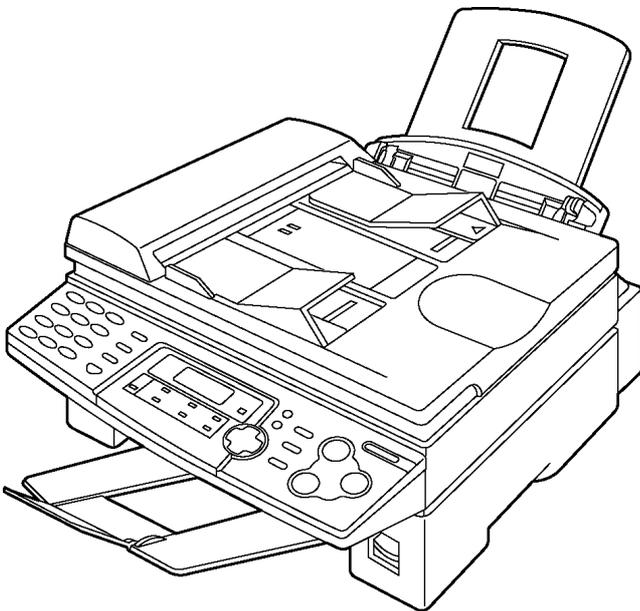


# Service Manual

Multi-Function Laser Fax

## KX-FLB758RU

(for Russia)



### **WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

# Panasonic

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# 1 INTRODUCTION

## 1.1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

**Note:**

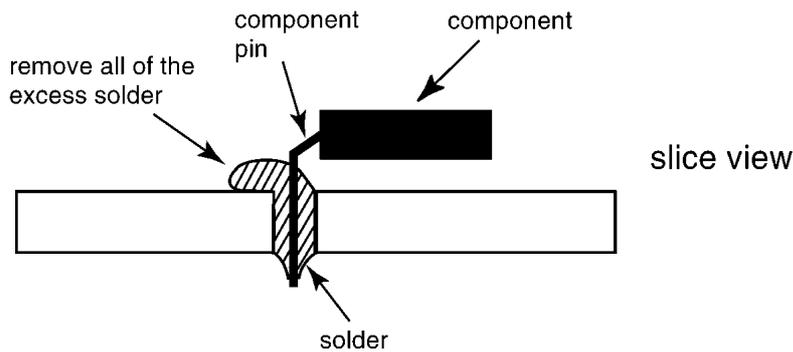
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

**Caution**

- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).



### 1.1.1. SUGGESTED PBF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufacturer’s specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

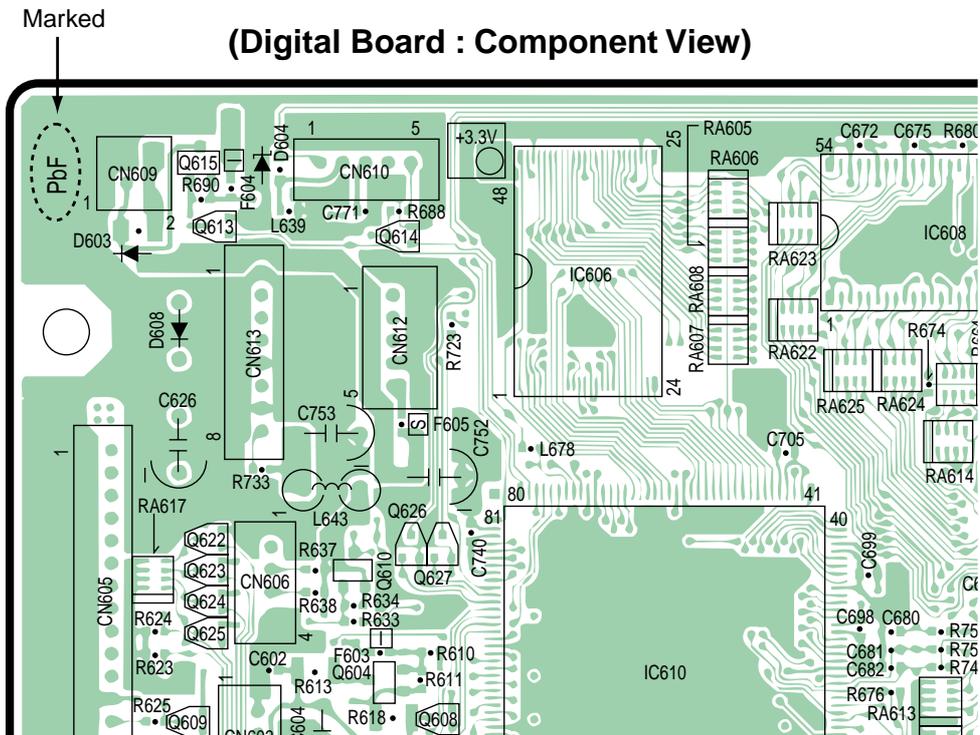
0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

## 1.2. HOW TO RECOGNISE THAT Pb FREE SOLDER IS USED

P.C.Boards marked as "PbF" use Pb Free solder. (See the figure below.)

Pb Free is not used the Power Supply Board of this unit.

(Example:Digital board)



**Note:** The "PbF" marked may be found on different areas of the same P.C.Board,depending on manufacture date.

## 1.3. TRANSLATION LISTS

### 1.3.1. HELP FUNCTION

ENGLISH	RUSSIAN												
FEATURE LIST	С	П	И	С	О	К		Ф	У	Н	К	Ц	.
DIRECTORY	Т	Е	Л	.	С	П	Р	А	В	.			
FAX RECEIVING	П	Р	И	Е	М		Ф	А	К	С	А		

### 1.3.2. LCD MESSAGES

ENGLISH	RUSSIAN															
CALL SERVICE 1	В	Ы	З	О	В	И	Т	Е		С	Е	Р	В	И	С	1
CALL SERVICE 2	В	Ы	З	О	В	И	Т	Е		С	Е	Р	В	И	С	2
CALL SERVICE 3	В	Ы	З	О	В	И	Т	Е		С	Е	Р	В	И	С	3
CALL SERVICE 4	В	Ы	З	О	В	И	Т	Е		С	Е	Р	В	И	С	4
CARRIAGE ERROR	О	Ш	И	Б	К	А		У	С	Т	А	Н	О	В	К	И
RELEASE	Р	А	З	Б	Л	О	К	И	Р	У	Й	Т	Е			
SHIPPING LOCK	Т	Р	А	Н	С	П	-	Ы	Й		К	Р	Е	П	Е	Ж
CHANGE DRUM	З	А	М	Е	Н	А		Б	А	Р	А	Б	А	Н	А	
CHECK ADF CABLE	П	Р	О	В	.	К	А	Б	Е	Л	Ь	У	А	П	Д	
CHECK DOCUMENT	П	Р	О	В	Е	Р	Ь	Т	Е		Д	О	К	.		
CHECK DRUM	П	Р	О	В	Е	Р	К	А		Б	А	Р	А	Б	.	
CHECK MEMORY	П	Р	О	В	Е	Р	Ь		П	А	М	Я	Т	Ь		
CLOSE ADF COVER	З	А	К	Р	.	К	Р	Ы	Ш	К	У		У	А	П	Д
COVER OPEN	О	Т	К	Р	Ы	Т	А		К	Р	Ы	Ш	К	А		
DATA IN MEMORY	В		П	А	М	Я	Т	И		Д	А	Н	Н	Ы	Е	
DIRECTORY FULL	Т	Е	Л	.	С	П	Р	А	В	.		П	О	Л	О	Н
FAILED PICK UP	О	Ш	-	К	А		З	А	Х	В	.		Б	У	М	
FAX IN MEMORY	Ф	А	К	С		В		П	А	М	Я	Т	И			
FAX MEMORY FULL	П	Е	Р	Е	П	О	Л	.	П	А	М	.	Ф	К	С	
LINE IN USE	И	С	П	О	Л	Ь	-	С	Я		Л	И	Н	И	Я	
MEMORY FULL	П	Е	Р	Е	П	О	Л	Н	.	П	А	М	Я	Т	И	
MODEM ERROR	О	Ш	И	Б	К	А		М	О	Д	Е	М	А			
NO FAX REPLY	Ф	А	К	С		Н	Е	О	Т	Е	Ч	А	Е	Т		
OUT OF PAPER	Н	Е	Т		Б	У	М	А	Г	И						
PAPER JAMMED	Б	У	М	А	Г	А		З	А	С	Т	Р	Я	Л	А	
PC FAIL OR BUSY	П	К		Н	Е	И	С	П	Р	/	З	А	Н	Я	Т	
PLEASE WAIT			П	О	Д	О	Ж	Д	И	Т	Е					
REDIAL TIME OUT	П	Р	Е	В	.	В	Р	Е	М	.	Д	О	З	В	.	
REMOVE DOCUMENT	У	Д	А	Л	И	Т	Е		Д	О	К	У	М	.		
TONER EMPTY	Н	Е	Т		Т	О	Н	Е	Р	А						
TONER LOW	М	А	Л	О		Т	О	Н	Е	Р	А					
TRANSMIT ERROR	О	Ш	И	Б	К	А		П	Е	Р	Е	Д	А	Ч	И	
WRONG PAPER	Д	Е	Ф	Е	К	Т		Б	У	М	А	Г	И			

## 1.3.3. REPORTS

ENGLISH	RUSSIAN
COMMUNICATION ERROR	СБОЙ В ТЕЛЕФОННОЙ ЛИНИИ
DOCUMENT JAMMED	ЗАСТРЕВАНИЕ ДОКУМЕНТА
ERROR-NOT YOUR UNIT	ОШ.-В ДРУГ.ФАКСЕ
MEMORY FULL	ПАМЯТЬ ПЕРЕПОЛНЕНА
NO DOCUMENT	НЕТ ДОКУМЕНТА
OTHER FAX NOT RESPOND	ВЫЗ. ФАКС НЕ ОТВЕЧАЕТ
PRESSED THE STOP KEY	НАЖАТА КНОПКА "STOP"
THE COVER WAS OPENED	ОТКРЫТА КРЫШКА КОНСОЛИ
OK	НОРМАЛЬНО

## 1.4. SAFETY PRECAUTIONS

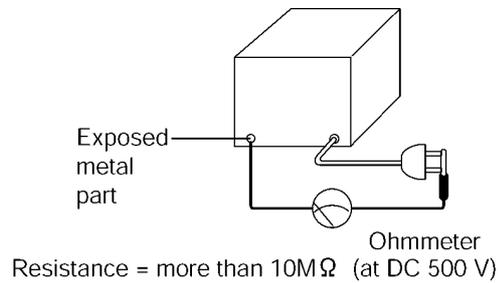
1. Before servicing, unplug the AC power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.

## 1.5. INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part (screw heads, control shafts, bottom frame, etc.).

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard.



## 1.6. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic part's boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the worktable.
4. Do not touch the IC or LSI pins with bare fingers.

## 1.7. BATTERY CAUTION

### CAUTION

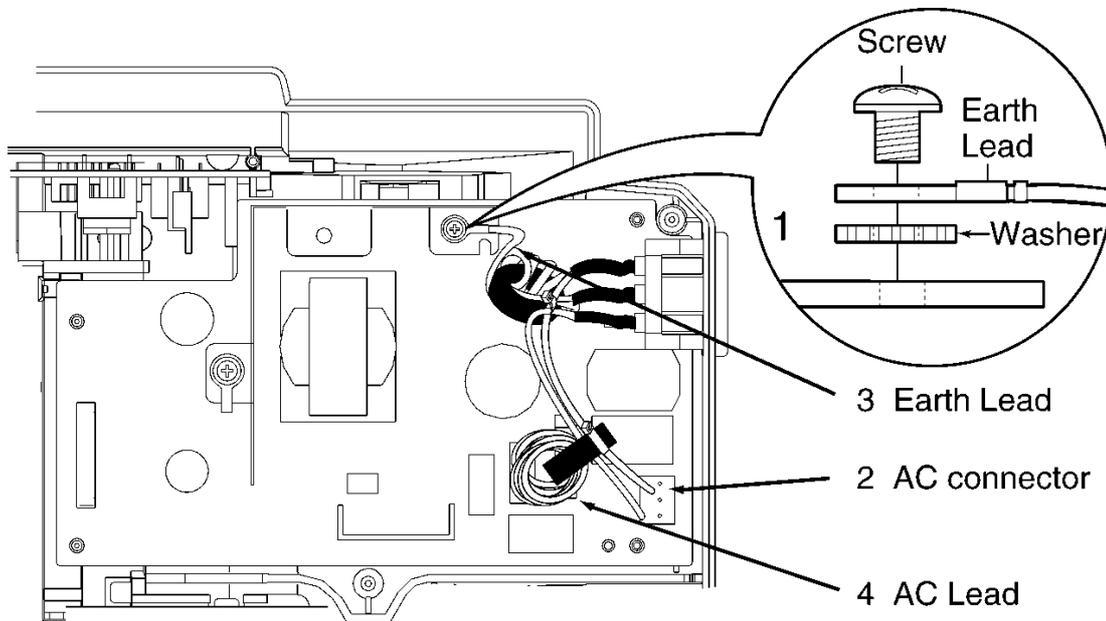
There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose used batteries according to the manufacturer's instructions:

The lithium battery is a critical component (type No. CR2032). Please observe for the proper polarity and exact location when replacing and soldering the replacement battery .

## 1.8. AC CAUTION

For safety, before closing the lower cabinet, please make sure of the following precautions.

1. The earth lead is fixed with the screw.
2. The AC connector is connected properly.
3. Wind the earth lead around the core 5 times.
4. Wind the earth AC around the core 4 times.

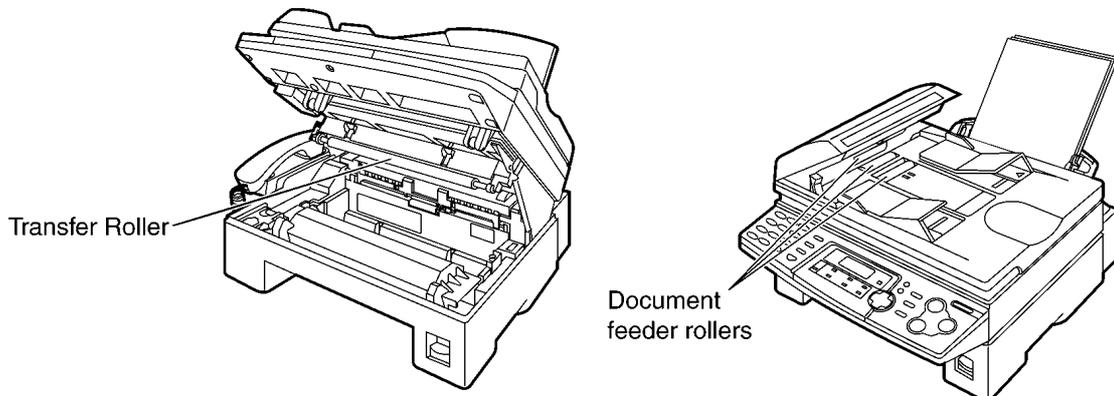


## 1.9. PERSONAL SAFETY PRECAUTIONS

### 1.9.1. MOVING SECTIONS OF THE UNIT

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving sections of the unit.

The moving sections of the unit are the rollers and a gear. There is a separation roller and a document feed roller which are rotated by the document feed motor. A gear rotates the two rollers. Be careful not to touch them with your hands, especially when the unit is operating.



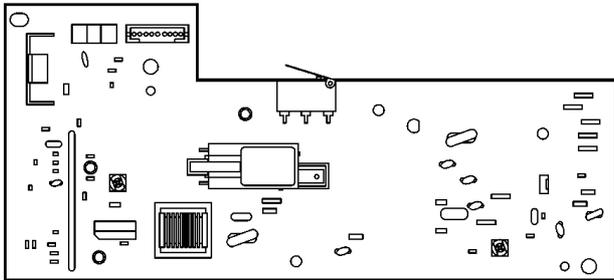
### 1.9.2. LIVE ELECTRICAL SECTIONS

All the electrical sections of the unit supplied with AC power by the AC power cord are live.

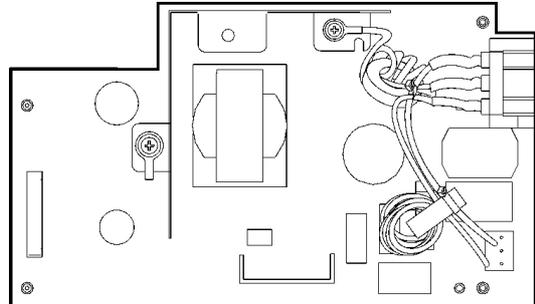
Never disassemble the unit for service with the AC power supply plugged in.

**CAUTION:**

AC voltage is supplied to the primary side of the power supply unit. Therefore, always unplug the AC power cord before disassembling for service.



**High Voltage Power Supply Board**



**Low Voltage Power Supply Board**

### 1.9.3. LASER BEAM AND FUSER UNIT SECTION

- The printer of this unit utilises a laser. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- The fuser unit is inside of the unit and gets hot. Do not touch it when removing the jammed paper or cleaning the lower glass.

ЛАЗЕРНЫЙ ПРОДУКТ КЛАСС 1  
ЛАЗЕРНИЙ ПРОДУКТ КЛАС 1

Fuser unit

**Caution:**  
Do not touch the bottom of this cover. It is very hot.

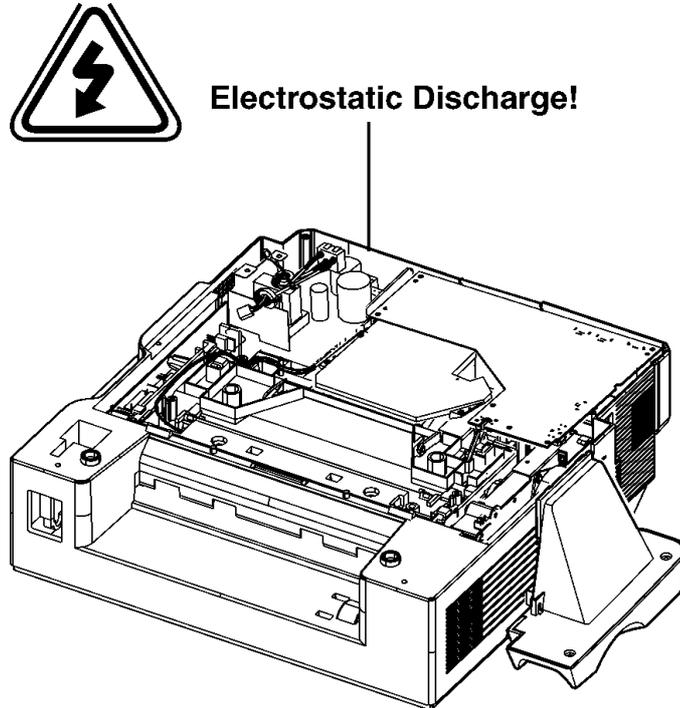
**ОПАСНО:**  
Невидимое лазерное излучение при открытой крышке и неисправной блокировке. ИЗБЕГАЙТЕ ПРЯМОГО ПОПАДАНИЯ ЛУЧА.

**НЕБЕЗПЕЧНО:**  
Невидиме лазерне випромінювання при відкритій кришці та несправному блокуванні. УНИКАЙТЕ ПРЯМОГО ПОПАДАНИЯ ПРОМЕНЯ.

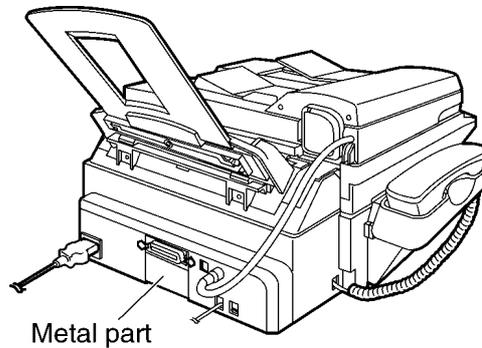
## 1.10. SERVICE PRECAUTIONS

### 1.10.1. PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

Electrical charges accumulate on a person. For instance, clothes rubbing together can damage electric elements or change their electrical characteristics. In order to prevent static electricity, touch a metallic part that is grounded to release the static electricity. Never touch the electrical sections such as the power supply unit, etc.



To prevent static electricity damage to the interface connectors (parallel and USB) or other electrical components inside the unit, touch a grounded metal surface, such as the metal part under the parallel interface connector before touching the components.



## 2 FEATURES AND SPECIFICATIONS

### 2.1. FEATURES

#### General

- Help function
- Display:
  1. FEATURE LIST
  2. DIRECTORY
  3. FAX RECEIVING
- LCD (Liquid Crystal Display) readout
- TAM (Telephone answering machine) interface

#### Plain Paper Facsimile Machine

- Letter/A4/Legal, G3 compatible
- Automatic document feeder (15 sheets)
- Quick scan
- Resolution: Standard/Fine/Super fine/Photo (64 level)
  - STANDARD: For printed or typewritten originals with normal-sized characters.
  - FINE: For originals with small printing.
  - SUPER FINE: For originals with minute printing.
  - PHOTO: For originals containing photograph.
- Broad cast
- 150-sheet paper capacity (60 g/m<sup>2</sup>~ 75 g/m<sup>2</sup>[16 lb~20 lb.]

#### Large Memory... Performed by DRAM

- Approx. 150 pages of memory reception
- Approx. 150 pages of memory transmission

#### Integrated Telephone System

- On-hook dialing
- Monitor speaker
- Voice muting
- Redialing function
- 112-Station telephone directory

#### Enhanced Copier Function

- Multi-copy function (up to 99 copies)
- Enlargement and reduction
- Collate
- 64-Level halftone

## 2.2. SPECIFICATIONS

<b>Applicable Lines:</b>	Public Switched Telephone Network
<b>Document Size:</b>	Max. 216 mm (8 1/2") in width Max. 600 mm (23 5/8") in length
<b>Effective Scanning Width:</b>	208 mm (8 3/16")
<b>Effective Printing Width:</b>	A4: 202mm Letter/Legal: 208mm
<b>Transmission Time*:</b>	Approx. 4 s/page (ECM-MMR Memory transmission)**
<b>Scanning Density:</b>	Horizontal: 11.8 pels/mm (300 pels/mm) Vertical: 3.9 lines/mm (100 lines/mm)-STANDARD 11.8 lines/mm (300 lines/mm)-FINE/SUPER FINE/PHOTO
<b>Halftone Level:</b>	64-level
<b>Scanner Type:</b>	Contact Image Sensor (CIS)
<b>Printer Type:</b>	Laser printer
<b>Data Compression System:</b>	Modified Huffman (MH), Modified READ (MR), Modified, Modified READ (MMR)
<b>Modem Speed:</b>	33,600/31,200/28,800/26,400/24,000/21,600/19,200/16,800/14,400/12,000/9,600/7,200/ 4,800/2,400 bps; Automatic Fallback
<b>Operating Environment:</b>	10°C—32.5°C (50°F—90.5°F), 20—80% RH (Relative Humidity)
<b>Dimensions (H×W×D):</b>	217 mm × 443 mm × 461 mm (8 17/32"×17 7/16"×18 5/32")
<b>Mass (Weight):</b>	Approx. 9.2 kg (20.3 lb.)
<b>Power Consumption:</b>	Standby: Approx. 7 W Transmission: Approx. 17 W Reception: Approx. 250 W Copy: Approx. 250 W Maximum: Approx. 900 W (When the fuser unit turns on)
<b>Power Supply:</b>	220-240 V AC, 50/60 Hz
<b>Memory Capacity:</b>	Approx. 150 pages of memory transmission/reception. (Based on ITU-T No. 1 Test Chart in standard resolution.)
<b>Laser diode properties:</b>	Laser output: Max. 5 mW Wave length: 760 nm—800 nm Emission duration: Continuous
<b>Print Speed:</b>	10 ppm (page per minute)
<b>Printing Resolution:</b>	600 × 600 dpi
<b>OS:</b>	Works with Windows 95/98/Me/2000/NT4.0/XP
<b>Interface:</b>	USB/Parallel (IEEE 1284)

\* Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party's machine.

\*\* Transmission speed is based upon the ITU-T No. 1 Test Chart and original mode. (Refer to **ITU-T No.1 TEST CHART(P.232)**.) If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

**Note:**

- Any details given in these instructions are subject to change without notice.
- The pictures and illustrations in these instructions may vary slightly from the actual product.

Design and specifications are subject to change without notice.

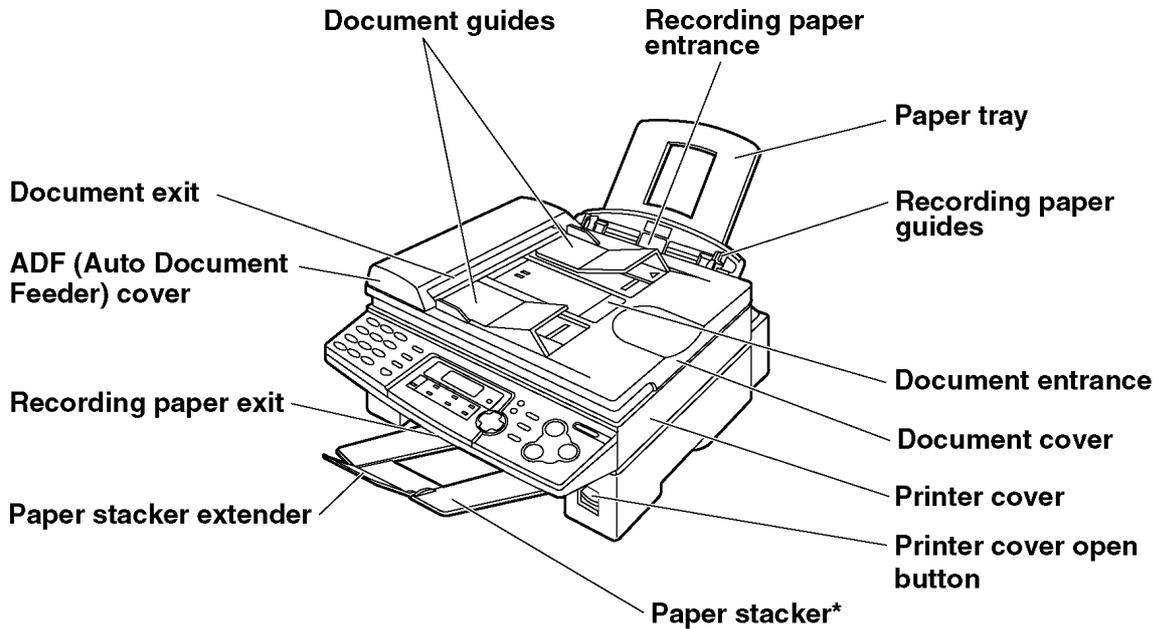
## 2.3. OPTIONAL ACCESSORIES

Model No.	Description	Specifications
KX-FA76A	Toner cartridge	1 toner cartridge
KX-FA78A	Drum unit	1 drum unit

### 3 INSTALLATION

#### 3.1. LOCATION OF CONTROLS

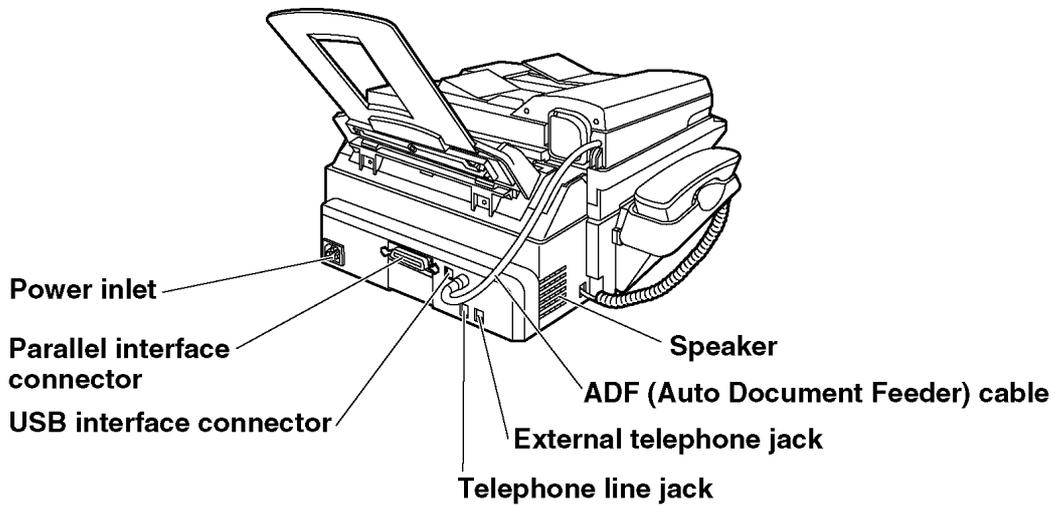
##### 3.1.1. OVERVIEW



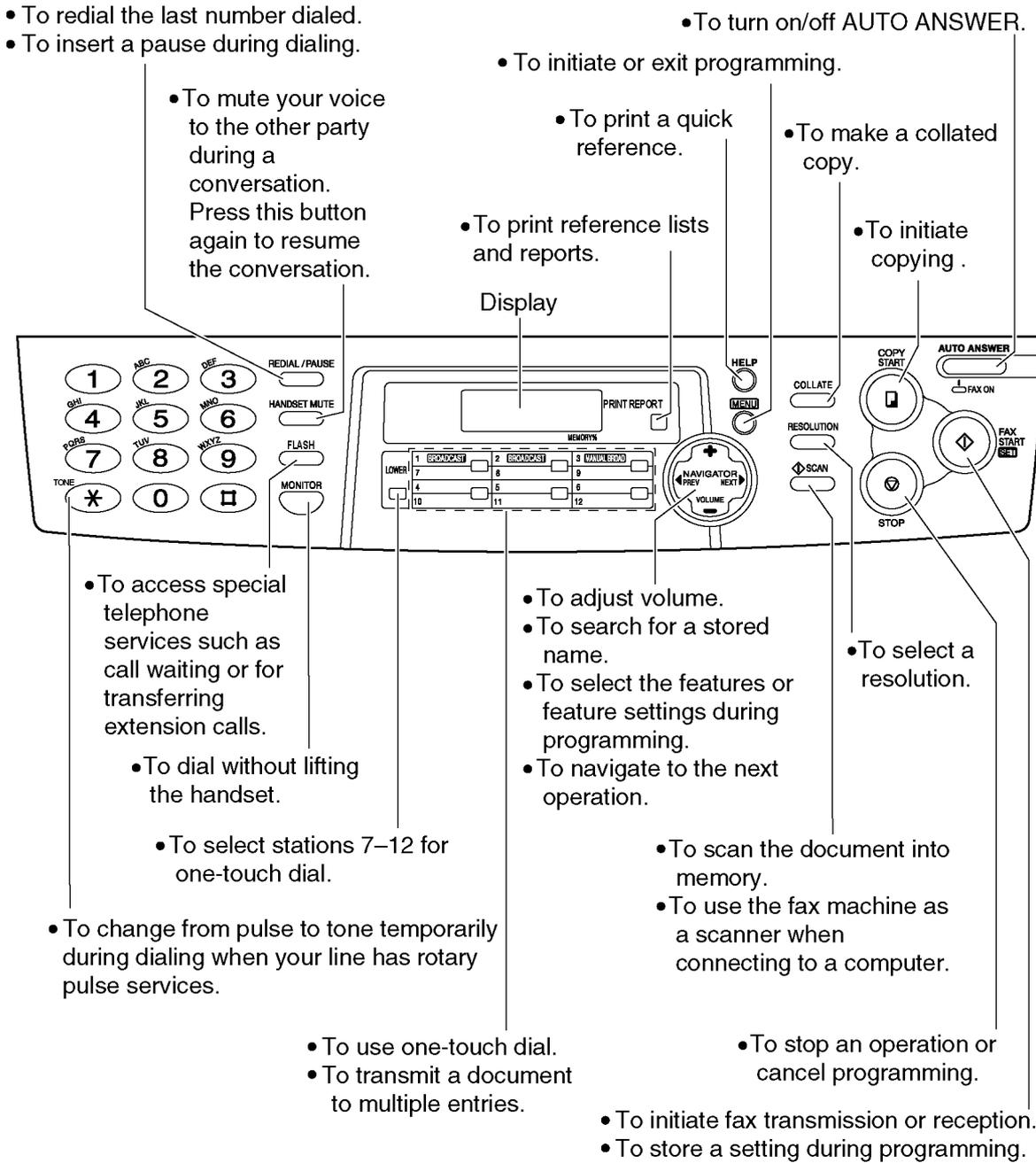
**Note:**

\*The paper stacker may not be shown in all illustrations.

##### 3.1.2. REAR VIEW



### 3.1.3. CONTROL PANEL



## 3.2. CONNECTIONS

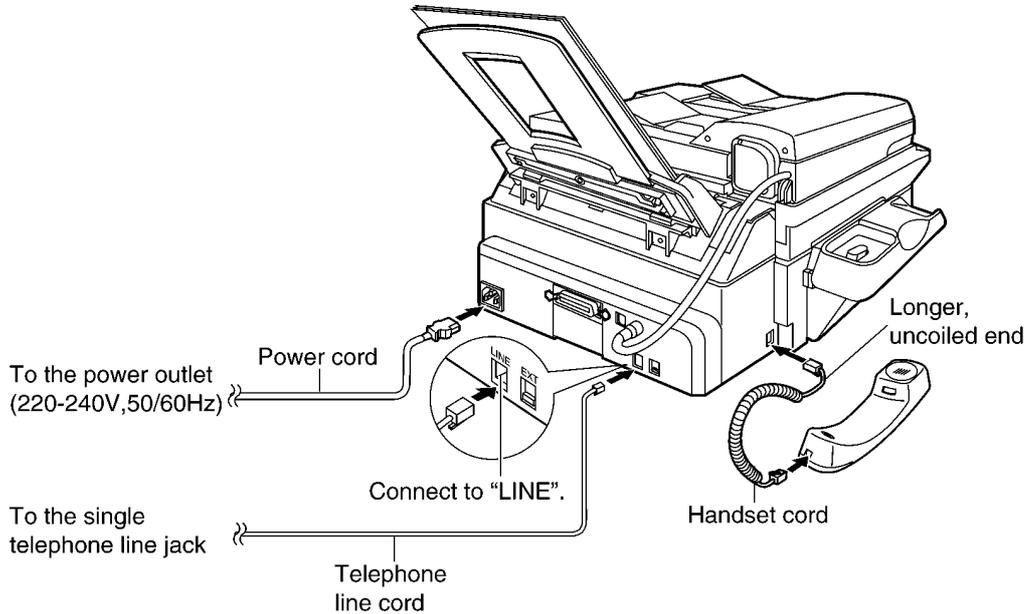
(1) Connect the handset cord.

**The jack on the longer, uncoiled end of the handset cord should be connected to the unit.**

(2) Connect the telephone line cord.

(3) Connect the power cord.

• When the power is turned on for the first time, the unit will print some basic information.

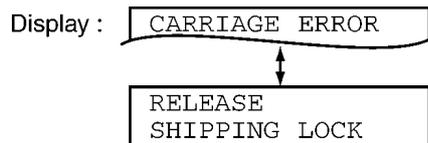


### Caution:

- When you operate this produce, the power outlet should be near the product and easily accessible.
- Be sure to use the telephone line cord included in this unit.
- Do not extend the telephone line cord.

### Note:

- You can connect an answering machine or extension telephone to the external telephone jack ("EXT") on this unit.
- When the power is turned on and the display shows the following, unlock the shipping lock.



- Telephone line connection is TNV (Telecommunication Network Voltage).

### 3.3. CONNECTING TO A COMPUTER

Panasonic Multi-Function Station enables your fax machine to carry out the following functions:

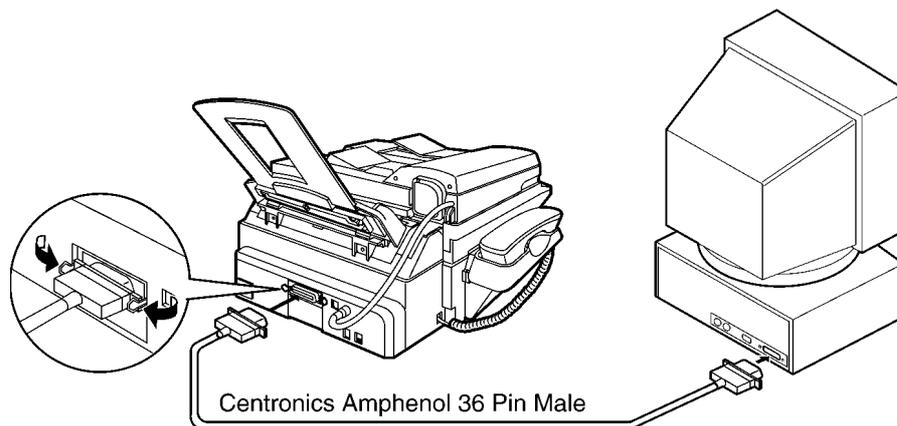
- Printing on plain paper, transparencies, labels and envelopes
- Scanning documents and converting an image into text with Readiris OCR software
- Scanning from other Microsoft® Windows® applications that support TWAIN scanning
- Storing, editing or erasing entries in directories from your PC
- Programming the basic and advanced features from your PC

To run Multi-Function Station software, you need the following:

OS:	Works with Windows 95/98/Me/2000/XP and Windows NT4.0
CPU:	Windows 95/98: Pentium 90 MHz or higher processor Windows Me: Pentium 150 MHz or higher processor Windows NT4.0: Pentium 133 MHz or higher processor Windows 2000: Pentium 166 MHz or higher processor Windows XP: Pentium 300 MHz or higher processor
Memory minimum:	Windows 95/98/NT4.0: 24 MB (32 MB or more is recommended.) Windows Me: 32 MB (64 MB or more is recommended.) Windows 2000: 64 MB Windows XP: 128 MB
Hard disk:	More than 50 MB available space
Other:	Parallel (IEEE1284) port or USB port, and CD-ROM drive

#### 3.3.1. Using an IEEE1284 compliant parallel cable:

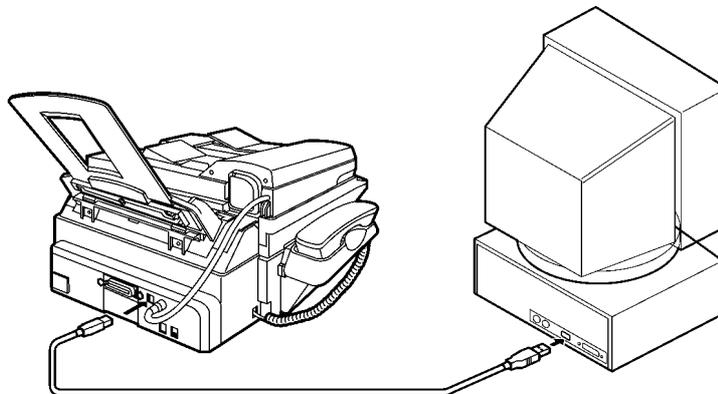
Parallel cable (amphenol 36pin, less than 3 metres long) must be purchased separately.



#### 3.3.2. Using a USB cable: (Windows 95 does not apply for USB port)

USB cable (less than 3 metres long) must be purchase separately.

After connecting the USB cable, you must set the cable type to "USB" (feature #15)

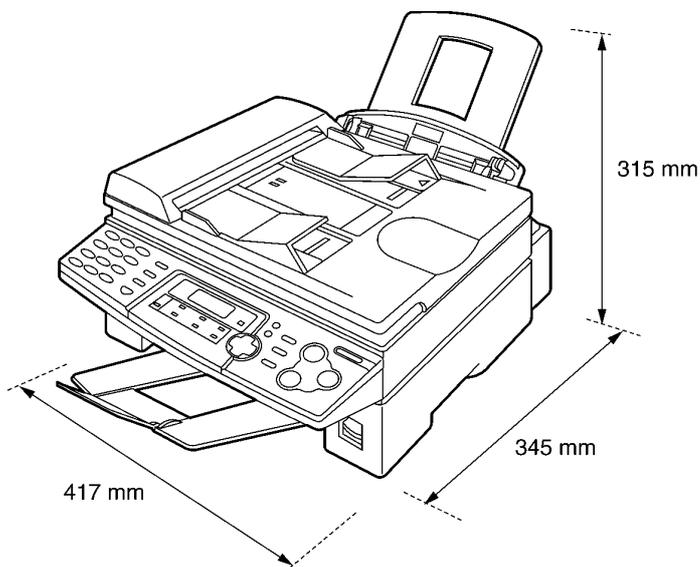


## 3.4. INSTALLATION

### 3.4.1. INSTALLATION SPACE

The space required to install the unit is shown below.

The dimensions given are necessary for the unit to operate efficiently.



**Note:**

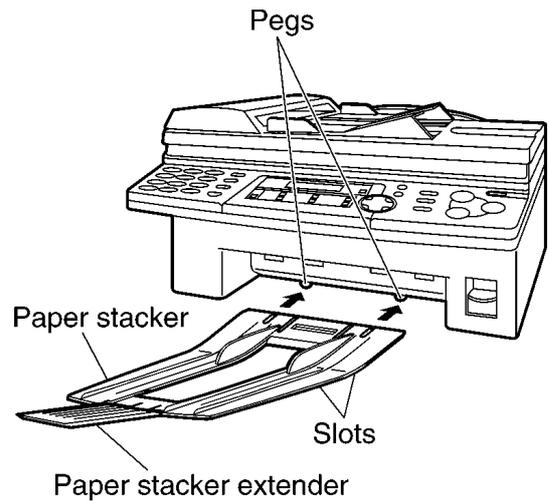
- Avoid excessive heat or humidity.
- Use the unit within the following ranges of temperature and humidity.
- Ambient temperature: 10°C to 32.5°C
- Relative humidity: 20% to 80% (without condensation)
- Power cord length should be less than 5 meters (16.4 feet). Using a longer cord may reduce the voltage or cause malfunctions.
- Avoid direct sunlight.
- Do not install near devices which contain magnets or generate magnetic fields.
- Do not subject the unit to strong physical shock or vibration.
- Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.
- To protect the unit from damage, hold both sides when you move it.

### 3.4.2. PAPER STACKER

Line up the slots in the paper stacker with the pegs on the bottom of the unit, then slide until locked.

Open the paper stacker extender when using legal size paper.

- The paper stacker can hold up to approx. 100 sheets of printed paper. Remove the printed paper before the paper stacker becomes full.

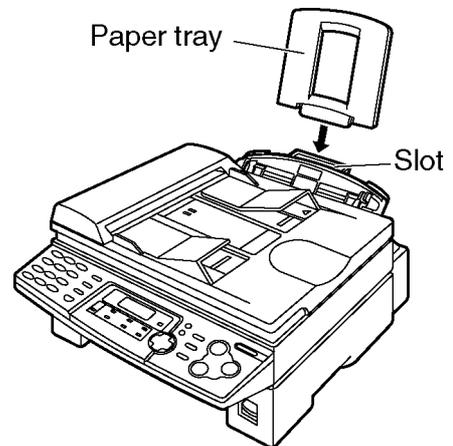


### 3.4.3. PAPER TRAY

Insert the paper tray into the slot on the back of the unit.

**Note for installation:**

- Do not place the unit in an area where the paper tray may be obstructed (i.e. by a wall etc.).
- Recording paper will be ejected from the front of the unit. Do not place anything in front of the unit.

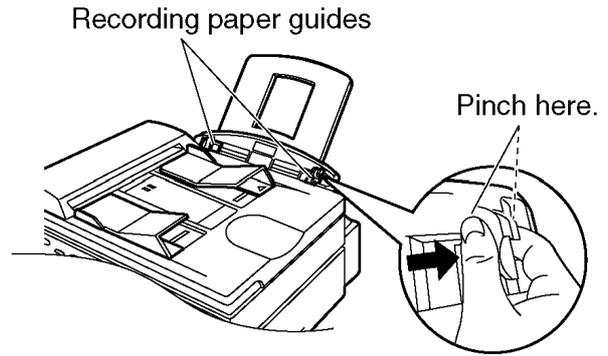


### 3.4.4. INSTALLING THE RECORDING PAPER

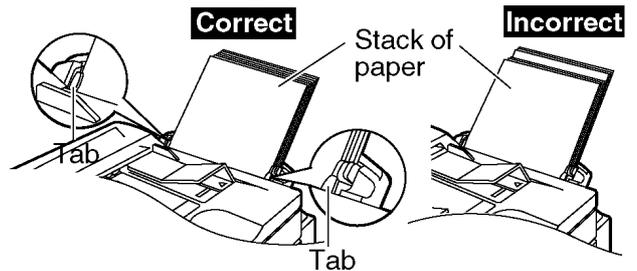
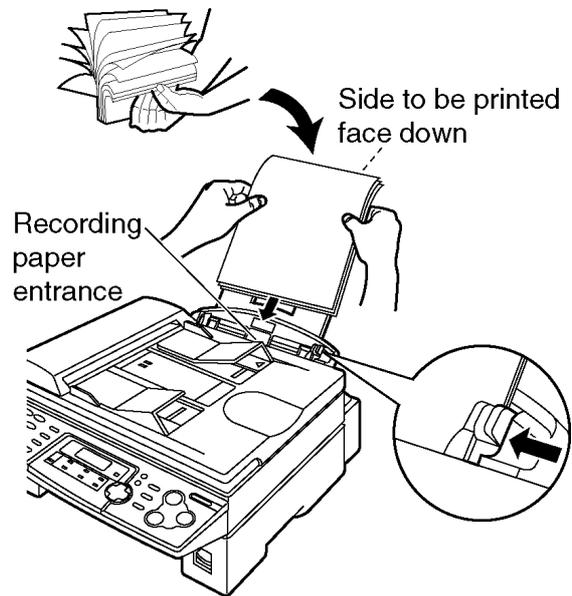
Letter, legal or A4 size recording paper can be used for fax messages. The unit can hold up to 150 sheets of 60 g/m<sup>2</sup> to 75 g/m<sup>2</sup> (16 lb. to 20 lb.) paper or 120 sheets of 90 g/m<sup>2</sup> (24 lb.) paper. See the note for paper specifications.

• The unit is set for letter size paper by default. If you want to use legal or A4 size paper, change the setting (feature #16).

1. Pinch the right side of the recording paper guide, then slide it open to its full width.



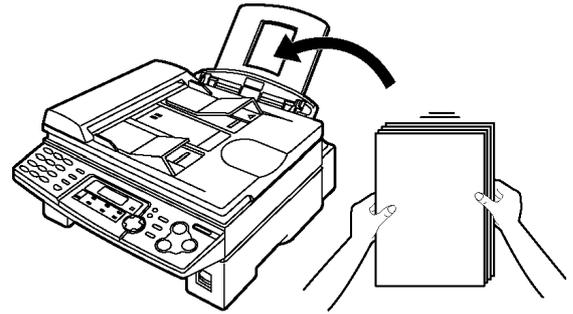
2. Fan the stack of paper to prevent a paper jam.
3. Insert the paper into the recording paper entrance.
  - The paper should not be over the tab.
  - If the paper is not inserted correctly, readjust the paper, or the paper may jam.



4. Adjust the width of the guides to the size of the recording paper by sliding the right recording paper guide.

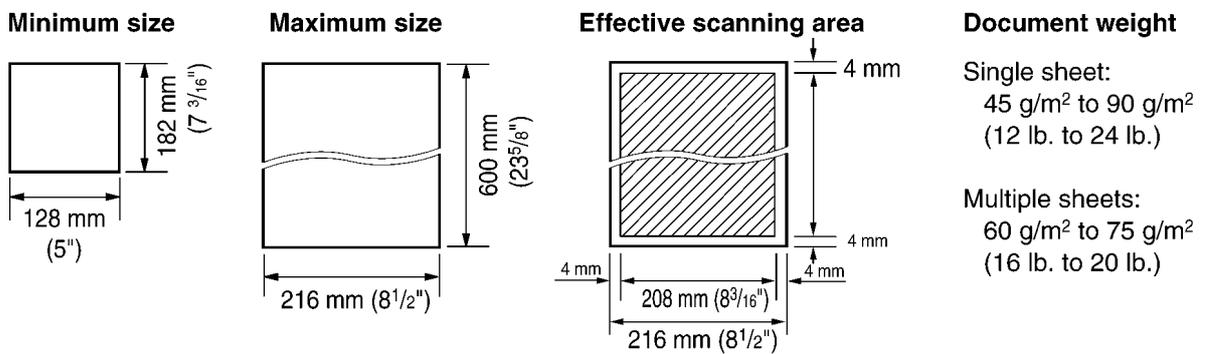
### 3.4.4.1. Adding Paper

1. Remove all of the installed paper.
2. Add paper to the stack of paper you removed and straighten.
3. Follow steps 1 to 4 above.



### 3.4.5. DOCUMENTS THE UNIT CAN FEED

#### 3.4.5.1. USING THE ADF (AUTO DOCUMENT FEEDER)

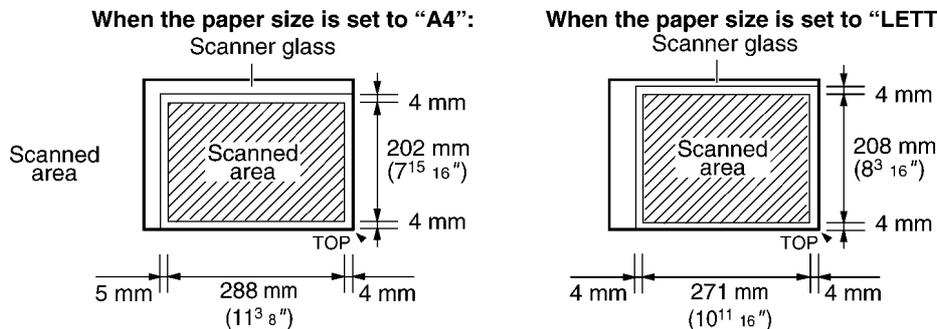


**Note:**

- Remove chips, staples or other similar fasteners.
- Do not send the following types of documents. (Use the scanner glass for fax transmission.)
  - Chemically treated paper such as carbon or carbonless duplicating paper
  - Electrostatically charged paper
  - Badly curled, creased or torn paper
  - Paper with a coated surface

#### 3.4.5.2. USING SCANNER GLASS

Effective scanning area is changed depending on the setting of the paper size. (# 16 PROGRAM MODE TABLE P.78)



**Note for the auto document feeder and the scanner glass**

- Check that ink, paste or correction fluid has dried completely.
- Do not send the following types of documents: (Use copies for fax transmission.)
  - Paper with a faint image
  - Paper with printing on the opposite side that can be seen through the other side (i.e. newspaper)
- To transmit the document with a width of less than A4 size (210 mm), we recommend transmitting the document using the scanner glass.

### 3.4.6. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

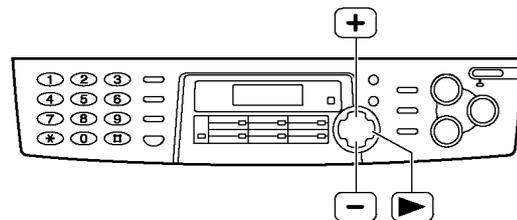
Keys	Characters
[1]	1 [ ] { } + - / = , . _ ` : ; ?
[2]	A B C A Б В Г 2
[3]	D E F Д Е Ж 3
[4]	G H I З И Й К 4
[5]	J K L Л М Н О 5
[6]	M N O П Р С Т 6
[7]	P Q R S У Ф Х Ц 7
[8]	T U V Ч Ш Щ Ъ 8
[9]	W X Y Z Ы Ь Э Ю Я 9
[0]	0 ( ) < > ! " # \$ % & ¥ * @ ^ ' →
[ FLASH ]	<b>Hyphen</b> button (To insert a hyphen.)
[ REDIAL ]	<b>Insert</b> button (To insert one character or one space.)
[ STOP ]	<b>Delete</b> button (To delete a character.)
[▶]	▶ key (To move the cursor to the right.) To enter another character using the same number key, move the cursor to the next space.
[◀]	◀ key (To move the cursor to the left.)

### 3.4.7. TO SELECT CHARACTERS USING THE (+) OR (-) KEY

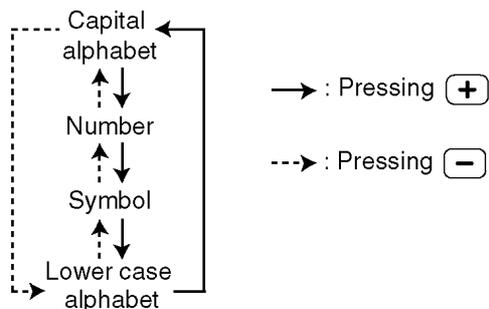
To select characters using **+** or **-**

Instead of pressing the dial keys, you can select characters using **+** or **-**.

1. Press **+** or **-** until the desired character is displayed.
2. Press **▶** to move the cursor to the next space.
  - The character displayed in step 1 is inserted.
3. Return to step 1 to enter the next character.



#### Display order of characters



### 3.4.8. SETTING YOUR LOGO

The logo can be your company, division or name.

**1** Press **[MENU]**.  
 Display: SYSTEM SET UP  
 PRESS NAVI. [◀ ▶]

**2** Press **[◀]** or **[▶]** until the following is displayed.  
 YOUR LOGO  
 PRESS SET

**3** Press **[SET]**  
 LOGO=

**4** Enter your logo, up to 30 characters, using the dial keypad. See the next page for details.  
**Example:** "Bill"

1. Press **[2]** 2 times.  
 Cursor  
 LOGO=B

2. Press **[4]** 6 times.  
 LOGO=BI

3. Press **[5]** 6 times.  
 LOGO=BI1

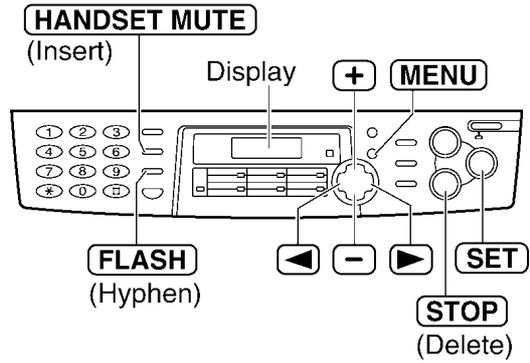
4. Press **[▶]** to move the cursor to the next space and press **[5]** 6 times.  
 LOGO=BI11

**5** Press **[SET]**  
 • The next feature will be displayed.  
 YOUR FAX NO.  
 PRESS SET

**6** Press **[MENU]**.

**Note:**

- You can enter your logo by pressing **[+]** or **[-]** (see the next page) in step 4. In this case, press **[▶]** to move the cursor.
- You can use only capital alphabet.



**To change capital or lower case letters**

Pressing the **[#]** key will change to capital or lower case alternatively.

1. Press **[2]** 2 times.  
 Display: LOGO=B

2. Press **[4]** 3 times.  
 LOGO=BI

3. Press **[#]**.  
 LOGO=BI

4. Press **[5]** 3 times.  
 LOGO=BI1

Note: You can use only capital alphabet,

**To correct a mistake**

- Press **[◀]** or **[▶]** to move the cursor to the incorrect character, and make the correction.

**To delete a character**

- Move the cursor to the character you want to delete and press **[STOP]** (Delete).

**To insert a character**

1. Press **[◀]** or **[▶]** to move the cursor to the position to the right of where you want to insert the character (Insert) to insert a
2. Press **[HANDSET MUTE]** space and enter the character

### 3.4.9. REPLACING THE TONER CARTRIDGE AND THE DRUM UNIT

When the display shows the following, replace the toner cartridge.

Display: TONER LOW or TONER EMPTY

We recommend you replace the drum unit every third time you replace the toner cartridge. To check the drum life and quality, please print the printer test list.

To ensure that the unit operates properly, we recommend the use of **Panasonic toner cartridge (Model No. KX-FA76A)** and **drum unit (Model No. KX-FA78A)**.

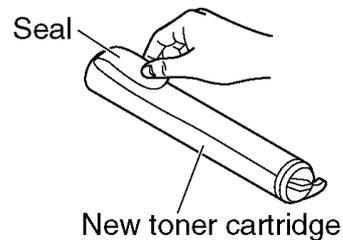
**Caution:**

- **The drum unit contains a photosensitive drum. Exposing it to light may damage the drum. Once you have opened the protection bag:**
  - Do not expose the drum unit to light for more than 5 minutes.
  - Do not touch or scratch the green drum surface.
  - Do not place the drum unit near dust or dirt, or in a high humidity area.
  - Do not expose the drum unit to direct sunlight.
- Do not unplug the fax machine to prevent loss of fax documents in memory.
- We cannot be responsible for any damage to the unit or degradation of print quality which may occur from the use of non-Panasonic toner cartridge and drum unit.
- Do not leave the toner cartridge out of the protection bag for a long time. It will decrease the toner life.
- Do not pour any toner into the toner cartridge.

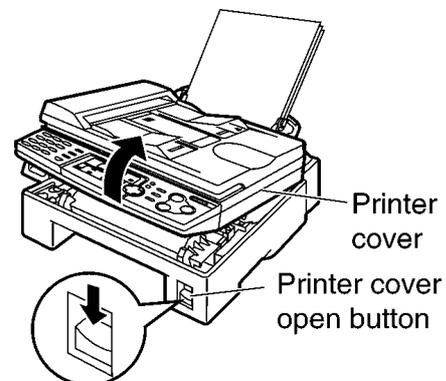
1. Before opening the protection bag of the new toner cartridge, shake it vertically more than 5 times.



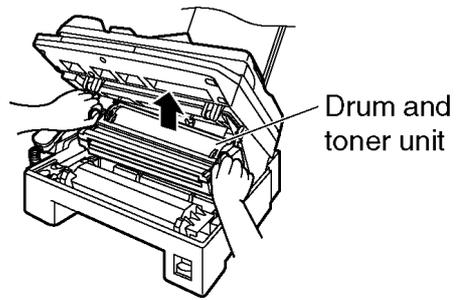
2. Remove the new toner cartridge from the protection bag. Peel off the seal from the toner cartridge.



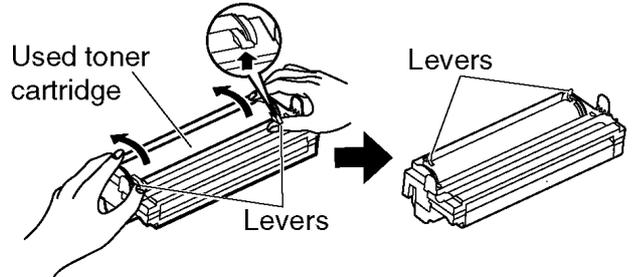
3. Press down the printer cover open button then open the printer cover.



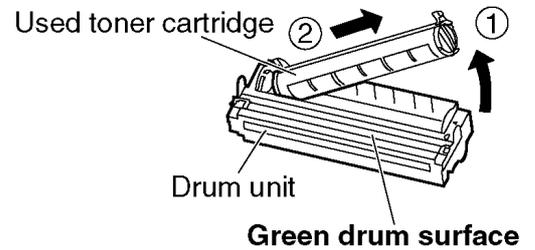
4. Tap on the used toner cartridge several times to allow the remaining toner to fall into the drum unit. Remove the drum and toner unit by holding the two tabs.
- If you replace the toner cartridge and the drum unit at the same time, skip to step 7.



5. Turn the two levers on the used toner cartridge firmly.

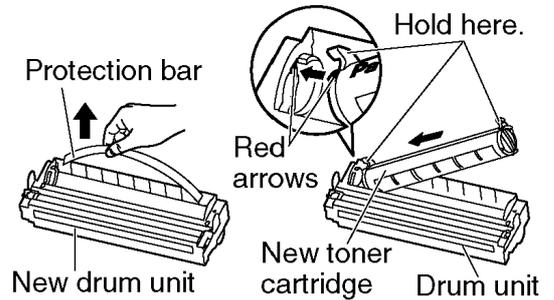


6. Pull up the right edge of the used toner cartridge (①). Remove the cartridge from the drum unit (②).
- The toner may stick to the cartridge and the drum unit. Be careful handling.
  - Do not drop the toner on the green drum surface.
  - Put the used toner cartridge into the protection bag.

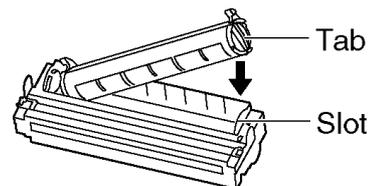


7. If you replace the drum unit at the same time, remove the new drum unit from the protection bag. Remove the protection bar from the drum unit.

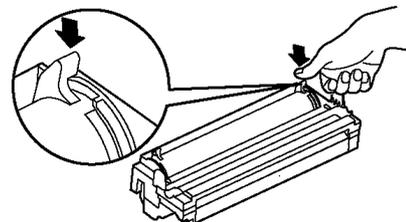
With "Panasonic" face up on the toner cartridge, match the red arrows on the cartridge and the drum unit.



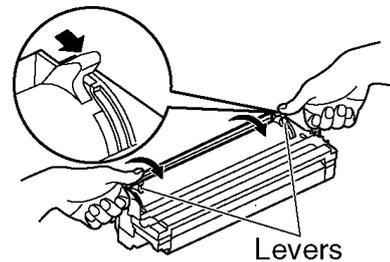
8. Slide the tab on the toner cartridge into the slot of the drum unit.



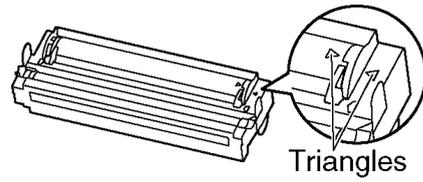
9. Firmly press down on the right side of the toner cartridge to snap into position.



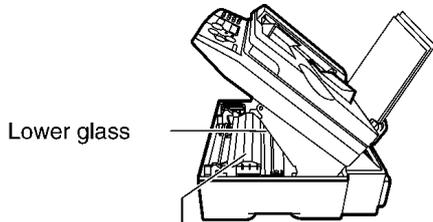
10. Turn the two levers on the toner cartridge with firm pressure.



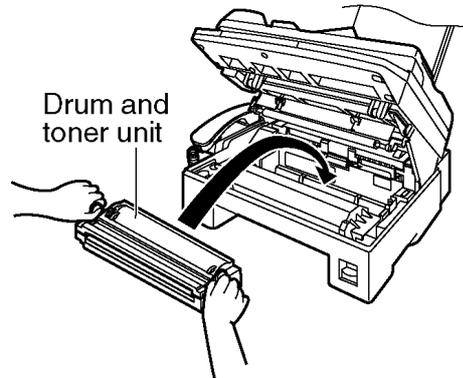
11. The toner cartridge is installed when the triangles match.



12. Install the drum and toner unit by holding the tabs.  
• If the lower glass is dirty, clean it with a soft and dry cloth.



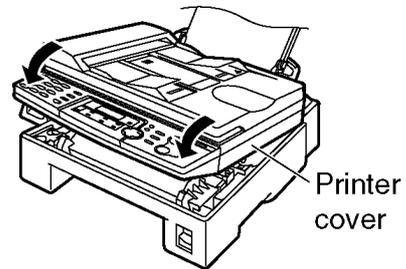
**Caution:**  
Do not touch the bottom of this cover when cleaning the lower glass. It is very hot.



13. Close the printer cover by pushing down on both sides until locked.

**Waste disposal method**

- Waste material may be dumped or incinerated under conditions which meet all country and local environmental regulations.

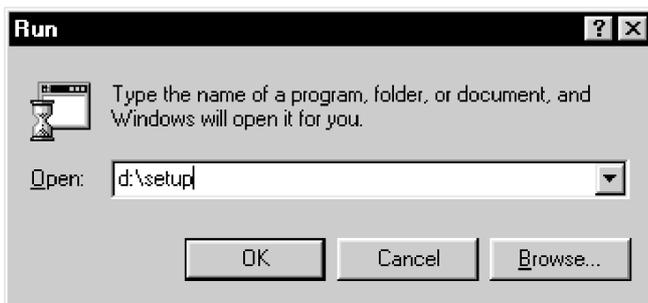


## 3.5. INSTALLING MULTI-FUNCTION STATION SOFTWARE

- 1 Connect the fax machine to the PC.
  - To use via USB connection, you must set the cable type to "USB" (feature #15) The default setting is "PARALLEL".
- 2 Start Windows 95/98/Me/NT4.0/2000/XP and close all applications.
  - The following dialog box may appear. Click **[Cancel]** to close it.



- You must be logged in as an administrator in Windows NT4.0/2000/XP.
- 3 Insert the included CD-ROM into your CD-ROM drive.
    - The **[Choose Setup Language]** dialog box will appear. Select the desired language that you want to use with this software from the drop-down list. Click **[OK]**.  
The installation will automatically start.
    - If the **[Choose Setup Language]** dialog box does not appear:  
The installation will automatically start.
    - If the installation does not start automatically:  
Click **[Start]**, choose **[Run...]**. Type "d:\setup" (where "d:" is the drive letter of your CD-ROM drive). Click **[OK]**.  
(If you are not sure what the drive letter is for your CD-ROM drive, use Windows Explorer and look for the CD-ROM drive.)



- The installation will start.

- 4 Follow the instructions on the screen until all files have been installed.
  - Readiris OCR software can also be installed. For details about OCR software.
  - If the fax machine is not connected to your computer, the **[Port Selection]** dialog box will appear.  
Select the port number which you want to use. If the fax machine is connected to your computer, the port number will be automatically detected.

### To uninstall the software

1. Click **[Start]**.
2. Point to **[Settings]**, then click **[Control Panel]**.
3. Double-click **[Add/Remove Programs]**.
4. Select **[Panasonic Multi-Function Station]** from the list.
5. Click **[Add/Remove...]** (Windows 95/98/Me/NT4.0)/**[Change/Remove...]** (Windows 2000/XP), then follow the instructions on the screen.

### Important notice for USB cable users.

- If you use a USB cable with Windows XP, the following message may appear:  
"The software you are installing for this hardware has not passed Windows Logo testing to verify its compatibility with Windows XP"  
You can continue the installation with no problem.

- The screens shown in these instructions are from Windows Me.
- The screens may differ slightly from those of the actual product.
- The screens are subject to change for improvement without notice.

## 4 MAINTENANCE

### 4.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

#### 4.1.1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

##### 1. Periodic maintenance

Inspect the equipment periodically and if necessary, clean any contaminated parts.

##### 2. Check for breakdowns

Look for problems and consider how they arose.

If the equipment can be still used, perform copying, self testing or communication testing.

##### 3. Check equipment

Perform copying, self testing and communication testing to determine if the problem originates from the transmitter, receiver or the telephone line.

##### 4. Determine causes

Determine the causes of the equipment problem by troubleshooting.

##### 5. Equipment repairs

Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.

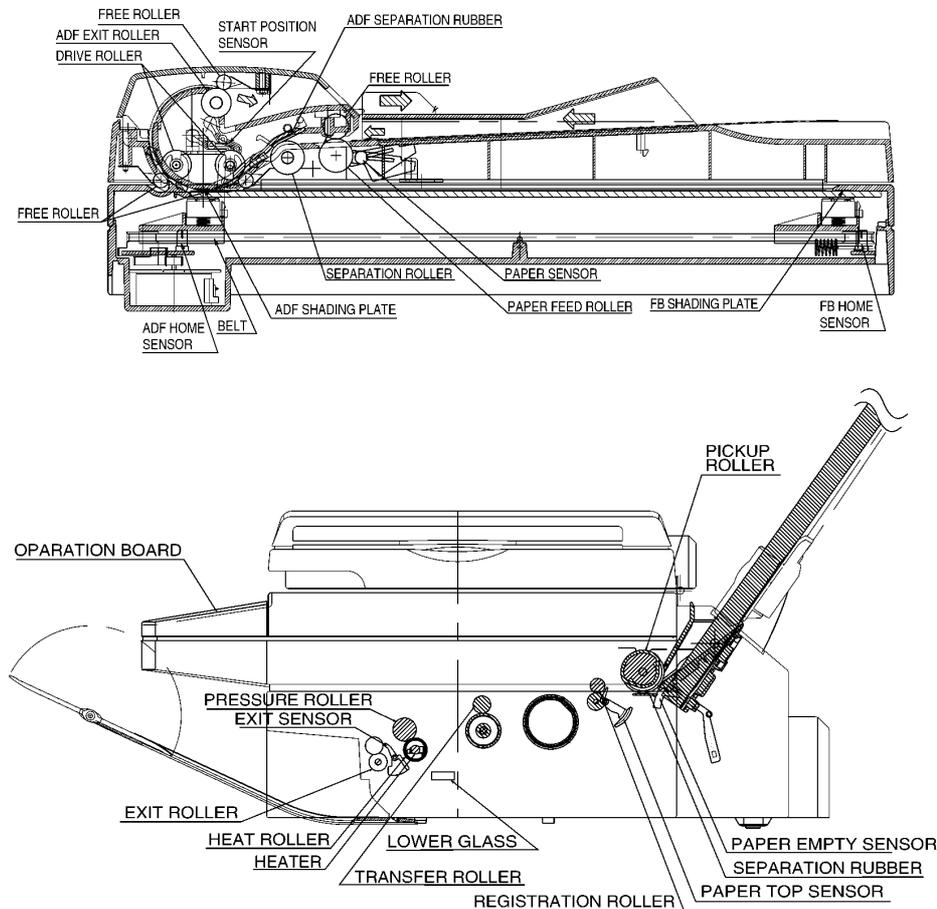
##### 6. Confirm normal operation of the equipment

After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.

##### 7. Record keeping

Make a record of the measures taken to rectify the problem for future reference.

#### 4.1.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS



### 4.1.2.1. Maintenance List

NO.	OPERATION	CHECK	REMARKS
1	Document Path	Remove any foreign matter such as paper.	—
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	Refer to <b>MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS</b> (P.28). <b>DOCUMENT FEEDER ROLLERS</b> (P.35)
3	Sensors	Document sensor (PS500), Paper feed sensor (PS501), Printer cover open switch (SW101), ADF cover open sensor (SW501), FB cover open sensor (SW500), ADF CIS position sensor (PS502), FB CIS position sensor (PS503) Resist sensor (PC201), Paper exit sensor (PS50). Paper sensor (PS1) Confirm the operation of the sensors.	See <b>MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS</b> (P.28) and <b>SENSORS AND SWITCHES SECTION</b> (P.185) <b>TEST FUNCTIONS</b> (P.74)
4	Glass	If the glass is dirty, clean them with a dry soft cloth.	Refer to <b>MAINTENANCE</b> (P.33).
5	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

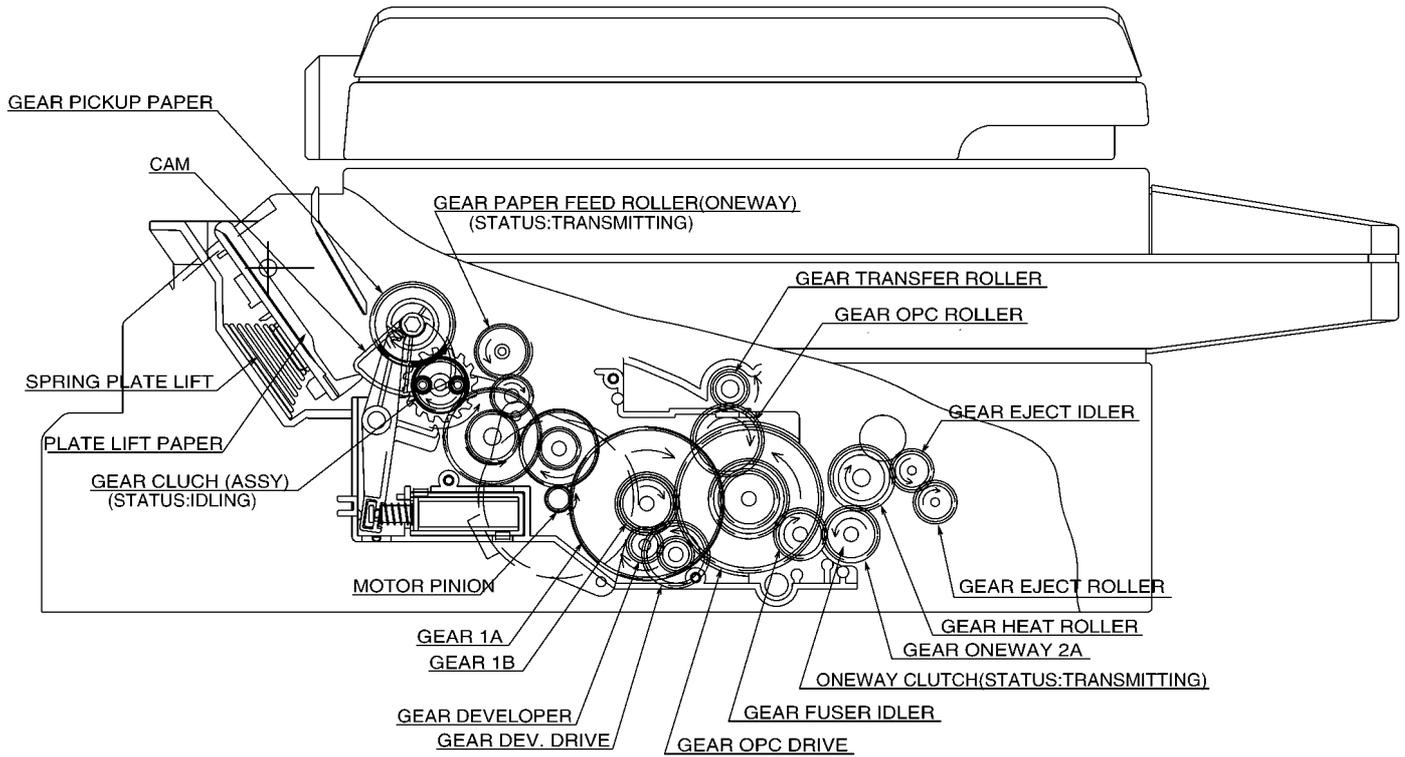
### 4.1.2.2. Maintenance Cycle

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Procedure
1	ADF Separation Roller (Ref.No.82)	3 months	7 years* (100,000 documents)	Refer to <b>HOW TO REMOVE THE FEED ROLLER AND ADF SEPARATION ROLLER</b> (P.54).
2	Paper Feed Roller (Ref.No.81)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE FEED ROLLER AND ADF SEPARATION ROLLER</b> (P.54).
3	ADF Separation Rubber (Ref. No.43)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE TOP COVER AND CONVEYOR BLOCK</b> (P.55).
4	Drive Roller (Ref. No.34)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE ADF EXIT ROLLER AND DRIVE ROLLER</b> (P.56).
5	ADF Exit Roller (Ref.No.32)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE ADF EXIT ROLLER AND DRIVE ROLLER</b> (P.56).
6	Pick up Roller (Ref No.201)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE PICK UP ROLLER ASS'Y</b> (P.45).
7	Separation Rubber (Ref. No.215)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE PICK UP ROLLER ASS'Y</b> (P.45).
8	Registration Roller (Ref.No.334)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE REGISTRATION ROLLER</b> (P.49)
9	Transfer Roller (Ref.No.161)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE TRANSFER ROLLER</b> (P.57).
10	Pressure Roller (Ref.No.292)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE PRESSURE ROLLER</b> (P.50).
11	Heat Roller (Ref.No.299)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE HEAT ROLLER AND EXIT ROLLER</b> (P.50).
12	Exit Roller (Ref.No.307)	3 months	7 years (100,000 documents)	Refer to <b>HOW TO REMOVE THE HEAT ROLLER AND EXIT ROLLER</b> (P.50).

If each part has got dirty, clean it with a damp cloth then dry thoroughly.

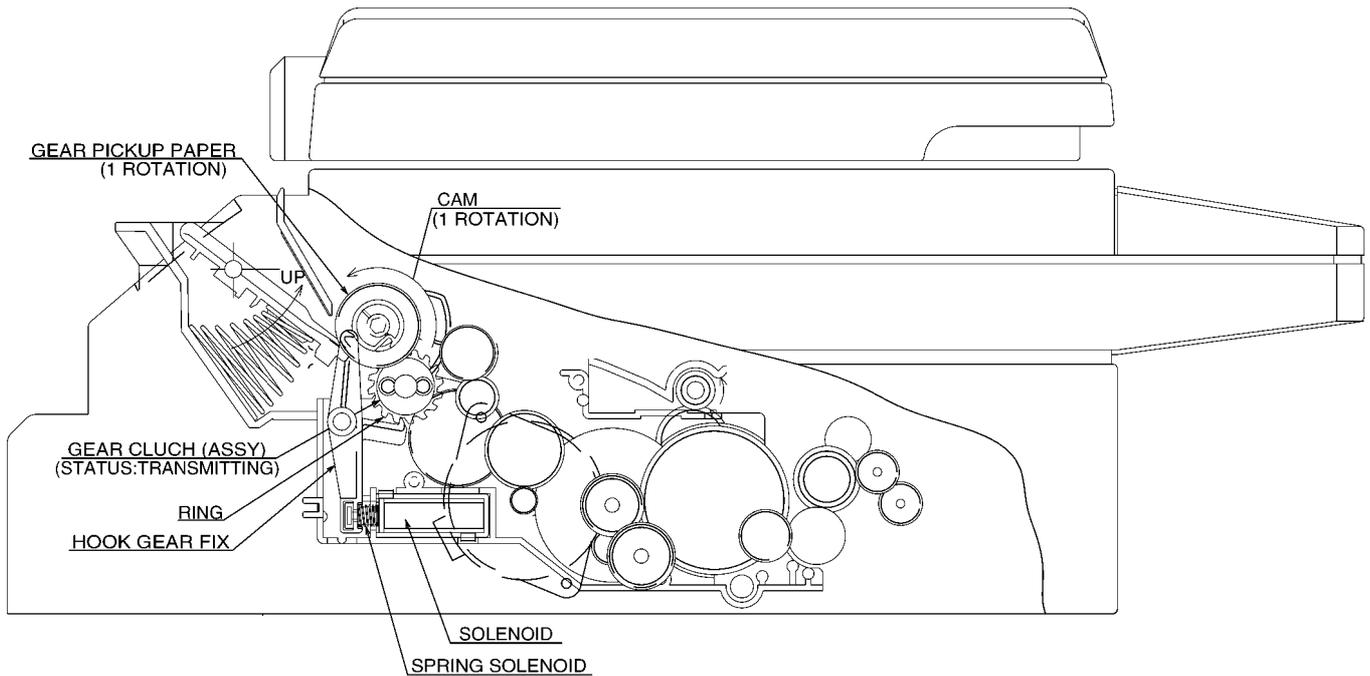
\* These values are standard and may vary depending on usage conditions.

## 4.2. PRINTING



- The motor pinion rotates in the direction shown in the figure.
- The gears of fixing and developing parts are driven by the GEAR 1A.
- The GEAR PAPER FEED ROLLER drives the roller.
- The GEAR CLUTCH runs idle and GEAR PICKUP PAPER is still.

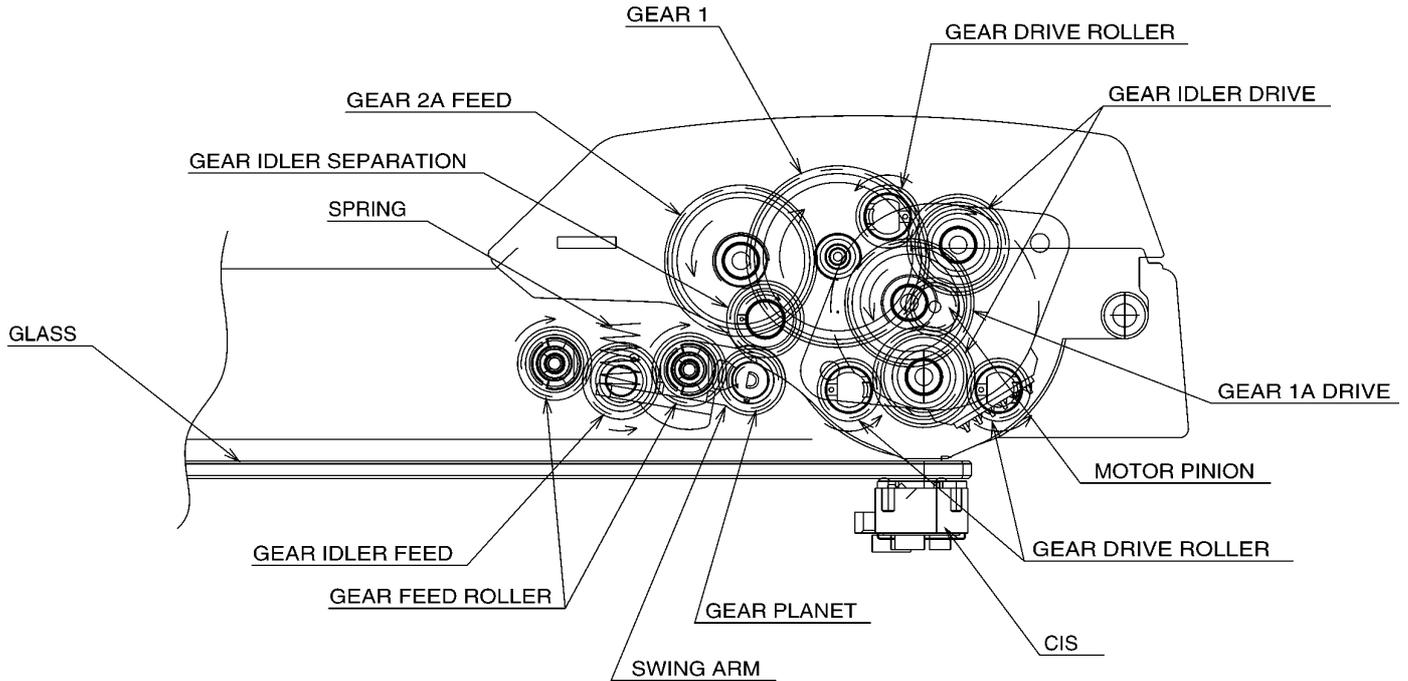
### 4.3. PRINTING (PAPER PICK UP)



#### During printing

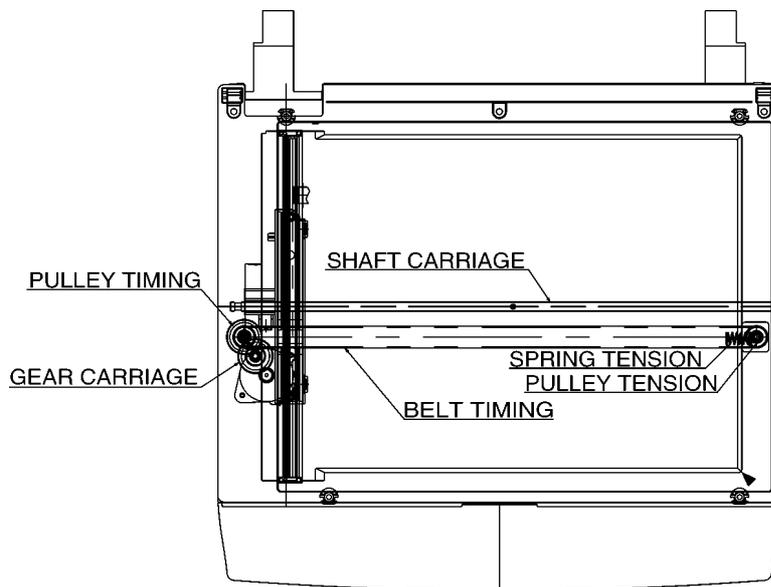
- When the SOLENOID is turned ON, the HOOK GEAR FIX is hooked on the RING of GEAR CLUTCH. It causes the GEAR PICKUP PAPER to rotate.
- At the same time, CAM's rotation lifts up the PLATE LIFT PAPER. The recording paper is pressed by the PICKUP ROLLER and the top paper is separated and fed. Then the PLATE LIFT PAPER is pressed down.
- Even the SOLENOID is turned OFF, it can not stop on the way of a turn because the tip of HOOK GEAR FIX is on the CAM of GEAR PICKUP PAPER.
- When the tip of HOOK GEAR FIX returns to CAM's home position, the GEAR CLUTCH RING is unhooked, then the GEAR PICKUP PAPER is stopped.

### 4.4. SCANNING (ADF)



• DOCUMENT TRANSMISSION (ADF)

The tip of the document is sent to a point of contact between the separation roller and the separation pad through the document feed roller, then the document is fed there separately. The document transference roller carries the document and the CIS reads it through the glass. The document U-turns along the guide and is exited through the paper exit roller.



• DOCUMENT TRANSMISSION (SCANNER GLASS)

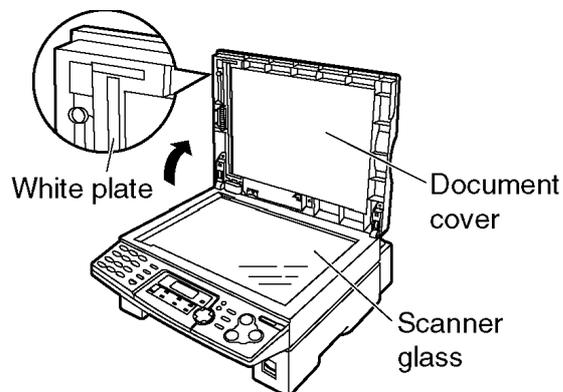
The CIS held in the CIS holder is carried by the belt timing along the shaft carriage to the reading start position. Then it goes back to the home position reading the document through the glass.

## 4.5. MAINTENANCE

If a black line, a white line or a dirty pattern appears on your recording paper, on your original, or on the fax document received by the other party, clean the white plate, scanner glass and lower glass.

### 4.5.1. WHITE PLATE AND SCANNER GLASS

1. Open the document cover.
2. Clean the white plate and scanner glass with a soft and dry cloth.
3. Close the document cover.

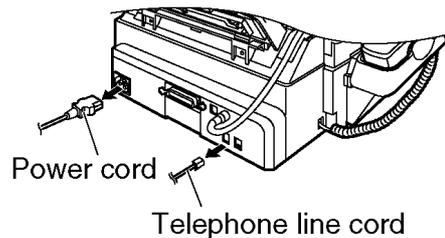


### 4.5.2. LOWER GLASS

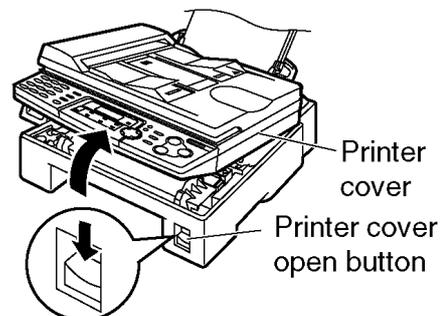
**Caution:**

- Be careful when handling the drum and toner unit.
- Do not use paper products, such as paper towels or tissues, to clean the inside of the unit.

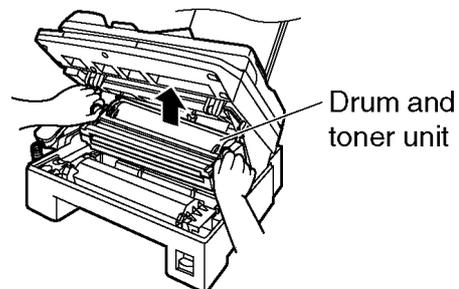
1. Disconnect the power cord and the telephone line cord.



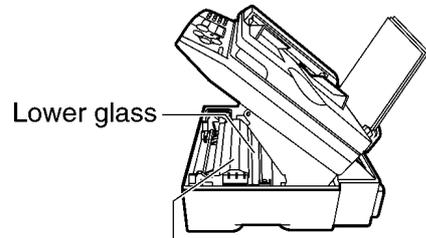
2. Press down the printer cover open button then open the printer cover.



3. Remove the drum and toner unit by holding the two tabs.

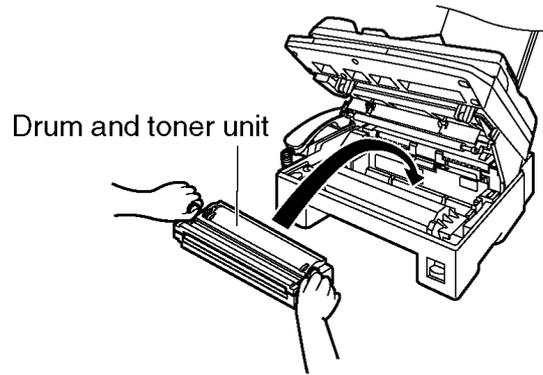


4. Clean the lower glass with a soft and dry cloth.

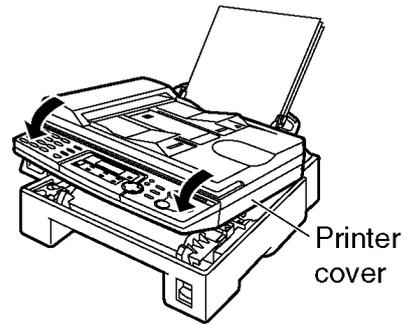


**Caution:**  
Do not touch the bottom of this cover when cleaning the lower glass. It is very hot.

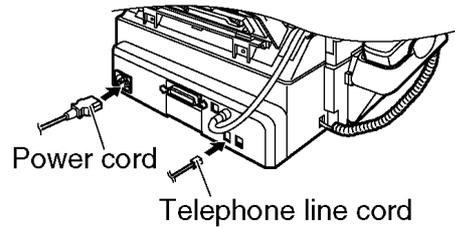
5. Reinstall the drum and toner unit by holding the tabs.



6. Close the printer cover, until locked, by pushing down on both sides.



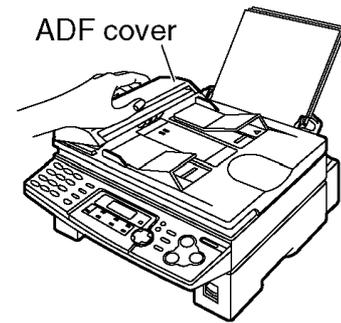
7. Reconnect the power cord and the telephone line cord.



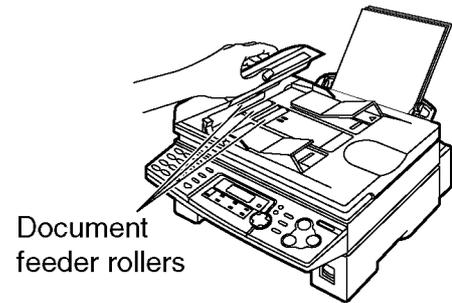
### 4.5.3. DOCUMENT FEEDER ROLLERS

If misfeeding of your original occurs frequently, clean the document feeder rollers.

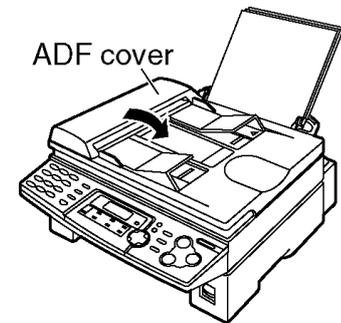
1. Lift, and hold open the ADF cover.



2. Clean the document feeder rollers with a soft and dry cloth.



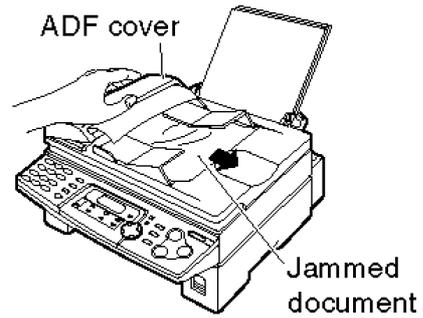
3. Close the ADF cover.



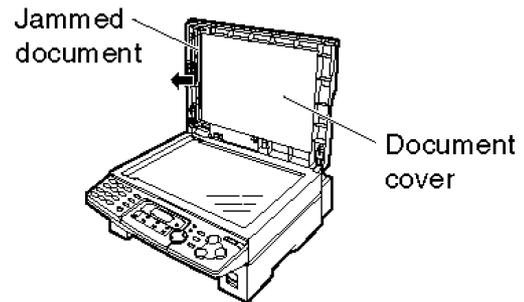
## 4.6. DOCUMENT JAMS

If the unit does not release the document during feeding, remove the jammed document as follows.

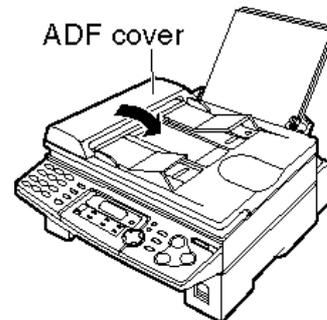
1. Lift, and hold open the ADF cover.
  - Do not pull out the jammed document forcibly before lifting the ADF cover.



2. Remove the jammed document carefully.
  - If you cannot remove the jammed document, open the document cover, remove the document, then close the document cover.



3. Close the ADF cover.



## 4.7. RECORDING PAPER JAMS

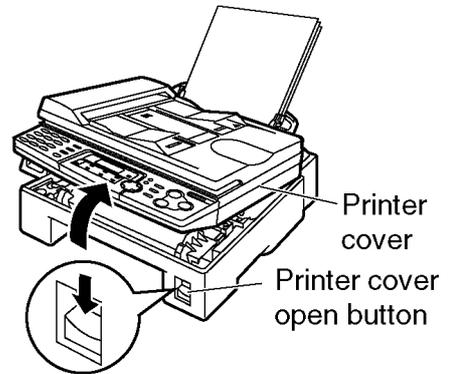
If the unit does not eject any recording paper during reception or copying, the recording paper has jammed and the display will show the following message.

The display will show the following.

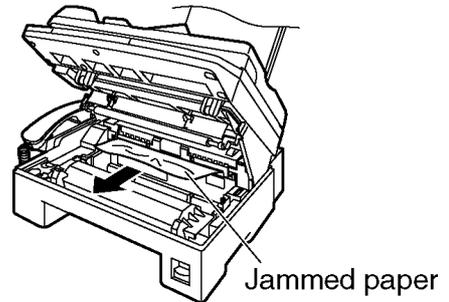
Display:

PAPER JAMMED

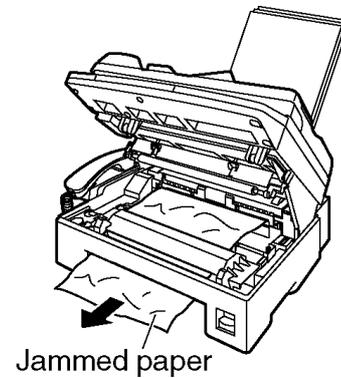
1. Push the front cover open button then open the front cover.



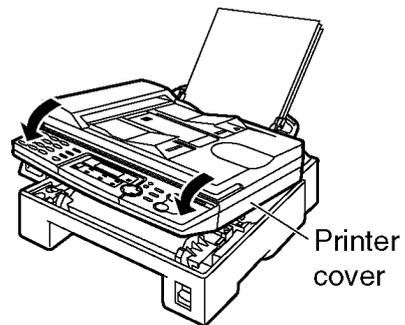
2. When the recording paper has jammed near the drum and toner unit:  
Remove the jammed paper by pulling it toward you.



When the recording paper has jammed near the recording paper exit:  
Remove the jammed paper by pulling it toward you.



3. Close the front cover, until locked, by pushing down on both ends.

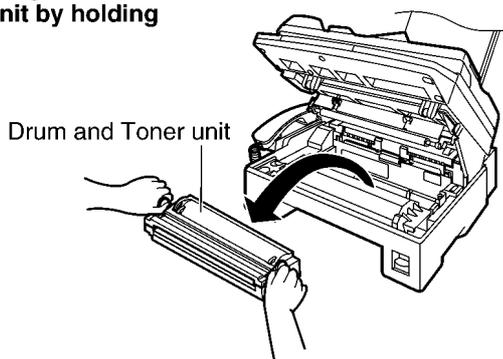


4. Remove the recording paper. Straighten and reinsert it into the recording paper entrance.

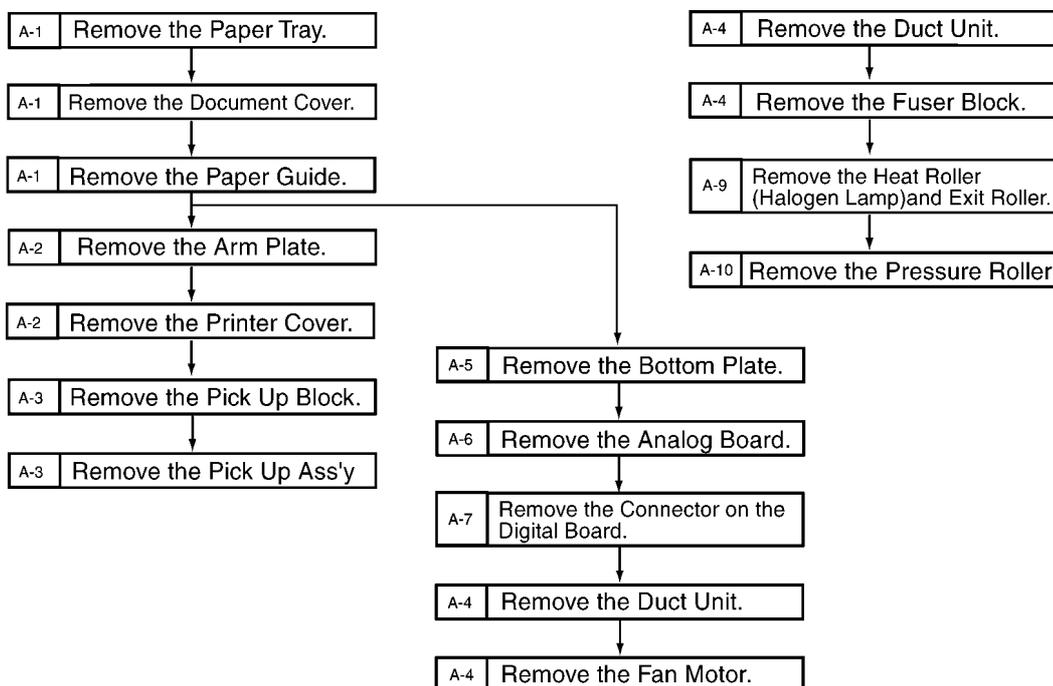


## 5 DISASSEMBLY INSTRUCTIONS

Before disassembling, remove the Drum and Toner unit by holding the two tabs.



### 5.1. UPPER MAIN CABINET SECTION



#### CROSS REFERENCE:

A1: HOW TO REMOVE THE PAPER TRAY, DOCUMENT COVER AND PAPER GUIDE (P.43)

A2: HOW TO REMOVE THE PRINTER COVER (P.44)

A3: HOW TO REMOVE THE PICK UP ROLLER ASS'Y (P.45)

A4: HOW TO REMOVE THE DUCT UNIT AND FAN MOTOR (P.46)

A5: HOW TO REMOVE THE BOTTOM PLATE (P.46)

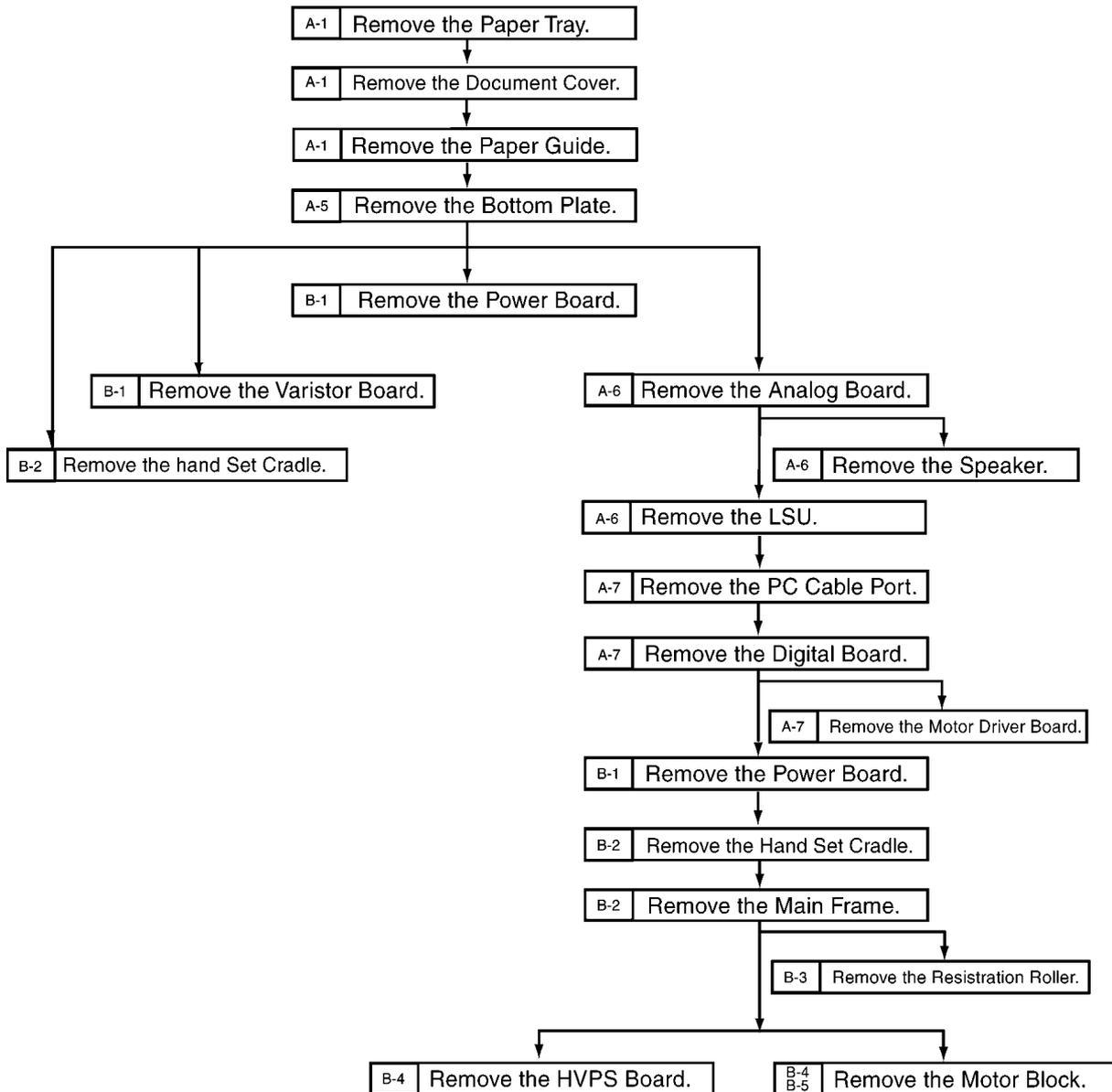
A6: HOW TO REMOVE THE ANALOG BOARD AND LSU (P.47)

A7: HOW TO REMOVE THE DIGITAL BOARD AND MOTOR DRIVER BOARD (P.47)

A9: HOW TO REMOVE THE HEAT ROLLER AND EXIT ROLLER (P.50)

A10: HOW TO REMOVE THE PRESSURE ROLLER (P.50)

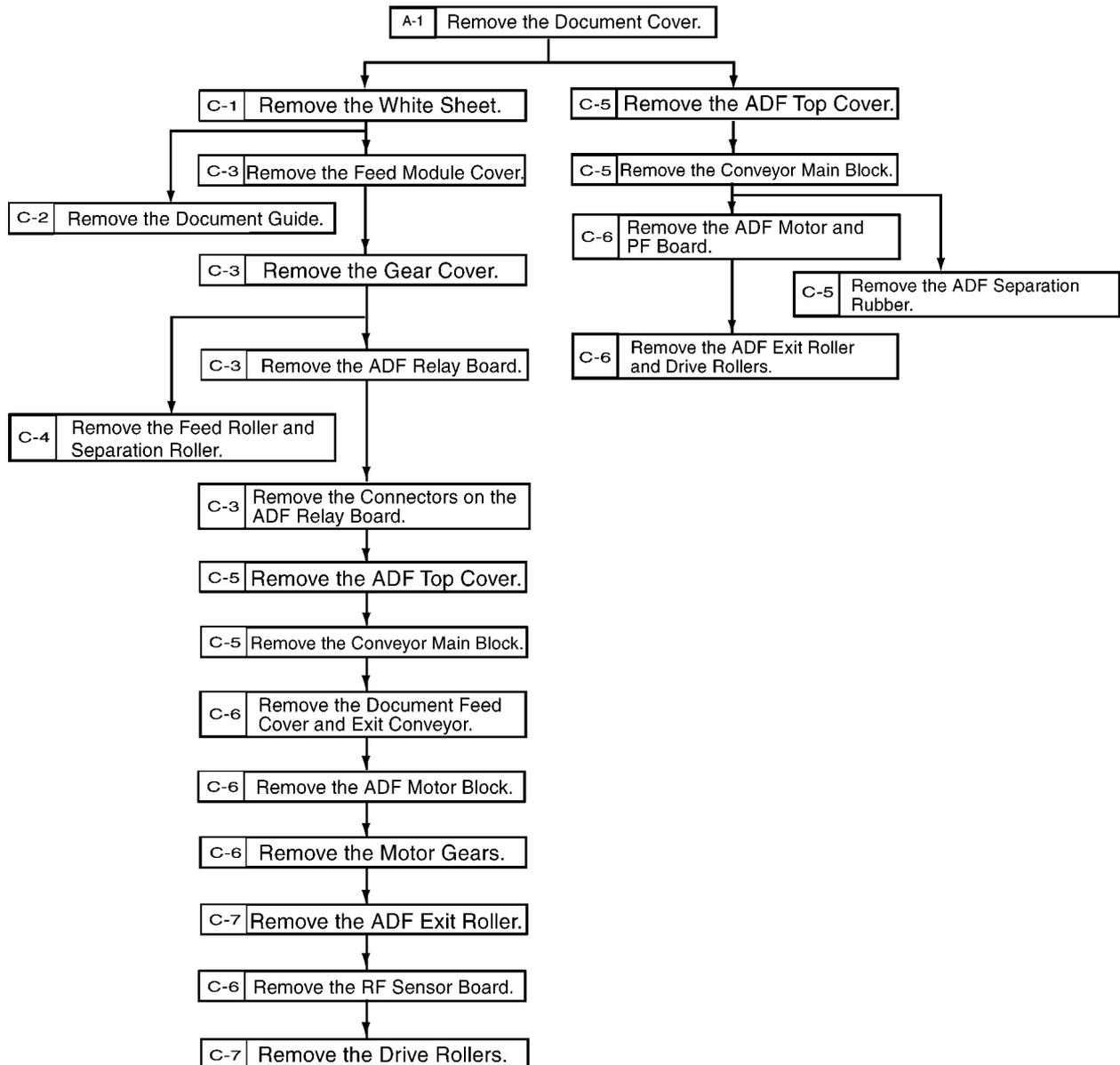
## 5.2. LOWER MAIN CABINET SECTION



### CROSS REFERENCE:

- A1: HOW TO REMOVE THE PAPER TRAY, DOCUMENT COVER AND PAPER GUIDE (P.43)
- A5: HOW TO REMOVE THE BOTTOM PLATE (P.46)
- A6: HOW TO REMOVE THE ANALOG BOARD AND LSU (P.47)
- A7: HOW TO REMOVE THE DIGITAL BOARD AND MOTOR DRIVER BOARD (P.47)
- B1: HOW TO REMOVE THE POWER BOARD, AND VARISTOR BOARD AND AC INLET (P.48)
- B2: HOW TO REMOVE THE MAIN FRAME (P.48)
- B3: HOW TO REMOVE THE REGISTRATION ROLLER (P.49)
- B4: HOW TO REMOVE THE H.V.P.S (P.49)
- B5: HOW TO REMOVE THE MOTOR BLOCK (P.51)

### 5.3. DOCUMENT COVER (ADF) SECTION



#### CROSS REFERENCE:

A1: HOW TO REMOVE THE PAPER TRAY, DOCUMENT COVER AND PAPER GUIDE (P.43)

C1: HOW TO REMOVE THE WHITE SHEET (P.52)

C2: HOW TO REMOVE THE DOCUMENT GUIDE (P.53)

C3: HOW TO REMOVE THE ADF RELAY BOARD (P.53)

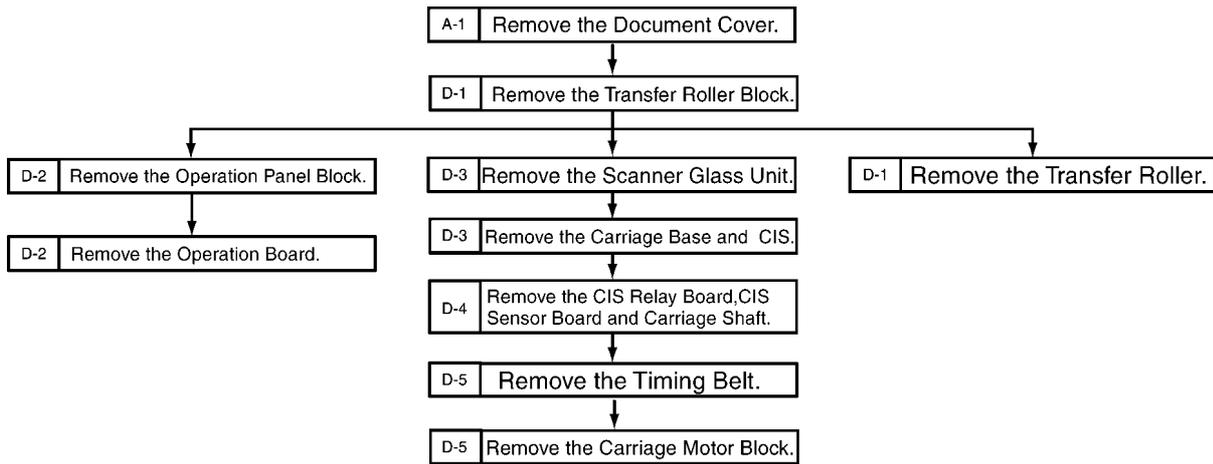
C4: HOW TO REMOVE THE FEED ROLLER AND ADF SEPARATION ROLLER (P.54)

C5: HOW TO REMOVE THE TOP COVER AND CONVEYOR BLOCK (P.55)

C6: HOW TO REMOVE THE ADF MOTOR AND PF SENSOR BOARD (P.56)

C7: HOW TO REMOVE THE ADF EXIT ROLLER AND DRIVE ROLLER (P.56)

## 5.4. PRINTER COVER SECTION



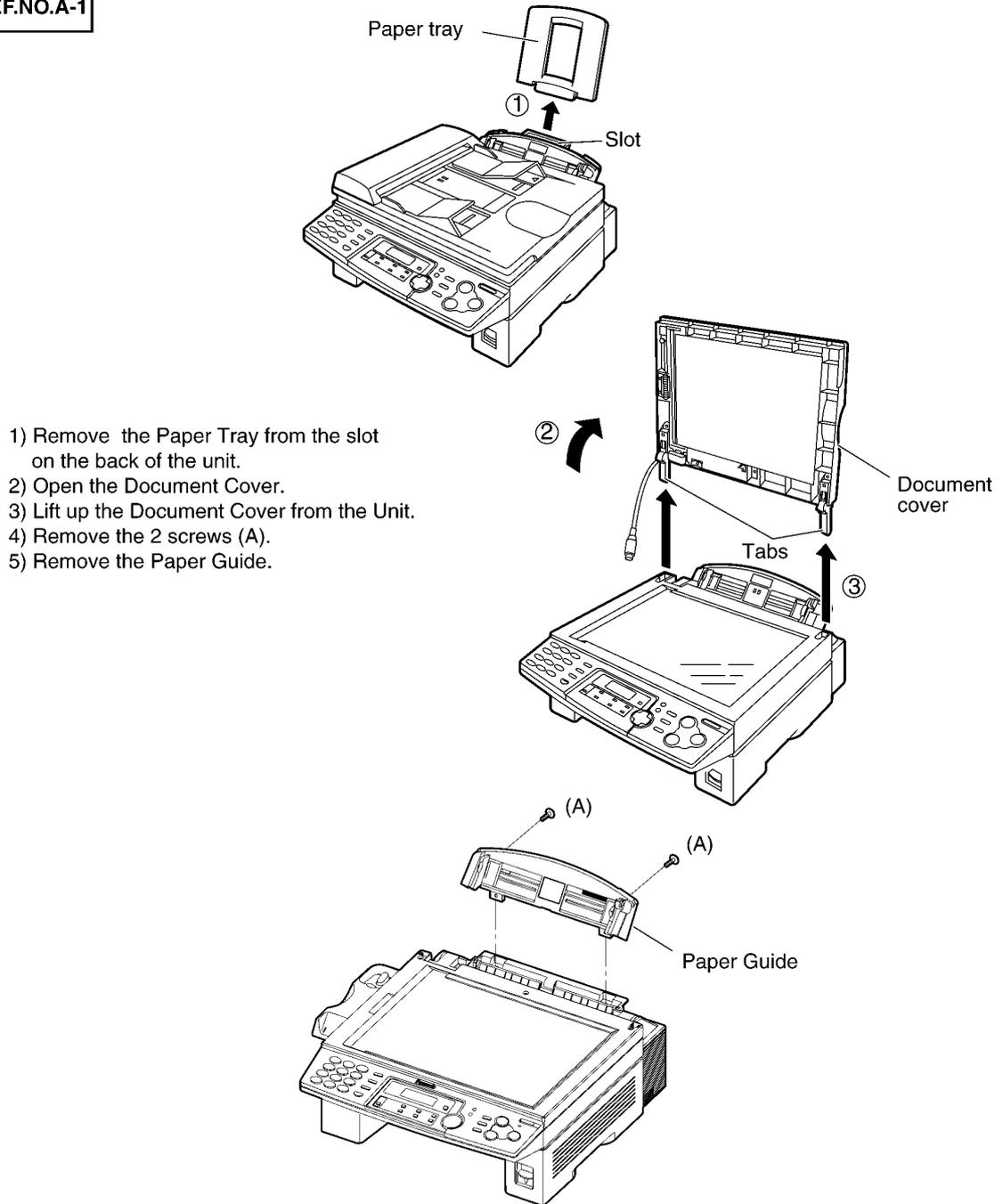
### CROSS REFERENCE:

- A1: HOW TO REMOVE THE PAPER TRAY, DOCUMENT COVER AND PAPER GUIDE (P.43)
- D1: HOW TO REMOVE THE TRANSFER ROLLER (P.57)
- D2: HOW TO REMOVE THE OPERATION BOARD (P.58)
- D3: HOW TO REMOVE THE SCANNER GLASS UNIT AND CIS (P.59)
- D4: HOW TO REMOVE THE CIS RELAY BOARD AND CIS SENSOR BOARD (P.60)
- D5: HOW TO REMOVE THE CARRIAGE MOTOR AND SCAN MOTOR DRIVE BOARD (P.60)

## 5.5. HOW TO REMOVE THE PAPER TRAY, DOCUMENT COVER AND PAPER GUIDE

PROCEDURE: A-1

REF.NO.A-1



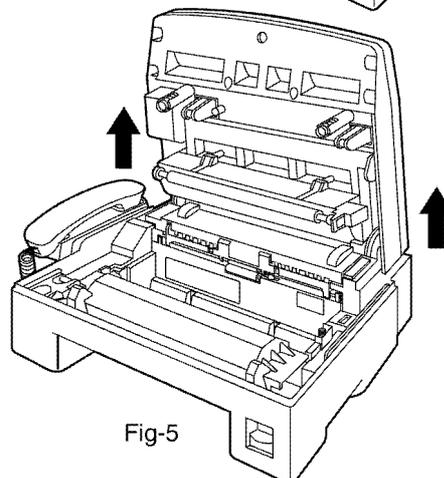
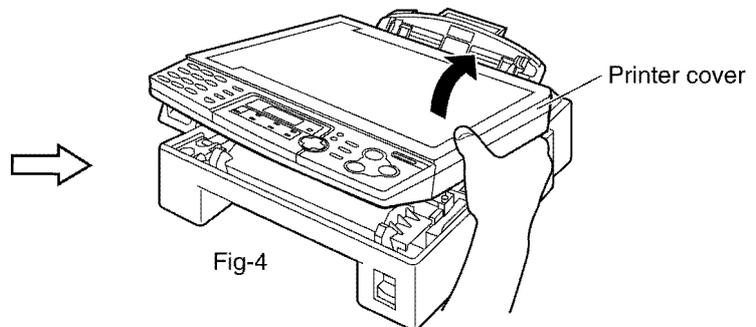
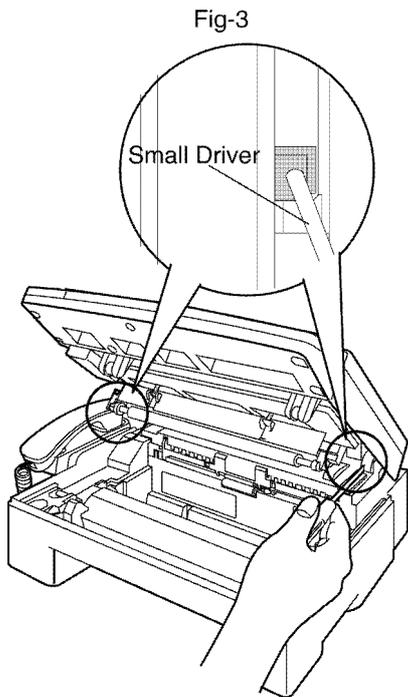
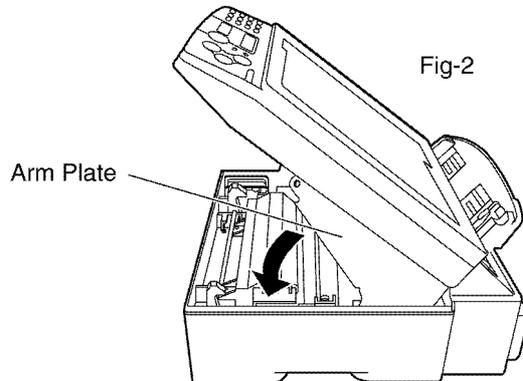
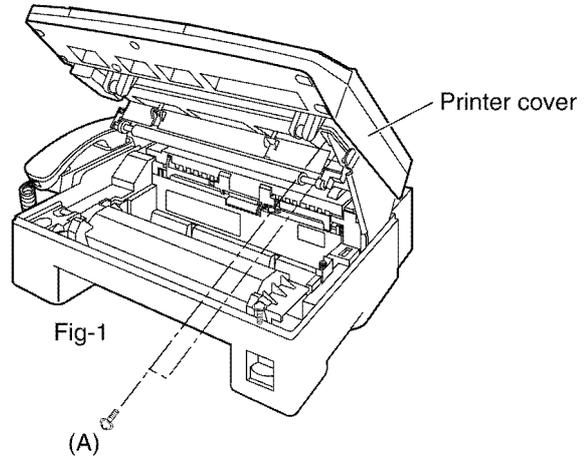
- 1) Remove the Paper Tray from the slot on the back of the unit.
- 2) Open the Document Cover.
- 3) Lift up the Document Cover from the Unit.
- 4) Remove the 2 screws (A).
- 5) Remove the Paper Guide.

## 5.6. HOW TO REMOVE THE PRINTER COVER

PROCEDURE: A-1-->A-2

REF.NO.A-2

- 1) Open the Printer Cover.
- 2) Remove the 2 screws (A). (Fig-1)
- 3) Push down the Arm Plate. (Fig-2)
- 4) Insert the small driver as illustrated in Fig-3.
- 5) Close the Printer Cover with the driver remaining like fig-4 and raise it with the driver. (Fig-4)
- 6) Lift up the Printer Cover. (Fig-5)

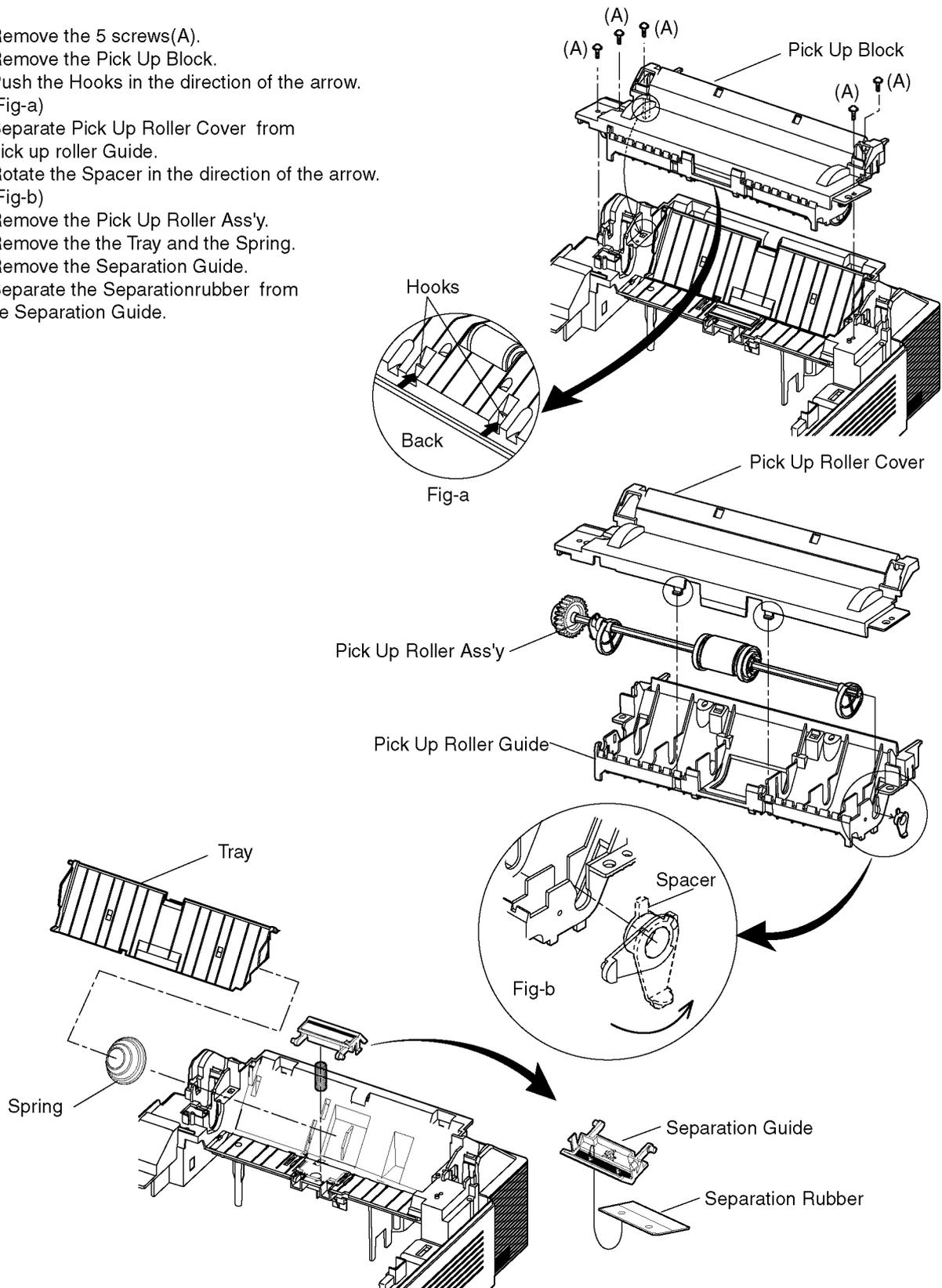


## 5.7. HOW TO REMOVE THE PICK UP ROLLER ASS'Y

PROCEDURE: A-1--> A-2--> A-3

REF.NO.A-3

- 1) Remove the 5 screws(A).
- 2) Remove the Pick Up Block.
- 3) Push the Hooks in the direction of the arrow.  
(Fig-a)
- 4) Separate Pick Up Roller Cover from Pick up roller Guide.
- 5) Rotate the Spacer in the direction of the arrow.  
(Fig-b)
- 6) Remove the Pick Up Roller Ass'y.
- 7) Remove the the Tray and the Spring.
- 8) Remove the Separation Guide.
- 9) Separate the Separationrubber from the Separation Guide.

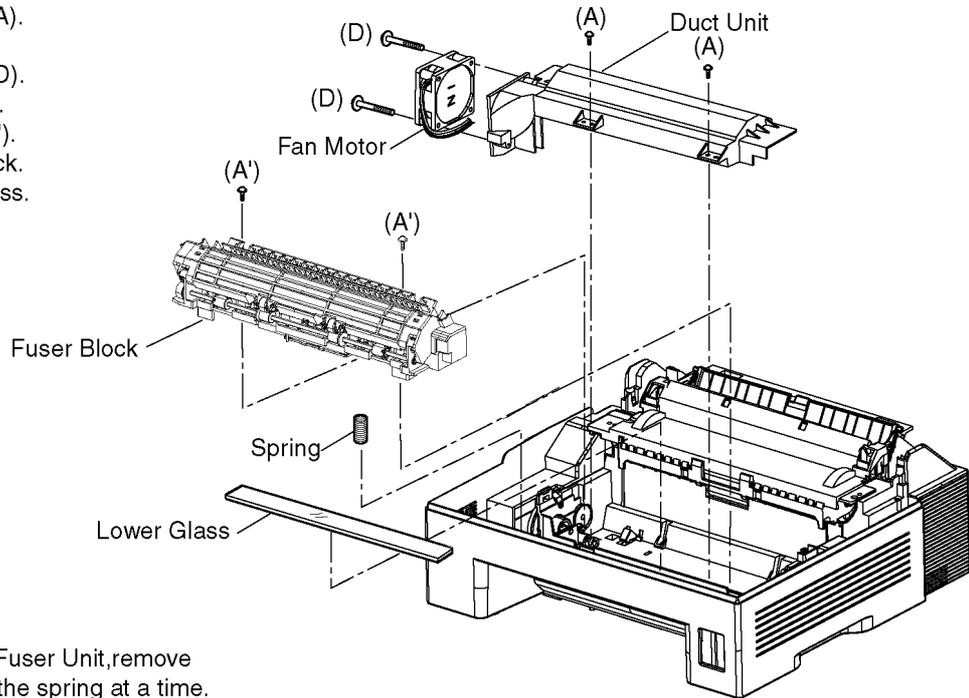


## 5.8. HOW TO REMOVE THE DUCT UNIT AND FAN MOTOR

PROCEDURE: A-1--> A-2--> A5--> A6--> A7--> A4

### REF.NO.A-4

- 1) Remove the 2 screws(A).
- 2) Remove the Duct Unit.
- 3) Remove the 2 screws(D).
- 4) Remove the Fan Motor.
- 5) Remove the 2 screw(A').
- 6) Remove the Fuser Block.
- 7) Remove the Lower Glass.
- 8) Remove the Spring.



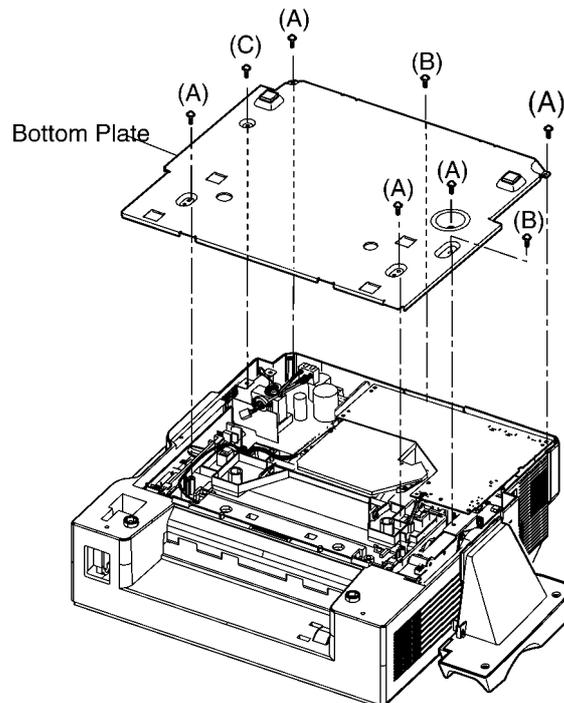
Note: When removing the Fuser Unit,remove the lower glass and the spring at a time.

## 5.9. HOW TO REMOVE THE BOTTOM PLATE

PROCEDURE: A1--> A-5

### REF.NO.A-5

- 1) Remove the 5 screws (A).
- 2) Remove the 2 screws (B).
- 3) Remove the screw (C).
- 4) Remove the Bottom Plate.

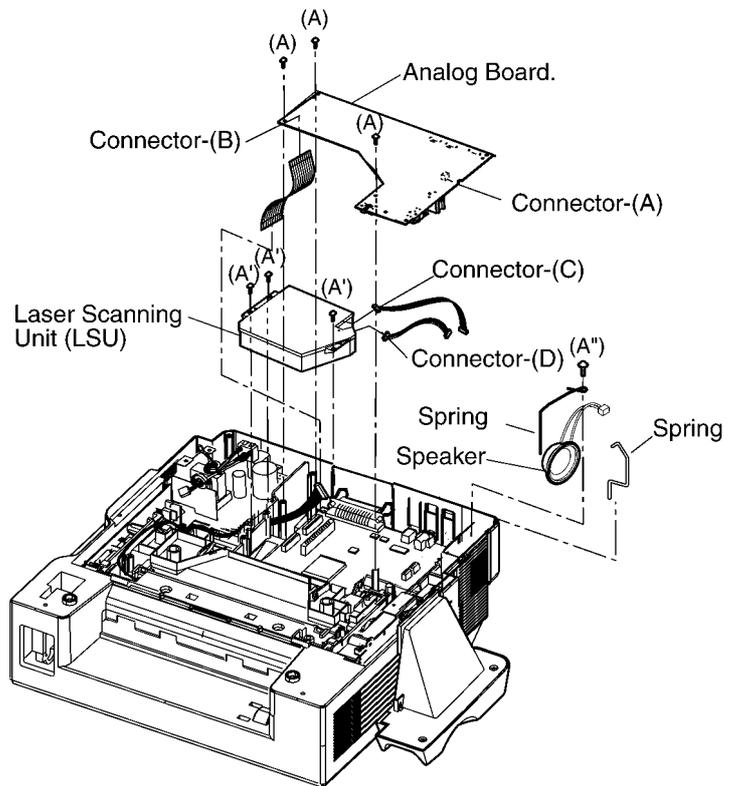


## 5.10. HOW TO REMOVE THE ANALOG BOARD AND LSU

PROCEDURE: A-1--> A-5--> A-6

### REF.NO.A-6

- 1) Remove the 3 screws (A).
- 2) Remove the Connector-(A) ,then remove the Connector- (B).
- 3) Remove the Analog Board.
- 4) Remove the 3 screws (A').
- 5) Remove the Connector-(C) and (D).
- 6) Remove the Laser Scanning Unit.
- 7) Remove the screw (A'').
- 8) Remove the 2 Springs and the Speaker

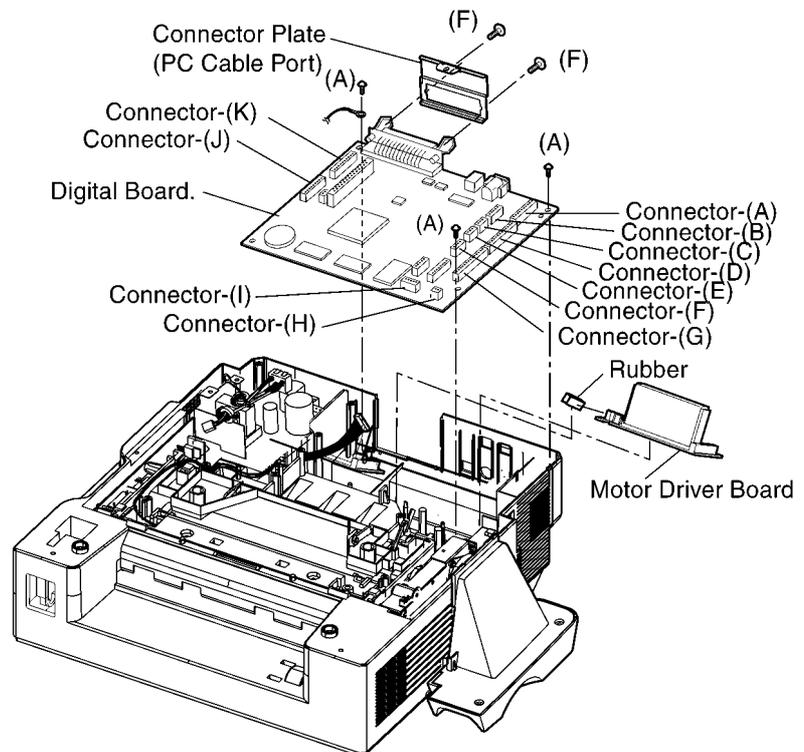


## 5.11. HOW TO REMOVE THE DIGITAL BOARD AND MOTOR DRIVER BOARD

PROCEDURE: A-1--> A-5--> A-6--> A-7

### REF.NO.A-7

- 1) Remove the 2 screws (F).
- 2) Remove the Connector Plate.
- 3) Remove the 3 screws (A).
- 4) Remove 11 Connectors (A)-(K).
- 5) Remove the Digital Board.
- 6) Take out the Rubber.
- 7) Remove the Motor Driver Board.

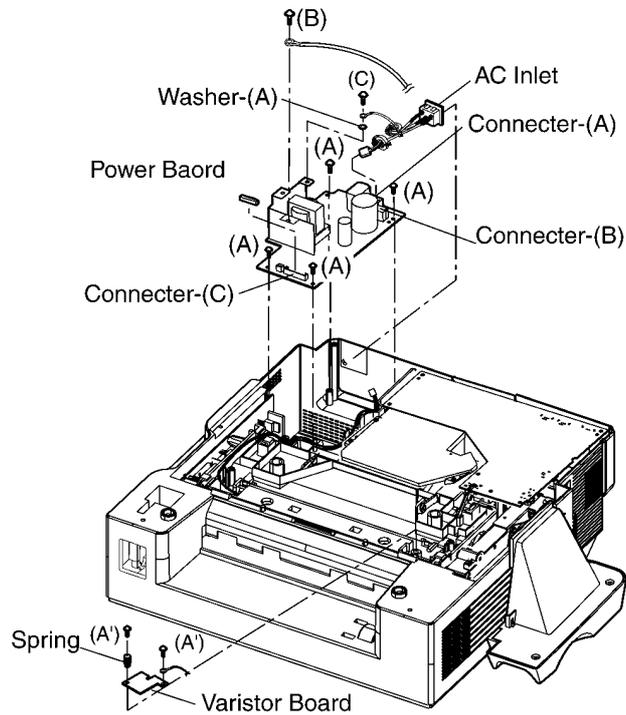


## 5.12. HOW TO REMOVE THE POWER BOARD, AND VARISTOR BOARD AND AC INLET

PROCEDURE: A-1--> A-5--> B-1

REF.NO.B-1

- 1) Remove the Connector-(A).
- 2) Remove the screw(C) and Washer-(A).
- 3) Remove the AC Inlet.
- 4) Remove the 4 screws (A).
- 5) Remove the Connector-(B) and (C).
- 6) Remove the screw (B).
- 7) Remove the Power Board.
- 8) Remove the 2 screw(A').
- 9) Remove the Spring.
- 10) Remove the Varistor Board.

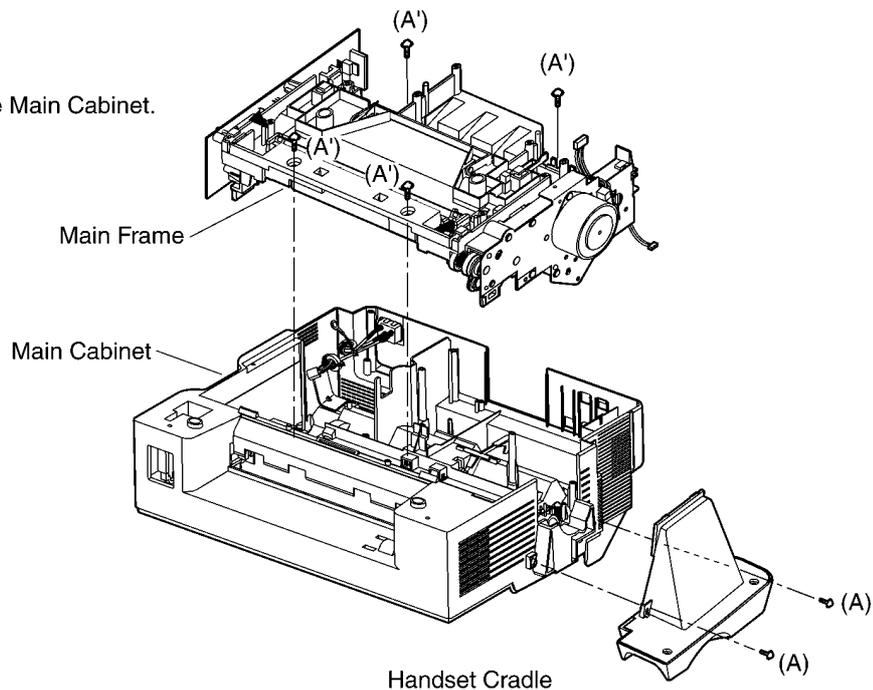


## 5.13. HOW TO REMOVE THE MAIN FRAME

PROCEDURE: A-1--> A-4--> A-5--> A-6--> A-7--> B-1--> B-2

REF.NO.B-2

- 1) Remove the 2 screws (A).
- 2) Remove the Handset Cradle.
- 3) Remove the 4 screws (A').
- 2) Lift up the Main Frame From the Main Cabinet.

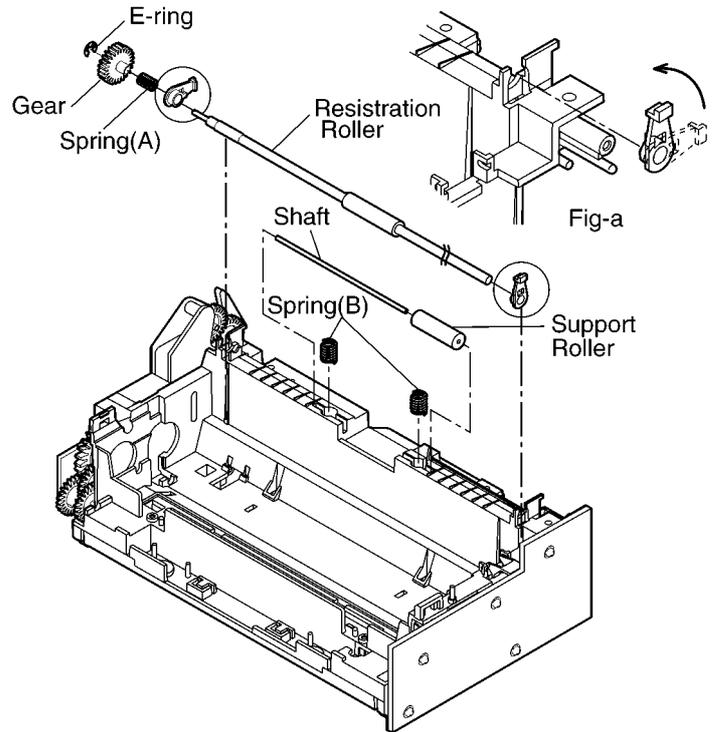


## 5.14. HOW TO REMOVE THE REGISTRATION ROLLER

PROCEDURE: A-1--> A-4--> A-5--> A-6--> A-7--> B-1--> B-2--> B-3

REF.NO.B-3

- 1) Rotate the Spacer in the direction of the arrow.  
(Fig-a)
- 2) Remove the E-ring
- 4) Remove the Spring (A).
- 5) Remove the Resistration Roller.
- 6) Remove the Support Roller and the Shaft.
- 7) Remove the 2 Springs (B).

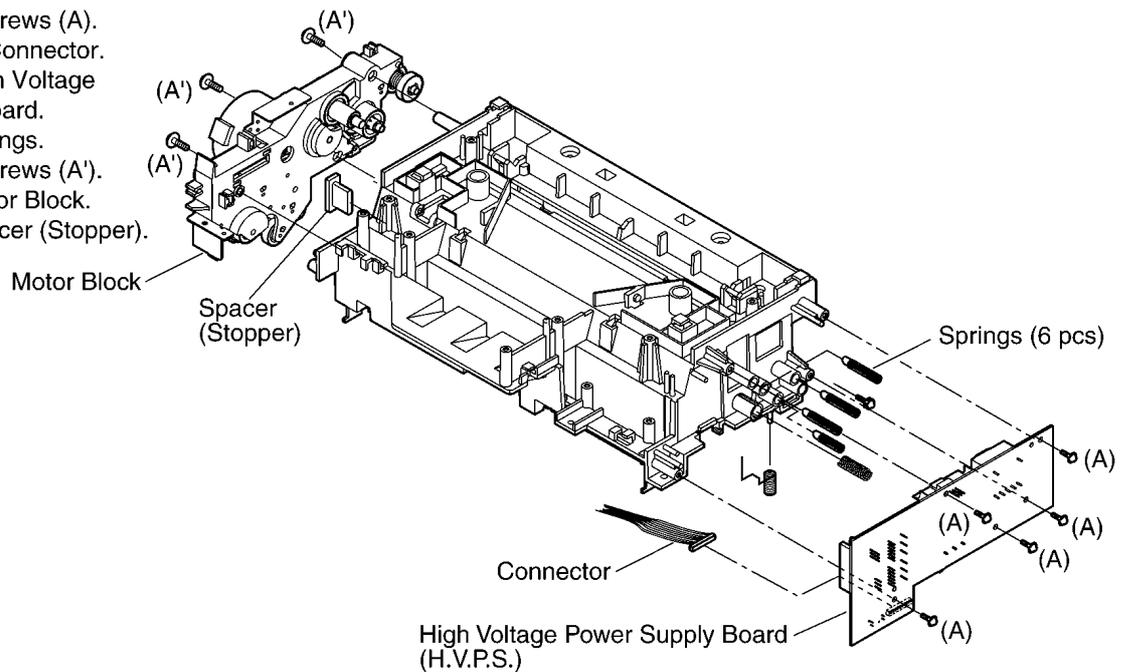


## 5.15. HOW TO REMOVE THE H.V.P.S

PROCEDURE: A-1--> A-4--> A-5--> A-6--> A-7--> B-1--> B-2--> B-4

REF.NO.B-4

- 1) Remove the 5 screws (A).
- 2) Disconnect the Connector.
- 3) Remove the High Voltage Power Supply Board.
- 4) Remove the Springs.
- 5) Remove the 3 screws (A').
- 6) Remove the Motor Block.
- 7) Remove the Spacer (Stopper).



## 5.16. HOW TO REMOVE THE HEAT ROLLER AND EXIT ROLLER

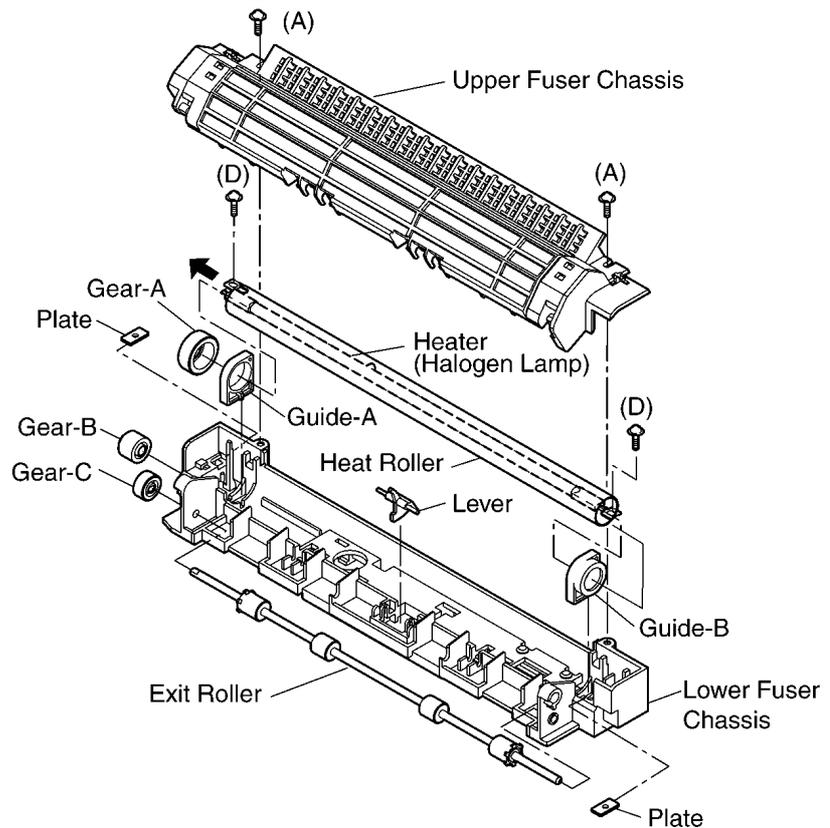
PROCEDURE: A-1--> A-2--> A-4--> A-9

### REF.NO.A-9

- 1) Remove the 2 screws (A).
- 2) Remove the Upper Fuser Chassis.
- 3) Remove the 2 screws (D).
- 4) Remove the Heat Roller.
- 5) Pull out the Heater in the direction of the arrow as shown to take it out of the Heat Guide.

**\*Do not touch the glass part of the Heater (Halogen Lamp).**

- 6) Remove the Gear-A, Guide-A, B and the Plates.
- 7) Remove the Gear-B and C.
- 8) Remove the Exit Roller.

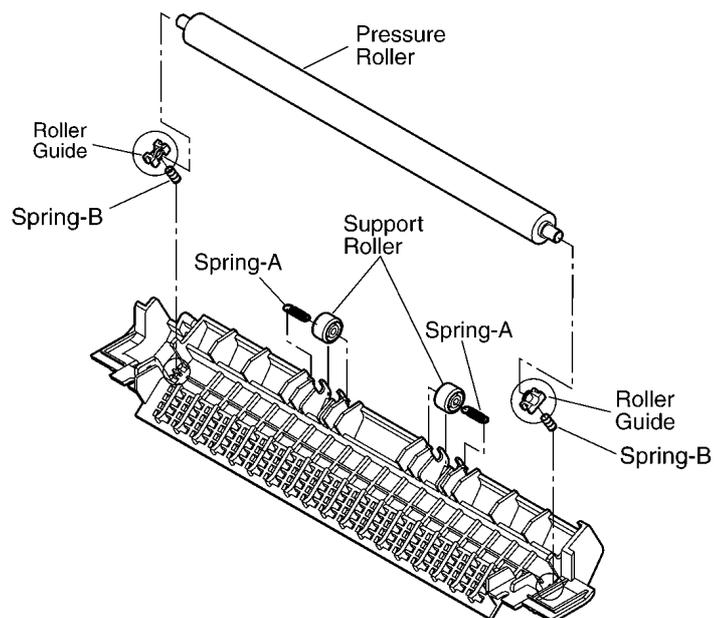


## 5.17. HOW TO REMOVE THE PRESSURE ROLLER

PROCEDURE: A-1--> A-2--> A-4--> A-9--> A-10

### REF.NO.A-10

- 1) Remove the 2 Springs-(A) and 2 Support Rollers.
- 2) Remove the 2 Roller Guides.
- 3) Remove the Pressure Roller.
- 4) Remove the 2 Springs-(B).

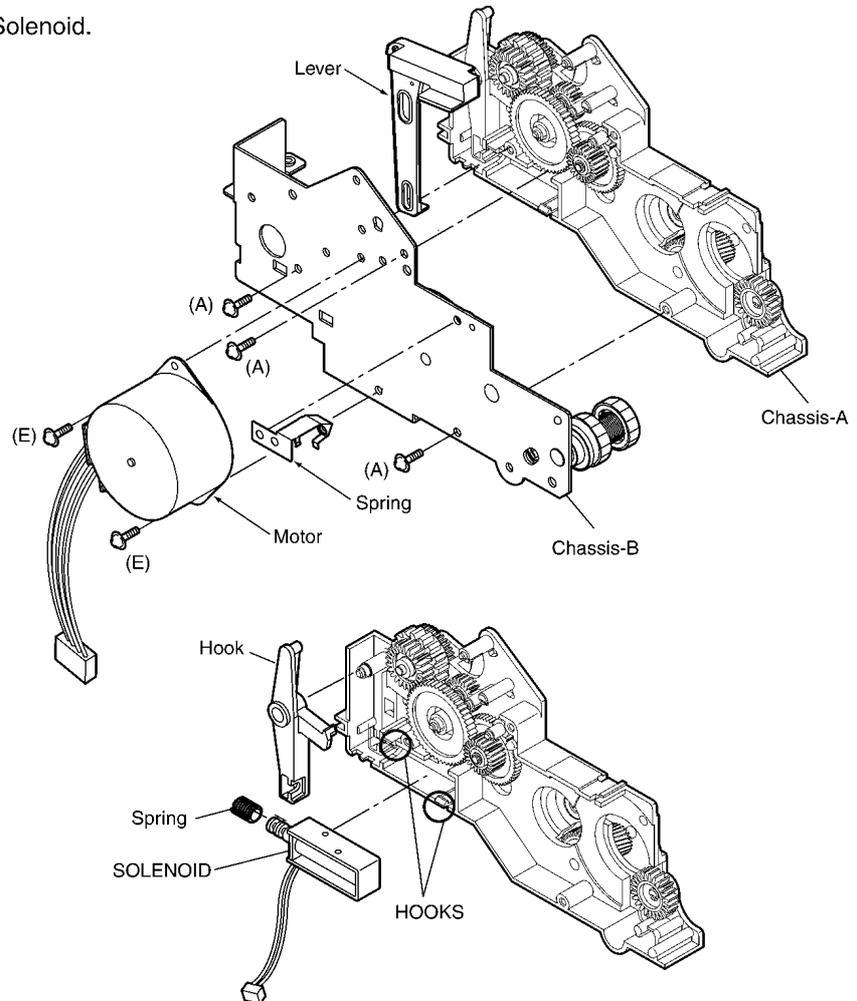


## 5.18. HOW TO REMOVE THE MOTOR BLOCK

PROCEDURE: A-1--> A-5--> A-6--> A-7--> B-1--> B-2--> B-4--> B-5

REF.NO.B-5

- 1) Remove the 2 screws (E).
- 2) Remove the Motor.
- 3) Remove the 3 screws (A).
- 4) Separate the Chassis-B from the Chassis-A.
- 5) Remove the Lever.
- 6) Unhook and remove the Solenoid.
- 7) Remove the Spring.

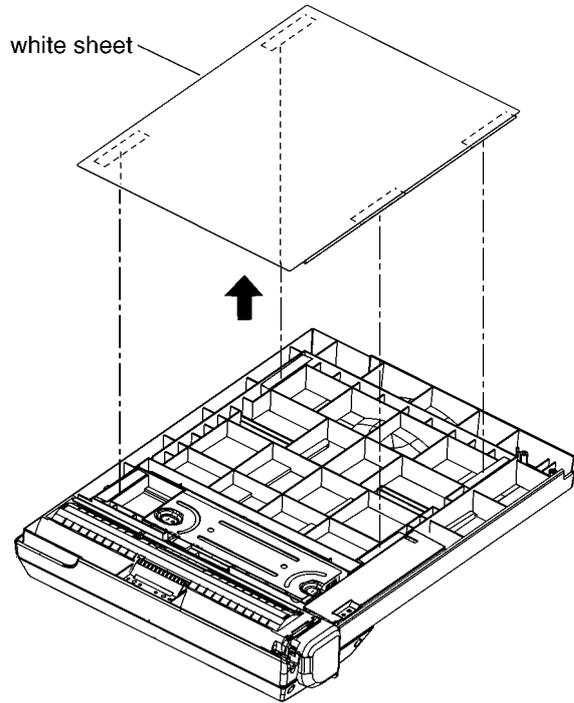


## 5.19. HOW TO REMOVE THE WHITE SHEET

PROCEDURE: A-1--> C-1

REF.NO.C-1

1) Remove the white sheet.

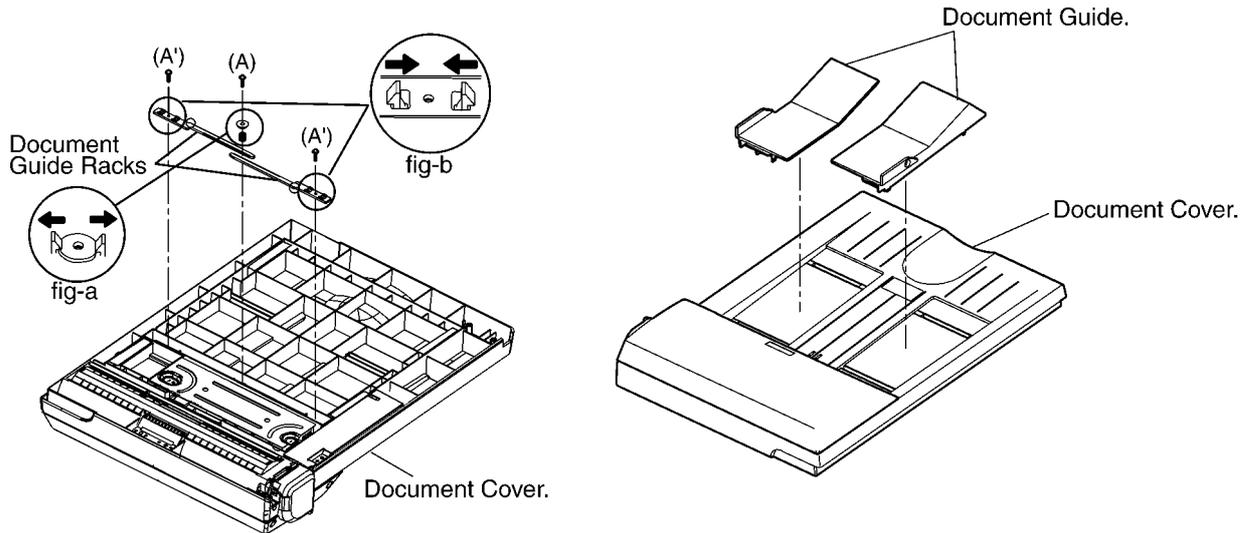


## 5.20. HOW TO REMOVE THE DOCUMENT GUIDE

PROCEDURE: A-1--> C-1--> C-2

REF.NO.C-2

- 1) Remove the 1 screw (A)
- 2) Release the washer from the hooks.  
by pushing in derection of illustrated in fig-a.
- 3) Remove the 2 screws (A').
- 4) Release the 2 hooks as shown in fig-b
- 5) Remove the Document Guide Racks.
- 6) Reverse the Document Cover.
- 7) Lift up the 2 Document Guide from Document Cover.

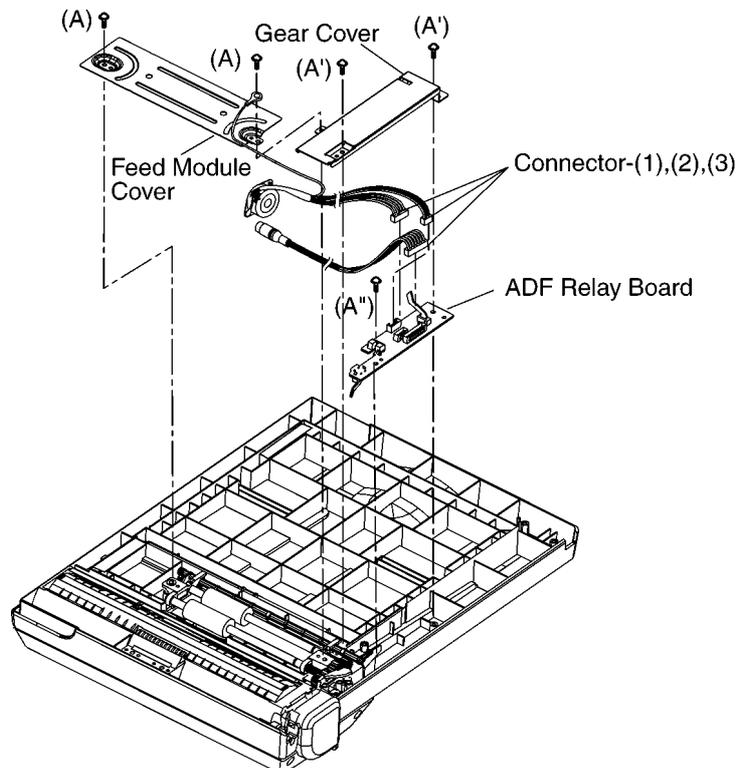


## 5.21. HOW TO REMOVE THE ADF RELAY BOARD

PROCEDURE: A-1--> C-1--> C-3

REF.NO.C-3

- 1) Remove the 2 screws (A).
- 2) Remove the Feed Module Cover.
- 3) Remove the 2 screws (A').
- 4) Remove the Gear Cover.
- 5) Remove the Connector-(1),(2),(3).
- 6) Remove the 1 screw (A").
- 7) Remove the ADF Relay Board.

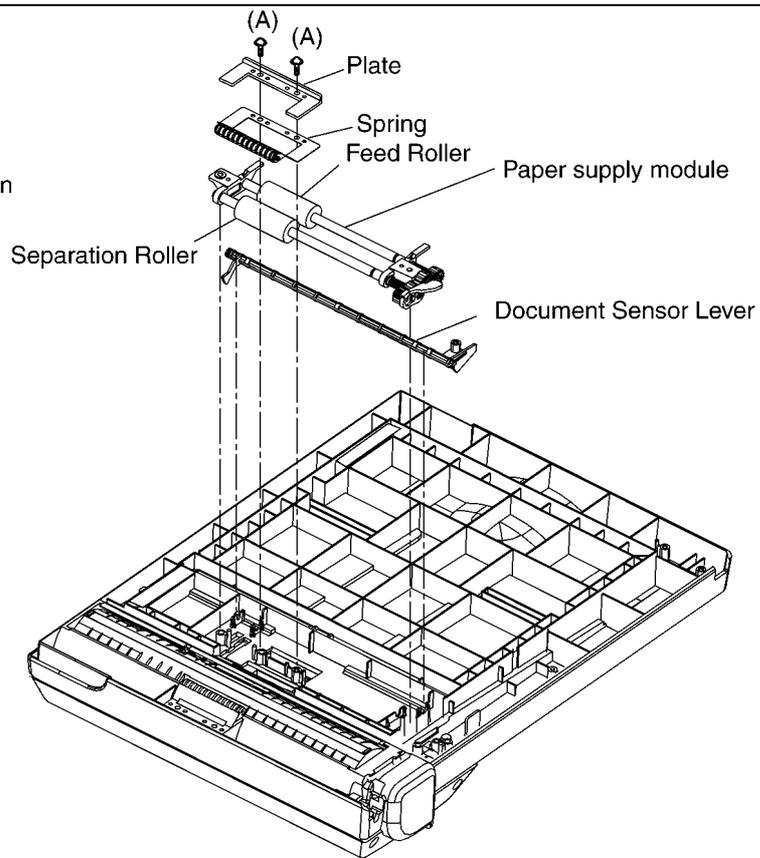


## 5.22. HOW TO REMOVE THE FEED ROLLER AND ADF SEPARATION ROLLER

PROCEDURE: A-1--> C-1--> C-3--> C-4

### REF.NO.C-4

- 1) Remove the 2 screws (A).
- 2) Remove the Plate and Spring.
- 3) Lift up the Paper Supply Module.
- 4) Remove the Feed Roller and Separation Roller.
- 5) Remove the Document Sensor Lever.

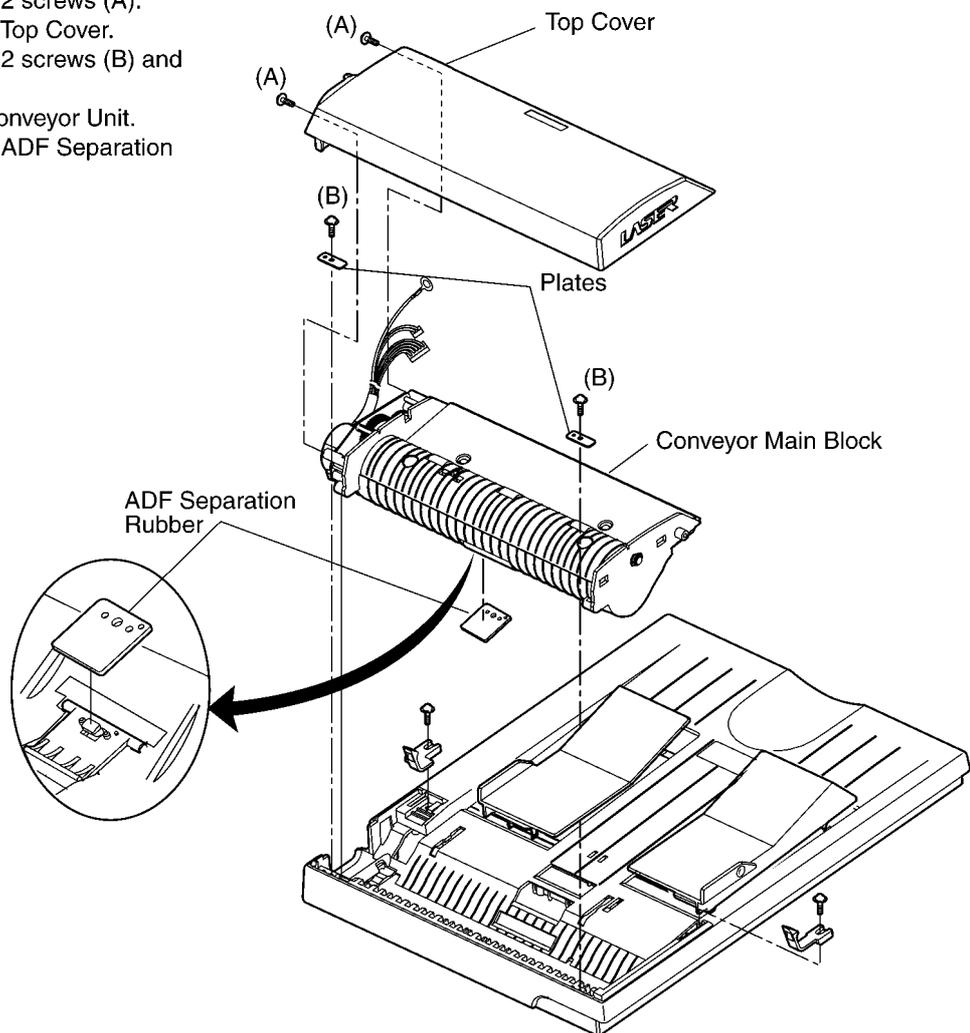


## 5.23. HOW TO REMOVE THE TOP COVER AND CONVEYOR BLOCK

PROCEDURE: A-1--> C-5

REF.NO.C-5

- 1) Remove the 2 screws (A).
- 2) Remove the Top Cover.
- 3) Remove the 2 screws (B) and 2 Plates.
- 4) Lift up the Conveyor Unit.
- 5) Remove the ADF Separation Rubber.

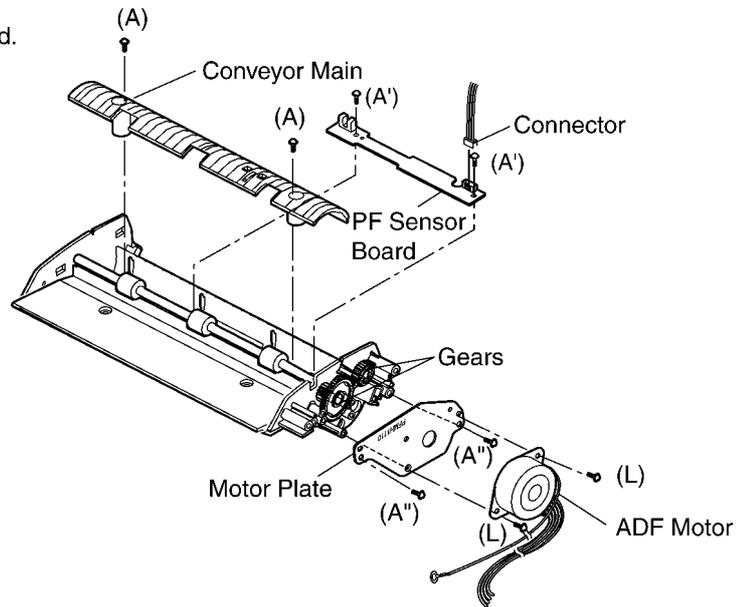


## 5.24. HOW TO REMOVE THE ADF MOTOR AND PF SENSOR BOARD

PROCEDURE: A-1--> C-5--> C-6

REF.NO.C-6

- 1) Remove the 2 screws (A).
- 2) Remove the Conveyor Main.
- 3) Remove the Connector on the PF Sensor Board.
- 4) Remove the 2 Screws (A')
- 5) Remove the PF Sensor Board.
- 6) Remove the 2 Screws (L).
- 7) Remove the ADF Motor.
- 8) Remove the 2 screws (A'').
- 9) Remove the Motor Plate.
- 10) Remove the gears.

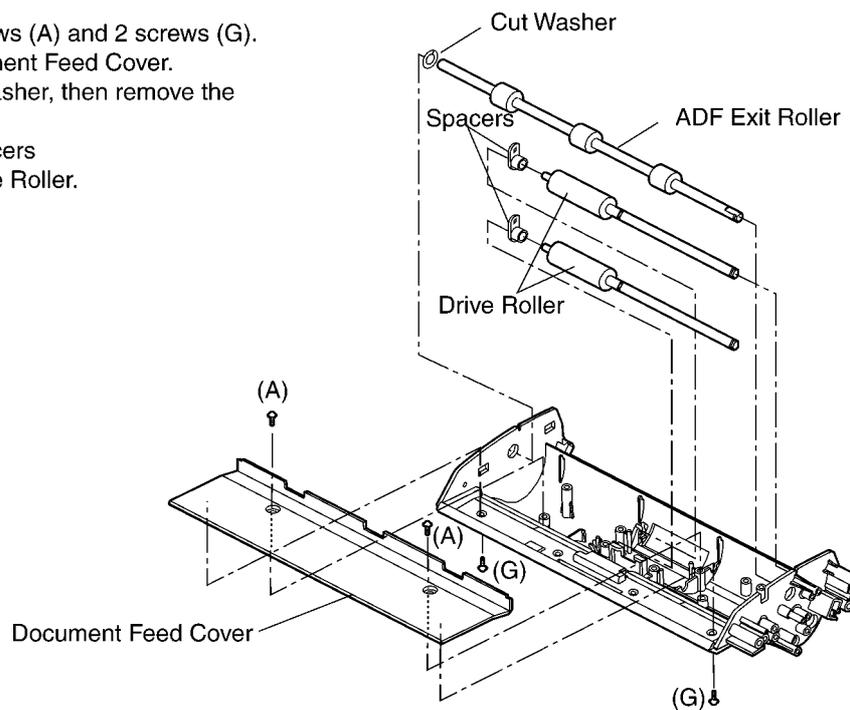


## 5.25. HOW TO REMOVE THE ADF EXIT ROLLER AND DRIVE ROLLER

PROCEDURE: A-1--> C-5--> C-6--> C-7

REF.NO.C-7

- 1) Remove the 2 screws (A) and 2 screws (G).
- 2) Remove the Document Feed Cover.
- 3) Remove the Cut washer, then remove the ADF Exit Roller.
- 5) Remove the 2 Spacers.
- 6) Remove the 2 Drive Roller.

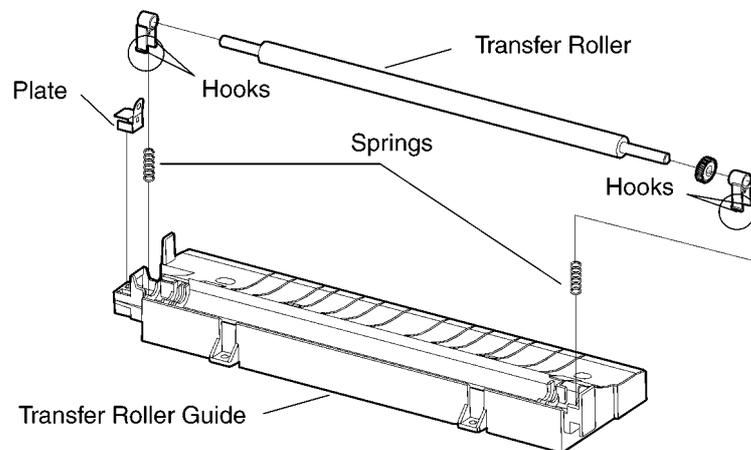
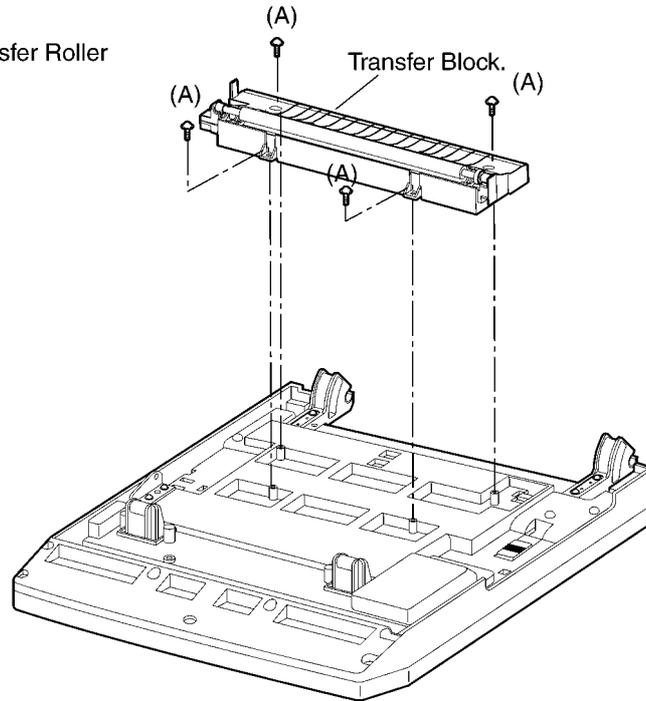


## 5.26. HOW TO REMOVE THE TRANSFER ROLLER

PROCEDURE: A-1--> D-2--> D-1

REF.NO.D-1

- 1) Remove the 4 screws (A).
- 2) Remove Transfer Block.
- 3) Release the Hooks from the Transfer Roller Guide.
- 4) Lift up the Transfer Roller.
- 5) Remove 2 Springs.
- 6) Remove the Plate.

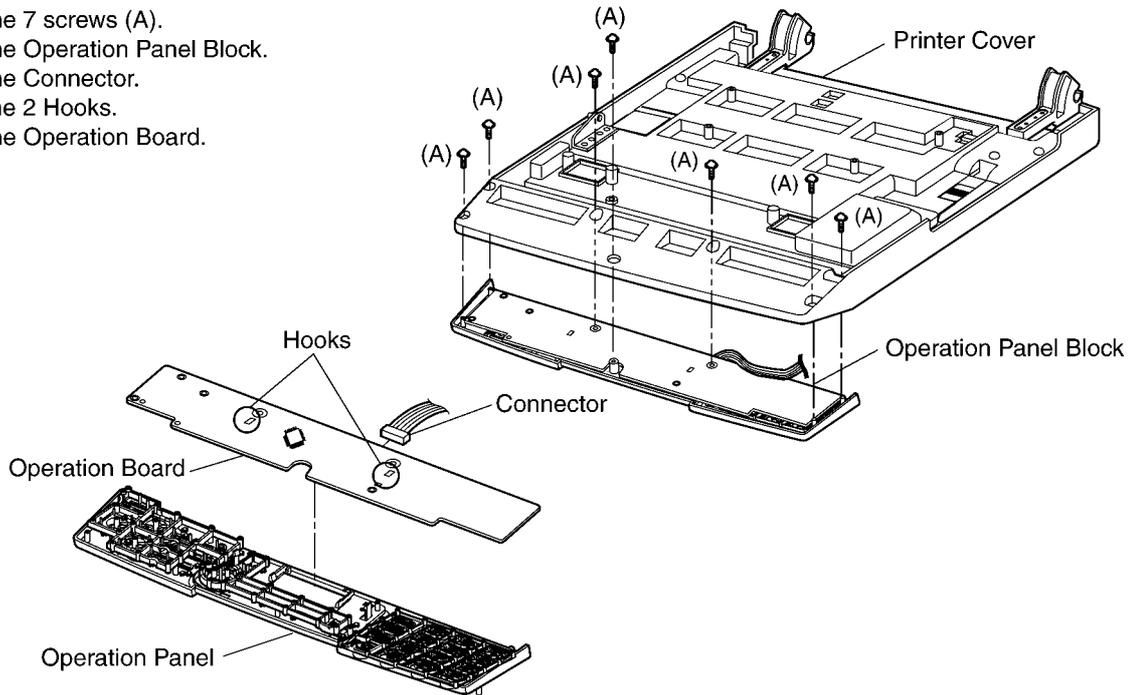


## 5.27. HOW TO REMOVE THE OPERATION BOARD

PROCEDURE: A-1--> A-2--> D-1--> D-2

REF.NO.D-2

- 1) Remove the 7 screws (A).
- 2) Remove the Operation Panel Block.
- 3) Remove the Connector.
- 4) Release the 2 Hooks.
- 5) Remove the Operation Board.

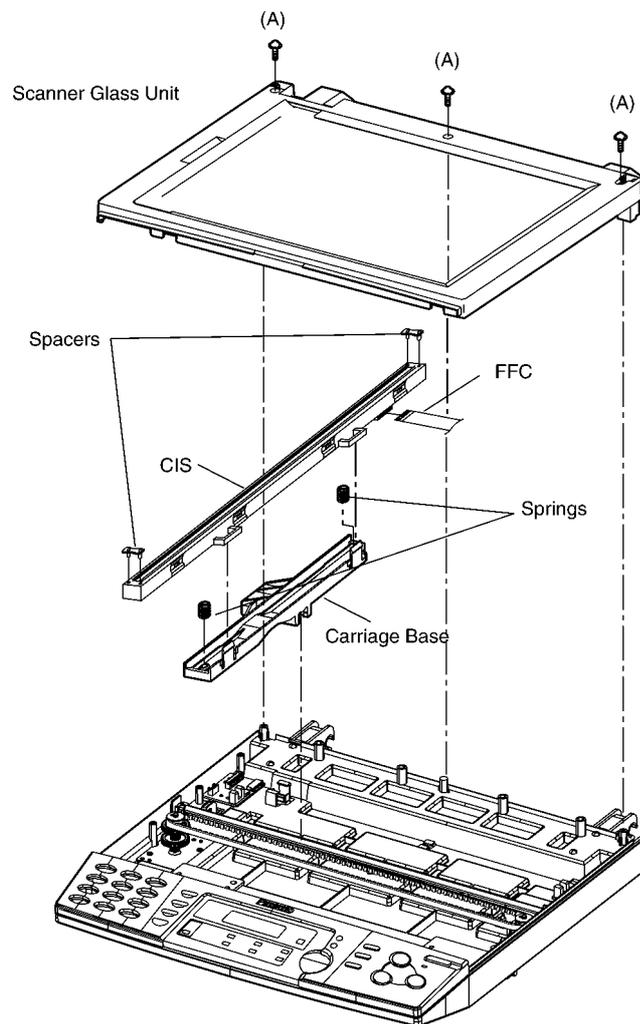


## 5.28. HOW TO REMOVE THE SCANNER GLASS UNIT AND CIS

PROCEDURE: A-1--> A-2--> D-1--> D-3

REF.NO.D-3

- 1) Remove 3 screws (A)
- 2) Lift up the Scanner Glass Unit.
- 3) Remove the 2 Spacers.
  - \* **Take care not to lose the spacers.**
- 4) Remove the FFC.
- 5) Lift up the CIS from the Carriage Base.
  - \* **Take care not to touch the top of the CIS.**
- 6) Remove the Springs.
- 7) Remove the Carriage Base.

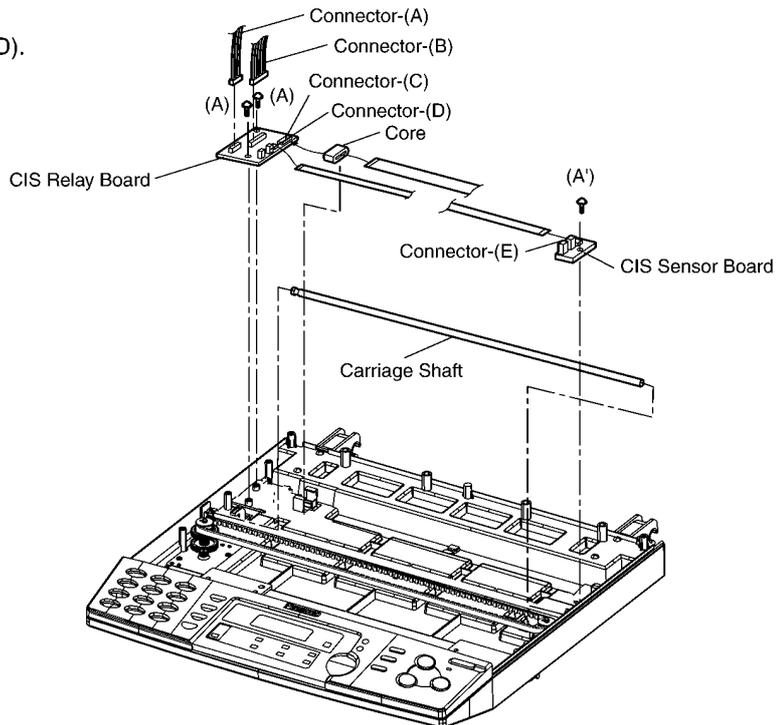


## 5.29. HOW TO REMOVE THE CIS RELAY BOARD AND CIS SENSOR BOARD

PROCEDURE: A-1--> A-2--> D-3--> D-4

REF.NO.D-4

- 1) Remove the Connectors-(A),(B),(C) and (D).
- 2) Remove the 2 screws-(A).
- 3) Remove the CIS Relay Board.
- 4) Remove the Connector-(E).
- 5) Remove the screw -(A').
- 6) Remove the CIS Sensor Board.
- 7) Remove the Carriage Shaft.

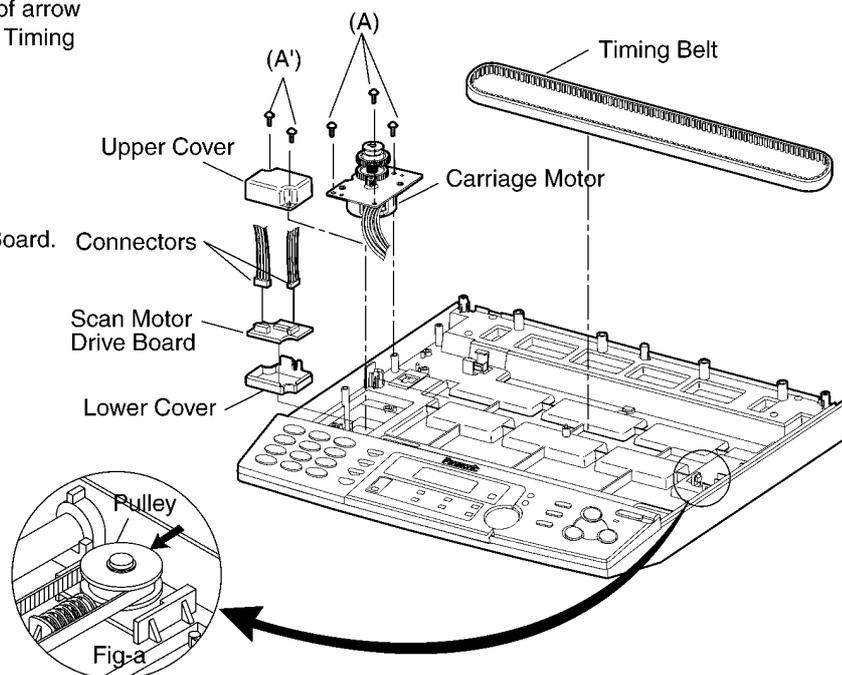


## 5.30. HOW TO REMOVE THE CARRIAGE MOTOR AND SCAN MOTOR DRIVE BOARD

PROCEDURE: A-1--> A-2--> D-3--> D-4--> D-5

REF.NO.D-5

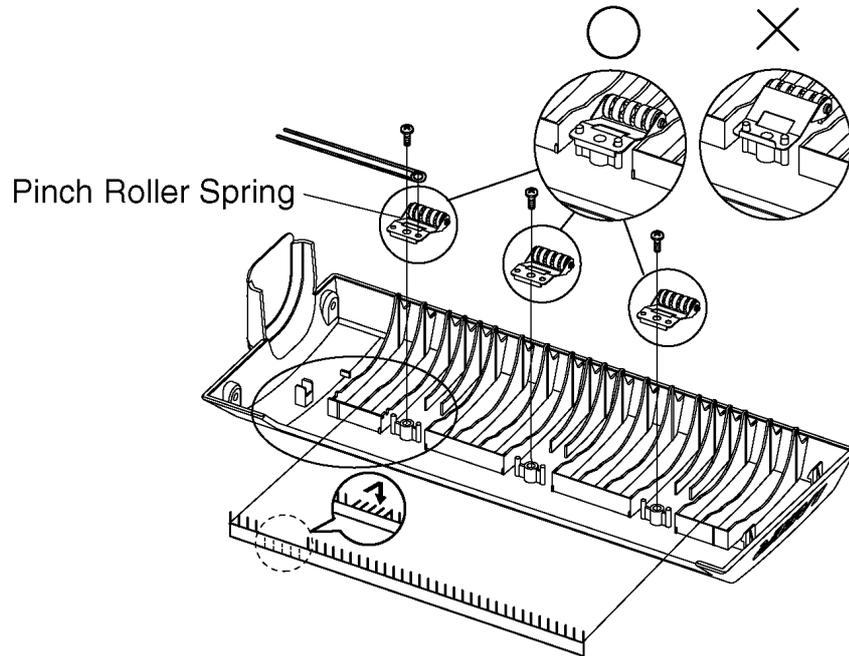
- 1) Push the Pulley in the direction of arrow as shown in Fig-a to remove the Timing Belt.
- 2) Remove the 3 screws (A).
- 3) Remove the Carriage Motor.
- 4) Remove the 2 screws (A').
- 5) Remove the Upper Cover.
- 6) Remove the 2 Connectors.
- 7) Remove the Scan Motor Drive Board.
- 8) Remove the Lower Cover.



## 5.31. NOTES FOR ASSEMBLING

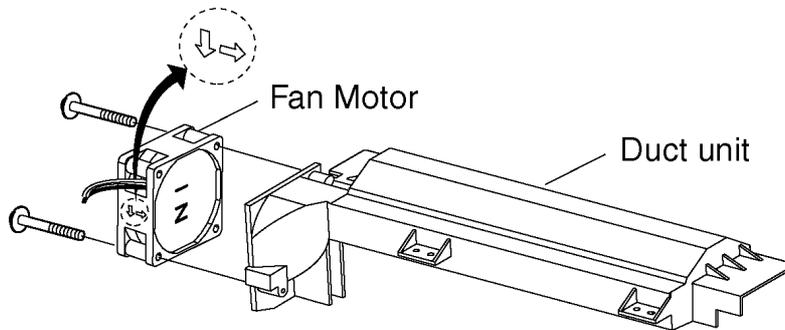
### 5.31.1. PINCH ROLLER SPRING

Be sure the direction of the installing the Pinch Roller Springs.



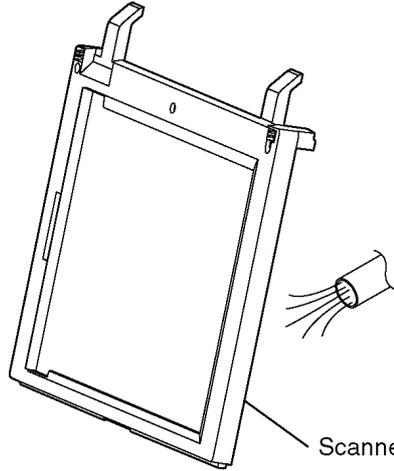
### 5.31.2. FAN MOTOR

When attaching the Fan Motor to the Duct Unit, be sure the Direction of the Motor.



### 5.31.3. SCANNER GLASS ASS'Y

Assemble after air suction .



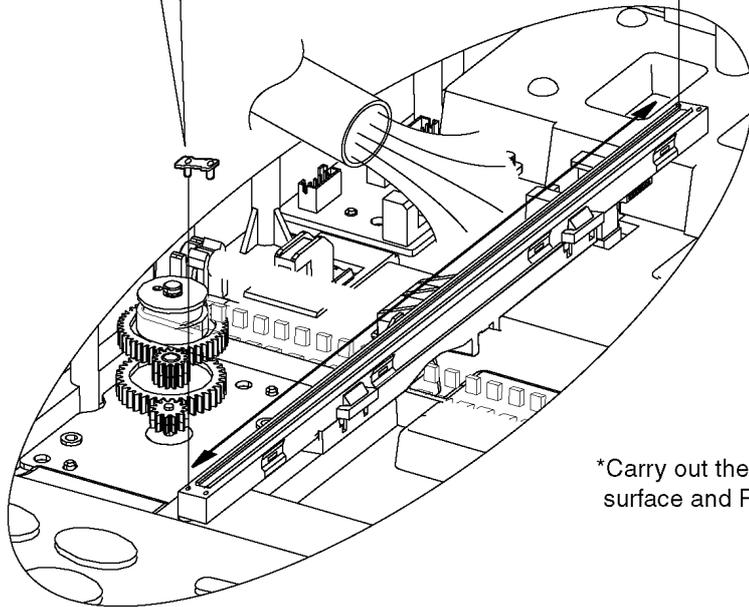
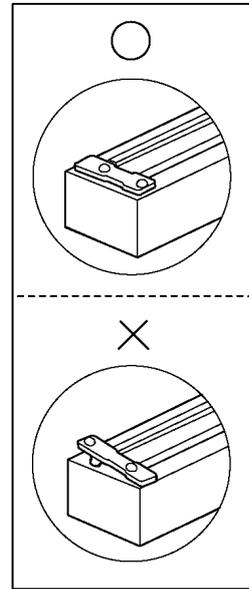
Trash,dust,dirt fingerprint,and so on must not adhere to the back of glass. (The inside of the set.)

Scanner Glass Ass'y

\*Diameter: bigger

Pay attention to the direction of the installation.

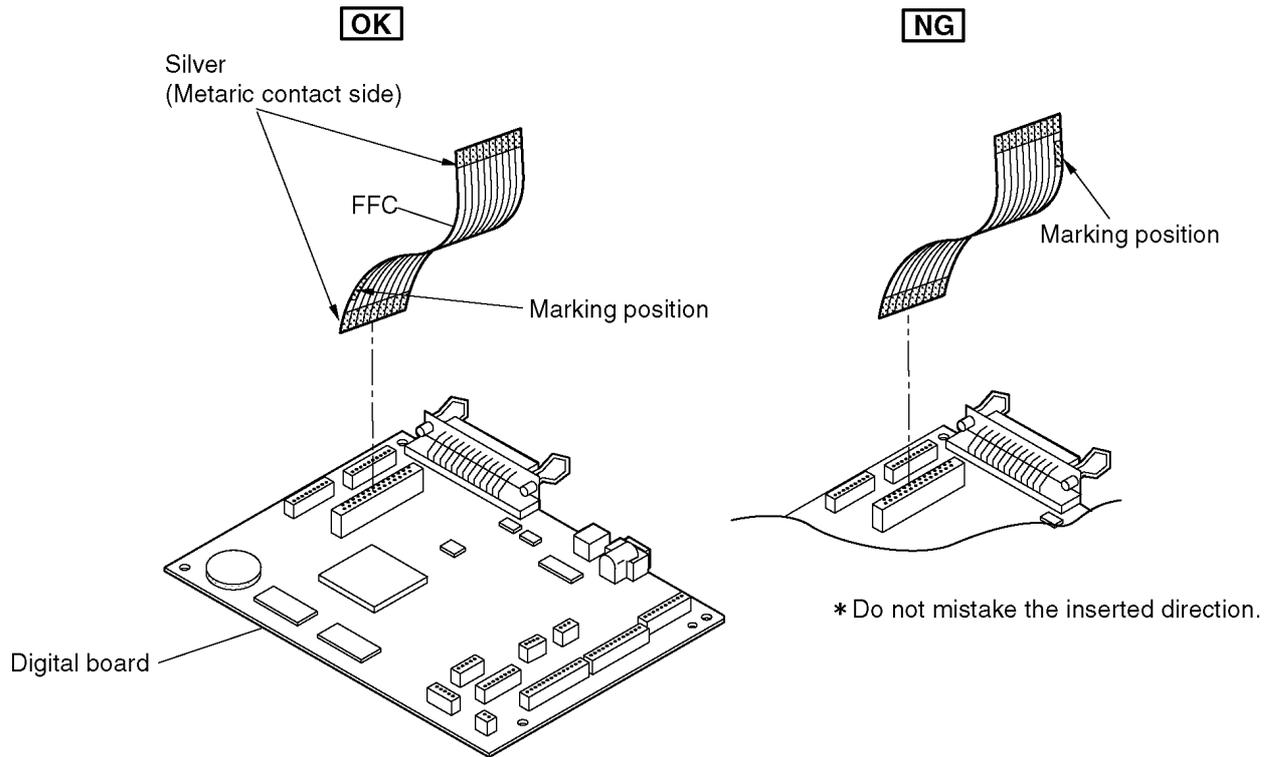
\*Assemble after the air suction.

A detailed view of a small metal bracket being inserted into a slot on a larger component. A vertical line indicates the direction of insertion.

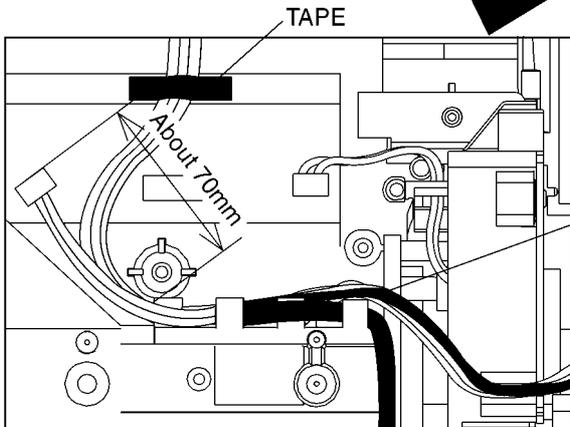
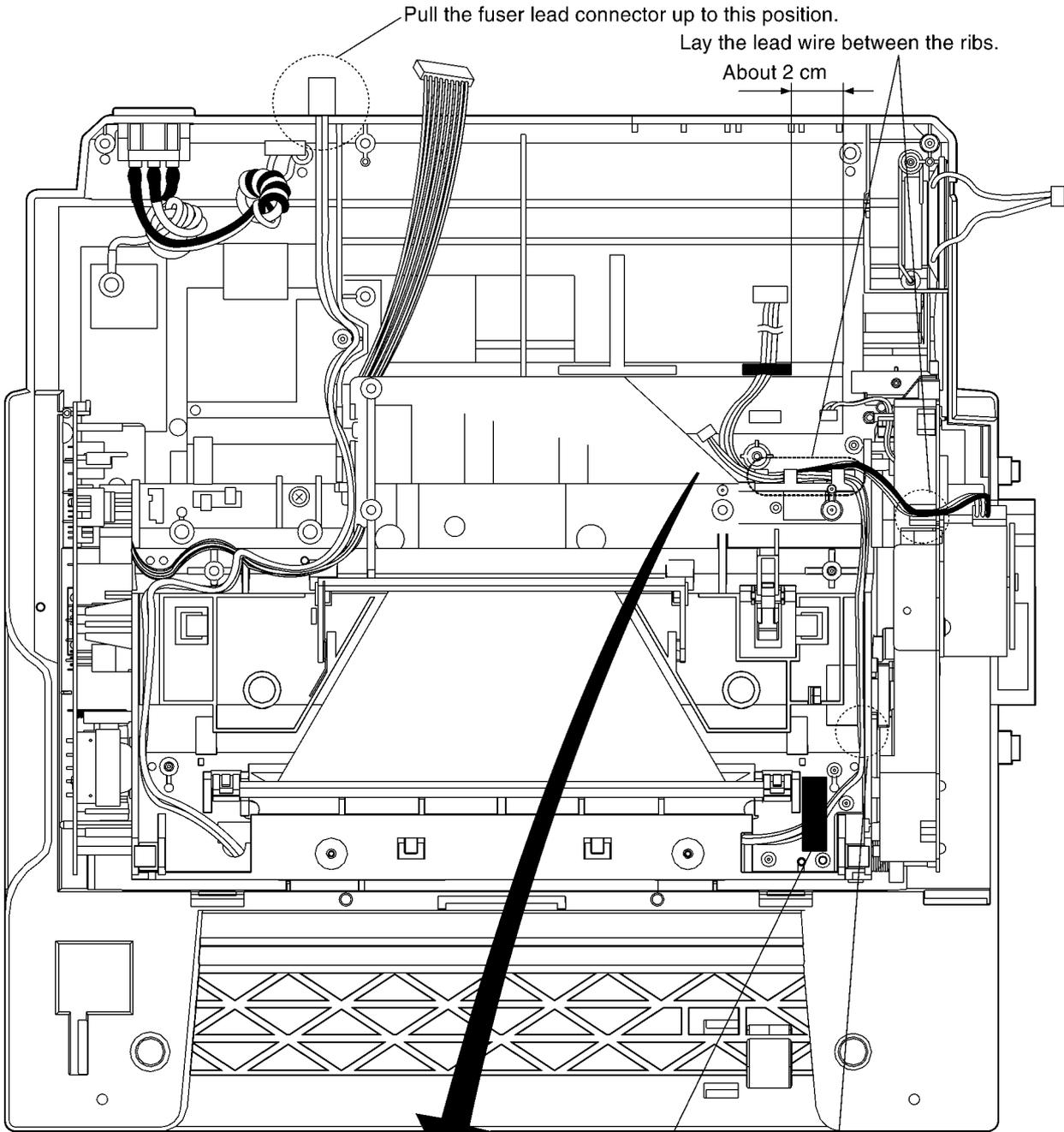
\*Carry out the air suction of the CIS reading surface and FB base surface fully.

### 5.31.4. FCC (DIGITAL BOARD)

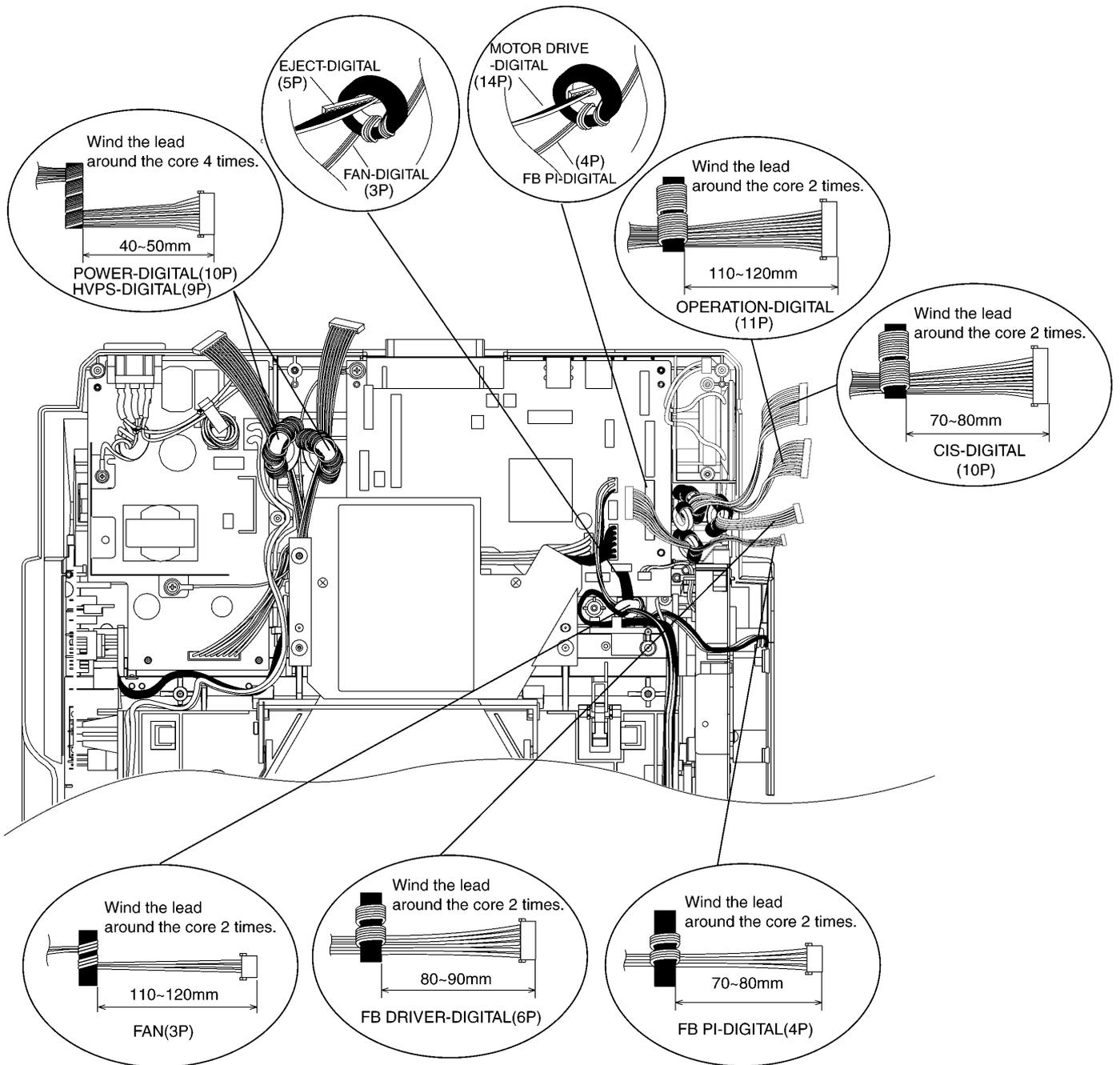
Install the FCC as following pictures,when you connect the FCC to the digital board.



### 5.32. INSTALLATION POSITION OF THE LEAD



Lay the lead wire on the right side of the rib.



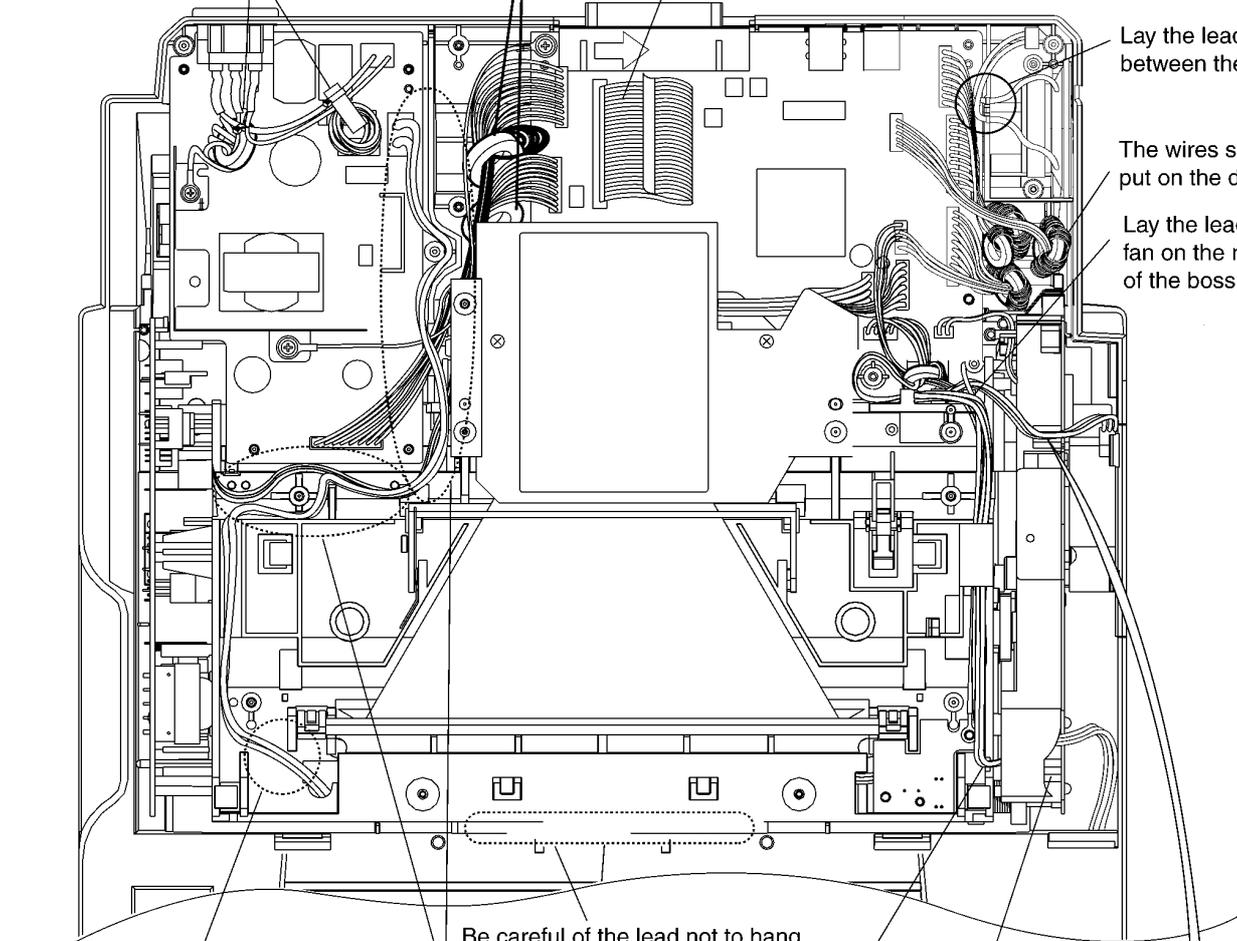
Place these two ferrite cores  
apart as far as possible.

The wires should not be put on the digital board.  
Confirm the processing direction of FFC.  
Don't take wrong FFC processing direction.

Lay the lead wire  
between the ribs .

The wires should not be  
put on the digital board.

Lay the lead wire of the  
fan on the right side  
of the boss.



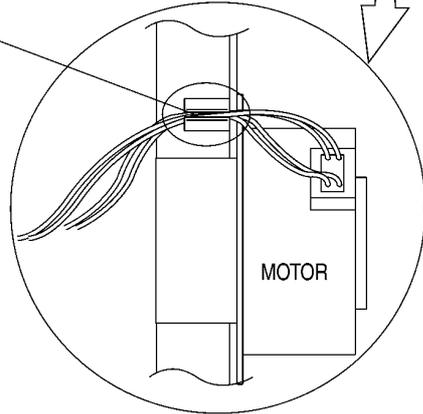
Lay the lead wire properly  
not to get loose.

The wires should not touch  
the power supply board even  
if they are pushed by a hand.

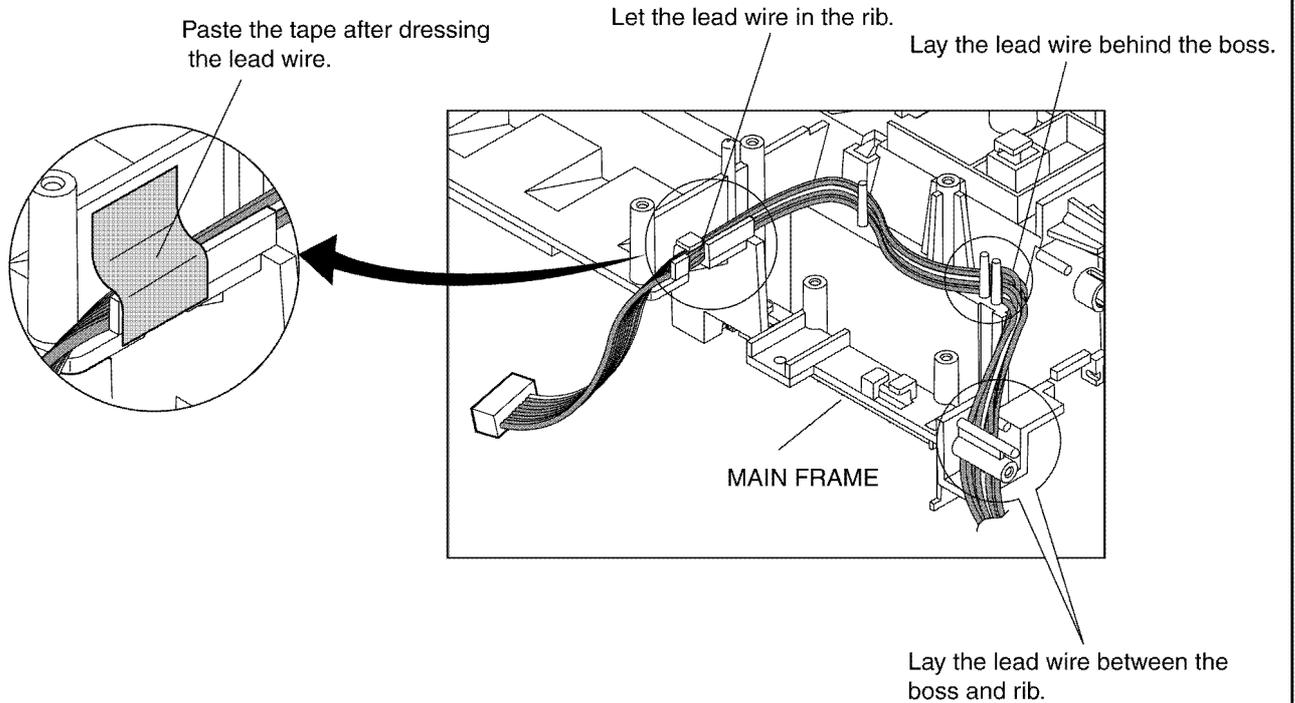
Be careful of the lead not to hang  
out from the clearance of the cabinet.

Take care not to lay the lead  
wire into the gap of the rib.

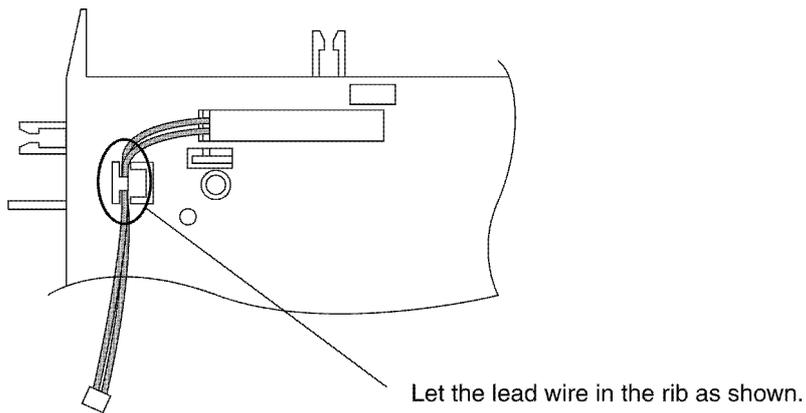
Push the lead wire into the gap of the rib.



### Placing the lead wire of HIGH VOLTAGE POWER SUPPLY BOARD - DIGITAL BOARD

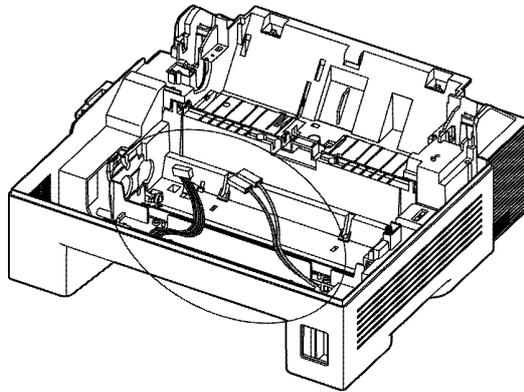


### Placing the lead wire of the solenoid.

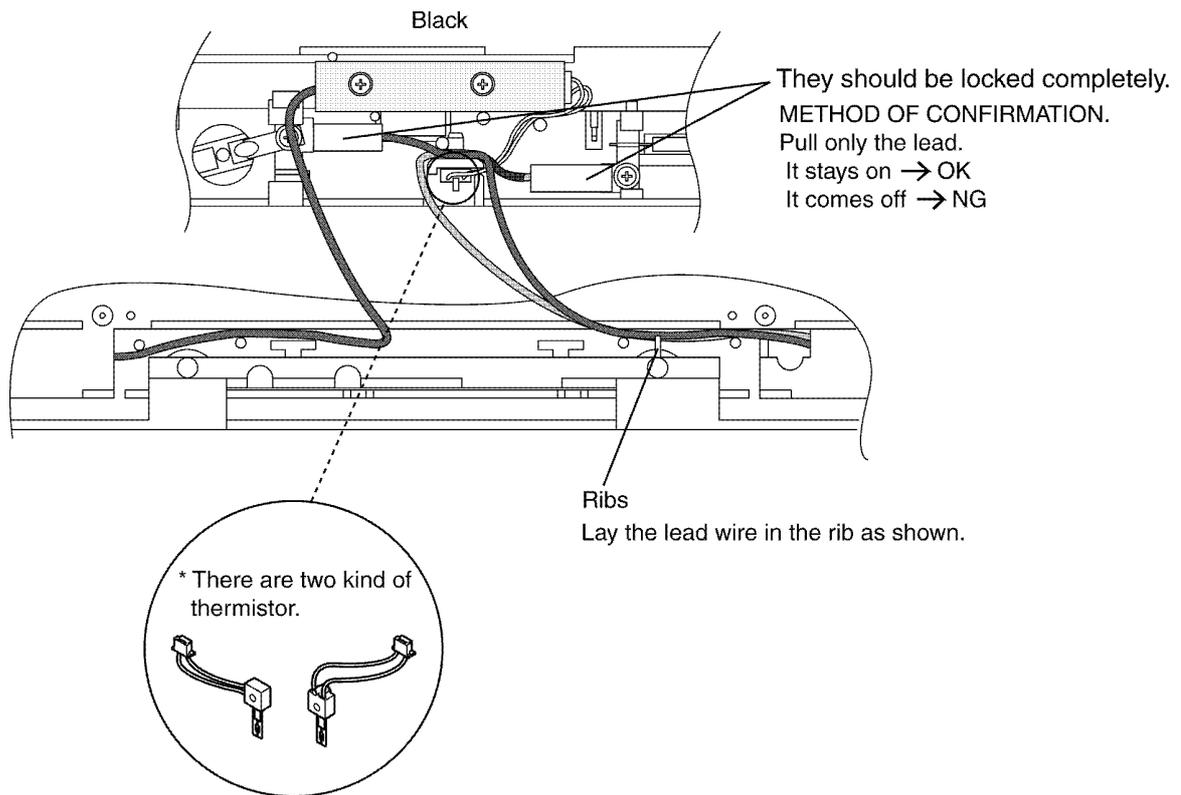


### Placing the lead wire of FUSSER UNIT.

Place the lead wires as figure below



After connecting Fusser lead wire, pass the brown wire first and the black wire next in between the rib and the wall.



## 6 TROUBLESHOOTING GUIDE

### 6.1. USER RECOVERABLE ERRORS

If the unit detects a problem, one or more of the following messages will appear on the display.

The explanations given in the [ ] are for servicemen only.

DISPLAY MESSAGE	CAUSE AND REMEDY
CALL SERVICE 1	<ul style="list-style-type: none"> <li>• Polygon motor error. Refer to <b>CALL SERVICE TROUBLESHOOTING GUIDE (P.92)</b>.</li> </ul>
CALL SERVICE 2	<ul style="list-style-type: none"> <li>• Laser beam error. Replace LSU unit. Refer to <b>CALL SERVICE TROUBLESHOOTING GUIDE (P.92)</b>.</li> </ul>
CALL SERVICE 3	<ul style="list-style-type: none"> <li>• Fuser unit cannot heat up. Replace fuser unit. Refer to <b>CALL SERVICE TROUBLESHOOTING GUIDE (P.92)</b>.</li> </ul>
CALL SERVICE 4	<ul style="list-style-type: none"> <li>• Fan motor error. Replace fan motor. Refer to <b>CALL SERVICE TROUBLESHOOTING GUIDE (P.92)</b>.</li> </ul>
CARRIAGE ERROR	<ul style="list-style-type: none"> <li>• The shipping lock is locked. Unlock the shipping lock. If the display messages still remain after unlocking, there is something wrong with the carriage sensor. Contact our service personnel.</li> </ul>
RELEASE SHIPPING LOCK	
CHANGE DRUM	<ul style="list-style-type: none"> <li>• There is something wrong with the drum unit. Replace the drum unit and the toner cartridge.</li> </ul>
CHECK ADF CABLE	<ul style="list-style-type: none"> <li>• The ADF cable is not connected correctly. Check the connection.</li> </ul>
CHECK DOCUMENT	<ul style="list-style-type: none"> <li>• The document is not fed into the unit properly. Reinsert the document. If misfeeding occurs frequently, clean the document feeder rollers and try again.</li> </ul>
CHECK DRUM	<ul style="list-style-type: none"> <li>• The drum unit is not inserted properly. Reinsert it correctly.</li> <li>• The installed drum is worn out. Replace the drum unit with a new one.</li> </ul>
CHECK MEMORY	<ul style="list-style-type: none"> <li>• The memory (telephone numbers, parameters, etc.) has been erased. Re-program. [The backup lithium battery on the top of the digital board may be low or dead, so check it.]</li> </ul>
COVER OPEN	<ul style="list-style-type: none"> <li>• The printer cover is open. Close it.</li> </ul>
DATA IN MEMORY	<ul style="list-style-type: none"> <li>• You tried to change the cable type setting (feature #15), while the fax machine has a document in memory. Finish sending faxes, print out the document in memory or cancel the delayed transmission (feature #25) and try again.</li> </ul>
CLOSE ADF COVER	<ul style="list-style-type: none"> <li>• The printer cover (ADF cover) is open. Close it.</li> </ul>
DIRECTORY FULL	<ul style="list-style-type: none"> <li>• There is no space to store new entries in navigator directory. Erase unnecessary entries.</li> </ul>
FAILED PICK UP	<ul style="list-style-type: none"> <li>• Recording paper was not fed into the unit properly. Reinsert the recording paper.</li> </ul>
FAX IN MEMORY	<ul style="list-style-type: none"> <li>• The unit has a document in memory. See the other displayed message instructions to print out the document.</li> </ul>
FAX MEMORY FULL	<ul style="list-style-type: none"> <li>• Memory is full of received documents due to lack of recording paper or a recording paper jam, etc. Install paper or clear the jammed paper.</li> <li>• When performing memory transmission, the document being stored exceeds the memory capacity of the unit. Transmit the entire document manually.</li> </ul>
LINE IN USE	<ul style="list-style-type: none"> <li>• You cannot change the cable type setting (feature #15) while using the handset or the monitor. Hang up and try again.</li> </ul>
MEMORY FULL	<ul style="list-style-type: none"> <li>• When making a copy, the document being stored exceeds the memory capacity of the unit. Press <b>STOP</b> to clear the message. Divide the document into sections.</li> </ul>
MODEM ERROR	<ul style="list-style-type: none"> <li>• There is something wrong with the modem circuit.</li> </ul>
NO FAX REPLY	<ul style="list-style-type: none"> <li>• The other party's fax machine is busy or has run out of recording paper. Try again.</li> </ul>
OUT OF PAPER	<ul style="list-style-type: none"> <li>• Recording paper is not installed or the unit has run out of paper. Install paper.</li> <li>• Recording paper is not fed into the unit properly. Reinstall paper.</li> </ul>
PAPER JAMMED	<ul style="list-style-type: none"> <li>• A recording paper jam occurred. Clear the jammed paper. [If the printout jams, please refer to <b>RECORDING PAPER JAMS (P.37)</b>.]</li> </ul>
PC FAIL OR BUSY	<ul style="list-style-type: none"> <li>• The cable or the PC power cord is not connected correctly. Check the connections.</li> <li>• The software is not running on the PC. Restart the software and try again.</li> </ul>

DISPLAY MESSAGE	CAUSE AND REMEDY
PLEASE WAIT	<ul style="list-style-type: none"> <li>The unit is warming up. Wait for a while.</li> </ul>
REDIAL TIME OUT	<ul style="list-style-type: none"> <li>The other party's fax machine is busy or has run out of recording paper. Try again.</li> </ul>
REMOVE DOCUMENT	<ul style="list-style-type: none"> <li>The document is jammed. Remove the jammed document.</li> <li>Attempted to transmit a document longer than 600 mm (23 5/8"). Press the <b>STOP</b> to remove the document. Divide the document into two or more sheets and try again.</li> <li>[Alternately, turn off service code #559 to enable sending of documents longer than 600 mm] (Refer to <b>DOCUMENT JAMS</b> (P.36).)</li> </ul>
TONER EMPTY	<ul style="list-style-type: none"> <li>The toner cartridge is empty. Replace the toner cartridge.</li> </ul>
TONER LOW	<ul style="list-style-type: none"> <li>The remaining toner is low. Replace the toner cartridge and as soon as possible. We recommend you replace the drum unit every third time you replace the toner cartridge. To check the drum life and quality, please print the printer test list. (Refer to <b>TEST FUNCTIONS</b> (P.74).)</li> </ul>
TRANSMIT ERROR	<ul style="list-style-type: none"> <li>A transmission error occurred. Try again.</li> </ul>
WRONG PAPER	<ul style="list-style-type: none"> <li>The unit print on paper which is shorter then letter size paper. To prevent the drum unit becoming dirty, use A4 or letter size paper.</li> </ul>

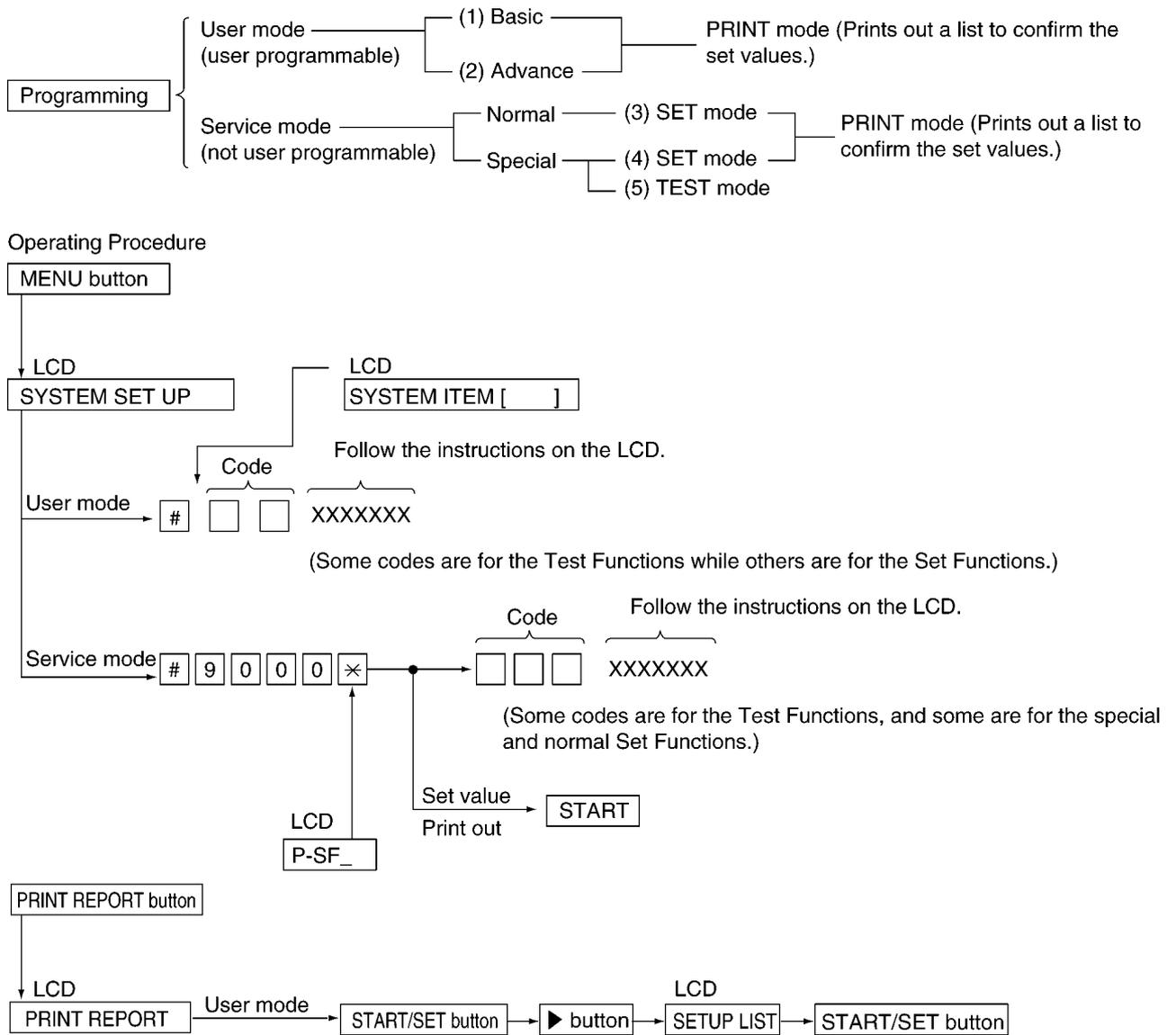
## 6.2. PROGRAMMING AND LISTS

The programming functions are used to program the various features and functions of the machine, and to test the machine. This facilitates communication between the user and the service man while programming the unit.

### 6.2.1. OPERATION

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and are available to the user. The special programs are only those listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test the various functions. The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

### 6.2.2. OPERATION FLOW



### 6.2.3. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	-----
502	Flash time	X 10 ms	01~99	85	-----
503	Dial speed select	1:10pps 2:20pps	1, 2	1	-----
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in.
521	International mode select	1:ON 2:OFF	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in.
522	Auto standby select	1:ON 2:OFF	1, 2	1	The resolution reverts to the default when transmission is complete.
523	Receive equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	Set RX equalizer to automatic mode.
524	Transmission equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	
527	V8 Mode	1:DISABLE 2:ENABLE	1,2	2	-----
529	Memory clear for Call Service				"START" input
550	Memory clear: To reset the value to the default one, except the top margin (#853),left margin (#854),time/day (#001),logo (#002),Fax No.(#003),History and Directory.				"START" input
551	ROM check				See <b>TEST FUNCTIONS</b> (P.74).
552	DTMF signal tone test	1:ON 2:OFF	1, 2	2	See <b>TEST FUNCTIONS</b> (P.74).
553	Monitor on FAX communication select	1:OFF 2:PHASE B 3:ALL	1~3	1	Sets whether to monitor the line signal with the unit's speaker during FAX communication or not.
554	Modem test				See <b>TEST FUNCTIONS</b> (P.74).
556	Motor test			0	See <b>TEST FUNCTIONS</b> (P.74).
557	LED test				See <b>TEST FUNCTIONS</b> (P.74).
558	LCD test				See <b>TEST FUNCTIONS</b> (P.74).
561	KEY test				See <b>TEST FUNCTIONS</b> (P.74).
570	BREAK % select	1:61% 2:67%	1, 2	1	Sets the % break of pulse sialing according PBX.
573	Remote turn-on ring number set	X number of rings	01~99	10	Sets the number of rings before the unit starts to receive a document in the TEL mode.
590	FAX auto redial time set	X number of times	00~99	03	Selects the number of redial times during FAX communication (not including the first dial).
591	FAX auto redial time disconnection time set	X second	001~999	065	Sets the FAX redial interval during FAX communication.
592	CNG transmit select	1:OFF 2:ALL 3:AUTO	1~3	2	Lets you select the CNG output during FAX transmission. ALL: CNG is output at phase A. AUTO: CNG is output only when automatic dialing is performed. OFF: CNG is not output at phase A. Refer to <b>SOMETIME THERE IS A TRANSMIT PROBLEM</b> (P.118).
593	Time between CED and 300bps	1:75 msec 2:500 msec 3:1 sec	1~3	1	See <b>Symptom/Countermeasure Table</b> for long distance and international calls in. Refer to <b>RECEIVE PROBLEM</b> (P.119).
594	Overseas DIS detection select	1:detects at the 1st time 2:detects at the 2nd time	1, 2	1	See <b>Symptom/Countermeasure Table</b> for long distance and international calls in. Refer to <b>SOMETIME THERE IS A TRANSMIT PROBLEM</b> (P.118).
595	Receive error limit value set	1: 5% 2: 10% 3: 15% 4: 20%	1~4	2	If the number of errors during transmission exceeds this value, the sending side terminates the call.
596	Transmit level set	X dBm	- 15~00	10	Selects the FAX transmission level. Refer to <b>SOMETIME THERE IS A TRANSMIT PROBLEM</b> (P.118)and <b>RECEIVE PROBLEM</b> (P.119).
598	Receiving sensitivity	01= -01 dBm	20~48	43	Used when there is an error problem.
599	ECM frame size	1:256 2:64	1, 2	1	-----
651	Write system program into the Flash Rom with a parallel cable.				-----
655	Call service 3 detection number				See <b>CALL SERVICE TROUBLESHOOTING GUIDE</b> (P.92)

Code	Function	Set Value	Effective Range	Default	Remarks
717	Transmit speed selection	1: 33600BPS 2: 31200BPS 3: 28800BPS 4: 26400BPS 5: 24000BPS 6: 21600BPS 7: 19200BPS 8: 16800BPS 9: 14400BPS 10: 12000BPS 11: 9600BPS 12: 7200BPS 13: 4800BPS 14: 2400BPS	1~14	1	Adjusts the speed to start training during FAX transmission. Refer to <b>SOMETIME THERE IS A TRANSMIT PROBLEM (P.118)</b>
718	Receive speed selection	1: 33600BPS 2: 31200BPS 3: 28800BPS 4: 26400BPS 5: 24000BPS 6: 21600BPS 7: 19200BPS 8: 16800BPS 9: 14400BPS 10: 12000BPS 11: 9600BPS 12: 7200BPS 13: 4800BPS 14: 2400BPS	1~14	1	Adjusts the speed to start training during FAX reception. Refer to <b>RECEIVE PROBLEM(P.119)</b>
771	T1 timer	1: 35 sec 2: 60 sec	1, 2	1	Sets a higher value when the response from the other party needs more time during FAX transmission.
774	T4 timer	x 100 msec	00~99	00	Use this function when delay occurs in the line and communication. (ex. Mobile comm) does not work well.
815	Sensor check				See <b>TEST FUNCTIONS (P.74)</b> .
852	Print test pattern				See <b>TEST FUNCTIONS (P.74)</b> .
853	Top margin		1~5	3	-----
854	Left margin		1~7	4	See <b>LSU (Laser Scanning Unit) SECTION (P.183)</b> .
880	History list				See <b>HISTORY (Example of a printed out list) (P.82)</b> .
881	Journal 2 list				See <b>PRINTOUT EXAMPLE (P.123)</b> .
882	Journal 3 list				See <b>PRINTOUT EXAMPLE (P.123)</b> .

### 6.3. TEST FUNCTIONS

The codes listed below can be used to perform simple checks of some of the unit's functions. When complaints are received from customers, they provide an effective tool for identifying the locations and causes of malfunctions.

Test Mode	Type of Mode	Code	Function
		Operation after code input	
MOTOR TEST	Service Mode	"5" "5" "6"	0: Recording paper feed 1: Auto Document feed (STANDARD) 2: Auto Document feed (FINE/SUPER FINE) 4: Carriage (STANDARD) 5: Carriage (FINE/SUPER FINE)
		START	
MODEM TEST	Service Mode	"5" "5" "4"	Telephone line circuit is connected automatically, output the following signals on the circuit line. 1) OFF 2) V21 ter 300bps 3) V27 ter 2400bps 4) V27 ter 4800bps 5) V29 7200 6)V29 9600bps 7) V17 7200bps 8) V17 9600bps 9) V17 12000bps 10) V17 14400bps 11) V34 2400bps 12) V34 4800bps 13)V34 7200bps 14)V24 9600bps 15) V34 12000bps 16) V34 14400bps 17)V34 16800bps 18)V34 19200bps 19) V34 21600bps 20) V34 24000bps 21)V34 26400bps 22)V34 28800bps 23) V34 31200bps 24) V34 33600bps 25)1100Hz 22)2100Hz
		START	
ROM CHECK	Service Mode	"5" "5" "1"	Indicates the version and checks the sum of the ROM.
		START	
LCD CHECK	Service Mode	"5" "5" "8"	Checks the LCD indication. Illuminates all the dots to check if they are normal.
		START	
DTMF SINGLE TEST	Service Mode	"5" "5" "2"	Outputs the DTMF as single tones. Used to check the frequencies of the individual DTMF tones. Refer to <b>DTMF SINGLE TONE TRANSMIT SELECTION</b> (P.75).
		1...ON 2...OFF	
LED CHECK	Service Mode	"5" "5" "7"	All LEDs above the operation panel board flash on and off, or are illuminated.
		START	
KEY CHECK	Service Mode	"5" "6" "1"	Checks the button operation. Indicates the button code on the LCD while the button is pressed. Refer to <b>BUTTON CODE TABLE</b> (P.75).
		START (any key)	
MEMORY CLEAR	Service Mode	"5" "5" "0"	To reset the value to the default one, except the top margin (#853),left margin (#854),time/day (#001),logo (#002),Fax No.(#003),History and Directory. Please restart a power supply after clearing a memory.
		START	
High Voltage Power Supply Board CHECK	Service Mode	"6" "2" "8"	Refer to <b>HIGH VOLTAGE VALUE CHECK POINT</b> (P.149).
		START	
SENSOR CHECK	Service Mode	"8" "1" "5"	First of all, press the copy button, and confirm the action of ON/OFF. For each sensor's operation, refer to <b>SENSORS AND SWITCHES SECTION</b> (P.183). <b>D S C P R E D T * 3 F * A F H B</b> : LCD DISPLAY <b>D: Document sensor</b> :When a document is insert. <b>S: Scanner read Pos.</b> :When the edge of the document is detected. <b>C: Cover of Printer</b> :When the top cover is open. <b>P: Paper exist</b> :When recording paper exists. <b>R: Pick up paper</b> :When the edge of the recording paper is detected. <b>E: Exit sensor on</b> :When exist sensor is on. <b>D: Developer exist</b> <b>T: Toner exist</b> <b>*: None</b> <b>3F: Temperature of fuser unit (2 digits)</b> :Refer to <b>HEAT LAMP CONTROL CIRCUIT</b> (P.199). <b>*: None</b> <b>A: ADF Cover Open</b> :When the ADF Cover is open. <b>F: Document Cover Open</b> :When the Document Cover is open. <b>H: ADF Home Sensor</b> :When the ADF Home Sensor is on. <b>B: FB Home Sensor</b> :When the FB Home Sensor is on.
		START	

Test Mode	Type of Mode	Code	Function
		Operation after code input	
PRINT TEST PATTERN	Service Mode	"8" "5" "2"	1. Press "852" then the SET key in the service mode. 2. As "PATNO =" is displayed on the LCD, enter the test pattern No. and press the SET key. 3. When "No. =" is displayed on the LCD, enter the printing number and press the SET key. (Press "00" for the infinite printing.) 4. "MODE" is displayed on the LCD. Press "0" to start printing or press "1" to go to the next screen. 5. When "1" is pressed at MODE, "INTVL =" is displayed on the LCD. Enter the printing interval (00~99 sec). 6. The printing repeats the designated number of times at the programmed printing intervals.
		START	

**Note:**

The numbers in the boxes (XXX) indicate the keys to be input for the various test modes.

**6.3.1. DTMF SINGLE TONE TRANSMIT SELECTION**

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	High Frequency (Hz)	Key	Low Frequency (Hz)
"1"	697	"5"	1209
"2"	770	"6"	1336
"3"	852	"7"	1477
"4"	941	"8"	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) / Low (Hz)	1209	1336	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	"*" (X)	"0"	"#" (#)

**Note:**

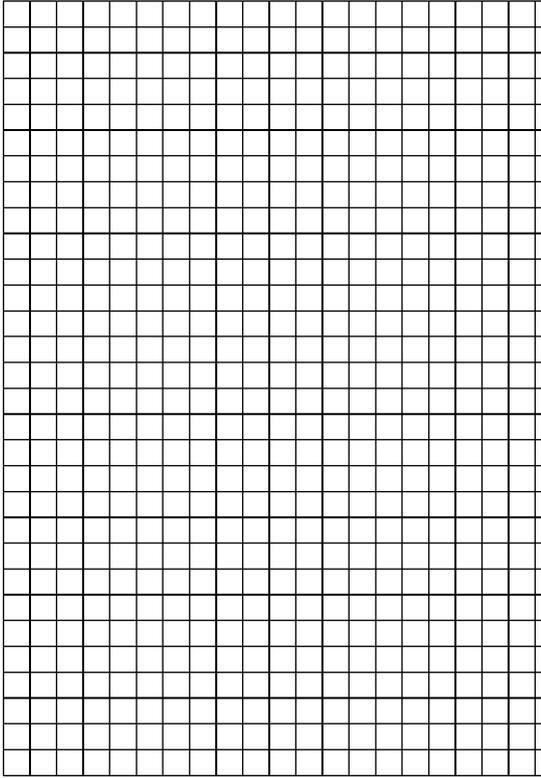
After performing this check, do not forget to turn the setting off. otherwise, dialing in DTMF signal will not work.

**6.3.2. BUTTON CODE TABLE**

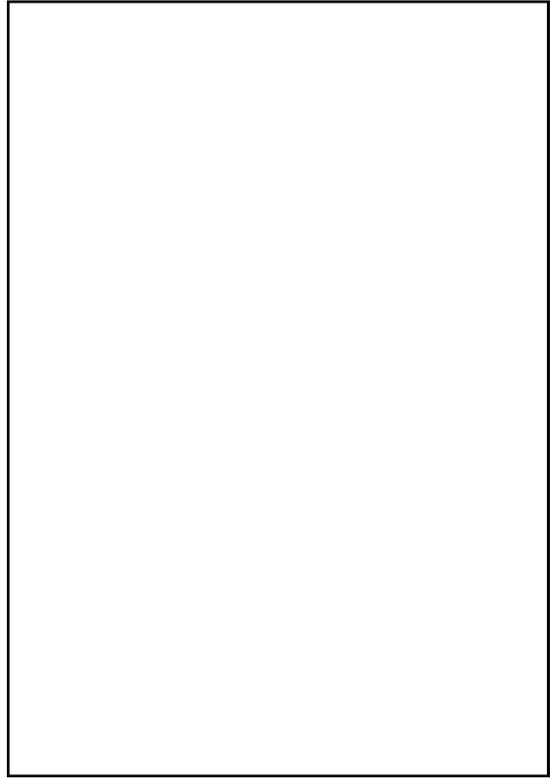
Code	Button Name	Code	Button Name	Code	Button Name
5D	RESOLUTION	35	5	46	NAVIGATOR -
43	START/SET	36	6	47	NAVIGATOR +
4D	LOWER	37	7	48	BROADCAST 1
41	COPY START	38	8	49	BROADCAST 2
54	MONITOR	39	9	4A	MANUAL BROAD
55	HANDSET MUTE	30	0	4B	STATION 4
4E	AUTO ANSWER	3A	* (X)	4C	STATION 5
44	MENU	3B	#	65	NAVIGATOR ►
53	HELP	52	REDIAL/PAUSE	66	NAVIGATOR ◀
31	1	57	FLASH	67	STATION 6
32	2	68	PRINT REPORT	00	NO INPUT
33	3	58	SCAN	—	STOP
34	4	5F	COLLATE		

### 6.3.3. PRINT TEST PATTERN

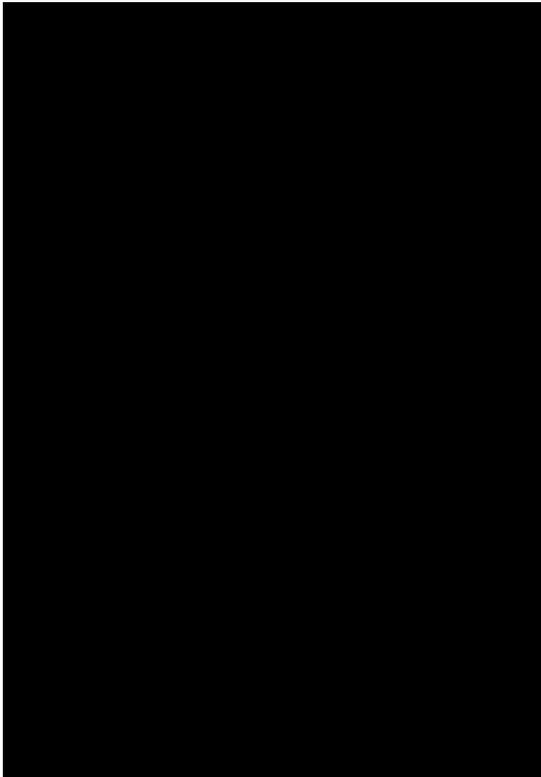
1. NO. 01



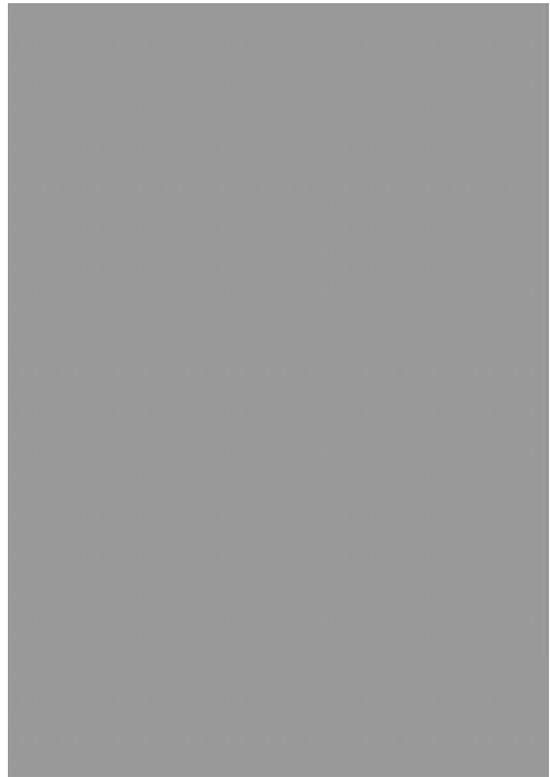
3. NO.03



2. NO.07



4. NO.09



## 6.4. REMOTE PROGRAMMING

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (**PROGRAM MODE TABLE**(P.78)). The function used to accomplish this is remote programming.

First, in order to check the current status of the service code parameter, print out the setup list (code: 991) and the service list (code: 999) from the customer's fax machine.

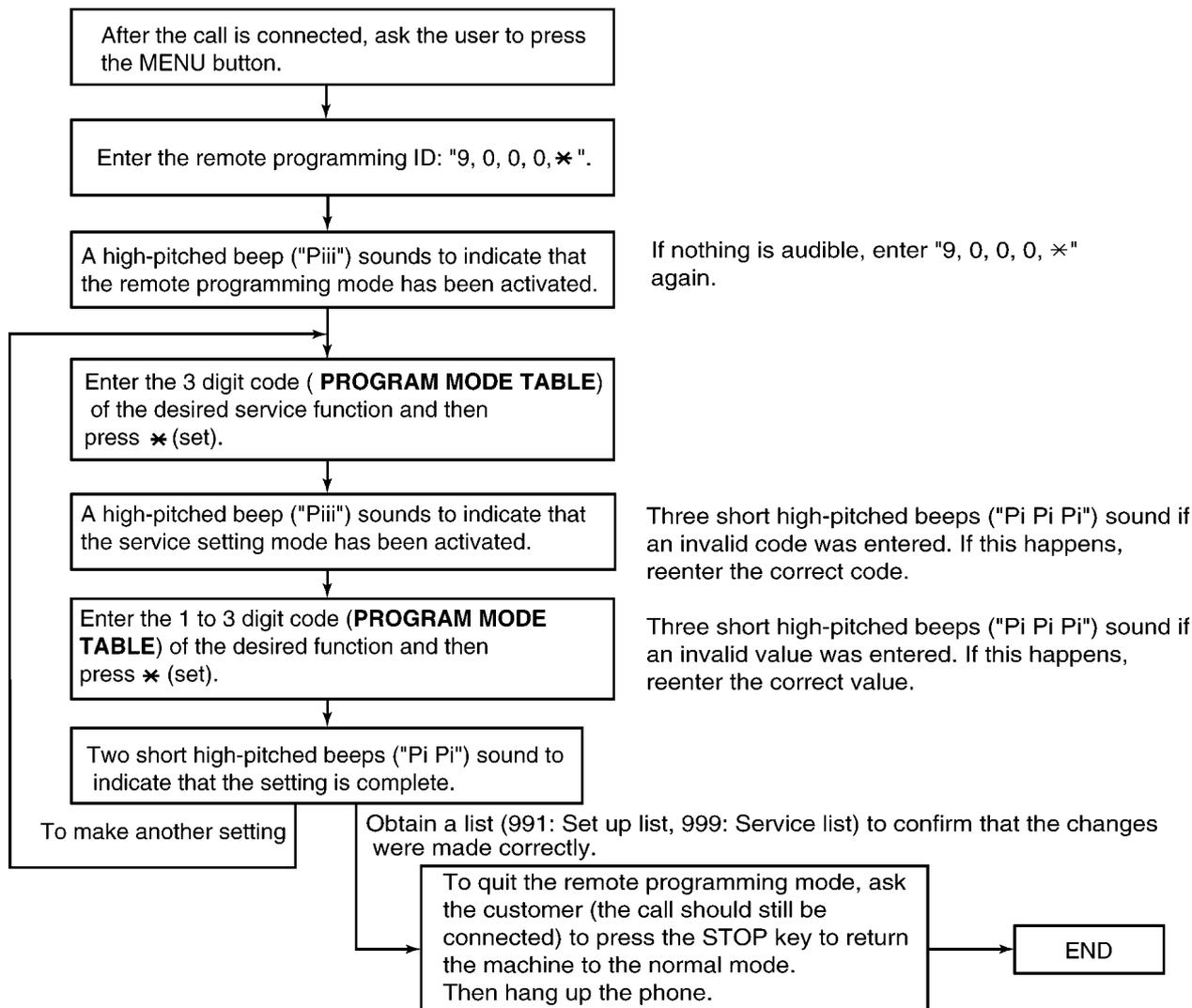
Based on this, the parameters for the desired codes can be changed.

The procedure for changing and listing parameters is described on **ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES**(P.77). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that the changes were made correctly.

### Hint:

Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone. This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

### 6.4.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES



### CROSS REFERENCE:

**PROGRAM MODE TABLE** (P.78)

## 6.4.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	Remote Setting
001	Set date and time	dd/mm/yy hh:mm	01/Jan/2003	NG
002	Your logo	-----	None	NG
003	Your fax telephone number	-----	None	NG
004	Transmission report mode	1:Error / 2:ON / 3:OFF	OFF	OK
006	FAX ring count	1 to 9 rings	2	OK
012	Remote TAM activation	ON/ID=11 / OFF	OFF	NG
013	Dialing mode	1:PULSE / 2:TONE	PULSE	OK
015	PC INTERACE	1:PARALLEL / 2:USB	PARALLEL	NG
016	Paper size	1:LETTER / 2:A4 / 3:LEGAL	A4	OK
017	Ringer pattern	1:A / 2:B / 3:C	A	NG
022	Auto journal print	1:ON / 2:OFF	ON	OK
023	Overseas mode	1:NEXT FAX / 2:ERROR / 3:OFF	ERROR	OK
025	Delayed transmission	1:ON / 2:OFF	OFF	NG
031	Ring detection	1:OFF/ 2:A / 3:B/ 4:C /5:D	OFF	OK
037	Auto REDUCTION	1:ON / 2:OFF	ON	OK
039	LCD contrast	1:NORMAL / 2:DARKER	NORMAL	NG
041	Remote FAX activation code	1:ON / 2:OFF	ON CODE=*#9	NG
044	Receive alert	1:ON / 2:OFF	ON	OK
048	Language	1:RUSSIAN / 2:ENGLISH	RUSSIAN	OK
058	LCD contrast	1:NORMAL / 2:LIGHT / 3:DARKER	NORMAL	OK
068	ECM Selection	1: ON / 2: OFF	ON	OK
076	FAX tone	1:ON / 2:OFF	ON	OK
079	Toner save	1:ON / 2:OFF	OFF	OK
080	Set default	YES / NO	NO	NG
501	Pause time set	001~600 x 100msec	030	OK
502	Flash time	01~99 x 10ms	85	OK
503	Dial speed	1:10pps / 2:20pps	10	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100	OK
521	International mode select	1:ON / 2:OFF	ON	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
524	Transmission equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
527	V8 Mode	1:DISABLE /2:ENABLE	ENABLE	OK
529	Memory clear for Call Service	-----	-----	NG
550	Memory clear	-----	-----	NG
551	ROM check	-----	-----	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	-----	-----	NG
556	Motor test	-----	-----	NG
557	LED test	-----	-----	NG
558	LCD test	-----	-----	NG
561	Key test	-----	-----	NG
570	BREAK % select	1:61% 2:67%	61%	OK
573	Remote turn-on ring number	01~99	10	OK
590	FAX auto redial time set	00~99	03	OK
591	FAX auto redial line disconnection time set	001~999sec	065	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection select	1:1st / 2:2nd	1st	OK
595	Receive error limit value set	1:5% / 2:10% / 3:15% / 4:20%	10%	OK
596	Transmit level set	-15~00dBm	10	OK
598	Receiving Sensitivity	20~48	43	OK
599	ECM Frame size	1:256 / 2:64	256byte	OK
655	Call service 3 detection number	00~06	-----	NG
717	Transmit speed select	1:33600/ 2:31200/ 3:28800/ 4:26400/ 5:24000/ 6:21600/ 7:19200/ 8:16800/ 9:14400/ 10:12000/ 11:9600/ 12:7200/ 13:4800/ 14:2400	33600bps	OK
718	Receive speed select	1:33600/ 2:31200/ 3:28800/ 4:26400/ 5:24000/ 6:21600/ 7:19200/ 8:16800/ 9:14400/ 10:12000/ 11:9600/ 12:7200/ 13:4800/ 14:2400	33600bps	OK
771	T1 timer	1:35s / 2:60s	35s	OK
774	T4 timer	00~99 x 100msec	00	OK

Code	Function	Set Value	Default	Remote Setting
815	Sensor test	-----	-----	NG
852	Print test pattern	-----	-----	NG
853	Top margin	1~5	3	OK
854	Left margin	1~7	4	OK
880	History list	1:Start	-----	NG
881	Journal 2	-----	-----	NG
882	Journal 3	-----	-----	NG
991	Setup list	1:Start	-----	OK
994	Journal list	1:Start	-----	OK
995	Journal 2 list	1:Start	-----	OK
996	Journal 3 list	1:Start	-----	OK
998	History list	1:Start	-----	OK
999	Service list	1:Start	-----	OK

OK means "can set".

NG means "can not set".

**Note:**

Refer to **SERVICE FUNCTION TABLE** (P.72) for descriptions of the individual codes.

**Example:**

If you want to set value in the "004 Transmission report mode", press the dial key number 1, 2 or 3 corresponding to the Set Value you want to select. (1:ERROR/2:ON/3:OFF)

**6.4.3. USER MODE (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)**

**СПИСОК УСТАНОВОК**

[ СПИСОК ОСН.ФУНКЦИЙ ]

NO.	ФУНКЦИЯ	ТЕКУЩАЯ УСТАНОВКА	
#01	УСТАНОВКА ДАТЫ И ВРЕМЕНИ	ЯНВ. 01 2003 00:00	
#02	ВАШ ЛОГОТИП		
#03	НОМЕР ВАШЕГО ФАКСА		
#04	РАСПЕЧАТКА ОТЧЕТА ОБ ОТПРАВКЕ	ВЫКЛ.	[ ОШИБКА, ВКЛ, ВЫКЛ. ]
#06	СЧЕТЧИК ЗВОНКОВ В РЕЖИМЕ ФАКСА	2	[ 1...9 ]
#12	ВКЛЮЧЕНИЕ ВНЕШНЕГО АВТООТВЕТЧИКА	ВЫКЛ.	[ ВКЛ, ВЫКЛ. ]
		КОД = 11	
#13	РЕЖИМ НАБОРА НОМЕРА	ИМПУЛЬСН	[ ИМПУЛЬСН, ТОНАЛЬН ]
#15	ИНТЕРФЕЙС С ПК	ПАРАЛЛЕЛЬНЫЙ	[ ПАРАЛЛЕЛЬНЫЙ, USB ]
#16	ФОРМАТ БУМАГИ	A4	[ LETTER, A4, LEGAL ]
#17	ТИП ЗВОНКА	A	[ A, B, C ]

[ СПИСОК УСОВЕРШ.ФУНКЦИЙ ]

NO.	ФУНКЦИЯ	ТЕКУЩАЯ УСТАНОВКА	
#22	АВТОМАТИЧЕСКАЯ РАСПЕЧАТКА ЖУРНАЛА	ВКЛ	[ ВКЛ, ВЫКЛ. ]
#23	РЕЖИМ МЕЖДУНАРОДНОЙ СВЯЗИ	ОШИБКА	[ СЛЕД.ФАКС, ОШИБКА, ВЫКЛ. ]
#25	ЗАДЕРЖАННАЯ ПЕРЕДАЧА	ВЫКЛ.	[ ВКЛ, ВЫКЛ. ]
		ПОЛУЧАТЕЛЬ =	
		ВРЕМЯ ОТПРАВКИ = 00:00	
#31	РАСПОЗНАВАНИЕ ЗВОНКА	ВЫКЛ.	[ ВЫКЛ., A, B, C, D ]
#37	АВТОМАТ.УМЕНЬШ.	ВКЛ	[ ВКЛ, ВЫКЛ. ]
#39	КОНТРАСТНОСТЬ ЖК-ДИСПЛЕЯ	НОРМ.	[ НОРМ., ТЕМНЕЕ ]
#41	КОД ВКЛЮЧЕНИЯ ФАКСА	ВКЛ	[ ВКЛ, ВЫКЛ. ]
		КОД = *#9	
#44	ПРЕДУПРЕЖДЕНИЕ О ПРИЕМЕ В ПАМЯТЬ	ВКЛ	[ ВКЛ, ВЫКЛ. ]
#48	ЯЗЫК	РУССКИЙ	[ РУССКИЙ, АНГЛИЙСКИЙ ]
#58	КОНТРАСТНОСТЬ ДОКУМЕНТА	НОРМ.	[ НОРМ., СВЕТЛЫЙ, ТЕМНЕЕ ]
#68	ВЫБОР ЕСМ	ВКЛ	[ ВКЛ, ВЫКЛ. ]
#76	ТОНАЛЬНЫЙ СИГНАЛ СОЕДИНЕНИЯ	ВКЛ	[ ВКЛ, ВЫКЛ. ]
#79	ЭКОНОМИЯ ТОНЕРА	ВЫКЛ.	[ ВКЛ, ВЫКЛ. ]
#80	СТАНДАРТНАРТНЫЕ УСТАНОВКИ(ИСКЛЮЧАЯ #48)		

**Note:**

The above values are the default values.

### 6.4.4. SERVICE MODE SETTINGS (Example of a printed out list)

[ SERVICE DATA LIST ]

```

501 PAUSE TIME           = 030*100ms      [001...600]*100ms
502 FLASH TIME          = 85*10ms        [01...99]*10ms
503 DIAL SPEED           = 10pps          [1=10      2=20]pps
520 CED FREQUENCY       = 2100Hz          [1=2100    2=1100]Hz
521 INTERNATIONAL MODE  = ON              [1=ON      2=OFF]
522 AUTO STANDBY        = ON              [1=ON      2=OFF]
523 RX EQUALIZER        = 0.0Km           [1=0.0     2=1.8     3=3.6     4=7.0]
524 TX EQUALIZER        = 0.0Km           [1=0.0     2=1.8     3=3.6     4=7.0]
853 TOP MARGIN          = 3*0.5mm         [1...5]*0.5mm
854 LEFT MARGIN         = 4*0.677mm       [1...7]*0.677mm
    
```

Set Value

[ SPECIAL SERVICE SETTINGS ]

```

552  553  570  573  590  591  592  593  594  595  596  598  599
   2    1    1   10   03  065   2    1    1    2    10   43    1

717  718  771  774
  01   01   1   00
    
```

Set Value

USAGE TIME = 0 HOURS

Version = G121RN 20D4

**Note:**

The above values are the default values.

### 6.4.5. HISTORY (Example of a printed out list)

[ HISTORY ]

---

[ G 1 1 1 J A ] (1)      [ D F 3 6 ] (2)      [ N O N E ] (48)      [ N O N E ] (49)

[ N O N E ] (5)

(6) [ 0 0 0 0 0 ]    [ 0 1 ] (7)    [ 0 1 ] (8)    [ 2 0 0 3 ] (9)    [ 0 0 0 0 ] (10)

(11) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (12)

(13) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (14)    [ N O N E ] (15)    [ N O N E ] (16)    [ F A X ] (17)

Factory use only [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ]    [ T O N E ] (18)    [ O N ] (19)    [ 0 0 0 0 0 ] (20)

(21) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (22)    [ 0 0 0 0 0 ] (23)    [ 0 0 0 0 0 ] (24)    [ N O N E ] (25)    [ N O N E ] (47)

(26) [ N O N E ]    [ N O N E ] (27)    [ N O N E ] (28)    [ N O N E ] (29)    (33)

(30) [ 0 0 1 ]    (31) [ 0 0 0 ]    (32) [ 0 0 0 0 0 ]    [ I N C O M P L E T E ]    (34) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (35)

(36) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (37)    [ 0 0 0 0 0 ] (38)    [ 0 0 0 0 0 ] (39)    (40) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (41)

(42) [ 0 0 0 0 0 ]    [ 0 0 0 0 0 ] (43)    [ 0 0 0 0 0 ] (44)    [ 0 0 0 0 0 ] (45)    (46) [ 0 0 0 0 0 ]    [ 0 0 0 0 1 ] (50)

[ 0 0 0 0 0 ] (52)    [ 0 0 0 0 0 ] (the latest) (53)    [ 0 0 0 0 0 ] (the last time) (54)    [ 0 0 0 0 0 ] (the second last time)

CALL SERVICE 3 Failure Cause Records (for Three times)

Cause Distinction    Temperature
   
 Code

---

NAME \_\_\_\_\_ DATE \_\_\_\_\_ DEALER \_\_\_\_\_

CUSTOMER COMPLAINT \_\_\_\_\_

SURVEY RESULT : CKOK (UNKNOWN/DESIGN/EDUC) DEFECT (PART/WORKER/DESIGN)

ABUSE (CUST/DEALER/SHIP) NEW (OPEN/NOT)

PHONE SURVEY RESULT.

**Note:**

See the following descriptions of this report. Item No. (1) ~ (49) are corresponding to the listed items in **DESCRIPTIONS OF THE HISTORY REPORT**(P.83).

### 6.4.5.1. DESCRIPTIONS OF THE HISTORY REPORT

(1) ROM VERSION

FLASH ROM version

(2) SUM

FLASH ROM internal data calculation.

(3) YOUR LOGO

The user logo recorded in the unit. If it is not recorded, NONE will be displayed.

(4) YOUR TELEPHONE NUMBER

The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed.

(5) Not used

(6) FACTORY - CUSTOMER

This shows how many days from factory production until the user turns ON the unit.

(7) MONTH

The shows the very first month, date, year and time set by the user after they purchased the unit.

(8) DAY

The shows the very first month, date, year and time set by the user after they purchased the unit.

(9) YEAR

The shows the very first month, date, year and time set by the user after they purchased the unit.

(10) TIME

The shows the very first month, date, year and time set by the user after they purchased the unit.

(11) USAGE TIME

The amount of time the unit has been powered ON.

(12) FACTORY - NOW

This shows how many days from factory production until the user prints out this history list.

(13) TEL MODE

The amount of time the TEL mode setting was used.

(14) FAX MODE

The amount of time the FAX mode setting was used.

(15) Not used

(16) Not used

(17) FINAL RECEIVE MODE

The last set receiving mode by the user.

(18) TONE/PULSE SELECTION

The most recently used setting used, either TONE or PULSE.

(19) RECEIVE REDUCTION

The compression rate when receiving.

(20) SETTING NO. OF DIRECTORY

The recorded directory stations (one touch dial).

(21) NUMBER OF COPY

The number of pages copied.

(22) NUMBER OF RECEIVE

The number of pages received.

(23) NUMBER OF SENDING

The number of pages sent.

(24) NUMBER OF CALLER ID

The number of times Caller ID was received.

(25) Not used

(26) NUMBER OF PC SCAN

The number of times multifunction was used for the Scanner. (The number of pages scanned. If the unit does not have a PC

interface, NONE will be printed.)

(27) NUMBER OF PC-PRINT

The number of times multifunction was used for the Printer. (The number of pages printed. If the unit does not have a PC interface, NONE will be printed.)

(28) Not used

(29) Not used

(30) Not used

(31) NUMBER OF PRINTING HELP

The number of help lists printed until now.

(32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION

The number of faxes received that were divided into more than one sheet since the unit was purchased.

(33) DETECTION OF PC INTERFACE (USB OR PARALLEL)

When the fax and PC interface (USB or parallel) are connected and the signal is received correctly, COMPLETE will be printed. For models without a PC interface or when there is a PC interface but the signal cannot be received between the fax and PC, INCOMPLETE will be printed. (The number of pages transmitted. If the unit does not have a PC interface, NONE will be printed.)

(34), (35) Not used.

(36) FAX MODE

Means the unit received a fax message in the FAX mode.

(37) MAN RCV

Means the unit received a fax message by manual operation.

(38) Not used

(39) Not used

(40) RMT DTMF

Means the unit detected DTMF (Remote Fax activation code) entered remotely.

(41) PAL DTMF

Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.

(42) TURN-ON

Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)

(43) Not used

(44) Not used

(45) Not used

(46) Not used

(47) Not used

(48) Not Used

(49) Not Used

(50) DRUM COUNT

The number of pages printed by current drum unit.

(51) Not Used

(52) CALL SERVICE 3 failure cause record (the latest)

(53) CALL SERVICE 3 failure cause record (the last time)

(54) CALL SERVICE 3 failure cause record (the second last time)

**Note:**

See the following descriptions of this report. Item No. (52) (53) (54) are corresponding to the listed items in **CALL SERVICE TROUBLESHOOTING GUIDE**(P.92).

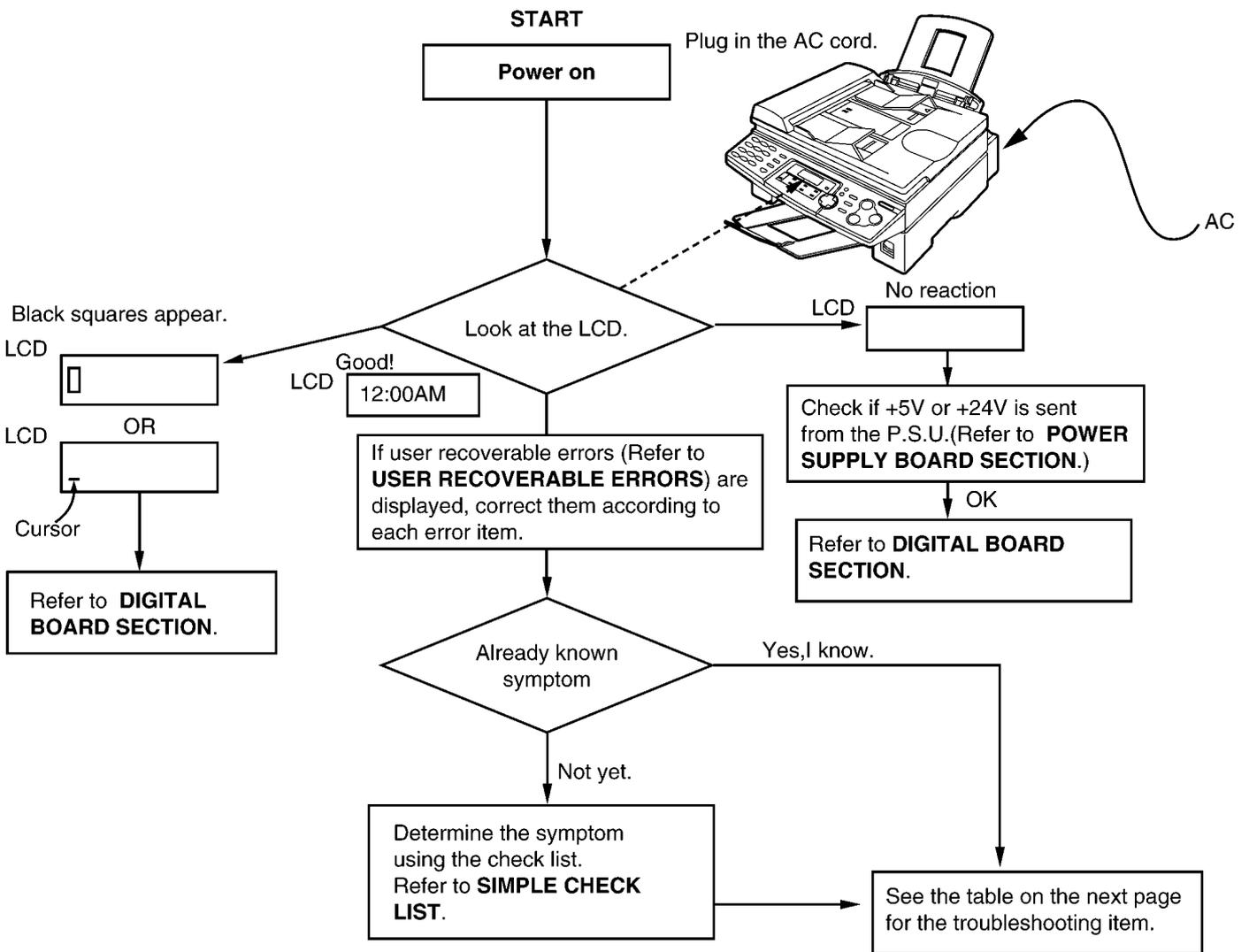
## 6.5. TROUBLESHOOTING DETAILS

### 6.5.1. OUT LINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on **SIMPLE CHECK LIST**(P.87). Difficult problems may be hard to determine, so repeated testing is necessary.

### 6.5.2. STARTING TROUBLESHOOTING

Determine the symptom and the troubleshooting method.

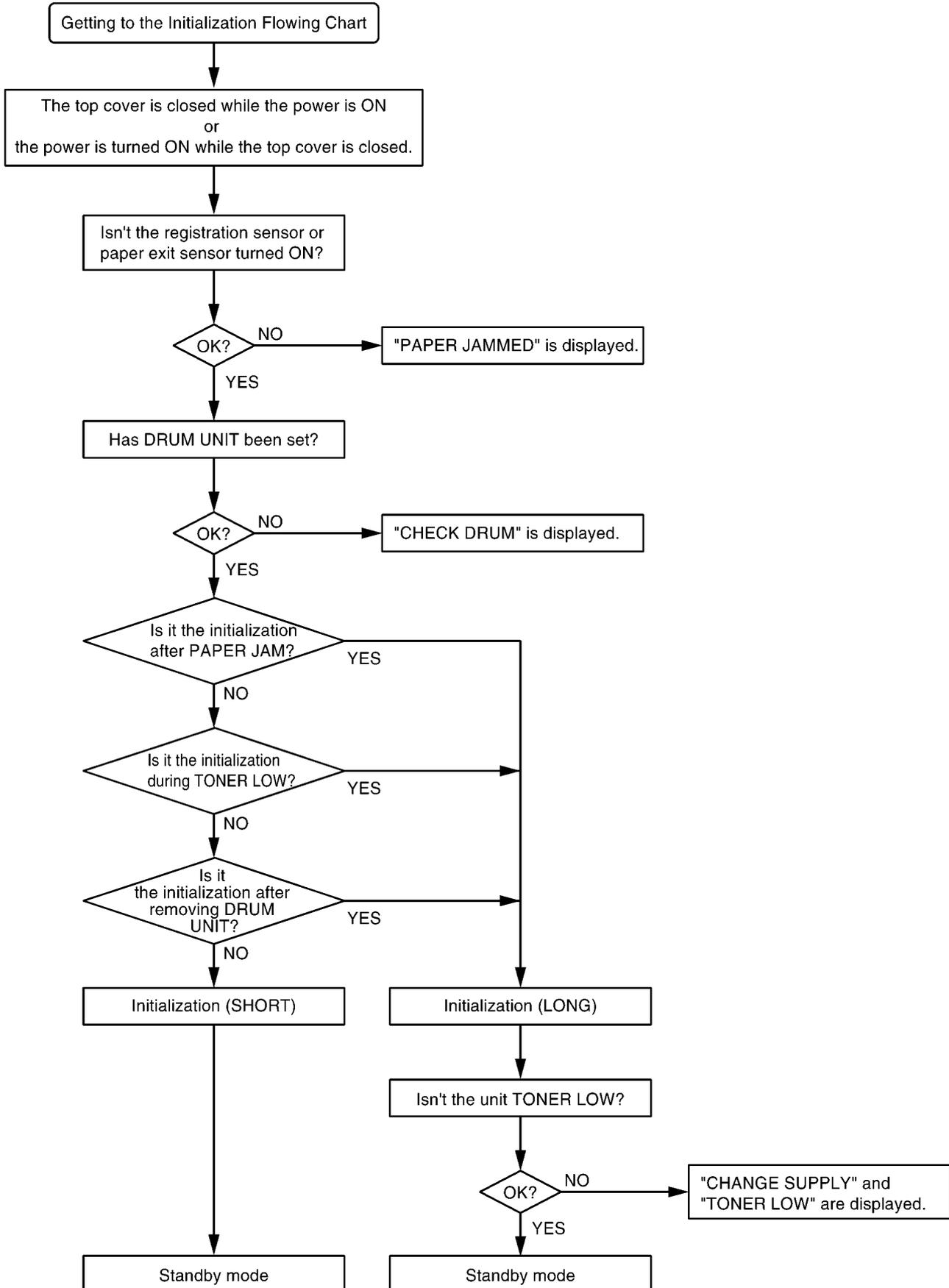


**CROSS REFERENCE:**

- USER RECOVERABLE ERRORS(P.69)
- SIMPLE CHECK LIST(P.87)
- DIGITAL BOARD SECTION(P.218)
- POWER SUPPLY BOARD SECTION(P.155)

### 6.5.3. INITIALIZATION

There are two types of initialization, one is the short initialization (about 3 seconds) and the other is the long initialization (about 10 seconds). The short initialization makes the unit enter the standby mode. The long initialization makes the unit enter the standby mode after cleaning or detecting the rest of toner.



## 6.5.4. SIMPLE CHECK LIST

SERIAL NO. _____		DATE _____	
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	Copy by ADF	OK / NG	
	Copy by Flat Bed	OK / NG	
PC operation	Parallel PC print	OK / NG	
	USB PC print	OK / NG	
Telephone operation	Handset transceiver/ receiver	OK / NG	
	MONITOR sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
Operation panel	Key check	OK / NG	Service code 561*
	LED check	OK / NG	Service code 557*
	LCD check	OK / NG	Service code 558*
Sensor	Sensor check	OK / NG	Service code 815*
Clock		OK / NG	Is the time kept correctly? Check with another clock.*
EXT-TAM	Handset transceiver/receiver	OK / NG	
	Remote control	OK / NG	

**Note:**

Check according to the service code referring to **TEST FUNCTIONS (P.74)**

## 6.5.5. SIMPLIFIED TROUBLESHOOTING GUIDE

### 6.5.5.1. PRINTING

No.	Symptom	Cause	Countermeasure
1	<b>GHOST IMAGE</b> (P.97)	Failed drum unit	Replace drum unit
		Failed transfer unit	Check the transfer roller and spring
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Failed fuser unit	Check the heat roller and the pressurized roller and the spring and the heat lamp and the thermistor
		Failed the power supply board	Go to <b>POWER SUPPLY BOARD SECTION</b> (P.155)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
2	<b>DARK OR WHITE VERTICAL LINE</b> (P.98)	Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Dust on the path of the laser beam	Clean the path of the laser beam
		Dust on the developer roller	Replace drum unit
		Failed the heat roller or the pressurized roller	Check the heat roller and the pressurized roller
		Failed LSU	Go to <b>LSU SECTION</b> (P.147)
3	<b>DARK OR WHITE HORIZONTAL LINE</b> (P.99)	Failed drum unit	Replace drum unit
		Failed the gear	Check the gear
		Failed the engine motor	Go to <b>ENGINE MOTOR</b> (P.144)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Scratch on the OPC drum	Replace drum unit
		Static electricity on the documents (when copying)	Check the connection between the parts around CIS and earth
4	<b>DIRTY OR HALF DARKNESS BACKGROUND</b> (P.100)	Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller	Clean the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Dirty the recording paper path	Clean the recording paper path
5	<b>BLACK PRINT</b> (P.101)	Failed drum unit	Replace drum unit
		Failed LSU	Go to <b>LSU SECTION</b> (P.147)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to <b>CIS (Contact Image Sensor) SECTION</b> (P.148)
6	<b>LIGHT PRINT</b> (P.102)	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
7	<b>BLACK DENSITY IS LIGHT OR UNEVEN.</b> (P.103)	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Failed the high-voltage terminal	Check the high-voltage terminal
8	<b>BLANK PRINT</b> (P.104)	Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Failed drum unit	Replace drum unit
		Failed LSU	Go to <b>LSU SECTION</b> (P.147)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to <b>CIS (Contact Image Sensor) SECTION</b> (P.148)
9	<b>BLACK OR WHITE POINT</b> (P.104)	Failed the developer roller (27mm pitch)	Replace drum unit
		Failed the OPC drum (75mm pitch)	Replace drum unit
		Failed the heat roller (50mm pitch)	Check the heat roller
		Failed the charge blush	Replace drum unit
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb

### 6.5.5.2. RECORDING PAPER FEED

No.	Symptom	Cause	Countermeasure
1	<b>MULTIPLE FEED</b> (P.105)	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the pickup rubber
2	<b>THE RECORDING PAPER IS WAVED OR WRINKLED</b> (P.105)	Dirty the pressure roller or the heat roller	Clean the pressure roller and the heat roller
		Failed the spring of pressure roller	Replace the spring of pressure roller
		Too thin recording paper	Use the recording paper from 16lb to 24lb
3	<b>SKEW</b> (P.106)	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the pickup rubber
		Dirty or failed the regist roller	Clean or replace the regist roller
		Dust on the recording paper path	Clean the recording paper path
		Failed LSU	Replace LSU
		Over the max capacity of the recording paper	Set up to MAX 150 sheets
4	<b>THE RECORDING PAPER DOES NOT FEED</b> (P.107)	Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
		Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the pickup rubber
		Failed the solenoid	Replace the solenoid
		Failed the gear	Check the gear
		Failed the engine motor	Go to <b>ENGINE MOTOR</b> (P.144)
		Failed the regist sensor lever	Check the regist sensor lever
Failed the regist sensor	-----		
5	<b>THE RECORDING PAPER JAM(P.108)"PAPER JAMED" ON THE LCD</b>	Dirty or failed the pressure roller	Clean or replace the pressure roller
		Dirty or failed the heat roller	Clean or replace the heat roller
		Dust on the recording paper path	Clean the recording paper path
		Failed the regist roller	Replace the regist roller
		Failed the gear	Check the gear
		Failed the engine motor	Go to <b>ENGINE MOTOR</b> (P.144)
		Failed the regist sensor lever	Check the regist sensor lever
		Failed the regist sensor	-----
		Failed the exit sensor lever	Check the exit sensor lever
		Failed the exit sensor	Go to <b>PAPER EXIT SENSOR..... "PAPER JAMMED"</b> (P.191)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
Not set the toner bottle	Set toner bottle		
6	<b>BACK SIDE OF THE RECORDING PAPER IS DIRTY</b> (P.109)	Dirty the recording paper path	Clean the recording paper path
		Dirty the pressure roller	Clean the pressure roller
		Dirty the regist roller	Clean the regist roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to <b>HIGH VOLTAGE SECTION</b> (P.150)

## 6.5.5.3. COPY AND FAX

No.	Symptom	Cause	Countermeasure
1	<b>NO DOCUMENT FEED</b> (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.110)	Failed the document sensor lever	Replace the document sensor lever
		Failed the document sensor	Go to <b>DOCUMENT SENSOR...."CHECK DOCUMENT" AND PAPER FEED SENSOR...."REMOVE DOCUMENT"</b> (P.161)
		Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubber
		Failed the separation spring	Replace the separation spring
	<b>DOCUMENT JAM</b> (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.110)	Dust or scratch on the document paper path	Clean the document paper path
		Failed the gear	Check the gear
		Failed the ADF motor	Go to <b>ADF MOTOR</b> (P.145)
		Failed the ADF cover open switch lever	Replace the ADF cover open switch lever
	<b>MULTIPLE DOCUMENT FEED</b> (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.110)	Failed the ADF cover open switch	Go to <b>ADF COVER OPEN SWITCH</b> (P.188)
		Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubber
Failed the separation spring		Replace the separation spring	
2	<b>SKEW</b> (P.112)	Dust or scratch on the document paper path	Clean the document paper path
		Failed the document feed roller	Replace the document feed roller
		Failed the document guide	Replace the document guide
3	<b>SCANNER GLASS</b> (P.113)	Failed CIS unit holder	Replace CIS unit holder
4	<b>THE SENT FAX DATA IS SKEWED</b> (P.113)	The cause of ADF	Go to ADF (P.112)
		The cause of scanner glass	----
		Problem with the other FAX machine	
5	<b>THE RECEIVED FAX DATA IS SKEWED</b> (P.113)	The cause of printing	Go to <b>SKEW</b> (P.106)
		Problem with the other FAX machine	
6	<b>THE RECEIVED OR COPIED DATA IS EXPANDED</b> (P.114)	Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed roller
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the shaft or the ADF motor
7	<b>BLACK OR WHITE VERTICAL LINE IS COPIED</b> (P.114)	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		The cause of printing	Go to <b>DARK OR WHITE VERTICAL LINE</b> (P.98)
		Failed CIS	Go to <b>CIS (Contact Image Sensor) SECTION</b> (P.148)
8	<b>AN ABNORMAL IMAGE IS COPIED</b> (P.115)	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed roller
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the shaft or the ADF motor
		Failed CIS	Go to <b>CIS (Contact Image Sensor) SECTION</b> (P.148)
		The cause of printing	Go to <b>DARK OR WHITE VERTICAL LINE</b> (P.98)

#### 6.5.5.4. Others

No.	Symptom	Cause	Countermeasure
1	Cannot print legal size	Not selected the legal mode	Select the legal mode in the user programming mode
2	'CHECK DRUM' on the LCD	No connection between the drum unit and the whole unit	Replace the drum unit or the terminal of whole unit
		Failed the drum sensor	Go to DRUM SENSOR...."CHECK DRUM" (P.189)
3	'CHANGE DRUM' on the LCD	The toner sensor cannot detect the drum unit	Replace the toner sensor lever or check the analog board
		Dust between the drum unit and the toner sensor (especially metals)	Remove the dust
4	'OUT OF PAPER' on the LCD	Failed the paper sensor lever	Replace the paper sensor lever
		Failed the paper sensor	Go to PAPER SENSOR..... "OUT OF PAPER" (P.191)
5	'COVER OPEN' on the LCD	Failed the top cover open switch lever	Replace the top cover open switch lever
		Failed the top cover open switch	Go to TOP COVER OPEN SWITCH...."COVER OPEN" (P.189)
6	CALL SERVICE 1' on the LCD	The polygon motor of LSU is unusually	Check the connector and LSU and the digital board
7	CALL SERVICE 2' on the LCD	The laser of LSU is unusually	Check the connector and LSU and the digital board
8	CALL SERVICE 3' on the LCD	The fuser temperature is unusually	Check the connector and the fuser and the thermistor and the digital board
9	CALL SERVICE 4' on the LCD	The fan motor is unusually	Check the connector and the fan motor and the digital board

## 6.5.6. CALL SERVICE TROUBLESHOOTING GUIDE

### Call Service related error is most frequent.

Call Service 1 ----- Polygon doesn't rotate..... Refer to **LSU (Laser Scanning Unit) SECTION** (P.183).

- First, listen to the sound. If rotation sound isn't heard, check 24V line, POLON signal and POLCLK signal. If even a little of sound is heard, check XREADY signal.

Call Service 2 ----- Laser isn't output..... Refer to **LSU (Laser Scanning Unit) SECTION** (P.183)

- This can be judged only by referring to signal. Check 5V line, LDEN and VIDEO.

Call Service 3 ----- Detection of fixing temperature..... Refer to **HEAT LAMP CONTROL CIRCUIT** (P.199)

- The most possible reason is that connector isn't engaged firmly. And comparator (IC611) on the digital PCB might be broken because of static electricity. There are 2 kinds of temperature errors, "low temperature error", which means that low voltage is input to the comparator and "high temperature error", which means that high voltage is input to the comparator.
- \*Service mode \*655 tells the detection number and 3 latest temperatures of the thermistor. The detection point of the Call Service 3 and the thermistor temperature is displayed. Maximum 3 latest temperatures are displayed showing the newest on the left. [AABB CCDD EEFF] AA, CC and EE show the detection points and BB, DD and FF show their temperature detection points.

00: means that CALL SERVICE 3 has not been appeared.

01: means that it did not reach 85°C within 11 seconds since the heater was turned ON.

03: means that it did not reach the secondary stabilizing temperature (180°C) within 30 seconds from 85°C.

04: means that it became T2-55deg (125°C or below) after T2; the secondary stabilizing temperature (180°C). (The heater has burnt out.)

05: means that it became over 247°C.

06: means that during printing the SHORT of the thermistor (AD:0FF HEX) was detected.

Call Service 4 ----- Rotation of Fan..... Refer to **FAN MOTOR SECTION** (P.180)

- Connector isn't inserted firmly, dust is caught in and the fan is broken.
- \* As for Call Services 1, 2 and 4, turn the power OFF then ON to restart.

### <Note>

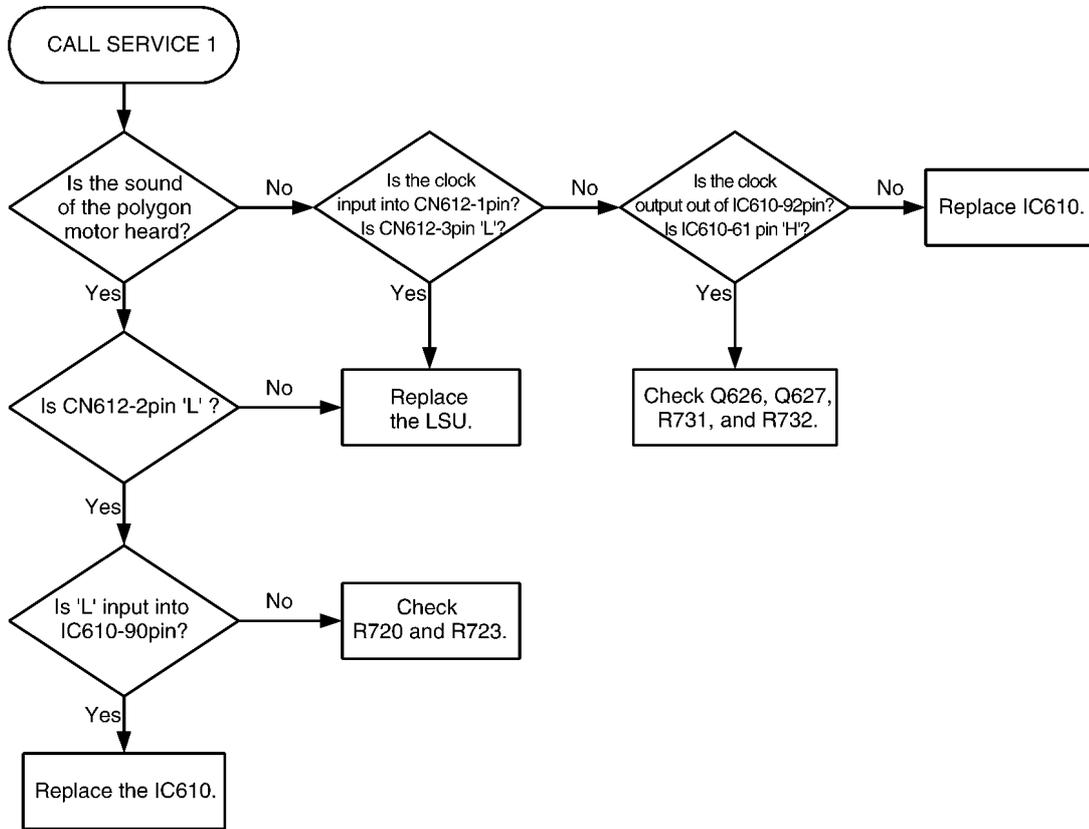
Once "CALL SERVICE3" is displayed, the unit does not disappear until the Factory Setup or Service Function #529 is executed. Therefore Service Function #529 should be executed before the confirmation, and #529 should be done after the countermeasure.

### 6.5.6.1. CALL SERVICE 1

"CALL SERVICE 1" means that the polygon motor inside the LSU does not rotate.

The rotation of the polygon motor is detected by IC610-90pin (XREADY).

After the LCD indicates "CALL SERVICE 1", turn the power OFF/ON. Then, when the unit starts initial operation, confirm that the rotating sound of the polygon motor is heard before the engine motor starts to run.

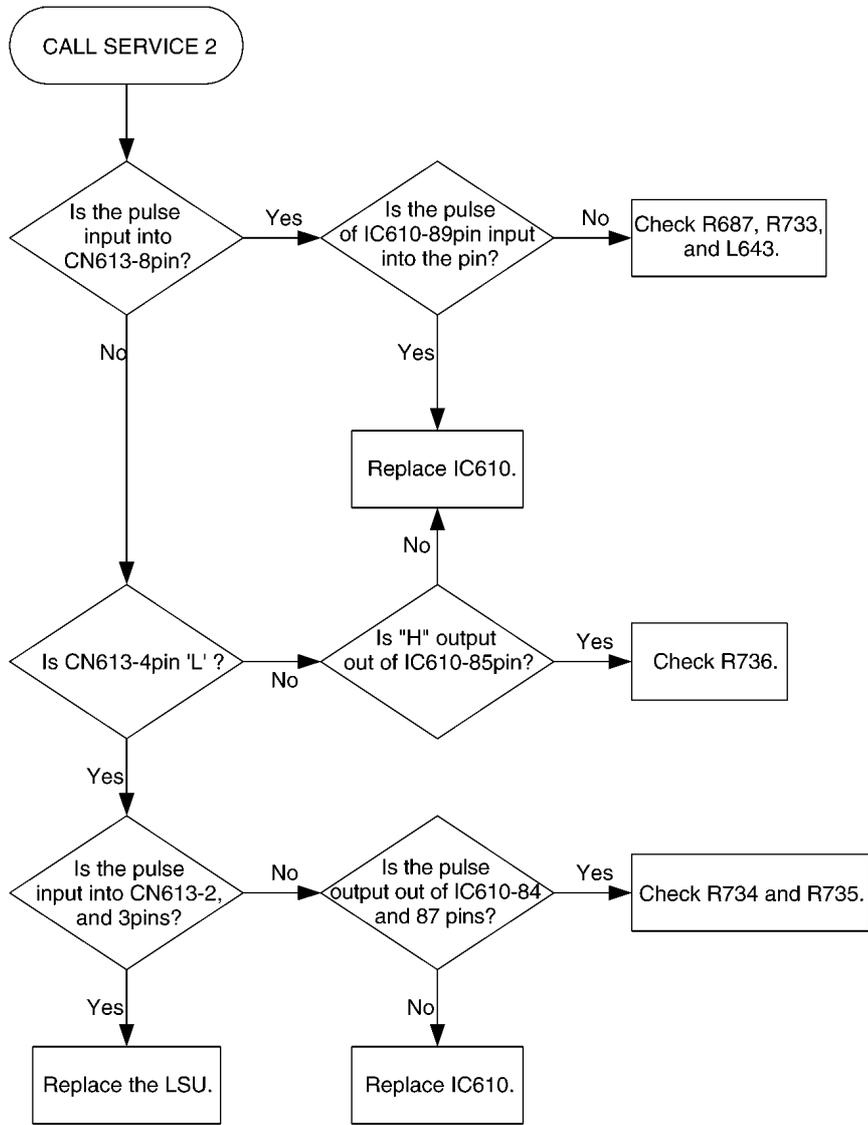


### 6.5.6.2. CALL SERVICE 2

"CALL SERVICE 2" means that the synchronous signal out of the LSU cannot be detected.

The synchronous signal out of the LSU is detected by IC 610-89pin. (XHSYNC)

After the LCD indicates "CALL SERVICE 2", turn the power ON/OFF, then confirm the waveform when the unit starts initial operation.



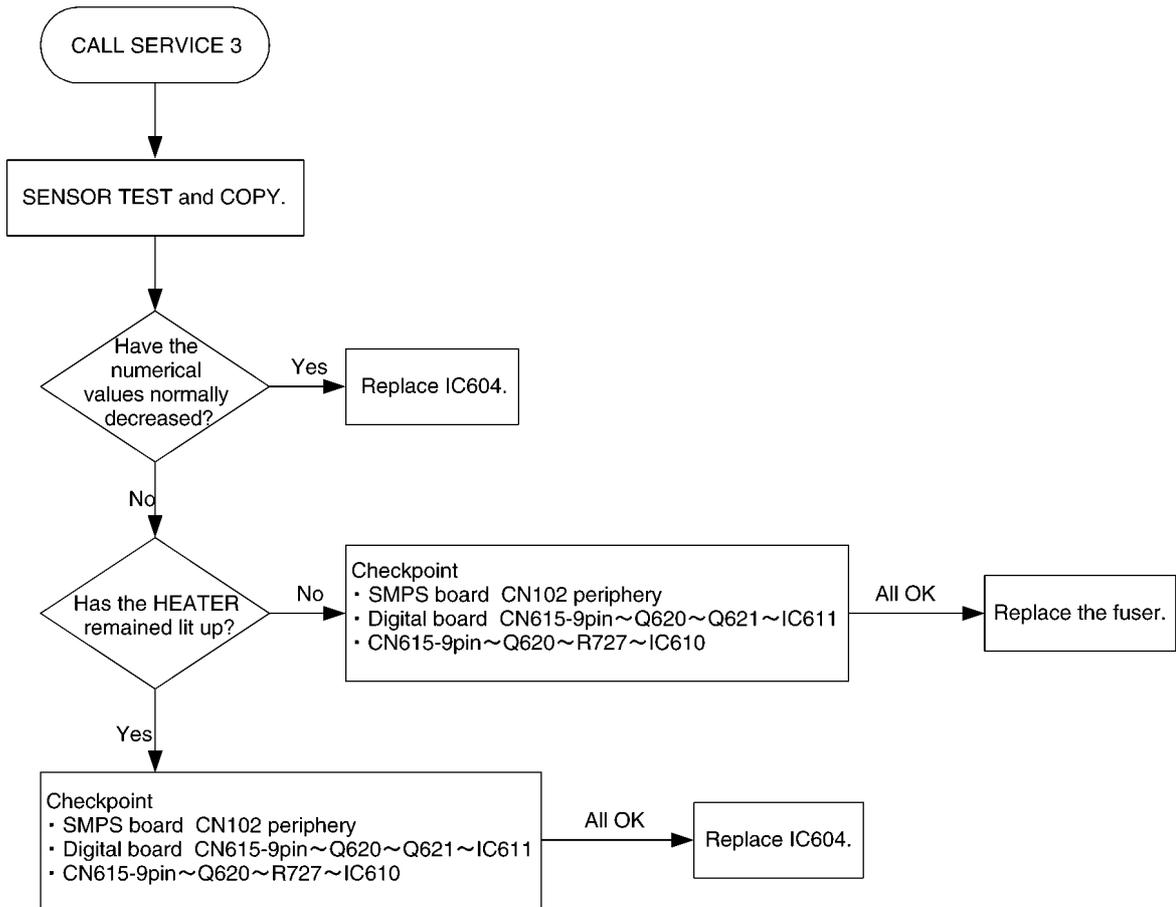
**Note:**

As for the "Pulse" waveform of the above flow chart, see the timing chart.

### 6.5.6.3. CALL SERVICE 3

"CALL SERVICE 3" means that the temperature of the fuser does not rise up to or exceed a constant temperature. The temperature is monitored with the thermistor inside the fuser and detected with the voltage input into IC 604-Y6pin.

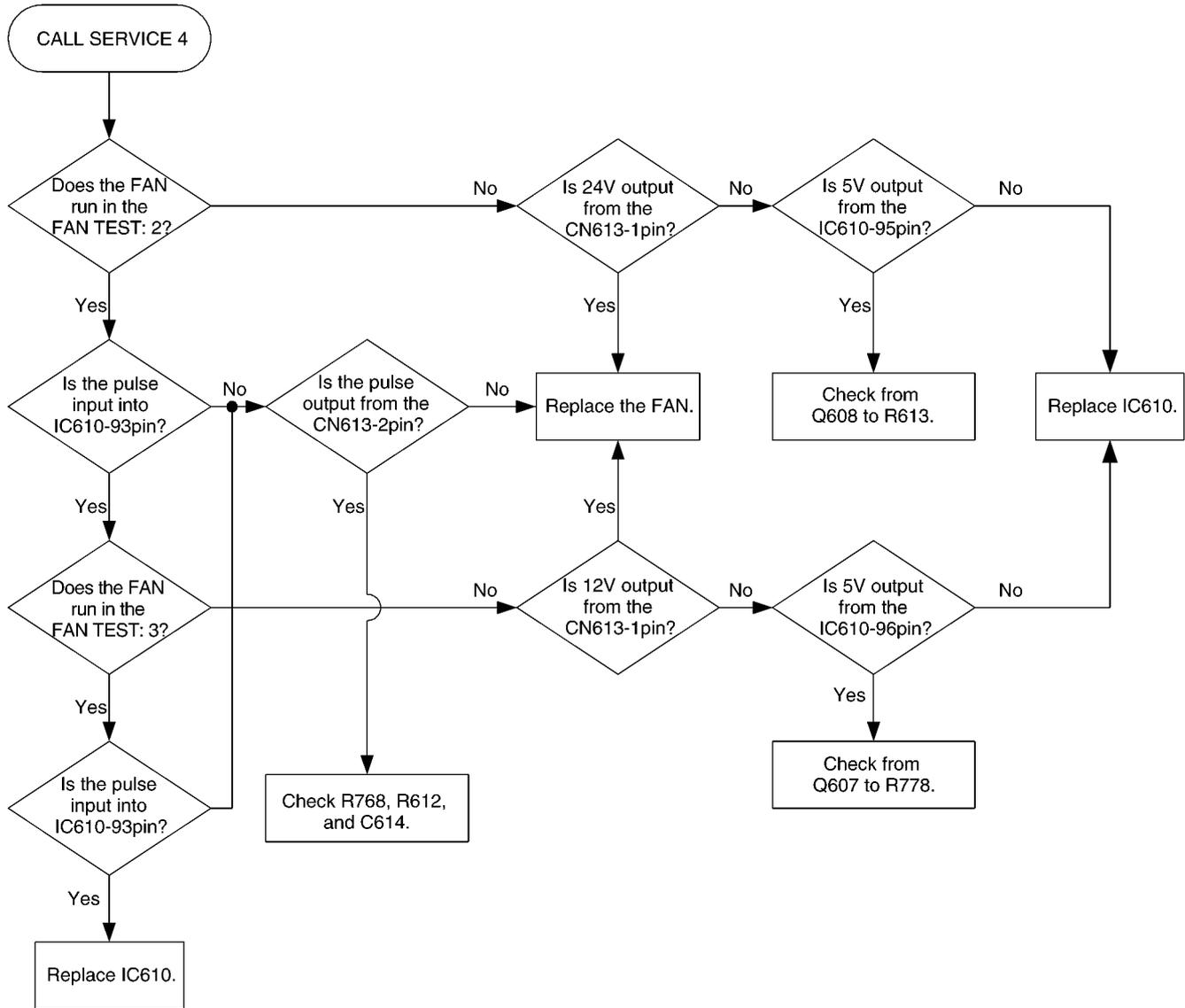
After the LCD indicate "CALL SERVICE 3" , perform the MENU → # → 9000 → × 529. Then, turn the power OFF/ON.  
 Perform the SENSOR TEST in service mode.  
 SENSOR TEST can be performed by pressing MENU → # → 9000 → ×815.  
 1: Normal mode (default)  
 2: The temperature is displayed on the LCD.  
 In this state, perform the copy operation to confirm how the two-digit numbers on the LCD change. In normal times, '3F' is displayed in the waiting state, and '1A' or its approximate numbers are displayed during printing.



### 6.5.6.4. CALL SERVICE 4

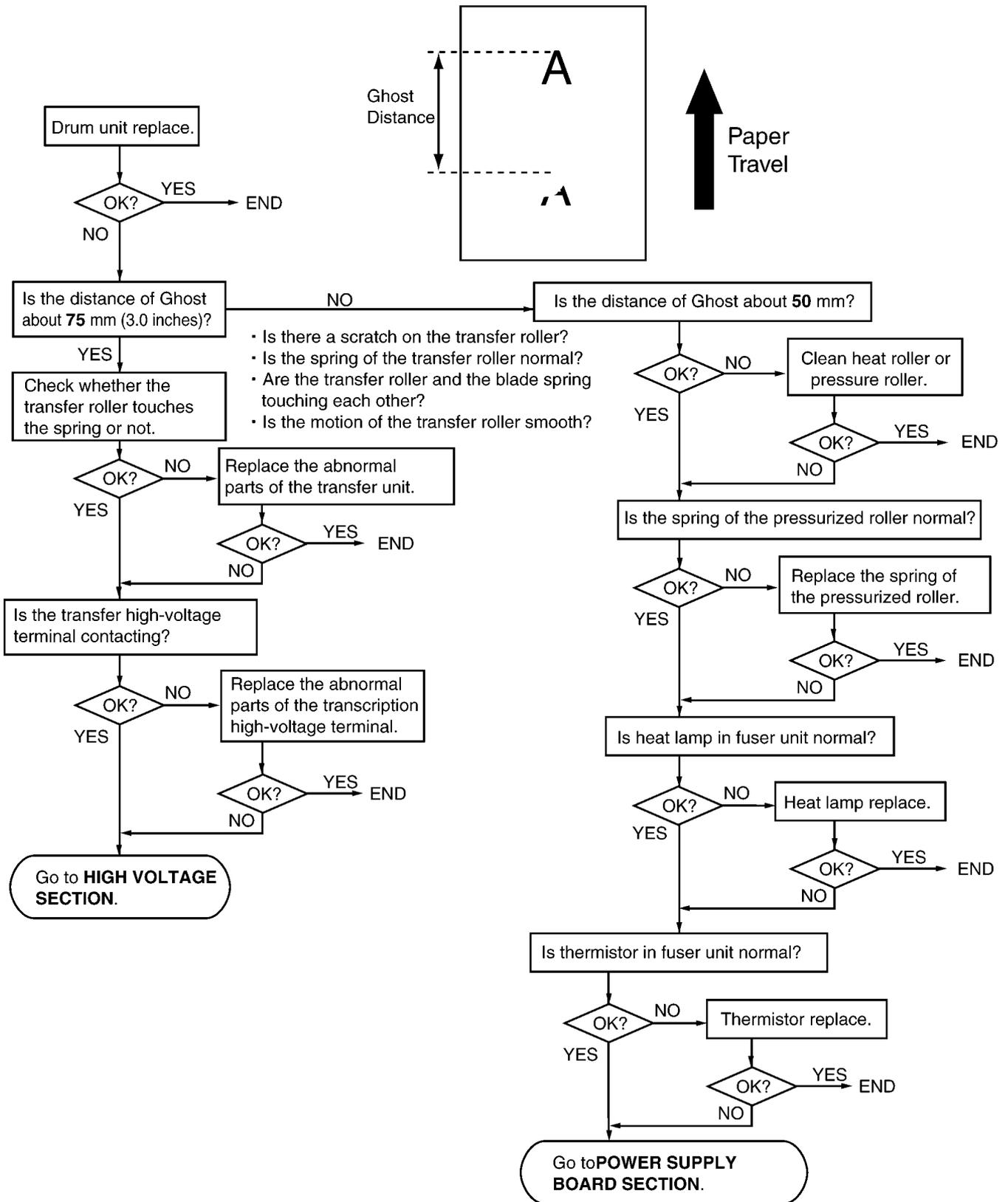
"CALL SERVICE 4" means that the FAN does not run or the running of the FAN cannot be detected normally. The running of the FAN is detected by IC 610-93pin. "CALL SERVICE 4" is displayed when it detects NG five times continuously. After repairing, copy five times.If "CALL SERVICE 4 " is displayed, check again.

After the LCD indicates "CALL SERVICE 4 " , turn the power OFF/ON. Then, perform the FAN TEST in service mode. This can be performed by pressing MENU→#→9000→\*677.  
 1: OFF (Default)  
 2: ON (High Speed)  
 3: ON (Low Speed)



### 6.5.7. PRINT

#### 6.5.7.1. GHOST IMAGE

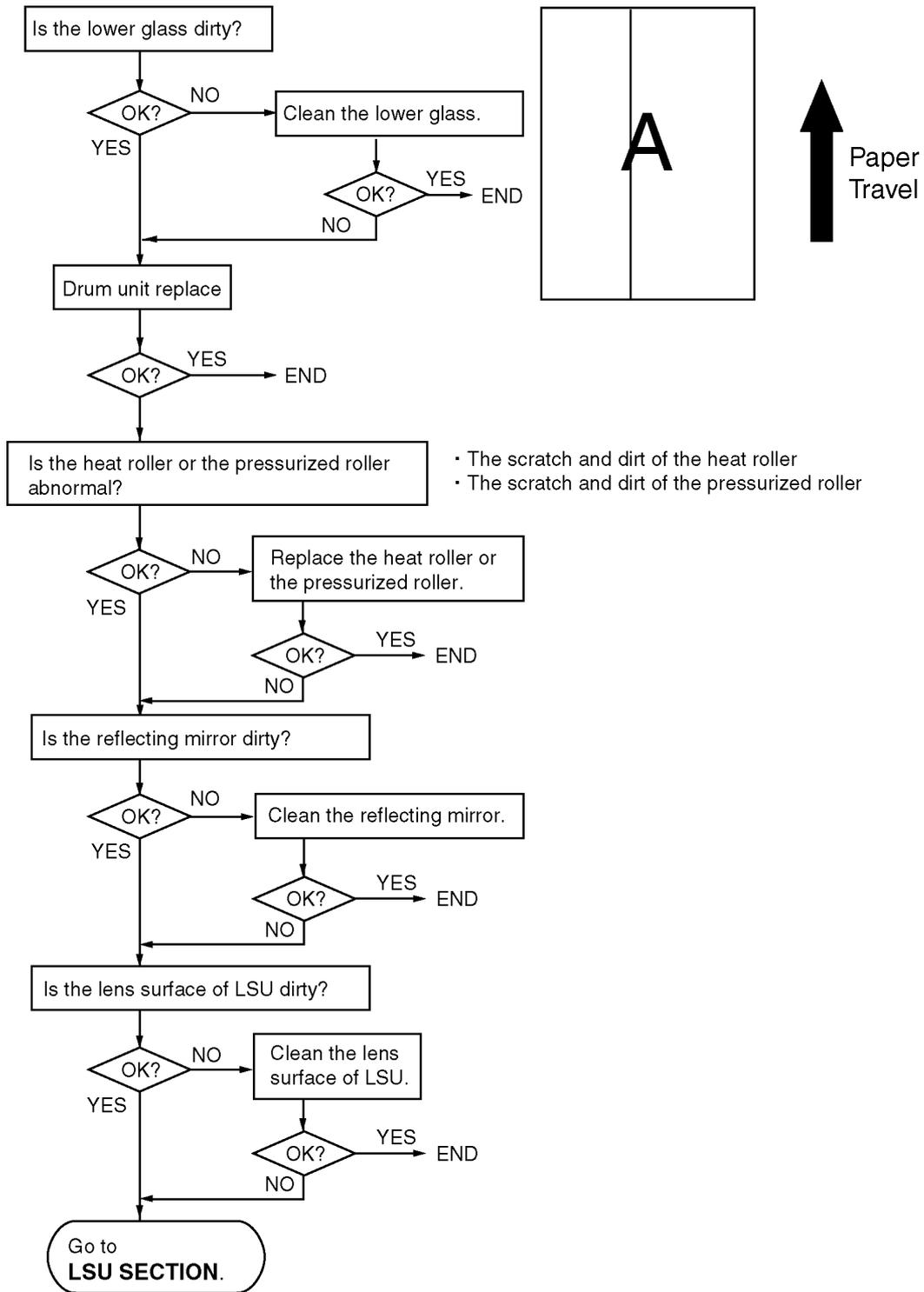


**CROSS REFERENCE:**

**HIGH VOLTAGE SECTION(P.150)**

**POWER SUPPLY BOARD SECTION(P.155)**

### 6.5.7.2. DARK OR WHITE VERTICAL LINE



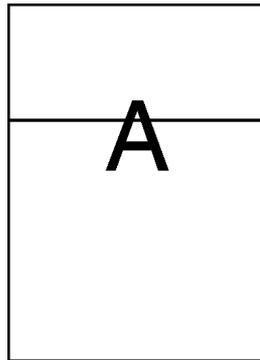
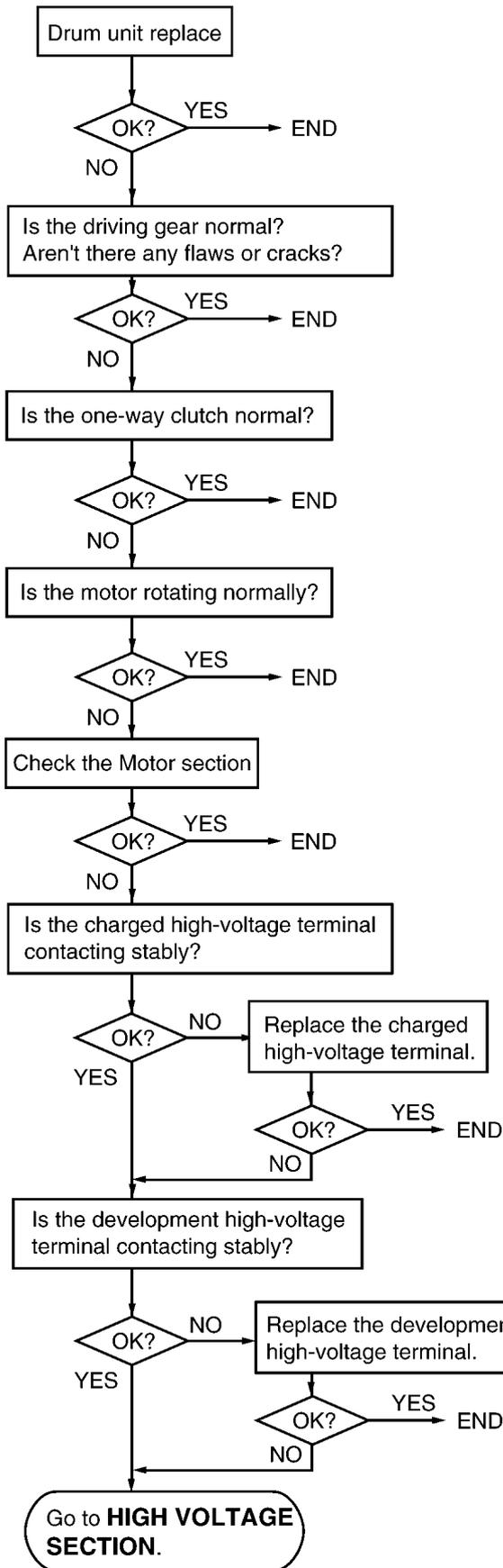
**Note:**

When wiping the lower glass, reflecting mirror and LSU lens, use a dry and soft cloth.

**CROSS REFERENCE:**

LSU SECTION (P.147)

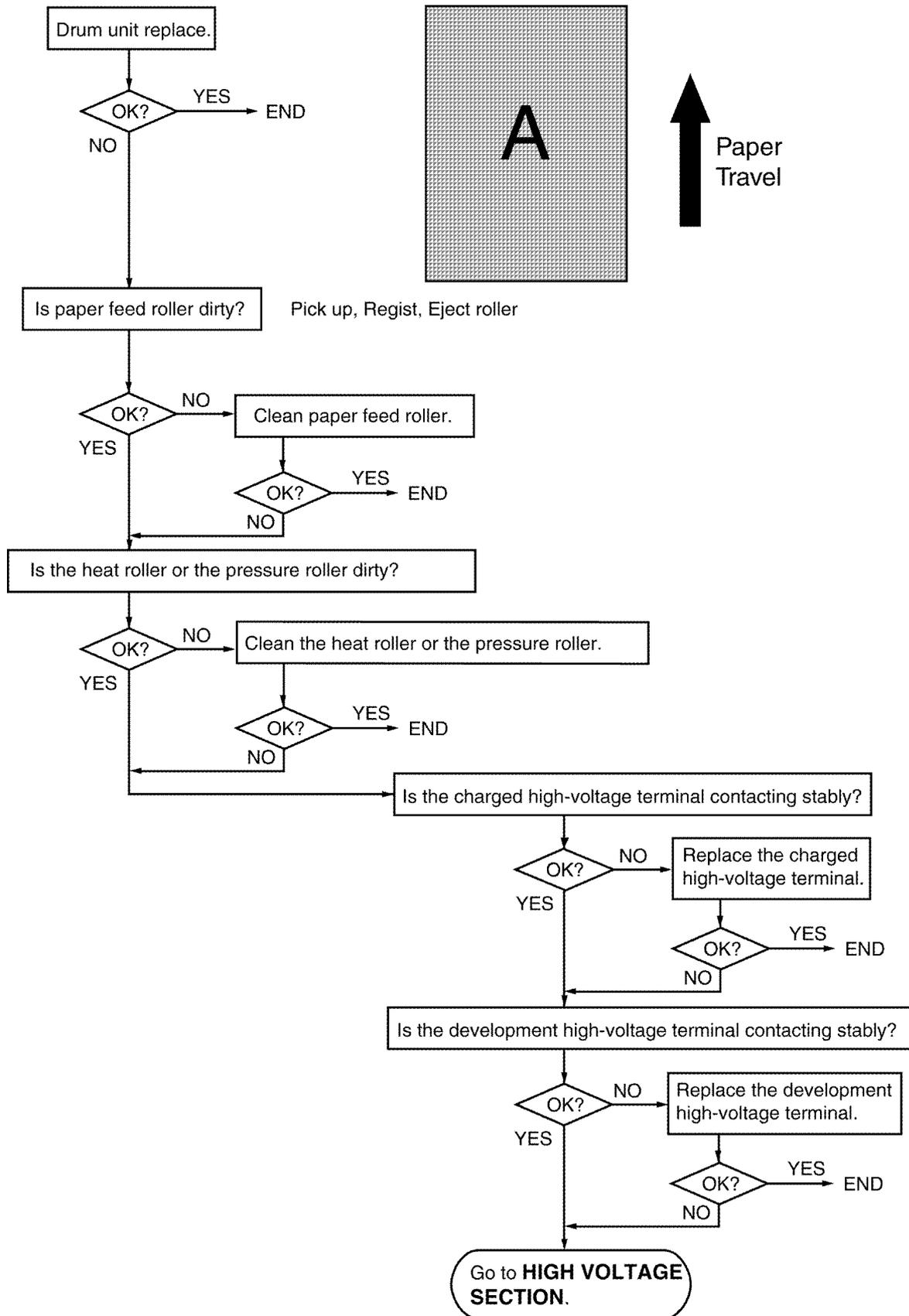
### 6.5.7.3. DARK OR WHITE HORIZONTAL LINE



• It is necessary to describe the information about the lines that cannot be troubleshot in such as halftone.  
 • When there is the information about the troubleshot horizontal line, please add the description of it.

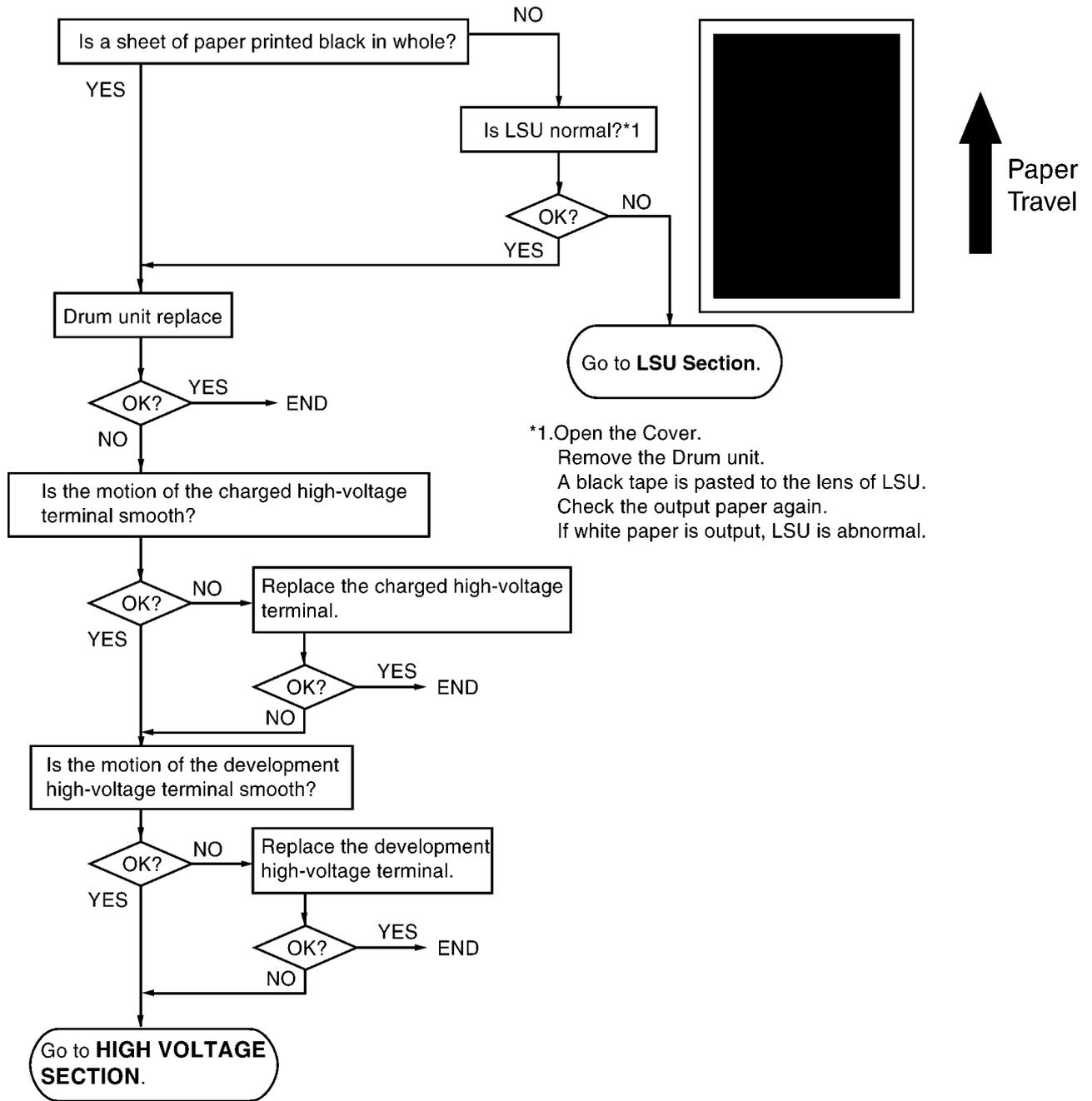
**CROSS REFERENCE:**  
**HIGH VOLTAGE SECTION (P.150)**

### 6.5.7.4. DIRTY OR HALF DARKNESS BACKGROUND



**CROSS REFERENCE:**  
**HIGH VOLTAGE SECTION (P.150)**

### 6.5.7.5. BLACK PRINT

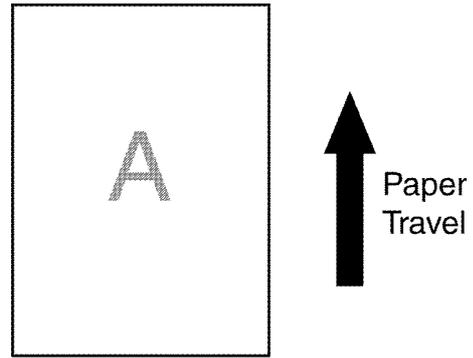
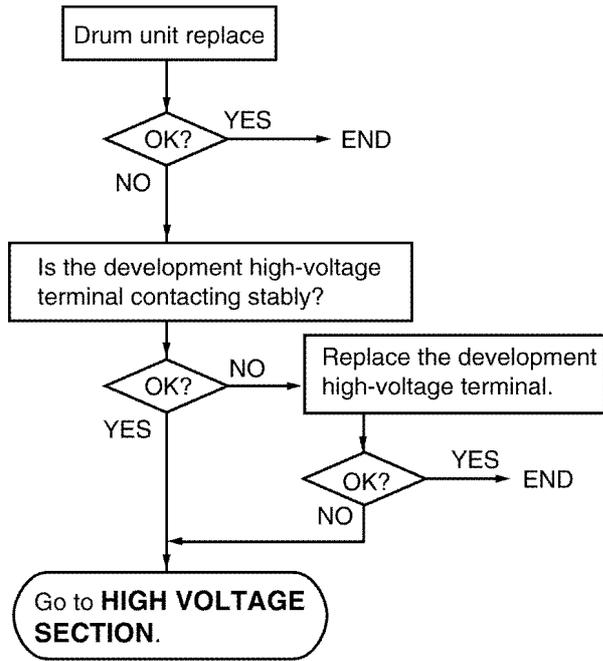


**CROSS REFERENCE:**

**HIGH VOLTAGE SECTION (P.150)**

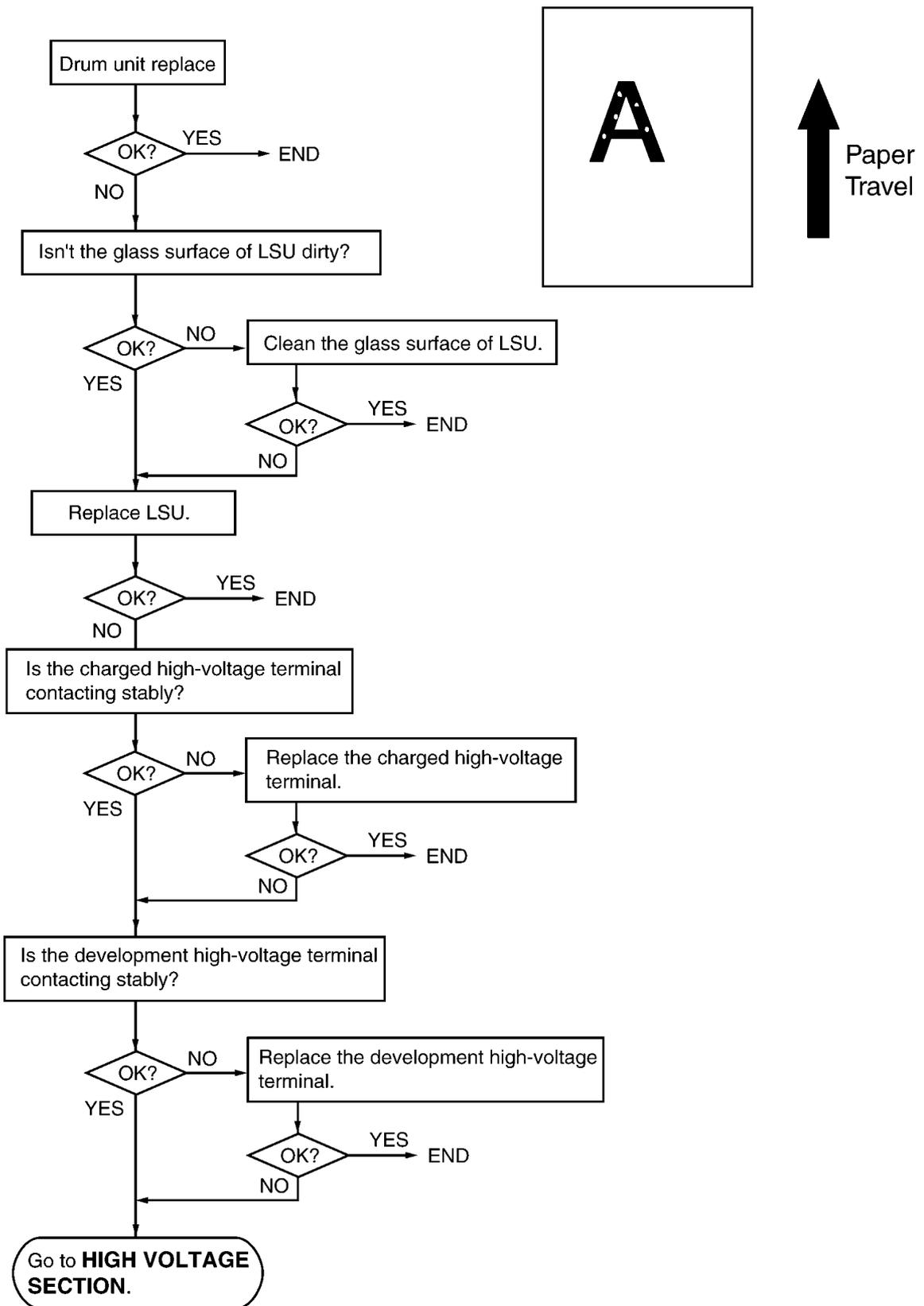
**LSU SECTION (P.147)**

### 6.5.7.6. LIGHT PRINT



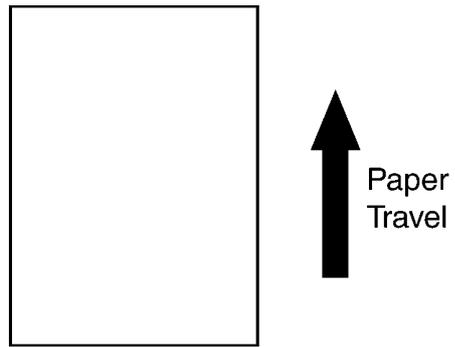
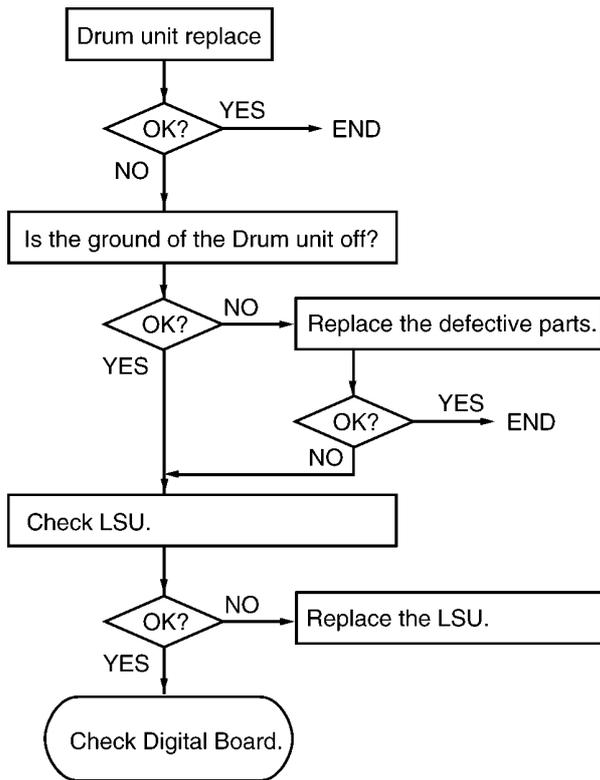
**CROSS REFERENCE:**  
**HIGH VOLTAGE SECTION (P.150)**

6.5.7.7. BLACK DENSITY IS LIGHT OR UNEVEN.

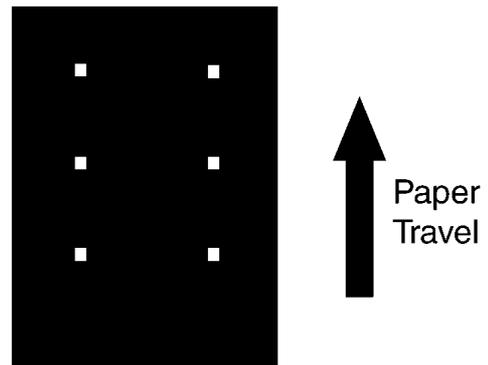
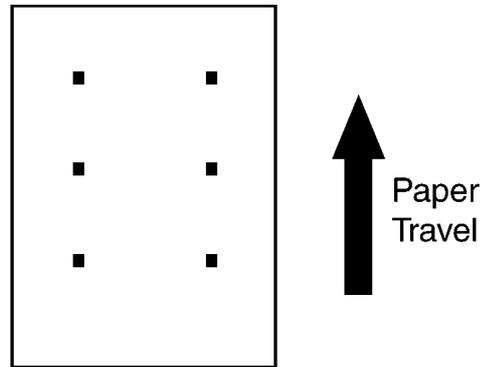
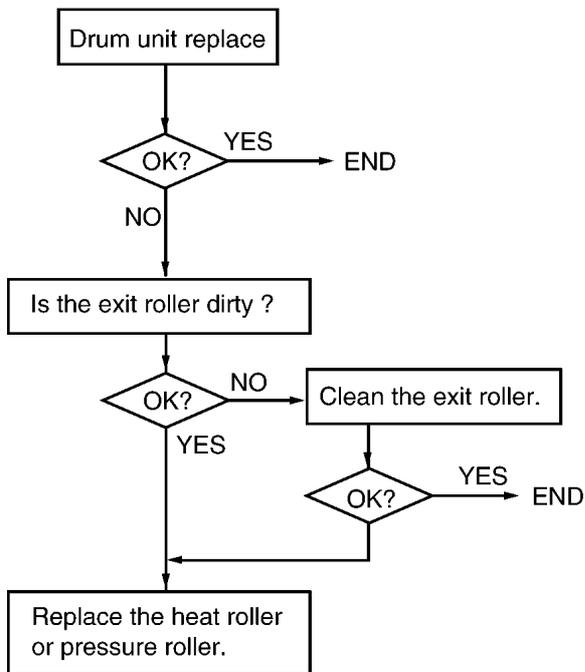


CROSS REFERENCE:  
HIGH VOLTAGE SECTION (P.150)

### 6.5.7.8. BLANK PRINT

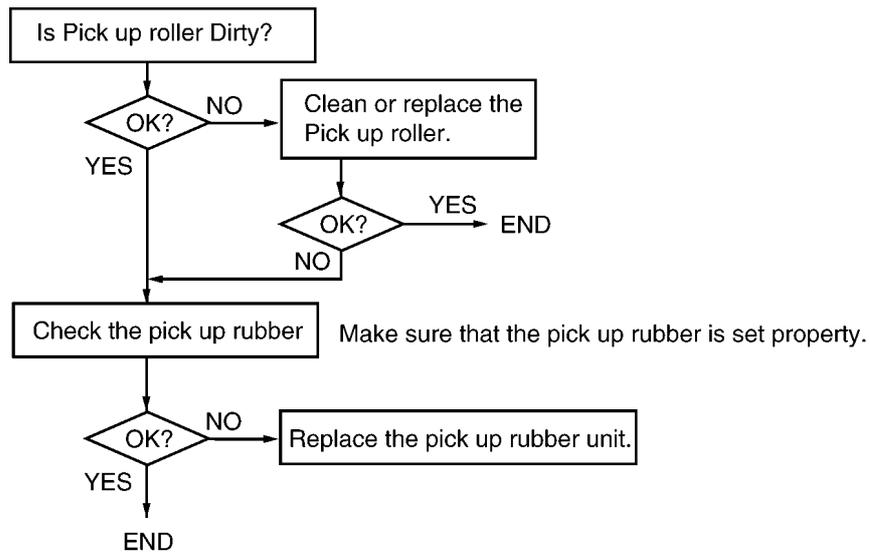


### 6.5.7.9. BLACK OR WHITE POINT

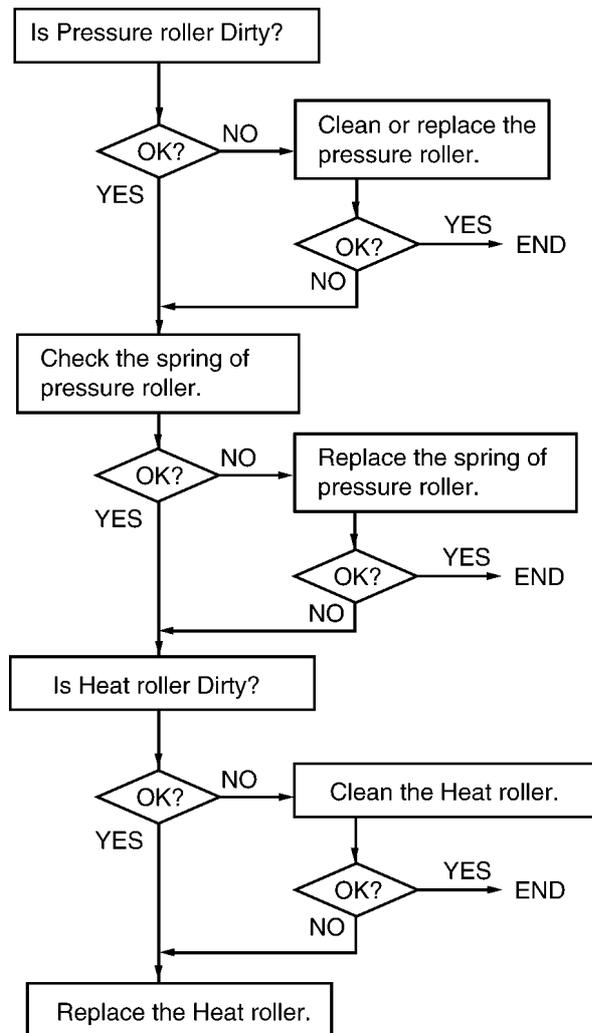


### 6.5.8. RECORDING PAPER FEED

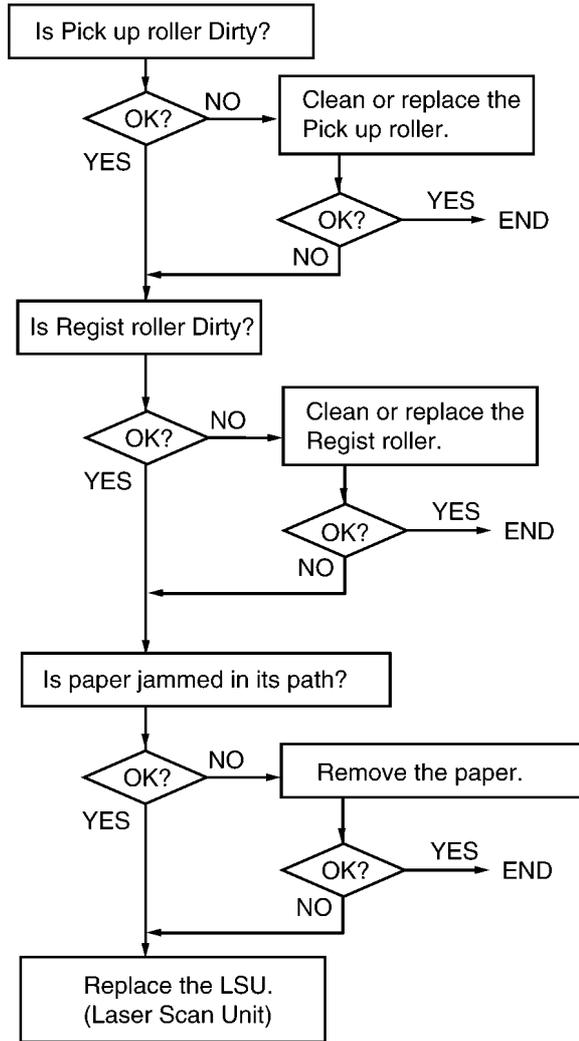
#### 6.5.8.1. MULTIPLE FEED



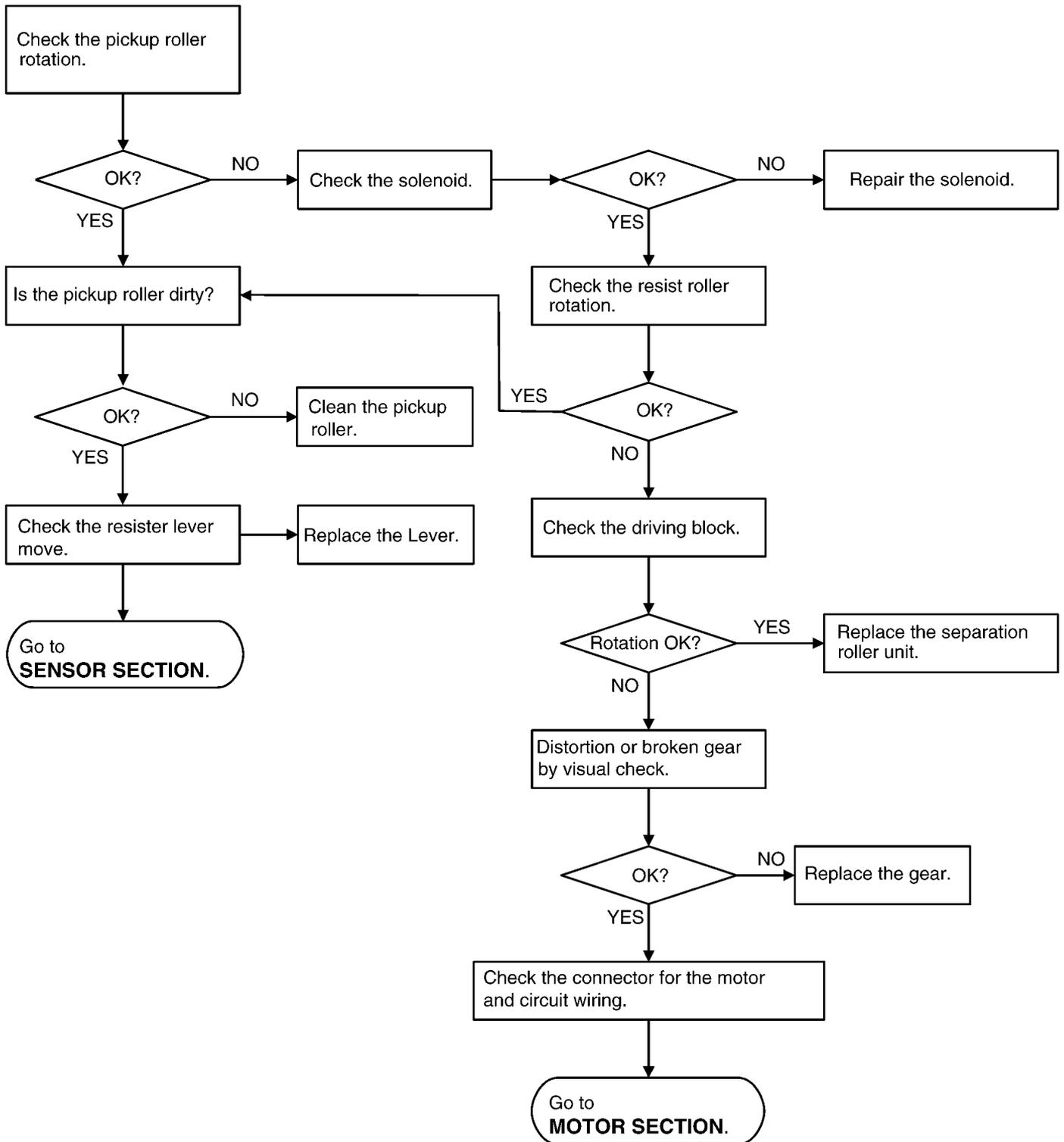
#### 6.5.8.2. THE RECORDING PAPER IS WAVED OR WRINKLED



### 6.5.8.3. SKEW



### 6.5.8.4. THE RECORDING PAPER DOES NOT FEED

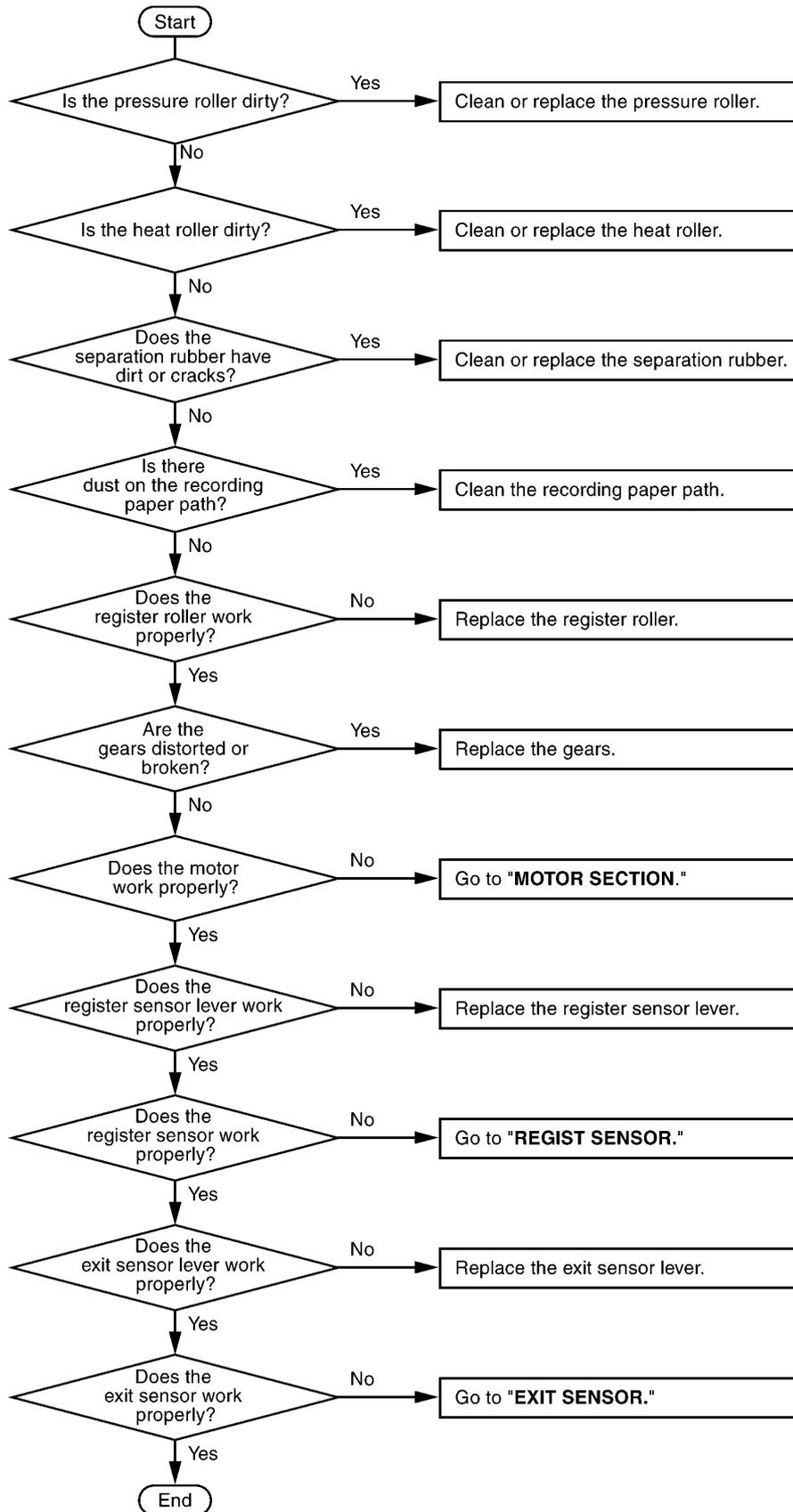


**CROSS REFERENCE:**

**SENSOR SECTION (P.141)**

**MOTOR SECTION (P.144)**

### 6.5.8.5. THE RECORDING PAPER JAM

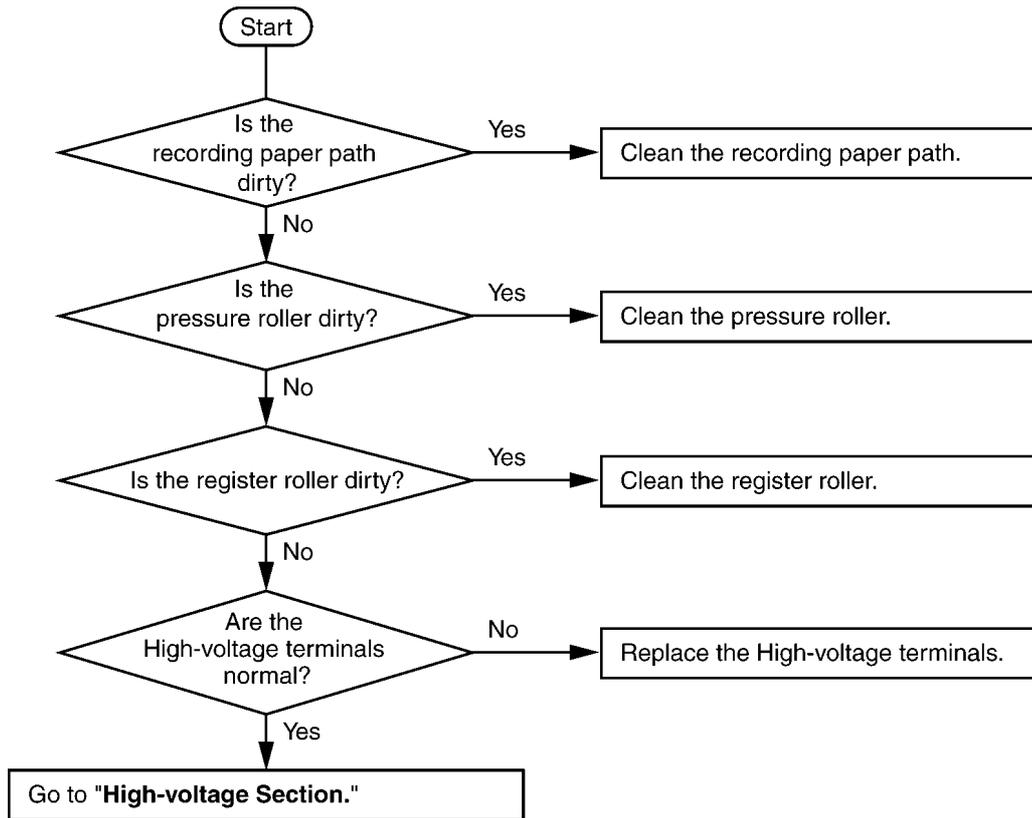


**CROSS REFERENCE:**

**PAPER EXIT SENSOR..... "PAPER JAMMED" (P.191)**

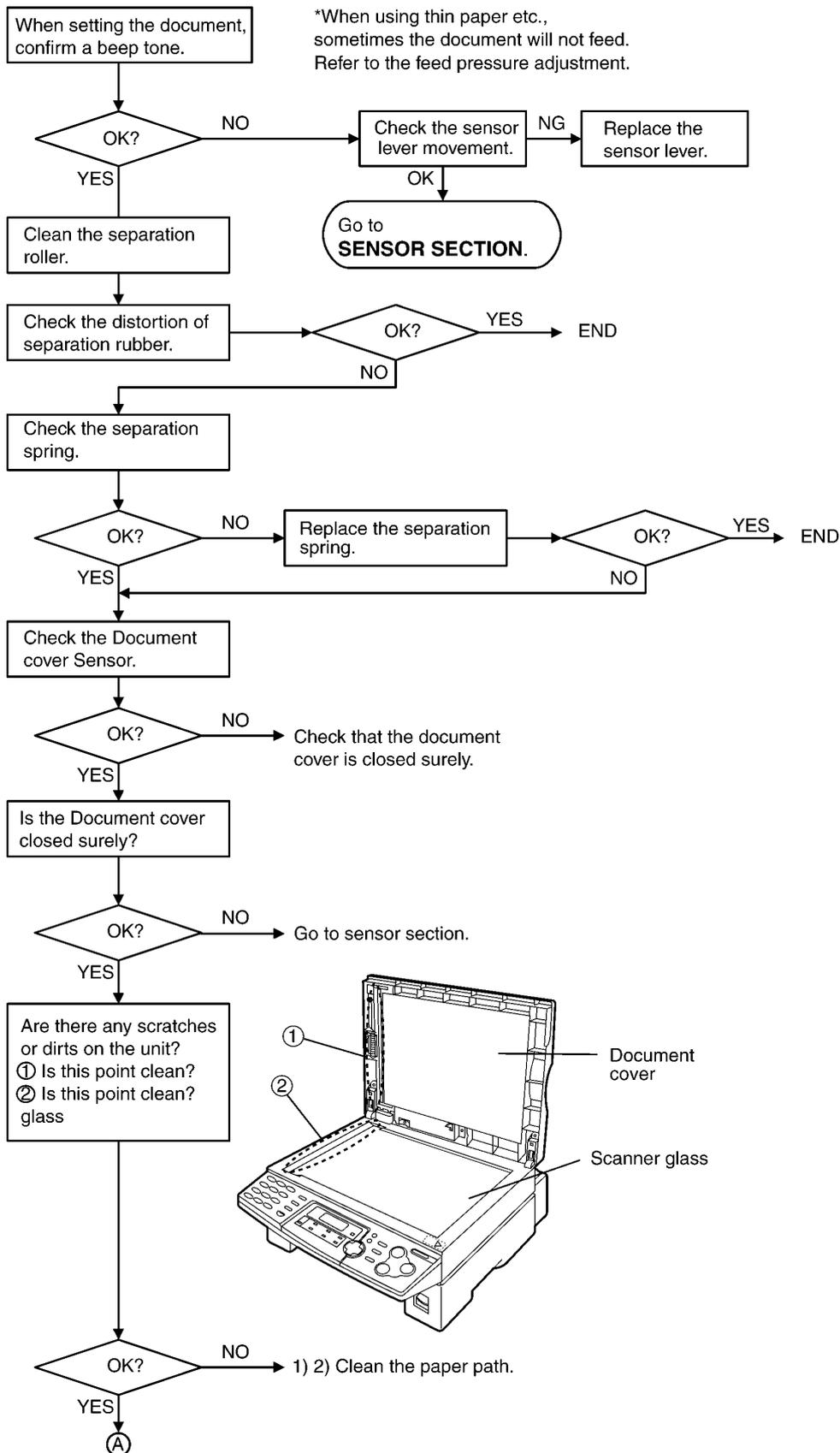
**FAN MOTOR SECTION (P.180)**

**REGIST SENSOR....."FAILED PICK UP" (P.190)**

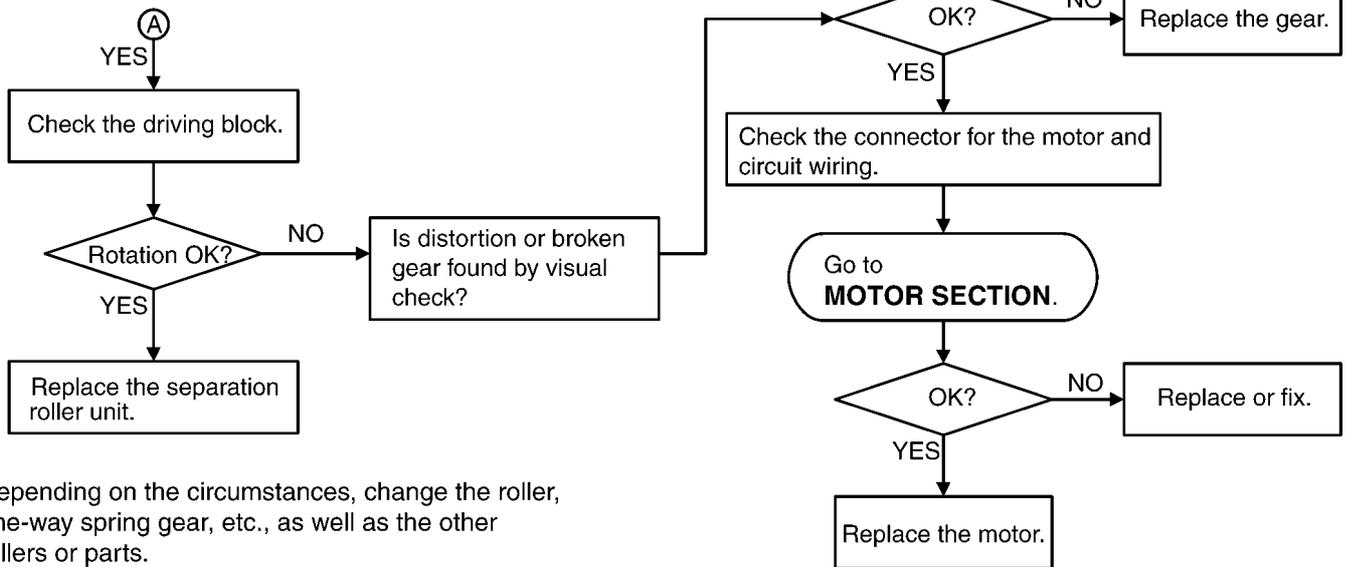
**6.5.8.6. BACK SIDE OF THE RECORDING PAPER IS DIRTY****CROSS REFERENCE:****HIGH VOLTAGE SECTION (P.150)**

### 6.5.9. ADF (Auto document feed) SECTION

#### 6.5.9.1. NO DOCUMENT FEED, DOCUMENT JAM and MULTIPLE DOCUMENT FEED.



**CROSS REFERENCE:**  
**SENSOR SECTION (P.141)**



Depending on the circumstances, change the roller, one-way spring gear, etc., as well as the other rollers or parts.

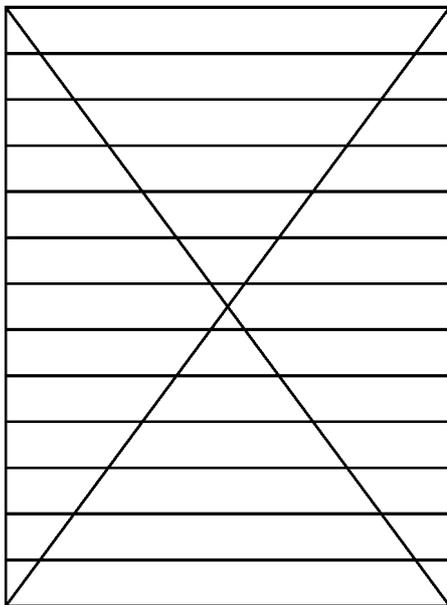


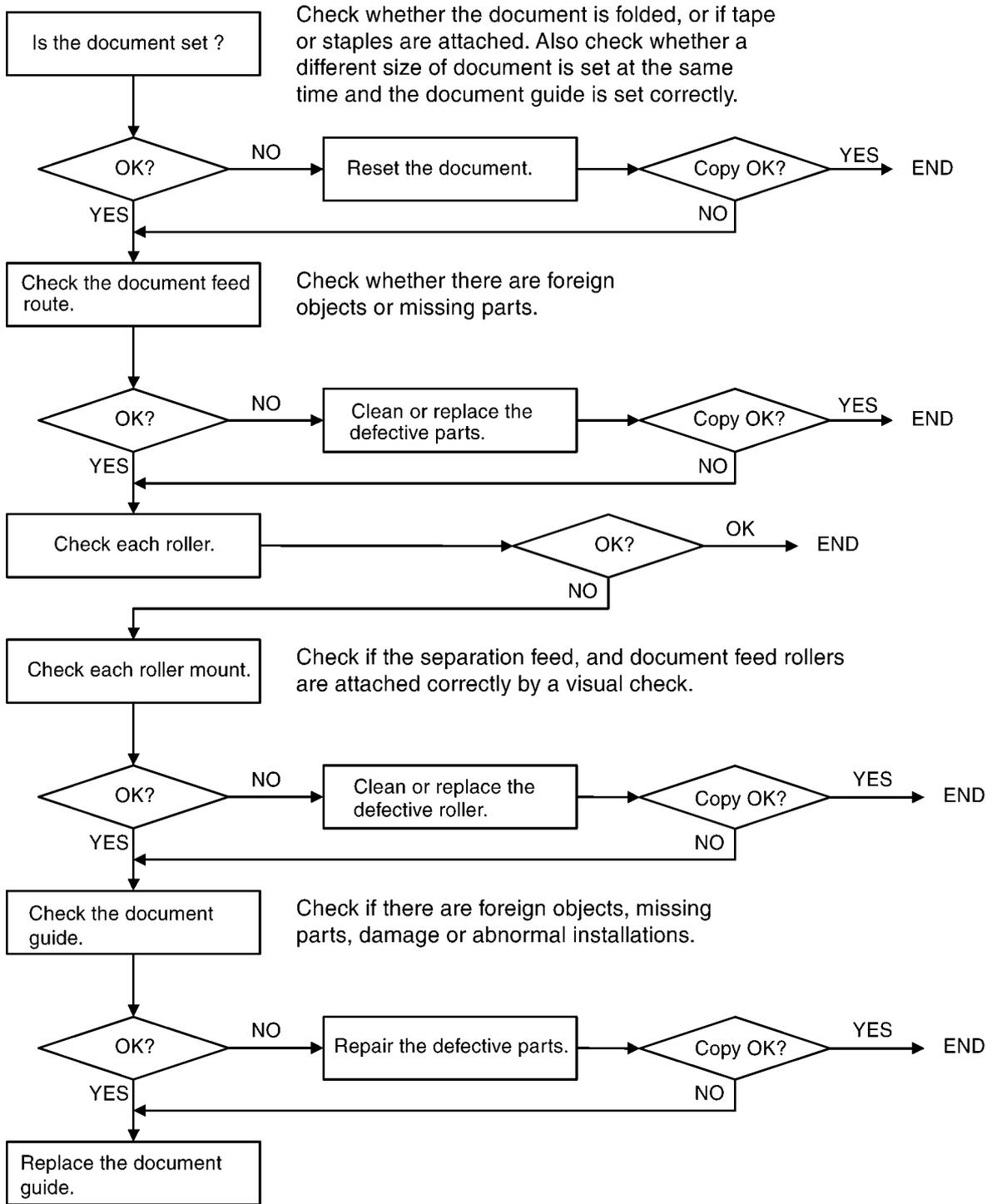
Fig. b

When confirming if the characters are extended or distorted on, if the feed problem occurs, use this test chart. (Fig b)

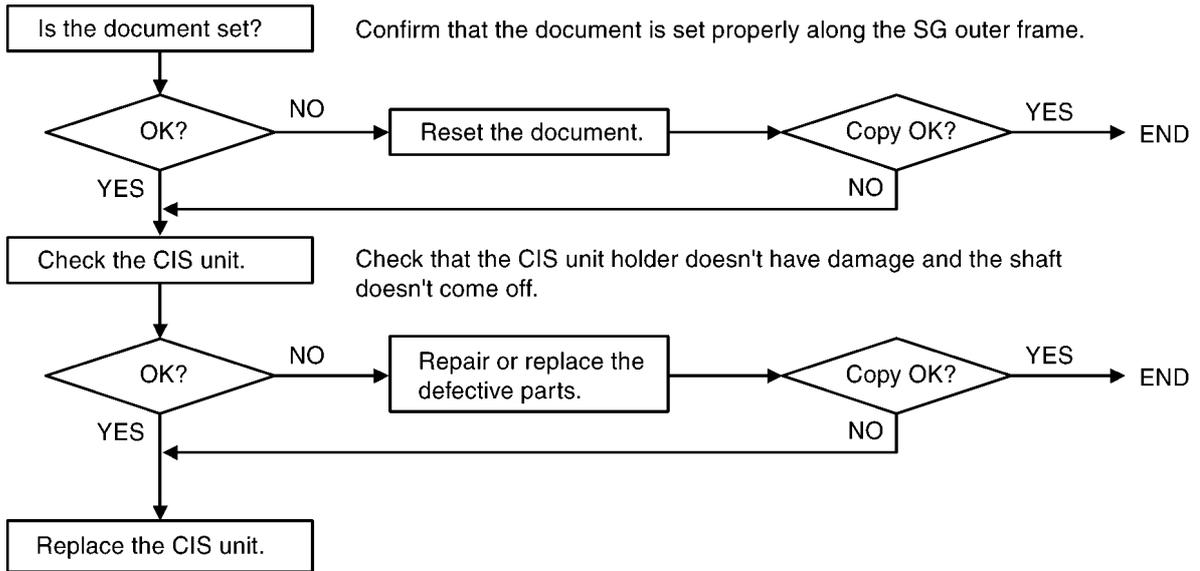
**CROSS REFERENCE:**  
**MOTOR SECTION (P.144)**

### 6.5.9.2. SKEW

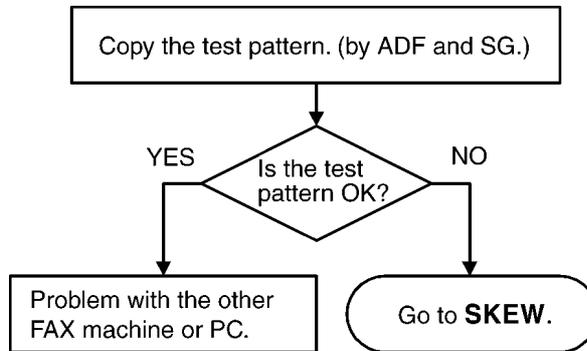
#### 6.5.9.2.1. ADF



**6.5.9.2.2. SCANNER GLASS**



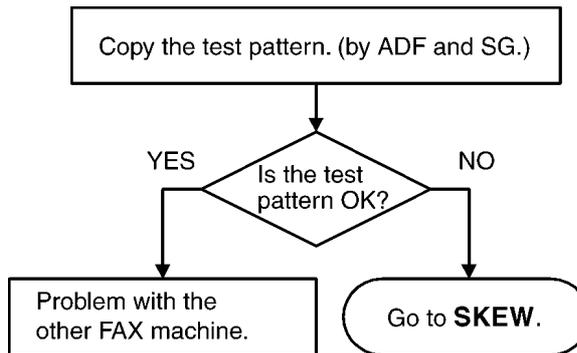
**6.5.9.3. THE SENT FAX DATA IS SKEWED**



**CROSS REFERENCE:**

**SKEW (P.112)**

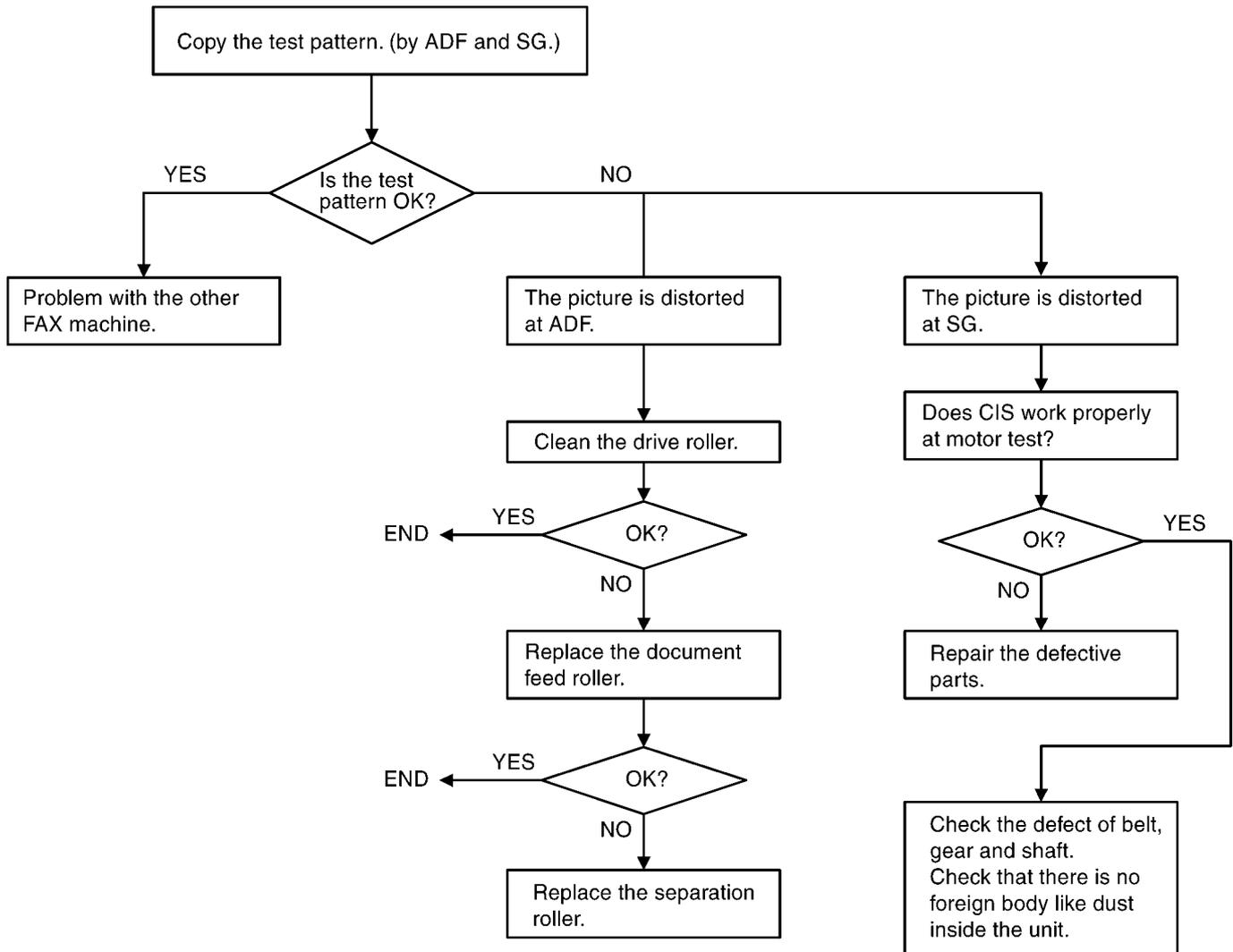
**6.5.9.4. THE RECEIVED FAX DATA IS SKEWED**



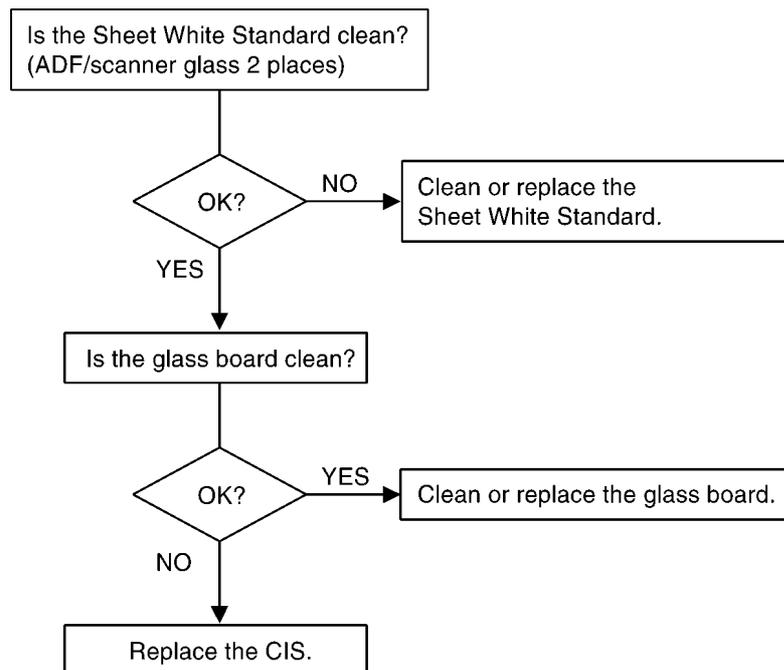
**CROSS REFERENCE:**

**SKEW (P.106)**

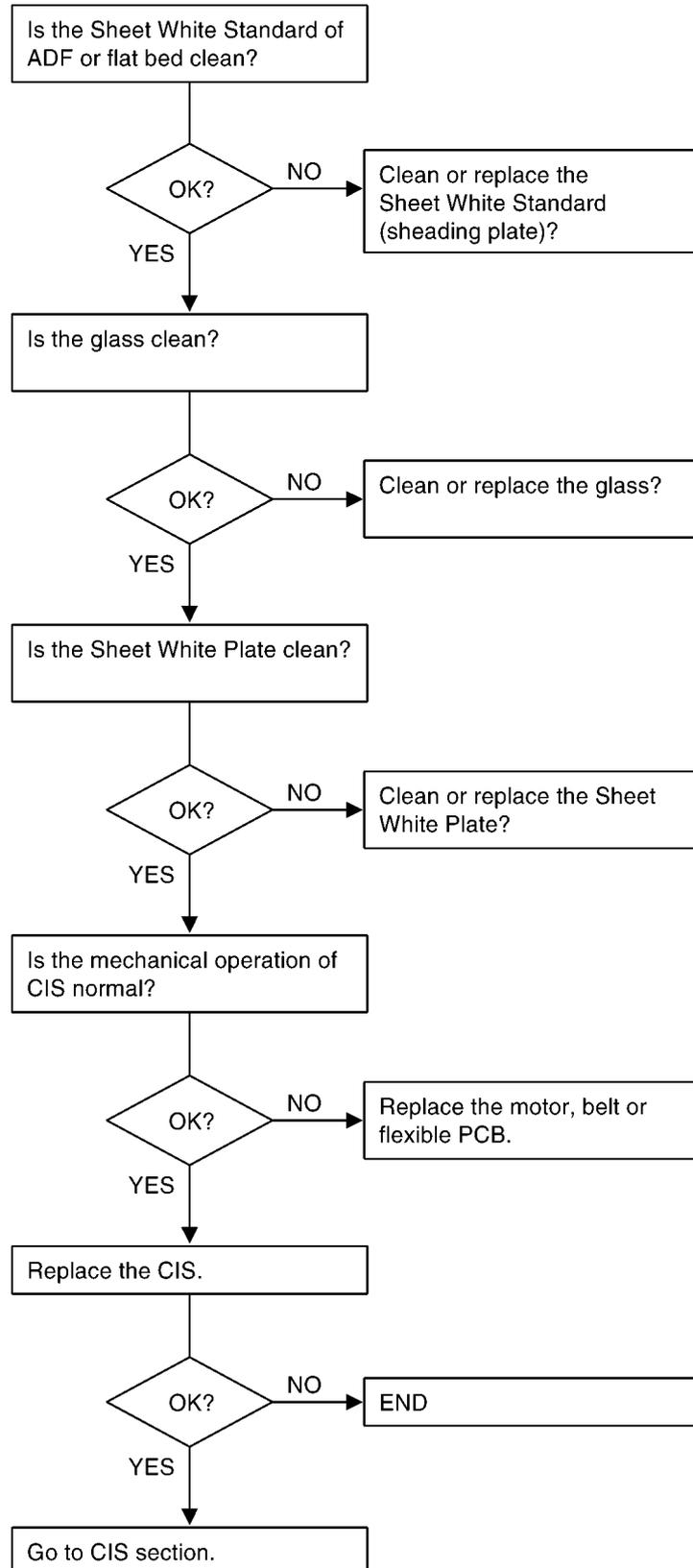
**6.5.9.5. THE RECEIVED OR COPIED DATA IS EXPANDED**



**6.5.9.6. BLACK OR WHITE VERTICAL LINE IS COPIED**



### 6.5.9.7. AN ABNORMAL IMAGE IS COPIED



#### CROSS REFERENCE:

CIS (Contact Image Sensor) SECTION (P.148)

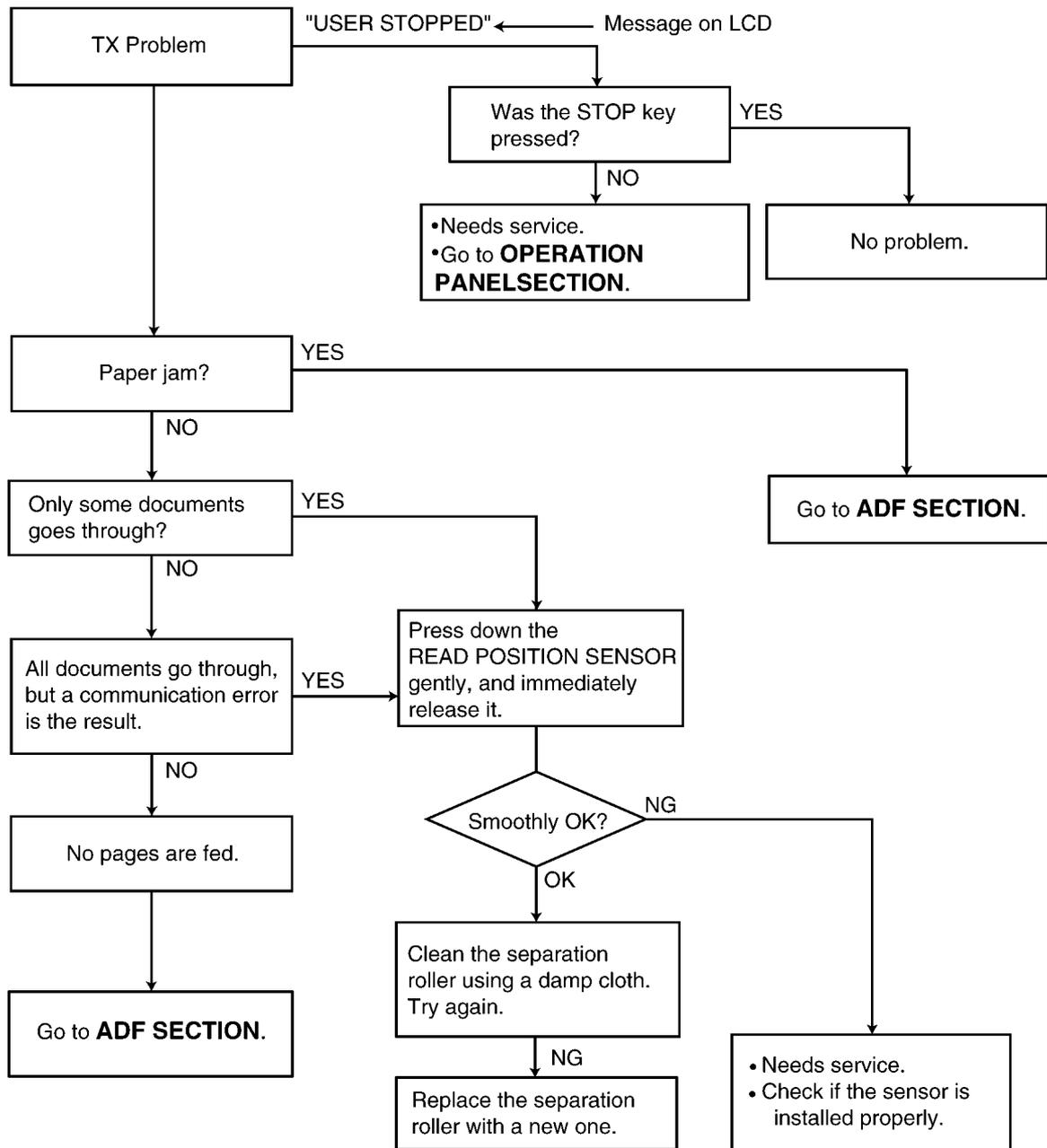
## 6.5.10. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **DEFECTIVE FACSIMILE SECTION** (P.117).

No.	Symptom	Content	Possible cause
1	The paper dose not feed properly when faxing. (Copying is also not possible.)	Troubleshooting	Problem with the feeding mechanism. (Refer to <b>TRANSMIT PROBLEM</b> (P.117).)
2	The fax transmits successfullly one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the receiver's fax. (Refer to <b>SOMETIME THERE IS A TRANSMIT PROBLEM</b> (P.118).)
3	The fax receives successfullly one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the transmitter's fax. (Refer to <b>RECEIVE PROBLEM</b> (P.119).)
4	The fax completely fails to transmit or receive. (Copying is also possible.)	Troubleshooting	Problem with the electric circuit. (Refer to <b>THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE</b> (P.120).)
5	The fax fails either to transmit or receive when making a long distance or an international call. (Copying is also possible.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	The fax image is poor when transmitting or receiving during a long distance or international call.		
7	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	(Refer to <b>HOW TO OUTPUT THE JOURNAL REPORT</b> (P.125).)

### 6.5.10.1. DEFECTIVE FACSIMILE SECTION

#### 6.5.10.1.1. TRANSMIT PROBLEM



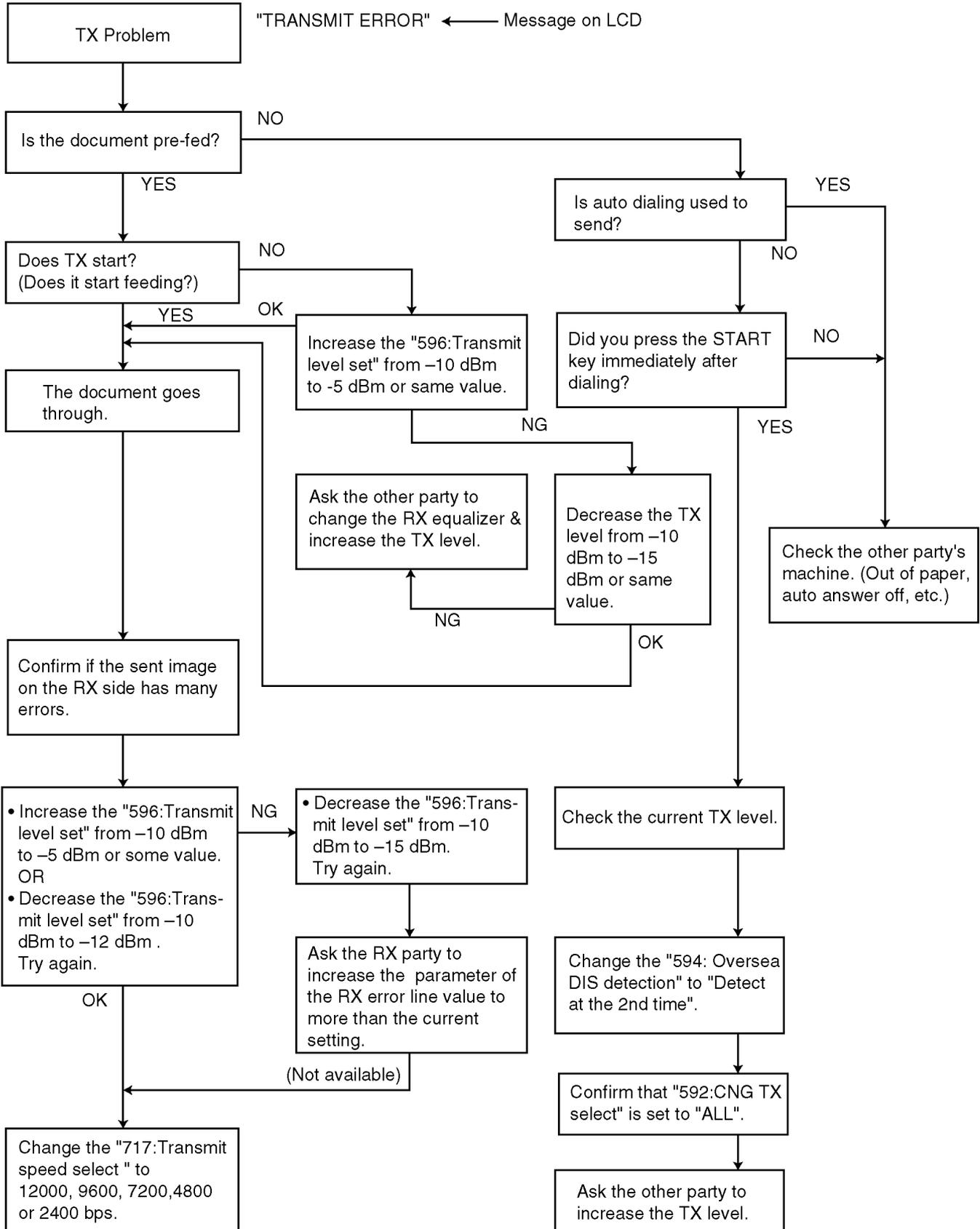
**CROSS REFERENCE:**

**WHITE PLATE AND SCANNER GLASS (P.33)**

**ADF (Auto document feed) SECTION (P.110)**

**OPERATION PANEL SECTION (P.140)**

### 6.5.10.1.2. SOMETIME THERE IS A TRANSMIT PROBLEM



**Note:**

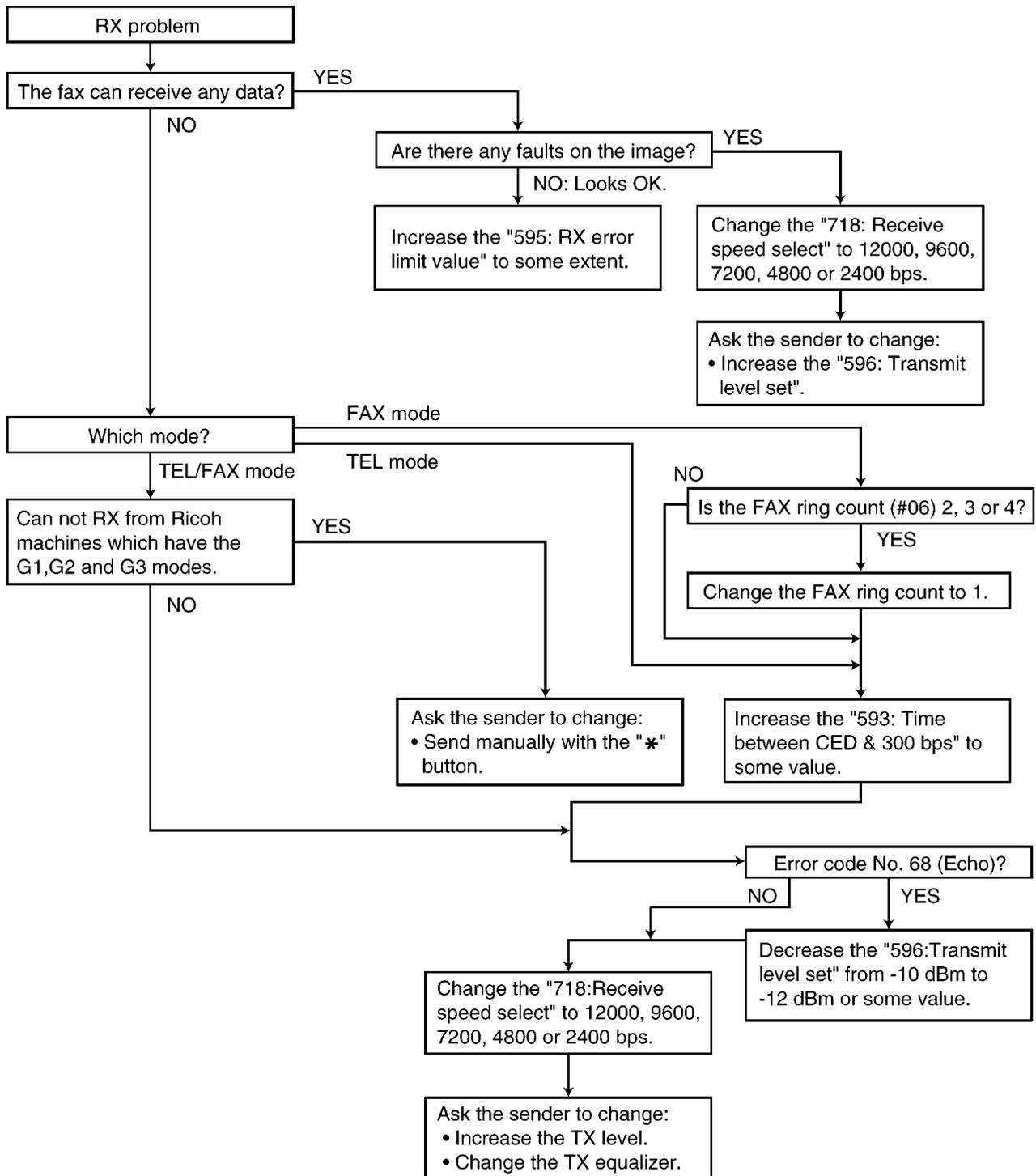
"596: Transmit level set" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.72).

"717: Transmit speed select" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.72).

### 6.5.10.1.3. RECEIVE PROBLEM

Confirm the following before starting troubleshooting.

- Is the recording paper installed properly? Refer to the next page.



**Note:**

“596: Transmit level set” represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.72).

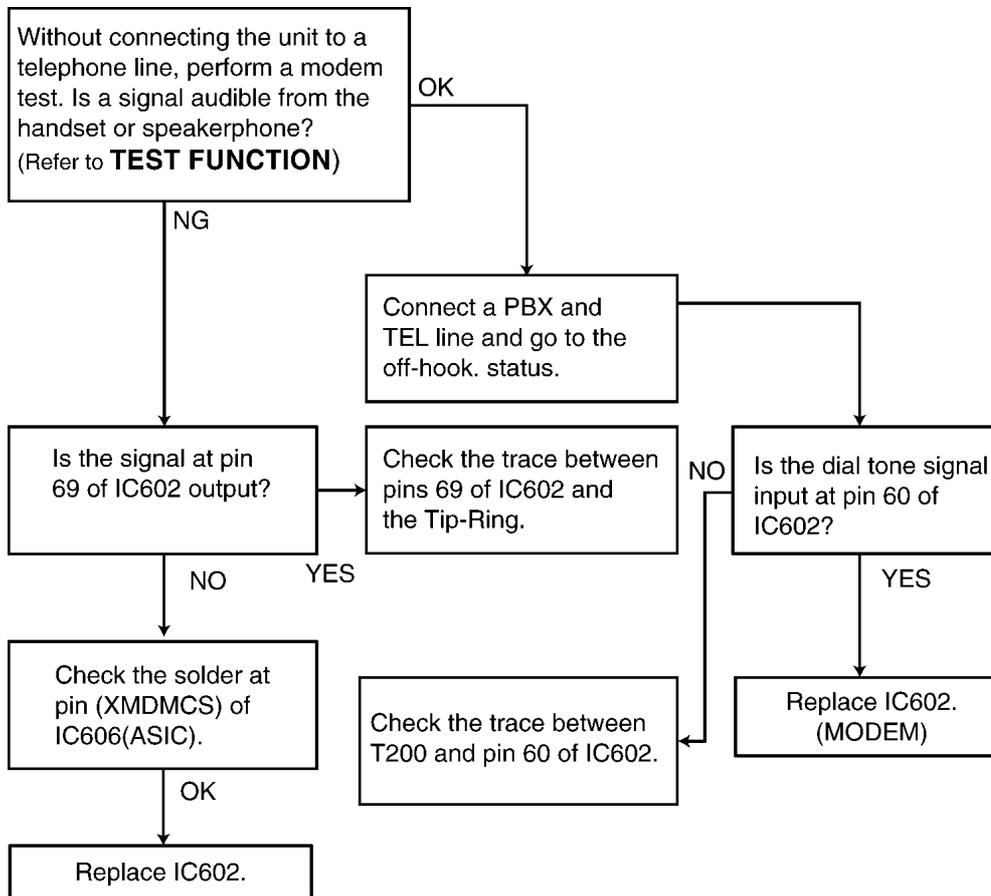
“718: Receive speed select” represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.72).

For the receiving problem, we have thought of causes other than in the software. Some causes may be when the fax changes to the memory receiving mode (for example, when out of paper). and the memory becomes full of the unprinted fax data. In this case, [MEMORY FULL] and its main cause (for example, "OUT OF PAPER") are displayed on the LCD. Accordingly, by solving the main problem, [MEMORY FULL] can be canceled and the receiving problem can solved. The causes of the display errors are shown below.

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| MODEM ERROR     | FAX IN MEMORY   | PLEASE WAIT     |
| CHANGE DRUM     | FAX MEMORY FULL | REDIAL TIME OUT |
| CHECK ADF CABLE | LINE IN USE     | REMOVE DOCUMENT |
| CHECK DOCUMENT  | MEMORY FULL     | TONER EMPTY     |
| COVER OPEN      | MODEM ERROR     | TONER LOW       |
| DATA IN MEMORY  | NO FAX REPLY    | TRANSMIT ERROR  |
| CLOSE ADF COVER | OUT OF PAPER    | WRONG PAPER     |
| DIRECTORY FULL  | PAPER JAMMED    | CARRIAGE ERROR  |
| FAILED PICK UP  | PC FAIL OR BUSY |                 |

Please refer to **USER RECOVERABLE ERRORS** (P.69) for the above items.  
 Also, when it actually becomes a hardware deformity, please check each sensor.

**6.5.10.1.4. THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE**



**CROSS REFERENCE:**  
**TEST FUNCTIONS** (P.74)

### 6.5.11. SPECIAL SERVICE JOURNAL REPORTS

Journal 2 and Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 881 or 882. Remote printing function for the journal reports (JOURNAL, JOURNAL 2 and JOURNAL 3) is also available for service technicians. (Refer to **PROGRAM MODE TABLE**(P.78).) The JOURNAL report only gives you basic information about a communication, but the other two journal reports provide different information on the same item (communication).

Mar. 23 2002 09:51AM

YOUR LOGO :  
YOUR FAX NO:

NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	*CODE
01	3332222	Jan. 21 02:14PM	00'45	SND	01	OK	
02	9998765	Jan. 21 03:17PM	00'58	SND	02	OK	
03	John	Jan. 21 05:18PM	00'48	RCV	01	OK	
04	555556677	Jan. 22 10:35AM	02'45	RCV	03	COMMUNICATION ERROR	(46)

Mar. 23 2000 09:51AM

NO.	(1) RCV. MODE	(2) SPEED (CNT.)	(3) RESOLUTION	(4) RCV-TRIG.(CNT.)	(5) ERROR->MEMORY
01	TEL	9600BPS	STD.		
02	TEL	9600BPS	FINE		
03	FAX ONLY	7200BPS	STD.	FAX MOD	
04	FAX ONLY	9600BPS	STD.	CNG (0003)	

**NO RESPONSE DISAPPEARED ON JOURNAL**

NO.	START TIME	(1) RCV MODE	(4) RCV-TRIG (CNT.)
YOUR LOGO			
YOUR FAX NUMBER			

Mar. 23 2000 09:51AM

NO.	(6) ENCODE	(7) MSLT	(8) EQM(RX)	(9) ERROR LINE(RX)	(10) MAKER CODE
01	MH	20msec	0000	00000	79
02	MH	20msec	0000	00000	00
03	MR	20msec	1200	00013	00
04	MR	20msec	0000	00000	00

**HOW TO READ JOURNAL REPORTS:**

**Example:**

1. Look at **NO. 01** in the JOURNAL. If you want to know about the details about that item, see **NO. 01** in the JOURNAL 2 and the JOURNAL 3. You can get the following information.

- \* MODE: Fax transmission
- \* RCV. MODE: TEL
- \* TX SPEED: 9.6 kbps
- \* RESOLUTION: standard
- \* ENCODE: MH
- \* MAKER CODE: 79

2. Look at **NO. 04** in the JOURNAL 2. CNG (0003) indicates that the CNG signal has been received three times since the purchase date.

For further details, see **JOURNAL 2** and **JOURNAL 3**.

### 6.5.11.1. JOURNAL 2

Refer to JOURNAL 2 in **PRINTOUT EXAMPLE**(P.123).

Journal 2 displays the additional detailed information about the last 35 communications.

#### Descriptions:

##### (1) RCV. MODE

Indicates which receive mode the unit was in when the unit received a fax message.

This information is also displayed when the unit transmitted a fax message.

##### (2) SPEED

Indicates the speed of the communication. If multiple pages are transmitted or received, it indicates the last page's communication speed. If there is a communication error, "?" is displayed.

##### (3) RESOLUTION

Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page's resolution. If there is a communication error, "?" is displayed.

##### (4) RCV-TRIG. (CNT.)

Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 2 in **PRINTOUT EXAMPLE**(P.123). The values in parentheses indicate how many times the trigger has been used. (For example, "0003" means three times.)

No.	Display	Function
1	FAX MODE	Means the unit received a fax message in the FAX mode.
2	MAN RCV	Means the unit received a fax message by manual operation.
3	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
4	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
5	TURN-ON	Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)

##### (5) ERROR→MEMORY

Indicates the reason why the unit received a fax message in memory.

If you look at No.11 in the JOURNAL 2 in **PRINTOUT EXAMPLE**(P.123), it shows the fax message was received in memory due to "PAPER OUT" error.

#### **NO RESPONSE DISAPPEARED ON JOURNAL**

The "**NO RESPONSE DISAPPEARED ON JOURNAL**" displays the information about the last 10 communications terminated by "No Response". (Some of the communications terminated by "No Response" were not displayed in the JOURNAL.)

When a fax transmission cannot be performed because the other party's unit is set to the TEL mode, "No response" will be printed.

### 6.5.11.2. JOURNAL 3

Refer to JOURNAL 3 in **PRINTOUT EXAMPLE**(P.123).

#### Description

##### (6) ENCODE

Compression Code: MH/MR/MMR

##### (7) MSLT

MSLT means Minimum Scan Line Time. Used only at the factory.

##### (8) EQM

EQM means Eye Quality Monitor. Used only at the factory.

##### (9) ERROR LINE (RX)

When an error occurs while receiving a fax, this shows the number of error lines.

##### (10) MAKER CODE

This shows a 2 digit code of the other party's fax machine brand.

0E: "KX" model

00: Unknown

79: "UF" model

19: "Xerox" model

### 6.5.11.3. PRINTOUT EXAMPLE

#### JOURNAL2

Mar. 25 2000 01:59PM

NO.	RCV. MODE	SPEED (CNT.)	RESOLUTION	RCV-TRIG. (CNT.)	ERROR->MEMORY
01	FAX ONLY	9600BPS	FINE.	FAX MOD	
02	FAX ONLY	9600BPS	STD.	FAX MOD	
03	FAX ONLY	9600BPS	FINE.		
04	FAX ONLY	9600BPS	FINE.	FAX MOD	
05	FAX ONLY	9600BPS	FINE.	FAX MOD	
06	FAX ONLY	9600BPS	FINE.	FAX MOD	
07	FAX ONLY	9600BPS	FINE.		
08	FAX ONLY	9600BPS	FINE.		
09	FAX ONLY	9600BPS	FINE.		
10	FAX ONLY	9600BPS	STD.	FAX MOD	
11	FAX ONLY	9600BPS	FINE.	FAX MOD	PAPER OUT
12	FAX ONLY	9600BPS	STD.	FAX MOD	
13	FAX ONLY	9600BPS	STD.		
14	FAX ONLY	?	?		
15	FAX ONLY	?	?		
16	FAX ONLY	?	?		
17	FAX ONLY	9600BPS	STD.		
18	FAX ONLY	9600BPS	FINE.	FAX MOD	
19	FAX ONLY	9600BPS	STD.	FAX MOD	
20	FAX ONLY	9600BPS	S-FINE.		
21	FAX ONLY	9600BPS	FINE.		
22	FAX ONLY	9600BPS	FINE.	FAX MOD	
23	FAX ONLY	?	?	FAX MOD	
24	FAX ONLY	9600BPS	STD.	FAX MOD	
25	FAX ONLY	9600BPS	STD.	FAX MOD	
26	FAX ONLY	9600BPS	FINE.	FAX MOD	
27	FAX ONLY	9600BPS	FINE.		
28	FAX ONLY	9600BPS	STD.	FAX MOD	
29	FAX ONLY	9600BPS	FINE.	FAX MOD	
30	FAX ONLY	9600BPS	S-FINE.	FAX MOD	
31	FAX ONLY	9600BPS	STD.	FAX MOD	
32	FAX ONLY	9600BPS	STD.	FAX MOD	
33	FAX ONLY	?	?	FAX MOD	
34	FAX ONLY	9600BPS	STD.	FAX MOD	
35	FAX ONLY	9600BPS	STD.	FAX MOD	

#### NO RESPONSE DISAPPEARED ON JOURNAL

NO.	START TIME	RCV MODE	RCV-TRIG. (CNT.)
-----	------------	----------	------------------

## JOURNAL3

Mar. 25 2000 01:58PM

NO.	ENCODE	MSLT	EQM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	10msec	007A	00000	0E
02	MR	20msec	016B	00000	00
03	MH	10msec	0000	00000	00
04	MR	20msec	019B	00003	00
05	MR	20msec	0156	00011	00
06	MR	20msec	0113	00000	00
07	MR	5msec	0000	00000	79
08	MR	5msec	0000	00000	79
09	MR	0msec	0000	00000	19
10	MR	20msec	0100	00000	00
11	MR	10msec	0073	00000	0E
12	MR	20msec	012B	00000	00
13	MH	20msec	0000	00000	79
14	MH	20msec	0000	00000	00
15	MH	20msec	0000	00000	00
16	MH	20msec	0000	00000	00
17	MR	5msec	0000	00000	79
18	MR	10msec	00AB	00004	0E
19	MR	20msec	0124	00000	00
20	MR	20msec	0000	00000	00
21	MR	20msec	0000	00000	00
22	MR	20msec	0135	00000	00
23	MR	20msec	0000	00000	00
24	MR	20msec	01BC	00000	00
25	MR	20msec	01AC	00000	00
26	MR	20msec	020F	00000	00
27	MR	10msec	0000	00000	0E
28	MR	20msec	01DF	00000	00
29	MR	20msec	01EA	00000	00
30	MR	20msec	00CD	00000	00
31	MR	20msec	02F8	00000	0E
32	MR	10msec	04F8	00000	0E
33	MR	10msec	0000	00000	00
34	MR	20msec	03B6	00000	0E
35	MH	20msec	00E0	00000	00

### 6.5.11.4. HOW TO OUTPUT THE JOURNAL REPORT

1. Press the MENU button.
2. Press “#”, then “8” and “3”.
3. Press the START/COPY/SET button.
4. The report prints out.

**JOURNAL**

Jan. 20 2000 01:19PM

YOUR LOGO :  
YOUR FAX NO:

NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	*CODE
01	2345678	Jan. 20 01:18PM	00'51	SND	00	COMMUNICATION ERROR	(43)

(3) **SND:** Sent directly.  
**RCV:** Received directly

(2) Communication message

(1) Error code message

**CROSS REFERENCE:**

FEATURES(P.12)

**Error code table:**

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
	PRESSED THE STOP KEY	SND & RCV	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	SND	The document paper is jammed.	
	NO DOCUMENT	SND	No document paper.	
	THE COVER WAS OPENED	SND & RCV	The cover is open.	
28	COMMUNICATION ERROR	SND & RCV		
40	COMMUNICATION ERROR	SND	Transmission is finished when the T1 TIMER expires.	1
41	COMMUNICATION ERROR	SND	DCN is received after DCS transmission.	2
42	COMMUNICATION ERROR	SND	FTT is received after transmission of a 2400BSP training signal.	3
43	COMMUNICATION ERROR	SND	No response after post message is transmitted three times.	4
44	COMMUNICATION ERROR	SND	RTN and PIN are received.	5
46	COMMUNICATION ERROR	RCV	No response after FTT is transmitted.	6
48	COMMUNICATION ERROR	RCV	No post message.	7
49	COMMUNICATION ERROR	RCV	RTN is transmitted.	8
50	COMMUNICATION ERROR	RCV	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR	RCV	PIN is transmitted.	8
52	COMMUNICATION ERROR	RCV	Reception is finished when the T1 TIMER expires.	9
54	ERROR-NOT YOUR UNIT	RCV	DCN is received after DIS transmission.	11
58	COMMUNICATION ERROR	RCV	DCN is received after FTT transmission.	13
59	ERROR-NOT YOUR UNIT	SND	DCN responds to the post message.	14
64	COMMUNICATION ERROR	POL. RX	Polling is not possible.	15
65	COMMUNICATION ERROR	SND	DCN is received before DIS reception.	2
65	COMMUNICATION ERROR	RCV	Reception is not EOP, EOM PIP, PIN, RTP or RTN.	2
68	COMMUNICATION ERROR	RCV	No response at the other party after MCF or CFR is transmitted.	13
70	ERROR-NOT YOUR UNIT	RCV	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR	RCV	Carrier is cut when the image signal is received.	16
75	MEMORY FULL	RCV	The document was not received due to memory full.	
79	CANCELED	SND	The multi-station transmission was rejected by the user.	
FF	COMMUNICATION ERROR	SND & RCV	Modem error. For the DCN, DCN, etc. abbreviations, refer to <b>MODEM SECTION (P.221)</b> .	12

SND=TRANSMISSION / RCV=RECEPTION

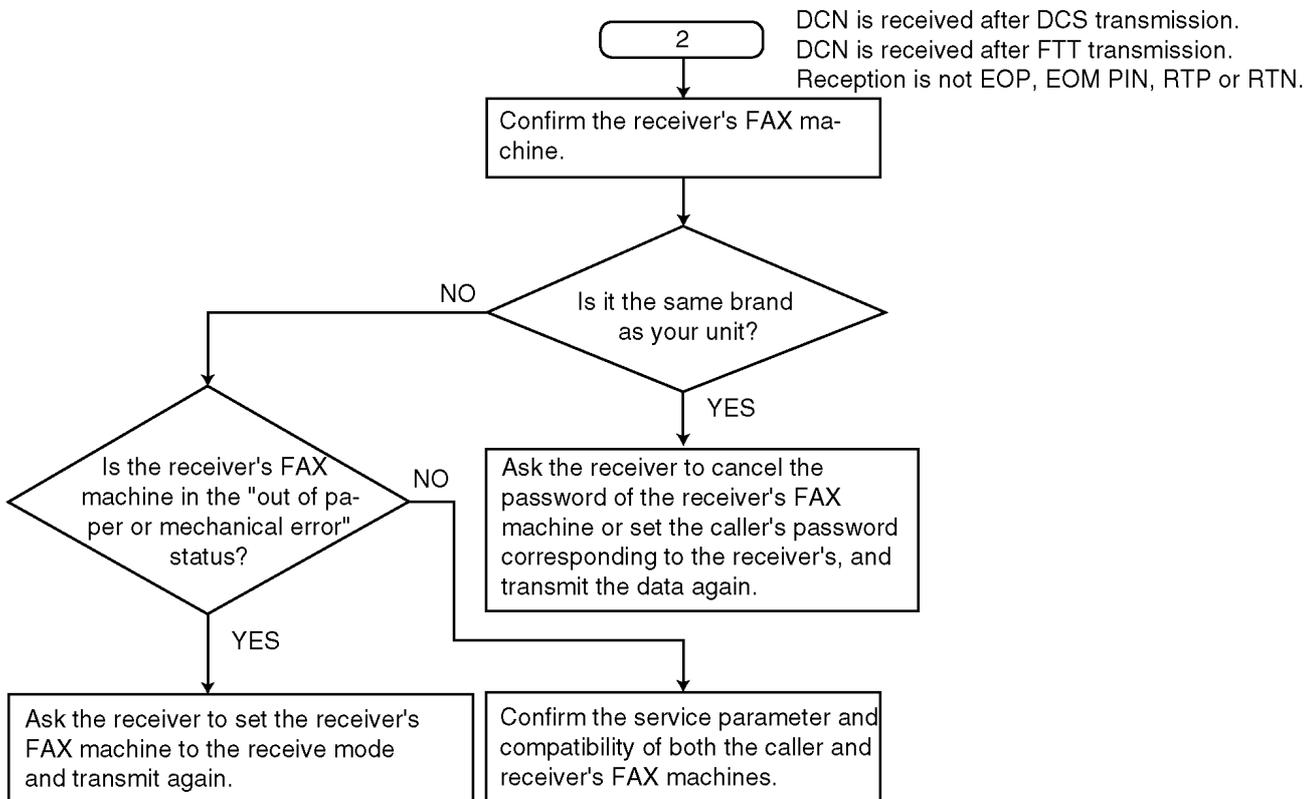
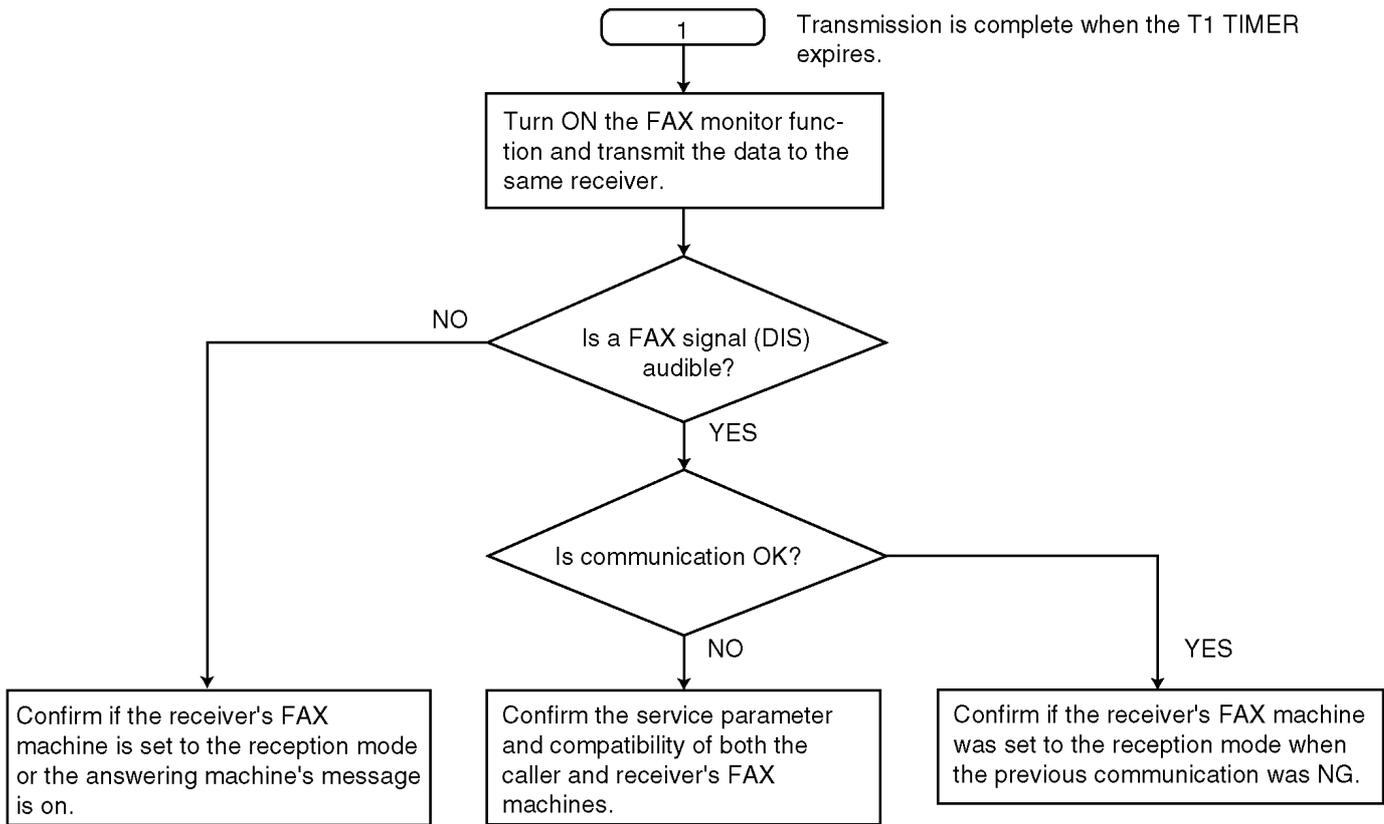
Most fax communication problems can be resolved by the following steps.

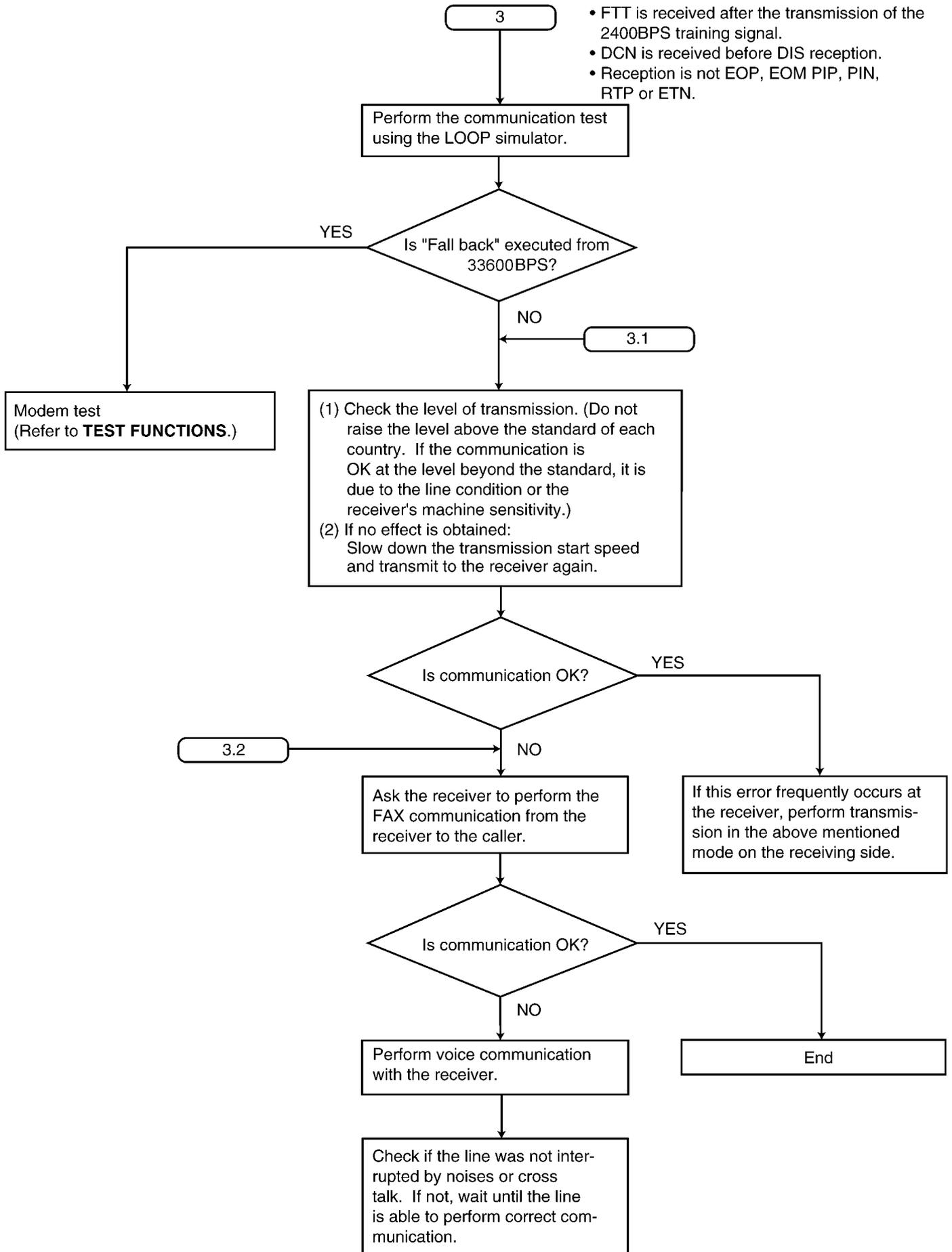
1. Change the transmit level. (Service code: 596, refer to **SERVICE FUNCTION TABLE(P.72)**.)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to **SERVICE FUNCTION TABLE (P.72)**.)

**Note\*:**

If the problem remains, see the following "Countermeasure" flow chart.

**Countermeasure**





**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**

4 No response after the post message is transmitted three times.

Inquire with the receiver if the caller's document was sent correctly.

Was the data sent correctly?

NO  
3.2

YES  
Ask the service section for the receiver's FAX machine to confirm the machine's condition.

5 RTN and PIN are received.

3.1

6 No response after FTT is transmitted.

Perform the communication test using the LOOP simulator and check the machine's reception condition.

Is FTT sent from the receiver?

YES  
Modem test  
(Refer to **TEST FUNCTIONS**.)

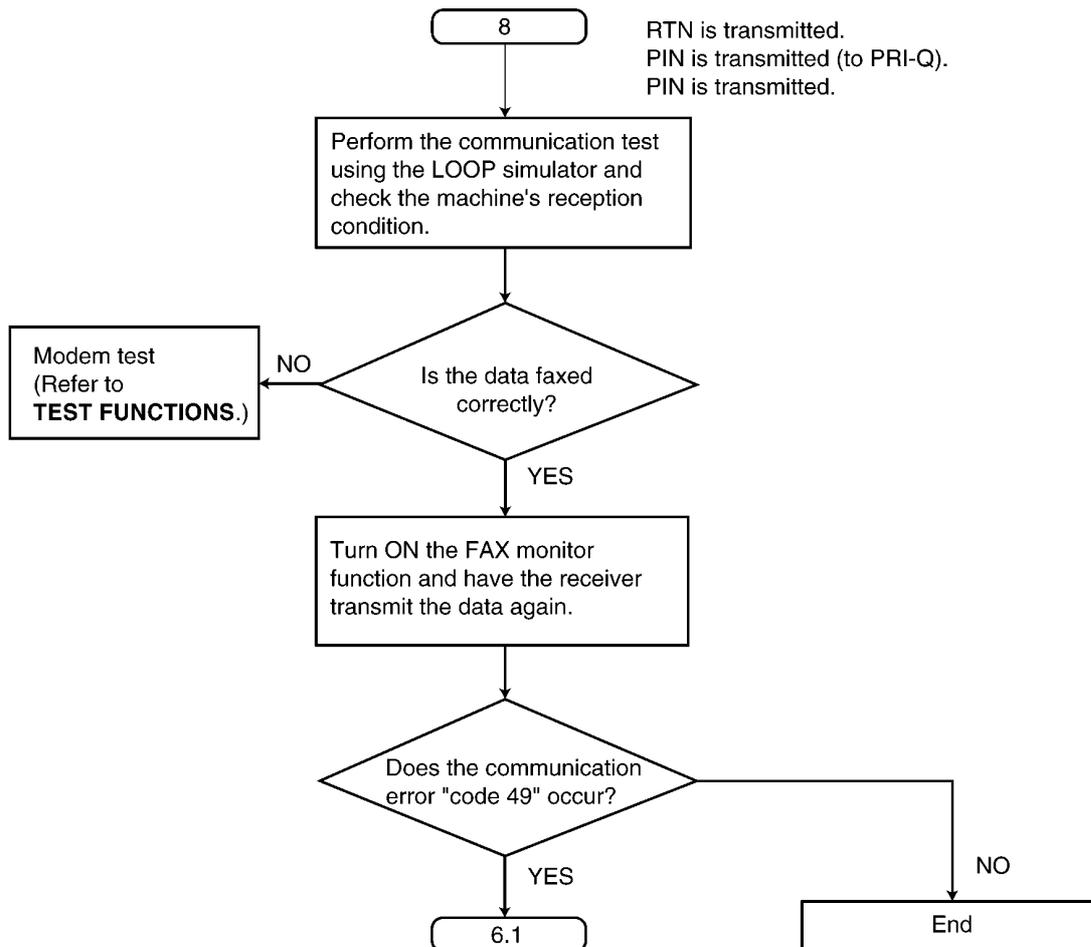
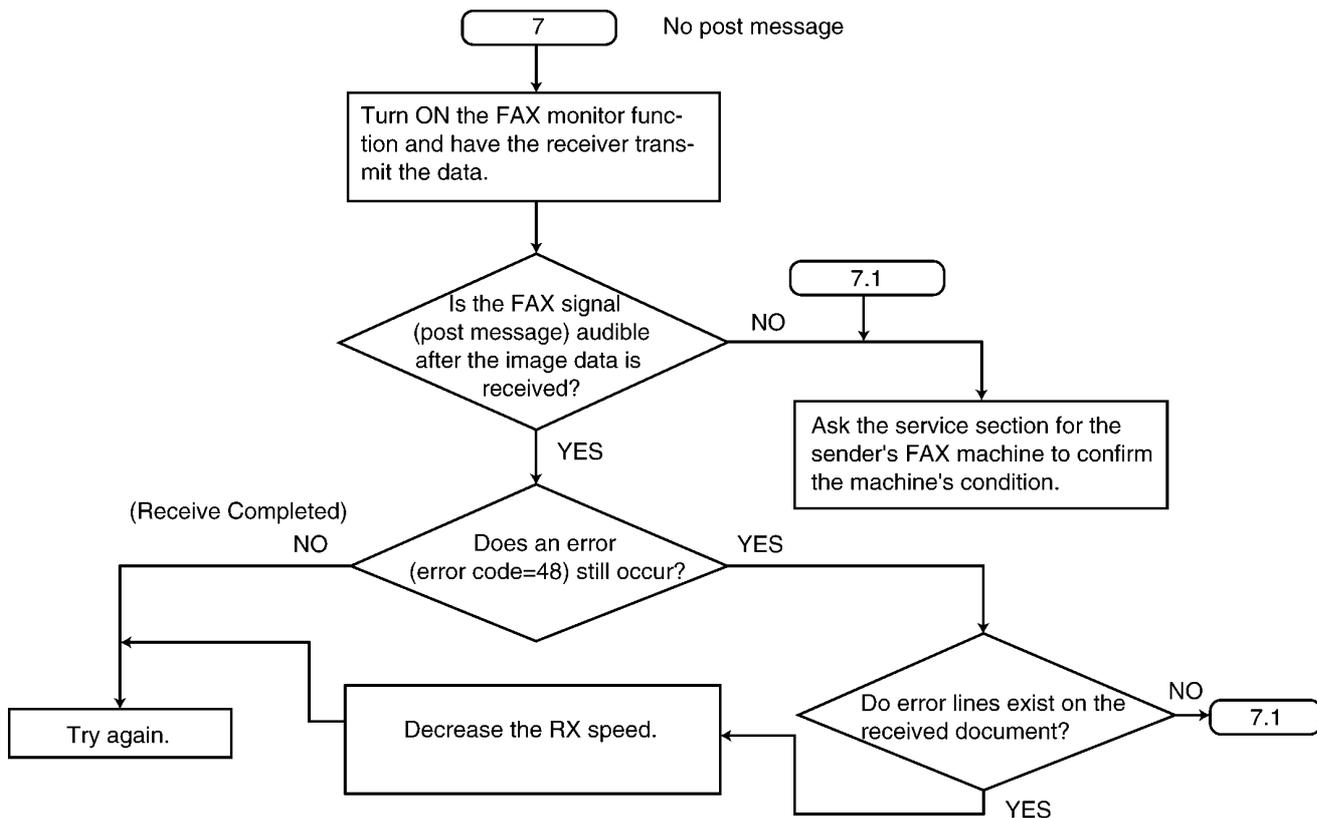
6.1

NO  
No problem with the machine hardware.

Perform voice communication with the NG caller.

Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.

**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**



**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**

9

Reception is complete when the T1 TIMER expires.

Perform the communication test using the LOOP simulator and check the machine's reception condition.

Is the data transmitted correctly?

Modem test  
(Refer to  
**TEST FUNCTIONS.**)

Turn ON the FAX monitor function and have the receiver transmit the data again.

Is communication OK?

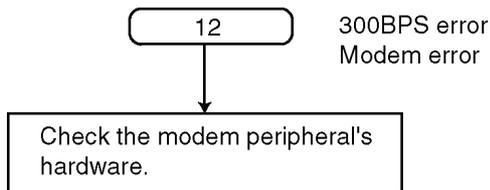
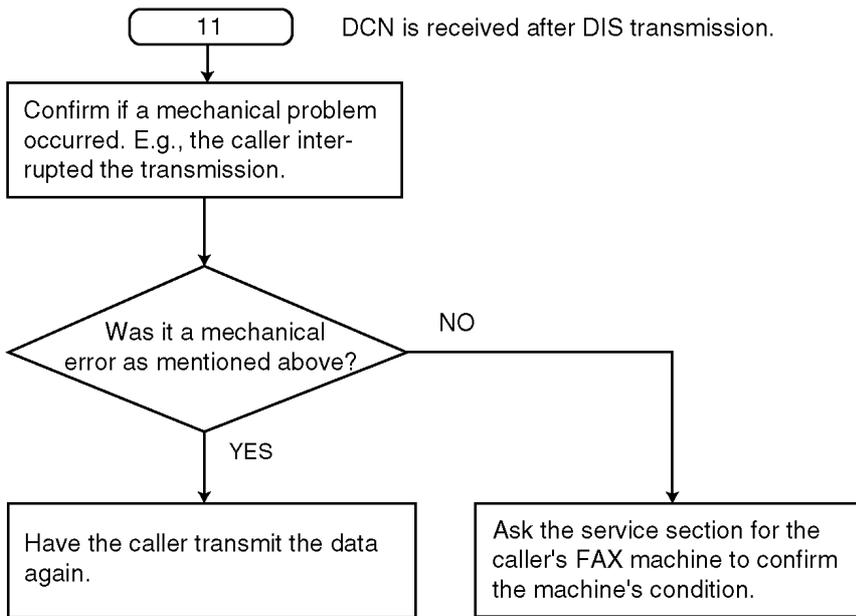
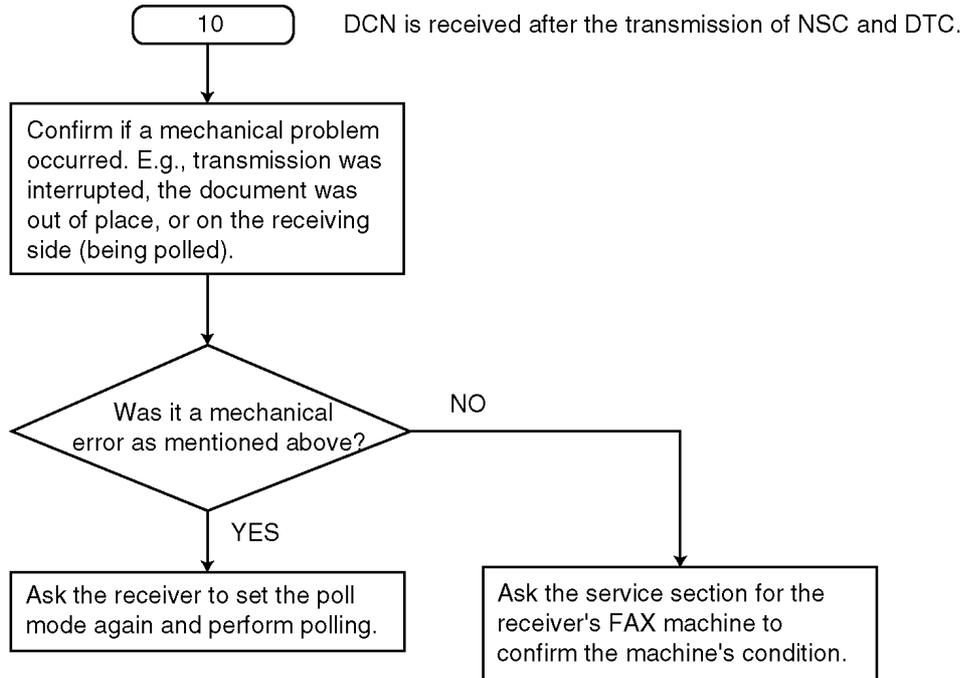
End

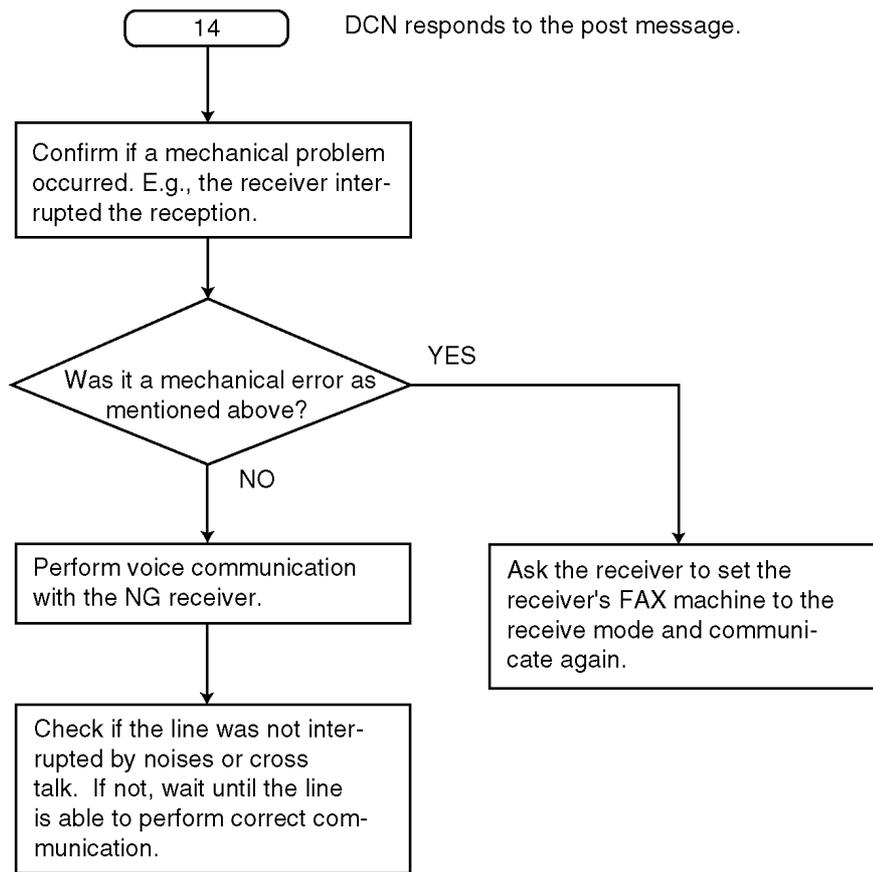
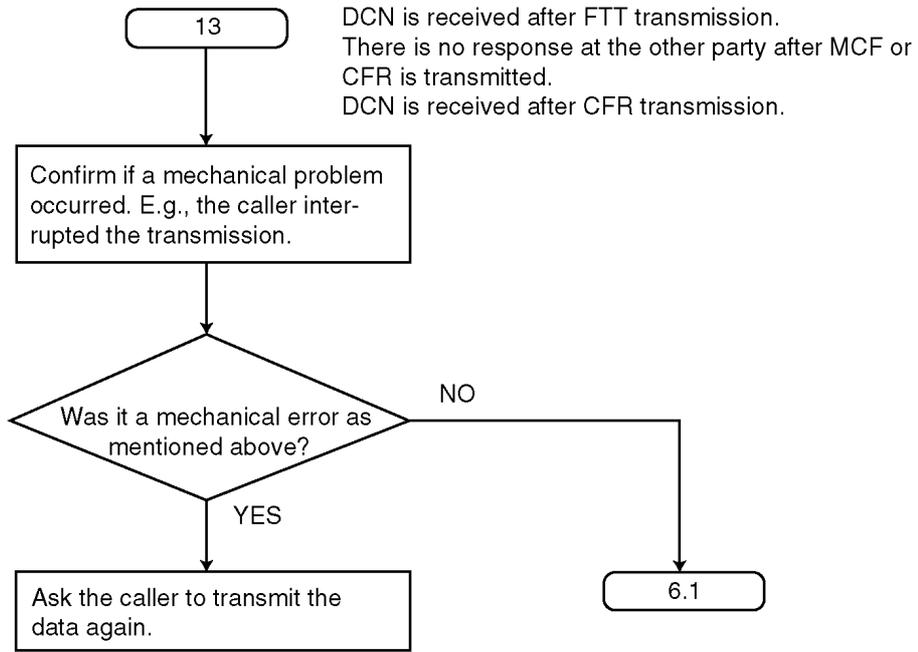
Is the FAX signal audible after the image data is received?

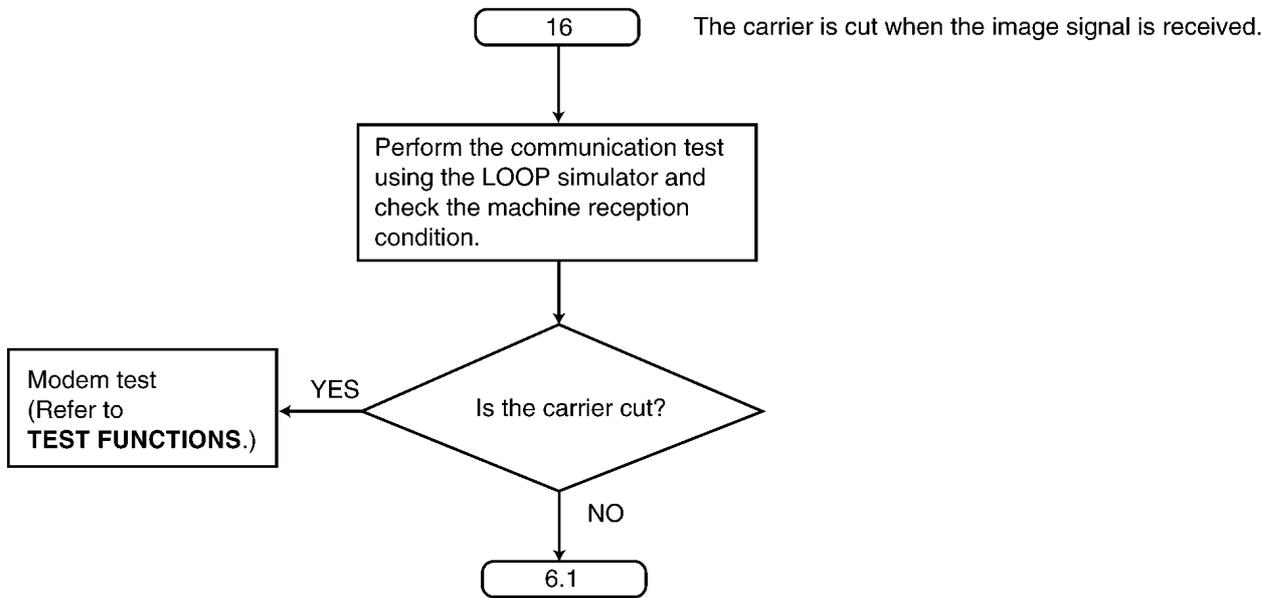
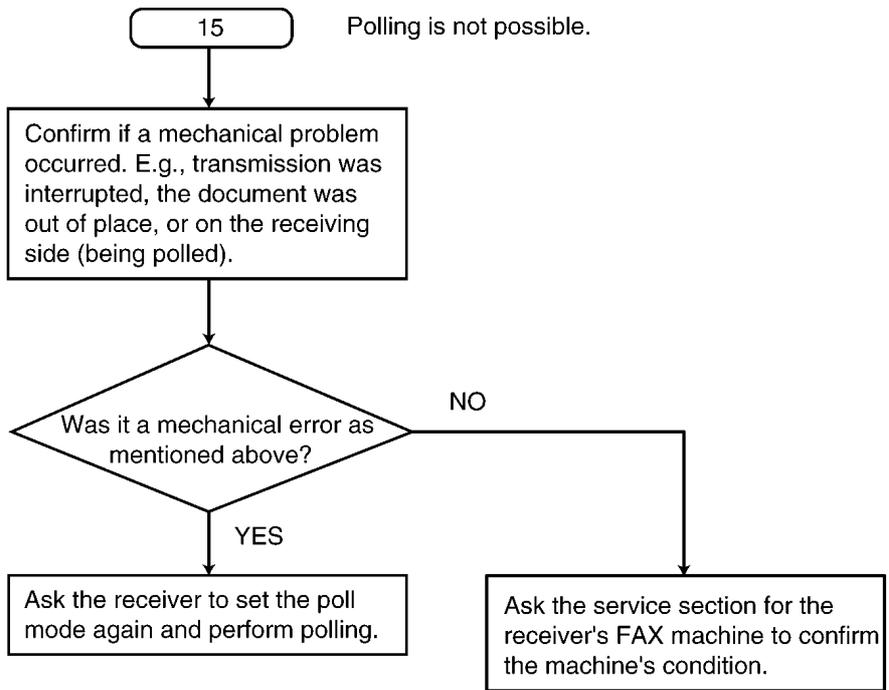
Confirm if the receiver's FAX machine was set to the receive mode.

6.1

**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**



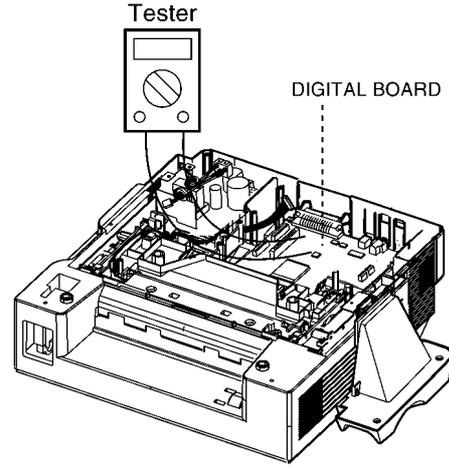
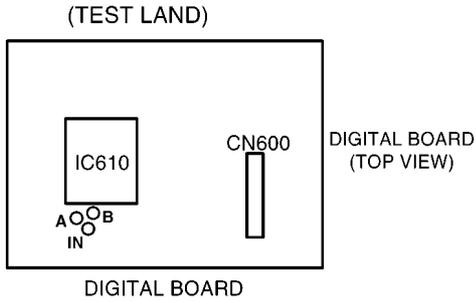




**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**

### 6.5.11.5. CHECK THE STATUS OF THE DIGITAL BOARD

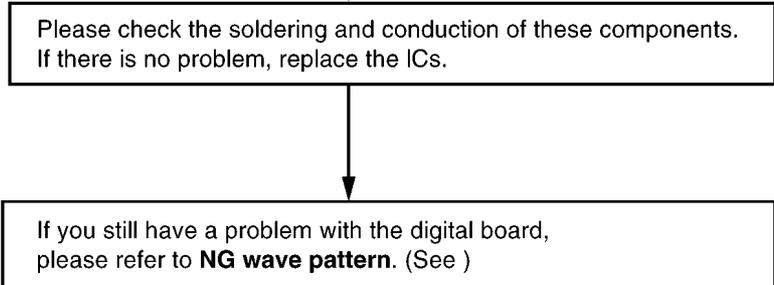
Please check the status (voltage) of test lands **TP-A** and **TP-B**.  
The result may tell you a defective point.



- Turn off the power supply.
- Short using a metallic object, such as tweezers, between the **TP-IN** point and **DG** land, and turn on the AC power for a few seconds. And then remove a metallic object.
- Check the following voltages using an oscilloscope or tester.
- To cancel the status check mode, turn off the AC power.

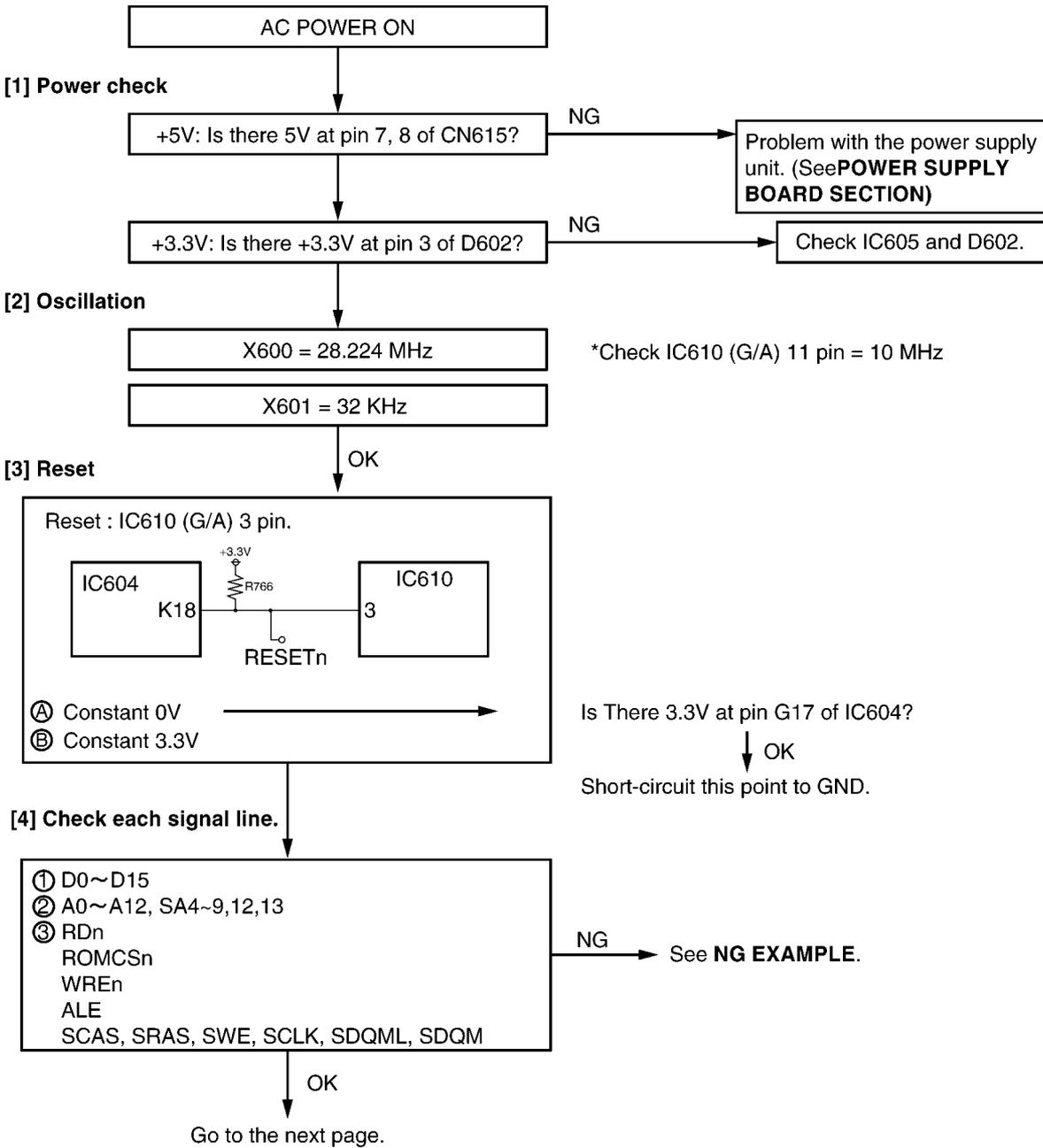
Defective point	Check point voltage		Check items
	A	B	
RTC (IC604)	5V	5V	IC604( RTC is included in IC604), X601
SDRAM (IC608)	0V	5V	IC608, RA610, RA614, RA622~625, R675, R676, R680, R681
MODEM (IC604)	5V	0V	IC604(MODEM is included in IC604), IC609
ALL OK	0V	0V	

- This indicates that the Add/Data Bus, RAM, ROM, and G/A are all connected to the ASIC properly and that control from the ASIC is possible.



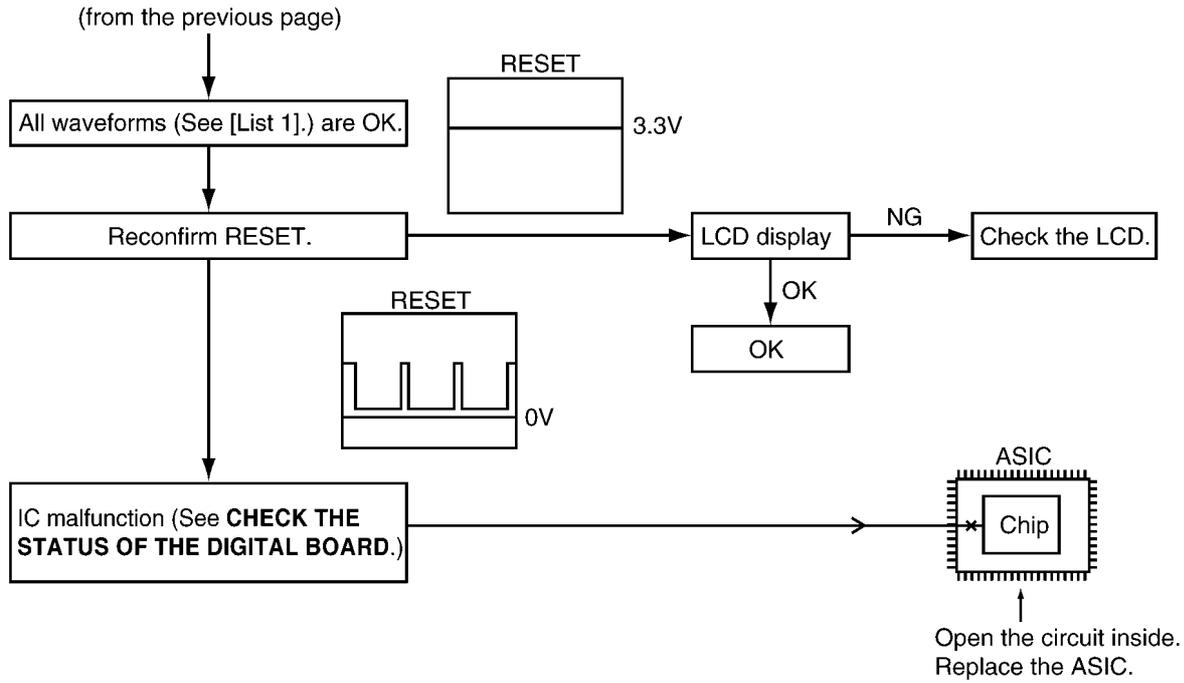
### 6.5.12. INITIALIZING ERROR

After the power is turned on, the ASIC initializes and checks each IC.  
 The ROM, SDRAM, and modem are checked.  
 If initialization fails for the ICs, the system will not boot up.  
 In this case, please find the cause as follows.

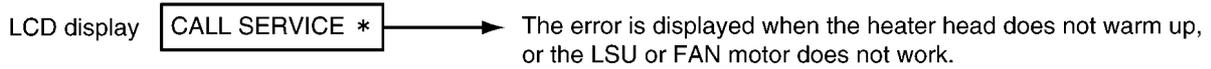


**CROSS REFERENCE:**

- NG EXAMPLE** (P.219)
- CHECK THE STATUS OF THE DIGITAL BOARD** (P.134)
- POWER SUPPLY BOARD SECTION** (P.155)



Other NG examples while the power is ON and the LCD displays the following.



**CROSS REFERENCE:**

**CHECK THE STATUS OF THE DIGITAL BOARD (P.134)**

### 6.5.13. ANALOG BOARD SECTION

This chapter provides the testing procedures required for the analog parts. A signal route to be tested is determined depending upon purposes. For example, the handset TX route begins at the handset microphone and the signal is output to the telephone line. The signal mainly flowing on this route is analog. You can trace the signal with an oscilloscope. The signal flow on each route is shown in the Check Sheet here. If you find a specific problem in the unit, for example if you cannot communicate with the H/S, trace that signal route locally with the following Check Sheet and locate the faulty point.

#### 6.5.13.1. CHECK SHEET

(SYMPTOM) CHECK ITEMS	Signal IN	ROUTE	OUT
MONITOR		TEL LINE-F201-L235-L229-D209-Q211-Q208-R295-R263-C278-T201-R277-R269-C285-IC207(6-7)- [LPF]-C266-R247-C244-R234-L207-IC201(23-34)-C224-L256-R206-IC202(3-2)-L257-R208-C257- IC204(2-1)-R246-C226-R217-IC201(32-35) -R233-C242-IC203(4-5,8)-SPEAKER	
HANDSET Tx		HS MIC {CN204(4)-FL221-L242-C351-FL217-L232-R325-IC209(6-7)} C330-R308-L250-C324-L249- {CN204(1)-FL221-L241-C350-FL218-L233-R326-IC209(5-7)} IC208(3-5)-R301-C317-R297-L260 {L264-IC201(15-22)} L254-R235-C239-IC202(14-15)-C243-R239- {R205-IC201(16-22)} R271-R276-IC207(2-1)-C312-R293-R292-T201-C278-R263-R295-Q208-Q211-D209-L229-L235-F201 -TEL LINE	
HANDSET Rx		TEL LINE-F201-L235-L229-D209-Q211-Q208-R295-R263-C278-T201-R277-R269-C285-IC207(6-7)- L257-R208-C257- IC204(2-1)-R246-C226-R217-IC201(32-11)-L259-FL223-J228-J225-R318-IC209(2-1)-FL216-L234- C349-R334-Q214-C359-L243-FL221-CN204(2)-HS SPEAKER	
DTMF Monitor	Speaker	{IC604(P3)-IC609(20-9,10)} {CN616(21)}-CN202(8)-C256-R244-L212-R249 {IC204(5,6-7)-C219-R222- {CN616(20)}-CN202(9)-C254-R245-L211-R248} IC201(24-34)-C224-L256-R206-IC202(3-2)-L257-R208-C257-IC204(2-1)-R246-C226-R217-IC201 (32-35) -R233-C242-IC203(4-5,8)-SPEAKER	
	Handset	{IC604(P3)-IC609(20-9,10)} {CN616(21)}-CN202(8)-C256-R244-L212-R249 {IC204(5,6-7)-C219-R222- {CN616(20)}-CN202(9)-C254-R245-L211-R248} IC201(24-34)-C224-L256-R206-IC202(3-2)-L257-R208-C257-IC204(2-1)-R246-C226-R217-IC201 (32-11)-L259-FL223-J228-J225-R318-IC209(2-1)-FL216-L234-C349-R334-Q214-C359-L243-FL221- CN204(2)-HS SPEAKER	
DTMF for TEL Line FAX Tx		{IC604(P3)-IC609(20-9,10)} {CN616(21)}-CN202(8)-C256-R244-L212-R249 {IC204(5,6-7)-C219-R222- {CN616(20)}-CN202(9)-C254-R245-L211-R248} IC201(24-22)-L254-R235-C239-IC202(14-15)-C243-R239-R271-R276-IC207(2-1)-C312-R293-R292- T201-C278-R263-R295-Q208-Q211-D209-L229-L235-F201-TEL LINE	
Ringing/Alarm/ Beep/Key tones		{IC604(V9)-C761-R761-CN616(11)}-CN202(18)-C214-R221-IC201(27-35)-R233-C242-IC203(4-5,8)- SPEAKER	
CNG/DTMF detection (ON-HOOK) CALLER ID		TEL LINE-T202-C217-R223-IC201(20-31)-CN202(4)-{CN616(25)-L666-C723-R707-IC609(13-22)- IC604(P1)	
CNG/DTMF detection (OFF-HOOK)		TEL LINE-F201-L235-L229-D209-Q211-Q208-R295-R263-C278-T201-R277-R269-C285-IC207 (6-7)-[LPF]-C266-R247-C244-R234-L207-IC201(23-31)-CN202(4)-{CN616(25)-L666-C723-R707- IC609(13-22)-IC604(P1)	

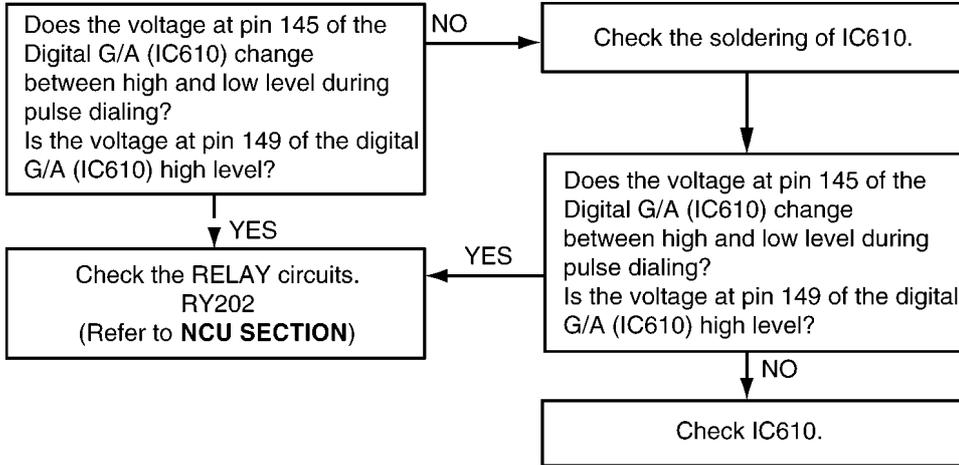
**Note:** { }: Inside the digital board

### 6.5.13.2. DEFECTIVE ITS (Integrated Telephone System) SECTION

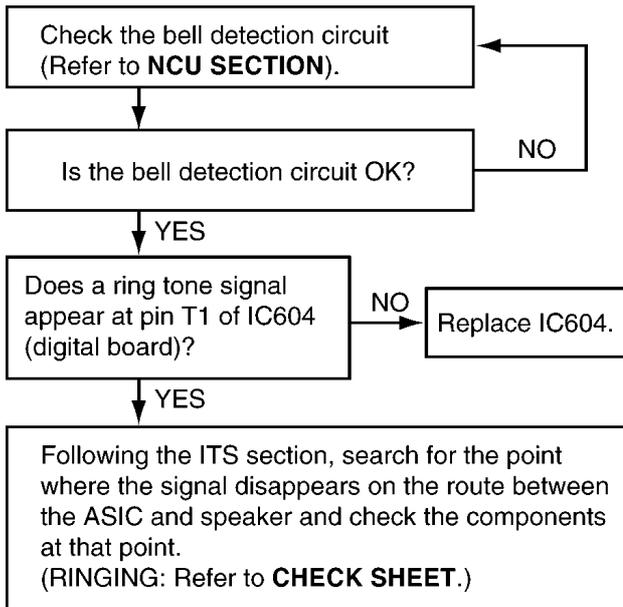
#### 1. No handset and speakerphone transmission / reception

Perform a signal test in the **ITS or the NCU section** and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. **CHECK SHEET**(P.137) is useful for this investigation.

#### 2. No pulse dialing

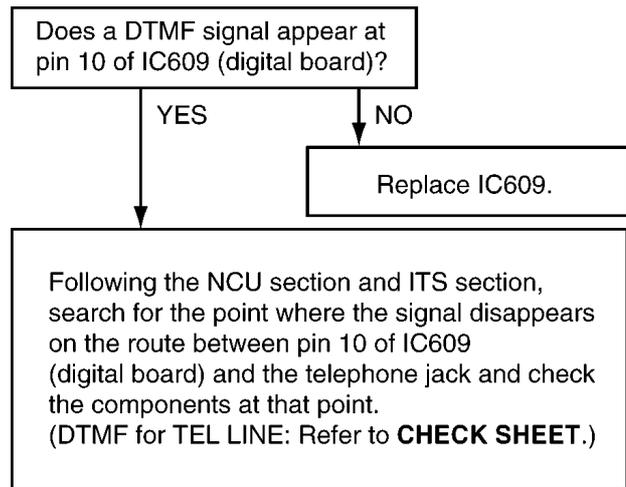


#### 3. No ring tone (or No bell)



**CROSS REFERENCE:**  
**CHECK SHEET** (P.137)  
**NCU SECTION** (P.227)

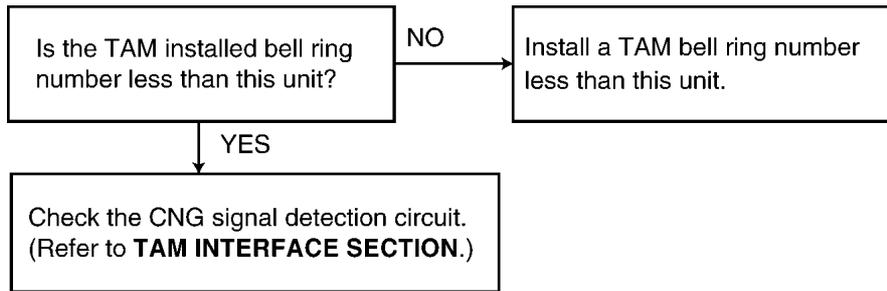
#### 4. No tone dialing



**CROSS REFERENCE:**  
**CHECK SHEET** (P.137)

### 6.5.13.3. DETECTIVE TAM INTERFACE SECTION

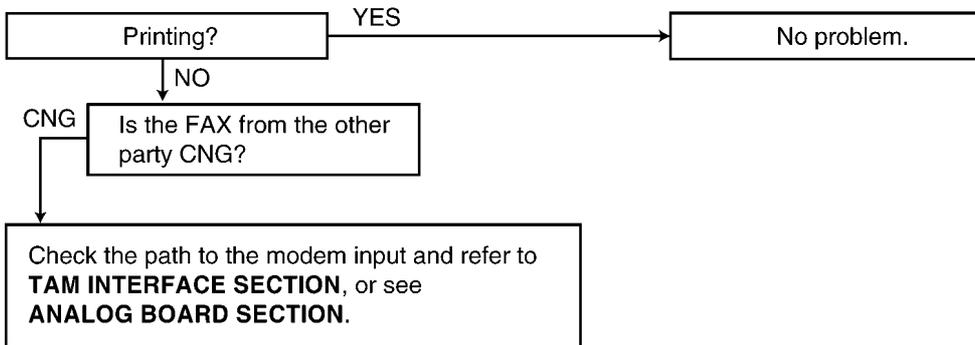
#### 1. The FAX turns on, but does not arrive through TAM.



#### CROSS REFERENCE:

**TAM INTERFACE SECTION (P.230)**

#### 2. A FAX is received, but won't switch from TAM to FAX.



#### CROSS REFERENCE:

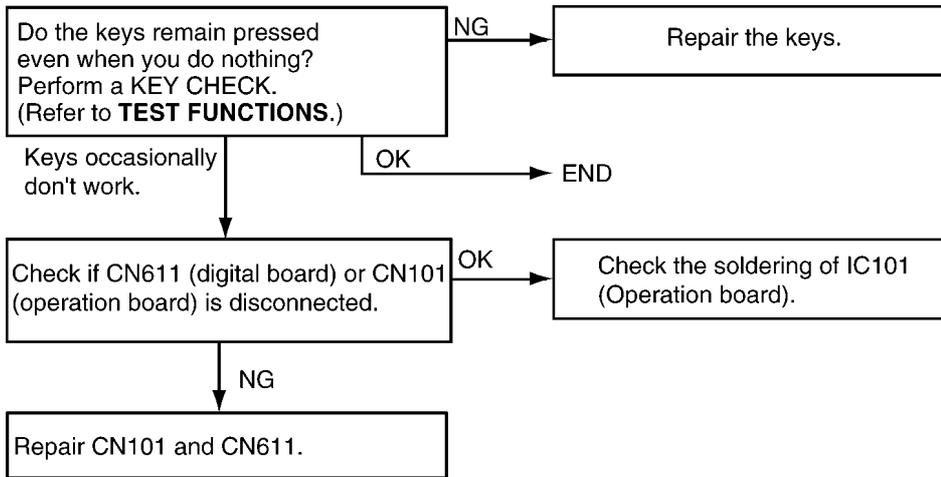
**ANALOG BOARD SECTION (P.137)**

**TAM INTERFACE SECTION (P.230)**

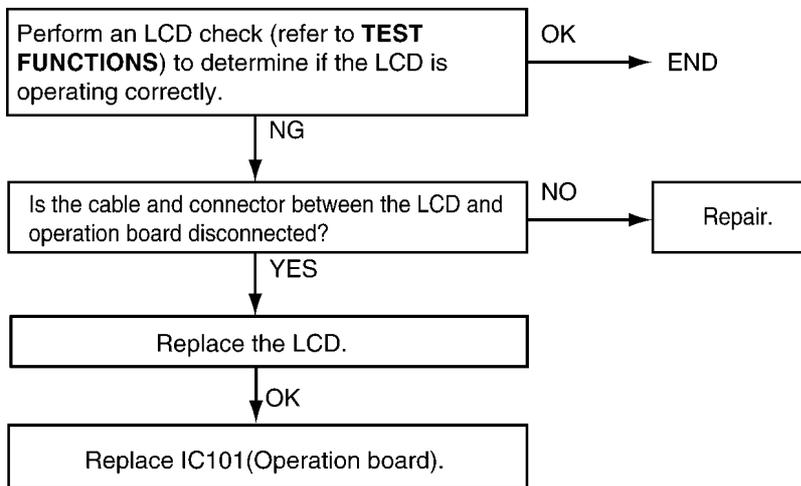
### 6.5.13.4. OPERATION PANEL SECTION

Refer to **TEST FUNCTIONS** (P.74).

#### 1. NO KEY OPERATION



#### 2. NO LCD INDICATION



#### CROSS REFERENCE:

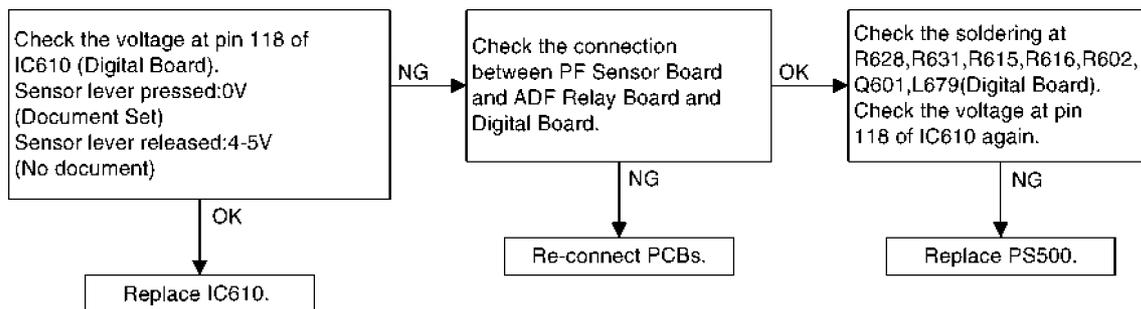
**TEST FUNCTIONS** (P.74)

### 6.5.13.5. SENSOR SECTION

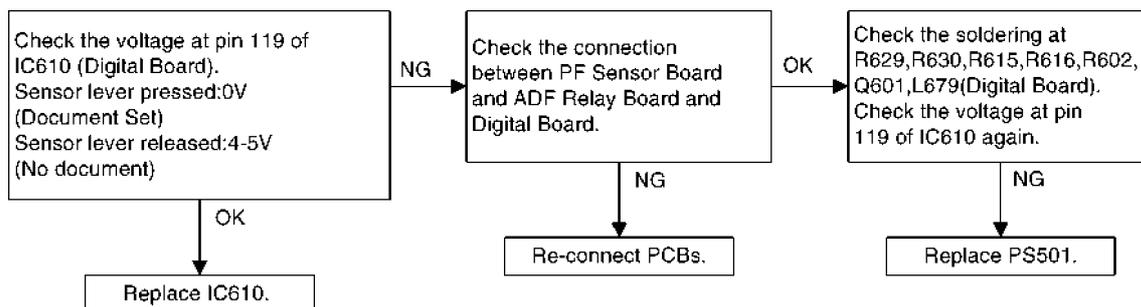
Refer to SENSORS AND SWITCHES for the circuit description.

Perform an SENSOR CHECK to determine if the sensor is operating correctly.

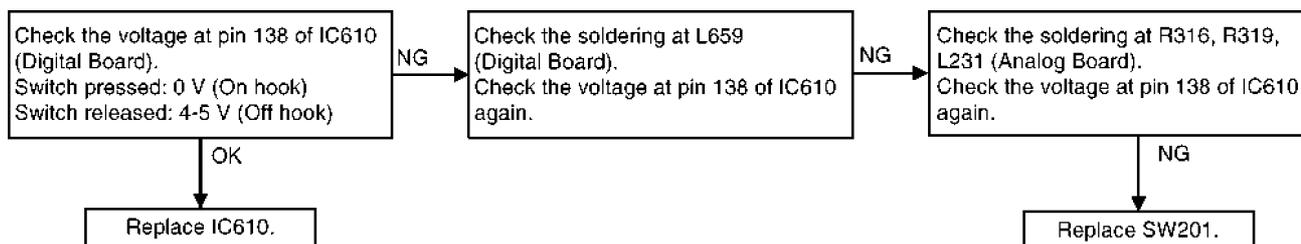
#### 1. Check the document sensor..... "CHECK DOCUMENT"



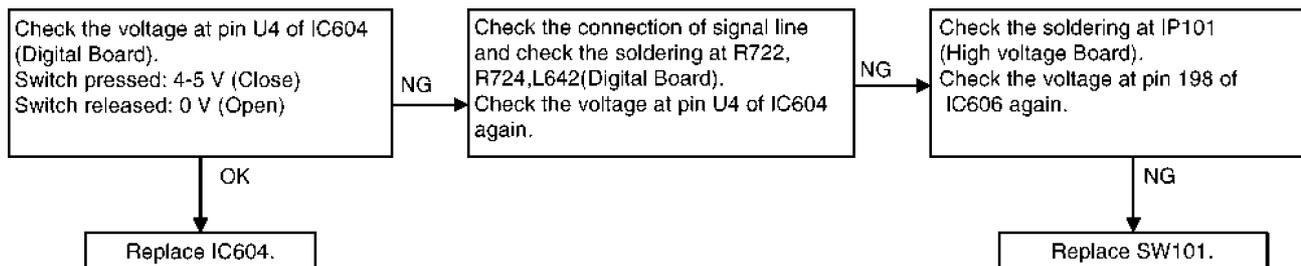
#### 2. Check the paper feed sensor..... "REMOVE DOCUMENT"



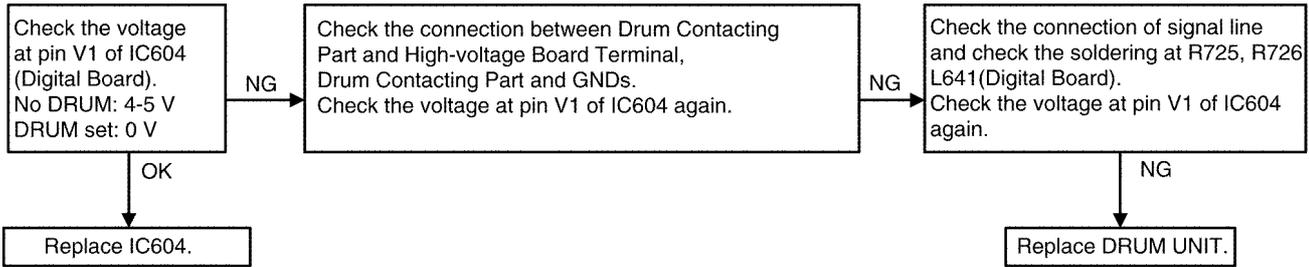
#### 3. Check the hook switch



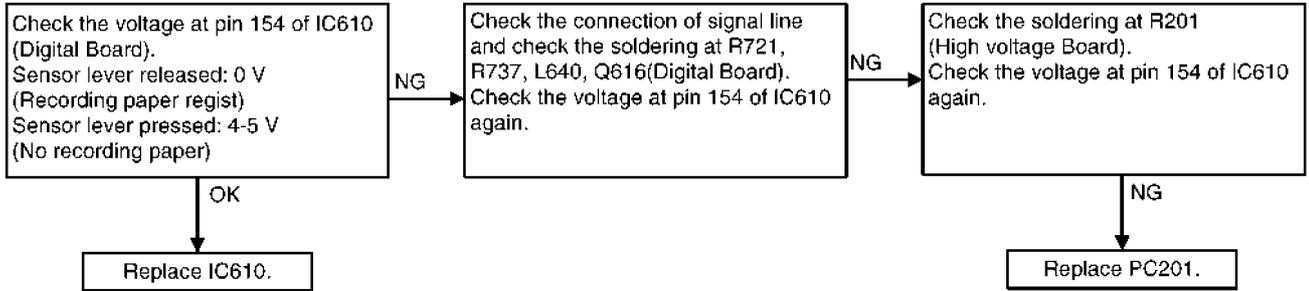
#### 4. Check the cover open switch..... "COVER OPEN"



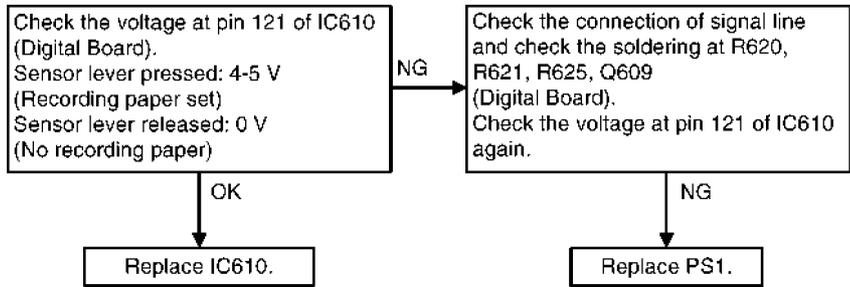
**5. Check the DRUM sensor..... “CHECK DRUM”**



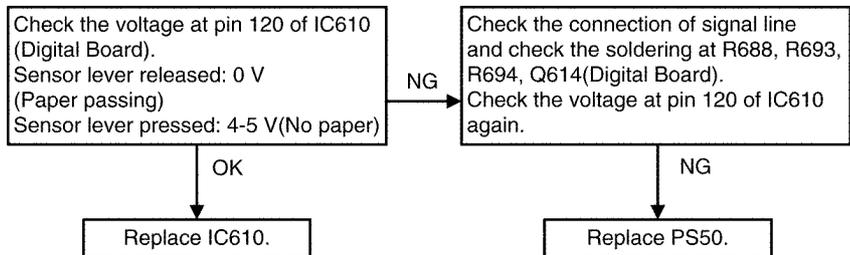
**6. Check the regist sensor..... “FAILED PICKUP”**



**7. Check the paper sensor..... “OUT OF PAPER”**



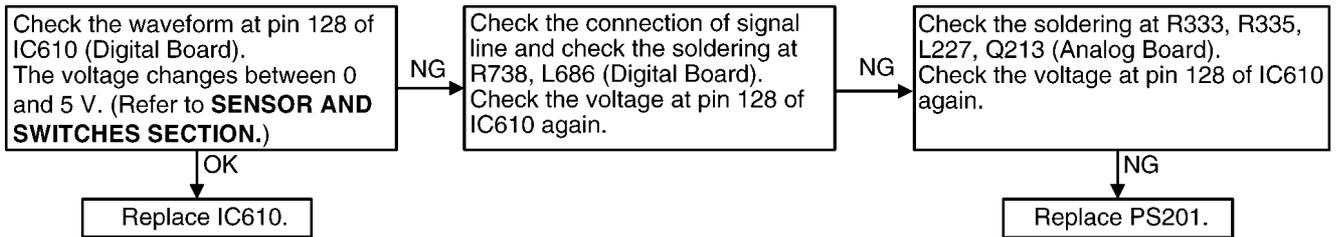
**8. Check the exit switch..... “PAPER JAMED”**



**9. Check the toner sensor..... “TONER LOW”, “CHECK TONER”**

**Note:**

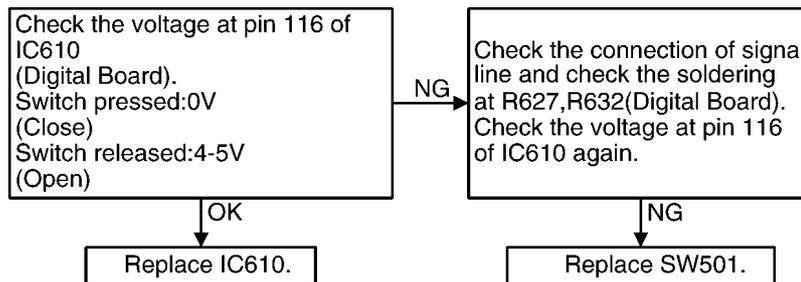
As for the following check, remove the drum from the main body, set it again and close the cover, then perform that check during initializing operation. Refer to **SENSORS AND SWITCHES SECTION (P.185)**.



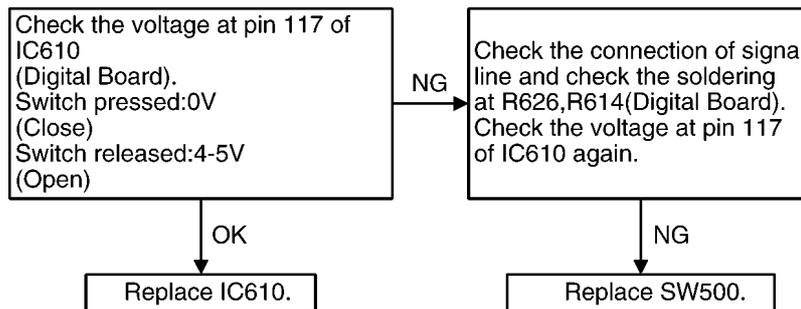
**CROSS REFERENCE:**

**SENSORS AND SWITCHES SECTION (P.185)**

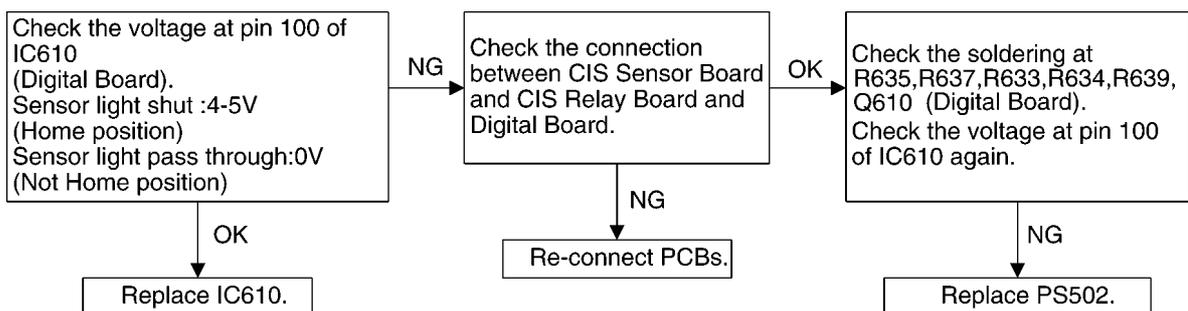
**10. Check the ADF cover open switch**



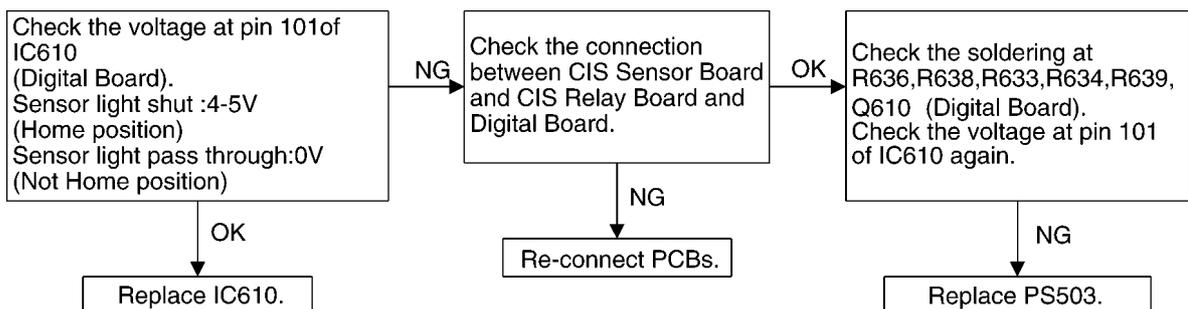
**11. Check the FB cover open switch**



**12. Check the CIS position sensor (ADF Home side)**

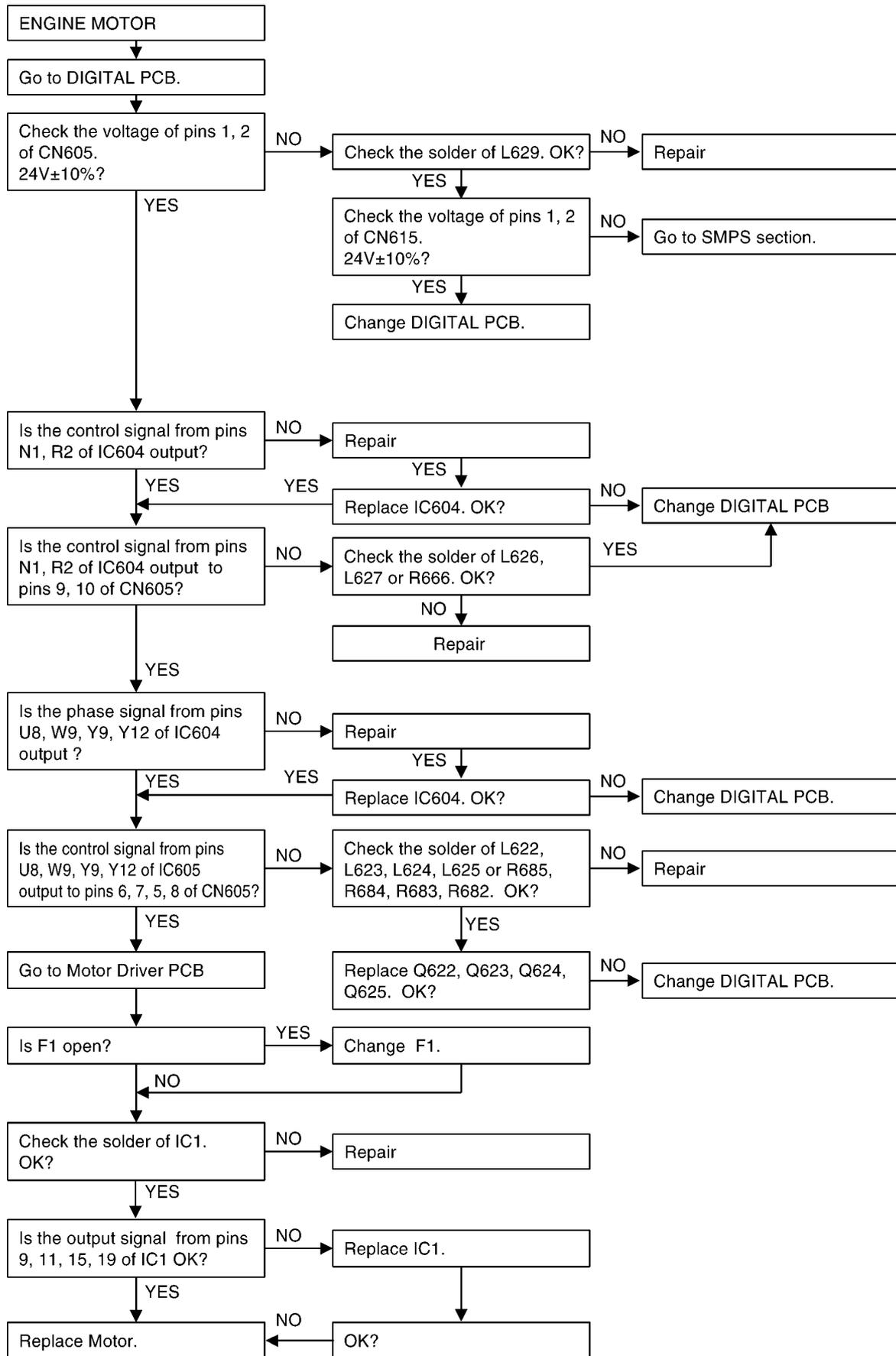


**13. Check the CIS position sensor (FB Home side)**

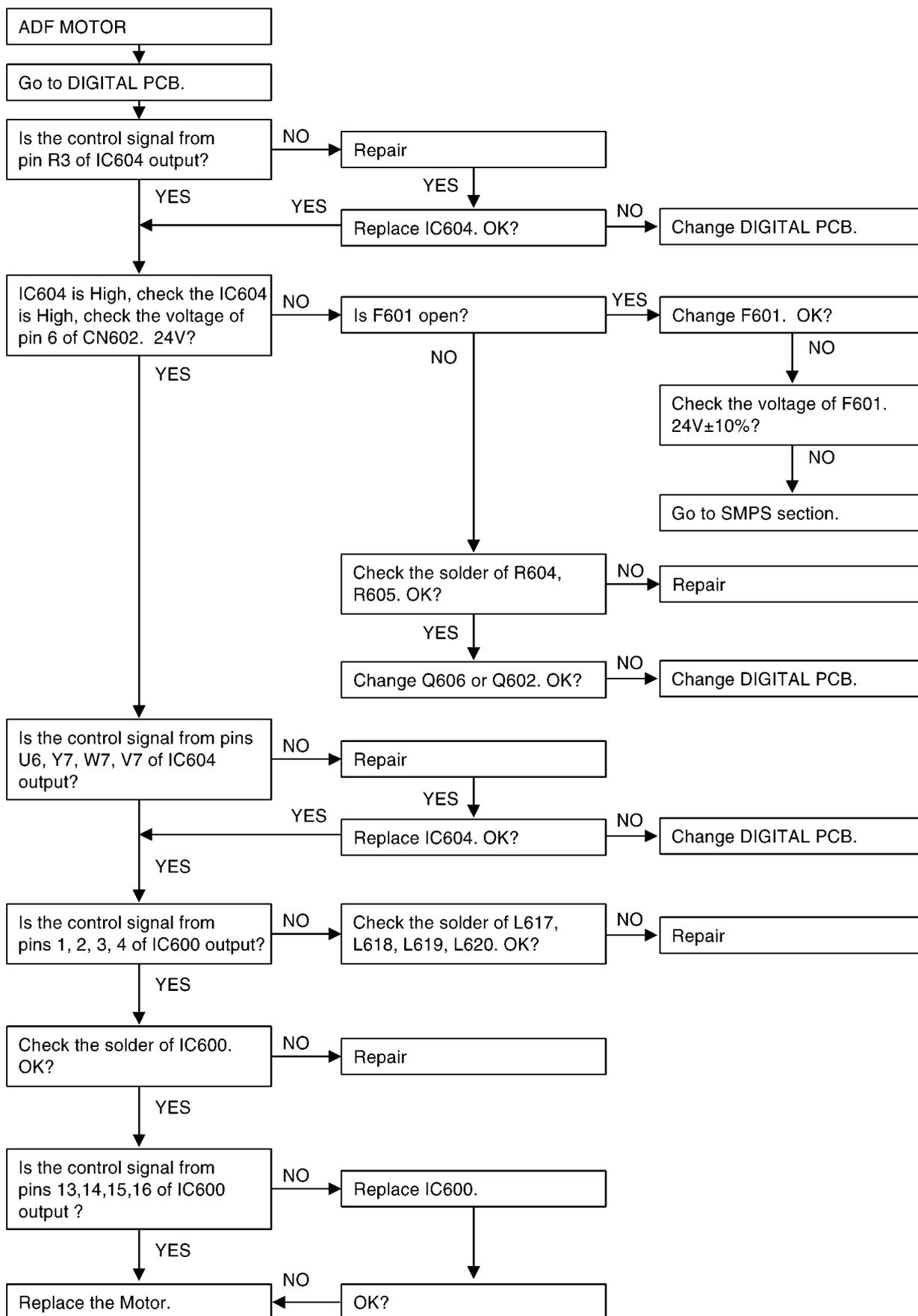


### 6.5.13.6. MOTOR SECTION

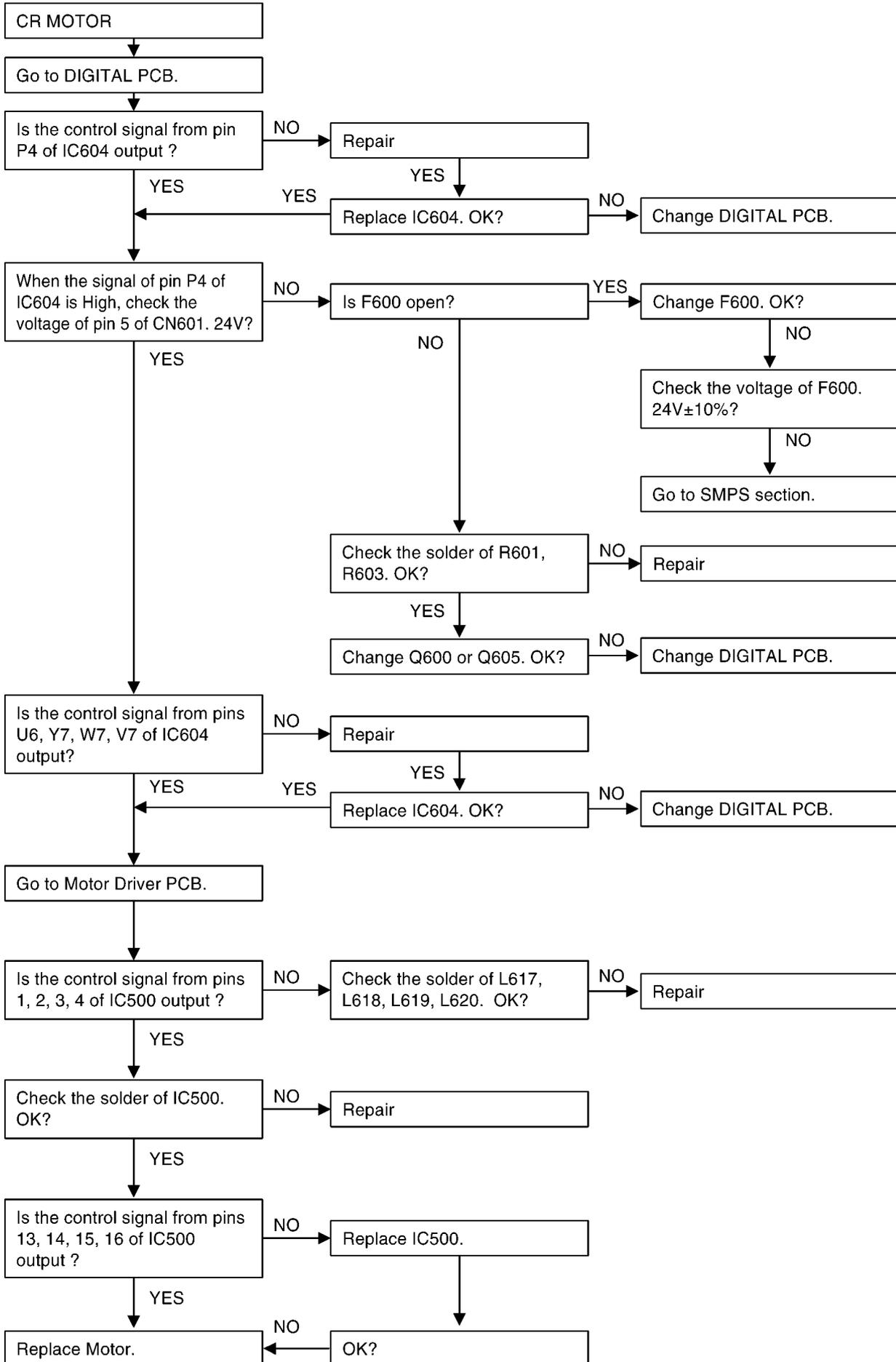
#### 6.5.13.6.1. ENGINE MOTOR



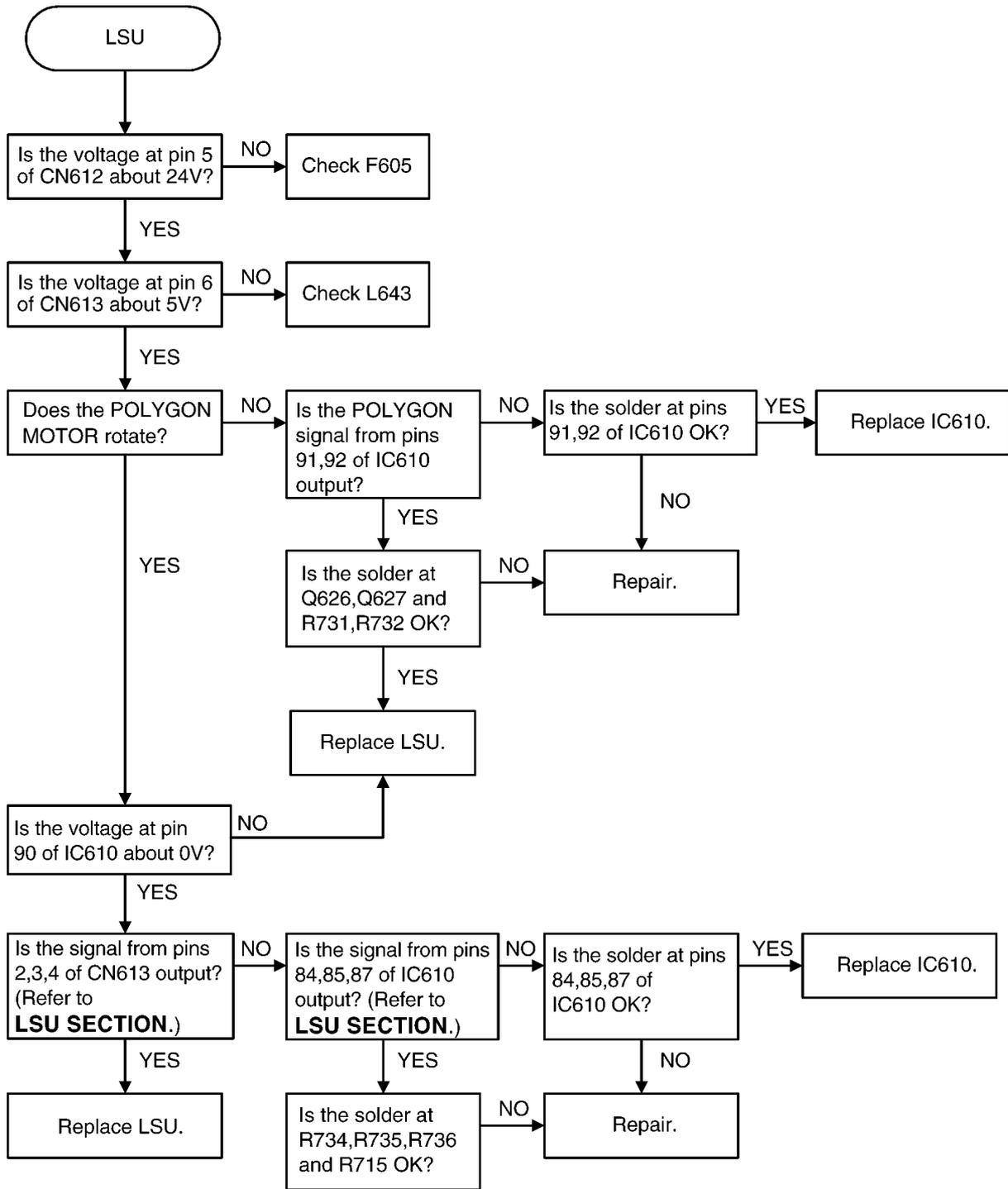
### 6.5.13.6.2. ADF MOTOR



### 6.5.13.6.3. CR MOTOR



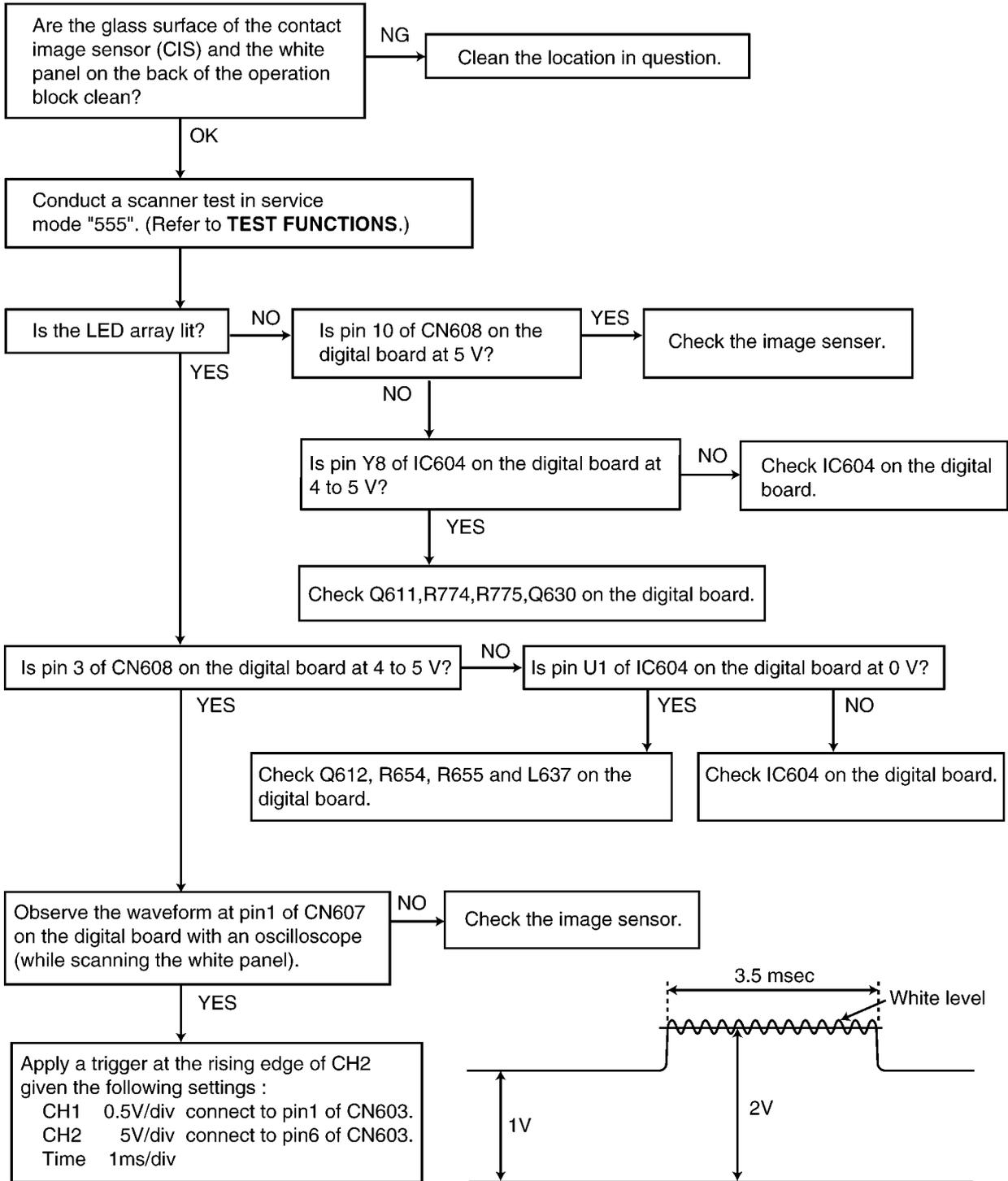
### 6.5.13.7. LSU SECTION



**CROSS REFERENCE:**

LSU (Laser Scanning Unit) SECTION (P.183)

### 6.5.14. CIS (Contact Image Sensor) SECTION



**CROSS REFERENCE:**  
**TEST FUNCTIONS (P.74)**

## 6.5.15. HIGH VOLTAGE VALUE CHECK POINT

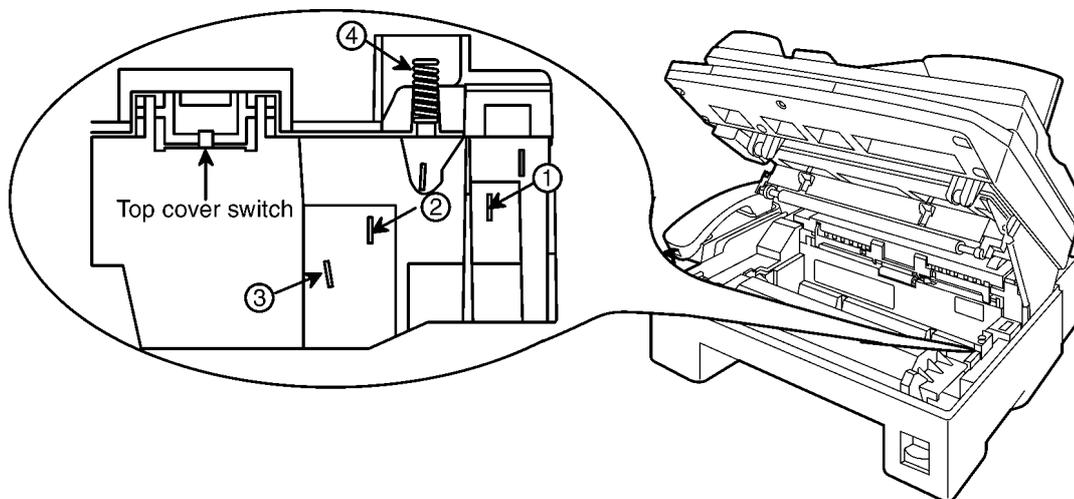
### Measurement Procedure

1. Open the TOP cover.
2. Remove the developing unit, if it is equipped.
3. Open the TOP cover, and turn ON the TOP cover SW.  
(Push the TOP cover SW with a sharp-tipped insulator or insert folded paper, etc. to the slit.)
4. The unit enters the service mode when the TOP cover is open, then push \*628.  
(Don't push the START button.)
5. Touch the output terminals under test with the high voltage probes.
6. Push the START button.  
(This causes to output high voltage from each terminal, so be careful not to touch them. The sound "Pi Pi Pi" warns that the high voltage is outputting.)
7. When the measurement is finished, push the STOP button.  
(The high voltage output is stopped.)
8. Repeat the items No. 5~7 until the measurement is finished.
9. When the measurement is finished, turn OFF the TOP cover SW.

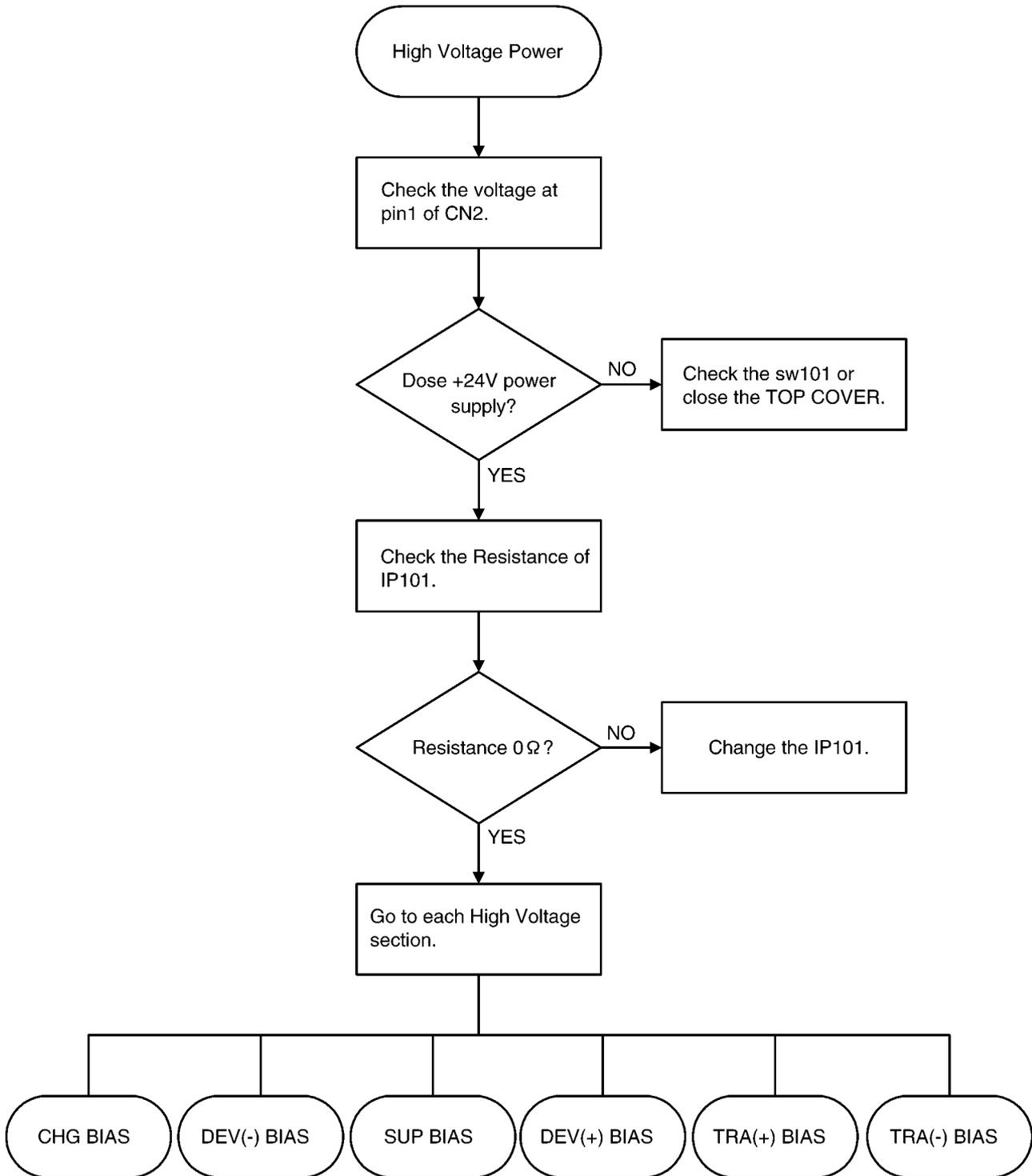
### Output voltage of each terminal

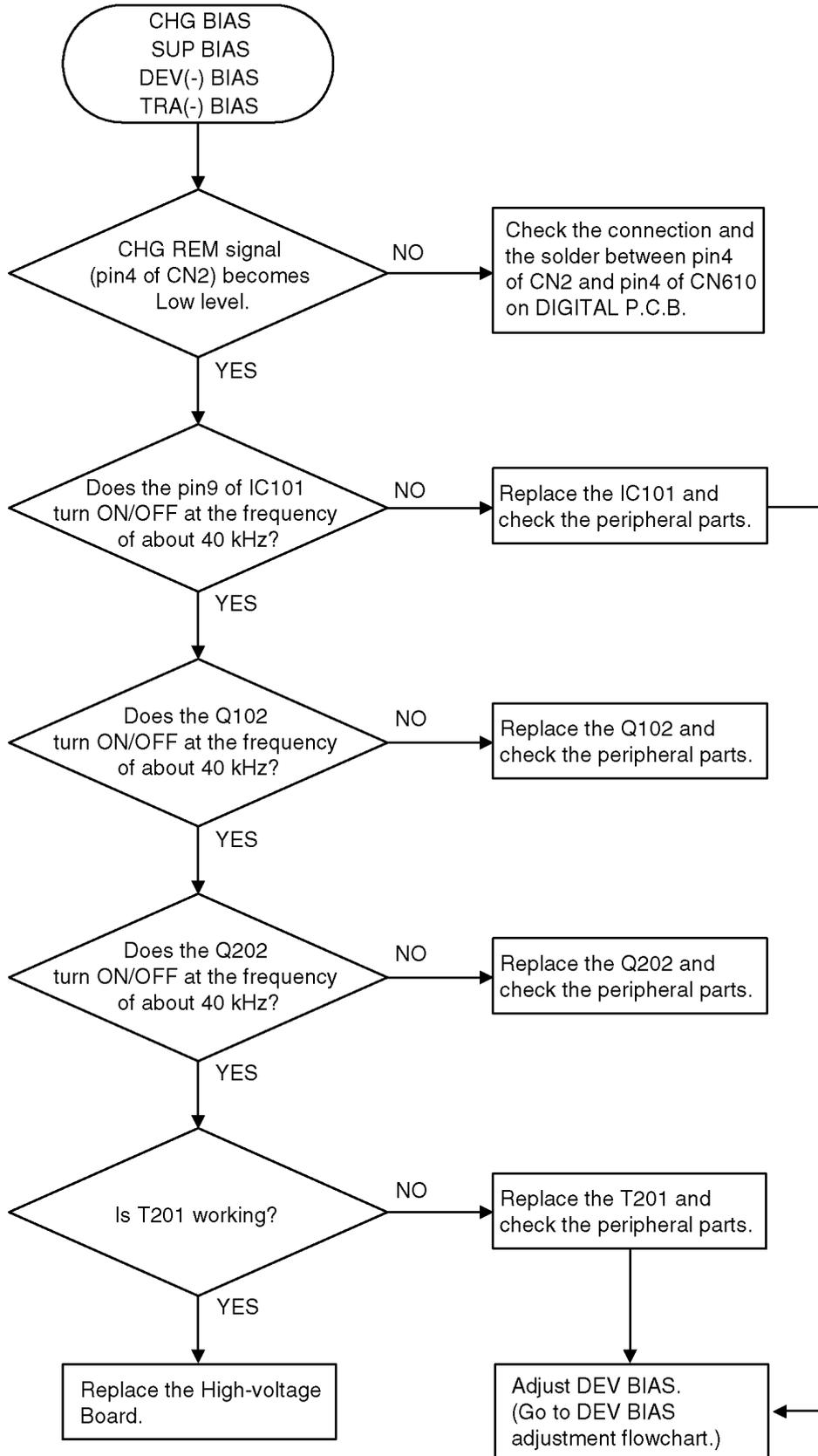
No.	BIAS Name	Specified output voltage	The range of specified output voltage
①	CHG (Charge)	-1200V	-1200V± 35V
②	DEV (Developing)	-350V	-350V± 15V
③	SUP (Supply)	-550V	-550V± 50V
④	TRA (Transfer)	-1200V	-1200V± 100V

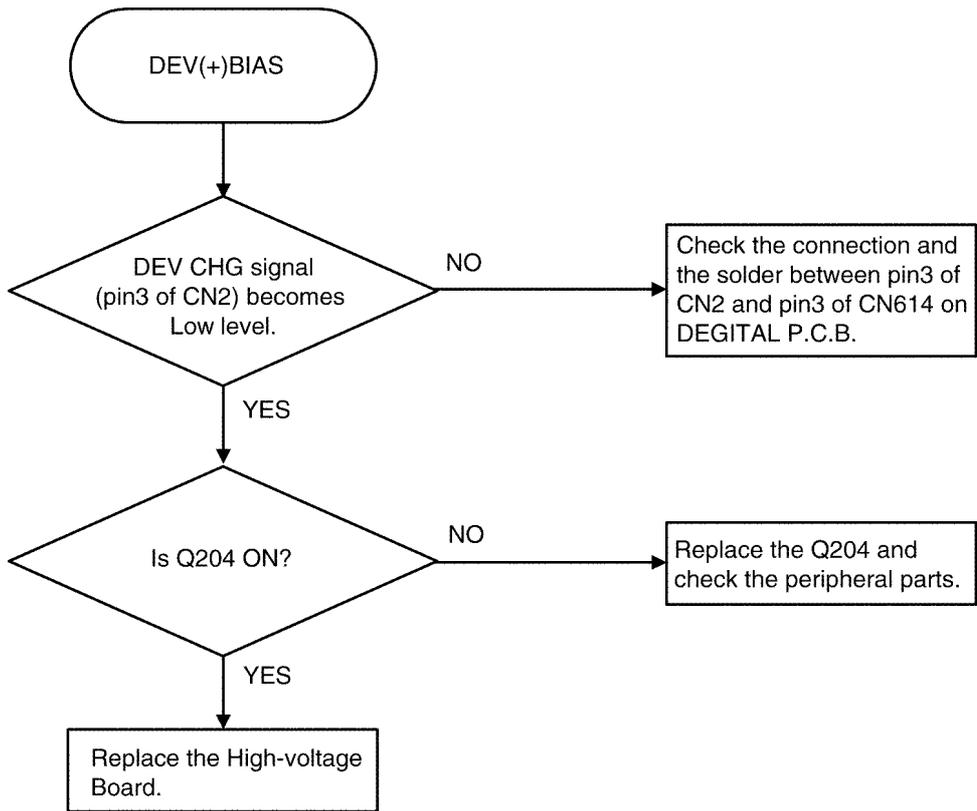
\* As for the High Voltage test equipment, FLUKE 85 (MULTIMETER)+ HIOKI (HV PROBE 9014) or the equivalent should be used.

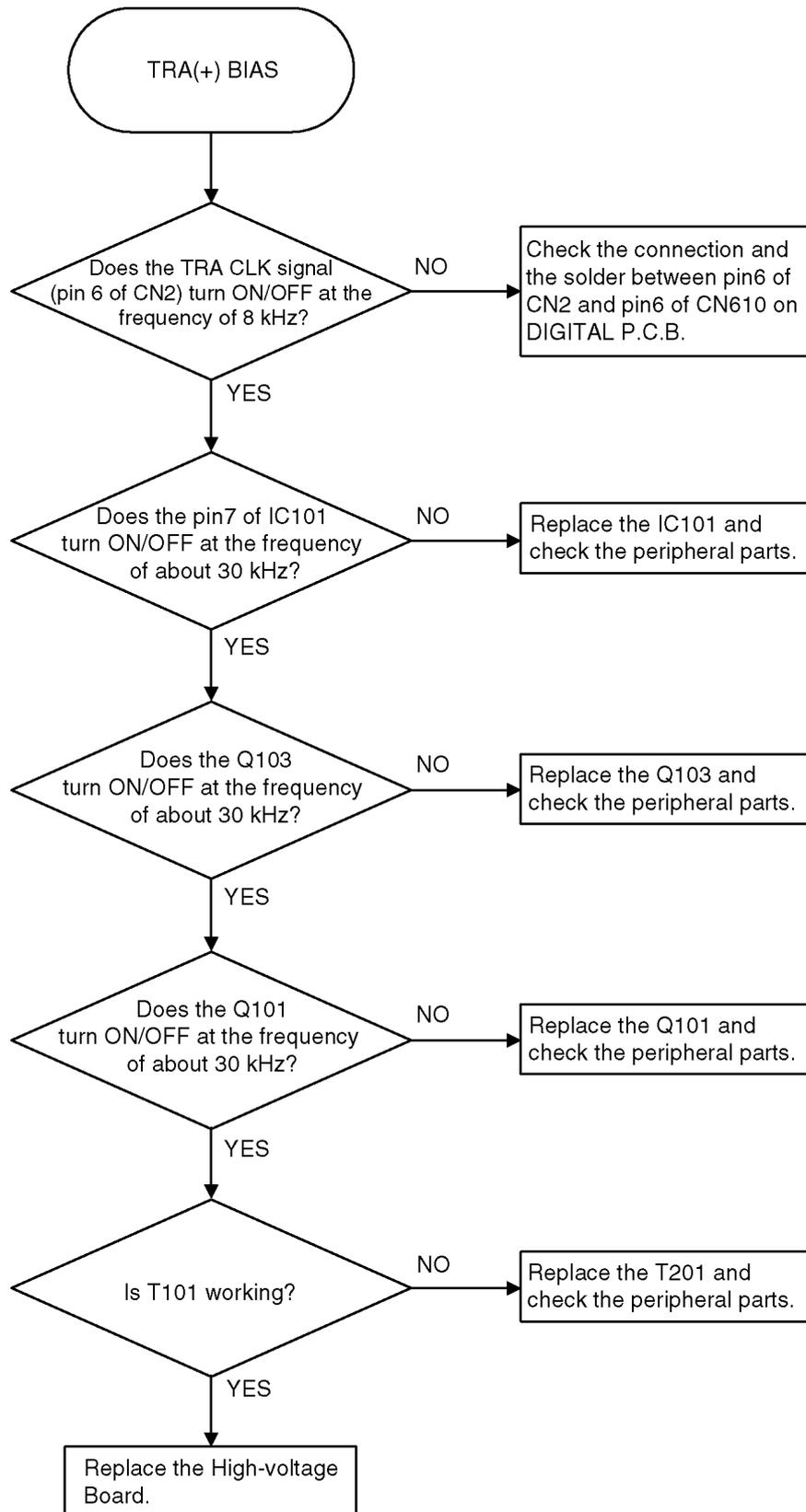


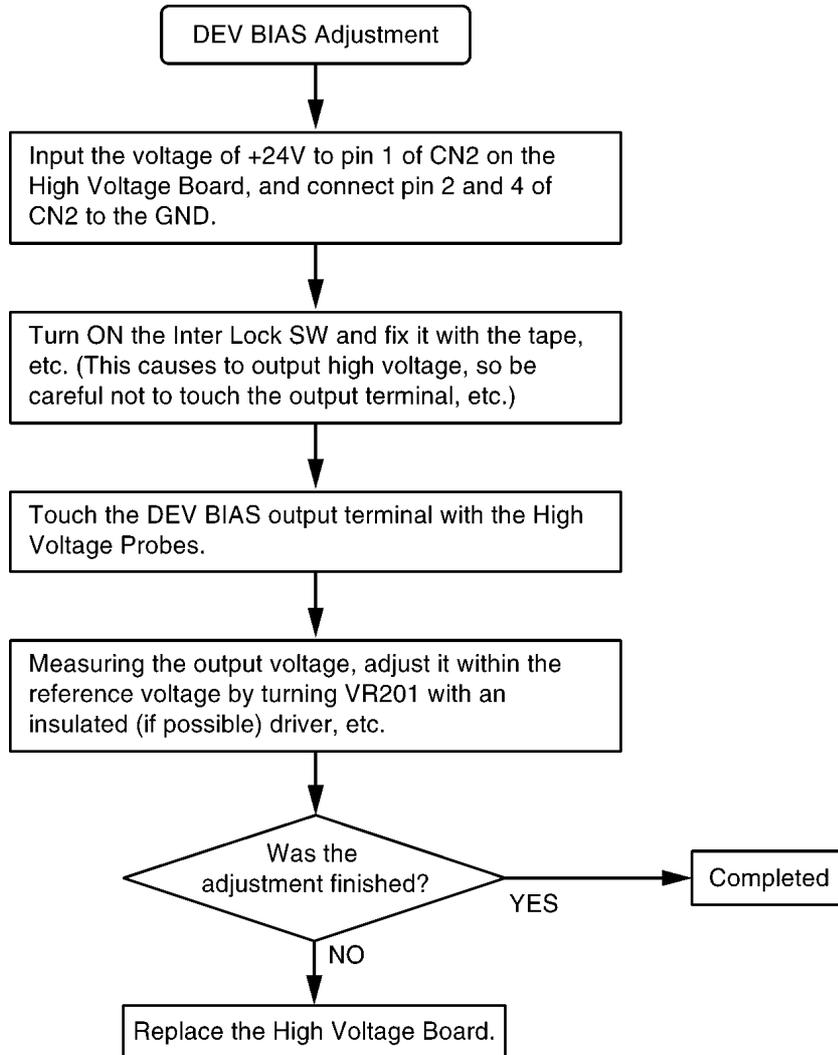
### 6.5.16. HIGH VOLTAGE SECTION











\* This Adjustment should be done with a single High Voltage Board.

\* As for the High Voltage Probe, HV PROBE 9014 of HIOKI electric co. or the equivalent should be used.

\* As for the tester, FLUKE 85 III multimeter or the equivalent should be used.

\* Be careful not to touch the terminals during adjustment because the high voltage is used.

## 6.5.17. POWER SUPPLY BOARD SECTION

### 6.5.17.1. KEY COMPONENTS FOR TROUBLESHOOTING

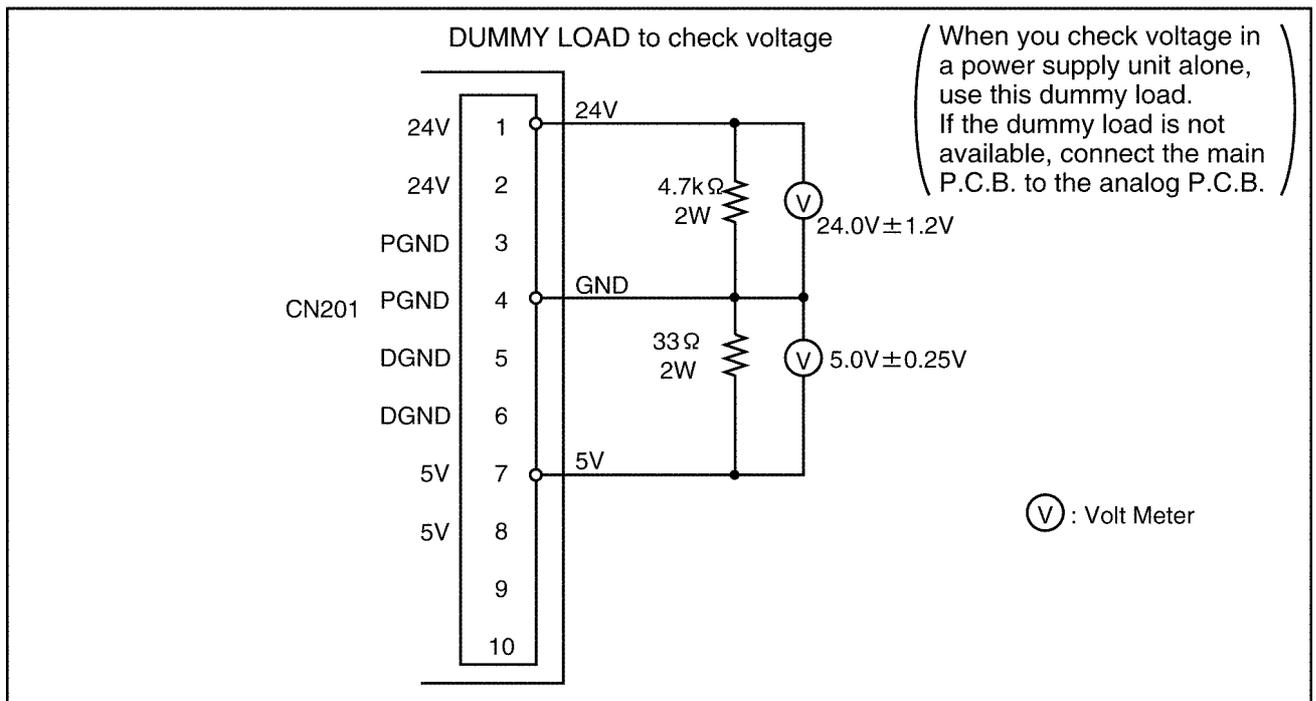
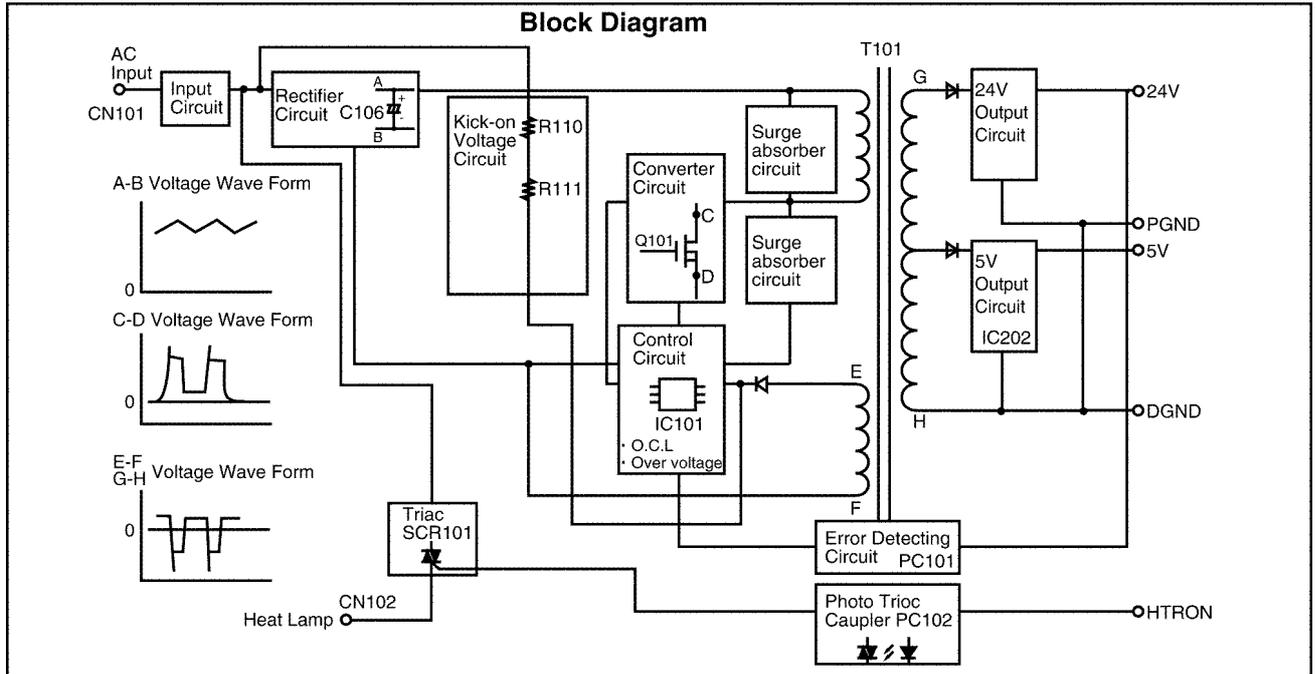
Check the following parts first: F101, D101-D104, C106, Q101, PC101 and IC101.

This comes from our experience with experimental tests. For example: power supply and lightning surge voltage test, withstanding voltage test, intentional short circuit test, etc.

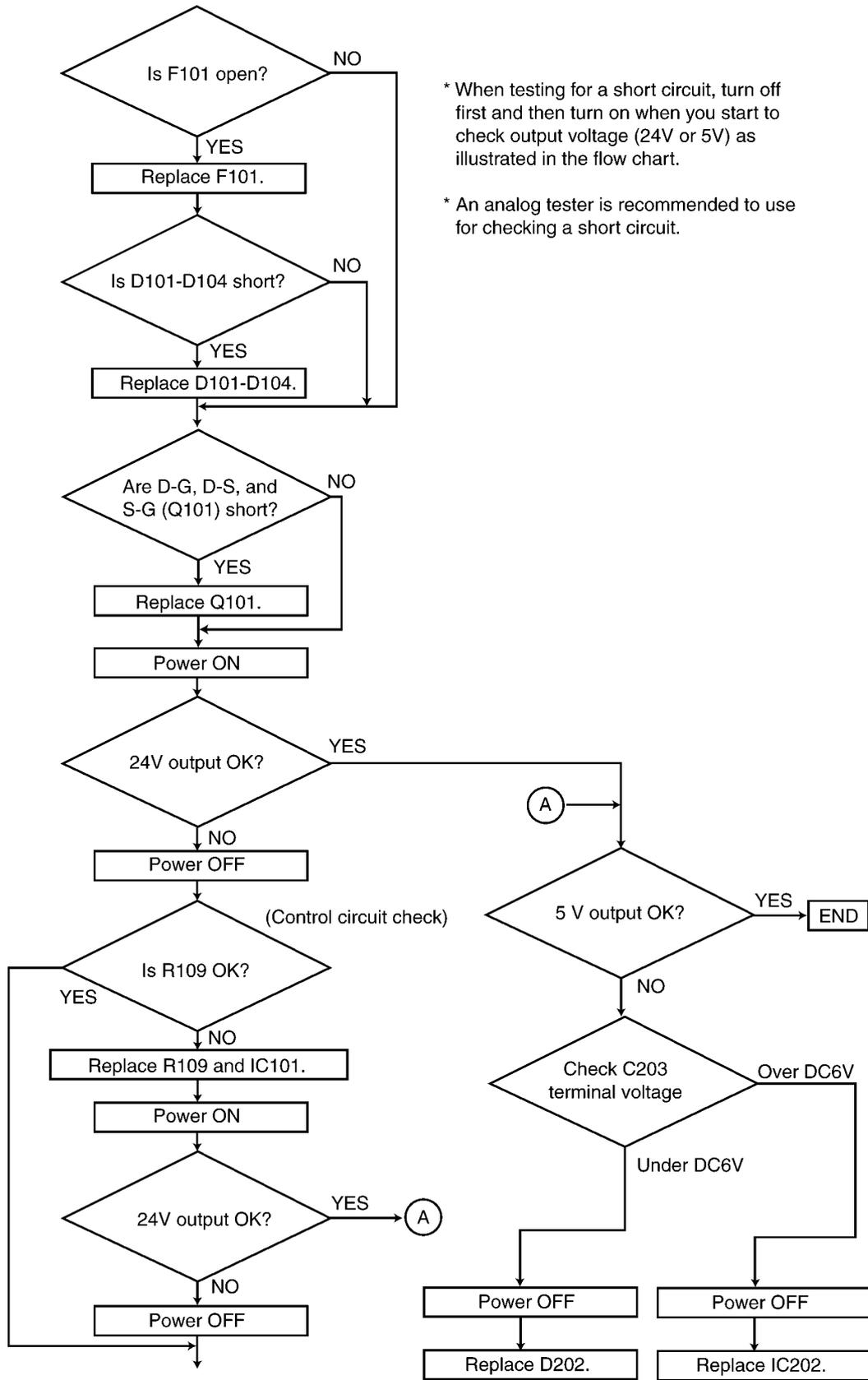
**Caution:**

If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

In most cases, the symptom is that nothing is output. It is more likely that the fault is in the primary side rather than the secondary side. Check the primary side first.

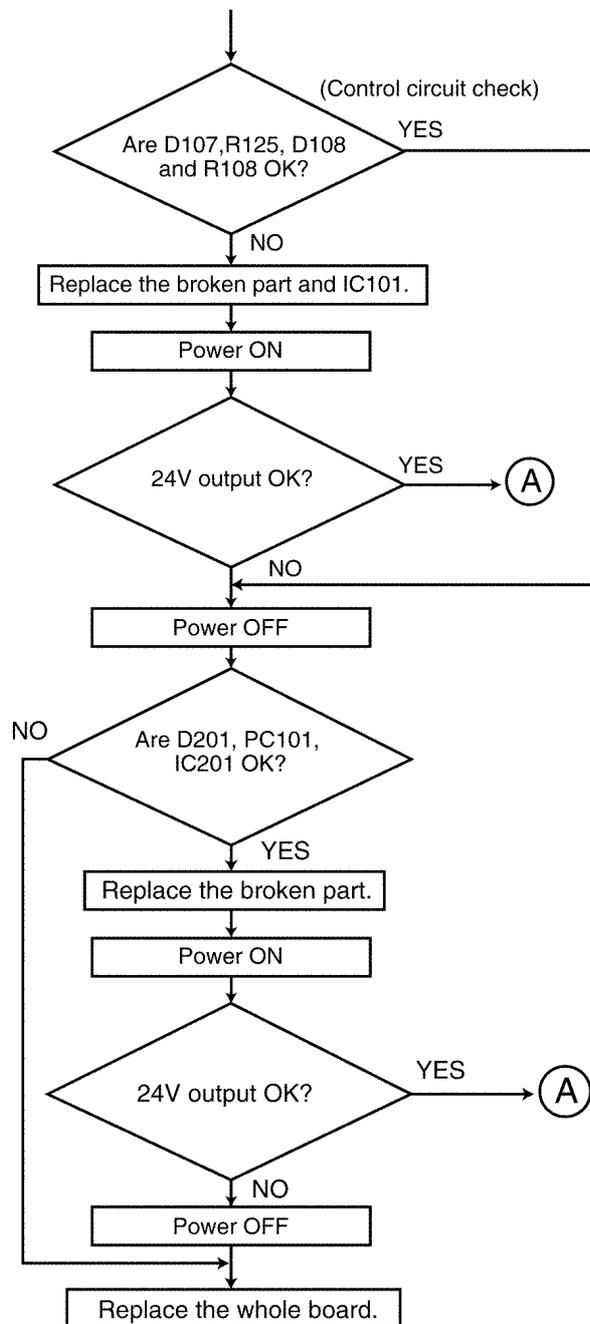


### 6.5.17.2. TROUBLESHOOTING FLOW CHART



\* When testing for a short circuit, turn off first and then turn on when you start to check output voltage (24V or 5V) as illustrated in the flow chart.

\* An analog tester is recommended to use for checking a short circuit.



### 6.5.17.3. BROKEN PARTS REPAIR DETAILS

(D101~D104)

Check for a short-circuit in terminal 4. If D101~D104 is short-circuit, F101 will melt (open). In this case, replace all of the parts (D101~D104, F101).

(Q101)

The worst case of Q101 is a short-circuit between the Drain and Gate because damage expands to the peripheral circuit of Q101. This is due to a very high voltage through the Gate circuit which is composed of R109 and IC101. You should change all of the parts listed as follows.

F101, Q101, R109, IC101

(D201)

If D201 is broken, the oscillation circuit in the power supply cannot operate. Check it with an electric tester.

## 6.6. PROBLEMS WITH PC SOFTWARE

### 6.6.1. GENERAL

Problem	Cause & Remedy
<p><b>I cannot open a TIFF file.</b></p>	<ul style="list-style-type: none"> <li>• You must change the compression format of the file. Example: To convert an image using Imaging for Windows.</li> <li>1. Click <b>[Start]</b>, point to <b>[Programs]-[Accessories]</b>, then click <b>[Imaging]</b>.</li> <li>2. Open the TIFF file that you cannot open in <b>[Multi-Function Viewer]</b>.</li> <li>3. Select <b>[Properties]</b> from the <b>[Page]</b> menu. - The <b>[Page Properties]</b> dialog box will appear.</li> <li>4. Click the <b>[Compression]</b> tab, then select <b>[CCITT Group 3 (1d) Modified Huffman]</b> from the drop-down list.</li> <li>5. Click <b>[OK]</b>. - The compression format of the file is now changed.</li> </ul>
<p><b>[Launcher]</b> disappears.</p>	<ul style="list-style-type: none"> <li>• Look in the tool bar. If you do not find the <b>[Launcher]</b> icon, it is closed. If you do find the icon, it is just minimized. Click the icon in the tool bar.</li> </ul>
<p><b>I cannot recognize the last part of an entry in the list of the [One Touch], [Directory], [Journal] or [Caller ID].</b></p>	<ul style="list-style-type: none"> <li>• Put the cursor on the line between the buttons, the cursor changes shape and you can expand the area by dragging or double-clicking.</li> </ul>
<p><b>When I exit Multi-Function Station, the [Multi-Function Viewer] window does not close.</b></p>	<ul style="list-style-type: none"> <li>• The <b>[Multi-Function Viewer]</b> window can be operated separately. Click the <b>[X]</b> button to close the window.</li> </ul>
<p><b>Multi-Function Station does not work properly.</b></p>	<ul style="list-style-type: none"> <li>• Click the <b>[X]</b> button to exit Multi-Function Station, and restart. If Multi-Function Station still does not close, restart the PC.</li> <li>• If you connect the USB cable to USB hub, connect it to the USB port of your computer directly.</li> <li>• Confirm the BIOS setting of your computer. For parallel connection, select ECP, Bi-directional or an equivalent parallel port mode. For USB connection, select USB port mode. Please refer to your PC operating instructions or consult the manufacturer.</li> <li>• If you have any other multifunction softwares installed on your computer, uninstall it.</li> </ul>
<p><b>I want to replace the parallel cable with a USB cable and vice versa.</b></p>	<ul style="list-style-type: none"> <li>• You must change the printer properties.</li> <li>1. Replace the cables.</li> <li>2. Set the connection type (parallel or USB) by using the fax machine according to the cable type you use (feature #15)</li> <li>3. Click <b>[Start]</b>, point to <b>[Settings]</b>, then click <b>[Printers]</b>.</li> <li>4. Right-click <b>[Panasonic FLM551/FLB751 Series]</b> and click <b>[Properties]</b>. - The <b>[Panasonic FLM551/FLB751 Series Properties]</b> dialog box will appear.</li> <li>5. Click the <b>[Details]</b> (Windows 98/Me) /<b>[Ports]</b> (Windows 2000/XP) tab, select the connection type, then click <b>[OK]</b>. - If Multi-Function Station does not work correctly, uninstall the software, then re-install it.</li> </ul>

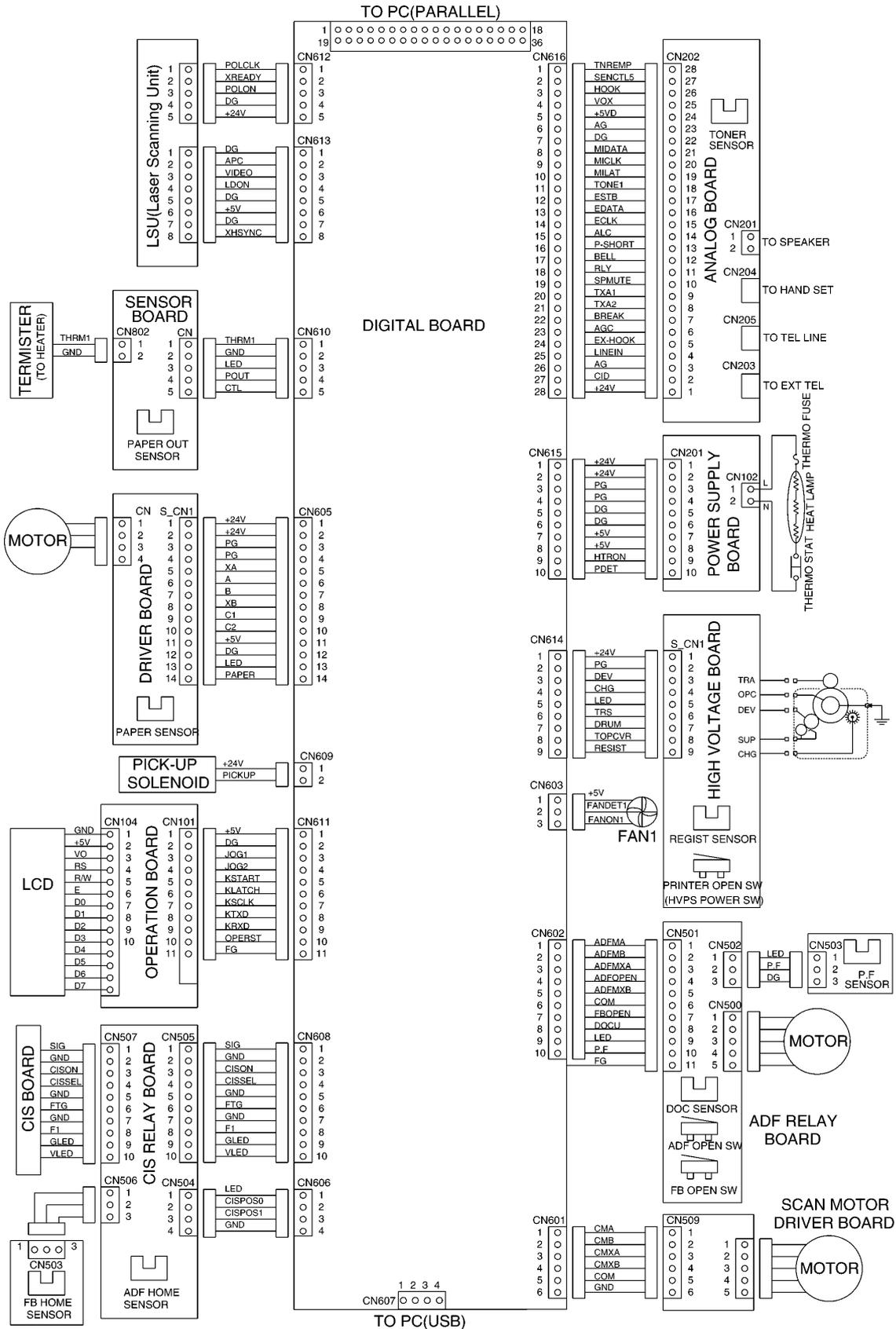
## 6.6.2. SCAN

Problem	Cause & Remedy
<p><b>I cannot scan.</b></p>	<ul style="list-style-type: none"> <li>• The fax machine is in use. Try later on.</li> <li>• There is not enough space on the hard disk. Delete unnecessary files and try again.</li> <li>• There is not enough memory. Close some applications and try again.</li> <li>• Restart the PC, and try again.</li> <li>• Check the connection of the PC and the fax machine.</li> <li>• You attempted to scan a document longer than the paper size which you set in the <b>[Panasonic FLM551/FLB751 Series]</b> dialog box. Change the setting or divide the document into the appropriate paper size, and try again.</li> </ul>
<p><b>The document does not feed into the fax machine.</b></p>	<ul style="list-style-type: none"> <li>• Remove the document and reinsert it.</li> </ul>
<p><b>Even after clicking [Cancel], scanning continues.</b></p>	<ul style="list-style-type: none"> <li>• Please wait. It may take a while for the cancel request to be accepted.</li> </ul>

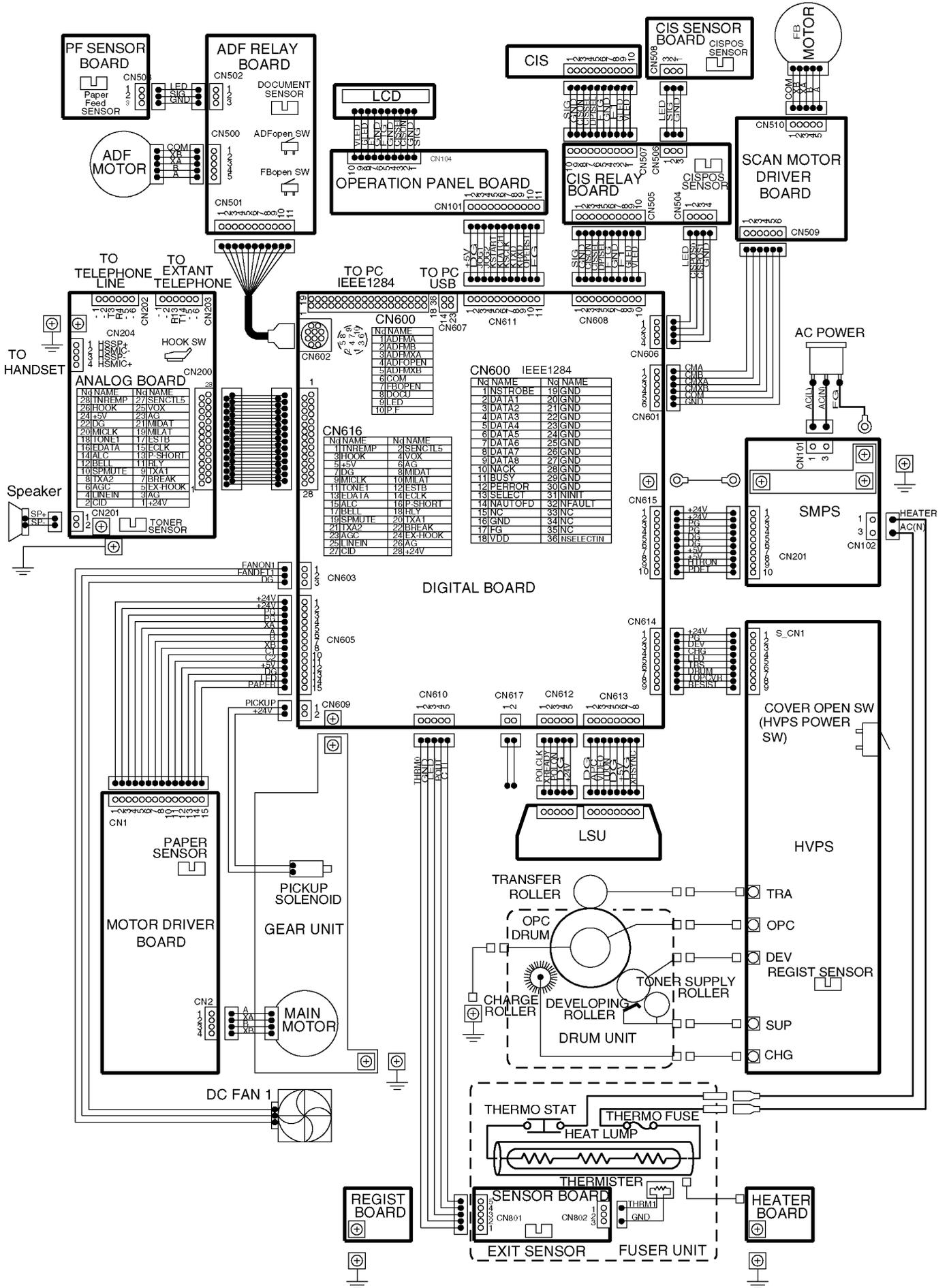
# 7 CIRCUIT OPERATIONS

## 7.1. CONNECTION DIAGRAM

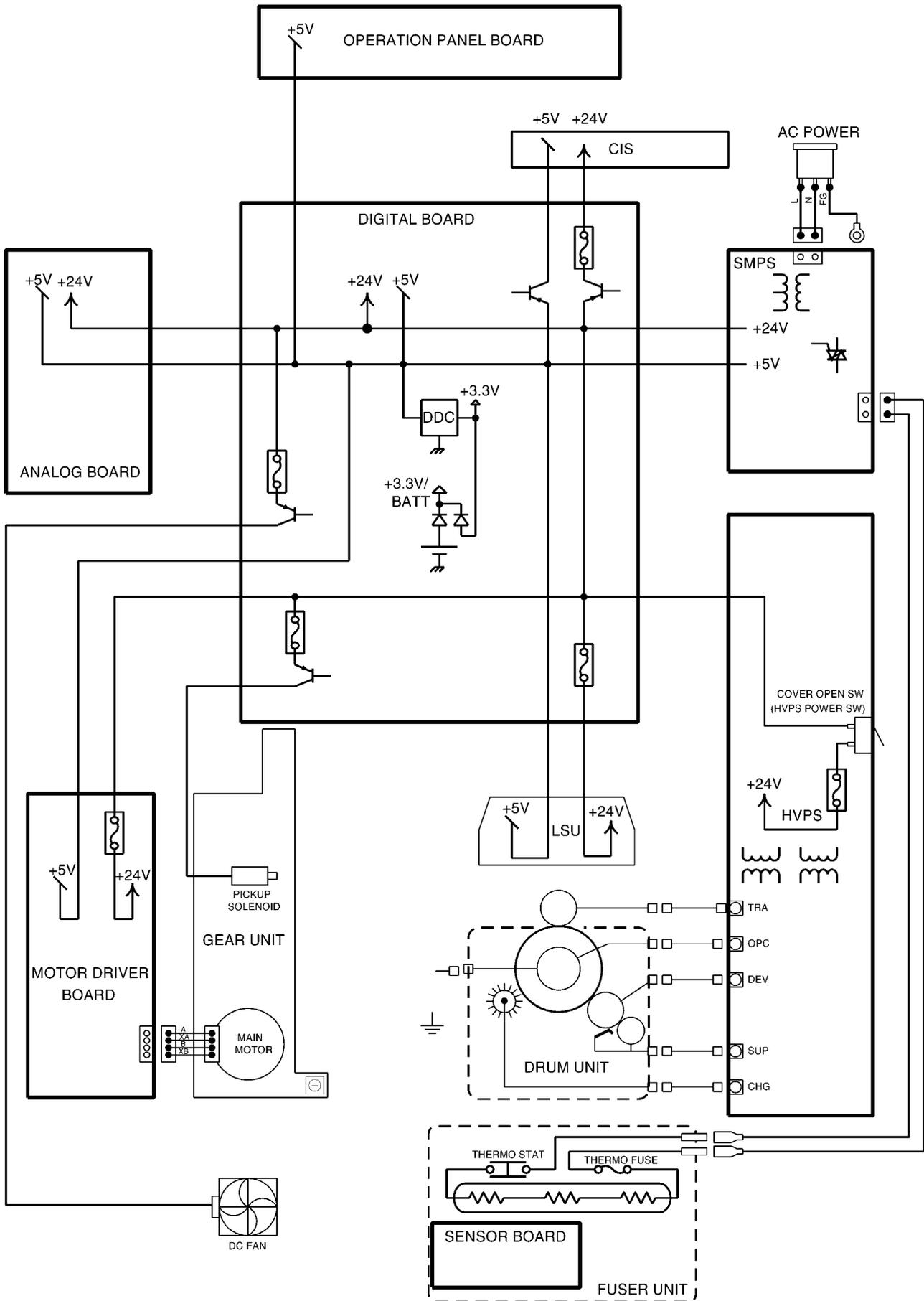
### 7.1.1. CONNECTION DIAGRAM (1)



### 7.1.2. CONNECTION DIAGRAM (2)



### 7.1.3. POWER SUPPLY FLOW



## 7.2. GENERAL BLOCK DIAGRAM

The following is an outline of each device IC on the digital board.

### 1. ASIC (IC604)

Composed mainly of an address decoder and a modem control.

Controls the general FAX operations.

Performs the image processing.

CPU and Real time clock

Provides the reset pulse for each of the major ICs.

### 2. G/A (IC610)

Controls the operation panel I/F.

Controls the LSU I/F.

Latches lower address.

Controls FANs, LEDs and analog I/F.

### 3. Flash ROM (IC606)

Contains all of the program instructions on the unit operations.

### 4. Synchronous Dynamic RAM

4-1. (IC608) This memory is used for the parameter working in the storage area and for the page memory.

4-2. (IC603) This memory is used for image processing.

### 5. CODEC (IC609)

Performs the modulation and the demodulation for FAX communication.

### 6. Read Section

CIS image sensor to read transmitted documents.

### 7. Motor Driver Board

Drives the motor.

### 8. LSU (Laser Scanning Unit)

Forms the images on the OPC drum by rotating polygon motor and reflecting the laser beam against polygon.

### 9. Analog Board

Composed of ITS circuit and NCU circuit.

### 10. Sensor Section

Composed of a cover open switch, a document sensor, a document top sensor, a paper sensor, a paper regist sensor, a paper exit sensor and a toner sensor.

### 11. Power Supply Board Switching Section

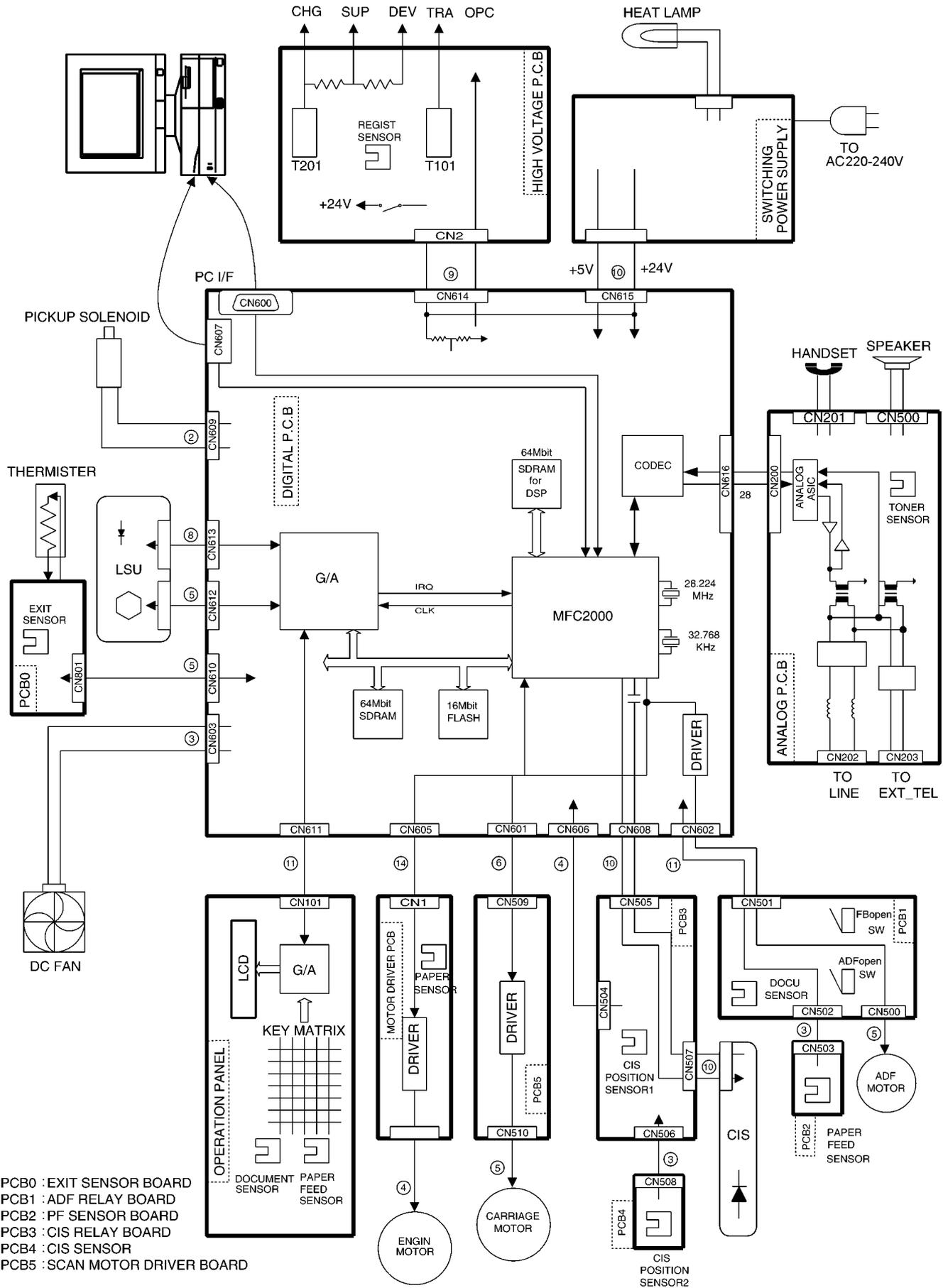
Supplies +5V and +24V to the unit.

### 12. High Voltage Power Supply Board

Supplies bias need for the printing operation: bias of the Drum, developing and transcription.

### 13. Fixing Unit

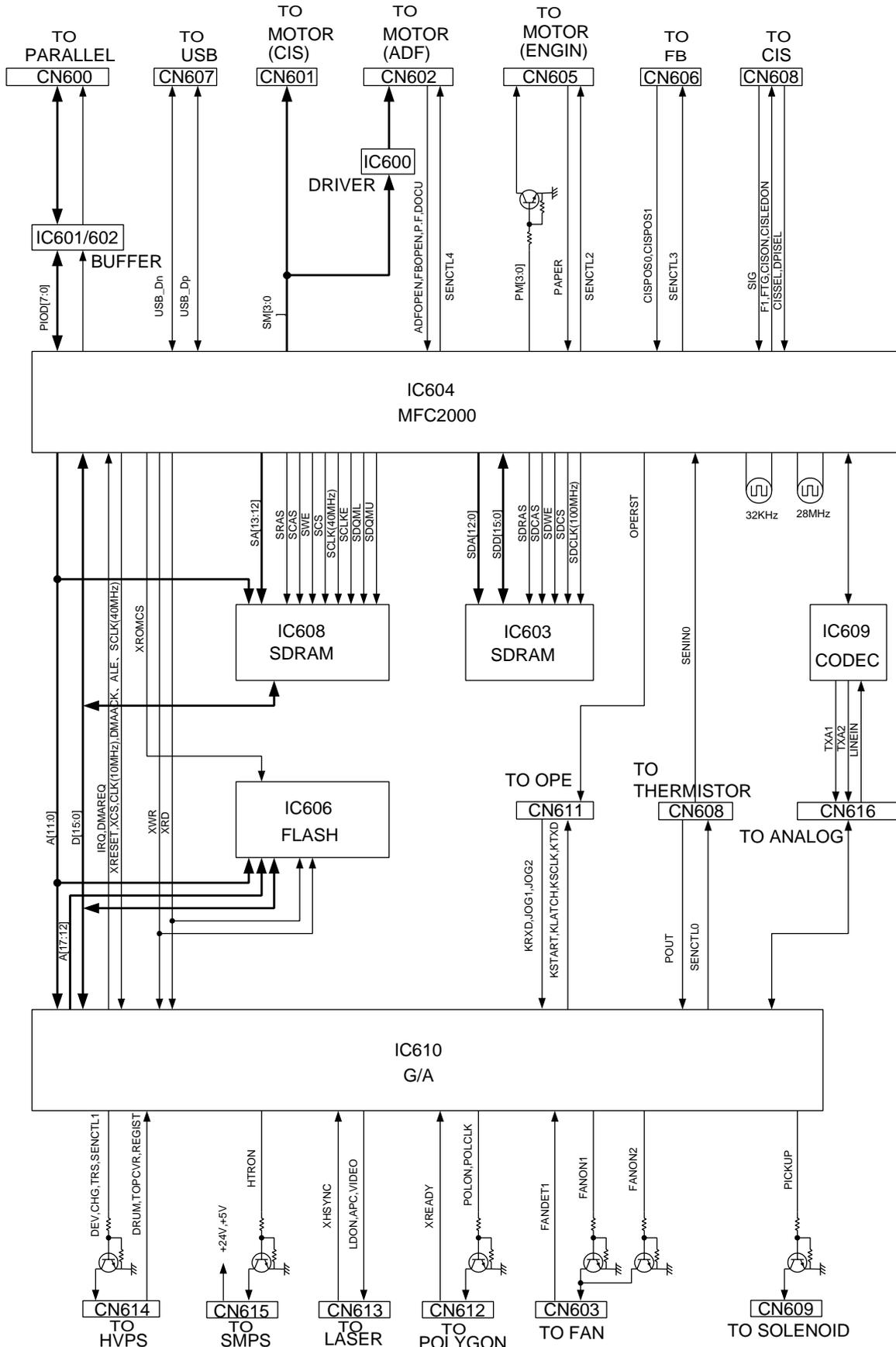
Composed heat lamp, thermistor and thermal fuse.



### 7.3. FACSIMILE SECTION

#### 7.3.1. DIGITAL SECTION

##### 7.3.1.1. DIGITAL BLOCK DIAGRAM



### 7.3.1.2. ASIC (IC604)

This IC is used for general FAX operations.

(1)	CPU:	This model uses ARM equivalent CPU operating at 40 MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the results.
(2)	RTC:	Real time clock.
(3)	DECORDER:	Records the address.
(4)	ROM/RAM I/F:	Controls the SELECT signal of ROM or RAM and bank switching.
(5)	ANALOG UNIT:	Sends beep tones, etc.

### 7.3.1.3. ROM (IC606)

This 2MB FLASH ROM has 31 blocks.

The capacity of each block is 64 KB.

The addresses of the this area are from 000000H to 1FFFFFFH.

### 7.3.1.4. GATE ARRAY (IC610)

This custom IC is used as following.

- (1) LSU I/F Control the polygon motor and output video signal to LSU.
- (2) OPERATION PANEL I/F Serial interface with operation canal.
- (3) FAN MOTOR I/F Control FAN MOTOR and detect the rotation of FAM MOTOR.
- (4) ANALOG I/F Serial interface for analog ASIC and electrical volume.
- (5) I/O PORT I/O Port Interface.

### 7.3.1.5. SYNCHRONOUS DYNAMIC RAM (IC608)

This SDRAM is used for CPU work and receiving memory and page memory.

The address are from 200000H to 27FFFFFFH.

### 7.3.1.6. SYNCHRONOUS DYNAMIC RAM (IC603)

The SDRAM is used for Image Processing work memory.

This address are from 1000000H to 11FFFFFFH.

### 7.3.2. RTC BACKUP CIRCUIT

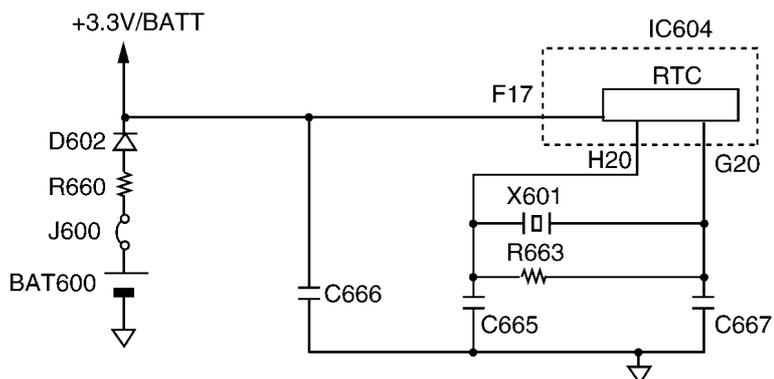
#### 1. Function

This unit has a lithium battery (BAT600) which works for the Real Time Clock IC (RTC: inside IC604). The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.

#### 2. RTC Inside (IC604) Backup Circuit Operation

When the power switch is turned ON, power is supplied to the RTC (inside IC604). At this time, the voltage at pin F17 of the IC604 is +3.3V. When the power switch is turned OFF, the BAT600 supplies power to RTC through D602. The voltage at pin F17 of IC604 is about +2.5V. When the power switch is OFF and the voltage of +3.3V decreases, pin F17 of RTC (IC604) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

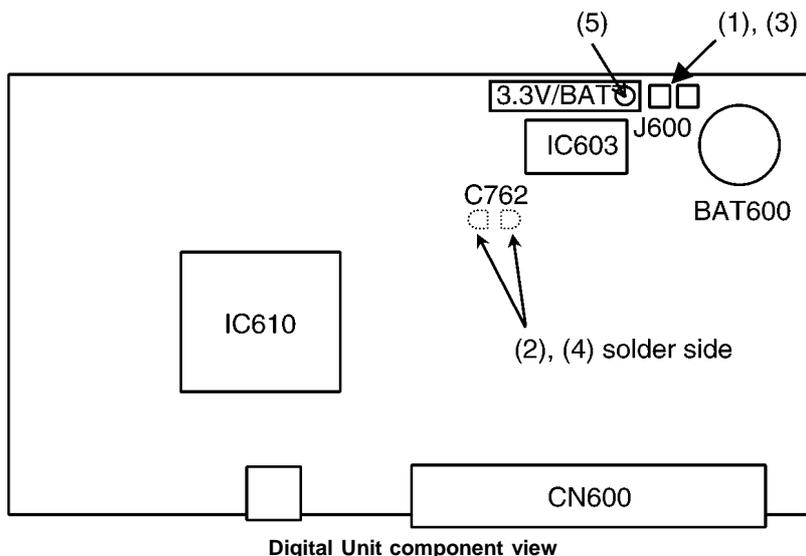
**Circuit Diagram**



#### Points to notice when replacing the battery

When the backup battery becomes low or the backup function is turned off for repairing, recover the backup power supply following the procedure described below.

- (1) Replace the battery and IC. J600 should be removed beforehand.
- (2) Short the both ends of C762. (Ex. Pinch them with tweezers.)
- (3) Connect terminals of J600 with solder.
- (4) Short the both ends of C762 again. (Ex. Pinch them with tweezers.)
- (5) Make sure that the voltage of 3.3V/BATT test land is more than 2.7 V.



### 7.3.3. MODEM CIRCUIT OPERATION

The CODEC (IC609) and ASIC (IC604) has all the hardware satisfying the CCITT standards mentioned previously.

ASIC (IC604) controlled codec (IC609) by serial data.

This CODEC (IC609) and ASIC (IC604) has an automatic application equalizer. With training signal 1 or 2 at the time of G3 reception, it can automatically establish the optimum equalizer.

#### 1. Facsimile Transmission/DTMF Line Send

The digital image data on the data bus is modulated in ASIC(IC604), and sent from pin 9 and 10 via CODEC(IC609),amplifier IC204(5/6→7). Analog gate array IC201(24→22), electric volume IC202(14→15),amplifier IC207(2→1) and the NCU section to the telephone line.

Refer to **CHECK SHEET**(P.137).

#### 2. Facsimile Reception

The analog image data which is received from the telephone line passes through the NCU section and enters pin 13 of the CODEC (IC609). The signals that enter pin 13 of the CODEC (IC609) are demodulated in the board to digital image signals and then send pin p1 of the ASIC (IC604).

In this case, the image signals from the telephone line are transmitted serially. In the ASIC (IC604). Here, the internal equalizer circuit reduces the image signals to a long-distance receiving level.

This is designed to correct the characteristics of the frequency band centered around 3 kHz and maintain a constant receiving sensitivity.

It can be set in the service mode.

Refer to **CHECK SHEET**(P.137).

#### 3. DTMF Transmission (Monitor tone)

The DTMF signal generated in the ASIC (IC604) is output from pin P3, and the NCU section to the telephone line the same as facsimile transmission signals.

##### (DTMF Monitor Tone)

Refer to **CHECK SHEET**(P.137).

#### 4. Call Tone Transmission

This is the call signal which is generated the ASIC (IC604) and sent to the speaker.

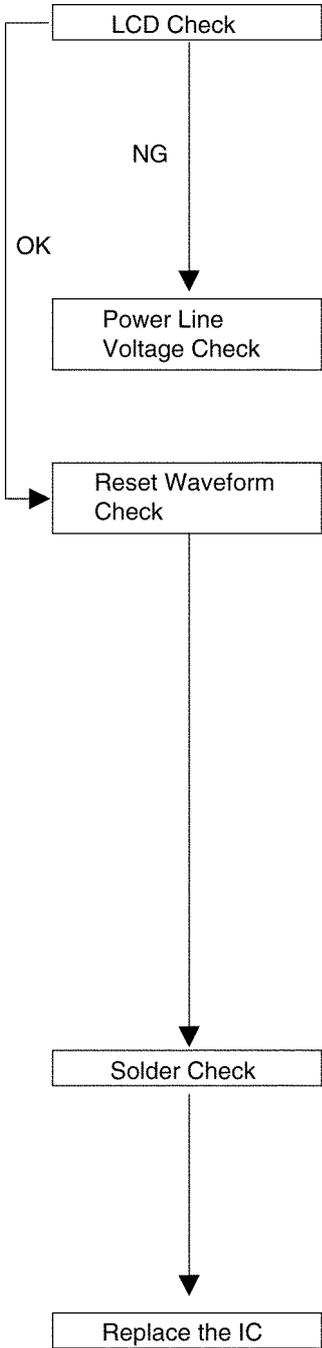
Refer to **CHECK SHEET**(P.137).

### 7.3.4. RESET

#### RESET signal

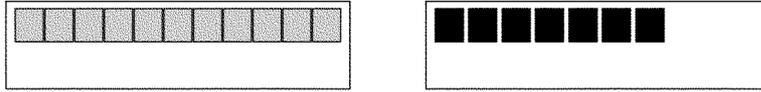
The System Reset signal (RESETn) comes from the IC 604-K18pin, 'H' level (3.3V) in normal times, while 'L' (0V) at reset. A built-in reset circuit inside IC 604 triggers a reset when the +5V power line voltage drop below 4.3V, or the 3.3V power line voltage drop below 2.9V.

#### What to do when the system does not start up after the power is turned ON.



First, carefully observe the LCD.

Confirm that the displays turn slightly dark or black squares appear after the power is turned ON.

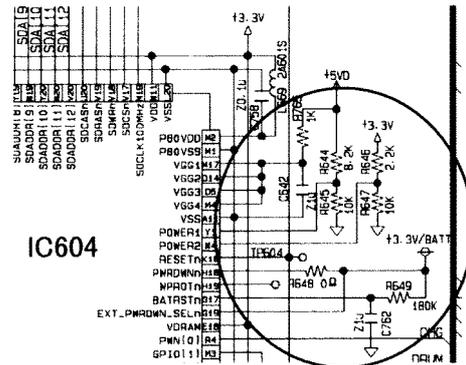


If no change is found in the LCD, there are probably problems in the power supply system. Measure the power line voltages (+5V, +3.3V) of the digital board. Check CN 615 and the power board in case of NG.

First, remove the Digital Board, and supply 5V power line voltage externally. Check the reset signal. Check the Test Land of the "RESET" on the solder side. Check that it is stable at 3.3 V.

If so, it is OK. If it is 0, check the items below.

1. Is the + 3.3V/BATT voltage about 2.7 to 3V when the power is OFF?
2. Are any failures of solders found on the periphery of the circuit shown on the right?



When the Reset signal indicates 'H', check the items below.

1. Perform a visual check of the soldering of IC 606, IC 608, and IC 610 in order.
2. Check that no short, open, or other failures are found in the System Data Bus (D[15:0]), Address Bus (A[21:0]), XRD, ROMCS, and the others. (Check also the resistance on their ways and the resistance array condenser.) It is recommended to monitor the waveform to see that it does not show intermediate electric potential (1.5 to 2V).

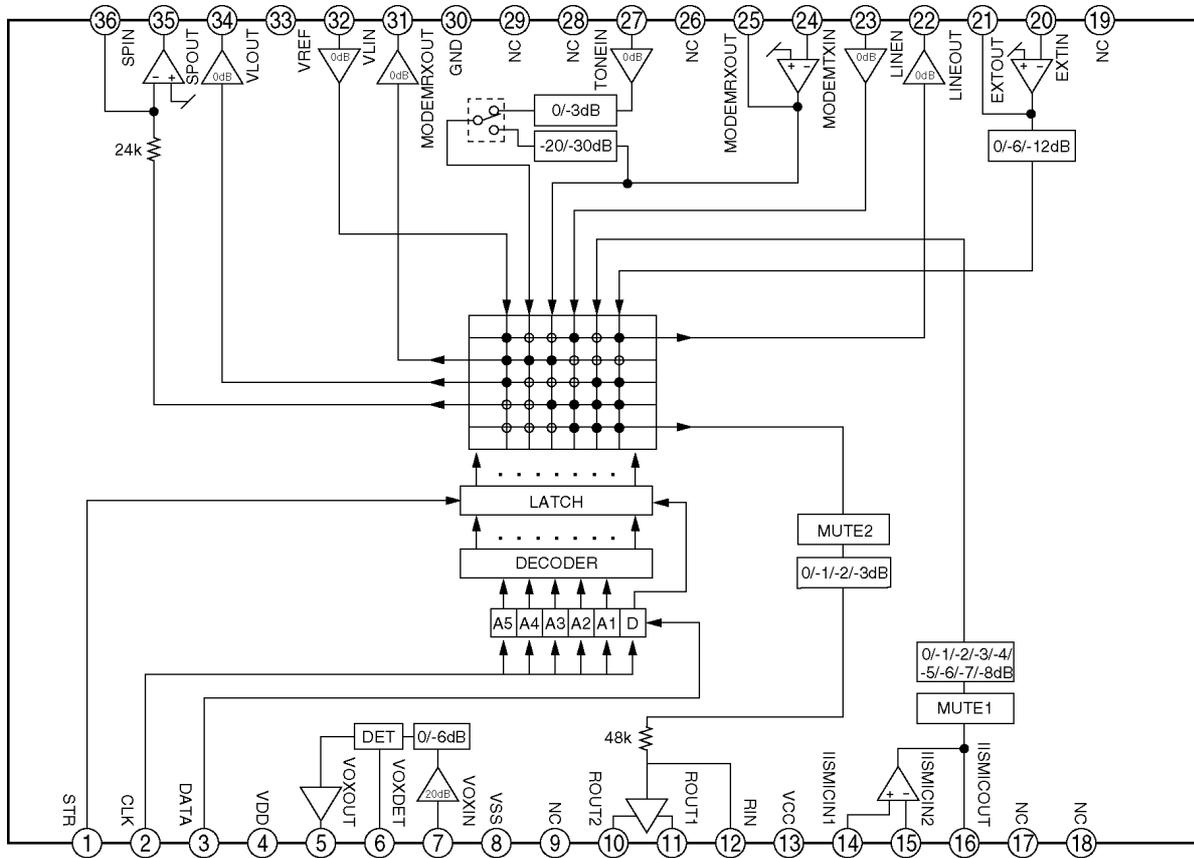
When no failures are found in the soldering, replace the ICs in order below.

1. IC606 (FLASH memory)
2. IC608 (SDRAM)
3. IC610 (G./A)
4. IC604 (ASIC)

### 7.3.5. ANALOG SECTION

#### 7.3.5.1. ANALOG GATE ARRAY (IC201 on the Digital Board))

This IC can perform signal route switching and level adjustments for various types of analog signals.  
 This IC incorporates a cross-point switch (CPS), an electronic volume.  
 The CPS of this IC is controlled by sending data from digital ASIC.



Explanation of ANALOG GATE ARRAY (IC201 on the DIGITAL Board)

No.	Name	Function	No.	Name	Function
1	STR	Strobe input	19	NC	Not used
2	CLOCK	Clock input	20	EXTIN	Ext amp output
3	DATA	Data input	21	EXTOUT	Ext amp input
4	VDD	Logic power supply	22	LINEOUT	Line amp output
5	VOXOUT	VOX output	23	LINEIN	Line amp input
6	VOXDET	VOX detection adjustment	24	MODEMTXIN	MODEM TX amp input
7	VOXIN	VOX input	25	MODEMTXOUT	MODEM TX amp output
8	VSS	Logic ground	26	NC	Not used
9	NC	Not used	27	TONEIN	Tone amp input
10	ROUT2	HS receiver amp output 2	28	NC	Not used
11	ROUT1	HS receiver amp output 1	29	NC	Not used
12	RIN	HS receiver amp input	30	GND	Analog ground
13	VCC	Analog ground	31	MODEMRXOUT	MODEM RX amp output
14	HSMICIN1	HS mic amp input 1	32	VLIN	Volume amp input
15	HSMICIN2	HS mic amp input 2	33	VREF	Reference voltage output
16	HSMICOUT	HS mic amp output	34	VLOUT	Volume amp output
17	NC	Not used	35	SPOUT	Speaker amp output
18	NC	Not used	36	SPIN	Speaker amp input

## 7.3.5.2. DESCRIPTION OF BLOCK DIAGRAM IN ANALOG SECTION

### 1. Function

The analog section works as an interface between the telephone line.

The analog ASIC (IC201) on the digital board exchanges FAX TX and RX signals between the CODEC (IC609) and the analog section.

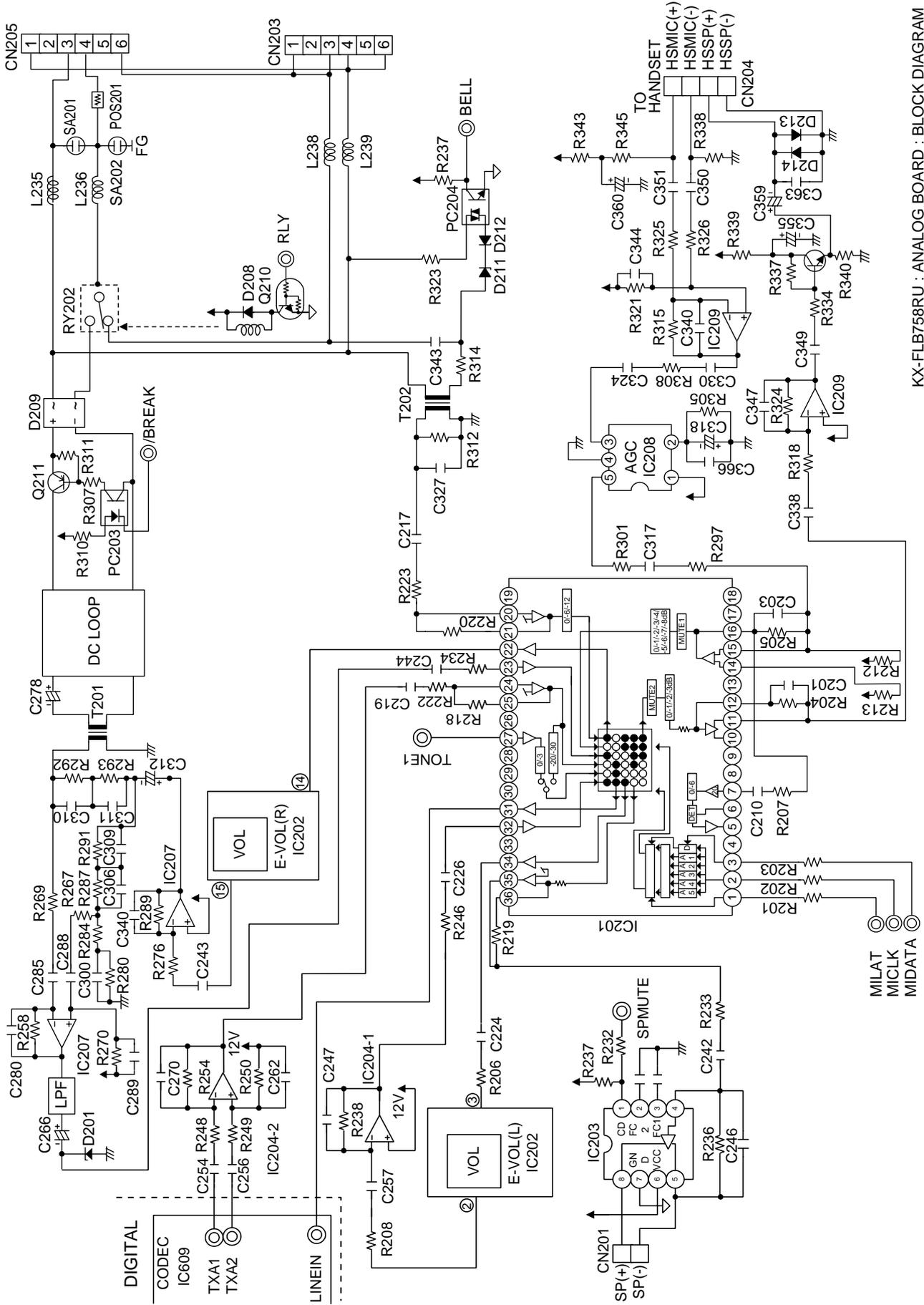
The control signals transmitted to the analog section are output mainly from G/A IC610, and the analog status is stored as data in G/A IC610.

### 2. Circuit Operation

[NCU]: Network Control Unit the NCU comprises of the following; DC loop forming circuit to connect with the telephone line; Switching circuit for other interconnected telephones; Bell detection circuit; Side tone circuit; Remote fax activation circuit.

Refer to **NCU SECTION** (P.227) for the details.

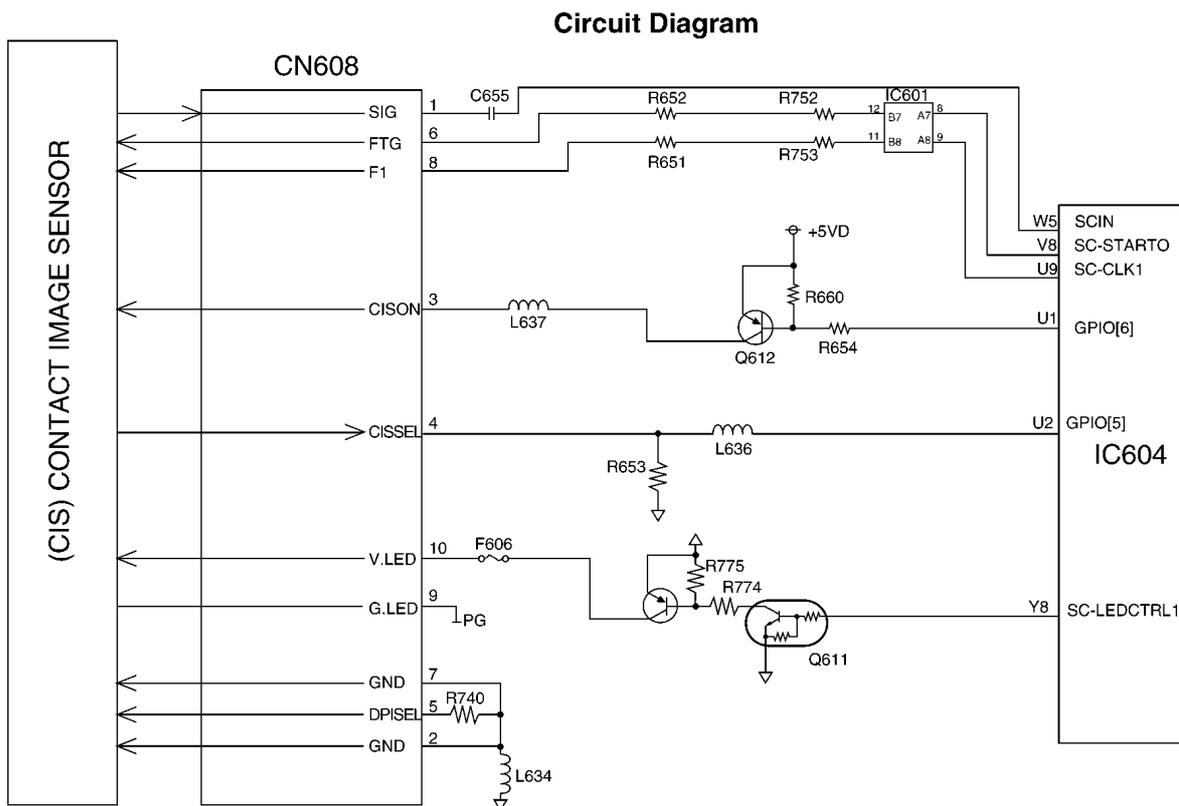
### 7.3.5.3. BLOCK DIAGRAM



KX-FLB758RU : ANALOG BOARD : BLOCK DIAGRAM

## 7.4. CIS CONTROL SECTION

The scanning block of this device consists of a control circuit and a contact image sensor made up of a celfoc lens array, an LED array, and photoelectric conversion elements.



When an original document is inserted and the start button pressed, pin Y8 of IC604 goes to a high level and the transistor Q611 turns on. This applies voltage to the LED array to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC604, and the original image illuminated by the LED array undergoes photoelectric conversion to output an analog image signal (SIG). The analog image signal is input to the system ASIC on SCIN (pin w5 of IC604) and converted into 8-bit data by the A/D converter inside IC604. Then this signal undergoes digital processing in order to obtain a high-quality image.

## 7.5. STEPPING MOTOR DRIVE SECTION

### 7.5.1. ENGINE MOTOR DRIVE CIRCUIT

#### 1. Functions

This motor functions for main operations FAX reception and copy printing.

This feed recording paper synchronized for printing.

#### 2. Motor operation

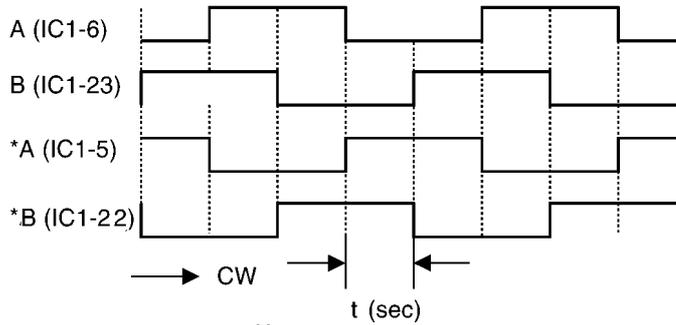
Excitation pulses is output from ASIC (IC604) pins U8, W9 Y9 and Y12. Then stepping pulses are output from driver IC (IC1) pin No 9, 11, 15 and 19, and drives the motor coil.

During motor driving, pin N1 and pin R2 of ASIC IC604 becomes a low level.

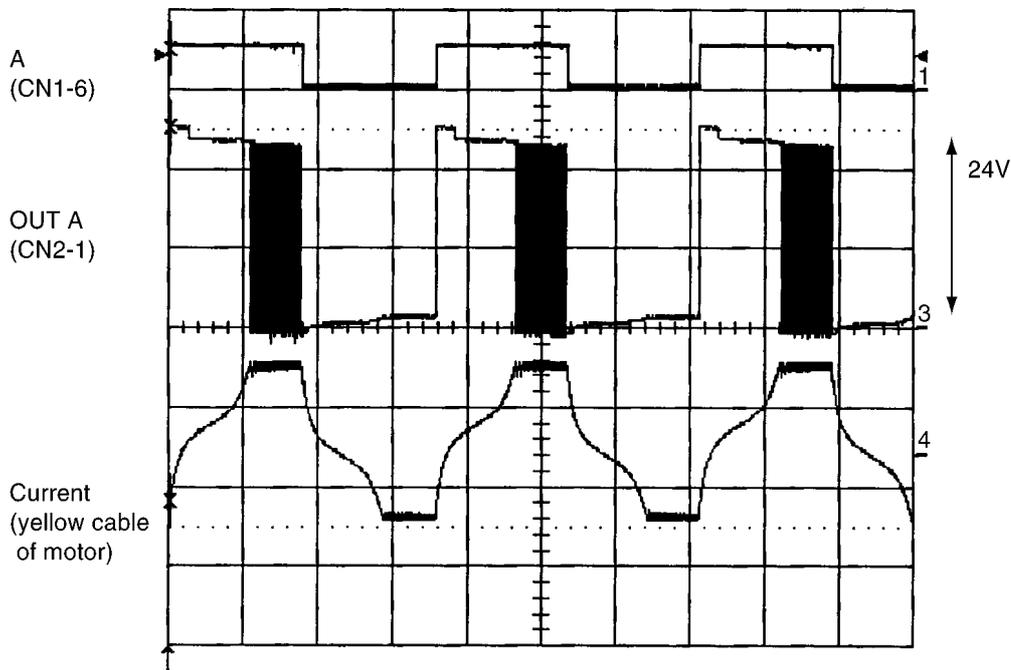
As a result, a current of about 1A are supplied to the motor coil.

#### 7.5.1.1. TIMING CHART

##### ① 2 phase excitation



##### ② 2 phase excitation output waveform (example "A Phase")



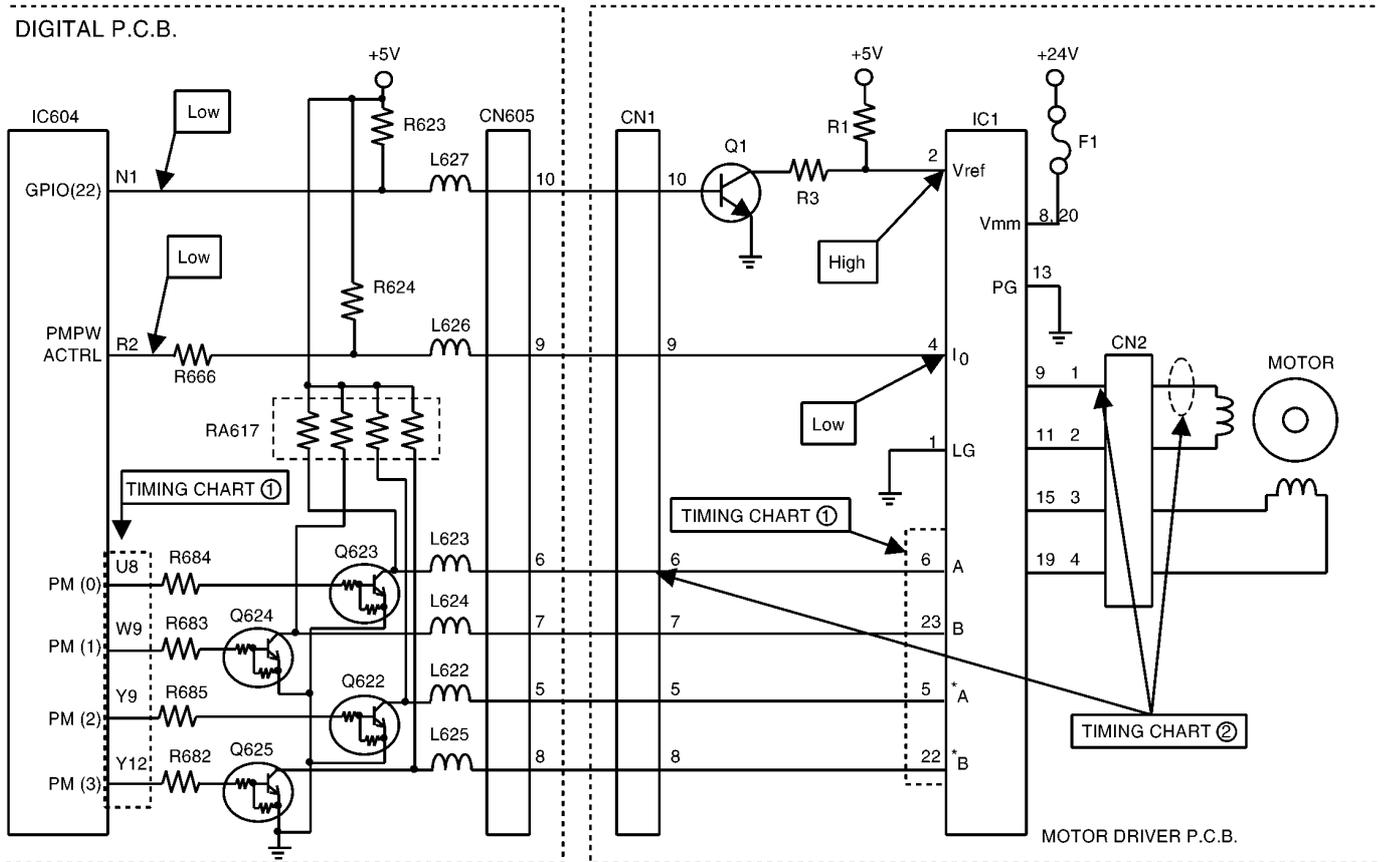
Other phase (B, \*A, \*B) operates as A phase does.

#### DRIVE MODE

FUNCTION	MODE	PHASE PATTERN	SPEED	CURERENT
PRINT	-	2 phase	743pps (t=1/743)	1A

### 7.5.1.2. ENGINE MOTOR DRIVE CIRCUIT

#### (1) Circuit Diagram



## 7.5.2. ADF (Auto Document Feed) MOTOR DRIVE CIRCUIT

### 1. Functions

This motor functions for main operations including FAX transmission, ADF copy and PC scan.

This feed document paper synchronized for reading.

### 2. Motor operation

During motor driving, pin R3 of ASIC IC604 becomes a high level, and Q606, Q602 turns ON.

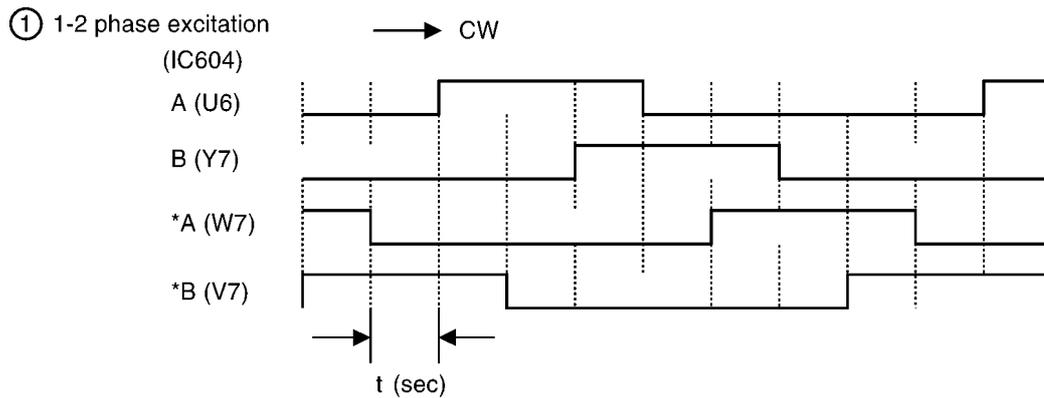
As a result, +24V is supplied to the motor coil.

Stepping pulses are output from ASIC IC604 pins, U6, Y7, W7, V7, causing driver IC600 pins, 16 ~ 13 to drive the motor coil.

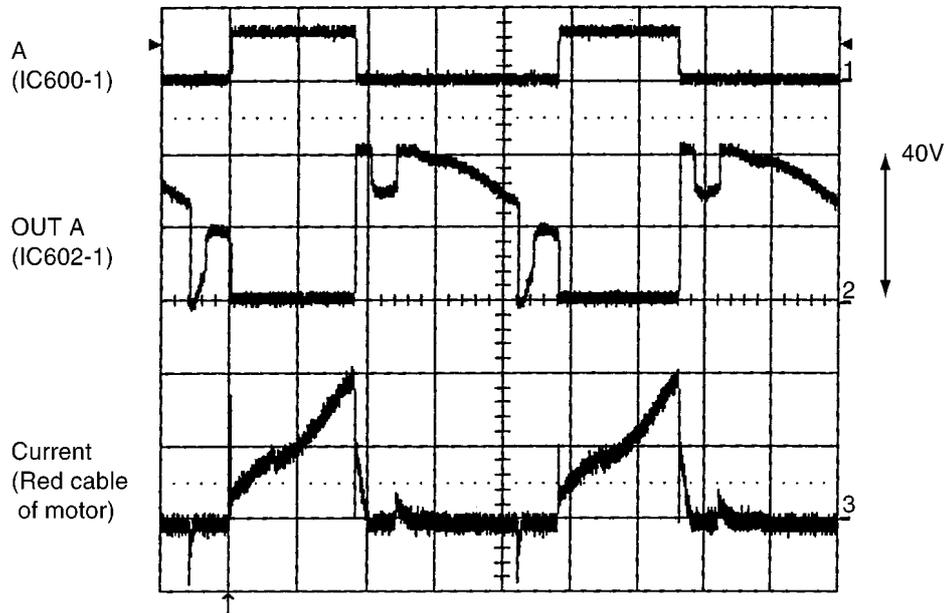
The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation.

A 1-step rotation feeds 0.042mm of document paper.

### 7.5.2.1. TIMING CHART



② 1-2 phase excitation output wave form (example "A Phase")



Other phase (B, \*A, \*B) operates as A phase does.



### 7.5.3. CR (Carriage) MOTOR DRIVE CIRCUIT

#### 1. Functions

This motor functions for main operations including FAX transmission, FB copy and PC scan.

This feed document paper synchronized for reading.

#### 2. Motor operation

During motor driving, pin P4 of ASIC IC604 becomes a high level, and Q605, Q600 turns ON.

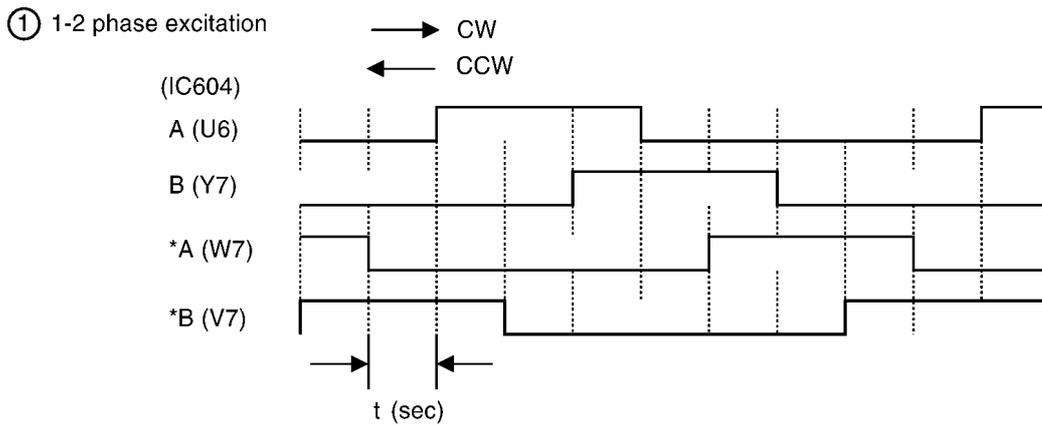
As a result, +24V is supplied to the motor coil.

Stepping pulses are output from ASIC IC604 pins, U6, Y7, W7, V7, causing driver IC500 pins, 16 ~ 13 to drive the motor coil.

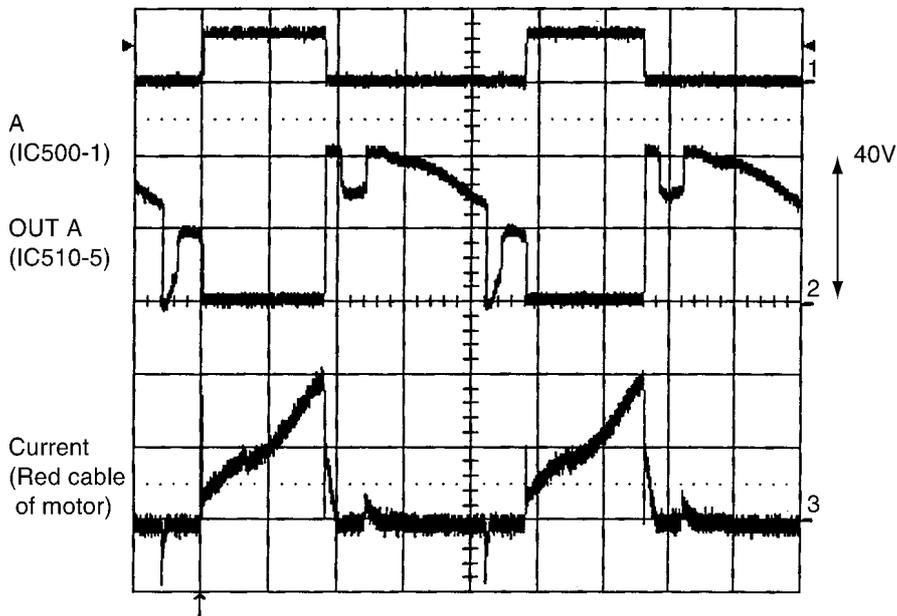
The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation.

A 1-step rotation feeds 0.042mm of document paper.

#### 7.5.3.1. TIMING CHART



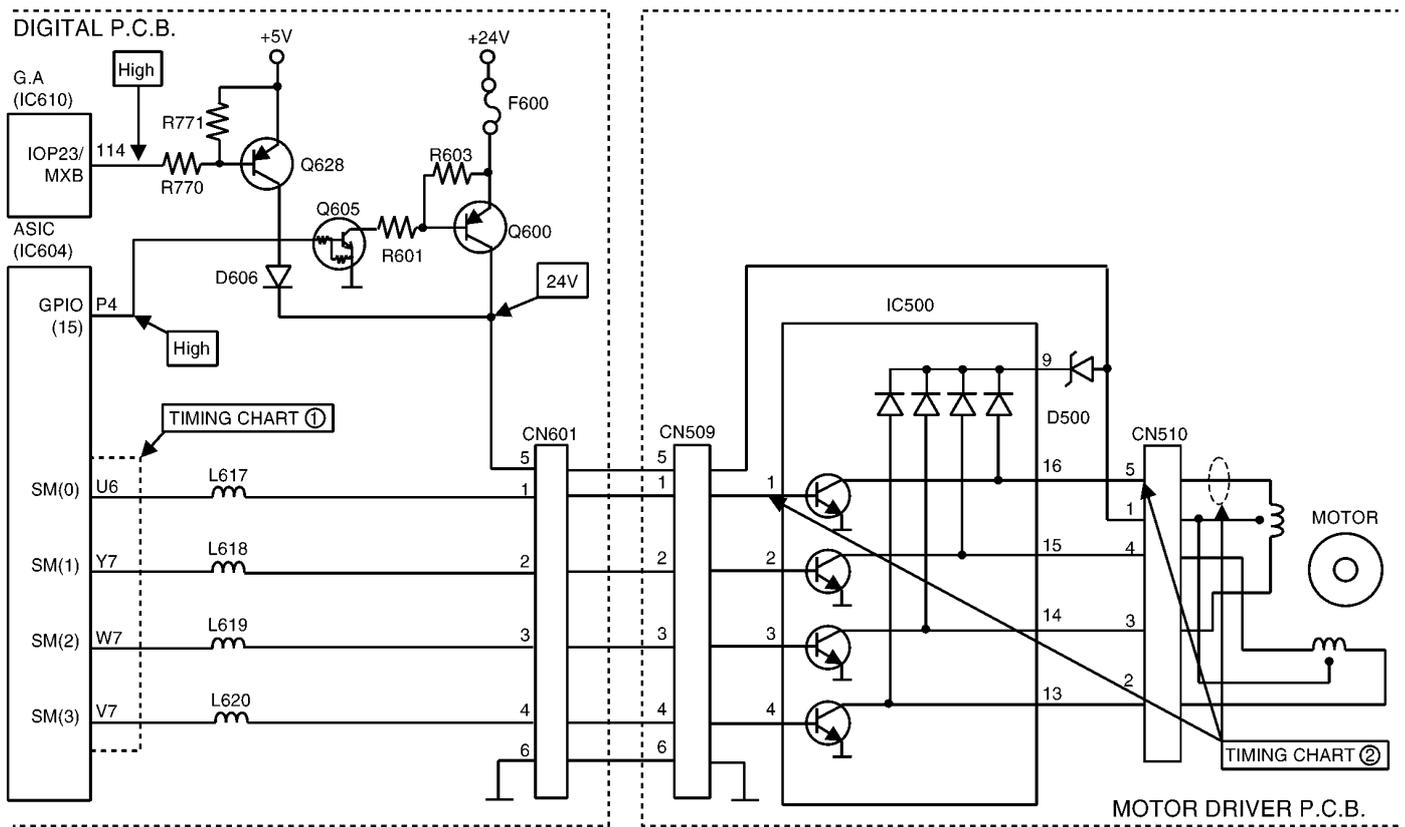
② 1-2 phase excitation output wave form (example "A Phase")



Other phase (B, \*A, \*B) operates as A phase does.

### 7.5.3.2. CR (Carriage) MOTOR DRIVE CIRCUIT

(1) Circuit Diagram



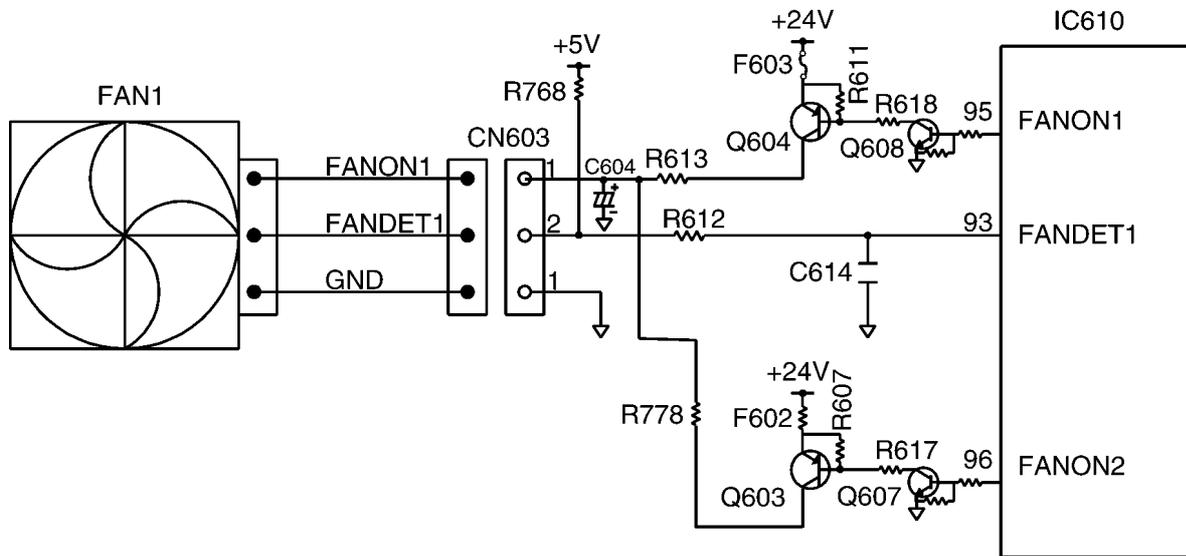
#### DRIVE MODE

FUNCTION		MODE	PHASE PATTERN	SPEED
SCAN	FAX	STANDARD	1 - 2 phase	833pps (t= 1/833)
SCAN	FAX/COPY	FINE/HALF TONE	1 - 2 phase	833pps (t= 1/833)
SCAN	FAX/COPY	SUPER FINE	1 - 2 phase	833pps (t= 1/833)
SCAN	NO SCANNING	-	1 - 2 phase	1250pps (t= 1/1250)
STAND-BY		-	ALL PHASE OFF	-

## 7.6. FAN MOTOR SECTION

This FAN is used to radiate heat in the unit.

The signal level at pin 95/96 of IC610 becomes high, the FAN is activated. In this case, the pulse signal as shown below input to pin 93 of IC610 and the rotation of the FAN is detected.



### 7.6.1. FAN CONTROL

This unit is equipped with fan to prevent the developing device from rising in temperature while printing.

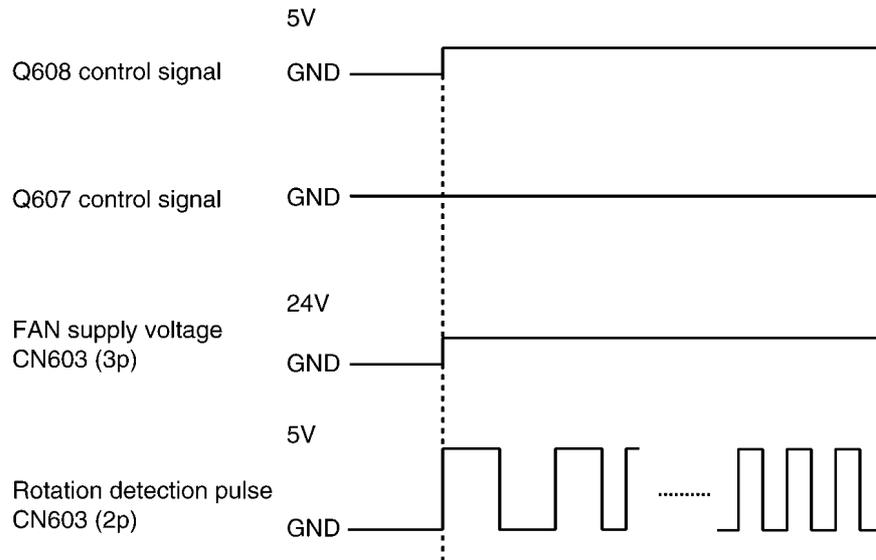
The air is inhaled from the left side of the unit.

The fan rotates at high speed (typ. 4800 rpm) while printing (controlling the developing device). After printing is finished, it rotates at low speed (typ. 2400) rpm when the temperature of the unit goes up over a fixed one or depending on the number of printed papers (frequency).

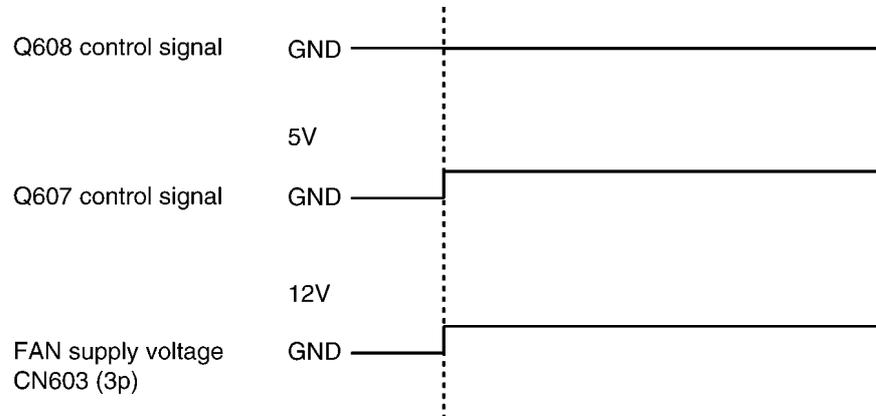
While the fan is rotating at high speed, the voltage of 24 V is supplied to the fan, however, while rotating at low speed, the supply voltage is decreased to 12V.

Each signal wave is as follows:

1. High-speed rotation (typ. 4800 rpm)



2. Low-speed rotation (typ. 2400 rpm)



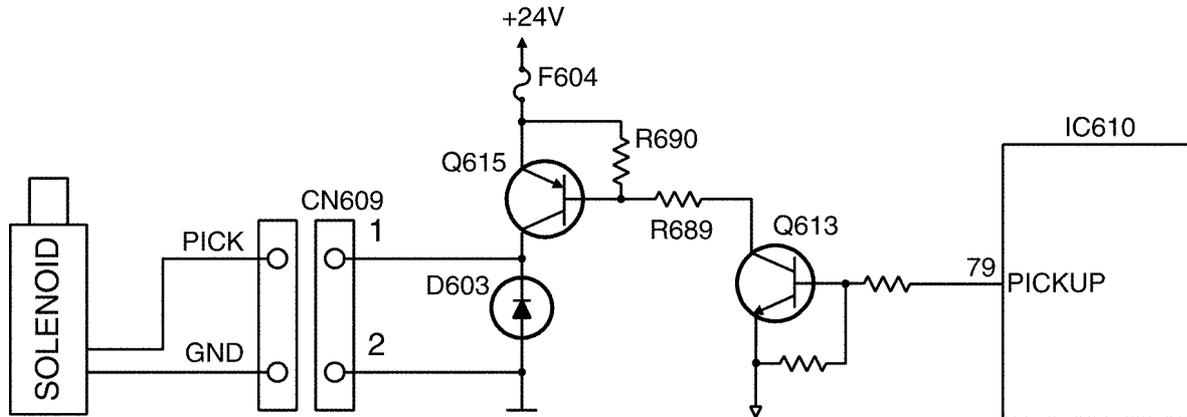
During low-speed rotation, the rotation detection does not function.

## 7.7. SOLENOID DRIVE SECTION

The solenoid drive circuit controls the pick-up clutch.

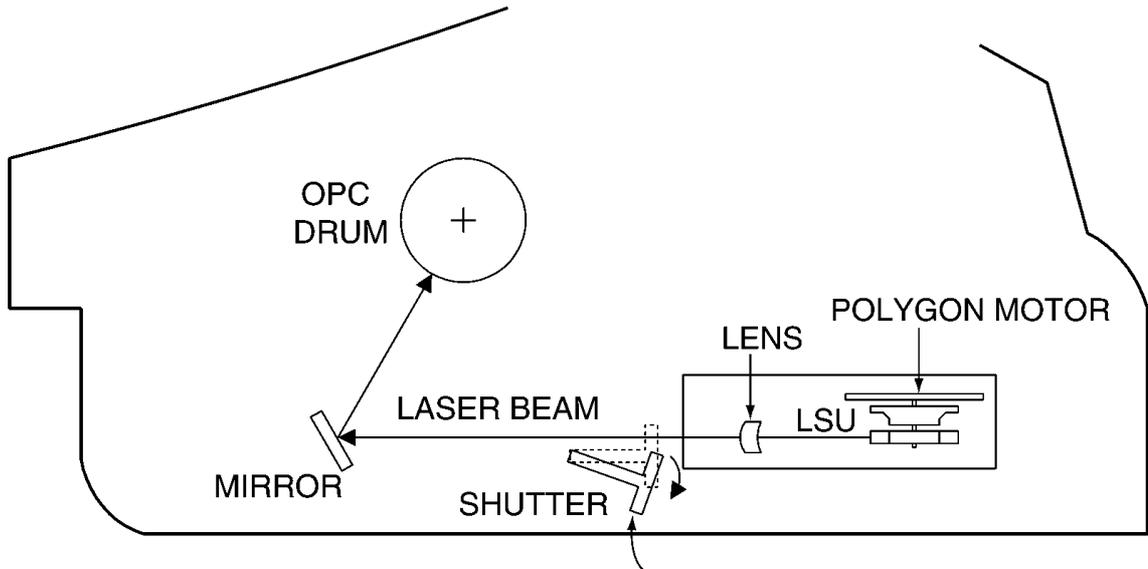
The solenoid is designed to be driven by +24V, driven by IC610-79 pin.

Diode D603 protects Q615 from backward voltage when the solenoid is driven.

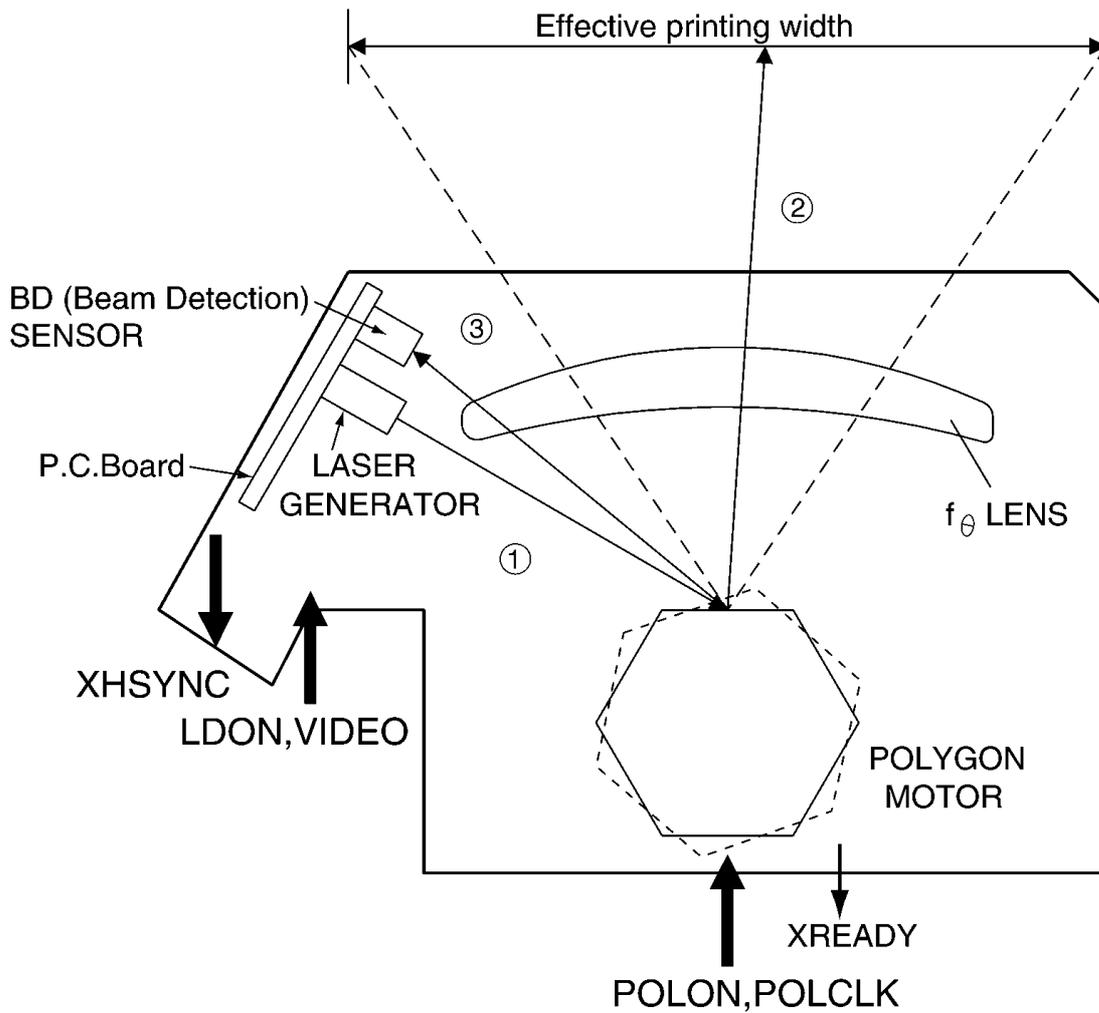


Mode	IC606-149 pin
SOLENOID ON	high level
SOLENOID OFF	low level

### 7.8. LSU (Laser Scanning Unit) SECTION

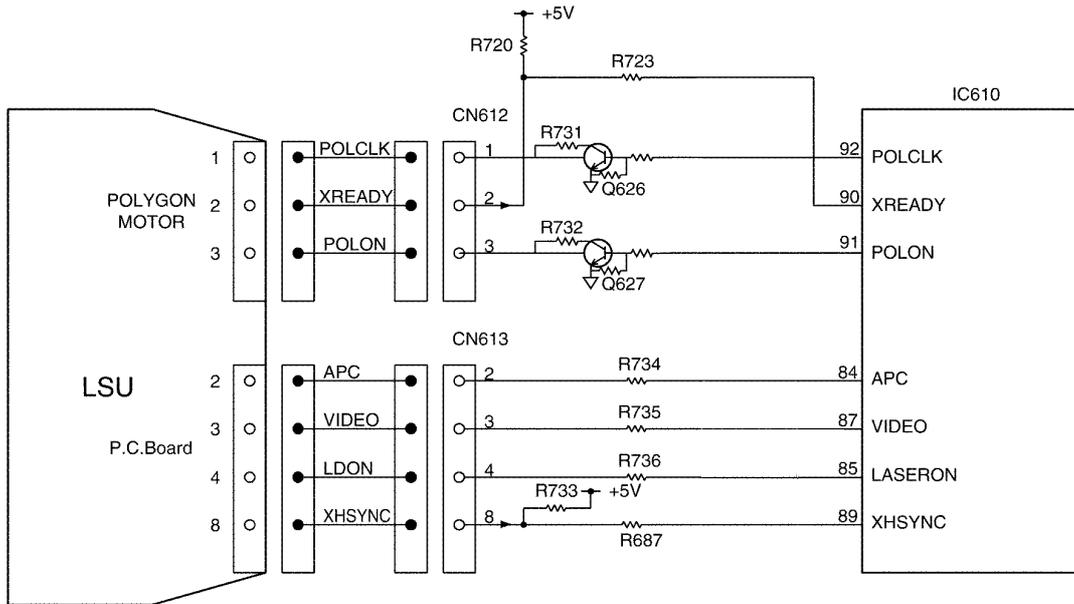


The mechanical shutter will be opened by setting DRUM UNIT properly.

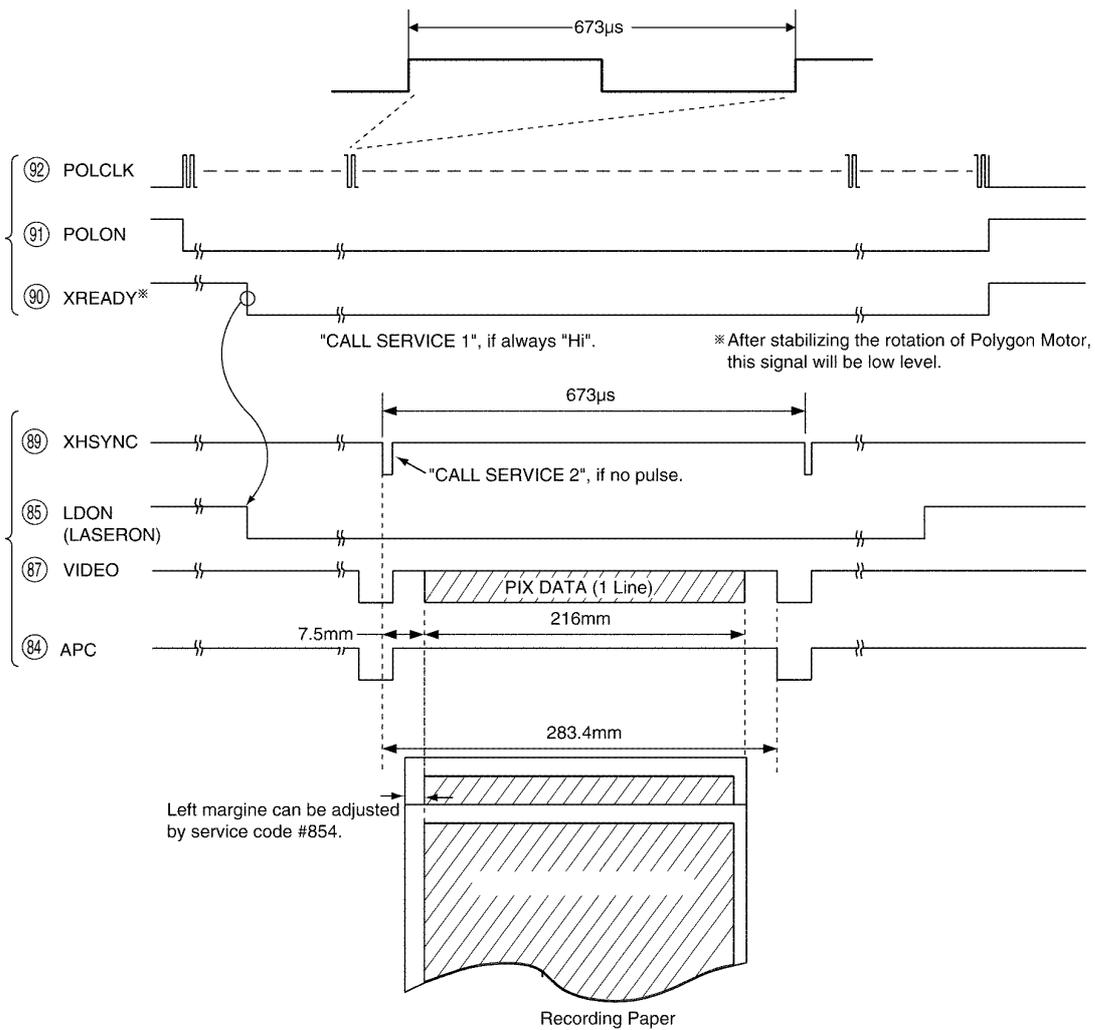


- ① Laser output
- ② Laser reflecting on the drum
- ③ Laser towards the effective printing outside range onto the sensor

### Circuit Diagram



### Timing Chart



## 7.9. SENSORS AND SWITCHES SECTION

All of the sensor and switches are shown below.

Sensor Circuit Location	Sensor	Sensor or Switch Name	Message Error
ADF Relay Board	PS500	Document	[CHECK DOCUMENT]
RF Sensor Board	PS501	Paper Feed	[REMOVE DOCUMENT]
High Voltage Board	SW101	Printer Open	[COVER OPEN]
ADF Relay Board	SW501	ADF Cover Open	————
ADF Relay Board	SW500	FB Cover Open	————
ADF Relay Board	PS502	CIS Position (ADF Home)	————
CIS Sensor Board	PS503	CIS Position (FB Home)	————
High Voltage Board	—	OPC Set	[CHECK DRUM]
High Voltage Board	PC201	Register	[FAILED PICK UP]
Motor Driver Board	PS1	Paper	[OUT OF PAPER]
Exit Sensor Board	PS50	Exit	[PAPER JAMMED]
Analog Board	PS201	Toner	[TONER EMPTY] [TONER LOW] [CHANGE DRUM]
Analog Board	SW200	Hook	————

### Note:

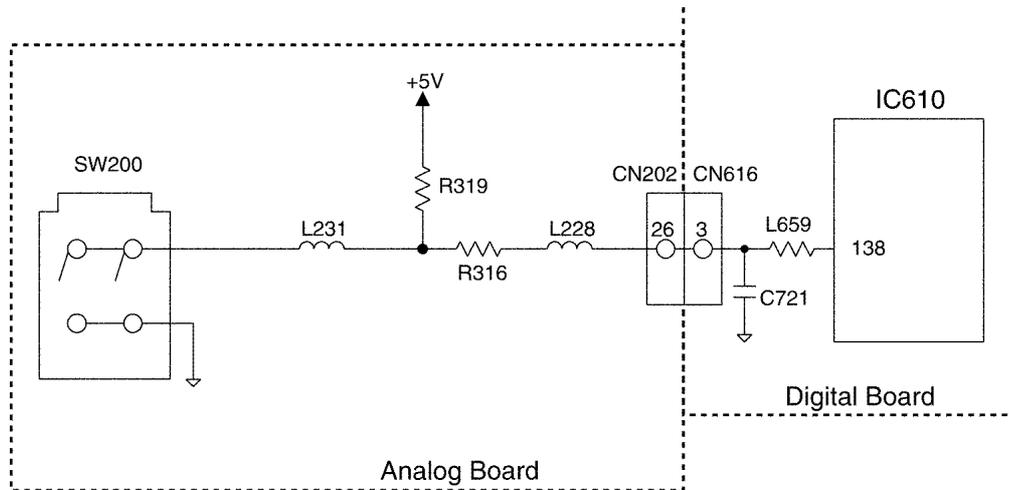
See TEST FUNCTIONS - SENSOR CHECK SECTION for the sensor test.

(#815 of Service Mode test. Refer to **TEST FUNCTIONS** (P.74).)

### 7.9.1. HOOK SWITCH

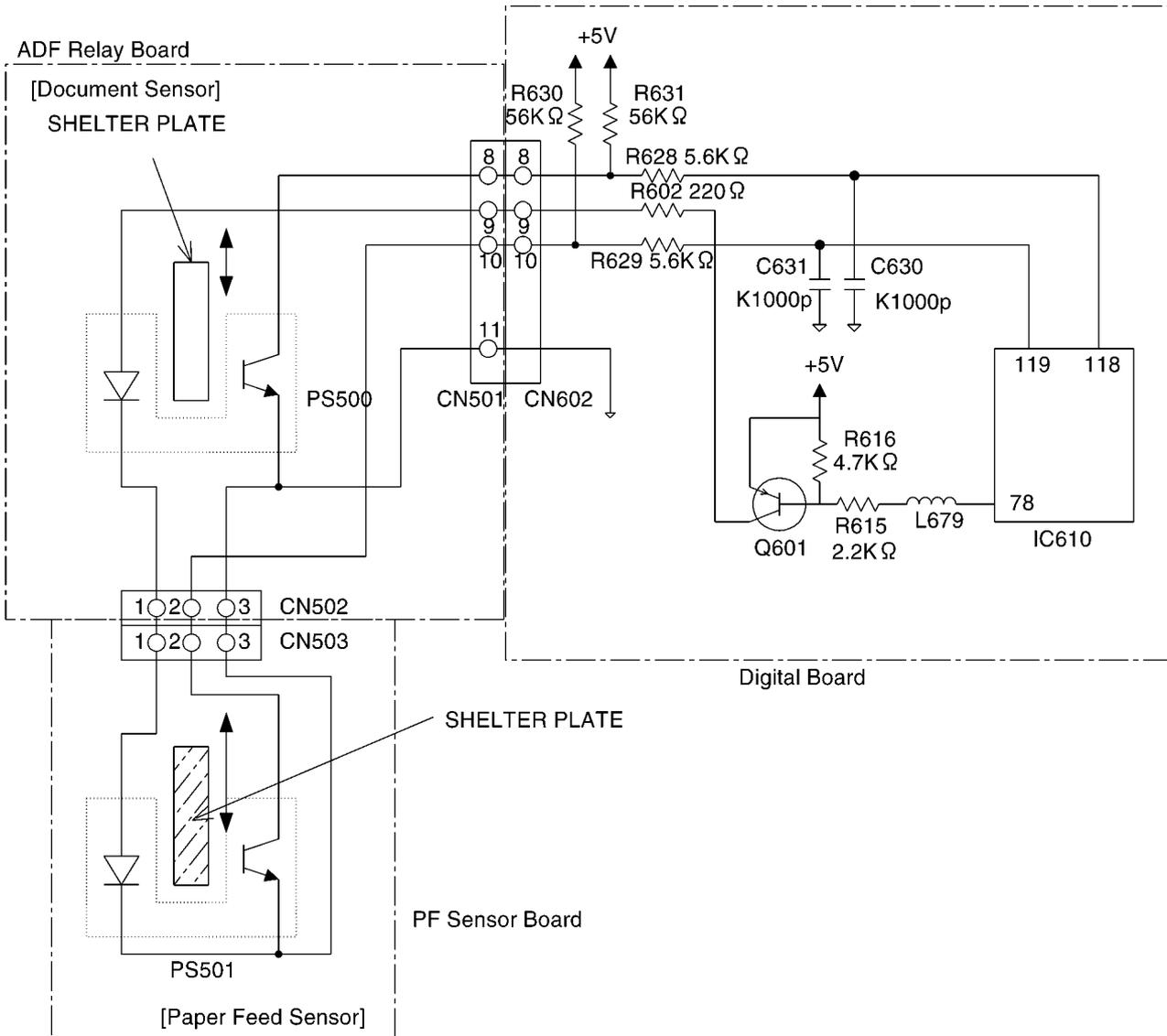
When the handset is raised, the switch is turned ON, and the signal at pin 57 of IC606 is low.

When the handset is returned, the switch is turned OFF, and the signal at pin 57 of IC606 is high.



### 7.9.2. DOCUMENT SENSOR....”CHECK DOCUMENT” AND PAPER FEED SENSOR....”REMOVE DOCUMENT”

These Sensors detect whether or not a document is in place. When a document is detected, the shelter plate let the sensor light pass through, the photo-transistor turns ON, and the input signal of IC610-118pin /IC610-119pin becomes a low level. When there is no document, the shelter plate shuts off the sensor light, the photo-transistor turns OFF, and the input signal of IC610-118pin /IC610-119pin becomes a high level.



**Document Sensor**

	Phototransistor	Signal(IC610 - 118pin)
No Document	OFF	High level
Document Set	ON	Low level

**Paper Feed Sensor**

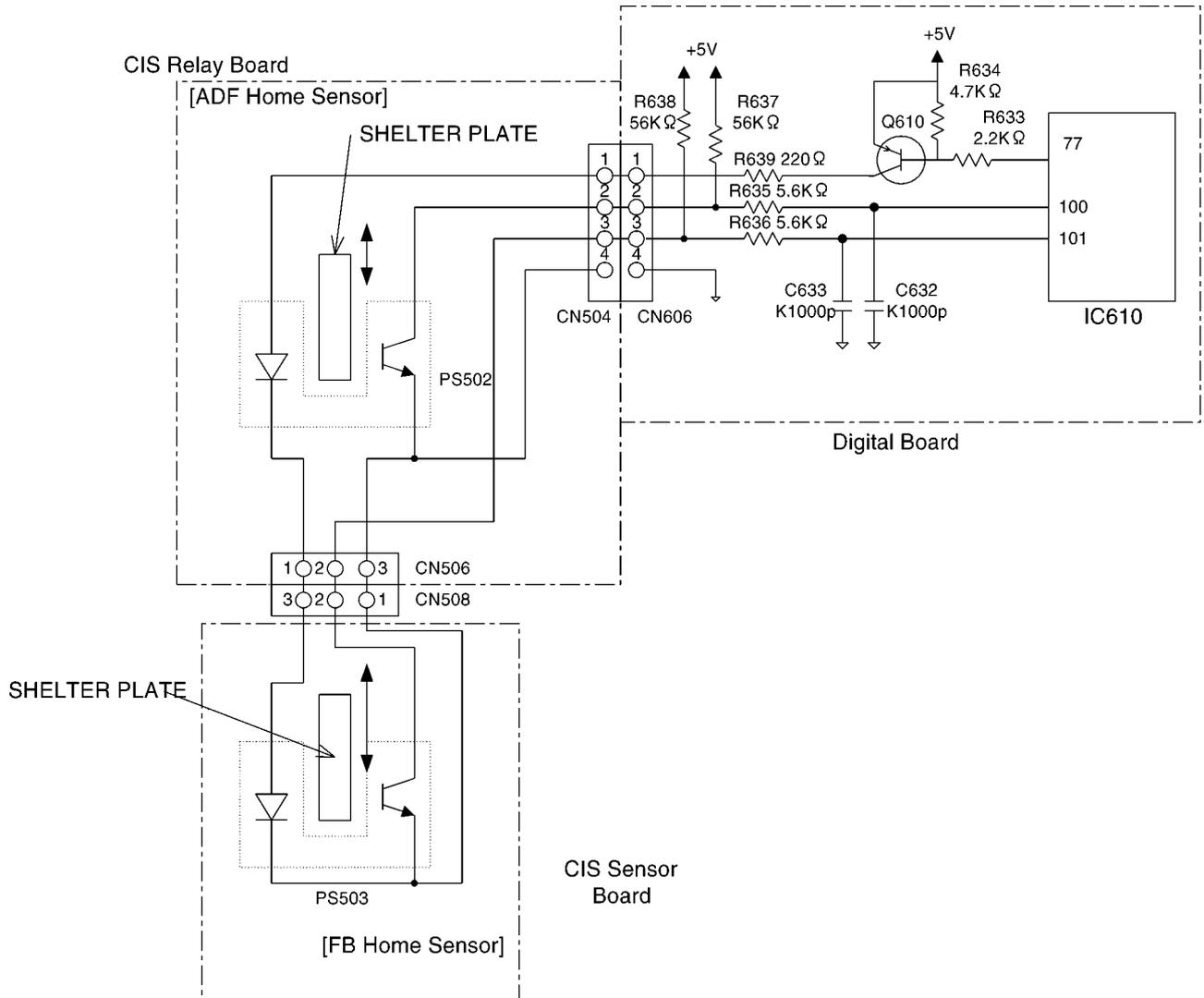
	Phototransistor	Signal(IC610 - 119pin)
No Read Position	OFF	High level
Read Position	ON	Low level

### 7.9.3. CIS POSITION SENSOR

These Sensors detect whether or not CIS is in home position.

When the CIS is detected, the shelter plate shuts off the sensor light, the photo-transistor turns OFF, and the input signal of IC610-100pin /IC610-101pin becomes a high level.

When there is no CIS, the shelter plate let the sensor light pass through, the photo-transistor turns ON, and the input signal of IC610-100pin /IC610-101pin becomes a low level.



**ADF Home Sensor**

	Phototransistor	Signal(IC610 - 100pin)
Home position	OFF	High level
Not Home position	ON	Low level

**FB Home Sensor**

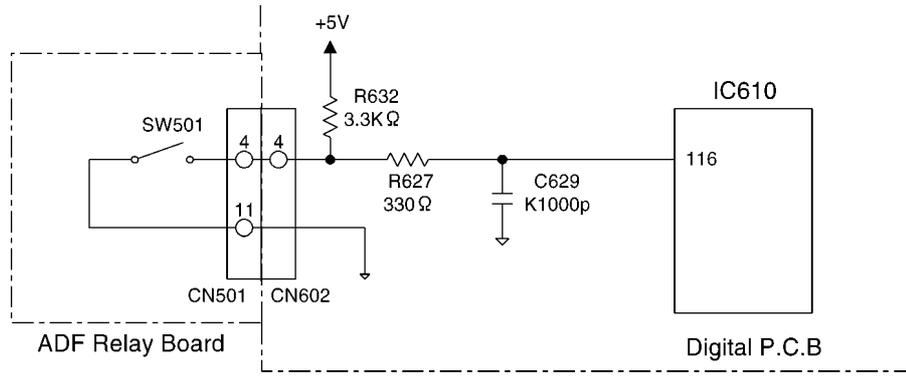
	Phototransistor	Signal(IC610 - 101pin)
Home position	OFF	High level
Not Home position	ON	Low level

### 7.9.4. ADF COVER OPEN SWITCH

The Switch detects whether the ADF cover is open or closed.

When the ADF cover is closed, the switch turns ON, and the input signal of IC610-116pin becomes a low level.

When the ADF cover is open, the switch turns OFF, and the input signal of IC610-116pin becomes a high level.



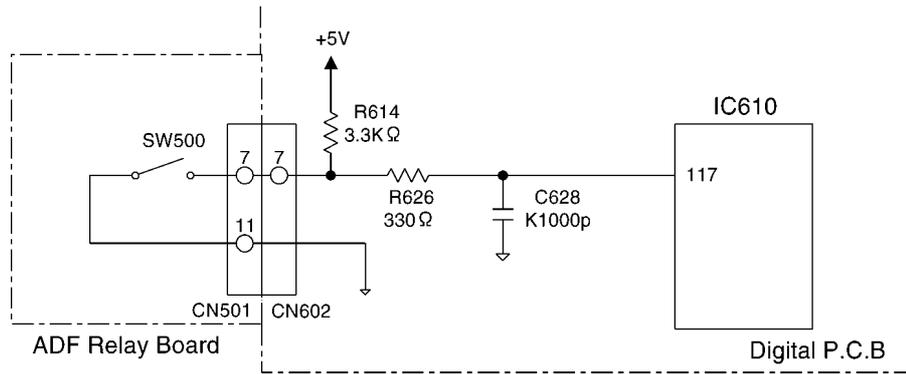
	Switch	Signal(IC610 - 116pin)
Open	OFF	High level
Close	ON	Low level

### 7.9.5. FB COVER OPEN SWITCH

The Switch detects whether the Flat Bed cover is open or closed.

When the Flat Bed cover is closed, the switch turns ON, and the input signal of IC610-117pin becomes a low level.

When the Flat Bed cover is open, the switch turns OFF, and the input signal of IC610-117pin becomes a high level.



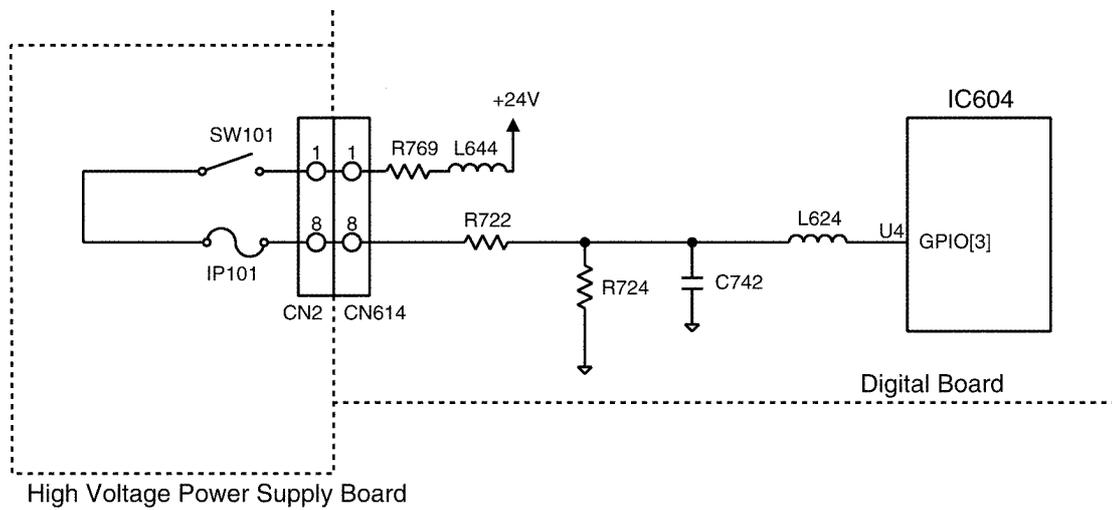
	Switch	Signal(IC610 - 117pin)
Open	OFF	High level
Close	ON	Low level

### 7.9.6. TOP COVER OPEN SWITCH....”COVER OPEN”

The Switches detect whether the printer cover is open or closed.

When the printer cover is closed, the switches turn ON, and the input signal of IC604-U4 pin becomes a high level.

When the printer cover is open, the switches turns OFF, and the input signal of IC604-U4 pin becomes a low level.



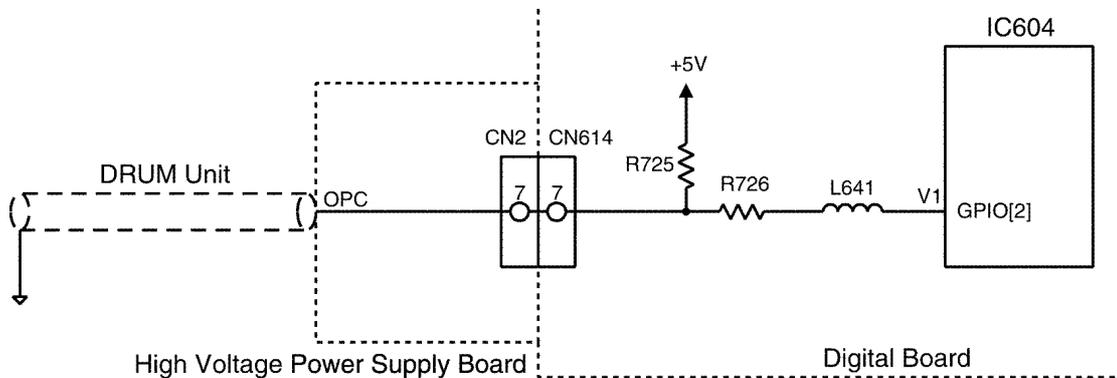
	Switch	Signal (IC604-U4 pin)
Open	OFF	Low level
Close	ON	High level

### 7.9.7. DRUM SENSOR....”CHECK DRUM”

The Switch detects whether the DRUM unit is set or not.

When there is the DRUM unit, the input signal of IC604-V1 pin becomes a low level.

When there is no DRUM unit, the input signal of IC604-V1 pin becomes a high level.



	Signal (IC604-V1 pin)
DRUM Set	Low level
No DRUM	High level

### 7.9.8. REGIST SENSOR....."FAILED PICK UP"

The Sensor detects whether or not the recording paper is present so that printing can start.

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC610-154 pin becomes a low level.

When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC610-154 pin becomes a high level.

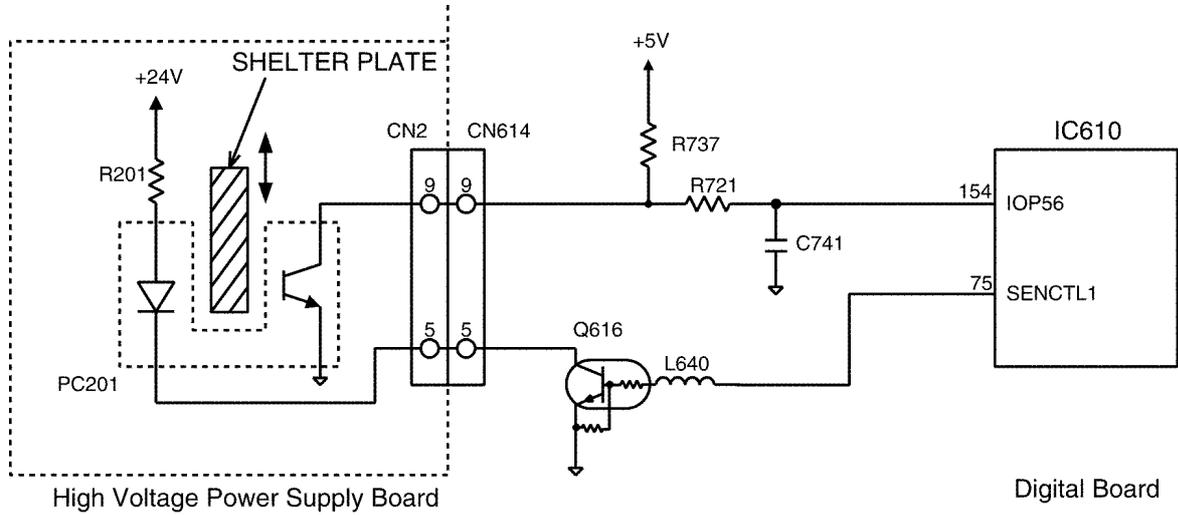


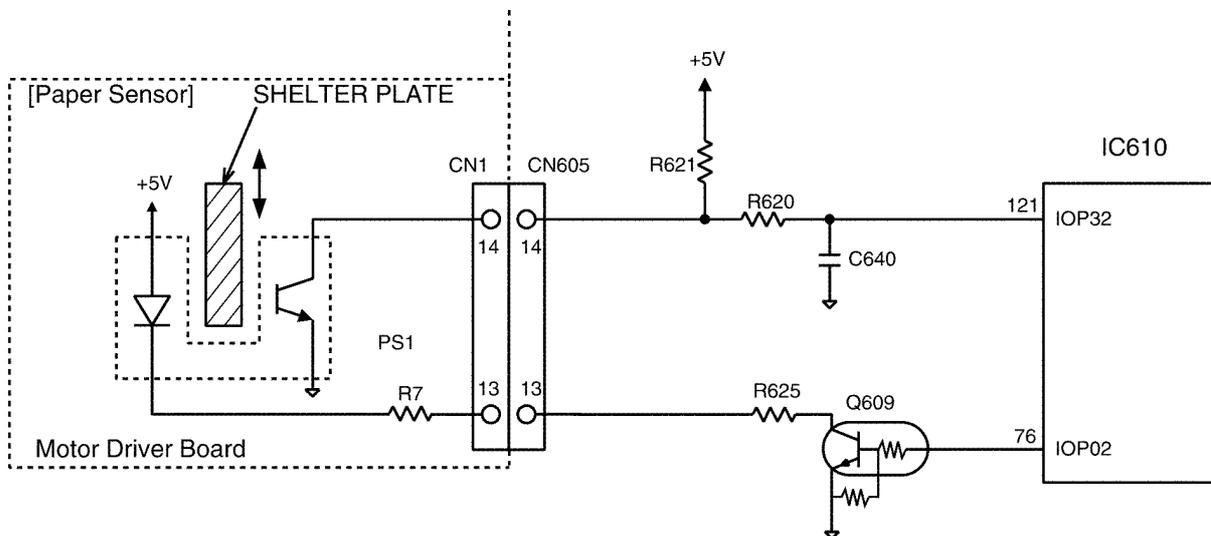
	Photo-transistor	Signal (IC610-154 pin)
No Recording Paper	OFF	High level
Recording Paper Regist	ON	Low level

### 7.9.9. PAPER SENSOR..... “OUT OF PAPER”

The Sensor detects the recording paper are in place.

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC610-121 pin becomes a low level.

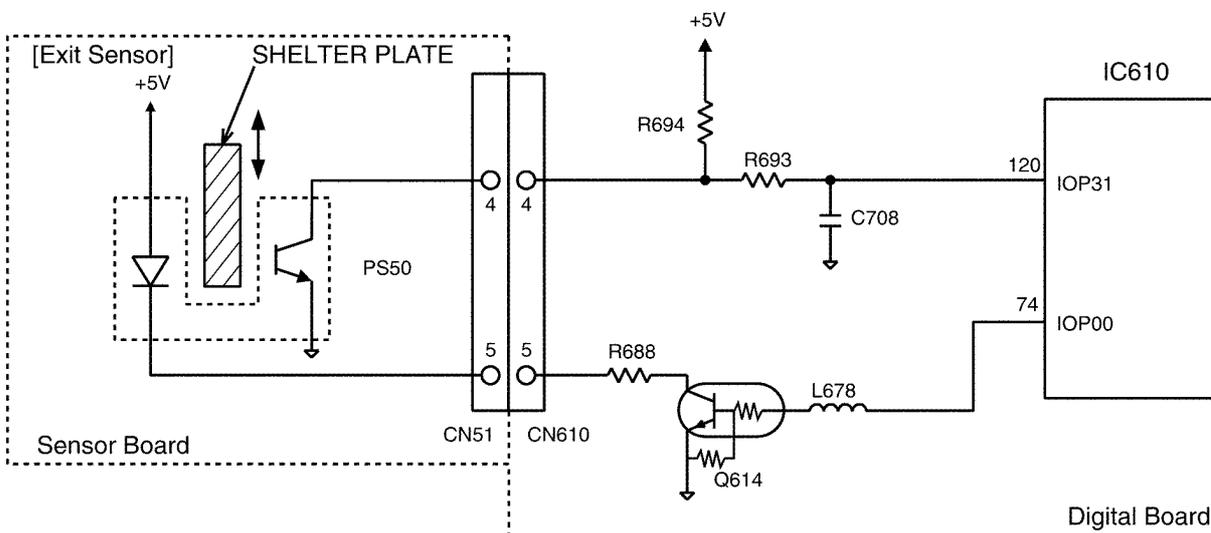
When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC610-121 pin becomes a high level.



[Paper Sensor]

	Photo-transistor	Signal (IC606-178 pin)
Recording Paper Set	OFF	High level
No Recording Paper	ON	Low level

### 7.9.10. PAPER EXIT SENSOR..... “PAPER JAMMED”



The sensor detects whether the recording paper exit out or noy.

When there is no recording paper at the position of the sensor, the shelter plate closes the sensor light, the photo-transistor fot tarus OFF, and the input signal of IC610-120pin becomes high level.

When the recording paper reach the exit sensor, the shelter plate let the sensor light passing through, the photo-transistor ON, and the input signal of IC610-120pin becomes a low level.

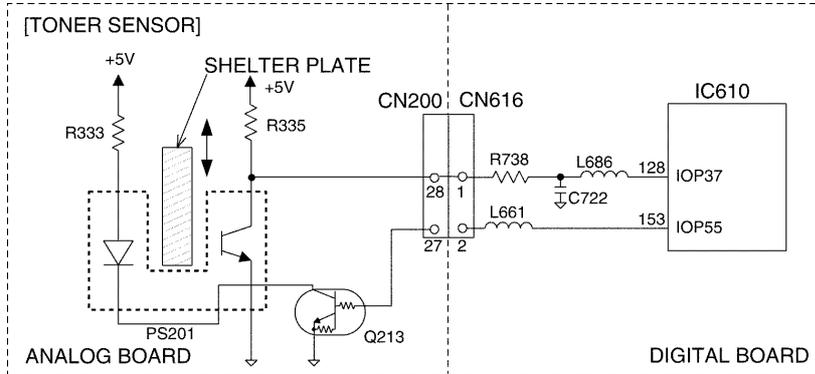
[Exit Sensor]

	Photo-transistor	Signal (IC606-179 pin)
No Paper	OFF	High level
Paper Exist	ON	Low level

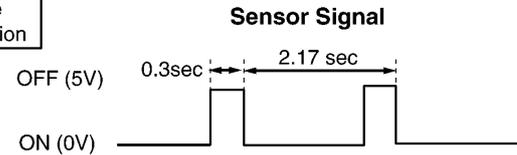
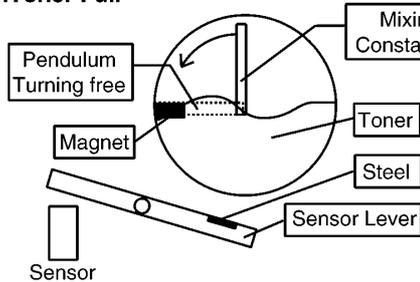
### 7.9.11. TONER SENSOR.... “TONER EMPTY”, “TONER LOW”, “CHANGE DRUM”

The Sensor detects whether or not the Developer unit and the toner are present.

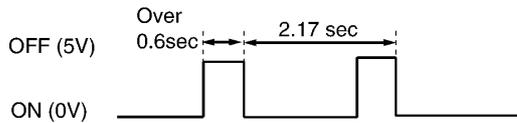
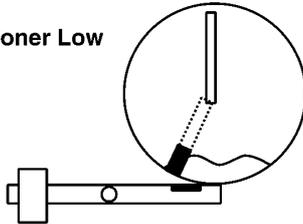
When there is not Development unit, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC610-128 pin (Digital P.C.B) becomes a low level over 9s. When the Developer unit is set, the shelter plate move with rotation of development roller, so the photo-transistor turns ON/OFF. If the time of IC610-128 pin’s high level is under 600ms, there is enough toner in Developer unit, if not, toner is near empty.



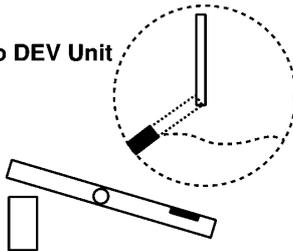
#### 1. Toner Full



#### 2. Toner Low



#### 3. No DEV Unit

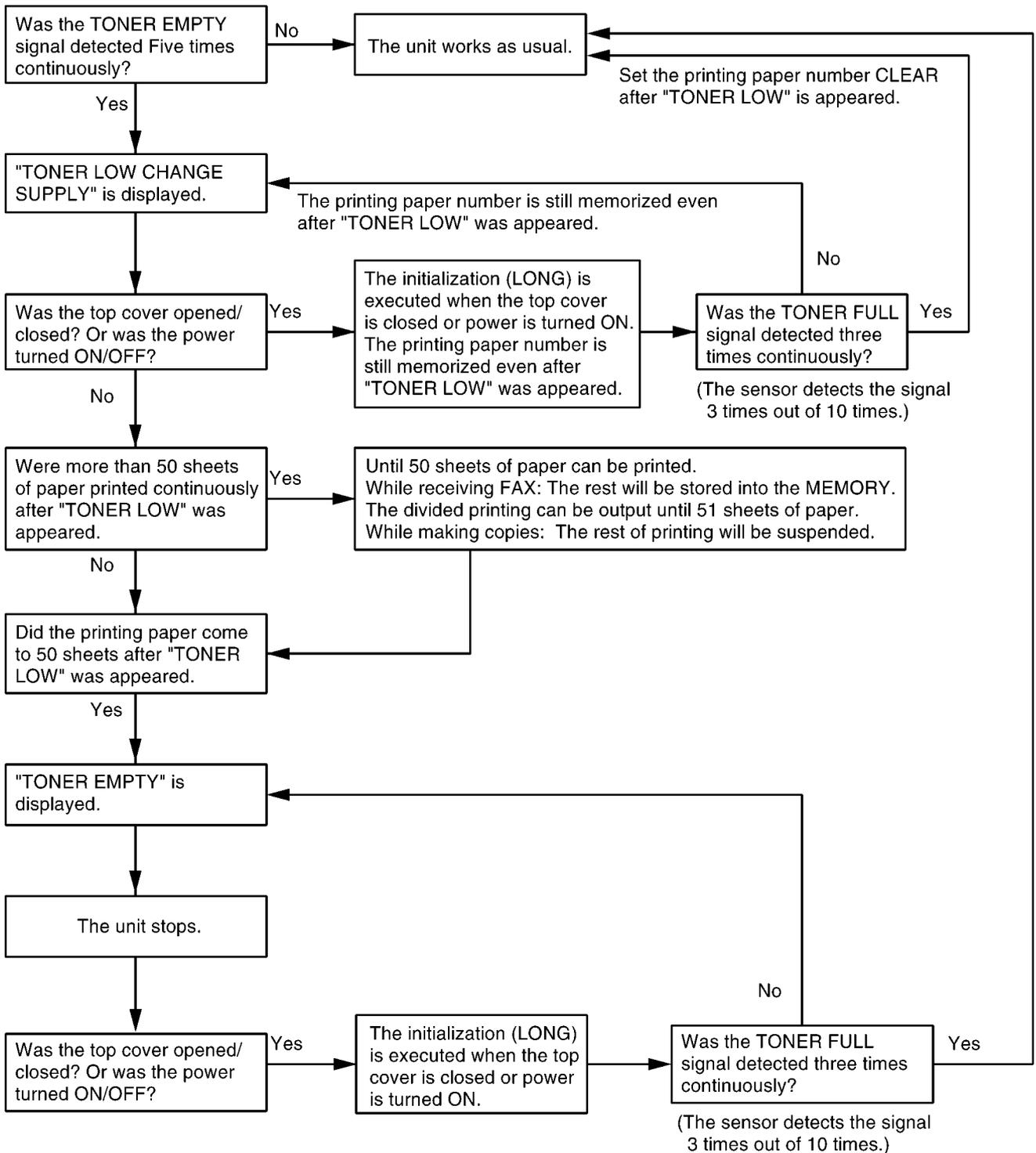


#### Toner Sensor

The rest of toner is detected by the move speed of the magnet put on the pendulum of Mixing Paddle. The pendulum is pushed up by the Mixing Paddle, then it falls down by its own weight. The rotation speed of paddle is set slower than the one of pendulum which falls down by its own weight. When the toner is still left, the pendulum falls and stops on the toner, then pushed by the paddle, it starts to rotate. When no toner is left, the pendulum falls to the bottom. Consequently the contact time between the magnet and steel becomes short when toner is left and long with no toner.

State	Photo-transistor	Signal (IC610-128pin)
Toner Set (full)	OFF time = about 0.3s	High level = about 0.3s
Near Empty Toner	OFF time > 0.6s	High level > 0.6s
No DEV Unit ("CHANGE DRUM")	ON	Low level fix

### 7.9.11.1. TONER DETECTION FLOW



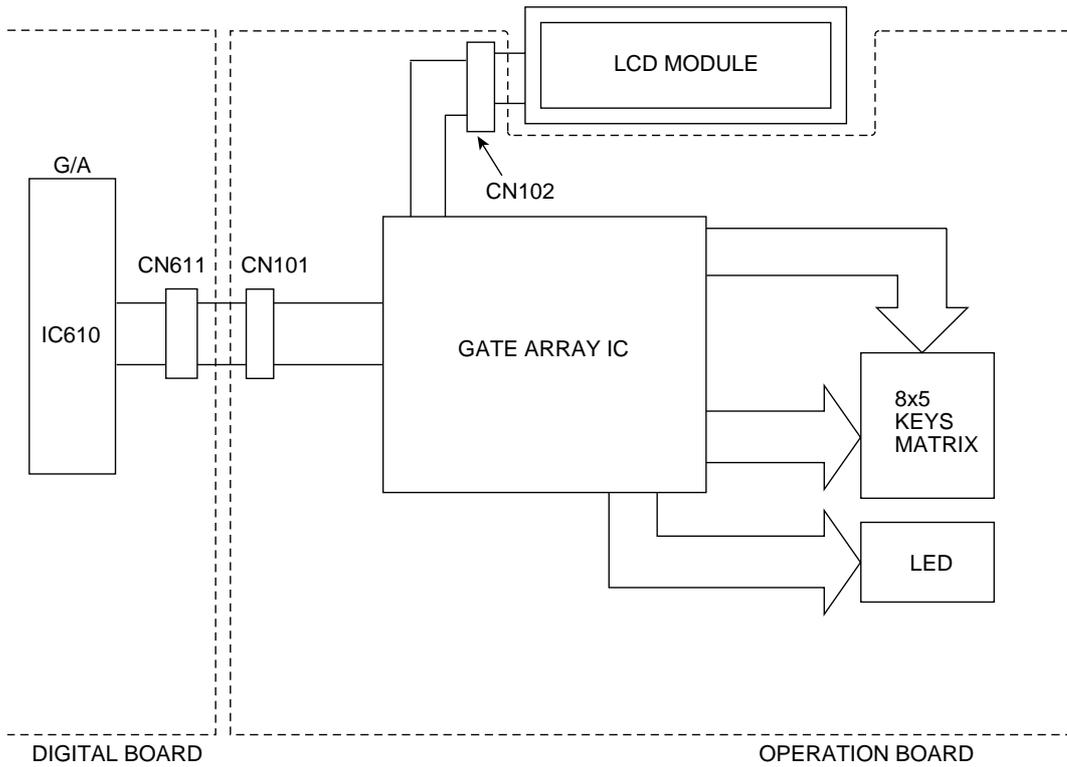
**CAUTION:**

1. Toner low can be judged by continuous 5-times TONER LOW signal at only printing.  
(It is not executed at.)
2. Toner full can be judged by continuous 3-times TONER FULL signal at initialization.  
(It is not executed at printing.)
3. In the ordinal operation, "CHECK DRUM" is displayed when TONER EMPTY sensor does not generate a signal for 2.7 seconds.

## 7.10. OPERATION BOARD SECTION

The unit consists of a LCD (Liquid crystal display), KEYS and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC101) and ASIC (IC610: on the DIGITAL BOARD).

The key matrix table is shown below.



### 1. Key Matrix (Hard only)

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	KIN7
KS0	3 (SW109)	# (SW112)	6 (SW110)	8 (SW107)	5 (SW106)	2 (SW105)	9 (SW111)	0 (SW108)
KS1	REDIAL (SW113)	MONITOR (SW116)	HANDSET MUTE (SW114)	7 (SW103)	4 (SW102)	1 (SW101)	FLASH (SW115)	* (SW104)
KS2	RESOLUTION (SW133)	FAX START (SW137)	SCAN (SW134)	COPY (SW135)	COLLATE (SW132)	-----	STOP (SW136)	AUTO ANSWER (SW117)
KS3	F3 (SW123)	F5 (SW122)	F4 (SW120)	F2 (SW121)	F1 (SW119)	-----	F6 (SW124)	LOWER (SW118)
KS4	VOL+ (SW126)	VOL- (SW129)	NEXT (SW128)	MENU (SW131)	HELP (SW130)	PRINT REPORT (SW125)	PREV (SW127)	-----

### 2. LED

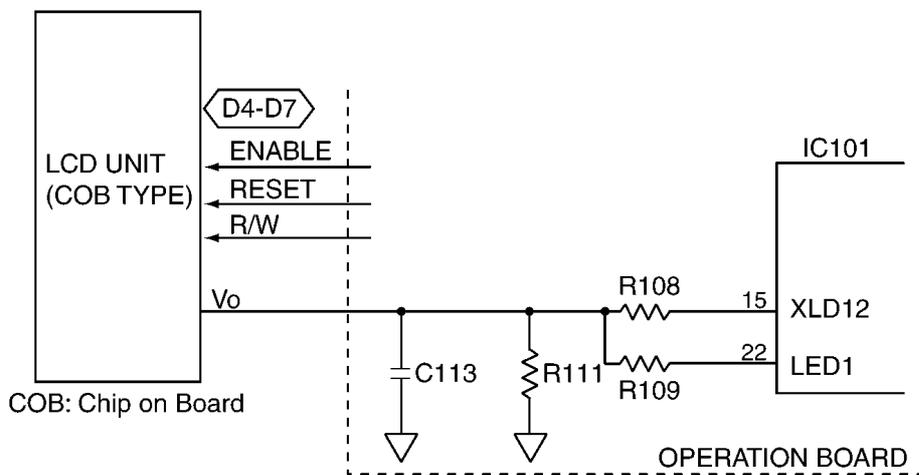
- AUTO ANSWER LED ON/OFF port---XLD8 (IC101-5)

## 7.11. LCD SECTION

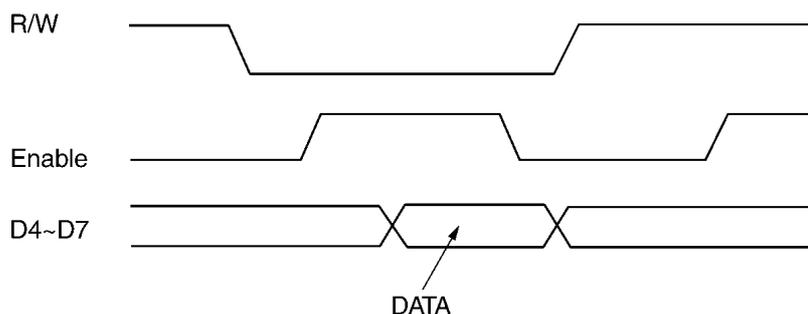
The Gate Array (IC101) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive. R130 and R134 are density control resistors.

Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC101).

### Circuit Diagram



### Timing Chart



<Density>

Display mode	User setting	LED1	XLD12
2 LINE	NORMAL	H	L
	DARKER	L	L
Large	NORMAL	H	Input setting
	DARKER	H	L

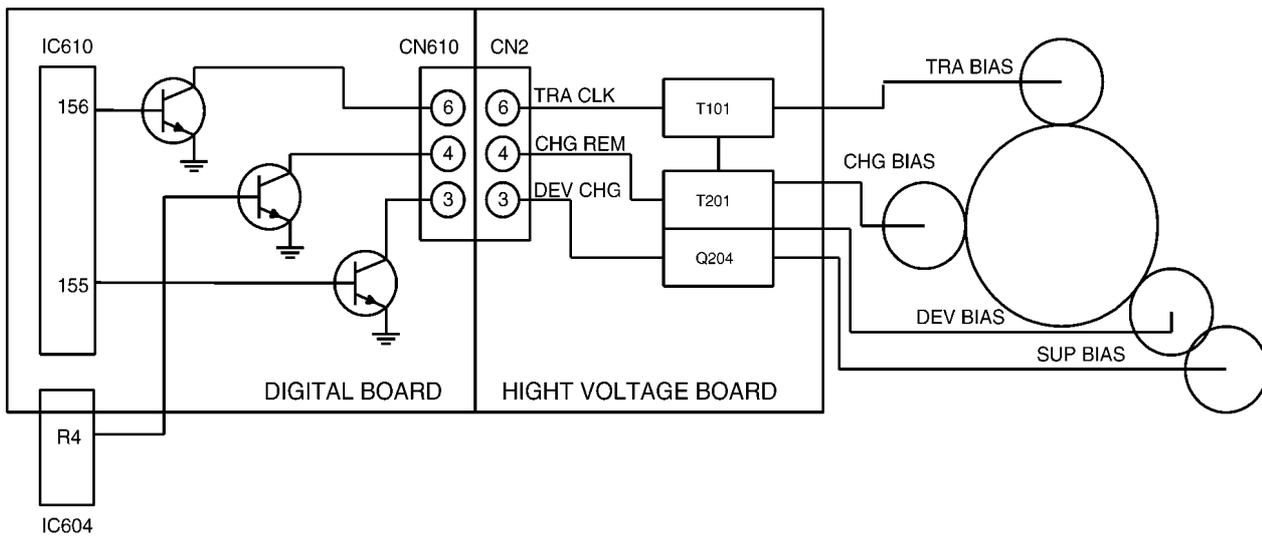
## 7.12. HVPS (High Voltage Power Supply) SECTION

### 7.12.1. HVPS SPECIFICATION

No	Output voltage	Item	Specification	Notes
1	Electrostatic Charge CHG BIAS	Rate output voltage	-1200±35V	
		Impedance range	80M~1200MΩ	
		Output format	Constant voltage	
2	Developing DEV(-) BIAS	Rate output voltage	-350±15V	
		Impedance range	20M~2000MΩ	
		Output format	Constant voltage	
	Developing DEV(+) BIAS	Rate output voltage	+220±20-50V	
		Output format	Constant voltage	
3	Supply roller SUP BIAS	Rate output voltage	-550±50V	
		Impedance range	20M~2000MΩ	
		Output format	Constant voltage	
4	Transfer TRA(+) BIAS	Variable output current	+4~30μA	Output current varies with the printed rate.
		Output voltage	+3500V Max.	
		Output format	Variable Constant current	
	Transfer TRA(-) BIAS	Rate output voltage	-1200±100V	
		Output format	Constant voltage	

DEV BIAS is output from one of the output terminals after the DEV CHG signal selects DEV(+) BIAS and DEV(-) BIAS.  
 TRA BIAS is output from one of the output terminals after the TRA CLK signal selects TRA(+) BIAS and TRA(-) BIAS.

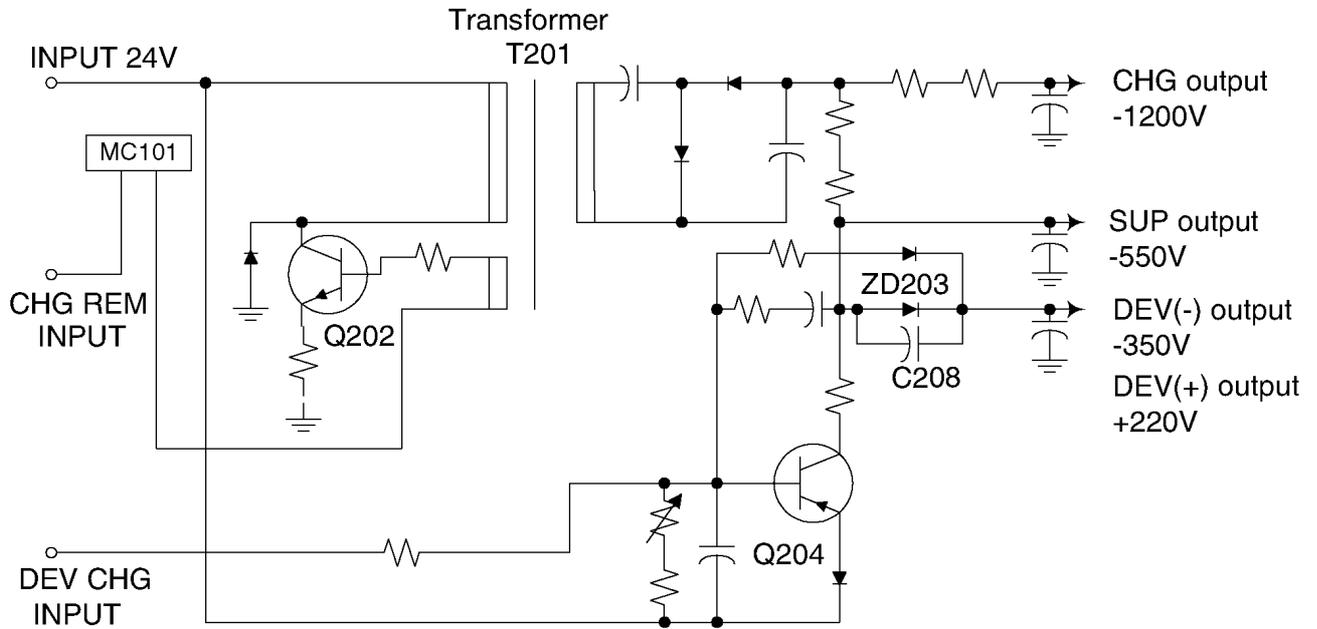
**H.V.P.S.(High Voltage Power Supply) Circuit Diagram**



### 7.12.2. CHG-BIAS (Charge BIAS)/SUP BIAS (Supply BIAS)/DEV(-) BIAS (Developing(-) BIAS)/DEV(+) BIAS (Developing(+) BIAS) UNIT

When the CHG REM terminal becomes "L", the transistor Q202 turns ON by MC101, Charge BIAS(-1200V) is output from CHG OUTPUT, Supply BIAS(-550V) is output from SUP output, and Developing(-) BIAS(-350V) is output from DEV(-) BIAS. By performing the DEV(-) BIAS output, the condenser C208 is charged with an electric charge. Charging the C208 will be saturated at 50ms. After that, when DEV CHG terminal becomes "L", Q204 turns ON, and the electric charge charged to the C208 is released. This electric charge becomes a constant voltage at ZD203, and Developing(+) BIAS(+220V) is output from DEV(+) BIAS.

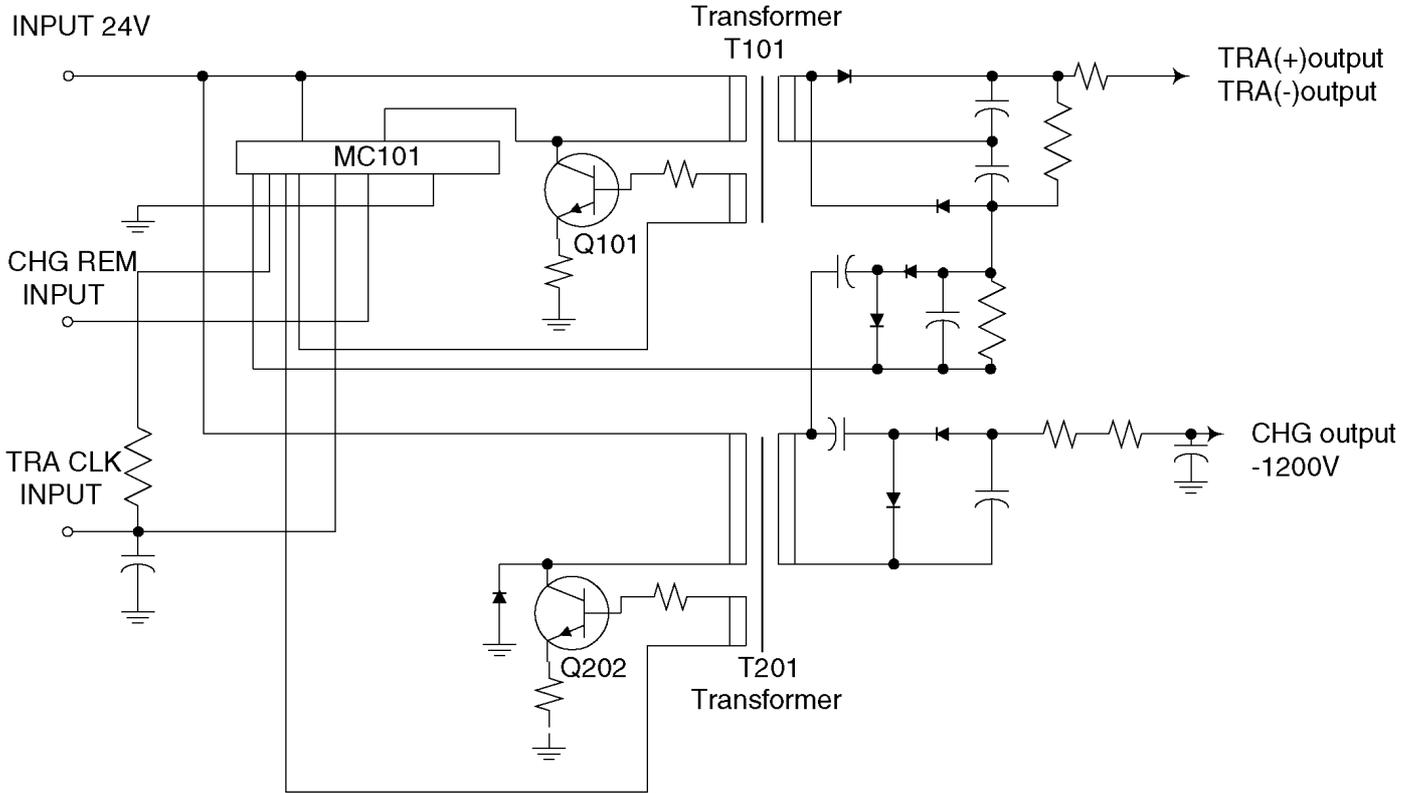
**Circuit Diagram**



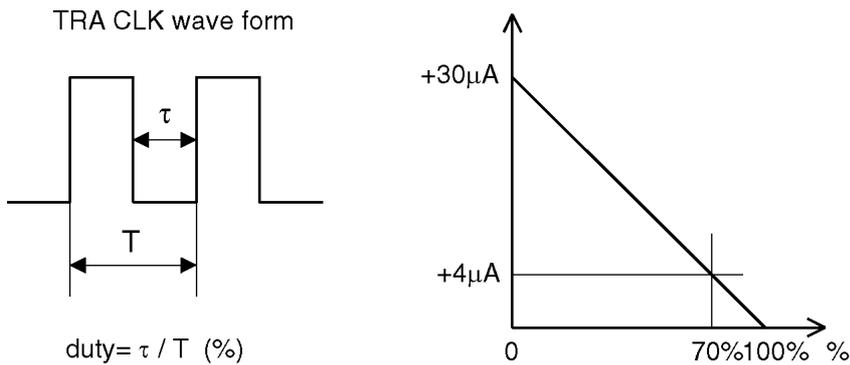
### 7.12.3. TRA(+) BIAS (Transfer(+) BIAS)/TRA(-) BIAS (Transfer(-) BIAS) UNIT

When the CHG REM terminal is "L" and the TRA CLK terminal is "Open", Transfer(-) BIAS(-1200V) is output from TRA OUTPUT the moment Charge BIAS(-1200V) is output from CHG OUTPUT. When 8KHz PWM (pulse-width modulation) signal is input to the TRA CLK terminal, Q101 turns ON by MC101, and TRA(+)  
CURRENT BIAS according to the PWM signal is output from TRA OUTPUT. The PWM signal will be turned to a constant voltage by the resistor and the condenser, and input to the MC101. The MC101 compares this voltage with the feedback voltage from T101 and controls the Q101. As for the transfer current, +30μA is output when DUTY of the TRA CLK input signal is 0%, or +4μA is output when that is 70%.

Circuit Diagram



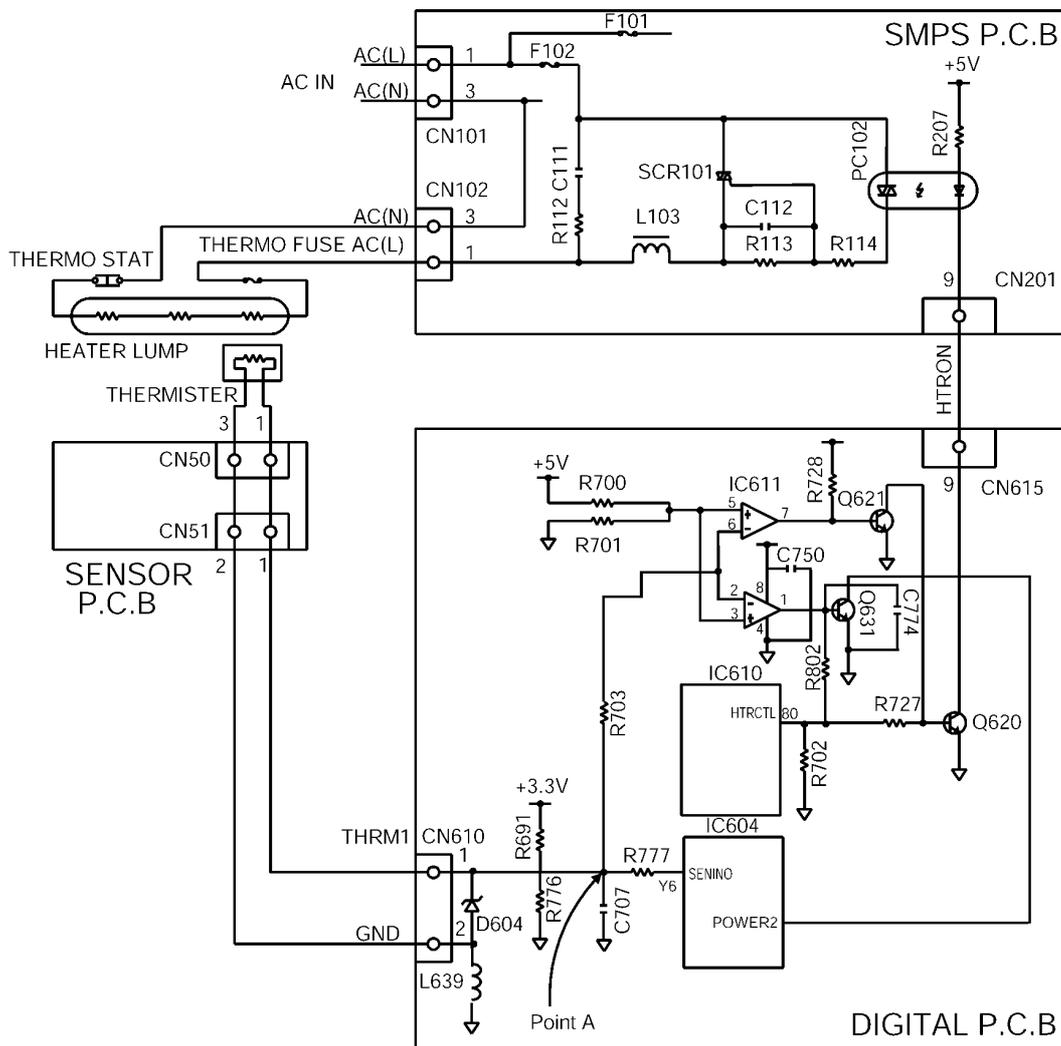
Transfer Current Variation by PWM Input



## 7.13. HEAT LAMP CONTROL CIRCUIT

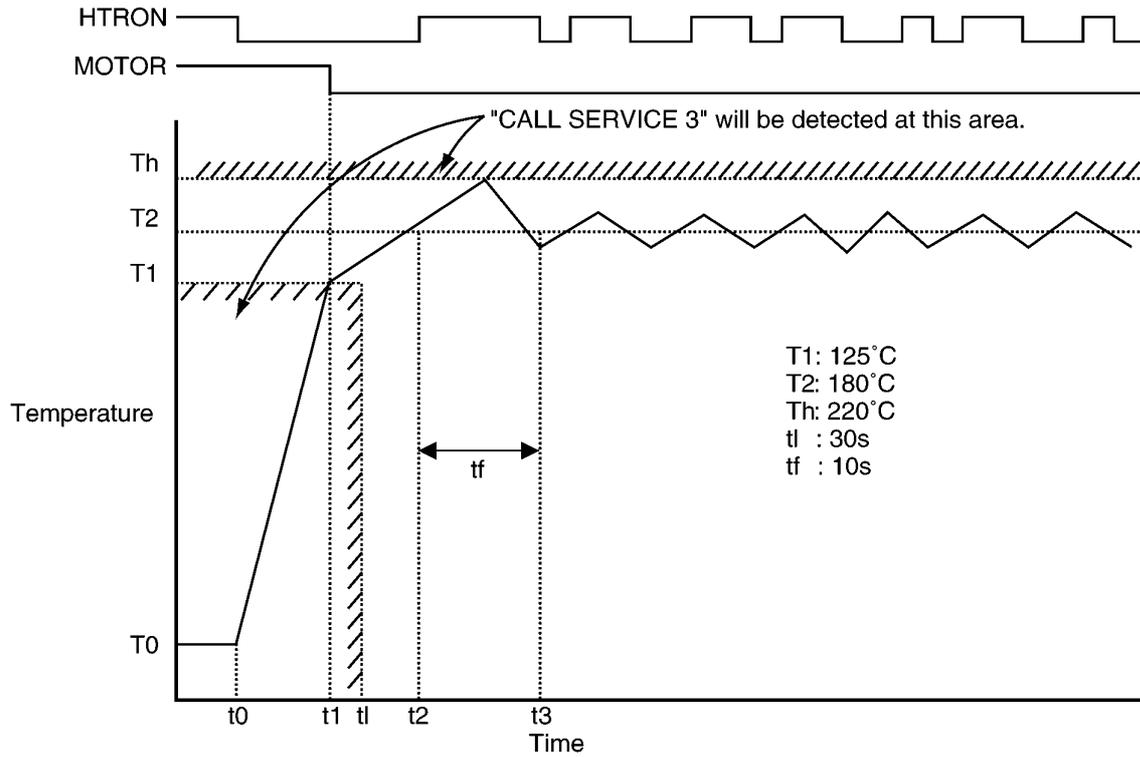
The temperature of the fixing part of the Fixing Unit is converted to a voltage by THERMISTER and input to IC604-Y6 (analog input). The heater turns ON/OFF the photo-coupler PC101 at the heater control port (IC610-80pin), and is turned ON/OFF at the triac CR101. And a thermostat and a thermo fuse are set on the AC line as the safety devices.

Circuit Diagram



### 1. Control at Printing

- After the printing signal is received, turn ON the heater.
- After that, turn ON the motor at the temperature T1 (about 125°C).
- After that, control at the temperature T2 (about 180°C), and after the fixing stable time  $t_f$  has passed, feed papers at the paper feeding permission time  $t_3$ .



- T0: Initial Temperature (At Power OFF / Normal Temperature)
- T1: Primary Stable Temperature (Heater Disconnection / Thermistor Loose Connection Detection Temperature)
- T2: Secondary Stable Temperature (Paper Feeding Permission Temperature / Fixing Control Temperature)
- Th: Abnormal High Temperature
- t0: Initial Time (After Printing Signal Received)
- t1: Primary Stable Time
- t2: Secondary Stable Time
- t3: Paper Feeding Permission Time
- tl: Abnormal Low Temperature Detection Time
- tf: Fixing Stable Time

**2. Safety Control by Hardware**

Considering the heater remains ON due to such as a program runaway or a thermistor breakdown, the following safety devices are prepared.

- a. If the temperature detected by the thermistor exceeds 220°C, IC610-7pin becomes Low, and the heater is turned OFF forcibly.
- b. If the temperature of the thermostat exceeds 135°C(\*), the internal switch turns off to cut off the current to the heater, and the heater is turned off.
- c. If the temperature of the thermo fuse exceeds 118°C(\*), the internal switch turns off to cut off the current to the heater, and the heater is turned off.

\* Thermo stat and thermo fuse is apart from heat roller, so the detect temperature is low.

**3. Safety Control by Software**

- a. Abnormal Low Temperature Detection (Heater Disconnection Detection / Thermistor Loose Connection Detection)

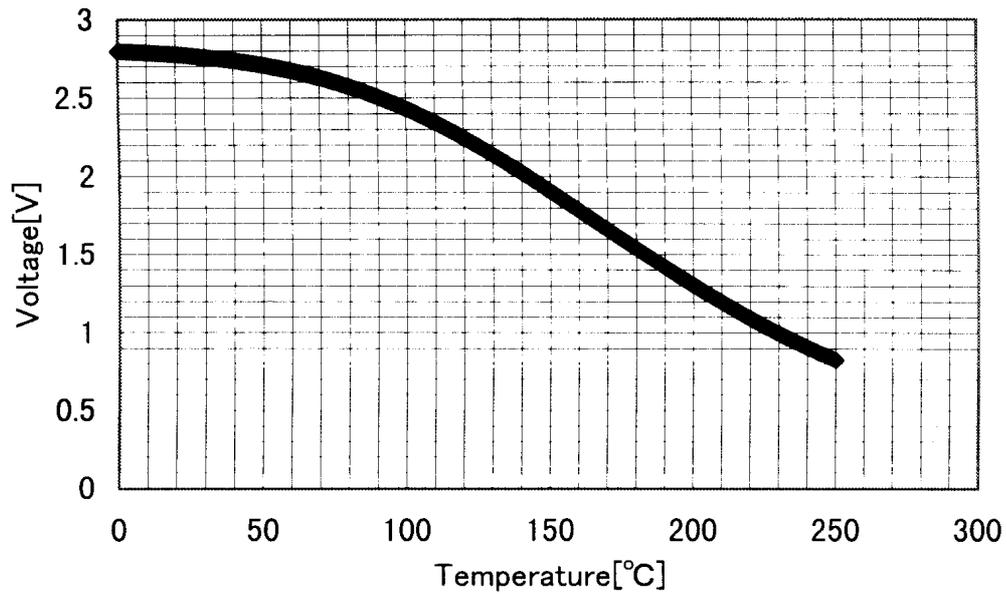
After the heater is ON, if the temperature of the fixing part does not reach T1 until tl, the heater will be OFF due to the abnormal low temperature detection (heater disconnection / thermistor loose connection).

- b. Abnormal High Temperature Detection

If the thermistor detects the temperature Th, the heater will be OFF due to the abnormal high temperature detection.

Temperature [°C]	Register Value [KΩ]	Voltage [V]
125	20.6	2.2
180	7.0	1.5
225	3.4	1.0

Temperature-voltage



The correspondence readings between temperature measured by thermistor and HEX readings

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX reading
0	3F	84	3C	168	20
1	3F	85	3B	169	20
2	3F	86	3B	170	1F
3	3F	87	3B	171	1F
4	3F	88	3B	172	1F
5	3F	89	3A	173	1E
6	3F	90	3A	174	1E
7	3F	91	3A	175	1D
8	3F	92	3A	176	1D
9	3F	93	3A	177	1D
10	3F	94	39	178	1C
11	3F	95	39	179	1C
12	3F	96	39	180	1B
13	3F	97	39	181	1B
14	3F	98	38	182	1B
15	3F	99	38	183	1A
16	3F	100	38	184	1A
17	3F	101	38	185	1A
18	3F	102	37	186	19
19	3F	103	37	187	19
20	3F	104	37	188	18
21	3F	105	36	189	18
22	3F	106	36	190	18
23	3F	107	36	191	17
24	3F	108	36	192	17
25	3F	109	35	193	17
26	3F	110	35	194	16
27	3F	111	35	195	16
28	3F	112	34	196	15
29	3F	113	34	197	15
30	3F	114	34	198	15
31	3F	115	34	199	14
32	3F	116	33	200	14
33	3F	117	33	201	14
34	3F	118	33	202	13
35	3F	119	32	203	13
36	3F	120	32	204	13
37	3F	121	32	205	12
38	3F	122	31	206	12

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX reading
39	3F	123	31	207	12
40	3F	124	31	208	11
41	3F	125	30	209	11
42	3F	126	30	210	11
43	3F	127	30	211	10
44	3F	128	2F	212	10
45	3F	129	2F	213	0F
46	3F	130	2F	214	0F
47	3F	131	2E	215	0F
48	3F	132	2E	216	0E
49	3F	133	2D	217	0E
50	3F	134	2D	218	0E
51	3F	135	2D	219	0E
52	3F	136	2C	220	0D
53	3F	137	2C	221	0D
54	3F	138	2C	222	0D
55	3F	139	2B	223	0C
56	3F	140	2B	224	0C
57	3F	141	2B	225	0C
58	3F	142	2A	226	0B
59	3F	143	2A	227	0B
60	3F	144	29	228	0B
61	3F	145	29	229	0A
62	3F	146	29	230	0A
63	3F	147	28	231	0A
64	3F	148	28	232	0A
65	3F	149	28	233	09
66	3F	150	27	234	09
67	3F	151	27	235	09
68	3E	152	26	236	08
69	3E	153	26	237	08
70	3E	154	26	238	08
71	3E	155	25	239	08
72	3E	156	25	240	07
73	3E	157	24	241	07
74	3D	158	24	242	07
75	3D	159	24	243	07
76	3D	160	23	244	06
77	3D	161	23	245	06
78	3D	162	22	246	06
79	3D	163	22	247	05
80	3C	164	22	248	05
81	3C	165	21	249	05
82	3C	166	21	250	20
83	3C	167	21		

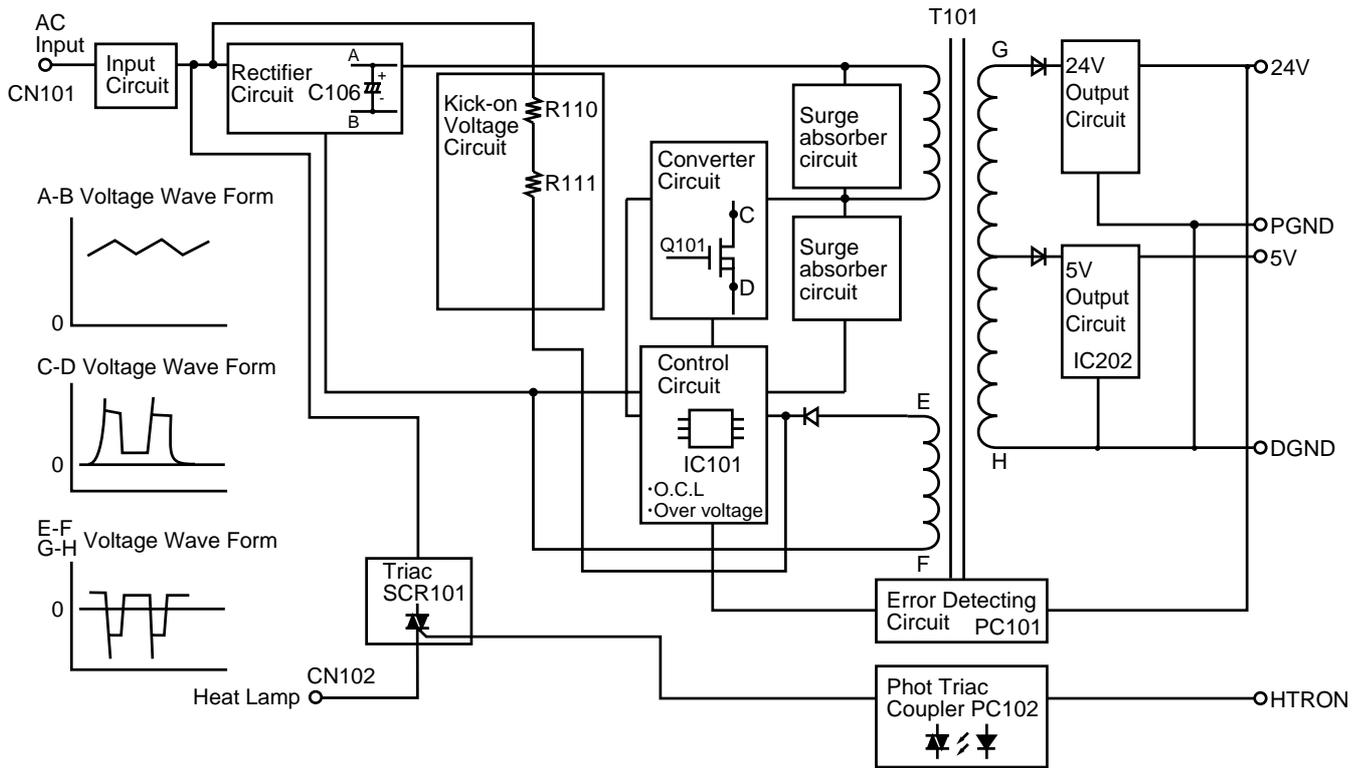
**Note:**

The value is displayed on LCD at **TEST FUNCTIONS** (P.74) [#815].

## 7.14. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.

**Block Diagram**



### [Input Circuit]

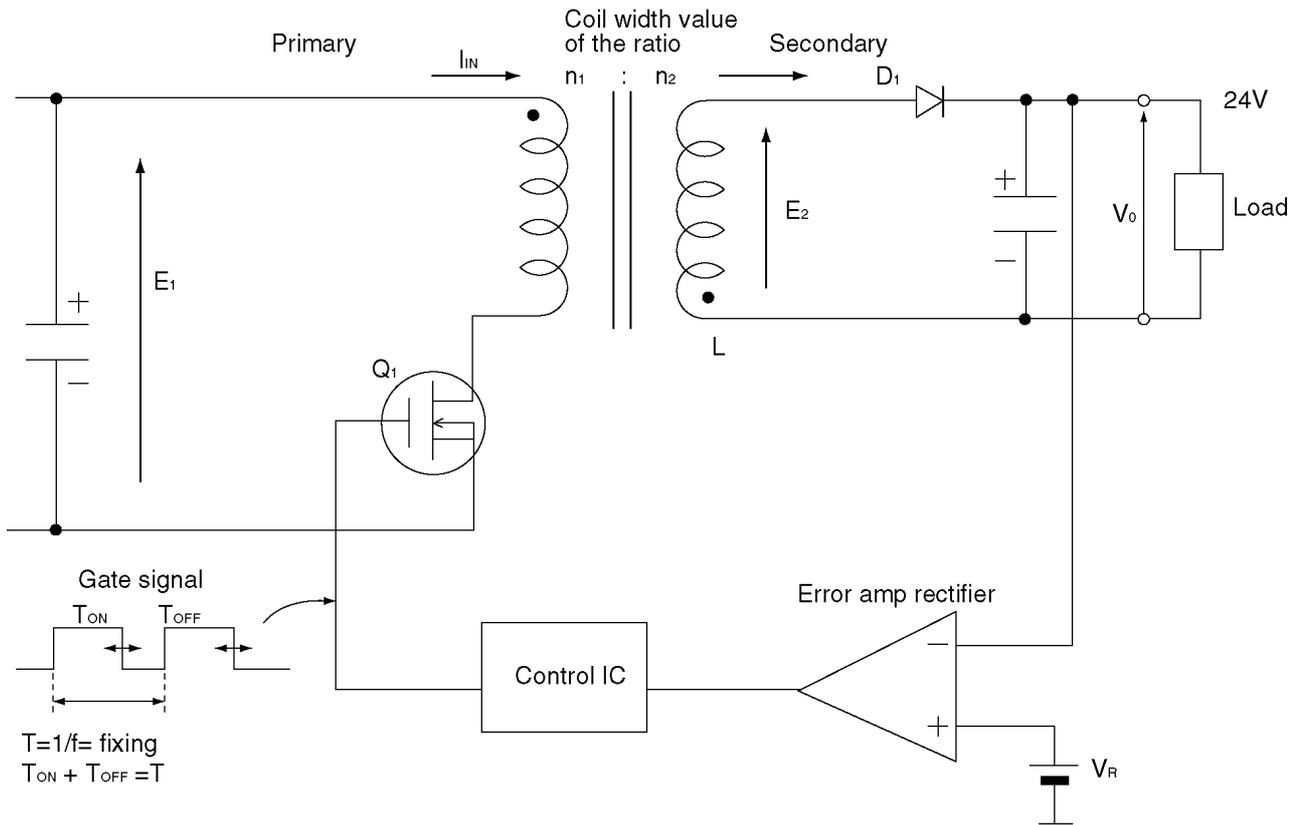
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

### [Rectifier Circuit]

The input current is rectified by D101~ D104 and charges C106 to make DC voltage. Then it supplies power to the converter circuit.

### [Kick-on voltage circuit]

Bias is applied to the Q101 gate via this circuit when the AC power is turned on and Q101 begins operating.



The following is an overview of how the power supply unit is controlled.  
 The control method of this power supply unit is pulse width modulation.

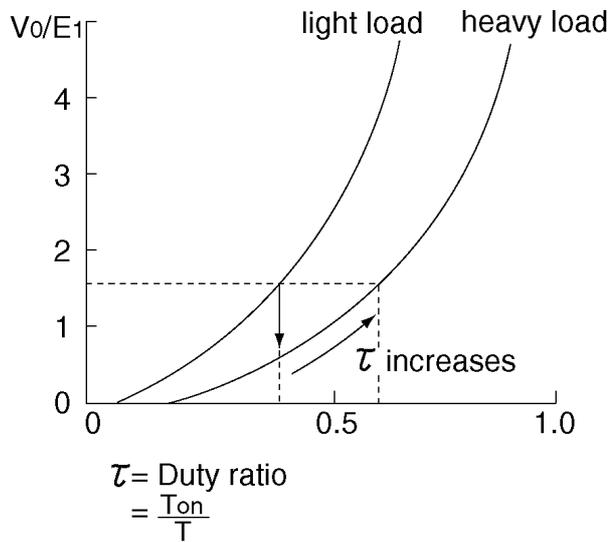
When  $Q_1$  is ON, the energy is charged in the transfer primary coil according to  $E_1$ . When  $Q_1$  is OFF, the energy is output from the secondary transfer as follows.

$L \rightarrow D_1 \rightarrow \text{Load} \rightarrow L$

Then the power is supplied to the Load. When  $Q_1$  is ON, power is not output from the secondary side. The output voltage is fed back in the control IC according to the error amp rectifier. Then depending on how  $T_{ON}$  is controlled, stabilization occurs. Also, when the current load becomes too large, in order to decrease the voltage output, the increase in  $\tau$  is controlled and the output voltage is stabilized.

Therefore, basically the timing:  $T_{on}/T_{off}$  of  $Q_1$  controls the output voltage.

Output/Input voltage value of ratio



**[Surge Absorber Circuit]**

This circuit is for absorbing surge voltage generated by the transformer.

**[Control Circuit and Detecting Circuit]**

The control circuit amplifies the output with increased voltage detected in the error detecting circuit. Then it drives the main transistor.

In this power supply, the duty ratio is defined by changing the ON period of the main transistor.

This is shown as follows.

When the output voltage of the 24V circuit increases, the current of the photo coupler PC101 increases, the pulse width of the output control IC becomes narrower and the ON period of Q101 becomes shorter.

**[Over Current Limiter (O.C.L)]**

The highest drain current (Q101) is limited by a limiter circuit (IC101) of 24V. The 24V output is limited by this circuit.

**[Over Voltage Circuit]**

If the 24V output increases because the error detecting circuit or control circuit is broken, IC101 will recognize this signal and output becomes 0V.

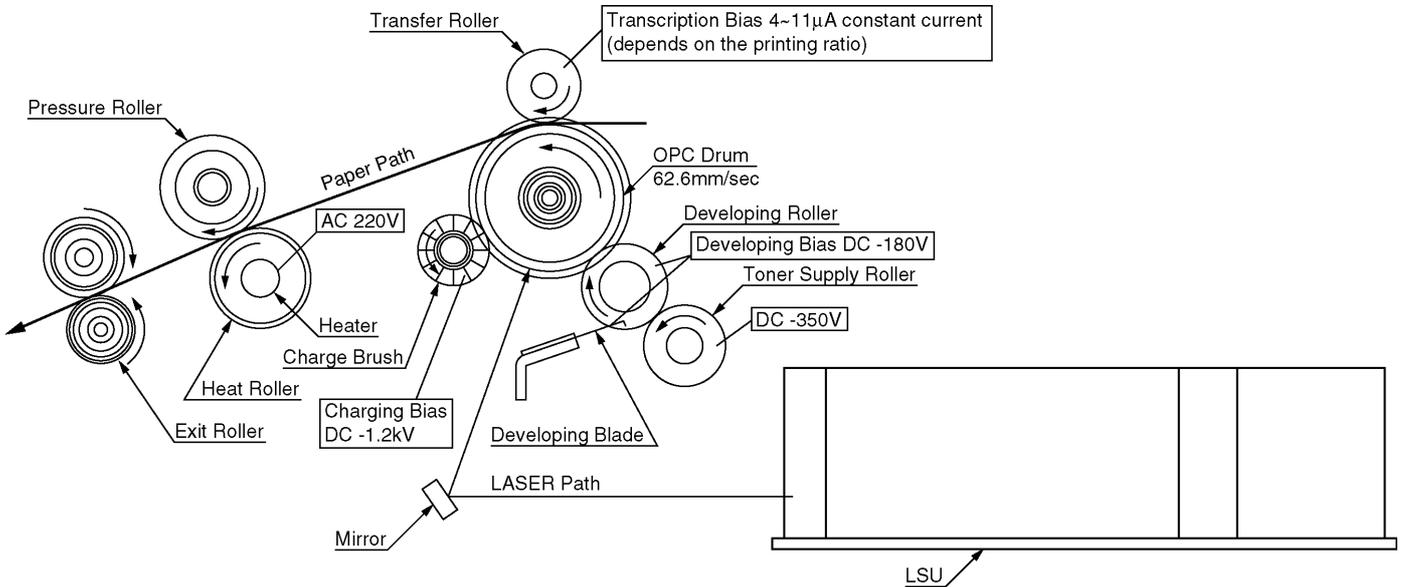
**Dummy load method (to quickly check the power supply output)**

Refer to **POWER SUPPLY BOARD SECTION,**] (P.155).

# 8 REFERENCE MATERIALS DATA

## 8.1. PRINTING OPERATION PRINCIPLE

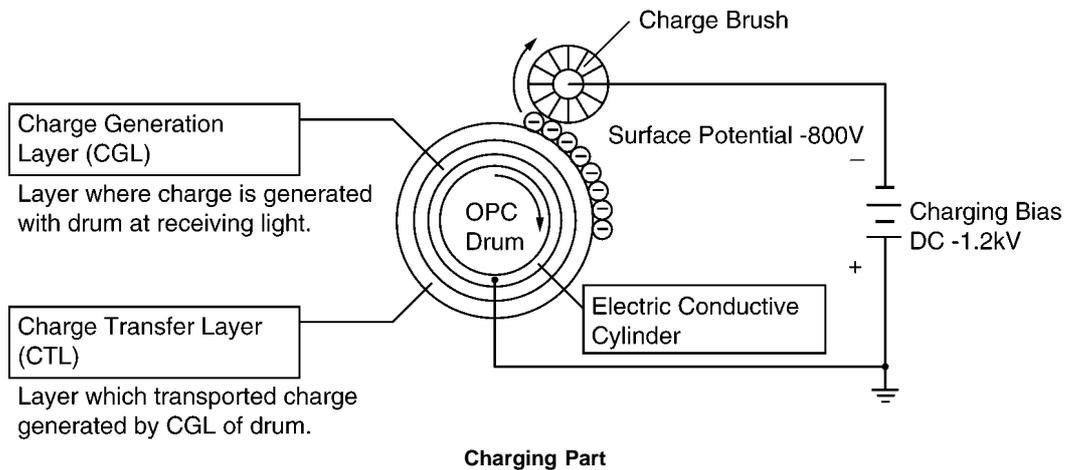
### 8.1.1. PROCESS CHART AND PROCESS BIAS



### 8.1.2. CHARGING

Charging is the stage that keeps the surface of the sensitive drum a fixed electric potential. The sensitive drum is the Organic Photo Conductor (OPC), which is a electric conductive cylinder whose surface is covered with the Charge Generation Layer (CGL) and Charge Transfer Layer (CTL).

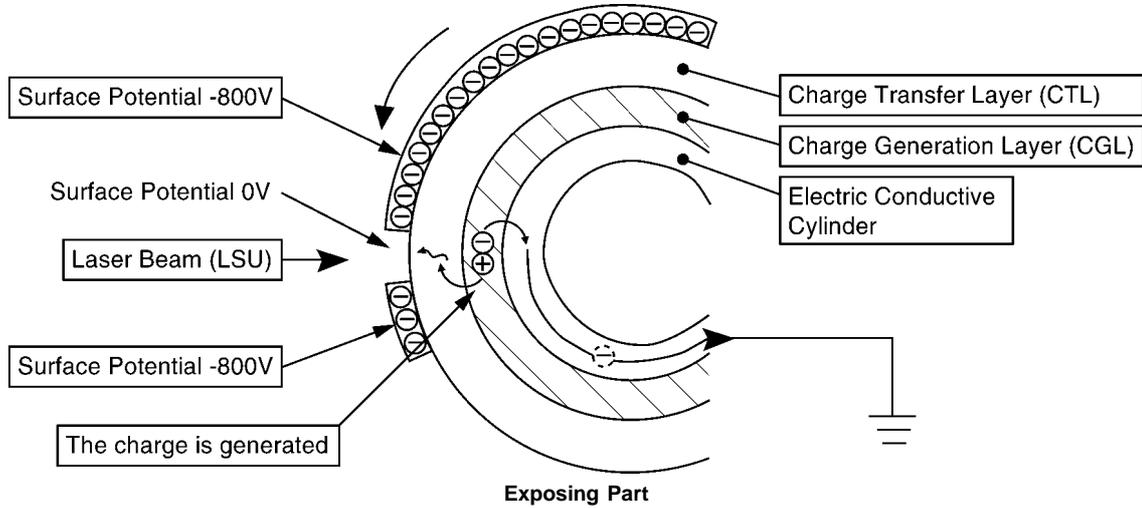
When the charging bias (DC -1.2 Kiev) is added and the minus charge is supplied to the charge brush while charging, the whole surface potential of the drum is -800V.



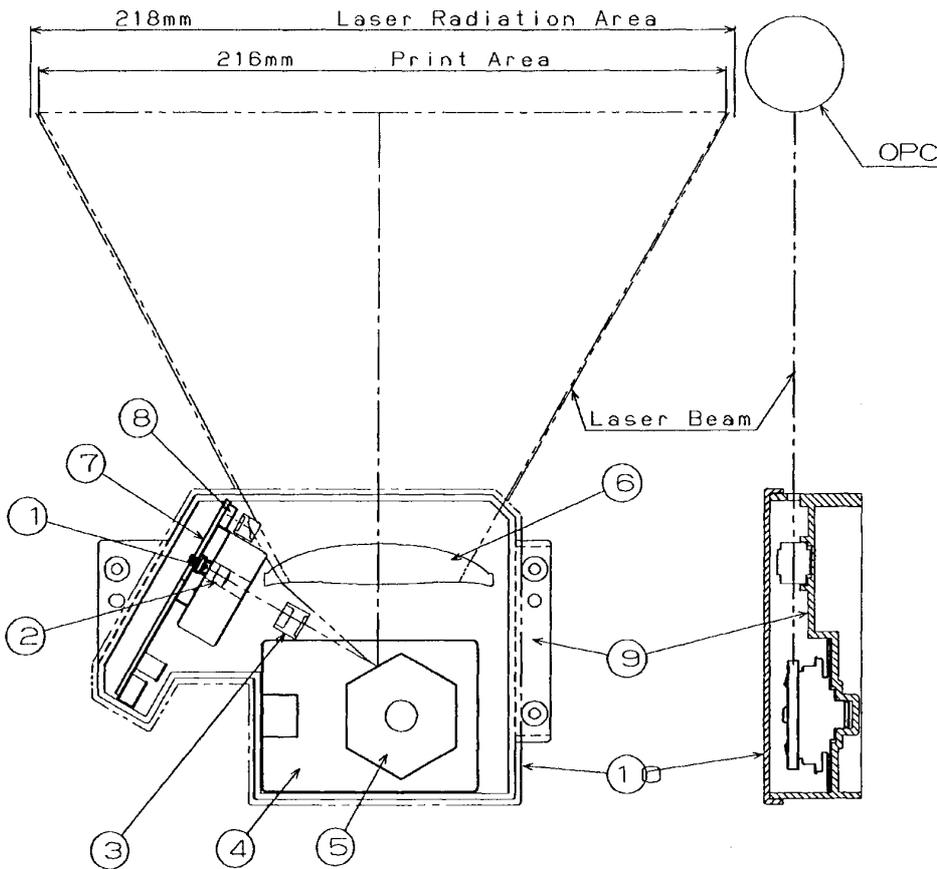
### 8.1.3. EXPOSING

When the drum which is charged with the fixed electric charge is irradiated by the laser beam, the plus charge and minus charge are generated at the Charge Generation Layer. Passing through the Charge Transfer Layer which conducts the plus charge, the minus-charged drum's surface is neutralized to be skipped. Then the minus charge goes to the ground from the electric conductive cylinder. Consequently the charge of the part which is not exposed remains as it is, and the electric potential of the scanned part changes.

At that time an invisible image is created on the drum.



### 8.1.4. LASER SCANNING UNIT LOCATIONS

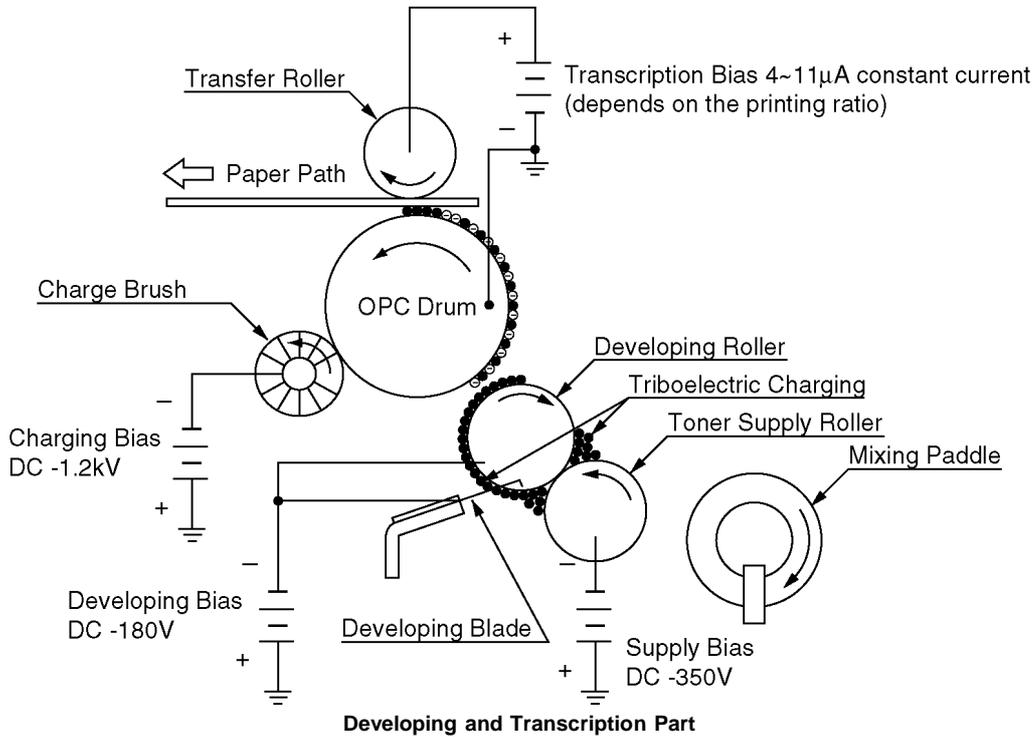


10	Cover
9	Housing
8	Pin Photodiode
7	LD Driving Circuit
6	f $\theta$ Lens
5	Polygon Mirror
4	Scanning Motor Driving Circuit
3	Cylindrical Lens
2	Collimator Lens
1	Semiconductor Laser Diode

### 8.1.5. DEVELOPING AND TRANSCRIPTION

The developing is the stage that the OPC drum with an invisible image is changed to visible by the toner. The developer consists of mixing paddle, toner supply roller, developing roller, developing blade and OPC drum. The bias voltage is added to the developing roller (DC -180V) and toner supply roller (DC -350V). Firstly the toner is mixed up in the mixing paddle and minus-charged by triboelectricity, then led to the toner supply roller. Secondly the potential difference causes to send the toner to the developing roller from the toner supply roller. The supplied toner to the developing roller is kept to a certain layer thickness by the developing blade and also it is charged by triboelectricity. Consequently the toner is transferred to the surface of the exposed OPC drum by the potential difference between the developing roller and OPC drum's surface.

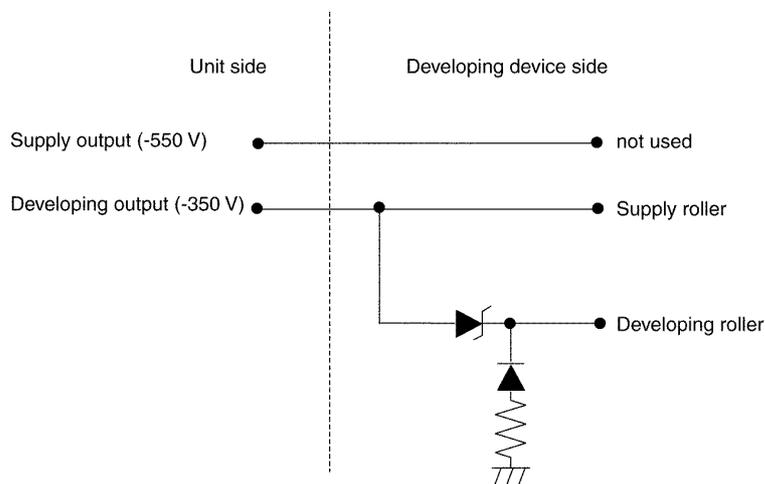
The transcription is the stage that the created image on the OPC drum is transferred to the paper. When the transfer roller is plus-charged with the image, the minus-charged toner particles are gathered on the surface of the drum and transferred to the paper.



The values of developing bias and supply bias are different from the ones described in the Service Manual for FL501. The biases output from the unit of FL501,FLM551 and FLB751 (FLB750) have the same voltage. However, the developing device of FA78X(FA78A) converts the developing and supply biases inside the developing device to improve the image quality.

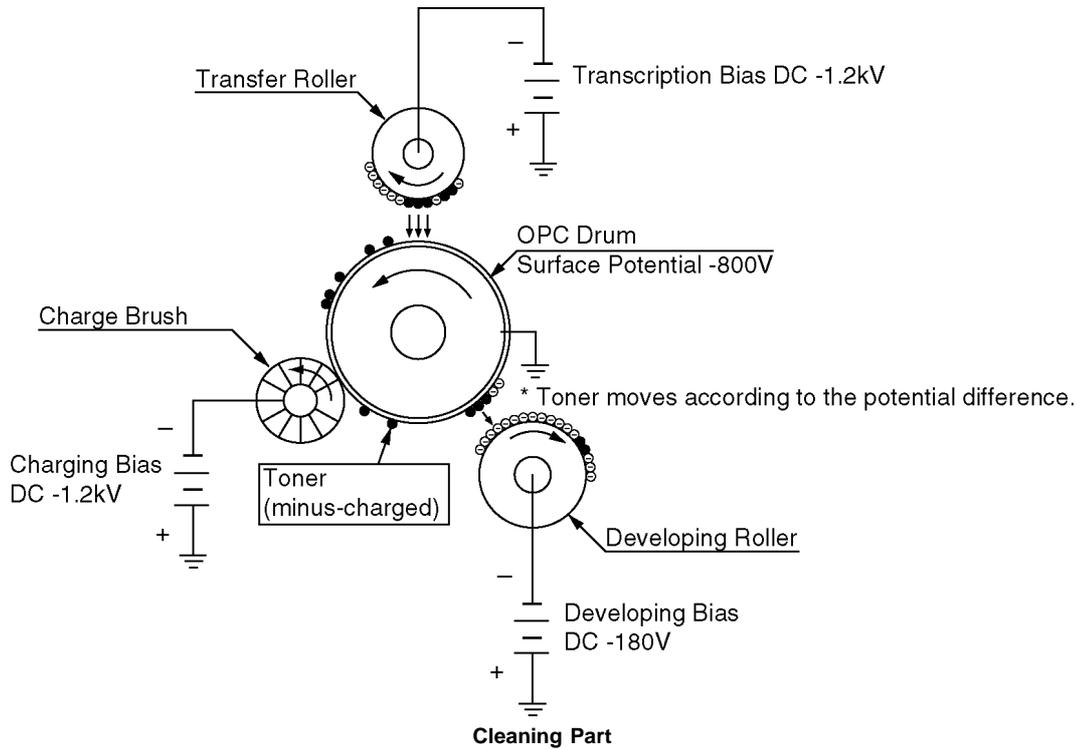
	FA77X(FA77A) developing device	FA78X(FA78A) developing device
Developing bias	-350V	-180V
Supply bias	-550V	-350V

Inside voltage conversion circuit of the developing device



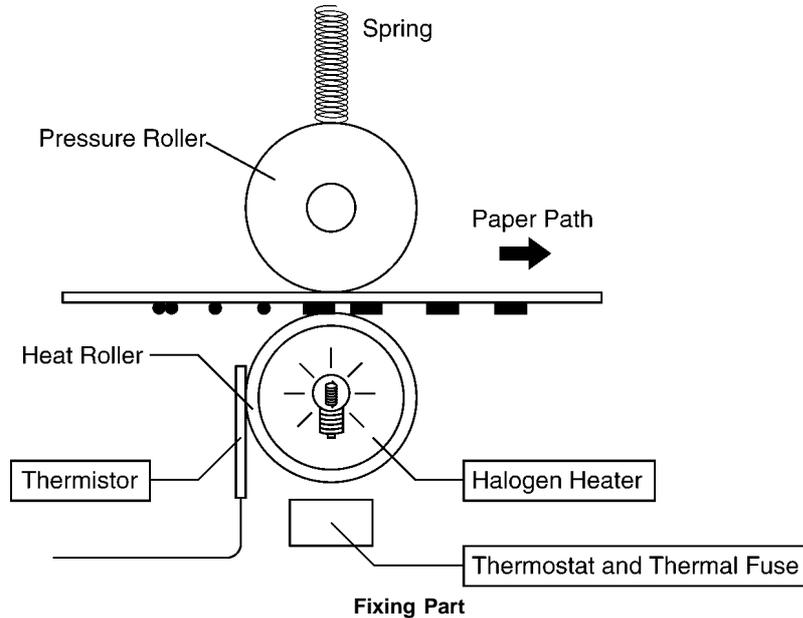
### 8.1.6. CLEANING

The toner attached to the surface of the OPC drum is transferred to the paper at the transcription stage, but a part of the toner remains. The cleaning is the stage that cleans the remain toner after the transcription stage. The remain toner on the drum and the toner which was attached to the place where the laser beam didn't scan are gathered to the developing roller to be used again. When no paper is supplied, the transcription roller is minus-charged to eliminate the minus-charged toner.



### 8.1.7. FIXING

On the process of the transcription, the transferred toner is weakly attached on the paper. Fixing means the process to fix the toner on the paper permanently. The fixing part melts the toner at the high temperature using the halogen heater. The toner is fixed on the paper by the heat and pressure through the fixing part with the image. The surface of the heat roller is rosined by Teflon and lubricated to prevent from attaching the toners. The press roller is made of silicon, and its spring compresses the melted toner.



The fixing part becomes high temperature, so the thermistor and the thermal fuse are provided.

#### 1. Thermistor

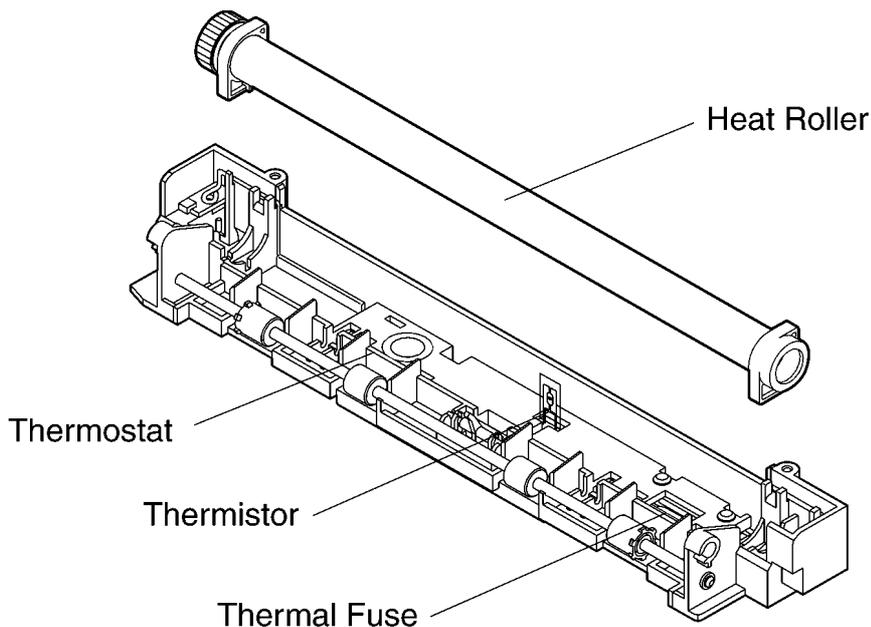
The thermistor touches the heat roller and check the temperature to feed back to the control circuit. The surface temperature should be kept 178 °C while printing.

#### 2. The thermal fuse

The thermal fuse plays the role to prevent the heat roller from rising to abnormal high temperature. The thermal fuse is located near the heat roller and turns OFF the power when the temperature around the thermal fuse becomes over 121°C. Once the thermal fuse is turned OFF, it will not be turned ON again.

#### 3. Thermostat

The thermostat takes the same role with the thermal fuse. The thermostat is located near the heat roller, and it turns OFF the power when the temperature around the thermostat becomes over 135°C.



## 8.1.8. IMAGE READING

The Image Reading Part feeds and ejects the document when copying or scanning.

The image reading part consists of the followings.

### 8.1.8.1. Copying with the Automatic Document Feeder

The automatic document feeder consists of separation roller, document feed roller, separation pad, springs, etc. It divides the documents and transfers to the reading part, then stacks the documents on the document guide when finished reading.

This automatic document feeder is affordable until 15 documents at once. When the user set a document on the document feeder and the top of the document is touched, the document detection sensor is turned ON and beep tone sounds, then the motor is driven.

The driven motor feeds the document and transfers it a little. When the printing part is ready for reading the document, the motor is driven again by the operation of the user to move the roller at a fixed speed. The documents are fed one by one separated by the separation pad. The spring plate adds the pressure to the document so that the separation pad can separate the documents properly. Spring plate helps the document endure the pressure of separation pad to be fed smoothly. The document is ejected document stacker.

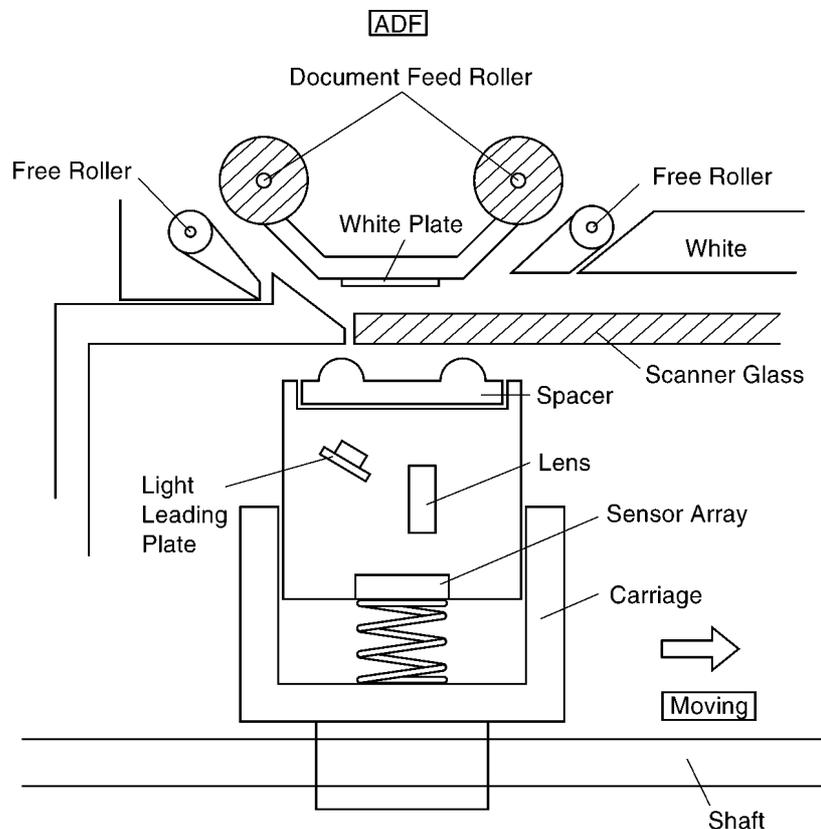
### 8.1.8.2. Copying with the Scanner Glass

The motor, gear, belt, etc., cause CIS and the carriage above CIS to drive while copying with the scanner glass. The document should be set to the lower right standard point. Copy can be done without closing the document cover when the document is thick. When ADF document detection sensor detects the scanner glass, CIS moves to the right of the document from the home position.

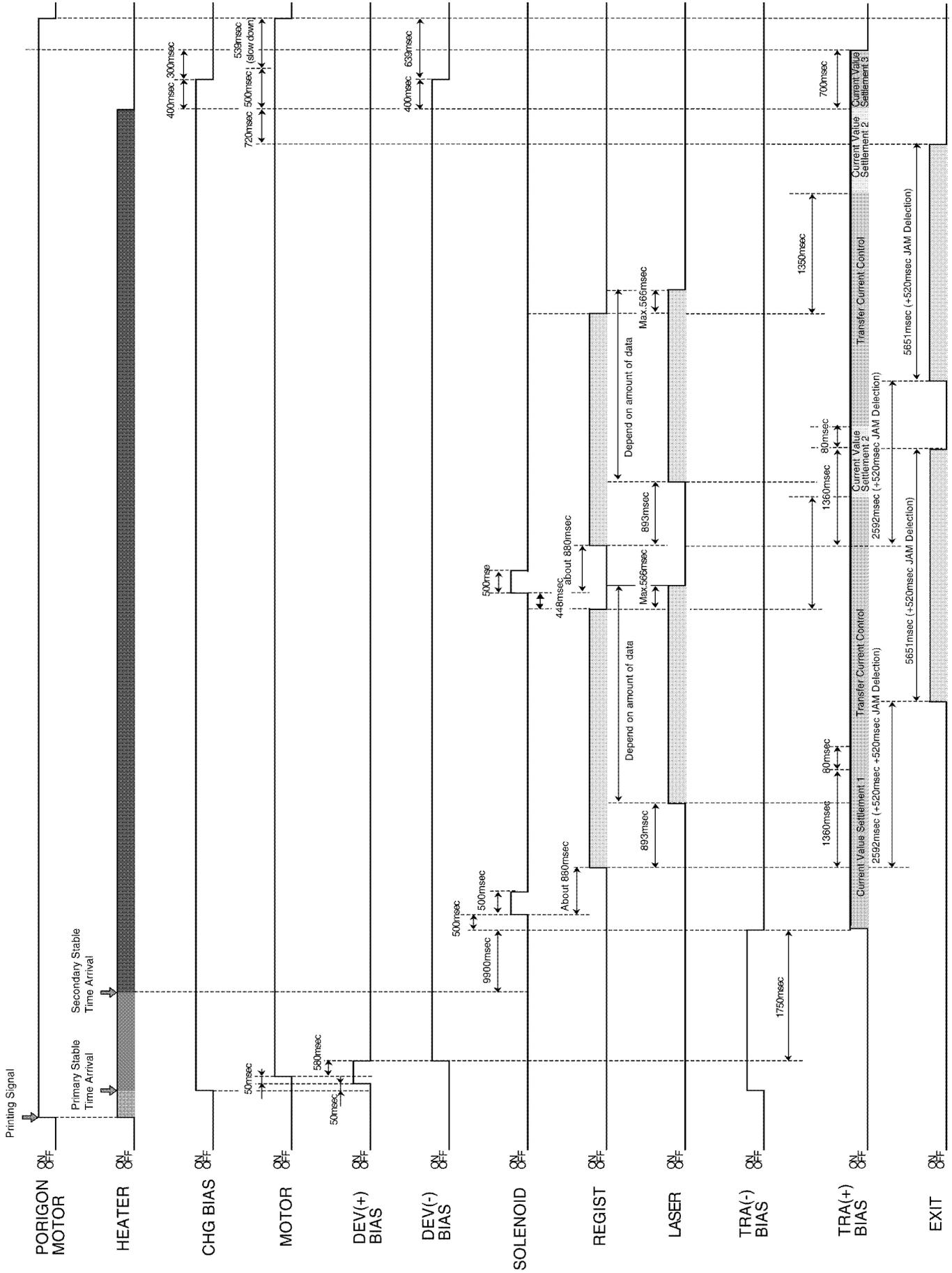
When the printing part is ready for reading the document, the motor is driven again by the operation of the user to move the roller at a fixed speed. This operation is repeated from the next copy.

### 8.1.8.3. CIS (Contact Image Scanner)

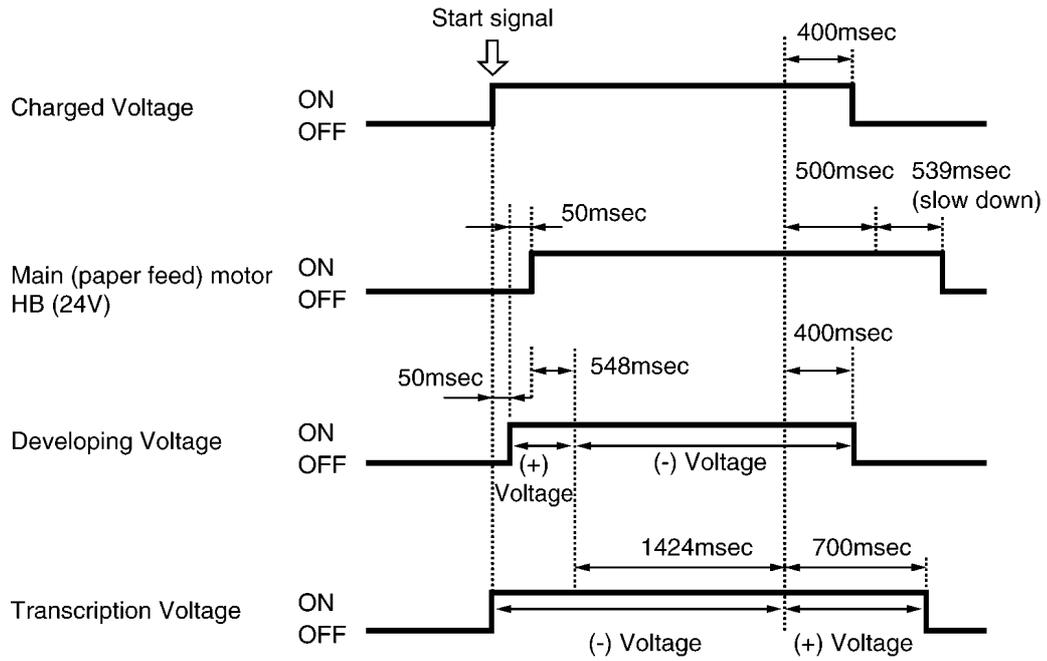
CIS consists of LED, lens and sensor array. When the light emitted from LED is reflected on the document, the light reaches the sensor through the lens, then the sensor array detects the document.



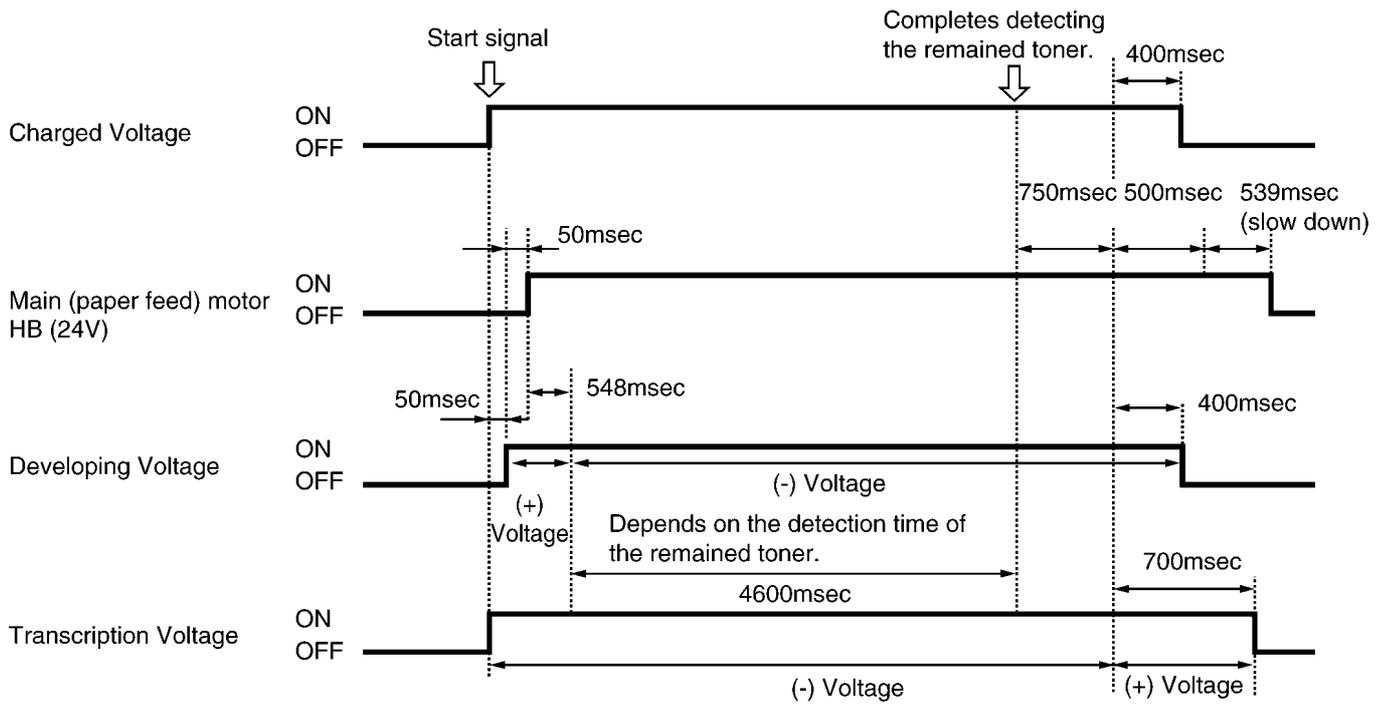
### 8.1.9. TIMING CHART (When Printing Two Sheets of Paper) BASIC



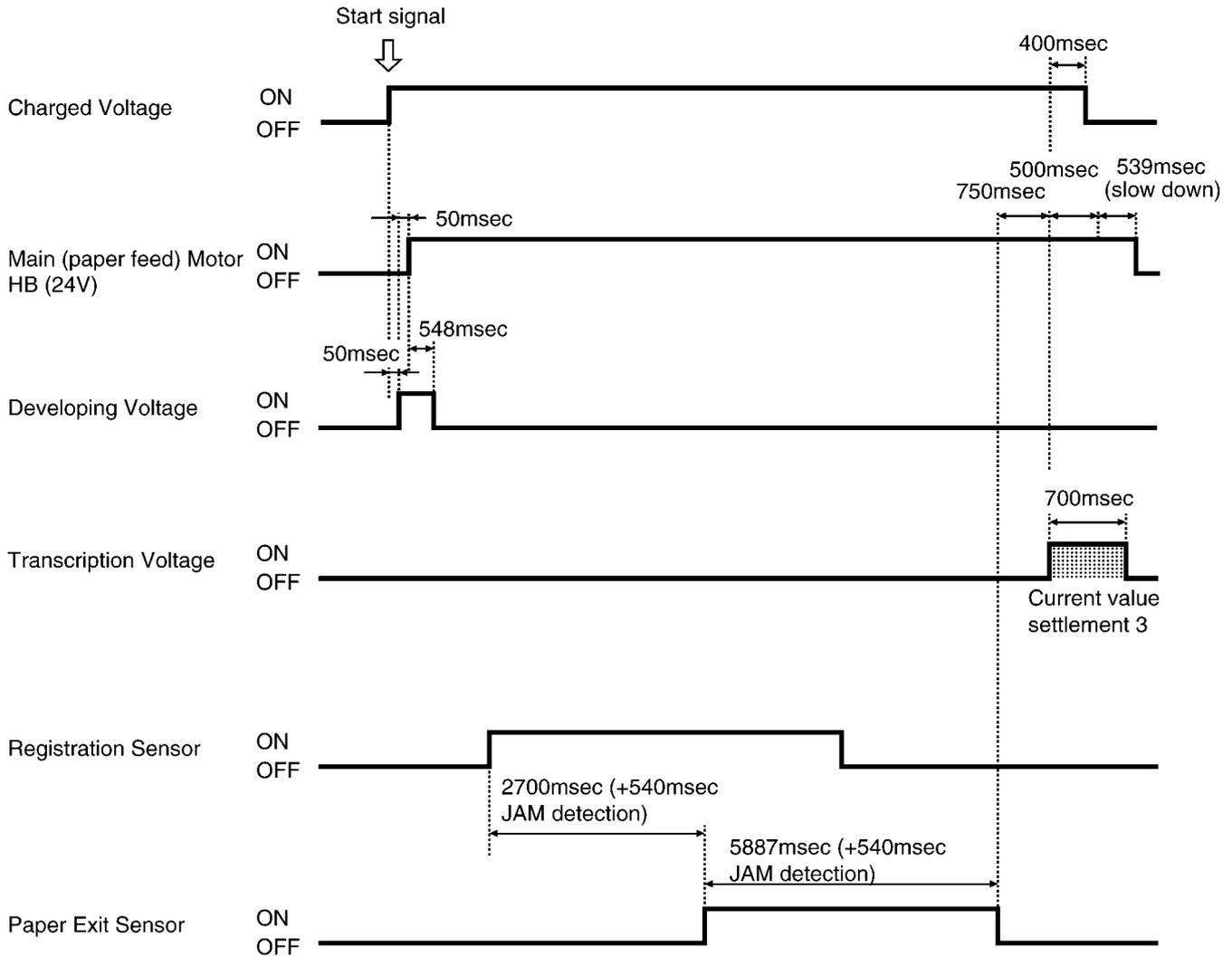
### 8.1.10. Timing Chart [Initializing (Short)]



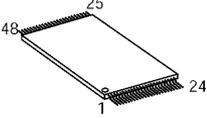
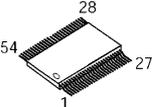
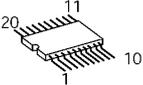
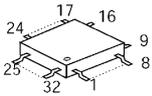
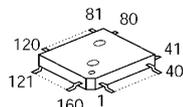
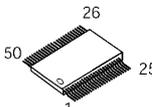
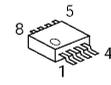
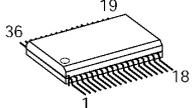
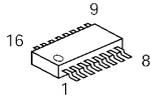
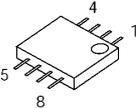
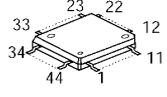
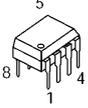
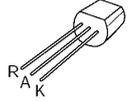
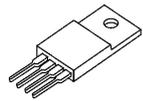
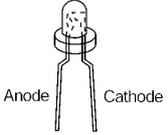
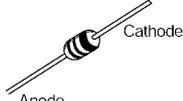
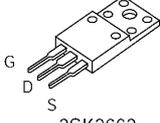
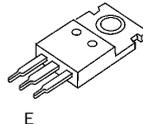
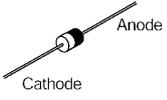
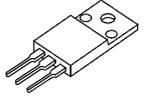
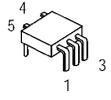
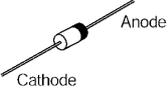
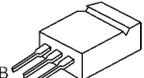
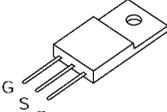
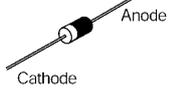
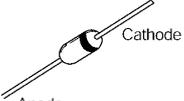
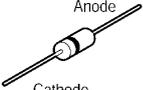
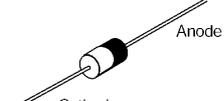
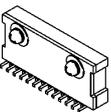
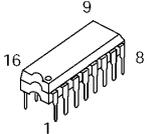
### 8.1.11. Timing Chart [Initializing (Long)]

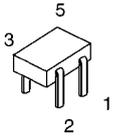
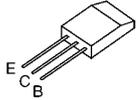
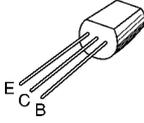
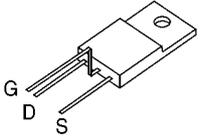


### 8.1.12. Timing Chart (when the registration sensor is turned OFF then ON during initializing)



## 8.2. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES

 C1CB00001402	 PFWIFLB758RU	 C3ABPG000080	 PFVITVT245FT	 C1CB00001365
 PFVINSL1087D	 C1ZBZ0001924	 C3ABMG000039	 PQVINJM2903M	 C0JBAD000093 C0JBAC000265
 AN6384SB	 C1BB00000101	 PQVIMC34119D PQVINJM4558M	 MN7D032Z9J	 PFVIFA5317P
 AN1431T	 PFVIPQ05RD11	 MC41H13	 2SB1197K PQVTDTC143E 2SD1819A PQVINJM4558	 Anode Cathode PFVLRM505VRT
 2SD1921Q	 Anode Cathode MA4056	 G D S 2SK2662	 E 2SD1990P	 PQVDNCD56DT
 Cathode Anode PQVDRLS73T PFVDRMRLS245	 Anode Cathode PFVDAG01A PFVDD1NL20U PFVDAU02Z	 2SK2662 PFVDSF5LC20U	 4 5 3 1 PFVDNECD5R6G	 Anode Cathode PFVDLT1505 PFVDRK36LFB2
 Anode Cathode 1SS133 MA4220	 MA141WK, MA143 B0ZBZ0000048 PQVTDTC123JU	 B C E 2SD2137A	 G S D 2SA1413	 Anode Cathode PQVDS5688G PQVDDHM3M20
 Anode Cathode PQVDRD200EB PQVDRD6.2ESB	 Anode Cathode MA165	 Anode Cathode B0JAME000005	 PFVIMT200303	 9 16 8 1 PFVIT2003APS

 <p>AN6123MS</p>	 <p>2SA1267</p>	 <p>2SC2235</p>	 <p>PFVDDGS1ZB60</p>	 <p>2SK2717</p>
---	--	--	--	--

### 8.3. HOW TO REPLACE A FLAT PACKAGE IC

#### 8.3.1. PREPARATION

- PbF (: Pb free) Solder
- Soldering Iron

Tip Temperature of 662°F ± 50°F (350°C ± 10°C)

**Note:** We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

Recommended Flux: Specific Gravity → 0.82.

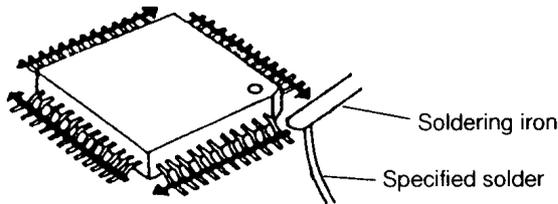
Type → RMA (lower residue, non-cleaning type)

**Note:**

See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.4).

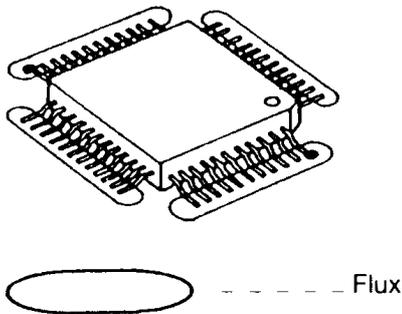
#### 8.3.2. PROCEDURE

1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.

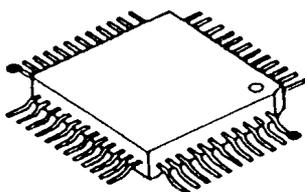


Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.



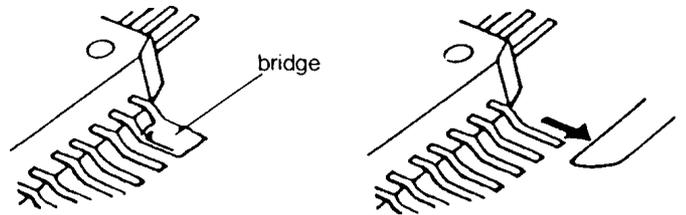
3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



● - - - - - Temporary soldering point.

#### 8.3.3. REMOVING SOLDER FROM BETWEEN PINS

1. Add a small amount of solder to the bridged pins.
2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



## 8.4. DIGITAL BOARD SECTION

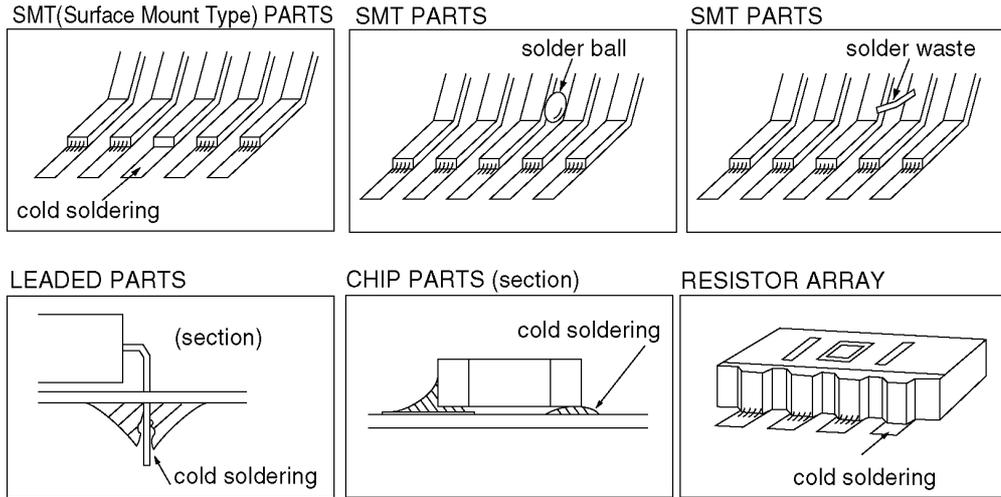
When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.

The symptom: No response when the power is turned on. (No LCD display, and keys are not accepted.)

The first step is to check the power source. If there is no problem with the power supply unit, the problem may lie in the digital unit (main board).

As there are many potential causes in this case (ASIC, DRAM, etc.), it may be difficult to specify what you should check first. If a mistake is made in the order of checks, a normal part may be determined faulty, wasting both time and money.

Although the tendency is to regard the problem as a serious one (IC malfunction, etc.), usually most cases are caused by solder faults (poor contact due to a tunnel in the solder, signal short circuit due to solder waste).



### Note:

1. Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.
2. Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially, DRAM and ROM) malfunctions are extremely rare after installation in the product.)

This may be repaired by replacing the IC, (DRAM etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.

Soldering faults difficult to detect with the naked eye are common, particularly for ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines.

Even if you don't have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.

An explanation of the main signals (for booting up the unit) is presented below.

Don't replace ICs or stop repairing until checking the signal lines.  
An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?

Please refer to **DIGITAL BLOCK DIAGRAM** (P.165).

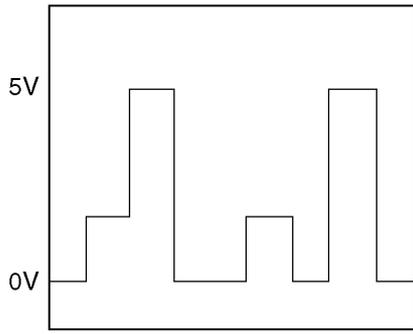
The ASIC (IC604) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC606), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.

It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.

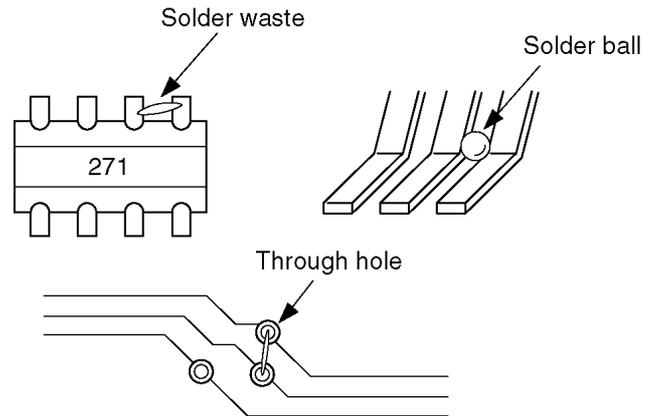
These signal lines are all controlled by voltages of 3.3V (H) or 0V (L).

### 8.4.1. NG EXAMPLE

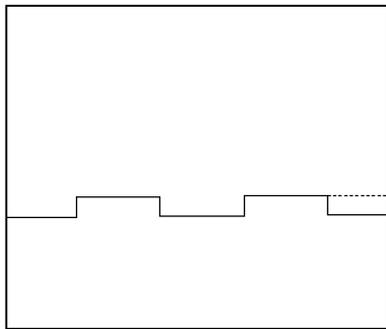
1.



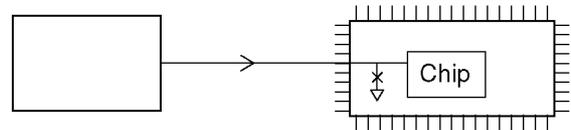
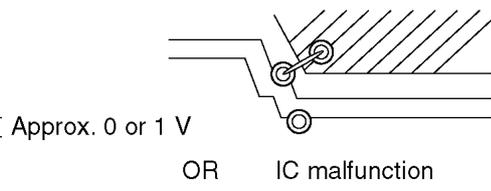
Short circuit from the adjacent signal wires.  
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.



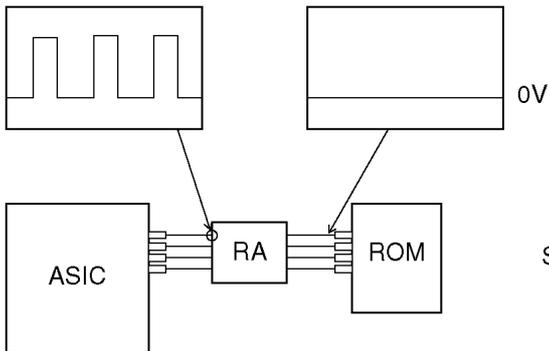
2.



Short between the signal line and GND.

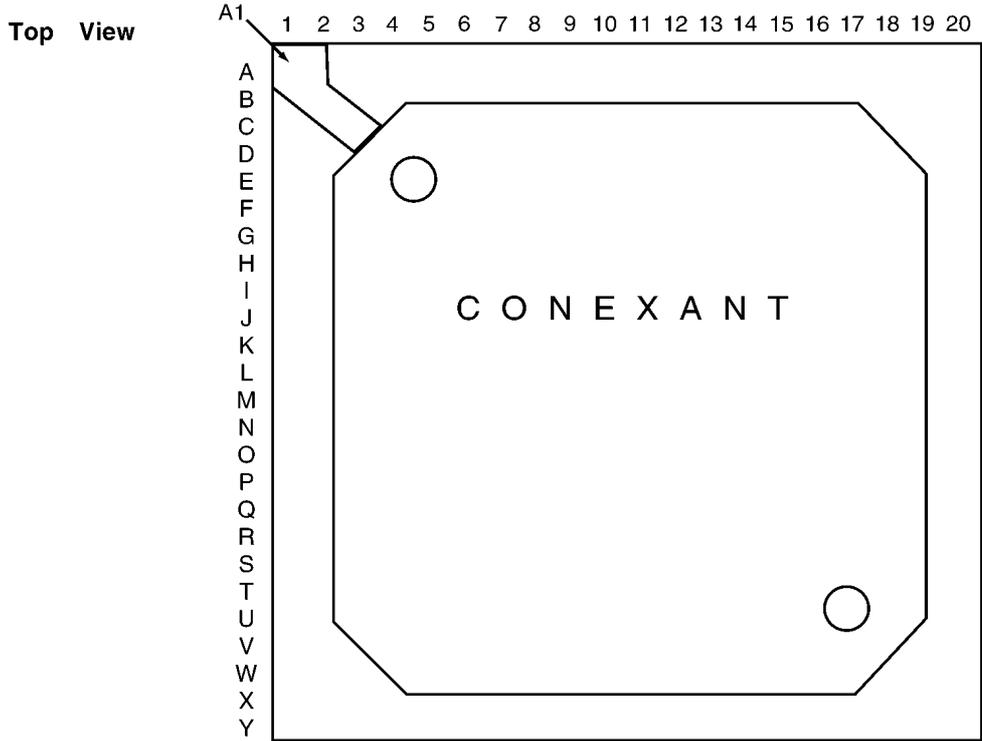


3.

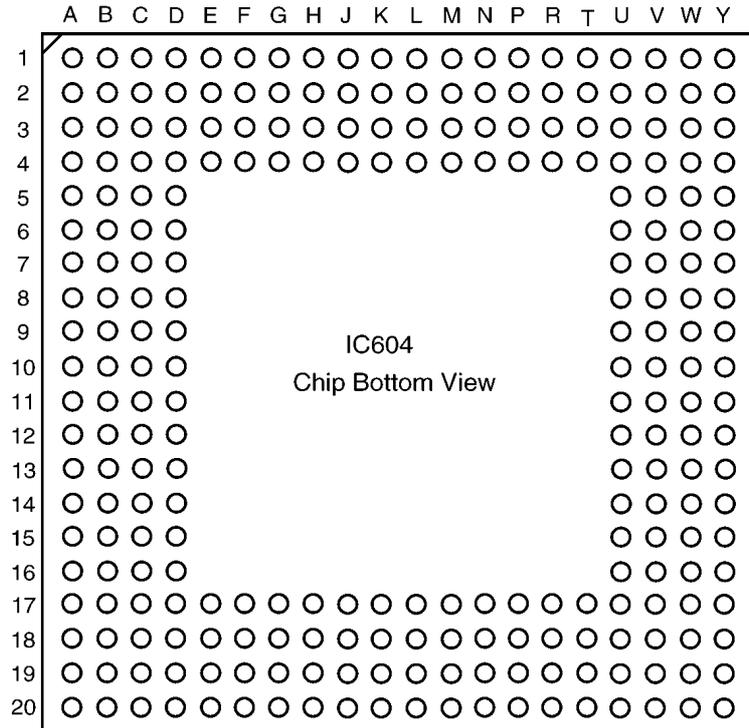


Solder fault on RA.

### 8.4.2. ASIC (IC604) PIN LAYOUT



**Bottom View**



## 8.5. MODEM SECTION

### 8.5.1. FUNCTION

The unit uses CODEC (IC609) and ASIC (IC604) that serves as an interface between the control section for FAX transmission and reception and the telephone line. During a transmitting operation, the digital image signals are modulated and sent to the telephone line.

During a receiving operation, the analog image signals which are received via the telephone line are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by ITU-T. CODEC and ASIC has hardware which sends and detects all of the necessary signals for FAX communication.

It can be controlled by writing commands from the CPU (IC604: inside ASIC).

This CODEC and ASIC also sends DTMF signals, generates a call tone (from the speaker), and detects a busy tone and dial tones.

Overview of Facsimile Communication Procedures (ITU-T Recommendation):

#### 1. ON CCITT (International Telegraph and Telephone Consultative Committee)

The No. XIV Group of ITU-T, one of the four permanent organizations of the International Telecommunications Union (ITU), investigates and make recommendations on international standards for facsimiles.

#### 2. Definition of Each Group

- Group I (G1)

Official A-4 size documents without using formats which reduce the band width of a signal are sent over telephone lines. Determined in 1968.

Transmission for about 6 minutes at a scanning line density of 3.85 lines/mm.

- Group II (G2)

Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes.

Methods to suppress redundancy are not used.

Determined in 1976.

- Group III (G3)

Method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent within about one minute.

Determined in 1980.

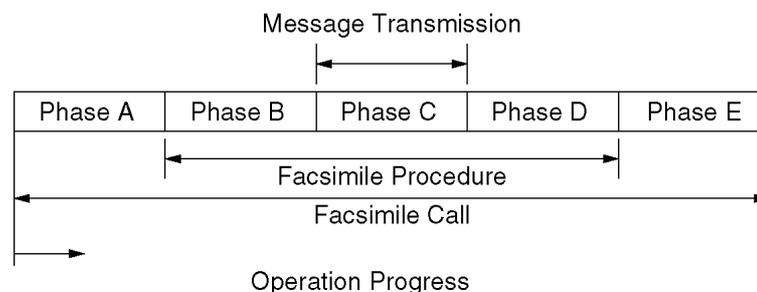
- Group IV (G4)

Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible.

The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.

#### 3. Facsimile Call Time Series

As shown in the following diagram, the facsimile call time series is divided into five phases.



##### Phase A : Call setting

Call setting can be manual/automatic.

##### Phase B : Pre-message procedure

Phase B is a pre-processing procedure and sequence for confirming the status of the terminal, transmission route, etc., and for terminal control. It implements terminal preparation status, determines and displays terminal constants, confirms

synchronization status, etc. and prepares for transmission of facsimile messages.

**Phase C : Message transmission**

Phase C is the procedure for the transmitting facsimile messages.

**Phase D : Post message procedure**

Phase D is the procedure for confirming that the message is completed and received. For continuous transmission, phase B or phase C is repeated for transmission.

**Phase E : Call retrieval**

Phase E is the procedure for call retrieval, that is for circuit disconnection.

**4. Concerning Transmission Time**

$$\text{Transmission Time} = \text{Control Time} + \text{Image Transmission Time} + \text{Hold Time}$$

Transmission time consists of the following.

**Control time:**

This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

**Image transmission time:**

This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

**Hold time:**

This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

**5. Facsimile Standards**

Item	Telephone Network Facsimile
	G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29)
Transmission Speed	300 bps (Control Signal) 2400, 4800, 7200, 9600, 12000, 14400 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension: MH Mode 2 dimension: MR Mode (K=2.4)
Resolution	Main Scan: 8 pel/mm Sub Scan: 3.85, 7.71/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value: 10, 20 Can be recognized in 40ms.

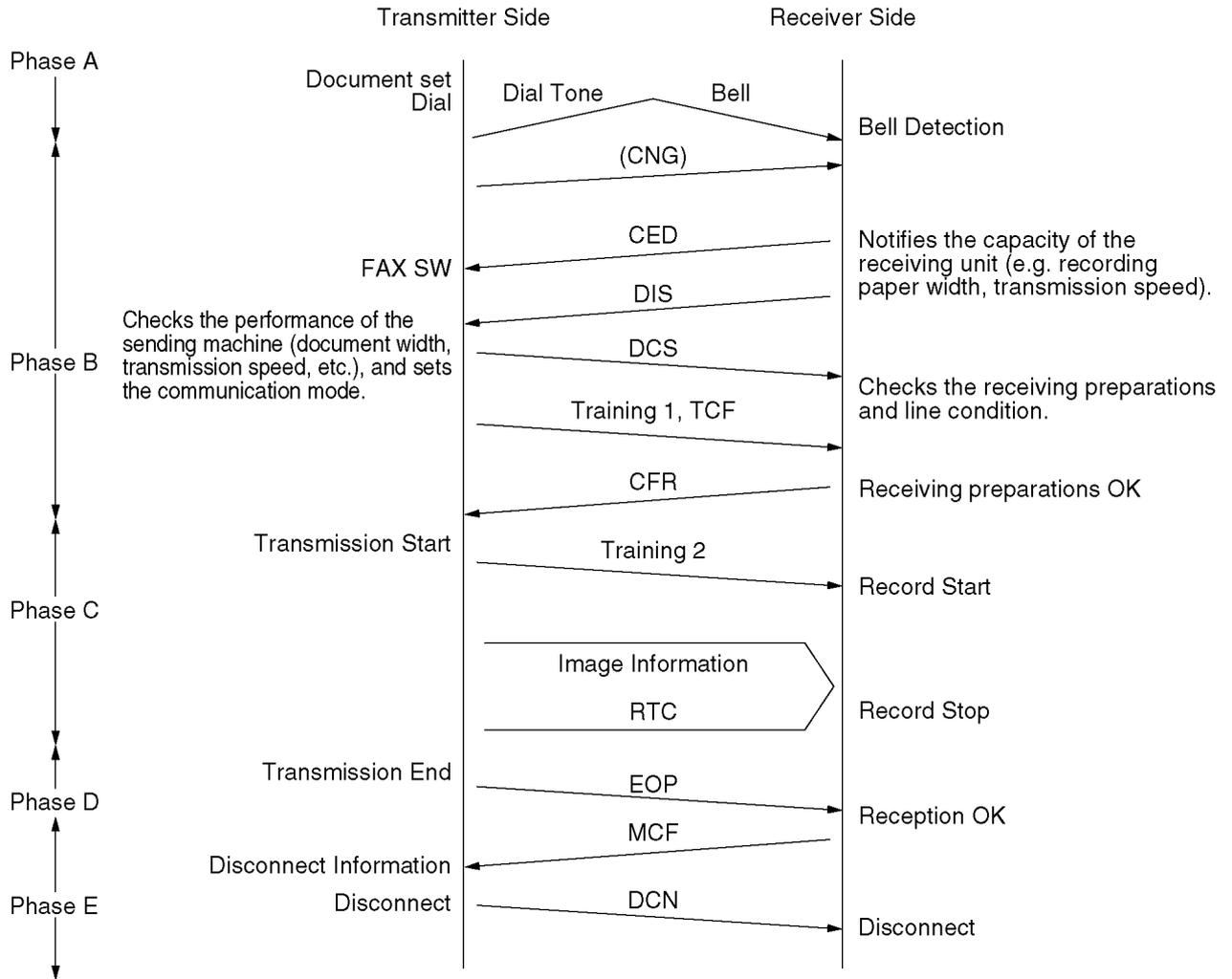
**6. Explanation of Communication and Compression Technology**

**a. G3 Communication Signals (T. 30 Binary Process)**

For G3 Facsimile communication, this is the procedure for exchanging control signals between the sending and receiving machines both before and after transmission of image signals.

Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1.

An example of a binary process in G3 communication is shown below.



**Explanation of Signals**

Control signals are comprised mainly of 8-bit identification signals and the data signals added to them. Data signals are added to DIS and DCS signals.

Signal.....DIS (Digital Identification Signal)

Identification Signal Format.....00000001

**Function:**

Notifies the capacity of the receiving unit. The added data signals are as follows.

Signal.....DCS (Digital Command Signal)

Identification Signal Format.....X1000001

**Example**

(Some models do not support the following items.):

Bit No.	DIS/DTC	DCS
1	Transmitter --- T.2 operation	
2	Receiver --- T.2 operation	Receiver --- T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter --- T.3 operation	
5	Receiver --- T.3 operation	Receiver --- T.3 operation
6	Reserved for future T.3 operation features	
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	
10	Receiver --- T.4 operation	Receiver --- T.4 operation

Bit No.	DIS/DTC	DCS
11, 12, 13, 14 0, 0, 0, 0 0, 1, 0, 0 1, 0, 0, 0 1, 1, 0, 0 0, 0, 1, 0 0, 1, 1, 0 1, 0, 1, 0 1, 1, 1, 0 0, 0, 0, 1 0, 1, 0, 1 1, 0, 0, 1 1, 1, 0, 1 0, 0, 1, 1 0, 1, 1, 1 1, 0, 1, 1 1, 1, 1, 1	Data signaling rate V.27 ter fall back mode V.27 ter V.29 V.27 ter and V.29 Not used Reserved Not used V.27 ter and V.29 and V.33 Not used Reserved Not used V.27 ter and V.29 and V.33 and V.17 Not used Reserved Not used Reserved Not used Reserved	Data signaling rate 2400 bit/s, V.27 ter 4800 bit/s, V.27 ter 9600 bit/s, V.29 7200 bit/s, V.29 14400 bit/s, V.33 12000 bit/s, V.33 Reserved 14400 bit/s, V.17 12000 bit/s, V.17 9600 bit/s, V.17 7200 bit/s, V.17 Reserved Reserved Reserved Reserved
15	R8x7.7 lines/mm and/or 200x200 pels/25.4mm	R8x7.7 lines/mm and/or 200x200 pels/25.4mm
16	Two-dimensional coding capability	Two-dimensional coding capability
17, 18 (0, 0) (0, 1) (1, 0) (1, 1)	Recording width capabilities 1728 picture elements along scan line length of 215 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% 2432 picture elements along scan line length of 303 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% Invalid	Recording width 1728 picture elements along scan line length of 215 mm ± 1% 2432 picture elements along scan line length of 303 mm ± 1%  2048 picture elements along scan line length of 255 mm ± 1% Invalid
19, 20 (0, 0) (0, 1) (1, 0) (1, 1)	Maximum recording length capability A4 (297 mm) Unlimited A4 (297 mm) and B4 (364 mm) Invalid	Maximum recording length A4 (297 mm) Unlimited B4 (364 mm) Invalid
21, 22, 23 (0, 0, 0) (0, 0, 1) (0, 1, 0) (1, 0, 0) (0, 1, 1) (1, 1, 0) (1, 0, 1) (1, 1, 1)	Minimum scan line time capability of the receiver 20 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 5 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$ 20 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$ 0 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	Minimum scan line time 20 ms 40 ms 10 ms 5 ms    0 ms
24	Extend field	Extend field
25	2400 bit/s handshaking	2400 bit/s handshaking
26	Uncompressed mode	Uncompressed mode
27	Error correction mode	Error correction mode
28	Set to "0".	Frame size 0 = 256 octets 1 = 64 octets
29	Error limiting mode	Error limiting mode
30	Reserved for G4 capability on PSTN	Reserved for G4 capability on PSTN
31	T.6 coding capability	T.6 coding enabled
32	Extend field	Extend field
33 (0) (1)	Validity of bits 17, 18 Bits 17, 18 are valid Bits 17, 18 are invalid	Recording width Recording width indicated by bits 17, 18 Recording width indicated by this field bit information
34	Recording width capability 1216 picture elements along scan line length of 151 ± mm 1%	Middle 1216 elements of 1728 picture elements
35	Recording width capability 864 picture elements along scan line length of 107 ± mm 1%	Middle 864 elements of 1728 picture elements
36	Recording width capability 1728 picture elements along scan line length of 151 ± mm 1%	Invalid
37	Recording width capability 1728 picture elements along scan line length of 107 ± mm 1%	Invalid
38	Reserved for future recording width capability.	
39	Reserved for future recording width capability.	
40	Extend field	Extend field
41	R8x15.4 lines/mm	R8x15.4 lines/mm
42	300x300 pels/25.4 mm	300x300 pels/25.4 mm
43	R16x15.4 lines/mm and/or 400x400 pels/25.4 mm	R16x15.4 lines/mm and/or 400x400 pels/25.4 mm

Bit No.	DIS/DTC	DCS
44	Inch based resolution preferred	Resolution type selection "0": metric based resolution "1": inch based resolution
45	Metric based resolution preferred	Don't care
46	Minimum scan line time capability for higher resolutions "0": $T_{15.4} = T_{7.7}$ "1": $T_{15.4} = 1/2T_{7.7}$	Don't care
47	Selective Polling capability	Set to "0".
48	Extend field	Extend field

Note 1 - Standard facsimile units conforming to T.2 must have the following capability: Index of cooperation (IOC)=264.

Note 2 - Standard facsimile units conforming to T.3 must have the following capability: Index of cooperation (IOC)=264.

Note 3 - Standard facsimile units conforming to T.4 must have the following capability: Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	_____	A fixed pattern is transmitted to the receiving side at a speed (2400 to 14400 bps) designated by DCS, and the receiving side optimizes the automatic equalizer, etc., according to this signal.
TCF (Training Check)	_____	Sends 0 continuously for 1.5 seconds at the same speed as the training signal.
CFR (Confirmation to Receive)	X0100001	Notifies the sending side that TCF has been properly received. If TCF is not properly received, FTT (Failure To Train) X0100010 is relayed to the sender. The sender then reduces the transmission speed by one stage and initiates training once again.
Training 2	_____	Used for reconfirming the receiving side like training 1.
Image Signal	Refer to the next page.	_____
RTC (Return to Control)	_____	Sends 12 bits (0..01 x 6 times) to the receiver at the same speed as the image signal and notifies completion of transmission of the first sheet.
EOP (End of Procedure)	X1110100	End of one communication
MCF (Message Confirmation)	X0110001	End of 1 page reception
DCN (Disconnect)	X1011111	Phase E starts.
MPS (Multi-Page Signal)	X1110010	Completion of transmission of 1 page. If there are still more documents to be sent, they are output instead of EOP. After MCF reception, the sender transmits an image signal of the second sheet.
PRI-EOP (Procedural Interrupt-EOP)	X1111100	If there is an operator call from the sender, it is output after RTC.
PIP (Procedural Interrupt Positive)	X0110101	This is output when an operator call is received.

#### b. Redundancy Compression Process Coding Mode

This unit uses one-dimensional MH format.

Modified Huffman (MH) Code		
Run length	Code for White Line	Code for Black Line
0	00110101	000011011
1	000111	010
2	0111	11
3	1000	10
4	1011	011
5	1100	0011
6	1110	0010
7	1111	00011
8	10011	000101
9	10100	000100
10	00111	0000100
11	01000	0000101
12	001000	0000111
13	000011	00000100
14	110100	00000111
15	110101	000011000
16	101010	0000010111
17	101011	0000011000
18	0100111	0000001000

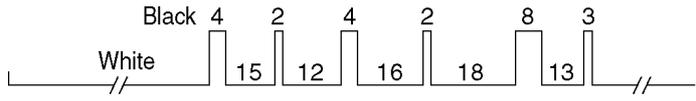
(a) Document



(b) Part of document



(c) Run length and image signals equivalent to (b)



(d) Codification of (c) according to MH formula

00110111101010 (White 400)    011 (Black 4)    110101 (White 15)    11 (Black 2)    001000 (White 12)    011 (Black 4)    101010 (White 16)

11 (Black 2)    0100111 (White 18)    000101 (Black 8)    000011 (White 13)    10 (Black 3)

- (c) Total bit number before MH codification (497 bit)
- (d) Total bit number after MH codification (63 bit)

## 8.6. NCU SECTION

### 8.6.1. GENERAL

This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RY202), bell detection circuit, TAM interface circuit, line amplifier and side tone circuits and a multiplexer.

### 8.6.2. EXT. TEL. LINE RELAY (RY202)

#### 1. Circuit Operation

Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.

{ IC610 (149) High Level→CN616 (18) High Level} →CN202 (11) High Level→Q210 ON→RY202 ON→(make)

{ IC610 (145) Low Level→CN616 (22) Low Level} →CN202 (7) Low Level→PC203 ON→Q211 ON→(make)

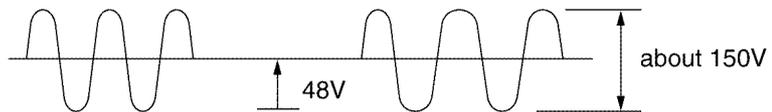
### 8.6.3. BELL DETECTION CIRCUIT

#### 1. Circuit Operation

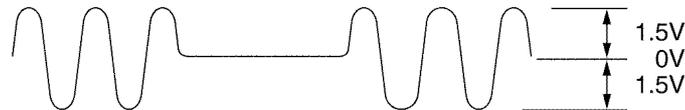
The signal waveform for each point is indicated below. The signal (low level section) input to pin T1 of ASIC IC604 on the digital board is read by ASIC and judged as a bell.

TEL LINE→PC204 (1, 2 - 4)→IC604 (T1)

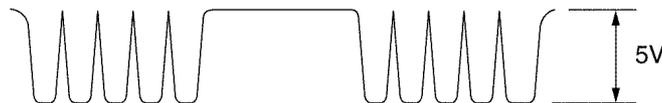
Between the Tip and Ring  
from the telephone line



Between PC204 (1) and (2)



PC204 (4)/ASIC IC604 (T1)



### 8.6.4. LINE AMPLIFIER AND SIDE TONE CIRCUIT

#### 1. Circuit Operation

The reception signal output from the line transformer T201 is input to pin (6) of IC207 via R269, C285 and then the signal is amplified at pin (7) of IC207 and sent to the reception system at 1.7dB.

The transmission signal goes through C243, R276 and enters IC207-pin (2), where the signal is amplified to about 27.2dB. Then, it is output from pin (1) of IC207 and transmitted to T201 via C312, R293 and R292. Without a side tone circuit, the transmission signal will return to the reception amplifier via R269, C285. When the side tone circuit is active, the signal output from IC207 pin (1) passes through C312, R291, C306, R284, R280, C300, R267 and C288 and goes into the amplifier IC207 pin (5). This circuit is used to cancel the transmission return signal.

The TX signal is output to the circuit analog the route from the IC207 1 pin→C312→R293→R292→T201→TEL LINE.

However, if balance is lost in the bridge, a voltage occurs between the IC207 6 pin and 5 pin and a side tone results, because the balance cannot be maintained completely at all frequencies in the audio range some side tone always occur.

## 8.6.5. REMOTE FAX ACTIVATION CIRCUIT

### 1. Function

Another telephone connected to same line activates the unit to the FAX mode by using a DTMF signal.

### 2. Signal Path

Refer to **CHECK SHEET** (P.137).

## 8.6.6. TAM INTERFACE CIRCUIT

This circuit is to switch between FAX receiving and the external TAM's message recording automatically. This circuit consists of a transformer, multiplexer, amplifier.

For details, please refer **TAM INTERFACE SECTION** (P.230).

## 8.7. ITS (Integrated telephone System) and MONITOR SECTION

### 8.7.1. GENERAL

The general ITS operation is performed by the special IC201 which has a handset circuit. The alarm tone, the key tone, and the beep are output from the ASIC IC604 (digital board).

#### 8.7.1.1. TELEPHONE MONITOR

##### 1. Function

This is the function when you are not holding the handset and can hear the caller's voice from the line.

##### 2. Circuit Operation

(Telephone Monitor Signal Path)

Signals received from the telephone line are output through at the speaker via the following path.

##### 3. Signal Path

Refer to **CHECK SHEET**.

#### 8.7.1.2. HANDSET CIRCUIT

##### 1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

##### 2. Signal Path (Transmission signal)

Refer to **CHECK SHEET**.

##### 3. Signal path (Reception signal)

Refer to **CHECK SHEET**.

#### 8.7.1.3. MONITOR CIRCUIT

##### 1. Function

This circuit monitors various tones, such as (1) DTMF tone, (2) Alarm/Beep/Key tone/Bell.

##### 2. Signal Path

###### a. DTMF MONITOR

(Speaker Operation)

Refer to **CHECK SHEET**.

(Handset Operation)

Refer to **CHECK SHEET**.

###### b. ALARM/BEEP/KEY TONE/BELL

Refer to **CHECK SHEET**.

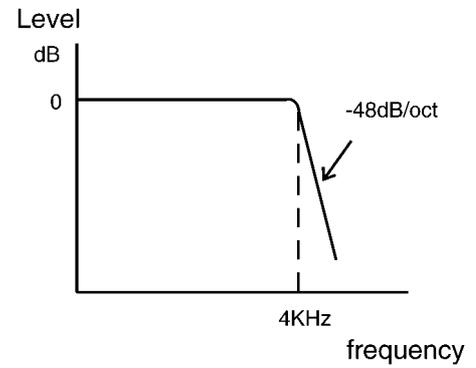
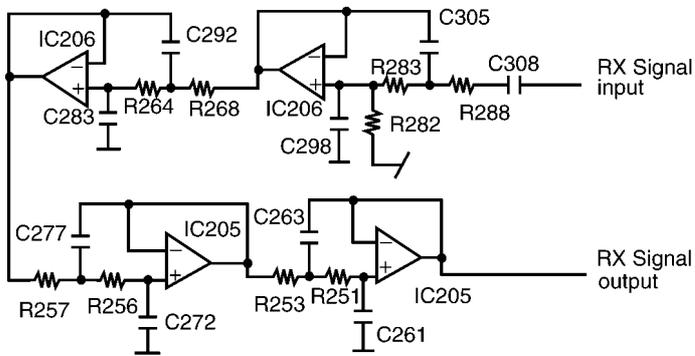
### 8.7.1.4. LOW PASS FILTER

#### 1. Function

This low pass filter attenuates the 16-kHz account signal from the commutator to eliminate influence on the conversation and communication.

#### 2. Circuit Operation

This low pass filter is an eight-order active filter, and the cutoff frequency is approximately 4 kHz.



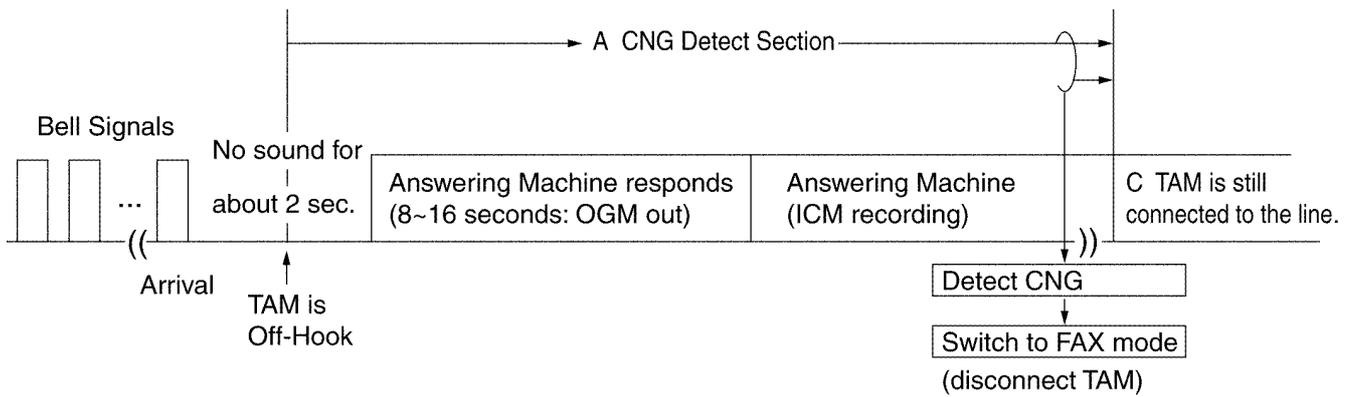
### 8.7.1.5. TAM INTERFACE SECTION

#### 1. Function

If EXT. TAM is selected in the Receive mode, the unit receives documents for FAX calls or the external TAM records a voice message automatically.

#### To switch between the answering machine and facsimile in the EXT. TAM Mode.

#	EXTERNAL TAM OPERATION	UNIT OPERATION
1	When the bell signal rings as many times as the number memorized into the connected answering machine (TAM), the answering machine is connected to the line and the answering message is sent out to the line. (OGM out for 8 ~ 16 sec.)	The length of the answering message should be 8~16 seconds. While the message is being played, the unit starts to detect the CNG signal.(A) If the unit detects the CNG signal, it will switch to FAX receiving and disconnect the external TAM automatically.
2	After sending the OGM, the answering machine starts to record the message of the other party (ICM recording).	If the unit detect the CNG signal or the unit will disconnect the line. (C)



#### 2. Circuit Operation

The TAM INTERFACE circuit consists of CNG signal from the other party's detection circuit and RY202 (to separate EXT. TAM).

##### a. CNG signal detection circuit

The CNG signal from the other party's FAX is detected in ASIC IC604 via CODEC(IC609) (digital board).

(Signal path)

Refer to **CHECK SHEET**(P.137).

##### b. Remote receiving

This is the parallel-connected DTMF signal for the TEL or EXT.TEL mode between T and R. When the other party is a FAX, the unit switches to FAX receiving.

(Signal Path)

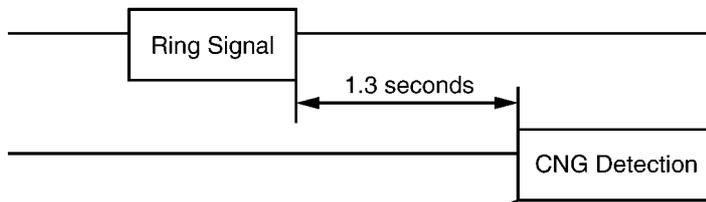
Detects the DTMF signal in the MODEM.

**USER-FRIENDLY RECEPTION FOR PARALLEL-CONNECTED TELEPHONE**

When CNG signal is transmitted from the other party's phone after a parallel-connected phone or an external phone goes OFF-Hook while the telephone is ringing, the machine automatically starts receiving FAX.

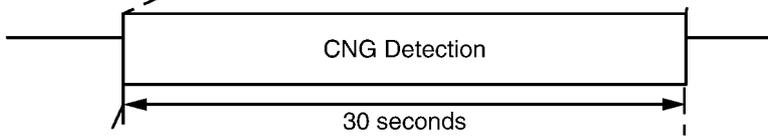
**1. Starts CNG detection.**

a) 1.3 seconds after the ring signal goes off

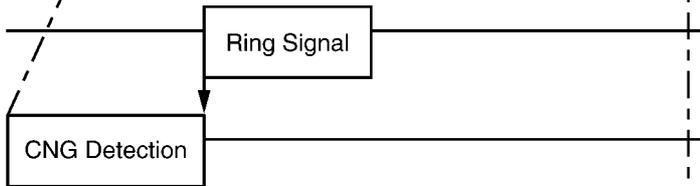


**2. Completes CNG detection.**

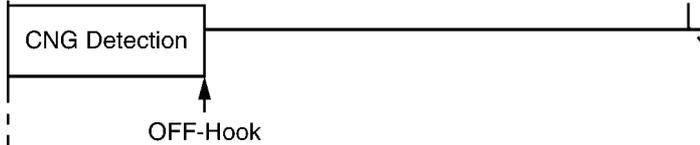
a) 30 seconds after CNG detection starts



b) While the telephone is ringing

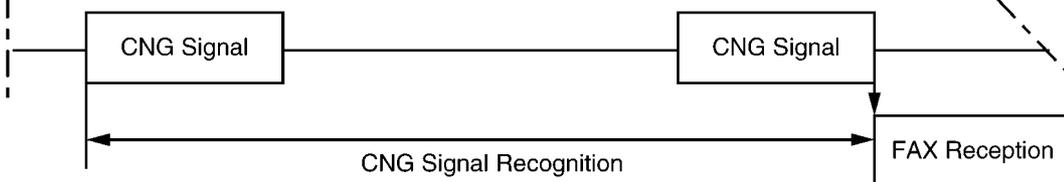


c) When the unit goes off-hook



**3. Recognizes CNG signal.**

a) When the unit detects the CNG signal twice consecutively, it starts receiving FAX.



## 8.8. TEST CHART

### 8.8.1. ITU-T No.1 TEST CHART



## THE SLEREXE COMPANY LIMITED

SAPORS LANE - BOOLE - DORSET - BH 25 8 ER

TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC

18th January, 1972.

Dr. P.N. Cundall,  
Mining Surveys Ltd.,  
Holroyd Road,  
Reading,  
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

Probably you have uses for this facility in your organisation.

Yours sincerely,

P.J. CROSS  
Group Leader - Facsimile Research

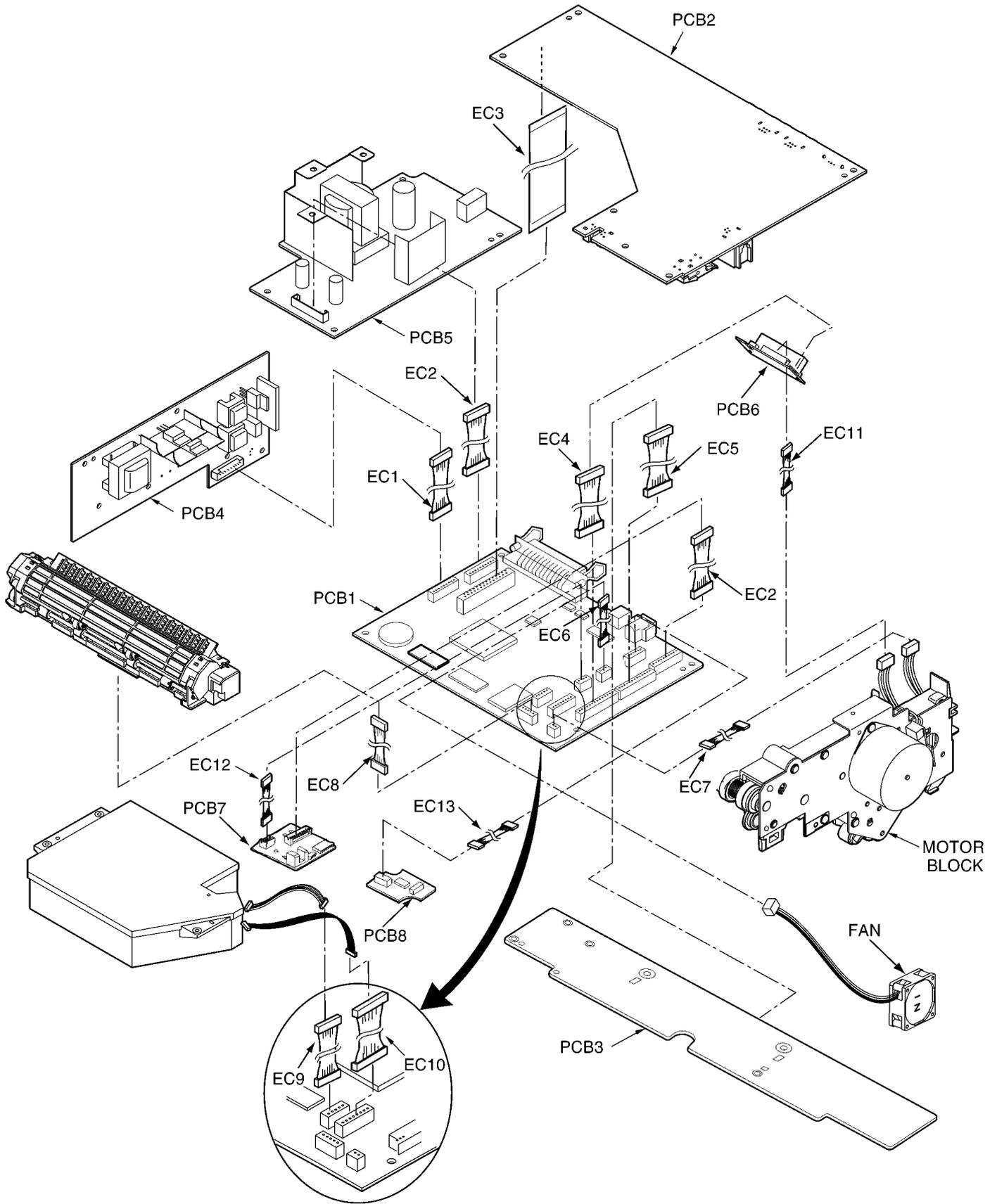
8.8.2. ITU-T No.2 TEST CHART

CCITT N° 2: Mire pour test de Transmission

The chart includes several key elements:

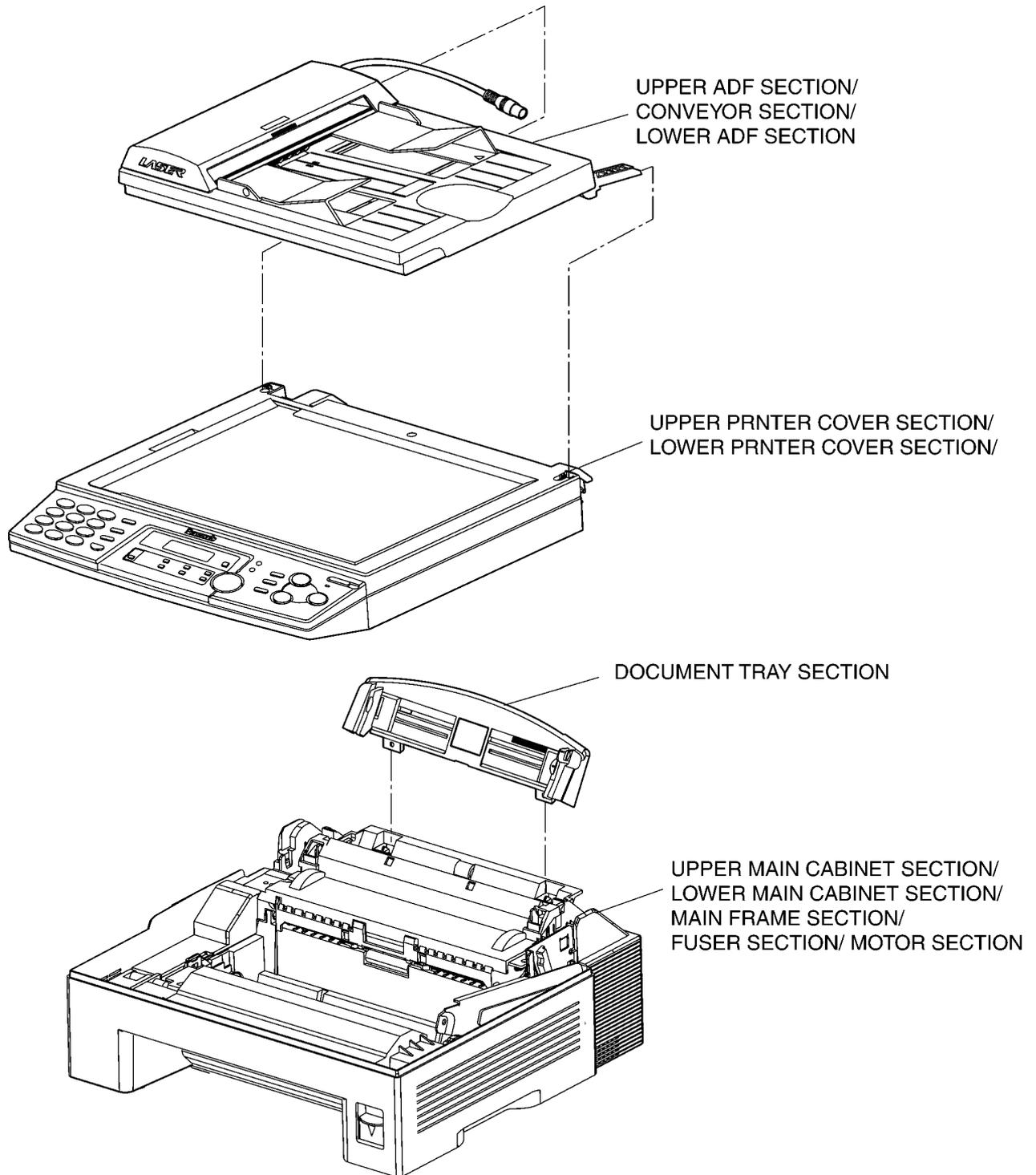
- Scales:** Vertical scales on the left and right sides, and horizontal scales at the top and bottom, all marked with values 0, 200, 400, 600, 800, 1000.
- Patterns:** A central circular target (2.6) with concentric circles and a crosshair. Two solid black circles (2.5) are positioned on either side of the target. A series of vertical bars (2.2) spans the top of the chart.
- Text Groups:**
  - 2.3:** Transmission Test Group n° I Character UNIVERS SIZE 8 (English)
  - 2.4:** Transmission Test Group n° II Character UNIVERS SIZE 10 (English)
  - 2.5:** Transmission Test Group n° III Character ENGLISH-TIMES SIZE 8 (English)
  - 2.6:** Transmission Test Group n° IV Character ENGLISH-TIMES SIZE 10 (English)
  - 2.7:** Similar to 2.3 and 2.4, but in French.
  - 2.8:** Similar to 2.5 and 2.6, but in Spanish.
  - 2.9:** Similar to 2.3 and 2.4, but in Chinese.
  - 2.10:** Similar to 2.5 and 2.6, but in Arabic.
  - 2.11:** Similar to 2.3 and 2.4, but in Russian.
  - 2.12:** Chinese text for transmission test groups 13.75P and 10.5P.
  - 2.13:** Arabic text for transmission test groups 13.75P and 10.5P.
  - 2.14:** Russian text for transmission test groups 13.75P and 10.5P.
  - 2.15:** Russian text for transmission test groups 10 and 10.
- Character Sets:** Various alphanumeric and special character sets are provided for each group, including English, French, Spanish, Chinese, and Arabic characters.

# 9 FIXTURES AND TOOLS

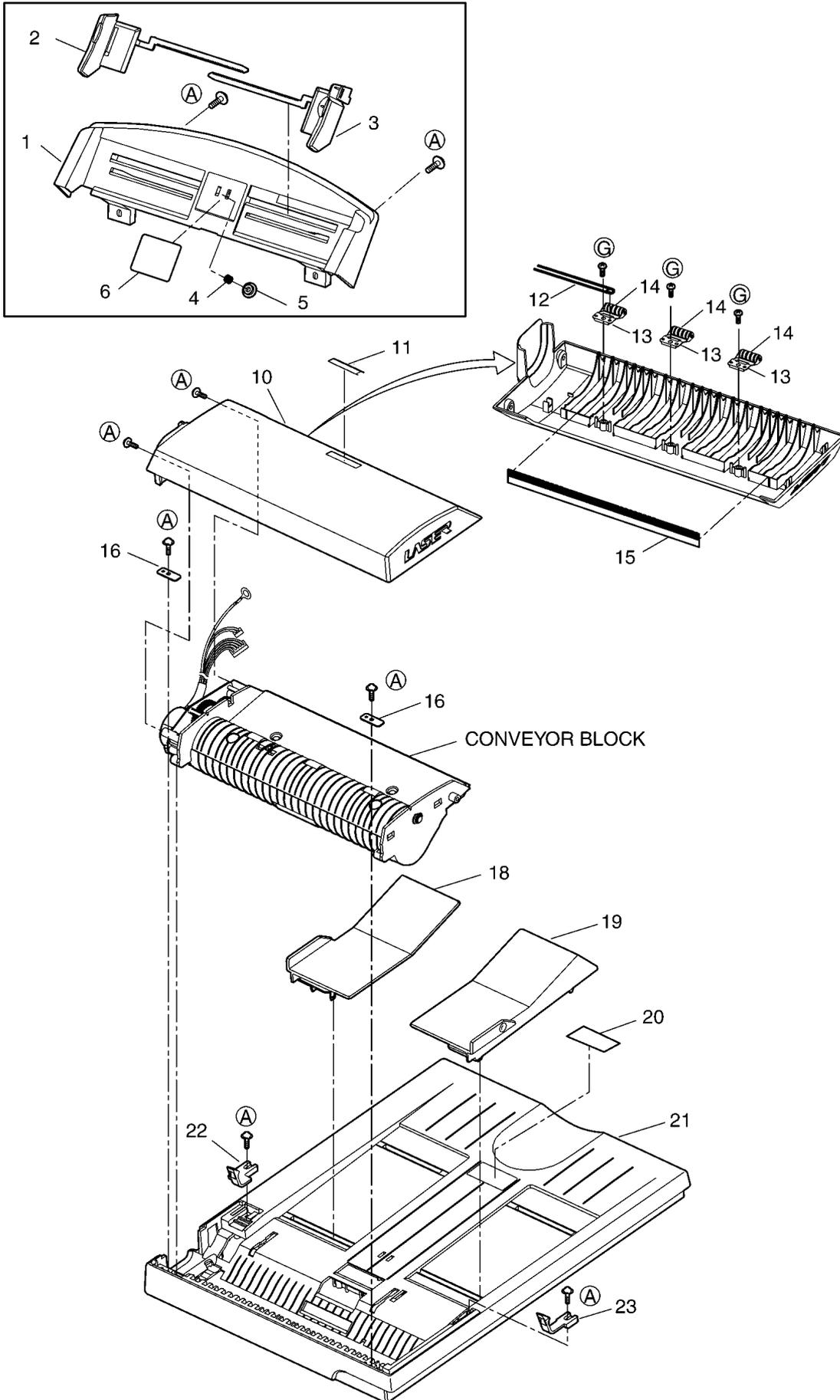


# 10 CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

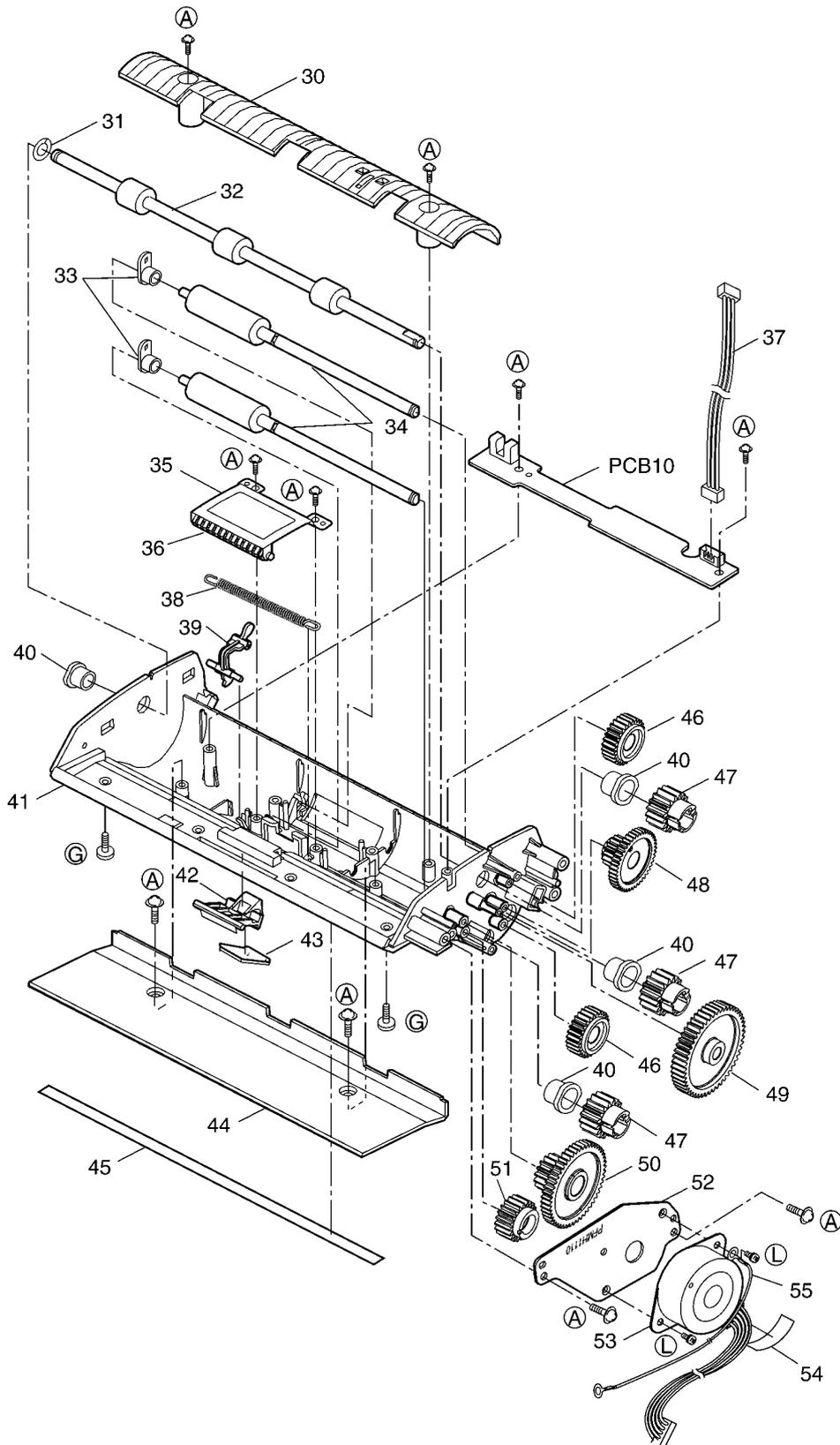
## 10.1. GENERAL SECTION



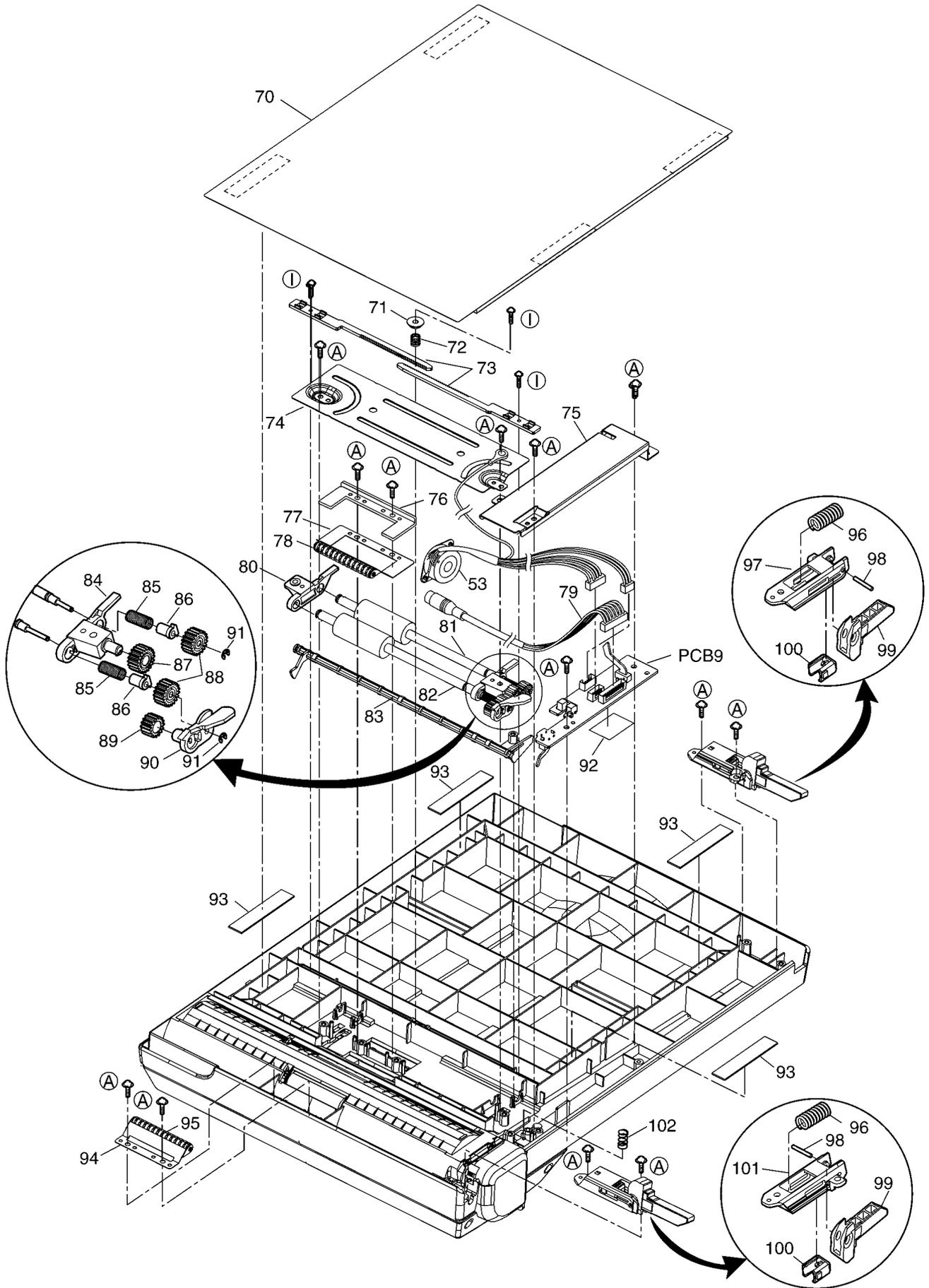
## 10.2. DOCUMENT TRAY BLOCK AND UPPER ADF SECTION



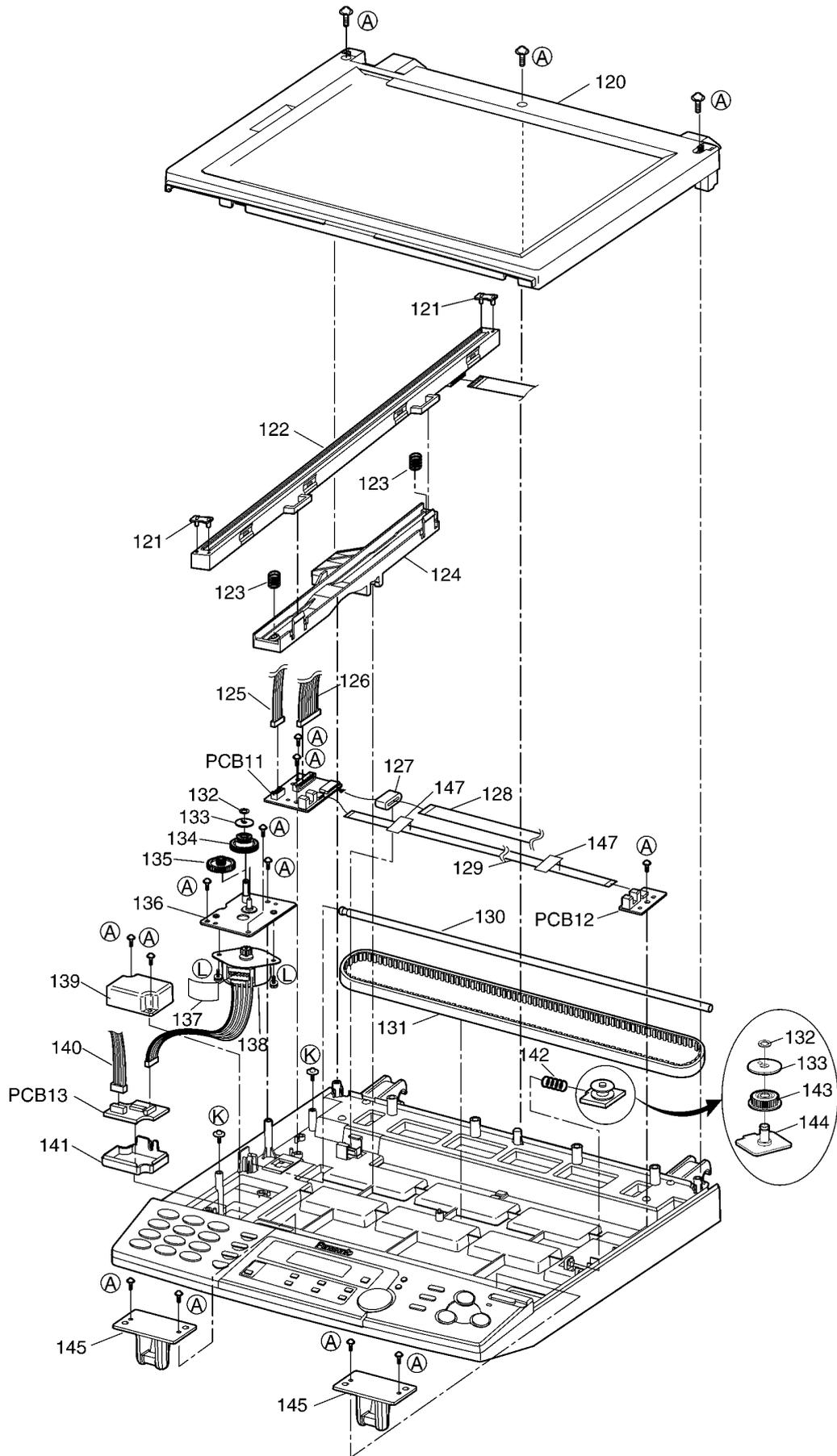
### 10.3. CONVERYOR BLOCK SECTION



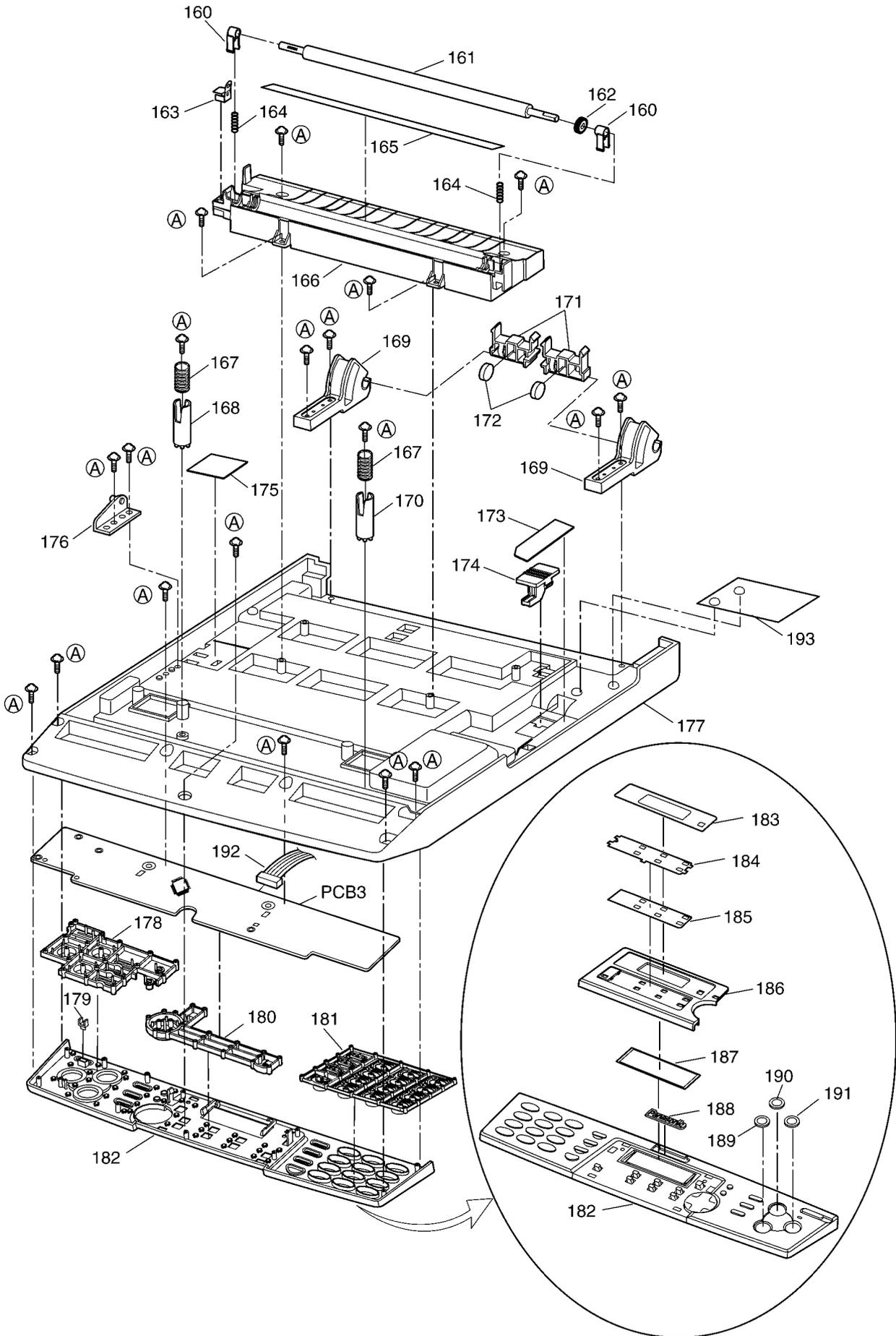
# 10.4. LOWER ADF SECTION



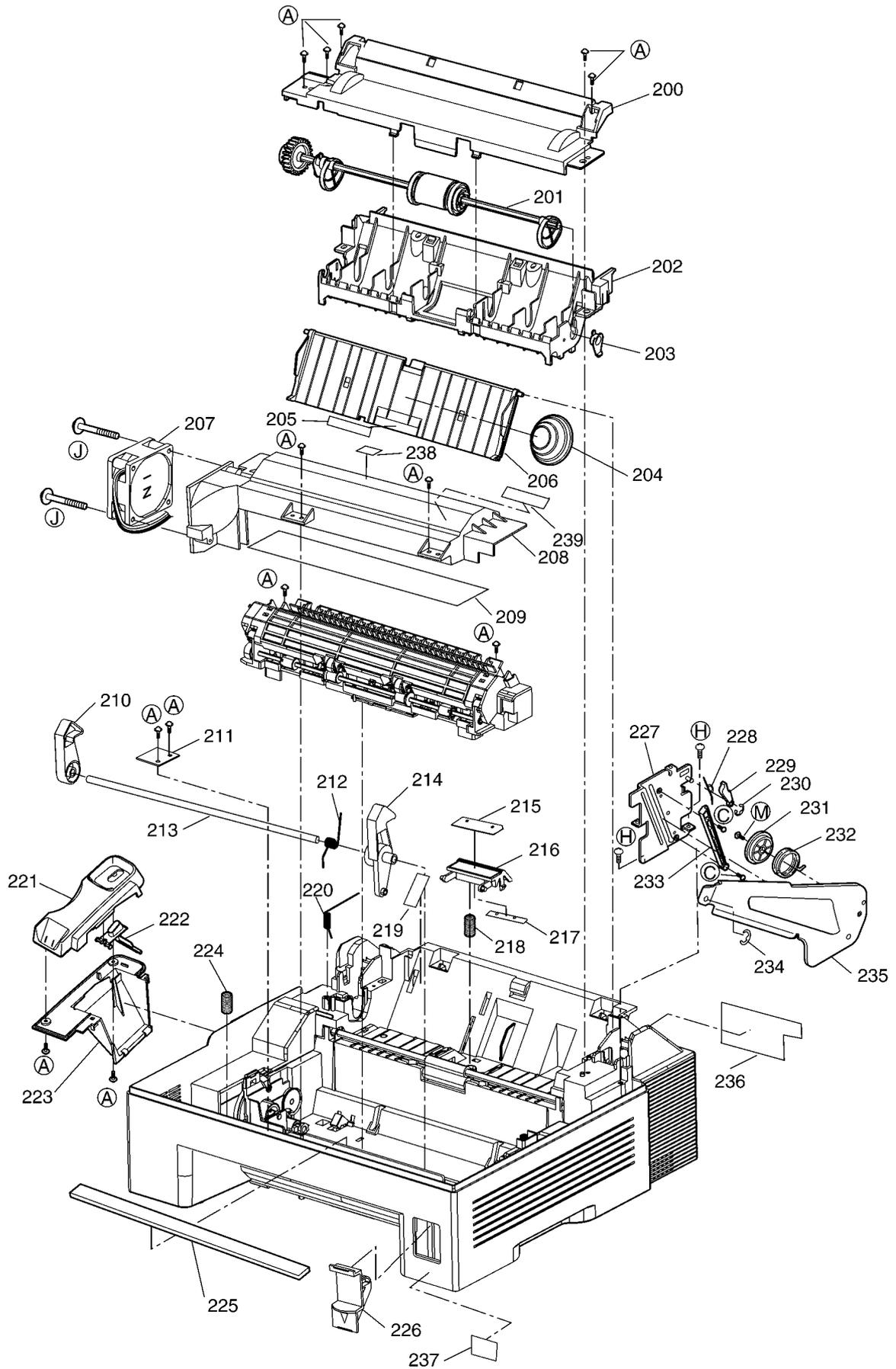
### 10.5. UPPER PRINTER COVER SECTION



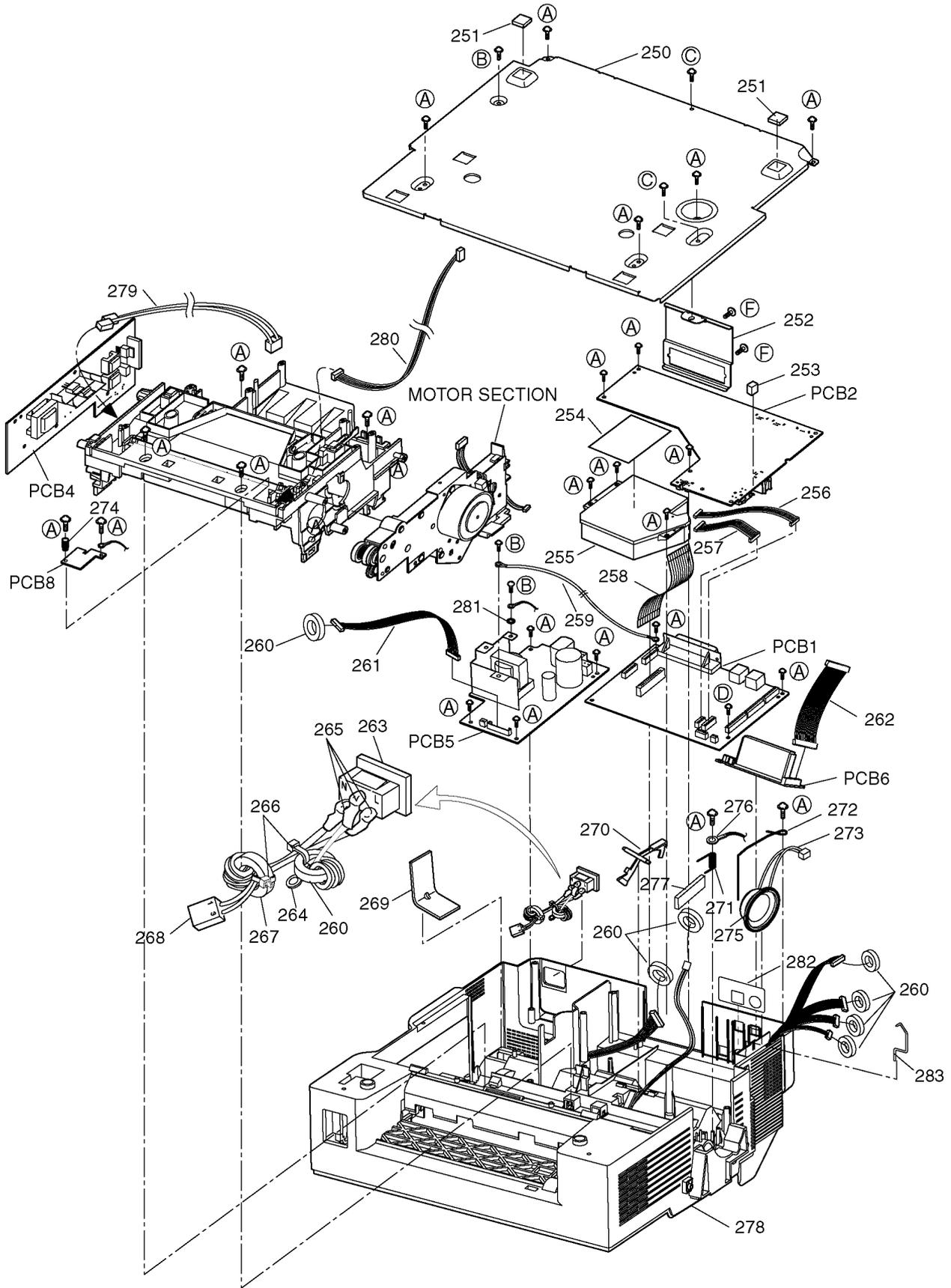
# 10.6. LOWER PRINTER SECTION



### 10.7. UPPER MAIN CABINET SECTION

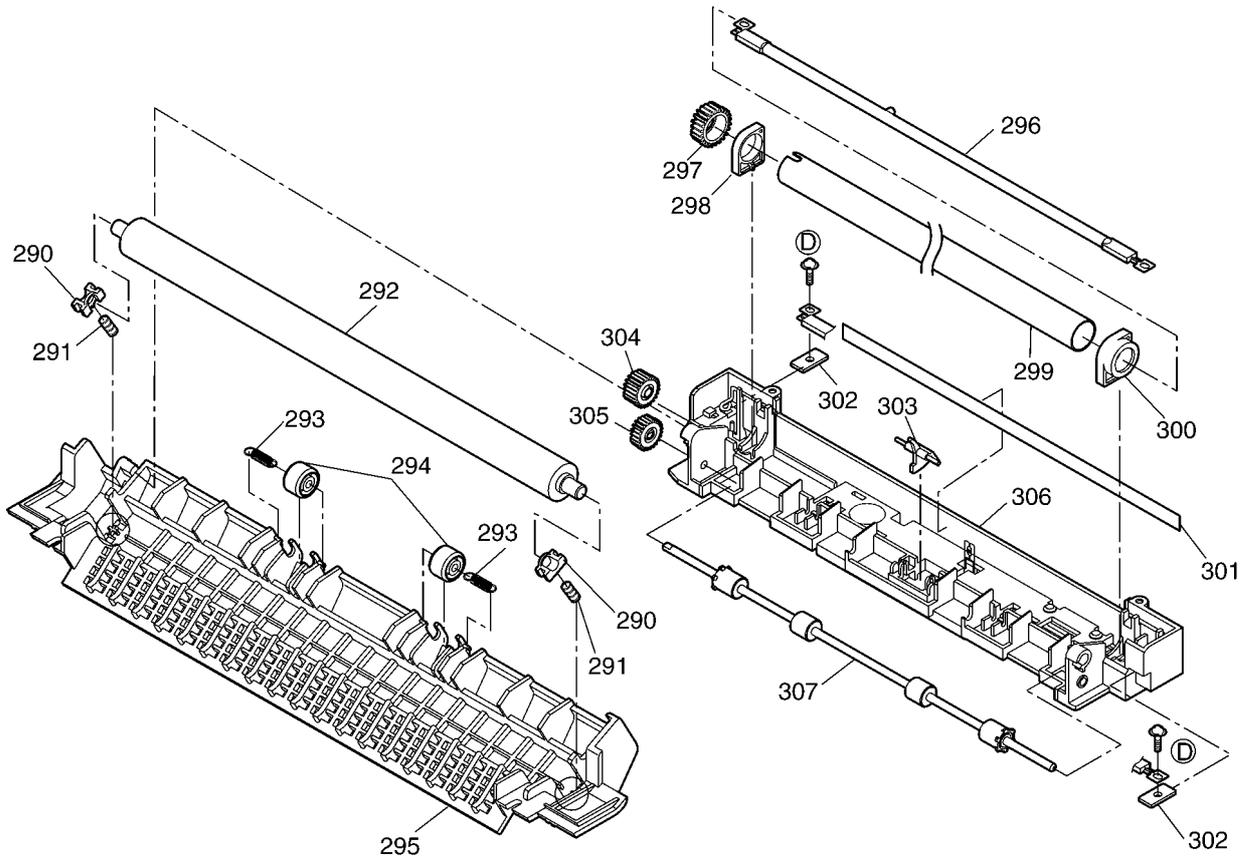


# 10.8. LOWER MAIN CABINET SECTION

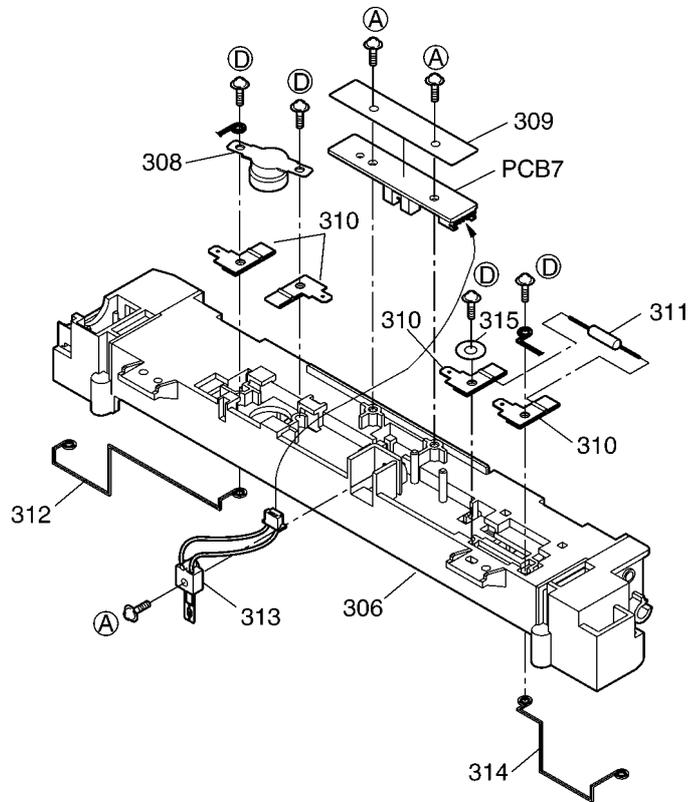


# 10.9. FUSER SECTION

(Top view)

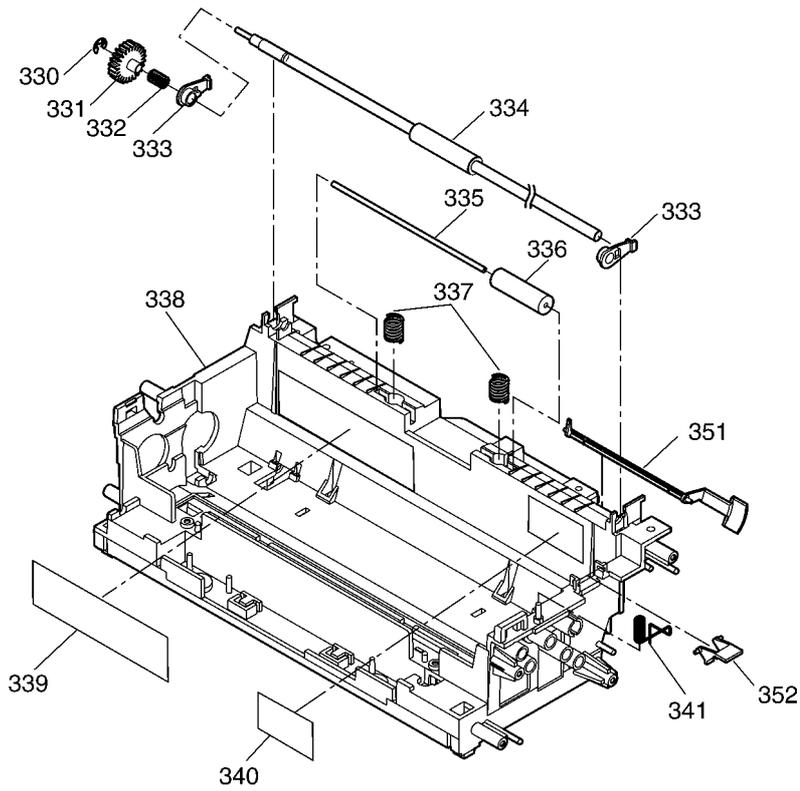


(Bottom view)

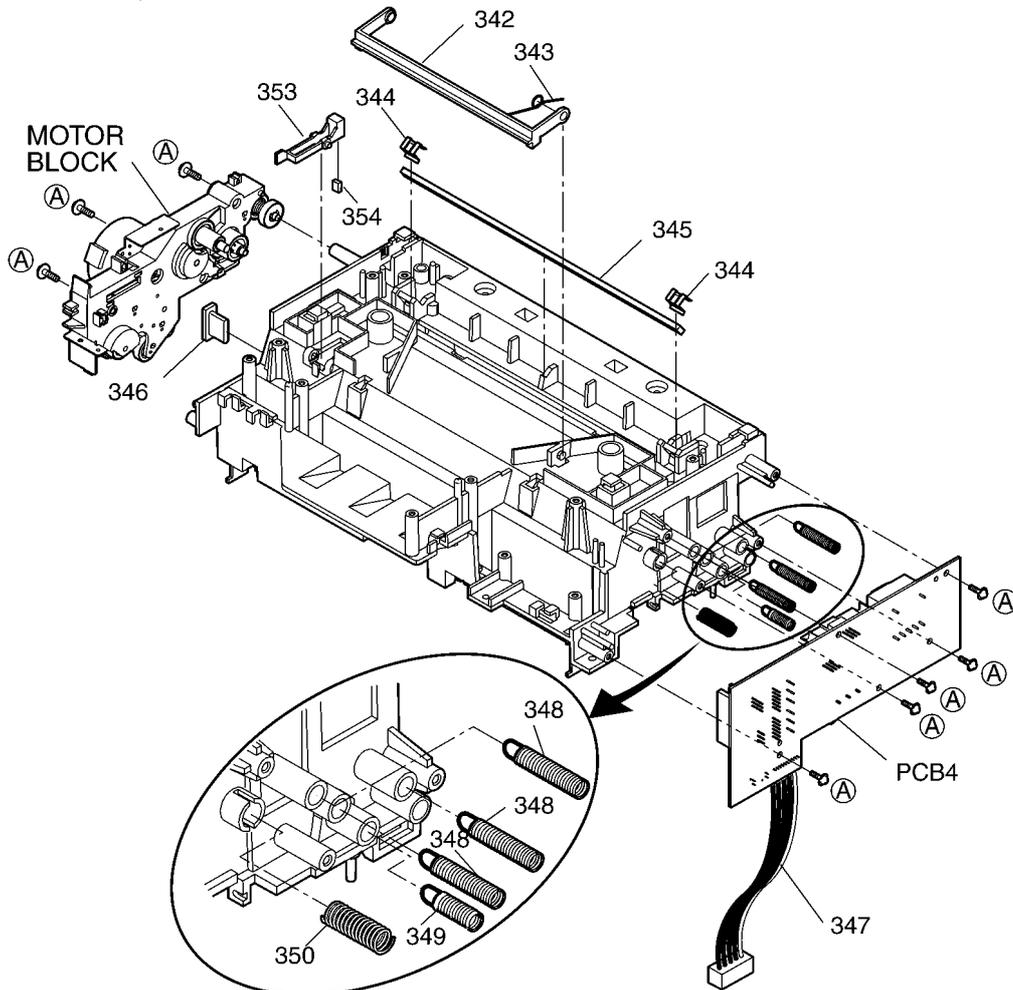


# 10.10. MAIN FRAME SECTION

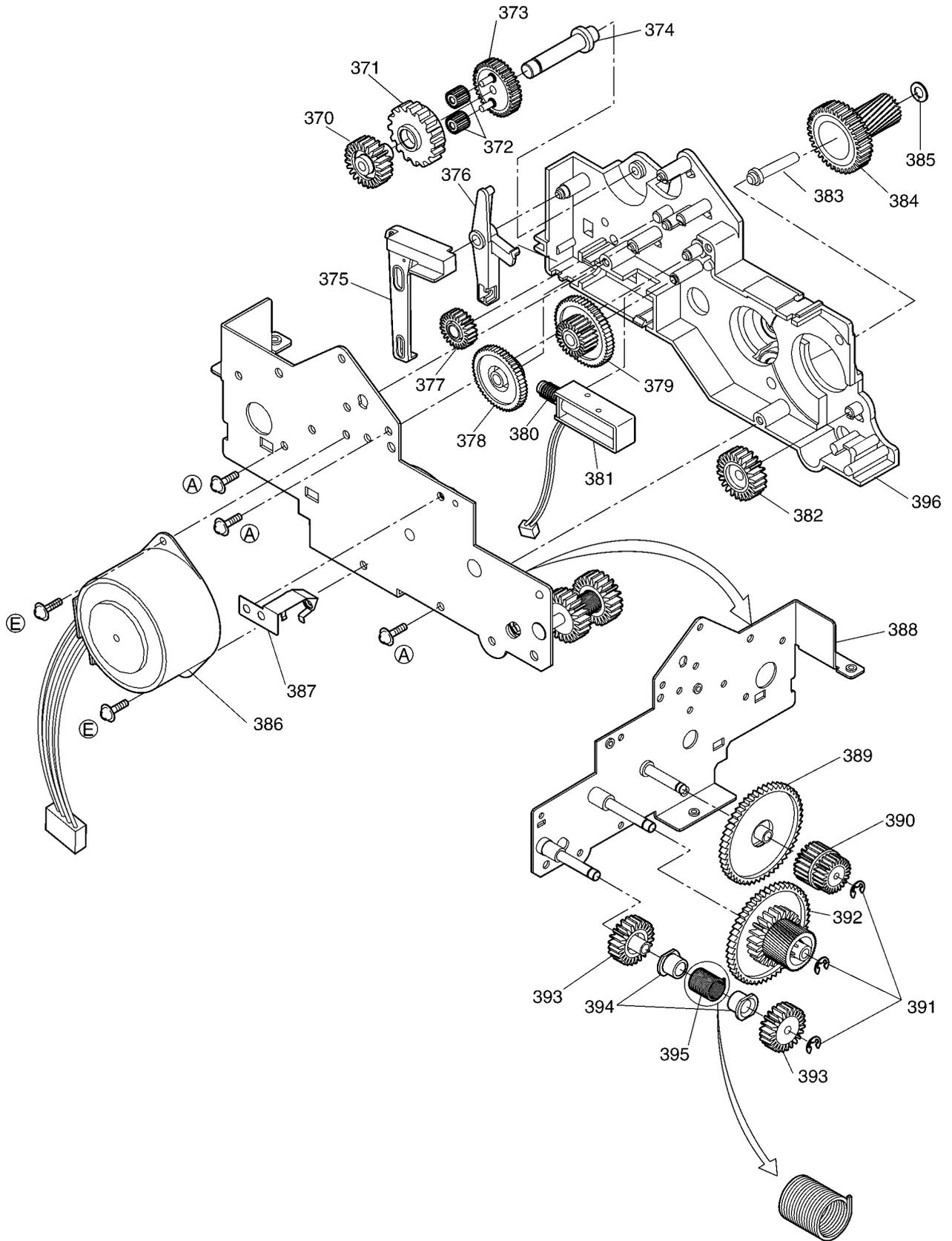
(Top view)



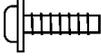
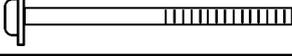
(Bottom view)



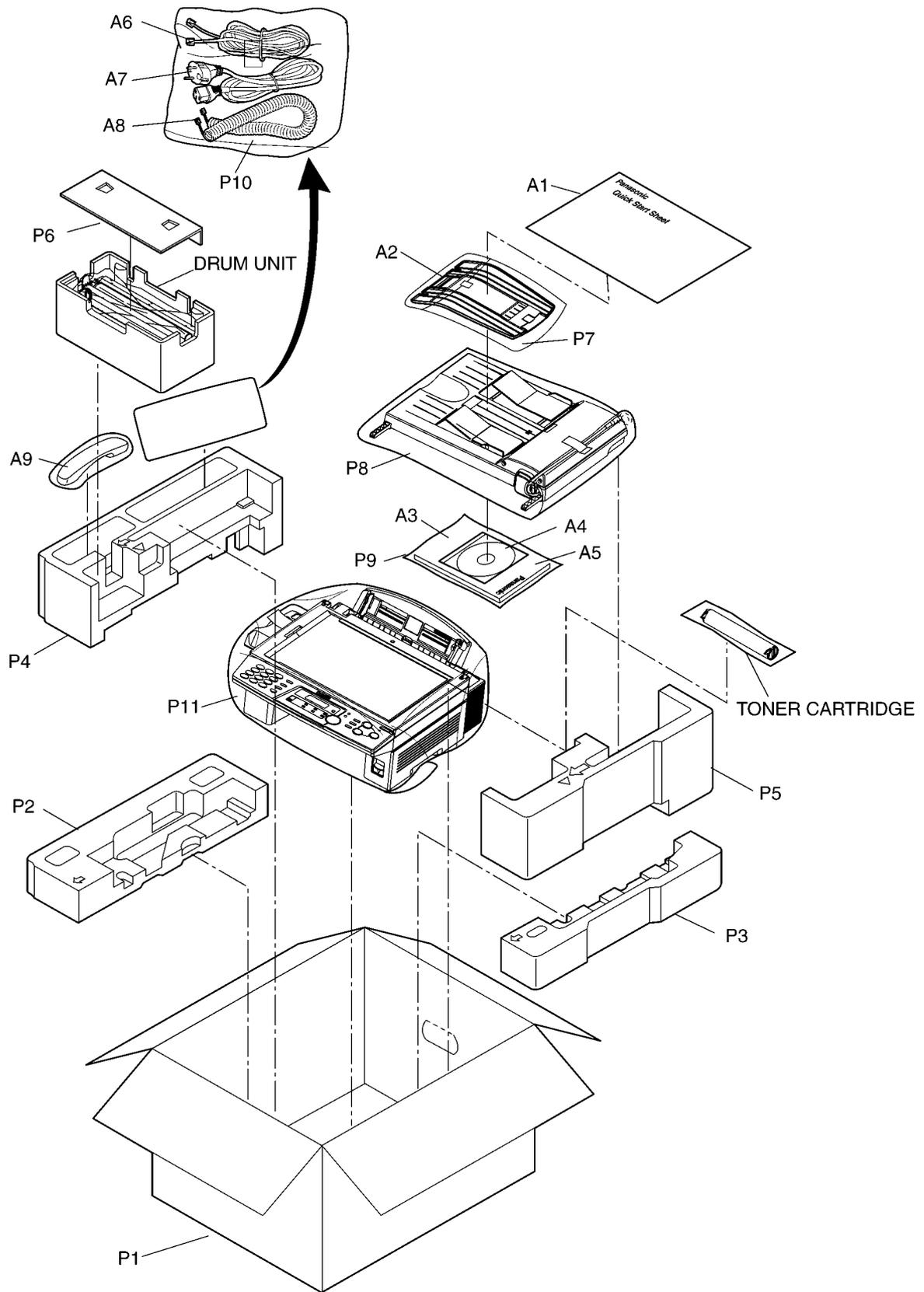
# 10.11. MOTOR SECTION



## 10.12. ACTUAL SIZE OF SCREWS AND WASHER

	Parts No.	Illustration
Ⓐ	XTW3+S10P	
Ⓑ	XSB4+6	
Ⓒ	XTW3+6L	
Ⓓ	XYC3+FF8C	
Ⓔ	XTW3+5LFZ	
Ⓕ	XSN3+6L	
Ⓖ	XTB3+8G	
Ⓗ	XTB4+10G	
Ⓘ	XTW2+R8PFN	
Ⓙ	XTW3+S35P	
Ⓚ	XTW3+W8P	
Ⓛ	XYN3+C6	
Ⓜ	XYN3+F6	

# 11 ACCESSORIES AND PACKING MATERIALS



# 12 REPLACEMENT PARTS LIST

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.

After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms ( $\Omega$ ) k=1000 $\Omega$ , M=1000k $\Omega$

All capacitors are in MICRO FARADS ( $\mu$ F) P= $\mu$ F

\*Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQ4R:Chip	ERX:Metal Film ERG:Metal Oxide ERO:Metal Film	PQRD:Carbon PQRQ:Fuse ERF:Wire Wound
--------------------------------------	---	--

Wattege

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W
---------------	---------------	---------------	------	------	------

ECFD:Semi-Conductor ECQS:Styrol PQCBX,ECUV:Chip ECMS:Mica	ECCD,ECKD,PQCBC,PQVP : Ceramic ECQM,ECQV,ECQE,ECQU,ECQB : Polyester ECEA,ECSZ,ECOS : Electrolytic ECQP : Polypropylene
--	---

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H : 50V 2A : 100V 2E : 250V 2H : 500V	05 : 50V 1 : 100V 2 : 200V	0F : 3.15V 1A : 10V 1V : 35V 0J : 6.3V	0J : 6.3V 1A : 10V 1C : 16V 1E,25 : 25V	1V : 35V 50,1H : 50V 1J : 63V 2A : 100V	

## 12.1. CABINET AND ELECTRICAL PARTS

### 12.1.1. DOCUMENT TRAY BLOCK AND UPPER ADF SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
1	PFKS1063Y1	TRAY	PS-HB
2	PFKR1023Z1	GUIDE,PAPER SLIDE L	ABS-HB
3	PFKR1024Z1	GUIDE,PAPER SLIDE R	ABS-HB
4	PFUS1222Z	SPRING,SLIDER	
5	PFDG1015Y	GEAR,SLIDER	POM-MB
6	PFQT1852Z	LABEL,MULTI TRAY	
10	PFKV1051X1	COVER	PS-HB
11	PFQT1850Z	LABEL,PULL TO OPEN	

Ref. No.	Part No.	Part Name & Description	Remarks
12	PFUS1351Z	SPRING,EXIT EARTH	
13	PFUS1343Z	SPRING,EXIT PINCH ROLLER	
14	PFDR1030Z	ROLLER,EXIT PINCH	POM-HB
15	PFJV1002Z	HOLDER	
16	PFMH1111Z	METAL PART/ADF PIVOT	
17	Not used		
18	PFKR1021Y1	GUIDE,DOCUMENT R	ABS-HB
19	PFKR1022Y1	GUIDE,DOCUMENT L	ABS-HB
20	PFQT1838Z	LABEL,FACE DOWN	
21	PFKV1050V1	COVER, TOP	PS-HB
22	PFDE1177Z	LEVER,LOCK ADF R	POM-HB
23	PFDE1178Z	LEVER,LOCK ADF L	POM-HB

### 12.1.2. CONVEYOR SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
30	PFUE1012Z1	COVER,CONVEYOR EXIT	PS-HB
31	PFNPD052080	SPACER	
32	PFDN1056Z	ROLLER,ROLLER EXIT	
33	PFDJ1056Z	SPACER,DRIVE ROLLER2	
34	PFDN1055Z	ROLLER,DRIVE	POM-HB
35	PFUS1340Z	LEAF SPRING,FEED PINCH	
36	PFDR1029Z	ROLLER,FEED PINCH	POM-HB
37	PFJS03Q28Z	CONNECTOR	
38	PFUS1348Z	COIL SPRING,SEPA. RUBBER	
39	PFDE1175Y	LEVER,DOCUMENT TOP	POM-HB
40	PFDJ1055Z	SPACER,DRIVE ROLLER1	POM-HB
41	PFUE1011Y1	FRAME,VONVEYOR MAIN	PS-HB
42	PFHR1297Z	GUIDE,SEPARATION RUBBER	ABS-HB
43	PFHG1128Z	RUBBER PART,SEPARATION	
44	PFKV1052Z1	COVER,DOCUMENT FEED	PS-HB
45	PFHX1512Z	METAL PART,WHITE STANDARD	
46	PFDG1250Z	GEAR,IDLER DRIVE	
47	PFDG1249Z	GEAR,DRIVE ROLLER	POM-HB
48	PFDG1247Z	GEAR	POM-HB
49	PFDG1246Z	GEAR	POM-HB
50	PFDG1248Z	GEAR	POM-HB
51	PFDG1251Z	GEAR,IDLER SEPARATION	POM-HB
52	PFMH1110Z	METAL PART,ADF MOTOR	
53	35S1S15DGNE	DC MOTOR	
54	PFHX1399Z	COVER,MOTOR	
55	WLK22TG17M3M	CONNECTOR,EARTH ADF	

### 12.1.3. LOWER ADF SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
70	PFHX1511Y	COVER,WHITE PLATE	
71	PFDG1015Y	GEAR,SLIDER	POM-HB
72	PFUS1222Z	COIL SPRING,SLIDER	
73	PFHR1298Z	RACK,GUIDE DOCUMENT	ABS-HB
74	PFUV1044Z	COVER,FEED MODULE	PS-V0
75	PFUV1043Z	COVER,GEAR	PS-V0
76	PFMH1117Z	METAL PART	
77	PFUS1341Z	LEAF SPRING	
78	PFDR1029Z	ROLLER,FEED PINCH	POM-HB
79	PFJS11Q27Z	CONNECTOR	
80	PFDJ1054Z	SPACER	POM-HB
81	PFDN1053Z	ROLLER	
82	PFDN1054Z	ROLLER,SEPARATION	
83	PFDE1174Z	LEVER/DOCUMENT	POM-HB
84	PFDJ1053Z	SPACER	POM-HB
85	PQUS10038Z	COIL SPRING	
86	PFDE1163Z	SPACER	POM-HB
87	PFDG1244Z	GEAR,IDLER FEED	POM-HB
88	PFDG1243Z	GEAR,FEED ROLLER	POM-HB
89	PFDG1245Z	GEAR	POM-HB
90	PFDE1173Z	ARM	POM-HB
91	XUC2FY	RETAINING RING	

Ref. No.	Part No.	Part Name & Description	Remarks
92	PFHX1519Z	COVER	
93	PFHE1068Z	TAPE,MAGIC TAPE	
94	PFUS1342Y	LEAF SPRING	
95	PFDR1029Z	ROLLER	POM-HB
96	PFUS1350Z	COIL SPRING	
97	PFHR1289Z	CHASSIS	POM-HB
98	XPJ2A14VW	KEY-PIN	
99	PFHR1291Z	CAM	POM-HB
100	PFHR1292Z	PLASTIC PART	POM-HB
101	PFHR1290Z	CHASSIS	POM-HB
102	PFUS1349Z	COIL SPRING	

#### 12.1.4. UPPER PRINTER COVER SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
120	PFYCFLB751M	TRANSPARENT PLATE	
121	PFHR1293Z	SPACER,CIS	POM-HB
122	N2GABE000001	PHOTO ELECTRIC TRANSDUCER	
123	PFUS1344Z	SPRING,CIS	
124	PFDC1001Y	GUIDE,CARRIAGE	PS-HB
125	PFJS04Q29Z	CONNECTOR,4P	
126	PFJS10Q31Z	CONNECTOR,10P	
127	PFLBK002	CORE	
128	PFJE1025Z	LEAD WIRE,FFC	
129	PFJE1026Z	LEAD WIRE,FFC	
130	PFDF1072Z	SHAFT,CARRIAGE	
131	PFDV1001Z	FLAT BELT,TIMING	
132	PFNPD031054C	WASHER	
133	PFDE1170Z	SPACER	POM-HB
134	PFDE1168Z	PULLEY	POM-HB
135	PFDG1238Z	GEAR,CARRIAGE	POM-HB
136	PFMH1103Z	METAL PART	
137	PFHX1399Z	COVER,MOTOR	
138	35S1S15DGNE	DC MOTOR	
139	PFUV1045Z	COVER	PS-V0
140	PFJS06Q30Y	CONNECTOR	
141	PFUV1046Z	COVER	PS-V0
142	PFUS1345Z	SPRING,TENTION	
143	PFDE1169Z	PULLEY,TENTION	POM-HB
144	PFMH1104Z	METAL PART	
145	PFDE1167Z	METAL PART,F.B. LOCK	POM-HB
146	Not used		
147	PFHX1566Z	COVER,SHEET	

#### 12.1.5. LOWER PRINTER COVER SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
160	PFDJ1042Z	SPACER,TRANSFER ROLLER	POM-HB
161	PFDS1003Y	ROLLER,TRANSFER	
162	PFDG1211Z	GEAR,TRANSFER ROLLER	POM-HB
163	PFMH1090Y	METAL PART	
164	PFUS1269Y	SPRING,TRANSFER ROLLER	
165	PFHX1518Z	PLASTIC PART	
166	PFUG1012X	GUIDE,MIDDLE	PS-HB
167	PFUS1347Z	SPRING,POP UP	
168	PFHR1301Z	COVER	PS-HB
169	PFUE1013Z	ARM,FLAT BED	PS-HB
170	PFHR1302Z	COVER	PS-HB
171	PFME1001Z	SPACER,DAMPER	POM-HB
172	PFHG1094Z	RUBBER PART,DAMPER	
173	PFQT1868Z	LABEL,CARRIAGE STOPPER	
174	PFHR1294Z1	COVER,CARRIAGE	ABS-HB
175	PFHX1539Z	COVER,PROTECTION TONER	
176	PFMH1105Z	METAL PART,PIVOT LOCK	
177	PFKM1086Y1	CABINET BODY,FLAT BED	PS-HB
178	PFBX1156Z2	PUSH BUTTON,FUNCTION	
179	PFGE1005Z1	PANEL,LIGHT	
180	PFBX1157Z1	PUSH BUTTON,NAVI	
181	PFBX1155Z2	PUSH BUTTON,DIAL	ABS-HB
182	PFGG1200K2	GRILLE,OPERATION	PS-HB

Ref. No.	Part No.	Part Name & Description	Remarks
183	PFGP1207X	PANEL,LCD	
184	PFGV1012Z	COVER/TEL.NO.CARD	
185	PFGD1047Z	CARD,TEL.NO.	
186	PFGG1074Z2	GRILLE,SUB	PS-HB
187	PFGV1016Z	COVER,LCD PROTECT	
188	PFGB1003Z3	BADGE	PS-HB
189	PFGX1004Z	PUSH BUTTON,STOP	
190	PFGX1002Z	PUSH BUTTON,COPY	
191	PFGX1003Z	PUSH BUTTON,FAX	
192	PFJS11Q32Y	CONNECTOR	
193	PFHP1105V	SHEET,CARRIAGE STOPPER	

#### 12.1.6. UPPER MAIN CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
200	PFKV1049Z1	COVER,PICK UP ROLLER	PS-HB
201	PFZRFLB751M	ROLLER,PICKUP ASS'Y	
202	PFUG1011Z1	GUIDE,PICK UP ROLLER	PS-HB
203	PFDJ1038Z	SPACER	POM-HB
204	PFUS1276Y	COIL SPRING	
205	PFHG1105Z	RUBBER PART	
206	PFKS1047Y1	TRAY	PC+ABS-HB
207	L6FAKEEK0010	MOTOR,FAN	
208	PFUE1010Y	AIR DUCT	
209	PFHX1538Z	COVER,SHEET	
210	PFDE1166Z	LEVER	POM-MB
211	PFMH1109Z	METAL PART,LOCK LEVER	
212	PFUS1360Z	SPRING,OPEN BUTTON	
213	PFDF1073Z	SHAFT,LOCK LEVER	
214	PFDE1165Z	LEVER	POM-HB
215	PFHG1127Z	RUBBER,SEPARATION PAPER	
216	PFHR1296X	GUIDE,SEPARATION PAPER	ABS-HB
217	PFHX1510Y	SPACER,SEPARATION PAPER	
218	PFUS1362X	SPRING,PAPER SEPARATION	
219	PFHX1545Z	COVER	
220	PFUS1279Y	SPRING,FEED EARTH	
221	PFKM1066Z1	CABINET,H/S CRADLE UPPER	PS-HB
222	PFBH1015Z1	BUTTON,HOOK	ABS-HB
223	PFKF1047Y1	CABINET,H/S CRADLE LOWER	PS-HB
224	PFUS1323Z	SPRING,FUSER EARTH	
225	PF0G1004Z	GLASS	
226	PFBC1083Z1	BUTTON,OPEN	ABS-HB
227	PFMH1107Z	METAL PART	
228	PFUS1359Y	SPRING,DOOR LOCK SPACER	
229	PFHR1300Y	SPACER,DOOR LOCK	POM-HB
230	XUC3FY	RETAINING RING	
231	PFDG1237X	GEAR,DAMPER	POM-HB
232	PFUS1346Y	COIL SPRING,DAMPER	
233	PFHR1288Y	DAMPER	POM-HB
234	XUC4FY	RETAINING RING	
235	PFMH1106Y	METAL PART	
236	PFGT2182Z-M	NAME PLATE	
237	PFQT1871Z	LABEL,OPEN	
238	PFQT1741Z	LABEL,HOT CAUTION	
239	PFQT1971Z	LABEL,PAPER REMOVAL	

#### 12.1.7. LOWER MAIN CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
250	PFMD1058Z	METAL PART	
251	PFHA1005Z	RUBBER,LEG	
252	PFMH1108Z	METAL PART	
253	PFHG1119Z	SPACER	
254	PFQT1719Z	LABEL,LSU CAUTION	⚠
255	LPA1602K	LSU	⚠
256	PFJS05P06Z	CONNECTOR,5P	
257	PFJS08P05Z	CONNECTOR,8P	
258	PFJE1023Z	LEAD WIRE,FFC	
259	WLL20YB20M4M	CONNECTOR (LEAD WIRE)	
260	PQLB1E1	INSULATOR	

Ref. No.	Part No.	Part Name & Description	Remarks
261	PFJS10P11Z	CONNECTOR,10P	
262	PFJS14P09Z	CONNECTOR,14P	
263	PFJP03S04Z	AC INLET	S △
264	WLR18YK26CM4	LEAD WIRE	S
265	PQMX10010Z	COVER	
266	PQHR945Z	BAND	
267	KR06TT251508	INSULATOR	
268	PFJS02P02Z	CONNECTOR,2P	
269	PFHX1508Z	TORSION SPRING	
270	PFDE1149Y	LEVER,PAPER EMPTY	ABS-HB
271	PFUS1278Z	SPRING,PICK UP EARTH	
272	PFUS1268Z	SPRING,SPEAKER	
273	PFJS02P12Z	CONNECTOR,2P	
274	PFUS1320Z	COIL SPRING	
275	PFAS50P003Z	SPEAKER	S
276	WLL20YG20M3M	CONNECTOR	
277	PFHG1138Z	RUBBER PART	
278	PFKM1087X1	CABINET BODY	
279	PFJS02P07Y	CONNECTOR,2P	
280	PFJS05P04Y	CONNECTOR,5P	
281	XWC4B	WASHER	
282	PFHX1553Z	COVER, EARTH SHEET	
283	PFUS1395Z	SPRING,SPEAKER EARTH	

### 12.1.8. FUSER SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
290	PFDJ1037Z	SPACER,PRESSURE ROLLER	PPS-V0
291	PFUS1263Z	COIL SPRING,PRESSURE	
292	PFDS1007Z	ROLLER,PRESSURE	
293	PFUS1264Z	COIL SPRING,EJECT	
294	PFDR1017Z	ROLLER,SUPPORT ROLLER	POM-MB
295	PFUA1032X	CHASSIS	PBT+ABS+GF30%-V0
296	A4DP7K000001	HEATER,230 FUSER	△
297	PFDG1196Z	GEAR	PPS+GF30%-V0
298	PFDJ1036Z	SPACER,HEAT ROLLER B	PPS-V0
299	PFDS1004Z	ROLLER	
300	PFDJ1035Z	SPACER,HEAT ROLLER A	PPS-V0
301	PFHX1442Y	COVER	
302	PFMH1085Z	METAL PART	
303	PFDE1142X	LEVER,EXIT SENSOR	PBT-V0
304	PFDG1198Z	GEAR,EJECT IDLER	POM-HB
305	PFDG1197Z	GEAR,EJECT	POM-HB
306	PFUA1031W	CHASSIS	PBT+ABS+GF30%-V0
307	PFDR1016Z	ROLLER,EJECT	
308	PFTA1001Z	THERMOSTAT	△
309	PFHX1437Z	COVER	
310	PFJT1014Y	TERMINAL	
311	PF AE001	THERMAL FUSE	
312	PFJT1016Z	TERMINAL	
313	PFRT003	THERMISTOR	S
314	PFJT1015Z	TERMINAL	
315	XWE4E8	WASHER	

### 12.1.9. MAIN FRAME SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
330	XUC2FY	RETAINING RING	
331	PFDG1201Z	GEAR,FEED ROLLER	
332	PFUS1325Z	COIL SPRING	
333	PFDJ1044Z	SPACER,FEED ROLLER	POM-HB
334	PF DN1047Z	ROLLER,FEED PAPER	
335	PFDF1005Z	SHAFT,SUPPORT ROLLER	
336	PQDR9685Y	ROLLER,SUPPORT	POM-HB
337	PFUS1396Z	COIL SPRING	

Ref. No.	Part No.	Part Name & Description	Remarks
338	PFUA1027X	CHASSIS	PC+ABS+GF20%-V0
339	PFQT1874V	LABEL,DRUM INSTALL	
340	PFQT2115Z	LABEL,LASER CAUTION	
341	PFUS1272Z	TORSION SPRING	
342	PFUE1001Z	PLASTIC PART	PS-FB
343	PFUS1274Z	TORSION SPRING	
344	PFUS1028Z	TORSION SPRING	
345	PFOM1004Z	MIRROR	
346	PFHR1299Z	COVER,DRUM UNIT	PS-HB
347	PFJS09P08Z	CONNECTOR	
348	PFUS1270Z	COIL SPRING	
349	PFUS1271Z	COIL SPRING	
350	PFUS1273Z	COIL SPRING	
351	PFDE1148Z	LEVER,PAPER TOP SENSOR	ABS-HB
352	PFUE1002X	LEVER,COVER OPEN	POM-HB
353	PFUE1003W	LEVER,TONER EMPTY	POM-HB
354	PFMH1089Z	METAL PARTS,MIX ROLLER	

### 12.1.10. MOTOR SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
370	PF DG1186Z	GEAR	POM-HB
371	PF DG1188Z	GEAR	POM-HB
372	PF DG1189Z	GEAR	POM-HB
373	PF DG1187Z	GEAR	POM-HB
374	PFDF1056Z	SHAFT	
375	PFDE1171X	LEVER	POM-HB
376	PFDE1139Y	LEVER	POM-HB
377	PF DG1177Z	GEAR	POM-HB
378	PF DG1176Z	GEAR	POM-HB
379	PF DG1175Z	GEAR	POM-HB
380	PFUS1259Y	COIL SPRING	
381	PF FP1003Z	PLUNGER	
382	PF DG1190Y	GEAR	POM-HB
383	PFDF1057Z	SHAFT	
384	PF DG1185Z	GEAR	POM-HB
385	PF NPD052080	SPACER	
386	55SPM25D4NC	DC MOTOR	
387	PFUS1260Y	LEAF SPRING	
388	PFUA1029X	CHASSIS	PBT+ABS-HB
389	PF DG1241Z	GEAR	POM-HB
390	PF DG1242Z	GEAR	POM-HB
391	XUC4FY	RETAINING RING	
392	PF DG1184Z	GEAR	POM-HB
393	PF DG1181Y	GEAR	POM-HB
394	PF DJ1031X	SPACER	
395	PFUS1262Z	COIL SPRING	
396	PFUA1028U	CHASSIS	PBT+ABS-HB

### 12.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PFQW1991Z	LEAFLET	
A2	PFZX1FL501M	TRAY	
A3	PFZXFLB751M	TRAY	
A4	PFJKFLB756Z	CD-ROM	
A5	PFQX1866Z	INSTRUCTION BOOK(RUSSIAN)	
A5	PFQX1874Z	INSTRUCTION BOOK(UKRAINIAN)	
A6	PQJA10075Z	CORD,TEL	
A7	PQJA10038Y	CORD,POWER	△
A8	PQJA10126Z	CORD,CURL	
A9	PFJXE1005Z	HANDSET	
A10	Not used		
P1	PFPE1455Z-M	GIFT BOX	
P2	PF PN1266Y	CUSHION	
P3	PF PN1267Y	CUSHION	

Ref. No.	Part No.	Part Name & Description	Remarks
P4	PFPN1264Y	CUSHION	
P5	PFPN1265Y	CUSHION	
P6	PFPD1120Z	CUSHION	
P7	XZB20X30A04	PROTECTION COVER	
P8	PFPH1041Z	PROTECTION COVER	
P9	XZB32X45A04	PROTECTION COVER	
P10	PFPP1017Z	PROTECTION COVER	
P11	PFPH1040Y	PROTECTION COVER	

## 12.3. DIGITAL BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PFWPF758RU	DIGITAL BOARD ASS'Y (RTL) (ICs)	
IC600	PFVIT2003APS	IC	S
IC601	PFVITVT245FT	IC	S
IC602	PFVITVT245FT	IC	S
IC603	C3ABPG000080	IC	
IC604	PFWPF758RU	It is impossible to replace IC604 by itself. To replace IC604, replace the PCB1 assembly.	
IC605	PFVINS11087D	IC	S
IC606	PFWIF758RU	IC	
IC608	C3ABPG000080	IC	
IC609	C1CB00001365	IC	
IC610	C1ZB20001924	IC	
IC611	PQVINJM2903M	IC	S
IC614	C0JBAC000265	IC	
IC615	C0JBAD000093	IC	
		(TRANSISTORS)	
Q600	2SB1322	TRANSISTOR(SI)	S
Q601	2SB1197K	TRANSISTOR(SI)	S
Q602	2SB1322	TRANSISTOR(SI)	S
Q603	2SB1197K	TRANSISTOR(SI)	S
Q604	2SB1197K	TRANSISTOR(SI)	S
Q605	PQVTDTC143E	TRANSISTOR(SI)	S
Q606	PQVTDTC143E	TRANSISTOR(SI)	S
Q607	PQVTDTC143E	TRANSISTOR(SI)	S
Q608	PQVTDTC143E	TRANSISTOR(SI)	S
Q609	PQVTDTC143E	TRANSISTOR(SI)	S
Q610	2SB1197K	TRANSISTOR(SI)	S
Q611	PQVTDTC143E	TRANSISTOR(SI)	S
Q612	2SB1197K	TRANSISTOR(SI)	S
Q613	PQVTDTC143E	TRANSISTOR(SI)	S
Q614	PQVTDTC143E	TRANSISTOR(SI)	S
Q615	2SB1197K	TRANSISTOR(SI)	S
Q616	PQVTDTC143E	TRANSISTOR(SI)	S
Q617	PQVTDTC143E	TRANSISTOR(SI)	S
Q618	PQVTDTC143E	TRANSISTOR(SI)	S
Q619	PQVTDTC143E	TRANSISTOR(SI)	S
Q620	2SD1819A	TRANSISTOR(SI)	S
Q621	2SD1819A	TRANSISTOR(SI)	S
Q622	PQVTDTC143E	TRANSISTOR(SI)	S
Q623	PQVTDTC143E	TRANSISTOR(SI)	S
Q624	PQVTDTC143E	TRANSISTOR(SI)	S
Q625	PQVTDTC143E	TRANSISTOR(SI)	S
Q626	PQVTDTC143E	TRANSISTOR(SI)	S
Q627	PQVTDTC143E	TRANSISTOR(SI)	S
Q628	2SB1197K	TRANSISTOR(SI)	S
Q629	2SB1197K	TRANSISTOR(SI)	S
Q630	2SB1197K	TRANSISTOR(SI)	S
		(DIODES)	
C654	PQVDNCD56DT	DIODE(SI)	S
D600	MA7160	DIODE(SI)	
D601	PQVDNCD56DT	DIODE(SI)	S
D602	MA141WK	DIODE(SI)	
D603	PQVDRLS73T	DIODE(SI)	S
D604	PQVDNCD56DT	DIODE(SI)	S
D606	PFVDRMRLS245	DIODE(SI)	S
D607	PFVDRMRLS245	DIODE(SI)	S
D608	BOJAME000005	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
DA600	PFVDNECD5R6G	DIODE(SI)	
DA601	PFVDNECD5R6G	DIODE(SI)	
DA602	PFVDNECD5R6G	DIODE(SI)	
DA603	PFVDNECD5R6G	DIODE(SI)	
DA604	BOZBZ0000048	DIODE(SI) (BATTERY)	
BAT600	PFSU1004Z	LITHIUM BATTERY (CAPACITORS)	S
C600	ECUV1E104ZVF	0.1	S
C604	ECEALVKA101	100	S
C605	ECUV1H102KBV	0.001	
C606	ECUV1H102KBV	0.001	
C607	ECUV1H102KBV	0.001	
C608	ECUV1H102KBV	0.001	
C609	ECUV1H102KBV	0.001	
C610	ECUV1H102KBV	0.001	
C611	ECUV1H102KBV	0.001	
C612	ECUV1H102KBV	0.001	
C613	ECUV1H102KBV	0.001	
C614	ECUV1H102KBV	0.001	
C616	ECUV1H102KBV	0.001	
C617	ECUV1H102KBV	0.001	
C618	ECUV1H102KBV	0.001	
C619	ECUV1H102KBV	0.001	
C620	ECUV1H102KBV	0.001	
C621	ECUV1H102KBV	0.001	
C622	ECUV1H102KBV	0.001	
C623	ECUV1H102KBV	0.001	
C624	ECUV1C104ZVF	0.1	
C625	ECUV1C104ZVF	0.1	
C626	ECEALHU100	10	S
C627	ECUV1E104ZVF	0.1	S
C628	ECUV1H102KBV	0.001	
C629	ECUV1H102KBV	0.001	
C630	ECUV1H102KBV	0.001	
C631	ECUV1H102KBV	0.001	
C632	ECUV1H102KBV	0.001	
C633	ECUV1H102KBV	0.001	
C634	ECUV1C104ZVF	0.1	
C635	ECUV1H270JCV	27P	
C636	ECUV1C104ZVF	0.1	
C637	ECUV1C104ZVF	0.1	
C638	ECUV1C104ZVF	0.1	
C639	ECUV1C334ZVF	0.33	
C640	ECUV1H102KBV	0.001	
C642	ECUV1A105ZVF	1	
C643	ECUV1C334ZVF	0.33	
C647	ECUV1H270JCV	27P	
C648	ECUV1C104ZVF	0.1	
C649	ECUV1C104ZVF	0.1	
C650	ECUV1H270JCV	27P	
C652	ECUV1C104ZVF	0.1	
C653	ECEA0JK221	220	S
C655	ECUV1C104KBV	0.1	
C656	ECUV1C334ZVF	0.33	
C657	ECUV1C104KBV	0.1	
C658	ECUV1C104KBV	0.1	
C659	ECUV1C104KBV	0.1	
C660	ECUV1C104ZVF	0.1	
C661	ECUV1C104ZVF	0.1	
C662	ECUV1C104ZVF	0.1	
C663	ECEA0JKS101	100	S
C664	ECUV1H150JCV	15P	
C665	ECUV1H220JCV	22P	
C666	ECUV1C104ZVF	0.1	
C667	ECUV1H220JCV	22P	
C671	ECUV1C104ZVF	0.1	
C672	ECUV1H270JCV	27P	
C673	ECUV1C104ZVF	0.1	
C674	ECUV1C104ZVF	0.1	
C675	ECUV1C104ZVF	0.1	
C676	ECUV1C104ZVF	0.1	
C678	ECUV1H180JCV	18P	

Ref. No.	Part No.	Part Name & Description	Remarks
C681	ECUV1H150JCV	15p	
C682	ECUV1H150JCV	15p	
C684	ECUV1H150JCV	15p	
C685	ECUV1H150JCV	15p	
C686	ECUV1H150JCV	15p	
C687	ECUV1H270JCV	27p	
C688	ECUV1C104ZFV	0.1	
C689	ECUV1C104ZFV	0.1	
C690	ECUV1H270JCV	27p	
C691	ECUV1C334ZFV	0.33	
C692	ECUV1C104ZFV	0.1	
C693	ECUV1H331JCV	330p	S
C694	ECUV1C104ZFV	0.1	
C695	ECUV1C104ZFV	0.1	
C698	ECUV1C104ZFV	0.1	
C699	ECUV1C104ZFV	0.1	
C700	ECUV1C104ZFV	0.1	
C701	ECUV1C104ZFV	0.1	
C702	ECEA1HU100	10	S
C703	ECEA1HU100	10	S
C704	ECUV1C104ZFV	0.1	
C705	ECUV1C104ZFV	0.1	
C707	ECUV1C104ZFV	0.1	
C708	ECUV1H102KEV	0.001	
C709	ECUV1C104ZFV	0.1	
C710	ECUV1C104ZFV	0.1	
C711	ECEA1HU100	10	S
C712	ECUV1C104ZFV	0.1	
C713	ECEA1HU100	10	S
C714	ECUV1C104ZFV	0.1	
C715	ECUV1C104ZFV	0.1	
C716	ECUV1C104ZFV	0.1	
C717	ECUV1C104ZFV	0.1	
C718	ECUV1C104ZFV	0.1	
C719	ECUV1C104ZFV	0.1	
C720	ECUV1C104ZFV	0.1	
C721	ECUV1H103KEV	0.01	
C722	ECUV1H102KEV	0.001	
C723	ECUV1A224KBV	0.22	
C738	ECUV1C104ZFV	0.1	
C739	ECUV1C104ZFV	0.1	
C740	ECUV1C104ZFV	0.1	
C741	ECUV1H103KEV	0.01	
C742	ECUV1H102KEV	0.001	
C743	ECUV1H102KEV	0.001	
C744	ECUV1H821KBV	820p	
C745	ECEA1AU101	100	S
C747	ECUV1C104ZFV	0.1	
C750	ECUV1C104ZFV	0.1	
C751	ECUV1C104ZFV	0.1	
C752	ECEA1VKA101	100	S
C753	ECEA1AU101	100	S
C754	ECUV1C104ZFV	0.1	
C755	ECUV1E104ZFV	0.1	S
C756	ECUV1E104ZFV	0.1	S
C757	ECEA1VKA101	100	S
C758	ECUV1C104ZFV	0.1	
C759	ECUV1C104ZFV	0.1	
C760	ECUV1C104ZFV	0.1	
C761	ECUV1C104ZFV	0.1	
C762	ECUV1A105ZFV	1	
C763	ECUV1C104ZFV	0.1	
C764	ECUV1H101JCV	100p	
C765	ECUV1H101JCV	100p	
C766	ECUV1H101JCV	100p	
C767	ECUV1H101JCV	100p	
C768	ECUV1H101JCV	100p	
C769	ECUV1H180JCV	18p	
C772	ECUV1C104ZFV	0.1	
C774	ECUV1C104ZFV	0.1	
		(CONNECTORS)	
CN600	K1FB136B0031	CONNECTOR, 36P	
CN601	PQJP6G30Y	CONNECTOR, 6P	S

Ref. No.	Part No.	Part Name & Description	Remarks
CN602	K1AB110B0001	CONNECTOR, 10P	
CN603	PQJP3G30Z	CONNECTOR, 3P	S
CN605	PQJP14G30Y	CONNECTOR, 14P	
CN606	PQJP4G30Y	CONNECTOR, 4P	S
CN607	K1KB04B00036	CONNECTOR, 4P	
CN608	PQJP10G30Y	CONNECTOR, 10P	S
CN609	PQJP02G100Z	CONNECTOR, 2P	
CN610	PQJP5G30Y	CONNECTOR, 5P	S
CN611	PQJP11G30Y	CONNECTOR, 11P	S
CN612	PQJP05G100Z	CONNECTOR, 5P	
CN613	PQJP8G30Y	CONNECTOR, 8P	S
CN614	PQJP9G30Y	CONNECTOR, 9P	S
CN615	PQJP10G30Y	CONNECTOR, 10P	S
CN616	PQJS28X59Z	CONNECTOR (FUSE)	
F600	FFRB002122KZ	FUSE	S
F601	FFRB002122KZ	FUSE	S
F602	FFRB0031063	FUSE RESISTOR	
F603	FFRB0031063	FUSE RESISTOR	
F604	FFRB0031063	FUSE RESISTOR	
F605	FFRB0031200	FUSE RESISTOR	S
F606	FFRB0031031T	FUSE RESISTOR (COILS)	S
L621	PQLQR2BT	COIL	S
L628	PQLQR2BT	COIL	S
L632	PQLQR2BT	COIL	S
L638	PQLQR1ET	COIL	S
L649	PQLQR2BT	COIL	S
L669	PQLQR2BT	COIL	S
L670	PQLQR2BT	COIL	S
L671	PQLQR2BT	COIL	S
L672	PQLQR2BT	COIL	S
R667	PQLQR2BT	COIL	S
R790	PQLQR2BT	COIL (COMPONENT PARTS)	S
L643	EXCELDR35	COMPONENTS PART	
L644	EXCELDR35	COMPONENTS PART (CERAMIC FILTERS)	
L600	PFVF1B601ST	CERAMIC FILTER	S
L601	PFVF1B601ST	CERAMIC FILTER	S
L602	PFVF1B601ST	CERAMIC FILTER	S
L603	PFVF1B601ST	CERAMIC FILTER	S
L604	PFVF1B601ST	CERAMIC FILTER	S
L605	PFVF1B601ST	CERAMIC FILTER	S
L606	PFVF1B601ST	CERAMIC FILTER	S
L607	PFVF1B601ST	CERAMIC FILTER	S
L608	PFVF1B601ST	CERAMIC FILTER	S
L609	PFVF1B601ST	CERAMIC FILTER	S
L610	PFVF1B601ST	CERAMIC FILTER	S
L611	PFVF1B601ST	CERAMIC FILTER	S
L612	PFVF1B601ST	CERAMIC FILTER	S
L613	PFVF1B601ST	CERAMIC FILTER	S
L614	PFVF1B601ST	CERAMIC FILTER	S
L615	PFVF1B601ST	CERAMIC FILTER	S
L616	PFVF1B601ST	CERAMIC FILTER	S
L617	PFVF1B601ST	CERAMIC FILTER	S
L618	PFVF1B601ST	CERAMIC FILTER	S
L619	PFVF1B601ST	CERAMIC FILTER	S
L620	PFVF1B601ST	CERAMIC FILTER	S
L622	PFVF1B601ST	CERAMIC FILTER	S
L623	PFVF1B601ST	CERAMIC FILTER	S
L624	PFVF1B601ST	CERAMIC FILTER	S
L625	PFVF1B601ST	CERAMIC FILTER	S
L626	PFVF1B252SDT	CERAMIC FILTER	S
L627	PFVF1B252SDT	CERAMIC FILTER	S
L639	PFVF1B601ST	CERAMIC FILTER	S
L640	PFVF1B252SDT	CERAMIC FILTER	S
L641	PFVF1B252SDT	CERAMIC FILTER	S
L642	PFVF1B252SDT	CERAMIC FILTER	S
L648	PFVF1B252SDT	CERAMIC FILTER	S
L654	PFVF1B252SDT	CERAMIC FILTER	S
L655	PFVF1B252SDT	CERAMIC FILTER	S
L656	PFVF1B252SDT	CERAMIC FILTER	S

Ref. No.	Part No.	Part Name & Description	Remarks
L657	PFVFB252SDT	CERAMIC FILTER	S
L658	PFVFB252SDT	CERAMIC FILTER	S
L659	PFVFB252SDT	CERAMIC FILTER	S
L660	PFVFB252SDT	CERAMIC FILTER	S
L661	PFVFB252SDT	CERAMIC FILTER	S
L662	PFVFB252SDT	CERAMIC FILTER	S
L663	PFVFB252SDT	CERAMIC FILTER	S
L664	PFVFB252SDT	CERAMIC FILTER	S
L665	PFVFB252SDT	CERAMIC FILTER	S
L666	PFVFB252SDT	CERAMIC FILTER	S
L667	PFVFB252SDT	CERAMIC FILTER	S
L673	PFVFB252SDT	CERAMIC FILTER	S
L674	PFVFB252SDT	CERAMIC FILTER	S
L678	PFVFB252SDT	CERAMIC FILTER	S
L679	PFVFB252SDT	CERAMIC FILTER	S
L680	PFVFB252SDT	CERAMIC FILTER	S
L681	PFVFB252SDT	CERAMIC FILTER	S
L682	PFVFB252SDT	CERAMIC FILTER	S
L683	PFVFB252SDT	CERAMIC FILTER	S
L684	PFVFB252SDT	CERAMIC FILTER	S
L685	PFVFB252SDT	CERAMIC FILTER	S
L686	PFVFB252SDT	CERAMIC FILTER	S
R743	PFVFB252SDT	CERAMIC FILTER	S
R744	PFVFB252SDT	CERAMIC FILTER	S
		(RESISTORS)	
L630	PQ4R10XJ000	0	S
L634	PQ4R10XJ000	0	S
L636	ERJ3GEY0R00	0	
L637	ERJ3GEYJ4R7	4.7	
L645	ERJ3GEY0R00	0	
L646	ERJ3GEY0R00	0	
L647	ERJ3GEY0R00	0	
L650	ERJ3GEYJ471	470	
L651	ERJ3GEYJ471	470	
L652	ERJ3GEYJ471	470	
L668	PQ4R10XJ000	0	S
R600	PQ4R10XJ000	0	S
R601	ERDS1VJ152	1.5k	S
R602	ERJ3GEYJ221	220	
R603	ERJ3GEYJ102	1k	
R604	ERDS1VJ152	1.5k	S
R605	ERJ3GEYJ102	1k	
R607	ERJ3GEYJ103	10k	
R611	ERJ3GEYJ103	10k	
R612	ERJ3GEYJ101	100	
R613	ERJ14YJ4R7	4.7	
R614	ERJ3GEYJ332	3.3k	
R615	ERJ3GEYJ222	2.2k	
R616	ERJ3GEYJ472	4.7k	
R617	ERJ14YJ472	4.7k	
R618	ERJ14YJ472	4.7k	
R619	ERJ3GEYJ102	1k	
R620	ERJ3GEYJ562	5.6k	
R621	ERJ3GEYJ563	56k	
R623	ERJ3GEYJ103	10k	
R624	ERJ3GEYJ103	10k	
R625	ERJ3GEYJ101	100	
R626	ERJ3GEYJ562	5.6k	
R627	ERJ3GEYJ562	5.6k	
R628	ERJ3GEYJ562	5.6k	
R629	ERJ3GEYJ562	5.6k	
R630	ERJ3GEYJ563	56k	
R631	ERJ3GEYJ563	56k	
R632	ERJ3GEYJ332	3.3k	
R633	ERJ3GEYJ222	2.2k	
R634	ERJ3GEYJ472	4.7k	
R635	ERJ3GEYJ562	5.6k	
R636	ERJ3GEYJ562	5.6k	
R637	ERJ3GEYJ563	56k	
R638	ERJ3GEYJ563	56k	
R639	ERJ3GEYJ221	220	
R640	ERJ3GEYJ152	1.5k	
R641	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R642	ERJ3GEYJ152	1.5k	
R643	ERJ3GEYJ332	3.3k	
R644	ERJ3GEYJ822	8.2k	
R645	ERJ3GEYJ103	10k	
R646	ERJ3GEYJ222	2.2k	
R647	ERJ3GEYJ103	10k	
R648	ERJ3GEY0R00	0	
R649	ERJ3GEYJ184	180k	
R651	ERJ3GEYJ270	27	
R652	ERJ3GEYJ270	27	
R653	ERJ3GEYJ563	56k	
R654	ERJ3GEYJ222	2.2k	
R655	ERJ3GEYJ472	4.7k	
R657	ERJ3GEYJ220	22	
R658	ERJ3GEYJ122	1.2k	
R659	ERJ3GEYJ221	220	
R660	ERJ3GEYJ101	100	
R661	ERJ3GEYJ105	1M	
R662	ERJ3GEYJ101	100	
R663	ERJ3GEYJ475	4.7M	
R665	ERJ3GEYJ103	10k	
R666	ERJ3GEY0R00	0	
R669	PQ4R10XJ000	0	S
R671	ERJ3GEY0R00	0	
R672	ERJ3GEY0R00	0	
R673	ERJ3GEY0R00	0	
R675	ERJ3GEYJ220	22	
R676	ERJ3GEYJ220	22	
R677	ERJ3GEYJ103	10k	
R678	ERJ3GEYJ103	10k	
R679	ERJ3GEYJ103	10k	
R680	ERJ3GEYJ103	10k	
R681	ERJ3GEYJ103	10k	
R682	ERJ3GEY0R00	0	
R683	ERJ3GEY0R00	0	
R684	ERJ3GEY0R00	0	
R685	ERJ3GEY0R00	0	
R686	ERJ3GEYJ392	3.9k	
R687	ERJ3GEYJ101	100	
R688	ERJ3GEYJ331	330	
R689	ERJ14YJ472	4.7k	
R690	ERJ3GEYJ103	10k	
R691	ERJ3EKF6801	6.8k	
R693	ERJ3GEYJ562	5.6k	
R694	ERJ3GEYJ563	56k	
R700	ERJ3EKF1802	18k	
R701	ERJ3EKF4701	4.7k	
R702	ERJ3GEYJ103	10k	
R703	ERJ3GEYJ103	10k	
R704	ERJ3GEYJ103	10k	
R705	ERJ3GEYJ104	100k	
R706	ERJ3GEYJ332	3.3k	
R707	ERJ3GEYJ562	5.6k	
R711	ERJ3GEYJ102	1k	
R712	ERJ3GEYJ101	100	
R713	ERJ3GEYJ101	100	
R714	ERJ3GEYJ101	100	
R715	ERJ3GEYJ101	100	
R716	ERJ3GEYJ101	100	
R719	ERJ3GEYJ103	10k	
R720	ERJ3GEYJ472	4.7k	
R721	ERJ3GEYJ272	2.7k	
R722	ERJ3GEYJ393	39k	
R723	ERJ3GEYJ101	100	
R724	ERJ3GEYJ103	10k	
R725	ERJ3GEYJ102	1k	
R726	ERJ3GEYJ103	10k	
R727	ERJ3GEYJ103	10k	
R728	ERJ3GEYJ103	10k	
R731	ERJ3GEY0R00	0	
R732	ERJ3GEY0R00	0	
R733	ERJ3GEYJ103	10k	
R734	ERJ3GEYJ101	100	

Ref. No.	Part No.	Part Name & Description	Remarks
R735	ERJ3GEYJ101	100	
R736	ERJ3GEYJ101	100	
R737	ERJ3GEYJ333	33k	
R738	ERJ3GEYJ562	5.6k	
R739	ERJ3GEYJ103	10k	
R740	ERJ3GEY0R00	0	
R748	ERJ3GEYJ101	100	
R749	ERJ3GEYJ101	100	
R750	ERJ3GEYJ101	100	
R754	ERJ3GEYJ103	10k	
R755	ERJ3GEYJ103	10k	
R756	ERJ3GEYJ103	10k	
R757	ERJ3GEYJ103	10k	
R758	ERJ3GEYJ103	10k	
R759	ERJ3GEYJ103	10k	
R760	ERJ3GEYJ563	56k	
R761	ERJ3GEYJ563	56k	
R762	PQ4R10XJ000	0	S
R763	ERJ3GEYJ220	22	
R764	ERJ3GEYJ103	10k	
R765	ERJ3GEYJ102	1k	
R766	ERJ3GEYJ103	10k	
R768	ERJ3GEYJ103	10k	
R769	ERX1S2R2	2.2	
R770	ERJ3GEYJ222	2.2k	
R771	ERJ3GEYJ472	4.7k	
R772	ERJ3GEYJ222	2.2k	
R773	ERJ3GEYJ472	4.7k	
R774	ERJ14YJ472	4.7k	
R775	ERJ3GEYJ103	10k	
R776	ERJ3GEYF393	39k	S
R777	ERJ3GEYJ103	10k	
R778	ERG2S271	270	
R779	ERJ3GEYJ220	22	
R780	ERJ3GEYJ220	22	
R781	ERJ3GEYJ220	22	
R782	ERJ3GEYJ220	22	
R783	ERJ3GEYJ220	22	
R784	ERJ3GEYJ220	22	
R785	ERJ3GEYJ220	22	
R786	ERJ3GEYJ220	22	
R787	ERJ3GEYJ220	22	
R788	PQ4R10XJ000	0	S
R791	ERJ3GEYJ103	10k	
R792	ERJ3GEYJ103	10k	
R796	PQ4R10XJ000	0	S
R799	PQ4R10XJ000	0	S
R800	ERJ3GEY0R00	0	
R801	ERJ3GEY0R00	0	
R802	ERJ3GEYJ103	10k	
RA600	D1H81024A010	1k	
RA601	D1H81024A010	1k	
RA602	D1H81024A010	1k	
RA603	D1H81024A010	1k	
RA604	D1H82204A010	22	
RA610	D1H82204A010	22	
RA612	D1H81034A010	10k	
RA613	D1H81034A010	10k	
RA614	D1H81034A010	10k	
RA617	D1H81034A010	10k	
RA622	D1H82204A010	22	
RA623	D1H82204A010	22	
RA624	D1H82204A010	22	
RA625	D1H82204A010	22	
RA626	D1H82204A010	22	
	(COMPONENTS PARTS)		
RA605	PFXBV8V470JV	RESISTOR ARRAY	S
RA606	PFXBV8V470JV	RESISTOR ARRAY	S
RA607	PFXBV8V470JV	RESISTOR ARRAY	S
RA608	PFXBV8V470JV	RESISTOR ARRAY	S
RA618	PFXBV8V470JV	RESISTOR ARRAY	S
RA619	PFXBV8V470JV	RESISTOR ARRAY	S
RA620	PFXBV8V470JV	RESISTOR ARRAY	S

Ref. No.	Part No.	Part Name & Description	Remarks
RA621	PFXBV8V470JV	RESISTOR ARRAY	S
		(CRYSTAL OSCILLATORS)	
X600	H0J282500005	CRYSTAL OSCILLATOR	
X601	PFVCCFS32Z	CRYSTAL OSCILLATOR	S

## 12.4. ANALOG BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PFLP1377RU-A	ANALOG BOARD ASS'Y (RTL)	
		(ICs)	
IC201	AN6384SB	IC	
IC202	C1BB00000101	IC	
IC203	PQVIMC34119D	IC	S
IC204	C0ABEB000038	IC	
IC205	C0ABEB000038	IC	
IC206	C0ABEB000038	IC	
IC207	C0ABEB000038	IC	
IC208	AN6123MS	IC	
IC209	C0ABEB000038	IC	
		(TRANSISTORS)	
Q201	2SD1921Q	TRANSISTOR (SI)	S
Q202	2SC2235	TRANSISTOR (SI)	S
Q203	2SB1218A	TRANSISTOR (SI)	
Q205	PQVTDTC143E	TRANSISTOR (SI)	S
Q206	2SD1819A	TRANSISTOR (SI)	S
Q207	2SD1819A	TRANSISTOR (SI)	S
Q208	2SA1627	TRANSISTOR (SI)	S
Q210	PQVTDTC143E	TRANSISTOR (SI)	S
Q211	2SA1627	TRANSISTOR (SI)	S
Q213	PQVTDTC143E	TRANSISTOR (SI)	S
Q214	2SD1819A	TRANSISTOR (SI)	S
Q215	2SB1218A	TRANSISTOR (SI)	
		(DIODES)	
D201	MA4056	DIODE (SI)	
D202	MA4056	DIODE (SI)	
D203	MA4056	DIODE (SI)	
D204	1SS133	DIODE (SI)	S
D205	1SS133	DIODE (SI)	S
D208	1SS133	DIODE (SI)	S
D209	PFVDDGS1ZB60	DIODE (SI)	
D211	MA4056	DIODE (SI)	
D212	MA4056	DIODE (SI)	
DA201	MA143	DIODE (SI)	
		(CONNECTORS & JACKS)	
CN201	PQJP02G100Z	CONNECTOR, 2P	
CN202	PQJS28X59Z	CONNECTOR	
CN203	PQJJ1TC5Z	JACK	S
CN204	PQJJ1TB18Z	JACK	S
CN205	PQJJ1TC5Z	JACK	S
		(COILS)	
FL221	PFLE126	COIL	S
L229	PQLQXD152K	COIL	S
L230	PQLQXD152K	COIL	S
L235	PQLQR1E32A07	COIL	S
L236	PQLQR1E32A07	COIL	S
L238	PQLQR1E32A07	COIL	S
L239	PQLQR1E32A07	COIL	S
		(CERAMIC FILTERS)	
FL216	PQVFN3C223R	CERAMIC FILTER	
FL217	PQVFN3C223R	CERAMIC FILTER	
FL218	PQVFN3C223R	CERAMIC FILTER	
FL219	PQVFN3C223R	CERAMIC FILTER	
FL223	PQVFN3C223R	CERAMIC FILTER	
J229	PFVFB252SDT	CERAMIC FILTER	S
J230	PFVFB252SDT	CERAMIC FILTER	S
J378	PFVFB252SDT	CERAMIC FILTER	S
J385	PFVFB252SDT	CERAMIC FILTER	S
L202	PFVFB252SDT	CERAMIC FILTER	S
L203	PFVFB252SDT	CERAMIC FILTER	S
L205	PFVFB252SDT	CERAMIC FILTER	S
L206	PFVFB252SDT	CERAMIC FILTER	S
L207	PFVFB252SDT	CERAMIC FILTER	S

Ref. No.	Part No.	Part Name & Description	Remarks
L213	PFVFB252SDT	CERAMIC FILTER	S
L232	PFVFB252SDT	CERAMIC FILTER	S
L233	PFVFB252SDT	CERAMIC FILTER	S
L234	PFVFB252SDT	CERAMIC FILTER	S
L237	PFVFB252SDT	CERAMIC FILTER	S
L241	PFVFB252SDT	CERAMIC FILTER	S
L242	PFVFB252SDT	CERAMIC FILTER	S
L243	PFVFB252SDT	CERAMIC FILTER	S
L244	PFVFB252SDT	CERAMIC FILTER	S
L249	PFVFB252SDT	CERAMIC FILTER	S
L250	PFVFB252SDT	CERAMIC FILTER	S
L251	PFVFB252SDT	CERAMIC FILTER	S
L253	PFVFB252SDT	CERAMIC FILTER	S
L254	PFVFB252SDT	CERAMIC FILTER	S
L255	PFVFB252SDT	CERAMIC FILTER	S
L256	PFVFB252SDT	CERAMIC FILTER	S
L257	PFVFB252SDT	CERAMIC FILTER	S
L259	PFVFB252SDT	CERAMIC FILTER	S
L260	PFVFB252SDT	CERAMIC FILTER	S
L261	PFVFB252SDT	CERAMIC FILTER	S
L264	PFVFB252SDT	CERAMIC FILTER	S
L265	PFVFB252SDT	CERAMIC FILTER	S
L266	PFVFB252SDT	CERAMIC FILTER	S
L267	PFVFB252SDT	CERAMIC FILTER	S
L268	PFVFB252SDT	CERAMIC FILTER	S
L269	PFVFB252SDT	CERAMIC FILTER	S
L270	PFVFB252SDT	CERAMIC FILTER	S
L271	PFVFB252SDT	CERAMIC FILTER	S
L272	PFVFB252SDT	CERAMIC FILTER	S
L273	PFVFB252SDT	CERAMIC FILTER	S
R217	PFVFB252SDT	CERAMIC FILTER	S
R244	PFVFB252SDT	CERAMIC FILTER	S
R245	PFVFB252SDT	CERAMIC FILTER	S
R247	PFVFB252SDT	CERAMIC FILTER	S
R252	PFVFB252SDT	CERAMIC FILTER	S
R255	PFVFB252SDT	CERAMIC FILTER	S
R259	PFVFB252SDT	CERAMIC FILTER	S
R265	PFVFB252SDT	CERAMIC FILTER	S
R271	PFVFB252SDT	CERAMIC FILTER	S
R274	PFVFB252SDT	CERAMIC FILTER	S
R277	PFVFB252SDT	CERAMIC FILTER	S
R278	PFVFB252SDT	CERAMIC FILTER	S
R299	PFVFB252SDT	CERAMIC FILTER	S
R308	PFVFB252SDT	CERAMIC FILTER	S
R313	PFVFB252SDT	CERAMIC FILTER	S
		(CAPACITORS)	
C201	ECUV1H121JCV	120p	
C203	ECUV1H151JCV	150p	
C204	ECUV1H101JCV	100p	
C205	ECUV1H101JCV	100p	
C206	ECUV1H101JCV	100p	
C209	ECUV1C104ZFB	0.1	
C210	ECUV1C104KBV	0.1	
C211	ECEAJU331	330	S
C212	ECUV1H152KBV	0.0015	
C213	ECUV1C104ZFB	0.1	
C214	ECUV1C104KBV	0.1	
C215	ECUV1C104ZFB	0.1	
C216	ECEAHU100	10	S
C217	ECUV1H223KBV	0.022	S
C218	ECUV1C104ZFB	0.1	
C219	ECUV1C104KBV	0.1	
C220	ECUV1H681JCV	680p	
C221	ECEALVU101	100	S
C222	ECUV1H330JCV	33p	
C223	ECUV1H100DCV	10p	S
C224	ECUV1C104KBV	0.1	
C225	ECUV1C104ZFB	0.1	
C226	ECUV1C104KBV	0.1	
C228	ECEAEU101	100	S
C229	ECEAJK221	220	S
C230	ECUV1C104ZFB	0.1	
C231	ECUV1C104ZFB	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C234	ECUV1C104ZFB	0.1	
C235	ECUV1H152KBV	0.0015	
C236	ECEAHKS010	1	S
C237	ECEAJK221	220	S
C239	ECUV1C104KBV	0.1	
C240	ECUV1A105ZFB	1	
C241	ECUV1A105ZFB	1	
C242	ECUV1C273KBV	0.027	
C243	ECUV1C104KBV	0.1	
C244	ECUV1A224KBV	0.22	
C246	ECUV1H102KBV	0.001	
C247	ECUV1H270JCV	27p	
C248	ECUV1H681JCV	680p	S
C250	ECEALAU101	100	S
C252	ECUV1H681JCV	680p	S
C254	ECUV1C104KBV	0.1	
C256	ECUV1C104KBV	0.1	
C257	ECUV1C104KBV	0.1	
C261	ECUV1H821KBV	820p	
C262	ECUV1H391JCV	390p	
C263	ECUV1H223KBV	0.022	S
C266	ECEALCKS100	10	S
C267	ECUV1H100DCV	10p	S
C268	ECUV1C273KBV	0.027	
C269	ECUV1C104ZFB	0.1	
C270	ECUV1H391JCV	390p	
C272	ECUV1H222KBV	0.0022	
C273	ECUV1C104ZFB	0.1	
C274	ECEALVU101	100	S
C275	ECUV1C104ZFB	0.1	
C277	ECUV1H682KBV	0.0068	
C278	ECEAHU2R2	2.2	S
C279	ECEALVU331	330	S
C280	ECUV1H271JCV	270p	
C281	ECUV1H100DCV	10p	S
C282	ECUV1C104ZFB	0.1	
C284	ECUV1H332KBV	0.0033	
C285	ECUV1H223KBV	0.022	S
C286	ECUV1H100DCV	10p	S
C287	ECUV1H100DCV	10p	S
C288	ECUV1H223KBV	0.022	S
C289	ECUV1H271JCV	270p	
C290	ECEALCKS100	10	S
C291	ECUV1H103KBV	0.01	
C292	ECUV1H472KBV	0.0047	
C293	ECEAEU470	47	S
C294	ECUV1C104ZFB	0.1	
C295	ECUV1H101JCV	100p	
C296	ECUV1H272KBV	0.0027	
C298	ECUV1H392KBV	0.0039	
C299	ECUV1C104ZFB	0.1	
C300	ECUV1A224KBV	0.22	
C302	ECUV1H100DCV	10p	S
C304	ECUV1H680JCV	68p	
C305	ECUV1H392KBV	0.0039	
C307	ECEAHKS010	1	S
C308	ECUV1C104KBV	0.1	
C312	ECEAHKS4R7	4.7	S
C313	ECUV1C683KBV	0.068	
C315	ECUV1C104ZFB	0.1	
C316	ECEAHKS4R7	4.7	S
C317	ECUV1H123KBV	0.012	
C318	ECEAJU331	330	S
C319	ECUV1C104ZFB	0.1	
C320	ECUV1H101JCV	100p	
C321	ECEALCKS100	10	S
C322	ECEALVU101	100	S
C324	ERJ3GEYJ224	220K	
C325	ECUV1H332KBV	0.0033	
C326	ECUV1C104ZFB	0.1	
C327	ECUV1H103KBV	0.01	
C328	ECKD2H681KB	680p	S
C329	ECKD2H681KB	680p	S

Ref. No.	Part No.	Part Name & Description	Remarks
C330	ECUV1H332KBV	0.0033	
C332	ECUV1C273KBV	0.027	
C333	ECUV1H333KBV	0.033	s
C334	ECUV1H333KBV	0.033	s
C335	ECUV1C273KBV	0.027	
C336	ECUV1C104ZFV	0.1	
C337	ECEA0JU331	330	s
C338	ECUV1H123KBV	0.012	
C340	ECUV1H391JCV	390p	
C341	ECUV1H100DCV	10p	s
C343	ECQE2E105KZ	1	s
C344	ECUV1H391JCV	390p	
C345	ECUV1H100DCV	10p	s
C347	ECUV1H182KBV	0.0018	
C349	ECUV1A224KBV	0.22	
C350	ECUV1C104KBV	0.1	
C351	ECUV1C104KBV	0.1	
C353	ECUV1H103KBV	0.01	
C354	ECUV1H103KBV	0.01	
C355	ECEA1CKS100	10	s
C357	ECUV1H103KBV	0.01	
C359	ECEA1CKS100	10	s
C360	ECEA1EU470	47	s
C363	ECUV1H103KBV	0.01	
C365	ECUV1C104ZFV	0.1	
C366	ECUV1C104ZFV	0.1	
C372	ECEA1EU101	100	s
C373	ECEA0JK221	220	s
C374	ECUV1C104KBV	0.1	
C375	ECUV1H103KBV	0.01	
C377	ECUV1H100DCV	10p	s
		(RESISTORS)	
J225	ERJ3GEY0R00	0	
J227	ERJ3GEY0R00	0	
J228	ERJ3GEY0R00	0	
J369	ERJ3GEY0R00	0	
J384	ERJ3GEY0R00	0	
L209	ERJ3GEY0R00	0	
L210	ERJ3GEY0R00	0	
L211	ERJ3GEY0R00	0	
L212	ERJ3GEY0R00	0	
L214	ERJ3GEY0R00	0	
L215	ERJ3GEY0R00	0	
L216	ERJ3GEY0R00	0	
L217	ERJ3GEY0R00	0	
L218	ERJ3GEY0R00	0	
L219	ERJ3GEY0R00	0	
L220	ERJ3GEY0R00	0	
L227	ERJ3GEY0R00	0	
L228	ERJ3GEYJ103	0	
L231	ERJ3GEY0R00	0	
L262	ERJ3GEY0R00	0	
L263	ERJ3GEY0R00	0	
L274	ERJ3GEY0R00	0	
R201	ERJ3GEYJ101	100	
R202	ERJ3GEYJ101	100	
R203	ERJ3GEYJ101	100	
R204	ERJ3GEYJ563	56k	
R205	ERJ3GEYJ154	150k	
R206	ERJ3GEYJ472	4.7k	
R207	ERJ3GEYJ683	68k	
R208	ERJ3GEYJ104	100k	
R209	ERJ3GEYJ822	8.2k	
R210	ERJ3GEYJ124	120k	
R212	ERJ3GEYJ224	220k	
R213	ERJ3GEYJ224	220k	
R214	ERJ3GEYJ394	390k	
R216	ERJ3GEYJ183	18k	
R218	ERJ3GEYJ123	12k	
R219	ERJ3GEYJ394	390k	
R220	ERJ3GEYJ134	130k	
R221	ERJ3GEYJ563	56k	
R222	ERJ3GEYJ153	15k	

Ref. No.	Part No.	Part Name & Description	Remarks
R223	ERJ3GEYJ103	10k	
R224	ERJ3GEYJ223	22k	
R225	ERJ3GEYJ223	22k	
R226	ERJ3GEYJ4R7	4.7	
R227	ERJ3GEYJ394	390k	
R228	ERJ3GEYJ223	22k	
R229	ERJ3GEYJ223	22k	
R230	ERJ3GEYJ822	8.2k	
R231	ERJ3GEYJ222	2.2k	
R232	ERJ3GEYJ102	1k	
R233	ERJ3GEYJ103	10k	
R234	ERJ3GEYJ123	12k	
R235	ERJ3GEYJ472	4.7k	
R236	ERJ3GEYJ103	10k	
R237	ERJ3GEYJ103	10k	
R238	ERJ3GEYJ684	680k	
R239	ERJ3GEYJ183	18k	
R240	ERJ3GEYJ4R7	4.7	
R241	ERJ3GEYJ394	390k	
R242	ERJ3GEYJ154	150k	
R243	ERJ3GEYJ124	120k	
R246	ERJ3GEYJ103	10k	
R248	ERJ3GEYJ473	47k	
R249	ERJ3GEYJ473	47k	
R250	ERJ3GEYJ273	27k	
R251	ERJ3GEYJ103	10k	
R253	ERJ3GEYJ103	10k	
R254	ERJ3GEYJ273	27k	
R256	ERJ3GEYJ103	10k	
R257	ERJ3GEYJ103	10k	
R258	ERJ3GEYJ683	68k	
R260	ERJ3GEYJ223	22k	
R261	ERJ3GEYJ152	1.5k	
R262	ERJ3GEYJ821	820	
R263	ERDS2TJ150	15	s
R264	ERJ3GEYJ103	10k	
R266	ERJ3GEYJ222	2.2k	
R267	ERJ3GEYJ563	56k	
R268	ERJ3GEYJ103	10k	
R269	ERJ3GEYJ563	56k	
R270	ERJ3GEYJ683	68k	
R272	ERJ3GEYJ103	10k	
R273	ERJ3GEYJ562	5.6k	
R275	ERJ3GEYJ123	12k	
R276	ERJ3GEYJ183	18k	
R280	ERJ3GEYJ621	620	
R281	ERJ3GEYJ102	1k	
R282	ERJ3GEYJ474	470k	
R283	ERJ3GEYJ103	10k	
R284	ERJ3GEYJ431	430	
R285	ERJ3GEY0R00	0	
R287	ERJ3GEY0R00	0	
R288	ERJ3GEYJ103	10k	
R289	ERJ3GEYJ334	330k	
R290	ERJ3GEYJ101	100	
R291	ERJ3GEYJ102	1k	
R292	ERJ3GEYJ102	1k	
R293	ERJ3GEY0R00	0	
R294	ERDS2TJ561	560	s
R295	ERDS2TJ4R7	4.7	s
R296	ERG2S821	820	
R297	ERJ3GEYJ223	22k	
R298	ERJ3GEYJ104	100k	
R300	ERJ3GEYJ204	200k	
R301	ERJ3GEYJ103	10k	
R303	ERJ3GEYJ392	3.9k	
R305	ERJ3GEYJ105	1M	
R307	ERJ3GEYJ472	4.7k	
R310	ERJ3GEYJ102	1k	
R311	ERJ3GEYJ104	100k	
R312	ERJ3GEYJ103	10k	
R314	ERDS1VJ333	33k	
R315	ERJ3GEYJ154	150k	

Ref. No.	Part No.	Part Name & Description	Remarks
R316	ERJ3GEYJ101	100	
R318	ERJ3GEYJ333	33k	
R319	ERDS2TJ563	56k	s
R321	ERJ3GEYJ154	150k	
R323	ERDS1TJ682	6.8k	s
R324	ERJ3GEYJ273	27k	
R325	ERJ3GEYJ243	24k	
R326	ERJ3GEYJ243	24k	
R327	ERJ3GEYJ822	8.2k	
R330	ERDS1TJ6R8	6.8	s
R333	ERJ3GEYJ331	330	
R334	ERJ3GEYJ561	560	
R335	ERJ3GEYJ563	56k	
R337	ERJ3GEYJ622	6.2k	
R338	ERJ3GEYJ182	1.8k	
R339	ERJ3GEYJ101	100	
R340	ERJ3GEYJ331	330	
R341	ERJ3GEYJ104	100k	
R343	ERJ3GEYJ331	330	
R345	ERJ3GEYJ182	1.8k	
R355	ERJ3GEYJ222	2.2k	
R359	ERJ3GEYJ473	47k	
R364	ERJ3GEYJ104	100k	
		(RELAY)	
RY202	PFSL003Z	RELAY	s △
		(VARISTORS)	
SA201	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	s
SA202	PFRZ001Z	VARISTOR (SURGE ABSORBER)	s △
ZR201	ERZVA7D151	VARIATOR	
		(TRANSFORMERS)	
T201	PFLT8E003	TRANSFORMER	s △
T202	PFLT8E004	TRANSFORMER	s △
		(PHOTO ELECTRIC TRANSDUCERS)	△
PC201	0N3131SKU	PHOTO COUPLER	△
PC202	0N3131SKU	PHOTO COUPLER	
PC203	PQVITLP627	PHOTO COUPLER	s △
PC204	PQVITLP620K	PHOTO COUPLER	s △
PS201	CNA1006N	PHOTO SENSOR	
		(OTHERS)	
F201	PQBA1N10NMAL	FUSE	s
SW201	ESE14A211	PUSH SWITCH	

## 12.5. OPERATION BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PFLP1378MZ	OPERATION BOARD ASS'Y (RTL)	
		(IC)	
IC101	MN7D032Z9J	IC	
		(DIODE)	
LED101	PQVDR325CA47	DIODE (SI)	s
		(CONNECTOR)	
CN101	PQJJP11G43Z	CONNECTOR, 11P	
		(LCD)	
CN102	L5DAAF00001	LIQUID CRYSTAL DISPLAY	
		(CAPACITORS)	
C101	ECUV1C104ZV	0.1	
C102	ECUV1H103KBV	0.01	
C103	ECUV1H101JCV	100p	
C104	ECUV1H101JCV	100p	
C105	ECUV1H101JCV	100p	
C106	ECUV1H101JCV	100p	
C110	ECUV1C104ZV	0.1	
C111	ECUV1C104ZV	0.1	
C112	ECEA1CK101	100	s
C113	ECUV1C104ZV	0.1	
C117	ECUV1C104ZV	0.1	
C118	ECEA1CK101	100	s
C119	ECUV1H101JCV	100p	
		(RESISTORS)	
R101	ERJ3GEYJ101	100	
R102	ERJ3GEYJ101	100	

Ref. No.	Part No.	Part Name & Description	Remarks
R103	ERJ3GEYJ101	100	
R104	ERJ3GEYJ101	100	
R105	ERJ3GEYJ101	100	
R106	ERJ3GEYJ101	100	
R107	ERJ3GEYJ471	470	
R108	ERJ3GEYJ222	2.2k	
R109	ERJ3GEYJ183	18k	
R111	ERJ3GEYJ222	2.2k	
R112	ERJ3GEYJ4R7	4.7	
R113	ERJ3GEYJ181	180	
R114	ERJ3GEYJ181	180	
R115	ERJ3GEYJ181	180	
R116	ERJ3GEYJ181	180	
R117	ERJ3GEYJ181	180	
R118	ERJ3GEYJ181	180	
R119	ERJ3GEYJ181	180	
R120	ERJ3GEYJ181	180	
		(SWCTCHS)	
SW101	EVQ11Y05B	SWITCH	
SW102	EVQ11Y05B	SWITCH	
SW103	EVQ11Y05B	SWITCH	
SW104	EVQ11Y05B	SWITCH	
SW105	EVQ11Y05B	SWITCH	
SW106	EVQ11Y05B	SWITCH	
SW107	EVQ11Y05B	SWITCH	
SW108	EVQ11Y05B	SWITCH	
SW109	EVQ11Y05B	SWITCH	
SW110	EVQ11Y05B	SWITCH	
SW111	EVQ11Y05B	SWITCH	
SW112	EVQ11Y05B	SWITCH	
SW113	EVQ11Y05B	SWITCH	
SW114	EVQ11Y05B	SWITCH	
SW115	EVQ11Y05B	SWITCH	
SW116	EVQ11Y05B	SWITCH	
SW117	EVQ11Y05B	SWITCH	
SW118	EVQ11Y05B	SWITCH	
SW119	EVQ11Y05B	SWITCH	
SW120	EVQ11Y05B	SWITCH	
SW121	EVQ11Y05B	SWITCH	
SW122	EVQ11Y05B	SWITCH	
SW123	EVQ11Y05B	SWITCH	
SW124	EVQ11Y05B	SWITCH	
SW125	EVQ11Y05B	SWITCH	
SW126	EVQ11Y05B	SWITCH	
SW127	EVQ11Y05B	SWITCH	
SW128	EVQ11Y05B	SWITCH	
SW129	EVQ11Y05B	SWITCH	
SW130	EVQ11Y05B	SWITCH	
SW131	EVQ11Y05B	SWITCH	
SW132	EVQ11Y05B	SWITCH	
SW133	EVQ11Y05B	SWITCH	
SW134	EVQ11Y05B	SWITCH	
SW135	EVQ11Y05B	SWITCH	
SW136	EVQ11Y05B	SWITCH	
SW137	EVQ11Y05B	SWITCH	

## 12.6. HIGH VOLTAGE POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB4	EUKMBN862HA	HIGH VOLTAGE POWER SUPPLY BOARD ASS'Y (RTL)	△
		(IC)	
IC101	MA6742S	IC	
		(TRANSISTORS)	
Q101	2SD1990P	TRANSISTOR (SI)	
Q102	2SB709ARTX	TRANSISTOR (SI)	
Q103	2SB709ARTX	TRANSISTOR (SI)	
Q202	2SD2137A	TRANSISTOR (SI)	
Q204	2SA1413	TRANSISTOR (SI)	
		(DIODES)	

Ref. No.	Part No.	Part Name & Description	Remarks
D102	PQVDS5688G	DIODE(SI)	
D103	PFVDDHM3M20	DIODE(SI)	S
D104	PFVDDHM3M20	DIODE(SI)	S
D110	PFVDERA9102	DIODE(SI)	
D111	MA3J147	DIODE(SI)	
D112	MA3J147	DIODE(SI)	
D201	PQVDS5688G	DIODE(SI)	
D202	PFVDDHM3M20	DIODE(SI)	S
D203	PFVDDHM3M20	DIODE(SI)	S
D205	PQVDS5688G	DIODE(SI)	
ZD202	PQVDRD6.2ESB	DIODE(SI)	
ZD203	PFVDRD200EB	DIODE(SI)	S
		(CONNECTOR)	
CN2	PQJP9G30Y	CONNECTOR, 9PIN	
		(CAPACITORS)	
C101	ECA1VHG470	47	
C102	ECQV1H473KB	0.047	
C103	ECEA50M1	1	
C104	ECEA50M2R2	2.2	
C106	ECQB1H153KB	0.015	
C107	ECKR2H102KB	0.001	
C108	ECKK3A471KB	470P	
C109	ECKK3D102KB	0.001	
C110	ECUV1H103KB	0.01	
C111	ECUV1H102KB	0.001	
C112	ECUV1H102KB	0.001	
C202	ECKK3A471KB	470P	
C203	ECKR1H472KB	0.0047	
C204	ECKK3D221KB	220P	
C206	ECQB1H103JF	0.01	
C207	ECKK3A471KB	470P	
C208	ECQE2103KS	0.01	
C209	ECKK3D102KB	0.001	
C210	ECKZ3A101KB	100P	S
C211	ECKZ3A101KB	100P	S
C212	ECUV1H221JC	220P	
		(RESISTORS)	
R102	ERJ6GEYJ104	100k	
R103	ERJ6ENF7871	7.87k	
R104	ERJ6GEYJ103	10k	
R105	ERJ6ENF1002	10k	S
R106	ERJ6ENF1653	165k	
R107	ERJ6ENF6653	665k	
R108	ERJ6ENF8451	8.45k	
R110	ERJ6ENF1003	100k	
R113	ERDS2TJ102	1k	
R114	PFRGVR25J106	10M	S
R116	ERJ6GEYJ272	2.7k	
R117	ERDS2TJ272	2.7k	
R119	ERJ6ENF7871	7.87k	
R120	ERJ6GEYJ473	47k	
R121	ERJ6GEYJ103	10k	
R122	ERJ6GEYJ103	10k	
R123	ERJ6GEYJ103	10k	
R124	ERJ6GEYJ103	10k	
R125	ERJ6GEYJ103	10k	
R126	ERDS2TJ103	10k	
R127	ERDS2TJ103	10k	
R128	ERDS2TJ152	1.5k	
R129	ERDS2TJ152	1.5k	
R201	ERDS2TJ152	1.5k	
R202	ERJ6ENF1582	15.8k	
R206	PQ4R10XJ102	1k	
R209	PFRGVR25J105	1M	S
R210	ER0S2TKF2492	24.9k	
R211	PFRGR25F1504	1.5M	S
R214	PFRGVR25J105	1M	S
R215	PFRGVR25J105	1M	S
R216	ERDS2TJ333	33k	
R217	PFRGR25F1005	10M	S
R218	ERDS1TJ225	2.2M	
R219	ERDS2TJ473	47k	
R220	ERDS1TJ225	2.2M	

Ref. No.	Part No.	Part Name & Description	Remarks
VR101	ER0S2TKF7871	7.87k	
		(FUSE)	
IP101	PFBAICPN38	FUSE	S
		(PHOTO ELECTRIC TRANSDUCER)	
PC201	PFVISG206S	PHOTO COUPLER	S
		(SWITCH)	
SW101	PFSEDE2LEALB	MICRO SWITCH	△ S
		(TRANSFORMERS)	
T101	MS15BTP20	TRANSFORMER	△
T201	ETB16GKL1	TRANSFORMER	△
		(VARIABLE RESISTOR)	
VR201	EVMAASA00B53	VARIABLE RESISTOR	

## 12.7. LOW VOLTAGE POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB5	N0AC2GF00003	LOW VOLTAGE POWER SUPPLY BOARD ASS'Y (RTL)	△ S
		(ICs)	
IC101	PFVIFA5317P	IC	S
IC201	AN1431T	IC	
IC202	PFVIPQ05RD11	IC	S
		(TRANSISTOR)	
Q101	2SK2717	TRANSISTOR(SI)	△
		(DIODES)	
D101	PFVDLT1505	DIODE(SI)	△ S
D102	PFVDLT1505	DIODE(SI)	△ S
D103	PFVDLT1505	DIODE(SI)	△ S
D104	PFVDLT1505	DIODE(SI)	△ S
D105	PFVDEG01C	DIODE(SI)	S
D106	1SS133	DIODE(SI)	
D107	MA4220	DIODE(SI)	
D108	PFVDAU02Z	DIODE(SI)	S
D109	PFVDD1NL20U	DIODE(SI)	S
D201	PFVDSF5LC20U	DIODE(SI)	S
D202	PFVDRK36LFB2	DIODE(SI)	S
		(CONNECTORS)	
CN101	PQJP2D98Z	CONNECTOR, 2 PIN	△ S
CN102	PQJP2D98Z	CONNECTOR, 2 PIN	△ S
CN201	PQJP10G30Y	CONNECTOR, 10 PIN	S
		(FUSE)	
F101	PFBA21500315	FUSE	△ S
F102	PFBA215005	FUSE	△ S
		(COILS)	
L101	PFLES11V0523	COIL	△ S
L102	PFLES11V0523	COIL	△ S
L103	PFLQDR020006	COIL	△ S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	0N3171	PHOTO COUPLER	△
PC102	PFVIS21ME6NY	PHOTO COUPLER	△ S
		(COMPONENTS PARTS)	
L104	EXCELD35	COMPONENTS PARTS	
L108	EXCELD35	COMPONENTS PARTS	
L206	EXCELD35	COMPONENTS PARTS	
SCR101	PFXFMT1661SE	COMPONENTS PARTS	△ S
		(TRANSFORMER)	
T101	ETS29AK6P8AC	TRANSFORMER	△
		(VARIABLE RESISTOR)	
VR201	EVNDJAA03B53	VARIABLE RESISTOR	
		(VARISTOR)	
ZNR101	ERZV10D751	VARIATOR	△
		(RESISTORS)	
J210	ERJ3GEYJ0R00	0	
J214	ERJ3GEYJ0R00	0	
R101	ERDS1J105	1M	△
R102	ERDS2J824	820k	
R103	ERDS2J824	820k	
R104	ERG2SJ104	100k	
R105	ERX2SJR22	0.22	

Ref. No.	Part No.	Part Name & Description	Remarks
R106	ERG2SJ470	47	
R108	ERDS2FJ150	15	
R109	ERDS2FJ220	22	
R110	ERDS2J823	82k	
R111	ERDS2J823	82k	
R112	ERDS1FJ121	120	
R113	ERDS2FJ101	100	
R114	ERDS1FJ220	22	
R121	ERJ3GEYJ103	10k	
R122	ERJ3GEYHJ561	560	
R124	ERJ3GEYHJ331	330	
R125	ERJ3GEYJ103	10k	
R126	ERJ3GEYHJ682	6.8k	
R127	ERJ3GEYHJ102	1k	
R128	ERJ3GEYHJ181	180	
R201	ERDS2J470	47	
R202	ERG2FJS152	1.5k	
R203	ERG2FJS152	1.5k	
R207	ERDS2J221	220	
R221	ERJ3GEYF222	2.2k	
R222	ERJ3GEYF222	2.2k	
R223	ERJ3GEYJ101	100	
R224	ERJ3GEYJ273	27k	
R225	ERJ3GEYJ332	3.3k	
		(CAPACITORS)	
C101	ECQU2A224ML	0.22	△
C102	ECQU2A224ML	0.22	△
C103	PFKDE2GA222M	2200	△ s
C104	PFKDE2GA222M	2200	△ s
C106	EEUEB2W560U	56	
C108	ECKD3A102KBP	1000P	
C109	PFCEA35A47M	47	s
C110	PFKD12EGA222	2200	△ s
C111	ECQU2A104ML	0.1	△
C112	ECQB1H104KF	0.1	
C119	ECKD3A470KBP	47P	
C121	ECUV1H472KBV	0.0047	
C122	ECUV1A224KBV	0.22	
C123	ECUV1H821KBV	820P	
C124	ECUV1E104KBV	0.1	
C201	PFCEA35F1000	1000	s
C202	ECKD3A102KBP	0.001	
C203	PFCEA35F471	470	s
C204	PFCEA35A47M	47	s
C205	PFCEA50A01M	0.1	s
C206	ECKD3A102KBP	0.001	
C210	ECUV1E104KBV	0.1	
C222	ECUV1H104KBX	0.1	

## 12.8. MOTOR DRIVE BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB6	PFLP1377MZ-B	MOTOR DRIVE BOARD ASS'Y (RTL)	
		(IC)	
IC1	PFVIMT200303	IC	
		(TRANSISTOR)	
Q1	PQVTDTC123JU	TRANSISTOR (SI)	
		(CONNECTORS)	
CN1	PQJP14G30Y	CONNECTOR, 14P	s
CN2	PQJP4G30Z	CONNECTOR, 4P	
		(CAPACITORS)	
C1	ECUV1C104KBV	0.1	s
C2	PFCA1HYK331M	330P	
C3	ECUV1H104ZFBV	0.1	s
C4	ECEA1CK101	100	s
C5	ECUV1C104KBV	0.1	s
C6	ECUV1C104KBV	0.1	s
C7	ECUV1H332KBV	0.0033	
C8	ECUV1C104KBV	0.1	s
		(RESISTORS)	
R1	ERJ3GEYJ331	330	
R2	ERX2SZGR47	0.47	

Ref. No.	Part No.	Part Name & Description	Remarks
R3	ERJ3GEYJ221	220	
R4	ERX2SZGR47	0.47	
R5	ERJ3GEYJ183	18k	
R7	ERJ3GEYJ221	220	
R8	ERJ3GEYJ333	33k	
		(FUSE RESISTOR)	
F1	PFRB0032315T	FUSE RESISTOR	
		(PHOTO ELECTRIC TRANSDUCERS)	
PS1	CNA1006N	PHOTO SENSOR	
		(OTHER)	
HSINK	PFMY1001Z	HEAT SINK	

## 12.9. SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB7	PFLP1377MZ-C	SENSOR BOARD ASS'Y (RTL)	
		(CONNECTORS)	
CN50	PQJP03A21Z	CONNECTOR, 3P	
CN51	PQJP5G43Y	CONNECTOR, 5P	s
		(CAPACITOR)	
C51	ECUV1H271KBV	270p	
		(PHOTO ELECTRIC TRANSDUCERS)	
PS50	PFVIRM574SL	PHOTO SENSOR	

## 12.10. VARISTOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB8	PFLP1377MZ-D	VARISTOR BOARD ASS'Y (RTL)	
		(VARISTOR)	
ZNR60	PFRV271NS05K	VARISTOR	

## 12.11. ADF RELAY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB9	PFLP1379MZ-A	ADF RELAY BOARD ASS'Y (RTL)	
		(CONNECTORS)	
CN500	PQJP5G30Y	CONNECTOR, 5P	s
CN501	K1KA11A00032	CONNECTOR, 11P	
CN502	PQJP3G30Z	CONNECTOR, 3P	s
		(SWITCHES)	
SW500	PFSH1A003Z	SWITCH	s
SW501	PFSH1A008Z	SWITCH	s
		(PHOTO ELECTRIC TRANSDUCER)	
PS500	CNA1006N	PHOTO SENSOR	

## 12.12. PF SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB10	PFLP1379MZ-B	PF SENSOR BOARD ASS'Y (RTL)	
		(CONNECTORS)	
CN503	PQJP3G30Z	CONNECTOR, 3P	s
		(PHOTO ELECTRIC TRANSDUCER)	
PS501	PQVIPS4506	PHOTO SENSOR	s

## 12.13. CIS RELAY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB11	PFLP1379MZ-C	CIS RELAY BOARD ASS'Y (RTL)	
		(CAPACITORS)	
C501	ECUV1H151JCV	150p	
C502	ECUV1H151JCV	150p	
		(CONNECTORS)	
CN504	PQJP4G30Y	CONNECTOR, 4P	s
CN505	PQJP10G30Y	CONNECTOR, 10P	s
CN506	K1MN03B00016	CONNECTOR, 3P	
CN507	K1MN10B00082	CONNECTOR, 10P	
		(PHOTO ELECTRIC TRANSDUCER)	

Ref. No.	Part No.	Part Name & Description	Remarks
P8502	PQVIPS4506	PHOTO SENSOR (RESISTORS)	S
R501	ERJ3GEY0R00	0	
R502	ERJ3GEY0R00	0	

## 12.14. CIS SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB12	PFLP1379MZ-D	CIS SENSOR BOARD ASS'Y(RTL) (CONNECTORS)	
CN508	K1MN03B00016	CONNECTOR, 3P (PHOTO ELECTRIC TRANSDUCER)	
P8503	PQVIPS4506	PHOTO SENSOR	S

## 12.15. SCAN MOTOR DRIVE BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB13	PFLP1379MZ-E	SCAN MOTOR DRIVER BOARD ASS'Y(RTL) (IC)	
IC500	PFVIT2003APS	IC (DIODE)	S
D500	MA7160	DIODE (CONNECTORS)	
CN509	PQJP6G30Y	CONNECTOR, 6P	S
CN510	PQJP5G30Y	CONNECTOR, 5P	S

## 12.16. FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PQZZ9K4Z	EXTENSION CORD, 9P	
EC2	PFZZ10K1Z	EXTENSION CORD, 10P	
EC3	PQZZ28F1Z	EXTENSION CORD, 28P	
EC4	PFZZ14K3Z	EXTENSION CORD, 14P	
EC5	PFZZ11K12Z	EXTENSION CORD, 11P	
EC6	PQZZ3K5Z	EXTENSION CORD, 3P	
EC7	PQZZ2K12Z	EXTENSION CORD, 2P	
EC8	PFZZ5K13Z	EXTENSION CORD, 5P	
EC9	PQZZ5K6Z	EXTENSION CORD, 5P	
EC10	PQZZ8K18Z	EXTENSION CORD, 8P	
EC11	PQZZ4K5Z	EXTENSION CORD, 4P	
EC12	PQZZ4K5Z	EXTENSION CORD, 4P	
EC13	PQZZ6K7Z	EXTENSION CORD, 6P	
	KM79811245C0	BASIC FACSIMILE TECHNIQUE (for training service technicians)	

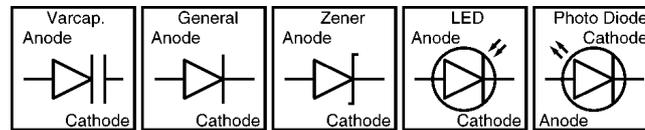
### Note:

Tools and Extension Cords are useful for servicing.  
(They make servicing easy.)

# 13 FOR THE SCHEMATIC DIAGRAMS

## Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.
- 3.



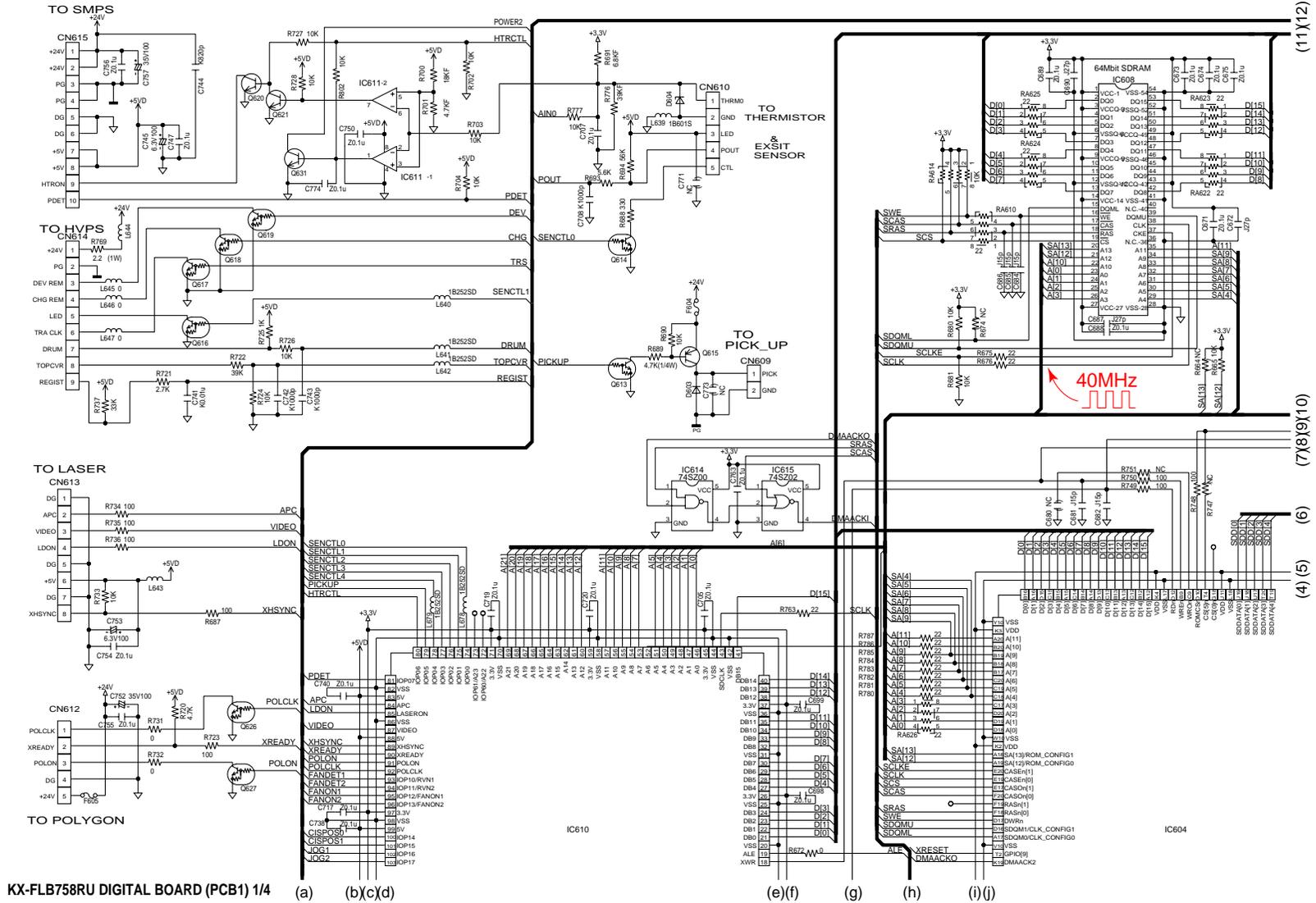
### Important safety notice

Components identified by  $\triangle$  mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

# 14 SCHEMATIC DIAGRAM

## 14.1. DIGITAL BOARD (PCB1)

262



KX-FLB758RU DIGITAL BOARD (PCB1) 1/4

(a) (b)(c)(d)

(e)(f)

(g)

(h)

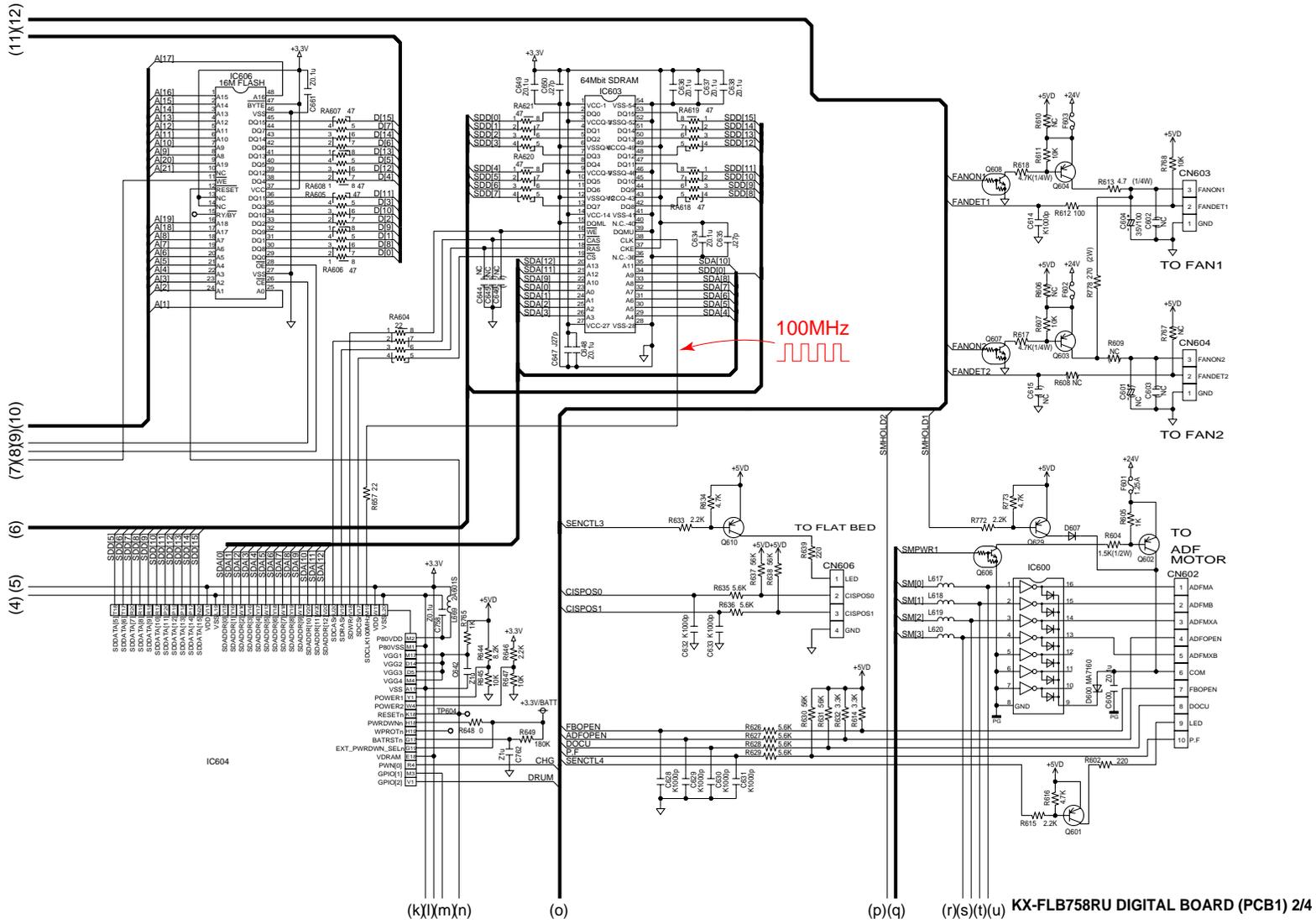
(i)(j)

(11)(12)

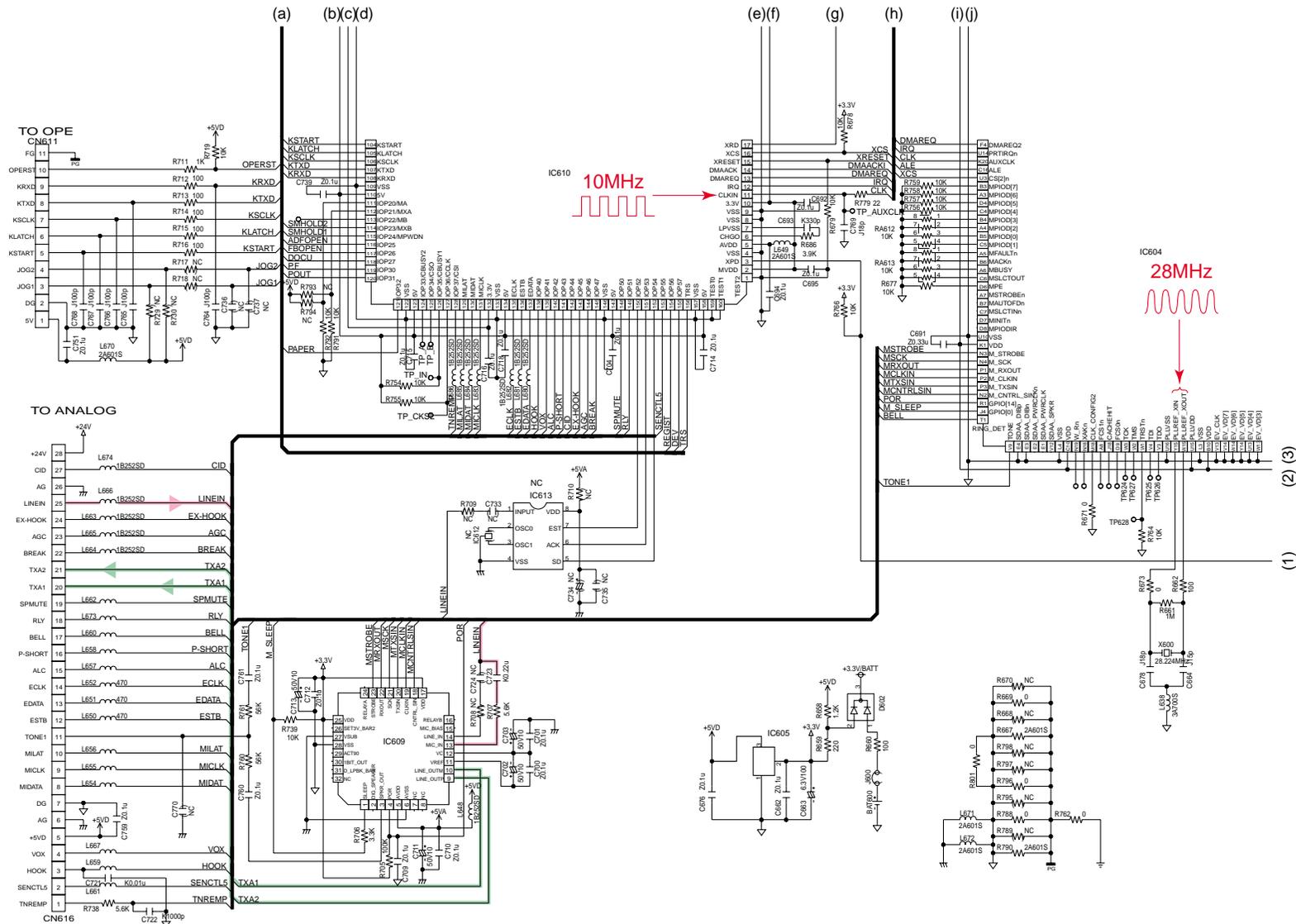
(7)(8)(9)(10)

(6)

(4)(5)



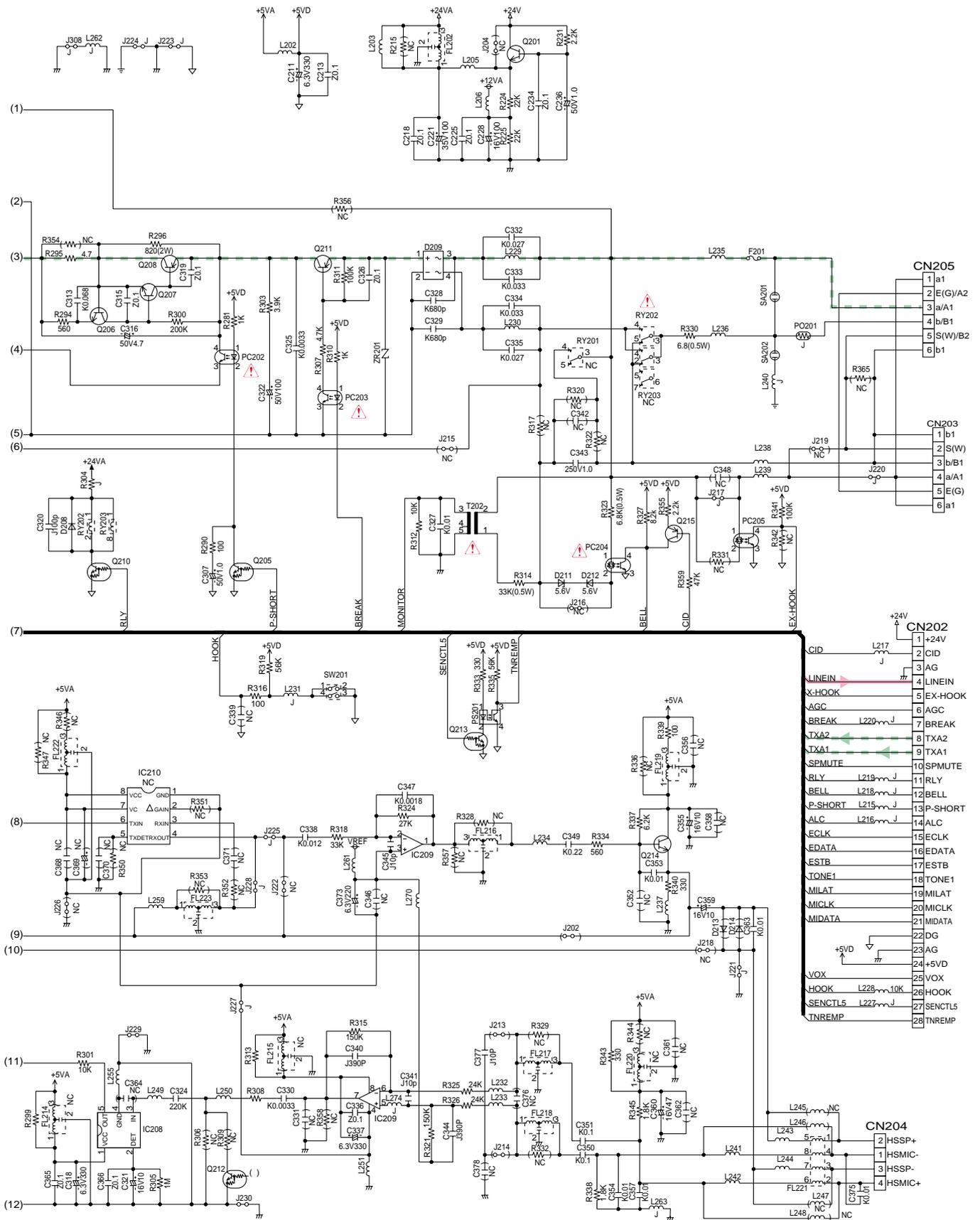
KX-FLB758RU Digital Board (PCB1) 2/4



KX-FLB758RU DIGITAL BOARD (PCB1) 3/4

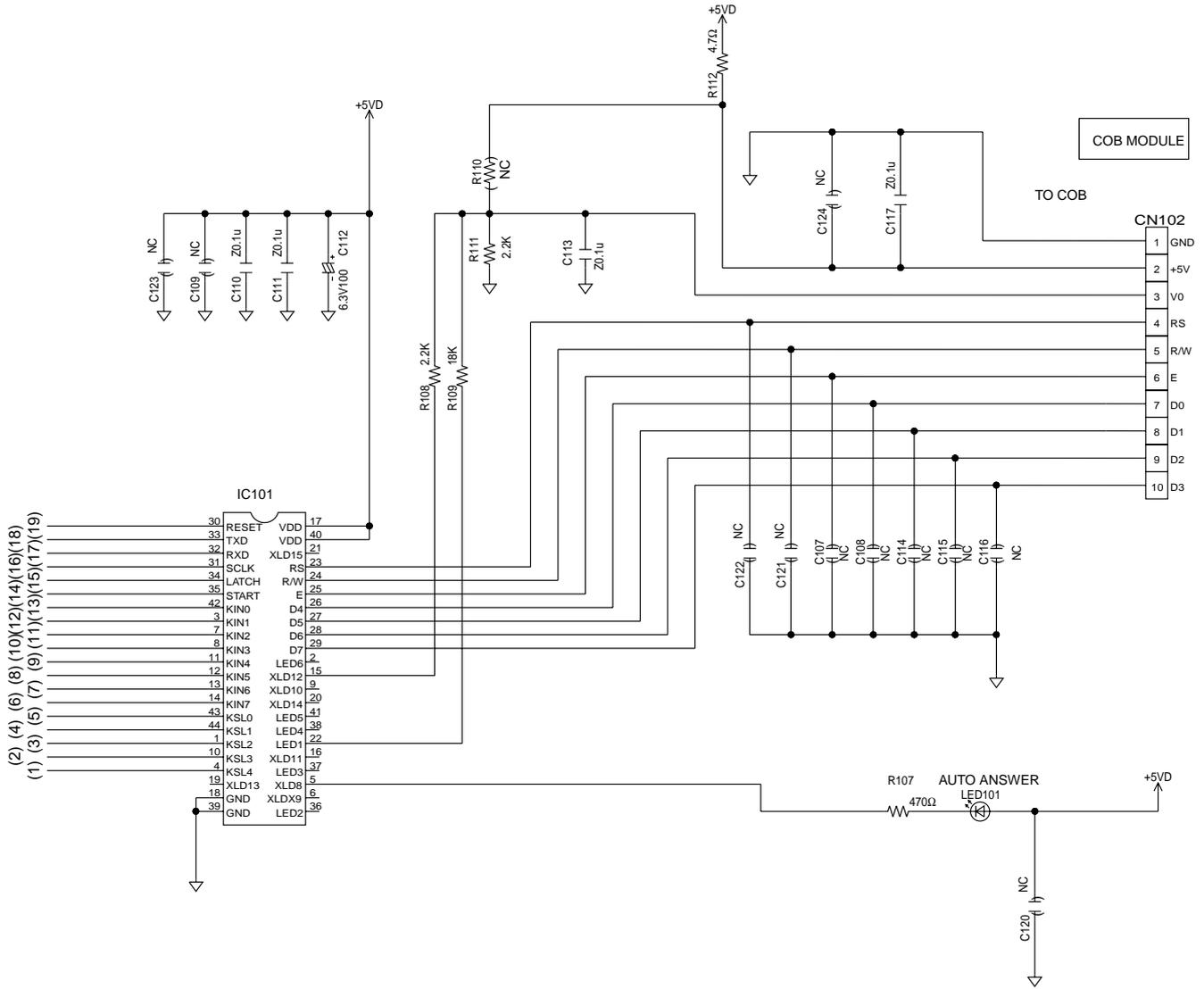






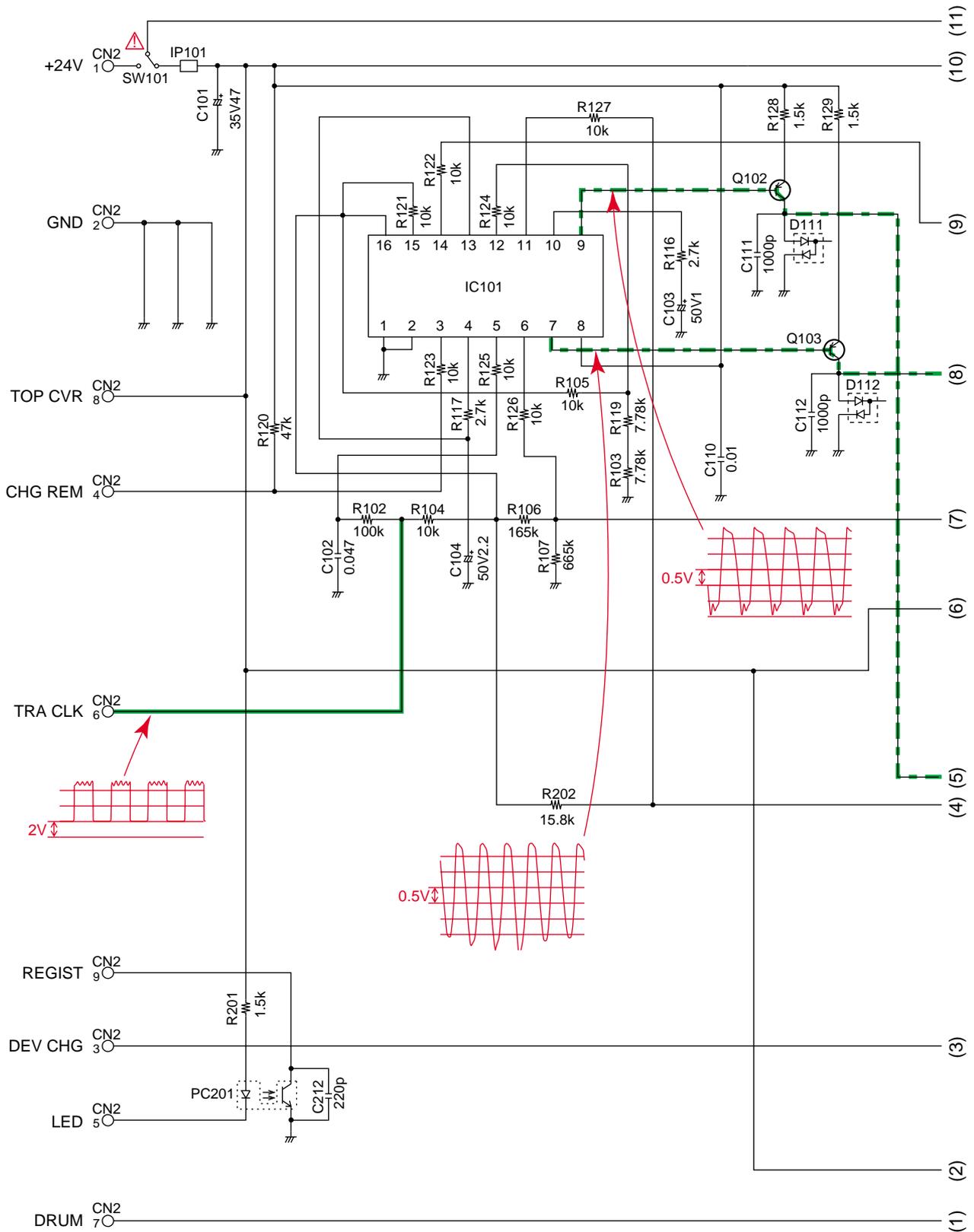
KX-FLB758RU ANALOG BOARD (PCB 2/2)



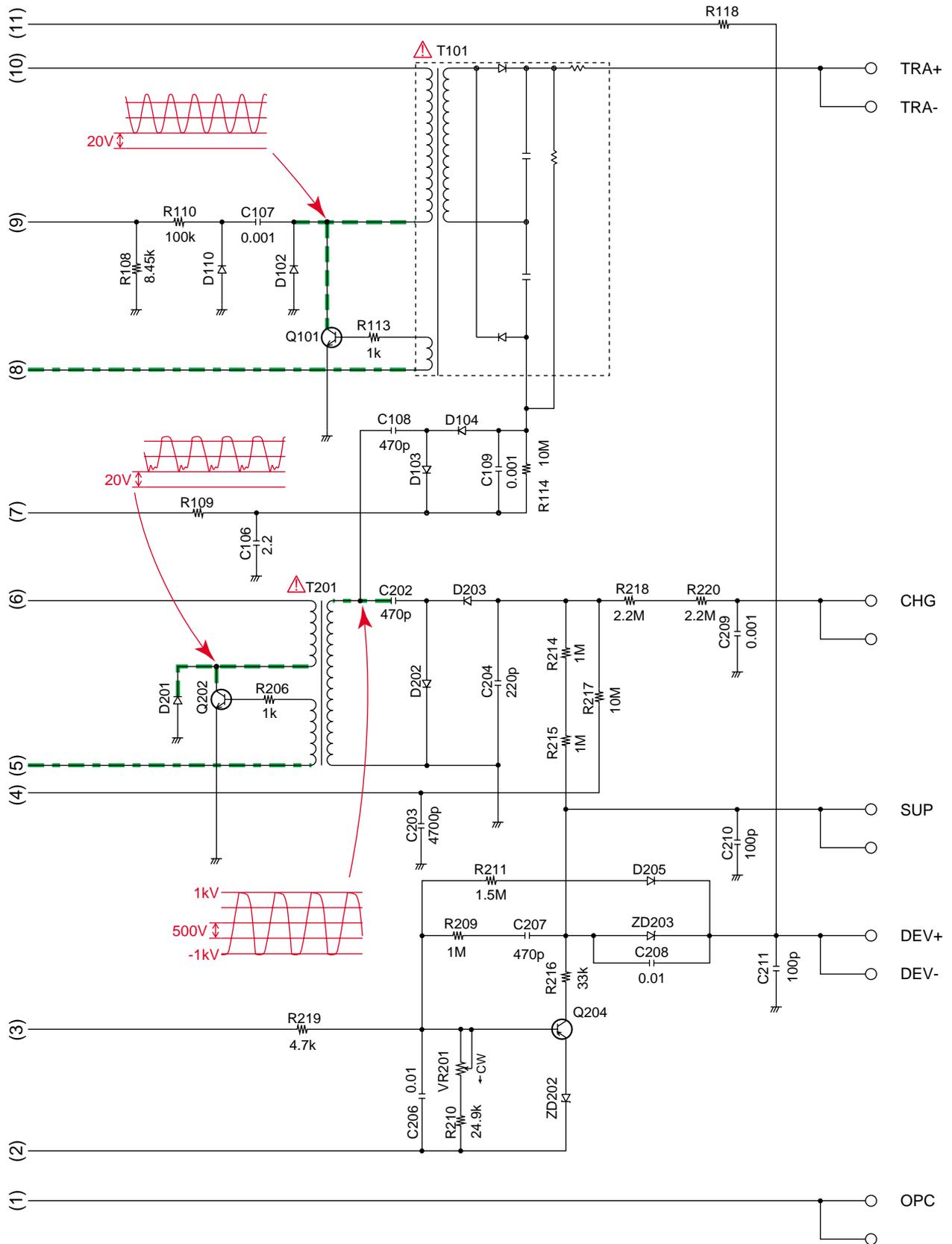


KX-FLB758RU OPERATION BOARD (PCB3) 2/2

# 15.3. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

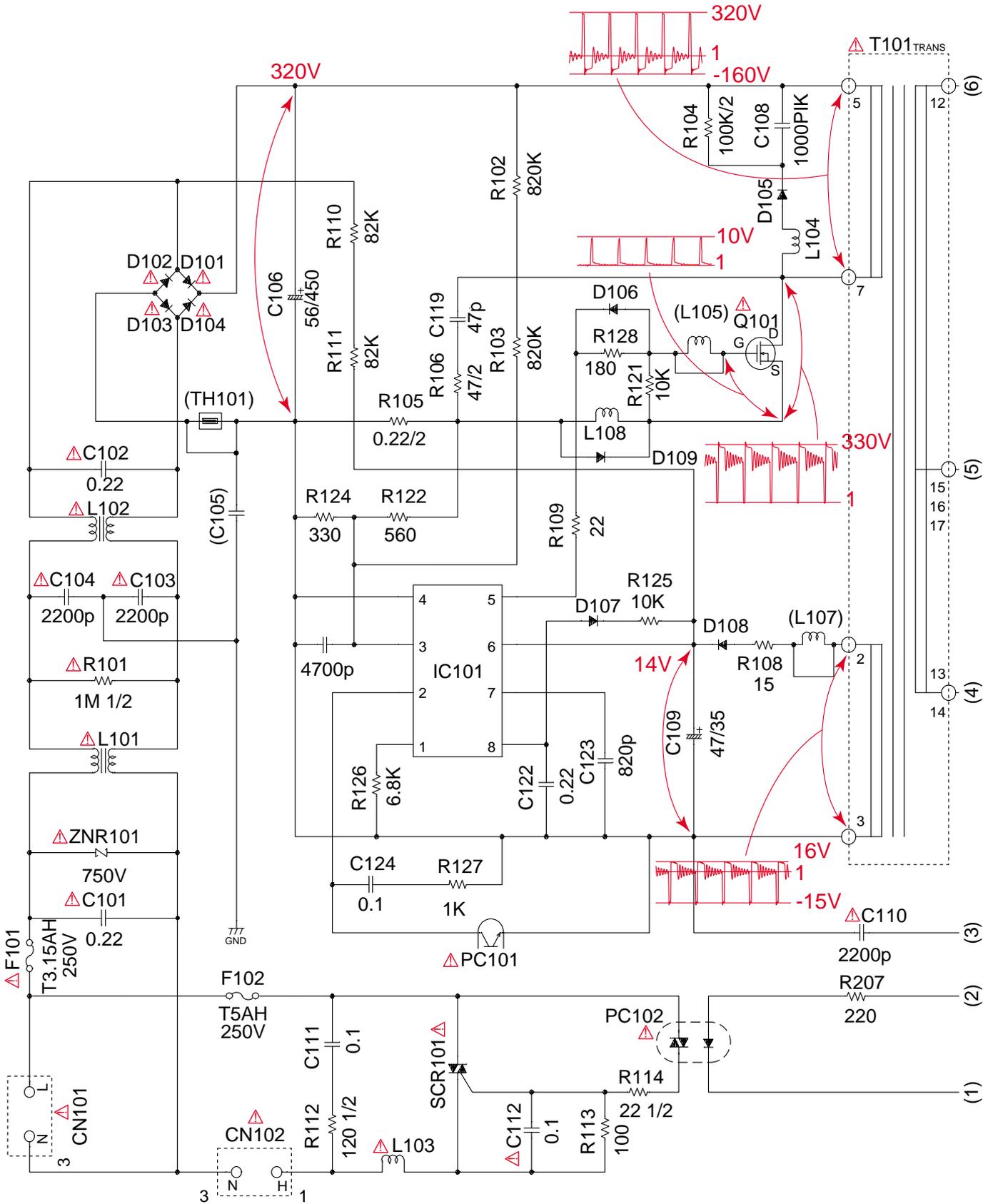


KX-FLB758RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) 1/2

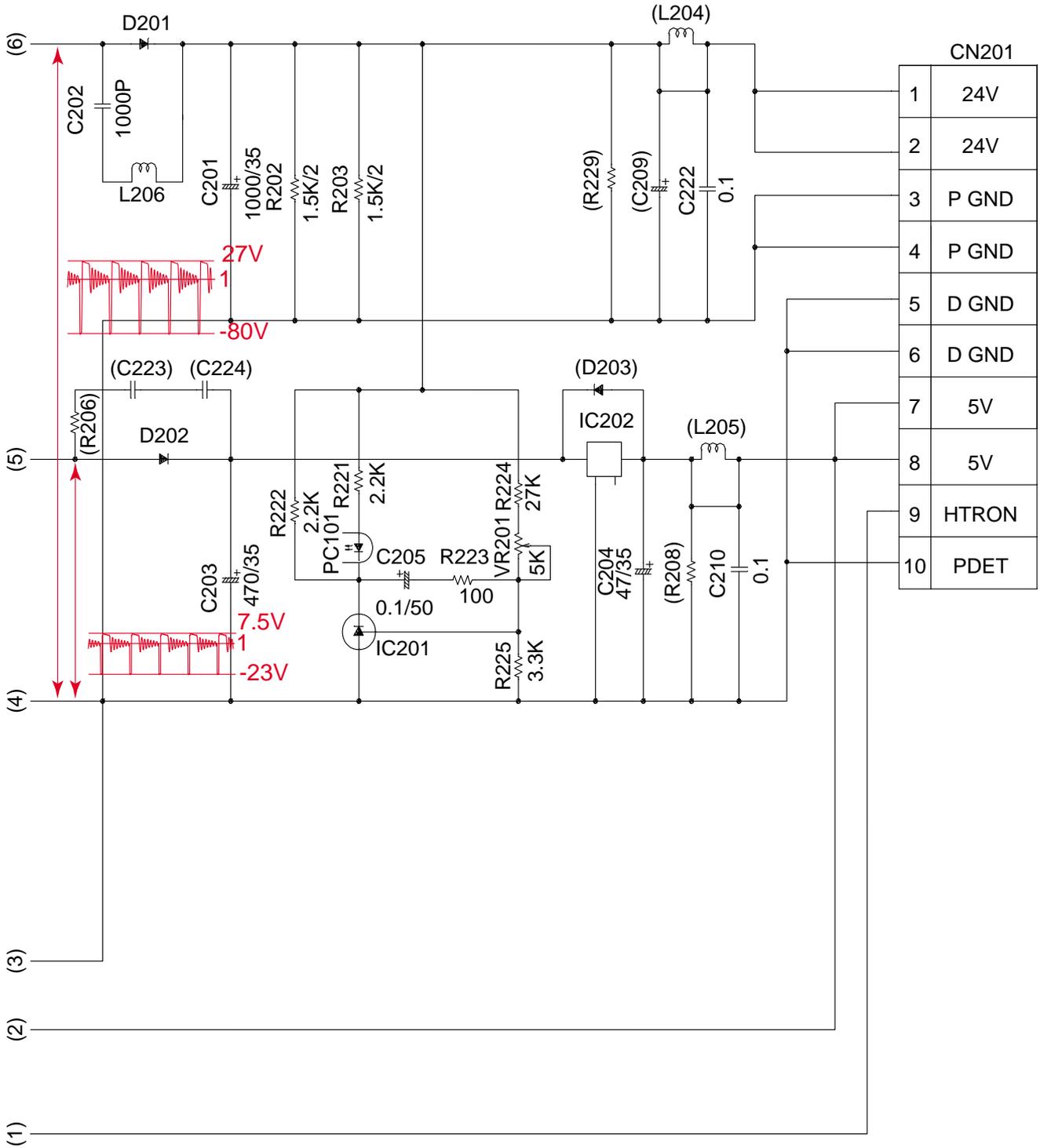


KX-FLB758RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) 2/2

### 15.4. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)



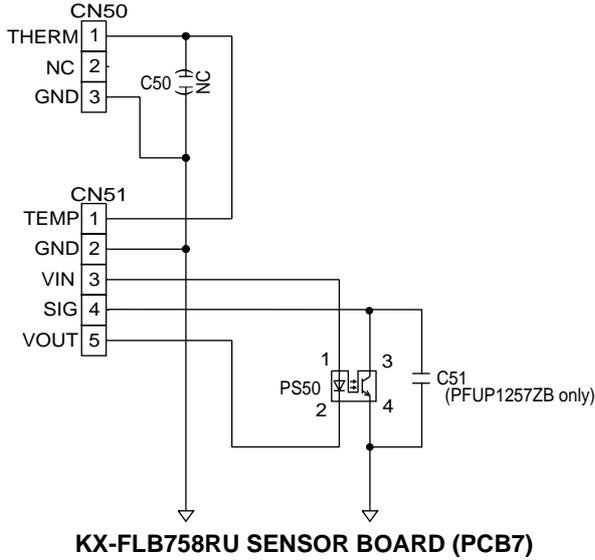
KX-FLB758RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) 1/2



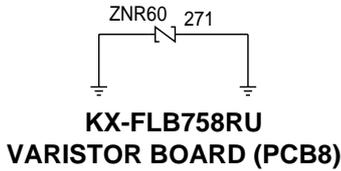
KX-FLB758RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) 2/2



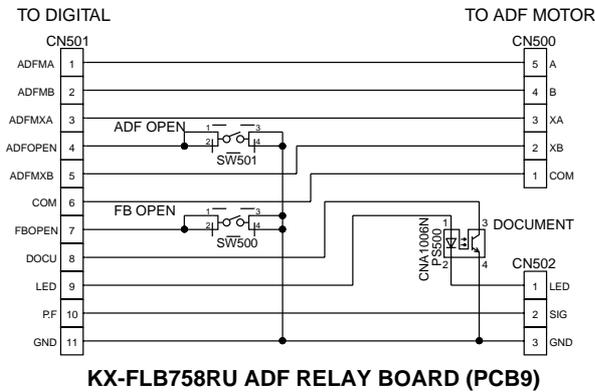
### 15.6. SENSOR BOARD (PCB7)



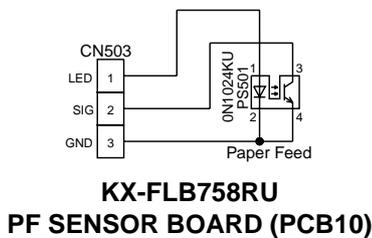
### 15.7. VARISTOR BOARD (PCB8)



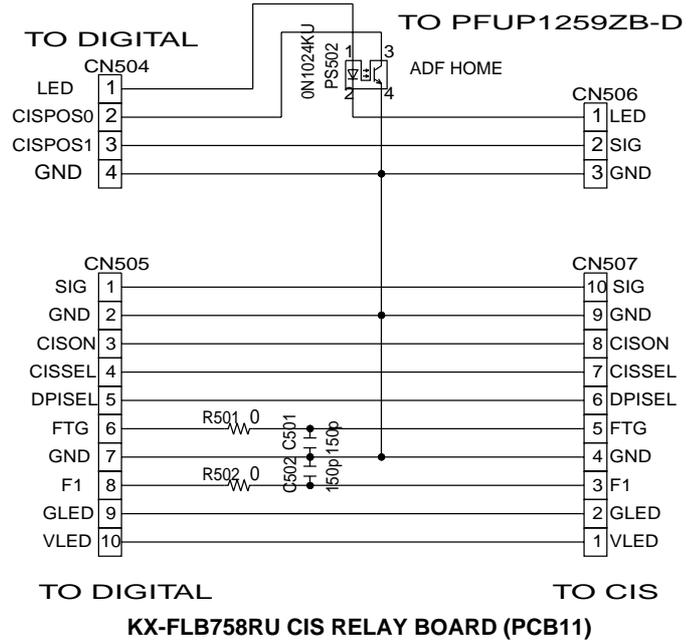
### 15.8. ADF RELAY BOARD (PCB9)



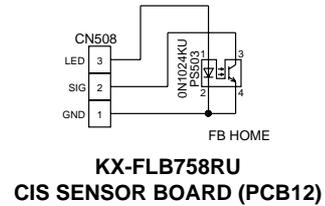
### 15.9. PF SENSOR BOARD (PCB10)



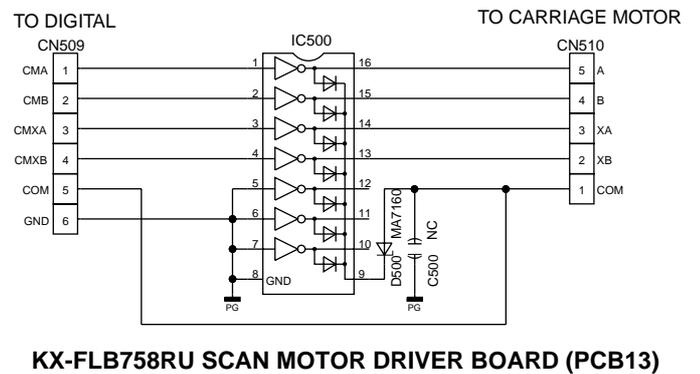
### 15.10. CIS RELAY BOARD (PCB11)



### 15.11. CIS SENSOR BOARD (PCB12)



### 15.12. SCAN MOTOR DRIVER BOARD (PCB13)

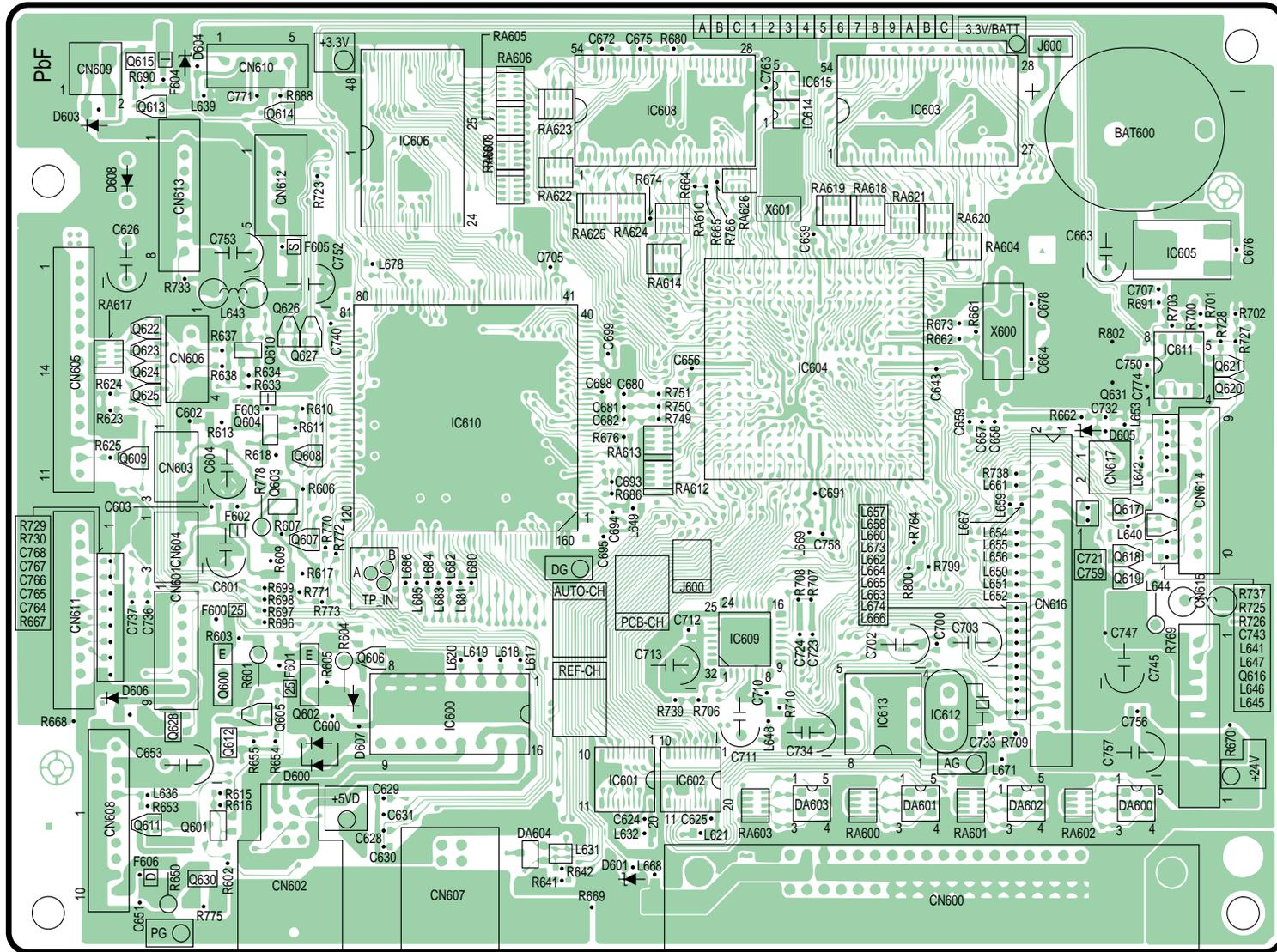


# 16 PRINTED CIRCUIT BOARD

## 16.1. DIGITAL BOARD (PCB1)

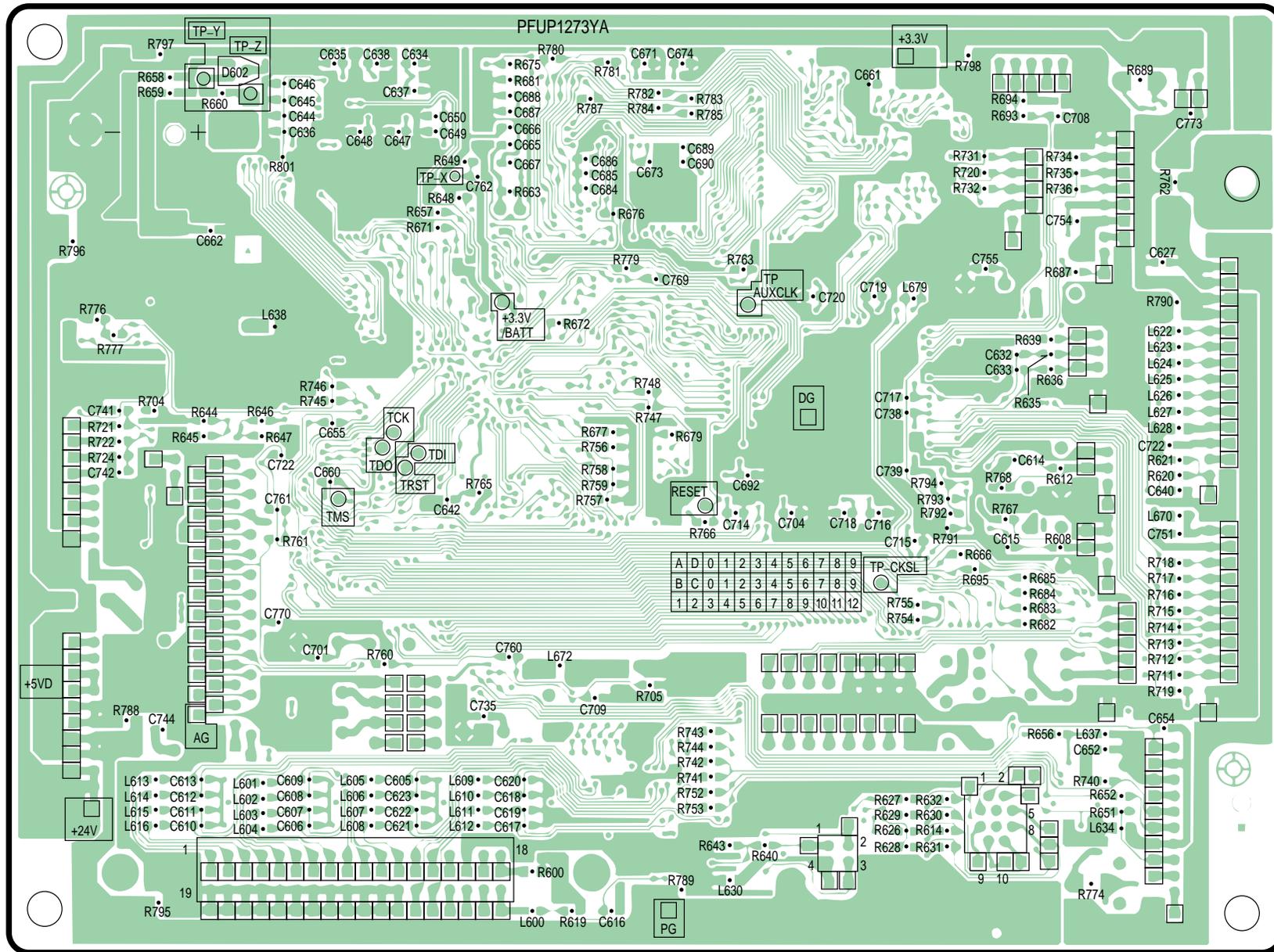
### 16.1.1. DIGITAL BOARD: COMPONENT VIEW

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KX-FLB758RU DIGITAL BOARD (PCB1) COMPONENT VIEW

## 16.1.2. DIGITAL BOARD: BOTTOM VIEW



KX-FLB758RU DIGITAL BOARD (PCB1) BOTTOM VIEW

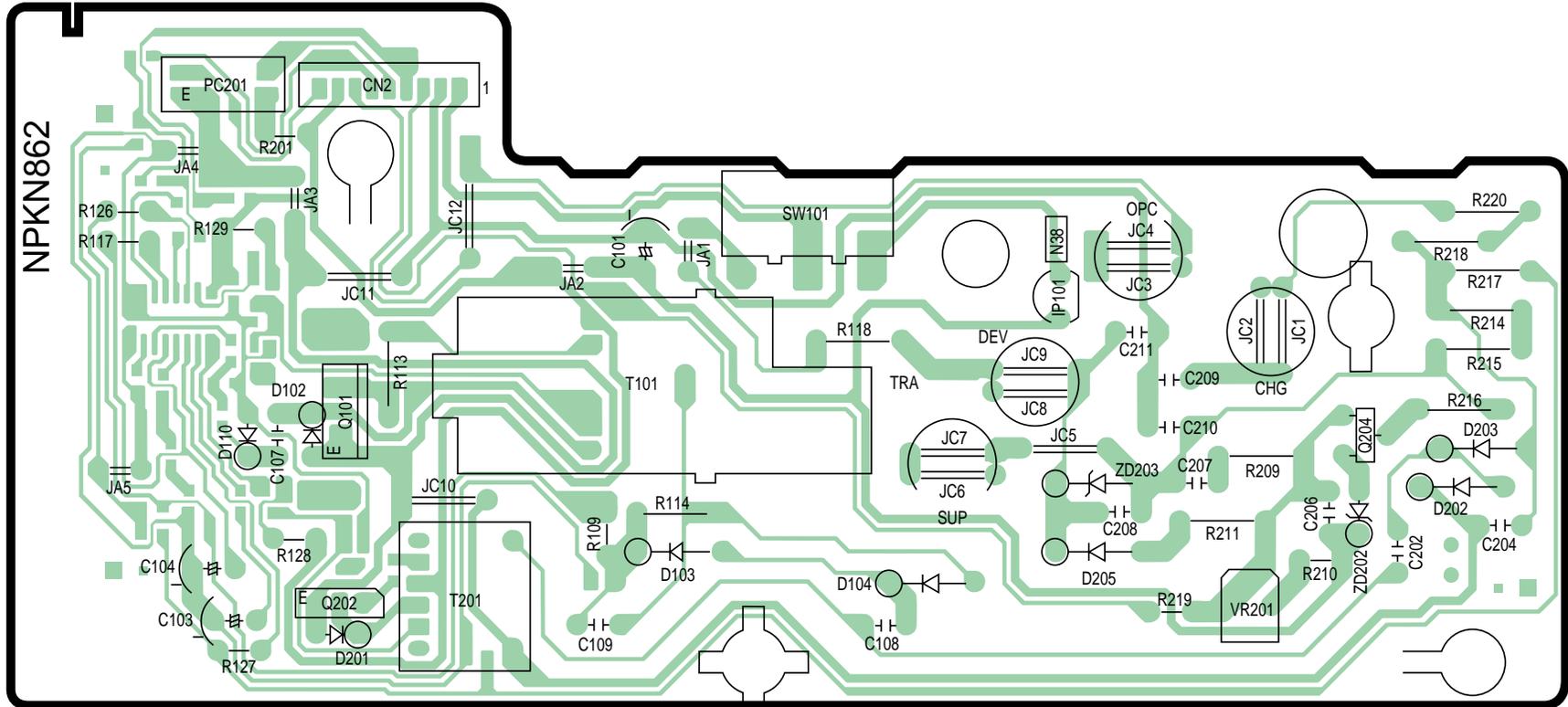






## 16.4. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

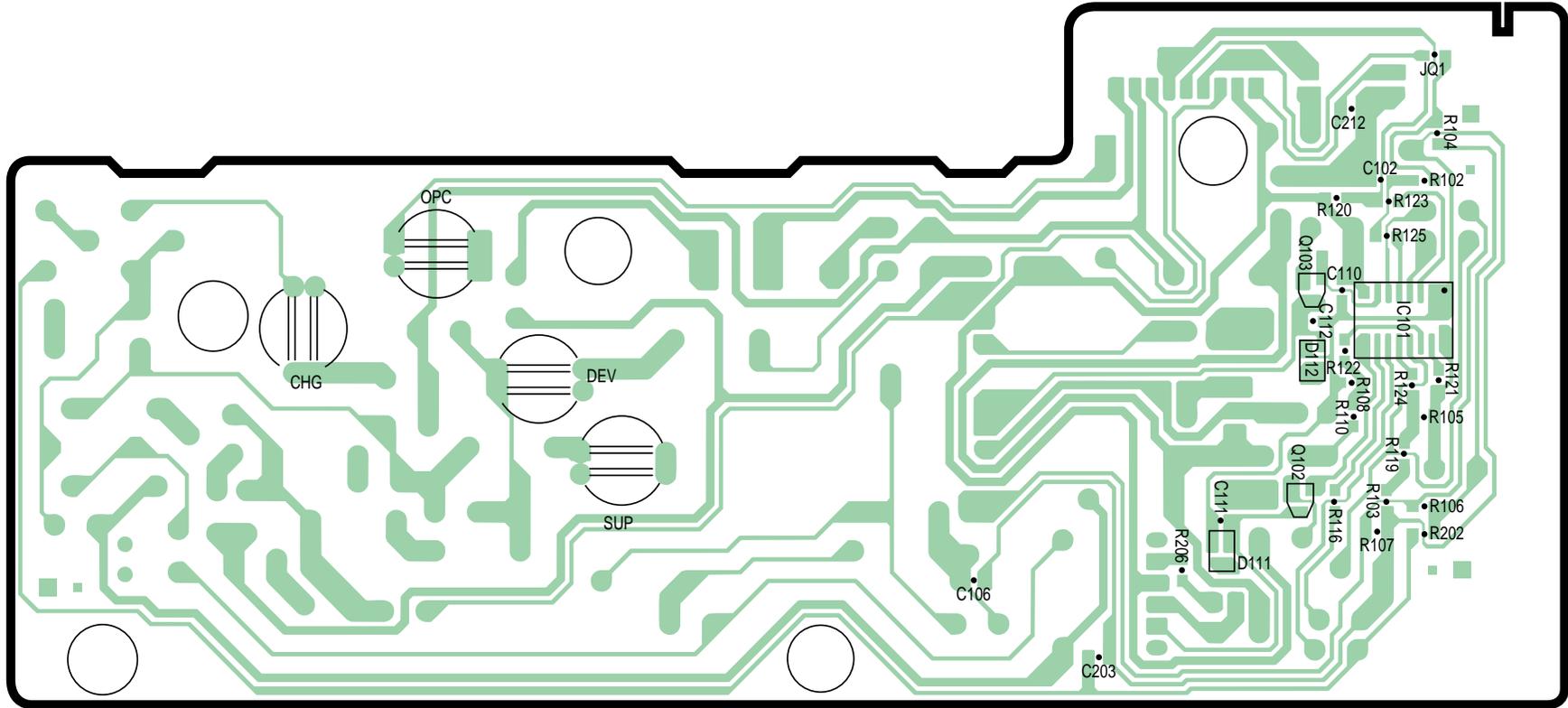
### 16.4.1. COMPONENT VIEW



KX-FLB758RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) COMPONENT VIEW

16.4.2. BOTTOM VIEW

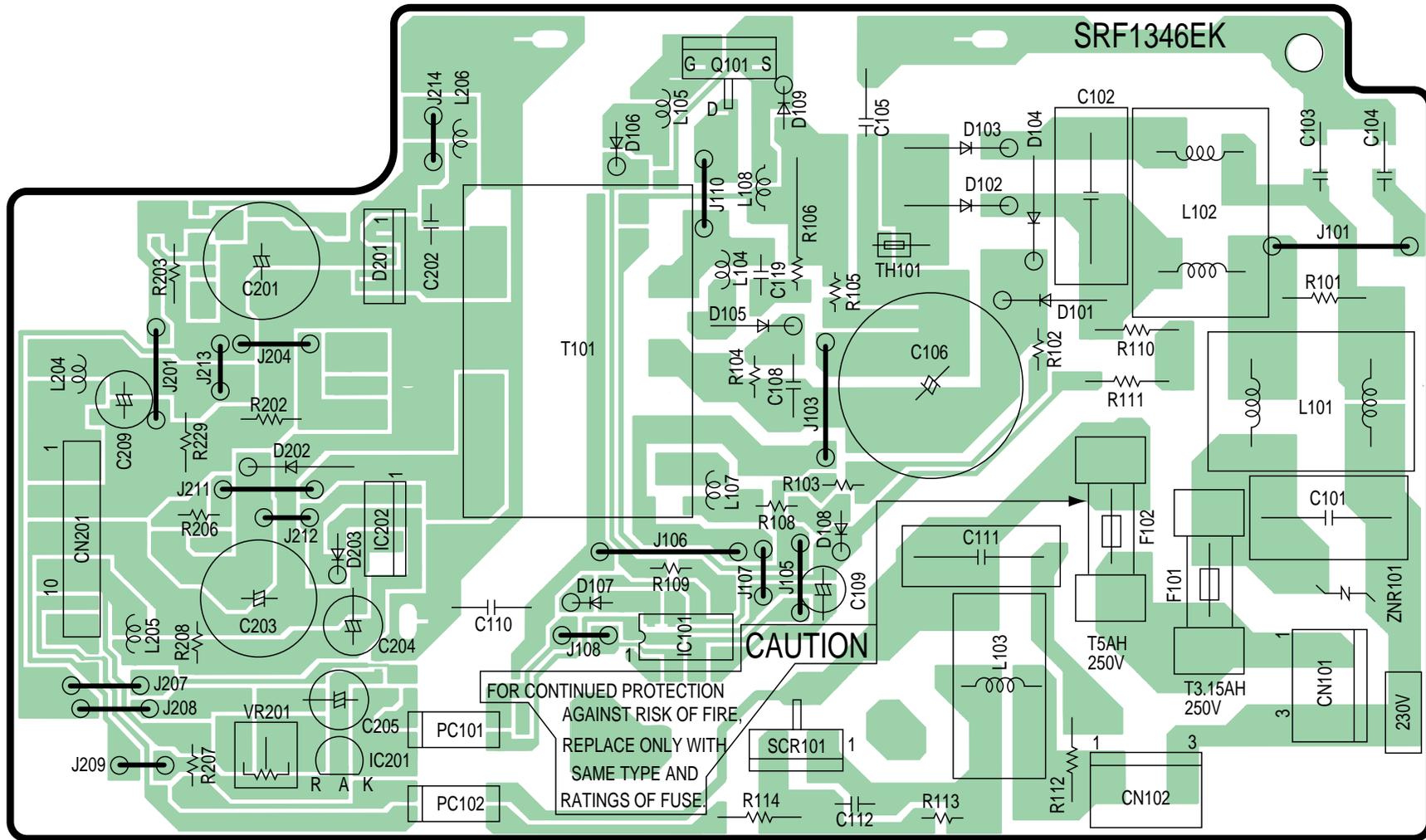
282



KX-FLB758RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) BOTTOM VIEW

# 16.5. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)

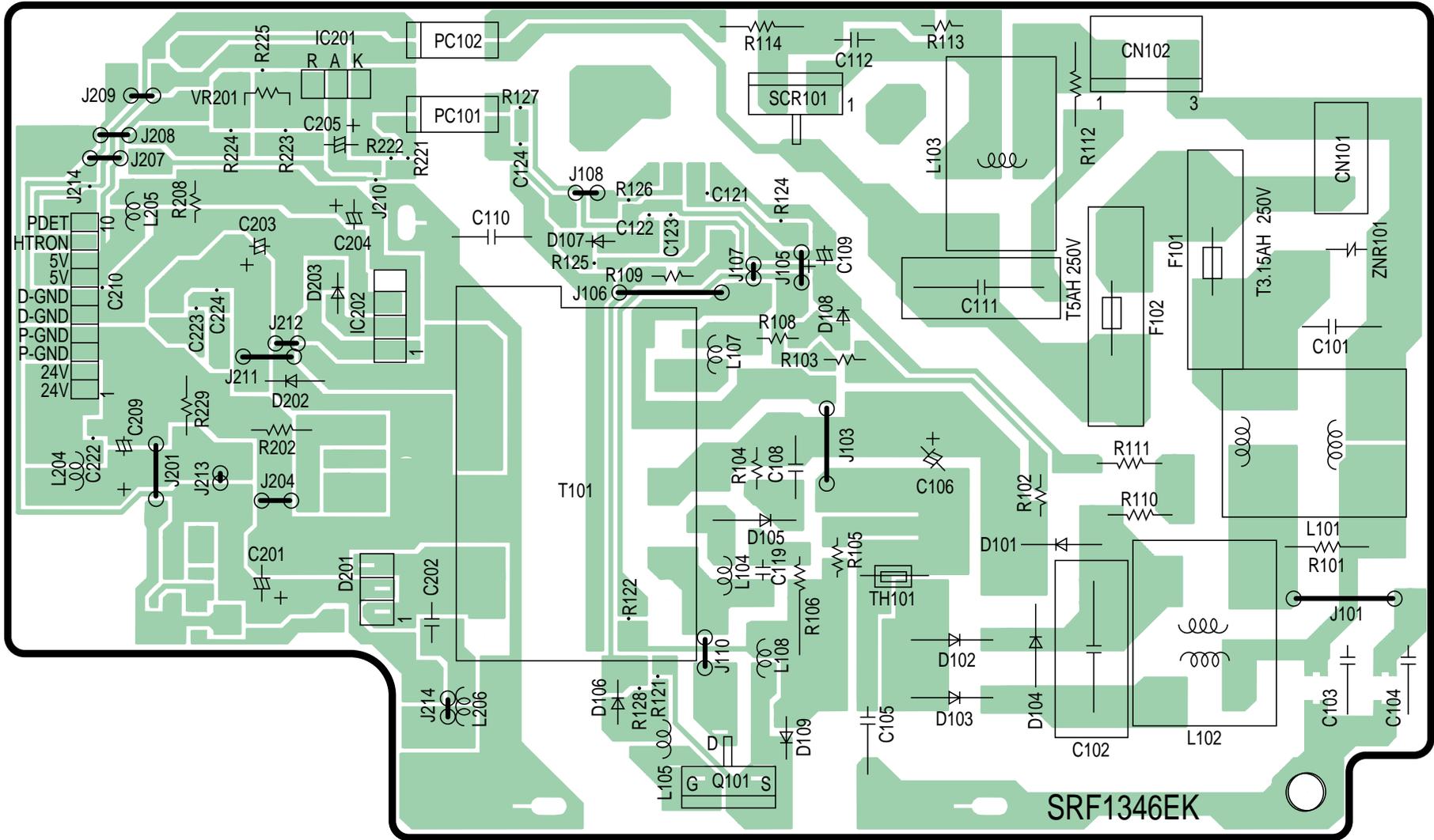
## 16.5.1. COMPONENT VIEW



KX-FLB758RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) COMPONENT VIEW

### 16.5.2. BOTTOM VIEW

284

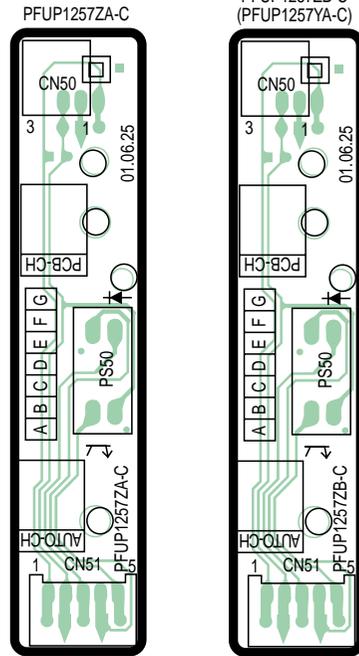


KX-FLB758RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) BOTTOM VIEW

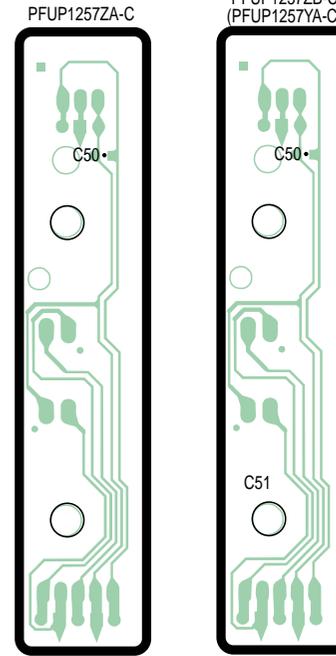


# 16.7. SENSOR BOARD (PCB7)

## (COMPONENT VIEW)



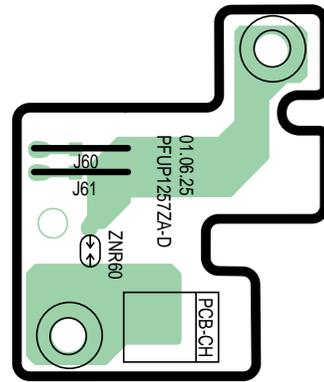
## (BOTTOM VIEW)



KX-FLB758RU SENSOR BOARD (PCB7)

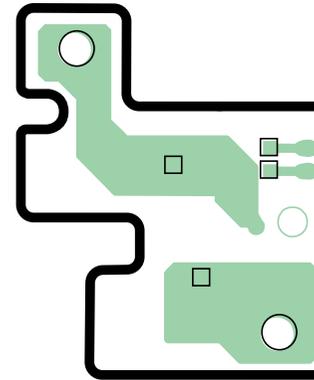
## 16.8. VARISTOR BOARD (PCB8)

(COMPONENT VIEW)



PFUP1257ZA-D  
(PFUP1257ZB-D)  
(PFUP1257YA-D)

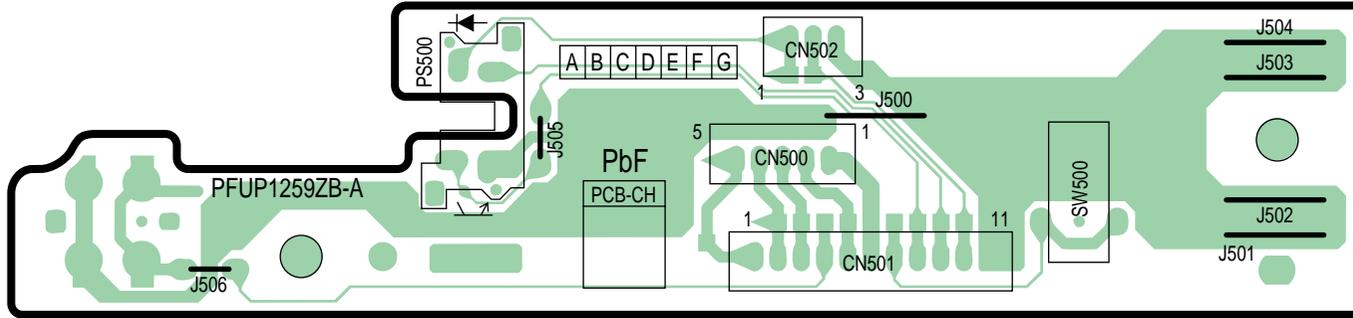
(BOTTOM VIEW)



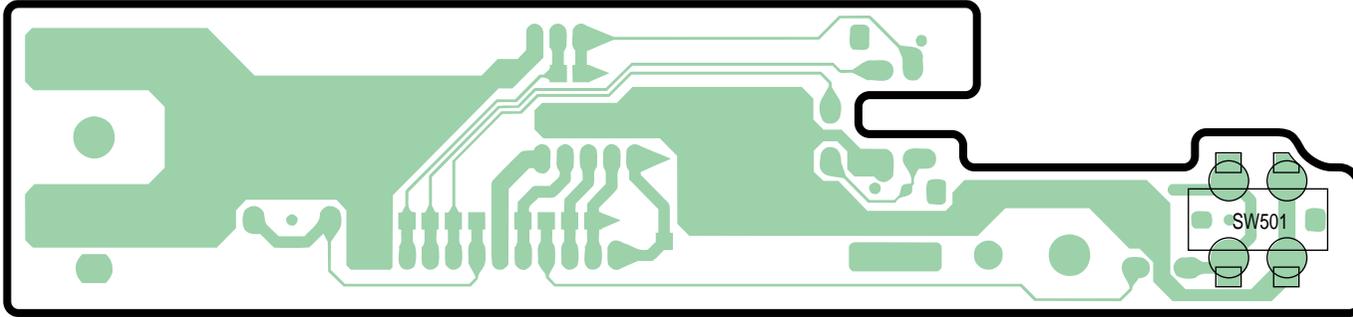
KX-FLB758RU VARISTOR BOARD (PCB8)

### 16.9. ADF RELAY BOARD (PCB9)

(COMPONENT VIEW)

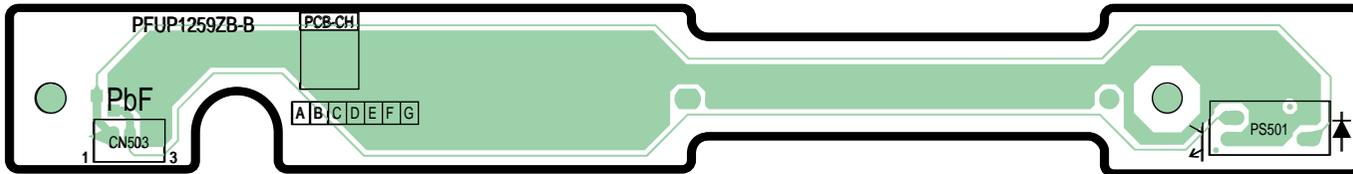


(BOTTOM VIEW)



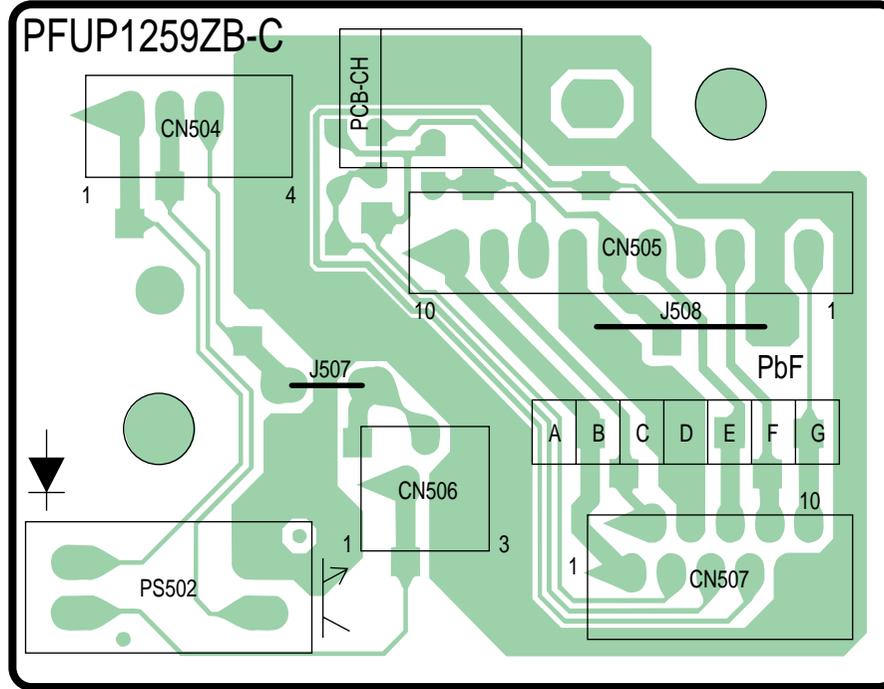
KX-FLB758RU ADF RELAY BOARD (PCB9)

### 16.10. PF SENSOR BOARD (PCB10)

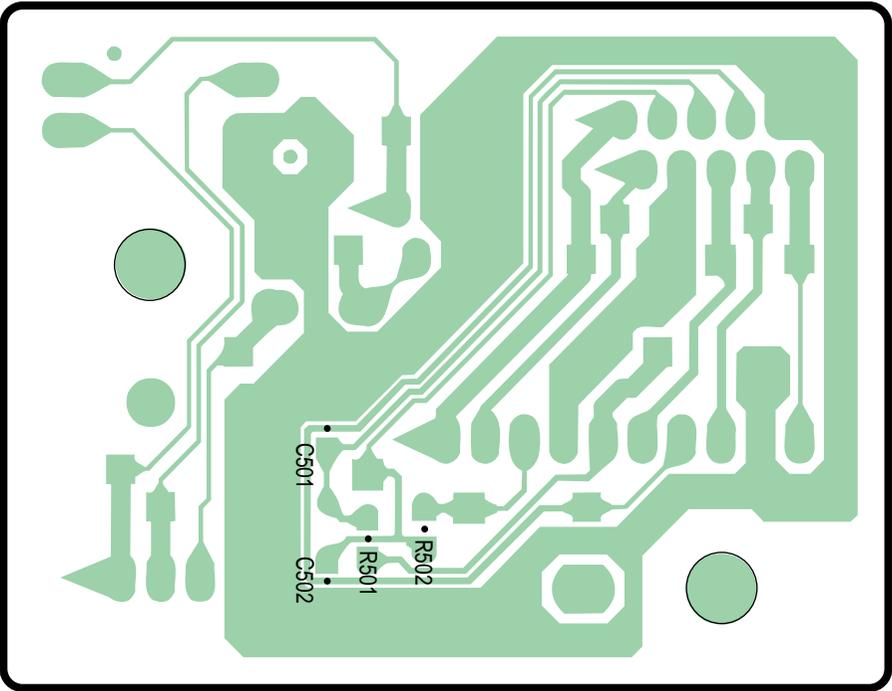


KX-FLB758RU PF SENSOR BOARD (PCB10)

# 16.11. CIS RELAY BOARD (PCB11)

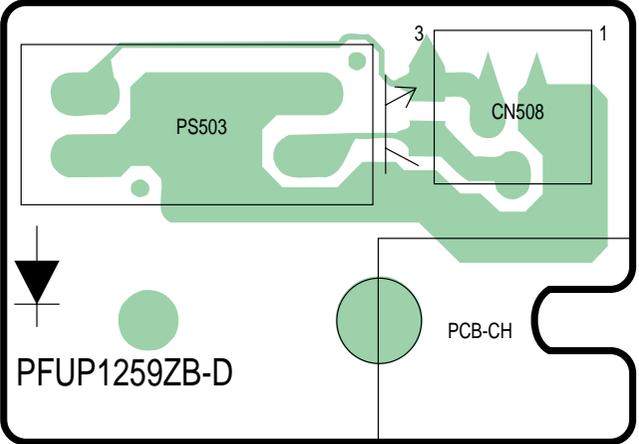


KX-FLB758RU  
CIS RELAY BOARD (PCB11) COMPONENT VIEW



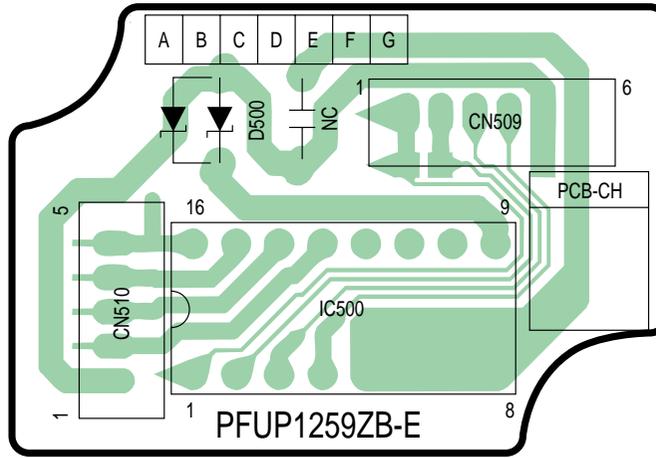
KX-FLB758RU  
CIS RELAY BOARD (PCB11) BOTTOM VIEW

16.12. CIS SENSOR BOARD (PCB12)



KX-FLB758RU  
CIS SENSOR BOARD (PCB12)

### 16.13. SCAN MOTOR DRIVER BOARD (PCB13)



KX-FLB758RU  
SCAN MOTOR DRIVER BOARD (PCB13)

