

# Service Manual

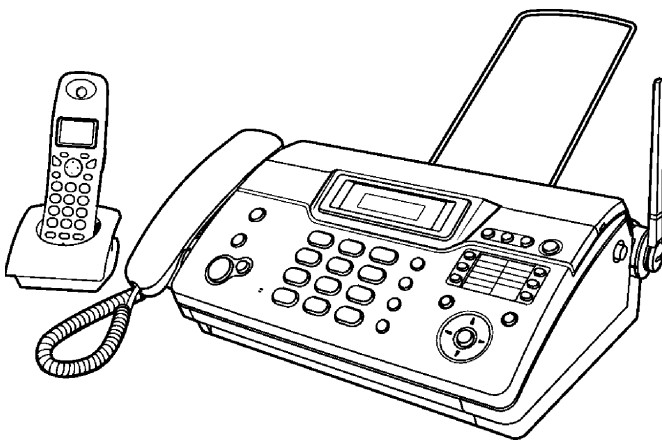
Thermal FAX with Digital Cordless Phone

**KX-FC971CX-S**

**KX-FGA521CX-S**

Silver Version

(for Asia and Middle Near East)



## **⚠ 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 of the 11 digits. The serial number may be found on the bottom of the unit.

## **IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING**

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.

Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

# **Panasonic**

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# 1 INTRODUCTION

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

### Note:

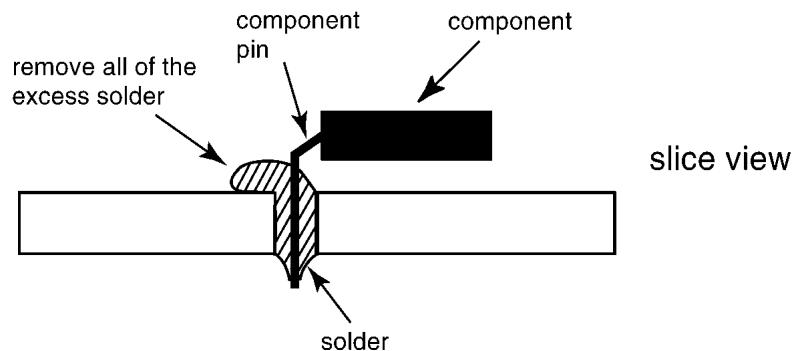
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

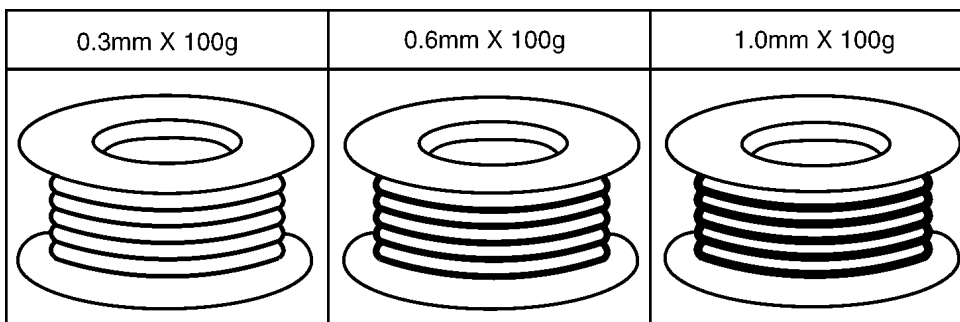
- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend 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.





### 1.3. SAFETY PRECAUTIONS

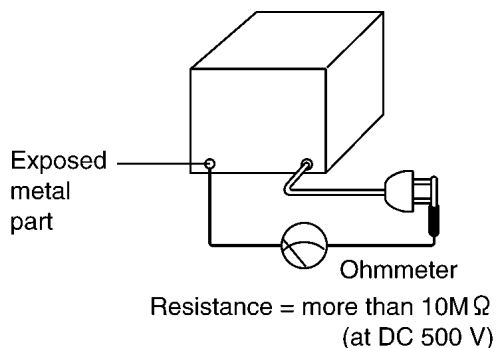
1. Before servicing, unplug the AC power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, 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.

### 1.4. 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.



### 1.5. 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.

### 1.6. BATTERY CAUTION

#### CAUTION

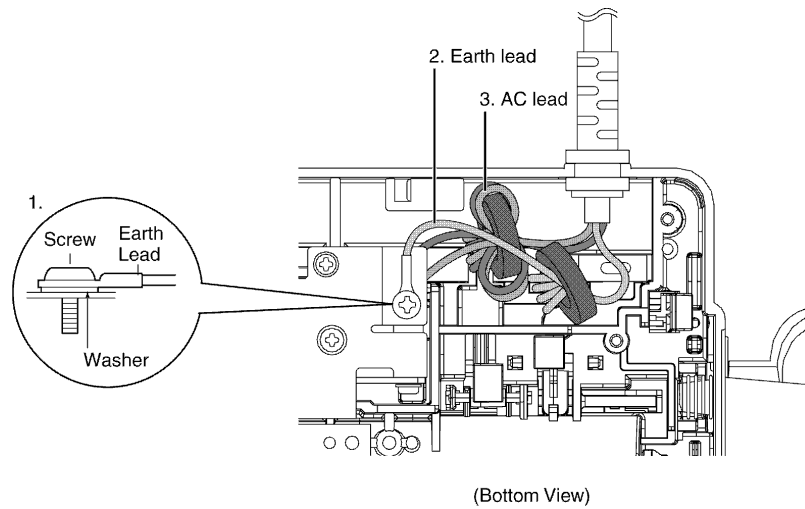
Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's Instructions.

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

## 1.7. 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. Wrap the earth lead around the core 5 times.
3. Wrap the AC lead around the core 5 times.

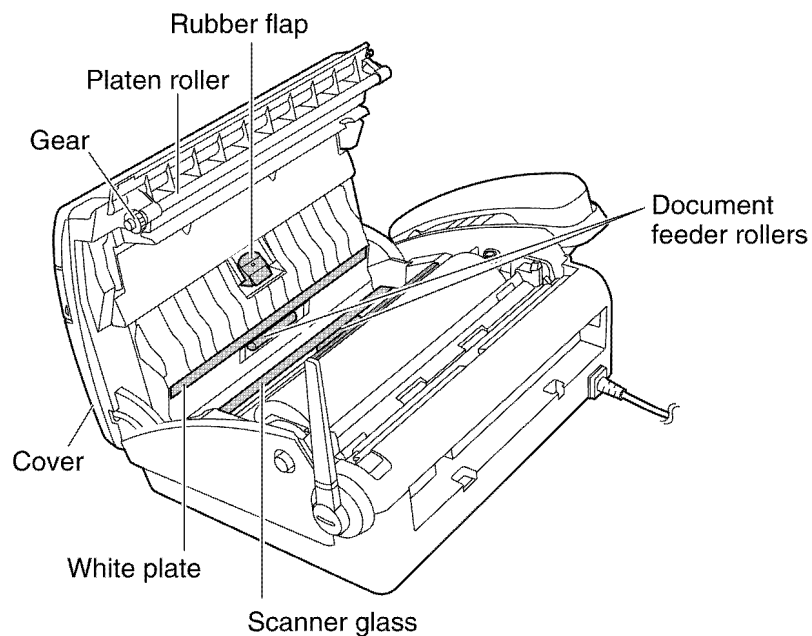


## 1.8. PERSONAL SAFETY PRECAUTIONS

### 1.8.1. 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.



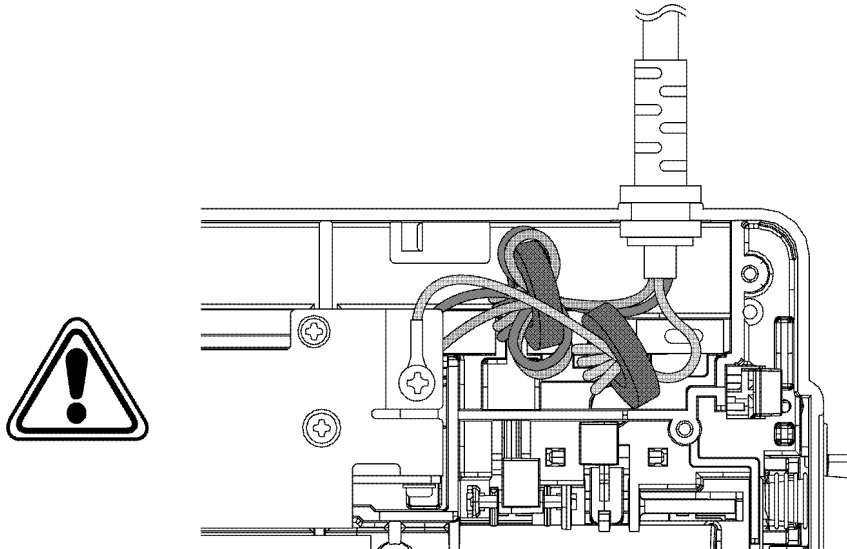
## 1.8.2. LIVE ELECTRICAL SECTIONS

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.

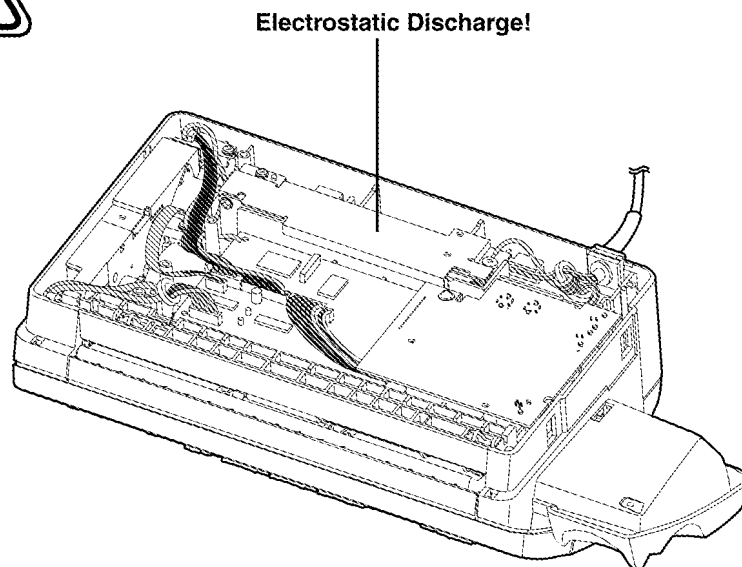


(Bottom View)

## 1.9. SERVICE PRECAUTIONS

### 1.9.1. 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.





## 2 FEATURES AND SPECIFICATIONS

### 2.1. FEATURES

#### General

- LCD (Liquid Crystal Display) readout

#### Enhanced Copier Function

- 64-Level halftone

#### Facsimile

- Automatic document feeder (10 sheets)
- Resolution: Standard/Fine/Photo/Super Fine (64 level)
- Broad cast

#### Integrated Telephone System

- Redialing function
- Base unit phonebook function (100 names)
- Cordless handset phonebook function (150 names)
- Caller ID compatible\*\*

\*\*Feature requires a subscription to caller identification services offered by certain local telephone companies for a fee. You and your caller(s) must be in areas that provide caller identification services, and compatible equipment must be used by both telephone companies. Feature not available when the unit is connected to a PBX system.

### 2.2. OPTIONAL ACCESSORIES

Model No.	Item	Specifications/Usage
KX-A106	Standard thermal recording paper*1	216 mm x 30 m roll, with 25 mm core
HHR-P106	Rechargeable battery	Nickel metal hydride (Ni-MH) battery
KX-FGA521CX	Additional cordless handset	English LCD display

\*1 Use only the included or specified recording paper. Using other recording paper may affect print quality and/or cause excessive wear to the thermal head.

## 2.3. SPECIFICATIONS

### 2.3.1. Base unit

<b>Applicable Lines:</b>	Public Switched Telephone Network
<b>Document Size:</b>	Max. 216 mm in width Max. 600 mm in length
<b>Effective Scanning Width:</b>	208 mm
<b>Recording Paper Size:</b>	216 x max. 30 m roll
<b>Effective Printing Width:</b>	208 mm
<b>Transmission Time*<sup>1</sup>:</b>	Approx. 15 s/page (Original mode) <sup>2</sup>
<b>Scanning Density:</b>	Horizontal: 8 pels/mm Vertical: 3.85 lines/mm - in standard resolution, 7.7 lines/mm - in fine/photo resolution, 15.4 lines/mm - in super fine resolution
<b>Photo resolution:</b>	64-level
<b>Scanner Type:</b>	Contact Image Sensor
<b>Printer Type:</b>	Thermal printing
<b>Data Compression System:</b>	Modified Huffman (MH), Modified READ (MR)
<b>Modem Speed:</b>	9,600 / 7,200 / 4,800 / 2,400 bps; Automatic Fallback
<b>Operating Environment:</b>	5 - 35°C, 20 - 80% RH (Relative Humidity)
<b>Dimensions (HxWxD):</b>	Approx. height 121 mm x width 364 mm x depth 224 mm
<b>Mass (Weight):</b>	Approx. 2.8 kg
<b>Power Consumption:</b>	Standby: Approx. 2.0 W Transmission: Approx. 13 W Reception: Approx. 30 W (When receiving a 20% black document) Copy: Approx. 35 W (When copying a 20% black document) Maximum: Approx. 110 W (When copying a 100% black document)
<b>Power Supply:</b>	220 V - 240 V AC, 50/60 Hz
<b>Fax Memory Capacity*<sup>3</sup>:</b>	Approx. 28 pages memory reception (Based on the ITU-T No. 1 Test Chart in standard resolution, with original mode.)
<b>Voice Memory Capacity*<sup>4</sup>:</b>	Approx. 15 minutes of recording time

\*<sup>1</sup> Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party's machine.

\*<sup>2</sup> Transmission speed is based upon the ITU-T No. 1 Test Chart with original mode. If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

\*<sup>3</sup> If an error occurs during fax reception, such as a paper jam or if the recording paper runs out, the fax and subsequent faxes will be retained in memory.

\*<sup>4</sup> Recording time may be reduced by the calling party's background noise.

### 2.3.2. Cordless handset

<b>Frequency range:</b>	2,402 MHz~2,480 MHz
<b>Operating environment:</b>	5 - 35°C, 20 - 80% RH (Relative Humidity)
<b>Duplex procedure:</b>	FHSS
<b>RF Transmission Power:</b>	EIRP<. 25 mW
<b>Voice coding:</b>	ADPCM 32 kbit/s
<b>Dimensions:</b>	Approx. height 161 mm x width 47 mm x depth 39 mm
<b>Mass (Weight):</b>	Approx. 140 g

### 2.3.3. Charger unit

<b>Operating environment:</b>	5 - 35°C, 20 - 80% RH (Relative Humidity)
<b>Dimensions:</b>	Approx. height 64 mm x width 80 mm x depth 90 mm
<b>Mass (Weight):</b>	Approx. 80 g
<b>Power consumption:</b>	Standby: Approx. 1 W Maximum: Approx. 2 W
<b>Power supply:</b>	AC adaptor (220V-240V AC, 50/60 Hz)

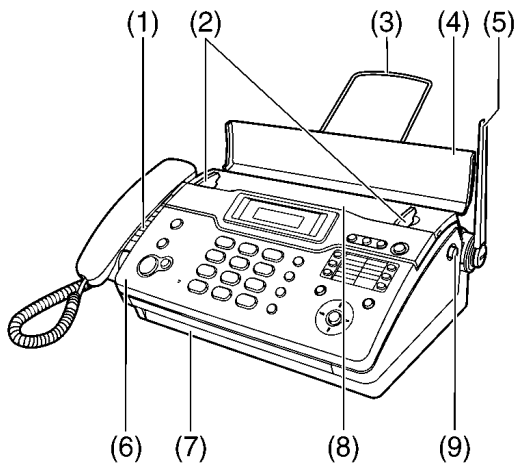
**Note:**

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

## 3 LOCATION

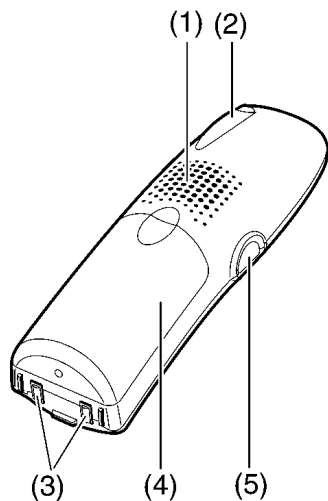
### 3.1. Overview

#### 3.1.1. Base Unit



- (1) Speaker
- (2) Document guides
- (3) Paper stacker
  - The paper stacker may not be shown in all illustrations in these operating instructions.
- (4) Document feeder tray
- (5) Antenna
- (6) Top cover
- (7) Document exit
- (8) Document entrance
- (9) Top cover release button

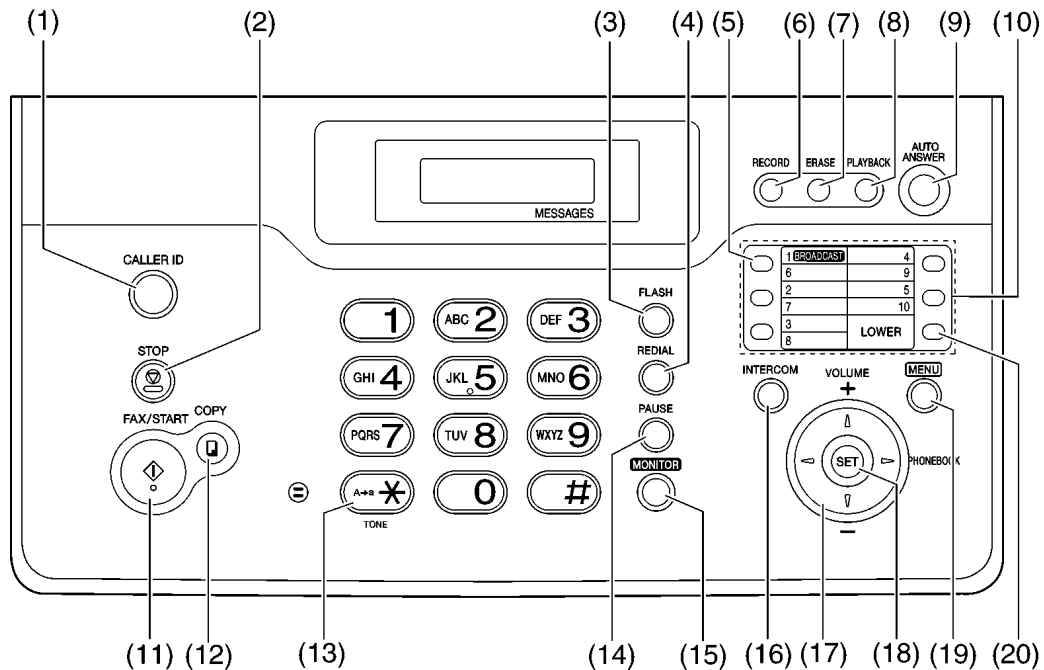
#### 3.1.2. Cordless Handset



- (1) Speaker
- (2) Antenna
- (3) Charge contacts
- (4) Battery cover
- (5) Voice select button
  - To select the tone quality of the receiver .

## 3.2. Control Panel

### 3.2.1. Base Unit



#### Buttons

##### (1) [CALLER ID]

- To use Caller ID features.

##### (2) [STOP]

- To stop an operation or programming session.
- To erase a character/number. Press and hold to erase all characters/numbers.

##### (3) [FLASH]

- To access special telephone services or for transferring extension calls.

##### (4) [REDIAL]

- To redial the last number dialed from the base unit.

##### (5) [BROADCAST]

- To transmit a document to multiple parties.

##### (6) [RECORD]

- To record a telephone conversation.

##### (7) [ERASE]

- To erase messages.

##### (8) [PLAY MESSAGES]

- To play messages.

##### (9) [AUTO ANSWER]

- To turn the auto answer setting ON/OFF.

##### (10) Station keys

- To use one-touch dial feature.

##### (11) [FAX/START]

- To start sending or receiving a fax.

##### (12) [COPY]

- To copy a document.

##### (13) [TONE]

- To change from pulse to tone temporarily during dialing when your line has rotary pulse services.

##### (14) [PAUSE]

- To insert a pause during dialing.

##### (15) [MONITOR]

- To initiate dialing without lifting the handset.

##### (16) [INTERCOM]

- To page or locate the handset.

##### (17) Navigator/ [VOLUME][PHONEBOOK]

- To adjust volume.
- To search for a stored item.
- To select features or feature settings during programming.
- To navigate to the next operation.
- To open a phonebook.

##### (18) [SET]

- To store a setting during programming.

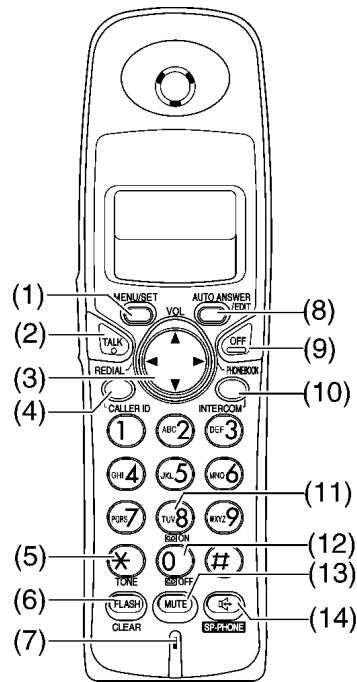
##### (19) [MENU]

- To initiate or exit programming.

##### (20) [LOWER]

- To select stations 6-10 for the one-touch dial feature.

### 3.2.2. Cordless Handset



#### Buttons

##### (1) [MENU/SET]

- To initiate programming.
- To store a setting during programming.

##### (2) [TALK]

- To make/answer calls.

##### (3) Navigator key/[VOL][REDIAL][PHONEBOOK]

- To search for a stored item.
- To select features or feature settings during programming.
- To adjust volume.
- To redial the last number dialed from the handset.
- To open a phonebook.

##### (4) [CALLER ID]

- To use Caller ID features.

##### (5) [TONE]

- To change from pulse to tone temporarily during dialing when your line has rotary pulse services.

##### (6) [FLASH/CLEAR]

- To access special telephone services or for transferring extension calls.
- To erase a character/number.  
Press and hold to erase all characters/numbers.

##### (7) Microphone

- The built-in microphone.

##### (8) [AUTO ANSWER/EDIT]

- To turn the auto answer setting ON/OFF.
- To edit the caller's phone number.

##### (9) [OFF]

- To stop an operation or programming session.
- To hang up.
- To stop viewing caller information.

##### (10) [INTERCOM]

- To page or locate the base unit or another cordless handset.

##### (11) [ON]

- To turn ON the AUTO ANSWER mode .

##### (12) [OFF]

- To turn OFF the AUTO ANSWER mode .

##### (13) [MUTE]

- To mute your voice to the other party during a conversation. Press again to resume the conversation.

##### (14) [SP-PHONE]

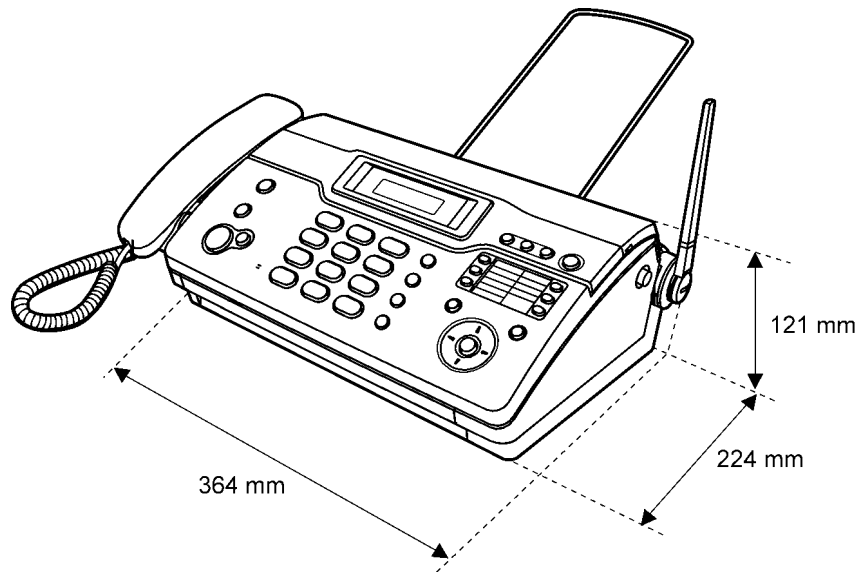
- For speakerphone operation.

## 4 INSTALLATION

### 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: 5°C to 35°C
- Relative humidity: 20% to 80% (without condensation)
- Power cord length should be less than 5 meters. 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.

## 4.2. CONNECTIONS

### Important:

- The unit will not function when there is a power failure. To make calls in emergency situations, you should connect a telephone that can function during a power failure to the telephone line.

### 4.2.1. Base unit

#### (1) Paper stacker

- The paper stacker will drop to a lower angle after inserting into the base unit.
- The paper stacker may not be shown in all illustrations in these operating instructions.

#### (2) Power cord

- Connect to the power outlet (220 V - 240V, 50/60 Hz).

#### (3) Telephone line cord

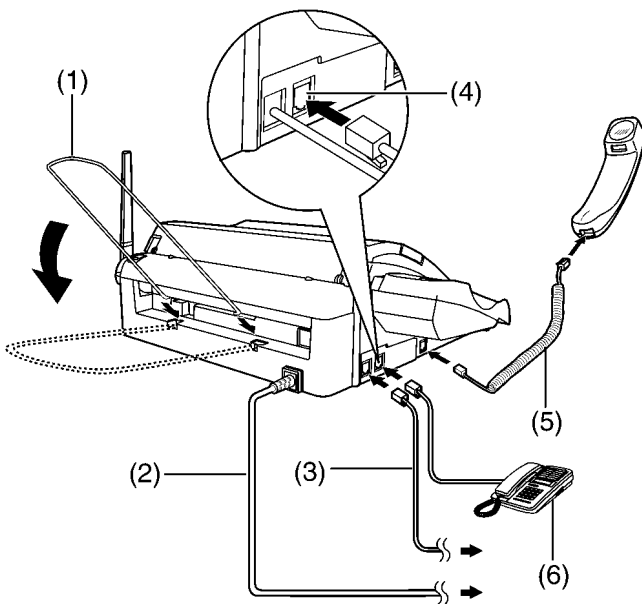
- Connect to [LINE] jack and a single telephone line jack.

#### (4) [EXT] jack

- Remove the stopper if attached.

#### (5) Handset cord

#### (6) Extension telephone (not included)



### Caution:

- When you operate this product, 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.
- Keep the base unit away from walls as far as possible to prevent a recording paper jam .

### Note:

- Before you can make calls, the dialing mode setting may need to be changed.

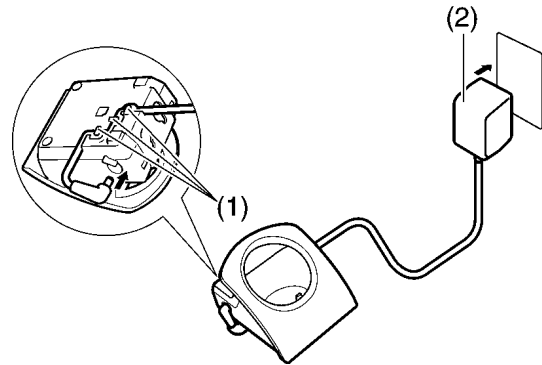
### 4.2.2. Charger Unit

#### (1) Hooks

- Fasten the AC adaptor cord to prevent it from being disconnected.

#### (2) AC adaptor

- Connect to the power outlet (220 V - 240 V, 50/60 Hz).



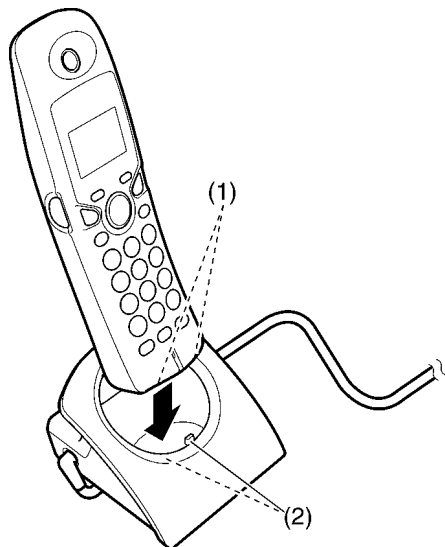
### CAUTION:

- **USE ONLY WITH** the included Panasonic AC adaptor.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.



### 4.3. BATTERY CHARGE

Place the cordless handset on the charger for about 10 hours before initial use. Make sure the base unit power cord is connected while charging the battery.



**Note:**

- Clean the cordless handset charge contacts (1) and the charger charge contacts (2) with a soft, dry cloth once a month, otherwise the battery may not charge properly. Clean more often if the unit is exposed to grease, dust or high humidity.
- While charging the battery, make sure the cordless handset and charger are within range of the base unit (where intercom call is available).

**Battery strength**

You can confirm the battery strength on the cordless handset display.

Battery icons	Battery strength
	High
	Medium
	Low
	Needs to be charged.

**Note:**

- The cordless handset will not operate while it is on the charger.

**Battery life**

After your Panasonic battery is fully charged, you can expect the following performance:

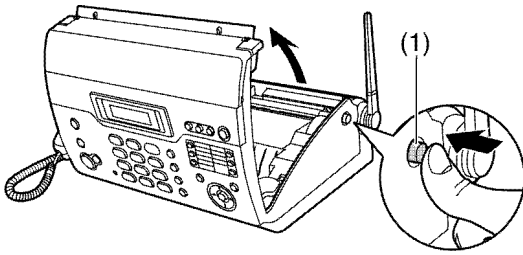
Operation	Operating Time
While in use (talking)	7 hours approx.
While not in use (standby)	150 hours approx.

- Times indicated are for peak performance.
- Battery operating time may be shortened depending on usage conditions and ambient temperature.
- Battery power is consumed whenever the cordless handset is off the charger, even when the cordless handset is not in use. The longer you leave the cordless handset off the charger, the less time you can actually talk on the cordless handset.

- The battery cannot be overcharged unless it is repeatedly removed and replaced.
- For maximum battery life, it is recommended that the cordless handset is not recharged until "Recharge" is displayed.

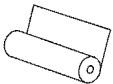
## 4.4. RECORDING PAPER

1. Open the top cover by pressing the top cover release button (1).

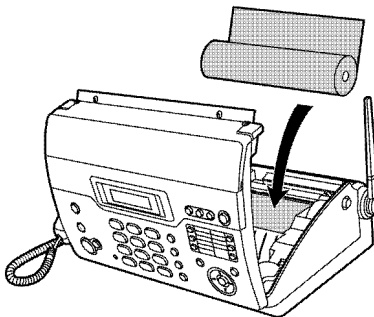


2. Install the recording paper.

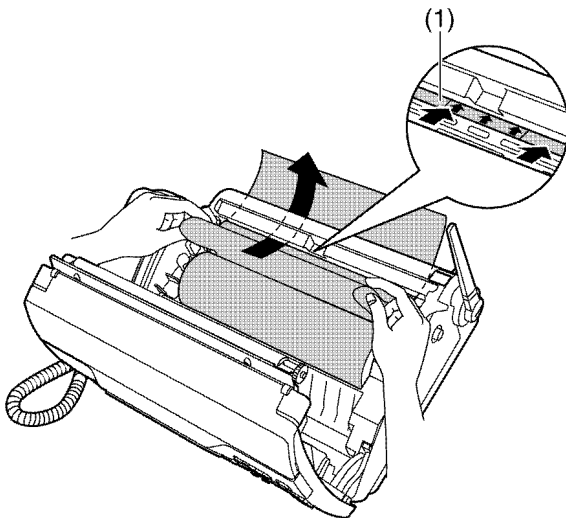
**Correct**



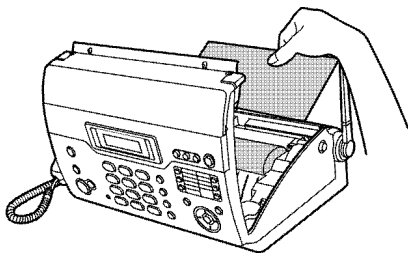
**Incorrect**



3. Insert the leading edge of the paper into the opening above the thermal head (1).

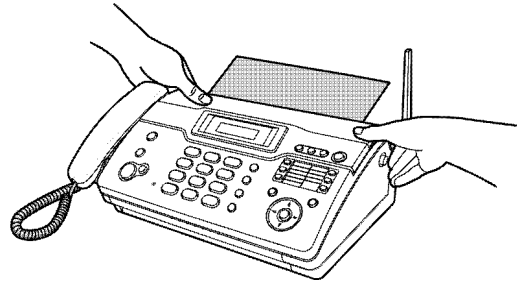


4. Pull the paper out of the unit.

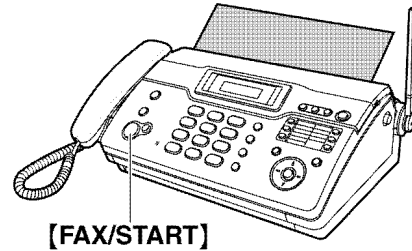


- Make sure that there is no slack in the paper roll.

5. Close the top cover securely by pushing down on both sides.



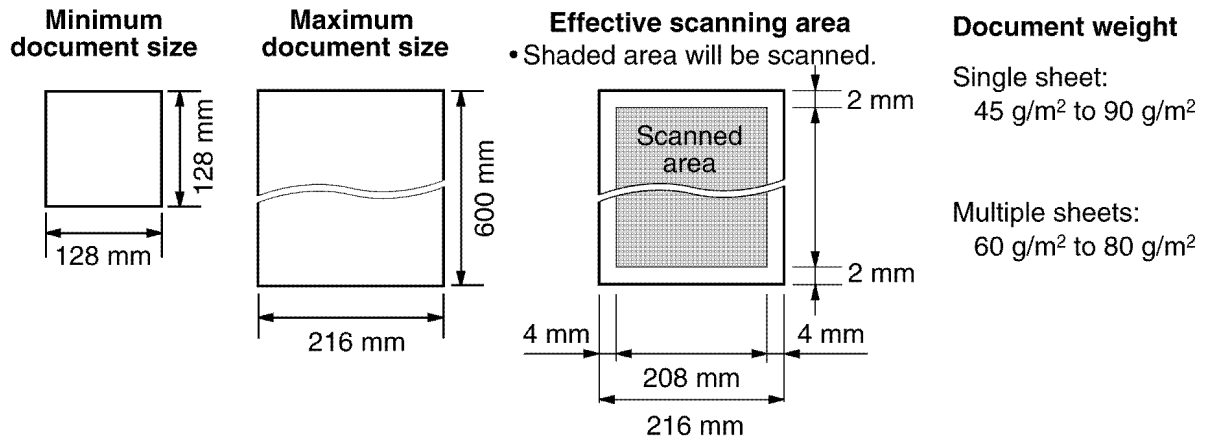
6. Press **[FAX/START]** to cut the paper.



**Note:**

- If the paper is secured with glue or tape, cut approximately 15 cm from the beginning of the roll before installing it.
- When the power cord is connected, a message is printed each time the top cover is opened then closed. If the recording paper is installed upside down, the message will not be printed. Install the paper correctly.
- For accessory information, see **OPTIONAL ACCESSORIES** (P.9).

## 4.5. DOCUMENTS THE UNIT CAN SEND



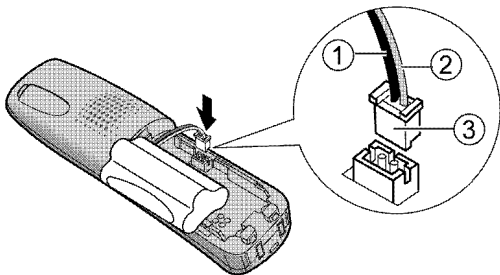
### Note:

- Remove clips, staples or other fasteners.
- Do not send documents that are on the following types of paper: (Make a copy of the document and send the copy.)
  - Chemically treated paper such as carbon or carbonless duplicating paper
  - Electrostatically charged paper
  - Badly curled, creased or torn paper
  - Paper with a coated surface
  - Paper with a faint image
  - Paper with printing on the opposite side that can be seen through the other side, such as newsprint.
- Check that ink, paste or correction fluid has dried completely.
- To send a document with a width of less than 210 mm, we recommend using a copy machine to copy the original document onto A4 or letter-sized paper, then sending the copied document.

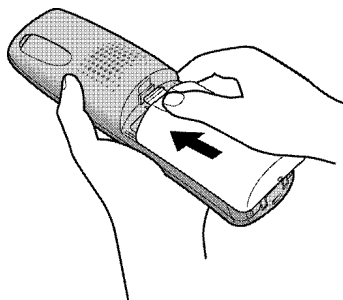
## 4.6. INSTALLING THE BATTERY

1. Insert the battery, then plug the connector.

- ① Black lead
- ② Red lead
- ③ Connector



2. Close the battery cover.



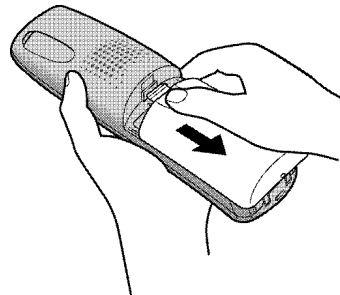
## 4.7. REPLACING THE BATTERY

If "Recharge" is displayed even when the battery has been fully charged, the battery must be replaced. **Please use only Panasonic battery.** See **OPTIONAL ACCESSORIES** (P.9).

**Important:**

- Charge the new battery for about 10 hours before initial use.
- Use only a rechargeable battery. If you install a non-rechargeable battery and start charging, the battery may leak electrolyte.

1. Press the notch on the cover firmly and slide it in the direction of the arrow.

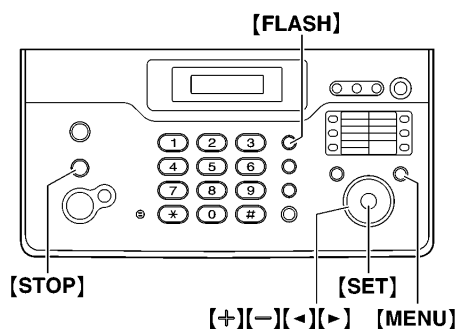


2. Unplug the connector, then remove the old battery.

3. Install the new battery. See the battery installation procedure.

## 4.8. SETTING YOUR LOGO

Your logo will be printed on the top of each page sent from your unit. The logo can be your name or the name of your company.



1. Press **[MENU]**.



2. Press **[◀]** or **[▶]** repeatedly to display the following.



3. Press **[SET]**.

• The cursor (█) will appear on the display.



4. Enter your logo, up to 30 characters. See the following character table below for details.

5. Press **[SET]**.

• The next feature will be displayed.

6. Press **[MENU]**.

To select characters with the base unit dial keypad

Keypad	Characters
[1]	Space # & ' ( ) * , - . / 1
[2]	A B C 2 a b c 2
[3]	D E F 3 d e f 3
[4]	G H I 4 g h i 4
[5]	J K L 5 j k l 5
[6]	M N O 6 m n o 6
[7]	P Q R S 7 p q r s 7
[8]	T U V 8 t u v 8
[9]	W X Y Z 9 w x y z 9
[0]	Space 0
[*]	To change uppercase or lowercase letter.
[FLASH]	To enter a hyphen.
[STOP]	To delete a digit.

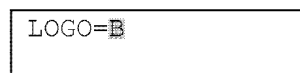
**Note:**

To enter another character that is located on the same dial key, press **[▶]** to move the cursor to the next space.

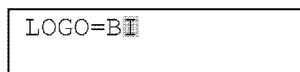
**To enter your logo**

**Example: "BILL"**

1. Press **[2]** 2 times.



2. Press **[4]** 3 times.



3. Press **[5]** 3 times.



4. Press **[▶]** to move the cursor to the next space and press **[5]** 3 times.

LOGO=BIL

### To change uppercase or lowercase letters

Pressing the **[\*]** button will change to uppercase or lowercase letters alternately.

1. Press **[2]** 2 times.

LOGO=B

2. Press **[4]** 3 times.

LOGO=Bi

3. Press **[\*]**.

LOGO=Bi

4. Press **[5]** 3 times.

LOGO=Bi

### To correct a mistake

1. Press **[◀]** or **[▶]** to move the cursor to the incorrect character.
2. Press **[STOP]**.
  - To erase all characters, press and hold **[STOP]**.
3. Enter the correct character.

### To select characters using **[ + ]** or **[ - ]**

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

1. Press **[ - ]** repeatedly to display the desired character.  
Characters will be displayed in the following order:
  - (1) Uppercase letters
  - (2) Number
  - (3) Symbol
  - (4) Lowercase letters
  - If you press **[ + ]**, the order will be reversed.
2. Press **[▶]** to insert the character.
3. Return to step 1 to enter the next character.

## 5 MAINTENANCE

### 5.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

#### 5.1.1. 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.

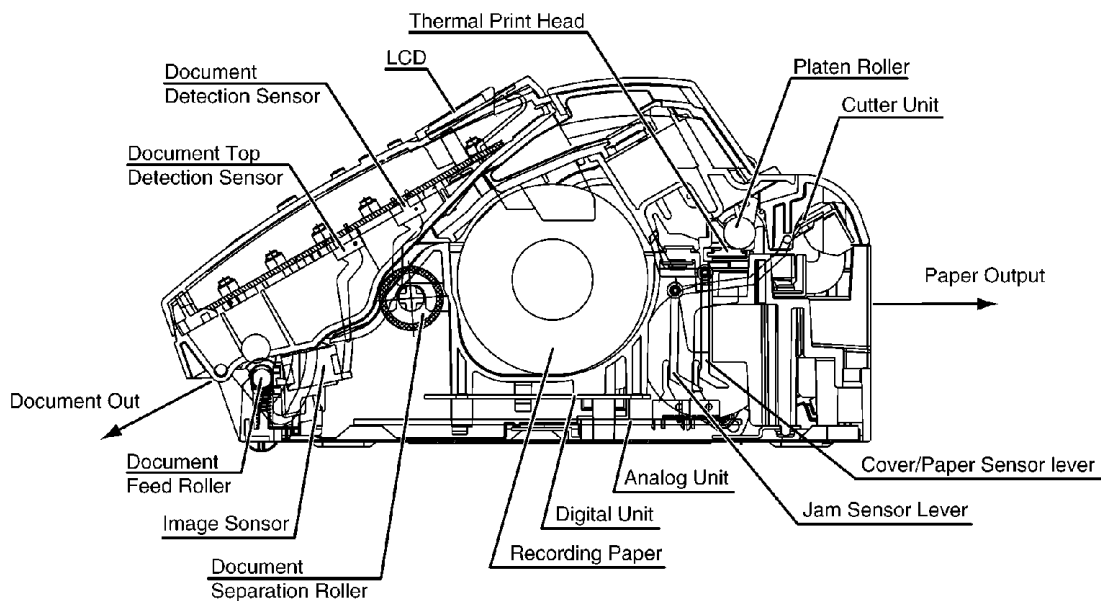
##### 6. Confirm normal operation of the equipment

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.

#### 5.1.2. COMPONENT LOCATIONS



### 5.1.3. 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>THERMAL HEAD CLEANING</b> (P.26).
3	Platen Roller	If the platen is dirty, clean it with a damp cloth then dry thoroughly. Remove the paper and film cartridge before cleaning.	—
4	Thermal Head	If the thermal head is dirty, clean the printing surface with a cloth moistened with denatured alcohol (alcohol without water), then dry thoroughly.	Refer to <b>DOCUMENT FEEDER/SCANNER GLASS CLEANING</b> (P.26).
5	Sensors	Document sensor (SW39), Read position sensor (SW38), Recording paper/cover open sensor(SW501), Jam sensor (SW502), Hook switch (SW500) Confirm the operation of the sensors.	See <b>COMPONENT LOCATIONS</b> (P.23) and <b>HOW TO REMOVE THE ANALOG BOARD, DIGITAL BOARD, POWER SUPPLY BOARD AND POWER CORD</b> (P.37).
6	Glass	If the glass is dirty, clean them with a dry soft cloth.	Refer to <b>DOCUMENT FEEDER/SCANNER GLASS CLEANING</b> (P.26).
7	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

### 5.1.4. MAINTENANCE CYCLE

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Procedure
1	Separation Roller (Ref. No. 110)	3 months	7 years* (31,500 documents)	Refer to <b>MOTOR SECTION</b> (P.194)
2	Separation Rubber (Ref. No.23)	3 months	7 years (31,500 documents)	Refer to <b>MAINTENANCE ITEMS AND COMPONENT LOCATIONS</b> (P.23)
3	Feed Rollers (Ref. No. 30, 78)	3 months	7 years (31,500 documents)	Refer to <b>HOW TO REMOVE THE IMAGE SENSOR (CIS) AND FEED ROLLER</b> (P.33).
4	Thermal Head (Ref. No. 58)	3 months	7 years (31,500 documents)	Refer to <b>HOW TO REMOVE THE ANTENNA AND CUTTER UNIT</b> (P.34).

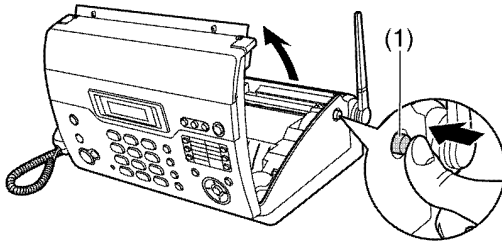
\* These values are standard and may vary depending on usage conditions.



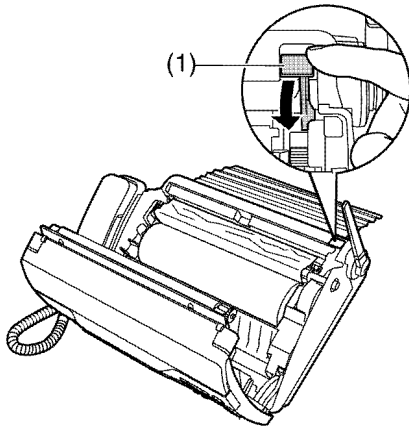
## 5.2. JAMS

### 5.2.1. Recording Paper Jams

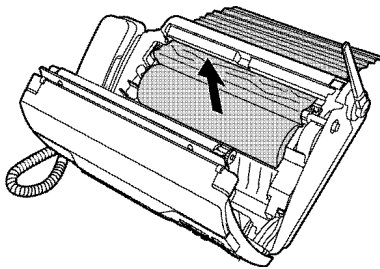
1. Open the top cover by pressing the top cover release button (1).



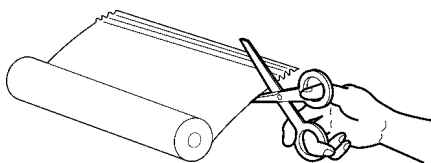
2. Pull the cutter release lever (1) forward.
  - The paper cutter will be released.



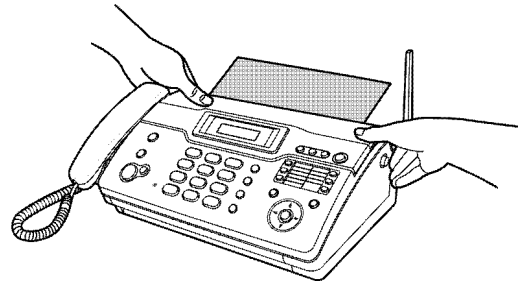
3. Remove the recording paper.



4. Cut off the wrinkled portion.

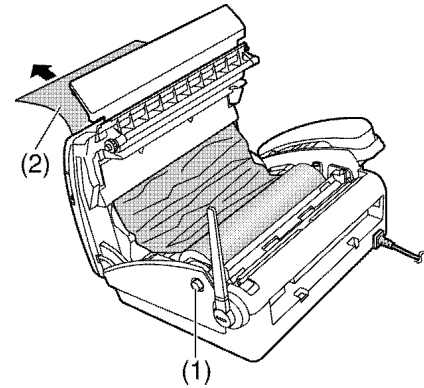


5. Install the recording paper and close the top cover securely by pushing down on both sides (Refer to RECORDING PAPER (P.18)).

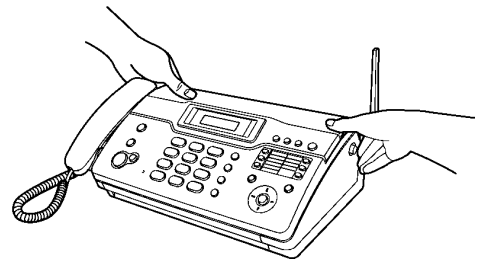


### 5.2.2. Document Jams Sending

1. Open the top cover by pressing the top cover release button (1) and remove the jammed document carefully (2).



2. Close the top cover securely by pushing down on both sides.



**Note:**

- Do not pull out the jammed paper forcibly before opening top cover.

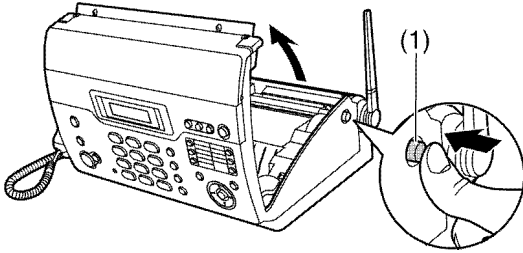


### 5.2.3. DOCUMENT FEEDER/SCANNER GLASS CLEANING

Clean the document feeder when:

- Documents frequently misfeed.
- Smudges or black/white lines appear on the original document when sending or copying.

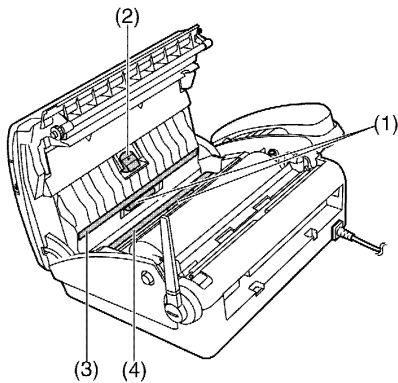
1. Disconnect the power cord and the telephone line cord.
2. Open the top cover by pressing the top cover release button (1).



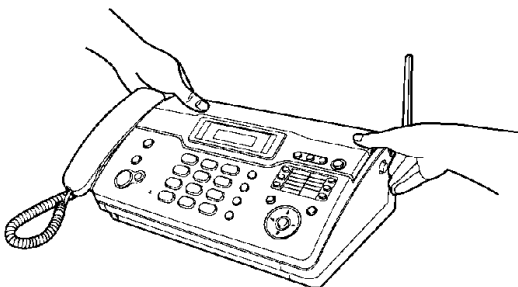
3. Clean the document feeder rollers (1) and rubber flap (2) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly. Clean the white plate (3) and scanner glass (4) with a soft and dry cloth.

**Caution:**

- Do not use paper products, such as paper towels or tissues.



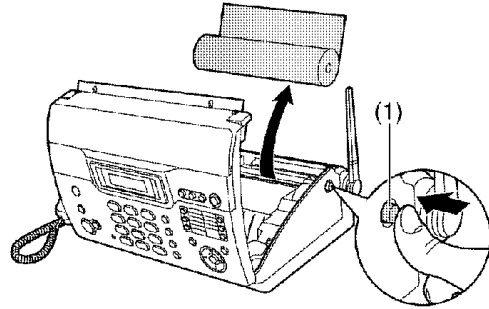
4. Connect the power cord and the telephone line cord.
5. Close the top cover securely by pushing down on both sides.



### 5.2.4. THERMAL HEAD CLEANING

If smudges or black/white lines appear on a copied/received document, check whether there is dust on the thermal head. Clean it to remove the dust.

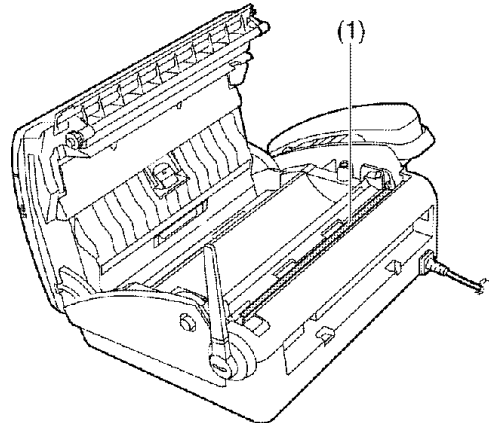
1. Disconnect the power cord and the telephone line cord.
2. Open the top cover by pressing the top cover release button (1) and remove the recording paper.



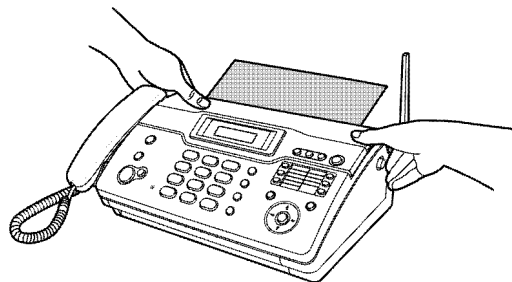
3. Clean the thermal head (1) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.

**Caution:**

- To prevent a malfunction due to static electricity, do not use a dry cloth and do not touch the thermal head directly.



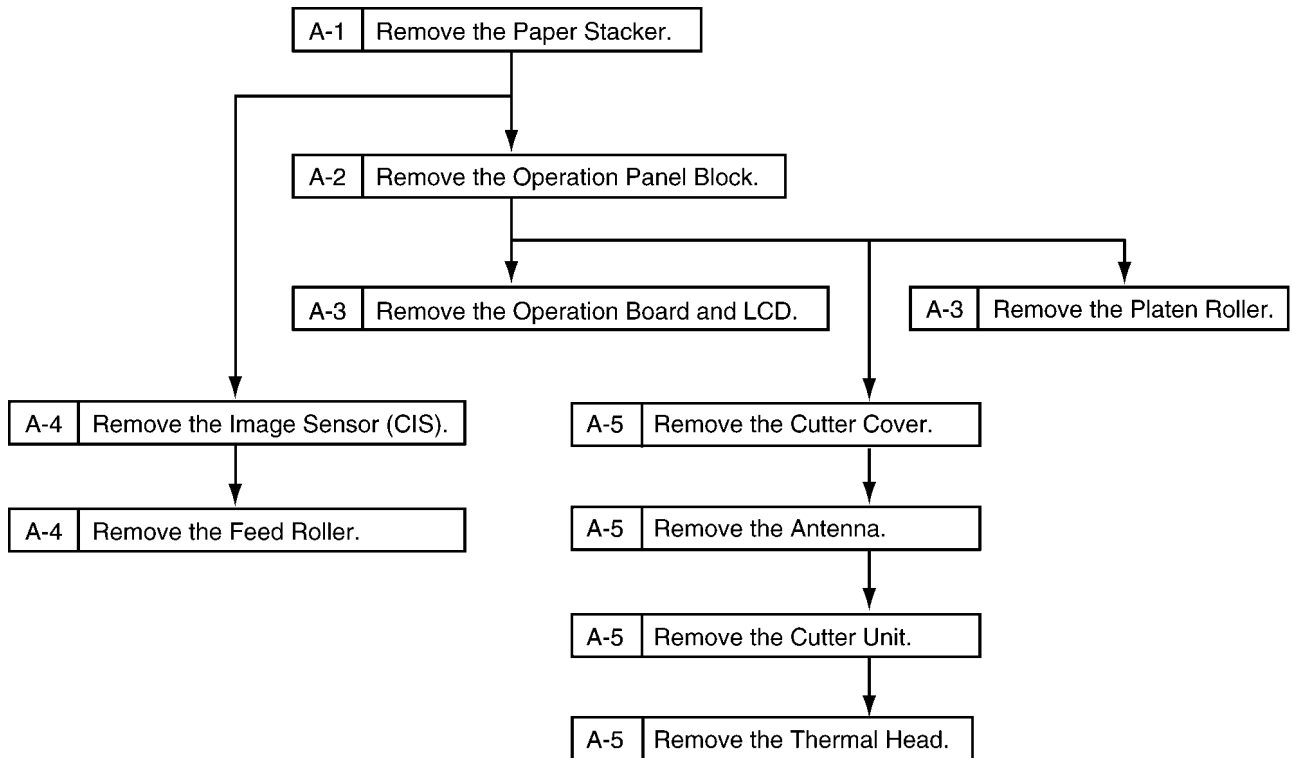
4. Connect the power cord and the telephone line cord.
5. Install the recording paper and close the top cover securely by pushing down on both sides. (Refer to RECORDING PAPER (P.18))



## 6 DISASSEMBLY INSTRUCTIONS

### 6.1. DISASSEMBLY FLOW CHART

#### 6.1.1. UPPER CABINET SECTION



#### CROSS REFERENCE:

HOW TO REMOVE THE PAPER STACKER (P.29)

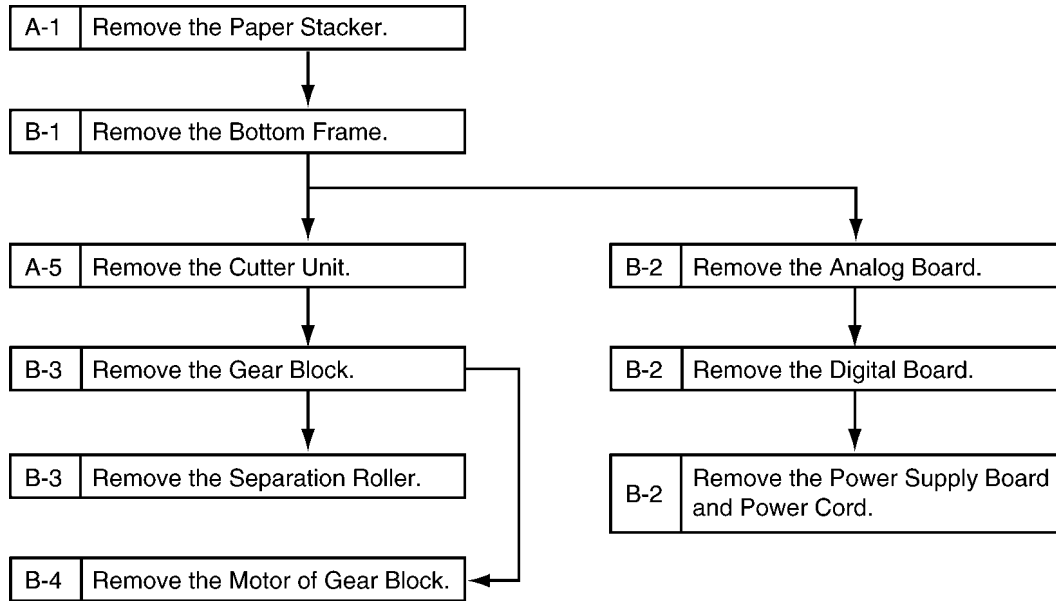
HOW TO REMOVE THE OPERATION PANEL BLOCK (P.30)

HOW TO REMOVE THE OPERATION BOARD, LCD, MICROPHONE UNIT and PLATEN ROLLER (P.31)

HOW TO REMOVE THE IMAGE SENSOR (CIS) AND FEED ROLLER (P.33)

HOW TO REMOVE THE ANTENNA AND CUTTER UNIT (P.34)

### 6.1.2. LOWER CABINET SECTION



**CROSS REFERENCE:**

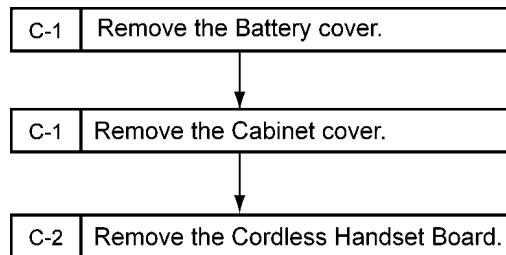
**HOW TO REMOVE THE BOTTOM FRAME (P.36)**

**HOW TO REMOVE THE ANALOG BOARD, DIGITAL BOARD, POWER SUPPLY BOARD AND POWER CORD (P.37)**

**HOW TO REMOVE THE GEAR BLOCK AND SEPARATION ROLLER (P.38)**

**HOW TO REMOVE THE MOTOR OF GEAR BLOCK (P.33)**

### 6.1.3. CORDLESS HANDSET SECTION



**CROSS REFERENCE:**

**HOW TO REMOVE THE BATTERY COVER AND CABINET COVER (P.40)**

**HOW TO REMOVE THE CORDLESS HANDSET BOARD. (P.43)**

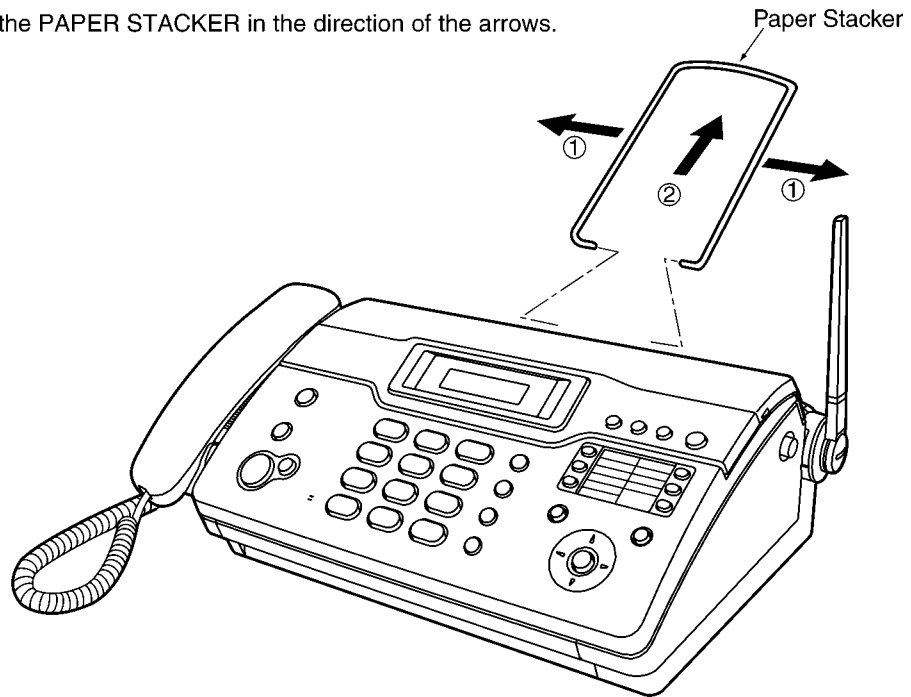
## 6.2. BASE UNIT

### 6.2.1. HOW TO REMOVE THE PAPER STACKER

PROCEDURE: A-1

Ref. No. A-1

1) Push the lower of the PAPER STACKER in the direction of the arrows.

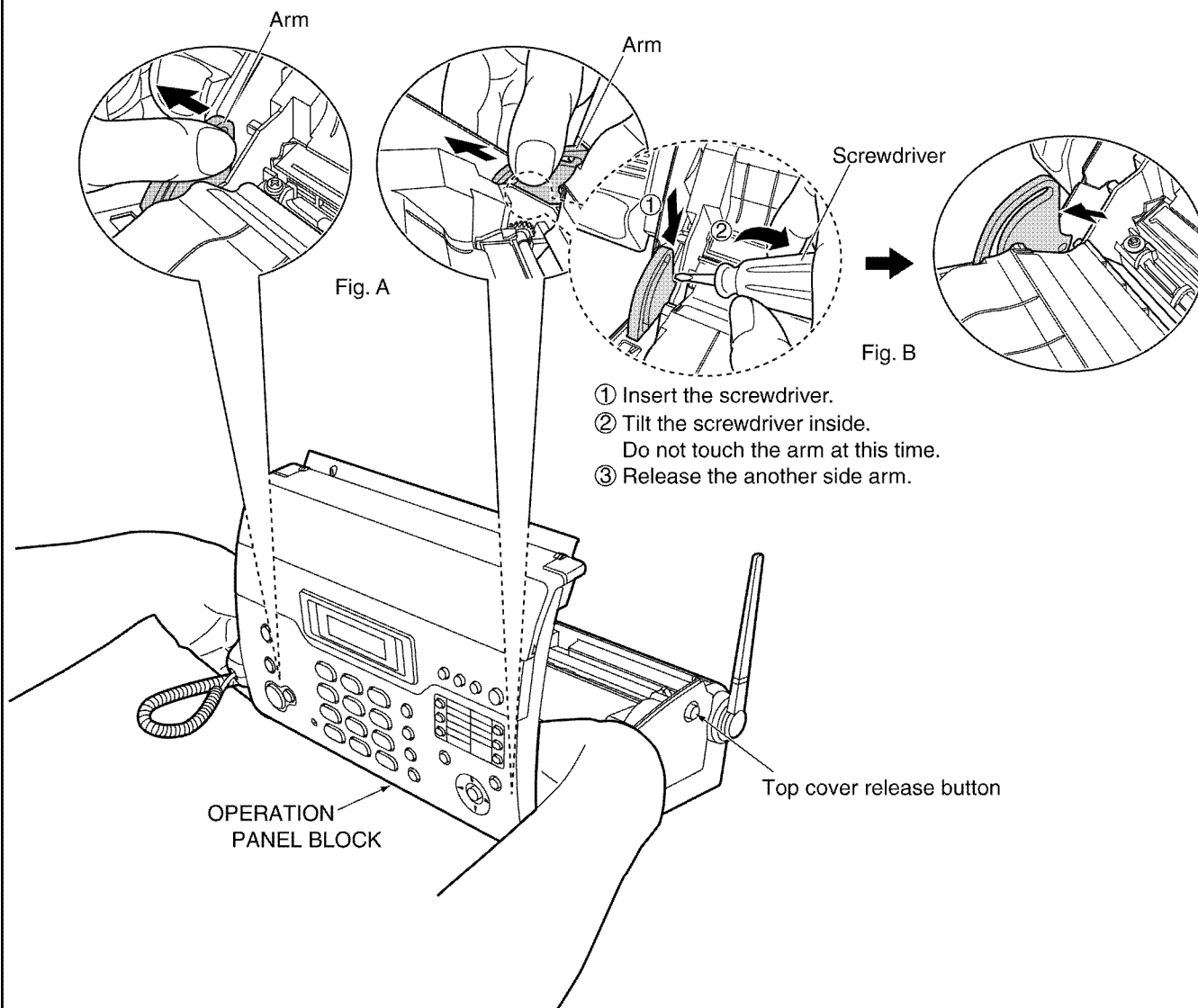


## 6.2.2. HOW TO REMOVE THE OPERATION PANEL BLOCK

PROCEDURE: A-1 → A-2

Ref. No. A-2

- 1) Unhook all the connectors connecting the main cabinet with the OPERATION PANEL BLOCK. (Refer to **Ref. No. B-1**)
- 2) Push the Top cover release button.
- 3) Push the both side arms (in the direction of the arrow shown in Fig. A) simultaneously to release the top of arms.
- 4) Release the both side arms, as shown in a Fig. B.
- 5) Remove the OPERATION PANEL BLOCK.



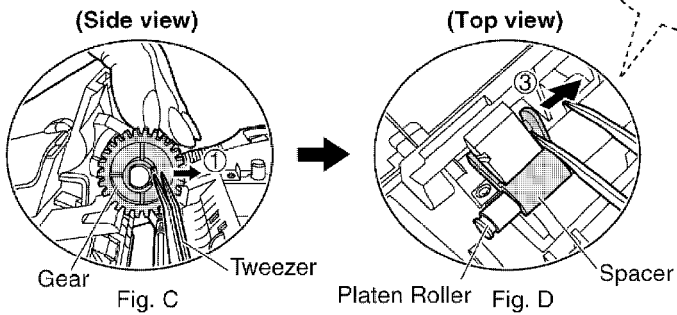
### 6.2.3. HOW TO REMOVE THE OPERATION BOARD, LCD, MICROPHONE UNIT and PLATEN ROLLER

PROCEDURE: A-1 → A-2 → A-3

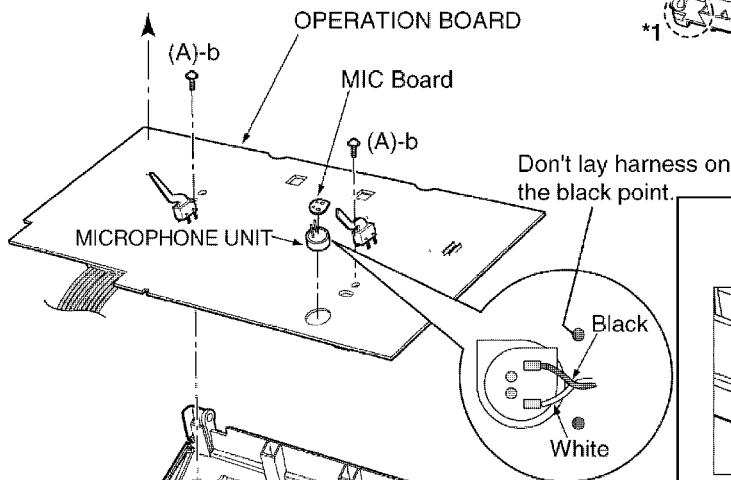
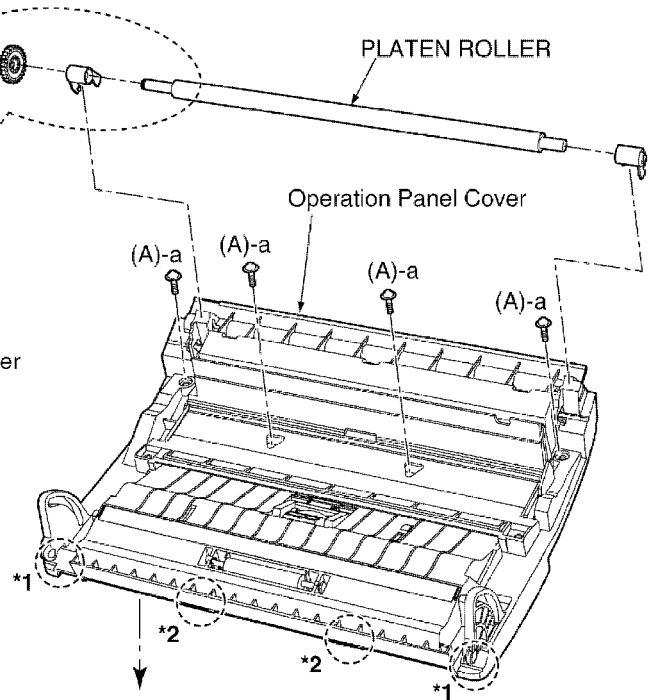
Ref. No. A-3

- 1) Remove the 4 screws (A)-a.
- 2) Remove the OPERATION PANEL COVER.
- 3) Remove the 2 screws (A)-b.
- 4) Remove the OPERATION BOARD and LCD.
- 5) Remove the MICROPHONE UNIT .
- 6) Remove the MIC Board .

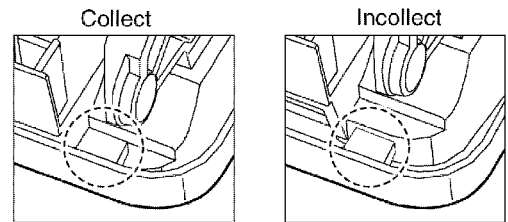
- 1) Remove the Gear, as shown in a Fig. C .
- 2) Remove the Spacer, as shown in a Fig. D .
- 3) Remove the PLATEN ROLLER.



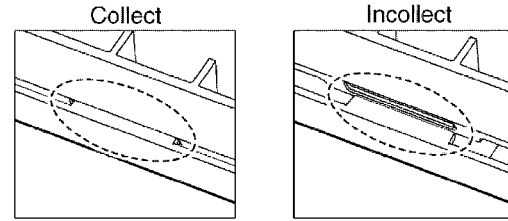
- ① Pull the hook of Gear.
- ② Remove the Gear.
- ③ Pull the hook of Spacer.
- ④ Remove the Spacer.



\*1 : Attachment of Operation Panel Cover



\*2 : Attachment of Operation Panel Cover

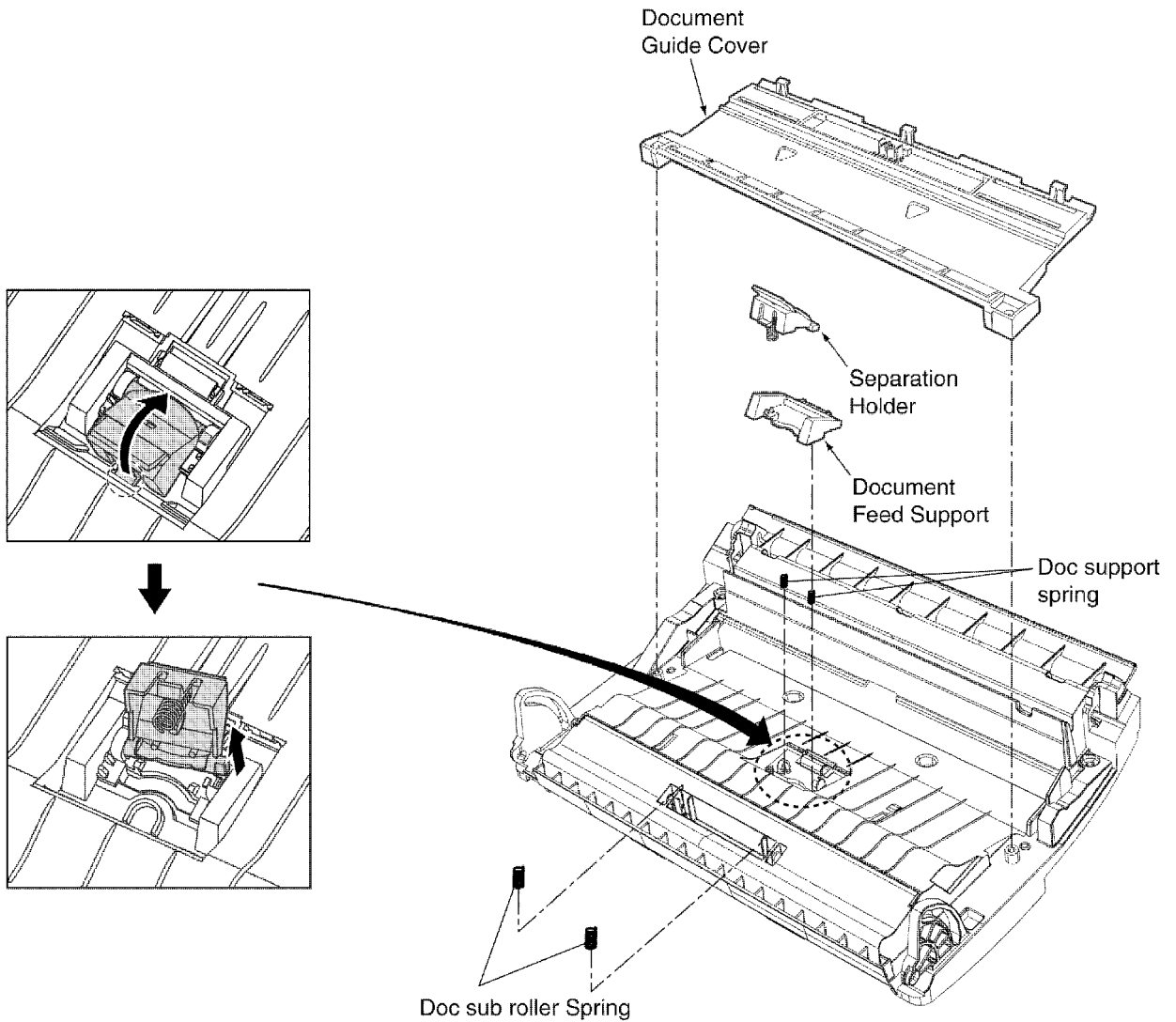


## 6.2.4. HOW TO REMOVE THE SEPARATION HOLDER AND DOCUMENT FEED SUPPORT

PROCEDURE: A-1 → A-2 → A-3 (1) → A-3 (2)

Ref. No. A-3 (2)

- 1) Remove the Document Guide Cover.
- 2) Remove the Separation Holder.
- 3) Remove the Document Feed Support.



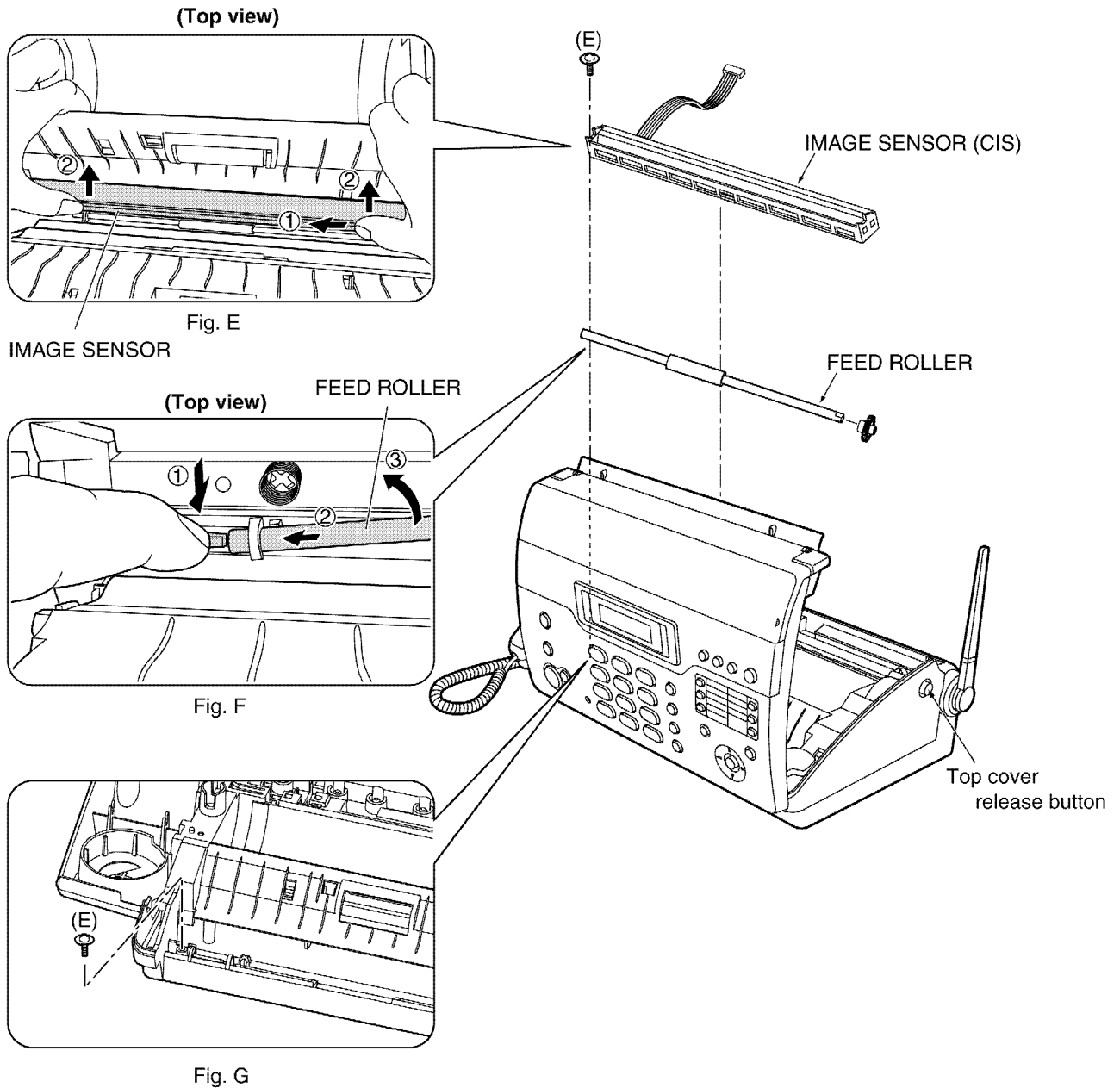


## 6.2.5. HOW TO REMOVE THE IMAGE SENSOR (CIS) AND FEED ROLLER

PROCEDURE: A-1 → A-2 → B-1 → A-4

Ref. No. A-4

- 1) Push the Top cover release button.
- 2) Release the top of Operation Panel Block arms.  
(Refer to Fig. A on **Ref. No. A-2**)
- 3) Remove the 1 screw (E), as shown in a Fig. G.
- 4) Remove the IMAGE SENSOR, as shown in a Fig. E.
- 5) Remove the BTOTM FRAME. (Refer to **Ref. No. B-1**)
- 6) Remove the FEED ROLLER, as shown in a Fig. F.

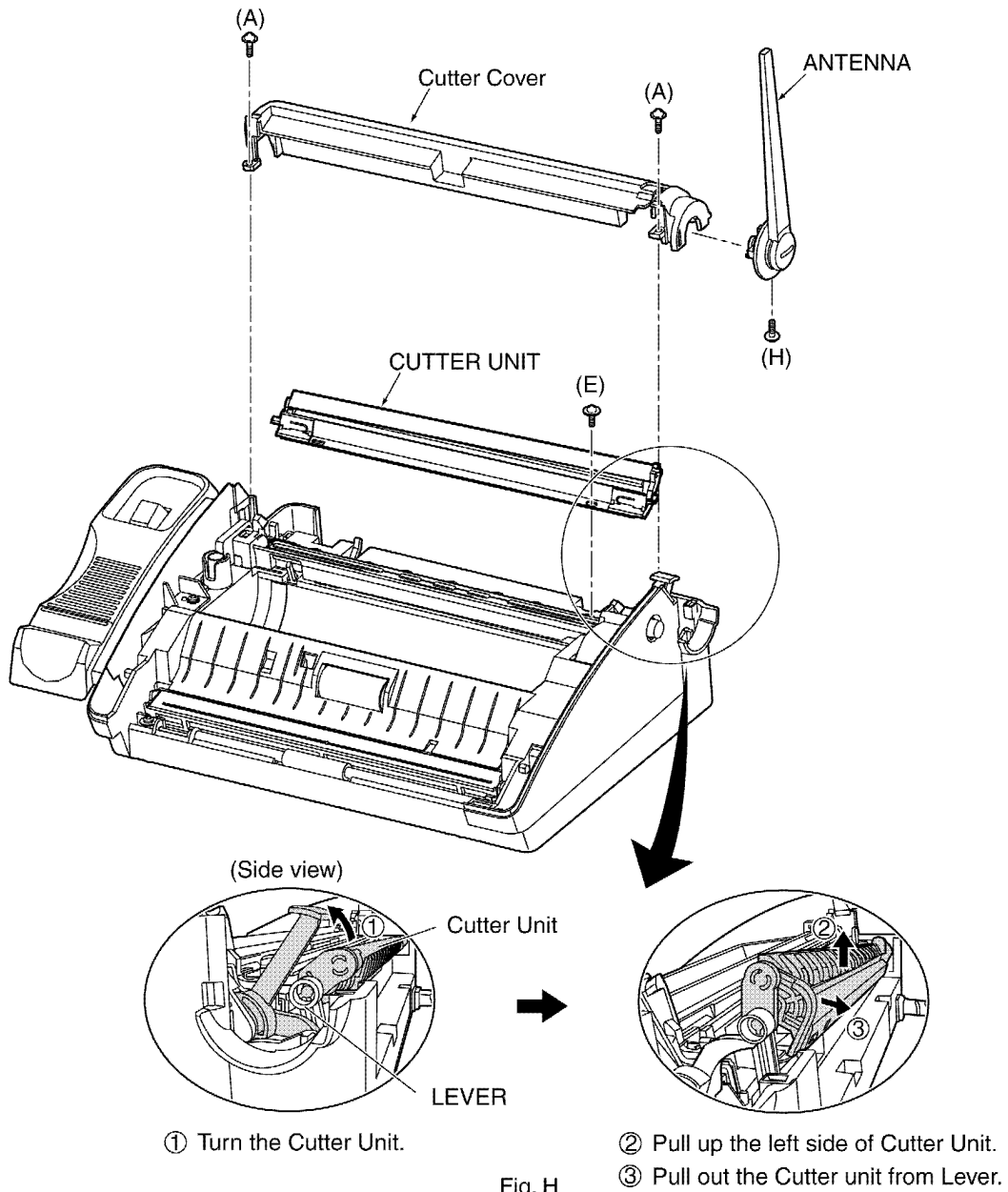


## 6.2.6. HOW TO REMOVE THE ANTENNA AND CUTTER UNIT

PROCEDURE: A-1 → A-2 → A-5

Ref. No. A-5

- 1) Remove the 2 screw (A).
- 2) Remove the Cutter Cover.
- 3) Remove the 1 screw (H).
- 4) Remove the ANTENNA.
- 5) Remove the 1 screw (E).
- 6) Release the Lever, as shown in Fig. H.
- 7) Remove the CUTTER UNIT.

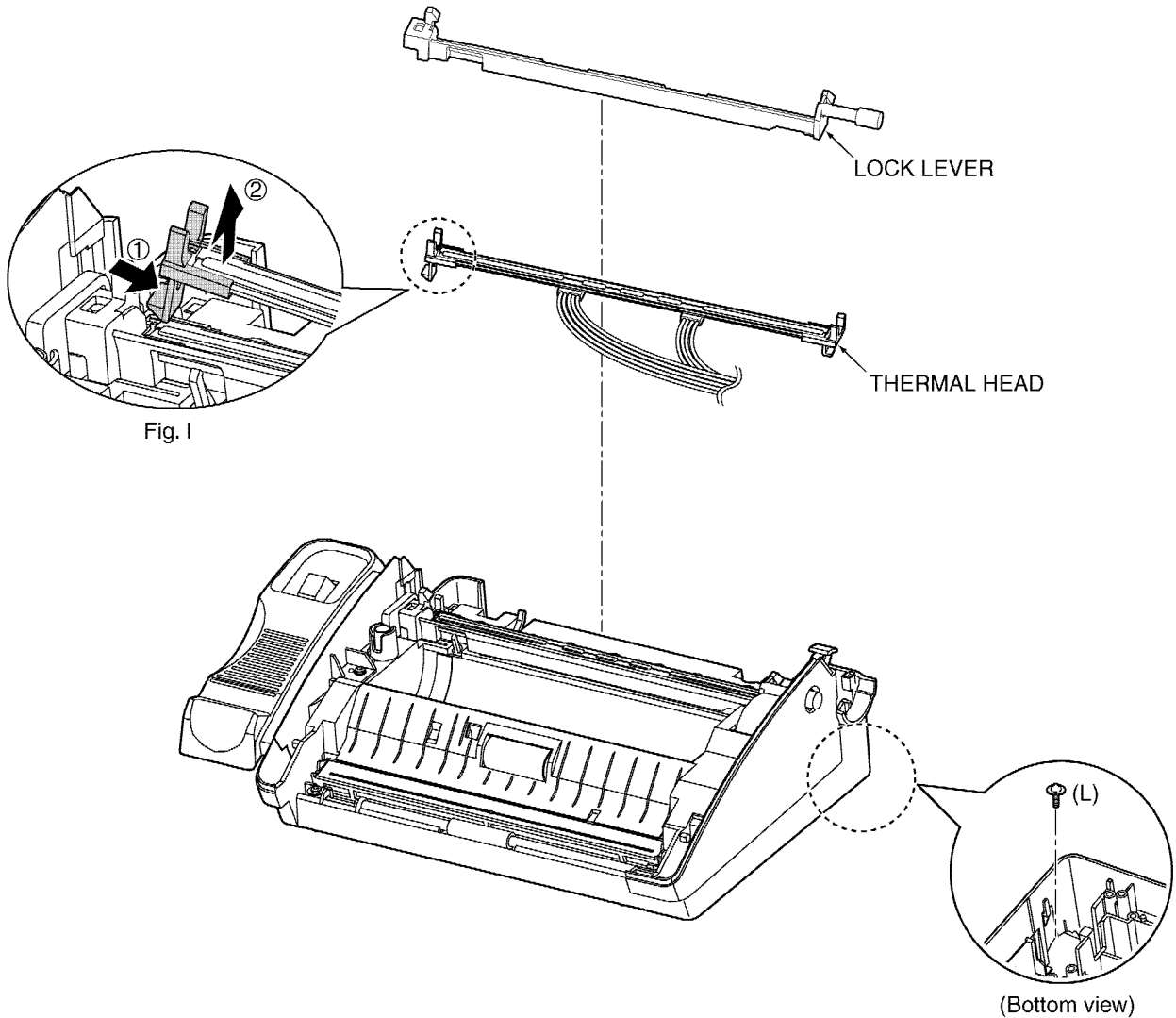


## 6.2.7. HOW TO REMOVE THE LOCK LEVER AND THERMAL HEAD

PROCEDURE: A-1 → A-2 → A-5 → B-3 → A-6

Ref. No. A-6

- 1) Remove the 1 screw (L). (Refer to Ref No. B-3)
- 2) Remove the LOCK LEVER.
- 3) Remove the THERMAL HEAD, as shown in a Fig. 1.

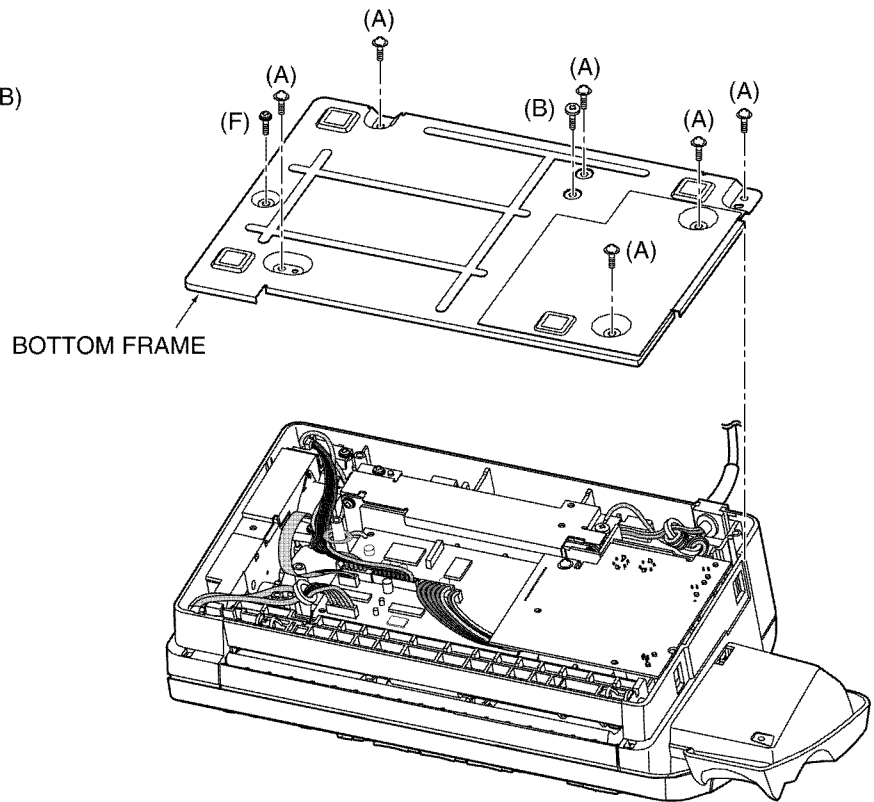


## 6.2.8. HOW TO REMOVE THE BOTTOM FRAME

PROCEDURE: A-1 → B-1

Ref. No. B-1

- 1) Remove the 6 screws (A), 1 screw (B) and 1 screw (F).
- 2) Remove the BOTTOM FRAME.



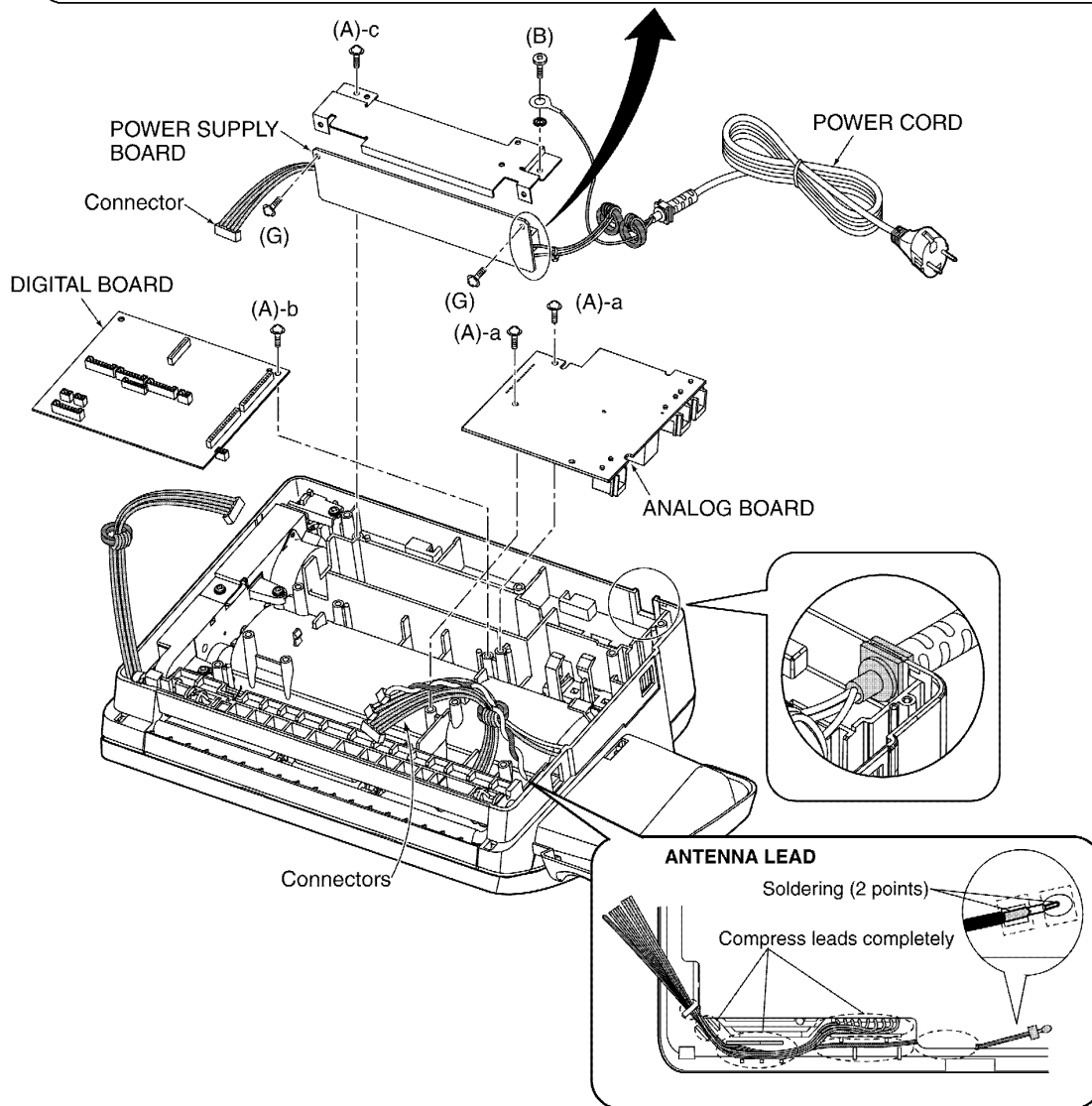
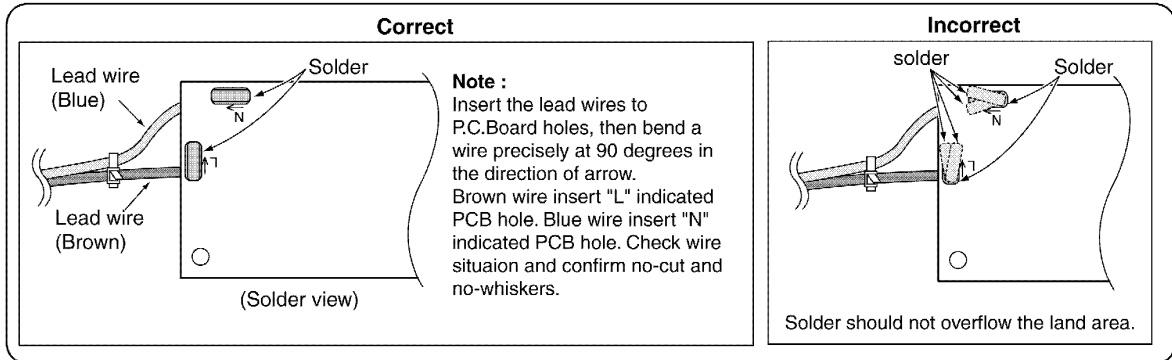
## 6.2.9. HOW TO REMOVE THE ANALOG BOARD, DIGITAL BOARD, POWER SUPPLY BOARD AND POWER CORD

PROCEDURE: A-1 → B-1 → B-2

Ref. No. B-2

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1) Remove the 2 screws (A)-a.</li> <li>2) Remove the ANALOG BOARD.</li> <li>3) Remove the Connectors on the Digital Board.</li> <li>4) Remove the 1 screw (A)-b.</li> <li>5) Remove the DIGITAL BOARD.</li> </ol> | <ol style="list-style-type: none"> <li>1) Remove the 1 screw (A)-c and 1 screw (B).</li> <li>2) Remove the 2 screws (G).</li> <li>3) Remove the Connector on the Power Supply Board.</li> <li>4) Remove the POWER SUPPLY BOARD and POWER CORD.</li> </ol> |
|--|---|

### Soldering the lead wire of Power Cord

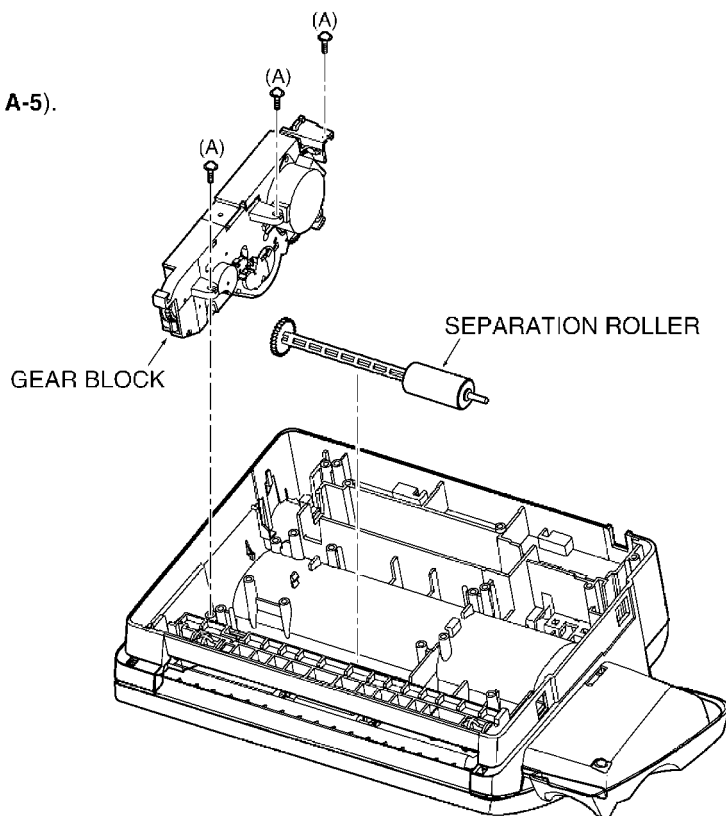


## 6.2.10. HOW TO REMOVE THE GEAR BLOCK AND SEPARATION ROLLER

PROCEDURE: A-1 → A-2 → A-5 → B-2 → B-3

### Ref. No. B-3

- 1) Remove the CUTTER UNIT (Ref to Ref No. A-5).
- 2) Remove the 3 screws (A).
- 3) Remove the GEAR BLOCK.
- 4) Remove the SEPARATION ROLLER.

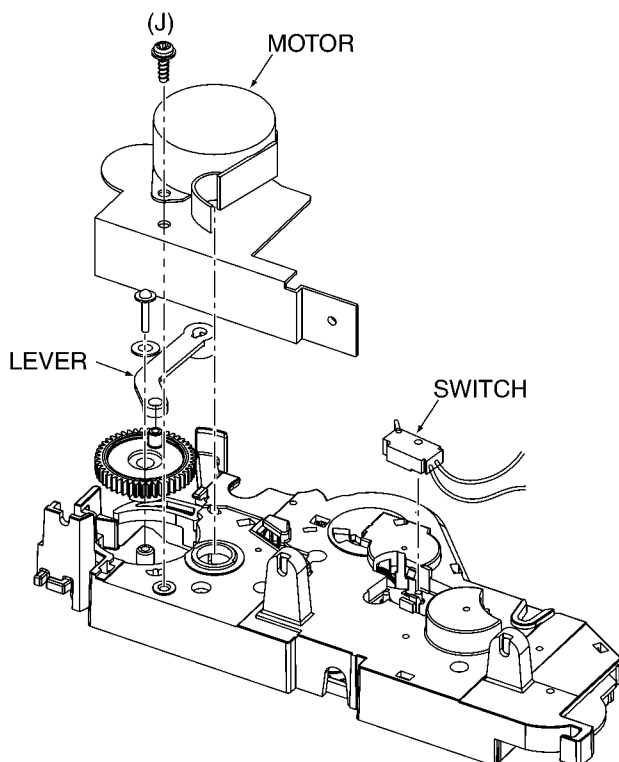


## 6.2.11. HOW TO REMOVE THE MOTOR OF GEAR BLOCK

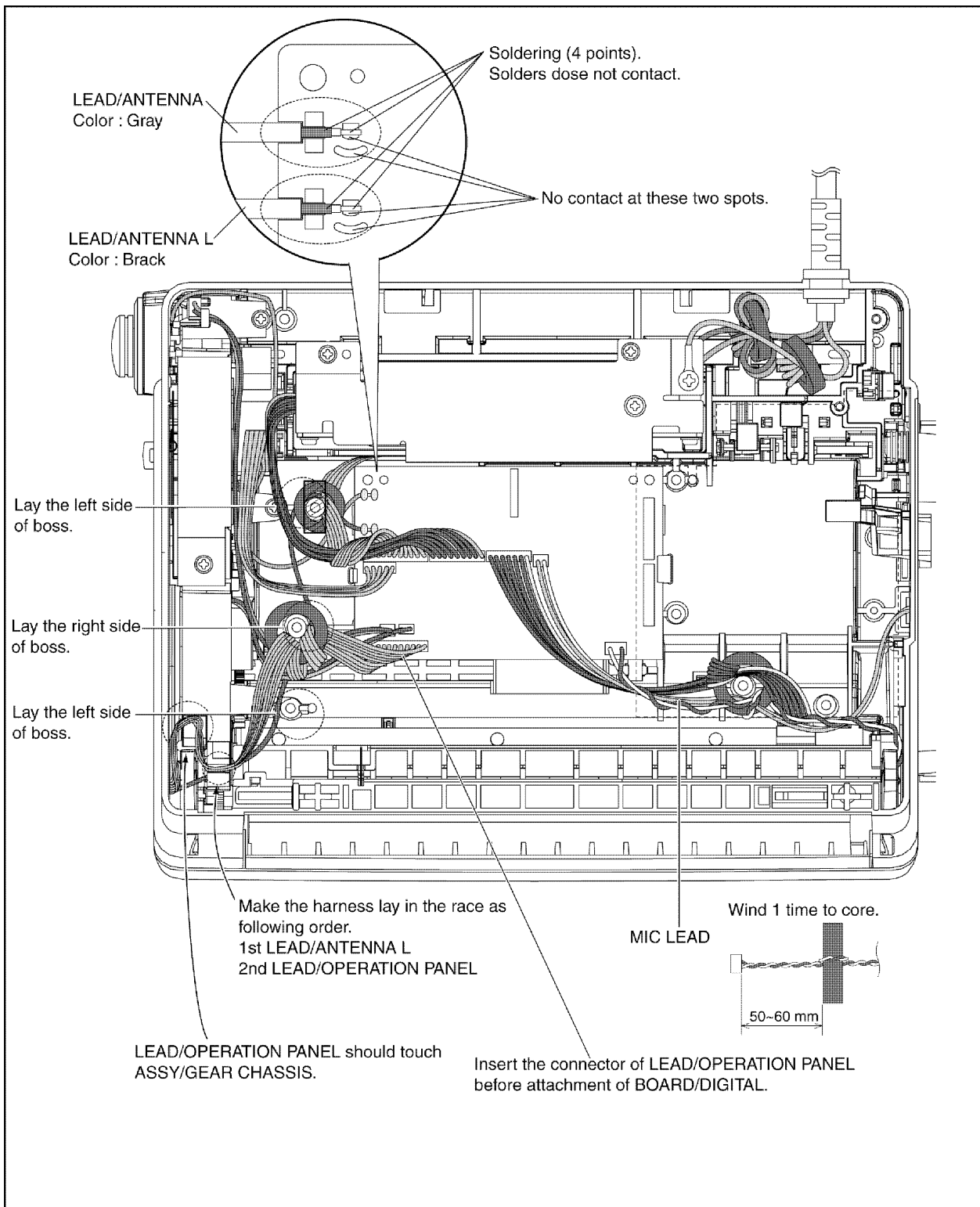
PROCEDURE: A-1 → A-2 → A-5 → B-2 → B-3 → B-4

### Ref. No. B-4

- 1) Remove the 1 screw (J).
- 2) Remove the MOTOR.
- 3) Remove the SWITCH.
- 4) Remove the LEVER.



### 6.2.12. INSTALLATION POSITION OF THE LEAD WIRES



## 6.3. CORDLESS HANDSET

### 6.3.1. HOW TO REMOVE THE BATTERY COVER AND CABINET COVER

**PROCEDURE: C-1**

Ref. No. C-1

- (1) Remove the BATTERY COVER by sliding in the direction of the arrow as shown in Fig-1.
- (2) Disconnect the CONNECTOR-A and remove the BATTERY PACK (Fig-2).
- (3) Remove the 2 screws (D).
- (4) As shown in Fig.4-1, grip the CABINET and open to where there is about a 5 mm gap.

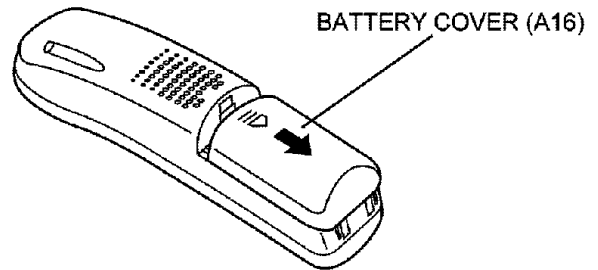


Fig-1

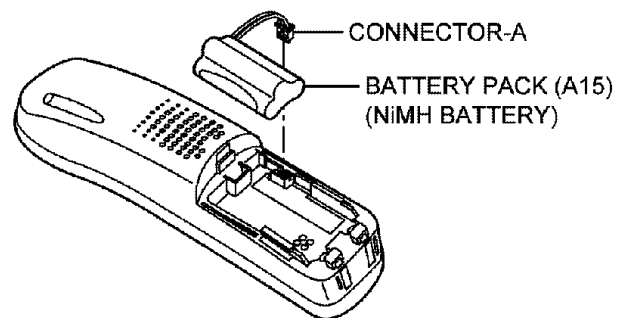


Fig-2

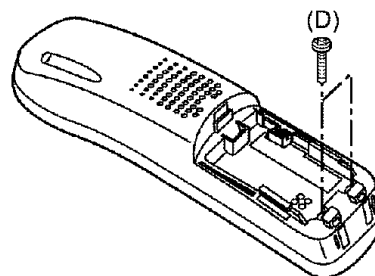


Fig-3

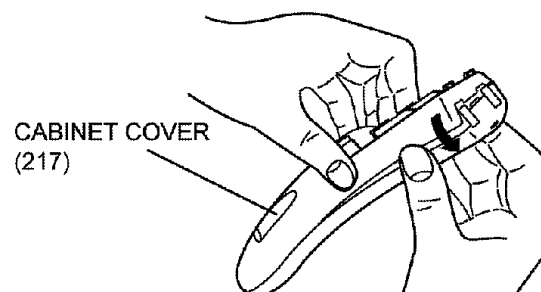


Fig-4-1



- (5) As shown in Fig-4-2, insert the special jig (PQDJ10006Y) into the gap and pull in the direction of the arrow to open the cabinet.
- (6) Open the opposite side in the same manner (Fig-4-3).

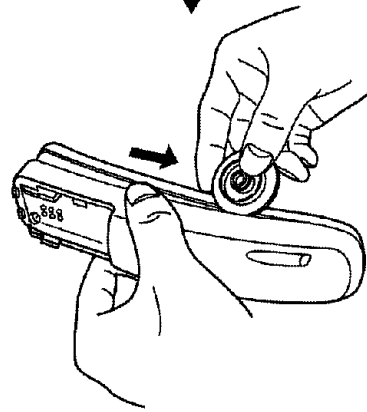
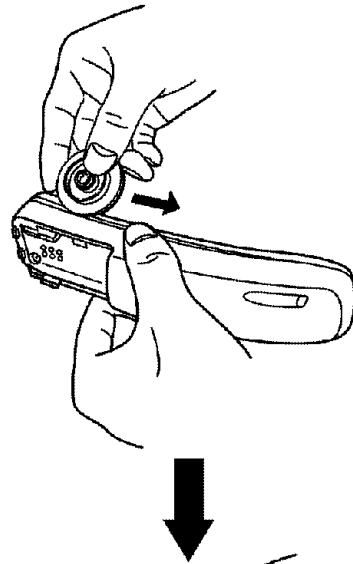


Fig-4-2

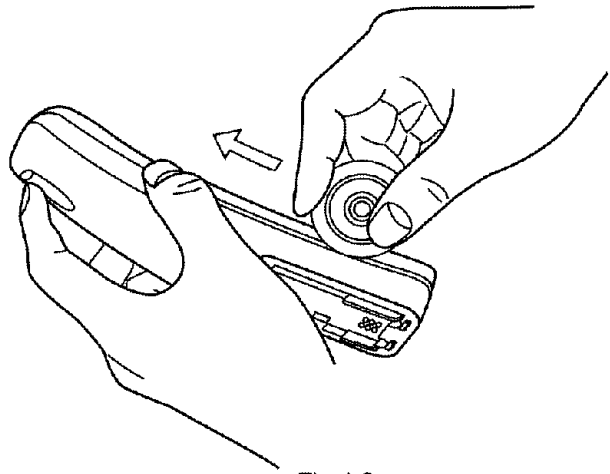


Fig-4-3

- (7) As shown in Fig-4-4, push up the CABINET COVER in the direction of the arrow, confirm that the hook has separated from the CABINET COVER, and open slowly, being careful of the SPEAKER LEAD connection.
- (8) Disjoin the solder joints of the SPEAKER LEAD and remove the CABINET COVER (Fig-4-5).

CABINET COVER (217)

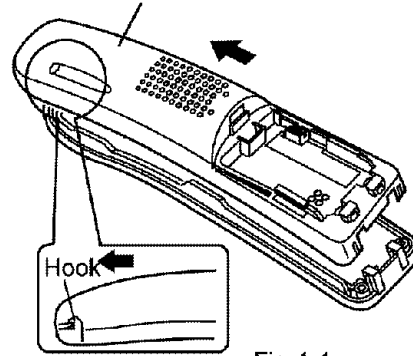


Fig-4-4

CABINET COVER (217)

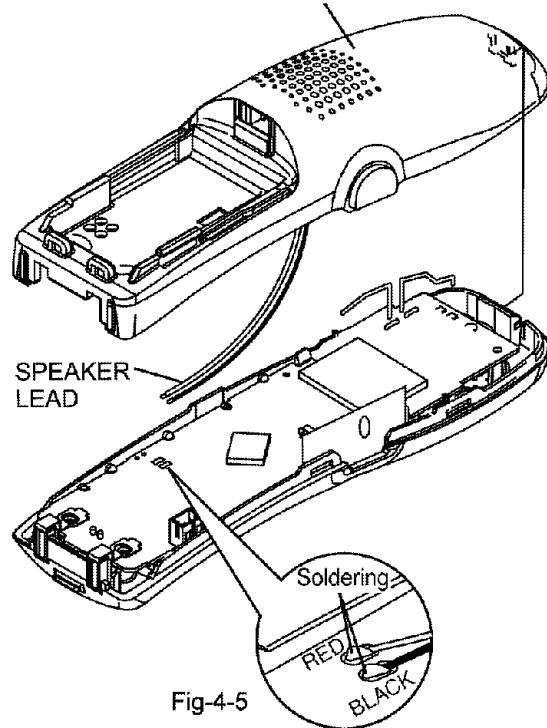


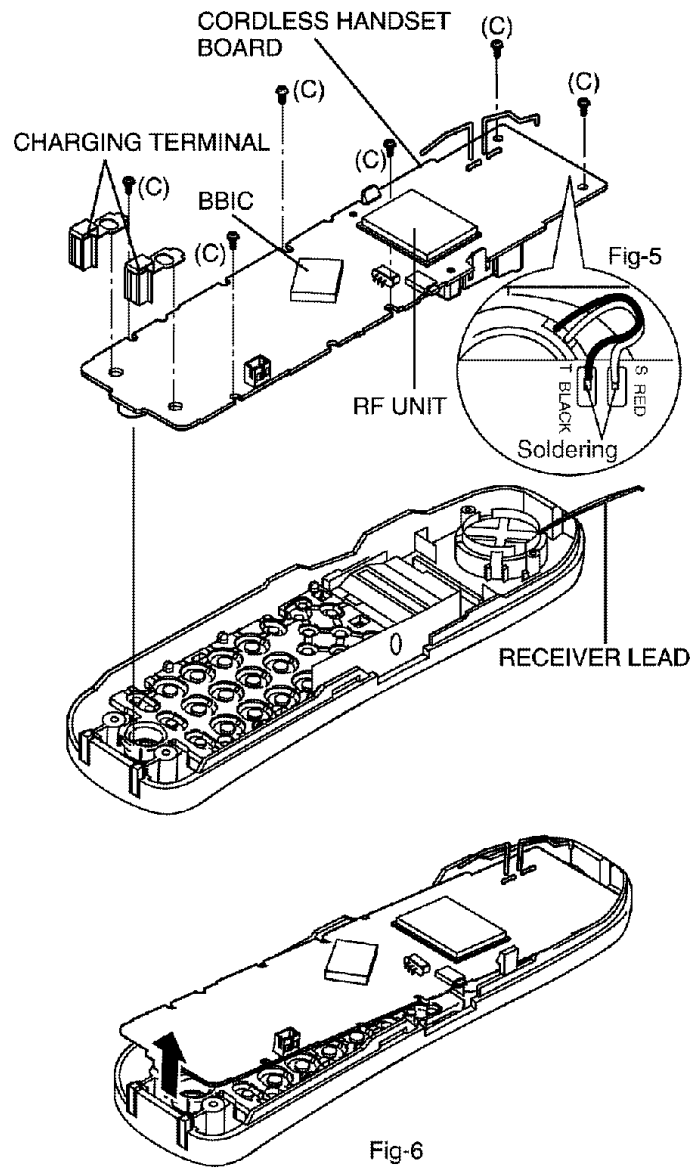
Fig-4-5

### 6.3.2. HOW TO REMOVE THE CORDLESS HANDSET BOARD.

PROCEDURE: C-1 → C-2

Ref. No. C-2

- (1) Remove the 6 screws (C).
- (2) Disjoin the solder joints of the end of the RECEIVER LEAD (See Fig.5).
- (3) Remove the 2 CHARGING TERMINALS.
- (4) Push up the CORDLESS HANDSET BOARD in the direction shown in Fig.6 and remove.



## **7 TROUBLESHOOTING GUIDE**

### **7.1. TROUBLESHOOTING SUMMARY**

#### **7.1.1. TROUBLESHOOTING**

**After confirming the problem by asking the user, troubleshoot according to the instructions and observe the following precautions.**

#### **7.1.2. PRECAUTIONS**

1. If there is a problem with the print quality or the paper feed, first check if the installation space and the print paper meets the specifications, the paper selection lever/paper thickness lever is set correctly, and the paper is set correctly without any slack.
2. Before troubleshooting, first check that the connectors and cables are connected correctly (not loose).  
If the problem occurs randomly, check it very carefully.
3. When connecting the AC power cord with the unit and checking the operation, exercise utmost care when handling electric parts in order to avoid electric shocks and short-circuits.
4. After troubleshooting, double check that you have not forgotten any connectors, left any loose screws, etc.
5. Always test to verify that the unit is working normally.

## 7.2. 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.

BUSY

- The cordless handset you tried to call is in use.
- The cordless handset you are calling is too far from the base unit.

CALL SERVICE

CALL SERVICE2

- There is something wrong with the unit.  
[This error is displayed when the thermal head does not warm up. Check the thermistor on the thermal head and connector lead.]

CHECK DOCUMENT

- The document was not fed into the unit properly. Re-insert the document. If misfeeding occurs frequently, clean the document feeder rollers and try again.  
(Refer to **Document Jams Sending** (P.25).)
- Attempted to send a document longer than 600 mm. Press **[STOP]** to remove the document. Divide the document into two or more sheets and try again.  
[Alternately, turn off service code #559 to enable sending of documents longer than 600 mm] (Refer to **SERVICE FUNCTION TABLE** (P.48).)

CHECK MEMORY

- Memory (telephone numbers, parameters, etc.) has been erased. Re-program.

COVER OPEN



CHECK PAPER

- The cover is open. Close it and press **[FAX/START]** to clear the message.
- The unit has run out of recording paper. Install recording paper and press **[FAX/START]** to clear the message.

FAX IN MEMORY

- The unit has a document in memory. See the other displayed message instructions to print out the document.

For fax memory capacity, (Refer to **SPECIFICATIONS** (P.10)).

FAX MEMORY FULL

- The memory is full of received documents due to lack of recording paper or a recording paper jam. Install paper or clear the jammed paper. (Refer to **RECORDING PAPER** (P.18) and **Recording Paper Jams** (P.25).)
- When performing broadcast transmission, the document being stored exceeded the memory capacity of the unit. Send the entire document manually.

MEMORY FULL

- There is no space to store new items in the base unit phonebook. Erase unnecessary items.

MESSAGE FULL

- There is no memory available to record voice messages. Erase unnecessary messages.

MODEM ERROR

- There is something wrong with the unit's modem.

NO FAX REPLY

- The other party's fax machine is busy or has run out of recording paper. Try again.

PAPER JAMMED

- A recording paper jam occurred. Clear the jammed paper. (Refer to **Recording Paper Jams** (P.25).)

PLEASE WAIT

- The unit is checking and initializing the paper cutter. Wait for a moment while the check is completed.

POLLING ERROR

- The other party's fax machine does not support polling. Check with the other party.

REDIAL TIME OUT

- The other party's fax machine is busy or has run out of recording paper. Try again.

REMOVE DOCUMENT

- The document is jammed. Remove the jammed document. (Refer to **Document Jams Sending** (P.25).)
- Press **[STOP]** to eject the jammed document.

SERIAL ERROR

- There is something wrong with the unit and the base unit will not work. To make or receive calls, use the cordless handset.

SYSTEM IS BUSY

- The system is busy. Replace the handset or stop using speakerphone, then try again.

TRANSMIT ERROR

- A transmission error occurred. Try again.

UNIT OVERHEATED

- The unit is too hot. Stop using the unit for a while and let the unit cool down.

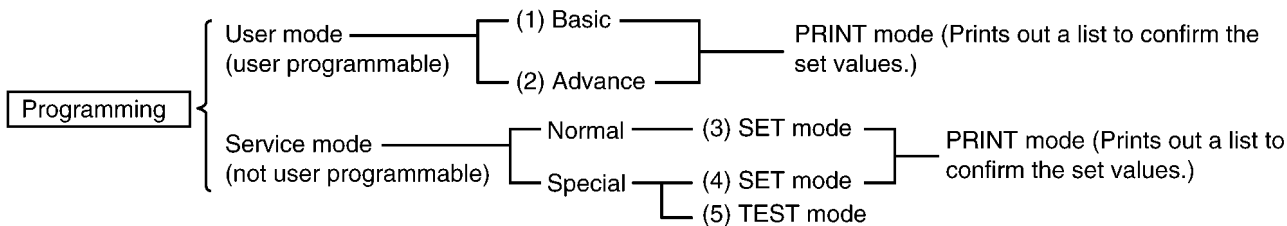
### 7.3. PROGRAMMING AND LISTS

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.

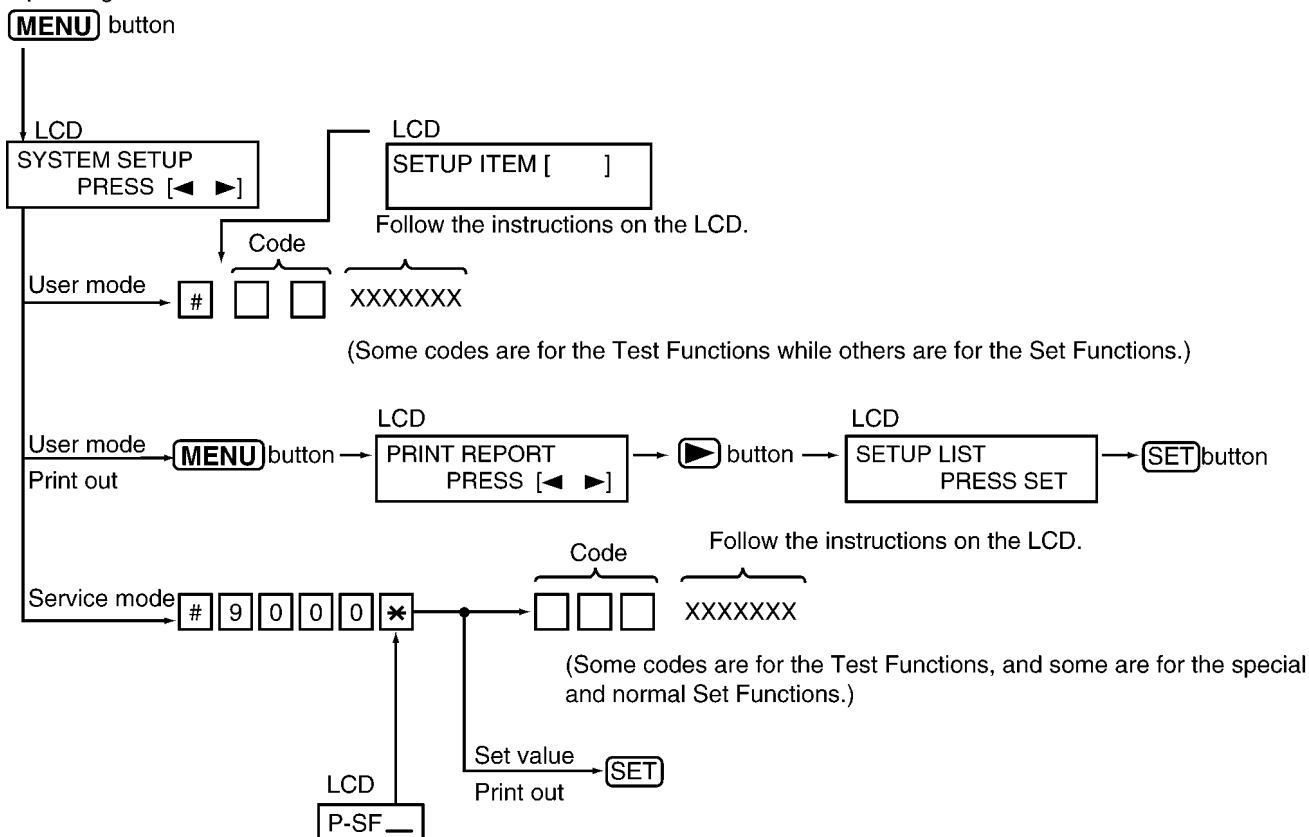
#### 7.3.1. OPERATION

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.

#### 7.3.2. OPERATION FLOW



#### Operating Procedure



### 7.3.3. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time	1:SHORT (3S) 2:LONG (5S)	1, 2	1	-----
502	Flash time	1:Type1 2:Type2 3:Type3	1, 2, 3	2	1: 100 ms 2: 600 ms 3: 300 ms
511	VOX sense	1:High 2:Low	1, 2	1	When the TAM (or EXT TAM) does not stop recording the ICM because noise is detected on the telephone line, change this setting to "LOW".
514	Bell detection time	X 10 msec	10~90	60	-----
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in <b>The unit can copy, but cannot transmit/receive (P.74)</b> .
521	International mode select	1:ON 2:OFF	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in <b>The unit can copy, but cannot transmit/receive (P.74)</b> .
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	When the telephone station is far from the unit or reception cannot be performed correctly, adjust accordingly.
524	Transmission equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	When the telephone station is far from the unit or transmission cannot be performed correctly, adjust accordingly.
544	Document feed position adjustment value set	1: 3 mm 2: 4 mm 3: 5 mm 4: 6 mm 5: 7 mm	1~5	3	If it is difficult to feed documents, raise the set value. If multi documents feed occurs, lower the set value.
550	MEMORY CLEAR				See <b>Memory Clear Specification(P.49)</b> .
551	ROM check				See <b>TEST FUNCTIONS(P.50)</b> .
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(P.50)</b> .
555	Scan check				See <b>TEST FUNCTIONS(P.50)</b> .
556	Motor test			0	See <b>TEST FUNCTIONS(P.50)</b> .
557	LED test				See <b>TEST FUNCTIONS(P.50)</b> .
558	LCD test				See <b>TEST FUNCTIONS(P.50)</b> .
559	Document jam detection select	1:ON 2:OFF	1, 2	1	See <b>TEST FUNCTIONS(P.50)</b> .
561	KEY test				See <b>TEST FUNCTIONS(P.50)</b> .
562	Cutter test				Press "SET" key.
570	BREAK % select	1:61% 2:67%	1, 2	1	Sets the % break of pulse dialing according PBX.
571	ITS auto redial time set	X number of times	00~99	05	Selects the number of times that ITS is redialed (not including the first dial).
572	ITS auto redial line disconnection time set	X second	001~255	065	Sets the interval of ITS redialing.
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	05	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 id output only when automatic dialing is performed. OFF: CNG id not output at phase A. Refer to <b>Sometime there is a transmit problem(P.72)</b> .
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 <b>The unit can copy, but cannot transmit/receive (P.74)</b> . Refer to <b>Receive Problem(P.73)</b> and <b>The unit can copy, but cannot transmit/receive (P.74)</b> .
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 <b>The unit can copy, but cannot transmit/receive (P.74)</b> . Refer to <b>Sometime there is a transmit problem(P.72)</b> and <b>The unit can copy, but cannot transmit/receive (P.74)</b> .



Code	Function	Set Value	Effective Range	Default	Remarks
595	Receive error limit check	1: 5% 2: 10% 3: 15% 4: 20%	1~4	2	-----
596	Transmit level set	X dBm	-15~00	-10	Selects the FAX transmission level. Refer to <b>Sometime there is a transmit problem (P.72)</b> and <b>Receive Problem (P.73)</b> .
598	Receiving sensitivity	43= -43 dBm	20~48	42	Used when there is an error problem. Refer to <b>The unit can copy, but cannot transmit/receive(P.74)</b> .
710	Memory clear except History data				Refer to <b>Memory Clear Specification(P.49)</b> .
717	Transmit speed selection	1:9600BPS 2:7200BPS 3:4800BPS 4:2400BPS	1~4	1	Adjusts the speed to start training during FAX transmission. Refer to <b>Sometime there is a transmit problem (P.72)</b> and <b>The unit can copy, but cannot transmit/receive(P.74)</b> .
718	Receive speed selection	1:9600BPS 2:7200BPS 3:4800BPS 4:2400BPS	1~4	1	Adjusts the speed to start training during FAX reception. Refer to <b>Receive Problem(P.73)</b> and <b>The unit can copy, but cannot transmit/receive (P.74)</b> .
722	Redial tone detect	1:ON 2:OFF	1, 2	1	-----
731	CPC mode	X 10 msec	1~255	036	Sets the CPC signal detection mode from the converter.
745	Power ON film feed	1:ON 2:OFF	1,2	1	Invalid function for thermal model.
763	CNG detect time for friendly reception	1:10 sec 2:20 sec 3:30 sec	1~3	3	Selects the CNG detection tone of friendly reception.
771	T1 timer	1:35 sec 2:60 sec	1, 2	2	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.
784	Voice prompt test				See <b>TEST FUNCTIONS(P.50)</b> .
815	Sensor & Vox check				See <b>TEST FUNCTIONS(P.50)</b> .
852	Print test pattern				See <b>TEST FUNCTIONS (P.50)</b> .
853	Top margin		1~9	10	-----
874	DTMF on time	X 10 msec	6~20	10	-----
875	DTMF off time	X 10 msec	6~20	10	-----
880	History list				-----
881	Journal 2 list				See <b>Special service journal reports (P.88)</b> .
882	Journal 3 list				See <b>Special service journal reports (P.88)</b> .

### 7.3.4. Memory Clear Specification

Item	Status after Memory Clear	
	Service Mode #550 <sup>*1</sup>	Service Mode #710 <sup>*2</sup>
Date and time (user mode #001)	—	Default
Your logo (user mode #002)	—	Default
Your Fax Number (user mode #003)	—	Default
One touch dial and Directory	—	Default
History	—	—
Top margin (service mode #853)	—	—
Other Setting data (User setting and Service setting data)	Default	Default

— : Not changed

\*1 Execute Service Mode #550 when you want to reset the all setting data keeping the user information.

\*2 Execute Service Mode #710 to clear the user information in case that Main Unit is recycled.

#### Note:

Please restart a power supply after clearing a memory.

## 7.4. TEST FUNCTIONS

The codes listed below can be used to perform simple checks for 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. To do this, you set the Service mode (Refer to **OPERATION FLOW** (P.47).) first, then operate the below test items.

Test Mode	Type of Mode	Code	Function
		Operation after code input	
FACTORY SET	Service Mode	"5" "5" "0"	Refer to <b>Memory Clear Specification</b> (P.49).
		SET	
FLASH MEMORY CHECK	Service Mode	"5" "5" "1"	Indicates the version and checks the sum of the FLASH MEMORY.
		SET	
MODEM TEST	Service Mode	"5" "5" "4"	Telephone line circuit is connected automatically, output the following signals on the circuit line. 1) OFF 2) 9600bps 3) 7200bps 4) 4800bps 5) 2400bps 6) 300bps 7) 2100Hz 8) 1100Hz
		SET	
SCAN CHECK	Service Mode	"5" "5" "5"	Turns on the LEDs of the CIS and operates the read systems. Refer to <b>CIS (Contact Image Sensor) SECTION</b> (P.106).
		SET	
MOTOR TEST	Service Mode	"5" "5" "6"	Rotates the transmission and reception motor to check the operation of the motor. 12: FAX TX / Reading memory 52: Recording paper is fed 22: Copy 34: Cutter 44: Paper reverse  Press <b>[STOP]</b> button to quit.
		SET	
LED CHECK	Service Mode	"5" "5" "7"	All LEDs above the operation panel board flash on and off, or are illuminated.
		SET	
LCD CHECK	Service Mode	"5" "5" "8"	Checks the LCD indication. Illuminates all the dots to check if they are normal. Refer to <b>OPERATION PANEL SECTION</b> (P.104).
		SET	
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.51). Refer to <b>OPERATION PANEL SECTION</b> (P.104).
		START (any key)	
MEMORY CLEAR (except History data)	Service Mode	"7" "1" "0"	Refer to <b>Memory Clear Specification</b> (P.49).
		START	
VOICE PROMPT TEST	Service Mode	"7" "8" "4"	You can hear the voice prompt from speaker after pressing "SET" key.
		SET	
SENSOR CHECK	Service Mode	"8" "1" "5"	If you enter this mode and operate sensor levers with your hands, the LCD display of the related sensor (or switch) turns ON / OFF. Also, when copying a document, the related sensor will turn ON / OFF. For each sensor's operation, refer to <b>SENSORS AND SWITCHES</b> (P.149). <b>[Do Sn Co Jm Ct]</b> : LCD DISPLAY <b>Do: Document set sensor</b> :Paper inserted. Turns on when a document is inserted. <b>Sn: Read position sensor.</b> :At the read position, turns on when the front cover is opened and the sensor lever is pressed directory. <b>Co: Cover open sensor</b> :Turns on and off when the front cover is opened and closed. <b>Jm: JAM sensor</b> :When JAM sensor is on "Jm" functions. <b>Ct: Cutter sensor</b> :When cutter sensor is on "Ct" functions.
		SET	
PRINT TEST PATTERN	Service Mode	"8" "5" "2"	Prints out the test pattern. Used mainly at the factory to test the print quality. You can select 1~4. (See <b>PRINT TEST PATTERN</b> (P.51))
		SET	

### Note:

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

### 7.4.1. 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)	1209	1336	1477
Low (Hz)			
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	" <del>X</del> "	"0"	"#"

**Note:**

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

### 7.4.2. BUTTON CODE TABLE

Code	Button Name	Code	Button Name	Code	Button Name
04	FAX /START	32	2	47	CALLER ID
05	LOWER	33	3	64	STATION 1
06	COPY	34	4	65	STATION 2
08	MONITOR	35	5	66	STATION 3
0C	AUTO ANSWER	36	6	67	STATION 4
0F	REDIAL	37	7	68	STATION 5
14	RECORD	38	8	1E	[▶] NEXT
16	ERASE	39	9	1F	[◀] PREV
18	PLAYBACK	3A	0	00	NO INPUT
20	MENU	3B	<del>X</del>	01	STOP
25	[+] VOLUME	3C	#	F8	SET
26	[-] VOLUME	3D	PAUSE		
31	1	3E	FLASH		

### 7.4.3. PRINT TEST PATTERN



## 7.5. 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.53)). 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.

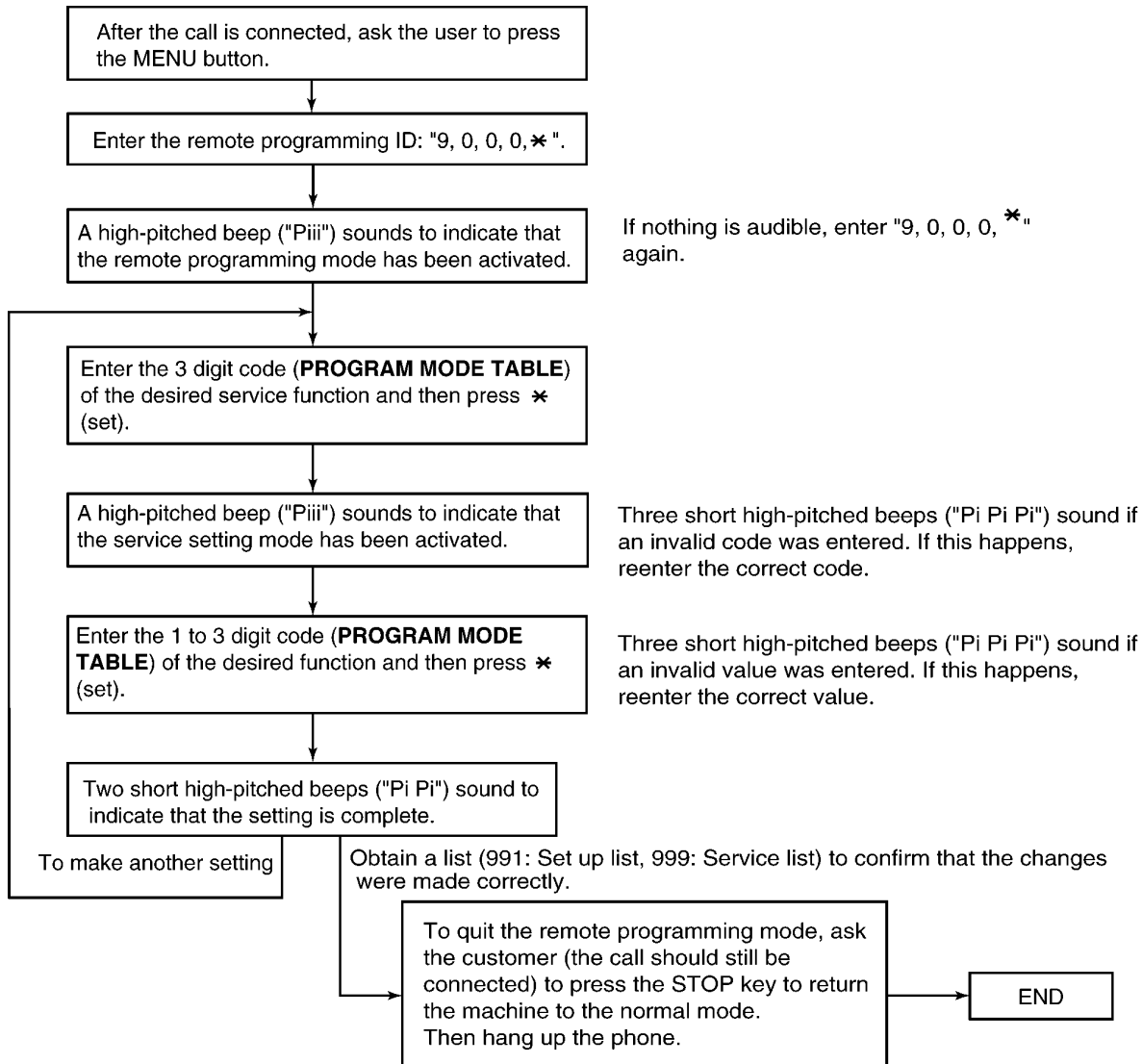
Based on this, the parameters for the desired codes can be changed.

The procedure for changing and listing parameters is described on **ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES** (P.52). 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.

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



**CROSS REFERENCE:**

**PROGRAM MODE TABLE** (P.53)

## 7.5.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	Remote Setting
001	Set date and time	mm/dd/yy hh:mm	01/01/05	NG
002	Your logo	-----	None	NG
003	Your FAX number	-----	None	NG
004	Print sending report	1:ON / 2:OFF / 3:ERROR	ERROR	OK
006	FAX ring count	1-4	2	OK
	TAM/FAX ring count	0: auto / 2-7	2	OK
010	Recording time	1:1MINUTE / 2:GREETING ONLY / 3: NO LIMIT	NO LIMIT	OK
011	Remote TAM ID	----- (000-999)	-----	NG
013	Dialing mode	1:PULSE / 2:TONE	TONE	OK
017	Ringer pattern	1-6	1	NG
022	Journal auto print	1:ON / 2:OFF	ON	OK
023	Overseas mode	1:NEXT FAX / 2:ERROR / 3:OFF	ERROR	OK
025	Delayed transmission	ON / OFF	OFF	NG
026	Auto CALLER ID list	1:ON / 2:OFF	OFF	OK
031	Distinctive ring	1:ON / 2:OFF	B	OK
032	Fax ring pattern	1:A / 2:B / 3:C / 4:D / 5:B-D	B-D	OK
036	RCV reduction	1:ON / 2:OFF	ON	OK
039	LCD contrast	1:NORMAL / 2:DARKER	NORMAL	NG
041	FAX activation code	1:ON / 2:OFF	ON ID= <del>X</del> #9	NG
044	Memory receive alert	1:ON / 2:OFF	ON	OK
046	Friendly reception	1:ON / 2:OFF	ON	OK
054	Common greeting MSG. REC. time	1:16s / 2:60s	16s	OK
055	TAM-greeting	1:RECORD / 2:CHECK / 3:ERASE	RECORD	NG
058	Scan contrast	1:NORMAL 2:LIGHT 3:DARKER	NORMAL	OK
059	Print contrast	1:NORMAL 2:DARKER	NORMAL	OK
067	Greeting monitor	1:ON / 2:OFF	ON	OK
070	Pager call	1:ON / 2:OFF	OFF	NG
076	Connecting tone	1:ON / 2:OFF	ON	OK
077	Auto answer mode	3: TAM/FAX 2: FAX Only	TAM/FAX	OK
080	Set default	YES / NO	NO	NG
501	Pause time	1:SHORT (3S) / 2:LONG (5S)	SHORT (3S)	OK
502	Flash time	1:TYPE1 / 2:TYPE2 / 3:TYPE3	TYPE2	OK
511	Vox sense	1:High / 2:Low	High	OK
514	Bell detection time	(10-90) x 10ms	60	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100Hz	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	1:0km / 2:1.8km / 3:3.6km / 4:7.2km	0km	OK
524	Transmission equalizer select	1:0km / 2:1.8km / 3:3.6km / 4:7.2km	0km	OK
544	Document feed position adjustment value set	1:3mm / 2:4mm / 3:5mm / 4:6mm / 5:7mm	5mm	OK
550	Memory clear	-----	-----	NG
551	ROM check	-----	-----	NG
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	-----	-----	NG
555	Scanner test	-----	-----	NG
556	Motor test	-----	-----	NG
557	LED test	-----	-----	NG
558	LCD test	-----	-----	NG
559	Document jam detection	1:ON / 2:OFF	ON	OK
561	Key test	-----	-----	NG
562	Cutter test	-----	-----	NG
570	Break % select	1:61% / 2:67%	61%	OK
571	ITS auto redial time set	00-99	05	OK
572	ITS auto redial line disconnection time set	001-999sec	065sec	OK
573	Remote turn-on ring number	01-99	10	OK
590	FAX auto redial time set	00-99	05	OK
591	FAX auto redial line disconnection time set	001-999sec	065sec	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300 bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection	1:1st / 2:2nd	1st	OK
595	Receive error limit check	1: 5% / 2: 10% / 3: 15% / 4: 20%	10%	OK
596	Transmit level set	from-15 to 00dBm	-10dBm	OK
598	Receiving Sensitivity	20-48 dBm	42	OK

Code	Function	Set Value	Default	Remote Setting
710	Memory clear except History data	-----	-----	NG
717	Transmit speed select	1:9600/ 2:7200/ 3:4800/ 4:2400	9600bps	OK
718	Receive speed select	1:9600/ 2:7200/ 3:4800/4:2400	9600bps	OK
722	Redial tone detect	1:ON / 2:OFF	ON	OK
731	CPC mode	001-255	036	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
771	T1 timer	1:35s / 2:60s	35s	OK
774	T4 timer	00~99 x 100ms	00ms	OK
784	Voice prompt	1:SET	-----	NG
815	Sensor & VOX test	-----	-----	NG
852	Print test pattern	-----	-----	NG
853	Top margin	1~9 mm	5	OK
874	DTMF ON time	6~20 x 10ms	10 x 10ms	OK
875	DTMF OFF time	6~20 x 10ms	10 x 10ms	OK
880	History list	1:Start	-----	NG
881	Journal 2	1:SET	-----	NG
882	Journal 3	1:SET	-----	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.48) 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)

## 7.6. THE EXAMPLE OF THE PRINTED LIST

### 7.6.1. USER MODE (Example of a printed out list)

#### SETUP LIST

##### [ BASIC FEATURE LIST ]

NO.	FEATURE	CURRENT SETTING
#01	SET DATE & TIME	Jan. 01 2005 00:00
#02	YOUR LOGO	
#03	YOUR FAX NUMBER	
Code → #04	PRINT SENDING REPORT	ERROR [ERROR, ON, OFF]
#06	TAM/FAX RING COUNT	2 [2...7, AUTO]
#10	RECORDING TIME	NO LIMIT [1 MINUTE, GREETING ONLY, NO LIMIT]
#11	REMOTE TAM ID	
#13	DIALLING MODE	TONE [TONE, PULSE]
#17	EXT RINGER TYPE	RINGER 1 [RINGER 1...6]

##### [ ADVANCED FEATURE LIST ]

NO.	FEATURE	CURRENT SETTING
#22	JOURNAL AUTO PRINT	ON [ON, OFF]
#23	OVERSEAS MODE	ERROR [NEXT FAX, ERROR, OFF]
Code → #25	DELAYED TRANSMISSION	OFF [ON, OFF]
	DESTINATION =	
	START TIME =	00:00
#26	AUTO CALLER ID LIST	OFF [ON, OFF]
#31	DISTINCTIVE RING	OFF [ON, OFF]
#32	FAX RING PATTERN	B-D [B-D, A, B, C, D]
#36	RCV REDUCTION	ON [ON, OFF]
#39	LCD CONTRAST	NORMAL [NORMAL, DARKER]
#41	FAX ACTIVATION CODE	ON [ON, OFF]
	CODE =	*#9
#44	MEMORY RECEIVE ALERT	ON [ON, OFF]
#46	FRIENDLY RECEPTION	ON [ON, OFF]
#54	GREETING MSG. RECORDING TIME	16s [16s, 60s]

NOTE : If you change from 60sec. to 16sec.,  
your-greeting will be erased and your new greeting will be limited to 16 seconds.

#55	TAM GREETING	RECORD [RECORD, CHECK, ERASE]
#58	SCAN CONTRAST	NORMAL [NORMAL, LIGHT, DARKER]
#59	PRINT CONTRAST	NORMAL [NORMAL, DARKER]
#67	GREETING MONITOR	ON [ON, OFF]
#70	PAGER CALL	OFF [ON, OFF]
	DESTINATION =	
#76	CONNECTING TONE	ON [ON, OFF]
#77	AUTO ANSWER MODE	TAM/FAX [TAM/FAX, FAX ONLY]
#80	SET DEFAULT	

Set Value

#### Note:

The above values are the default values.





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

[ HISTORY ]

```

[Ver 3.0]—(1)   [BC6A]—(2)
[NONE]—(3)
[NONE]—(4)
[NONE]—(5)

(6)—[0000] [01]—(7) [01]—(8) [2004]—(9) [0000]—(10)
(11)—[0000] [0000]—(12)
(13)—[0000] [0000]—(14) [NONE]—(15) [0000]—(16) [TAM/FAX]—(17)
Factory use only [0000] [0000]—(18) [TONE]—(19) [DN]—(19) [0000]—(20)
(21)—[0000] [0000]—(22) [0000]—(23) [0000]—(24) [0000]—(25)
(26)—[NONE] [NONE]—(27) [NONE]—(28) [NONE]—(29)
(30)—[000] (31)—[000] (32)—[0000] [NONE]—(33)
(34)—[0000] [0000]—(35) [0000]—(36) [0000]—(37) (38)—[0000] [0000]—(39)
(40)—[0000] [0000]—(41) [0000]—(42) [0000]—(43) [0000]—(44)
    
```

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

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) ~ (44) are corresponding to the listed items in **DESCRIPTIONS OF THE HISTORY REPORT** (P.58).

### 7.6.3.1. DESCRIPTIONS OF THE HISTORY REPORT

- |   |  |
|---|--|
| (1) SOFTWARE VERSION<br>FLASH ROM version   | (22) NUMBER OF RECEIVE<br>The number of pages received.  |
| (2) SUM<br>FLASH ROM internal data calculation.   | (23) NUMBER OF SENDING<br>The number of pages sent.  |
| (3) YOUR LOGO<br>The user logo recorded in the unit. If it is not recorded, NONE will be displayed.                         | (24) NUMBER OF CALLER ID<br>The number of times Caller ID was received.  |
| (4) YOUR TELEPHONE NUMBER<br>The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed. | (25) NUMBER OF RECORDING MESSAGE<br>The number of messages recorded in TAM.  |
| (5) FAX PAGER NUMBER<br>If you program a pager number into the unit, the pager number will be displayed here.               | (26)~(29) Not Used   |
| (6) FACTORY - CUSTOMER<br>This shows how many days from factory production until the user turns ON the unit.                | (30) NUMBER OF PRINTING WARNING LIST<br>The number of warning lists printed until now.   |
| (7) MONTH<br>The shows the very first month, date, year and time set by the user after they purchased the unit.             | (31) NUMBER OF PRINTING HELP<br>The number of help lists printed until now.  |
| (8) DAY<br>The shows the very first month, date, year and time set by the user after they purchased the unit.               | (32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION<br>The number of faxes received that were divided into more than one sheet since the unit was purchased.  |
| (9) YEAR<br>The shows the very first month, date, year and time set by the user after they purchased the unit.              | (33) Not used  |
| (10) TIME<br>The shows the very first month, date, year and time set by the user after they purchased the unit.             | (34) FAX MODE<br>Means the unit received a fax message in the FAX mode.  |
| (11) USAGE TIME<br>The amount of time the unit has been powered ON.   | (35) MAN RCV<br>Means the unit received a fax message by manual operation.   |
| (12) FACTORY - NOW<br>This shows how many days from factory production until the user prints out this history list.         | (36) FRN RCV<br>Means the unit received a fax message by friendly signal detection.  |
| (13) TEL MODE<br>The amount of time the TEL mode setting was used.  | (37) VOX<br>Means the unit detected silence or no voice.   |
| (14) FAX MODE<br>The amount of time the FAX mode setting was used.  | (38) RMT DTMF<br>Means the unit detected DTMF (Remote Fax activation code) entered remotely.   |
| (15) TEL/FAX MODE<br>The amount of time the TEL/FAX mode setting was used.  | (39) PAL DTMF<br>Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.  |
| (16) ANS/FAX MODE<br>The amount of time the ANS/FAX mode setting was used.  | (40) TURN-ON<br>Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)  |
| (17) FINAL RECEIVE MODE<br>The last set receiving mode by the user.   | (41) TIME OUT<br>Means the unit started to receive after Ring Time Out in the EXT-TAM or TEL/FAX mode.   |
| (18) TONE/PULSE SELECTION<br>The most recently used setting used, either TONE or PULSE.                                     | (42) IDENT<br>Means the unit detected Ring Detection.  |
| (19) RECEIVE REDUCTION<br>The compression rate when receiving.  | (43) CNG OGM<br>Means the unit detected the CNG while it was sending the Dummy Ring Back Tone in the TEL/FAX mode, or while answering a call in the EXT-TAM mode. Or means the unit detected the CNG while it was sending the OGM in the ANS/FAX mode. |
| (20) SETTING NO. OF DIRECTORY<br>The recorded directory stations.   | (44) CNG ICM<br>Means the unit detected the CNG while it was recording the ICM in the ANS/FAX mode.  |
| (21) NUMBER OF COPY<br>The number of pages copied.  |  |

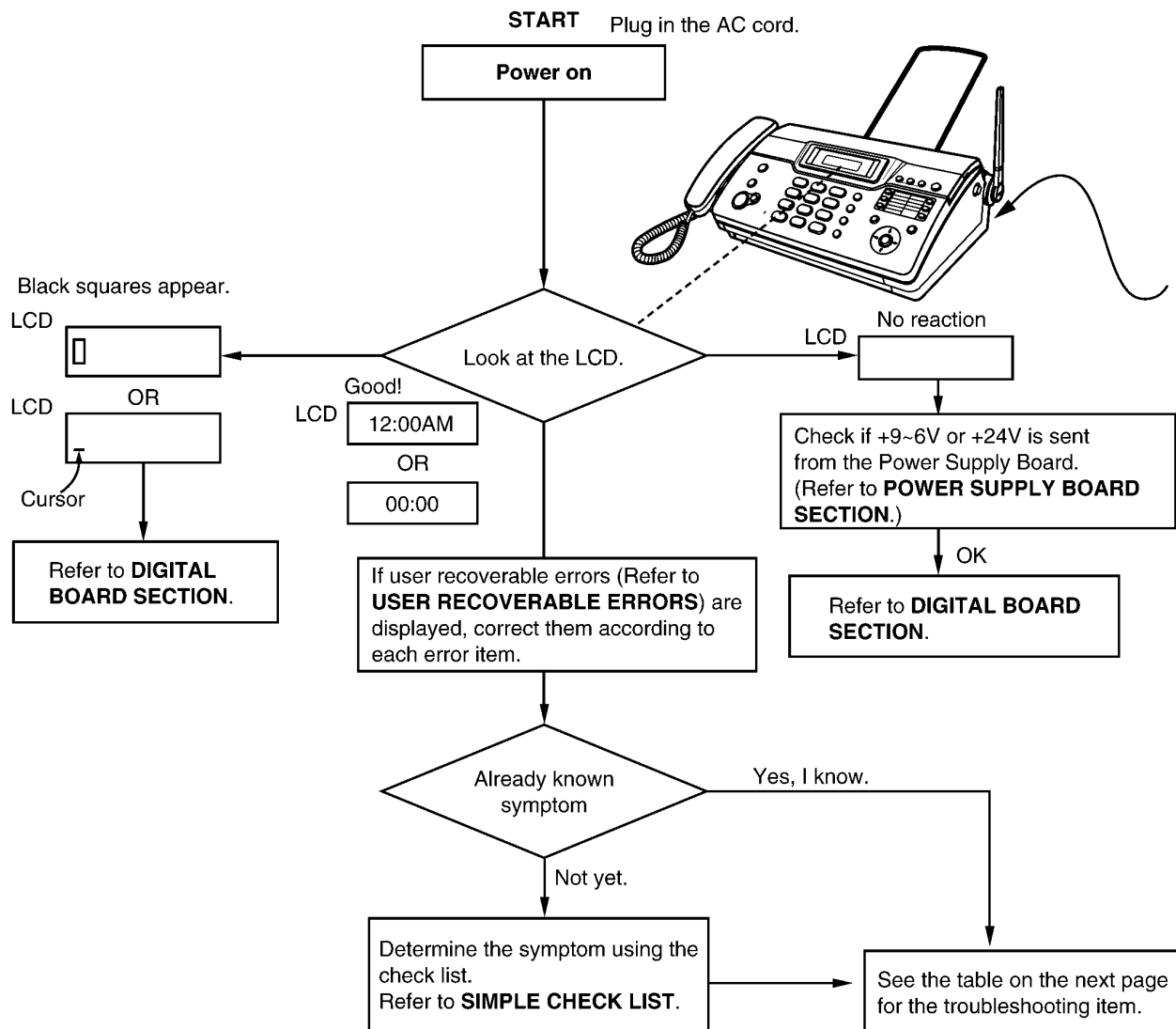
## 7.7. TROUBLESHOOTING DETAILS

### 7.7.1. OUTLINE

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.61). Difficult problems may be hard to determine, so repeated testing is necessary.

### 7.7.2. STARTING TROUBLESHOOTING

Determine the symptom and the troubleshooting method.



#### CROSS REFERENCE:

**USER RECOVERABLE ERRORS**(P.45)

**SIMPLE CHECK LIST**(P.61)

**DIGITAL BOARD SECTION**(P.92)

**POWER SUPPLY BOARD SECTION**(P.101)

### 7.7.3. TROUBLESHOOTING ITEMS TABLE

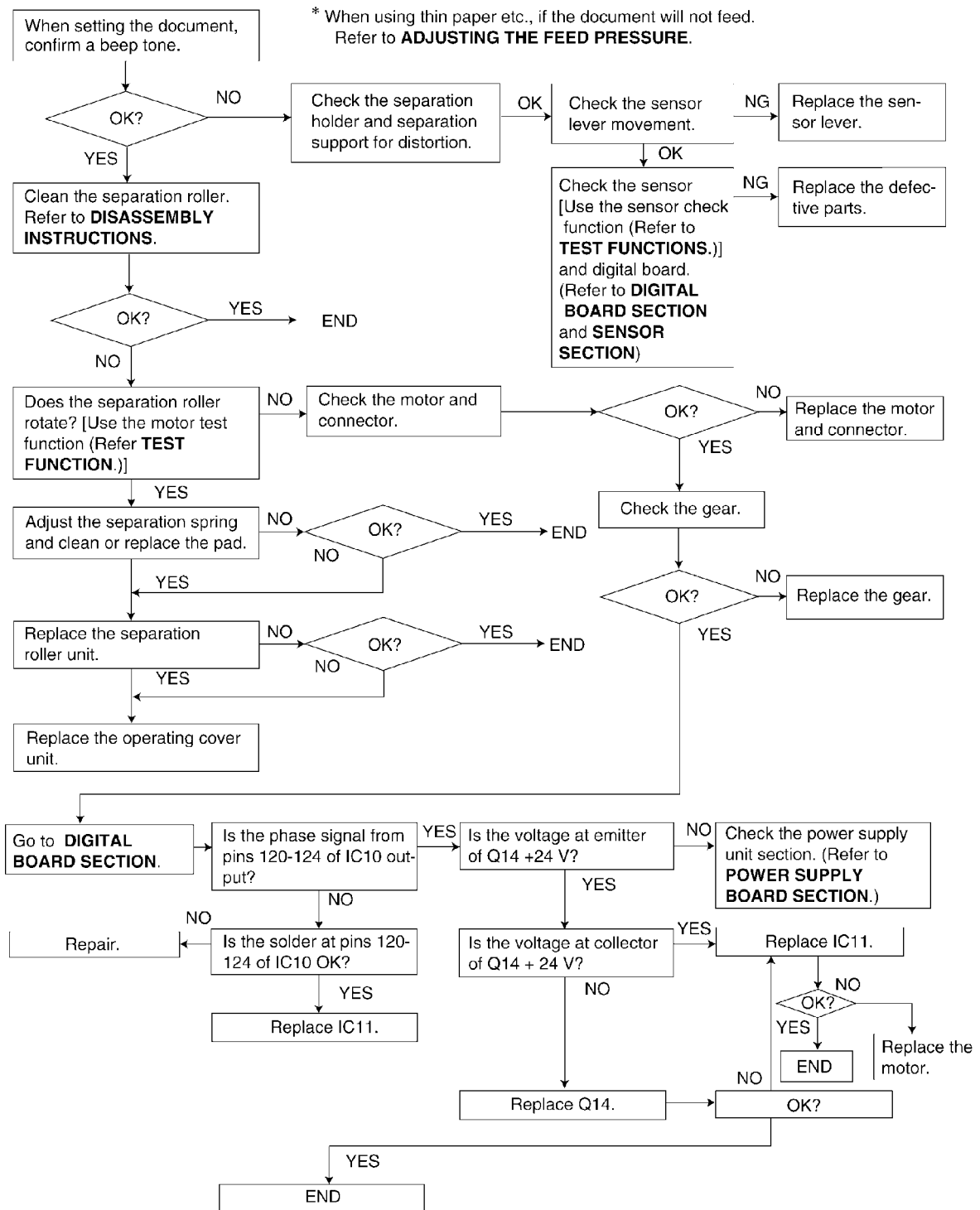
ITEM	SYMPTOM	REFERENCE
ADF (Auto Document Feeder)	No feed.	See <b>NO DOCUMENT FEED</b> (P.62)
	Paper jam	See <b>DOCUMENT JAM</b> (P.63)
	Multiple feed	See <b>MULTIPLE FEED</b> (P.64)
	Skew	See <b>SKEW</b> (P.65)
Printing	Skewed receiving image.	See <b>SKEWED RECEIVING IMAGE</b> (P.67)
	Image is distorted.	See <b>IMAGE IS DISTORTED (WHEN PRINTING)</b> (P.66)
	Black or white lateral line on print out	See <b>BLACK OR WHITE VERTICAL LINES APPEAR</b> (P.67)
Communication FAX, TEL (analog board)	Cannot communicate by fax.	See <b>COMMUNICATION SECTION</b> (P.70) and <b>How to output the journal report</b> (P.79)
	Error code is displayed.	See <b>How to output the journal report</b> (P.79)
	cannot talk.	See <b>ANALOG BOARD SECTION</b> (P.99)
	DTMF tone doesn't work. Handset/Monitor sound, volume.	
Operation panel	Keys are not accepted.	See <b>OPERATION PANEL SECTION</b> (P.104)
Sensor	If the electric circuit is the cause, the error message corresponding to the sensor will be displayed.	See <b>SENSOR SECTION</b> (P.105)
Cordless	No link	See <b>Check Link</b> (P.109)
	Battery won't charge	See <b>Check Power of Cordless Handset</b> (P.108) and <b>Check Battery Charge</b> (P.108)
	No voice reception	See <b>Check Cordless Handset Reception</b> (P.110)
	No voice transmission	See <b>Check Cordless Handset Transmission</b> (P.110)
	Bell does not sound	See <b>Bell Reception</b> (P.111)

## 7.7.3.1. SIMPLE CHECK LIST

SERIAL NO.		DATE	
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation		OK / NG	
Telephone operation	Handset MIC/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 (Refer to <b>TEST FUNCTIONS</b> (P.50).)
	LED check	OK / NG	Service code #557 (Refer to <b>TEST FUNCTIONS</b> (P.50).)
	LCD check	OK / NG	Service code #558 (Refer to <b>TEST FUNCTIONS</b> (P.50).)
Sensor	Sensor check	OK / NG	Service code #815 (Refer to <b>TEST FUNCTIONS</b> (P.50).)
Clock	Time goes by	OK / NG	Is the time kept correctly? Check with another clock.
Digital TAM	Greeting REC / PLAY	OK / NG	
	Incoming message REC / PLAY	OK / NG	
	Memo REC / PLAY	OK / NG	
Voice prompt		OK / NG	Service code #784 (Refer to <b>TEST FUNCTIONS</b> (P.50).) Check whether voice prompt is play or not.
Cordless Operation	Portable handset	OK / NG	
	Link talking	OK / NG	
	Battery charge	OK / NG	

## 7.7.4. ADF (AUTO DOCUMENT FEED) SECTION

### 7.7.4.1. NO DOCUMENT FEED



#### CROSS REFERENCE:

**TEST FUNCTIONS** (P.50)

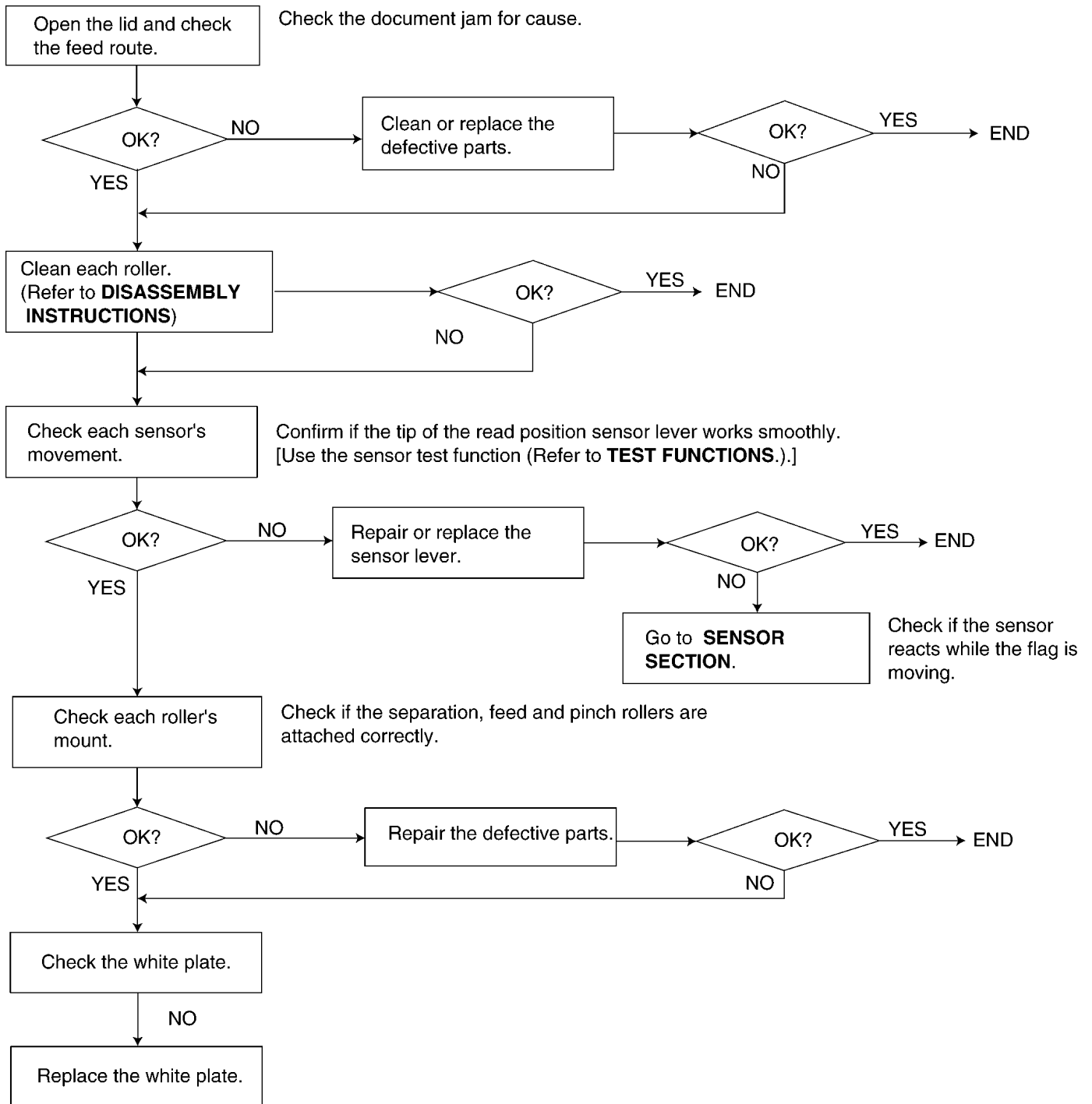
**DIGITAL BOARD SECTION** (P.92)

**SENSOR SECTION** (P.105)

**POWER SUPPLY BOARD SECTION** (P.101)

**DISASSEMBLY INSTRUCTIONS** (P.27)

### 7.7.4.2. DOCUMENT JAM



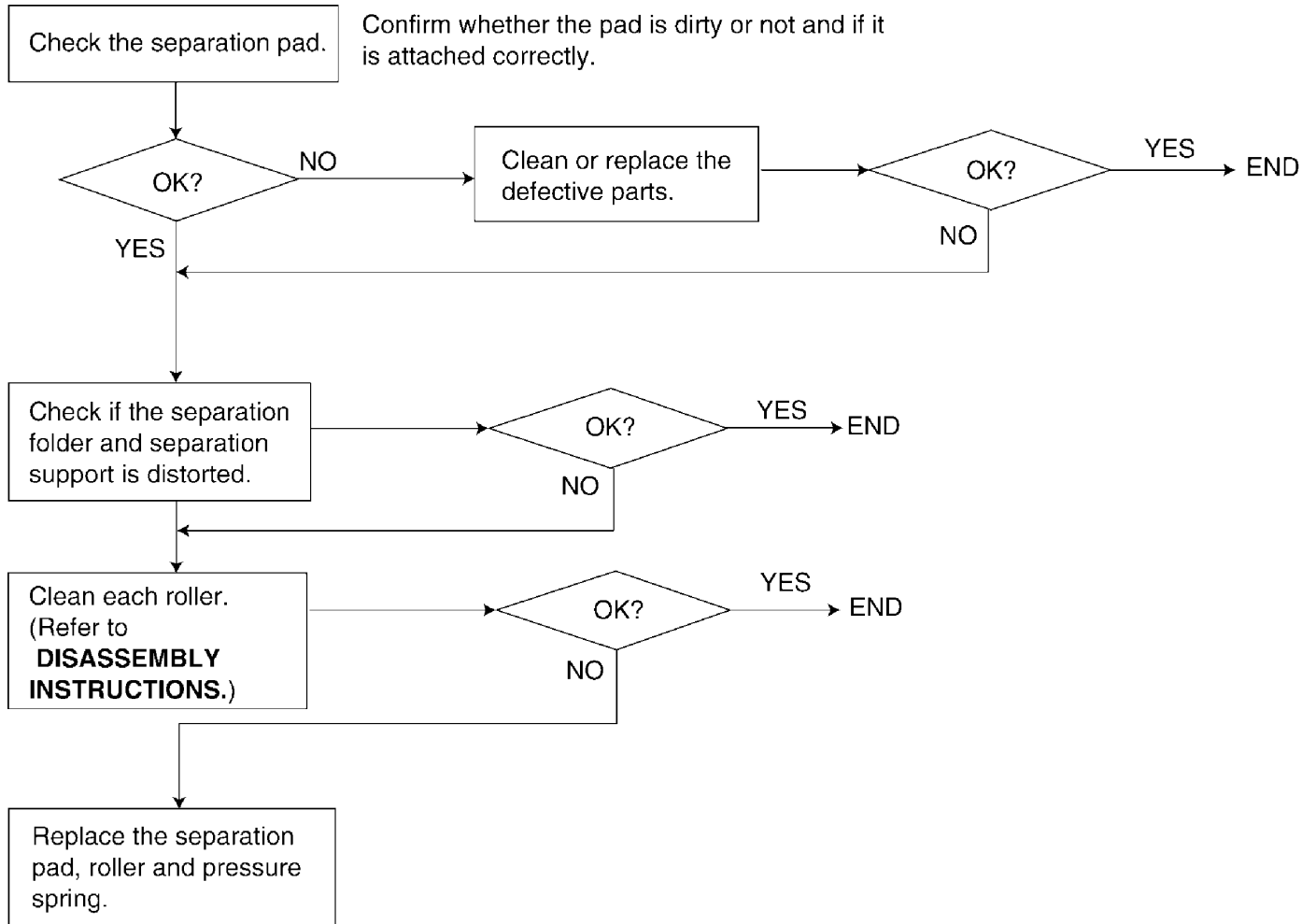
**CROSS REFERENCE:**

**SENSOR SECTION** (P.105)

**DISASSEMBLY INSTRUCTIONS** (P.27)

### 7.7.4.3. MULTIPLE FEED

When using thick paper etc., If the document will not feed.

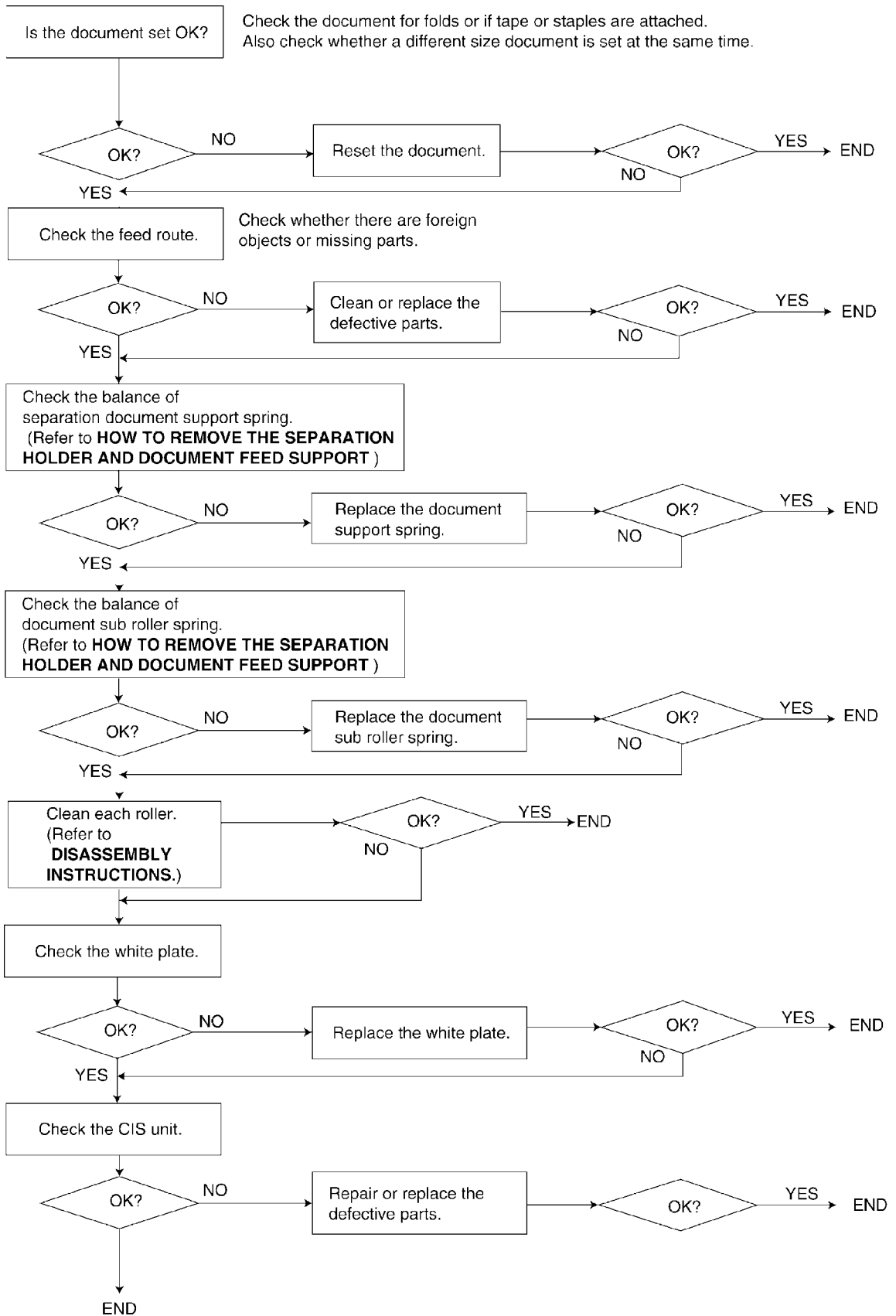


**CROSS REFERENCE:**

**DISASSEMBLY INSTRUCTIONS (P.27)**



### 7.7.4.4. SKEW

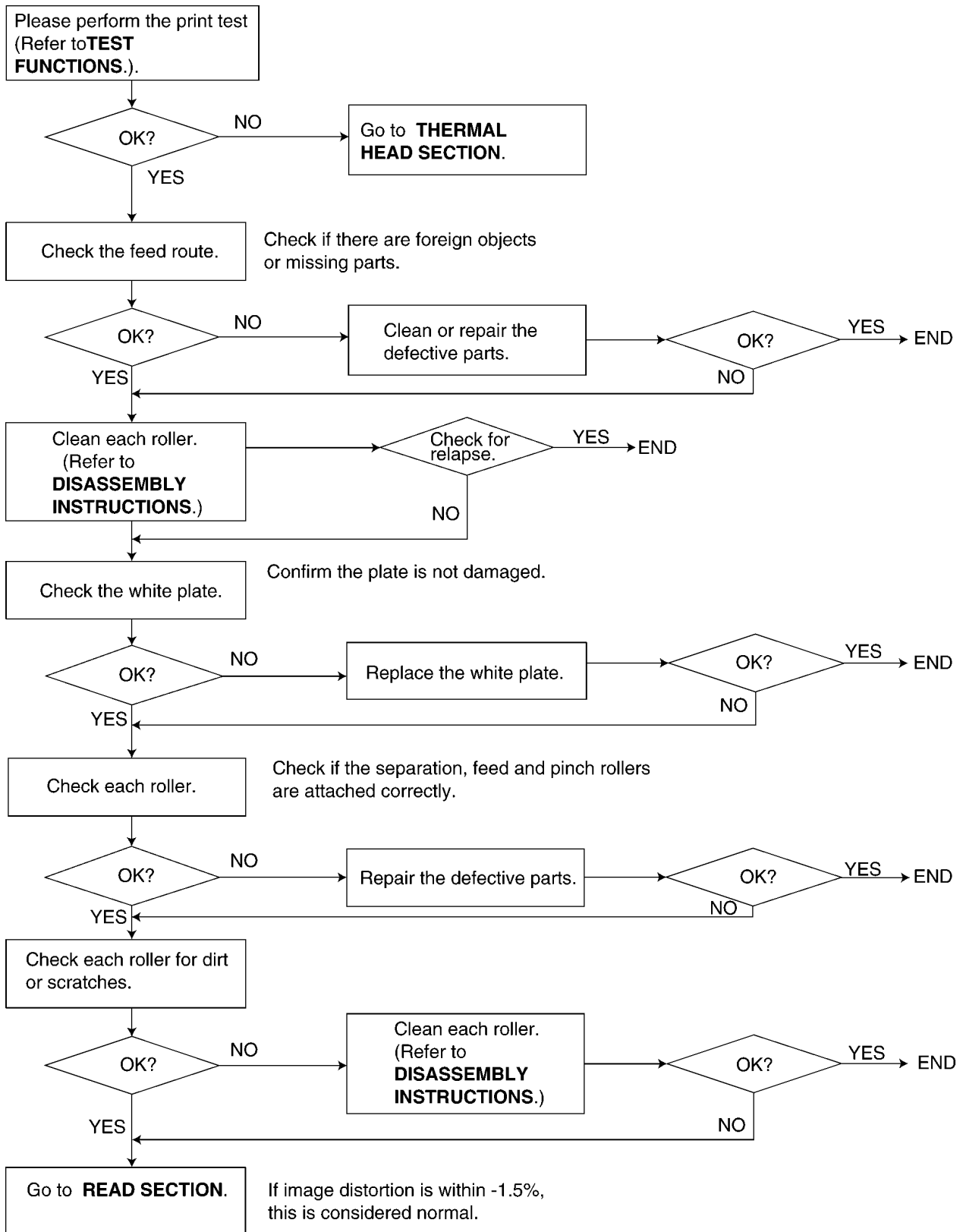


**CROSS REFERENCE:**

**DISASSEMBLY INSTRUCTIONS (P.27)**

**HOW TO REMOVE THE SEPARATION HOLDER AND DOCUMENT FEED SUPPORT (P.32)**

### 7.7.4.5. IMAGE IS DISTORTED (WHEN PRINTING)



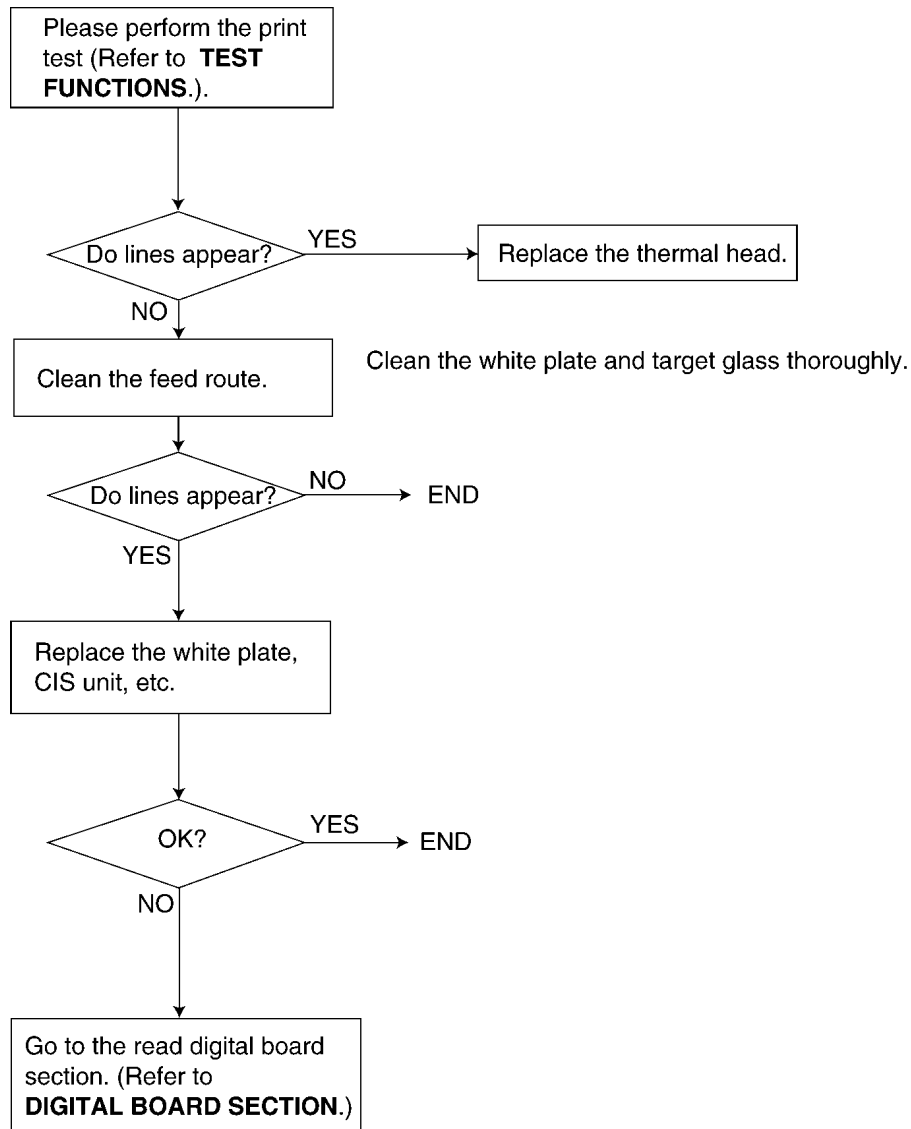
**CROSS REFERENCE:**

**THERMAL HEAD SECTION** (P.107).

**TEST FUNCTIONS**(P.50)

**DISASSEMBLY INSTRUCTIONS** (P.27)

### 7.7.4.6. BLACK OR WHITE VERTICAL LINES APPEAR

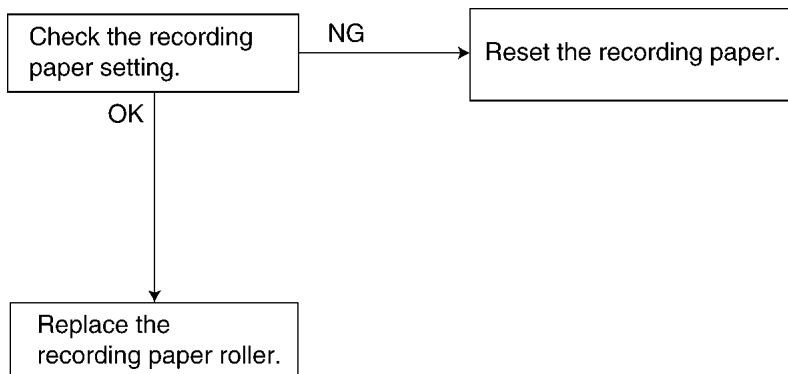


**CROSS REFERENCE:**

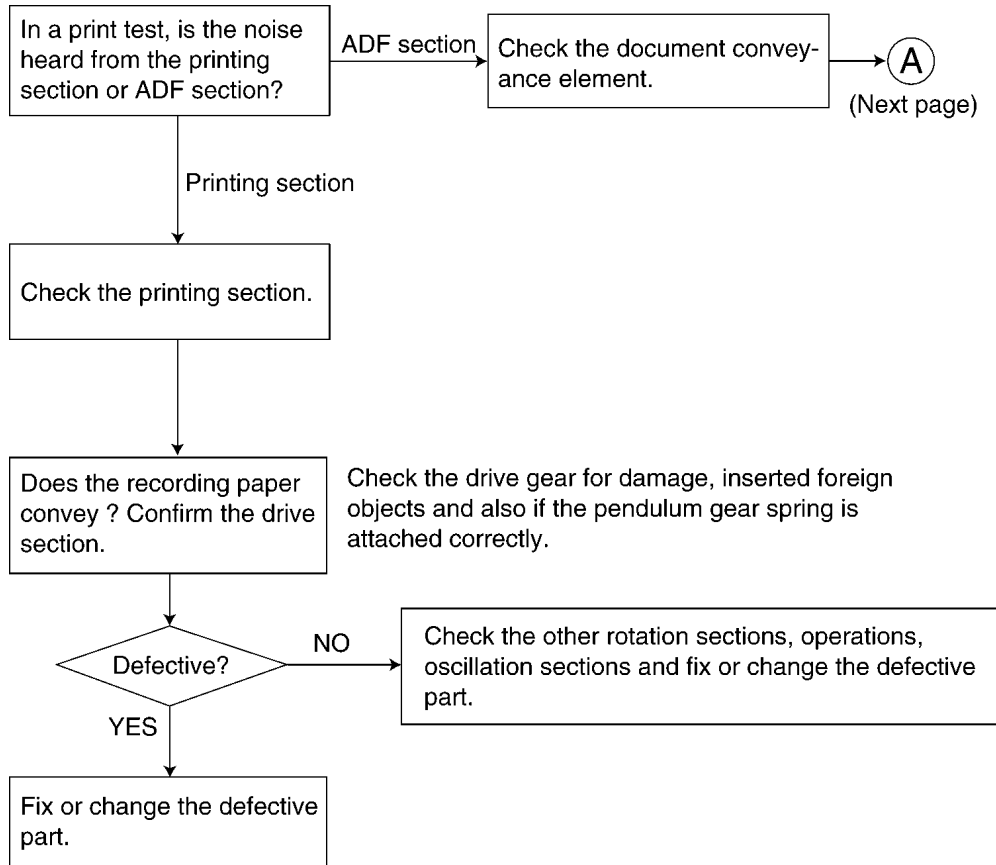
TEST FUNCTIONS(P.50)

DIGITAL BOARD SECTION (P.92)

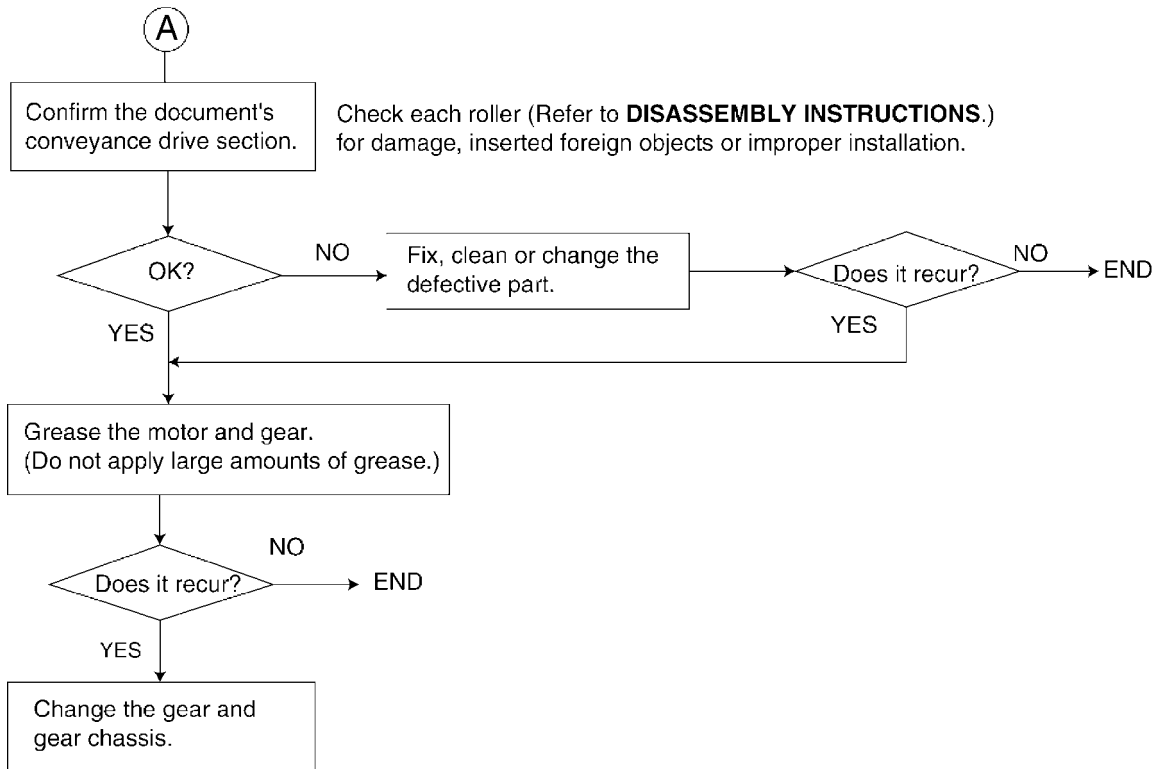
### 7.7.4.7. SKEWED RECEIVING IMAGE



### 7.7.4.8. WHEN COPYING OR PRINTING, AN ABNORMAL SOUND IS HEARD FROM THE UNIT



(From the previous page)



**CROSS REFERENCE:**

**DISASSEMBLY INSTRUCTIONS (P.27)**

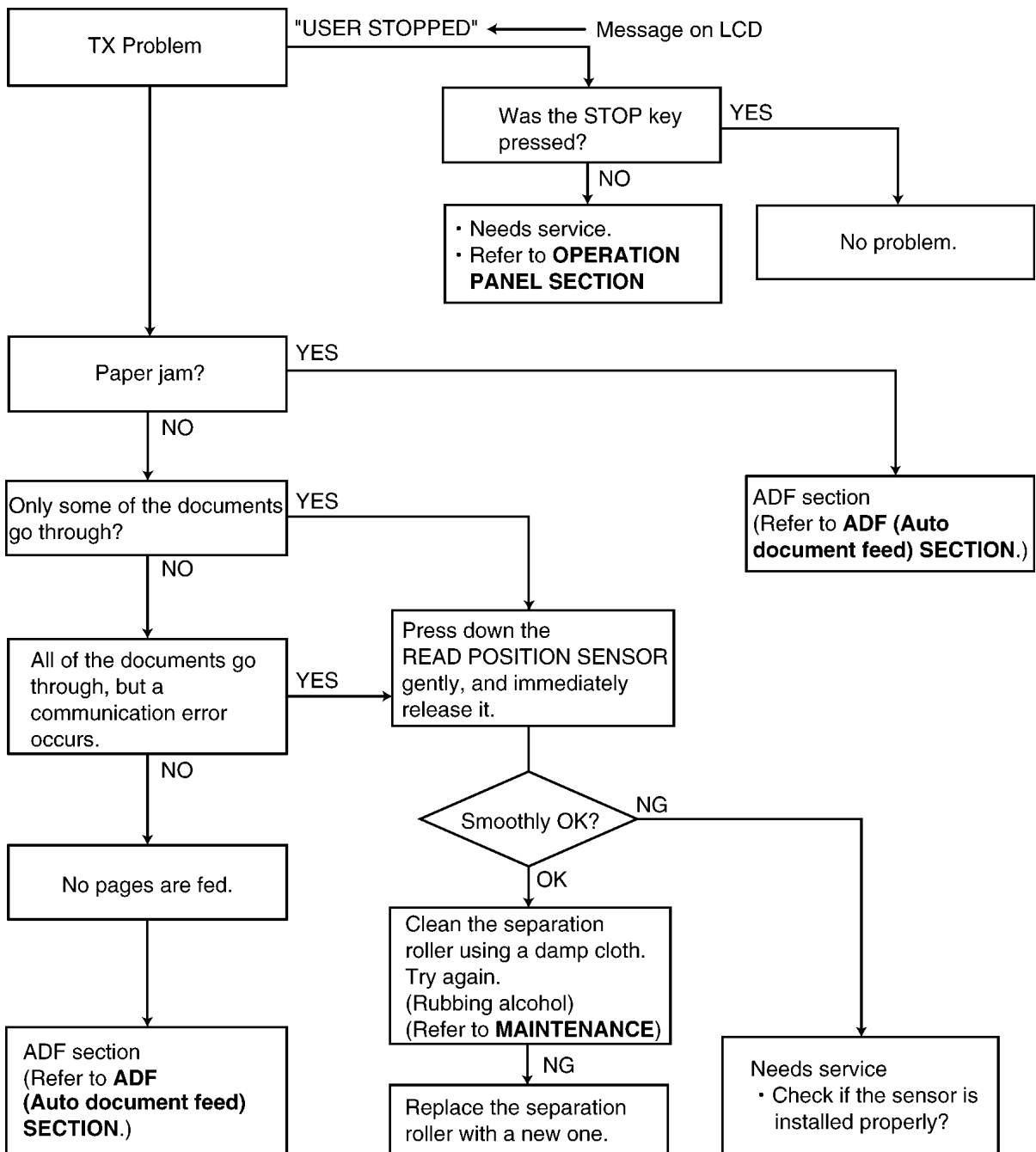
## 7.7.5. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **Defective Facsimile Section** (P.71).

No.	Symptom	Content	Possible cause
1	The paper is not fed properly when faxing. (Nor in the copy mode.)	Troubleshooting	Problem with the feeding mechanism.
2	The fax usually transmits successfully but sometimes fails. (The unit can copy documents.)	Troubleshooting	Problem with the service line or with the receiver's fax.
3	The fax usually receives successfully but sometimes fails. (The unit can copy documents.)	Troubleshooting	Problem with the service line or with the transmitter's fax.
4	The fax completely fails to transmit or receive. (The unit can copy documents.)	Troubleshooting	Problem with the electric circuit.
5	The fax fails either to transmit or receive when making a long distance or an international call. (The unit can copy documents.)	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 an international call.		
7	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	

### 7.7.5.1. Defective Facsimile Section

#### 7.7.5.1.1. Transmit Problem



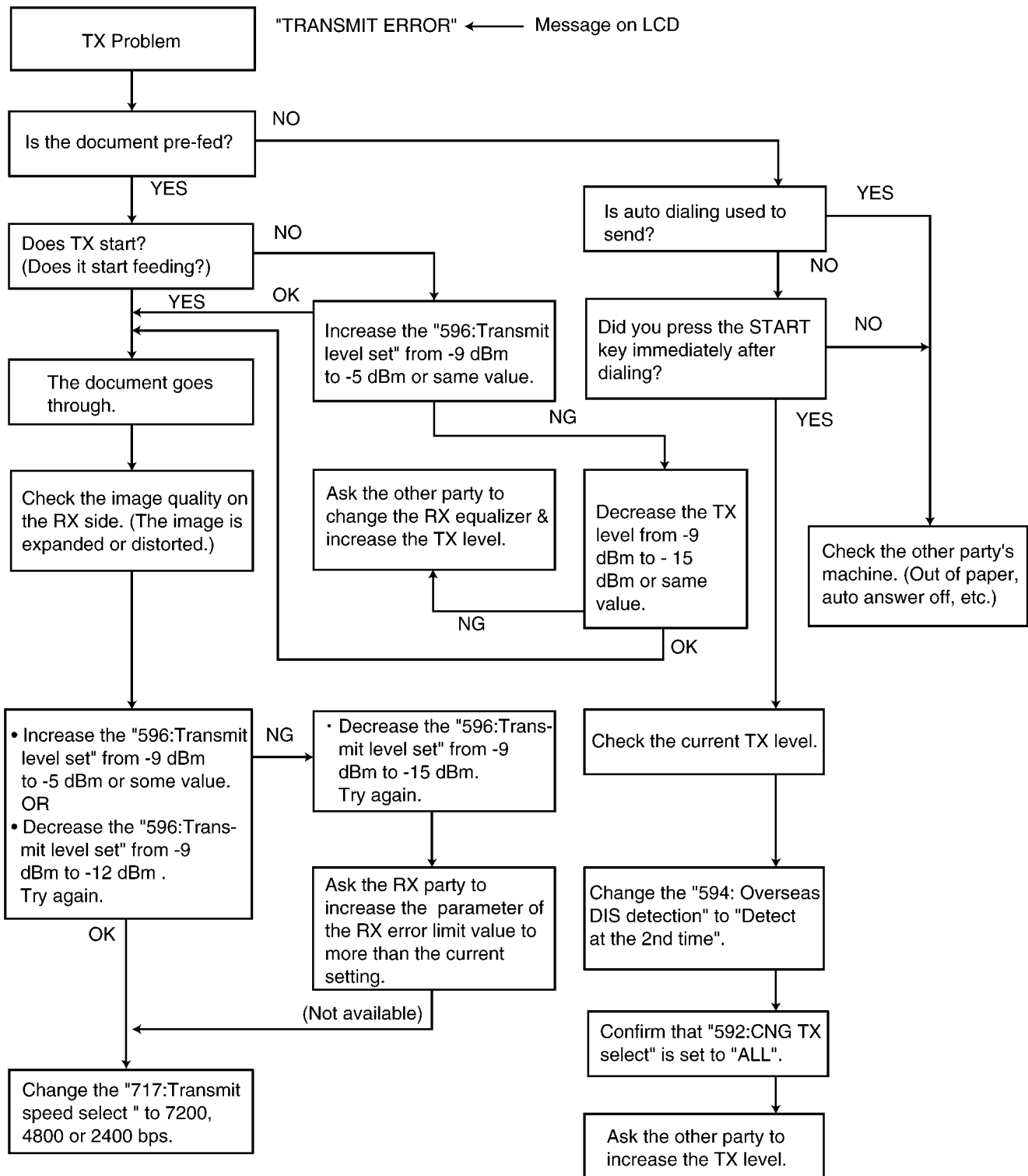
**CROSS REFERENCE:**

**MAINTENANCE**(P.23)

**ADF (AUTO DOCUMENT FEED) SECTION**(P.62)

**OPERATION PANEL SECTION**(P.104)

### 7.7.5.1.2. Sometime there is a transmit problem



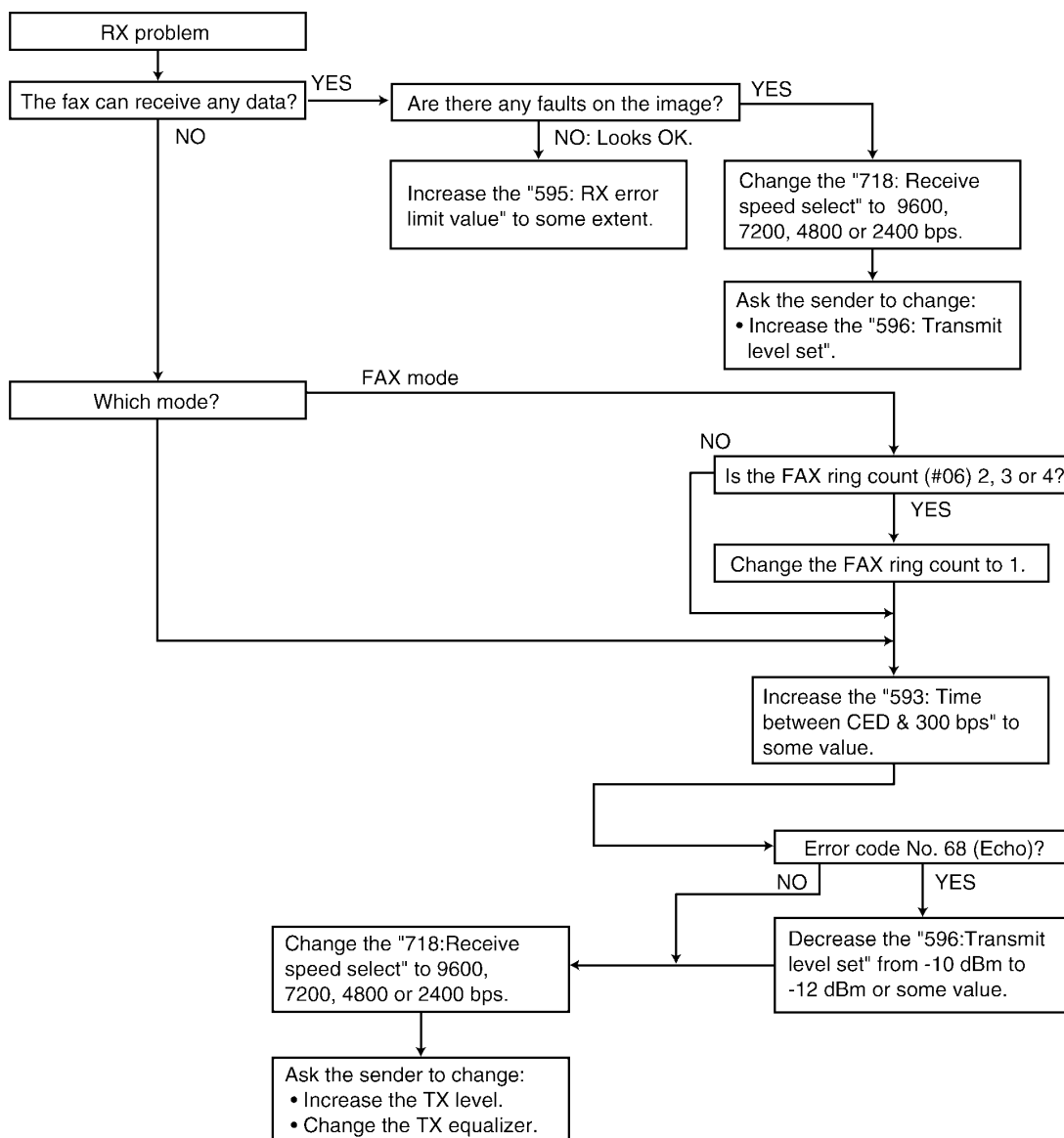
**Note:**

"596: Transmit level set" represents a service code. (Refer to **SERVICE FUNCTION TABLE**(P.48).)



### 7.7.5.1.3. Receive Problem

First confirm whether the recording paper is installed properly or not before starting troubleshooting. (Refer to "Remarks".)



#### Note:

"596: Transmit level set" represents a service code. (Refer to **SERVICE FUNCTION TABLE**(P.48).)

#### Remarks:

Regarding the reception problem, we have investigated the conceivable causes in the flow chart except for the software-related errors. However, some troubles may occur due to the software-related problems such as "OUT OF PAPER" when the fax switches to the memory receiving mode and the memory capacity becomes full of the unprintable data. In this case, error messages [MEMORY FULL] and its main cause, for example "CHECK PAPER" are displayed on the LCD. Once you solve the main problem, [MEMORY FULL] will be cancelled and the reception problem will be resolved.

LCD display messages indicating the error causes are shown below.

CHECK PAPER

COVER OPEN

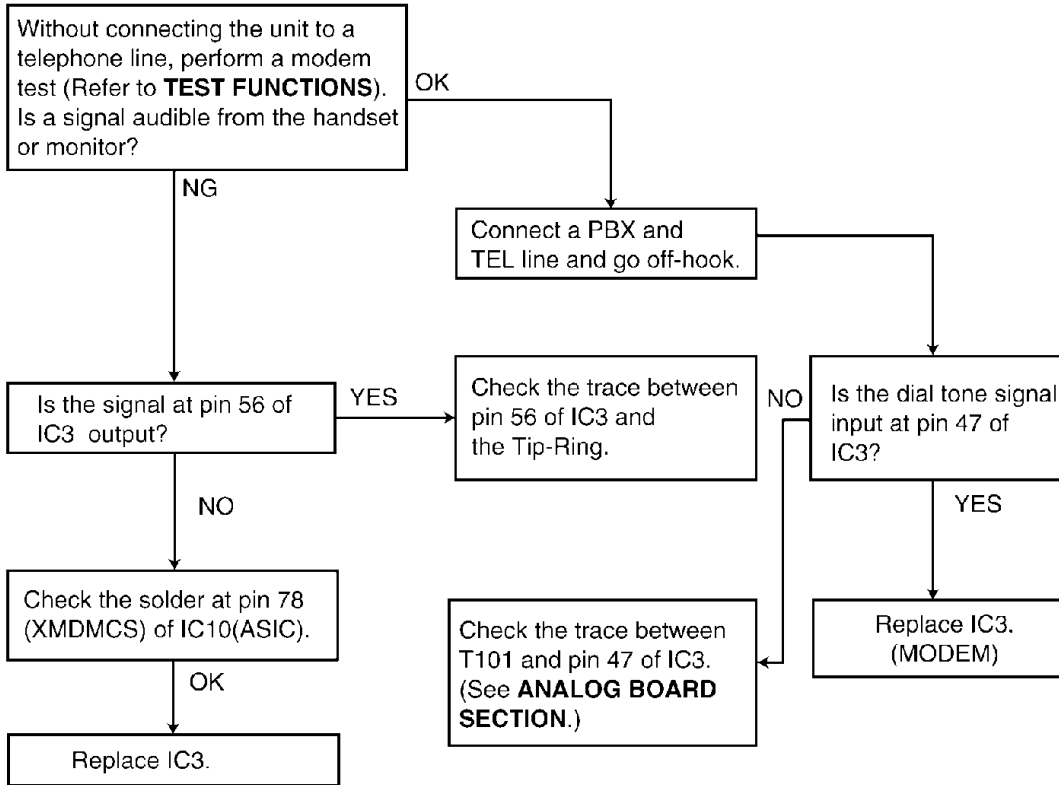
UNIT OVERHEATED (COVER OPEN, etc.)...Reset the unit.

PAPER JAMMED

CHECK FILM

Please refer to **USER RECOVERABLE ERRORS** (P.45) for the above items. If it turns out to be a hardware deformity, please check each sensor. (Refer to **TEST FUNCTIONS** (P.50).)

### 7.7.5.1.4. The unit can copy, but cannot transmit/receive



**CROSS REFERENCE:**

**ANALOG BOARD SECTION(P.99)**

**TEST FUNCTIONS(P.50)**

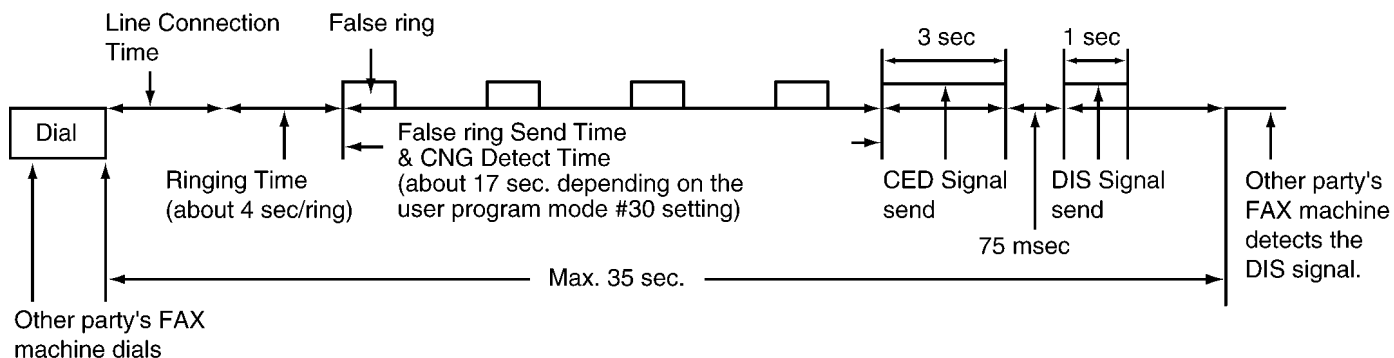
### 7.7.5.1.5. The unit can copy, but cannot either transmit/receive long distance or international communications

The following two causes can be considered for this symptom.

**Cause 1:**

The other party is executing automatic dialing, the call has been received by this unit, and the CED or DIS signal response time is too long. (In most cases, this unit detects the CNG signal and can respond to CED or DIS.) (According to the ITU-T standard, the communication procedure is cancelled when there is no response from the other party within 35 sec, so that the other party releases the line.)

(Response Time)



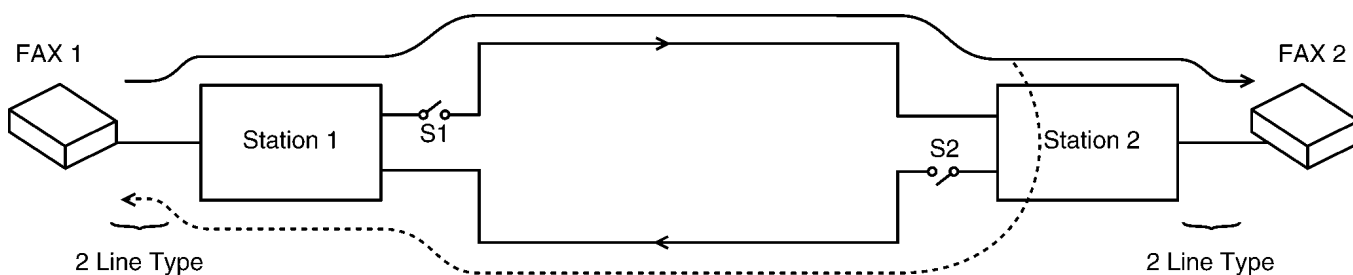
**(Cause and Countermeasure)**

As shown in the chart above, the total handshaking time must be reduced, but because of the long distance connection and linking of several stations, the line connection time cannot be reduced. Accordingly, the following countermeasures should be tried.

(A)... As the 35 sec. count is started directly after dialing or directly after the START button has been pressed for models with a START button, the other party should be called manually, if possible. Another possibility is entering two pauses at the end of the auto dial number on the transmission side. Then the count start time can be delayed for 2 pauses (about 10 sec.).

**Cause 2:**

Erroneous detection because of an echo or an echo canceler.



**(Echo/Echo Canceler)**

The signal from FAX1 reaches FAX2 via stations 1 and 2, but the reflection signal at station 2 also returns via station 1 (echo). As the distance between station 1 and station 2 is far, the echo returns to FAX 1 at a max of 600 msec after transmission. There is a possibility that this signal is detected erroneously as the signal from FAX2. For a normal call, there is also a possibility that the echo of their own voice will make the call difficult to understand. For this reason, each station (station 1 and station 2) attaches echo cancelers (S1 and S2) for international lines or long distance lines. For the echo canceler, the level of the transmission signal from FAX 1 is compared with the level of the reception signal from FAX2. When the transmission signal is larger, S1 is closed while S2 is opened when it is smaller. In other words, for transmission from FAX1, S1 is closed and S2 is open, so that the echo does not return to FAX1.

**(Causes and Countermeasures)**

No.	Countermeasure Side	Echo Communication Problem Example	Countermeasure	Service Code
1	Sending side	Some time is needed to compare the level of the receiving and sending signals for the echo canceler. The header of the training signal lacks due to a switching delay to close S1.	Add a dummy signal to the beginning of the training signal.	Service code (521) (International mode select) This countermeasure becomes the default value.
2	Receiving side	The echo canceler function stops according to a CED signal frequency of 2100Hz (S1 and S2 are both ON), a DIS signal is returned as an echo, and a DCS signal from the sending side overlaps the DIS echo. Then the receiving side FAX cannot retrieve the DCS signal. (Refer to Fig. a)	Change to a 1100Hz CED signal frequency. (Refer to Fig. b)	Service code (520) (CED frequency select)
	Receiving side		Change the regular rime of 75 msec between the CED signal and DIS signal to 500 msec. This will give at least 250 msec to recover the echo canceler operation. (Refer to Fig. c)	Service code (593) (Time between CED and 300 bps)
	Sending side		The sending side FAX sends a DCS signal not after receiving the 1st DIS signal but after receiving the 2nd DIS signal. (Refer to Fig. d)	Service code (594) (Overseas DIS detection select)
3	Sending side	Communication failure occurs in a long distance communication on the telephone line without an echo canceler.	Decrease the transmission level from -10 dBm to -15 dBm and the echo level will decrease.	Service code (596) (Transmit level set)
4	Sending side Receiving side	or	Decrease the receiving sensitivity from -13 dBm to about -32 dBm so an echo signal will not received.	Service code (598) (Receiving sensitivity)
5	Sending side Receiving side	There are some cases (e.g. Mobil comms.) which cause the collision of TX / RX signals due to the delay / echo and noise of the network / terminal. (Refer to Fig. e)	Set additional Pause time (Service mode: code No. 774) in between the original and its repeated signals, to prevent the collision of the signals at both end.	Service code (774) (T4 timer)

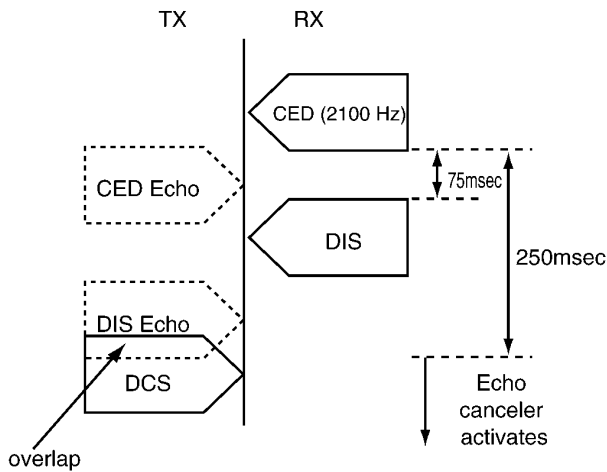


Fig. a (Overlapping the Echo of the DIS signal and DCS signal)

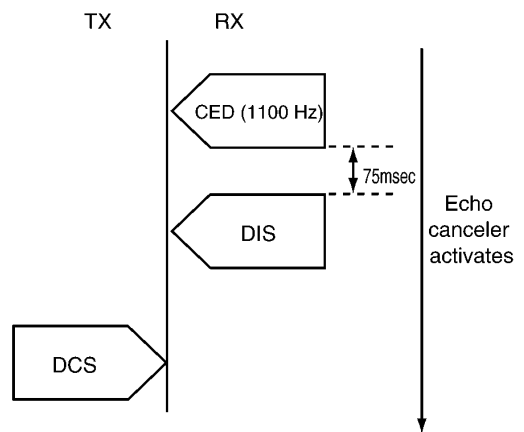


Fig. b (Countermeasure by Changing the CED Frequency)

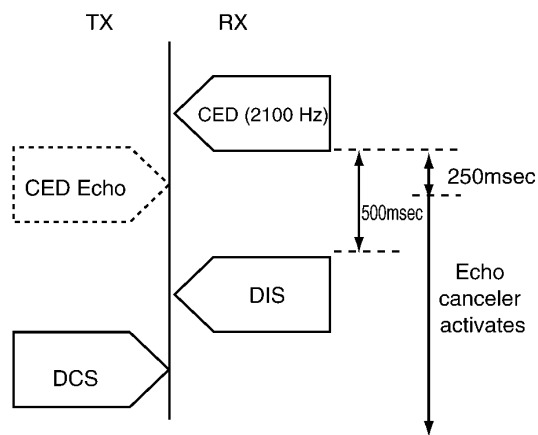


Fig. c (Countermeasure by Changing the Interval Between CED and DIS)

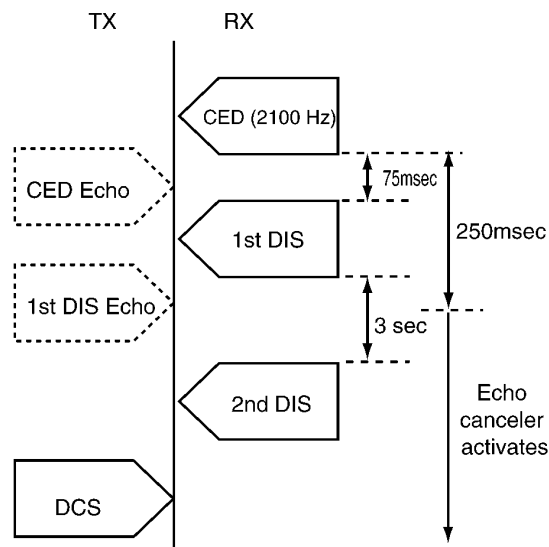
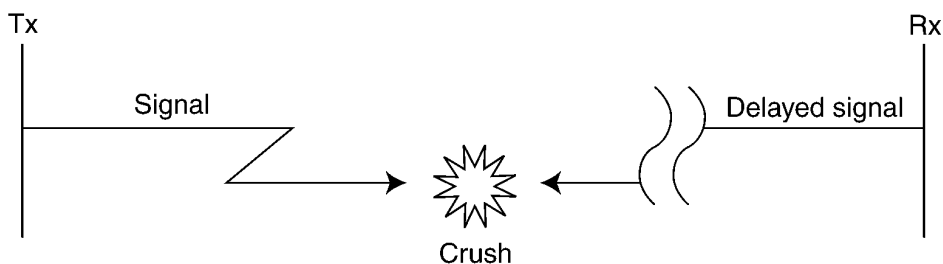


Fig. d (Countermeasure by Ignoring the 1st DIS)

<TX side signal>	<RX side signal>	<Countermeasure>
2nd / 3rd DCS / Training	& delayed CFR / FTT	at TX side
2nd / 3rd EOP / EOM / MPS	& delayed MCF / PIP / PIN / RTP / RTN	at TX side
delayed DCS	& 2nd / 3rd / --- DIS	at RX side



(Fig. e)

### 7.7.5.1.6. The unit can copy, but the transmission and reception image are incorrect

(Long distance or international communication operation)

This symptom highly depends on the transmission and reception capability of the other FAX unit and the line conditions. The countermeasures for this unit are shown below.

#### Transmission Operation:

Set the transmitting speed to 4800BPS (service mode: code No. 717) or select the overseas mode.

#### Reception Operation:

If 80% or more of the reception is incorrect, set the receiving speed to 4800BPS. (Service mode: code No. 718)

- Refer to **SERVICE FUNCTION TABLE**(P.48).

### 7.7.5.1.7. How to record fax signal by using PC

Recording FAX signal is one of the useful analysis measures to solve communication problems.

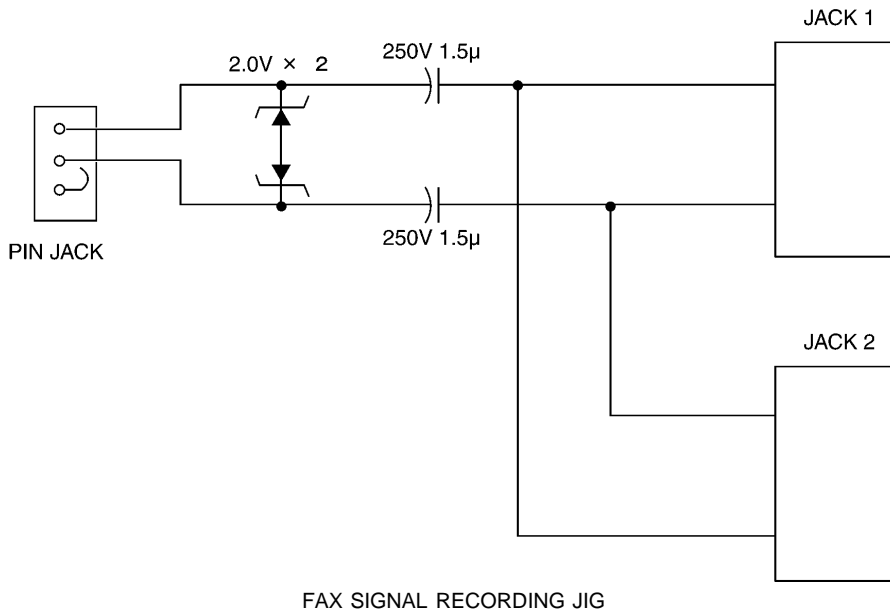
The way of recording easily by using PC is shown as follows.

#### 1. Equipment

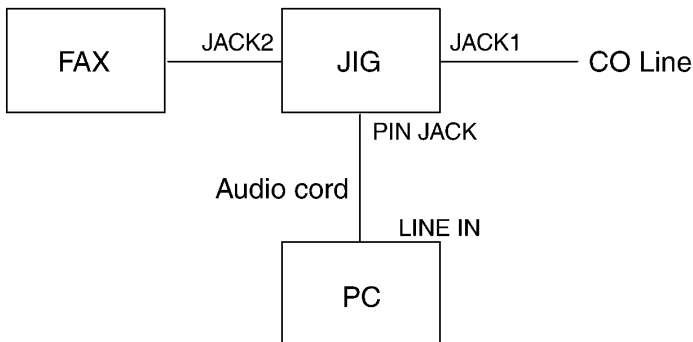
- 1 jig
- 1 PC (with LINE IN)
- 1 audio cord (mini jack supported)
- 2 tel cords

Parts No.	Parts Name & Description	Qt'y
PQJJ1T004Z	JACK1, JACK2	2
PQJJ1D010Z	PIN JACK	1
ECQE2155KF or ECQE2E155KC	CAPACITOR	2
MA4020	DIODE	2

#### 2. Setting up



#### 3. Connecting PC and JIG



#### 4. PC setting and recording

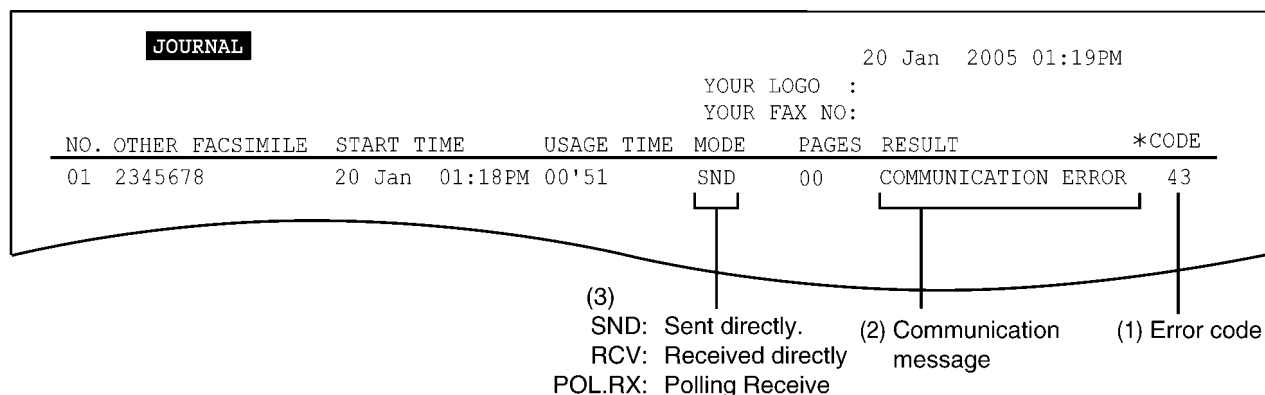
1. Set LINE IN to be valid in the volume control setting.  
Refer to the PC instruction book.
2. Start up the PC software "SOUND RECORDER". (This software is bundled to Windows OS, which can create WAV file.)  
Set the audio format "PCM 22.050kHz, 8bit, mono".
3. Click the record button and start recording after acquisition the signal.

#### Note:

- Not to be wind wave patterns on the wave monitor.
- Please compress the recording data when you send attaching to E-Mail because the data size will be so heavy.
- Any software which can create WAV files is available.

### 7.7.5.1.8. How to output the journal report

1. Press **[MENU]** repeatedly to display "PRINT REPORT".
2. Press **[◀]** or **[▶]** until the "JOURNAL REPORT" is displayed.
3. Press **[SET]**.
4. The report is printed out.



**Error code table:**

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Countermeasure*
	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.	
	OTHER FAX NOT RESPONDING	SND	Transmission is finished when the T1 TIMER expires.	1
28	COMMUNICATION ERROR	SND & RCV	-----	
41	COMMUNICATION ERROR	SND	DCN is received after DCS transmission.	2
42	COMMUNICATION ERROR	SND	FTT is received after transmission of a 2400BPS 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
	OTHER FAX NOT RESPONDING	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
	MEMORY FULL	RCV	The document was not received due to memory full.	
	CANCELLED	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.153)</b> .	12

SND=TRANSMISSION RCV=RECEPTION

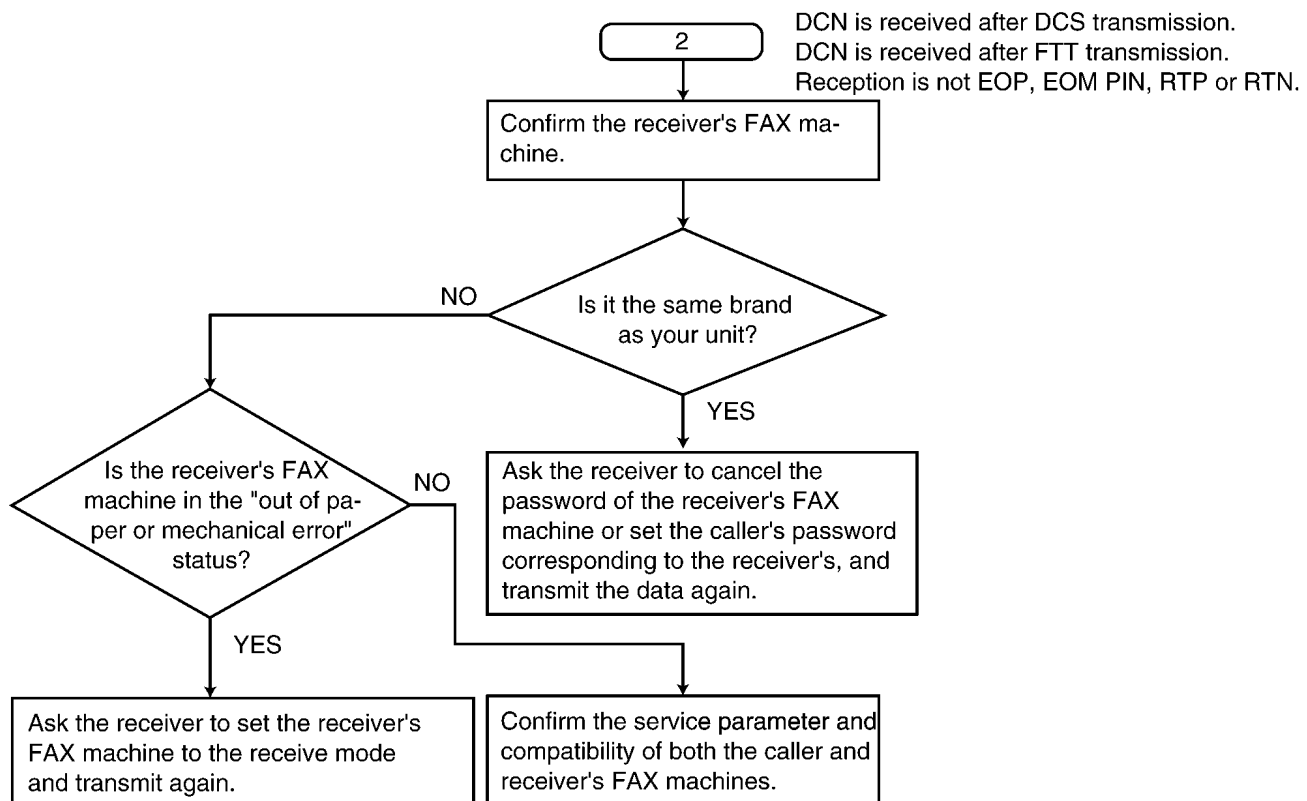
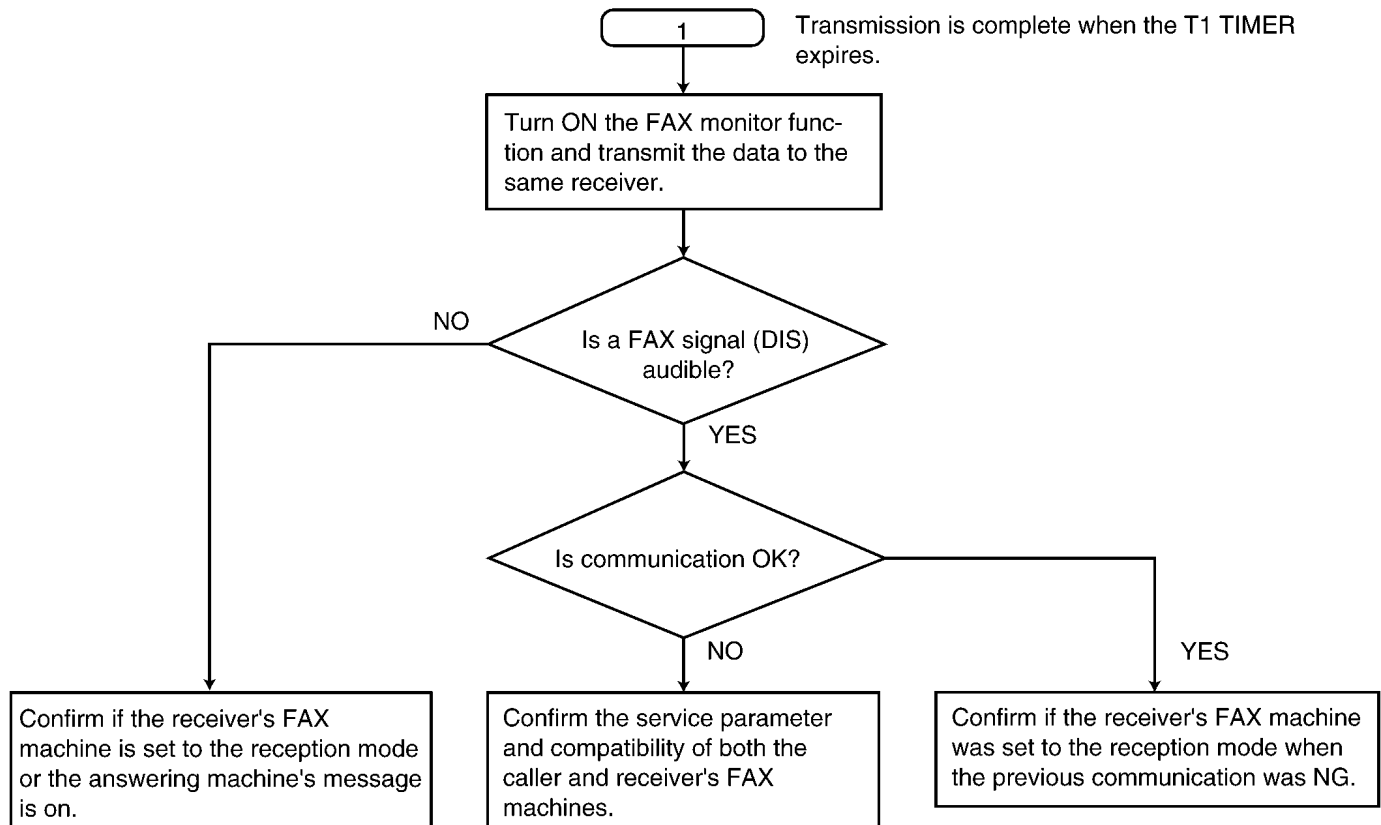
Most fax communication problems can be resolved by the following steps.

1. Change the transmit level. (Service code: 596, refer to **SERVICE FUNCTION TABLE(P.48)**.)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to **SERVICE FUNCTION TABLE (P.48)**.)

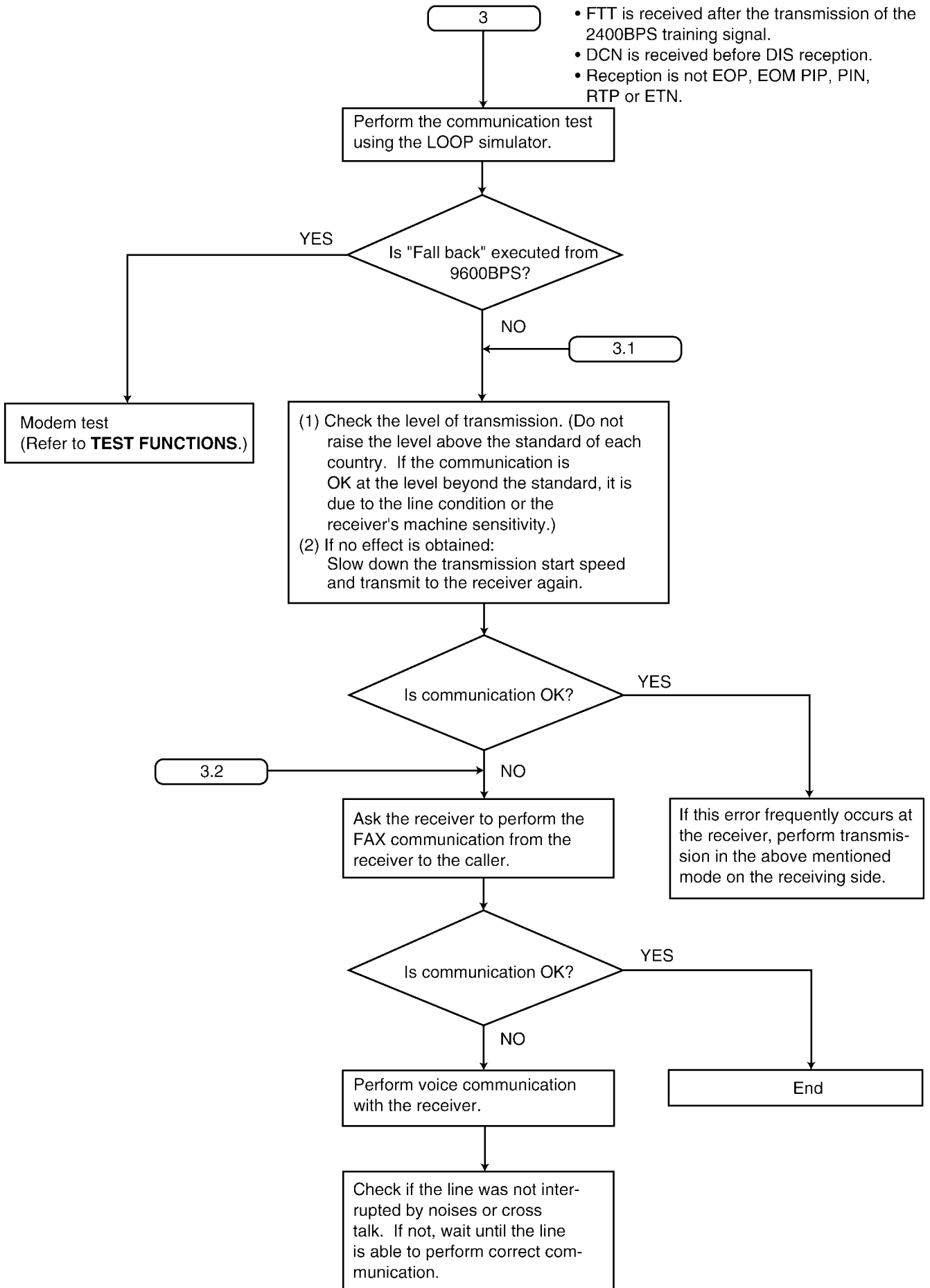
**Note\*:**

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

**Countermeasure**

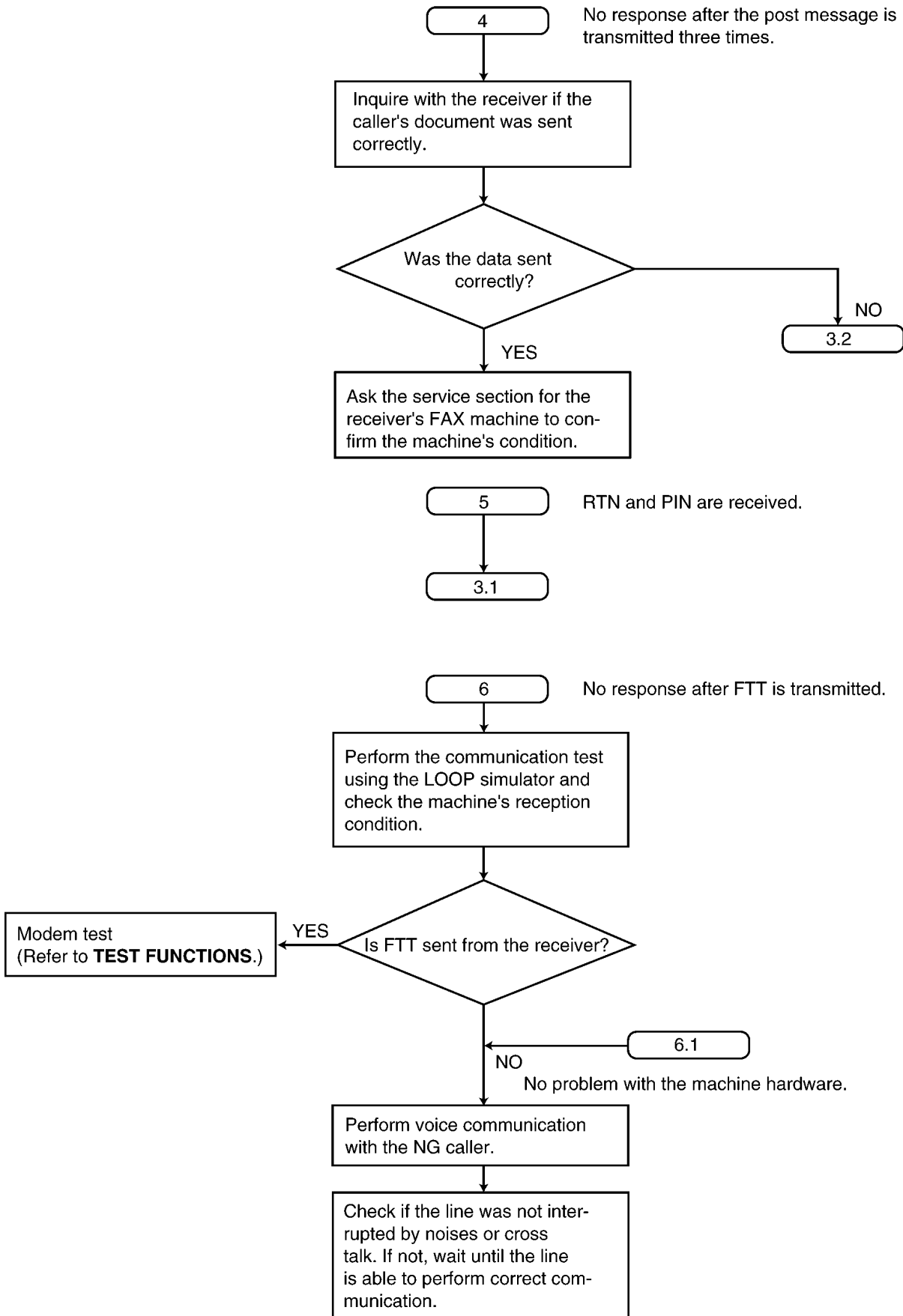




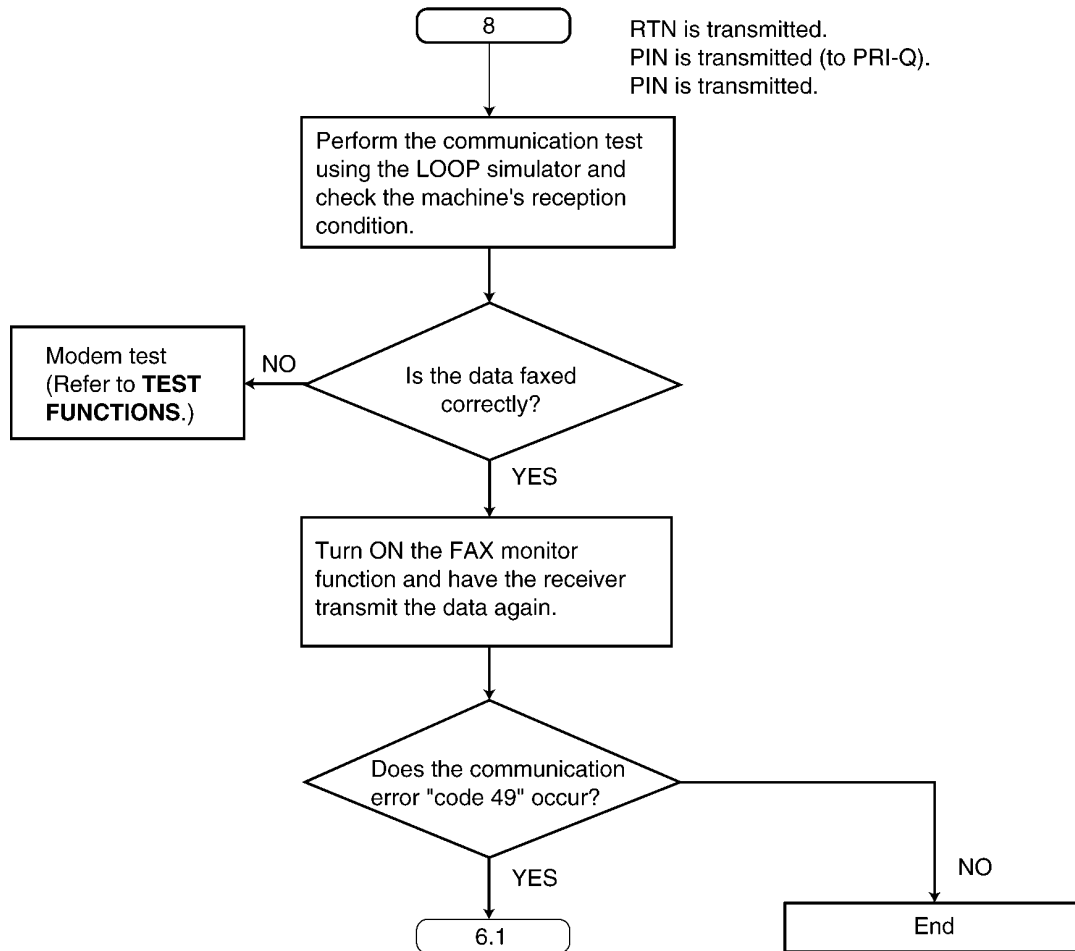
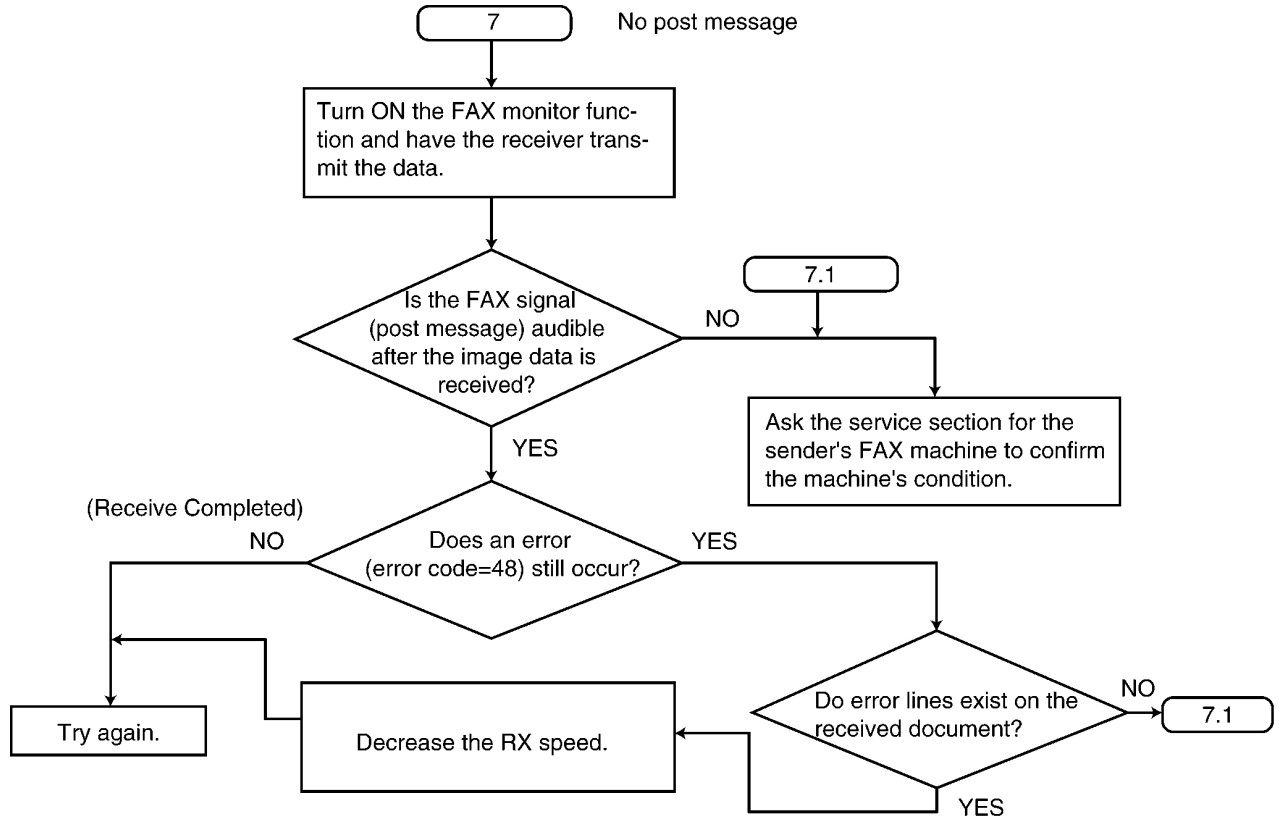


- FTT is received after the transmission of the 2400BPS training signal.
- DCN is received before DIS reception.
- Reception is not EOP, EOM PIP, PIN, RTP or ETN.

**CROSS REFERENCE:**  
**TEST FUNCTIONS(P.50)**



**CROSS REFERENCE:**  
**TEST FUNCTIONS(P.50)**



**CROSS REFERENCE:**  
**TEST FUNCTIONS(P.50)**

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?

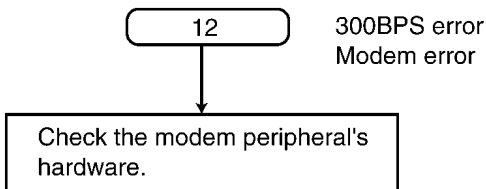
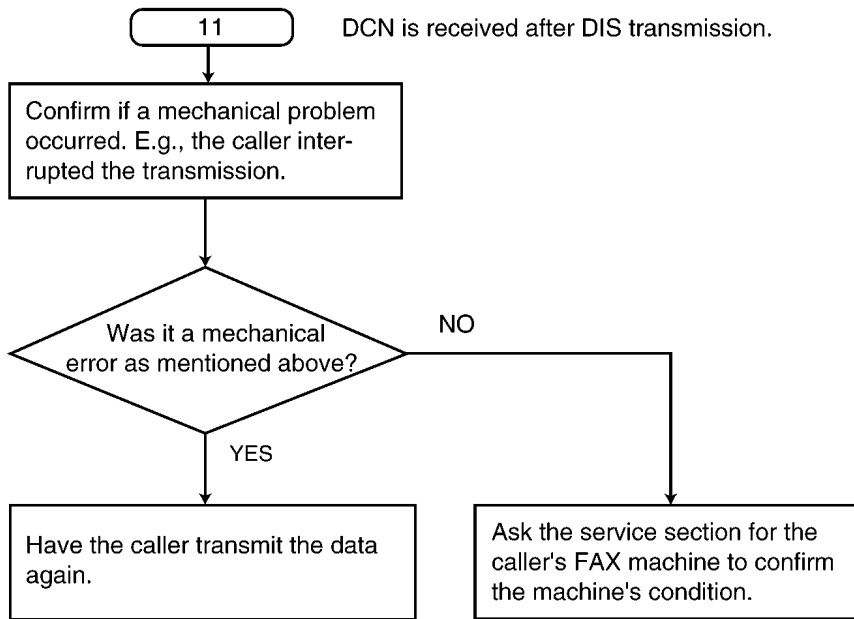
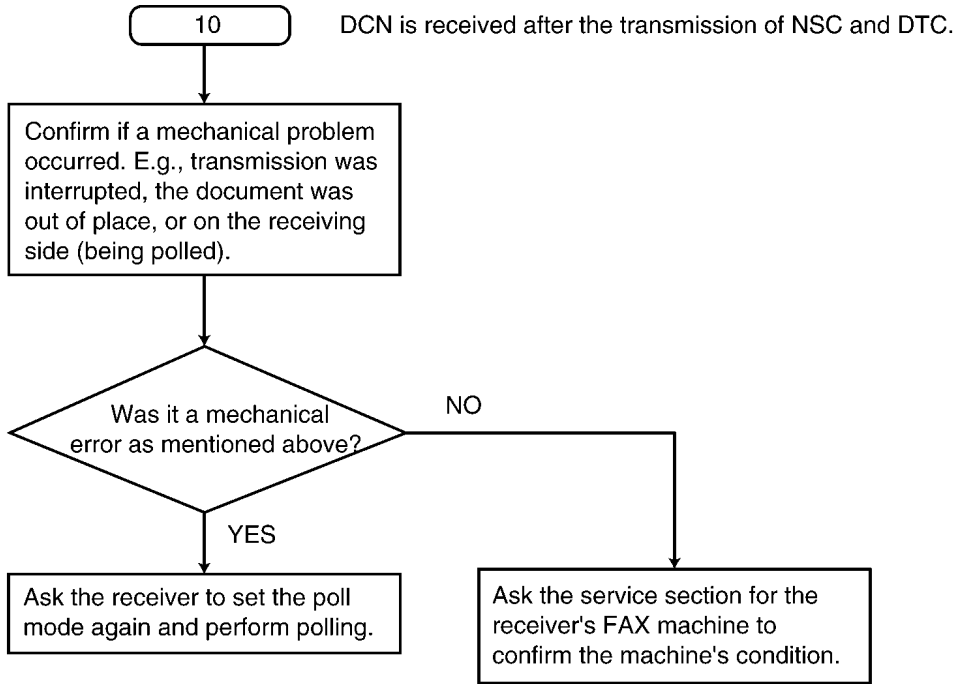
End

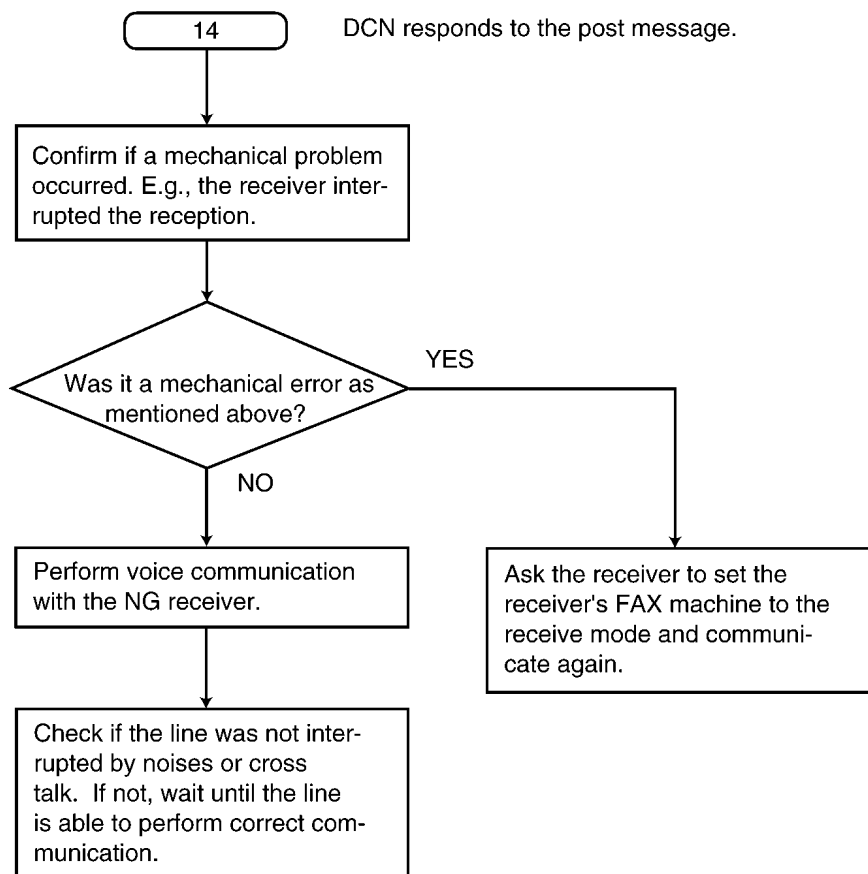
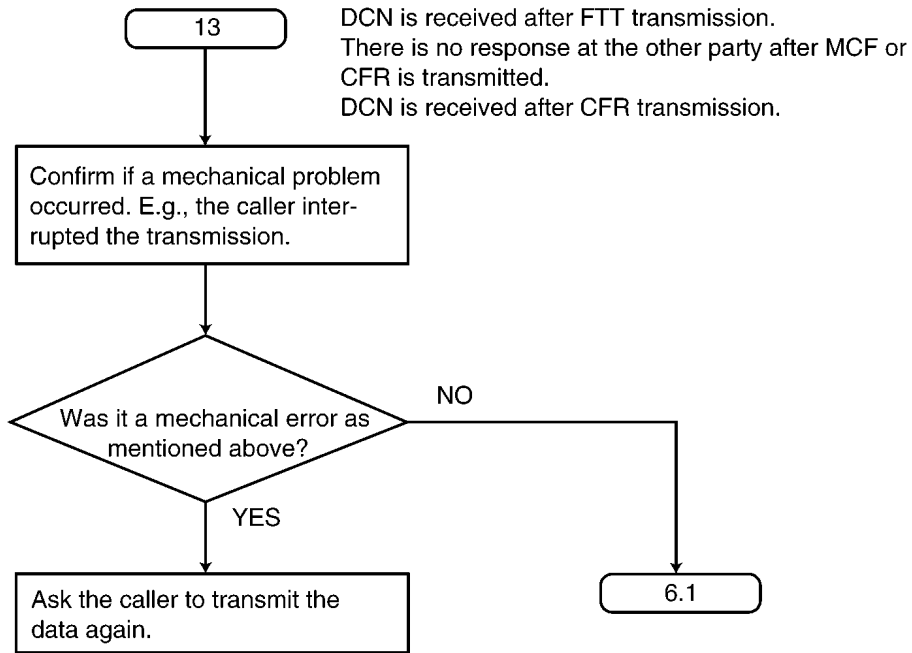
Is the FAX signal audible after the image data is received?

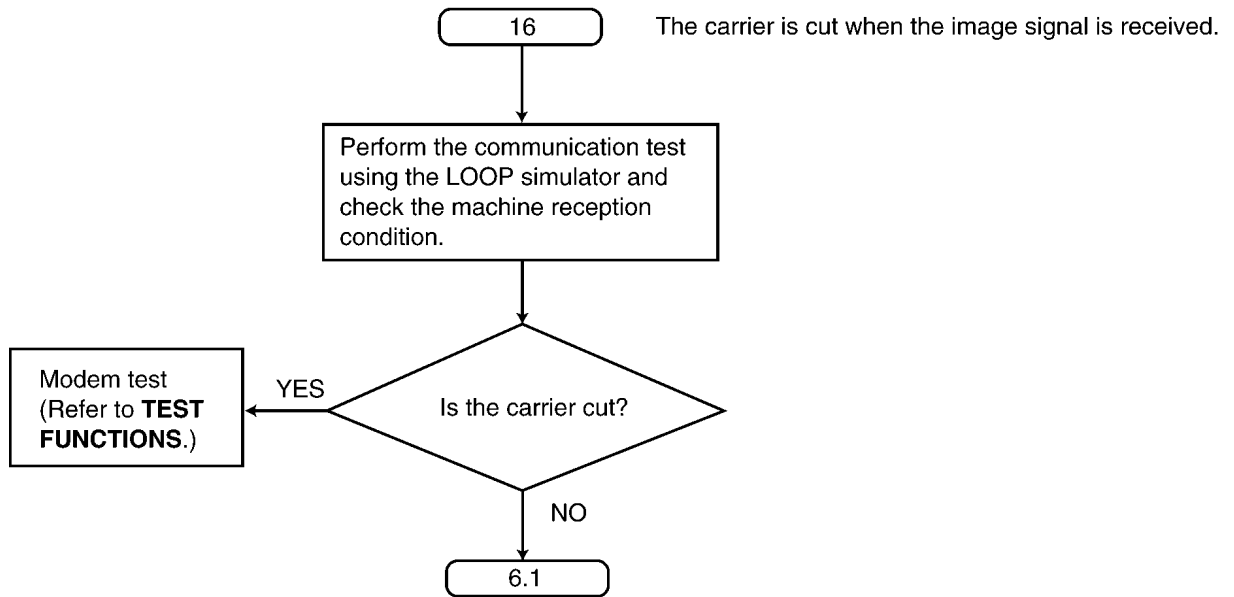
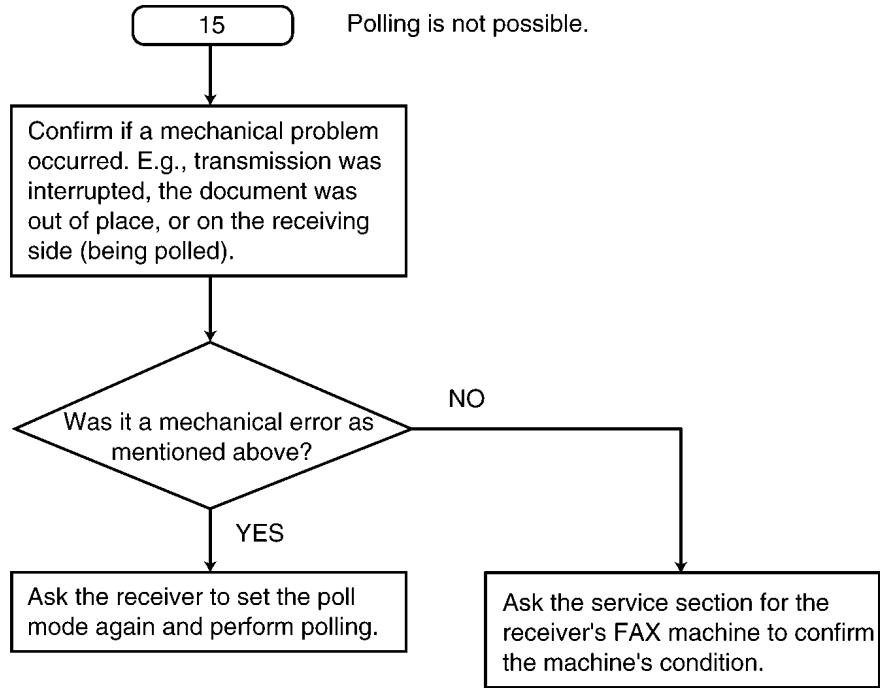
Confirm if the receiver's FAX machine was set to the receive mode.

6.1

**CROSS REFERENCE:**  
**TEST FUNCTIONS(P.50)**







**CROSS REFERENCE:**  
**TEST FUNCTIONS(P.50)**

### 7.7.5.2. 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 **REMOTE PROGRAMMING**(P.52).) 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).

<b>JOURNAL</b>									
20 Jan 2005 09:51AM									
YOUR LOGO :									
YOUR FAX NO:									
NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	*CODE		
01	3332222	21 Jan 02:14PM	00'45	SND	01	OK			
02	9998765	21 Jan 03:17PM	00'58	SND	02	OK			
03	John	21 Jan 05:18PM	00'48	RCV	01	OK			
04	55556677	21 Jan 10:35AM	02'45	RCV	03	COMMUNICATION ERROR	46		

<b>JOURNAL 2</b>					
20 Jan 2005 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	:	

<b>JOURNAL 3</b>					
20 Jan 2005 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**(P.89) and **Journal 3**(P.90).



### 7.7.5.2.1. Journal 2

Refer to JOURNAL 2 in **Printout Example**(P.90).

Journal 2 displays the additional detailed information about the last 30 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.90). 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	FRN RCV	Means the unit received a fax message by friendly signal detection.
4	VOX	Means the unit detected silence or no voice.
5	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
6	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
7	TURN-ON	Means the unit started to receive after 20 rings. (Remote Turn On: Service Code #573)
8	TIME OUT	Means the unit started to receive after Ring Time Out in the EXT-TAM or TEL/FAX mode.
9	IDENT	Means the unit detected Ring Detection.
10	CNG OGM	Means the unit detected the CNG while it was sending the Dummy Ring Back Tone in the TEL/FAX mode. OR Means the unit detected the CNG while it was sending the OGM in the ANS/FAX mode.
11	CNG ICM	Means the unit detected the CNG while it was recording the ICM in the ANS/FAX mode.

##### (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.90), 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.

### 7.7.5.2.2. Journal 3

Refer to JOURNAL 3 in **Printout Example** (P.90).

**Descriptions:**

**(6) ENCODE**

Compression Code: MH/MR

**(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

### 7.7.5.2.3. Printout Example

**JOURNAL2**

25 Mar 2005 01:59PM

NO.	RCU MODE	SPEED (CNT.)	RESOLUTION	RCU-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	RCU MODE	RCU-TRIG. (CNT.)
-----	------------	----------	------------------

## JOURNAL3

25 Mar 2005 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

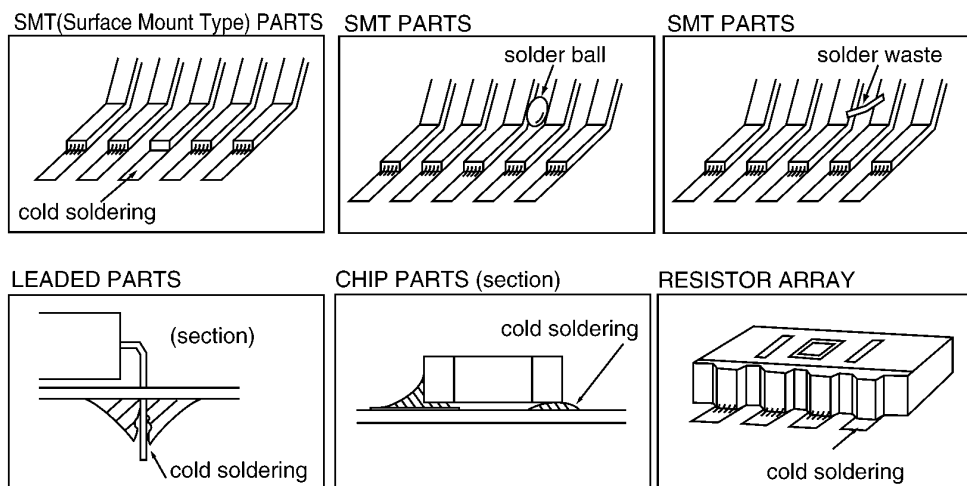
## 7.7.6. DIGITAL BOARD SECTION

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 FLASH 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.93).

The ASIC (IC10) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the FLASH ROM (IC16), 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.

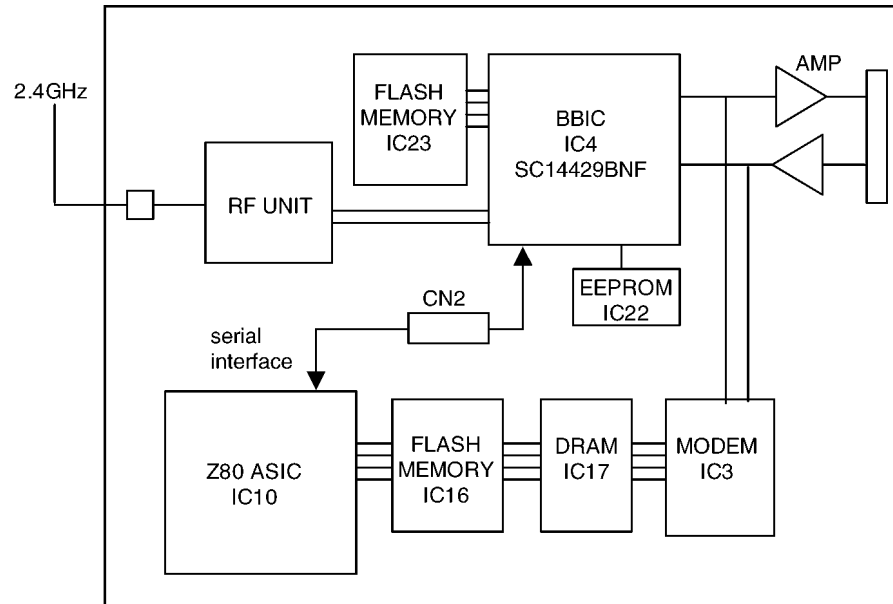
These signal lines are all controlled by voltages of 3.3V (H) or 0V (L).

### 7.7.6.1. Digital Block Diagram

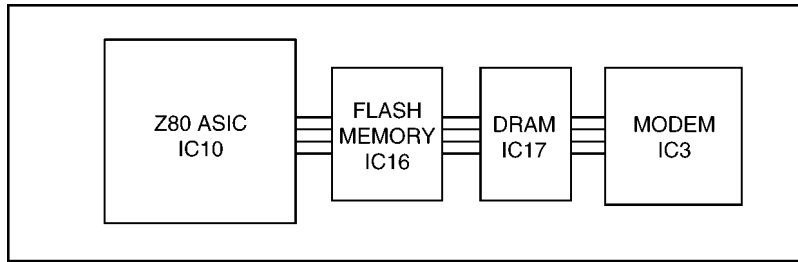
Digital board is including 2 systems. One is the BBIC system, BBIC controls CDL (FHSS) and all analog signals (Telephone, CID and TAM) excepting Fax communications. Another one is Z80 ASIC system for mechanical functions: Copy, Fax and UI (LCD/Key). And serial interface (UART) connects both systems.

Each system includes own Flash Memory for software program. Flash memory IC23 in the BBIC system is for both software and voice data of TAM functions (message REC/PLAY, voice prompt). EEPROM IC22 in the BBIC system is for software parameter for CDL, Telephone and TAM functions.

Flash memory IC16 in the ASIC system is for software and also for user memory (settings, Phone book, CID memory) DRAM IC17 in the ASIC system is for work memory and also for fax memory.

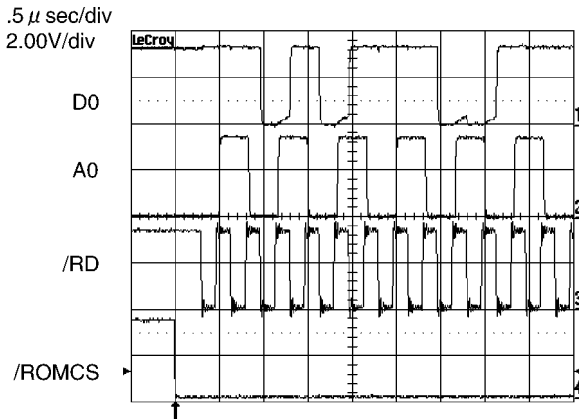


**Z80 ASIC SYSTEM**



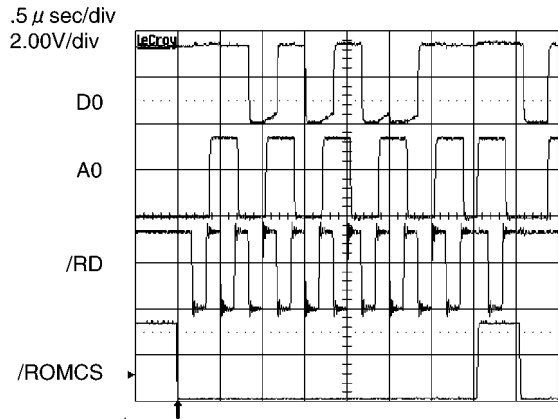
After /RESET is released CPU starts reading the DATA (software program) from Flash memory. CPU reads the data when /RD and /ROMCS are active (low). Waveform-1 shows such a situation.

work correctly  
Waveform of digital signals when boot starts



**Waveform-1 (CORRECT) <Flash memory ACCESS>**

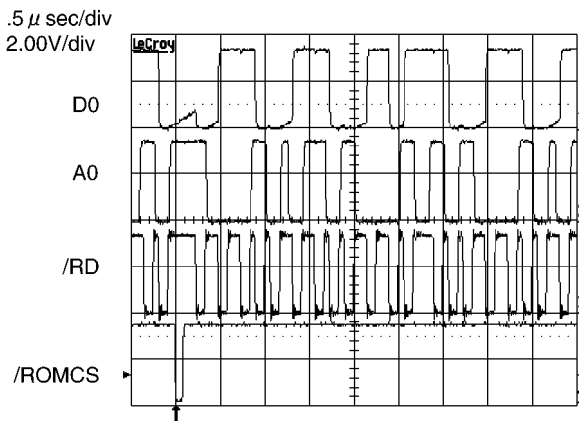
digital board doesn't start to work.  
This Waveform is observed with short circuit (ADR:A4-A5)



**Waveform-2 (WRONG) <Flash memory ACCESS>**

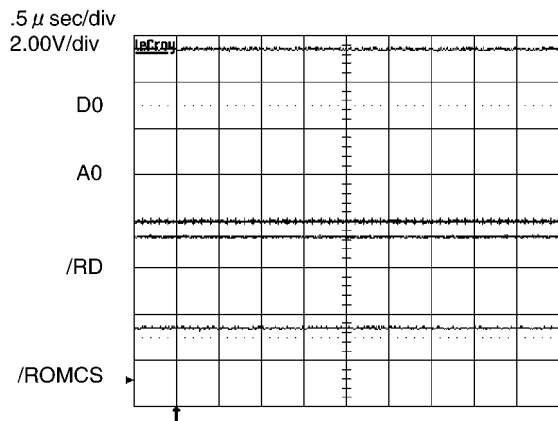
Please compare waveform-1 "correct → work" and waveform-2 "wrong → doesn't work"  
In case of waveform-2, Software isn't executed correctly by short-circuit, so that Waveform is different from waveform-1.

work correctly  
Waveform of digital signals when boot starts



**Waveform-3 (CORRECT) <DRAM ACCESS>**

digital board doesn't start to work.  
This Waveform is observed with short circuit (ADR:A4-A5)

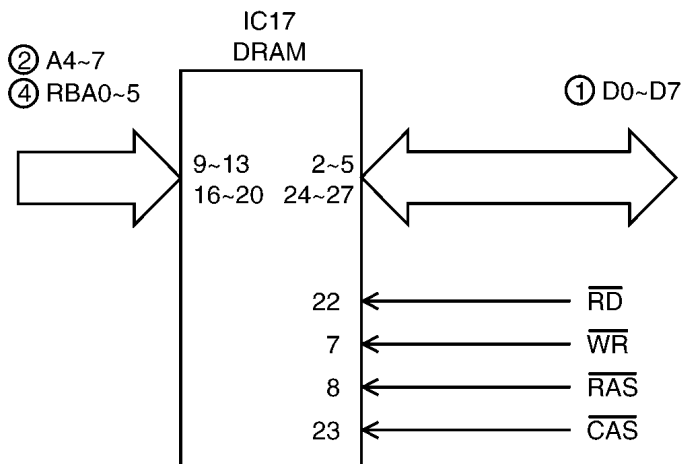
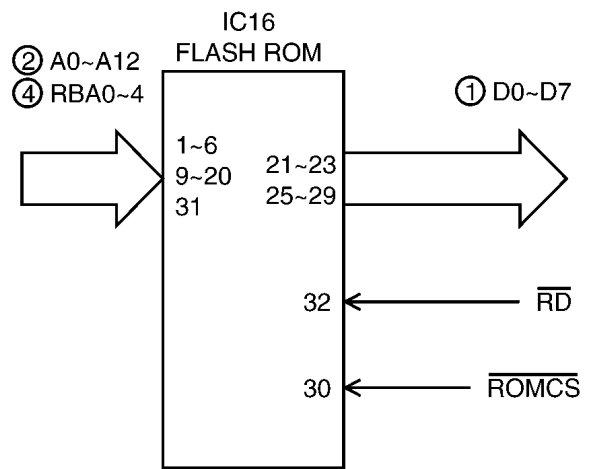
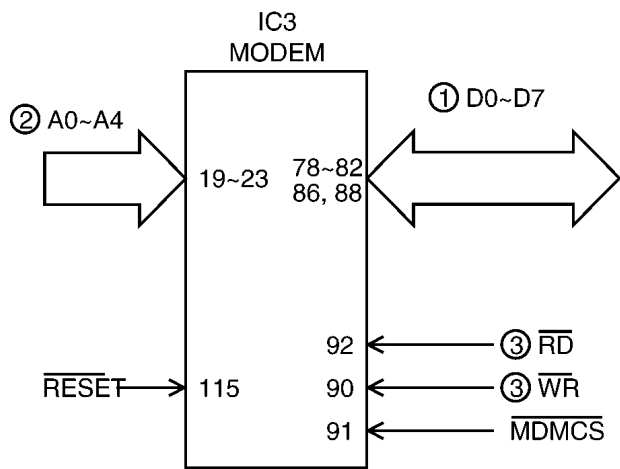
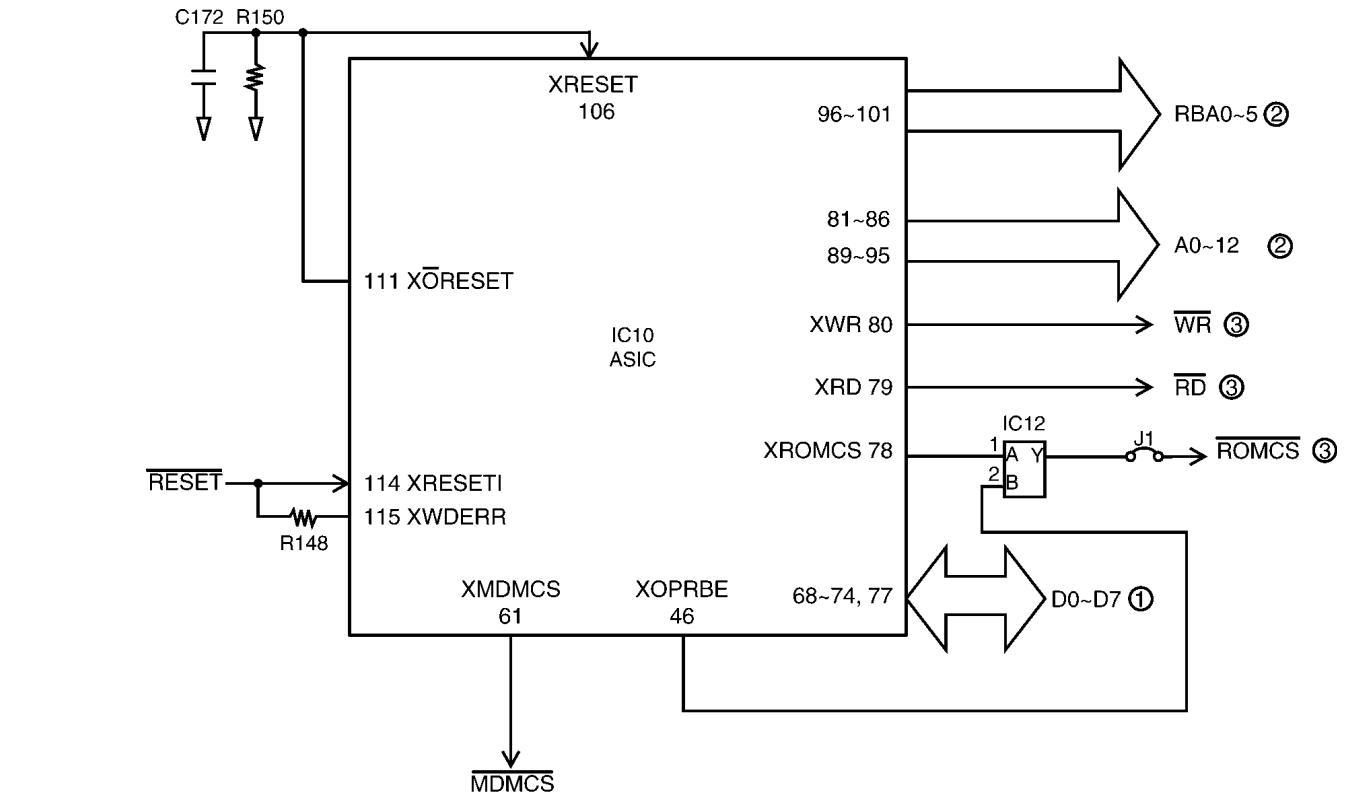


**Waveform-4 (WRONG) <DRAM ACCESS>**

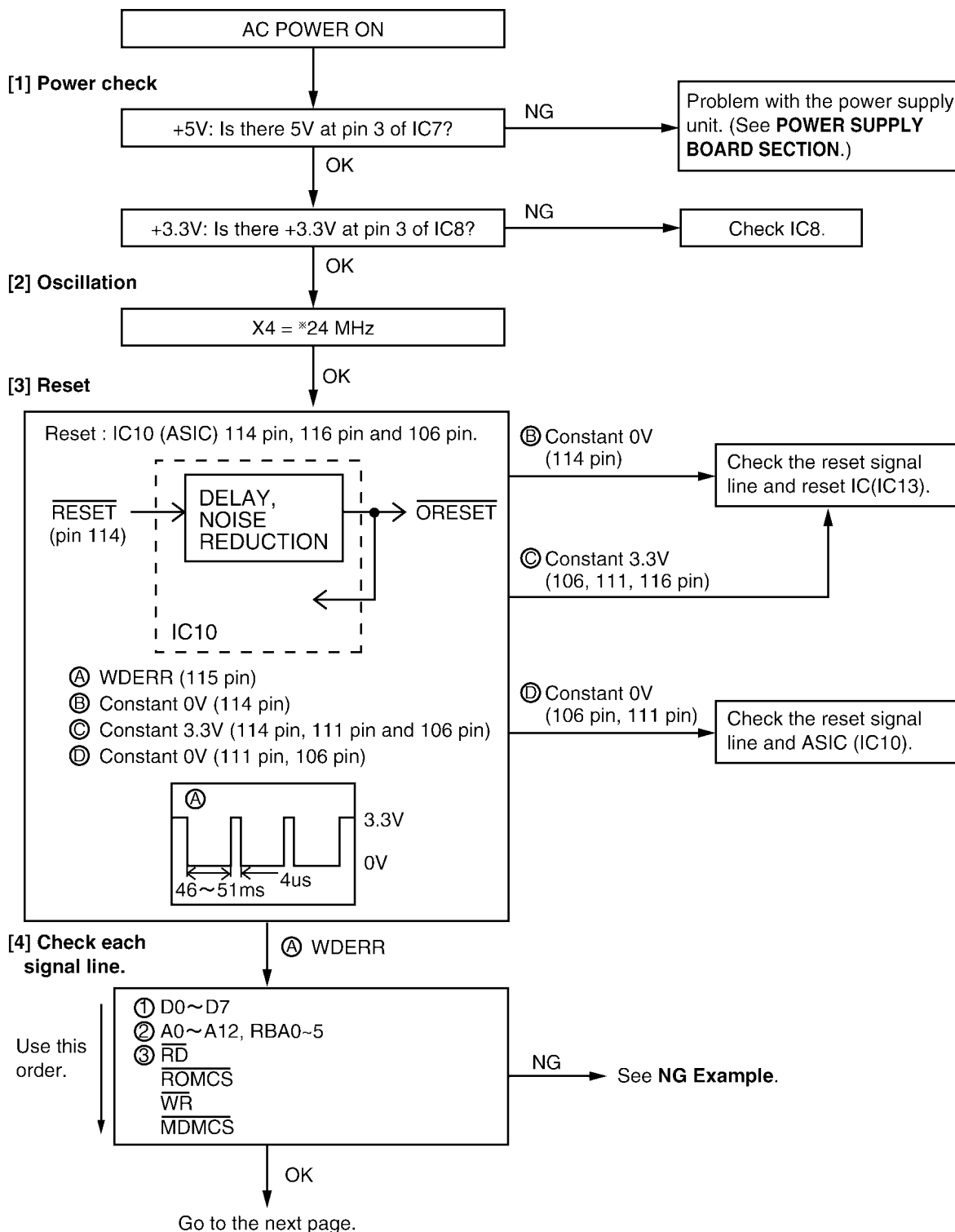
In case of waveform-4, DRAM isn't accessed because Software of DRAM access procedure isn't executed correctly by short-circuit.

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

#### I/O and Pin No. Diagram



After the power is turned on, the ASIC initializes and checks each IC.  
 The ROM, DRAM, 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.

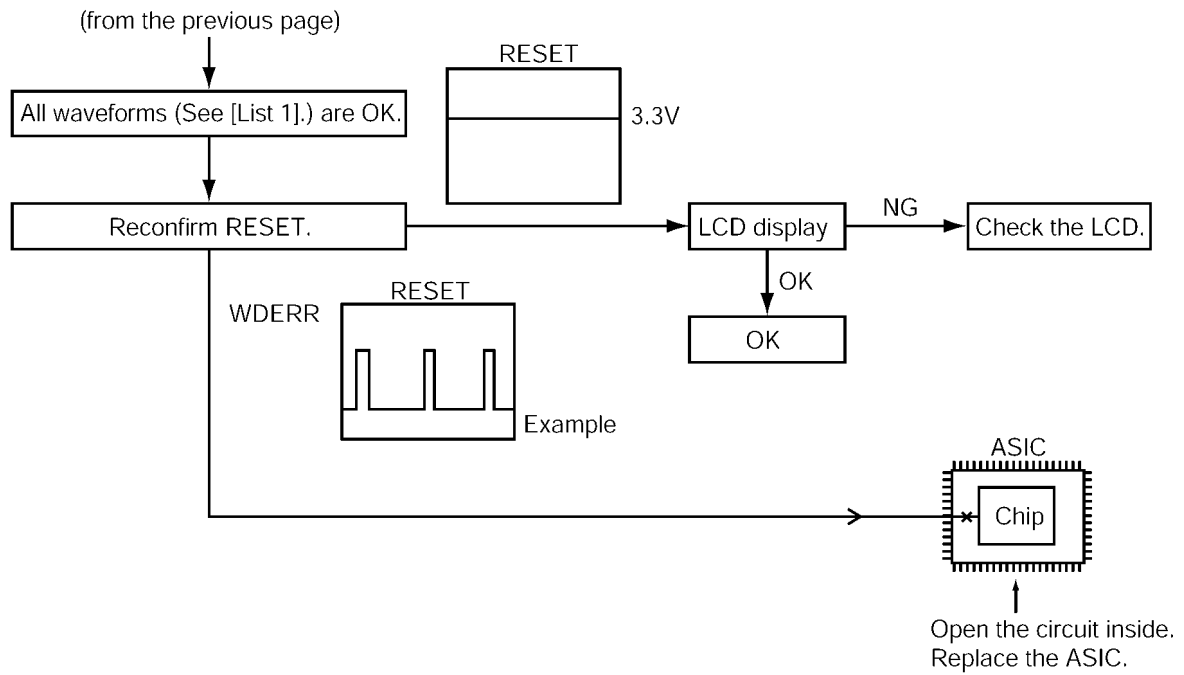


**CROSS REFERENCE:**

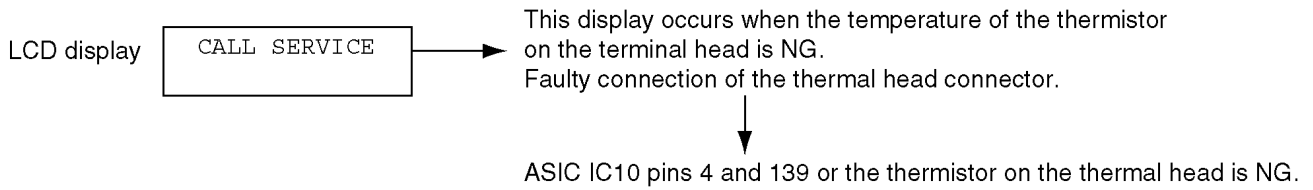
**NG Example(P.98)**

**POWER SUPPLY BOARD SECTION(P.101)**

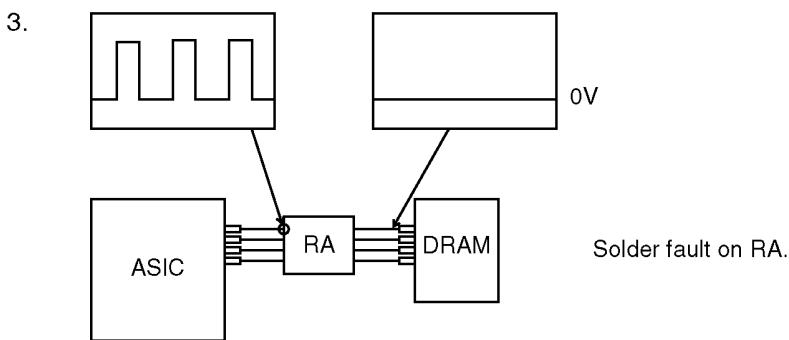
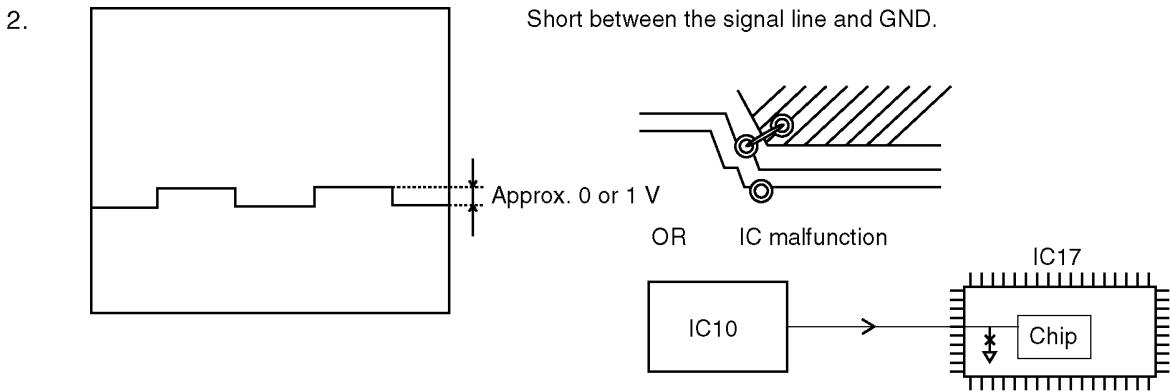
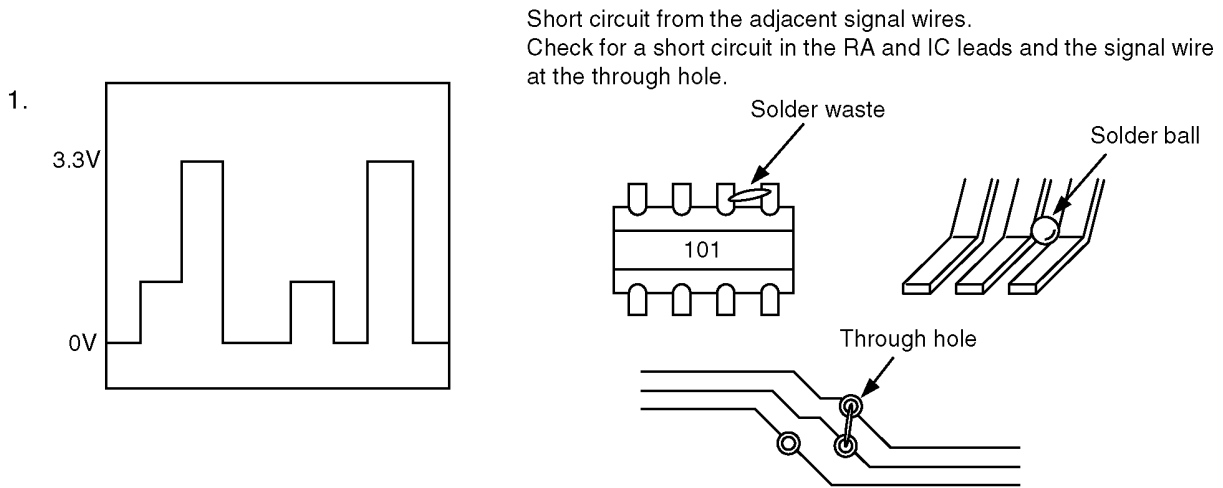




**Other NG example while the power is ON and the LCD displays the following.**



### 7.7.6.3. NG Example



## 7.7.7. 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 SP-PHONE, trace that signal route locally with the following Check Sheet and locate the faulty point.

### 7.7.7.1. Check Sheet for Signal Route

(SYMPTOM) ITEMS TO CHECK	IN → signal → ROUTE → OUT
MONITOR RX (TELLINE to SP)	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → CN507(7) → {CN19(7) → R230 → C98 → R75 → IC4(102) → IC4(110) → C11 → R11 → IC2(4-5) → CN1}
HANDSET TX	HANDSET → CN502(1,4) → L516,L519 → CN504(1,3) → {CN19(1,3) → L8,L11 → R336,R337 → C279,C278 → R302,R303 → IC4(114,118) → IC4(100) → CN19(8)} → CN504(8) → C522 → R535 → IC501(6-7) → C533 → R543 → R542 → T501 → C505 → RLY500 → TELLINE
HANDSET RX	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → CN507(7) → {CN19(7) → R230 → C98 → R75 → IC4(102) → IC4(110,111) → R299,R300 → L9,L10 → CN19(2,4)} → CN504(2,4) → L517,L518 → CN502(2,3) → HANDSET
FAX TX	{IC3(56) → C247 → R262 → CN19(9)} → CN504(9) → C521 → R534 → IC501(6-7) → C533 → R543 → R542 → T501 → C505 → RLY500 → TELLINE
FAX RX	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → CN507(7) → {CN19(7) → C18 → R17 → R22 → C20 → IC3(47)}
DTMF to SPEAKER	{IC4(110) → C11 → R11 → IC2(4-5) → CN1}
DTMF to HANDSET	{IC4(110,111) → R299,R300 → L9,L10 → CN19(2,4)} → CN504(2,4) → L517,L518 → CN502(2,3) → HANDSET
DTMF, TAM OGM, BEEP to TELLINE	{IC4(100) → CN19(8)} → CN504(8) → C522 → R535 → IC501(6-7) → C533 → R543 → R542 → T501 → C505 → RLY500 → TELLINE
OGM RECORDING	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → CN507(7) → {CN19(7) → R230 → C98 → R75 → IC4(102)}
CORDLESS HANDSET TX	on the AIR 2.4GHz radio frequency → {ANTENA → RF → IC4(digital signal) → IC4(100) → CN19(8)} → CN504(8) → C522 → R535 → IC501(6-7) → C533 → R543 → R542 → T501 → C505 → RLY500 → TELLINE
CORDLESS HANDSET RX	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → CN507(7) → {CN19(7) → R230 → C98 → R75 → IC4(102) → RF → ANTENA} → on the AIR 2.4GHz radio frequency
CALLER ID	TELLINE(JACK:CN501) → RLY500 → T501 → R539 → C517 → R531 → IC500(2-1) → R526 → C564 → C511 → R523 → IC500(6-7) → CN504(6) → {CN19(6) → R274 → C292 → R63 → IC4(101)}

**Note:**

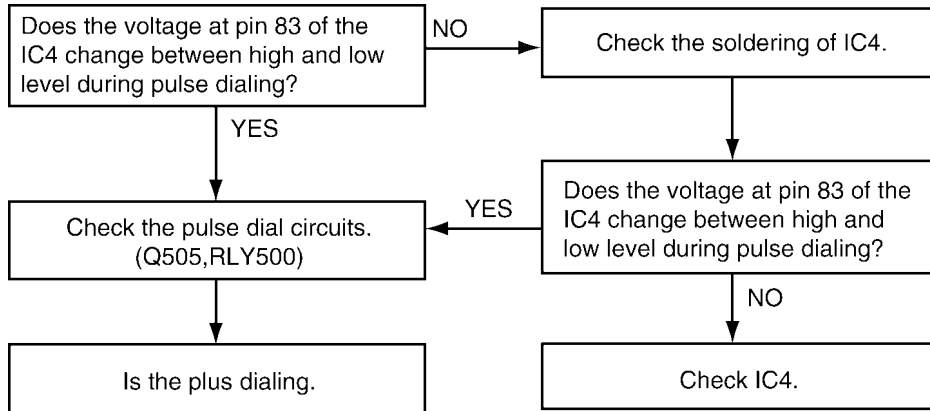
{ }: Inside the digital board

### 7.7.7.2. Defective fax NCU section

#### 1. No Speakerphone and no monitor reception

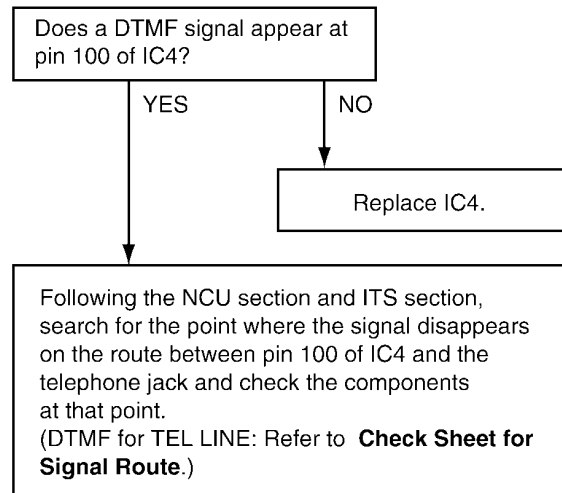
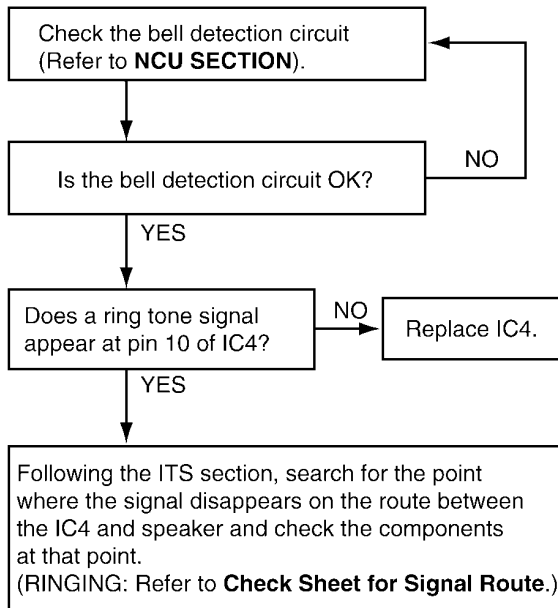
Perform a signal test in the **FAX NCU section** and locate a defective point (where the signal disappears) on each route between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. **Check Sheet for Signal Route(P.99)** is useful for this investigation.

#### 2. No pulse dialing



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

#### 4. No tone dialing



#### CROSS REFERENCE:

**Check Sheet for Signal Route(P.99)**  
**NCU SECTION(P.160)**

#### CROSS REFERENCE:

**Check Sheet for Signal Route(P.99)**

## 7.7.8. POWER SUPPLY BOARD SECTION

### 7.7.8.1. Key components for troubleshooting

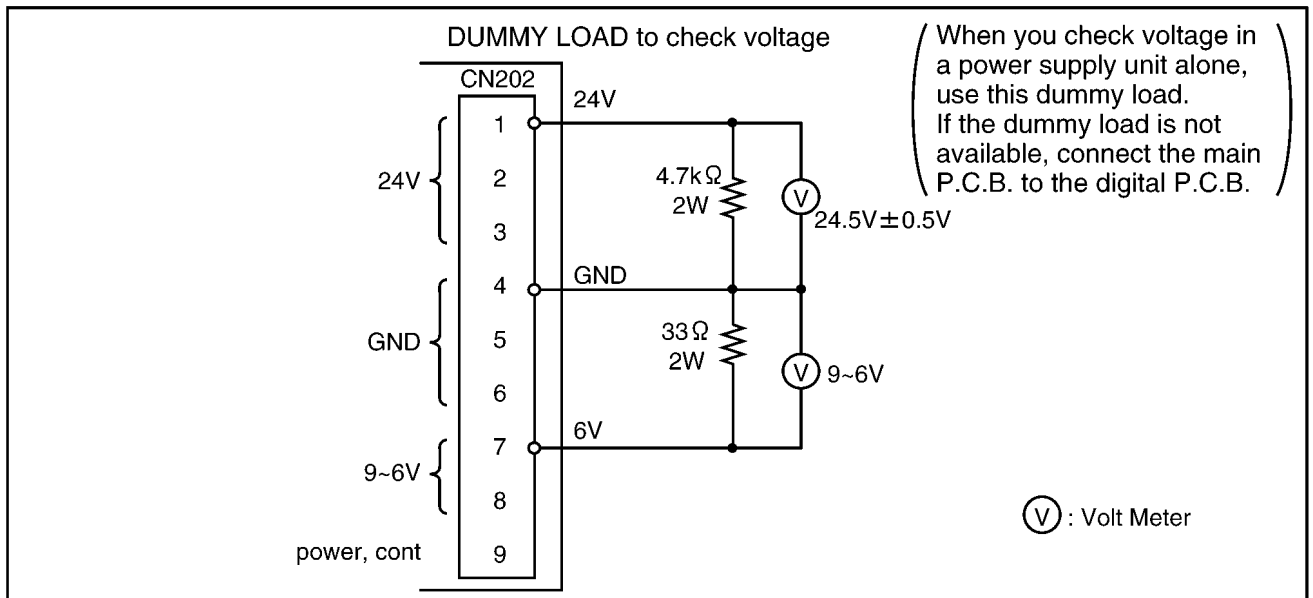
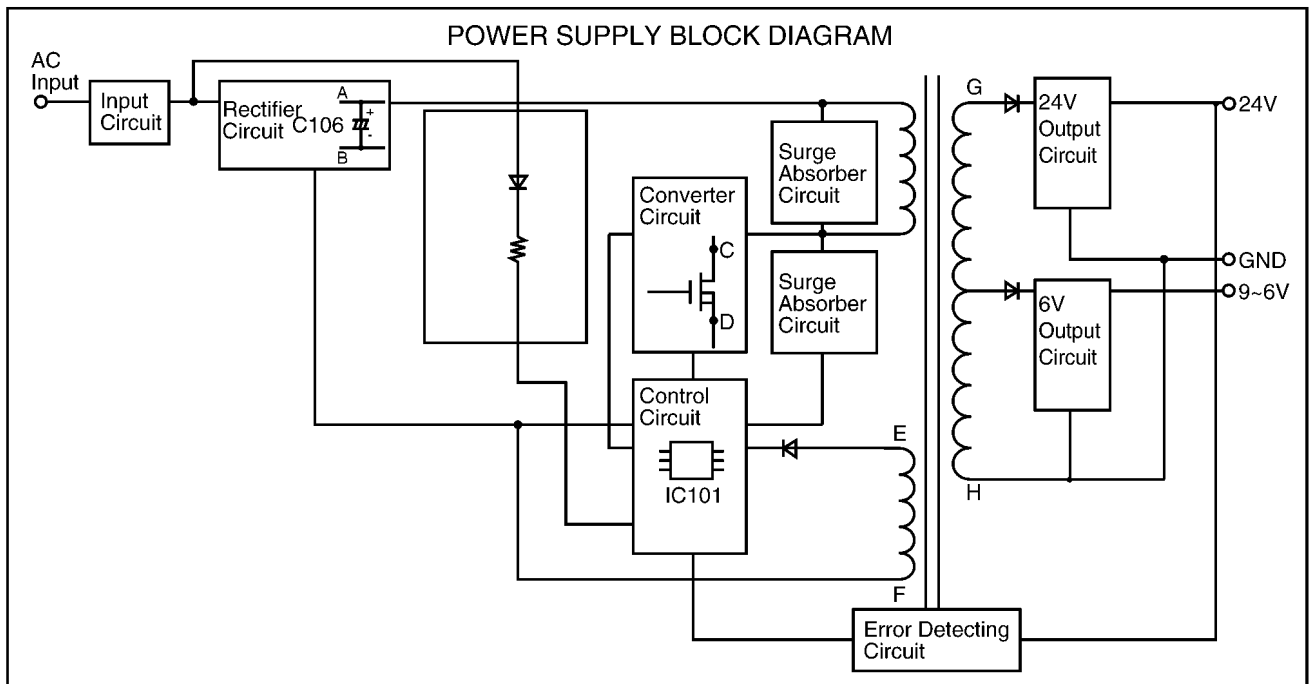
Check the following parts first: F101, D101-D104, C106, Q101 and IC101.

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.

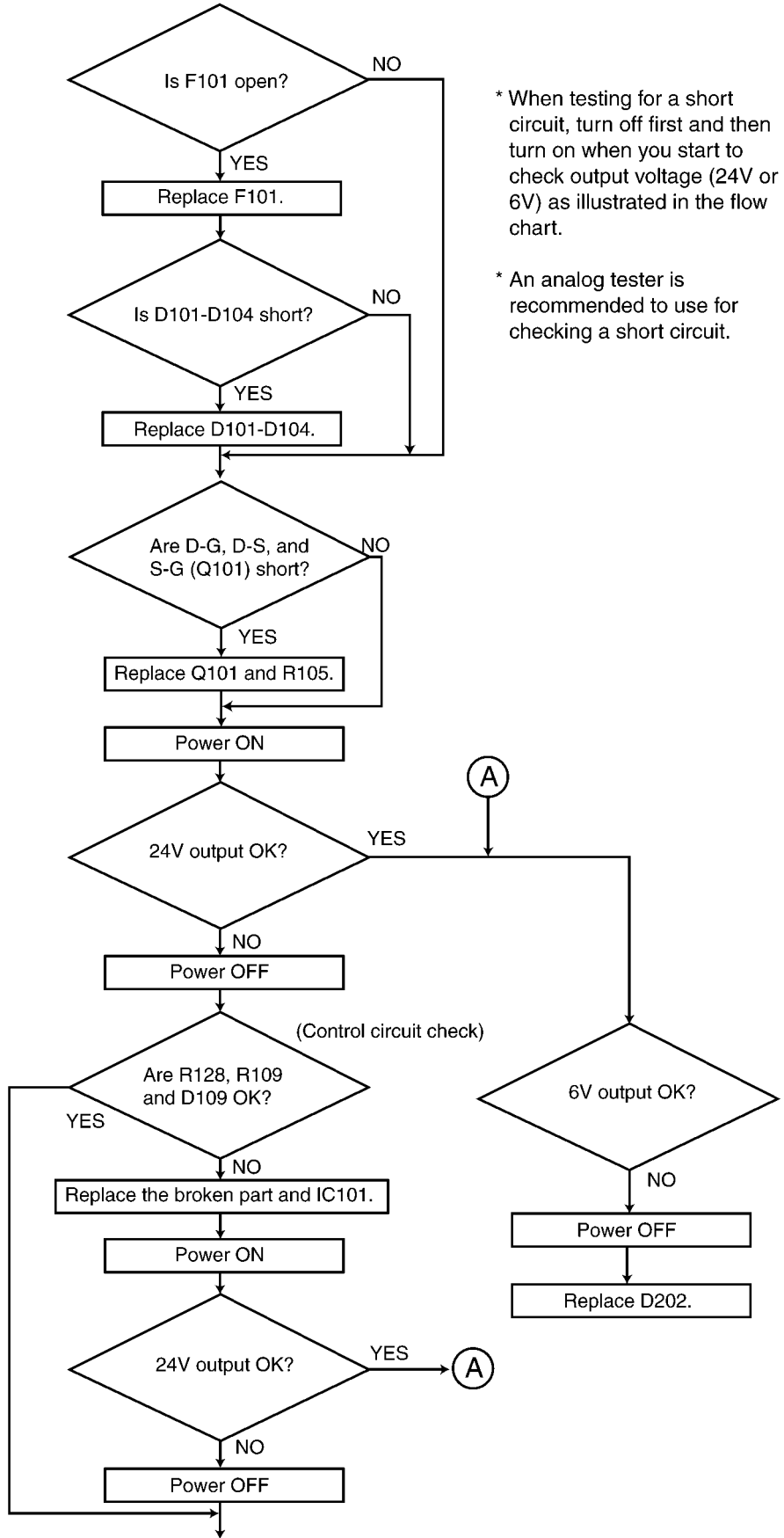
**Caution:**

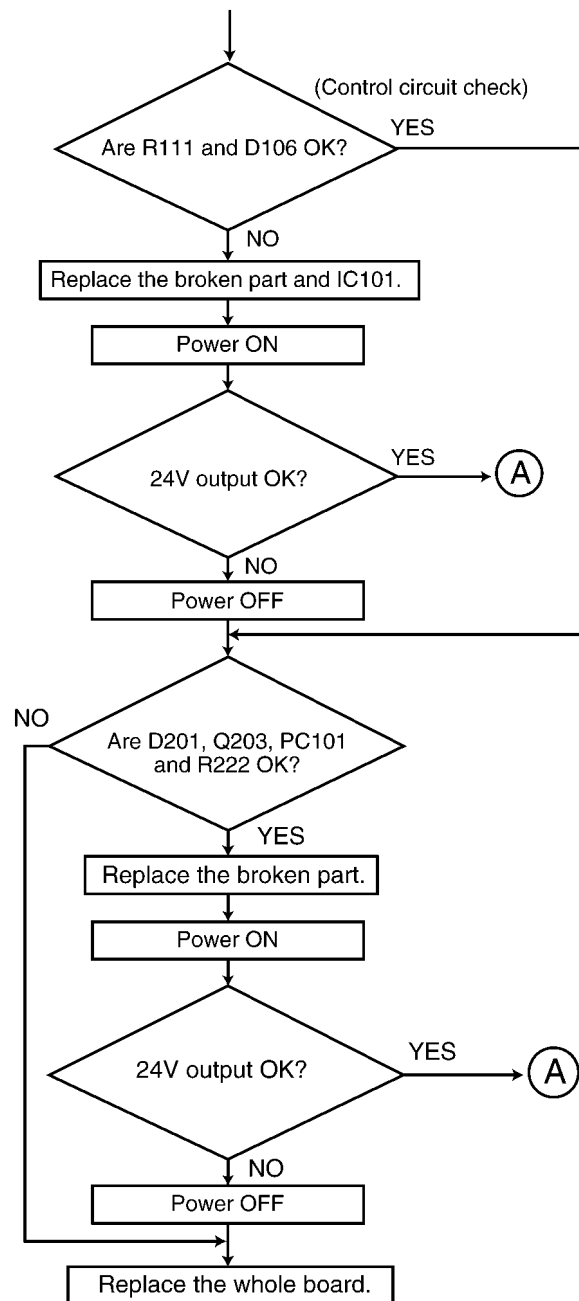
If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

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.



### 7.7.8.2. Troubleshooting Flow Chart





### 7.7.8.3. Broken Parts Repair Details

(D101, D102, D103, D104)

Check for a short-circuit in terminal 4. If D101, D102, D103 and D104 are short-circuits, F101 will melt (open). In this case, replace all of the parts (D101, D102, D103, 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 R128, R109, D109 and IC101. You should change all of the parts listed as follows.

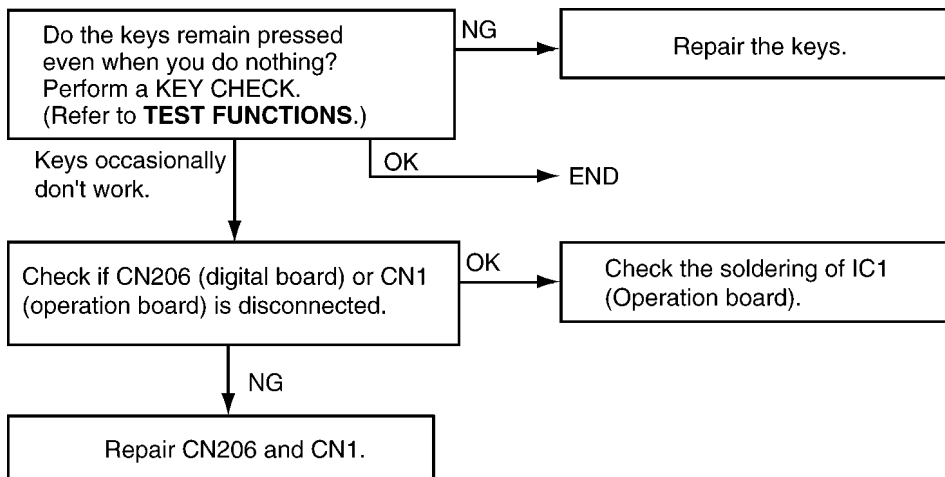
F101, Q101, R128, R109, D109, IC101

(D201)

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

## 7.7.9. OPERATION PANEL SECTION

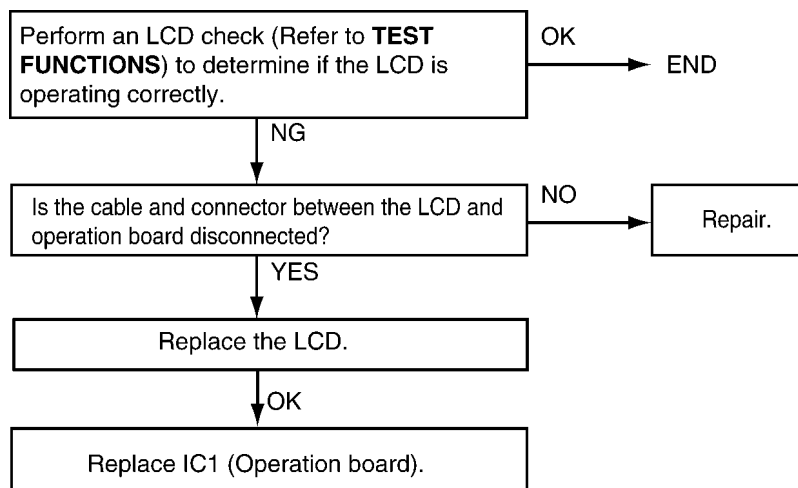
### 7.7.9.1. No Key Operation



**CROSS REFERENCE:**

TEST FUNCTIONS(P.50)

### 7.7.9.2. No LCD Indication



**CROSS REFERENCE:**

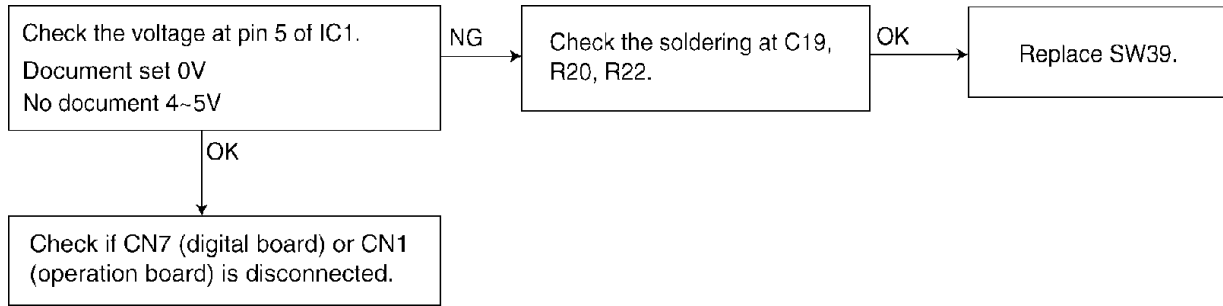
TEST FUNCTIONS(P.50)



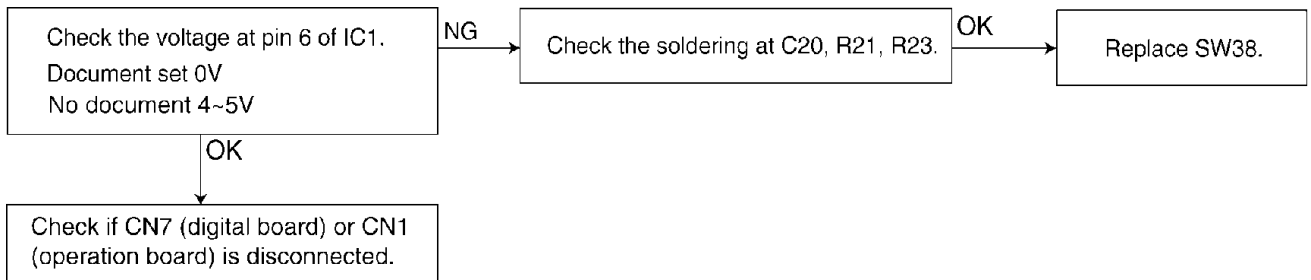
### 7.7.10. SENSOR SECTION

Refer to **SENSORS AND SWITCHES** for the circuit descriptions.

#### 7.7.10.1. CHECK THE DOCUMENT SENSOR (SW39)....."CHECK DOCUMENT"

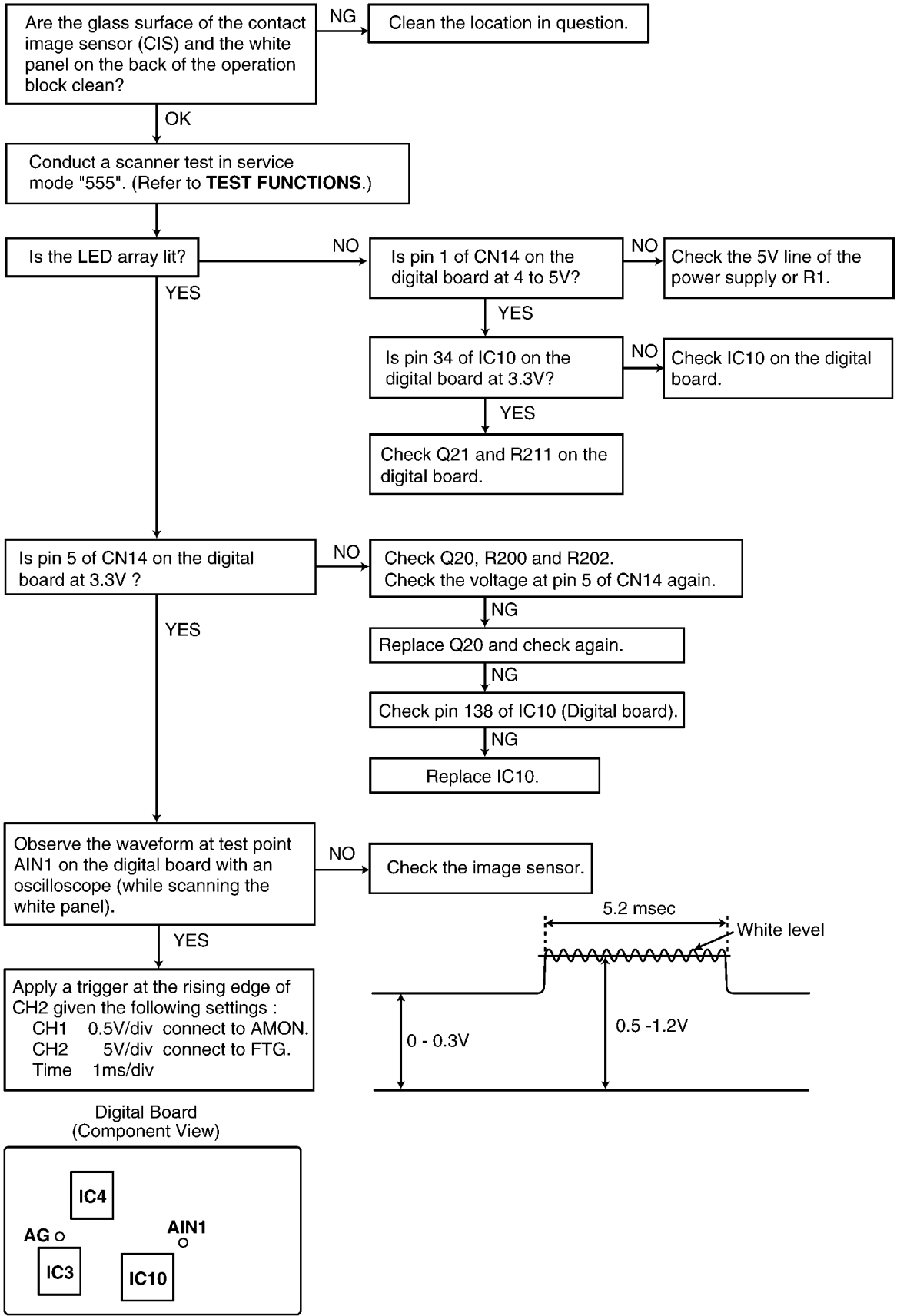


#### 7.7.10.2. CHECK THE READ POSITION (SW38)....."REMOVE DOCUMENT"



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

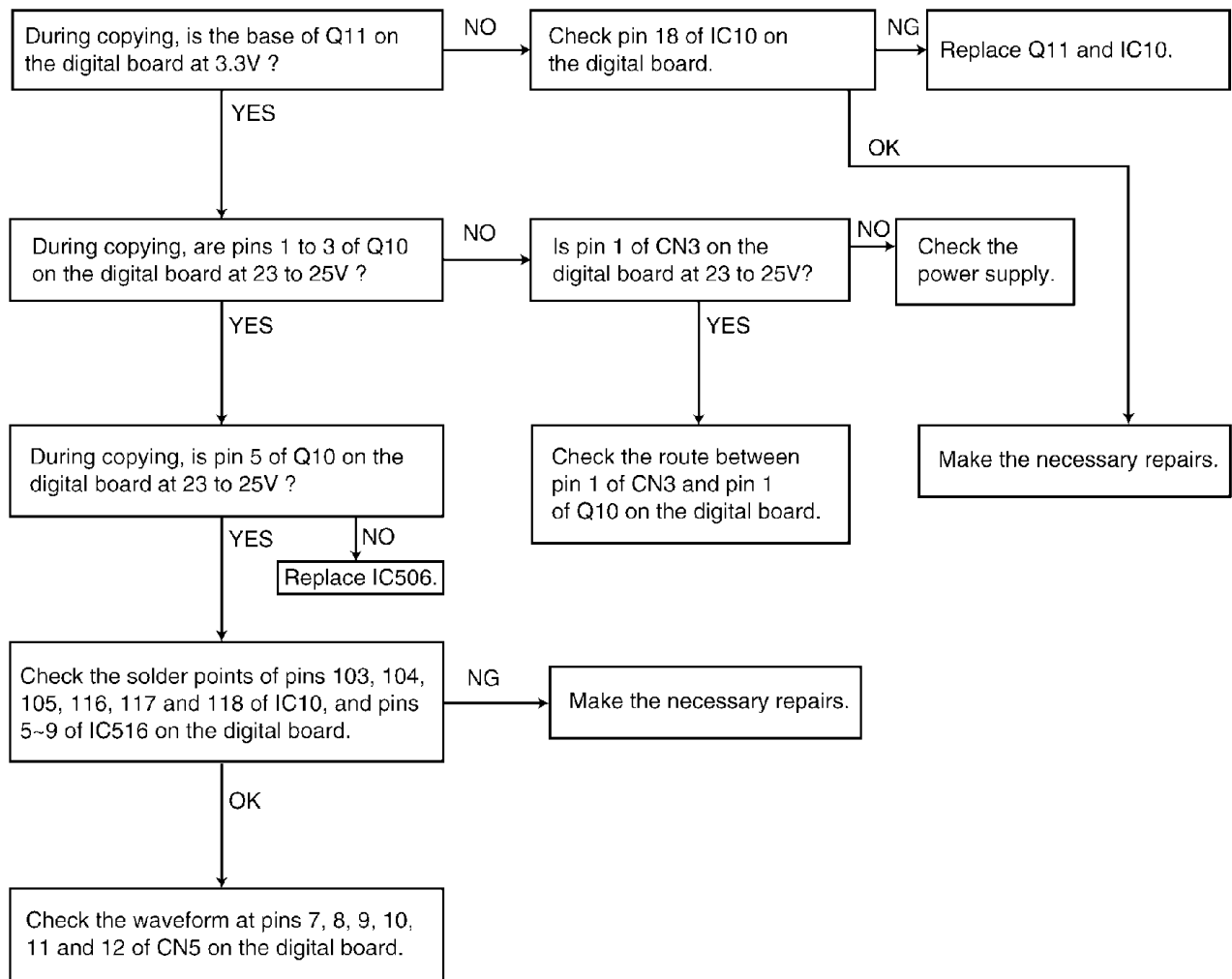
Refer to **SCANNING BLOCK**(P.140).



**CROSS REFERENCE:**  
**TEST FUNCTIONS**(P.50)

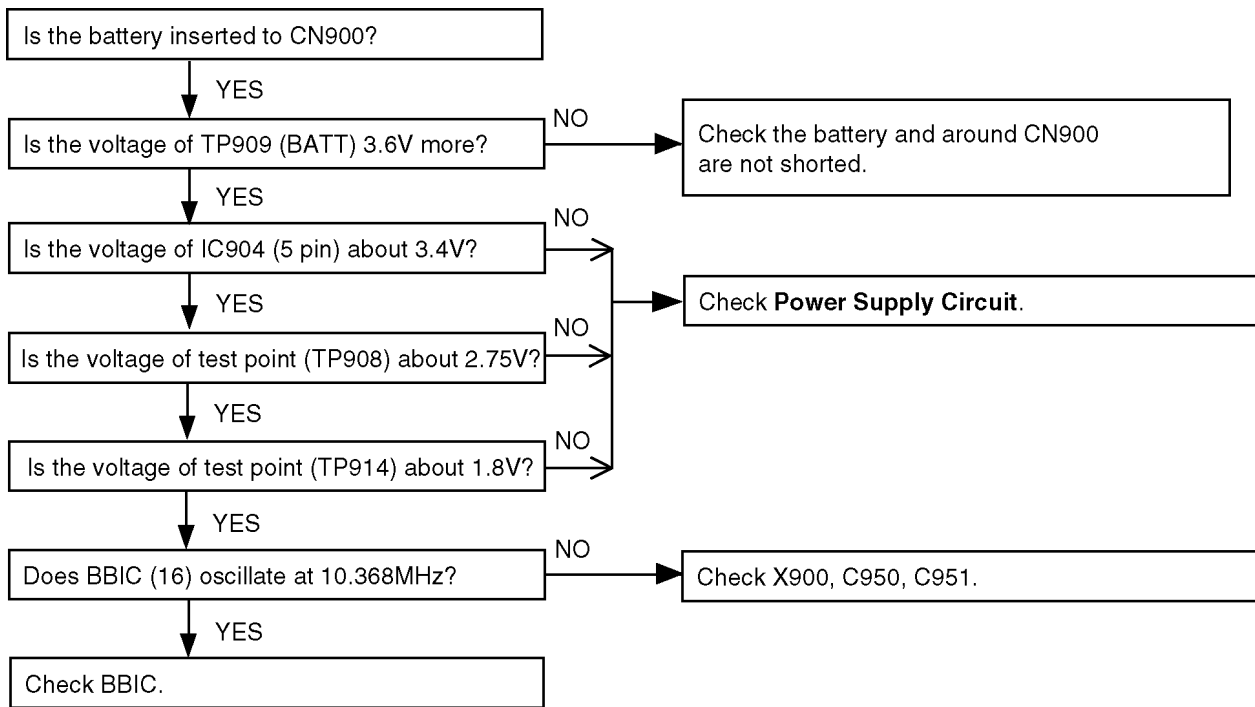
### 7.7.12. THERMAL HEAD SECTION

Refer to **THERMAL HEAD**(P.138).



### 7.7.13. Cordless Section

#### 7.7.13.1. Check Power of Cordless Handset

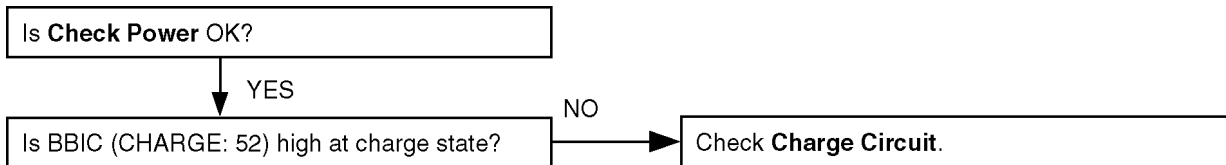


**Note:**

BBIC is IC1.

#### 7.7.13.2. Check Battery Charge

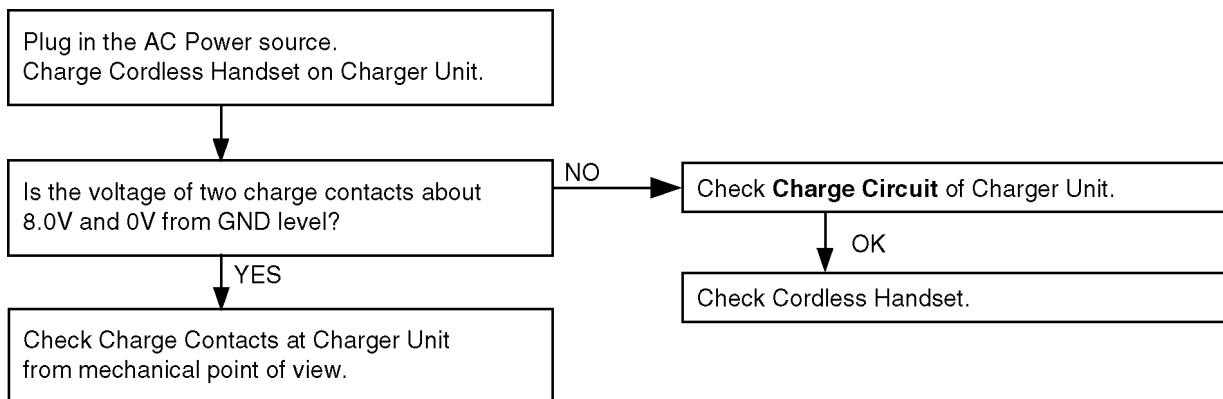
##### 7.7.13.2.1. Cordless Handset



**Note:**

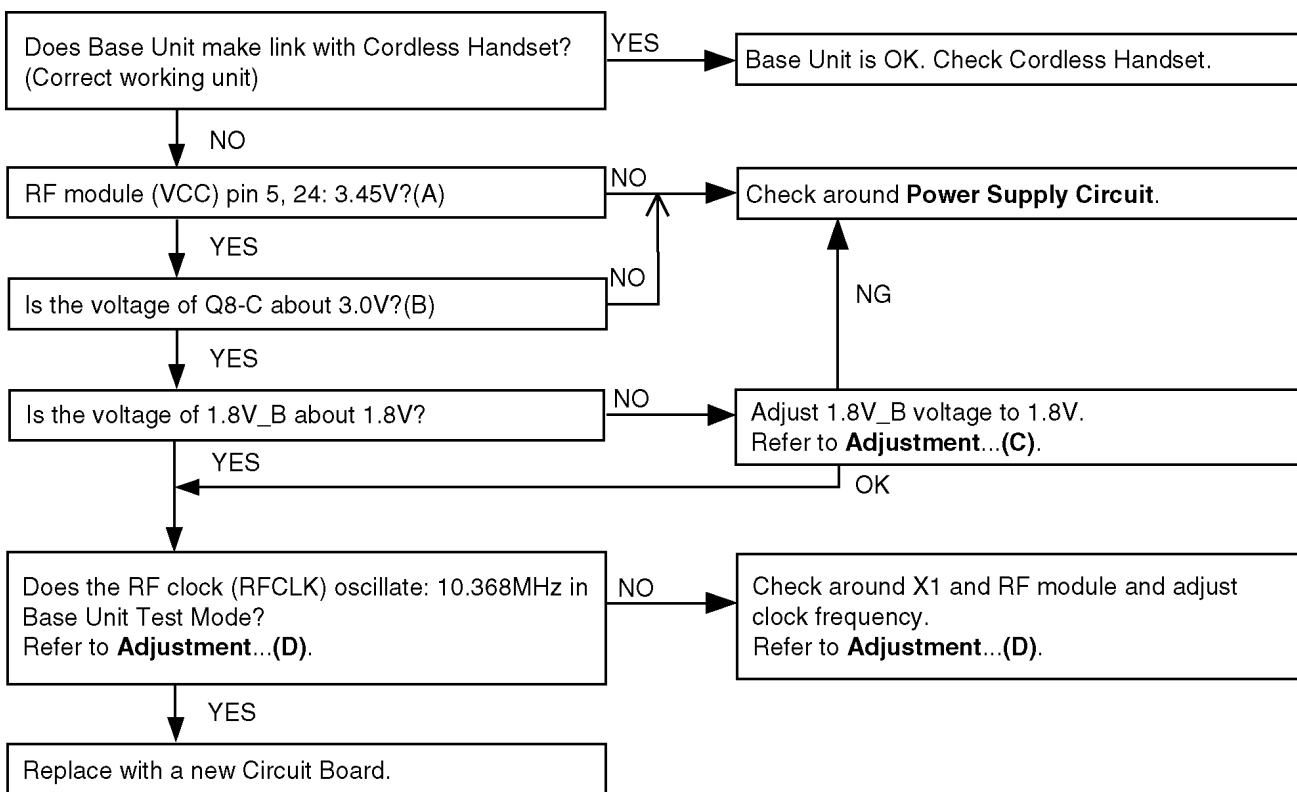
BBIC is IC1.

##### 7.7.13.2.2. Charger Unit

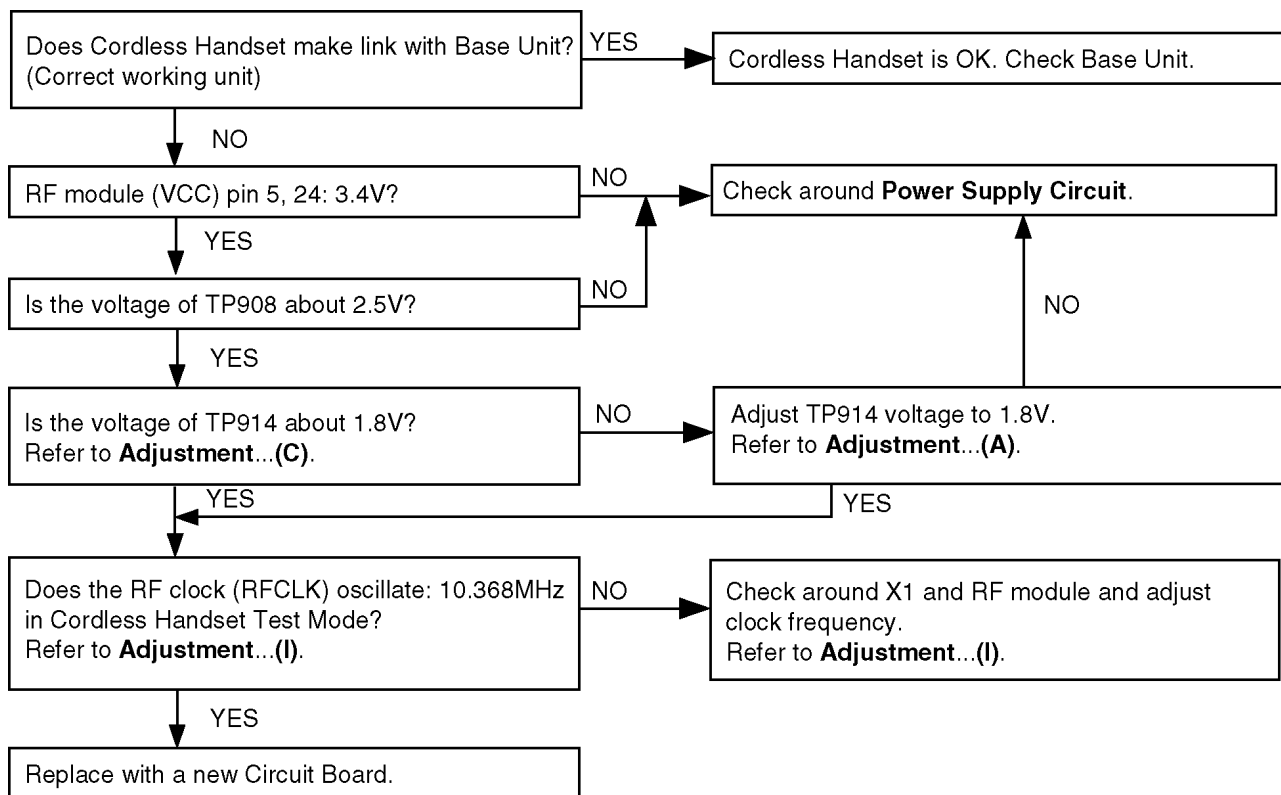


### 7.7.13.3. Check Link

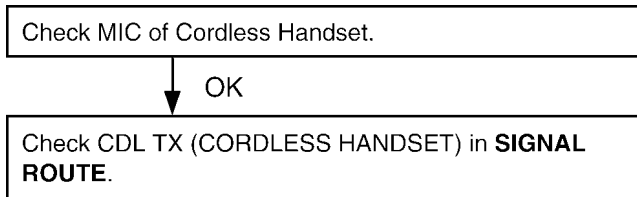
#### 7.7.13.3.1. Base Unit (Analog Board)



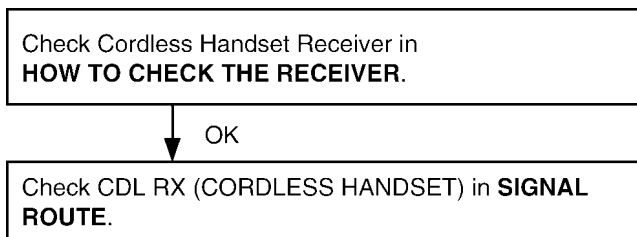
#### 7.7.13.3.2. Cordless Handset



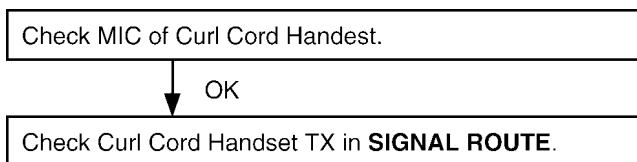
#### 7.7.13.4. Check Cordless Handset Transmission



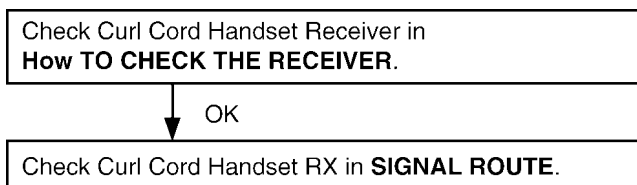
#### 7.7.13.5. Check Cordless Handset Reception



#### 7.7.13.6. Check Curl Cord Handset Transmission



#### 7.7.13.7. Check Curl Cord Handset Reception

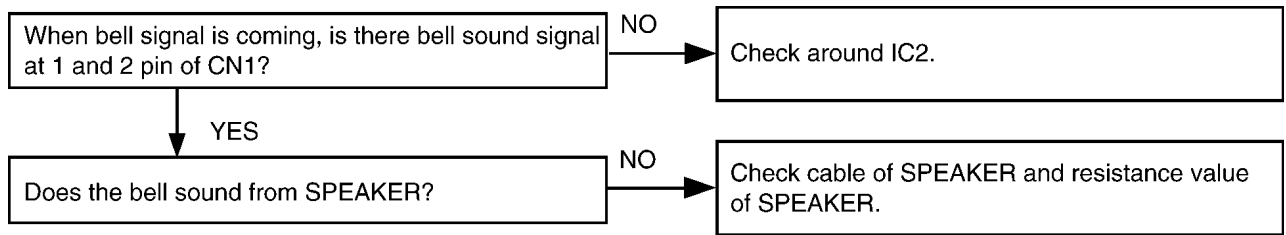


#### 7.7.13.8. Check Caller ID



## 7.7.13.9. Bell Reception

### 7.7.13.9.1. Cordless Handset



**Note:**

BBIC is IC900.

### 7.7.13.10. Check DTMF Dial

Check DTMF TONE TEL OUT in **SIGNAL ROUTE**.

## 7.8. DIGITAL BOARD (CORDLESS BASE SECTION) ADJUSTMENT

When you have replaced EEPROM or BBIC or X'tal, adjustment is necessary.

This supplement will explain further details for adjustment.

### 1. Items as follows are necessary for adjustment.

#### 1-1. PQZZ1CD505E\*

3 wire Cable: it connect Board and PC.

#### 1-2. PFZZFC533CN

Batch Files: it's executed on PC.

Please copy FC533 folder in PFZZFC533CN (CD-ROM) folder including Batch files to your PC.

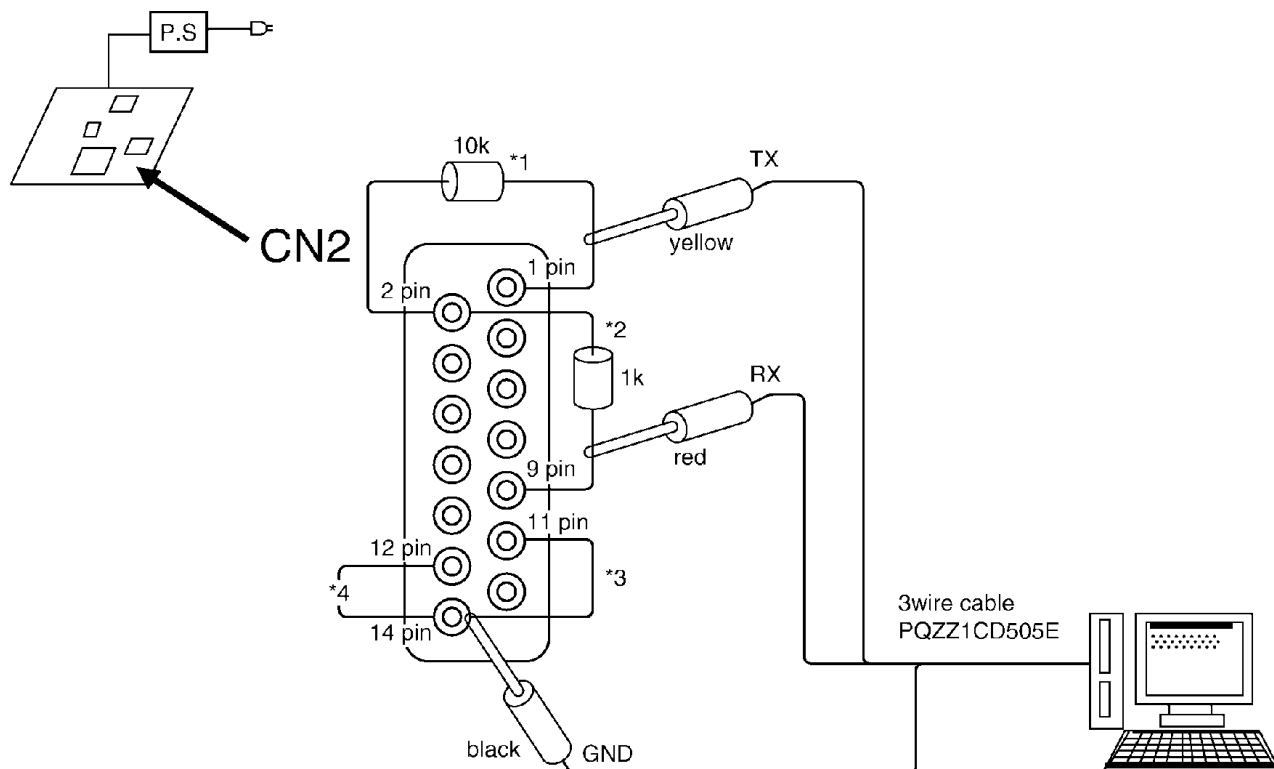
#### 1-3. PC

input a command for adjustment.

### 2. Settings of Board

at pins of CN2 on the back side of FC971\*\*, FC972\*\*, FC973\*\* digital board

Please connect the component and the cable as follows:



Refer to **Flow Solder Side View** (P.123).

**\*1: 10k resistor:** please put it between 1pin and 2pin and connect TX cable from PC. (ERDS2TJ103T or ERDS1TJ103T)

**\*2: 1k resistor:** please put it between 9pin and 2pin and connect RX cable from PC. (ERDS2TJ102T or ERDS1TJ102T)

**\*3: wire:** please put it between 11pin and 14pin (shorted) and connect GND cable from PC. (this makes a board 3 wire mode.)

**\*4: 2 wires:** please put it 12pin and 14pin. **please connect 2 wires after turning power on. (this makes reset)**

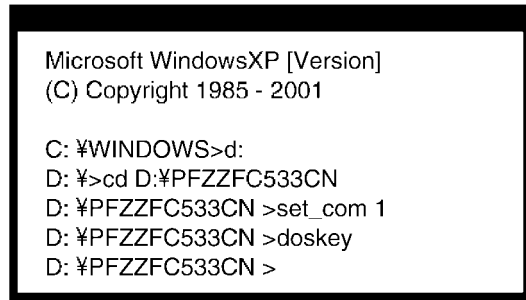


### 3. Batch Files settings:

Please copy FC533 folder in PFZZFC533CN (CD-ROM) folder including Batch files to your PC.

how to use it:

1. open COMAND PROMPT window
2. change directry to PFZZFC533CN refer to Figure-1.  
This is an example for there is a folder in D drive.
3. Type "set\_com 1" and push Enter key. (When com port 1 is used for the connection)
4. Type "doskey" and push Enter key.



<Figure-1>

Here is the screen that appears when batch file is copied into the D drive.

it is just ready to input a command for adjustment item.

### 4. Commands

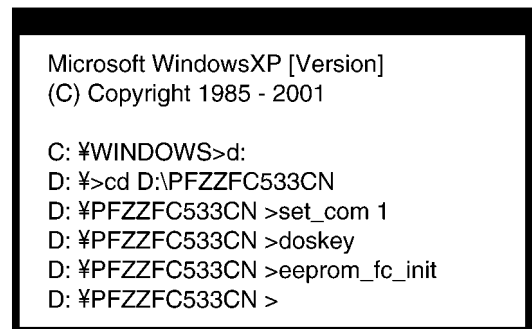
command	function and how to use
readid	read ID number of Base unit
writeid ** ** ** **	write ID number of Base unit **: ID number, example if ID number is 00010000ff00, input 00 01 00 00 ff 00
rdeeprom ** ** **	read EEPROM with address 1st, 2nd **: Address you want: example: if you want to read address 0010, input 00 10. 3rd ** data length: example: if you want to read 10 datas from address ** **, input 10.
wreeprom ** ** **	write EEPROM with address 1st, 2nd **: Address you want: example: if you want to write to address 0010, input 00 10. 3rd ** data length: example: if you want to write 2 datas from address ** **, input 2. 4th ** data example: if you want to write datas "01" from address ** **, input 01.
eprom_fc_init	initialize EEPROM: default vales are written to EEPROM
getver	get Version of BBIC software: you can check Version.
contx	output RF CLK continuously

### 5. How to adjust

#### 5-1. in case of EEPROM replacement

When you replace EEPROM, you need to adjust **Frequency** and **Voltage**. ID number has been already written to the EEPROM that you take from service center.

1. Initilize please input initializing command "eprom\_fc\_init"
2. Adjust **Frequency** and **Voltage**.  
--> Refer to "**6. Frequency and Voltage adjustment**"
3. Confirm ID of Base unit.  
Please check ID number with "readid" command.  
If ID is 00 00 00 00 00, please replace again.
4. Re-register CDL Handsets <-- Don't forget please.



Here is the screen that appears when batch file is copied into the D drive.

#### 5-2. in case of BBIC replacement

When you replace BBIC, you need to adjust **Frequency** and **Voltage**. --> Refer to "**6. Frequency and Voltage adjustment**"

#### 5-3. in case of X'tal (X5) replacement

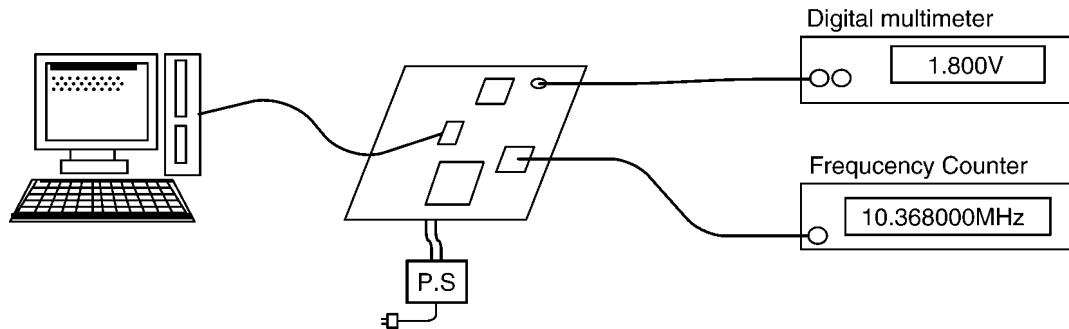
When you replace X'tal, you need to adjust **Frequency**. --> Refer to "**6. Frequency and Voltage adjustment**"

## 6. Frequency and Voltage adjustment

### 6-1. Settings and connectings

Please connect a Frequency counter to "RFCLK" point on the Digital Board located near the RF unit.

Please connect a Digital multimeter to "1.8V\_A" or "1.8V\_B" point on the Digital Board located near the BBIC.



### 6-2. Frequency adjustment

**adjustment value of frequency is at address "01 08" of EEPROM. (default value: 68)**

after typing "eeprom\_fc\_init", please type "conttx" to output RF CLK.  
(In order to be continuously output RF CLK, it is necessary to type "conttx".)

If Frequency displayed on the frequency counter is lower than 10.368000MHz, please increase the value at 01 08.

In order to do it,

Please write a value with "**wreeprom 01 08 01 \* \***" command.  
if you increase 1, input "wreeprom 01 08 01 69".

If frequency is higher, please write decreased value to.

Frequency should be

**10.367990MHz < frequency < 10.368010MHz**

```
Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001

C: ¥WINDOWS>d:
D: ¥>cd D:\PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >eeprom_fc_init
D: ¥PFZZFC533CN >conttx
D: ¥PFZZFC533CN >wreeprom 01 08 01 69
```

Here is the screen that appears when batch file is copied into the D drive.

### 6-3. Voltage adjustment

**adjustment value of voltage is at address 01 09 of EEPROM. (default value: 0F)**

If 1.8V\_voltage displayed on the Digital multimeter is higher than 1.85v, please decrease the value at 01 09.

Please write a value with "**wreeprom 01 09 01 \* \***" command.  
if you decrease 1, input "wreeprom 01 09 01 0E".

If voltage is lower, please write increased value to.

Voltage should be

**1.75V < Voltage < 1.85V**

```
Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001

D: ¥>cd D:\PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >eeprom_fc_init
D: ¥PFZZFC533CN >wreeprom 01 08 01 69
D: ¥PFZZFC533CN >wreeprom 01 09 01 0E
D: ¥PFZZFC533CN >
```

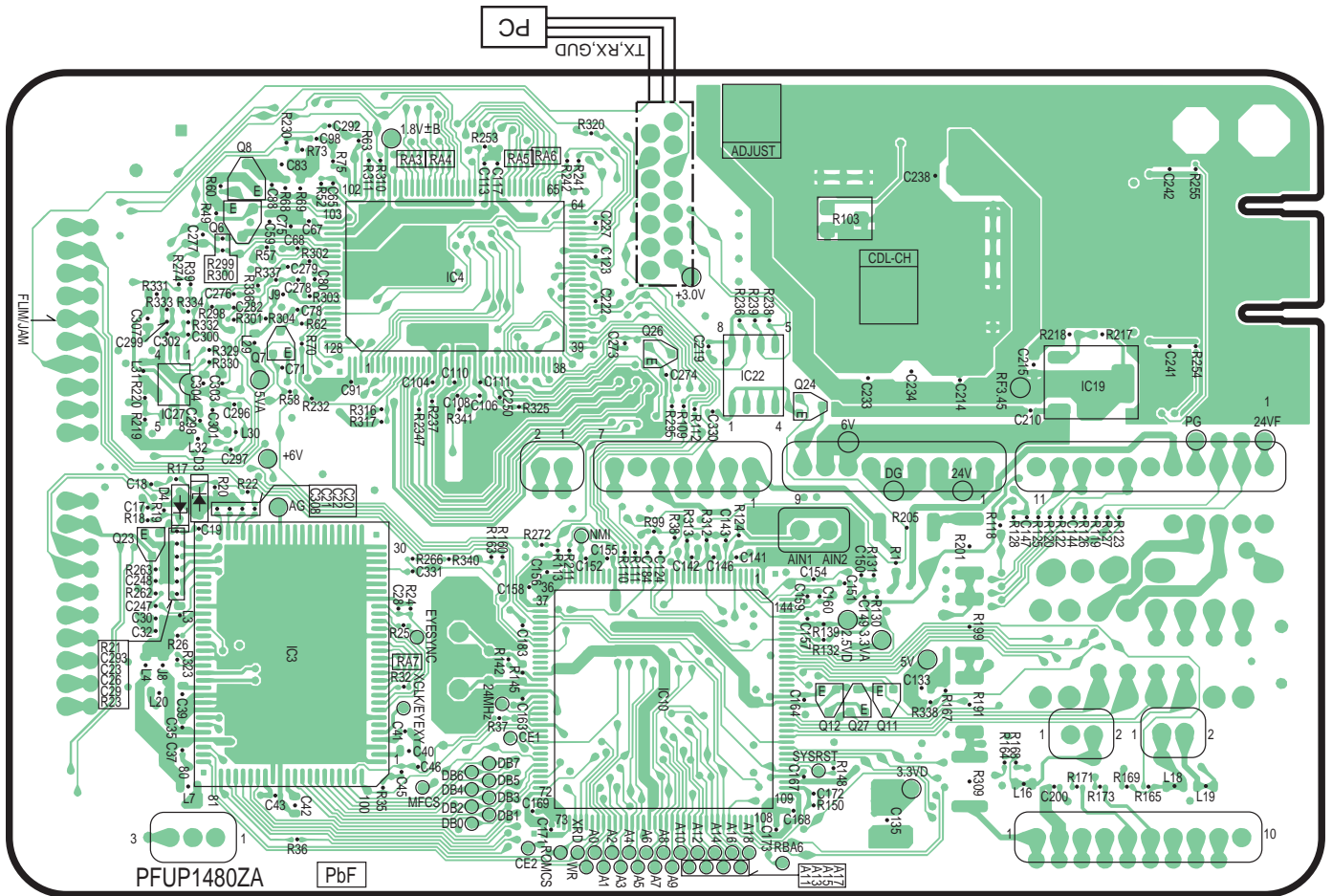
Here is the screen that appears when batch file is copied into the D drive.

#### Note:

**When you write new value to the EEPROM, it is necessary to turn the power off and then power on again. After power on again, Board works with new value you wrote.**



### 7.8.1.2. Flow Solder Side View



Refer to **DIGITAL BOARD (CORDLESS BASE SECTION) ADJUSTMENT (P.112)**

## 7.9. CORDLESS HANDSET ADJUSTMENT

When you have replaced EEPROM or BBIC or X'tal, adjustment is necessary.

This supplement will explain further details for adjustment.

### 1. Items as follows are necessary for adjustment.

#### 1-1. PQZZ1CD505E

3 wire Cable: it connect Board and PC.

#### 1-2. PFZZFC533CN

Batch Files: it's executed on PC.

#### 1-3. PC

input a command for adjustment.

#### 1-4. Frequency Counter

it's to adjust frequency (10.368000MHz) of BBIC.

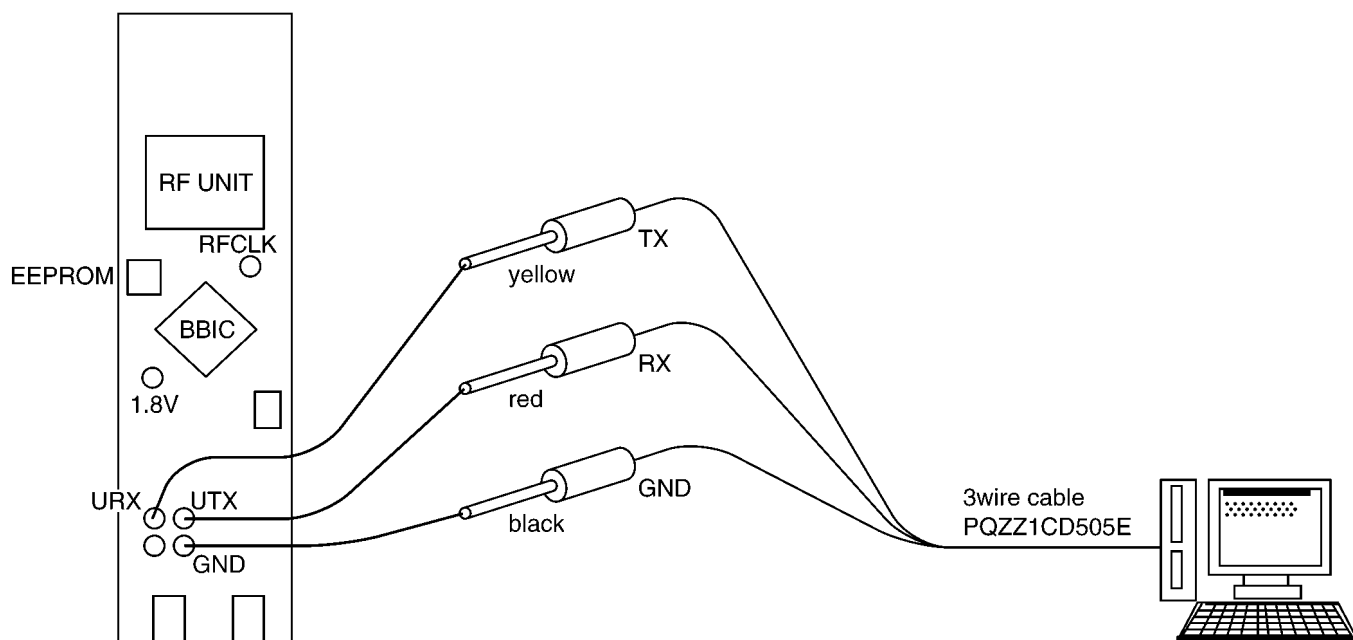
it requires an accuracy that can measure 1Hz. (precise;  $\pm 1\text{ppm}$ )

#### 1-5. Digital multimeter

it's to adjust voltage (1.8V) of BBIC.

### 2. Settings of Board and connecting

**CN2 (back side of FC972 cordless handset board):** Please connect the component and the cable as follows:



### 3. Batch Files settings:

Please copy FC533 folder in PFZZFC533CN (CD-ROM) folder including Batch files to your PC.

how to use it:

1. open COMAND PROMPT window
2. change directry to PFZZFC533CN refer to Figure-1.  
This is an example for there is a folder in D drive.
3. Type "set\_com 1" and push Enter key. (When com port 1 is used for the connection)
4. Type "doskey" and push Enter key.

it is just ready to input a command for adjustment item.

```
Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001
```

```
C: ¥WINDOWS>d:
D: ¥>cd D:¥PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >
```

<Figure-1>

Here is the screen that appears when batch file is copied into the D drive.

#### 4. Commands

command	function and how to use
readid	read ID number of Base unit
writeid ** * * * * *	write ID number of Base unit ** : ID number, example if ID number is 00010000ff00, input 00 01 00 00 ff 00
rdeeprom ** * * *	read EEPROM with address 1st, 2nd **: Address you want: example: if you want to read address 0010, input 00 10. 3rd ** data length: example: if you want to read 10 datas from address ** **, input 10.
wreeprom ** * * * * *	write EEPROM with address 1st, 2nd **: Address you want: example: if you want to write to address 0010, input 00 10. 3rd ** data length: example: if you want to write 2 datas from address ** **, input 2. 4th ** data example: if you want to write datas "01" from address ** **, input 01.
<b>eeeprom_fcphp_init</b>	initialize EEPROM: default vales are written to EEPROM
getver	get Version of BBIC software: you can check Version.
contx	output RF CLK continuously

#### 5. How to adjust

##### 5-1. in case of EEPROM replacement

When you replace EEPROM, you need to adjust **Frequency** and **Voltage**.  
ID number has been already written to the EEPROM that you take from service center.

1. Initilize please input initialzing command "**eeeprom\_fcphp\_init**"
2. Adjust **Frequency** and **Voltage**.  
--> Refer to "**6. Frequency and Voltage adjustment**"
3. Confirm ID of Base unit.  
Please check ID number with "readid" command.  
If ID is 00 00 00 00 00 00, please replace again.
4. Re-register CDL Handsets <-- Don't forget please.

```

Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001

C: ¥WINDOWS>d:
D: ¥>cd D:\PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >eeeprom_fcphp_init
D: ¥PFZZFC533CN >
    
```

##### 5-2. in case of BBIC replacement

When you replace BBIC, you need to adjust **Frequency** and **Voltage**. --> Refer to "**6. Frequency and Voltage adjustment**"

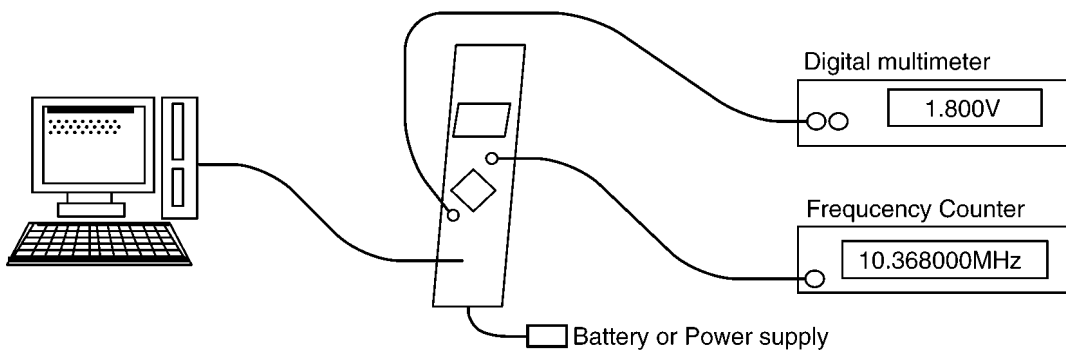
##### 5-3. in case of X'tal (X5) replacement

When you replace X'tal, you need to adjust **Frequency**. --> Refer to "**6. Frequency and Voltage adjustment**"

#### 6. Frequency and Voltage adjustment

##### 6-1. Settings and connectings

Please connect a Frequency counterr to "RFCLK" point on the Handset Board located near the RF unit.  
Please connect a Digital multimeter to "1.8V" point on the Handset Board located near the BBIC.



## 6-2. Frequency adjustment

adjustment value of frequency is at address "02 08" of EEPROM. (default value: 80)

after typing "eeprom\_fc\_init", please type "conttx" to output RF CLK.  
(In order to be continuously output RF CLK, it is necessary to type "conttx".)

If Frequency displayed on the frequency counter is lower than 10.368000MHz, please increase the value at 02 08.

In order to do it,

Please write a value with "wreeprom 02 08 01 \*\*" command.

if you increase 1, input "wreeprom 02 08 01 81".

If frequency is higher, please write decreased value to.

Frequency should be

**10.367990MHz < frequency < 10.368010MHz**

```
Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001

C: ¥WINDOWS>d:
D: ¥>cd D:\PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >eeprom_fc_init
D: ¥PFZZFC533CN >conttx
D: ¥PFZZFC533CN >wreeprom 02 08 01 81
```

## 6-3. Voltage adjustment

adjustment value of voltage is at address 02 09 of EEPROM. (default value: 0F)

If 1.8V\_voltage displayed on the Digital multimeter is higher than 1.8000v, please decrease the value at 02 09.

Please write a value with "wreeprom 02 09 01 \*\*" command.

if you decrease 1, input "wreeprom 02 09 01 0E".

If voltage is lower, please write increased value to.

Voltage should be

**1.75V < Voltage < 1.85V**

\* If you want to check a value you wrote, you can check it with "rdeeprom" command.

```
Microsoft WindowsXP [Version]
(C) Copyright 1985 - 2001

D: ¥>cd D:\PFZZFC533CN
D: ¥PFZZFC533CN >set_com 1
D: ¥PFZZFC533CN >doskey
D: ¥PFZZFC533CN >eeprom_fc_init
D: ¥PFZZFC533CN >wreeprom 02 08 01 81
D: ¥PFZZFC533CN >wreeprom 02 09 01 0e
D: ¥PFZZFC533CN >rdeeprom 02 08 10
81 0E 06 01 06 01 00 3F 01 00 CE FF 7F 00 00 FF
D: ¥PFZZFC533CN >
```

### Note:

When you write new value to the EEPROM, it is necessary to turn the power off and then power on again. After power on again, Board works with new value you wrote.

### 7.9.1. Adjustment (Cordless Handset)

Please follow the items below when BBIC or EEPROM is replaced.

	Items	Adjustment Point	Procedure	Check or Replace Parts
(R)	Audio Check and confirmation	-	<ol style="list-style-type: none"> <li>1. Link to BASE which is connected to Line Simulator.</li> <li>2. Set line voltage to 48V and line current to 40mA.</li> <li>3. Input -45dBm/1KHz to MIC and measure Line output level.</li> <li>4. Confirm that the level is -8dBm <math>\pm</math> 5dB and confirm that the distortion level is &lt; 5% at TEL Line (600<math>\Omega</math> Road).</li> <li>5. Input -20dBm/1KHz to Line I/F and measure Receiving level at TP911 and TP912.</li> <li>6. Confirm that the level is -14dBm <math>\pm</math> 5dB and confirm that the distortion level is &lt; 5% at Receiver (Volume Middle, 150<math>\Omega</math> Road).</li> </ol>	MIC ROUTE R1025, R1026, R940, R942, C904, R941, R943, C933, C934, R936, R937, C929, C928, IC900 RECEIVER ROUTE IC907, C972, R908, R911, C993, R1033, IC900, C914, C915
(S)	SP phone Audio check and confirmation	-	<ol style="list-style-type: none"> <li>1. Link to Base Unit.</li> <li>2. let ringer be sounded by pushing volume key. (lower direction = volume low)</li> <li>3. While ringing, confirm that level is -10dBm<math>\pm</math>3dB.</li> </ol>	IC900 SP ROUTE IC903, C945, R944, R945, C949, R946, IC900, C940, C941

**Note:**

After the measuring, sock up the solder of TP.

The connection of adjustment equipment are as shown in **Adjustment Standard (Cordless Handset)** (P.121).





### 7.9.3. FREQUENCY TABLE

Channel	Frequency
—	2401.9200
1	2402.7840
2	2403.6480
3	2404.5120
4	2405.3760
5	2406.2400
6	2407.1040
7	2407.9680
8	2408.8320
9	2409.6960
10	2410.5600
11	2411.4240
12	2412.2880
13	2413.1520
14	2414.0160
15	2414.8800
16	2415.7440
17	2416.6080
18	2417.4720
19	2418.3360
20	2419.2000
21	2420.0640
22	2420.9280
23	2421.7920
24	2422.6560
25	2423.5200
26	2424.3840
27	2425.2480
28	2426.1120
29	2426.9760
30	2427.8400
31	2428.7040
32	2429.5680
33	2430.4320
34	2431.2960
35	2432.1600
36	2433.0240
37	2433.8880
38	2434.7520
39	2435.6160
40	2436.4800
41	2437.3440
42	2438.2080
43	2439.0720
44	2439.9360
45	2440.8000
46	2441.6640
47	2442.5280
48	2443.3920
49	2444.2560
50	2445.1200
51	2445.9840
52	2446.8480
53	2447.7120
54	2448.5760
55	2449.4400
56	2450.3040
57	2451.1680
58	2452.0320
59	2452.8960
60	2453.7600
61	2454.6240
62	2455.4880
63	2456.3520
64	2457.2160

Channel	Frequency
65	2458.0800
66	2458.9440
67	2459.8080
68	2460.6720
69	2461.5360
70	2462.4000
71	2463.2640
72	2464.1280
73	2464.9920
74	2465.8560
75	2466.7200
76	2467.5840
77	2468.4480
78	2469.3120
79	2470.1760
80	2471.0400
81	2471.9040
82	2472.7680
83	2473.6320
84	2474.4960
85	2475.3600
86	2476.2240
87	2477.0880
88	2477.9520
89	2478.8160
90	2479.6800
91	2480.5440
—	2481.4080
—	2482.2720

## 7.10. CHECK (Charger Unit)

### 7.10.1. Check (Charger Unit)

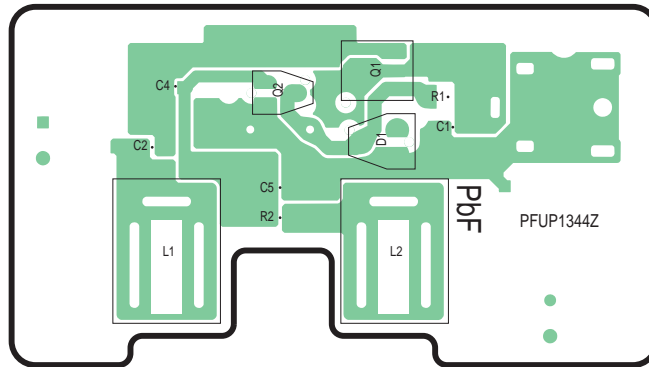
	Items	Adjustment Point	Procedure	Check or Replace Parts
(A)	Charging Check	-	1. Connect Charge Contact 12Ω/2W register between charge+ and charge-. 2. Measure and confirm voltage across the register is 3.9V ± 0.3V.	Q1, D1, Q2, R1, R2, L1, L2, C1, C2

**Note:**

After the measuring, sock up the solder of TP.

The connection of adjustment equipment are as shown in **Flow Solder Side View** (P.123).

### 7.10.2. Flow Solder Side View



## 7.11. RF SPECIFICATION

### 7.11.1. Base Unit

Item	Value	Refer to -. *	Remarks
TX Power	20 dBm ~ 25 dBm	-	
BBIC Clock	-10 Hz ~ +10 Hz	-	

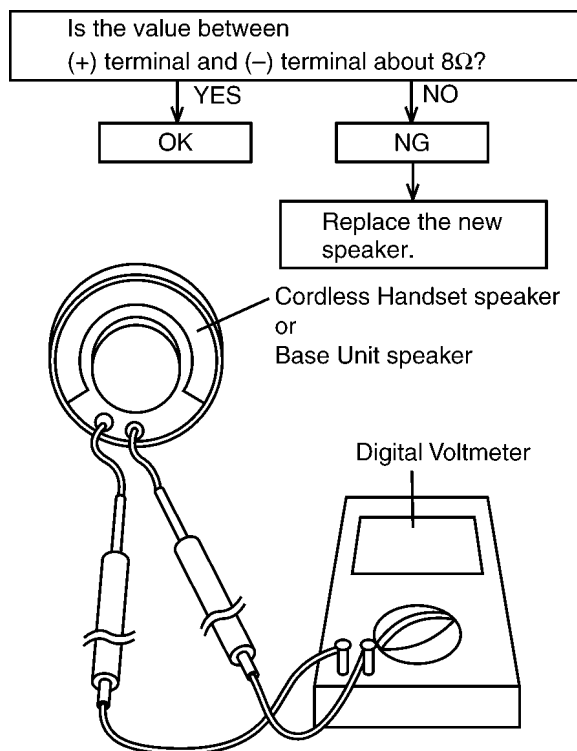
### 7.11.2. Cordless Handset

Item	Value	Refer to -. *	Remarks
TX Power	17 dBm ~ 19 dBm	<b>Adjustment (Cordless Handset)</b>	
BBIC Clock	-10 Hz ~ +10 Hz	<b>Adjustment (Cordless Handset)</b>	

\* : Refer to **Adjustment (Cordless Handset)** (P.120)

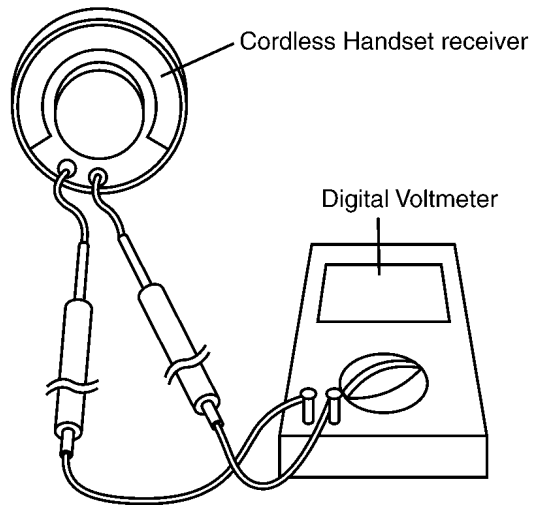
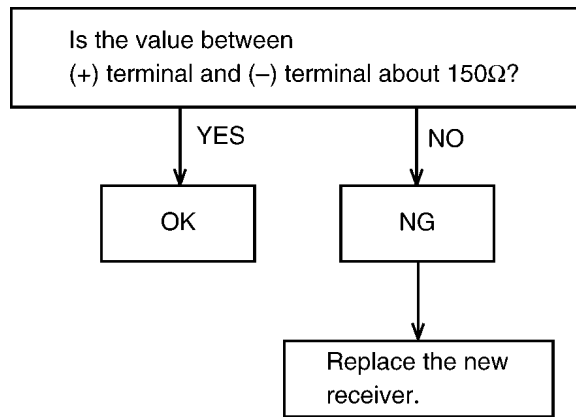
## 7.12. HOW TO CHECK THE CORDLESS HANDSET AND BASE UNIT SPEAKER

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown below.



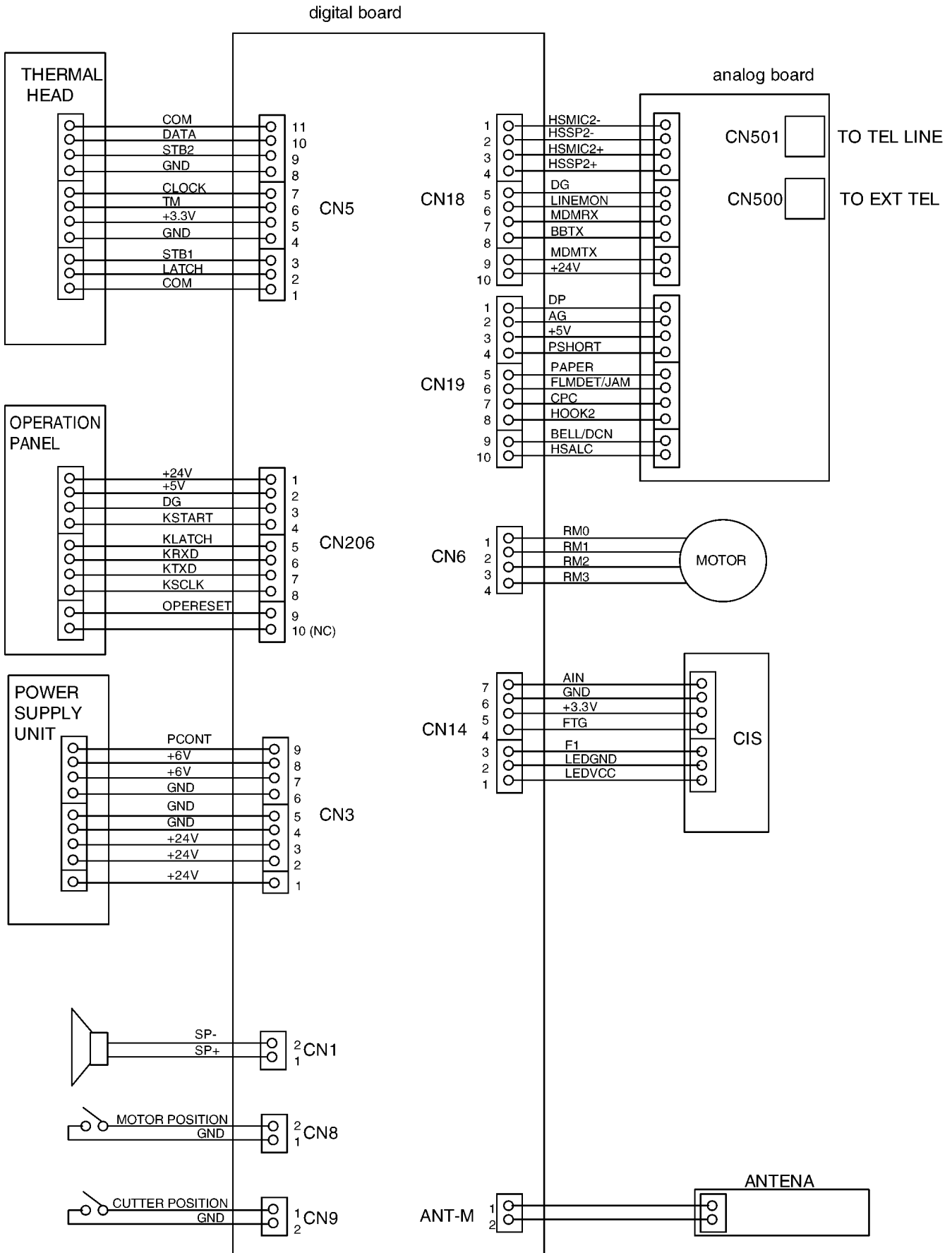
## 7.13. HOW TO CHECK THE CORDLESS HANDSET RECEIVER

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the receiver terminals as shown below.



# 8 CIRCUIT OPERATIONS

## 8.1. CONNECTION DIAGRAM



## 8.2. GENERAL BLOCK DIAGRAM

The following is an outline of each device IC on the digital board. (Refer to **GENERAL BLOCK DIAGRAM**(P.129).).

### 1. ASIC (IC10)

Composed mainly of an address decoder and a modem control.

Controls the general FAX operations.

Controls the operation panel I/F.

Controls the thermal head I/F and CIS I/F.

Performs the image processing.

CPU and Real time clock

Provides the reset pulse for each of the major ICs.

### 2. Flash ROM (IC16)

Contains all of the program instructions on the unit operations.

This memory is used mainly for the parameter working in the storage area.

### 3. Dynamic RAM (IC503)

This memory is used mainly for the parameter working in the storage area.

### 4. MODEM (IC3)

Performs the modulation and the demodulation for FAX communication.

### 5. Read Section

CIS image sensor to read transmitted documents.

### 6. Motor Driver (IC11)

Drives the transmission motor and the reception motor.

### 7. Thermal Head

Contains heat-emitting elements for dot matrix image printing.

### 8. BBIC (**B**ase **B**and IC): IC4

Handling all the audio, signal and data processing needed in a DECT base unit

Controlling the DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)

ADPCM codec filter for speech encoding and speech decoding (DSP section)

Echo-cancellation and Echo-suppression (DSP section)

Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)

DTMF receiver (DSP section)

Clock Generation for RF Module

ADC, DAC, timer, and power control circuitry

All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)

### 9. RF Module: IC24

PLL Oscillator

Detector

Compress/Expander

First/Second Mixer

Amplifier for transmission and reception

### 10. FLASH MEMORY: IC23

Voice Prompt (TAM) D/L (**D**own**L**oad) Area

### 11. FLASH MEMORY: IC7

Program D/L (**D**own**L**oad) Area

### 12. EEPROM: IC22

Temporary operating parameters (for RF, etc.)

### 13. Sensor Section

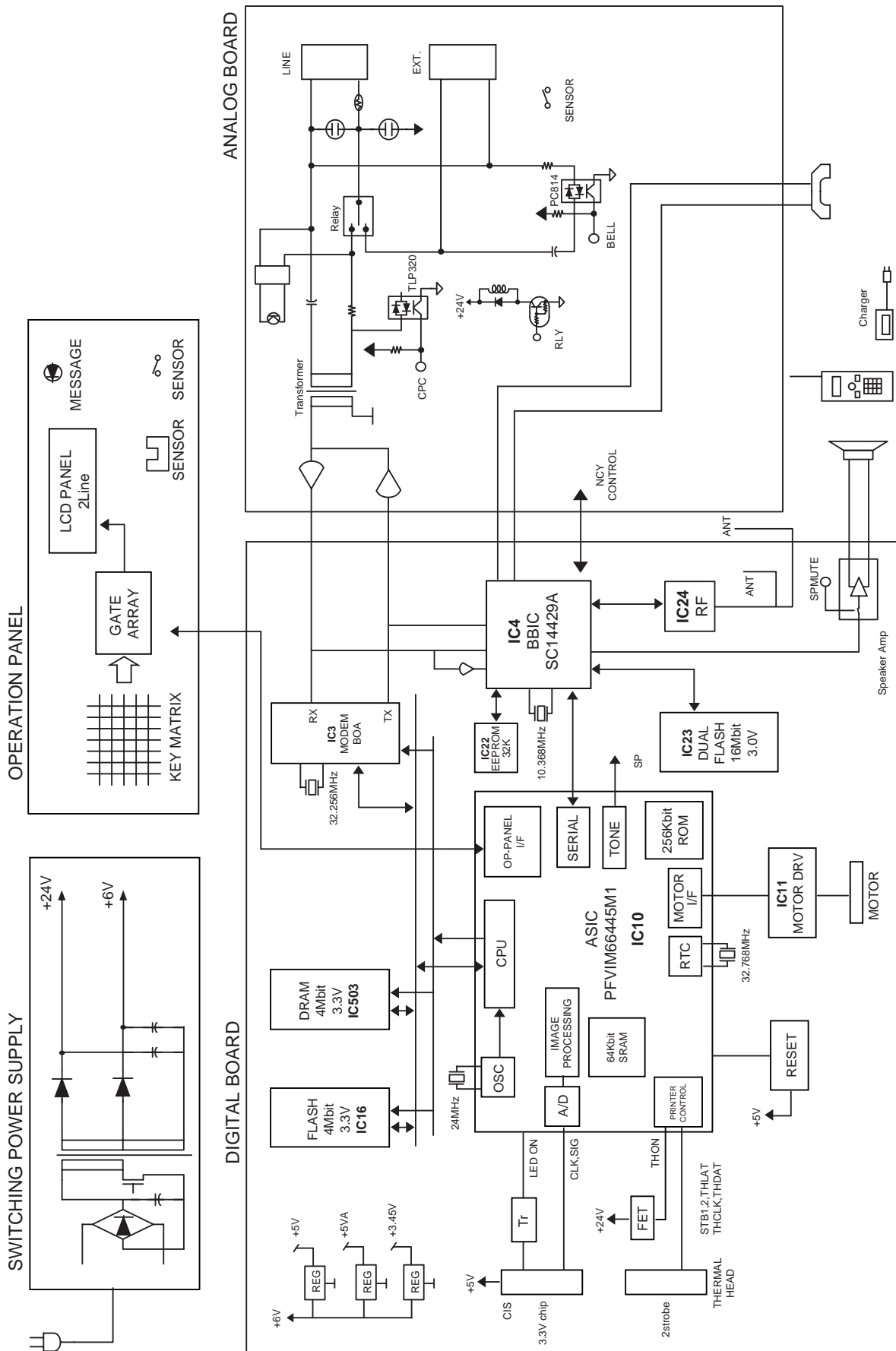
Composed of a cover open and film end switch, a document set switch, a document top switch, a paper top sensor and a motor position switch.

### 14. Power Supply Board Switching Section

Supplies +5V , +8V and +24V to the unit.



### 8.2.1. GENERAL BLOCK DIAGRAM



## 8.3. CONTROL (Facsimile) SECTION

### 8.3.1. ASIC (IC10)

This custom IC is used for the general FAX operations.

#### 1. CPU:

This model uses a Z80 equivalent to the CPU operating at 12 MHz. Most of the peripheral functions are performed by custom-designed LSIs. Therefore, the CPU only works for processing the results.

#### 2. RTC:

Real Time Clock

#### 3. DECODER:

Decodes the address.

#### 4. ROM/RAM I/F:

Controls the SELECT signal of ROM or RAM and the bank switching.

#### 5. CIS I/F:

Controls the document reading.

#### 6. IMAGE DATA RAM:

This memory is programmed into the ASIC and uses 8 KB for the image processing.

#### 7. THERMAL HEAD I/F:

Transmits the recorded data to the thermal head.

#### 8. MOTOR I/F:

Controls the transmission motor which feeds the document.

Controls the receiving motor which feeds the recording paper.

#### 9. OPERATION PANEL I/F:

Serial interface with Operation Panel.

#### 10. I/O PORT:

I/O Port Interface.

#### 11. ANALOGUE UNIT:

Electronic volume for the monitor.

Sends beep tones, etc.

#### Note\*:

This memory is incorporated into the ASIC (IC10) and used for the image processing.

Fig. A shows the memory map of the Image Data RAM.

### 8.3.2. FLASH MEMORY (IC16)

This 512KB ROM (FLASH MEMORY) carries a common area of 32KB and bank areas which each have 8KB (BK4~BK63). The addresses from 0000H to 7FFFH are for the common area and from 8000H to 9FFFH are for the bank areas.

### 8.3.3. DYNAMIC RAM (IC17)

The DRAM serves as CPU and receives memory.

The address is F200H~F3FFH (DRAM access window 1) and F600H~F7FFH (DRAM access window 2).

**I/O PORT ASSIGNMENT (IC10)****INPUT PORT**

PIN NO.	SIGNAL	RESET STATE		533	I/O
19	CPC		I	HOOK	I
20	RVN		I	PDET	I
43	XWAIT/IP60		I	PTOP	I
119	STBNP		I	FLMDET	I
136	KRXD/IP	KRXD	I	KRXD	I

**SWITCHING OUTPUT PIN/INPUT PORT**

PIN NO.	SIGNAL	RESET STATE		533	I/O
124	RXE/IP04		HIGH	RXE	O
131	TXE/IP14		HIGH	TXE	O

**OUTPUT PORT**

PIN NO.	SIGNAL	RESET STATE		533	I/O
17	F2/OP50	F2	LOW	XMDMRST	O
18	FR/OP51	FR	LOW	HEADON	O
46	XOPRBE/MUX/OP53	XOPRBE	HIGH	XOPRBE	O
47	ADR13/OP	ADR13			
48	ADR14/OP	ADR14			
49	ADR15/OP	ADR15			
65	XRESCS2/OP71	XRESCS2	HIGH	—	O
101	RBA5/OP	RBA5		A18	
133	KLATCH	KLATCH		KLATCH	O

**PORT ENABLE TO SWITCHING INPUT/OUTPUT**

PIN NO.	SIGNAL	RESET STATE		533	I/O
21	IRDATXD/IOP81	TXD	LOW	CHK_IN2	I/O
22	IRDARXD/IOP80	RXD	INPUT	F_TXMUTE	O
23	TXD/IOP30	IOP	INPUT	TXD	O
24	RXD/IOP31	IOP	INPUT	RXD	I
25	XRTS/IOP32	IOP	INPUT	XRTS	O
26	XCTS/IOP33	IOP	INPUT	XCTS	I
34	FMEMDO/IOP26	IOP	INPUT	LEDON	O
39	MIDAT/IOP45	IOP	INPUT	PWRCNT	O
40	MICLK/IOP46	IOP	INPUT	OPERST	O
41	MILAT/IOP47	IOP	INPUT	NISHI1	I
42	20KOSC/IOP56	IOP	INPUT	CCONT	O
44	XHSTRD/IOP40	IOP	INPUT	MURA1	O
45	XHSTWR/IOP41	IOP	INPUT	TX2-2	O
62	XRAS/IOP42	IOP	INPUT	RAS	O
63	XCAS1/IOP43	IOP	INPUT	CAS	O
64	XCAS2/IOP44	IOP	INPUT	RCONT	O
102	RBA6/IOP	RBA6		A19	
120	RM0/IOP00	RM0	LOW	RM0	
121	RM1/IOP01	RM1	LOW	RM1	
122	RM2/IOP02	RM2	LOW	RM2	
123	RM3/IOP03	RM3	LOW	RM3	
125	TM0/IOP10	TM0	LOW	TM0	O
128	TM1/IOP11	TM1	LOW	TM1	O
129	TM2/IOP12	TM2	LOW	TM2	O
130	TM3/IOP13	TM3	LOW	TM3	O
137	FMEMCLK/IOP24	IOP	INPUT	BBRST	O
138	FMEMDI/IOP25	IOP	INPUT	CISON	O

**[MODEM GPIO]: 100**

PIN NO.	SIGNAL	RESET STATE		533	I/O
93	GPI2	GPI2	INPUT	—	I
94	GPI3	GPI3	INPUT	—	I
95	GPI4	GPI4	INPUT	—	I
96	GPI5	GPI5	INPUT	—	I
97	GPI6	GPI6	INPUT	CHK_IN2	I
98	GPI7	GPI7	INPUT	CHK_IN3	I
99	GPO7	GPO7	LOW	—	O
101	GPO6	GPO6	LOW	—	O
102	GPO5	GPO5	LOW	—	O

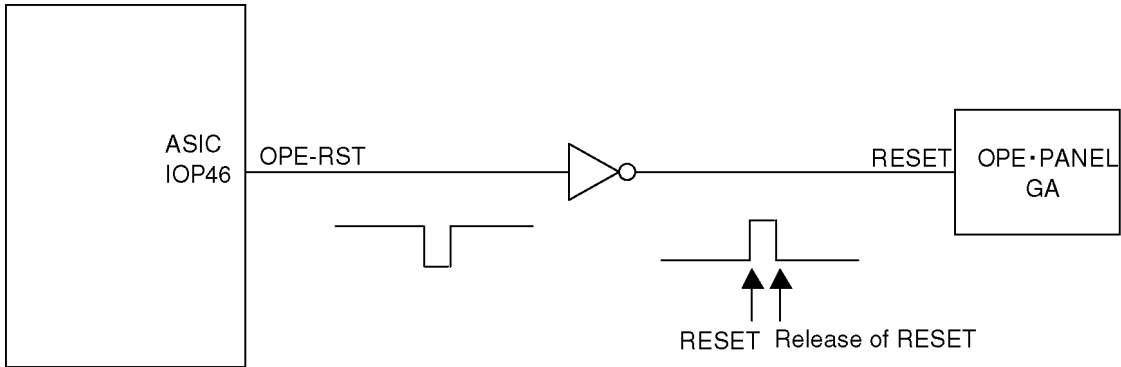
PIN NO.	SIGNAL	RESET STATE		533	I/O
104	GPO4	GPO4	LOW	—	O
105	GPO3	GPO3	LOW	GPO3	O
109	GPO2	GPO2	LOW	—	O
110	GPO1	GPO1	LOW	—	O

**I/O PORT ASSIGNMENT (IC4)**

PIN NO.	PIN NAME				DESCRIPTION		PIN STATEMENT		ASSIGNMENT			
	1	2	3	4	1	2	Pull up or down	Reset state	PIN NAME	DIR	Connection	
10	P3[7]	PD7			General I/O port	purpose		O_HiZ	BELL/D CN	I	external 33k pullup to 3.0V	
42	P3[6]	PD6			General I/O port	purpose		O_HiZ	URTS	O	directly connect to ASIC	
12	P3[5]	PD5			General I/O port	purpose		O_HiZ	ANT1	O	RF	
13	P3[4]	PD4			General I/O port	purpose		O_HiZ	ANT2	O	RF	
14	P3[3]	PD3			General I/O port	purpose		O_HiZ	PAON	O	RF	
15	P3[2]	PD2			General I/O port	purpose		O_HiZ	RXDS G	O	RF	
11	P3[1]	PD1			General I/O port	purpose		O_HiZ	BTXON	I	external 10k pullup to 3.0V	
66	P3[0]	SCL2			General I/O port	purpose	Access bus2 fixed clk output	O_1	SDA2	O	external 5.6k pullup to 3.0V	
94	P2[7]	SPIDO			General Output	purpose	SPI Data out	O_HiZ	SPIDO	O	directly to connect CN703	
97	P2[6]	stop_charge			-	-	-	O_0	Do not use.		OPEN	
84	P2[5]	SDA1			General I/O port	purpose	Access bus1 serial clk output	I	NC	O		
83	P2[4]	SCL1			General I/O port	purpose	Access bus1 serial Data output	I	NC	O		
82	P2[3]	ADC1			General Output	purpose	ADC1 input	I	NISHI1	O		
81	P2[2]	ADC0	CLK100		General Output	purpose	ADC0 input	I	DP	O	connect to Digital Tr	
80	P2[1]	PWM1	SPICLK				SPI CLK	I	SPICLK	O	directly to connect CN703	
79	P2[0]	PWM0	SPIDI				SPI DATA in	I	SPIDI	I	external pull down	
96	P1[7]	CHARGE	INT7n		General I/O port	purpose		160k pull down	I_PD	MURA1	I	voltage convert with R/R ,, 3.3V->3.0V
95	P1[6]	PON	INT6n		General I/O port	purpose	power on	160k pull down	I_PD			directly connect to 1.8V
63	P1[5]	INT5n	HOLDAC Kn	VDDE	General I/O port	purpose		selectable pullup	O_1	SPMUTE	O	directly connect to SP AMP CD
62	P1[4]	INT4n	HOLDn		General I/O port	purpose		selectable pullup	I_PU	RSVIO	I	connect to CHK_IN2
61	P1[3]	INT3n	DACK1n	ACS2	General I/O port	purpose	Auxiliary Chip Select2	selectable pullup	I_PU	SRAM_CS	O	OPEN
59	P1[2]	INT2n	DREQ1n	ACS1	General I/O port	purpose	Auxiliary Chip Select1	selectable pullup	I_PU	CPC	I	voltage convert with R/R ,, 3.3V->3.0V
58	P1[1]	INT1n	DACK0n		General I/O port	purpose		selectable pullup	I_PU	HALC	I	external 3.3k pullup to 3.0V
57	P1[0]	INT0n	DREQ0n		General I/O port	purpose		selectable pullup	I_PU	WP	O	external 10k pullup to 3.0V
54	P0[7]	PCM_DIN			General I/O port	purpose	PCM_DIN	selectable pullup	I_PU	PSHORT	O	connect to Digital Tr
53	P0[6]	PCM_DO UT			General I/O port	purpose	PCM_DOUT	selectable pullup	I_PU	PCM_DOUT	O	directly to connect CN917
52	P0[5]	PCM_C LK			General I/O port	purpose	PCM_CLK	selectable pullup	I_PU	PCM_C LK	O	directly to connect CN917
51	P0[4]	PCM_F S C0			General I/O port	purpose	PCM_FSC0	selectable pullup	I_PU	PCM_F SC0	O	directly to connect CN917
50	P0[3]	PCM_F S C1			General I/O port	purpose	PCM_FSC1	selectable pullup	I_PU	UCTS	I	voltage convert with R/R,, 3.3V->3.0V
49	P0[2]	JTIO			General I/O port	purpose	JTAG INPUT/OUTPUT	selectable pullup	I_PU	JTIO	I/O	external 1k pullup to 3.0V

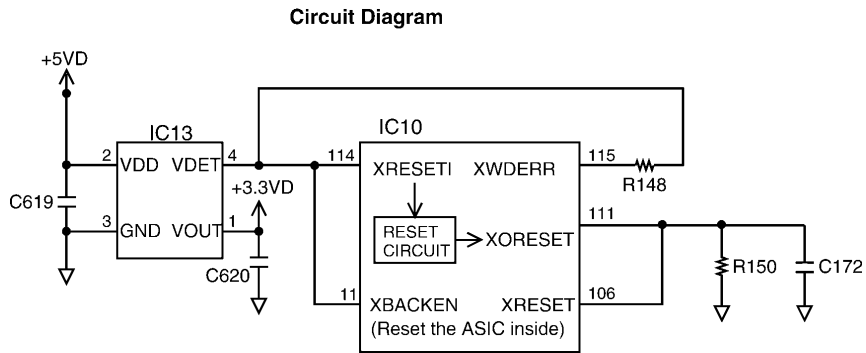
PIN NO.	PIN NAME				DESCRIPTION		PIN STATEMENT		ASSIGNMENT		
	1	2	3	4	1	2	Pull up or down	Reset state	PIN NAME	DIR	Connection
48	P0[1]	URX			General purpose I/O port	input Data to UART	pull down	I	URX	I	voltage convert with R/R „ 3.3V->3.0V
47	P0[0]	UTX			General purpose I/O port	UART DATA output	selectable pullup	I_PU	UTX	O	connect to ASIC UART RXD

**Connection to operation reset circuit**

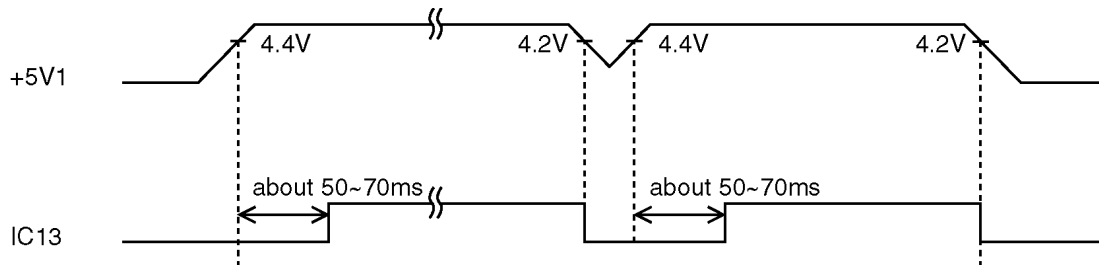


### 8.3.4. RESET CIRCUIT (WATCH DOG TIMER)

The output signal (reset) from pin 4 of the voltage detect IC (IC13) is input to the ASIC (IC10) 114 pin.



1. During a momentary power interruption, a positive reset pulse of 50~70 msec is generated and the system is reset completely.



2. The watch dog timer, built-in the ASIC (IC10), is initialized by the CPU about every 1.5 ms.

When a watch dog error occurs, pin 115 of the ASIC (IC10) becomes low level.

The terminal of the 'WDERR' signal is connected to the reset line, so the 'WDERR' signal works as the reset signal.

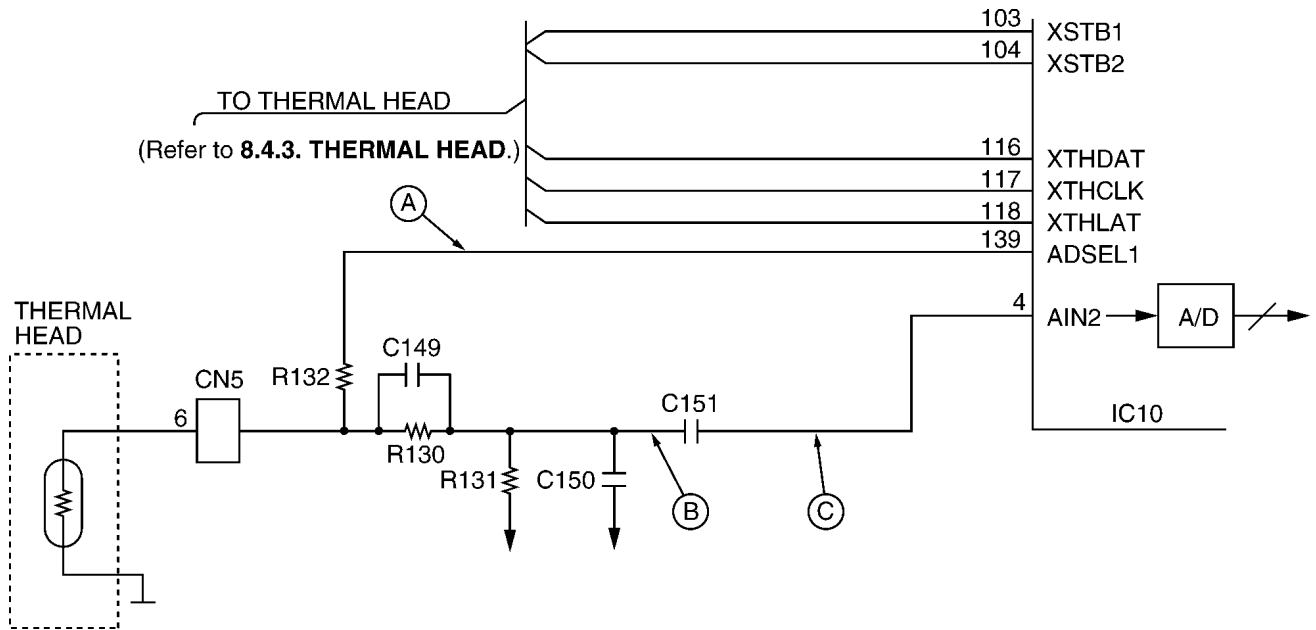
### 8.3.5. SUPERVISION CIRCUIT FOR THE THERMAL HEAD TEMPERATURE

#### 1. Function

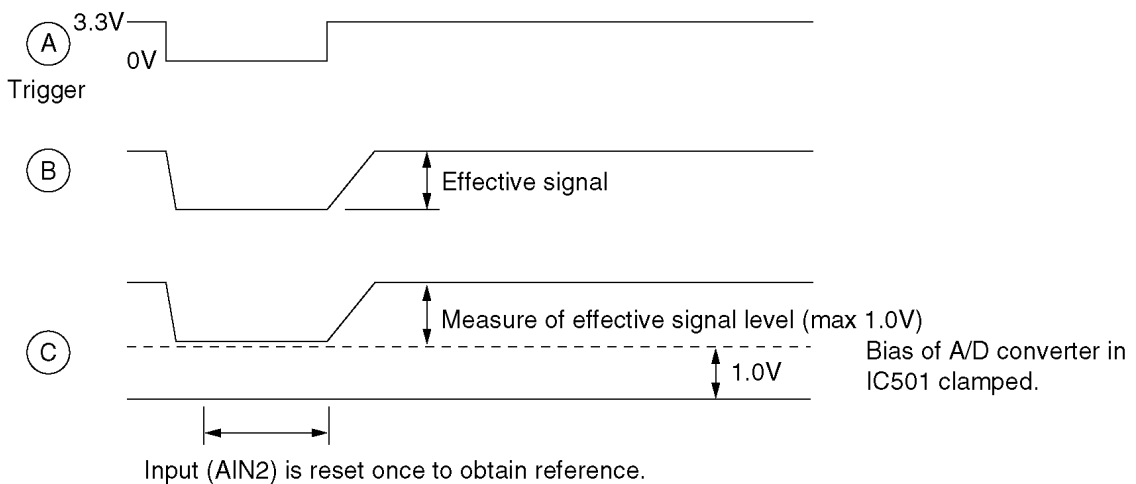
The thermistor changes the resistor according to the temperature and uses the thermistor's characteristics. The output of pin 139 of IC10 becomes a low level. Then when it becomes a high level, it triggers point A. In point C, according to the voltage output time, the thermal head's temperature is detected.

After the thermal head temperature is converted to voltage in B, it is then changed to digital data in the A/D converter inside IC10. The CPU decides the strobe width of the thermal head according to this value. Therefore, this circuit can keep the thermal head at an even temperature in order to stabilize the printing density and prevent the head from being overheated.

**Circuit Diagram**



**Timing Chart**



**CROSS REFERENCE:**  
**THERMAL HEAD(P.138)**

## 8.4. FACSIMILE SECTION

### 8.4.1. IMAGE DATA FLOW DURING FACSIMILE OPERATION

#### Copy (Fine, Super-Fine, Half Tone)

1. Line information is read by CIS (to be used as the reference white level) via route1, and is input to IC10. Refer to **BLOCK DIAGRAM**(P.137)
2. In IC10, the data is adjusted to a suitable level for A/D conversion in the Analogue Signal Processing Section, and via route2 it is input to A/D conversion (8 bit). After finishing A/D conversion, the data is input to the Image Processing Section via route3. Then via route4 and route5, it is stored in RAM as shading data.
3. The draft's information that is read by CIS is input to IC10 via route1. After it is adjusted to a suitable level for A/D conversion via route2, the draft's information is converted to A/D (8 bit), and it is input to the Image Processing Section. The other side, the shading data which flows from RAM via route6 and route7, is input to the Image Processing Section. After finishing the draft's information image processing, white is regarded as "0" and black is regarded as "1". Then via routes4 and 5, they are stored in RAM.
4. The white/black data stored as above via routes6 and8 is input to the P/S converter. The white/black data converted to serial data in the P/S converter is input to the Thermal Head via route9 and is printed out on recording paper.

#### Note:

- Standard: Reads 3.85 lines/mm
- Fine/Photo: Reads 7.7 lines/mm
- Super-Fine: Reads 15.4 lines/mm

#### Transmission

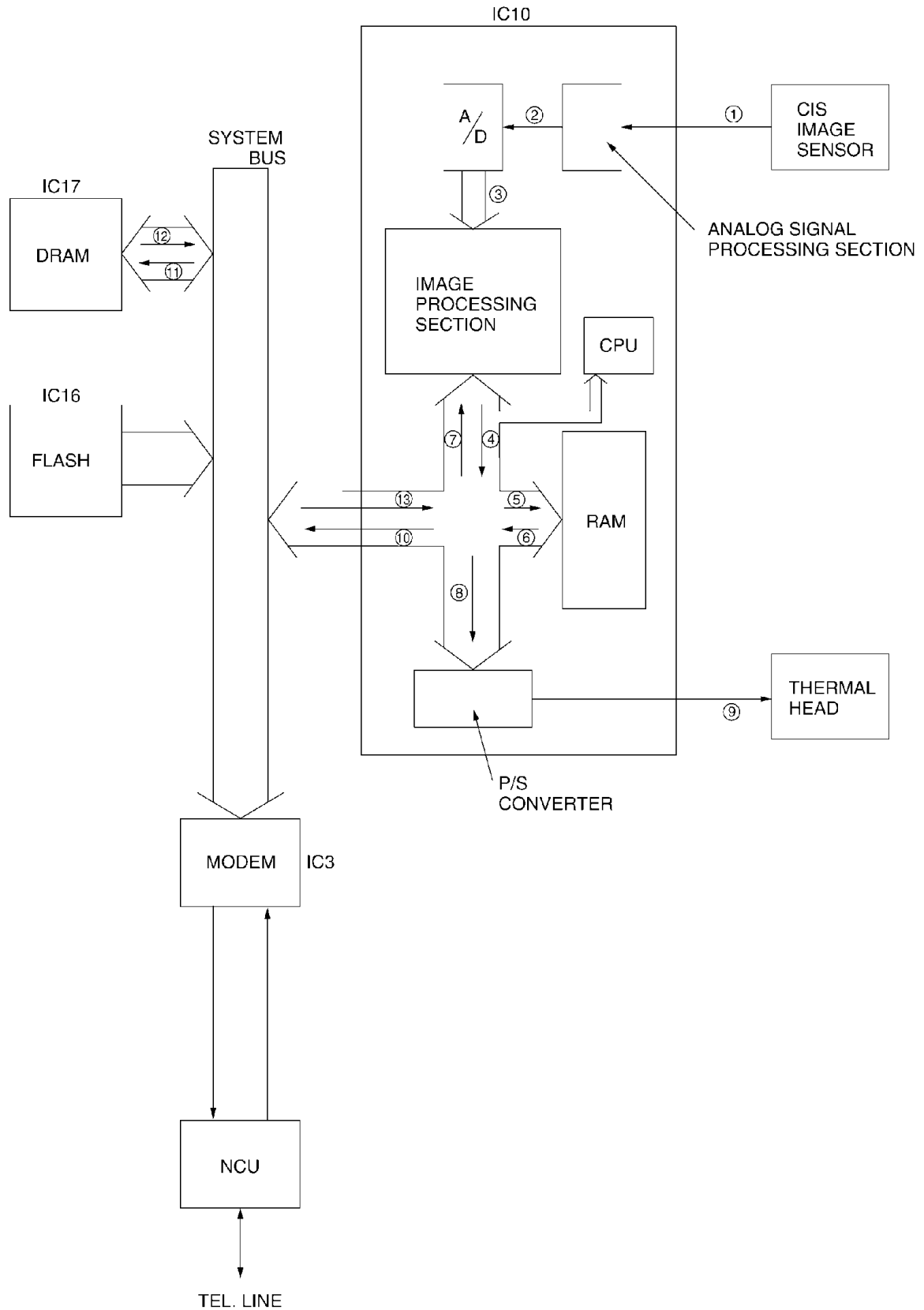
1. Same processing as **Copy** items 1 - 3.
2. The data stored in the RAM of IC10 is output from IC10 via routes6 and 10, and is stored in the system bus. Via route11, it is stored in the communication buffer inside DRAM (IC17).
3. While retrieving data stored in the communication buffer synchronous with the modem, the CPU (inside IC10) inputs the data to the modem along route12, where it is converted to serial analogue data and forwarded over the telephone lines via the NCU Section.

#### Reception

1. The serial analogue image data is received over the telephone lines and input to the modem via the NCU section, where it is demodulated to parallel digital data. Then the CPU (IC10) stores the data in the communication buffer DRAM (IC17) along route12.
2. The data stored in DRAM (IC17) is decoded by the CPU (IC10) via route12, and is stored in DRAM (IC17) via routes13 and 5.
3. Same processing as **Copy** item 4.



### 8.4.2. BLOCK DIAGRAM



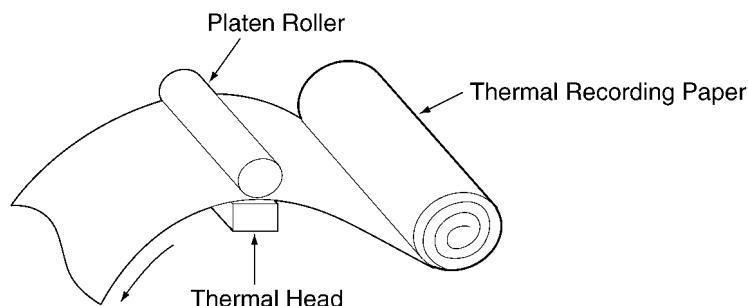
### 8.4.3. THERMAL HEAD

#### 1. Function

This unit utilizes state of the art thermal printer technology.

The recording paper (roll paper) is chemically processed. When the thermal head contacts this paper it emits heat momentarily, and black dots (appearing like points) are printed on the paper. If this continues, letters and/or diagrams appear, and the original document is reproduced.

#### COMPOSITION OF THE RECEIVE RECORD SECTION (THERMAL RECORDING FORMAT)



#### 2. Circuit Operation

There are 27 driver ICs aligned horizontally on the thermal head and each one of these ICs can drive 64 heat emitting registers. This means that one line is at a density of  $64 \times 27 = 1728$  dots  $(= 8$  dots/mm).

White/Black (white=0, black=1) data in one line increments is synchronized at IC1 pin 117 (THCLK), and sent from IC1 pin 116 (THDAT) to the shift register of the ICs. The shift registers of the 27 ICs are connected in series, and upon the shift of dot increment 1728, all the shift registers become filled with data, and a latch pulse is emitted to each IC from IC1 pin 118 (THLAT). With this latch pulse, all the contents of the shift registers are latched to the latch registers. Thereafter, through the addition of strobos from the IC1 pins (103 - 105) only black dot locations (=1) among latched data activates the driver, and the current passes to heat the emitting body causing heat emission.

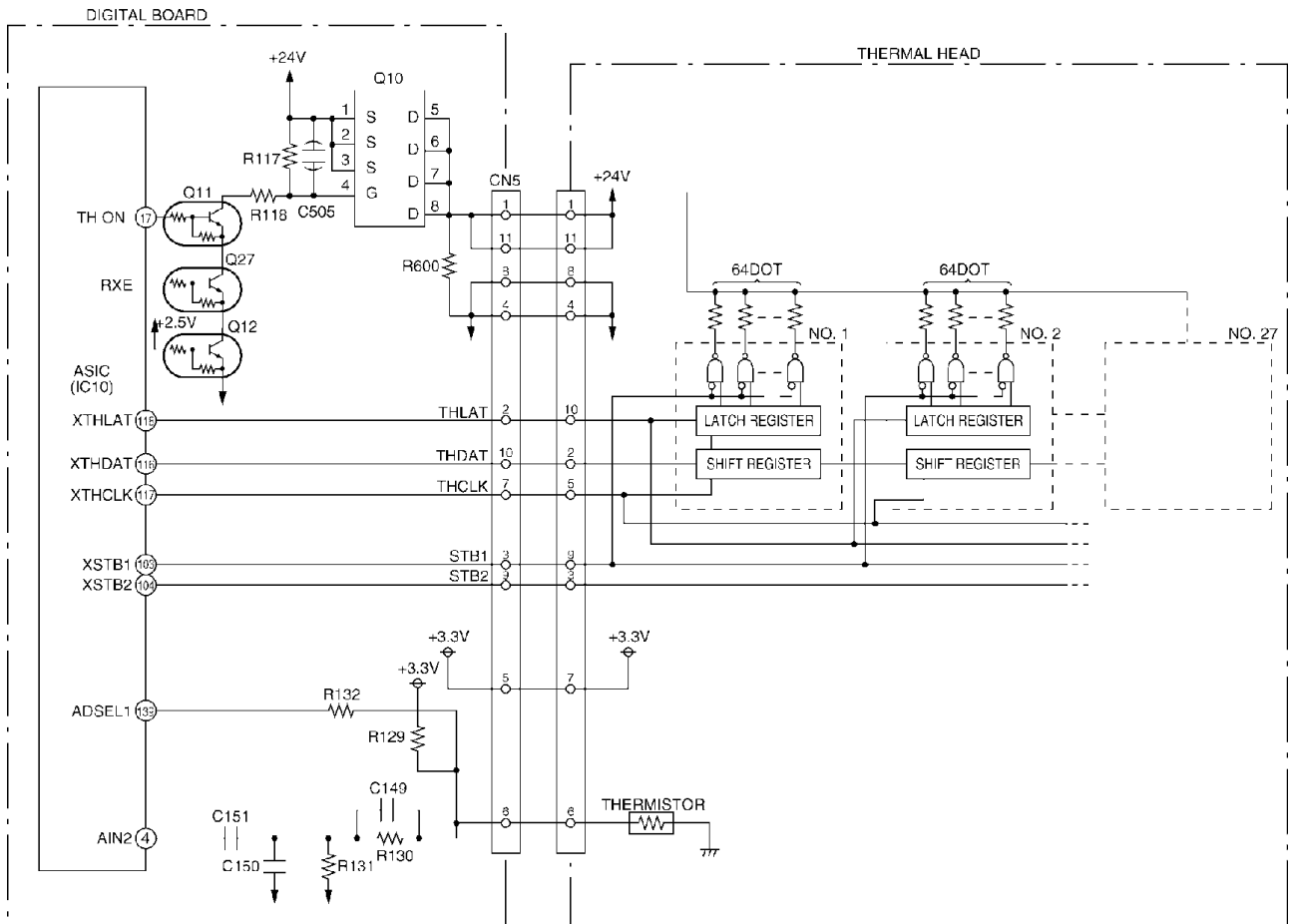
Here, the three line strobos, STB1 to STB3, impress at intervals of 9.216 msec, as required for one-line printout.

The sequence is shown on the next page. [Moreover, for the strobe width, the thermistor value inside the thermal head is detected according to IC1 pin 4. (See **BLOCK DIAGRAM** (P.137).) Depending on that value, the strobe width is recorded in ROM (IC2).

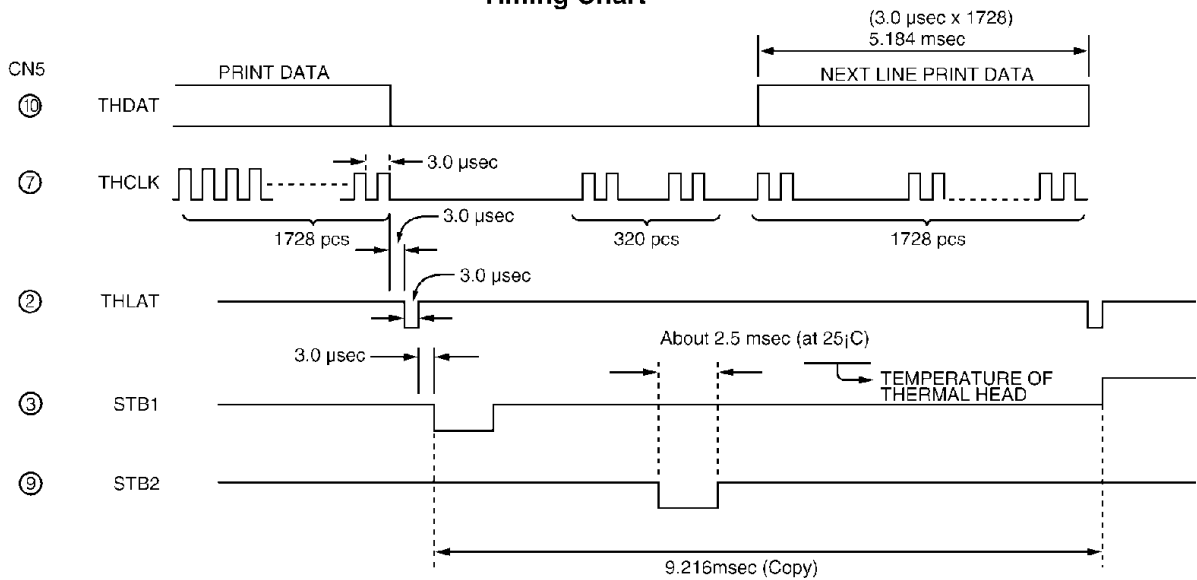
Accordingly, the strobe width is determined.

When the thermal head is not used, the IC1 (125, THON) becomes low, Q3 turns OFF, Q2 turns OFF, and the +24 V power supply for the thermal head driver is not impressed to protect the IC.

### Circuit Diagram

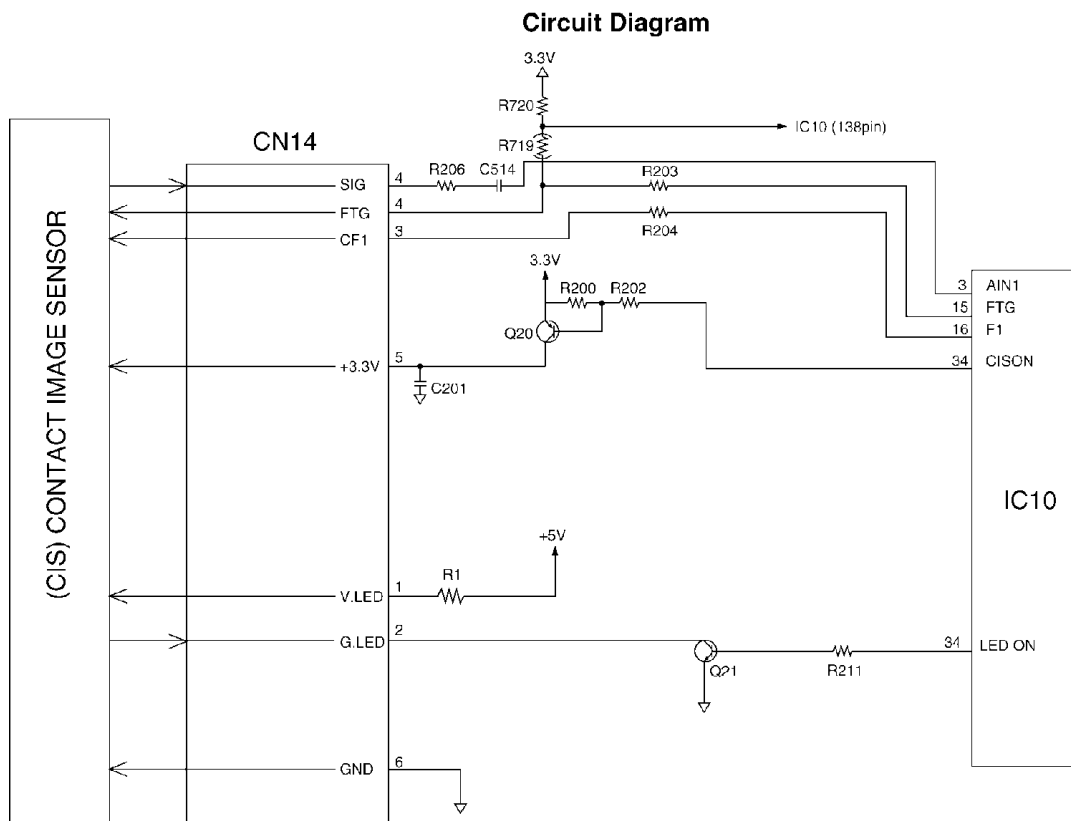


### Timing Chart



### 8.4.4. SCANNING BLOCK

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



When an original document is inserted and the start button pressed, pin 34 of IC10 goes to a high level and the transistor Q21 turns on. This applies voltage to the light source to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC10, and the original image illuminated by the light source undergoes photoelectric conversion to output an analogue image signal (SIG). The analogue image signal is input to the system ASIC on AIN1 (pin 3 of IC10) and converted into 8-bit data by the A/D converter inside IC10. Then this signal undergoes digital processing in order to obtain a high-quality image.

### 8.4.5. STEPPING MOTOR DRIVE CIRCUIT

#### 1. Function

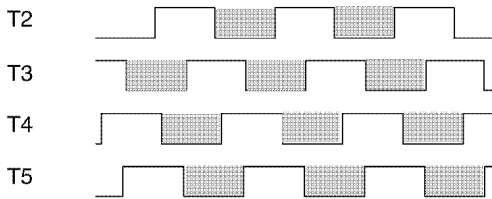
One individual stepping motor is used for transmission and reception. It feeds the document or recording paper synchronized for reading or printing.

#### 2. Circuit Operation

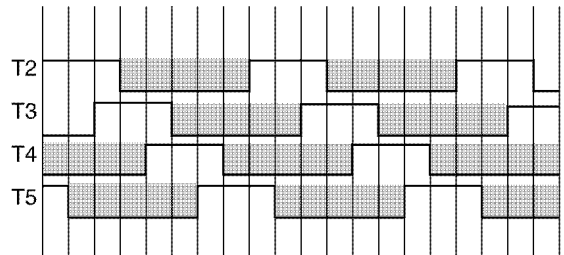
During motor drive, gate array IC10 pin 124 becomes a high level, and Q13 and Q14 go ON as a result. +24 V is supplied to the motor coil.

Stepping pulses are output from gate array IC10, causing driver IC11 to go ON. The motor coil is energized sequentially in 2 phase increments or 1-2 phase increments, which causes a 1-step rotation. A 1-step rotation is 0.13mm of recording paper or document paper. The timing chart is below.

Timing chart (2 Phase)



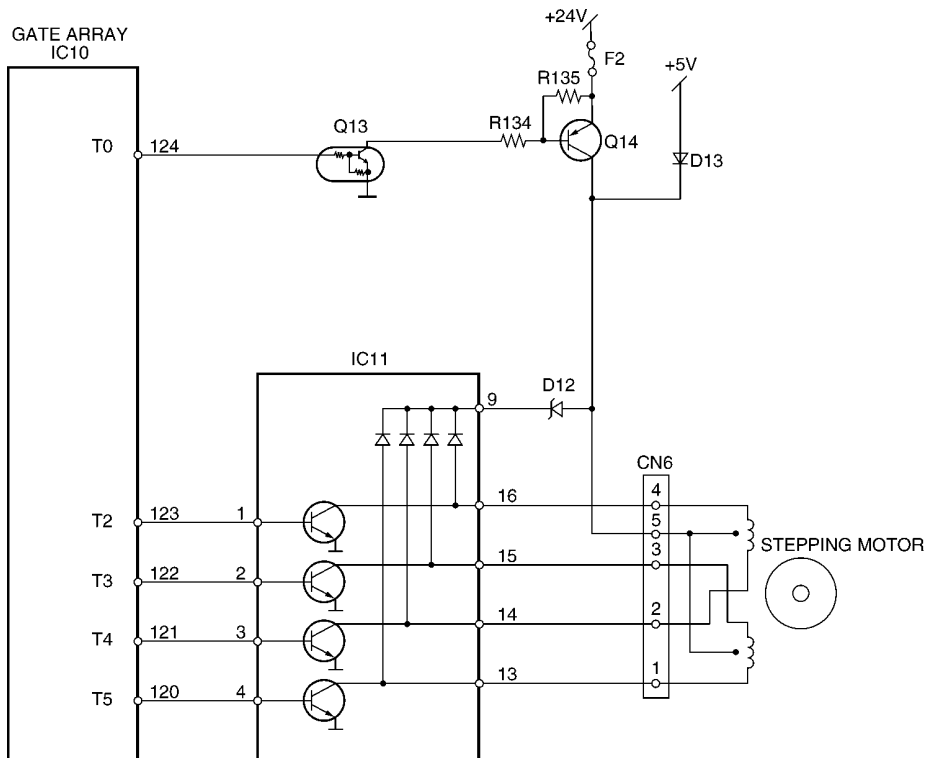
1-2 Phase (Asic T2-T5, output)



Stepping Motor Phase Pattern

Function	Mode	Phase Pattern	Speed
Copy	Fine/Photo	1-2	432 pps
	Super Fine	1-2	216 pps
FAX	STD	2	432 pps
	Fine/Photo	1-2	432 pps
	Super Fine	1-2	216 pps
—	Paper Feed	2	432 pps

Circuit Diagram



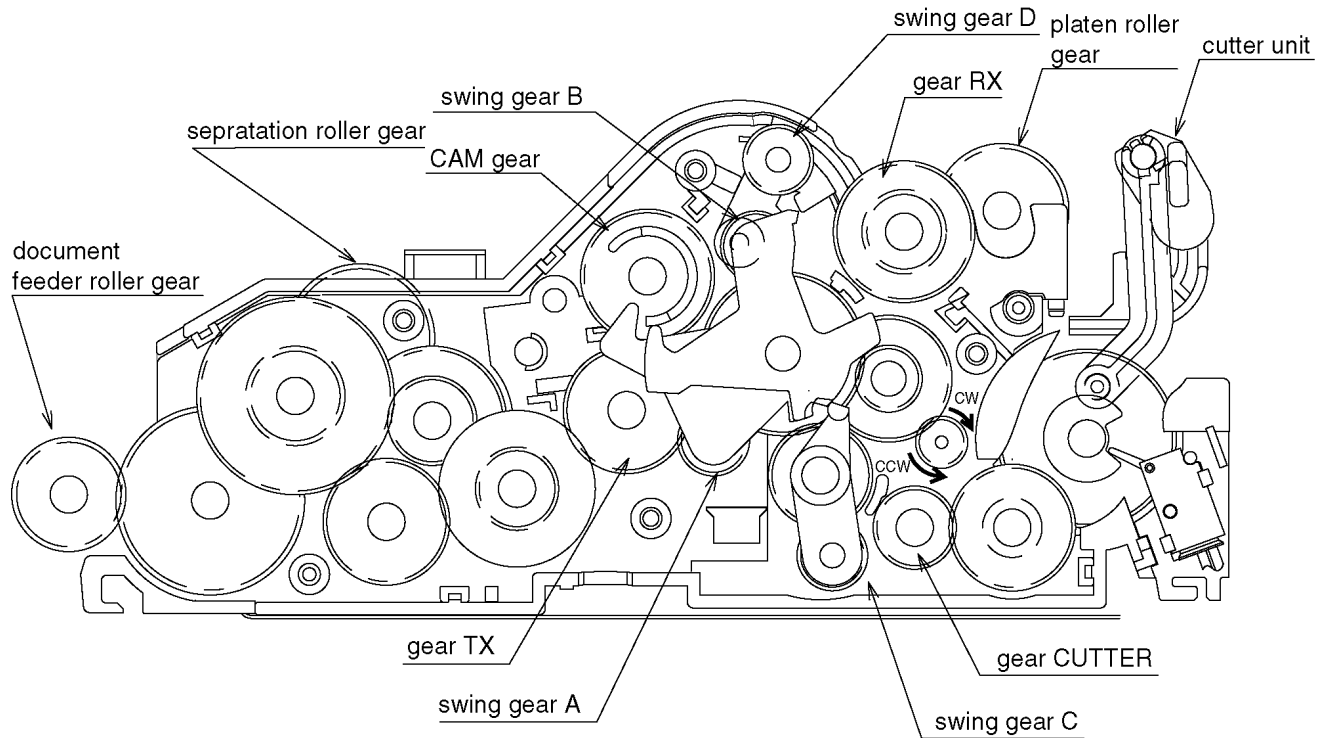
When the motor is OFF, gate array IC10 pin 124 becomes a low level and Q13 and Q14 also turns OFF. Instead of +24V, +5V is supplied through D13 so that the motor is held in place.

## 8.4.6. GEAR SECTION

This section shows how the motor-driven gear mechanism works in the main operations: FAX transmission, FAX reception the motor and copying.

### 8.4.6.1. MODE SELECTION

When the motor attached to the Drive Motor Gear rotates counterclockwise (CCW), Swing Gear A engages the CAM and the CAM turns counterclockwise to select a mode. (See **Fig. A.**) There are three mode options controlled by the Switch: **A:** Transmit mode, **B:** Receive mode and **C:** Copy mode. In **Fig. B.**, you can see which mode is selected by the position of the rib in the CAM.



<Fig. A>

## 8.4.6.2. MODE OPERATION

Once a mode is selected, the Drive Motor Gear rotates clockwise (CW) and then the Swing Gear A-1 controls the mode operation.

### 8.4.6.2.1. TX Mode

Swing Gear A engages Gear TX and conveys its drive power to the Separation Roller Gear for pre-feeding documents.

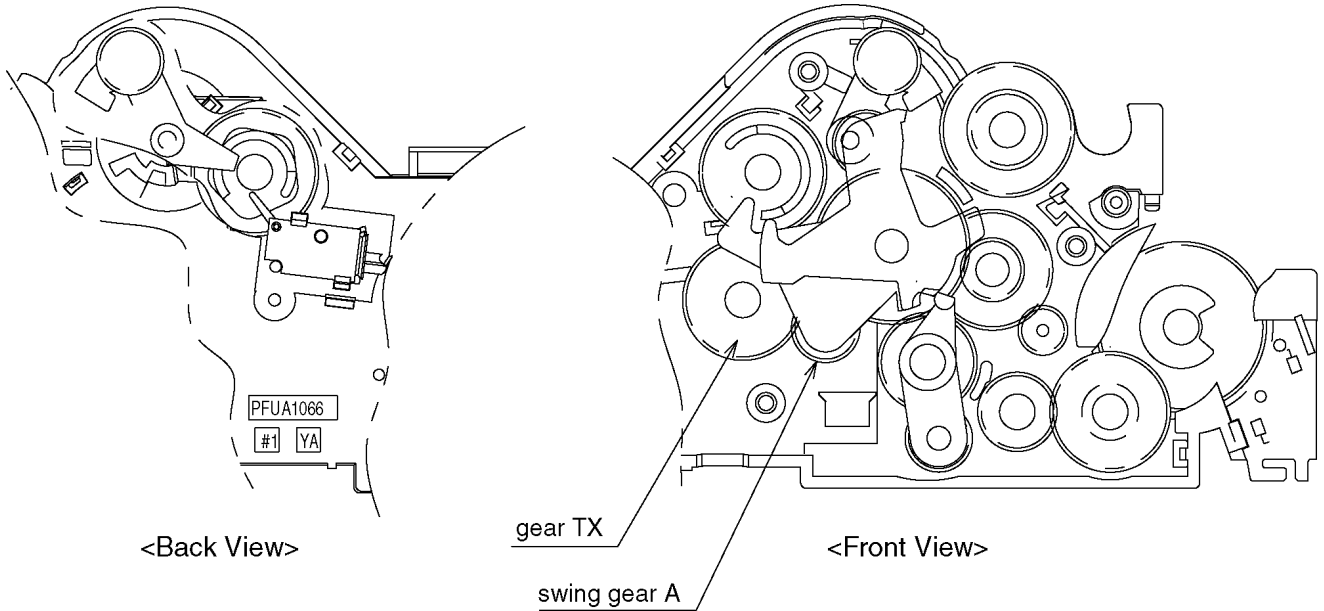


Fig. B: TX mode

### 8.4.6.2.2. RX Mode

Swing Gear B engages RX and conveys its drive power to the Platen Roller Gear for printing the received data.

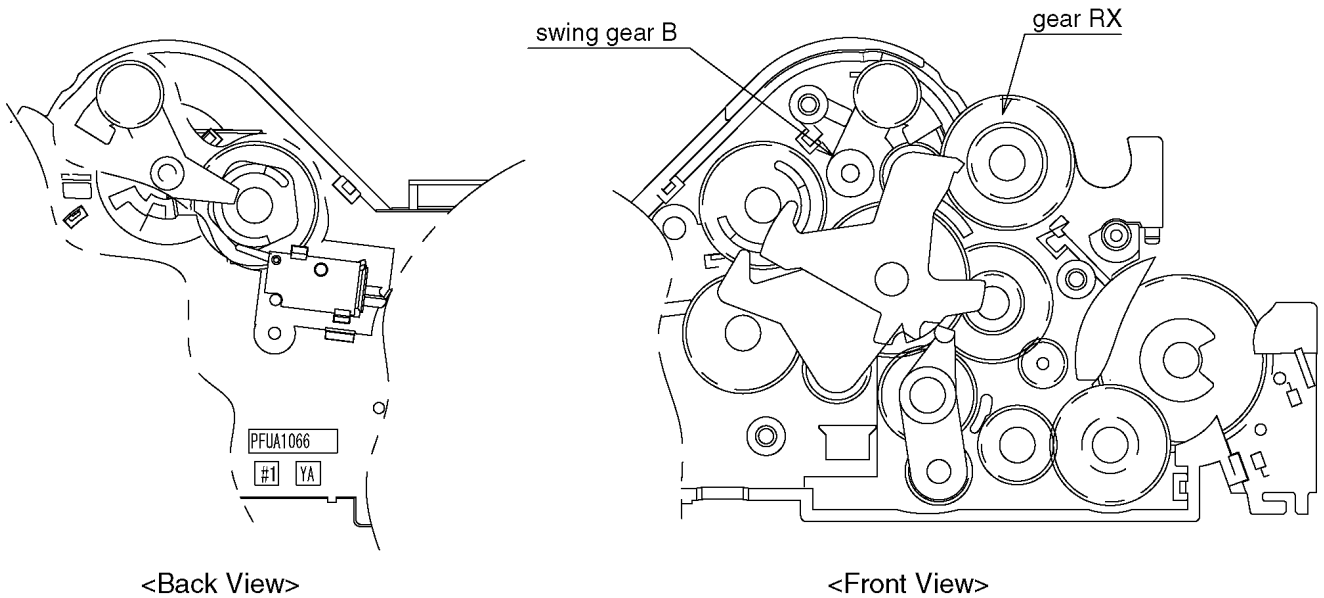


Fig. C: RX mode

### 8.4.6.2.3. Copy Mode

Swing Gear A and B engage Gears TX and Gears RX respectively and drive both the Separation Roller Gear and the Platen Roller Gear for feeding documents and recording paper in the copying operation.

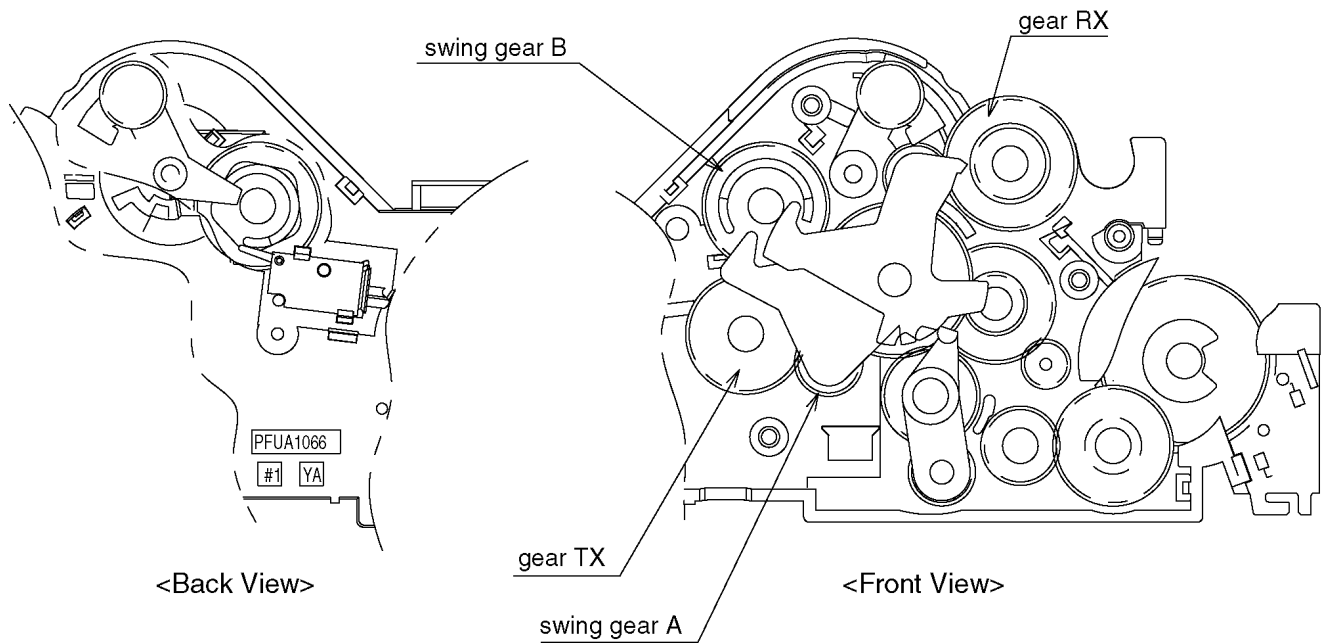


Fig. D: Copy mode

### 8.4.6.2.4. Reverse Mode

Swing gear D engages between swing gear B and gear RX, and conveys its drive power to the platen roller gear for reversing the recording paper.

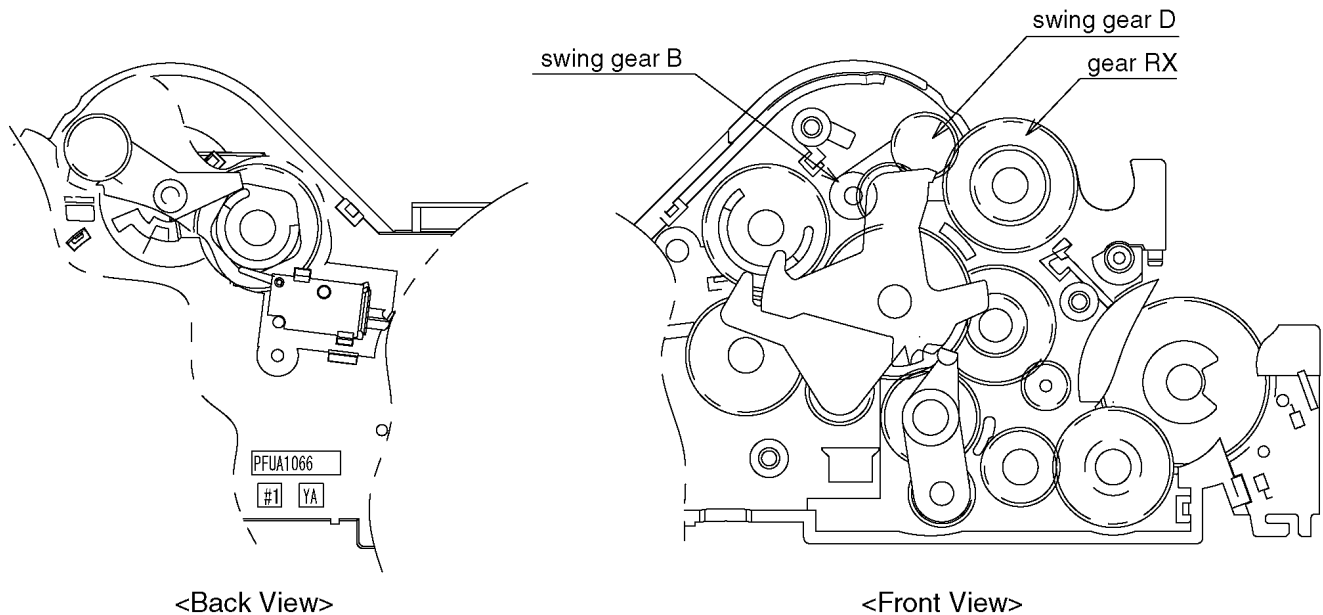


Fig. E: Reverse mode



### 8.4.6.2.5. Cutter Mode

Swing gear C engages the gear cutter and conveys its drive power to cutter unit for cutting recording paper.

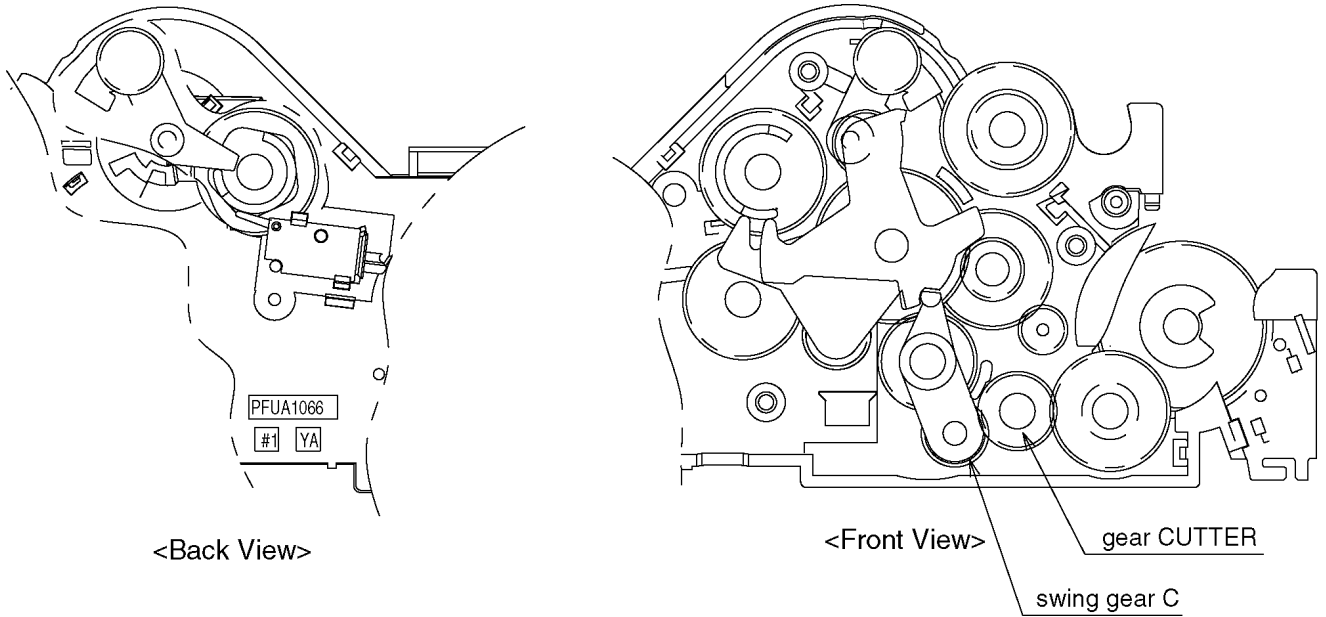
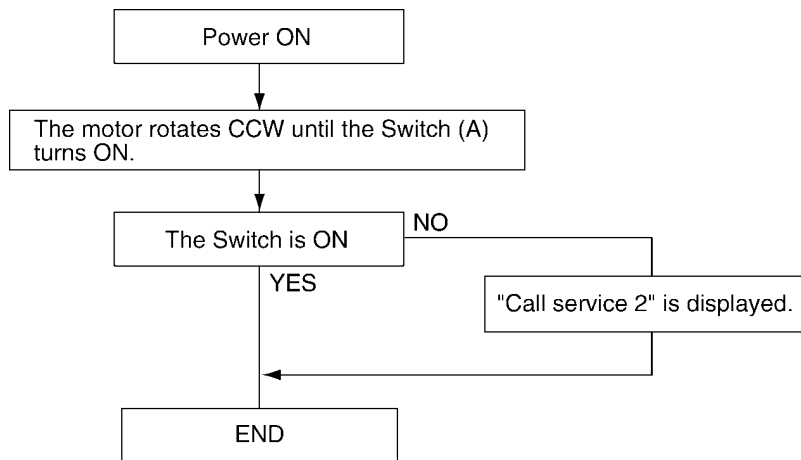


Fig. F: Cutter mode

### 8.4.6.3. MECHANICAL MOVEMENTS IN THE MAIN OPERATIONS

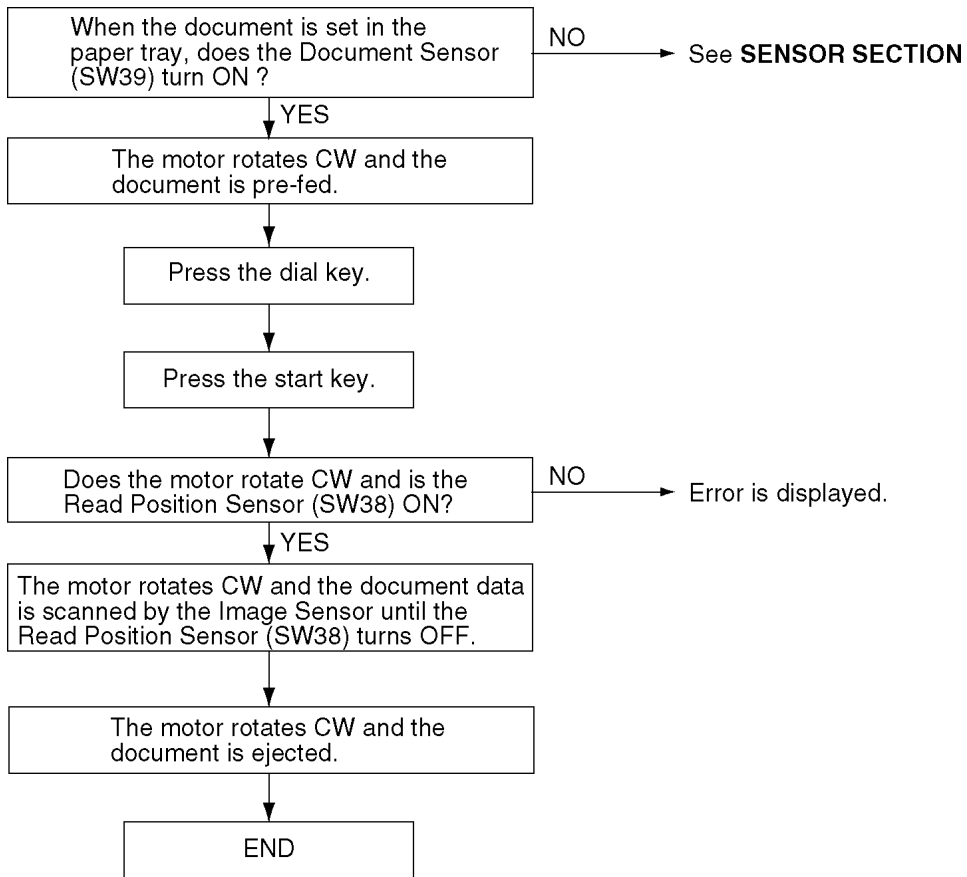
#### 8.4.6.3.1. IDLE STATUS



**CROSS REFERENCE:**

**HOW TO REMOVE THE MOTOR OF GEAR BLOCK (P.38)**

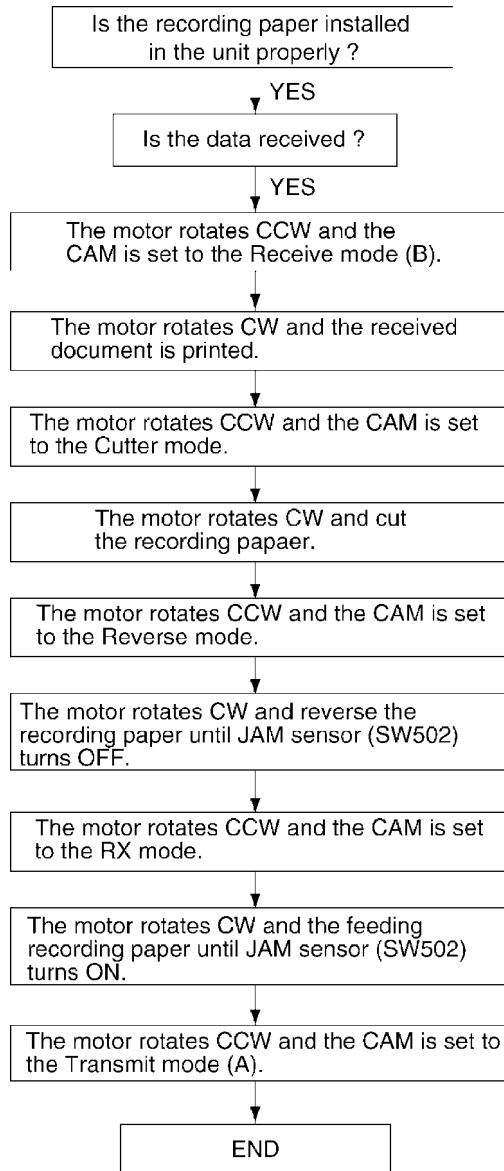
### 8.4.6.3.2. SCANNING



**CROSS REFERENCE:**

**SENSOR SECTION (P.105)**

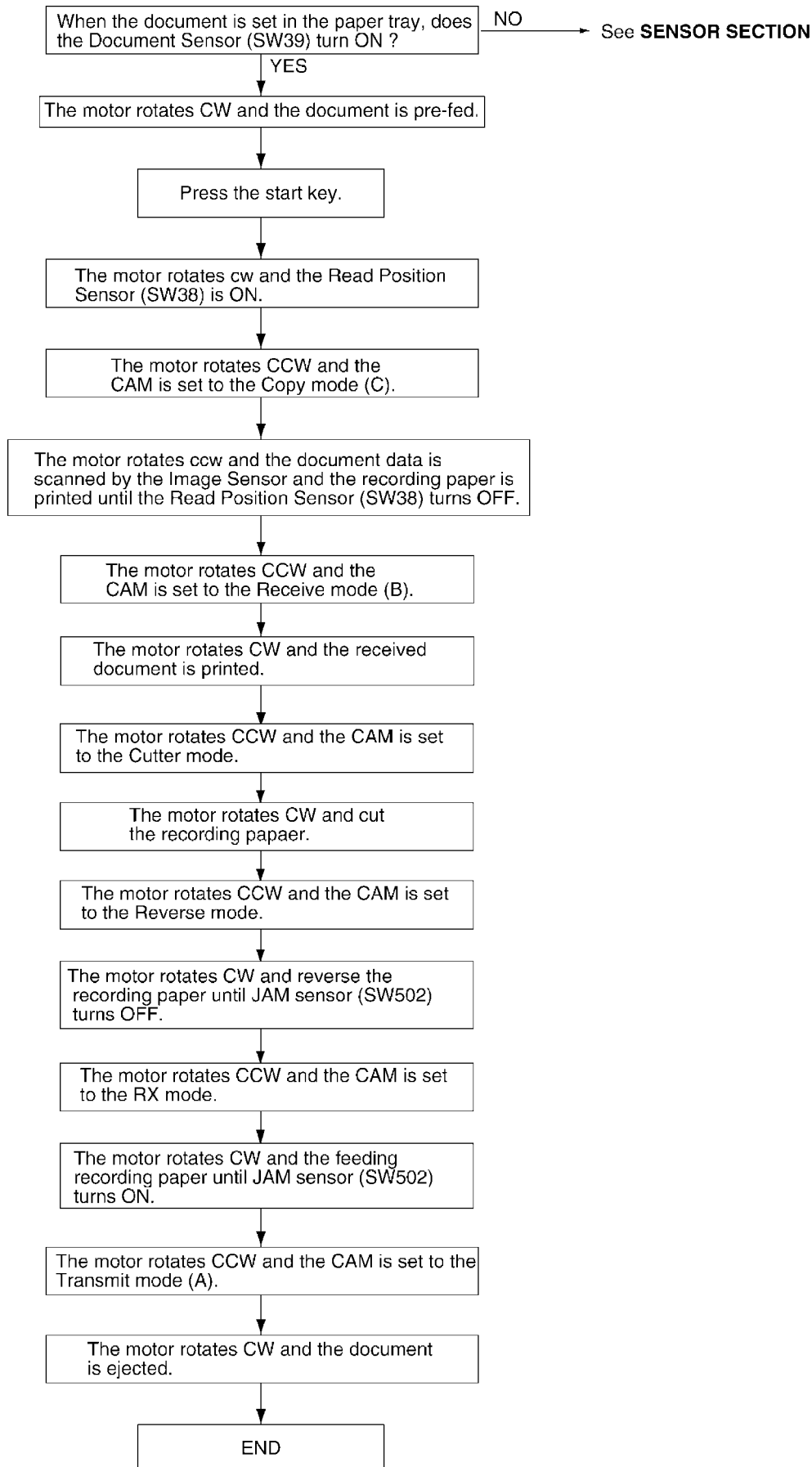
### 8.4.6.3.3. PRINTING



**Note:**

See **SENSORS AND SWITCHES** (P.149).

### 8.4.6.3.4. COPYING



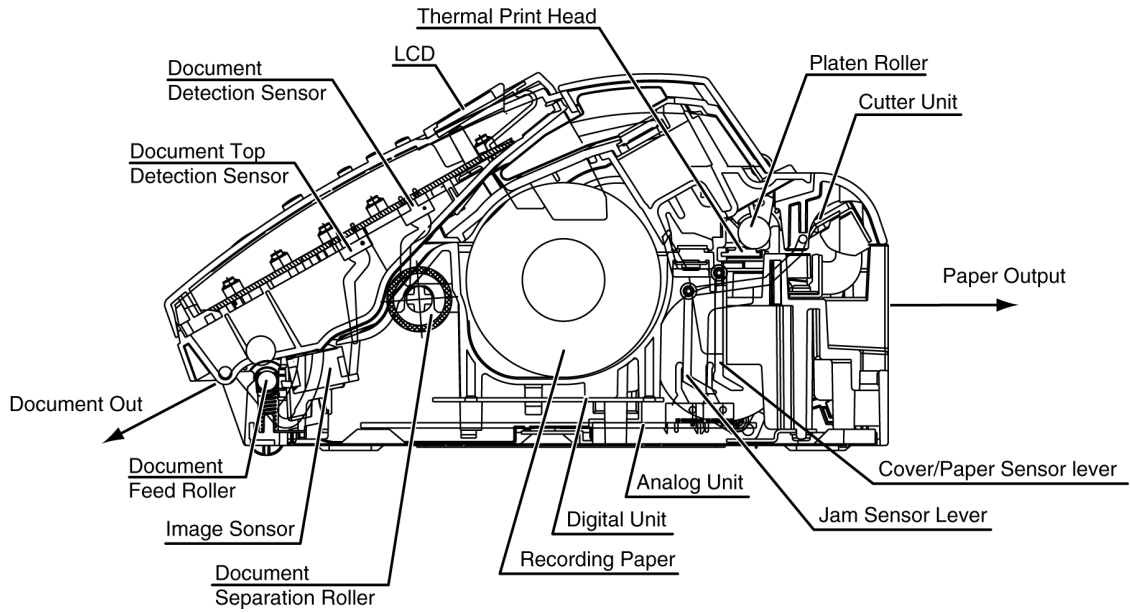
#### CROSS REFERENCE:

**SENSOR SECTION (P.105)**

## 8.5. SENSORS AND SWITCHES

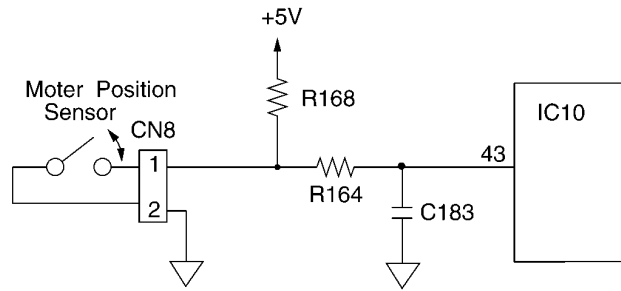
All of the sensors and switches are shown below.

Sensor Circuit Location	Sensor	Sensor or Switch Name	Error Message
DIGITAL	CN8	Motor Position	[CALL SERVICE 2]
	CN9	Cutter Position	[PAPER JAMED]
ANALOG	SW501	Cover Open and Paper set	[CHECK COVER] and [OUT OF PAPER]
	SW500	Hook SW	---
	SW502	JAM set	[PAPER JAMED]
Operation Panel	SW38	Document Read Position	[REMOVE DOCUMENT]
	SW39	Document set	[CHECK DOCUMENT]



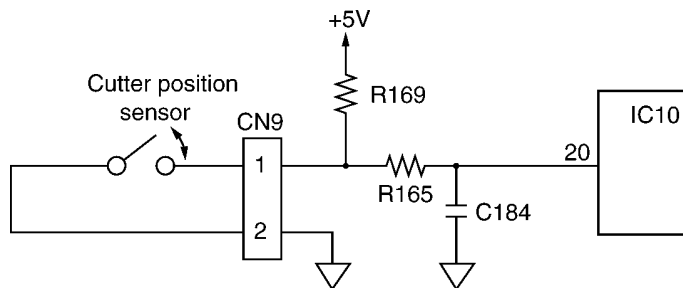
### 8.5.1. MOTOR POSITION SENSOR

This sensor is a detection switch for recording the position of the CAM.



Digital Board	
	Signal (IC10-43 Pin)
Home position	Low level
Other	High level

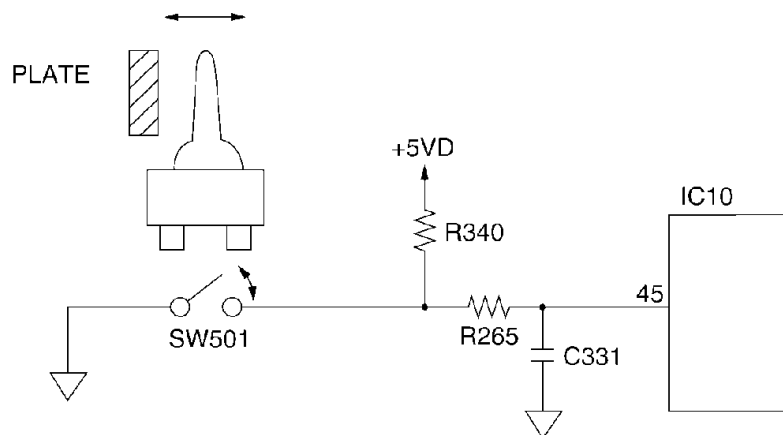
### 8.5.2. CUTTER POSITION SENSOR



Digital Board	
	Signal (IC10-20 Pin)
Home position	Low level
Other	High level

### 8.5.3. RECORDING PAPER SENSOR (SW501)

When there is no recording paper, the plate is separated from the switch lever and the switch turns off. Pin 45 of IC10 becomes a high level. When there is recording paper, the plate pushes the switch lever and the switch turns ON. Pin 45 of IC10 becomes a low level.

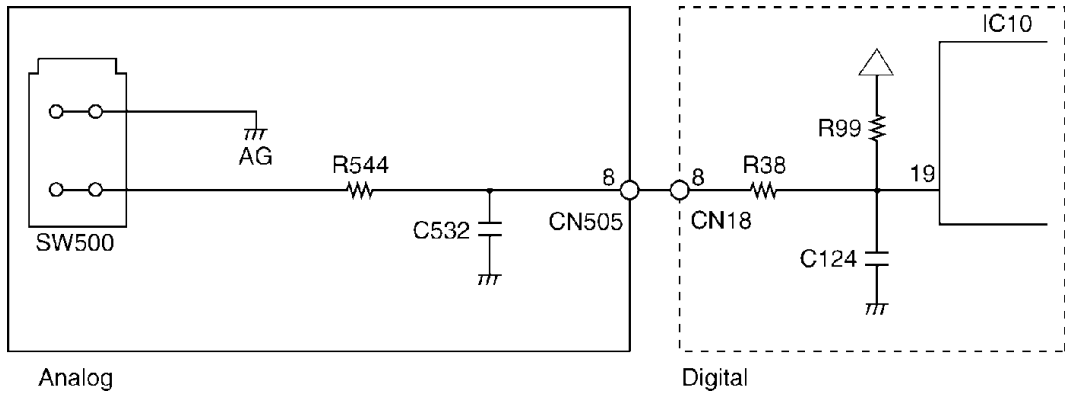


Analog Board	
	Signal (IC10-45 Pin)
Paper	Low level
No paper	High level

### 8.5.4. HOOK SWITCH (SW500)

When the handset is lifted, the switch turns ON, and the signal at pin 19 of IC10 becomes low.

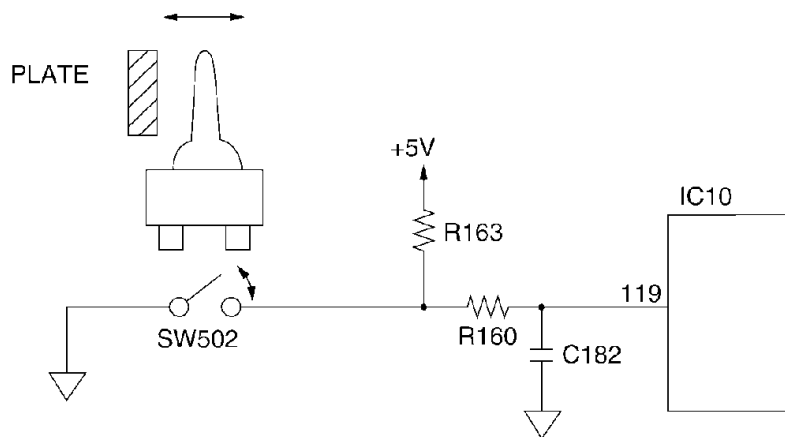
When the handset is returned, the switch turns OFF, and the signal at pin 19 of IC10 becomes high.



Digital Board		
	SW	Signal
ON-Hook	OFF	High level (IC10-19 pin)
OFF-Hook	ON	Low level

### 8.5.5. JAM SENSOR (SW502)

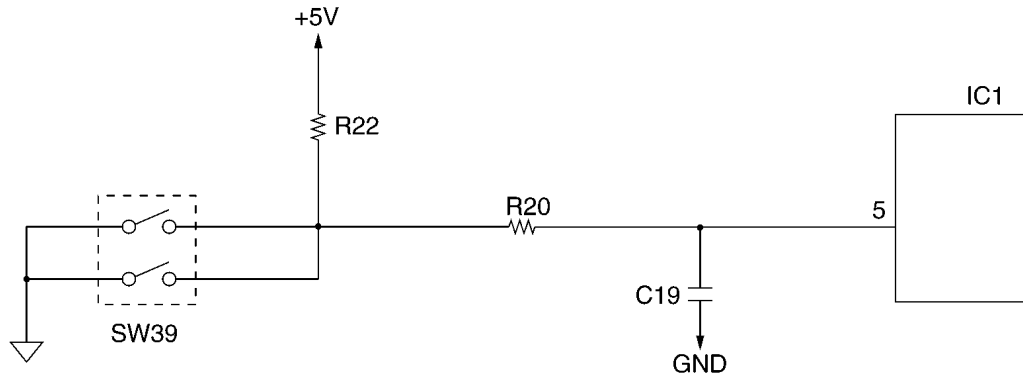
The JAM sensor is a detection switch for determining whether the recording paper edge is in the correct position or not. If the recording paper cannot be detected correctly at the JAM sensor position even when recording paper is present, then JAM is displayed. If the recording paper is at the sensor position, then the switch turns on the IC10-119pin switches to a high level.



Analog Board	
	Signal (IC10-119 Pin)
Paper	Low level
No paper	High level

### 8.5.6. DOCUMENT TOP SW (SW39)

When a document is brought to the read position, the SW becomes ON, and the input signal of IC1-5 pin (Operation) becomes a low level. When there is no document at the read position, the SW becomes OFF, and the input signal of IC1-5 pin (Operation) becomes a high level.

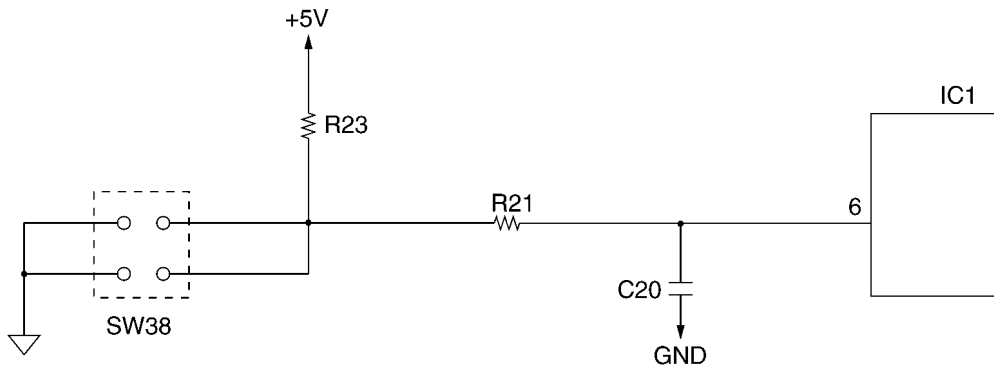


Operation Board

	Signal (IC1-5 pin)
Out of the Read Position	High level
At the Read Position	Low level

### 8.5.7. DOCUMENT SET SW (SW1)

When a document is set, the SW becomes ON, and input signal of IC1-6 pin (Operation) becomes a low level. When there is no document, the SW becomes OFF, and the input signal of IC1-6 pin (Operation) becomes a high level.



Operation Board

	Signal (IC1-6 pin)
No document	High level
Set document	Low level



## 8.6. MODEM SECTION

### 8.6.1. FUNCTION

The unit uses a 1 chip modem (IC3) 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 analogue 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. This 1 chip modem (IC3) has hardware which sends and detects all of the necessary signals for FAX communication.

It can be controlled by writing commands from the CPU (IC10: inside ASIC) to the register in the modem (IC3).

This modem (IC3) 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 CCITT, 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.

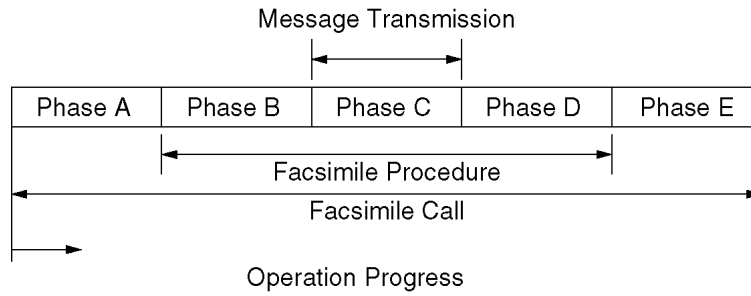
- Group IV (G4)

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

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

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 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, 7.7l/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.

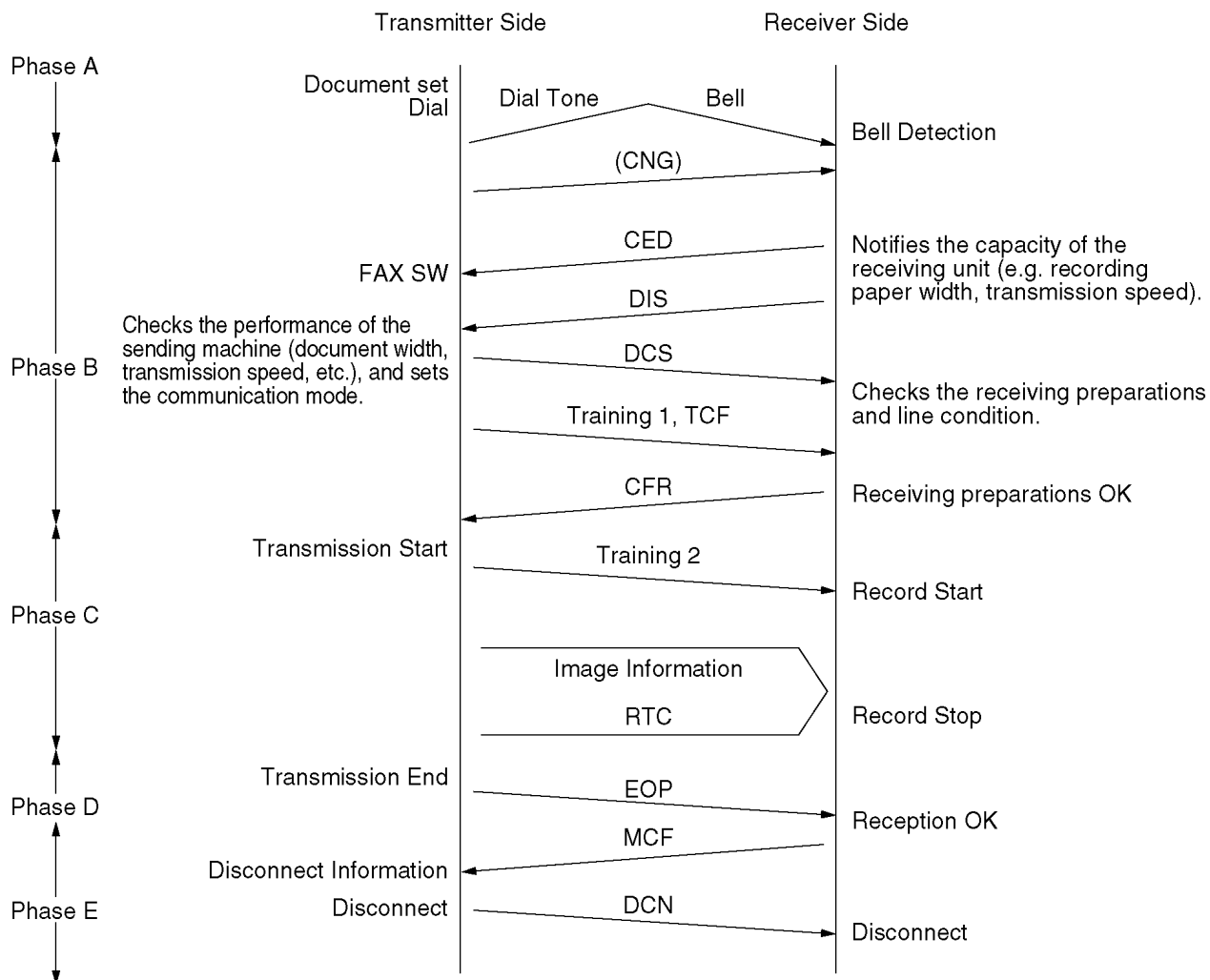
**6. Explanation of Communication and Compression Technology**

**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.	

Bit No.	DIS/DTC	DCS
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	
10	Receiver --- T.4 operation	Receiver --- T.4 operation
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	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

Bit No.	DIS/DTC	DCS
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
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.

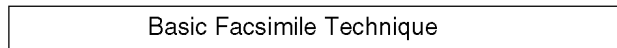
Note 3 - Standard facsimile units conforming to T.4 must have the following capability: Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	_____	A fixed pattern is transmitted to the receiving side at a speed (2400 bps to 9600 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.

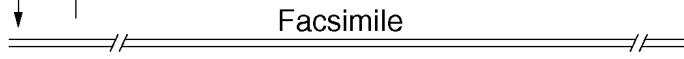
**b. Redundancy Compression Process Coding Mode**

This unit uses one-dimensional MH format.

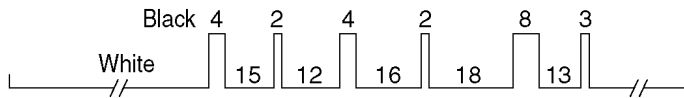
(a) Document



(b) Part of document



(c) Run length and image signals equivalent to (b)



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

(d) Codification of (c) according to MH formula

001101111101010 (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)

## 8.6.2. MODEM CIRCUIT OPERATION

The modem (IC3) has all the hardware satisfying the CCITT standards mentioned previously.

When the ASIC IC10 (61) is brought to a low level, the modem (IC3) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC10) ADR0-ADR4. The commands are written through the data bus, and all the processing is controlled by the ASIC (IC10) according to CCITT procedures. The INT signal dispatched from IRQ (pins 108 of IC3) to ASIC (IC10) when the transmission data is accepted and the received data is demodulated, the ASIC (IC10) implements post processing. This modem (IC3) has an automatic application equalizer.

With training signal 1 or 2 during G3 reception, it can automatically establish the optimum equalizer. The modem (IC505) operates using the 32.256 MHz clock (X1).

### 1. Facsimile Transmission

The digital image data on the data bus is modulated in the modem (IC3), and sent from pin 69 via Analogue SW IC509, amplifier IC102 and the NCU section to the telephone line.

Refer to **Check Sheet for Signal Route**(P.99).

### 2. Facsimile Reception

The analogue image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC3). The signals that enter pin 60 of the modem (IC3) are demodulated in the board to digital image signals, then placed on the data bus.

In this case, the image signals from the telephone line are transmitted serially. Hence, they are placed on the bus in 8 bit units. 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 about 3 kHz and maintain a constant receiving sensitivity. It can be set in the service mode.

Refer to **Check Sheet for Signal Route**(P.99).

### 3. DTMF Transmission (Monitor tone)

The DTMF signal generated in the modem (IC3) is output from pin 69, and is then sent to the circuit on the same route as used for facsimile transmission.

Refer to **Check Sheet for Signal Route**(P.99).

#### (DTMF Monitor Tone)

Refer to **Check Sheet for Signal Route**(P.99).

### 4. Call Tone Transmission

This is the call signal which is generated in the ASIC (IC10) and sent to the speaker.

Refer to **Check Sheet for Signal Route**(P.99).

### 5. Busy/Dial Tone Detection

The path is the same as FAX receiving. When it is detected, the carrier detect bit of the resistor in the modem (IC3) becomes 1, and this status is monitored by the ASIC (IC10).

### 6. Caller ID Detection

The caller ID signal which is received from the telephone line/passes through IC500 pin (6-7). And it enters pin 101 of the BBIC (IC4).

## 8.7. NCU SECTION

### 8.7.1. GENERAL

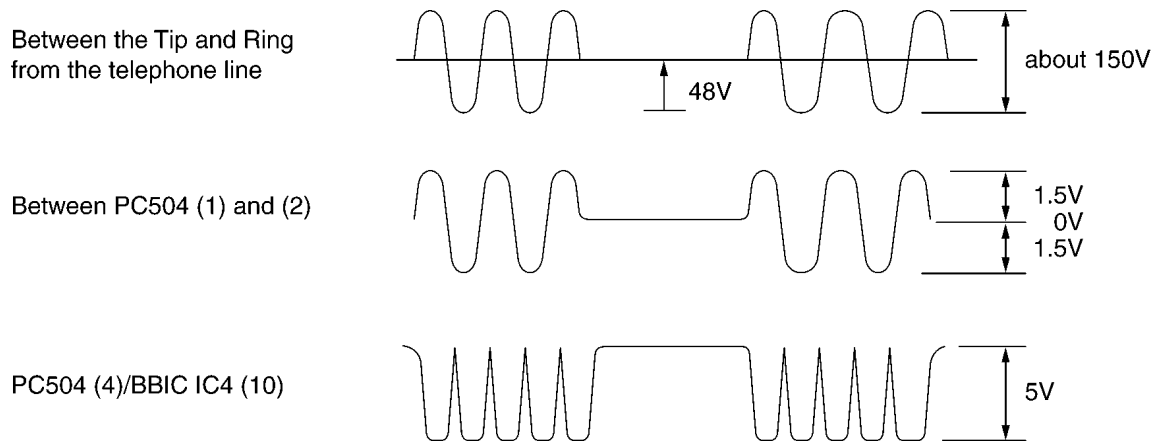
It is composed of bell detection circuit, pulse dial circuit, line amplifier, sidetone circuits.

### 8.7.2. BELL DETECTION CIRCUIT

#### 1. Circuit Operation

The signal waveform for each point is indicated below. The signal (low level section) input to pin 10 of BBIC IC4 on the digital board.

TEL LINE → PC504 (1, 2 → 4) → IC4 (10)



### 8.7.3. ON/OFF HOOK CIRCUIT

Normally (ON-HOOK condition), LINE RELAY (RL500) is OFF. While OFF-HOOK, RL500 turns ON. This LINE RELAY is controlled by pin 83 of IC4 through the Q505.

#### ON-HOOK:

IC4 (83) Low Level → Q505 OFF → RL500 OFF

#### OFF-HOOK:

IC4 (83) High Level → Q505 ON → RL500 ON

### 8.7.4. PULSE DIAL CIRCUIT

#### Make state:

IC4 (83) High Level → Q505 ON → RL500 ON

#### Break state:

IC4 (83) Low Level → Q505 OFF → RL500 OFF



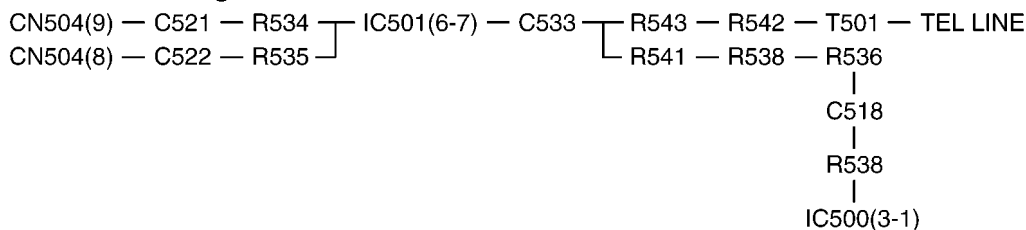
## 8.7.5. LINE AMPLIFIER AND SIDE TONE CIRCUIT

### 1. Circuit Operation

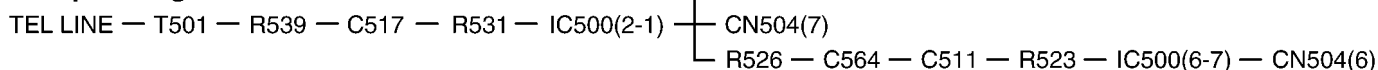
The reception signal output from the line transformer T101 is input to pin (2) of IC101 via C129, R115 and then the signal is amplified at pin (1) of IC101 and sent to the reception system at through the LPF.

### Side Tone Circuit

#### Transmission Signal:



#### Reception Signal:



## 8.7.6. Calling Line Identification Circuit

### 1. Function

This unit is compatible with the Caller ID service offered by your local telephone company. To use this feature, you must subscribe to a Caller ID service. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1300 Hz sine wave, and data 1 a 2100 Hz sine wave.

There are two type of the message format which can be received:i.e.the single data message format and multiple data message format.

The multiple data format allows to transmit the name and data code information in addition to the time and telephone number data.

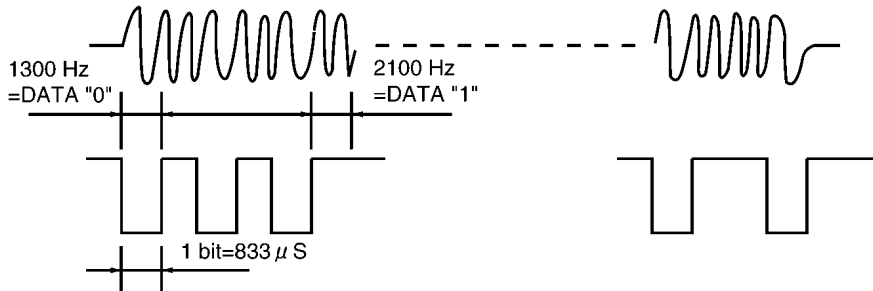
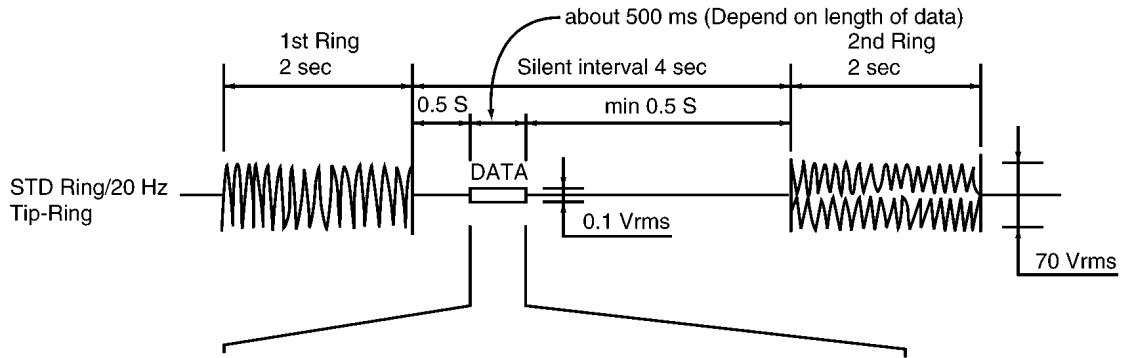
When there is multiple data in the unit, the name or telephone number are displayed.

### 2. Circuit Operation:

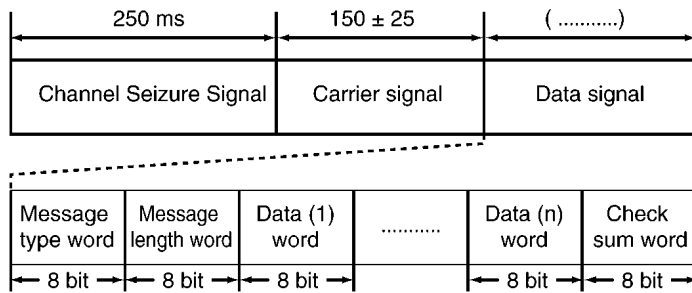
The caller ID signal input from TEL LINE is processed with MODEM (IC505).

Refer to **Check Sheet for Signal Route** (P.99) for the route of caller ID signal.

### Timing Chart

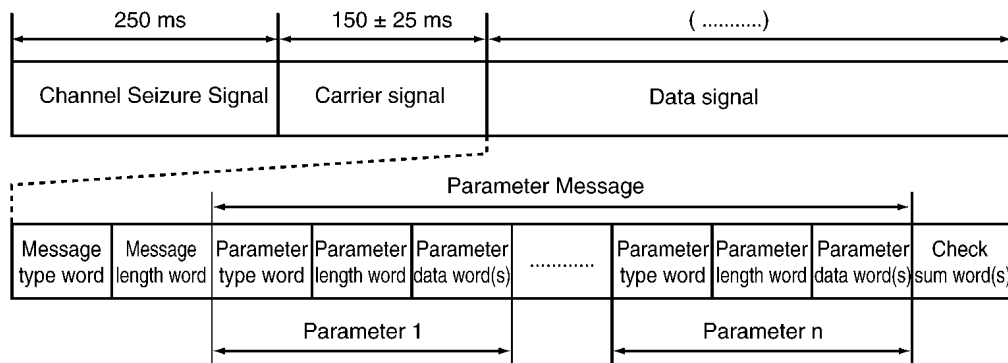


• **Single data message**



- 1 word = All 8 bit data
- Message Type Word = Fixed value "00000100"
- Message Length Word = number of the data word
- Data word = The data value (month, day, hour, minute, telephone number)

· Multiple data message



- 1 word = All 8 bit data
- Message Type = Fixed value "10000000"
- Message Length Word = number of the Parameter Message word
- Parameter Type Word = Kind of data (ex. the time, phone number)
- Parameter Length Word = number of the Parameter data word
- Parameter Word (s) = the data value

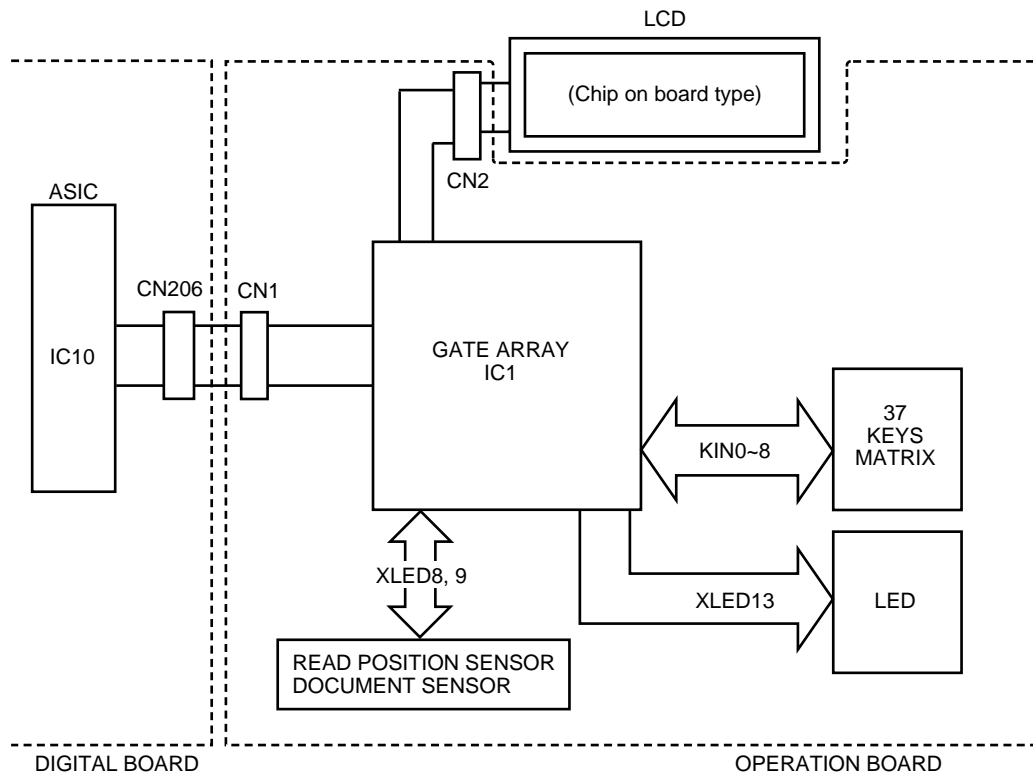
### 8.8. Transmitter/Receiver (Cordless)

Base Unit and Cordless Handset mainly consist of RF Module and DECT BBIC.

Base Unit and Cordless Handset transmit/receive voice signal and data signal through the antenna on carrier frequency.

## 8.9. 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 (IC1) and ASIC (IC10: on the DIGITAL BOARD). The key matrix table is shown below.



KX-FC971CX-S: OPERATION BOARD BLOCK DIAGRAM

### Key Matrix

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	KIN7
KSL0	FAX/START (SW1)	INTERCOM (SW26)	# (SW16)	0 (SW11)	* (SW6)	ERASE (SW36)	SKEY 6 (SW31)	NAVI LEFT (SW21)
KSL1	COPY (SW2)	SKEY 3 (SW27)	MONITOR (SW17)	8 (SW12)	7 (SW7)	PLAYBACK (SW37)	MENU (SW32)	NAVI DOWN (SW22)
KSL2	STOP (SW3)	SKEY 2 (SW28)	PAUSE (SW18)	9 (SW13)	4 (SW8)	RECORD (SW29)	AUTO ANSWER (SW33)	NAVI UP (SW23)
KSL3	1 (SW4)	/	FLASH (SW19)	3 (SW14)	2 (SW9)	/	SKEY 5 (SW34)	NAVI RIGHT (SW24)
KSL4	CALLER ID (SW5)	SKEY 1 (SW30)	REDIAL (SW20)	6 (SW15)	5 (SW10)	/	SKEY 4 (SW35)	NAVI CENTER (SW25)

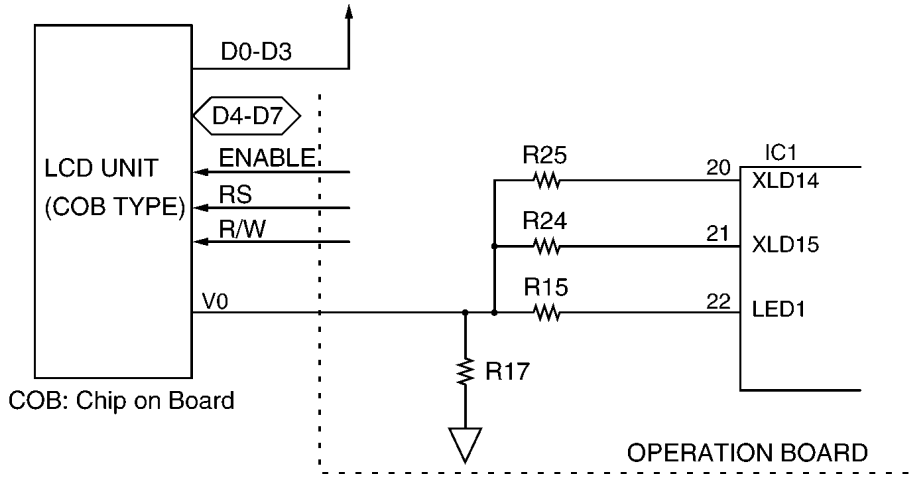
### LED

	XLED13
	LED1 PLAY MESSAGES

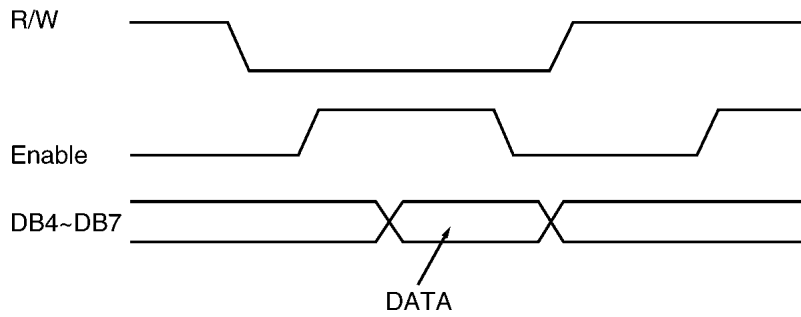
### 8.10. LCD SECTION

The Gate Array (IC301) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive. R303, R305, R306 and R307 are density control resistors. Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC301).

#### Circuit Diagram



#### Timing Chart

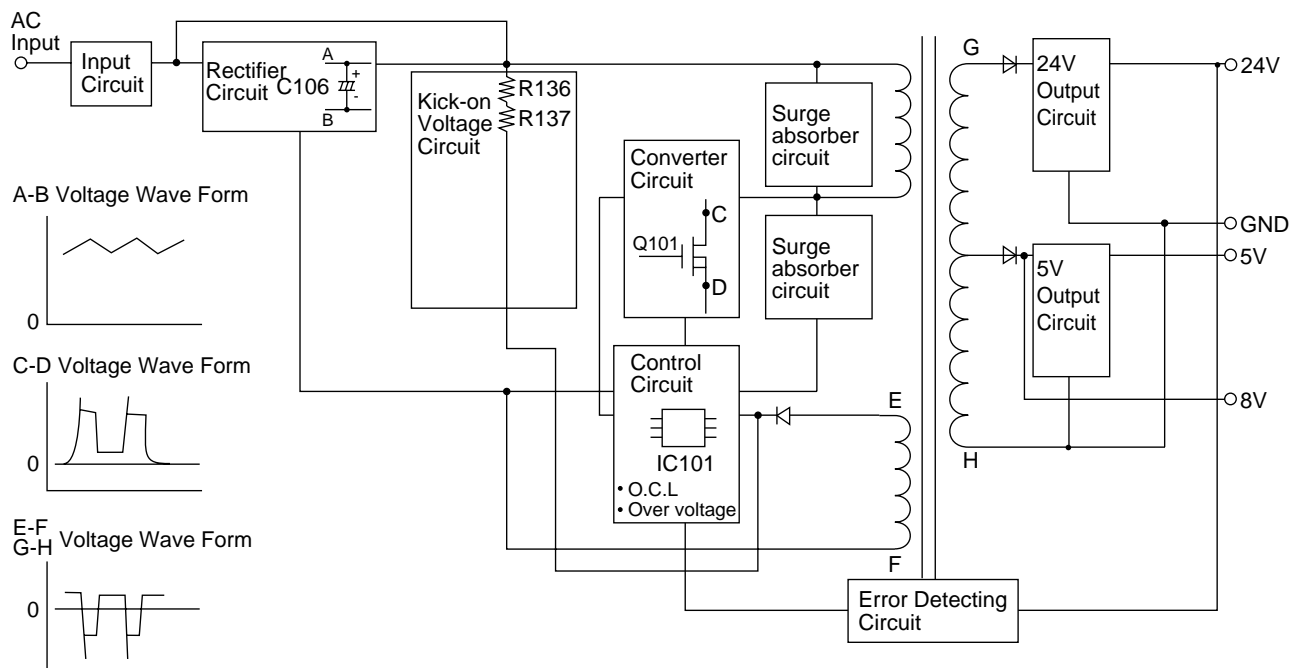


Display mode	Density	Normal	Dark
2 lines (X1.0)	LED1 (IC1-22pin)	H	L
	LED15 (IC1-21pin)	L	L
	LED14 (IC1-20pin)	Hi-Z	L
X1.5	LED1	H	H
	LED15	Hi-Z	L
	LED14	Hi-Z	Hi-Z

## 8.11. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.

**Block Diagram**



### [Input Circuit]

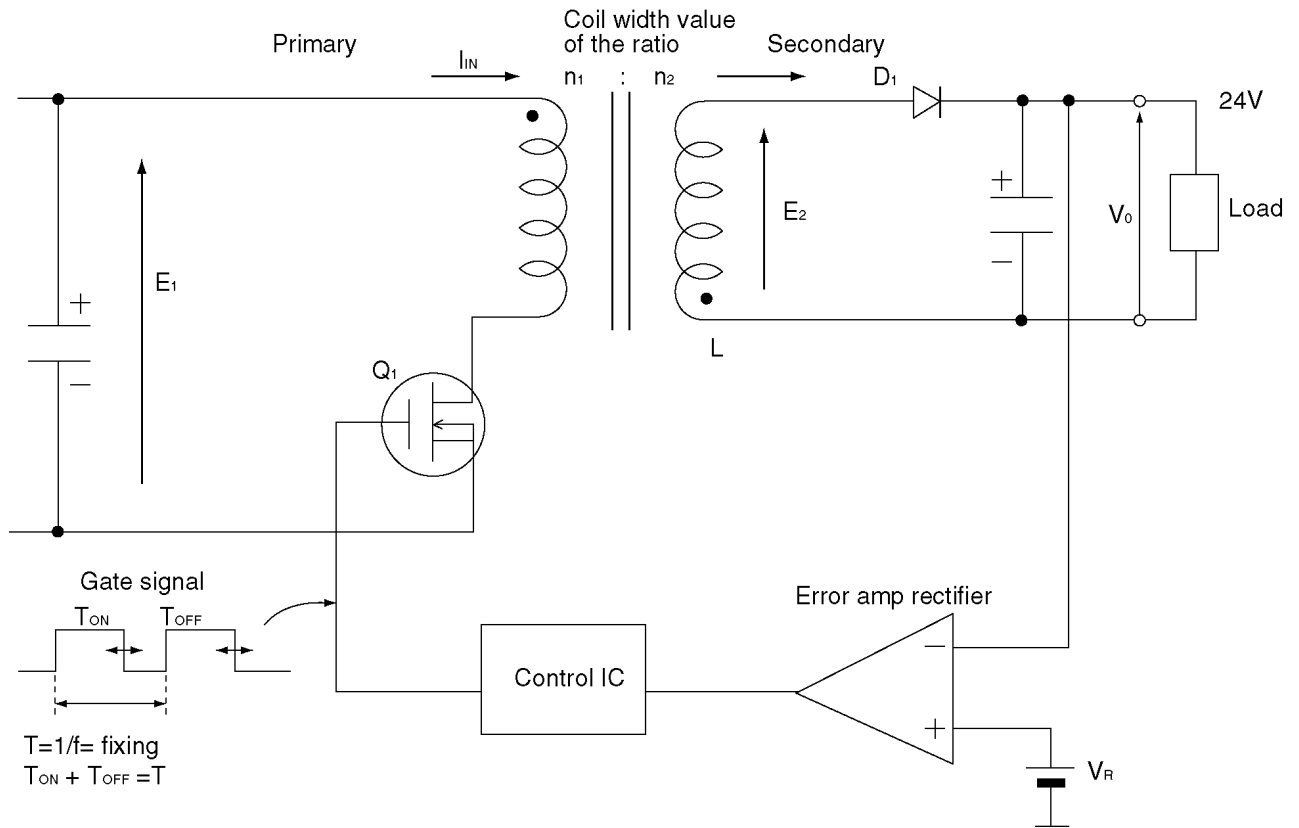
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

### [Rectifier Circuit]

The input current is rectified by D101, D102, D103 and 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.

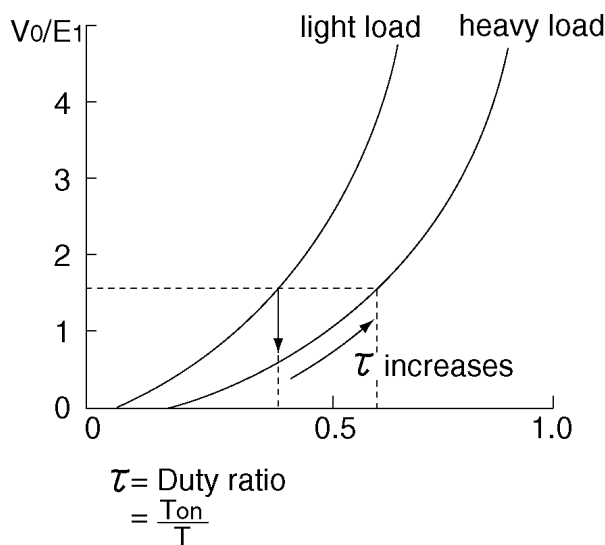
When Q<sub>1</sub> is ON, the energy is charged in the transfer primary coil according to E<sub>1</sub>. When Q<sub>1</sub> is OFF, the energy is output from the secondary transfer as follows.

L → D<sub>1</sub> → Load → L

Then the power is supplied to the Load. When Q<sub>1</sub> 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<sub>ON</sub> is controlled, stabilization occurs. Also, when the current load becomes too large, in order to decrease the voltage output, the increase in τ is controlled and the output voltage is stabilized.

Therefore, basically the timing: Ton/Toff of Q1 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.101)**.



## 8.12. CORDLESS SECTION (BASE UNIT)

### 8.12.1. Description

#### 8.12.1.1. Frequency

The frequency range of 2400MHz~2483.5MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to **FREQUENCY TABLE** (P.122).

#### 8.12.1.2. FHSS (Frequency Hopping Spread Spectrum)

This telephone is using an IC chip which has similar specification to WDCT (World Digital Cordless Telephone) and is the cordless telephone system that can use multiple portable unit simultaneously.

The explanation of this system is mentioned below.

This system uses a Time Division Multiple Access/Time Division Duplex (**TDMA/TDD**) scheme:

transmitting and receiving frequencies of the base unit and cordless handset are shared in the same

frequency. The construction of RX/TX frequency data is shown below. It consists

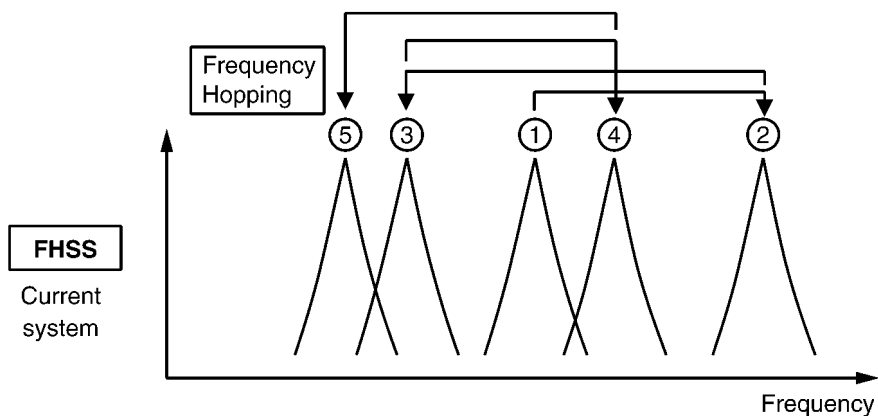
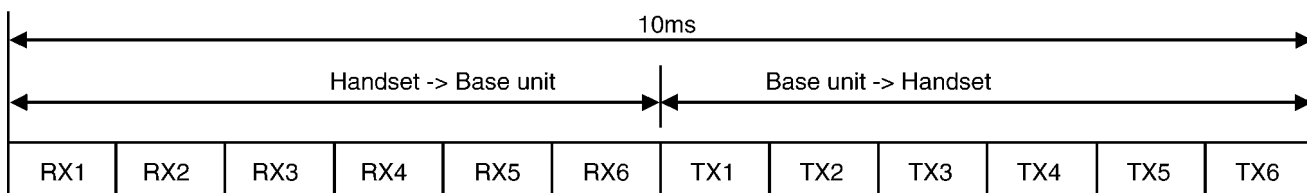
of 6 slots from the base unit to the cordless handset, and 6 slots from the cordless handset to the

base unit, total 12 slots in 10ms. By this slot system, simultaneous air link and communication between 2 cordless handsets and

the base unit can be realized. The spread spectrum modulation techniques in this telephone is FHSS method.

**FHSS** makes spectrum spread by changing channel every 10ms according to

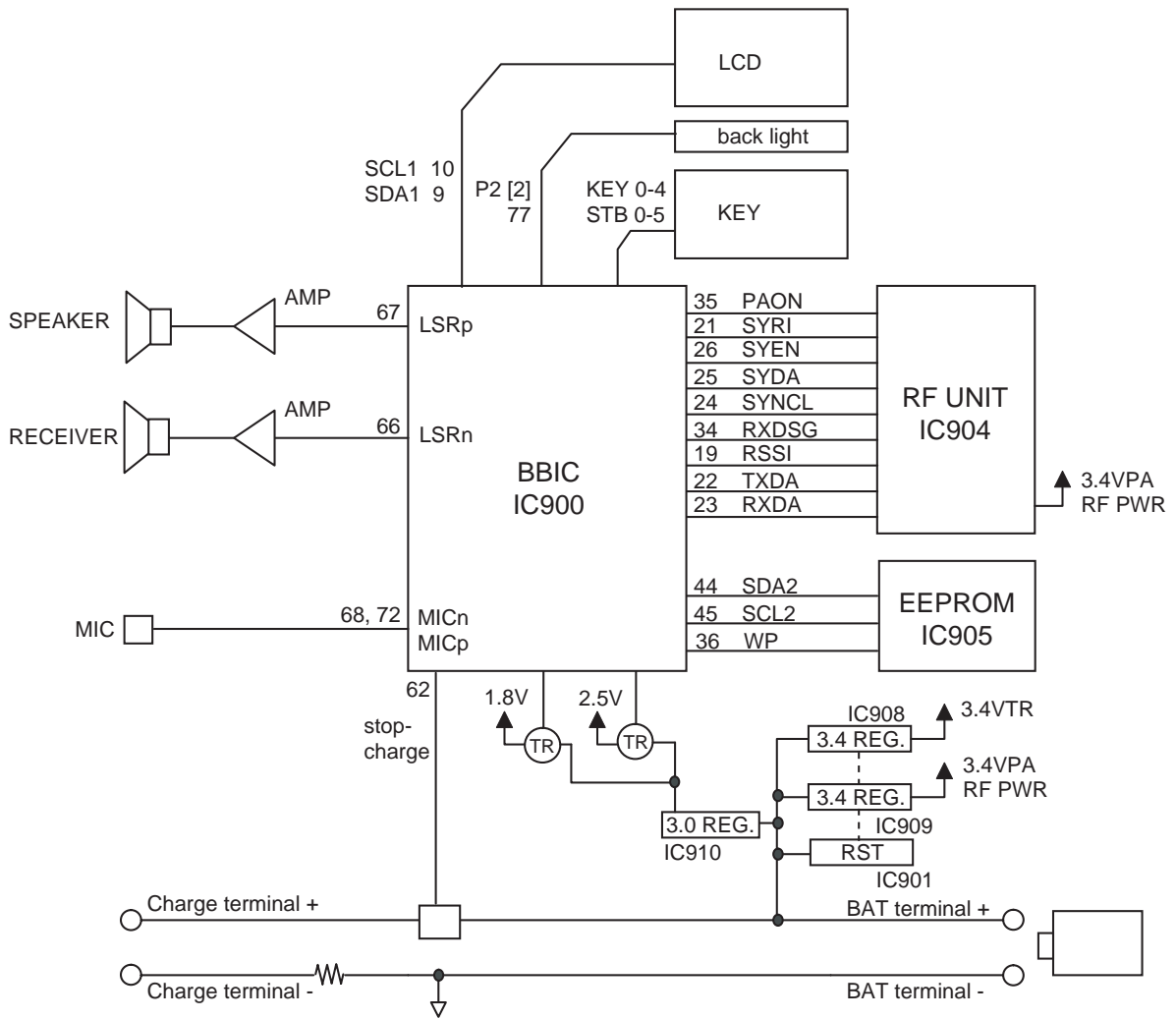
Hopping table. Also the purpose to make spectrum spread is to reduce power density per time and per band.





## 8.13. CORDLESS HANDSET

### 8.13.1. BLOCK DIAGRAM



### 8.13.2. Outline

Cordless Handset consists of the following ICs as shown in **BLOCK DIAGRAM** (P.171).

- BBIC (Base Band IC): IC900
  - FHSS
  - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD)
- RF Module: IC904 (2.4GHz FHSS)
  - Tranceiver (TX/RX) including PLL, LNA, LOGIC
  - Power amplifier for transmission
- AMP: IC903
  - Single OP\_AMP for SP
- AMP: IC907
  - single OP\_AMP for RECEIVER
- EEPROM: IC905
  - Temporary operating parameters (for RF, etc.)

### 8.13.3. Power Supply Circuit/Reset Circuit

#### Circuit Operation:

When power on the Cordless Handset, the voltage is as follows;

BATTERY(2.2V ~ 2.6V: J1) → L1, D1, Q2 (1.8V) → Q3 (2.7V) → Q1 (4.0V)

The Reset signal generates IC1 (78) and 1.8V.

### 8.13.4. Charge Circuit

#### Circuit Operation:

When charging the cordless handset on the Base Unit, the charge current is approx 100mA.

In this way, the BBIC on Cordless Handset detects the fact that the battery is charged.

The charge current is controlled by switching Q5 of Cordless Handset.

### 8.13.5. Battery Low/Power Down Detector

#### Circuit Operation:

"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery.

The detected voltage is as follows;

- Battery Low

Battery voltage:  $V(\text{Batt}) = 3.45\text{V}$

The BBIC detects this level and "■" starts flashing.

- Power Down

Battery voltage:  $V(\text{Batt}) = 3.0\text{V}$

The BBIC detects this level and power down.

### 8.13.6. Speakerphone and Headset Jack

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm. IC2 is used to switch off the telephone loudspeaker and is used to amplify the signal to drive the hands-free loudspeaker. They are selected using the SP\_AMP line from pin 70 of the BBIC. 2.5mm headset jack is also available.

## 8.14. CPU DATA (BASE UNIT)

### 8.14.1. IC2 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
1	VDDIO	-	VDDIO	-	-
2	VSS	-	VSS	-	-
3	AD8	D.O	AD8	0	O-Hi
4	AD9	D.O	AD9	0	O-Hi
5	AD10	D.O	AD10	0	O-Hi
6	AD11	D.O	AD11	0	O-Hi
7	AD12	D.O	AD12	0	O-Hi
8	AD13	D.O	AD13	0	O-Hi
9	AD14	D.O	AD14	0	O-Hi
10	P3[7]/PD7	D.O	P3[7]	0	O-Hi-Z
11	P3[1]/PD1	D.O	P3[1]	0	O-Hi-Z
12	P3[5]/PD5	D.O	ANT1	0	O-Hi-Z
13	P3[4]/PD4	D.O	ANT2	0	O-Hi-Z
14	P3[3]/PD3	D.O	PAON	0	O-Hi-Z
15	P3[2]/PD2	D.O	RXDSG	0	O-Hi-Z
16	VDD	-	VDD	-	-
17	VSS	-	VSS	-	-
18	RFCLK	D.O	RFCLK	0	O-Low
19	VDDRF	-	VDDRF	-	-
20	VSSRF	-	VSSRF	-	-
21	Xtal1	A.I	Xtal1	I	I
22	CAP	A.I	CAP	I	I
23	AVS	-	AVS	-	-
24	AVD	-	AVD	-	-
25	RSSI	A.I	RSSI	I	I
26	RDI	A.I	RXDA	I	I
27	CMPREF	A.I	CMPREF	I	I
28	TDO	A.O	TXDA	0	O-Hi-Z
29	AD15	D.O	AD15	0	O-Hi
30	AD16	D.O	AD16	0	O-Hi
31	AD17	D.O	AD17	0	O-Hi
32	AD18	D.O	AD18	0	O-Hi
33	AD19	D.O	AD19	0	O-Hi
34	AD20	D.O	AD20	0	O-Hi
35	AD21	D.O	AD21	0	O-Hi
36	AD22	D.O	AD22	0	O-Hi
37	AD23	D.O	AD23	0	O-Hi
38	LE	D.O	LE	0	O-Low
39	SO	D.O	SO	0	O-Low
40	SK	D.O	SK	0	O-Hi-Z
41	DAC/ADC2	A.I	ADC2	I	I
42	P3[6]/PD6	D.O	CE	0	O-Hi-Z
43	RDN	D.O	RDN	0	O-Hi
44	WRN	D.O	WRN	0	O-Hi
45	MI/READY	D.O	MI/READY	0	I
46	SCLK	D.O	SCLK	0	O-Hi
47	UTX/P0[0]	D.O	UTX	0	I
48	URX/P0[1]	D.I	URX	I	I
49	JTIO/P0[2]	D.I/O	JTIO	I/O	I
50	PCM_FSC1/P0[3]	D.I	P0[3]	I	I
51	PCM_FSC0/P0[4]	D.I	P0[4]	I	I
52	PCM_CLK/P0[5]	D.I	P0[5]	I	I
53	PCM_DOUT/P0[6]	D.I	P0[6]	I	I
54	PCM_DIN/P0[7]	D.I	P0[7]	I	I
55	VDDIO	-	VDDIO	-	-
56	VSS	-	VSS	-	-
57	INT0n/P1[0]	D.O	ALE	0	I
58	INT1n/P1[1]	D.O	CLE	0	I
59	ACS1/INT2n/P1[2]	D.O	ACS1	0	I
60	ACS0	D.O	ACS0	0	O-Hi
61	ACS2/INT3n/P1[3]	D.O	ACS2	0	I
62	INT4n/P1[4]	D.I	HOOK_SW	I	I
63	INT5n/P1[5]	D.I	R/_B	I	O-Hi

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
64	BE1n	D.O	BE1n	O	O-Hi
65	BE0n	D.O	BE0n	O	O-Hi
66	SCL2/P3[0]	D.O	SCL2	O	O-Hi-Z
67	SDA2	D.I/O	SDA2	I/O	I
68	DAB0	D.I/O	DAB0	I/O	I
69	DAB8	D.I/O	DAB8	I/O	I
70	DAB1	D.I/O	DAB1	I/O	I
71	DAB9	D.I/O	DAB9	I/O	I
72	DAB2	D.I/O	DAB2	I/O	I
73	DAB10	D.I/O	DAB10	I/O	I
74	DAB3	D.I/O	DAB3	I/O	I
75	DAB11	D.I/O	DAB11	I/O	I
76	VSS	-	VSS	-	-
77	VDD	-	VDD	-	-
78	VDDIO	-	VDDIO	-	-
79	P2[0]/PWM0	D.O	P2[0]	O	I
80	P2[1]/PWM1	D.O	PULSE_CTRL	O	I
81	P2[2]/ADC0	A.I	ADC0	I	I
82	P2[3]/ADC1	A.I	ADC1	I	I
83	P2[4]/SCL1	D.O	SCL1	O	I
84	P2[5]/SDA1	D.O	SDA1	O	I
85	DAB4	D.I/O	DAB4	I/O	I
86	DAB12	D.I/O	DAB12	I/O	I
87	DAB5	D.I/O	DAB5	I/O	I
88	DAB13	D.I/O	DAB13	I/O	I
89	DAB6	D.I/O	DAB6	I/O	I
90	DAB14	D.I/O	DAB14	I/O	I
91	DAB7	D.I/O	DAB7	I/O	I
92	DAB15	D.I/O	DAB15	I/O	I
93	TM	D.I	TM	I	O-Low
94	P2[7]/SPIDO	D.O	P2[7]	O	O-Hi-Z
95	P1[6]/PON	A.I	PON	I	I
96	P1[7]/CHARGE	D.I	P1[7]	I	I
97	P2[6]/stop_charge	D.O	P2[6]	O	O-Low
98	VBAT3/RINGING	A.I	RINGING	I	I
99	LINEREF	A.O	LINEREF	O	-
100	LINEOUT	A.O	LINEOUT	O	-
101	LINE_IN+	A.I	LINE_IN+	I	-
102	LINE_IN-	A.I	LINE_IN-	I	-
103	LDO1_Senes	A.I	LDO1_Senes	I	I
104	LDO1_CTRL	A.O	LDO1_CTRL	O	O-Hi
105	LDO2_CTRL	A.O	LDO2_CTRL	O	O-Low
106	VBAT2	A.I	VBAT2	I	I
107	CIDIN+	A.I	CIDIN+	I	I
108	AVS2	-	AVS2	-	-
109	AVD2	-	AVD2	-	-
110	LSR+/REF	A.O	LSR+	O	O
111	LSR-/REF	A.O	LSR-	O	O
112	CIDIN-	A.I	CIDIN-	I	O
113	CIDOUT	A.O	CIDOUT	O	O
114	MIC-	A.I	MIC-	I	I
115	VREF-	A.O	VREF-	O	O
116	VBUF	A.O	VBUF	O	O
117	AGND	A.O	AGND	O	O
118	MIC+	A.I	MIC+	I	I
119	VREF+	A.O	VREF+	O	I
120	RSTn	A.I	RSTn	I	I
121	AD0/EXT_MEMORY	D.I	EXT_MEMORY	I	I
122	AD1	D.O	AD1	O	O-Hi
123	AD2	D.O	AD2	O	O-Hi
124	AD3	D.O	AD3	O	O-Hi
125	AD4	D.O	AD4	O	O-Hi
126	AD5	D.O	AD5	O	O-Hi
127	AD6	D.O	AD6	O	O-Hi
128	AD7	D.O	AD7	O	O-Hi

## 8.15. CPU DATA (CORDLESS HANDSET)

### 8.15.1. IC1 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
1	P3_7/PD7	D,O	LCD_A0	O	O
2	P3_1/PD1	D,O	RXDSG	O	O
3	P3_5/PD5	D,O	SPAMP CD	O	O
4	P3_4/PD4	D,I/O	MIDI_ERQ	I	O
5	P3_3/PD3	D,O	PAON	O	O
6	P3_2/PD2	D,O	PSEL	O	O
7	VDD	-	-	-	-
8	VSS	-	-	-	-
9	RFCLK	D,O	SYRI	O	O
10	VDDRF	-	-	-	-
11	VSSRF	-	-	-	-
12	Xtal1	A,I	←	I	O
13	CAP	A,I	←	I	O
14	AVS	-	-	-	-
15	AVD	-	-	-	-
16	RSSI	A,I	RSSI	I	O
17	RDI	D,I	RXDA	I	O
18	CMPREF	A,I	NC	OPEN	O
19	TDO	A,O	TXDA	A,O	O
20	LE	D,O	SYEN	D,O	O
21	SO	D,O	SYDA	D,O	O
22	SK	D,O	SYCL	D,O	O
23	DAC/ADC2	D,I	JACK DETECTION	I	O
24	P3_6/PD6	D,I/O	MIDI_SRQ	I	O
25	UTX/P0_0	D,O	UTX	O	O
26	URX/P0_1	D,I	URX	I	O
27	JTIO/P0_2	D,I	JTAG	I	O
28	PCM_FSC1/P0_3	D,I	COL1	I	O
29	PCM_FSC0/P0_4	D,I	COL2	I	O
30	PCM_CLK/P0_5	D,I	COL3	I	O
31	PCM_DOUT/P0_6	D,I	COL4	I	O
32	PCM_DIN/P0_7	D,I	COL5	I	O
33	VDDIO	-	-	-	-
34	VSS	-	-	-	-
35	INT0n/P1_0	D,O	ROW0	O	O
36	INT1n/P1_1	D,O	ROW1	O	O
37	INT2n/P1_2	D,O	ROW2	O	O
38	INT3n/P1_3	D,O	ROW3	O	O
39	INT4n/P1_4	D,I	MIDI_IRQ	I	O
40	VDDE/INT5n/P1_5	D,O	COL0	O	-
41	SCL2/P3_0	D,O	SCL	O	O
42	SDA2	D,I/O	SDA	I/O	O
43	VSS	-	-	-	-
44	VDD	-	-	-	-
45	P2_0/PWM0	D,O	PWM0	O	O
46	P2_1/PWM1	D,O	CS2	O	O
47	P2_2/ADC0	D,O	EX_RESET	O	O
48	P2_3/ADC1	D,O	MIDI-CS	O	O
49	P2_4/SCL1	D,O	LCD-SCLK MIDI_SCLK	O	O
50	P2_5/SDA1	D,O	LCD-SCLK MIDI_SCLK	O	O
51	P2_7/DC_CTRL	D,O	DC_CTRL	O	O
52	DC_I	A,I	←	I	O
53	P1_6/PON/INT6n	A,I	PON	I	O
54	P1_7/CHARGE/INT7n	A,I	CHARGE	I	O
55	P2_6/stop_charge	A,O	STOP-CHARGE	O	O
56	VBAT3/RINGING	A,I	VBAT3	I	O
57	DC_stab	A,O	←	O	O
58	DC_Sense	A,I	←	I	O
59	AVS_sense	A,I	←	I	O
60	ADC3	A,I	←	I	O
61	LDO1_sense	A,I	←	I	O

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
62	LDO1_CTRL	A,O	←	0	0
63	LDO2_CTRL	A,O	←	0	0
64	VBAT2	A,I	←	1	0
65	VBAT1	A,I	←	1	0
66	AVS2	-	-	-	-
67	AVD2	-	-	-	-
68	LSR+/REF	A,O	LSR+	0	0
69	LSR-/REF	A,O	LSR-	0	0
70	LSR_HS/CIDIN-	A,O	LSR_HS	0	0
71	VREF_HS/CIDOUT	A,O	NC	OPEN	-
72	MIC-	A,I	←	1	0
73	VREF-	A,O	←	0	0
74	VBUF	A,O	←	0	0
75	AGND	A,O	←	0	0
76	MIC+	A,I	←	1	0
77	VREF+/CIDIN+	A,O	VREF+	0	0
78	RSTN	D,I	←	1	0
79	VDDIO	-	-	-	-
80	VSS	-	-	-	-

**Note:**

JACK DETECTION; Detect if a Headset is inserted into the JACK or not. Without a Headset, 1.5V is measured at pin 23, while with a Headset, 0V is measured at pin 23.

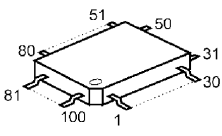
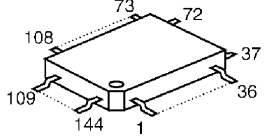
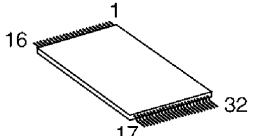
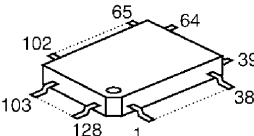
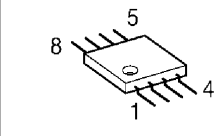
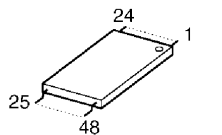
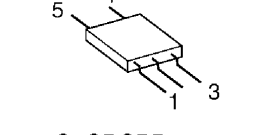
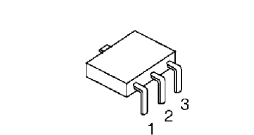
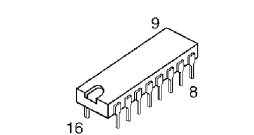
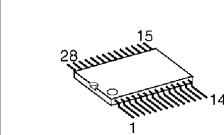
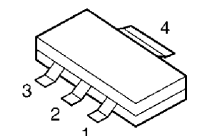
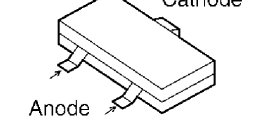
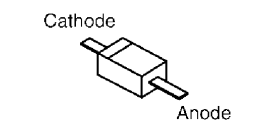
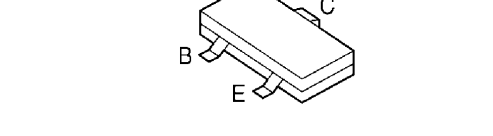
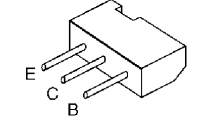
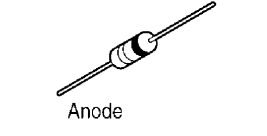
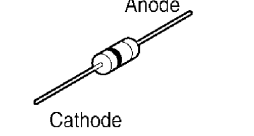


# 9 REFERENCE MATERIAL DATA

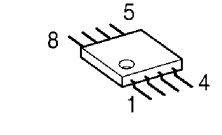
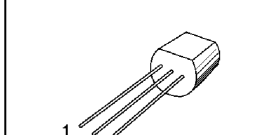
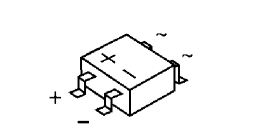
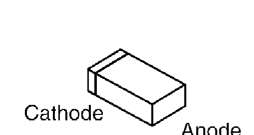
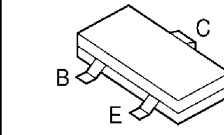
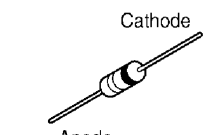
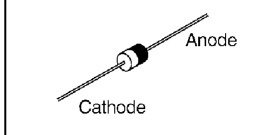
## 9.1. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES

### 9.1.1. Base Unit

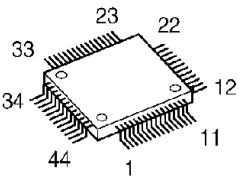
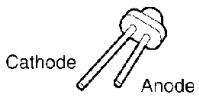
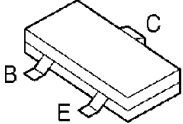
#### 9.1.1.1. Digital Board

 <p>C1CB00001959</p>	 <p>C1ZBZ0001896</p>	 <p>PFWI1FC971CX</p>	 <p>C1CB00001879</p>	 <p>C1BB00000129 C3EBHC000030 B1DHDD000026</p>
 <p>PFWI2FC971CX</p>	 <p>C0CBCBD00008 C0EBH0000518 C0JBAA000393</p>	 <p>C0CBADD00009 C0CBABD00011</p>	 <p>B1HAGFF00015</p>	 <p>C3ABKC000032</p>
 <p>C0CBAYF00016</p>	 <p>B0DDCM000001</p>	 <p>B0BC2R1A0006</p>	 <p>PQVTDTC143E, B1ABDF000025 B1ADGE000004, 2SB1218ARL</p>	
 <p>2SB1322</p>	 <p>PFVDRMRLS245</p>	 <p>B0BA02000032</p>		

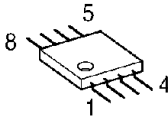
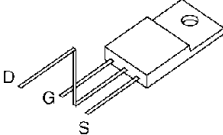
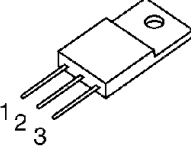
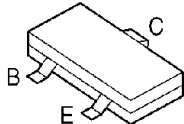
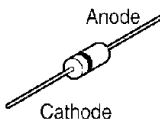
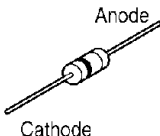
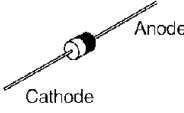
#### 9.1.1.2. Analog Board

 <p>C0ABEB000083 C0ABEB000075</p>	 <p>B1AAKL000006</p>	 <p>B0EDER000009</p>	 <p>MA153</p>	 <p>PQVTDTC143E B1ABDF000025</p>
 <p>MA4056</p>	 <p>B0EAAD000001</p>			

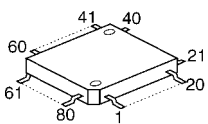
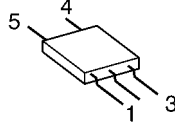
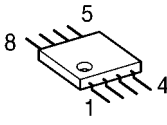
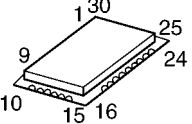
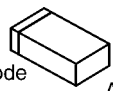
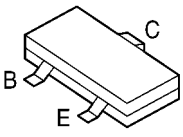
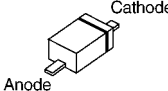
### 9.1.1.3. Operation Board

 <p>C1ZBZ0002089</p>	 <p>LNJ801LPDJA</p>	 <p>B1ABDF000026</p>		
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### 9.1.1.4. Power Supply Board

 <p>PFVIFA5518N</p>	 <p>2SK2647</p>	 <p>PFVDSF5LC20U</p>	 <p>2SC3928 DTA114EKAT46</p>	 <p>MA165, PQVDPR107</p>
 <p>PFVD1N4005</p>	 <p>PFVINL20U</p>			

### 9.1.2. Cordless Handset

 <p>C1CB00001831</p>	 <p>C0EBF0000162 C0DBAGF00031</p>	 <p>PFVINJM2149M PFVIN2149RT1</p>	 <p>PFLP1598JPZ</p>	 <p>MA729, MA8033</p>
 <p>UN521, 2SB1219ARL, 2SD1819A, UN5213 UN5216</p>	 <p>B3ACB0000129 B3ABB0000157</p>			

## 9.2. HOW TO REPLACE THE FLAT PACKAGE IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

### 9.2.1. PREPARATION

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°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)

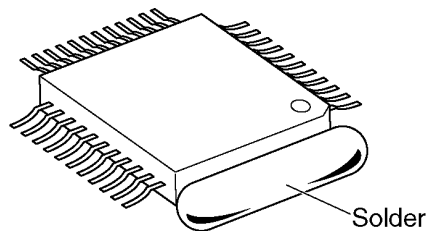
**Note:** See **ABOUT LEAD FREE SOLDER (PbF: Pb free) (P.4)**.

### 9.2.2. FLAT PACKAGE IC REMOVAL PROCEDURE

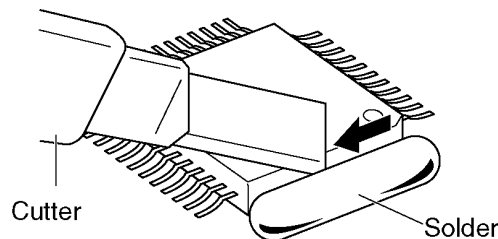
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

**Note:**

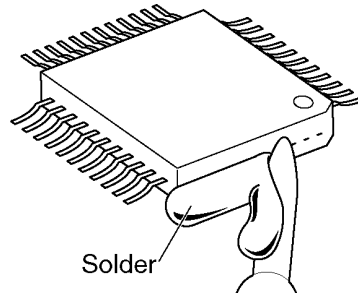
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.



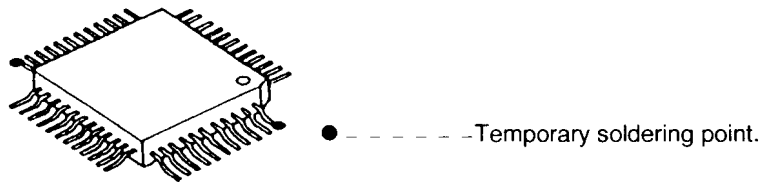
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

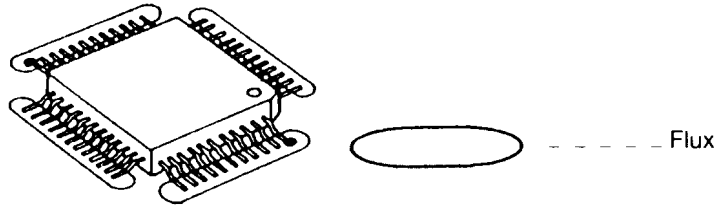
### 9.2.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

1. Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.

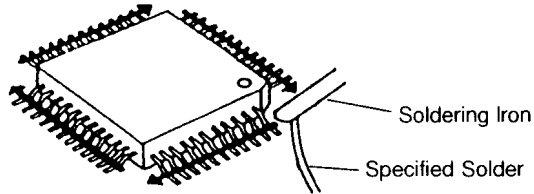


\*Check the accuracy of the IC setting with the corresponding soldering foil.

2. Apply flux to all pins of the FLAT PACKAGE IC.



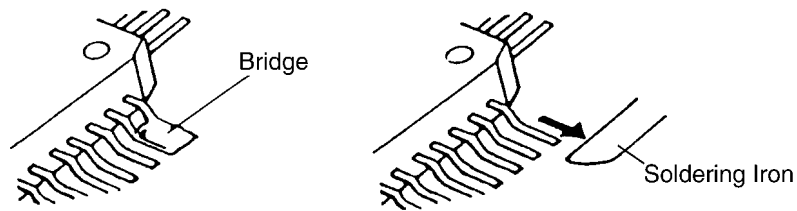
3. Solder the pins, sliding the soldering iron in the direction of the arrow.



### 9.2.4. BRIDGE MODIFICATION PROCEDURE

1. Lightly resolder the bridged portion.

2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.



## 9.3. TEST CHART

### 9.3.1. 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,

*Phil.*

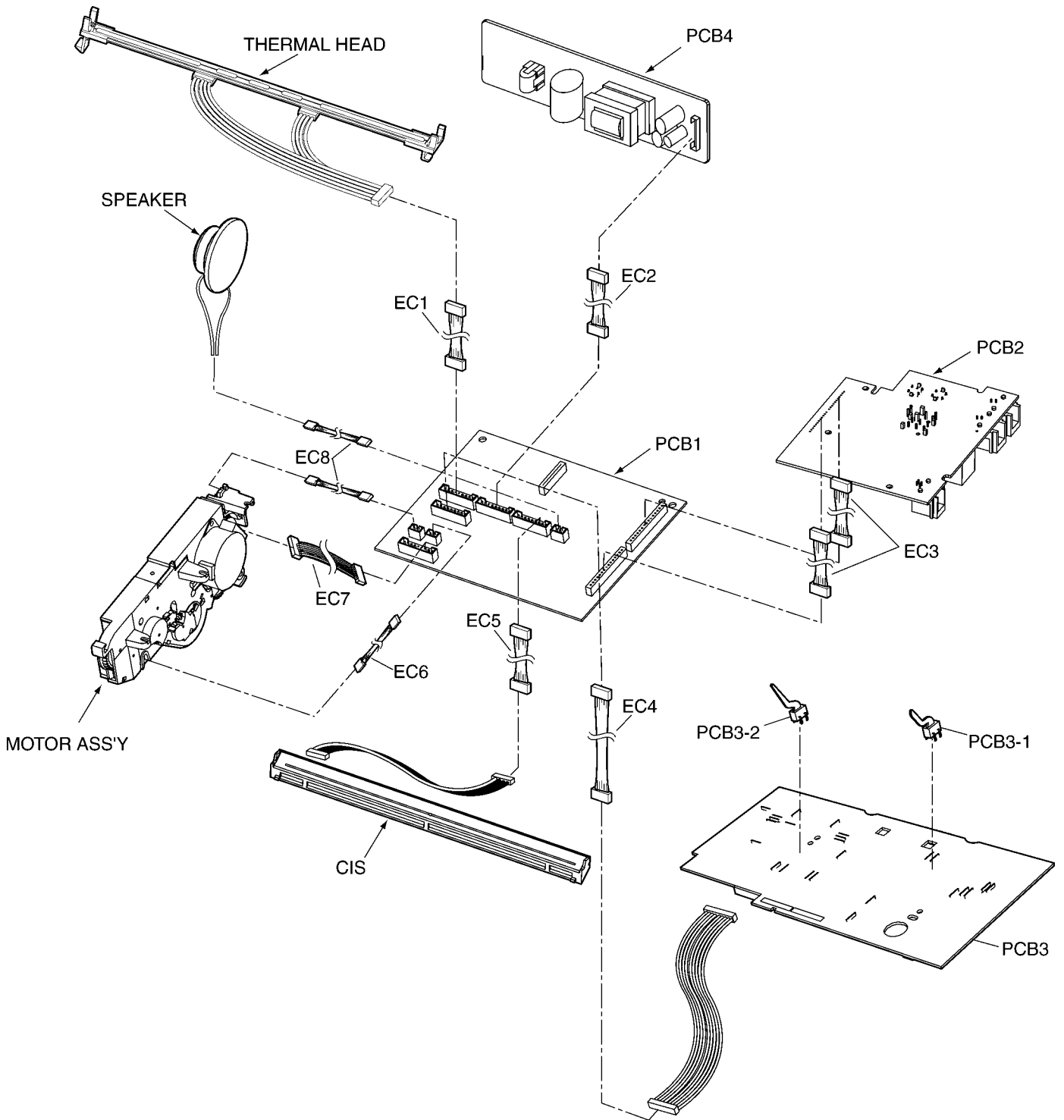
P.J. CROSS  
Group Leader - Facsimile Research

9.3.2. ITU-T No.2 TEST CHART

CCITT N° 2: Mire pour test de Transmission

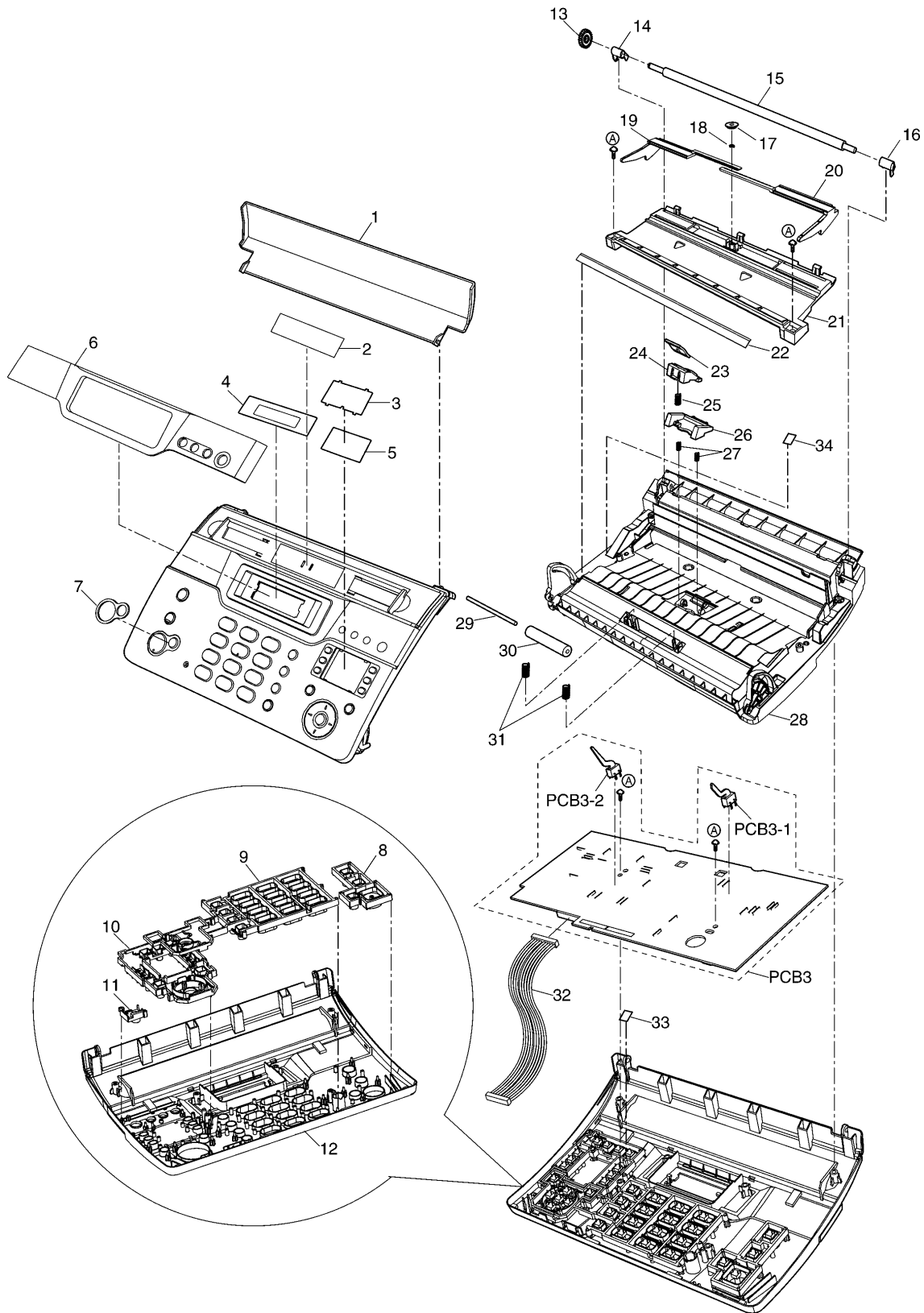
QS2DR	QS2DR	KWJ4H	KWJ4H	S5TR7	S5TR7	QS2DR	KWJ4H	S5TR7	BC6IT	ZP3FM	XB8UG	BC6IT	BC6IT	ZP3FM	ZP3FM	XB8UG	XB8UG
Transmission Test Group n° I Character UNIVERS SIZE 8 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *									Transmission Test Group n° III Character ENGLISH-TIMES SIZE 8 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *								
Transmission Test Group n° II Character UNIVERS SIZE 10 Groupe n° I pour test de transmission caractères UNIVERS 8 POINTS A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *									Transmission Test Group n° IV Character ENGLISH-TIMES SIZE 10 Groupe n° III pour test de transmission composé de caractères ENGLISH-TIMES 8 POINTS A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *								
Grupo n° I para prueba de transmisión de los caracteres UNIVERS 8 PUNTOS A B C D E F G H I J K L M N Ñ O P Q R S T U V W X Y Z a b c d e f g h i j k l m n ñ o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *									Grupo n° III para prueba de transmisión de los caracteres ENGLISH-TIMES 8 PUNTOS A B C D E F G H I J K L M N Ñ O P Q R S T U V W X Y Z a b c d e f g h i j k l m n ñ o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 S <sup>2</sup> ³ œ ♦ [ ] Ç □ . £ - ± × : ° © ● ß _ é + = \$ / ( ) & % *								
傳輸試驗用字第一組 13.75P 万有引力 科学方法 男女体操 文化交流 地理条件 家庭用品 共同研究 相互往来 新春景色 主要内容 世界各国 普通教育									傳輸試驗用字第二組 10.5P 万有引力 科学方法 男女体操 文化交流 地理条件 家庭用品 共同研究 相互往来 新春景色 主要内容 世界各国 普通教育								
المجموعة الثانية سخط الرقعة آء أ ا ب ء ح د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ب ب ت ج ح خ س ش ص ض ع غ ف ق ك ل م ن ه ي لا لا 9 8 7 6 5 4 3 2 1 0 ؟ > = < · ± / +									المجموعة الأولى سخط النسخ آء أ ا ب ء ح د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ب ب ت ج ح خ س ش ص ض ع غ ف ق ك ل م ن ه ي لا لا × % [ ] ( ) « » ! * , - ' ~ °								
ГРУППА № 1-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 8 АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩЪЫЬЭЮЯ абвгдежзийклмнопрстуфхцчшщъыьэюя 1234567890									ГРУППА № 3-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 8 АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩЪЫЬЭЮЯ абвгдежзийклмнопрстуфхцчшщъыьэюя 1234567890								
ГРУППА № 2-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 10									ГРУППА № 4-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 10								

# 10 FIXTURES AND TOOLS



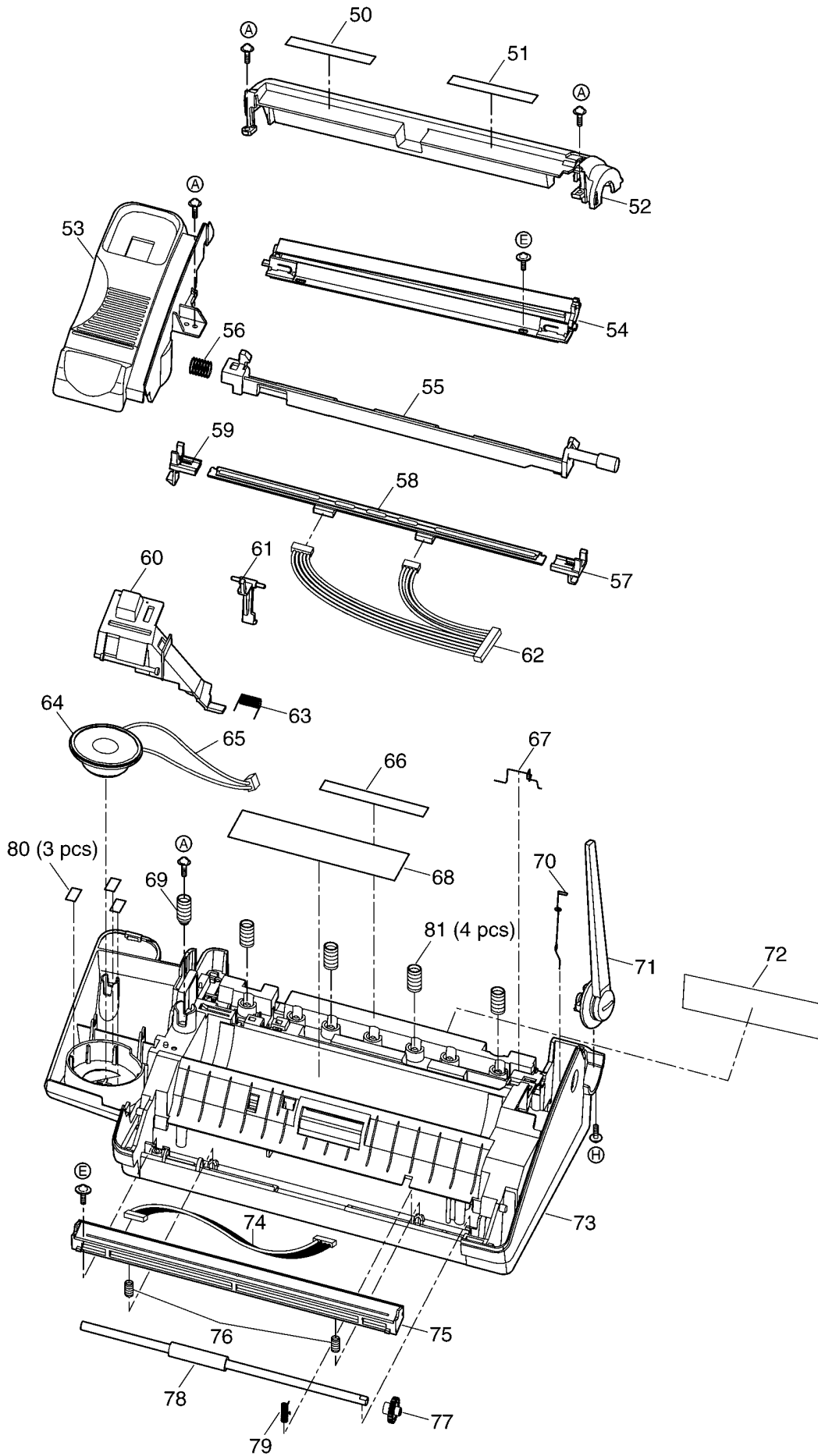
# 11 CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

## 11.1. OPERATION PANEL SECTION

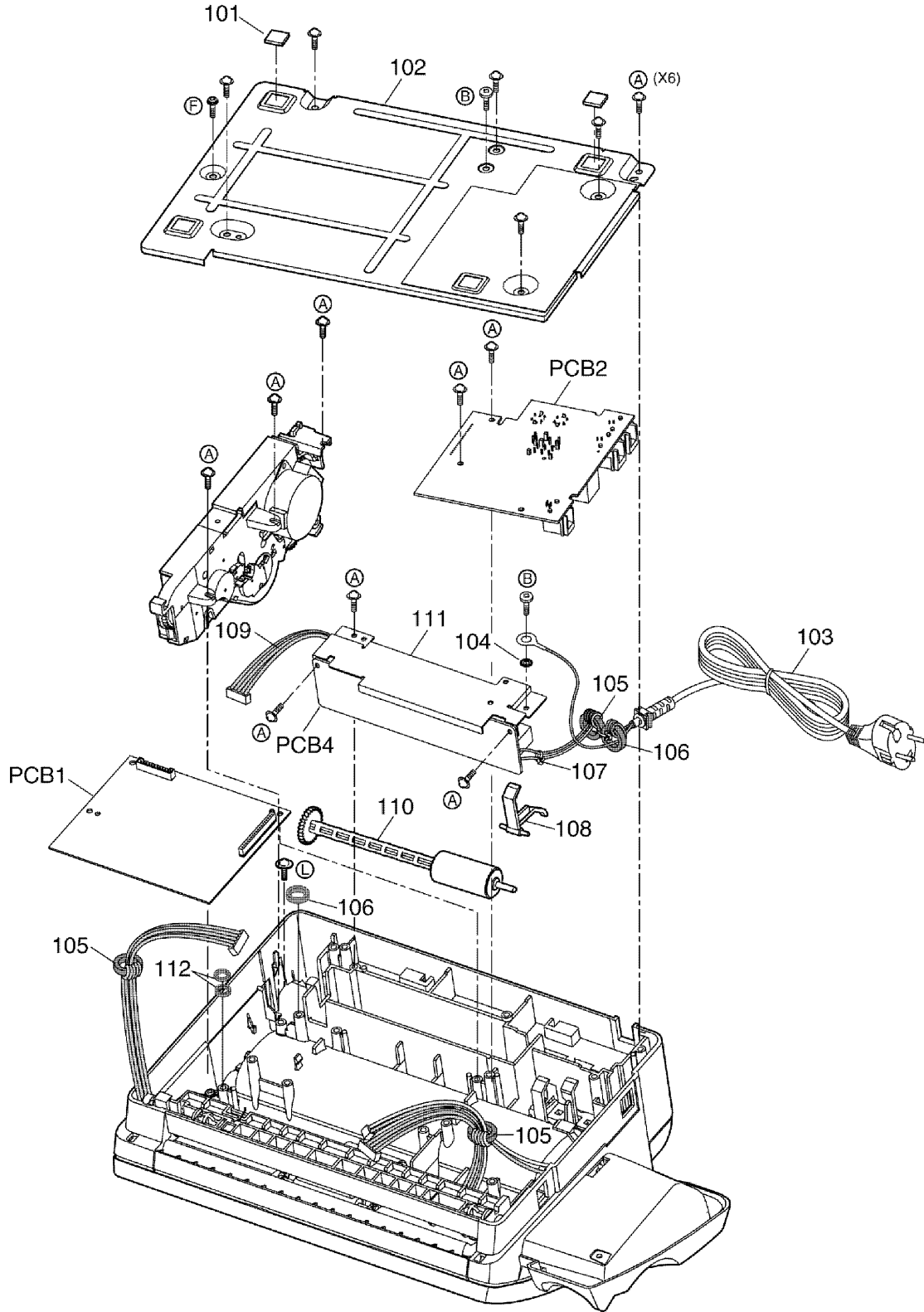




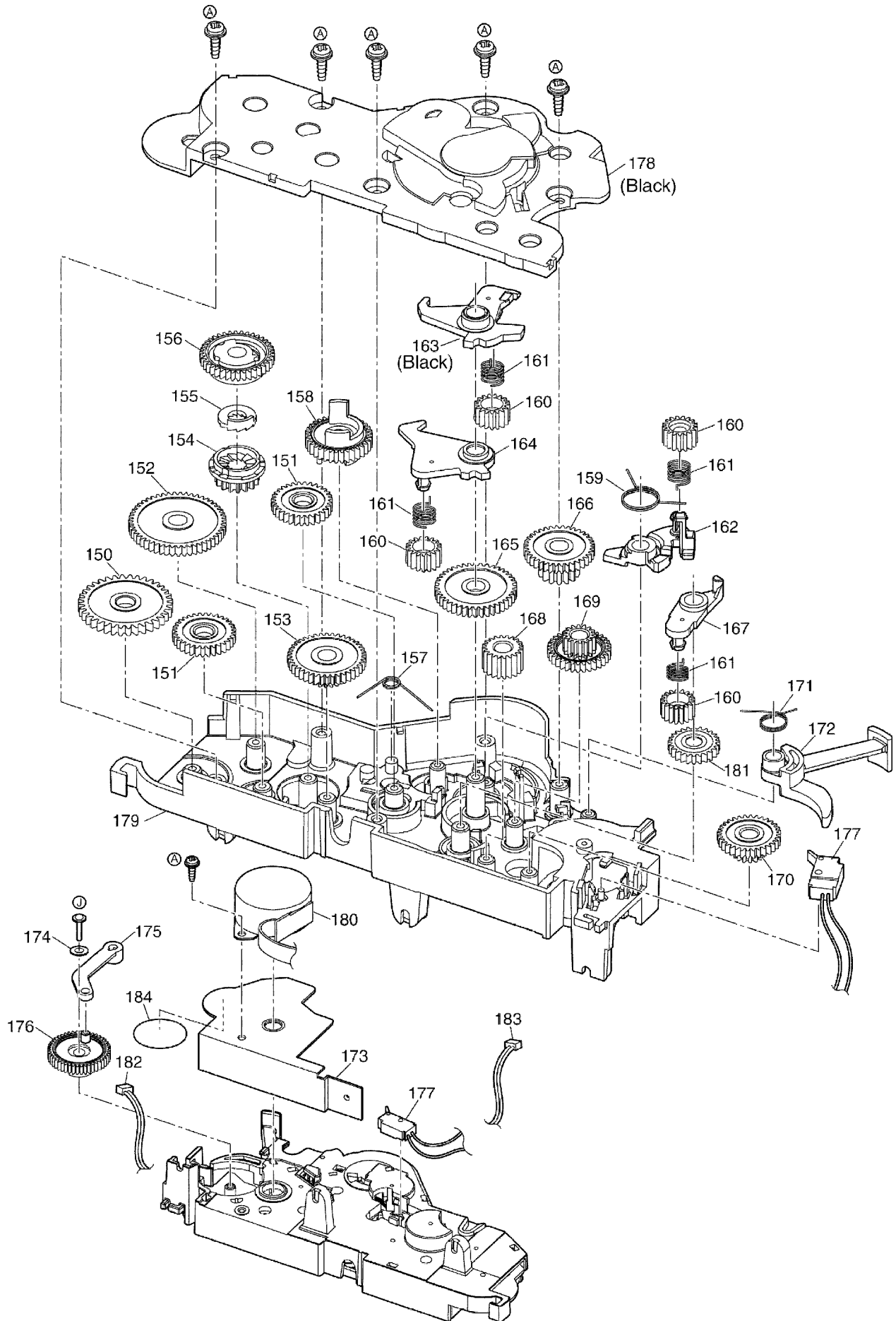
## 11.2. UPPER CABINET SECTION



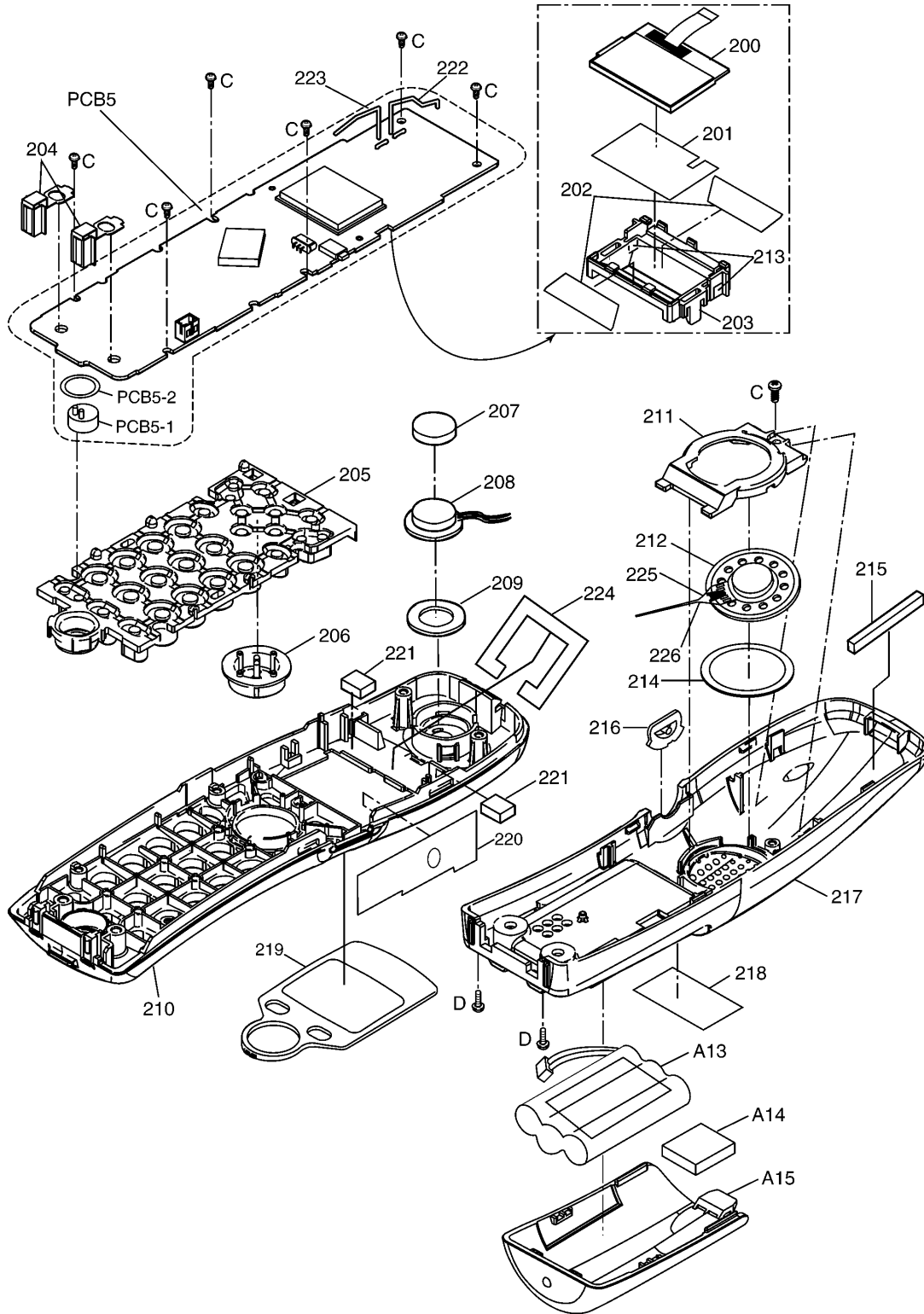
### 11.3. LOWER CABINET SECTION



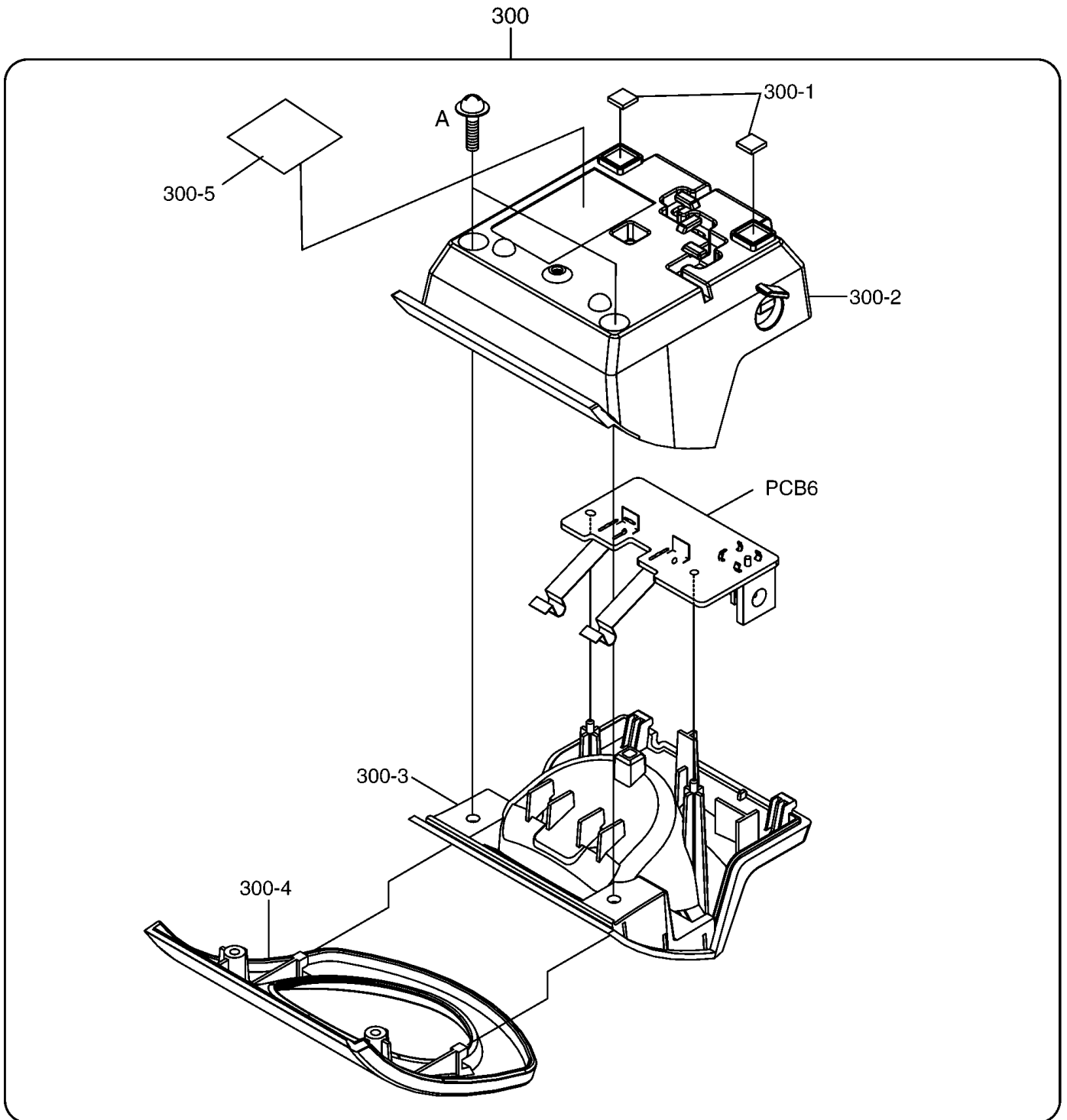
# 11.4. MOTOR SECTION










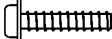



# 11.5. CORDLESS HANDSET SECTION



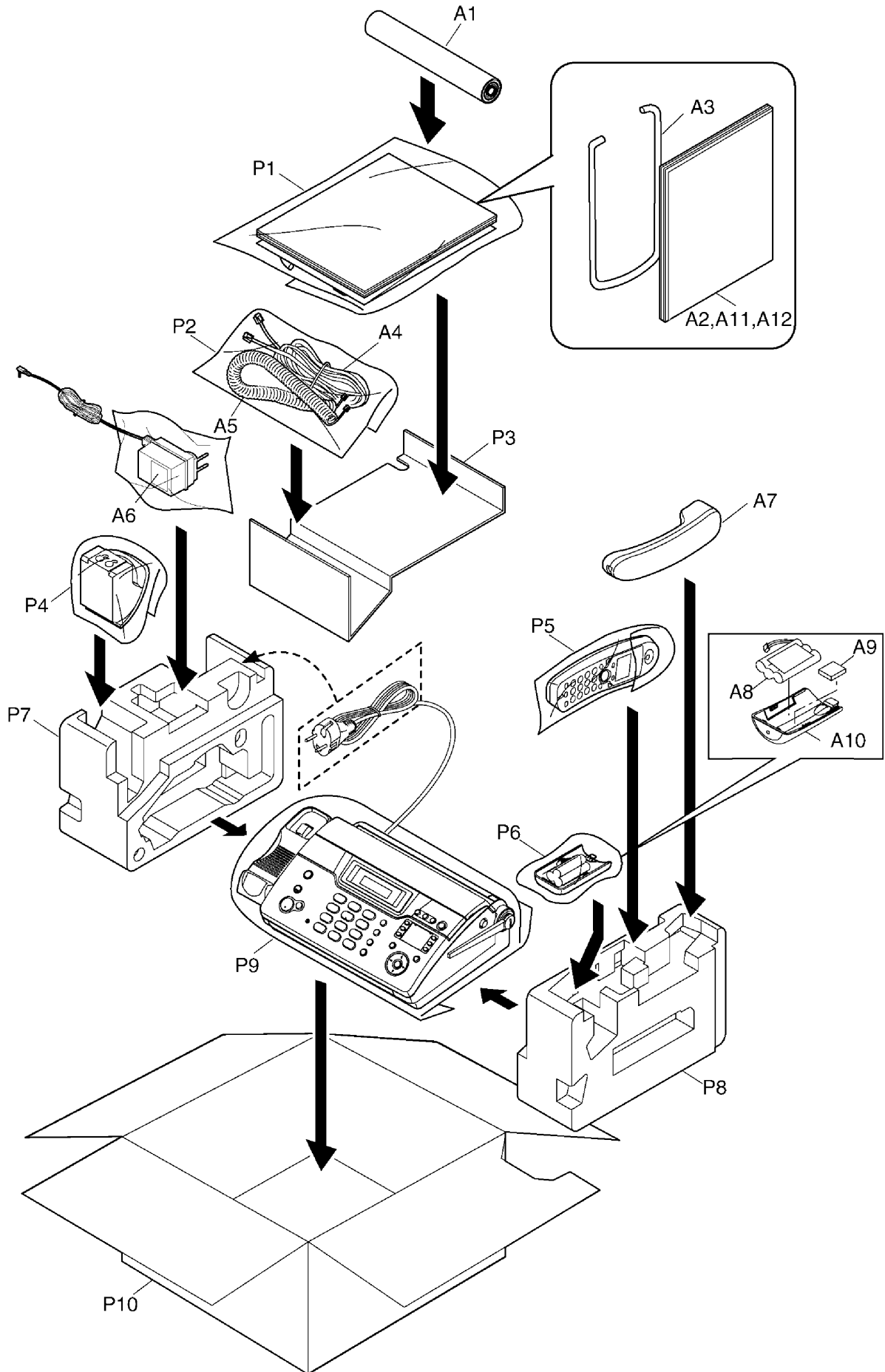
## 11.6. CHARGER UNIT SECTION



## 11.7. ACTUAL SIZE OF SCREWS

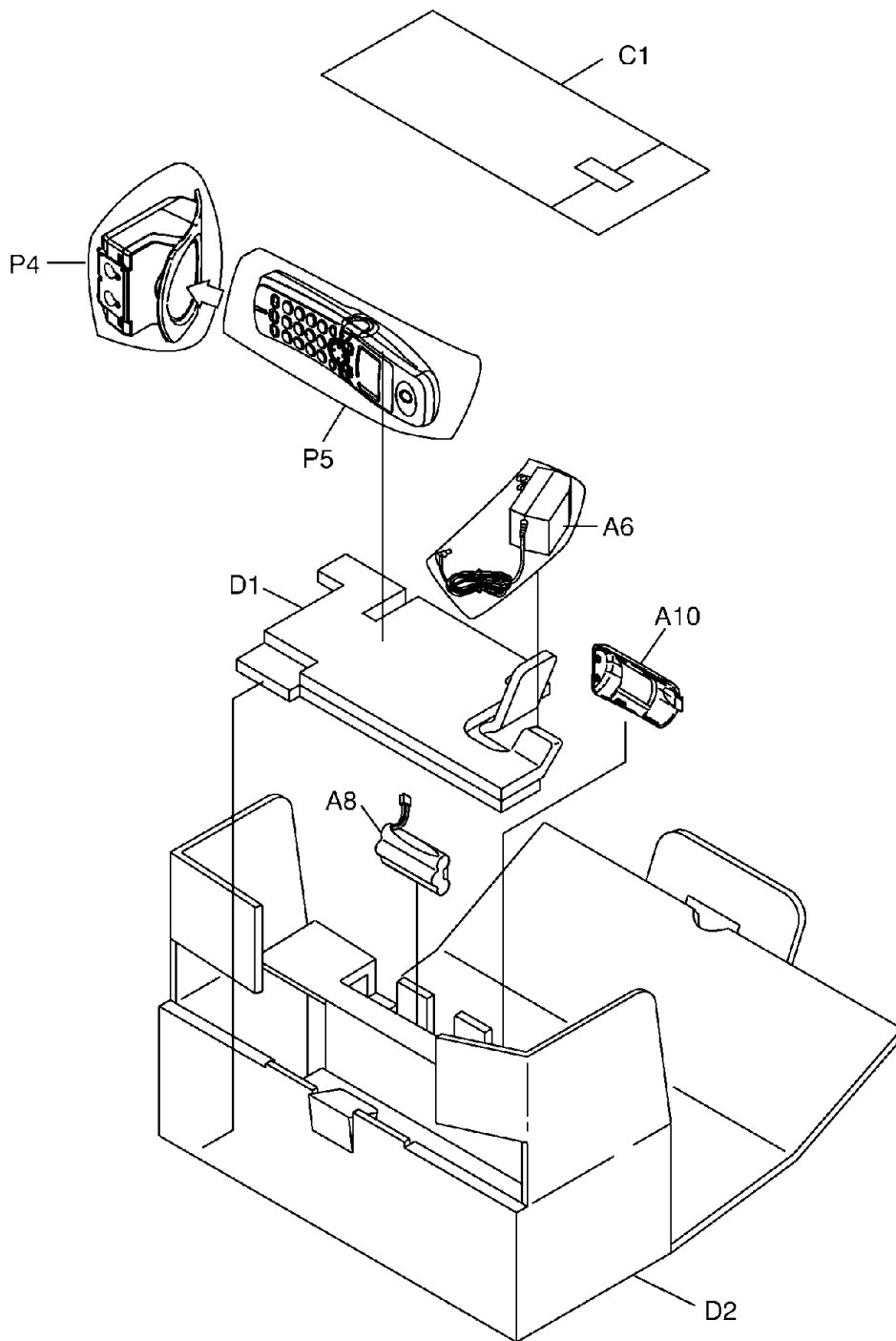
	Part No.	Figure
Ⓐ	XTW3+10PFJ7	 $\phi 3 \times 10 \text{ mm}$
Ⓑ	XSB4+6FJ	 $\phi 4 \times 6 \text{ mm}$
Ⓒ	XTW2+R5PFJ	 $\phi 2 \times 5 \text{ mm}$
Ⓓ	XTB26+8GFJ	 $\phi 2.6 \times 8 \text{ mm}$
Ⓔ	XTW3+W8PFJ	 $\phi 3 \times 8 \text{ mm}$
Ⓕ	XTW3+6LFJK (Black)	 $\phi 3 \times 6 \text{ mm}$
Ⓖ	XTW3+6LFJ	 $\phi 3 \times 6 \text{ mm}$
Ⓗ	XTW26+14PFJ7	 $\phi 2.6 \times 14 \text{ mm}$
Ⓙ	XTN2+14FJK	 $\phi 2 \times 14 \text{ mm}$
Ⓚ	XTW26+10PFJ65	 $\phi 2.6 \times 10 \text{ mm}$
Ⓛ	XTW26+U8PFJ	 $\phi 2.6 \times 8 \text{ mm}$

# 12 ACCESSORIES AND PACKING MATERIALS



# 13 ACCESSORIES AND PACKING MATERIALS

## 13.1. KX-FGA521CX





# 14 REPLACEMENT PARTS LIST

## Notes:

- 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.

- Important safety notice

Components identified by  $\triangle$  mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

- The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

- 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	ERX:Metal Film	PQRD:Carbon
ERD:Carbon	ERG:Metal Oxide	PQRQ:Fuse
PQ4R:Chip	ERO:Metal Film	ERF:Wire Wound

### Wattage

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W
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ECFD:Semi-Conductor	ECCD,ECKD,PQCBC,PQVP : Ceramic
ECQS:Styrol	ECQM,ECQV,ECQE,ECQU,ECQB : Polyester
PQCBX,ECUV:Chip	ECEA,ECSZ,ECOS : Electrolytic
ECMS:Mica	ECQP : Polypropylene

### Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H : 50V	05 : 50V	OF : 3.15V	OJ : 6.3V	1V : 35V	
2A : 100V	1 : 100V	1A : 10V	1A : 10V	50,1H : 50V	
2E : 250V	2 : 200V	1V : 35V	1C : 16V	1J : 63V	
2H : 500V		OJ : 6.3V	1E,25 : 25V	2A : 100V	

## 14.1. CABINET AND ELECTRICAL PARTS

### 14.1.1. OPERATION PANEL SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
1	PFKS1119Y1	TRAY, DOCUMENT	PS
2	PFQT2393Y	LABEL, FACE DOWN	
3	PFQV1018Z	COVER, TELCARD	
4	PFQV1303Y	PANEL, LCD	
5	PFQD1054Z	TEL CARD	
6	PFQV1269U1	PANEL, SUB OPERATION	ABS
7	PFHX1833Z1	SHEET, RING	
8	PFBX1238Z1	KEY, START	ABS
9	PFBX1237X2	KEY, DIAL	ABS
10	PFBX1239Z1	KEY, FUNCTION	ABS
11	PFBC1140Z1	KEY, ABSENT	ABS
12	PFQV1268S1	PANEL, OPERATION	PS
13	PFQD1450Z	GEAR, PLATEN	POM
14	PFQD1097Z	SPACER, PLATEN, R	POM
15	PFQD1077Z	POLLER, PLATEN	

Ref. No.	Part No.	Part Name & Description	Remarks
16	PFQD1096Z	SPACER, PLATEN, L	POM
17	PFQD1015Y	SLISER, GEAR	POM
18	PFUS1222Z	SLIDERSPRING	
19	PFKR1087Z1	GUIDE, DOCUMENT, R	S PS
20	PFKR1086Z1	GUIDE, DOCUMENT, L	S PS
21	PFUV1088Z1	COVER DOCUMENT GUIDE	S PS
22	PFHX1834Z	SEET, READ	
23	PFHG1210Z	SEPARATION, RUBBER	
24	PFHR1504Y	HOLDER, SEPARATION	PS
25	PFUS1588Z	SPRING, DOC SUPPORT	
26	PFHR1503Z	SUPPORT, DOC FEED	PBT
27	PFUS1631Z	SPRING, DOC SUB POLLER	
28	PFUV1082X2	COVER, OPERATION PANEL	PS
29	PFDF1017Z	SHAFTZ	
30	PFDR1045Z	POLLER, DOC. SUB	POM
31	PFUS1587Z	SPRING, DOC SUB PROLLER	
32	PFJS10N15Y	LEAD, OPERA	
33	PFHX1911Z	SEET, PANEL	
34	PFHX1913Z	SEET, LCD	

### 14.1.2. UPPER CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
50	PFQT2411V	LABEL, PAPER SET	
51	PFQT2390V	LABEL, CUTTER CAUTION	
52	PFKV1107Z1	CABINET, BACK	PS
53	PFKM1173Z1	CRADLE, HANDSET	PS
54	PFDX1062Z	CUTTER	
55	PFDE1254Z1	LEVER, LOCK	ABS
56	PFUS1585Z	SPRING, LOCK LVER	
57	PFDE1261Z	HOLDER, HEAD, R	
58	LLCC00000061	PRINTER HEAD	
59	PFDE1260Z	HOLDER, HEAD, L	
60	PFBH1031Z1	BUTTON, HOOK	PS
61	PFDE1248Y	LEVER, PAPERSENSOR	
62	PFJS11N16Y	LEAD, THERMAL HEAD	
63	PFUS1589Z	SPRING, HOOK LVER	
64	PFAS50P003Z	SPEAKER	
65	PFJS02N13Z	LEAD, SPEAKER	
66	PFQT2425Z	LABEL, ARROW	
67	PFUS1583Y	SPRING, EARTH HEAD	
68	PFQT2391Z	LABEL, PAPER CAUTION	
69	PFUS1254Z	SPRING, POP UP	
70	PFUS1581Z	SPRING, EARH LOCK LEVER	
71	PFSA1042Z	ANTENNA	
72	PFGT2784Z-M	NAME PLATE	
73	PFKM1172V1	CABINET, MAIN	PS
74	PFJS07N09Y	LEAD, CIS	
75	N2GZBE000013	IMAGE SENSOR	
76	PFUS1463Z	SPRING THERMALHEAD	
77	PFQD1449Z	GEAR, FEEDROLLER	POM
78	PFQD1078Z	POLLER,FEED	
79	PFUS1584X	SPRING, EARTH DOC	
80	PFHX1350Z	SHEET, HEAD	
81	PFUS1318Z	SPRING, THERMAL HEAD	

### 14.1.3. LOWER CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
100	Not Used		
101	PFHA1001Z	LEGRUBBER	
102	PFMD1088Z	PLATE, BOTTOM	
103	PFJA03A016Z	AC CORD	
104	XWC4BFJ	WASHER	
105	PQLB1E1	FERRITE CORE	
106	JOKE00000101	FILTER	
107	PQHR945Z	LEAD, BINDER	
108	PFDE1253Y	LEVER, JAMSENSOR	

Ref. No.	Part No.	Part Name & Description	Remarks
109	PFJS09P92X	LEAD, POWER	
110	PFDR1072Y	POLLER, SEPARATION	
111	PFMH1173Z	PLATE, POWER SUPPLY	
112	PFHX1912Z	SEET, BOSS	

### 14.1.4. MOTOR SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
150	PFDG1447Z	GEAR, TX4	POM
151	PFDG1444Z	GEAR, TX1	POM
152	PFDG1446Z	GEAR, TX3	POM
153	PFDG1445Z	GEAR, TX2	POM
154	PFDG1442Z	GEAR, DOC2	PDM
155	PFDE1259Z	ARM	POM
156	PFDG1441Z	GEAR, DOC1	POM
157	PFUS1579Z	BAR SPRING	
158	PFDG1448Z	GEAR, CAM	POM
159	PFUS1591Z	COIL SPRING	
160	PFDG1438Z	GEAR, D	POM
161	PFUS1231Y	SPRINT, GEAR 1	
162	PFHR1500Z	ARM4	POM
163	PFHR1497Y	ARM1 (Black)	POM
164	PFHR1498Z	ARM2	POM
165	PFDG1436Z	GEAR, B	POM
166	PFDG1443Z	GEAR, RX	POM
167	PFHR1499Z	ARM3	POM
168	PFDG1440Z	GEAR, CUTTER 2	POM
169	PFDG1435Z	GEAR, A	POM
170	PFDG1435Y	GEAR, A	POM
171	PFUS1580Z	BAR SPRING	
172	PFHR1502Z	LEVER, CUTTER	PS
173	PFMH1171Z	COVER	
174	PFHX1413Z	SHEET, GEAR	
175	PFHR1501Z	ARM, CUTTER	
176	PFDG1439Z	GEAR, CUTTER 1	POM
177	KOLICF000001	SENSOR	
178	PFHR1488Y	COVER, GEAR BASE (Black)	POM
179	PFUA1066Z	GEAR BASE	ABS+PBT
180	L6HAGCLK0008	MOTOR	

### 14.1.5. CORDLESS HANDSET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
200	L5DZADC00008	GRILLE, LCD	
201	PFHX1784Z	SHEET	
202	PFHX1783Z	SHEET	
203	PFHR1285Y	GUIDE	
204	PFJT1007Z	CHARGE TERMINAL L	
205	PF SX1024Z	KEY, SWITCH	
206	PFBC1105Z1	PUSH BUTTON	ABS
207	PFHG1176Z	SPACER	
208	L0AD01A00008	SPEAKER	
209	PFHX1700Z	RUBBER, RECEIVER	
210	PFKM1121W5	CABINET BODY	ABS
211	PFHR1404Z	GUIDE	ABS
212	L0AD02A00010	SPEAKER	
213	PFHX1882Z	SHEET HOLDER	
214	PFHG1144Z	RUBBER, SPEAKER	
215	PFHE1108Z	SPACER	
216	PFHG1163Z2	KEY, TALK	
217	PFKF1061X2	COVER, CABINET	ABS
218	PFGT2784Z-M	NAME PLATE	
219	PFGP1239EH	PANEL, LCD	
220	PFHX1808Z	SHEET, BACKLIGHT	
221	PFHG1174Z	RUBBER, R LCD	
222	PFSA1015Z	ANTENNA A	
223	PFSA1016Z	ANTENNA B	
224	PFHE1156Z	SPONGE, LCD	
225	WLK28YB08AA	LEADWIRE SPEAKER (BLACK)	
226	WLK28YR08AA	LEADWIRE SPEAKER (RED)	

### 14.1.6. CHARGER UNIT SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
300	KXFGA521CXCS	HANDSET CHARGER	
300-1	PFHG1044Z	RUBBER, FOOT	
300-2	PFKF1062X1	COVER	PS
300-3	PFKM1124Z1	CABINET	PS
300-4	PFGG1195XB	GRILL	PS
300-5	PFGT2603Z-M	NAME PLATE	

### 14.1.7. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQHP10023	RECORDING PAPER	
A2	PFQX2269Z	INSTRUCION BOOK	
A3	PQUS10136Z	STACKER	
A4	PFJA02B002Y	TEL CORD	
A5	PFJA04C001Z	HANDSET CORD	
A6	N0JCDA000001	AC ADAPTER	
A7	PFJXH0837Z	HANDSET ASS'Y	
A8	N4HHGLB00008	BATTERY	
A9	PFHE1106Z	BATTERY CUSHION	
A10	PFKV1090Y2	BATTERY COVER	ABS
A11	PFQX2338Z	INSTRUCTION BOOK, Quick Reference Guide	
A12	PFQX2339Z	INSTRUCTION BOOK, Quick Reference Guide	
P1	PQPP10005Z	POLYETHLENEBAG	
P2	XZB20X35A04	POLYETHLENEBAG	
P3	PFPD1231Z	ACCESSRIES BOX	
P4	PFPH1018Z	POLYETHLENEBAG	
P5	XZB11X30A04	POLYETHLENEBAG	
P6	PFPH1045Z	POLYETHLENEBAG	
P7	PFPN1373Y	PAT L	
P8	PFPN1374Y	PAT R	
P9	PFPH1030Z	PACKING	
P10	PFPK2845Z-M	GIFT BOX	

### 14.1.7.1. KX-FGA521CX

Ref. No.	Part No.	Part Name & Description	Remarks
C1	PFQX2178Z	INSTRUCTIN BOOK	
A6	NOJCEA000001	AC ADAPTPR	△
A8	N4HHGLB00008	BATTERY	
D1	PFPD1049Z	PAD	
D2	PFPK2738Y	CARTON BOX	
P4	PFPH1018Z	POLYETHLENEBAG	
P5	XZB11X30A04	POLYETHLENEBAG	

## 14.2. DIGITAL BOARD PARTS

Note:

(\*1) When replacing IC22, data need to be written to them with PFZZFC533CN.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	FFWP1FC971CX	DIGITAL BOARD ASS'Y (RTL)	
		(ICs)	
IC2	C1BB00000129	IC	△
IC3	C1CB00001959	IC	
IC4	C1CB00001879	IC	
IC7	C0CBADD00009	IC	
IC8	C0CBABD00011	IC	
IC10	C1ZBZ0001896	IC	
IC11	B1HAGFF00015	IC	
IC12	C0JBAA000393	IC	
IC13	C0EBH0000518	IC	

Ref. No.	Part No.	Part Name & Description	Remarks
IC16	PFWILFC971CX	IC	
IC17	C3ABKC000032	IC	
IC19	C0CBAYF00016	IC	
IC22	C3EBHC000030	IC	
IC23	PFWI2FC971CX	IC	
IC25	C0CBCBD00008	IC	
		(TRANSISTORS)	
Q6	BLADGE000004	TRANSISTOR(SI)	
Q7	BLABDF000025	TRANSISTOR(SI)	
Q8	BLADGE000004	TRANSISTOR(SI)	
Q9	BLABDF000025	TRANSISTOR(SI)	
Q10	BLDHHDD000026	TRANSISTOR(SI)	
Q11	PQVTDTC143E	TRANSISTOR(SI)	S
Q12	PQVTDTC143E	TRANSISTOR(SI)	S
Q13	PQVTDTC143E	TRANSISTOR(SI)	S
Q14	2SB1322	TRANSISTOR(SI)	S
Q20	2SB1218ARL	TRANSISTOR(SI)	
Q21	BLABDF000025	TRANSISTOR(SI)	
Q23	PQVTDTC143E	TRANSISTOR(SI)	S
Q24	PQVTDTC143E	TRANSISTOR(SI)	S
Q26	BLABDF000025	TRANSISTOR(SI)	
Q27	PQVTDTC143E	TRANSISTOR(SI)	S
		(DIODES)	
DA2	B0DDCM000001	DIODE(SI)	
D7	B0BC2R1A0006	DIODE(SI)	
D12	B0BA02000032	DIODE(SI)	
D13	PFVDRMRLS245	DIODE(SI)	S
D15	B0BC2R1A0006	DIODE(SI)	
		(CAPACITORS)	
C1	ECJ0EC1H100D	10P	
C2	ECJ0EC1H100D	10P	
C8	ECJ1VF1A105Z	1	
C9	ECJ1VF1A105Z	1	
C10	ECJ0EC1H030C	3P	
C11	ECJ0EB0J224K	0.22	
C12	ECJ0EB1H182K	0.0018	
C13	ECJ1VF1A105Z	1	
C18	ECJ0EB0J224K	0.22	
C20	ECJ0EB1A104K	0.1	
C21	ECJ0EB1A104K	0.1	
C22	ECJ0EB1A104K	0.1	
C23	ECJ0EF1C104Z	0.1	
C24	F2G1C1000014	10	
C25	F2G1C1000014	10	
C26	ECJ0EF1C104Z	0.1	
C28	ECJ0EB1H102K	0.001	
C29	ECJ0EF1C104Z	0.1	
C30	ECJ0EC1H101J	100P	
C31	F2G1C1000014	10	
C32	ECJ0EF1C104Z	0.1	
C33	ECJ0EC1H120J	12P	
C34	ECJ0EC1H120J	12P	
C35	ECJ0EF1C104Z	0.1	
C37	ECJ0EF1C104Z	0.1	
C38	ECJ0EF1C104Z	0.1	
C39	ECJ1VF1A105Z	1	
C40	ECJ1VF1A105Z	1	
C41	ECJ0EF1C104Z	0.1	
C42	ECJ1VF1A105Z	1	
C43	ECJ0EF1C104Z	0.1	
C46	ECJ0EC1H101J	100P	
C48	ECJ0EB1H102K	0.001	
C50	ECJ0EB1H102K	0.001	
C51	ECJ0EB1H102K	0.001	
C59	ECJ1VB1C105K	1	
C67	ECJ0EC1H030C	3P	
C68	ECJ0EC1H030C	3P	
C71	ECJ0EB1A104K	0.1	
C75	ECJ0EB1C103K	0.01	
C78	ECJ0EB1H102K	0.001	

Ref. No.	Part No.	Part Name & Description	Remarks
C80	ECJ0EB1A104K	0.1	
C83	ECJ1VB1C105K	1	
C88	ECJ0EC1H330J	33P	
C91	ECJ0EB1C103K	0.01	
C98	ECJ0EB1A104K	0.1	
C100	ECJ0EF1C104Z	0.1	
C104	ECJ0EB1C103K	0.01	
C106	ECJ0EC1H060C	6P	
C108	ECJ0EC1H180J	18P	
C110	ECJ0EB1C103K	0.01	
C111	ECJ0EB1C103K	0.01	
C113	ECJ0EB1A104K	0.1	
C117	ECJ0EB1A104K	0.1	
C121	ECJ0EC1H150J	15P	
C122	ECJ0EC1H150J	15P	
C123	ECJ0EB1C103K	0.01	
C124	ECJ0EB1C103K	0.01	
C126	ECJ1VF1H104Z	0.1	
C127	F2G1C2210008	220	
C128	ECJ1VF1A105Z	1	
C130	ECJ0EB1C103K	0.01	
C131	F2G0J4700032	47	
C132	ECJ1VF1A105Z	1	
C133	ECJ1VF1A105Z	1	
C134	F2G0J4700032	47	
C135	ECJ1VF1A105Z	1	
C136	ECJ0EF1C104Z	0.1	
C137	ECJ0EF1C104Z	0.1	
C138	ECJ1VB1C104K	0.1	
C140	ECJ0EF1C104Z	0.1	
C141	ECJ0EC1H150J	15P	
C143	ECJ0EC1H150J	15P	
C144	ECJ0EC1H101J	100P	
C147	ECJ0EC1H101J	100P	
C149	ECJ0EB1H102K	0.001	
C150	ECJ0EB1H222K	0.0022	
C151	ECJ0EB1A104K	0.1	
C152	ECJ0EB1H102K	0.001	
C153	FLJ1A4750003	4.7	
C154	ECJ0EB1A104K	0.1	
C155	ECJ0EF1C104Z	0.1	
C156	ECJ0EF1C104Z	0.1	
C157	ECJ0EF1C104Z	0.1	
C158	ECJ0EF1C104Z	0.1	
C159	ECJ0EF1C104Z	0.1	
C160	ECJ0EF1C104Z	0.1	
C161	ECJ0EF1C104Z	0.1	
C163	ECJ0EF1C104Z	0.1	
C164	ECJ0EF1C104Z	0.1	
C167	ECJ0EF1C104Z	0.1	
C168	ECJ0EF1C104Z	0.1	
C169	ECJ0EF1C104Z	0.1	
C170	ECJ0EB1H102K	0.001	
C171	ECJ0EF1C104Z	0.1	
C172	ECJ0EC1H101J	100P	
C173	ECJ0EF1C104Z	0.1	
C174	ECJ0EF1C104Z	0.1	
C178	ECJ0EB1C103K	0.01	
C182	ECJ0EC1H101J	100P	
C183	ECJ0EC1H101J	100P	
C184	ECJ0EC1H101J	100P	
C185	ECJ0EC1H101J	100P	
C190	ECJ0EF1C104Z	0.1	
C200	ECJ0EF1C104Z	0.1	
C201	ECJ0EF1C104Z	0.1	
C202	ECJ0EF1C104Z	0.1	
C204	ECJ0EF1C104Z	0.1	
C206	ECJ0EC1H101J	100P	
C210	ECJ0EF1C104Z	0.1	
C212	F2G0J1010042	100	
C214	ECJ0EF1C104Z	0.1	
C215	ECJ1VF1A105Z	1	
C219	ECJ0EB1C103K	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C220	ECJ0EC1H100D	10P	
C221	ECJ0EC1H100D	10P	
C223	ECJ0EC1H100D	10P	
C224	ECJ0EC1H100D	10P	
C225	ECJ0EC1H560J	56P	
C227	ECJ0EC1H220J	22P	
C228	ECJ0EC1H100D	10P	
C229	ECJ0EF1C104Z	0.1	
C230	ECJ0EC1H100D	10P	
C231	ECJ0EC1H100D	10P	
C232	ECJ0EC1H100D	10P	
C233	ECJ1VF1A105Z	1	
C235	ECJ0EC1H100D	10P	
C236	ECJ1VF1A105Z	1	
C241	ECJ0EC1H101J	100P	
C242	ECJ0EC1H101J	100P	
C244	ECJ0EC1H100D	10P	
C245	ECJ0EC1H100D	10P	
C247	ECJ0EB1A104K	0.1	
C248	ECJ0EB1H331K	330P	
C250	ECJ0EC1H150J	15P	
C273	ECJ0EB1H102K	0.001	
C274	ECJ0EB1A104K	0.1	
C275	ECJ0EB1H102K	0.001	
C276	ECJ0EB1H331K	330P	
C277	ECJ1VB1C103K	0.01	
C278	ECJ0EB1A104K	0.1	
C279	ECJ0EB1A104K	0.1	
C282	ECJ0EB1H331K	330P	
C283	F2G0J1010042	100	
C286	ECJ0EC1H030C	3P	
C287	ECJ1VB1C105K	1	
C288	ECJ1VF1A105Z	1	
C289	ECJ0EB1C103K	0.01	
C292	ECJ0EB1A104K	0.1	
C308	ECJ0EB1A104K	0.1	
C331	ECJ0EC1H101J	100P	
		(CONNECTORS)	
CN1	K1KA02A00587	CONNECTOR, 2PIN	
CN2	PQJS14A30Z	CONNECTOR, 14PIN	S
CN3	K1KA09A00204	CONNECTOR, 9PIN	
CN5	K1KA11A00158	CONNECTOR, 11PIN	
CN6	K1KA05AA0193	CONNECTOR, 5PIN	
CN8	K1KA02A00746	CONNECTOR, 2PIN	
CN9	K1KA02A00745	CONNECTOR, 2PIN	
CN14	K1KA07A00257	CONNECTOR, 7PIN	
CN18	K1KA10A00441	CONNECTOR, 10PIN	
CN19	K1KA10A00441	CONNECTOR, 10PIN	
CN206	K1KA10A00412	CONNECTOR, 10PIN	
		(FUSES)	
F2	K5H122200005	FUSE	
F203	K5H251200003	FUSE	
		(COILS)	
J8	PQLQR2KA20T	COIL	S
L3	PQLQR2KA20T	COIL	S
L5	J0JCC0000042	COIL	
L6	PQLQR2KA113	COIL	S
L7	PQLQR2KA113	COIL	S
L8	PQLQR2KA113	COIL	S
L9	PQLQR2KA113	COIL	S
L10	PQLQR2KA113	COIL	S
L11	PQLQR2KA113	COIL	S
L25	ELJRF39NJFB	COIL	
L34	PQLQR2KB20T	COIL	S
		(RESISTORS)	
J5	ERJ2GE0R00	0	
J6	ERJ2GE0R00	0	
J7	ERJ2GE0R00	0	
J9	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
L23	ERJ2GE0R00	0	
L24	ERJ2GE0R00	0	
R1	ERJ3GEYJ100	10	
R11	ERJ2GEJ682	6.8K	
R12	ERJ2GEJ183	18K	
R13	ERJ2GEJ124	120K	
R14	ERJ2GEJ124	120K	
R17	ERJ2GEJ472X	4.7K	
R20	ERJ2GEJ472X	4.7K	
R22	ERJ2GE0R00	0	
R23	ERJ2GEJ220	22	
R24	ERJ2GEJ272	2.7K	
R25	ERJ2GEJ101	100	
R26	ERJ2GEJ473	47K	
R30	ERJ3GEYJ102	1K	
R32	ERJ2GEJ101	100	
R33	ERJ2GE0R00	0	
R35	ERJ2GEJ472X	4.7K	
R37	ERJ2GE0R00	0	
R38	ERJ2GEJ101	100	
R49	ERJ2GEJ153	15K	
R57	ERJ2GE0R00	0	
R58	ERJ2GEJ561	560	
R60	ERJ2GEJ562X	5.6K	
R62	ERJ2GEJ102	1K	
R63	ERJ2GEJ272	2.7K	
R68	ERJ3GEYF133	13K	S
R69	ERJ3EKF5601	5.6K	
R70	ERJ2GEJ102	1K	
R73	ERJ2GEJ112X	1.1K	
R75	ERJ2GEJ272	2.7K	
R97	ERJ2GEJ330	33	
R98	ERJ2GEJ330	33	
R99	ERJ2GEJ103	10K	
R107	ERJ2GEJ102	1K	
R108	ERJ2GEJ102	1K	
R109	ERJ2GEJ100	10	
R110	ERJ2GEJ101	100	
R111	ERJ2GEJ101	100	
R112	ERJ2GEJ100	10	
R113	ERJ2GEJ472X	4.7K	
R114	ERJ3EKF1101	1.1K	
R115	ERJ3EKF3602	36K	
R116	ERJ2GEJ104	100K	
R117	ERJ3GEYJ562	5.6K	
R118	ERJ3GEYJ472	4.7K	
R119	ERJ2GEJ101	100	
R120	ERJ2GEJ101	100	
R122	ERJ2GEJ101	100	
R123	ERJ2GEJ101	100	
R125	ERJ2GEJ101	100	
R130	ERJ2GEJ473	47K	
R131	ERJ2GEJ223	22K	
R132	ERJ2GEJ223	22K	
R134	D0GN152JA016	1.5K	
R135	ERJ3GEYJ821	820	
R136	ERJ2GEJ103	10K	
R137	ERJ2GEJ100	10	
R138	ERJ3GEYJ221	220	
R142	ERJ2GEJ151	150	
R145	ERJ3GEYJ105	1M	
R148	ERJ2GEJ182	1.8K	
R149	ERJ2GEJ103	10K	
R150	ERJ2GEJ222	2.2K	
R160	ERJ2GEJ102	1K	
R162	ERJ2GEJ473	47K	
R163	ERJ2GEJ472X	4.7K	
R164	ERJ2GEJ102	1K	
R165	ERJ2GEJ102	1K	
R168	ERJ2GEJ472X	4.7K	
R169	ERJ2GEJ472X	4.7K	
R170	ERJ2GEJ271	270	
R171	ERJ2GEJ271	270	

Ref. No.	Part No.	Part Name & Description	Remarks
R173	ERJ2GEJ101	100	
R174	ERJ2GEJ101	100	
R175	ERJ2GEJ101	100	
R176	ERJ2GEJ101	100	
R179	ERJ2GEJ222	2.2K	
R187	ERJ2GEJ103	10K	
R188	ERJ2GEJ103	10K	
R200	ERJ3GEYJ223	22K	
R202	ERJ3GEYJ222	2.2K	
R203	ERJ3GEYJ221	220	
R204	ERJ3GEYJ221	220	
R206	ERJ3GEYJ152	1.5K	
R209	ERJ2GEJ100	10	
R210	ERJ2GEJ100	10	
R211	ERJ2GEJ332	3.3K	
R217	ERJ3EKF1870	187	
R218	ERJ3EKF3300	330	
R230	ERJ2GEJ332	3.3K	
R231	ERJ2GEJ473	47K	
R232	ERJ2GEJ392	3.9K	
R233	ERJ2GEJ683	68K	
R234	ERJ2GEJ102	1K	
R236	ERJ2GEJ103	10K	
R238	ERJ2GEJ562X	5.6K	
R239	ERJ2GEJ562X	5.6K	
R241	ERJ2GEJ101	100	
R242	ERJ2GEJ101	100	
R243	ERJ2GEJ103	10K	
R244	ERJ2GEJ103	10K	
R245	ERJ2GEJ104	100K	
R246	ERJ2GEJ102	1K	
R247	ERJ2GEJ101	100	
R248	ERJ2GEJ102	1K	
R250	ERJ2GE0R00	0	
R252	ERJ2GEJ104	100K	
R253	ERJ2GEJ103	10K	
R254	ERJ2GEJ271	270	
R255	ERJ2GEJ271	270	
R256	ERJ2GEJ680	68	
R259	ERJ2GEJ103	10K	
R262	ERJ2GEJ103	10K	
R263	ERJ2GEJ224	220K	
R266	ERJ2GEJ102	1K	
R272	ERJ2GEJ561	560	
R273	ERJ2GEJ271	270	
R274	ERJ2GE0R00	0	
R295	ERJ2GEJ561	560	
R296	ERJ2GEJ103	10K	
R297	ERJ3GEY0R00	0	
R298	ERJ2GEJ102	1K	
R299	ERJ2GEJ680	68	
R300	ERJ2GEJ680	68	
R301	ERJ2GEJ102	1K	
R302	ERJ2GEJ272	2.7K	
R303	ERJ2GEJ272	2.7K	
R304	ERJ2GEJ331	330	
R309	ERJ12YJ8R2U	8.2	
R310	ERJ2GEJ101	100	
R311	ERJ2GEJ102	1K	
R316	ERJ2GEJ102	1K	
R317	ERJ2GEJ103	10K	
R318	ERJ2GE0R00	0	
R320	ERJ2GEJ332	3.3K	
R323	ERJ2GE0R00	0	
R324	ERJ2GEJ473	47K	
R336	ERJ2GEJ100	10	
R337	ERJ2GEJ100	10	
R338	ERJ2GEJ472X	4.7K	
R34	PQLQR2KA113	COIL	S
R340	ERJ2GEJ472X	4.7K	
R341	ERJ3GEYJ105	1M	
		(VARIABLE RESISTOR)	

Ref. No.	Part No.	Part Name & Description	Remarks
R103	EVN5ESX50B54	VARIABLE RESISTOR	
		(COMPONENTS PARTS)	
RA3	EXB28V470JX	SOLID RESISTOR	
RA4	EXB28V470JX	SOLID RESISTOR	
RA5	EXB28V470JX	SOLID RESISTOR	
RA6	EXB28V470JX	SOLID RESISTOR	
RA7	EXB28V101JX	SOLID RESISTOR	
		(CRYSTAL OSCILLATORS)	
X1	H0J322500004	CRYSTAL OSCILLATOR	
X3	H0A327200096	CRYSTAL OSCILLATOR	
X4	H2A240500005	CRYSTAL OSCILLATOR	
X5	H0D103500003	CRYSTAL OSCILLATOR	
		(OTHER)	
IC24	PFLP1598JPZ	PC BOARD W/COMPONENT	S

### 14.3. ANALOG BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PFLP1670CXZ	ANALOG BOARD ASS'Y (RTL)	
		(ICs)	
IC500	C0ABEB000083	IC	
IC501	C0ABEB000075	IC	
		(DIODES)	
D500	B0EAAD000001	DIODE(SI)	
D501	MA4056	DIODE(SI)	S
D502	MA4056	DIODE(SI)	S
D504	B0EDER000009	DIODE(SI)	
D505	MA4030	DIODE(SI)	S
D506	MA4030	DIODE(SI)	S
D508	B0EAAD000001	DIODE(SI)	
DA502	MA153	DIODE(SI)	S
		(TRANSISTORS)	
Q501	BLAACL000006	TRANSISTOR(SI)	
Q502	PQVTDTC143E	TRANSISTOR(SI)	S
Q505	PQVTDTC143E	TRANSISTOR(SI)	S
Q506	BLABDF000025	TRANSISTOR(SI)	
Q508	PQVTDTC143E	TRANSISTOR(SI)	S
		(CAPACITORS)	
C503	ECEA1HKA4R7	4.7	
C505	ECEA1HKN4R7	4.7	
C506	ECJ1VB0J105K	1	
C508	ECEA0JKA101	100	
C509	ECJ1VC1H181J	180P	
C510	ECJ1VC1H100D	10P	
C511	ECJ1VB1C104K	0.1	
C513	ECJ1VB1H821K	820P	
C514	ECJ1VF1E104Z	0.1	
C515	ECJ1VB1H821K	820P	
C516	ECJ1VC1H100D	10P	
C517	ECJ1VB1C104K	0.1	
C518	ECJ1VB1C104K	0.1	
C520	ECUV1H333KDV	0.033	S
C521	ECJ1VB1C104K	0.1	
C522	ECJ1VB1C104K	0.1	
C524	ECJ1VC1H100D	10P	
C527	ECJ1VC1H121J	120P	
C532	ECJ1VB1H103K	0.01	
C533	ECEA1HKA4R7	4.7	
C534	ECJ1VB1C105K	1	
C536	ECJ1VC1H100D	10P	
C539	ECJ1VF1H104Z	0.1	
C540	ECJ1VB1C104K	0.1	
C542	ECKD2H681KB	680P	S
C543	ECKD2H681KB	680P	S
C552	ECJ1VB1H103K	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C555	F0C2E105A146	14	
C563	ECJ1VF1H104Z	0.1	
C564	ECJ1VB1C104K	0.1	
C565	ECJ1VB1H102K	0.001	
C566	ECJ1VB1H102K	0.001	
C567	ECJ1VB1H103K	0.01	
C569	ECEA0JKA101	100	
C570	ECJ1VC1H100D	10P	
C571	ECEA1VKA330	33	
C572	ECJ1VB1C105K	1	
		(CONNECTORS & JACKS)	
CN500	PFJJ1T006Z	JACK	S
CN501	PFJJ1T006Z	JACK	S
CN502	K2LA104B0019	JACK	
CN504	PQJS10A10Z	CONNECTOR, 10 PIN	S
CN505	PQJS10A10Z	CONNECTOR, 10 PIN	S
		(COILS)	
L500	PFLE003	COIL	S
L500	PFLE003	COIL	S
L501	PQLQR2BT	COIL	S
L502	PQLQR2BT	COIL	S
L504	PQLQR2KA113	COIL	S
L505	PQLQR2KA113	COIL	S
L506	PQLQR2KA113	COIL	S
L516	PQLQR2KB113T	COIL	S
L517	PQLQR2KB113T	COIL	S
L518	PQLQR2KB113T	COIL	S
L519	PQLQR2KB113T	COIL	S
L520	PQLQR2BT	COIL	S
L521	PQLQR2BT	COIL	S
L522	PQLQR2KA113	COIL	S
L523	PQLQR2KA113	COIL	S
L524	PQLQR2KA113	COIL	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC501	B3PAB0000058	PHOTO COUPLER	
PC502	CNC7S102	PHOTO COUPLER	△
PC504	B3PAA0000330	PHOTO COUPLER	
		(THERMISTOR)	
POS500	PFRT002	THERMISTOR	△ S
		(RESISTORS)	
R511	ERDS1TJ330	33	S
R512	ERJ3GEYJ123	12K	
R513	ERJ3GEYJ682	6.8K	
R514	ERJ3GEYJ102	1K	
R515	ERDS2TJ221	220	S
R519	ERJ3GEYJ222	2.2K	
R520	ERJ3GEYJ104	100K	
R521	ERJ3GEYJ103	10K	
R522	ERJ3GEYJ103	10K	
R523	ERJ3GEYJ123	12K	
R524	ERJ3GEY0R00	0	
R525	ERJ3GEYJ105	1M	
R526	ERJ3GEYJ272	2.7K	
R528	ERJ3GEYJ223	22K	
R529	ERJ3GEYJ223	22K	
R530	ERJ3GEYJ123	12K	
R531	ERJ3GEYJ123	12K	
R532	ERJ3GEYJ202	2K	
R533	ERJ3GEYJ242	2.4K	
R534	ERJ3GEYJ153	15K	
R535	ERJ3GEYJ153	15K	
R536	ERJ3GEY0R00	0	
R537	ERJ3GEY0R00	0	
R538	ERJ3GEYJ122	1.2K	
R539	ERJ3GEY0R00	0	
R540	ERJ3GEYJ154	150K	
R541	ERJ3GEYJ222	2.2K	

Ref. No.	Part No.	Part Name & Description	Remarks
R542	ERDS2TJ221	220	S
R543	ERDS2TJ121	120	S
R544	ERJ3GEYJ101	100	
R548	ERJ3GEYJ103	10K	
R549	ERJ3GEYJ103	10K	
R559	ERDS1TJ223	22K	S
R567	ERDS1TJ153	15K	S
R573	ERJ3GEYJ103	10K	
R578	PQ4R10XJ2R2	2.2	S
		(COMPONENTS PARTS)	
L503	EXCELD35	COMPONENTS PARTS	
		(RELAY)	
RLY500	PFSL003Z	RELAY	S
		(VARISTORS)	
SA500	PQVDDSS301L	VARISTOR	△ S
SA501	J0LS00000024	VARISTOR	
ZNR500	ERZVA7D121	VARISTOR	
		(TRANSFORMER)	
T501	G4A1A0000170	TRANSFORMER	
		(SWITHES)	
SW500	K0L1KA000007	PUSH SWITCH	
SW501	PFSH1A03Z	PUSH SWITCH	S
SW502	PFSH1A03Z	PUSH SWITCH	S

### 14.4. OPERATION BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PFWP2FC533CN	OPERATION BOARD ASS'Y (RTL)	
PCB3-1	K0L1BA000095	SWITCH	
PCB3-2	K0L1BA000116	SWITCH	
		(IC)	
IC1	C1ZBZ0002089	IC	
		(TRANSISTORS)	
Q2	B1ABDF000026	TRANSISTOR(SI)	
Q3	B1ABDF000026	TRANSISTOR(SI)	
		(DIODE)	
LED1	LNJ801LPDJA	DIODE(SI)	
		(CONNECTOR)	
CN1	K1KA10B00215	CONNECTOR, 10 PIN	
CN2	L5DAAF000001	LIQUID CRYSTAL DISPLAY	
		(CAPACITORS)	
C1	ECJ1VF1E104Z	0.1	
C3	ECEA0JKA221	220	S
C4	ECJ1VB1H331K	330P	
C6	ECJ1VB1H103K	0.01	
C13	ECJ1VB1H331K	330P	
C14	ECJ1VC1H121J	120P	
C15	ECJ1VF1E104Z	0.1	
C16	ECJ1VF1E104Z	0.1	
C17	ECJ1VFC224Z	0.22	
C19	ECJ1VB1H103K	0.01	
C20	ECJ1VB1H103K	0.01	
		(RESISTORS)	
R1	ERJ3GEY0R00	0	
R2	ERJ3GEY0R00	0	
R3	ERJ3GEY0R00	0	
R4	ERJ3GEY0R00	0	
R5	ERJ3GEY0R00	0	
R14	ERJ3GEY0R00	0	
R15	ERJ3GEYJ183	18K	

Ref. No.	Part No.	Part Name & Description	Remarks
R17	ERJ3GEYJ222	2.2K	
R18	ERJ3GEYJ271	270	
R19	ERJ3GEYJ4R7	4.7	
R20	ERJ3GEYJ101	0	
R21	ERJ3GEYJ101	100	
R22	ERJ3GEYJ472	4.7K	
R23	ERJ3GEYJ472	4.7K	
R24	ERJ3GEYJ102	1K	
R25	ERJ3GEYJ821	820	
R26	ERJ3GEYJ222	2.2K	
R27	ERJ3GEYJ222	2.2K	
R28	DOGN222JA016	2.2K	
R29	DOGN222JA016	2.2K	
R30	DOGN222JA016	2.2K	
R31	DOGN222JA016	2.2K	
R32	DOGN222JA016	2.2K	
R33	ERJ14YJ472H	4.7K	
R50	ERJ3GEYJ330	33	
		(SWITCHES)	
SW1	EVQ11Y05B	SPECIAL SWITCH	S
SW2	EVQ11Y05B	SPECIAL SWITCH	S
SW3	EVQ11Y05B	SPECIAL SWITCH	S
SW4	EVQ11Y05B	SPECIAL SWITCH	S
SW5	EVQ11Y05B	SPECIAL SWITCH	S
SW6	EVQ11Y05B	SPECIAL SWITCH	S
SW7	EVQ11Y05B	SPECIAL SWITCH	S
SW8	EVQ11Y05B	SPECIAL SWITCH	S
SW9	EVQ11Y05B	SPECIAL SWITCH	S
SW10	EVQ11Y05B	SPECIAL SWITCH	S
SW11	EVQ11Y05B	SPECIAL SWITCH	S
SW12	EVQ11Y05B	SPECIAL SWITCH	S
SW13	EVQ11Y05B	SPECIAL SWITCH	S
SW14	EVQ11Y05B	SPECIAL SWITCH	S
SW15	EVQ11Y05B	SPECIAL SWITCH	S
SW16	EVQ11Y05B	SPECIAL SWITCH	S
SW17	EVQ11Y05B	SPECIAL SWITCH	S
SW18	EVQ11Y05B	SPECIAL SWITCH	S
SW19	EVQ11Y05B	SPECIAL SWITCH	S
SW20	EVQ11Y05B	SPECIAL SWITCH	S
SW21	EVQ11Y05B	SPECIAL SWITCH	S
SW22	EVQ11Y05B	SPECIAL SWITCH	S
SW23	EVQ11Y05B	SPECIAL SWITCH	S
SW24	EVQ11Y05B	SPECIAL SWITCH	S
SW25	EVQ11Y05B	SPECIAL SWITCH	S
SW26	EVQ11Y05B	SPECIAL SWITCH	S
SW27	EVQ11Y05B	SPECIAL SWITCH	S
SW28	EVQ11Y05B	SPECIAL SWITCH	S
SW29	EVQ11Y05B	SPECIAL SWITCH	S
SW30	EVQ11Y05B	SPECIAL SWITCH	S
SW31	EVQ11Y05B	SPECIAL SWITCH	S
SW32	EVQ11Y05B	SPECIAL SWITCH	S
SW33	EVQ11Y05B	SPECIAL SWITCH	S
SW34	EVQ11Y05B	SPECIAL SWITCH	S
SW35	EVQ11Y05B	SPECIAL SWITCH	S
SW36	EVQ11Y05B	SPECIAL SWITCH	S
SW37	EVQ11Y05B	SPECIAL SWITCH	S

### 14.5. CORDLESS HANDSET

Note:

(\*2) When replacing IC905, data need to be written to them with PFZZFC533CN.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB5	PFWP3FC533CN	CORDLESS MAIN BOARD ASS'Y (RTL)	
PCB5-1	LOCBAB000052	BUILTIN-MICROPHONE	
PCB5-2	PFHX1661Z	SPACER	
		(ICS)	
IC900	PFWI3FC533CN	IC	S

Ref. No.	Part No.	Part Name & Description	Remarks
IC901	C0EBF0000424	IC	
IC903	C1BB00001024	IC	
IC905	C3EBJC000017	IC	
IC907	C1BB00001021	IC	
IC908	C0CBCBC00175	IC	
IC909	C0DBAGF00031	IC	
		(TRANSISTORS)	
Q901	UN521	TRANSISTOR(SI)	S
Q905	2SB1219ARL	TRANSISTOR(SI)	
Q906	2SB1219ARL	TRANSISTOR(SI)	
Q908	UN521	TRANSISTOR(SI)	S
Q909	UN521	TRANSISTOR(SI)	S
Q910	UN5113	TRANSISTOR(SI)	S
Q911	2SB1219ARL	TRANSISTOR(SI)	
Q915	2SD1819A	TRANSISTOR(SI)	
Q916	UN5213	TRANSISTOR(SI)	S
Q917	2SB1219ARL	TRANSISTOR(SI)	
Q918	UN521	TRANSISTOR(SI)	S
Q919	UN5216	TRANSISTOR(SI)	S
		(DIODES)	
LED900	PQVDBR1111C	DIODE(SI)	S
LED901	B3ACB0000129	DIODE(SI)	
LED902	B3ACB0000129	DIODE(SI)	
LED903	B3ACB0000129	DIODE(SI)	
LED904	B3ACB0000129	DIODE(SI)	
LED905	B3ABB0000157	DIODE(SI)	
D903	MA729	DIODE(SI)	S
D906	MA8033	DIODE(SI)	S
D907	MA8033	DIODE(SI)	S
D908	MA8033	DIODE(SI)	S
D909	MA729	DIODE(SI)	S
		(CAPACITORS)	
C900	ECUV1A105KBV	1	
C902	PQCUV0J475KB	4.7	
C907	ECJ0EB1C103K	0.01	
C909	ECJ0EB1A104K	0.1	
C911	ECJ0EF1C104Z	0.1	
C913	ECJ0EB1C103K	0.01	
C914	ECJ0EB1A104K	0.1	
C915	ECUV1C334ZFB	0.33	
C916	ECUV1C104ZFB	0.1	
C918	ECUV1A105KBV	1	
C920	ECUV1A105KBV	1	
C921	ECUV1A474KBV	0.47	
C922	ECJ0EB1C103K	0.01	
C923	ECJ0EB1C103K	0.01	
C928	ECJ0EB1A683K	0.068	
C929	ECJ0EB1A683K	0.068	
C933	ECJ0EB1C103K	0.01	
C934	ECJ0EB1C103K	0.01	
C938	ECJ0EC1H050C	5P	
C939	ECUV1A224KBV	0.22	
C940	ECUV1C104KBV	0.1	
C941	ECUV1C473KBV	0.047	
C945	ECJ0EB1H392K	0.0039	
C946	ECJ0EB1A104K	0.1	
C949	ECUV1C683KBV	0.068	
C950	ECJ0EC1H150J	15P	
C951	ECUV1H080DCV	8P	S
C952	ECJ0EB1C103K	0.01	
C953	ECJ0EB1C103K	0.01	
C954	ECJ0EB1C103K	0.01	
C955	ECJ0EC1H330J	33P	
C956	ECUV1C104ZFB	0.1	
C957	ECJ0EC1H100D	10P	
C958	ECJ0EC1H100D	10P	
C959	ECJ0EC1H100D	10P	
C961	PQCUV1E104MD	0.1	S
C963	PQCUV0J475KB	4.7	
C964	ECJ0EC1H100D	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C965	ECJ0EC1H100D	10P	
C966	ECJ0EC1H150J	15P	
C967	ECJ0EC1H100D	10P	
C968	ECJ0EC1H100D	10P	
C969	ECJ0EC1H100D	10P	
C970	ECJ0EC1H100D	10P	
C972	ECJ0EB1E682K	0.0068	
C981	PQCUV1E104MD	0.1	S
C982	ECJ0EF1C104Z	0.1	
C993	ECJ0EB1A683K	0.068	
C1005	PQCUV0J475KB	4.7	
C1008	ECJ0EB1H271	270P	
C1009	PQCUV0J475KB	4.7	
C1011	ECUV1C104KBV	0.1	
C1013	ECJ0EC1H030C	3P	
C1014	ECJ0EC1H030C	3P	
C1015	ECUV1H680JCV	68P	
C1018	ECJ0EB1C103K	0.01	
C1024	ECJ0EB1C103K	0.01	
C1028	ECJ1VC1H070C	7P	
		(CONNECTOR)	
CN901	K1KA02A00552	CONNECTOR, 3 PIN	
CN904	PQJS07A80Z	CONNECTOR, 7 PIN	
		(RESISTORS)	
R1006	ERJ3GEYJ102	1K	
R1007	ERJ3GEYJ102	1K	
R1008	ERJ2GEJ102	1K	
R1009	ERJ2GEJ102	1K	
R1010	ERJ2GEJ102	1K	
R1014	ERJ2GEJ102	1K	
R1015	ERJ2GEJ152	1.5K	
R1016	ERJ3GEYJ152	1.5K	
R1021	ERJ2GEJ271	270	
R1023	ERJ2GEJ223	22K	
R1024	ERJ2GEJ223	22K	
R1025	ERJ2GEJ100	10	
R1026	ERJ2GEJ100	10	
R1027	EVN5ESX50B54	50	
R1033	ERJ2GEJ104	100K	
R1034	ERJ3GEY0R00	0	
R1036	ERJ3GEY0R00	0	
R1037	ERJ3GEY0R00	0	
R1038	ERJ3GEY0R00	0	
R1039	ERJ3GEYJ102	1K	
R1040	ERJ2GEJ101	100	
R1041	ERJ2GEJ102	1K	
R1042	ERJ3GEY0R00	0	
R1043	ERJ2GE0R00	0	
R1044	ERJ2GEJ105X	1M	
R902	ERJ6RQFR51	0.51	
R903	ERJ2GEJ102	1K	
R904	ERJ3EKF4702	47	
R905	ERJ3EKF5102	51	
R908	ERJ2GEJ183	18K	
R910	ERJ2GEJ103	10K	
R911	ERJ2GEJ153	15K	
R912	ERJ3GEYJ102	1K	
R918	ERJ3GEYJ681	680	
R919	ERJ2GEJ561	560	
R920	ERJ3GEYF393	39K	S
R921	ERJ2GEJ103	10K	
R923	ERJ3GEYJ102	1K	
R930	ERJ3ENF8202	82	S
R936	ERJ2GEJ472X	4.7K	
R937	ERJ2GEJ472X	4.7K	
R940	ERJ2GEJ102	1K	
R941	ERJ2GEJ101	100	
R942	ERJ2GEJ102	1K	
R943	ERJ3GEYJ101	100	
R944	ERJ2GEJ123	12K	
R945	ERJ2GEJ103	10K	

Ref. No.	Part No.	Part Name & Description	Remarks
R946	ERJ2GEJ104	100K	
R954	ERJ2GEJ103	10K	
R955	ERJ3GEYJ103	10K	
R956	ERJ2GEJ102	1K	
R957	ERJ2GEJ104	100K	
R959	ERJ2GEJ104	100K	
R961	ERJ2GEJ682	6.8K	
R962	ERJ2GEJ473	47K	
R966	ERJ2GEJ104	100K	
R973	ERJ2GEJ101	100	
R974	ERJ2GEJ101	100	
R975	ERJ2GEJ101	100	
R976	ERJ2GEJ102	1K	
R977	ERJ2GEJ102	1K	
R978	ERJ3GEYJ104	100K	
R979	ERJ2GEJ153	15K	
R985	ERJ3GEYJ331	330	
R986	ERJ2GEJ271	270	
R987	ERJ3GEYJ241	240	
R988	ERJ3GEYJ241	240	
R989	ERJ3GEYJ241	240	
R990	ERJ3GEYJ241	240	
R991	ERJ2GEJ102	1K	
R994	ERJ3GEYJ104	100K	
R995	ERJ2GEJ104	100K	
R996	ERJ2GEJ104	100K	
		(CRYSTAL OSCILLATORS)	
X900	H0D103500006	CRYSTAL OSCILLATOR	
		(OTHERS)	
SW900	EVQPSM02K	PUSH SWITCH	
C903	F1G0J1050007	CERAMIC CAPACITOR	S
C904	F3F0J226A016	ELECTROLYTIC CAPACITOR TA	
IC904	PFLP1598JPZ	RF UNIT BOARD	

## 14.6. CHARGER UNIT

### 14.6.1. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB6	PFLP1525JPZ	MAIN P.C.BOARD ASS'Y (RTL)	
		(COILS)	
L1	PQLQR2BT	COIL	S
L2	PQLQR2BT	COIL	S
		(CONNECTORS)	
CN1	PFJT1006Z	CONNECTOR	S
CN1	PFJT1006Z	CONNECTOR	S
		(DIODE)	
D1	MA3062M	DIODE(SI)	
		(TRANSISTORS)	
Q1	2SD0874AS	TRANSISTOR(SI)	S
Q2	2SC4081R	TRANSISTOR(SI)	
		(JACK)	
J1	PFJJ1B02Z	JACK	S
		(RESISTORS)	
R1	PQ4R18XJ271	270	
R2	PQ4R18XJ6R8	6.8	
		(CAPACITORS)	
C1	ECUV1E104ZFV	0.1	
C2	ECUV1H104MD	0.1	S
C3	ECA1CHG101	100P	



## 14.7. POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB4	N0AC2GJ00005	POWER SUPPLY BOARD ASS'Y (RTL)	△
		(ICs)	
IC101	PFVIFA5518N	IC	S
		(TRANSISTOR)	
Q101	2SK2647	TRANSISTOR(SI)	
Q201	DTA114EKAT46	TRANSISTOR(SI)	
Q203	2SC3928	TRANSISTOR(SI)	
		(DIODES)	
D101	PFVD1N4005	DIODE(SI)	S
D102	PFVD1N4005	DIODE(SI)	S
D103	PFVD1N4005	DIODE(SI)	S
D104	PFVD1N4005	DIODE(SI)	S
D105	PQVDP1007	DIODE(SI)	S
D109	MA165	DIODE(SI)	S
D110	PFVD1N4005	DIODE(SI)	S
D201	PFVDSF5LC20U	DIODE(SI)	S
D202	PFVDD1NL20U	DIODE(SI)	S
D204	MA165	DIODE(SI)	S
D205	HZS5.1NB3	DIODE(SI)	
D206	MA165	DIODE(SI)	S
		(CONNECTORS)	
CN202	PFJPB9BPHKL	CONNECTOR, 9 PIN	S
CN31	PQJP2D98Z	CONNECTOR, 2 PIN	
		(COIL)	
L101	PFLES11V0523	COIL	S
		(COMPONENTS PARTS)	
L103	EXCELDR35	COMPONENTS PARTS	
		(FUSE)	
F101	PFBAST250315	FUSE	S
		(PHOTO ELECTRIC TRANSDUCER)	
PC101	PFVIPC123	PHOTO ELECTRIC TRANSDUCER	△ S
		(TRANSFORMER)	
T101	PFLTSRW28LEC	TRANSFORMER	S
		(VARIABLE RESISTOR)	
VR201	ECNCYAA03B53	VARIABLE RESISTOR	S
		(VARISTOR)	
ZNR101	ERZV10D751	VARISTOR	
		(RESISTORS)	
JP204	ERJ3GEY0R00	0	
R101	ERDS1TJ105	1M	
R102	ERJ3GEYJ103	10K	
R105	ERX2SJR22E	0.22	
R106	ERG2SJ470	47	
R107	ERG2DJ104E	100K	
R109	ERDS2TJ100	10	
R111	ERDS2TJ220	22	
R121	ERJ3GEYJ103	10K	
R122	ERJ3GEYJ181	180	
R123	ERJ3GEYJ182	1.8K	
R128	ERJ6GEYJ101	100	
R221	ERJ3GEYJ102	1K	
R222	ERJ3GEYJ102	1K	
R223	ERJ3GEYJ102	1K	
R224	ERJ3GEYJ562	5.6K	
R225	ERJ3GEYJ222	2.2K	
R228	ERJ3GEYJ102	1K	

Ref. No.	Part No.	Part Name & Description	Remarks
R229	ERJ3GEYJ183	18K	
		(CAPACITORS)	
C101	ECQU2A104ML	0.1	
C102	ECQU2A104ML	0.1	
C103	PFKDD2GA102M	0.001	S
C105	PFKDD2GA332M	0.033	S
C106	EEUEB2W560U	56	
C107	PFKDD3DD470J	47P	S
C108	PFKDD3AD102K	0.001	S
C109	PFCEA35A47M	47	S
C110	PFKDD2GA102M	0.001	S
C121	ECUV1H472KBV	0.0047	S
C122	ECUV1E104KBV	0.1	S
C123	ECUV1H104KCV	0.1	S
C124	ECUV1H103KBV	0.01	S
C125	ECUV1H471JCV	470P	S
C201	PFCEA35L220	22P	S
C202	PFCEA33A102	0.001	S
C203	PFCEA16A470	47P	S
C205	ECUV1E104KBV	0.1	S

## 14.8. FIXTURES AND TOOLS

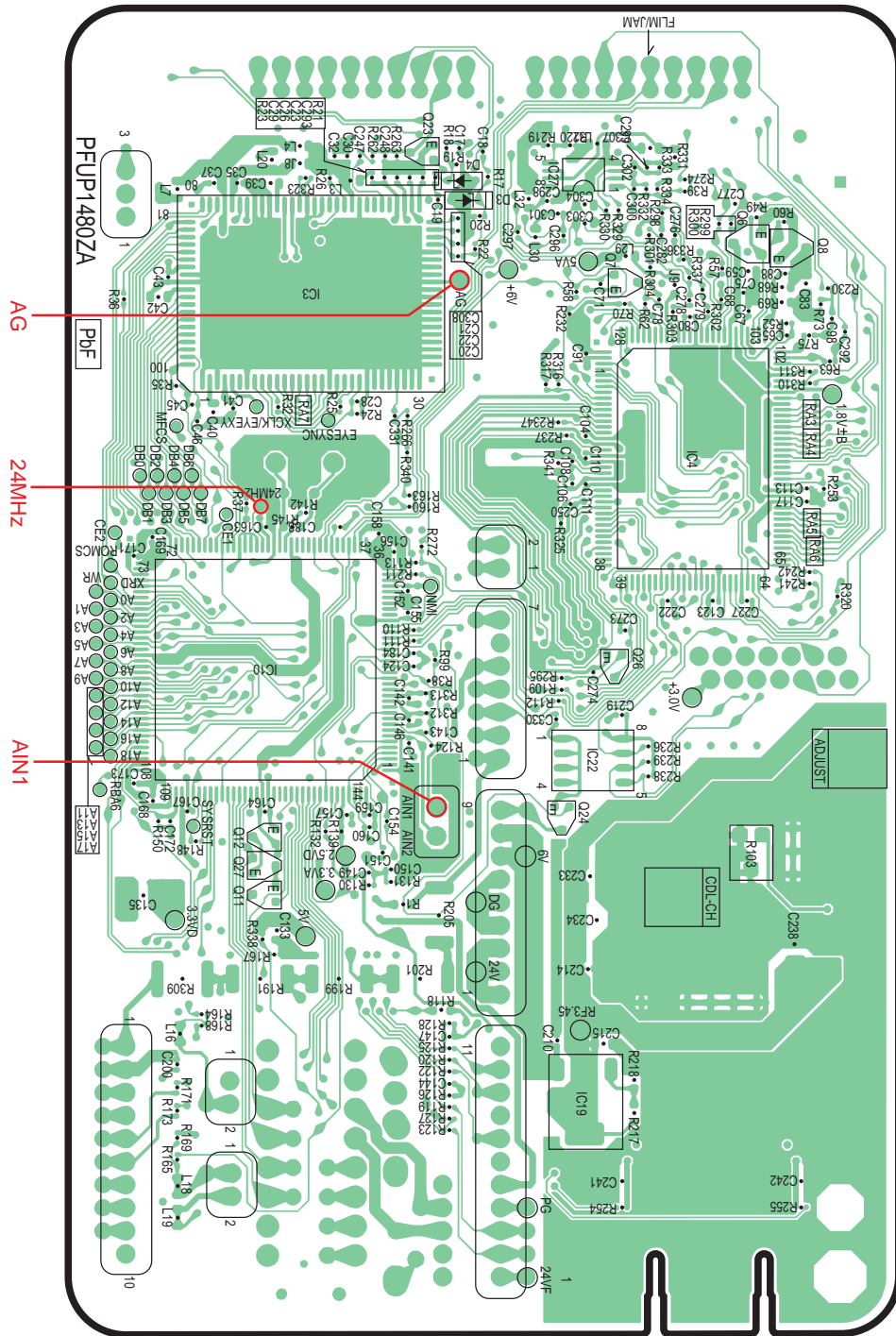
Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PQZZ11K4Z	EXTENSION CORD, 11 PIN	
EC2	PQZZ9K4Z	EXTENSION CORD, 9 PIN	
EC3	PFZZ10K3Z	EXTENSION CORD, 10 PIN	
EC4	PFZZ5K13Z	EXTENSION CORD, 5 PIN	
EC5	PQZZ7K5Z	EXTENSION CORD, 7 PIN	
EC6	PQZZ2K6Z	EXTENSION CORD, 2 PIN	
EC7	PFZZ10K1Z	EXTENSION CORD, 10 PIN	
EC8	PQZZ2K12Z	EXTENSION CORD, 2 PIN	
EC9	PQZZ2K12Z	EXTENSION CORD, 2 PIN	
	KM79811245C0	BASIC FACSIMILE TECHNIQUE (for training service technicians)	
	PQZZ1CD505E	JIG CABLE (*3)	
	PFZZFC533CN	BATCH FILE (*3)	

### Note:

- (\*3) See **DIGITAL BOARD (CORDLESS BASE SECTION) ADJUSTMENT (P.112)** and **CORDLESS HANDSET ADJUSTMENT (P.117)**.
- Tools and Extension Cords are useful for servicing.  
(They make servicing easy.)



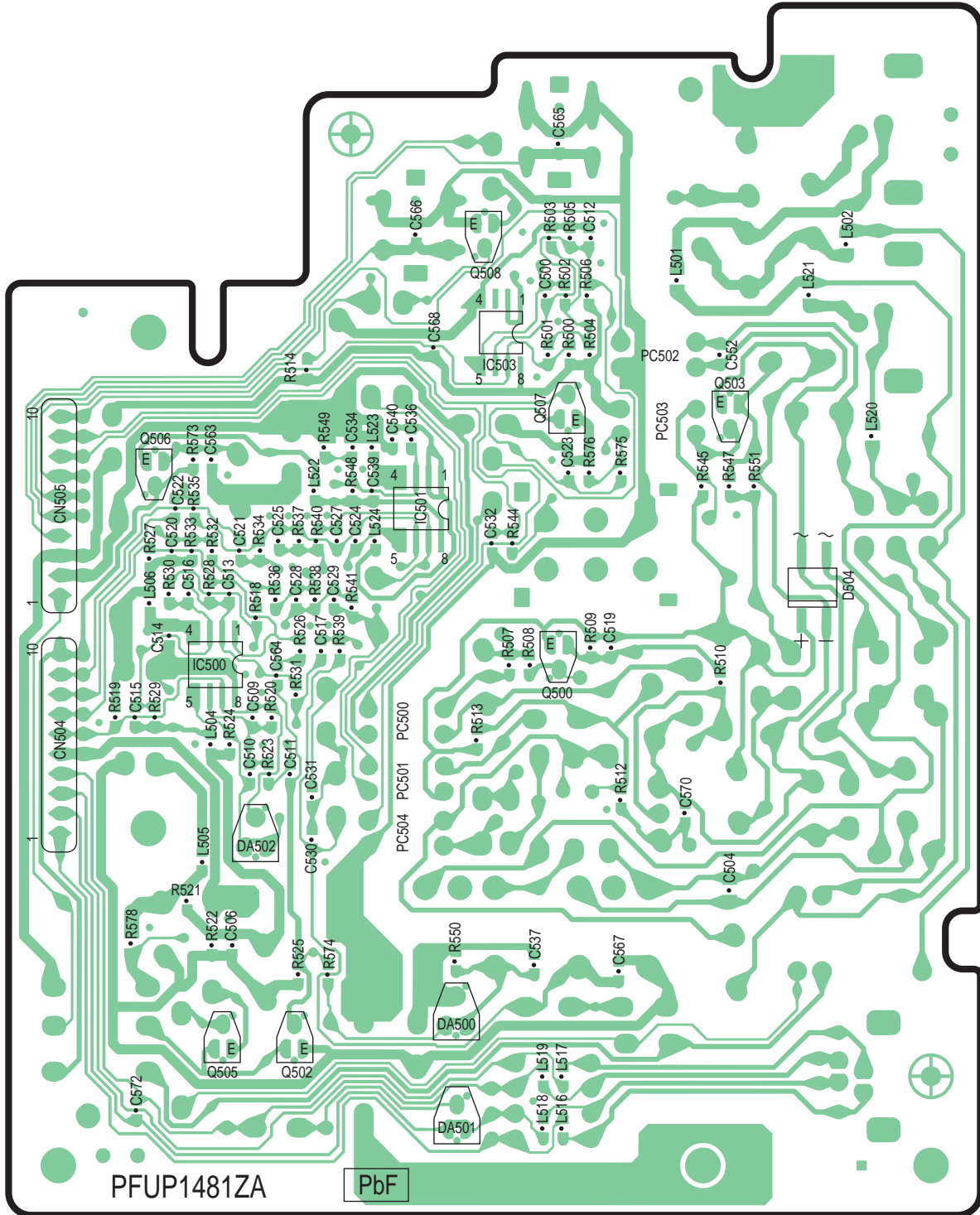
### 15.1.2. BOTTOM VIEW



KX-FC971CX-S: DIGITAL BOARD (Bottom View)

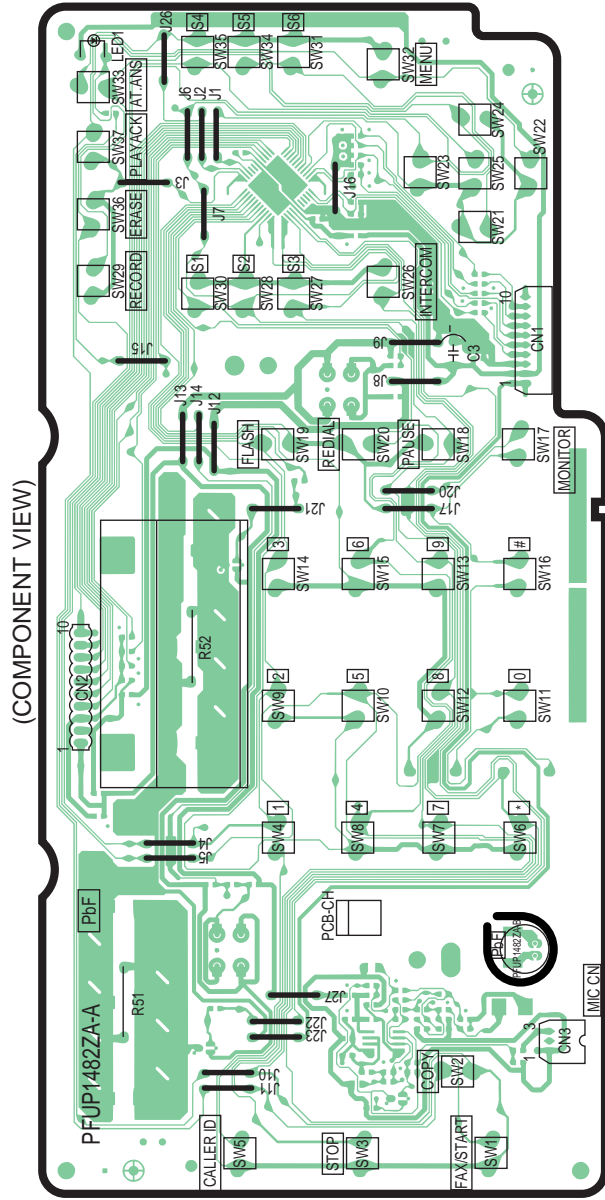
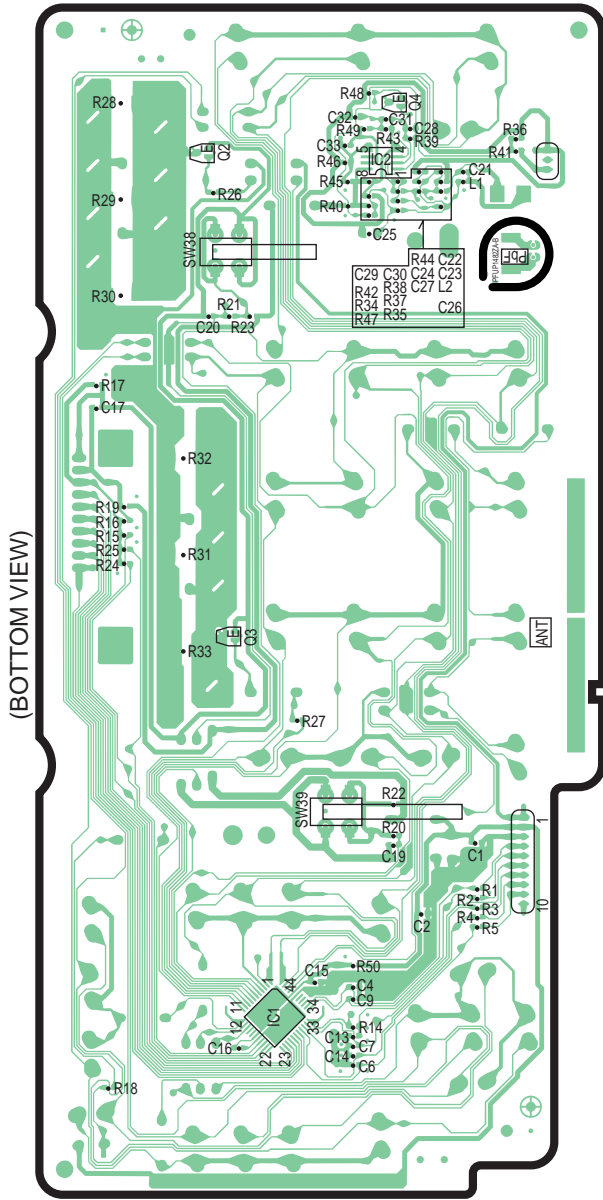


15.2.2. BOTTOM VIEW



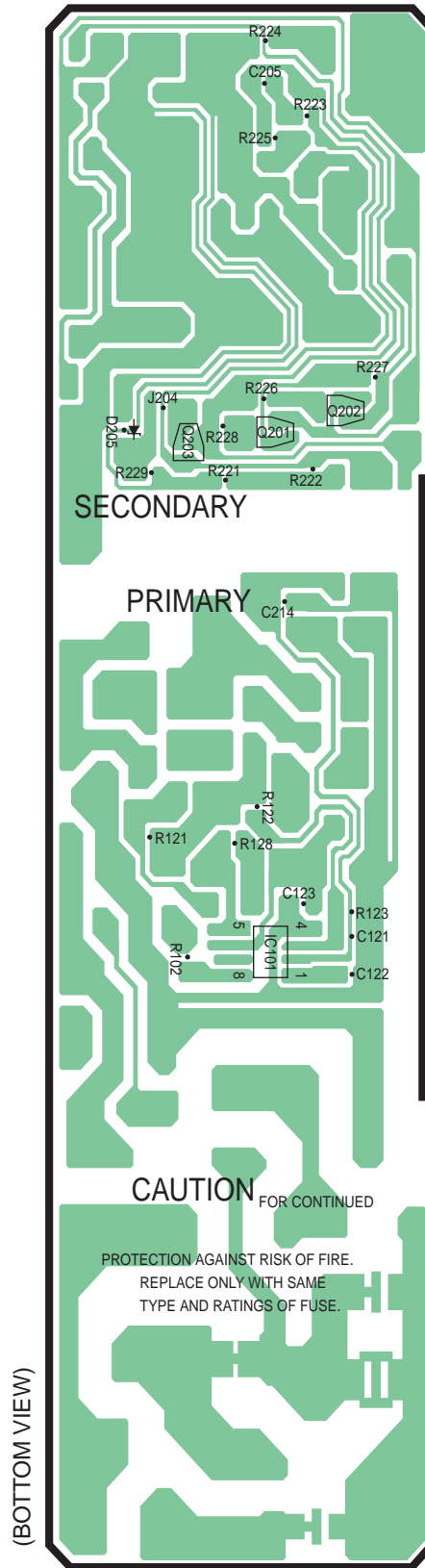
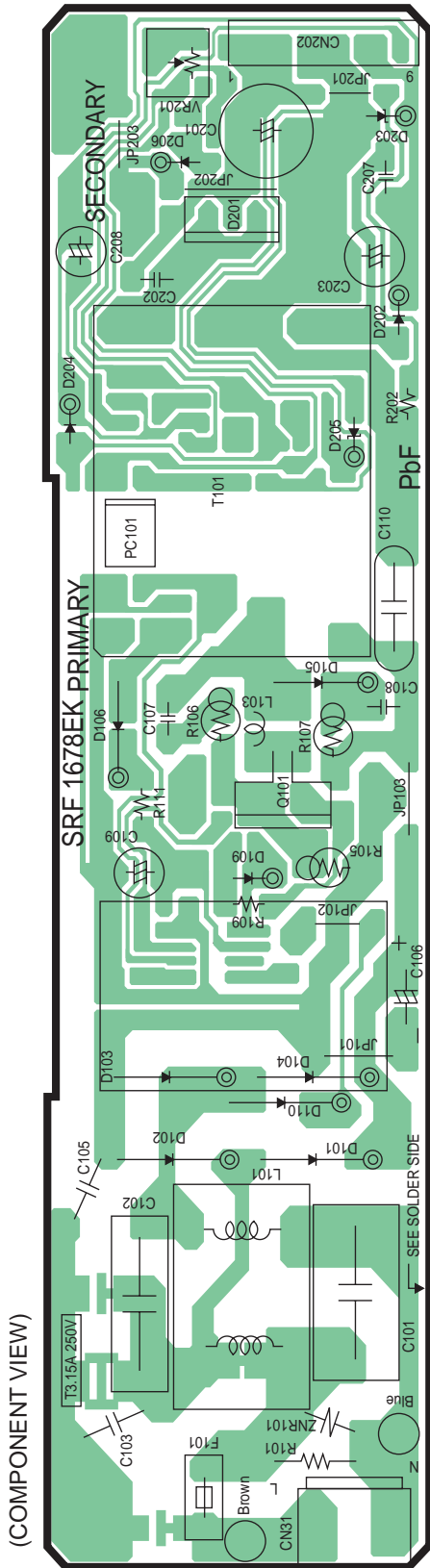
KX-FC971CX-S : ANALOG BOARD (Bottom View)

# 15.3. OPERATION BOARD



KX-FC971CX-S : OPERATION BOARD

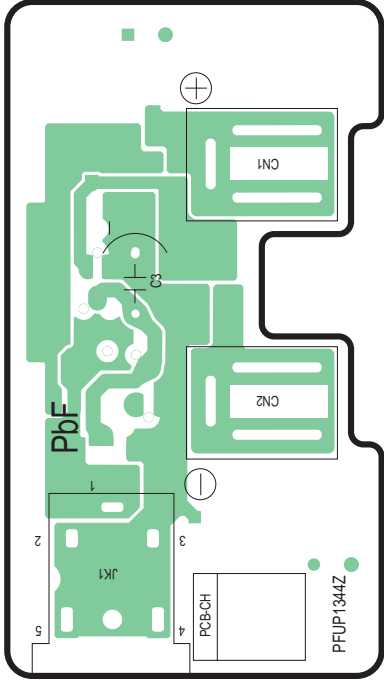
# 15.4. POWER SUPPLY BOARD



KX-FC971CX-S : POWER SUPPLY BOARD

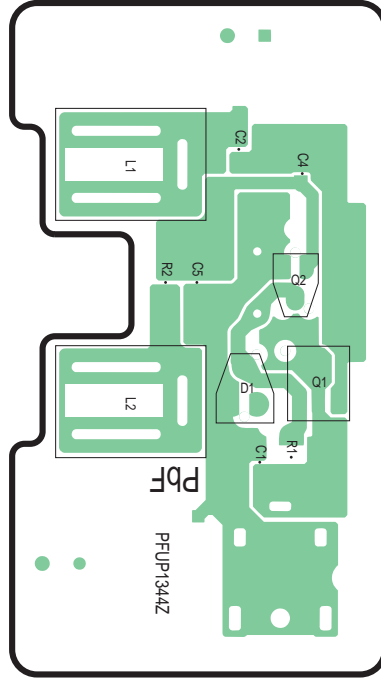
## 15.5. CHARGER UNIT BOARD

### 15.5.1. COMPONENT VIEW



KX-FC971CX-S : CHRGR UNIT BOARD COMPONENT VIEW

### 15.5.2. BOTTOM VIEW

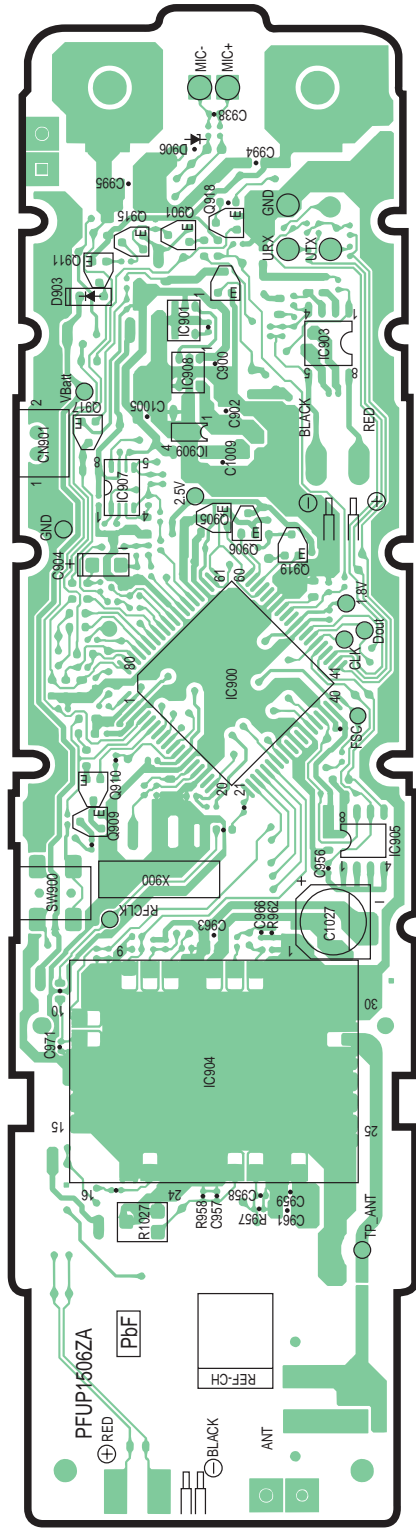


KX-FC971CX-S : CHRGR UNIT BOARD BOTTOM VIEW

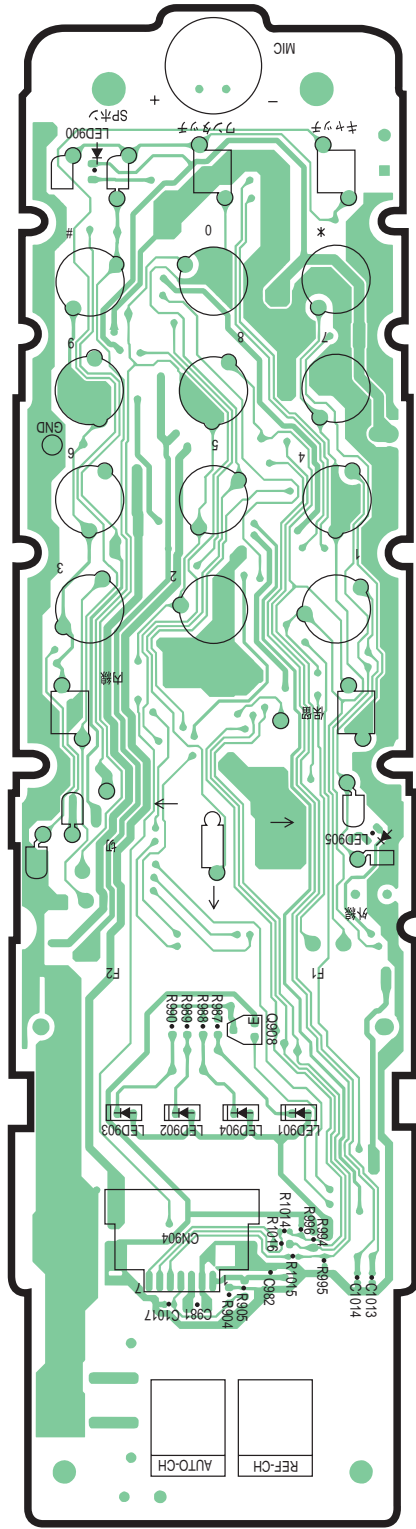


# 15.6. CORDLESS HANDSET BOARD

(COMPONENT VIEW)



(BOTTOM VIEW)

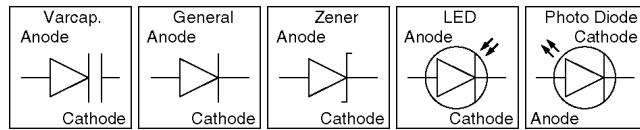


KX-FC971CX-S : HANDSET BOARD

## 16 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.

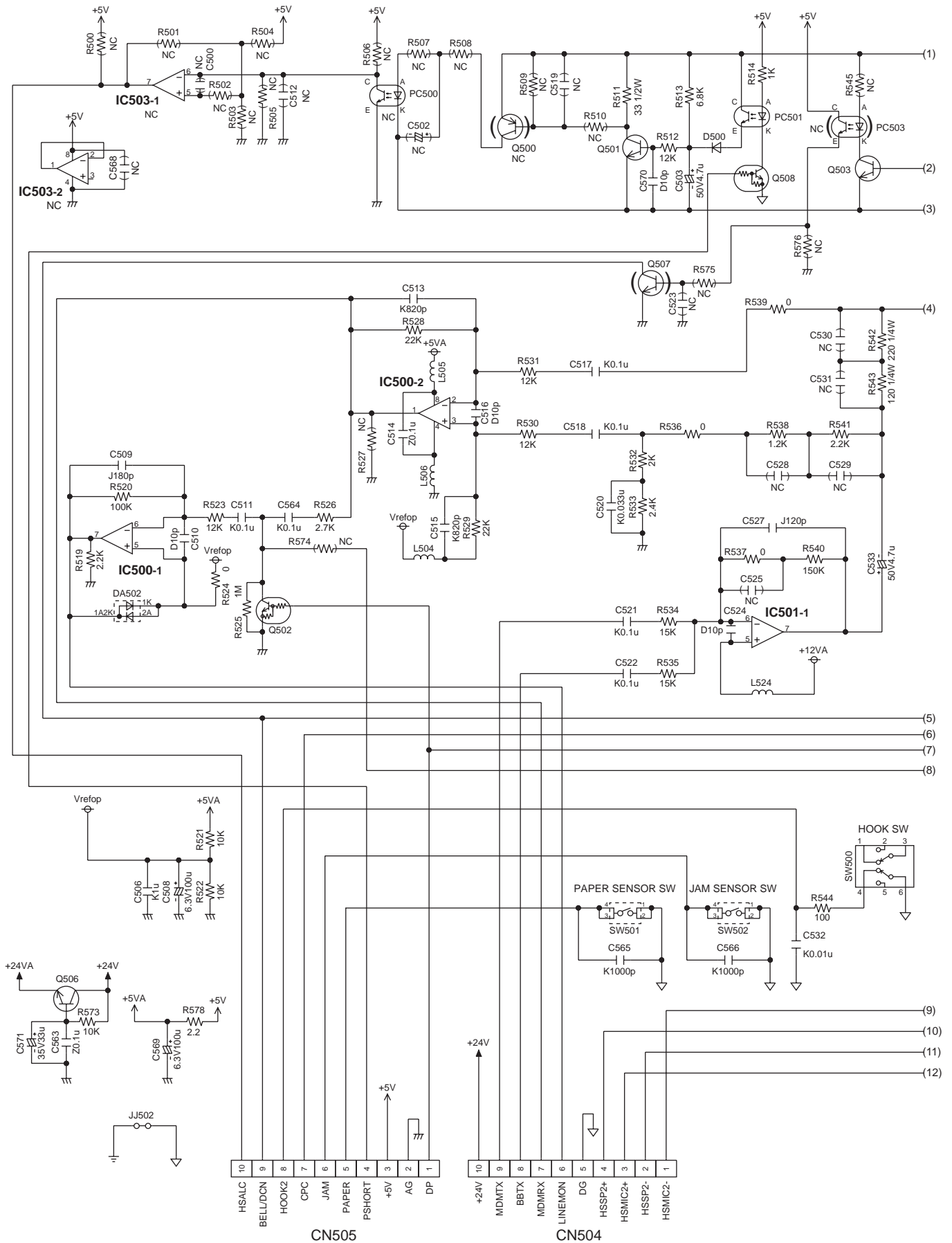


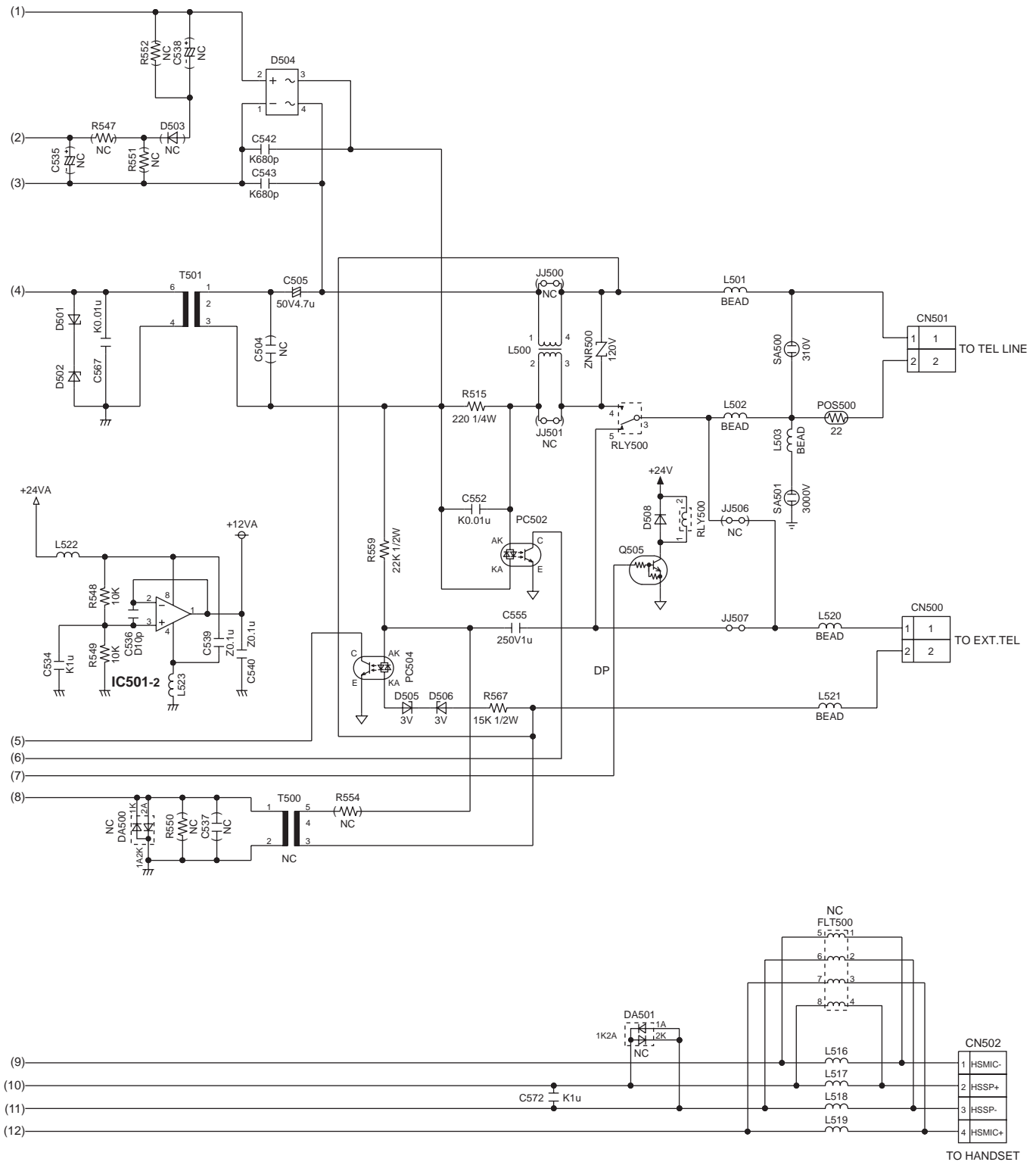
### Important safety notice

Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

# 17 SCHEMATIC DIAGRAM

## 17.1. ANALOG BOARD

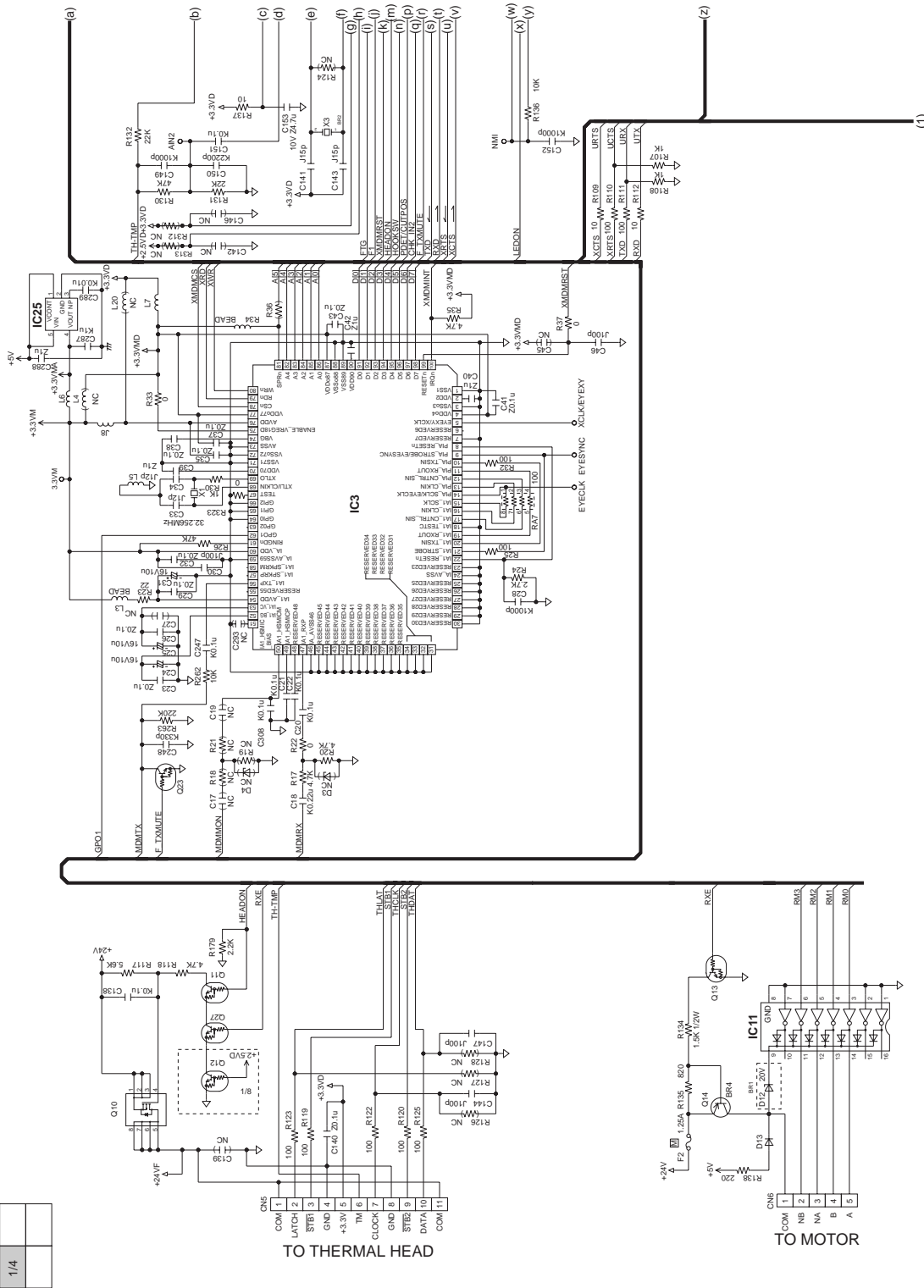




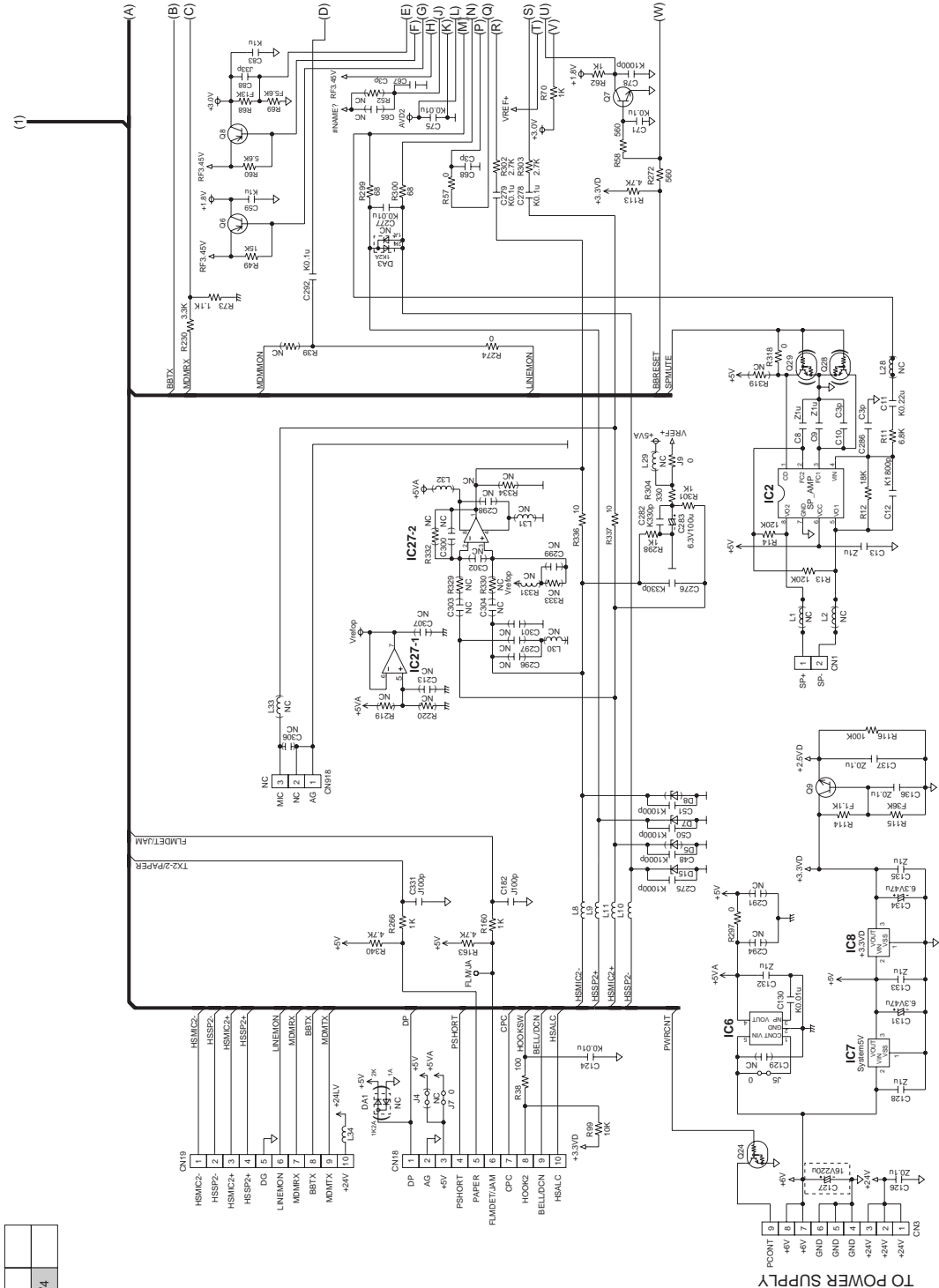
KX-FC971CX-S : ANALOG BOARD SCHEMATIC DIAGRAM

# 17.2. DIGITAL BOARD

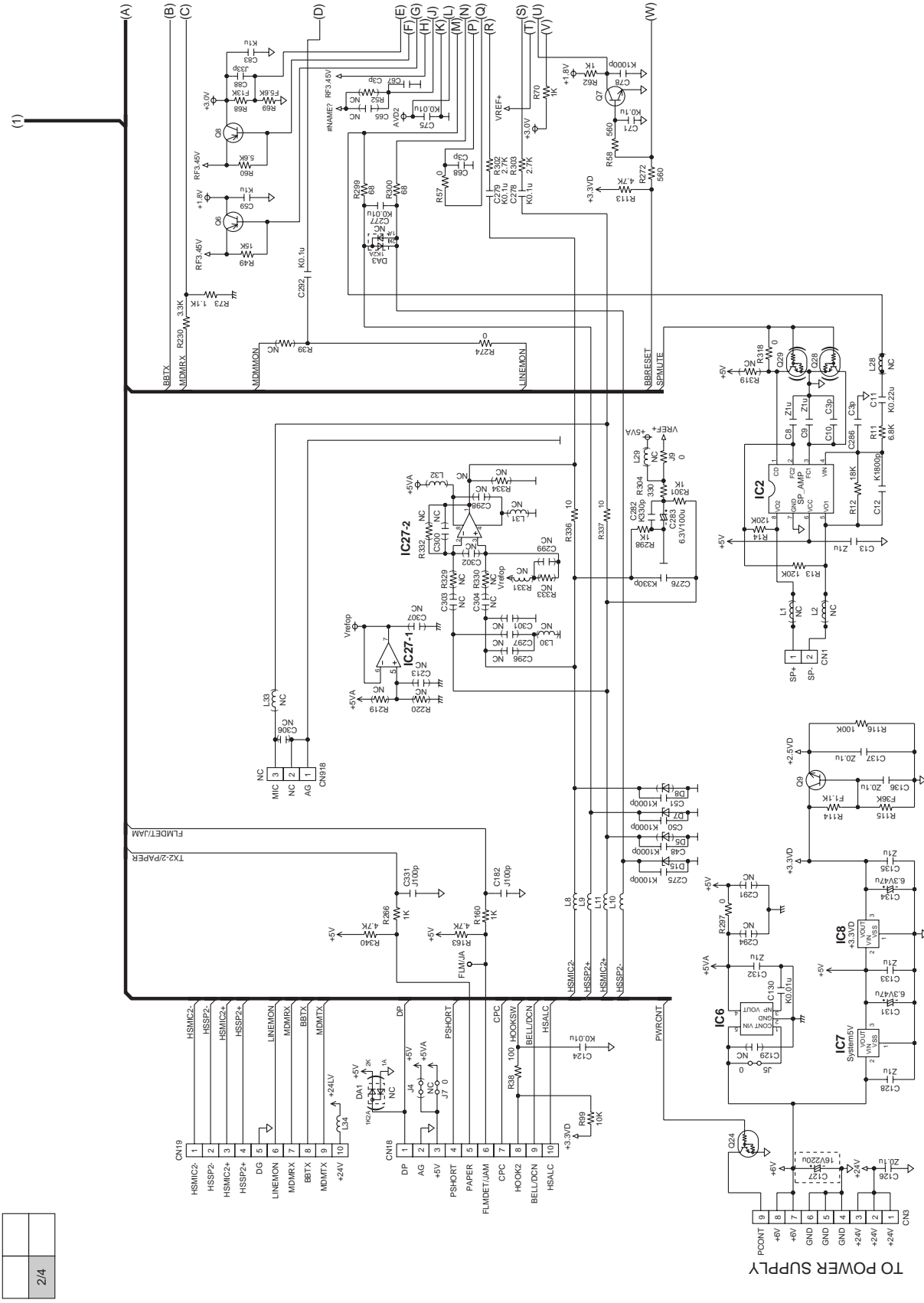
1/4



KX-FC971CX-S : DIGITAL BOARD SCHEMATIC DIAGRAM (1/4)



KX-FC971CX-S : DIGITAL BOARD SCHEMATIC DIAGRAM (2/4)

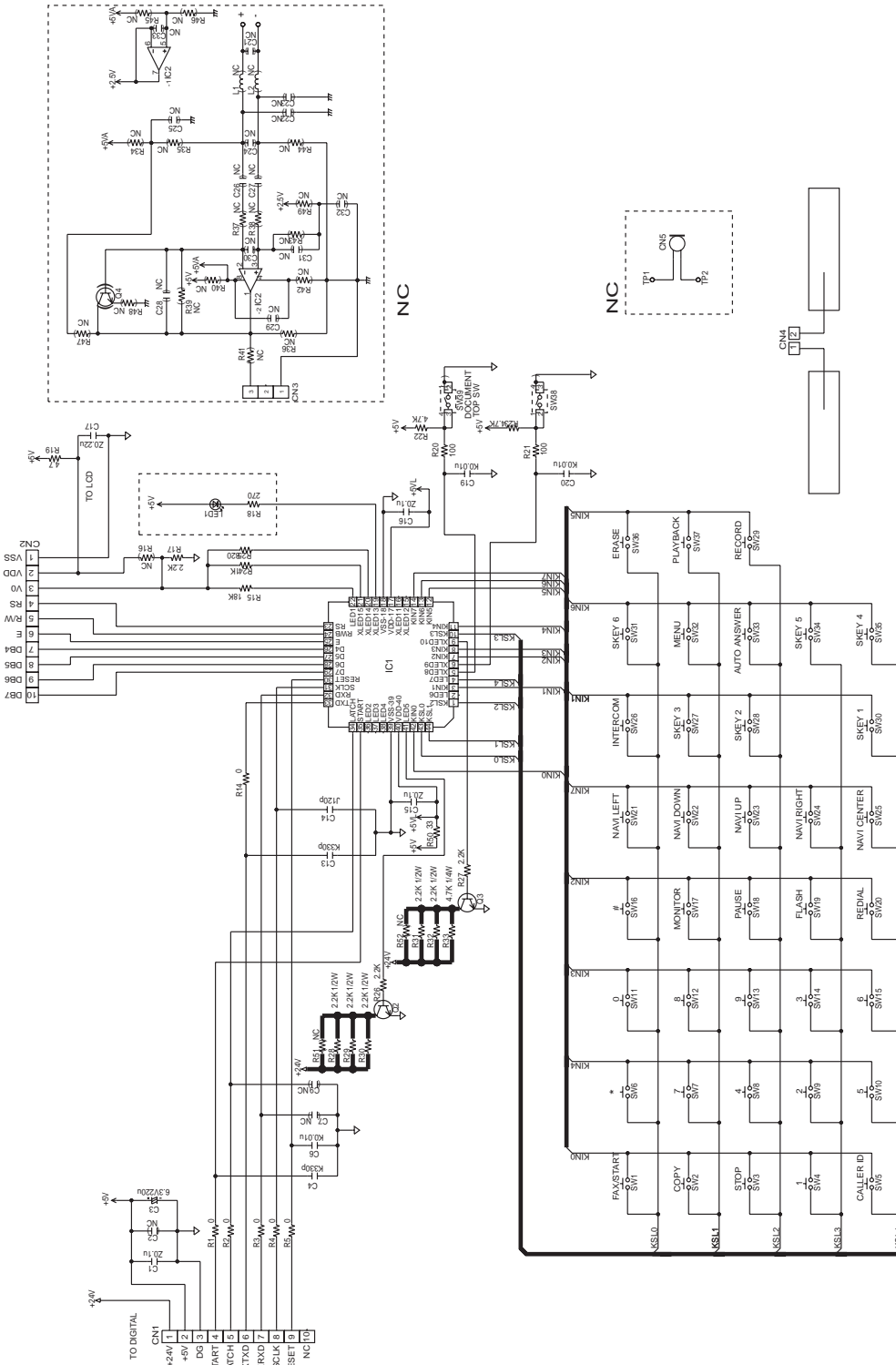


KX-FC971CX-S : DIGITAL BOARD SCHEMATIC DIAGRAM (2/4)

2/4
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TO POWER SUPPLY

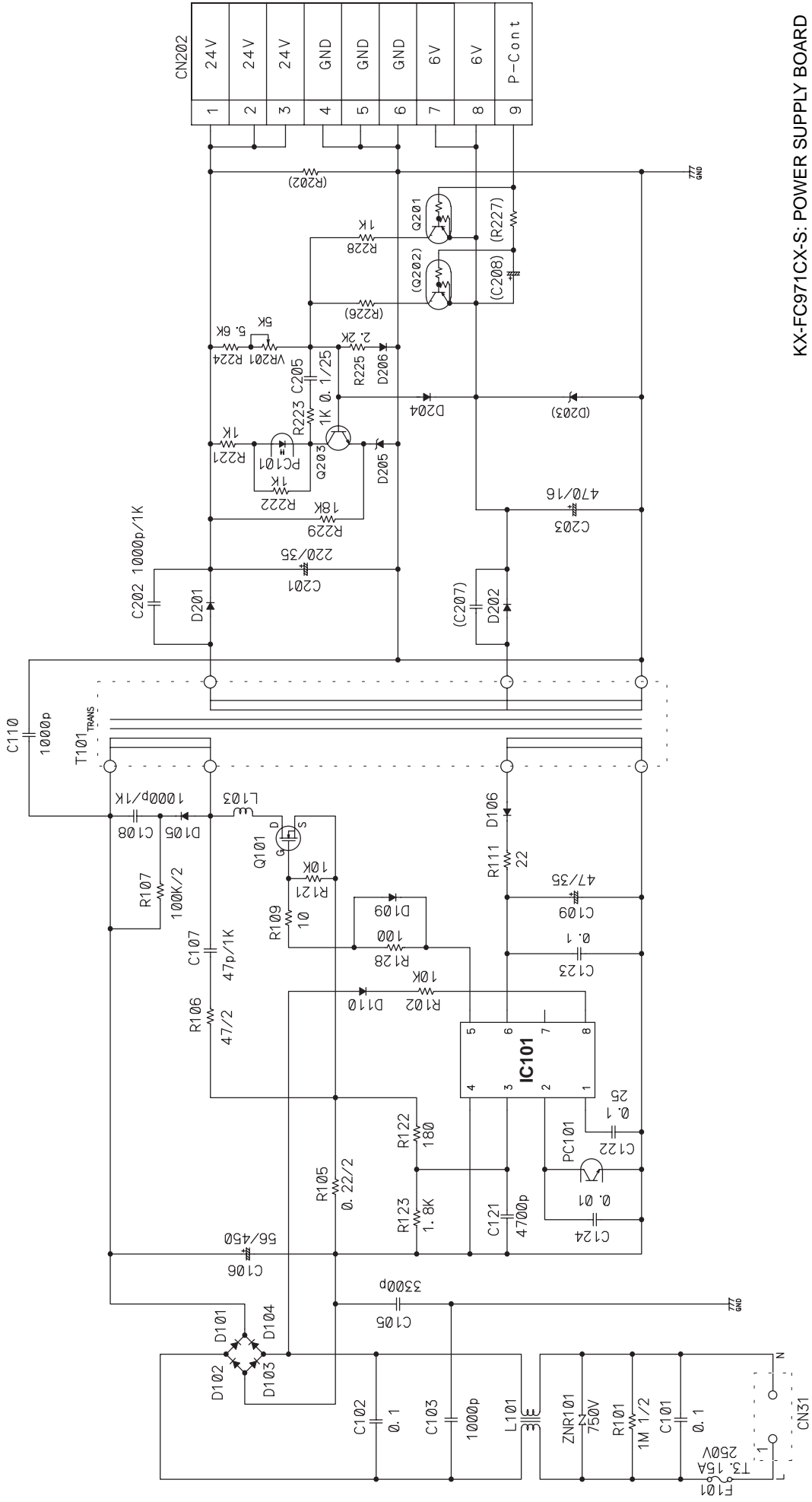
# 17.3. OPERATION BOARD



KX-FC971CX-S: OPERATION BOARD SCHEMATIC DIAGRAM

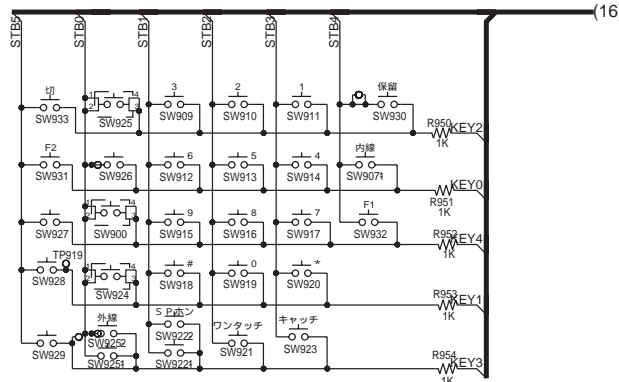
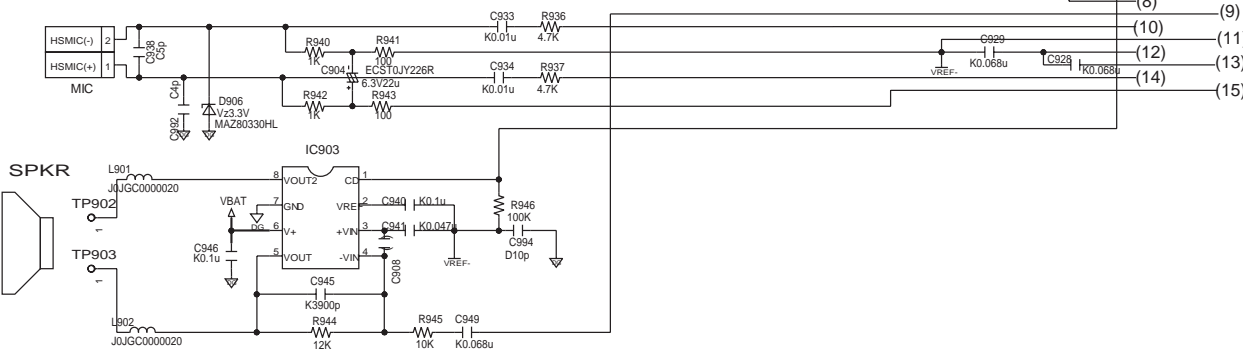
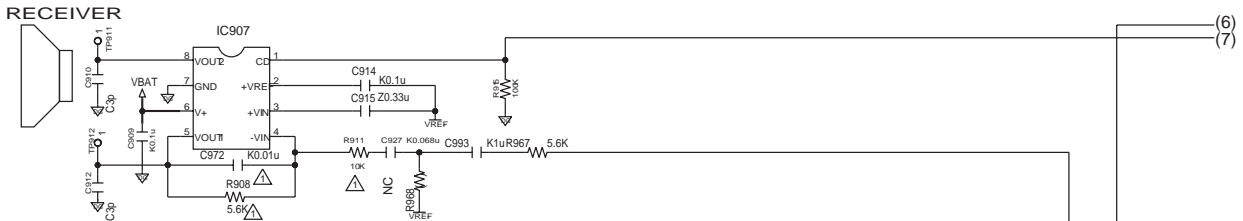
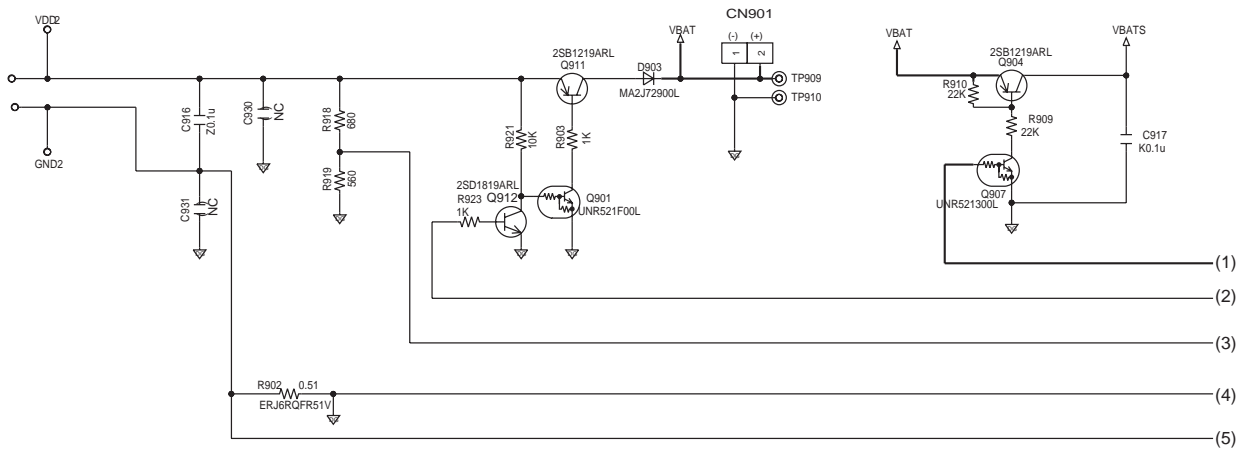


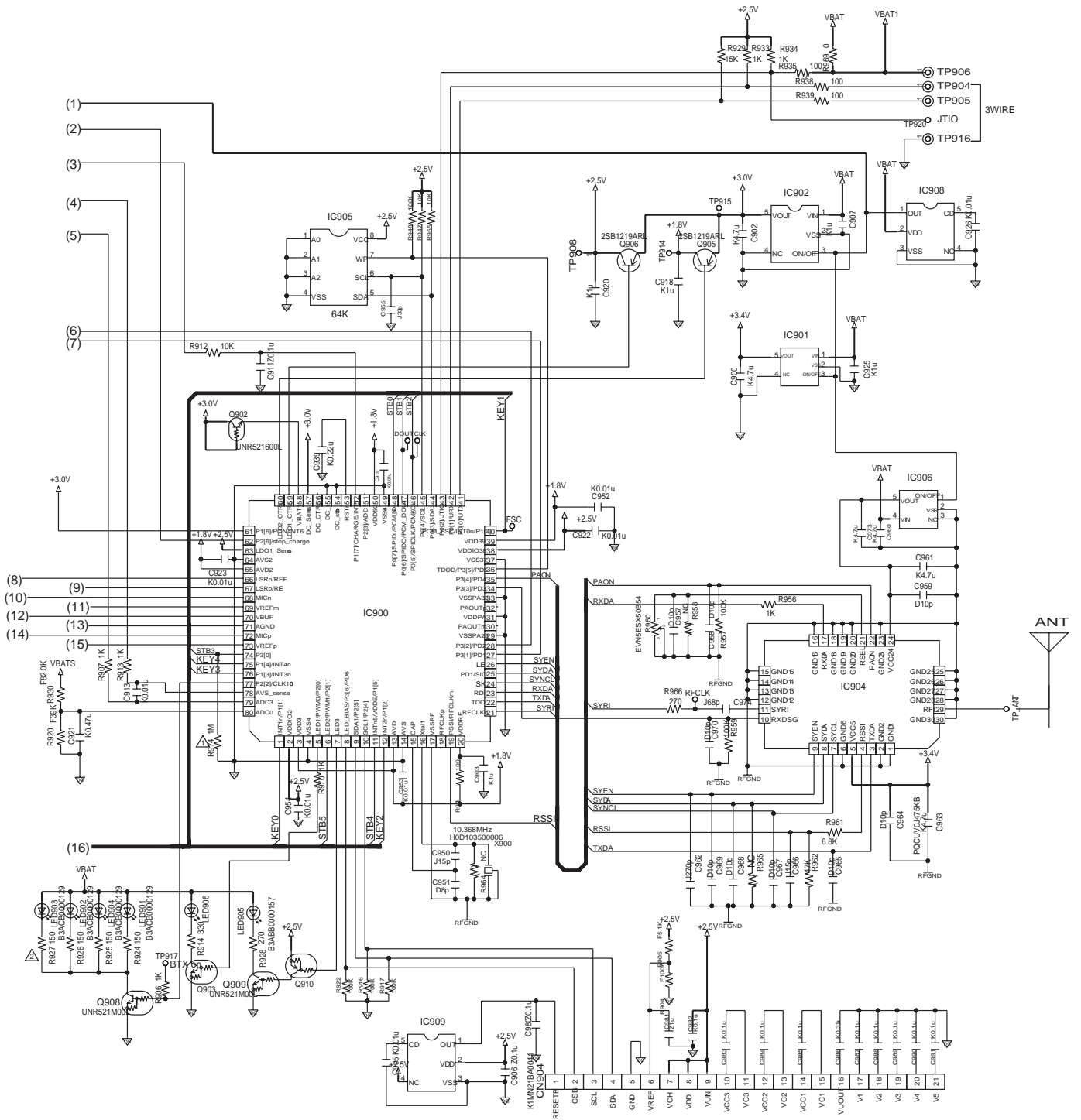
# 17.4. POWER SUPPLY BOARD



KX-FC971CX-S: POWER SUPPLY BOARD

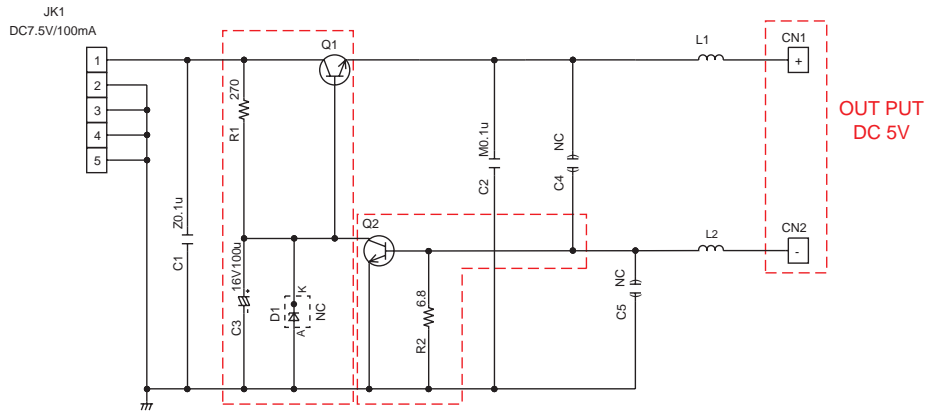
# 17.5. CORDLESS HANDSET BOARD





KX-FC971CX-S: CORDLESS HANDSET BOARD

# 17.6. CHARGER UNIT BOARD



KX-FC971CX-S: CHARGER UNIT BOARD