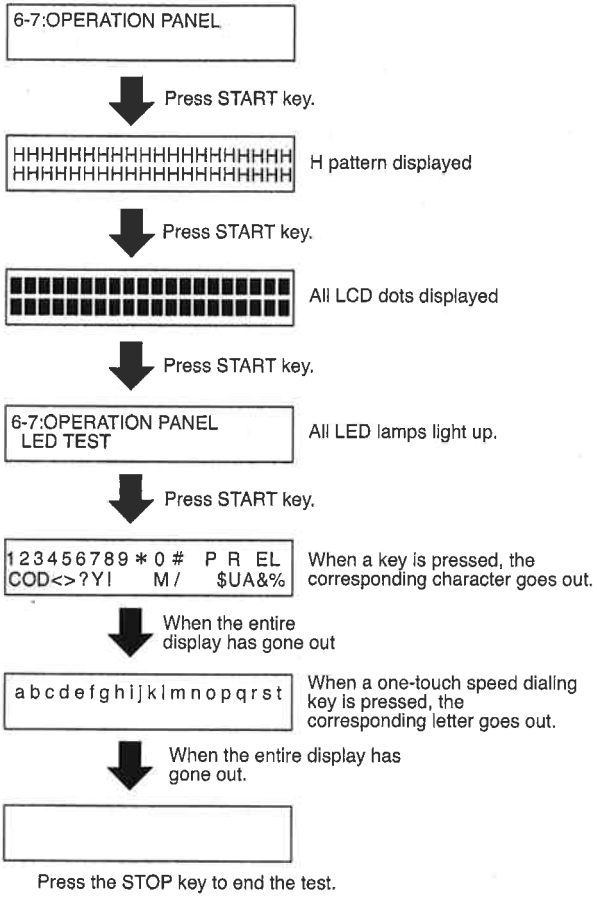


Figure 2-44 Operation Panel

Chapter 3

Technical Reference

Technical Reference

1. SPECIFICATIONS

1.1 Overview

This G3 facsimile transceiver conforms to ITU-T international standards.

•Improved speed (LASER CLASS 9000/9500 only)

This fax unit is equipped with the ITU-T standard V.34 mode which enables transmission speeds up to 33,600bps, more than double the rate of older G3 fax models.

•Full support of ITU-T subaddresses and passwords

You can employ ITU-T subaddresses and passwords to communicate not only with other Canon faxes, but fax machines of other manufacturers as well.

•Economical and quiet

Canon's RAPID Fusing System™ realizes quiet operation while you save money. If the fax machine remains idle for a specified length of time, the fax machine automatically shuts itself down and enters the low energy sleep mode, and will remain in this low energy mode until the fax machine receives a document transmission or until you press the ENERGY SAVER button, You can also use recycled paper in this fax.

1.2 Configuration and Structure

1.2.1 Product names

LASER beam printing type G3 facsimile
LASER CLASS 8500/9000/9500

1.2.2 External view

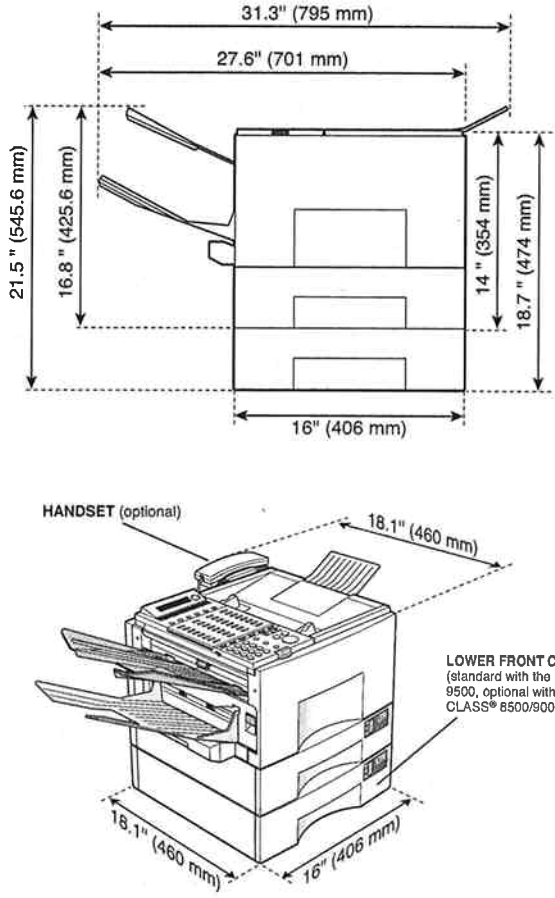


Figure 3-1 External View

1.2.3 Configuration

a) Main unit

Structural section	: Frame, motors, rollers, covers, and others (sensors, etc.)
Control section	: SCNT board, PCNT board
Scanning section	: Contact sensor
Printing section	: LASER beam printer unit
Operation section	: OPCNT board
Power supply	: Power supply unit
Line interface section	: NCU board, Modular board

b) Accessories

- Power Cord
- Document Tray
- Exit Tray
- Destination Labels (4)
- Modular Line Cord
- User's guide
- Warranty Registration Card
- Limited Warranty Note
- Installation Completion Report
- Installation Guide for Lower Front Cassette*1
- Front Cassette Feeder*1
- Screws (4)*1

*1 LASER CLASS 9500 only

1.3 Specifications and Functions

1.3.1 Basic specifications

Type

Desktop facsimile transceiver

Body colour

Art gray

Power source

Voltage	from 85 to 132 V AC
Frequency	from 45 to 65 Hz

Power consumption

Standby (ESS On)	approx. 10W
Standby (ESS Off)	approx. 15W
Operation	approx. 380W (100% of document black copy)

Main unit usage environment

Temperature	from 50.0°F to 90.6°F (10°C to 32.5°C)
Humidity	from 20% to 80% RH
Horizontality	±3° or less

Operating noise

Measured in accordance with ISO standards

Standby	approx. 35 dB(A)
Operating	approx. 52 dB(A)

Dimensions

15.98" (W) × 18.11" (D) × 13.94" (H) (406mm × 460mm × 354mm)
(LASER CLASS 8500/9000)
15.98" (W) × 18.11" (D) × 18.66" (H) (406mm × 460mm × 474mm)
(LASER CLASS 9500)

Not including handset, paper tray

Weight

Approx. 41.89 lbs (19 kg) (LASER CLASS 8500/9000)
Approx. 57.32 lbs (26 kg) (LASER CLASS 9500)
Not including handset, paper, cartridge, document tray, exit tray

1.3.2 Communications specifications

Applicable lines

Analog line (one line)

- PSTN (Public Switched Telephone Network)

Handset (Option)

Handset with no numeric buttons (CT-17)

Transmission method

Half-duplex

Transmission control protocol

ITU-T V.8 protocol V.34 protocol/ECM protocol (LASER CLASS 9000/9500 only)
ITU-T T.30 binary protocol/ECM protocol

Modulation method

G3 image signals	ITU-T V.27ter (2.4k, 4.8k bps)
	ITU-T V.29 (7.2k, 9.6k bps)
	ITU-T V.17 (14.4kbps, 12kbps, TC9.6kbps, TC7.2kbps)
	ITU-T V.33 (14.4kbps, 12kbps)
	ITU-T V.34*(2.4kbps, 4.8kbps, 7.2kbps, 9.6kbps, 12kbps, 14.4kbps, 16.8kbps, 19.2kbps, 21.6kbps, 24kbps, 26.4kbps, 28.8kbps, 31.2kbps, 33.6kbps)
G3 procedure signals	ITU-T V.21 (No.2) 300bps
	ITU-T V.8, V.34* 300bps, 600bps, 1200bps
	*LASER CLASS 9000/9500 only

Transmission speed

33.6k*, 31.2k*, 28.8k*, 26.4k*, 24k*, 21.6k*, 19.2k*, 16.8k*, 14.4k, 12k, TC9.6k, TC7.2k, 9.6k, 7.2k, 4.8k, 2.4k bps
With automatic fallback function
*LASER CLASS 9000/9500 only

Coding

MH, MR, MMR, JBIG

Error correction

ITU-T ECM

Canon express protocol

CEP1
CEP2 (Tx only for the LASER CLASS 9000/9500)

Time required for transmission protocol

Mode	Pre-message Protocol *1	Post-message Protocol *2 (between pages)	Post-message Protocol *3 (after pages)
V.8 / V.34 (LASER CLASS 9000/9500 only)	Approx. 8 s	Approx. 2 s	Approx. 2 s
T.30 Standard	Approx. 18 s	Approx. 4 s	Approx. 4 s
CEP2	Approx. 3 s	Approx. 2 s	Approx. 1 s
CEP1	Approx. 9 s	Approx. 2 s	Approx. 1 s

*1 Time from when other facsimile is connected to the line until image transmission begins.
*2 Post-message (between pages): Time from after one document has been sent until transmission of the next document starts if several pages are transmitted.
*3 Post-message (after last pages): Time from after image transmission is completed until line is switched from facsimile to telephone.

Minimum transmission time

G3	10 ms
G3 (ECM)	0 ms

Transmission output level

from -8 to -15 dBm (LASER CLASS 9000/9500)
from 0 to -15 dBm (LASER CLASS 8500)

Minimum receive input level

-43 dBm

Modem IC

Rockwell R288F (LASER CLASS 9000/9500)
Rockwell R144EFXL (LASER CLASS 8500)

1.3.3 Scanner specifications

Type

Sheets

Sheet dimensions

Maximum	Width 10.98" × length 39.4" (Width 279mm × length 1m)
Minimum	Width 5.83" × length 4.13" (Width 148mm × length 105mm)
Thickness	Multiple pages from 0.002" to 0.005" (0.06mm × 0.13mm) Single page from 0.002" to 0.012" (0.05mm × 0.30mm)

ADF capacity

A4/Letter	50 sheets or less
B4/Legal	20 sheets or less
11 inch × 17 inch	20 sheets or less

Effective scanning width

A4	8.19" (208mm)
LTR/LGL	8.43" (214mm)
B4 (LASER CLASS 9000/9500 only)	10.00" (254 mm)

Scanning method

Contact sensor scanning method

Scanning line density

Horizontal:	
Standard/Fine/Superfine	203.2 dpi (8 dots/mm)
Ultrafine	406.4 dpi (16 dots/mm) (Interpolated)
Vertical:	
Standard	97.79 dpi (3.85 line/mm)
Fine	195.58 dpi (7.7 line/mm)
Superfine/Ultrafine	391.16 dpi (15.4 line/mm)

Copy resolution

Direct copy	400 dpi × 600 dpi (Interpolated)
Memory copy	16 dots/mm × 15.4 line/mm (Interpolated)

Scanning density adjustment

Lighter, Standard, Darker:	The density level of each mode can be selected by the user data.


NOTE

Scanning density adjustment is only valid in binary image mode.

Image modes

Binary	Documents containing black-and-white characters
Auto halftone	Document containing black and white characters, documents containing photographs, mixed black and white characters, and photographs.


NOTE

Auto halftone mode cannot deal with blueprints, tracing paper, blue or green mark highlighting parts.

Half tone

64-gradation error diffusion system (UHQ 6.6)

Scanning range

Item	A4	Letter	Legal	B4 (LASER CLASS 9000/9500 only)
① Effective scanning width	8.19"±0.004" (208 ±0.1 mm)	8.43"±0.004" (214 ±0.1 mm)	8.43"±0.004" (214 ±0.1 mm)	10.00"±0.004" (254 ±0.1 mm)
② Effective scanning length	11.54"±0.16" (293 ±4.0 mm)	10.84"±0.16" (275.4±4.0 mm)	13.84"±0.16" (351.6±4.0 mm)	14.17"±0.16" (360.0±4.0 mm)
③ Left margin	0.04" ±0.12" (1.0 ±3.0 mm)	0.04" ±0.12" (1.0 ±3.0 mm)	0.04" ±0.12" (1.0 ±3.0 mm)	0.04" ±0.12" (1.0 ±3.0 mm)
④ Right margin	0.04" ±0.14" (1.0 ±3.5 mm)	0.04" ±0.14" (1.0 ±3.5 mm)	0.04" ±0.14" (1.0±3.5 mm)	0.04" ±0.14" (1.0±3.5 mm)
⑤ Top margin	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)
⑥ Bottom margin	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)

Units are inches with mm shown in parentheses.

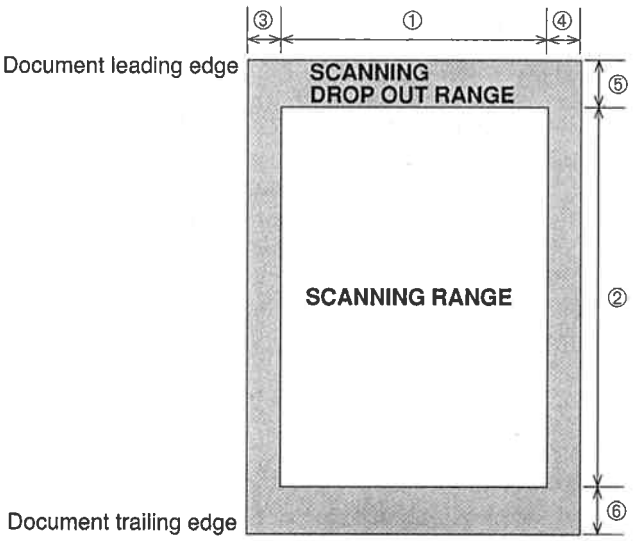


Figure 3-2 Scanning Range

NOTE

Document scanning width "A4/LTR" is set in service data #1SSSW SW 06, bit 4.

1.3.4 Printer section specifications

Paper dimensions

A4	8.27" × 11.69" (210 mm × 297 mm)
Letter	8.50" × 10.98" (216 mm × 279 mm)
Legal	8.50" × 14.02" (216 mm × 356 mm)

Paper cassette capacity

Front cassette
2.17" (55mm) or less in stacking height (Approx. 500 sheets)

Side cassette
0.39" (10mm) or less in stacking height (Approx. 100 sheets)

Exit tray stacking

A4/LTR	Approx. 250 sheets
LGL	Approx. 100 sheets

Printing method

Laser beam printer

Printing cartridge

Product name	Canon FX4 Cartridge	
Product code	H11-6401-220	
Strage conditions	Temperature	from 32.0°F to 95.0°F (0°C to 35°C)
	Humidity	from 35% to 85% RH
Valid period	2.5 years from date of manufacture displayed on carton.	
Yield	approx. 4000 pages (black rate 4% chart)	

Toner detection

Toner out detected.

Printing speed

8 sheets/min

Printing resolution

600dpi Smoothing

Reduction for reception

Fixed reduction (75%, 90%, 95%, 97%)
Auto reduction (70~100%)

Recommended recording paper

Canon Copier LTR/LGL Premium Paper

Weight	75 g/m^2
Paper size	Letter, Legal
Manufactured by	BOISE CASCADE

Printing range

Item	A4	Letter	Legal
① Effective printing width	8.01 (203.5 mm)	8.24" (209.4 mm)	8.24" (209.4 mm)
② Effective printing length	11.34" ±0.12" (288.0 ±3.0 mm)	10.65" ±0.12" (270.4 ±3.0 mm)	13.65" ±0.14" (346.6 ±3.6 mm)
③ Left margin	0.08" ±0.10" (2.0 ±2.5 mm)	0.08" ±0.10" (2.0 ±2.5 mm)	0.08" ±0.10" (2.0 ±2.5 mm)
④ Right margin	0.08" ±0.18" (2.0 ±4.5 mm)	0.08" ±0.18" (2.0 ±4.5 mm)	0.08" ±0.18" (2.0 ±4.5 mm)
⑤ Top margin	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)	0.08" ±0.08" (2.0 ±2.0 mm)
⑥ Bottom margin	0.28" ±0.26" (7.0 ±6.5 mm)	0.28" ±0.26" (7.0 ±6.5 mm)	0.28" ±0.27" (7.0 ±6.9 mm)

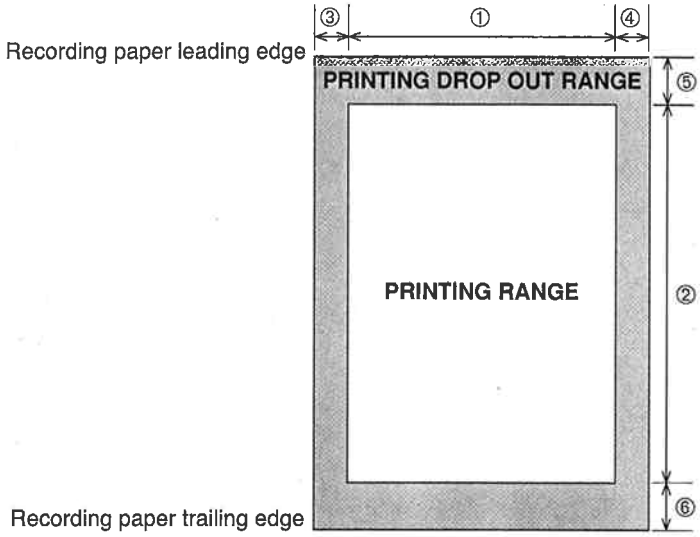


Figure 3-3 Printing Range

1.3.5 Functions

FAX/TEL switching

None

Answering machine connection

None

Polling

Polling transmission

The document is accumulated into memory ahead of time, then transmitted when there is a polling request from the other party.

Polling reception

Receives from a fax in automatic transmission mode

One touch locations	Max. 72
Coded speed dial locations	Max. 128

Confidential reception

Memory reception of images from a transmitting fax that has the confidential transmission function for memory reception.

Box No.	00-99 (Up to 70 boxes can be created.)
Subadress (ITU-T standard)	Max. 20 digits
Transmission password (ITU-T standard)	Max. 20 digits
Operation password	4 digits

Confidential transmission

Sends transmission images to receiving fax machines with the confidential reception function for memory reception.

Box No.	00-99
Subadress (ITU-T standard)	Max. 20 digits
Transmission password (ITU-T standard)	Max. 20 digits
Destinations	Max. 200

Remote reception

Method	ID call# (ID input method)
Remote ID (with ID call#)	2 digits

Auto dialing

Telephone number digits	Max. 120 digits
One-touch dial	Max. 72
Coded speed dial	Max. 128
Group dial	Max. 199 (One-touch: 71, Coded speed dial: 128)
Redial	Numeric button redial function (max. 120 digits)

Delayed transmission

Locations	Max. 210 (One-touch : 72, Coded speed dial : 128) Numeric button: 10)
Designated time	Max. 5 time

Broadcast transmission

Locations	Max. 210 (One-touch : 72, Coded speed dial : 128) Numeric button: 10)
Group button addresses	Max. 199 (One-touch : 71, Coded speed dial : 128)

Relay broadcasting originating

Group No.	00-99 (Up to 70 boxes can be created.)
Subadress (ITU-T standard)	Max. 20 digits
Transmission password (ITU-T standard)	Max. 20 digits
Destinations	Max. 200

Relay broadcasting

Group No.	00-99
Subadress (ITU-T standard)	Max. 20 digits
Transmission password (ITU-T standard)	Max. 20 digits
Destinations	Max. 200

Closed network

The 8 bit ID is specified by SSSW.

Direct mail prevention

Telephone numbers compared	Telephone numbers registered under one-touch and coded speed dial, and a TSI signal
Number of digits	Lower 6 digits (number of digits can be changed with service data #3)

Activity management

a) User report
Activity management report
(Every 40 transactions : Can be separated into Tx and Rx)
Activity report (sending / receiving)
One-touch speed dialling list
Coded speed dialling list
Group dial list
Memory clear list
User's data list
Multi activity report
Transmission reserve list
Document memory list

b) Service report
System data list
System dump list

Transmitting terminal identification

Items	Time, telephone No. (max 20 digits), senders ID, address, number of transmitted pages (max 3 digits)
Address	Can be registered with one-touch/ coded speed dial keys (16 characters)
Senders ID	24 characters (1 name)

Display

Display size	2 rows × 20 digits, 5 × 7 dot

Program key

The document mode for scanning or a transmission result report can be registered with the program key.

Redial

Interval	2 min. (from 2 to 99 min. can be selected in user data)
Count	2 times (from 1 to 10 times can be selected in user data)

Memory backup

Backup contents	dial registration data, user data, service data, time
Backup IC	512 kbit SRAM (256 kbit SRAM × 2)
Backup battery	Lithium battery 3.0 V DC / 560 mAh
Battery life	Approx. 5 years

Image data backup

Backup contents	Memory reception, memory copy, delayed transmission and broadcast transmission image data, activity management report
Backup IC	2Mbyte DRAM 2Mbyte/4Mbyte DRAMs (optional memory)
Backup battery	Rechargeable vanadium lithium battery 3.0V DC/ 50 mAh
Battery life	40 cycles with 100% discharge (Temperature 77°F(25°C))

Time

Management data	year/month/day/hour/minute (24 hour display)
precision	±30 sec per month

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2. THEORY OF OPERATIONS

2.1 Product Overview

2.1.1 Fax main unit

This fax operates on ordinary 120V AC household current, and has fax, telephone, and copy functions.

The communication functions include 33.6k bps G3 transmission with ECM (14.4k bps for LASER CLASS 8500), contact scanner scanning with an ADF (auto document feeder) that can consecutively transmit multi-page documents, and a LASER beam printer that can print on plain paper.

2.1.2 Option overview

a) Lower front cassette feeder

With the lower front cassette feeder installed in the bottom of the main unit, this fax operates as a three-cassette machine.

A cassette can hold up to 500*1 pages of letter-size recording paper at a time. For example, if letter-size recording paper is loaded in the lower front cassette and legal-size recording paper is loaded in the side cassette, the paper appropriate to the document received can be fed.

Also, if the same size paper is loaded into each cassettes, up to 1,100 pages can be printed on one loading.

*1 Loaded paper height of 2.17" (55mm) max.

b) 2MB/4MB memory kit

The image memory can be expanded by installing 2MB or 4MB memory boards. Two*2 memory boards can be installed in the fax machine regardless of the type of memory board.

*2 A 4MB memory board is preinstalled in the LASER CLASS 9500.

c) Verification stamp unit

The verification stamp unit stamps a check mark near the trailing edge of the scanning side of each document to verify that all documents are transmitted correctly without any errors, such as double feeding. This unit is installed near the contact sensor in the ADF (lower).

d) Handset kit

The handset kit includes a handset, a cradle, and installation screws. Installing the handset enables the telephone functions to be used.

2.1.3 Consumables

a) Toner cartridge

A new type of toner cartridge (FX4) is used. It is not compatible with the previous types of cartridges.

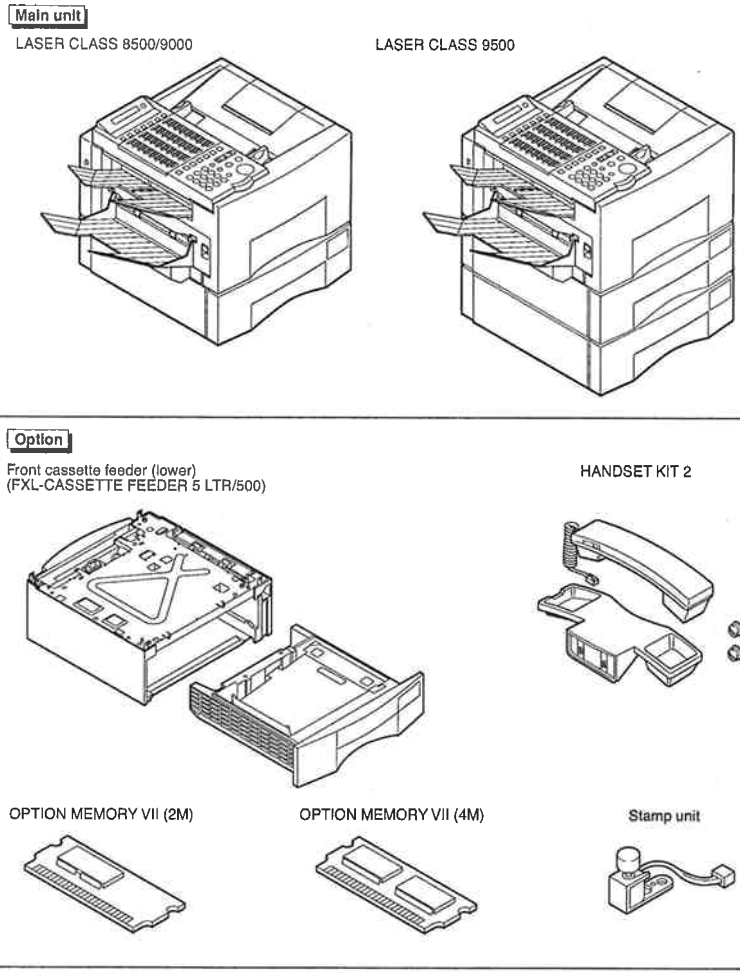


Figure 3-4 Product Overview

2.2 Mechanical Overview

The mechanical section of this fax comprises the scanner section, the pickup section, and the printer section.

2.2.1 Unit layout diagrams

a) Scanner section

The scanner section has an ADF (auto document feeder) function and can automatically feed 50 sheets of A4 or letter size documents (20 sheets of B4 or legal size documents). This section has a stopper mechanism to hold documents properly. A contact sensor scans one document in about 2 seconds (standard).

b) Pickup section

The pickup section feeds recording paper from a side cassette or front cassette to the printer section. The universal cassette type side cassette can hold up to 100 pages at a time, or paper to a maximum height of 0.39" (10 mm), whichever is the lesser, and the guide positions can be adjusted for letter, A4, and legal paper sizes. The front cassette can hold up to 500 pages at a time, or paper to a maximum height of 2.17" (55 mm). The recording paper is fed into the printer unit one page at a time, powered by the main motor.

c) Printer section

The printer section uses a new LASER beam printer engine.
It uses the surf fixing system that activates the heater only when printing to save power and shorten the wait time.

2.2.2 Document and recording paper flow

a) Document flow

When the document is inserted into the document insertion slot at the right of the main unit, it is fed by the loading roller to the separation roller , and one page at a time is separated. Then, the document is fed onto the contact sensor unit by the feed roller, and ejected by the eject roller to the document delivery tray from the document outlet at the left of the main unit.

b) Recording paper flow

When recording paper is fed from the front paper cassette, one sheet of paper is separated from the others and transferred by the pickup roller and separation rollers. When it is fed from the side paper cassette, one sheet of paper is separated from the others and transferred by the pickup roller and separation pad. It is then inverted by the feed roller and at the same time fed from the pickup section to the printer section. Then, after the recording paper is printed by the printer section, toner cartridge and fixing section, the paper is ejected by the eject roller at the recording paper outlet on the left side of the main unit.

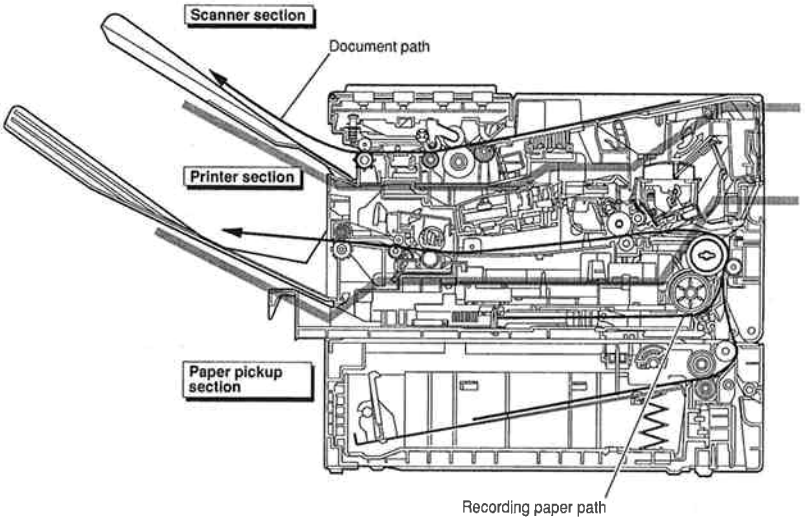


Figure 3-5 Paper Path

2.2.3 Drive system layout

a) Scanner section

The power of the document feed motor is transmitted by gears to drive the loading, separation, feed, and eject rollers. The rotation of loading roller is controlled by a solenoid and spring clutch.

b) Pickup section

The power of the main motor is transmitted by gears to drive the main unit's paper pickup, feeder paper pickup and feed rollers. The rotation of each roller is controlled by a solenoid and spring clutch.

c) Printer section

The power of the main motor is transmitted by gears to drive the transfer charging roller, the toner cartridge photosensitive drum, primary charging roller, and developing cylinder, and the fixing pressure roller and eject roller. The recording paper eject roller is driven by power transmitted by gear from the fixing unit eject roller.

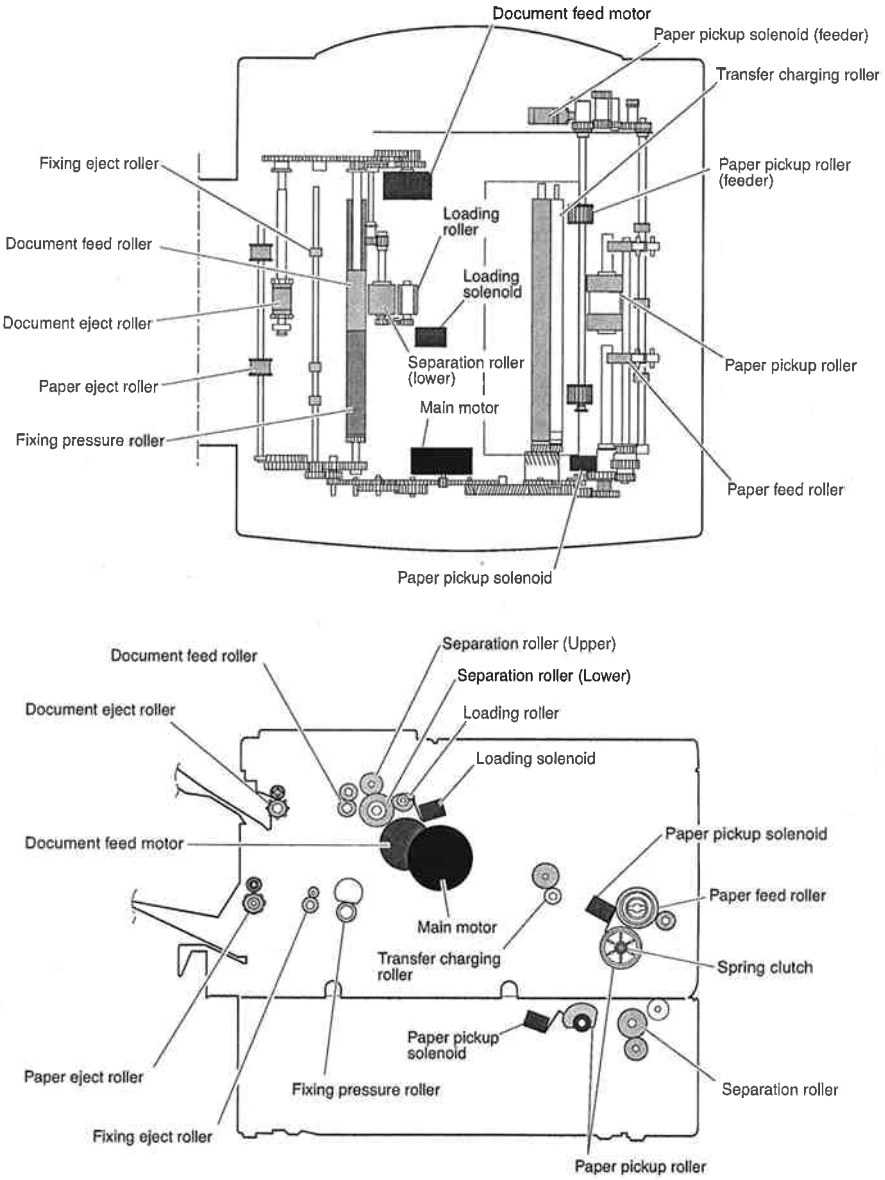


Figure 3-6 Drive System Layout

2.2.4 Electrical system layout

a) Board layout

a-1) SCNT board

This board integrates the system controller that controls the entire fax machine. This board is located at the rear of the main unit.

a-2) NCU board

This board controls the telephone line. This board is located at the rear of the main unit.

a-3) PCNT board

This board drives the motors, solenoids, toner cartridge, and fixing unit used in the printer section. This board is located at the bottom of the main unit.

a-4) OPCNT board

This board controls the operation panel. This board is contained in the operation panel.

a-5) Power supply unit

This board controls the power supply for the fax machine. This board is located in the left side of the SCNT board at the rear of the main unit.

a-6) Modular board

This board relays the telephone line to the NCU board. This board is located on the NCU board at the rear of the main unit.

a-7) Connector board

This board relays the sensors and solenoids to the PCNT board.

a-8) Paper sensor board

This board relays the feeder sensors and solenoids to the PCNT board. The side cassette paper sensor and paper size sensors are installed on this board.

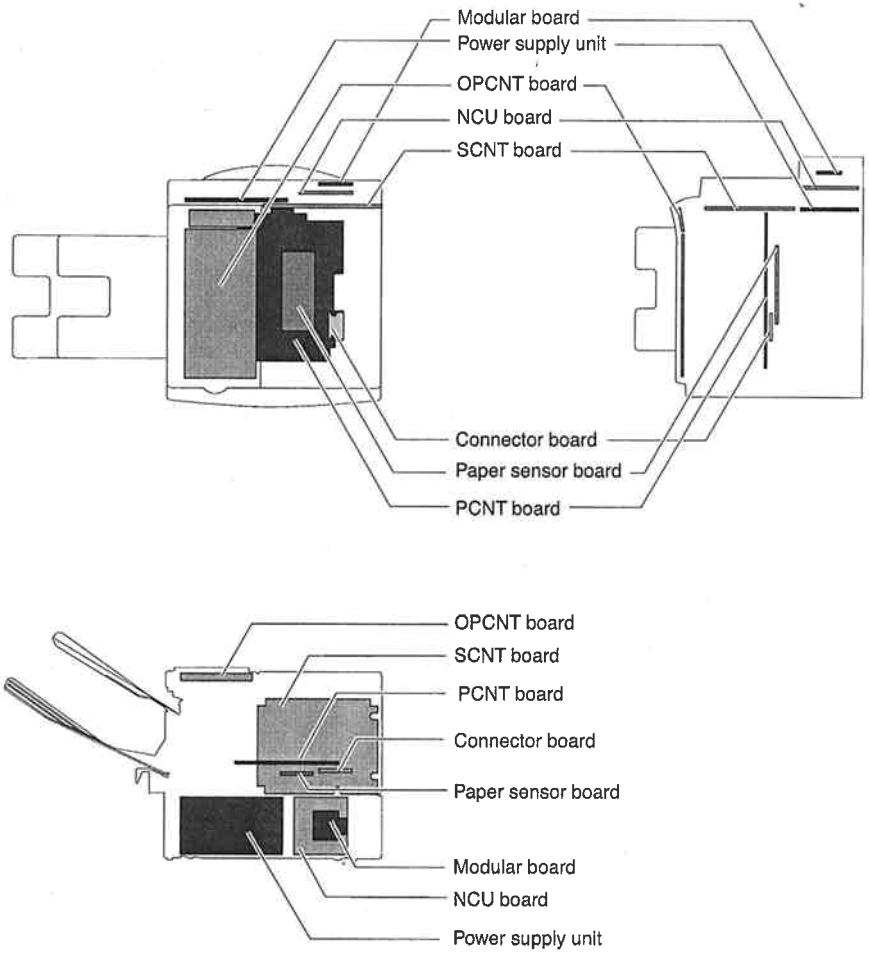


Figure 3-7 Electrical System Layout

b) Sensor layout

b-1) Contact sensor

This contact sensor (CS) horizontally scans documents up to B4 size 10.00" (254 mm) (LTR size 8.42" (214mm) for LASER CLASS 8500), at a horizontal scanning resolution of 8 dot/mm.

b-2) Document width sensor (DWS) (LASER CLASS 9000/9500 only)

This sensor detects the width of the document, and is located in the ADF ass'y (lower) at the bottom of the document slider.

b-3) Document sensor (DS)

This sensor detects the document, and is located in the ADF ass'y (upper).

b-4) Document edge sensor (DES)

This sensor detects the leading and trailing edges of the document as it is fed through the fax, and is located in the ADF ass'y (upper).

b-5) Panel sensor (A / B)

These sensors detect whether the one-touch speed dialing panels are open or closed, and are located on the OPCNT board.

b-6) Recording paper sensor

This sensor detects whether the side cassette contains paper, and is located on the paper sensor board.

b-7) Recording paper size sensor (A) / Recording paper size sensor (B)

These sensor detect that the side cassette is installed and the size of the recording paper in it, and is located on the paper sensor board.

b-8) Recording paper pickup sensor

This sensor detects the status of the paper pickup and paper feed, and is located in the paper feed section.

b-9) Recording paper eject sensor

This sensor detects the paper ejection condition, and is located on the PCNT board.

b-10) Right cover sensor

This sensor detects whether the right cover is open or closed, and is located on the right of the main unit.

b-11) Printer cover sensor

This sensor detects that the printer cover is closed and toner cartridge is installed, and is located on the PCNT board.

b-12) Exit paper cover sensor

This sensor detects whether the exit paper cover is open or closed, and is located on the printer frame.

b-13) Toner sensor

This sensor detects whether there is toner in the toner cartridge or not, and is located in the paper feed section.

b-14) Recording paper sensor

This sensor detects whether there is recording paper or not in the front cassette, and located on the upper portion of the frame at the rear of the front cassette opening.

b-15) Feeder right cover sensor

This sensor detects whether the feeder cover is open or closed, and is located on the right of the feeder.

b-16) Front cassette size sensor

This sensor detects that the front cassette is loaded and the size of the recording paper in it, and is located at the rear of the feeder frame.

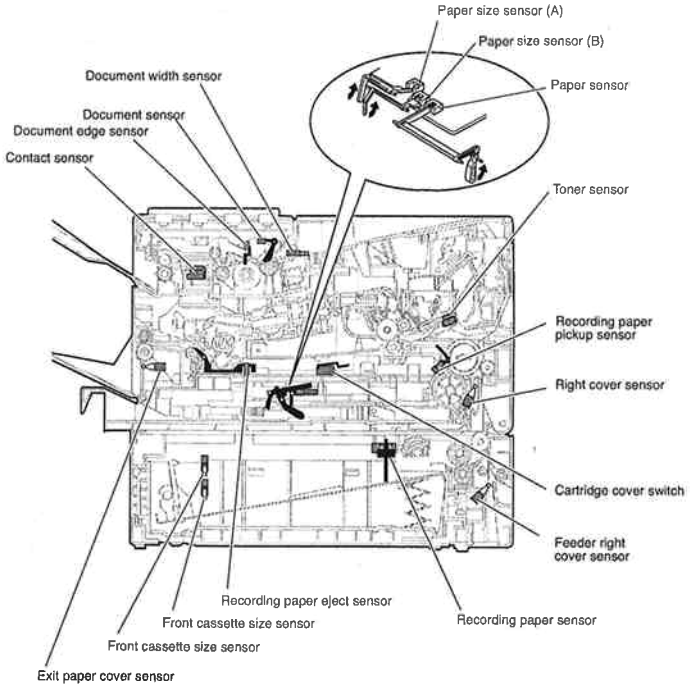


Figure 3-8 Arrangement of Sensors

2.3 Scanner Section

The scanner section comprises the document feed section and the optical section.

2.3.1 Document feed section

a) Document feed function

a-1) ADF (auto document feed) function

The ADF feeds up to 50 pages*1 of documents placed on the document table, separates each page with the separation roller (upper) and separation roller (lower), passes the page over the contact sensor unit, then ejects the paper to the document exit tray.

*1: Letter/A4 size: up to 50 pages, Legal/B4 size: up to 20 pages

a-2) Document jam detection function

The document jam detection functionses to detect eject paper jams and over-length documents with.

b) Document feed section structure

b-1) ADF structure

In the ADF structure, the rollers needed for document pickup, document separation, document feed, and document ejection are driven via gears with the power for the stepping pulse type document feed motor.

The document stopper is installed to position documents correctly and reduce feed errors due to documents inserted too deeply or insufficiently. When document transfer begins, the document stopper goes down, and documents are separated one at a time and fed with pickup roller and the separation rollers.

After separation, the document is fed to the contact sensor section with the document feed roller. The document feed roller turns faster than the separation roller to prevent the document from slackening between the document feed roller and the separation roller. The separation roller is pulled by the document feed roller.

The document fed to the contact sensor section is pressed by a white sheet above the contact sensor to prevent it from lifting during scanning. To correct shading, the white level is detected from the white sheet immediately before the paper passes through the contact sensor.

The document scanned with the contact sensor is delivered to the output tray with the document eject roller.

The ADF is controlled by the SCNT board's main CPU counting the document feed motor step pulses, and the photo-interruptor type document edge sensor*2 and document sensor*3 equipped with actuator arms detecting the document feed status.

*2: DES *3: DS

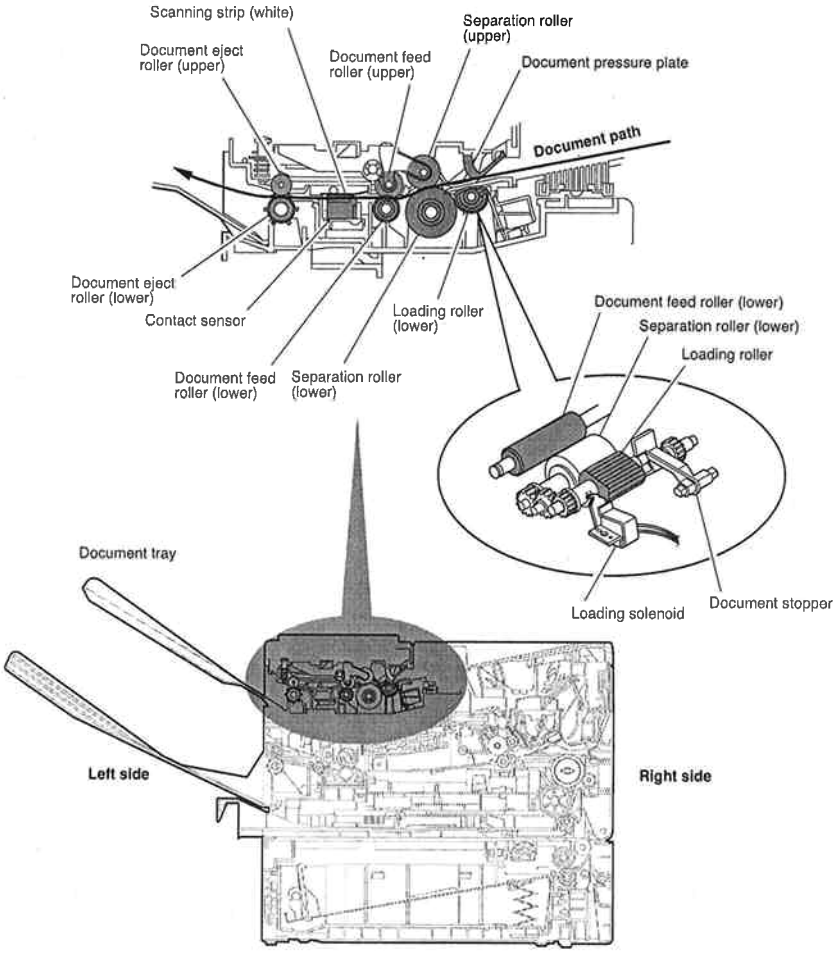


Figure 3-9 Document Feed Section

NOTE

Document stopper movement

(1) When documents are set (Fig. A)
The document stopper located in the ADF lower ass'y stops the documents inserted from the document inlet to prevent them from entering too deeply.

(2) When the stopper goes down (Fig. B)
When the document feed motor runs, the cam turns clockwise, and the stopper begins going down.

(3) When document feed begins (Fig. C)
When the cam turns further and the spring clutch projection touches the frame, the stopper reaches the bottom position. The spring clutch continues turning idly while the feed rollers are turning to transport the document.

(4) After the document feed ends (Fig. D)
After all documents are ejected, the motor turns reversely and the cam turns reversely until the stopper returns to position A. Since the eject roller has a mechanical timer, it does not rotate even if the motor runs reversely.

Initializing the document stopper

The projection on the upper document feed roller needs to be set (initialized) to the optimum position to operate the document stopper properly.
The fax machine performs initialization when the power is turned on, and after a document is ejected. The initialize operation is described in (4) above.

For details on the other ADF operations, see *the FACSIMILE BASIC• INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

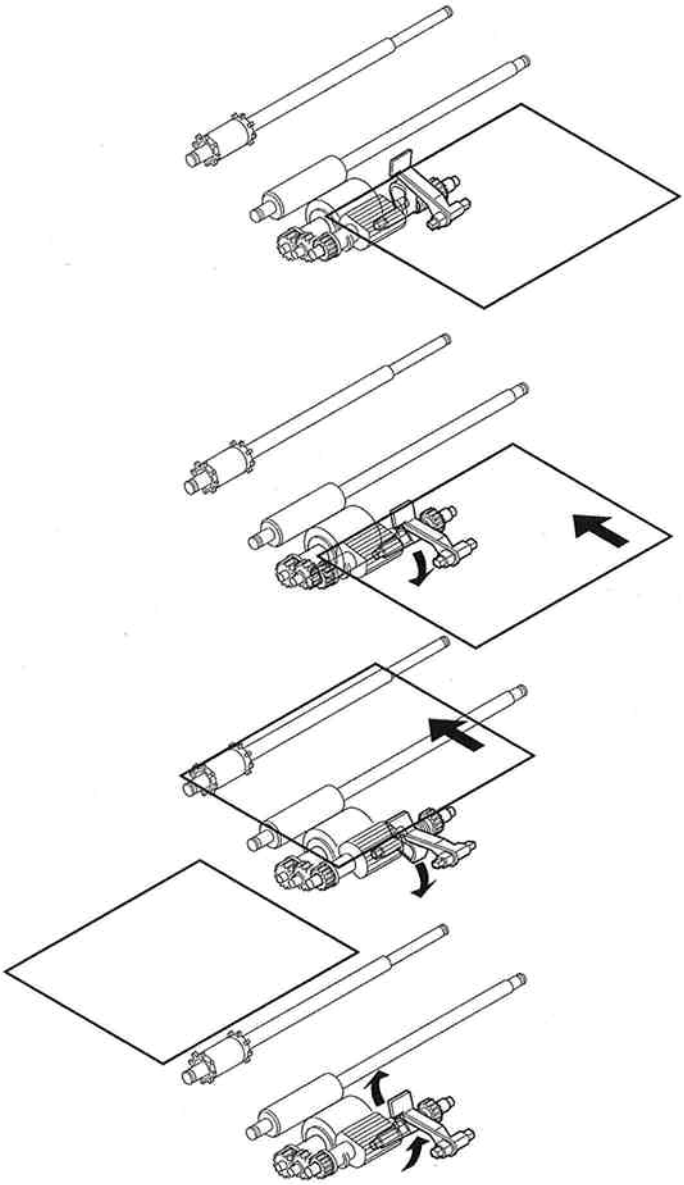


Figure 3-10 Stopper Movement

b-2) Document jam detection

The document edge sensor detects such document jams as pickup jams and document too long errors.

A "pickup jam" means the document edge sensor cannot detect the leading edge of the document within 15 seconds after document feeding begins.

A "document too long error" means that the document edge sensor cannot detect the trailing edge of the document, even after the stepping pulses for feeding more than 39.4" (1000 mm) of document have been transmitted.

Document Jam Processing

If a document jam occurs, the fax stops the document feed motor and ADF operations, displays the error, and the ALARM lamp flashes in red.

For a pickup jam, "CHECK DOCUMENT" is displayed. For document too long error, "DOCUMENT TOO LONG" is displayed.

If the document is being copied when a document jam occurs, the image data scanned in and stored in memory are erased for all pages, and print operations are stopped. Image data stored in memory when memory transmission, or delayed transmission, or sequential broadcasting, is erased from memory at the point when the jam is detected.

2.3.2 Optical section

a) Functions

a-1) Document scanning

For document scanning, the Contact Sensor (CS) horizontally scans documents up to B4 size 10.00" (254mm) (LTR size 8.42" (214mm) for LASER CLASS 8500), at a horizontal scanning resolution of 8 dot/mm.

Vertical scanning resolution is fixed by selecting resolution button on the operation panel. The document scanning speed changes according to the resolution setting, and scanning will be done at either 97.79 line/inch (3.85 line/mm) for Standard, 195.58 line/inch (7.7 line/mm) for Fine, and 391.16 line/inch (15.4 line/mm) for Superfine. The scanned data are sent to the SCNT board, and image processing carried out by the image processing IC (UHQ 6.6). When this IC is set for TEXT/PHOTO, areas of the document that contain photographs are automatically processed with 64 gradations of gray, rather than just two, black and white. This results in a much better reproduction of the photograph.

a-2) Prescanning

The variation of contact sensor output during document scanning is corrected by the prescan function.

a-3) Automatic slice level

The slice level for determining the white and black areas is set automatically to scan density correctly regardless of the document paper color.

b) Structures

b-1) Contact sensor

The contact sensor is designed to be dust-free, so that dust and other such minute particles cannot find their way inside the contact sensor housing, to settle on the sensor surface.

The contact sensor consists of an LED array that emits light for scanning, a lens that distributes light from the LED array uniformly in the horizontal direction, a contact glass that refracts the light to the document, a rod lens array that receives the light reflected from the document, and a phototransistor array that receives reflected light.

The LED array of the contact sensor is controlled by the SCNT board.

The phototransistor array consists of 2054 phototransistors (1728 phototransistors for LASER CLASS 8500), and 13 driver circuits (11 driver circuits for LASER CLASS 8500) that amplify the light reception output in units of 158 phototransistors.

The output from the 13 driver circuits (11 driver circuits for LASER CLASS 8500) is converted to serial data and sent to the SCNT board.

b-2) Prescanning

At the start each communication, the prescan function reads in one line of the white sheet pasted to the document feed section at the top of the contact sensor, stores the contact sensor output variation correction value into memory, and corrects contact sensor output for the image then read in.

b-3) Automatic slice level

The SCNT board image processing IC has a built-in ABC (Automatic Background Control) circuit. This circuit sets the slice level for each line of image data read, so that gradations can always be reproduced clearly, no matter the background colour of the paper.

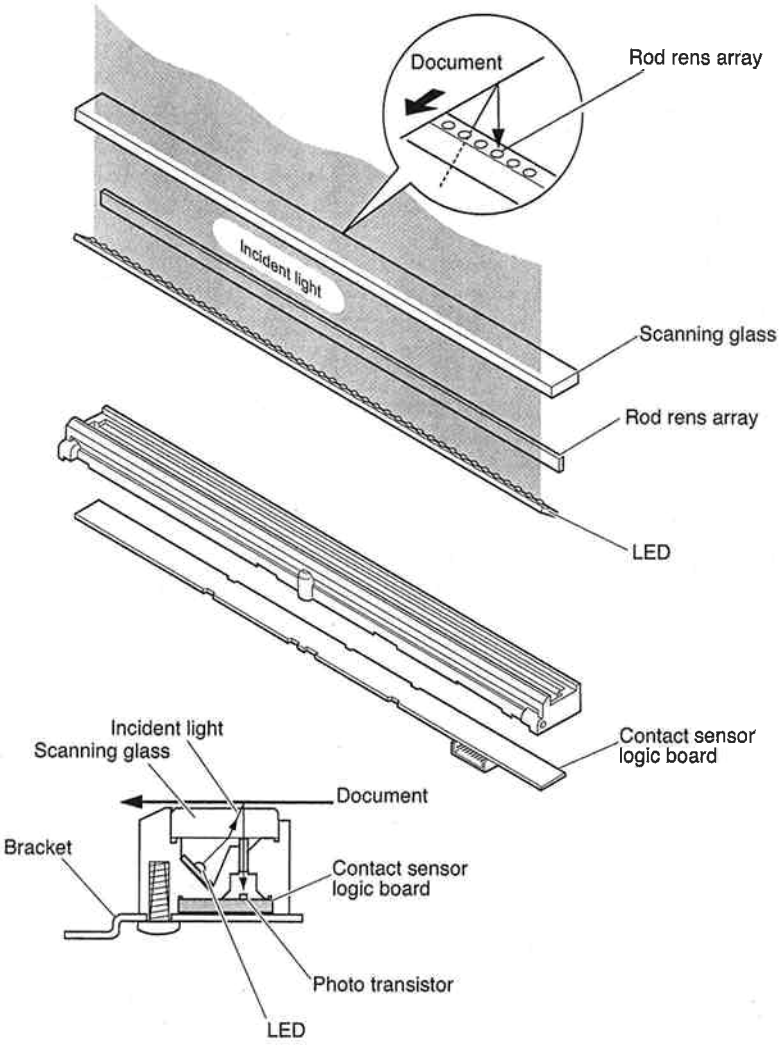


Figure 3-11 Contact Sensor

2.4 Paper Load Section

a) Functions

a-1) Recording paper pickup function

(From side cassette)

The load section uses the power of the main motor to separate recording paper from the side cassette with the pickup roller and the separator pad, then feed it with the feed rollers through the U-turn paper path at the right of the main unit and into the printer section.

(From front cassette)

After a page of recording paper is separated from the front cassette by claws on both sides and separation rollers, it is sent through the paper path at the right of the fax main unit by the recording paper feed roller to the printer section.

a-2) Universal recording paper cassette function (side cassette)

Up to 100 pages can be loaded into the side cassette at one time and the position of the movable paper guides can be adjusted for letter, A4, and legal size paper.

a-3) Recording paper pickup jam detection function

When there is a recording paper pickup jam, this is detected by the recording paper pickup sensor.

a-4) No recording paper detection function

When there is no recording paper in the side cassette, this is detected by the recording paper sensor on the paper sensor board.

The recording paper sensor in the feeder detects whether or not there is recording paper in the front cassette.

a-5) Recording paper size and no cassette detection function (side cassette)

(Side cassette)

The size of the paper in the side cassette and the absence of the side cassette are detected by the recording paper size sensor (A) and the recording paper size sensor (B).

(Front cassette)

The size of the paper in the front cassette and the absence of the front cassette are detected by the front cassette size sensors.

b) Structures

b-1) Cassette paper loading

In the recording paper loading configuration, the side cassette paper pickup roller, the front cassette paper pickup roller, separation rollers, and the recording paper feed roller are driven with power transmitted by gears from the main motor. The recording paper loading configuration is controlled by the PCNT board CPU counting the step pulses.

The two-step separation mechanism that uses the conventional claw separation and separation rollers when picking up paper from the front cassette is used to improve reliability.

NOTE

Loading operations

a) Side cassette

After the main motor rotation rate has reached a stipulated value, when the pickup solenoid spring clutch is released, the recording paper pickup roller turns 7/8 rotations, the lifting arm lifts up the lifting plate and the one page of recording paper held by the separation pad is picked up.

b) Front cassette

After the main motor starts rotating, when the feeder pickup solenoid spring clutch is released, the crescent shaped recording paper pickup roller rotates once, and one page of recording paper held by the separation claws at the front edge of the cassette is picked up. When one sheet is separated by the separation claws, the separation roller (lower) that is driven in the direction of pulling back the paper is turned in the opposite direction (clockwise) of driving by the feeding force of the separation roller (upper) and the action of the clutch. When two or more sheets are loaded, the separation roller (lower) turns in the direction of driving (pulling back the paper (counterclockwise)) to separate one sheet from the others. The recording paper is fed to the printer section by the feeder's recording paper feed roller.

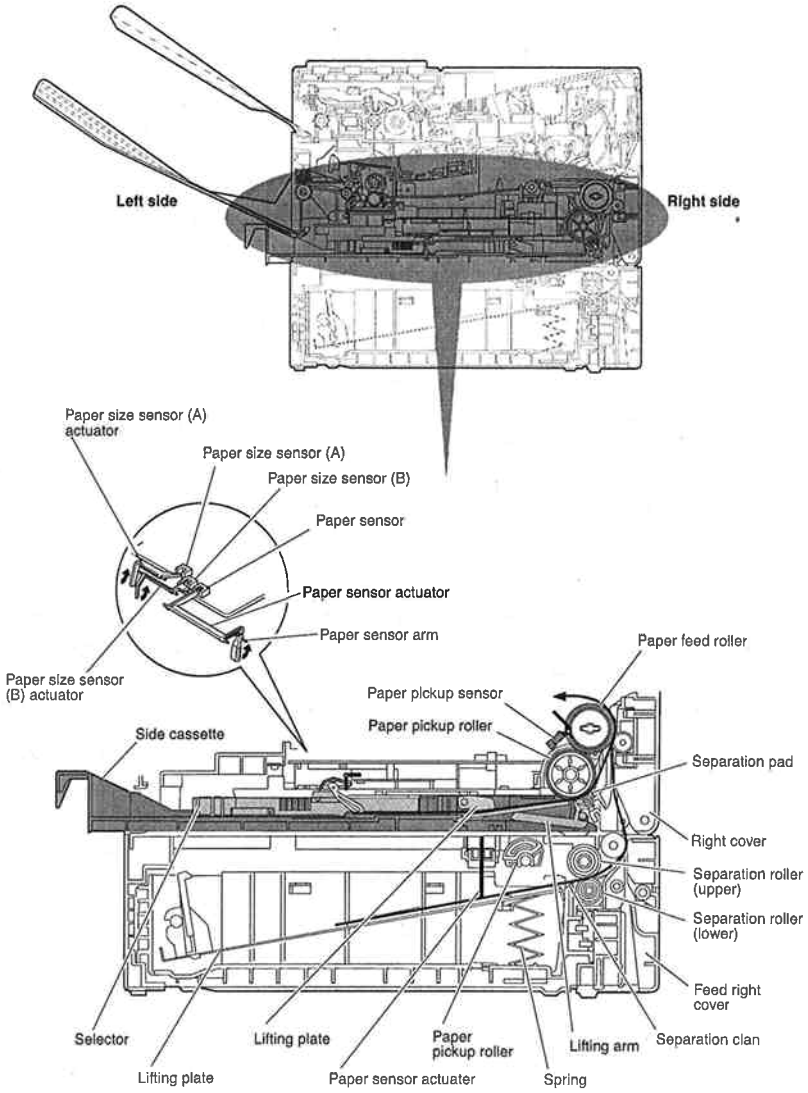


Figure 3-12 Cassette Paper Loading

b-2) Recording paper pickup jam detection configuration

Recording paper pickup jams are detected by the photo-interrupter type recording paper pickup sensor equipped with an actuator arm.
There are the following two types of recording paper pickup jams.

Recording paper pickup jam 1

A "recording paper pickup jam 1" means that the recording paper pickup sensor cannot detect the leading edge of the recording paper within 12.21*1 seconds of the pickup solenoid coming on.

*1 When paper pickup from the feeder (upper) section: 13.75 seconds
When paper pickup from the feeder (lower) section: 16.0 seconds

Recording paper pickup jam 2

A "recording paper pickup jam 2" means that the recording paper pickup sensor cannot detect the trailing edge of the recording paper within 8.46 seconds of detecting the leading edge of the recording paper.


NOTE

Recording paper pickup jam processing

When a recording paper pickup jam occurs, the main motor drive is stopped, print operations are stopped, the error is displayed on the display, and the REC. PAPER lamp and error lamp blink red.
For recording paper jams, **"REC. PAPER JAM"** is displayed on the display. If the error occurs during reception, the reception images are received into memory starting from the page during which the error occurred, but if the error occurs during copying, the copy image is erased.
If the printer cover, the right cover, the eject cover, or the feeder right cover is opened during recording paper feed, this causes a recording paper jam.

b-3) No recording paper detection configuration

A "no recording paper error" means that the photo-interrupter type recording paper sensor on the paper sensor board equipped with an actuator arm detects that the side cassette has no recording paper.

A "no recording paper error" means that the photo-interrupter type recording paper sensor in the front cassette feeder equipped with an actuator arm detects that the front cassette has no recording paper.


NOTE

No recording paper processing

When a no recording paper error occurs in the side cassette, the main motor drive is stopped, print operations are stopped, the error is displayed on the display, and the REC. PAPER lamp and the ALARM lamp blink red.

When a no recording paper error in the front cassette occurs, the main motor drive is stopped, print operations are stopped, the error is displayed on the display, the REC. PAPER lamp and the ALARM lamp blink red.

"SUPPLY REC. PAPER" is displayed on the display. If the error occurs during reception, the reception images are received into memory reception starting from the page during which the error occurred, but if the error occurs during copying, the copy image is erased.

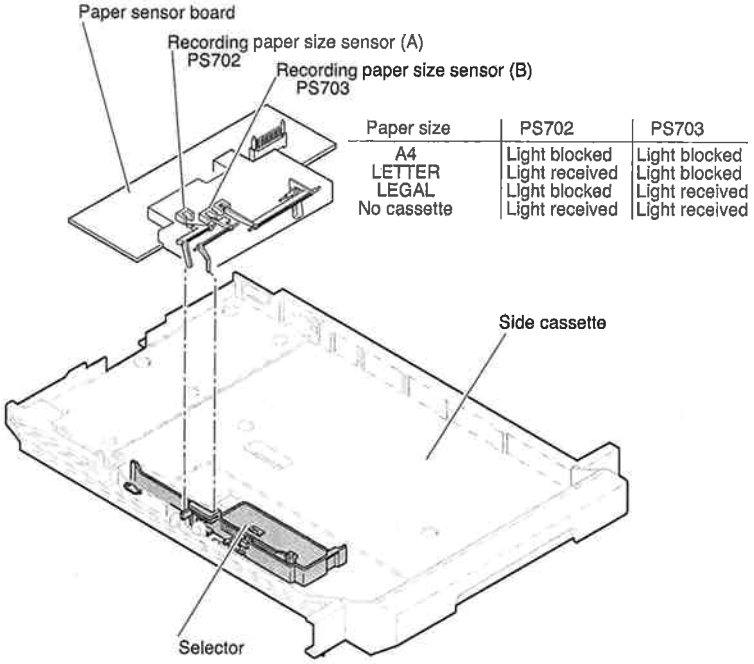
b-4) Recording paper size and no cassette detection configuration

(Side cassette)

The recording paper size sensor (A) and the recording paper size sensor (B), which are photo-interrupter type sensors equipped with actuator arms, detect the recording paper size and no cassette from the positions of the side cassette selector.

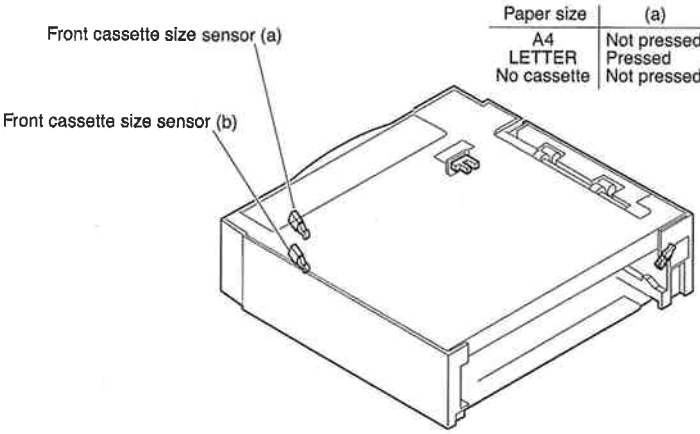
(Front cassette)

Protrusions on the rear of the cassettes switch the two micro switches (located on the rear of the feeder unit). In this way, this function detects letter-size cassette, A4-size cassette, or no cassette.



Paper size	PS702	PS703
A4	Light blocked	Light blocked
LETTER	Light received	Light blocked
LEGAL	Light blocked	Light received
No cassette	Light received	Light received

Figure 3-13 Paper Size Detection Configuration (Side cassette)



Paper size	(a)	(b)
A4	Not pressed	Pressed
LETTER	Pressed	Not pressed
No cassette	Not pressed	Not pressed

Figure 3-14 Paper Size Detection Configuration (Front cassette)

2.5 Printer Section

The LASER beam printer engine comprises the following sections.

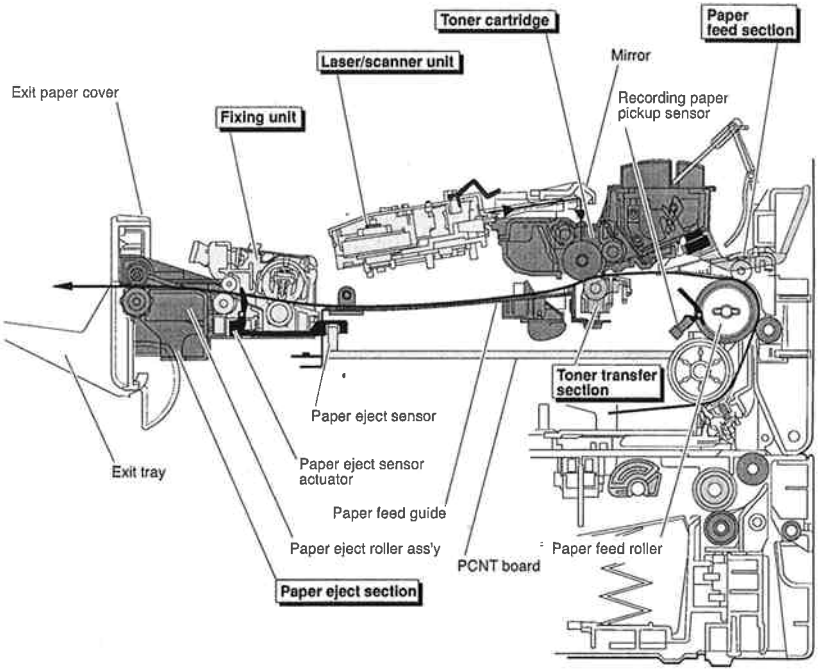


Figure 3-15 Printer Section

NOTE

For details on the print process, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

2.5.1 Paper feed/eject section

a) Functions

a-1) Paper feed/eject

The feed section feeds the recording paper fed from the pickup section to the toner transfer section and fixing unit. The eject section ejects the paper from the recording paper eject outlet at the left of the main unit after printing.

a-2) Paper jam detection

Jams of the recording paper fed from the load section are detected by the recording paper eject sensor.

a-3) No-toner detection

The toner sensor above the transfer charging roller detects toner in the cartridge.

b) Structure

b-1) Paper feed

The recording paper is fed to the toner transfer section by the recording paper feed roller which is driven by gears with power from the main motor.

The recording paper feed is controlled by the PCNT board CPU counting the main motor and the photo-interruptor type recording paper pickup sensor and recording paper eject sensor, which are equipped with actuator arms detecting the recording paper feed status.

After fixing, the recording paper is ejected by the eject roller driven by gears with power from the main motor through the recording paper eject outlet at the left of the main unit and accumulated in the order printed.

NOTE

Start of printing

0.9 to 1.2 seconds after the recording paper pickup sensor detects the leading edge of the recording paper the PCNT board CPU outputs the -TOP*1 signal (vertical sync signal) to the SCNT board. The SCNT board sends one page of print signals to the PCNT board synchronized with the -TOP signal.

*1 TOP: Top Of Page

The time from the detection of the leading edge of the recording paper until the output of the -TOP signal can be adjusted with VR301 on the PCNT board.

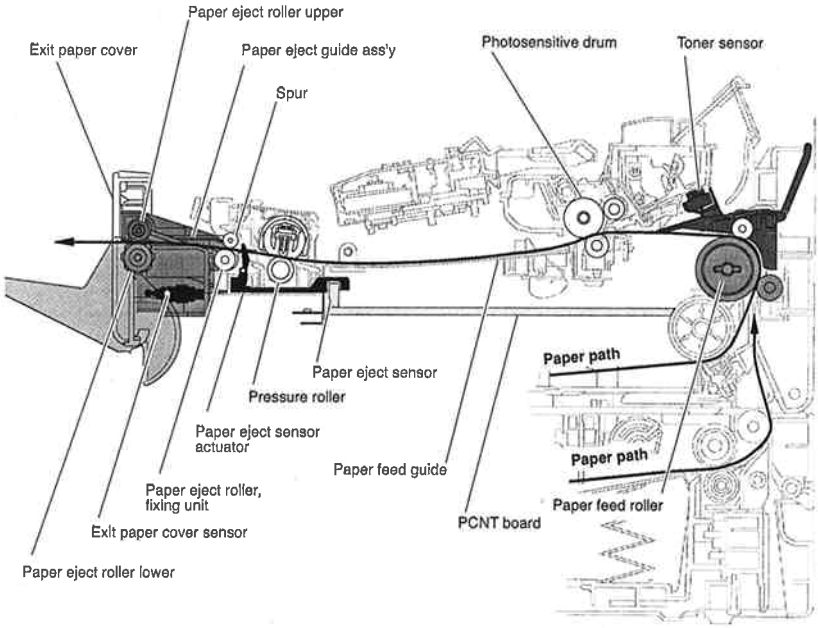


Figure 3-16 Paper Feed/Eject Section

b-2) Recording paper jam detection configuration

Recording paper jams in the paper feed/eject section are detected by the photo-interrupter type recording paper eject sensor, which is equipped with an actuator arm.

Recording paper feed jam

5.5 seconds after the PCNT board CPU has sent the -TOP signal*1, the recording paper eject sensor looks, once, for the leading edge. If it cannot detect it, a recording paper feed jam is judged.

*1 TOP: Top Of Page

Fixing unit wrap-around jam

5.81 seconds after the PCNT board CPU has sent the-TOP signal, the recording paper eject sensor looks, for 0.52 seconds continuously, for the leading edge. If it detects a paper-out during this time, a fixing unit wrap around jam judged.

During recording paper feed, sometimes the toner adhering to the fixing unit pressure roller and fixing film makes the recording paper wrap around the pressure roller without separating from it.

Recording paper eject jam

A "recording paper eject jam" means that the recording paper eject sensor cannot detect the trailing edge even 2.0 to 6.5 seconds after the recordig paper pickup sensor detects the trailing edge.


NOTE

Recording paper jam detection processing

When a recording paper jam occurs, the main motor drive is stopped, print operations are stopped, the error is displayed on the display, and the REC. PAPER lamp and the ALARM lamp blink red. Also, if the printer cover, right cover, exit paper cover, or feeder right cover is opened during recording paper feed, this is treated as a recording paper jam.

"REC. PAPER JAM" is displayed on the display.

If the jam occurs during reception, the reception images are received into memory reception starting from the page during which the recording paper jam occurred, but if the jam occurs during copying, the copy image data are erased.

b-3) No-toner detection

The no-toner state is detected by the toner sensor (magnetic sensor). If a toner cartridge is installed, the toner sensor touches the bottom of the cartridge. The part of the cartridge which the toner sensor touches is made thinner to increase the sensor output.

When the toner sensor detects no toner, the sensor output goes low.

2.5.2 LASER/Scanner section

For details on the functions and structure, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

Note that the following items are different from the those described in *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

- The scanner mirror has four sides, not two sides.
- The fax machine has laser power of 5 mW and a laser wavelength of approx. 780 nm.
- The LASER/scanner section is illustrated below.

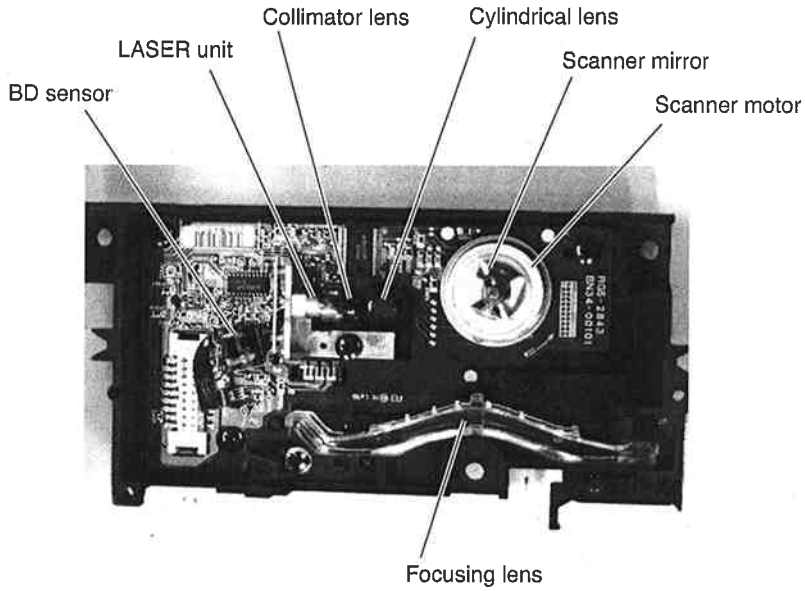


Figure 3-17 LASER/Scanner Section

- The resolution of the fax machine is 609.6dpi horizontally and 586.74dpi vertically.
- The synchronizing period of the BDI signal is 826.7583 µsec ± 1.7%.
- If the scanner motor does not reach the prescribed speed within 40 seconds after it starts rotation, it is considered to have failed and "CHECK PRINTER" is displayed.

2.5.3 Toner cartridge

For details on the functions and structure, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

Note that the following items are different from the those described in *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

- This fax machine detects toner using a magnetic sensor in the main unit. The wiper located on the cartridge is not designed to perform cleaning, but to stir toner near the magnetic sensor to increase the detection precision.
- The cross section of the toner cartridge is illustrated below.

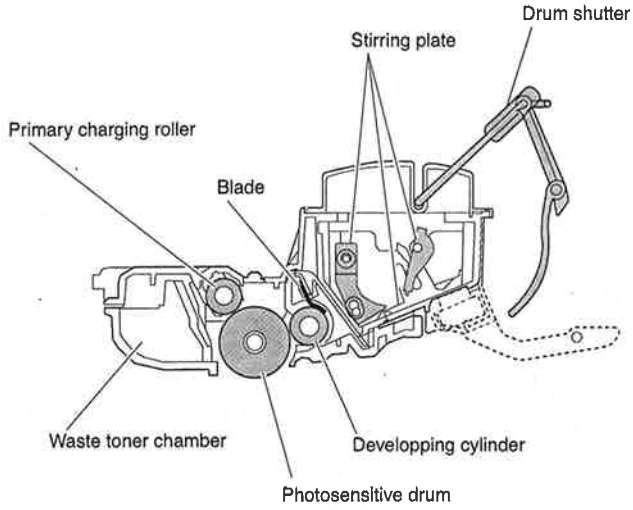


Figure 3-18 Toner Cartridge

- The AC bias applied to the primary charging roller during charging is about 600 μArms.
- The DC bias applied to the primary charging roller during charging varies -660V to -590V with "SELECT DENSITY" set in the user data.

• The high-voltage terminal of the toner cartridge is shown below.

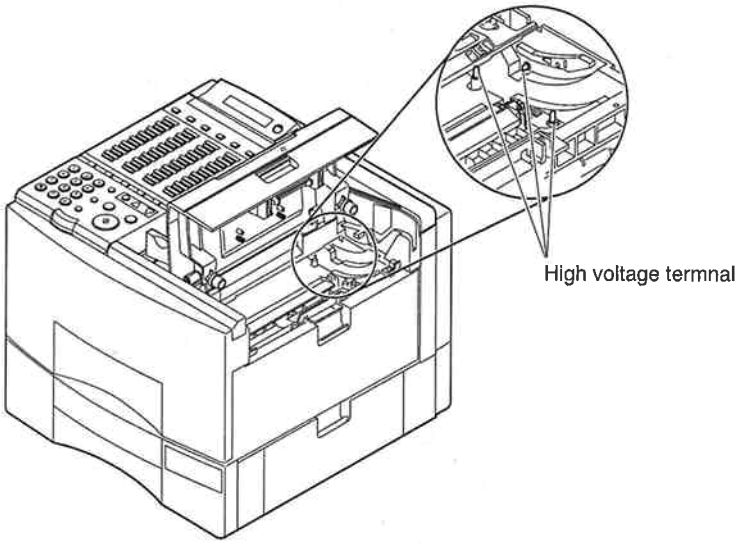


Figure 3-19 High Voltage Terminals

• The AC bias applied to the developing cylinder during development is about 1200 Vp-p.

• The DC bias applied to the developing cylinder during development varies -495V to -335V with "SELECT DENSITY" set in the user data.

2.5.4 Toner transfer section

For details on the functions and structure, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

Note that the following items are different from the those described in *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

- The positive bias during transfering is 3000V.
- The negative bias during transfer charging roller cleaning is -1050 V.
- The toner transfer section is illustrated below.

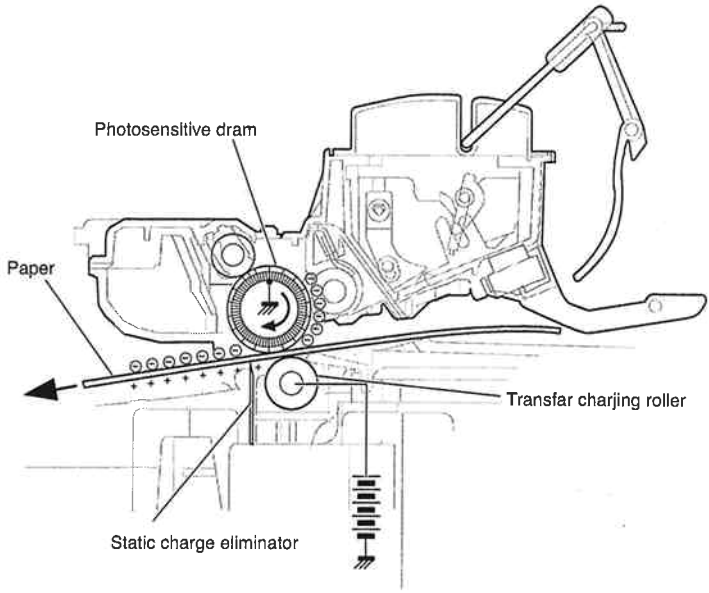


Figure 3-20 Toner Transfer Section

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2.5.5 Fixing section

For details on the functions and structure, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*
Note that the following items are different from the those described in *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

- The fixing film thickness is 66±7 µm.
- The fixing section is illustrated below.

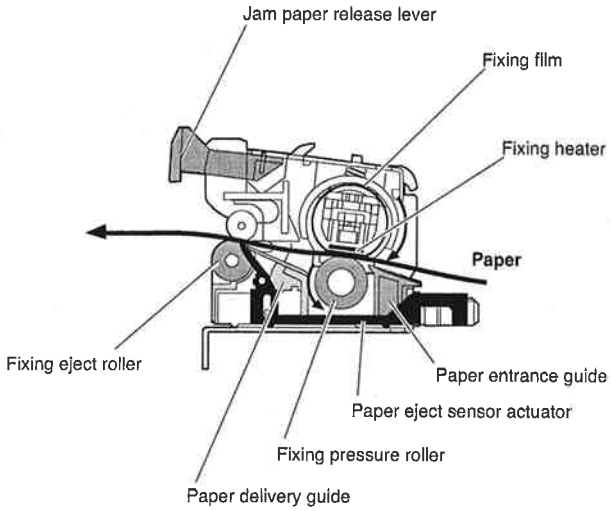

Figure 3-21 Fixing Section

- The fixing temperature has five settings: 392°F (200°C), 383°F (195°C), 374°F (190°C), 356°F (180°C), 338°F (170°C).

- The temperatures between pages and the fixing temperatures are related as follows:

Fixing temperature	Temperature between pages
392°F (200°C)	386.6°F (197°C)
383°F (195°C)	377.6°F (192°C)
374°F (190°C)	338°F (170°C)
356°F (180°C)	320°F (160°C)
338°F (170°C)	302°F (150°C)

- This fax machine does not have "-ACVIN signal".
- If the PCNT board CPU detects with the thermistor that the fixing heater temperature is over 428°F (220°C), it cuts off the power to the fixing heater (Software protection).
- If the PCNT board fixing heater protective circuit detects that the fixing heater temperature is 464°F~482°F (240°C~250°C), it cuts off the power to the fixing heater regardless of the PCNT board CPU output (Hardware protection).
- If the fixing heater temperature is over 442.4°F (228°C), the thermal fuse in the fixing film unit blows, turning the fixing heater off.
- If the PCNT board CPU detects any of the following states with the thermistor, it judges a fixing heater failure.
  1. The thermistor temperature in the fixing ass'y is lower than 68°F (20°C) when it is turned on, and the thermistor temperature is lower than 68°F (20°C) when it is turned on for 1.0 second.
  2. The thermistor temperature does not become higher than 212°F (100°C) after the start of temperature control.
  3. The thermistor temperature does not become the target temperature (-41°F) (5°C) for normal temperature control 100 seconds after the start of temperature control..
  4. The thermistor temperature is lower then 176°F (80°C) for 1.0 second after the startup control ends.
  5. The thermistor temperature exceeds 428°F (220°C) for 1.0 second.
  6. The thermistor temperature is lower than 32°F (0°C) for 1.0 seconds during temperature control.

2.6 Circuit Overview
2.6.1 Function block diagram

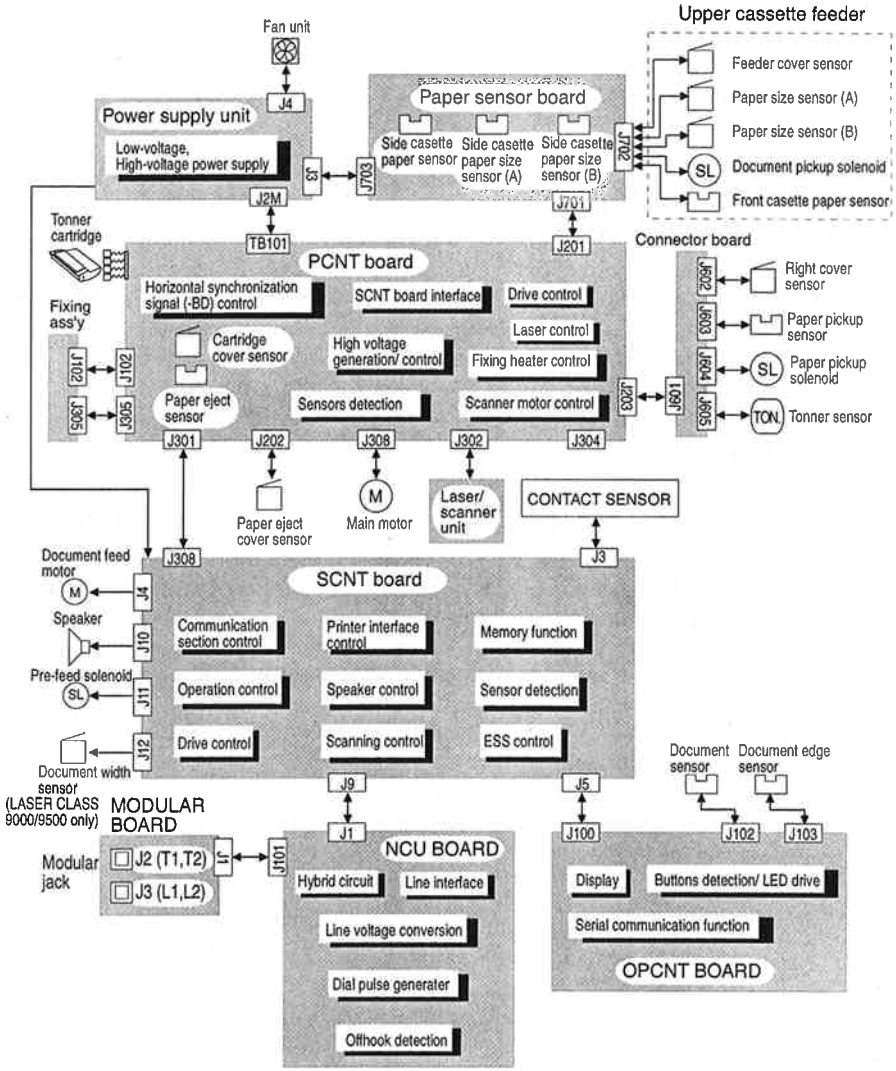

Figure 3-22 Function Block Diagram

2.6.2 Functions

a) SCNT board

The SCNT board performs the following functions.

Drive control

The drive control section controls the document feed motor in the document scanning section.

Operation panel control

The operation panel control section serially transfers data to or from the control IC on the OPCNT board, receives button operation status, document status, etc., and sends the display and LED signals to the control IC on OPCNT board.

Scanner control

Image data input from the contact sensor are processed by the UHQ-6.6 image processing IC, coded by the CODEC IC, and sent to the DRAM from the system controller.

Printer interface control

The printer control section converts facsimile data of horizontal resolution of 8 or 16 dots/mm, and vertical resolution of 3.85, 7.7 or 15.4 line/mm to LBP print data of 600 dpi. This section synchronizes the vertical sync signal (nTOP) to the printer section with the horizontal sync signal (nBD) from the printer section to transmit an image signal (nVDO) to the printer section.

Communications unit control

The SCNT board detects line signals, such as CNG, DTMF and ROT. The modem, with a transmission rate of 33.6k bps, modulates and demodulates transmission/reception data and sends DTMF signals.

Speaker control

The SCNT board controls the alarm, button operation tones and line monitor tones.

NOTE

The speaker volume control on the operation panel adjusts the line monitor volume. The button operation and alarm volumes are adjusted by specifying user data.

Sensor detection

The SCNT board detects the statues of the sensors which in the scanner section, printer section, paper loading section, and covers to monitor the drive section.

Memory functions

User data, service data, data registered before shipment from the factory, and communications management information, are stored to the SRAM. Image data are stored to the DRAM.

Memory backup

The SCNT board is provided with a function for backing up data in control/image processing memory (SRAM) and image storage memory (DRAM) by lithium battery, and rechargeable battery, even if a power interruption occurs, or the power cord is disconnected by accident.

ESS (Enagy Save Standby) control

The SCNT board controls the ESS function which reduces power consumption when the main unit is at standby.

b) NCU board

The NCU board performs the following functions.

Hybrid circuit

Signals sent from the system controller to the telephone line are prevented from entering the reception circuit.

Dial pulse generator

The dial pulse generator generates a dial pulse to send a dial signal from the fax through the dial line by turning the relay on and off using the control signal from the SCNT board.

Off-hook detection circuit

Detects the off hook state from the DC current flowing to the circuit, when the extension telephone (or option handset) is off hook.

Line voltage conversion circuit

The line primary on the NCU board is controlled by a +48 V DC line voltage, therefore, the line voltage conversion transformer converts the voltage of the control TTL for the lone secondary.

c) Modular board

Line interface

Signals from the two modular jacks for the telephone line and extension telephone (or option handset), are transferred to the line voltage conversion circuit on the NCU board and the signals from the fax are transferred to the telephone line.

d) OPCNT board

Buttons detection and LED drive function

The control IC on the OPCNT board detects the buttons operation status, and drives the LCD and LEDs.

Display

The control IC in the LCD module controls the 20-column × 2-line LCD according to the display signals from the SCNT board.

Serial communication

Serial communication with the SCNT board is used to send buttons, speaker volume switch, document status, etc., and to receive display, LED drive data, etc..

Sensors

The signals detected by the document sensor, document edge sensor and one touch dial cover sensors are sent to the SCNT board via the control IC on the OPCNT board.

e) PCNT board functions

Fixing heater control

The fixing heater control section monitors the DC voltage supplied from the power supply in response to the 85~132 VAC voltage, and the fixing heater thermistor, and drives the heater so that the temperature reaches the specified level. If the heater temperature is judged to be abnormal, the power supply to the heater is shut off.

High voltage generation/ control

The high voltage control section is to control the high voltage applied to the toner cartridge primary charge roller and developing cylinder, and the transfer charging roller of the toner transfer section.

Drive control

The drive control section controls the main motor, paper pickup solenoid, and fan. Also, the FANTAC signal from the fan via the power supply unit is detected, and the fan rotation monitored.

Sensors detection

The PCNT board monitors the drive section by detecting the statuses of the sensors in the printer section and paper pickup section.

SCNT board interface

The SCNT board interface section serially transmits the horizontal synchronization signal (-BD) and the vertical synchronization signal (-TOP) to the SCNT board, and, in turn, receives serially transmitted command signals from the SCNT board, and returns status signals, in order to inform the SCNT board of the printer section status.

Laser control

The laser control section controls the drive of the laser diode in the laser/scanner unit, in response to print data from the SCNT board. It also the laser diode auto power check, performed on each line of print data.

Horizontal synchronization signal control

When the laser beam reaches the horizontal printing start position, the horizontal position detection signal (-BDI) from the laser laser/scanner unit is detected, and the horizontal synchronization signal (-BD) sent to the SCNT board. Also, the output frequency status of the horizontal synchronization signal (-BD) is monitored.

Scanner motor control

The scanner motor drive is controlled so that the print image vertical resolution reaches 600 dpi. Also, the SCNTAC signal from the laser/scanner unit is detected, and the scanner motor rotation status monitored.

Toner detection

Signals are received from the magnetic type toner sensor, and monitors the remaining toner of the toner cartridge.

f) Paper sensor board

Sensors

The paper size sensor (A), paper size sensor (B), and paper sensor for side casette are attached to the paper sensor board. The signals detected by these sensors are sent to the PCNT board.

g) Connector board

Connectors

The connector board has connectors for the right cover sensor, paper pickup sensor, paper pickup solenoid, and toner sensor to transfer the signal incoming from sensors to the PCNT board and send the control signal and drive voltage from the PCNT board to the sensors and solenoid.

h) Power supply

Switching regulator

This fax generates +5V, +21V and +23V from the 120V household current power supply, and supplies these voltages to the respective sections.

2.6.3 Component block diagram

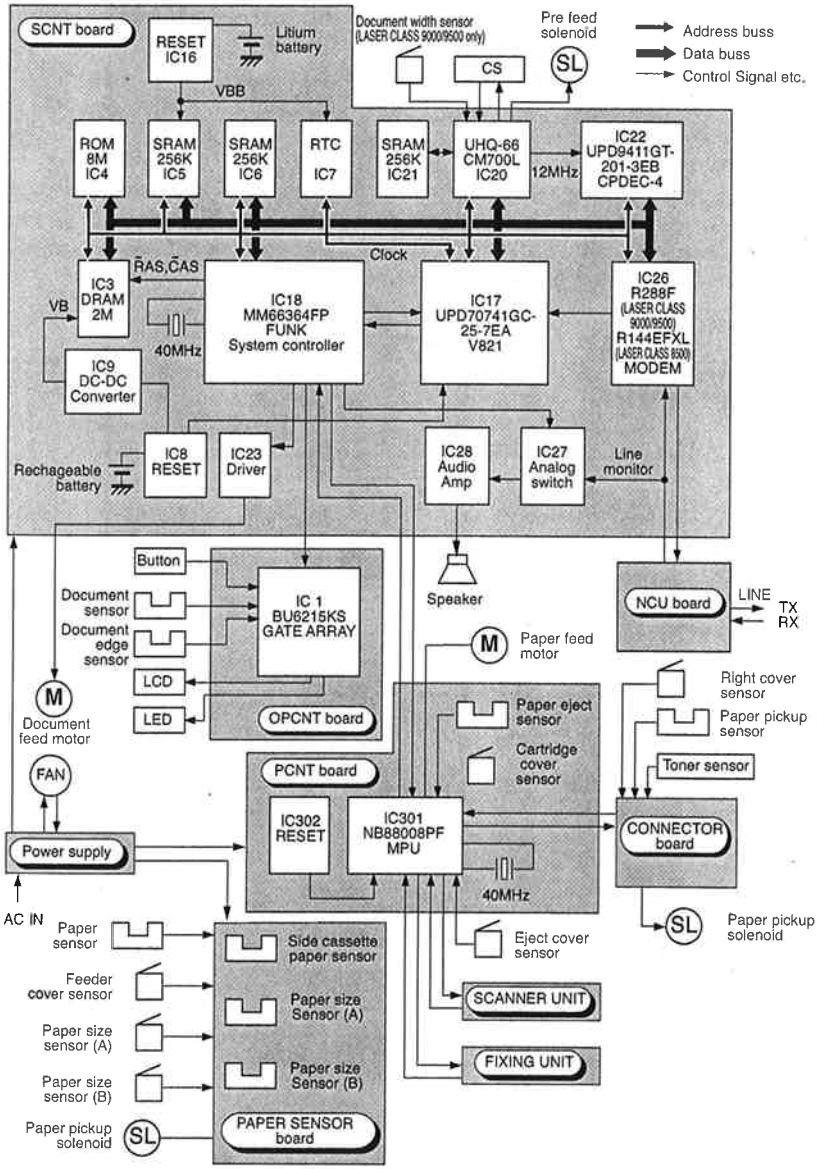

Figure 3-23 Component Block Diagram

a) System control section (SCNT board)

The system control section consists of the following components and controls the entire facsimile system.

a-1) MPU (Micro Processor Unit) (IC 17)

The MPU, on NEC UPD70741C-25-7EA, has the following main functions.

- 16-bit CPU
- 24-bit address bus
- 16-bit data bus
- Software CODEC
- Interrupt control unit
  The CPU controls interrupts from the system controller IC, and the others the inside.
- CSI (Clocked Serial Interface)
  Serial interface with RTC (IC7)

a-2) System controller (IC 18)

The system controller is a gate array for controlling MPU peripheral devices. The main functions of the system controller are as follows:

- DMA controller
- DMA interface
- DRAM controller
- ESS control
- Chip select
- NMI generator
  Generate NMI for ESS mode cancellation (cancellation in CPU stop mode)
- CI pulse width counter
- Timer
  Used to generate dial pulses
- Clock divider
  Generate basic clocks (16 MHz) for codec IC (IC22)
- CPU interface
- CODEC interface
- UHQ-6.6 interface
- Row to column converter
  Specify the DRAM address
- R.T.P.
  Fine adjust the motor speed during high speed scanning in Ultra Fine or Super Fine mode
- 16-bit serial interface
  Serial interface to gate array on the operation panel

a-3) EP-ROM (IC 4)

The 8-Mbit EP-ROM contains the control program for the operation section, read section, and communication control section of the fax.

a-4) DRAM (IC 3)

This 16-Mbit DRAM is backed up by rechargeable battery (approx. 12 hour after AC power interruption), and is used as memory for storing image data and MPU work area.

a-5) SRAM (IC 5, 6)

These 256-kbit SRAMs are backed up by lithium battery. SRAM holds data registered for system control and communications management information.

a-6) RTC (Real Time Clock) IC (IC 7)

A Epson RTC-4553A is used as the RTC. The RTC IC is backed up by lithium battery, and counts the date and time.

b) Document scanning section (SCNT board)

The document scanning section consists of the following components and processes scanning image data.

b-1) Image processing IC (IC 20)

The main functions of the image processing IC (UHQ-6.6) are as follows:

- A/D conversion
  Input signals from the contact sensor are A/D converted
- ABC (Auto Background Control)
  Sets the slice level for each scan line
- Edge enhancement processing
- Binarization processing
- Notch eliminate processing
- Autohalftone processing
- Serial interface
  Serial interface with the codic IC
- LEDAGC
  Adjust variations in light intensity of LED chips (The previous models used a CS volume switch to compensate them)
- Dark correction
  Adjust variations in the output of transistor array chips when the LED is turned off
- Shading correction

b-2) CODEC IC (IC 22)

The main functions of the CODEC IC are as follows:

- Scanner interface
  Serial interface to image processing IC
- Encoder
- Decoder
- Printer interface
  Serial interface port for the SCNT printer interface

b-3) SRAM (IC 21)

A 256-kbit SRAM is used as a buffer for the image processing data.

c) Communication control section (SCNT board)

The communication control section consists of the following components and controls facsimile communication.

c-1) MODEM IC (IC 26)

A Rockwell R288F (R144EFXL for LASER CLASS 8500) is used as the modem IC. The MODEM IC carries out G3 modulation conforming to ITU-T standards V.34, V.33, V.17, V.29, V.27ter, V.21 and V.8 (V.33, V.17, V.29, V.27ter, and V.21 for R144EFXL) on transmitted data received from the MPU during transmission. During reception, the MODEM IC carries out G3 modulation on received signals from the telephone line, according to the same standards.

d) Printer interface section (SCNT board)

The printer interface section consists of the following components and controls the printer section by conversion data from the system control section into print data and printer control commands.

d-1) System controller (IC 18)

The system controller has the following printing system image processing function.

- LBP video interface
- Line buffer control
- Smoothing processing
- Reduction processing
- WPD (Window Pattern Diffusion)
  Eliminate image defects when an image is reduced by the error diffusion method

e) Printer control section (PCNT board)

The printer control section consists of the following components and controls the LBP printer.

e-1) Single chip microcomputer (IC 301)

The single chip microcomputer has the following main functions.

- 4-bit CPU
- 16k-byte ROM
- 256k-byte RAM
- Fixing heater control
- Thermistor detection
- Sensor detection
- Main motor control
- Toner cartridge, transfer charging roller high voltage control
- Fan control
- Paper pickup solenoid, and paper feed solenoid control
- SCNT board interface
- Scanner motor control
- Beam detection signal (-BD) detection
- Laser diode control

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2.6.4 Flow of image signals

a) G3 memory transmission

(1) With the LED as a light source, the image is scanned by the contact sensor, and analogue image data sent to the SCNT board.

(2) The image processing IC (UHQ-6.6 IC20) converts analogue image data from the codec IC (IC 22) into digital data.

(3) The digitized image data is converted to MR code data by the codec IC using non-compression, and high speed DMA-transferred to the DRAM (IC3).

(4) The MPU (IC17) creates header fonts for transmission and encodes them in the direct magnification.
The code data stored in the DRAM is decoded by the software codec of the MPU, converted to run length data and scaled.


NOTE

Scaling
Scaling in the vertical direction is carried out by using the decoded run length data, and scaling in the horizontal direction is performed by using the run length data. The run length data scaled vertically and horizontally is generated in this way.

(5) The code suitable for the other fax is created according to the scaled run length data and a header is added to it. The resulting data is transferred to the DRAM transmit buffer.

(6) The MODEM IC (IC26) reads image data from the transmit buffer and sends it onto the line.


NOTE

G3 direct transmission
In direct transmission, the image data is high speed DMA-transferred to the DRAM in the same way as for memory transmission. Image data is scanned up to the 16-KB image file size. When the image file becomes full, the scanning stops. It resumes after data is transmitted and the image file becomes empty.

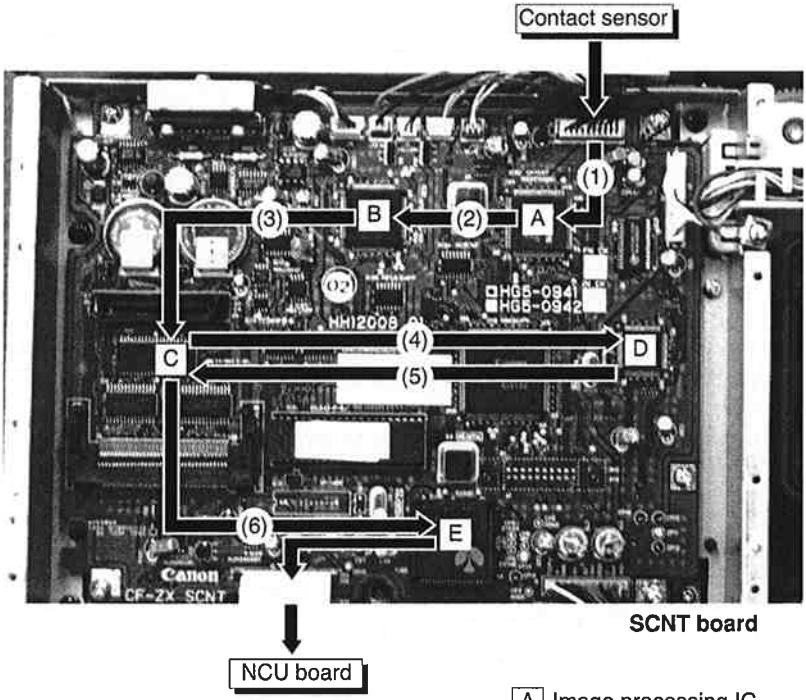

Figure 3-24 Transmission

b) G3 Reception

(1) Image signals received by L1, L2, pass through the hybrid circuit in the NCU board, and are amplified. The modem IC (IC26) stores received code data in the DRAM (IC3) receive buffer.

(2) The code data in the receive buffer is decoded by the software codec of the MPU (IC17) and stored in the DRAM receive buffer. Error lines are deleted, the data is further encoded with MR codes using non-compressed codes, and stored in the DRAM.
The MPU counts the lines and keeps the vertical length of one page.

(3) The MPU determines one-page direct, linear scaling, or page division for print processing according to the vertical length of one page, and sets the corresponding mode for the system controller and codec IC.

(4) The coded image data stored in the DRAM is high speed DMA-transferred to the codec IC and then serially transferred to the system controller IC.

(5) The system contoroller IC convents resolution on the fax data to the appropriate resolution for the printer data and sends it to the PCNT board.

(6) The PCNT board prints data by contorolling the main motor, laser, and high voltage to the received print data.


NOTE

The operations in (1) and (2) are carried out repeatedly during reception. When one-page image data is stored in memory, the recording-side tasks in (3) and later start as separate tasks.

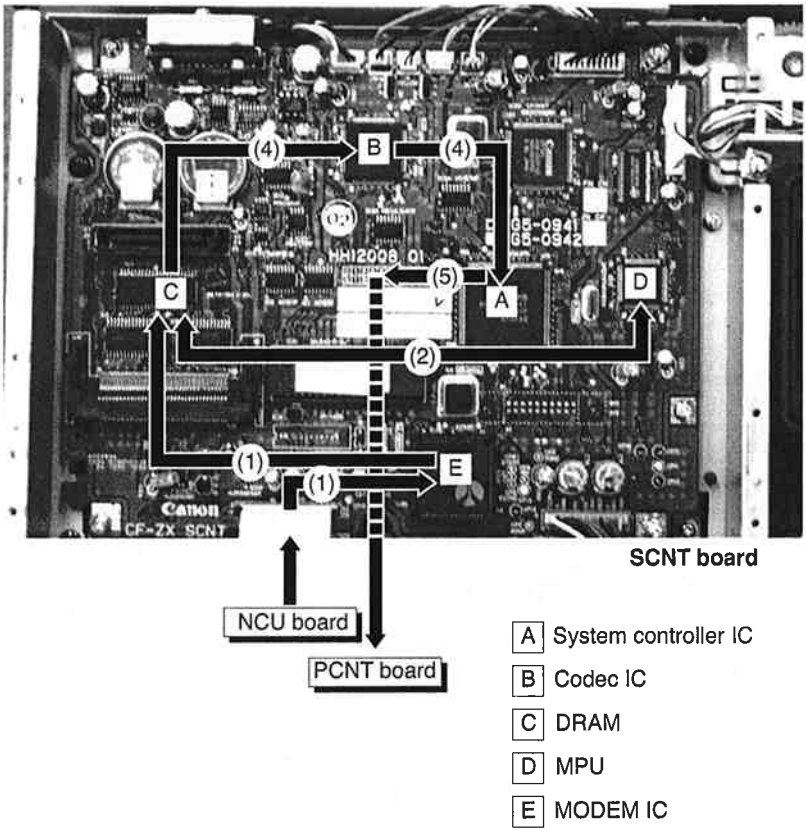

Figure 3-25 Reception

3. NEW FUNCTION

3.1 High-speed Transmission (LASER CLASS 9000/9500 only)

The image transmission time is reduced drastically compared with the previous models by combining the half-duplex operation mode of the V.34 modem (maximum transmission speed 33600 bps) recommended by ITU-T.

3.1.1 V.8/V.34 protocol

a) Outline

- The V.8 protocol is used as the startup protocol to move to V.34. The V.8 protocol enables connection with fax machines and equipment using existing V-series modems. The V.34 modem contains a modem circuit based on the previous recommendation to connect with the previous modems and has upper compatibility.

- The actual data transmission speed is improved entirely on average by speeding the modulation method and utilizing new techniques, such as the pre-emphasis technique*1 for increasing the S/N (signal-to-noise) ratio and the probing technique*1 for measuring line characteristics and optimizing the modem operation according to the line condition.

  *1 If there is much noise with a higher frequency than the transmit signal, the signal transmission level is increased.

  *2 A probing tone signal is sent to the receiver so that the receiver may measure the characteristics of the line.

- The V.8 protocol, V.34 pre-protocol and post-protocol use full-duplex transmission to speed the processing.

- Fourteen image transmission speeds are available:
  33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, and 2400 bps

- The modulation speed (baud rate) can be selected from among 2400, 3000, and 3200 symbols/sec (required) or 2743, 2800, and 3429 symbols/sec (option). The data transmission speed can be set more finely than the previous modems.

NOTE

1. The V.34 protocol uses ECM. If the ECM SW in user data is set to OFF, the V.8 protocol is not executed. Therefore, the V.34 protocol is not used, and V.17 or a lower protocol is selected.
2. If the transmission speed is set to 14400 bps or lower, the V.8 protocol is not executed and V.17 or a lower protocol is selected.
3. After the V.21 protocol is selected first, it can be changed to V.8 or V.34. (See c-1))
4. When the V.34 protocol begins, it falls back within the V.34 protocol, but it does not fall back to the V.17 mode or lower.

b) Typical protocol

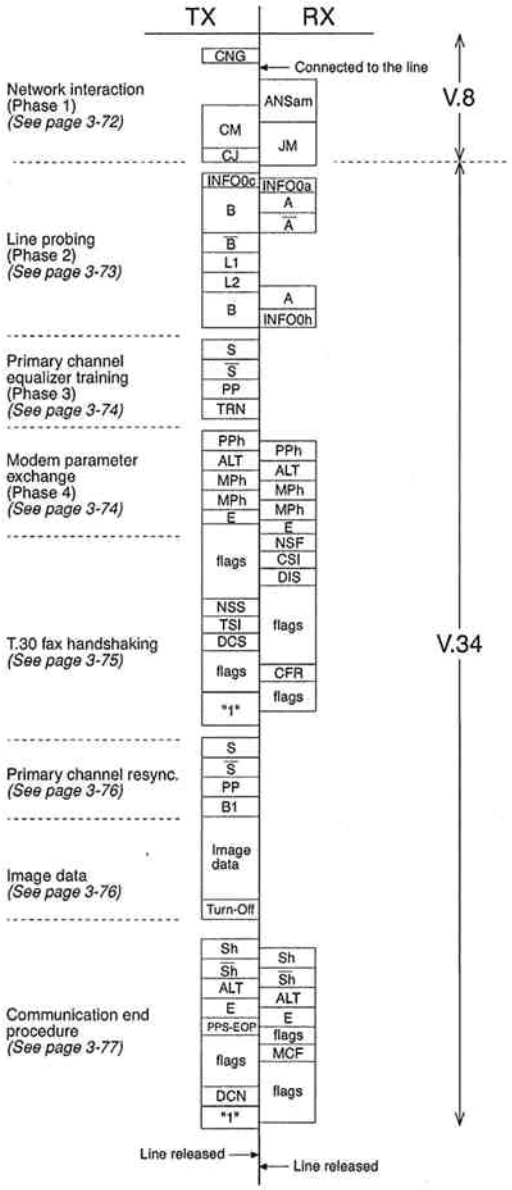

Figure 3-26 Typical Protocol

b-1) Network interaction (Phase 1)

The V.8 protocol is used as the startup protocol for high-speed modem V.34. The V.8 protocol determines the best modulation method (V-series modem mode) that is available between the transmitter and receiver.

• **Transmitter**

Signal	Abbreviation	Meaning	Remarks
Calling tone	CNG	1100-Hz tone signal specified by T.30 to identify an automatic-calling fax machine.	
Dial-tone menu signal	CM	Indicate an available modulation method (V.21, V.27ter, V.29, V.17, or V.34).	Modulated by V.21(L)*1.
CM terminator	CJ	Indicate JM signal detection and CM signal termination.	Modulated by V.21(L)*1.
Dial-tone display signal	CI	Indicate the general transmission function. Sent to resume the V.8 protocol.	Late start only. (See Figure 3-xx.) Modulated by V.21(L)*1.

• **Receiver**

Signal	Abbreviation	Meaning	Remarks
Modified response tone	ANSam	2100-Hz tone signal amplitude-modulated to 15 Hz.	Equivalent to CED for conventional models.
Common menu signal	JM	Indicate the terminal type, such as a fax machine, and an available modulation method in response to the available modulation method reported by the CM from the transmitter.	Modulated by V.21(H)*1.

*1 V.21(L): Low-frequency channel defined by V.21 recommendation 1080±100 Hz (980 Hz:1, 1180 Hz:0)
V.21(H): High-frequency channel defined by V.21 recommendation 1750±100 Hz (1650 Hz:1, 1850 Hz:0)

b-2) Line probing (Phase 2)

The line characteristics are measured and modulation-related parameters, such as symbol speed, are set.

• **Transmitter**

Signal	Abbreviation	Meaning	Remarks
INFO sequence	INFO0c	Indicate modem capabilities, such as baud rate and frequency transmission function (two frequency bands used to measure line characteristics), and request adjustment.	
Tone B	B	Modem synchronization with a 1200-Hz tone signal.	The phase of the B-signal is inverted 180 degrees from the phase of the B signal.
Tone $\overline{B}$	$\overline{B}$		
Line probing signal L1	L1	Tone signal for analyzing line characteristics by probing.	Probing: Measurement of line characteristics. Tone signal in the range 150 to 3750 Hz in 150-Hz steps.
Line probing signal L2	L2		

• **Receiver**

Signal	Abbreviation	Meaning	Remarks
INFO sequence	INFO0a	Report the modem capabilities, such as baud rate and frequency transmission ability.	
Tone A	A	Modem synchronization with a 2400-Hz tone signal.	The phase of the A-signal is inverted 180 degrees from the phase of the A signal.
Tone $\overline{A}$	$\overline{A}$		
INFO sequence	INFO0h	Report the pre-emphasis filter and baud rate used for data transmission based on the result of analysis of the line probing signal.	

b-3) Primary channel equalizer training (Phase 3)

Filters, such as equalizers, are trained (adjusted) with the parameters set in phase 2.

• Transmitter

Signal	Abbreviation	Meaning	Remarks
S signal	S	Short training	The phase of S- is shifted from the phase of S.
$\overline{S}$ signal	$\overline{S}$		
PP signal	PP	The other modem uses this signal to train the equalizer.	
TRN signal	TRN	The receiver uses this signal to determine the transmission speed.	

b-4) Modem parameter exchange (Phase 4)

Select the maximum data speed and trellis encoder and set the data speed that can be supported.

• Transmitter/receiver

Signal	Abbreviation	Meaning	Remarks
PPh signal	PPh	The other modem uses this signal to train the equalizer.	
ALT signal	ALT	———	
Modulation parameter	MPh	Indicate the image transmission parameters, such as maximum data signal speed, control channel data signal speed, trellis coding type, pre-coding type, and baud rate.	
E sequence	E	———	20-bit sequence of binary 1's.

b-5) T.30 fax handshaking

The conventional T.30 protocol is executed.
The protocol is half-duplex, but the modem has the full-duplex function (1200 bps), so it is not affected by echo.

• **Transmitter**

Signal	Abbreviation	Meaning	Remarks
Flag	flags	Maintain synchronization.	7E (H)
Non-standard facilities set-up	NSS	Receive NSF from the other party, select an available mode from it, and instruct reception.	
Transmitting subscriber identification	TSI	Report the transmitter telephone number.	
Digital command signal	DCS	Instruct the available mode.	
———	1	Declare to switch to high-speed protocol.	Transmit 1's.

• **Receiver**

Signal	Abbreviation	Meaning	Remarks
Non-standard facilities	NSF	Report functions not recommended by ITU-T, abbreviated user name, manufacturer code, etc.	
Called subscriber identification	CSI	Report the receiver telephone number.	
Digital identification signal	DIS	Report standard ITU-T-recommended functions.	
Flag	flags	Maintain synchronization.	7E (H)
Confirmation to receive	CFR	Report that modem training ends and image signal reception is ready.	

b-6) Primary channel resync.

Training is performed with the parameters set in phase 4.

• **Transmitter**

Signal	Abbreviation	Meaning	Remarks
S signal	S	Short training	The phase of S- is shifted from the phase of S.
$\overline{S}$ signal	$\overline{S}$		
PP signal	PP	The other modem uses this signal to train the equalizer.	
Sequence B1	B1	Scramble data frame transmitted at the end of startup protocol.	

b-7) Image data

Transmit image data.

• **Transmitter**

Signal	Abbreviation	Meaning	Remarks
Image data	Image data	Encoded image data	
———	Turn-off	———	Send scrambled 1's for 35 ms.

b-8) Communication end procedure

Protocol for terminating transmission.

• Transmitter

Signal	Abbreviation	Meaning	Remarks
Sh signal	Sh	Short training	
$\overline{\text{Sh}}$ signal	$\overline{\text{Sh}}$		
ALT signal	ALT	———	
E sequence	E	———	
End of procedures	PPS-EOP	One page is transmitted.	
Flag	flags	Maintain synchronization.	7E (H)
Disconnect signal	DCN	Disconnect the line.	

• Receiver

Signal	Abbreviation	Meaning	Remarks
Sh signal	Sh	Short training	
$\overline{\text{Sh}}$ signal	$\overline{\text{Sh}}$		
ALT signal	ALT	———	
E sequence	E	———	
Flag	flags	Maintain synchronization.	7E (H)
Message confirmation	MCF	Indicate that the receiver has received the image signal correctly and can receive the next document immediately.	

c) Examples of sequences

The signals in the shaded areas are important in the protocol.

c-1) Late start

Since the receiver cannot detect the CM signal while sending the ANSam signal, it sends the DIS signal containing the "V.8 protocol" declaration. The transmitter sends the CI signal to request the receiver to send the ANSam signal again to move to V.8 protocol.

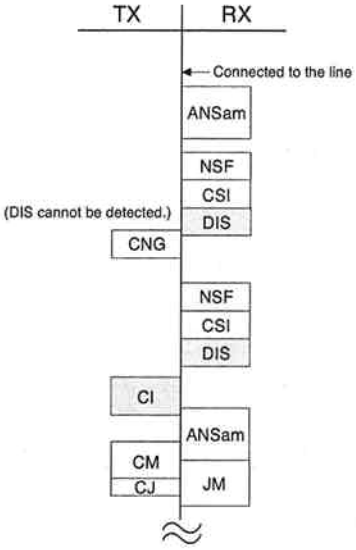

Figure 3-27 Late Start

c-2) Between-page sequence

The transmitter sends image data, then the PPS-MPS signal in the same as for the T.30 protocol. The receiver sends the MCF signal to receive the next page.

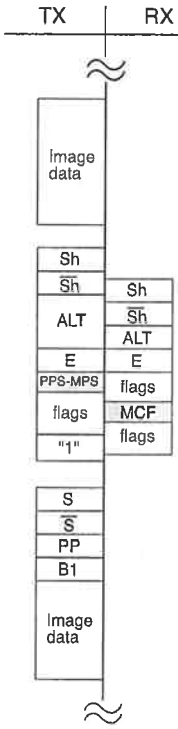

Figure 3-28 Between-page Sequence

c-3) Mode change

The transmitter sends PPS-EOM and the receiver sends the MCF signal. Then the receiver sends the DIS signal and the transmitter sends the DCS signal to change the mode.

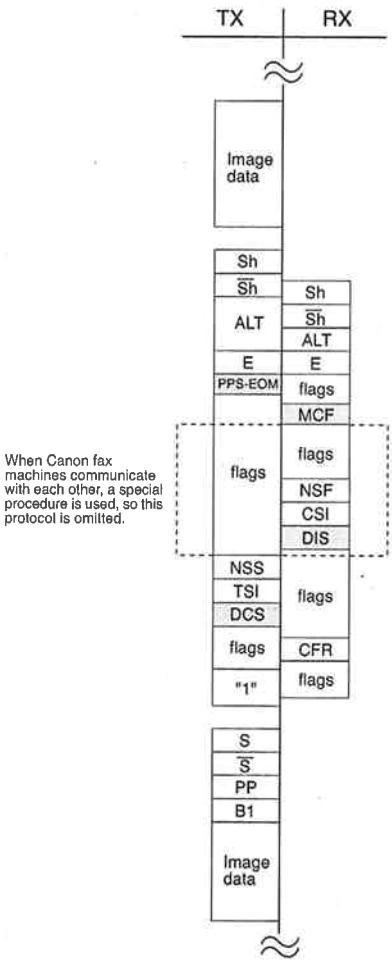

Figure 3-29 Mode Change

c-4) Image transmission speed change from the receiver

The receiver returns to the PPh signal in response to the Sh signal from the transmitter. The data transmission speed is then determined by the MPh sequence sent from both modems.

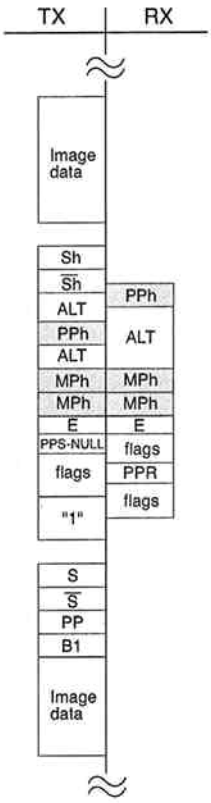

Figure 3-30 Image Transmission Speed Change from the Receiver

c-5) Image transmission speed change from the transmitter

The transmitter sends image data, and then the PPh signal, and the receiver returns the PPh signal to the transmitter. The image transmission speed is then determined by the MPh sequence sent from both modems.

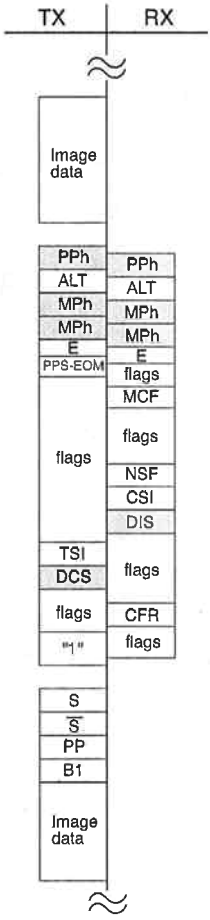

Figure 3-31 Image Transmission Speed Change from the Transmitter

d) Service data

Item	Setting	See Page
Caller V.8 protocol	#1 SW28 bit 0	2-44
Called party V.8 protocol	#1 SW28 bit 1	2-44
Caller V.8 protocol late start	#1 SW28 bit 2	2-44
Called party V.8 protocol late start	#1 SW28 bit 3	2-44
V.34 reception fallback	#1 SW28 bit 4	2-44
V.34 max baud rate	#2 No.08	2-45
V.34 max transmission speed	#2 No.09	2-45

If #1 SSSW 01 bit 1 is set to 1, the baud rate and transmission speed during V.34 communication are indicated on the TX/RX report when an error occurs. (*See pages 2-19 and 2-20.*)

3.1.2 JBIG Encoding System

JBIG stands for Joint Bi-level Image export Group. It is a new compression encoding method for binary images, which is specified by ITU-T T.82/T.85.
When JBIG is used, the size of compressed data, even grayscale images with few continuous black and white dots, does not exceed the size of the original data, so the compression ratio is higher than the conventional MMR encoding method (1.1 to 30 times). When data is decoded, the original image is restored completely like MR/MMR.

Coding method	UHQ chart (Auto halftone)
MMR	479.2 KByte
JBIG	238.7 KByte

3.2 Energy Save Standby (ESS)

a) Function

ESS is an energy save function that minimizes power consumption at standby. In ESS, the ESS control section on SCNT board interrupts 5V power supply to CS on SCNT board, and stops ICs on the SCNT board and PCNT board to reduce power consumption.

The main functions of the ESS control section in ESS mode are as follows:

- Display management — Control LCD display on the OPCNT board.
- Startup factor detection — Monitor startup factors all the time.
- Main unit start management — Enable the main unit when a startup factor is detected.

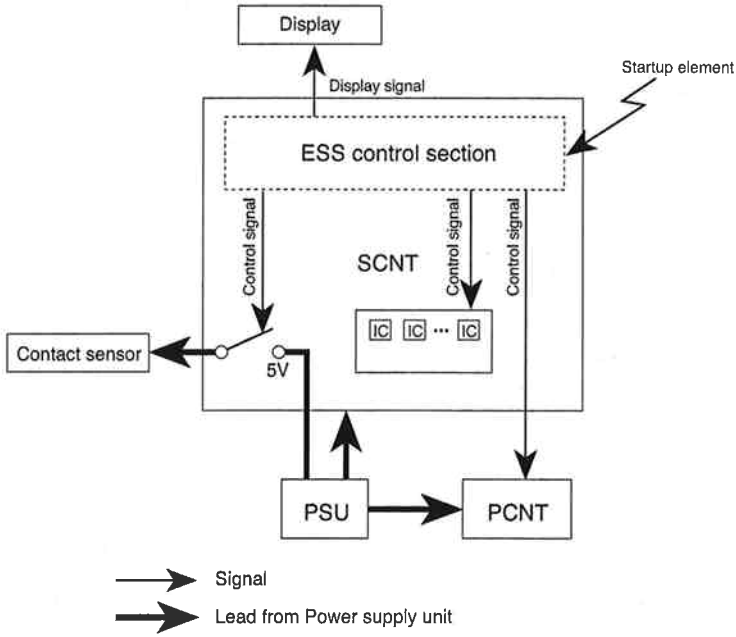

Figure 3-32 System Block Diagram

NOTE

The power consumption at standby is 12 W in non-ESS mode and 7 W in ESS mode.

b) Operation

The ESS function sets the main unit to the ESS mode if the next operation is not carried out within about three minutes after the main unit ends transmission, reception, or copying.
When the main unit enters the ESS mode, the ESS control section monitors one of the following start factors for the main unit. If it detects it, it cancels ESS.

1. CI termination
2. Offhook
3. ESS key pressing
4. Report output time
5. Timer calling time
6. Document sensor "ON"


NOTE

- All LEDs, except ESS-LED are off and "ENERGY SAVER" is displayed on the LCD in ESS mode.
- The main unit does not enter ESS mode if any of the following conditions is met:
  1. The ESS mode is not enabled by user data settings.
  2. The warning lamp is on due to no recording paper, jam, no toner, or a service error.
  3. Data is stored in the image memory.
  4. There is one or more documents in the ADF.

c) Setting

The ESS is enabled by setting 10. ENERGY SAVER, 7. System setting, in user data settings to ON. (Default: OFF)
The time after the main unit ends operation until it enters the ESS mode can be set (3 to 30 min.).

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Chapter 4

Maintenance and Service

Maintenance and Service

1. MAINTENANCE

1.1 Maintenance Items

1.1.1 Consumables

Level	Consumable	
User	Toner cartridge	Canon FX 4 Cartridge
	Stamp ink	Shachihata X Stamper Inks CS-20 Yellow
Service technician	None	

1.1.2 Cleaning

Level	Location	When
User	Main unit outer cover	When dirty
	Document separation roller (upper)	When document separation performance fails.
	Document separation roller (lower)	When document separation performance fails.
	Scanning glass/ strip (white)	When black vertical stripes appear in copied or transmitted images.
	Document feed/ eject rollers	When document feed performance fails.

Level	Location	When
Service technician	Mirror	When black or white vertical stripes in copied or received images.
	Transfer charging roller	When marks on back of paper or blank spots at intervals of 1.75" (44.5 mm) in copied or received images.
	Fixing film	When marks at intervals of 2.98" (75.6 mm) or poor fixing in copied or received images.
	Fixing entrance guide	When marks , marks on back of paper, irregular/smudged black vertical line, paper jam, or wrinkles in copied or received images.
	Fixing pressure roller	When marks on back of paper at intervals of 2.12" (53.8 mm), poor fixing, paper jam, or wrinkles in copied or received images.
	Fixing eject roller	When paper jam in copied or received images.
	Fixing eject guide	When paper jam in copied or received images.
	Paper feed guide	When marks, or marks on back of paper in copied or received images.
	Static charge eliminator	When polka dots in copied or received images.
	High-voltage terminal	When copied or received images are light, dark, or completely blank.

1.1.3 Periodic inspections

Level	Location	When
User	None	—
Service technician	None	—

1.1.4 Periodic replacement parts

Level	Location	When
User	None	—
Service technician	None	—

1.2 Tools

1.2.1 General tools

Tool	Use
Phillips screwdriver	Removing/inserting screws
Flat blated screwdriver	Removing/inserting screws
Precision Phillips screwdriver	Adjust VR
Precision flat blated screwdriver	Removing plastic tabs
Tweezers	Removing coil springs
Hex wrench	Removing hex socket setscrew
Pliers, needle nose	Driving retaining ring
Digital volt meter	Check Laser light volume
Blower brush	Clean mirror
Lint-free paper	Clean transfer charging roller, fixing film
Isopropyl alcohol	Clean fixing film, fixing entrance guide, fixing pressure roller, fixing eject roller, fixing eject guide, static charge eliminator, etc.
Setsquare	Check alignment of print image
Ruler	Measure leading edge margin of print image

1.2.2 Special tools

Tool	Use	Part No.
Grease (PARMALUB G-2)	Apply to specified parts	CK-0551
Grease (MOLYKOTE EM-50L)	Apply to specified parts	HY9-0007
Grease (FLOIL G311S)	Apply to specified parts	TKC-0953
Grease (IF-20)	Apply to specified parts	CK-8006
Printer driver checker	Check laser light volume	RY9-0093
External cable	Connect printer driver checker to the main unit	HY9-0005
IC-Removing Tool (24~64P)	Remove the main ROM on the SCNT board	HY9-0022

2. CONSUMABLES REPLACEMENT

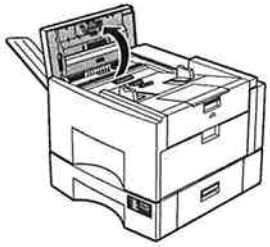
2.1 Toner Cartridge

REFERENCE

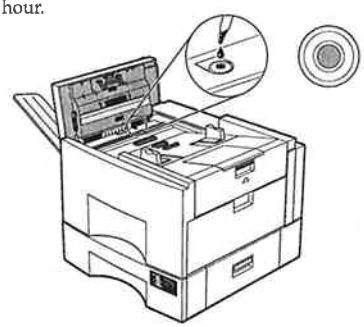
For details on how to replace the toner cartridge, see *Chapter 5: 1.4 Assembling the fax.*

2.2 Stamp Ink

1. Disconnect the power cord of the fax unit from its power source, and remove the document tray, and open the operation panel.



2. Locate the stamp pad then apply only one drop of ink to the stamp ink compartment.
   - ❑ To avoid a malfunction, do not add too much ink.
   - ❑ Use only Shachihata X Stamper Ink CS-20 Yellow.
   - ❑ Do not use the stamp feature for at least one hour. If you have to send a document, turn off the stamp feature for the first hour.



3. Close the operation panel, re-attach the document tray and connect the power cord of the fax unit to the power source.

N

Make sure that you do not drip ink on any other part of the fax, and do not fill the ink well so it overflows.

Figure 4-1 Refiling the Stamp Ink

3. CLEANING

3.1 Separation Roller (Upper)

Open the operation panel and wipe any dirt off the separation roller with a soft, dry cloth.

3.2 Separation Roller (Lower)

Open the operation panel and wipe any dirt off the separation roller (lower) with a soft, dry cloth.

3.3 Loading Roller

Open the operation panel and wipe any dirt off the loading roller with a soft, dry cloth.

3.4 Scanning Glass (Contact Sensor)

Open the operation panel and wipe any dirt off the scanning glass with a soft, dry cloth.

3.5 Scanning Strip (White)

Open the operation panel and wipe any dirt off the scanning strip (white) with a soft, dry cloth.

3.6 Document Feed Roller/Eject Roller

Open the operation panel and wipe any dirt off the feed roller/eject roller with a soft, dry cloth.

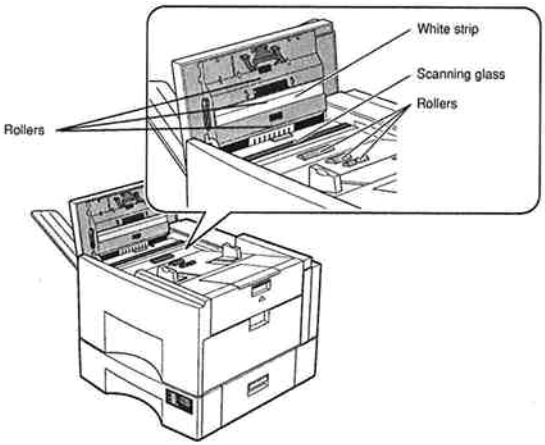


Figure 4-2 Cleaning Locations 1

Do not use tissue. Otherwise, paper dust may stick to the parts or a static charge may be generated.

3.7 Mirror

3.7.1 Using blower brush

a) Preparations for cleaning

Open the printer cover and remove the toner cartridge.

b) Cleaning

Clean with the blower brush.

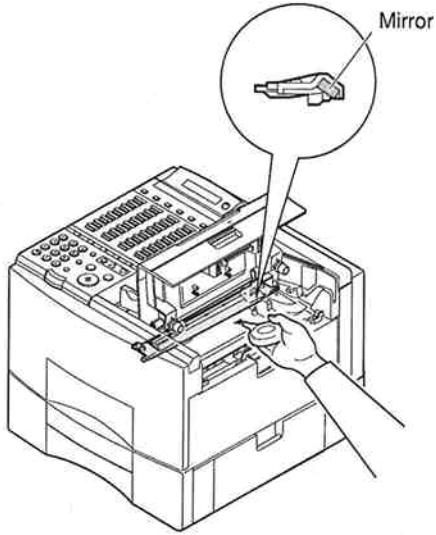


Figure 4-3 Cleaning Locations 2

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3.8 Transfer Charging Roller / Static Charge Eliminator

a) Preparations for cleaning

(1) Open the printer cover and remove the toner cartridge.
(2) Remove the transfer guide tabs at three points.
(3) Raise the left-most end of the transfer charging roller shaft clear of the transfer roller mount (left). (See ❶)
(4) Slide the transfer charging roller and transfer guide to the left and remove the transfer roller shaft from the transfer roller mount (right). (See ❷ & ❸)
(5) Remove the transfer charging roller from the transfer guide.

When removing the transfer charging roller, hold it by the transfer charging roller shaft. Do not hold it by the sponge section.

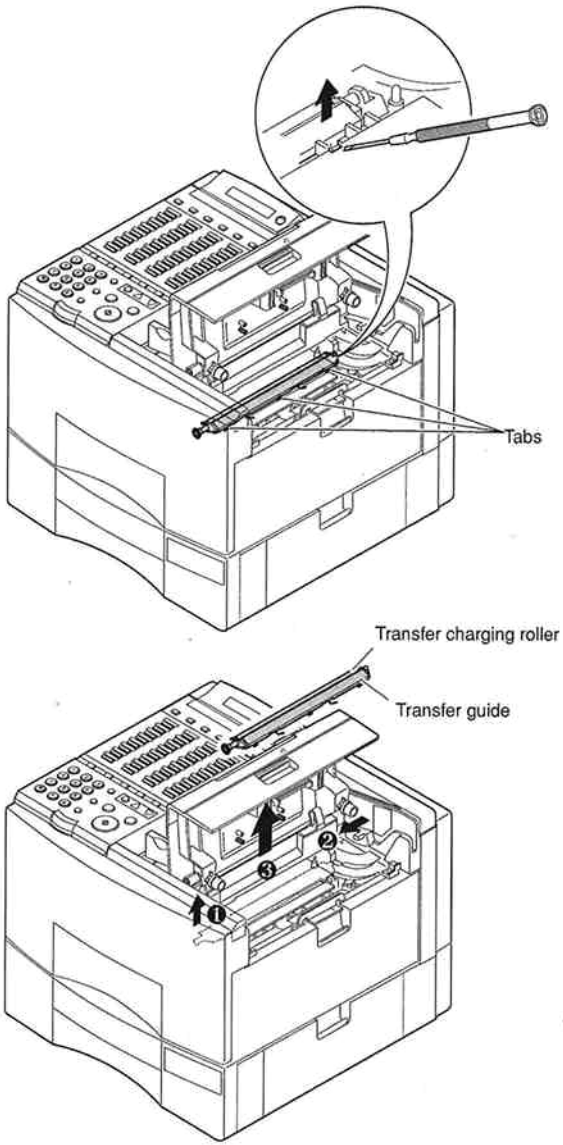


Figure 4-4 Disassembly Procedure (Transfer Charging Roller)

b) Cleaning

Use lint-free paper and remove any dirt, such as paper fragments and toner.

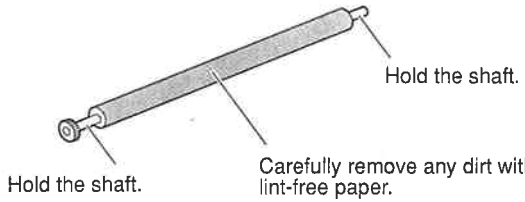


Figure 4-5 Cleaning Locations 3

Do not touch or hold the sponge section of the transfer charging roller. Doing so can cause marks on back of paper or blank spots in copied or received images.

Never clean with solvents!
If lint-free paper cannot fully clean the transfer charging roller or if the roller is deformed, replace it.

Open the printer cover, and use lint-free paper and remove any dirt, such as paper fragments and toner.

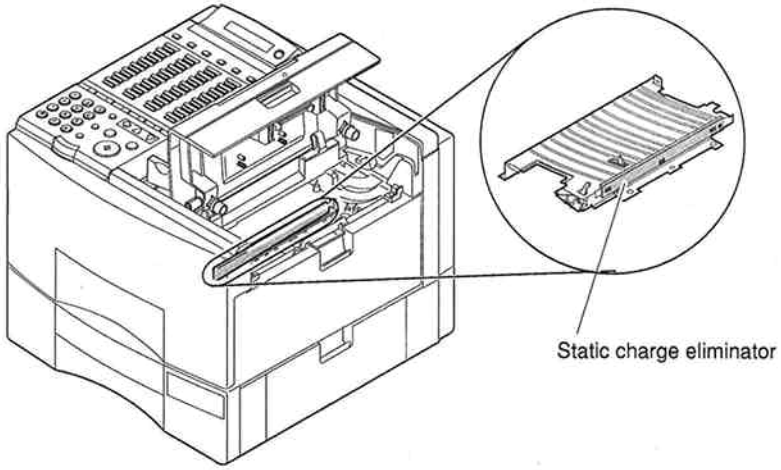


Figure 4-6 Cleaning Locations 4

3.9 Fixing Film / Fixing Entrance Guide

a) Preparations for cleaning

(1) Remove the side cassette and open the exit paper cover.

(2) Remove the four screws, and remove the paper eject roller ass'y and the fixing ass'y.

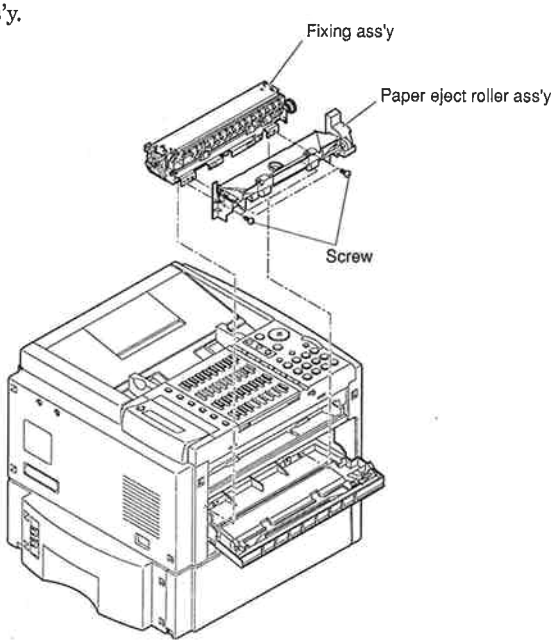


Figure 4-7 Disassembly Procedure (Fixing ass'y)

b) Cleaning

Using lint-free paper dipped in alcohol, wipe any dirt off the fixing entrance guide, and the fixing film with rotating the gear. The gears should always be greased. If the grease is lost, reapply grease to them, see *the PARTS CATALOG (supplied separately).*

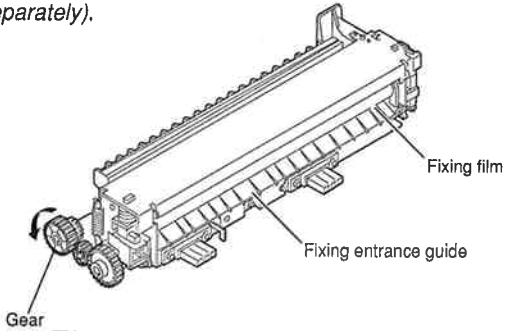


Figure 4-8 Cleaning Locations 5

3.10 Fixing Pressure Roller

a) Preparations for cleaning

(1) Remove the side cassette and open the exit paper cover.
(2) Remove the paper eject roller ass'y and the fixing ass'y.

See Figure 4-7 Disassembly Procedure (Fixing ass'y) for (1)~(2)

(3) Remove two springs and the fixing upper cover.
(4) Remove the fixing film unit.

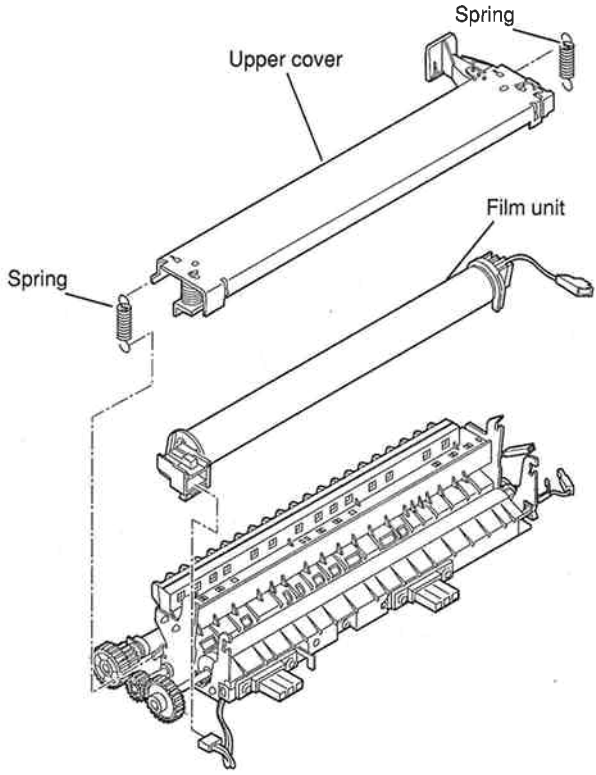


Figure 4-9 Disassembly Procedure (Fixing Film Unit)

When disconnect the connector, be careful not to damage the cable. When connecting the connector, wire the cable as shown in the figure. Provide a clearance of 0.039" (1 mm) or more between the base plate and the cable.

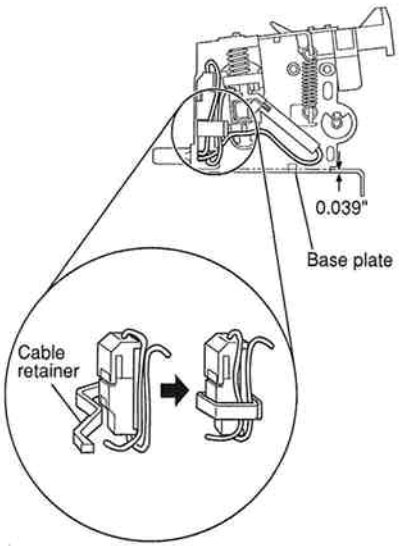


Figure 4-10 Caution for Cable Connecting

b) Cleaning

Using lint-free paper dipped in alcohol, wipe any dirt off the fixing pressure roller with rotating the gear. The gears should always be greased. If the grease is lost, reapply grease to them, see *the PARTS CATALOG (supplied separately).*

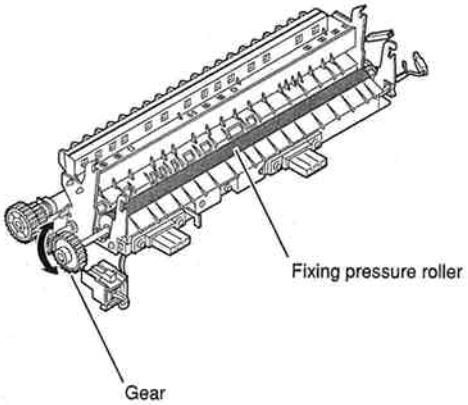


Figure 4-11 Cleaning Locations 6

3.11 Fixing Eject Roller

a) Preparations for cleaning

(1) Remove the side cassette and open the exit paper cover.
(2) Remove the paper eject roller ass'y.

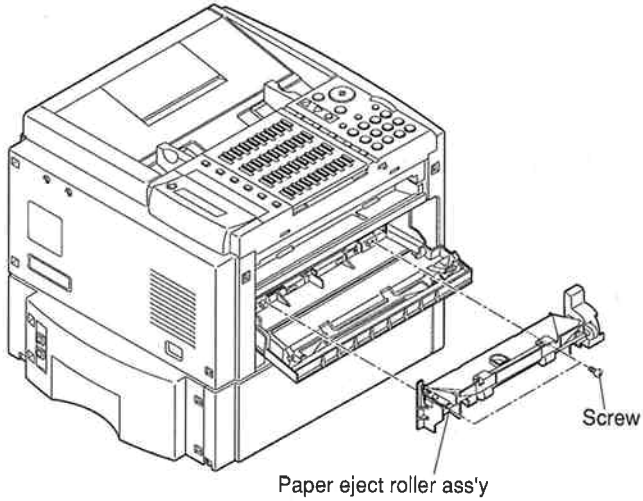


Figure 4-12 Disassembly Procedure (Paper Eject Roller Ass'y)

b) Cleaning

Using lint-free paper dipped in alcohol, wipe any dirt off the fixing eject roller.

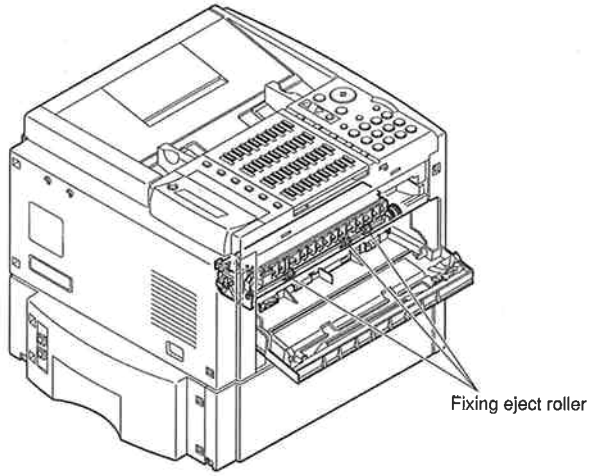


Figure 4-13 Cleaning Locations 7

3.12 Fixing Eject Guide

a) Preparations for cleaning

(1) Remove the side cassette and open the exit paper cover.
(2) Remove the paper eject roller ass'y and the fixing ass'y.

See Figure 4-7 Disassembly Procedure (Fixing ass'y) for (1)~(2)

(3) Remove the two springs and remove the fixing upper cover.
(4) Remove the fixing upper guide.

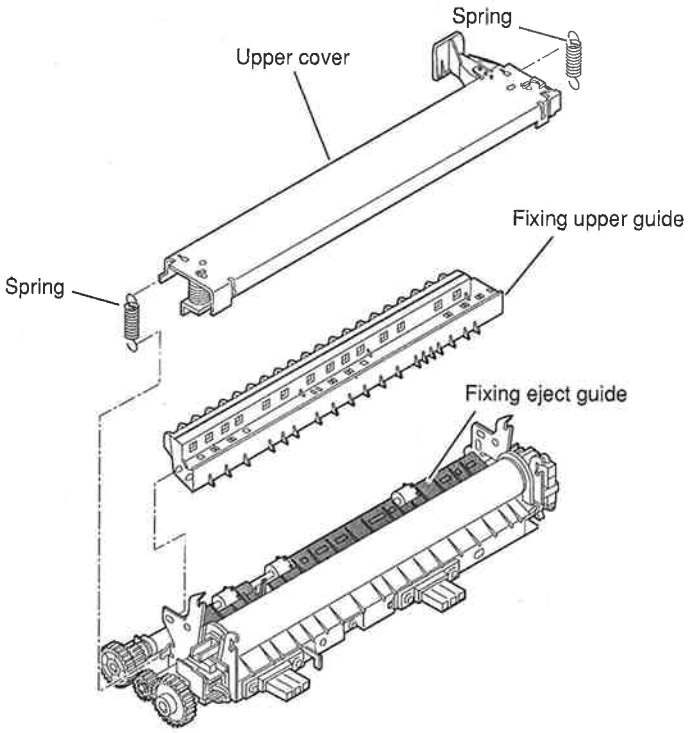


Figure 4-14 Cleaning Locations 8

b) Cleaning

Using lint-free paper dipped in alcohol, wipe any dirt off the fixing eject guide.

3.13 Paper feed guide

a) Preparations for cleaning

(1) Remove the side cassette and open the exit paper cover .
(2) Remove the paper eject roller ass'y and the fixing ass'y.

See Figure 4-7 Disassembly Procedure (Fixing ass'y) for (1)~(2)

(3) Open the printer cover and remove the toner cartridge.
(4) Remove the rear cover, the front cover, and the document table ass'y.
(5) Remove the two screws and remove the mirror.

(6) Remove the transfer guide tabs at three points.
(7) Raise the left-most end of the transfer charging roller shaft clear of the transfer roller mount (left). (See ❶)
(8) Slide the transfer charging roller and transfer guide to the left and remove the transfer roller shaft from the transfer roller mount (right). (See ❷ & ❸)

See Figure 4-4 Disassembly Procedure (Transfer Charging Roller) for (6)~(8)

b) Cleaning

(1) Open the right cover and wipe any dirt off the paper feed guide with lint-free paper.

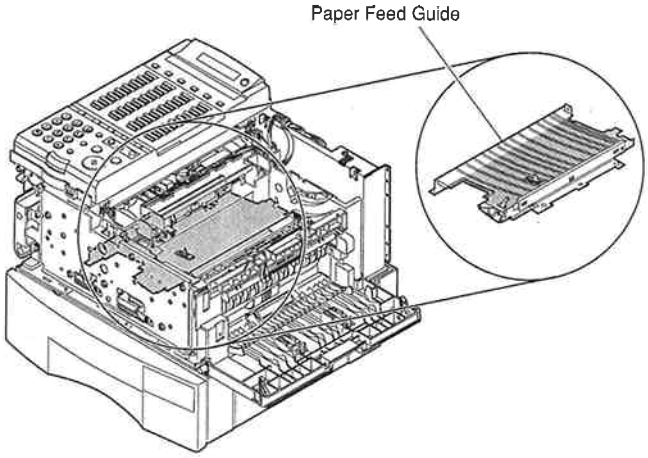


Figure 4-15 Cleaning Locations 9

(2) Open the exit paper cover and wipe any dirt off the paper feed guide with lint-free paper.

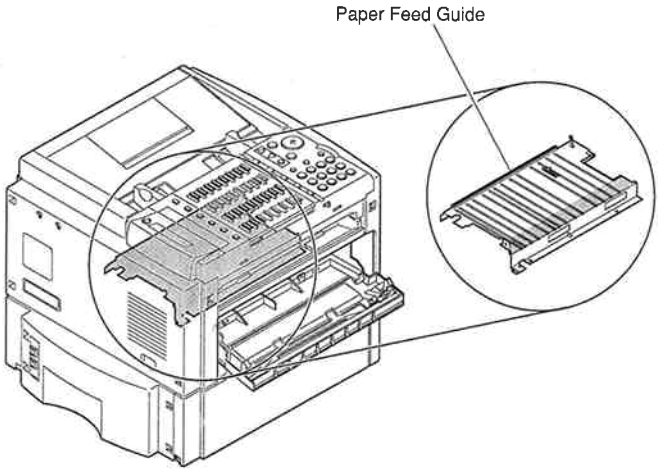


Figure 4-16 Cleaning Locations 10

3.14 High Voltage Terminal

(1) Open the printer cover and remove the toner cartridge.
(2) Using lint-free paper, wipe any dirt off the high voltage terminal.

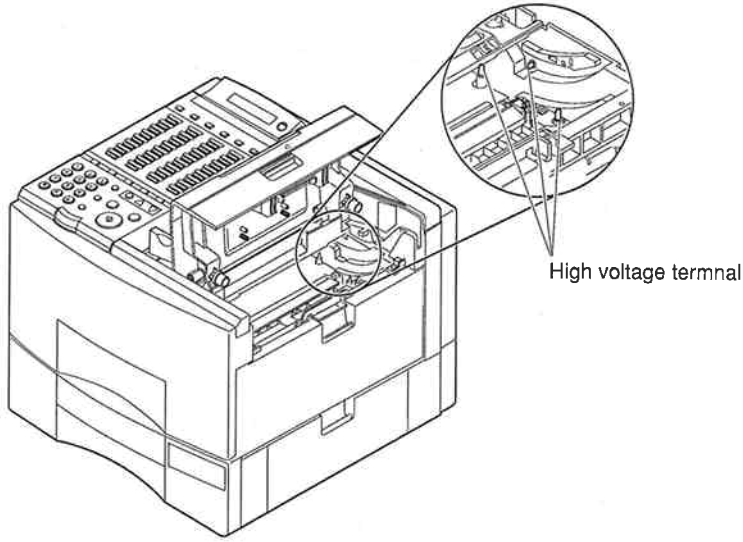


Figure 4-17 Cleaning Locations 11

When cleaning the high voltage terminal, do not touch the sponge section of the transfer charging roller.

4. Adjustment

4.1 Adjustment items

Item	When
Position of mirror	When the mirror is removed.
Leading edge margin	When the PCNT board or multi paper feeder ass'y is replaced. After mirror position adjustment is carried out.

4.2 Mirror position adjustment

a) When

When the mirror has been removed, adjust its position after re-installing it. This adjustment assures the alignment of printed images.

b) Tools

Tool	Use
Phillips screwdriver	Removing/inserting screws
Set square	Measuring alignment of print image

c) Adjustment

c-1) Preparations

(1) Open the printer cover and remove the toner cartridge.
(2) Remove the rear cover and the front cover.
(3) Remove the document table ass'y.
(4) Set letter or A4 size recording paper in the side cassette.
(5) Loosen the screw on the right, and move the mirror so that the center line of the adjustment scale on its right edge lines up with the mark on the main unit.

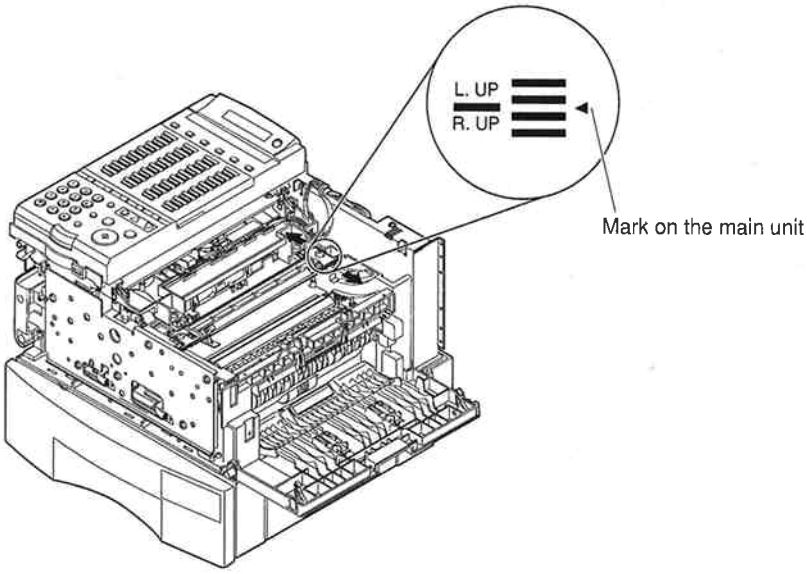


Figure 4-18 Mirror Position Adjustment 1

(6) Open the operation panel and install the document table ass'y.
(7) Open the printer cover and set the toner cartridge.

c-2) Adjustment

(1) Switch ON the power and press the test print switch (SW 301) on the PCNT board to start a test print.

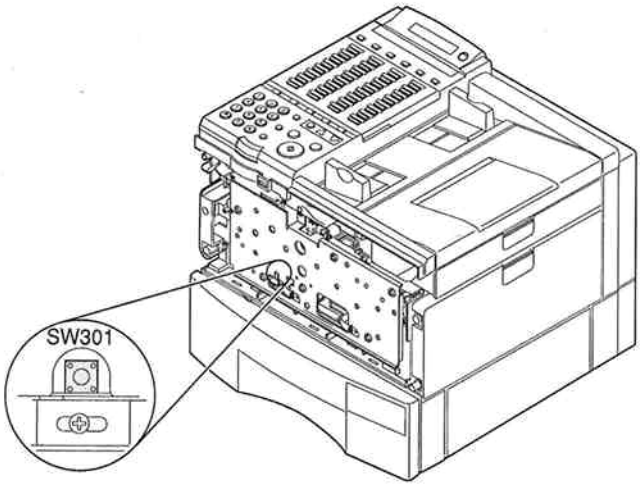


Figure 4-19 Test Print Switch

NOTE

When a test print is performed, the ALARM lamp blinks and "CHECK PRINTER" is displayed.

(2) Draw a line with a ball-point pen connecting the top ends of the vertical lines on the test print image.
(3) Draw a line with a ball-point pen by aligning the vertical lines of the test print image and one side of the setsquare.
(4) The displacement between the line drawn in (2), and that drawn in (3) is measured at the for right of the test print image.

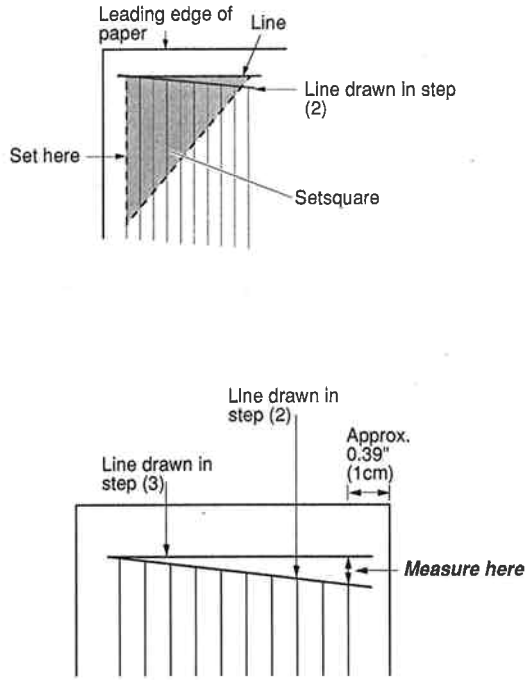


Figure 4-20 Mirror Position Adjustment 2

(5) After removing the toner cartridge and the document table ass'y, adjust the alignment by moving the right edge of the mirror so that the gap in 4) is no greater than 0.06" (1.5 mm).
The adjustment scale has the intervals shown in the figure below. Moving the mirror one gradation moves the image approx. 0.04" (1 mm).
(6) After making this correction and installing the document table ass'y, test print another page to verify that the gap is no greater than 0.06" (1.5 mm).

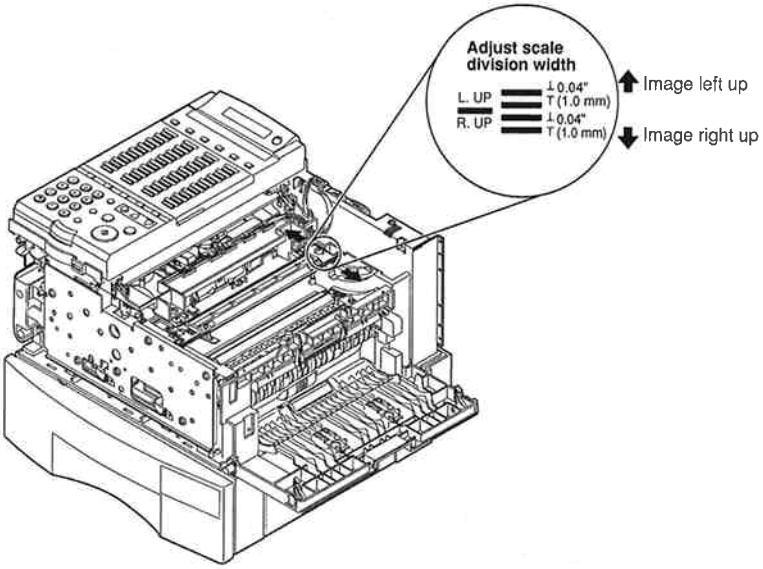


Figure 4-21 Mirror Position Adjustment 3

4.3 Leading edge margin adjustment

a) When

Carry out this adjustment after replacing the PCNT board. When carrying out the mirror position adjustment, carry out the leading edge margin adjustment after the mirror position adjustment.
Making this adjustment assures the print image leading edge margin.

b) Tools

Tool	Use
Phillips screwdriver	Removing/inserting screws
Precision phillips screwdriver	Adjusting controls
Ruler	Measuring leading edge margin of printed image

c) Adjustment

c-1) Preparations

(1) Open the right cover.
(2) Remove the front cover.
(3) Set letter or A4 size recording paper in the side cassette.
(4) Close the right cover.

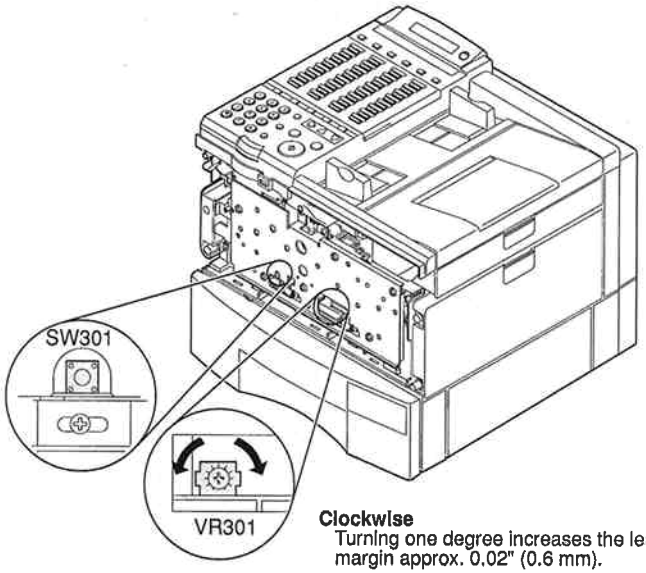
c-2) Adjustment

(1) Set VR301 on the PCNT board to the center position (±0).
(2) Connect the power cord and press the test print switch (SW 301) on the PCNT board to start a test print.


NOTE

When a test print is performed, the ALARM lamp blinks and "CHEGK PRINTER" is displayed.

(3) Measure the length from the leading edge of the recording paper to the test print image (the leading edge margin).
(4) Make a number of test printings and find the average of the leading edge margin.
(5) Adjust VR301 so that the leading edge margin found in (4) is 0.08" (2.0 mm). Turning VR301 one degree clockwise increases the leading edge margin approx. 0.02" (0.6 mm); turning VR301 one degree counterclockwise decreases the leading edge margin approx. 0.02" (0.6 mm).



Clockwise
Turning one degree increases the leading edge margin approx. 0.02" (0.6 mm).

Counterclockwise
Turning one degree decreases the leading edge margin approx 0.02" (0.6 mm).

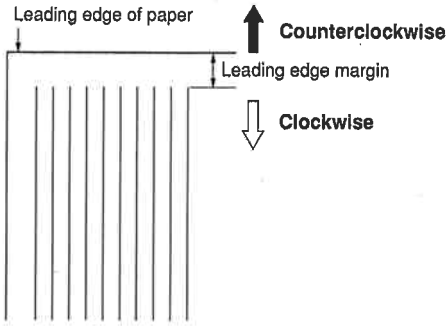


Figure 4-22 Leading Edge Margin Adjustment

5. TROUBLESHOOTING

5.1 Error shown on the display

5.1.1 User error message

"# ALREADY IN USE"

Cause: The box specified with confidential or polling communications is already in use.

Solution: Change the setting or select another box.

"BUSY/NO SIGNAL" (#005, #018)

Cause: There was no response from the other fax within 35 seconds. (T1 timer over)

Solution: Transmit again. Since there is a possibility that the other fax is not a G3 fax, check the other fax's communications mode.

"CHECK DOCUMENT" (#001, #011)

Cause: Document jam. This is displayed when the document sensor detects paper, but the document edge sensor cannot detect the leading edge of the document with 15 seconds from the start of the feed operation.

Solution: Open the operating panel and remove the document.

"CHECK POLLING ID" (#008, #021)

Cause: Polling was impossible because the polling ID or your subaddress/password did not match.

Solution: Check the polling ID or subaddress/password with the other party and try polling again.

"CHECK PRINTER"

See Printer error codes (##322~##325)

"CHECK PRINTER COVER"

Causes: (1) Displayed when the printer cover sensor, right cover sensor, exit paper cover sensor, or feeder right cover sensor detects an open cover.
(2) Displayed when the toner cartridge is not installed.

Solutions: (1) Close the open cover.
(2) Install a toner cartridge.

"CHECK SUBADDR/PASSWD" (#083, #102)

Cause: Password/subaddress does not match.

Solution: Contact the other party and confirm that the subaddress/password that you are using are correct.

"COMMUNICATING"

Cause: You tried to use direct sending while the fax was sending another document.

Solution: Wait until the transmission is finished, then try again.

"DATA ERROR PRESS SET KEY"

Cause: Check sum error. This is displayed when the SCNT board is replaced, when the SRAM is defective, or when the backup battery is replaced.

Solution: Press the SET key.

"DOCUMENT TOO LONG" (#003)

Cause: Displayed when one page of the document was longer than 39.4 inches (1 meter) or transmission/copying took longer than the regulated time (32 minutes).

Solution: Use a copy machine to copy the document onto several shorter pages, then transmit again.

"HANG UP PHONE"

Cause: The handset was left off the hook after the completion of transmission or reception.

Solution: Put the handset back on the hook.

"MEMORY FULL" (#037)

Cause: The image data storage memory area is full.

Solution: Output the image data stored in memory.

"NO ANSWER"

Cause: The number was redialed, but there was no answer.

Solution: Transmit again.

"NO CONFID. TX" (#033, #034)

Causes: (1) The other fax machine may not have the confidential function.
(2) ITU-T subaddress/password does not match.
(3) It is possible that the other fax has no free memory.

Solution: Check the above items for the other fax.

"NO ORIGINAL RELAY TX" (#035, #036)

Causes: (1) It is possible that the other fax has no relay function.
(2) ITU-T subaddress/password does not match.
(3) It is possible that the other fax has no free memory.

Solution: Check the above items for the other fax.

"NO RX PAPER" (#012)

Cause: Declares that the other fax has no recording paper for DIS.
Solution: Contact the other party and have them load paper into their fax.

"NO TEL#" (#022)

Cause: No one-touch speed dialing, coded speed dialing, or group dialing telephone number is registered.
Solution: Register the one-touch speed dialing, coded speed dialing, or group dialing telephone number.

"NOT AVAILABLE NOW"

Cause: Confidential transmission and relay control transmission were specified at the same time.
Solution: Check the contents of the one-touch dialing registration, then try again.

"NOT FOUND, TRY AGAIN"

Cause: An attempt was made to change the specification of a non-registered box for confidential or polling communications.
Solution: Check again if the box is registered.

"PASSWORD POLL REJECT"

Cause: You set up a polling box for polling sending with an ITU-T password, but the other party's fax unit does not support use of an ITU-T password for polling receiving.
Solution: Transmit without an ITU-T password.

"PASSWORD TX REJECT"

Cause: You attempted to send a document with an ITU-T password, but the other party's fax unit does not support use of an ITU-T password for receiving.
Solution: Transmit without an ITU-T password.

"REC. PAPER JAM" (#009)

Cause: Recording paper jam
This is displayed when the recording paper pickup sensor or the recording paper exit sensor detects a paper jam.
Solution: Recover paper jam.

"REPLACE CARTRIDGE"

Causes: (1) The toner in the toner cartridge has run out. This is displayed when the toner sensor cannot detect any toner.
(2) Toner detection structure defect

Solutions: (1) Replace the toner cartridge.
(2) Check the toner sensor unit and connector board J605 connector connections.
(3) Replace the toner sensor unit.
(4) Replace the PCNT board.
(5) Replace the SCNT board.

"SELECTIVE POLL REJECT"

Cause: You have setup a polling box for polling sending with an ITU-T subaddress, but the other party's fax unit does not support use of an ITU-T subaddress for polling receiving.

Solution: Transmit without a subaddress.

"START AGAIN"

Cause: An error due to system malfunction or line breakdown.

Solution: Carry out the same operation again.

"SUBADDRESS TX REJECT"

Cause: You attempted to send a document with an ITU-T subaddress, but the other party's fax unit does not support receiving a document with an ITU-T subaddress.

Solution: Transmit without a subaddress.

"SUPPLY REC. PAPER" (#009)

Cause: Either the recording paper ran out or there was no recording paper cassette loaded. This is displayed when the recording paper sensor detects no paper.

Solution: Refill the recording paper cassette or install the cassette correctly.

"TURN REG SW OFF"

Cause: Registration SW on the operation panel is ON.

Solution: Turn Registration SW OFF on the operation panel.

5.1.2 Error codes

a) Service error code output

If Service Data #1 SSSW Bit 0 is set to "1", then service error codes are printed on the activity management reports, reception result reports, error transmission reports, and system dump lists when communication ends in an error. Also, the following is displayed on the display when an error occurs.

REFERENCE

For samples of reports with the service codes displayed, see *Chapter 2: 2.1.2 Service report output functions.*

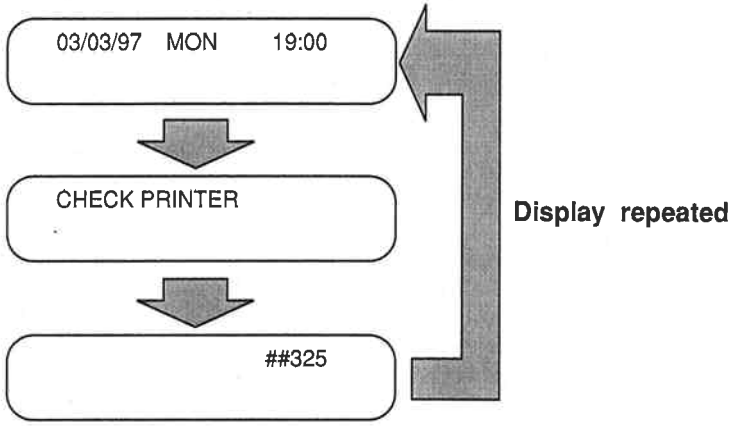


Figure 4-23 Service Error Code Display

b) Measure when an error code is output

Section c) shows the error codes displayed on the fax machine. However, they do not include the causes and measures that are described in a separate document titled *G3 Facsimile Error Code List (Rev. 1)*. See also this document. The *G3 Facsimile Error Code List (Rev. 1)* may not give details of some measures. The measures shown in the *G3 Facsimile Error Code List (Rev. 1)* and applicable to this fax machine are explained below.

- **Increase the transmission level**

  Set service data #2MENU Parameter No.07 to 0 (dBm). (LASER CLASS 8500)
  Set service data #2MENU Parameter No.07 to -8 (dBm).(LASER CLASS 9000/9500)

Do not set the transmission level for the LASER CLASS 9000/9500 to -7 dB or higher.

•Decrease the transmission level

Set service data #2MENU Parameter No.07 to -15 (dBm).

•Echo measures

Change the following bit switches of service data #1SSSW SW03.

Bit 4 → 1: Ignore the first DIS signal sent by the other fax machine.
0: Not to ignore the first DIS signal sent by the other fax machine.

Bit 5 → 1: Transmit a tonal signal (1850 or 1650 Hz) when the other fax machine sends a DIS signal.
0: Not to transmit a tonal signal when the other fax machine sends a DIS signal.

Bit 6 → 1: Transmit a 1850-Hz tonal signal when bit 5 is 1.
0: Transmit a 1650-Hz tonal signal when bit 5 is 1.

Bit 7 → 1: Transmit a tonal signal before sending a CED signal.
0: Not to transmit a tonal signal before sending a CED signal.

•EPT

Change service data #1SSSW SW03 bit 1.

Bit 1 → 1: Transmit an echo protect tone.
0: Not to transmit an echo protect tone.

•Adjust NL equalizer.

Set service data #2MENU Parameter No.05 to "ON".

If the LASER CLASS 9000/9500 cannot receive the signal from the other party because it has an excessive input level, for example, when a private branch exchange is used, it can receive signals with high levels by removing the jumper plug (JP7) from the SCNT board. (In this case, however, signals with low input levels may not be easily received.)

•Reduce the transmission start speed.

Reduce the transmission speed by changing user data "SYSTEM SETTINGS" "TX START SPEED".

•Loosen the TCF judgment standard.

Not available for this fax.

•Loosen the RTN transmission conditions.

Change service data #3NUMERIC Param. Parameter No.02 to 04.

No.02 Percentage of errors in all lines : Set close to 99%.
No.03 Number of lines of burst condition : Set close to 99 lines.
No.04 Lines below the burst condition : Set close to 99 times.

•Increase the no-sound time after CFR reception.

Change service data #1SSSW SW04 bit 4 to "1".

Bit 4 → 1: Time when the low-speed signal is ignored after sending a CFR signal: 1500 ms
0: Time when the low-speed signal is ignored after sending a CFR signal: 700 ms

c) Error codes and recovery methods

c-1) User error codes

#001 [TX] Document jam

Cause: The document jammed in the fax machine.
Solution: Remove the document and transmit/copy again.
Cause: The document width size or thickness does not meet the standards.
Solution: Use a copy machine to copy the document to LTR or other standard size paper, then transmit that copy.
Cause: Internal structure defect
Solutions: (1) Check the document sensor (DS), document edge sensor (DES), and OPCNT board (J102, J103) connections.
(2) Check if the document sensor (DS) and document edge sensor (DES) are operating correctly using the methods given in *Chapter 2: 2.4.6 Faculty tests*, Test Mode [6] Faculty Test, [3] Sensor Tests.
(3) Replace the document sensor (DS) or document edge sensor (DES).
(4) Replace the OPCNT board.
(5) Check the document feed motor and SCNT board (J4) connections.
(6) Make a copy, and make sure that the document feed motor is operating correctly.
Motor check: 4Ω per stepping coil phase
(7) Replace the SCNT board.

#003 [TX/RX] One-page copy/transmission-reception time over

Cause: One page of the document was longer than 39.4 inches (1 meter) or transmission/copying took longer than the regulated time (32 minutes).
Solutions: (1) Use a copy machine to copy the document onto several shorter page, then transmit/copy.
(2) Raise the page timer value with Service Data #1 SSSW SW12.
Cause: Reception took longer than the regulated time (32 minutes).
Solutions: (1) Have the other party split the document over multiple pages and receive it that way.
(2) Contact the other party and check the cause.
(3) Raise the page timer value with Service Data #1 SSSW SW12.

Cause: Internal structure defect

Solutions: (1) Check the document edge sensor (DES) and OPCNT board (J103) connections.

(2) Check if the document edge sensor (DES) is operating correctly using the methods given in *Chapter 2: 2.4.6 Faculty tests*, Test Mode [6] Faculty Test, [3] Sensor Tests.

(3) Replace the document edge sensor.

(4) Replace the OPCNT board.

(5) Check the document feed motor and SCNT board (J4) connections.

(7) Make a copy, and make sure that the document feed motor is operating correctly.
Motor check: 4Ω per stepping coil phase

(13)Replace the SCNT board.

#005 [TX/RX] Initial identification time (T0 / T1) over

Cause: Tone/pulse parameter set incorrectly.

Solution: Set the user data "TEL LINE TYPE" tone/pulse parameter correctly.

Cause: The time until connection with the other fax is too long.

Solution: (1) When registering for auto dialing, add a long pause to delay the start of the timer.

(2) Lengthen the T0 timer with Service Data #3 Numeric PARAM 10 so that the timer does not time out.

Cause: The other fax does not answer.

Solution: Contact the other party and have them check for the cause.

Cause: A significant signal has not been received after starting transmitting the DIS signal.

Solution: Lengthen the T1 timer (Rx) with Service Data #3 Numeric PARAM. 11 so that the time-out error does not occur.

Cause: The communications mode (G2, G3, etc.) of the other fax does not match that of this fax.

Solution: The communications mode is a part of specification for the fax, so there is no countermeasure.

Causes: (1) The other fax malfunctioned during transmission due to echoes.

(2) Malfunction due to echoes during reception

Solution: Implement echo countermeasures, given in this manual in *G3 Facsimile Service Data Handbook (Rev. 0) explanation of #1 SSSW SW03.*

#008 [TX] During polling transmission, the password did not match.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#009 [RX] Recording paper jam/no recording paper

Cause: The recording paper jammed.
Solution: Clear the recording paper jam.
Cause: There is no recording paper.
Solution: Load recording paper.
Cause: Internal structure defect
Solutions: (1) Check if the paper sensors, paper pickup sensor, paper eject sensor are operating correctly using the methods given in *Chapter 2: 2.4.6 Faculty tests*, Test Mode [6] Faculty Test, [3] Sensor Tests.
(2) Check the main motor and PCNT board connector J308 connections.
(3) Check the paper sensor board (J702) and recording paper sensor connections, the connector board (J603) and paper pickup sensor connections.
(4) Check the PCNT board (J201) and paper sensor board (J701) connections, the PCNT board (J203) and connector board (J601) connections.
(5) Replace the paper sensor board. (paper sensor defect)
(6) Replace the PCNT board. (paper eject sensor defect)
(7) Replace the feeder section recording paper sensor, or paper pickup sensor.

#011 [RX] Polling reception error

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#012 [RX] No recording paper in other fax

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#018 [TX/RX] Auto call error

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#021 [RX] DCN received during polling reception

Cause: No subaddress/password set in other machine.
Solution: Contact the other party and check subaddress/password of the other party.

#022 [TX] Cannot call

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#025 [TX/RX] Auto dialing setting error

Cause: An attempt was made to auto dial with confidential and relay set in auto dialing.

Solution: Set confidential and relay correctly for auto dialing.

#033 [TX] Confidential transmission not possible

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#034 [TX] Cannot transmit to other fax's confidential box

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#035 [TX] Relay control transmission not possible

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#036 [TX] Relay control transmission not possible

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#037 [RX] Image memory overflow during reception

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

#039 [TX] Closed network transmission not possible

Cause: The closed network transmission switch is switched off.

Solution: Set Service Data #1 SSSW SW07 bit 7 to "1" to switch on closed network transmission.

Cause: The other fax's closed network transmission switch is switched off.

Solution: Have the other party switch on the closed network reception switch on their fax.

Cause: The closed network ID does not match the other fax's.

Solution: Use Service Data #1 SSSW SW08 to set the same closed network ID for your fax and for the other fax.

#059 [TX] The number you dial and connected number (CSI) does not match

Cause: "USER TEL" on the Rx side not programmed, or wrongly programmed.

Solutions: (1) Contact Rx side and check whether "USER TEL" has been properly programmed.
(2) Check that the designated other party is connected, and transmit manually.

Cause: Faulty operation by exchange. Designated other party is not connected.

Solution: Inspect exchange.

#080 [TX] Other party does not have ITU-T recommended subaddress reception

Cause: The other party's DIS bit 49 is 0.
Solution: Contact the other party and confirm whether or not their fax supports subaddress receiving. Try sending again without a subaddress.

#081 [TX] Other party does not have ITU-T recommended password reception

Cause: The other party's DIS bit 50 is 0.
Solution: Contact the other party and confirm whether or not their fax supports ITU-T password receiving. Try sending again without a password.

#082 [RX] Other party does not have ITU-T recommended selective polling transmission function

Cause: The other party's DIS bit 47 is 0.
Solution: Contact the other party and confirm whether or not their fax can accept a polling request with a subaddress. Try again without a subaddress.

#083 [RX] DCN received during polling reception

Cause: Subaddress/password does not match.
Solution: Contact the other party and conform that the subaddress/password that you are using are correct.

#084 [RX] In polling reception, other party does not have ITU-T recommended password reception

Cause: The other party's DIS bit 50 is 0.
Solution: Contact the other party and confirm whether or not their fax supports receiving a polling request with an ITU-T password. Try again without a password.

#102 [TX] In transmission, DCN received in response to password/sub-address

Cause: Password/subaddress does not match.
Solution: Contact the other party and have them set a password/sub-address.
Cause: Other party's memory is full.
Solution: Contact the other party and have them make sufficient memory available.

#995 [TX/RX] The image data stored in memory have been cleared

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

c-2) Service error codes

- **G3 mode error codes**

##100 [TX] During transmission, the procedure signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##101 [TX/RX] Different modem speed from other fax

Causes (Transmission):
See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##102 [TX] Fall back impossible for transmission

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##103 [RX] For reception, EOL could not be detected for 5 seconds (for CBT, 15 seconds).

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##104 [TX] RTN or PIN received during transmission

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##106 [RX] When waiting for protocol signals during reception, protocol signals could not be received for 6 seconds.

Causes (line conditions were poor):
See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##107 [RX] During reception, the transmitting fax could not fall back.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##109 [TX] During transmission, after DCS was transmitted, a signal other than DIS, DTC, FTT, CFR, or CRP was received, and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##111 [TX/RX] Memory error

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##114 [RX] RTN transmitted during reception

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##200 [RX] During reception, no carrier could be detected for 5 seconds during image reception.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##201 [TX/RX] DCN received other than with normal binary procedure

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##204 [TX] DTC was received, even though there were no transmitted data

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##220 [TX/RX] System error (main program locked up)

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##224 [TX/RX] Abnormality in protocol signals for G3 communications

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##229 [RX] The recording system was locked for one minute.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##232 [TX] The encode control unit malfunctioned.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##237 [RX] The decode UPI malfunctioned.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##238 [RX] The print control unit malfunctioned.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##261 [TX/RX] System Error between Mode and CPU.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##280 [TX] In transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##281 [TX] In transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##282 [TX] During transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##283 [TX] During transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##284 [TX] During transmission, after TCF transmission, DCN received

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##285 [TX] During transmission, after EOP transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##286 [TX] During transmission, after EOM transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##287 [TX] During transmission, after MPS transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##288 [TX] During transmission, after EOP transmission, a signal other than PIN, PIP, MCF, RTP, or RTN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##289 [TX] During transmission, after EOM transmission, a signal other than PIN, PIP, MCF, RTP, or RTN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##290 [TX] During transmission, after MPS transmission, a signal other than PIN, PIP, MCF, RTP, or RTN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

- **Printer error codes**

##322 [RX] Fixing heater temperature abnormality

Cause: Your fax is connected to a UPS (Uninterruptable Power Supply).
Solution: Remove the UPS.
Cause: Internal unit defect
Solutions: (1) Check the PCNT board and fixing heater (J102 and J305) connector connections.
(2) Remove the fixing unit, and check the resistance between fixing unit J305-1 and J305-3, which should be 440 KW.
(3) Remove the fixing unit and check the conductance between fixing unit J102-1 and J102-2.
(4) Replace the fixing film unit.
(5) Replace the PCNT board.

##323 [RX] Laser/scanner unit BD signal output function abnormality

Cause: Internal unit defect
Solutions: (1) Check the laser/scanner unit and PCNT board (J302) connector connections.
(2) Check the amount of laser light, as explained in *Chapter 5: 3. SERVICE TOOLS.*
(3) Replace the laser/scanner unit.
(4) Replace the PCNT board.

##324 [RX] Printer section scanner motor rotation rate abnormality

Cause: Internal unit defect
Solutions: (1) Check the laser/scanner unit and PCNT board (J302) connector connections.
(2) Replace the laser/scanner unit
(3) Replace the PCNT board.

##325 [RX] Fan motor rotation rate abnormality

Cause: Internal unit defect

Solutions: (1) Check the fan motor and power supply unit (CN103) connector connections.
(2) Check if the voltage between power supply unit CN103-1 and CN103-3 goes from 0 to 23 VDC immediately after the power is switched on. If not so, replace the fan motor.
(3) Replace the power supply unit.

##670 [TX] At V.8 late start, the called party declares the V.8 protocol in DIS signal and this unit transmits a CI signal, but the protocol does not progress and a T1 time-out occurs. (LASER CLASS 9000/9500 only)

Cause: The other party disconnected the line while the CI signal was being transmitted, or ANSam/DIS from the called party was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 0 to "1" to inhibit the V.8/V.34 protocol on calling.

##671 [RX] At V.8 termination, the protocol did not advance to phase 2 and a T1 time-out occurs after the caller CM signal was detected. (LASER CLASS 9000/9500 only)

Cause: The caller disconnected the line or the signal from the caller was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 1 to "1" to inhibit the V.8/V.34 protocol for the called party.

##672 [TX] The protocol did not move from phase 2 to phase 3 and a T1 time-out occurred during V.34 transmission. (LASER CLASS 9000/9500 only)

Cause: The called party disconnected the line during phase 2 or the signal from the called party was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 0 to "1" to inhibit the V.8/V.34 protocol on calling.

##673 [RX] The protocol did not move from phase 2 to phase 3 and a T1 time-out occurred during V.34 reception. (LASER CLASS 9000/9500 only)

Cause: The transmitter disconnected the line during phase 2 or the signal from the transmitter was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 1 to "1" to inhibit the V.8/V.34 protocol on termination.

##674 [TX] The protocol did not move from phase 3 to phase 4 and a T1 time-out occurred during V.34 transmission. (LASER CLASS 9000/9500 only)

Cause: The called party disconnected the line during phase 3 or the signal from the called party was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 0 to "1" to inhibit the V.8/V.34 protocol on calling.

##675 [RX] The protocol did not move from phase 3 to phase 4 and a T1 time-out occurred during V.34 reception. (LASER CLASS 9000/9500 only)

Cause: The transmitter disconnected the line during phase 3 or the signal from the transmitter was not able to be detected.

Solutions: Increase #2 MENU No.07 transmission level within a range of -8~-15 (dBm) or set #1 SSSW SW-28 bit 1 to "1" to inhibit the V.8/V.34 protocol on termination.

- **ECM mode error codes**

##750 [TX] After PPS-NULL transmission, no significant signals could be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##752 [TX] During transmission, after PPS-NULL transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##753 [TX] After PPS-NULL transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) ran out.

Cause: The other fax's page buffer is full or is being used, so PPS-NULL was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##754 [TX] After PPS-NULL transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##755 [TX] After PPS-MPS transmission, significant signals could not be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##757 [TX] After PPS-MPS transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##758 [TX] After PPS-MPS transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) ran out.

Cause: The other fax's page buffer is full or is being used, so PPS-MPS was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##759 [TX] After PPS-MPS transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##760 [TX] After PPS-EOM transmission, significant signals could not be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##762 [TX] After PPS-EOM transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##763 [TX] After PPS-EOM transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) ran out.

Cause: The other fax's page buffer is full or is being used, so PPS-EOM was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##764 [TX] After PPS-EOM transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##765 [TX] After PPS-EOP transmission, significant signals could not be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##767 [TX] After PPS-EOP transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##768 [TX] After PPS-EOP transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) timed out.

Cause: The other fax's page buffer is full or is being used, so PPS-EOP was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##769 [TX] After PPS-EOP transmission, the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##770 [TX] After EOR-NULL transmission, no significant signals could be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##772 [TX] After EOR-NULL transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##773 [TX] After EOR-NULL transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) timed out.

Cause: The other fax's page buffer is full or is being used, so EOR-NULL was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##774 [TX] After EOR-NULL transmission, ERR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##775 [TX] After EOR-MPS transmission, no significant signals could be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##777 [TX] After EOR-MPS transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##778 [TX] After PPS-MPS transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) timed out.

Cause: The other fax's page buffer is full or is being used, so PPS-MPS was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##779 [TX] After EOR-MPS transmission, ERR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##780 [TX] After EOR-EOM transmission, no significant signals could be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##782 [TX] After EOR-EOM transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##783 [TX] After PPS-EOM transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) timed out.

Cause: The other fax's page buffer is full or is being used, so PPS-EOM was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##784 [TX] After EOR-EOM transmission, ERR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##785 [TX] After EOR-EOP transmission, no significant signals could be received and the protocol signals were retransmitted the maximum allowed number of times.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##787 [TX] After EOR-EOP transmission, DCN was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##788 [TX] After EOR-EOP transmission, the protocol signals were retransmitted the maximum allowed number of times or the T5 timer (60 seconds) timed out.

Cause: The other fax's page buffer is full or is being used, so EOR-EOP was transmitted, then RNR was received and after RR transmission, no significant signals could be received.

Solutions: (1) In the user data **"TX SETTINGS"**, set **"ECM TX"** to **"OFF"**.
(2) Set user data **"TX START SPEED"** in **"SYSTEM SETTINGS"** to lower speed.

##789 [TX] After EOR-EOP transmission, ERR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##790 [RX] After EOR-Q transmission, ERR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##791 [TX/RX] Something other than significant signals was received in the protocol in ECM mode.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##792 [RX] PPS-NULL between partial pages could not be detected

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##793 [RX] During reception of high-speed signals, the maximum allowable time ran out without this fax being able to detect a valid frame

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##794 [TX] All-0 PPR was received.

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##795 [TX/RX] Trouble in the decoding processing during communication

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

##799 [TX] System error

See the separate document *G3 Facsimile Error Code List (Rev. 1)* for details of the cause and measure.

5.2 Errors Not Shown on the Display

a) No power

Solutions: (1) Plug in the power cord.
(2) Check the fuse in the power supply unit. If the fuse (FU101, FU102) blows, check the fixing unit cables.
(3) Check the power supply and board connector connections.
(4) Replace the power supply unit.

b) No display

Solutions: (1) Remove and reinstall the power cord.
(2) Check the SCNT board (J5) and OPCNT board (J100) connector connections.
(3) Replace the OPCNT board.
(4) Replace the SCNT board.

c) Characters are distorted

Solutions: (1) Check the SCNT board (J5) and OPCNT board (J100) connector connections.
(2) Replace the OPCNT board.
(3) Replace the SCNT board.

d) Keys do not function

Solutions: (1) Check the SCNT board (J5) and OPCNT board (J100) connector connections.
(2) Replace the OPCNT board (defective key switches).
(3) Replace the OPCNT board (defective OPCNT control IC).
(4) Replace the SCNT board.

d) Document feed error
The document is not fed

Solutions: (1) Check the OPCNT board (J102) connector connections to the document sensor.
(2) Use the *Chapter 2: 2.4.6 Faculty Test*, Test Mode [6] Faculty Test [3] Sensor Test to check whether the document sensor is working normally.
(3) Replace the document sensor.
(4) Check the SCNT board (J5) and OPCNT board (J100) connector connections.
(5) Replace the OPCNT board.
(6) Replace the SCNT board.

Document feed motor does not run at all or dose not run normally

Solutions: (1) Check the SCNT board (J4) and document feed motor connector connections.
(2) Make a copy, and make sure that the document feed motor is operating correctly.
(3) Motor check: 4Ω per stepping coil phase
(4) Replace the document feed motor.
(5) Replace the SCNT board.

The document skews

Solutions: (1) Check whether the document guide width is set correctly for the document to be loaded.
(2) Check whether paper whose thickness is lower or higher than the prescribed value is used.
(3) Check whether the document stopper is initialized correctly.
(4) Clean the separation roller (upper), the separation roller (lower), the document feed roller and eject roller.

Two or more documents are fed at the same time

Solutions: (1) Check whether more documents than the maximum number of documents are set.
(2) Check whether paper whose thickness is lower or higher than the prescribed value is used.
(3) Clean the separation roller (upper), the separation roller (lower) and the document feed roller.
(4) Check whether the document stopper is initialized correctly.
(5) Replace the separation roller (upper).

e) Scanning error

See *Chapter 2: 2.4.4 Print test* and perform test print to confirm that there is no printing error.

Copy not printed

Solutions: (1) Check the contact sensor and SCNT board (J3) connections.
(2) Replace the contact sensor.
(3) Replace the SCNT board.

Vertical white line/band in images

Solutions: (1) Clean the scanning strip (white).
(2) Clean the scanning glass.
(3) Check the contact sensor and SCNT board (J3) connections.
(4) Replace the contact sensor unit.

Vertical black band in images

Solutions: (1) Clean the scanning strip (white).
(2) Clean the scanning glass.
(3) Set SSSW #1 SW06 Bits 0 and 1 to "1", as explained in the separate document *G3 Facsimile Service Data Handbook (Rev. 0)*.
(4) Check the contact sensor and SCNT board (J3) connections.
(5) Replace the contact sensor.

f) No sound from the speaker

Solutions: (1) Check the speaker and SCNT board (J10) connection.
(2) Replace the speaker.
(3) Replace the SCNT board.

g) Print defects

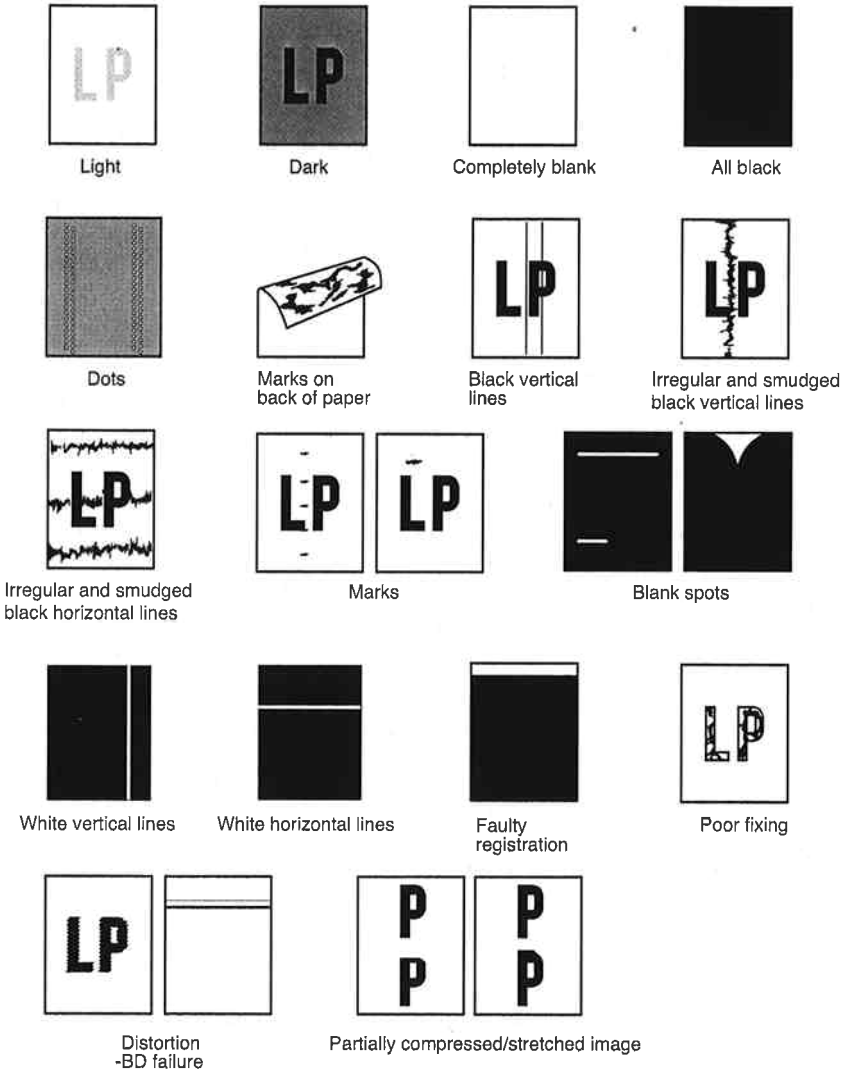


Figure 4-24 Faulty Print Samples

Light

Solutions: (1) In user data, set **"SELECT DENSITY"** to **"DK"**.
(2) Replace the toner cartridge.
(3) During printing, open the printer cover, open the toner cartridge drum shutter by hand, and check that the toner image on the photosensitive drum is transferred to the recording paper. If it is transferred and the toner image on the drum surface is light, proceed to (6); if not, proceed to the next step.
(4) Replace the transfer charging roller.
(5) Clean the transfer bias contact and the transfer charging roller shaft contact.
(6) Check that the laser shutter opens when you press the laser shutter lever.
(7) Replace the laser shutter lever or the laser shutter.
(8) Clean the developing bias contact and the toner cartridge contact.
(9) Check the amount of laser light, as explained in *Chapter 5: 3 SERVICE TOOLS.*
(10) Replace the PCNT board.
(11) Replace the laser/scanner unit.

Dark

Solutions: (1) In user data, set **"SELECT DENSITY"** to **"LT"**.
(2) Clean the drum ground contact and the toner cartridge contact.
(3) Clean the primary charging contact and the toner cartridge contact.
(4) Check the amount of laser light, as explained in *Chapter 5: 3 SERVICE TOOLS.*
(5) Replace the PCNT board.
(6) Replace the laser/scanner unit.

Completely blank

Solutions: (1) Clean the developing bias contact and the toner cartridge contact.
(2) Check if the laser shutter opens when you press the laser shutter lever.
(3) Replace the laser shutter lever or the laser shutter.
(4) Check the amount of laser light, as explained in *Chapter 5: 3 SERVICE TOOLS.*
(5) Replace the PCNT board.
(6) Replace the laser/scanner unit.

All black

Solutions: (1) Replace the toner cartridge.
(2) Check the amount of laser light, as explained in *Chapter 5: 3. SERVICE TOOLS.*
(3) Replace the PCNT board.
(4) Replace the laser/scanner unit.

Dots

Solutions: (1) Clean the static charge eliminator in the toner transfer section.
(2) Check the static charge eliminator contact.
(3) Clean the transfer charging roller.
(4) Replace the transfer charging roller.

Marks on back of papers

Solutions: (1) Copy a few white paper documents.
(2) If the marks are at intervals of approx. 1.75"(44.5 mm), clean the transfer charging roller, but if they are at intervals of approx. 2.12" (53.8 mm), clean the fixing pressure roller.
(3) Replace the transfer charging roller.
(4) Replace the fixing pressure roller.
(5) Clean the paper feed guide.
(6) Clean entrance guide in the fixing ass'y.

Black vertical lines

Solutions: (1) Clean the mirror.
(2) During printing, open the printer cover, open the toner cartridge drum shutter by hand, and check if there are vertical black lines on the photosensitive drum.
(3) If there are vertical black lines on the photosensitive drum, replace the toner cartridge.
(4) If there are not vertical black lines on the photosensitive drum, replace the fixing ass'y.

Irregular and smudged black vertical lines

Solutions: (1) Clean the entrance guide in the fixing ass'y.
(2) Replace the toner cartridge.

Irregular and smudged black horizontal lines

Solutions: If the irregular smudged black lines occur cyclically, replace the toner cartridge. If they are non-cyclically, replace the fixing film unit.

Marks

Solutions: (1) If the marks are at intervals of approx. 1.75" (44.5 mm), clean the transfer charging roller; if they are at intervals of approx. 2.98" (75.6 mm), clean the fixing film unit ; and if they are at intervals of approx. 3.00" (76.2 mm), 1.26" (31.9 mm), 1.50" (38.1 mm) or 3.10" (78.6 mm) replace the toner cartridge.
(2) Clean the paper feed guide.
(3) Clean the the entrance guide in the fixing ass'y.

Blank spots

Solutions: (1) Clean the transfer charging roller.
(2) Replace the transfer charging roller.
(3) Replace the toner cartridge.
(4) Check for foreign matter between the transfer charging roller gear and the drive gear.
(5) Clean the developing bias contact and the toner cartridge contact.
(6) Replace the PCNT board.

White vertical lines

Solutions: (1) Shake the toner cartridge.
(2) Clean the mirror.
(3) Check for foreign matter stuck in the laser output hole on the laser/scanner unit or the laser input hole on the toner cartridge.
(4) Replace the laser/scanner unit.

White horizontal lines

Solutions: (1) Replace the toner cartridge.
(2) Replace the fixing film unit.

Faulty registration

Solutions: (1) Check if more than the regulation amount of recording paper is loaded in the cassette.
(2) Adjust the leading edge margin as explained in 3.3.5 Leading edge margin adjustment.
(3) Replace the pickup sensor actuator.
(4) Replace the pickup roller.
(5) Replace the feed roller.
(6) Replace the PCNT board.

Distortion / -BD signal failure

Solutions: (1) Check the laser/scanner unit and PCNT board (J302) connector connections.
(2) Check the amount of laser light, as explained in *Chapter 5: 3. SERVICE TOOLS.*
(3) Replace the PCNT board.
(4) Replace the laser/scanner unit.

Poor fixing

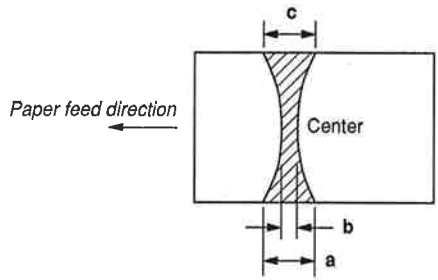
Solutions: (1) If the dirts are at intervals of approx. 2.98" (75.6 mm), clean the fixing film unit; if they are at intervals of approx. 2.12" (53.8 mm), clean the fixing pressure roller.
(2) Replace the fixing film unit.
(3) Replace the fixing pressure roller.
(4) Check the nip width of the fixing ass'y. If it is not as specified, replace the fixing ass'y.

NOTE

Checking the nip width of the fixing lower roller

Improperly set nip may cause a fixing unit problem. The fixing unit is not designed to allow adjustment of the nip.
Check the fixing unit nip by using the following procedure.

(1) Either take along one or two all-black copies of A4 or letter size made with a copier, or make it using a copier at the customer site.
(2) Set the black copy in the side cassette with the black side facing down.
(3) Press the test print switch (SW 301) on the PCNT board.
(4) Turn the power OFF when the beginning of the paper appears on the paper exit slot. Next, open the exit paper cover and remove the jam paper from the machine.
(5) Measure the widths of an area on the paper where toner luster is visible and check whether they fall within the range shown in below table.



	Dimension
b	0.1" to 0.16" (2.5 to 4 mm)
|a - c|	0.02" (0.5 mm) or less
|a - b|	0.06" (1.5 mm) or less
|b - c|	0.06" (1.5 mm) or less

Figure 4-25 Fixing Nip Width

Partially compressed/stretched image

Solutions: (1) Check for foreign matter between the toner cartridge gear and the drive gear.
(2) Check if the toner cartridge gear is not broken.
(3) Replace the toner cartridge.

h) Recording paper pickup error

The recording paper is not picked up from the side cassette.

Solutions: (1) Check that the side cassette is installed correctly.
(2) Check if more than the regulation amount of recording paper is loaded in the side cassette.
(3) Check that the recording paper is not curled and is set correctly on the cassette retaining tabs.
(4) Check that the lifting arm is at its initial position. If it is not, after switch the power on, insert the side cassette into the main unit.
(5) Replace the separation pad.
(6) Replace the separation ass'y.
(7) Check the pickup solenoid and connector board (J604) connections.
(8) Check the connector board (J601) and PCNT board (J203) connections.
(9) Replace the pickup roller.
(10) Replace the connector board.
(11) Replace the PCNT board.

Recording paper is not picked up from the front cassette

Solutions: (1) Check that the front cassette is installed correctly.
(2) Check if more than the regulation amount of recording paper is loaded in the front cassette.
(3) Check that the recording paper is set correctly on the cassette retaining clips.
(4) Check that the feeder pickup roller is at its initial position. If it is not, after switch the power on, insert the front cassette into the main unit.
(5) Check the feeder pickup solenoid and paper sensor board (J702) connections.
(6) Replace the feeder pickup solenoid.
(7) Replace the feeder pickup roller.
(8) Check the PCNT board (J201) and paper sensor board (J701) connections.
(9) Replace the paper sensor board.
(10) Replace the PCNT board.

i) Printer error

"REC. PAPER JAM" is displayed even though a paper jam has not occurred

Solutions: (1) Check that the printer cover, right cover, exit paper cover, or feeder right cover is closed correctly.
(2) Check that the toner cartridge is installed correctly.
(3) Check that the recording paper is not curled and the paper eject roller ass'y is attached correctly.
(4) Check if the paper pickup sensor, paper eject sensor are operating correctly using methods given in *Chapter 2: 2.4.6 Faculty tests*, Test Mode [6] Faculty Test, [3] Sensor tests.
(5) Check that the paper pickup sensor actuator is not damaged.
(6) Replace the paper pickup sensor actuator.
(7) Check that the paper eject sensor actuator in the fixing ass'y is not damaged.
(8) Replace the PCNT board.

"SUPPLY REC. PAPER" is displayed even though a paper is loaded in the side cassette

Solutions: (1) Re-install the side cassette and the front cassette correctly.
(2) Check if the paper sensor is operating correctly using methods given in *Chapter 2: 2.4.6 Faculty tests*, Test Mode [6] Faculty Test, [3] Sensor tests.
(3) Check the feeder paper sensor and paper sensor board (J702) connections.
(4) Check the paper sensor board (J701) and PCNT board (J201) connections.
(5) Check that the paper sensor actuators are not damaged.
(6) Replace the feeder paper sensor.
(7) Replace the paper sensor board.
(8) Replace the PCNT board.

Main motor does not run

Solutions: (1) Check the main motor and PCNT board (J308) connections.
(2) Replace the main motor.

Strange sounds in the paper eject section

Solutions: See *Parts Catalog 4. LUBRICATIONS* and verify that grease has been applied to the specified location in drive gear ass'y. If it has not been applied, apply it.

j) Recording paper jam

Jam in the paper pickup section

Solutions: (1) Check that the side cassette is installed correctly.
(2) Check if more than the regulation amount of recording paper is loaded in the side cassette.
(3) Check that the recording paper is set correctly on the cassette retaining tabs.
(4) Check that the lifting arm is at its initial position. If it is not, after switch the power on, insert the side cassette into the main unit.
(5) Replace the separation pad.
(6) Replace the separation ass'y.
(7) Check the pickup solenoid and connector board connections (J604), and connector board (J601) and PCNT board (J203) connections.
(8) Replace the pickup solenoid.
(9) Replace the pickup roller.
(10) Replace the PCNT board.

Jam in the front feeder

Solutions: (1) Check that the front cassette is installed correctly.
(2) Check if more than the regulation amount of recording paper is loaded in the front cassette.
(3) Check that the recording paper is set correctly on the cassette retaining clips.
(4) Check that the feeder pickup roller is at its initial position. If it is not, after switching the power on, insert the front cassette into the main unit.
(5) Check the feeder pickup solenoid and the paper sensor board (J702) connections.
(6) Replace the feeder pickup solenoid.
(7) Replace the feeder pickup roller.
(8) Check the PCNT board (J201) and the paper sensor board (J701) connections.
(9) Replace the paper sensor board.
(10) Replace the PCNT board.

Jam in the fixing unit

Solutions: (1) Clean the fixing entrance guide.
(2) Clean the fixing film unit.
(3) Clean the fixing eject roller.
(4) Clean the fixing pressure roller.
(5) Clean the fixing eject guide.
(6) Replace the fixing film unit.
(7) Replace the fixing eject roller.
(8) Replace the fixing pressure roller.
(9) Replace the fixing ass'y.

Jam in the paper eject section

Solutions: (1) Check that the paper eject roller ass'y is attached correctly.
(2) Replace the paper eject roller.
(3) Replace the paper eject roller ass'y.

k) Recording paper feed error

Multiple feed / Skew feed / Bend of paper leading edge

Solutions: (1) Check that the cassette is installed correctly.
(2) Check if more than the regulation amount of recording paper is loaded in the cassette.
(3) Check that the recording paper is set correctly on the cassette retaining tabs.
(4) Replace the separation pad.

Wrinkles

Solutions: (1) During printing, open the printer cover before the paper is fed to the transfer charging roller and check if there are wrinkles on the paper. If there are, check the paper pickup section using the methods given in *h) Recording paper pickup error*. If there are not, check that the transfer guide is correctly installed.
(2) Clean the fixing entrance guide.
(3) Clean the fixing pressure roller.
(4) Replace the fixing ass'y.

6. WIRING DIAGRAM

6.1 Wiring Diagram

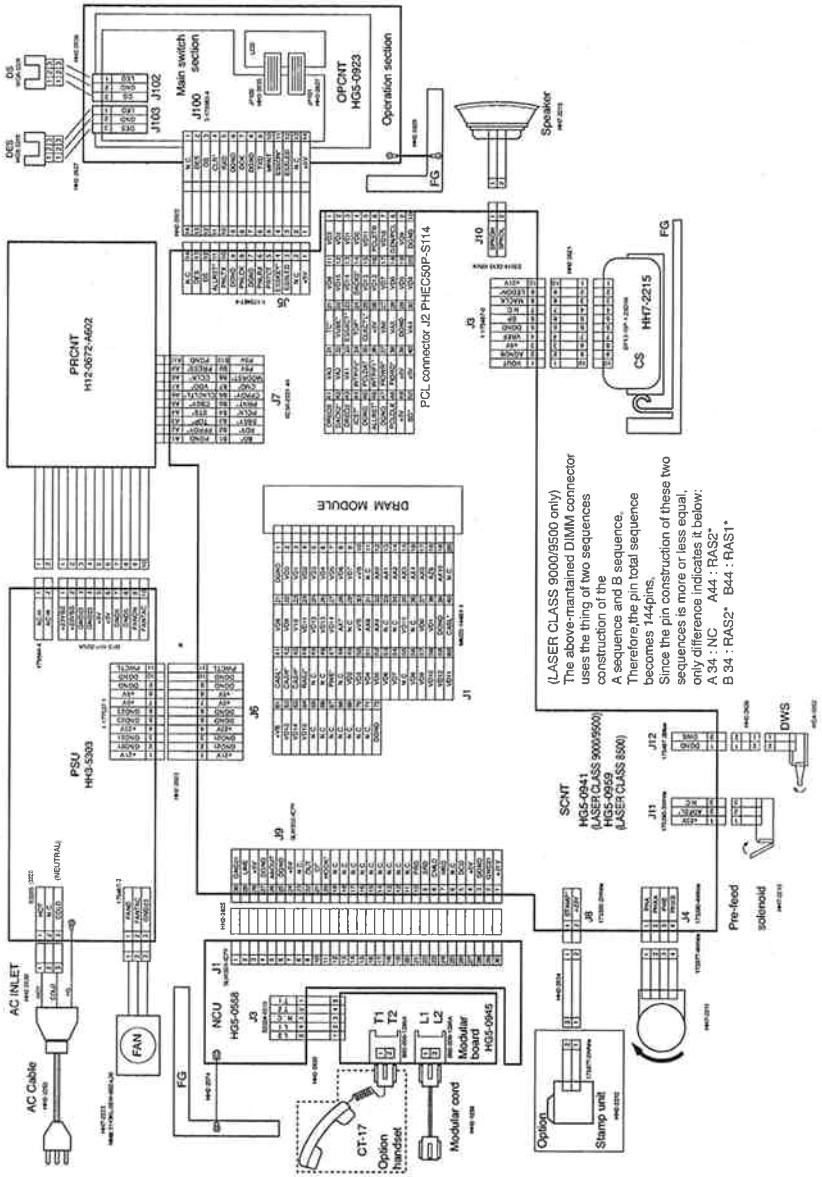


Figure 4-26 Wiring Diagram (1)

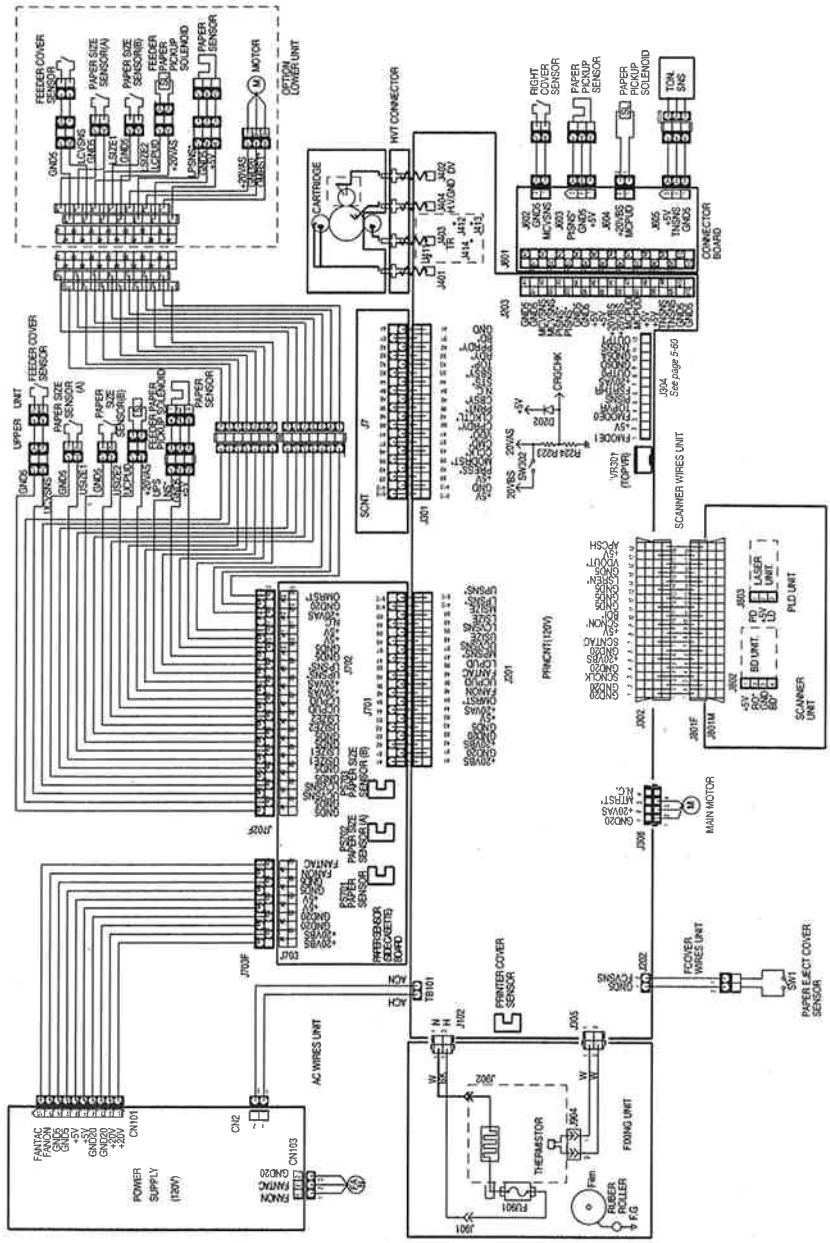


Figure 4-27 Wiring Diagram (2)

6.2 Connector Locations and Signal Description
6.2.1 SCNT board

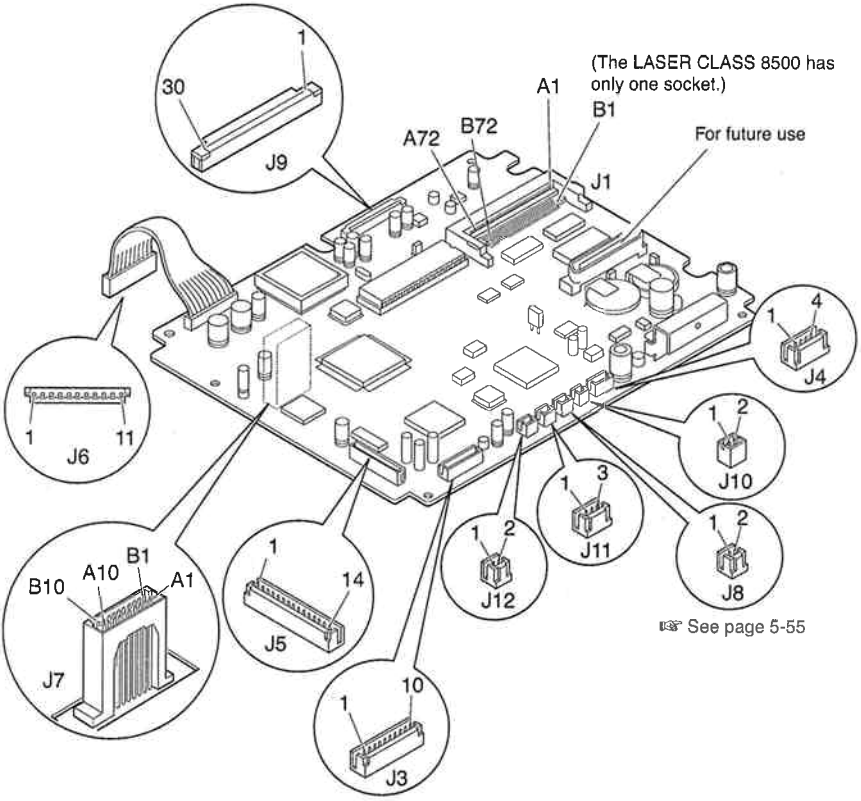


Figure 4-28 SCNT Board

SCNT board

J1 (to DRAM module)

Pin No.	Signal	In/Out	Source	Description
A1	DGND	---	---	Ground
A2	VD0	I/O	IC 18*	Data signal
A3	VD1	I/O	IC 18*	Data signal
A4	VD2	I/O	IC 18*	Data signal
A5	VD3	I/O	IC 18*	Data signal
A6	VD4	I/O	IC 18*	Data signal
A7	VD5	I/O	IC 18*	Data signal
A8	VD6	I/O	IC 18*	Data signal
A9	VD7	I/O	IC 18*	Data signal
A10	+ VB	OUT	Rechargeable battery	Logic drive voltage
A11	N.C.	---	---	Not connected
A12	AX0	I/O	IC 18*	Address/data signal
A13	AX1	I/O	IC 18*	Address/data signal
A14	AX2	I/O	IC 18*	Address/data signal
A15	AX3	I/O	IC 18*	Address/data signal
A16	AX4	I/O	IC 18*	Address/data signal
A17	AX5	I/O	IC 18*	Address/data signal
A18	AX6	I/O	IC 18*	Address/data signal
A19	AX10	I/O	IC 18*	Address/data signal
A20	N.C.	---	---	Not connected
A21	VD8	I/O	IC 18*	Data signal
A22	VD9	I/O	IC 18*	Data signal
A23	VD10	I/O	IC 18*	Data signal
A24	VD11	I/O	IC 18*	Data signal
A25	VD12	I/O	IC 18*	Data signal
A26	VD13	I/O	IC 18*	Data signal
A27	VD14	I/O	IC 18*	Data signal
A28	AX7	I/O	IC 18*	Address/data signal
A29	N.C.	---	---	Not connected
A30	+VB	Out	Rechargeable battery	Logic drive voltage
A31	AX8	I/O	IC 18*	Address/data signal
A32	AX9	I/O	IC 18*	Address/data signal
A33	N.C.	---	---	Not connected
A34	N.C.	---	---	Not connected
A35	VD15	I/O	IC 18*	Data signal
A36	N.C.	---	---	Not connected
A37	VD0	I/O	IC 18*	Data signal
A38	VD1	I/O	IC 18*	Data signal
A39	DGND	---	---	Ground

SCNT board

Pin No.	Signal	In/Out	Source	Description
A40	-CASL	Out	IC 18*	Column address/low-order byte access
A41	-CASL	Out	IC 18*	Column address/low-order byte access
A42	-CASH	Out	IC 18*	Column address/high-order byte access
A43	-CASH	Out	IC 18*	Column address/high-order byte access
A44	-RAS2	Out	IC 18*	Row address strobe signal No.2
A45	N.C.	---	---	Not connected
A46	N.C.	---	---	Not connected
A47	-FWE	Out	IC 18*	XWE signal to DRAM
A48	N.C.	---	---	Not connected
A49	VD2	I/O	IC 18*	Data signal
A50	VD3	I/O	IC 18*	Data signal
A51	VD4	I/O	IC 18*	Data signal
A52	VD5	I/O	IC 18*	Data signal
A53	VD6	I/O	IC 18*	Data signal
A54	VD7	I/O	IC 18*	Data signal
A55	N.C.	---	---	Not connected
A56	VD8	I/O	IC 18*	Data signal
A57	VD9	I/O	IC 18*	Data signal
A58	VD10	I/O	IC 18*	Data signal
A59	VD12	I/O	IC 18*	Data signal
A60	VD11	I/O	IC 18*	Data signal
A61	+VB	Out	Rechargeable battery	Logic drive voltage
A62	VD13	I/O	IC 18*	Data signal
A63	VD14	I/O	IC 18*	Data signal
A63	VD15	I/O	IC 18*	Data signal
A65	N.C.	---	---	Not connected
A66	N.C.	---	---	Not connected
A67	N.C.	---	---	Not connected
A68	N.C.	---	---	Not connected
A69	N.C.	---	---	Not connected
A70	N.C.	---	---	Not connected
A71	N.C.	---	---	Not connected
A72	DGND	---	---	Ground

*IC 18: System controller (gate array)

(LASER CLASS 9000/9500 only)
The J1 connector on the SCNT board has two rows A and B and has a total of 144 pins. Since rows A and B have a similar pin layout, only different pins are shown below:
B34 :-RAS2 B44 :-RAS1

SCNT board

J3 (to contact sensor)

Pin No.	Signal	In/Out	Source	Description
1	VOUT	In	Contact sensor	Analog image data
2	AGND5	---	---	Ground
3	+5R	Out	Power supply unit	Logic drive voltage
4	VREF	In	Contact sensor	Image signal reference voltage
5	DGND	---	---	Ground
6	SP	Out	IC 20 (UHQ-6.6)	Image scan start signal
7	DGND	---	---	Ground
8	MACLK	Out	IC 20 (UHQ-6.6)	Contact sensor drive clock
9	-LEDON	Out	IC 20 (UHQ-6.6)	LED drive control
10	+24V	Out	Power supply unit	Driver IC drive

J4 (to document feed motor)

Pin No.	Signal	In/Out	Source	Description
1	PHA	Out	IC 18*	Phase A
2	PHXA	Out	IC 18*	Phase -A
3	PHB	Out	IC 18*	Phase B
4	PHXB	Out	IC 18*	Phase -B

J5 (to OPCNT board)

Pin No.	Signal	In/Out	Source	Description
1	+5V	Out	Power supply unit	Logic drive voltage
2	SENPW	---	---	Not connected
3	ESSLED	Out	IC 18*	ESS LED drive signal
4	-ESSKEY	In	ESS key	ESS key input signal
5	PRTCT	In	OPCNT (IC 1)	Memory protection cancel signal
6	PNLRX	In	OPCNT (IC 1)	Serial reception data**
7	DGND	---	---	Ground
8	PNLCLK	Out	IC 18*	OPCNT drive clock
9	DGND	---	---	Ground
10	PNLTX	Out	IC 18*	Serial transmission data**
11	-ALLRST	Out	IC 19 (CMOS logic)	System reset signal
12	DS	In	Document Sensor	DS detect signal (H: no L: yes)
13	DES	In	Document End Sensor	DES detect signal (H: no L: yes)
14	N.C.	---	---	Not connected

* IC 18: System controller (gate array)

** Data for LEDs, display, buttons, and sensors.

SCNT board

J6 (to power supply)

Pin No.	Signal	In/Out	Source	Description
1	+21V	In	Power supply unit	Logic drive voltage
2	GND21	---	---	Ground
3	GND21	---	---	Ground
4	+23V	In	Power supply unit	Driver IC drive voltage
5	GND23	---	---	Ground
6	GND23	---	---	Ground
7	+5V	In	Power supply unit	Logic drive voltage
8	+5V	In	Power supply unit	Logic drive voltage
9	DGND	---	---	Ground
10	DGND	---	---	Ground
11	PWCTL	Out	IC 18	Main voltage control signal

J7 (to PCNT board)

Pin No.	Signal	In/Out	Source	Description
A1	PGND	---	---	Ground
A2	-PPRDY	---	---	Not used
A3	-TOP	In	PCNT (IC 301)	Vertical sync signal
A4	-STS	In	PCNT (IC 301)	Status signal
A5	-CBSY	Out	IC 18*	Command busy signal
A6	-CLKCTL	Out	IC 18*	ESS control signal
A7	-VDO	Out	IC 18*	Video signal
A8	-CCLK	Out	IC 18*	Controller clock signal
A9	-PRESS	Out	IC 18*	ESS printer reset control signal
A10	PGND	---	---	Ground
B1	-BD	In	PCNT (IC 301)	Horizontal sync signal
B2	-RDY	In	PCNT (IC 301)	Ready signal
B3	-SBSY	In	PCNT (IC 301)	Status busy signal
B4	-PCLK	---	---	Not used
B5	-PRNT	Out	IC 18*	Print signal
B6	-CPRDY	Out	IC 18*	Controller power ready signal
B7	-CMD	Out	IC 18*	Command signal
B8	-MODRST	Out	IC 18*	ESS system reset signal
B9	P5V	Out	Power supply unit	Logic drive voltage
B10	P5V	Out	Power supply unit	Logic drive voltage

*IC 18: System controller (gate array)

SCNT board

J9 (to NCU board)

Pin No.	Signal	In/Out	Source	Description
1	+23V	Out	Power supply unit	Offhook detection power supply
2	GND23	---	---	Ground
3	DGND	---	---	Ground
4	+5V	Out	Power supply unit	Logic drive voltage
5	DCD	Out	IC 20 (UHQ-6.6)	DC relay control signal
6	N.C.	---	---	Not connected
7	HRD	Out	IC 20 (UHQ-6.6)	H relay drive signal
8	CMLD	Out	IC 20 (UHQ-6.6)	CNL relay drive signal
9	SRD	Out	IC 20 (UHQ-6.6)	S relay drive signal
10	PRD	Out	IC 20 (UHQ-6.6)	P relay drive signal
11	DC	---	---	Not used
12	NORG	---	---	Not used
13	C2	---	---	Not used
14	C1	---	---	Not used
15	AST	---	---	Not used
16	CIST2	---	---	Not used
17	CIST1	---	---	Not used
18	NZ	---	---	Not used
19	RKEY	---	---	Not used
20	-HOOK	In	NCU boad (IC 2)	Off hook detection signal
21	-CI	In	NCU boad (IC 2)	CI detection signal
22	OUT	In	NCU board	ESS cancel signal (offhook)
23	N.C.	---	---	Not connected
24	+5V	Out	Power supply unit	Logic drive voltage
25	DGND	---	---	Ground
26	ANOUT		NCU board (IC 1)	CNG detection signal
27	DGND	---	---	Ground
28	+5V	Out	Power supply unit	Logic drive voltage
29	LINE	In	Telephone line	Signal received from telephone line
30	GND21	---	---	Ground

J10 (to speaker)

Pin No.	Signal	In/Out	Source	Description
1	SPKOH	Out	IC 28 (Audio AMP)	Speaker drive
2	SPKOL	Out	IC 28 (Audio AMP)	Speaker drive

SCNT board

J11 (to pre-feed solenoid)

Pin No.	Signal	In/Out	Source	Description
1	+23V	Out	Power supply unit	Solenoid drive voltage
2	-ADFSL	Out	IC 20 (UHQ-6.6)	Solenoid drive control signal
3	N.C.	---	---	Not connected

J12 (to Document Width Sensor)

Pin No.	Signal	In/Out	Source	Description
1	DGND	---	---	Ground
2	DWS	In	Document Width Sensor	Document width detection signal (H: no, L: yes)

6.2.2 NCU board

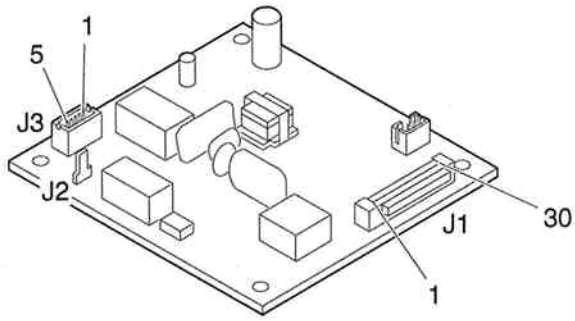


Figure 4-29 NCU Board

NCU board

J1 (to SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	GND21	---	---	Ground
2	LINE	Out	Telephone line	Signal received from telephone line
3	+5V		Power supply unit	Logic drive voltage
4	DGND	---	---	Ground
5	ANOUT	Out	IC 1 (OPAMP)	CNG detection signal
6	DGND	---	---	Ground
7	+5V	Out	Power supply unit	Logic drive voltage
8	N.C.	---	---	Not connected
9	OUT	Out	IC 2 (Photo MOS relay)	Off hook detection signal
10	-CI	Out	Telephone line	CI detection signal
11	-HOOK	Out	IC 2 (Photo MOS relay)	Off hook detection signal
12	RKEY	---	---	Not used
13	NZ	---	---	Not used
14	CIST1	---	---	Not used
15	CIST2	---	---	Not used
16	AST	---	---	Not used
17	C1	---	---	Not used
18	C2	---	---	Not used
19	NORG	---	---	Not used
20	DC	---	---	Not used
21	PRD	Out	SCNT (IC 20)	P relay control signal
22	SRD	Out	SCNT (IC 20)	S relay control signal
23	CMLD	Out	SCNT (IC 20)	CML relay control signal
24	HRD	Out	SCNT (IC 20)	H relay control signal
25	N.C.	---	---	Not connected
26	DCD	In	SCNT (IC 20)	DC relay control signal
27	+5V	Out	Power supply unit	Logic drive voltage
28	DGND	---	---	Ground
29	GND23	---	---	Ground
30	+23V	Out	Power supply unit	Off hook detection power supply

J2 (to FG)

Pin No.	Signal	In/Out	Source	Description
1	ARG	---	---	Ground

NCU board

J3 (to line)

Pin No.	Signal	In/Out	Source	Description
1	T1	---	---	Line for extension telephone or handset (an option)
2	T2	---	---	Line for extension telephone or handset (an option)
3	N.C.	---	---	Not connected
4	L1	---	---	Telephone line
5	L2	---	---	Telephone line

J4 (Not used)

J5 (Not used)

6.2.3 OPCNT board

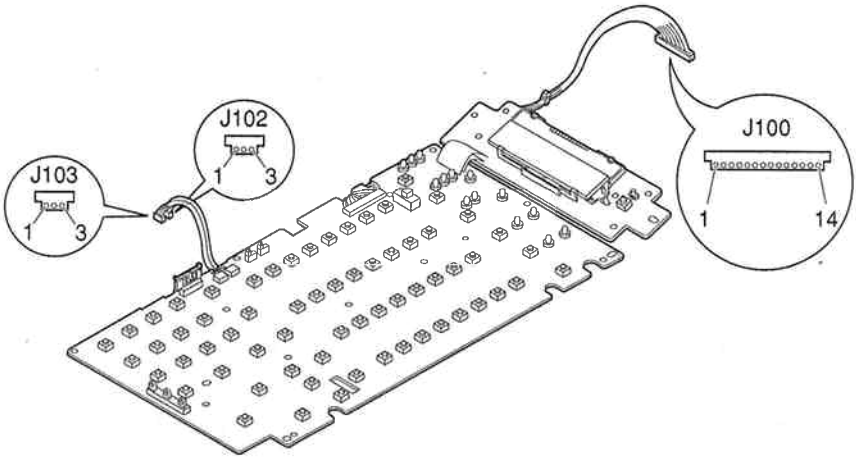


Figure 4-30 OPCNT Board

J100 (to SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	N.C.	---	---	Not connected.
2	DES	Out	Document Edge Sensor	Document edge detection signal (H: no; L: yes)
3	DS	Out	Document Sensor	Document detection signal (H: no; L: yes)
4	-CLR	In	SCNT (IC 19)	System reset signal
5	RXD	In	IC 1 (ASIC)	Serial transmission data
6	GND	---	---	Ground
7	DCK	In	SCNT (IC 18)	OPCNT drive clock
8	DGND	---	---	Ground
9	TXD	In	SCNT (IC 18)	Serial reception data
10	MPRT	Out	IC 1 (ASIC)	SRAM (data registration area) memory protection cancel signal
11	-ESSON	Out	ESS key	ESS button input signal
12	ESSLED	In	SCNT (IC 18)	ESS LED drive signal
13	N.C.	---	---	Not connected
14	+5 V	In	Power supply unit	Logic drive voltage

J104 (to Document Sensor)

Pin No.	Signal	In/Out	Source	Description
1	LED	Out	Power supply unit	DS drive voltage (+5V)
2	GND	---	---	Ground
3	DS	In	Document Sensor	Document detection signal (H: no; L: yes)

J105 (to Document Edge Sensor)

Pin No.	Signal	In/Out	Source	Description
1	LED	Out	Power supply unit	DES drive voltage (+5V)
2	GND	---	---	Ground
3	DES	In	Document Edge Sensor	Document edge detection signal (H: no; L: yes)

6.2.4 Power supply unit

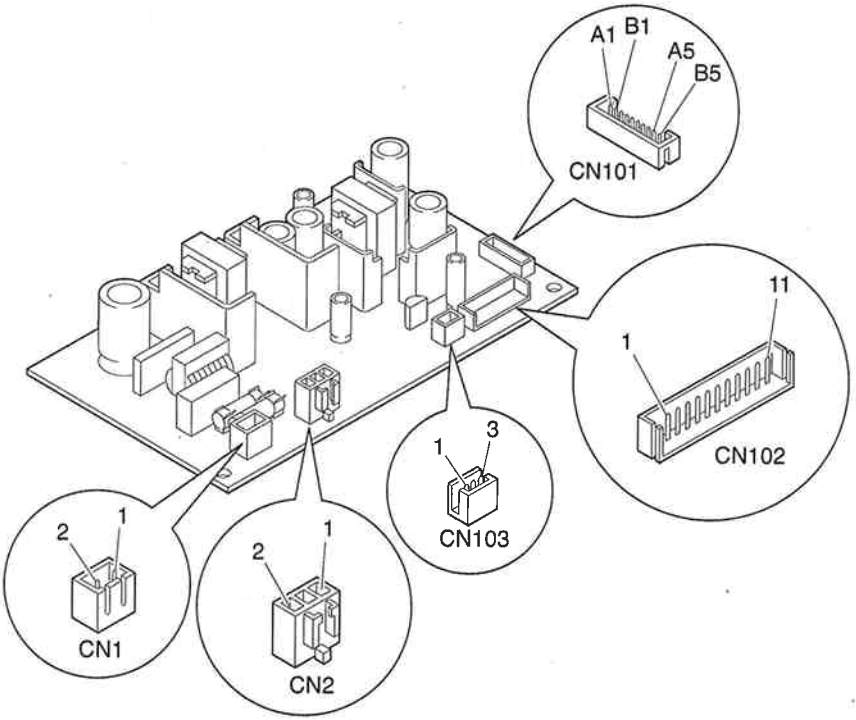


Figure 4-31 Power Supply Unit

CN1 (to inlet connector)

Pin No.	Signal	In/Out	Source	Description
1	HOT	In	Inlet	120V household current
2	---	---	---	Not connected
3	COLD	---	---	Ground

CN2 (to PCNT board)

Pin No.	Signal	In/Out	Source	Description
1	AC-H	Out	Outlet	120V household current
2	AC-N	Out	Outlet	120V household current

CN101 (to paper sensor board)

Pin No.	Signal	In/Out	Source	Description
A1	+20VBS	In	Power supply unit	Fixing ass'y drive voltage
B1	+20VBS	In	Power supply unit	Scanner unit drive voltage
A2	GND20	---	---	Ground
B2	GND20	---	---	Ground
A3	+5V	In	Power supply unit	Logic drive voltage
B3	+5V	In	Power supply unit	Logic drive voltage
A4	GND5	---	---	Ground
B4	GND5	---	---	Ground
A5	FANON	Out	PCNT (IC 301)	Fan motor drive signal
B5	FANTAC	In	Fan motor	Fan motor clock detect signal

CN102 (to SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	+21V	Out	Power supply unit	Power supply for analog processing for operational amplifier, etc.
2	GND21	---	---	Ground
3	GND21	---	---	Ground
4	+23V	Out	Power supply unit	Power supply for driving motors and relays
5	GND23	---	---	Ground
6	GND23	---	---	Ground
7	+5	Out	Power supply unit	Logic drive voltage
8	+5	Out	Power supply unit	Logic drive voltage
9	DGND	---	---	Ground
10	DGND	---	---	Ground
11	PWCTL	In	SCNT (IC 18)	Main voltage control signal

CN103 (to fan)

Pin No.	Signal	In/Out	Source	Description
1	FANON	Out	PCNT (IC 301)	Fan motor drive signal
2	FANTAC	In	Fan motor	Fan motor clock detect signal
3	GND20	---	---	Ground

6.2.5 Modular board

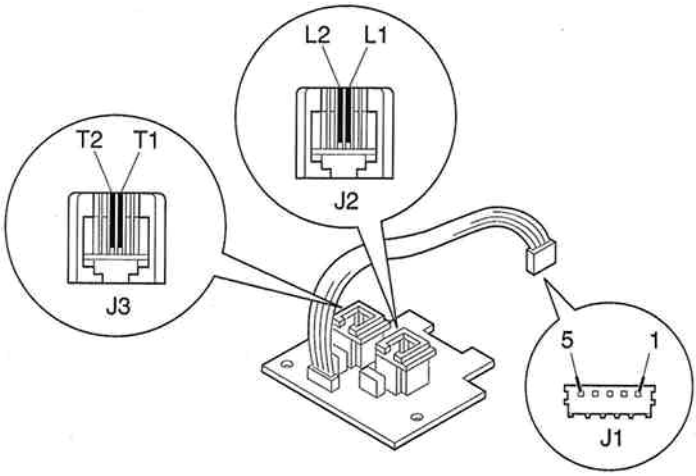


Figure 4-32 Modular Board

J1 (to NCU board)

Pin No.	Signal	In/Out	Source	Description
1	L2	---	---	Telephone line
2	L1	---	---	Telephone line
3	N.C.	---	---	Ground
4	T2	---	---	Line for extension telephone or handset (an option)
5	T1	---	---	Line for extension telephone or handset (an option)

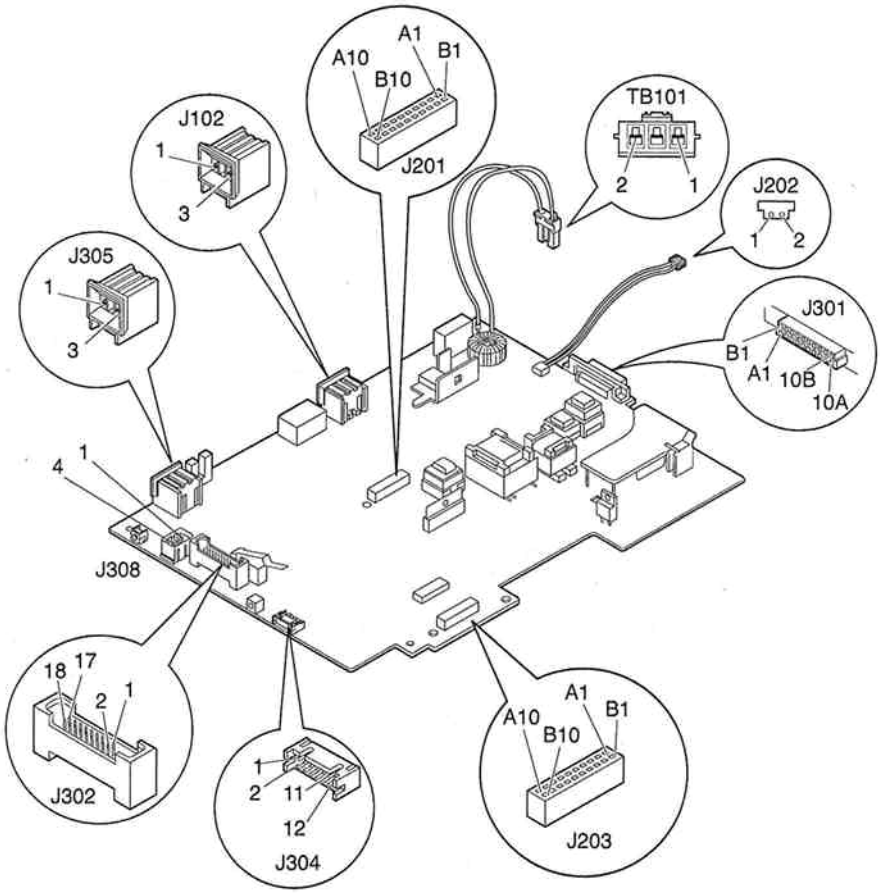
J2 (to line)

Pin No.	Signal	In/Out	Source	Description
1	L1	---	---	Telephone line
2	L2	---	---	Telephone line

J3 (to extention telephone or handset)

Pin No.	Signal	In/Out	Source	Description
1	T1	---	---	Line for extension telephone or handset (an option)
2	T2	---	---	Line for extension telephone or handset (an option)

6.2.6 PCNT board



☞ See page 5-59

Figure 4-33 PCNT Board

PCNT board

J102 (to fixing ass'y)

Pin No.	Signal	In/Out	Source	Description
1	AC-L	Out	Outlet	AC 120V household current
2	AC-N	Out	Outlet	AC 120V household current

J201 (to paper sensor board)

Pin No.	Signal	In/Out	Source	Description
A1	+20VBS	In	Power supply unit	Scanner motor drive voltage
A2	+20VBS	In	Power supply unit	Side casette pickup roller controll solenoid drive voltage
A3	GND	---	---	Ground
A4	+20VAS	In	Power supply unit	Front cassette motor (upper) drive
A5	FANON2	Out	IC 301 (CPU)	Fan motor drive signal
A6	FANTAC2	In	Fan motor	Fan motor clock detection signal
A7	-MPSNS	In	Side casette paper sensor (upper)	Side casette paper detection signal
A8	USIZE	In	Front cassette paper size sensor (upper)	Front cassette paper size (upper) detection signal
A9	LSIZE	In	Front cassette paper size sensor (lower)	Front cassette paper size (lower) detection signal
A10	–LPSNS	In	Front cassette paper sensor (lower)	Front cassette paper (lower) detection signal
B1	GNS20	---	---	Ground
B2	GND20	---	---	Ground
B3	+5V	In	Power supply unit	Logic drive voltage
B4	-OMTRST	Out	IC 301 (MPU)	Paper feed motor (lower) control signal
B5	UCPUD	Out	IC 301 (MPU)	Feeder section pickup solenoid (upper) control signal
B6	LCPUD	Out	IC 301 (MPU)	Feeder section pickup solenoid (lower) control signal
B7	UCVSNS	In	Feeder cover sensor (upper)	Feeder right cover (upper) open/ close detection
B8	LCVSNS	In	Feeder cover sensor (lower)	Feeder right cover sensor (lower) detection signal
B9	MSIZE	In	Side casette paper size sensor	Side casette paper size detection signal

PCNT board

Pin No.	Signal	In/Out	Source	Description
B10	-UPSNS	In	Front cassette paper sensor (upper)	Front cassette paper (upper) detection signal

J202 (to paper eject cover sensor)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	FCVSNS	In	Paper eject cover sensor	Paper eject cover open/close detection signal

J203 (to connector board)

Pin No.	Signal	In/Out	Source	Description
A1	GND5	---	---	Ground
A2	MCVSNS	In	Right cover sensor	Right cover open/close detection signal
A3	-PISNS	In	Paper pickup sensor	Paper pickup detection signal
A4	GND5	---	---	Ground
A5	+5V	Out	Power supply unit	Paper pickup sensor drive voltage
A6	+20VBS	Out	Power supply unit	Side casette paper pickup solenoid drive voltage
A7	MCPUD	Out	IC 301 (MPU)	Side casette paper pickup roller controll solenoid drive signal
A8	+5V	Out	Power supply unit	Paper pickup sensor drive voltage
A9	TNSNS	In	Tonner sensor	Remaining tonner detection signal
A10	GND5	---	---	Ground
B1	GND5	---	---	Ground
B2	MCVSNS	In	Right cover sensor	Right cover open/close detection signal
B3	-PISNS	In	Paper pickup sensor	Paper pickup detection signal
B4	GND5	---	---	Ground
B5	+5V	Out	Power supply unit	Tonner sensor drive voltage
B6	+20VBS	Out	Power supply	Side casette paper pickup roller controll solenoid drive voltage
B7	MCPUD	Out	IC 301 (MPU)	Side casette paper pickup roller controll solenoid drive signal
B8	+5V	Out	Power supply unit	Tonner sensor drive voltage
B9	TNSNS	In	Tonner sensor	Remaining tonner detection signal
B10	GND5	---	---	Ground

PCNT board

J301(to SCNT board)

Pin No.	Signal	In/Out	Source	Description
A1	GND	---	---	Ground
A2	-PPRDY	---	---	Not used
A3	-TOP	Out	IC 301 (CPU)	Vertical sync signal
A4	-STB	Out	IC 301 (CPU)	Status signal
A5	-CBSY	In	SCNT (IC 18)	Command busy signal
A6	-CLKCTL	In	SCNT (IC 18)	Controller clock signal
A7	-VDO	In	SCNT (IC 18)	Video signal
A8	-CCLK	In	SCNT (IC 18)	Controller clock signal
A9	-PRESS	In	SCNT (IC 18)	ESS printer reset control signal
A10	GND	---	---	Ground
B1	-BD	Out	IC 301 (MPU)	Horizontal sync signal
B2	-RDY	Out	IC 301 (MPU)	Ready signal
B3	-SBSY	Out	IC 301 (MPU)	Status busy signal
B4	N.C.	---	---	Not connected
B5	-PRNT	In	SCNT (IC 18)	Print signal
B6	-CPRDY	In	SCNT (IC 18)	Controller power ready signal
B7	-CMD	In	SCNT (IC 18)	Command signal
B8	-MODRST	In	SCNT (IC 18)	System reset signal
B9	+5V	In	Power supply unit	Logic drive voltage
B10	+5V	In	Power supply unit	Logic drive voltage

TB101 (to power supply unit)

Pin No.	Signal	In/Out	Source	Description
1	ACH	In	Power supply unit	120V household current
2	ACN	In	Power supply unit	120V household current

PCNT board

J302 (to scanner unit)

Pin No.	Signal	In/Out	Source	Description
1	GND20	---	---	Ground
2	GND20	---	---	Ground
3	SCNCLK	Out	IC 301 (MPU)	Scanner reference clock signal
4	GND20	---	---	Ground
5	+20VBS	Out	Power supply unit	Scanner motor drive voltage
6	GND20	---	---	Ground
7	SCNTAC	IN	Scanner unit	Scanner rotation rate monitor signal
8	+5V	Out	Power supply unit	Logic drive voltage
9	-SCNON	Out	IC 301 (MPU)	Scanner motor drive signal
10	-BDI	IN	Scanner unit	Horizontal sync signal
11	GND5	---	---	Ground
12	GND5	---	---	Ground
13	GND5	---	---	Ground
14	-LSREN	Out	IC 301 (MPU)	Laser enable signal
15	GND5	---	---	Ground
16	-VOUT	Out	IC 301 (MPU)	Laser drive controlsignal
17	+5V	Out	Power supply unit	Logic drive voltage
18	APCSH	Out	IC 301 (MPU)	APC sample hold signal

J305 (to fixing ass'y - thermistor-)

Pin No.	Signal	In/Out	Source	Description
1	FSRTHR	In	IC 301 (MPU)	FIxing motor monitor (thermister) detection signal
2	N.C.	---	---	Not connected
3	GND	---	---	Ground

J308 (to main motor ass'y)

Pin No.	Signal	In/Out	Source	Description
1	GND20	---	---	Ground
2	+20VAS	Out	Power supply unit	Main motor drive voltage
3	-MTRST	Out	IC 301 (MPU)	Main motor drive signal
4	N.C.	---	---	Not connected

6.2.7 Connector board

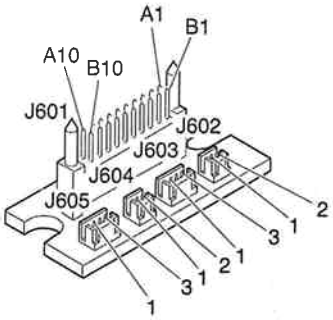


Figure 4-34 Connector Board

J601 (to PCNT board)

Pin No.	Signal	In/Out	Source	Description
A1	GND5	---	---	Ground
A2	MCVSNS	Out	Right cover sensor	Cartridge cover open/close detection signal
A3	-PISNS	Out	Paper pickup sensor	Paper pickup detection signal
A4	GND5	---	---	Ground
A5	+5V	In	Power supply unit	Paper pickup sensor drive voltage
A6	+20VBS	In	Power supply unit	Side casette paper pickup solenoid drive voltage
A7	MCPUD	Out	PCNT (IC 301)	Side casette paper pickup roller controll solenoid drive signal
A8	+5V	In	Power supply unit	Paper pickup sensor drive voltage
A9	TNSNS	Out	Tonner sensor	Remaining tonner detection signal
A10	GND5	---	---	Ground
B1	GND5	---	---	Ground
B2	MCVSNS	Out	Right cover sensor	Cartridge cover open/close detection signal
B3	-PISNS	Out	Paper pickup sensor	Paper pickup detection signal
B4	GND5	---	---	Ground
B5	+5V	In	Power supply unit	Tonner sensor drive voltage
B6	+20VBS	In	Power supply unit	Side casette paper pickup roller controll solenoid drive voltage
B7	MCPUD	In	PCNT (IC 301)	Side casette paper pickup roller controll solenoid drive signal

Connector board

Pin No.	Signal	In/Out	Source	Description
B8	+5V	In	Power supply unit	Tonner sensor drive voltage
B9	TNSNS	Out	Tonner sensor	Remaining tonner detection signal
B10	GND5	---	---	Ground

J602 (to right cover sensor)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	MCVSNS	In	Cartridge cover sensor	Right cover open/close ditection signal

J603 (to paper pickup sensor)

Pin No.	Signal	In/Out	Source	Description
1	-PISNS	In	Paper pickup sensor	Paper pickup detection signal
2	GND5	---	---	Ground
3	+5V	Out	Power supply unit	Paper pickup sensor drive voltage

J604 (to paper pickup solenoid)

Pin No.	Signal	In/Out	Source	Description
1	+20VBS	Out	Power supply unit	Side casette paper pickup roller control solenoid drive voltage
2	MCPUD	In	PCNT (IC 301)	Side casette paper pickup roller control solenoid drive signal

J605 (to tonner sensor)

Pin No.	Signal	In/Out	Source	Description
1	+5V	Out	Power supply unit	Tonner sensor drive voltage
2	TNSNS	In	Tonner sensor	Remaining tonner detection signal
3	GND5	---	---	Ground

6.2.8 Paper sensor board

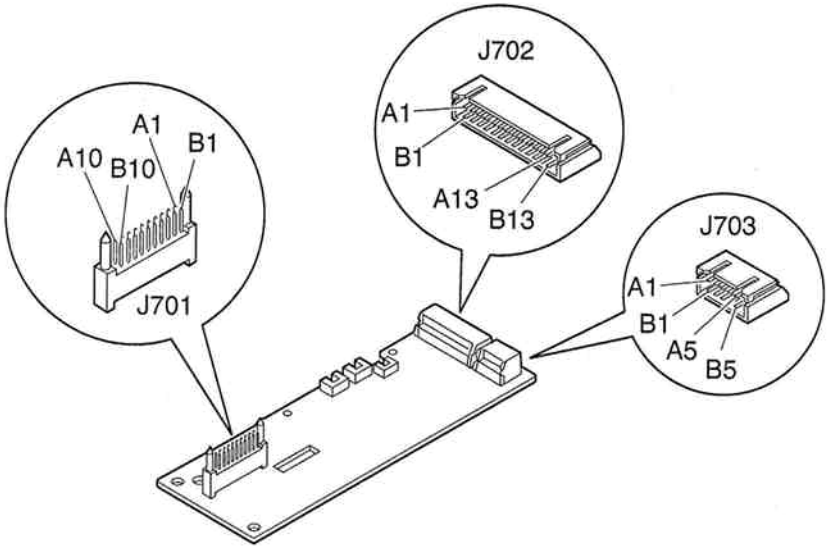


Figure 4-35 Paper Sensor Board

J701 (to PCNT board)

Pin No.	Signal	In/Out	Source	Description
A1	+20VBS	Out	Power supply unit	Scanner motor drive voltage
A2	+20VBS	Out	Power supply unit	Side casette pickup roller drive voltage
A3	GND	---	---	Ground
A4	+20VAS	Out	Power supply unit	Front casette motor (upper) drive voltage
A5	FANON	In	PCNT (IC 301)	Fan drive signal
A6	FANTAC	Out	Fan motor	Fan motor clock detection signal
A7	-MPSNS	Out	Side casette paper sensor	Side casette paper detection signal
A8	USIZE	Out	Front cassette paper size sensor (upper)	Front cassette paper size (upper) detection signal
A9	LSIZE	Out	Front cassette paper size sensor (lower)	Front cassette paper size (lower) detection signal
A10	–LPSNS	Out	Front cassette paper sensor (lower)	Front cassette paper (lower) detection signal
B1	GNS20	---	---	Ground
B2	GND20	---	---	Ground
B3	+5V	Out	Power supply unit	Logic drive
B4	-OMTRST	In	PCNT (IC 301)	Paper feed motor (lower) control signal
B5	UCPUD	In	PCNT (IC 301)	Feeder section pickup solenoid (upper) control signal
B6	LCPUD	In	PCNT (IC 301)	Feeder section pickup solenoid (lower) control signal
B7	UCVSNS	Out	Feeder right cover sensor (upper)	Feeder right cover (upper) open/ close detection
B8	LCVSNS	Out	Feeder right cover sensor (lower)	Feeder right cover (lower) open/ close detection signal
B9	MSIZE	Out	Side cassette paper size sensor	Side cassette paper size detection signal
B10	-UPSNS	Out	Front cassette paper sensor (upper)	Front cassette paper (upper) detection signal

Paper sensor board

J702 (to front casette) (upper)

Pin No.	Signal	In/Out	Source	Description
A1	GND	---	---	Ground
A2	UCVSNS	In	Feeder right cover sensor (upper)	Feeder right cover (upper) open/ close detection signal
A3	GND	---	---	Ground
A4	USIZE1	In	Front cassette paper size sensor (upper)	Front cassette paper size (upper) detection signal
A5	GND	---	---	Ground
A6	USIZE2	In	Front cassette paper size sensor (upper)	Front cassette paper size (upper) detection signal
A7	UCPUD	In	PCNT (IC 301)	Feeder section pickup solenoid (upper) control signal
A8	+20VAS	Out	Power supply unit	Feeder section pickup solenoid (upper) drive voltage
A9	-UPSNS	In	Front cassette paper sensor (upper)	Front cassette paper (upper) detection signal
A10	GND	---	---	Ground
A11	+5V	Out	Power supply unit	Front casette paper (upper) sensor drive voltage
A12	N.C.	---	---	Not connected
A13	GND	---	---	Ground
B1	GND	---	---	Ground
B2	LCVSNS	In	Feeder right cover sensor (lower)	Feeder right cover (lower) open/ close detection signal
B3	GND	---	---	Ground
B4	LSIZE1	In	Front cassette paper size sensor (lower)	Front cassette paper size (lower) detection signal
B5	GND	---	---	Ground
B6	LSIZE2	In	Front cassette paper size sensor (lower)	Front cassette paper size (lower) detection signal
B7	LCPUD	Out	PCNT (IC 301)	Feeder section pickup solenoid (lower) control signal
B8	+20VAS	Out	Power supply unit	Feeder section pickup solenoid (lower) drive
B9	-LPSNS	In	Front cassette paper sensor (lower)	Front cassette paper (lower) detection signal

Paper sensor board

Pin No.	Signal	In/Out	Source	Description
B10	GND	---	---	Ground
B11	+5V		Power supply unit	Logic drive voltage
B12	+20VAS	Out	Power supply unit	Front cassette motor (lower) drive voltage
B13	-OMTRST	Out	PCNT (IC 301)	Paper feed motor (lower) control signal

J703 (to power supply unit)

Pin No.	Signal	In/Out	Source	Description
A1	+20VBS	In	Power supply unit	Fixing ass'y drive voltage
A2	GND20	---	---	Ground
A3	+5V	In	Power supply unit	Logic drive voltage
A4	GND	---	---	Ground
A5	FANON	Out	PCNT (IC 301)	Fan motor drive signal
B1	+20VBS	In	Power supply unit	Scanner unit drive voltage
B2	GND20	---	---	Ground
B3	+5V	In	Power supply unit	Logic drive voltage
B4	GND5	---	---	Ground
B5	FANTAC	In	Fan motor	Fan motor clock detect signal

6.2.9 Contact sensor

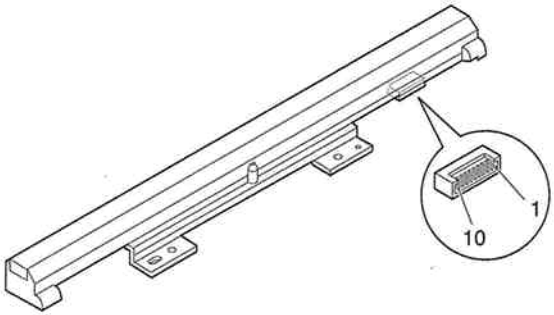


Figure 4-36 Contact Sensor

J3 (SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	VOUT	Out	Contact sensor	Analog image data
2	AGND5	---	---	Ground
3	+5R	In	Power supply unit	Logic drive voltage
4	VREF	Out	Contact sensor	Image signal reference voltage
5	DGND	---	---	Ground
6	SP	In	SCNT (IC 20)	Image scan start signal
7	DGND	---	---	Ground
8	MACLK	In	SCNT (IC 20)	Contact sensor drive clock
9	-LEDON	In	SCNT (IC 20)	LED drive control signal
10	+24V	In	Power supply unit	Driver IC drive voltage

6.2.10 Document feed motor

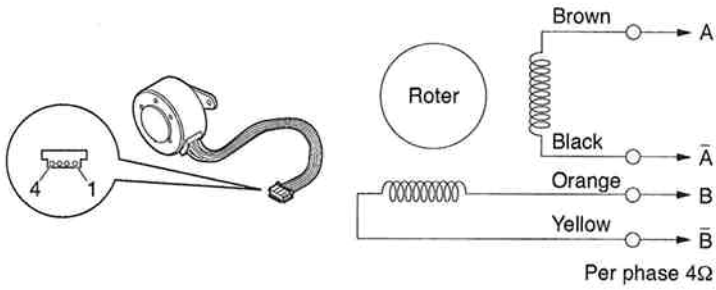


Figure 4-37 Document Feed Motor

J4 (SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	PHA	In	SCNT (IC 18)	Phase A
2	PHXA	In	SCNT (IC 18)	Phase -A
3	PHB	In	SCNT (IC 18)	Phase B
4	PHXB	In	SCNT (IC 18)	Phase -B

6.2.11 Speaker

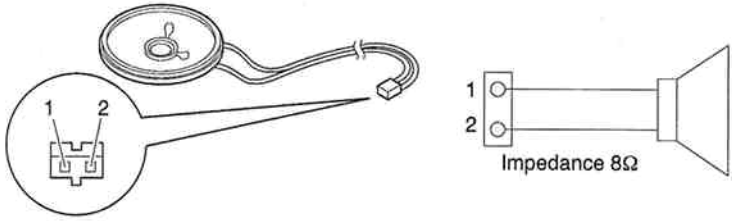


Figure 4-38 Speaker

J10 (SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	SPKOH	In	SCNT (IC 28)	Speaker drive
2	SPKOL	In	SCNT (IC 28)	Speaker drive

6.2.12 Pre-feed solenoid

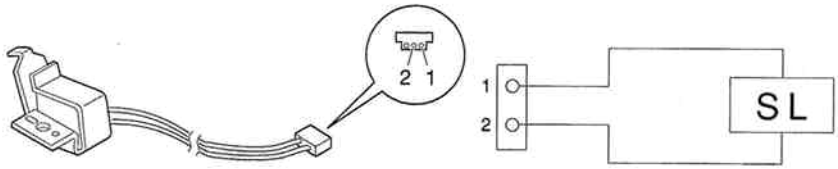


Figure 4-39 Pre-feed Solenoid

J11 (SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	+23V	In	Power supply unit	Pre-feed solenoid drive voltage
2	-ADFSL	In	SCNT (IC 20)	Pre-feed solenoid drive signal
3	N.C.	---	---	Not connected

6.2.13 Document width sensor (LASER CLASS 9000/9500 only)

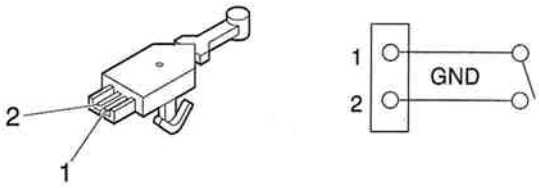


Figure 4-40 Document Width Sensor

J12 (SCNT board)

Pin No.	Signal	In/Out	Source	Description
1	DGND	---	---	Ground
2	DWS	Out	Document Width Sensor	DWS detection signal (H: A4, L: B4)

6.2.14 Document sensor/ Document edge sensor

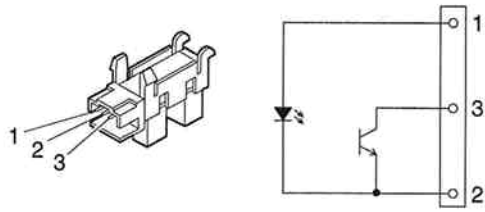


Figure 4-41 Document Sensor/ Document Edge Sensor

J104 (OPCNT board)

Pin No.	Signal	In/Out	Source	Description
1	LED	Out	Power supply unit	DS drive voltage
2	GND	---	---	Ground
3	DS	In	Document Sensor	Document detection signal (H: on; L: off)

J105 (OPCNT board)

Pin No.	Signal	In/Out	Source	Description
1	LED	Out	Power supply unit	DES drive voltage
2	GND	---	---	Ground
3	DES	Out	Document Edge Sensor	Document edge detection signal (H: on; L: off)

6.2.15 Fan

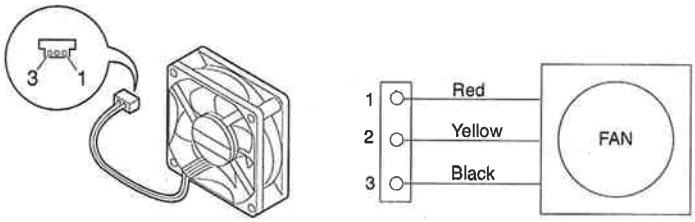


Figure 4-42 Fan

J2 (power supply unit)

Pin No.	Signal	In/Out	Source	Description
1	FANON	In	PCNT (IC 301)	Fan motor drive signal
2	FANTAC	Out	Fan motor	Fan motor clock detection signal
3	GND20	---	---	Ground

6.2.16 Paper eject cover sensor

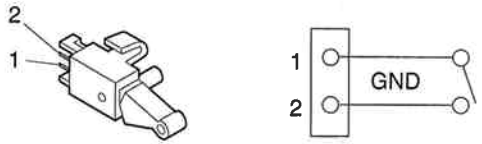


Figure 4-43 Paper Eject Cover Sensor

J202 (PCNT board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	FCVSNS	Out	Paper eject cover sensor	Paper eject cover sensor open/ close detection signal (H: open, L: close)

6.2.17 Fixing ass'y

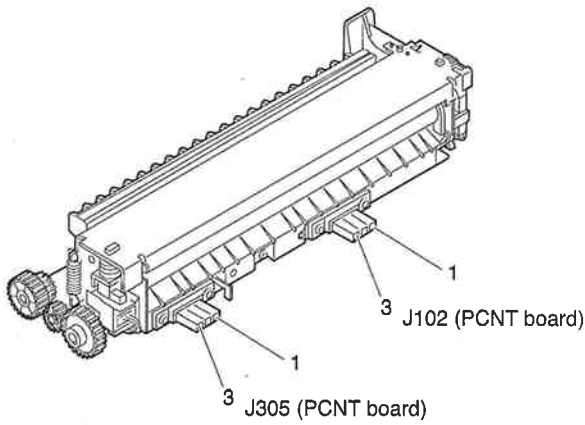


Figure 4-44 Fixing Ass'y

J102 (PCNT board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	AC-L	In	Outlet	AC 120V household current
3	AC-N	In	Outlet	AC 120V household current

J305 (PCNT board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	FSRTHER	Out	IC 301 (MPU)	Fixing motor monitor (thermister) detection signal
2	N.C.	---	---	Not connected
3	GND	---	---	Ground

6.2.18 Scanner unit

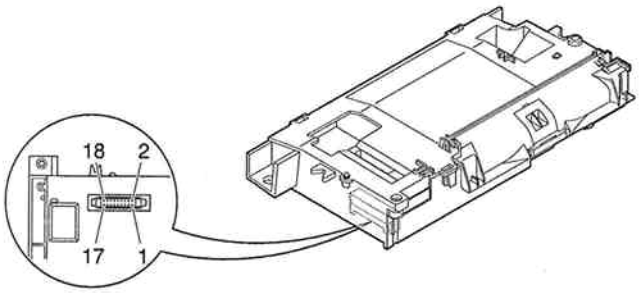


Figure 4-45 Scanner Unit

J302 (PCNT board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	GND20	---	---	Ground
2	GND20	---	---	Ground
3	SCNCLK	In	PCNT (IC 301)	Scanner reference clock signal
4	GND20	---	---	Ground
5	+20VBS	In	Power supply unit	Scanner motor drive voltage
6	GND20	---	---	Ground
7	SCNTAC	Out	Scanner unit	Scanner rotation rate monitor
8	+5V	In	Power supply unit	Logic drive voltage
9	-SCNON	In	PCNT (IC 301)	Scanner motor drive signal
10	-BDI	Out	Scanner unit	Horizontal sync signal
11	GND5	---	---	Ground
12	GND5	---	---	Ground
13	GND5	---	---	Ground
14	-LSREN	In	PCNT (IC 301)	Laser enable signal
15	GND5	---	---	Ground
16	-VOUT	In	PCNT (IC 301)	Laser drive controlsignal
17	+5V	In	Power supply	Logic drive voltage
18	APCSH	Out	PCNT (IC 301)	APC sample hold signal

6.2.19 Main motor ass'y

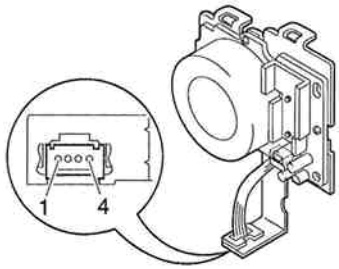


Figure 4-46 Main Motor Ass'y

J308 (PCNT board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	GND20	---	---	Ground
2	+20VAS	In	Power supply unit	Main motor drive voltage
3	-MTRST	In	PCNT (IC 301)	Main motor drive signal
4	N.C.	---	---	Not connected

6.2.20 Right cover sensor

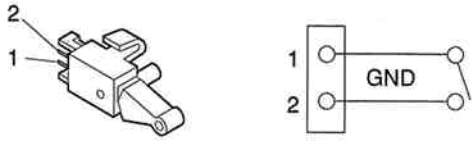


Figure 4-47 Right Cover Sensor

J602 (connector board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	MCVSNS	In	Right cover sensor	Right cover open/close detection signal (H: close, L: open)

6.2.21 Paper pickup sensor

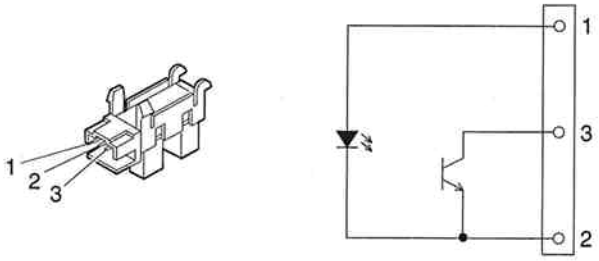


Figure 4-48 Paper Pickup Sensor

J603 (connector board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	-PISNS	Out	Paper pickup sensor	Paper pickup detection signal (H: paper, L: no paper)
2	GND5	---	---	Ground
3	+5V	In	Power supply unit	Paper pickup sensor drive voltage

6.2.22 Paper pickup solenoid

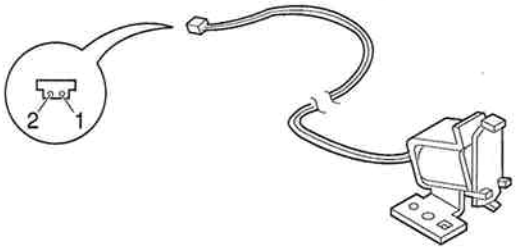


Figure 4-49 Paper Pickup Solenoid

J604 (connector board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	+20VBS	In	Power supply unit	Side cassette paper pickup roller control solenoid drive voltage
2	MCPUD	Out	PCNT IC 301	Side cassette paper pickup roller control solenoid drive signal

6.2.23 Tonner sensor

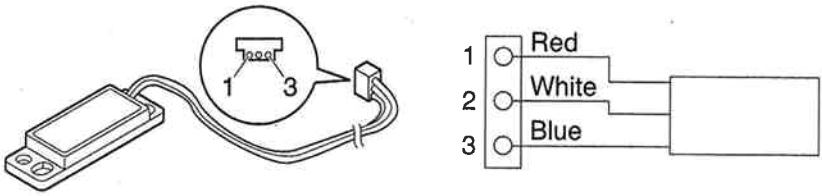


Figure 4-50 Toner Sensor

J605 (connector board ass'y)

Pin No.	Signal	In/Out	Source	Description
1	+5V	In	Power supply unit	Tonner sensor drive voltage
2	TNSNS	Out	Tonner sensor	Remainig tonner detection signal
3	GND5	---	---	Ground

6.2.24 Front cassette paper sensor (upper)

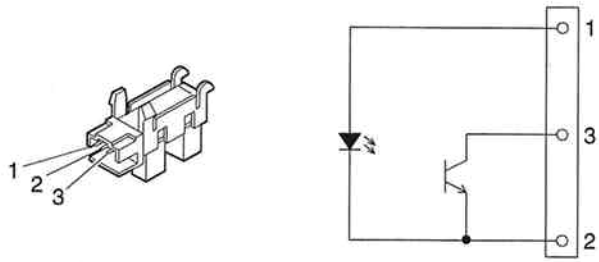


Figure 4-51 Front Cassette Paper Sensor (upper)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	-UPSNS	Out	Front cassette paper sensor	Front cassette paper (upper) detection signal (H: paper; L: no paper)
2	GND5	---	---	Ground
3	+5V	In	Power supply	Front cassette paper sensor drive voltage

6.2.25 Front cassette paper size sensor (A,B) (upper)

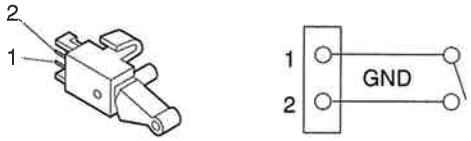


Figure 4-52 Front Cassette Paper Size Sensor (upper)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	USIZE (A,B)	Out	Front cassette paper size sensor	Front cassette paper size detection signal

NOTE

The front cassette paper size sensor (upper) uses the following signals:

	(A)	(B)
No feeder	OFF	OFF
A4	ON	OFF
LTR	OFF	ON
No cassette	ON	ON

6.2.26 Feeder right cover sensor (upper)

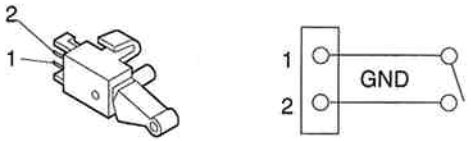


Figure 4-53 Feeder Right Cover Sensor (upper)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	UCVSNS	Out	Feeder cover sensor (upper)	Feeder right cover (upper) open/close detection signal (H: close; L: open)

6.2.27 Feeder section pickup solenoid (upper)

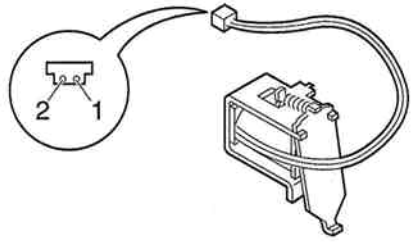


Figure 4-54 Feeder Section Pickup Solenoid (upper)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	UCPUD	Out	PCNT (IC 301)	Feeder section pickup solenoid (upper) control signal
2	+20VAS	In	Power supply unit	Feeder section pickup solenoid (upper) drive voltage

Chapter 5

Appendices

Appendices

1. INSTALLATION

Here is the procedure for installing this fax.

Contents

NOTE

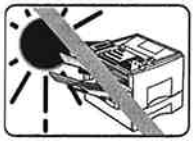
This installation section is the same as in the Instruction Book, so its layout differs from other pages.

1.1 Setting up the fax

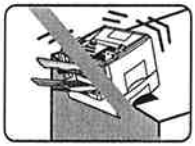
C CAUTIONS SHOW YOU HOW TO AVOID CONDITIONS OR INCORRECT OPERATIONS THAT COULD CAUSE DAMAGE TO YOUR HARDWARE OR SOFTWARE OR CAUSE PERSONAL INJURY.

This icon denotes feeding a document.

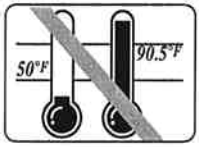
Where to Set up the Fax



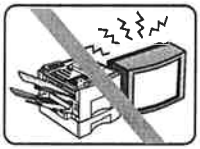
- Avoid direct sunlight. If you have to place the fax near a window, install heavy curtains or blinds to protect the fax from direct sunlight.



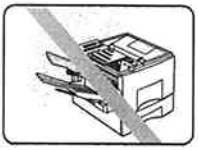
- Choose a flat, stable surface free of vibration .



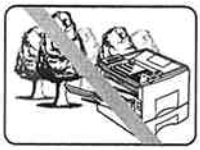
- Avoid a location subject to extreme temperature fluctuation. Use in a location within a temperature range of 50°F to 90.5°F (10°C to 32.5°C).



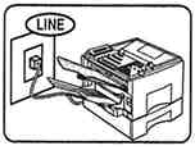
- Do not set up the fax near a television, radio, or heavy equipment like copy machines, air conditioners, computers, or large printers that can generate strong electromagnetic fields. Large equipment can generate electronic noise that can interfere with the operation of the fax.



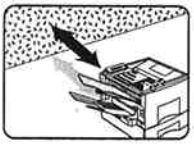
- Choose a location that is clean and free from dust and moisture.



- Do not use or store the fax outdoors.



- Place the fax unit near a telephone line. You must have an RJ11-C wall jack installed. If you need assistance, contact your authorized Canon dealer or service representative, or your local telephone company.



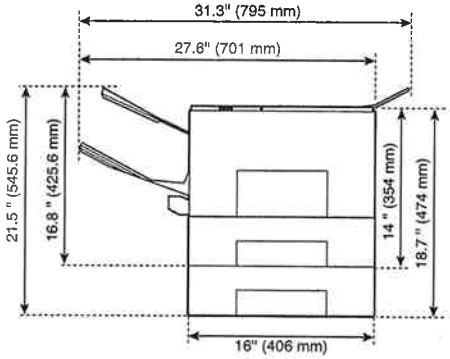
- To avoid damage to the fax unit from overheating, do not block the exhaust vent. Install the fax unit approximately 4 in. (10 cm) away from walls or other equipment.

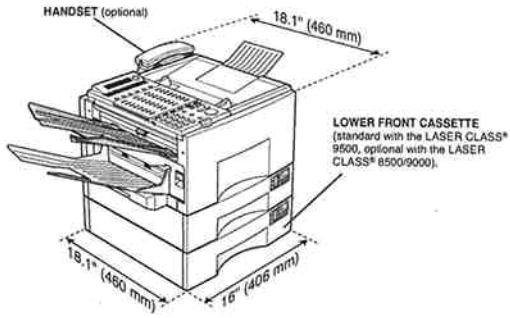
Space Around the Fax

To ensure proper ventilation and easy operation, set up the fax in an area that meets the minimum requirements for clearance as illustrated below.

C

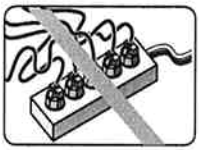
TO AVOID DAMAGE TO THE FAX UNIT FROM OVERHEATING, DO NOT BLOCK THE EXHAUST VENT. INSTALL THE FAX UNIT APPROXIMATELY 4 IN. (10CM) AWAY FROM WALL OR OTHER EQUIPMENT.



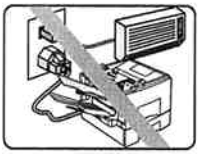


Power Requirements

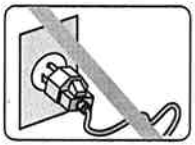
- Place the fax near a standard 120 V AC power outlet. This fax unit is intended for domestic use. Do not attempt to use it outside the country where you purchased it.



- Do not plug the power cord into an extension cord connector or power strip shared with other plugs.



- Do not plug the fax into a power outlet shared with an air conditioner, personal computer, electric typewriter, copier, or other equipment that generates electrical noise.



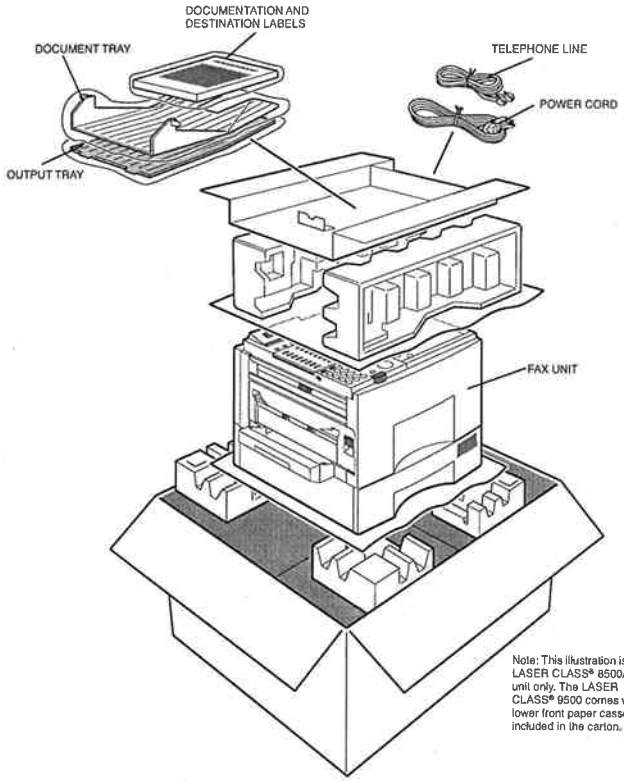
- Check the plug frequently and make sure that it is firmly plugged into the socket.

C **Do not connect the unit to a UPS (Uninterruptable Power Supply). If it is connected to a UPS, ##322 error may occur.**

1.2 Unpacking

Unpacking: Have You Got Everything?

As you unpack the fax, save the carton and packing material in case you want to move or ship the fax unit in the future. Ask someone to help you remove all items from the box. You will need someone to hold the box while you lift the fax unit and its protective packaging out of the carton.



Note: This illustration is for the LASER CLASS® 8500/9000 unit only. The LASER CLASS® 9500 comes with a lower front paper cassette included in the carton.

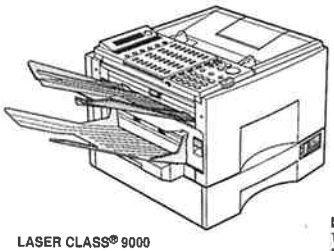
For the LASER CLASS® 8500/9000/9500

Check each item against this list as you remove it from the box.

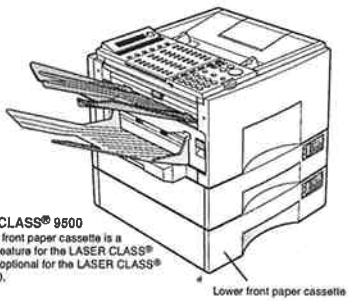
- ❑ 1 Fax machine
- ❑ 1 Document tray
- ❑ 1 Output tray
- ❑ 1 Side paper cassette (multi-size, 100-sheet capacity)
- ❑ 1 Front paper cassette (Letter-size, 500-sheet capacity)
- ❑ 1 Power cord
- ❑ 1 Telephone line
- ❑ 4 Sheets of destination labels
- ❑ 1 User's Guide
- ❑ 1 Warranty registration
- ❑ 1 Limited warranty note
- ❑ 1 Installation completion report

For the LASER CLASS® 9500 Only

- ❑ 1 Lower Front paper cassette



LASER CLASS® 9000



LASER CLASS® 9500
The lower front paper cassette is a standard feature for the LASER CLASS® 9500 and optional for the LASER CLASS® 8500/9000.

Lower front paper cassette

REFERENCE

For lower front cassette feeder installation, see *2.2 FXL-CASSETTE FEEDER 5 (LTR/500)*.

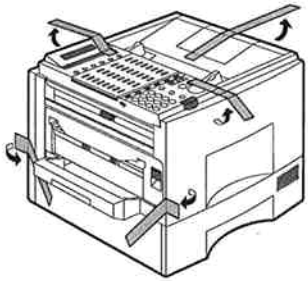
1.3 Removing the shipping material

Removing the Shipping Material

All shipping materials must be removed. Shipping materials are attached inside the fax unit and on the front paper cassette to protect delicate parts from vibration during shipping.

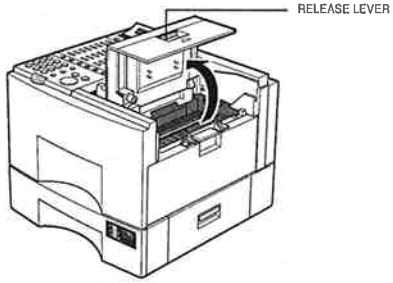
Removing the Shipping Tape

Remove all the shipping tape from the unit.

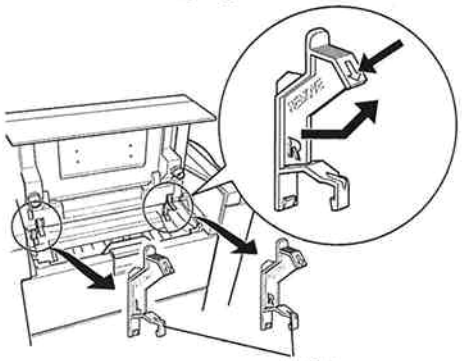


Removing the Spacers Inside the Fax Unit

1. Pull up the release lever to unlock the printer cover and lift it to open.



2. Remove the left and right spacer.



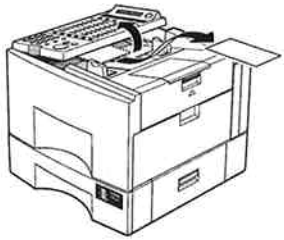
SPACERS

3. Close the cover.

N Save the left and right spacer. You may want to insert them again if you have to transport the fax unit.

Removing the Styrofoam Sheet from the ADF

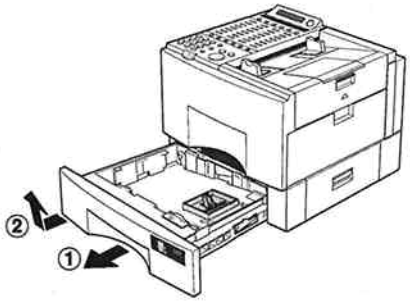
1. To open the Automatic Document Feeder (ADF), grip the operation panel and gently pull the panel up until it opens partially.
2. Remove the styrofoam sheet.



3. Gently push the operation panel shut until it clicks.

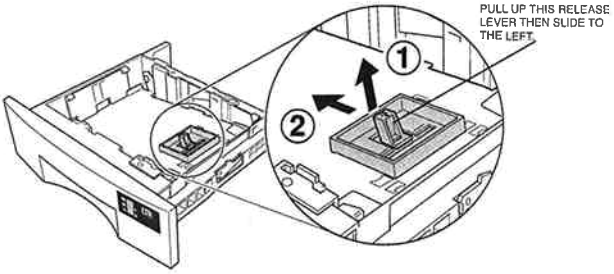
Removing the Orange Lock Plate from the Front Paper Cassette

1. Open the front paper cassette and remove it from the fax unit.



2. Set the front paper cassette down on a flat, stable surface.

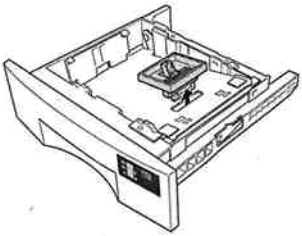
3. With your right hand hold the orange lock plate and use your right thumb to pull up the release lever and slide the plate to the left.



N

Pushing the metal base hard might break the cassette.

4. After the orange lock plate releases, lift it up.



5. Insert the paper cassette in the fax unit. (→ 2-28)

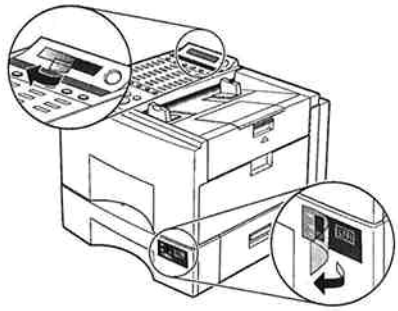
6. Repeat this procedure for the other front paper cassette if you have two front paper cassettes installed on the fax unit.

N

Save the orange lock plate of the paper cassette. You may want to insert it again if you have to transport the fax unit.

Removing the Protective Sheets

The LCD on the operation panel and the paper level gauge on the front paper cassette are covered with plastic sheets to protect them during shipping. This protective material should be removed before you use the fax unit.



1. Remove the plastic sheet covering the LCD on the operation panel.
2. Remove the plastic sheet covering the paper level gauge on the front paper cassette.
3. If you have two front paper cassettes, remove the plastic sheet covering the paper level gauge on the other front paper cassette.

N

The second front paper cassette is standard for the LASER CLASS® 9500 and an option for the LASER CLASS® 8500/9000.

1.4 Assembling the fax

Assembling the Fax

Follow the instructions in this section to assemble the fax and prepare it for full operation.

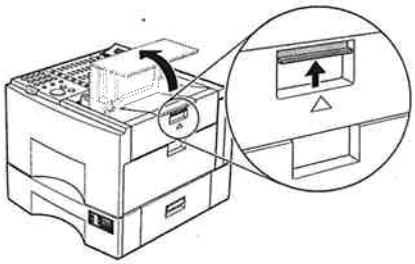
Installing the Toner Cartridge

Install only a Canon FX4 Toner Cartridge in your fax machine.

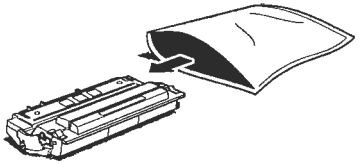
C

INSTALLING ANY OTHER TYPE OF CARTRIDGE IN THIS FAX UNIT COULD DAMAGE THE FAX UNIT AND VOID YOUR WARRANTY. LEAVE THE TONER CARTRIDGE IN ITS PROTECTIVE BAG UNTIL YOU ARE READY TO INSTALL THE CARTRIDGE. HANDLE THE TONER CARTRIDGE CAREFULLY. (→15-21)

1. Pull up on the lever above the ▲ mark to open the printer cover



2. Remove a new toner cartridge from its protective bag.

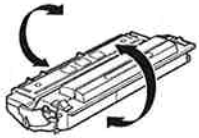


Save the protective bag. You can use it later to cover the cartridge if you have to remove it from the fax machine.

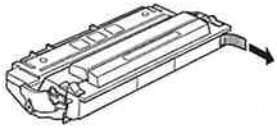
N

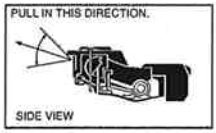
Save the protective bag and all other shipping material. You will need this material later when you dispose of the cartridge after it has run out of toner. (→15-18)

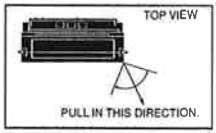
3. Hold the cartridge by the ends and rotate it slowly in the direction of the arrows five or six times to distribute the toner evenly inside the cartridge.



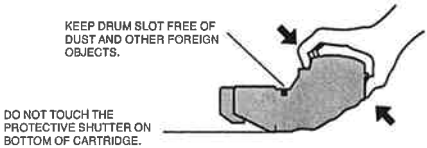
4. Place the new cartridge on a stable, flat, clean surface. As you steady the cartridge with one hand, remove the seal by gently pulling the plastic tab with your other hand. Use a firm, even pull to avoid breaking the seal.



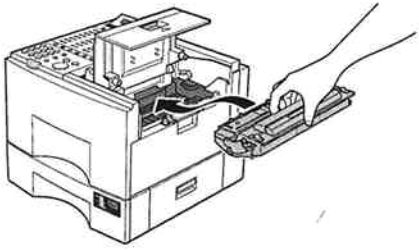




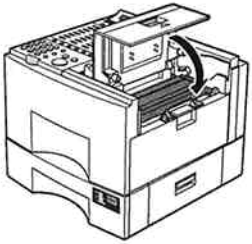
5. To avoid pinching your fingers between the toner cartridge and fax unit, grip the cartridge as shown below.



6. While avoiding touching the top and bottom of the cartridge body, load the cartridge in the direction indicated by the arrow. Gently slide the cartridge into the printer area until it is down inside the fax unit and level.



7. Shut the printer cover until you hear it lock.



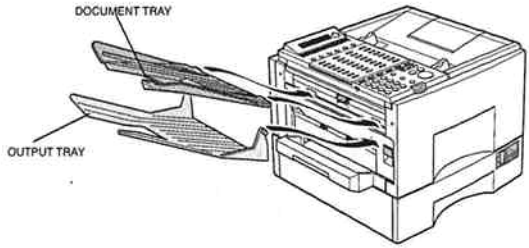
- The fax unit will not operate if the printer cover is not closed completely. If the printer cover is open (and the fax unit is plugged in), you will see a message:

CHECK PRINTER COVER

Open the cover again and make sure the toner cartridge is level. Then shut the printer cover again until you hear it lock.

Attaching Trays

1. Attach the output tray to the side of the printer.
2. Attach the document tray to the side of the fax unit, just above the output tray.

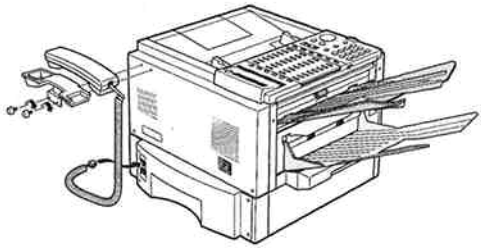


Connecting the Handset (an option)

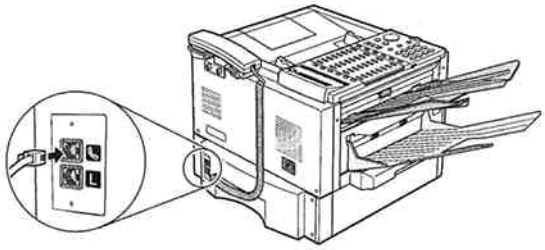
N

A telephone handset is available as an option for the fax machine. This handset is for use with Listed Canon Facsimile machine only.

1. Fit the handset cradle over the holes.
2. Fasten the handset cradle with the screws provided.



3. Connect the end of the handset connector cord to the jack marked with the handset icon ( ).

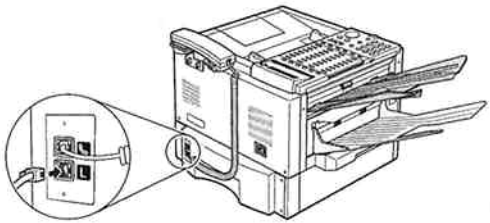


4. Place the handset on the handset cradle.

Connecting the Telephone Line

1. Make sure you have an RJ11-C wall jack. If you need assistance, contact your dealer or telephone company.

2. Connect one end of the supplied telephone line to the fax jack marked .



3. Connect the other end of the telephone line to your wall telephone jack.

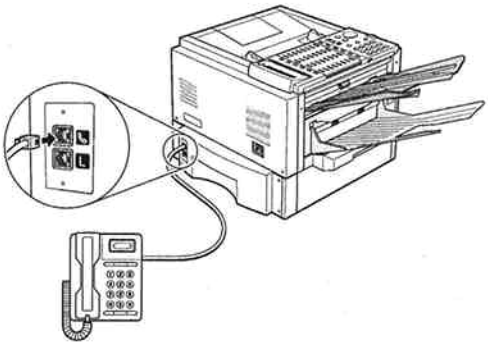
Connecting an Extension Phone

To connect an extension phone to the fax, you have to use the handset jack.

N

Only one jack is provided to be used with the optional handset or an extension phone. A separate jack is not provided for an extension phone.

1. Connect the extension phone cord to the jack marked with the handset icon ( ).



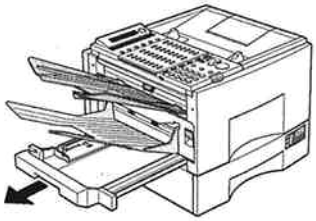
Loading Paper and Installing the Paper Cassettes

Before you load paper, follow these general guidelines:

- ❑ The side paper cassette can be adjusted to accept letter, legal, or A4 size paper. (→2-25)
- ❑ Use Canon standard 17-24 lb. (64-90 g/m²) weight paper.
- ❑ To avoid paper jams, do not load wrinkled or curled paper in the paper cassette.
- ❑ To avoid paper curling, do not open paper packs until you are ready to load the paper in the fax unit. Store unused paper from opened packs in a cool, dry location.
- ❑ Let the paper run out before you refill the paper cassette. Avoid mixing new paper with paper remaining in the paper cassette.

Loading Paper in the Side Paper Cassette

1. Pull out the side paper cassette.



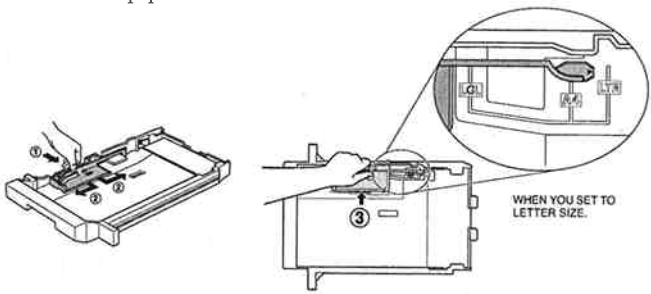
2. Check the selector inside the side paper cassette and make sure it is set for the size of the paper you are loading.

   If the setting is correct, go on to Step 3.

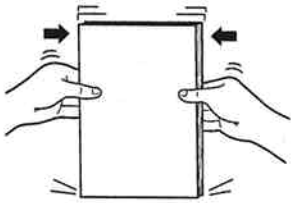
   -or-

   To set the paper cassette for a different paper size, slide the selector to the correct position.

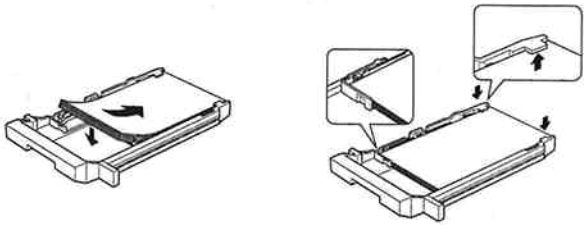
To release the guide, push it gently toward the center of the paper cassette. Gently push it up or back until the tip is just below the line of the setting you want. Then push it out toward the side of the paper cassette to lock it.



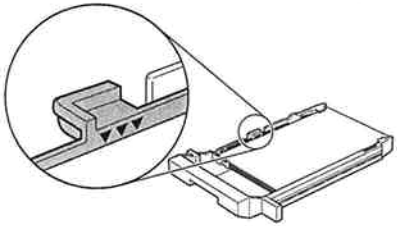
3. The side paper cassette holds approximately 100 sheets of paper. Before you load paper into the side paper cassette, tap the edges of the stack to make sure the leading edge and sides of the stack are even.



4. Load the paper into the side paper cassette. Slide the edge of the stack under the front tabs of the paper cassette

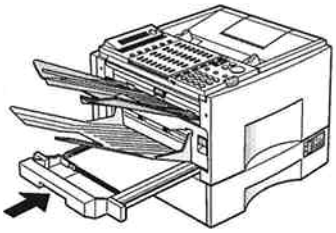


Make sure the paper stack is not higher than the load limit marks (▼▼▼) on the left side of the paper cassette.



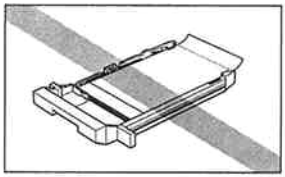
Check the corners of the stack and make sure they are below the tabs at the front end of the paper cassette.

5. Gently insert the side paper cassette into the fax until you hear it click.



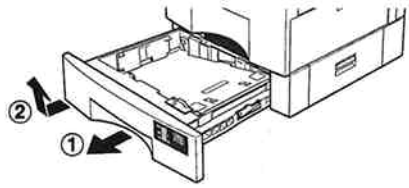
N

Inserting the side paper cassette carelessly may cause paper jams and distorted images. If you pull the side paper cassette out with paper remaining in the paper cassette, make sure no paper is out of the paper cassette and that there is no loose paper inside the fax unit.



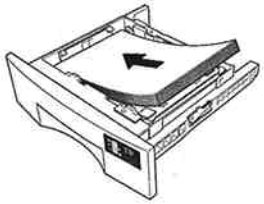
Loading Paper in the Front Paper Cassette

1. To pull out the front paper cassette, lift it up at a slight angle then pull it up and out.



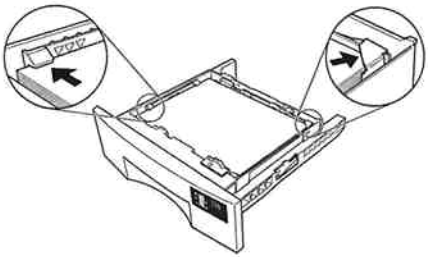
2. Before you load a stack of paper in the front paper cassette, tap the leading edge of the paper stack on a flat surface so the edges are evenly aligned.

3. Set the paper stack into the front paper cassette.



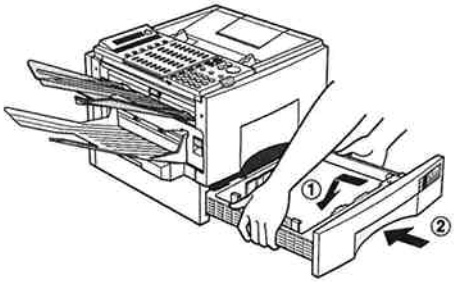
N

Before loading 500 sheets, divide the stack into approximately equal thirds about half an inch thick. Then load each stack separately. The paper stack should not be higher than the load limit marks (▼▼▼) on the side of the paper cassette. Make sure the stack is below the tabs at the front of the paper cassette.



Check the front corners of the stack and make sure they are below the tabs.

4. Gently insert the front paper cassette into the fax unit until you hear it click.



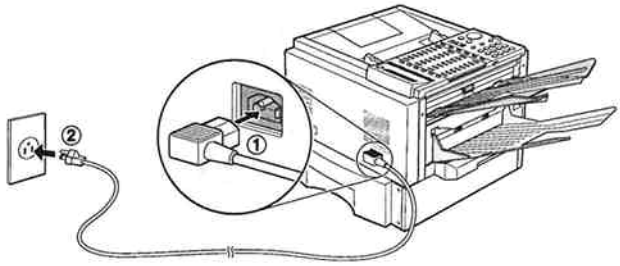
The paper level gauge on the front paper cassette tells you the level of the current paper supply without opening the paper cassette. When you see the paper level gauge drop, make sure you have a supply of paper on hand to fill the cassette. When you see the SUPPLY REC. PAPER message, re-fill the cassette.

Turning on the Power

1. Connect the power cord to the power receptacle on the rear of the fax unit.
2. Connect the other end of the power cord to the power source.

C **THE FAX MUST BE CONNECTED TO A PROPERLY GROUNDED, THREE-PRONG 120 V AC OUTLET.**

After you connect the power cord to the power source, the fax LCD display will light. There is no power switch on the fax unit.



It will take a few seconds for the unit to warm up.

PLEASE WAIT

The unit has warmed up and is ready to use when you see the date and time display.

12/27/96 FRI 12:20

When the date is displayed on the LCD, the fax is in the *standby mode* and ready for normal operation. If the alarm starts blinking red, wait for one of the following messages to appear.

REPLACE CARTRIDGE	The toner cartridge has run out of toner. Replace the toner cartridge.
CHECK PRINTER COVER	The printer cover is not closed completely. If it does not close easily, do not force it. Remove the toner cartridge, and insert it again. Make sure it is sitting level inside the fax machine then close the printer cover again. And make sure the toner cartridge is installed in the fax unit.
SUPPLY REC. PAPER	One of the paper cassettes is empty or one of the paper cassettes is not seated correctly inside the fax machine. Remove each cassette. Make sure the stack of paper is below the tabs and insert the paper cassette again. Push the paper cassettes all the way in until they lock in place.

Type setting (For only the LASER CLASS 8500 installed in Canada)

When the LASER CLASS 8500 is installed in Canada, set the type as follows:

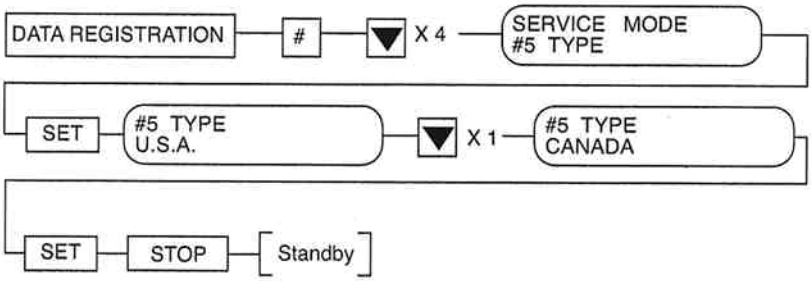


Figure 5-0~A Type Setting

The image data are backed up for approx. 12 hours at 77°F (25°C) when starting with a 100% charged battery. To charge the battery 100% takes 1 day (24 hours) or more with the power on.

Processing When Trouble Occurs

Very rarely, during use the display may go out, all the keys stop working, or some other trouble occur because of intense noise or a strong shock. If such trouble occurs, perform an All Clear operation. During installation, we recommend that you perform an All Clear operation. When the LASER CLASS 8500 is installed in Canada, set the type to CANADA after performing an All Clear operation.
Below is the procedure for performing an All Clear operation and type setting operation.

When perform an All Clear operation, all the registered data is erased and all the service data is initialized.

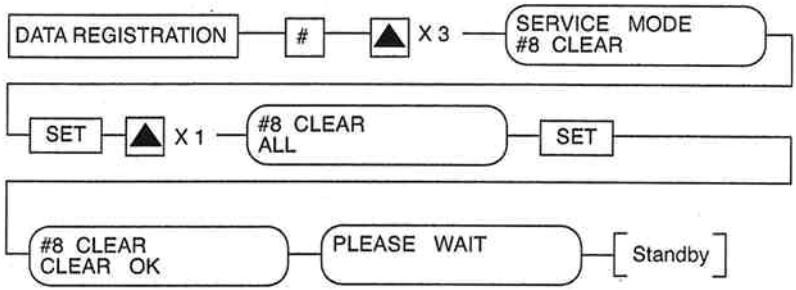


Figure 5-1 All Clear

(For only the LASER CLASS 8500 installed in Canada)

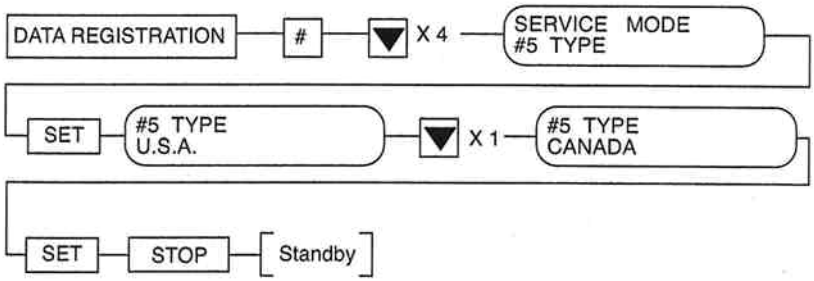


Figure 5-1~A Type Setting

1.5 Checking Operations

Copy operation

Check that normal images are printed.

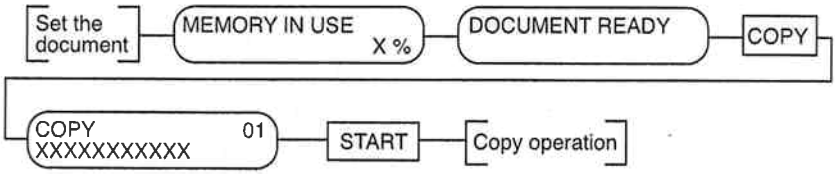


Figure 5-2 Copy Operation

Communication Test

Transmit to, and receive from other faxes, and check that images are sent normally for transmission, and are printed normally for reception.

Here is a procedure for a general communication test.

(1) Pickup the handset or press the ON HOOK button, and check that you can hear the dial tone. If you cannot, check the line connections.

(2) Dial the other fax and check that the line is connected. If you cannot connect with the other fax, check the line settings (tone/pulse).

(3) Transmit and receive a document and check the operation and the image.

2. OPTION

2.1 OPTION MEMORY VII (2M-BYTE) / (4M-BYTE)

2.1.1 Safety and precautions

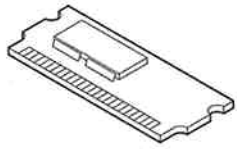
Danger by Static Charge

Static charge can change the electrical characteristics of the DRAM board or damage it. Do not handle the DRAM board under circumstances where static charge might occur easily.

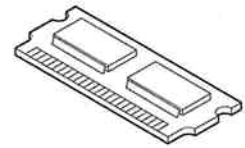
When repairing or replacing the DRAM boards, first touch the grounded metal part to prevent damage from static charge, and do not touch electrical parts on the DRAM board.

2.1.2 Service operations

a) External view



2M-Byte



4M-Byte

Figure 5-3 External View

b) Installation

(1) Output all image data in image memory.

When installing the DRAM boards, since it is necessary to switch off the memory backup function, all image data are cleared.

(2) Disconnect the power cord of the fax unit at the power source.
(3) Remove the four screws and remove the rear cover.

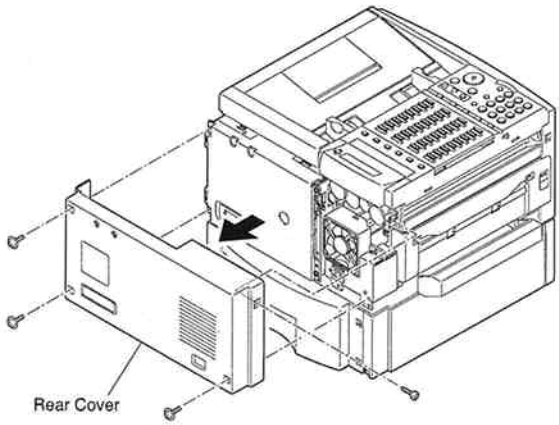


Figure 5-4 Preparations for Installation 1

(4) Remove the five screws and remove the shield cover.

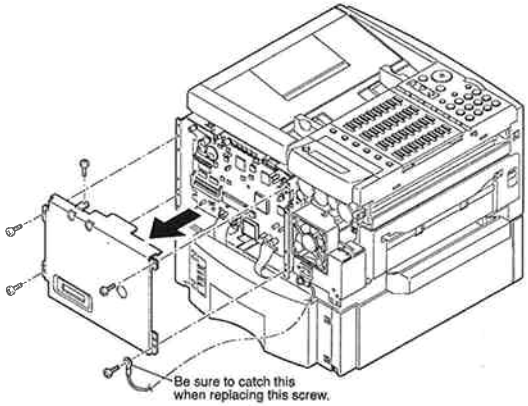


Figure 5-5 Preparations for Installation 2

(5) Remove jumper plug JP1 on the SCNT board.

While the power is switched off, the memory backup voltage (3VDC) is applied to the DRAM boards expansion connectors. Mounting the DRAM boards with this voltage being fed may destroy the DRAM boards.
Therefore, be sure to remove jumper plug JP1 on the SCNT board.

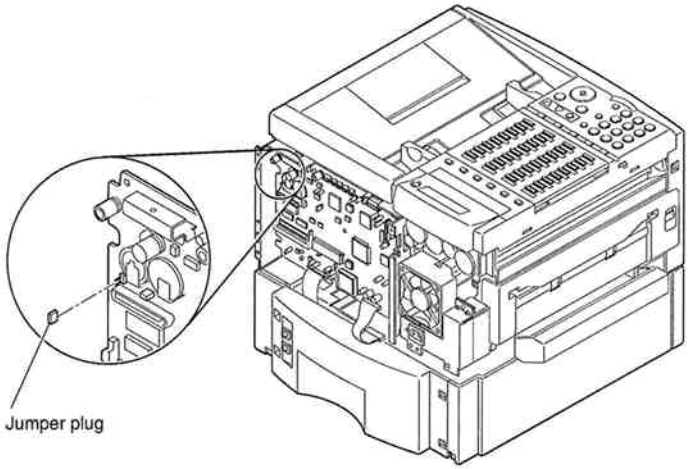


Figure 5-6 Jumper Plug (JP1) on the SCNT Board

(6) To install the first DRAM board, follow the steps ① and ② shown below.
To install the second DRAM board, follow the steps ③ and ④ shown below.

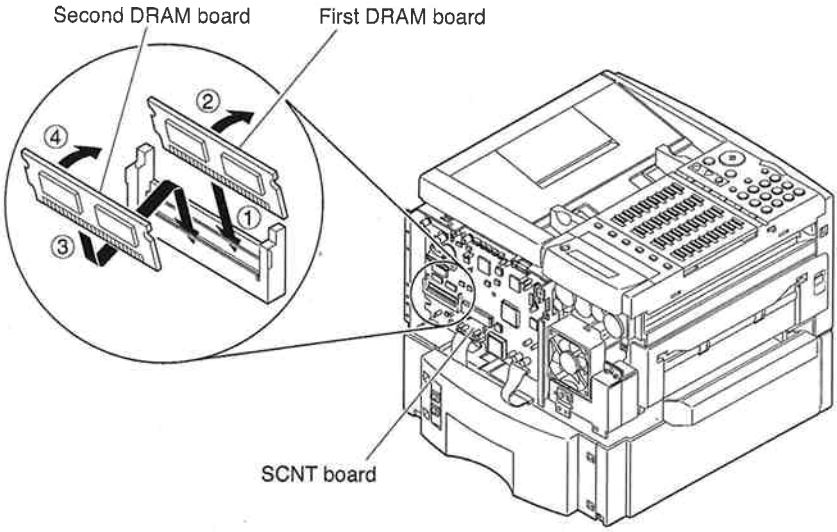


Figure 5-7 Installation

NOTE

The LASER CLASS 8500 has only one socket.

Insert the DRAM board into the socket in the direction indicated by arrow ① or ③, then push it in the direction indicated by arrow ② or ④ until it is fixed in place.

(7) Install jumper plug JP1 on the SCNT board.
(8) Fasten the rear cover in place with the four screws.
(9) Fasten the shield cover in place with the four screws.
(10) Plug in the fax.

c) Check after DRAM boards installation

After installing the DRAM boards, carry out the following procedure to ensure that the DRAM boards are properly identified by the fax.

(1) In test mode menu, select (1) to enter D-RAM test mode.
(2) If there is image data in the DRAM, the system asks you whether to delete the data. Select OK (press the SET key).
(3) When you enter D-RAM test mode, the total capacity of the D-RAM appears on the upper right side of the LCD.
(4) In D-RAM test mode, select (1) to enter D-RAM test 1.
(5) When you enter D-RAM test 1, D-RAM writing and reading checks are carried out. Check that the following is displayed.

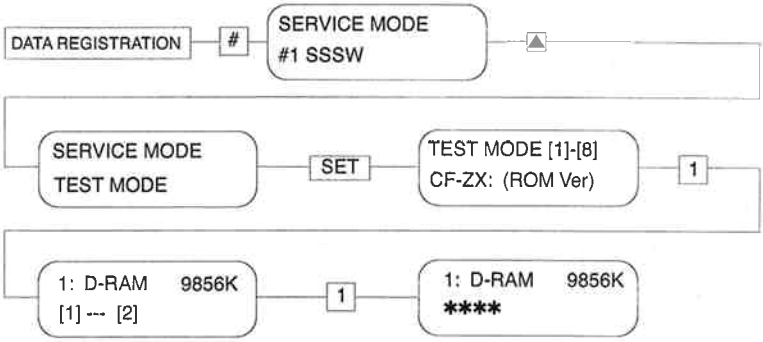


Figure 5-8 Flowchart of D-RAM test 1

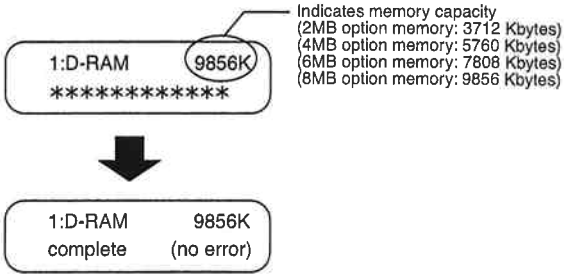


Figure 5-9 D-RAM Board Installation Check

(6) If this test does not end normally, check that the D-RAM boards are plugged securely into the socket, then check the memory with the D-RAM test 1 again.
(7) Press the STOP key and CLEAR key to return to standby.

2.1.3 Maintenance and service

a) Troubleshooting

The fax does not recognize the DRAM boards even when the test mode D-RAM test is executed.

Solutions: (1) Check that the DRAM boards are securely connected.
(2) Replace the DRAM board.
(3) Replace the SCNT board.

b) Connector locations and signals

b-1) DRAM board (2 MB)

b-2) DRAM board (4 MB)

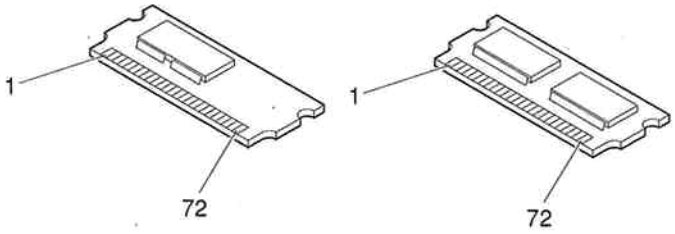


Figure 5-10 DRAM Board (2MB/4MB)

J1 (SCNT board connector)

Pin No.	Signal	In/Out	Source	Description
A1	DGND	---	---	Ground
A2	VD0	I/O	IC 18*	Data signal
A3	VD1	I/O	IC 18*	Data signal
A4	VD2	I/O	IC 18*	Data signal
A5	VD3	I/O	IC 18*	Data signal
A6	VD4	I/O	IC 18*	Data signal
A7	VD5	I/O	IC 18*	Data signal
A8	VD6	I/O	IC 18*	Data signal
A9	VD7	I/O	IC 18*	Data signal
A10	+ VB	In	Rechargeable battery	Logic drive voltage
A11	N.C.	---	---	Not connected
A12	AX0	I/O	IC 18*	Address/data signal
A13	AX1	I/O	IC 18*	Address/data signal
A14	AX2	I/O	IC 18*	Address/data signal
A15	AX3	I/O	IC 18*	Address/data signal
A16	AX4	I/O	IC 18*	Address/data signal
A17	AX5	I/O	IC 18*	Address/data signal
A18	AX6	I/O	IC 18*	Address/data signal
A19	AX10	I/O	IC 18*	Address/data signal
A20	N.C.	---	---	Not connected
A21	VD8	I/O	IC 18*	Data signal
A22	VD9	I/O	IC 18*	Data signal
A23	VD10	I/O	IC 18*	Data signal
A24	VD11	I/O	IC 18*	Data signal
A25	VD12	I/O	IC 18*	Data signal
A26	VD13	I/O	IC 18*	Data signal
A27	VD14	I/O	IC 18*	Data signal
A28	AX7	I/O	IC 18*	Address/data signal
A29	N.C.	---	---	Not connected
A30	+VB	In	Rechargeable battery	Logic drive voltage
A31	AX8	I/O	IC 18*	Address/data signal
A32	AX9	I/O	IC 18*	Address/data signal
A33	N.C.	---	---	Not connected
A34	N.C.	--	---	Not connected
A35	VD15	I/O	IC 18*	Data signal
A36	N.C.	---	---	Not connected
A37	VD0	I/O	IC 18*	Data signal
A38	VD1	I/O	IC 18*	Data signal
A39	DGND	---	---	Ground

Pin No.	Signal	In/Out	Source	Description
A40	-CASL	In	IC 18*	Column address/low-order byte access
A41	-CASL	In	IC 18*	Column address/low-order byte access
A42	-CASH	In	IC 18*	Column address/high-order byte access
A43	-CASH	In	IC 18*	Column address/high-order byte access
A44	-RAS2	In	IC 18*	Row address strobe signal No.1
A45	N.C.	---	---	Not connected
A46	N.C.	---	---	Not connected
A47	-FWE	In	IC 18*	XWE-signal to DRAM
A48	N.C.	---	---	Not connected
A49	VD2	I/O	IC 18*	Data signal
A50	VD3	I/O	IC 18*	Data signal
A51	VD4	I/O	IC 18*	Data signal
A52	VD5	I/O	IC 18*	Data signal
A53	VD6	I/O	IC 18*	Data signal
A54	VD7	I/O	IC 18*	Data signal
A55	N.C.	---	---	Not connected
A56	VD8	I/O	IC 18*	Data signal
A57	VD9	I/O	IC 18*	Data signal
A58	VD10	I/O	IC 18*	Data signal
A59	VD12	I/O	IC 18*	Data signal
A60	VD11	I/O	IC 18*	Data signal
A61	+VB	In	Rechargeable battery	Logic drive voltage
A62	VD13	I/O	IC 18*	Data signal
A63	VD14	I/O	IC 18*	Data signal
A63	VD15	I/O	IC 18*	Data signal
A65	N.C.	---	---	Not connected
A66	N.C.	---	---	Not connected
A67	N.C.	---	---	Not connected
A68	N.C.	---	---	Not connected
A69	N.C.	---	---	Not connected
A70	N.C.	---	---	Not connected
A71	N.C.	---	---	Not connected
A72	DGND	---	---	Ground

*IC 18: System controller (gate array)

(LASER CLASS 9000/9500 only)
The J1 connector on the DRAM board has two rows A and B and has a total of 144 pins. Since rows A and B have a similar pin layout, only different pins are shown below:
B34 :-RAS B44 :-RAS1

2.2 FXL-CASSETTE FEEDER 5 (LTR/500)

2.2.1 Safety and precautions

a) Personal precautions

During servicing, if you have to operate the sensor arm, be careful to keep hair, clothes, accessories, etc. from becoming wrapped up in moving and rotating parts.

- The paper pickup roller, separation rollers, and paper feed roller are rotated by the paper feed motor.
- The pickup solenoid controls the pickup roller.
- When the feeder right cover sensor arm is lifted up, the paper feed motor turns the moving parts.

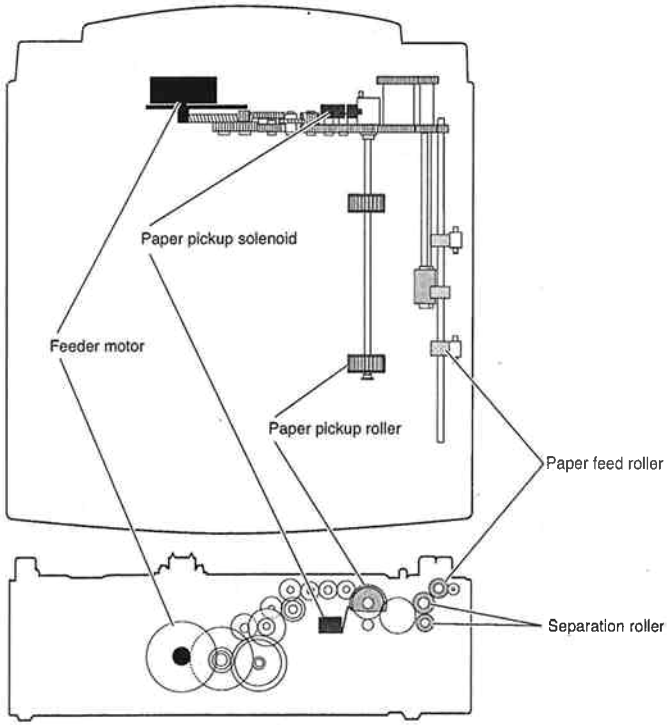


Figure 5-11 Moving and Rotating Parts

2.2.2 Service operations

a) External Views

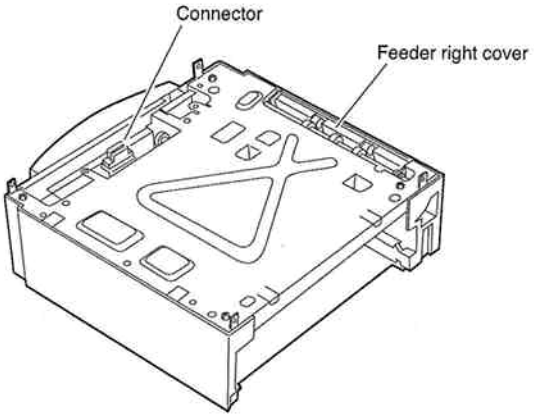


Figure 5-12 External Views

b) Installation

b-1) Unpacking

Check that the box contains the feeder main unit and four screws.

b-2) Attachment to the main unit

(1) Disconnect the power cord of the fax unit at the power source.
(2) Remove the side cassette, front cassette, document tray, exit tray, and toner cartridge from the main unit, and the front cassette from the feeder.
(3) Turn the main unit over to the side, so that its right side faces down.

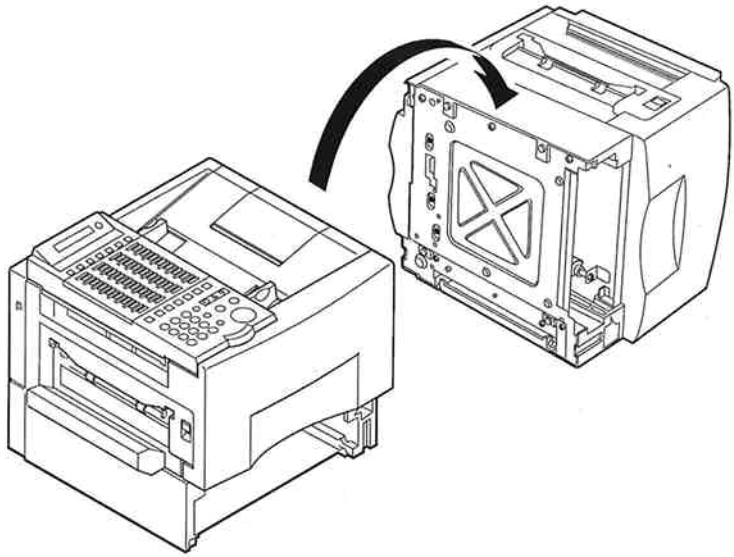


Figure 5-13 Attachment to the Main Unit 1

(4) Similarly, place the feeder on its side next to the main unit, and attach the feeder to the main unit.

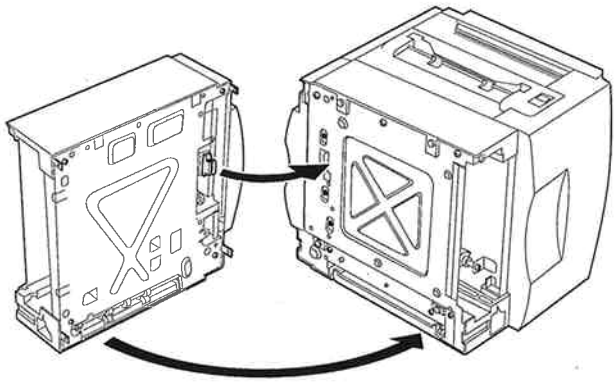


Figure 5-14 Attachment to the Main Unit 2

(5) Right the fax and the feeder to their original positions and fasten from the front and rear with the four screws.

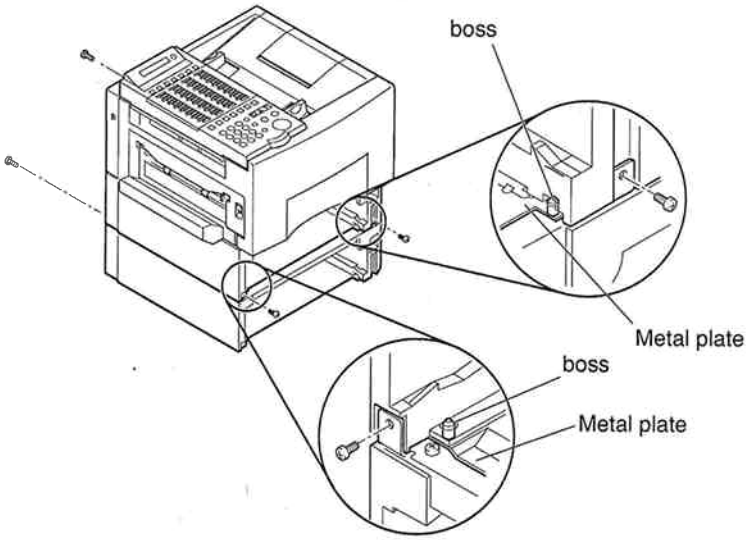


Figure 5-15 Attachment to the Main Unit 3

(6) Attach the side cassette and toner cartridge.
(7) Install the document tray and exit tray.

b-3) Cassette installation

(1) When you plug the power cord into a socket, "SUPPLY REC. PAPER" is displayed and the ALARM lamp blinks. Check that the feeder's recording paper pickup roller is at its initial position.

NOTE

After connecting the feeder and install the toner cartridge, when you plug the power cord, the main unit automatically detects that the feeder is connected and the feeder's recording paper pickup roller is set to its initial position. This initial position is as shown in below.

After connecting the feeder, if you load the front cassette when the recording paper pickup roller is not in its initial position, then the cassette will strike the roller and may break it. Always check that the roller is in its initial position before loading the front cassette.

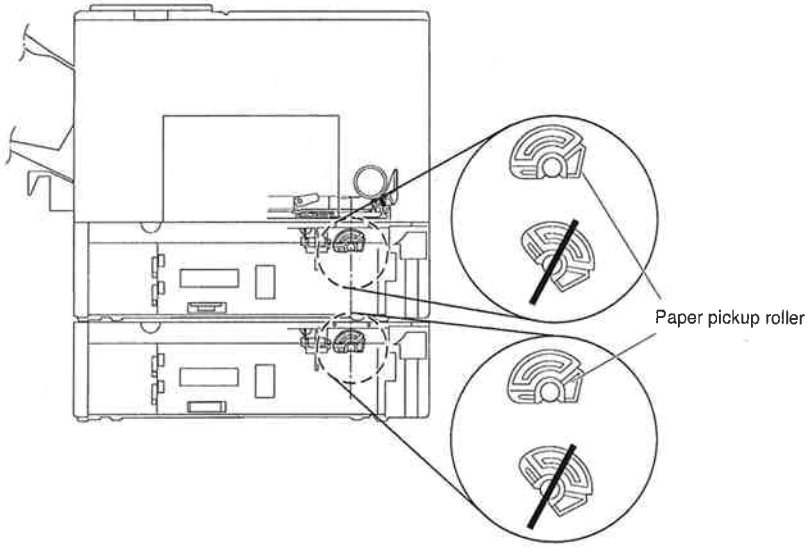


Figure 5-16 Pickup Roller Initial Position

b-4) Operation Check

Empty all the recording paper other than that in the lower front cassette, make a copy, and check that the recording paper is picked up correctly.

2.2.3 Technical information

a) Configuration and construction

External structure

Item	Dimensions and weight	Remarks
Dimensions	15.98" (W) × 18.11" (D) × 5.59" (H) (406 × 460 × 142 mm)	With cassette
Weight	approx. 14.3 lbs (6.5 kg)	

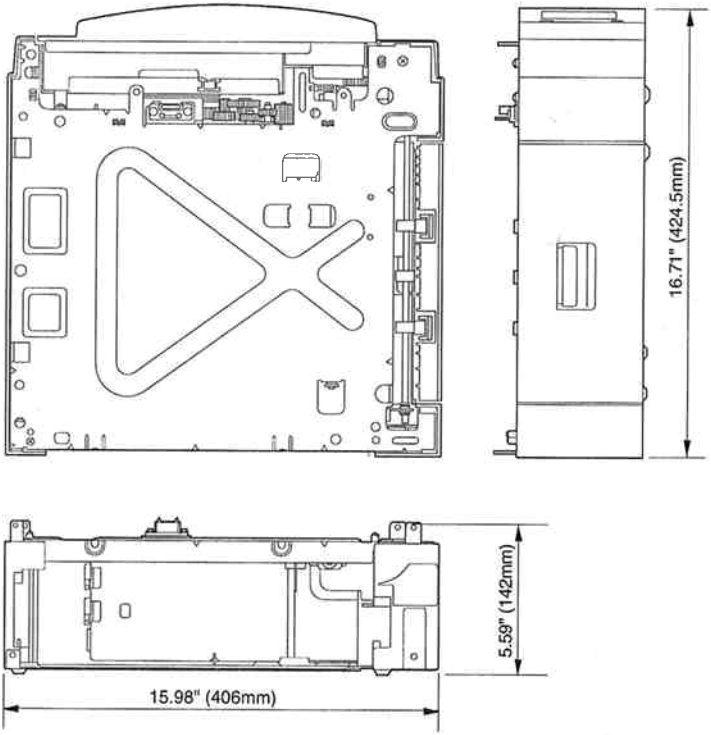


Figure 5-17 External View

b) Specifications

Recording paper dimensions

Letter 8.50" (W) × 10.98" (L) (216 × 279 mm)

Recording paper cassette capacity

Max. 500 sheets, or stacked to a height of 2.17" (55 mm) max.

2.2.4 Operations

a) Functions

a-1) Recording paper pickup function

After a page of recording paper is separated from the lower front cassette by claws on both sides and separation rollers driven by the paper feeder motor, it is sent through the paper path at the right side of the upper feeder's paper feed roller to the main unit's paper pickup section.

a-2) No recording paper detection function

The recording paper sensor in the lower feeder detects whether or not there is recording paper in the lower front cassette .

a-3) Cassette size detection function

The size of the paper in the lower front cassette and the absence of the lower front cassette are detected by the lower front cassette sensors.

a-4) Feeder right cover open/close detection function

The lower feeder right cover sensor detects whether the lower feeder right cover is open or closed.

b) Structures

See the description of the upper feeder *(b) Structures on page 3-37)*.

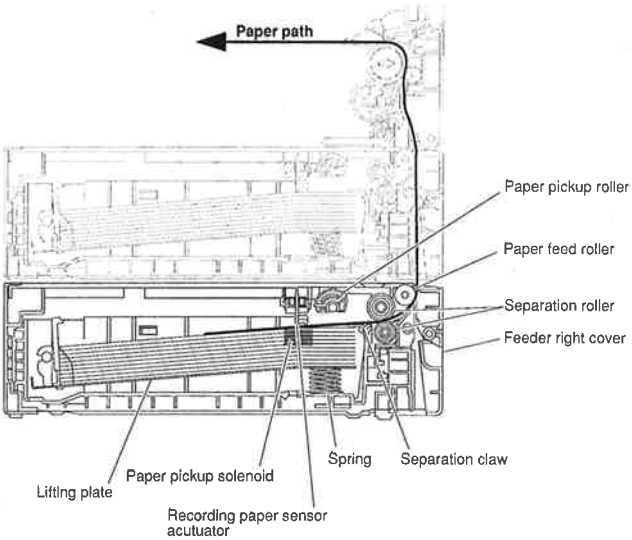


Figure 5-18 Cross-Sectional Diagram

c) Arrangement of sensors

Paper size	(a)	(b)
A4	Not pressed	Pressed
LETTER	Pressed	Not pressed
No cassette	Not pressed	Not pressed

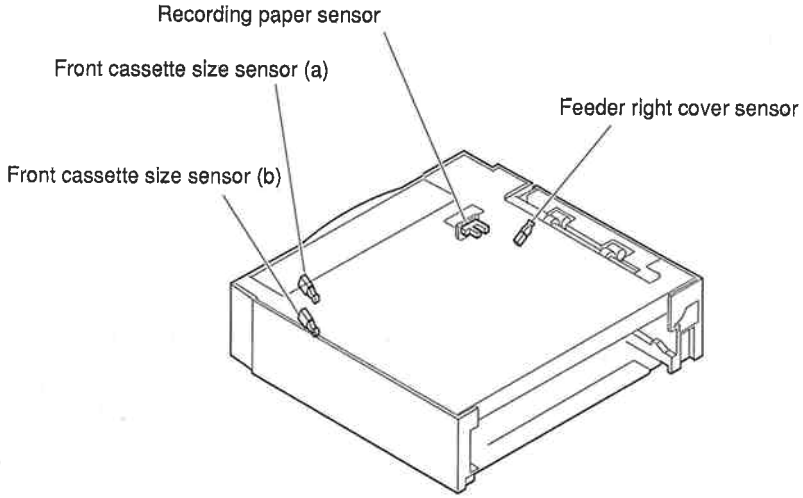


Figure 5-19 Arrangement of Sensors

d) Electrical circuit section

Sensors

The signals detected by the lower front cassette paper sensor, size sensors and feeder right cover sensor, are sent to the PCNT board via the paper sensor board.

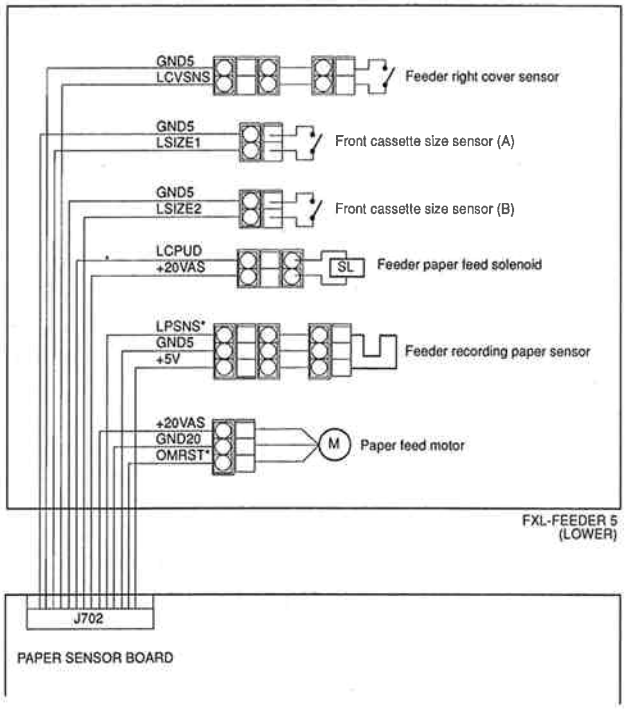


Figure 5-20 Electrical Circuit Section

2.2.5 Maintenance and service

a) Troubleshooting

The fax main unit does not detect that the FXL-FEEDER 5 is mounted.

Solutions: (1) Check the connection between the main unit and feeder connector.
(2) Check connectors J701 and J702 on the paper sensor board.
(3) Check connectors J201 on the main unit PCNT board.
(4) Replace the paper sensor board.
(5) Replace the PCNT board.

Recording paper is not picked up.

Solutions: (1) Check connector J702 on the paper sensor board in the main unit, and the pickup solenoid in the feeder.
(2) Replace the pickup solenoid.
(3) Replace the paper sensor board.
(4) Replace the PCNT board.

The paper feed motor does not move or is out of adjustment.

Solutions: (1) Check the paper sensor board (J702) and paper feed motor connector connections.
(2) Replace the paper feeder motor.
(3) Replace the paper sensor board.
(4) Replace the PCNT board.

b) Connector signals

b-1) Front cassette paper sensor (lower)

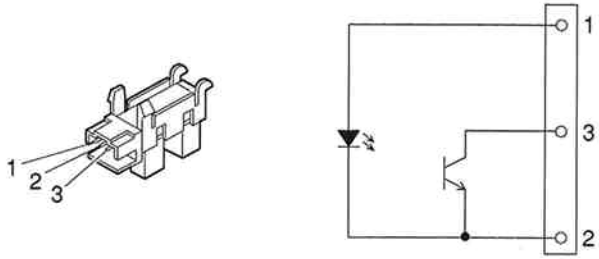


Figure 5-21 Front Cassette Paper Sensor (lower)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	–LPSNS	Out	Front cassette paper sensor (lower)	Front cassette paper (lower) sensor detection signal (H: paper; L: no paper)
2	GND5	---	---	Ground
3	+5V	In	Power supply	Sensor drive voltage

b-2) Front cassette paper size sensor (A,B) (lower)

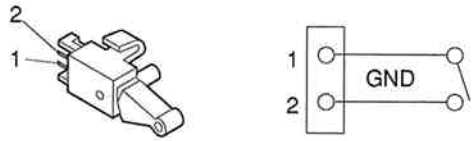


Figure 5-22 Front Cassette Paper Size Sensor (lower)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	LSIZE (A,B)	Out	Front cassette paper size sensor (lower)	Front cassette paper size (lower) detection signal

NOTE

The front cassette paper size sensor (lower) uses the following signals:

	(A)	(B)
No feeder	OFF	OFF
A4	ON	OFF
LTR	OFF	ON
No cassette	ON	ON

b-3) Feeder pickup solenoid (lower)

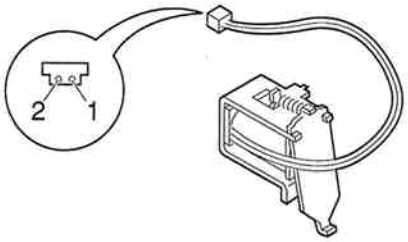


Figure 5-23 Feeder Pickup Solenoid (lower)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	LCPUD	In	PCNT CPU (IC301)	Pickup solenoid control signal
2	+20VAS	In	Power supply	Pickup solenoid drive voltage

b-4) Feeder right cover sensor (lower)

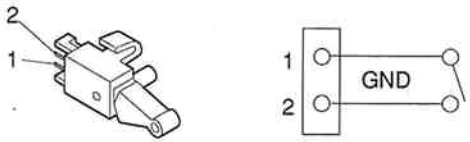


Figure 5-24 Feeder Right Cover Sensor (lower)

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	GND5	---	---	Ground
2	LCVSNS	Out	Feeder right cover sensor (lower)	Feeder right cover (lower) sensor detect signal (H: close, L: open)

b-5) Paper feeder motor

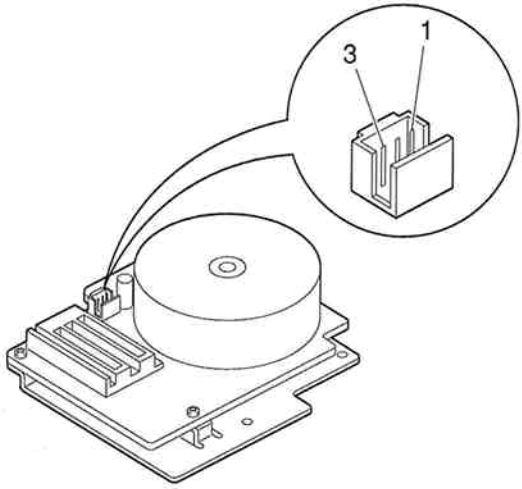


Figure 5-25 Paper Feeder Motor

J702 (paper sensor board)

Pin No.	Signal	In/Out	Source	Description
1	+20VAS	In	Power supply unit	Feeder motor drive voltage
2	GND20	---	---	Ground
3	-OMRST	In	PCNT (IC301)	Feeder motor drive signal

2.2.6 Recording Paper Size Priority

a) Cassette selection switches

Here are the two cassette selection switch items.

Switch A: divided recording

Enables/disables recording of received images onto recording paper with a length shorter than the received/copied length.

Switch B: margin recording

Enables/disables recording with margins of received images onto recording paper with a length longer than the received/copied length.

NOTE

When the print image can be printed on multiple recording paper sizes, the smallest recording cassette takes priority.
When printing divided across multiple pages, the recording paper size is selected giving priority to the size that will require the fewest pages.
The second and subsequent pages for divided printing use the same size recording paper as the first page. If enough recording paper of that size is not available, memory reception is used.

Recording paper is selected for received/copied images with the following procedure.

1) When set to Automatic Reduction with the user data:
   The minimum size that can record the print image without data loss from the actual size to the maximum reduction
   When set to No Automatic Reduction with the user data:
   The minimum size that can record the print image in the data loss range at the actual size
2) The minimum size that can record the print image without data loss at the actual size

REFERENCE

For details on the reduction function, see *the FACSIMILE BASIC•INTER SUPPLEMENT 2 (Rev. 0) (supplied separately).*

b) Reading the recording paper size table

When the recording paper size is determined with reduction, the combination of user data cassette selection switches A and B determine the priority order for the recording paper actually printed and the contents of printing. Below are examples of how to read the recording paper size table that shows this data.

Reception image size: A4

Cassette switches		④ A4/Letter	Letter/Legal
A	B		
OFF	OFF	1) Automatic reduction (Letter) 2) Memory reception (A4)	1) Automatic reduction (Letter) 2) Memory reception (Legal)

① ② ③

Figure 5-26 Reading the Recording Paper Size Table

① Priority order

The printed recording paper priority is determined by the contents of user data and service data settings.

The recording paper indicated by 2) is selected when there is none of the recording paper indicated by 1). When the recording paper indicated in the print recording paper column all runs out, the reception images are received into memory.

② Print recording paper size

Indicates the size of the recording paper on which the reception images are printed.

③ Contents of printing

Memory reception:	Compulsory memory reception
Automatic reduction:	The optimum reduction ratio (70~100%) is obtained from the length of the received image and the received image is reduced to that reduction ratio.
Actual size:	Printed out in actual size.

④ Recording paper cassette size

Indicates the size of the recording paper loaded in the side cassette and the front cassette.

c) Printed recording paper table

Reception image size: A4

Cassette switches			
A	B	A4/Letter	Letter/Legal
OFF	OFF	1) Actual size (A4) 2) Automatic reduction (Letter)	1) Automatic reduction (Letter) 2) Memory reception (Legal)
OFF	ON	1) Actual size (A4) 2) Automatic reduction (Letter)	1) Automatic reduction (Letter) 2) Actual size (Legal)
ON	OFF	1) Actual size (A4) 2) Automatic reduction (Letter)	1) Automatic reduction (Letter) 2) Memory reception (Legal)
ON	ON	1) Actual size (A4) 2) Automatic reduction (Letter)	1) Automatic reduction (Letter) 2) Actual size (Legal)

Reception image size: Letter

Cassette switches			
A	B	A4/Letter	Letter/Legal
OFF	OFF	1) Actual size (Letter) 2) Memory reception (A4)	1) Actual size (Letter) 2) Memory reception (Legal)
OFF	ON	1) Actual size (Letter) 2) Actual size (A4)	1) Actual size (Letter) 2) Actual size (Legal)
ON	OFF	1) Actual size (Letter) 2) Memory reception (A4)	1) Actual size (Letter) 2) Memory reception (Legal)
ON	ON	1) Actual size (Letter) 2) Actual size (A4)	1) Actual size (Letter) 2) Actual size (Legal)

Reception image size: Legal

Cassette switches			
A	B	A4/Letter	Letter/Legal
OFF	OFF	1) Automatic reduction (A4) 2) Automatic reduction (Letter)	1) Actual size (Legal) 2) Automatic reduction (Letter)
OFF	ON	1) Automatic reduction (A4) 2) Automatic reduction (Letter)	1) Actual size (Legal) 2) Automatic reduction (Letter)
ON	OFF	1) Automatic reduction (A4) 2) Automatic reduction (Letter)	1) Actual size (Legal) 2) Automatic reduction (Letter)
ON	ON	1) Automatic reduction (A4) 2) Automatic reduction (Letter)	1) Actual size (Legal) 2) Automatic reduction (Letter)

2.3 Verification stamp unit
2.3.1 Service operations
a) External View

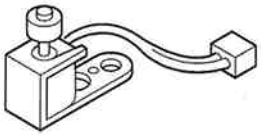


Figure 5-27 External View

b) Installation
b-1) Unpacking
Check that the box contains the stamp unit and one screw.

b-2) Attachment to the main unit
(1) Disconnect the power cord of the fax unit at the power source.
(2) Remove the document tray.
(3) While holding the operation panel open with one hand, use one finger of your other hand to gently push in the black plastic loop to separate it from the stub on the fax machine, and open the operation panel.

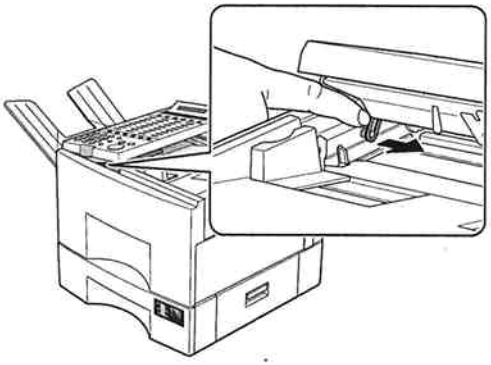


Figure 5-28 Attachment to the Main Unit 1

(5) Remove the two screws, and remove the ADF lower cover.

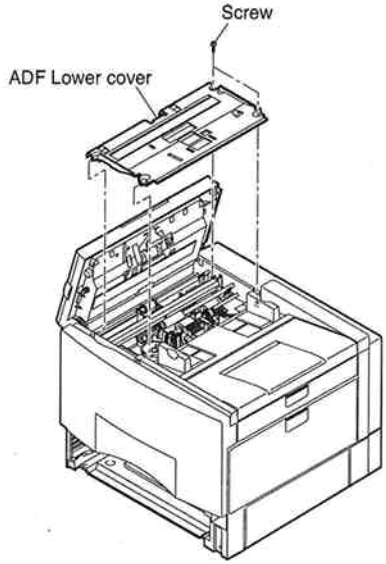


Figure 5-29 Attachment to the Main Unit 2

(6) Connect the stamp unit connector cable to the main unit, and fasten the stamp unit with the one screw as shown below.

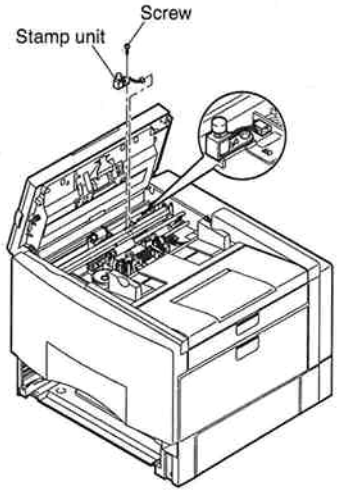


Figure 5-30 Attachment to the Main Unit 3

(7) Remove the cap from the stamp unit.

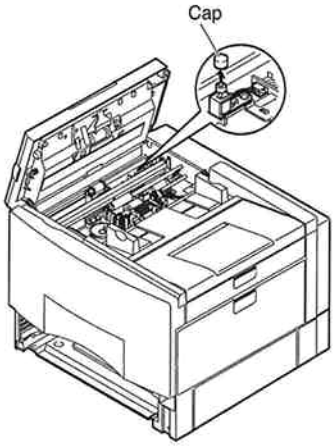


Figure 5-31 Attachment to the Main Unit 4

(8) Fasten the ADF lower cover in place with the two screws.

(9) Place the end of the plastic loop over the end of the stub so it locks in place, and close the operation panel.

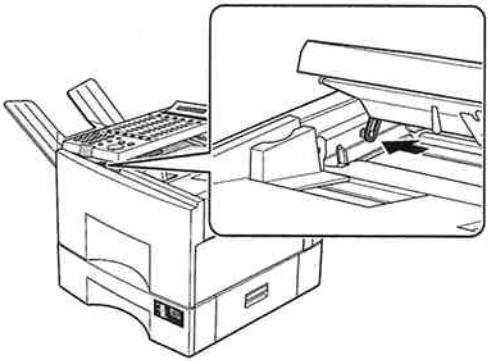


Figure 5-32 Attachment to the Main Unit 5

(10) Re-attach the document tray, and connect the power cord of the fax unit at the power source.

(11) In the service mode, set #1SSSW SW06 Bit3 to 1.

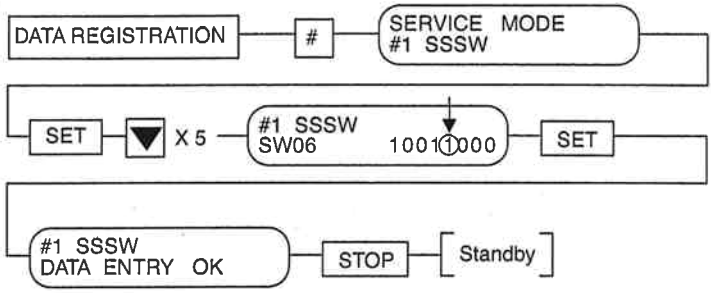


Figure 5-33 Flowchart of Changing SSSW

b-3) Operation check

After setting 8. TX STAMP of USER DATA TX SETTINGS to "ON", or after pressing the STAMP key on the operation panel and turning the STAMP function "ON" using the search button, fax a document to verify that a stamp is put at the bottom of the document scanning surface during scanning.

2.3.2 Maintenance and service

Connector locations and signals

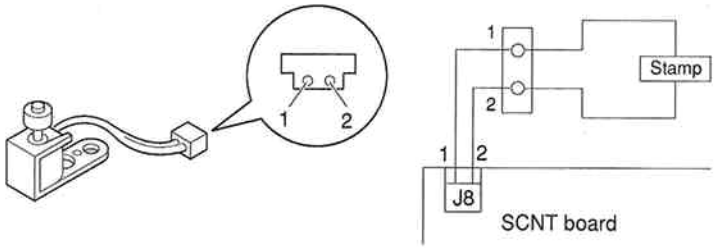


Figure 5-34 Stamp unit

J8 (SCNT board connector)

Pin No.	Signal	In/Out	Source	Description
1	-STAMP	Out	IC20	Stamp unit control signal
2	+23V	Out	Power supply unit	Stamp unit drive voltage

Stamp unit

Pin No.	Signal	In/Out	Source	Description
1	-STAMP	In	IC20	Stamp unit control signal
2	+23V	In	Power supply unit	Stamp unit drive voltage

3. SERVICE TOOLS

3.1 Printer Driver Tester

3.1.1 Outline

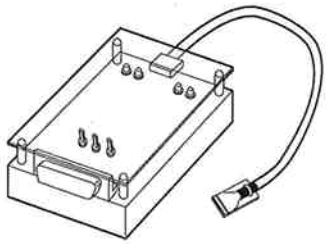


Figure 5-35 Printer Driver Tester

The printer driver tester allows this machine to operate without an external device to determine whether the printer is operating normally.
The tester has the following two functions:

a) It permits the printer section to output an image with vertical lines to determine the quality of the printed image. This also allows the serviceman to determine whether a problem is caused by the printer section or by the SCNT board.

b) It causes the printer section to emit the laser beam. The serviceman measures the output voltage which is proportional to the laser beam intensity with a digital multimeter and determine whether the laser beam intensity is within the specified range.

3.1.2 Explanation of LEDs and Switches

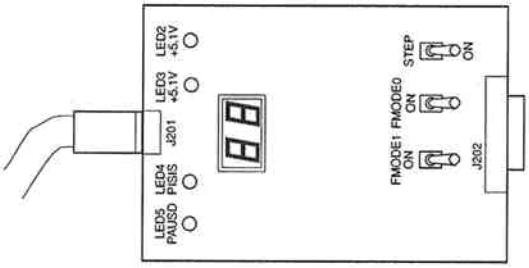


Figure 5-36 LEDs and Switches

LED2: Monitors the 5 V power supply.
LED3: Monitors the 20 V power supply.
LED4: Monitors the PISIS signal output from J304-5.
LED5: Monitors the CHKOUT signal output from J304-8.
FMODE0 switch, FMODE1 switch: Selects the function of the tester.
STEP switch: Not used for servicing

3.1.3 Connector signal list

Conneceor contact No.	Signal name	Function
J304-1	FMODE1	FMODE1
J304-2	+5 V	+5 V
J304-3	FMODE0	FMODE0
J304-4	TOPVR	Output voltage of VR301
J304-5	PISNS	Paper Pickup sensor signal
J304-6	FSRTHR	Output voltage of the thermister
J304-7	+20 VAS	+20 VAS
J304-8	CHKOUT	Function check signal
J304-9	GND	GND
J304-10	GND	GND
J304-11	TNSNS	Toner detect signal
J304-12	STPCNT	Counter stepup signal

Figure 5-37 Signal List

3.1.4 Operation

(1) Disconnect the power cord.
(2) Open the cartridge cover and remove the toner cartridge. (when checking the Laser beam intensity)
(3) Remove the front cover.
(4) Remove the rear cover, the document table ass'y and the ADF ass'y, given in the separate *Parts Catalog*. (when checking the Laser beam intensity)
(5) Connect the external cable to the driver tester cable, and connect external cable to the connector (J304) on the PCNT board.
(6) Set the driver tester switches as follows:
FMODE0: OFF
FMODE1: OFF
(7) Connect the power cord.

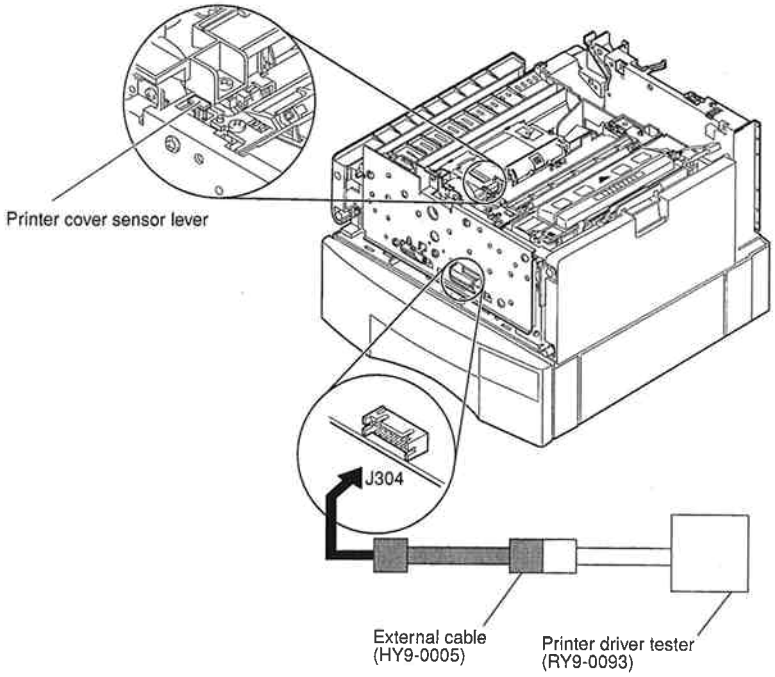


Figure 5-38 Connect Printer Driver Tester

a) Test print

After the machine has entered STANBY mode, set FMODE0 switch to ON to make the test print.

b) Check the Laser beam intensity

Check by using the flowchart shown in the following page.

3.1.5 Laser malfunction diagnosis flowchart

This machine is designed to use the laser beam which is invisible. When a problem in the laser output occurs, use the laser diagnosis flowchart to determine whether the malfunction was caused by the laser/scanner unit or the PCNT board.

This flowchart is used only for laser output abnormality.
For, –BD signal output function abnormality (##323), scanner motor rotation abnormality (##324), *page 4-40, Printer error codes.*

a) Notes for the flowchart

- The following abbreviations are used in the flowchart.
  a. Printer driver tester; Driver tester
  b. Digital multimeter; Meter
  c. FX 4 cartridge; Cartridge

- The voltage must be measured three times, and the average taken.

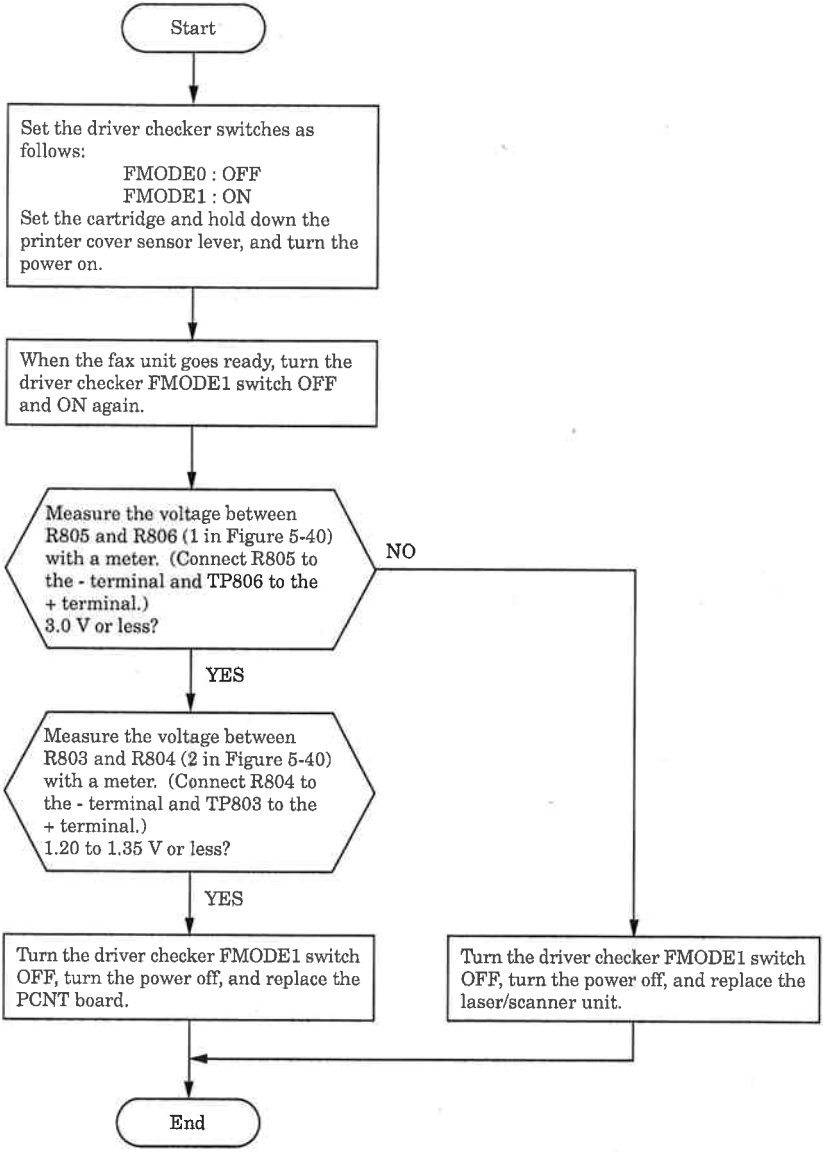


Figure 5-39 Diagnosis Flowchart

Laser/scanner section cover openings

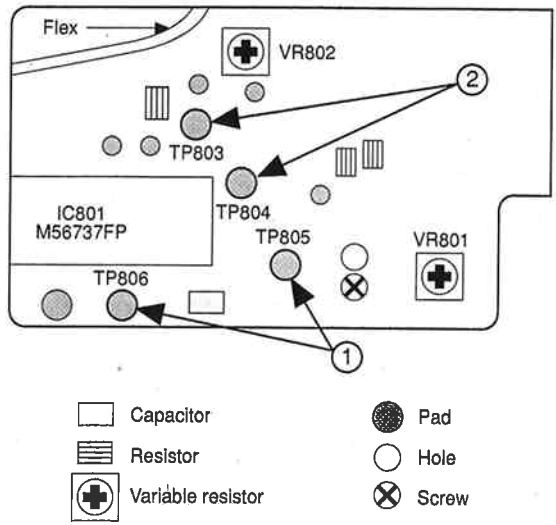
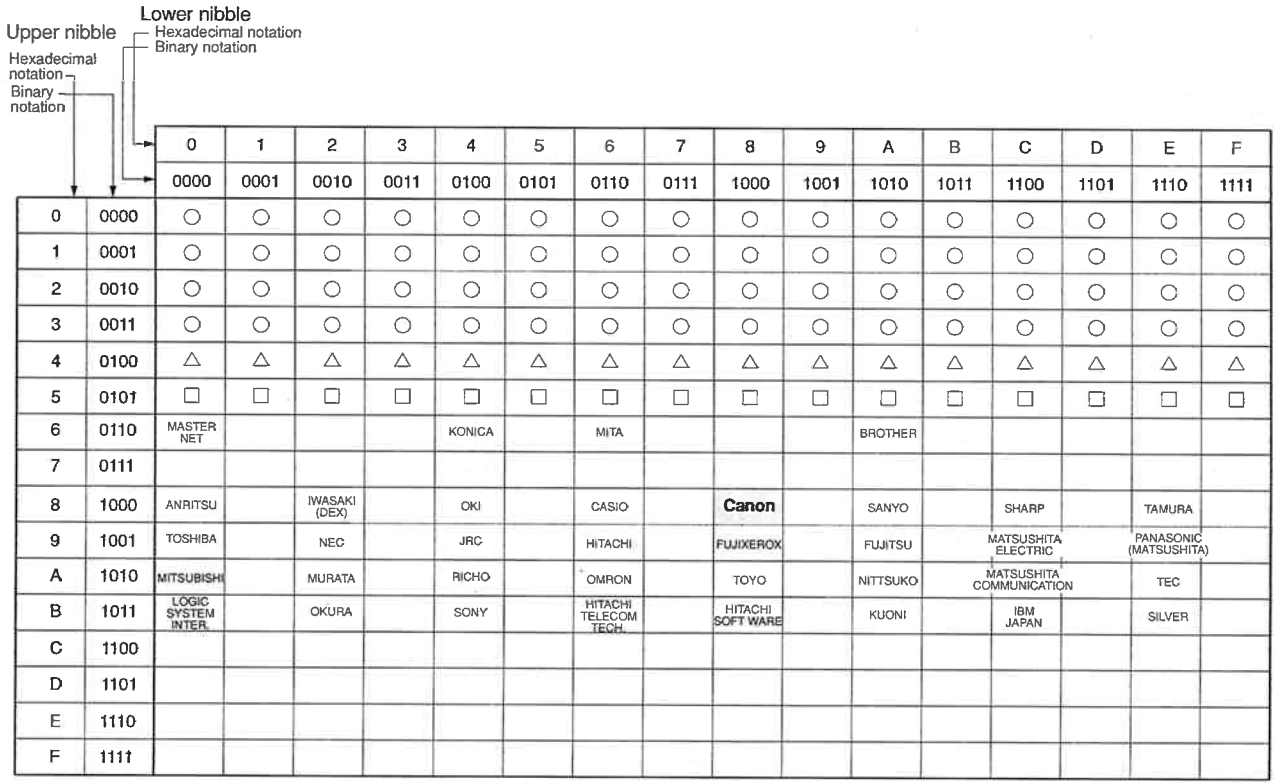


Figure 5-40 Testpoint Locations

4. MAKER CODE

The 1-byte maker code displayed on the error dump list corresponds to the list of makers shown on the following page.

For a sample of a dump list containing maker codes, *see pages 2-16 to 2-18.*



		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
		0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1	0001	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2	0010	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3	0011	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4	0100	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
5	0101	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
6	0110	MASTER NET				KONICA		MITA				BROTHER					
7	0111																
8	1000	ANRITSU		IWASAKI (DEX)		OKI		CASIO		**Canon**		SANYO		SHARP		TAMURA	
9	1001	TOSHIBA		NEC		JRC		HITACHI		FUJIXEROX		FUJITSU		MATSUSHITA ELECTRIC		PANASONIC (MATSUSHITA)	
A	1010	MITSUBISHI		MURATA		RICHO		OMRON		TOYO		NITTSUKO		MATSUSHITA COMMUNICATION		TEC	
B	1011	LOGIC SYSTEM INTER.		OKURA		SONY		HITACHI TELECOM TECH.		HITACHI SOFT WARE		KUONI		IBM JAPAN		SILVER	
C	1100																
D	1101																
E	1110																
F	1111																

○: National organization △: NTT □: KDD

Figure 5-41 Maker Code

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