brother®

FACSIMILE EQUIPMENT
SERVICE MANUAL
MODEL: MFC8550

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SECTION 1 SPECIFICATIONS

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1-1. General Specification

Type		Desk Top Type
Printing System		Dry, Electrostatics transfer system and Laser Printing
Photo conductor		OPC drum
Developing system		2 components magnetic brush
Fusing System		Heat roller type
Cleaning System		Blade cleaning system
Paper Handling	-1 Paper Input	Manual Feed Legal (max.) ~ 120 mm (L) x 65 mm (D) (min.)
		Cassette (Standard) (US type) : Letter, 250 sheets standard cassette (Note 1)
		(Europe Type) : A4, 250 sheets standard cassette
		Cassette (Option) Letter/Legal or A4, 500 sheets cassette
	-2 Effective Printing Area	A4 201 x 287 mm
		LT 207 x 269 mm
		LG 207 x 346 mm
Warming up time		35 sec. (23 C degree, 40% RH)
Power supply	-1 Voltage Tolerance	120V ± 10%, 230V ± 15% or 220V / 240V ± 10%
	-2 Frequency Tolerance	120V @60Hz ± 2 Hz
		220V, 230V, 240V @50Hz ± 2 Hz
Power Consumption		120V : 800W max.
		230V : 800W max.
Dimension		504mm(W) x 532mm(D) x 326mm(H) without paper tray
Weight		28 Kg / Main Unit
Environmental	-1 Operation	Temperature 10 to 30 Centigrade degree
		Humidity 30% to 80% RH, non-condensing
	-2 Packing	Temperature 0 to 35 Centigrade degree
		Humidity 20% to 80% RH, non-condensing
Supplies	-1 Toner Cartridge	5,000 pages (4% B/W ratio, normal condition)
	Oil Felt	5,000 pages
	Waste Toner Bottle	5,000 pages
		Master Carton = 1 packs each x 10 pcs
	-2 Developer Unit	50,000 pages (4% B/W ratio, normal condition)
		Master Carton = 1 cartridge x 10 pcs
	-3 Drum Unit	50,000 pages (normal condition)
		Master Carton = 1 cartridge x 10 pcs

Note 1 : Letter / Legal / A4, 250 sheets universal cassette is available by factory option.

1-2. Copy Function

[Platen Copy]

Platen Type		Stationary platen type (Platen copy)
Optical System		Mirror scan slit system / Halogen lamp
Acceptable Originals		- Size Letter / A4 max.
	- Type	Sheet, Book, 3D object
	- Weight	2 Kg
Copy Size		Letter / A4 (max.) ~ 140 x 105 mm (min.)
Copy Speed		10 cpm (Letter / A4 size), 9 cpm (Legal Size)
First Copy Time		9.5 ~ 12 sec. / LT, A4
Magnification		1 : 1 ± 0.01
Density Control		Manual
Continuous Copies		1 ~ 99 copies

[ADF Copy]

Platen Type		Single sheet Automatic Document Feeder
Optical System		Mirror scan slit system / Halogen lamp
Acceptable Originals		- Size Legal (max.) ~ A6 (min.)
	- Type	Sheet
Copy Size		Legal (max.) ~ 140 x 105 mm (min.)
Copy Speed		12 cpm (Letter / A4 size), 9 cpm (Legal Size)
First Copy Time		9.5 ~ 12 sec. / LT,A4
Magnification		1 : 1 ± 0.01
Density Control		Manual
Continuous Copies		Single copy
Automatic document feeder	-1 Capacity	30 sheets
	-2 Paper feed	Face down
	-3 Paper output	Face up

[FAX Copy]

Platen Type		Automatic Document Feeder
Optical System		Contact Image Sensor (CIS)
Acceptable Originals	- Size	Legal (max.) ~ A6 (min.)
	- Type	Sheet
Copy Size		Legal (max.) ~ 140 x 105 mm (min.)
Copy Speed		10 cpm (Letter / A4 size), 9 cpm (Legal Size)
Magnification		1 : 1 ± 0.01, 100% ~ 70% / 1% step
Density Control		Normal, Light
Continuous Copies		1 ~ 99 copies
Automatic document feeder	-1 Capacity	30 sheets
	-2 Paper feed	Face down
	-3 Paper output	Face up

1-3. Facsimile Function (General)

Communication Line		PSTN, PABX
Compatibility		Group 3 (ITU-T T.4, T30)
Transmission Speed		6 sec. (ITU No. 1 chart)
Modem		14,400 bps
Coding		MH, MR, MMR, Original
		(Original High Speed protocol)
Modulation Method		V.29, V27 ter, V.21 channel 2, V17, V33
Code Memory		256 KB or 1.25MB (Factory option), 1MB or 2MB (option)
Page memory		768 KB
Digital Signal		DP (10pps, 20pps), DTMF
ECM		off / on
Printing Speed		10 ppm / LT, A4
Printing Resolution		203 dpi x 196 dpi (for facsimile)
Laser Reduction Printing		Yes
Scanning -1 Type		Automatic document feeder
-2 Method		Contact Image Sensor
-3 Resolution	Normal	8 dots/mm x 3.85 dots/mm
	Fine	8 dots/mm x 7.7 dots/mm
	Super Fine	8 dots/mm x 15.4 dots/mm (TX only)
-4 Scanning Speed Normal		6 sec. / A4
	Fine	12 sec. / A4
	Super Fine	24 sec. / A4
-5 Paper feed capacity		30 pages / Face down
-6 Paper output capacity		30 pages / Face up
-7 Paper thickness	ADF	0.08 ~ 0.10 mm
	Manual feed	0.06 ~ 0.14 mm
-8 Paper length	ADF	105 ~ 356 mm
	Manual Feed	105 ~ 1,000 mm
-9 Paper Scanning width		140 ~ 257 mm
-10 Effective Scanning width		208 mm
-11 Paper weight	ADF	64 ~ 80 g/m2
	Manual Feed	52 ~ 115 g/m2
Contrast - 1 Halftone level		64 level
- 2 Threshold Pattern		Error Diffusion
- 3 Contrast		Normal, Light
Telephone Connection		
- 1 External Telephone jack		Available
- 2 TEL/FAX Automatic switching		Available (without voice guidance)
- 3 Telephone mode		DTMF signal
		Dial Pulse 10pps type : N, N+1, 10-N
		20pps type

1-4. Facsimile Function (Communication)

Manual Transmission		
Memory Transmission		
-1. Memory TX	Timer	off / on
	Confidential	off / on (Mail box number)
-2. Sequential Broadcast TX	Timer	off / on

	-3. Program TX	Confidential	off / on (Mail box number)
		Confidential	off / on (Mail box number)
	-4. Batch TX	Timer	on (timer preset)
		Confidential	off / on (Mail box number)
	-5. Polling TX	Closed Area Communication	off / on (Machine ID)
		Continuous Polling TX	off / on
ADF Transmission	-1. ADF TX	Confidential	off / on (Mail box number)
Transmission Other functions	-1. Header Information	off/on	
	-2. Memory File	10 files	
	-3. Redial Timer	1 timer	
	-4. Transmission Timer	10 timer	
Reception	-1. Reception mode	Auto / Manual	
	-2. Confidential Reception	Mail box	5 boxes (max.)
	-3. Substitute Memory Reception	Yes	
	-4. Polling Reception	Timer	off / on
		Continuous	off / on
	-5. Auto Reduction	off / on (min. 70%, step 1%)	
	-6. Auto Paper Selection	off (upper or lower) / on	
	-7. Page Separation Printing	off / on (10 mm overlap)	
	-8. Memory		
Dialing Function	-1. Direct dial (by TEN key)		
	-2. One touch dial (by OT key)	10 keys, 20 locations: FAX No, Name, Initial modem speed, High Speed	
	-3. Alpha Tel Directory (by AD key)	80 locations	: FAX No, Name, Initial modem speed, High Speed
	-4. Group dial (by OT key)	10 keys	: Dial (Ten, OT, AD key), Name
	-5. Program dial (by OT key)	10 keys	: Dial (Ten, OT, AD key), Name, Confidential
	-6. Batch dial (by OT key)	10 keys	: Dial (Ten, OT, AD key), Name, Timer, Confidential
	-7. Redial	Manual key, Auto off / on (redial count 1 ~ 11)	
	-8. Hook dialing operation	Hook off / on	
	-9. DTMF signal output	(in the case of DP telephone mode)	
	-10. Pause time	2 ~ 21 sec.	
	-11. Monitor speaker	Soft / Normal	
	-12. Buzzer	Small / Normal / Big	
Memory File Specification		Memory Files	
Memory Transmission		10 Files	
Sequential Broadcast Transmission		10 Files	Max 10 Files
Program Transmission		10 Files	
Polling Reception		10 Files	Max 32 Files
Batch Transmission		Max 10 Batch key (32 files)	
Confidential Reception		32 Files Max 32 Files	Max Total Page
Substitute Memory Reception		32 Files 128 pages	
Polling Transmission		1 File	

1-5. Facsimile Function (Registration)

System Operation			
	-1. Time	- USA	Month , Day , Year , Hour , Minute
		- Europe	Day , Month , Year , Hour , Minute
	-2. ID	- Machine	Name , ID Number , Fax Number
		- Mail Box	Name , Password
	-3. Power Save		Manual (off / on) , Auto (timer)
	-4. Line / Telephone	- Line Connection	PSTN , PABX (Number/Flash/Earth, not USA)
		- Detection	1st. - Dial Tone off / on (PSTN , PABX)
			2nd. - Dial Tone off / on
			Ring PSTN , PABX
		- Telephone Mode	DTMF / DP (20pps /10pps (N , N+1 ,10-N))
		- Pause Time	2~21 sec
		- Speaker Volume	Small , Normal , Big
	-5. Cassette Size	- Standard	A4 , LT , LG
		- Option	A4 , LT , LG
	-6. Auto Paper Selection	- FAX	off (upper , lower) / on
		- Digital Copy	off (manual select)/ on (Note : Service mode only)
Communication	-1. Closed Area Communication		off / on (machine ID , Fax number)
	-2. Header Information		off / on (File No, Date, Time, Name, Fax No, Page)
	-3. Auto Reception		Manual , Auto (FAX , TEL/FAX Auto Select)

Reception	-1. Auto Reduction	off / on (max. 70%)
	-2. Page Continuous Mark	off / on
	-3. Reception Data Restriction (side mask)	off / on
	-4. RX Time Print	off / on
Image Control	-1. Photo	error diffusion
Dialing	-1. One Touch Dial	Fax No, Name , Initial Modem Speed, High-speed
	-2. Alpha Tel Directory	Fax No, Name , Initial Modem Speed, High-speed
	-3. Program Dial	Dial (OT/AD/Ten-key), Name, Confidential
	-4. Group Dial	Dial (OT/AD/Ten-key), Name
	-5. Batch Dial	Dial (OT/AD/Ten-key), Name, Timer, Confidential
	-6. Auto Redial	off / on (redial count 1~11)
	-7. Other	PABX mode output off / on (S/K : P, L : =)
		2nd. - Dial-tone detection off / on
		Pause (S/K : ; , L : P)

1-6. Dual Access

"o" : This combination is possible to do. (Dual Access)

"-" : this combination is not possible to do by the limitation of mechanical / Operation / communication line and so on.

"&" : This mark indicates that the printing of FAX data will be stopped after end of current printing page when either copy / ADF copy operations or PC Printing is requested. — FAX Memory Reception

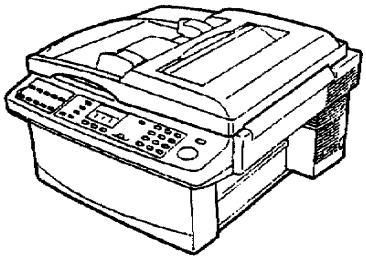
"@" : This mark indicates that the PC Printing data will be received in printer memory until memory full without output. The PC printing data will be printed after finishing another printing / copying job.

		Copy			FAX Operation						TX		RX		FAX Data			Tel	Class 1					PC Print		
		Copy	ADF Copy	FAX Copy	Memory TX Op.	ADF(Instant) TX Op.	Registration Op.	File cansel Op.	Report Print (Manual)	File Print (Manual)	ADF (Instant) TX	Memory TX w/o Op.	Memory RX w/o Print	Confidential RX	RX with Print	Print (Memory RX data)	Report Print (Auto)	Phone	PC-FAX TX	PC-FAX RX	PC-Print	PC-Scanner (ADF)	PC-Scanner (Memory)	GDI	PCL5e	PCL5e + PS
	Standby	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Copy	Copy		-	-	-	-	-	-	-	-	-	o	o	o	-	-	-	o	o	o	o	&	-	o	@	@	@
	ADF Copy	-		-	-	-	-	-	-	-	-	o	o	o	-	-	-	o	o	o	o	&	-	o	@	@	@
	FAX Copy	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	@	@	@
FAX Op.	Memory TX Op.	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	o	o	o
	ADF(Instant) TX Op.	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	o	o	o
	Registration Op.	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	o	o	o
	File cansel Op.	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	o	o	o
	Report Print (Manual)	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	@	@	@
	File Print (Manual)	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	o	-	-	-	-	-	-	@	@	@
FAX TX	ADF (Instant) TX	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	o	o	o
	Memory TX w/o Op.	o	o	-	o	o	-	o	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	o	o	o
FAX RX w/ o Print	Memory RX w/o Print	o	o	-	o	o	-	o	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	o	o	o
	Confidential RX	o	o	-	o	o	-	o	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	o	o	o
FAX Data Print	RX with Print	&	&	-	o	o	-	o	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	@	@	@
	Print (Memory RX data)	&	&	-	o	o	-	o	-	-	-	-	-	-	-		-	o	-	-	-	-	-	-	@	@	@
	Report Print (Auto)	-	-	-	o	o	o	o	-	-	-	-	-	-	-	-		o	-	-	-	-	-	-	@	@	@
Tel	Phone	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	o	o	o
Class 1	PC-FAX TX	o	o	-	o	o	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	o	o	o
	PC-FAX RX	o	o	-	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	o	o	o
	PC-Print	-	-	-	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	@	@	@
	PC-Scanner (ADF)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	o	o	o
	PC-Scanner (Memory)	o	o	o	o	o	-	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	o	o	o
PC Print	GDI	-	-	-	o	o	o	o	-	-	o	o	o	o	-	-	-	o	o	o	&	o	o		-	-	-
	PCL5e	-	-	-	o	o	o	o	-	-	o	o	o	o	-	-	-	o	o	o	&	o	o	-		-	-
	PCL5e + PS	-	-	-	o	o	o	o	-	-	o	o	o	o	-	-	-	o	o	o	&	o	o	-	-		

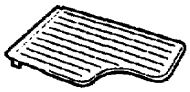
SECTION 2 INSTALLATION

1. STRUCTURE OF COMPONENTS

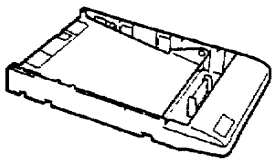
Check to ensure that you have a complete set of the items shown below. If there is a missing component, please contact your local dealer.



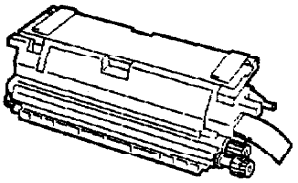
Main unit: 1



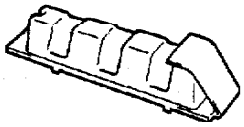
Receiving tray: 1



For Cassette : 1

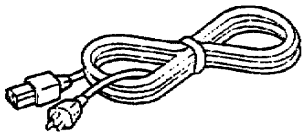


Development unit: 1



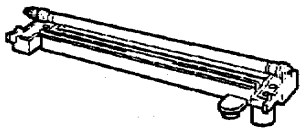
Toner cartridge

Drum unit: 1
(already installed in the main unit)

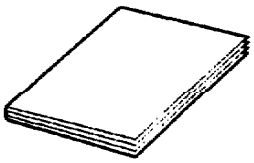


Power cord: 1

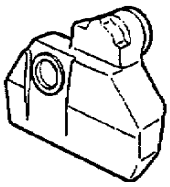
Modular cord: 1



TC charger



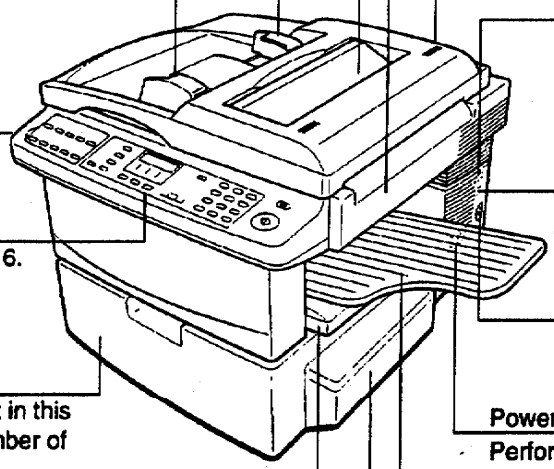
Instruction manual: 1



Waste toner bottle: 1
(already mounted in the main nit)

2. NAMES AND FUNCTIONS OF PARTS

■ **Main unit**



Automatic document feeder (ADF)
Documents are fed automatically.

Document guides
Set documents to be sent according to the width of sheet.

Release lever
Pull this lever to open the upper unit.

Document tray
Place a document for Fax transmission in this tray.

Top cover
Open this cover to remove jammed paper or clean the inside.

Telephone line connector
Telephone line is connected to this connector.

Upper unit
To be opened for period replacement and cleaning.

External telephone connector
Use this connector when telephone is connected.

Control panel
Description is given on page 16.

Power supply connector
Connect the power cord to this connector.

Cassette feeder (option)
500 sheets of paper can be set in this cassette. This reduces the number of times paper is replenished.

Power switch
Performs power ON/OFF control.

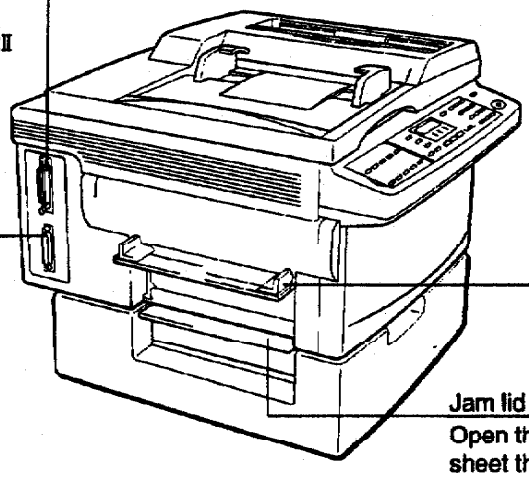
Paper cassette
(Upper paper cassette)
Set paper in this cassette

Receiving tray
Fax received document, copied or printed paper pages are stacked in this tray.

* Lower paper cassette
Set paper in this cassette.

* When the cassette feeder (option) is installed.

Parallel interface connector (Option)
When connected to a personal computer, it permits the use of GDI mode function or PCL-5e/BR-ScriptII emulation.



Serial interface connector (Option)
When connected to a personal computer, it permits the use of CLASS 1 mode function.

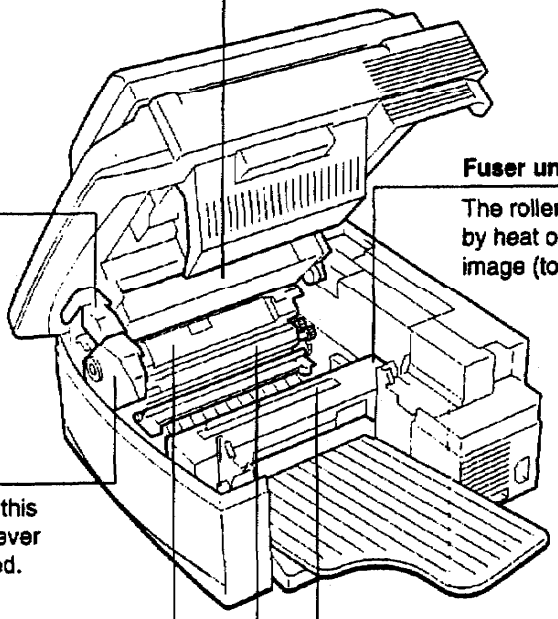
Manual feeding tray
Use this tray when paper is supplied by manual feed.

Jam lid
Open the jam lid to remove a paper sheet that jammed when being supplied to the lower cassette.

2. NAMES AND FUNCTIONS OF PARTS

Drum unit

Makes the drum surface electrified and produces an image. To be replaced periodically.



Bottle lever

ottle lever serves to fix the waste toner bottle to the drum unit.
Operate this lever when the waste toner bottle and the drum unit are replaced.

Waste toner bottle

Waste toner accumulates in this bottle. To be replaced whenever the toner cartridge is replaced.

Fuser unit

The roller presses the toner fused by heat on paper, so that an image (toner) is fixed onto paper.

Caution

Do not touch the fuser, because it becomes very hot when the power is turned on. If you touch the fuser, you may get burned.

Developing unit

Develops an image on the drum surface. To be replaced periodically.

Cleaning felt

Clean the fusing roller.
To be replaced periodically.

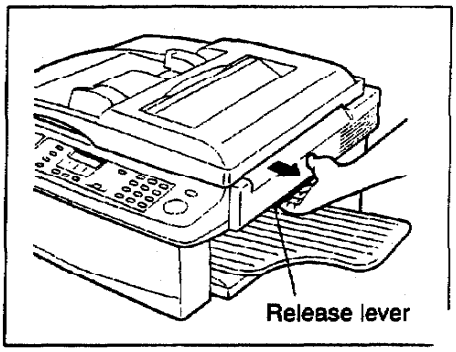
TC charger

Transfers an image developed on the drum surface onto paper. To be cleaned periodically.

3. REMOVING THE PACKING FOR TRANSPORT

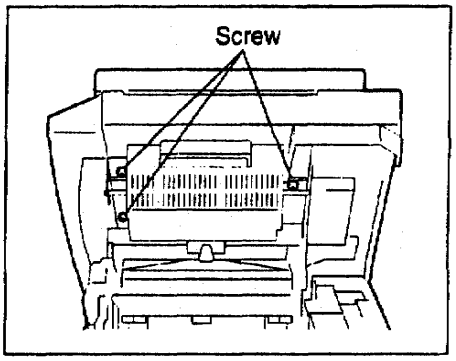
NOTE:
When it is necessary to transport(repack)the main body, contact the dealer and leave the packing to the serviceman.

1 Pull the release lever and open the upper unit.
- ◆ Push the upper unit up until it has clicked.



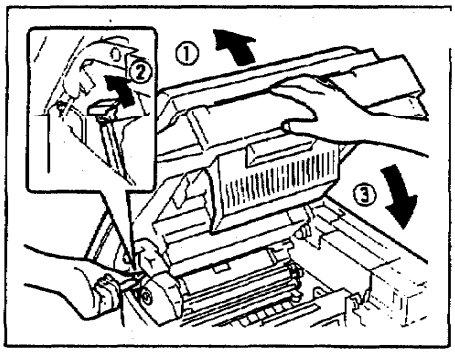
2 Remove the screws (three) fastening the optical unit.
- ◆ These screws fastening the optical unit are necessary for transportation of the main body. So keep them in custody.

⚠ **Caution**
Be sure to remove screws (three) that fastens the mirror section. If the power is turned on with these screws installed, it causes a machine trouble.



3 Remove any packing cardboard and tape.

4 Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.



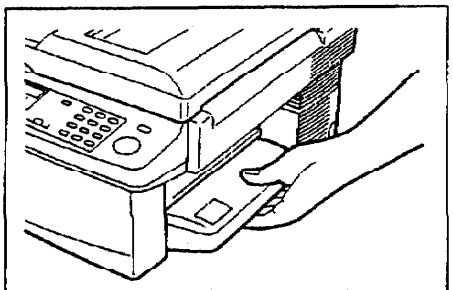
4. INSTALLING THE PAPER CASSETTE AND RECEIVING TRAY

About 250 sheets of paper can be set in the cassette at a time. With the cassette feeder (option), about 500 sheets of paper can be set. It is recommended to use Paper for Laser Printers-Facsimiles.
Three kinds of cassette are available: letter size, legal size and A4 size. Set Paper sheets in accordance with the cassette size.

	Main body	Cassette feeder
LT	250 sheets	500 sheets
LG	250 sheets	500 sheets
A4	250 sheets	500 sheets

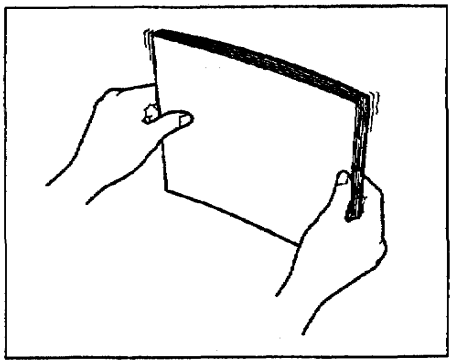
NOTE:
- Use the paper recommended. Use of paper of improper thickness and quality may cause a paper jam.
- Do not use undersized paper, badly wrinkled, creased or curled paper and torn paper. If such kind of paper is used, paper may be jammed inside the main unit.
- If the set paper is not used for a long time, take out the paper and store it in a place that is free from humidity. If the paper is allowed to stand long in the cassette, print quality may be degraded due to moisture and a paper jam may be liable to occur.
- Be sure to put paper sheets under the separation fingers. Sheets of paper over the separation fingers may cause a paper jam.
- Put paper in the cassette, using care so the height will not exceed the upper limit indication. Loading of paper sheets in excess of the upper limit may cause a paper jam.
- Do not add paper before the paper in the cassette is used up. Replenish the cassette with paper after the paper is almost used up.

1 Pull out the cassette while lifting its center by hand.
- ◆ When the cassette feeder (option) is used, take out the lower cassette as well in the same manne.
- ◆ A warning beep sounds when the cassette is pulled out and the paper is used up (if the power is on).



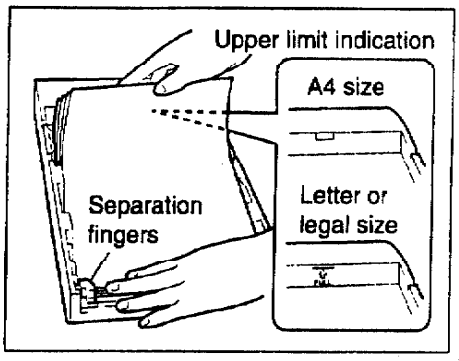
* This drawing shows the single-cassette type.

2 Fan the sheets of paper thoroughly a few times and align paper in the stack.



3 Place paper in the cassette with the paper under the separation fingers.

- ◆ After paper is put in the cassette, push the paper back lightly to align the paper to the back edge in order to prevent paper jam.

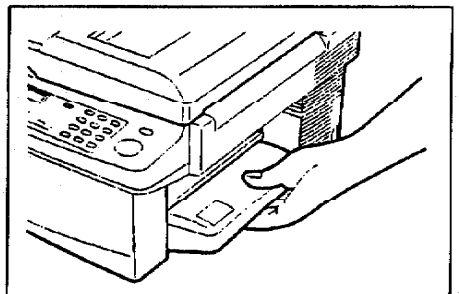


NOTE:

- If thick paper is used, the number of sheets that can be set may be less than the specified number. Thus, care should be taken not to exceed the upper limit indication in placing paper in the cassette.
- When placing paper in the lower cassette, make certain to align the paper to the edge.

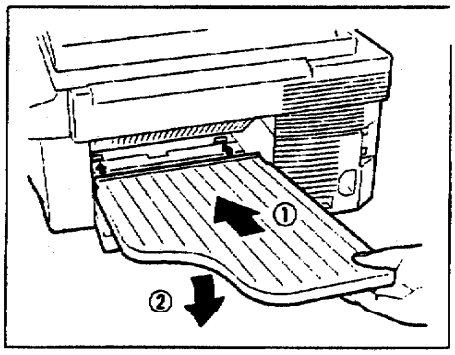
NO GOOD GOOD

4 Push the cassette all the way into the main unit.
When the optional cassette is set or the cassette size is changed, it is necessary to set the cassette size.



* This drawing shows the single-cassette type.

5 Push the receiving tray into the stopper of the main body, and fix the tray.

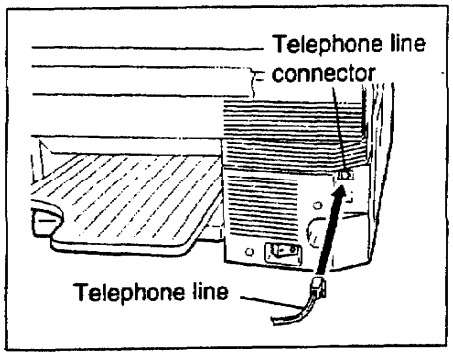


5. CONNECTING THE TELEPHONE LINE AND TELEPHONE

Connecting the Telephone Line

1 Connect the telephone line to the telephone line connector (LINE) located on the right side of the main unit.

- The connector is of modular type. If it does not match with the connector of telephone line that has been used so far, an adapter should be attached. Please contact your local dealer to make available the adapter.
- Care should be taken not to confuse "LINE" with "TEL".

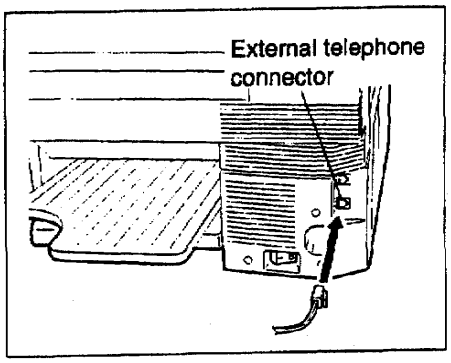


Connecting an External Telephone

(which pertains to only when an external telephone is used.)

1 Connect an external telephone to the external telephone connector (TEL) located on the right side of the main unit.

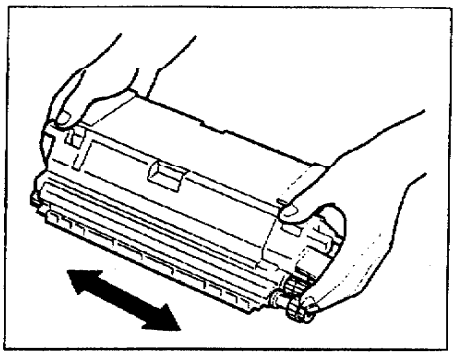
- The connector is of modular type. If it does not match with the connector that has been used so far, an adapter should be attached. Please contact your local dealer to make available the adapter.
- Do not confuse "LINE" with "TEL".



6. INSTALLING THE TC CHARGER AND DEVELOPING UNIT

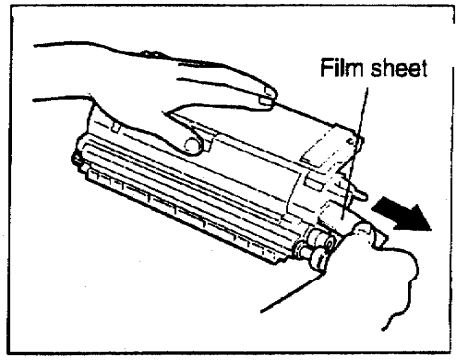
Insert the toner cartridge into the supplied developing unit and install the developing unit in the main unit.

1 Take the developing unit furnished as an accessory and shake it right and left 4 or 5 times gently.



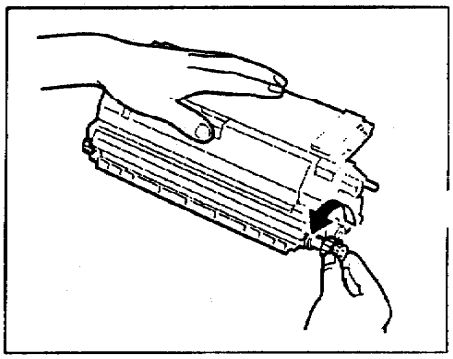
2 Pull out the film sheet.

NOTE:
Be sure to pull out the film sheet. If you do not so, then the developer is not let out and print is not made.

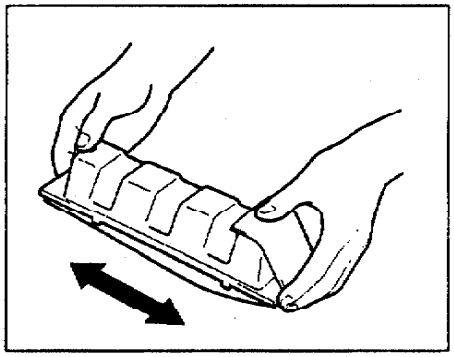


3 Turn the gear of the developing unit counter-clockwise so the developer may be spread evenly on the surface of the roller.

NOTE:
Do not turn the gear clockwise. If you do so, the developer is let out.

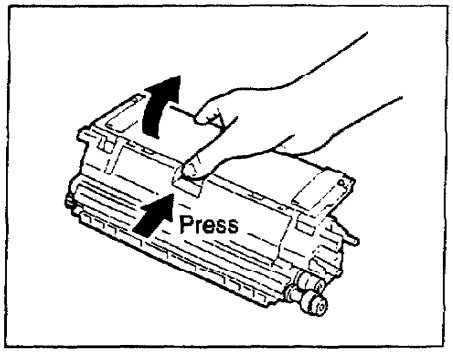


4 Take the toner cartridge furnished as an accessory and shake it right and left 4 or 5 times gently.

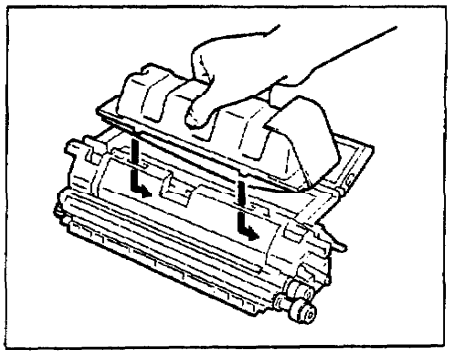


6. INSTALLING THE TC CHARGER AND DEVELOPING UNIT

5 Open the cover of the developing unit.

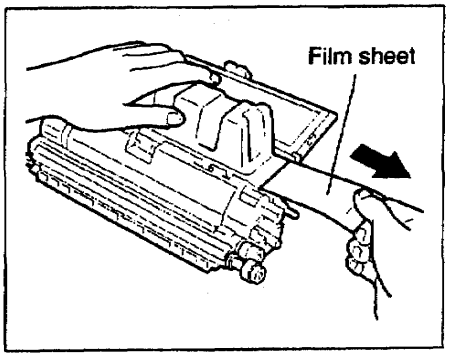


6 Insert the lugs of the toner cartridge through the slots of the developing unit and fix the toner cartridge.

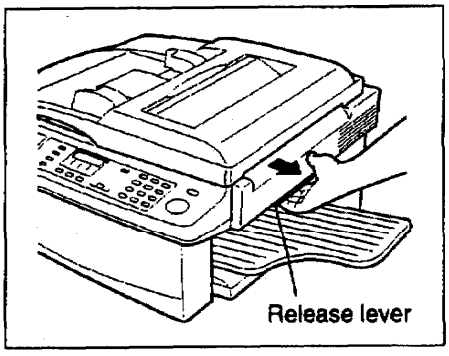


7 Pull out the film sheet and transfer the toner to the developing unit.
Let the remaining toner in the cartridge fall off completely by tapping the toner cartridge gently.

8 Remove the toner cartridge and close the cover of the developing unit.

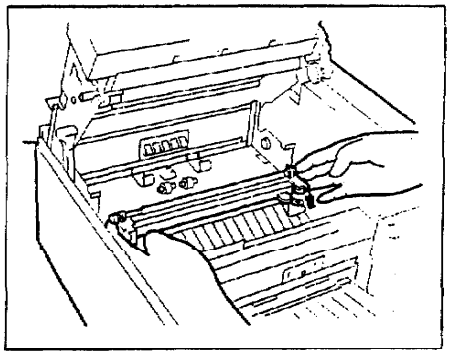


9 Pull the release lever to open the upper unit.
◆ Push the upper unit up until it has clicked.



10 Take the TC charger furnished as an accessory and install it in the main unit by holding its both ends.

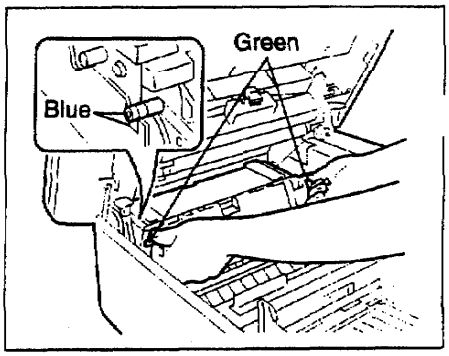
- By pulling down the waster toner bottle, the work can be performed easily.



CAUTION:
Do not touch the wire of the TC charger. Touching the wire may cause a poor image to be output or the wire to break.

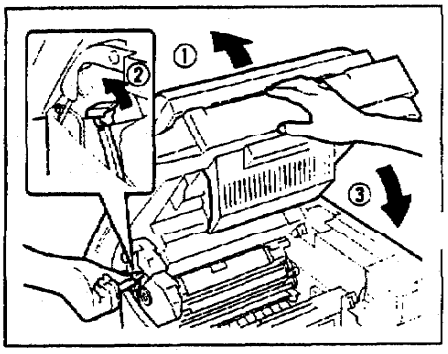
11 Install the developing unit in the holder by taking the right and left lugs (green) of the developing unit.

- Install the developing unit so the stopper (blue) of the developing unit fits on the holder (blue).



CAUTION:
Do not touch the drum surface. Touching the drum may mark or scratch it. Do not expose the drum unit to light for longer than 5 minutes.

12 Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.

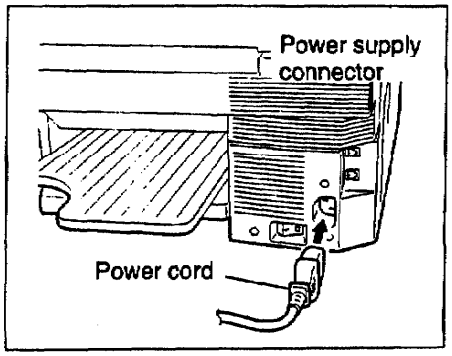


7. TURNING ON POWER

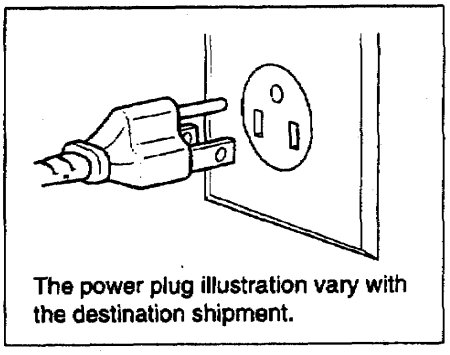
CAUTION:

- When turning on the power to the MFP-512 Multi-function facsimile machine at the first time of the use of this Multi-function facsimile machine, check to ensure that screws (three) fastening the mirror section during transportation are removed (p.5). If the power is applied to the Multi-function facsimile machine with these screws installed, it causes a Multi-function facsimile machine trouble.
- In case of power disruption or when the power is turned off carelessly, documents stored in memory are erased. When the power is turned on again, a power-down report is printed automatically to inform the user of the content of memory that has been erased. When the expansion memory board (option) is installed in the MFP-512, the backup function is provided by this board. Thus, the contents stored in the memory for Multi-function facsimile machine are not erased even if the power is turned off.

1 Connect the funished power cord to the power supply connector.



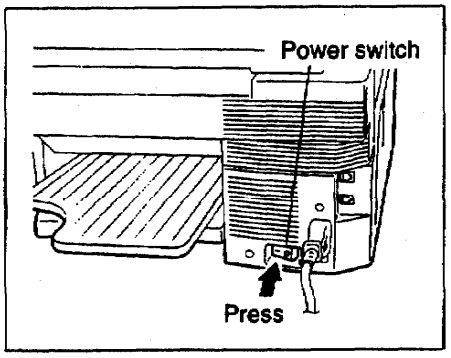
2 Insert the power cord plug into the outlet.



The power plug illustration vary with the destination shipment.

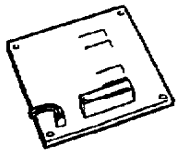
3 Turn the power switch ON.
"WARMING-UP 01" and "COPY:A4 01 or COPY:A4/UPPER 01" appear on the display panel to indicate that the equipment is ready. When the main unit is powered initially, the display panel shows "INITIALIZE DEVE". Initialize the development unit according to the appropriate procedure (p.13).

- ◆ When the upper unit is opened after turning on the power for periodical replacement and cleaning, the power supply to the stationary section is turned off automatically. In this case, the stored data in memory is not erased.



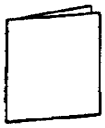
MEMORY BOARD INSTALLTION PROCEDURE

Accessories



Memory Board...1piece

Hinge...2pieces

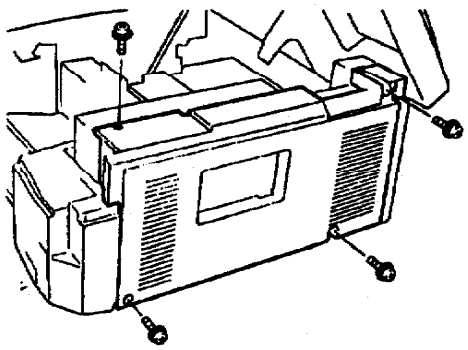


Installation pocedure...1piece

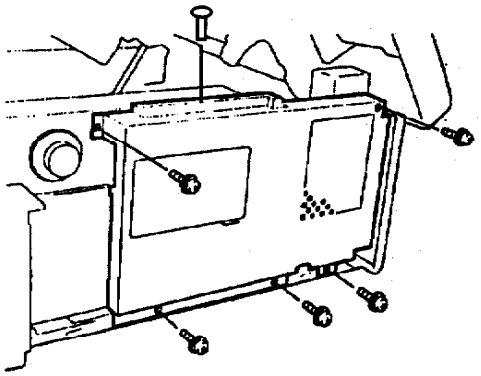
1. Turn off the power switch, and disconnect the power cord from the plug socket.

2. Pull the release lever to open the upper unit.
Push the upper unit up until it has clicked.

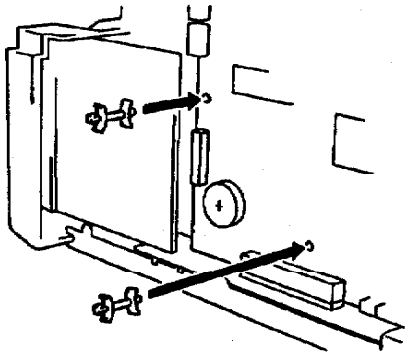
3. Remove the rear cover (4 screws).



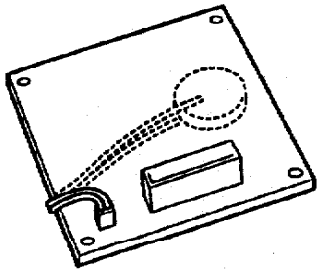
4. Remove the metal cover (6 screws).



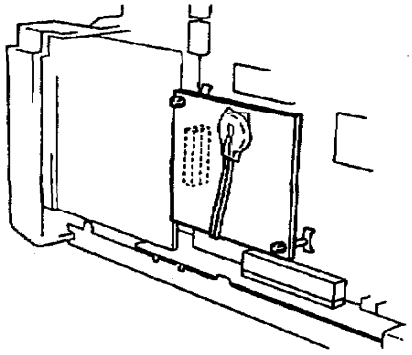
5. Attach the two hinges to the control board.



6. Connect the 2pin connector to the CN802 on the memory board.



7. Attach the memory board to the control board.
Position the memory board connector on CN104 of the control board,aligning the side holes of the memory board with the hinges.Then push the connector into the control board.

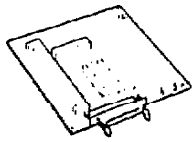


8. Reinstall the metal cover with five screws and reinstall the rear cover with four screws.

9. Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.

PCL-5e BOARD / BR-Script II BOARD INSTALLTION PROCEDURE

Accessories

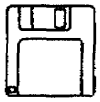


PCL-5e board /
BR-Script II board...1piece

Screw M3X6...1pieces

Screw M3X6...2pieces

Cap...1piece



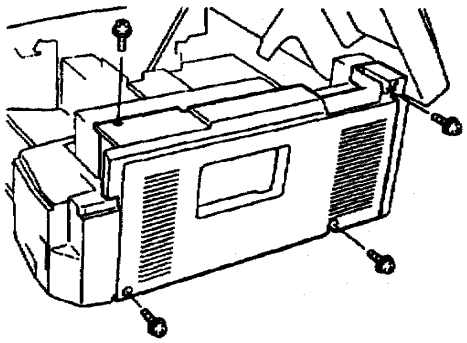
Diskette of driver software...1piece

Installation pocedure...1piece

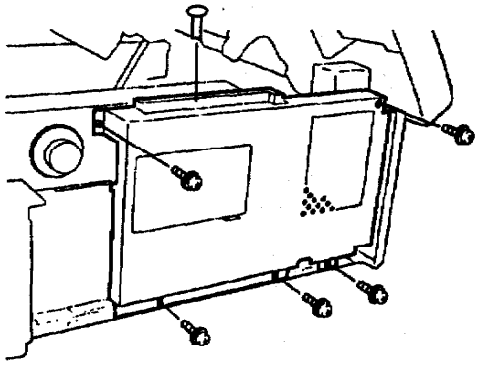
1. Turn off the power switch, and disconnect the power cord from the plug socket.

2. Pull the release lever to open the upper unit.
◆Push the upper unit up until it has clicked.

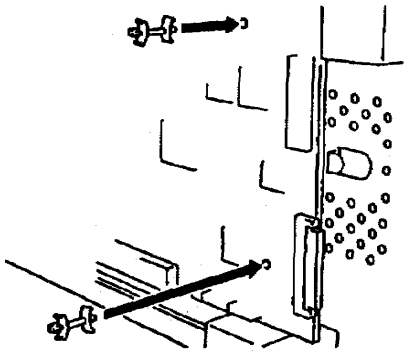
3. Remove the rear cover (4 screws).



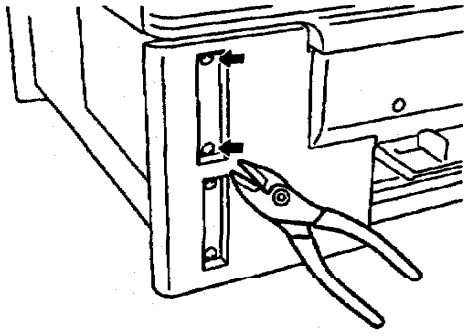
4. Remove the metal cover (6 screws).



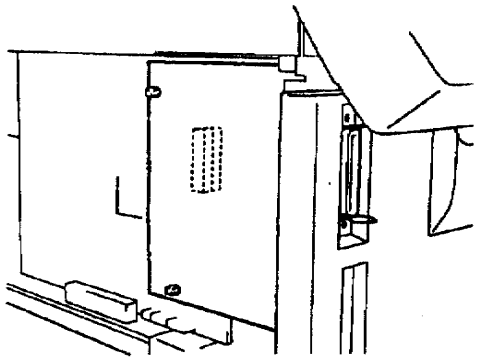
5. Attach the hinge to the control board.



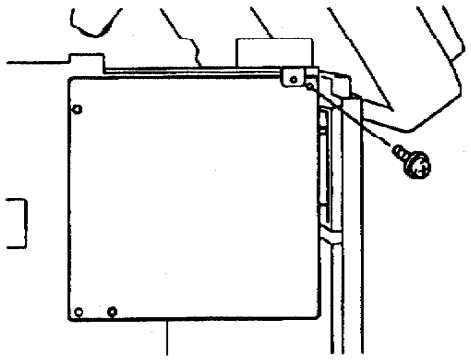
6. With nippers or link tool,provide the connector port opennig.



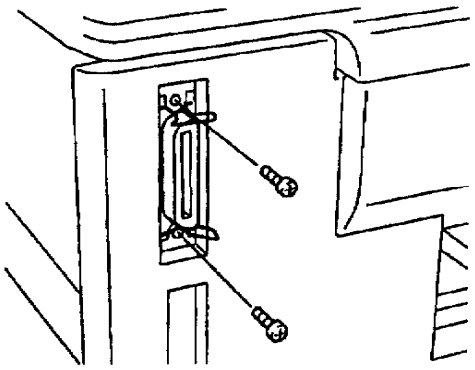
7. Attach the option board to the control board.
Position the memory board connector on CN301 of the control board,aligning the side holes of the memory board with the hinges.Then push the connector into the control board.



8. Fix the board to the main unit with one screw.



9. Attach the two screws to both sides of the connector.

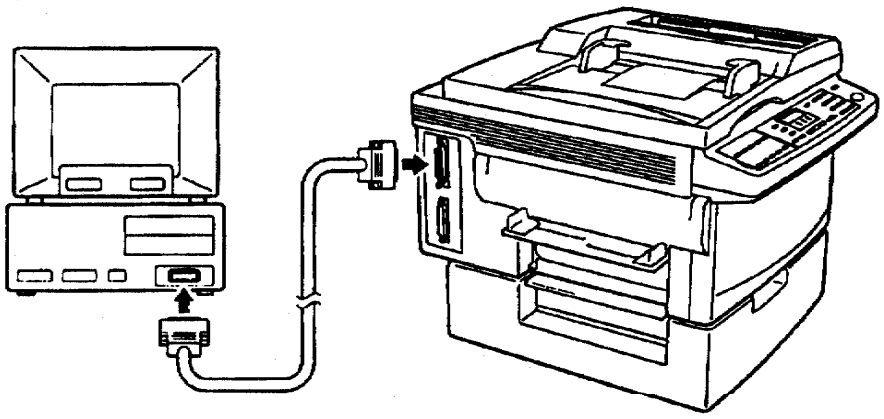


10. Reinstall the metal cover with five screws and reinstall the rear cover with four screws.

11. Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.

12. Connect one end connector of the parallel interface cable to the parallel interface connector of the computer and other end connector to the parallel interface connector of this equipment.

NOTE:
- To coprnly with the EMC requirements,cable connected to the parallel port and the serial port of this equipment shoud be shorter than 3m with high quality shield.
- When the machine is not to be connected to any personal computer, cap the connector to provide against static electricity. If the connector is not capped, the main unit may perform erratic operations.



13. Installing the Driver Software.

Install the driver software according to the following procedure:

To use the machine as the laser printer, it is necessary to install the dedicated driver software in the computer. Install the driver software according to the following procedure. The procedure described below applies to the operation on the computer and it is assumed that Windows are already activated.

For Windows95

(1)Start Windows 95. The screen shown on the right appears.

NOTE:If Windows95 does not recognize your printer;

1.Click the Start button and choose Run.
2.Insert the supplied disk for Windows into your floppy disk drive.
3.Type A:SETUP and choose the OK button or press the Enter key.
After the installer starts, skip the following steps and follow the instructions that appear on the screen.

(2) Make sure that the second option "Driver from disk provided by hardware manufac turer" is checked.

(3) Press the OK button. The screen shown on the right appears.

(4) Insert the supplied disk for Windows95 into the floppy disk drive: drive A in most cases.

(5) Press the OK button

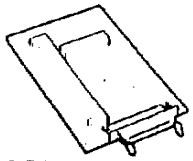
(6) Follows the instructions that appear on the screen.

For Windows3.1
(1) Start Windows3.1
(2) Insert the supplied disk for Windows into your floppy disk drive.
(3) Choose Run from the File menu in the Program Manager
(4) Type the drive name where you inserted the supplied disk and "SETUP" in the box: for example, A:/SETUP. Choose the OK button or press the Enter key

NOTE:
- The installer automatically updates your SYSTEM.INI Windows file by adding DEVICE=bi-di.386 under the [386Enh] section. if any bi-directional parallel communica tions device driver has previously been installed, it will be deactivated by this new driver If you want to use the driver that was previously installed, you should re-install your previous driver. However, reinstalling the previous driver will make the HL-1260e driver inactive.
- The installer makes the installed printer driver the Windows default.
- The installer automatically sets the printer port to the parallel interface,LPT1.
- During this installation, change have been made to the SYSTEM.INI file. It is necessary to restart Windows so that the changes become effective and the install bi-directional parallel communications device driver can take efect.

GDI BOARD INSTALLTION PROCEDURE

Accessories

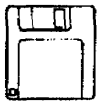


GDI board...1piece

Screw M3X6...1pieces

Screw M3X6...2pieces

Cap...1piece



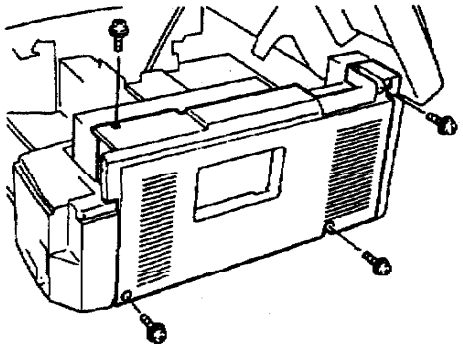
Diskette of driver software...1pieces

Installation pocedure...1piece

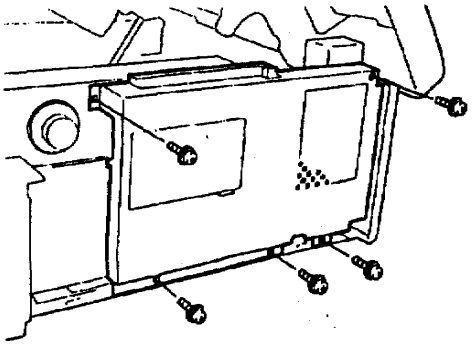
1. Turn off the power switch, and disconnect the power cord from the plug socket.

2. Pull the release lever to open the upper unit.
◆Push the upper unit up until it has clicked.

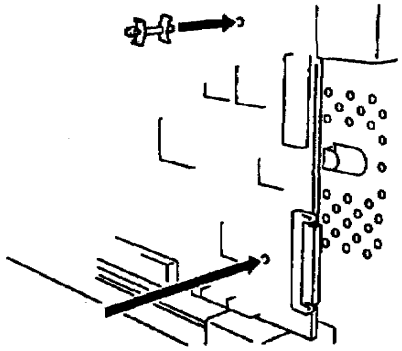
3. Remove the rear cover (4 screws).



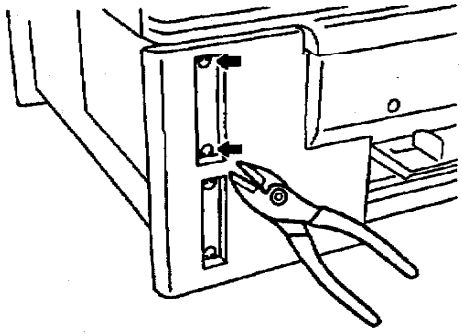
4. Remove the metal cover (5 screws).



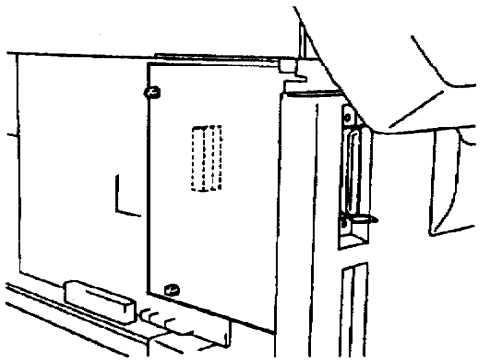
5. Attach the hinge to the control board.



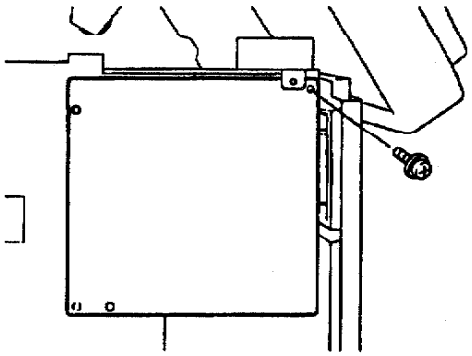
6. With nippers or link tool,provide the connector port opennig.



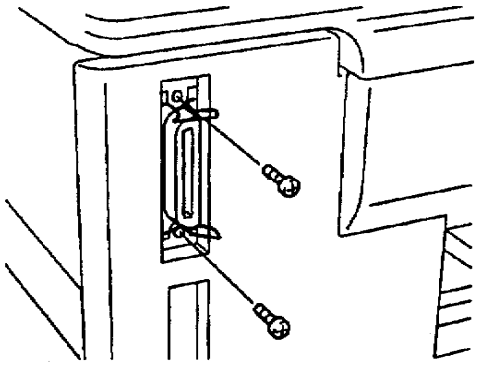
7. Attach the GDI board to the control board. Position the GDI board connector on CN301 of the control board,aligning the side holes of the GDI board with the hinges.Then push the connector into the control board.



8. Fix the GDI board to the main unit with one screw.



9. Attach the two screws to both sides of the connector.

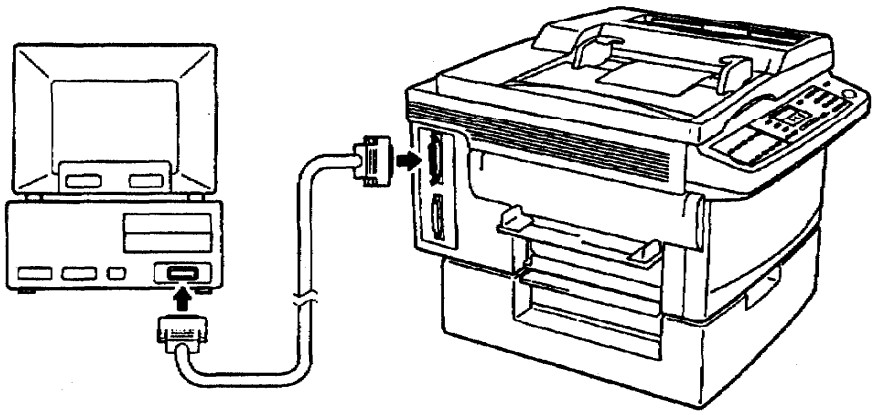


10. Reinstall the metal cover with five screws and reinstall the rear cover with four screws.

11. Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.

12. Connect one end connector of the parallel interface cable to the parallel interface connector of the computer and other end connector to the parallel interface connector of this equipment.

NOTE:
- To copmly with the EMC requirements,cable connected to the parallel port and the serial port of this equipment shoud be shorter than 3m with high quality shield.
- When the machine is not to be connected to any personal computer, cap the connector to provide against static electricity. If the connector is not capped, the main unit may perform erratic operations.



13. Installing the Driver Software.
Install the driver software according to the following procedure:

For Windows 95
1. Click [Start] and select [Settings] => [Printers].
2. Click [Printers].
3. Double-click [Add Printer].
4. Follows the instructions that appear on the screen.

For Windows 3.1
1. Check to ensure that the "program manager" is displayed.Set the program disk into the fioppy-disk drive slot.
2. Click [File] select and click [Run...] in the menu.
3. Enter "A:/INSTALL.EXE" in [Commnd Line:] and click [OK].

Upon the end of installation, the end message is displayed.Then click [Restart Windows].

CLASS1 BOARD INSTALLTION PROCEDURE

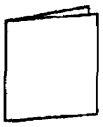
Accessories

CLASS1 Board...1piece

Hex head screw...2pieces
Wssher...2pieces

Screw M3X6...2pieces

Cap...1piece

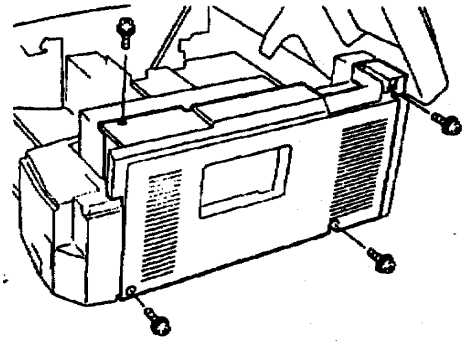


Installation pocedure...1piece

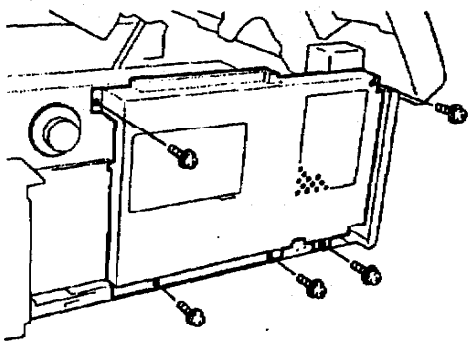
1. Turn off the power switch, and disconnect the power cord from the plug socket.

2. Pull the release lever to open the upper unit.
◆Push the upper unit up until it has clicked.

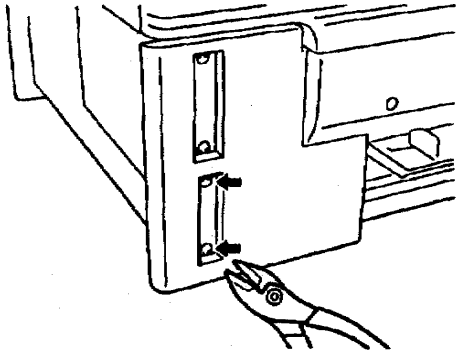
3. Remove the rear cover (4 screws).



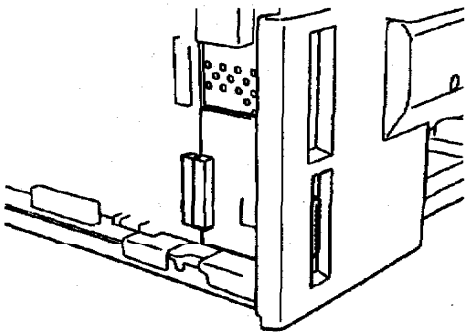
4. Remove the metal cover (5 screws).



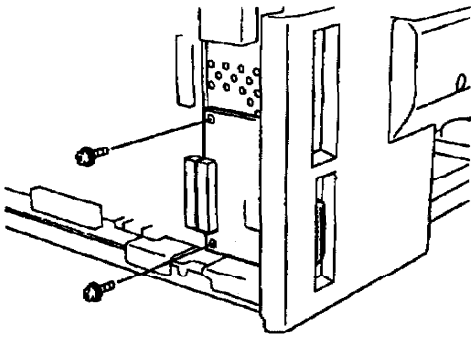
5. With nippers or link tool,provide the connector port opennig.



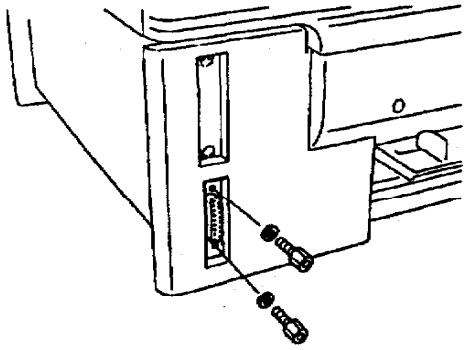
6. Connect the CLASS1 board connctor to the CN101 of the control board.



7. Fix the CLASS1 board to the main unit with two screws.



8. Attach the two hex head screws and the two washers to both sides of the connector.

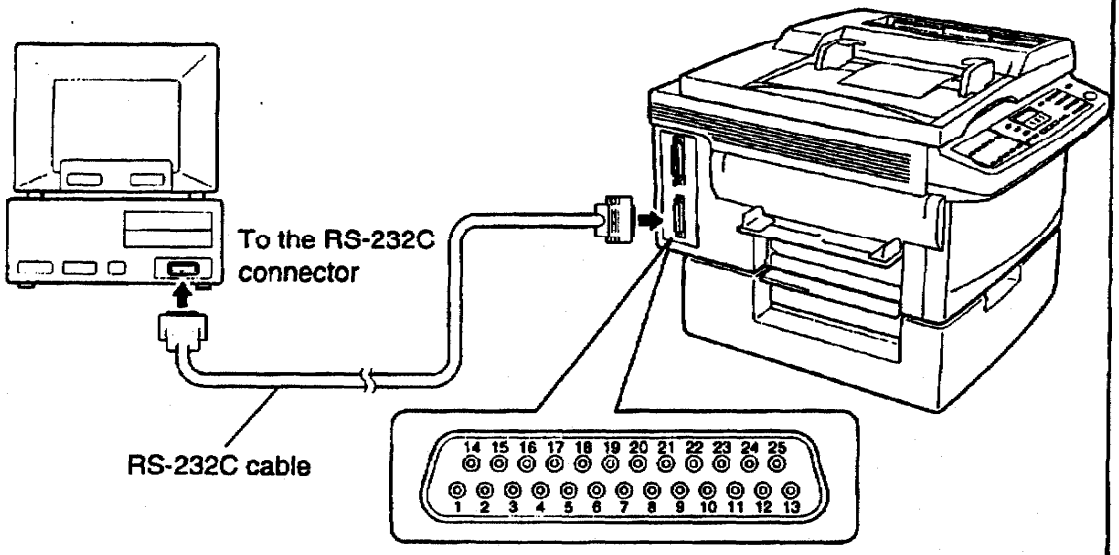


10. Reinstall the metal cover with five screws and reinstall the rear cover with four screws.

11. Close the upper unit by picking up the stopper lever while pushing up the upper unit slightly.

12. Connect one end connector of the RS-232C cable to the serial connector of the computer and other end connector to the serial connector of this equipment.

NOTE:
- To copmly with the EMC requirements,cable connected to the parallel port and the serial port of this equipment shoud be shorter than 3m with high quality shield.
- When the machine is not to be connected to any personal computer, cap the connector to provide against static electricity. If the connector is not capped, the main unit may perform erratic operations.

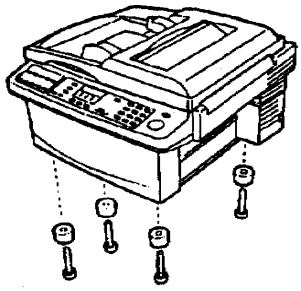


CASSETTE FEEDER INSTALLATION PROCEDURE

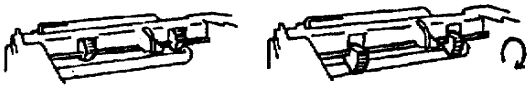
Accessories

Cassette feeder-1 piece, 500 sheet paper cassette-1 piece, screw(M4X10) - 4 pieces, and tape - 1 piece.

1. Turn the power switch OFF and unplug the power cord from the wall socket.
2. Remove the four screws and feet from the main unit.
   Place the unit on the corner of a desk, or similar location, and remove the screws and feet one at a time. Do not reuse the screws and feet.

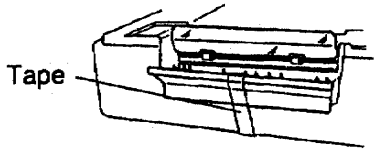


NOTE:
Before placing the main unit onto the cassette feeder, make sure that the feed roller is set in its home position. Turn the feed roller clockwise until it "clicks".

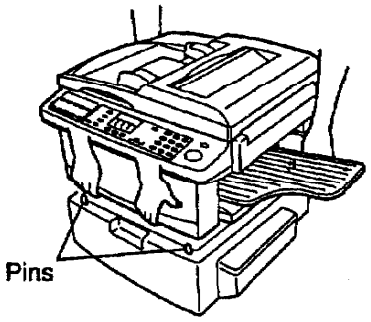


Home position Out of Home position

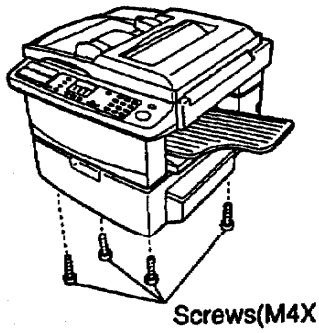
NOTE:
To facilitate mounting of the main unit onto the cassette feeder,open the jam lid and secure it with the tape supplied. After completing the installation of the cassette feeder remove the tape.



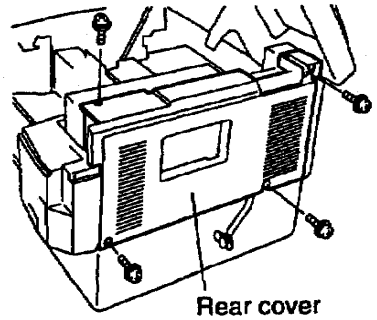
3. Place the main unit on the cassette feeder,so that the guide pins are aligned with the alignment holes.



4. Secure the main unit to the cassette feeder with four screws(M4X10).



5. Open the unit and remove the rear cover.(four screws)



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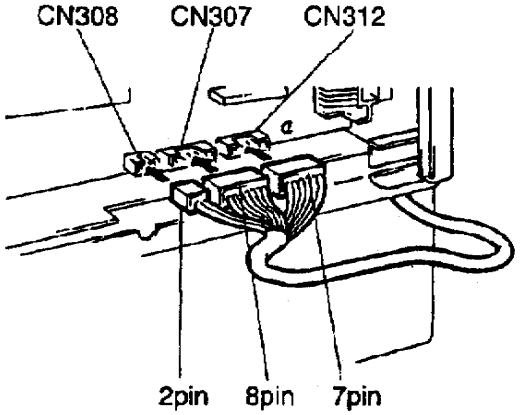
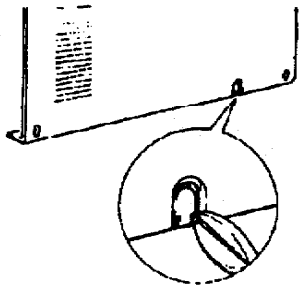
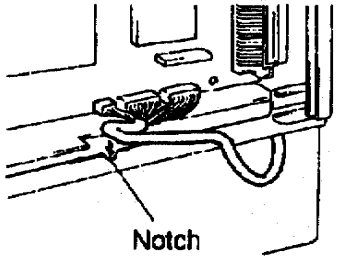
6. Connect the 7 pin connector to the CN312 , the 2 pin connector to the CN308, and the 8 pin connector to the CN307 of the main unit control board.



7. Cut the wire harness outlet port of the rear cover.



8. Reinstall the rear cover(four screws), while ensuring that the wire harness fits into the notch of the main body chassis.



9. Close the upper unit.

10. Plug the power cord into the wall outlet, turn the main unit power switch ON, and register the cassette size of the cassette feeder.

COPY:A4/UPPER 01
100%

(1) Press [MENU] key.

ENTER MENU No. _
1 - 7

(2) Press TEN key [2]

ENTER MENU No. 2
1 - 9/ENTER

(3) Select the [ENTER] key repeatedly until the screen for the appears.

PAPER SIZE LOWER

0:A4/1:LT/2:LG
0-2/ENTER

(4) With TEN key,select the paper size to be used with the paper cassette.

0:A4 size

1:Letter size

2:Legal size

NOTE;The blinking number indicates the current selection.

(5) Press the [ENTER] key two times. This concludes the paper size programming process and returns the display to the opening screen.

TEST OPERATION

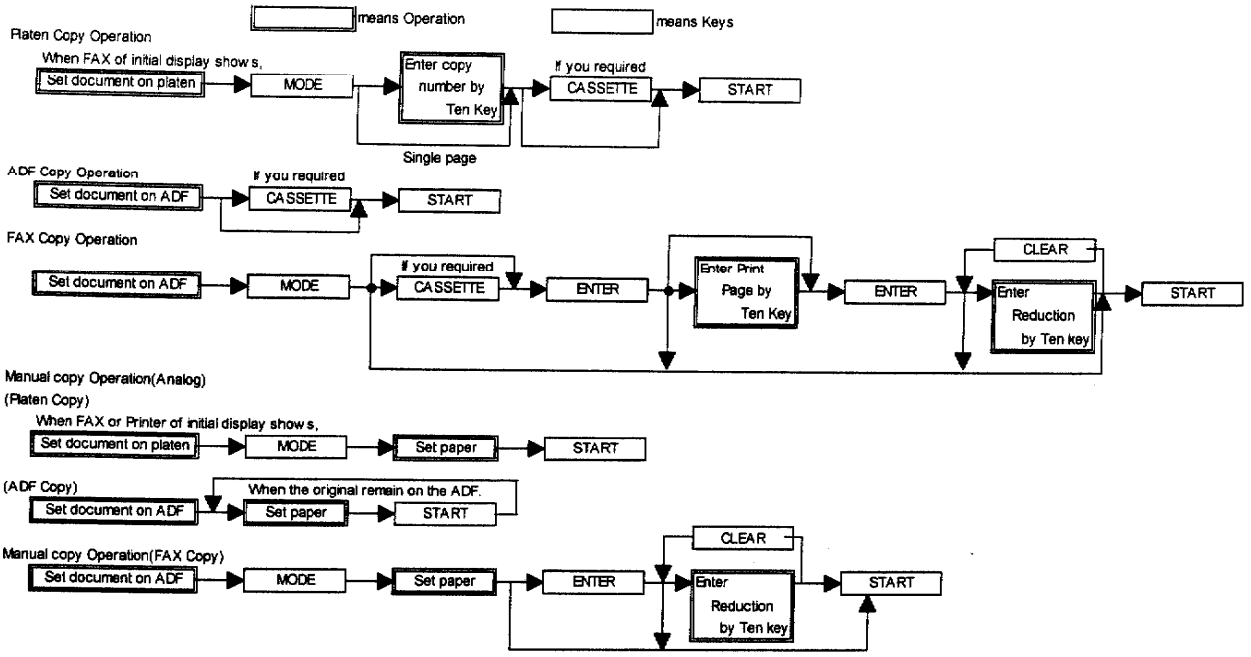
After installation, perform the test operation to check;

- Installation condition (ensure the main unit is level).
- Check the cassette and paper feed.
- Check for unusual noise.

SECTION 3 BASIC INSTRUCTION

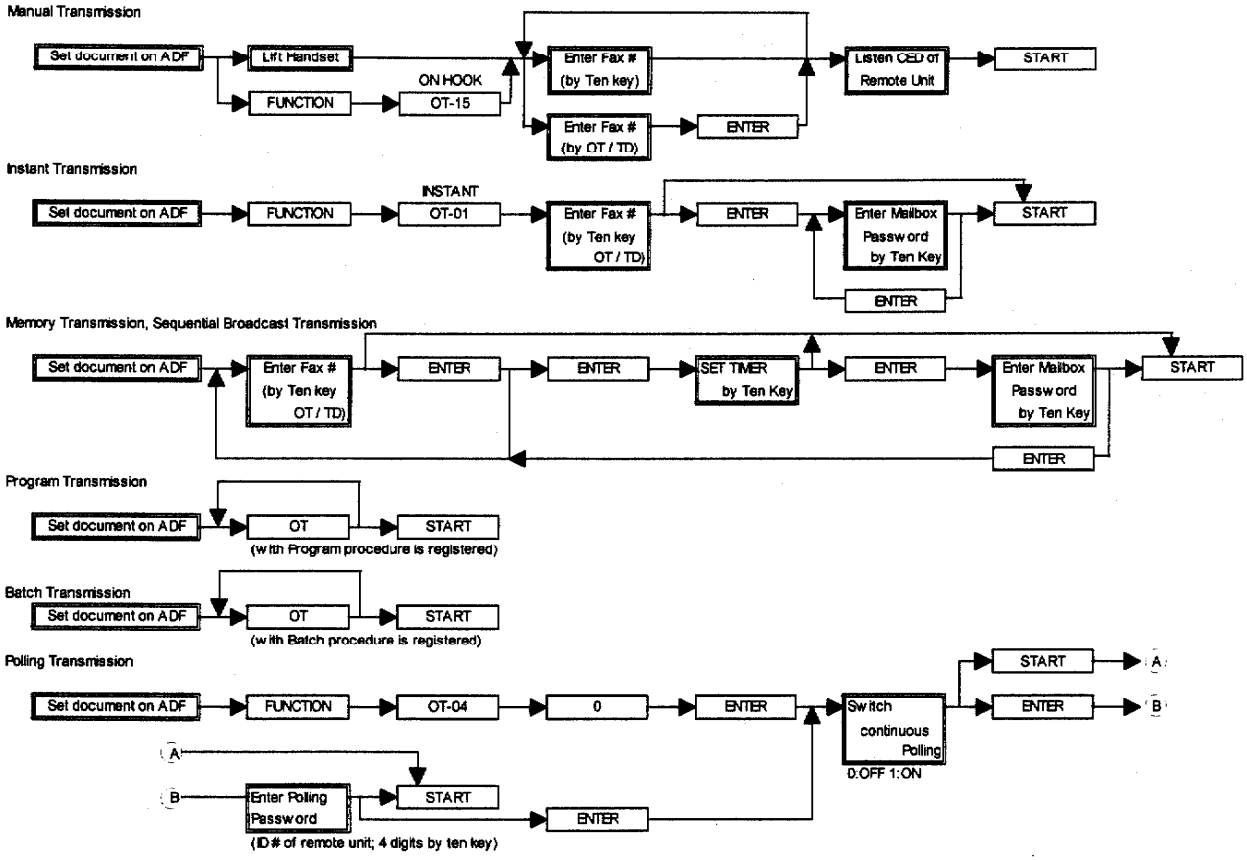
SECTION 3 BASIC INSTRUCTION

3-1. OPERATION (COPIER)

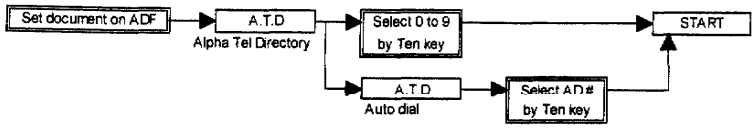


3-2. OPERATION (FACSIMILE)

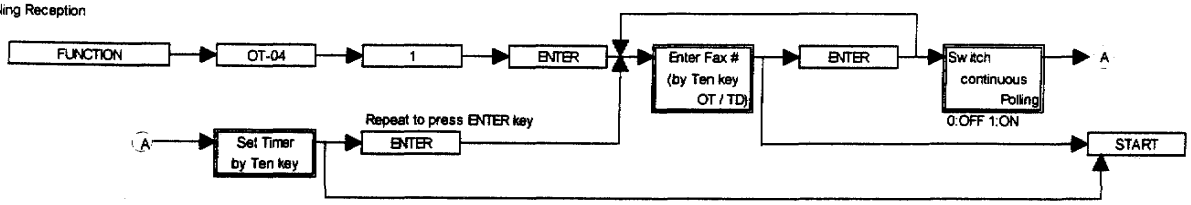
3-2-1. TRANSMISSION, RECEPTION



Auto dial Transmission

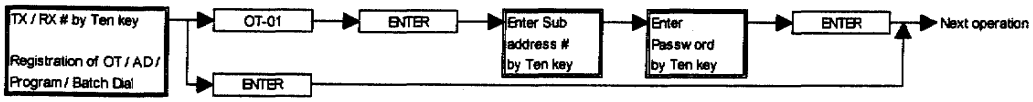


Polling Reception

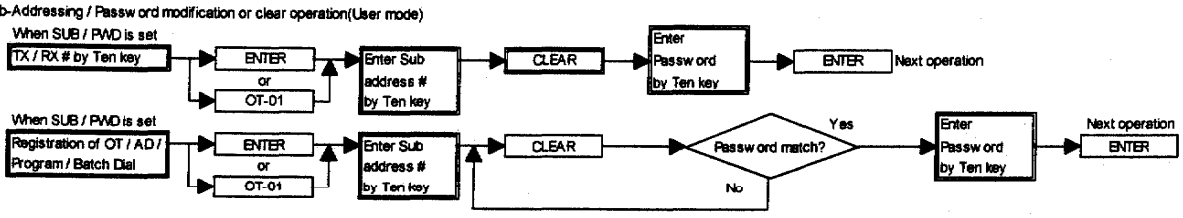


3-2-2. OTHER OPERATION

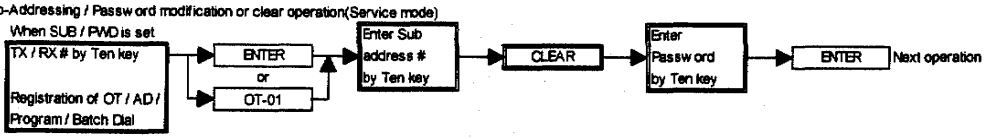
Sub-Addressing / Passw ord Registration



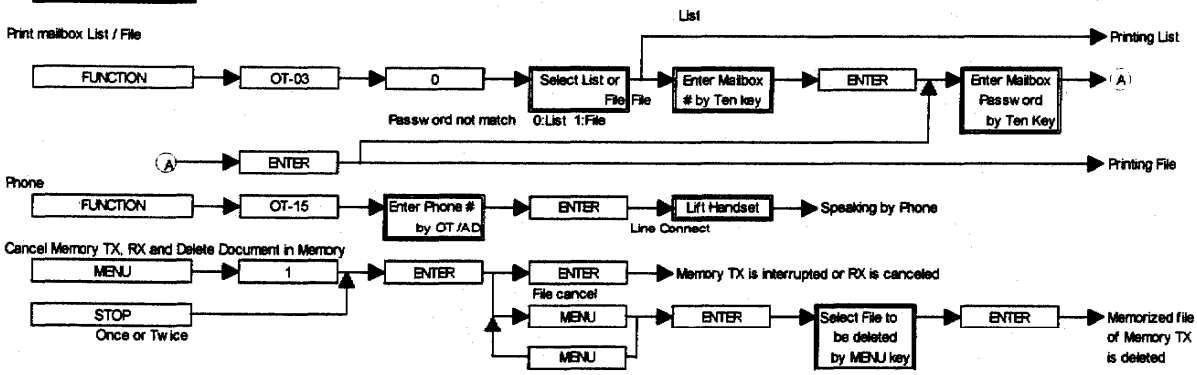
Sub-Addressing / Passw ord modification or clear operation(User mode)



Sub-Addressing / Passw ord modification or clear operation(Service mode)



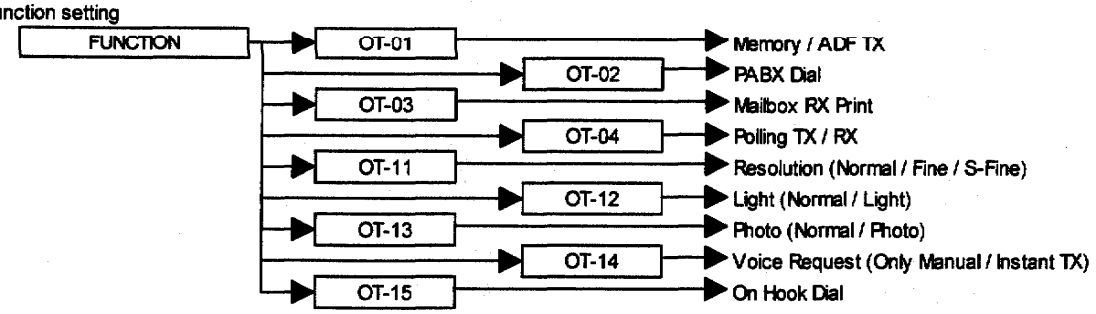
Print mailbox List / File



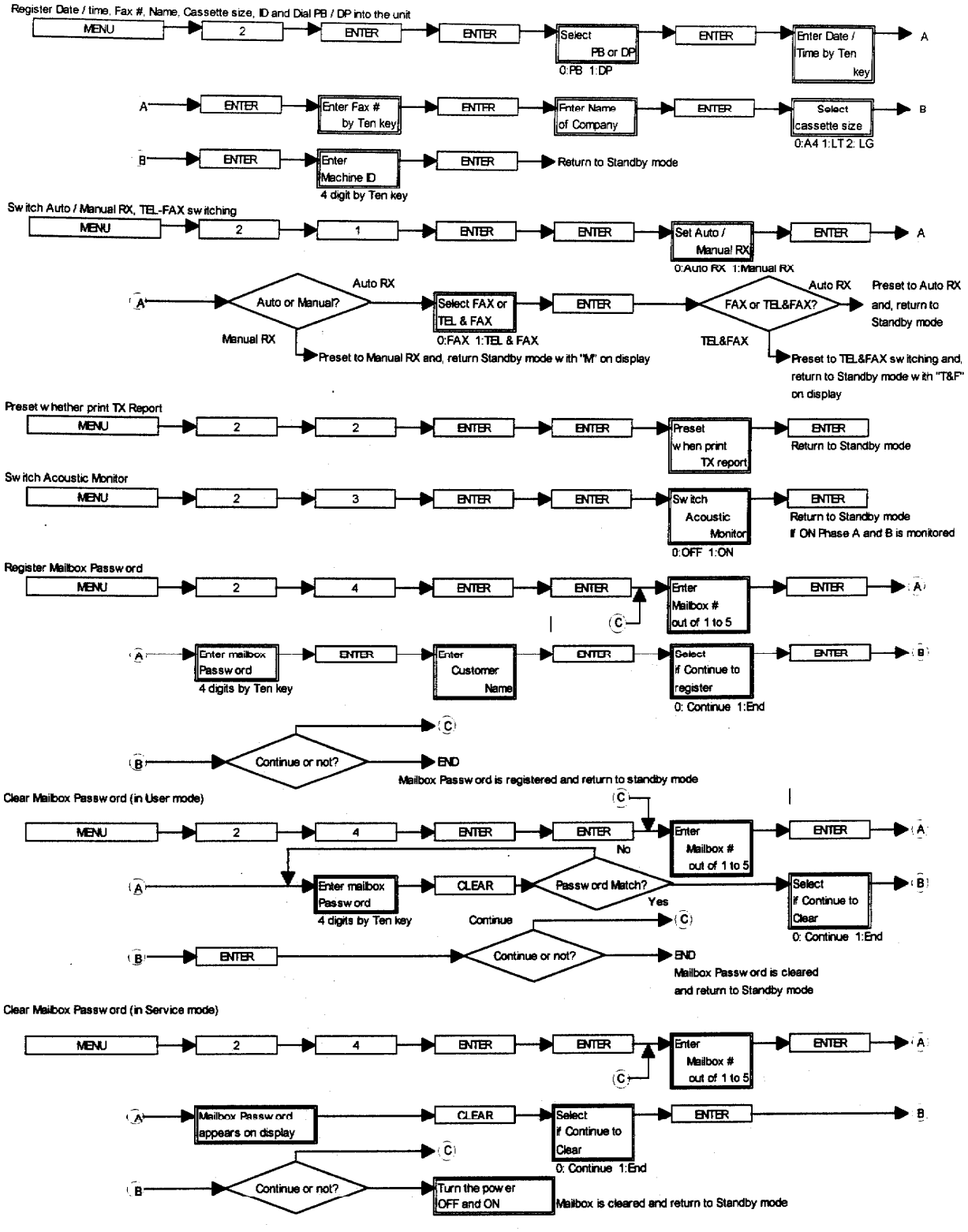
Phone

Cancel Memory TX, RX and Delete Document in Memory

Function setting

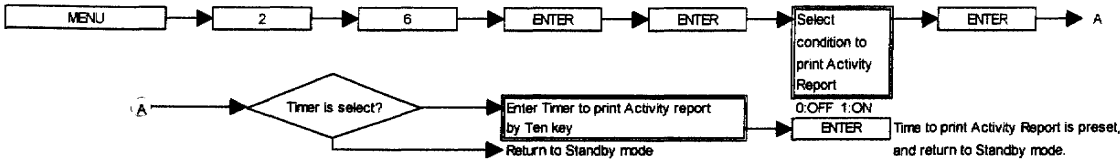


SECTION 3 BASIC INSTRUCTION

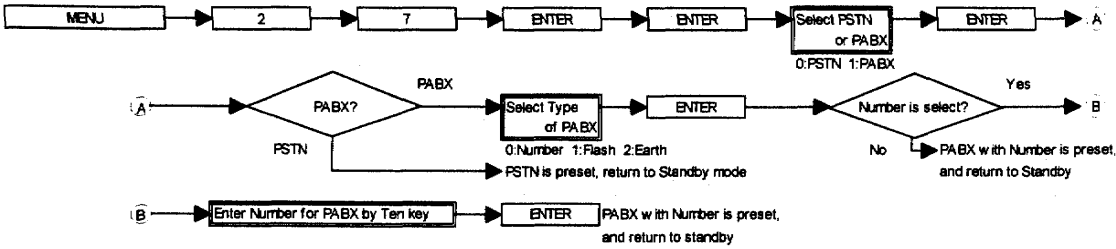


Switch Power save mode

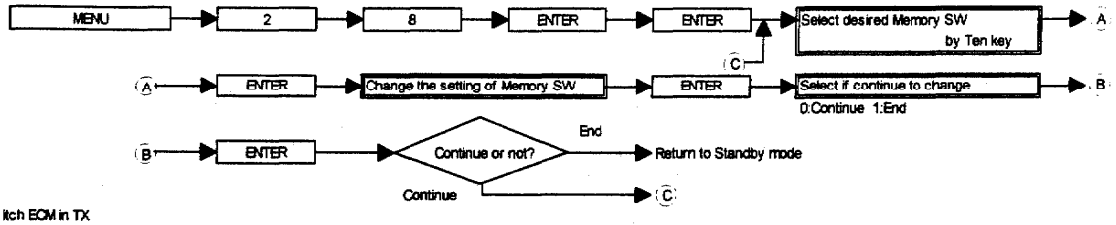
Register time print Activity Report



Register PSTN / PABX

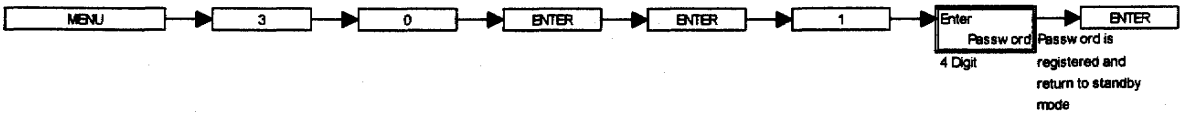


Register Memory Switches

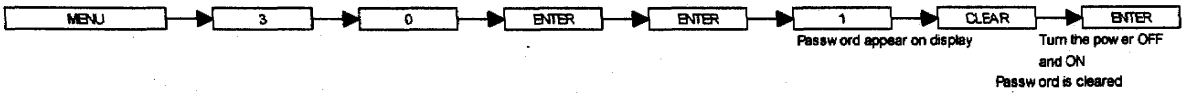


Switch ECM in TX

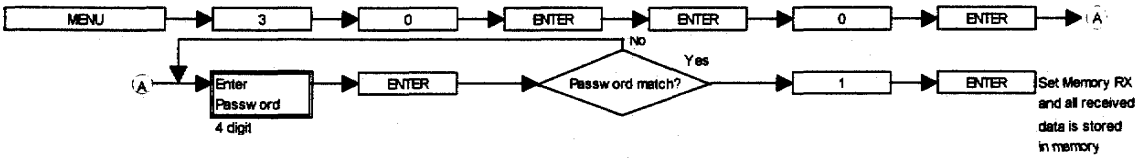
Register Password of Memory RX



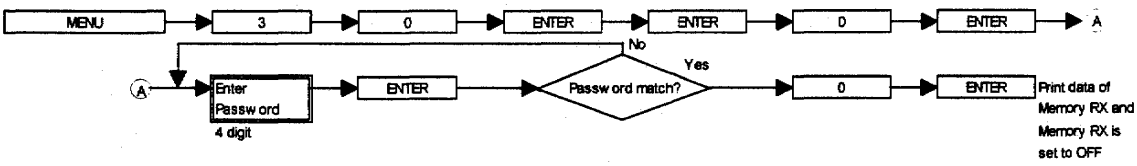
Clear Password of Memory RX (in service mode)



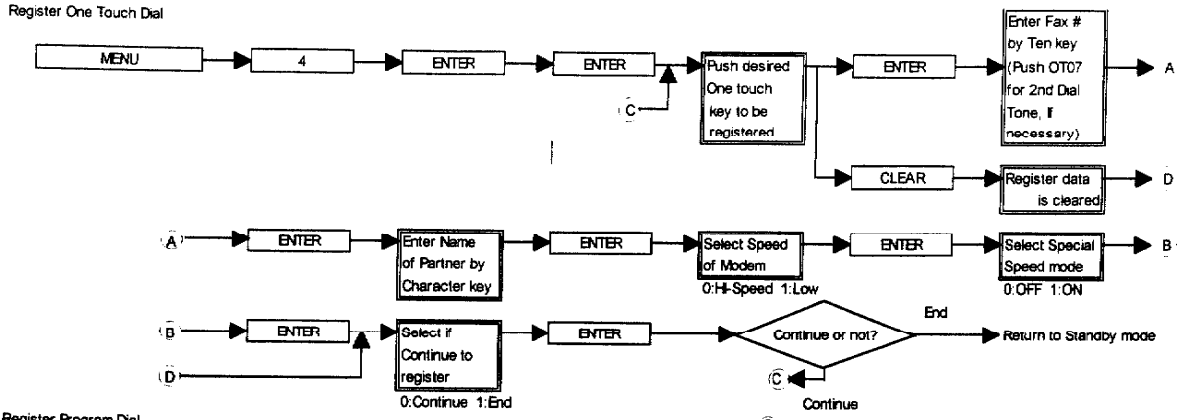
Set Memory RX



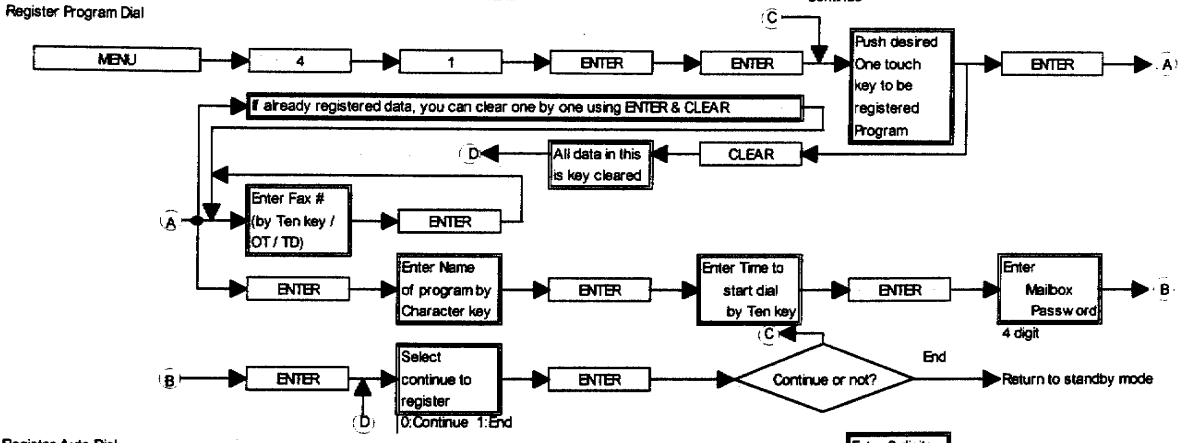
Print data of Memory RX



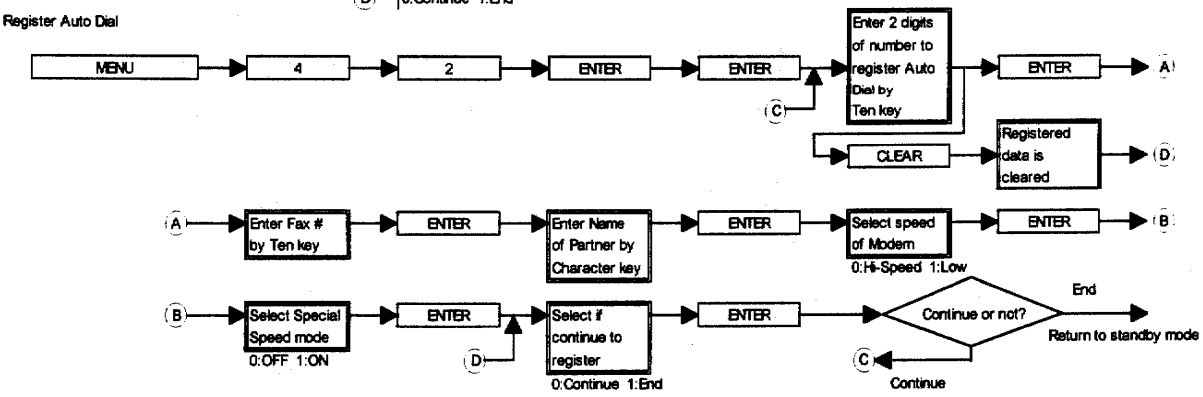
Register One Touch Dial



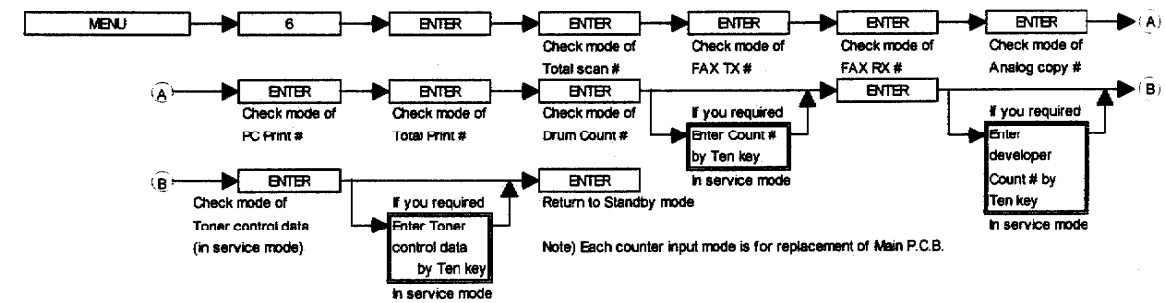
Register Program Dial

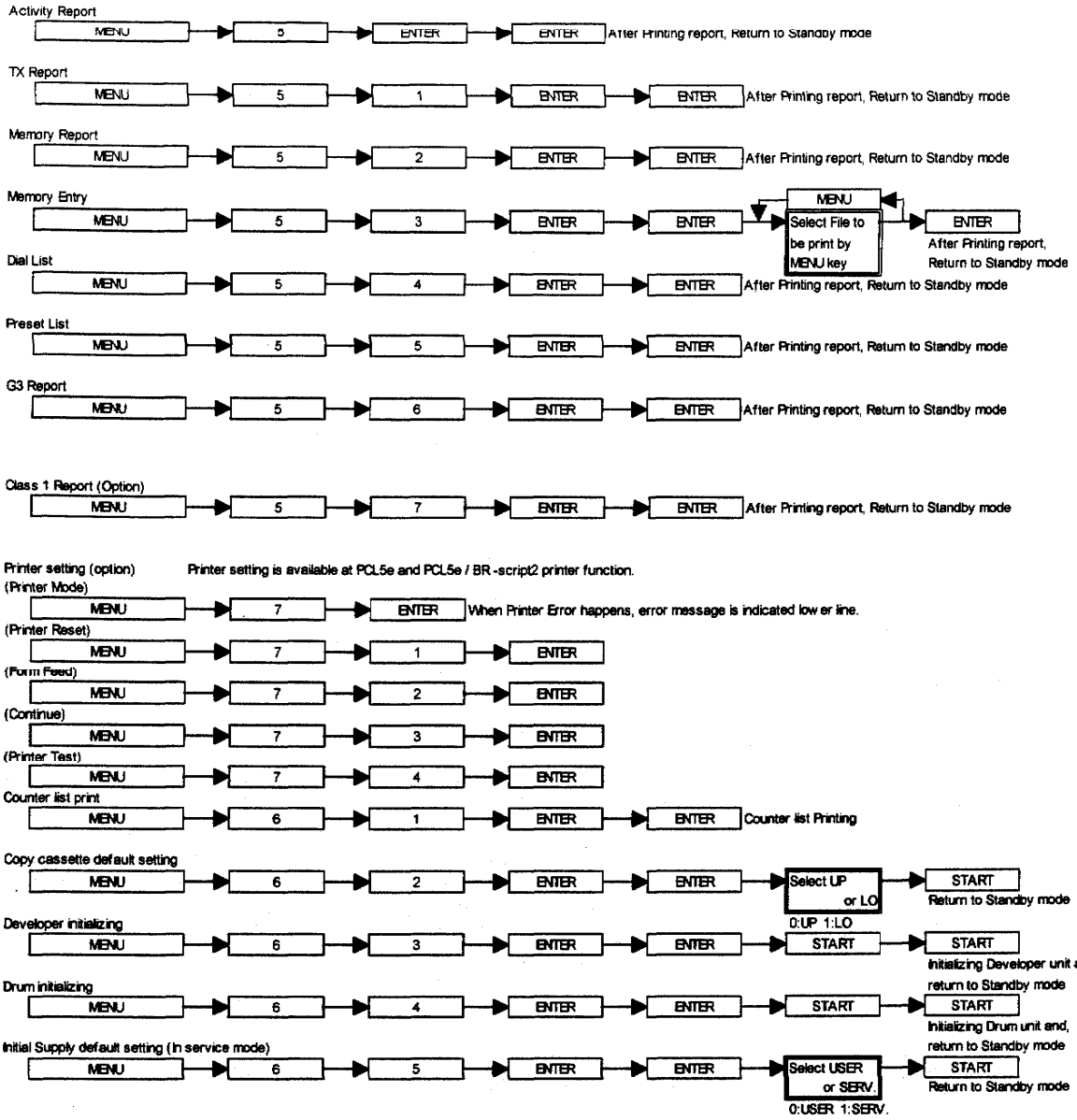


Register Auto Dial



Special setting mode (Counter check)




Activity Report
MENU → 5 → ENTER → ENTER After Printing report, Return to Standby mode
TX Report
MENU → 5 → 1 → ENTER → ENTER After Printing report, Return to Standby mode
Memory Report
MENU → 5 → 2 → ENTER → ENTER After Printing report, Return to Standby mode
Memory Entry
MENU → 5 → 3 → ENTER → ENTER
MENU
Select File to be print by MENU key
ENTER
After Printing report, Return to Standby mode
Dial List
MENU → 5 → 4 → ENTER → ENTER After Printing report, Return to Standby mode
Preset List
MENU → 5 → 5 → ENTER → ENTER After Printing report, Return to Standby mode
G3 Report
MENU → 5 → 6 → ENTER → ENTER After Printing report, Return to Standby mode
Class 1 Report (Option)
MENU → 5 → 7 → ENTER → ENTER After Printing report, Return to Standby mode
Printer setting (option) Printer setting is available at PCL5e and PCL5e / BR-script2 printer function.
(Printer Mode)
MENU → 7 → ENTER When Printer Error happens, error message is indicated low er line.
(Printer Reset)
MENU → 7 → 1 → ENTER
(Form Feed)
MENU → 7 → 2 → ENTER
(Continue)
MENU → 7 → 3 → ENTER
(Printer Test)
MENU → 7 → 4 → ENTER
Counter list print
MENU → 6 → 1 → ENTER → ENTER Counter list Printing
Copy cassette default setting
MENU → 6 → 2 → ENTER → ENTER → Select UP or LO → START Return to Standby mode
0:UP 1:LO
Developer initializing
MENU → 6 → 3 → ENTER → ENTER → START → START
Initializing Developer unit and, return to Standby mode
Drum initializing
MENU → 6 → 4 → ENTER → ENTER → START → START
Initializing Drum unit and, return to Standby mode
Initial Supply default setting (In service mode)
MENU → 6 → 5 → ENTER → ENTER → Select USER or SERV. → START Return to Standby mode
0:USER 1:SERV.

SECTION 4 ADJUSTMENT

SECTION 4 ADJUSTMENT

4-1. Common

4-1-1. Toner concentration

To adjust the concentration of black solid portions, change the toner concentration setting.

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "7", "ENTER" and "ENTER" keys.

07. TONER MODE 3
0-6/START

(3) Enter the data number (one of 0 - 6) associated with the toner concentration you choose by ten key, then press the "START" key.

Data	Toner concentration	
0	3.8 %	
1	4.2 %	
2	4.6 %	
3	5.0 %	Default
4	5.4 %	
5	5.8 %	
6	6.6 %	

Remark) Higher toner concentration, the more the inside of the machine is contaminated.

4-1-2. Fusing temperature

If the fusing performance needs to be increased because thick paper is used for copy and so on, change the fusing temperature setting.

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "6", "ENTER" and "ENTER" keys.

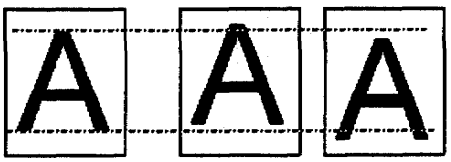
06. FUSER TEMP 2
0-4/START

(3) Enter the data number you want by ten key, then press the START key.

Data	Fusing temperature	
0	167.5°C (-10°C)	
1	172.5°C (-5°C)	
2	177.5°C	Default
3	182.5°C (+5°C)	
4	187.5°C (+10°C)	

4-1-3. Top end adjustment

If the top end of a print is out of place compared with the original, change the top end position setting.



Original Print

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "3", "ENTER" and "ENTER" keys.

(3) Select "COPY PAPER", "SDH PAPER", "FAX PAPER" or "PRINTER PAPER" by ten key (1 to 4).

Select No.	LCD display	Default
1	COPY PAPER 32 00-64/START	32
2	SDH PAPER 32 00-64/START	32
3	FAX PAPER 32 00-64/START	32
4	PRINTER PAPER 32 00-64/START	32

(4) Enter the desirable data value by ten key and press the START key.

Top end position	Data
-4.5 mm	0
0 mm	32
+4.5 mm	64

4-2. Copy Related

4-2-1. Light quantity of the exposure lamp (copy exposure)

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "1", "ENTER" and "ENTER" keys.

AVR ADJUSTMENT
1-3

(3) Select one of adjustment positions 1 to 3 of VR.

Ex.) Press ten key "1" to select the center position

VR-center 32
00-64/START

(4) Enter the desirable data value (00 - 64) by ten key, then press the START key.

(5) If you want to change the setting in other adjustment positions, repeat (2) to (4).

(Setting range) Voltage increases as the set value is made larger.
(Shade of copy is made lighter.)

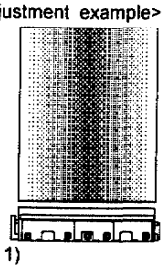
Position selecting data	Adjustment position	Setting range	Exposure lamp energizing voltage (V) (Default voltage)
1	Center	00~64	52~58 (About 55)
2	Min. position	00~64	48~51 (About 50)
3	Max. position	00~64	60~66 (About 63)

Note) When measuring the exposure lamp energizing voltage, an AC voltmeter of actual value detecting type should be used.

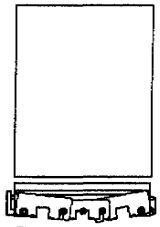
4-2-2. Light quantity balance of the exposure lamp

If the light quantity balance of the exposure lamp becomes uneven, make an adjustment by the light quantity compensating plate of the first scanner.

<Adjustment example>



(Fig. 1)
Before the adjustment



(Fig. 2)
After the adjustment

4-2-3. Scanner speed (copy dimensions)

If an original does not match the copy dimensions in the paper forward direction, make an adjustment by changing the scanner speed.

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "2", "ENTER" and "ENTER" keys.

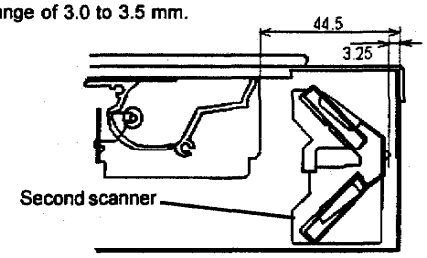
A-SCANNER ADJ. 32
00-64/START

(Setting range)

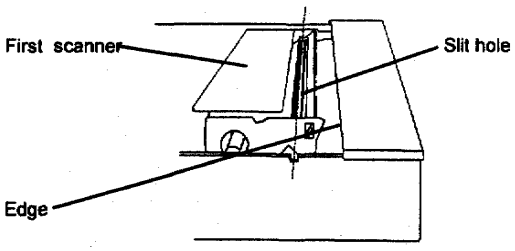
Setting data	Adjustable dimension range
0	-2.5 mm
32	0 mm
64	+2.5 mm

4-2-4. Scanner fixed position (focus adjustment)

(1) Move the second scanner so the distance between the second scanner frame and the chassis frame may fall within the range of 3.0 to 3.5 mm.



(2) Temporarily tighten the wire fastening screw of the first scanner in such a position that the slit hole of the first scanner is nearly parallel to the edge of the chassis frame.



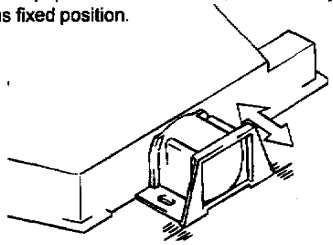
(3) Make fine adjustments of the position in which the first scanner is fixed, while making outputs of test copies.

Ref.) - When a vague copy is made larger than a original, make the first scanner away from the second scanner.
- When a vague copy is made smaller than a original, make the first scanner closer to the second scanner.

Note) After fine adjustments, there are some cases in which the positions do not agree with those shown in the figure.

4-2-5. Lens fixed position

If the original dimensions are deviant from the copy dimensions in perpendicular to the paper forward direction, make an adjustment by changing the lens fixed position.

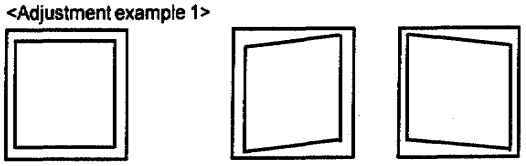


Note) Make an adjustment so right and left scales of the lens are balanced in position.

4-2-6. Squareness

If squareness is not obtained because of optical obliqueness, adjust the second scanner mounting angle or the mirror height.

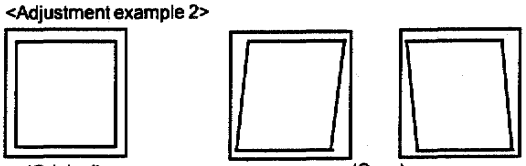
<Adjustment example 1>



(Original) (Copy)

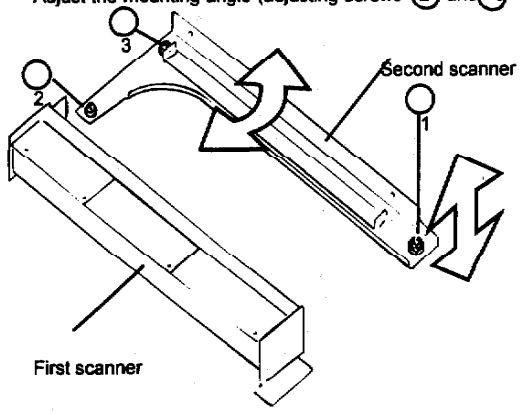
Adjust the mirror height (adjusting screw ①)

<Adjustment example 2>



(Original) (Copy)

Adjust the mounting angle (adjusting screws ② and ③)



Note) Because out-of-squareness occurs by oblique paper, make sure paper is not oblique beforehand. (Ref. If the paper is oblique case, out-of-squareness occurs by digital print also.)
If the paper is reckoned oblique, it is necessary to clean or

replace the paper supply roller and the paper feed roller.

4-3. Facsimile Related

4-3-1. CIS (contact image sensor) reading level

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU", "0", "ENTER" and "ENTER" keys.

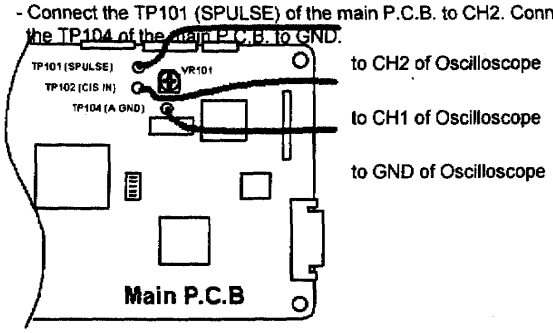
(3) Press "OT-01" key.

SCANNER LED ON

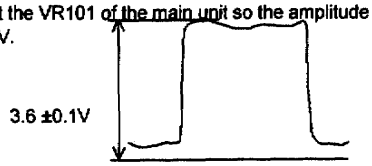
By this operation, CIS scans the white film attached to the reading section.

(4) Measure the reading level by an oscilloscope.

- Connect the TP102 (CIS IN) of the main P.C.B. to CH1.
- Connect the TP101 (SPULSE) of the main P.C.B. to CH2. Connect the TP104 of the main P.C.B. to GND.



(5) Adjust the VR101 of the main unit so the amplitude falls within 3.6 ± 0.1 V.



4-3-2. Transmission level of the facsimile modem

(1) Connect a level meter to the TEL/LINE of NCU.

Note) The modular code of the level meter having 600 W of terminating resistance should be used.

(2) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(3) Press "MENU", "0", "ENTER" and "ENTER" keys.

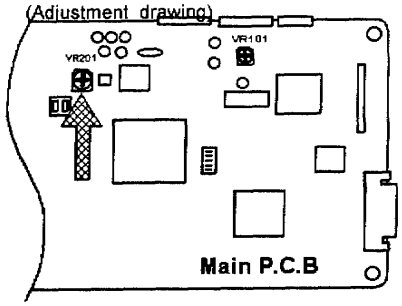
(4) Press "OT-03" key.

MODEM TEST

2100HZ

(4) Adjust the VR201 of the main unit so the transmission level falls within 10.5 ± 0.2 dB.

(Adjustment drawing)



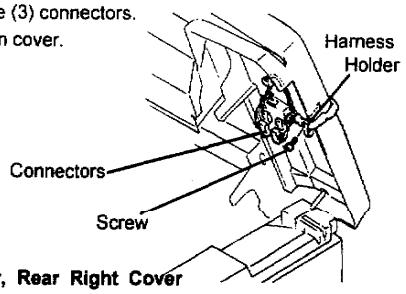
SECTION 5 DISASSEMBLY

SECTION 5 DISASSEMBLY

5-1. Covers

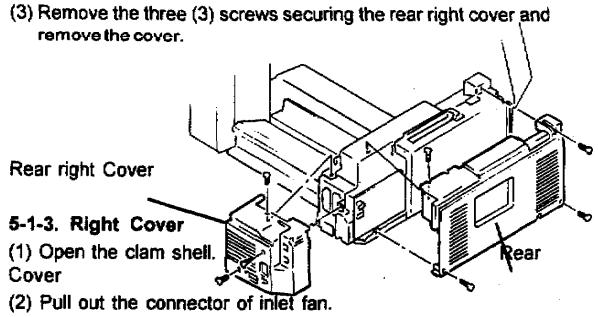
5-1-1. Platen Cover

(1) Open the clam shell and Platen Cover.
(2) Remove the one (1) screw securing wire harness holder.
(3) Pull out the three (3) connectors.
(4) Pull up the platen cover.



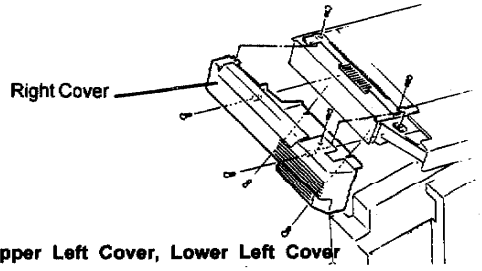
5-1-2. Rear Cover, Rear Right Cover

(1) Open the clam shell.
(2) Remove four (4) screws securing the rear cover and remove the cover.
(3) Remove the three (3) screws securing the rear right cover and remove the cover.



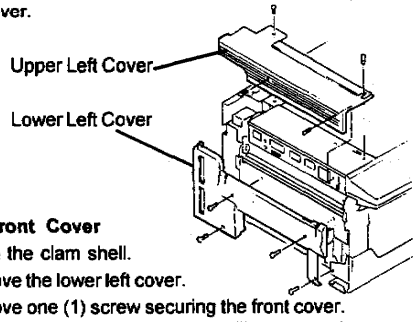
5-1-3. Right Cover

(1) Open the clam shell.
Cover
(2) Pull out the connector of inlet fan.
(3) Remove the seven (7) screws securing right cover and remove the cover.



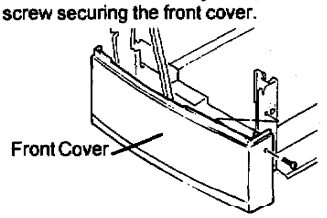
5-1-4. Upper Left Cover, Lower Left Cover

(1) Open the clam shell.
(2) Remove the four (4) screws securing the upper left cover and remove the cover.
(3) Remove the four (4) screws securing the lower cover and remove the cover.



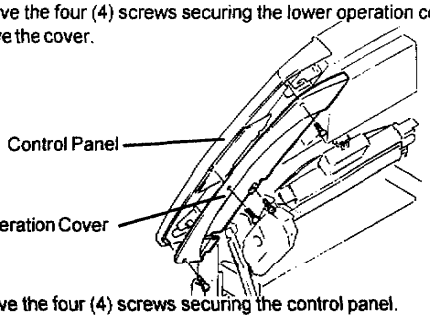
5-1-5. Front Cover

(1) Open the clam shell.
(2) Remove the lower left cover.
(3) Remove one (1) screw securing the front cover.

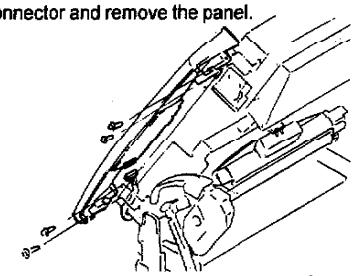


5-2. Control Panel

(1) Open the clam shell.
(2) Remove the four (4) screws securing the lower operation cover and remove the cover.

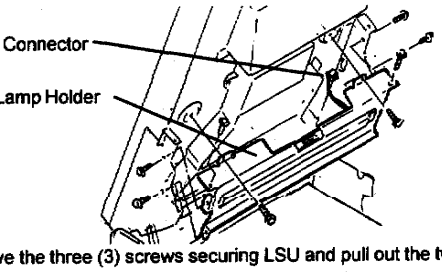


(3) Remove the four (4) screws securing the control panel.
(4) Pull out the connector and remove the panel.

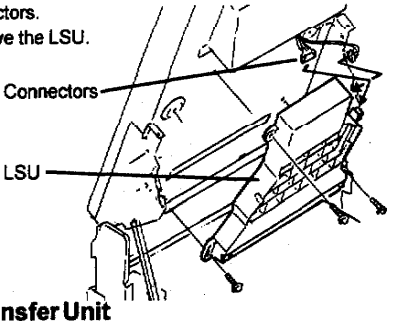


5-3. LSU (Laser scanner unit), Cleaning Lamp

(1) Open the clam shell and remove drum unit.
Note) Take care not to damage the surface of the drum. Keep the drum in a dark place.
(2) Remove the eight (8) screws securing cleaning lamp holder.
(3) Pull out the connector and remove the cleaning lamp holder.

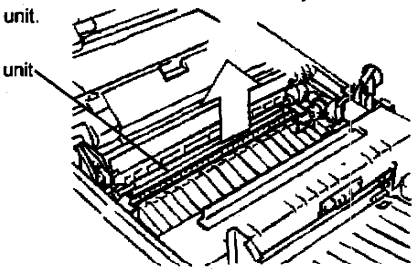


(4) Remove the three (3) screws securing LSU and pull out the two (2) connectors.
(5) Remove the LSU.

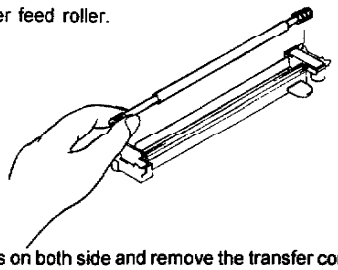


5-4. Transfer Unit

(1) Open the clam shell inside the main body and remove the transfer unit.

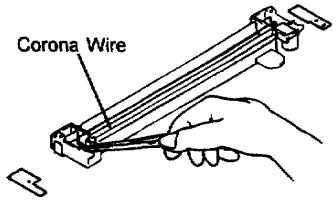


(2) Remove the paper feed roller.



(3) Remove the covers on both side and remove the transfer corona wire from the spring side.

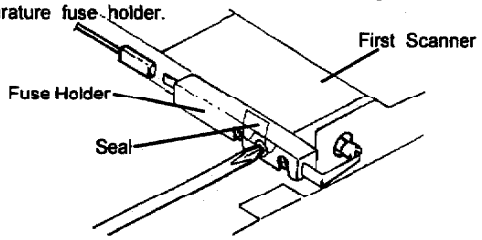
Note) Do not cut the transfer corona wire.



5-5. Exposure Lamp and Temperature Fuse

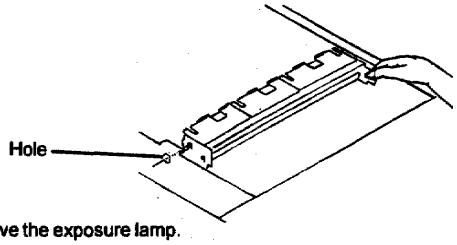
(1) Remove the control panel. (See 5-2.)

(2) Detach the seal and remove one screw fastening the temperature fuse holder.

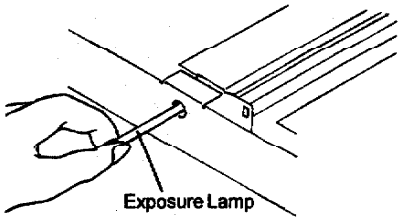


(3) Move the scanner to the hole for taking out the exposure lamp.

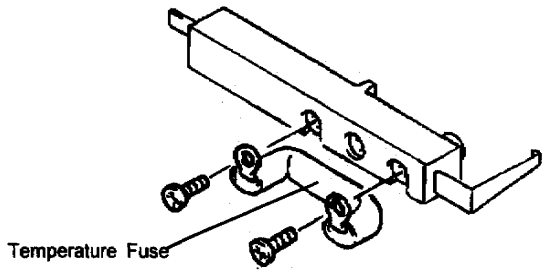
Note) Hold the scanner portion that is as close to the wire as possible.



(4) Remove the exposure lamp.



(5) Remove the temperature fuse by removing two (2) screws.

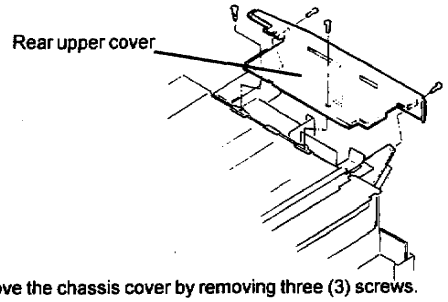


5-6. Scanner Wire

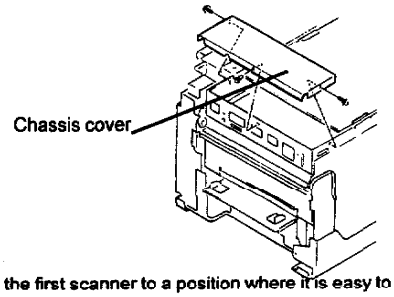
(1) Remove the platen cover, upper left cover, glass and control panel.

(See 5-1 and 5-2.)

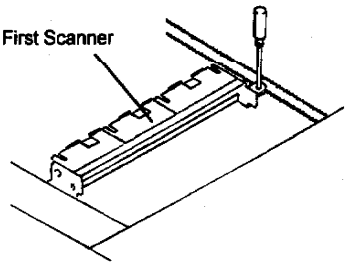
(2) Remove the rear upper cover by removing four (4) screws.



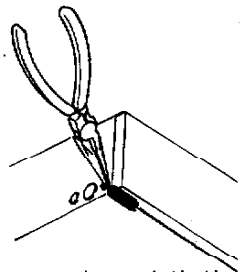
(3) Remove the chassis cover by removing three (3) screws.



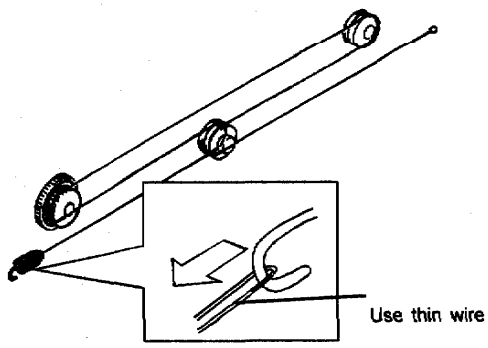
(4) Move the first scanner to a position where it is easy to remove and loosen the first scanner fastening screw (only one).



(5) Remove the wire by removing the spring fastening the wire.



(6) Attach the wire in the reverse procedure, and at last hook the spring to the chassis.

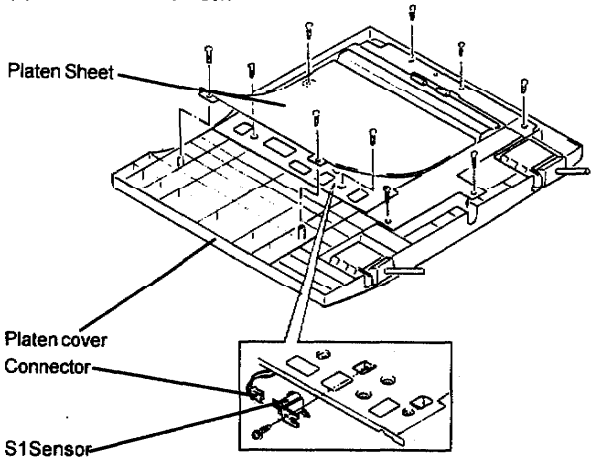


5-7. SDH (Single Document Handler) Unit

(1) Remove the platen cover. (See 5-1-1)
(2) Turn over the platen cover and remove the two (2) screws securing platen sheet.
(3) Remove the eight (8) screws securing SDH unit and remove the unit.

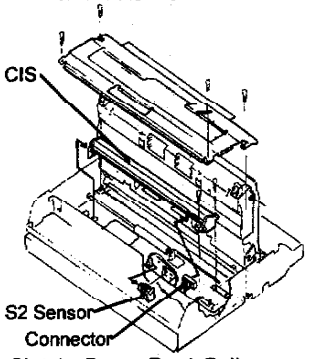
5-7-1. S1 Sensor

(1) Remove the one (1) screw and pull out the sensor connector.
(2) Remove the S1 sensor.



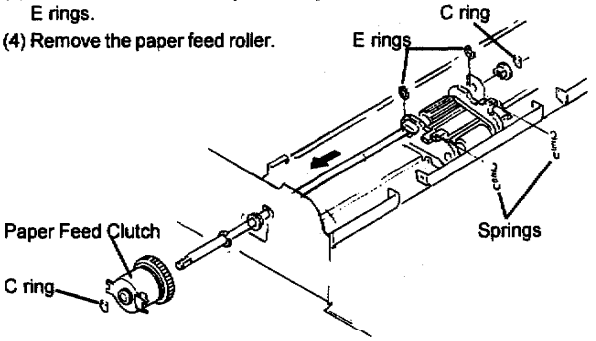
5-7-2. S2 Sensor, CIS (Contact Image Sensor)

(1) Open the top cover.
(2) Remove the four (4) screws securing paper guide and remove the guide.
(3) Pull out the connector.
(4) Remove the S2 sensor by removing the hook.
(5) Remove the two (2) screws securing CIS.
(6) Pull out connector and remove the CIS.



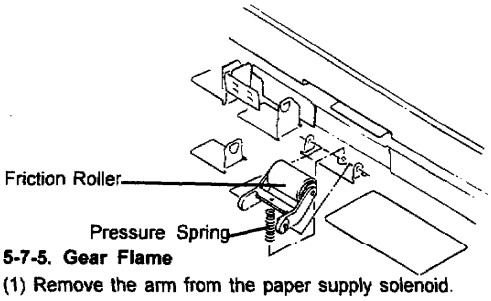
5-7-3. Paper Feed Clutch, Paper Feed Roller

(1) Remove the two (2) springs.
(2) Remove the paper feed clutch by removing the C ring.
(3) Pull out the roller shaft by removing the one (1) C ring and two (2) E rings.
(4) Remove the paper feed roller.



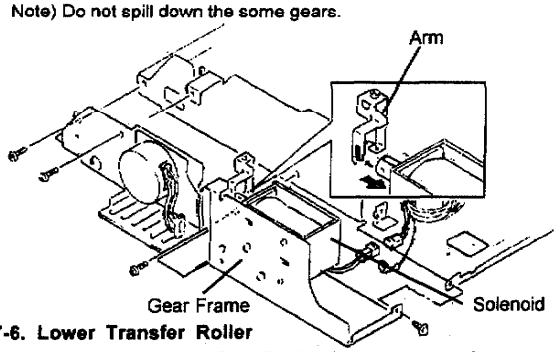
5-7-4. Friction Roller

(1) Remove the friction roller and removing the hook.
Note) Do not rose the pressure spring.



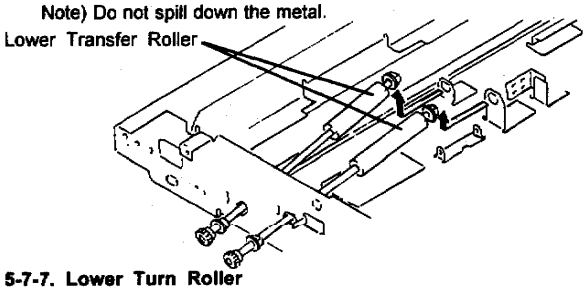
5-7-5. Gear Flame

(1) Remove the arm from the paper supply solenoid.
(2) Remove the gear frame by removing four (4) screws.
Note) Do not spill down the some gears.



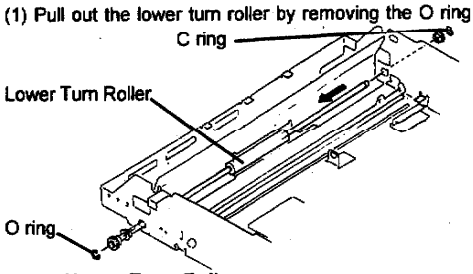
5-7-6. Lower Transfer Roller

(1) Remove the lower transfer roller by the arrow procedure.
Note) Do not spill down the metal.



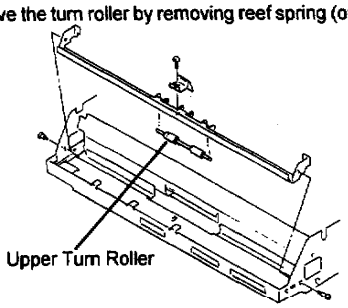
5-7-7. Lower Turn Roller

(1) Pull out the lower turn roller by removing the O ring and C ring.



5-7-8. Upper Turn Roller

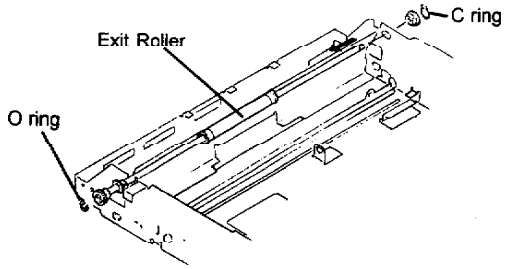
(1) Remove the roller frame by removing two (2) screws.
(2) Remove the turn roller by removing reef spring (one screw).



5-7-9. Exit Roller

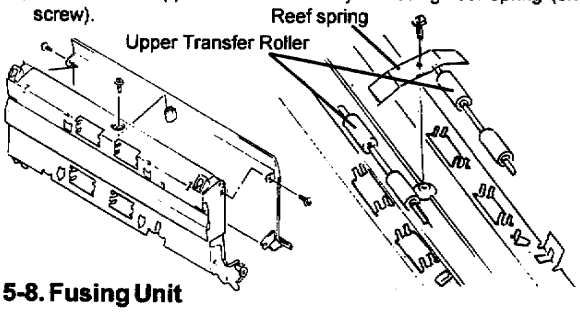
(1) Remove the O ring and C ring.

(2) Remove the exit roller by the arrow procedure.



5-7-10. Upper Transfer Roller

(1) Remove the upper transfer roller by removing reef spring (one screw).

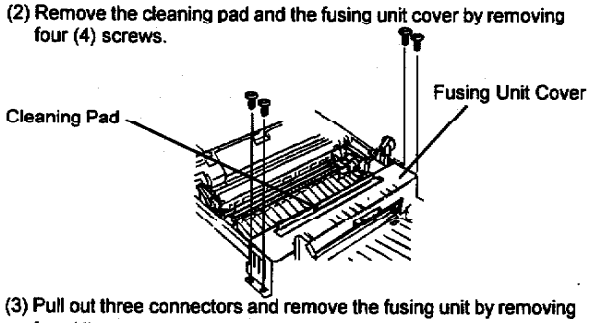


5-8. Fusing Unit

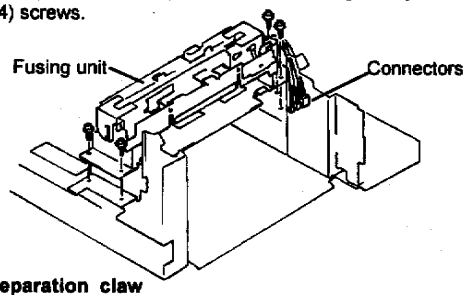
(1) Open the clamshell and remove the drum unit.

Note) Take care not to damage the surface of the drum. Keep the drum in a dark place.

(2) Remove the cleaning pad and the fusing unit cover by removing four (4) screws.

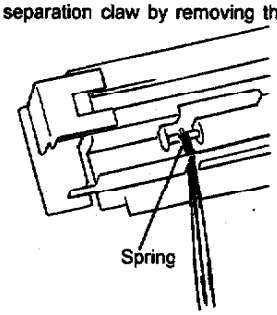


(3) Pull out three connectors and remove the fusing unit by removing four (4) screws.



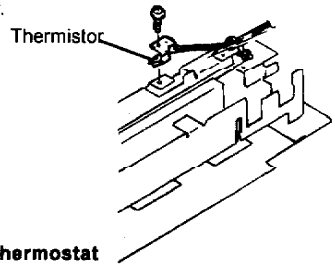
5-8-1. Separation claw

(1) Remove the separation claw by removing the spring.



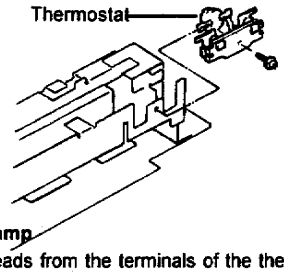
5-8-2. Thermistor

(1) Cut the binder and remove the thermistor by removing one (1) screw.



5-8-3. Thermostat

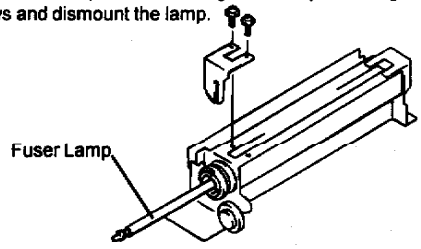
(1) Remove the thermostat by removing one (1) screw.



5-8-4. Fuser Lamp

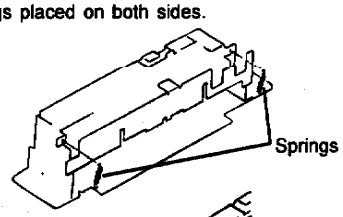
(1) Pull out the leads from the terminals of the thermostat and remove the leads from the harness clamp.

(2) Remove the lamp holder on the gear side by removing two (2) screws and dismount the lamp.

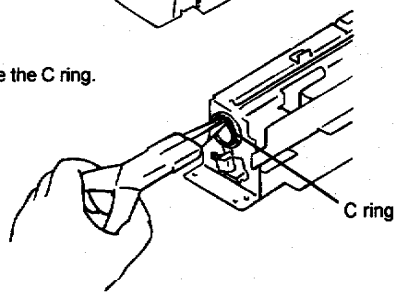


5-8-5. Heat Roller, Fuser Roller

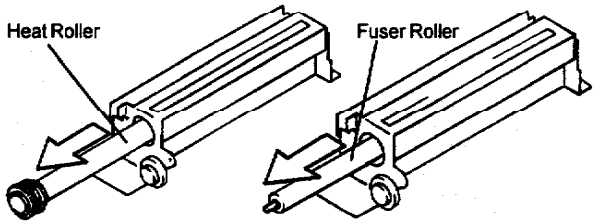
(1) Remove the springs placed on both sides.



(2) Remove the C ring.



(3) Pull out the heat roller from the gear side, them remove the fuser roller.



5-9. Paper Feed Rollers

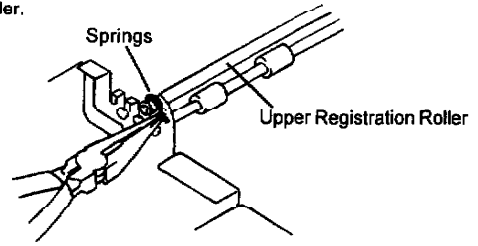
(1) Open the clam shell and remove the drum unit.

Note) Take care not to damage the surface of the drum. Keep the drum in a dark place.

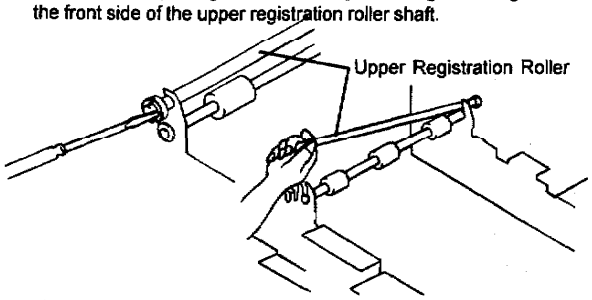
(2) Remove the front cover, lower left cover and rear cover. (See 5-1)

5-9-1. Upper Registration Roller

(1) Remove the springs placed at both ends of the upper registration roller.

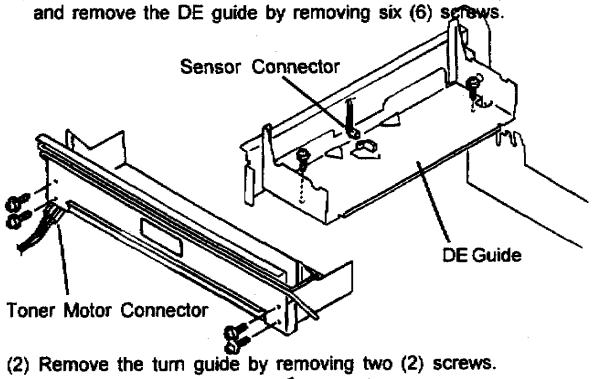


(2) Remove the upper registration roller by removing the E ring from the front side of the upper registration roller shaft.

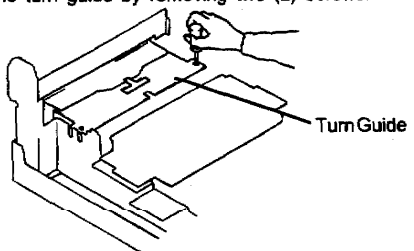


5-9-2. Lower Registration Roller

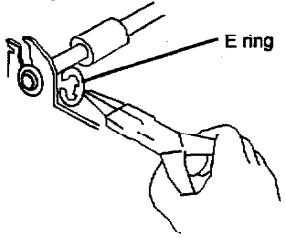
(1) Pull out the sensor connector and the toner motor connector and remove the DE guide by removing six (6) screws.



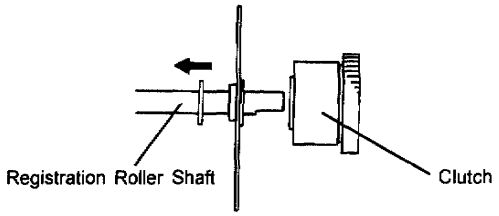
(2) Remove the turn guide by removing two (2) screws.



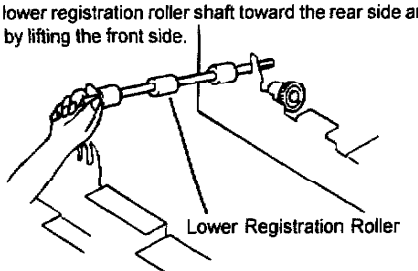
(3) Remove the E ring from the front side.



(4) Pull out the lower registration roller shaft from the clutch.

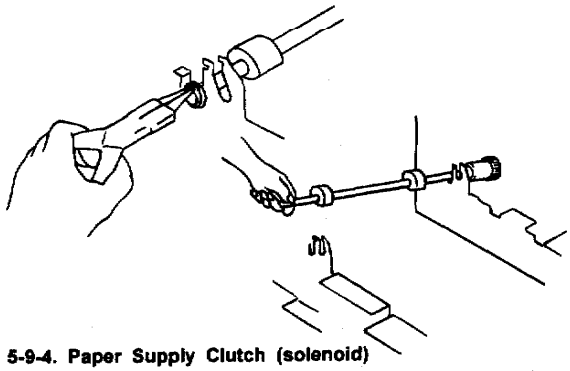


(5) Move the lower registration roller shaft toward the rear side and remove it by lifting the front side.



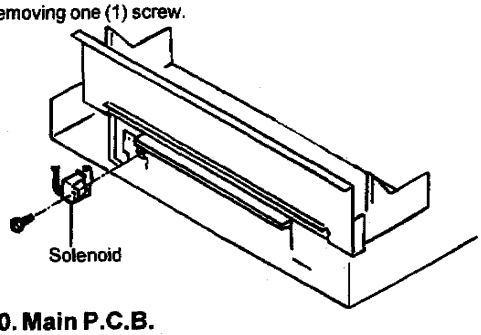
5-9-3. Paper Supply Roller

(1) Remove the C ring from the front side of the paper supply roller shaft, then remove the paper supply roller and spring clutch.



5-9-4. Paper Supply Clutch (solenoid)

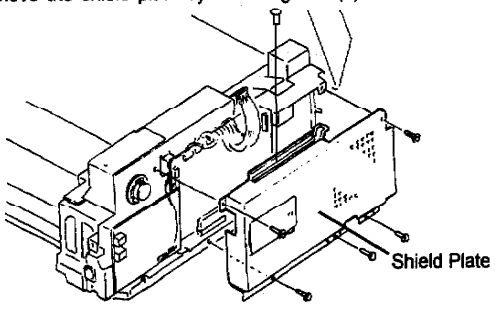
(1) Remove the paper supply clutch from the lower left side by removing one (1) screw.



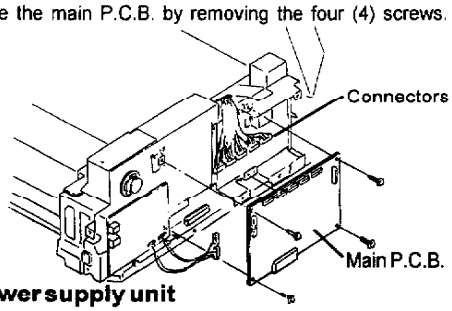
5-10. Main P.C.B.

(1) Open the clam shell and remove rear cover. (See 5-1)

(2) Remove the shield plate by removing five (6) screws.

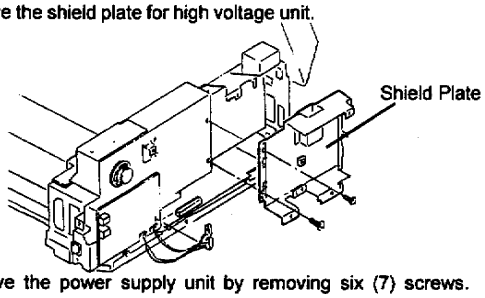


(3) Pull out the each connector.
(4) Remove the main P.C.B. by removing the four (4) screws.

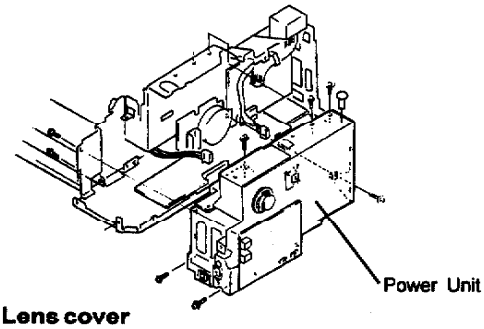


5-11. Power supply unit

(1) Remove the rear light cover, rear cover and main P.C.B.
(See 5-1, 5-9)
(2) Remove the shield plate for high voltage unit.

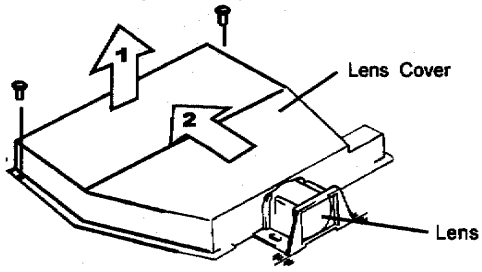


(3) Remove the power supply unit by removing six (7) screws.



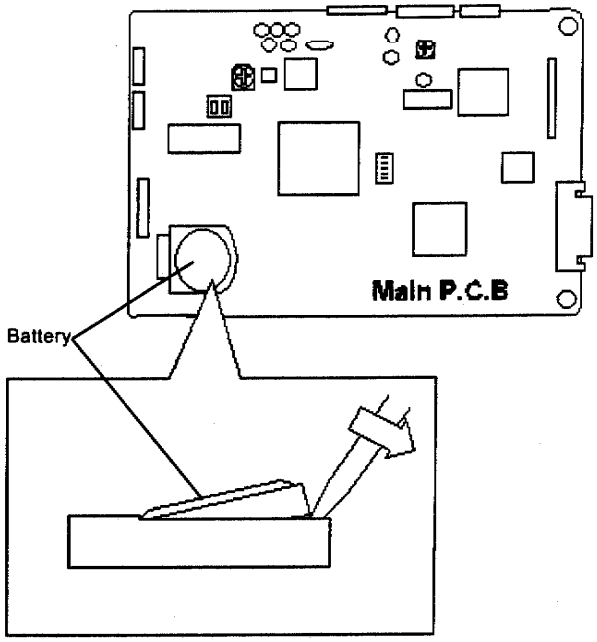
5-12. Lens cover

(1) Remove the upper right cover and glass.
(See page 5-1.)
(3) Remove the two (2) screws securing the lens cover.
(4) Remove the lens cover by the arrow procedure.



5-13. Back-up Battery

(1) Remove the rear cover and shield plate.
(See 5-1, 5-9)
(2) Remove the back-up battery on main P.C.B. by using the small stick as follows.
Note) Not use the metal stick.

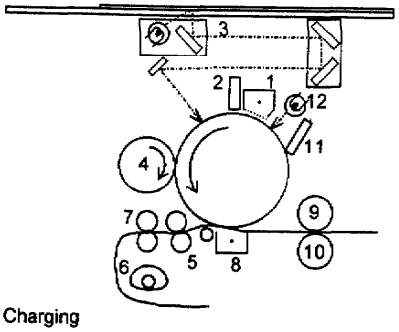


SECTION 6 CONSTRUCTION

SECTION 6 CONSTRUCTION

6-1. Principles of Print and Copy

6-1-1. Process drawing



(1) Charging
Makes the drum surface electrified.

(2) L.S.U (Laser Scanning Unit)
Produces an electrostatic latent image associated with the image data from the facsimile and printer on the surface of the drum.

(3) Analog exposure
Produces an electrostatic latent image associated with an original document on the surface of the drum.

(4) Developing
A visible image is developed by toner from the electrostatic latent image on the drum.

(5) Registration roller
Feeds paper to the transfer area at proper timing.

(6) Paper supply roller
Supplies paper sheet by sheet from the cassette.

(7) Slip roller
Feeds paper to the registration roller.

(8) Transfer
Transfers a toner image on the drum to paper.

(9) Heat roller
Heats the toner on paper.

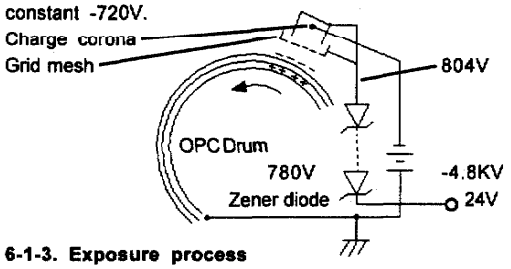
(10) Fuser roller
Presses the toner fused by heat on paper and fix it.

(11) Cleaning blade
Scrapes off the excessive toner remaining on the drum.

(12) Cleaning lamp
Removes the electricity being at residual potential on the drum before recharging.

6-1-2. Charging process

High voltage (-4.8KV) output from the high tension board is applied to the charge corona. The case and grid mesh of the charge corona are grounded to the earth through the 780V Zener diode. Thus, the surface of the OPC drum is electrified and maintained at constant -720V.

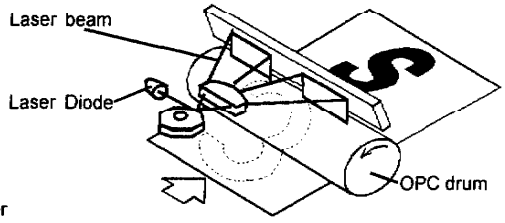


6-1-3. Exposure process

For the facsimile and printer functions, the laser scanning unit is used. For the copy function, the analog scanner is used.

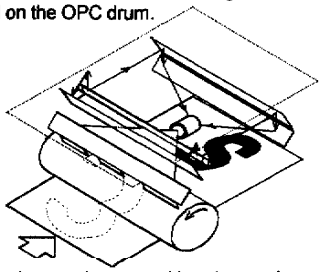
(1) Facsimile and printer

Exposure of the portions without images through the use of the laser scanning unit as the light source produces an electrostatic latent image associated with the image data on the drum.



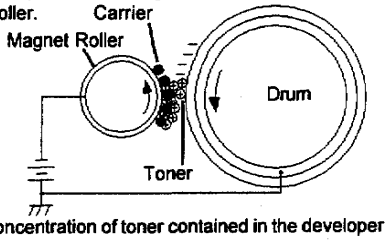
(2) Copier

An original document is irradiated by the exposure lamp and its reflecting light reaches the OPC drum through four mirrors and lens. When the surface of the drum is exposed to this reflecting light, the exposure quantity of the portions without images is larger than the portions having images. Thus, an electrostatic latent image associated with the original is generated on the OPC drum.

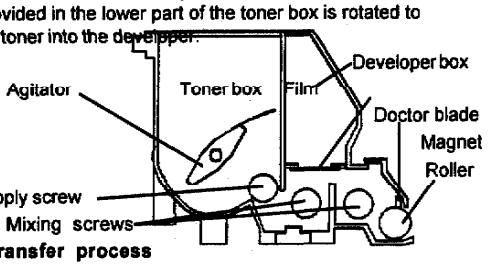


6-1-4. Developing process

(1) Toner contained in the developer unit gets positive charges by turbulence. The carrier (ferrite) and the magnet roller bring the electrified toner in contact with the OPC drum. Because the portions with images on the OPC drum have negative charges, the positive toner are attracted to such portions and a visible image is produced. However, a very small amount of toner is also attracted to the portions without images on the OPC drum because slight negative charges remain on these portions. To prevent this phenomenon, a bias voltage of -170V output from the high voltage board is applied to the magnet roller.

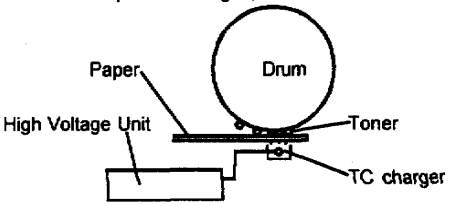


(2) The concentration of toner contained in the developer is checked by the toner sensor (magnetic sensor) so it can be kept constant. If low concentration is detected by the toner sensor, the toner supply screw provided in the lower part of the toner box is rotated to replenish toner into the developer.



6-1-5. Transfer process

Paper supplied from the cassette is carried into between the OPC drum and the TC charger (transfer corona). High voltage (-4.8KV) output from the high voltage board is applied to the TC charger and paper gets negative charges. Because the toner attached to the surface of the drum has positive charges, the toner is transferred to the paper.



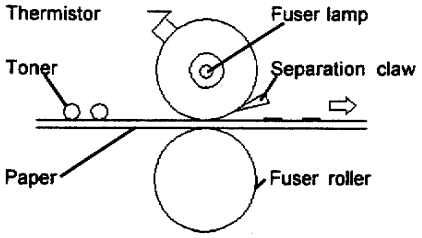
6-1-6. Separation process

Electricity on the paper after the transfer process is removed by the corona separation brush. Paper is separated from the OPC drum by itself. Because this machine uses a small drum of 30 mm in diameter, it is unnecessary to provide a special separation mechanism.

6-1-7. Fusing process

The toner image transferred to the paper is fixed when it is heated by the heat roller and pressed by the fuser roller. Paper for which the fusing process is complete is separated from the heat roller by the separation claw and goes out.

The surface temperature of the heat roller is always detected by the thermistor. The detected voltage is sent to the control circuit provided on the noise filter board of the main unit. This circuit controls lighting of the fuser lamp. Thus, the surface temperature of the heat roller is kept constant(177.5°C).

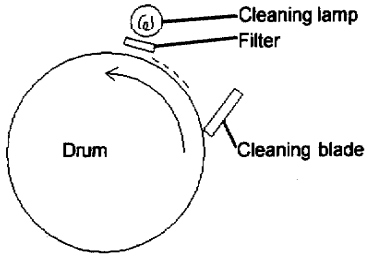


6-1-8. Cleaning process

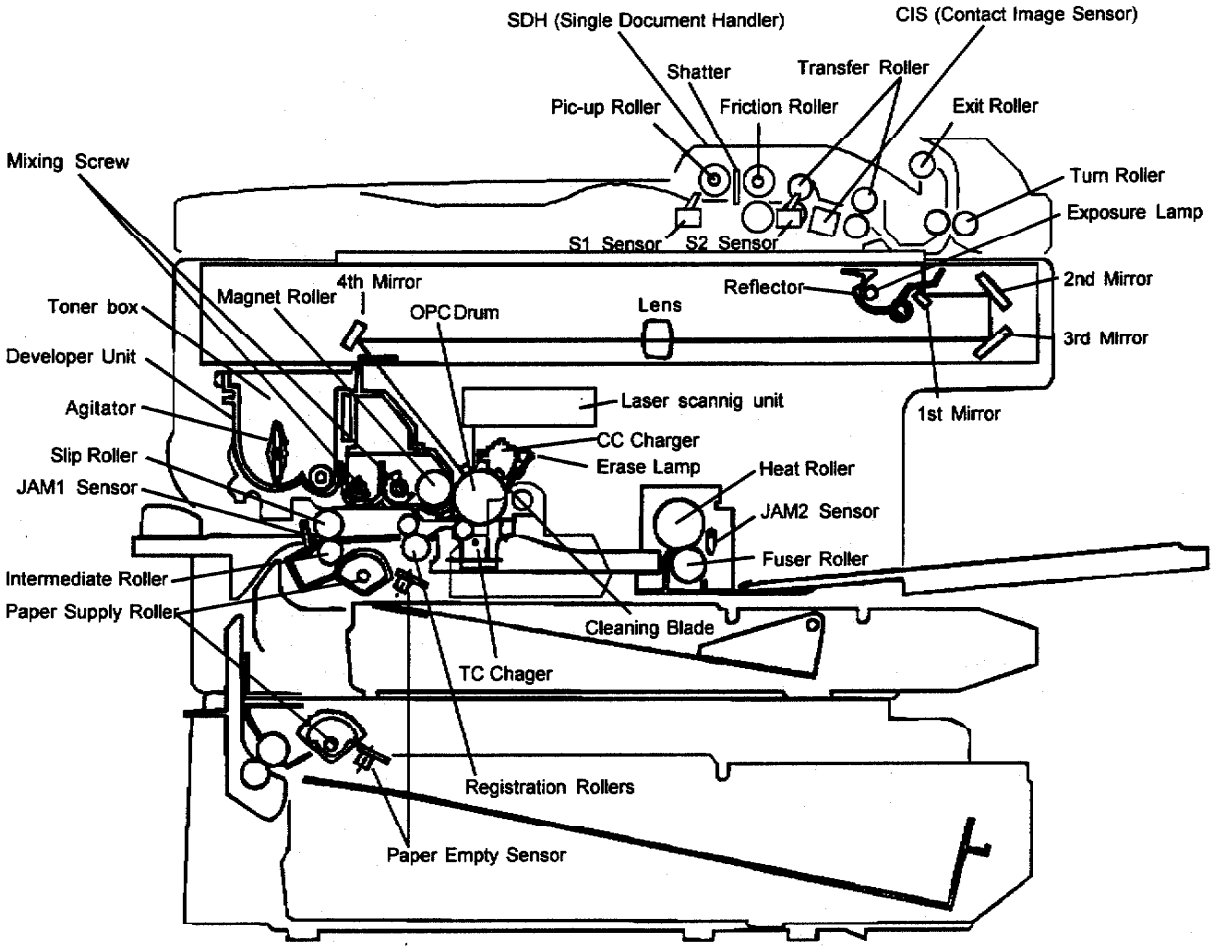
The excessive toner attached to the OPC drum after the transfer process is scraped off by the cleaning blade. The coming off toner is put in the waste toner collecting box by the agitator and stored in it. Capacity of the waste toner box equals to the excess of toner collected from about 40,000 pages at 4% black and white ratio.

6-1-9. Electricity removing process

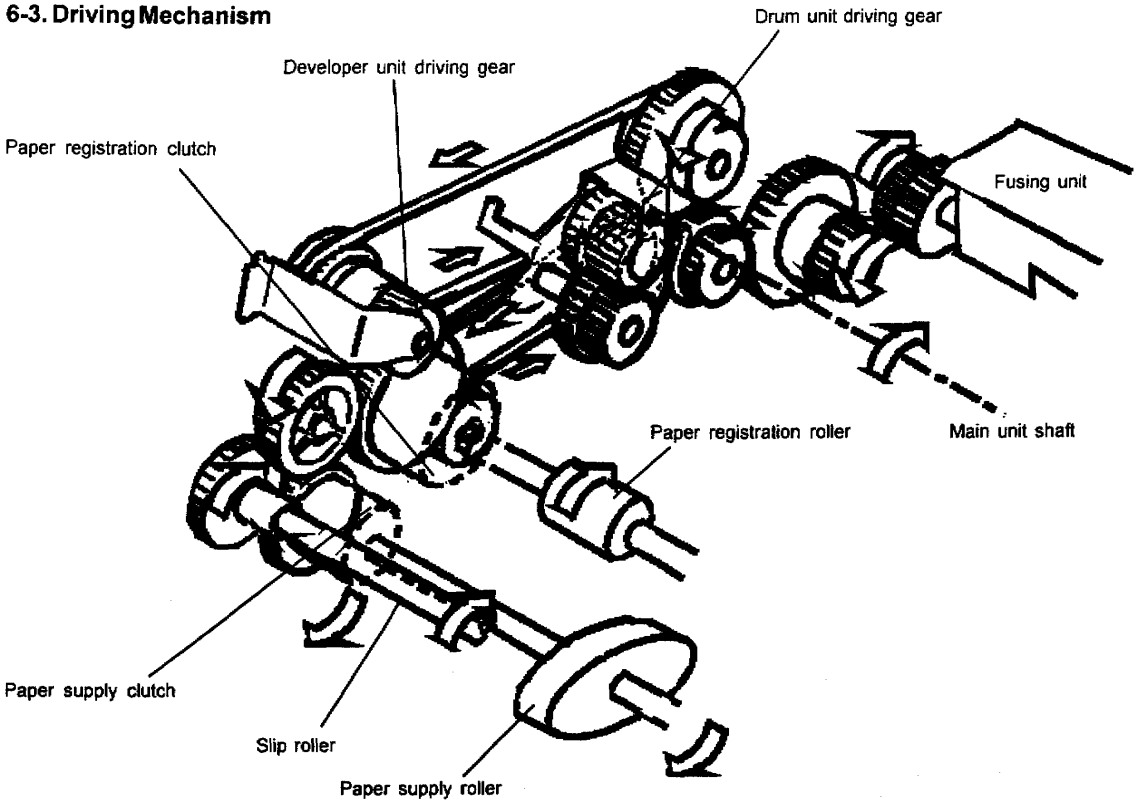
Slight residual electric potential stays on the surface of the OPC drum even after the toner is scraped off. Because the OPC drum is used repeatedly, the residual potential is removed by irradiation from the cleaning lamp.



6-2. Front View (Location for Major Components)



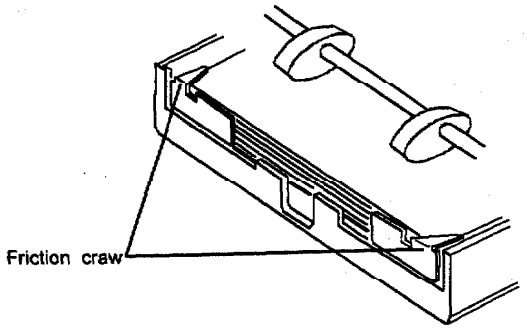
6-3. Driving Mechanism



6-4. Paper Supply and Paper Feed System

6-4-1. Paper Supply

The only 1 sheet Paper is then fed from the cassette by the paper supply roller and friction claw.



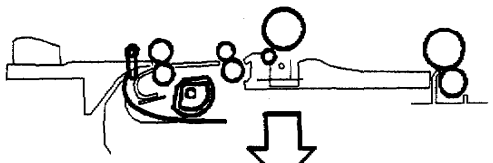
6-4-2. Paper Feed

(1) The paper feed from the cassette is carried to the registration roller by the slip roller.

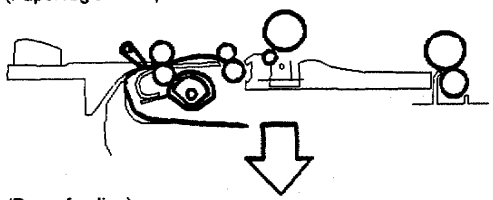
(2) The JAM1 sensor detects the top end of paper.

(3) This sensor is used as both the JAM1 and manual paper detection.

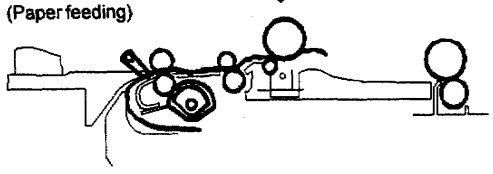
(Paper suppling)



(Paper registration)



(Paper feeding)



SECTION 7 ELECTRICAL SYSTEM

SECTION 7 ELECTRICAL SYSTEM

7-1. Controls of Printer Engine

7-1-1. Toner Concentration

Toner replenishment can be so controlled that the toner in the developer unit is always maintained at a constant level by detecting the toner concentration by the toner sensor (magnetic sensor).

(1) Concentration detecting circuit

Voltage TNS detected by the toner sensor is carried across the connection P.C.B. into No. 5 pin of the CN302 in the main P.C.B.. The TNS voltage taken at the test point TP302 will be about 1.9 V when toner concentration is proper (5.0 %). Also this circuit be using for detective developer unit in the machine.

(2) Toner motor drive circuit

If toner is consumed and toner concentration is decreased less than the proper level, the TNM0 and TNM1 (24V Pulse) is output from No. 1 pin and No.2 pin of CN302 in the Main P.C.B.. This signal turns on the toner motor drive circuit and the motor for toner replenishment is revolved so toner can be replenished for a proper time.

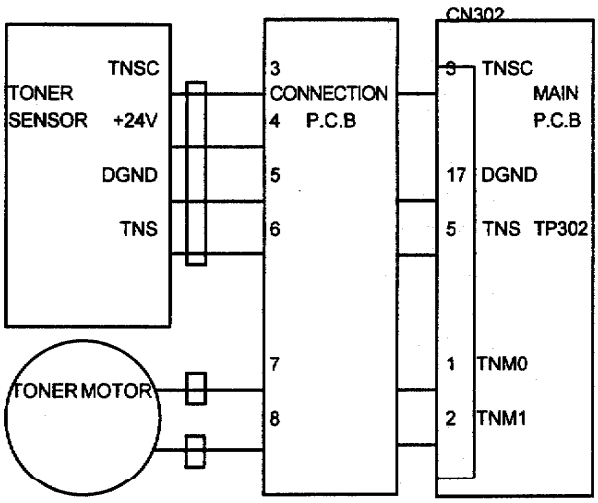
Replenishment time:

(Suppling 0.75 sec. + Mixing 0.4 sec.) X 5 times

(at each paper size)

(3) Forced toner supply mode

When toner sensor detects consecutively 3 times the -2 % under density compare the right density, machine proceed toner supply sequence (supply 30 sec. mixing 20 sec. MAX. 4 times). If the density return to standard level, machine will be ready mode. If the density is still low after toner supply sequence, the machine stops and LCD display shows "TONER EMPTY".



Surface temperature of the heat roller provided in the fusing unit is always maintained at a proper temperature of 351.5 °F (177.5 °C). Temperature detection by the thermistor and the S.S.R. circuit (PS-AC board) make this control possible.

(1) Temperature detection

The thermistor for temperature detection is set in contact with the surface of the heat roller. Resistance of the thermistor varies with temperature change.

Low temperature:

at 68°F(20°C), Approx 120 K ohm (95 K ohm to 145 K ohm)

Proper temperature:

at 351.5 °F (177.5 °C), 1.16 K ohm (1.1 K ohm to 1.2 K ohm)

The TEMP signal detected by the thermistor is carried through the connection P.C.B. into No. 41 pin of the CN302 in the main unit. The voltage of TEMP signal can be measured at the test point TP303 in the main P.C.B..

Low temperature: at 68 °F(20 °C), Approx. 0.2 V

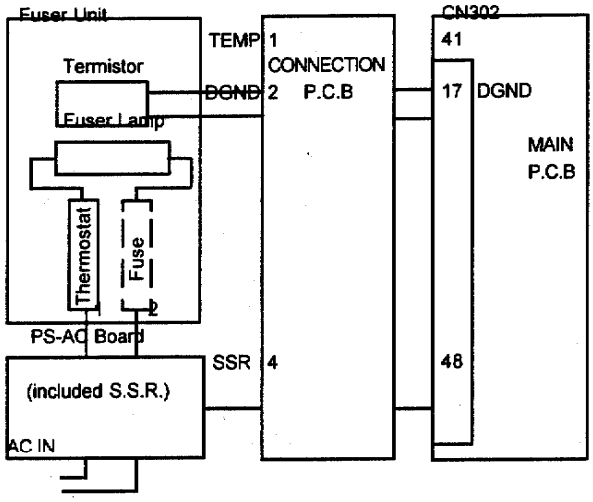
Proper temperature: at 351.5 °F (177.5 °C), Approx. 4.0 V

Standby (Power save) mode: at 257 °F (125 °C), Approx. 1.6 V

This TEMP signal also is used for the safety circuit provided in case abnormality occurs in the fusing unit. For the safety circuit.

(2) S.S.R. circuit (Solid State Relay)

If the temperature detection circuit finds that the surface temperature is less than the proper level, the S.S.R. signal (high to low) is output from No. 48 pin of the CN302 in the main P.C.B.. The S.S.R. signal turns on the S.S.R. (Triac) in the PS-AC board and the fuser lamp comes on.

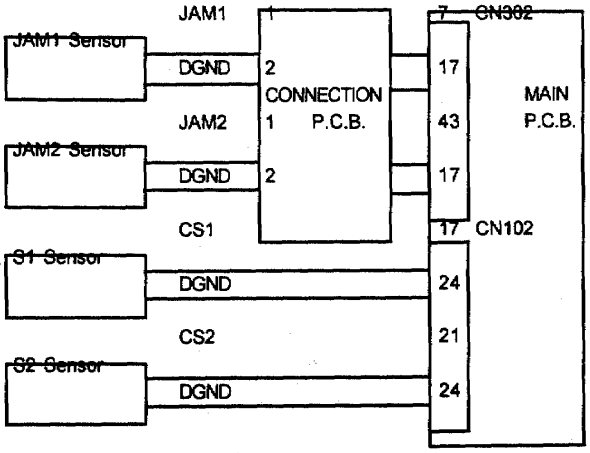


7-1-2. Fusing Temperature Control

7-1-3. Paper Jam Detection, Document Jam Detection

(1) Paper jam detection is carried out by two switch-type sensors. The JAM1 sensor is positioned in front of the slip roller and the JAM2 sensor in the rear of the heat roller. Paper detection signals JAM1 and JAM2 (high to low) are carried through the connection board into No. 7 and 43 pins of CN302 in the main P.C.B..

(2) Document jam in the S.D.H. (Single Document Handler) detection is carried out by two sensors. The S1 sensor (switch-type) is positioned in front of the paper feed roller and the S2 sensor (phot-interrupter type) in the front of the C.I.S. (Contact image sensor). Paper detection signals S1 and S2 (high to low) are into No. 17 and 21 pins of CN102 in the main P.C.B..



(3) Detection timing of the each JAM

PAPER JAM 0

Even after a lapse of 3.8 seconds since the paper supply roller of cassette feeder (option) has been turned on, the JAM1 sensor has not detected paper yet.

PAPER JAM 1

Even after a lapse of 1.5 seconds since the paper supply roller has been turned on, the JAM1 sensor has not detected paper yet.

PAPER JAM 2

Even after a lapse of 3.2 seconds since the registration roller has been turned on, the JAM2 sensor has not detected paper yet. The JAM1 sensor is turned on as to ready mode.

PAPER JAM 3

Even after a lapse of 3.7 seconds since the JAM1sensor has been turned OFF, the JAM2 sensor has not turned OFF.

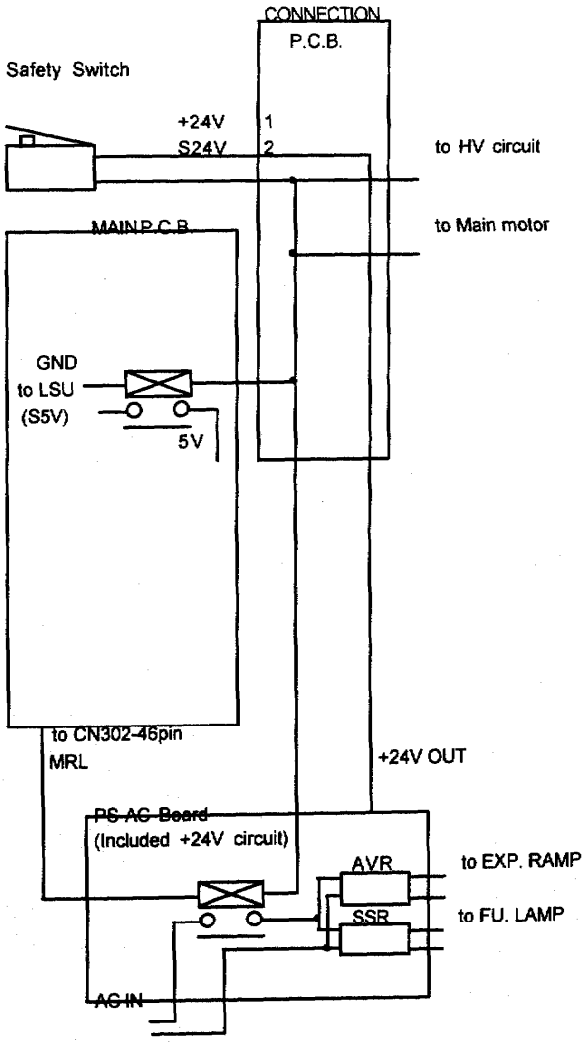
7-2. Safety Circuit

When the clamshell in the main unit is opened, the safety switch is turned off. As a result, the main relay is turned off, so that the AC power supply for lighting the fuser lamp and the exposure lamp is cut off.

At the same time, each DC power supply to the high voltage circuit, etc. shown in the circuit diagram is cut off. The main relay is turned off also when the MRL signal (main relay control) or the ERROR signal (error detection) is output (turned from high to low) in the main unit.

The ERROR signal is output in case fusing is abnormal or in case the exposure lamp lights abnormally.

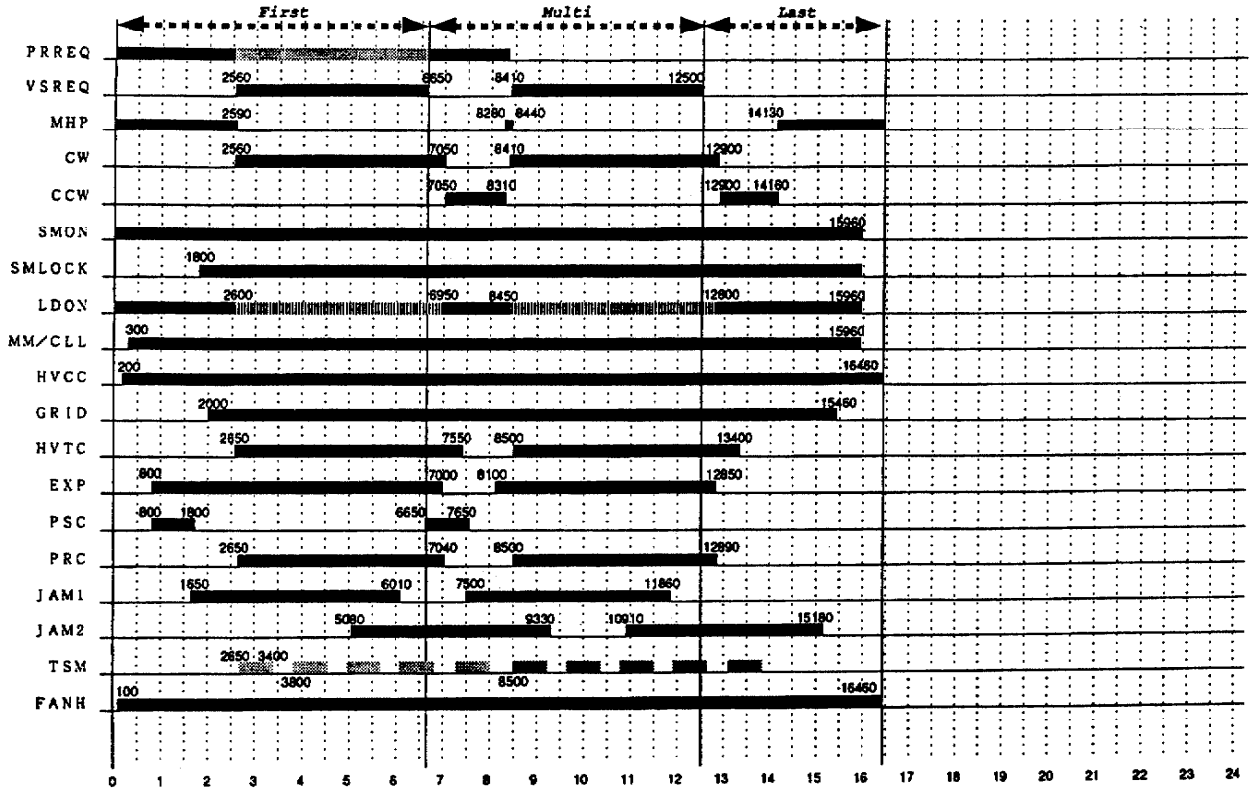
1) Safety switch and the mail relay turning-off circuit



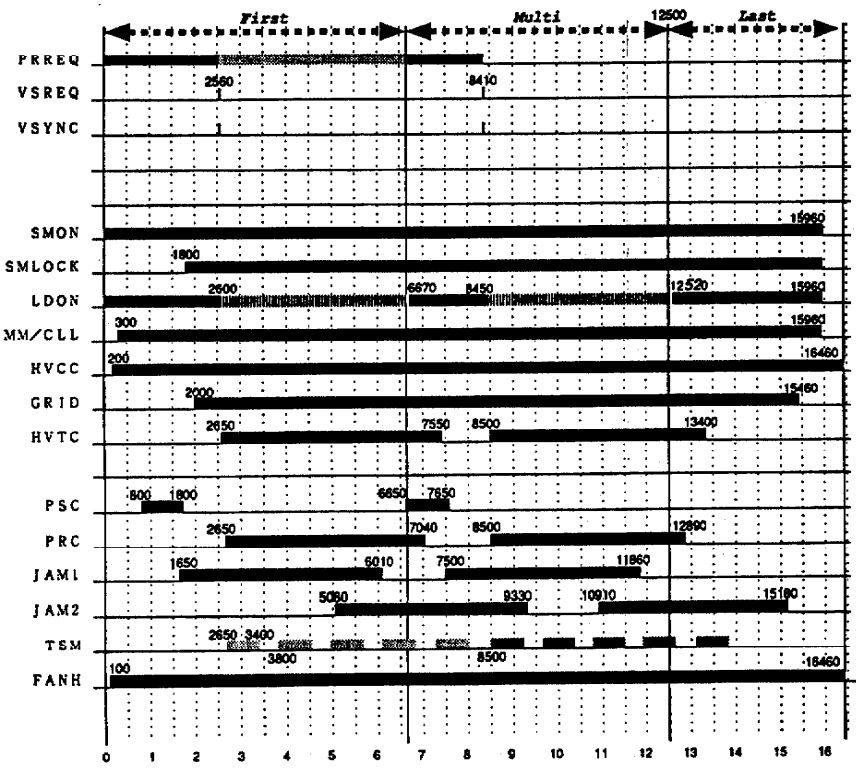
7-3. TIMING CHART

7-3-1. Printer Engine

A-Copy Timing Chart (A4/Upper)



D-Print Timing Chart (A4/Upper)

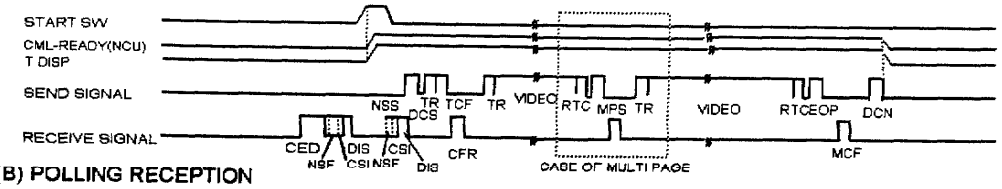


PRREQ: Print request
VSREQ: Video sync request
MHP: Mirror home position
CW: Clock width (mirror motor)
CCW: counter clock width (mirror motor)
SMON: Scan motor ON (LSU)
SMLOCK: Scan motor lock (LSU)
LDON: Laser diode ON (LSU)
MM / CLL: Main motor / Cleaning lamp
HVCC: High voltage of charge corona
GRID: Grid of cage corona
HVTC: High voltage of transfer corona
EXP: Exposure lamp
PSC: Paper supply clutch
PRC: Paper registration clutch
JAM1: JAM1 sensor
JAM2: JAM2 sensor
TSM: Toner supply motor
FANH: Cooling fan (high speed)

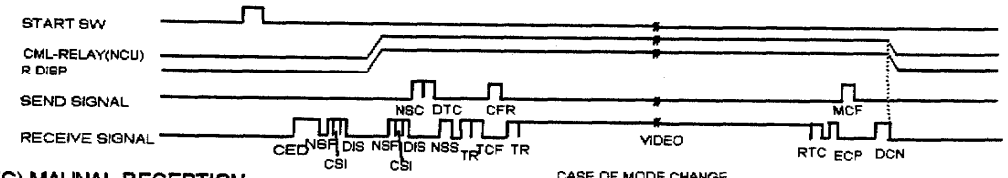
7-3-2. FAX

Normal Mode

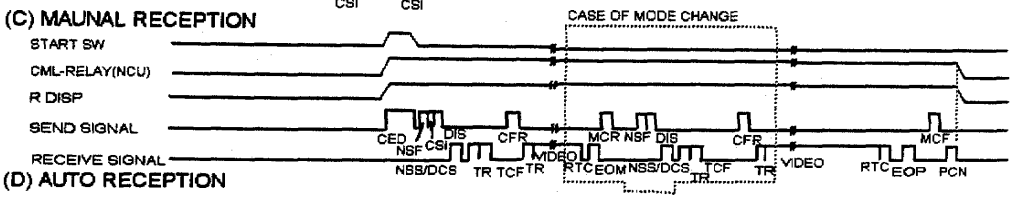
(A) MANUAL TRANSMISSION



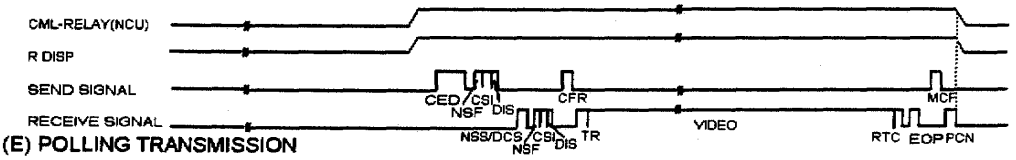
(B) POLLING RECEPTION



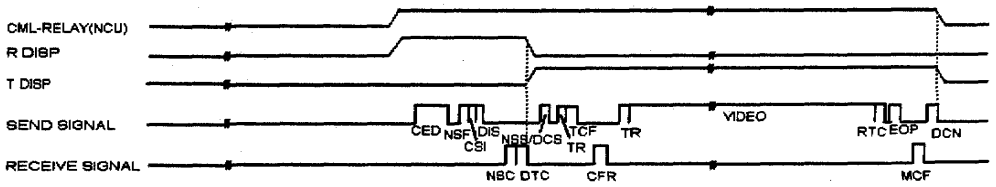
(C) MAUNAL RECEPTION



(D) AUTO RECEPTION

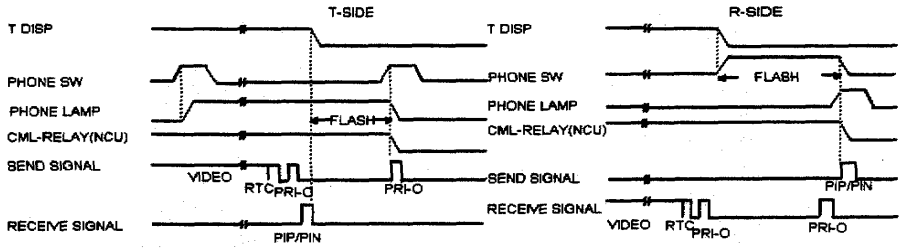


(E) POLLING TRANSMISSION



TEL RESERVATION (CALL UP AFTER SENDING)

CALL UP FROM T-SIDE



Signal sent by receiver unit

DIS	Digital Identification Signal
NSF	Non Standard Facilities
CSI	Called Subscriber Identification
CFR	Confirmation to Receive
FTT	Failure To Train
MCF	Message Confirmation
RTN	Return Negative
PIP	Procedural Interrupt Positive
PIN	Procedural Interrupt Negative

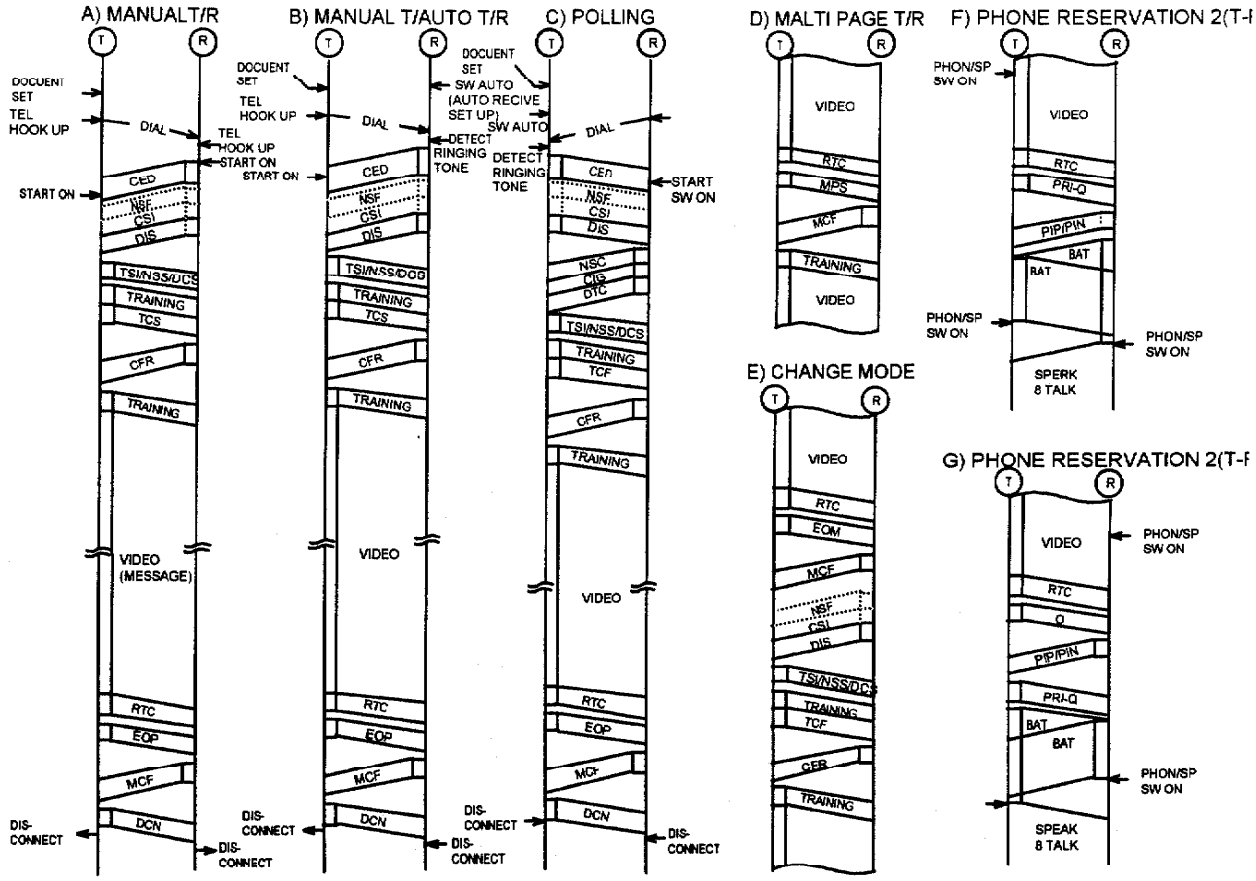
Signal sent by transmitter unit

DCS	Digital Command Signal
NSS	Non Standard Setup
TSI	Transmitting Subscriber Identification
TCF	Training check
Q	one of EOM, MPS, EOP
EOM	End Of Message
MPS	Multi-Page Signal
EOP	End Of Procedure
DCN	disconnect
PRI-Q	PRI-EOM, PRI-EOP, PRI-MPS
PRI-EOM	Procedural Interrupt EOM
PRI-EOP	Procedural Interrupt EOP
PRI-MPS	Procedural Interrupt MPS

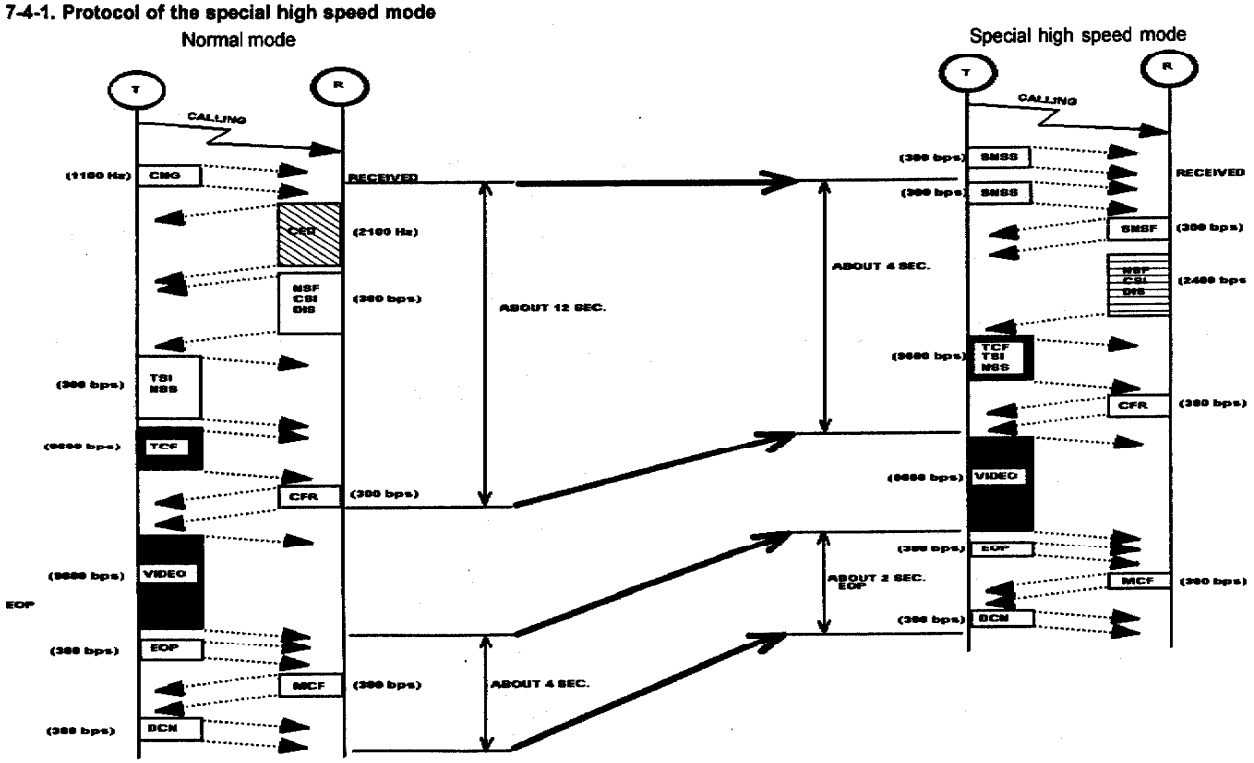
Signal sent by dialing unit at polling reception

DTC	Digital Transmit Command
NSC	Non Standard facilities Command

7-4. Protocols (FAX)

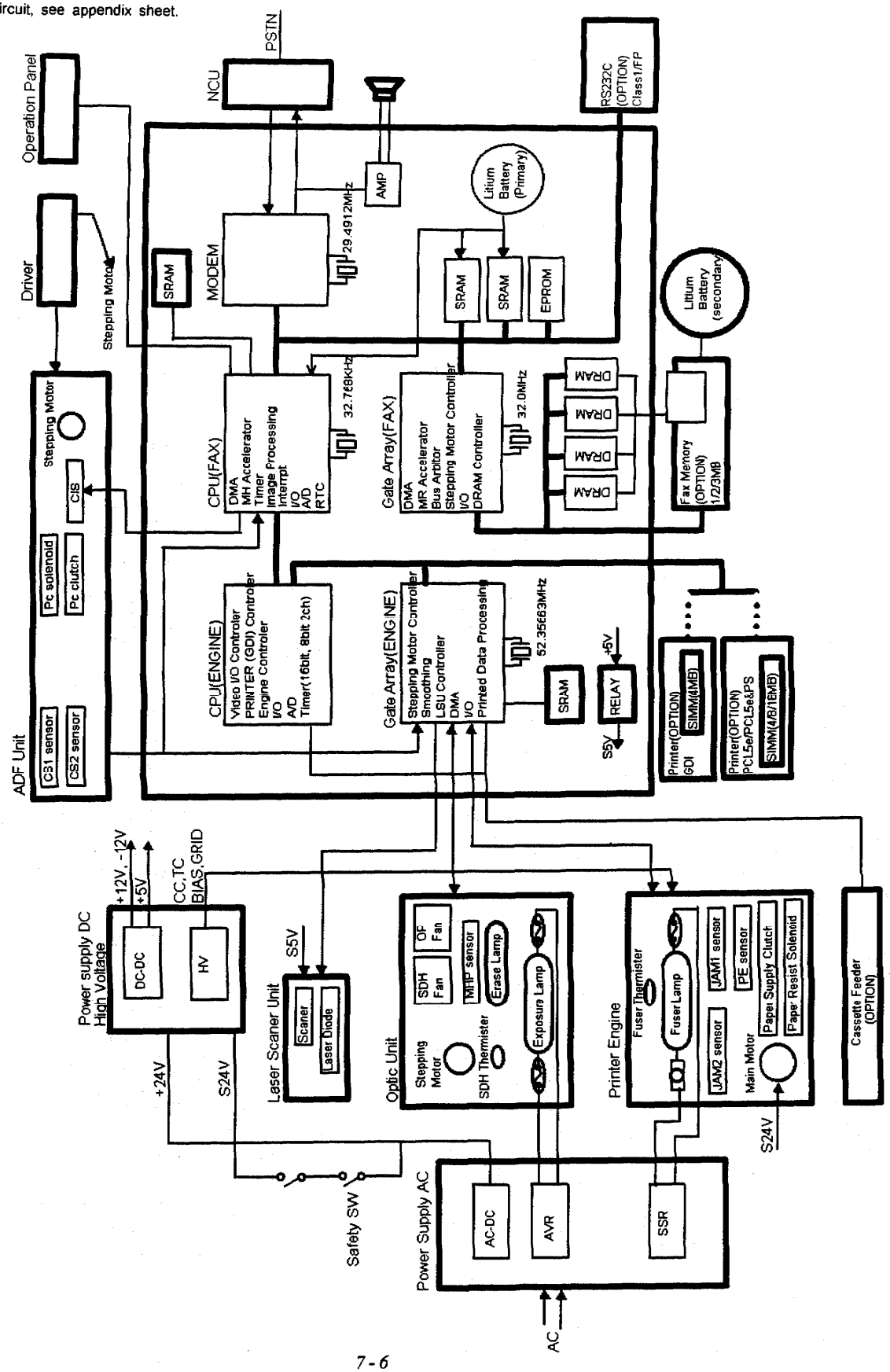


7-4-1. Protocol of the special high speed mode



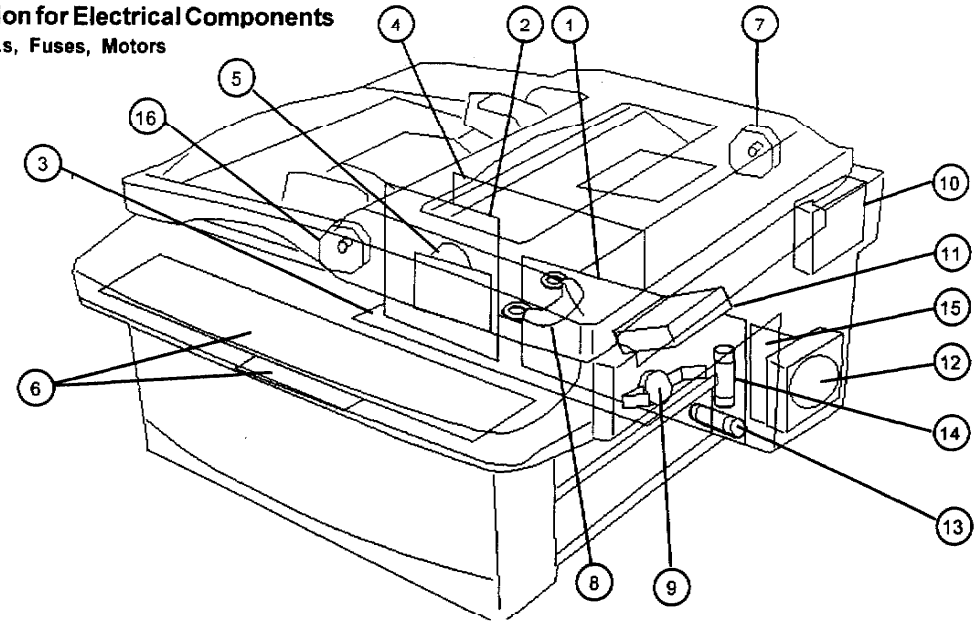
7-5. Whole diagram of the main P.C.B.

As each circuit, see appendix sheet.



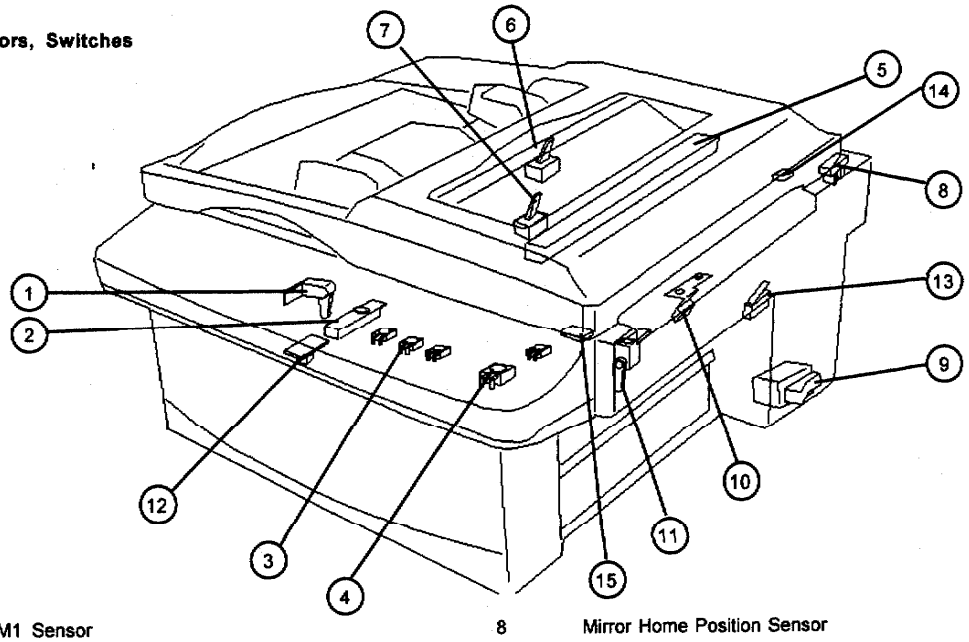
7-6. Location for Electrical Components

7-6-1. P.C.B.s, Fuses, Motors



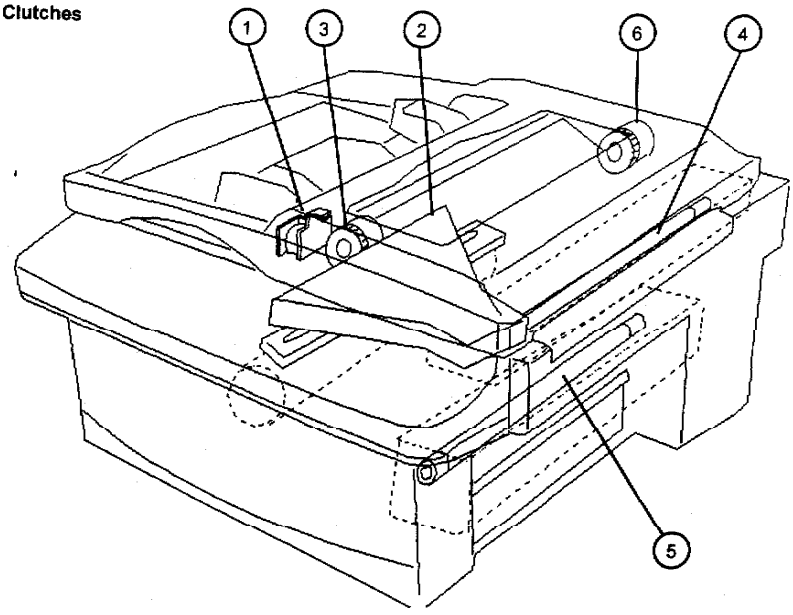
1	PS-AC P.C.B.	9	Fusing Thermostat
2	PS-DC / HV P.C.B.	10	SDH Cooling Fan
3	Connection P.C.B.	11	OP Cooling Fan
4	Main P.C.B	12	FU Cooling Fan
5	Main Motor	13	AC Main Fuse 125V T10A (250V T6.3A)
6	Operational P.C.B.	14	DC Main Fuse 125V T3.15A (250V T1.6A)
7	SDH Scan Motor	15	NCU (Network Control unit)
8	Exposure Temperature Fuse 128 C	16	Toner Motor

7-6-2. Sensors, Switches



1	JAM1 Sensor	8	Mirror Home Position Sensor
2	Toner Sensor	9	Power Switch
3	Each Operation Keys	10	Fusing Temperature Detect Sensor (Thermistor)
4	Start Key	11	JAM2 Sensor
5	C.I.S. (Contact Image Sensor)	12	Paper Empty Sensor
6	S1 Sensor	13	Safety Switch
7	S2 Sensor	14	SDH Temperature Detect Sensor
		15	SDH SW

7-6-3. Lamps, Heaters, Clutches



1	Paper Supply Clutch	4	Exposure Lamp
2	L.S.U. (Laser Scan unit)	5	Fusing Lamp
3	Paper Registration Clutch	6	SDH Paper supply Clutch

7-7. Function of Important ICs on Main P.C.B.

Symbol	Type	Description	Function	Note
IC101	LC82141	FAX CPU	DMA HM Accelerator Timer Image Processing Interrupt I/O A/D	
IC102	LC3564SM-10	64K bit S-RAM	Compensating circuit of CIS	
IC103	LC21057A	Gate Array	Printed Data Processing DMA HM Accelerator Bus Arbiter Stepping Motor Controller I/O DRAM Controller	
IC104	TMS27C040	4M bit EPROM	For FAX	
IC105	HM62256BLFP	256K bit S-RAM	For FAX	
IC106	HM62256BLFP	256K bit S-RAM	For FAX	
IC107	M51953BFP	Reset-IC	System Reset	
IC108	HD74HC245FP	Bus Driver		
IC109	HD74HC245FP	Bus Driver		
IC110	M5M44400CJ-7S-M0	4M bit DRAM		
IC111	M5M44400CJ-7S-M0	4M bit DRAM		
IC112	M5M44400CJ-7S-M0	4M bit DRAM		Optional
IC113	M5M44400CJ-7S-M0	4M bit DRAM		Optional
IC114	TC7W08FU	AND Gate		
IC115	TC7W14F	Schmitt Inverter		
IC116	LM318MX	OP-AMP		
IC117	HD74HC14FP	Schmitt Inverter		
IC118	TC4S71F	OR Gate		
IC119	HD74HC245FP	Bus Driver		
IC120	HD74AC00FP	Inverter		
IC201	LC89210	Modem	14400 bps	
IC202	LA6458M	OP-AMP		
IC203	LA6082M	OP-AMP		
IC205	LA6458M	OP-AMP		
IC206	TA2011S	MIC AMP		
IC207	TC4W53F	Analog-SW		
IC208	TC4053BF	Analog-SW		
IC209	LA4525	PW AMP		

Symbol	Type	Description	Function	Note
IC301	IC UPD78P014	Engin CPU	Engine Seqencer Control	
IC302	IC LC21063B	Gate Array	Printed Data Processing DMA Bus Arbiter Stepping Motor Controller I/O DRAM Controller Engine Seqencer	
IC303	LC3564SM-70	64K bit S-RAM	Printed Data Processing	
IC304	LA6393M	Voltage Comperater		
IC305	LA6458M	OP-AMP		
IC306	TC7W74F	D-Type F/F		
IC307	HD74AC08FP	AND Gate		
IC308	TC7WU04F	Inverter		
IC309	TC7W32F	OR Gate		

7-8. Variable Resistors of Main P.C.B.

VR-No.	Contents	Remark
VR101	CIS (contact image sensor) reading level adjustment	See 4-3-1.
VR102	Transmission level adjustment (facsimile modem)	See 4-3-2.

7-9. Switchs of Main P. C. B.

SW101 Countries switch

Countrys	SW No. 5	4	3	2	1
USA/CANADA	0	0	0	0	0
GERMANY	0	0	0	0	1
AUSTRIA	0	0	0	1	0
SWISS	0	0	0	1	1
AUSTRALIA	0	0	1	0	0
NEW ZEALAND	0	0	1	0	1
NORWAY	0	0	1	1	0
SPAIN	0	0	1	1	1
UK	0	1	0	0	0
	0	1	0	0	1
	0	1	0	1	0
PANAMA	0	1	0	1	1
	0	1	1	0	0
FRANCE	0	1	1	0	1
SOUTH AFRICA	0	1	1	1	0
JAPAN	0	1	1	1	1
BELGIUM	1	0	0	0	0

Countrys	SW No. 5	4	3	2	1
ITALY	1	0	0	0	1
NETHERLANDS	1	0	0	1	0
PORTUGAL	1	0	0	1	1
SWEDEN	1	0	1	0	0
FINLAND	1	0	1	0	1
DENMARK	1	0	1	1	0
	1	0	1	1	1
	1	1	0	0	0
	1	1	0	0	1
HONG KONG	1	1	0	1	0
SINGAPORE	1	1	0	1	1
SOUDI ARABIA	1	1	1	0	0
	1	1	1	0	1
	1	1	1	1	0
	1	1	1	1	1

SW201

No.	Contents	Remark
201-1	Service switch	See 8-2.
201-2	Not use	

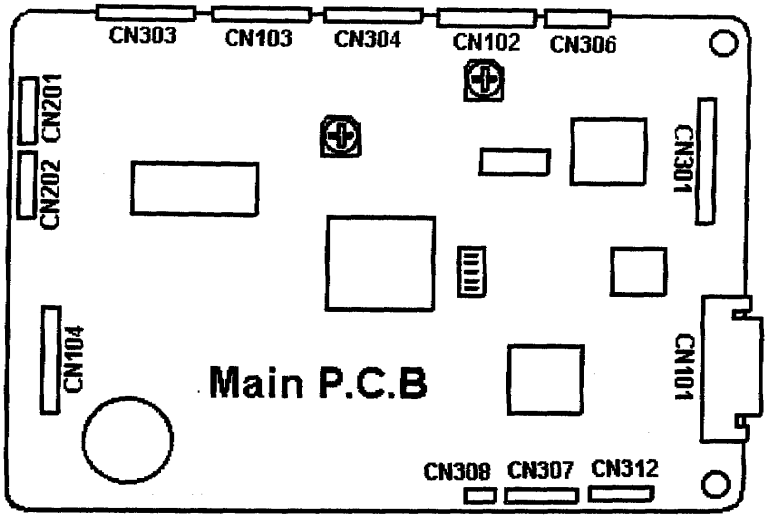
7-10. Main P.C.B. Test Point

TP-No.	Contents	Remark
TP101	CISIN	See 4-3-1.
TP102	SPULSE	See 4-3-1.
TP103	EXP_CONT	For factory use
TP202	EYEY	For factory use
TP203	EYEX	For factory use

TP-No.	Contents	Remark
TP301	SDH TMP	For factory use
TP302	TNS	See 7-1-1.
TP303	FUTEMP	See 7-1-2.
TP304	ANAROG GND	
TP305	DIGITAL GND	

7-11. Main P.C.B. connectors

7-11-1. Location of connectors on Main P.C.B.



7-11-2. List of Designations of Main Unit Connectors

CN-No.	Abbreviation	Description	In/Out (Active)
CN101		Connected to Optional Board (GDI or PCL5e/PS)	
CN101-1	DGND	Signal GND	-
CN101-2	CLK_16M	GDI CLK Out(CLK)	
CN101-3	DGND	Signal GND	-
CN101-4	DGND	Signal GND	-
CN101-5	BUS_ACK	Bus acknowledge signal	In(Hi)
CN101-6	BUS_REQ	Bus request signal Out(Hi)	
CN101-7	C1INT	Interrupt signal of RS-232C board	In(Hi)
CN101-8	/DLYRD	Read strobe signal	Out(Lo)
CN101-9	/DLYRESET	Reset signal	Out(Lo)
CN101-10	EXTRDY	Wait signal	In(Lo)
CN101-11	/IOCS	Cip select signal	Out(Lo)
CN101-12	/WR	Write strobe signal	Out(Lo)
CN101-13	N.C.	-	-
CN101-14	A0	Address bus	Out(Hi)
CN101-15	A1	Address bus	Out(Hi)
CN101-16	A2	Address bus	Out(Hi)
CN101-17	A3	Address bus	Out(Hi)
CN101-18	A4	Address bus	Out(Hi)
CN101-19	A5	Address bus	Out(Hi)
CN101-20	A6	Address bus	Out(Hi)
CN101-21	A7	Address bus	Out(Hi)
CN101-22	A8	Address bus	Out(Hi)
CN101-23	A9	Address bus	Out(Hi)
CN101-24	A10	Address bus	Out(Hi)
CN101-25	A11	Address bus	Out(Hi)
CN101-26	A12	Address bus	Out(Hi)
CN101-27	A13	Address bus	Out(Hi)
CN101-28	A14	Address bus	Out(Hi)
CN101-29	+5V	Power supply	-
CN101-30	+5V	Power supply	-
CN101-31	+5V	Power supply	-
CN101-32	+5V	Power supply	-
CN101-33	A15	Address bus	Out(Hi)

CN-No.	Abbreviation	Description	In/Out (Active)
CN101-34	A16	Address bus	Out(Hi)
CN101-35	A17	Address bus	Out(Hi)
CN101-36	A18	Address bus	Out(Hi)
CN101-37	A19	Address bus	Out(Hi)
CN101-38	A20	Address bus	Out(Hi)
CN101-39	A21	Address bus	Out(Hi)
CN101-40	A22	Address bus	Out(Hi)
CN101-41	A23	Address bus	Out(Hi)
CN101-42	D0	Data bus	In/Out(Hi)
CN101-43	D1	Data bus	In/Out(Hi)
CN101-44	D2	Data bus	In/Out(Hi)
CN101-45	D3	Data bus	In/Out(Hi)
CN101-46	D4	Data bus	In/Out(Hi)
CN101-47	D5	Data bus	In/Out(Hi)
CN101-48	D6	Data bus	In/Out(Hi)
CN101-49	D7	Data bus	In/Out(Hi)
CN101-50	N.C.	-	-
CN101-51	N.C.	-	-
CN101-52	N.C.	-	-
CN101-53	N.C.	-	-
CN101-54	N.C.	-	-
CN101-55	AGND	Analog signal GND	-
CN101-56	AGND	Analog signal GND	-
CN101-57	+12V	Power supply	-
CN101-58	-12V	Power supply	-
CN101-59	DGND	Signal GND	-
CN101-60	AGND	Analog signal GND	-
CN102		Connected to SDH(ADF)	Unit
CN102-1	VIN	Picture signals from the CIS.	In(Analog)
CN102-2	AGND	Analog signal GND	-
CN102-3	+5V	Power supply	-
CN102-4	-12V	Power supply	-
CN102-5	DGND	Signal GND	-
CN102-6	SP	Starting pulses for reading each line of document.	Out(Hi)
CN102-7	DGND	Signal GND	-
CN102-8	CLOCK	The clock for CIS only.	Out(Positive Pulse)
CN102-9	LED-GND	LED of CIS grows with LOW.	Out(Lo)
CN102-10	+24V	LED of CIS only.	-
CN102-11	SDHPS	Paper Supply Solenoid of the SDH	Out(Lo)
CN102-12	+24V	Power supply	-
CN102-13	/SDHPC	Paper Supply Clutch of the SDH	Out(Lo)
CN102-14	+24V	Power supply	-
CN102-15	SDHOPN	"When LOW, the signal detects open of the platen cover."	In(Lo)
CN102-16	DGND	Signal GND	-
CN102-17	/CS1	"When LOW, the signal detects a document."	In(Lo)
CN102-18	/CS3	"When LOW, the signal detects B4 size of a document. (Unused for this machine.)"	In(Lo)
CN102-19	DGND	Signal GND	-
CN102-20	DGND	Signal GND	-
CN102-21	/CS2	"When LOW, the signal detects the top end position of a document."	In(Lo)
CN102-22	/CS4	Unused -	
CN102-23	DGND	Signal GND	-
CN102-24	DGND	Signal GND	-
CN102-25	+5V	Power supply	-
CN102-26	+5V	Power supply	-

CN-No.	Abbreviation	Description	In/Out (Active)
CN103		Connected to Unit Operation	
CN103-1	+5V	Power supply	-
CN103-2	DGND	Signal GND	-
CN103-3	SOUT	Serial output signal for the control panel board	Out(Hi)
CN103-4	SCLK	Sync signal for control the control panel board	In/Out(CLK)
CN103-5	SIN	Serial input signal from the control panel board	In(Hi)
CN103-6	/HRDY	"Ready signal (When the main unit becomes ready for reception, it is set LOW.)"	Out(Lo)
CN103-7	/PRDY	"Ready signal (When the control panel board becomes ready for reception, it is set LOW.)"	In(Lo)
CN103-8	/RESET	"When the 4-bit CPU is reset, the signal is set LOW."	Out(Lo)
CN103-9	+5V(A)	Power supply	-
CN103-10	EXPCNT	Signal from the exposure voltage adjustment VR.	Out(analog)
CN103-11	AGND	Analog signal GND	-
CN104		Connected to FAX memory board (Option)	
CN104-1	DGND	Signal GND	-
CN104-2	DGND	Signal GND	-
CN104-3	MAU0	Memory address bus for DRAM	Out(Hi)
CN104-4	MAU1	Memory address bus for DRAM	Out(Hi)
CN104-5	MAU2	Memory address bus for DRAM	Out(Hi)
CN104-6	MAU3	Memory address bus for DRAM	Out(Hi)
CN104-7	MAU4	Memory address bus for DRAM	Out(Hi)
CN104-8	MAU5	Memory address bus for DRAM	Out(Hi)
CN104-9	MAU6	Memory address bus for DRAM	Out(Hi)
CN104-10	MAU7	Memory address bus for DRAM	Out(Hi)
CN104-11	MAU8	Memory address bus for DRAM	Out(Hi)
CN104-12	MAU9	Memory address bus for DRAM	Out(Hi)
CN104-13	/DOEU	Read strobe signal	Out(Lo)
CN104-14	/DWRU	Write strobe signal	Out(Lo)
CN104-15	/ICASU	Latch strobe signal for column address.(Internal)	Out(Lo)
CN104-16	/IRASU0	Latch strobe signal for row address.(Internal)	Out(Lo)
CN104-17	/IRASU1	Latch strobe signal for row address.(Internal)	Out(Lo)
CN104-18	/XCASU	Latch strobe signal for column address.(External)	Out(Lo)
CN104-19	/XRASU0	Latch strobe signal for row address.(External)	Out(Lo)
CN104-20	/XRASU1	Latch strobe signal for row address.(External)	Out(Lo)
CN104-21	/OPT_MEM1	"When 1MB optional memory is installed, the signal is set LOW."	In(Lo)
CN104-22	/OPT_MEM2	"When 2MB optional memory is installed, the signal is set LOW."	In(Lo)
CN104-23	+5V	Power supply	-
CN104-24	+5V	Power supply	-
CN104-25	+5V	Power supply	-
CN104-26	+5V	Power supply	-
CN104-27	DGND	Signal GND	-
CN104-28	DGND	Signal GND	-
CN104-29	VBD	Power supply by backup circuit.	-
CN104-30	VBD	Power supply by backup circuit.	-
CN104-31	MD0	Memory data bus for DRAM	In/Out(Hi)
CN104-32	MD1	Memory data bus for DRAM	In/Out(Hi)
CN104-33	MD2	Memory data bus for DRAM	In/Out(Hi)
CN104-34	MD3	Memory data bus for DRAM	In/Out(Hi)
CN104-35	MD4	Memory data bus for DRAM	In/Out(Hi)
CN104-36	MD5	Memory data bus for DRAM	In/Out(Hi)
CN104-37	MD6	Memory data bus for DRAM	In/Out(Hi)
CN104-38	MD7	Memory data bus for DRAM	In/Out(Hi)
CN104-39	DGND	Signal GND	-
CN104-40	DGND	Signal GND	-

CN-No.	Abbreviation	Description	In/Out (Active)
CN201		Connected to NCU	
CN201-1	CML	CML relay signal Hi : on (modem side)	Out(Hi)
CN201-2	DP	DP relay signal Hi : on (make)	Out(Hi)
CN201-3	SHORT	SHORT relay signal Hi : on (short)	Out(Hi)
CN201-4	SRL	PABX access signal Hi : on (short)	Out(Hi)
CN201-5	RING	Ring detection signal	In(HI)
CN201-6	LOOP	"When HIGH, the signal detects the loop on."	In(Hi)
CN201-7	TONE	"When HIGH, the signal detects the tone signal."	In(Hi)
CN201-8	CNG	Unused	-
CN202	Connected to NCU		
CN202-1	RXLINE	Modem reception signal	In(analog)
CN202-2	AGND	Analog signal GND	-
CN202-3	TXLINE	Modem transmission signal	Out(analog)
CN202-4	+12V	Power supply	-
CN202-5	AGND	Analog signal GND	-
CN202-6	-12V	Power supply	-
CN202-7	DGND	Signal GND	-
CN202-8	+5VA	Power supply	-
CN202-9	N.C.	Unused	
CN301		Connected to Optional Board (GDI or PCL5e/PS)	
CN301-1	DGND	Signal GND	-
CN301-2	DGND	Signal GND	-
CN301-3	+5V	Power supply	-
CN301-4	+5V	Power supply	-
CN301-5	ED0	Address/Data bus for GDI	In/Out(Hi)
CN301-6	ED1	Address/Data bus for GDI	In/Out(Hi)
CN301-7	ED2	Address/Data bus for GDI	In/Out(Hi)
CN301-8	ED3	Address/Data bus for GDI	In/Out(Hi)
CN301-9	ED4	Address/Data bus for GDI	In/Out(Hi)
CN301-10	ED5	Address/Data bus for GDI	In/Out(Hi)
CN301-11	ED6	Address/Data bus for GDI	In/Out(Hi)
CN301-12	ED7	Address/Data bus for GDI	In/Out(Hi)
CN301-13	DGND	Signal GND	-
CN301-14	DGND	Signal GND	-
CN301-15	+5V	Power supply	-
CN301-16	+5V	Power supply -	
CN301-17	EA8	Address bus for GDI	Out(Hi)
CN301-18	EA9	Address bus for GDI	Out(Hi)
CN301-19	EA10	Address bus for GDI	Out(Hi)
CN301-20	EA11	Address bus for GDI	Out(Hi)
CN301-21	EA12	Address bus for GDI	Out(Hi)
CN301-22	EA13	Address bus for GDI	Out(Hi)
CN301-23	EA14	Address bus for GDI	Out(Hi)
CN301-24	EA15	Address bus for GDI	Out(Hi)
CN301-25	GDICLK16M	System clock for GDI	Out(CLK)
CN301-26	OPT_PRINTER	"When High, the PCL board."	In(Hi□FPCL5e)
CN301-27	DGND	Signal GND	-
CN301-28	DGND	Signal GND	-
CN301-29	GDI_INT	Interrupt signal from the ASIC of GDI.	In(Hi)
CN301-30	/DLYRESET	System reset signal for GDI and PCL board.	Out(Lo)
CN301-31	/ERD	Read strobe signal	Out(Lo)
CN301-32	/EWR	Write strobe signal	Out(Lo)
CN301-33	ASB	address strobe signal	Out(Hi)
CN301-34	/HSYNC_OUT	Horizontal synchronous signal	Out(Negative Puls)
CN301-35	COMMAND1	Command data	In(Data)
CN301-36	READY1	Ready signal	Out(Hi)
CN301-37	VSREQ1	Video data request signal	Out(Hi)
CN301-38	STATUS1 Status data	Out(Data)	

CN-No.	Abbreviation	Description	In/Out (Active)
CN301-39	SSCLK1	Serial clock	In/Out(CLK)
CN301-40	SBSY1	Status busy signal	Out(Hi)
CN301-41	CBSY1	Command busy signal	In(Hi)
CN301-42	PRRWQ1	Print request signal	In(Hi)
CN301-43	VSYNC	Vertical synchronous signal	In(Hi)
CN301-44	VDO1	Video Data	In(Data)
CN301-45	H_STROBE	Horizontal strobe signal	In(Negative Puls)
CN301-46	ENCODE	Encode signal	In(Positive Puls)
CN301-47	VIDEO_CK	Video clock(in)	In(CLK)
CN301-48	N_VCLK0	Video clock(out)	Out(CLK)
CN301-49	PCL5EFAN	Unused	-
CN301-50	N.C.	-	-
CN301-51	PANELI0	Print Reset	Out(Lo)
CN301-52	PANELI1	Print Form Feed	Out(Lo)
CN301-53	PANELI2	Print Continue	Out(Lo)
CN301-54	PANELI3	Print Test Mode	Out(Lo)
CN301-55	PANELO0	Print Data LED	In(Hi)
CN301-56	PANELO1	Print Error LED	In(Hi)
CN301-57	+5V	Power supply	-
CN301-58	+5V	Power supply	-
CN301-59	DGND	Signal GND	-
CN301-60	DGND	Signal GND	-
CN302			
CN302-1	TNM0	TNM0 controls the agitation motor 2 of toner	Out(CLK)
CN302-2	TNM1	TNM1 controls the agitation motor 1 of toner	Out(CLK)
CN302-3	TNSC	Toner sensor control	Out(analog)
CN302-4	/DRUM	"When drum unit is not installed, the signal is set LOW."	In(Lo)
CN302-5	TNS	Toner sensor detection voltage	In(analog)
CN302-6	GRID	Charging GRID voltage turned on with LOW when HVCC turned LOW	Out(Lo)
CN302-7	JAM1	"JAM1 sensor signal (When the sensor detects paper, the signal is set LOW.)"	In(Lo)
CN302-8	HVTC	Transfer voltage control (It is turned on by LOW signal.)	Out(Lo)
CN302-9	PSC	Paper supply clutch control (It is turned on by LOW signal.)	Out(Lo)
CN302-10	HVCC	Charge voltage control (It is turned on by LOW signal.)	Out(Lo)
CN302-11	DGND	Signal GND	-
CN302-12	-12V	Power supply	-
CN302-13	AGND	Analog signal GND	-
CN302-14	AGND	Analog signal GND	-
CN302-15	DGND	Analog signal GND	-
CN302-16	+12V	Power supply	-
CN302-17	DGND	Signal GND	-
CN302-18	DGND	Signal GND	-
CN302-19	DGND	Signal GND	-
CN302-20	DGND	Signal GND	-
CN302-21	+5V	Power supply	-
CN302-22	+5V	Power supply	-
CN302-23	+5V	Power supply	-
CN302-24	+5V	Power supply	-
CN302-25	GND 24	Power GND	-
CN302-26	GND 24	Power GND	-
CN302-27	GND 24	Power GND	-
CN302-28	GND 24	Power GND	-
CN302-29	S24V	24V with the safety circuit	-
CN302-30	S24V	24V with the safety circuit	-
CN302-31	+24V	Power supply	-
CN302-32	+24V	Power supply	-
CN302-33	+24V	Power supply	-
CN302-34	+24V	Power supply	-

CN-No.	Abbreviation	Description	In/Out (Active)
CN302-35	SPGND	GND used for speaker	-
CN302-36	/FPLOCK	"Power supply cooling fan trouble detection (If a trouble occurs, the signal is set LOW.)"	In(Lo)
CN302-37	SP	Speaker output (buzzer/acoustic/on-hook).	Out(analog)
CN302-38	TPC	Total paper counter control (The counter is count up by LOW signal.)	Out(Lo)
CN302-39	PSFAN	Power supply cooling fan control (The fan is revolved by LOW signal.)	Out(Lo)
CN302-40	EXP_CNT	Exposure lamp energizing voltage control.	Out(CLK)
CN302-41	FUTEMP	Thermistor of Fuser temperature detection voltage.	In(analog)
CN302-42	AVRERR	Exposure lamp lighting detection (Lighting detection is performed when the signal is HIGH.)	In(Hi)
CN302-43	JAM2	"JAM2 sensor signal (When the sensor detects paper, the signal is set LOW.)"	In(Lo)
CN302-44	EXP	Exposure lamp lighting control (The lamp is turned on by LOW signal.)	Out(Lo)
CN302-45	MMST	Main motor control (Motor is revolved by LOW signal.)	Out(Lo)
CN302-46	MRL	Main relay control (The relay is turned on by LOW signal.)	Out(Lo)
CN302-47	/MMLOCK	"Main motor trouble detection (If a trouble occurs, the signal is set LOW.)"	In(Lo)
CN302-48	SSR	Fuser lamp control (The lamp is turned on by LOW signal.)	Out(Lo)
CN302-49	PE	"Paper empty sensor signal (When the paper in the cassette runs out, the signal is set HIGH.)"	In(Hi)
CN302-50	PRC	Paper registration clutch control (It is turned on by LOW signal.)	Out(Lo)
CN303			
CN303-1	+24V	Power supply	-
CN303-2	/SDHFAN	SDH(ADF) cooling fan control (The fan is revolved by LOW signal.)	Out(Lo)
CN303-3	/FSLOCK	"SDH(ADF) cooling fan trouble detection (If a trouble occurs, the signal is set LOW.)"	In(Lo)
CN303-4	+24V	Power supply	-
CN303-5	FANOP	Optical unit cooling fan control (The fan is revolved by LOW signal.)	Out(Lo)
CN303-6	/FOLOCK	"Optical unit cooling fan trouble detection (If a trouble occurs, the signal is set LOW.)"	In(Lo)
CN303-7	CCL	Erase lamp control (The lamp is turned on by HIGH signal.)	Out(Hi)
CN303-8	GND 24	Power GND	-
CN303-9	+5V	Power supply	-
CN303-10	MHP	"Mirror home position detecting signal (When the analog scanner is in the home position, it is set LOW.)"	In(Lo)
CN303-11	DGND	Signal GND	-
CN303-12	+5V	Power supply -	
CN303-13	SDHTHM	Thermistor of SDH temperature detection voltage.	In(analog)
CN304			
CN304-1	+24V	Power supply	-
CN304-2	GND 24	Power GND	-
CN304-3	/SMON	Laser scanner motor control (The scanner motor is turned on by LOW signal.)	Out(Lo)
CN304-4	/SMLOCK	"Laser scanner motor trouble detection (If a trouble occurs, the signal is set LOW.)"	In(Hi)
CN304-5	/LSUCLK	Laser scanner motor clock Out(CLK)	
CN304-6	/HSYNC	Horizontal strobe signal from laser scanner unit	In(Lo)
CN304-7	DGND	Signal GND	-
CN304-8	S5V	5V with the safety circuit	-
CN304-9	DGND	Signal GND	-
CN304-10	S/H	Sample and hold signal for laser scanner unit	Out(Hi)
CN304-11	/LD	Video data signal for laser diode	Out(Lo)
CN304-12	/ENB	Laser diode control (The laser diode is enabled by LOW signal.)	Out(Lo)

CN-No.	Abbreviation	Description	In/Out (Active)
CN306			
CN306-1	+24V	Power supply	-
CN306-2	+24V	Power supply	-
CN306-3	+24V	Power supply	-
CN306-4	GND 24	Power GND	-
CN306-5	GND 24	Power GND	-
CN306-6	GND 24	Power GND	-
CN306-7	SMRA	Stepping motor for analog copy control signal (Phase A)	Out(CLK)
CN306-8	SMRB	Stepping motor for analog copy control signal (Phase B)	Out(CLK)
CN306-9	SMRA/	Stepping motor for analog copy control signal (Phase A/)	Out(CLK)
CN306-10	SMRB/	Stepping motor for analog copy control signal (Phase B/)	Out(CLK)
CN306-11	MRM	Stepping motor for analog copy current switchover signal	Out(Hi)
CN306-12	SDHMA	Stepping motor for ADF control signal (Phase A)	Out(CLK)
CN306-13	SDHMB	Stepping motor for ADF control signal (Phase B)	Out(CLK)
CN306-14	SDHMA/	Stepping motor for ADF control signal (Phase A/)	Out(CLK)
CN306-15	SDHMB/	Stepping motor for ADF control signal (Phase B/)	Out(CLK)
CN306-16	+5V	Power supply	-
CN306-17	DGND	Signal GND	-
CN306-18	DGND	Signal GND	-
CN307			
CN307-1	DGND	Signal GND	-
CN307-2	+5V	Power supply	-
CN307-3	N.C.	-	-
CN307-4	N.C.	-	-
CN307-5	PTM	Clock for the paper supply motor of the cassette feeder (optional)	Out(CLK)
CN307-6	LMST	Paper supply motor control of the cassette feeder (optional) The motor is revolved by LOW signal.)	Out(Hi)
CN307-7		GND 24 Power GND	-
CN307-8	+24V	Power supply	-
CN308			
CN308-1	+24V	Power supply	-
CN308-2	LPSC	Paper supply clutch control of the cassette feeder (optional) It is turned on by LOW signal.	Out(Lo)
CN312			
CN312-1	N.C.	-	-
CN312-2	N.C.	-	-
CN312-3	N.C.	-	-
CN312-4	N.C.	-	-
CN312-5	+5V	Power supply	-
CN312-6	LPE	"Paper empty sensor signal of the cassette feeder (optional) When the paper in the cassette runs out, the signal is set HIGH.)"	In(Hi)
CN312-7	DGND	Signal GND	-

SECTION 8 SERVICE FUNCTION

SECTION 8 SERVICE FUNCTION

8-1. Error Messages

8-1-1. Operator call

SDH OPEN

SDH SW detect the platen cover open and S1 sensor detect the document.

UPPER UNIT OPEN

Safety switch detects the OFF state.

TONER EMPTY

Toner concentration still low as to after forced toner supply sequence.

SUPPLYING TONER

Machine proceed forced toner supply sequence.

NO PAPER | NO PAPER UPPER | NO PAPER LOWER

(When single cassette) (When dual cassette)
Each PE sensors detects the out-of-paper state.

PAPER JAM *

* = 0: detects the lack of paper supply from the lower cassette.
* = 1: detects the lack of paper supply from the upper
* = 2: detects faulty paper feed.
* = 3: detects faulty paper output.
(For detect timing. see 7-1-3)

DOCUMENT JAM

Even after a lapse of 4.3 seconds since the document has been start of transfer from the C.I.S. , S2 sensor detects still on.

NO DEVELOPER

Developer unit no mounted into the base machine. Controller be able to detect it by the output from toner sensor.

NO DRUM

Drum unit no mounted into the base machine. Controller be able to detect it by the connection of grid as to charging corona.

CHECK DEVELOPER

When the electronic counter reaches 50,000 counts, controller warn replace the developer unit.

CHANGE DEVELOPER

When the electronic counter reaches 50,000 counts and toner sensor detects the toner empty, replace the developer unit. After replacement, execute the initialization command.

CHECK DRUM

When the electronic counter reaches 49,500 counts, controller warn replace the drum unit.

CHANGE DRUM

When the electronic counter reaches 50,000 counts, replace the drum cartridge. After replacement, execute the drum initialization command.

CHECK DEVE/DRUM

When the electronic counter reaches 50,000 counts to simultaneously as to drum counter and developer counter.

INITIALIZE ERROR

When initialize the developer unit, controller can not adjust the control voltage of the toner sensor.

COOLING ADF

If SDH thermistor detect the abnormal high temperature then, controller produce the cooling of SDH by stop the copying mode.

8-1-2. Serviceman call

SYSTEM ERROR 001

Controller can not accuses page memory.

SYSTEM ERROR 002

Controller can not accuses code memory.

SYSTEM ERROR 003

Controller detects abnormal low temperature, high temperature or thermistor as to fuser unit.
Detection method:
Controller detects the more than 120 seconds as to lighting time of the fuser lamp (at waiting mode). When ready mode is more than 60 seconds.

SYSTEM ERROR 004

Controller detects the exposure lamp continuous coming on. (Continuous coming on time: Approx. 15 sec.) Also when A.C. circuit disconnects the exposure lamp, controller detects it.

SYSTEM ERROR 005

Analog scanner problem. Deviated detection timing of the mirror home position.
Even after a lapse of 6 seconds since the START key has been pressed, the first scanner has not been separated from the sensor. Or, within 6 seconds, the first scanner has not returned to the sensor.

SYSTEM ERROR 006

Abnormal LOCK signal from the main motor detected (synchronization lost).

SYSTEM ERROR 008

Temperature of S.D.H. reach 40°C.

SYSTEM ERROR 010

Abnormal LOCK signal from the cooling fan (OP / PS / SDH).

SYSTEM ERROR 012

Abnormal LOCK signal from L.S.U. (Laser scan unit) motor.

SYSTEM ERROR 013

Can not detect HSYNC signal from L.S.U..

SYSTEM ERROR 014

Can not access SRAM of printer engine.

SYSTEM ERROR 015

Can not access DRAM of printer engine.

8-1-3. Communication Error Code of FAX

The following codes are printed out at the CODE columns on the Activity Report, when communication errors occur.

The meaning of the symbol in the Mode column is as follows;

TX: Transmission RX: Reception
P-RX: Polling Reception P-TX: Polling Transmission
MP-RX: Multi-Polling RX B-TX: Broadcast TX

Code	Description	Mode
	The called party does not answer.	
I-10	T1 time out (No response from the other party's fax.)	TX RX
I-11	Receiver is telephone.	TX
	Own machine trouble	
I-20	Transmission is canceled by operator	TX
I-21	Document is jammed at ADF (SDH)	TX
I-23	No recording paper during Polling RX	P-RX
I-25	Memory data error / Memory full	TX RX
I-29	Data is canceled by power down	B-TX MP-RX
	Image deficiency	
I-30	Number of error lines is over.	RX
I-32	RTN reception. Sent image is poor.	TX
I-33	More than 5 sec. for one line.	RX
I-35	EOR transmission (for ECM communication)	TX
I-36	EOR reception (for ECM communication)	RX
	Error in the other party	
I-40	Other party has no recording paper.	TX
I-41	Other party has no polling original.	P-RX
I-44	T5 time out (for ECM communication)	TX
I-45	Loop current cannot be detected.	TX
I-46	Busy-tone is detected after dialing.	TX
I-47	Dial-tone cannot be detected.	TX
I-48	Other location does not respond.	TX
I-49	Busy-tone is detected before dialing.	TX
	Cut-off other party	
I-50	DCN receiving or illegal command.	TX
I-51	3 time trial of DCS, DTC or NSS.	TX
I-52	T6 time out.	RX
I-53	PHASE C carrier cut-off.	RX
I-54	3 time trial of post message signal.	TX
I-59	T1 is in time out. (Multi page)	TX
	Incomplete transmission due to deficient line.	
I-60	Fall back MODEM error.	TX
	Non-transmission due to incompatibility.	
I-71	Password does not match.	All
I-72	Polling request from incompatible unit	R-TX
I-73	Transmission Speed does not match	T
I-75	No polling document in this machine.	P-TX
I-79	Confidential communication is incompatible	TX
	Other error	
I-FE	Modem or DMA does not operate	TX
I-FF	Unexpected error	TX RX
CL	Mem. File is cleared by operator	-
P.D.	Mem. File is cleared by power down	-

8-1-4. Error code of PCL5e (Option)

COMPLEX DATA ERR

Can not extend the compression data.

BUFFER FULL

memory of receiving buffer is full.

MEMORY FULL

For the memory not remain, can not extend the compression data.

IGNORE DATA

Syntax error of postscript printer.

MNL A4 (One of example)

Error displays continued paper size in a cassette by printer and paper size by host machine.

Displays cassette:
STD / MF / OPT
Displays paper size:
LT / LG / EXEC / A4 / B5 / COM-10 / DL / C5 / MON / USER

SYSTEM ERROR 020

Error of parallel interface.

SYSTEM ERROR 021

Incorrect installation of expansion memory (SIMM).

SYSTEM ERROR 022

When detect the check sum error of Program ROM.

SYSTEM ERROR 023

When detect the check sum error of font ROM.

SYSTEM ERROR 024

D-RAM error.

SYSTEM ERROR 025

N-RAM writing error

SYSTEM ERROR 026

N-RAM reading error

SYSTEM ERROR 027

N-RAM error

SYSTEM ERROR 028

Service call error

8-2. Servicing (Test) mode

In this mode, various tests and adjustments can be made for the facsimile and printer engine.

8-2-1. Entering the test mode (MENU 0)

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).

(2) Press "MENU" keys.

ENTER MENU No. _ 1-7

(3) Select "MENU 0" by press "0" (ten key).

ENTER MENU No. 0 1-9 / ENTER

(4) Press "ENTER" key for into the "TEST MODE".

0. TEST MODE MENU / ENTER

TEST MODE OT

(5) Select each test mode by press each "OT" keys.

Press the "STOP" key and machine return from each mode.
Press the "STOP" key again and machine return to the ready mode.

OT-01: Scanner LED test

SCANNER LED ON

OT-02: Modem test

MODEM TES 9600BPS(V29)

one of example

Select the output menu by each "OT"keys.
Each "OT" keys be able to select the three output menu

	01: 9600 BPS (V29)
OT-01	02: 7200 BPS (V29)
	03: 4800 BPS (V29)
	04: 2400 BPS (V27ter)
OT-02	05: 300 BPS
	06: 1100 Hz
	07: 2100 Hz
OT-03	08: 1209 Hz
	09: 1336 Hz
	10: 1477 Hz
OT-04	11: 1633 Hz
	12: 697 Hz
	13: 770 Hz
OT-05	14: 852 Hz
	15: 941 Hz
	16: PB SIGNAL
OT-11	17: NO SIGNAL DP ON
	18: NO SIGNAL, DP OFF
	19: 14400 BPS (V17)
OT-12	20: 12000 BPS (V17)
	21: 9600 BPS (V17)
	22: 7200 BPS (V17)
OT-13	23: 14400 BPS (V33)
	24: 12000 BPS (V33)

OT-03: Print test

TEST CHART No. 0 0-2 / ENTER / START

Select the test chart by press between 0 to 2 (ten key) and press "START" or "ENTER" key.

0: TEST PATTERN
1: BLACK / WHITE PATTERN
2: CLEANING PATTERN

Select the mask control by press 0 or 1 (ten key) and press "START" key or "ENTER" key.

0: Not Mask
1: Mask

Select the cassette by press 0 or 1 (ten key) and press "START" key or "ENTER" key.

0: UP
1: LOWER

OT-04: Scanner test

SCANNER

This mode has been test for Scanner and LED of the S. D. H..

OT-05: Engine test

CONT OPERATION 0
ENTER / START

Select each engine test menu by enter 0 to 8 (ten key) and press "START" key or "ENTER" key.

0: DIGITAL RUNNING MODE WITHOUT PAPER
1: ANALOG RUNNING MODE WITHOUT PAPER
2: ANALOG SCANNER RUNNING MODE
3: SHIPPING POSITION, EXP. LAMP ON (6 sec.)
4: DEVELOPER RUNNING (1 min.)
5: TONER MOTOR ON (4 sec.)
6: TOTAL COUNTER 1 UP
7: LSU RUNNING MODE (**Don't use! for factory use.**)
8: HIGH VOLTAGE ON (1 min.)
9: SDH ANALOG RUNNING MODE WITHOUT PAPER

When running mode, select cassette by press 0 or 1 (ten key) and press "START" key or "ENTER" key.
If not mount the developer unit or drum unit then high voltage test mode does not ON.

8-2-2. Adjusting mode (MENU 01 to 07)

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).
(2) Press "MENU" keys.

ENTER MENU No. _
1-7

(3) Select each menu number (0, 1 to 0, 7) by press ten key and press "ENTER" KEY.

MENU 01: AVR ADJUSTMENT (VOLTAGE OF EXPOSURE LAMP)
MENU 02: ANALOG SCANNER SPEED ADJUSTMENT
MENU 03: TOP END ADJUSTMENT OF PRINTING PAPER
MENU 04: LEFT MARGIN ADJUSTMENT OF PRINTER MODE
MENU 05: TOP END ERASE ADJUSTMENT OF PRINTING PAPER
MENU 06: FUSING TEMPERATURE ADJUSTMENT
MENU 07: TONER CONCENTRATION ADJUSTMENT

In each adjusting procedure, see sec. 4.

8-3. G3 report

G3 Report shows the protocol of the communication. The memory switch 45 allows to print the G3 report. To change the setting of the memory switch 45, please take following instruction.

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).
(2) Press "MENU" key.
(3) Enter "2", "8" by ten key for the memory switch setting.
(4) Press "ENTER" key.
(5) Enter "4", "5" by ten key for G3 report setting.
(6) Enter "01" or "02" to print G3 report after the communication.
00: G3 report turned OFF.
01: Print G3 report after the every communications.
02: Print G3 report only if communication error has occurred.
(7) Press ENTER key.
(8) Enter "1" key by the ten key to quit this mode.
(9) Press "ENTER" key, then the unit return to standby mode.

A sample of G3 report is shown below.

```
                         *** G3 MONITOR REPORT ***

                                                              PAGE  1
PRINT TIME  17.09.'96 20:31 ID:               FAX:+
                                                        202SA00825 DE -

FILE START     MODE        LOCATION            STORE  TX/RX  TOTAL  CODE
No.  TIME                                      PAGE   PAGE   TIME
     17.09 19:26 RX                            0      5      01'12" OK-S

T/R  CMD       INFORMATION

TX   NSF
               00 00 51 00 00 04 31 F2 52 01 B4 0C 8C 4C 04 CA A6 4E 96 A6
               FF 04 04 04 04 04 04 04 04 04 04 FF FF FF FF FF FF FF FF 41
               4E FF 11 00 00
TX   CSI
               20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
TX   DIS
               00 EE 98 C4 80 10
RX   TSI
               20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
RX   NSS
               00 00 51 A2 98 04 81 CA 0A 62 B4 CC 8C 4C 04 CA A6 4E 96 A6
               CE 04 04 04 04 04 04 04 04 04 04 FF FF FF FF FF FF FF FF 41
               06 FF FF 00 00
RX   TCF       EQM(Hex)= 7873
TX   CFR
RX   PIX       TOTAL RX LINE 01161 / FAILURE LINE 00000
RX   MPS
TX   MCF
RX   PIX       TOTAL RX LINE 01160 / FAILURE LINE 00000
RX   MPS
TX   MCF
RX   PIX       TOTAL RX LINE 01161   FAILURE LINE 00000
RX   MPS
TX   MCF
RX   PIX       TOTAL RX LINE 01164   FAILURE LINE 00000
RX   MPS
TX   MCF
RX   PIX       TOTAL RX LINE 01160 / FAILURE LINE 00000
RX   EOP
TX   MCF
RX   DCN
```

8-4. Memory Switch

By changing the setting of memory switches, the settings associated with specific FAX functions or features can be altered.

(1) Initialize the test mode (turn on the DIP SW 102-1 on the main P.C.B).
(2) Press "MENU" key.
(3) Enter "2", "8" by ten key for the memory switch setting.
(4) Press "ENTER" key.
(5) Select memory switch number by ten keys and press "ENTER" Key.
(6) Alter the setting data by ten keys and press "ENTER".
(7) Enter "1" key by the ten key to quit this mode.
(8) Press "ENTER" key, then the unit return to standby mode.

8-4-1. Memory Switch List

00 FAX AUTO REDUCTION SELECT
Setting for FAX AUTO REDUCTION SELECT
0 : A4,LT,LG
1 : A4,LT
2 : LT

01 DIALING METHOD (DP)
Setting for dialing by DP (10pps / 20pps)
0 : DP(20pps) pulse number N ("0" is 10 pulse)
1 : DP(10pps) pulse number N ("0" is 10 pulse)
2 : DP(10pps) pulse number N+1
3 : DP(10pps) pulse number 10-N

02 PAUSE TIME
Setting for Pause Time.
Pause time can be set from 2sec to 21sec by 1sec.
02 : 2 sec
03 : 3 sec

21 : 21 sec

03 AUTO RE-DIAL
Setting for Auto Re-dial Number.
In the case of no response for Timer TX/Broadcasting etc., Auto Re-dial is performed.
00 : Auto Re-dial is NOT performed.
01 : 1 time
02 : 2 time

11 : 11 time

04 NUMBER OF RINGING
Setting for Number of Ringing.
In the case of Auto Receive Mode, Number of Ringing to received state is set.
Number of Ringing is set from 1 to 11 by 1 step.
01 : 1 time
02 : 2 time

11 : 11 time

06 SPEAKER BUZZER VOLUME
Setting for Speaker Volume.
1 : Small
2 : Normal
3 : Big

07 T.T.I. PRINT
Setting for T.T.I. Print.
In the case of document transmission, T.T.I. (Company/Date etc.) is added or not.
T.T.I. : FILE No.xxx
'92 Apr. 16 9 hour 35 minute 04/16/'92 09:35
ID Name 24 letters
Fax Number 20 or (19,+) figures
Page P1, P2, P3, ...
0 : Not add
1 : Add

08 CLOSED NETWORK & SELECT RECEIVE
Setting for Closed Network/Select Transmission and Receive.
0 : Not add Closed Network/Select Transmission and Receive
1 : Add Select Receive (lowest 4 figure of FAX number (*Note))
Note:AD key (AD01~50) / OT key [not check PROGRAM / GROUP / BATCH key]
2 : Add Closed Network
Only with same FAX Machines and same ID Number, communication can be performed.

09 TRANSMISSION REPORT
Setting for Transmission.
After Transmission , print Transmission Report.
0 : Not Print Transmission Report .
1 : Print Transmission Report .
2 : Print Transmission Report only if communication error has occurred.

10 INITIAL RESOLUTION
Setting for return position of Resolution after transmission
0 : Normal Mode
1 : Fine Mode
2 : Manual Setting

11 INITIAL CONTRAST/PHOTO
Setting for return position of Contrast /Photo after transmission
0 : Normal Mode
1 : Manual Setting

15 DISPLAY & PRINT LANGUAGE
Setting for the Language of LCD & Print message.
0 : Mother Language
1 : Second Language
2 : Third Language ~ 7 : 8th Language

16 RX TIME PRINT
Setting for RX TIME (RX TIME: YEAR/MONTH/DAY/HOUR/MINUTE) PRINT condition.
0 : NOT PRINT
1 : RX TIME PRINT
2 : TSI PRINT
3 : RX TIME and TSI PRINT

19 AUTO PAPER SELECTION (FAX)
Setting for Auto Paper Selection of Fax Mode
0 : Select cassette
1 : Not Select cassette (Upper cassette is prior to others)
2 : Not Select cassette (Lower cassette is prior to others)

20 COMMUNICATION MODE

Setting for Communication Mode whether it is Auto or G3

0 : Auto means that if the partner has Special Mode, Communication is performed by Special Mode, but it has not Special Mode, communication performed by G3.

1 : G3 means that communication is always performed by G3.

21 ECM RECEPTION

Setting for ECM RECEPTION.

0 : OFF

1 : ON

23 CED RESPONSE TIME

Setting for the Waiting Time for CED. (CED : Called station identification)

The Maximum waiting time is set. If CED does Not come while setting time, the result of communication is error.

0 : 35.0 sec	5 : 52.5 sec
1 : 38.5 sec	6 : 56.0 sec
2 : 42.0 sec	7 : 59.5 sec
3 : 45.5 sec	8 : 91.0 sec
4 : 49.0 sec	9 : 119.0 sec

24 T.S.I. TRANSMITTING CONDITION

TSI :Transmitting Subscriber Identification (TEL Number of transmitter)

CSI : Called Subscriber Identification (TEL Number of receiver)

Setting for the condition to transmit T.S.I.

00 : Not transmit

01 : Transmit

02 : Transmit if C.S.I. received

25 DCS TRANSMISSION TIMING

DCS : Digital Command Signal (Digital Recognition Signal of standard facility of transmitter)

DIS : Digital Identification Signal (Digital Recognition Signal of standard facility of receiver)

Setting for the condition to transmit D.C.S

0 : Response to First DIS

1 : Response to Second DIS

26 ATTENUATOR (TRANS.)

Setting for Transmitting Power Level of FAX Signal. (by 1 dBm step)

00 : 0 dBm

20 : -20 dBm

27 ATTENUATOR (DTMF)

Setting for Transmitting Power Level of DTMF Signal. (by 1 dBm step)

00 : 0 dBm

20: -20 dBm

28 RECEIVE LEVEL

Setting for Receive Level of FAX Signal. (by 1 dBm step)

If FAX Signal which is lower than setting level is received, it is NOT recognized as FAX Signal.

01 : - 38 dBm

11 : - 48 dBm

29 CABLE EQUALIZER

Setting for Cable Equalizer which rectifies the characteristics of the distance form setting place to switching office.

0 : 0 Km

1 : 7.2 km

30 CED FREQUENCY

Setting for CED frequency.

For International communication, 1100Hz CED can work the function of Echo cancel of the gate exchanger.

0 : 2100 Hz

1 : 1100 Hz

31 RECEIVE START SPEED

Setting for Receive Start Speed of Modem.

0 : 4,800 bps

1 : 14,400 bps

32 CARRIER OFF CHECK

Setting for Carrier Off Check Time. If carrier signal is cut off during more than setting time, only low-speed command signal is watched out up to total 6 second.

00 : 0 sec (by 0.5 sec step)

01 : 0.5 sec

12 : 6 sec

33 TCF CHECK INTERVAL

For TCF check, after detection of TCF signal, Time setting for stabilizing without TCF check.

Short sequence

	YES	NO
0 :	100 m sec	100 m sec
1 :	150 m sec	200 m sec
2 :	200 m sec	300 m sec

34 LINE ERROR

Setting for Error Line Treatment

In the case of the code error which exceeds the number of setting line in 1 page occurs, the page falls into image quality error and RTN is sent back.

0 : 0 %

1 : 5 %

2 : 10 %

3 : 15 %

4 : 25 %

5 : OFF

35 CONSECUTIVE LINE ERROR

Setting for Error Line Treatment

In the case of the consecutive code error which exceeds the number of setting line in 1 page occurs, the page falls into image quality error and RTN is sent back.

STD	FINE
0 : 3 lines	6
1 : 4 lines	8
2 : 5 lines	10
3 : 6 lines	12
4 : 7 lines	14
5 : 8 lines	16
6 : 9 lines	18
7 : OFF	

36 FSK CHECK BEFORE PHASE C

FSK CHECK BEFORE PHASE C
Setting FSK check before phase C.
0 : OFF
1 : ON

38 AUTO REDUCTION RX
Setting for Auto reduction of Receive mode.
0 : Not reduce (100 %, 2 Page)
1 : Reduce (~ 70 %, 1 % notch) Horizontal & Vertical
2 : Reduce (~ 70 %, 1 % notch) only Vertical

39 RECEIVE SIDE MASK
Setting for Side Masking of Received Image
0 : Not Mask
1 : Mask

41 RECEIVE DATA HOLD
Setting for Receive Data Hold in the Code Memory until the image is printed out completely.
0 : Not Hold (in Page Memory)
1 : Hold (in code Memory)

42 DCS-TCF INTERVAL
Setting for DCS-TCF INTERVAL
International regulation is 75 ms + 20 ms.
This setting is to have a good matching to other manufacturer.
0 : 75 ms
1 : 300 ms
2 : 500 ms
DCS : Digital Command Signal / TCF : Training Check

43 RTC-Q INTERVAL
Setting for RTC-Q INTERVAL
International regulation is 75 ms + 20 ms.
This setting is to have a good matching to other manufacturer.
0 : 75 ms
1 : 300 ms
2 : 500 ms

44 CONFIDENTIAL LIST
Setting for Confidential List Output Conditions.
0 : Not Print
1 : Print

45 G3 TESTER MODE
Setting for G3 Report printing after communication
0 : Not Print
1 : Print after every communication
2 : Print Only if communication error has occurred.

46 INITIALIZE
Setting for FAX Data initialize.
0 : All Data Clear
1 : File/Command Data Clear
2 : OT-key/AD-key/P-key/B-key Data Clear
3 : Report Data Clear
4 : Memory SW Table Data Clear
5 : Counter Data Clear (Except DRUM/DEVELOPER/TOTAL COUNTER/TONER CONTROL)
6 : Activity Report TX/RX Count Clear

47 FSK DELAY
Setting for exclusion of the echo obstacle by FSK Delay.
0 : 0 ms
1 : 100 ms
2 : 200 ms
3 : 300 ms
4 : 400 ms

48 HOOK UP ALARM
Setting for Hook Up Alarm which indicates Internal/External Handset is hung on.
0 : Not alarm
1 : Alarm

49 DIAL/BUSY TONE DETECT
Setting for Dial or Busy Tone Detection.
0 : Busy tone detection on, other tone detection off.
1 : Observe the regulation
2 : All tone detection off.

51 1 METER JAM
Setting for 1 Meter Jam which means if original document exceeds 1 m, Jam is judged.
0 : OFF
1 : ON

54 BUZZER ON or OFF
0 : OFF
1 : ON

55 CNG Tone
CNG Tone for Manual Dialing.
0 : OFF
1 : ON

56 ACOUSTIC MONITOR
Setting for Acoustic Monitor ON or OFF
0 : OFF
1 : ON (Phase A~E)

57 DETECTION LIMIT TIME
Setting for DETECTION LIMIT TIME
00 : 3.0 sec
01 : 3.1 sec

14 : 4.4 sec
15 : 4.5 sec

59 SPECIAL SPEED COMMUNICATION
Setting for Special Speed Communication

	TX	RX
0 :	Not Special Speed	Special Speed
1 :	Special Speed	Special Speed
2 :	Not Special Speed	Not Special Speed
3 :	Special Speed	Not Special Speed

Note: Hi-Speed (Original Hi-speed Protocol) setting is only available at memory transmission.
If this setting is ON and user transmits by ADF (Instant) Transmission, the machine without Hi-speed Protocol.

61 OPTION MODE (For Class 1)
Select Class 1 Mode
0 : OFF
1 : CLASS 1 I/F

3 : FP mode (for FP)

62 CLASS1 REPORT (For Class 1)
Select Class 1 Report Printing
0 : Not Print
1 : Print

63 RX PRIORITY (For Class 1)
Select FAX RX Priority
0 : FAX
1 : PC

66 FAX NUMBER In REPORT
Select CSI/NSF or Actual Number
0 : CSI/NSF/BLANK (This setting dose not indicates SUB/PWD/SEL on report)
1 : Actual Number (This setting indicates SUB/PWD/SEL/on report)

68 BROADCAST REPORT PRINT
Setting for print condition of BROADCAST REPORT.
0 : Not Print
1 : PRINT after B/C

69 MULTI-POLLING REPORT PRINT

Setting for print condition of MULTI-POLLING REPORT.
0 : Not Print
1 : Print after MULTI-POLLING

70 SUB/PWD/SEP COMM. SELECT
Setting for communication if a destination receiver dose not have SUB/PWD/SEP function
0 : OFF (When a receiver dose not have SUB/PWD/SEP function, machine that is included SUB/PWD/SEP data stop communication.
1 : ON (When a receiver dose not have SUB/PWD/SEP function, machine dose not stop communication.

72 HOOKING SELECT
Setting for hooking function on fax receiving
0 : Hooking OFF
1 : Hooking ON
Hooking select function utilizes below.
- Hooking select ON.
- When user pick up an external telephone during ringing.
- User hears FAX signal by the phone,
- When user takes hooking of telephone, the machine starts FAX communication.
This hooking is the same function as depressing START key.

73 MEMORY ENTRY REPORT
Setting for print condition of MEMORY ENTRY REPORT.
0 : NOT PRINT
1 : PRINT with every entry

75 INFORMATION CODE
Setting for print of INFORMATION CODE
0 : NOT PRINT
1 : PRINT

76 DATA SPEED (For Class 1)
Setting fro Data Speed for Class 1
0 : 2,400 bps
1 : 19,200 bps
2 : AUTO

77 PC RX NUMBER OF RINGING (For Class 1)
Setting for PC RX number of ringing
0 : Continuous
1 : 1 time

11 : 11 times

78 PC IDLE TIME (For Class 1)
Setting for PC Idle Time
0 : T=10 msec
1 : T=100 msec
2 : T=200 msec

9 : T=900 msec

79 DATA FORMAT (For Class 1)
Setting for Data format of Class 1 I/F

	data,	Parity,	stop bit
0 :	7 bit,	NON,	1 bit
1 :	7 bit,	ODD,	1 bit
2 :	7 bit,	EVEN,	1 bit
3 :	7 bit,	NON,	2 bit
4 :	7 bit,	ODD,	2 bit
5 :	7 bit,	EVEN,	2 bit
6 :	8 bit,	NON,	1 bit
7 :	8 bit,	ODD,	1 bit
8 :	8 bit,	EVEN,	1 bit
9 :	8 bit,	NON,	2 bit
10 :	8 bit,	ODD,	2 bit
11 :	8 bit,	EVEN,	2 bit

80 CANCELED REPORT PRINT
Setting for print condition of CANCELED REPORT.
0 : OFF
1 : PRINT after MEM.FILE clear by operation

81 ERROR PAGE REDIAL
Setting for error page redial condition
0 : pattern 1
1 : pattern 2

82 PABX RING DETECTION
Setting for PABX Ring Detection
0 : Ring pattern is detected up to the outer area of the PTT required.
1 : Ring pattern is detected only by the area of the PTT required.

83 PABX DIAL TONE DETECTION
Setting for PABX Dial Tone Detection
0 : Not detect dial Tone , but dial after fixed time.
1 : Detect dial Tone which is same to PSTN and start dialing after detection.
2 : Detect expanded PSTN dial Tone and start dialing after detection.

84 PSTN DIAL TONE DETECTION
Setting for PSTN Dial Tone Detection (PABX MODE)
0 : Not detect dial Tone , but dial after fixed time.

1 : Detect dial Tone which is same to PSTN and start dialing after detection.

2 : Detect expanded PSTN dial Tone and start dialing after detection.

85 COMMUNICATION SPEED PRINT

Setting for Communication Speed Print

0 : Not Print

1 : Print

86 COMMUNICATION SPEED / PAGE DISPLAY

Setting for Communication Speed / Page Display

0 : Not Display

1 : Display

88 TX REPORT PRINT CONDITION

Setting for TX REPORT PRINT CONDITION When Error Page Redial

0 : After Transmission

1 : After Final Transmission

91 TIME FOR DETECTION OF CNG

Setting for TIME FOR DETECTION OF CNG

0 : 1 sec

1 : 2 sec

2 : 3 sec

3 : 4 sec

4 : 5 sec

92 TIME FOR CALLING A OPERATOR

Setting for TIME FOR CALLING A OPERATOR

0 : 10 sec

1 : 15 sec

2 : 20 sec

3 : 25 sec

93 QUASI RING VOLUME

Setting for QUASI RING VOLUME

0 : Small

1 : Normal

2 : Big

94 TX MODE

Setting for TX Mode

0 : ADF TX

1 : Memory TX

95 MODEM CONTROL

Setting for MODEM CONTROL

0 : Equalizer freeze OFF / Carrier check

1 : Equalizer freeze ON / Carrier check

2 : Equalizer freeze OFF / EQM check

3 : Equalizer freeze ON / EQM check

96 1ST IMAGE PRINT

Setting for 1ST IMAGE PRINT

0 : OFF

1 : ON

97 PC TIME OUT

Setting for PC time out

0 : OFF

1 : 10 sec.

2 : 20 sec.

31 : 310 sec.

98 DATA SPEED

Setting for DATA SPEED for FP (For FP)

0 : 2400 bps

1 : 4800 bps

2 : 9600 bps

3 : 19200 bps

4 : 38400 bps

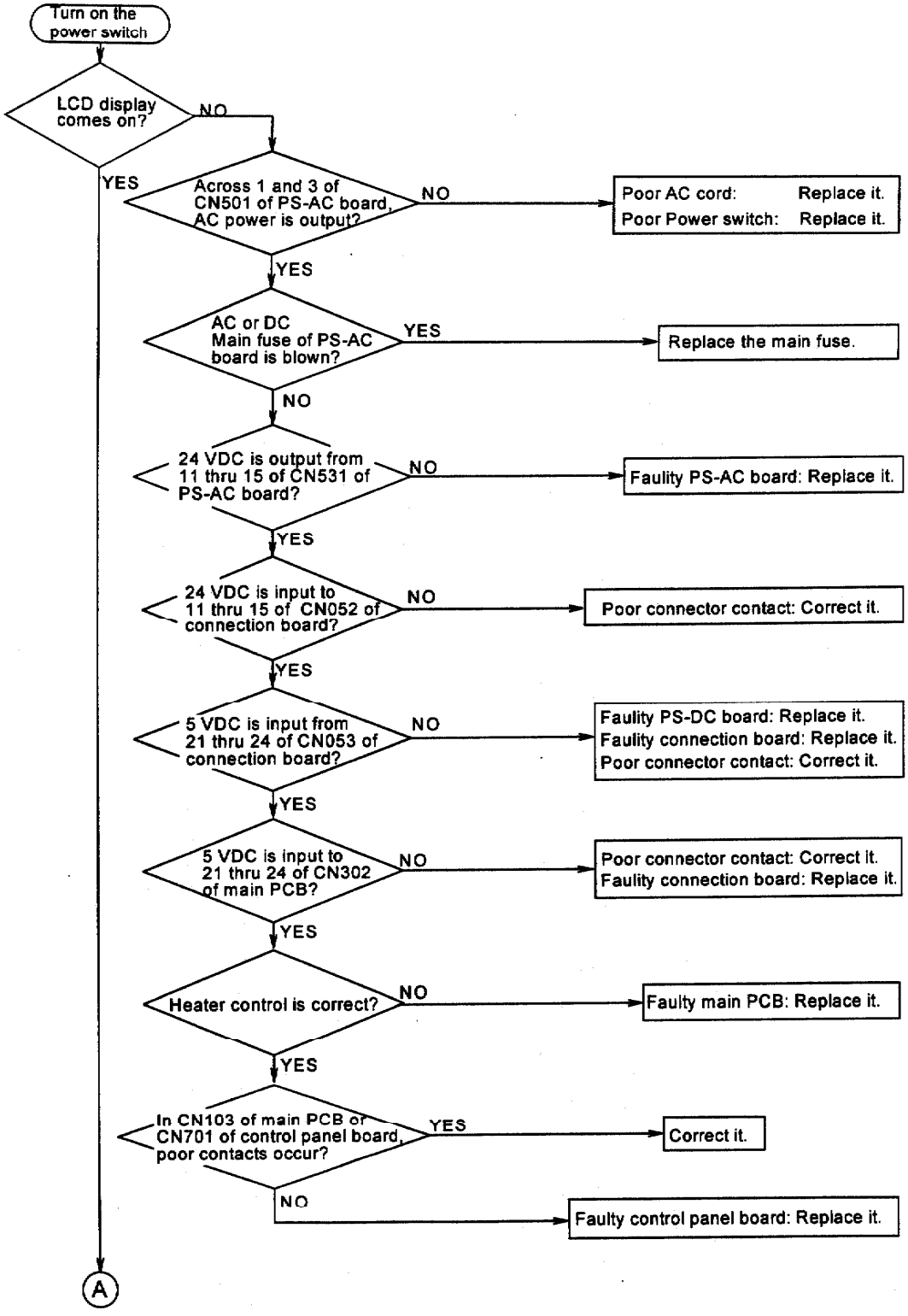
SECTION 9 TROUBLESHOOTING

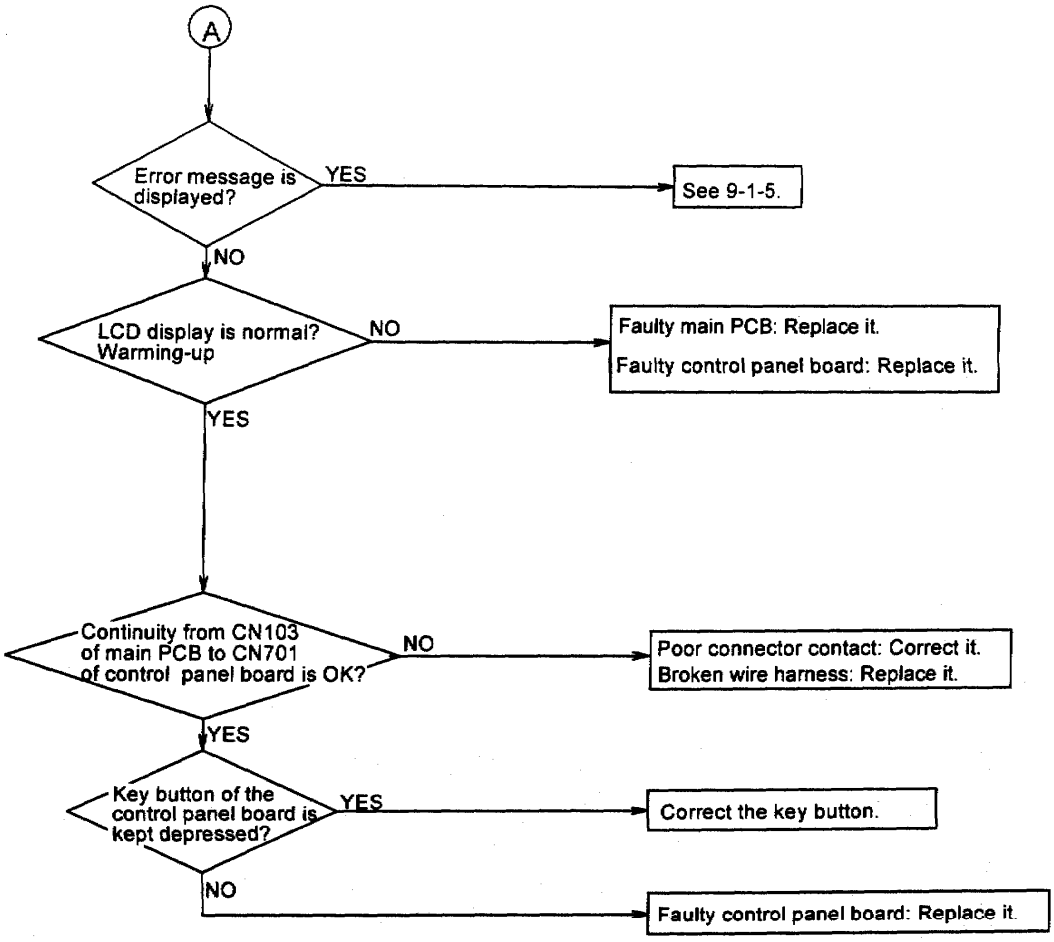
SECTION 9 TROUBLESHOOTING

In case of trouble, determine whether the trouble is related to a particular function or it is a common trouble, and then find out the check point.

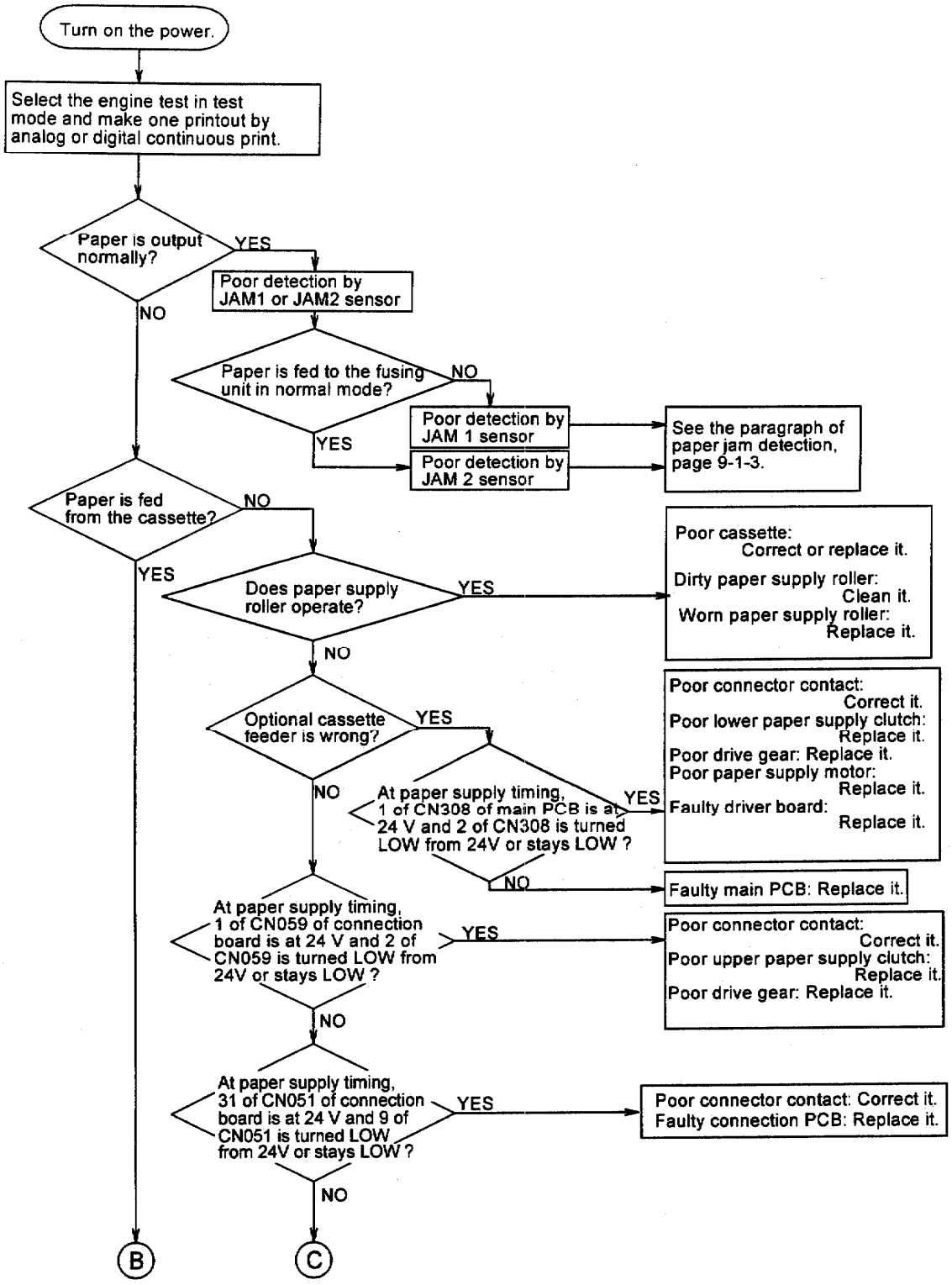
9-1. Common section of COPIER, FAX, PRINTER

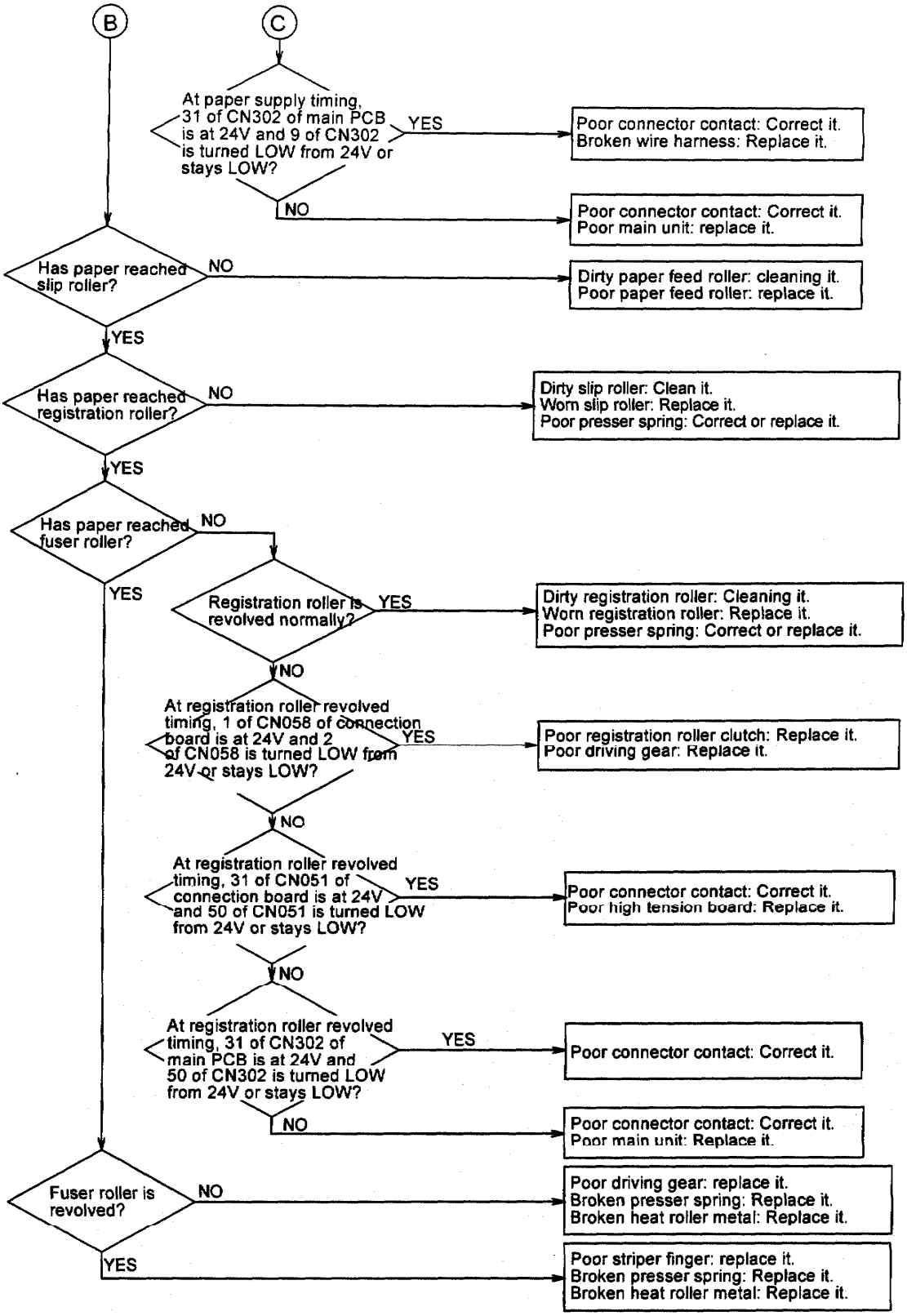
9-1-1. No operation's control panel display



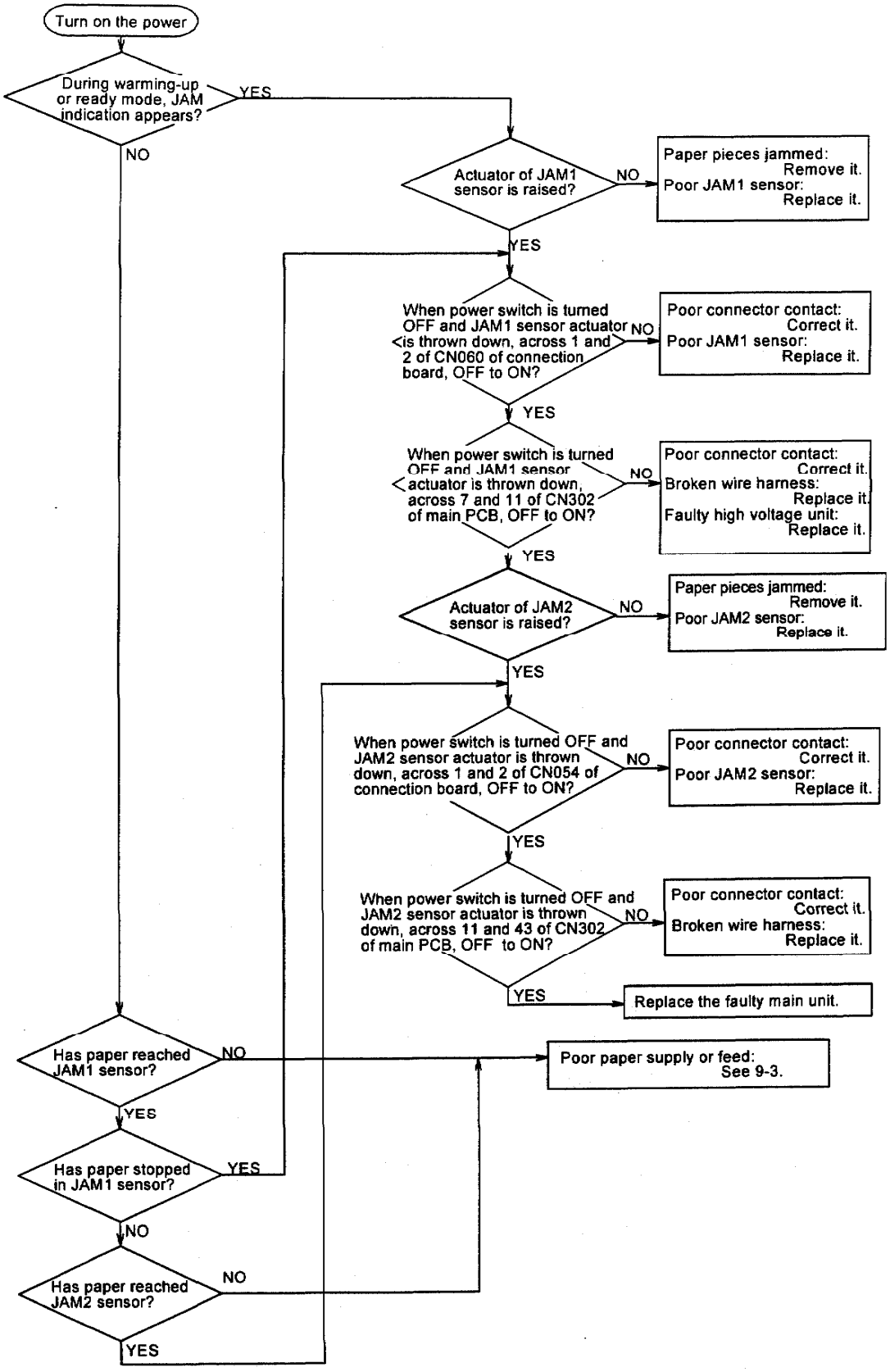

A
Error message is displayed?
YES
See 9-1-5.
NO
LCD display is normal? Warming-up
NO
Faulty main PCB: Replace it.
Faulty control panel board: Replace it.
YES
Continuity from CN103 of main PCB to CN701 of control panel board is OK?
NO
Poor connector contact: Correct it.
Broken wire harness: Replace it.
YES
Key button of the control panel board is kept depressed?
YES
Correct the key button.
NO
Faulty control panel board: Replace it.

9-1-2. Paper feeding problem




B
C
At paper supply timing, 31 of CN302 of main PCB is at 24V and 9 of CN302 is turned LOW from 24V or stays LOW?
YES
Poor connector contact: Correct it.
Broken wire harness: Replace it.
NO
Poor connector contact: Correct it.
Poor main unit: replace it.
Has paper reached slip roller?
NO
Dirty paper feed roller: cleaning it.
Poor paper feed roller: replace it.
YES
Has paper reached registration roller?
NO
Dirty slip roller: Clean it.
Worn slip roller: Replace it.
Poor presser spring: Correct or replace it.
YES
Has paper reached fuser roller?
NO
YES
Registration roller is revolved normally?
YES
Dirty registration roller: Cleaning it.
Worn registration roller: Replace it.
Poor presser spring: Correct or replace it.
NO
At registration roller revolved timing, 1 of CN058 of connection board is at 24V and 2 of CN058 is turned LOW from 24V or stays LOW?
YES
Poor registration roller clutch: Replace it.
Poor driving gear: Replace it.
NO
At registration roller revolved timing, 31 of CN051 of connection board is at 24V and 50 of CN051 is turned LOW from 24V or stays LOW?
YES
Poor connector contact: Correct it.
Poor high tension board: Replace it.
NO
At registration roller revolved timing, 31 of CN302 of main PCB is at 24V and 50 of CN302 is turned LOW from 24V or stays LOW?
YES
Poor connector contact: Correct it.
NO
Poor connector contact: Correct it.
Poor main unit: Replace it.
Fuser roller is revolved?
NO
Poor driving gear: replace it.
Broken presser spring: Replace it.
Broken heat roller metal: Replace it.
YES
Poor striper finger: replace it.
Broken presser spring: Replace it.
Broken heat roller metal: Replace it.

9-1-3. Paper JAM detecting



9-1-4. Poor Quality of Print Images

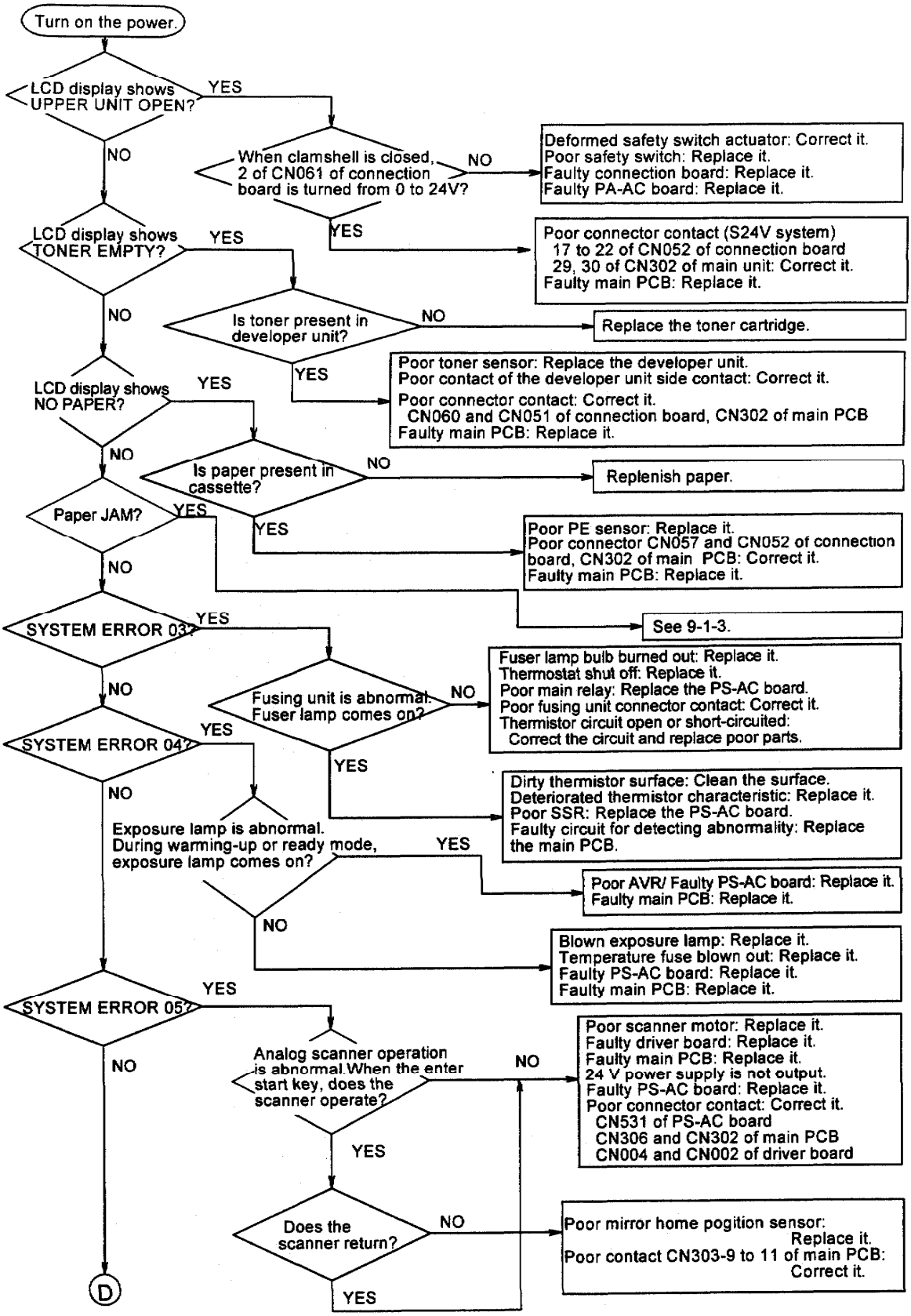
Note) If drum or developer unit was replace for repair, after replacement, execute the each initialization command. (Refer instruction manual.)

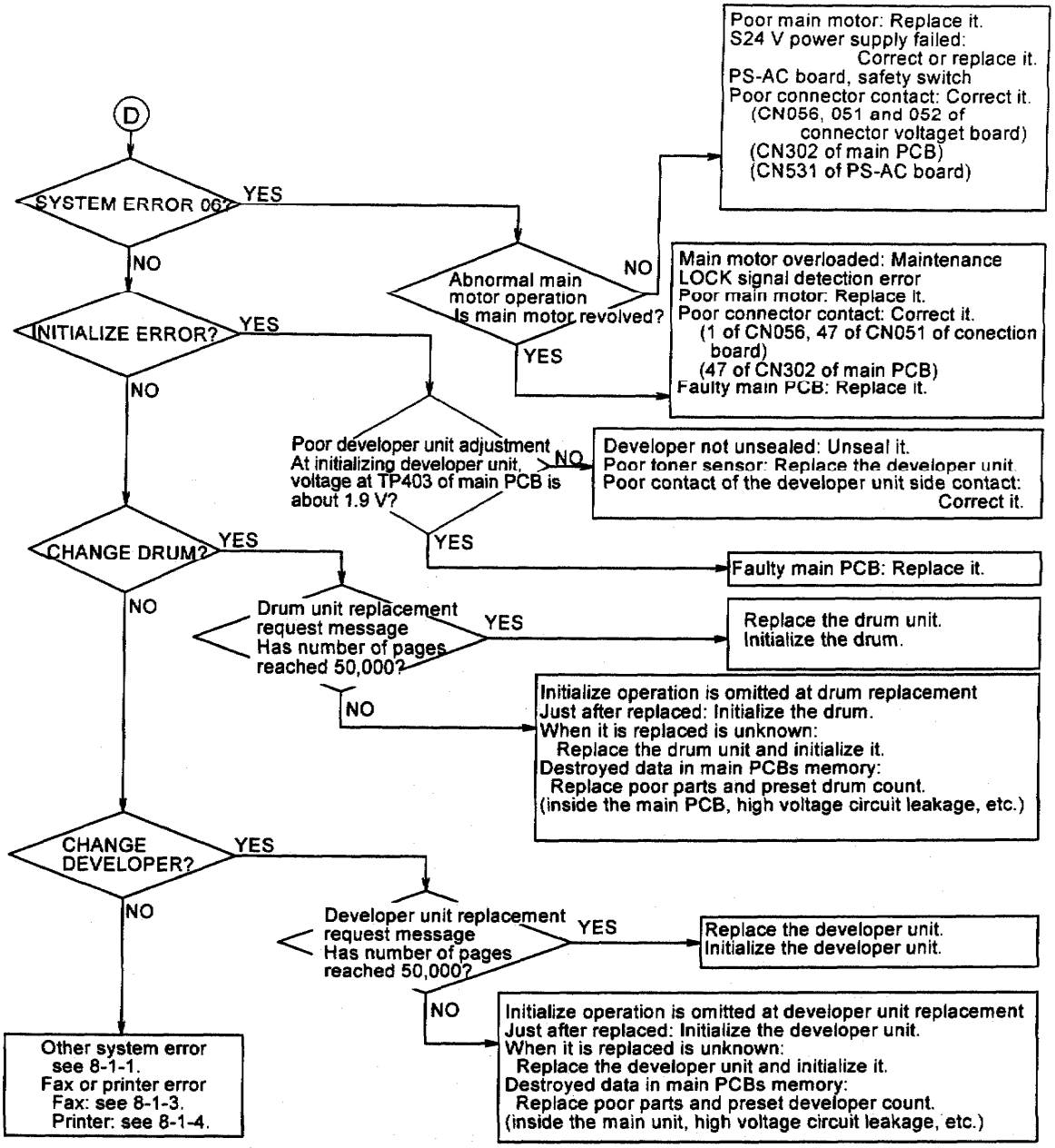
Trouble	Cause	Remedy
Light print	(1) Low toner concentration of the developer unit.	Check the toner control circuit.
	- Toner sensor is wrong.	Replace the developer unit.
	- Toner replenishing mechanism is wrong.	Replace the developer unit.
	(2) Developer unit is wrong.	Replace the developer unit.
	- The drive unit's life is nearly over. (Its life span should be regarded as about 30,000 pages of printouts.)	
	- The developer's life is nearly over. (Its life span should be regarded as about 30,000 pages of printouts.)	
	(3) Empty toner cartridge	Replace the toner cartridge.
	(4) OPC drum is wrong.	Replace the drum unit.
	- Its life is nearly over. (It should be replaced every 30,000 pages of printouts.)	
	- Sensitivity is deteriorated by external light.	
	(5) Dirty charge or transfer corona wire.	Clean the wire.
	(6) Paper becomes moist.	Replace the paper with new one just unsealed.
	(7) Improper special paper is used.	Use recommended paper.
Print cannot be made.	(1) Developer unit revolution is wrong.	Inspect the drive section and correct or replace it as required.
	(2) Drum unit revolution is wrong.	Inspect the drive section and correct or replace it as required.
	(3) Charge or transfer corona wire is disconnected.	Replace the wire.
	(4) High voltage unit is wrong.	Replace the unit.
Black solid print	(1) Cleaning lamp is wrong.	Replace it.
	(2) Charge grid circuit is wrong. Varistor has been broken (open). Poor contact of the charger socket.	Correct the circuit and replace poor parts.
	(3) Poor ground (earth) of the OPC drum.	Replace the drum unit.
White bands or lines	(1) Dirty charge or transfer corona wire.	Clean the wire.
	(2) Foreign matter has entered the developer unit.	Eliminate the foreign matter or replace the developer unit.
	(3) Binding toner is used. (because the toner cartridge has been stored in a high temperature condition, etc.)	Eliminate the binding toner or replace the developer unit.
Black bands or lines	(1) Dirty charge grid.	Clean it.
	(2) Damaged cleaning blade edge.	Replace the Drum unit.
	(3) Dirty or damaged heat roller or fuser roller of the fusing unit.	
	(4) Scratched OPC drum surface.	Replace the drum unit.
	(5) Dirty paper guides.	Clean the paper guides.

Trouble	Cause	Remedy
Spots	(1) Dirty paper guides.	Clean the paper guides.
	(2) Toner coming off the developer unit.	Inspect the drive section of the developer unit, then correct it or replace poor parts.
	- Abnormal vibration.	
	- Over toner	Check the toner control circuit.
	- Toner sensor is wrong.	Replace the developer unit.
	- Toner replenishing mechanism is wrong.	Replace the developer unit.
	(3) Toner coming off the drum unit.	
	- Deformed toner seal.	Replace the drum unit
	- Toner box is full with toner.	Remove toner or replace the drum unit.
	- Abnormal drum unit revolution	Inspect the drive section, then correct it or replace poor parts.
	(4) Dirty or scratched heat roller or fuser roller of the fusing unit.	Clean or replace it.
	(5) Unsuitable paper is used.	Use recommended paper.
	(6) Paper becomes moist.	Replace the paper with new one just unsealed.
	(7) Dirty paper supply or paper feed roller	Clean it.
Dark print image	(1) Over toner	Check the toner control circuit.
	- Toner sensor is wrong.	Replace the developer unit.
	- Toner replenishing mechanism is wrong.	Replace the developer unit.
	(2) Abnormally low bias voltage of the developer circuit.	
	- High voltage power unit is wrong.	Replace it.
	(3) OPC drum is wrong.	Replace the drum unit.
	- Its life is nearly over. (It should be replaced every 30,000 pages of printouts.)	
	- Sensitivity is deteriorated by external light.	
	(4) Cleaning lamp is wrong.	Replace it.
	(5) Charge grid circuit is wrong.	Correct the circuit and replace poor parts.
	- Varistor has been broken (open).	
	- Poor contact of the charger socket	
Offset image	(1) Poor fusing	
	- Heat roller surface is dirty or scratched.	Clean or replace the heat roller. Replace the oil pad.
	- Low fusing temperature.	Check the thermistor circuit, make temperature adjustment and inspect the spring.
	(2) Poor cleaning blade.	Replace the drum unit.
Print image top end being off the position	(1) Dirty registration roller	Clean the registration roller.
	(2) Registration roller clutch operation is wrong.	Clean or replace it.
	(3) Unsuitable paper is used.	Use recommended paper
	(4) Bad paper condition. (curled or wrinkled)	Replace the paper with good one.
Poor fusing.	(1) Too thick paper is used.	Use recommended paper.
	(2) Coated paper is used.	Use recommended paper.
	(3) Decrease in pressing force of the spring attached to the fuser roller.	Replace the spring.

Trouble	Cause	Remedy
Lengthened or shortened print image. (in paper forwarding direction)	(1) Paper has slipped on the registration roller. (2) Too thick or thin paper is used. (3) Abnormal OPC drum revolution	Clean the registration roller. Inspect the spring. Use recommended paper. Inspect the drive section and replace poor parts.
Distorted print image (Paper is made oblique.)	(1) Deformed separation claw in the cassette. (2) Dirty paper supply or feed roller. (3) Right and left pressure balance of the registration roller is uneven. (4) Right and left pressure balance of the fuser roller is uneven.	Correct it or replace the cassette. Clean it. Inspect the spring and replace it if required. Inspect the spring and replace it if required.
Dim vertical lines. (in paper forwarding direction)	(1) Dirty charge corona wire (2) Dirty charge grid (3) Uneven turbulence of the developer inside the developer unit Its life is nearly over. (It should be replaced every 30,000 pages of printouts.) (4) Unevenness due to deteriorated sensitivity of the OPC drum	Clean it. Clean it. Replace the developer unit. Replace the drum unit.
Dim horizontal lines (perpendicular to the paper forwarding direction)	(1) Abnormal developer unit revolution (2) Abnormal drum unit revolution	Inspect the drive section and replace poor parts. Inspect the drive section and replace poor parts.
93-mm pitch faulty image	(1) OPC drum is wrong. Partial fatigue due to external light.	Replace the drum unit.

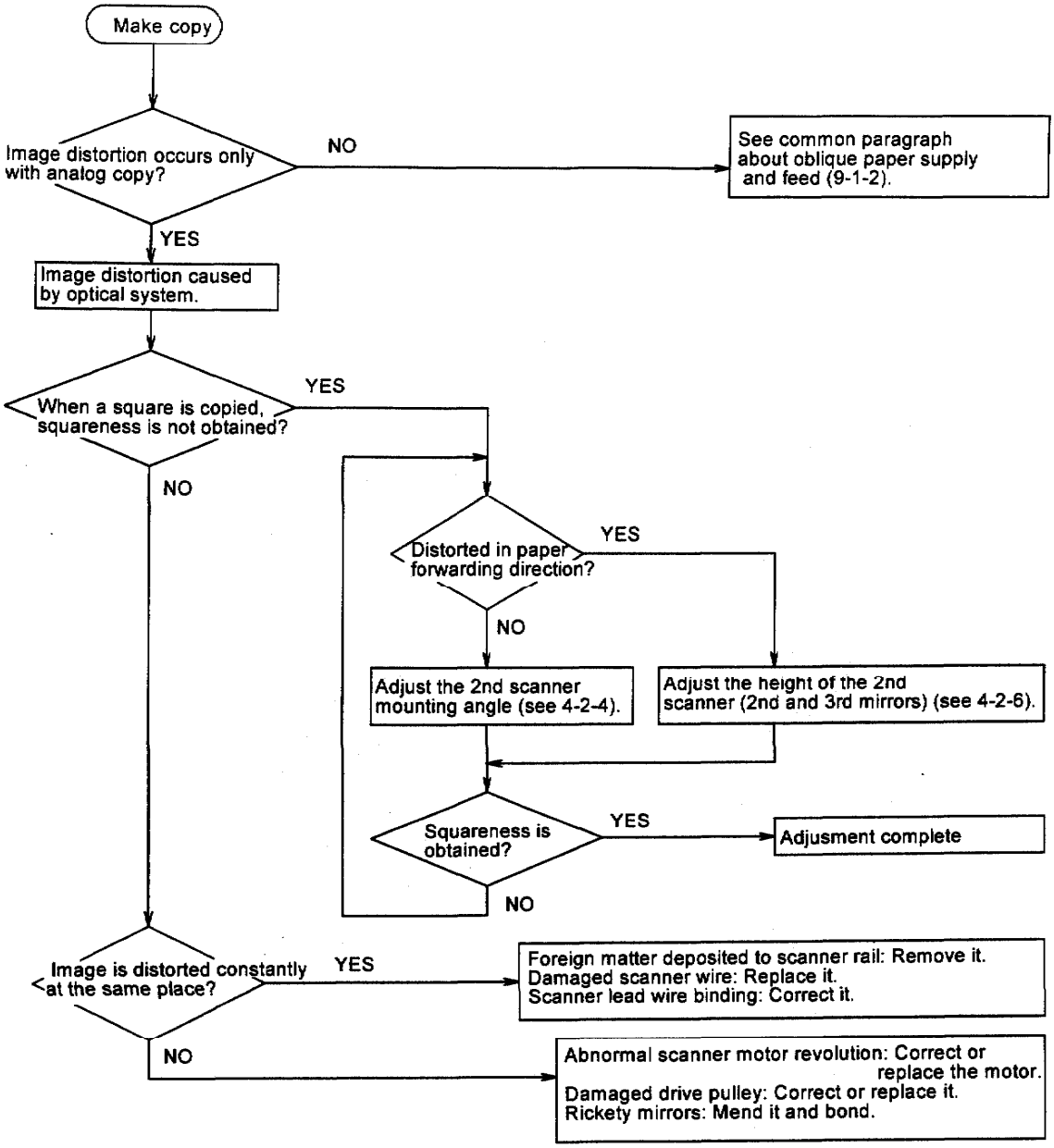
9-1-5. Error messages



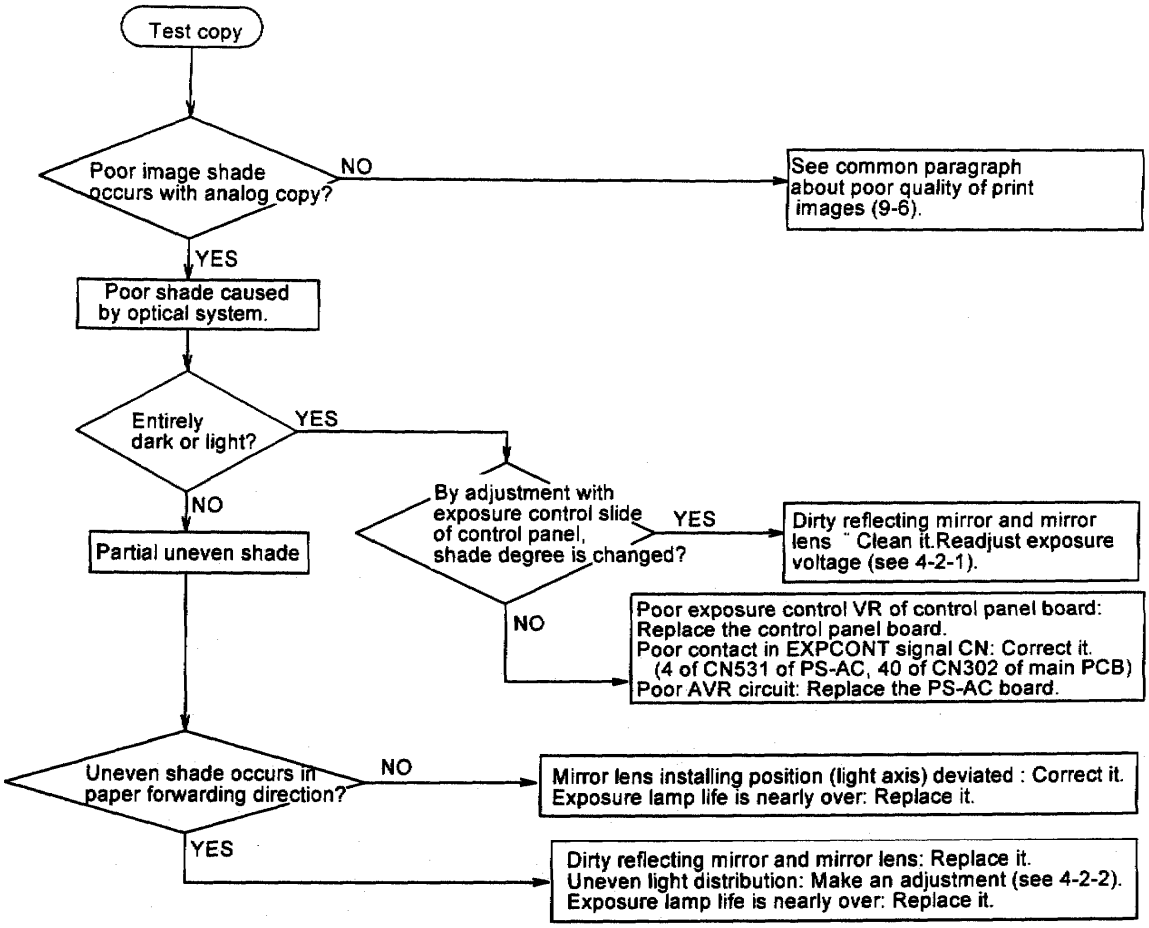

D
SYSTEM ERROR 06?
YES
NO
Poor main motor: Replace it.
S24 V power supply failed:
Correct or replace it.
PS-AC board, safety switch
Poor connector contact: Correct it.
(CN056, 051 and 052 of
connector voltaget board)
(CN302 of main PCB)
(CN531 of PS-AC board)
Abnormal main
motor operation
Is main motor revolved?
NO
YES
Main motor overloaded: Maintenance
LOCK signal detection error
Poor main motor: Replace it.
Poor connector contact: Correct it.
(1 of CN056, 47 of CN051 of conection
board)
(47 of CN302 of main PCB)
Faulty main PCB: Replace it.
INITIALIZE ERROR?
YES
NO
Poor developer unit adjustment
At initializing developer unit,
voltage at TP403 of main PCB is
about 1.9 V?
NO
YES
Developer not unsealed: Unseal it.
Poor toner sensor: Replace the developer unit.
Poor contact of the developer unit side contact:
Correct it.
CHANGE DRUM?
YES
NO
Faulty main PCB: Replace it.
Drum unit replacement
request message
Has number of pages
reached 50,000?
YES
NO
Replace the drum unit.
Initialize the drum.
Initialize operation is omitted at drum replacement
Just after replaced: Initialize the drum.
When it is replaced is unknown:
Replace the drum unit and initialize it.
Destroyed data in main PCBs memory:
Replace poor parts and preset drum count.
(inside the main PCB, high voltage circuit leakage, etc.)
CHANGE
DEVELOPER?
YES
NO
Developer unit replacement
request message
Has number of pages
reached 50,000?
YES
NO
Replace the developer unit.
Initialize the developer unit.
Initialize operation is omitted at developer unit replacement
Just after replaced: Initialize the developer unit.
When it is replaced is unknown:
Replace the developer unit and initialize it.
Destroyed data in main PCBs memory:
Replace poor parts and preset developer count.
(inside the main unit, high voltage circuit leakage, etc.)
Other system error
see 8-1-1.
Fax or printer error
Fax: see 8-1-3.
Printer: see 8-1-4.

9-2. Copier

9-2-1. Distorted print image

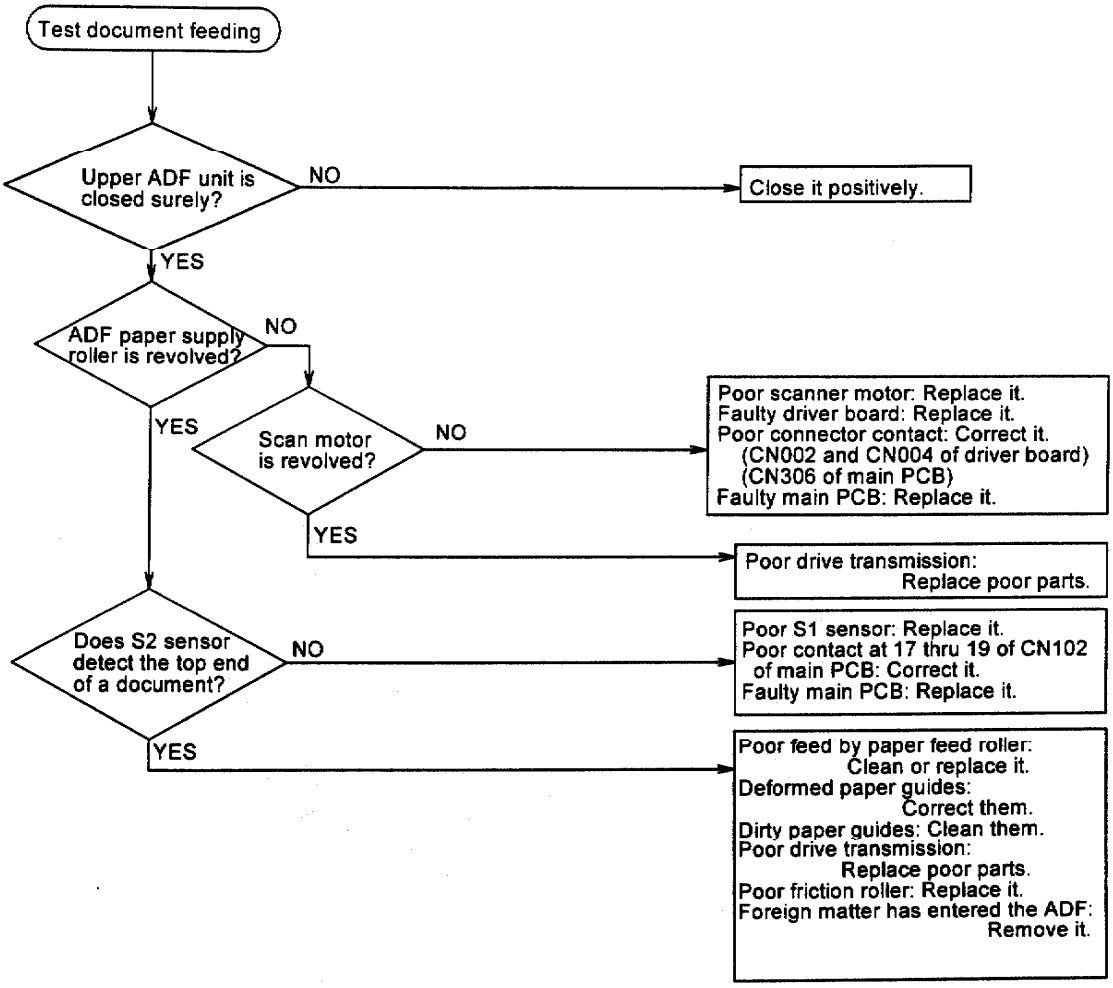


9-2-2. Poor image shade

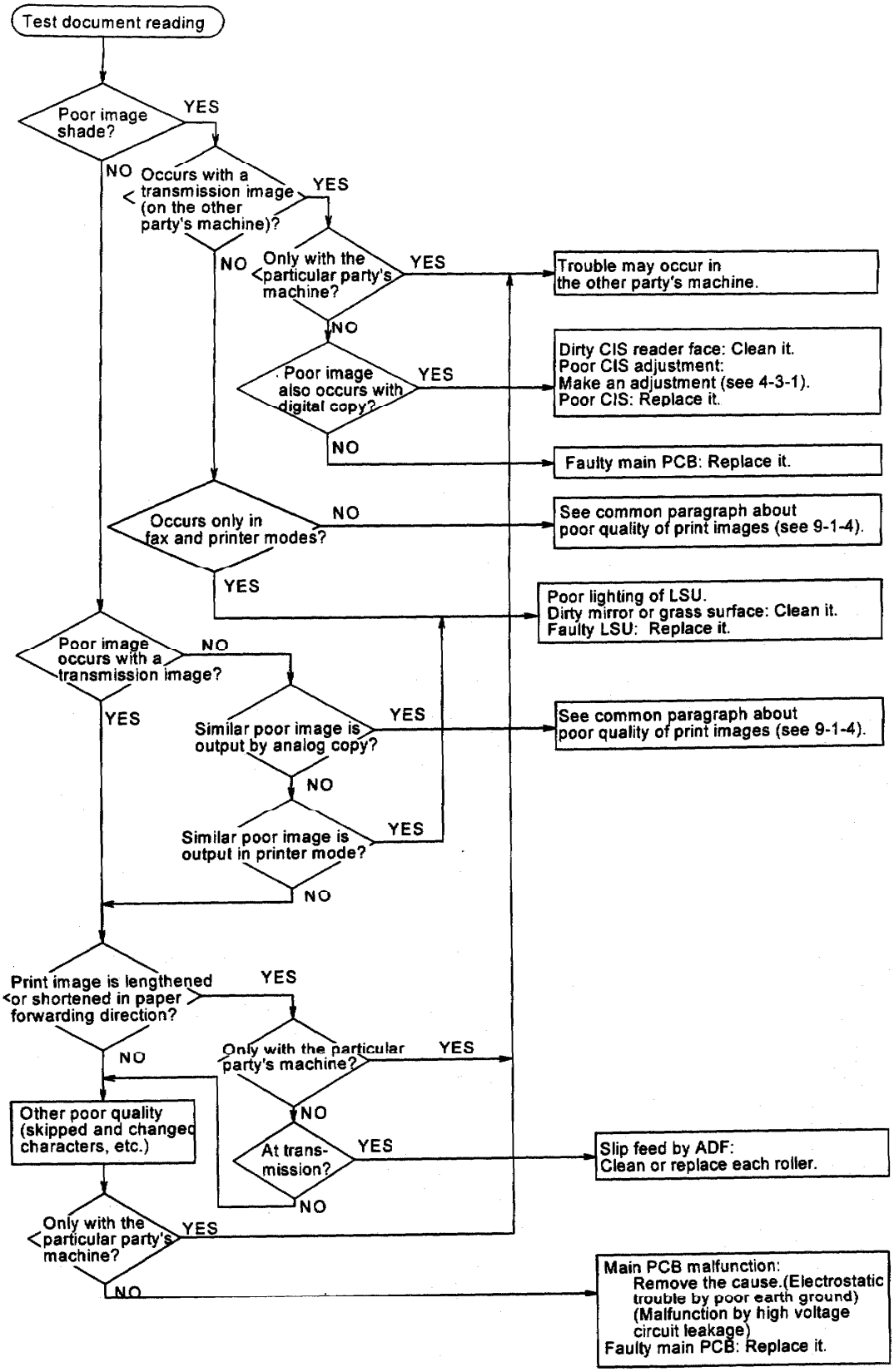


9-3. FAX

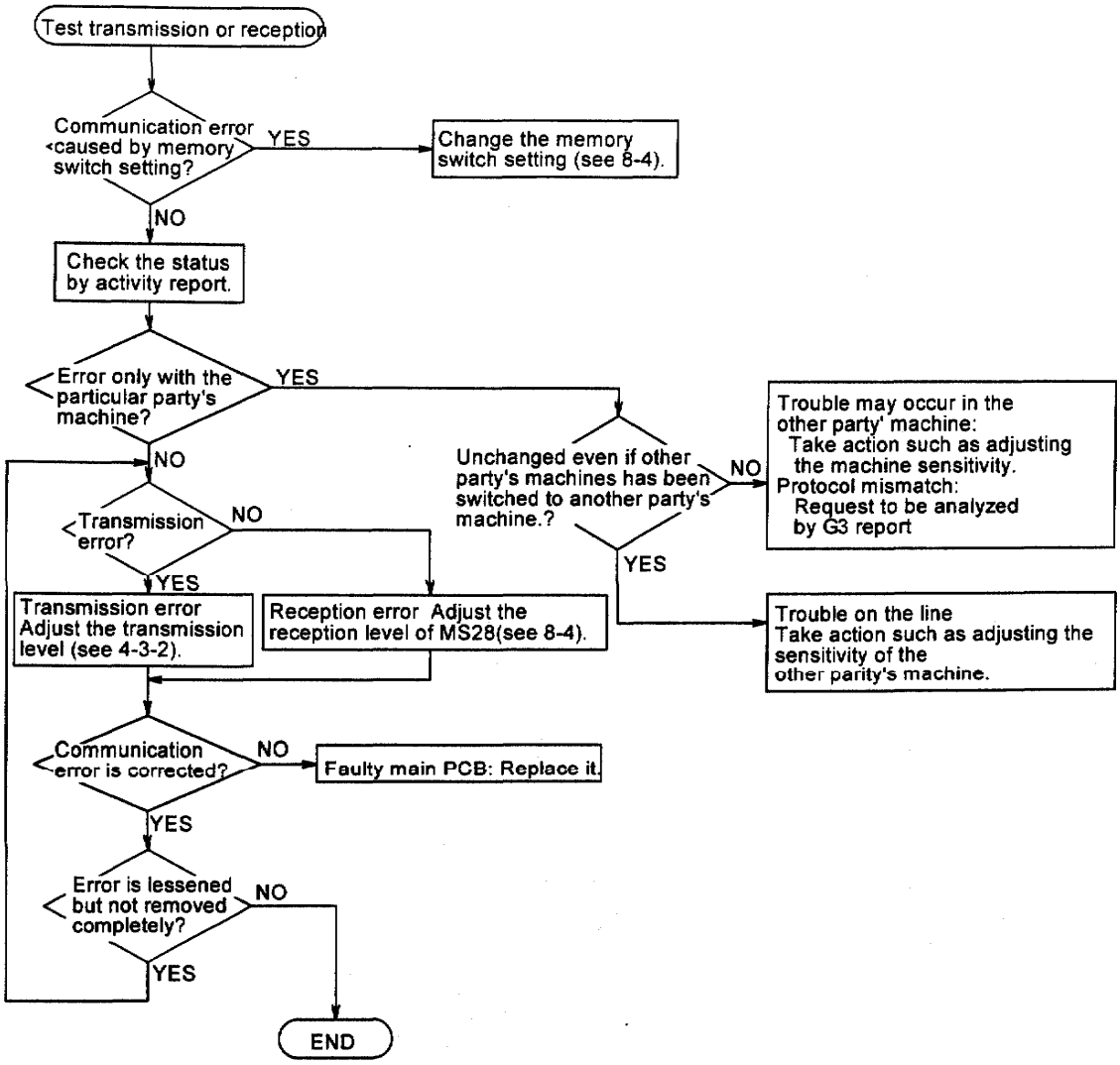
9-3-1. Document feeding problem



9-3-2. Poor quality of images

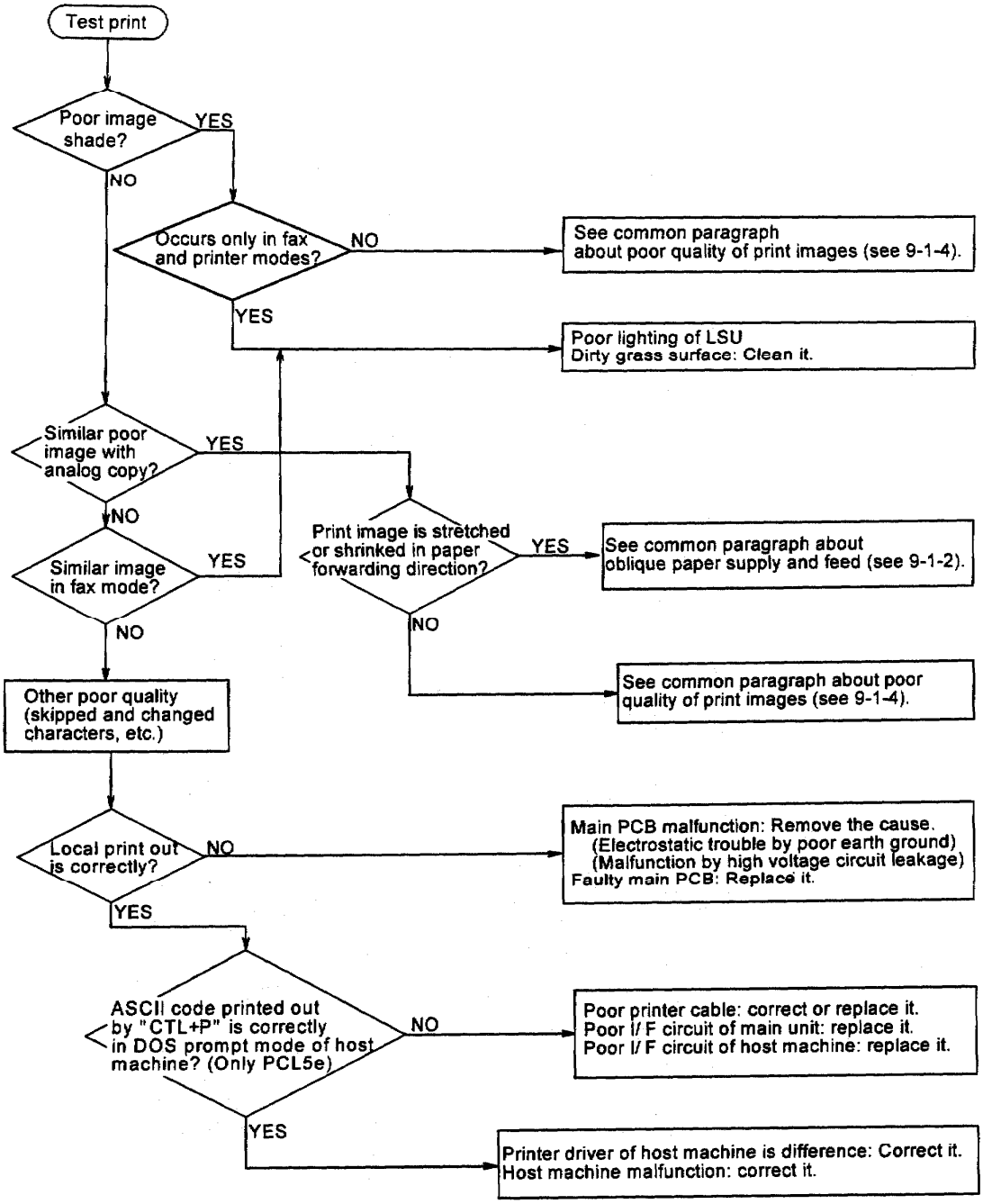


9-3-3. Communication error



9-4. Printer

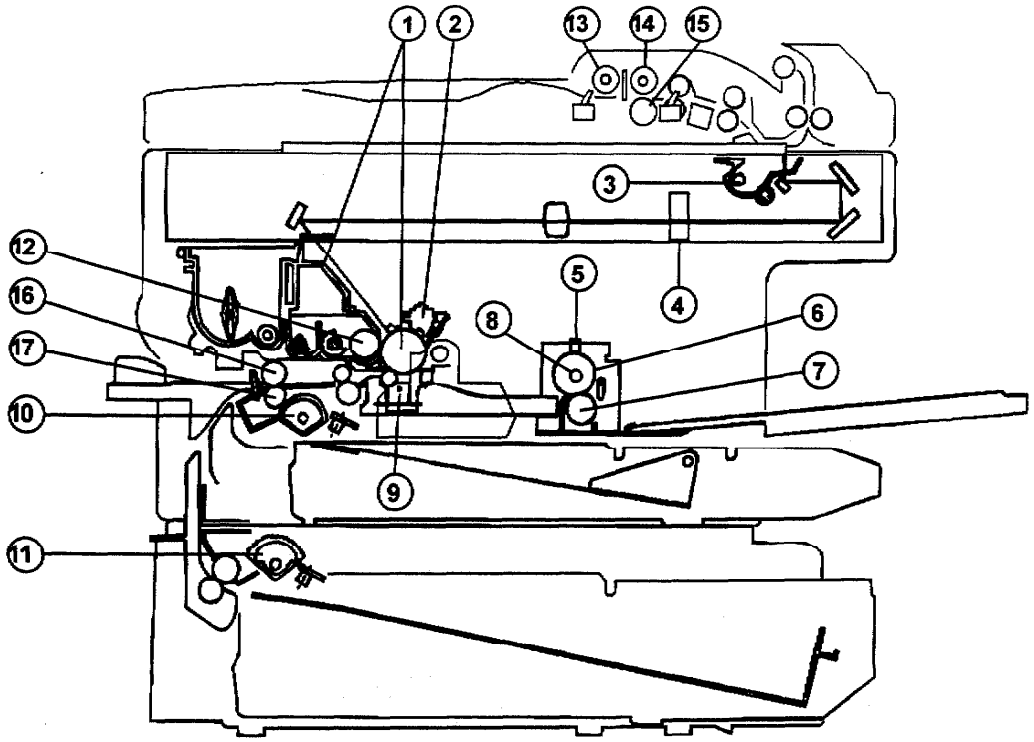
9-4-1. Poor printer quality image



SECTION 10 PREVENTIVE MAINTENANCE

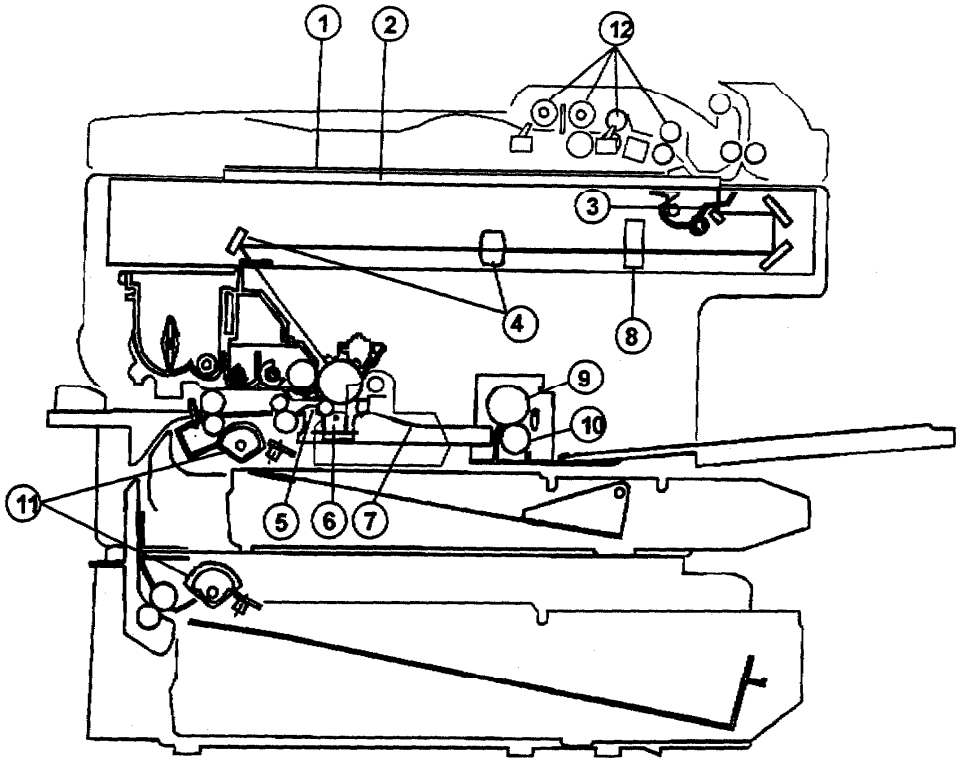
SECTION 10 PREVENTIVE MAINTENANCE

10-1. Replace cycle



Name		Parts code	Estimated replace cycle	Name of parts list
1	Drum and developer unit	DR8550/DEV8550	50K	——
2	Charge corona wire	U81478001	50K	WIRE (CC)
3	Exposure lamp	U81325001	100K	LAMP (EXPOSURE LO)
4	Ozone filter	U81410001	60K	OZONE FILTER
5	Cleaning pad	U81541001	5K (Included toner kit)	FELT ASSY (FU)
6	Heat roller	U81329001	50K	ROLLER (HEAT)
7	Fusser roller	U8133001	50K	ROLLER (PRESSURE)
8	Fusser lamp	U81332001	100K	LAMP (FU)
9	Transfer corona wire	U81350001	50K	WIRE (TC)
10	Paper feed roller	U81341001	100K	ROLLER ASSY (PS)
11	Paper feed roller	——	100K	SHAFT ASSY (SEGMENT LO)
12	D.E.gear (main unit side)	U81443001	50K	DE GEAR
13	SDH pic-up roller	U81621001	50K	
14	SDH upper friction Roller	U81623001	50K	
15	SDH lower friction Roller	U81636001	50K	
16	Slip roller	U81438001	50K	ROLLER (RELAY UP)
17	Intermediate roller	U81339001	50K	ROLLER (SLIP)

10-2. Cleaning cycle



	Point	Estimated cycle	Cleaning tools
1	Platen cover		Soft cotton, Cleaner
2	Platen glass		Soft cotton, Cleaner
3	Refractor	10K	Soft cotton, Cleaner
4	Each mirrors, renz	10K	Soft cotton, Cleaner
5	Paper guide under the developer unit	5K	Soft cotton
6	Transfer corona wire	5K	Soft cotton, Stick of cotton, Alcohol
7	Transfer unit	5K	Soft cotton,
8	Ozone filter	10K	Air brush
9	Heat roller	50K	Soft cotton, silicon oil
10	Fusser roller	50K	Soft cotton
11	Paper supply roller	10K	Soft cotton, Alcohol
12	SDH Paper feed roller, each feed roller	10K	Soft cotton, Alcohol
13	Registration roller	10K	Soft cotton, Alcohol

CLASS 1 LASER PRODUCTS

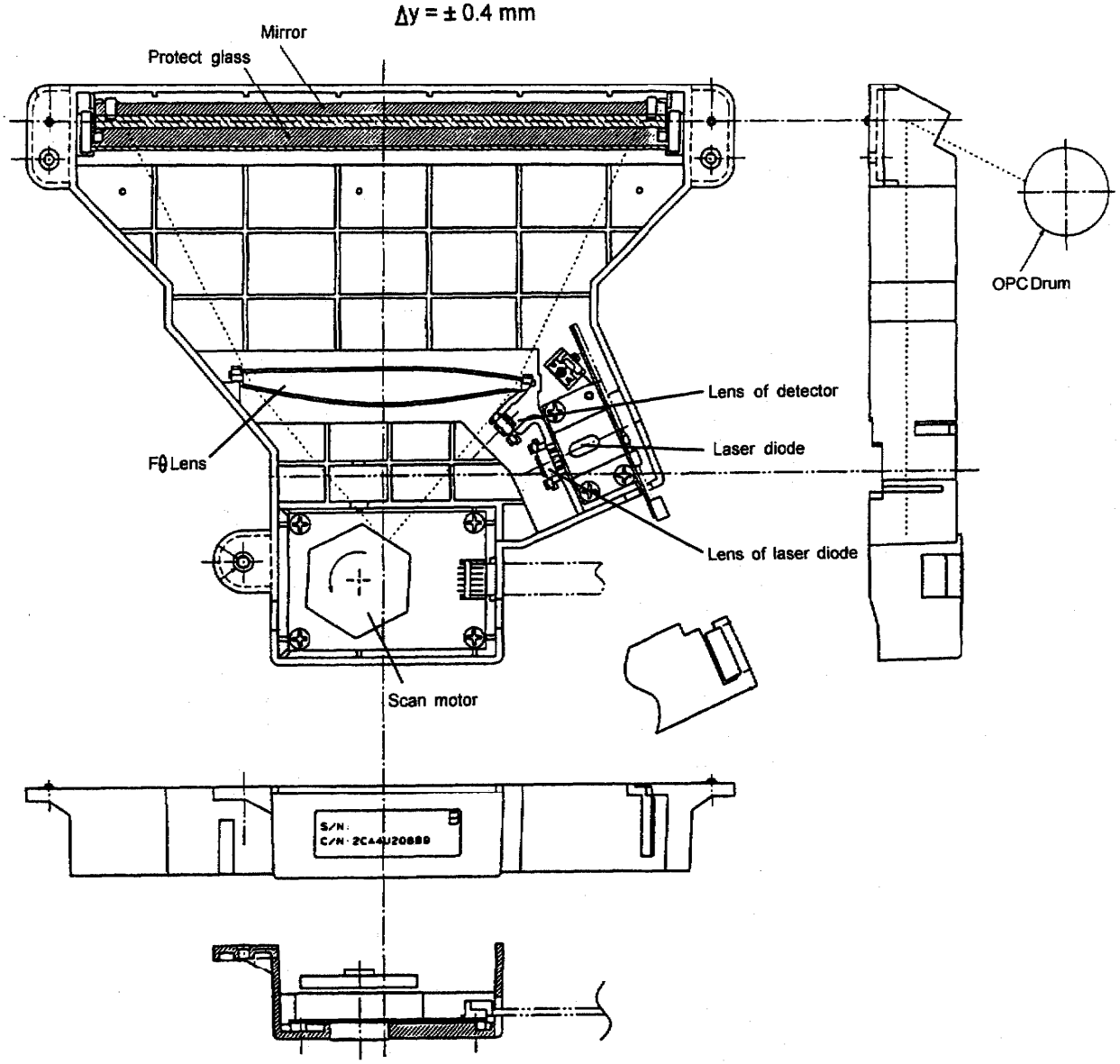
This equipment complies with the class 1 laser product according to radiation control health and safety Act of 1968 of the US department of health and human service (DHHS) radiation performance standard. Specification and performance of laser unit are shown below.

Laser diode

Laser diode power: (On the plain paper)	Typ. 0.45 mW
Wave length: (Single transverse mode)	785 (+ 25 / - 15) nm
Operating current:	Less than 0.4 A
Operating voltage:	+ 5 V ± 5%

Laser supply unit

Effective scanning width:	220 mm
F characteristics:	y = 160 θ Δy = ± 0.4 mm



ADDITIONAL INFORMATION

Laser product statement

DANGER !	- INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
VORSICHT !	- LASERSTRAHL UNG. WENN ABDECKUNG GEOFFNET. NICHT IN DEN STRAHL BLICHEN.
ATTENTION !	- RAYONNEMENT LASER INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
ADVARSEL !	- USYNL IG LASERSTRÁLING NÁR DEKSEL ÁPNES OG SIKKERHEDSLÁS BRYTES. UNNGÁ EKSPONERING FOR STRÁLEN.
ADVARSEL !	- USYNL IG LASERSTRÁLING VED ÁBNING NÁR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÁ UDSAETTELSE FOR STRÁLING.
VARNING ! SPÄRREN	- OSYNL IG LASERSTRÁLNING NÄR DENNA DEL ÄR ÖPPNAD OCH ÄR URKOPPLAD. BETRAKTA EJ STRÁLEN.
VARO !	- AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

CAUTION / VORSICHT / ATTENTION / ATTENCION

Disconnect power supply before servicing machine or changing fuse.

Netzstecker ziehen vor Reparaturen und Wechsel der Gerätesicherung.

Dèbrancher la prise avant de rèparer ou de changer un fusible.

Desconecte fuera el cable de corriente principal antes de servir una máquina o reemplazar un fusible.

LITHIUM BATTERY STATEMENT

WARNING

Lithium battery , danger of explosion.
Replace the battery with the same type recommended by the Equipment Manufacturer.

For Denmark

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

For Norway

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandoren.

For Sweden

VARNING!

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en elvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

For Finland

VAROITUS

Paristo voi räjähtää, jos se o virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

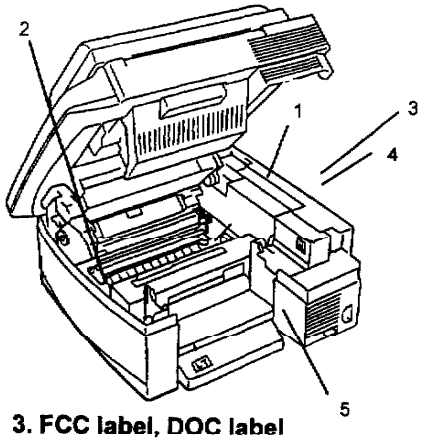
NICHEL CADMIUM BATTERY STATEMENT

(SPF-312 only)

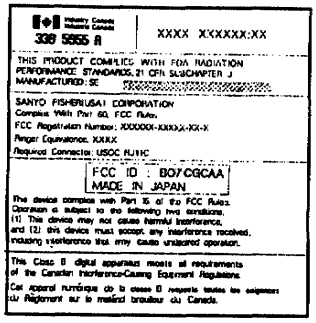
The product that you have purchased contains a rechargeable battery.The battery is recyclable. At the end of it's useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

ADDITIONAL INFORMATION

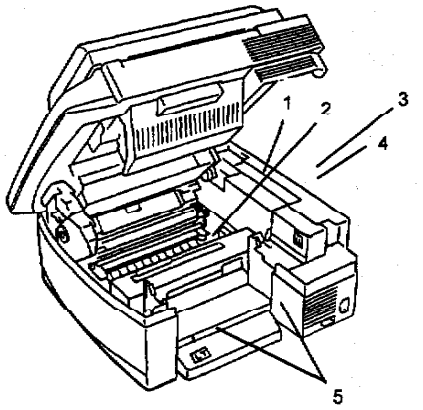
CAUTION LABELS ON THE MAIN UNIT (FOR US)



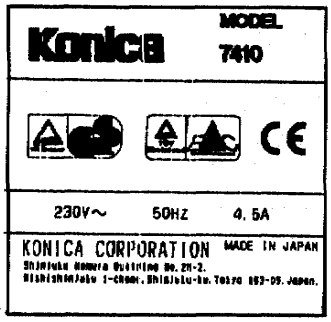
3. FCC label, DOC label



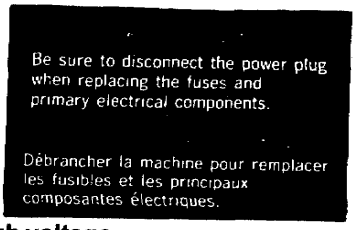
(FOR GENERAL)



4. Name plate

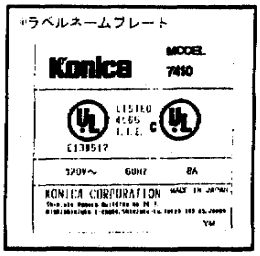


1. Replacing electlical components



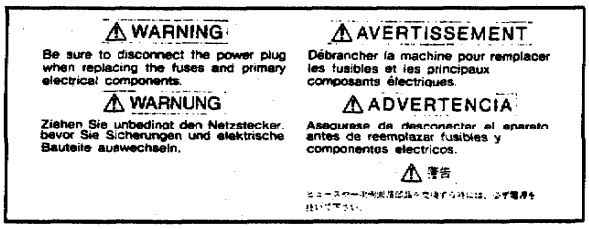
2. High voltage

4. Name plate

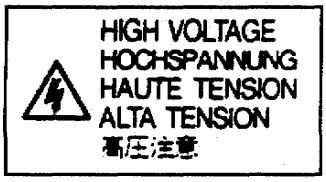


5. High temperature

1. Replacing electlical components



2. High voltage



3. PTT label

5. High temperature

SERVICE NUMBERS

	Telephone Number	Fax Number	E-Mail Address
Technical Support	908-356-8880 ext.7997	908-469-4379	faxtech@brother.com
Parts Department	901-373-6371	800-284-7278	
Bulletin Board System	908-469-5863		
Internet			http://www.brother.com