RICOH

FACSIMILE

RICOH FAX 1000L

FIELD SERVICE MANUAL

WARNING

RICOH FAX 1000L CONTAINS A LASER BEAM GENERATOR.

LASER BEAMS CAN CAUSE PERMANENT EYE DAMAGE.

DO NOT OPEN THE LASER DIODE OR LOOK ALONG THE LASER BEAM PATH WHILE THE MAIN POWER IS ON.

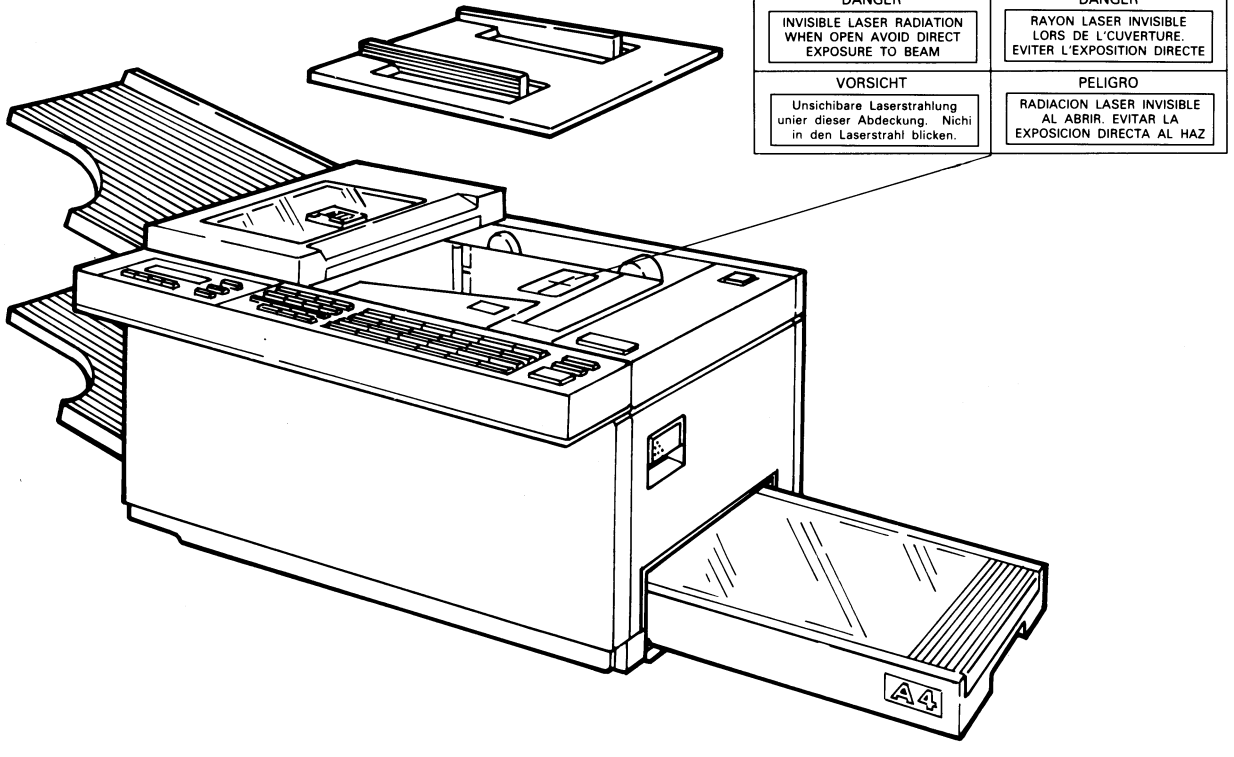

DANGER
INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
DANGER
RAYON LASER INVISIBLE LORS DE L'CUVERTURE. EVITER L'EXPOSITION DIRECTE
VORSICHT
Unsichibare Laserstrahlung unier dieser Abdeckung. Nichi in den Laserstrahl blicken.
PELIGRO
RADIACION LASER INVISIBLE AL ABRIR. EVITAR LA EXPOSICION DIRECTA AL HAZ
A4

TABLE OF CONTENTS

SECTION 1

FEATURES AND SPECIFICATIONS

1-1 FEATURES

Equipment	
Built-in handset	×
Connection for external tel.	○
Telephone set	×
Cassette (250 sheets)	○
LCT (500 sheets) — optional	○
Cabinet — optional	○
ADF (capacity — 30 sheets)	○
Manual feed for thick originals	○
Monitor speaker	○
SAF memory (896 Kbyte)	○
Battery back-up for SAF (72 hours)	○
Stamper	○
Remaining memory indicator	○
Document width detection	○
A3 scanner	○

○ = Included

× = Not included

Video Processing Features	
Contrast (Light, Normal, Dark)	○
Resolution (Standard, Detail)	○
Halftone	○
MTF (selectable by service)	○
Reduction — A3 to B4	○
— A3 to A4	○
— B4 to A4	○
Smoothing (reception only)	○

○ = Included

× = Not included

Communication Features — Auto	
Transmission standby	○
Redialing — twice	○
— four times in memory mode	○
G2, G3 autocompatibility	○
G1 compatibility	×
Confidential reception	○
Substitute reception	○
Page retransmission (twice max.) — memory mode only	○

Also known as Dual Access.

○ = Included
× = Not Included

Not used in W.Germany

Not used in W.Germany

Communication Features — Selectable by User	
Shared or dedicated line (Fax/Tel)	○
Automatic or manual reception (Fax/Tel)	○
Automatic dialing using pulses or DTMF	○
On-hook dial	×
Speed Dial (up to 90 codes)	○
Quick Dial (up to 24 keys)	○
— up to 24 single addresses	○
— up to 24 keystroke programs	○
Groups (up to 7)	○
— up to 100 addresses/group	○
— up to 10 full tel. nos. in all groups	○
Alternative destination	○
Department code	○
ECM	○

Service mode in Italy/W.Germany

○ = Included
× = Not Included

Communication Features — Selectable by User	
Batch-numbering	○
Turnaround polling	○
EFC disabling option (W.Germany only)	○
Auto-reduction override option (factory-set disabled)	○
Resolution stepdown override option (W.Germany only)	○
Immediate redial	○
Auto-answer delay time	×
Hold	×
Voice Request	○
Voice Message	×

○ = Included
× = Not Included

Communication Features — Selectable by Service	
Page retransmission (up to three times)	○
Closed network	○
MV1200 compatibility	○
Short Preamble	○
Well log (14 m) — transmission only	○
Protection against wrong connections	○
EFC	○
PSTN access through PABX	○
Polling ID code security	×

○ = Included
× = Not Included

Special Communication Functions	
Transmission from memory	○
— immediate and send later	○
— up to 100 addresses/file	○
— up to 99 files	○
— up to 300 addresses over all files	○
Send Later (one address — document stored in ADF)	○
Confidential Transmission	○
— immediate	○
— send later, broadcasting	×
— remote password override (to FAX70E/R610/R830/ FAX1000L)	○
Transfer Request	○
— one broadcaster, 30 end receivers	○
— time designatable	×
— use of broadcasters groups,quick dial, and speed dial	○
Polling Transmission	○
— free/secured option	○
— stored ID override	○
—from memory (erased after one polling)	×

○ = Included
× = Not Included

See note 1 on page 1 - 14.

Not used in W.Germany
Not used in W.Germany
Not used in W.Germany
Not used in W.Germany
Not used in W.Germany
Not used in W.Germany
Not used in W.Germany
Not used in W.Germany

Special Communication Functions	
Polling Reception	O
— free/secured option	O
— stored ID override	O
— poll later — up to 8 files	O
— up to 100 addresses/file	O
— up to 300 addresses overall	O

O = Included
× = Not Included

See note 1 on page 1 - 14.

Other Features	
Multicopy mode (up to 99 copies per original)	O
Convenience keys	O
Printing the contents of a memory file	O

Reports — Automatic	
Journal/TCR (optional)	○
Transmission Report (optional)	○
Error Report (optional)	○
Transfer Result Report	○
Polling File List (optional)	○
Memory Report (optional)	○
Power Failure Report	○
Memory Transmission Report (optional)	○
Telephone List (after programming — optional)	×

○ = Included
× = Not Included

Not used in W.Germany

Reports — User	
Journal/TCR	○
Telephone List (includes Group List)	○
Polling File List	○
SAF File List	○
Program List	○

○ = Included
× = Not Included

Reports — Service	
Auto Service Call (optional)	○
System Report	○
Memory Dump	○
Service Report	○

Programming — User	
Clock	○
Fax/Tel setting	○
Communicated page counter display	○
Sheet feed counter display	○
Batch-number enabling	○
Department code enabling	○
Speaker volume adjustment	○
Voice Message recording	×
Voice Message playback	×
Voice Message enabling	×
Transmission Report enabling	×
Quick Dial	○
Groups	○

○ = Included
× = Not Included

Programming — User	
Polling ID code	○
RTI	○
TTI	○
CSI	○
Polling file clearance	○
Memory file clearance	○
Own telephone number	○
Telephone line type	○
TTI disabling	○
Stamper enabling	○
Master belt counter reset	○
Password	○
Keystroke programs	○
ECM on/off	○
Full week timer	○
Full week timer override	○

○ = Included
× = Not Included

Italy and W.Germany — service mde

Italy and W.Germany — service mode

Programming — Service	
Dedicated transmission parameters	○
Bit switches	○
RAM rewriting — local	○
RAM rewriting — to a remote terminal	×
Error code display	○
CCITT and Maker codes	○
NCU parameters	○
Master belt counter reset	○
Printer system crash recovery	○
Service station telephone number	○
Maximum address limitation	×
CSI	○
Telephone line type	○

○ = Included
× = Not Included

Italy and W.Germany

Italy and W.Germany

Master belt counter reset is normally a user function, but can be changed to a service function by bit switch.

System Tests	
Modem	○
DTMF tone	○
Operation panel	○
Fluorescent lamp lighting	○
Sensor initialization	×
Back-to-back test	○
Printer test patterns	○
ADF mechanism test	×
Printer mechanism test	×

○ = Included
× = Not Included

Note 1: The total number of addresses stored in the machine for polling reception and memory transmission, when added together, cannot exceed 300.

1-2 SPECIFICATIONS

Type	Desk-top transceiver
Circuit	PSTN, PABX
Connection	Direct coupling
Document size	Length: 105 — 1200 mm Up to 14 m available Width: 148 — 301 mm Thickness: 0.05 — 0.2 mm
Document feed	Automatic feed, face down Manual feed for thick documents
ADF capacity	30 sheets
Scanning method	Flat bed with CCD
Scan resolution	Main scan: 8 pixels/mm Sub scan: 3.85 lines/mm (Standard) 7.7 lines/mm (Detail)
SAF capacity	896 kbytes (about 49 CCITT #1 test charts at standard resolution)
Compression	MH, MR, EFC
Modulation	QAM, PHM, AM-PM-VSB
Protocol	Groups 2 and 3; automatic compatibility

Data rate	9600/7200/4800/2400 bps Automatic fallback
Transmission time	15 s for one CCITT #1 test chart using standard resolution, 9600 bps, and EFC (no TTI, MTF, or ECM)
Printing system	Laser printing, plain paper, dry toner
Paper size	B4, A4
Maximum printout width	250 mm (B4)
Printer resolution	Main scan: 16 dots/mm Sub scan: 15.4 lines/mm
Power supply	230 ± 30 Vac, 50 Hz, single phase
Power consumption (average)	Standby: 30 w Transmission: 60 W Reception: 300 W (upper cassette) 310 W (lower cassette) Copying: 360 W (upper cassette) 370 W (lower cassette)
Power consumption (maximum)	520 W
Dimensions	435 x 550 x 295 mm (W x D x H) Excluding trays, handset, and cabinet
Weight	About 28 kgs Excluding trays, handset, and cabinet

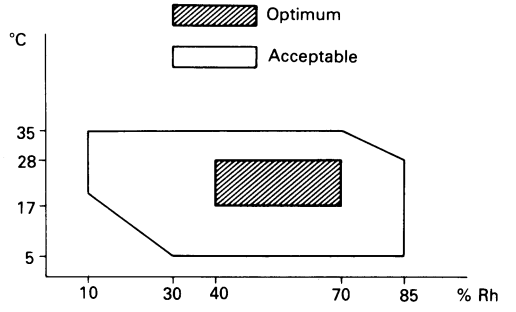
SECTION 2

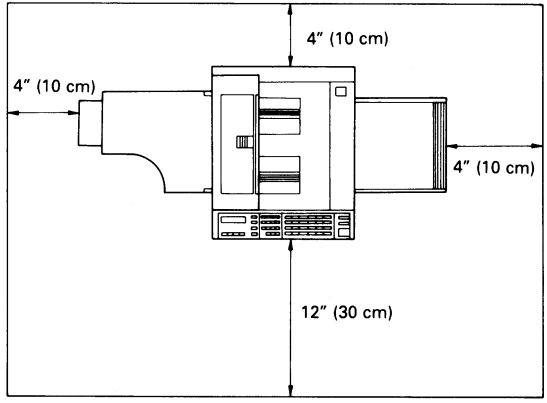
UNPACKING

2-1 INSTALLATION REQUIREMENTS

Install in a place which satisfies the following conditions.

- Not exposed to direct sunlight.
- Away from areas containing corrosive gas.
- Well ventilated (air turnover at least three times per hour).
- Not subject to vibration.
- Ambient dust 0.15 mg/m^3(4 X 10^{-3} oz/yd^3)
- Condensation-free
- Temperature 17 to 28°C (63 to 82° F)
- Humidity 40 to 70% RF (without condensation)
- Away from other electronic equipment, to avoid interference.
- Away from heaters and air conditioners, to avoid sudden changes of temperature.
- With clearance as shown to the right.
- On a strong and level base.



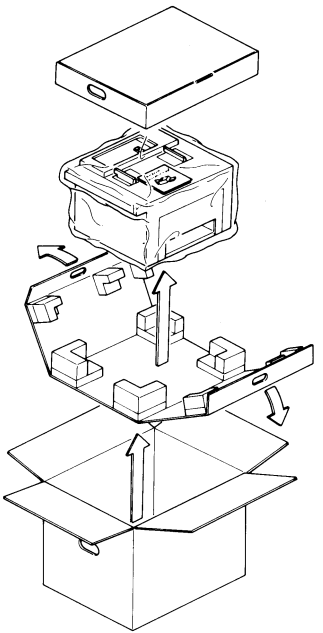


2-2 UNPACKING PROCEDURE

1. Take out the accessory box and the machine.

2. Open the vinyl envelope and take out the machine.

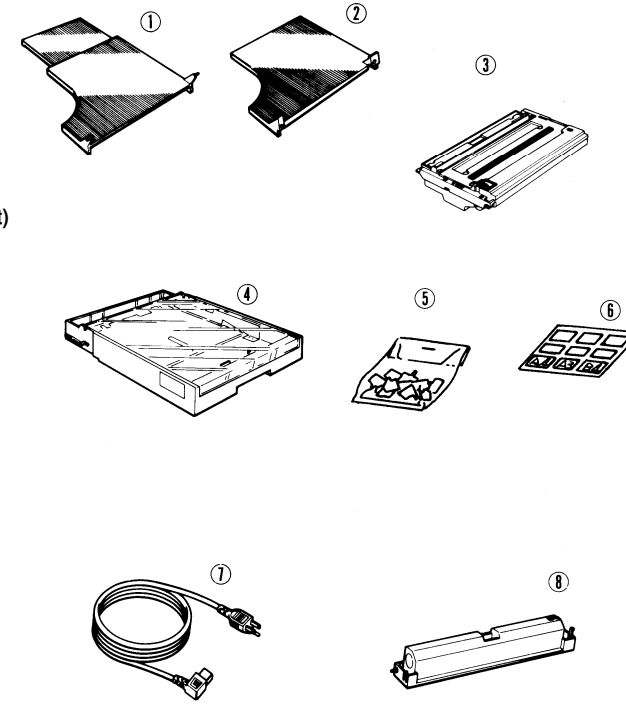
Caution: Put the machine on the optional table or a table that is horizontally level within 2 degrees.



2-3 ACCESSORIES CHECK LIST

1. Open the accessory box and check the following accessories.

1) Document Tray	**(1 pc)**
2) Copy Tray	**(1 pc)**
3) Master Unit	**(1 pc)**
4) Cassette	**(1 pc)**
5) Paper Size Actuators	**(1 pc)**
6) Paper Size Decals	**(1 sheet)**
7) Power Supply Cord	**(1 pc)**
8) Toner Cartridges	**(2 pcs)**



9) **Operators Manual** (1 pc)

10) **Speed Dial Label Cover** (1 pc)

11) **Refill Ink** (1 pc)

12) **Stamper Removal Tool** (1 pc)

13) **Sub-document Table** (1 pc)

14) **Paper** (1 pc)

15) **Vinyl Gloves** (2 pcs)

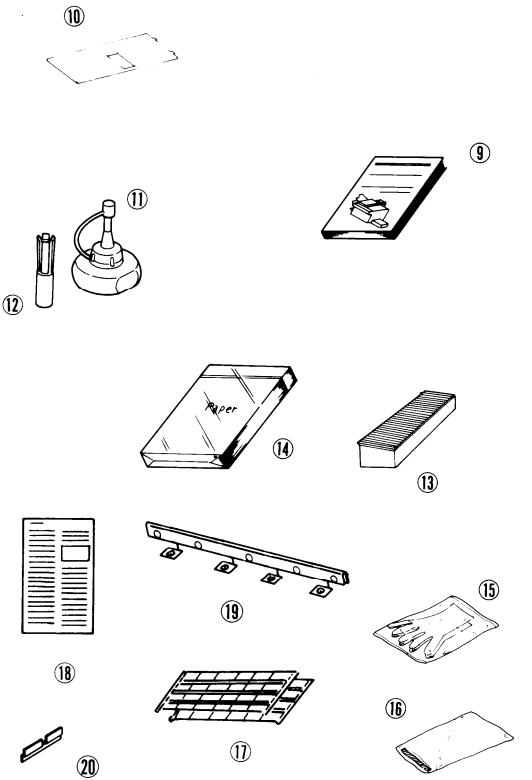
16) **Plastic bag** (1 pc)

17) **Quick Dial Labels** (2 pcs)

18) **Speed Dial Label** (1 pc)

19) **Cleaning Pad and Screws** (1 pc)

20) **Sub-document Table Bracket** (1 pc)



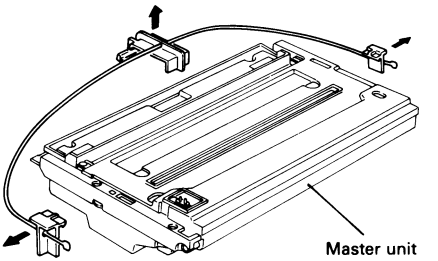
SECTION 3

INSTALLATION

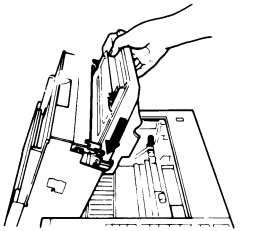
3-1 ASSEMBLY

1. Remove the three wedges from the master unit.

   Caution: Do not touch the master belt (purple material) and avoid exposing it to light.



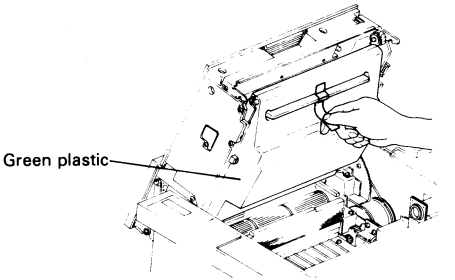
2. Open the upper unit and insert the master unit into the machine along the guide until the unit stops.



3. Peel off the green plastic cover that protects the master.

4. Close the upper unit.

   Caution: The master belt counter should be reset. (Please refer to page 3 - 7.)



5. Open the right cover.

6. Shake a toner cartridge well.

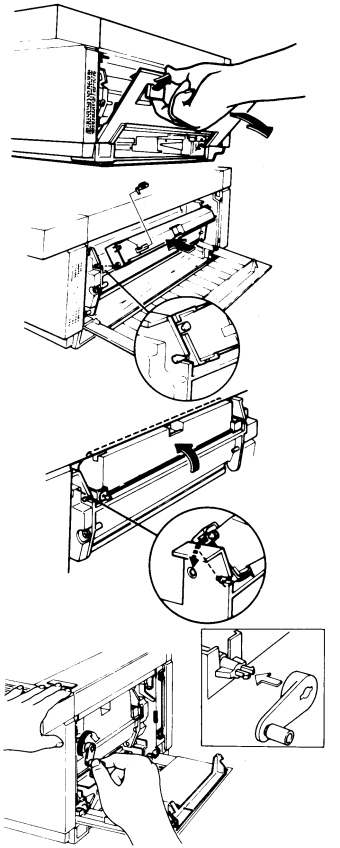
7. Remove the cartridge crank from the cartridge.

8. Set the pins on the toner cartridge into the slots on the development unit. Then rotate the cartridge upwards until it snaps into place.

9. Install the cartridge crank on the shaft.
Then turn the crank clockwise to strip off the cartridge seal. Remove the cartridge crank.

10. Remove the toner cartridge and install another toner cartridge (refer to steps 6 to 9).
Note: When adding toner during normal operation, only one cartridge should be replaced.

11. Close the right cover.



12. Install the cassette.

Note: **If the paper size which the customer will use is different from the initial size, modify the cassette as follows.**

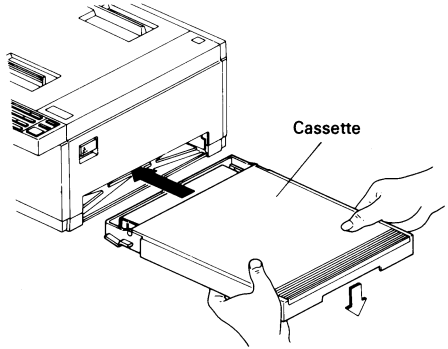
1) Move the rear and side fences to the appropriate positions.

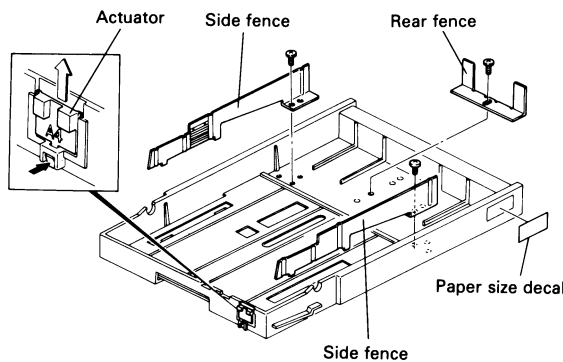
2) Attach the appropriate paper size decal to the tray.

3) Install the appropriate actuator.

4) Attach the top cover.

5) Add paper and install the tray.



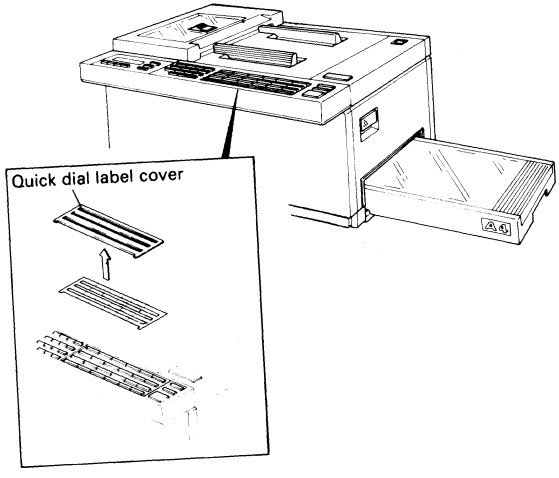


13. Quick Dial Labels

1) Remove the quick dial label cover.

2) Install the quick dial labels.

3) Replace the quick dial label cover.



14. Speed Dial Label

1) Install the speed dial label.

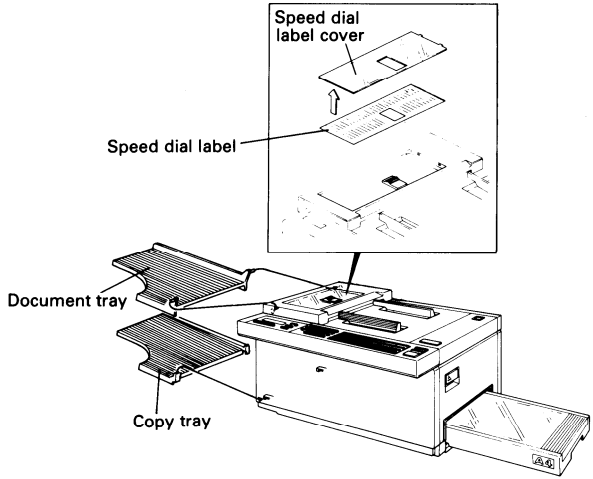
2) Install the speed dial label cover.

15. Install the cleaning pad (see page 3-8).

16. Install the copy tray.

17. Install the document tray.

18. Put some ink in the stamper (see page 3-9).



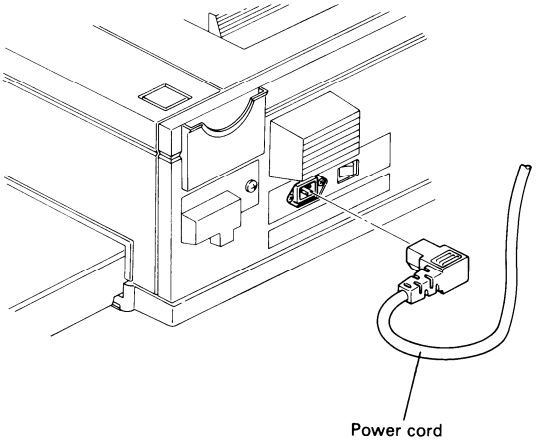
3-2 POWER CONNECTION

1. **Connect the power cord to a 115V 50/60 Hz power source (or 230V 50Hz depending on the model) capable of supplying more than 10A.**

2. **Wall voltage must not fluctuate more than 10%.**

3. **Make sure that the plug is firmly inserted into the outlet.**

4. **A dedicated circuit is recommended.**

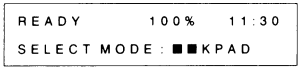


3-3 MASTER BELT ROTATION COUNTER INITIALIZATION

When the master is installed at installation or when changing the master, the counter should be initialized, as follows.

1. **Turn on the main switch.**

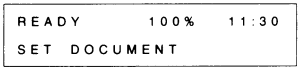
2. **Press the Function key.**



3. **Enter 87 at the keypad.**

4. **Press the Yes key.**

5. **Press the Yes key again.**



3-4 SUB-DOCUMENT TABLE

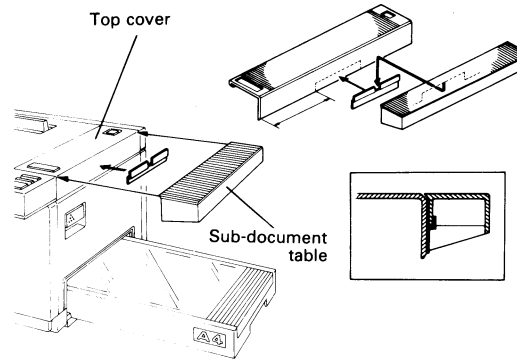
If the sub-document table is needed, please install it as follows.

1. Take the tape off the adhesive strip on the sub-document table bracket.

2. Attach the sub-document table bracket to the center of the top cover.

   Note: The top of the top cover must be flush with the top of the sub-document table.

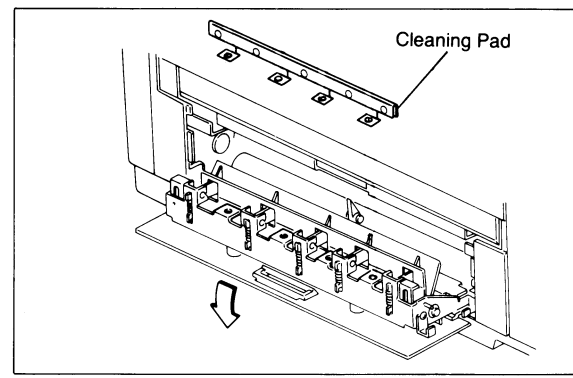
3. Attach the sub document table to the bracket.



3-5 CLEANING PAD INSTALLATION

1. Open the exit cover.

2. Attach the cleaning pad (4 screws).



3-6 FILLING THE STAMPER

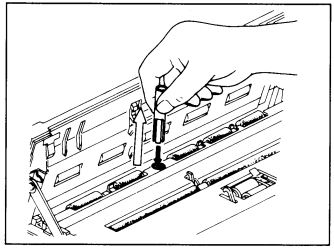
1. Open the ADF cover.

2. Remove the stamper as follows with the tool provided in the accessories box.

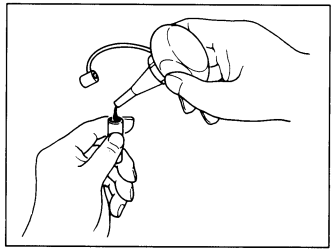
   1) Move the slotted end of the tool over the stamper.

   2) Push down the tool until the hooks click into place around the bottom of the stamper.

   3) Lift out the tool and stamper.



3. Add a few drops of ink.
   The inlet is in the bottom of the stamper.
   The ink is provided in the accessories box.
   Caution: The ink should not be taken internally.



4. Replace the stamper as follows.

   1) Place the stamper in position manually.

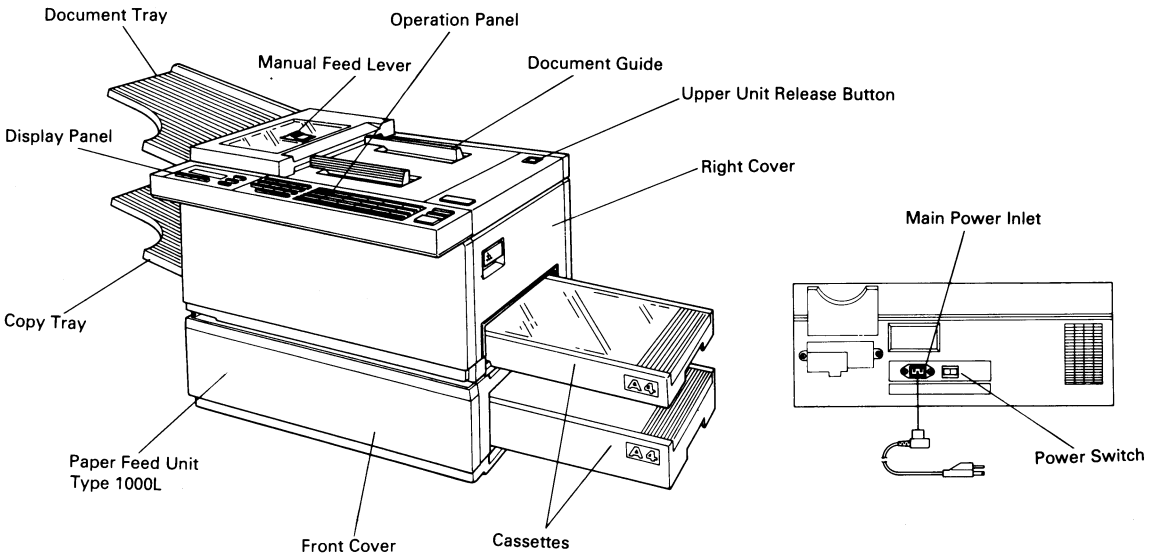
   2) Check that the stamper is in with the red end facing up.

5. Close the ADF cover.

SECTION 4

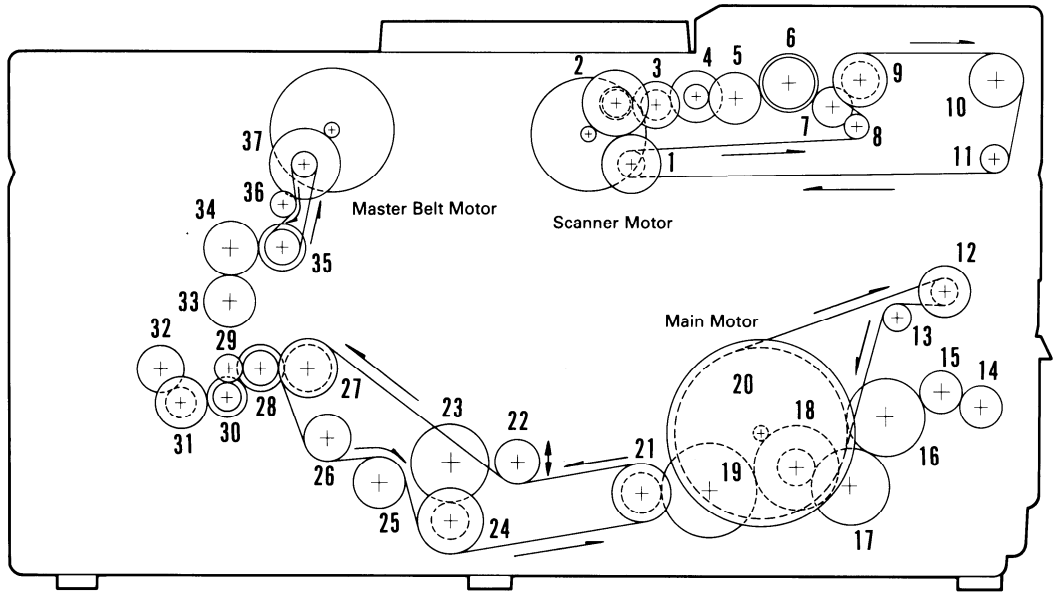
COMPONENT GUIDE

4-1 EXTERNAL VIEW



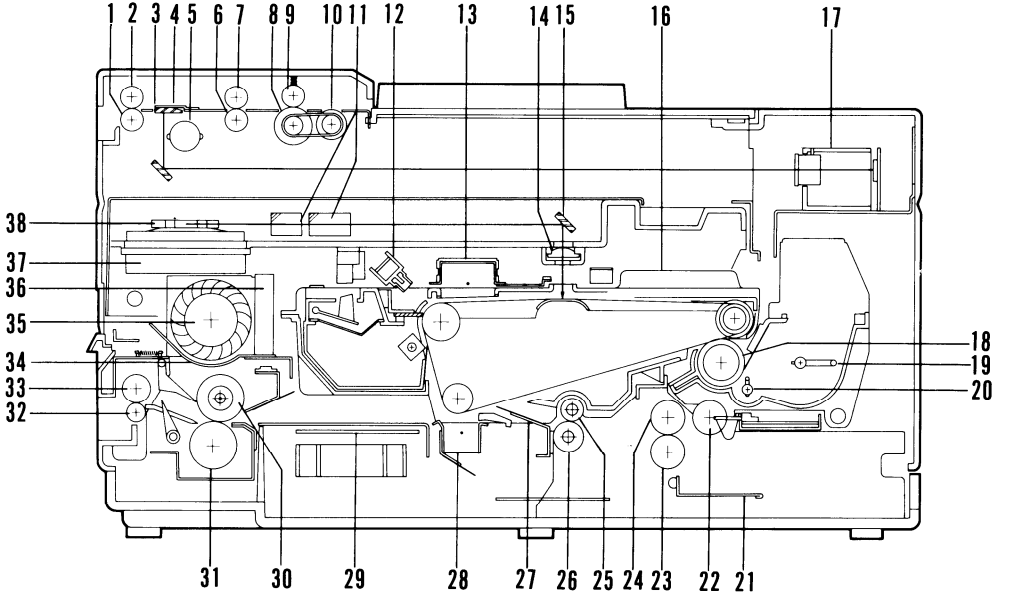
4-2 INTERNAL COMPONENTS

1. Drive Layout



No.	Name	No.	Name
1	R2 Idle Gear — 18T	20	Fan Drive Pulley — Large/Main Drive Gear — Small
2	Reverse Idle Gear	21	Main Drive Pulley
3	ADF Idle Gear — T40	22	Tensioner Roller — T16
4	ADF Idle Gear — T45	23	Registration Clutch
5	ADF Idle Gear — T48	24	Registration Drive Pulley
6	ADF Clutch	25	Belt Pulley
7	R1 Gear	26	Feed Pulley
8	Belt Tensioner Idler	27	Development Clutch
9	R1 Pulley	28	Sleeve Gear
10	R2 Pulley	29	Idle Gear — Toner Supply
11	Idler 2 — T14	30	Toner Supply Gear
12	Fan Drive Pulley — Medium	31	Agitator Idle Gear
13	Fan Drive Pulley — Small	32	Agitator Gear
14	Exit Gear — T18	33	Master Belt Rotation Gear — T20
15	Idle Gear — Z20	34	Master Drive Gear — T23
16	Fusing Unit Gear – T35	35	Master Drive Pulley — T20
17	Idle Gear — T33	36	Tensioner Pulley — Master Drive
18	Idle Gear — T44/T16	37	Idle Gear — Master Drive — T20
19	Main Drive Idler — T51		

2. Mechanical Component Layout

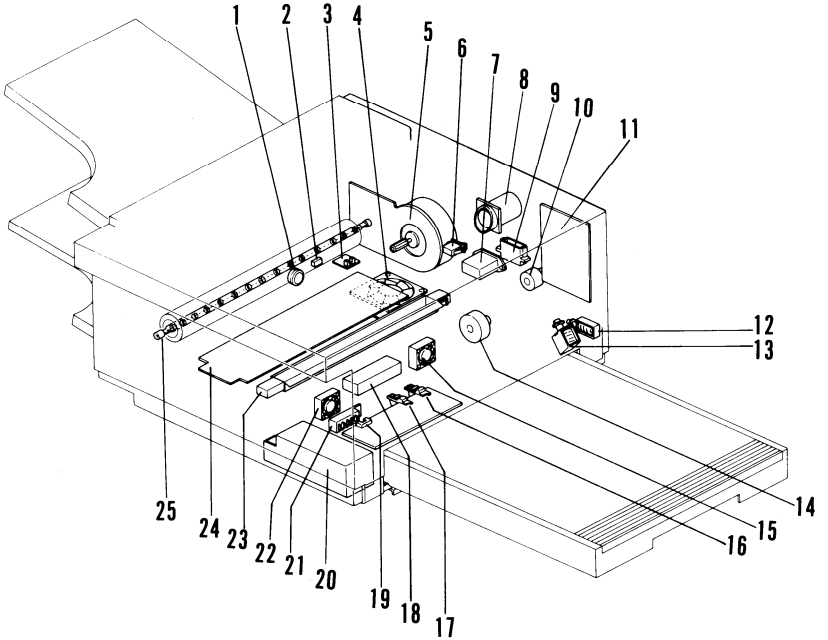


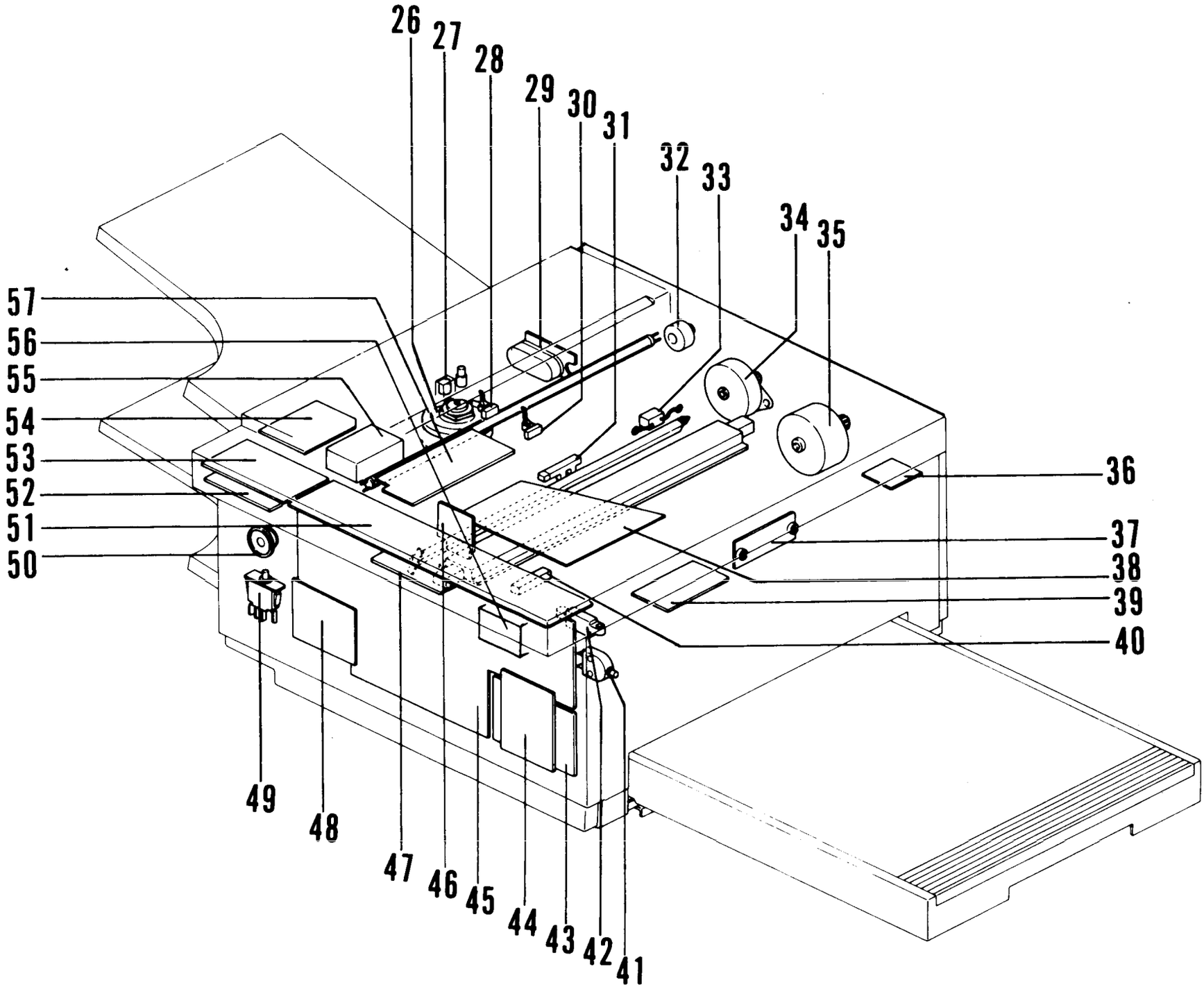
No.	Name	Function
1	R2 Roller	Feeds the document through the scanner.
2	R2 Pressure Roller	Feeds the document through the scanner.
3	Scanner Mirror	Reflects light from the document to the SBU.
4	Exposure Glass	Exposes the document to the scanner.
5	Fluorescent Lamp	Illuminates the document.
6	R1 Roller	Feeds the document through the scanner.
7	R1 Pressure Roller	Feeds the document through the scanner.
8	Document Feed Roller	Feeds the document into the scanner.
9	Document Separation Roller	Feeds and separates documents.
10	Document Pick-up Roller	Picks up a document from the document table.
11	Fθ Lenses	Direct the laser beam to the master belt.
12	Quenching Lamp	Removes residual charge from the master belt.
13	Charge Corona Unit	Gives the master an evenly distrubuted charge.
14	Second Cylindrical Lens	Focuses the laser beam; keeps dust out of the laser unit.
15	Mirror	Reflects the laser beam onto the master.
16	Master Unit	Contains the organic photoconductor master belt.

No.	Name	Function
17	Lens Block A'ssy	Focuses light from the scanner onto the CCD.
18	Development Roller	Transfers toner to the latent image on the master.
19	Toner Mixing Bar	Agitates toner; used for toner end detection.
20	Toner Agitator	Agitates toner in the toner cartridge.
21	Paper Lift Arm	Lifts the paper.
22	Pickup Roller	Picks up a sheet of copy paper from the stack.
23	Separation Roller	Feeds and separates copy paper.
24	Paper Feed Roller	Feeds the copy paper into the machine.
25	Registration Roller	Corrects copy paper skew.
26	Lower Registration Roller	As above.
27	Transfer Guide Plate	Guides copy paper into the transfer area.
28	Transfer Corona Unit	Transfers toner from the master to the copy paper.
29	Transport Guide Plate	Ensures transfer of small sheets to the fusing unit.
30	Hot Roller	Feeds the copy and fuses toner onto the copy paper.
31	Pressure Roller	Forces the copy against the hot roller.

No.	Name	Function
32	Lower Exit Roller	Feeds the copy out of the fusing unit.
33	Fusing Exit Roller	As above.
34	Hot Roller Strippers	Separate the copy from the hot roller.
35	Printer Fan	Removes ozone from the fusing unit.
36	Ozone Filter	Absorbs ozone.
37	Pentagonal Mirror Motor	Drives the pentagonal mirror in the laser unit.
38	Pentagonal Mirror	Reflects the laser beam towards the master.

3. Electrical Component Layout

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No.	Name	Function
1	Thermostat	Cuts power to the fusing lamp at about 245°C.
2	Thermistor	Detects hot roller temperature.
3	Copy Exit Sensor	Detects when paper leaves the fusing unit.
4	PSU Fan	Cools the PSU.
5	Main Motor	Drives the fusing unit, cassette paper feed, paper lift, and development units.
6	Main Switch	Switches on the main power.
7	Inlet Filter	Removes noise from the main power supply.
8	Charge Corona Fan	Removes ozone generated by the charge corona.
9	Scanner Motor Connector	Connects the scanner motor to the DRU board.
10	Development Clutch	Transfers main motor drive to the development roller.
11	NCU	Controls the communication system.
12	Paper Lift Solenoid	Activates the paper lift mechanism.
13	Paper Feed Solenoid	Activates the paper feed mechanism.
14	Registration Clutch	Activates the lower registration roller.
15	Rear Transfer Fan	Removes ozone generated by the transfer corona.

No.	Name	Function
16	Paper Height Sensor	Detects when the paper level has fallen below the paper feed position.
17	Paper End Sensor	Detects when the cassette is empty.
18	DRU	Drives the scanner motor, paper feed and paper lift solenoids, registration clutch, and some of the fans; contains the registration sensor.
19	Paper Near-end Sensor	Detects when the cassette is almost empty.
20	Power Pack	Drives the corona units and development bias.
21	Paper Size Sensor	Detects the size of paper in the cassette.
22	Front Transfer Fan	Removes ozone generated by the transfer corona.
23	Transfer Corona Unit	Transfers toner from the master to the copy paper.
24	PSU	Supplies power to all parts of the machine.
25	Fusing Lamp	Provides heat for the fusing unit.
26	Pentagonal Mirror Motor	Drives the pentagonal mirror in the laser unit.
27	Stamper Assembly	Contains the stamper and stamper solenoid.
28	SB-2 Sensor (Scan Line Sensor)	Detects when the document leading edge reaches the scan line.
29	LDDR	Contains the laser diode.
30	SB-1 Sensor (Document Sensor)	Detects when a document is placed in the ADF.
31	Toner Overflow Sensor	Detects when the toner collection tank is full.

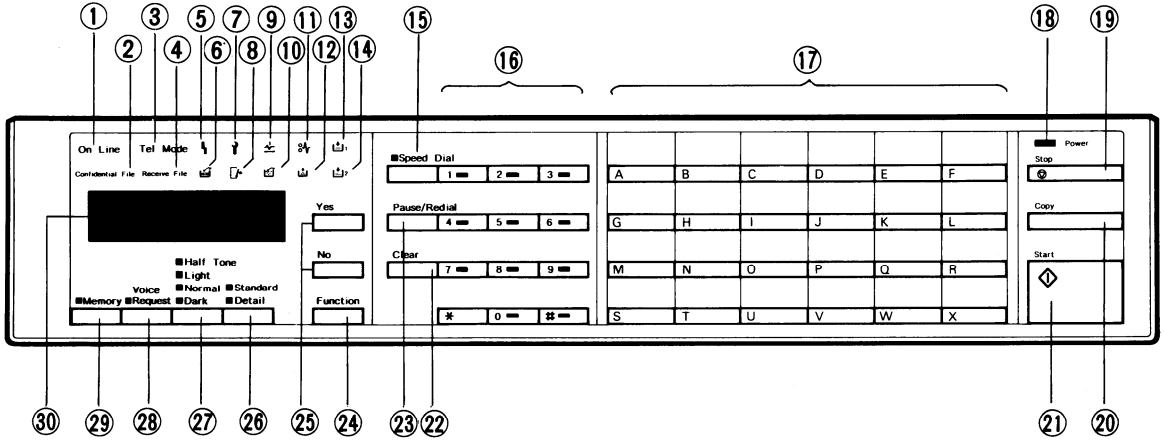
No.	Name	Function
32	ADF Clutch	Activates the document feed mechanism.
33	Varistor	Limits the charge given to the master belt.
34	Scanner Motor	Drives the document feed mechanism.
35	Master Belt Motor	Drives the master belt.
36	Toner End Sensor and Right Cover Switch	Detects when the toner cartridge is empty; detects when the right cover is open.
37	SBU	Converts optical images into an analog signal.
38	UIB	Links the FCU to the components in the upper unit.
39	VPU	Processes video signals from the SBU.
40	Master Home Position Sensor	Detects when the master belt is at home position or if the upper unit is open.
41	Right Cover Interlock Switch	Cuts the + 24VD supply when the right cover is open.
42	Master Set Sensor	Disables the laser diode power supply if a master is not installed.
43	R96F Modem	Modulates and demodulates; G2 and G3 only.
44	MIF	Interface board between Modem and FCU.
45	FCU	Controls the system.

No.	Name	Function
46	LSD	Detects the laser printer main scan start position.
47	PMU	Contains page memory.
48	MBU	Contains the programmed ROMs for controlling the system.
49	Upper Unit Interlock Switch	Detects when the upper unit or copy exit cover is open and cuts the + 24VD Supply.
50	Monitor Speaker	Monitors the telephone line condition.
51	OPU-1	Drives the operation and display panels.
52	OPU-3	As above.
53	OPU-2	Drives the operation and display panels.
54	SM-DR	Drives the pentagonal mirror motor.
55	FL Driver	Drives the fluorescent lamp.
56	BSR	Contains SAF and ECM double buffer memory, with battery backup.
57	DSB	Drives the master belt motor and scanner drive components other than the scanner motor; contains the document sensor, document width sensors, and the scanner cover switch.

SECTION 5

PROGRAMMING AND TESTING

5-1 OPERATION PANEL



No.	Name	Function
1	On Line Indicator	Lights during communication.
2	Confidential File Indicator	Lights when a confidential message has been received.
3	Tel Mode Indicator	Lights when the machine is in manual receive mode.
4	Receive File Indicator	Lights when a message was received but could not be printed out because the printer was out of order (copy jam or no paper).
5	Line Fail Indicator	Lights when communication fails.
6	Replace Master Indicator	Lights when it is time to replace the master unit or when the toner collection tank is full.
7	Call Service Indicator	Lights when the machine diagnostics detect a problem that requires service.
8	Close Cover Indicator	Lights when a door or cover is open.
9	Clear Original Indicator	Lights when a document jams in the scanner.
10	Toner Collection Indicator	Lights when the toner collection tank is full.
11	Clear Copy Indicator	Lights when a copy jams in the printer.
12	Add Toner Indicator	Lights when the toner tank is empty.
13	Add Paper 1 Indicator	Lights when the cassette is empty.
14	Add Paper 2 Indicator	Lights when the optional large capacity tray is empty.

No.	Name	Function
15	Speed Dial Key and Indicator	Press the key to change the mode of the ten-key pad; see the next item.
16	Ten-key Pad	Acts as a telephone ten-key pad when the Speed Dial indicator is off; used to enter Speed Dial codes otherwise.
17	Quick Dial Keypad	Use to input a single phone number or a sequence of features and phone numbers with one touch.
18	Power Indicator	Lights when the power switch is on and ac is supplied to the machine.
19	Stop Key	Stops operation and returns the machine to standby.
20	Copy Key	Press to copy a document.
21	Start Key	Press to start communication.
22	Clear Key	Press to clear the previously entered character or use as a cursor key, depending on the mode in use.
23	Pause/Redial Key	Press to insert a pause when entering a telephone number, or press to redial the last number dialed.
24	Function Key	Press to enter the programming mode.
25	Yes/No Keys	Use to answer questions on the character display.
26	Standard, Detail Indicators and Key	Use to select the resolution — “Standard” for normal text, “Detail” for drawings or fine print.

No.	Name	Function
27	Halftone, Light, Normal, Dark Indicators and Key	Use to select the contrast — “Halftone” for photographs, “Light” for light originals, “Normal” for normal originals, “Dark” for dark originals.
28	Voice Request Indicator and Key	During communication, press this key to request voice contact with the other terminal’s operator.
29	Memory Indicator and Key	Press this key to use the memory.
30	Character Display	Displays prompts, status, and selected modes.

5-2 USER LEVEL PROGRAMMING

— Initial Set Up –

The following items should be programmed or registered before starting operation. If these items are not set, the machine will not function at optimum potential. Refer to the operation manual for details.

Ž RTI/TTI/CSI

- **Polling ID code**
- **Date and time**
- **One-touch Keys**
  - **a) Keystroke programs**
  - **b) Quick Dial Keys (any number of vacant keys)**
- **Speed Dial codes**
- **Groups**
- **Local terminal telephone number**
- **FAX/TEL setting**
- **Local terminal telephone type**
- **Password**

— Function List —

No.	Function
1	Confidential Transmission
2	Send Later
3	Transfer Request
4	Polling
50	Clock Adjustment
51	Fax/Tel Setting
52	Communicated Page Counter Check
53	Scanned and Printed Sheet Counter Check
54	Batch-number Enabling
55	Department Code Enabling
56	Speaker Volume Adjustment
60	Quick Dial Programming
61	Group Programming
62	ID Code Programming
63	RTI Programming
64	TTI Programming
65	Clearing Polling Files
66	Clearing Memory Files
70	Journal Printing
71	Telephone List Printing
72	Polling File Printing
73	Program List Printing
74	SAF File List Printing
75	File Output
76	Confidential File Output
77	Multicopying
80	Entering Own Tel. No.
81	TTI Disabling
82	Password Programming
83	ECM on/off
84	Stamp Enabling
85	Full Week Timer Setup
86	Full Week Timer Override
87	Master Belt Counter Reset
88	Programming the CSI (not used in W.Germany)
89	Programming the Telephone Line Type (not used in W.Germany)

No.	Purpose	Remarks
1	To make a confidential transmission	You can specify the password if you wish.
2	To make a Send Later transmission	Enter the required transmission time in 24-hour clock format.
3	To send a message to more than one location through a broadcaster	All numbers must contain international dial and country codes. Function 80 must be programmed.
4	To poll or to set up your machine to be polled	
50	To enter the date and time	Increment with #, decrement with *, and move the cursor with Clear.
51	To select either automatic or manual reception	Press * to select FAX, and # to select TEL.
52	To view the communicated page counters	Press Yes after viewing.
53	To view the sheet feed counters	Press Yes after viewing.
54	To select the type of page numbering on the printout at the remote terminal	Press * for batch-numbering and # for simple numbering.

No.	Purpose	Remarks
55	To allow the user to use department codes	Press * to enable and # to disable.
56	To adjust the speaker volume	Increase with # and decrease with *.
60	To program Quick Dial keys and Speed Dial codes	Press the key or enter the code that you want to program. Then enter the number. For Quick Dial keys, you can also program a label. The method is the same as for RTI (see function 63).
61	To program groups	Groups can be labeled. There can be up to 7 groups.
62	To program the ID code needed for polling, transfer, and closed network communication	Enter the required code at the keypad. Do not use 0000 or FFFF.
63	To program the Remote Terminal Identifier. This is displayed on the remote terminal's operation panel during communication	Enter the identifier from the left. Use the ten-key pad (for numbers), Quick Dial keys (A – X), contrast key (Y) and resolution key (Z). Store the identifier by pressing Yes. Enter up to 20 characters.
64	To program the Transmitting Terminal Identifier. This is printed on the top of pages received at the remote terminal.	Up to 32 characters. Enter in the same way as the RTI.

No.	Purpose	Remarks
65	To erase a polling file	Enter the file number of the file to be erased. Refer to the Polling File List.
66	To erase a memory file	Enter the file number of the file to be erased. Refer to the SAF File List.
70	To print the Journal	
71	To print the Telephone List	Details on Quick Dial keys, and Speed Dial Codes, groups, and full telephone numbers will be printed.
72	To print the Polling File List	Prints information on all stored polling files.
73	To print the Program List	Prints information on keystroke programs and the Quick Dial keys they are allocated to.
74	To print the SAF File List	Prints information on all memory files.
75	To print the contents of a memory file	
76	To print a confidential file	The correct password must be entered. This will not be the same as the password programmed in function 82 if the sender specified a password.

No.	Purpose	Remarks
77	To make more than one copy of a document	Up to 99 copies can be made.
80	To enter the terminal's telephone number	This must be programmed if you want to use Transfer Request. A pause must be entered and the international dial and country codes must also be entered.
81	To enable/disable TTI printout on copies at the remote terminal	Press * to enable and # to disable.
82	To program the password to be used for printing confidential files	Before storing a password, the old password must be entered. In a new machine, this password is 0000.
83	To enable or disable ECM	Press * to enable and # to disable.
84	To enable/disable the stamp	Press * to enable and # to disable.
85	To program the fusing lamp on/off timer	Program on/off times for each day. Use # to increment and * to decrement the item at the cursor. Use the 24-hour clock. To keep the power on all day, enter 00:00 for the on and off times. To keep the power off all day, the display for on and off times should be blank (press the Pause/Redial key). key).
86	To override the timer	When asked for a password enter 2222. Press * to start the fusing unit. After use, use function 86 again to disable the fusing unit (press # instead of *).

No.	Purpose	Remarks
87	To reset the master belt rotation counter	Reset the counter after changing the master
88	To program the Called Subscriber Identifier. This is used in place of the RTI when communicating with a non-Ricoh machine.	Enter the telephone number (up to 20 numbers and spaces) at the keypad, then press #, then Yes.
89	To match the unit's dialing mode with the connected line	Press * for DTMF and # for pulse dialing.

5-3 SERVICE LEVEL

5-3-1 Service Functions

1. Entering and Exiting the Service Mode

To enter the service mode, press 1, 2, 3, 4, and 5 simultaneously.

Note: If you cannot access the service functions, short JP12 on the NCU.

To exit the service mode, press 6, 7, 8, and 9 simultaneously.

Note: If you wish to disable service mode, remove JP12 on the NCU.

Note: After entering the service mode, the service mode is disabled automatically if the keypad is not touched for 3 minutes.

2. Function Table

Number	Function
88	Programming the CSI (W.Germany)
89	Programming the Telephone Line Type (W.Germany)
90	Bit switch programming
91	ROM/RAM display, local RAM rewrite
92	System report
93	ROM/RAM printout
94	Error code display
95	Service report
96	CCITT and maker codes
97	Service station telephone number Recovery from printer system crashes
98	NCU parameter programming

Caution: Do not use function 99.

3. Functions

To enter the service mode, press 1, 2, 3, 4, and 5 simultaneously.

To exit the service mode, press 6, 7, 8, and 9 simultaneously.

Note: After entering service mode, the service mode is disabled automatically if the keypad is not touched for 3 minutes.

1. Bit Switch Programming

1) Press the Function key then enter 90.

2) Press Yes.

The first line on the display indicates the factory settings; the second line indicates the present settings.

3) Make your changes.

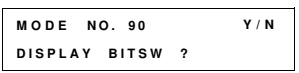
* Press # to increment the bit switch number; press* to decrement.

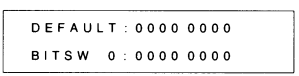
Hold down #/* for fast increment/decrement.

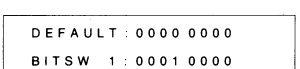
Example: Press # once.

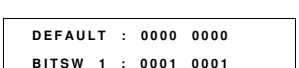
* Press the numeric keypad key corresponding to the bit that you want to change. Bits are numbered from 7 at the left to 0 at the right.

Example: Change bit 0 to 1; press 1.







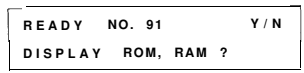


4) Either:
Change more bit switches using step 3.
Or:
Press the Function key to return to standby.

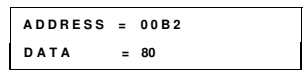
CAUTION: Refer to Appendix A (Bit Switch Functions) before changing any setting.

2. ROM and RAM Display, RAM Rewriting

1) Press the Function key then enter 91.



2) Press Yes.



3) Enter the address at the keypad.

4) Change the data, if necessary, using the keypad. The machine automatically prevents you from changing ROM areas.

5) Either:
Change more addresses; go back to step 3.
Or:
Press the Function key to return to standby.

Useful RAM Addresses

Redialing without SAF

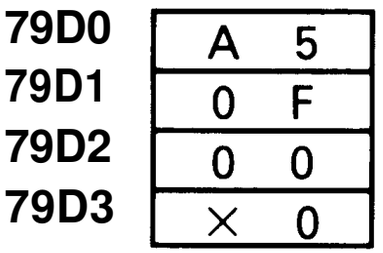
— **Number of redials** 7079 (hex code)

— **Redial interval** 707A (hex code, minutes, acceptable range: 1 —> 60)

Redialing with SAF

Max 7 redials, interval can be from 1 —> 15 minutes (entered in hex code)

Example: Three redials at intervals of 5, 10, and 15 minutes.



0 = Stop Code Redial Interval

x = Don't care

1: 79D0, lower 4 bits
2: 79D0, higher 4 bits
3: 79D1, lower 4 bits
4: 79D1, higher 4 bits
and so on

Contrast

Dark	14E7	Settings are in hex code, from 0 —> F.
Normal	14E8	The higher the value, the darker the
Light	14E9	contrast

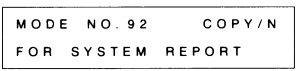
Error Code Memory 6E71 —> 6EB1

Password 7032 —> 7033

3. System Report

This report lists counter totals, programmed parameters, ID codes, and other items.

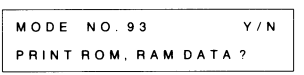
1) **Press the Function key and enter 92.**



2) **Press Copy to print the report.**

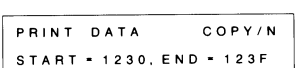
4. ROM and RAM Printout

1) Press the Function key and enter 93.



2) Press Yes.

3) Enter the start and end adresses at the keypad.
Example: 1230, 123F



4) Press Copy.

5. Error Code Display

This displays the most recent 32 error codes. All types of error are included.

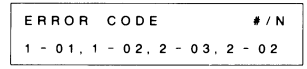
1) Press the Function key and enter 94.

2) Press Yes.

3) Either:
   Press # to display the next four codes.
   Note: If # is pressed more than 7 times, the machine returns to standby.

   Or:
   Press No to go on to print the service report.

   Or:
   Press the Function key to return to standby.



6. Service Report

1) Press the Function key and enter 95.

2) Press Copy.

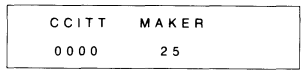
The Error Code column lists communication errors. The Error Code List area gives all types of error codes (the most recent 32 errors only).

7. CCITT and Maker Codes

1) Press the Function key and enter 96.

2) Press Yes.

3) Enter the correct codes.
CCITT = 0000; MAKER = 25



Note: If incorrect codes are programmed, communication using NSF(S) is disabled, and proprietary functions such as confidential transmission cannot be used.

4) Press the Function key to return to standby.

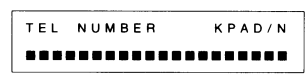
8. Service Station Telephone Number

If bit 6 of bit switch 1F is 0, the machine will send an auto service call to the service station on the following occasions:

- LD power control failure
- Master home position failure
- pentagonal mirror motor lock failure
- Main motor lock failure
- Lower paper feed motor lock failure
- Fusing lamp failure
- Transfer corona leak
- Toner overflow
- Time to replace the master

The service station's facsimile number must be programmed using function 97.

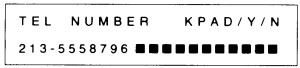
1) Press the Function key then enter 97.
2) Press Yes.



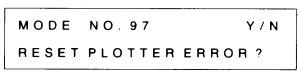
3) Enter the service station's telephone number.
Insert a pause after the area code.
Example: 213-555-9872

To correct errors:
* Press No to erase the entire number.
* Press Clear to erase the last digit only.

If a number has already been stored, press Yes to confirm it, or press Clear to erase it and enter a new number.



4) Press Yes to store this number. The next function begins (from section 9, step 3).



9. Recovery from Printer System Crashes

When the printer software crashes, carry out the following procedure.

1) Press the Function key and enter 97.

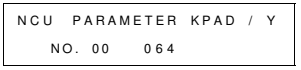
2) Press No.

3) Press Yes.
The system will recover.

10. NCU Parameter Programming

1) Press the Function key and enter 98.

2) Press Yes.



3) Either:

   Change the value of the displayed parameter, if required.

   Enter the new value at the keypad.
   Example: 075

   Or:
   Go on to step 4.

4) Go on to change another parameter.

   Press Yes until the desired parameter is displayed.
   Example: Press Yes once.

5) After you have finished, press the Function key to return to standby.

Consult a senior service technician before changing any of these parameters. For a table of parameters and their functions, refer to the following page.

Parameter No.	Description	Formula	Remarks
00	Acceptable ringing signal frequency : Range 1, upper limit	$\frac{1}{N \times 655 \times 10^{-6}}$ (Hz)	
01	Acceptable ringing signal frequency : Range 1, lower limit	$\frac{1}{N \times 655 \times 10^{-6}}$ (Hz)	
02	Acceptable ringing signal frequency : Range 2, upper limit	$\frac{1}{N \times 655 \times 10^{-6}}$ (Hz)	
03	Acceptable ringing signal frequency : Range 2, lower limit	$\frac{1}{N \times 655 \times 10^{-6}}$ (Hz)	
04	Number of rings until a call is detected	N (times)	
05	Minimum required length of the first ring	Nx20 (ms)	Note 3
06	Minimum required length of the second and subsequent rings	Nx20 (ms)	
07	Reset time	Nx40 (ms)	
08	Time between the closing of relay DS and the opening of relay DI (T0)	Nx1 (ms)	Notes 1, 2
09	Time that relay DI is open. (T1)	Nx1 (ms)	Note 1
10	Time that relay DI is closed. (T2)	Nx1 (ms)	Note 1
11	Time between the final closure of relay DI and the opening of relay DS. (T3)	Nx1 (ms)	Notes 1, 2

Parameter No.	Description	Formula	Remarks
12	Pause between dial digits (T4)	Nx20 (ms)	Notes 1, 2
13	Time waited when a pause is input	Nx20 (ms)	
14	DTMF tone on time (D0)	Nx1 (ms)	
15	DTMF tone off time (D1)	Nx1 (ms)	
16	DTMF tone transmission level	– (15 – N)	Note 4

Notes:

1. **The above pulse dialing times (T0, T1, T2, T3, T4) are the values for 10 pps.**
   Times for T0 to T3 for 20 pps are half those for 10 pps. For T4, the time for 20 pps is 3/4 of that for 10 pps.

2. **DS relay control should only be done for the Europe type NCU which has a ground start selection.**

3. **The first ring may not be detected until Parameter 05 + Ringing Signal wavelength x (1 to 2.5).**

4. **N must be between 0 and 15.**

5-3-2 TEST MODE

This machine has the following function tests.
* Modem test (G2 and G3 signal transmission)
* Operation panel test
* Fluorescent lamp lighting
* Tone transmission (DTMF signals)

1. Entering and Exiting the Test Mode

   1. Hold down the Stop key and switch the power on.

   2. When "ENABLE SERVICE FUNC." is displayed, press the Start key immediately. The following will appear.

      DENSITY : MDM, LCD, LAMP
      TEL : DTMF

      The meaning of this display is as follows:

      * Light the "Normal" LED to test the modem.
      * Light the "Dark" LED to test the operation panel.
      * Light the "Light" LED to light the fluorescent lamp.
      * Light the "Speed Dial" LED to make a tone test.

   3. Make the required tests according to the next few pages.

4. After testing, press 6, 7, 8, 9 simultaneously.

2. Modem Test

1. Make sure that the Speed Dial LED is off.

2. Select "Normal" contrast, then press Start.
   The unit will go into off-hook mode.

3. Press the required keys to test the desired signal
   (refer to the following table).
   Example: 9600 bps; press Speed Dial then Start.

Note: * The machine will return to standby after any one tone has been on for 8 minutes.
* If more than one LED is lit, the priority is:
Speed Dial > Voice Request > Detail > Contrast

4. Press Stop to return to step 3.

5. Press Stop once more to return to standby.

— Signal Generation —

Signal	Operation
9600 bps	Light the Speed Dial LED then press Start.
7200 bps	Select “Detail” resolution then press Start.
4800 bps	Select “Dark” contrast then press Start.
2400 bps	Select “Normal” contrast then press Start.
300 bps	Select “Light” contrast then press Start.
2100 Hz (CED)	Select “Light” contrast then press Copy.
1850 Hz	Select “Normal” contrast then press Copy.
1650 Hz	Select “Dark” contrast then press Copy.
1100 Hz	Select “Detail” resolution then press Copy.
462 Hz	Light the Speed Dial LED then press Copy.
2100 Hz (G2 video)	Light the Voice Request LED then press Copy.

3. Operation Panel Test

1. Make sure that the Speed Dial LED is off.

2. Select “Dark” contrast then press Start.
   The indicators above keys should be lit and the green and red indicators should be blinking.

3. Press the Stop key to return to standby.

LCD ALL DISPLAY

4. Fluorescent Lamp Lighting

1. **Make sure that the Speed Dial LED is off.**

2. **Select "Light" contrast then press Start.**
   The fluorescent lamp will light. It will remain lit for 8 minutes.

3. **Press Stop to return to standby.**

5. Tone Tests

1. **Light the Speed Dial LED then press Start.**

2. **Press the key that corresponds to the required tone (see the table on the next page).**
   Example: 697 Hz, press A.
   Note: The machine will return to standby if no key is pressed for 8 minutes.

3. **Press Stop after testing this tone.**

4. **Either:**
   Return to standby — press Stop once more.

   Or:
   Test another tone — go to step 2.

— Tone Generation —

Tone	Operation	Tone	Operation
DTMF 0	Press 0	DTMF *	Press *
DTMF 1	Press 1	DTMF #	Press #
DTMF 2	Press 2	697 Hz	Press A
DTMF 3	Press 3	770 Hz	Press B
DTMF 4	Press 4	852 Hz	Press C
DTMF 5	Press 5	941 Hz	Press D
DTMF 6	Press 6	1209 Hz	Press E
DTMF 7	Press 7	1336 Hz	Press F
DTMF 8	Press 8	1477 Hz	Press G
DTMF 9	Press 9	1633 Hz	Press H

Note: If any of keys A through H do not generate a tone, a keystroke program is stored in that key. Print a Program list (function 73), erase the program (function 60), make the required tests, then re-input the keystroke program.

5-3-3 Printer Tests

It is not necessary to enter the Service Mode.

From standby:

* Press the Copy key, then immediately press a specified key, depending on the desired printout.

Do not release the keys until the printer has started.

- Thin, closely spaced lines
  Copy key + 1

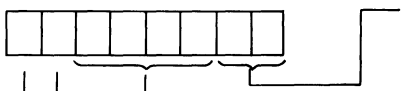
- Thick, vertical stripes
  Copy key + 2

- Pattern
  Copy key + 3

- Dense diagonal stripes
  Copy key + 4

5-3-4 Dedicated Transmission Parameter Programming

Each telephone number programmed as a Quick Dial key or Speed Dial code has three bytes in RAM allocated for transmission parameters.



Byte 1

Initial modem rate (bps)
(0, 0) = 9600 (0, 1) = 7200
(1,0) = 4800 (1, 1)= 2400

Transmission level
Example: (1, 1, 0, 0) = –12 dB

compression
0: MH/MR 1: MH

Program Enable/Disable
0: Transmissions to this remote terminal will use parameters as specified by the bit switch settings.
1: The dedicated parameters in bytes 1 —> 3 will be used.

Byte 2
Bit 0 DIS detection
0: First
1: Second (First DIS is ingored)
Bit 1 ECM 0: Used 1: Not used
Bit 7 Short preamble 0: Not used 1: Used

Byte 3 CCITT T1 time, in units of 2.56 seconds
Example: 60 seconds
60/2.56 = 24 approx
Byte 3 contains 18 (H) = 00011000

The RAM addresses are as follows

NO	ADDRESS	N O	ADDRESS	NO	ADDRESS	NO	ADDRESS	NO	ADDRESS	NO	ADDRESS
*1	7850	I	786B	R	7886	12	78A1	21	78BC	30	78D7
	7851		786C		7887		78A2		78BD		78D8
	7852		786D		7888		78A3		78BE		78D9
A	7853	J	786E	S	7889	13	78A4	22	78BF	31	78DA
	7854		786F		788A		78A5		78C0		78DB
	7855		7870		788B		78A6		78C1		78DC
B	7856	K	7871	T	788C	14	78A7	23	78C2	32	78DD
	7857		7872		788D		78A8		78C3		78DE
	7858		7873		788E		78A9		78C4		78DF
C	7859	L	7874	U	788F	15	78AA	24	78C5	33	78E0
	785A		7875		7890		78AB		78C6		78E1
	785B		7876		7891		78AC		78C7		78E2
D	785C	M	7877	V	7892	16	78AD	25	78C8	34	78E3
	785D		7878		7893		78AE		78C9		78E4
	785E		7879		7894		78AF		78CA		78E5
E	785F	N	787A	W	7895	17	78B0	26	78CB	35	78E6
	7860		787B		7896		78B1		78CC		78E7
	7861		787C		7897		78B2		78CD		78E8
F	7862	O	787D	X	7898	18	78B3	27	78CE	36	78E9
	7863		787E		7899		78B4		78CF		78EA
	7864		787F		789A		78B5		78D0		78EB
G	7865	P	7880	10	789B	19	78B6	28	78D1	37	78EC
	7866		7881		789C		78B7		78D2		78ED
	7867		7882		789D		78B8		78D3		78EE
H	7868	Q	7883	11	789E	20	78B9	29	78D4	38	78EF
	7869		7884		789F		78BA		78D5		78F0
	786A		7885		78A0		78BB		78D6		78F1

*1: **Service Station (Auto Service Call)**

NO	ADDRESS	NO	ADDRESS	NO	ADDRESS	NO	ADDRESS	NO	ADDRESS	NO	ADDRESS
39	78F2	49	7910	59	792E	69	794C	79	796A	89	7988
	78F3		7911		792F		794D		796B		7989
	78F4		7912		7930		794E		796C		798A
40	78F5	50	7913	60	7931	70	794F	80	796D	90	798B
	78F6		7914		7932		7950		796E		79BC
	78F7		7915		7933		7951		796F		798D
41	78F8	51	7916	61	7934	71	7952	81	7970	91	798E
	78F9		7617		7935		7953		7971		798F
	78FA		7918		7936		7954		7972		7990
42	78FB	52	7919	62	7937	72	7955	82	7973	92	7991
	78FC		791A		7938		7956		7974		7992
	78FD		791B		7939		7957		7975		7993
43	78FE	53	791C	63	793A	73	7958	83	7976	93	7994
	78FF		791 D		793B		7959		7977		7995
	7900		791E		793C		795A		7978		7996
44	7901	54	791F	64	793D	74	795B	84	7979	94	7997
	7902		7920		793E		795C		797A		7998
	7903		7921		793F		795D		797B		7999
45	7904	55	7922	65	7940	75	795E	85	797C	95	799A
	7905		7923		7941		795F		797D		799B
	7906		7924		7942		7960		797E		799C
46	7907	56	7925	66	7943	76	7961	86	797F	96	799D
	7908		7926		7944		7962		7980		799E
	7909		7927		7945		7963		7981		799F
47	790A	57	7928	67	7946	77	7964	87	7982	97	79A0
	790B		7929		7947		7965		7983		79A1
	790C		792A		7948		7966		7984		79A2
48	790D	58	792B	68	7949	78	7967	88	7985	98	79A3
	790E		792C		794A		7968		7986		79A4
	790F		792D		794B		7969		7987		79A5
										99	79A6
											79A7
											79A8

5-3-5 Confidential File Printout

If the user has forgotten the password, you can find it on the system report (function 92).

However, if the user cannot find out the personal ID specified by the sender, which overrides the password, then use the following procedure.

1. When the machine is in standby, simultaneously press 1, 2, 3, 4 and 5 to enter the service mode.

2. Press the Function key, enter 75, then press Yes.

3. Enter # 0.

4. Press Copy.
   All memory files will be printed, including confidential files. However, they will not be erased from memory.

   To erase the confidential files from memory:
   1. Change the data in RAM address 15E6 to 00, using function 91.

   2. Switch the machine off, wait for ten seconds, then switch back on.

   3. Re-store files for transmission.

5-4 QUALITY CHECKS

1. Copy Quality

1) Copy density

Method: Visually check the density in the left, right and center.

Standard: Density must be even in the left, right and center.

2) Skew

Method: Copy an R1 test chart using standard resolution.

Standard: The difference in length between A and B must be as follows.

A4 or larger: Less than 1% of the document length.

Smaller than A4: Less than 3% of the document length.

Correction: Clean the R1 and R2 rollers.

3) Intelligibility

Method: Copy an R1 test chart using standard resolution.

Check the characters in frame F

(see the chart on page 5-37).

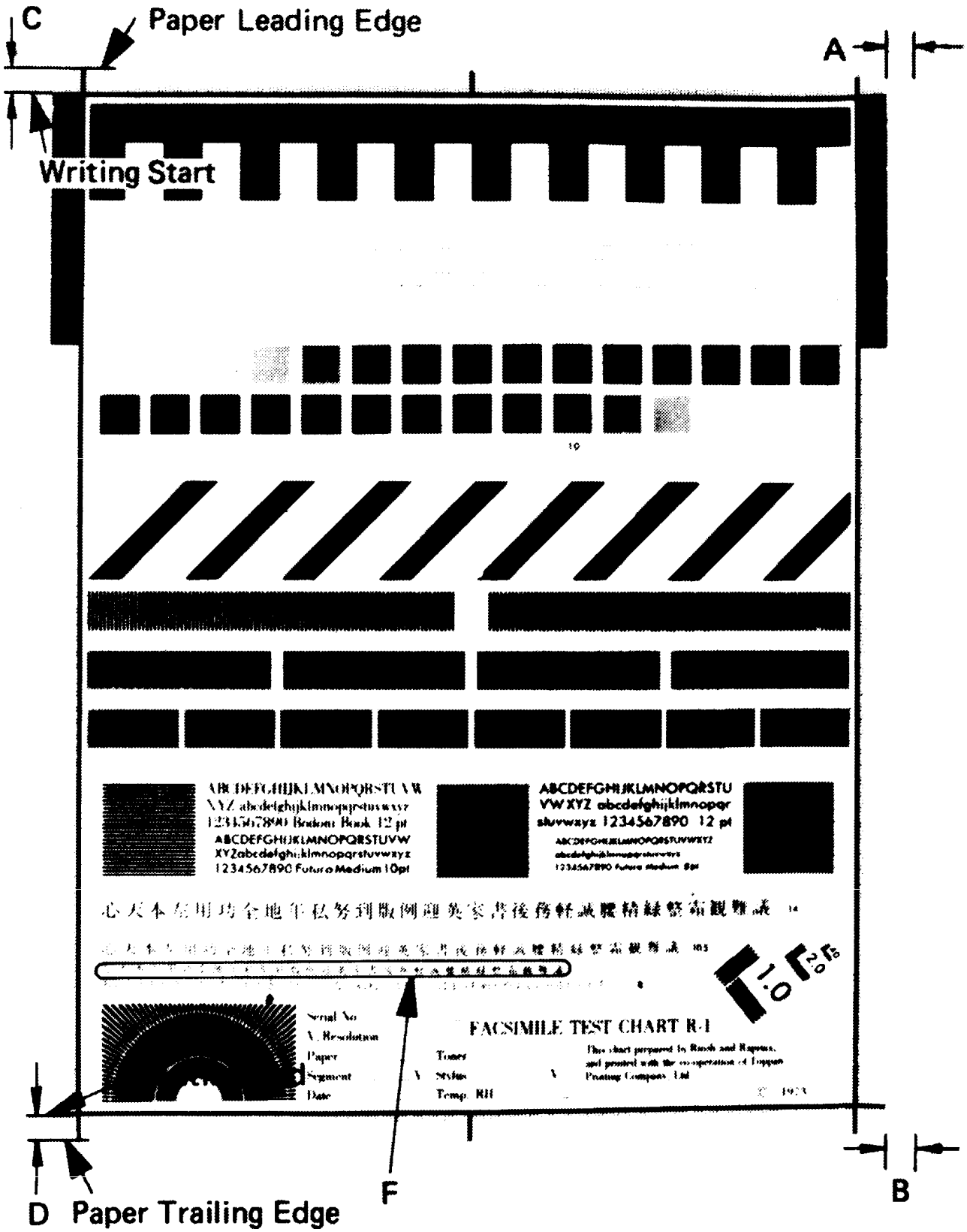
Standard: No characters must be missing in the subscan direction.

Correction: Check and adjust the following.

- Flatness
- Reduction rate
- MTF

Refer to section 7-2 for details.

4) **Make another copy. If the copy is still defective, make a printer test (see page 5-30) and check the SBU waveforms if necessary (refer to page 7-2).**


C
Paper Leading Edge
A
Writing Start
FACSIMILE TEST CHART R-1
D
Paper Trailing Edge
F
B

2. Test the operation panel display. Refer to page 5-27.

3. Check ADF and printer operation.

4. Communication Tests.

No.	Procedure	Check Items
1	Call a remote unit and send 2 test charts, one in standard and the other in detailed resolution.	1. Resolution selection. 2. RTI display. 3. Voice request function.
2	Receive 2 test charts.	1 - RTI display. 2. Copy quality. 3. Automatic reception function 4. Voice request function.
3	Test the special communication functions	1. Polling transmission. 2. Polling reception. 3. Turnaround polling. 4. Memory transmission. 5. Confidential reception. 6. Substitute reception. 7. Closed network.

SECTION 6

REMOVAL AND REPLACEMENT

Note: **If you will switch off the machine for more than 72 hours, do the following, if it is possible.**

- **Print out confidential rx files (see page 5-34)**
- **Print out files stored for transmission, and a SAF File List. Note which documents were stored in which files.**

After switching the machine back on, re-store the files for transmission.

6-1 COVER REMOVAL

6-1-1 Front Cover

1. Remove the document tray (A) and copy tray (B).

2. Remove the cover plate (C) below the document exit (2 screws).

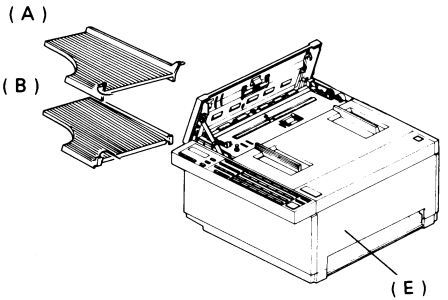
3 Open the copy exit cover.

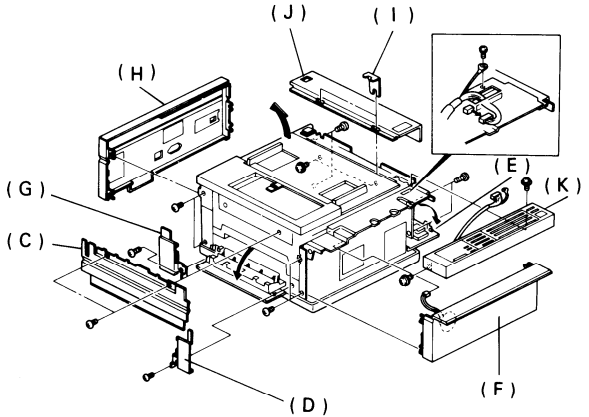
4. Remove the small cover plate (D) to the front of the copy exit cover (1 screw).

5. Open the right cover (E).

6. Remove the front cover (F) – remove 4 screws and disconnect the monitor speaker.

When replacing the cover plate (C), be sure that the hooks on the bottom of the plate clip under the plate on the left end of the upper unit.





6-1-2 Rear Cover

See the diagram on page 6-1.

1. Remove the document and copy trays.

2. Remove the cover plate (C) below the document exit (2 screws).

3. Remove the small cover plate (G) to the rear of the copy exit cover (1 screw). Open the copy exit cover to remove the plate.

4. Disconnect the handset.

5. Open the right cover (E).

6. Remove the rear cover (H) – remove 4 screws.

6-1-3 Top Cover

See the diagram on page 6-1.

1. Open the upper unit.

2. Remove the top cover securing brackets (I) – 2 screws.

3. Take off the top cover (J).

6-1-4 Operation Panel

See the diagram on page 6-1.

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

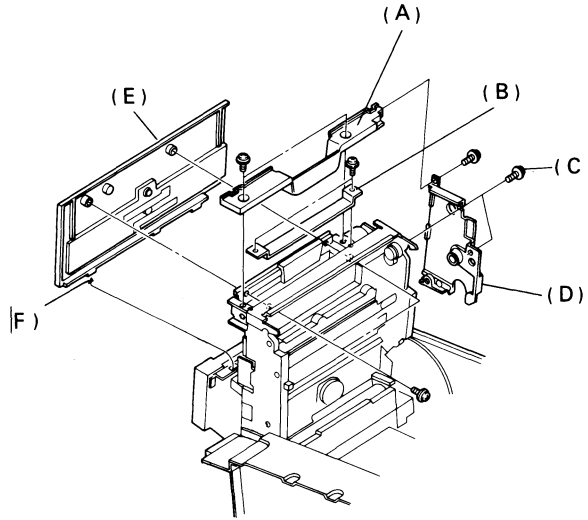
2. Remove the top cover (see section 6-1-3).

3. Remove the operation panel (K) – 2 screws, 1 ground wire, 1 connector.

6-1-5 Document Table

1. Open the upper unit.
2. Take out the master unit (do not touch the master belt).
3. Remove the right inner cover strip (A) – 3 screws.
4. Remove the bracket (B) exposed after taking out the right inner cover strip (2 screws).
5. Remove the two screws (C) holding the rear inner cover (D). Do not take off the cover.
6. Open the ADF.
7. Remove the document table (E) – 2 screws.
   Pull the top of the rear inner cover (D) towards the rear to allow you to remove the document table.

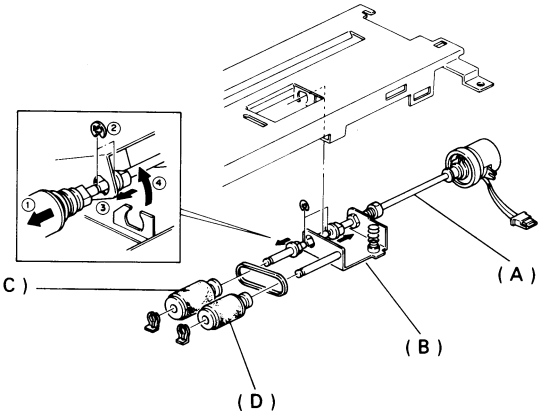
While replacing, be sure to fit the three tabs (F) on the document table into the three slots on the right edge of the document guide plate.



6-2 ADF AND SCANNER

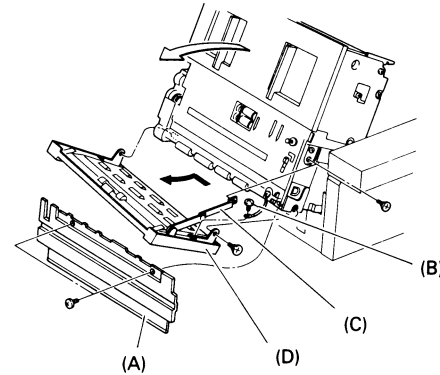
6-2-1 Feed and Pick-up Rollers

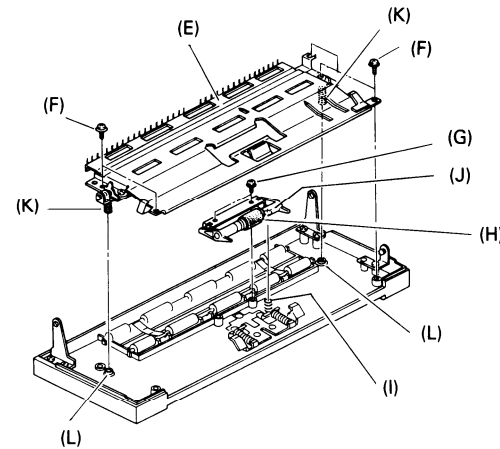
1. Remove the document table (see section 6-1-5).
2. Remove the ADF clutch covers (4 screws).
   See section 6-2-3.
3. Remove the rear inner cover (3 screws).
   See section 6-1-5.
4. Remove the front inner cover (5 screws).
   See section 6-9-1
5. Remove the lower document guide plate (5 screws).
   CAUTIONS:
   - Put the exposure glass and the two retaining plates in a safe place.
   - Do not lose the leaf spring from on top of the ADF clutch.
   - On reassembly, don't forget to connect the ground wire to the front exposure glass retaining plate.
6. Take out the pick up/feed roller and shaft assembly (A).
   1) Push the roller shaft towards the DSB
   2) Remove 2 E-rings
   3) Slide the two bushings towards the rollers until they are free of the pickup bracket (B)
   4) Lift out the shaft
7. Take off the paper feed roller (C) and pick-up roller (D) (1 clip each, 1 belt).



6-2-2 Separation Roller

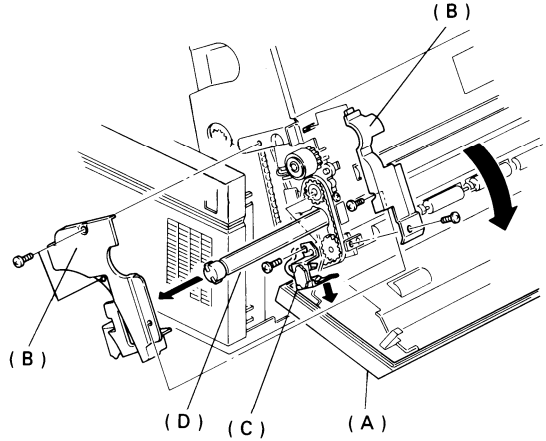
1. Remove the document tray and copy tray.
2. Remove cover (A) — 2 screws.
3. Open the ADF cover.
4. Remove ground wire (B) — 1 screw.
5. Open the upper unit.
6. Disconnect hinge (C) – 1 screw.
7. Remove the ADF cover (D) — 1 screw.
8. Remove the upper document guide plate (E) from the ADF covver — 5 screws (F).
   Caution: Do not lose the ground wire.
9. Remove the two screws holding the separation roller bracket (G).
10. Take out the separation roller (H).
    Take care not to lose the spring (I) at the front end.
11. Remove the separation roller (2 screws).
    When replacing:
    - The spring (I) at the front end of the separation roller must be fit into the circular depression (J) on the separation roller shaft bracket.
    - The two springs (K) on the upper document guide plate must be fit into their respective circular depressions (L) on the ADF cover.
    - Do not touch the rubber surface of the new roller, or paper feed errors will develop sooner than normal.





6-2-3 Fluorescent Lamp

1. Remove the document tray. (See section 6-1-5.)
2. Open the ADF cover (A).
3. Open the upper unit.
4. Remove the ADF clutch covers (B) — 4 screws.
5. Remove the screw holding the fluorescent lamp terminal (c).
6. Slide out the lamp (D).



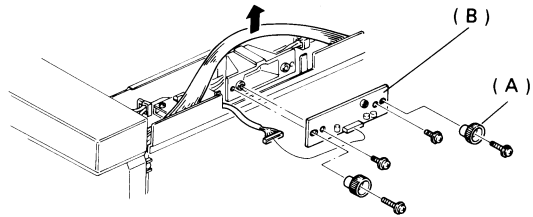
6-2-4 S B U

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

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

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

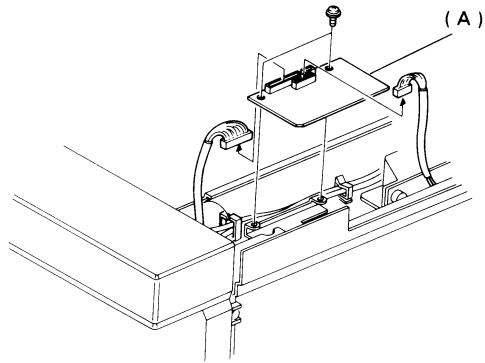
After replacement, carry out the scanner adjustment procedures in section 7-2, and copy a test chart.



6-2-5 V P U

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

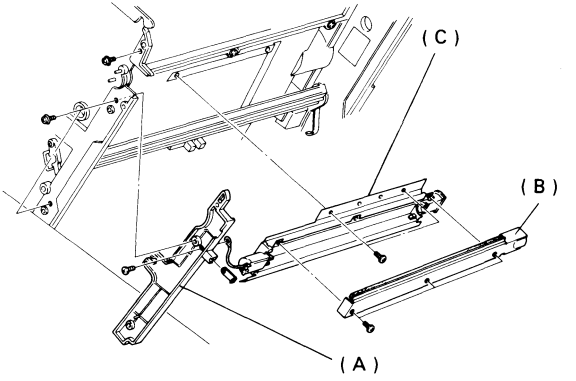
2. Remove the VPU (A) — 2 screws, 2 connectors.



6-3 CHARGE

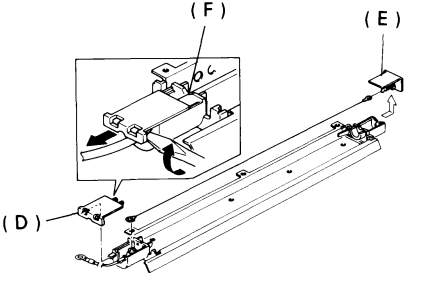
6-3-1 Charge Corona Unit and Wire

1. Remove the operation panel (see section 6-1-4).
2. Remove the document table (see section 6-1-5).
3. Remove the front inner cover — 5 screws. See page 6-28.
4. Remove the front master unit guide rail (A) — 3 screws.
5. Remove the ozone duct (B) — 3 screws.
6. Remove the charge corona unit (C) – 2 screws.
7. Prise off the front endblock cover (D).
8. Carefully slide off the rear endblock cover (E).
9. Unhook the corona wire from the tension spring inside the rear endblock cover.
10. Unhook the corona wire from the screw in the front endblock cover.
    Do not remove the screw.



On 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 (F).
- After installing both ends of the new wire, test the action of the tension spring.



6-4 EXPOSURE

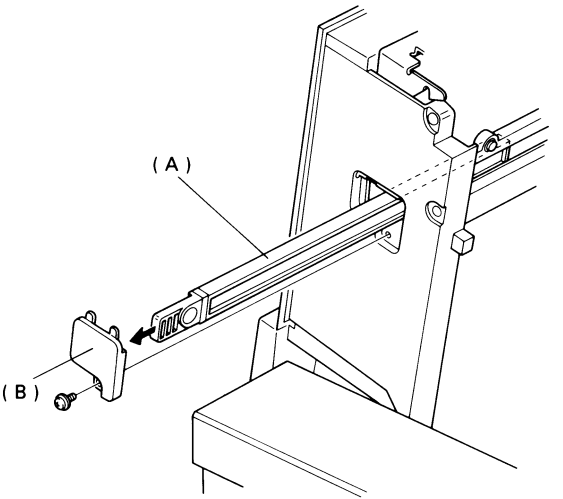
WARNING: Switch off the main power before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

6-4-1 Second Cylindrical Lens

1. Open the upper unit.
2. Remove the second cylindrical lens cover plate (A) — 1 screw.
3. Slide out the lens (B).

Cautions:

- When installing a new lens, make sure that the screw on the lens handle faces downwards.
- Do not touch the surface of the new lens.
- If you need to clean the lens, use an air brush.



6-4-2 Pentagonal Mirror and Motor

1. Open the upper unit.

2. Take out the master unit (do not touch the master belt).

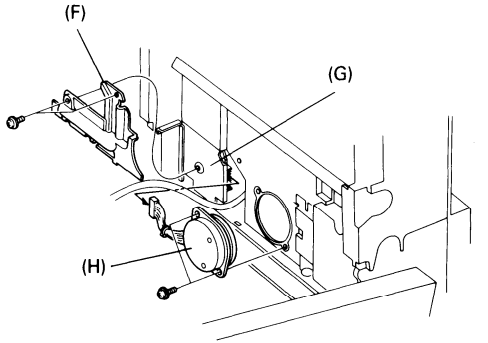
3. Remove the printer fan (A).
   - Remove the rear cover (see section 6-1-2).
   - Remove the printer fan drive pulley (B) – 1 screw, 1 bushing.
   - Remove the printer fan (remove two screws and spring plates (C), loosen two screws (D)). Don't forget to reattach the earth plate (E) when reassembling the machine.

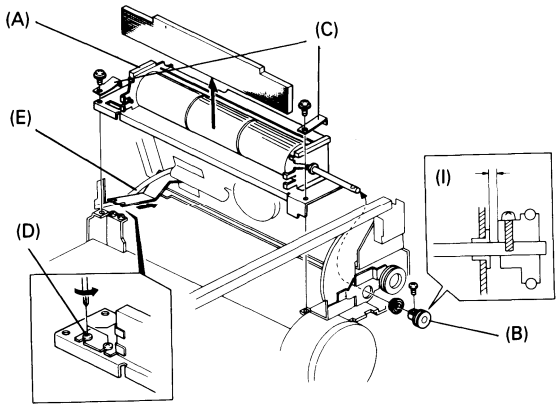
4. Remove the harness cover (F) – 2 screws.

5. Disconnect the motor from the SMDR PCB (G).

6. Remove the pentagonal mirror and motor (H) – 2 screws.

Notes:
- Do not touch the faces of the mirror.
- If you need to clean the mirror, use an air brush. Remove fingerprints with a soft dry cloth.
- The clearance (I) between the printer fan drive gear and the rear bracket must be 0.2 mm.

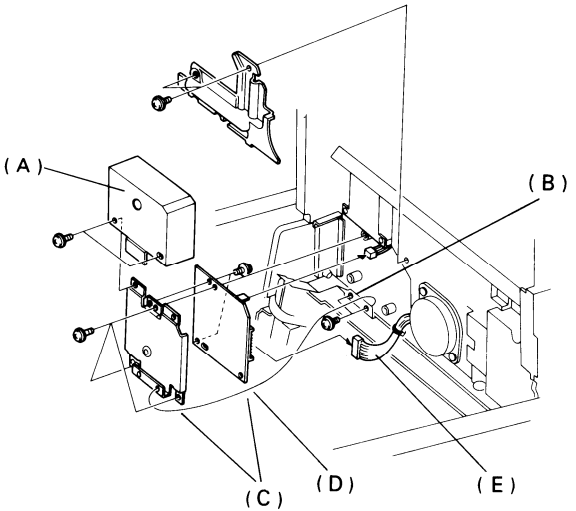




6-4-3 SMDR

1. Carry out steps 1 through 5 of section 6-4-2.
2. Remove the fluorescent lamp driver cover (A) — 2 screws.
3. Remove the ground plate (B) – 4 screws (2 shown on the diagram, and 2 on the opposite side).
4. Remove the SMDR assembly (C) – 3 screws.
5. Take off the SMDR (D) – 1 connector, 2 screws.

When reassembling, be sure to thread the SMDR-motor harness (E) between the upper unit and the FCU-UIB harness.



6-4-4 LSD

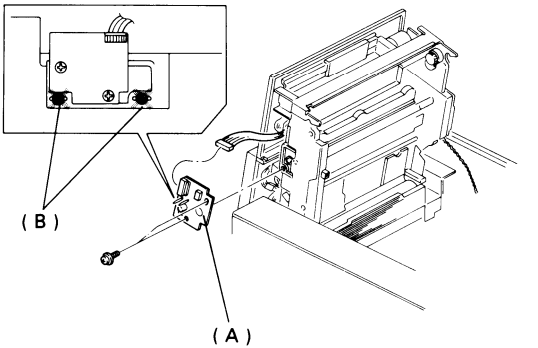
1. Remove the operation panel (see section 6-1-4).

2. Remove the document table (see section 6-1-5).

3. Remove the front inner cover (see page 6-28).

4. Remove the LSD (A) — 1 connector, 2 screws.
   Caution: Do not touch the screws (B) on the LSD holder, or the sensor on the new LSD will be misaligned.

5. Make a test copy after reassembly. If the copy is not centered, loosen the screws (B) and tap the LSD slightly to one side (the adjustment is sensitive). Repeat step 5.

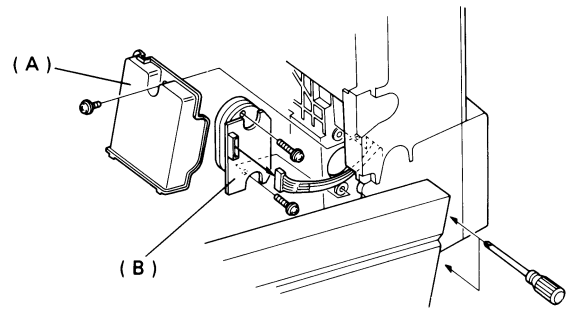


6-4-5 LD Unit

WARNING: SWITCH OFF THE MAIN POWER NOW.

1. Remove the document tray.
2. Open the ADF cover.
3. Open the upper unit.
4. Remove the master unit (do not touch the master belt).
5. Remove the LD unit cover (A) — 1 screw.
6. Disconnect the harness at the LDDR.
7. Remove the LDDR assembly (B) – 2 screws.

No adjustment is necessary after replacement if the LD unit is screwed in properly.



6-5 PAPER FEED

6-5-1 Paper Feed and Pick-up Rollers

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

2. Remove the rollers (1 clip each).

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

6-5-2 Separation Roller and Spring Clutch

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

2. Take out the cassette and remove the pickup and feed rollers.

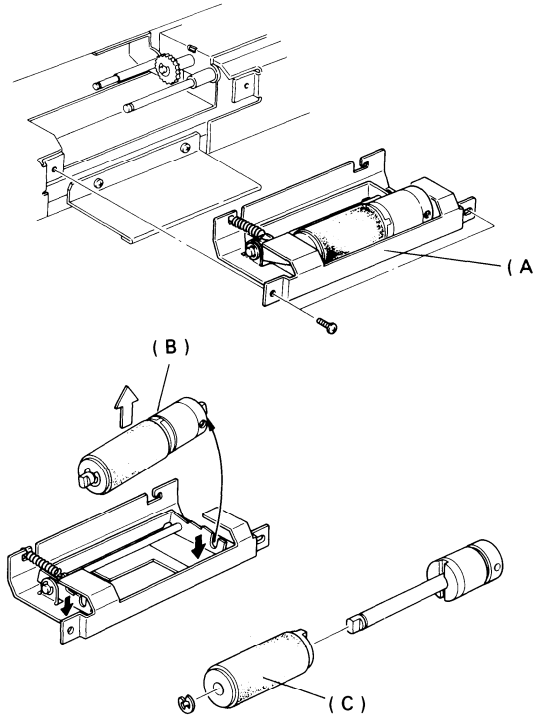
3. Remove the separation roller assembly (A) – 2 screws.

4. Take out the separation roller and spring clutch assembly (B).

5. Remove the separation roller (C) — 1 E-ring.

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

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



6-6 DEVELOPMENT

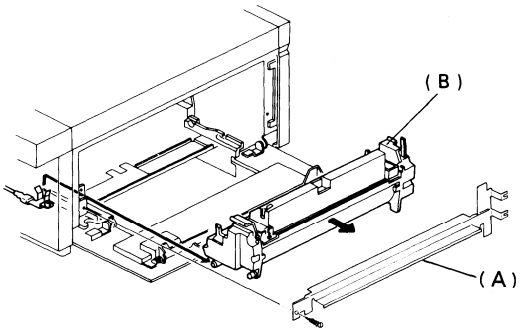
6-6-1 Development Unit

1. Remove the cassette.

2. Open the right cover.

3. Remove the development cover plate (A) — 1 screw.

4. Take out the development unit (B) and lay it on a flat surface covered with newspaper.



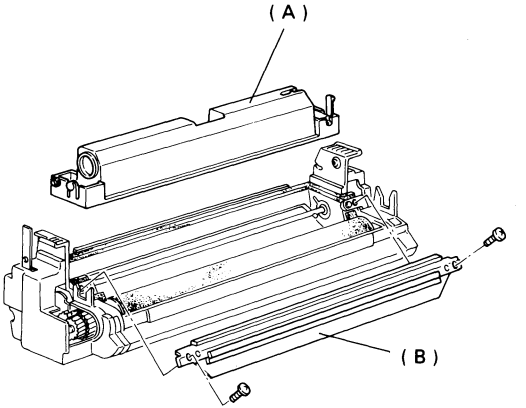
6-6-2 Toner Metering Blade

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

2. Remove the toner cartridge (A).

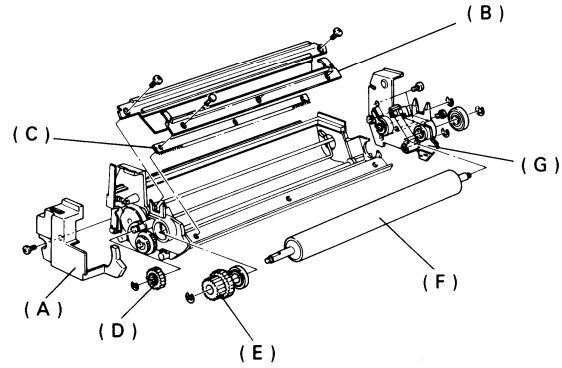
3. Remove the toner metering blade (B) – 2 screws.

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



6-6-3 Development Roller

1. Take out the development unit (see section 6-6-1).
2. Remove the toner metering blade (see section 6-6-2).
3. Remove the development unit rear cover (A) – 1 screw.
4. Remove the bias brush cover (B) – 3 pins.
5. Take out the bias brush (C).
6. Remove the idle gear (D) – 1 E-ring.
7. Remove the development roller gear (E) – 1 E-ring.
8. Remove the E-ring and bearing at each end of the development roller (F).
9. Remove the front side of the toner hopper (G) — 2 E-rings, 3 screws.
10. Slide out the development roller.
    When reinstalling:
    - Do not touch the new development roller.
    - Make sure that the bristles of the bias brush are tucked under the leading edge of the development roller.



6-7 TRANSFER

6-7-1 Transfer Corona Unit

1. Open the upper unit.

2. Take out the master unit (do not touch the master belt).

3. Remove the terminal block (A) — 2 screws.

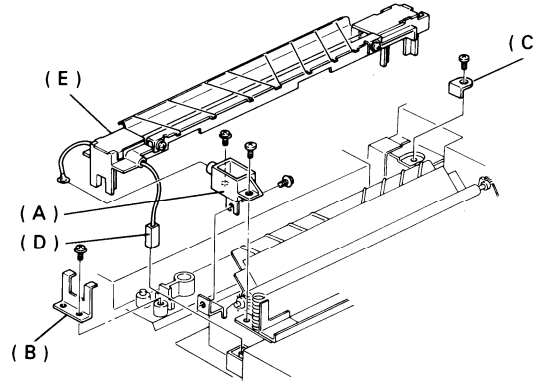
4. Remove the front endblock securing bracket (B) – 1 screw.

5. Remove the rear endblock securing tab (C) — 1 screw.

6. Remove the transport guide plate (see page 6-35) – 4 screws (one has a ground wire).
   To remove this guide plate, you will need to push the transfer corona unit towards the development unit.

7. Carefully disconnect the corona power supply harness (D) at the power pack (use long-nosed pliers).

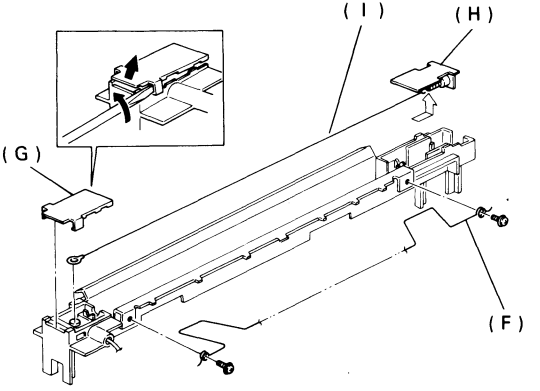
8. Remove the transfer corona unit (E).



9. Remove the nylon wire (F) – one screw at each end.
10. Prise off the front endblock cover (G).
11. Carefully slide off the rear endblock cover (H).
12. 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).

On 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. You will have to push down quite hard to get it back in position. While holding down the corona unit, put back the transport guide plate.



6-8 FUSING

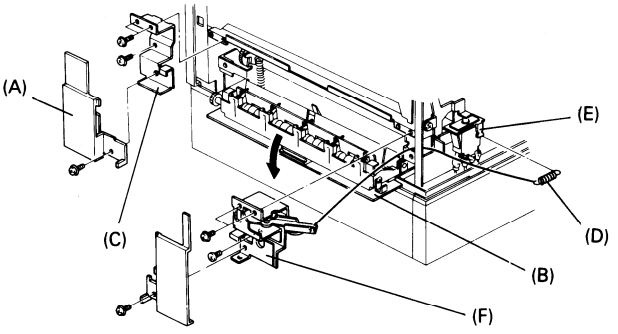
6-8-1 Fusing Unit Removal

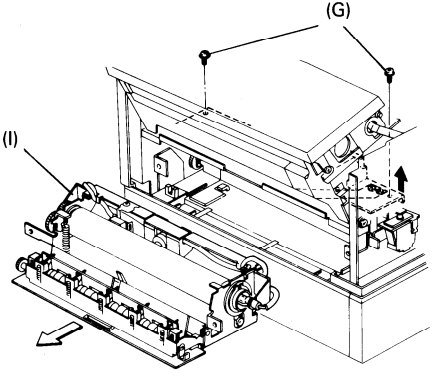
1. Remove the front cover (see section 6-1-1).
2. Remove the rear exit assembly cover (A) — 1 screw.
3. Open the copy exit cover (B).
4. Remove the rear fusing unit retaining bracket (C) – 3 screws.
5. Unhook the spring (D) from the upper unit interlock switch (E).
6. Remove the front fusing unit retaining bracket assembly (F) – 3 screws.
7. Open the upper unit and take out the master unit (do not touch the master belt).
8. Remove two screws (G) and lift off the spring plates underneath, one at the front and one at the rear of the printer fan assembly.

   Note: Do not remove or disassemble the fan.
9. Lift up the right-hand end of the printer fan assembly and slide out the fusing unit (I) from the copy exit.

   Reassembling:

   • When putting back the printer fan screws push the printer fan assembly towards the development unit and tighten the screws. Otherwise the machine may generate excessive noise during printing.





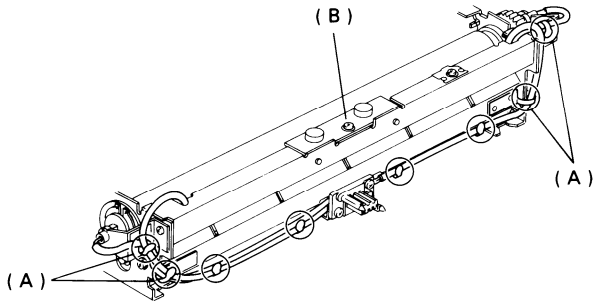
6-8-2 Thermostat

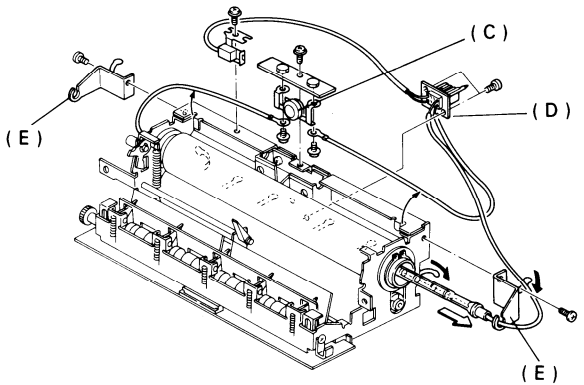
1. Take out the fusing unit (see section 6-8-1).

2. Unhook 4 harness clamps (A).

3. Take out the screw holding the thermostat assembly (B) and lift out the assembly.

4. Remove the thermostat (C) — 2 screws.





6-8-3 Fusing Lamp/Thermistor Assembly

See the diagram on page 6-23.

1. Remove the thermostat (see section 6-8-2).
2. Unhook the other 4 harness clamps.
3. Remove the PSU connector (D) – 2 screws.
4. Remove the front and rear fusing lamp support brackets (E) – 1 screw each.
5. Slide out the fusing lamp.

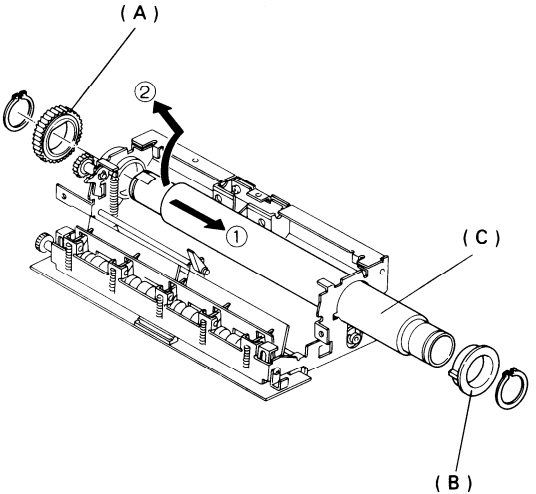
6-8-4 Hot Roller

1. Remove the fusing lamp/thermistor assembly (see section 6-8-3).

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

3. Remove the bushing (B) at the front end of the hot roller (1 C-ring).

4. Slide out the hot roller (C) as shown.



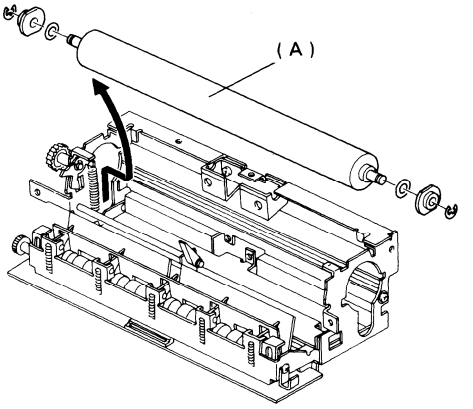
Reinstalling:

- 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.

6-8-5 Pressure Roller

1. **Remove the hot roller carefully (see section 6-8-4).**

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.**

6-8-6 Hot Roller Strippers

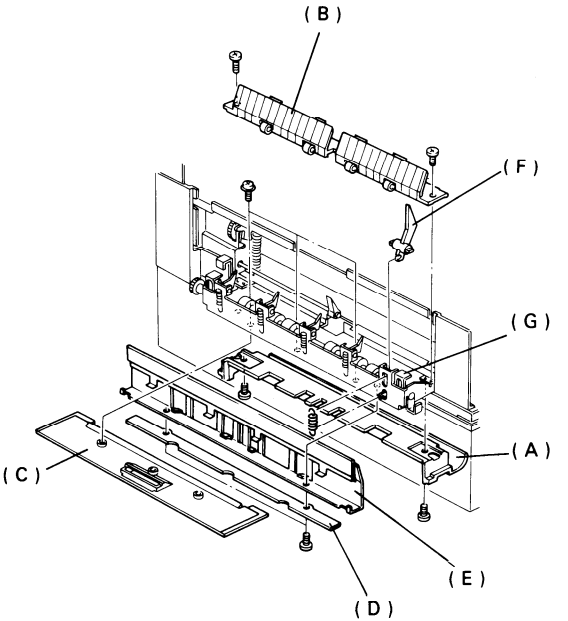
It is advisable to replace all five as a set.

There is no need to remove the fusing unit.

1. **Remove the lower copy exit cover (A) — 2 screws.**
2. **Open the exit assembly.**
3. **Remove the lower copy exit guide plate (B) – 2 screws.**
4. **Remove the upper copy exit cover (C) — 3 screws.**
5. **Close the exit assembly and remove the antistatic brush and holder (D) — 2 screws.**
6. **Open the exit assembly.**
7. **Move the upper copy exit 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 holding bar (G) while taking them out.**

Reinstalling:

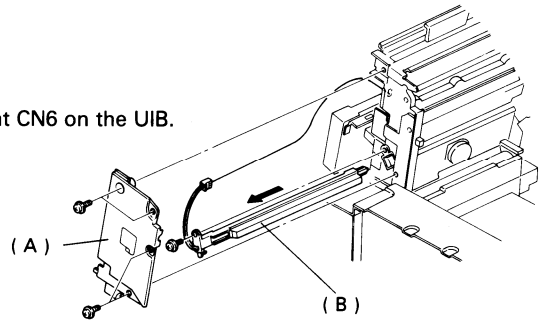
- **The bristles on the antistatic brush should be pointing down. Also make sure that the three indentations in the top of the antistatic brush match the positions of the screw holes for the upper copy exit cover.**
- **Lower copy exit cover — the clip on the center of the right side of the fusing unit (as viewed from the front of the machine) must clip onto the cover before the cover is screwed in.**



6-9 QUENCHING

6-9-1 Quenching Lamp

1. Remove the operation panel (see section 6-1-4).
2. Remove the document table (see section 6-1-5).
3. Remove the front inner cover (A) – 5 screws.
4. Remove the UIB cover (5 screws) and disconnect the lamp at CN6 on the UIB.
5. Remove the lamp (B) — 1 screw.



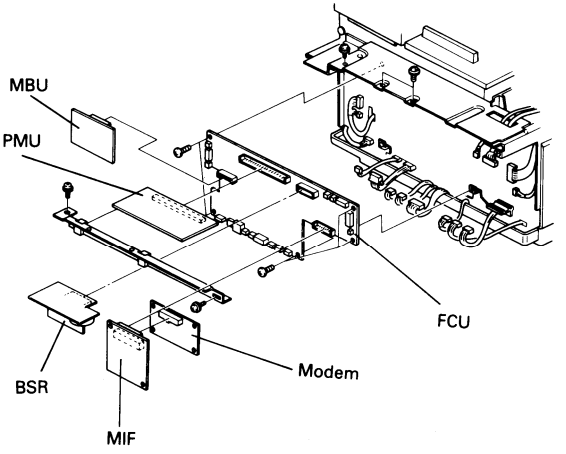
6-10 PCBs

6-10-1 MIF, Modem, and MBU

Before changing the MBU, do the following if possible.

1) Print the following reports:
   - Telephone List
   - Program List
   - Polling File List
   - Service Report — Keep for reference during future service calls.
   - System Report
   - TCR — give to the user
   - SAF File List — give to the user
   - Stored memory files — give to the user
   - Confidential rx files (see page 5-34)
   - Substitute rx files
2) Print out the following RAM data.
   - 7850 to 79A8 (dedicated Tx parameters).
3) Check the records for the user to determine what other RAM changes have been made (e.g., redial interval).
4) Make sure that the battery switch of the new MBU is ON.

1. Remove the front cover.
2. Take off the MIF, Modem, or MBU.
3. MBU — make sure that the battery switch (SW1) of the new MBU is on, and turn off the battery switch of the old MBU.



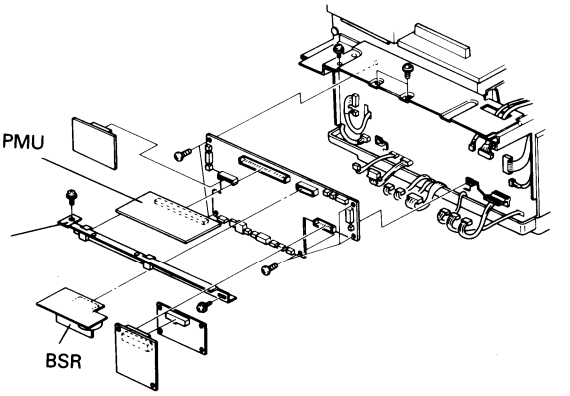
After changing the MBU, do the following:

1) Initialize the RAM on the new MBU.
   - Use RAM R/W mode to change the data in address 14B0 to 00.
   - Switch the power switch off and on.

   Note: Wait 10 seconds before turning power back on due to possible damage to the PSU.
2) Carry out quality checks 1-3 in section 5-4.
3) Reprogram the Speed Dial codes, Quick Dial keys, groups, keystroke programs and polling files.
4) Reprogram the items listed on the system report.
5) Enter the RAM data previously noted in steps 2 and 3 of the previous page.
6) Enter the date and time.
7) Make a communication test (item 4 of section 5-4).
8) Instruct the user to reprogram stored files for memory transmission and to contact the senders of any confidential or substitute rx files that were lost (see the SAF File List).

6-10-2 PMU

1. Remove the front cover (see section 6-1-1).
2. Remove the operation panel (see section 6-1-4).
3. Remove the PMU cover (A) — 4 screws.
4. Take off the PMU.



6-10-3 BSR

Before removal, do the following if possible:

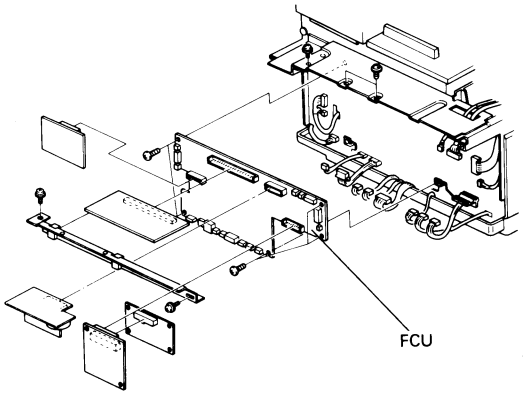
- Print a SAF File List
- Print or send stored files, and print confidential and substitute rx files.

1. Remove the front cover (see section 6-1-1).
2. Remove the operation panel (see section 6-1-4).
3. Remove the PMU cover (A) — 4 screws.
4. Take off the BSR.
5. Make sure the battery switch (SW1) of the new BSR is on, and turn off the battery switch on the old BSR.
6. Install the new BSR.
7. Instruct the user to reprogram stored files for transmission and to contact the senders of any confidential or substitute rx files that were lost (see the SAF File List).

6-10-4 FCU

1. Remove the MIF, MBU, Modem, BSR, and PMU (see sections 6-10-1 and 6-10-2).
   CAUTION: Make sure that you do not accidentally flick off the jumper from the MBU or BSR battery switches (SW1 on each PCB).

2. Remove the FCU — 16 connectors (not including the OPU and monitor speaker), 5 screws.



After replacing the FCU do the following:

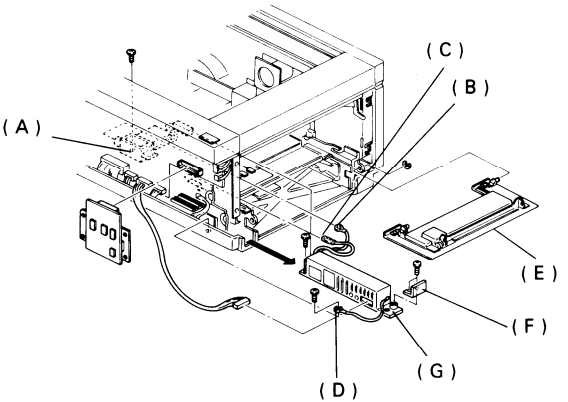
1. Adjust the standby level of the video signal.

2. Carry out the quality checks stated in section 5-4.

3. Enter the date and time.

6-10-5 Power Pack

1. Remove the front cover (see section 6-1-1).
2. Open the upper unit and take out the master unit.
3. Take out the development unit.
4. Remove the terminal block (A) — 2 screws.
5. Take the charge corona power terminal (B) out of the terminal block (1 screw).
6. Carefully disconnect the transfer corona power terminal (C) — use long-nosed pliers.
7. Remove the bias terminal (D) – 1 screw.
8. Remove the right cover (E) — 1 screw at the rear hinge.
9. Remove the power pack cover (F) — 1 screw.
10. Remove the power pack (G) – 1 screw, 1 connector, 1 ground wire, and slide out the power pack.

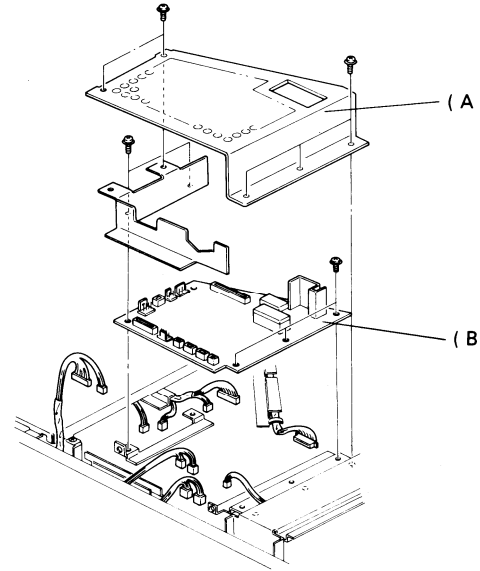


6-10-6 UIB

1. Remove the document table (see section 6-1-5).

2. Remove the UIB cover (A) – 5 screws.

3. Remove the UIB (B) — 5 screws, 12 connectors.



6-10-7 PSU

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

2. Remove the fusing unit (see section 6-8-1).

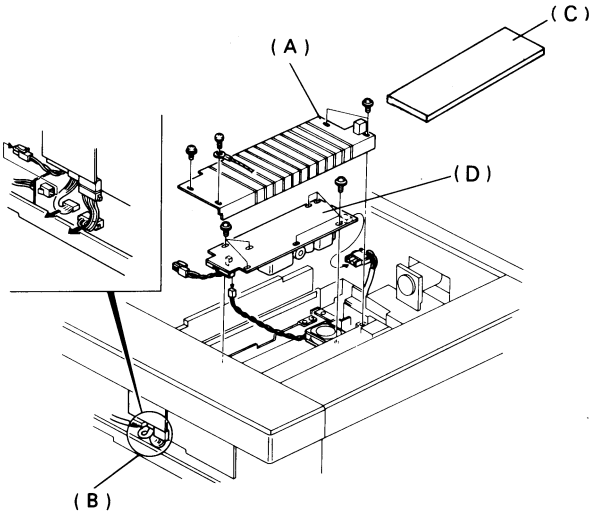
3. Remove the transport guide plate (A) – 4 screws.

4. Disconnect three connectors (B) below the FCU at the front of the machine.

5. Take out the PSU sheet (C).

6. Remove the PSU (D) – 6 screws, 2 connectors.
   Note: Only remove the PCB, not the PSU cover.

CAUTION:
Take care not to damage the transfer corona unit.

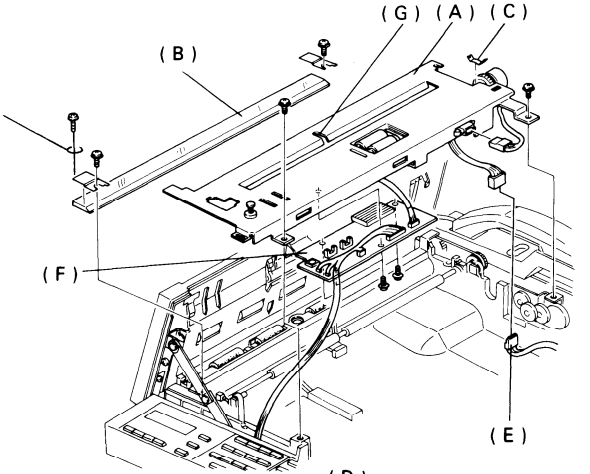


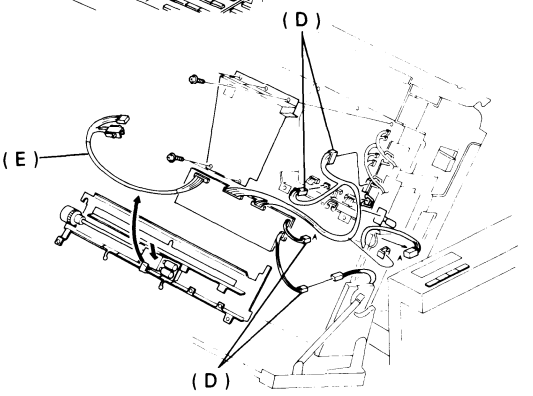
6-10-8 DSB

1. Remove the document table (see section 6-1-5).
2. Remove the front inner cover (see section 6-9-1) — 5 screws.
3. Open the ADF cover.
4. Remove the 5 screws holding the lower document guide plate (A).

   CAUTIONS:
   - Put the exposure glass (B) and the two retaining plates in a safe plate.
   - Do not lose the leaf spring (C) from on top of the ADF clutch.
   - On reassembly, don't forget to connect the ground wire to the front exposure glass retaining plate.
5. Remove the UIB cover (5 screws).
6. Open the upper unit.
7. Disconnect 4 connectors (D) at the front of the machine.
8. Disconnect the master belt drive motor harness and the ADF clutch (E).
9. Take out the lower document guide plate (A).
10. Remove the DSB (F) – 4 screws.

On reassembly:
- Check that the scanner cover sensor actuator can reach the sensor.
- Hook the scan line sensor actuator through the covered opening (G) on the guide plate.
- Make sure that the harnesses do not obstruct the sensors.





6-10-9 DRU

1. Remove the front and rear covers (see sections 6-1-1 and 6-1-2).

2. Remove the transfer corona unit (see section 6-7-1).

3. Remove the 2 screws holding the transfer entrance guide plate (A).

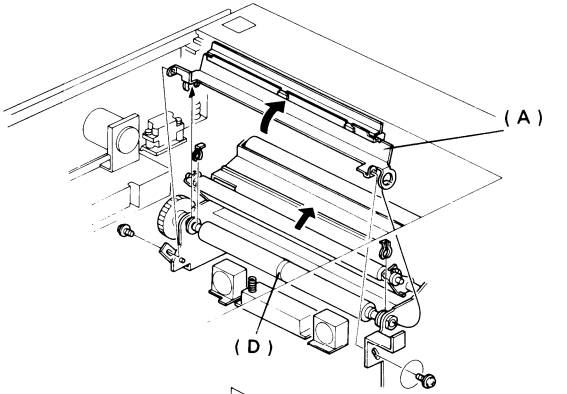
4. Remove the snap ring at each end of the registration roller shaft.

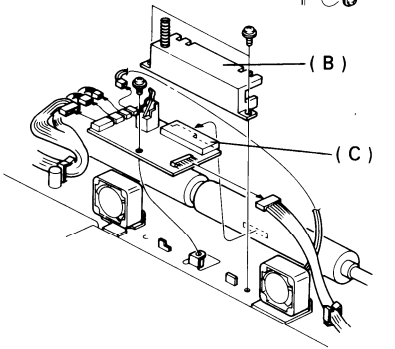
5. Lift up the side of the transfer entrance guide plate nearest the transfer corona unit and slide it out.

6. Remove the DRU cover (B) – 2 screws.

7. Remove the DRU (C) – 1 screw, 5 connectors.
   Note: Take note of where each connector plugs into the DRU.

Reassembly:
- Make sure that the registration sensor actuator pokes up through the opening (D) in the registration roller.
- Adjust the transfer entrance guide plate (see page 7-9).





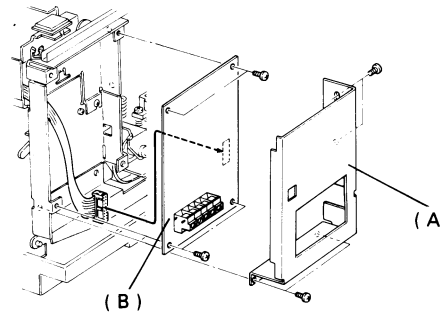
6-10-10 NCU

1. Disconnect the line and the telephone.

2. Remove the rear cover (see section 6-1-2).

3. Remove the NCU cover (A) – 4 screws.

4. Remove the NCU (B) — 4 screws, 1 connector.



SECTION 7

ADJUSTMENTS

7-1 ADF

7-1-1 Tx Motor Timing Belt

1. Open the upper unit.

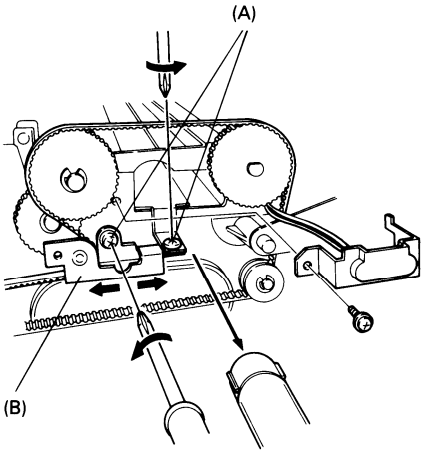
2. Remove the ADF clutch covers (4 screws).

3. Remove the fluorescent lamp (see page 6-7).

4. Remove two screws (A).

5. Push the tensioner bracket (B) towards the document exit. Hold it there while tightening the tensioner bracket securing screw.

Symptoms if incorrect.
- Document jam
- Poor image quality



7-2 SCANNER

When installing a new SBU, adjust the scanner. Use the following procedure.

— Preparation —

1. **Remove the top cover (see section 6-1-3).**

2. **Connect the test lead (P/N H0129301) to CN3 of the VPU.**

VPU	CN3
1	VIDADJ
2	XVIDEO
3	G N D

3. **Connect up the oscilloscope.**

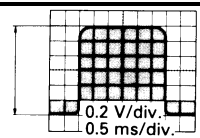
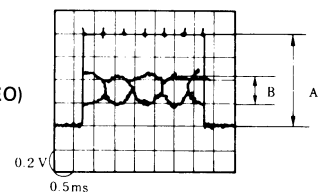
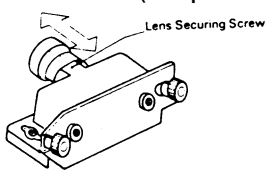
— Special Tools —

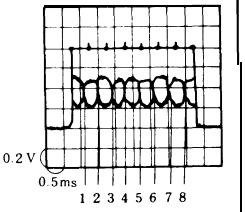
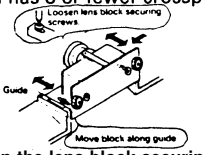
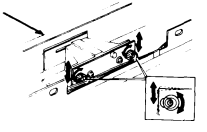
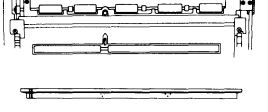
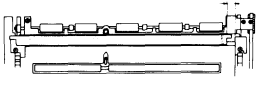
Test lead
Oscilloscope
Scan line test strip
R1 test chart

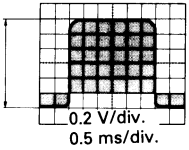
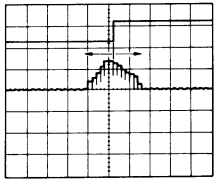
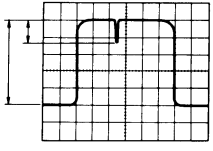
4. Light the fluorescent lamp (see page 5-28).

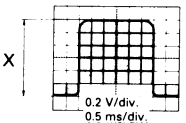
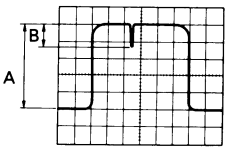
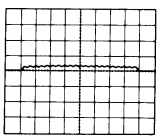
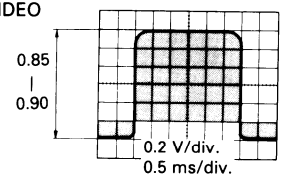
5. Carry out the following procedures in the order they are given.

— Procedure —

Step	Item	Procedure	Symptoms	Tools
1	Alignment	1. Turn the adjustment knobs until the scan line is roughly aligned. 	No image or partial image.	
2	Focusing	1. Set the 8-line/mm pattern of the test chart at the scan line position. 2. Loosen the lens securing screw. 3. Move the lens back and forth until B is maximised. (Test point = XVIDEO)   4. Tighten the lens securing screw.	Blurred characters	Oscilloscope, Allen keys, Test chart (R1)

Step	Item	Procedure	Symptoms	Tools
3	Reduction rate	1. Set the 8-line/mm pattern of the test chart at the scan line position. 2. Loosen both lens block securing screws. 3. Push the lens block to the left and move it back and forth until the signal has 8 or fewer crosspoints.   4. Tighten the lens block securing screws. Note: Tighten each screw little by little alternately.	Blurred or filled-in characters	Oscilloscope, Phillips screwdriver, Test chart (R1)
4	Scan line	1. Loosen both adjusting knob securing screws and the SBU securing screws.  2. Switch on the fluorescent lamp. 3. Set the scan line test strip on the exposure glass as shown below.  	Uneven density, Partial scanning	Oscilloscope, Phillips screwdriver, Scan line test strip

Step	Item	Procedure	Symptoms	Tools
4	Scan line (continued)	4. Adjust the white XVIDEO waveform with the adjusting knobs until it is as shown on the right. 5. Tighten the adjusting knob securing screws. 6. Take out the test strip. 		
5	Scan start position	1. Set the scan line test strip on the exposure glass as in procedure 4 above. 2. Slightly loosen the SBU securing screws. 3. Connect one channel of the oscilloscope to XVIDEO and one to VIDADJ. 4. Gently tap the SBU until its position is correct (see diagram opposite). 5. Tighten the SBU securing screws.  The peak of XVIDEO must be within 4 bits of the peak of VIDADJ	Misaligned margin on copies	Oscilloscope, Scale: 0.2V/unit 10µs/unit Phillips screwdriver, Scan line test strip.
6	Check	Repeat procedures 4 and 5 until both adjustments are correct.		
7	Error bits	1. Set the white zone of the test chart at the scan line. 2. Ensure that there are no abnormal peaks in the waveform. If there are abnormal peaks: • Clean the CCD, lens mirrors, exposure glass, test chart • Change the SBU 	Abnormal lines along prints made with the copy key.	Test chart (R1), Oscilloscope 0.2V/div 0.5 ms/div

Step	Item	Procedure	Symptoms	Tools
8	White level	1. Adjust VR2 on the SBU. The maximum voltage (X), should be 0.85 — 0.9V. 	Copies too bright or too dark	
9	Check	**Recheck the white level, focusing, and reduction rate. Repeat each procedure if necessary as they affect each other.**		**See procedures 2, 3, and 8.**
10	Shading and Flatness	**1. If (A – B) / A > 30%, adjust the fluorescent lamp shading plate.** **2. Check the flatness. If (A – B) / A > 30%, either:** **• Clean the CCD, lens, mirrors, exposure glass, test chart.** **• Change the fluorescent lamp.** 		
11	Black Level	**1. Switch off the fluorescent lamp or place a black chart on the exposure glass.** **2. Connect CH1 of the oscilloscope to TP1 of the SBU.** **3. Adjust VR2 on the SBU until the max level is 1.1 – 1.3V** 		
12	White Level	1. Connect CH1 of the oscilloscope to XVIDEO 2. Check that the white level is 0.85 — 0.9V. Adjust with VR1 if necessary. If you had to adjust VR1, recheck the black level, using VR1. Continue adjusting both values until they fall into the specified ranges. 		

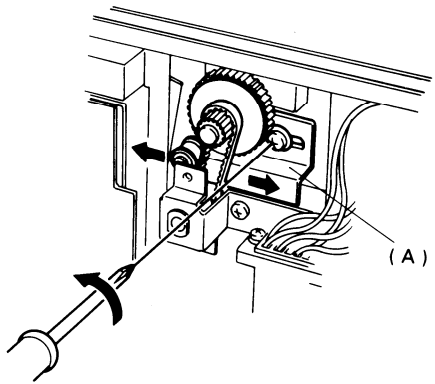
7-3 PRINTER

1. Master Belt Motor Timing Belt Tension

1. Open the upper unit.

2. Remove the rear inner cover (see page 6-4).

3. Move the tensioner bracket (A) until its edge is flush with the edge of the master belt motor bracket.



Symptoms if incorrect:
- Master home position sensor failure
- Stretched or irregular copies
- Copy jam

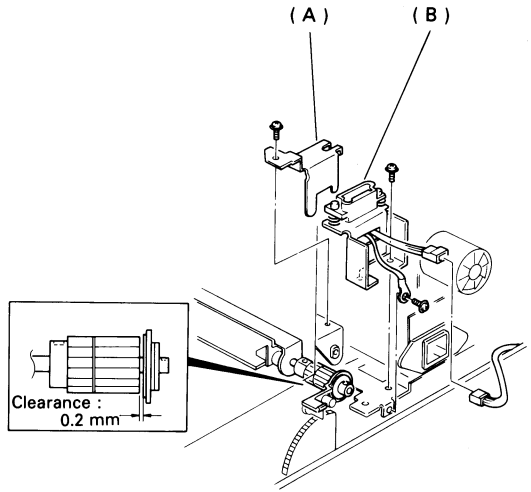
2. Paper Feed Clutch Clearance

1. Remove the rear cover.

2. Remove the bracket (A), and the connector bracket (B).

3. Make sure that the clearance is 0.2 mm.

Symptoms if incorrect:
Copy jam

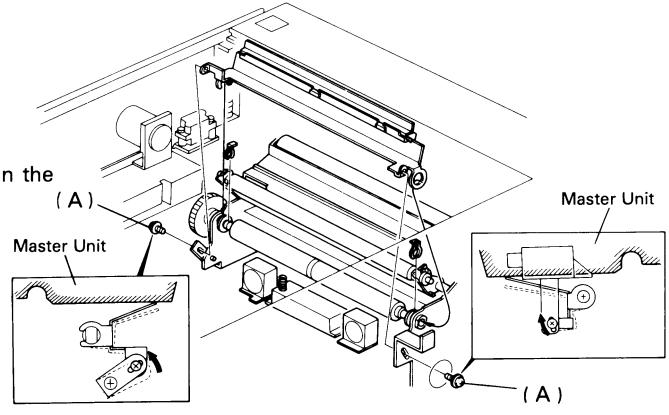


3. Transfer Entrance Guide Plate

1. Remove the front and rear covers.
2. Make sure there is a master unit in the machine.
3. Close the upper unit.
4. Slide each screw (A) up until it stops, then tighten the screw.

Symptoms if incorrect:

- Copy jam
- Poor copy quality
- Damage to master belt
- Loose toner in registration roller area



7-4 VPU

RAM address 151E

Bits 0, 1 **Process selector threshold (T1SL), used in halftone mode only.**

Bit 0	0	2	1	3	0	4	1	OFF
Bit 1	0		0		1		1	

If the process selector result is less than T1SL, or if T1SL is off, halftone is selected. Otherwise, MTF is selected. Experiment with these bits when there is an image quality problem such as background.

Bit 2 **Edge detection threshold (T2SL)**

0;4 1;5

Elements higher than T2SL are taken as black. Experiment with this bit if edges of characters or images appear fuzzy.

Bit 3 **Pixel density range processed in halftone mode.**

0; 6% —> 68% (Density less than 6% is white and more than 68% is black).

1; 8% —> 78%

Experiment with this bit if halftone printouts are too bright or too dark.

Bit 4 **Do not use.**

Bit 5 **Edge detection**

0; Disabled 1; Enabled

Bit 6 **Contrast in halftone mode**

0; Standard 1; Light

Bit 7 **MTF**

0; On 1; Off

SECTION 8

MAINTENANCE

PM Table

Item	Servicing Intervals			Notes
	Clean	Lubricate	Replace	
Scanner				
1. Pressure Plate	10K			Soft cloth soaked in alcohol
2. Exposure Glass	10K			As above
3. R1 and R2 rollers	10K			As above
ADF				
1. Paper feed and pick up rollers	10K		30K	As above
2. Separation roller	10K		30K	As above
3. Separation roller spring clutch	60K	60K		Clean with soft cloth soaked in alcohol, then grease (Mobil Temp 78)
4. Stamp			(5K)	Refill with ink after 5K
Paper Feed Unit				
1. Paper feed and pick up rollers	10K		30K	Soft cloth soaked in alcohol
2. Separation roller	10K		30K	As above
3. Paper feed spring clutch	30K	30K		Clean with soft cloth soaked in alcohol, then grease (G-40H)
4. Separation roller spring clutch	90K	90K		As above
5. Registration rollers	30K			Soft cloth soaked in alcohol
6. Pick-up clutch			90K	
7. Pulley Washer (H0063601)		30K		G-40H

Item	Servicing Intervals			Notes
	Clean	Lubricate	Replace	
Printer				
1. Corona Wires (Transfer, Charge)	30K			Soft cloth soaked in alcohol
2. Master Unit			7K	
3. Quenching lamp	30K			
4. Toner Collection Tank			21K	
Other				
1. Ozone filter			7K	
2. Main motor timing belt			30K	

Item	Servicing Intervals			Notes
	Clean	Lubricate	Replace	
Fusing unit				
1. Thermistor	30K		60K	Soft cloth soaked in alcohol
2. Hot roller strippers	30K		60K	As above
3. Hot roller (Teflon)			60K	As above
4. Pressure roller			60K	As above
5. Fusing unit drive gear		60K		G-40H
Development				
1. Metering blade			60K	
Paper feed-out				
1. Paper feed-out roller	30K			Soft cloth soaked in alcohol

SECTION 9

TROUBLESHOOTING

9-1 SERVICE CALL CONDITIONS

If the Call Service indicator is lit, one of the following errors has occurred.

- LD power control failure
- Master home position failure
- Pentagonal mirror motor lock failure
- Laser main scan synchronization failure
- Main motor lock failure
- Lower paper feed motor lock failure
- Fusing lamp failure
- Transfer corona leak
- FCU-UIB handshake error
- FCU-LIB handshake error
- Master unit needs replacing

To find out which error has occurred, check the error code memory (see page 5-18).

To clear the Service Call condition, do one of the following:

- Switch the power off, wait a few seconds, then switch back on
- Execute function 97.

If the problem is not cleared, proceed as follows.

Symptom	Action
LD power control failure	Does the FCU receive – 12V, + 24VS, and + 5V from the PSU ? Y N | | | Replace the PSU Does the master set sensor component on the upper unit pass + 12V ? Y N | | | Replace the sensor Replace the master unit, LDDR, UIB, or FCU
Master home position failure	• Clean the sensor patch on the master belt. • Replace the master unit if it cannot be cleaned. • Check the master belt drive mechanism. • Does the master belt motor work ? Y N | | | Does the UIB output + 24V to the DSB ? | Y N | | | | | Replace the UIB or FCU | Does the DSB output the motor drive phases ? | Y N | | | | | Replace the PSB, UIB, or FCU | Replace the motor | (Continued on next page)

Symptom	Action
Master home position failure (continued)	• Does the (UIB receive a signal from the sensor ? Y: Replace the UIB or FCU N: Does the sensor receive + 5V ? Y: Replace the sensor N: Trace the + 5V supply line and replace defective board (PSU, FCU, or UIB)

Symptom	Action
Pentagonal mirror motor lock fail, or laser main scan synchronization fail	• Does the FCU receive + 24VD at CN17-1 ? Y: If the FCU does not output + 24V at CN9-1, replace the FCU N: Does 1POWON go high after Copy is pressed ? Y: Replace the PSU, upper unit interlock switch, or right cover interlock switch N: Replace the FCU • Replace the pentagonal mirror motor or the SMDR • Replace the LSD or LDDR • Replace the UIB or FCU
Main or lower paper feed motor lock fail (Error code 9-24)	If the main motor caused the problem: • Check the + 24VD supply from the PSU to the main motor as for the previous procedure (check output at CN18-7 instead of CN9-1). • Replace the main motor assembly or the FCU. If the lower paper feed motor caused the problem: • Trace the + 24VD Supply from the PSU through to the motor similarly to the main motor procedure. Replace the defective board. • Does the motor return a low at CN5-4 (on the LIB) ? Y: Replace the motor N: Replace the LIB or FCU

Symptom	Action
Fusing lamp failure	• 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 FCU or UIB. • Replace the PSU. • Replace the upper unit interlock switch or right cover interlock switch.
Transfer corona power leak	• Clean the transfer corona unit, wire, endblocks, etc. • Check that the development bias is correct (— 225 ± 10V). If not, replace the power pack. • Check that the FCU outputs power and trigger signals to the power pack for bias and transfer corona. • Replace the power pack or the transfer corona unit if the problem still occurs.
Handshake errors	Replace the FCU, UIB, or LIB

9-2 COPY QUALITY PROBLEMS

Symptom	Action
Blank or Faint Copy	Make a printer test (see page 5-30). Is the test pattern normal ? Y: Are the charge or transfer corona units and wires installed badly or broken ? If there is a faint image, the transfer corona unit may be defective. Y: Reset the defective corona wire. If the problem is not solved, check the trigger and power signals as above, then check the varistor. Is it shorted ? Y: Change the varistor. N N: Does CN15-6 on the FCU (1TRLEK) go high ? If so, clean the transfer corona unit, removing any foreign objects that could cause a leak. Are the + 24V supplies to the power pack and the trigger signals present ? Y: Replace the FCU. N: Replace the power pack, if there is no power at the corona wire. N (Continued on next page)

Symptom	Action
	The laser beam may not be responding to the data signal, thus continually exposing the master. Does the data signal at the LDDR switch on and off normally ? N Replace the defective part of the circuit (LDDR, UIB, FCU, or PMU). If there is a faint image, there may be a problem with the development unit. Check the development drive mechanism. Clean any dirty components. Does the bias terminal receive – 225V ± 10V ? If not, replace the FCU or the power pack. Does the development roller attract toner ? Y N Replace Does the development clutch work ? N Replace the defective part of the circuit (refer to the point-to-point diagram) Is there a video signal from the SBU and is the white level normal ? Y N Adjust the white level. Replace the SBU if necessary. Replace the FCU, VPU, PMU, BSR, MBU, NCU, MIF, or modem

Symptom	Action
Black copy	Make a printer test (see page 5-30). Is the printout normal ? Y: (Continued on next page) N: Is the master unit properly grounded ? N: Check the grounding terminal near the rear of the quenching lamp and check the grounding plate on the master unit. Clean or replace the defective part. Y: Does the bias terminal receive – 225 ± 10V ? N: Does the power pack receive the trigger signal and + 24V supply ? N: Replace the FCU Y: Replace the power pack Y: Is the toner metering blade securely in place ? N: Install it properly Y: (Continued on next page)

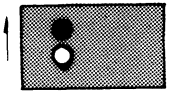
Symptom	Action
	The laser beam is not reaching the master. Does the data signal at the LDDR switch on/off normally ? Y N Replace the defective part of the laser signal circuit (LDDR, UIB, FCU, or PMU). Check the laser optics for broken or dirty components. Check for condensation on the optics or the master. Clean the scanner optics, pressure plate, and exposure glass. Does the fluorescent lamp light properly ? Y N Does the FL driver receive the + 24V power and trigger signals from the UIB ? Y N Replace the UIB or FCU Replace the lamp or driver Is there a video signal from the SBU ? Y N Replace the SBU. Replace the FCU, VPU, PMU, BSR, MBU, NCU, MIF, or modem

Symptom	Action
Low Image Density	Make a printer test (see page 5-30). Is the test pattern normal ? Y N • Replace the master unit. • Check the corona wires. Clean (with cotton swabs) or replace. • Clean the development roller (soft cloth + alcohol). • If paper in the cassette is damp, replace it. • Replace the varistor if it is faulty. • If the toner contains dirt or paper particles, throw it out and install a new cartridge. Does the bias terminal receive – 225V ± 10V ? Y N Does the power pack receive the trigger signal and + 24V supply ? Y N Replace the FCU. Replace the power pack. Check the development drive mechanism. Clean any dirty components. Does the development roller attract toner ? If not, replace it. Does the development clutch work ? Y N Replace the defective part of the circuit. Are the power pack trigger signals and the + 24V supply present ? Y N Change the FCU. Change the power pack if there is no power at the corona wires. (Continued on next page)

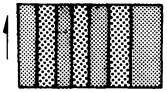
Symptom	Action
	Is there toner in the toner cartridge ? N Check the toner end sensor mechanism. Does CN21-2 of the FCU go low if the actuator leaves the toner end sensor ? Y N Replace the toner end sensor. Replace the FCU if the Add Toner indicator is not lit. Clean the white pressure plate used for auto-shading. Adjust the SBU white level voltage.
Faint copy at leading or trailing edge	If the paper is curled, correct paper curl before installing in the cassette. If the paper is damp, change the paper in the cassette. • Instruct operator how to store paper when it is not to be used for a long time. • Thick and/or thin paper sometimes make faint copies due to paper quality. • Instruct the operator to use recommended paper.

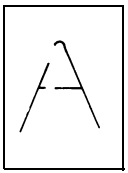
Symptom	Action
Dirty background on entire copy image	If "Call Service" is lit, replace the LD unit and LDDR. Make a printer test (see page 5-30). Is the printout normal ? Y N • Reinstall the master (incorrectly installed). • Replace the master (worn out OPC). • Clean the quenching lamp. • If toner in the development unit contains paper particles or dirt, replace the toner. • Tighten the toner metering blade securing screws (see page 7-9). • Clean the charge and transfer corona wires. • Clean the grounding plates on the master unit (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. • Clean the cleaning blade (inside the master unit). (Continued on next page)

Symptom	Action
	Does the bias terminal receive + 225 ± 10V ? Y N Does the power pack receive the trigger signal and + 24V supply ? Y N Replace the FCU. Replace the power pack. Does the quenching lamp work ? Y N Does the UIB generate the + 24V supply and trigger signals ? Y N Replace the FCU or UIB. Replace the lamp. • Clean the laser optics carefully with a blower brush or soft dry cloth. • Replace the power pack or the FCU (corona failure). • Clean the scanner optics and the exposure glass. • Adjust the contrast threshold RAM contents. • Adjust the SBU output levels (section 7-2).

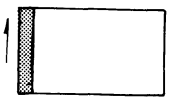
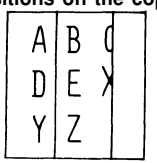
Symptom	Action
Dirty background with negative image 	Clean the cleaning blade or replace the master unit.
Dirty background after the trailing edge of solid black copies 	Does the quenching lamp work ? N Are the + 24V supply and trigger signal generated by the UIB ? Y N Replace the FCU or UIB. Replace the lamp.
Stray toner flecks fused into the copy 	• Clean the cleaning blade. • Check the transfer entrance guide plate (see section 7-3-3). • Clean the hot roller and/or pressure roller. • Replace the master (worn out OPC or defective cleaning blade). • If the problem is not solved, clean the quenching lamp Does the quenching lamp work ? N Are the + 24V supply and trigger signals output by the UIB. Y N Replace the FCU or UIB. Replace the lamp.

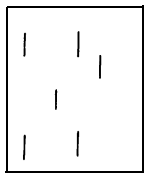
Symptom	Action
Previous copy shows faintly	• Clean the master belt • Clean the quenching lamp or the defective part of the drive circuit (see the previous symptom for check method).
Uneven Density 1) Density changes gradually across the copy	Make a printer test (see page 5-30). Is the printout normal ? 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 a soft dry cloth. • Clean the scanner optics and exposure glass. • Adjust the scan line (section 7-2). • Change the fluorescent lamp.

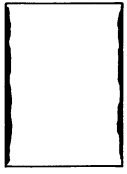
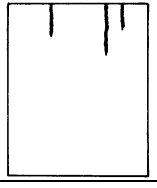
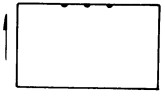
Symptom	Action
2) Uneven density appears in vertical bands 	Make a printer test (see page 5-30). Is the printout normal ? Y: • Clean the exposure glass and scanner optics. • Change the fluorescent lamp if the bands appear on the sides of the copy. N: • Clean the charge and transfer corona wires. • Clean the quenching lamp. • If the problem is not solved, clean the laser optics.
3) Horizontal bands 	Is there a clear contrast between the bands ? Y: • Clean the transfer corona unit. • Change the fluorescent lamp if it is flickering. N: Clean the development roller bearings.

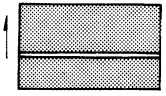
Symptom	Action
Vertical White Lines or Bands **1) Straight sharp lines** 	**Make a printer test (see page 5-30). Is the printout normal ?** **Y** **N** **Start a copy cycle and stop it before the copy reaches the fusing unit. Do the same lines appear on the unfused copy ?** **Y** **N** • **If the surface of the hot roller is scratched, replace the component that is scratching the roller (e.g., Hot Roller Strippers).** • **If the hot roller strippers are badly stained with toner, replace the thermistor (or the UIB, FCU, or PSU).** • **Then replace the hot roller.** **(Continued on next page)**

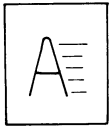
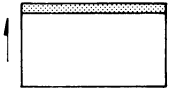
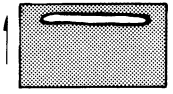
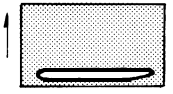
Symptom	Action
	Is the master belt scratched ? Y N • Clean the grid plate. • Clean the toner metering blade — toner may be piling up there. • Add toner if supply is low. • Follow the procedure for "Uneven Density, 2) Vertical Bands" (page 9-1 6). • Correct or replace any parts that scratch the belt. • Change the master unit. • 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 waveform for error bits.
2) Fuzzy lines or bands	Clean the corona wires

Symptom	Action
Vertical Black Lines or Bands	
1) Wavy Lines	• Replace the master if the cleaning blade is damaged. • Pentagonal mirror motor fault. • Replace the SMDR or pentagonal mirror motor. If the problem still occurs, replace the UIB or FCU.
2) Dotted lines or bands	If the master belt is scratched, change the master unit and the part that is doing the damage.
3) Band at left or right edge of the copy, superimposed on the data 	Make a printer test (see page 5-30). Is the output normal ? Y: • Clean the scanner optics. • Replace the fluorescent lamp. N: • Clean the laser optics (e.g., second cylindrical lens).
4) Straight lines or bands at constant positions on the copy 	Make a printer test (see page 5-30). Is the output normal ? Y: 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: (Continued on next page) N:

Symptom	Action
	• Clean the thermistor, hot roller, and hot roller strippers. • If the hot roller surface is scratched, correct or clean or replace any parts that damage the roller. Then replace the hot roller. • If the hot roller strippers are badly stained with toner, replace the thermistor (or the UIB, FCU, or PSU).
	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, FCU, or MBU.
	• Clean the scanner optics and exposure glass. • Check for error bits in the SBU waveform.
5) 	• Clean the charge corona wire.

Symptom	Action
Dirty margins 	• Change the master unit. • Clean the quenching lamp. • Change the development unit. • Change the fluorescent lamp.
Black streaks at the leadiing edge 	• Clean the hot roller strippers. • Replace the master.
Black spots at the leading edge 	• Check that the transfer corona wire is installed properly. • Clean the transfer corona unit. • Replace the power pack if the problem cannot be solved.

Symptom	Action
Horizontal white lines or bands across copies 	**Does the copy have a crease mark where the white band appears ?** **Y** — **N** **Y:** **Check the paper transport mechanism from paper feed through transfer; correct any faults.** **N:** **• Clean the transfer unit (wire, end blocks, and casing).** **• Check and replace any defective parts that cause the transfer corona to leak.** **If the problem only happens on the first copy of a copy run:** **If the master has a horizontal band scratched on it, check the development clutch and the development roller drive mechanism. Replace any defective components.**
Horizontal black stripes	**• If "Call Service" is lit, replace the LDDR.** **• Check that the toner metering blade is screwed into place proparly.** **• Check that the master unit is installed correctly and that the master unit is grounded properly.** **• Does the bias terminal receive — 225 ± 10V ?** **If not, does the power pack receive + 24V and the trigger signal ?** **Y** — **N** **Y:** **Replace the power pack.** **N:** **Replace the FCU.**

Symptom	Action
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. • Replace the power pack.
Black streaks after right-hand edges of black characters 	Laser diode drive defective. Replace the FCU, MBU, PMU, or LDS.
Blank areas	 If paper is wrinkled, refer to "Wrinkled Copy". 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.

Symptom	Action
Leading edge missing	• Check that the scan line sensor is positioned correctly. • Change the FCU.
Fuzzy cory	Make a printer test (see page 5-30). Is the copy normal ? Y: • Clean the scanner optics. • Adjust the MTF and reduction rate (see section 7-2). N: Are the charge corona fan (at rear of machine) and the transfer fans working ? Y: • Change the ozone filter. • Replace the master unit. • Clean or replace the laser optics. • Replace the charge corona unit. • Replace the transfer corona unit. N: Do the fans receive + 24V from the DRU ? Y: Replace the defective fan. N: Replace the FCU or DRU

Symptom	Action
Hollowing out 	Is the paper damp ? Y: Replace the paper N: • Clean the transfer corona wire. • Replace the power pack if problem not solved.
Hat image 	Does the quenching lamp turn on ? Y: • Check that the charge corona wire is correctly installed. • If the problem still occurs, change the power pack. N: Does the lamp receive power and the trigger signal from the UIB ? Y: Replace the lamp. N: Replace the UIB or FCU
Unfused copy	• Clean the thermistor. • Change the pressure roller springs. • Replace the thermistor or fusing unit, or the UIB, FCU, or PSU. Follow the fusing unit control circuit in Appendix F.

Symptom	Action
Jitter	Make a printer test (see page 5-30). Is it normal ? Y N • The master belt or main motor drive mechanism (e.g., motor, gears, timing belt) may be defective. Check the belt tension (see section 7-3-1). • Check all gears and timing belts. • Replace the transfer entrance guide plate. • The scanner drive mechanism (e.g., Tx motor, gears, timing belt) may be defective. Check the belt tension (see section 7-1-1).
Image enlarged in sub scan direction	Scanner or printer drive mechanisms (e.g., motors, belts, gears) may be obstructed or defective. Check the Tx motor timing belt (see section 7-1-1) and master belt motor timing belt (see section 7-3-1). Replace the FCU, DRU, or the Tx motor if the Tx motor is making abnormal noise.
Magnification or reduction	Adjust the reduction rate (see section 7-2).
Filled-in characters	Same as above

Symptom	Action
Misaligned output - margin of data has been shifted to the left or right	**Make a printer test (see page 5-30). Is the output normal ?** **Y** **N** **The LDS board may be out of position. Adjust as explained in section 6-4-4.** **• Adjust the scan start position (see section 7-2).** **• Center the SBU.**

Effects of line problems on copy quality

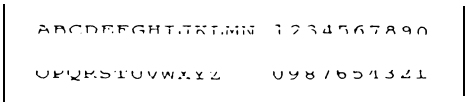
1. Missing lines; shrinkage in sub scan direction

— Original —

ABCDEFGHIJKLMN 1234567890

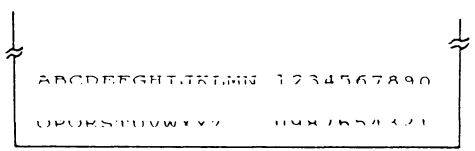
OPQRSTUVWXYZ 0987654321

— Bad copy sample —



2. Cut off.

— Bad copy smaple —



Some lines may be missing just before the cutoff.

9-3 MECHANICAL PROBLEMS

Symptom	Action
Wrinkled copy	• Check whether the problem can be solved by using another stack of paper. • Check paper transport through the copier and replace the defective component. • Replace the fusing unit pressure roller springs.
Soiled copy paper	• Clean the paper feed, pickup, and separation rollers with a soft damp cloth. • If the dirt is part of the copy, then clean the ADF rollers. R1, R2 – soft cloth + alcohol Paper feed, pickup, separation — soft cloth + water
Dirt along leading edge or on reverse side	• Same as above. • Clean: 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 + alcohol) • Clean the feed, pickup, and separation rollers (soft cloth + water) • Replace the separation roller • Check that the scanner cover switch (SB-10) and actuator are in the correct position. If the problem is in the printer, then: • Clean the paper feed, pickup, and separation rollers (soft cloth + water), and replace if necessary. • Check that the registration clutch works properly.

Symptom	Action
Document Jam	• Clean the R1 and R2 rollers (soft cloth and alcohol). • Clean the feed, pickup, and separation rollers (soft cloth and water). • Check the Tx motor timing belt (see section 7-1-1). • Check the scan line sensor (SB-2). Does the UIB receive a signal from the sensor at CN4-5 ? Y: Replace the FCU or UIB. N: Does the DSB receive a signal at CN3-2 ? Y: Replace the DSB. N: Replace the sensor, or check the continuity of the + 5V supply through the machine. • If the sound is abnormal, check the scanner is assembled correctly, or replace the Tx motor or DRU.
Document non-feed	• Clean the feed and pickup rollers (soft cloth + water), and check the spring clutches. • Does the Tx motor turn on ? Y: Do the pins on the upper unit connector (rear of machine) carry the phase drive signals ? Y: (Continued on next page) N: (Continued on next page) N:

Symptom	Action
	Does the FCU receive + 24VD from the PSU when Copy is pressed. Y N Does 1POWON go high ? Y N Replace the FCU. Replace the PSU or, upper unit interlock switch, or right cover interlock switch. If the FCU does not output 24VD at CN8-12, change the FCU. Otherwise, replace the DRU. Replace the Tx motor. Does the UIB output the ADF clutch drive signal ? Y N Replace the UIB or FCU. Does the DSB output the ADF clutch drive signal ? Y N (Continued on next page)

Symptom	Action
	Replace the DSB. After Copy is pressed, does the FCU output 24V at CN9-1 and receive it at CN17-1. Y N Does 1POWON go high ? Y N Replace the FCU. Replace the PSU the upper unit interlock switch, or the right cover interlock switch. Trace the + 24VD signal from the UIB to the ADF clutch and 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 pickup roller assembly and in the separation roller. • Replace the tx motor or DRU. • Check that the scanner is assembled correctly.

Symptom	Action
Copy Jams	• Is the correct type of paper being used ? • Is the paper correctly loaded ?
1) Paper Feed Entrance — Error Code 9-07	• Clean the paper feed, pickup, and separation rollers. Remove any debris from the feed-in area. • Check the paper feed clutch clearance (see section 7-3-2). • Check the registration sensor. Does the FCU receive a signal from the sensor at CN8-2 ? Y — Replace the FCU. N — Does the FCU send + 5V to the DRU ? Y — Replace the DRU. N — Replace the FCU.

Symptom	Action
Copy Jams **2) Registration Area — Error Code 9-08**	**• Clean the registration rollers (soft cloth and alcohol).** **• Check the registration sensor (as for item 1 above).** **• Check the registration clutch. If it is not working, do the following:** **Does the FCU output + 24VD and the drive signal to the DRU ?** **Y — N** **| — Replace the FCU.** **Does the registration clutch receive + 24V and the drive signal ?** **Y — N** **| — Replace the DRU.** **Replace the clutch.**
3) Inside the Machine — Error Code 9-08	**• Check the master belt motor timing belt (see section 7-3-1).** **• Check the transfer entrance guide plate (see section 7-3-3).** **• Check the fusing unit drive. Replace the pressure roller springs, hot roller, or pressure roller if necessary.** **• Check the copy feed-out sensor.** **Does the FCU receive a signal from the sensor ?** **Y — N** **| — Does the FCU send + 5V to the sensor ?** **Y — N** **| — |** **(Continued on next page)**

Symptom	Action
Copy Jams **3) continued**	Replace the FCU. Replace the sensor. Replace the FCU.
4) Copy Exit — Error Code 9-09	• Clean the copy exit rollers. • Check the copy exit sensor (as for item 3 above).
Copy Non-feed	• Check that non-feed is not due to another problem (e.g., "Call Service" is lit, Error Code is generated). • Clean or replace the feed and pickup rollers; check the feed mechanism. • Clean and lubricate the feed and pickup spring clutches. • Clean the separation roller slip clutch. • Remove any debris from the feed-in area. • Does the main motor turn on ? Y N Does the FCU receive + 24VD from the PSU after Copy is pressed ? Y N (Continued on next page)

Symptom	Action
Copy Non-feed (continued)	Does 1POWON go high after Copy is pressed ? Y N Replace the FCU. Replace the PSU, the upper unit interlock switch, or the right cover interlock switch. Does the FCU send the drive signal and + 24VD to the main motor ? Y N Replace the FCU. Replace the main motor + driver. • Check the paper feed solenoid. If it does not work, check the following. Does the FCU output the drive signal to the DRU at CN8-4 ? Y N Replace the FCU. Does the solenoid receive the drive signal ? Y N Replace the DRU. Replace the solenoid. (Continued on next page)

Symptom	Action
Copy Non-feed (continued)	• Check that paper is at the paper feed position. If not, check the paper lift mechanism, then check the circuit as follows. Does the FCU output the paper lift drive signal at CN8-5 ? Y: Does the paper lift solenoid receive the drive signal ? Y: Replace the solenoid if it is not working. N: Replace the FCU. N: Replace the DRU. Does the FCU receive signals from the paper height sensor ? Y: Replace the paper sensor board. N: Does the FCU output + 5V at CN11-5 ? Y: Replace the FCU. N: Replace the FCU. (Continued on next page)

Symptom	Action
Copy Non-feed (continued)	Does the FCU receive signals from the paper size sensor ? Y N Replace the paper size sensor. Replace the FCU. 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 conditions for starting copying may not have been met. • The fusing lamp may not have reached the correct temperature (error code 9-22). • The pentagonal mirror (error code 9-23) or main or lower paper feed motor (error code 9-24) may not have reached the correct speed. • One page may not be stored in the DMU (error code 9-02 may be indicated) — check the component PCBs of the video data path.
Copy Double Feed	Clean, and lubricate, or replace the separation roller.
Abnormal Noise from Printer	• Dirty paper feed or pick-up clutch. • Dirty separation roller clutch.
Dog-eared copies	• Defective hot roller stripper. • Excessive copy paper curl.

Symptom	Action
Ozone odor	Are the fans working ? Y N Replace either • Printer fan drive belt • Defective fan — charge corona fan — front transfer fan — rear transfer fan • DRU, PSU, or FCU Change the ozone filter.

9-4 ERROR CODES

1. **Protocol Errors**

— G3 transmission —

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF/GI not detected within 35 seconds after the Start button was depressed.	1. Check all connections inside the machine. 2. Replace the FCU. 3. Replace the modem. 4. Measure the Rx signal level. 5. Check the received signal on an oscilloscope. 6. Incompatible remote terminal. 7. Replace the NCU.
0-01	DCN detected	1. Check remote terminal for printer failure (jam or empty cassette) or whether the operator pushed Stop.
0-02	Remote terminal G3 mode disabled	Check the remote terminal.
0-03	Incompatible remote terminal	Example: 1850, 1000, 800
0-04	CFR or FTT not detected from remote unit after modem training	1. As for 0-00, actions 1 —> 4. 2. Check the remote terminal. 3. Replace the NCU and/or modem. 4. Check the Tx signal level. 5. Check for a line problem.

Code	Meaning	Suggested Cause/Action
0-05	FTT from remote unit detected after modem training at 2400 bps	1. As for 0-00, actions 1 —> 3. 2. Replace the NCU and/or modem. 3. Check the Tx signal level. 4. Check for line problems.
0-06	DIS detected after DCS and modem training were sent (machine failed after 3rd try)	1. As for 0-00, actions 1 —> 3. 2. Replace the NCU. 3. Check the remote terminal. 4. Check the Tx signal level. 5. Incompatible remote terminal. 6. Check for line problems.
0-07	Post message response signal not detected after transmission.	1. As for 0-00, actions 1 —> 3. 2. Line was disconnected.
0-08	RTN or PIN detected after transmission	1. Check the Tx signal level. 2. As for 0-00, actions 1 —> 3. 3. Replace the NCU. 4. Defective modem at either end. 5. Check for line problems and noise. 6. Rx signal at either end too weak or too strong. 7. Check line connections. 8. Check remote terminal: • Is paper jammed ? • Send to another remote terminal. • Decrease modem rate.

Code	Meaning	Suggested Cause/Action
0-09	Protocol signal could not be recognized	1. As for 0-00, actions 1 —> 3. 2. Check the remote terminal.
0-10	As for 0-08, but error report disabled	As for 0-08.
0-11	Error code memory overflow when printer failed	1. Check for printer jam or roll end.
0-12	After sending at 2400 bps, RTN was detected.	As for 0-08.
0-15	Confidential or transfer function with remote unit not possible	Check whether the remote terminal has SAF, or whether its SAF is full.
0-16	CFR/FTT in Confidential mode not detected	1. As for 0-00, actions 1 —> 3. 2. Replace the NCU. 3. Measure the Rx signal level. 4. Check the Tx signal level. 5. Check the remote terminal.
0-52	Polarity change occurred	Retry the transmission

Code	Meaning	Suggested Cause/Action
0-20	Image information not received within 6 seconds after retraining	1. Check all connections inside the machine. 2. Replace the FCU. 3. Replace the modem. 4. Check for line problems.
0-21	When receiving image information, the following EOL not detected within 5 seconds of the previous EOL	1. As for 0-20. 2. Check for line noise. 3. Disconnected line. 4. Check remote FCU is faulty.
0-22	Modem carrier dropped for 200 ms or more while receiving image information	1. As for 0-20. 2. Replace the NCU. 3. Check the remote terminal. 4. Check for line problems. 5. Remote terminal modem faulty.
0-23	Line errors have exceeded the limit	1. As for 0-20. 2. Replace the NCU. 3. Measure the Rx signal level. 4. Check for line noise. 5. Check remote NCU/modem is faulty.

Code	Meaning	Suggested Cause/Action
0-50	CFR or MCF not detected within 5 seconds after phasing or image information transmission	1. As for 0-20. 2. Measure the Tx signal level. 3. Incompatible remote terminal.
0-51	CFR or MCF carrier not dropped for 6 seconds or more	1. As for 0-20. 2. Incompatible or defective remote terminal. 3. Check MCF/CFR signal turn-off timing.
0-52	PIS detected but operator did not respond	1. Check all connections inside the machine. 2. Check with the operator whether operator call tone sounded. 3. Faulty stop key. 4. Check whether operator call is working. If not, replace FCU. 5. If no ACK/NAK tones on pushing a key, change speaker.
0-53	Confidential N/A because remote terminal is G2	1. As for 0-52, item 1. 2. Replace the FCU. 3. Replace the OP-PORT.

Code	Meaning	Suggested Cause/Action
0-60	Phasing signal not finished within 8 seconds.	1. As for 0-20. 2. Check phasing signal timing.
0-61	Image information not received within 3 seconds.	1. As for 0-60. 2. Incompatible or defective remote terminal.
0-62	Phasing failed	1. As for 0-61. 2. Try to receive from another G2 unit.
0-63	“Black” line sync signal longer than expected.	1. As for 0-62.
0-64	EOM not detected within 3 seconds.	1. As for 0-20. 2. Defective remote terminal. 3. Check whether EOM signal comes in.
0-65	EOM carrier not dropped within 5 seconds.	1. As for 0-20, item 1 —> 3. 2. Incompatible or defective remote terminal. 3. Check EOM signal timing.

Code	Meaning	Suggested Cause/Action
0-70	Communication modes unmatched	1. Check all connections inside the machine. 2. Replace the FCU. 3. Replace the modem. 4. Check what mode is selected at remote terminal.

2. Document Errors

Code	Meaning	Suggested Cause/Action
1-00 1-01	Document jammed Maximum document length exceeded. (Transmission, Copy)	1. Improperly inserted document. 2. Faulty sensors. 3. Replace FCU. 4. Replace Tx motor. 5. Check all connectors inside machine. 6. Document length exceeded maximum. 7. Check document feed condition.
1-10	Document in reading position at power-up.	1. Check all connectors inside machine. 2. Replace the FCU. 3. Check SB1 and SB2. 4. Check whether a document is actually jammed.
1-11 1-12 1-13 1-14	Document was pulled out prematurely (G3 Tx) Document was pulled out prematurely (G2 Tx) Document was pulled out prematurely (Copy) Document was pulled out prematurely (Poll standby)	1. As for 1-10. 2. Check SB2. 3. Check whether operator pulled out document during operation.

Code	Meaning	Suggested Cause/Action
1-15	Document was set when a jam condition existed.	1. As for 1-00.
1-17	Document jammed when feeding out.	1. Replace the FCU. 2. Check SB2. 3. Scanner feedout path blocked. 4. Document length exceeded maximum. 5. Check document feed condition.

Code	Meaning	Suggested Cause/Action
2-00	FCU stalled — interrupt timer to CPU stopped	1. Replace FCU. 2. Replace PSU.
2-10 2-11 2-12	Modem not turned into transmission state Rx data transfer clock not output Tx data transfer clock not output	1. Check modem — FCU connection. 2. Replace FCU. 3. Replace modem.
2-20 2-21 2.22 2-25 2-26	No data compression Data compression not completed A scan line needed more than 10s for compression No phasing signal Data not sent out	1. Check all connections inside machine. 2. Replace FCU.

Code	Meaning	Suggested Cause/Action
2-30 2-31 2-32 2-33 2-34	Ringing signal detection continues for more than 6s Line not connected Line not disconnected Incoming carrier either: Continues for more than 6s Has signal dropout less than 200ms Incoming carrier continues for more than 6s	1. As for 2-20. 2. Replace NCU. 3. Replace modem. 4. Check the line condition.
2-40 2-41 2-42	Abnormality after interrupt signal Abnormality when FCU receives OP-PORT data Abnormality after operator adjusted clock	1. As for 2-20. 2. Replace OP-PORT.

Code	Cause	Required Action
4-00	One page took longer than eight minutes to transmit	Resend the message.
4-01	Line current was cut	Reattmpt the communication.
4-02	The remote terminal cut the received page as it was longer than the maximum limit	Resend the message if necessary, after changing the remote terminal's maximum receive length.
4-10	Communication failed because of polling ID mismatch using closed network or CSI/tel no. mismatch using protection against wrong connections.	Redial.

Note: Error codes 4 - xx do not appear on Error Reports.

5. SAF Errors

Code	Cause	Required Action
5-10	DR circuit does not work	Change FCU.
5-20	Storage impossible because either: • Memory all used up • File tables all full • Mode tables all full	No action; temporary memory shortage.
5-21	Memory overflow	
5-22	Mode tables became all full while storing the second or subsequent page of a document	
5-23	A confidential or substitute reception had poor image quality	Ask sender to retransmit.
5-24	The SAF memory became full while storing the second or subsquent page of a document	No action; temporary memory shortage.
5-30	While printing the first page of a file, all mode tables became used up.	

6. ECM Errors

Code	Cause	Required Action
6-00	T1 timer ran out	Retry the communication.
6-01	Protocol cannot be received	
6-02	EOR received	
6-03	Unexpected or abnormal protocol signal received	
6-04	RTC was not received	
6-05	Facsimile data frame not received (line fail does not occur)	
6-06	DCR error	
6-08	PIP/PIN was received in reply to PPS. NULL	
6-09	ERR received	
6-10	Error frames still received at other end after all communication attempts at 2400 bps.	
6-99	A protocol signal took more than 6s to transmit.	

Code	Meaning	Suggested Cause/Action
9-00	Page memory and FIFO full	
9-01	Toner collection tank full	1. Replace master unit. 2. Replace toner overflow sensor.
9-02	The printer control hardware cannot receive a line of data using the usual DMA process.	
9-03	Copy jam in feed-out area	
9-04	Copy jam in feed-out area	
9-05	Copy jam in feed-out area	
9-06	Time to replace the master	
9-07	Copy jam at cassette entrance	
9-08	Copy jam under the upper unit	
9-09	Copy jam at copy feed-out area	
9-10	Toner cartridge empty	
9-12	Cover open	1. Close the door. 2. Check cover switches. 3. Replace FCU, UIB, DSB, or LIB.

Code	Meaning	Suggested Cause/Action
9-17	Transfer corona power leak	1. Execute function 97. 2. Clean corona unit. 3. Replace FCU, power pack or corona unit.
9-20	LD power control failed	1. Excute function 97. 2. Replace the FCU, UIB, LDDR, master set sensor, or the master.
9-21	Master home position sensor failed	1. Execute function 97. 2. Clean master unit sensor patch. 3. Replace sensor, UIB, or FCU.
9-22	Fusing lamp failed	
9-23	Pentagonal mirror motor lock failed or laser main scan synchronization failed.	1. Execute function 97. 2. Replace the FCU, SMDR, UIB, LDS or pentagonal mirror motor.

Code	Meaning	Suggested Cause/Action
9-24	Main motor lock failed or lower paper feed motor lock failed	1. Execute function 97. 2. Replace the motor and driver, or the FCU.
9-25	Handshake error between FCU and UIB	1. Software error; use function 97 to reset. 2. Change FCU or UIB.
9-26	Handshake error between FCU and LIB	1. Software error; use function 97 to reset. 2. Change FCU or LIB.
9-27	Handshake error between the two cpus on the FCU.	1. Replace the FCU.

9-5 ECM Communication Troubleshooting

Communication tests in areas with frequent bad lines have led to the following countermeasures.

1. **Excessive Impulse Noise**
   Reduce the frame size to 64 octets.
   To do this, set bit 1 of bit switch 1A to 1.

2. **Poor Signal-to-noise Ratio**
   Adjust the training error tolerance with bits 6 and 7 of bit switch 8. The most effective setting is different for each data rate, as follows.

   9600 bps: 0
   7200 bps: 2
   4800 bps: 4*
   2400 bps: 15

   ***This machine can not use this setting, so try either 2 or 10.**

APPENDIX

APPENDIX A BIT SWITCHES

1. Factory Settings

BITSW	G	I	UK	UNI
0	02	02	02	02
1	60	60	60	60
2	A0	00	00	00
3	0A	0A	06	0A
4	96	96	96	96
5	00	00	00	00
6	D7	C0	C0	C0
7	00	00	00	00
8	22	20	20	20
9	00	00	00	00
A	60	40	40	00
B	71	70	70	70
C	86	86	86	86
D	00	00	00	00
E	00	00	00	00
F	C0	C0	C0	C0

BITSW	G	I	UK	UNI
10	20	38	38	38
11	01	03	02	02
12	80	80	80	80
13	FF	FF	FF	FF
14	C0	C0	C0	C0
15	13	13	13	13
16	E4	E4	E4	E4
17	A0	A0	A0	A0
18	08	08	08	08
19	0A	0A	0A	0A
1A	40	40	40	40
1B	00	00	00	00
1C	00	00	00	00
1D	08	08	08	08
1E	50	50	70	70
1F	18	18	18	18

Note: • G = W.Germany, I = Italy, UK = United Kingdom, UNI = Universal

• The bit switch factory settings are given in hex code. The first figure represents bits 7 to 4 and the second figure represents bits 3 to 0.

2. Functions

BITSW 0

Bit No.	Function	Remarks
0	Back-to-back function 1; Enabled When this bit is set to "1", the Start key is enabled without picking up the handset.	Set to 1 when connecting two machines in a back-to-back test.
1	Memory read/write request 1; Not acceptable When this bit is set to "1", a memory read/write request is not accepted.	This bit should be "0" when RAM data is to be changed from the service center.
2	Operator call if there is no response to DIS 0; Enabled 1; Disabled	If bit switch B bit 3 is set to 1, there is never any operator call
3	Program key guidance (Austrian PTT requirement) 0; Disabled 1; Enabled	
4 5 6	Not used	

Bit No.	Function	Remarks
7	Communication parameter display 1; Display enabled When connected in GIII mode, the communication parameters are displayed during communication. Data are displayed as shown below.	Use to confirm the communication parameters. Note that the size in the third column refers to the transmitted size (after reduction) i.e., the paper size in the receiver.

96,	S	2D,	AN,	DCS,	10M,
Modem rate	Resolution	Coding	Size and reduction	Mode	I/O rate
96: 9600 bps	S: 3.85 lines/mm	1D: MH	A: A4 size	DCS: CCITT	10M
72: 7200 bps	D: 7.7 lines/mm	2D: MR	N: No reduction	standard mode	20M
48: 4800 bps		1E: EFC and MH	B: B4 size	NSS: Non-standard	40M
24: 2400 bps		2E: EFC and MR	R: Reduction	mode (RICOH)	
		1C: MH and ECM			
		2C: MR and ECM			

BITSW 1

Bit No.	Function	Remarks
0	Fax/Tel selection 0; Fax 1; Tel This bit can be changed by Function 51. When this bit is set to "1", automatic reception is not available.	
1	Resolution selection at power-up 0; Standard 1; Detail	
2	Standby default resolution 1; As specified in bit 1 When communication is finished, the resolution returns to that selected by bit No. 1 if this is "1".	
3 4	Contrast selection at power-up 0, 0 } Normal; 1, 0 } Dark; 0, 1 } Light; 1, 1 } Halftone The contrast selected by these bits is selected at power up and when transmission is completed.	
5	Setting of keypad default mode 0; Speed Dial 1; Full telephone numbers	
6	Standby contrast selection 0; Contrast does not reset after the end of transmission. 1; Contrast resets to the setting specified in bits 3 and 4 above.	
7	MTF 0; Enabled 1; Disabled	

BITSW 2

Bit No.	Function	Remarks
0 1	Transmission modem rate 0 0 } 9600 bps　1 0 } 7200 bps　0 1 } 4800 bps　1 1 } 2400 bps	
2 3 4	Do not use.	Keep at 0.
5	EFC in transmit mode 0; Enabled　1; Disabled	If the remote end has compatible EFC, EFC is used if this bit is 0.
6	Coding　0; MR priority　1; MH only	
7	Recognition of remote terminal's paper length 0; No limit is recognized 1; Limit is recognized. MPS is sent after receiving the length specified by the remote terminal. The remote terminal may designate a fixed paper length, such as A4 or B4.	

BITSW 3

Bit No.	Function	Remarks
	Transmission level from modem	The Tx level is the sum of these 4 bits.
0 1 2 3	0: – 1 dB 1: 0 dB 0: – 2 dB 1: 0 dB 0: – 4 dB 1: 0 dB 0: – 8 dB 1: 0 dB	Controls the attenuator in the MIF.
4	Protection against wrong connections	
5	0 0 } No protection 0 1 } When the CSI number from the remote terminal is different from the telephone number entered, transmission is stopped. 1 1 } 0 1 } When CSI or RTI is not sent from the remote terminal, transmission is stopped.	If there is a wrong connection and protection is enabled, the TCR indicates E if bit 6 of BITSW 4 is 1, but there is no error code.
6 7	Do not use in the field.	Keep at 0

BITSW 4

Bit No.	Function	Remarks
0	Hang-up decision when a negative code (RTN or PIN) is received. 0; No hang-up 1; Hang-up	
1	Echo countermeasure 0; Enabled When the same code that was sent is received, it is ignored.	If this is set to 1, the machine will disconnect instead of ignoring echoes.
2	CNG signal transmission in manual transmission mode 0; Enabled	
3	DIS detection times (Echo countermeasure for transmission) 0; Once 1; Twice	If this is set to 1, the machine waits for a second DIS before returning DCS.
4 5	Page retransmission times 0, 0 } None 1, 0 } Once 0, 1 } Twice 1, 1 } Three times	
6	Printing condition of TCR 0; Results of communications which were disconnected before transmission/reception of image data are not printed. 1; All communications are listed except for telephone calls	
7	Do not use.	Keep at 1.

BITSW 5

Bit No.	Function	Remarks
0	Display priority between RTI and CSI 0; RTI priority 1 ; CSI When both RTI and CSI are received, the frame with priority is displayed.	
1	RIT and CSI frame display decision 0; Displays the frame with priority 1; Displays both frames	
2	RTI and/or CSI frame display decision 0; Displayed When this bit is “1”, bits 0 and 1 are ignored.	
3	NSF frame reception in Tx mode 0; Enabled	
4	Transmission of the TSI frame before the DCS code in Tx mode 0; Enabled	
5	Transmission of the RTI frame after the NSS (S) code in Tx mode 0; Enabled	
6	GI (Group Identification) signal reception in G2 Tx mode 0; Enabled	
7	Not used.	

BITSW 6

Bit No.	Function	Remarks
0	Confidential transmission 0; Enabled 1; Disabled	FTZ specification (Europe)
1	Transfer request 0; Enabled 1; Disabled	FTZ specification (Europe)
2	End of page signal after 8 minutes 0; Disabled 1; The transmitter sends an end-of-page signal if the page takes longer than 8 minutes to transmit. The receiver outputs the rest of the page on a separate sheet.	FTZ specification (Europe)
3	Print out of copy sample on memory transmission report, even if transmission was successful 0; Disabled 1; Enabled	
4	Resolution in A3-to-A4 reduction mode during G3 transmission 0; Detail 1; Resolution which is selected	This works in CCITT mode and Ricoh non-standard mode.

Bit No.	Function	Remarks
5	Reduction in transmission 0; Enabled Document Width / Paper width at the remote terminal / Reduction A3 / B4 / Reduced to B4 A3 / A4 / Reduced to A4 B4 / A4 / Reduced to A4 1; Disabled The width of transmitted data will match the paper width which is set in the remote terminal; left and right edges will be lost. Note: When this bit is set to "1", bit No. 4 is ignored.	
6	Not used	
7	Conditions for going into transmit mode 0; After detecting polarity change or CED 1; Goes into Tx mode after detecting any frame.	

BITSW 7

Bit No.	Function	Remarks
0	Line error counter method 0; Selects bit no. 1 method 1; Selects bit no. 2/3 and bit no. 4/5/6 method (for Europe)	
1	Line error counter decrement during G3 reception 0; Decremented by 1 every time 10 lines are received perfectly. 1; Disabled When a line error occurs, the error counter increases by 1. When the counter reaches 10, RTN is sent.	
2 3	New FTZ Quality Criterion — Threshold value for line errors. 0 3 (6) 0 lines 1 4 (8) 0 lines 0 5 (10) 1 lines 1 6(12) 1 lines	Values for detailed resolution are in parenthesis. In the new FTZ quality check, the error line counter will be decremented by one every time an error-free line is received.
4 5 6	New FTZ Quality Criterion — Error Line Ratio (Error Lines/Total Lines * 100) 0 0 0 } 5% 1 0 0 } 6% 0 1 0 } 7% 1 1 0 } 8% 0 0 1 } 9% 1 0 1 } 10%	
7	Reconstruction time for the first line 0; 6 s 1; 10 s	If the sending terminal is controlled by a computer (e.g., PC with fax board), the delay between CFR and data transmission may be longer than usual. In this case, set this bit to 1.

BITSW 8

Bit No.	Function	Remarks
0	Paper length informed in NSF to tx side 0; Unlimited 1; A4	
1	EFC function in receive mode 0; Enabled	
2	Coding method to be notified to the transmitting terminal 0; MH and MR 1; MH only	
3 4	Modem types to be notified to the transmitting terminal 0 V29 1 V27 ter 0, 1 V27 ter 0 V27 ter 0 (4800 bps) 1, 1 fall back (2400 bps)	
5	Receiver training error counter method 0; For USA, Asia, etc. 1; For Europe only	See bits 6 and 7.
6 7	Receiver training error tolerance For USA, Asia, etc. 0,0: 15 bits; 1,0: 10 bits; 0,1: 2 bits; 1,1: 0 bits For Europe only 0,0: 14 bits; 1,0: 9 bits; 0,1: 4 bits; 1,1: 1 bit	

BITSW 9

Bit No.	Function	Remarks
0	Resolution to be notified to the transmitting terminal 0; 3.85 (Standard) and 7.7 (Detail) 1; 3.85 only	
1 2	Do not use in the field.	Keep at 0.
3 4	Modem rate for the start of reception 0, 0: 9600 bps; 1, 0: 7200 bps; 0, 1: 4800 bps; 1, 1: 2400 bps	
5 6 7	Do not use.	Keep at 0.

BITSW A

Bit No.	Function	Remarks
0	Transmission of the NSF (S) frame in Rx mode 0; Enabled	
1	Transmission of the RTI frame in Rx mode 0; Enabled	
2	Transmission of the CSI frame in Rx mode 0; Enabled	
3	Transmission of the Group Identification signal in Rx mode 0; Enabled	
4	Substitute reception 1; Disabled	For Europe
5	Confidential reception 1; Disabled	For Europe
6	Condition for SAF reception 1; SAF can receive only when a RTI or CSI frame is received from the remote terminal. 0; SAF can receive even when a RTI or CSI frame is not detected.	
7	Not used.	Always keep at 0.

BITSW B

Bit No.	Function	Remarks
0	Confidential transmission or reception with personal ID 1; Disabled	
1	Communication mode at power up 0; AUTO 1; G2	
2	Compatibility with MV1200 1; Enabled	
3	FTZ Specifications 1; Enabled	For Europe; enables FTZ protocol and bits 3 and 5 of BITSW 10.
4	Do not use.	Keep at 1.
5 6 7	Do not use.	

BITSW C

Bit No.	Function	Remarks
0	Monitor speaker during transmission 1; Disabled at all times during transmission	
1 2 3	Monitor speaker volume during transmission 0; 0 dB 1; + 3 dB 0; 0 dB 1; + 6 dB 0; 0 dB 1; + 12 dB	Changed by function 56.
4	Monitor speaker during reception 1; Disabled at all times during reception	
5 6 7	Monitor speaker volume during reception 0; 0 dB 1; + 3 dB 0; 0 dB 1; + 6 dB 0; 0 dB 1; + 12 dB	Changed by function 56.

BITSW D

Bit No.	Function	Remarks
0	Transmission report output 0; Enabled	
1	Error report output 0; Enabled	
2	Automatic Journal output 0; Output automatically every 35 communications 1; Not output automatically	
3	Journal memory cleared after output 1; Journal cleared Journal memory is cleared after a manual Journal output (Function 70) is performed.	
4	TSI printing 0; Enabled When this bit is set at 0, the TSI or RTI sent from the transmitter is printed at the head or the output data.	If this is enabled and if bit 3 of bit switch F is 1, the TSI will be printed on top of the RTI
5	Clearing of the report memory 1; Clear When the stop button or function button is pressed, or when the timer is exceeded after this bit is set at 1, Journal, Service Report, Error Report and error codes are all cleared. After erasing, the bit is automatically set back to 0.	

Bit No.	Function	Remarks
6	Clearing of the transmit and receive counters/scanned and printed document counters 1; Clear When the stop button or function button is pressed, or when the timer is exceeded after this bit is set at 1, the counters are cleared. When they are cleared, this bit is automatically set back to 0.	
7	RAM clear and reset After this bit is set to 1, the CPU resets the machine to all default settings.	Factory use only.

BITSW E

Bit No.	Function	Remarks
0 1	Maximum transmittable document length 0, 0: 600 mm 1, 0: 1.2 m 0, 1: 14 m	(1, 1) is not used.
2	Do not use.	Keep at zero.
3	Printer paper width 0; Read from sensor 1; Taken as A width; informs A width in protocol	
4	Do not use.	Keep at zero.
5	Di relay ON time interval when using DTMF mode for on-hook dialing. 0; 0.5 s 1; 1 s	Set to 1 if the pause between digits is not long enough, and causes dialing to be affected by noise.
6	Stamper 0; Enabled	
7	Monitor speaker status during video data communication 0; Off 1; On	

BITSW F

Bit No.	Function	Remarks
0	TTI date output 0; Transmitted as document data 1; Not transmitted	
1	TTI character output 0; Transmitted 1; Not transmitted	
2	TTI page number output 0; Transmitted 1; Not transmitted	
3	TTI printing start position This is the distance of the time/date information in from the scan start position. 0; 24 mm 1; 48mm	
4	TTI printing during copying 0; Prohibited 1; Printed	
5 6	Buzzer volume during operator call for Voice Request 0 0 Loud; 1 0 Medium; 0 1 Weak; 1 1 Off	
7	Do not use	Keep at 1.

BITSW 10

Bit No.	Function	Remarks
0	Page count prompt 0; Displayed 1; Not displayed	Changed by function 54.
1	Department code prompt 0; Displayed 1; Not displayed	Changed by function 55.
2	Page numbering on copies made in multicopy mode 0; Batch-numbering 1; No numbering	
3	EFC prompt 0; Displayed	FTZ specification.
4	Reduction prompt 0; Displayed	FTZ specification.
5	Resolution prompt 0; Displayed	FTZ specification.
6	Closed network reception 0; Disabled 1; Enabled	
7	Closed network transmission 0; Disabled 1; Enabled	

BITSW 11

Bit No.	Function	Remarks
0 1 2 3 4	Country code of the local terminal BIT NO. 4 3 2 1 0 Germany 0 0 0 0 1 England 0 0 0 1 0 Italy 0 0 0 1 1 Austria 0 0 1 0 0 Belgium 0 0 1 0 1 Denmark 0 0 1 1 0 Finland 0 0 1 1 1 Ireland 0 1 0 0 0 Norway 0 1 0 0 1 Sweden 0 1 0 1 0 Switzerland 0 1 0 1 1 Portugal 0 1 1 0 0 Netherlands 0 1 1 0 1 U.S.A. 1 0 0 0 1 Asia 1 0 0 1 0 Japan 1 0 0 1 1 Spain 0 1 1 1 0	For enabling the required set of PTT parameters.
5	Not used (Japan only)	
6 7	PSTN access method through PABX BIT NO. 7 6 No PABX used 0 0 Loop Start 0 1 Ground Start 1 0 Flash Start 1 1	

BITSW 12

Bit No.	Function	Remarks
0 1	Dialing method in pulse dial mode BIT NO. 1 0 P = N 0 0 Normal P = 10 — N 0 1 Oslo P = N + 1 1 0 Sweden P: Number of pulses N: Dialed No.	Note that in P = N mode, 0 is 10 pulses.
2	Dial tone detection (PSTN) 0; Enabled	Europe only
3	Busy and ringback tone detection 0; Enabled	Europe only
4	Line current detection 0; Enabled	Europe only
5	Dial tone detection (PABX) 0; Enabled	Europe only
6	Redial when CCITT T1 timer exceeded 0; Enabled 1; Disabled (for Austria and Norway)	
7	Dialing method 0; DTMF 1; PD	Changed by function 89.

BITSW 13

Bit No.	Function		Remarks
0	PSTN access number		
1			
2	Access No.	Hex value of BITSW13	Example: Code 0 Set bits 0 — 3 to 0 and bits 4 — 7 to 1.
3	0	F0	
	↓	↓	
4	9	F9	
			FF: Disabled
5	00	00	
	↓	↓	
6	99	99	
7	If the machine detects this access code at the start of a telephone number, it will close the loop, then pause for a few seconds before continuing. This function is only enabled when bit switch 11, bit 6 and 7 select loop Start.		

BITSW 14

Bit No.	Function	Remarks
0	Do not use	Keep at 0.
1	Not used.	
2 3 4	Do not use	
5	Ground start (Europe NCU only) 0; Enabled	Set this bit to 1 when the ground start jumper is installed.
6	Do not use	Keep at 1.
7	Dial pulse rate of NCU auto-dialer 0; 20 pps 1; 10 pps	

BITSW 15

Bit No.	Function	Remarks
0	Machine type	Keep at (1, 1) for the FAX1000L.
1	1 } FAX1000L 1	
2	Do not use	Keep at 0.
3	Halftone dither method 0; 64 levels 1; 16 levels	
4	Do not use	Keep at 1.
5	Not used	
6	Not used.	
7	Polling File List and Memory Transmission Report 0; Enabled 1; Disabled	Even if this bit is set to 1, the report is printed when an error occurs.

BITSW 16

Bit No.	Function	Remarks
0	Monitor speaker in dialing mode 0; Enabled	
1 2 3	Monitor speaker volume in dialing mode 0; 0 dB 1; + 3 dB 0; 0 dB 1; + 6 dB 0; 0 dB 1; + 12 dB	
4	Do not use	Keep at 0.
5 6	Buzzer volume for ringing signals 0, 0: Loud; 1, 0: Medium; 0, 1: Weak; 1, 1: Off	
7	Do not use	Keep at 1.

BITSW 17

Bit No.	Function	Remarks
0 1 2 3 4 5 6 7	Do not use	

BITSW 18

Bit No.	Function	Remarks
0	Automatic memory report output 0; Enabled 1; Disabled	
1	Image data on memory transmission reports for failed transmissions 1; Not included 0; Included	
2	Length of reproduced image data on memory transmission report for failed transmissions 0; 150 mm 1; 250 mm Only valid if bit 1 is set to 1.	
3	Multicopy 0; Disabled 1; Enabled	
4	Reduction when printing out a message received by substitute reception 0; Enabled 1; Disabled	
5	Action when there is a jam while printing a message received by substitute reception 0; Pages already printed are erased 1; No pages are erased.	

Bit No.	Function	Remarks
6	Use of Quick Dial key “W” to toggle between stamper enabled and disabled 0; Disabled 1; Enabled If enabled, key W cannot be used to store a telephone number or keystroke program.	
7	Use of Quick Dial key “X” to toggle between Fax Tel modes 0; Disabled 1; Enabled If enabled, key X cannot be used to store a telephone number or keystroke program.	

BITSW 19

Bit No.	Function	Remarks
0	Action when paper ends 0; Data coming in after paper end is stored in the SAF. 1; Communication ends after paper runs out.	
1	Do not use	Keep at 1.
2	Action when memory overflows during memory reception. 0; Only complete pages are kept. 1; The latest page is kept even if it cannot be completely stored.	
3	Do not use	Keep at 1.
4	Do not use	Keep at 1.
5 6 7	Do not use	Keep at 0.

BITSW 1A

Bit No.	Function	Remarks
0	ECM transmission 0; Enabled	
1	Frame size 0; 256 octets 1; 64 octets	
2	CTC transmission 0; Used 1; Not used (always sends EOR)	
3	CTC shiftdown 0; Enabled	
4	End of page alignment before RCP 0; End of current octet 1; End of current frame	
5	CTC fallback method 0; Ricoh non-standard (only for use between Ricoh machines) 1; CCITT method	
6	Maximum number of PPR frames that can be received after sending CTC without data rate fallback, before sending DCN 0; 3 1; 4	
7	ECM in reception 0; Enabled	

BITSW 1B

Bit No.	Function	Remarks
0	Short preamble in transmit mode 1; Enabled	
1	Short preamble in receive mode 1; Enabled	
2	Page printout timing 0; Page is printed out until an error frame is received 1; Page is printed only when all frames have been correctly received.	
3	Flow control based on remote receiver's printer speed 0; None 1; When transmitting, the local ECM terminal sends data in blocks; each block needs one minute to be printed at the remote terminal.	
4	Action on receiving EOR 0; Ricoh mode — prints the block up to the first error frame, then cuts the line 1; CCITT mode — prints the block up to the first error frame, then the next block will be sent at the original data rate (before fallback)	
5	Not used	

Bit No.	Function	Remarks
6	ECM transmission with halftone mode 0; In the transmission mode, if halftone is selected, ECM is disabled. During ECM communication, halftone cannot be selected. 1; Both halftone and ECM can be selected at the same time	
7	ECM mode: Data rate for the next page (after EOM) if there was fallback in the page just sent 0; As for the end of the page just sent 1; Original data rate before fallback (specified by bit switch 2) Non-ECM mode: Action when RTN is received 0: Next page transmitted at a lower data rate 1; Next page transmitted at the same speed	

BITSW 1C

Bit No.	Function	Remarks
0 1	Not used.	
2	Cable equalization in receive mode 1; Enabled	Adjust bits 2 — 7 when there is signal loss due to the length of wire between the modem and the telephone exchange.
3 4	Cable equalization in receive mode 0 0 → 0 1 0 → Low 0 1 → Medium 1 1 → High	
5	Cable equalization in transmit mode 1; Enabled	
6 7	Cable equalization in transmit mode 0 0 → 0 1 0 → Low 0 1 → Medium 1 1 → High	

BITSW 1D

Bit No.	Function	Remarks
0	Not used.	
1	Report output size 0; A4 1; Letter	
2	Do not use	Keep at 0.
3	Master belt replacement level 0; Service function 1; User function	
4	Do not use	Keep at 0.
5	Lower cassette option 0; Not installed 1; Installed	If there is a problem in the lower cassette, set this bit to 0 until the problem is cleared.
6 7	Do not use	Keep at 0.

BITSW 1E

Bit No.	Function	Remarks
0	ECM in Tx mode (FTZ specification). When this bit is 1, bits 1 and 2 of BITSW 1E are ignored and ECM cannot be selected by function 83.	
1	Standby default setting of ECM 1: As specified in bit 2 1; Bit 2 is ignored	
2	Standby default setting of ECM 0; On 1; Off	
3	Do not use	Keep at 0.
4	Full week timer programming 0; Disabled 1; Enabled	
5	Functions 88 and 89 0; Service Mode 1; User Mode	
6	Action if EOR • Q or EOR • PRI-Q was received or if there was a protocol error. 0; Normal frames after the error frame are not transmitted. 1; Normal frames after the error frame are transmitted.	
7	Do not use	Keep at 0.

BITSW 1F

Bit No.	Function	Remarks
0	Do not use	Keep at 0.
1	Smoothing 0; Enabled (except for reports) 1; Disabled	
2	Reduction in copy mode 0; Disabled 1; Enabled	
3	Action when received page is longer than the copy paper 0; The final-few lines of the page are printed again at the top of the next page 1; The next page begins from where the previous page left off	
4	Reduction when received page is longer than the copy paper. 0; Enabled. Bit 3 is ignored unless Rx page is still too big after reduction. In this case, the page is not reduced and is treated according to bit 3. 1; Disabled. The page is treated according to bit 3.	

Bit No.	Function	Remarks
5	End of page mark on all printed pages but the final one 0; Enabled 1; Disabled If this feature is enabled, marks (as described opposite) are printed on received pages when the transmitted page was so long that it had to be printed on two pages of copy paper.	If enabled, printed pages are marked as follows — An asterisk is printed in the bottom right-hand corner of each page — The page numbers of pages 2 through 12 are printed in the top right-hand corner — Pages 13 and onwards have an asterisk in the top right-hand corner
6	Auto Service Call 0; Enabled 1; Disabled	The service station number must be programmed for Auto Service Call to work.
7	Operator warning on LCD for master belt exchange and user maintenance. 0; Enabled 1; Disabled	Keep at 0.

APPENDIX B JUMPERS, TEST POINTS, AND VRs.

1. FCU

— Test Points —

TP1	See the point-to-point diagram
TP2	Laser Data Transfer Clock
TP3 – 10	See the point-to-point diagram

VC1 – Do not touch.

JP1 – Not used

2. MBU

SW1 – Battery switch. Keep closed during operation and open during transportation.

3. OPU

JP1, 2 — LCD brightness adjustment.

4. UIB, DSB, DRU, PMU, LSD

TPs – See the point-to-point diagram.

5. LDDR

VR1 – Do not touch
TP1 – + 12V
TP2, 3, 4 — Do not use
TP5 – XLPDET (Laser power feedback signal)
TP6 – COM1

6. SBU

TP1 – XVIDEO

7. Power Pack

Do not touch any of the VRs.

8. PSU

VR1 — Do not touch

9. BSR
SW – Battery switch. Keep closed during operation and open during transportation
TP1 — COM1
TP2 – VDD2 (Power to SRAM)

10. MIF

All jumpers: Not used

11. NCU

Country	JP1	JP2	JP3	JP4	JP5	JP6	JP7	JP8	JP9	JP11	JP12	JP13	JP14	JP15	JP16	JP17	JP18
Austria	x	x	x	x	x	o	o	o	o	x	o	o	o	o	o	o	x
Belgium	x	o	x	x	x	o	o	o	o	x	o	o	o	o	o	o	x
Denmark	x	o	x	x	x	x	o	o	x	x	o	o	o	o	x	x	x
Finland	o	x	o	x	x	x	o	o	o	x	o	o	o	x	o	o	x
France	x	o	x	x	x	o	o	o	o	x	o	o	o	o	o	o	x
W.Germany	o	x	x	o	x	o	o	o	o	x	o	o	o	o	o	o	x
Ireland	o	x	x	o	x	o	o	o	o	x	o	o	o	o	o	o	o
Italy	o	x	x	o	x	o	o	o	o	x	o	o	o	o	o	o	x
Netherlands	x	o	x	x	x	x	o	o	o	x	o	o	o	o	o	o	x
Norway	x	o	x	x	x	x	o	o	o	o	o	o	o	o	o	o	x
Portugal	x	o	x	x	x	o	o	o	o	x	o	o	o	o	o	o	x
Sweden	x	o	x	x	o	x	o	x	o	x	o	o	o	o	o	o	x
Switzerland	x	x	x	x	x	o	x	o	o	x	o	o	x	x	o	o	x
U.K.	o	x	x	o	x	o	o	o	o	x	o	o	o	o	o	o	x

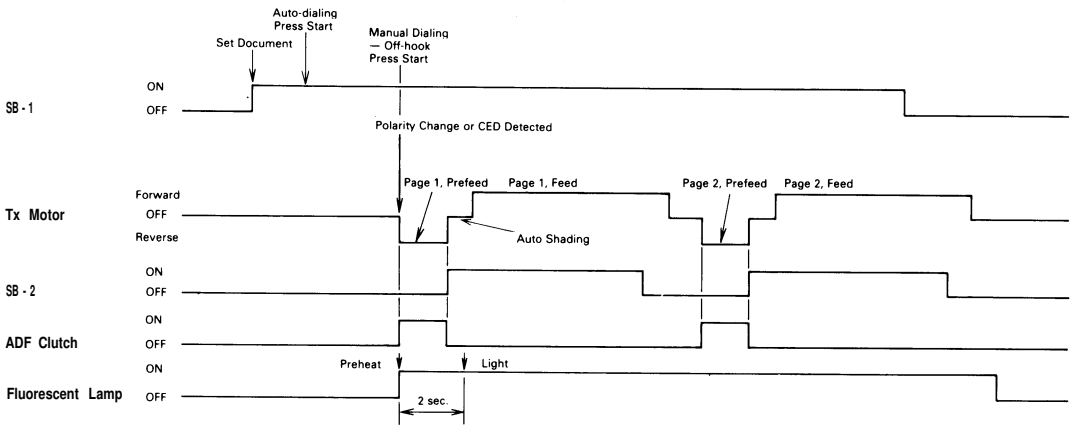
o : Shorted x : Open

JP1 — 4, 18:	Ringing detection circuit
JP5 — 7, 9:	Spark quenching circuit
JP8:	Insertion loss improvement
JP10:	Not used
JP11:	Return loss
JP12:	Service mode enable/disable (Shorted = enabled)
JP13:	HIC2 output level
JP14, 15:	Arrestor grounding
JP16, 17	Inclusion of capacitor across terminals
JP101, 102:	Not used

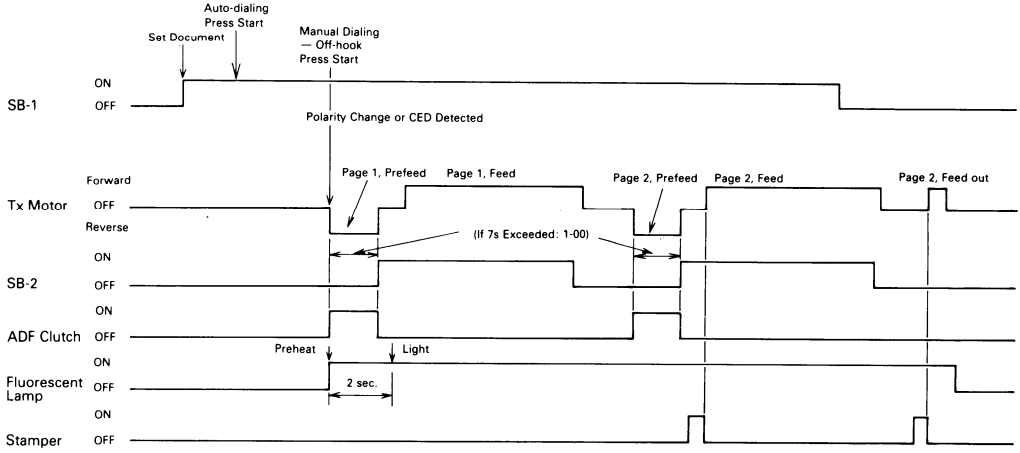
VR1 – Tx level fine adjustment (range 3 dB)

APPENDIX C. TIMING CHARTS

1. ADF/Scanner

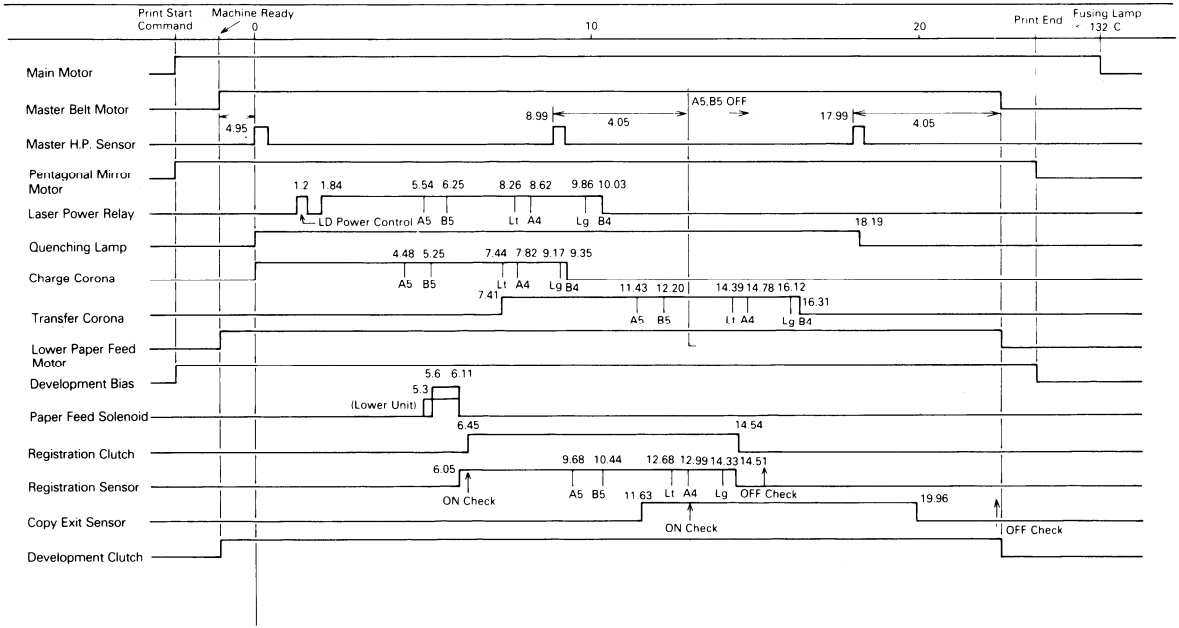


1. Two pages, stamper disabled

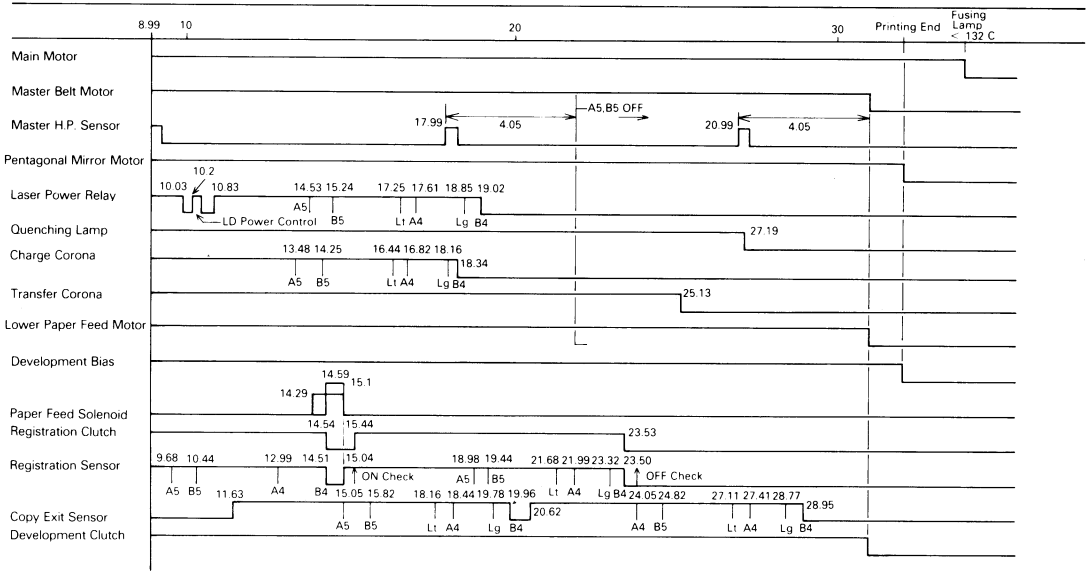


2. Two pages, stamper enabled

2. Printer



1. One-page Reception



2. Two-page Reception (extension to previous chart)

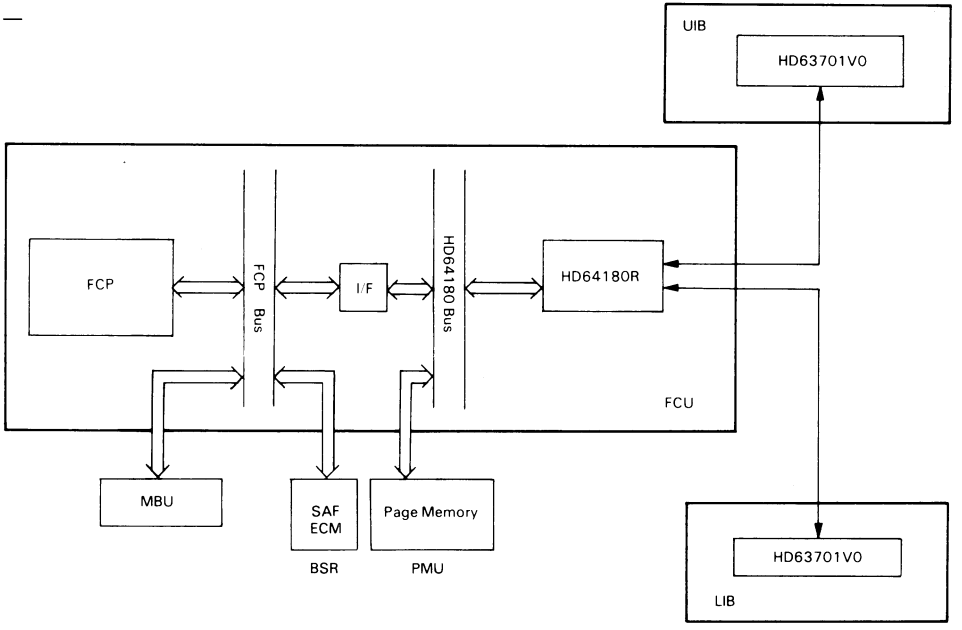
APPENDIX D. SENSOR TABLE

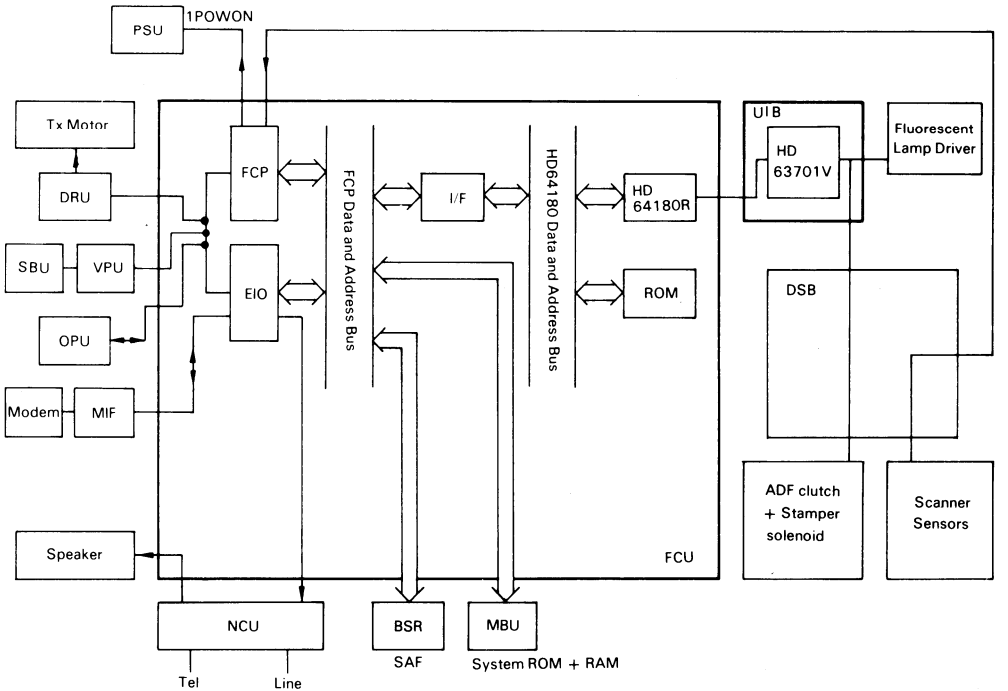
Name	Type	Output H	Output L	Remarks
Document sensor (SB - 1)	Photointerruptor	No paper	Paper	
Scan line sensor (SB - 2)	Photointerruptor	No paper	Paper	
Document width sensors (SB - 3A, 3B)	Photointerruptors	No paper	Paper	
ADF cover switch (SB - 10)	Microswitch	Cover open	Cover closed	
Master home position sensor	Reflective photosensor	Not home	Home	Low for 0.2 s
Master set sensor	Interlock switch	Cover closed	Cover open	+ 12V for LDDR
Paper size sensor	Microswitches	Not actuated	Actuated	
Paper end sensor	Photointerrupter	No paper	Paper	
Paper near-end sensor	Photointerrupter	Near-end	Normal	
Paper height sensor	Photointerrupter	Level low	Level normal	
Registration sensor	Photointerrupter	No paper	Paper	
Copy exit sensor	Photointerrupter	No paper	Paper	
Toner overflow sensor	Photointerrupter	Overflow	Normal	
Toner end sensor	Photointerrupter	Toner present	Toner end	L peaks for 50 ms every 2 s.
Right cover switch	Microswitch	Cover open	Cover closed	
Upper unit interlock switch	Interlock switch	Cover open	Cover closed	Measure at FCU CN22-2

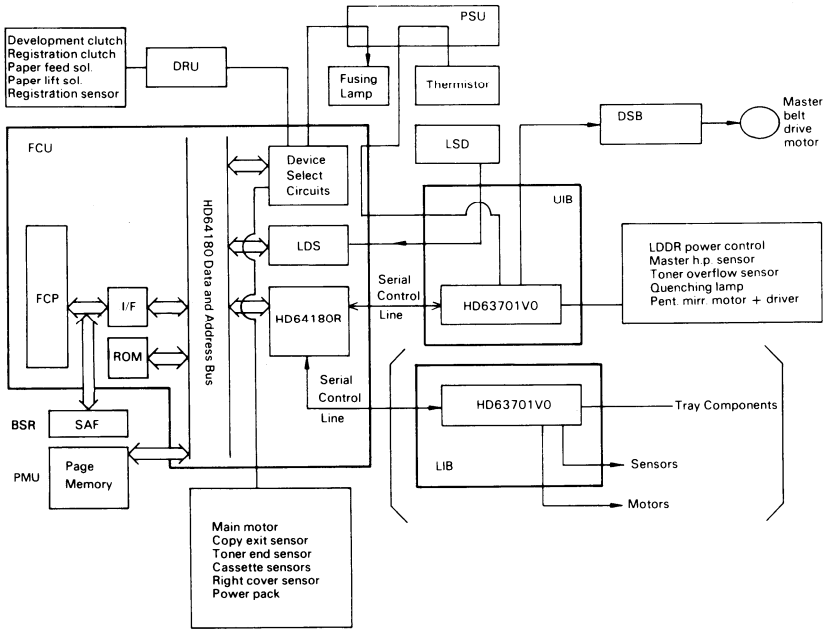
APPENDIX E. BLOCK DIAGRAMS

1. Overall System Control

— Overview —

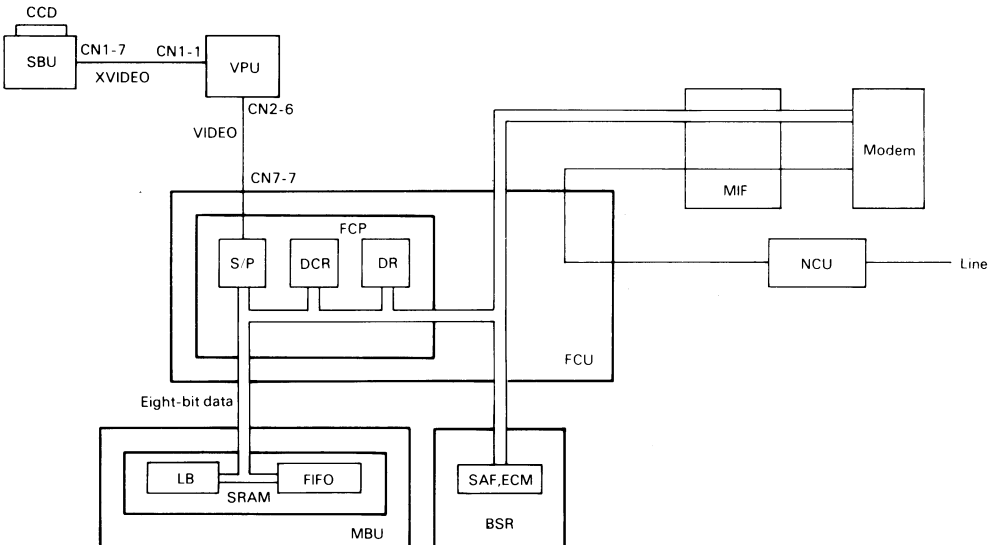



PSU
1POWON
Tx Motor
DRU
SBU
VPU
OPU
Modem
MIF
Speaker
FCP
EIO
FCP Data and Address Bus
I/F
HD64180 Data and Address Bus
HD 64180R
ROM
UIB
HD 63701V
Fluorescent Lamp Driver
DSB
ADF clutch + Stamper solenoid
Scanner Sensors
FCU
NCU
Tel
Line
BSR
SAF
MBU
System ROM + RAM

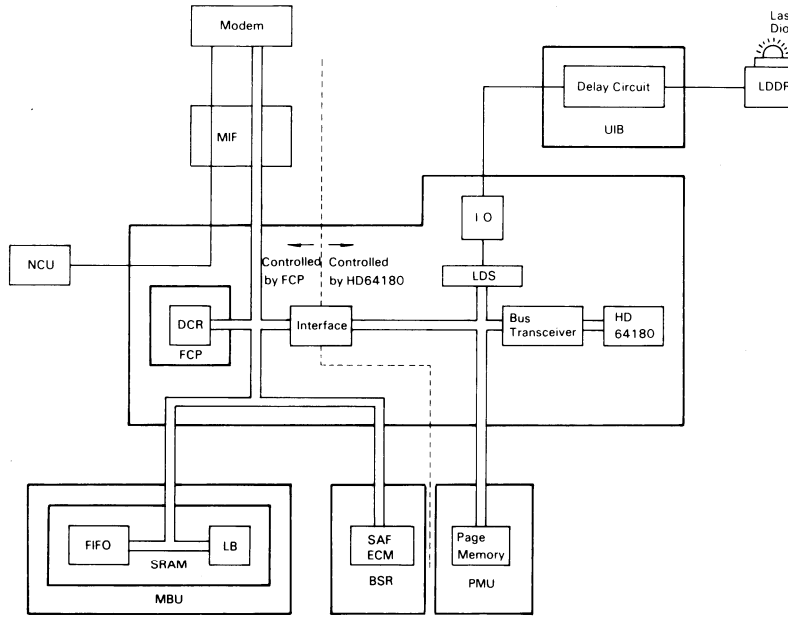

PSU
Development clutch
Registration clutch
Paper feed sol.
Paper lift sol.
Registration sensor
DRU
Fusing Lamp
Thermistor
DSB
Master belt drive motor
FCU
Device Select Circuits
LSD
UIB
HD64180 Data and Address Bus
LDS
LDDR power control
Master h.p. sensor
Toner overflow sensor
Quenching lamp
Pent. mirr. motor + driver
FCP
I/F
ROM
HD64180R
Serial Control Line
HD63701V0
Serial Control Line
HD63701V0
Tray Components
BSR
SAF
PMU
Page Memory
LIB
Sensors
Motors
Main motor
Copy exit sensor
Toner end sensor
Cassette sensors
Right cover sensor
Power pack

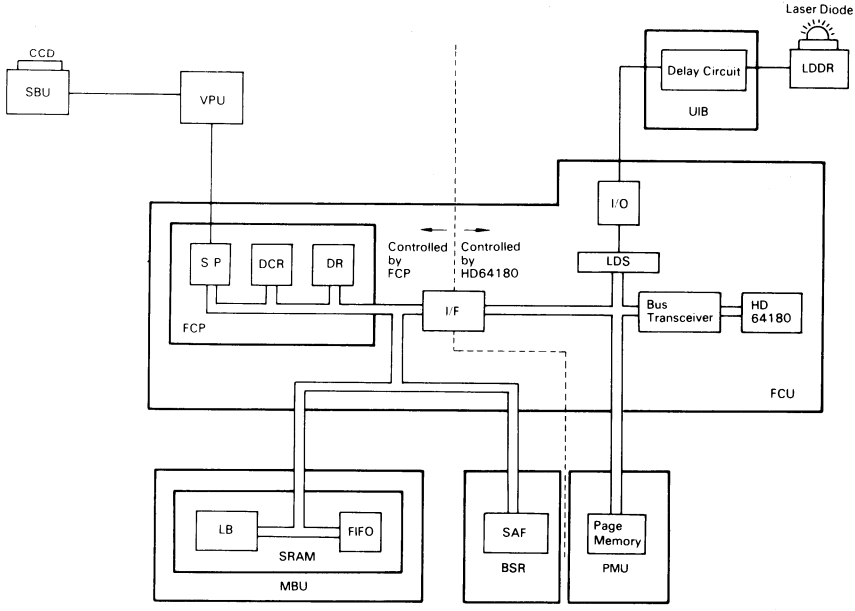
2. Video Data Flow

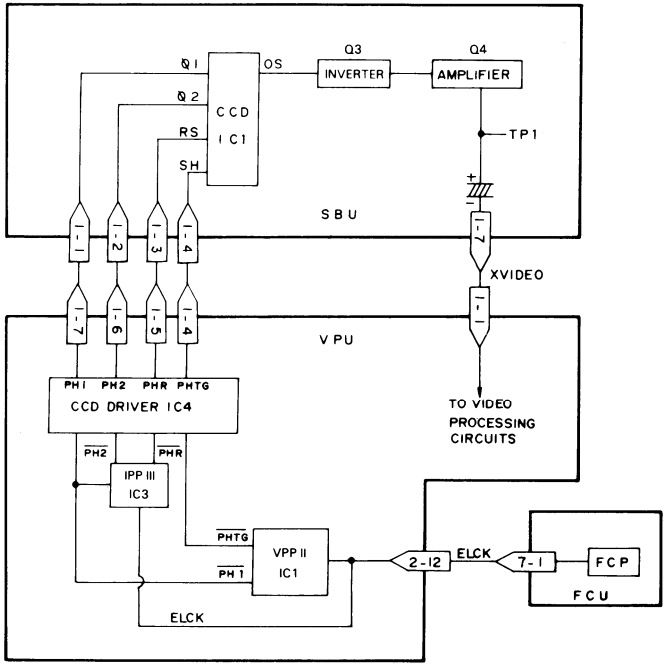
— Transmission —



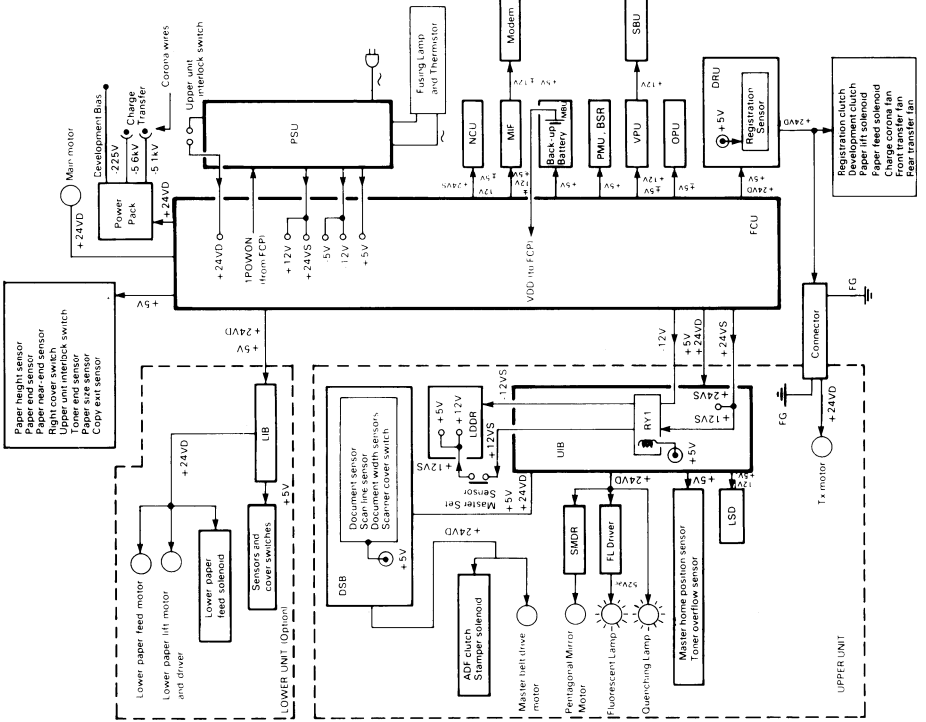
— Reception —


Modem
Laser Diode
Delay Circuit
LDDR
UIB
MIF
I O
NCU
Controlled by FCP
Controlled by HD64180
LDS
DCR
FCP
Interface
Bus Transceiver
HD 64180
FIFO
LB
SRAM
MBU
SAF ECM
BSR
Page Memory
PMU

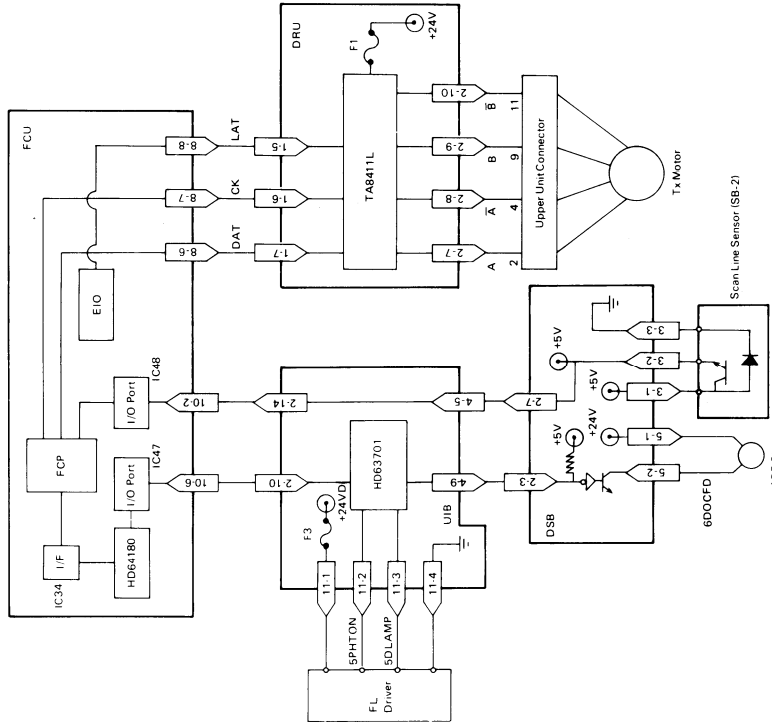

Laser Diode
CCD
SBU
VPU
Delay Circuit
LDDR
UIB
I/O
S P
DCR
DR
Controlled by FCP
Controlled by HD64180
LDS
FCP
I/F
Bus Transceiver
HD 64180
FCU
LB
FIFO
SRAM
MBU
SAF
BSR
Page Memory
PMU


Q3
Q4
Q1
OS
INVERTER
AMPLIFIER
Q2
CCD
I C1
RS
TP1
SH
SBU
1-1
1-2
1-3
1-4
1-7
XVIDEO
1-7
1-6
1-5
1-4
1-1
VPU
PH1 PH2 PHR PHTG
CCD DRIVER IC4
TO VIDEO
PROCESSING
CIRCUITS
PH2
PHR
IPP III
IC3
PHTG
VPP II
IC1
PH1
2-12
ELCK
7-1
FCP
FCU
ELCK

3. Power Distribution

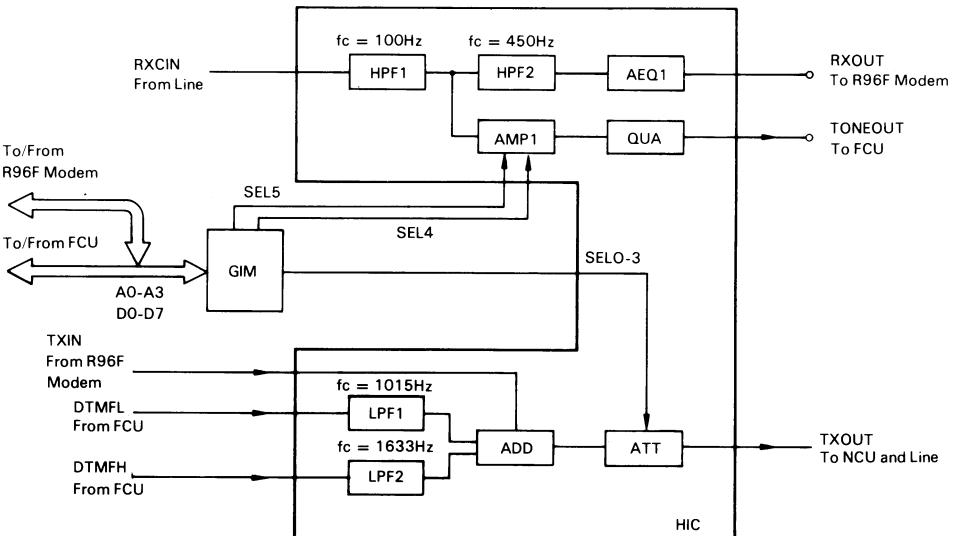


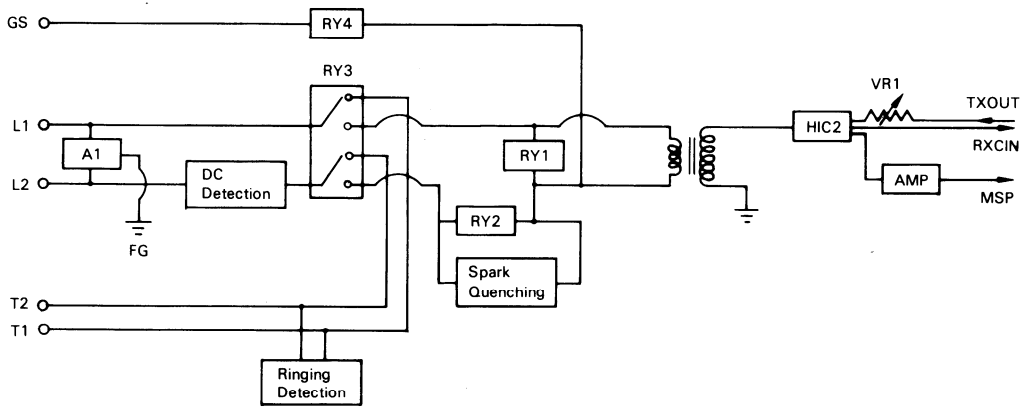
4. Scanner


FCU
DRU
F1
+24V
TA8411L
LAT
CK
DAT
8-8
8-7
8-6
1-5
1-6
1-7
2-10
2-9
2-8
2-7
Upper Unit Connector
Tx Motor
EIO
IC48
I/O Port
IC47
I/O Port
FCP
IC34
I/F
HD64180
10-2
10-6
2-14
2-10
HD63701
+24VD
F3
11-1
11-2
11-3
11-4
5PHTON
5DLAMP
FL Driver
UIB
4-5
4-9
2-7
2-3
DSB
+5V
+24V
3-3
3-2
3-1
5-1
5-2
6DOCFD
Scan Line Sensor (SB-2)
ADF Clutch

5. Communication Control

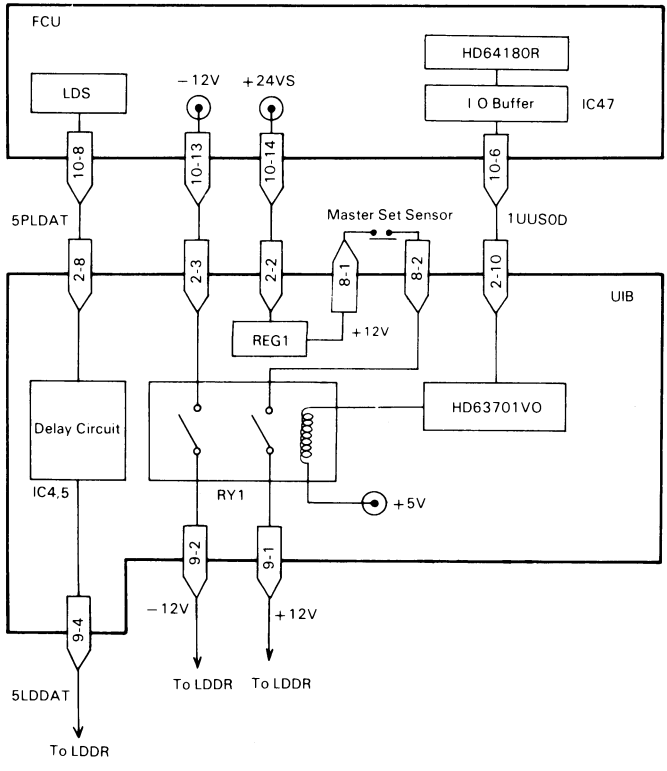
– MIF –



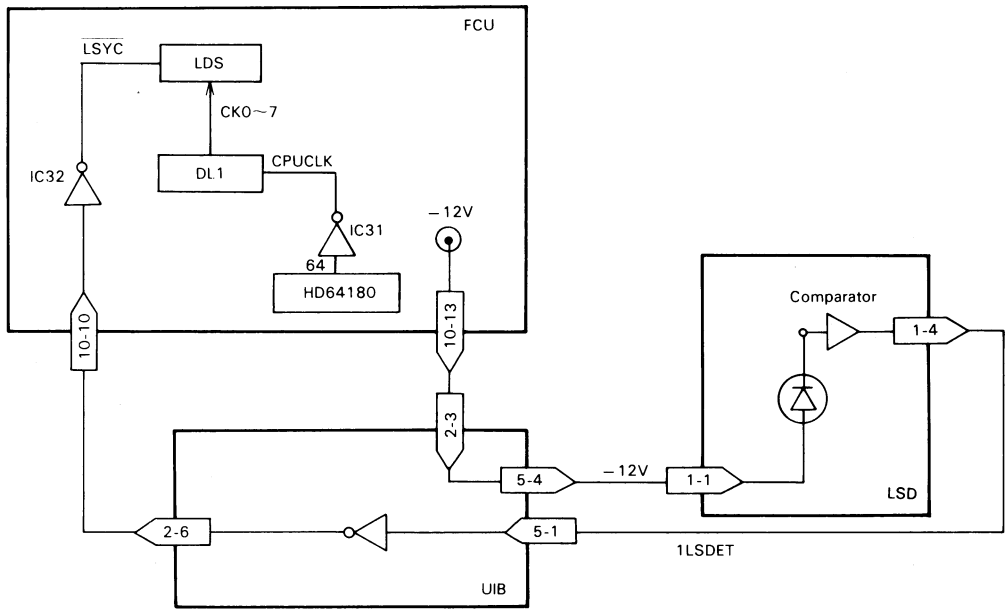

GS
RY4
RY3
L1
L2
A1
DC
Detection
FG
RY1
RY2
Spark
Quenching
T2
T1
Ringing
Detection
VR1
HIC2
TXOUT
RXCIN
AMP
MSP

6. Printer

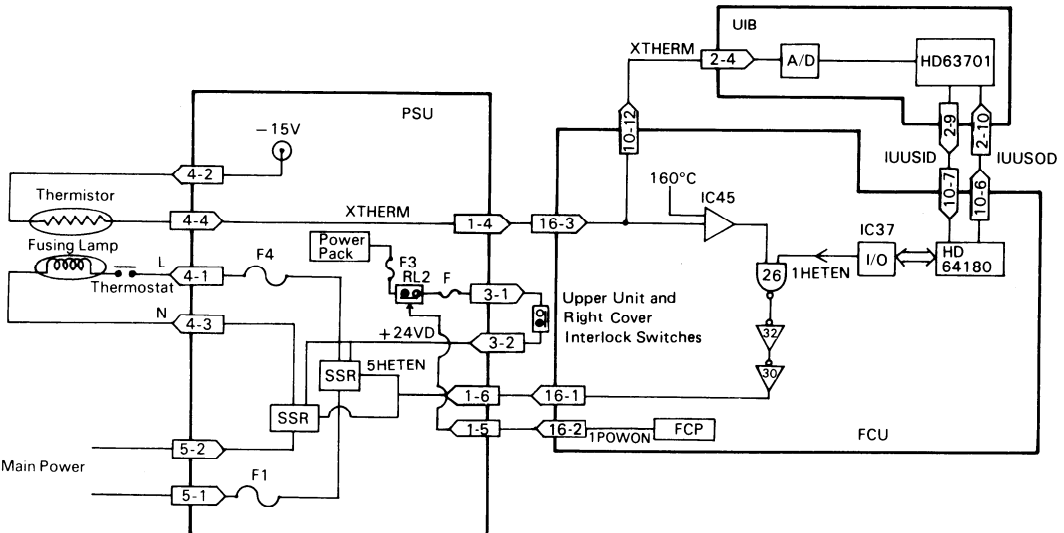
— Laser Diode Drive —



— Main Scan Synchronization —



— Fusing Lamp Control —



APPENDIX F. GLOSSARY OF TERMS

ADF – Automatic Document Feeder: An assembly used to automatically feed documents into the scanner.

BSR – Backed-up Static RAM: A PCB that contains SAF and ECM double buffer memory, both with back-up guaranteed for 72 hours.

CCD – Charge Coupled Device: The device used to scan a document and convert black and white data into an electric signal.

CED – Called Station Identification: A protocol signal which informs the calling station that a fax terminal has been reached.

CCITT – Consultive 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 telling the transmitter that modem training and set-up information was accepted.

CNG – Calling Tone: An 1100 Hz tone that is used by autodialing 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; used for identification.

DCN – Disconnect: A protocol signal sent by the transmitter to release the telephone line.

DCR – Data Compressor Reconstructor: A VLSI circuit used to compress and reconstruct data; contained in the FCP.

DCS – Digital Command Signal: a protocol signal that sets up Group 3 facsimile parameters.

DIS – Digital Identification Signal: A protocol signal that informs the calling station of the called station's capabilities.

DR – Data Reducer: A circuit that reduces data in the main scan direction. It can also do MH reconstruction.

DRAM – Dynamic Random Access Memory: A LSI used for the storage of information.

DRU – Drive and Registration Unit: A PCB that contains the registration sensor and drivers for various components.

DSB – Document Sensor Board: A PCB that contains scanner sensors and the master belt motor driver.

DTMF – Dual Tone Multi Frequency: A method of dialing using tones instead of pulses.

EFC – Estimated Fill Bit Control: A Ricoh-developed data compression method used with either MH or MR. Reduces number of fill bits on a line and make transmission times faster.

EIO – A Ricoh custom LSI that interfaces the FCP with various components, mainly with the NCU.

EOM – End of Message: A protocol signal that informs the receiver that there are more pages using different parameters.

EOP – End of Procedure: A protocol signal that informs the receiver that this is the end of page data transmission.

EPROM – Electronically Programmable Read Only Memory: A memory chip that can only be read from; contains system parameters.

FCP – Facsimile Control Peripheral: A Ricoh custom LSI which contains the main CPU.

FCU – Facsimile Control Unit: A PCB which controls the entire facsimile machine.

FIFO – First In First Out: A buffer which passes data, the first data arriving is the first out.

FTT – Fail to Train: A protocol signal that informs the transmitter that either set-up information and/or modem training was not acceptable.

HD63701 – A cpu made by Hitachi, used as a slave cpu of the HD64180 (see below).

HD64180 – A cpu made by Hitachi, used as a slave cpu of the FCP. Controls the printer.

IPP – Image Processing Peripheral: A Ricoh custom LSI that processes the digital video signal from the VPP. Located on the VPU.

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: Display on the operator panel used to inform the operator of machine status and programming.

LCT – Large Capacity Tray: The Paper Feed Unit Type 1000L.

LD – Laser Diode: A diode that emits a laser beam. Used to make an image of the original on the master belt.

LDDR – Laser Diode Driver: A PCB that contains components for driving the Laser Diode.

LDS – Laser Data Synchronizer: A Ricoh custom LSI that generates the clock signal for data output to the laser diode. Located on the FCU.

LED – Light Emitting Diode: An electronic component, a diode that emits light. Used as an indicator lamp.

LIB – Lower Interface Board: A PCB that interfaces the optional large capacity tray with the FCU.

LSD – Laser Synchronization Detector: A PCB that detects the start of each scan of the laser beam across the master belt.

LSI – Large Scale Integration: A process of making microchips.

MBU – Memory Board Unit: A PCB that contains ROM and RAM data for the facsimile program.

MCF – Message Confirmation: A protocol signal confirming reception of the previous page sent.

MH – Modified Huffman: A compression method used in facsimile to code scan lines. Modified Huffman Coding is a one dimensional run length digital scheme of coding white and black runs.

MIF – Modem Interface: A PCB that interfaces the modem with the NCU and FCU.

MPS – Multipage Signal: A protocol signal that informs the receive station that more pages are to follow using the same parameters.

MR – Modified Read: A compression method. Modified Read Coding is a two-dimensional digital coding scheme.

MTF – Modulation Transfer Function: MTF is necessary for the transmission of details such as points, thin lines and detailed characters.

NCU – Network Control Unit: A PCB that interfaces the facsimile machine with the telephone circuit, sometimes referred to as a coupler.

NSF – Non-Standard Facilities: A protocol signal that informs the calling station of the called station's capabilities, otherwise known as Ricoh Group 3.

NSS – Non-Standard Set-up: Set up command in Ricoh Protocol.

OPU – Operator Unit: A PCB, the panel that contains the keypad and switches and the LCD display for the operator.

PABX – Public Access Broadcast Exchange: A switchboard, normally electronic, found at the customer's location.

Page Memory – A memory that contains one page of uncompressed data for the printer.

PD – Pulse Dialing: Pulse or Rotary dialing method of a telephone.

PIN – Procedural Interrupt Negative: A protocol signal used to inform the transmitter that the previous page was not received satisfactorily due to depletion of paper jam or because the Stop button was pushed on the receiving machine.

PIP – Procedural Interrupt Positive: A protocol signal that confirms reception of the previous page, but the receive machine's operator wishes to make a voice request.

PMU – Page Memory Unit: This PCB contains page memory for the printer

PSTN – Public Switched Telephone Network: The normal telephone network used for voice communications.

PSU – Power Supply Unit: The assembly that supplies voltages to the required sections and components of the fax.

QAM – Quardrature Amplitude Modulation: A modulation technique used when transmitting at 9600 and 7200 bps, so that we can transmit over the PSTN.

RTI – Remote Terminal Identification: The RTI is an alphanumeric ID that is displayed on the other terminai's operator panel display. It may be the company name, serial number or any other identifying code that the operator wishes.

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 informing the transmitter that the previous page was OK, but retraining of the modems must occur before continuing. Usually due to poor telephone line conditions.

SAF – Store And Forward: A device used to store messages in memory at the local terminal. Used in broadcasting, send later, confidential reception and substitute reception. Located on the BSR.

SBU – Scanner Board Unit: A PCB that contains the CCD and circuitry needed for reading a document.

SMDR – Scanner Motor Driver: A PCB that drives the pentagonal mirror motor. The mirror scans the laser beam across the master belt.

TCR – Transaction Confirmation Report: A report that contains all fax transactions and shows date, time, RTI, mode, number of pages, result and department code.

TTI – Transmit Terminal Identification: An ID of the transmitter that is printed at the top of each page sent; includes the date and time, customer ID and page number.

UIB – Upper Interface Board: A PCB that interfaces components of the upper unit with the FCU.

VPP – Video Processing Peripheral: A Ricoh custom LSI that processes and A/D converts the CCD output video signal. Located on the VPU.

VPU – Video Processing Unit: A PCB that processes analog video into digital video data. Also performs halftone, MTF and autoshading.