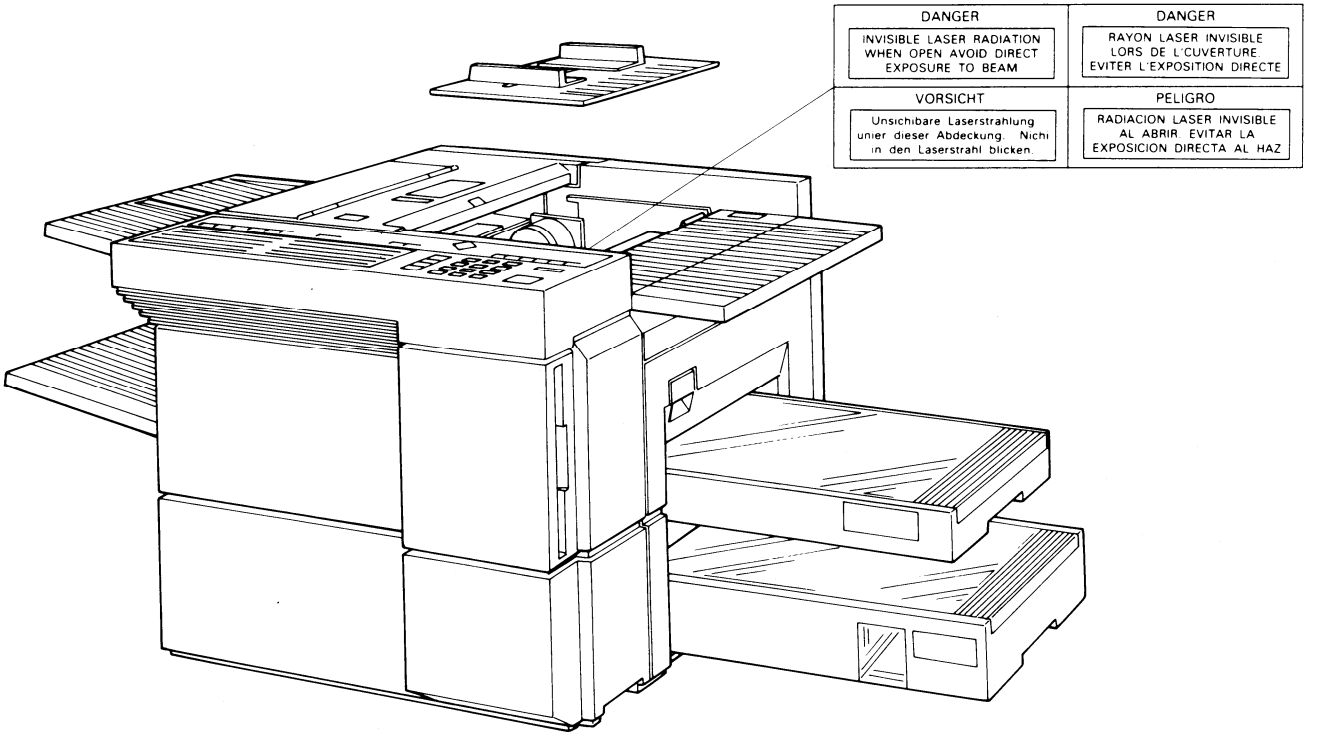
RICOH FAX7000L

FIELD SERVICE MANUAL

WARNING

THIS MACHINE CONTAINS A LASER BEAM GENERATOR. LASER BEAMS CAN CAUSE PERMANENT EYE DAMAGE. DO NOT OPEN THE LASER UNIT OR LOOK ALONG THE LASER BEAM PATH WHILE THE MAIN POWER IS ON.


DANGER
INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
DANGER
RAYON LASER INVISIBLE LORS DE L'OUVERTURE EVITER L'EXPOSITION DIRECTE
VORSICHT
Unsichtbare Laserstrahlung unter dieser Abdeckung. Nicht in den Laserstrahl blicken.
PELIGRO
RADIACION LASER INVISIBLE AL ABRIR EVITAR LA EXPOSICION DIRECTA AL HAZ

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SECTION 6. OPTIONAL BAR CODE READER

SECTION 7. ELECTRICAL DATA

APPENDIX

SECTION 1

INSTALLATION

SECTION 1. INSTALLATION

1-1. Specifications

Type		Console-type transceiver	
Circuit		PSTN, PABX	
Connection		Direct couple	
Document size		Auto Doc. Feed	Manual Doc. Feed
	Length:	105 - 600 mm [4.13 - 23.6 ins]	105 - 1,200 mm [4.13 - 47.2 ins]
		Unlimited length is available. User must support documents longer than 420 mm [16.5 ins]	
	Width:	105 - 304 mm [4.1 - 12.0 ins]	
	Thickness:	0.05 - 0.2 mm [2 - 8 mils]	0.04 - 0.4 mm [2 - 16 mils]
	Weight:	About 50 to 80 g/m^2	About 40 to 120 g/m^2
Document feed		Automatic feed, face down	
ADF capacity		30 sheets (using 75 g/m^2 paper)	
Scanning method		Flat bed, with CCD	
Maximum scan width		304 mm [12.0 ins]	

Scan resolution	Main scan:	Standard, Detail - 200 dpi (7.87 dots/mm) Super Fine - 400 dpi (15.75 dots/mm) Options: 8, 16 dots/mm
	Sub scan:	Standard - 100 dpi (3.94 lines/mm) Detail - 200 dpi (7.877 lines/mm) Super Fine - 400 dpi (15.75 lines/mm) Options: 3.85, 7.7, 15.4 lines/mm
	300 x 300 dpi (11.8 x 11.8 dots per mm) is also available after programming a user function key (tx mode only).	
Memory capacity	Hard disk, 18 M capacity after formatting	
Compression	MH, MR, EFC, MMR, New EFC	
Modulation	V.29, V.27ter, V.21, AM-PM-VSB, QAM	
Protocol	Groups 2, and 3 with ECM; autocompatibility Group 4 interface option available	
Data rate	9600/7200/4800/2400 bps; automatic fallback	
Transmission time	10 s for a CCITT #1 document (Slerexe letter) using standard resolution	
Printing system	Laser printing, plain paper, dry toner	

Paper size	Letter [8.5 x 11"] Legal [8.5 x 14"] B4 A4
Maximum printout width	250 mm [9.8 ins]
Maximum printer resolution	Main scan - 400 dots/inch [15.75 dots/mm] Sub scan - 400 lines/inch [15.75 dots/mm]
Power supply	220 Vac + 22/-33 V; 50/60 Hz +/- 1 Hz 240 Vac + 24/-36 V; 50/60 Hz +/- 1 Hz
Power consumption (W)	Standby: 90 Transmit: 140 Receive: 900 Copying: 900
Operating Environment	Temperature: 5 - 35 degC [41 - 95 degF] Humidity: 10 - 85 %Rh
Dimensions (W x D x H)	475 x 603 x 388 (mm) 18.7 x 23.7 x 15.3 (inches) Excludes trays and cassette
Weight	55 kg [121 lbs]

1-2. Features

Equipment	Availability	Default
Built-in handset	x	
Connection for external tel.	o	
Base cabinet	o	KEY
Manual feed for thick originals	o	o = Used
Monitor speaker	o	x = Not used
Microphone	o	
Speakerphone	x	
Stamp	o	
Remaining memory indicator (Function mode)	o	

Video Processing Features	Availability	Default
Contrast (Lighten, Normal, Darken)	o	See Note 1.
Resolution (Std, Dtl, Super Fine)	o	
Halftone	o	
MTF (selectable by service)	x	
Reduction - A3 to A4	o	o
- A3 to B4	o	o
- B4 to A4	O	o
Smoothing (rx) - 200 x 100 to 400 x 400	o	o
- 200 x 200 to 400 x 400	o	o

Communication Features - Automatic	Availability	Default
Scanning and storing during tx or rx	o	
Redialling	o	Four redials
G2, G3 compatibility	o	
Automatic fallback	o	
Confidential/substitute reception	o	Confidential: Not used in W. Germany
Page retransmission from memory	o	

Communication Features - User Selectable	Availability	Default
Auto/Manual reception	o	
On hook dial	x	
Speed Dial	2,000	
Quick Dial Keys	50	
Keystroke programs (See Note 2)	50	
Groups	32	
- max no. of addresses/group	200	
- max no. of full tel nos. in all groups	1,020	
Alternative destination	o	(with Quick and Speed Dial only)
Department code	o	
Batch numbering	o	
MMR/EFC disabling option	o	
ECM disabling option	o	(Not available in machines from factory for W. Germany)
Turnaround polling	o	

Continued on the next page

Communication Features - User Selectable (continued)	Availability	Default
Auto-reduction override option	o	
Immediate redial	o	
Auto-answer delay time	x	
Hold	x	
Voice Request	o	
Automatic Voice Message	o	Not used in W. Germany

Communication Features - Service Selectable	Availability	Default
Closed network	o	x
MV1200 compatibility	x	
Short preamble	o	x
Well log (tx)	o	x
Protection against bad connections	x	
E F C	o	Tx - on, Rx - on
PSTN access through PBX	o	x
Polling ID code security	x	
ECM	o	o
Operator restriction by department code	o	x
Resol'n stepdown override option	x	
Conf'l password override option	o	

Special Communication Features	Availability	Default
Transmission from memory	o	
- immediate	o	
- send later	o	
- max no. of addresses/file	200	
- max no. of files	500	
- max no. of addresses over all files	1,020	See Note 3 (p. 1-13).
Send Later	o	
Confidential Transmission	o	Not used in W. Germany
- immediate	o	Not used in W. Germany
- send later	o	Not used in W. Germany
- broadcasting	o	Not used in W. Germany
- remote password override	o	Not used in W. Germany
Transfer Request	o	Not used in W. Germany
- max no. of broadcasters	200	Not used in W. Germany
- max no. of end receivers	30	Not used in W. Germany
- time designatable	O	Not used in W. Germany
Action as a Transfer Broadcaster	O	Not used in W. Germany
Polling Transmission	O	
- free/secured option	O	
- stored ID override	o	
- from memory	o	
- 1 day/1 polling memory duration option	o	1 day

Continued on the next page

Special Communication Features (Continued)	Availability	Default
Polling Reception	o	
- free/secured option	o	
- stored ID override	o	
- poll later: max no. of files	500	
: max addresses/file	200	
: max addresses overall	1,020	See Note 3 (p. 1-13).
Batch transmission	o	o
Forwarding	o	
Transmission deadline	o	
Notify	x	

Other Features	Availability	Default
Multicopy: max 99 copies/original	o	
Copy mode	o	
User function keys	o	See Note 2.
Dialled tel. number check	o	
Auto note	o	
A3-width transmission	o	
LCD brightness adjustment	o	
Night timer	o	
Printing out a memory file	o	

Reports - Automatic	Availability	Default
Journal (optional)	o	o
Charge Control Report	o	W. Germany/Italy: o, Others: x
Tx Result Report (optional)	o	o
Error Report (optional)	o	x
Transfer Result Report	o	Not used in W. Germany
Mode Change Report	o	W. Germany: o, Others: x
Polling File List	o	
Memory Report (optional)	o	x
Power Failure Report	o	
Polling Result Report (optional)	o	o
Polling Reserve Report (optional)	o	o
Polling Clear Report (optional)	o	o

Reports - User	Availability	Default
Journal	o	
Charge Control Report	o	W. Germany/Italy: o, Others: x
Telephone List (includes Group List)	o	
Polling File List	o	
SAF File List	o	
User Function List	o	
Department Code List	o	
Transmission Status Report	o	
Program List	o	

Reports - Service	Availability	Default
Group 3 Protocol Dump Lists	o	
Auto Service Call	o	
System Parameter List	o	
RAM Address Dump	o	
Hard Disk Dump	o	
Handshake Logging Dump	o	(For G3CCU and SPU)
Error Code Logging Dump	o	
Transmission Status Report	o	
System Data List	o	
Service Monitor Report	o	

User Programming	Availability	Default
Clock	o	
Auto/Manual Rx setting	o	Auto
Tx/Rx page counter display	o	
Sheet feed counter display	o	
Batch number on/off	o	x
Department code on/off	o	x
Speaker volume adjustment	o	

Continued on the next page

User Programming (Continued)	Availability	Default
Automatic Voice Message recording	o	
Automatic Voice Message playback	o	
Automatic Voice Message on/off	o	o
Quick Dial/Group programming	o	
Polling ID code	o	
RTI/TTI/CSI	o	See Note 4.
RTI #2, TTI #2	o	
Direct entry of labels and identifiers	o	
Changing the contents of a file	o	
Polling file clearance	o	
Memory file clearance	o	
Own telephone number	o	
Telephone line type (See Note 4.)	U. K.: o, Others: x	Pulse
TTI on/off	o	o
ECM on/off	o	
Substitute reception on/off	x	
Forwarding	o	
Stamp on/off	o	x
Password	o	
Rx mode switching timer	x	
Master unit counter reset	o	
Keystroke programs	o	

ECM on/off is not available in machines shipped for W. Germany. It can be made available by bit switch adjustment.

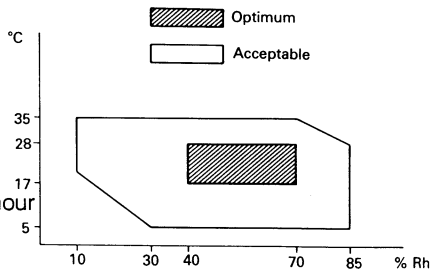
Service Mode and System Tests	Availability	Default
Dedicated Tx Parameters	o	
Printout of all memory files	x	
Bit switches	o	
RAM rewriting - to local fax only	o	
Error code display	o	
Printer status display	o	
Counter check and rewrite	o	
Chequered mark on 1st page on/off	o	o
Number of copies per printout	o	1
Rx fax printout in reverse page order	o	x
Serial number programming	o	
NCU parameters	o	
Modem and DTMF tone tests	o	
Operation panel test	o	
Fluorescent lamp lighting	o	
Back-to-back test	o	
RAM tests	o	
Hard disk tests and maintenance	o	
SPU tests	o	
DCR tests	o	
SPU reset	o	
Printer test patterns	o	
Maximum address limitation	x	
ADF/printer mechanism tests	o	

Notes

1. Contrast can also be selected in halftone mode.
2. The keystroke programs are stored in Quick Dial Keys, so the no. of programmed Quick Dial Keys plus the no. of programs plus the number of user function keys programmed as Quick Dial Keys cannot exceed 50 (user function keys can also be stored as Quick Dial Keys if more than 5 keys are needed).
3. The number of addresses programmed for polling reception and for memory transmission, when combined, cannot exceed 1,020.
4. CSI is a service function in W. Germany. Telephone line type selection is a service mode in all except machines for the U.S.A. and the U. K..

1-3. Installation Requirements

1-3-1. Environment



Temperature range: 17 to 28 degrees C [63 to 82 degrees F]

Humidity range: 40 to 70 %Rh - no condensation

Ventilation: Room air should turn over at least three times per hour

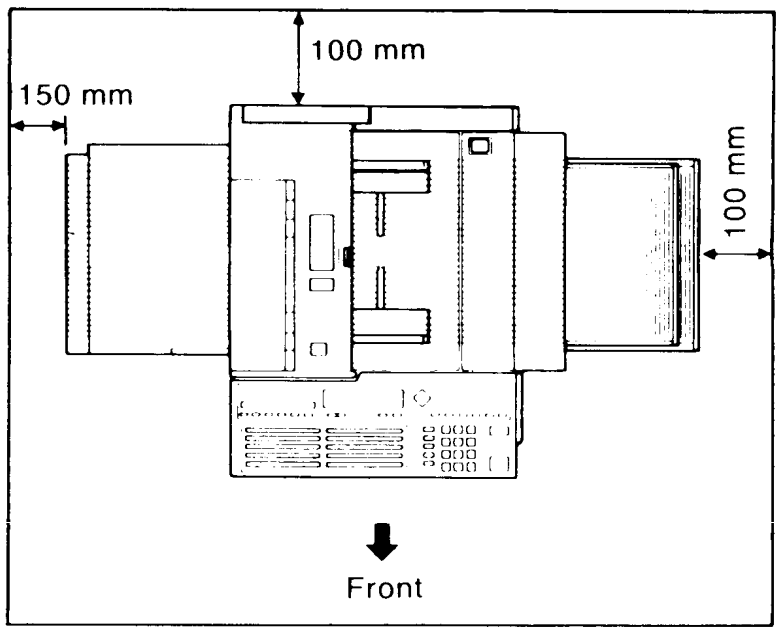
Ambient dust: Less than 0.15 mg/m^3 [4 x 10^{-3} oz/yd^3]

Avoid placing the machine where it will be exposed to corrosive gases.

Place the machine on a strong and level base.

Place the machine where it will be:
- Not subject to direct sunlight
- Not subject to strong vibration
- Condensation free
- Away from other electronic equipment, to avoid interference
- Away from heaters and air conditioners, to avoid sudden temperature changes.

1-3-2. Minimum Space Requirements



1-3-3. Power Requirements

Voltage

- 220 Vac + 22/-33 V, or 240 Vac + 24/-36 V, 50/60 Hz, capable of supplying more than 10 A

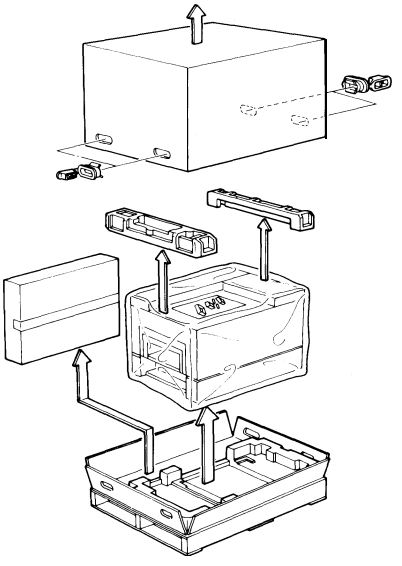
Power Outlet

- Must be properly grounded
- If possible, do not connect other equipment to the same outlet.
- Insert the plug securely.

1-4. Unpacking

1. Remove the packing clips from the carton.
2. Remove the two cushion blocks.
3. Take the accessories box and the machine out of the carton.
4. Open the vinyl envelope and take out the machine.
5. Peel off the packing tapes from the outside of the machine.
6. Inside the machine, remove the packing tapes from the development unit, registration roller, jam removal lever (lower cassette), and the upper and lower paper lift arms.
7. Open the lower front cover and remove the cushion block from inside the lower cassette.
8. Place the machine on a table.

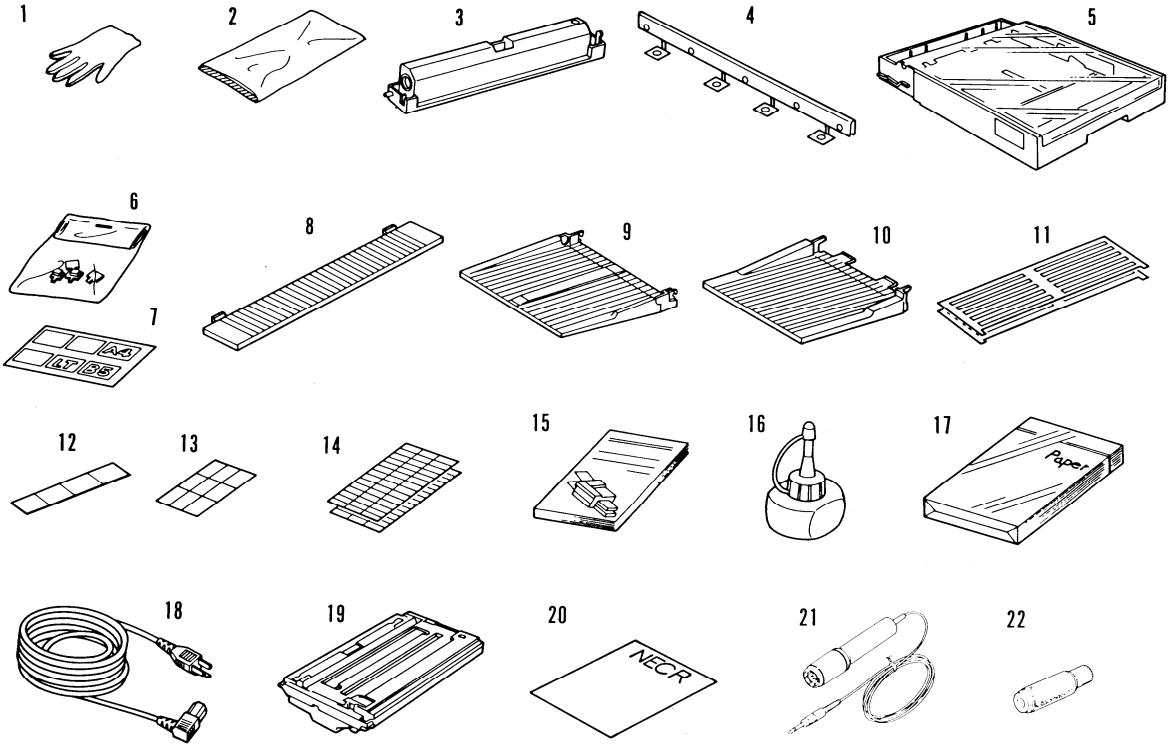
   Caution: The table must be horizontally level within 2 degrees.



1-5. Accessory Check List

Open the accessories box and check that the following items are present.

1. Vinyl Gloves	1 set
2. Plastic Bag	1
3. Toner Cartridges	2
4. Cleaning Pad	1
5. Cassettes (upper and lower)	2
6. Paper Size Actuators	6
7. Paper Size Decals	2 sets
8. Sub-document Table	1
9. Document Tray	1
10. Copy Tray	1
11. Quick Dial Labels	2
12. User Function Key Cards	2
13. User Function Label	1
14. Speed Dial Address Decal	5 pcs
15. Operator's Manual	1
16. Stamp Ink	1
17. Pack of Paper	1
18. Power Cord	1
19. Master Unit	1
20. NECR	1
21. Scanner Pick-up Roller	1
22. Microphone	1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NECR

1-6. Installation Procedure

1-6-1. Master Unit

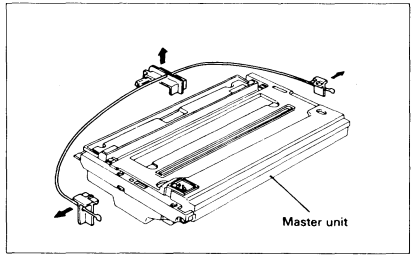
1. Remove the three plastic wedges from the master unit.

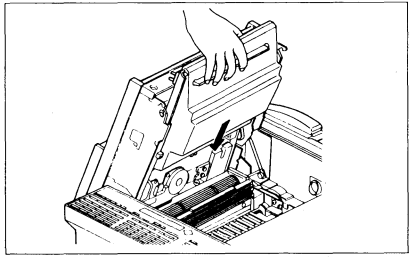
   Caution: Do not remove the green plastic cover.

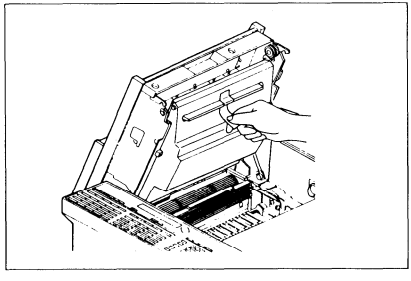
2. Open the upper unit and insert the master unit into the machine with the green plastic cover facing out.

3. Take off the green plastic cover.
   Note: Do not touch the master belt surface (purple sheet), and do not expose it to direct sunlight or bright light.

4. Close the upper unit.

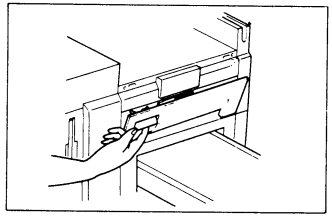


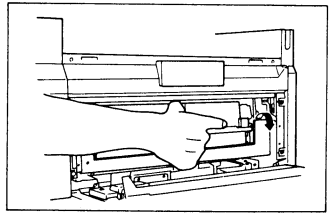


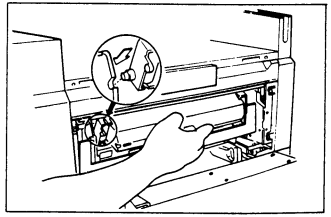


1-6-2. Toner

1. Open the right cover.
2. Shake a toner cartridge well.
3. Remove the cartridge crank from the cartridge.
4. Set the pins on the toner cartridge into the slots on the development unit.
5. Rotate the cartridge up until it snaps into position.







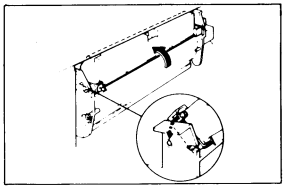
6. Fit the cartridge crank (or winding lever) onto the pin on the bottom left of the cartridge.

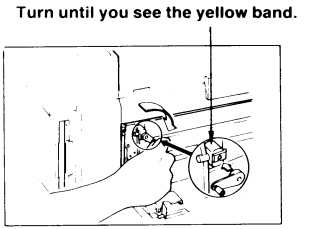
7. Turn the crank (or winding lever) clockwise to strip off the cartridge seal, until you see the yellow band. Then remove the cartridge crank (or winding lever).

   CAUTION: If the yellow band is not showing, the plastic strip could become caught in the toner mixing mechanism, leading to machine damage.

8. Remove the empty toner cartridge and install another (refer to steps 2 to 7). Place the empty cartridge in the disposal bag.
   Note: When adding toner during normal operation, only one cartridge should be replaced.

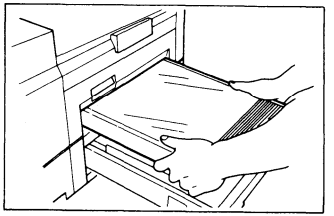
9. Close the right cover.





1-6-3. Cassettes

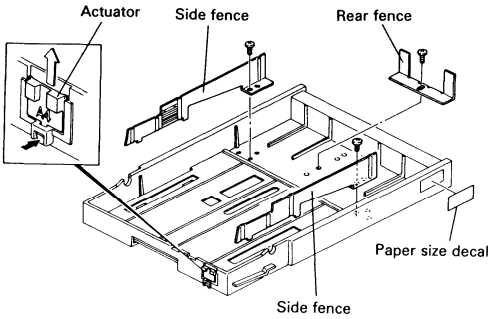
Remove the tape from the trays in the upper and lower cassettes.



Put some copy paper in the cassettes, attach the cassette top covers, and install the cassettes.

Note: The cassettes are set up for Letter-size paper. If the user wishes to use a different paper size than this, modify the cassette(s) as follows.

1. Move the rear and side fences to the appropriate positions.
2. Attach the appropriate paper size decal to the tray.
3. Change the paper size actuator to the appropriate one.
4. Add paper.
5. Attach the top cover.
6. Install the cassette.

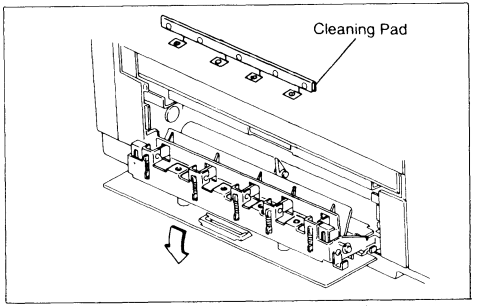


1-6-4. Telephone

1. If you connect a telephone to the rear of the machine, make sure that the type of dialling signal generated by the telephone matches the type of signal that the local exchange accepts (pulse or tone dialing).

1-6-5. Cleaning Pad

1. Open the copy exit cover.
2. Install the cleaning pad (4 screws).
3. Close the copy exit cover.



1-6-6. Other Components

1. Attach the function label.
2. Attach the copy tray.
3. Attach the document tray.

1-6-7. Power Connection

1. Connect the power cord to a supply of the type specified on page 1-16.
2. Voltage must not fluctuate more than the limits specified on page 1-16.
3. Make sure that the plug is firmly inserted into the outlet.
4. A dedicated circuit is recommended.

1-6-8. Hard Disk Initialization

1. Switch the main power on.

   If an error message is displayed at this time, there is a problem with the hard disk. See page 5-70 (Power-up Error Codes).

2. Within 3 seconds of switching the power on, press Function, then *, then #. An error message is displayed. However, there is no problem unless an error code is displayed in the central line of the LCD. If an error message is displayed at this time, there is a problem with the hard disk. See page 5-70 (Power-up Error Codes).

3. Press Function, then *, then # once more.

4. The hard disk troubleshooting menu is displayed. Press 8 then Yes.

5. When ENTER PASSWORD is displayed, enter 1988, then press Yes.

6. When “Initialize System? Y/N” is displayed, press Yes.

7. Enter the bad spot information listed on the decal inside the lower front cover.
   The format of data on the label is shown in the following example:
   CYL HD BYTE
   319 1 8132

   In the above example, press 31918132.

   Press the down arrow on the scroll key to enter the next bad spot.

   If there are no more bad spots, press Yes.

   Note: Bad spots that develop after shipment from the factory and during machine use are automatically discovered and stored in the system RAM when the following conditions occur. Such areas will be avoided when storing messages and parameters to the disk.
   - During formatting, either at installation or at any other time
   - During use, if an error occurs, the machine will avoid the area of the disk that caused the error. In this case, the memory capacity display will read less than 100%, even if there are no fax messages on the hard disk.

8. “Initialize System Y/N’ is displayed again. Press Yes to format the hard disk.

9. After formatting, the machine automatically enters initial programming mode. After doing the initial programming (see section 1-7), press Function to return the machine to standby.

10. Program the CSI (section 1-7-8), telephone line type (section 1-7-10), charge control parameters (section 1-8), serial number (section 2-3-10) and the service station telephone number (section 2-3-6).

1-7. Initial Programming

After installation, the following items should be programmed. They can all be programmed by the user. They can all be programmed in sequence by using Function 81. In this manual, each individual procedure will be explained.

1-7-1. Country Code - Function 81

Program the international dial access code then the country code.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 81.
4. Enter the international dial access code then the country code. For example, enter 00144 (International code = 001, country code = 44).
   To correct a mistake, press Clear (erases the last digit or the cursor digit), or No (erases the entire code).
5. Press Yes to store the displayed codes, then press Function to return the machine to standby mode.

1-7-2. Fax Terminal's Telephone Number - Function 81

If this number is not programmed, Transfer Request is impossible.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 81, then press Yes.
4. Enter the fax terminal's telephone number. Place a pause after the area code, using the Pause key. To correct a mistake, press Clear (erases the last digit or the cursor digit), or No (erases the entire number).
5. Press Yes to store the displayed number, then press Function to return the machine to standby mode.

1-7-3. Transfer Station Number - Function 81

If this machine will be used as the first stage in a two-step transfer operation, the number of the terminal acting as the second stage must be stored here. This function is only used in Group 4 communications.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 81, then press Yes twice.
4. Enter the transfer station number.
   To correct a mistake, press Clear (erases the last digit or the cursor digit), or No (erases the entire number).
5. Press Yes to store the displayed number, then press Function to return the machine to standby mode.

1-7-4. Polling ID Code - Function 82

This four-digit code is necessary for secured polling, closed network communication, and transfer request. All terminals in these types of communications must decide on the same ID code or the communication will fail.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 82.
4. Enter the code. Do not use 0000 or FFFF.
5. Press Yes to store the displayed code, then press Function to return the machine to standby mode.

1-7-5. Confidential ID Code - Function 83

This ID code is used to print confidential messages stored on the hard disk.

This function is not used in W. Germany.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 83.
4. Enter the code.
5. Press Yes to store the displayed code, then press Function to return the machine to standby mode.

1-7-6. RTI #1 and RTI #2 - Function 84

The RTI (Remote Terminal Identification) identifies your terminal at the other end. It is displayed on the operation panel at the other end during communication. RTI #1 will normally be used. However, when you program a number as a Speed Dial or Quick Dial, you can select either RTI #1 or RTI #2 for use when sending to that terminal. Note that if RTI #1 is selected, TTI #1 will also be used, and if RTI #2 is selected, TTI #2 will be used.

Each RTI can have up to 20 characters.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 84.
4. Type in RTI #1. For numbers use the ten-key pad. For letters and punctuation marks, use the Quick Dial keys. For a space, use Quick Dial 27.
   To correct a mistake, press Clear (erases the last letter or the cursor letter), or No (erases the entire name).
5. Press Yes to store the displayed RTI.
6. Type in RTI #2 in the same way, then press Yes to store it.
7. Press Function to return the machine to standby mode.

1-7-7. TTI #1 and TTI #2 - Function 85

The TTI (Transmit Terminal Identification) is another label which identifies you at the other end. It is printed at the other end on the top line of each page that you send. Each TTI can have up to 32 characters.

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222, then enter 85.
3. Either:
   - If RTI #1 can be easily added to or edited to make the TTI #1, then press 2. (Then, if TTI #1 is the same as RTI #1, press Yes and go to step 5.) To edit RTI #1, press 1 then go to step 4.
   - To enter a TTI, press 1 and go to step 4.
4. Enter TTI #1 as explained for RTI #1 (page 1-30). Then press Yes twice to store it.
5. Repeat steps 3 and 4 for TTI #2.
6. Press Function to return the machine to standby mode.

1-7-8. CSI - Function 86 (W. Germany: Service Function 11)

In W. Germany, this is service function 11. The CSI (Called Subscriber Identification) is used instead of the RTI when the machine communicates with another maker's facsimile terminal.

1. Make sure that the machine is in standby mode.
2. W. Germany: Enter the service mode as shown on page 2-18, then enter 11.
   Other areas: Press Function, then enter 80, then enter 2222 then 86.
3. Enter the CSI. It is best to use the fax machine's telephone number.
   To correct a mistake, press Clear (erases the last digit), or No (erases the entire CSI).
4. Press Yes to store the displayed CSI, then press Function to return the machine to standby mode.

1-7-9. Date and Time - Function 87

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 87.
4. Use the left and right arrows of the scroll key to highlight the parts of the display that need changing, and type in the new values at the ten key pad. For the month, press the down arrow on the scroll key until the correct month appears. The time is typed in using the 24 hour format.
5. Press Yes to store the displayed date and time, then press Function to return the machine to standby mode.

1-7-10. Telephone Line Type - Service Function 12 (U. K.: User Function 88)

This must match the dialling method accepted by the local exchange, or the machine will not be able to dial.

1. Make sure that the machine is in standby mode.
2. U.K. and U. S.A.: Press Function, enter 80, then 2222, then 88.
   Other areas: Enter the service mode as shown on page 2-18, then enter 12.
3. Use the left and right arrows of the scroll key to highlight the required setting.
4. Press Function to store the displayed setting and return the machine to standby mode.

1-7-11. Reception Mode - Function 88

Select either Automatic Reception (the machine receives fax messages automatically without intervention by the user) or Manual Reception (the user must be present by the machine when a fax message comes in).

1. Make sure that the machine is in standby mode.
2. Press Function, then enter 80, then enter 2222.
3. Enter 88, then press Yes.
4. Use the left and right arrows of the scroll key to highlight the required setting.
5. Press Function to store the displayed setting and return the machine to standby mode.

1-7-12. Service Station Number - Service Function 04

1. Make sure that the machine is in standby mode.
2. Enter the service mode as shown on page 2-18, then enter 04.
3. Type in the service station telephone number. Press Yes to store the number.
4. Type in the second service station number. Press Yes to store the number.
5. Press Function to return to standby mode.

1-7-13. Serial Number Programming - Service Function 08

1. Make sure that the machine is in standby mode.
2. Enter the service mode as shown on page 2-18, then enter 08.
3. Type in the serial number. Press Yes to store the number.
4. Press Function to return to standby mode.

1-8. Charge Control Parameter Programming

Using charge control, the user can check the cost of each call made with the machine. Charge control is only available on numbers that have been stored using Quick Dial, Speed Dial, Speed Dial # 1, or Speed Dial # 2, and is controlled using option 7 of the option menu for Quick/Speed Dial programming.

Using option 7, the user selects the time per unit cost for a particular charge period (see Charge Control Codes, M to P, below); the user selects the correct value for the address from a menu of values stored by the service technician.

Figures for West Germany and Italy have been programmed in the software. For other areas, a service technician must enter the following values in advance:

- Number of periods in the day having different rates (maximum 4 charge periods)
- Number of zones, in which the charge varies with distance (maximum 7 charge zones)
- Basic charge unit
- The charge periods
- The time per basic charge unit for each zone, during each period

The procedure is as follows.

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 03 at the ten-key pad.

3. When the RAM menu is displayed, press 9. A table of 80 two-digit codes is displayed. An example is shown below.

   0207 302E 3233 2044
   4D00 FFFF 0800 1800

Only two rows (16 codes) are visible at once. More rows in the charge control table can be seen by pressing the down arrow on the cursor key.

4. Press the left and right arrows on the cursor key to highlight the number to be changed.

5. Type in any changes as required. The meanings of the codes are explained after this procedure.

6. Press Yes when all numbers have been entered.

7. Press Function if all service mode operations have been finished.

Charge Control Codes

To illustrate how to program the charge control parameters, let us represent the table of codes in the following manner. Remember that only two rows are visible at once. Following this explanation, an example will be given.

AB	CD	EF	GH
I J	KL	MN	OP
QR	ST	UV	WX
YZ	ab	cd	ef
gh	i j	kl	mn
op	qr	st	uv
wx	yz	*ab*	*cd*
ef	*gh*	*i j*	*kl*
mn	*op*	*qr*	*st*
uv	***wx***	*yz*	$\alpha\beta$

A: This shows the number of different charge periods in the day. For example, if there are only two, enter 02.

B: This shows the number of charge zones. For example, if there are seven zones, enter 07.

C to L: These 10 ASCII codes show the basic charge unit. A table of ASCII codes follows at the end of this section. For example, to enter '0.23 DM' (0.23 German marks), enter 30 2E 32 33 20 44 4D 00 FF FF. '00' is entered at the end, after the 'M' in the example, and 'FF' is added to make the total up to 10 ASCII codes.

M to X: These show the charge periods. Up to four periods can be used. Enter all the periods except one; the missing one is deduced from the three entered periods. For example, if there are two periods, one from 08:00 to 18:00, and the other from 18:00 to 08:00, enter 08 00 18 00 in M, N, O, P, then enter 00 in codes Q to X. The machine will assume that there is another period from 18:00 to 08:00 to fill up the 24 hour day.

Note: When the customer enters the time per basic charge unit for a destination with Quick/Speed Dial option 7, the choices displayed will be based on the period entered in codes M to P. Therefore, in most cases, this should represent the peak rate, or the period in which the machine is most often used. Consult the user about which period to enter here.

The rest of the codes are a table of times allowed per basic charge unit, for each zone, and for each period. The column YZ to *uv* shows the times allowed for calling during the period programmed in codes M to P, for up to 7 zones. These are the values from which the user selects using Quick/Speed Dial option 7.
The column ab to *wx* shows the times per charge unit during the period programmed in codes Q to T, for up to 7 zones. However, if there are only two charge periods, this column will show the times for the period deduced by the machine to fill up the 24 hour day.
The column cd to *yz* shows the times per charge unit during the period programmed in codes U to X, for up to 7 zones. However, if there are only three charge periods, this column will show the times for the period deduced by the machine to fill up the 24 hour day.
The column ef to $\alpha\beta$ shows the times per charge unit during the fourth period, which is deduced by the machine from the other three periods. If there are less than four charge periods, this column is all blank.
The codes are programmed as shown in the following examples: if the value is 3.8 seconds, enter 00 38; if the value is 12 seconds, enter 01 20; if the value is 480 seconds, enter 48 00. Any codes that do not need to be programmed must contain FF.

Example

Number of charge periods: 2
Number of charge zones: 7
Basic charge unit: 0.23 DM (Deutschmarks)
Charge periods: (1) 08:00 to 18:00, (2) 18:00 to 08:00
Times allowed (seconds) in charge period 1 for each zone: 3.8, 10.7, 12, 12, 20, 45, 480
Times allowed (seconds) in charge period 2 for each zone: 3.8, 10.7, 16, 38.6, 38.6, 67.5, 720
The user wishes to see the times allowed for charge period 1 when programming Quick/Speed Dial.

Program the table as follows.

0207	302E	3233	2044
4D00	FFFF	0800	1800
0000	0000	0000	0000
4800	7200	FFFF	FFFF
0450	0675	FFFF	FFFF
0200	0386	FFFF	FFFF
0120	0386	FFFF	FFFF
0120	0160	FFFF	FFFF
0107	0107	FFFF	FFFF
0038	0038	FFFF	FFFF

ASCII Codes

Do not use other codes than listed here, or Japanese characters will appear.

Symbol	Code	Symbol	Code	Symbol	Code	Symbol	Code
Space	20	0	30	@	40	P	50
!	21	1	31	A	41	Q	51
"	22	2	32	B	42	R	52
#	23	3	33	C	43	S	53
$	24	4	34	D	44	T	54
%	25	5	35	E	45	U	55
&	26	6	36	F	46	V	56
'	27	7	37	G	47	W	57
(	28	8	38	H	48	X	58
)	29	9	39	I	49	Y	59
*	2A	:	3A	J	4A	Z	5A
+	2B	;	3B	K	4B	[	5B
Comma	2C	<	3C	L	4C	Yen	5D
-	2D	=	3D	M	4D	]	5D
Full stop	2E	>	3E	N	4E	Inverted v	5E
/	2F	?	3F	O	4F	_	5F

1-9. Transporting the Machine

When moving the machine to a new location, it is important to move the hard disk read/write head back to its shipping position. Do the following procedure.

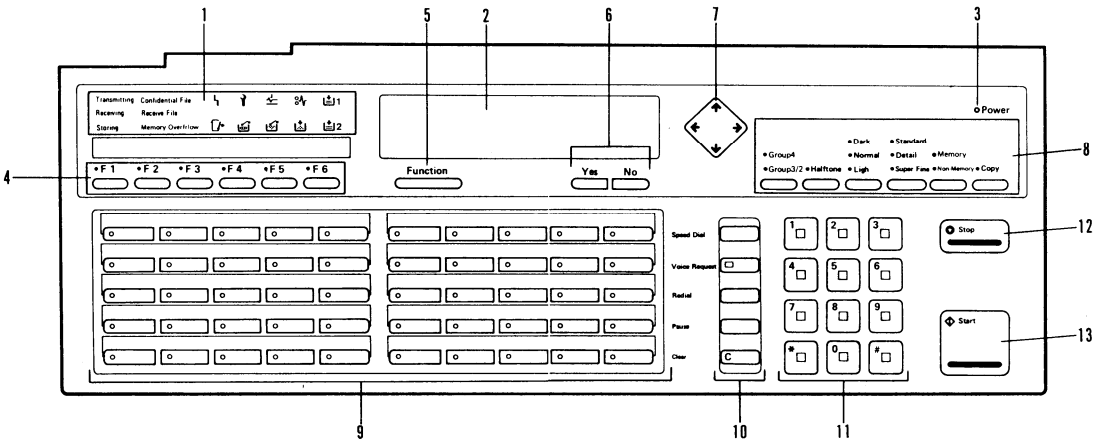
1. Press Function, then enter 80 at the ten-key pad.
2. Enter 1988 then press Yes.
3. Enter 18 at the ten-key pad. The head moves to the shipping position.
4. The display indicates “Please Power Off”. Switch off the power. Do not switch on again until the machine is in its new location. When the power is switched back on, the head will automatically move away from the shipping position.

SECTION 2

PROGRAMMING, TESTING, AND PRINTING REPORTS

SECTION 2. PROGRAMMING, TESTING, AND PRINTING REPORTS

2-1. Operation Panel



1. Indicators

Transmitting Indicator
Lights when the machine is sending a fax message.

Receiving Indicator
Lights when the machine is receiving a fax message.

Storing Indicator
Lights when the machine is storing a fax message to the hard disk.

Confidential File Indicator
Lights when a confidential message has been received.

Receive File Indicator
Lights when a message was received but could not be printed because the printer was out of order (copy jam, no toner, or no paper).

Memory Full Indicator
Blinks when the remaining memory space falls below 5%, and lights when there is no more space on the hard disk.

Line Fail Indicator
Blinks when transmission fails.

Call Service Indicator
Blinks when the machine diagnostics detect a problem that requires service.

Clear Original Indicator
Blinks when a document has jammed in the scanner.

Clear Copy Indicator
Blinks when paper has jammed in the printer.

Add Paper 1 Indicator
Blinks when the upper cassette is almost empty, and lights when it is empty.

Add Paper 2 Indicator
Blinks when the lower cassette is almost empty, and lights when it is empty.

Add Toner Indicator
Blinks when the toner cartridge is almost empty, and lights when it is empty.

Toner Collection Indicator
Blinks when the toner collection tank is almost full, and lights when it is full.

Close Cover Indicator
Blinks when a cover is open.

Replace Master Indicator
Blinks when it is time to replace the master unit.

2. Character Display
Displays prompts, status, warnings, and selected modes.

3. Power Indicator
Lights when the power switch is on and when power is supplied to the machine.

4. User Function Keys
Each of these keys (except F6) can be programmed to execute a function or option during programming or communication. Note that F6 is only used with keystroke programs.

5. Function Key
Press this key to use one of the user or service programming functions, or to return the machine to standby during programming.

6. Yes/No Keys
Use these to answer questions on the character display.

7. Scroll Key
When an arrow is displayed on the character display, use this key to access the options, items, or functions indicated by this arrow. Also use it to shift the cursor when programming or editing an item on the display.

8. Selector Keys

Digital and Analog Indicators and Key
When dialling, press this key to light the indicator that corresponds with the type of network that will be used for dialling. The Digital setting is only available if you have installed the optional G4 interface.

Halftone Indicator and Key
If you are transmitting a photograph, press the key to light the Halftone indicator.

Contrast Indicators and Key
The indicator that is lit shows the contrast that is now selected. Press the key if you wish to change the setting.

Resolution Indicators and Key
The indicator that is lit shows the resolution that is now selected. Press the key if you wish to change the setting.

Memory Indicator and Key
If the indicator is lit, the document will be stored to the hard disk before it is transmitted. If it is not lit, the document will be sent immediately, without being stored. Press the key if you wish to change the setting.

Copy Key
Press this key to copy the page(s) now in the feeder. You can do this to check whether your contrast, resolution, and halftone settings are appropriate.

9. Quick Dial Keys
You can program each of these to dial a number, a group of numbers, or enter a sequence of numbers and settings, with just one touch. You can also use these keys to enter and edit labels, such as the RTI, TTI, and CSI.

10. Keys

Speed Dial Key
Press this when you wish to dial using a Speed Dial Code.

Voice Request/On Hook Dial Indicator and Key
Press this key during fax communication if you wish to talk to the person at the other end on the same call. Also, to make a phone call, press this key then dial on the ten-key pad. There is no need to pick up the handset during dialling.

Pause Key
When entering a telephone number at the ten-key pad, press this key when you need to enter a pause.

Redial Key
Press this key when you wish to redial the last number that was dialled.

Clear Key
This is used during programming to clear the last character entered, or to clear the character at the cursor, depending on the mode in use.

11. Ten-key Pad
Acts as a telephone keypad. Also used for entering other numbers, such as Speed Dial Codes, depending on the mode in use.

12. Stop Key
Press this to stop the machine during communication and return it to standby.

13. Start Key
Press this to start transmission.

2-2. User Level Programming

2-2-1. Function List

To select a function, press the Function key, then enter the number at the ten key pad. The functions are explained very briefly below. For full details, see the Operator's Manual.

No	Function	Details
10	Function List	This displays a menu of functions 11 to 14.
11	Confidential Transmission	Use this function to send a confidential message. This function is not used in W. Germany.
12	Secured Polling Transmission	Use polling transmission to store a message on the hard disk for another fax terminal to pick up. If this type of polling is used, the other end's Polling ID code must be the same as this machine's.
13	Free Polling Transmission	This is like function 12, except that the Polling ID is not checked.
14	Polling Reception	Use this function to pick up a fax message that has been stored for polling transmission in another terminal.
30	Printing a confidential message	To print the message, enter the password then press Start. Note that if the sender has over-ridden the machine's confidential ID, the message will not be printed. In this case, contact the sender. This function is not used in W. Germany.

No	Function	Details
40	Function List	Displays a list of functions 41 to 45
41	Changing the contents of a stored memory file	Using this function, you can add or remove an address from a memory or polling file, or change the time when the communication is scheduled to start, or you can delete the file altogether. You can also print out the contents of a message that has been stored for polling or memory transmission.
42	Checking stored memory files	Use this to check whether the messages (and polling operations) stored in the memory have been transmitted successfully.
43	Displaying the remaining memory space	Use this to check how much space is remaining on the hard disk.
44	Forwarding a substitute reception	When printer supplies have run out, use this to send any non-confidential receptions on to another fax machine. Dial the number, then press Yes, then Start.
45	Forwarding a confidential reception	This is the same as for function 44, except that this is used for forwarding confidential messages. Before dialling the number, the confidential ID must be entered. This function is not used in W. Germany.

No	Function	Details
50	Function List	Displays a list of functions 51 to 57.
51	Programming Speed Dial	Enter the two-digit code that you wish to program, then press Yes. Press the line selector key to select either Analog or Digital. Enter the number, then press Yes. Press Yes twice more then press No to start to enter another Speed Dial Code.
52	Programming Quick Dial Keys	Press the key that you wish to program, then press Yes. The procedure from this point is the same as for Speed Dial Codes.
53	Programming Groups	Enter the group number that you wish to program, then press Yes. Press the Quick Dial Key that you wish to store the group in (to select this group during dialling, you will press this key). Type in a label for the group, then press Yes. Press 1. Store numbers in the group: first, select the line type (Analog or Digital), then enter the number, then press Yes. Press Function when you have finished with the group.
54	Labelling or Erasing a Keystroke Program	Use this function to label or erase a keystroke program. Press the key that contains the program. To label the program, press 1, type in the label, then press Yes. To erase the program, press 2 then Yes. To store a keystroke program, see page 2-13.

No	Function	Details
55	Programming the User Function Keys	Keys F1 to F5 can be programmed as user function keys. F6 is not programmable; it is used for storing keystroke programs. Quick Dial Keys can also be programmed as user function keys. Press the key that you wish to program, then press Yes. Enter the two-digit code that corresponds to the function that you wish to program into this key (see the Operator's Manual for a full list of codes). Then press Yes.
56	Programming Speed Dial #1	Enter the three-digit code (from 000 to 999) that you wish to program. Then proceed as for Programming Speed Dial (Function 51).
57	Programming Speed Dial #2	Enter the three-digit code (from 000 to 899) that you wish to program. Then proceed as for Programming Speed Dial (Function 51).
60	Function List	Displays a list of functions 61 to 72
61	Printing the Journal	The Journal contains information on the most recent communications. Press Start to print the Journal.
62	Printing the File List Report	This report lists information on all files (polling and memory) still on the hard disk. Press Start to print the report.
63	Printing the Department Code List	This report lists all department codes that have been programmed with function 96.

No	Function	Details
64	Printing the Speed Dial List	This is a list of all telephone numbers stored as Speed Dial Codes.
65	Printing the Quick Dial List	This is a list of all telephone numbers stored as Quick Dial Keys.
66	Printing the Program List	This is a list of all the stored keystroke programs.
67	Printing the Group List	This is a list of all the groups.
68	Printing the Transmission Status Report	This shows information on selected stored memory or polling operations. You can either list information on a particular file, or you can list information on all files stored under a particular department code. Use the scroll key to select the desired method, then type in the file number or department code. Then, press Start.
69	Printing the Speed Dial #1 List	This is a list of all telephone numbers stored as Speed Dial #1 Codes.
70	Printing the Speed Dial #2 List	This is a list of all telephone numbers stored as Speed Dial #2 Codes.
71	Printing the User Function Key List	This is a list of all the user function keys that have been programmed.
72	Printing the Charge Control Report	This lists the calls made by the machine and the line charges.

No	Function	Details
80	Entering initial setting mode	See page 1-27 for details.
81	Storing the country code, fax terminal's own telephone number, and transfer station number	See pages 1-27 and 1-28 for details. You can also use this function as a starting point for running through all the initial settings.
82	Programming the polling ID code	See page 1-29 for details.
83	Programming the confidential ID code	See page 1-29 for details. This function is not used in W. Germany.
84	Programming the RTI #1 and RTI #2	See page 1-30 for details.
85	Programming the TTI #1 and TTI #2	See page 1-31 for details.
86	Programming the CSI	See page 1-31 for details. This function is a service mode in W. Germany.
87	Programming the date and time	See page 1-32 for details.

No	Function	Details
88	Programming the reception mode and telephone line type	See page 1-33 for details.
93	Programming the heater on/off timer	This timer controls the on/off timing of the fusing lamp. The user can keep the fusing lamp off when absent; received faxes will be kept on the hard disk. The timer can be programmed differently for each day of the week. Type in the required on and off times for each day. Press # to change from AM to PM, or from PM to AM. Press the up arrow on the scroll key to change the day.
94	Switching the heater on/off	After entering this mode, the status of the fusing lamp is changed. This can be used to switch the fusing lamp on to print an urgent message in the middle of the night. If the printer is idle for five minutes at any time after using Function 94 to switch the lamp on, the lamp switches off automatically, or the user can use Function 94 to switch the fusing lamp back off again.
95	Adjusting the speaker volume	First adjust the transmission mode monitor - use the left and right arrows of the scroll key to adjust the volume, and to check the volume, press Start. Press Yes to store the volume. Then repeat the procedure for the voice message monitor.
96	Programming department codes	Enter the department code that you wish to register, then press Yes. Type in the department name, then press Yes.

No	Function	Details
97	Checking the counters	The tx, rx, scan, and print counters are displayed. Press Function after viewing the counters.
98	Storing the voice message, playing back the voice message, and switching voice message on/off	To store a voice message, press 1, pick up the handset, press Start, and speak. Press Stop when you have finished. To play back the voice message, press 2. The current on/off setting is highlighted on the bottom right of the screen. To change the setting, press 3.
99	Master belt rotation counter reset	After installing a new master belt, use this function. Press Yes then Function to reset the counter.

1. Multicopy Mode

You can use the machine to make up to 99 copies of an original.

Place the document in the feeder, press Copy, type in the number of copies that you need, use the scroll key to select the required copy paper size, then press Start.

2. Keystroke Programs

If the user regularly transmits to or polls a particular destination or set of destinations using the same features, a lot of repetitive keypad operation can be saved by storing the settings as a keystroke program.

1. Place a sheet of paper in the feeder (unless you are making a polling reception program).
2. Press F6.
3. Press the key that you wish to store the program in.
4. Select all required settihgs (such as contrast), features (such as Send Later), options (such as ID Transmission), and destinations.
5. Press Start.
6. Press F6 to store the program (or press Stop if there was an error).
7. Remove the paper from the feeder.

2-3. Service Level Functions

2-3-1. Function List

No	Function	Details
01	Bit Switches	Use this function to change a bit switch setting. See page 2-19.
02	CCU	0: G3 test - Use this to test tone generation. See page 2-20. 1: G3 dump 1 - Use this to print a protocol dump list for communication troubleshooting. Forward the printout to Ricoh Technical Services for assistance. See page 2-22. 2: G3 dump 2 - Use this to print a table of recent software commands. Send this list to Ricoh Technical Services if there is a communication problem. See page 2-22. 3: NCU data - Use this to adjust NCU parameters for ringing detection and auto-dialling. See page 2-23.
03	RAM	0: RAM read/write - Use this to display the contents of a RAM address, and to change the data if necessary. This function cannot be used to rewrite remote terminal RAM. See page 2-24. 1: Memory dump - Use this to print a table of RAM address contents. See page 2-25. 2: Hard disk dump - This function is intended to help find problems with missing files. With the help of Ricoh Technical Services, use it to print the contents of a hard disk sector in hex code. This function is unlikely to be practical in the field. See p. 2-26.

Continued on the next page

No	Function	Details
03	RAM (continued)	3: G3 CCU Handshake List - Use this to print a table of software commands that recently passed between the SCU and the G3 CCU. Send this list to Ricoh Technical Services if there is an unsolvable hardware or communication problem. See page 2-27. 4: SPU Handshake List - Use this to print a table of software commands that recently passed between the SCU and the SPU. Send this list to Ricoh Technical Services if there is an unsolvable hardware problem. See page 2-27. 5: Error Code Logging - Send this list to Ricoh Technical Services if the machine is defective and cannot be repaired. See page 2-28. 6: Multicopy - Use this to determine how many copies of each received page is printed. See page 2-28. Bit 1 of SCU bit switch 18 must be set to 1 for this feature to work. 7: Counter Check - Use this to check and/or alter the Toner End, Toner Full, and Master counters. See page 2-29. 9: Charge Control - Use this to enter charge control parameters. See section 1-8.
04	Service Station Number	Use this to program the service station number. The machine automatically calls this number when there is an Auto Service Call condition. See page 2-30.
05	Counter Check	Use this to check and/or alter the Scan, Print, Tx, and Rx counters. See page 2-30.
06	Service Monitor Report	This report lists the most recent error codes and gives information on the most recent communications that experienced errors. See page 2-31.

No	Function	Details
07	Parameter List	This report lists information such as bit switch settings and current counter values. See page 2-31.
08	Serial Number	Use this to program the machine's serial number. This number is used by the Auto Service Call administration system. See page 2-32.
09	Tests	0: Printer test patterns. See page 2-32. 1: Scanner - 0: Fluorescent lamp lighting. See page 2-33. - 1: SPU Reset - Use this to reset the machine after clearing an Auto Service Call condition. See p. 2-34 2: Operation panel test - Use this to check the operation of the operation panel LEDs. See page 2-34. 3: RAM test - Use this to test the function of the various RAM chips inside the machine. See page 2-35. Note that the tested RAM will be cleared. 4: DCR test - Use this to test the function of the data compression/reconstruction chips on the SCU. This function does not test the DCR chip on the VPU. See page 2-36. 5: ADF mechanism test - See page 2-36. 6: SPU tests - There are three tests to check motor operation, master home position detection, and charge corona operation. See page 2-37. 7: Hard disk tests - Factory use only. Do not use.
10	Not used	

No	Function	Details
11	Programming the CSI	W. Germany only.
12	Telephone line type selection	See page 1-32 for details.
13	Not used	
14	Printer Status	Use this to display the most recent printer error messages. See page 2-38.
15	Transmission Status Report	This report is similar to the user report of the same name, except that in the service mode, it lists the status of all files on the hard disk. See page 2-40.
16	G4 CCU Parameters	See the service manual for the Group 4 interface kit.
17	System Data List	This report contains software data. Pass this report to Ricoh Technical Services if the machine malfunctions. See page 2-42.
18	Set Hard Disk to Shipping Position	If the machine is to be moved to a new location, do this function to move the hard disk head to the shipping position. See page 1-39.

ENTERING SERVICE MODE

Do the following procedure.

1. Make sure that JP19 is installed on the G3 NCU board.
2. Press Function then enter 80 at the keypad.
3. Enter 1988.
4. Press Yes.

Page 1 of the service mode menu is now displayed.

EXITING SERVICE MODE

After finishing with the service mode, do the following.

1. Press Function to leave service mode and return the machine to standby.
2. Hold down the Stop key for about 10 seconds until the machine resets.
3. Remove JP19 from the G3 NCU if you wish to disable service mode.

2-3-3. Bit Switches - Function 01

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 01 at the ten-key pad.

3. Either:
   - Program SCU bit switches - press 0.
   - Program G3 CCU bit switches - press 1.
   - Go back to the service mode menu - press Yes.

4. Bit switch 01 is displayed. The default settings are on the top line. The current settings are on the bottom line, highlighted. Bit 7 is on the left end and bit 0 is on the right.

   To increment the bit switch number, press the down arrow on the scroll key. To decrement, press the up arrow.

   To change the setting of a bit switch, press the number of that bit on the ten-key pad. For example, to change bit 1, press 1.

5. Either:
   - Program another bit switch of the same type - go to step 4.
   - Program a different type of bit switch or finish programming bit switches - press Yes and go to step 3.

6. Press Function if all service mode operations have been finished.

1. G3 CCU Test Mode

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 02 at the ten-key pad.
3. When the CCU, test menu is displayed, press 0.
4. On the LCD, the highlighted number on the left indicates the tone currently selected. The name of the tone is given in the bottom right corner. Press the down arrow to decrement the number or the up arrow to increment it.
5. When the correct tone is displayed, press Start.
6. When you have finished with the tone, press Stop.
7. Either:
   - Test another tone - go to step 4.
   - Go back to the CCU test menu - press Yes. (Press Yes once more to go back to the service mode menu.)
8. Press Function when all service mode operations have been finished.

A list of the tones and their corresponding three-digit codes follows.

00 Tone 2100 Hz

01 G2 carrier

02 G3 9600 bps

03 V.21 1650 Hz

04 V.21 1850 Hz

05 Tone 462 Hz

06 Tone 1100 Hz

07 Tone 1300 Hz

08 Tone 1650 Hz

09 Tone 1850 Hz

10 G1 carrier

11 G3 2400 bps

12 G3 4800 bps

13 G3 7200 bps

14 DTMF 697 Hz

15 DTMF 770 Hz

16 DTMF 852 Hz

17 DTMF 941 Hz

18 DTMF 1209 Hz

19 DTMF 1336 Hz

20 DTMF 1477 Hz

21 DTMF 1633 Hz

22 ARQ 330 Hz
(Not used)

23 DTMF 0

24 DTMF 1

25 DTMF 2

26 DTMF 3

27 DTMF 4

28 DTMF 5

29 DTM F 6

30 DTMF 7

31 DTMF 8

32 DTMF 9

33 DTMF *

34 DTMF #

35 330 Hz det.
(Not used)

36 Dial Make

37 Dial Break

38 Codec 400 Hz
(Not used)

39 Codec 1 kHz
(Not used)

European Dial Tone
Detection Frequencies

40 GM 370-500

41 UK 320-480

42 ITA 390-470

43 AUS 380-510

44 BEL 405-470

45 DEN 340-510

46 FIN 315-535

47 IRE 200-450

48 NOR 340-510

49 SWE 340-510

50 SWI 340-570

51 NET 80-560

2. G3 Dump List 1

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 02 at the ten-key pad.
3. When the CCU test menu is displayed, press 1.
4. Press Start to print the list. A list of the protocol signals that the machine transmitted and received most recently is printed.

3. G3 Dump List 2

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 02 at the ten-key pad.
3. When the CCU test menu is displayed, press 2.
4. Press Start to print the list. A table of software commands is printed. Pass this list on to Ricoh Technical Services.

4. NCU Parameter Programming

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, press 02.

3. When the CCU test menu is displayed, press 3.

4. The data stored in NCU parameter 1 is displayed. Press the up arrow on the scroll key to increment the parameter number, or press the down arrow to decrement it.

5. When the correct parameter number is displayed, type in the new parameter. Press No if you make a mistake.

6. Either:
   - Program another parameter - go to step 4.
   - Press Yes to return to the CCU test menu. Press Yes again to return to the service mode menu.

7. Press Function if all service mode operations have been finished.

1. RAM Read/Write

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 03 at the ten-key pad.
3. When the RAM menu is displayed, press 0.
4. Type the address that you wish to change. If you make a mistake, retype the address.
5. Press the right arrow on the scroll key to move the cursor to the data.
6. Type in the new data in hexadecimal format.
7. Either:
   - If you want to change data in another address, press the left arrow on the scroll key to move the cursor back to the address - go to step 4.
   - Press Yes to go back to the RAM menu (press Yes once again to go back to the service mode menu).
8. Press Function when all service mode operations have been finished.

2. Memory Dump List

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 03 at the ten-key pad.
3. When the RAM menu is displayed, press 1.
4. Type the first four digits of the start address (the last two digits is always fixed at 00). The cursor automatically moves to the end address.
5. Type in the first four digits of the end address (the last two digits is always fixed at FF).
6. If you made an error, press Yes. Go back to step 3.
7. Press Start. The list is printed and the service mode menu is displayed.
8. Press Function if all service mode operations have been finished.

3. Hard Disk Dump

If there is a missing file on the hard disk or another hard disk problem, and the hard disk maintenance routines did not help, the best thing to do is replace the hard disk, or the SPU or SCU. However, some information can be obtained by making a hard disk dump. To do this requires co-ordination with Ricoh Technical Services. Tell them the following:

- How many files remain on the disk.
- What file numbers are missing
- What other good files remain on the disk (make a File List)

Then in a few days, Ricoh Technical Services should inform which cylinder and block number to enter. Print the report and send it to Ricoh Technical Services for analysis.

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 03 at the ten-key pad.

3. When the RAM menu is displayed, press 2.

4. Enter the cylinder number and block number of interest. If you make an error, press Yes and go to step 3.

5. Press Start. The dump list is printed.

6. Press Function if all service mode operations have been finished.

4. G3 CCU Handshake Logging Dump List

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 03 at the ten-key pad.

3. When the RAM menu is displayed, press 3 then press Start. The list is printed. Pass the list on to Ricoh technical services.

5. SPU Handshake Logging Dump List

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 03 at the ten-key pad.

3. When the RAM menu is displayed, press 4 then press Start. The list is printed. Pass the list on to Ricoh technical services.

6. Error Code Logging Dump List

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 03 at the ten-key pad.
3. When the RAM menu is displayed, press 5.
4. Press Start. The list is printed. Pass the list on to Ricoh technical services.

7. Multicopy

Before using this function set bit 1 of SCU bit switch 18 to 1, and keep it at 1 after the end of programming.

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 03 at the ten-key pad.
3. When the RAM menu is displayed, press 6.
4. Type in the number of copies of each received page that the user wishes to be printed (maximum 19).
5. Press Yes to store the value. The RAM menu is displayed.
6. Press Function if all service mode operations have been finished.

8. Counter Check

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 03 at the ten-key pad.

3. When the RAM menu is displayed, press 7.

4. The Toner End, Toner Full, and Master counters are displayed. They can be changed by typing in the new value at the keypad. Note that the Toner End and Toner Full counters can only be changed if they are not at zero.

   The Toner End counter starts the first time the toner end sensor is activated. The Toner Full counter starts the first time the toner overflow sensor is activated. The Master counter starts at 0 when the counter is reset with user function 99 when a new master unit is installed.

5. Press Yes after viewing the counters. The RAM menu is displayed.

6. Press Function if all service mode operations have been finished.

9. Charge Control

   See section 1-8.

2-3-6. Service Station Number - Function 04

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 04 at the ten-key pad.

3. Type in the service station telephone number. If you make an error, press Clear (erases the last digit) or No (erases the complete number).

4. Press Yes to store the number.

5. Type in the second service station number (this will be dialled if the first one is still busy after all redialling attempts).

6. Press Yes to store the number. The service mode menu will be displayed.

7. Press Function if all service mode operations have been finished.

2-3-7. Counter Check - Function 05

Reset these counters to zero when installing the machine at a new location.

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 05 at the ten-key pad.

3. The Scan, Print, Tx, and Rx counters are displayed. They can be changed by typing in the new value at the keypad.

4. Press Yes after viewing. Then press Function if all service mode operations have been finished.

2-3-8. Service Monitor Report Printing - Function 06

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 06 at the ten-key pad.
3. To print the report, press Start.
4. Press Function if all service mode operations have been finished.

2-3-9. Parameter List Printing - Function 07

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 07 at the ten-key pad.
3. To print the report, press Start.
4. Press Function if all service mode operations have been finished.

2-3-10. Serial Number Programming - Function 08

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 08 at the ten-key pad.
3. The serial number is displayed. If it is correct, go to step 5.
4. If it is not correct, type in the correct one using the ten-key pad (digits) and the Quick Dial keys (letters). If you make a mistake, press Clear (erases last digit only) or No (erases the entire number).
5. Press Yes to store the number.
6. Press Function if all service mode operations have been finished.

2-3-11. Tests - Function 09

1. Printer Tests

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 0.

Continued on the next page

4. A list of options is displayed.

Test pattern -	Press 0 then Start
Thin diagonal lines -	Press 1 then Start
Thick diagonal lines -	Press 2 then Start
All black -	Press 3 then Start
Horizontal and vertical line patterns -	Press 4 then Start

5. Either:
   - Print another pattern - go to step 4.
   - Press Yes to return to the test menu (press Yes once more to return to the service mode menu).

6. Press Function if all service mode operations have been finished.

2. Fluorescent Lamp Lighting

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 1.
4. Press 0 to light the lamps.
5. Press Yes to turn the lamps off again. The test menu is displayed.
6. Press Function if all service mode operations have been finished.

3. SPU Reset

Use this function to reset the machine after clearing an Auto Service Call condition.

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 1.
4. Press 1. The SPU software resets and the machine returns to standby. No data is erased.

4. Operation Panel Test

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 2.
4. The LEDs on the operation panel light up. Press Yes to stop the display. The test mode is displayed.
5. Press Function if all service mode operations have been finished.

5. RAM Test

If the machine software crashes (for example, communication or printing fails even though the mechanisms are in good working order), a RAM may be defective. There are 5 RAM tests, as follows. After testing, the tested RAM is cleared and reset; if the RAM normally contains system parameters, these are loaded back in from the hard disk.

CAUTION: If the MBU RAM is tested, the hard disk bad sector information must be reprogrammed. See "Installation - Hard Disk Initialization" for details. There is no need to reformat the hard disk.

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 09 at the ten-key pad.

3. The test menu is displayed. Press 3.

4. A list of options is displayed.

Line buffer test (SCU) -	Press 0 then Start
Page memory test (SPU) -	Press 1 then Start
System RAM test (MBU) -	Press 2 then Start
FIFO and ECM memory test (G3 CCU) -	Press 3 then Start
Group 4 HDLC frame buffer test (G4 CCU) -	Press 4 then Start

Each test takes up to 2 or 3 minutes. All storage locations in the RAM are tested. At the end of the test, if there were no errors, the system resets and the machine returns to standby mode. If there is a fault, an alarm sounds; press Stop, then replace the defective PCB.

6. DCR Test

Do this test if received images are abnormal (for example, bottom half of the page is missing, skewed printout, missing data, blank page). The type of compression/reconstruction to be tested is selected by bits 6 and 7 of SCU bit switch 15.

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 4.
4. Press Start. Two pages of diagonal stripes should be printed. If the diagonals are disjointed, change the SCU.

   Note: If received images at the other end are still bad, try replacing the VPU.

5. The machine returns to the test menu. Press Function if all service mode operations have been finished.

7. ADF Mechanism Test

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 5.
4. Place a document in the ADF then press Start. The document is fed (and stamped if SCU bit switch 07 bit 1 is at 1).

5. Press Function if all service mode operations have been finished.

8. SPU Test Menu

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 09 at the ten-key pad.
3. The test menu is displayed. Press 6.
4. A list of options is displayed.
   Test the motors (the main motor, tx motor, pentagonal mirror motor, master belt drive motor, and lower paper feed motor are all turned on at the same time) - Press 0 then Start
   Test the charge corona (it will switch on after master home position is detected) - Press 1 then Start
   Test the charge corona (it will switch on a set interval after you press Start; home position detection is not tested) - Press 2 then Start
5. Press Stop to end the test.
6. Either:
   - Do another test - go to step 4.
   - Press Yes to return to the test menu (press Yes once more to return to the service mode menu).
7. Press Function if all service mode operations have been finished.

9. Hard Disk Test

This is for factory use only.

Functions 11 and 12 are explained in section 1-7.

2-3-12. Printer Status - Function 14

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 14 at the ten-key pad.
3. The current errors are displayed. Press the up and down arrows on the scroll key to scroll through the messages.
4. When you have finished, press Yes to return to the service mode menu.
5. Press Function if all service mode operations have been finished.

The error messages are as shown on the next page; a brief explanation follows each one. See Section 5 (Troubleshooting) for details on solving problems.

Message	Explanation
LD_POWER_FAIL	The same as Auto Service Call condition “LD Power Lock Fail”
HEATER_DOWN	The same as Auto Service Call condition “Heater Control Fail”
CHARGER_DOWN	The same as Auto Service Call condition “Charger Current Leak”
HMC_LDS_FAIL	The same as Auto Service Call condition “LDS Handshake Fail”
UIB_HDS_ERR	The same as Auto Service Call condition “UIB Handshake Fail”
LIB_HDS_ERR	The same as Auto Service Call condition “LIB Handshake Fail”
LD_ILOC_FAIL	Error code 9-13
P_DOOR_OPEN	One of the printer covers is open (error code 9-12).
P_FEED_JAM	Error code 9-07
P_PLOT_JAM	Error code 9-08
P_EJECT_JAM	Error code 9-09
PM_LOCK_FAIL	The same as Auto Service Call condition “Polygon Motor Fail”
MM_LOCK_FAIL	The same as Auto Service Call condition “Main Motor Lock Fail”
HP_SENSE_FAIL	The same as Auto Service Call condition “Home Position Fail”
HEATER_NT_RDY	Printing impossible due to a jam, no paper, no toner, night timer in operation, or an Auto Service Call condition
TONER_NREND	The toner is almost used up.
TONER_NRFULL	The toner overflow sensor has been activated.
TONER_END	The toner is all used up (error code 9-10).
TONER_FULL	The toner collection tank must be replaced (error code 9-01).
OBM_OVER	The master belt lifetime counter has run out; the same as Auto Service Call condition “Master Unit Replacement Required”
OBM_NROVER	The master belt lifetime counter has almost run out.
PAPER1_END	The upper cassette ran out of paper.
PAPER1_NREND	The upper cassette almost ran out of paper.
PAPER2_END	The lower cassette ran out of paper.
PAPER2_NREND	The lower cassette almost ran out of paper.

2-3-13. Transmission Status Report - Function 15

1. Enter the service mode. See page 2-18.

2. When the service mode menu is displayed, enter 15 at the ten-key pad.

3. Press Start to print the report. A report of the status of all files on the hard disk is printed. The machine then returns to the service mode menu.

4. Press Function if all service mode operations have been finished.

When this report is printed out in the service mode, two-digit codes may appear in the Remote Terminal Identification (Address) column. Either one or two of these codes may appear; the first code is known as the Job Code, and the second one is called the Job Sub-code. The meaning of these codes is described in the following tables.

Job Code	Definition	Job Sub-code	Definition
01	Report/list output	See the table on the following page.	
02	Video data output	02	Printing the contents of a file (function 42)
		07	Substitute reception printout
		08	Confidential reception printout
		17	Transfer result report printout when acting as a broadcasting station, and when the line to the transfer requester is busy
03	Copy mode	There are no job sub-codes.	
18	Multicopy mode		
19	Test mode	00: DCR test, 01: ADF test	

Job Sub-code	Definition	Job Sub-code	Definition
01	Not used	20	G4CCU system parameter list
02	Department code list	21	Transmission status report (service mode)
03	Service monitor report	22	Polling clear report
04	File list	23	Polling reserve report
05	Journal	24	Hard disk dump list
06	Charge control report (Europe/Asia only)	25	Test pattern
07	Memory report	26	Auto service call transmission
08	Memory transmission report	27	Mode change report
09	Error report	28	Memory transmission report (for failed transmission)
10	Transfer result report	29	Polling reception report, or transmission deadline (TRD) expiry report
11	Power failure report	30	Speed dial #1 list
12	Quick dial list	31	Speed dial #2 list
13	Group list	32	Memory transmission report (for successful transmission)
14	Speed dial list	33	Address label check printout (option when programming Quick or Speed Dial)
15	Program list	34	User function key list
16	RAM dump list	35	Disconnection recovery report (Group 4 only)
17	G4CCU dump list	36	Two-step transfer result report
18	G3CCU dump list	37	System data list
19	System parameter list	38	Polling reception result report

Note: The items denoted by job sub-codes 07, 08, 09, 22, 23, and 29 may be printed on the report in English, instead of the codes themselves.

2-3-14. G4 CCU Parameters - Function 16

See the service manual for the Group 4 interface kit.

2-3-15. System Data List - Function 17

1. Enter the service mode. See page 2-18.
2. When the service mode menu is displayed, enter 17 at the ten-key pad.
3. Press Start to print the report. Pass the report on to Ricoh Technical Services.
4. Press Function if all service mode operations have been finished.

2-3-16. Hard Disk Shipping Position - Function 18

This is only for use when moving the machine to a new location. See section 1-9.

2-3-17. Dedicated Transmission Parameters

Each destination programmed as a Quick Dial Key or Speed Dial Code can be given dedicated parameters (such as tx level) that will override the machine's settings when sending to that address. Consult a senior technician before changing any of these settings.

Each Quick Dial and Speed Dial has a number of switches containing these dedicated parameters. They will be explained after the procedure.

Procedure

1. Set bit 5 of SCU bit switch 21 to 1. See page 2-19 for how to program bit switches. Then press Function to return the machine to standby.

2. Press the Function key, enter 51 (Speed Dial), 52 (Quick Dial), 56 (Speed Dial #1) or 57 (Speed Dial #2) at the keypad.

3. Enter the required Speed Dial Code at the keypad or press the required Quick Dial Key (press No if you entered the wrong code or pressed the wrong key). Then press Yes three times.

4. The option display should now be visible. Press 8 at the keypad to store dedicated tx parameters.

5. The display now shows the settings for switch no. 1. The highlighted zone shows the current settings of tx parameter switch number 1. Bit 7 is at the left end of the display, and bit 0 is at the right.

6. To change the setting of a bit, press the key on the ten key pad that corresponds to that bit. For example, to change bit 3, press 3.

7. If the settings of tx parameter switch number 1 are correct, press the down arrow on the scroll key to move to the next switch.

8. The settings of switch number 2 are now displayed. Change the settings of this and any of the other tx parameter switches as shown in steps 5, 6, and 7.

9. After all parameters for this address have been programmed, press Yes to return to the option display.

10. Press Yes.

11. Either:
    To program parameters for another address, go back to step 3.
    To return to standby, press Function.

12. After finishing programming, set bit 5 of SCU bit switch 21 back to 0.

- Bit Assignment -

Switch number 1

Bits 0 to 4 - Not used

Bits 5 to 7 - Initial modem rate

Bit 7	6	5	Rate (bps)
0	1	0	2400
0	1	1	4800
1	0	0	7200
1	0	1	9600

Continued on the next page

Switch number 2

Bit 0 - ECM transmission 0: Enabled 1: Disabled
Bit 1 - Not used
Bit 2 - Short preamble 0: Enabled 1: Disabled
Bit 3 - Ricoh Group 3 protocol 0: Enabled 1: Disabled
Bit 4 - DIS detection 0: First 1: Second (first DIS is ignored)
Bits 5 and 6 - Not used
Bit 7 - Dedicated Parameters Disable/Enable
0: Disabled - transmissions to this remote terminal will use the parameters specified by the bit switches.
1: Enabled - the dedicated parameters in bytes 1 to 3 will be used.

Switch number 3

Bits 0 to 3 - Tx level

Bit 0	1	2	3	Level(- dB)
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4

and so on until

1	1	1	1	15

Bits 4 and 5 - Cable equalizer

Bit 5	4	dB
0	0	0
0	1	4
1	0	8
1	1	12

Bits 6 and 7 - Not used

2-3-18. Back to Back Test

1. Connect the machine to another fax terminal back to back (connect them directly, without using an exchange or any type of switching device).

2. Set bit 7 of G3CCU bit switch 40 to 1.

3. Place the other fax machine in back to back mode. For example, if it is another FAX7000L, set bit 7 of G3CCU bit switch 40 to 1. See the machine's field service manual for details.

4. Place a document in the feeder of one of the machines and press Start on that machine.

5. Press Start on the other machine.

6. Check that the document is transmitted correctly.

7. Repeat the test, but send the document from the other machine.

8. After testing, reset bit 7 of G3CCU bit switch 40 to 0. Also, reset the other machine to normal operating mode.

Note: There is no need to use a battery to supply line power for the test.

2-3-19. Machine Reset

In most cases, if the system software crashes, the machine can be reset by holding down the Stop key for about 10 seconds. If that does not work, switch power off, wait a few seconds, then switch back on.

2-4. Bit Switches

WARNING
Do not adjust a bit switch that is described as “Not used”, as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other markets, such as Japan.

1. SCU - Factory Settings

The factory settings are shown in hexadecimal format. The first digit gives the settings of bits 7 to 4, with bit 7 as the most significant bit; the second digit gives the settings of bits 3 to 0, with bit 3 as the most significant bit. For example, a setting of 34 means that bits 5, 4, and 2 are set to 1, and the rest are at 0.

Bit Sw.	U. K. Hex	**Germany** Hex	Italy Hex	France Hex	Universal Hex
1	05	05	05	05	05
2	05	05	05	05	05
3	06	06	06	06	06
4	07	07	07	07	07
5	12	12	12	12	12
6	0C	0C	0C	0C	0C
7	00	40	00	00	00
8	00	00	00	00	00
9	40	00	40	40	40
10	07	07	07	07	07

Continued on the next page

Bit Sw.	U. K. Hex	Germany Hex	Italy Hex	France Hex	Universal Hex
11	00	00	00	00	00
12	00	00	00	00	00
13	00	00	00	00	00
14	00	F7	00	00	00
15	00	00	00	00	00
16	20	10	00	00	00
17	00	00	00	00	00
18	00	00	00	00	00
19	46	46	46	46	46
20	35	35	35	35	35
21	00	09	00	00	00
22	00	00	00	00	00
23	02	02	02	02	02
24	00	00	00	00	00
25	00	00	00	00	00
26	06	06	06	06	06
27	00	00	00	00	00
28	04	04	04	04	04
29	03	03	03	03	03
30	00	00	00	00	00
31	34	34	34	34	34
32	01	03	01	01	01

Blt switches 33 to 40: Factory settings are all 0.

SCU Bit Switch 01

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Smoothing of received images	0: Enabled 1: Disabled	If this bit is 0, faxes received in standard or detail mode will be smoothed to super-fine mode.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Maximum document length limit	0: As specified by bit 5 1: No limit	If the user wishes to send very long documents, such as well logs, set this bit to 1. Otherwise, set this bit to 0 and adjust bit 5 to the required setting.
5	Maximum document length limit	0: 600 mm [23.6”] 1: 1200 mm [47.2”]	If a page longer than this setting is scanned, a document jam will occur. This bit is ignored if bit 4 is 1. Note that if manual feed is in use, the limit is taken to be 1,200 mm regardless of the setting of this bit.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
	Contrast threshold level (Darken)		
0 1 2 3	0 0 (0) to 0 0	1 1 (15) 1 1	The threshold value can be between 0 and 15. The most significant bit is bit 3. For example, if bit 3 is 1 and the other bits are 0, the contrast threshold would be 8. Lower thresholds give a darker image.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU Bit Switch 03

BIT	FUNCTION	DATA	COMMENTS
	Contrast threshold level (Normal)		
0 1 2 3	0 0 0 0	1 (0) to 1 (15) 1 1	The threshold value can be between 0 and 15. The most significant bit is bit 3. For example, if bit 3 is 1 and the other bits are 0, the contrast threshold would be 8. Lower thresholds give a darker image.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU Bit Switch 04

BIT	FUNCTION	DATA	COMMENTS
	Contrast threshold level (Lighten)		
0 1 2 3	0 0 0 0	1 (0) to 1 (15) 1 1	The threshold value can be between 0 and 15. The most significant bit is bit 3. For example, if bit 3 is 1 and the other bits are 0, the contrast threshold would be 8. Lower thresholds give a darker image.
4 to 7	Not used		Do not change the factory settings.

BIT	FUNCTION	DATA	COMMENTS
0	Default setting of the auto reduce option	0: On 1: Off	If auto reduce is on, the machine will reduce the data so that it will fit the paper in the remote terminal. If auto reduce is off, the data will not be reduced; data will be lost if the paper is not wide enough. For each transmission, auto reduce can be switched on/off with a user option setting, but after transmission, the setting will always return to the default specified by this bit.
1	Reduction when the received page is longer than the copy paper	0: Enabled 1: Disabled	0: If the received page is shorter than the copy paper by 5 mm, there is no reduction. If it is between 5 mm shorter than and x mm longer than the copy paper, reduction is done by deleting a few lines (x depends on bits 4 to 7 of SCU bit switch 26). If it is more than x mm longer than the copy paper, it is not reduced; however, it is printed on two sheets and treated as specified by the setting of bit 4 of SCU bit switch 05. 1: The data will not be reduced. However, in pages up to x mm longer than the copy paper, the excess portion (x) will not be printed. If it is longer than x mm longer than the copy paper, the page is printed on two sheets and treated in accordance with the setting of bit 4 of SCU bit switch 05. The value of x is determined in accordance with bits 0 to 3 of SCU bit switch 26.
2	Not used		Do not change the factory setting.

Continued on the next page

SCU Bit Switch 05 - Continued

BIT	FUNCTION	DATA	COMMENTS
3	Page separation mark	0: Printed 1: Not printed	0: If a received page has to be printed on two sheets (see bit 1), an "x" inside a small box is printed in the bottom right corner of the first sheet. This helps the user identify pages that have been split up. 1: No mark is printed at the bottom of the first sheet.
4	Repetition of data when the received page is longer than the copy paper	0: Enabled 1: Disabled	0: The bottom 10 mm of the page is repeated at the top of the next page 1: The next page continues from where the first page left off
5	Fusing lamp warm up time	0: Standard 1: Short	0: The fusing lamp is switched off when the machine is in standby mode; this is good for safety and energy conservation. However, a longer warm up time will be needed. 1: The fusing lamp stays at 170°C during standby mode, allowing quick printout.
6	Fusing lamp activation timing	0: Standard 1: Delayed	0: The fusing lamp turns on immediately when any key is pressed. This allows for faster report printing. 1: The fusing lamp turns on only when a ringing signal is detected, the Copy key is pressed, or a report output command is generated. Use this setting if the user complains about noise from the printer fan, as fan usage will be reduced.
7	Night timer	0: Enabled 1: Disabled	If this bit is at 1, the night timer cannot be operated or programmed. This is an FTZ requirement.

BIT	FUNCTION	DATA	COMMENTS
	Resolution default setting		
0	Bit 1 Bit 0	Setting	These bits state the default resolution setting. The machine's resolution returns to this setting when power is switched on and when the machine returns to standby after transmission. If (1, 1) is selected, a) the resolution will always reset to Standard if the power is switched off/on, b) on returning to standby, the resolution will remain at the setting used for the transmission.
1	0 0	Standard	
	0 1	Detail	
	1 0	Super Fine	
	1 1	No default	
	Default resolution setting used for copy mode		
2	Bit 3 Bit 2	Setting	These bits state the resolution used when the user presses the Copy key. The machine will return to the standby default setting after copying. If (1, 1) is selected, on returning to standby, the resolution will remain at the setting used for copying.
3	0 0	Standard	
	0 1	Detail	
	1 0	Super Fine	
	1 1	No default	
	Contrast default setting		
4	Bit 5 Bit 4	Setting	These bits state the default contrast setting. The machine's contrast returns to this setting when power is switched on and when the machine returns to standby after transmission. If (1, 1) is selected, a) the contrast will always reset to Normal if the power is switched off/on, b) on returning to standby, the contrast will remain at the setting used for the transmission.
5	0 0	Normal	
	0 1	Lighten	
	1 0	Darken	
	1 1	No default	

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
	Line type selection default setting		
6	Bit 7 Bit 6	Setting	These bits state the default line type setting. The line type returns to this setting when power is switched on and when the machine returns to standby after transmission. If (1, 1) is selected, a) the setting will always reset to Analog if the power is switched off/on, b) on returning to standby, the setting will remain at the setting used for the transmission. (1, 0) is only available if the G4 kit has been installed.
7	0 0	Analog	
	0 1	Not used	
	1 0	Digital	
	1 1	No default	

BIT	FUNCTION	DATA	COMMENTS
0	Default transmission mode	0: Memory 1: Non-memory (immediate)	This bit determines which setting the machine returns to when power is switched off/on, and when returning to standby at the end of transmission. In memory mode, the message is always stored to the hard disk before transmission. In non-memory mode, it is never stored.
1	Stamp default setting	0: Disabled 1: Enabled	If this bit is 1, the stamp will be enabled when power is switched on, and every page scanned successfully (memory mode) or sent successfully (non-memory mode) will have a small red circle stamped on it. For each transmission, the stamp can be switched on/off with a user option setting, but after scanning/transmission, the setting will always return to the default specified by this bit.
2	Transmission restriction by department code	0: Off 1: On	If this bit is 1, the user must enter a department code to gain access to the machine. The code must have been programmed in advance with Function 96.
3	Free polling	0: Enabled 1: Disabled	In free polling, polling can take place even if Polling ID codes of the communicating machines do not match. If this bit is 1, free polling cannot be used.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
4	Default setting for the time a message remains in memory during polling transmission	0: 24 hours 1: Erased after one transmission	The message for polling transmission is stored to the hard disk. If this bit is 0, it can be polled many times within 24 hours, then the message is erased. If this bit is 1, the message remains on the disk until it has been polled once. For each polling transmission, the setting can be changed with a user option setting, but it will always return to the default specified by this bit.
5	Department code input method if transmission restriction is in use.	0: Keypad or bar code 1: Bar code only	If the user has installed the optional bar code reader, the department code can be entered by scanning the reader across the required bar code. If the bit is 0, the code can be entered by either keypad or bar code reader. If the bit is 1, only the bar code reader can be used.
6	Default setting for the A3 width transmission option	0: Off 1: On	If this bit is 1, A3 width transmission will be enabled when power is switched on. If A3 width transmission is on, scanned A3 fax messages will not be reduced to B4 or A4 before storing; this is useful if the fax at the other end has an A3 printer. For each transmission, A3 width transmission can be switched on/off with a user option setting, but after transmission, the setting will always return to the default specified by this bit.
7	Not used		Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
0	Stamp during copy mode	0: Disabled 1: Enabled	If this bit is 1, a small red circle will be printed at the bottom of each copied original.
1	TTI in copy mode	0: Disabled 1: Enabled	If this bit is 1, the machine's TTI will be printed at the top of each page printed using copy mode.
2	Closed network for transmission	0: Disabled 1: Enabled	0: Transmission will always take place. 1: The machine will not transmit if the other end has a different Polling ID code. Note that if the other end is not a Ricoh machine, closed network may not be reliable.
3	Closed network for reception	0: Disabled 1: Reception	This is similar to bit 2 above, except that it is for reception.
4	Transmission to alternate address	0: Enabled 1: Disabled	Quick Dial Keys and Speed Dial Codes can be programmed with two numbers. The second number is the alternate address. If this bit is 0, the first address is dialled. If the number is busy, the number will be redialled until the maximum number of redial attempts has passed. If the number still cannot be reached, the machine will dial the alternate address. If that address also cannot be reached, it will be redialled until the maximum number of redial attempts has passed, and the machine will return to standby and attempt no more redialling.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
5	Batch transmission	0: Enabled 1: Disabled	With batch transmission, if the machine sends a message from the hard disk to a certain location, any other files waiting to be resent to the same address will be sent out on the same call. Also, if memory transmission is in progress, another message can be sent to the same location on the same call by placing the pages in the feeder, dialling, and pressing Start.
6	Stop key during memory transmission	0: Disabled 1: Enabled	0: The Stop key has no effect during memory transmission. 1: If Stop is pressed during memory transmission, the communication will stop immediately. This has no effect on transfer transmission or if a remote control system is reading from the machine's memory. The Stop key can always be used in non-memory mode.
7	Not used		Do not change the factory setting.

SCU Bit Switch 09

BIT	FUNCTION	DATA	COMMENTS
0	Transmission result report	0: Enabled 1: Disabled	This report is printed after each transmission.
1	Error report	0: Enabled 1: Disabled	This report is printed if there was an error during the communication. It contains an error code if bit 1 of bit switch 10 is 0.
2	Memory report	0: Enabled 1: Disabled	This report is printed after a message has been stored to the hard disk for transmission.
3	Polling reserve report	0: Enabled 1: Disabled	This report is printed after the user has programmed the machine for polling.
4	Polling clear report	0: Enabled 1: Disabled	This report is printed after the machine automatically erases a message for polling transmission (see SCU bit switch 07, bit 4).
5	Polling result report	0: Enabled 1: Disabled	This report is printed after a polling operation has been completed.
6	Mode change report	0: Enabled 1: Disabled	This report is printed when the machine changed the resolution of the message before sending it out. This report is only used in W. Germany.
7	Automatic Journal printout	0: Enabled 1: Disabled	The Journal informs the user about recent communications, including the date, time, duration, other party name, and result. If this bit is 0, it is printed after every 50 communications. If it is 1, the Journal is only printed if the user executes Function 61.

SCU Bit Switch 10

BIT	FUNCTION	DATA	COMMENTS
0	Automatic charge control report output	0: Enabled 1: Disabled	If this bit is at 0, the charge control report is automatically printed out once a month, on a fixed date that is decided by a RAM address setting. If the bit is 1, the report can only be printed by function 72.
1	Error code listing on error reports	0: Enabled 1: Disabled	If this bit is 1, error codes are not printed on error reports, and the user will never see any error codes.
2	Explanation of codes and symbols on the Journal	0: Brief 1: Detailed	0: A few of the codes and symbols used on the Journal are explained at the bottom of the report. 1: A more detailed list is given.
3	Printing of dedicated tx parameters on the Quick Dial and Speed Dial lists	0: Disabled 1: Enabled	If this bit is 1, the dedicated tx parameters for each Quick Dial/Speed Dial will be listed. This is a useful check for service personnel, but this bit should be kept at 0 during normal operation.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Printing of a sample of the stored message on memory, transmission, error, and polling clear reports	0: Enabled 1: Disabled	If this bit is 0, the first few inches of the message are printed at the bottom of the report as a reference for the user.

SCU Bit Switch 11

BIT	FUNCTION	DATA	COMMENTS
0	Addition of '1' before the area code during transfer request	0: No (Japan/Europe) 1: Yes (USA)	If this bit is 1, a '1' is automatically inserted before the area code of transfer broadcaster and end receiver numbers in a transfer request operation.
1	International dial access code for transfer request	0: '0' is added 1: Not included	If this bit is 0, a '0' will be automatically inserted before the area code of end receiver numbers in a transfer request operation, if those stations are inside the same country as the broadcaster. This will be useful, for example, when making a transfer request to a broadcaster and end receivers all located inside the U. K., because area codes start with '0' in the U.K.
2 to 7	Not used		Do not change the factory settings.

SCU Bit Switch 12

BIT	FUNCTION	DATA	COMMENTS
0	Date and time in the TTI	0: Included 1: Not included	If this bit is 0, the date and time of transmission will be printed on pages received at the other end.
1	TTI name in the TTI	0: Included 1: Not included	If this bit is 0, the TTI will be printed on pages received at the other end.
2	Page number in the TTI	0: Included 1: Not included	If this bit is 0, the page number will be printed on pages received at the other end.
3	Auto note in the TTI	0: Included 1: Not included	If this bit is 0, the auto note selected by the user will be printed on pages received at the other end.
4	Department name in the TTI	0: Included 1: Excluded	If this bit is 0 and if a department code was used, the identifying label stored with the department code will be printed on pages received at the other end.
5 6	Distance of TTI from the margin Bit 6 Bit 5 Distance 0 0 Normal (2 cm in from the left) 0 1 2.75 cm in from the left 1 0 3.5 cm in from the left 1 1 4.25 cm in from the left		These bits control the starting position of the TTI from the left margin of the pages printed at the other end.

Continued on the next page.

BIT	FUNCTION	DATA	COMMENTS
7	TTI printing position	0: Superimposed on the page data 1: Printed before the data leading edge	0: The TTI is printed on top the data at the start of the page, so some of the image will not be visible. For normal business letters, this is not usually a problem. 1: If all the image must be visible, use this setting. The TTI will be printed just before the leading edge of the data. Note that this could cause problems if the receiver is a cut paper machine like the FAX7000; the extra length could cause data reduction and/or page separation, so the data would not be an exact reproduction of the original. This bit affects the printed pages at the other end.

SCU Bit Switch 13

BIT	FUNCTION	DATA	COMMENTS
0	TTI letter size	0: Normal 1: Half size	This determines the size of letters in the TTI printed at the other end.
1	Address label inclusion in the TTI	0: Enabled 1: Disabled	If this bit is 0, the address label the user programmed as an option in Quick and Speed Dial programming will be included in the TTI sent to the other end. This address label can take the form of a message up to 8 lines long; it is not the same as the address label that is displayed on the LCD during dialling.
2	File number in the TTI	0: Included 1: Not included	If this bit is 0, the hard disk file number is printed on messages received at the other end. Even if non-memory transmission is used, there will be a file number.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU Bit Switch 14

BIT	FUNCTION	DATA	COMMENTS
0	Transfer request	0: Enabled 1: Disabled	
1	Confidential transmission	0: Enabled 1: Disabled	
2	Action as a transfer broadcaster	0: Enabled 1: Disabled	
3	Transfer request using Speed Dial, Quick Dial, and Groups stored in the transfer broadcaster	0: Enabled 1: Disabled	If this bit is set to 0, the machine can use the Quick Dials, Speed Dials, and Groups stored in the transfer broadcasting terminal when dialling the end receivers. An up-to-date version of the broadcaster's telephone list must be referred to when dialling in this manner.
4	Confidential reception	0: Enabled 1: Disabled	
5	Inclusion of ECM on/off as a user function	0: Yes 1: No	If this bit is 0, ECM can be switched on/off by the user.
6	Voice message storage	0: Enabled 1: Disabled	If this is 1 and if G3 CCU bit switch 11 bit 0 is 1, no voice message can be stored.
7	Minimum voice message length	0: No limit 1: 5 seconds	If this bit is 1, the stored voice message must be longer than 5 seconds, or the machine will not transmit it.

BIT	FUNCTION	DATA	COMMENTS
0 1	Compression method Bit 1 Bit 0 Setting 0 0 MMR, MR, MH, EFC 0 1 MR, MH, EFC 1 0 MR, MH 1 1 MH		In tx mode, these bits determine what compression methods are available. The methods are listed in order of priority; if the other end cannot receive using the highest priority mode (for example, MMR), the machine will step down (for example, to MR). EFC is not used with MMR, or when communicating with another maker's machine. In rx mode, these bits inform the transmitting terminal of the type(s) of coding that the machine is able to receive.
2	Mark in left margin of printout if there was a line error	0: Disabled 1: Enabled	If this bit is 1, a dash is printed in the margin alongside lines that were affected by line errors.
3	Printing of error data if a line error occurs	0: The previous line is repeated 1: The line is printed complete with errors	This bit determines how the machine treats received lines that were affected by line errors.
4	Error counter decrement during G3 reception Valid only if SCU bit switch 17, bit 0, is 0.	0: Enabled 1: Disabled	0: Data errors caused by a noisy line or defective machine are counted. If the count reaches 10, the machine will send RTN to the other end in reply to the post-message command. As 10 good lines cause the count to decrement by 1, RTN will only occur in bad conditions. 1: The counter will not decrement; frequent RTNs may occur. Line error counting is not done if ECM is being used.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
5	Sub scan OR processing of scanned data in memory tx mode	0: Enabled 1: Disabled	0: If the data was stored using Super Fine resolution, and the other end can only print in Detail mode, the data is OR processed. In immediate transmission, this bit is ignored and OR processing is always done to convert Super Fine to Detail if the other end cannot print in Super Fine mode.
	Type of coding used in the DCR test mode		
6 7	Bit 7 6 Type 0 0 MMR 0 1 Not used 1 0 MR 1 1 MH		The settings of these bits determine what type of coding is used for the DCR test (service function 09, mode 4).

SCU Bit Switch 16

BIT	FUNCTION	DATA	COMMENTS
0	Page retransmission	0: Enabled 1: Disabled	0: In memory or in non-memory transmission, if the other end returns a negative receipt signal, the machine will try to resend the page from memory. Page retransmission is not done if ECM is enabled, as ECM is a more efficient retransmission method.
1	Not used		Do not change the factory setting.
2	Not used		Do not change the factory setting.
3	Dialling at the machine's ten-key pad when the handset is off-hook	0: Enabled 1: Disabled	1: Numbers cannot be dialled at the fax machine's built in telephone keypad if the handset connected to the machine is off-hook.
4	Action if Redial is pressed after chain dialling	0: Normal 1: Limited	0: If the Redial key is pressed to redial a destination that was input by chain dialling (using more than one Quick Dial/Speed Dial to dial a destination), the whole chain will be redialled. 1: Only the number stored in the first part of the chain will be redialled. For example, a number could be dialled by pressing three Quick Dial keys; the first key holding the international dial access code, the second holding the country code, and the third the area code and number. If this bit is at 1, only the international dial access code would be redialled.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU Bit Switch 17

BIT	FUNCTION	DATA	COMMENTS
0	Error count method	0: SCU bit switch 15, bit 4 1: SCU bit switch 17, bits 3 to 7	
1	Not used		Do not change the factory setting.
2	Not used		Do not change the factory setting.
3 4	Error threshold Bit 4 3 0 0 0 1 1 0 1 1	Threshold 3/ 6/ 12 4/ 8/ 16 5/ 10/ 20 6/ 12/ 24	If there are more error lines in the received page than the threshold specified by these bits, the page is rejected. The first value given is for Standard resolution, the second is for Detail resolution, and the third is for Super Fine resolution. The error counter is decremented by one every time an error-free line is received.
5 6 7	Error line ratio Bit 7 6 5 0 0 0 0 0 1 0 1 0 0 1 1 1 0 0 1 0 1	Value 5% 6% 7% 8% 9% 10%	The value is the number of error lines divided by the number of total lines, expressed as a percentage.

BIT	FUNCTION	DATA	COMMENTS
0	Reception mode	0: Automatic 1: Manual	This bit determines the default reception mode setting. The reception mode returns to this setting when power is switched off/on. The bit is changed by user function 88.
1	Number of copies of received document	0: One 1: As specified by service function 03, mode 6	This feature allows the machine to print more than one copy of each received document.
2	Communication parameter display	0: Disabled 1: Enabled	If this bit is set to 1, communication modes and the latest protocol signals are displayed on the operation panel LCD. This is a useful aid for troubleshooting. However, this bit must be kept at 0 during normal operation, or the user will not be able to see the other end's RTI on the display. An explanation of the display follows below, starting with an example display.

TRANSMITTING G3N 72 STD A4 MR NFC
T: NSS R: CFR
FILE NO. 0165 PAGE: 1/1

Column 1 (Protocol Mode): G4 (Group 4), G3S (CCITT Group 3), G3N (Ricoh Group 3), or G2 (Group 2)
Column 2 (Modem Rate): 96 (9600 bps), 72 (7200 bps), 48 (4800 bps), 24 (2400 bps)
Column 3 (Resolution): 400 (400 x 400 dpi), 300 (300 x 300 dpi), 200 (200 x 200 dpi), 100 (200 x 100 dpi), SDL (16 x 15.4 l/mm), DTL (8 x 7.7 l/mm), or STD (8 x 3.85 l/mm)
Column 4 (Document Width): A4 (up to 10. 1" wide), B4 (from 10. 1" to 11.7" wide), or A3 (wider than 11.7")
Column 5 (Compression Type): MM (MMR), MR (MR), or MH (MH)
Column 6 (Others): ECM (ECM), NFC (New EFC - no fillbits), EFC (EFC - fillbits added)

BIT	FUNCTION	DATA	COMMENTS
3	Chequered mark	0: Enabled 1: Disabled	If this bit is 0, the machine will print a chequered mark on the top left corner of the first page of every received fax message. This helps the user to separate the messages in the copy tray.
4	Redial mode if a polarity change is detected	0: Only one redial 1: As programmed in the NCU parameter RAM addresses	0: If the machine dials a telephone by mistake, it will detect a polarity change. Then it will only redial once. 1: The machine will redial as programmed in the NCU parameter RAM addresses.
5	Not used		Do not change the factory setting.
6	Printing order of received pages	0: Starting from page 1 1: Printed in reverse order	Most fax machines print the pages in the order that they were received. However, if this bit is 1, the pages are printed from the hard disk in reverse order; the user does not have to reorder the pages after picking them off the copy tray.
7	Not used		Do not change the factory setting.

SCU bit switches 19 and 20 are not used.

SCU Bit Switch 21

BIT	FUNCTION	DATA	COMMENTS
0	FTZ requirements	0: Disabled 1: Enabled	For use in W. Germany only. Do not change the factory setting.
1	Display priority between RTI and CSI	0: RTI 1: CSI	This bit determines whether the remote terminal's RTI or CSI will be displayed on the LCD during communication. If the bit is 0, RTI is given priority over CSI when communicating with a Ricoh machine. RTI is received in the NSF(C) frame. If the bit is 1, CSI will be given priority.
2	Eight-minute close	0: Disabled 1: Enabled	For use in W. Germany.
3	Programming level for CSI	0: User level 1: Service level	Do not change the factory setting.
4	Running a keystroke program	0: Press the program key only 1: Press the program key then press Start	0: When storing a program, enter the destinations, functions and so on, then press the Start key, then F6. 1: When storing a program, enter the destinations, functions and so on, then press F6.

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BIT	FUNCTION	DATA	COMMENTS
5	Dedicated tx parameter programming	0: Disabled 1: Enabled	When this is 1, an extra option (for programming dedicated tx parameters - see page 2-43) appears in the display for programming Quick and Speed Dial (Functions 51, 52, 56, and 57). After programming, reset this bit to 0.
6	Memory read/write	0: Enabled 1: Disabled	When this is 0, a remote control system can read or write RAM data, such as TTI, RTI, and bit switches. The remote control system must know the RAM addresses of this machine to make any changes. If the remote control device can only enter four-digit RAM addresses, then only addresses 240000 to 24FFFF can be changed; for example, to change address 240000, the control system operator must enter 0000. When this bit is 1, all remote control systems are locked out.
7	Recognition of the remote terminal's paper length	0: Unlimited length assumed 1: Limit specified by the other end is recognized.	0: The unit always assumes that the other end has no rx paper length limit (such as in a thermal roll machine), and ignores the paper length limit in the protocol from the other end. 1: Use this setting if the machine frequently sends to machines that use cut paper. For example, if the receiver specifies Letter size in the protocol, but the machine is sending a Legal size page, the machine will send MPS when it has sent a Letter sized length of data. The other end will then feed another sheet of copy paper and the rest of the data will be sent.

SCU Bit Switch 22

BIT	FUNCTION	DATA	COMMENTS
0	Inch-mm conversion in tx mode	0: Disabled 1: Enabled	The data is scanned in dot per inch format to meet Group 4 standards. This bit determines whether to convert the data into dot per mm format for transmission to a Group 3 terminal. If this bit is 0, the data is not converted and the printed copy at the other end is slightly distorted (if the other end is a Group 3 based machine). If this bit is 1, the data will be converted; however, the conversion cuts out dots and lines of data, so the copy quality may be poor. The recommended setting for this bit is 0.
1	Inch-mm conversion in rx mode	0: Disabled 1: Enabled	The printer is designed to operate in dot per inch format, and assumes that each received page is in a dot per inch layout. This is to meet Group 4 standards. However, Group 3 messages are in dot per mm format, so they are slightly distorted when they are printed (if the other end is a Group 3 based machine). This bit determines whether to convert the data from a dot per inch format into a dot per mm format before printing. If this bit is 0, the data is not converted and the printout is a slightly distorted representation of the original. If the bit is 1, the data is converted; however, as dots and lines of data are inserted, the copy may not be a faithful reconstruction of the original.
2 to 7	Not used		Do not change the factory settings.

SCU Bit Switch 23

BIT	FUNCTION	DATA	COMMENTS
0	Transmission over analog networks	0: Enabled 1: Disabled	0: The “Analog” selection is available by pressing the line selection key to light the Analog indicator. 1: The “Analog” selection is not available even if the line selection key is pressed.
1	Not used		Do not change the factory setting.
2	Transmission over digital networks	0: Enabled 1: Disabled	0: The “Digital” selection is available by pressing the line selection key to light the Digital indicator. 1: The “Digital” selection is not available even if the line selection key is pressed. This bit is ineffective if the optional Group 4 interface kit is not installed.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU bit switch 24 is not used.

BIT	FUNCTION	DATA	COMMENTS
0 1	Conditions for substitute reception to take place	Bit 1 Bit 0 Condition 0 0 No conditions 0 1 RTI or CSI must be received 1 0 Polling IDs must match 1 1 Substitute rx is disabled	Substitute reception never takes place if a Call Service condition exists, regardless of the settings of these bits. (1, 1) - Substitute reception is disabled only if the printer was down before reception started. If a printer problem develops during printing, substitute reception will take place, unless a Call Service condition develops.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
	Excess length (x) when bit 1 of SCU bit switch 05 is 1 (reduction disabled)		
0	Bit 3 Bit 2 Bit 1 Bit 0	x (mm)	Refer to bits 1 and 4 of SCU bit switch 05 for a full explanation.
	0 0 0 0	0	
1	0 0 0 1	1	
	0 0 1 0	2	
2			
	to		
3			
	1 1 1 0	14	
	1 1 1 1	15	
	Excess length (x) when bit 1 of SCU bit switch 05 is 0 (reduction enabled)		
4	Bit 7 Bit 6 Bit 5 Bit 4	x (mm)	When reduction is enabled, the machine converts the length of the paper (L) to a value L1 using the following formula:
	0 0 0 0	0	L1 = 16(L - 5)/15.
5	0 0 0 1	1	The excess length (x) is then the length in excess of L1. Typical values of L and L1 (in mm) follow.
	0 0 1 0	2	A5: L = 148, L1 = 152.5
6			B5: L = 182, L1 = 188.8
	to		Letter: L = 279, L1 = 292.3
7			A4: L = 297, L1 = 311.5
	1 1 1 0	14	Legal: L = 356, L1 = 374.4
	1 1 1 1	15	B4: L = 364, L1 = 382.9
	Refer to bits 1 and 4 of SCU bit switch 05 for more on reduction of received pages.		

SCU Bit Switch 27

BIT	FUNCTION	DATA	COMMENTS
0	Standard resolution	0: Enabled 1: Disabled	If this bit is 1, Standard resolution cannot be selected.
1	Detail resolution	0: Enabled 1: Disabled	If this bit is 1, Detail resolution cannot be selected.
2	Super Fine resolution	0: Enabled 1: Disabled	If this bit is 1, Super Fine resolution cannot be selected.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU bit switch 28 is not used.

SCU Bit Switch 29

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Charge control	0: Enabled 1: Disabled	If this bit is 1, charge control functions, such as the charge control report will not operate. The charge control parameter table has been designed for use only in Italy and W. Germany. It cannot be used in areas that have more than 4 charge periods and/or more than 7 charge zones. See Page 1-34 for details.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU bit switch 30 is not used.

BIT	FUNCTION	DATA	COMMENTS
0 1 2	Maintenance interval (Unit = '000 copies)	Bit 2 Bit 1 Bit 0 Interval 0 0 0 7 0 0 1 10 0 1 0 15 0 1 1 20 1 0 0 30 1 0 1 40 1 1 0 60 1 1 1 Never	When the maintenance interval has expired, the machine will send an Auto Service Call report to the service station. The report will contain a message informing the service center that maintenance is due. (1, 1, 1) - No preventive maintenance
3	Inclusion of Replace Master in the Auto Service Call conditions	0: No 1: Yes	If the master belt is to be replaced by the user, set this bit to 0. Otherwise, set this bit to 1; if this bit is 1, the machine will send an Auto Service Call report to the service station whenever the master belt needs replacing.
4	Master unit replacement level	0: Service level 1: User level	If the master belt is to be replaced by the user, set this bit to 1. If this bit is 0, the master belt rotation counter can only be reset (using Function 99) by service personnel. Bits 4 and 5 must be set to the same value, and bit 3 must be the opposite value.
5	Replace Master indicator	0: Disabled 1: Enabled	If the master belt is to be replaced by the user, set this bit to 1. If this bit is 0, the Replace Master indicator will not light up when it is time to replace the master unit. Bits 4 and 5 must be set to the same value, and bit 3 must be the opposite value.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
	Master Belt counter limit (Unit = '000 copies)		
6	Bit 7 Bit 6 Limit 0 0 7 0 1 10 1 0 12 1 1 15		These bits determine the lifetime of the master unit. The master unit will have to be replaced when the master belt rotation counter reaches the value determined by these bits. The counter must then be reset using user function 99.
7			

SCU Bit Switch 32

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	W. German version	0: Disabled 1: Enabled	Set this bit to 1 in machines installed in W. Germany. After 4 consecutive automatic dialling operations, the machine will have to wait for 5 minutes before auto dialling can take place again.
2	Austrian version	0: Disabled 1: Enabled	Set this bit to 1 in machines installed in Austria. 1. When dialling an address, if busy tone, CED, GI, or DIS are not detected and T1 times out, the address cannot be redialled; if the same thing happens for three consecutive addresses, dialling/transmission from the hard disk is disabled (to reset the machine, press Stop when the machine is in standby mode). 2. If a busy tone is received in 10 consecutive dialling attempts, dialling/transmission from memory is disabled (to reset the machine, press Stop when the machine is in standby mode). 3. If a ringback tone and then a busy tone are detected, the machine cannot dial to the same address.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
3	Norwegian version	0: Disabled 1: Enabled	Set this bit to 1 in machines installed in Norway. When dialling an address, if busy tone, CED, GI, or DIS are not detected and T1 times out, the address cannot be redialled.
4	Swiss version	0: Disabled 1: Enabled	Set this bit to 1 in machines installed in Switzerland. After printing a confidential or substitute reception (or a polling reception kept on the hard disk by substitute reception), the message is not cleared from the hard disk. Also, if the power was switched off during memory reception, all data is kept on the hard disk unless less than one page had been received at the time.
5	Denmark version	0: Disabled 1: Enabled	Set this bit to 1 in machines installed in Denmark. If dial tone detection, T1 timeout, or busy tone detection occurs on more than 10 consecutive dialling attempts, automatic dialling will be disabled (manual dialling will still be available).
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

SCU bit switches 33 to 40 are not used.

3. G3 CCU - Factory Settings

Bit Sw.	U. K. Hex	Germany Hex	Italy Hex	France Hex	Universal **Hex**
1	05	05	05	05	05
2	27	27	27	27	27
3	00	00	00	00	00
4	80	80	80	80	80
5	00	02	00	00	00
6	00	00	00	00	00
7	4E	4E	4E	4E	4E
8	00	00	00	00	00
9	00	01	00	00	00
10	44	44	44	44	44
11	80	81	80	80	80
12	00	00	00	00	00
13	00	00	00	00	00
14	00	00	00	00	00
15	02	01	03	00	02

Continued on the next page

Bit Sw.	U. K. Hex	Germany Hex	Italy Hex	France Hex	Universal Hex
16	06	06	06	06	06
17	C0	C0	C0	C0	C0
18	00	00	00	00	00
19	09	06	06	09	06
20	00	00	00	00	00
21	07	37	07	07	07
22	01	01	01	01	01
23	00	00	00	00	00
24	C0	C0	C0	C0	C0
25	00	00	00	00	00
26	09	06	06	09	06
27	00	00	00	00	00
28	07	07	07	07	07
29	01	01	01	01	01
30	00	00	00	00	00
31	01	01	01	01	01
32	9F	9F	9F	9F	9F
33	00	00	00	00	00
34	20	20	20	20	20
35	08	08	08	08	08
36	0F	0F	0F	0F	0F
37	FF	FF	FF	FF	FF
38	00	00	00	00	00
39	00	44	00	00	00
40	00	00	00	00	00

G3 CCU Bit Switch 01

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Group 2	0: Enabled 1: Disabled	Set this bit to 1 during communication tests that require Group 2 to be disabled. Reset the bit to 0 after testing.
2	Not used		Do not change the factory setting.
3	CCITT Group 3	0: Enabled 1: Disabled	Set this bit to 1 during communication tests that require CCITT Group 3 to be disabled. Reset the bit to 0 after testing.
4	Ricoh Group 3	0: Enabled 1: Disabled	Set this bit to 1 during communication tests that require Ricoh Group 3 to be disabled. Reset the bit to 0 after testing.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

G3 CCU Bit Switch 02

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Short preamble	0: Enabled 1: Disabled	This allows communication time between Ricoh machines to be reduced. The pre-frame flag sequence is reduced from 1 s to 0.2 s.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	ECM communication	0: Enabled 1: Disabled	0: ECM will be used if the other end can communicate using ECM. 1: ECM is never used.
7	Not used		Do not change the factory setting.

G3 CCU Bit Switch 03

BIT	FUNCTION	DATA	COMMENTS
0 1	Initial modem rate for transmission (bps) Bit 1 Bit 0 Rate 0 0 9600 0 1 7200 1 0 4800 1 1 2400		These bits set the initial starting modem rate for transmission. The rate may fall back to a slower rate depending on the line condition and the other terminal.
2 3	Initial modem rate for reception (bps) Bit 3 Bit 2 Rate 0 0 9600 0 1 7200 1 0 4800 1 1 2400		The setting of these bits is used to inform the sending machine of the initial starting modem rate that the machine can receive. If 9600 bps presents a problem during rx, use a lower setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6 7	Not used		Do not change the factory settings.

BIT	FUNCTION	DATA	COMMENTS
0 1	Monitor speaker off timing Bit 1 Bit 0 Timing 0 0 After GI/NSF/DIS (tx mode) or GC/NSS/DCS detected (rx mode) 0 1 20 s after start of communication 1 0 At DCN 1 1 At DCN		These bits determine how much of the communication can be heard at the monitor speaker. (1, 0) or (1, 1) may be useful during tests. Bits 2 and 3 determine the types of communication that the monitor speaker operates with.
2 3	Communications for which the speaker is used Bit 2 Bit 3 Type 0 0 Non-memory tx only 0 1 All tx 1 0 Tx and rx 1 1 Speaker off		These bits determine the types of communication for which the monitor speaker can be used. If the setting is (1, 1), the speaker does not operate during communication.
4	Not used		Do not change the factory setting.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
	Monitor speaker volume (dB)		
5	Bit 7 Bit 6 Bit 5 Volume		These bits are changed by user function 95. These bits do not affect the voice message playback volume.
	0 0 0 -25		
6	0 0 1 -18		
	0 1 0 -12		
7	0 1 1 -6		
	1 0 0 0		
	1 0 1 7		
	1 1 0 10		
	1 1 1 13		

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Not used		Do not change the factory setting.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	ECM T5 timer	0: 3 minutes 1: 1 minute	The T5 timer determines how long the machine waits for a multipage signal from the receiver after sending a page. The bit could be set to 1 as a time-saving measure, but it is normally 0 because if the other end is a single buffer machine with a slow I/O rate, more than 1 minute could be needed.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
0 1	Maximum number of attempts to resend a page after sending CTC Bit 1 Bit 0 Setting 0 0 4 0 1 3 1 0 2 1 1 1		After sending a page, the machine waits for the response. If the other end informs (using the PPR signal) that there were errors, the defective part of the data will be resent. The machine can then try to correct the data up to 4 times; the number of times is determined by the setting of these two bits. If the data is still bad, the machine will send CTC or EOR (see bit 2 below).
2	CTC transmission (tx side)	0: Enabled 1: Disabled	This is normally kept at 0. If the bit is 1, EOR is sent instead or CTC. CTC means that the tx side will continue to resend the remaining error data for the page, possibly at a lower data rate (see bit 3 below), although all retries have been made. EOR means that the tx side will stop trying to correct the errors for this page and will go on to the next page.
3	Modem rate fallback using CTC	0: Enabled 1: Disabled	After all attempts to correct errors on a page, the machine can send CTC or EOR (see bit 2 above). If CTC is used, the tx side will continue trying. If this bit is 0, the data will be sent at a lower modem rate. EOR will only be sent if all tries at 2400 bps fail. If this bit is 1, the data will be resent at the original speed. If the page cannot be sent after all retries, the machine will not send CTC or retry. This bit is ignored if bit 2 is 1.

Continued on the next page

BIT	FUNCTION	DATA	COMMENTS
4	Modem rate fallback method used with CTC	0: Ricoh non-standard 1: CCITT standard	0: Ricoh non-standard can be used to transmit to another maker's machine. The modem rate will fall back after CTC sooner than the CCITT standard if the line is very bad, unless the modem rate is already 2400 or 4800 bps. 1: The modem rate will fail back after CTC when the maximum number of attempts to send the page have been made (see bits 0 and 1). If bits 2 or 3 are 1, this bit is ignored.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

G3 CCU Bit Switch 07

BIT	FUNCTION	DATA	COMMENTS
0	Echo counter-measure 1	0: Enabled 1: Disabled	0: If the same frame that was transmitted is received, it is ignored. 1: The machine will hang up if it receives the same signal twice.
1	Echo counter-measure 2	0: Enabled 1: Disabled	0: Frame end flag transmission time is increased by 3 s.
2	Recovery method when a carrier drop cannot be detected after receiving a frame	0: Line fail 1: Expected reply to the frame is transmitted after 1 s	Set this bit to 1 if error code 1100 occurs.
3	Training error tolerance method	0: Ricoh 1: Kalle	This bit determines which of the settings described in bits 4 and 5 below will be used.
4 5	Training error tolerance Bit 5 Bit 4 Ricoh Kalle 0 0 15 14 0 1 10 9 1 0 2 4 1 1 0 1		If the machine detects more errors during training than the number set by these bits, training fails and the machine will send FTT. The data will be resent at a lower rate.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

G3 CCU bit switch 08 is not used.

BIT	FUNCTION	DATA	COMMENTS
0	Fallback on receiving a negative signal (RTN/PIN)	0: No 1: Yes	If this bit is 1, the machine's tx modem rate will fall back in accordance with the settings of bits 6 and 7 below before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
1	Voice request from other end in memory tx mode	0: Ignored 1: Enabled	If this bit is 0, voice requests made by the other end when the machine is transmitting from memory will be ignored. If this bit is 1, the user will be alerted even in memory mode, if G3CCU bit switch 05, bit 1 is set to 0.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4 5	Not used		Do not change the factory settings.
6 7	Number of times RTN/PIN can be received before modem rate fallback Bit 7 Bit 6 Times 0 0 2 0 1 3 1 0 4 1 1 5		These bits determine the maximum number of training attempts that can be made at the same modem rate. When the limit has run out, the machine's modem rate falls back. See bit 0 above.

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1 2	Manual dial mode, pulse dial - minimum interval between the start of each dialled digit	Bit 2 Bit 1 Interval 0 0 2s 0 1 0.5s 1 0 1s 1 1 1.5s	If a digit takes less than this value to dial (for example, if dialling 1), the machine will not dial the next digit until the interval has elapsed, even if the user already pressed the next digit. The Ds relay will not be switched off between digits in such cases, so excessive wear of the relay is saved. If the user complains about the long time between sending out digits in manual dial mode, use a lower value, but try not to set it lower than 1 s, to avoid wear on the Ds relay.
3	DIS detection times	0: 1 1: 2	The machine will send DCS (G3 set-up signal) if it receives DIS. If echoes are frequent, setting this bit to 1 will allow the machine to wait for the second DIS before sending DCS.
4	Echo suppression in V.29 (7200 or 9600 bps) communication	0: Disabled 1: Enabled	If this bit is 1, when the machine is sending a signal to the other end, it ignores incoming signals on the line until it has finished sending the signal.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
0	Automatic voice message	0: Enabled 1: Disabled	If this bit is 0 and a voice message is programmed, the machine will send the voice message if a telephone user calls the machine by mistake. The message can then warn the other end to hang up before it sends the modem tones. This bit changes when the user switches voice message on/off.
1	Not used		Do not change the factory setting.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4 5 6 7	Attenuation for automatic voice message (dB) Bit 7 Bit 6 Bit 5 Bit 4 Attenuation 0 0 0 0 0 0 0 0 1 - 1 to 1 1 1 0 -14 1 1 1 1 -15		These bits determine how much the Tx Hybrid IC (HIC 2) on the G3CCU board attenuates the voice message.

G3 CCU Bit Switch 12

BIT	FUNCTION	DATA	COMMENTS
0			
1	Not used		Do not change the factory setting.
2			
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

G3 CCU bit switches 13 and 14 are not used.

BIT	FUNCTION	DATA	COMMENTS
	Country code		
0	Bit 4 3 2 1 0	Country	Set these bits in accordance with the country of installation.
1	0 0 0 0 1	W. Germany	
2	0 0 0 1 0	U. K./Universal	These bits are automatically copied to G4 CCU bit switch 15 when power is switched on or the Stop key presses for more than 10 seconds, if the G4 interface kit is installed.
3	0 0 0 1 1	Italy	
4	0 0 1 0 0	Austria	
	0 0 1 0 1	Belgium	
	0 0 1 1 0	Denmark	Machines sent to countries other than those on the list opposite will have a country code of 00000. The NCU and autodial parameters will be the same as those for W. Germany, so the parameters must be adjusted to suit local requirements.
	0 0 1 1 1	Finland	
	0 1 0 0 0	Ireland	
	0 1 0 0 1	Norway	
	0 1 0 1 0	Sweden	
	0 1 0 1 1	Switzerland	
	0 1 1 0 0	Portugal	
	0 1 1 0 1	Netherlands	
	0 1 1 1 0	Spain	
	0 1 1 1 1	Israel	
	1 0 0 0 1	U. S. A./Canada	
	1 0 0 1 0	Asia	
	1 0 0 1 1	Japan	
	0 0 0 0 0	France	
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Not used		Do not change the factory setting.

G3 CCU Bit Switch 16 is not used

G3 CCU Bit Switch 17

BIT	FUNCTION	DATA	COMMENTS
0 1	CNG signal transmission	Bit 1 Bit 0 Signal 0 0 1100 Hz 0 1 1300 Hz 1 0 CNG transmission disabled 1 1 1300 Hz for 4 s	These bits determine the type of CNG signal that the machine transmits.
2 3	CED signal transmission	Bit 3 Bit 2 Signal 0 0 2100 Hz 0 1 1650 Hz 1 0 1850 Hz 1 1 CED transmission disabled	These bits determine the type of CED signal that the machine transmits.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6 7	Not used		Do not change the factory settings.

BIT	FUNCTION	DATA	COMMENTS
0 1	Telephone line type Bit 1 Bit 0 Type 0 0 Pulse dial, 10 pps 0 1 Not used 1 0 DTMF 1 1 Not used		These bits determine the type of dialling used by the machine. The bits are changed when the user changes the telephone line type setting with function 81.
2 3	Conditions for going into tx mode Bit 3 Bit 2 Conditions 0 0 Polarity change, 2100 Hz, and NSF detection 0 1 Polarity change detection 1 0 2100 Hz detection 1 1 NSF detection		In some countries, this setting is fixed according to PTT requirements. In countries that have the setting at (0, 0), the other settings can be used to troubleshoot tx problems; if there is a problem going into tx mode, each setting can be tried and the cause determined by a process of elimination.
4 5	Not used		Do not change the factory settings.
6 7	Not used		Do not change the factory settings.

BIT	FUNCTION	DATA	COMMENTS
0	Attenuation for transmitted data (dB)	Bit 3 Bit 2 Bit 1 Bit 0 Attenuation 0 0 0 0 0 1 0 0 0 1 -1 2 to 3 1 1 1 0 -14 1 1 1 1 -15	These bits determine how much the modem attenuates the data signal.
4	Not used		Do not change the factory settings.
5			
6			
7			

BIT	FUNCTION	DATA	COMMENTS
	Cable equalizer for G3 transmission (dB)		
0	Bit 1	Bit 0 dB	Adjust these bits if there is a lot of signal loss because of the length of wire between the modem and the telephone exchange.
	0	0 0	
1	0	1 4	
	1	0 8	
	1	1 12	
	Cable equalizer for G3 reception (dB)		
2	Bit 3	Bit 2 dB	Adjust these bits if there is a lot of signal loss because of the length of wire between the modem and the telephone exchange. The alternative values in square brackets are used if bit 6 of G3CCU bit switch 22 is at 1.
	0	0 0 [16]	
3	0	1 4 [20]	
	1	0 8 [20]	
	1	1 12 [20]	
	Minimum G3 rx signal carrier detection level		
4	Bit 5	Bit 4 dB	Select a higher value if bad lines are often encountered (-33 is the highest value).
	0	0 -43	
5	0	1 -38	
	1	0 -33	
	1	1 -48	
6	Not used		Do not change the factory settings.
7			

BIT	FUNCTION	DATA	COMMENTS
	Cable equalizer for G2 transmission (dB)		
0	Bit 1 Bit 0 dB		Adjust these bits if there is a lot of signal loss because of the length of wire between the modem and the telephone exchange.
	0 0 0		
1	0 1 4		
	1 0 8		
	1 1 12		
	Cable equalizer for G2 reception (dB)		
2	Bit 3 Bit 2 dB		Adjust these bits if there is a lot of signal loss because of the length of wire between the modem and the telephone exchange. The alternative values in square brackets are used if bit 7 of G3CCU bit switch 22 is at 1.
	0 0 0 [16]		
3	0 1 4 [20]		
	1 0 8 [20]		
	1 1 12 [20]		
	Minimum received G2 signal carrier detection level (dB)		
4	Bit 5 Bit 4 dB		Select a higher value if bad lines are often encountered (-33 is the highest value).
	0 0 -43		
5	0 1 -38		
	1 0 -33		
	1 1 -48		

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BIT	FUNCTION	DATA	COMMENTS
	G2 delay equalizer links		
6	Bit 7 Bit 6 Links		If there is a copy quality problem in G2 tx or rx mode, try adjusting these bits. If the other terminal is in the same area, try setting the link number to 0 for that communication. If the other end is a long distance away, try a setting of 2.
	0 0 1		
7	0 1 0		
	1 0 2		
	1 1 2		

G3 CCU Bit Switch 22

BIT	FUNCTION	DATA	COMMENTS
0 1	Printout contrast threshold for received G2 fax messages (Hex)	Bit 1 Bit 0 Hex value 0 0 20 (Medium dark) 0 1 14 (Lightest) 1 0 18 (Medium light) 1 1 28 (Darkest)	Use these bits to adjust the printout black/white threshold level for received G2 fax messages.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	G3 cable equalizer values	0: 0, 4, 8, 12 1: 16, 20, 20, 20	This bit determines which values are available with various settings of bits 2 and 3 of G3CCU bit switch 20.
7	G2 cable equalizer values	0: 0, 4, 8, 12 1: 16, 20, 20, 20	This bit determines which values are available with various settings of bits 2 and 3 of G3CCU bit switch 21.

G3 CCU bit switches 23 to 36 are not used.

Note: Bit 0 of G3 CCU bit switch 31 must be kept at 1.

BIT	FUNCTION	DATA	COMMENTS
	PSTN access number		
0	Access no.	Hex value of bit switch 37	Program this bit switch if the machine is behind a PABX. The access number is the number that the user must dial to get an outside line. If the machine detects the access number at the start of a telephone number, it will connect with the PABX. pause for a few seconds, then dial the number. Example: If the access number for the PABX is 0, the bit switch must be set to F0. To do this, set bits 0 to 3 at 0, and bits 4 to 7 at 1. If there is no PABX, keep all bits at 1.
1	0	F0	
	to	to	
	9	F9	
2			
	00	00	
3	to	to	
	99	99	
4			
5			
6			
7			

BIT	FUNCTION	DATA	COMMENTS
0 1	Dialling method in pulse dial mode Bit 1 Bit 0 Method 0 0 Normal (P = N) 0 1 Oslo (P = 10 - N) 1 0 Sweden (N + 1) 1 1 Not used		P = Number of pulses sent out. N = Number dialled. Do not change the factory settings.
2 3	PSTN access method through PABX Bit 3 Bit 2 Method 0 0 No PABX 0 1 Access code (Loop Start) 1 0 Ground start 1 1 Flash start		Set these bits to match the type of signals accepted by the PABX.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Black line on the image in Group 2 mode	0: Disabled 1: Enabled	If this bit is 0, the black line for synchronization on the left side of the image will not be included.
7	TSI inclusion in the NSS frame	0: Disabled 1: Enabled	Do not change the factory setting.

BIT	FUNCTION	DATA	COMMENTS
0	Line current detection	0: Enabled 1: Disabled	Some countries require line current detection. To enable line current detection, set this bit to 0 then program the RAM addresses containing line current detection parameters.
1	PSTN dial tone detection	0: Enabled 1: Disabled	Some countries require PSTN dial tone detection. To enable PSTN dial tone detection, set this bit to 0 then program the RAM addresses containing PSTN dial tone detection parameters.
2	PABX dial tone detection	0: Enabled 1: Disabled	Some countries require PABX dial tone detection. To enable PABX dial tone detection, set this bit to 0 then program the RAM addresses containing PABX dial tone detection parameters.
3	Busy tone detection	0: Enabled 1: Disabled	Some countries require busy tone detection. To enable busy tone detection, set this bit to 0 then program the RAM addresses containing busy tone detection parameters.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Action if the user presses Stop during manual dialling (with handset)	0: All numbers dialled 1: Dialling stops immediately	0: The machine will dial all numbers entered by the user before Stop was pressed, then transmission will stop. 1: Dialling will stop immediately after the user presses Stop.
7	Not used		Do not change the factory setting.

G3 CCU Bit Switch 40

BIT	FUNCTION	DATA	COMMENTS
0	Not used		Do not change the factory setting.
1	Not used		Do not change the factory setting.
2	Not used		Do not change the factory setting.
3	Not used		Do not change the factory setting.
4	Not used		Do not change the factory setting.
5	Not used		Do not change the factory setting.
6	Not used		Do not change the factory setting.
7	Back-to-back configuration	0: Disabled 1: Enabled	To connect two machines directly, without using an exchange, set this bit to 1, then do the back-to-back test as described in the service mode section. After the test, reset the bit to 0.

No	Description	Formula	Remarks
1	Acceptable ringing signal frequency: Range 1, upper limit, low byte	See Note 1.	
2	Acceptable ringing signal frequency: Range 1, upper limit, high byte	See Note 1.	
3	Acceptable ringing signal frequency: Range 1, lower limit, low byte	See Note 1.	
4	Acceptable ringing signal frequency: Range 1, lower limit, high byte	See Note 1.	
5	Acceptable ringing signal frequency: Range 2, upper limit, low byte	See Note 1.	
6	Acceptable ringing signal frequency: Range 2, upper limit, high byte	See Note 1.	
7	Acceptable ringing signal frequency: Range 2, lower limit, low byte	See Note 1.	
8	Acceptable ringing signal frequency: Range 2, lower limit, high byte	See Note 1.	
9	Number of rings until a call is detected	N [rings]	
10	Minimum required ring length, first limit	See Note 3.	See Note 2.

No.	Description	Formula	Remarks
11	Minimum required ring length, second limit	See Note 3.	See Note 2.
12	Ringing detection, reset time, lower byte	See Note 4.	
13	Ringing detection, reset time, upper byte	See Note 4.	
14	Time between closing the Ds relay and opening the Di relay	N = Time/2 [ms]	See Note 5.
15	Pulse dial relay, break time	N = Time/2 [ms]	See Note 5.
16	Pulse dial relay, make time	N = Time/2 [ms]	See Note 5.
17	Time between the final closure of the Di relay and the opening of the Ds relay	N = Time/2 [ms]	See Note 5.
18	Minimum pause between dialled digits (pulse dial mode)	N = Time/20 [ms]	See Note 5.
19	Time waited when a pause is entered at the operation panel	N = Time/20 [ms]	
20	DTMF tone length	N = Time/2 [ms]	
21	Time between dial digits (DTMF dial mode)	N = Time/2 [ms]	
22	DTMF tone transmission level	Level = -N (dBm)	See Note 6.

Notes

1. Each frequency limit value requires two parameters. The settings of the two parameters (N) are calculated from the required frequency limit value (F) as follows.

   N = FFFF[H] - 500,000/F

   Example: Parameters 1 and 2. The required value (F) is 24 Hz. So:

   N = FFFF[H] - 500,000/24

   = FFFF[H] - 20,833

   20,833 in hexadecimal code is 5161[H], so N = FFFF[H] - 5161[H], = AE9E.
   Therefore, parameter 1 becomes 9E, and parameter 2 becomes AE.

2. The cpu may not detect the first ring until parameter 05 + ringing signal wavelength x (1 to 2.5).

3. If the ringing signal frequency is within range 1, parameter 10 will be used. If the frequency is within range 2, parameter 11 will be used. The parameter (N) is calculated from the required value (T) as follows.

   N = T x Mid-point frequency of the range

   Example: Parameter 10. The required value is 200 ms. So:

   N = 0.2 x 18 = 3.6

   This value is rounded up to obtain 4.

4. The parameter setting (N) is calculated from the desired value (T) as follows.

   N = 50T

   Example: The desired value (T) is 8 seconds.
   Therefore N = 50 x 8 = 400. In hexadecimal code, this is 190[H]. Therefore parameter 12 becomes 90[H] and parameter 13 becomes 01[H].

5. Pulse dial timing parameters (14 to 18) are the values for a dial rate of 10 pps.

6. N must be between 0 and 15.

2-6. Useful RAM Addresses

Redialling

Program the following addresses in hexadecimal code.

Non-memory transmission

Number of redials - RAM address 304050; maximum number of redials = 255
Redial interval - RAM address 304051 (unit = 1 minute); maximum interval = 255 minutes

Memory transmission

Number of redials - RAM address 304052; maximum number of redials = 255
Redial interval - RAM address 304053 (unit = 1 minute); maximum interval = 255 minutes

Charge Control Parameters

These are normally programmed using the procedure described in section 2-7. They can also be programmed by RAM address. The values are stored in addresses 2401E8 to 240237. The order in RAM is the same as the order in the table given in section 2-7.

Charge Control Report Printout Date

If automatic charge control printout is enabled by bit switch (SCU bit switch 10 bit 0 at 0), the report is printed once a month on a certain day.

The date of the next scheduled printout is stored in RAM as follows. Subsequent reports are printed monthly, on the same day of the month as specified in the RAM. To fix the day of output, enter the date for the next required output; subsequent printouts will be automatically made monthly.

30369A - Year (for. example, enter 90 for 1990)
30369B - Month (enter a value from 01 to 12)
30369C - Date (enter a value from 01 to 31)
30369D - Day of the week (enter a value from 01 [Monday] to 07 [Sunday])

CAUTION

Do not select the 31st, 30th, or 29th day of the month for regular report output. The reason is as follows.

For example, if the 31st of August is selected, the report will be printed on the 31st. The next month, September, has no 31st, so the report will be printed on the 30th. Then reports for future months will be printed on the 30th of the month, even if there are 31 days. In February, the report will be printed on the 28th (or 29th), and all reports after that will be printed on the 28th (or 29th until the following February).

Therefore, recommend that the user prints the reports on the 1st day of the month.

SECTION 3

REMOVAL AND REPLACEMENT

SECTION 3. REMOVAL AND REPLACEMENT

IMPORTANT NOTICES

Switch off the machine and disconnect the power cord before doing any of the removal procedures, especially if those procedures involve components in or near the laser diode unit and laser beam path. Laser beams can cause permanent eye damage.

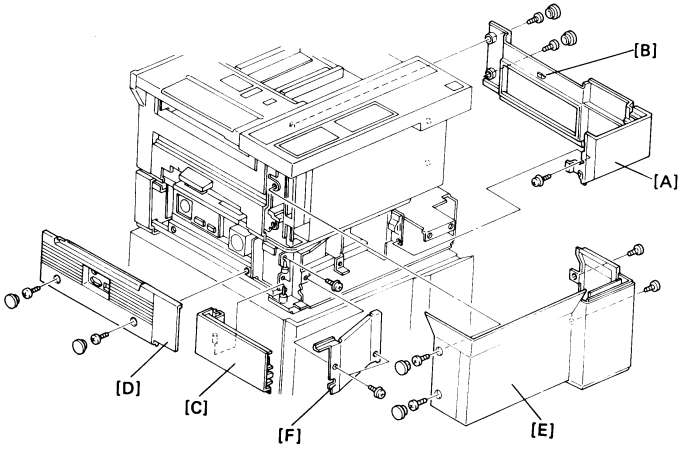
If the MBU is replaced, or the battery switch is accidentally switched off, reprogram the hard disk bad sectors. See “Installation - Hard Disk Initialization” for details.

If the hard disk is replaced, reprogram the bad sectors, using the bad sector information for the new hard disk. Also, format the hard disk. See “Installation - Hard Disk Initialization” for details.
Then instruct the user to reprogram all user functions, such as Quick Dials, Speed Dials, Groups, RTI, TTI, CSI, and voice message.

3-1. Covers

3-1-1. Lower Front Right, Lower Left, and Upper Front Covers

1. Remove the upper and lower cassettes.
2. Open the lower front left cover [C].
3. Remove the lower front right cover [A] (3 screws, 2 rubber plugs). Unhook the cover carefully, taking care not to break hook [B].
4. Open the upper right cover.
5. Remove the upper front cover [E] (4 screws, 2 rubber plugs). Pull the cover straight out, but take care not to tear off the foam from the components on the left side of the machine.
6. Remove the lower left cover [D] (4 screws). Partly close the lower front left cover [C] while easing the cover off.
7. Remove the bracket [F] (2 screws).
8. Remove the lower front left cover [C].



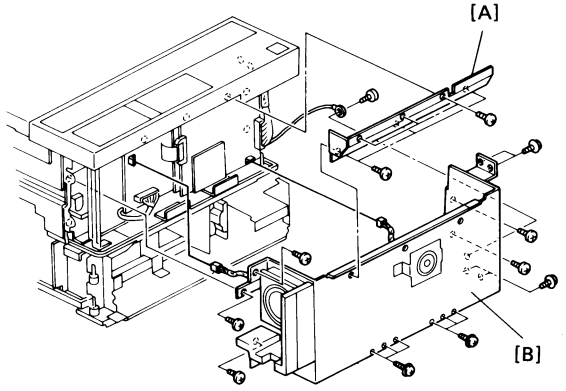
3-1-2. Operation Panel

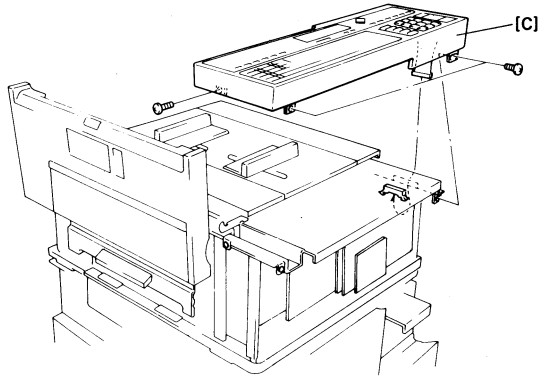
1. Remove the upper front cover (see section 3-1-1).

2. Remove plate [A] (6 screws).

3. Remove the PCB cover [B] (16 screws, unplug the speaker and SPU fan).

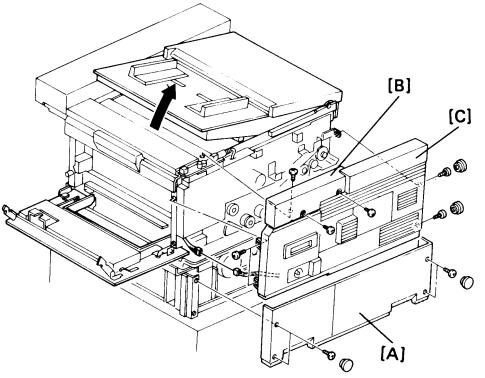
4. Remove the operation panel [C] (4 screws, 2 connectors).





3-1-3. Upper Rear, Lower Rear, and BSRU Covers

1. Access the machine from the rear.
2. Remove the telephone.
3. Remove the lower rear cover [A] (4 screws).
4. Open the right cover and the upper unit.
5. Remove the BSRU cover [B] (3 screws)
6. Remove the upper rear cover [C] (4 screws, 2 connectors, 2 rubber plugs).

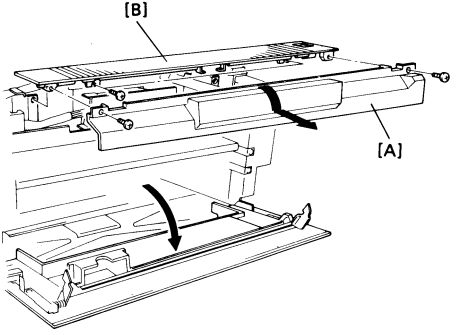


3-1-4. Top Right and Top Covers

1. Take off the sub document table.
2. Remove the top right cover [A] (2 screws). Pull down the handle first then ease off the cover.

Note: Do not break the six hooks on the bottom of the cover.

3. Remove the top cover [B] (loosen 2 screws).



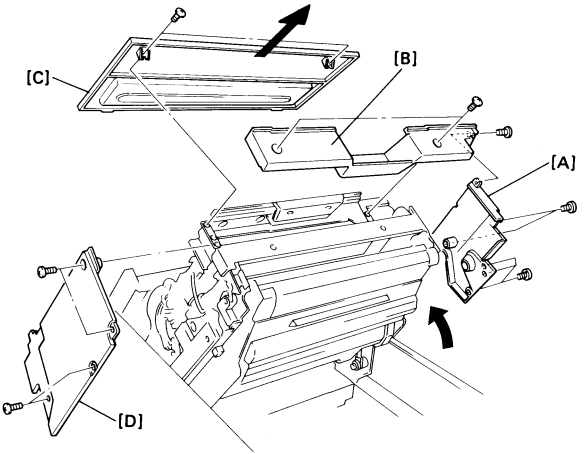
3-1-5. Rear Inner Cover, Right Inner Cover, and Document Table

1. Open the upper unit.

2. Remove the rear inner cover [A] (5 screws).

3. Remove the right inner cover [B] (2 screws).

4. Remove the document table [C] (unhook 4 hooks, remove 2 screws).



3-1-6. Front Inner Cover

1. Open the upper unit.

2. Remove the cover [D] (4 screws).

3-2. ADF and Scanner

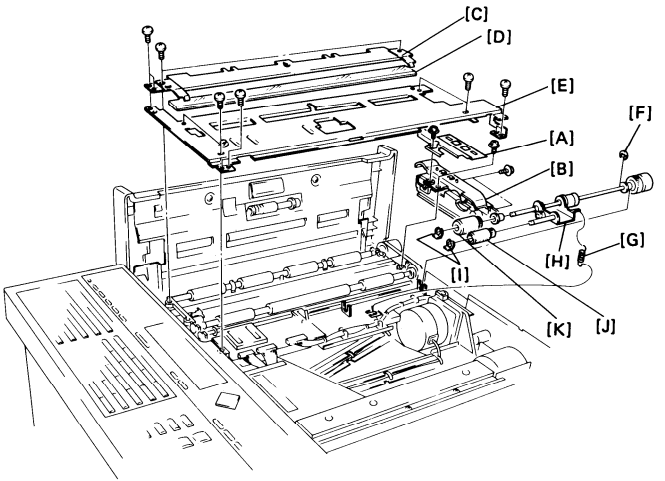
3-2-1. Document Feed and Pick-up Rollers

1. Remove the document table (see p. 3-5).
2. Open the scanner cover.
3. Remove the timing belt cover [A] (1 screw). Slide the cover towards the cassette end of the machine and lift it off.
4. Open the upper unit. Remove the ADF clutch cover [B] (3 screws). Close the upper unit.
5. Remove the left document guide plate [C] (4 screws).
6. Remove the exposure glass [D].

Caution: • Place the exposure glass in a safe place.

• Do not touch the surface of the glass.

• Wipe the glass with a soft dry cloth before replacement.

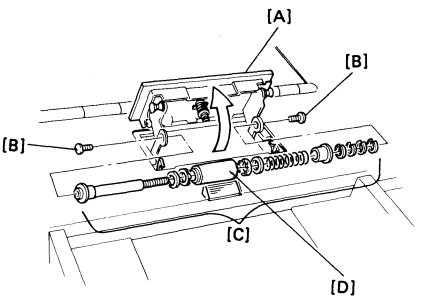


7. Remove the document guide plate [E] (8 screws).

8. Remove E-ring [F], slide the bushing across, remove spring [G], then remove the feed roller unit [H].

9. Remove clips [I] and remove the pick-up [J] and feed [K] rollers.

3-2-2. Document Separation Roller



1. Press the manual feed button to open the manual feed cover [A].

2. Remove 2 screws [B].

3. Remove the separation roller ass'y [C] (2 screws).

4. Remove the separation roller [D].

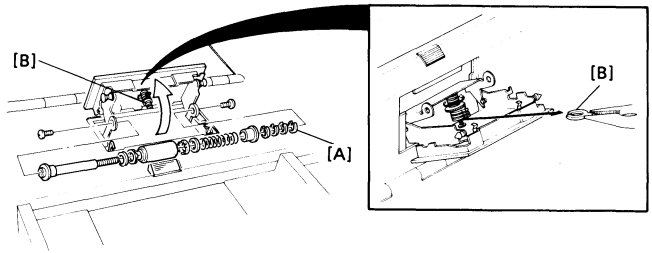
Cautions: • Do not touch the surface of the new roller, or document feed errors will develop sooner than normal.

• Do not replace the roller ass'y the wrong way round.

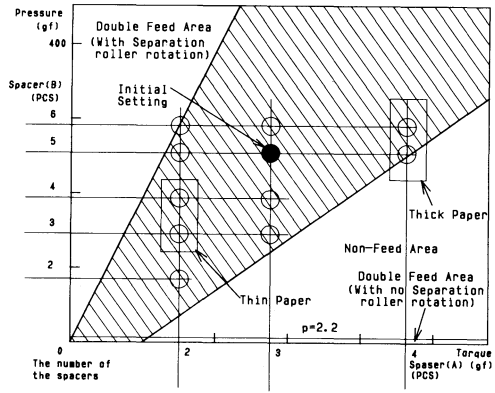
Separation Roller Adjustment

The separation torque and pressure can be adjusted to correct double feed or non-feed problems, or to customize the machine to meet user requirements if non-standard paper types are frequently used as documents.

Adjustment is done by adding or removing spacers [A] for torque, or [B] for pressure.



The machine is factory-set with 5 pressure spacers and 3 torque spacers. Do not use more than 6 pressure spacers or 5 torque spacers. Always keep within the shaded zone on the graph opposite, as close to the center as possible.



If the user uses thinner paper than usual, try to remove spacers (both [A] and [B]).
If the user uses thicker paper than usual, try to add spacers (both [A] and [B]).
Use trial and error until document feed is satisfactory.

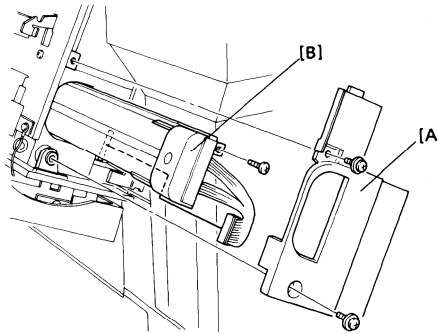
Double feed: Add torque spacers and/or remove pressure spacers.
Non-feed: Add pressure spacers and/or remove torque spacers.

Part Numbers

Torque Spacers [A]:	H0081223
Pressure Spacers [B]:	H0081224

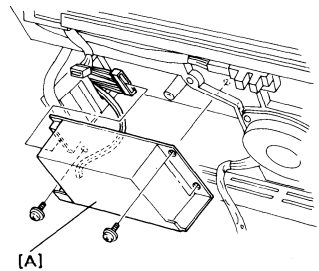
3-2-3. Fluorescent Lamp

1. Remove the document table (see section 3-1-5).
2. Open the scanner cover.
3. Open the upper unit.
4. Remove cover [A] (2 screws).
5. Slide out the lamps [B] (1 screw, 1 connector).



3-24. Fluorescent Lamp Driver

1. Remove the SMDR (see page 3-25).
2. Remove the fluorescent lamp driver [A] (3 screws, 2 connectors).

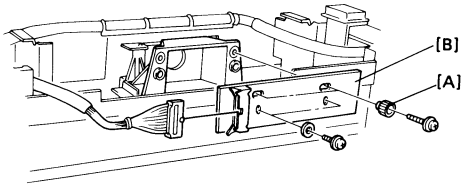


3-2-5. SBU

1. Remove the top cover (see section 3-1-4).

2. Remove the adjustment knobs [A] (1 screw each).

3. Remove the SBU [B] (2 screws, 1 connector).



After installing a new SBU, do the scanner adjustments on the following pages, and make a test copy of a chart before leaving the machine.

- Tools Required -

- Scan line test chart - P/N H0089503
- 200 dpi test pattern - P/N A0129110
- Allen wrench

- Preparation -

1. Remove the top cover (see section 3-1-4).

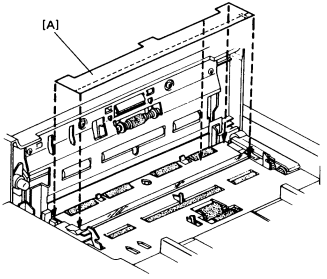
2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal).

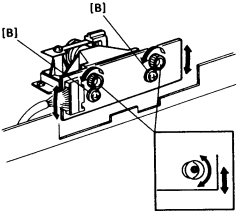
3. Connect the oscilloscope probe to the XVIDEO test point and the ground to the GND test point on the SBU.

4. Clean the white pressure plate with a soft cloth and alcohol.

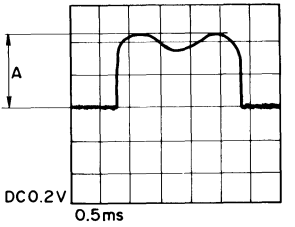
5. Light the fluorescent lamps (see page 2-33).

Step	Item	Procedure
1	Alignment	1. Access the SBU as explained in “Preparation” above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Connect the oscilloscope probe to the XVIDEO test point and the ground to the GND test point. 4. Light the fluorescent lamps (see page 2-33). 5. Place the scan line test chart [A] on the exposure glass as shown. 6. Loosen the SBU securing screws [B]. 7. Turn the adjustment knobs on the SBU until the scanner is aligned. 8. Carefully tighten the SBU securing screws.

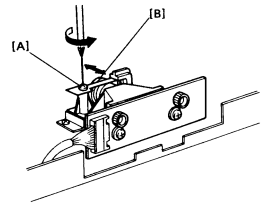


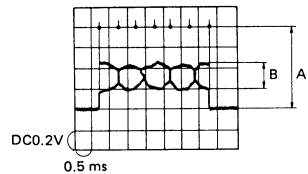


Step	Item	Procedure
2	White Level	In the oscilloscope waveform, A should be about 1.5 V. If it is not, do the following. 1. Access the SBU as explained in "Preparation" above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Connect the oscilloscope probe to XVIDEO and the ground to GND. 4. Light the fluorescent lamps (see page 2-33). 5. Remove any test charts that are on the exposure glass. 6. The white level voltage A should be about 1.5 V. Adjust VR1 if necessary.

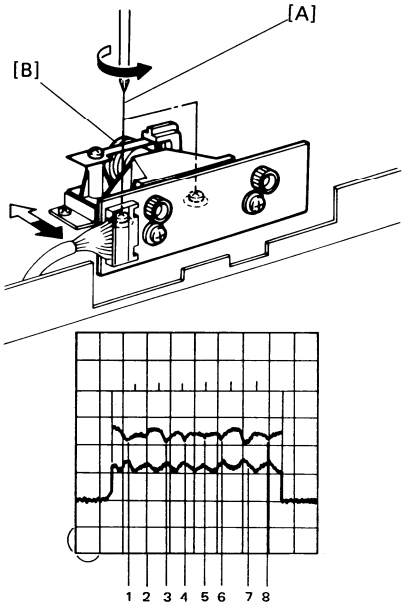


Step	Item	Procedure
3	Check	If the waveform has irregular patches, the lens, mirror, exposure glass, white pressure plate, or CCD may be dirty. If the waveform level is lower at the ends than in the middle, the fluorescent lamps may be wearing out. If the waveform has sharp peaks or dropouts, the CCD may be defective.
4	Focusing	1. Access the SBU as explained in “Preparation” above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Connect the oscilloscope probe to XVIDEO and the ground to GND. 4. Light the fluorescent lamps (see page 2-33). 5. Place the 200 dpi test pattern on the exposure glass. 6. Loosen the lens securing screw [A] (Allen screw). 7. Move the lens block back [B] and forth until B is maximized (see the diagram opposite). B/A must be more than 0.45 in the center and more than 0.3 at each end of the waveform. 8. Tighten the lens securing screw.

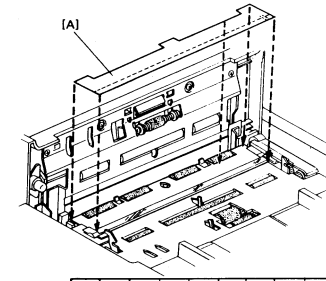


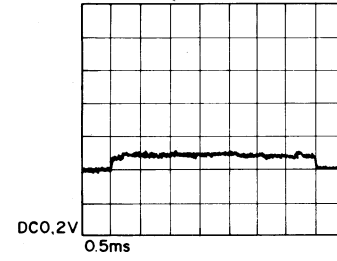


Step	Item	Procedure
5	Reduction Rate	1. Access the SBU as explained in “Preparation” above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Connect the oscilloscope probe to XVIDEO and the ground to GND. 4. Light the fluorescent lamps (see page 2-33). 5. Place the 200 dpi test pattern on the exposure glass. 6. Loosen the lens block securing screws [A]. 7. Move the lens block [B] back and forth until the signal has 8 or fewer crosspoints. 8. Tighten the lens block securing screws. Note: Tighten each screw little by little alternately.

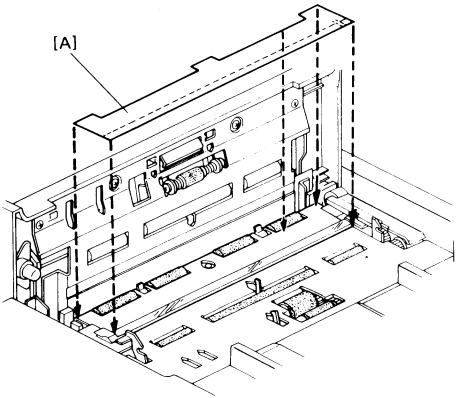


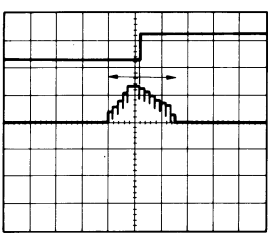
Step	Item	Procedure
6	Scan Line	1. Access the SBU as explained in "Preparation" above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Light the fluorescent lamps (see page 2-33). 4. Connect the oscilloscope probe to XVIDEO and the ground to GND. 5. Place the scan line test chart [A] on the exposure glass as shown. 6. Loosen the SBU securing screws (see procedure 1). 7. Adjust the waveform with the adjusting knobs until the waveform is as shown on the right.



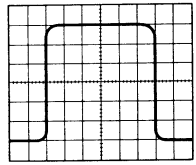


Step	Item	Procedure
7	Scan Start Position	1. Access the SBU as explained in "Preparation" above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. tight the fluorescent lamps. 4. Place the scan line test chart [A] on the exposure glass as shown. 5. Connect the oscilloscope to the test lead as follows: Channel 1 to XVIDEO, channel 2 to SH, ground to GND. 6. Set the oscilloscope scales as follows: Vertical - CH1 0.2 V/unit, CH2 2 V/unit; Horizontal - 2 µs/unit. 7. Gently tap the SBU until the waveform is as shown on the right. The peak of XVIDEO must be within 4 bits of the peak of SH. 8. Reset the oscilloscope to the original settings and repeat procedure 6 (scan line) on the previous page. It may be necessary to recheck procedures 6 and 7 until the scan line is perfectly positioned. 7. Tighten the SBU securing screws.



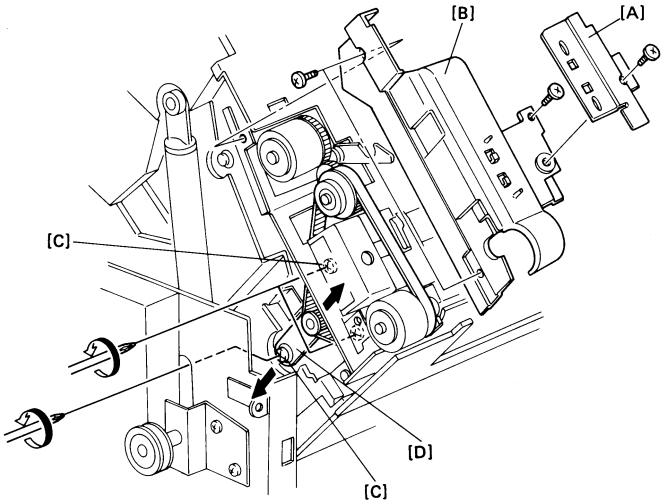


Step	Item	Procedure
8	White Level	1. Access the SBU as explained in "Preparation" above. 2. Set the oscilloscope scale to 0.2 V/unit (vertical) and 0.5 ms/unit (horizontal). 3. Light the fluorescent lamps (see page 2-33). 4. Remove all charts from the scanner and close the scanner cover. 5. Keep the lamps on for more than 2 minutes. 6. Adjust VR1 until the maximum white level is 1.5 Volts.



3-2-6. Tx Motor Timing Belt Adjustment

1. Remove cover [A] (1 screw).
2. Remove cover [B].
3. Loosen both screws [C] on the belt tensioner [D].
4. Push the tensioner until the tension of both belts is acceptable.
5. Tighten both screws [C].
6. Reassemble the machine.



3-3-1. Charge Corona Wire

1. Remove the operation panel (see section 3-1-2).

2. Slide out the master unit.

Caution: • Do not expose the master unit to light.

• Keep it in a shaded place and cover it with paper.

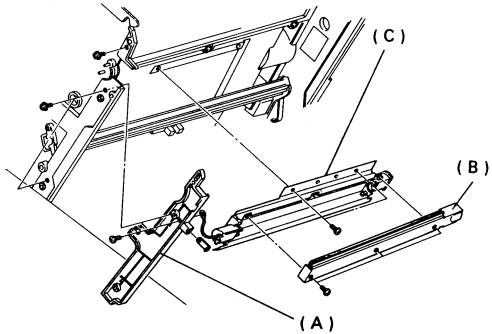
• Do not touch the master belt surface.

3. Remove the gas spring tightener ring.

4. Remove the front inner cover (see section 3-1-6).

5. Remove the front master unit guide rail [A] (3 screws).

6. Remove the ozone duct [B] (3 screws).



7. Remove the charge corona unit [C] (3 screws).

8. When you put back the gas spring tightener ring, the clearance [A] must be 0.2 +/- 0.1 mm (see section 3-11).

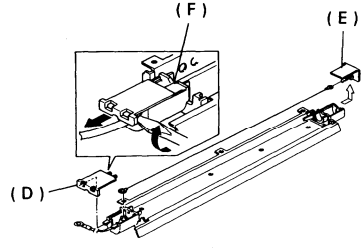
9. Prize off the front endblock cover [D].

10. Carefully slide off the rear endblock cover [E].

11. Unhook the corona wire from the tension spring inside the rear endblock cover.

12. Unhook the corona wire from the screw in the front endblock cover.

Note: Do not remove the screw.



Reassembly:

- Do not touch the new corona wire with your bare hands.
- Hook the new corona wire into the rear endblock first.
- Set the corona wire in the front endblock groove [F].
- After installing both ends of the new wire, test the action of the tension spring.

3-4. Printer - Exposure

WARNING
Switch off the main power before attempting any of the procedures in this section.
Laser beams can seriously damage the eyes.

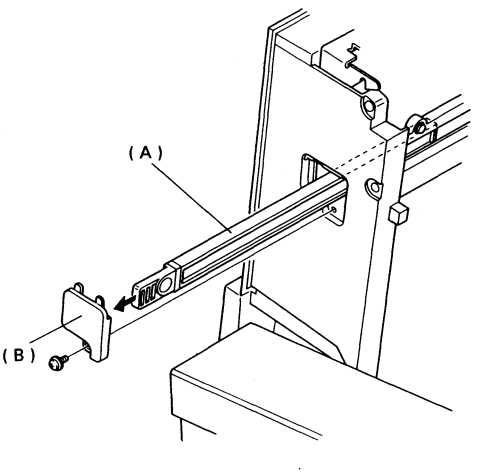
3-4-1. Second Cylindrical Lens

1. Open the upper unit.
2. Remove plate [B] (1 screw).
3. Slide out the lens [A].

Cautions: • When installing a new lens, make sure that the screw on the lens handle faces down.

• Do not touch the surface of the new lens.

• If you need to clean the lens, use an air brush, or a soft dry cloth.



3-4-2. Pentagonal Mirror and Motor

1. Open the upper unit.

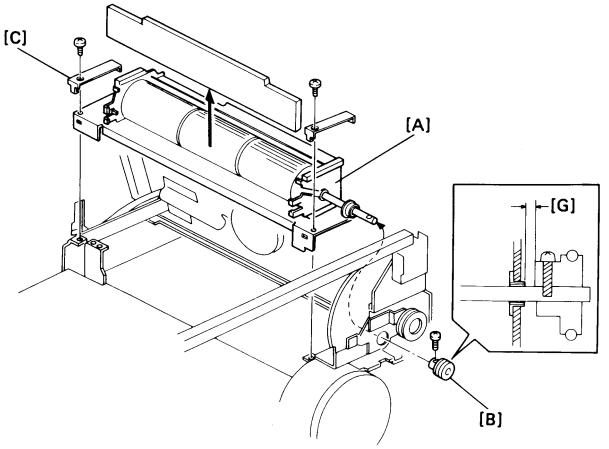
2. Slide out the master unit.

Caution: • Do not expose the master unit to light.

• Keep it in a shaded place and cover it with paper.

• Do not touch the master belt surface.

3. Remove the printer fan [A].
   - Remove the upper rear cover (see section 3-1-3).
   - Remove the printer fan drive pulley [B] (1 screw).
   - Remove the printer fan (remove 2 screws and spring plates [C] to take out the fan).

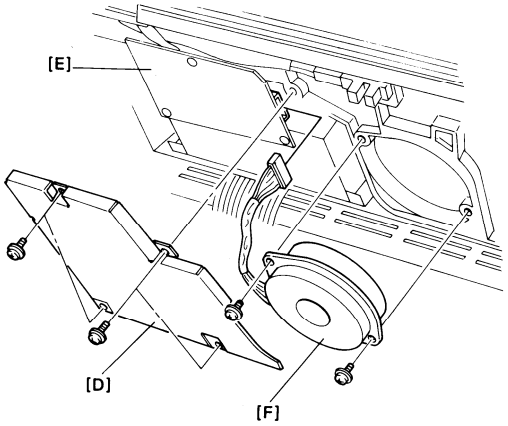


4. Remove plate [D] (4 screws).

5. Disconnect the motor from the drive board [E].

6. Remove the mirror and motor [F] (2 screws).

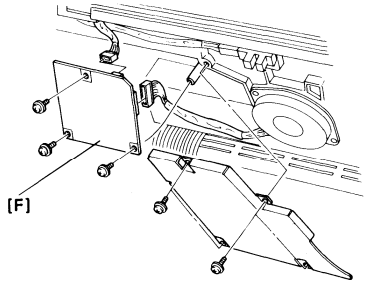
Note:
- Do not touch the faces of the mirror.
- If you need to clean the mirror, use an air brush or a soft dry cloth.
- The gap [G] between the printer fan drive gear and the rear bracket must be 0.2 mm (see the previous page).



3-4-3. Pentagonal Mirror Motor Driver (SMDR)

1. Do steps 1 to 5 of section 3-4-2.

2. Remove the SMDR board [F] (3 screws).

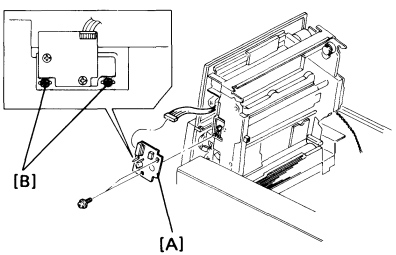


3-4-4. LSD

1. Remove the front inner cover (see section 3-1-6)

2. Remove the LSD [A] (1 connector, 2 screws).

Cautions:
- Do not touch the screws [B] on the LSD holder, or the sensor on the new LSD will be misaligned.
- After replacement, make a test copy. If the copy is not centered, loosen the screws [B] and tap the LSD slightly to one side (the adjustment is sensitive). Make another test copy and readjust if necessary.



WARNING: SWITCH OFF THE MAIN POWER.

1. Remove the document tray.

2. Remove the upper rear cover (see section 3-1-3).

3. Slide out the master unit.

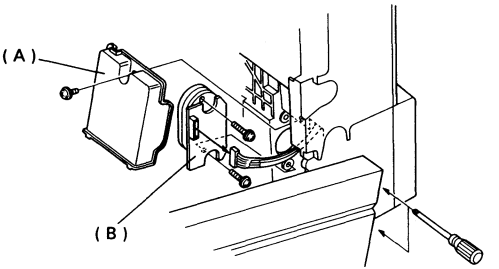
Cautions:
- Do not expose the master unit to light.
- Keep it in a shaded place and cover it with paper.
- Do not touch the master belt surface.

4. Remove cover [A] (1 screw).

5. Disconnect the harness at the LDDR board.

6. Remove the laser diode unit [B] (2 screws).

No adjustment is needed after replacement if the laser diode unit is screwed in properly.



3-5. Printer - Paper Feed

3-5-1. Upper Paper Feed and Pick-up Rollers

1. Take out the development unit (see section 3-6-1).

2. Remove the rollers (1 clip each).

Do not touch the surface of the new rollers or paper feed errors will develop sooner than normal.

3-5-2. Upper Paper Separation Roller and Spring Clutch

1. Take out the cassette then the development unit (see section 3-6-1).

2. Remove the feed and pick-up rollers (1 clip each).

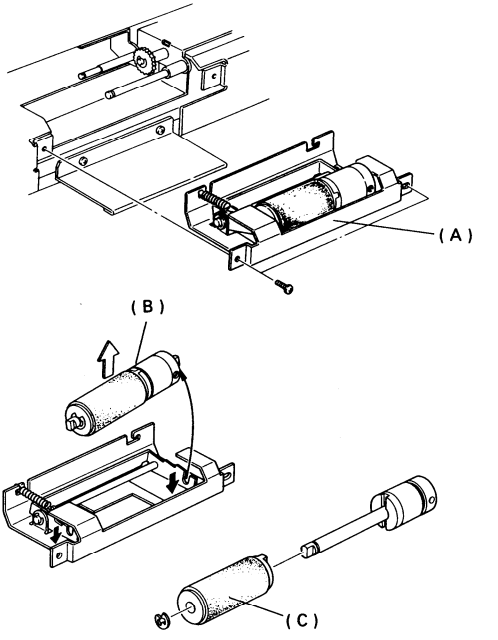
3. Remove the separation roller ass'y [A] (2 screws).

4. Take out the roller and spring clutch ass'y [B].

5. Remove the roller [C] (1 E-ring).

After installing the new roller, make sure that it pokes through the larger opening in the separation roller bracket.

Note: Do not touch the surface of the new rollers or paper feed errors will develop sooner than normal.



3-5-3. Lower Paper Feed and Pick-up Rollers

1. Take out the cassettes.

2. Remove the paper feed and pick-up rollers (1 clip each).

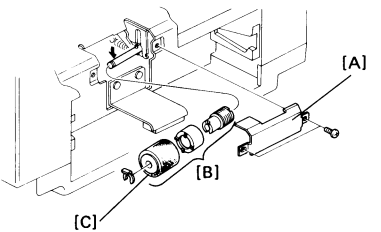
3-5-4. Lower Paper Separation Roller

1. Take out the cassettes.

2. Remove the separation roller cover plate [A] (2 screws).

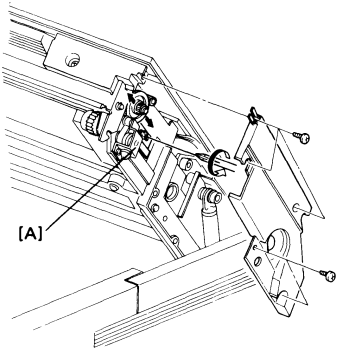
3. Take off the separation roller assembly [B] (1 clip).

4. Pull off the separation roller [C].



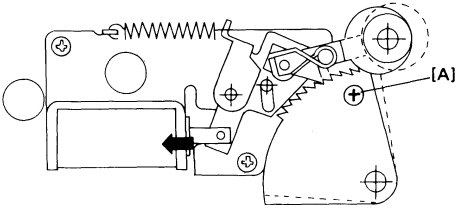
3-5-5. Master Belt Drive Motor Timing Belt Adjustment

1. Open the upper unit.
2. Remove the rear inner cover (see section 3-1-5).
3. Move the belt tensioner [A] until its edge is flush with the edge of the master belt motor bracket, then tighten the screw.



3-5-6. Upper Paper Lift Mechanism Adjustment

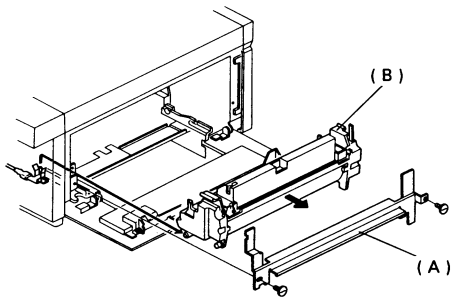
1. Remove the rear cover.
2. Loosen screw [A].
3. Contact the pawl to the sector gear by pushing the upper paper lift solenoid actuator into the solenoid.
4. lighten screw [A].



3-6. Printing - Development

3-6-1. Development Unit

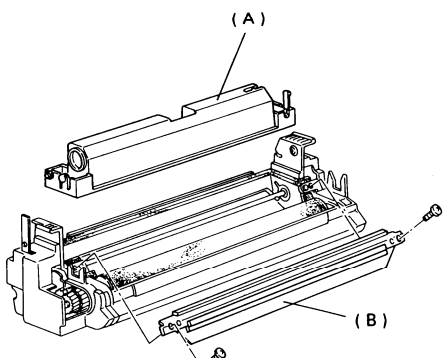
1. Remove the upper cassette and open the right cover.
2. Remove plate [A] (2 screws).
3. Take out the development unit [B] and lay it on a flat surface covered with newspaper.



3-6-2. Toner Metering Blade

1. Take out the development unit.
2. Remove the toner cartridge [A].
3. Remove the toner metering blade [B] (2 screws).

Cautions:
- Do not touch, bend, or damage the new blade.
- Do not touch the development roller.
- Do not scrape the blade against the development roller.



3-6-3. Development Roller

1. Take out the development unit and toner metering blade (see the previous page).

2. Remove the rear development unit cover [A] (1 screw).

3. Remove the bias brush cover [B] (3 pins).

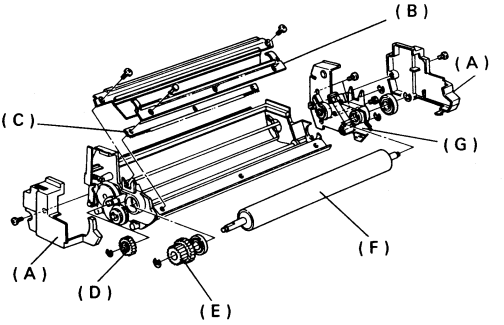
4. Take out the bias brush [C].

5. Remove the idle gear [D] (1 E-ring) then the development roller gear [E] (1 E-ring).

6. Remove the E-ring and bearing at each end of the development roller [F].

7. Remove the front side of the toner hopper [G] (2 E-rings, 3 screws).

8. Slide out the development roller.



Reinstallation
- Do not touch the surface of the new development roller.
- Make sure that the bristles of the bias brush are tucked under the leading edge of the development roller.

3-7. Printer - Transfer

3-7-1. Transfer Corona Wire

1. Open the upper unit and take out the master unit.

Caution:
- Do not expose the master unit to light.
- Keep it in a shaded place and cover it with paper.
- Do not touch the master belt surface.

2. Remove the terminal block [A] (2 screws).

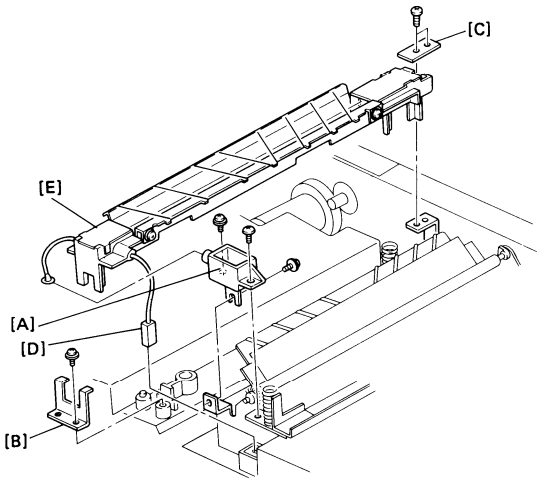
3. Remove bracket [B] (1 screw).

4. Remove tab [C] (1 screw).

5. Remove the transport guide plate (see section 3-10-5). One of the 5 screws has a ground wire.

   To remove this guide plate, you will need to push the transfer corona unit towards the development unit.

6. Carefully disconnect connector [D] at the power pack (use long-nosed pliers).

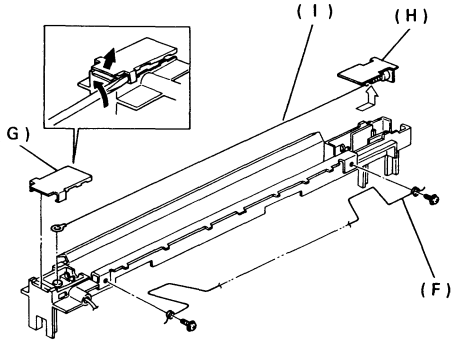


7. Remove the transfer corona unit [E].

8. Remove the nylon wire [F] (1 screw at each end).

9. Prize off the front endblock cover [G] then carefully slide off the rear endblock cover [H].

10. Unhook the corona wire [I] from the tension spring in the rear endblock and from the screw in the front endblock (do not remove the screw).



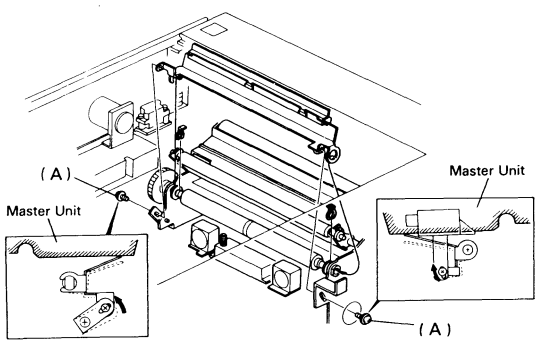
Reassembly

- Do not touch the new corona wire with your bare hands.
- Hook the new corona wire onto the rear endblock first.
- Set the corona wire in the front endblock groove.
- Check the action of the tension spring after installing the new wire.
- Rethread the nylon wire.
- To replace the corona unit, make sure that it is positioned correctly on the two springs. Push down fairly hard to get it back in position. While holding down the corona unit, put back the transport guide plate.

3-7-2. Transfer Entrance Guide Plate Adjustment

1. Remove the front and rear covers.
2. Make sure that there is a master unit in the machine.
3. Close the upper unit.
4. Tighten the screw [A] at each end of the transfer entrance guide plate (access the screws through the front and rear sides of the machine).

Note: If this is not adjusted correctly, the following may occur:
- Copy jam
- Poor copy quality
- Master belt damage
- Loose toner in the registration area



3-8-1. Fusing Unit

1. Remove the upper front cover (see section 3-1-1)

2. Remove cover [A] (1 screw).

3. Remove cover [B] (1 screw).

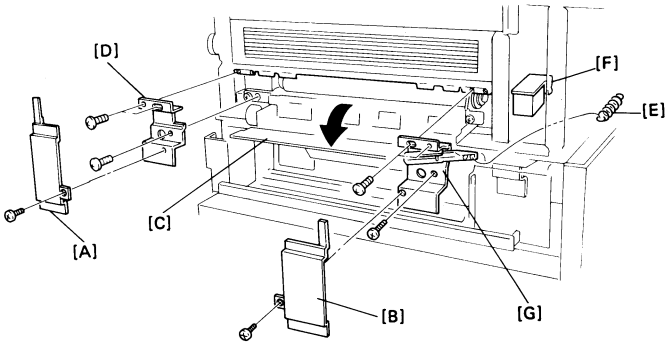
4. Open the copy feed-out cover [C].

5. Remove bracket [D] (3 screws).

6. Unhook spring [E] from the upper unit interlock switch [F].

7. Remove retaining bracket ass'y [G] (3 screws).

8. Open the upper unit and take out the master unit.



Caution:
- Do not expose the master unit to light.
- Keep it in a shaded place and cover it with paper.
- Do not touch the master belt surface.

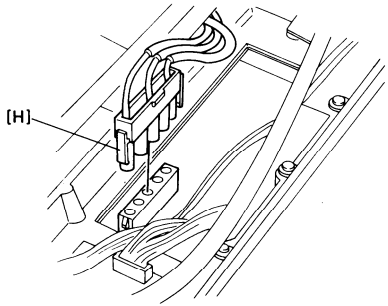
9. Remove two screws (see section 3-4-2; remove screws [C]) and lift off the spring plates underneath, one at the front and one at the rear of the fan assembly.

   Note: Do not remove or disassemble the fan.

10. Remove the transport guide plate (see section 3-10-5). One of the 5 screws is grounded.

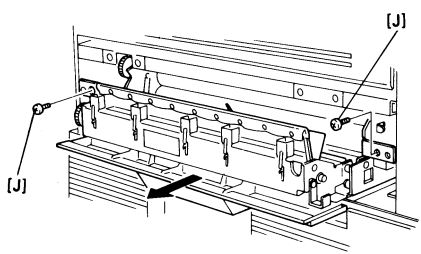
11. Disconnect the fusing unit harness [H] at the PSU.

12. Remove 2 screws [I], lift up the right-hand end of the printer fan ass'y, and slide out the fusing unit from the copy exit.



Reassembly

Clearance [G] (see section 3-4-2) must be 0.2 +/-0.1 mm.



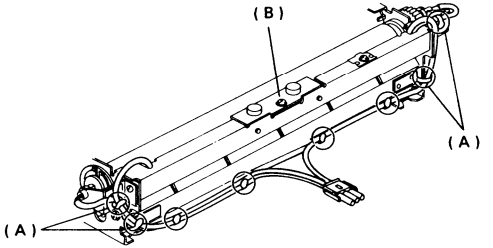
3-8-2. Thermostat

1. Remove the fusing unit (see section 3-8-1).

2. Unhook 4 clamps [A].

3. Remove screw [B].

4. Remove the thrmostat [C] (2 screws).



3-8-3. Fusing Lamp/Thermistor Assembly

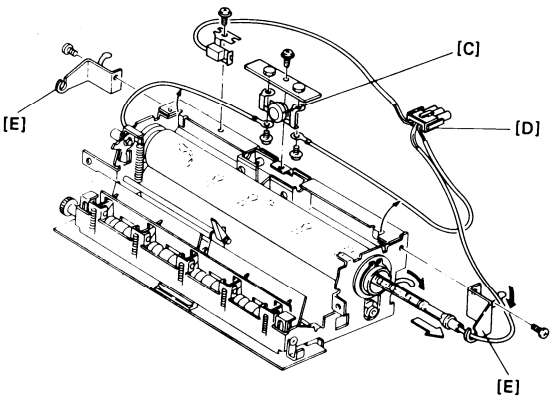
1. Remove the thermostat (see section 3-8-2).

2. Unhook the other clamps.

3. Remove the connector [D] (2 screws).

4. Remove support brackets [E] at the front and rear.

5. Slide out the fusing lamp.



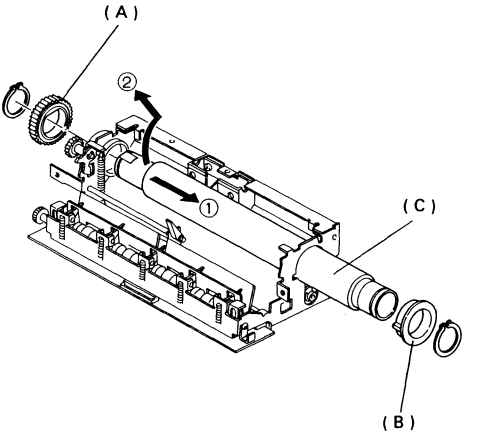
3-8-4. Hot Roller

1. Remove the fusing lamp/thermistor ass'y (see section 3-8-3).

2. Remove drive gear [A] and the bushing at the rear (1 C-ring).

3. Remove bushing [B] at the front (1 C-ring).

4. Slide out the hot roller [C] as shown.



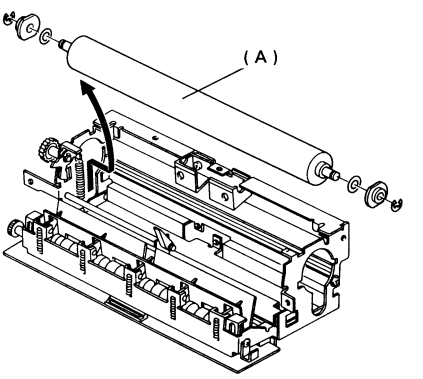
Reinstalling:

- Do not take the paper off the new roller until the roller has been installed. The paper prevents damage to the roller during installation.
- Do not hit or scratch the teflon coating on the new roller.

3-8-5. Pressure Roller

1. Remove the hot roller carefully (see section 3-8-4). Put the roller in a safe place.

2. Lift out the pressure roller [A], and take off the E-ring, bushing and washer at each end.



Reinstalling:
- Do not take the paper off the new roller until the roller has been installed. The paper prevents damage to the roller during installation.
- Do not hit or scratch the surface of the new roller.

3-8-6. Hot Roller Strippers

It is advisable to replace them all as a set. There is no need to remove the fusing unit.

For a diagram, see the next page.

1. Remove cover [A] (2 screws).

2. Open the feed-out ass'y.

3. Remove guide plate [B] (2 screws).

4. Remove cover [C] (3 screws).

5. Close the feed-out ass'y and remove the antistatic brush and holder [D] (2 screws).

6. Open the feed-out ass'y.

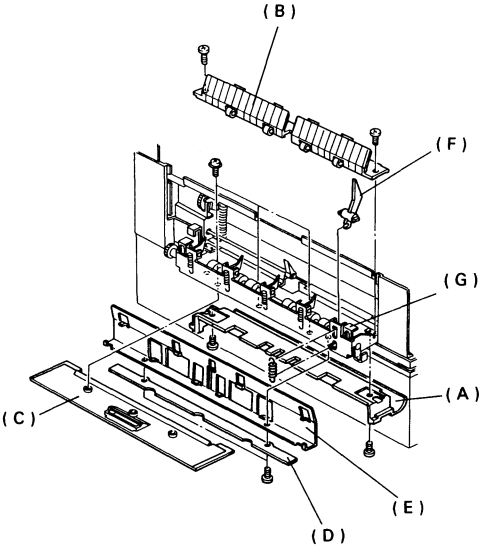
7. Move guide plate [E] out of the way.

8. Unhook the springs from the hot roller strippers.

9. Take out the hot roller strippers [F]; push down on the retaining bar [G] while taking them out.

Reinstalling:

- The bristles on the antistatic brush should be pointing down.
- The three indentations in the top of the antistatic brush holder must match the positions of the screw holes in the upper copy feed-out cover [C].
- The clip on the center of the side of the fusing unit must clip onto the lower copy exit cover [A] before the cover is screwed in.



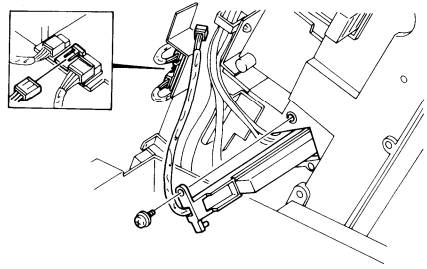
3-9. Printer - Quenching

3-9-1. Quenching Lamp

1. Remove the operation panel (see section 3-1-2).

2. Remove the front inner cover (see page 3-4).

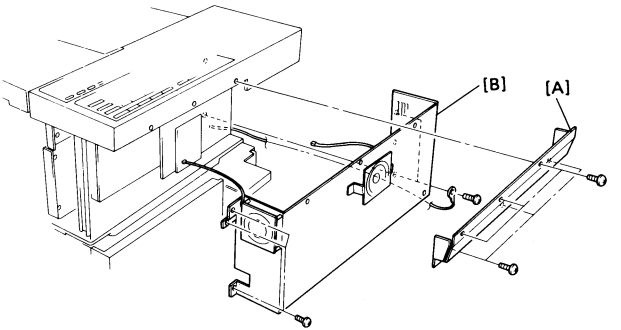
3. Remove the quenching lamp (1 screw, 1 connector).

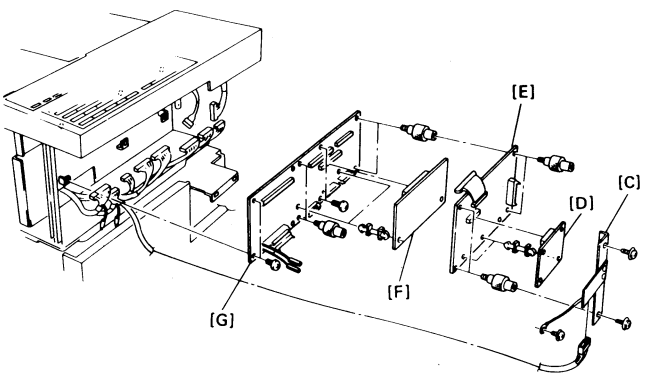


3-10. PCBs

3-10-1. SPU, VPU, G3CCU, and Modem

1. Remove the upper front cover (see section 3-1-1).
2. Remove plate [A] (6 screws).
3. Remove plate [B] (15 screws, 2 connectors).
4. Remove the G4 harness terminating block and bracket [C] (2 screws).
5. Remove the modem [D] (2 clips) and G3CCU [E] (4 stand-off screws, 2 connectors).
6. Remove the VPU [F] (1 screw, 1 connector, 1 clip).
7. Remove the SPU [G] (3 stand-off screws, 8 screws, 17 connectors).



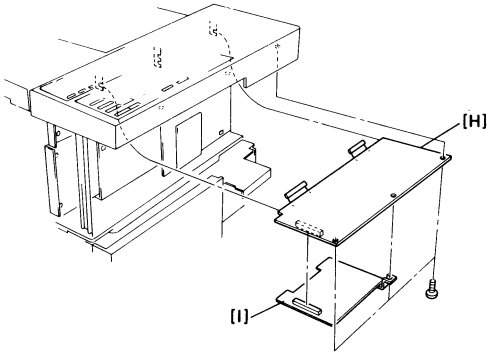


Notes for MBU replacement
- Print the service monitor report (service function 06).
- Make sure that the battery switch of the new MBU is on.

1. Remove the modem and G3CCU (see p. 3-43).

2. Remove the SCU [H] and MBU [I] assembly (3 screws). Note how the SCU fits into the slot at the back.

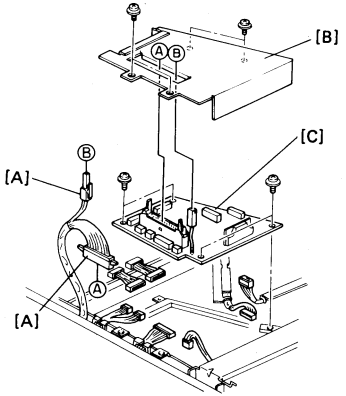
   Note: If the same MBU will be reinstalled, do not switch off the battery switch on the MBU.



After MBU replacement
- Turn off the battery switch on the old MBU.
- Initialize the RAM on the new MBU by turning off the battery switch for a few seconds. Don't forget to switch it back on afterwards.
- Reprogram the hard disk bad sectors (see page 1-25). There is no need to reformat the disk - during reformatting, all other bad sectors will be detected automatically.
- Reprogram the date and time (user function 87) and the serial number (service function 08).

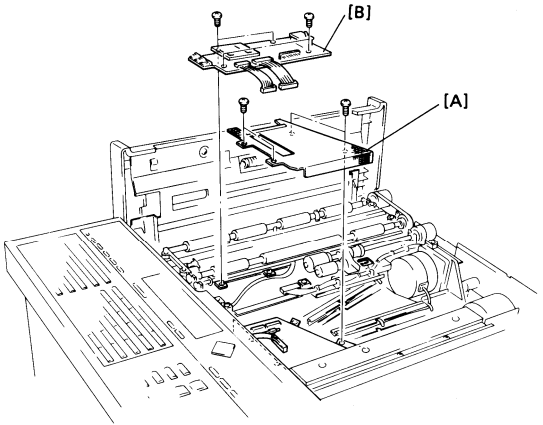
3-10-3. UIB

1. Remove the document table (see section 3-1-5).
2. Remove two connectors [A].
3. Remove the UIB cover [B] (4 screws).
4. Remove the UIB [C] (4 screws, 8 connectors).



3-10-4. DSB

1. Remove the document table (see section 3-1-5).
2. Remove the document guide plate ([E] in section 3-2-1, “Document Feed and Pick-up Rollers”).
3. Remove the UIB cover [A] (4 screws).
4. Remove the DSB [B] (4 screws, 6 connectors).

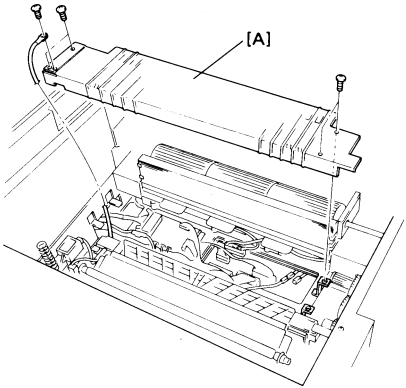


3-10-5. DRU

1. Open the upper unit.

2. Remove the transport guide plate [A] (5 screws, 1 earth wire).

3. Remove the DRU [B] (4 screws, 7 connectors).



3-10-6. Power Pack

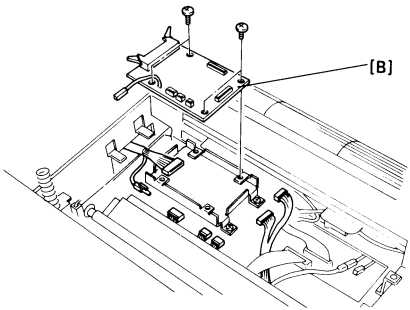
See the next page for a diagram.

1. Remove the upper front cover (see section 3-1-1).

2. Remove 2 plates ([A] and [B] in section 3-10-1).

3. Open the upper unit and take out the master unit.

Caution:
- Do not expose the master unit to light.
- Keep it in a shaded place and cover it with paper.
- Do not touch the master belt surface.



4. Take out the development unit.

5. Take the charge corona power terminal [A] out of the terminal block (1 screw).

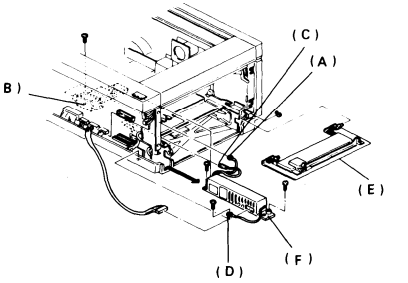
6. Remove the terminal block [B] (2 screws).

7. Carefully disconnect the transfer corona power terminal [C]; use long-nosed pliers.

8. Remove the bias terminal [D] (1 screw).

9. Remove the right cover [E] (1 screw at the rear hinge).

10. Remove the power pack [F] (1 screw, 1 connector, and slide out the power pack).



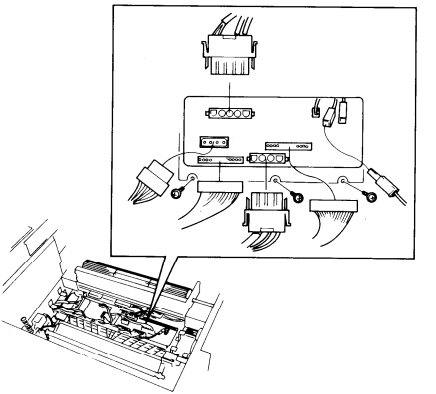
3-10-7. PSU

1. Remove the transport guide plate (see section 3-10-5).

2. Remove the 5 connectors and the earth wire (see the top figure on the right).

3. Remove the lower left cover (see section 3-1-1).

4. Remove the PSU [A] (5 screws, three of which are under cables on top of the PSU).



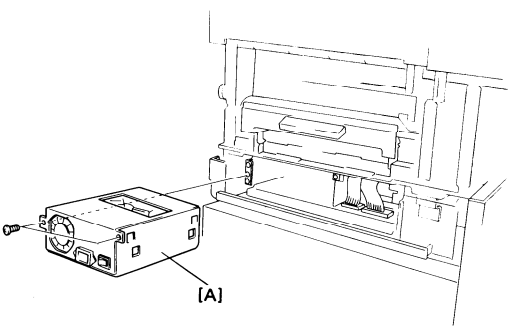
When sliding in the new PSU, take care not to damage the cables.

3-10-8. Hard Disk

See the next page for a diagram.

Before switching off the power, return the hard disk head to its shipping position if possible (see page 1-39).

1. Remove the transport guide plate (see section 3-10-5).



2. Remove the ozone filter (note that the end with the green mark goes at the rear of the machine).

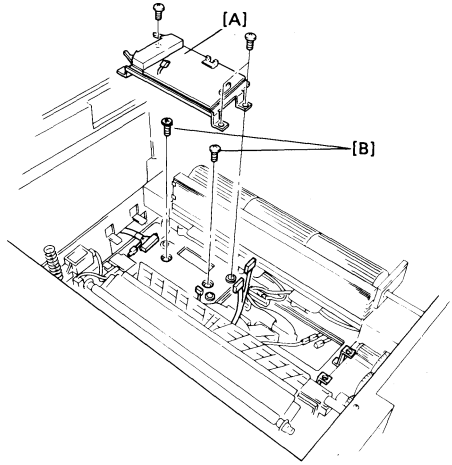
3. Remove the DRU and its bracket [A] (3 screws).

4. Remove 2 screws [B] under the cables on top of the hard disk.

5. Remove the lower left cover (see section 3-1-1).

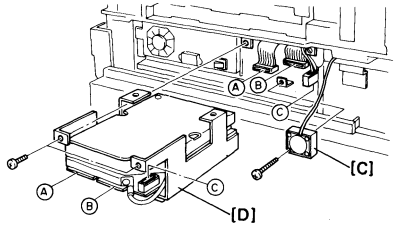
6. Remove the hard disk fan [C] (1 screw).

7. Remove the hard disk [D] (2 screws, 3 connectors). Handle the hard disk carefully, and return it for servicing.



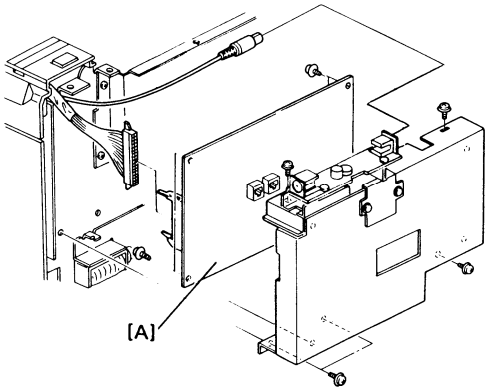
Replacement

- Support the PCB on the hard disk when plugging the power connection back in.
- Program the bad sectors on the hard disk and format the hard disk (see page 1-25).



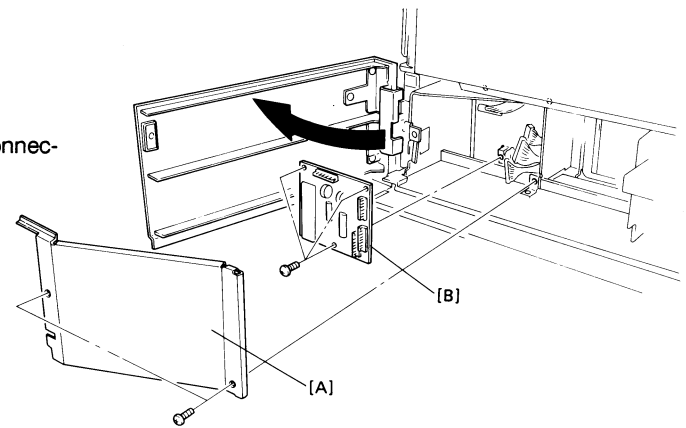
3-10-9. G3NCU

1. Remove the rear cover (see section 3-1-3).
2. Remove the top cover (see section 3-1-4).
3. Remove the NCU/shield cover ass'y (3 connectors, 5 screws, one of which is grounded).
4. Remove the G3NCU [A] (4 screws).



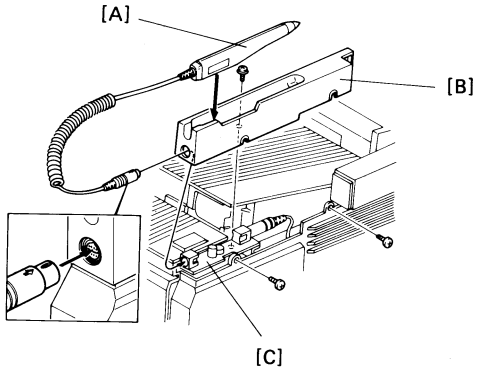
3-10-10. LIB

1. Open the lower front cover.
2. Remove bracket [A] (2 screws).
3. Remove the LIB [B] (3 screws, 5 connectors).



3-10-11. BSRU

1. Access the machine from the rear.
2. Open the upper unit.
3. Remove the bar code reader [A] if installed.
4. Remove the BSRU cover [B] (3 screws).
5. Remove the BSRU [C] (4 screws, 1 connector).

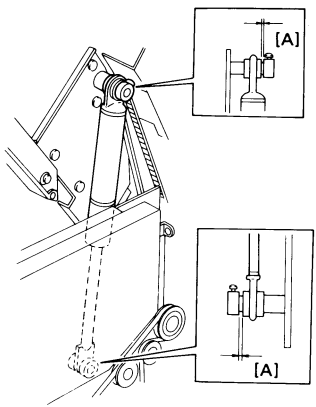


3-11. Others

3-11-1. Gas Spring Adjustment

If the gas spring is removed at any time, do the following adjustment when replacing the spring.

• Clearance [A] must be 0.2 +/-0.1 mm



SECTION 4

SERVICE TABLES

SECTION 4. SERVICE TABLES

4-1. PM Table

1. Scanner

Part	Clean	Lubricate	Replace	Remarks
Separation Roller	10K		30K	
Pick-up Roller	10K		30K	
Feed Roller	10K		30K	
R1 Roller	10K			
R2 Roller	10K			
Exposure Glass	10K			
Pressure Plate	10K			

2. Printer and Upper Paper Feed Mechanism

Part	Clean	Lubricate	Replace	Remarks
Separation Roller	10K		30K	
Pick-up Roller	10K		30K	
Feed Roller	10K		30K	
Separation Torque Limiter		30K		G40H
Pick-up Roller Clutch		30K		G40H
Registration Roller	10K			
Transfer Corona Unit	10K			
Charge Corona Unit	10K			

Continued on the next page

2. Printer and Upper Paper Feed Mechanism (Continued)

Part	Clean	Lubricate	Replace	Remarks
Master Unit			7K	
Toner Collection Tank			21K	
Development Unit			60K	
Ozone Filter			7K	
Thermistor	30K		60K	
Thermostat	30K			
Hot Roller Strippers	10K		60K	
Cleaning Pad			30K	
Hot Roller			60K	
Pressure Roller (Fusing Unit)			60K	
Printer Fan Belt			30K	

3. Lower Paper Feed Mechanism

Part	Clean	Lubricate	Replace	Remarks
Separation Roller	10K		30K	Alcohol
Pick-up Roller	10K		30K	Alcohol
Feed Roller	10K		30K	Alcohol
Other Rollers	10K			Alcohol
Pick-up Cam Ratchet Pawl		30K		NF-46
Separation Torque Limiter		30K		Mobil Temp 78
Paper Feed Clutch		30K		Mobil Temp 78

4-2. General Service Tables

4-2-1. Test Points

1. SCU
TP1 - Drive clock (8 MHz): system, main cpu
TP2 - Drive clock (3.072 MHz): buzzer timer, bar code reader
TP3 - + 5V
TP4 - COM1 (Ground)
2. SPU
TP1 - COM1 (Ground)
TP2 - Drive clock (8 MHz): SPU system, ADCR1 (VPU), hard disk controller
TP3 - Slave cpu drive clock (16 MHz)
TP4 - COM1 (Ground)
TP5 - Data for printing (to the laser diode)
TP6 - Transfer clock (4.0748 MHz) for printed data
TP7 - + 5V
3. MBU
TP1 - Drive clock (32.768 kHz): Real time clock
TP2 - Used when adjusting VC1
TP3 - COM1 (Ground)
TP4 - + 5V
4. UIB
TP1 - Laser main scan start sync signal, from LSD
TP2 - COM1 (Ground)
TP3 - Laser power feedback signal (XLPDET, from LDDR)
TP4 - + 5V
COM1 - Ground
5. LIB
TP1 - COM1 (Ground)
TP2 - COM3 (Ground)
6. DSB
TP1 - + 5V
TP2 - COM1 (Ground)
7. DRU
TP1 - COM1 (Ground)
TP2 - + 5V
8. VPU
TP1 - COM2 (Ground)
TP2 - Video signal output
TP3 - COM1 (Ground)
9. SBU
VIDEO - Video signal (XVIDEO)
SH - CCD drive clock (main scan start sync)
COM2 - Ground
GND - Ground

10. LDDR
TP1 - + 12V supply
TP 2, 3, 4 - Factory use only
TP5 - XLPDET (laser power feedback signal)
11. LSD
TP1 - COM1 (Ground)
TP2 - 1LSDET (laser main scan synchronization signal)
12. G3CCU
TP1 - + 5V
TP2 - COM1 (Ground)
TP3 - COM2 (Ground)
TP4 - Not used
TP5 - Not used
TP6 - Received data (RXL, output to modem)
TP7 - Voice message tx signal, from voice message processor
TP8 - Not used
TP9 - Not used
TP10 - COM2 (Ground)
TP11 - Received data (HYBRXL, input from G3NCU)
TP12 - Not used
TP13 - Not used
TP14 - Not used

13. G3NCU
TP1 - HYBTXL COM (Ground)
TP2 - Data for transmission (HYBTXL, from G3CCU)
TP3 - HYBRXL COM (Ground)
TP4 - Received data (HYBRXL, to G3CCU)
TP5 - Arrestor ground
TP6 - COM1 (Ground)

4-2-2. Variable Resistors and Capacitors

1. SCU
VR1 - Buzzer volume control
2. MBU
VC1 - Real time clock drive frequency adjustment
3. SBU
VR1 - White level adjustment
4. G3CCU
VR1 - Not used
VR2 - Not used
5. G3NCU
VR1, 2 - Do not touch
VR3 - Tx level adjustment (range = 4 dB)
6. Power Pack
All controls - Do not touch
7. LDDR
VR1 - Do not touch

4-2-3. Switches

1. MBU
SW1 - Battery switch
2. DSB
SW1 - Scanner cover switch
3. G3CCU
SW1 - Not used

4-2-4. LED Indicators

1. SPU
LED 1 - Factory use only
LED 2 - On = VPU FIFO reset
LED 3 - Copy feed-out sensor; Off = Paper present, On = No paper
LED 4 - Registration sensor; Off = Paper present, On = No paper
LED 5 - On = Upper paper feed clutch on, Off = Upper paper feed clutch off
LED 6 - On = Registration clutch on, Off = Registration clutch off
LED 7 - On = Transfer corona unit off, Off = Transfer corona unit on
LED 8 - On = Charge corona unit off, Off = Charge corona unit on
LEDs 2 to 8 light up cyclically if there is an Auto Service Call condition.
2. UIB
LED 1 - On: Upper unit CPU running
LED 2 - On: + 12V supply is present at the LDDR
LED 3 - On: Pentagonal mirror motor is running

3. G3CCU

LED 1 - Not used

LED 2 - On: Line current polarity, output 1 activated

LED 3 - On: Line current polarity, output 2 activated

LED 4 - On: Interrupt processing in progress (modem or SCU handshake)

LEDs 5 to 8 - Most recent response sent to main cpu (on the SCU)

LED 8	7	6	5	Response
0	0	0	0	Status inquiry
0	0	0	1	Ringing signal detected, request start rx mode
0	0	1	0	Line connected
0	0	1	1	Transmission request
0	1	0	0	Transmit mode (tx protocol start)
0	1	0	1	Transmission start (tx data start)
0	1	1	0	Transmission end (RTC)
0	1	1	1	Transmission check (end-of-page signal)
1	0	0	0	Polling request
1	0	0	1	Reception request
1	0	1	0	Receive mode (rx protocol start)
1	0	1	1	Reception start (rx data start)
1	1	0	0	Reception end (RTC)
1	1	0	1	Reception check (end-of-page signal)
1	1	1	0	DCN sent; dc loop open request

4-2-5. Jumpers

Do not touch any of the jumpers inside this machine, except the following jumpers on the G3NCU. Configure these jumpers in accordance with the location of installation.

Jumper	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
W. Germany	O	O	X	O	O	O	No. 1		O	X	X	O	X	O	X	O	X	O	O	O	O
U.K.	O	O	X	O	O	O	No. 1		O	X	O	O	X	O	X	O	X	O	O	O	O
Italy	O	O	X	O	O	O	No. 1		O	X	O	O	X	O	X	O	X	O	O	O	O
Austria	O	O	X	O	O	O	No. 1		O	X	O	O	X	O	X	X	X	X	O	O	O
Belgium	O	O	X	O	O	O	No. 1		O	X	O	O	X	O	X	X	X	X	O	O	O
Denmark	O	O	X	X	X	O	No. 2		X	X	O	O	X	O	X	X	X	X	O	O	O
Finland	O	X	X	O	O	O	No. 1		X	X	O	O	X	X	O	O	X	O	O	O	O
Ireland	O	O	X	O	X	O	No. 1		O	X	O	O	X	O	O	X	O	X	O	O	O
Norway	O	O	X	O	X	O	No. 1		X	X	O	O	X	O	X	X	O	X	O	O	O

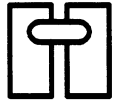
Continued on the next page

Jumper	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sweden	O	O	X	O	O	O	No. 3		X	X	X	X	X	O	X	X	X	X	O	O	O
Switzerland	X	X	O	O	O	X	No. 1		O	X	O	O	X	O	X	X	X	X	O	O	O
Portugal	O	O	X	X	X	O	No. 1		O	X	O	O	X	O	X	X	X	X	O	O	O
Netherlands	O	O	X	O	O	O	No. 1		X	X	O	O	X	O	X	X	O	X	O	O	O
Hong Kong	O	O	X	O	O	O	No. 3		X	O	O	O	O	X	X	X	X	X	O	O	O
S. Africa	O	O	X	O	O	O	No. 1		O	X	O	O	X	O	O	O	X	O	O	O	O

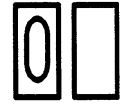
Key: O = Shorted, X = Open

For an explanation of No. 1, No. 2, and No. 3 in the columns for jumpers 7 and 8, see below.

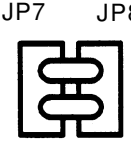
No. 1 =



No. 2 =



No. 3 =



4-2-6. Special Tools and Lubricants

Scan line test chart:	H0089503
200 dpi test chart	A0129110
NF-46 grease:	H0069600
Separation roller spacers:	H0081223 (torque)
	H0081224 (pressure)

SECTION 5

TROUBLESHOOTING

SECTION 5. TROUBLESHOOTING

5-1. Quality Checks

During troubleshooting, the quality checks in this section may help find the problem. These checks should also be done when installing a new machine, in order to discover any defects that may be present.

1. Copy Quality

The test chart shown on this page is used for the copy quality checks explained on the following pages.

1. Copy Density

Density must be equal in the left, right, and center. If it is not, adjust the alignment (see page 3-12).

2. Skew

Copy a test chart using standard resolution.

The difference between A and B (see the diagram on page 5-1) must be as follows.
A4 [8.5" x 11.7"] or larger: Less than 1% of the document length
Smaller than A4: Less than 3% of the document length

To correct skew, see page 5-28.

3. Intelligibility

Copy a test chart using standard resolution. Check the characters in frame F (see page 5-1). No characters must be missing. If some of the characters are illegible, check and adjust the following: alignment (see page 3-12), reduction rate (see page 3-15), focusing (see page 3-14).

4. Copy Test

Make another copy. If the copy is still defective, make a printer test (see page 2-32) and check the video waveforms if necessary (see pages 3-11 to 3-18).

2. Operation Panel Display

See page 2-34.

3. Mechanism Test

Check the operation of the document feed and printing mechanism. See section 5-3 (Machine Operation) if there are any problems.

4. Communication Tests

1. Call a remote unit and send 2 test charts, one in standard, and one in detail resolution. If the remote unit can accept 8 x 15.4 (Fine) resolution, also send one in Fine resolution. (Note that Fine resolution in the Rapicom 610 or 830 is 16 x 15.4 and not the same as Fine resolution in the FAX105.)
   Check the following: resolution selection, RTI display, voice request function.

2. Receive 2 test charts.

   Check the following: RTI display, copy quality, automatic reception function, voice request function.

5-2. Copy Quality Troubleshooting

If there is a copy quality problem, try the DCR test (service function 09, mode 5; see page 2-36). If the problem cannot be solved easily, try using the following troubleshooting flow chart, while referring to the point-to-point diagram and signal tables. The flow chart may not be exhaustive, but it may help you to find the problem.

Symptom	Action
Blank or faint copies	1. Make a printer test (service function 09, mode 0). Is the printout normal? Y N Adjust the transfer guide plate (page 3-35). Are the charge or transfer corona units and wires installed badly or broken? (Charge corona wire operation can be checked with service function 09, mode 6.) If there is a faint image, the transfer corona unit may be defective. Y N Does CN17-10 on the SPU (1TRLEK) go high? If so, clean the transfer corona unit, removing any foreign objects that could cause a leak. Check that the following connectors are not loose: SPU CN9 and 10 - PSU CN1 and 2, SPU CN17 - Power pack. Are the + 24V supplies to the power pack and trigger signals present? Y N Replace the SPU or SCU. Replace the power pack. Reset the defective corona wire. If the problem is not solved, check the trigger and power signals again, then check the varistor. Is the varistor intact (Y) or shorted(N)?. (Continued on the next page)

Symptom	Action
Blank or faint copies (continued)	Y N Change the varistor. The laser beam may not be responding to the data signal, and may be continuously exposing the master. Check that the following connections are not loose: SPU CN4 - UIB CN6, UIB CN8 - LDDR. Does the data signal at the LDDR (CN1-6) switch on/off normally? Y N Replace the LDDR, UIB, SCU, or SPU. If there is a faint image, there could be a problem with the development unit. Check the development drive mechanism. Clean any dirty components. Does the bias terminal receive -225 V +/- 10 V? Y N Does the power pack receive the trigger signal (SPU CN17-9 to low) and the power signal (SPU CN17-5)? Y N Replace the SPU or SCU. Replace the power pack. Does the development roller attract toner? Y N Clean the roller. Replace it if necessary. Check that the following connectors are not loose: SPU CN5 - DRU CN3, DRU CN1. Does the development clutch operate? Y N Replace either the development clutch, the DRU, the SPU, or the SCU. Check the scanner (continued on the next page).

Symptom	Action
Blank or faint copies (continued)	2. If there is nothing wrong with the printer, check the scanner. Check that the connections from the SBU - VPU and from VPU - SPU are not loose. Is there a video signal from the SBU, and is the white level normal? Y N Adjust the white level. Replace the SBU, VPU, SPU, or SCU if necessary. 3. Does the problem only occur when printing from memory?. Y N Go to step 4. Check that the connections from the SPU and PSU to the hard disk are not loose. Does the PSU send + 5V and + 12V to the hard disk? Y N Replace the PSU. Replace the hard disk, SPU, or SCU. 4. If the problem only occurs during transmission or reception, and not in copy or printer test mode, check the connections from the SPU to the CCU, and from the CCU to the modem and NCU, and from the NCU to the line. Check for severe line problems. If the problem cannot be found, replace the CCU, NCU, modem, SPU, or SCU.

Symptom	Action
Black copy	1. Make a printer test (service function 09, mode 0). Is the printout normal? Y N Is the master unit properly grounded? Y N Check the grounding terminal near the rear of the machine by the quenching lamp, and check the grounding plate on the master unit. Clean or replace the defective part. Check that SPU CN17 is not loose. Does the bias terminal receive -225 +/- 10 V? Y N Does the power pack receive the trigger signal (SPU CN17-9 to low) and the power signal (SPU CN17-5)? Y N Replace the SPU or SCU. Replace the power pack. Is the toner metering blade securely in place? Y N Install it properly. The laser beam may not be reaching the master. Check that the following connections are not loose: SPU CN4 - UIB CN6, UIB CN8 - LDDR. Does the data signal at the LDDR (CN1-6, 5LDDAT) switch on/off normally? Y N Replace the LDDR, UIB, SCU, or SPU. Check the laser optics for broken or dirty components. Check for condensation on the optics or the master. (Continued on the next page)

Symptom	Action
Black copy (continued)	2. There may be a scanner problem. Clean the scanner optics, pressure plate, and exposure glass. Does the fluorescent lamp light properly? Y N Check that the following connections are not loose: SPU CN4 - UIB CN6, UIB CN3 - FI. lamp driver, FI. lamp driver - FI. lamp. Does the lamp driver receive the + 24V power and trigger signals from the UIB? Y N Replace the UIB, SPU, or SCU. Replace the lamp or driver. Check that the connections from the SBU - VPU and from VPU - SPU are not loose. Is there a video signal from the SBU, and is the white level normal? Y N Adjust the white level. Replace the SBU, VPU, SPU, or SCU if necessary 3. Does the problem only occur when printing from memory? See step 3 of "Blank or faint copy" (page 5-6). 4. If the problem only occurs during transmission or reception, and not in copy or printer test mode, check the CCU, NCU, modem, and line. See step 4 of "Blank or faint copy" (page 5-6). 5. Check the transfer guide plate adjustment (page 3-35).

Symptom	Action
Low image density	1. Make a printer test (service function 09, mode 0; see page 2-32). Is the test pattern normal? Y N Try the following • Replace the master unit. • Check the corona wires. Clean with cotton swabs or replace. • Clean the development roller (soft cloth and alcohol). • If the paper in the cassette is damp, replace it. • If the toner contains dirt or paper particles, throw it out and add fresh toner. Is the varistor intact (Y) or shorted(N)?. Y N Change the varistor. Check that SPU CN17 is not loose. Does the bias terminal receive -225 +/- 10 V? Y N Does the power pack receive the trigger signal (SPU CN17-9 to low) and the power signal (SPU CN17-5)? Y N Replace the SPU or SCU. Replace the power pack. Check the development drive mechanism. Clean any dirty components. Does the development roller attract toner? Y N Clean the roller. Replace it if necessary. Continued on the next page

Symptom	Action
Low image density (continued)	Check that the following connectors are not loose: SPU CN5 - DRU CN3, DRU CN1. Does the development clutch operate? Y N Replace either the development clutch, the DRU, the SPU, or the SCU. Does the power pack send trigger signals to the transfer and charge corona wires? (Charge corona wire operation can be checked with service function 09, mode 6.) Y N Change the SCU or SPU. Is there any power at the corona units? Y N Change the power pack. Is there any toner in the toner cartridge? Y N Check the toner end sensor mechanism. Does SPU CN17-3 go low if the actuator leaves the toner end sensor? Y N Replace the sensor. If the Add Toner indicator does not light when there is no toner, replace the SCU, SPU, or OPU.

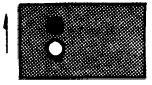
2. Clean the white plate used for auto-shading. Check the SBU white level voltage (see page 3-13).

3. Check the transfer guide plate adjustment (page 3-35).

Symptom	Action
Faint copy at leading or trailing edge	If the paper is curled, correct the curl before installing the cassette. If the paper is damp, change the paper in the cassette. Instruct the operator how to store paper when it is not to be used for a long time. Thick or thin paper sometimes makes faint copies. Instruct the operator to use a recommended brand of paper.
Dirty background on entire copy image	1. If "Call Service" is lit, replace the laser diode unit and the LDDR. 2. Make a printer test (service function 09, mode 0). Is the printout normal? Y N • Reinstall the incorrectly installed master. • Replace the master (worn out OPC belt). • Clean the quenching lamp. • If the toner in the development unit contains dust or paper particles, change the toner. • Tighten the toner metering blade securing screws (see page 3-31). • Clean the charge and transfer corona wires. • Clean the grounding plates on the master unit (there is one on each side of the exposure slit). • Clean the grid plate grounding terminal (at the far right corner of the master unit as seen from the paper feed direction). • Replace the varistor if it is shorted. • Clean the cleaning blade inside the master unit. Continued on the next page

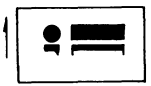
Symptom	Action
Dirty background on entire copy image (continued)	Check that SPU CN17 is not loose. Does the bias terminal receive -225 +/- 10 V? Y N Does the power pack receive the trigger signal (SPU CN17-9 to low) and the power signal (SPU CN17-5)? Y N Replace the SPU or SCU. Replace the power pack. Check that the following connections are not loose: SPU CN4 - UIB CN6, UIB CN1 and 7 - DSB CN4 and 5, DSB CN2 - Quenching lamp. Does the quenching lamp operate correctly? Y N Does the DSB output the drive and power signals on CN2? Y N Does the UIB send the drive and power signal to the DSB? Y N Replace the UIB, SPU, or SCU. Replace the DSB. Replace the quenching lamp. Clean the laser optics carefully with a blower brush or soft dry cloth. Continued on the next page

Symptom	Action
Dirty background on entire copy image (continued)	Does the power pack send trigger signals to the transfer and charge corona wires? (Charge corona wire operation can be checked with service function 09, mode 6.) Y N Change the SCU or SPU. Is there any power at the corona units? Y N Change the power pack. 3. Clean the scanner optics and the exposure glass. Adjust the bit switches containing contrast threshold levels. Adjust the SBU output level (see page 3-13).
Dirty background with negative image	Clean the cleaning blade or replace the master unit.



Symptom	Action

Dirty background after the trailing edge of solid black areas



The quenching lamp may be defective.
Check that the following connections are not loose: SPU CN4 - UIB CN6, UIB CN1 and 7 - DSB CN4 and 5, DSB CN2 - Quenching lamp. Does the quenching lamp operate correctly?

Y

N

Does the DSB output the drive and power signals on CN2?

Y

N

Does the UIB send the drive and power signal to the DSB?

Y

N

Replace the UIB, SPU, or SCU.

Replace the DSB.

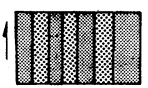
Replace the quenching lamp.

Stray toner flecks fused into the copy

- Clean the inside of the machine.
- Clean the cleaning blade.
- Check the transfer entrance guide plate (see page 3-35).
- Clean the fusing unit hot roller and pressure roller.
- Replace the master (worn out OPC belt or defective cleaning blade).
- Clean the quenching lamp.
- Does the quenching lamp operate correctly? See “Dirty background after the trailing edge of solid black areas” (this page).

Previous copy shows faintly

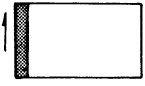
- Clean the master belt.
- Clean the quenching lamp. Does the quenching lamp operate correctly? See “Dirty background after the trailing edge of solid black areas” (this page).

Symptom	Action
Uneven Density Type 1 - Density changes gradually across the copy	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N • Check that the charge corona wire is clean and that it is installed correctly in the V-slots of the endblocks. • Clean the laser optics carefully with a blower brush or soft dry cloth. • Clean the scanner optics and exposure glass. • Check the SBU output and check scan line alignment (see pages 3-12 and 3-13). • Change the fluorescent lamps.
Uneven Density Type 2 - Uneven density appears in vertical bands 	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N • Clean the transfer and charge corona wires. • Clean the quenching lamp. • If the problem remains, clean the laser optics carefully with a blower brush or soft dry cloth. • Clean the exposure glass and scanner optics. • Change the fluorescent lamps, especially if bands appear only on the sides of a copy made in copy mode.

Symptom	Action
Uneven Density Type 3 - Horizontal bands 	Is there a clear contrast between the bands? Y N Clean the development roller bearings. • Change the fluorescent lamps if they is flickering. • Clean the transfer corona unit.
Vertical White Lines or Bands Type 1 - Straight sharp lines 	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N Start a copy cycle and stop it before the copy reaches the fusing unit. Do the same lines appear on the unfused copy? Y N • If the surface of the hot roller is scratched, replace the component that is scratching the roller (such as a hot roller stripper) • If the hot roller strippers are badly stained with toner, replace the thermistor (or the PSU, UIB, SPU, or SCU). Then, replace the hot roller. Continued on the next page.

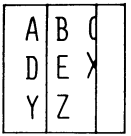
Symptom	Action
Vertical White Lines or Bands Type 1 - Straight sharp lines (continued)	Is the master belt scratched? Y • Correct or replace any parts that scratch the belt. • Change the master unit. N • Clean the grid plate. • Clean the toner metering blade - toner may be piling up there. • Add toner if the supply is low. • Follow the procedure for “Uneven Density Type 2 - Vertical bands” (page 5-15). • If the problem does not clear, check for foreign objects around the old master that could cause leakage of charge from the master unit. • Clean the cleaning blade. • Clean the white pressure plate. • Check the white waveform for error bits.
Vertical White Lines or Bands Type 2 - Fuzzy lines or bands	Clean the corona wires.

Symptom	Action
Vertical Black Lines or Bands Type 1 - Wavy lines	• Replace the master if the cleaning blade is damaged. • Pentagonal mirror motor problem - replace the motor. If the problem still occurs, replace the SCU, SPU, or UIB.
Vertical Black Lines or Bands Type 2 - Dotted lines or bands	If the master belt is scratched, replace the master unit and the part that is doing the damage.
Vertical Black Lines or Bands Type 3 - Band at left or right edge of the copy, superimposed on the data	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N Clean the laser optics carefully with a blower brush or soft dry cloth. • Clean the scanner optics. • Replace the fluorescent lamps.



Symptom	Action

Vertical Black Lines or Bands Type 4 - Straight lines or bands at constant positions on the copy



Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal?

Y

N

Start a copy cycle and stop it just before the copy reaches the fusing unit. Does the copy have the same lines on it?

Y

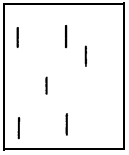
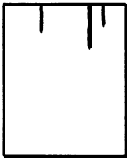
N

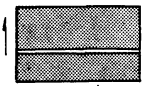
- Clean the thermistor, hot roller, and hot roller strippers.
- If the hot roller surface is scratched, correct or clean any parts that are damaging the roller, then replace the roller.
- If the hot roller strippers are badly stained with toner, replace the thermistor (or the UIB, PSU, SPU, or SCU).

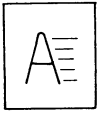
Replace the master unit if the belt is scratched.
Also, correct or replace any parts that may be damaging the belt.

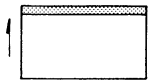
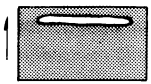
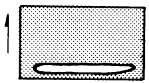
- Clean the corona wires.
- Clean the quenching lamp.
- Replace the toner metering blade if it is deformed.
- Clean the laser optics carefully with a blower brush or soft dry cloth.
- Replace the LSD, UIB, SPU, or SCU.

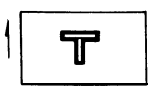
- Clean the scanner optics and exposure glass.
- Check for error bits in the SBU waveform.

Symptom	Action
Vertical Black Lines or Bands Type 5 	Clean the master belt with a soft dry cloth carefully, and clean the interior of the machine. Clean the charge corona wire.
Dirty margins 	Clean the quenching lamp. Change the master unit. Change the fluorescent lamps. Change the development unit.
Black streaks at the leading edge 	Clean the hot roller strippers. Replace the master unit.

Symptom	Action
Black spots at the leading edge 	• Clean inside the machine, especially the fusing entrance and transfer entrance guide plates. • Check that the transfer corona wire is installed properly. • Clean the transfer corona wire. • Replace the power pack.
Horizontal white lines or bands across copies 	Does the copy have a crease mark where the white band appears? Y N • Clean the transfer corona unit (wire, end blocks, and casing). • Check and replace any defective parts that may cause the transfer charge to leak. • Check the paper transport mechanism from paper feed through transfer; correct any faults. If the problem only happens on the first copy of a copy run, check whether the master has a horizontal band scratched on it. If it does, check the development clutch and the development roller drive mechanism. Replace any defective components.

Symptom	Action
Horizontal black stripes	• If “Call Service” is lit, replace the LDDR. • Check that the toner metering blade is screwed into place properly • Check that the master unit is installed correctly and that the master unit is grounded properly. • Check that SPU CN17 is not loose. Does the bias terminal receive -225 +/- 10 V? If not, does the power pack receive the trigger signal (SPU CN17-9 to low) and the power signal (SPU CN17-5)? Y N Replace the SPU or SCU. Replace the power pack.
White spots in black areas	• Clean the development roller with a soft cloth and alcohol. • Clean the transfer corona wire. If the problem cannot be solved, replace the development unit and/or power pack.
Black streaks after right-hand edges of black characters 	Laser diode circuit defective - replace the LSD, LDDR, UIB, SPU, or SCU.

Symptom	Action
Blank areas	If paper is wrinkled, refer to “Wrinkled Copy” (page 5-28). Otherwise, change the power pack.     Check that the corona wires are clean and properly installed. If that does not solve the problem, change the power pack.
Leading edge missing	• Check that the scan line sensor is positioned correctly. • Change the SPU or SCU.

Symptom	Action
Fuzzy copy	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N Are the charge corona fan (at the rear of the machine) and the front and rear transfer fans operating? Y N Do the fans receive + 24V from the DRU? Y N Replace the DRU, SPU, PSU, or SCU. Replace the defective fan. • Change the ozone filter. • Replace the master unit. • Clean the laser optics carefully with a blower brush or soft dry cloth. • Replace any defective components. • Replace the charge corona unit (charge corona wire operation can be checked with service function 09, mode 6). • Replace the transfer corona unit. • Clean the scanner optics. • Adjust focusing and reduction rate (see pages 3-14 and 3-15).
Hollowing out 	Is the paper damp? Y N • Clean the transfer corona wire. • Replace the power pack if that does not solve the problem. Replace the paper.

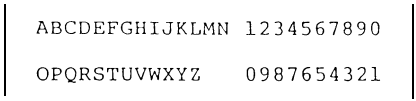
Symptom	Action
Hat image 	Does the quenching lamp turn on? Y N Does the lamp receive power and the trigger signal from the DSB? Y N Does the DSB receive + 24VD and the quenching lamp trigger signal from the UIB? Y N Replace the UIB, SPU, or SCU. Replace the DSB. Replace the lamp. • Check that the charge corona wire is correctly installed. • If the problem still occurs, change the power pack.
Unfused copy	• Clean the thermistor. • Change the pressure roller springs. • Replace the thermistor, fusing unit, UIB, SPU, SCU, or PSU.
Jitter	Make a printer test (service function 09, mode 0; see page 2-32). Is the printout normal? Y N • The master belt or main motor drive mechanism (such as motors, gears, timing belts) may be defective. Check the belt tension (see page 3-30). • Check all gears and timing belts. • Replace the transfer entrance guide plate. • The scanner drive mechanism (such as the tx motor, gears, or timing belt) may be defective. Check the belt tension (see page 3-19).

Symptom	Action
Image enlarged in the sub scan direction	If the problem only occurs in copy mode, it is a scanner problem. If the problem only occurs while receiving, it is a printer problem. The scanner or printer drive mechanisms (motors, gears, belts, and so on) may be obstructed or defective. (Motor operation can be checked with service function 09, mode 6.) The tx motor or master belt motor timing belt tension may need adjusting (see pages 3-19 and 3-30). If the tx motor is making abnormal noise, replace the tx motor, UIB, SPU, or SCU. If the master belt motor is making abnormal noise, replace the motor, DSB, UIB, SPU, or SCU.
Magnification or reduction	Adjust the reduction rate (see page 3-15).
Filled-in characters	Same as above.
Misaligned output - margin of data has been shifted to the left or right.	Make a printer test (service function 09, mode 0; see page 2-32). Is the output normal? Y N The LSD board may be out of position. Adjust as explained on page 3-25. • Adjust the scan start position (see page 3-17).

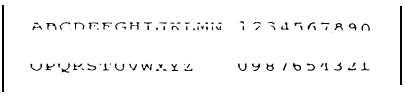
Effects of line problems on copy quality

1. Missing lines; shrinkage in the sub scan direction

- Original -

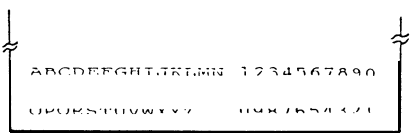


- Bad copy sample -



2. Cut off

- Bad copy sample -



Some lines may be missing just before the cut off.

Symptom	Action
Wrinkled copy	• Check whether the problem can be solved by using another stack of paper. • Check paper transport through the printer and replace the defective component. • Replace the fusing unit pressure springs.
Soiled copy paper	• Clean the paper feed, pick-up, and separation rollers with a soft damp cloth. • If the dirt is part of the image, then clean the ADF rollers. Metal rollers - soft cloth and alcohol Rubber rollers - soft cloth and water
Dirt along the leading edge on the reverse side	• Same as above. • Clean the following components: Transfer corona unit and entrance guide plate (damp cloth) Transport guide plate (damp cloth) Registration rollers (soft dry cloth) Feed-out rollers (damp cloth)
Skew	Check that paper is correctly stacked in the tray. If the problem is in the ADF, then: • Clean the R1 and R2 rollers (soft cloth and alcohol) • Clean the feed, pick-up, and separation rollers (soft cloth and water) • Replace the separation roller. • Check that the scanner cover switch and actuator are in the correct position.

Continued on the next page

Symptom	Action
Skew (continued)	If the problem is in the printer, then: • Clean the paper feed, pick-up, and separation rollers (soft cloth and water). Replace if necessary. • Check that the registration clutch operates correctly.
Document Jam	• Clean the R1 and R2 rollers (soft cloth and alcohol). • Clean the feed, pick-up, and separation rollers (soft cloth and water). • Check the Tx motor timing belt (see page 3-19). • Check the scan line sensor. Does the UIB receive a signal from the sensor at CN1-5? Y N Does the DSB receive a signal from the sensor at CN3-2? Y N Replace the sensor. Replace the DSB. Replace the UIB, SPU, or SCU. • If the sound is abnormal, check that the scanner is assembled correctly, or replace the Tx motor or UIB. (Motor operation can be checked with service function 09, mode 6.)
Document non-feed	• Clean the feed and pick-up rollers (soft cloth and water), and check the spring clutches

Continued on the next page

Symptom	Action
Document non-feed (continued)	• Does the tx motor turn on? (Motor operation can be checked with service function 09, mode 6.) Y N Does the UIB output the tx motor drive signals? Y N Does the SPU receive + 24VD from the PSU when Copy is pressed? Y N Does 1POWON go high? Y N Replace the SPU or SCU. Replace the PSU, or the upper unit interlock switch, or the right cover interlock switch. If the SPU does not send + 24VD to the UIB, replace the SPU. Otherwise, replace the UIB. Replace the tx motor. Does the UIB output the ADF clutch drive signal (CN1-1)? Y N Replace the UIB, SPU, or SCU. Does the DSB output the ADF clutch drive signal? Y N Replace the DSB.

Continued on the next page

Symptom	Action
Document non-feed (continued)	Does the SPU receive + 24VD from the PSU when Copy is pressed? Y N Does 1POWON go high? Y N Replace the SPU or SCU. Replace the PSU, or the upper unit interlock switch, or the right cover interlock switch. Trace the + 24VD signal from the SPU to the ADF clutch. Replace the defective component.
Document double-feed	Clean and lubricate, or replace the separation roller.
Noise from ADF	Clean and lubricate the springs and clutches in the feed and pick-up roller assembly and in the separation roller. Replace the tx motor or UIB. Check that the scanner is assembled correctly.

Symptom	Action
Copy Jam	• Is the correct type of paper being used?
	• Is the paper correctly loaded?
1) Paper Feed Entrance - Error Code 907	• Clean the paper feed, pick-up, and separation rollers. Remove any debris from the feed-in area.
	• Check the registration sensor. Does the DRU receive a signal from the registration sensor? Y N Replace the sensor. Does the SPU receive the signal from the registration sensor? Y N Replace the DRU. Replace the SPU or SCU.

Symptom	Action
Copy Jam (continued) 2) Registration Area Error Code 908	• Clean the registration rollers (metal roller - soft cloth and alcohol, rubber roller - soft cloth and water) • Check the registration sensor and circuit (see Copy Jam Type 1). • Check the registration clutch. If it is not working, do the following: Does the SPU send + 24VD and the drive signal to the DRU? Y N Replace the SPU or SCU. Does the registration clutch receive + 24VD and the drive signal? Y N Replace the DRU. Replace the clutch.
3) Inside the Machine - Error Code 908	• Check the master belt motor timing belt (see page 3-30). • Check the transfer entrance guide plate (see page 3-35). • Check the fusing unit drive. Replace the pressure roller springs, hot roller, or pressure roller if necessary. • Check the copy feed-out sensor and circuit as follows. Does the DRU receive a signal from the copy feed-out sensor? Y N Replace the sensor. Does the SPU receive the signal from the copy feed-out sensor? Y N Replace the DRU. Replace the SPU or SCU.
4) Copy Exit - Error Code 909	• Clean the copy feed-out rollers. • Check the copy feed-out sensor and circuit (see Copy Jam Type 3).

Symptom	Action
Copy Jam at the lower cassette feed-in area	• Clean the lower paper feed, pick-up; and separation rollers. • Remove any debris from the feed-in area
Copy non-feed - upper cassette	• Check that non-feed is not due to another problem (such as “Call Service” being lit, power cord not plugged in). • Clean or replace the upper paper feed and pick-up rollers; check the feed mechanism. • Clean and lubricate the feed and pick-up spring clutches. • Clean the separation roller slip clutch. • Remove any debris from the feed-in area. • Does the main motor turn on? (Motor operation can be checked with service function 09, mode 6.) Y N Does the SPU receive + 24VD from the PSU when Copy is pressed? Y N Does 1POWON go high? Y N Replace the SPU or SCU. Replace the PSU, or the upper unit interlock switch, or the right cover interlock switch. Continued on the next page.

Symptom	Action
Copy non-feed - upper cassette (continued)	Does the SPU output the drive (CN5-7) and power signals to the DRU? Y N Replace the SPU or SCU. Does the DRU output the drive and power signals to the motor driver? Y N Replace the DRU. Replace the main motor and driver. • Check the paper feed clutch. If it does not operate, do the following. Does the SPU output the drive signal to the DRU at CN5-13? Y N Replace the SPU or SCU. Does the solenoid receive the drive signal? Y N Replace the DRU. Replace the solenoid. • Check that there is paper at the paper feed position. If there is not, check the lift mechanism (see page 3-30). Then check the circuit as follows. Does the SPU output the tray lift drive signal at CN5-15? Y N Replace the SPU or SCU. Does the tray lift solenoid receive the drive signal? Y N Replace the DRU Replace the solenoid if it is not working. Continued on the next page

Symptom	Action
Copy non-feed - upper cassette (continued)	Does the SPU receive signals from the paper height sensor at CN14-2? Y N Does the SPU output 5V at CN14-5? Y N Replace the SPU or SCU. Replace the sensor. Does the SPU receive signals from the paper size sensor on CN6? Y N Replace the sensor. Replace the SPU or SCU. If the main motor, pentagonal mirror motor, and development bias turn on, but not the master belt motor or lower paper feed motor, then the basic starting conditions for copying may not have been met. • The fusing lamp may not have reached the correct temperature (error code 922). • The pentagonal mirror motor (error code 923) or main or lower paper feed motor (error code 924) may not have reached the correct speed. • One page may not be stored in the page memory - check the component PCBs of the video data path and the connections between them.

Symptom	Action
Copy non-feed - lower cassette	• Check that non-feed is not due to another problem (such as “Call Service” being lit, power cord not plugged in). • Clean or replace the lower paper feed and pick-up rollers. • Check the feed mechanism. • Clean and lubricate the spring clutches. • Clean the separation roller clutch. • Remove debris from the feed-in area. • Does the lower paper feed motor turn on? (Motor operation can be checked with service function 09, mode 6.) Y N Does the LIB receive + 24VD from the SPU? Y N Continued on the next page

Symptom	Action
Copy non-feed - lower cassette (continued)	Does 1POWON go high after Copy has been pressed? Y N Replace the SPU or SCU. Does the SPU receive + 24VD from the PSU after Copy has been pressed? Y N Replace the PSU, upper unit interlock switch, or right cover interlock switch. Does the SPU output + 24V to the LIB after Copy has been pressed? Y N Replace the SPU or SCU. Check the connectors and harnesses. Does the LIB output the lower paper feed motor drive signal? Y N Replace the LIB, SPU, or SCU. Replace the motor and driver. Does the motor return a low at CN2-4 within 3 s of the motor turning on? Y N Replace the motor and driver (lock failed). Check the lower paper feed solenoid. If it does not work, check the following. Does the LIB send power (CN2-5) and drive (CN2-6) signals to the solenoid? Y N Replace the LIB, SPU, or SCU. Replace the solenoid.

Symptom	Action
Copy non-feed - lower cassette (continued)	• Check that paper is at the paper feed position. If not, check the lift mechanism. then check the circuit as follows. Does the lift motor work? (This motor cannot be checked with service function 09, mode 6.) Y N Does the LIB send the power (CN3-10) and drive (CN3-11) signal to the motor? Y N Replace the LIB, SPU, or SCU. Replace the motor and driver. Does the LIB receive a signal from the lower paper height sensor at CN3-9? Y N Does the SPU send + 5V to the LIB? Y N Replace the SPU. Does the LIB send + 5V to the sensor at CN3-7? Y N Replace the LIB. Replace the sensor. Does the LIB receive signals from the lower paper size sensor on CN4-7, 8, and 9 when the cassette is installed? Y N Does the lower cassette switch cause the lower paper size sensor to activate when the switch is closed? Y N Replace the lower cassette sensor. Replace the lower paper size sensor. Replace the LIB, SPU, or SCU.

Symptom	Action
Copy double feed	Clean and lubricate, or replace the separation roller (upper or lower).
Abnormal noise from the printer	Dirty paper feed, pick-up, or separation clutch.
Dog-eared copies	Defective hot roller stripper. Excessive copy paper curl.
Ozone odour	Are the fans working? Y N Replace either: • Printer fan drive belt and/or main motor • Defective fan - charge corona fan - front transfer corona fan - rear transfer corona fan • DRU, SPU, SCU, or PSU. Change the ozone filter.
Toner overflow	This should be solved by installing a new toner collection tank or master unit. If it is not: Check that the toner overflow detection mechanism is not defective. Does the UIB send power to the toner overflow sensor and receive signals from it? Y N Replace the sensor. Replace the UIB, SPU, or SCU.

5-4. Service Call Conditions

If the Call Service indicator is lit, one of the following conditions has occurred. In the following list, the messages printed on the Auto Service Call printout are given followed by an explanation in brackets if necessary.

- Master Unit Replacement Required
- Preventive Maintenance Required
- Polygon Motor Fail (pentagonal mirror motor lock failure, or laser main scan synchronization failure)
- Heater Control Fail (fusing lamp failure)
- LD Power Lock Fail (laser diode power control failure)
- Home Position Fail (master belt home position detection failure)
- Main Motor Lock Fail (main motor or lower paper feed motor lock failure)
- Charger Current Leak (transfer corona charge leak)
- UIB Handshake fail
- LIB Handshake fail
- LDS Handshake Fail
- Disk Drive Error (hard disk error)
- Disk Controller Error (hard disk error)
- Disk Memory Logical Error (hard disk error)

To find out which problem has occurred, either:

- See the Auto Service Call report that was sent to the service station for the problem with the machine.
- Check the error code history using service function 06 (see page 2-31).
- Check the printer status using service function 14, and scroll through the error messages on the screen (see page 2-38).
- Try to clear the service call condition using one of the following methods:

1. Use service function 09, mode 1 (SPU reset) to reset the machine.
2. Hold the Stop key down for about 10 s.
3. Switch the power off, wait 10 seconds, then switch back on.

If the problem remains, work through the appropriate troubleshooting procedure from the following pages.

- Resetting the Machine -

After each troubleshooting attempt, reset the machine with service function 09, mode 1 as explained above. If the machine still does not work, continue troubleshooting.

Symptom	Action
Master Unit Replacement Required	If the problem remains after installing a new master and resetting the master belt rotation counter with Function 99, reset the RAM addresses containing the counter (3036F6 to 3036F8, and 240030 to 240032) or replace the MBU, SPU, or SCU.
Preventive Maintenance Required	A service technician should visit the machine and do the PM procedures.

Polygon Motor Fail

Does the SPU receive + 24VD from the PSU?
Y N
Does 1POWON go high after Copy is pressed?
Y N
Replace the SPU or SCU.
Replace the PSU, upper unit interlock switch, or right cover interlock switch.
Does the SPU output + 24V at CN4-1, 2, and 3?
Y N
Replace the SPU.
Does the UIB output + 24V at CN2-4?
Y N
Replace the UIB.

- Replace the pentagonal mirror motor. (Motor operation can be checked with service function 09, mode 6).
- Replace the LSD or LDDR.
- Replace the UIB, SPU, or SCU.

Heater Control Fail

- Is the fusing unit thermistor open or shorted? If so replace it. Otherwise clean it.
- Replace the fusing lamp if it is open circuit.
- Replace the SPU or UIB.
- Replace the PSU.
- Replace the upper unit interlock switch or right cover interlock switch.

LD Power Lock Fail

Does the SPU receive all power supply signals from the PSU?
Y N
Replace the PSU or the interlock switches.
Does the master unit interlock switch component on the upper unit pass + 12V and -12V?
Y N
Replace the interlock switch.
Replace the master unit, LDDR, UIB, SPU, or SCU.

Home Position Fail

(Home position detection can be checked with service function 09, mode 6).

- Clean the sensor patch on the master belt. Replace the master unit if it cannot be cleaned.
- Check the master belt drive mechanism. (Motor operation can be checked with service function 09, mode 6).
  Check the belt tension (p.3-30).

Does the master belt drive motor operate?
Y N
Does the SPU receive + 24VD from the PSU?
Y N
Does 1POWON go high after Copy is pressed?
Y N
Replace the SPU or SCU.
Replace the PSU, upper unit interlock switch, or right cover interlock switch.
Check that + 24VD is passed from the PSU through to the DSB.
Replace any PCB that does not pass on the voltage.

Continued on the next page

Does the DSB output the motor drive phases?
Y N
Replace the DSB, UIB, SPU, or SCU.
Replace the motor.
Does the UIB receive a signal from the master belt home position sensor?
Y N
Does the sensor receive + 5V?
Y N
Trace the + 5V supply line through the machine from the PSU to the sensor and replace the defective PCB.
Replace the sensor.
Replace the UIB, SCU, or SPU.

Main Motor Lock Fail

Main Motor (Motor operation can be checked with service function 09, mode 6).
Does the SPU receive + 24VD from the PSU?
Y N
Does 1POWON go high after Copy is pressed?
Y N
Replace the SPU or SCU.
Replace the PSU, upper unit interlock switch, or right cover interlock switch.
Does the SPU output + 24V at CN5-1, 2, and 3?
Y N
Replace the SPU.
Does the DRU output + 24V at CN2-3?
Y N
Replace the DRU.
Replace the main motor or the SPU or SCU.

Lower Paper Feed Motor (Motor operation can be checked with service function 09, mode 6).
Does the SPU receive + 24VD from the PSU?
Y
N
Does 1POWON go high after Copy is pressed?
Y
N
Replace the SPU or SCU.
Replace the PSU, upper unit interlock switch, or right cover interlock switch.
Does the SPU output + 24V at CN3-1 and 2?
Y
N
Replace the SPU.
Does the LIB output + 24V at CN2-1?
Y
N
Replace the LIB.
Replace the motor or the SPU or SCU.

Charger Current Leak

- Clean the transfer corona wire and unit.
- Check that the development bias is correct (-225 +/- 10 V). If it is not, replace the power pack.
- Check that the SPU outputs the power and trigger signals to the power pack for transfer corona and bias. If not, replace the SPU.
- Replace the SPU, SCU, power pack or transfer corona unit if the problem still occurs.

UIB Handshake Fail

Change the SPU, UIB, or SCU.

LIB Handshake Fail

Change the SPU, LIB, or SCU.

LDS Handshake Fail

Change the SCU, SPU, LDS, or UIB.

Disk Drive Error	Replace the hard disk, SPU, or SCU.
Disk Controller Error	Replace the SPU, hard disk, or SCU.
Disk Memory Logical Error	Replace the hard disk, SPU, or SCU.

5-5. Error Codes

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below.

Three digit error codes can appear with a dash after the first digit; if a report shows code 9-13, see code 913 in this manual.

Error codes 1xxx and three-digit codes will appear on the error report. Other codes will only appear in service mode operations.

Code	Meaning	Suggested Cause/Action
1 to 44	Software error	1. Do a RAM test (service function 09, mode 3) to find out if there is a defective memory chip. Replace the defective board. 2. Replace the MBU or SCU.
45	System RAM was cleared and reset by holding down the Stop key for 10 s	There is no problem.
46	Temporary power dropout	There is no problem.
47	A RAM test was executed (service function 09)	There is no problem. However, if the MBU RAM was tested, the hard disk bad sector data must be reprogrammed.

Code	Meaning	Suggested Cause/Action
008	The other end sent RTN or PIN after receiving a page, because there were too many errors (G3 mode)	1. Check the line connection. 2. Check the connectors from the SCU through the machine to the G3NCU and modem. 3. Replace the SCU, SPU, G3CCU, G3NCU, or modem. 4. The other end may have jammed, or run out of paper or memory space. 5. Try adjusting the tx level (use G3CCU bit switch 19 bits 0 to 3 or a dedicated tx parameter for that address). 6. The other end may have a defective modem, CCU, NCU, SCU, or SPU. 7. Check for line problems and noise.
015	The other end does not have the confidential or transfer function (G3 mode)	1. Incompatible remote terminal. 2. Remote terminal memory full.

Code	Meaning	Suggested Cause/Action
023	Too many errors during reception (G3 mode); RTN was sent back to the other end	1. Check the line connection. 2. Check the connectors from the SCU through the machine to the G3NCU and modem. 3. Replace the SCU, SPU, G3CCU, G3NCU, or modem. 4. Defective remote terminal. 5. Check for line problems. 6. Ask the other end to adjust their tx level.
100	Document jam during non-memory transmission	1. Improperly inserted document. 2. See section 5-3.
134	Paper ran out immediately after the end of printing	1. Replace paper. 2. Clear debris from the paper end sensors. 3. Check the connections through the machine from the paper end sensors to the SCU (see the point-to-point diagram); replace any defective component in this circuit.
410	Communication failed because of Polling ID mismatch (Closed Network)	1. Get the Polling ID codes the same. 2. Resend.
521	Memory overflow	1. Temporary memory shortage. 2. Replace the SCU, SPU, or MBU. 3. Test the hard disk using the routines in section 5-6, starting on page 5-64; if the hard disk is defective, reformat or replace it.

Code	Meaning	Suggested Cause/Action
880	CCU requested data transfer halt	1. Retry the communication. 2. Replace the G3CCU, SCU, or SPU.
881	Timer for DMA transfer to the CCU ran out	Same as for 880.
900	Either: a) An Auto Service Call condition occurred during rx, b) PIN was sent back because substitute reception was impossible	1. Retry the communication. 2. If the Call Service indicator is lit, solve the problem as explained in section 5-4, then reset the machine as explained on page 5-42.
901	Toner collection tank full	1. Replace the master unit. 2. Clean the toner overflow sensor. 3. Check the connections through the machine from the SCU to the toner overflow sensor. Replace any defective part of the circuit.
906	Master belt rotation counter ran out	See section 5-4 (Master Unit Replacement Required).
907	Copy jam at the cassette entrance	See section 5-3.
908	Copy jam under the master unit	See section 5-3.
909	Copy jam in the copy feed-out area	See section 5-3.

Code	Meaning	Suggested Cause/Action
910	Toner cartridge empty	1. Add toner. 2. Check the toner end mechanism. 3. Check the connections through the machine from the SCU to the toner end sensor. Replace any defective part of the circuit.
912	Cover open	1. Check all covers. 2. Check that all cover switches are working properly (scanner cover switch, right cover switch, upper unit interlock switch, lower front cover switch, jam removal switch). 3. Check the connections through the machine from the SCU to the cover switches. Replace any defective part of the circuit.
913	Master unit interlock switch open	1. Check that the upper unit is closed properly. 2. Check the + 12V supply circuit for the LDDR; replace the interlock switch or any defective PCBs.
917	Transfer corona power leak	See section 5-4 (Charger Current Leak).
918	HMC - LDS handshake error	See section 5-4 (LDS Handshake Fail).
919	Toner collection tank nearly full	No error, see code 901.
920	Laser diode power control failed	See section 5-4 (LD Power Lock Fail).

Code	Meaning	Suggested Cause/Action
921	Master belt home position detection failure	See section 5-4 (Home Position Fail).
922	Fusing lamp failure	See section 5-4 (Heater Control Fail).
923	Pentagonal mirror motor lock failure, or laser main scan synchronization failure	See section 5-4 (Polygon Motor Fail).
924	Main motor or lower paper feed motor lock failed	See section 5-4 (Main Motor Lock Fail).
925	UIB handshake error	See section 5-4 (UIB Handshake Fail).
926	LIB handshake error	See section 5-4 (LIB Handshake Fail).
930	Hard disk drive error	See section 5-4 (Disk Drive Error).
931	Hard disk control error	See section 5-4 (Disk Controller Error).
932	Hard disk memory error	See section 5-4 (Disk Memory Logical Error).

Code	Meaning	Suggested Cause/Action
1000 to 1019	SCU - G3CCU handshake error	1. Check the connection through the machine from the SCU to the G3CCU. Replace any defective part of the circuit. 2. Replace the MBU.
1030	No reply from the other end (automatic dialling)	1. Check that the machine is connected to the line. 2. Retry the communication. 3. Replace the G3NCU, G3CCU, modem, SPU, or SCU.
1031	Call collision (automatic dialling)	1. Retry the communication. 2. Replace the G3NCU, G3CCU, SPU, or SCU.
1032	The other end is busy (automatic dialling)	1. Retry the communication. 2. Listen to the line; if the line is not busy but this error occurs, replace the G3NCU, G3CCU, modem, SCU, or SPU.
1033	CED (2100 Hz) be detected (automatic dialling)	1. Retry the communication. 2. Monitor the line; if CED comes in but this error occurs, replace the G3NCU, G3CCU, SCU, modem, or SPU.
1034	Line cut-off detected (automatic dialling)	1. Retry the communication. 2. Monitor the line; if the line is not cut but this error still occurs, replace the G3CCU, G3NCU, SPU, or SCU.

Code	Meaning	Suggested Cause/Action
1036	Polarity reversal not detected at the expected time (automatic dialling)	1. Retry the communication. 2. Monitor the line; if polarity reversal occurs as expected but the error still occurs, replace the G3CCU, G3NCU, SPU, or SCU.
1037	Dialling not completed within 2 minutes (automatic dialling)	1. Retry the communication, using the same or different numbers. 2. Replace the G3CCU, G3NCU, SPU, or SCU.
1038	Dialling not complete within 30 s (manual dialling)	1. Retry the communication, completing dialling within 30 s. If the error still occurs, replace the G3CCU, G3NCU, SCU, or SPU.
1051	G2 is disabled at this end, but the other end is a G2 machine	Enable G2 (G3CCU bit switch 01, bit 1 must be 0), then retry the communication.
1100	The machine cannot send a response because the modem carrier from the other end did not turn off (tx mode).	1. Noisy line; retry the communication. 2. Set bit 2 of G3 CCU bit switch 07 to 1. 3. Monitor the line; if the carrier did drop but the error still occurred, replace the G3CCU, G3NCU, SCU, modem, or SPU.
1101	Modem training hardware error (tx mode)	1. Retry the communication. 2. Replace the modem, G3CCU, G3NCU, SPU, or SCU.
1103	PIS (462 Hz) received (tx mode)	1. Retry the communication.

Code	Meaning	Suggested Cause/Action
1104	PIN received from the other end (tx mode)	1. Noisy line; retry the communication. 2. Defective remote terminal. 3. Replace the modem, G3CCU, G3NCU, SPU, or SCU.
1105	Third try failed (normal response to a signal cannot be detected after three tries)	Same as for code 1104.
1106	Modem training at 2400 bps failed (tx mode)	Same as for code 1104.
1110	Video data buffer became empty (tx mode)	1. Retry the communication. 2. Replace the SCU, SPU, or VPU.
1112	DCN received from the other end at an unexpected time (tx mode)	Same as for code 1104. If possible, check the protocol timing by which DCN was received.
1113	DIS/NSF/CI cannot be received	Same as for code 1104.
1117	FTT received during confidential or transfer transmission.	Same as for code 1104.
1122	PIS (462 Hz) received from the other end (G2 tx mode)	Same as for code 1104.

Code	Meaning	Suggested Cause/Action
1123	CFR signal not detected within 5 s after phase synchronization finished, or CFR lasted longer than 6 s (G2 tx mode)	Same as for code 1104.
1124	MCF signal not detected within 5 s of transmission of EOM, or MCF lasted longer than 6 s (G2 tx mode)	Same as for code 1104.
1160	At the start of the video data, no data was received from the SCU within 35 s (ECM tx mode).	1. Replace the SCU, SPU, or G3CCU
1161	During video data transmission, no data was received from the SCU for 35 s (ECM tx mode).	Same as for code 1160.
1162	Transmission failed at 2400 bps (ECM tx mode)	Same as for code 1104.
1163	T5 timer ran out (ECM tx mode)	1. Defective remote terminal
1164	Unexpected protocol frame received (ECM tx mode)	Same as for code 1104.
1165	EOR sent out (ECM tx mode)	1. Retry the communication.

Code	Meaning	Suggested Cause/Action
1166	PPR received with all bits in the FIF at 0 (ECM tx mode)	1. Retry the communication. 2. Defective remote terminal.
1201	Modem carrier cut and machine hanged up (rx mode)	Same as for code 1104.
1204	Modem training failed (rx mode)	Same as for code 1104.
1205	No HDLC frame was received (rx mode)	Same as for code 1104.
1206	Modem carrier not switched off (rx mode)	Same as for code 1104.
1210	Video data buffer full (rx mode)	1. Retry the communication.
1211	DCS/GC cannot be received (rx mode)	Same as for code 1104.
1212	Modem training hardware failure (rx mode)	1. Retry the communication. 2. Replace the G3CCU, G3NCU, modem, SPU, or SCU.

Code	Meaning	Suggested Cause/Action
1215	RTC could not be detected (rx mode)	Same as for code 1104.
1216	EOL cannot be detected within 5 s	Same as for code 1104.
1222	PIS received from the other end (G2 rx mode)	1. Defective remote terminal. 2. Other end made a voice request. 3. Replace the G3CCU, G3NCU, modem, SCU, or SPU.
1223	Synchronization (phasing) failure (G2 rx mode)	Same as for code 1104.
1224	2100 Hz video data carrier cannot be received (G2 rx mode)	Same as for code 1104.
1225	EOM could not be detected at the end of the data, or EOM lasted longer than 4 s (G2 rx mode)	Same as for code 1104.
1260	T2 timer ran out (ECM rx mode)	Same as for code 1104.
1261	The tx side sent more than 35 s of flags before a frame.	1. Retry the communication. 2. Defective remote terminal.
1262	No frame or V.21 signal received for more than 3 s, so the rx side sent DCN.	1. Retry the communication. 2. Defective remote terminal.

Code	Meaning	Suggested Cause/Action
1263	Unexpected frame received after sending out RNR in response to PPS-Q or RR (ECM rx mode)	Same as for code 1104.
1264	T2 timer ran out after receiving EOR (ECM rx mode)	Same as for code 1104.
1265	Unexpected frame received after sending out RNR in response to EOR-Q or RR (ECM rx mode)	Same as for code 1104.
1266	EOR received (ECM rx mode)	Retry the communication.
9201 to 9274	Data compression/reconstruction hardware error	1. Replace the SCU, SPU, or VPU.
9331	Document jam, or scanner cover open	1. If document jams are persistent, see section 5-3 (document jam troubleshooting). 2. Check the connections through the machine from the SCU to the scan line sensor and the scanner cover switch; replace any defective parts of this circuit.
9332	SPU-SCU handshake error	1. Replace the SPU or SCU.
9333	Scanning stopped at the other end (for example, the user pressed stop)	Retry the communication.

Code	Meaning	Suggested Cause/Action
9401	Paper fed-out indication not received within 30 s of the printing start command	Change the SPU, copy feed-out sensor, DRU, or SCU.
9403	No printer paper	1. Add paper. 2. If this error occurs when paper is present, check the connections through the machine from the SCU to the defective cassette's sensors and drive components. Replace any defective components.
9405	Page memory full, and memory did not become available within 30 s	1. Retry the communication. 2. Replace the SCU or SPU.
9406	Machine cannot print	1. Check that there is enough toner and paper. Check for paper jams. Check that all covers are closed properly. 2. If all in step 1 is ok but the error still occurs, check the circuits through the machine from the SCU to the sensors and cover switches.
9532	See code 1105.	
9551	RTN received but retransmission was not possible; the line was cut.	See code 008.
9553	See code 1104.	

Code	Meaning	Suggested Cause/Action
9556	EOR was sent out and the line was cut (ECM tx mode)	See code 1165.
9557	EOR was sent out and the transmission resumed from the next page	Retry the communication if the page was illegible at the other end
9592	No response from the CCU	Check the connections through the machine from the SCU to the CCU. Replace any defective components.
9599	CCU reset due to handshake error	If this error is persistent, change the SCU, CCU, or SPU.
9608	Hard disk controller error	Replace the SPU, hard disk, or SCU.
9609	Disk drive error	See code 9608.
9610	Hard disk DMA transfer error	See code 9608.
9625	The disk drive accessed a non-existent or forbidden disk area.	See code 9608.

Code	Meaning	Suggested Cause/Action
9626 to 9628	Insufficient RAM area for hard disk administration	See code 9608.
9629, 9630	Hard disk data file destroyed	See code 9608.
9631	Hard disk control sequence error	See code 9608.
9632 to 9634	Abnormality in the hard disk administration RAM area	See code 9608.

5-6. Hard Disk Troubleshooting Routines

1. Outline

These functions display hard disk error codes and provide a few routines to help you restore the hard disk to normal operation. The various hard disk error codes will help to decide which action to take.

Some hard disk error conditions lead to Auto Service Calls. Check whether any Auto Service Calls were received from this machine, and find out what the error message was. Then consult section 5-4.

If a hard disk error code is displayed on the error report or Service Monitor Report (service function 06), see section 5-5 (Error Codes) for guidance.

If an error code is displayed on the LCD immediately after power-up, see the Power-up Error Code table on page 5-70 for guidance.

If there are no hard disk errors on the error report or the LCD at power-up, enter the hard disk troubleshooting mode as shown below and see the displayed error code. Check the Power-up Error Code table on page 5-70 for guidance. If there are still no error codes displayed, do hard disk routine 2 (Error Code Display), and see the Hard Disk Error Code table on page 5-71.

If it is difficult to decide what to do, a basic rule of thumb to follow would be to try the procedures in the following order:

- File Correction - Function 3
- Clear Address - Function 6
- Clear Job - Function 7
- Disk Format - Function 8 (there is no need to enter the bad sector data)
- Replace the hard disk, SPU, or SCU.

2. Entering and Exiting Hard Disk Troubleshooting Mode

ENTERING HARD DISK TROUBLESHOOTING MODE

1. From standby mode, hold down the Stop key for about 10 seconds until the machine does a warm start.
2. Immediately, press Function, then *, then #. An error message is displayed. Disregard this message unless an error code is also displayed.
3. Press Function, then *, then # once more.

The hard disk troubleshooting menu is now displayed.

If a warm start is impossible, switch the machine off, wait for 10 s, then switch back on. Then go to step 2.

EXITING HARD DISK TROUBLESHOOTING MODE

Do Function 1 (System Start) to return the machine to standby.

3. Functions

3-1. System Start - Function 1

1. Enter the hard disk troubleshooting mode. See above.
2. When the hard disk troubleshooting menu is displayed, enter 1 at the ten-key pad, then press Yes.
3. The machine resets itself automatically.

3-2. Error Code Display - Function 2

See the Hard Disk Error Code table on page 5-71 for an explanation of the error codes.

1. Enter the hard disk troubleshooting mode. See page 5-65.

2. When the hard disk troubleshooting menu is displayed, enter 2 at the ten-key pad.

3. A table of error codes is displayed. Press the up and down arrows of the scroll key to scroll through the table.

   The display contains four columns.
   ID: This contains a sequence number from 0001 to 00FF.
   MODE: This explains what mode the machine was in when the error occurred
   - 0001 - Hard disk set-up
   - 0002 - Normal system start-up: reading from hard disk
   - 0003 - Formatting the hard disk
   - 0005 - Normal system start-up: writing to hard disk
   - FF00 - Address label data error
   - FF10 - Job file (memory file) error

   FILE NO: This gives the number of the defective file, as it is shown on the Journal.
   SAF ID: This is not for use in the field.
   ERROR: This is the error code.

   A normally operating machine will show:

ID	MODE	FILE NO.	SAF ID	ERROR
0001	0001	FFFF	FFFF	0000

4. When you have finished, press Yes to return to the hard disk troubleshooting menu.

3-3. File Correction - Function 3

This function allows the hard disk to attempt to recover defective files. If this routine is successful, all defective files will be recovered intact; no data will be lost. If this routine fails, it will be necessary to try routines 6 (Clear Address) and/or 7 (Clear Job) depending on the recovery method for the observed error code.

1. Enter the hard disk troubleshooting mode. See page 5-65.
2. When the hard disk troubleshooting menu is displayed, enter 3 at the ten-key pad, then press Yes.
3. The machine asks “Recover SAF File Y/N?”. Press Yes. The machine resets itself automatically.

3-4. Random Read Test - Function 4

Factory use only.

3-5. All Read Test - Function 5

Factory use only.

3-6. Clear Address - Function 6

This function clears the address labels associated with the Quick Dials and Speed Dials used in the files on the hard disk. These “address labels” are programmed with the option setting mode of Quick/Speed Dial programming, and they have a similar function to a cover letter; they can be up to 8 lines long.

If this routine is successful, all defective files will be recovered intact; no data will be lost, except the labels. If this routine fails, it may be necessary to try routine 7 (Clear Job), depending on the recovery method for the observed error code.

1. Enter the hard disk troubleshooting mode. See page 5-65.

2. When the hard disk troubleshooting menu is displayed, enter 6 at the ten-key pad, then press Yes.

3. When “Clear All Name Insertions? Y/N” is displayed, press Yes. The machine automatically resets itself.

3-7. Clear Job - Function 7

This is a last-resort routine to recover the hard disk. All files will be lost if this is successful, but the hard disk will be operational. Note that programmed data such as Speed and Quick Dials will not be cleared. If this routine fails, try reformatting the hard disk (Function 8 below).

1. Enter the hard disk troubleshooting mode. See page 5-65.

2. When the hard disk troubleshooting menu is displayed, enter 7 at the ten-key pad, then press Yes.

3. When “Clear All Files? Y/N” is displayed, press Yes. The machine automatically resets itself.

3-8. Disk Format - Function 8

This function has already been explained in section 1-6 (Installation). If there are severe hard disk problems in the field, try reformatting the disk. Note that all files will be lost. If the hard disk is still defective, replace it.

1. Enter the hard disk troubleshooting mode. See page 5-65.

2. When the hard disk troubleshooting menu is displayed, enter 8 at the ten-key pad, then press Yes, enter 1988, and press Yes.

3. When “Initialize System? Y/N” is displayed, press Yes.

4. Enter the bad spot information listed on the decal inside the machine. Press Yes when you have finished.

   Notes:

   The hard disk bad sectors need only be reprogrammed under the following circumstances:
   - After hard disk or MBU replacement
   - After making an MBU RAM test (service function 09, mode 3)
   - After initializing the MBU RAM by removing the battery switch.
   - After MBU battery failure or accidentally turning the battery switch off.

5. “Initialize System Y/N” is displayed again. Press Yes to format the hard disk. After formatting has finished, the machine will ask you to program the initial settings. This is because the hard disk contains user-programmed items such as Quick Dial Keys.

4. Error Codes

4-1. Power-up Error Codes

Code	Meaning	Suggested Action
10	During system reset (power up, or pressing Stop for 10 s), no response came from the hard disk controller (on the SPU), or the response was in error	1. Check the SCU/SPU and SPU/hard disk connections. 2. Replace the SPU. 3. Replace the hard disk.
12	Abnormal completion of disk formatting	Try to format the disk again. If the same error occurs, do the same steps as for error code 10.
13	Disk I/O error during system reset	See error code 10.
14	Address label data error during system reset	Try Function 3 (File Correction). If the same error occurs after that, try Function 6 (Clear Address). If that fails, see error code 12.
15	Job file data error during system reset	Try Function 3 (File Correction). If the same error occurs after that, try Function 7 (Clear Job). If that fails, see error code 12.
16	See error code 13.	See error code 13.
20	Disk formatting error	See error code 10

4-2. Hard Disk Error Codes

Code	Suggested Action
01	Try “File Correction” (hard disk function 3). If that fails, try Clear Address (function 6). If that fails, try Clear Job (function 7). If that fails, reformat the disk (function 8). If that fails, replace the hard disk.
02 to 10	See code 01.
21 to 32	See code 01.
40 to 42	See code 01.

SECTION 6

OPTIONAL BAR CODE READER

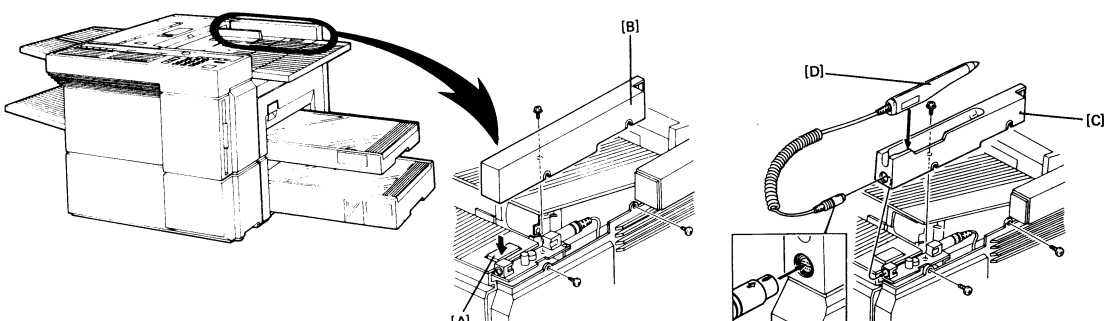
SECTION 6. OPTIONAL BAR CODE READER

6-1. Accessory Check List

1.	Bar Code Reader Installation Instructions	1
2.	Bar Code Reader Holder	1
3.	Bar Code Reader	1
4.	Department Card Set (1 set = 10 cards)	1
5.	Operation Manual	1

6-2. Installation Procedure

1. Turn off the main switch.
2. Open the upper unit by pushing button [A].
3. Remove cover [B] (3 screws).
4. Install the bar code reader holder [C] (3 screws).
5. Install the bar code reader [D].
6. Turn on the main switch.

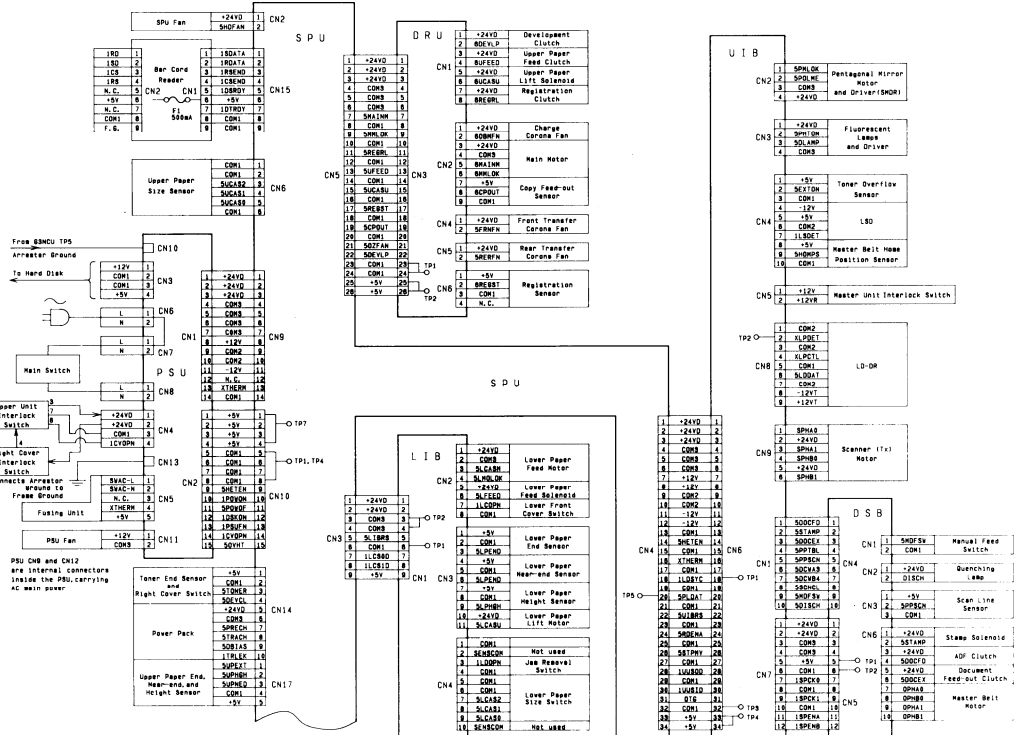


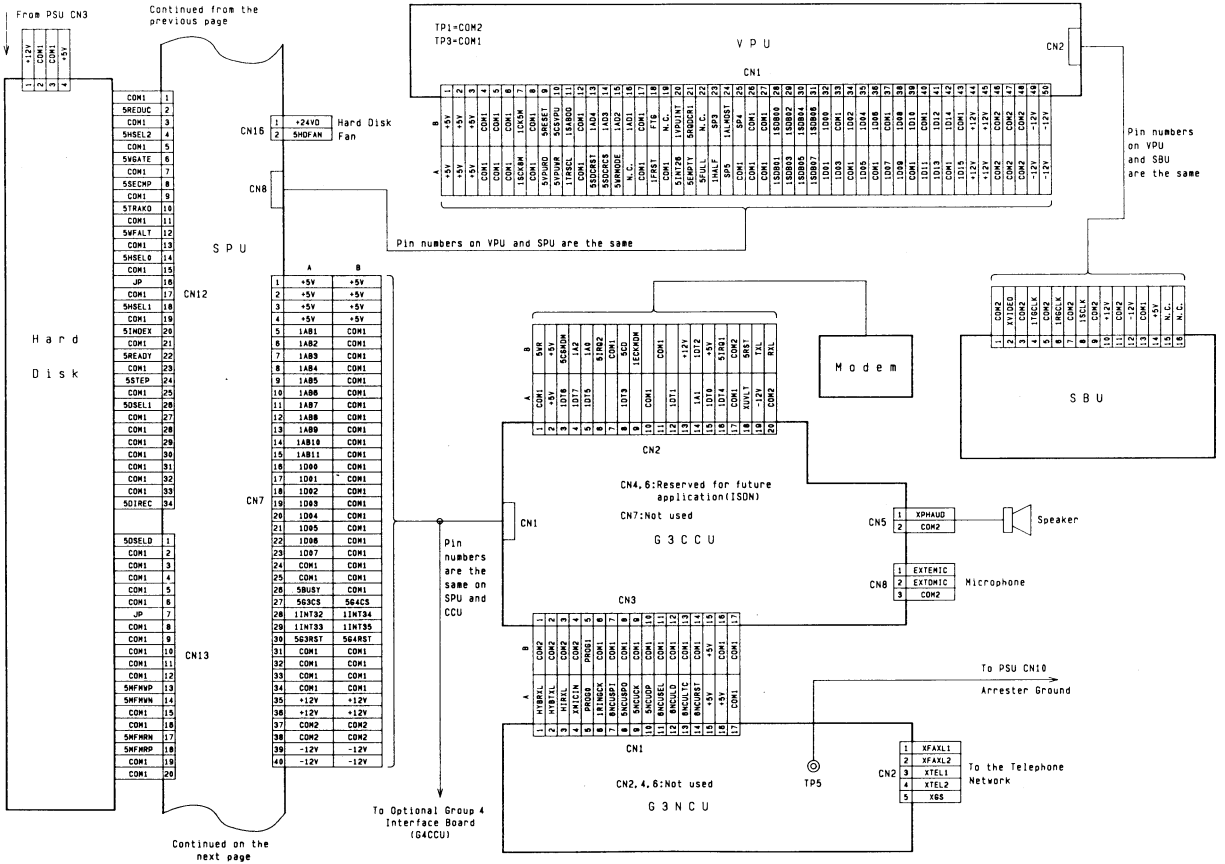
SECTION 7

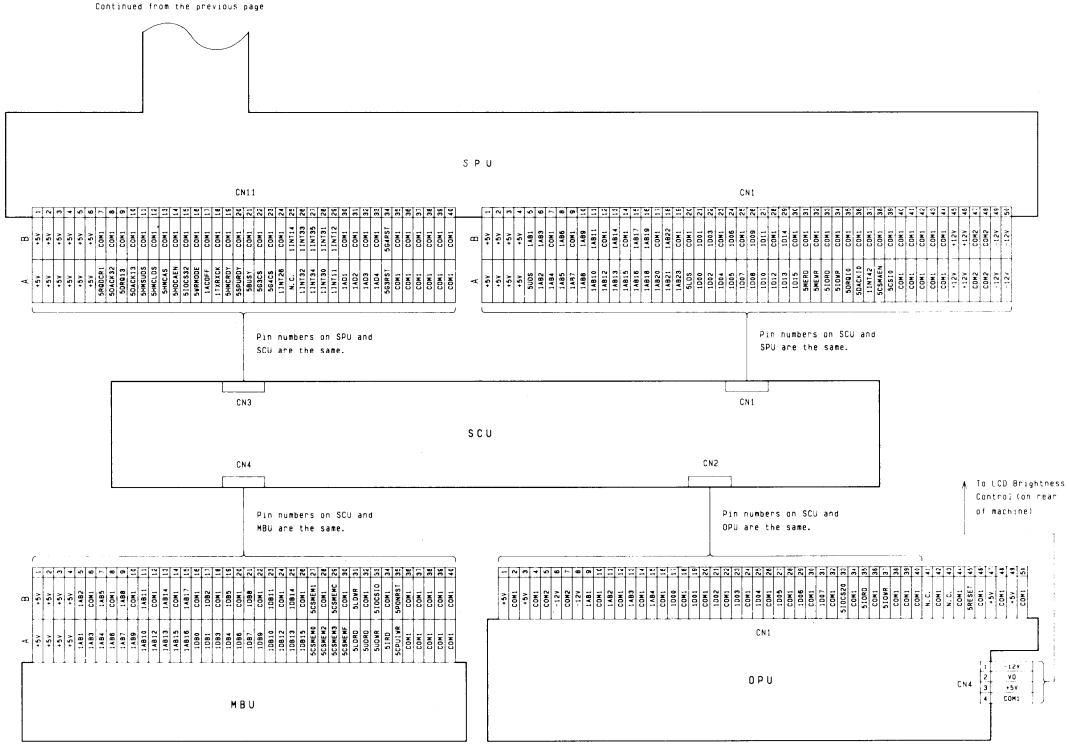
ELECTRICAL DATA

SECTION 7. ELECTRICAL DATA

7-1. Point-to-point Diagram




From PSU CN3
+12V
COM1
COM1
+5V
Continued from the previous page
TP1=COM2
TP3=COM1
V P U
CN1
CN2
Pin numbers on VPU and SBU are the same
CN16
+24VD
5HDFAN
Hard Disk Fan
CN8
S P U
Pin numbers on VPU and SPU are the same
Hard Disk
CN12
CN7
CN13
Modem
S B U
CN2
CN4,6:Reserved for future application(ISDN)
CN7:Not used
G3CCU
CN1
CN5
XPHAUD
COM2
Speaker
CN8
EXTEMIC
EXTOMIC
COM2
Microphone
CN3
To PSU CN10
Arrester Ground
CN1
CN2,4,6:Not used
G3NCU
TP5
CN2
XFAXL1
XFAXL2
XTEL1
XTEL2
XGS
To the Telephone Network
Pin numbers are the same on SPU and CCU
To Optional Group 4 Interface Board (G4CCU)
Continued on the next page


Continued from the previous page
S P U
CN11
CN1
Pin numbers on SPU and SCU are the same.
Pin numbers on SCU and SPU are the same.
CN3
CN1
S C U
CN4
CN2
To LCD Brightness Control (on rear of machine)
Pin numbers on SCU and MBU are the same.
Pin numbers on SCU and OPU are the same.
M B U
O P U
CN1
CN4

7-2. Signal Tables

1. SCU

CN1 - SPU

Pin	Name	Function
A1	+ 5V	Supply from SPU
B1	+ 5V	Supply from SPU
A2	+ 5V	Supply from SPU
B2	+ 5V	Supply from SPU
A3	+ 5V	Supply from SPU
B3	+ 5V	Supply from SPU
A4	+ 5V	Supply from SPU
B4	+ 5V	Supply from SPU
A5	5UDS	Upper data strobe
B5	1AB1	Address bus
A6	1AB2	Address bus
B6	1AB3	Address bus
A7	1AB4	Address bus
B7	COM1	Ground
A8	1AB5	Address bus
B8	1AB6	Address bus
A9	1AB7	Address bus
B9	COM1	Ground
A10	1AB8	Address bus
B10	1AB9	Address bus
A11	1AB10	Address bus
B11	1AB11	Address bus
A12	1AB12	Address bus
B12	COM1	Ground
A13	1AB13	Address bus
B13	1AB14	Address bus
A14	1AB15	Address bus
B14	COM1	Ground
A15	1AB16	Address bus
B15	1AB17	Address bus
A16	1AB18	Address bus
B16	1AB19	Address bus
A17	1AB20	Address bus
B17	COM1	Ground
A18	1AB21	Address bus
B18	1AB22	Address bus
A19	1AB23	Address bus
B19	COM1	Ground
A20	5LDS	Lower data strobe
B20	COM1	Ground
A21	1D00	Data bus
B21	1D01	Data bus
A22	1D02	Data bus
B22	1D03	Data bus
A23	1D04	Data bus
B23	COM1	Ground

Continued on the next page

CN1 (Continued) - SPU

Pin	Name	Function
A24	1D05	Data bus
B24	1D06	Data bus
A25	1D07	Data bus
B25	COM1	Ground
A26	1D08	Data bus
B26	1D09	Data bus
A27	1D10	Data bus
B27	1D11	Data bus
A28	1D12	Data bus
B28	COM1	Ground
A29	1D13	Data bus
B29	1D14	Data bus
A30	1D15	Data bus
B30	COM1	Ground
A31	5MERD	Memory read enable
B31	COM1	Ground
A32	5MEWR	Memory write enable
B32	COM1	Ground
A33	5IORD	I/O read enable
B33	COM1	Ground
A34	5IOWR	I/O write enable
B34	COM1	Ground
A35	5DRQ10	Not used
B35	COM1	Ground
A36	5DACK10	Not used
B36	COM1	Ground
A37	1INT10	Not used
B37	COM1	Ground
A38	5CSMAEN	Not used
B38	COM1	Ground
A39	5CSIO	I/O chip select
B39	COM1	Ground
A40	5RESET	Reset signal
B40	COM1	Ground
A41	COM1	Ground
B41	COM1	Ground
A42	COM1	Ground
B42	COM1	Ground
A43	COM1	Ground
B43	COM1	Ground
A44	COM1	Ground
B44	COM1	Ground
A45	+ 12V	Not connected
B45	+ 12V	Not connected
A46	+ 12V	Not connected
B46	+ 12V	Not connected
A47	COM2	Ground
B47	COM2	Ground
A48	COM2	Ground
B48	COM2	Ground
A49	- 12V	Supply from SPU
B49	- 12V	Supply from SPU
A50	- 12V	Supply from SPU
B50	- 12V	Supply from SPU

CN2 - OPU

Pin	Name	Function
1	+ 5V	supply to OPU
2	COM1	Ground
3	+ 5V	supply to OPU
4	COM1	Ground
5	COM2	LCD ground
6	- 12V	Supply to LCD
7	COM2	LCD ground
8	- 12V	Supply to LCD
9	1AB1	Address bus
10	COM1	Ground
11	1AB2	Address bus
12	COM1	Ground
13	1AB3	Address bus
14	COM1	Ground
15	1AB4	Address bus
16	COM1	Ground
17	1D00	Data bus
18	COM1	Ground
19	1D01	Data bus
20	COM1	Ground
21	1D02	Data bus
22	COM1	Ground
23	1D03	Data bus
24	COM1	Ground
25	1D04	Data bus
26	COM1	Ground
27	1D05	Data bus
28	COM1	Ground
29	1D06	Data bus
30	COM1	Ground
31	1D07	Data bus
32	COM1	Ground
33	5IOCS20	Chip select
34	COM1	Ground
35	5IORD	OPU status read enable
36	COM1	Ground
37	5IOWR	OPU command write enable
38	COM1	Ground
39	COM1	Ground
40	COM1	Ground
41	N. C.	Grounded at SCU
42	COM1	Ground
43	N. C.	
44	COM1	Ground
45	5RESET	Reset signal
46	COM1	Ground
47	+ 5V	supply to OPU
48	COM1	Ground
49	+ 5V	supply to OPU
50	COM1	Ground

CN3 - SPU

Pin	Name	Function
A1	+ 5V	Supply from SPU
B1	+ 5V	Supply from SPU
A2	+ 5V	Supply from SPU
B2	+ 5V	Supply from SPU
A3	+ 5V	Supply from SPU
B3	+ 5V	Supply from SPU
A4	+ 5V	Supply from SPU
B4	+ 5V	Supply from SPU
A5	+ 5V	Supply from SPU
B5	+ 5V	Supply from SPU
A6	+ 5V	Supply from SPU
B6	+ 5V	Supply from SPU
A7	5RQDCR1	DMA request (ADCR1)
B7	COM1	Ground
A8	5DACK32	DMA acknowledge (ADCR1)
B8	COM1	Ground
A9	5DRQ13	DMA request (Hard disk control)
B9	COM1	Ground
A10	5DACK13	DMA acknowledge (Hard disk control)
B10	COM1	Ground
A11	5HMCUDS	HMC upper byte data strobe
B11	COM1	Ground
A12	5HMCLDS	HMC lower byte data strobe
B12	COM1	Ground
A13	5HMCAS	HMC address strobe
B13	COM1	Ground
A14	5HDCAEN	Hard disk controller address enable
B14	COM1	Ground
A15	5IOCS32	Hard disk controller chip select
B15	COM1	Ground
A16	5WRMODE	Main cpu write mode
B16	COM1	Ground
A17	1ACOFF	Main power dropout
B17	COM1	Ground
A18	1TXRXCK	Bar code reader clock (9600 bps)
B18	COM1	Ground
A19	5HMCRDY	HMC ready
B19	COM1	Ground
A20	5SPURDY	SPU ready
B20	COM1	Ground
A21	5BUSY	G3/G4 CCU handshake memory busy
B21	COM1	Ground
A22	5G3CS	G3 handshake memory chip select
B22	COM1	Ground
A23	5G4CS	G4 handshake memory chip select
B23	COM1	Ground

Continued on the next page.

CN3 (Continued) - SPU

Pin	Name	Function
A24	1INT26	Interrupt request (ADCR1)
B24	COM1	Ground
A25		Not connected
B25	1INT14	Interrupt request from hard disk controller
A26	1INT32	Interrupt request from G3CCU handshake port (write mode)
B26	1INT33	Interrupt request from G3CCU handshake port (read mode)
A27	1INT34	Interrupt request from G4CCU handshake port (write mode)
B27	1INT35	Interrupt request from G4CCU handshake port (read mode)
A28	1INT30	Interrupt request from SPU handshake port (write mode)
B28	1INT31	Interrupt request from SPU handshake port (read mode)
A29	1INT11	R interrupt request from bar code reader
B29	1INT12	T interrupt request from bar code reader
A30	1AD1	Address bus for ADCR on the VPU
B30	COM1	Ground
A31	1AD2	Address bus for ADCR on the VPU
B31	COM1	Ground
A32	1AD3	Address bus for ADCR on the VPU
B32	COM1	Ground
A33	1AD4	Address bus for ADCR on the VPU
B33	COM1	Ground
A34	5G3RST	G3 reset signal
B34	5G4RST	G4 reset signal
A35 to B40	COM1	Ground

CN4 - MBU

Pin	Name	Function
A1	+ 5V	Supply from SPU
B1	+ 5V	Supply from SPU
A2	+ 5V	Supply from SPU
B2	+ 5V	Supply from SPU
A3	+ 5V	Supply from SPU
B3	+ 5V	Supply from SPU
A4	+ 5V	Supply from SPU
B4	+ 5V	Supply from SPU
A5	1AB1	Address bus
B5	1AB2	Address bus
A6	1AB3	Address bus
B6	COM1	Ground
A7	1AB4	Address bus
B7	1AB5	Address bus
A8	1AB6	Address bus
B8	COM1	Ground
A9	1AB7	Address bus
B9	1AB8	Address bus
A10	1AB9	Address bus
B10	COM1	Ground
A11	1AB10	Address bus
B11	1AB11	Address bus
A12	1AB12	Address bus
B12	COM1	Ground
A13	1AB13	Address bus
B13	1AB14	Address bus
A14	1AB15	Address bus
B14	COM1	Ground
A15	1AB16	Address bus
B15	1AB17	Address bus
A16	1DB0	Data bus
B16	COM1	Ground
A17	1DB1	Data bus
B17	1DB2	Data bus
A18	1DB3	Data bus
B18	COM1	Ground
A19	1DB4	Data bus
B19	1DB5	Data bus
A20	1DB6	Data bus
B20	COM1	Ground
A21	1DB7	Data bus
B21	1DB8	Data bus
A22	1DB9	Data bus
B22	COM1	Ground
A23	1DB10	Data bus
B23	1DB11	Data bus
A24	1DB12	Data bus
B24	COM1	Ground
A25	1DB13	Data bus
B25	1DB14	Data bus
A26	1DB15	Data bus
B26	COM1	Ground
A27	5CSMEM0	EPROM chip select
B27	5CSMEM1	EPROM chip select

Continued on the next page.

Pin	Name	Function
A28	5CSMEM2	EPROM chip select
B28	COM1	Ground
A29	5CSMEM3	EPROM chip select
B29	5CSMEMC	SRAM (battery backed-up) chip select
A30	5CSMEMF	Not used
B30	COM1	Ground
A31	5LDRD	Data memory read (low byte)
B31	5LDWR	Data memory write (low byte)
A32	5UDRD	Data memory read (high byte)
B32	COM1	Ground
A33	5UDWR	Data memory write (high byte)
B33	5IOCS10	Real time clock chip select
A34	5IRD	Main cpu or DMA controller I/O read
B34	COM1	Ground
A35	5CPU1WR	Main cpu I/O write
B35	5PONRST	Power on reset to all systems
A36	COM1	Ground
B36	COM1	Ground
A37	COM1	Ground
B37	COM1	Ground
A38	COM1	Ground
B38	COM1	Ground
A39	COM1	Ground
B39	COM1	Ground
A40	COM1	Ground
B40	COM1	Ground

2. SPU

CN1 - SCU

See SCU CN1.

The following pins are not connected on the SPU: A35, A36, A37, A38.

CN2 - SPU Fan

Pin	Name	Function
1	+ 24VD	Power supply
2	5HDFAN	Fan drive (L = On)

CN3 - LIB

Pin	Name	Function	V
1	+ 24VD	Power supply	
2	+ 24VD	Power supply	
3	COM3	Ground	
4	COM3	Ground	
5	5LIBRS	LIB reset (L = Reset)	
6	COM1	Ground	
7	1LCSOD	LIB drive data	
8	1LCSID	LIB status data	
9	+ 5V	Power supply	

CN4 - UIB

Pin	Name	Function
1	+ 24VD	Power supply
2	+ 24VD	Power supply
3	+ 24VD	Power supply
4	COM3	Ground
5	COM3	Ground
6	COM3	Ground
7	+ 12V	Power supply
8	+ 12V	Power supply
9	COM2	Ground
10	COM2	Ground
11	- 12V	Power supply
12	- 12V	Power supply
13	COM1	Ground
14	5HETEN	Fusing lamp enable (L = On)
15	COM1	Ground
16	XTHERM	Fusing thermistor output
17	COM1	Ground
18	1LDSYC	Main scan sync (H = Sync signal)
19	COM1	
20	5PLDAT	Data for printing (L = Off [Black])
21	COM1	Ground
22	5UIBRS	UIB reset (active L)

Continued on the next page.

CN4 (Continued) - UIB

Pin	Name	Function
23	COM1	Ground
24	5RDENA	Tx motor speed feedback signal
25	COM1	Ground
26	5STPMV	Tx motor enabled (L: Enabled)
27	COM1	Ground
28	1UUSOD	UIB drive data
29	COM1	Ground
30	1UUSID	UIB status data
31	ΦTG	Main scan line start sync, from VPU
32	COM1	Ground
33	+ 5V	Power supply
34	+ 5V	Power supply

CN5 - DRU

Pin	Name	Function
1	+ 24VD	Power supply
2	+ 24VD	Power supply
3	+ 24VD	Power supply
4	COM3	Ground
5	COM3	Ground
6	COM3	Ground
7	5MAINM	Main motor drive (L = On)
8	COM1	Ground
9	5MMLOK	Main motor lock (L = Lock)
10	COM1	Ground
11	5REGRL	Registration clutch drive (L = On)
12	COM1	Ground
13	5UFEED	Upper paper feed clutch drive (L = On)
14	COM1	Ground
15	5UCASU	Upper paper lift solenoid drive (L = On)
16	COM1	Ground
17	5REGST	Reg. sensor output (L = Paper present)
18	COM1	Ground
19	5CPOUT	Copy feed-out sensor output (L = Paper present)
20	COM1	Ground
21	5OZFAN	Ozone fan drive (L = On)
22	5DEVLP	Development clutch drive (L = On)
23	COM1	Ground
24	COM1	Ground
25	+ 5V	Power supply
26	+ 5V	Power supply

CN6 - Upper Paper Size Sensor

Pin	Name	Function
1	COM1	Ground
2	COM1	Ground
3	5UCAS2	Signal from sensor
4	5UCAS1	Signal from sensor
5	5UCAS0	Signal from sensor
6	COM1	Ground

Upper cassette size sensor status table

	Size					
Pin	B4	B5	Lg	A4	Lt	A5
6-5	H	L	H	L	H	L
6-4	L	L	H	H	L	L
6-3	H	H	L	L	L	L

CN7 - CCU Boards

Pin	Name	Function
A1	+ 5V	Power supply
B1	+ 5V	Power supply
A2	+ 5V	Power supply
B2	+ 5V	Power supply
A3	+ 5V	Power supply
B3	+ 5V	Power supply
A4	+ 5V	Power supply
B4	+ 5V	Power supply
A5	1AB1	Address bus
B5	COM1	Ground
A6	1AB2	Address bus
B6	COM1	Ground
A7	1AB3	Address bus
B7	COM1	Ground
A8	1AB4	Address bus
B8	COM1	Ground
A9	1AB5	Address bus
B9	COM1	Ground
A10	1AB6	Address bus
B10	COM1	Ground
A11	1AB7	Address bus
B11	COM1	Ground
A12	1AB8	Address bus
B12	COM1	Ground
A13	1AB9	Address bus
B13	COM1	Ground
A14	1AB10	Address bus
B14	COM1	Ground
A15	1AB11	Address bus
B15	COM1	Ground
A16	1D00	Data bus
B16	COM1	Ground
A17	1D01	Data bus
B17	COM1	Ground
A18	1D02	Data bus
B18	COM1	Ground
A19	1D03	Data bus
B19	COM1	Ground

Continued on the next page

Pin	Name	Function
A20	1D04	Data bus
B20	COM1	Ground
A21	1D05	Data bus
B21	COM1	Ground
A22	1D06	Data bus
B22	COM1	Ground
A23	1D07	Data bus
B23	COM1	Ground
A24	5MEMRD	Main cpu or DMA controller memory read
B24	COM1	Ground
A25	5MEMWR	Main cpu or DMA controller memory write
B25	COM1	Ground
A26	5BUSY	CCU handshake memory busy (L = Busy)
B26	COM1	Ground
A27	5G3CS	G3 handshake memory chip select
B27	5G4CS	G4 handshake memory chip select
A28	1INT32	Interrupt request from G3CCU handshake port (write mode)
B28	1INT34	Interrupt request from G4CCU handshake port (write mode)
A29	1INT33	Interrupt request from G3CCU handshake port (read mode)
B29	1INT35	Interrupt request from G4CCU handshake port (read mode)
A30	5G3RST	G3 reset (L = reset)
B30	5G4RST	G4 reset (L = reset)
A31	COM1	Ground
B31	COM1	Ground
A32	COM1	Ground
B32	COM1	Ground
A33	COM1	Ground
B33	COM1	Ground
A34	COM1	Ground
B34	COM1	Ground
A35	+ 12V	Power supply
B35	+ 12V	Power supply
A36	+ 12V	Power supply
B36	+ 12V	Power supply
A37	COM2	Ground
B37	COM2	Ground
A38	COM2	Ground
B38	COM2	Ground
A39	- 12V	Power supply
B39	- 12V	Power supply
A40	- 12V	Power supply
B40	- 12V	Power supply

CN8 - VPU

Pin	Name	Function
A1 to B3	+ 5V	Power supply
A4 to B6	COM1	Ground
A7	1SCK8M	ADCR drive clock (8 MHz)
B7	1CK5M	Video processor clock (5MHz)
A8	COM1	Ground
B8	COM1	Ground
A9	5VPURD	DIPP read enable
B9	5RESET	VPU reset
A10	5VPUWR	DIPP write enable
B10	5CSVPU	VPU chip select
A11	1TRSCN	Scan line start signal
B11	1SAB00	DIPP access address bus (slave cpu)
A12	COM1	Ground
B12	COM1	Ground
A13	5SDCR ST0	ADCR strobe
B13	1AD4	Address bus (ADCR)
A14	5SDCR CS0	ADCR chip select
B14	1AD3	Address bus (ADCR)
A15	5WRMODE	Main cpu write mode
B15	1AD2	Address bus (ADCR)
A16		Not connected
B16	1AD1	Address bus (ADCR)
A17	COM1	Ground
B17	COM1	Ground
A18	1FRST	FIFO reset
B18	ΦTG	Main scan line start sync, from UIB
A19	COM1	Not connected
B19		Not connected on VPU
A20	5INT26	Interrupt from ADCR
B20	1VPUINT	Interrupt from DIPP
A21	5EMPTY	VPU FIFO empty
B21	5RQDCR1	DMA request from ADCR
A22	5FULL	VPU FIFO full
B22		Not connected
A23	1HALF	VPU FIFO status signal
B23	SP3	Not connected on VPU
A24	SP5	Not connected on VPU
B24	1ALMOST	VPU FIFO status signal
A25	COM1	Ground
B25	SP4	Not connected on VPU
A26 to B27	COM1	Ground
A28	1SDB01	SBU drive signal
B28	1SDB00	SBU drive signal
A29	1SDB03	SBU drive signal
B29	1SDB02	SBU drive signal
A30	1SDB05	SBU drive signal
B30	1SDB04	SBU drive signal

Continued on the next page

CN8 (Continued) - VPU

Pin	Name	Function
A31	1SDB07	SBU drive signal
B31	1SDB06	SBU drive signal
A32	1D01	Data bus
B32	1D00	Data bus
A33	1D03	Data bus
B33	COM1	Ground
A34	COM1	Ground
B34	1D02	Data bus
A35	1D05	Data bus
B35	1D04	Data bus
A36	COM1	Ground
B36	1D06	Data bus
A37	1D07	Data bus
B37	COM1	Ground
A38	1D09	Data bus
B38	1D08	Data bus
A39	COM1	Ground
B39	1D10	Data bus
A40	1D11	Data bus
B40	COM1	Ground
A41	1D13	Data bus
B41	1D12	Data bus
A42	COM1	Ground
B42	1D14	Data bus
A43	1D15	Data bus
B43	COM1	Ground
A44	+ 12V	Power supply
B44	+ 12V	Power supply
A45	+ 12V	Power supply
B45	+ 12V	Power supply
A46	COM2	Ground
B46	COM2	Ground
A47	COM2	Ground
B47	COM2	Ground
A48	COM2	Ground
B48	COM2	Ground
A49	- 12V	Power supply
B49	- 12V	Power supply
A50	- 12V	Power supply
B50	- 12V	Power supply

CN9 - PSU

Pin	Name	Function
1	+ 24VD	Power supply
2	+ 24VD	Power supply
3	+ 24VD	Power supply
4	COM3	Ground
5	COM3	Ground
6	COM3	Ground
7	COM3	Ground
8	+ 12V	Power supply
9	COM2	Ground
10	COM2	Ground
11	- 12V	Power supply
12		Not connected
13	XTHERM	Fusing thermistor output
14	COM1	Ground

CN10 - PSU

Pin	Name	Function
1	+ 5V	Power supply
2	+ 5V	Power supply
3	+ 5V	Power supply
4	+ 5V	Power supply
5	COM1	Ground
6	COM1	Ground
7	COM1	Ground
8	COM1	Ground
9	5HETEN	Fusing lamp enable (L = On)
10	1POWON	+ 24VD enable (H = On)
11	5POWOF	Main power dropout
12	1DSKON	Not connected
13	1PSUFN	Not connected
14	1CVOPN	H: Upper unit or copy exit cover open
15	5OVHT	L: PSU overheated

CN11 - SCU

See SCU CN3.

CN12 - Hard Disk

Pin	Name	Function
1	COM1	Ground
2	5REDUC	L: Write current decreased
3	COM1	Ground
4	5HSEL2	Head 2 select
5	COM1	Ground
6	5WGATE	Read/write enable (H = Read)
7	COM1	Ground
8	5SECMP	Seek completed
9	COM1	Ground
10	5TRAK0	L: Head at track 0
11	COM1	Ground
12	5WFALT	L: Head write error, will retry
13	COM1	Ground
14	5HSEL0	Head 0 select
15	COM1	Ground
16	JP	Ground link, CN12 - CN13
17	COM1	Ground
18	5HSEL1	Head 1 select
19	COM1	Ground
20	5INDEX	1 pulse/disk rotation
21	COM1	Ground
22	5READY	Hard disk ready
23	COM1	Ground
24	5STEP	Head stepper motor pulse
25	COM1	Ground
26	5DSEL1	Drive 1 select
27	COM1	Ground
28	COM1	Ground
29	COM1	Ground
30	COM1	Ground
31	COM1	Ground
32	COM1	Ground
33	COM1	Ground
34	5DIREC	Head motion direction (L = Inward)

CN13 - Hard Disk

Pin	Name	Function
1	5DSELD	L. Hard disk drive selected
2	COM1	Ground
3	COM1	Ground
4	COM1	Ground
5	COM1	Ground
6	COM1	Ground
7	JP	Ground link between CN12 and CN13
8	COM1	Ground
9	COM1	Ground
10	COM1	Ground
11	COM1	Ground
12	COM1	Ground
13	5MFMWP	Write data, + ve signal
14	5MFMWN	Write data, - ve signal
15	COM1	Ground
16	COM1	Ground
17	5MFMRN	Read data, - ve signal
18	5MFMRP	Read data, + ve signal
19	COM1	Ground
20	COM1	Ground

CN14 - Upper Cassette Sensors

Pin	Name	Function
1	5UPEXT	Upper paper end sensor (H = No paper)
2	5UPHGH	Upper paper height sensor (H = Paper level low)
3	5UPNED	Upper paper near-end sensor (L = Near-end)
4	COM1	Ground
5	+ 5V	Power supply

CN15 - Bar Code Reader, via BSRU

Pin	Name	Function
1	1SDATA	Bar code reader start-up signal
2	1RDATA	Data from bar code reader
3	1RSEND	Not used (possible future RS-232C application)
4	1CSEND	Not used (possible future RS-232C application)
5	1DSRDY	Not used
6	+ 5V	Power supply
7	1DTRDY	Not used
8	COM1	Ground
9	FG	Ground

CN16 - Hard Disk Fan

Pin	Name	Function
1	+ 24VD	Power supply
2	5HDFAN	Fan drive (L = On)

CN17 - Power Pack, Toner End Sensor, Right Cover Switch

Pin	Name	Function
1	+ 5V	Power supply
2	COM1	Ground
3	5TONER	Toner end sensor (Constant L = Toner present)
4	5DEVCL	Rt. cover switch (L = Closed)
5	+ 24VD	Power supply
6	COM3	Ground
7	5PRECH	Charge corona (L = On)
8	5TRACH	Transfer corona (L = On)
9	5DBIAS	Development bias (L = On)
10	1TRLEK	Transfer leak (H = Leak)

3. VPU

CN1 - SPU

See SPU CN8.

The following pins are not connected on the VPU: A16, A19, B19, B22, B23, A24, B25.

CN2 - SBU

Pin	Name	Function
1	COM2	Ground
2	XVIDEO	Analog video signal
3	COM2	Ground
4	1TGCLK	CCD drive clock: ϕSH
5	COM2	Ground
6	1RGCLK	CCD drive clock: ϕRS
7	COM2	Ground
8	1SCLK	CCD drive clock: ϕ1, ϕ2
9	COM2	Ground
10	+ 12V	Power supply
11	COM2	Ground
12	- 12V	Power supply
13	COM1	Ground
14	+ 5V	Power supply
15		Not connected
16		Not connected

4. SBU

CN1 - VPU

See VPU CN2.

5. DRU

CN1 - Development Unit, Registration Clutch, and Upper Cassette Drive

Pin	Name	Function
1	+ 24VD	Dev. clutch power supply
2	6DEVLP	Development clutch drive (L = On)
3	+ 24VD	Upper paper feed clutch power supply
4	6UFEED	Upper paper feed clutch drive (L = On)
5	+ 24VD	Upper paper lift solenoid power supply
6	6UCASU	Upper paper lift solenoid drive (L = On)
7	+ 24VD	Registration clutch power supply
8	6REGRL	Registration clutch drive (L = On)

CN2 - Charge Corona Fan and Main Motor Drive, and Copy Feed-out Sensor

Pin	Name	Function
1	+ 24VD	Charge corona fan power supply
2	6OBMFN	Charge corona fan drive (L = On)
3	+ 24VD	Main motor power supply
4	COM3	Ground
5	6MAINM	Main motor drive (L = On)
6	6MMLOK	Main motor lock (L = Lock)
7	+ 5V	Power supply
8	6CPOUT	Copy feed-out sensor output (L = Paper present)
9	COM1	Ground

CN3 - SPU

See SPU CN5.

CN4 - Front Transfer Corona Fan

Pin	Name	Function
1	+ 24VD	Power supply
2	5FRNFN	Fan drive (L = On)

CN5 - Rear Transfer Corona Fan

Pin	Name	Function
1	+ 24VD	Power supply
2	5RERFN	Fan drive (L = On)

CN6 - Registration Sensor

Pin	Name	Function
1	+ 5V	Power supply
2	6REGST	Reg. sensor output (H = No paper)
3	COM1	Ground
4		Not connected

6. UIB

CN1 - DSB

Pin	Name	Function
1	5DOCFD	ADF clutch drive (L = On)
2	5STAMP	Stamp solenoid (L = On)
3	5DOCEX	Document feed-out clutch drive (L = On)
4	5PPTBL	Document sensor output (H = No paper)
5	5PPSCN	Scan line sensor output (H = No paper)
6	5DCWA3	A3 [11.7"] document width sensor (H = Less than 11.7")
7	5DCWB4	B4 [10.1"] document width sensor (H = Less than 10.1")
8	5SCNCL	Scanner cover switch (H = Cover open)
9	5MDFSW	Manual feed switch (H = Manual feed, L = ADF)
10	5DISCH	Quenching lamp (L = On)

CN2 - Pentagonal Mirror Motor and Driver

Pin	Name	Function	V
1	5PMLOK	Motor lock (L = Lock)	
2	5POLME	Motor drive (L = On)	
3	COM3	Ground	
4	+ 24VD	Power supply	

CN3 - Fluorescent Lamps

Pin	Name	Function
1	+ 24VD	Power supply
2	5PHTON	Preheat (L = Preheat)
3	5DLAMP	Lamp drive (L = On)
4	COM3	Ground

CN4 - LSD, Master Belt Home Position Sensor, Toner Overflow Sensor

Pin	Name	Function
1	+ 5V	Power supply
2	COM1	Ground
3	1EXTON	Toner overflow sensor (H = Overflow)
4	- 12V	Power supply
5	+ 5V	Power supply
6	COM2	Ground
7	1LDSET	Laser main scan sync
8	+ 5V	Power supply
9	5HOMPS	Master belt home position sensor (L = Home)
10	COM1	Ground

CN5 - Master Unit Interlock Switch

Pin	Name	Function
1	+ 12V	Power to switch
2	+ 12VR	Power from switch

CN6 - SPU

See SPU CN4.

CN7 - DSB

Pin	Name	Function
1	+ 24VD	Power supply
2	+ 24VD	Power supply
3	COM3	Ground
4	COM3	Ground
5	+ 5V	Power supply
6	COM1	Ground
7	1SPCK0	Master belt motor drive signal
8	COM1	Ground
9	1SPCK1	Master belt motor drive signal
10	COM1	Ground
11	1SPENA	Master belt motor phase A on/off (L = Off)
12	1SPENB	Master belt motor phase B on/off (L = Off)

CN8 - LDDR

Pin	Name	Function
1	COM2	Ground
2	XLPDET	Laser power feedback signal
3	COM2	Ground
4	XLPCTL	Laser power control signal
5	COM1	Ground
6	5LDDAT	Data for printing (L = Diode off - Black)
7	COM2	Ground
8	- 12VT	Power supply
9	+ 12VT	Power supply

CN9 - Scanner Motor

Pin	Name	Function
1	SPHA0	Scanner motor phase A
2	+ 24VD	Power supply
3	SPHA1	Scanner motor phase $\overline{A}$
4	SPHB0	Scanner motor phase B
5	+ 24VD	Power supply
6	SPHB1	Scanner motor phase $\overline{B}$

7. DSB

CN1 - Manual Feed Switch

Pin	Name	Function
1	5MDFSW	Manual feed switch (L = Manual Feed, H = ADF)
2	COM1	Ground

CN2 - Quenching Lamp

Pin	Name	Function
1	+ 24VD	Power supply
2	5DISCH	Quenching lamp drive (L = On)

CN3 - Scan Line Sensor

Pin	Name	Function
1	+ 5V	Power supply
2	5PPSCN	Scan line sensor (H = No paper)
3	COM1	Ground

CN4 - UIB

See SPU CN1.

CN5 - UIB

See SPU CN7.

CN6 - Stamp, ADF Clutch, Document Feed-out Clutch, Master Belt Motor

Pin	Name	Function
1	+ 24VD	Power supply
2	5STAMP	Stamp solenoid drive (L = On)
3	+ 24VD	Power supply
4	5DOCFD	ADF clutch drive (L = On)
5	+ 24VD	Power supply
6	5DOCEX	Document feed-out clutch (L = On)
7	OPHA0	Master belt motor phase A
8	OPHB0	Master belt motor phase $\overline{B}$
9	OPHA1	Master belt motor phase $\overline{A}$
10	OPHB1	Master belt motor phase $\overline{B}$

8. LIB

CN1 - SPU

See SPU CN3.

CN2 - Lower Front Cover Switch, Lower Paper Feed Motor, and Lower Paper Feed Solenoid

Pin	Name	Function
1	+ 24VD	Power supply
2	COM3	Ground
3	5LCASM	Lower paper feed motor drive (L = On)
4	5LMLOK	Lower paper feed motor lock (L = Lock)
5	+ 24VD	Power supply
6	5LFEED	Lower paper feed solenoid drive (L = On)
7	5LCOPN	Lower front cover switch (L = cover open)
8	COM1	Ground

CN3 - Lower Paper Lift Motor, Lower Paper End, Near-end, and Height Sensors

Pin	Name	Function
1	+ 5V	Power supply
2	COM1	Ground
3	5LPEND	Lower paper end sensor (L = No paper)
4	+ 5V	Power supply
5	COM1	Ground
6	5LPNED	Lower paper near-end sensor (L = Near-end)
7	+ 5V	Power supply
8	COM1	Ground
9	5LPHGH	Lower paper height sensor (H = paper level low)
10	+ 24VD	Power for motor
11	5LCASU	Lower paper lift motor drive (L = On)

CN4 - Jam Removal Switch, Lower Paper Size Sensor, Lower Cassette Switch

Pin	Name	Function
1	COM1	Ground, from lower cassette sw.
2	5ENSCOM	Ground, to lower cassette sw.
3	1LDOPN	Jam removal switch (L = standby position)
4	COM1	Ground
5	COM1	Ground
6	COM1	Ground, from paper size sensor to lower cassette switch
7	5LCAS2	Lower paper size sensor
8	5LCAS1	Lower paper size sensor
9	5LCAS0	Lower paper size sensor
10	5ENSCOM	Ground. to lower cassette sw.

Lower cassette size sensor status table

	Size					
Pin	B4	B5	Lg	A4	Lt	A5
4-9	H	L	H	L	H	L
4-8	L	L	H	H	L	L
4-7	H	H	L	L	L	L

9. OPU

CN1 - SCU

See SCU CN2.

CN2 - Internal connector to keyboard
CN3 - Internal connector to LCD

CN4 - LCD Brightness Control

Pin	Name	Function
1	-	12V LCD power
2	Vo	Output voltage from control
3	+	5V Power supply
4	COM1	Ground

10. PSU

CN1 - SPU

See SPU CN9.

CN2 - SPU

See SPU CN10.

CN3 - Hard Disk

Pin	Name	Function
1	+	12V Power supply
2	COM1	Ground
3	COM1	Ground
4	+	5V Power supply

CN4 - Upper Unit and Right Cover Interlock Switches

Pin	Name	Function
1		+ 24V Power, from switches
2		+ 24V Power, to switches
3		COM1 Ground
4	1CVOPN	H = Cover open

CN5 - Fusing Unit

Pin	Name	Function
1	SWAC	- L Ac power - live
2	SWAC	- N Ac power - neutral
3		N.C. Not used
4	XTHERM	Thermistor output
5		+ 5V Thermistor power supply

CN6 - Main Power Inlet

Pin	Name	Function
1		L Live ac power supply
2		N Neutral

CN7 - To Main Switch

Pin assignment: same as CN6

CN8 - Internal connector; carries main power

CN9 - From Main Switch

Pin assignment: same as CN6

CN10 - From Arrestor Ground (G3NCU)

CN11 - PSU Fan

Pin	Name	Function
1		+ 12V Power supply
2		COM3 Ground

CN12 - Internal connector; carries main power

11. G3 CCU

CN1 - SPU

See SPU CN7.

CN2 - Modem

Pin	Name	Function
A1	COM1	Ground
B1	5WR	Write enable
A2	+ 5V	Power supply
B2	+ 5V	Power supply
A3	1DT6	Data bus
B3	5CSMDM	Chip select
A4	1DT7	Data bus
B4	1A2	Address bus
A5	1DT5	Data bus
B5	1A0	Address bus
A6		Not used
B6	5IRQ2	Interrupt request
A7		Not used
B7	COM1	Ground
A8	1DT3	Data bus
B8	5CD	Carrier detect
A9		Not used
B9	1ECKMDM	Modem chip select
A10	COM1	Ground
B10		Not used
A11		Not used
B11	COM1	Ground
A12	1DT1	Data bus
B12		Not used
A13		Not used
B13	+ 12V	Power supply
A14	1A1	Address bus
B14	1DT2	Data bus
A15	1DT0	Data bus
B15	+ 5V	Power supply
A16	1DT4	Data bus
B16	5IRQ1	Interrupt request
A17	COM1	Ground
B17	COM2	Ground
A18	XUVLT	Not used
B18	5RST	Modem reset
A19	- 12V	Power supply
B19	TXL	Data for transmission to PSTN
A20	COM2	Ground
B20	RXL	Received data from PSTN

CN3 - G3 NCU

Pin	Name	Function
A1	HYBRXL	Rx signal, from line to modem
B1	COM2	Ground
A2	HYBTXL	Tx signal, to line from modem
B2	COM2	Ground
A3	HIRXL	Not used
B3	COM2	Not used
A4	XMICIN	Not used
B4	COM2	Not used
A5	PROG0	To variable resistor
B5	PROG1	From variable resistor
A6	1RINGCK	Ringing signal
B6	N.C.	Not connected
A7	6NCUSPI	G3NCU status
B7	COM1	Ground
A8	5NCUSPO	G3NCU commands
B8	COM1	Ground
A9	5NCUCK	G3NCU command/status transfer clock
B9	COM1	Ground
A10	5NCUDP	Not used
B10	COM1	Ground
A11	6NCUSEL	G3NCU chip select signal
B11	COM1	Ground
A12	6NCULD	Command/status data S/P convert signal
B12	COM1	Ground
A13	6NCULTC	Command/status data transfer latch
B13	COM1	Ground
A14	6NCURST	Command/status data reset
B14	COM1	Ground
A15	+ 5V	Power supply
B15	+ 5V	Power supply
A16	+ 5V	Power supply
B16	COM1	Ground
A17	COM1	Ground
B17	COM1	Ground

CN4 - Reserved for future applications

Pin	Name	Function
1	5SWHK	
2	COM2	Ground
3	VTX	
4	VRX	

CN5 - Speaker

Pin	Name	Function
1	XPHAUD	
2	COM2	Ground

CN6 - Reserved for future applications

Pin	Name	Function
A3	COM2	Ground
B3	COM1	Ground
A4	COM2	
B4	COM1	Ground
A5	1HD4	Data bus
B5	1HD0	Data bus
A6	1HD4	Data bus
B6	1HD1	Data bus
A7	1HD6	Data bus
B7	1HD2	Data bus
A8	1HD7	Data bus
B8	IHD3	Data bus
A9	5HRD1	
A10	1RDY1	
A11	5HWT1	
A12	5RD1H	
A13	5INT1R	
A14	5INT1W	
A25	COM1	
B25	COM1	Ground

Other pins are not used.

CN7 - Not used

Pin	Name	Function
1	- 12V	Power supply
2	+ 12V	Power supply
3	+ 5VA	Power supply
4		Not connected
5	COM1	Ground
6	5ADCK	
7	COM1	Ground
8	5EYSY	
9	COM1	Ground
10	1EQMD	

CN8 - Microphone (Voice Message Storage)

Pin	Name	Function
1	EXT EMIC	Not used
2	EXT DMIC	Signal from microphone
3	COM2	Ground

12. G3 NCU

CN1 - G3 CCU

See G3 CCU CN3.

CN2 - Network/External Telephone

Pin	Name	Function
1	XFAXL1	Telephone line
2	XFAXL2	Telephone line
3	XTEL1	Handset
4	XTEL2	Handset
5	XGS	Ground start terminal

CN3 - Not used

Pin	Name	Function
4	XFAXL1	
5	XFAXL2	
7	XPROG2	
8	XPROG3	

CN4 - Not used

Pin	Name	Function
4	XFAXL3	
5	XFAXL4	

CN5 - Not used

Pin	Name	Function
3	XTEL1	
4	XTEL2	

CN6 - Not used

Pin	Name	Function
1	XTELCN1	
2	XTELCN2	

13. BSRU

CN1 - SPU. See SPU CN15.

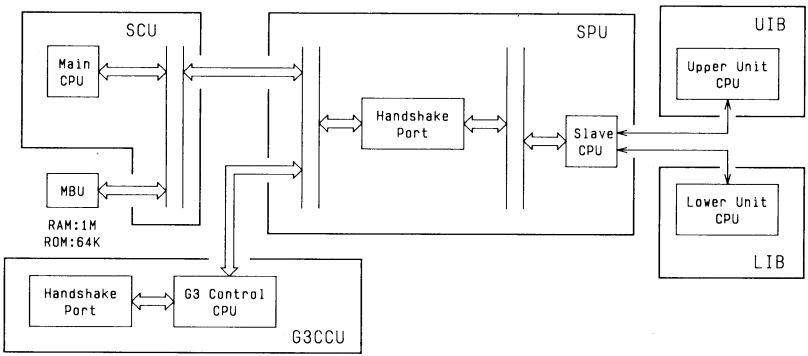
CN2 - Bar Code Reader

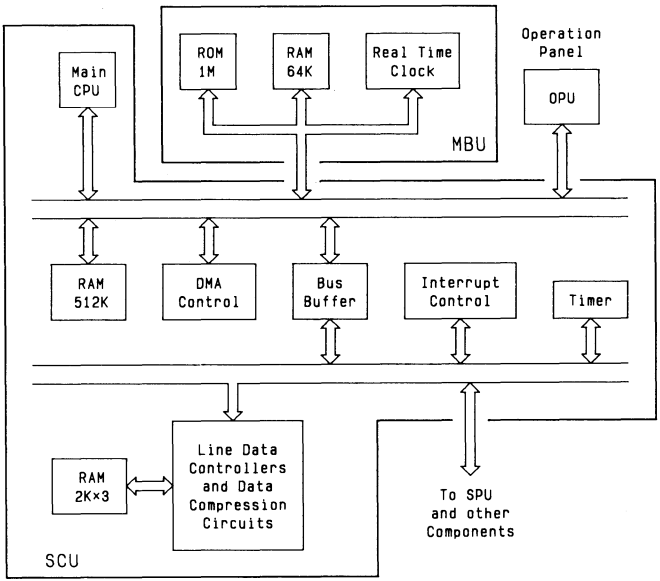
Pin	Name	Function
1	1RD	Bar code reader start-up signal
2	1SD	Data from bar code reader
3	1CS	Not used (possible future RS-232C application)
4	1RS	Not used (possible future RS-232C application)
5	N.C.	Not used
6	+ 5V	Power supply
7	N.C.	Not used
8	COM1	Ground
9	FG	Ground

7-3. Block Diagrams

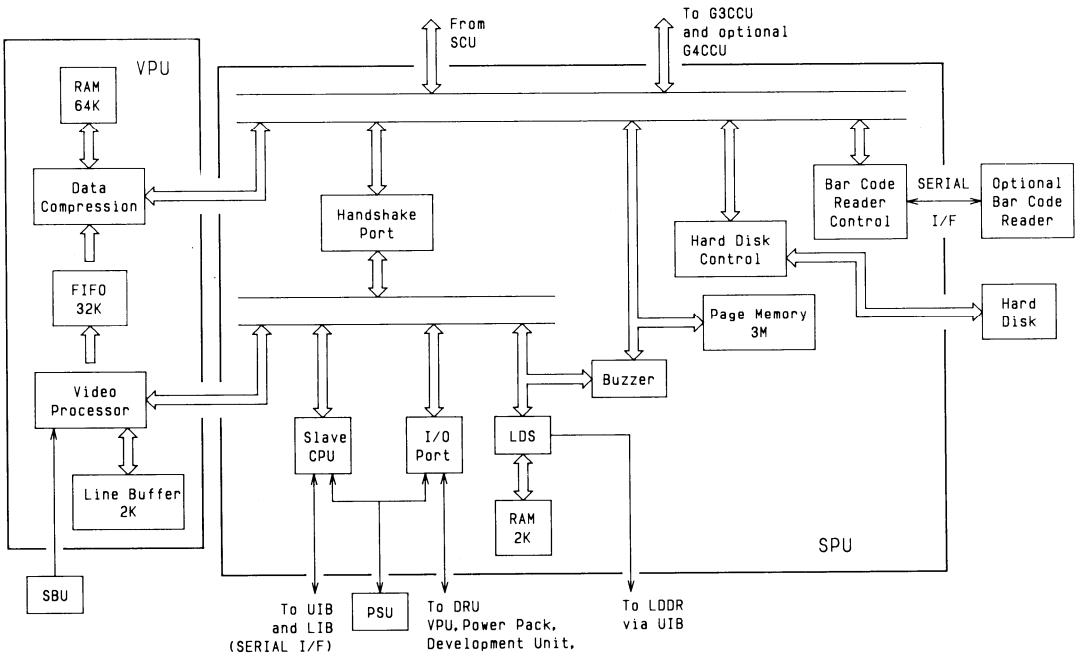
1. Overall Machine Control

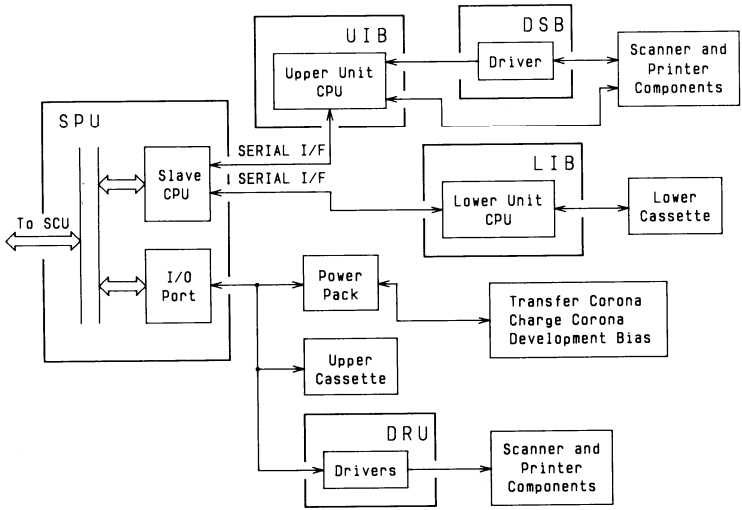
- Overall -

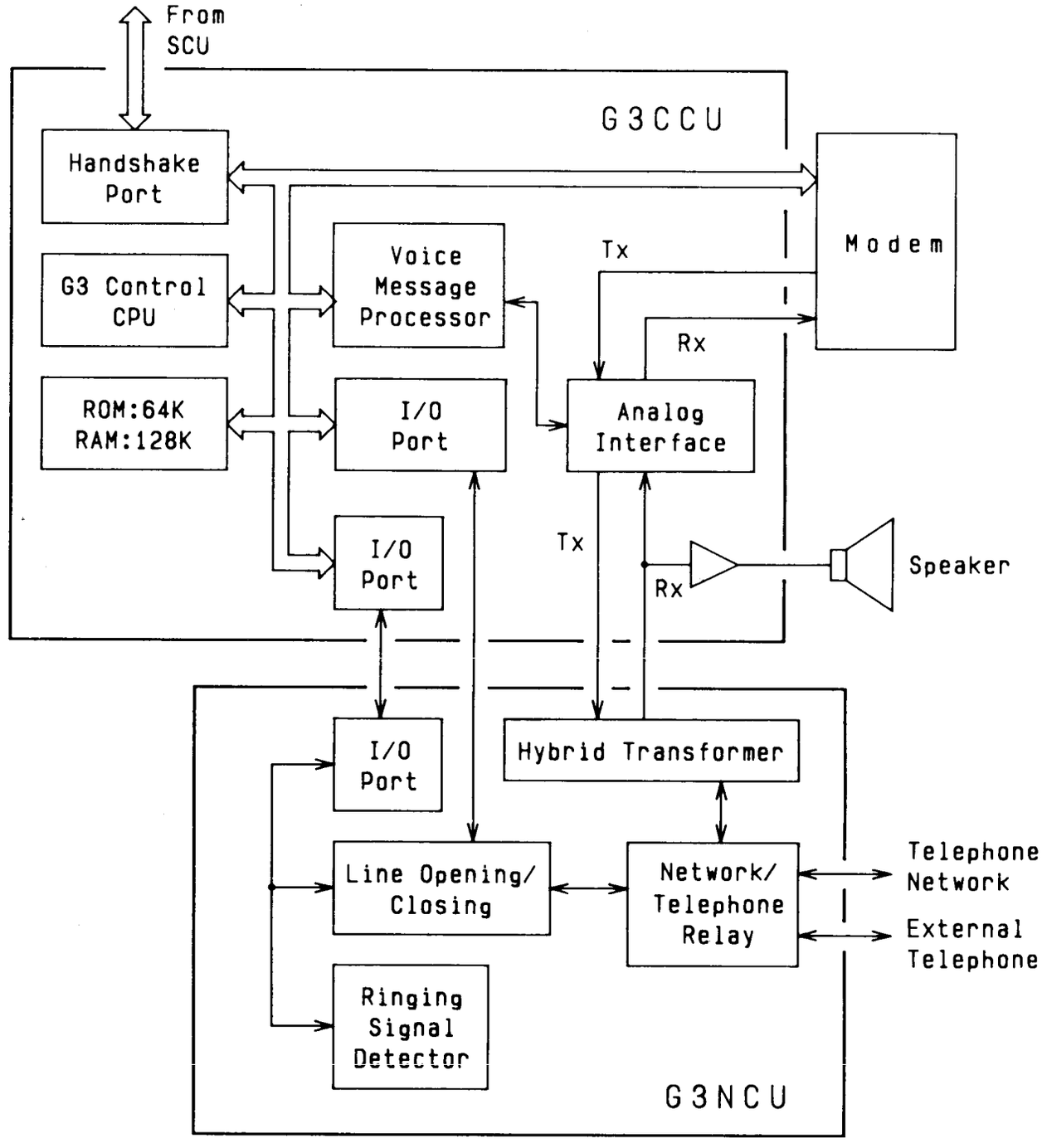



Main CPU
ROM 1M
RAM 64K
Real Time Clock
MBU
Operation Panel
OPU
RAM 512K
DMA Control
Bus Buffer
Interrupt Control
Timer
RAM 2K×3
Line Data Controllers and Data Compression Circuits
To SPU and other Components
SCU

- Main/Slave CPU Interface -

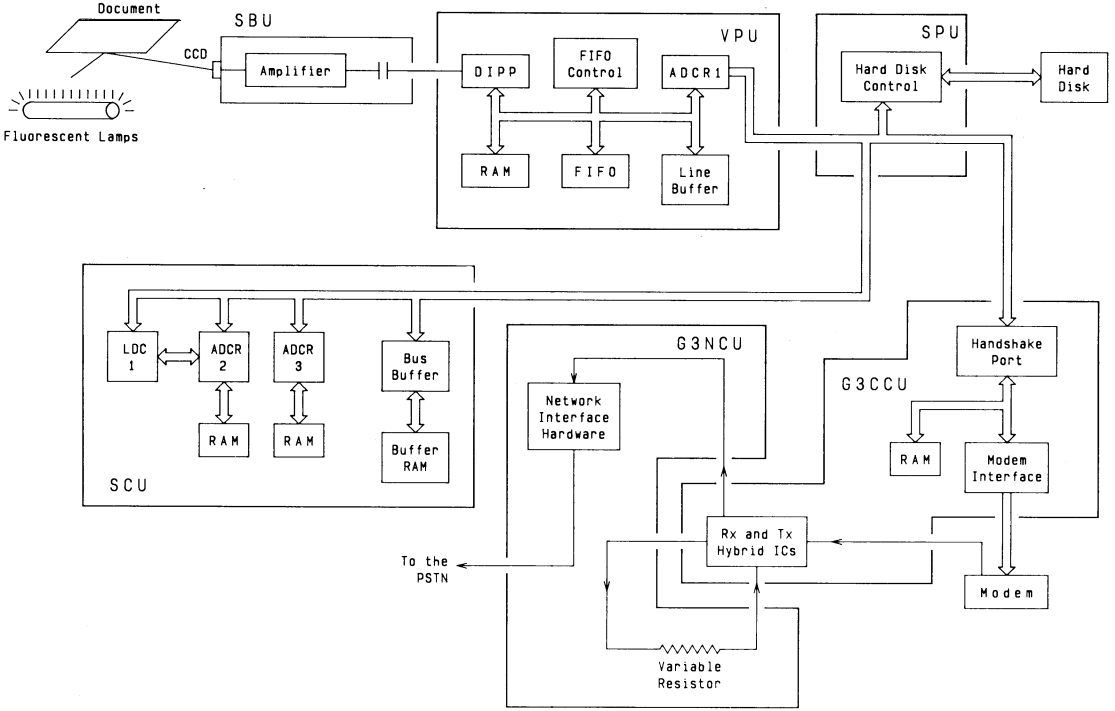


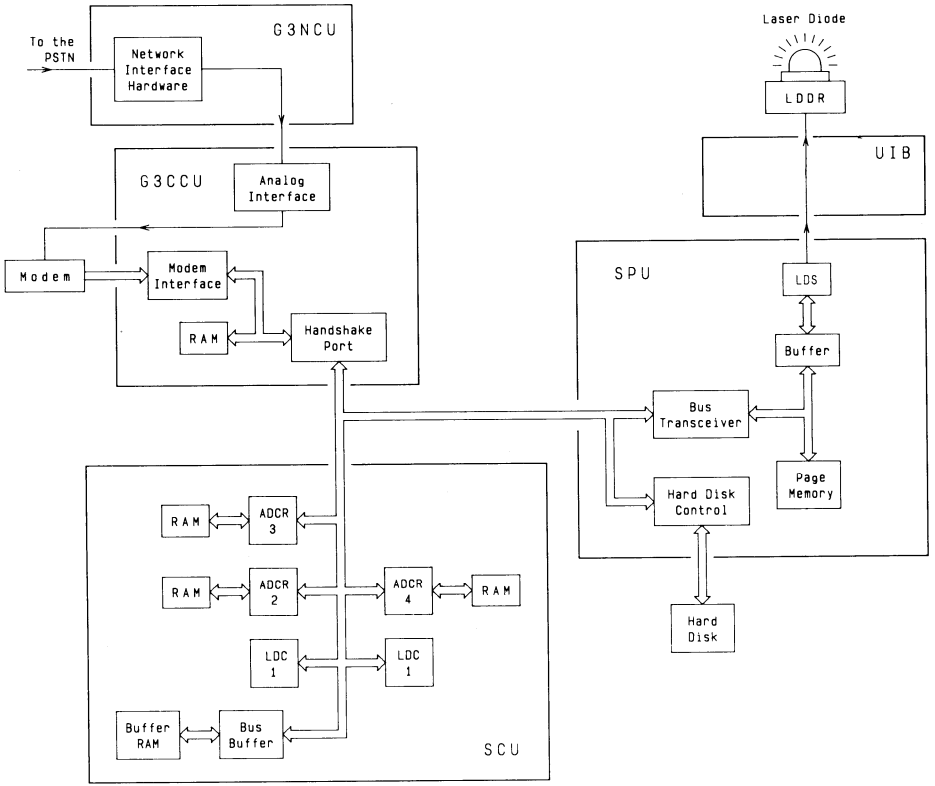

UIB
Upper Unit CPU
DSB
Driver
Scanner and Printer Components
SPU
SERIAL I/F
SERIAL I/F
Slave CPU
LIB
Lower Unit CPU
Lower Cassette
To SCU
I/O Port
Power Pack
Transfer Corona
Charge Corona
Development Bias
Upper Cassette
DRU
Drivers
Scanner and Printer Components

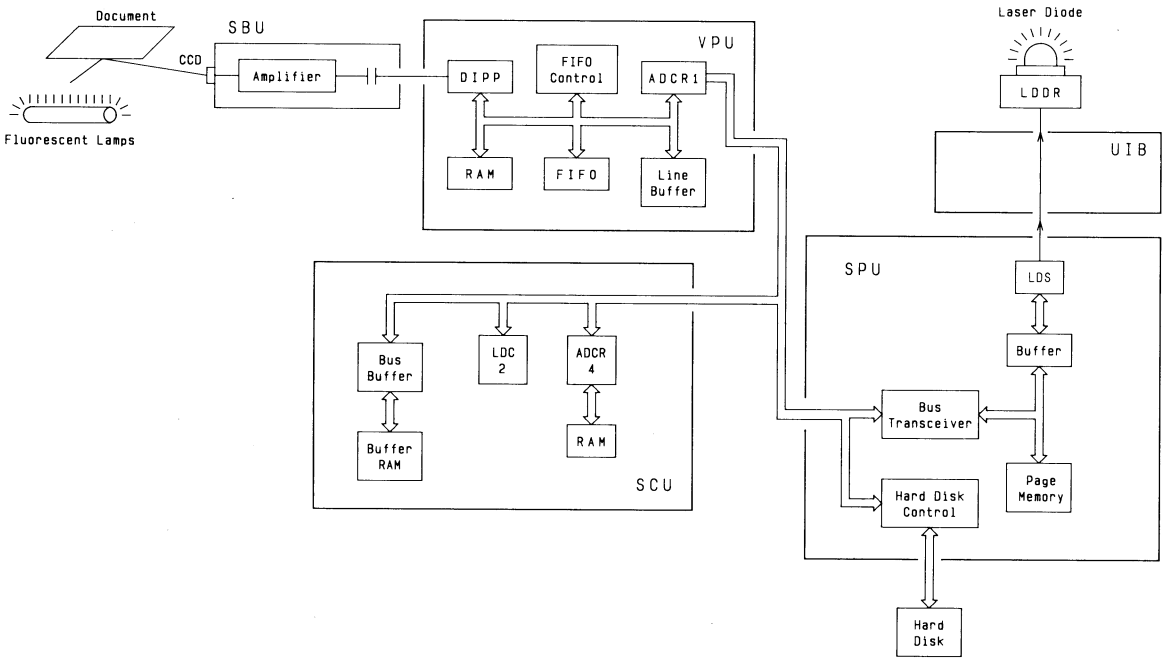

From
SCU
G3CCU
Handshake
Port
G3 Control
CPU
ROM:64K
RAM:128K
Voice
Message
Processor
I/O
Port
I/O
Port
Modem
Tx
Rx
Analog
Interface
Tx
Rx
Speaker
I/O
Port
Hybrid Transformer
Line Opening/
Closing
Network/
Telephone
Relay
Telephone
Network
External
Telephone
Ringing
Signal
Detector
G3NCU

2. Video Data Path

- Transmission -

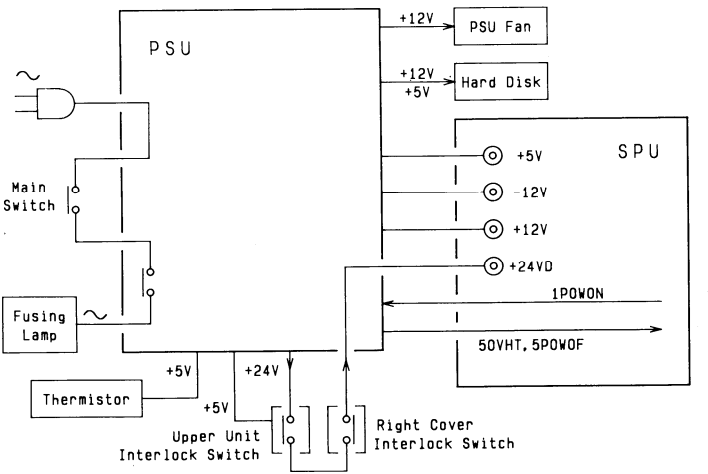



To the PSTN
Network Interface Hardware
G3NCU
G3CCU
Analog Interface
Modem
Modem Interface
RAM
Handshake Port
Laser Diode
LDDR
UIB
SPU
LDS
Buffer
Bus Transceiver
Page Memory
Hard Disk Control
Hard Disk
RAM
ADCR 3
RAM
ADCR 2
ADCR 4
RAM
LDC 1
LDC 1
Buffer RAM
Bus Buffer
SCU

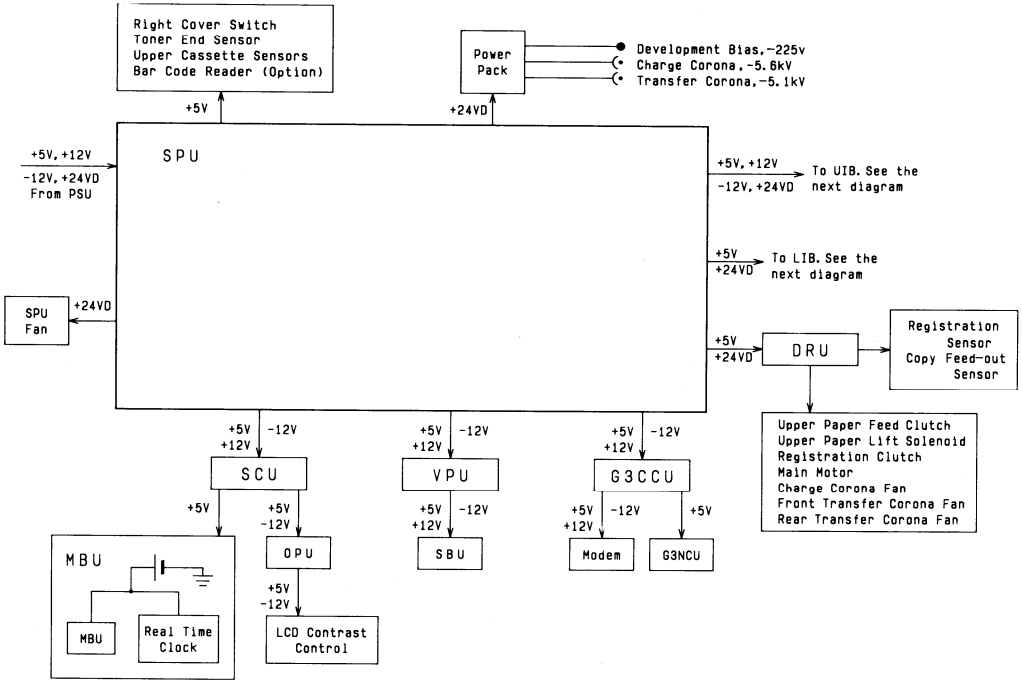

Document
SBU
CCD
Amplifier
Fluorescent Lamps
VPU
DIPP
FIFO Control
ADCR1
RAM
FIFO
Line Buffer
Laser Diode
LDDR
UIB
SPU
LDS
Buffer
Bus Transceiver
Page Memory
Hard Disk Control
Hard Disk
Bus Buffer
LDC 2
ADCR 4
Buffer RAM
RAM
SCU

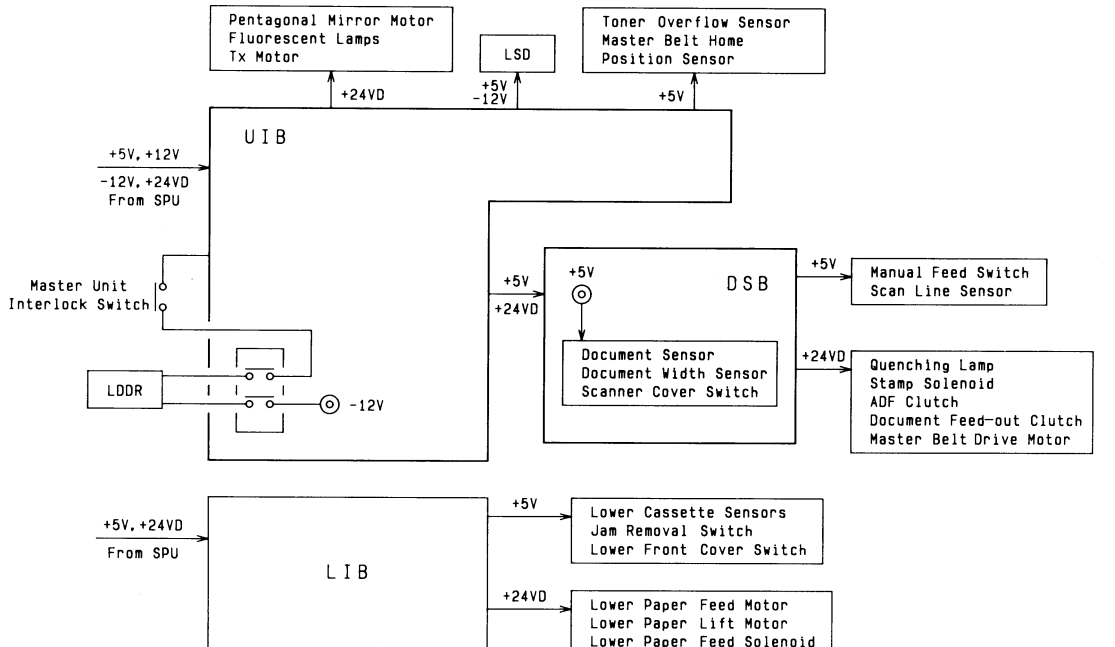
3. Power Distribution

- From PSU to SPU -



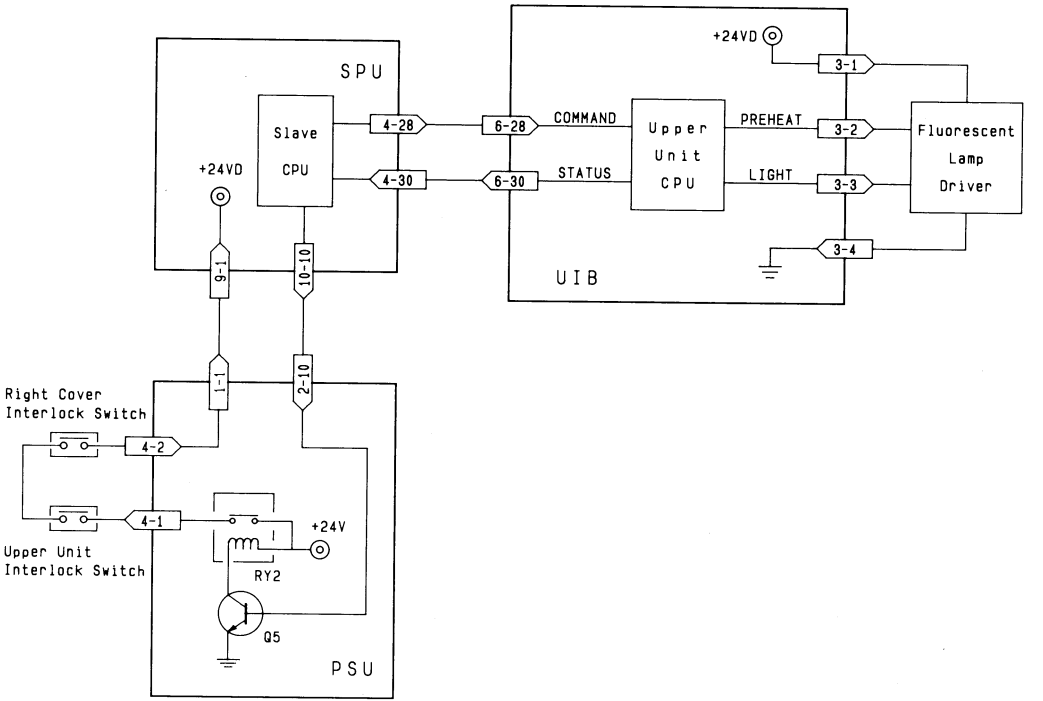
- Distribution by SPU -

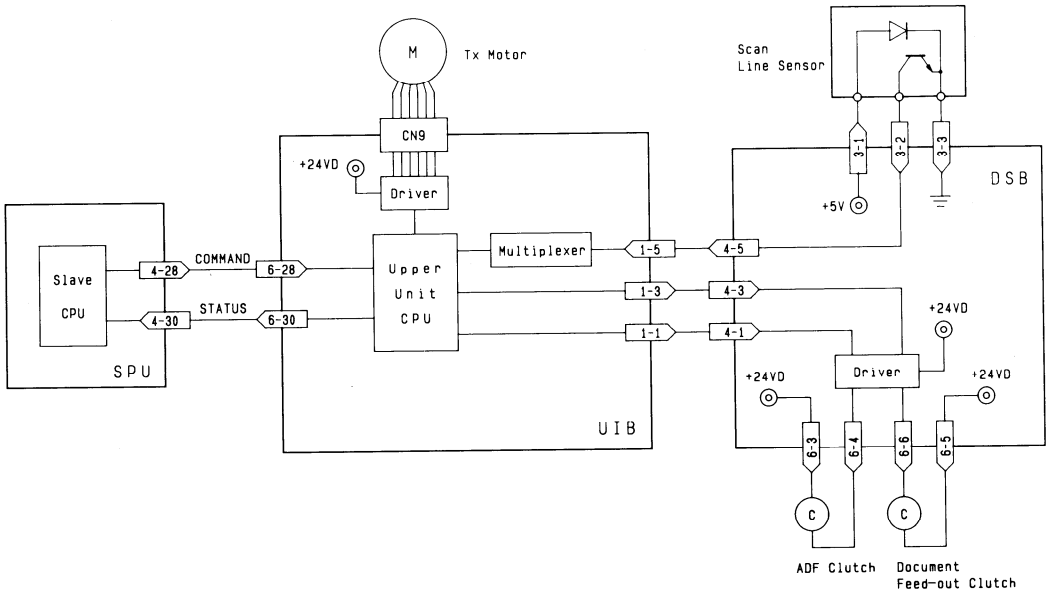


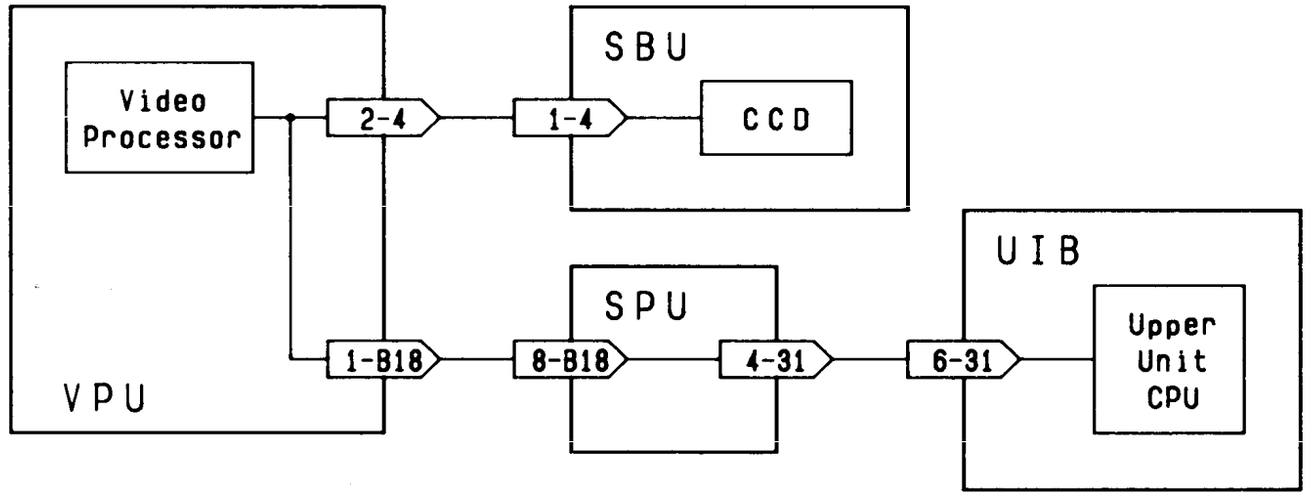

Pentagonal Mirror Motor
Fluorescent Lamps
Tx Motor
LSD
Toner Overflow Sensor
Master Belt Home
Position Sensor
+24VD
+5V
-12V
+5V
UIB
+5V, +12V
-12V, +24VD
From SPU
Master Unit
Interlock Switch
LDDR
-12V
+5V
+24VD
+5V
DSB
Document Sensor
Document Width Sensor
Scanner Cover Switch
+5V
Manual Feed Switch
Scan Line Sensor
+24VD
Quenching Lamp
Stamp Solenoid
ADF Clutch
Document Feed-out Clutch
Master Belt Drive Motor
+5V, +24VD
From SPU
LIB
+5V
Lower Cassette Sensors
Jam Removal Switch
Lower Front Cover Switch
+24VD
Lower Paper Feed Motor
Lower Paper Lift Motor
Lower Paper Feed Solenoid

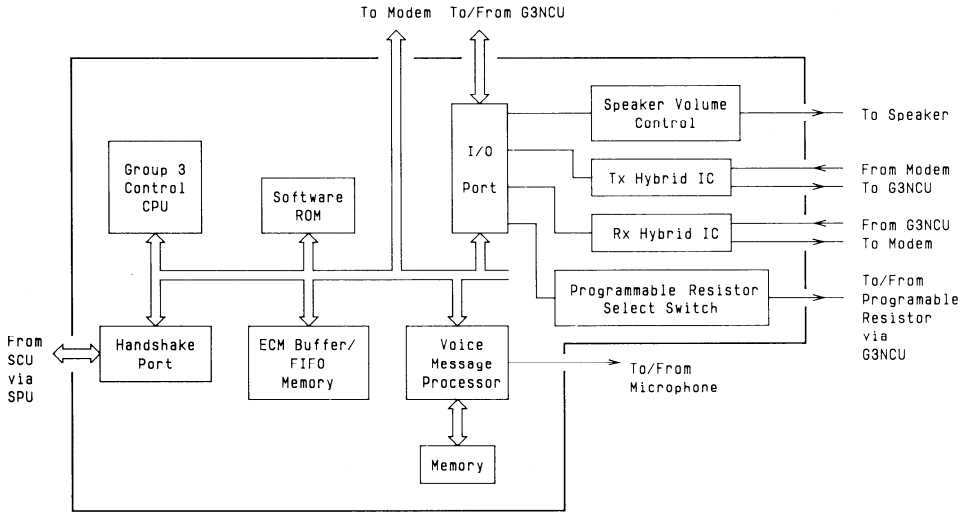
4. Scanner

- Fluorescent Lamps, + 24VD Power Supply -



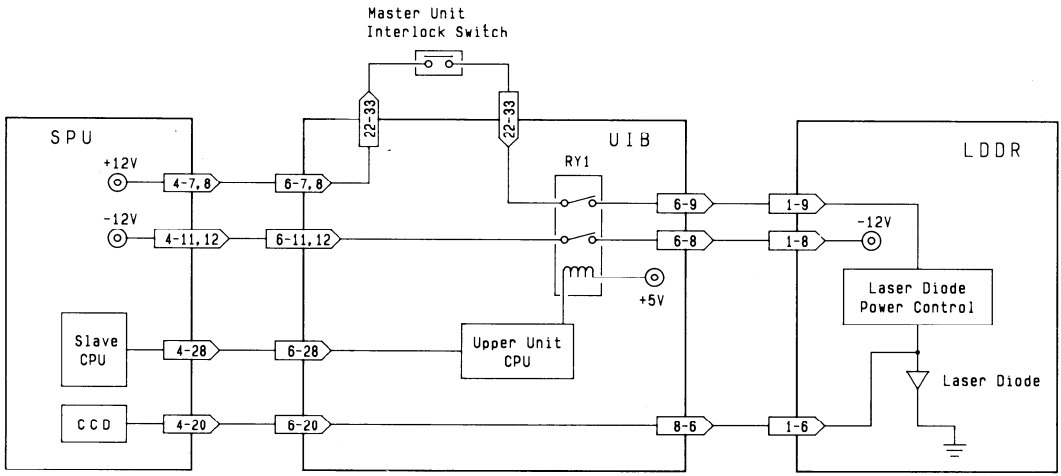

M
Tx Motor
CN9
+24VD
Driver
Scan
Line Sensor
3-1
3-2
3-3
DSB
+5V
Slave
CPU
SPU
4-28
COMMAND
6-28
4-30
STATUS
6-30
Upper
Unit
CPU
Multiplexer
1-5
1-3
1-1
4-5
4-3
4-1
+24VD
Driver
+24VD
+24VD
UIB
6-3
6-4
6-6
6-5
C
C
ADF Clutch
Document
Feed-out Clutch

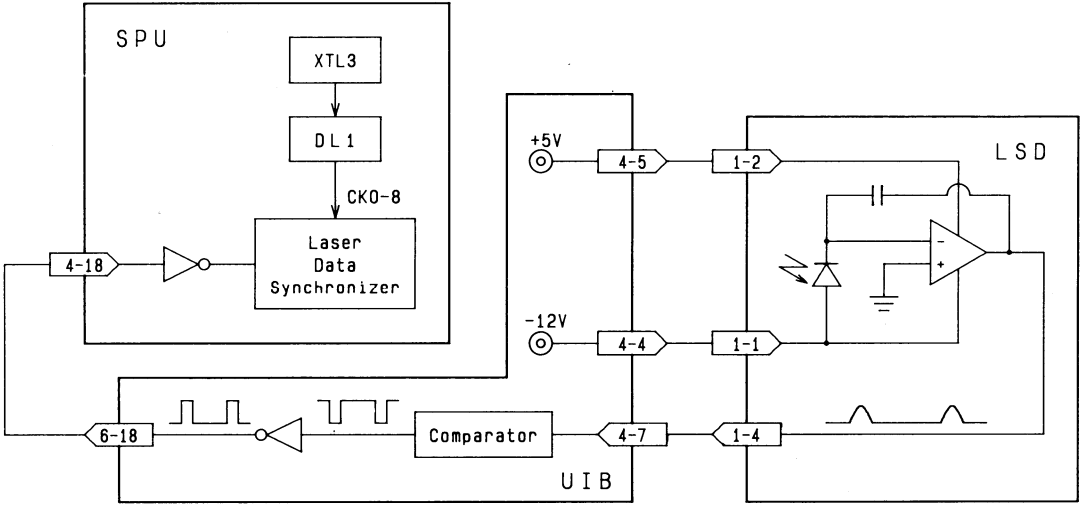

Video
Processor
2-4
1-4
CCD
SBU
1-B18
8-B18
4-31
SPU
6-31
UIB
Upper
Unit
CPU
VPU

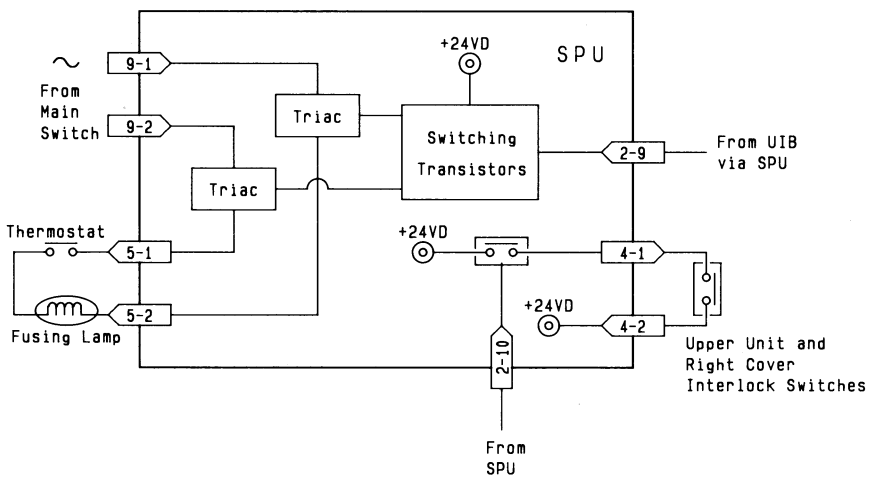

To Modem
To/From G3NCU
Speaker Volume Control
To Speaker
I/O Port
Group 3 Control CPU
Software ROM
Tx Hybrid IC
From Modem To G3NCU
Rx Hybrid IC
From G3NCU To Modem
Programmable Resistor Select Switch
To/From Programable Resistor via G3NCU
From SCU via SPU
Handshake Port
ECM Buffer/ FIFO Memory
Voice Message Processor
To/From Microphone
Memory

6. Printer

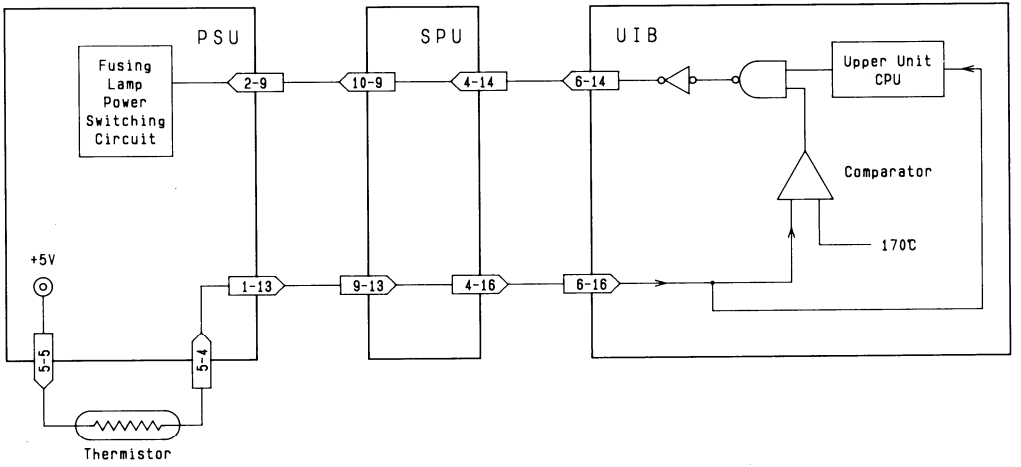
- Laser Diode Drive -



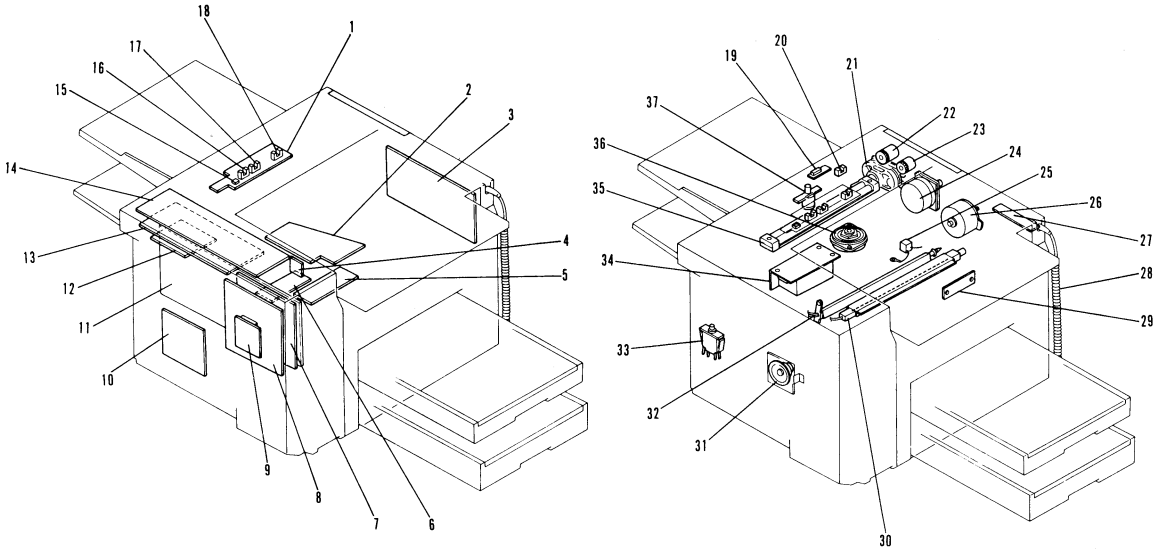

SPU
XTL3
DL1
CKO-8
Laser
Data
Synchronizer
4-18
+5V
4-5
1-2
LSD
-12V
4-4
1-1
6-18
Comparator
4-7
1-4
UIB

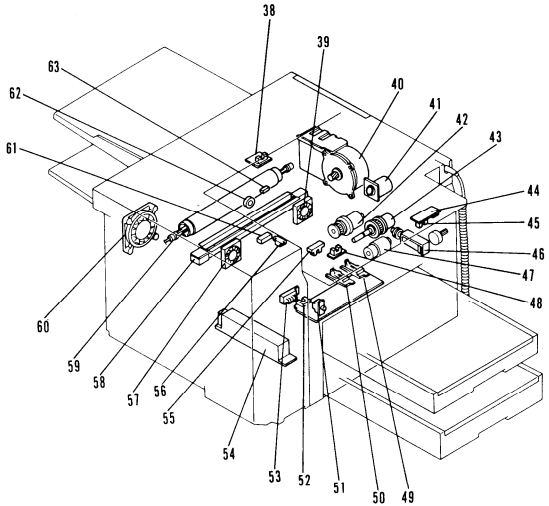

+24VD
SPU
9-1
From
Main
Switch
9-2
Triac
Triac
Switching
Transistors
2-9
From UIB
via SPU
Thermostat
5-1
+24VD
4-1
5-2
Fusing Lamp
+24VD
4-2
Upper Unit and
Right Cover
Interlock Switches
2-10
From
SPU

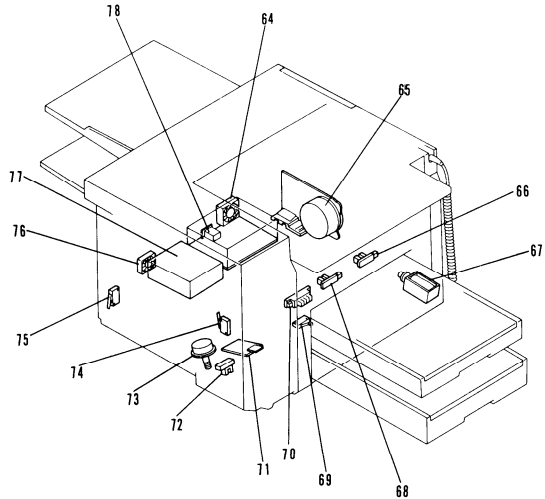
- Fusing Lamp Temperature Monitoring -



7-4. Electrical Component Layout




38
39
63
62
40
41
42
61
43
44
45
46
47
48
60
59
58
57
56
55
54
53
52
51
50
49

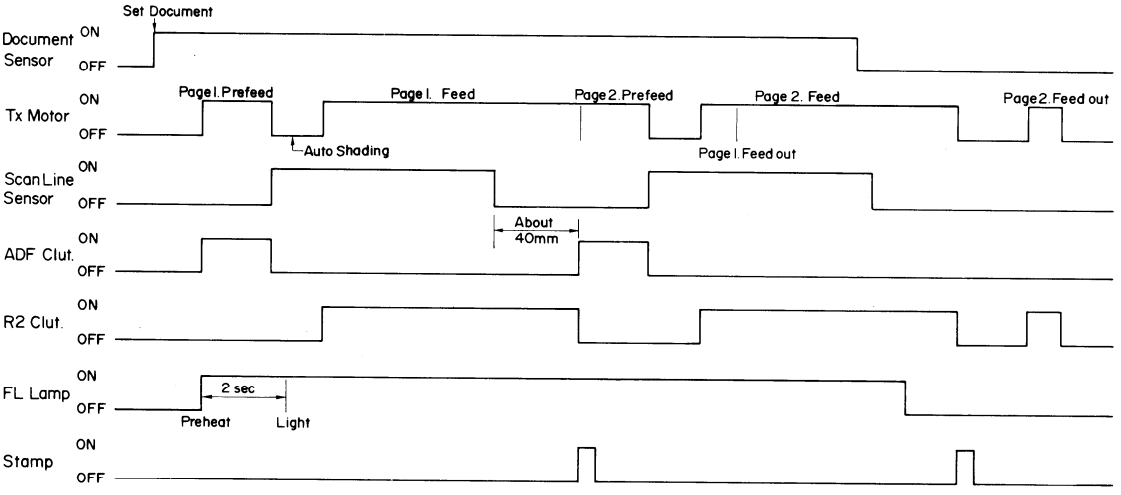

78
64
65
77
66
76
67
75
74
73
72
71
70
69
68

1. DSB (Document Sensor Board)
2. UIB (Upper Interface Board)
3. G3NCU (G3 Network Control Unit)
4. LSD (Laser Synchronization Detector)
5. SMDR (Scanner Motor Driver)
6. DRU (Drive and Registration Unit)
7. VPU (Video Processor Unit)
8. G3CCU (G3 Communication Control Unit)
9. Modem
10. LIB (Lower Interface Board)
11. SPU (Scanner/Printer Unit)
12. MBU (Memory Board Unit)
13. SCU (System Control Unit)
14. OPU (Operation Panel Unit)
15. Scanner Cover Switch
16. A3 [11.7"] Document Width Sensor
17. B4 [10.1"] Document Width Sensor
18. Document Sensor
19. Manual Feed Switch
20. Scan Line Sensor
21. LDDR (Laser Diode Driver)
22. Document Feed-out Clutch
23. ADF Clutch
24. Tx Motor
25. Varistor
26. Master Belt Drive Motor
27. BSRU (Bar Scanner Reader Unit)
28. Bar Code Reader
29. SBU (Scanner Board Unit)
30. Charge Corona Unit
31. Speaker
32. Quenching Lamp
33. Upper Unit Interlock Switch
34. Fluorescent Lamp Driver
35. Fluorescent Lamps
36. Pentagonal Mirror Motor
37. Stamp Solenoid
38. Copy Feed-out Sensor
39. Rear Transfer Fan
40. Main Motor
41. Charge Corona Fan
42. Registration Clutch
43. Development Clutch
44. Right Cover Switch
45. Toner End Sensor
46. Upper Paper Lift Solenoid
47. Upper Paper Feed Clutch
48. Registration Sensor
49. Upper Paper Height Sensor
50. Upper Paper End Sensor
51. Right Cover Interlock Switch
52. Upper Paper Near-end Sensor
53. Upper Paper Size Sensor
54. Power Pack
55. Toner Overflow Sensor
56. Master Unit Interlock Switch
57. Front Transfer Fan
58. Transfer Corona Unit
59. Fusing Lamp
60. SPU Fan

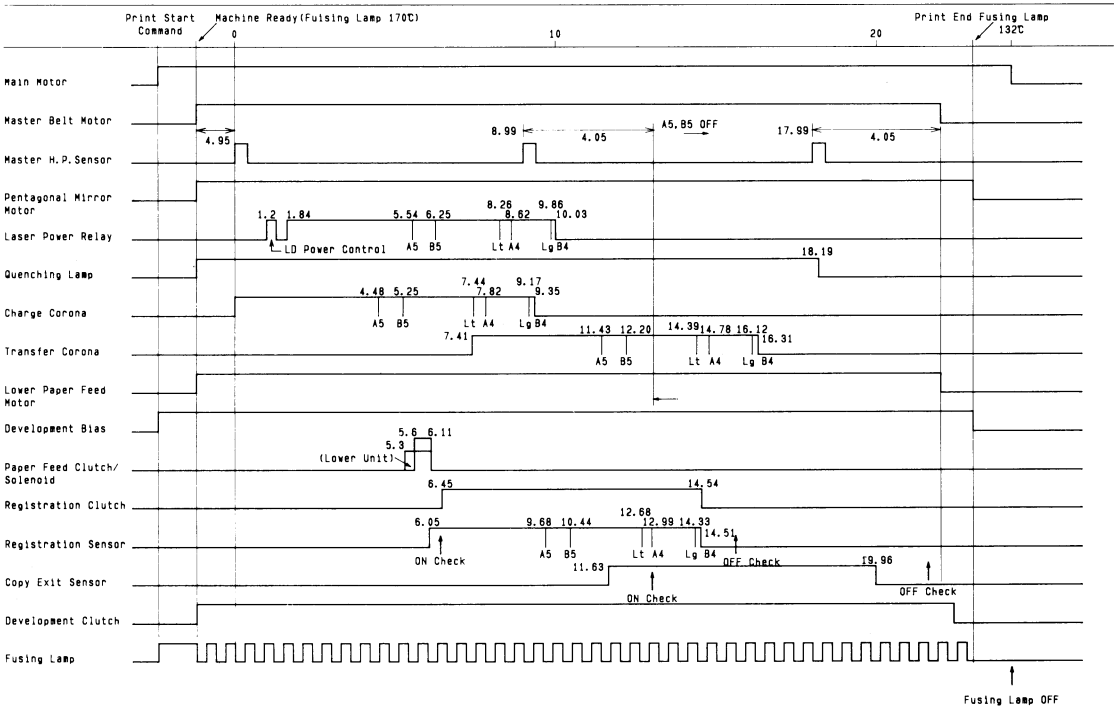
61. Master Belt Home Position Sensor
62. Thermostat
63. Thermistor
64. PSU Fan
65. Lower Paper Feed Motor
66. Lower Paper End Sensor
67. Lower Paper Feed Solenoid
68. Lower Paper Height Sensor
69. Lower Cassette Switch
70. Lower Paper Size Sensor
71. Lower Paper Lift Motor Driver
72. Lower Paper Near-end Sensor
73. Lower Paper Lift Motor
74. Jam Removal Switch
75. Lower Front Cover Switch
76. Hard Disk Fan
77. Hard Disk
78. PSU (Power Supply Unit)

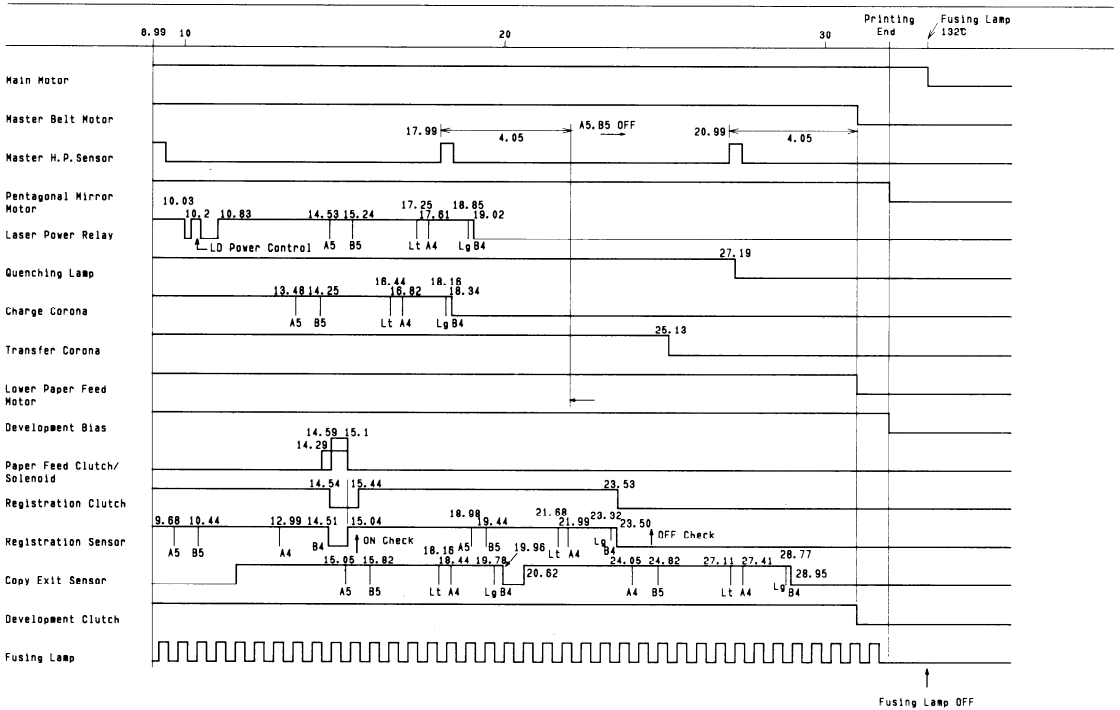
7-5. Timing Charts

1. Scanner



First Page


Print Start Command
Machine Ready(Fulsing Lamp 170℃)
0
10
20
Print End Fusing Lamp 132℃
Main Motor
Master Belt Motor
4.95
8.99
4.05
A5,B5 OFF
17.99
4.05
Master H.P.Sensor
Pentagonal Mirror Motor
Laser Power Relay
1.2
1.84
LD Power Control
5.54
6.25
A5
B5
8.26
8.62
Lt A4
9.86
10.03
Lg B4
Quenching Lamp
18.19
Charge Corona
4.48
5.25
A5
B5
7.44
7.82
Lt A4
9.17
9.35
Lg B4
Transfer Corona
7.41
11.43
12.20
A5
B5
14.39
14.78
16.12
16.31
Lt A4
Lg B4
Lower Paper Feed Motor
Development Bias
5.6
6.11
5.3
(Lower Unit)
Paper Feed Clutch/ Solenoid
6.45
14.54
Registration Clutch
6.05
ON Check
9.68
10.44
A5
B5
12.68
12.99
14.33
14.51
Lt A4
Lg B4
OFF Check
Registration Sensor
11.63
ON Check
19.96
OFF Check
Copy Exit Sensor
Development Clutch
Fusing Lamp
Fusing Lamp OFF


8.99
10
20
30
Printing End
Fusing Lamp 132℃
Main Motor
Master Belt Motor
Master H.P.Sensor
17.99
4.05
A5, B5 OFF
20.99
4.05
Pentagonal Mirror Motor
Laser Power Relay
10.03
10.2
10.83
14.53
15.24
17.25
17.61
18.85
19.02
LD Power Control
A5
B5
Lt A4
Lg B4
Quenching Lamp
27.19
Charge Corona
13.48
14.25
16.44
16.82
18.16
18.34
A5
B5
Lt A4
Lg B4
Transfer Corona
25.13
Lower Paper Feed Motor
Development Bias
14.59
15.1
14.29
Paper Feed Clutch/ Solenoid
Registration Clutch
14.54
15.44
23.53
Registration Sensor
9.68
10.44
12.99
14.51
15.04
18.98
19.44
21.68
21.99
23.32
23.50
A5
B5
A4
B4
ON Check
Lt A4
Lg B4
OFF Check
Copy Exit Sensor
15.05
15.82
18.16
18.44
19.78
19.96
20.62
24.05
24.82
27.11
27.41
28.77
28.95
A5
B5
Lt A4
Lg B4
A4
B5
Lt A4
Lg B4
Development Clutch
Fusing Lamp
Fusing Lamp OFF

APPENDIX

APPENDIX

Appendix A. Glossary

ADF
Automatic Document Feeder: An assembly which automatically feeds documents into the scanner one page at a time.

BSRU
Bar Scanner Reader Unit: This PCB connects the optional bar code reader to the controller on the SPU board.

CCD
Charge Coupled Device: A solid state device which converts light reflected from the document into an analog video signal.

CED
Called Station Identification: A protocol signal which informs the calling station that a fax terminal has been reached.

CCITT
Consultative Committee for International Telephone and Telegraph: A part of the U.N. which sets and governs facsimile standards.

CFR
Confirmation to Receive: A protocol signal used by the receiving terminal to tell the transmitter that modem training and set-up information was accepted.

CNG
Calling Tone: A 1100 Hz tone that is used by auto-dialling machines to alert a manual receive machine that a fax is on the line.

CSI
Called Subscriber Identification: The phone number of the fax machine. This is used for identification instead of the TTI when communicating with a non-Ricoh machine.

DCN
Disconnect: A protocol signal used by the transmitter to release the line.

DCR
Data Compression and Reconstruction: Compression reduces the volume of data being sent out, and reconstruction recreates the original data at the other end. See MH, MR, MMR, and EFC.

DCS
Digital Command Signal: A protocol signal that informs the calling station of the called terminal's capabilities.

DTMF
Dual Tone Multi Frequency: A method of dialling using tones instead of pulses.

DRU
Drive/Registration Unit: This PCB contains drivers for mechanical components of the upper unit, and monitors the registration and feed-out sensors.

DSB
Document Sensor Board: This PCB contains drivers for some of the upper unit components, and contains the sensors in the ADF/scanner on-board.

EFC
Estimated Fill bit Control: A Ricoh-developed compression method used with MH, MR, or MMR. It reduces the number of fill bits on a line, making transmission time faster. New EFC does not add any fill bits, so transmission is even faster.

EOM
End Of Message: A protocol signal that informs the receiver that there are more pages to follow, using different parameters.

EOP
End Of Procedure: A protocol signal that informs the receiver that this is the end of the page of data.

FTT
Failure To Train: A protocol signal that informs the transmitter that either set-up information and/or modem training was not acceptable.

G3CCU
Group 3 Communication Control Unit: This PCB controls the interface with the public telephone network, under the control of the main cpu.

G3NCU
Group 3 Network Control Unit: This PCB contains the hardware for connecting the machine to the public telephone network.

LB
Line Buffer: An area of memory where lines of video data are temporarily held before being passed on to the next process. This helps to ensure a smooth flow of data.

LCD
Liquid Crystal Display: A display on the operation panel used to inform machine status and programming prompts to the user.

LDDR
Laser Diode Driver: This PCB contains the laser diode and components for driving it.

LDS
Laser Data Synchronizer: This LSI generates the clock signal for data output to the laser diode and smooths the data to 400 x 400 dpi.

LED
Light Emitting Diode: A diode that emits light; used as an indicator lamp.

LIB
Lower Interface Board: This PCB links the SPU to the components in the lower cassette.

LSD
Laser Synchronization Detector: This PCB detects the start of each scan of the laser beam across the master belt.

LSI
Large Scale Integration: A process of making complex microchips.

MBU
Memory Board Unit: This PCB contains the system software ROMs, system parameter memory, and the battery for backing up the system parameter and voice message memories.

MCF
Message Confirmation: A protocol signal that confirms reception of the page just sent.

MH
Modified Huffman: A compression method used to reduce the number of bits needed to represent the facsimile data. MH coding is a one-dimensional run length digital scheme of coding black and white runs.

MMR
Modified Modified Read: A modified version of MR coding (see below).

MPS

Multipage Signal: A protocol signal that informs the receiving fax that more pages are to follow using the same parameters.

MR
Modified Read: A compression method (see MH above). MR coding is a two-dimensional digital coding scheme which works by comparing a line of data with the line above it.

MTF
Modulation Transfer Function: MTF is necessary for transmitting details such as fine points, thin lines, and complex characters.

NSF
Non Standard Facilities: A protocol signal that informs the calling station of the called station's capabilities. It is also called Ricoh Group 3.

NSS
Non Standard Set-up: The set-up command in Ricoh protocol.

OPU
Operation Panel Unit: This PCB contains the operation panel components.

PABX
Public Access Broadcast Exchange: A switchboard found at the customer's location.

PD
Pulse Dialling: A dialling method that uses pulses; also known as Rotary Dialling.

PIN
Procedural Interrupt Negative: A protocol signal used to inform the transmitter that the previous page was not received satisfactorily due to paper running out, paper jam, or because the Stop key was pushed on the receiving fax.

PIP
Procedural Interrupt Positive: A protocol signal that confirms reception of the previous page, and indicates that the receiver operator wants to make a voice request.

PSTN
Public Switched Telephone Network: The network normally used for telephoning.

PSU
Power Supply Unit: The PCB that supplies voltages to machine components.

QAM
Quadrature Amplitude Modulation: The modulation technique which enables fax machines to transmit at 9600 and 7200 bps over the PSTN.

RTI
Remote Terminal Identification: The RTI is displayed on the other terminal's display panel to identify the local terminal during communication.

RTN
Retrain Negative: A protocol signal that informs the transmitter that the previous page was not received satisfactorily due to excessive errors.

RTP
Retrain Positive: A protocol signal that informs the transmitter that the previous page was OK but modem retraining must be done before continuing; this is normally because of poor line condition.

SAF
Store And Forward: A memory used to hold documents for transmission later or for broadcasting, to receive confidential messages, and to receive messages when the printer is jammed or out of paper.

SBU
Scanner Board Unit: This PCB contains the CCD.

SCU
System Control Unit: This PCB contains the main cpu, which controls the machine.

SMDR
Scanner Motor Driver: This PCB drives the pentagonal mirror motor.

SPU
Scanner Printer Unit: This PCB controls the scanner and printer, under the control of the main cpu.

TTI
Transmit Terminal Identification: The TTI of the sender is printed at the top of each page as it is received at the other end. It identifies the sender.

UIB
Upper Interface Board: This PCB links the SPU to components in the upper unit of the machine.

VPU
Video Processing Unit: This PCB contains circuits to process the CCD output into a digital data signal.