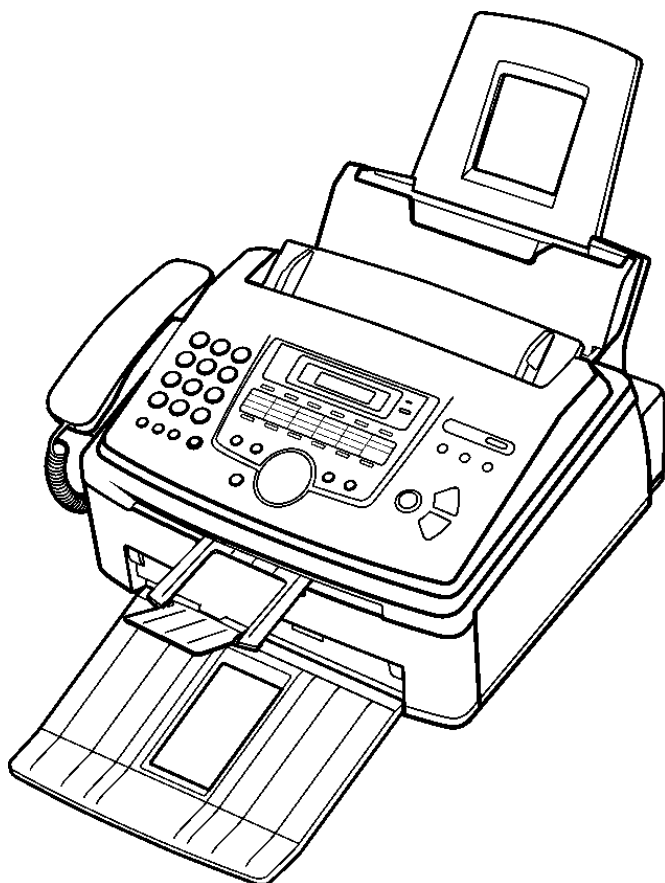


Service Manual

High Speed Laser Fax and Copier

KX-FL513RU

(for Russia)



WARNING

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

When you note the serial number, write down all 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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CONTENTS

| | Page | | Page |
|---|-----------|--|------------|
| 1 INTRODUCTION | 4 | 5.19. HOW TO REMOVE THE MAIN MOTOR | 55 |
| 1.1. TRANSLATION LISTS | 4 | 5.20. HOW TO REMOVE THE FUSER UNIT | 56 |
| 1.2. ABOUT LEAD FREE SOLDER (PbF: Pb free) | 6 | 5.21. HOW TO REMOVE THE CIS | 57 |
| 1.3. HOW TO RECOGNISE THAT Pb FREE SOLDER IS USED | 7 | 5.22. NOTE FOR ASSEMBLING | 58 |
| 1.4. SAFETY PRECAUTIONS | 8 | 5.23. INSTALLATION POSITION OF THE LEAD | 59 |
| 1.5. INSULATION RESISTANCE TEST | 8 | 6 TROUBLESHOOTING GUIDE | 60 |
| 1.6. FOR SERVICE TECHNICIANS | 8 | 6.1. USER RECOVERABLE ERRORS | 60 |
| 1.7. BATTERY CAUTION | 8 | 6.2. PROGRAMMING AND LISTS | 62 |
| 1.8. AC CAUTION | 9 | 6.3. TEST FUNCTIONS | 65 |
| 1.9. PERSONAL SAFETY PRECAUTIONS | 9 | 6.4. REMOTE PROGRAMMING | 69 |
| 1.10. SERVICE PRECAUTIONS | 11 | 6.5. TROUBLESHOOTING DETAILS | 77 |
| 1.11. FOR BEST PERFORMANCE | 11 | 7 CIRCUIT OPERATIONS | 148 |
| 2 FEATURES AND SPECIFICATIONS | 12 | 7.1. CONNECTION DIAGRAM | 148 |
| 2.1. FEATURES | 12 | 7.2. GENERAL BLOCK DIAGRAM | 149 |
| 2.2. SPECIFICATIONS | 13 | 7.3. FACSIMILE SECTION | 151 |
| 2.3. OPTIONAL ACCESSORIES | 13 | 7.4. NCU SECTION | 162 |
| 3 INSTALLATION | 14 | 7.5. ITS (Integrated telephone System) and MONITOR SECTION | 164 |
| 3.1. LOCATION OF CONTROLS | 14 | 7.6. CIS CONTROL SECTION | 166 |
| 3.2. CONNECTIONS | 16 | 7.7. STEPPING MOTOR DRIVE SECTION | 167 |
| 3.3. INSTALLATION | 17 | 7.8. FAN MOTOR SECTION | 171 |
| 4 MAINTENANCE | 29 | 7.9. SOLENOID DRIVE SECTION | 173 |
| 4.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS | 29 | 7.10. LSU (Laser Scanning Unit) SECTION | 174 |
| 4.2. PRINTING | 31 | 7.11. SENSORS AND SWITCHES SECTION | 176 |
| 4.3. PRINTING (PAPER PICK UP) | 32 | 7.12. OPERATION BOARD SECTION | 185 |
| 4.4. SCANNING (ADF) | 33 | 7.13. LCD SECTION | 186 |
| 4.5. MAINTENANCE | 34 | 7.14. HVPS (High Voltage Power Supply) SECTION | 187 |
| 4.6. DOCUMENT JAMS | 37 | 7.15. HEAT LAMP CONTROL CIRCUIT | 189 |
| 4.7. RECORDING PAPER JAMS | 38 | 7.16. POWER SUPPLY BOARD SECTION | 195 |
| 5 DISASSEMBLY INSTRUCTIONS | 41 | 8 REFERENCE MATERIALS DATA | 198 |
| 5.1. UPPER MAIN CABINET SECTION | 42 | 8.1. PRINTING OPERATION PRINCIPLE | 198 |
| 5.2. LOWER MAIN CABINET SECTION | 43 | 8.2. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES | 206 |
| 5.3. HOW TO REMOVE THE OPERATION PANEL ASS'Y | 44 | 8.3. HOW TO REPLACE THE FLAT PACKAGE IC | 207 |
| 5.4. HOW TO REMOVE THE PICK UP UNIT | 45 | 8.4. DIGITAL BOARD SECTION | 209 |
| 5.5. HOW TO REMOVE THE PICK UP ROLLER | 46 | 8.5. MODEM SECTION | 211 |
| 5.6. HOW TO REMOVE THE OPERATION BOARD | 47 | 8.6. TEST CHART | 217 |
| 5.7. HOW TO REMOVE THE LOWER FLAME | 48 | 9 FIXTURES AND TOOLS | 219 |
| 5.8. HOW TO REMOVE THE SEPARATION RUBBER | 48 | 10 CABINET, MECHANICAL AND ELECTRICAL PARTS | |
| 5.9. HOW TO REMOVE THE TRANSFER ROLLER | 49 | LOCATION | 220 |
| 5.10. HOW TO REMOVE THE SEPARATION ROLLER | 50 | 10.1. GENERAL SECTION | 220 |
| 5.11. HOW TO REMOVE THE BOTTOM PLATE | 51 | 10.2. OPERATION COVER SECTION (1) | 221 |
| 5.12. HOW TO REMOVE THE ANALOG BOARD | 51 | 10.3. OPERATION COVER SECTION (2) | 222 |
| 5.13. HOW TO REMOVE THE HIGH VOLTAGE POWER BOARD | 52 | 10.4. OPERATION COVER SECTION (3) | 223 |
| 5.14. HOW TO REMOVE THE LASER UNIT | 52 | 10.5. PICK UP SECTION | 224 |
| 5.15. HOW TO REMOVE THE FAN UNIT | 53 | 10.6. FUSER SECTION | 225 |
| 5.16. HOW TO REMOVE THE LOW VOLTAGE POWER BOARD | 53 | 10.7. UPPER MAIN CABINET SECTION | 226 |
| 5.17. HOW TO REMOVE THE SOLENOID | 54 | 10.8. LOWER MAIN CABINET SECTION (1) | 227 |
| 5.18. HOW TO REMOVE THE HANDSET HOLDER | 54 | 10.9. LOWER MAIN CABINET SECTION (2) | 228 |
| | | 10.10. LOWER CABINET SECTION (3) | 229 |
| | | 10.11. ACTUAL SIZE OF SCREWS AND WASHER | 230 |

| | | | |
|---|------------|--|------------|
| 11 ACCESSORIES AND PACKING MATERIALS | 231 | 15.1. ANALOG BOARD (PCB2) | 248 |
| 12 REPLACEMENT PARTS LIST | 232 | 15.2. OPERATION BOARD (PCB3) | 250 |
| 12.1. CABINET AND ELECTRICAL PARTS | 232 | 15.3. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) ... | 252 |
| 12.2. ACCESSORIES AND PACKING MATERIALS | 234 | 15.4. LOW VOLTAGE POWER SUPPLY BOARD (PCB5) | 253 |
| 12.3. DIGITAL BOARD PARTS | 234 | 15.5. EXIT SENSOR BOARD (PCB6) | 254 |
| 12.4. ANALOG BOARD PARTS | 237 | 15.6. DRUM AND TONER SENSOR BOARD (PCB7) | 254 |
| 12.5. OPERATION BOARD PARTS | 239 | 15.7. VARISTOR BOARD (PCB8) | 254 |
| 12.6. HIGH VOLTAGE POWER SUPPLY BOARD PARTS ... | 240 | 16 PRINTED CIRCUIT BOARD | 255 |
| 12.7. LOW VOLTAGE POWER SUPPLY BOARD PARTS ... | 240 | 16.1. DIGITAL BOARD (PCB1) | 255 |
| 12.8. EXIT SENSOR BOARD PARTS | 241 | 16.2. ANALOG BOARD (PCB2) | 257 |
| 12.9. DRUM AND TONER SENSOR BOARD PARTS | 241 | 16.3. OPERATION BOARD (PCB3) | 259 |
| 12.10. VARISTOR BOARD PARTS | 241 | 16.4. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) ... | 261 |
| 12.11. FIXTURES AND TOOLS | 241 | 16.5. LOW VOLTAGE POWER SUPPLY BOARD (PCB5) | 263 |
| 13 FOR THE SCHEMATIC DIAGRAMS | 243 | 16.6. EXIT SENSOR BOARD PARTS (PCB6) | 265 |
| 14 SCHEMATIC DIAGRAM | 244 | 16.7. DRUM AND TONER SENSOR BOARD (PCB7) | 265 |
| 14.1. DIGITAL BOARD (PCB1) | 244 | 16.8. VARISTOR BOARD (PCB8) | 265 |
| 15 SCHEMATIC DIAGRAM | 248 | | |

1 INTRODUCTION

1.1. TRANSLATION LISTS

1.1.1. LCD MESSAGE

| ENGLISH | RUSSIAN | | | | | | | | | | | | | | |
|-----------------|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALL SERVICE 1 | В | Ы | З | О | В | . | | С | Е | Р | В | И | С | | 1 |
| CALL SERVICE 2 | В | Ы | З | О | В | . | | С | Е | Р | В | И | С | | 2 |
| CALL SERVICE 3 | В | Ы | З | О | В | . | | С | Е | Р | В | И | С | | 3 |
| CALL SERVICE 4 | В | Ы | З | О | В | . | | С | Е | Р | В | И | С | | 4 |
| CALLER ID | И | Д | Е | Н | Т | . | В | Ы | З | Ы | В | . | А | Б | О |
| CHANGE DRUM | | З | А | М | - | Т | Е | | Б | А | Р | А | Б | А | Н |
| CHANGE SUPPLIES | З | А | М | | Р | А | С | Х | | М | А | Т | - | Л | Ы |
| CHECK DOCUMENT | | П | Р | О | В | - | Т | Е | | Д | О | К | У | М | . |
| CHECK DRUM | П | Р | О | В | - | Т | Е | | Б | А | Р | А | Б | А | Н |
| CHECK MEMORY | | П | Р | О | В | - | Т | Е | | П | А | М | Я | Т | Ь |
| COVER OPEN | | О | Т | К | Р | Ы | Т | А | | К | Р | Ы | Ш | К | А |
| DIRECTORY | Т | Е | Л | . | С | П | Р | А | В | О | Ч | Н | И | К | |
| DIRECTORY FULL | Т | Е | Л | . | С | П | Р | А | В | . | | П | О | Л | О |
| DRUM LIFE OVER | Б | А | Р | А | Б | А | Н | | И | З | Н | О | Ш | Е | Н |
| FAILED PICK UP | С | Б | О | Й | | З | А | Х | В | . | | Б | У | М | . |
| FAX IN MEMORY | | Ф | А | К | С | | В | | П | А | М | Я | Т | И | |
| FAX MEMORY FULL | П | А | М | . | Ф | А | К | С | . | З | А | П | О | Л | Н |
| FAX RECEIVING | П | Р | И | Е | М | | Ф | А | К | С | А | | | | |
| FEATURE LIST | С | П | И | С | О | К | | Ф | У | Н | К | Ц | И | Й | |
| LOW TEMP. | Н | И | З | К | А | Я | | Т | Е | М | П | Е | Р | А | Т |
| MEMORY FULL | П | Е | Р | Е | П | О | Л | Н | . | П | А | М | Я | Т | И |
| MODEM ERROR | | О | Ш | И | Б | К | А | | М | О | Д | Е | М | А | |
| NO FAX REPLY | Ф | А | К | С | | Н | Е | | О | Т | Е | Ч | А | Е | Т |
| OUT OF PAPER | | | | Н | Е | Т | | Б | У | М | А | Г | И | | |
| PAPER JAMMED | З | А | С | Т | Р | Я | Л | А | | Б | У | М | А | Г | А |
| PLEASE WAIT | | | | П | О | Д | О | Ж | Д | И | Т | Е | | | |
| POLLING ERROR | | О | Ш | И | Б | К | А | | П | О | Л | И | Н | Г | А |
| PRESS NAVI. | Н | А | Ж | М | И | Т | Е | | Н | А | В | І | . | | |
| PRESS SET | Н | А | Ж | М | И | Т | Е | | С | Е | Т | | | | |
| REDIAL TIME OUT | П | Р | Е | В | . | В | Р | Е | М | . | Д | О | З | В | . |
| REMOVE DOCUMENT | | У | Д | А | Л | И | Т | Е | | Д | О | К | У | М | . |
| REPLACE DRUM | З | А | М | Е | Н | И | Т | Е | | Б | А | Р | А | Б | А |
| SETUP LIST | С | П | И | С | О | К | | У | С | Т | А | Н | О | В | О |
| SOON | С | К | О | Р | О | | | | | | | | | | |
| SYSTEM SET UP | П | Р | О | Г | Р | . | С | И | С | Т | Е | М | Ы | | |
| TONER EMPTY | | | | Н | Е | Т | | Т | О | Н | Е | Р | А | | |
| TONER LOW | | | М | А | Л | О | | Т | О | Н | Е | Р | А | | |
| TRANSMIT ERROR | О | Ш | И | Б | К | А | | П | Е | Р | Е | Д | А | Ч | И |
| USER STOPPED | | П | Р | Е | Р | В | А | Н | О | | В | А | М | И | |
| WARM UP | | | Р | А | З | О | Г | Р | Е | В | | | | | |
| WRONG PAPER | | Д | Е | Ф | Е | К | Т | | Б | У | М | А | Г | И | |
| YOUR LOGO | В | А | Ш | | Л | О | Г | О | Т | И | П | | | | |

1.1.2. ERROR CODE TABLE

| ENGLISH | RUSSIAN |
|--------------------------|--------------------------------|
| COMMUNICATION ERROR | СБОЙ СВЯЗИ |
| DOCUMENT JAMMED | ЗАСТРЕВАНИЕ ДОКУМЕНТА |
| ERROR-NOT YOUR UNIT | ОШ.-В ДРУГ. ФАКСЕ |
| JUNK FAX PROH. REJECT | ФАКС ИЗ ЧЕРН. СПИСКА НЕ ПРИНЯТ |
| MEMORY FULL | ПАМЯТЬ ПЕРЕПОЛНЕНА |
| NO DOCUMENT | НЕТ ДОКУМЕНТА |
| OTHER FAX NOT RESPONDING | ФАКС АБОНЕНТА НЕ ОТВЕЧАЕТ |
| PRESSED THE STOP KEY | НАЖАТА КНОПКА " STOP " |
| THE COVER WAS OPENED | ОТКРЫТА КРЫШКА КОНСОЛИ |
| OK | НОРМАЛЬНО |

1.2. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

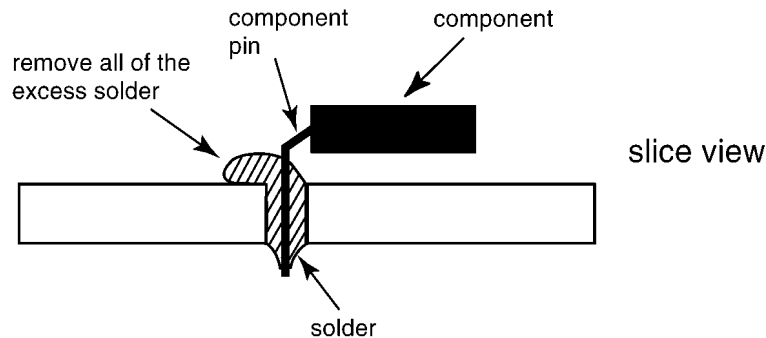
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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).



1.2.1. SUGGESTED PBF SOLDER

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

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

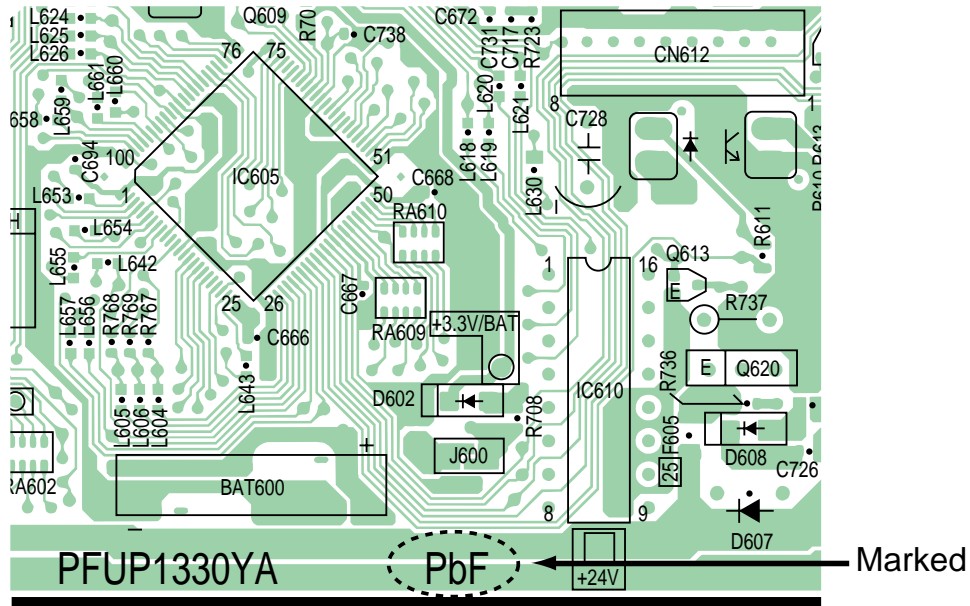
| 0.3mm X 100g | 0.6mm X 100g | 1.0mm X 100g |
|--------------|--------------|--------------|
| | | |

1.3. HOW TO RECOGNISE THAT Pb FREE SOLDER IS USED

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

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

(Example :Digital board)



DIGITAL BOARD COMPONENT VIEW

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

1.4. SAFETY PRECAUTIONS

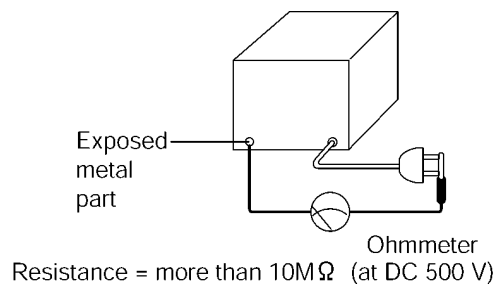
1. Before servicing, unplug the AC power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers,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

1.5. INSULATION RESISTANCE TEST

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

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

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



1.6. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

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

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

1.7. BATTERY CAUTION

CAUTION

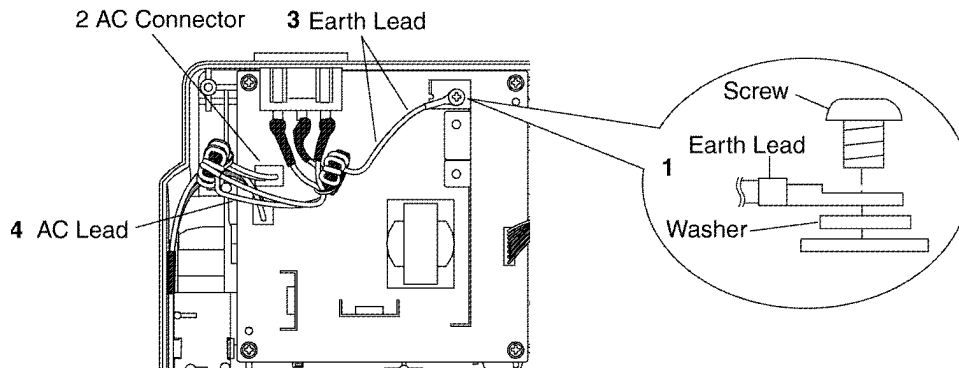
There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose used batteries according to the manufacturer's instructions:

The lithium battery is a critical component (type No. CR-2032/V9A). Please observe for the proper polarity and exact location when replacing and soldering the replacement battery.

1.8. AC CAUTION

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

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

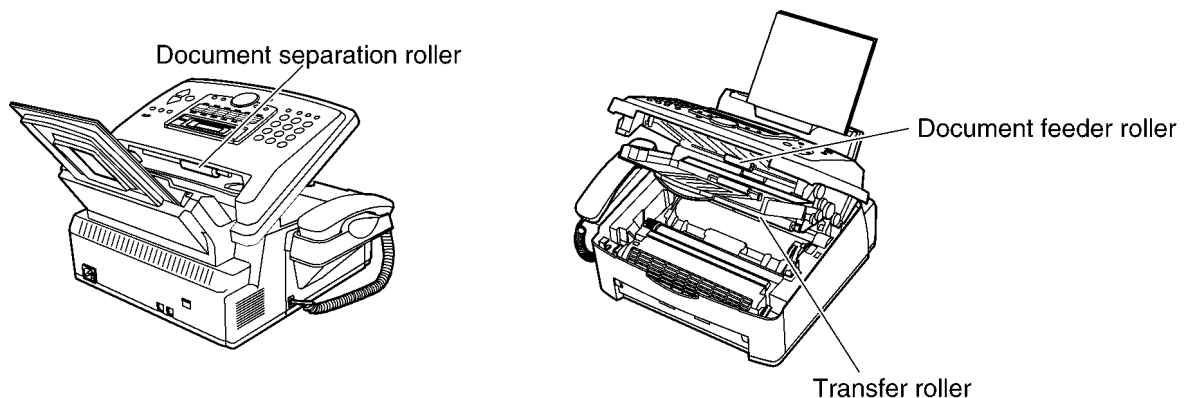


1.9. PERSONAL SAFETY PRECAUTIONS

1.9.1. MOVING SECTIONS OF THE UNIT

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

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



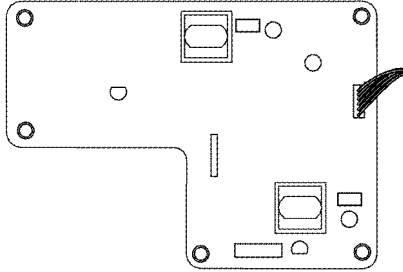
1.9.2. LIVE ELECTRICAL SECTIONS

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

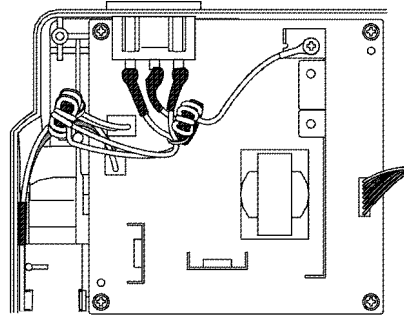
Never disassemble the unit for service with the AC power supply plugged in.

CAUTION:

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



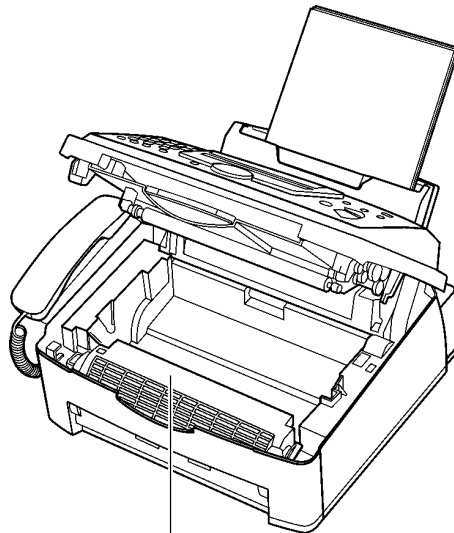
High Voltage power Supply board



Low Voltage power Supply board

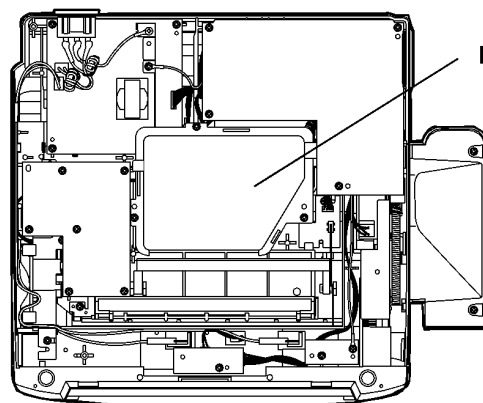
1.9.3. LASER BEAM AND FUSER UNIT SECTION

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



Fuser unit

The fuser unit gets hot. Do not touch it.



LASER UNIT

(BOTTOM VIEW)

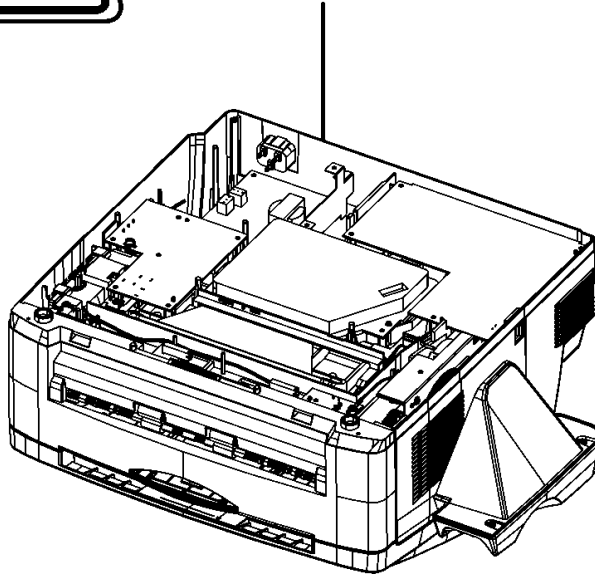
1.10. SERVICE PRECAUTIONS

1.10.1. PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

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



Electrostatic Discharge!



1.11. FOR BEST PERFORMANCE

- To extend the life of the drum unit, the unit should never be turned OFF immediately after printing. Leave the power turned ON for a minimum of 30 minutes after printing.
- In the printing process, heat is used to fuse toner onto the page. As a result, it is normal for the machine to produce an odor during and shortly after printing. Be sure to use this unit in an area with proper ventilation.
- Do not cover slots or openings on the unit. Inspect the air circulation vents regularly and remove any dust build-up with a vacuum cleaner.
- If the inside of the unit is dirty, clean it with a soft and dry cloth (especially the lower glass).
- When replacing the toner cartridge or drum unit, do not allow dust, water, or liquids to come in contact with the drum. This may affect print quality.
- Store unused paper in the original packaging, in a cool and dry place. Not doing so may affect print quality.
- Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall, etc.).
- Keep the air circulation vents away from walls etc. more than 50 mm (1 31 / ") to let the unit cool down.

2 FEATURES AND SPECIFICATIONS

2.1. FEATURES

General

- Help function
Display: Refer to **LCD MESSAGE** (P.4).
 1. FEATURE LIST
 2. DIRECTORY
 3. FAX RECEIVING
 4. CALLER ID
- LCD (Liquid Crystal Display) readout
- TAM (Telephone answering machine) interface

Plain Paper Facsimile Machine

- G3 compatible
- Automatic document feeder (20 sheets)
- Quick scan
- Resolution: Standard/Fine/Super fine/Photo/Photo with text.
(64 level)
 - STANDARD: For printed or typewritten originals with normal-sized characters.
 - FINE: For originals with small printing.
 - SUPER FINE: For originals with very small printing.
 - PHOTO: For originals containing photographs, shaded drawing, etc.
 - PHOTO WITH TEXT: For originals containing photograph and text.
- Broad cast
- 220-sheet paper capacity (60 g/m²~ 75 g/m²[16 lb~20 lb.]

Large Memory... Performed by DRAM

Approx. 120 pages of memory transmission
Approx. 170 pages of memory reception

Integrated Telephone System

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

Enhanced Copier Function

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

2.2. SPECIFICATIONS

| | |
|----------------------------------|--|
| Applicable Lines: | Public Switched Telephone Network |
| Document Size: | Max. 216 mm (8 1/2") in width Max. 600 mm (23 5/8") in length |
| Effective Scanning Width: | 208 mm (8 3/16") |
| Effective Printing Width: | A4 : 202mm |
| Transmission Time*: | Approx. 8 s/page (ECM-MMR Memory transmission)** |
| Scanning Density: | Horizontal: 8 pels/mm (203 pels/inch) Vertical: 3.85 lines/mm (98 lines/inch)-STANDARD 7.7 lines/mm (196 lines/inch)-FINE/PHOTO/PHOTO WITH TEXT 15.4 lines/mm (392 lines/inch)-SUPER FINE |
| Halftone Level: | 64-level |
| Scanner Type: | Contact Image Sensor (CIS) |
| Printer Type: | Laser printer |
| Data Compression System: | Modified Huffman (MH), Modified READ (MR), Modified, Modified READ (MMR) |
| Modem Speed: | 14,400/12,000/9,600/7,200/4,800/2,400 bps; Automatic Fallback |
| Operating Environment: | 10°C—32.5°C (50°F—90.5°F), 20—80% RH (Relative Humidity) |
| Dimensions (H×W×D): | 220 mm × 430 mm × 360 mm (8 21/32"×16 15/16"×14 5/32") |
| Mass (Weight): | Approx. 9 kg (19.8 lb.) |
| Power Consumption: | Standby: Approx. 4 W Transmission: Approx. 12W Reception: Approx. 290 W Copy: Approx. 290 W Maximum: Approx. 950W (When the fuser lamp turns on) |
| Power Supply: | 220-240 V AC, 50/60Hz |
| Memory Capacity: | Approx. 120 pages of memory transmission. Approx. 170 pages of memory reception. (Based on ITU-T No. 1 Test Chart in standard resolution.) |
| Laser diode properties: | Laser output: Max. 5 mW Wave length: 760 nm—800 nm Emission duration: Continuous |
| Print Speed: | 12 ppm (page per minute) |
| Printing Resolution: | 600 × 600 dpi |

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

** Transmission speed is based upon the ITU-T No. 1 Test Chart and original mode. (Refer to **ITU-T No.1 TEST CHART(P.217).**)
If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

Note:

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

Design and specifications are subject to change without notice.

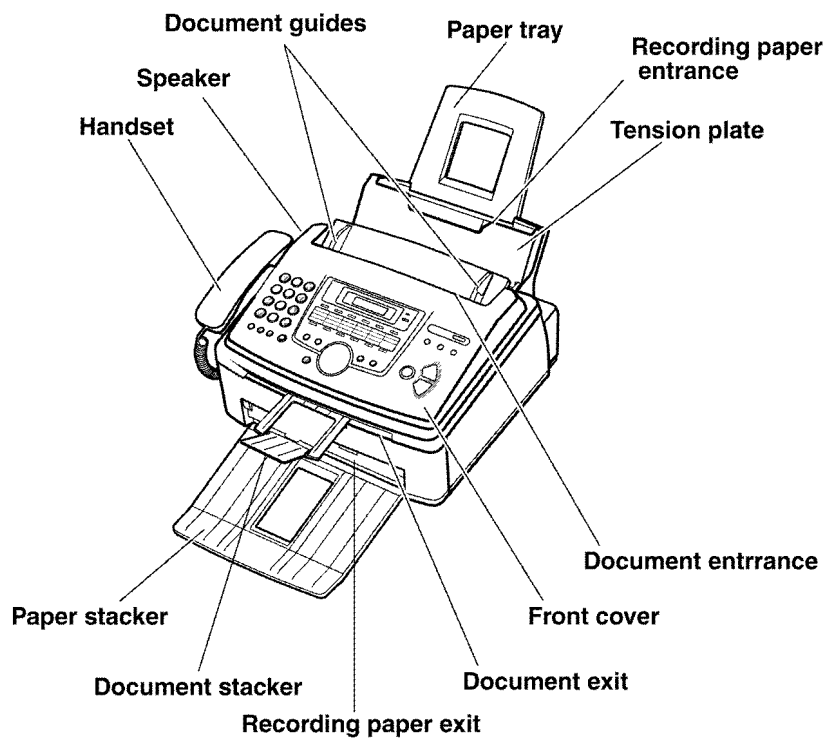
2.3. OPTIONAL ACCESSORIES

| Model No. | Description | Specifications |
|----------------------|-----------------|-------------------|
| KX-FA83A or KX-FA83E | Toner cartridge | 1 toner cartridge |
| KX-FA84A or KX-FA84E | Drum unit | 1 drum unit |

3 INSTALLATION

3.1. LOCATION OF CONTROLS

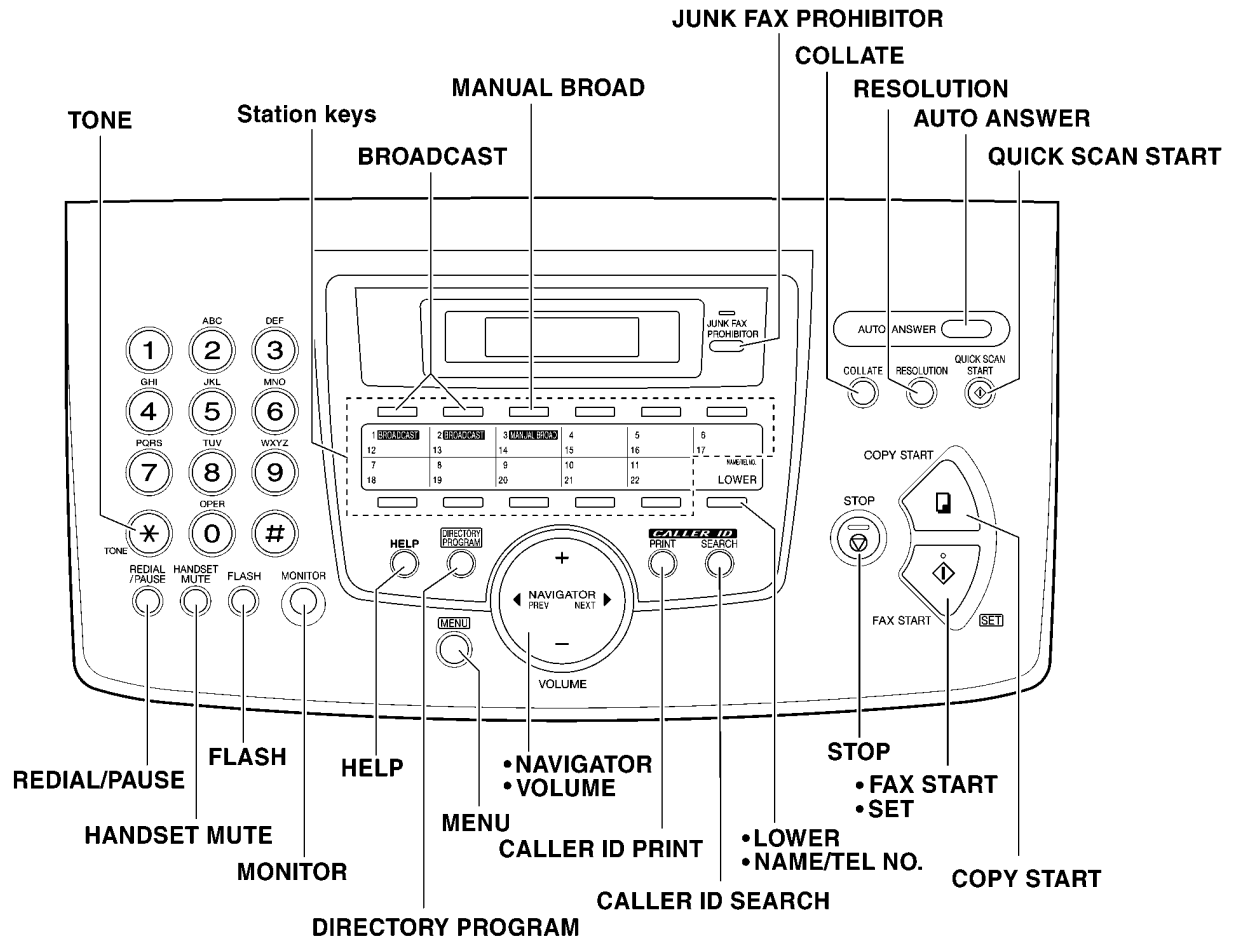
3.1.1. OVERVIEW



Note:

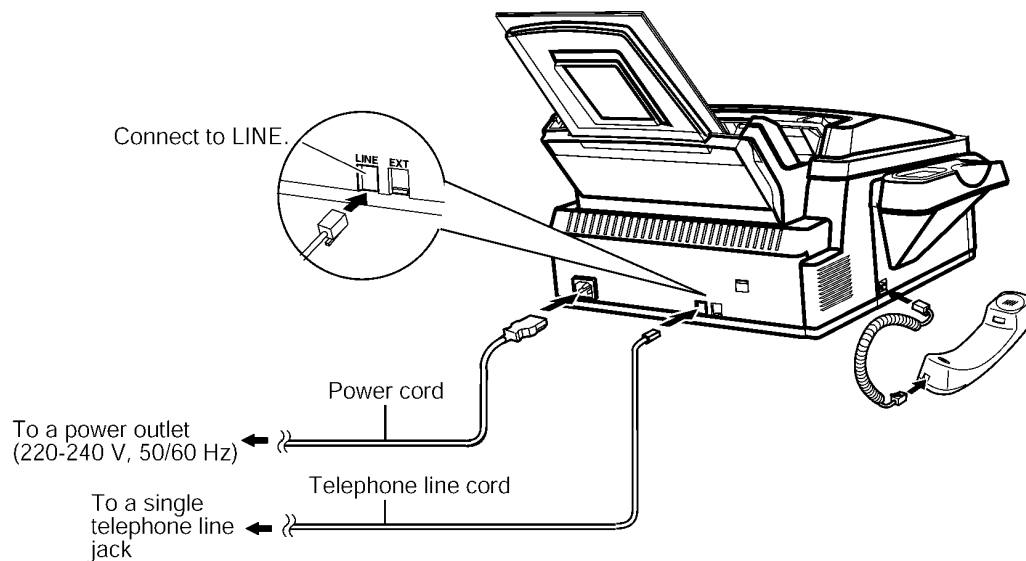
*The paper stacker and document stacker may not be shown in all illustrations.

3.1.2. CONTROL PANEL



3.2. CONNECTIONS

- (1) Connect the handset cord.
 - (2) Connect the telephone line cord.
 - (3) Connect the power cord.
- When the power is turned on for the first time, the unit will print some basic information.



Caution:

- When you operate this 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.

Note:

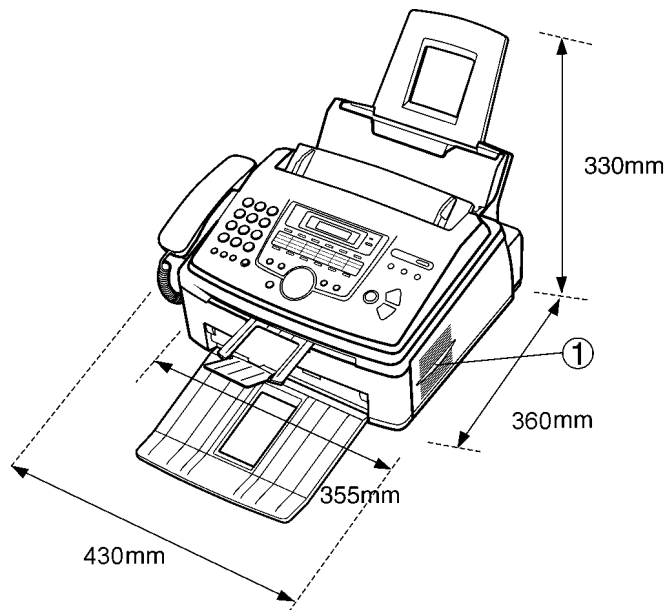
- The warranty does not cover damage due to power line surges or lightning. For additional equipment protection, we recommend the use of a surge protector. The following types are available: TELESPIKE BLOK MODEL TSB (TRIPPE MFG. CO.), SPIKE BLOK MODEL SK6-0 (TRIPPE MFG. CO.), SUPER MAX (PANAMAX) or MP1 (ITW LINX).
- To avoid malfunction, do not position fax machine near appliances such as TVs or speakers which generate an intense magnetic field.
- If any other device is connected on the same line, this unit may disturb the network condition of the device.

3.3. INSTALLATION

3.3.1. INSTALLATION SPACE

The space required to install the unit is shown below.

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



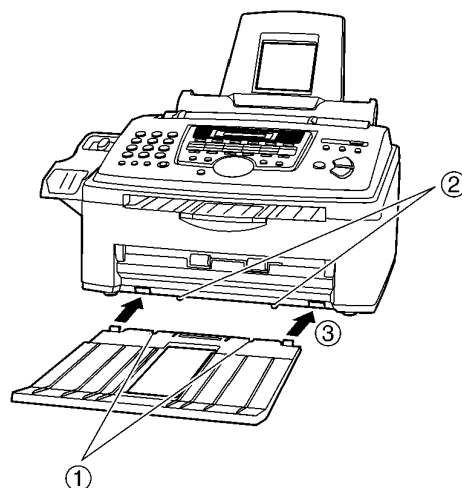
Note:

- Avoid excessive heat or humidity.
- Use the unit within the following ranges of temperature and humidity.
- Ambient temperature: 10°C to 32.5°C
- Relative humidity: 20% to 80% (without condensation)
- Power cord length should be less than 5 meters (16.4 feet). Using a longer cord may reduce the voltage or cause malfunctions.
- Avoid direct sunlight.
- Do not install near devices which contain magnets or generate magnetic fields.
- Do not subject the unit to strong physical shock or vibration.
- Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.
- To protect the unit from damage, hold both sides when you move it.
- Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall, etc.)
- Keep this surface (①) away from walls etc. more than 50 mm (1 31/32") to let the unit cool down.

3.3.2. PAPER STACKER

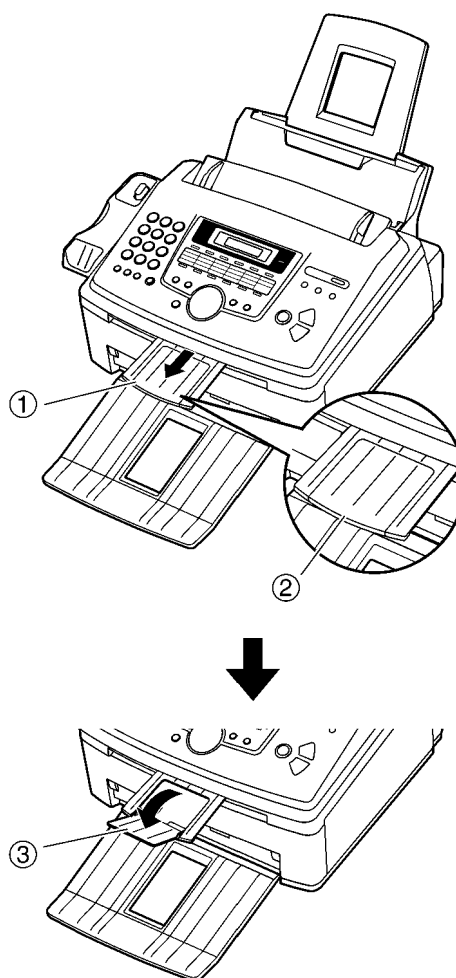
Line up the slots (①) in the paper stacker with the pegs (②) on the bottom of the unit, then insert the two tabs of the paper stacker into the slots on the unit (③).

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



3.3.3. DOCUMENT STACKER

Pull the document stacker (①) forward gently until it clicks into place, then press the center part of the document stacker (②) to open the document stacker extender (③).

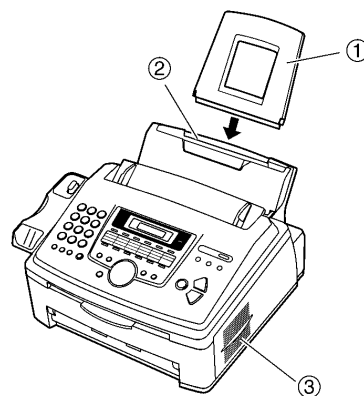


3.3.4. PAPER TRAY

Insert the paper tray (①) into the slot (②) on the back of the unit.

Note for installation:

- Do not place the unit in an area where the paper tray may be obstructed (i.e. by a wall etc.).
- Document and recording paper will be ejected from the front of the unit. Do not place anything in front of the unit.
- Keep this surface (③) away from walls etc. more than 50 mm to let the unit cool down.

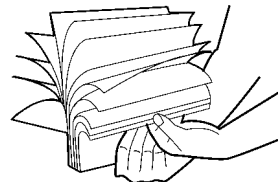


3.3.5. INSTALLING THE RECORDING PAPER

A4, Letter or legal size recording paper can be used for fax messages. The unit can hold up to 220 sheets of 60/75 g/m² to (16 lb. to 20 lb.) paper, 200 sheets of 80 g/m² (21 lb.) or 180 sheets of 90 g/m² (24 lb.) paper. See the note for paper specifications.

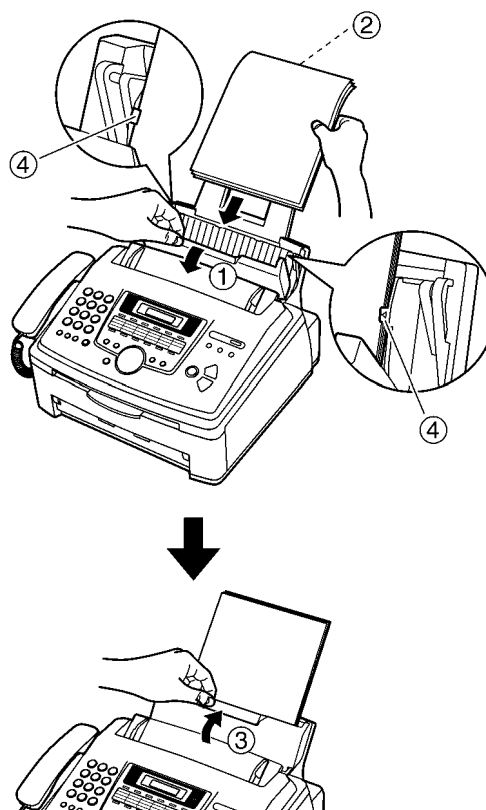
- The unit is set for letter size paper by default. If you want to use legal or A4 size paper, change the setting (feature #16).

1. Before inserting a stack of paper, fan the paper to prevent paper jams.



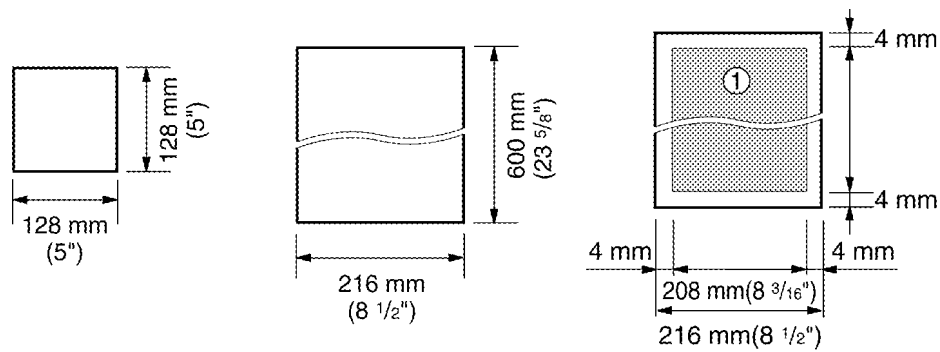
2. Pull the tension plate forward (①) and insert the paper, print-side down (②), then push the tension plate (③) back.

- The paper should not be over the tabs (④)
- If the paper is not inserted correctly, readjust the paper, or the paper may be jam.



3.3.6. DOCUMENTS THE UNIT CAN SEND

3.3.6.1. USING THE ADF (AUTO DOCUMENT FEEDER)



Note:

- Remove chips, staples or other similar fasteners.
- Do not send the following types of documents. (Use copies for fax transmission.)
 - Chemically treated paper such as carbon or carbonless duplicating paper
 - Electrostatically charged paper
 - Badly curled, creased or torn paper
 - Paper with a coated surface
 - Paper with a faint image
 - Paper with printing on the opposite side that can be seen through the other side (i.e. newspaper)

Note for the auto document feeder and the scanner glass

- Check that ink, paste or correction fluid has dried completely.
- To transmit the document with a width of less than A4 size (210 mm), we recommend using a copy machine to copy the original document onto letter-sized paper, then transmitting the copied document.

3.3.7. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

Pressing the dial keys will select a character as shown below.

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

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

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

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

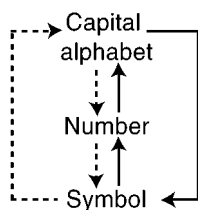
1. Press **+** or **-** repeatedly to display the desired character.

2. Press **▶** to move the cursor to the next space.

- The character displayed in step 1 is inserted.

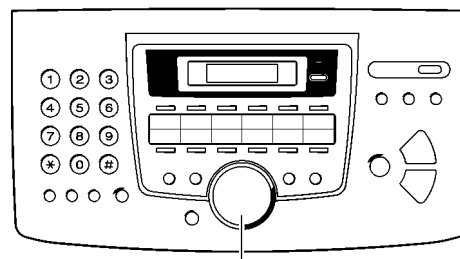
3. Return to step 1 to enter the next character.

Display order of characters



→ : Pressing **+**

---> : Pressing **-**



◀ ▶ + -

3.3.9. SETTING YOUR LOGO

The logo can be your company, division or name.

Refer to **LCD MESSAGE** (P.4).

1 Press **[MENU]**.
Display:

| |
|-------------------|
| SYSTEM SET UP |
| PRESS NAVI. [◀ ▶] |

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

| |
|-----------|
| YOUR LOGO |
| PRESS SET |

3 Press **[SET]**
• Cursor () will disappear on the display.

| |
|-------|
| LOGO= |
|-------|

4 Enter your logo, up to 30 characters, using the dial keypad. See the character table.

Example: "BILL"

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

| |
|--------|
| Cursor |
| LOGO=B |

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

| |
|---------|
| LOGO=BI |
|---------|

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

| |
|----------|
| LOGO=BIL |
|----------|

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

| |
|-----------|
| LOGO=BILL |
|-----------|

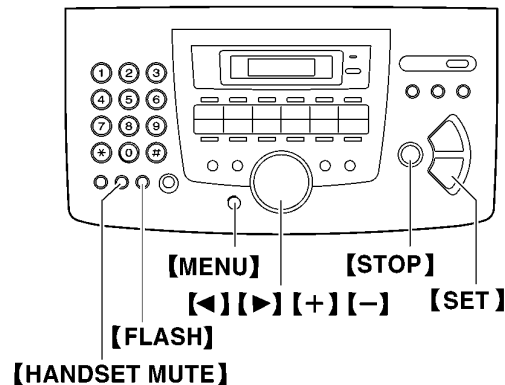
5 Press **[SET]**
•The next feature will be displayed.

| |
|--------------|
| YOUR FAX NO. |
| PRESS SET |

6 Press **[MENU]** to exit the program.

Note:

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



To correct a mistake

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

To delete a character

- Press **[◀]** or **[▶]** to move the cursor to the character you want to delete and press **[STOP]** (Delete).

To insert a character

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

3.3.10. REPLACING THE TONER CARTRIDGE AND THE DRUM UNIT

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

Display: TONER LOW or TONER EMPTY

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

To ensure that the unit operates properly, we recommend the use of **Panasonic toner cartridge (Model No. KX-FA83X)** and **drum unit (Model No. KX-FA84X)**.

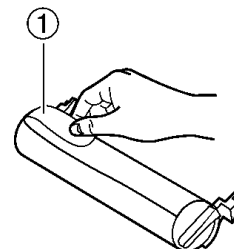
Caution:

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

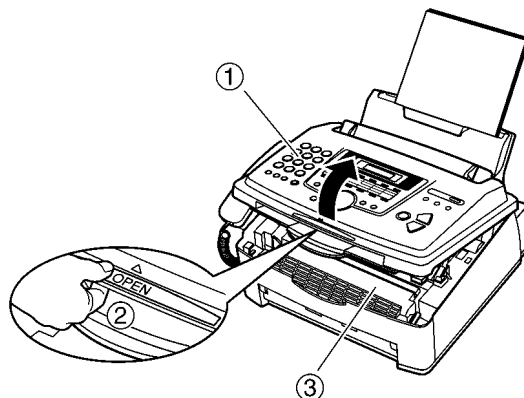
1. Before opening the protection bag of the new toner cartridge, shake it vertically more than 5 times.



2. Remove the new toner cartridge from the protection bag. Peel off the seal (1) from the toner cartridge.

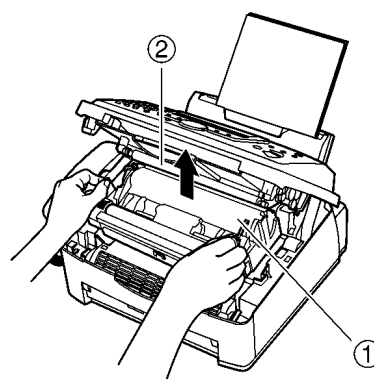


3. Lift open the front cover (①), holding OPEN (②).

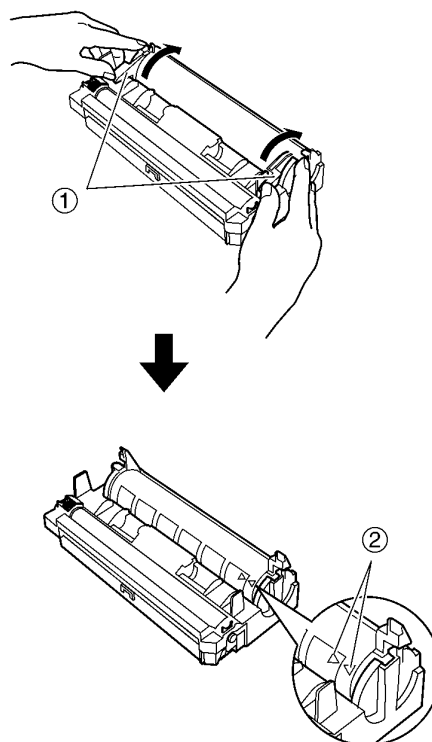


Caution:
The fuser unit (③) gets hot.
Do not touch it.

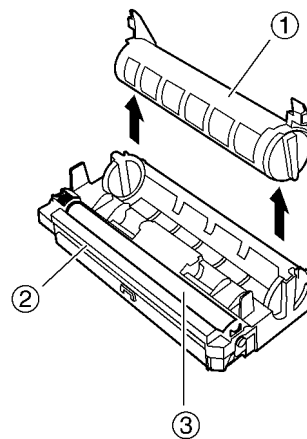
4. Tap on the used toner cartridge several times to allow the remaining toner to fall into the drum unit. Remove the drum and toner unit (①) by holding the two tabs.
- Do not touch the transfer roller (②).
 - If you replace the toner cartridge and the drum unit at the same time, skip to step 7.



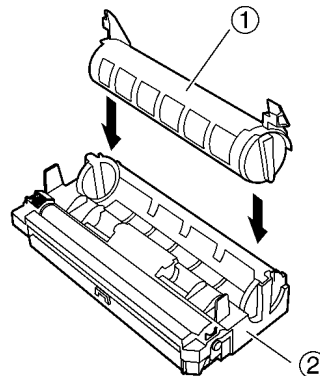
5. Turn the two levers (①) on the used toner cartridge firmly, until the triangles (②) match.



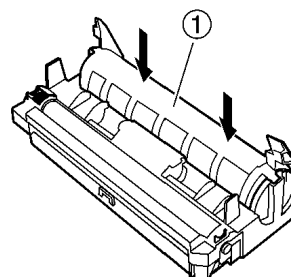
6. Remove the used cartridge (①) from the drum unit (②).
- The toner may stick to the cartridge and the drum unit. Be careful when handling.
 - Do not drop the toner on the green drum surface (③).
 - Put the used toner cartridge into the protection bag.



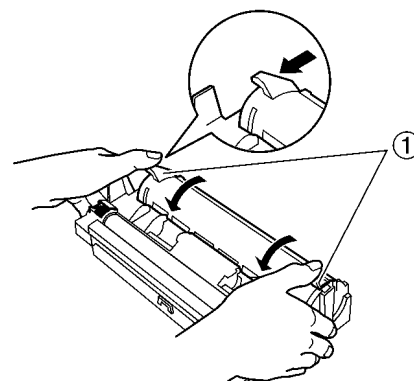
7. If you replace the drum unit at the same time, remove the new drum unit from the protection bag. Place the toner cartridge (①) into the drum unit (②) vertically.



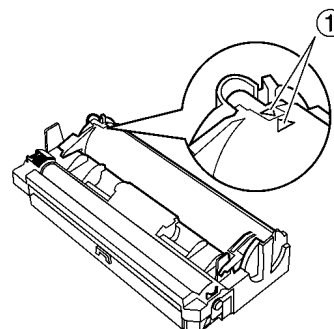
8. Firmly press down the toner cartridge to snap into position.



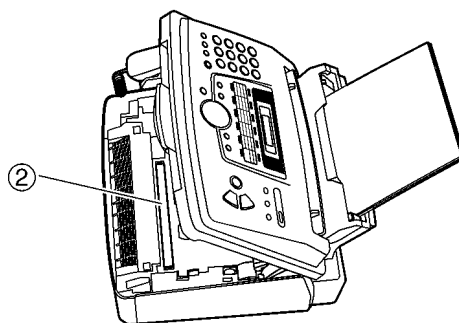
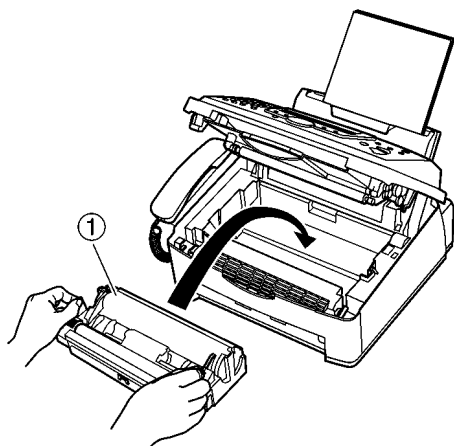
9. Turn the two levers (①) on the toner cartridge firmly.



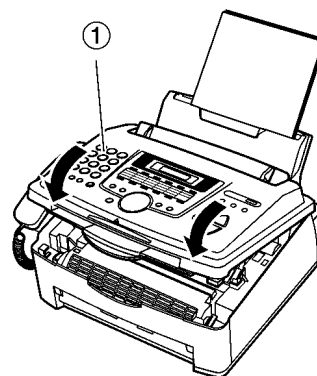
10. Make sure that the triangles (①) match, to install the toner cartridge correctly.



11. Install the drum and toner unit (①) by holding the tabs.
- If the lower glass (②) is dirty, clean it with a soft dry cloth.



12. Close the front cover (①) by pushing down on both sides, until locked.
- While the unit displays "PLEASE WAIT", do not open the front cover, or disconnect the power cord.



4 MAINTENANCE

4.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

4.1.1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1. Periodic maintenance

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

2. Check for breakdowns

Look for problems and consider how they arose.

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

3. Check equipment

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

4. Determine causes

Determine the causes of the equipment problem by troubleshooting.

5. Equipment repairs

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

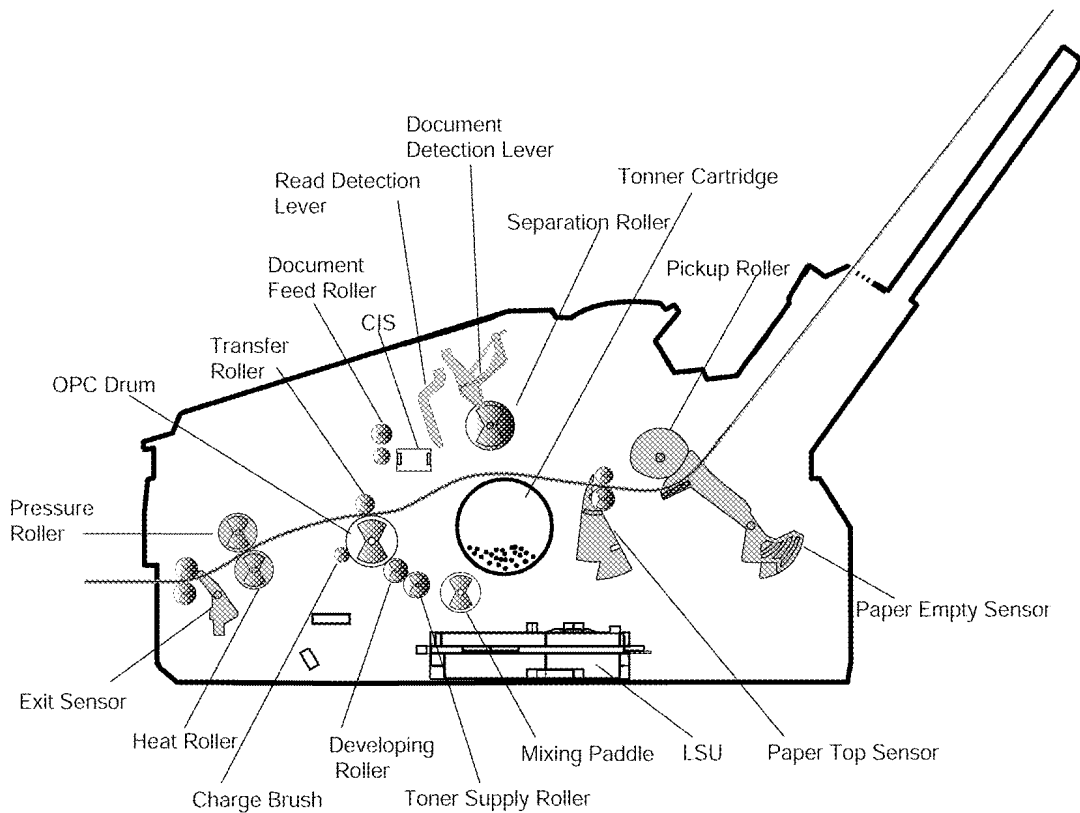
6. Confirm normal operation of the equipment

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

7. Record keeping

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

4.1.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS



4.1.2.1. Maintenance List

| NO. | OPERATION | CHECK | REMARKS |
|-----|--|--|--|
| 1 | Document Path | Remove any foreign matter such as paper. | — |
| 2 | Rollers | If the roller is dirty, clean it with a damp cloth then dry thoroughly. | Refer to MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS (P.29).() |
| 3 | Sensors | Document sensor (PS500), Paper feed sensor (PS501), Printer cover open switch (SW101),ADF cover open sensor (SW501), FB cover open sensor (SW500), ADF CIS position sensor (PS502),FB CIS position sensor (PS503)Resist sensor (PC201),Paper exit sensor (PS50). Paper sensor (PS1)Confirm the operation of the sensors. | See MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS (P.29) and SENSORS AND SWITCHES SECTION (P.176) TEST FUNCTIONS (P.65) |
| 4 | Glass | If the glass is dirty, clean them with a dry soft cloth. | Refer to MAINTENANCE (P.34). |
| 5 | Abnormal, wear and tear or loose parts | Replace the part. Check if the screws are tight on all parts. | — |

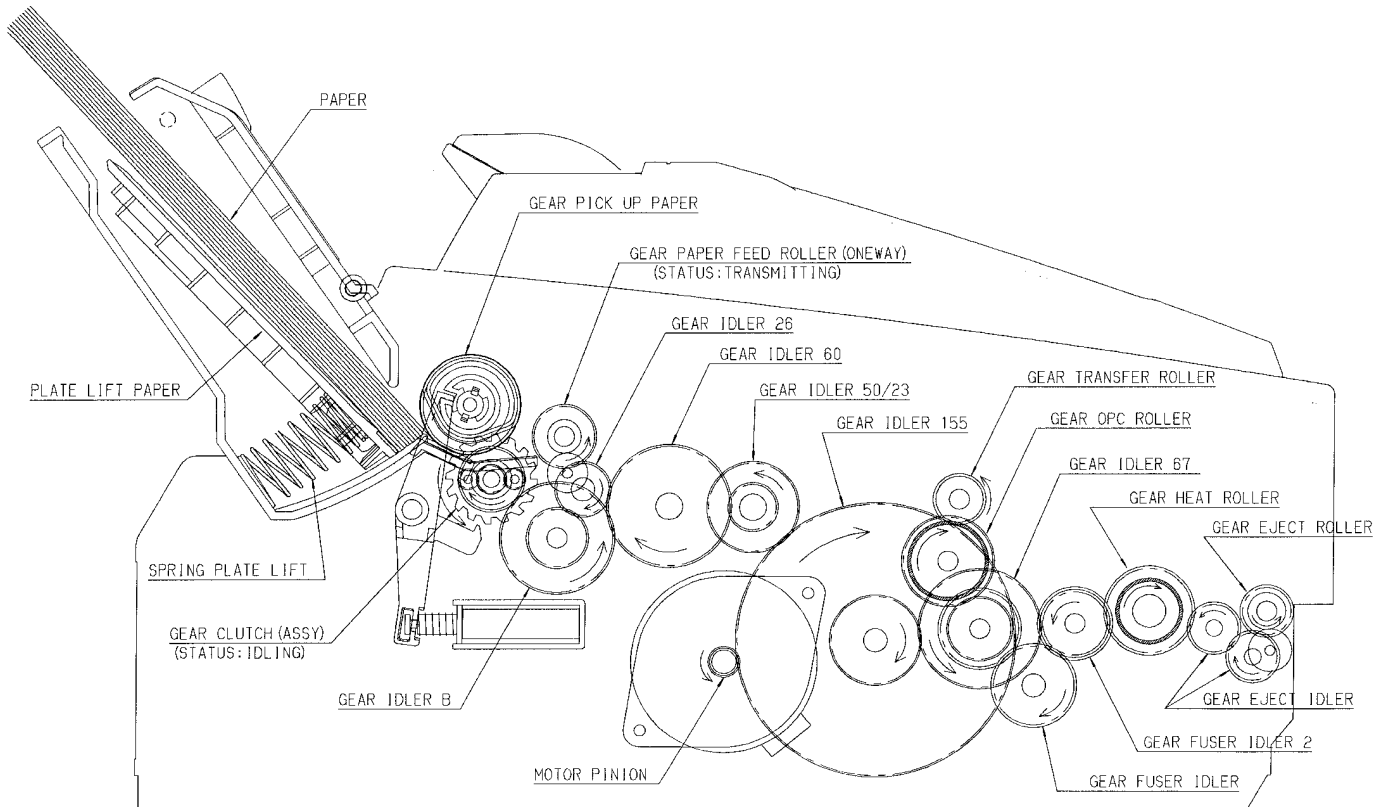
4.1.2.2. Maintenance Cycle

| No. | Item | Cleaning Cycle | Replacement | |
|-----|------------------------------------|----------------|------------------------------|---|
| | | | Cycle | Procedure |
| 1 | ADF Separation Roller (Ref.No.50) | 3 months | 7 years* (100,000 documents) | Refer to HOW TO REMOVE THE SEPARATION ROLLER (P.50). |
| 2 | Paper Feed Roller (Ref.No.154) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE SEPARATION RUBBER (P.48). |
| 3 | ADF Separation Rubber (Ref. No.35) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE SEPARATION RUBBER (P.48). |
| 4 | ADF Exit Roller (Ref.No.34) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE SEPARATION RUBBER (P.48). |
| 5 | Pick up Roller (Ref No.108) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE PICK UP UNIT (P.46). |
| 6 | Separation Rubber (Ref. No.99) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE PICK UP ROLLER (P.45). |
| 7 | Document Feed Roller (Ref.No.154) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE SEPARATION RUBBER (P.48) |
| 8 | Transfer Roller (Ref.No.73) | 3 months | 7 years (100,000 documents) | Refer to HOW TO REMOVE THE TRANSFER ROLLER (P.49). |
| 9 | Pressure Roller (Ref.No.120) | 3 months | 7 years (100,000 documents) | Refer to FUSER SECTION (P.225). |
| 10 | Heat Roller (Ref.No.127) | 3 months | 7 years (100,000 documents) | Refer to FUSER SECTION (P.225). |
| 11 | Exit Roller (Ref.No.142) | 3 months | 7 years (100,000 documents) | Refer to FUSER SECTION (P.225). |

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

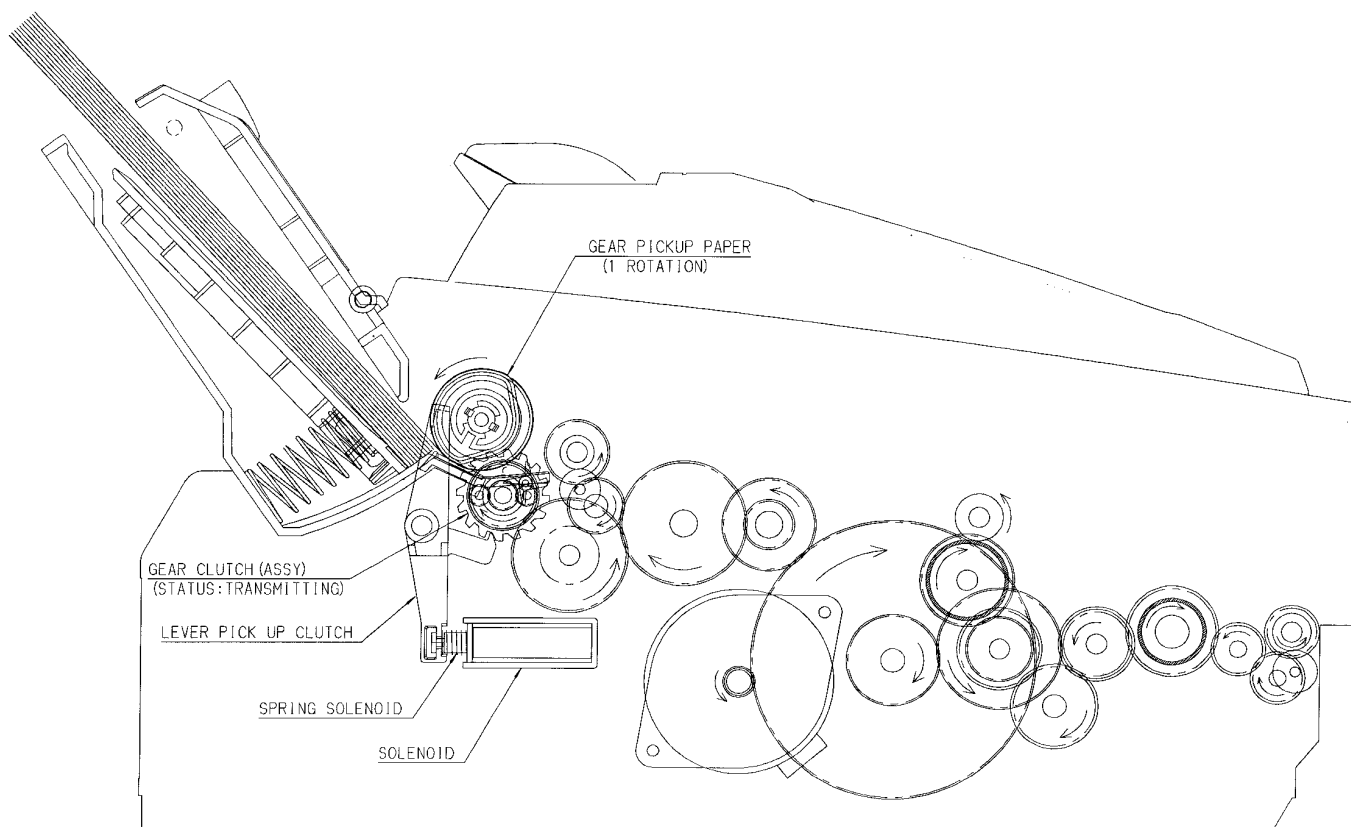
* These values are standard and may vary depending on usage conditions.

4.2. PRINTING



- The motor pinion rotates in the direction shown in the figure.
- The gears of fixing and developing parts are driven by the GEAR IDLER 67.
- The GEAR PAPER FEED ROLLER drives the roller.
- The GEAR CLUTCH runs idle and GEAR PICKUP PAPER is still.

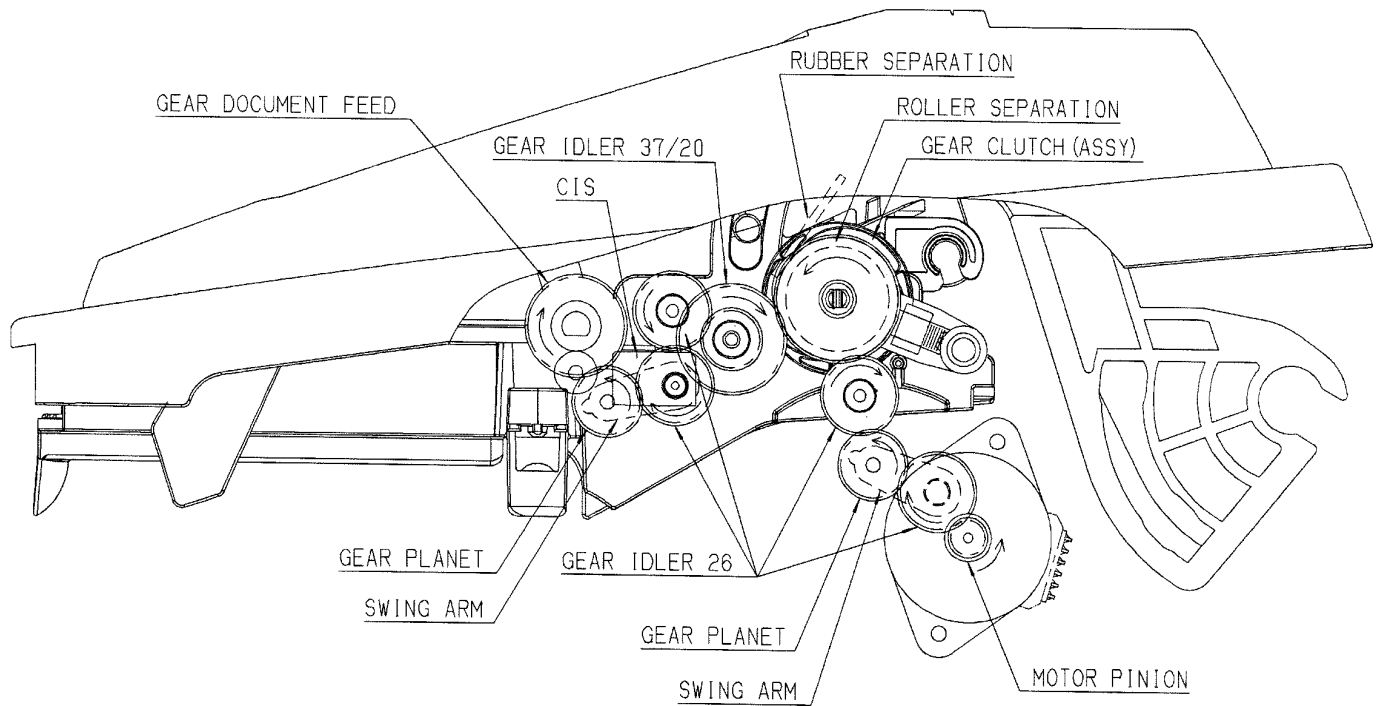
4.3. PRINTING (PAPER PICK UP)



During printing

- When the SOLENOID is turned ON, the LEVER PICK UP CLUTCH is hooked on the RING of GEAR CLUTCH. It causes the GEAR PICKUP PAPER to rotate.
- The recording paper is pressed by the PICKUP ROLLER and the top paper is separated and fed.
- Even the SOLENOID is turned OFF, it can not stop on the way of a turn because the tip of LEVER PICK UP CLUTCH is on the CAM of GEAR PICKUP PAPER.
- When the tip of LEVER PICK UP CLUTCH returns to CAM's home position, the GEAR CLUTCH RING is unhooked, then the GEAR PICKUP PAPER is stopped.

4.4. SCANNING (ADF)



- DOCUMENT TRANSMISSION (ADF)

When the tip of the document is set to a point of contact between the separation roller and the separation pad through the document feed roller, then the document is fed there separately. The document feed roller carries the document and the CIS reads it through the glass. The document is exited through the document feed roller.

4.5. MAINTENANCE

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

4.5.1. CLEANING THE INSIDE OF THE UNIT

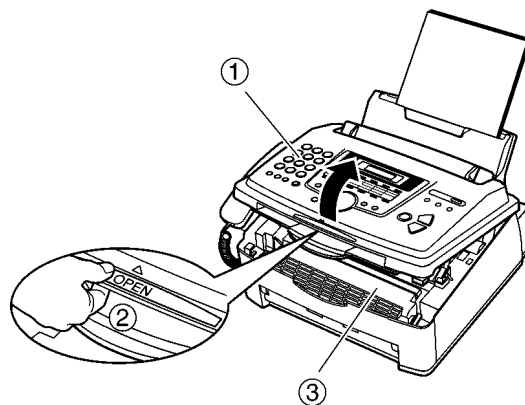
If any of the following problems occurs, clean the inside of the unit:

- If misfeeding of your original occurs frequently.
- If a black line, a white or dirty pattern appears on your recording paper, on your original, or on the fax document received by the other party.

Caution:

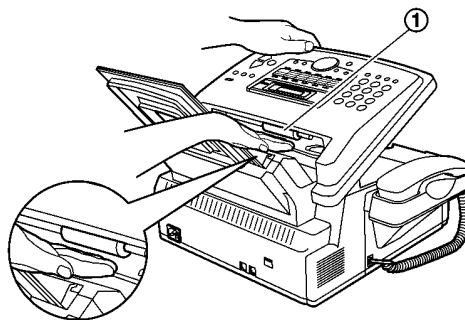
- **Be careful when handling the toner and drum unit.**
- **Do not use paper products, such as paper towels or tissues, to clean inside of the unit.**

1. Disconnect the power cord and the telephone line cord.
2. Lift open the front cover (①), holding OPEN (②).

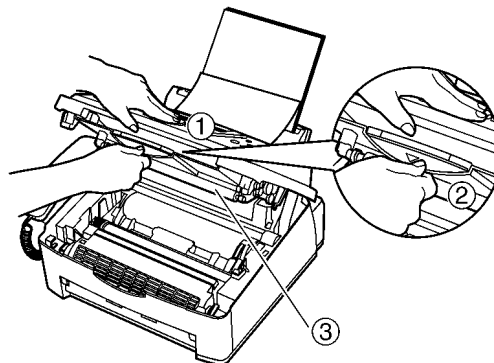


Caution:
The fuser unit (③) gets hot.
Do not touch it.

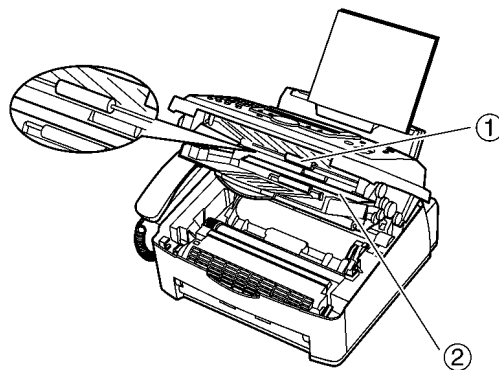
3. Clean the document separation roller (①) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.



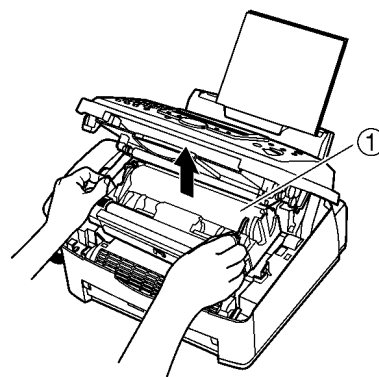
4. Hold the center part of the front cover (①), and pull open the inner cover (②).
 - Do not touch the transfer roller (③).



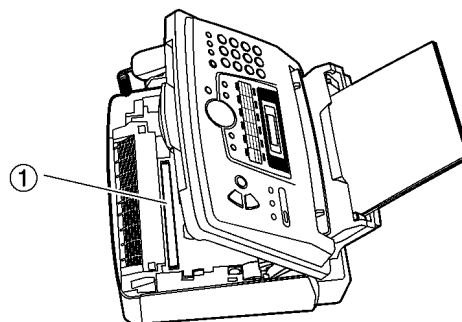
5. Clean the document feeder roller (①) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.
Clean the upper glass (②) with a soft and dry cloth.



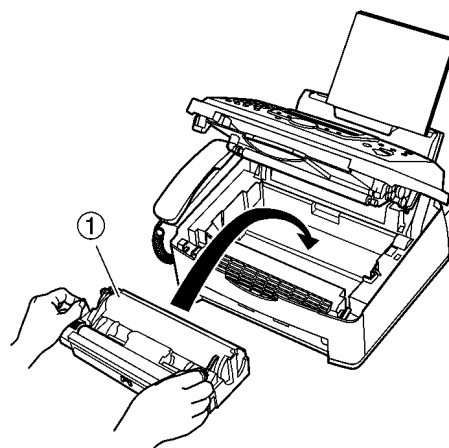
6. Push back the inner cover.
7. Remove the drum and toner unit (①) by holding the two tabs.



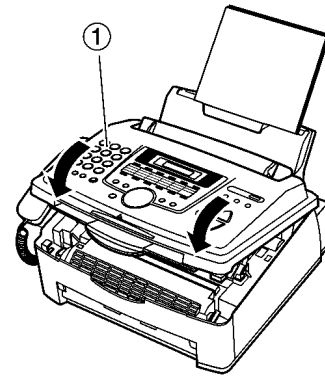
8. Clean the lower glass (①) with a soft and dry cloth.



9. Reinstall the drum and toner unit (①) by holding the tabs.



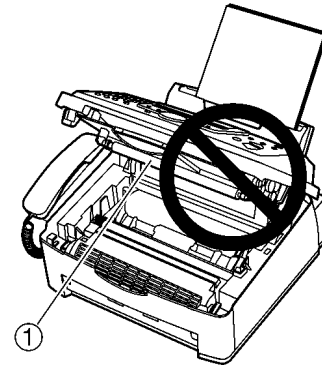
10. Close the front cover (1) by pushing down on both sides, until locked.



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

Note:

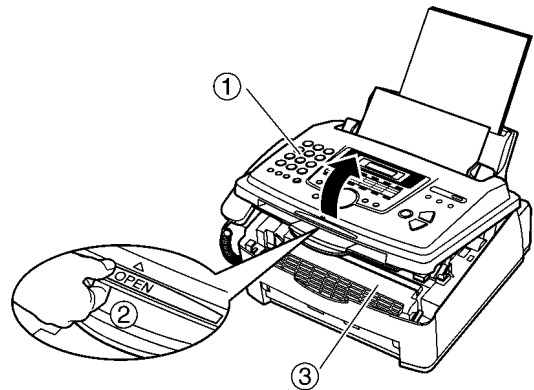
- Do not touch the transfer roller (1).



4.6. DOCUMENT JAMS

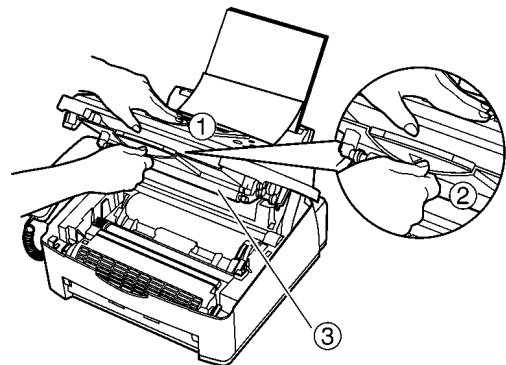
If the unit does not release the document during feeding, remove the jammed document as follows.

1. Lift open the front cover (①), holding OPEN (②).

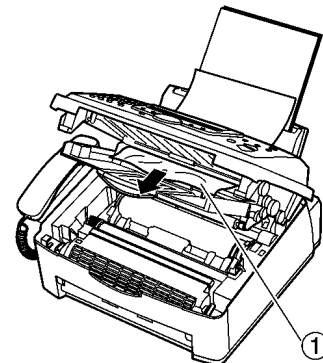


Caution:
The fuser unit (③) gets hot.
Do not touch it.

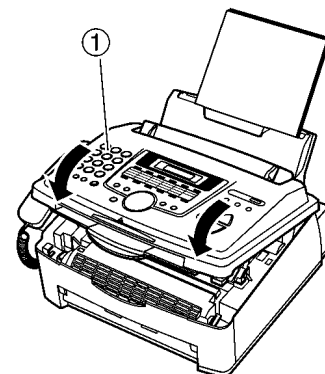
2. Hold the center part of the front cover (①), and pull open the inner cover (②).
 - Do not touch the transfer roller (③).



3. Remove the jammed document carefully (①).

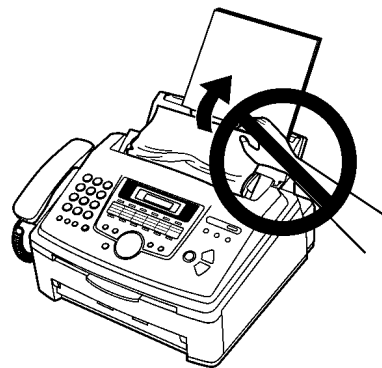


4. Push back the inner cover.
5. Close the front cover (①) by pushing down on both sides, until locked.



Note:

- Do not pull out the jammed document forcibly before opening the front cover.



4.7. RECORDING PAPER JAMS

4.7.1. When the recording paper has jammed in the unit

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

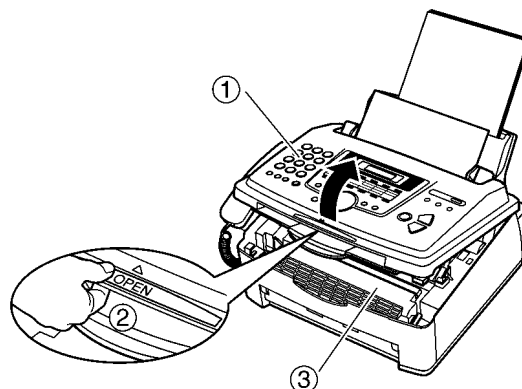
The display will show the following.

Refer to **LCD MESSAGE** (P.4).

Display:

PAPER JAMMED

- Lift open the front cover (①), holding OPEN (②).



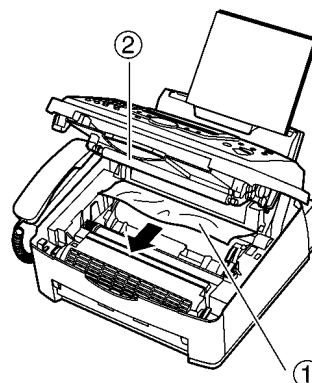
Caution:
The fuser unit (③) gets hot.
Do not touch it.

- Remove the jammed paper.

When the recording paper has jammed near the drum and toner unit:

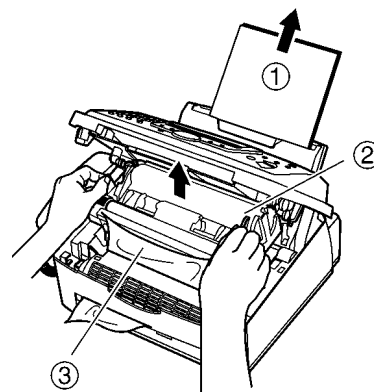
Remove the jammed paper (①) carefully by pulling it toward you.

- Do not touch the transfer roller (②).

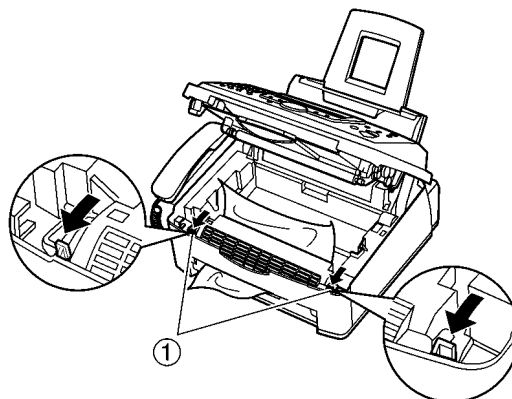


When the recording paper has jammed near the recording paper exit:

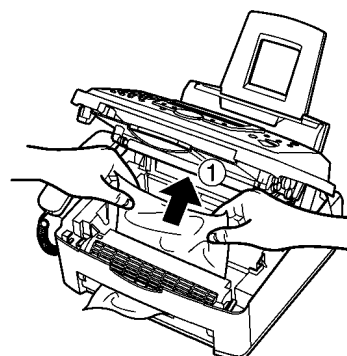
1. Remove the recording paper (①), then remove the drum and toner unit (②) to allow the jammed paper (③) to pull free from the rear cabinet.



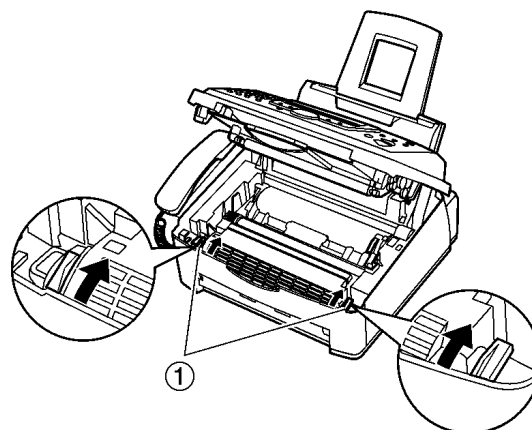
2. Lift both green levers (①) forward until they stop.



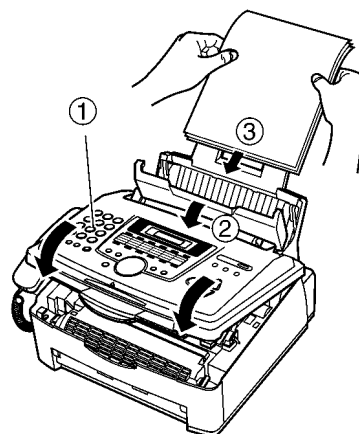
3. Remove the jammed paper (①) from the fuser unit by pulling it upwards carefully, then install the drum and toner unit.



4. Push back the levers (①) to the original position.



- 3 Close the front cover (①) by pushing down on both sides, until locked. Pull the tension plate forward (②) and re-insert the recording paper (③), then push back the tension plate.
- Before re-inserting, make sure to fan and straighten the recording paper.



4.7.2. When the recording paper is not fed into the unit properly

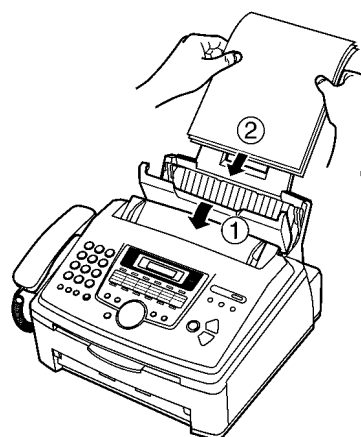
The display will show the following.

Refer to **LCD MESSAGE** (P.4).

Display:

FAILED PICK UP

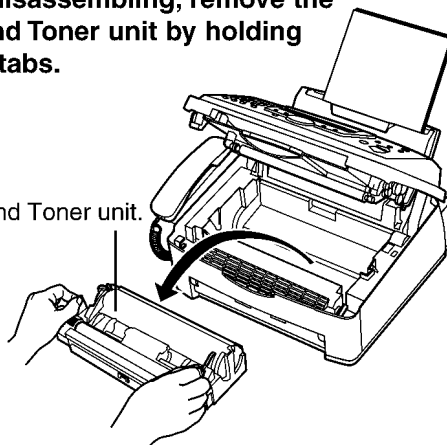
1. Remove the recording paper. Pull the tension plate forward (①) and re-insert the recording paper (②), then push back the tension plate.
- Before re-inserting, make sure to fan and straighten the recording paper.



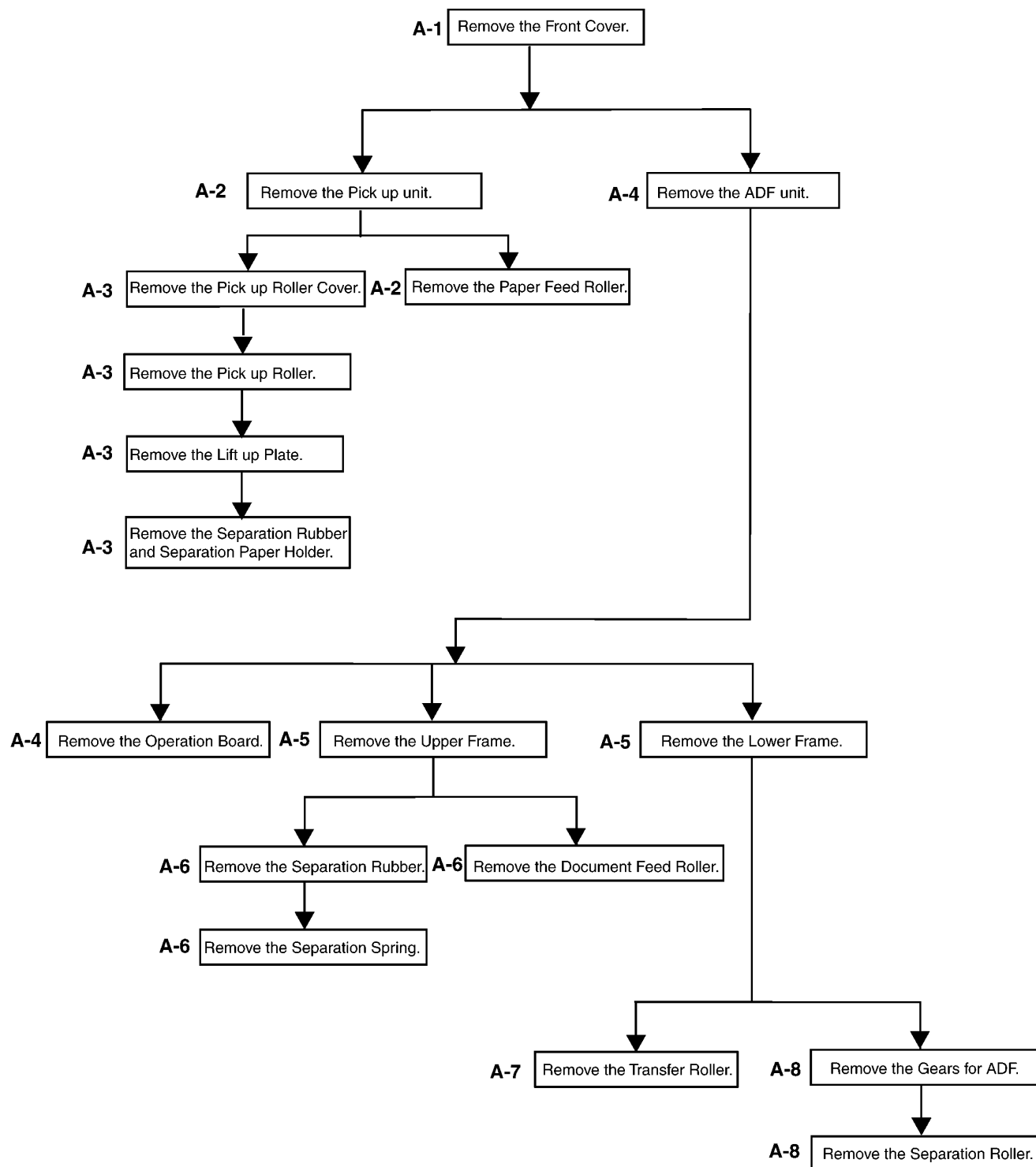
5 DISASSEMBLY INSTRUCTIONS

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

Drum and Toner unit.



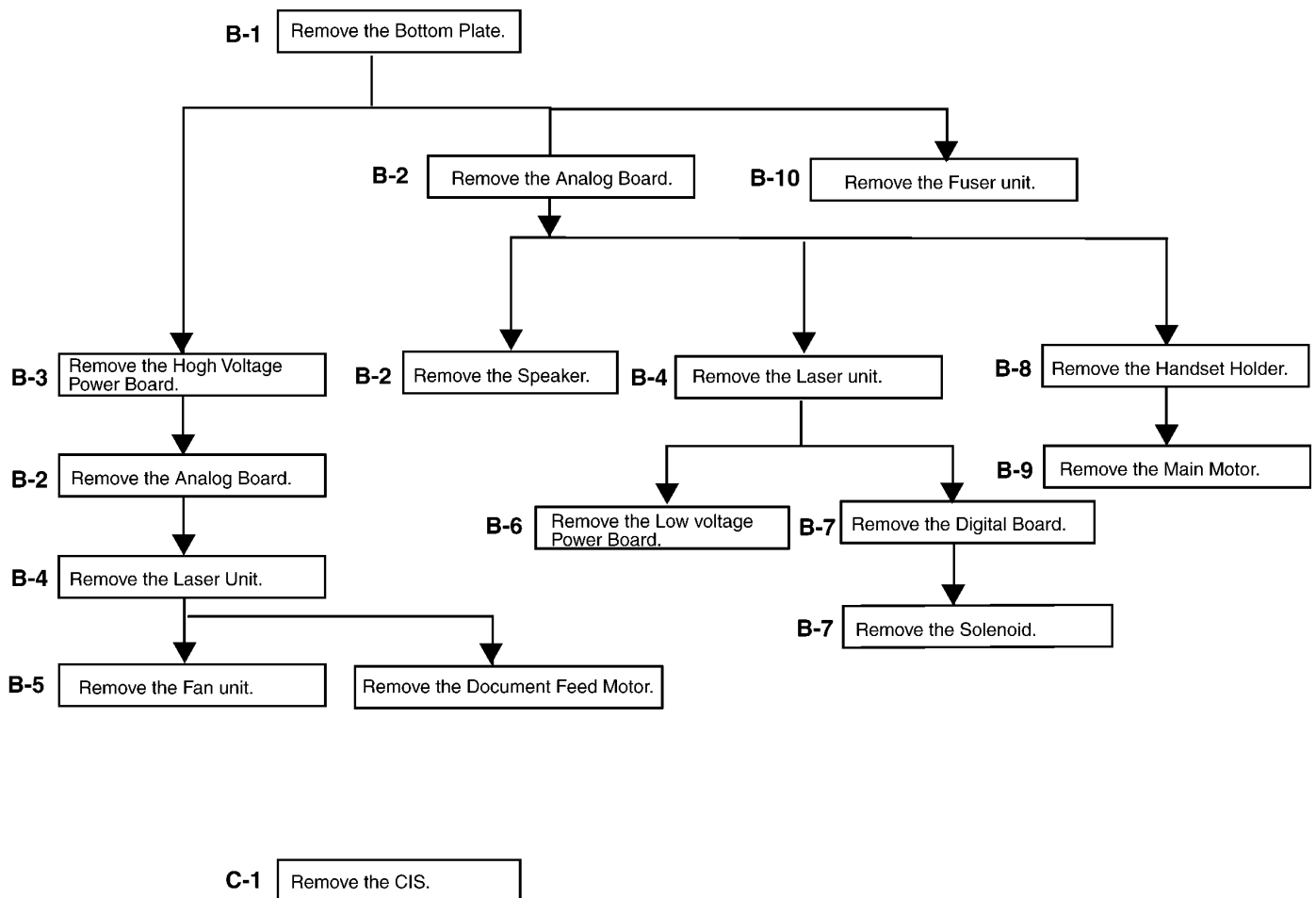
5.1. UPPER MAIN CABINET SECTION



CROSS REFERENCE:

- A1: HOW TO REMOVE THE OPERATION PANEL ASS'Y (P.44)
- A2: HOW TO REMOVE THE PICK UP UNIT (P.45)
- A3: HOW TO REMOVE THE PICK UP ROLLER (P.46)
- A4: HOW TO REMOVE THE OPERATION BOARD (P.47)
- A5: HOW TO REMOVE THE LOWER FLAME (P.48)
- A6: HOW TO REMOVE THE SEPARATION RUBBER (P.48)
- A7: HOW TO REMOVE THE TRANSFER ROLLER (P.49)
- A9: HOW TO REMOVE THE FAN UNIT (P.53)
- A10: HOW TO REMOVE THE LOW VOLTAGE POWER BOARD (P.53)

5.2. LOWER MAIN CABINET SECTION



CROSS REFERENCE:

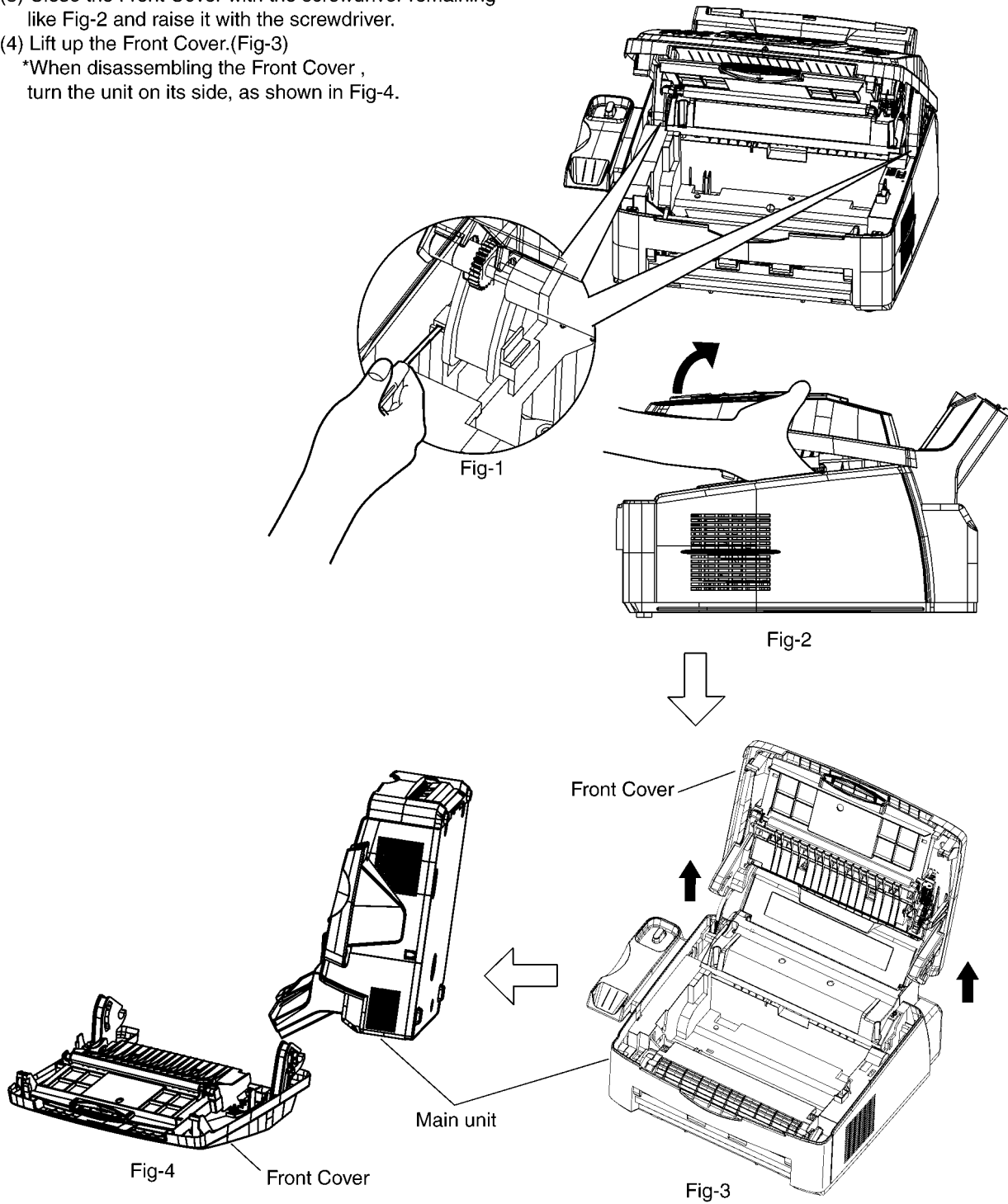
- A1: HOW TO REMOVE THE OPERATION PANEL ASS'Y (P.44)
- A5: HOW TO REMOVE THE LOWER FLAME (P.48)
- A6: HOW TO REMOVE THE SEPARATION RUBBER (P.48)
- A7: HOW TO REMOVE THE TRANSFER ROLLER (P.49)
- B1: HOW TO REMOVE THE BOTTOM PLATE (P.51)
- B2: HOW TO REMOVE THE ANALOG BOARD (P.51)
- B3: HOW TO REMOVE THE HIGH VOLTAGE POWER BOARD (P.52)
- B4: HOW TO REMOVE THE LASER UNIT (P.52)
- B5: HOW TO REMOVE THE SOLENOID (P.54)

5.3. HOW TO REMOVE THE OPERATION PANEL ASS'Y

PROCEDURE: A-1

REF.NO.A-1

- (1) Open the Front Cover.
 - (2) Insert the small screwdriver as illustrated in Fig-1
 - (3) Close the Front Cover with the screwdriver remaining like Fig-2 and raise it with the screwdriver.
 - (4) Lift up the Front Cover.(Fig-3)
- *When disassembling the Front Cover , turn the unit on its side, as shown in Fig-4.

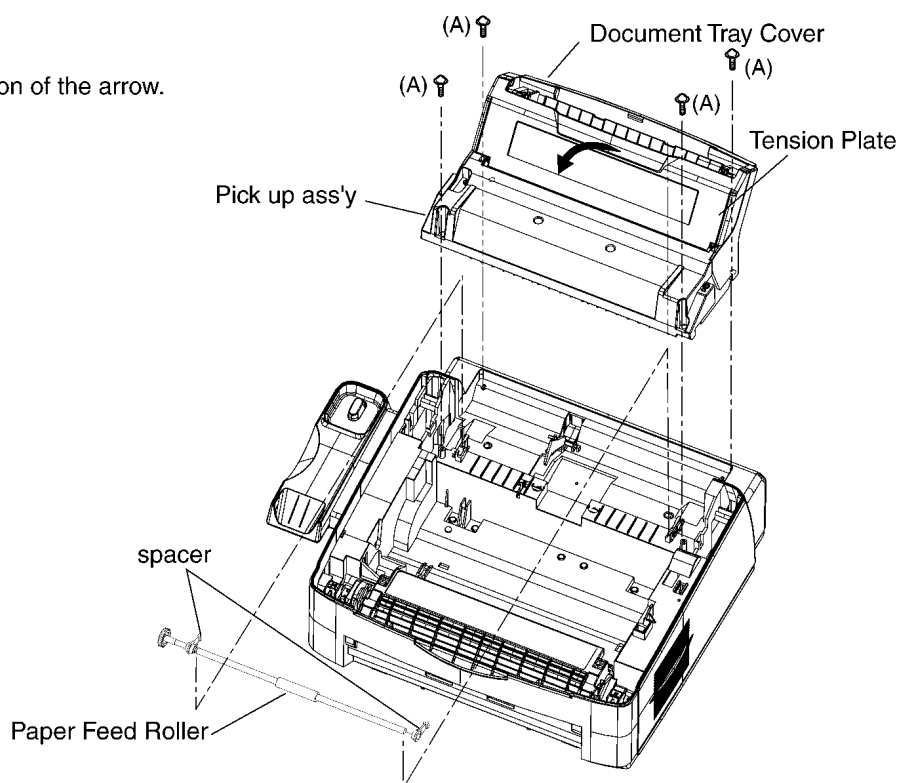


5.4. HOW TO REMOVE THE PICK UP UNIT

PROCEDURE: A1--> A-2

REF.NO.A-2

- 1) Pull the tension plate in the direction of the arrow.
- 2) Remove the 4 screws (A).
- 3) Lift up the Pick up ass'y.
- 4) Remove the 2 spacers.
- 5) Remove the Paper Feed Roller.

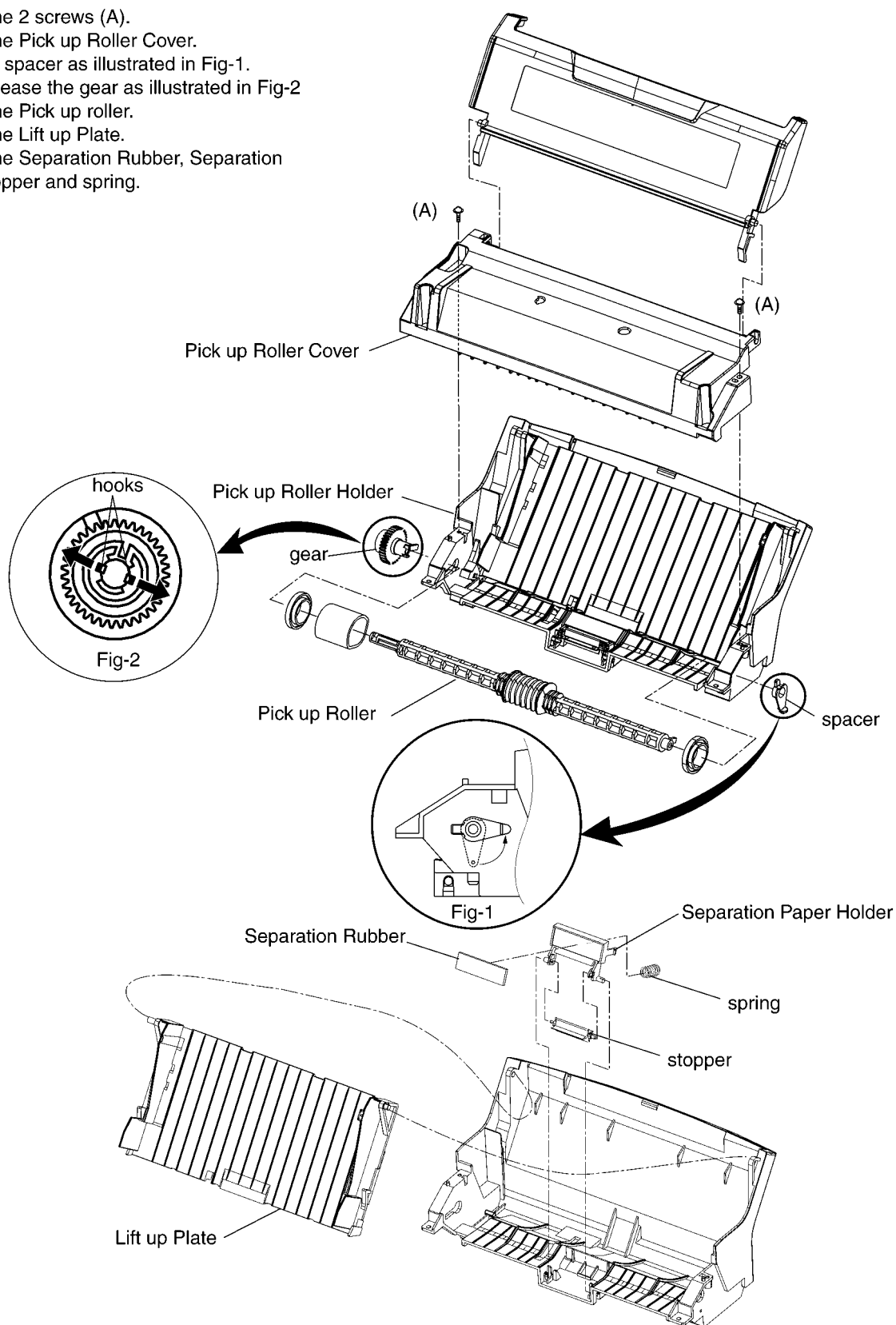


5.5. HOW TO REMOVE THE PICK UP ROLLER

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

REF.NO.A-3

- 1) Remove the 2 screws (A).
- 2) Remove the Pick up Roller Cover.
- 4) Rotate the spacer as illustrated in Fig-1.
and the release the gear as illustrated in Fig-2
- 5) Remove the Pick up roller.
- 6) Remove the Lift up Plate.
- 7) Remove the Separation Rubber, Separation
Holder, stopper and spring.

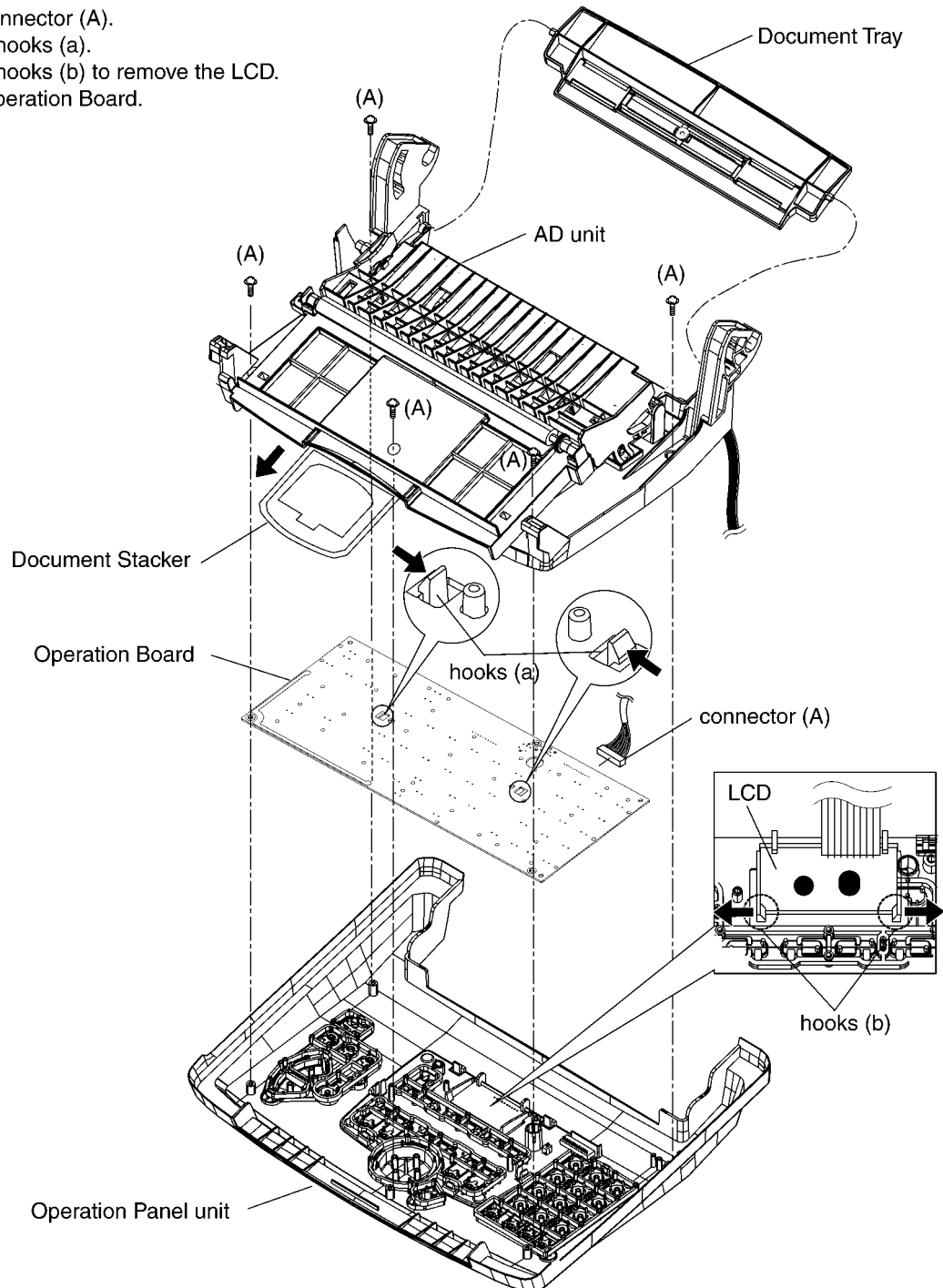


5.6. HOW TO REMOVE THE OPERATION BOARD

PROCEDURE: A-1--> A-4

REF.NO.A-4

- 1) Pull out the Document Stacker ahead.
- 2) Remove the 5 screws (A)
- 3) Separate the AD (Auto Document Feeder) unit from the Operation Panel unit.
- 4) Remove the connector (A).
- 5) Release the 2 hooks (a).
- 6) Release the 2 hooks (b) to remove the LCD.
- 7) Remove the Operation Board.

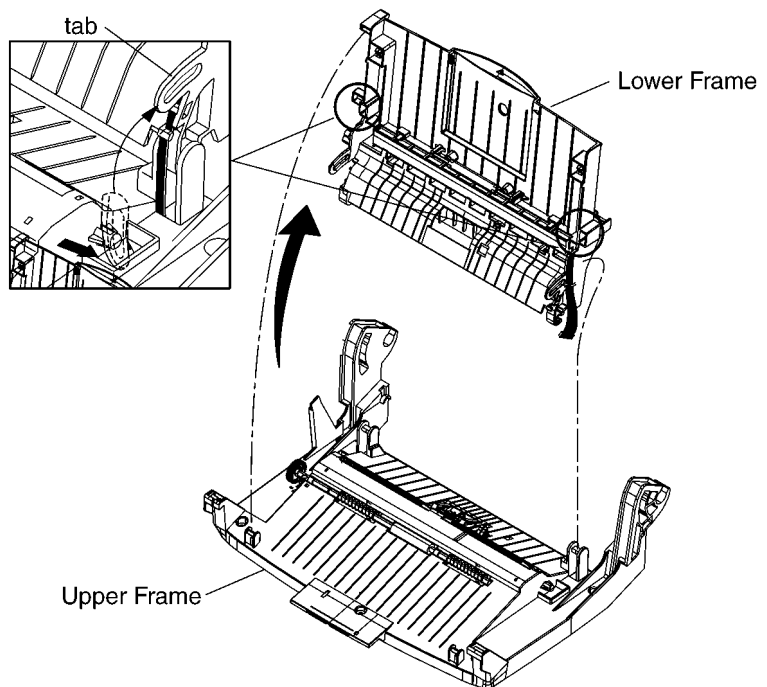


5.7. HOW TO REMOVE THE LOWER FLAME

PROCEDURE: A1--> A-4--> A-5

REF.NO.A-5

- 1) Push the two tabs toward the outside of the unit and lift the Lower Frame.

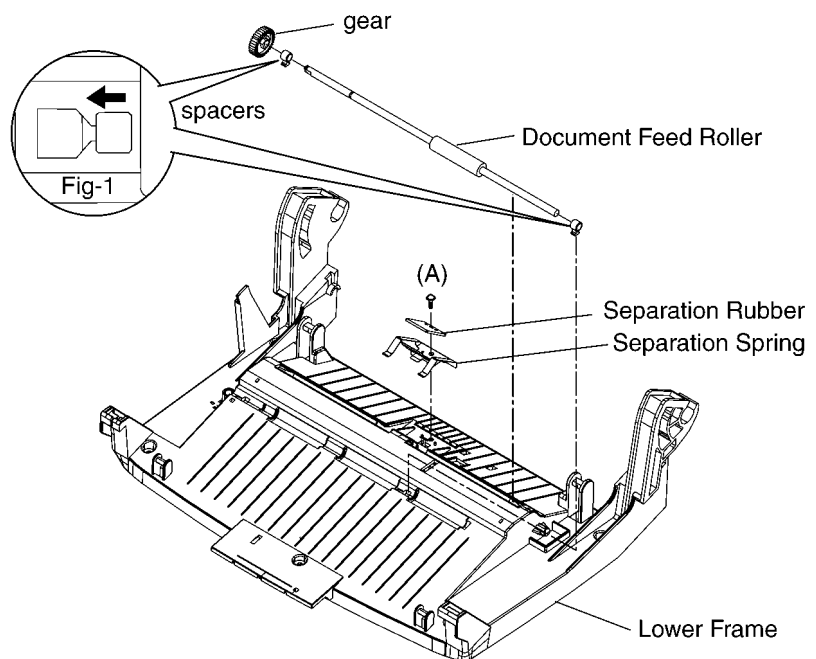


5.8. HOW TO REMOVE THE SEPARATION RUBBER

PROCEDURE: A-1--> A-4--> A-5--> A-6

REF.NO.A-6

- 1) Remove the screw (A).
- 2) Remove the Separation Rubber and Separation Spring.
- 3) Remove the 2 spacers as illustrated Fig-1.
- 4) Remove the gear.
- 5) Remove the Document Feed Roller.

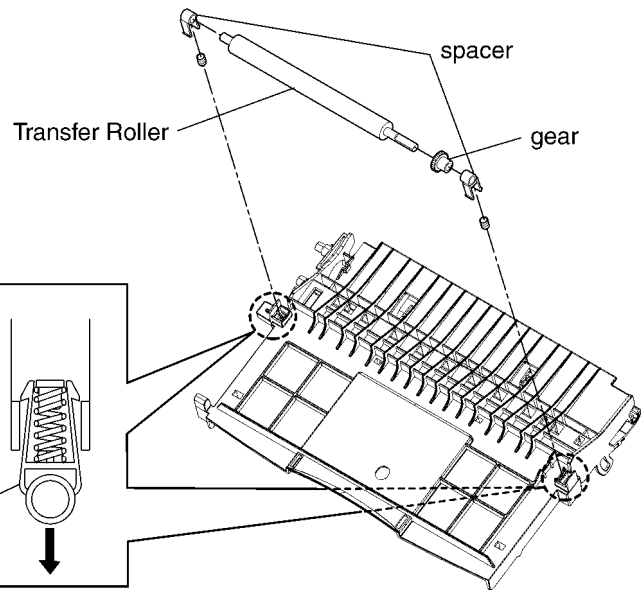
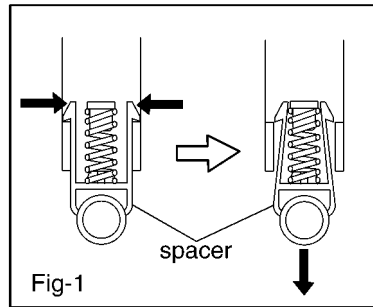


5.9. HOW TO REMOVE THE TRANSFER ROLLER

PROCEDURE: A-1--> A-4--> A-5--> A-7

REF.NO.A-7

- 1) Remove the 2 spacers as illustrated Fig-1.
(If the leg of both the sides of the spacer is pinched using tweezers, it can remove easily.)
- 2) Remove the Transfer Roller.

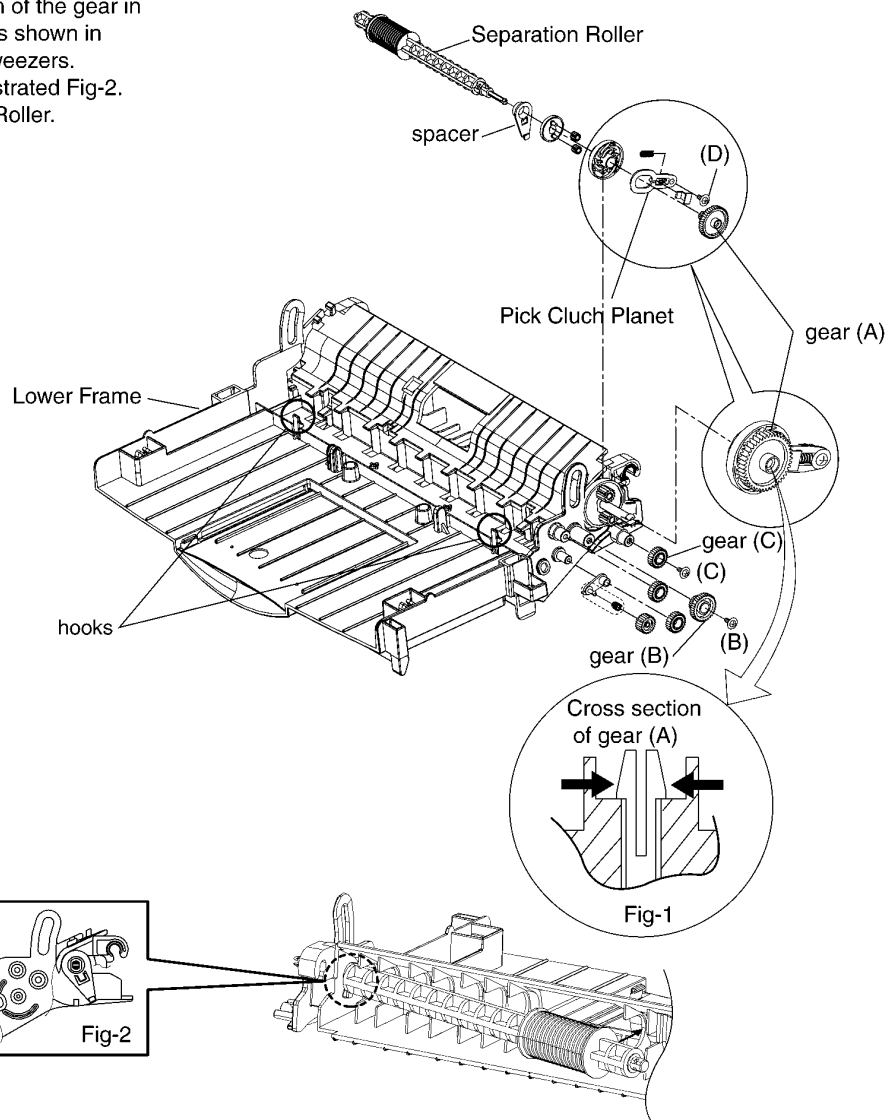


5.10. HOW TO REMOVE THE SEPARATION ROLLER

PROCEDURE: A-1--> A-4--> A-5--> A-8

REF.NO.A-8

- 1) Remove the screw (B) and (C).
- 2) Remove the gear (B) and (C).
- 3) Pinch and remove the pin of the gear in the direction of the arrows shown in Fig-1 using a thing like tweezers.
- 4) Rotate the spacer as illustrated Fig-2.
- 5) Remove the Separation Roller.

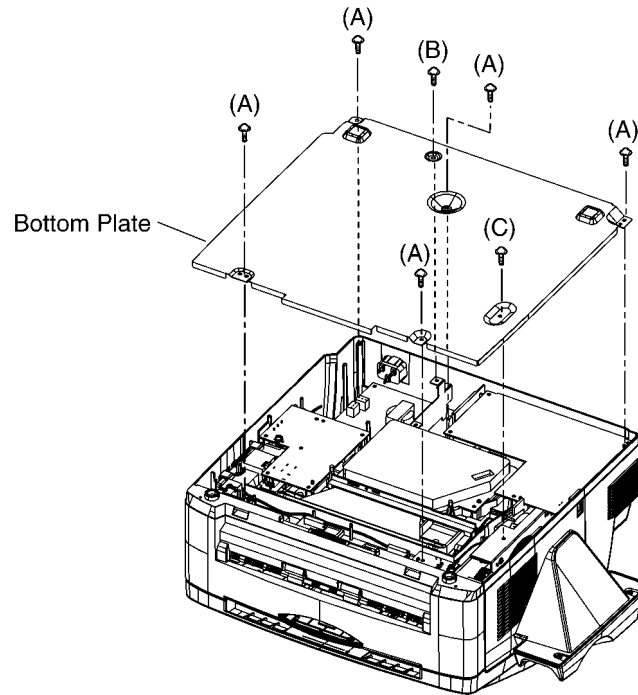


5.11. HOW TO REMOVE THE BOTTOM PLATE

PROCEDURE: B-1

REF.NO.B-1

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

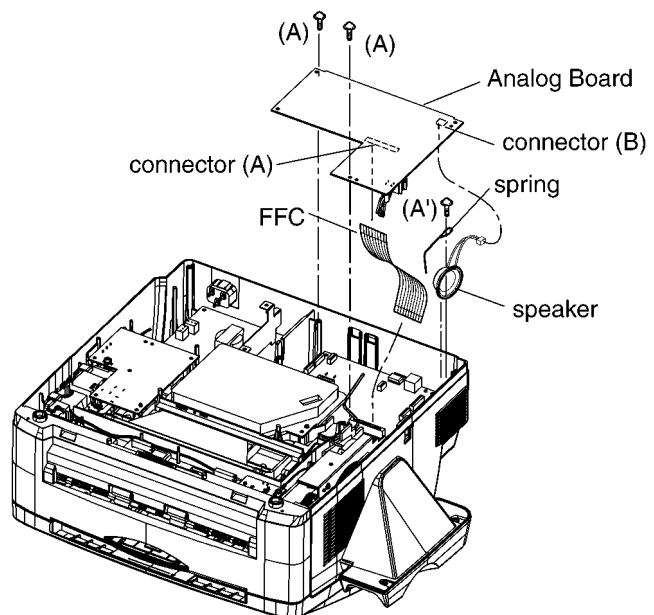


5.12. HOW TO REMOVE THE ANALOG BOARD

PROCEDURE: B-1--> B-2

REF.NO.B-2

- 1) Remove the 2 screws (A).
- 2) Remove the connector (A) and (B).
- 3) Remove the Analog Board.
- 4) Remove the screw (A').
- 5) Remove the spring.
- 6) Remove the speaker.

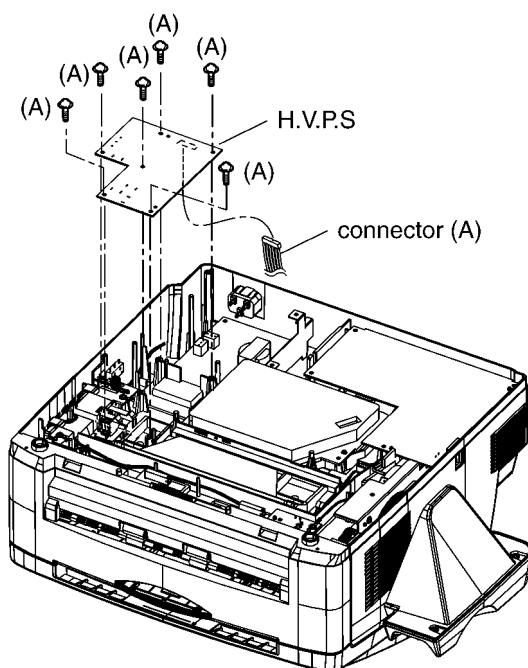


5.13. HOW TO REMOVE THE HIGH VOLTAGE POWER BOARD

PROCEDURE: B-1--> B-3

REF.NO.B-3

- 1) Remove the 6 screws (A).
- 2) Remove the connector (A).
- 3) Remove the H.V.P.S. (High Voltage Power Board).

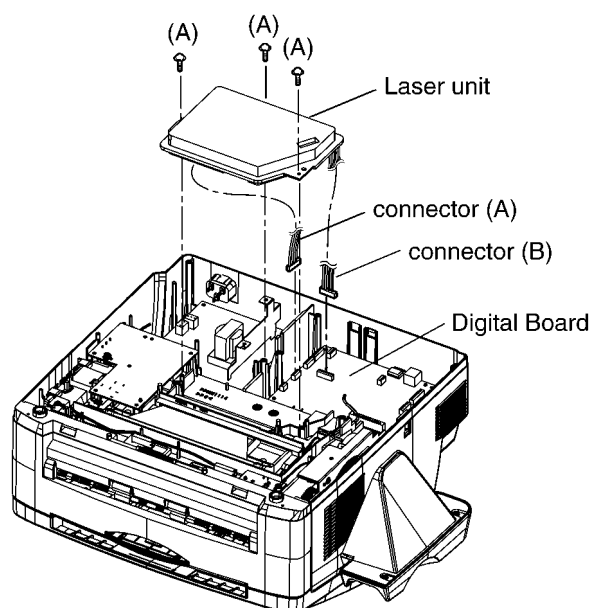


5.14. HOW TO REMOVE THE LASER UNIT

PROCEDURE: B-1--> B-2--> B-4

REF.NO.B-4

- 1) Remove the 3 screws (A).
- 2) Remove the connector (A) and (B).
- 3) Remove the Laser unit.

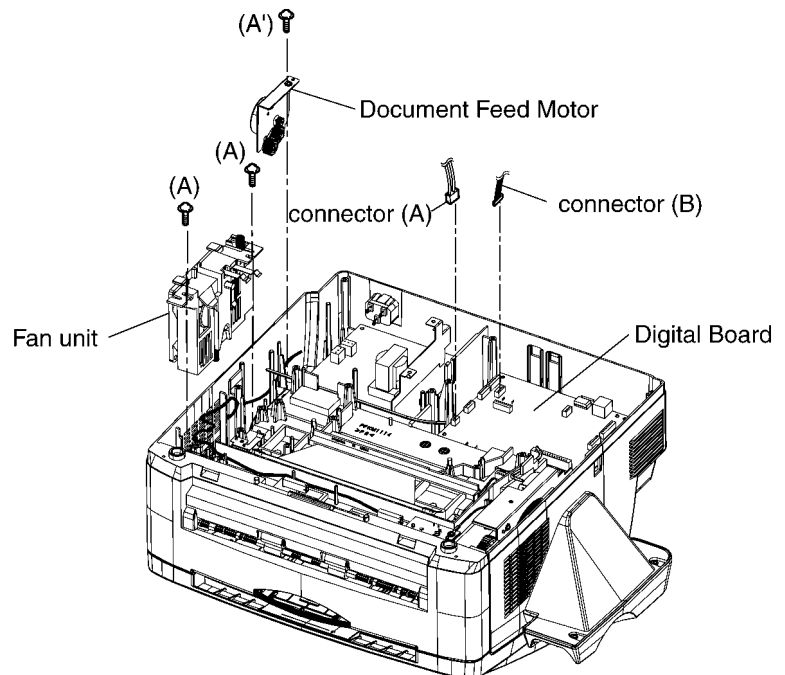


5.15. HOW TO REMOVE THE FAN UNIT

PROCEDURE: B-1--> B-3--> B-2--> B-4--> B-5

REF.NO.B-5

- 1) Remove the 2 screws (A).
- 2) Remove the connector (A).
- 3) Remove the Fan unit.
- 4) Remove the screw (A').
- 5) Remove the connector (B).
- 6) Remove the Document Feed Motor.

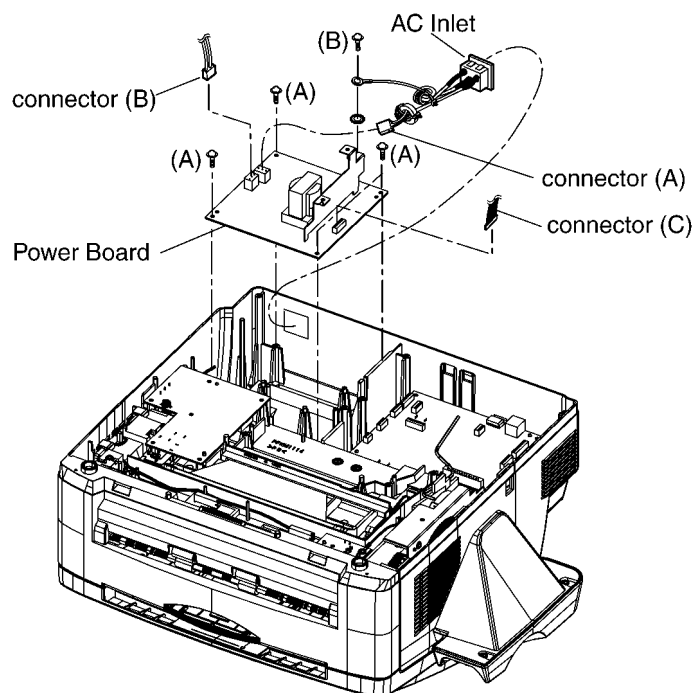


5.16. HOW TO REMOVE THE LOW VOLTAGE POWER BOARD

PROCEDURE: B-1--> B-2--> B-4--> B-6

REF.NO.B-6

- 1) Remove the screw (B) and connector (A).
- 2) Remove the AC Inlet.
- 3) Remove the connector (B) and (C).
- 4) Remove the 4 screws (A).
- 5) Remove the Power Board (Low Voltage Power Board).

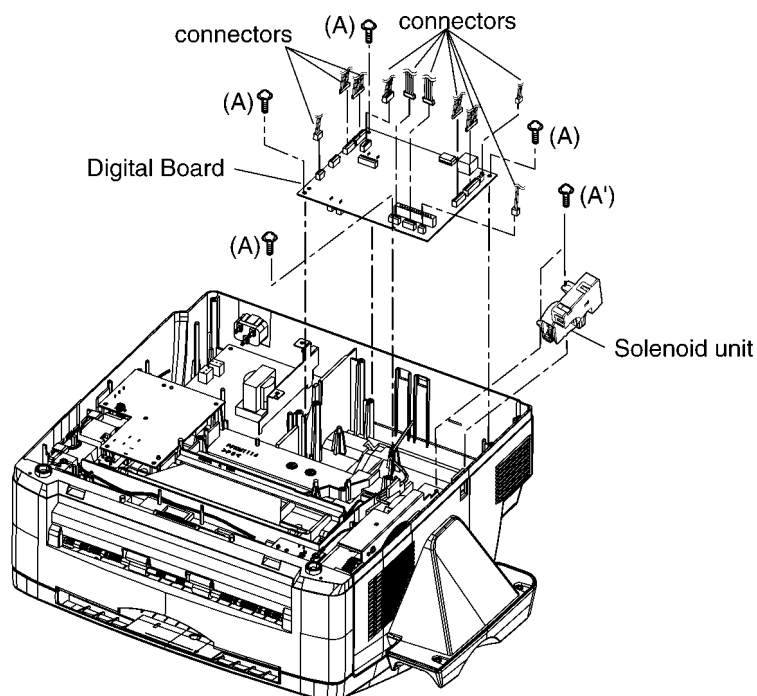


5.17. HOW TO REMOVE THE SOLENOID

PROCEDURE: B-1--> B-2--> B-4--> B-7

REF.NO.B-7

- 1) Remove the 4 screws (A).
- 2) Remove the 10 connectors.
- 3) Remove the Digital Board.
- 4) Remove the 2 screws (A').
- 5) Remove the Solenoid unit.

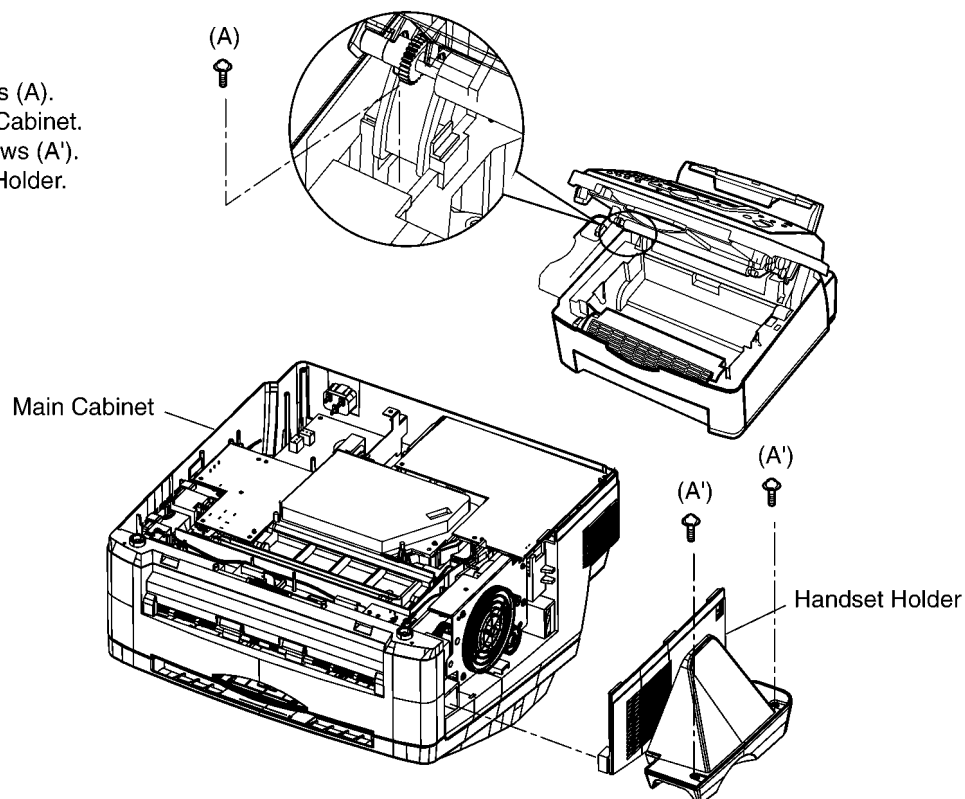


5.18. HOW TO REMOVE THE HANDSET HOLDER

PROCEDURE: A-1--> B-1--> B-8

REF.NO.B-8

- 1) Remove the screws (A).
- 2) Reverse the Main Cabinet.
- 3) Remove the 2 screws (A').
- 4) Remove Handset Holder.

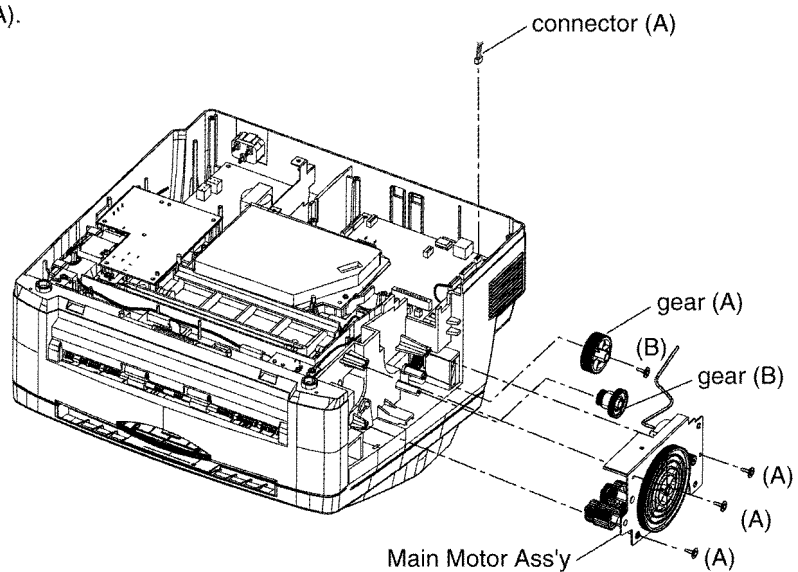


5.19. HOW TO REMOVE THE MAIN MOTOR

PROCEDURE: B-1--> B-2--> B-8--> B-9

REF.NO.B-9

- 1) Remove the 3 screw (A) and connector (A).
- 2) Remove the Main Motor Ass'y.
- 3) Remove the screw (B).
- 4) Remove the gear (A) and (B).



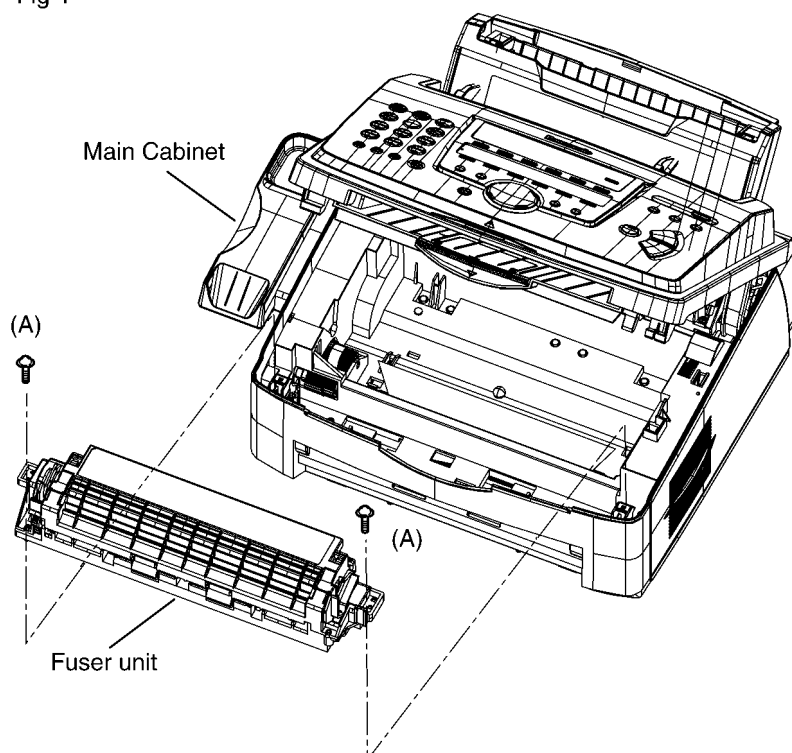
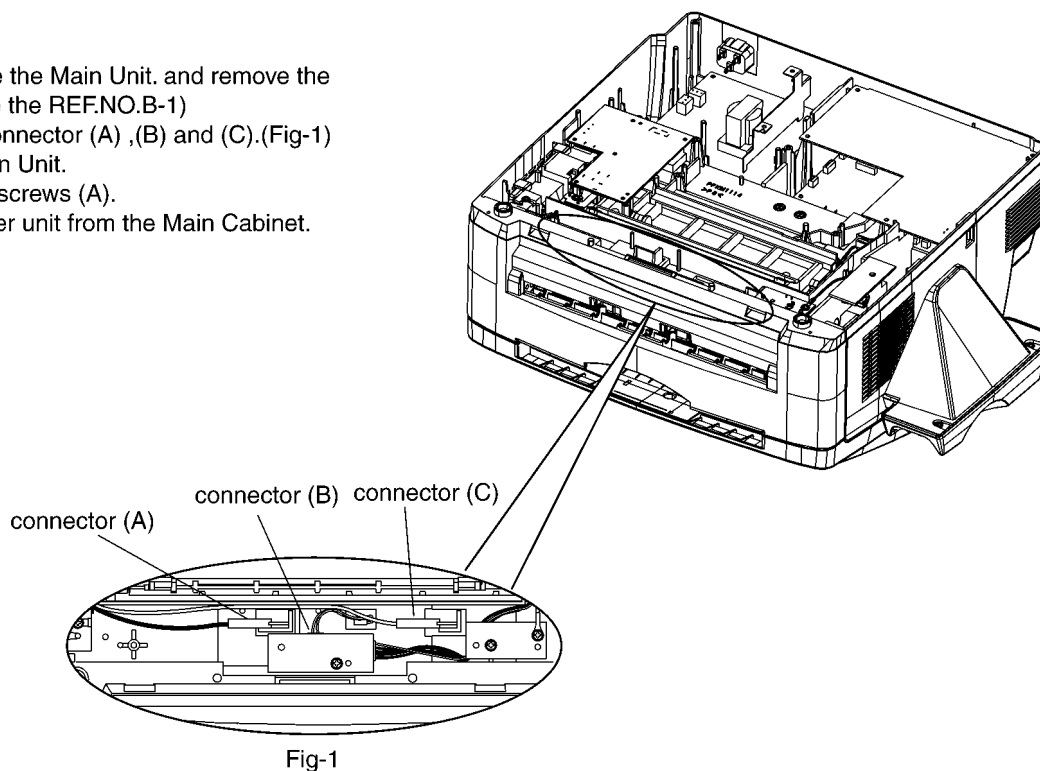
5.20. HOW TO REMOVE THE FUSER UNIT

PROCEDURE: B-1--> B-10

REF.NO.B-10

First of all,reverse the Main Unit. and remove the bottom Plate.(see the REF.NO.B-1)

- 1) Remove the connector (A) ,(B) and (C).(Fig-1)
- 2) Revert the Main Unit.
- 3) Remove the 2 screws (A).
- 4) Lift up the Fuser unit from the Main Cabinet.

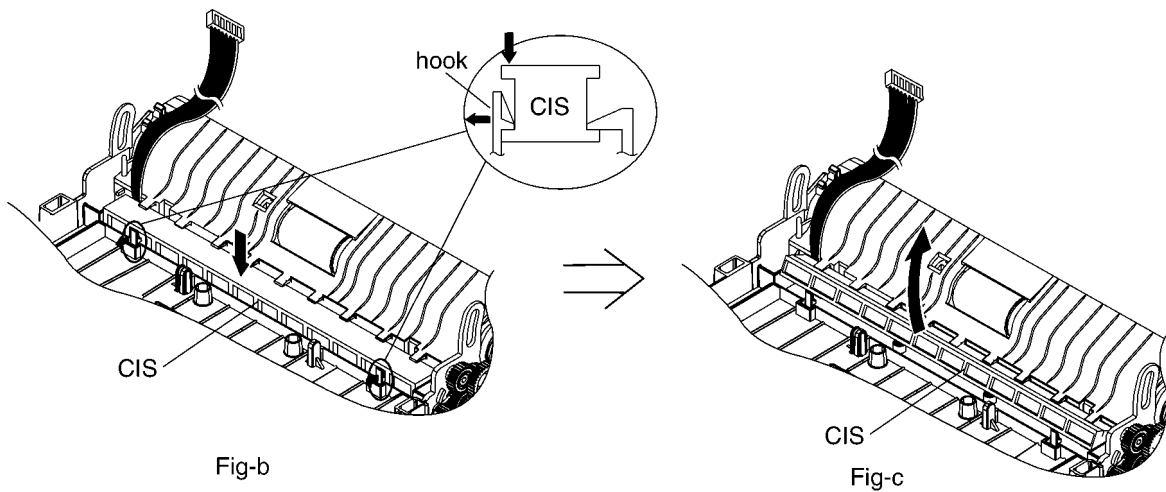
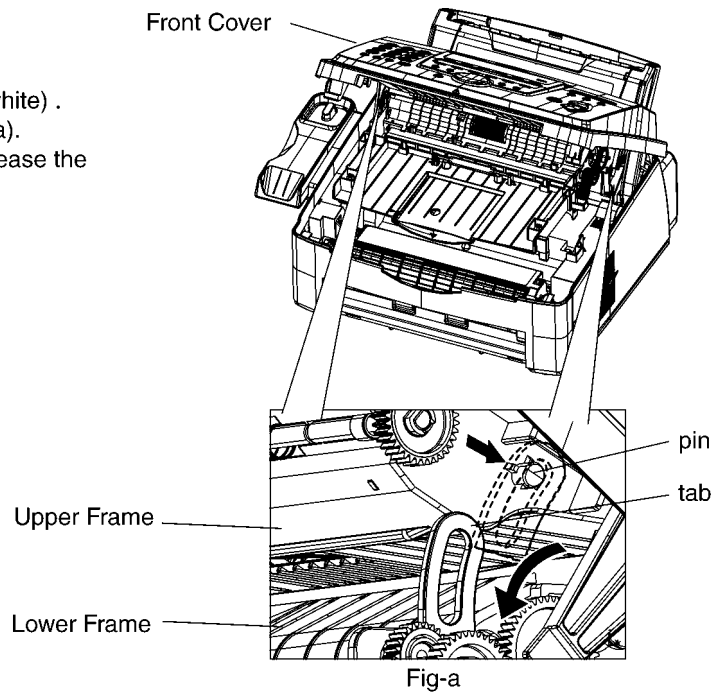


5.21. HOW TO REMOVE THE CIS

PROCEDURE: C-1

REF.NO.C-1

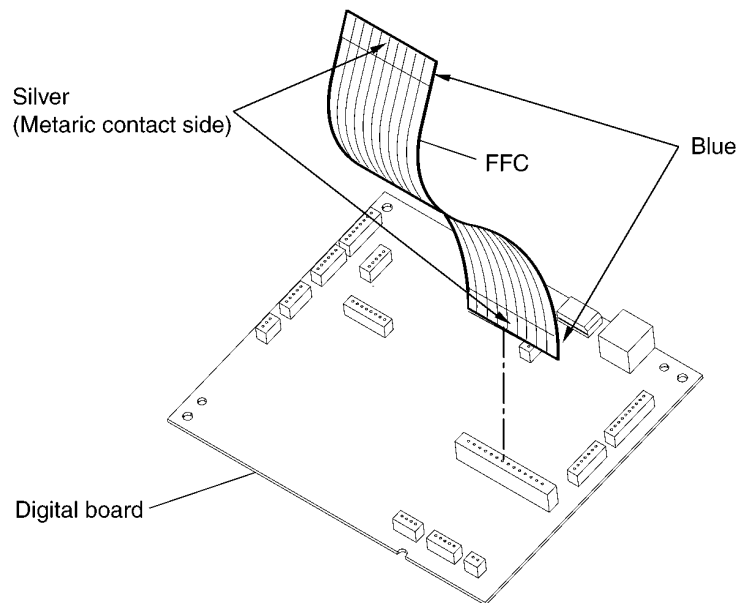
- 1) Lift open the Front Cover.
- 2) Pull the tab(gray) back to free it from the pin (white) .
on both the left and right sides of the unit (Fig-a).
- 3) Push the CIS in the direction of an arrow to release the
hooks.(Fig-b).
- 4) Remove the CIS.



5.22. NOTE FOR ASSEMBLING

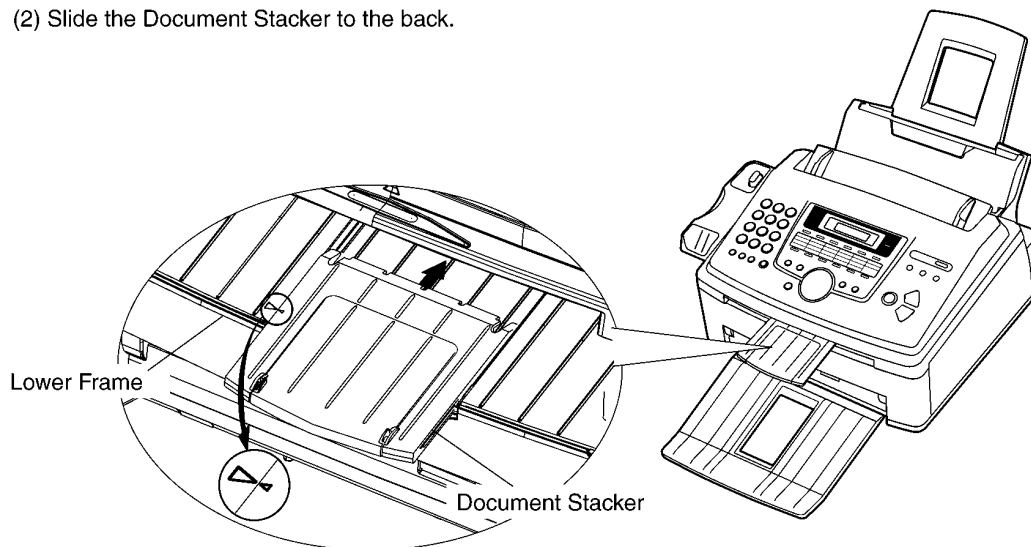
5.22.1. FCC (DIGITAL BOARD)

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



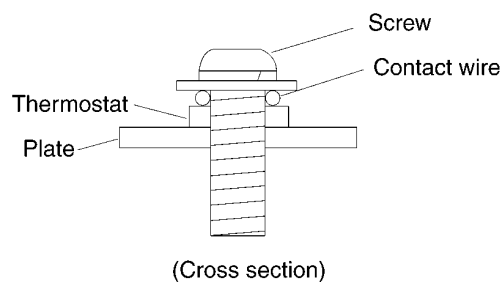
5.22.2. DOCUMENT STACKER

- (1) Mark of a Lower Frame and Document Stacker is united and assemble.
- (2) Slide the Document Stacker to the back.

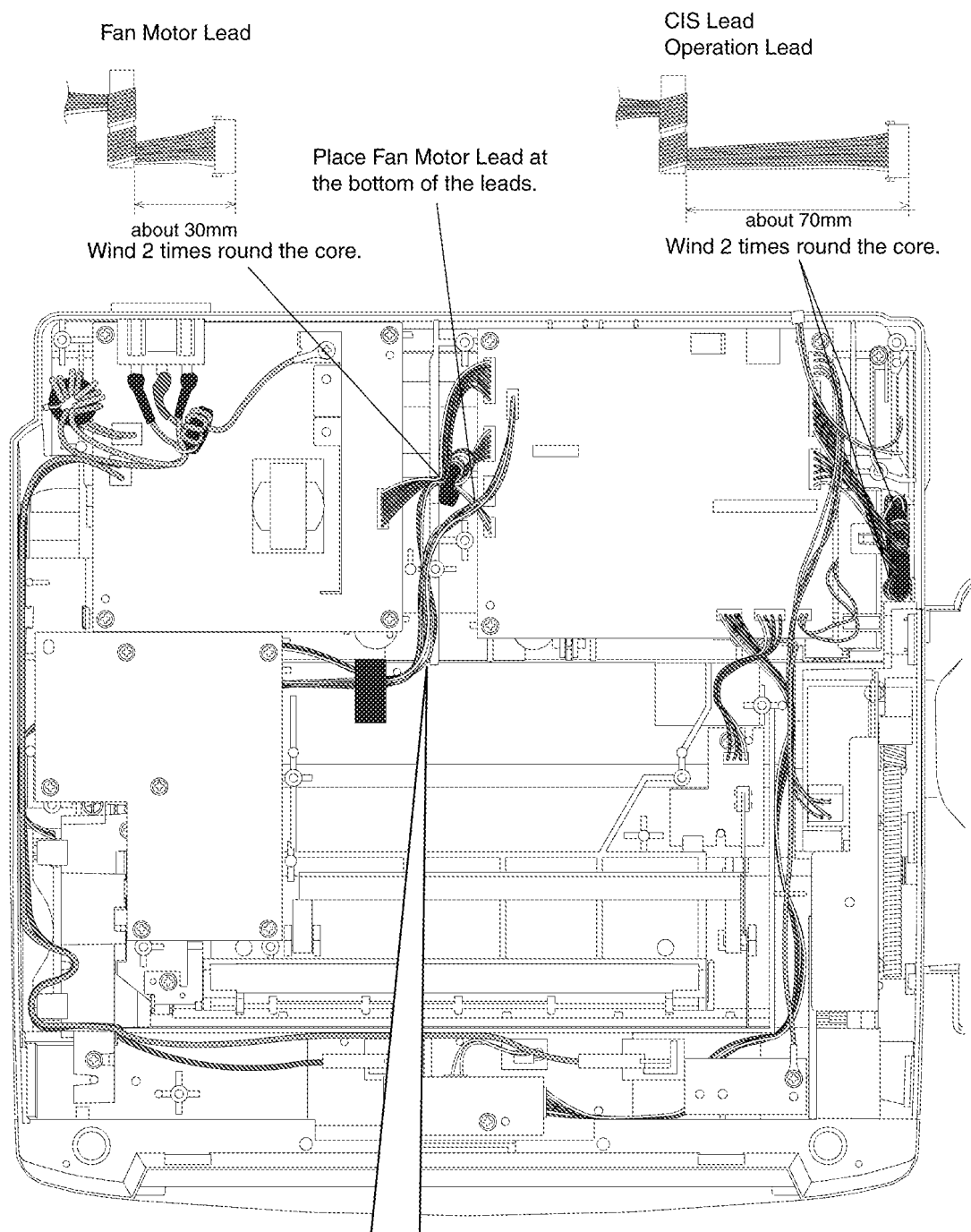


5.22.3. THERMOSTAT

Attach the thermostat correctly, as shown in the right figure.
Do not use the thermostat which changed.



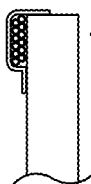
5.23. INSTALLATION POSITION OF THE LEAD



25 (4cm)
Attach the tape equally
to right and left.

Attach FAN MOTOR LEAD, LEAD/HVPS
and MOTOR LEAD.

SECTIONAL VIEW



Leads is processed in accordance
with the side of cabinet.

< Caution point >

If the leads is processed in accordance
with the edge side of the rib, the leads
are crushed by LSU.

6 TROUBLESHOOTING GUIDE

6.1. USER RECOVERABLE ERRORS

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

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

Refer to **LCD MESSAGE** (P.4).

| DISPLAY MESSAGE | CAUSE AND REMEDY |
|--|---|
| CALL SERVICE 1 | <ul style="list-style-type: none"> Polygon motor error. Refer to CALL SERVICE 1 (P.85). |
| CALL SERVICE 2 | <ul style="list-style-type: none"> Laser beam error. Replace LSU unit. Refer to CALL SERVICE 2 (P.86). |
| CALL SERVICE 3 | <ul style="list-style-type: none"> Fuser unit cannot heat up. Replace fuser unit. Refer to CALL SERVICE 3 (P.87). |
| CALL SERVICE 4 | <ul style="list-style-type: none"> Fan motor error. Replace fan motor. Refer to CALL SERVICE 4 (P.88). |
| CHANGE DRUM ↕ CHANGE SUPPLIES | <ul style="list-style-type: none"> There is something wrong with the drum unit. Replace the drum unit and the toner cartridge. |
| CHECK DOCUMENT | <ul style="list-style-type: none"> The document is not fed into the unit properly. Reinsert the document. If misfeeding occurs frequently, clean the document feeder rollers and try again. |
| CHECK DRUM | <ul style="list-style-type: none"> The drum unit is not inserted properly. Reinsert it correctly. The installed drum is worn out. Replace the drum unit with a new one. |
| CHECK MEMORY | <ul style="list-style-type: none"> The memory (telephone numbers, parameters, etc.) has been erased. Re-program. |
| COVER OPEN | <ul style="list-style-type: none"> The front cover is open. Close it. |
| DIRECTORY FULL | <ul style="list-style-type: none"> There is no space to store new entries in navigator directory. Erase unnecessary entries. |
| DRUM LIFE OVER REPLACE DRUM ↕ CHANGE SUPPLIES | <ul style="list-style-type: none"> The drum life is complete. Replace the drum unit immediately. |
| FAILED PICK UP | <ul style="list-style-type: none"> Recording paper was not fed into the unit properly. Reinsert the recording paper. |
| FAX IN MEMORY | <ul style="list-style-type: none"> The unit has a document in memory. See the other displayed message instructions to print out the document. |
| FAX MEMORY FULL | <ul style="list-style-type: none"> The memory is full of received documents due to lack of recording paper or a recording paper jam, etc. Install paper or clear the jammed paper. When performing memory transmission, the document being stored exceeds the memory capacity of the unit. Transmit the entire document manually. |
| LOW TEMP. | <ul style="list-style-type: none"> The inside of the unit is extremely cold and cannot be operated. Use the unit in a warmer area. While the unit cannot be operated, the received documents are temporarily stored into the memory, and will be printed out automatically when the unit warms up. |
| MEMORY FULL | <ul style="list-style-type: none"> When making a copy, the document being stored exceeds the memory capacity of the unit. Press STOP to clear the message. Divide the document into sections. |
| MODEM ERROR | <ul style="list-style-type: none"> There is something wrong with the modem circuit. |
| NO FAX REPLY | <ul style="list-style-type: none"> The other party's fax machine is busy or has run out of recording paper. Try again. |
| OUT OF PAPER | <ul style="list-style-type: none"> Recording paper is not installed or the unit has run out of paper. Install paper. Recording paper is not fed into the unit properly. Reinstall paper. |
| PAPER JAMMED | <ul style="list-style-type: none"> A recording paper jam occurred. Clear the jammed paper. [If the printout jams, please refer to RECORDING PAPER JAMS (P.38).] |
| PLEASE WAIT | <ul style="list-style-type: none"> The unit is warming up. Wait for a while. |
| POLLING ERROR | <ul style="list-style-type: none"> The other party's fax machine does not offer the polling function. Check with the other party. |

| DISPLAY MESSAGE | CAUSE AND REMEDY |
|--|---|
| REDIAL TIME OUT | <ul style="list-style-type: none"> The other party's fax machine is busy or has run out of recording paper. Try again. |
| REMOVE DOCUMENT | <ul style="list-style-type: none"> The document is jammed. Remove the jammed document. Attempted to transmit a document longer than 600 mm (23 5/8"). Press the 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 DOCUMENT JAMS (P.37).) |
| REPLACE DRUM SOON | <ul style="list-style-type: none"> The drum life is near to the end. Replace the drum unit as soon as possible. |
| <div>TONER EMPTY</div> <div>↕</div> <div>CHANGE SUPPLIES</div> | <ul style="list-style-type: none"> The toner life is complete. Replace the toner cartridge immediately. |
| <div>TONER LOW</div> <div>↕</div> <div>CHANGE SUPPLIES</div> | <ul style="list-style-type: none"> The toner life is near to the end. Replace the toner cartridge as soon as possible. |
| TRANSMIT ERROR | <ul style="list-style-type: none"> A transmission error occurred. Try again. |
| WARM UP | <ul style="list-style-type: none"> The inside of the unit is too cold. Let the unit warm up. Wait for a while. |
| WRONG PAPER | <ul style="list-style-type: none"> The fax message was printed on paper which is shorter than letter size paper. Use the appropriate size paper. To prevent the drum unit becoming dirty, use A4 or letter size paper. |

6.2. PROGRAMMING AND LISTS

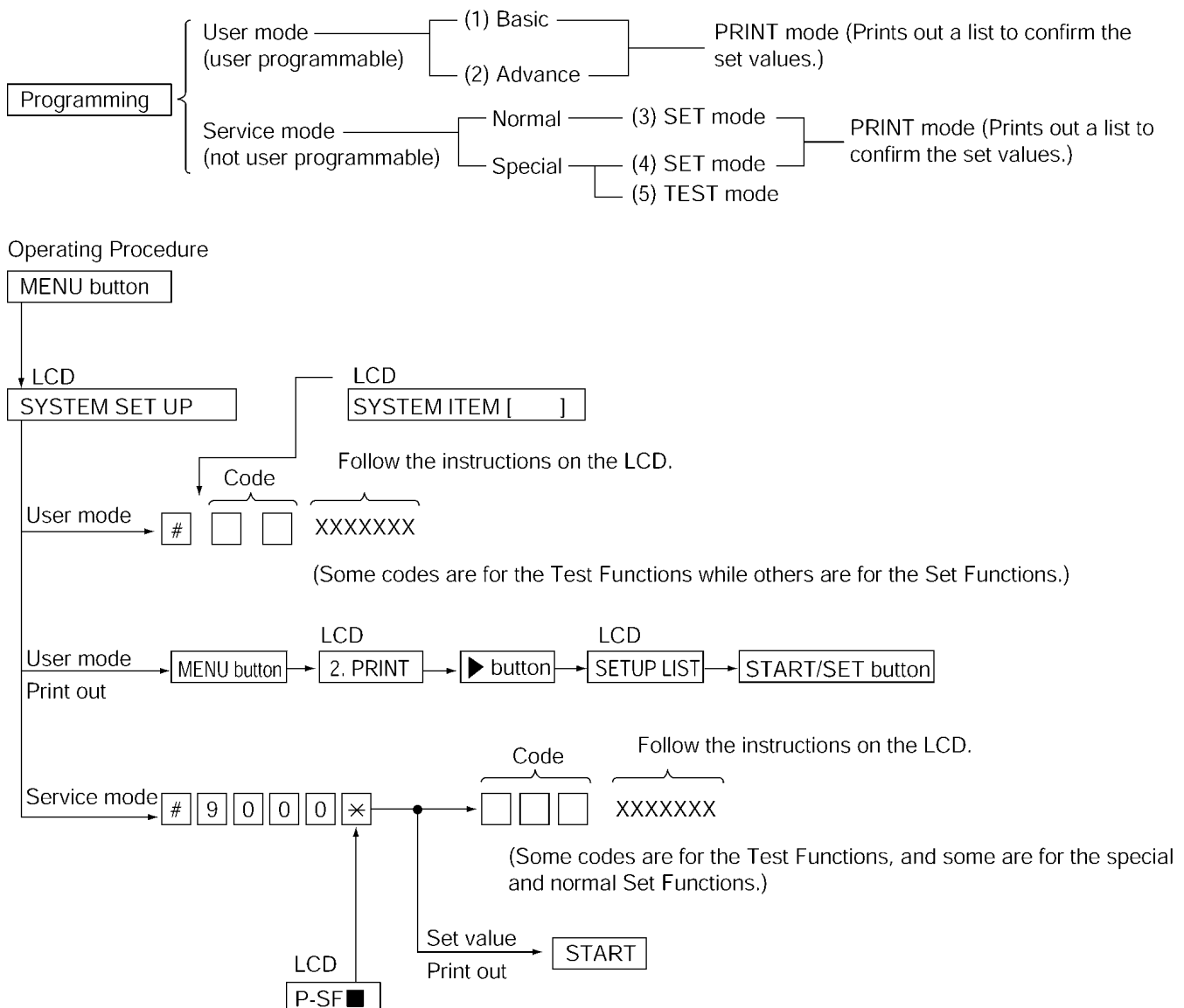
The programming functions are used to program the various features and functions of the machine, and to test the machine. This facilitates communication between the user and the service man while programming the unit.

6.2.1. OPERATION

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

6.2.2. OPERATION FLOW

Refer to **LCD MESSAGE** (P.4).



6.2.3. SERVICE FUNCTION TABLE

| Code | Function | Set Value | Effective Range | Default | Remarks |
|------|---|--|-----------------|---------|---|
| 501 | Pause time set | X 100 msec | 001~600 | 030 | ----- |
| 502 | Flash time | X 10 ms | 01~99 | 085 | ----- |
| 503 | Dial speed select | 1:10 pps 2:20 pps | 1, 2 | 1 | ----- |
| 514 | Bell signal detect time | X 100msec | 1~9 | 6 | ----- |
| 520 | CED frequency select | 1:2100 Hz 2:1100 Hz | 1, 2 | 1 | See Symptom/Countermeasure Table for long distance and international calls in (P.119). |
| 521 | International mode select | 1:ON 2:OFF | 1, 2 | 1 | See Symptom/Countermeasure Table for long distance and international calls in (P.119). |
| 522 | Auto standby select | 1:ON 2:OFF | 1, 2 | 1 | The resolution reverts to the default when transmission is complete. |
| 523 | Receive equalizer select | 1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km | 1~4 | 1 | Set RX equalizer to automatic mode. |
| 524 | Transmission equalizer select | 1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km | 1~4 | 1 | |
| 529 | Call Service Clear | | | | |
| 544 | Selecting the document feed position | 0~4mm | 0~4 | 2 | When the ADF function is incorrect, adjust the feed position. |
| 550 | Memory clear | | | | See (P.65). |
| 551 | ROM check | | | | See (P.65). |
| 552 | DTMF single tone test | 1:ON 2:OFF | 1, 2 | 2 | See (P.65). |
| 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 (P.65). |
| 555 | Scan check | | | | See (P.65). |
| 556 | Motor test | | | 0 | See (P.65). |
| 557 | LED test | | | | See (P.65). |
| 558 | LCD test | | | | See (P.65). |
| 561 | KEY test | | | | See (P.65). |
| 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 | 03 | Selects the number of times that ITS is redialed (not including the first dial). |
| 572 | ITS auto redial line disconnection time set | X second | 001~999 | 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 | 03 | Selects the number of redial times during FAX communication (not including the first dial). |
| 591 | FAX auto redial time disconnection time set | X second | 001~999 | 65 | 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 (P.112). |
| 593 | Time between CED and 300bps | 1:75 msec 2:500 msec 3:1 sec | 1~3 | 1 | See Symptom/Countermeasure Table for long distance and international calls in (P.119). Refer to (P.113) and (P.119). |
| 594 | Overseas DIS detection select | 1:detects at the 1st time 2:detects at the 2st time | 1, 2 | 1 | See Symptom/Countermeasure Table for long distance and international calls in (P.119). Refer to (P.112) and (P.119). |
| 595 | Receive error limit value set | 1: 5% 2: 10% 3: 15% 4: 20% | 1~4 | 2 | If the number of errors during transmission exceeds this value, the sending side terminates the call. |
| 596 | Transmit level set | X dBm | - 15~00 | 13 | Selects the FAX transmission level. Refer to (P.112)and (P.113). |
| 598 | Receiving sensitivity | 43= -43 dBm | 20~48 | 41 | Used when there is an error problem. Refer to (P.119). |
| 599 | ECM frame size | 1:256 2:64 | 1, 2 | 1 | ----- |
| 628 | H.V.P.S. check | | | | See (P.65). |

| Code | Function | Set Value | Effective Range | Default | Remarks |
|------|--|--|-----------------|---------|--|
| 630 | Paper Jam Cause Distinction Code | | | | 0:No Paper Jam 1:The paper was pulled into the unit. 2:The paper was longer than the maximum length of the register sensor. 3:The paper exit was not detected after the registration. 4:The paper was longer than the maximum length of the paper exit sensor. 5:The register sensor or paper exit sensor was turned ON before the motor started to rotate. 6:The register sensor chattered. 7:The paper exit sensor chattered. |
| 639 | LSU test | | | | See (P.65). |
| 651 | Write system program into the Flash Rom with a tool. | | | | See the parts number of the tool. (P.241). The tool includes the operating manual for writing program. |
| 655 | Cause Distinction Code of Call Service 3 | | | | See (P.84). |
| 677 | Fan test | | | | See (P.65). |
| 710 | Memory clear except History data | | | | To reset the value to the default one, except History data. Please restart a power supply after clearing a memory. |
| 717 | Transmit speed selection | 1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS | 1~6 | 1 | Adjusts the speed to start training during FAX transmission. Refer to (P.112) and |
| 718 | Receive speed selection | 1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS | 1~6 | 1 | Adjusts the speed to start training during FAX reception. Refer to (P.113) and |
| 721 | Pause tone detect | 1:ON 2:OFF | 1, 2 | 2 | Selects the tone detection for pause in dialing. |
| 722 | Redial tone detect | 1:ON 2:OFF | 1, 2 | 1 | Sets the tone detection mode after redialing. |
| 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 | 1 | Sets a higher value when the response from the other party needs more time during FAX transmission. |
| 774 | T4 timer | X 100 sec | 00~99 | 00 | Use this function when delay occurs in the line and communication. (ex. Mobile comm) does not work well. |
| 815 | Sensor & Vox check | | | | See (P.65). |
| 852 | Print test pattern | | | | See (P.65). |
| 853 | Top margin | | 1~5 | 3 | ----- |
| 854 | Left margin | | 1~7 | 4 | ----- |
| 861 | Paper size set | 1:LETTER 2:A4 3:LEGAL | 1~3 | 2 | ----- |
| 874 | DTMF ON time | X msec | 060~200 | 90 | ----- |
| 875 | DTMF OFF time | X msec | 060~200 | 90 | ----- |
| 880 | History list | | | | See (P.74). |
| 881 | Journal 2 list | | | | See (P.117). |
| 882 | Journal 3 list | | | | See (P.117). |

6.3. TEST FUNCTIONS

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

| Test Mode | Type of Mode | Code | Function |
|---------------------------------------|--------------|----------------------------|--|
| | | Operation after code input | |
| MOTOR TEST | Service Mode | "5" "5" "6" | 0: Recording paper feed 1: Auto Document feed (STANDARD) 2: Auto Document feed (FINE) 3: Auto Document feed (SUPER FINE) |
| | | START | |
| MODEM TEST | Service Mode | "5" "5" "4" | Telephone line circuit is connected automatically, output the following signals on the circuit line. 1) OFF 2) 14400bps 3) 12000bps 4) 9600bps 5) 7200 bps 6) 4800bps 7) 2400bps 8) 300bps 9) 2100Hz 10) 1100Hz |
| | | START | |
| ROM CHECK | Service Mode | "5" "5" "1" | Indicates the version and checks the sum of the ROM. |
| | | START | |
| LCD CHECK | Service Mode | "5" "5" "8" | Checks the LCD indication. Illuminates all the dots to check if they are normal. Refer to OPERATION PANEL SECTION (P.132) . |
| | | START | |
| DTMF SINGLE TEST | Service Mode | "5" "5" "2" | Outputs the DTMF as single tones. Used to check the frequencies of the individual DTMF tones. Refer to DTMF SINGLE TONE TRANSMIT SELECTION (P.67) . |
| | | 1...ON 2...OFF | |
| LED CHECK | Service Mode | "5" "5" "7" | All LEDs above the operation panel board flash on and off, or are illuminated. |
| | | START | |
| KEY CHECK | Service Mode | "5" "6" "1" | Checks the button operation. Indicates the button code on the LCD while the button is pressed. Refer to BUTTON CODE TABLE (P.67) . Refer to OPERATION PANEL SECTION (P.132) . |
| | | START (any key) | |
| CIS TEST | Service Mode | "5" "5" "5" | LED lights up, CIS scanning. Refer to CIS (Contact Image Sensor) SECTION (P.139) . |
| LSU TEST | Service Mode | "6" "3" "9" | Laser radiates, Polygon rotates Refer to LSU (Laser Scanning Unit) SECTION (P.174) . |
| MEMORY CLEAR | Service Mode | "5" "5" "0" | To reset the value to the default one, except the top margin (#853), left margin (#854), time / day (#001), logo (#002), Fax no. (#003), History and Directory data. Please restart a power supply after clearing a memory. |
| | | START | |
| High Voltage Power Supply Board CHECK | Service Mode | "6" "2" "8" | Refer to HIGH VOLTAGE VALUE CHECK POINT (P.140) . |
| | | START | |
| FAN TEST | Service Mode | "6" "7" "7" | 1:TEST OFF 2:High-speed rotation 3:Low-speed rotation |
| | | START | |

| Test Mode | Type of Mode | Code | Function |
|--------------------|--------------|----------------------------|---|
| | | Operation after code input | |
| SENSOR CHECK | Service Mode | "8" "1" "5" | <p>First of all, press the copy button, and confirm the action of ON/OFF. For each sensor's operation, refer to SENSORS AND SWITCHES SECTION (P.176).</p> <p>D S C P R E D T * 3 F * D 4 * V : LCD DISPLAY</p> <p>D: Document sensor D: Document set -: No document</p> <p>S: Paper Feed Sensor S: Read position -: No read position</p> <p>C: Printer Cover Switch C: Open -: Close</p> <p>P: Paper sensor P: Recording paper set -: No recording paper</p> <p>R: Regist Sensor R: Detect recording paper -: Not defect recording paper</p> <p>E: Exit Sensor E: Detect recording paper -: Not detect recording paper</p> <p>D: Drum Sensor D: DRUM set -: No DRUM</p> <p>T: Toner Sensor T: Toner sensor ON -: Toner sensor OFF</p> <p>*: None 3F: Temperature of THERMISTOR Hex (00-FF)</p> <p>*: None D4: Temperature of Atmosphere Hex (00-FF)</p> <p>*: None V: VOX signal V: Detect the tone on the line -: Not detect</p> |
| | | "8" "5" "2" START | |
| PRINT TEST PATTERN | Service Mode | | <p>1. Press "852" then the SET key in the service mode.</p> <p>2. As "PATNO =" is displayed on the LCD, enter the test pattern No. and press the SET key.</p> <p>3. When "No. =" is displayed on the LCD, enter the printing number and press the SET key. (Press "00" for the infinite printing.)</p> <p>4. "MODE" is displayed on the LCD. Press "0" to start printing or press "1" to go to the next screen.</p> <p>5. When "1" is pressed at MODE, "INTVL =" is displayed on the LCD. Enter the printing interval (00~99 sec).</p> <p>6. The printing repeats the designated number of times at the programmed printing intervals.</p> |

Note:

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

6.3.1. DTMF SINGLE TONE TRANSMIT SELECTION

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

| key | Low Frequency (Hz) | Key | High 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.

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

Note:

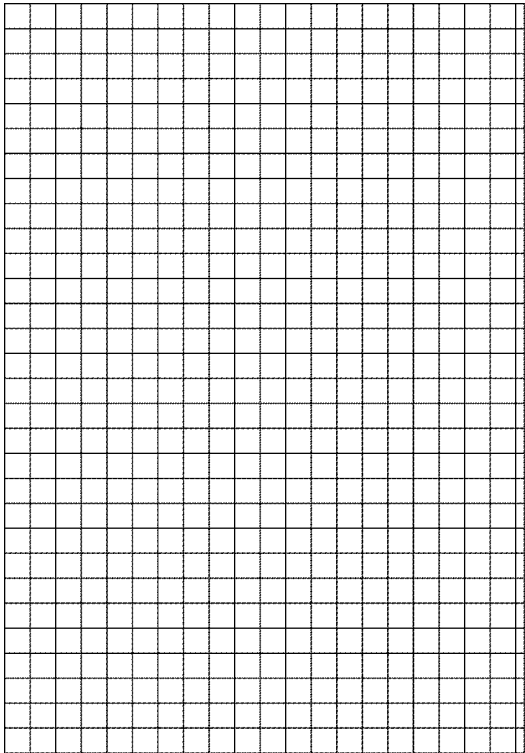
After performing this check, do not forget to turn the setting off.
otherwise, dialing in DTMF signal will not work.

6.3.2. BUTTON CODE TABLE

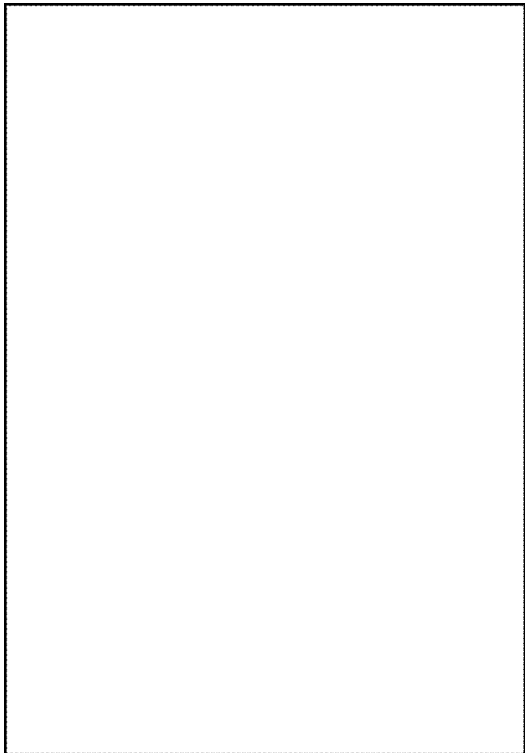
| Code | Button Name | Code | Button Name | Code | Button Name |
|------|-------------------|------|---------------------|------|-----------------|
| 00 | NO INPUT | 31 | 1 | 49 | QUICK SCAN |
| - | STOP | 32 | 2 | 4C | CALLER ID PRINT |
| 02 | RESOLUTION | 33 | 3 | 4D | COLLATE |
| 04 | FAX START | 34 | 4 | 5B | BROADCAST 1 |
| 05 | LOWER | 35 | 5 | 5C | BROADCAST 2 |
| 06 | COPY START | 36 | 6 | 5D | MANUAL BROAD |
| 08 | MONITOR | 37 | 7 | 5E | STATION 4 |
| 0A | HANDSET MUTE | 38 | 8 | 5F | STATION 5 |
| 0C | AUTO ANSWER | 39 | 9 | 60 | STATION 6 |
| 1E | NAVIGATOR NEXT | 3A | 0 | 61 | STATION 7 |
| 1F | NAVIGATOR PREV | 3B | * (TONE) | 62 | STATION 8 |
| 20 | MENU | 3C | # | 63 | STATION 9 |
| 22 | HELP | 3D | REDIAL/PAUSE | 64 | STATION 10 |
| 24 | DIRECTORY PROGRAM | 3E | FLASH | 65 | STATION 11 |
| 25 | VOLUME + | 47 | CALLER ID SEARCH | | |
| 26 | VOLUME - | 48 | JUNK FAX PROHIBITOR | | |

6.3.3. PRINT TEST PATTERN

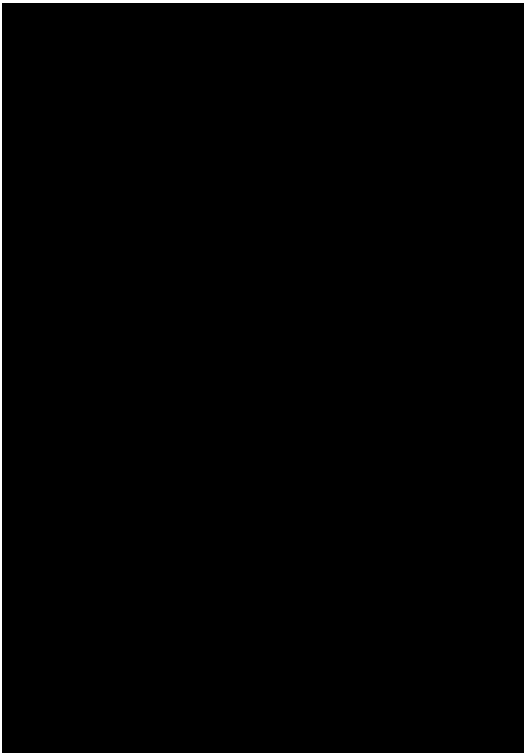
1. NO. 01



2. NO.08



3. NO.20



4. NO.19



6.4. REMOTE PROGRAMMING

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (**PROGRAM MODE TABLE**(P.70)). 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.

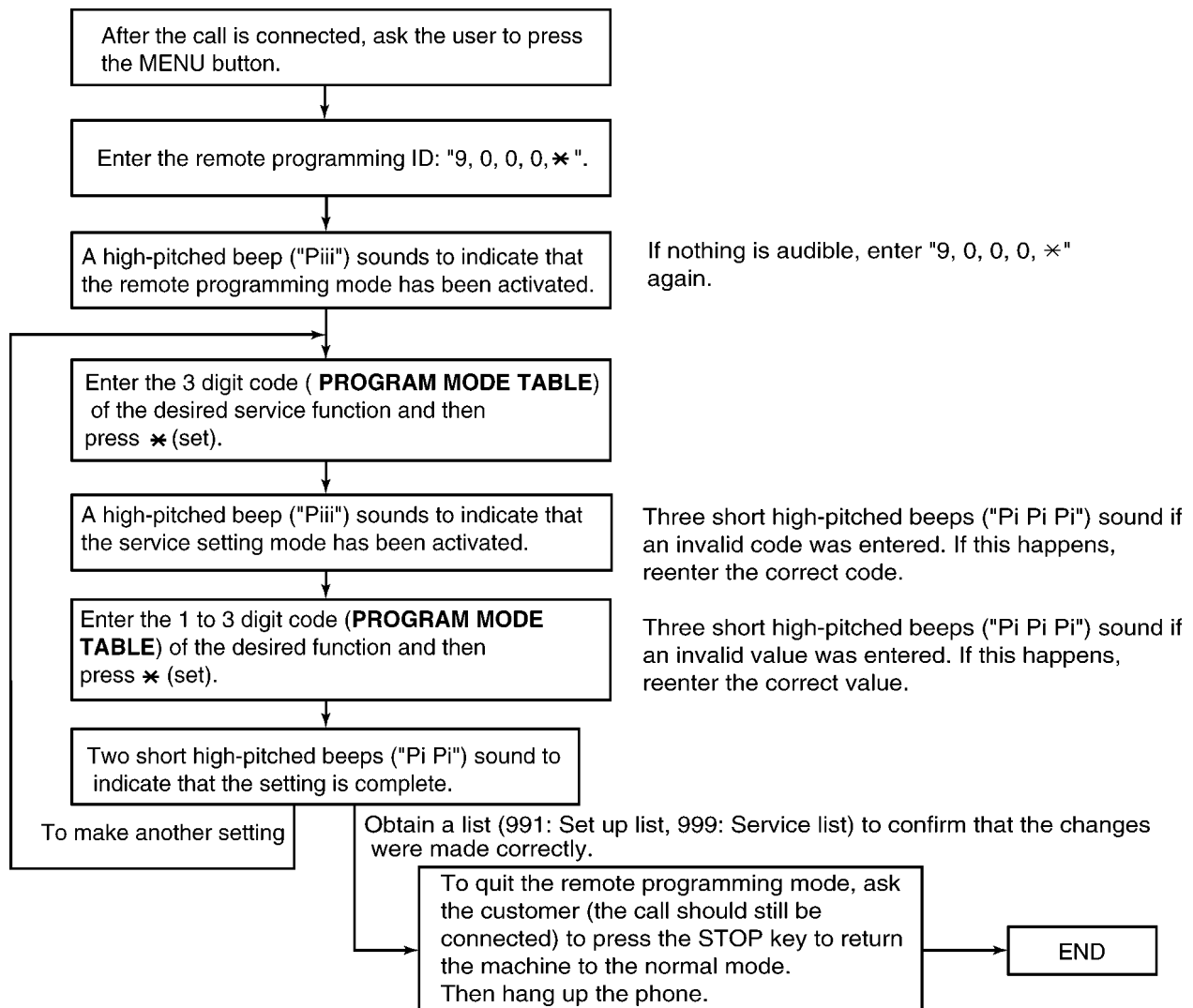
Based on this, the parameters for the desired codes can be changed.

The procedure for changing and listing parameters is described on **ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES**(P.69). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that the changes were made correctly.

Hint:

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

6.4.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES



CROSS REFERENCE:

PROGRAM MODE TABLE (P.70)

6.4.2. PROGRAM MODE TABLE

| Code | Function | Set Value | Default | Remote Setting |
|------|---|---|-------------|----------------|
| 001 | Set date and time | mm/dd/yy hh:mm | Jan/01/2003 | NG |
| 002 | Your logo | ----- | None | NG |
| 003 | Your fax telephone number | ----- | None | NG |
| 004 | Transmission report mode | 2:ON / 3:OFF / 1:ERROR | OFF | OK |
| 006 | FAX ring count | 1 to 9 rings | 2 | OK |
| 012 | Remote TAM activation | ON/ID=11 / OFF | OFF | NG |
| 013 | Dialling Mode | 2:TONE / 1:PULSE | PULSE | OK |
| 017 | Ringer pattern | A / B / C | A | NG |
| 022 | Auto journal print | 1:ON / 2:OFF | ON | OK |
| 023 | Overseas mode | 1:NEXT FAX / 2:ERROR / 3:OFF | ERROR | OK |
| 025 | Delayed transmission | ON / OFF | OFF | NG |
| 026 | Auto CALLER ID list | 1:ON / 2:OFF | ON | OK |
| 037 | Auto REDUCTION | 1:ON / 2:OFF | ON | OK |
| 039 | LCD contrast | NORMAL / DARKER | NORMAL | NG |
| 041 | Remote FAX activation code | ON / OFF | ON CODE=*#9 | NG |
| 044 | Receive alert | 1:ON / 2:OFF | ON | OK |
| 046 | Friendly receive | 1:ON / 2:OFF | ON | OK |
| 048 | Language | 1:ENGLISH / 2:RUSSIAN | ENGLISH | OK |
| 058 | Original setting | 1:NORMAL / 2:LIGHT/ 3:DARKER | NORMAL | OK |
| 068 | ECM Selection | 1:ON / 2:OFF | ON | OK |
| 072 | Set flash time | 1:100msec / 2:200msec / 3:700msec / 4:850msec | 850msec | OK |
| 076 | FAX tone | 1:ON / 2:OFF | ON | OK |
| 079 | Toner save | 1:ON / 2:OFF | OFF | OK |
| 080 | Set default | YES / NO | NO | NG |
| 501 | Pause time set | 001~600 x 100msec | 030 | OK |
| 502 | Flash time | 01~99 x 10ms | 85 | OK |
| 503 | Dial speed | 1:10pps / 2:20 pps | 10pps | OK |
| 514 | Bell signal detect time | 1~9 x 100msec | 6 | 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 | 1:0kms / 2:1.8km / 3:3.6km / 4:7.2km | 0 km | OK |
| 524 | Transmission equalizer select | 1:0kms / 2:1.8km / 3:3.6km / 4:7.2km | 0 km | OK |
| 529 | Memory clear for Call Service | ----- | ----- | NG |
| 544 | Document feed position adjustment value set | 0~4mm | 2 | OK |
| 550 | Memory clear | ----- | ----- | NG |
| 551 | ROM check | ----- | ----- | NG |
| 552 | DTMF signal tone test | 1:ON / 2:OFF | OFF | OK |
| 553 | Monitor on FAX communication | 1:OFF / 2:Phase B / 3:ALL | OFF | OK |
| 554 | Modem test | ----- | ----- | NG |
| 556 | Motor test | ----- | ----- | NG |
| 557 | LED test | ----- | ----- | NG |
| 558 | LCD test | ----- | ----- | NG |
| 561 | Key test | ----- | ----- | NG |
| 570 | Break % select | 1:61% / 2:67% | 61% | OK |
| 571 | ITS auto redial time set | 00~99 | 03 | OK |
| 572 | ITS auto redial line disconnection time set | 001~999sec | 065 | OK |
| 573 | Remote turn-on ring number | 01~99 | 10 | OK |
| 590 | FAX auto redial time set | 00~99 | 03 | OK |
| 591 | FAX auto redial line disconnection time set | 001~999sec | 065 | OK |
| 592 | CNG transmit select | 1:OFF / 2:ALL / 3:AUTO | ALL | OK |
| 593 | Time between CED and 300bps | 1:75ms / 2:500ms / 3:1sec | 75ms | OK |
| 594 | Overseas DIS detection select | 1:1st / 2:2nd | 1st | OK |
| 595 | Receive error limit value set | 1:5% / 2:10% / 3:15% / 4:20% | 10% | OK |
| 596 | Transmit level set | -15~00dBm | 13 | OK |
| 598 | Receiving Sensitivity | 20~48 | 41 | OK |
| 599 | ECM Frame size | 1:256 / 2:64 | 256byte | OK |
| 628 | H.V.P.S check | ----- | ----- | NG |
| 630 | Paper jam cause distinction | ----- | ----- | NG |
| 639 | LSU test | ----- | ----- | NG |
| 651 | White system program into the Flash ROM | ----- | ----- | NG |
| 655 | Cause distinction code of call service 3 | ----- | ----- | NG |
| 677 | Fan test | ----- | ----- | NG |

| Code | Function | Set Value | Default | Remote Setting |
|------|--|---|----------|----------------|
| 710 | Memory clear except History data | ----- | ----- | NG |
| 717 | Transmit speed select | 1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400 | 14400bps | OK |
| 718 | Receive speed select | 1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400 | 14400bps | OK |
| 721 | Pause tone detect | 1:ON / 2:OFF | OFF | OK |
| 722 | Redial tone detect | 1:ON / 2:OFF | ON | 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 100msec | 00 | OK |
| 815 | Sensor test | ----- | ----- | NG |
| 852 | Print test pattern | ----- | ----- | NG |
| 853 | Top margin | 1~5 | 3 | OK |
| 854 | Left margin | 1~7 | 4 | OK |
| 861 | Paper size set | 1:LETTER / 2:A4 / 3:LEGAL | A4 | OK |
| 874 | DTMF ON time | 060~200msec | 90 | OK |
| 875 | DTMF OFF time | 060~200msec | 90 | OK |
| 880 | History list | 1:Start | ----- | NG |
| 881 | Journal 2 | ----- | ----- | NG |
| 882 | Journal 3 | ----- | ----- | NG |
| 991 | Setup list | 1:Start | ----- | OK |
| 994 | Journal list | 1:Start | ----- | OK |
| 995 | Journal 2 list | 1:Start | ----- | OK |
| 996 | Journal 3 list | 1:Start | ----- | OK |
| 998 | History list | 1:Start | ----- | OK |
| 999 | Service list | 1:Start | ----- | OK |

OK means "can set".

NG means "can not set".

Note:

Refer to **SERVICE FUNCTION TABLE** (P.63) for descriptions of the individual codes.

Example:

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

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

СПИСОК УСТАНОВОК

[СПИСОК ОСН. ФУНКЦИЙ]

| NO. ФУНКЦИЯ | ТЕКУЩАЯ УСТАНОВКА |
|--------------------------------------|------------------------------------|
| #01 УСТАНОВКА ДАТЫ И ВРЕМЕНИ | ЯНВ. 01 2003 00:00 |
| #02 ВАШ ЛОГОТИП | |
| #03 НОМЕР ВАШЕГО ФАКСА | |
| #04 РАСПЕЧАТКА ОТЧЕТА ОБ ОТПРАВКЕ | ВЫКЛ. [ОШИБКА, ВКЛ, ВЫКЛ.] |
| #06 КОЛ-ВО ЗВОНКОВ В РЕЖИМЕ ФАКСА | 2 [1...9] |
| #12 ВКЛЮЧЕНИЕ ВНЕШНЕГО АВТООТВЕТЧИКА | ВЫКЛ. [ВКЛ, ВЫКЛ.] |
| КОД = 11 | |
| #13 РЕЖИМ НАБОРА НОМЕРА | ИМПУЛЬСНЫЙ [ТОНАЛЬНЫЙ, ИМПУЛЬСНЫЙ] |
| #17 ТИП ЗВОНКА | A [A, B, C] |

[СПИСОК РАСШИРЕННЫХ ФУНКЦИЙ]

| NO. ФУНКЦИЯ | ТЕКУЩАЯ УСТАНОВКА |
|---|---|
| #22 АВТОМАТИЧЕСКАЯ РАСПЕЧАТКА ЖУРНАЛА | ВКЛ [ВКЛ, ВЫКЛ.] |
| #23 РЕЖИМ МЕЖДУНАРОДНОЙ СВЯЗИ | ОШИБКА [СЛЕДУЮЩ. ФАКС, ОШИБКА, ВЫКЛ.] |
| #25 ЗАДЕРЖАННАЯ ПЕРЕДАЧА | ВЫКЛ. [ВКЛ, ВЫКЛ.] |
| ПОЛУЧАТЕЛЬ = | |
| ВРЕМЯ ОТПРАВКИ = 00:00 | |
| #26 АВТО СПИСОК ВЫЗЫВАЮЩИХ АБОНЕНТОВ | ВКЛ [ВКЛ, ВЫКЛ.] |
| #37 АВТОМАТ. УМЕНЬШ. | ВКЛ [ВКЛ, ВЫКЛ.] |
| #39 КОНТРАСТНОСТЬ ЖК-ДИСПЛЕЯ | НОРМАЛЬН. [НОРМАЛЬН. , ТЕМНЫЙ] |
| #41 КОД ВКЛЮЧЕНИЯ ФАКСА | ВКЛ [ВКЛ, ВЫКЛ.] |
| КОД = *#9 | |
| #44 ПРЕДУПРЕЖДЕНИЕ О ПРИЕМЕ В ПАМЯТЬ | ВКЛ [ВКЛ, ВЫКЛ.] |
| #46 ДРУЖЕСТВЕННЫЙ ПРИЕМ | ВКЛ [ВКЛ, ВЫКЛ.] |
| #48 ЯЗЫК | РУССКИЙ [АНГЛИЙСКИЙ, РУССКИЙ] |
| #58 КОНТРАСТНОСТЬ ДОКУМЕНТА | НОРМАЛЬН. [НОРМАЛЬН. , СВЕТЛЫЙ, ТЕМНЫЙ] |
| #68 ВЫБОР РЕЖИМА КОРРЕКЦИИ ОШИБОК ЕСМ | ВКЛ [ВКЛ, ВЫКЛ.] |
| #72 УСТ-КА ДЛИТ ФЛЭШ | 850МС [100МС, 200МС, 700МС, 850МС] |
| #76 ТОНАЛЬНЫЙ СИГНАЛ СОЕДИНЕНИЯ | ВКЛ [ВКЛ, ВЫКЛ.] |
| #79 ЭКОНОМИЯ ТОНЕРА | ВЫКЛ. [ВКЛ, ВЫКЛ.] |
| #80 СТАНДАРТАРТНЫЕ УСТАНОВКИ (ИСКЛЮЧАЯ #48) | |

Note:

The above values are the default values.

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

```

【 SERVICE DATA LIST 】

Code  501 PAUSE TIME           = 030*100ms      [001...600]*100ms
      502 FLASH TIME          = 85*10ms         [01...99]*10ms
      503 DIAL SPEED           = 10pps              [1=10      2=20]pps
      520 CED FREQUENCY        = 2100Hz              [1=2100    2=1100]Hz
      521 INTERNATIONAL MODE   = ON               [1=ON      2=OFF]
      522 AUTO STANDBY         = ON               [1=ON      2=OFF]
      523 RX EQUALIZER         = 0.0Km             [1=0.0     2=1.8   3=3.6   4=7.2]Km
      524 TX EQUALIZER         = 0.0Km             [1=0.0     2=1.8   3=3.6   4=7.2]Km
      853 TOP MARGIN           = 3                  [1...5]
      854 LEFT MARGIN          = 4                  [1...7]

【 SPECIAL SERVICE SETTINGS 】

Code  514 544 552 553 570 571 572 573 590 591 592 593 594
      6   2   2   1   1   03  065  10  03  065  2   1   1
      595 596 598 599 717 718 721 722 763 771 774 861 874
      2   13  41   1   1   1   2   1   3   1   00  2   090
                                         Set Value

875
090

USAGE TIME =00000 HOURS

Version = G071RP 53F5

```

Note:

The above values are the default values.

6.4.5. HISTORY (Example of a printed out list)

[HISTORY]

| | | | |
|--|----------------------|----------------------|---|
| [G 0 7 1 R P] — (1) | [5 3 F 5] — (2) | [N O N E] — (48) | [N O N E] — (49) |
| [N O N E] — (3) | | | |
| [N O N E] — (4) | | | |
| [N O N E] — (5) | | | |
| (6) — [0 0 0 0 0] [0 1] — (7) | [0 1] — (8) | [2 0 0 3] — (9) | [0 0 0 0] — (10) |
| (11) — [0 0 0 0 0] [0 0 0 0 0] — (12) | | | |
| | [0 0 0 0 0] — (14) | [0 0 0 0 0] — (15) | |
| (13) — [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] N O N E — (16) | | | [F A X] — (17) |
| Factory use only [0 0 0 0 0] [0 0 0 0 0] T O N E [0 N] — (19) | | | [0 0 0 0 1] — (20) |
| | [0 0 0 0 0] — (22) | [0 0 0 0 0] — (23) | |
| (21) — [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] — (24) | | | [N O N E] — (25) |
| | | | [0 0 0 0 0] — (47) |
| (26) — [N O N E] [N O N E] — (27) | [N O N E] — (28) | [N O N E] — (29) | |
| (30) — [0 0 3] (31) — [0 0 0] (32) — [0 0 0 0 0] N O N E — (33) | | | (34) — [0 0 0 0 0] [0 0 0 0 0] — (35) |
| | [0 0 0 0 0] — (37) | [0 0 0 0 0] — (38) | |
| (36) — [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] — (39) | | | (40) — [0 0 0 0 0] [0 0 0 0 0] — (41) |
| | | | [0 0 0 0 0] — (46) |
| (42) — [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] [0 0 0 0 0] — (45) | | | |
| | [0 0 0 0 0] — (52) | [0 0 0 0 0] — (53) | [0 0 0 0 0] — (54) |
| | ↑ (the latest) | ↑ (the last time) | ↑ (the second last time) |
| CALL SERVICE 3 Failure Cause Records (for Three times) | | | |
| <div style="text-align: center;"> <div style="display: inline-block; text-align: center;"> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">2</div> </div> <div style="display: inline-block; text-align: center; margin-left: 10px;"> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">2</div> </div> </div> <p style="text-align: center;">Cause Distinction Temperature Code</p> | | | |

NAME _____ DATE _____ DEALER _____

CUSTOMER COMPLAINT _____

SURVEY RESULT : CKOK (UNKNOWN/DESIGN/EDUC) DEFECT (PART/WORKER/DESIGN)
 ABUSE (CUST/DEALER/SHIP) NEW (OPEN/NOT)
 PHONE SURVEY RESULT.

Note:

See the following descriptions of this report. Item No. (1) ~ (49) are corresponding to the listed items in **DESCRIPTIONS OF THE HISTORY REPORT**(P.75).

6.4.5.1. DESCRIPTIONS OF THE HISTORY REPORT

(1) ROM VERSION

FLASH ROM version

(2) SUM

FLASH ROM internal data calculation.

(3) YOUR LOGO

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

(4) YOUR TELEPHONE NUMBER

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

(5) Not used

(6) FACTORY - CUSTOMER

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

(7) MONTH

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

(8) DAY

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

(9) YEAR

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

(10) TIME

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

(11) USAGE TIME

The amount of time the unit has been powered ON.

(12) FACTORY - NOW

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

(13) TEL MODE

The amount of time the TEL mode setting was used.

(14) FAX MODE

The amount of time the FAX mode setting was used.

(15) Not used

(16) Not used

(17) FINAL RECEIVE MODE

The last set receiving mode by the user.

(18) TONE/PULSE SELECTION

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

(19) RECEIVE REDUCTION

The compression rate when receiving.

(20) SETTING NO. OF DIRECTORY

The recorded directory stations (one touch dial).

(21) NUMBER OF COPY

The number of pages copied.

(22) NUMBER OF RECEIVE

The number of pages received.

(23) NUMBER OF SENDING

The number of pages sent.

(24) NUMBER OF CALLER ID

The number of times Caller ID was received.

(25) Not used

(26) Not used

(27) Not used

(28) Not used

(29) Not used

(30) Not used

(31) NUMBER OF PRINTING HELP

The number of help lists printed until now.

(32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION

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

(33) Not used.

(34), (35) Not used.

(36) FAX MODE

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

(37) MAN RCV

Means the unit received a fax message by manual operation.

(38) FRN RCV

Means the unit received a fax message by friendly signal detect.

(39) Not used

(40) RMT DTMF

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

(41) PAL DTMF

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

(42) TURN-ON

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

(43) Not used

(44) IDENT

Means the unit detected Ring Detection.

(45) Not used

(46) Not used

(47) Not used

(48) Not Used

(49) Not Used

(50) Printing number of the drum unit

(51) Paddle rotation number of the drum unit

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

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

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

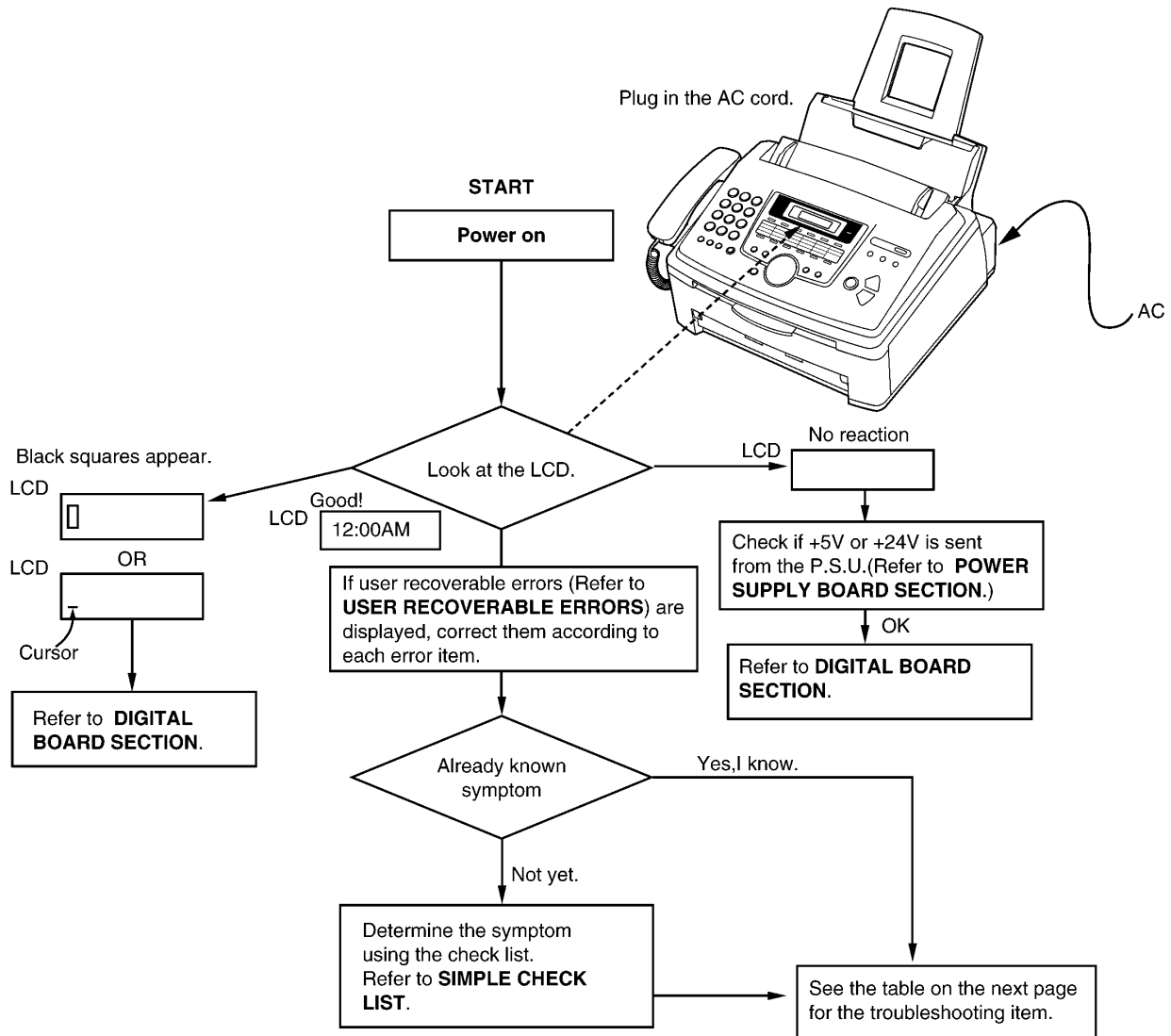
6.5. TROUBLESHOOTING DETAILS

6.5.1. OUT LINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on **SIMPLE CHECK LIST**(P.79). Difficult problems may be hard to determine, so repeated testing is necessary.

6.5.2. STARTING TROUBLE SHOOTING

Determine the symptom and the troubleshooting method.



CROSS REFERENCE:

USER RECOVERABLE ERRORS(P.60)

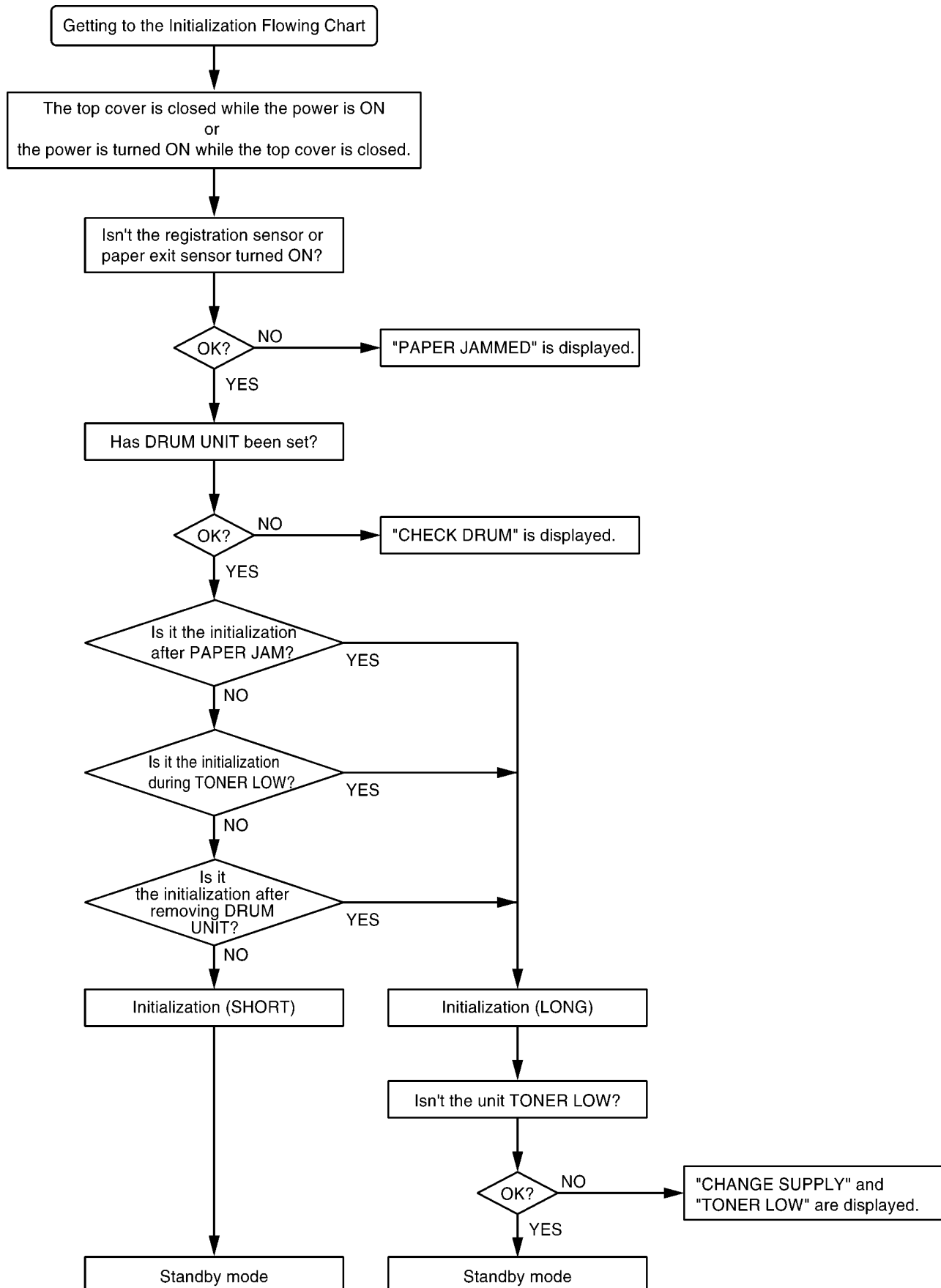
SIMPLE CHECK LIST(P.79)

DIGITAL BOARD SECTION(P.209)

POWER SUPPLY BOARD SECTION(P.145)

6.5.3. INITIALIZATION

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



6.5.4. SIMPLE CHECK LIST

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

Note:

Check according to the service code referring to **TEST FUNCTIONS** (P.65)

6.5.5. SIMPLIFIED TROUBLESHOOTING GUIDE

6.5.5.1. PRINTING

| No. | Symptom | Cause | Countermeasure |
|-----|--|--|--|
| 1 | GHOST IMAGE (P.89) | Failed drum unit | Replace drum unit |
| | | Failed transfer unit | Check the transfer roller and spring |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Failed fuser unit | Check the heat roller and the pressurized roller and the spring and the heat lamp and the thermistor |
| | | Failed the power supply board | Go to POWER SUPPLY BOARD SECTION (P.145) |
| | | Too thick or too thin recording paper | Use the recording paper from 16lb to 24lb |
| 2 | DARK OR WHITE VERTICAL LINE (P.90) | Dirty the lower glass or the reflecting mirror | Clean the lower glass and the reflecting mirror |
| | | Dust on the path of the laser beam | Clean the path of the laser beam |
| | | Dust on the developing roller | Replace drum unit |
| | | Failed the heat roller or the pressurized roller | Check the heat roller and the pressurized roller |
| | | Failed LSU | Go to LSU SECTION (P.138) |
| 3 | DARK OR WHITE HORIZONTAL LINE (P.91) | Failed drum unit | Replace drum unit |
| | | Failed the gear | Check the gear |
| | | Failed the engine motor | Go to ENGINE MOTOR (P.136) |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Scratch on the OPC drum | Replace drum unit |
| | | Static electricity on the documents (when copying) | Check the connection between the parts around CIS and earth |
| 4 | DIRTY OR DARKNESS BACKGROUND (P.92) | Failed drum unit | Replace drum unit |
| | | Life of drum unit is over | Replace drum unit |
| | | Dirty the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller | Clean the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Dirty the recording paper path | Clean the recording paper path |
| 5 | BLACK PRINT (P.93) | Failed drum unit | Replace drum unit |
| | | Failed LSU | Go to LSU SECTION (P.138) |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Failed the digital board | Check the digital board |
| | | Failed CIS (when copying) | Go to CIS (Contact Image Sensor) SECTION (P.139) |
| 6 | LIGHT PRINT (P.94) | Short toner | Supply toner |
| | | Failed drum unit | Replace drum unit |
| | | Life of drum unit is over | Replace drum unit |
| | | Dirty the lower glass or the reflecting mirror | Clean the lower glass and the reflecting mirror |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| 7 | BLACK DENSITY IS LIGHT OR UNEVEN (P.95) | Short toner | Supply toner |
| | | Failed drum unit | Replace drum unit |
| | | Life of drum unit is over | Replace drum unit |
| | | Dirty the lower glass or the reflecting mirror | Clean the lower glass and the reflecting mirror |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| 8 | BLANK PRINT (P.96) | Failed drum unit | Replace drum unit |
| | | Failed LSU | Go to LSU SECTION (P.138) |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Failed the digital board | Check the digital board |
| | | Failed CIS (when copying) | Go to CIS (Contact Image Sensor) SECTION (P.139) |
| 9 | BLACK OR WHITE POINT (P.96) | Failed the developing roller (31.4mm pitch) | Replace drum unit |
| | | Failed the OPC drum (75.4mm pitch) | Replace drum unit |
| | | Failed the heat roller (62.8mm pitch) | Check the heat roller |
| | | Failed the charge blush (21mm pitch) | Replace drum unit |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |
| | | Too thick or too thin recording paper | Use the recording paper from 16lb to 24lb |

6.5.5.2. RECORDING PAPER FEED

| No. | Symptom | Cause | Countermeasure |
|-----|--|--|--|
| 1 | MULTIPLE FEED (P.97) | Dirty or failed the pickup roller | Clean or replace the pickup roller |
| | | Dirty or failed the pickup rubber | Clean or replace the separation rubber |
| 2 | THE RECORDING PAPER IS WAVED OR WRINKLED (P.97) | Dirty the pressure roller or the heat roller | Clean the pressure roller and the heat roller |
| | | Failed the spring of pressure roller | Replace the spring of pressure roller |
| | | Too thin recording paper | Use the recording paper from 16lb to 24lb |
| 3 | SKEW (P.98) | Dirty or failed the pickup roller | Clean or replace the pickup roller |
| | | Dirty or failed the pickup rubber | Clean or replace the separation rubber |
| | | Dirty or failed the paper feed roller | Clean or replace the regist roller |
| | | Dust on the recording paper path | Clean the recording paper path |
| | | Failed LSU | Replace LSU |
| | | Over the max capacity of the recording paper | Set up to MAX 150 sheets |
| | | Too thick or too thin recording paper | Use the recording paper from 16lb to 24lb |
| 4 | THE RECORDING PAPER DOES NOT FEED (P.99) | Dirty or failed the pickup roller | Clean or replace the pickup roller |
| | | Dirty or failed the pickup rubber | Clean or replace the separation rubber |
| | | Failed the gear | Check the gear |
| | | Failed the engine motor | Go to ENGINE MOTOR (P.136) |
| | | Failed the paper feed sensor lever | Check the regist sensor (paper top sensor) lever |
| 5 | THE RECORDING PAPER JAM(P.100)"PAPER JAMMED" ON THE LCD | Failed the paper feed sensor | ----- |
| | | Dirty or failed the pressure roller | Clean or replace the pressure roller |
| | | Dirty or failed the heat roller | Clean or replace the heat roller |
| | | Dust on the recording paper path | Clean the recording paper path |
| | | Failed the paper feed roller | Replace the regist roller |
| | | Failed the gear | Check the gear |
| | | Failed the engine motor | Go to ENGINE MOTOR (P.136) |
| | | Failed the paper feed sensor lever | Check the regist sensor (paper top sensor) lever |
| | | Failed the paper feed sensor | ----- |
| | | Failed the exit sensor lever | Check the exit sensor lever |
| | | Failed the exit sensor | Go to PAPER EXIT SENSOR..... "PAPER JAMMED" (P.180) |
| | | Too thick or too thin recording paper | Use the recording paper from 16lb to 24lb |
| 6 | BACK SIDE OF THE RECORDING PAPER IS DIRTY(P.102) | Not set the toner bottle | Set toner bottle |
| | | Dirty the recording paper path | Clean the recording paper path |
| | | Dirty the pressure roller | Clean the pressure roller |
| | | Dirty the regist roller | Clean the regist roller |
| | | Failed the high-voltage terminal | Check the high-voltage terminal |
| | | Failed the high voltage power supply board | Go to HIGH VOLTAGE SECTION (P.141) |

6.5.5.3. COPY AND FAX

| No. | Symptom | Cause | Countermeasure |
|-----|---|---|--|
| 1 | NO DOCUMENT FEED (NO DOCUMENT FEED, DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.103) | Failed the document sensor lever | Replace the document sensor lever |
| | | Failed the document sensor | Go to DOCUMENT SENSOR (P.161) |
| | | Dirty or failed the separation roller | Clean or replace the separation roller |
| | | Dirty or failed the separation rubber | Clean or replace the separation rubber |
| | DOCUMENT JAM (NO DOCUMENT FEED, DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.103) | Failed the separation spring | Replace the separation spring |
| | | Dust or scratch on the document paper path | Clean the document paper path |
| | | Failed the gear | Check the gear |
| | | Failed the ADF motor | Go to ADF MOTOR (P.137) |
| | MULTIPLE DOCUMENT FEED (NO DOCUMENT FEED, DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.103) | Failed the ADF cover open switch lever | Replace the ADF cover open switch lever |
| | | Dirty or failed the separation roller | Clean or replace the separation roller |
| | | Dirty or failed the separation rubber | Clean or replace the separation rubber |
| | | Failed the separation spring | Replace the separation spring |
| 2 | SKEW (ADF) (P.105) | Dust or scratch on the document paper path | Clean the document paper path |
| | | Failed the document feed roller | Replace the document feed roller |
| | | Failed the document guide | Replace the document guide |
| 3 | THE SENT FAX DATA IS SKEWED (P.106) | The cause of ADF | Go to SKEW (ADF) (P.105) |
| | | The cause of scanner glass | ---- |
| | | Problem with the other FAX machine | |
| 4 | THE RECEIVED FAX DATA IS SKEWED (P.106) | The cause of printing | Go to SKEW (ADF) (P.105) |
| | | Problem with the other FAX machine | |
| 5 | THE RECEIVED OR COPIED DATA IS EXPANDED (P.107) | Dirty or failed the drive roller (at ADF) | Clean or replace the drive roller |
| | | Dirty or failed the document feed roller (at ADF) | Clean or replace the document feed roller |
| | | Dirty or failed the separation roller (at ADF) | Clean or replace the separation roller |
| | | Failed CIS movement (at SG) | Replace the belt or the gear or the shaft or the ADF motor |
| 6 | BLACK OR WHITE VERTICAL LINE IS COPIED (P.108) | Dirty or failed the white plate (2 places) | Clean or replace the white plate |
| | | Dirty or failed the glass board | Clean or replace the glass board |
| | | The cause of printing | Go to DARK OR WHITE VERTICAL LINE (P.90) |
| | | Failed CIS | Go to CIS (Contact Image Sensor) SECTION (P.139) |
| 7 | AN ABNORMAL IMAGE IS COPIED (P.109) | Dirty or failed the white plate (2 places) | Clean or replace the white plate |
| | | Dirty or failed the glass board | Clean or replace the glass board |
| | | Dirty or failed the drive roller (at ADF) | Clean or replace the drive roller |
| | | Dirty or failed the document feed roller (at ADF) | Clean or replace the document feed roller |
| | | Dirty or failed the separation roller (at ADF) | Clean or replace the separation roller |
| | | Failed CIS movement (at SG) | Replace the belt or the gear or the shaft or the ADF motor |
| | | Failed CIS | Go to CIS (Contact Image Sensor) SECTION (P.139) |
| | | The cause of printing | Go to DARK OR WHITE VERTICAL LINE (P.90) |

6.5.5.4. Others

| No. | Symptom | Cause | Countermeasure |
|-----|----------------------------|---|--|
| 1 | Cannot print legal size | Not selected the legal mode | Select the legal mode in the user programming mode |
| 2 | 'CHECK DRUM' on the LCD | The drum unit can not be detected. • Drum Sensor trouble • Mechanical shutter trouble | Go to DRUM SENSOR (P.178) Go to LSU (Laser Scanning Unit) SECTION (P.174) |
| 3 | 'CHANGE DRUM' on the LCD | The toner sensor cannot detect the toner sensor signal. | Go to TONER SENSOR.... "TONER EMPTY", "TONER LOW", "CHANGE DRUM" (P.183) |
| 4 | 'OUT OF PAPER' on the LCD | Failed the paper sensor lever Failed the paper sensor | Replace the paper sensor lever Go to PAPER SENSOR..... "OUT OF PAPER" (P.180) |
| 5 | 'COVER OPEN' on the LCD | Failed the top cover open switch lever Failed the top cover open switch | Replace the top cover open switch lever Go to TOP COVER OPEN SWITCH (P.178) |
| 6 | CALL SERVICE 1' on the LCD | The polygon motor of LSU is unusually | Check the connector and LSU and the digital board |
| 7 | CALL SERVICE 2' on the LCD | The laser of LSU is unusually | Check the connector and LSU and the digital board |
| 8 | CALL SERVICE 3' on the LCD | The fuser temperature is unusually | Check the connector and the fuser and the thermistor and the digital board |
| 9 | CALL SERVICE 4' on the LCD | The fan motor is unusually | Check the connector and the fan motor and the digital board |

6.5.6. CALL SERVICE TROUBLESHOOTING GUIDE

Call Service related error is most frequent.

Call Service 1 ----- Polygon doesn't rotate..... Refer to **LSU (Laser Scanning Unit) SECTION** (P.174).

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

Call Service 2 ----- Laser isn't output..... Refer to **LSU (Laser Scanning Unit) SECTION** (P.174)

- This can be judged only by referring to signal. Check 5V line, XHSYNC, SPC, VIDEO, LDON.

Call Service 3 ----- Detection of fixing temperature..... Refer to **HEAT LAMP CONTROL CIRCUIT** (P.189)

- *Service mode *655 tells the detection number and 3 latest temperatures of the thermistor. The cause distinction code of the Call Service 3 and the thermistor temperature is displayed. Maximum 3 latest temperatures are displayed showing the newest on the left. [AABB CCDD EEFF] AA, CC and EE show the cause distinction code and BB, DD and FF show their temperature.

Cause distinction code

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

01: means that it did not reach 56°C within 22 seconds since the heater was turned ON.

03: means that it did not reach the secondary stabilizing temperature (160°C) within 35 seconds from 56°C.

04: means that it became T2-40deg (120°C or below) after T2; the secondary stabilizing temperature (160°C). (The heater has burnt out.)

05: means that it became over 220°C.

06: means that during printing the SHORT of the thermistor (AD: 01h or below) was detected.

07: means that the thermistor's SHORT (AD:00h) and OPEN (AD: F9h or over) were detected.

Call Service 4 ----- Rotation of Fan..... Refer to **FAN MOTOR SECTION** (P.171)

- Connector isn't inserted firmly, dust is caught in and the fan is broken.

* As for Call Services 1, 2 and 4, turn the power OFF then ON to restart.

<Note>

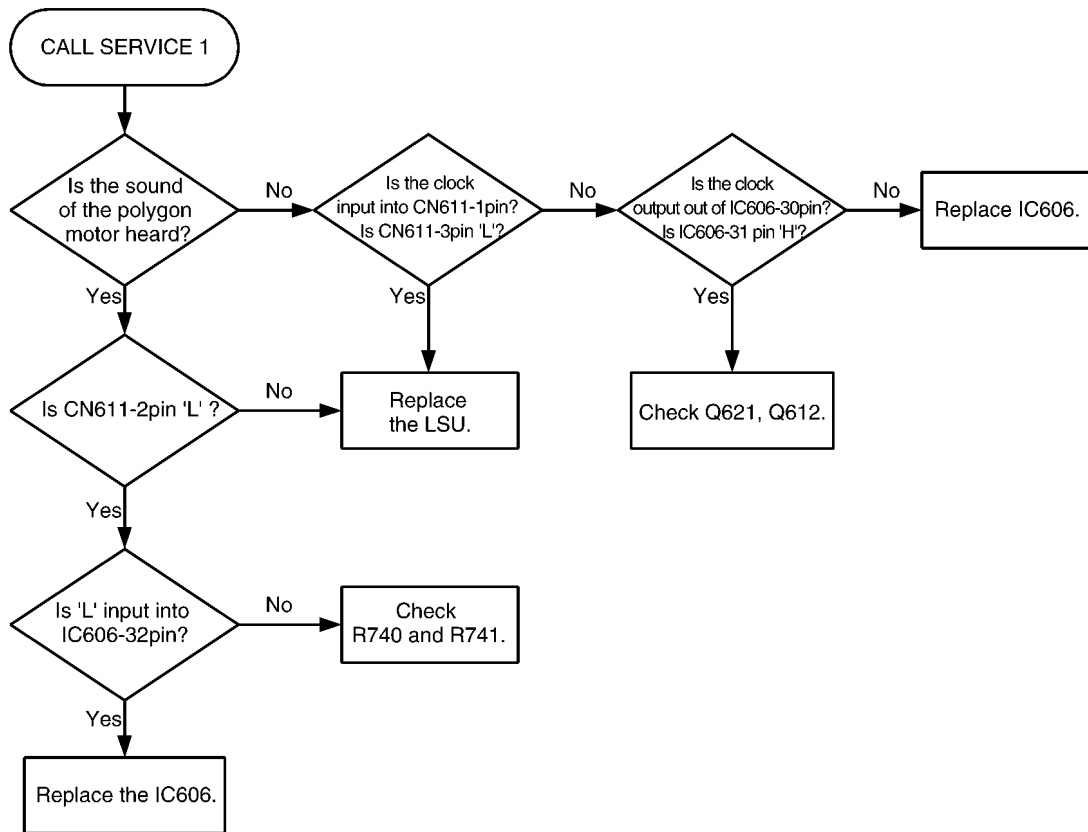
Once "CALL SERVICE3" is displayed, the unit does not disappear until the Factory Setup or Service Function #529 is executed. Therefore Service Function #529 should be executed before the confirmation, and #529 should be done after the countermeasure.

6.5.6.1. CALL SERVICE 1

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

The rotation of the polygon motor is detected by IC606-32pin (XREADY).

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

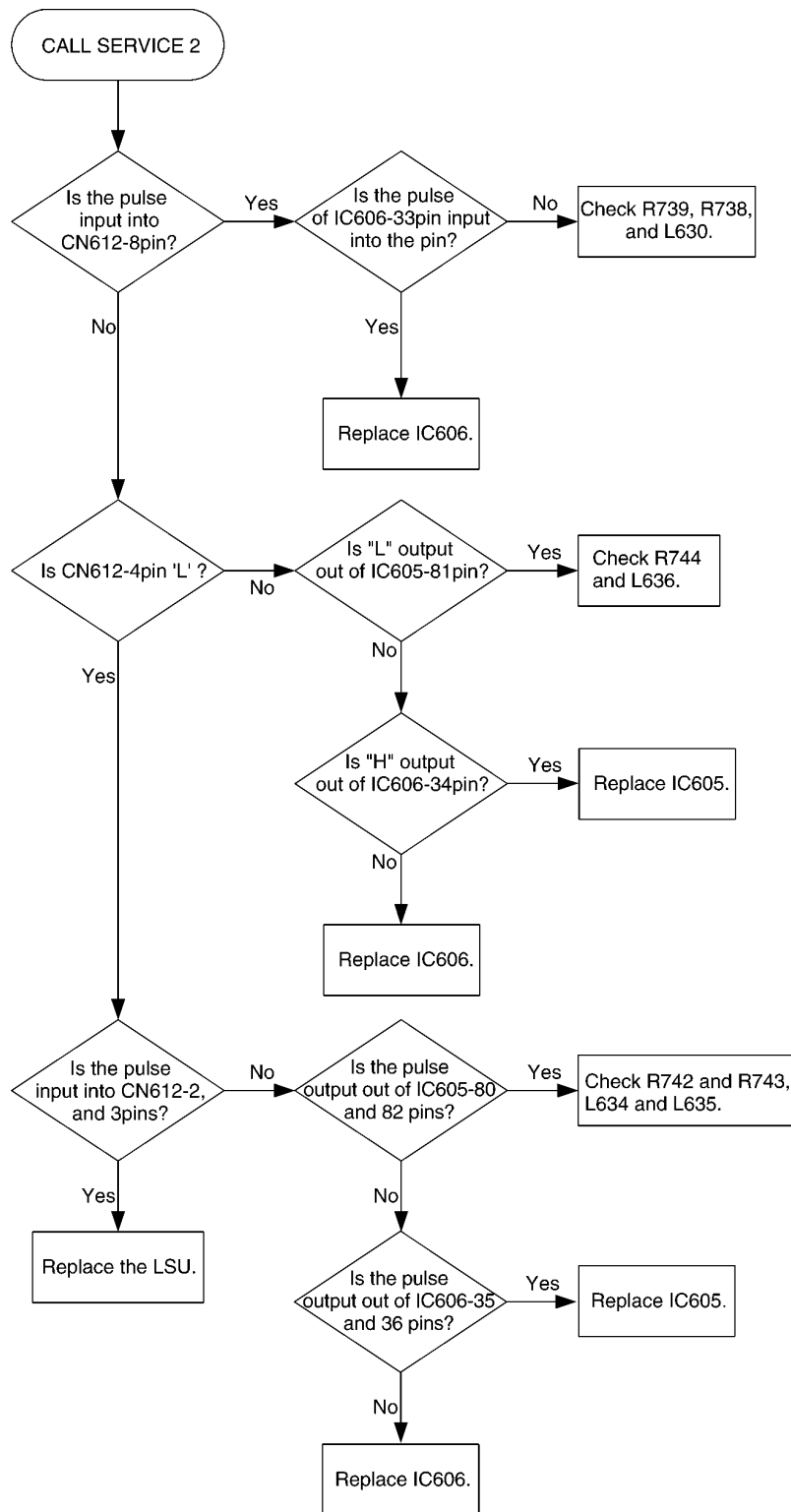


6.5.6.2. CALL SERVICE 2

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

The synchronous signal out of the LSU is detected by IC 606-33pin. (XHSYNC)

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



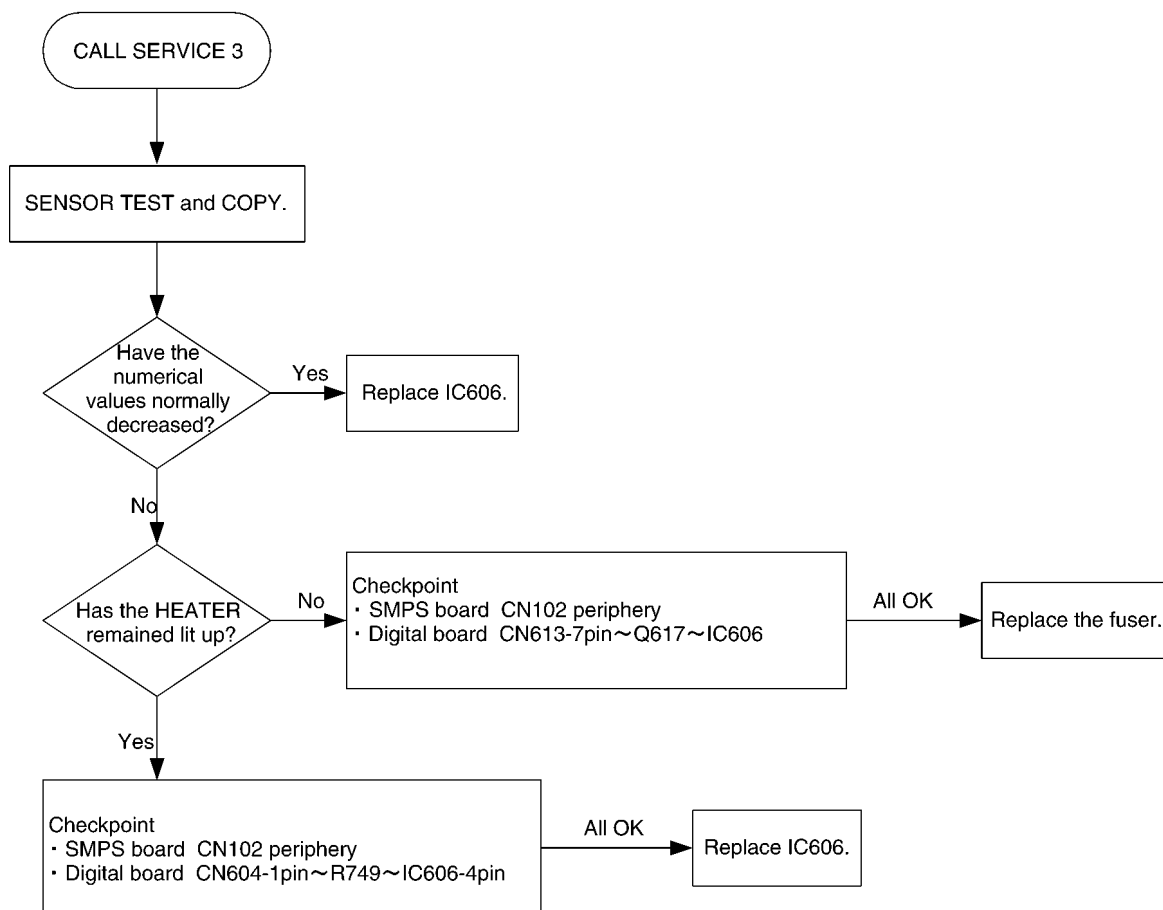
Note:

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

6.5.6.3. CALL SERVICE 3

"CALL SERVICE 3" means that the temperature of the fuser does not rise up to or exceed a constant temperature. The temperature is monitored with the thermistor inside the fuser and detected with the voltage input into IC 606-4pin.

After the LCD indicate "CALL SERVICE 3", perform the MENU → # → 9000 → × 529. Then, turn the power OFF/ON.
 Perform the SENSOR TEST in service mode.
 SENSOR TEST can be performed by pressing MENU → # → 9000 → × 815.
 In this state, perform the copy operation to confirm how the two-digit numbers on the LCD change. In normal times, 'DF(25°C)' is displayed in the waiting state, and '60(160°C)' or its approximate numbers are displayed during printing.



*When Call Service 3 is occurred, the cause can be distinguished.

Refer to page 80 for details.

6.5.6.4. CALL SERVICE 4

"CALL SERVICE 4" means that the FAN does not run or the running of the FAN cannot be detected normally.

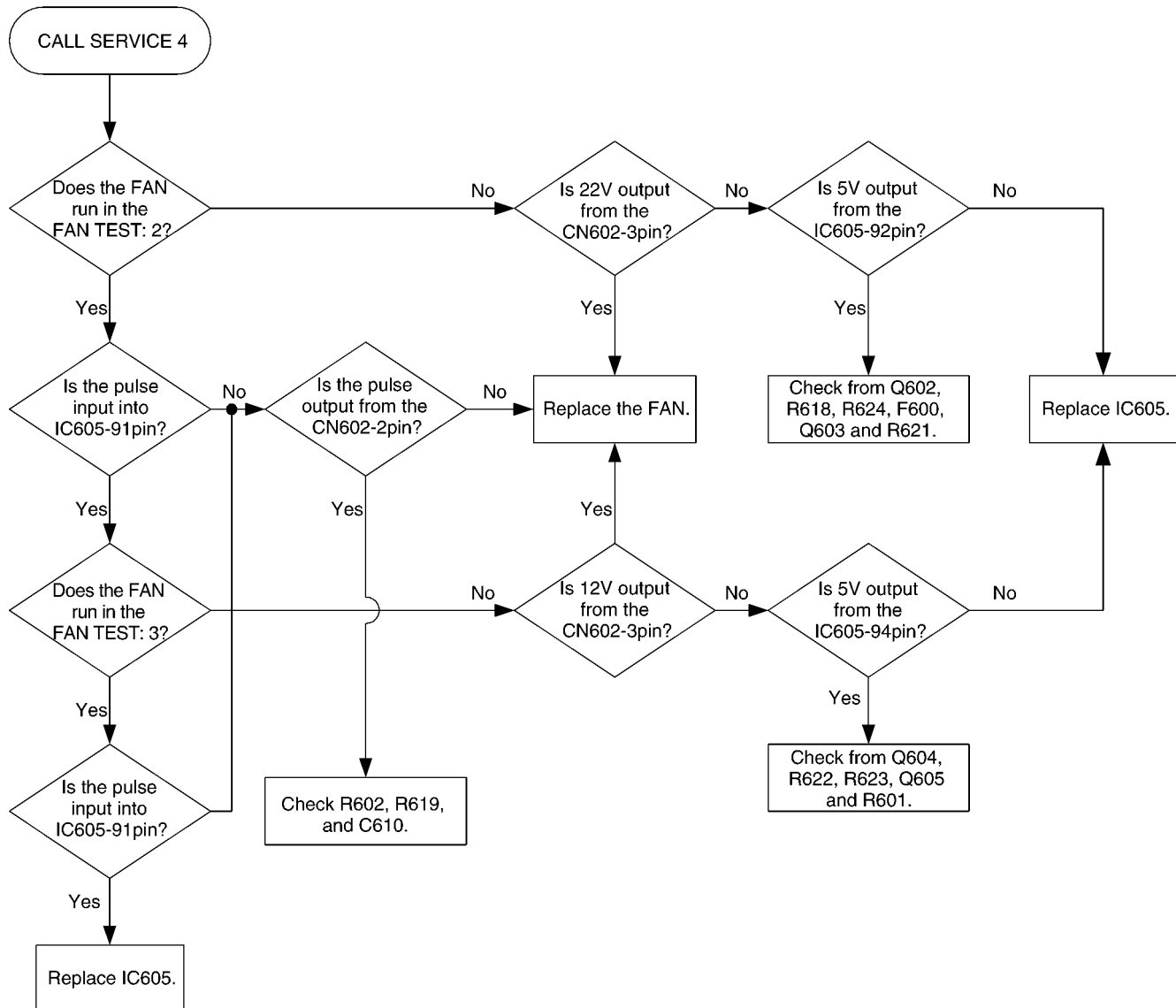
The running of the FAN is detected by IC 605-91pin. "CALL SERVICE 4" is displayed when it detects NG five times continuously.

After repairing, copy five times.If "CALL SERVICE 4 " is displayed,check again.

After the LCD indicates "CALL SERVICE 4 ", turn the power OFF/ON.
Then, perform the FAN TEST in service mode.

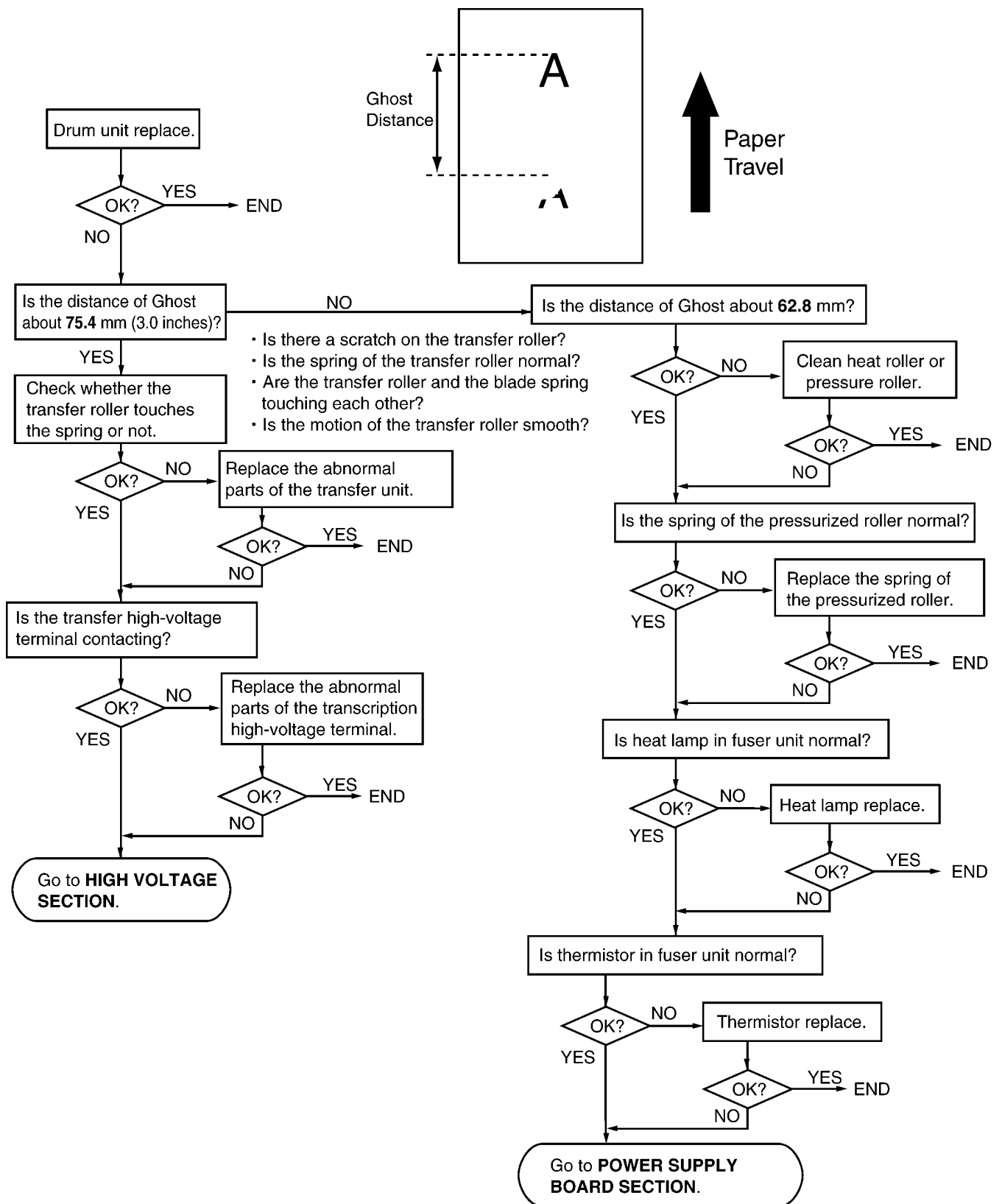
This can be performed by pressing MENU→#→9000→*677.

- 1: OFF (Default)
- 2: ON (High Speed)
- 3: ON (Low Speed)



6.5.7. PRINT

6.5.7.1. GHOST IMAGE

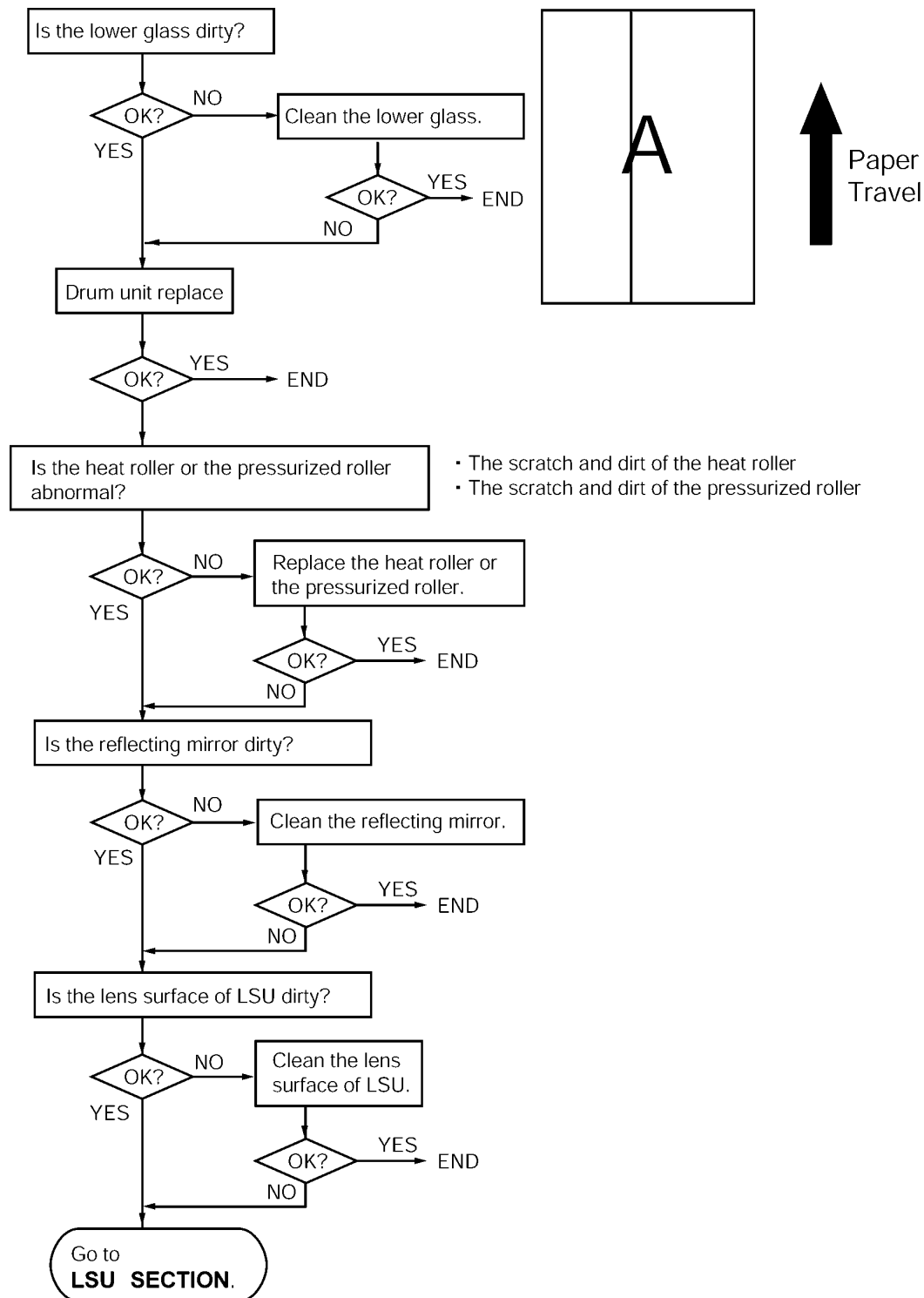


CROSS REFERENCE:

HIGH VOLTAGE SECTION(P.141)

POWER SUPPLY BOARD SECTION(P.145)

6.5.7.2. DARK OR WHITE VERTICAL LINE



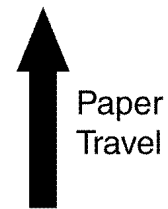
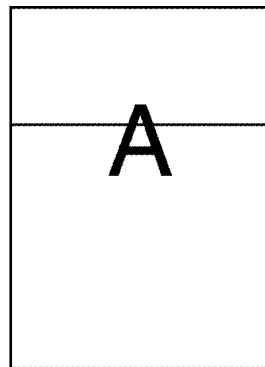
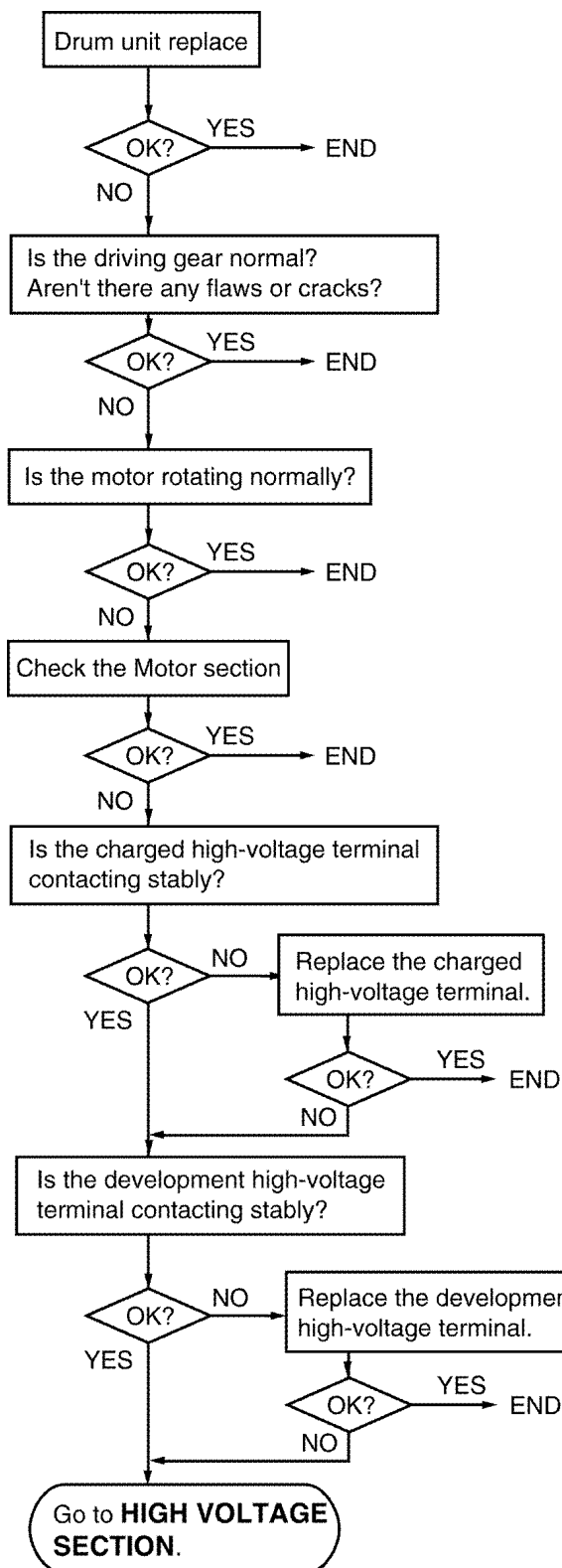
Note:

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

CROSS REFERENCE:

LSU SECTION (P.138)

6.5.7.3. DARK OR WHITE HORIZONTAL LINE

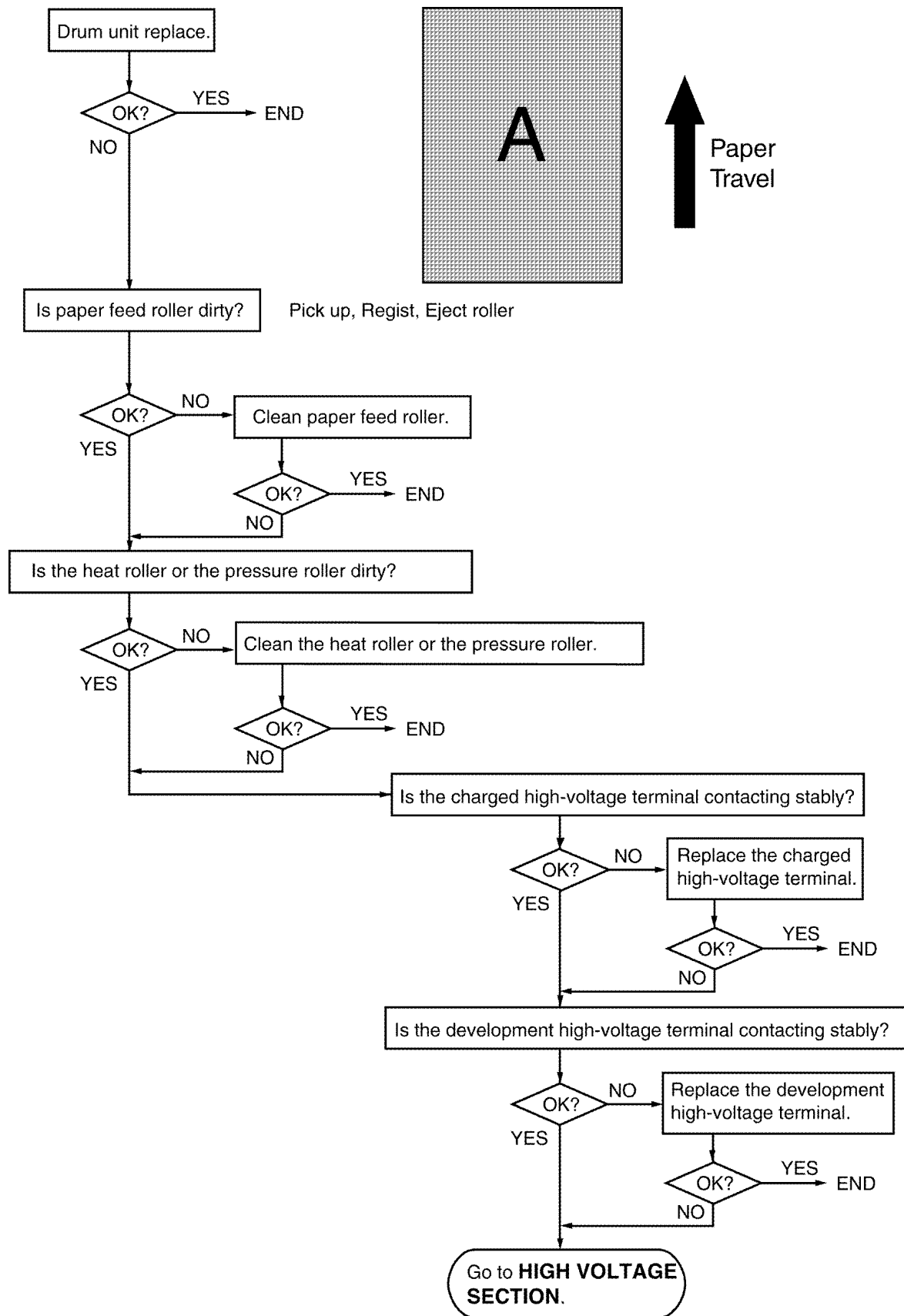


- It is necessary to describe the information about the lines that cannot be troubleshooted in such as halftone.
- When there is the information about the troubleshooted horizontal line, please add the description of it.

CROSS REFERENCE:

HIGH VOLTAGE SECTION (P.141)

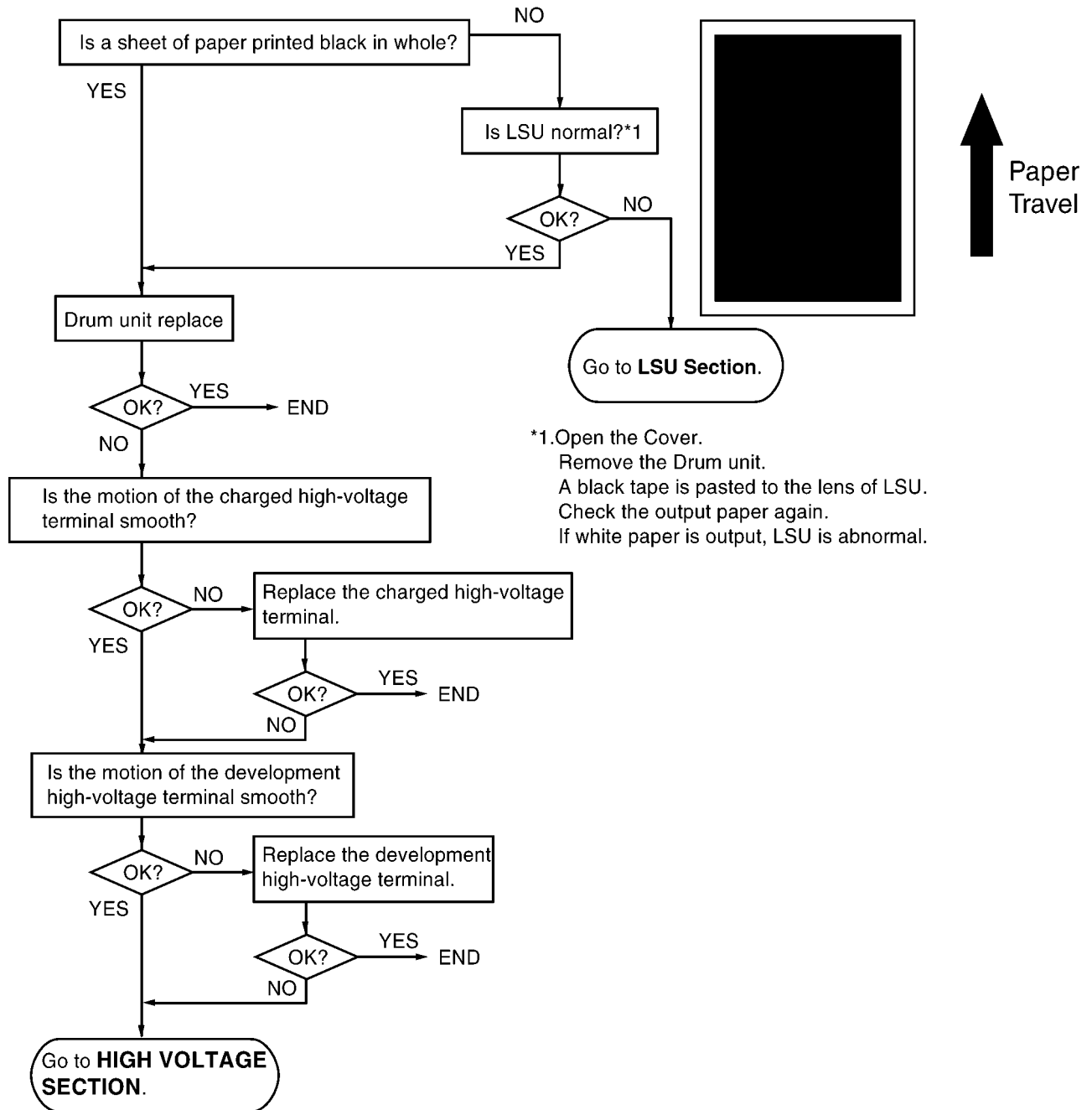
6.5.7.4. DIRTY OR HALF DARKNESS BACKGROUND



CROSS REFERENCE:

HIGH VOLTAGE SECTION (P.141)

6.5.7.5. BLACK PRINT

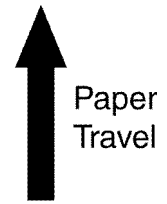
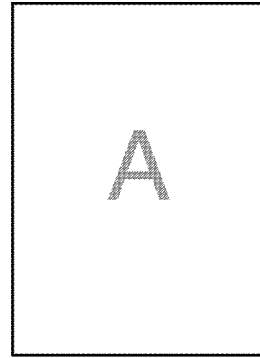
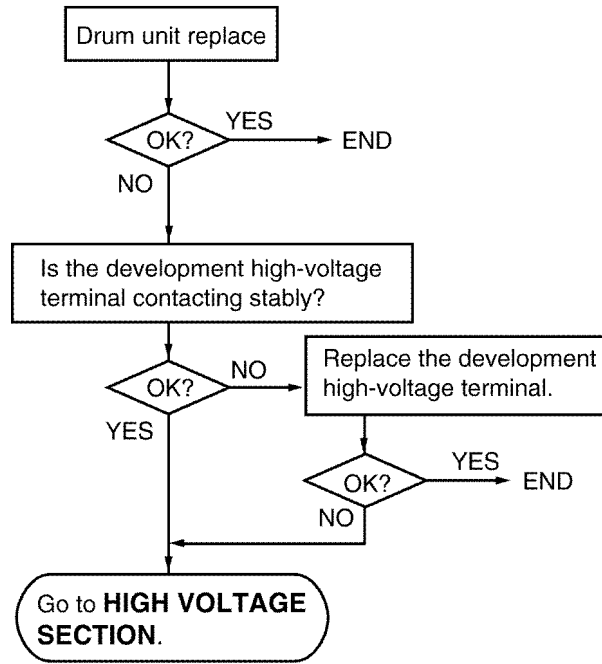


CROSS REFERENCE:

HIGH VOLTAGE SECTION (P.141)

LSU SECTION (P.138)

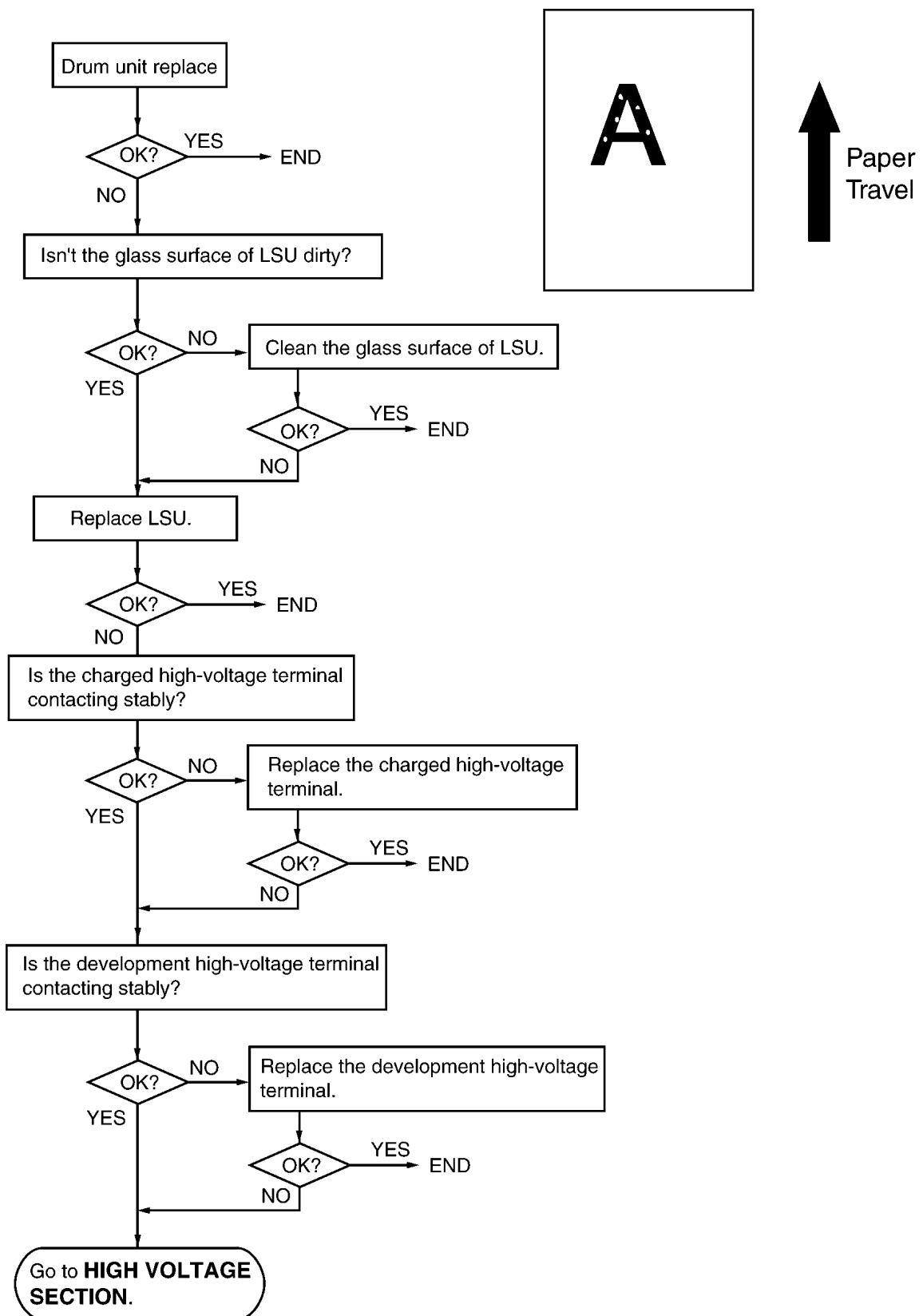
6.5.7.6. LIGHT PRINT



CROSS REFERENCE:

HIGH VOLTAGE SECTION (P.141)

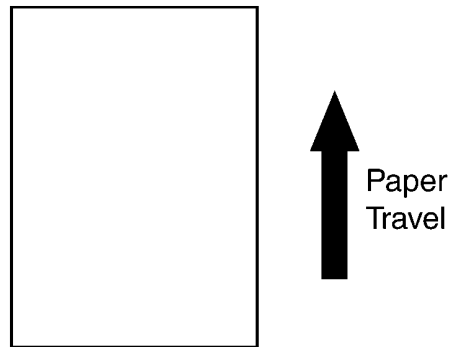
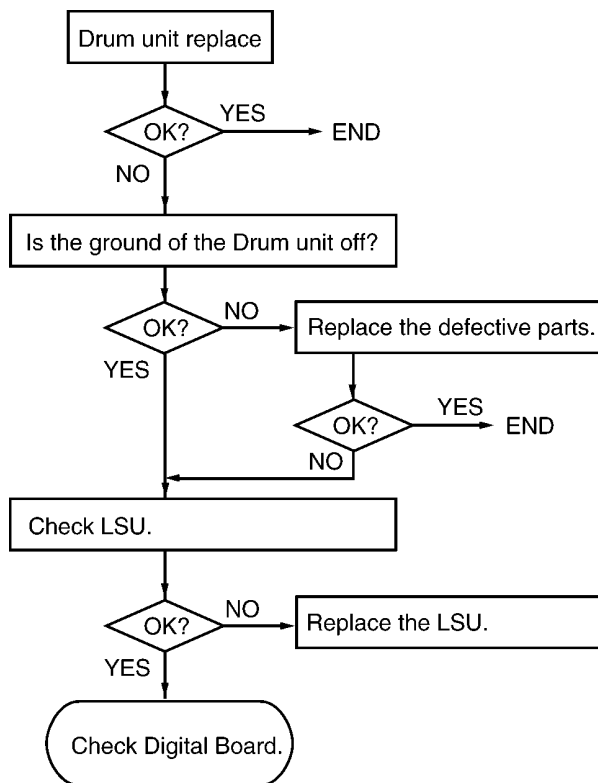
6.5.7.7. BLACK DENSITY IS LIGHT OR UNEVEN



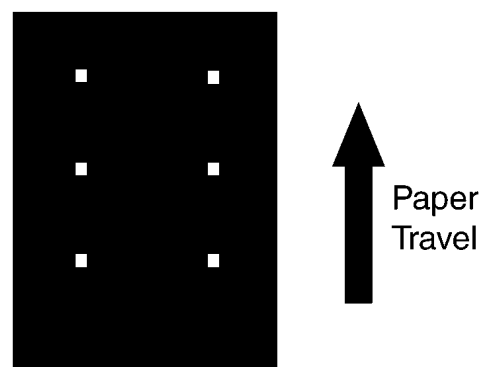
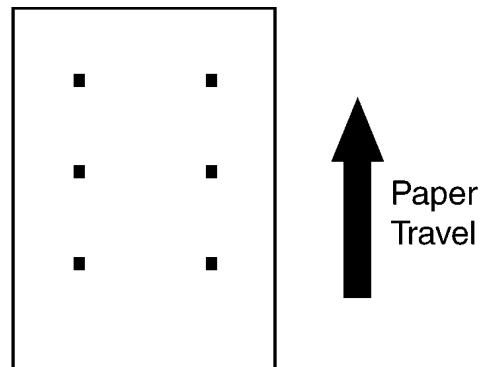
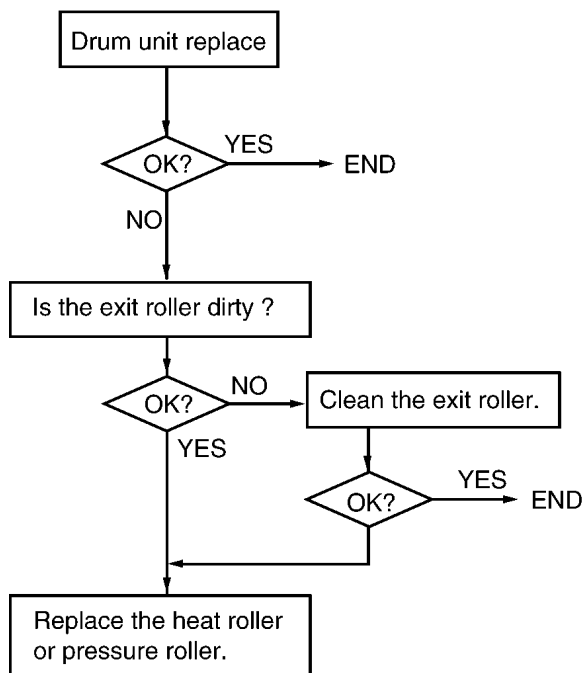
CROSS REFERENCE:

HIGH VOLTAGE SECTION (P.141)

6.5.7.8. BLANK PRINT

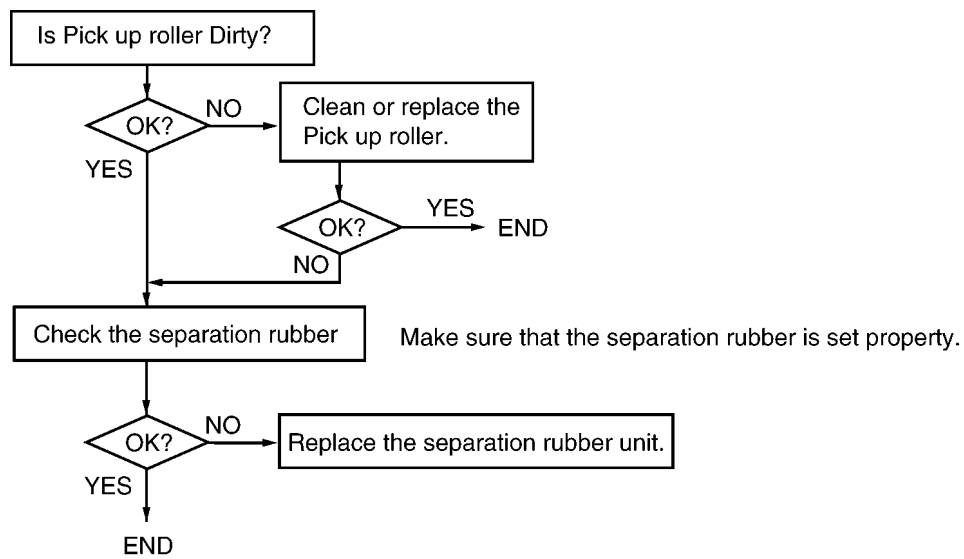


6.5.7.9. BLACK OR WHITE POINT

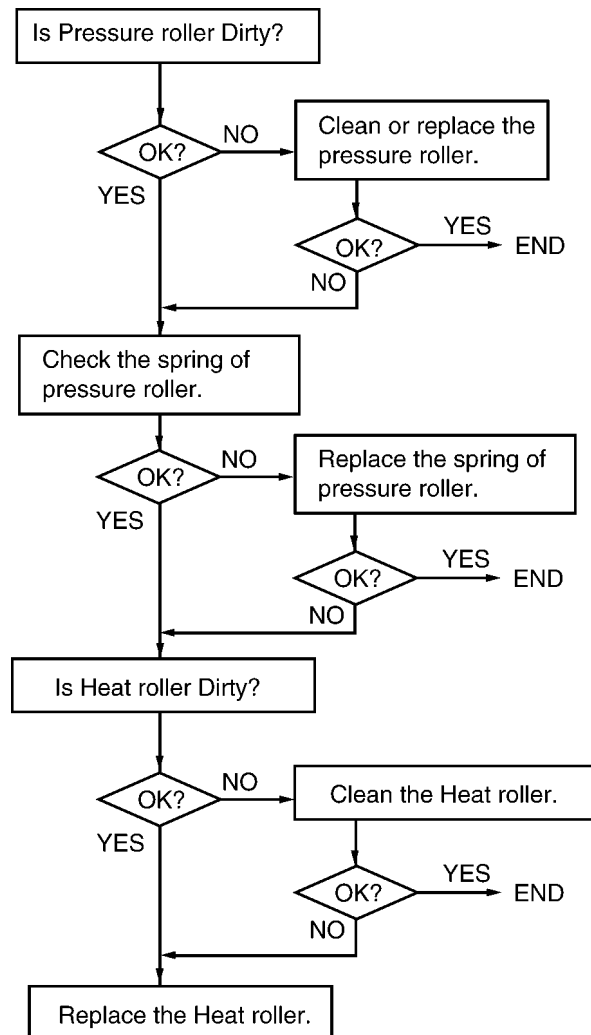


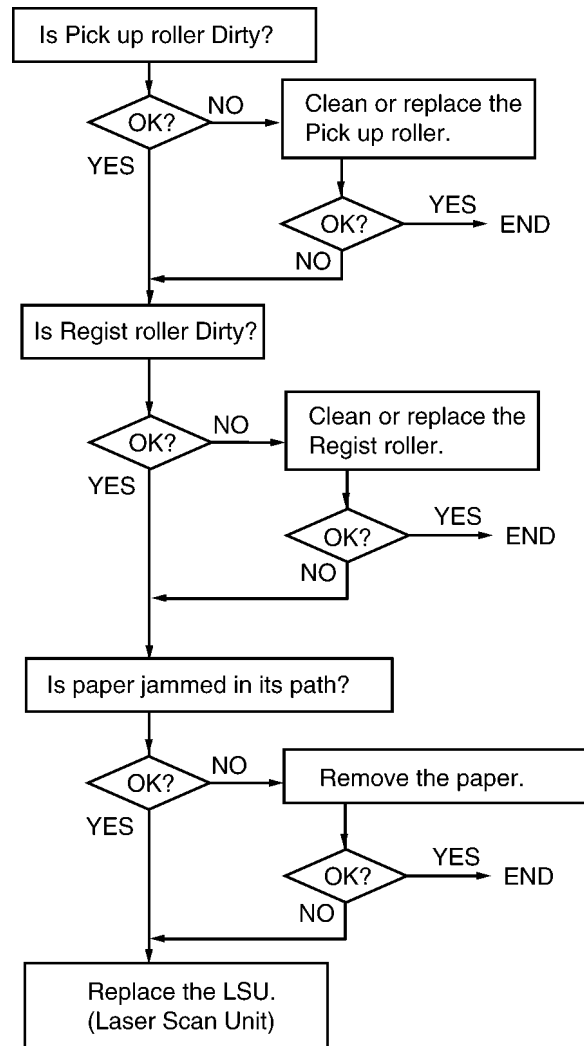
6.5.8. RECORDING PAPER FEED

6.5.8.1. MULTIPLE FEED

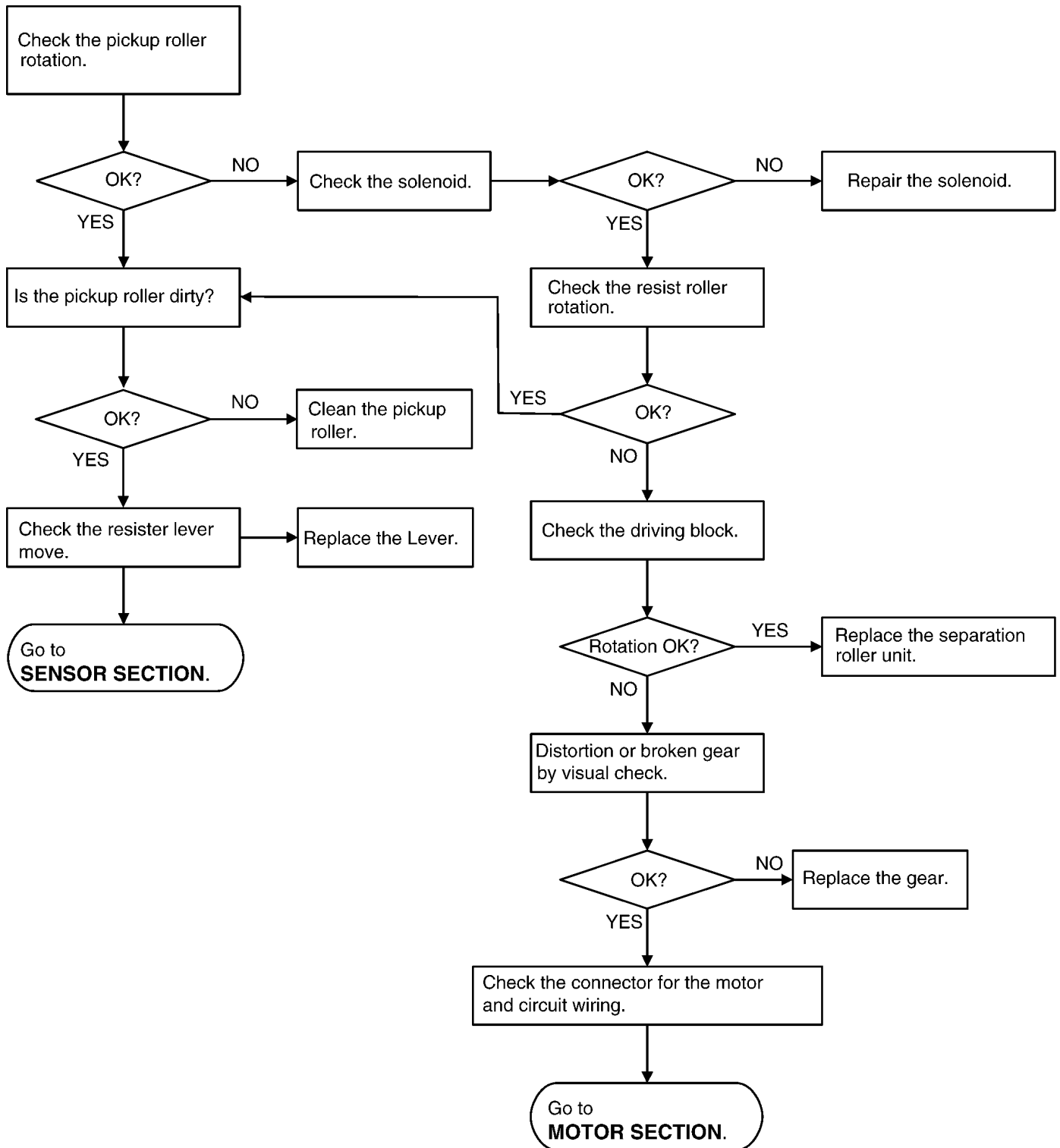


6.5.8.2. THE RECORDING PAPER IS WAVED OR WRINKLED



6.5.8.3. SKEW

6.5.8.4. THE RECORDING PAPER DOES NOT FEED

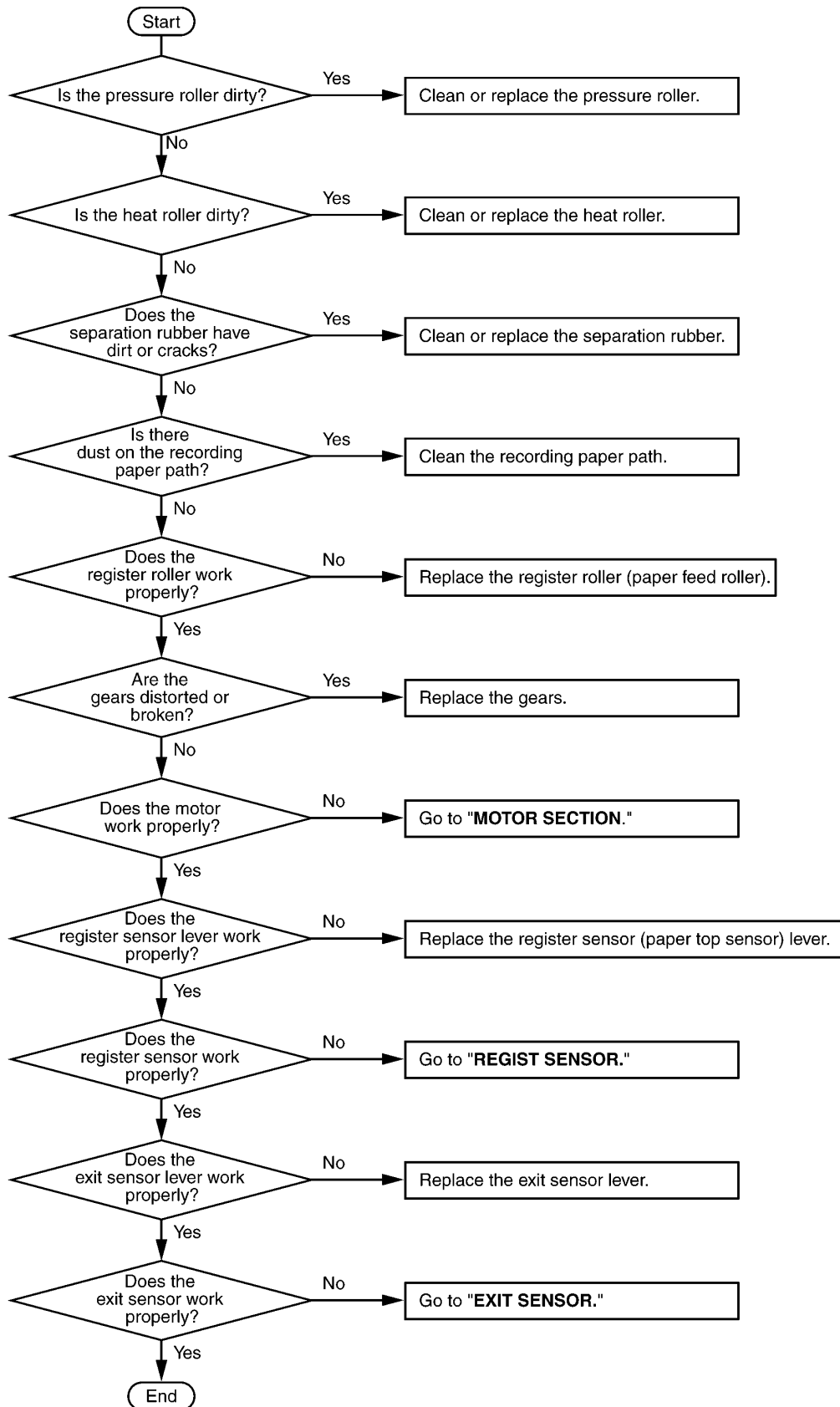


CROSS REFERENCE:

SENSOR SECTION (P.133)

MOTOR SECTION (P.136)

6.5.8.5. THE RECORDING PAPER JAM



CROSS REFERENCE:

PAPER EXIT SENSOR..... "PAPER JAMMED" (P.180)

FAN MOTOR SECTION (P.171)

REGIST SENSOR (P.179)

When the recording paper jam is occurred, the service

mode *630 distinguishes the cause.

0:No Paper Jam

1:Failed pick up

2:The paper top sensor is not turned OFF although the fixed time had passed since the sensor was turned ON.

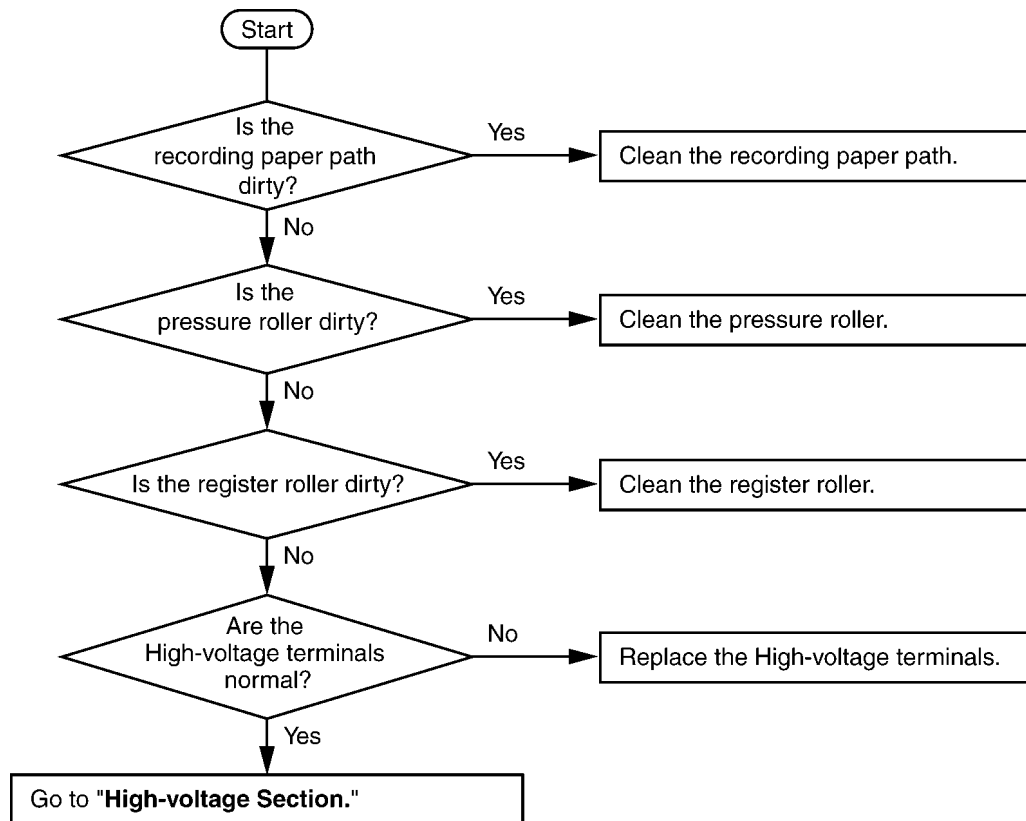
3:The paper eject sensor is not turned ON although the fixed time had passed since the paper top sensor was turned ON.

4:The paper eject sensor is not turned OFF although the fixed time had passed since it was turned ON.

5:The register sensor (paper top sensor) or paper exit sensor was turned ON before the motor started to rotate.

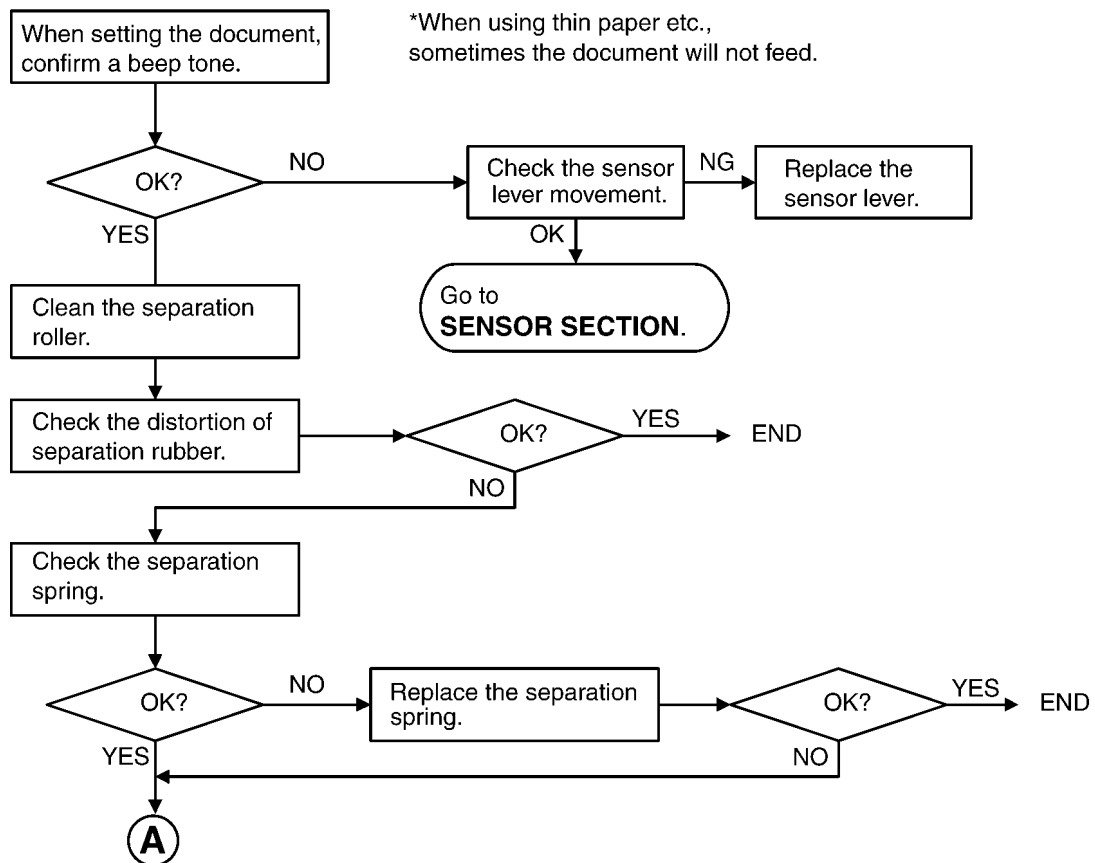
6:The register sensor (paper top sensor) chattered.

7:The paper exit sensor chattered.

6.5.8.6. BACK SIDE OF THE RECORDING PAPER IS DIRTY**CROSS REFERENCE:****HIGH VOLTAGE SECTION (P.141)**

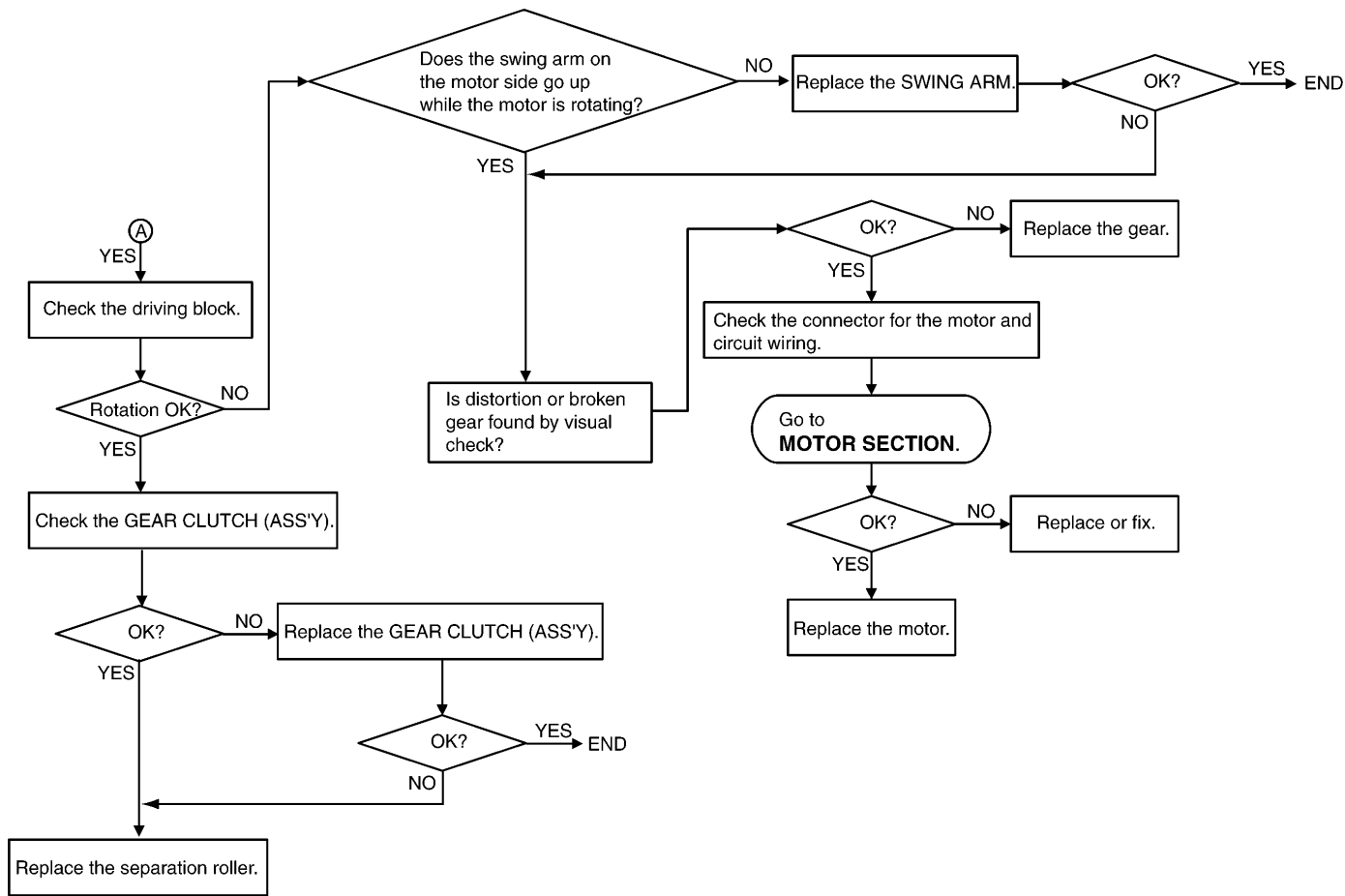
6.5.9. ADF (Auto document feed) SECTION

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



CROSS REFERENCE:

SENSOR SECTION (P.133)



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

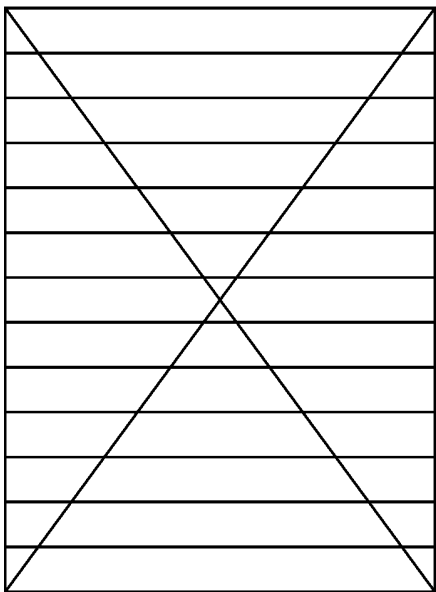
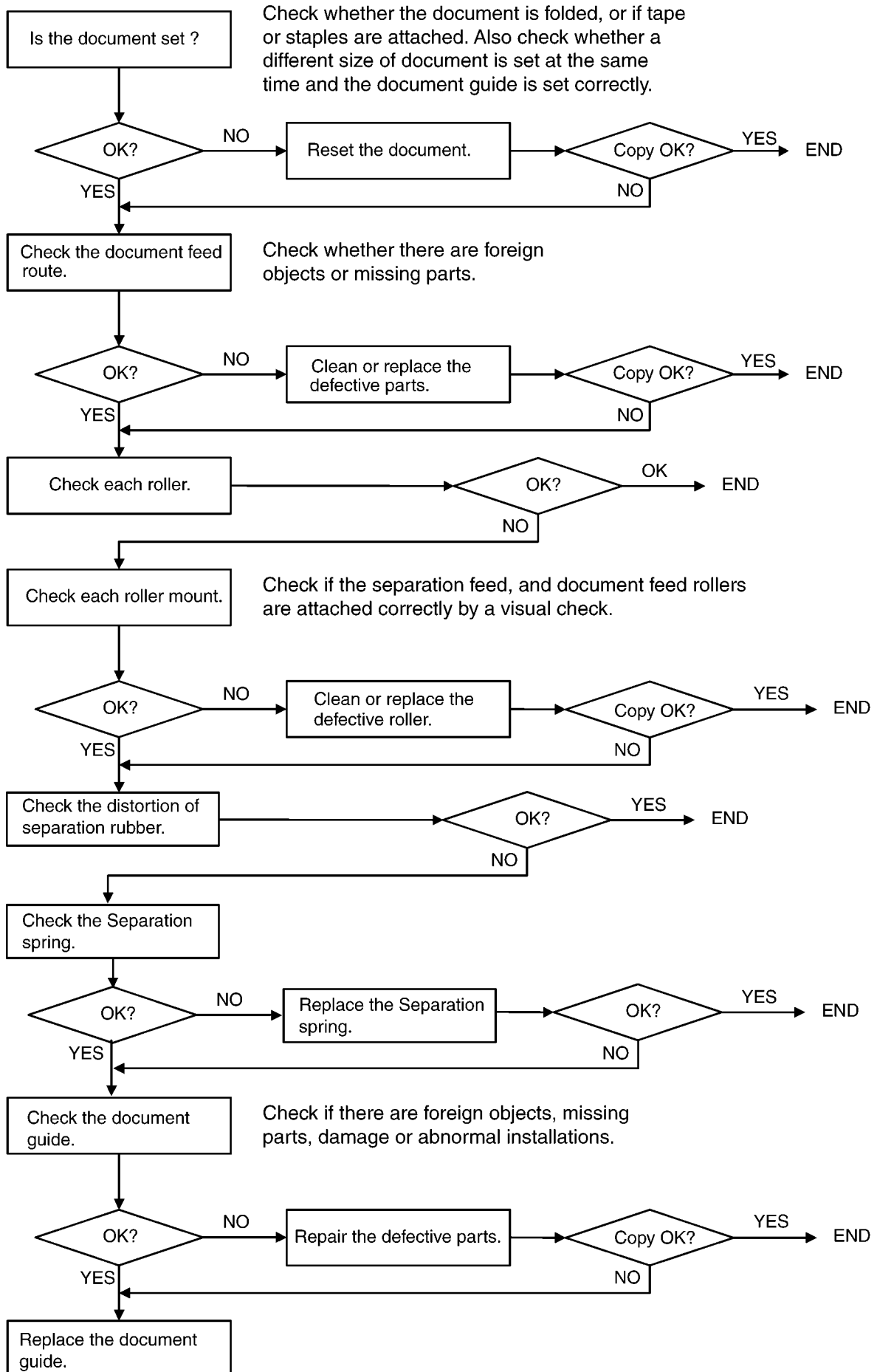


Fig. b

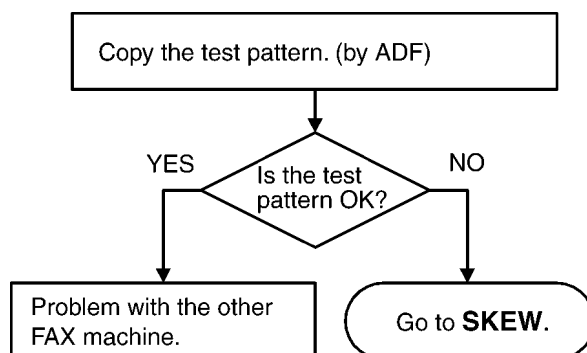
CROSS REFERENCE:
MOTOR SECTION (P.136)

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

6.5.9.2. SKEW (ADF)



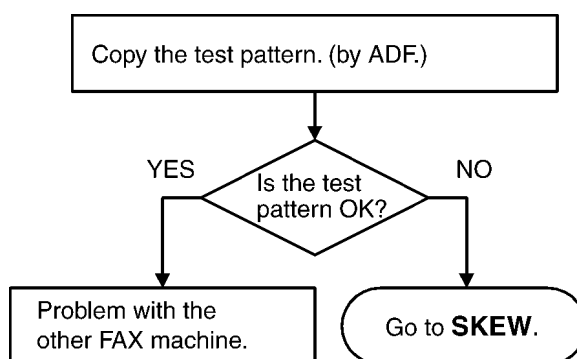
6.5.9.3. THE SENT FAX DATA IS SKEWED



CROSS REFERENCE:

SKEW (ADF) (P.105)

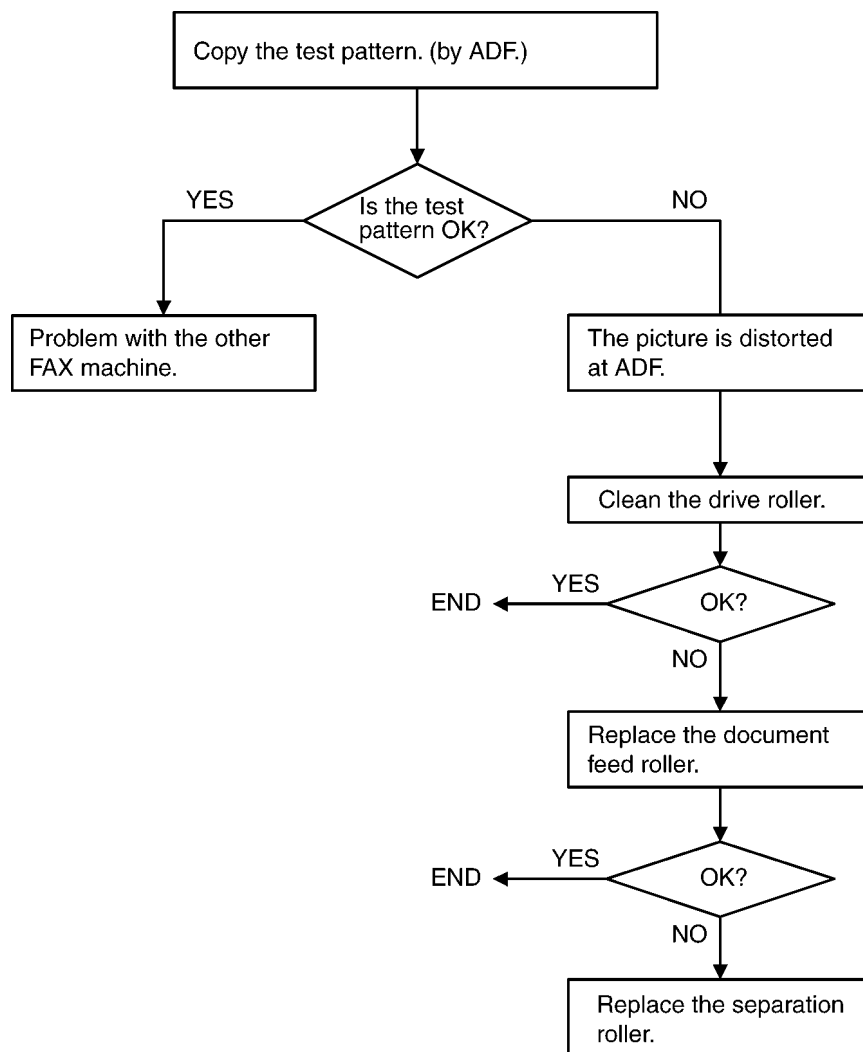
6.5.9.4. THE RECEIVED FAX DATA IS SKEWED

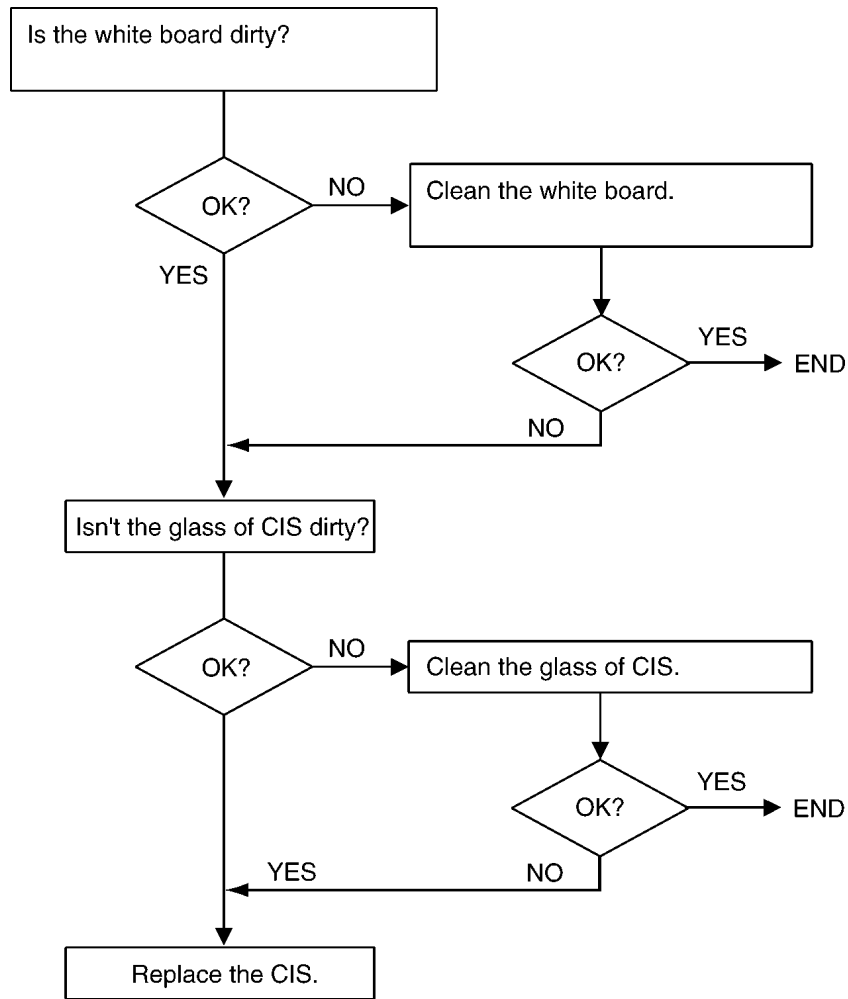


CROSS REFERENCE:

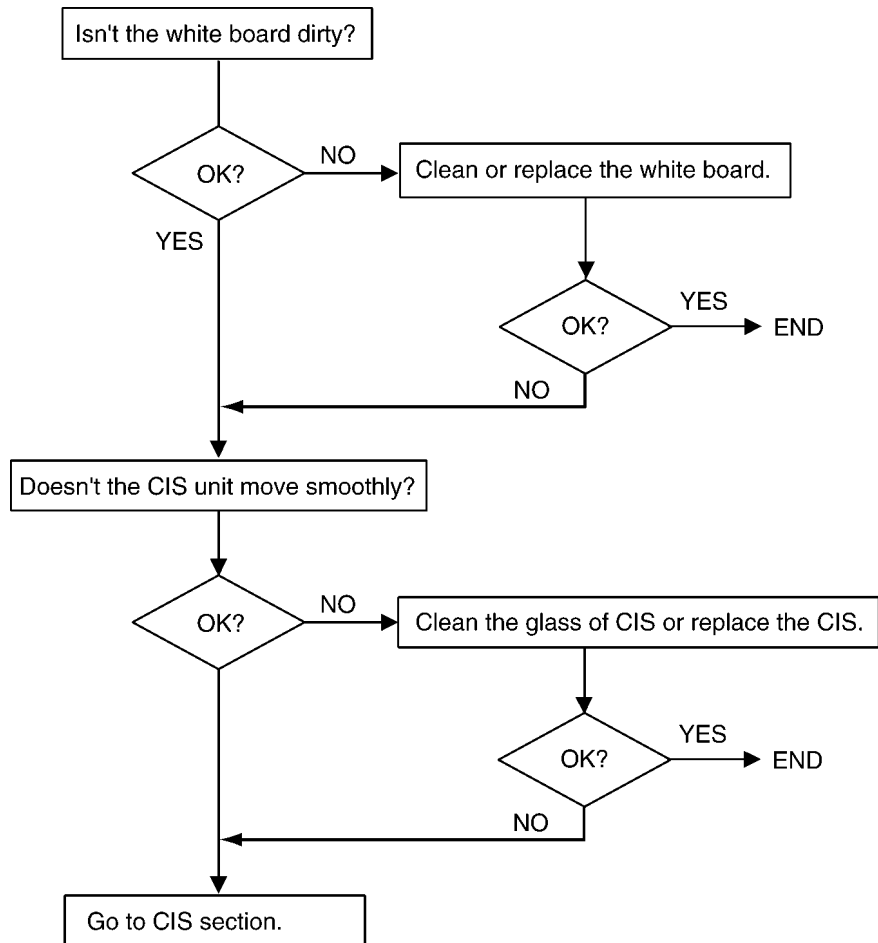
SKEW (P.98)

6.5.9.5. THE RECEIVED OR COPIED DATA IS EXPANDED



6.5.9.6. BLACK OR WHITE VERTICAL LINE IS COPIED

6.5.9.7. AN ABNORMAL IMAGE IS COPIED



CROSS REFERENCE:

CIS (Contact Image Sensor) SECTION (P.139)

6.5.10. COMMUNICATION SECTION

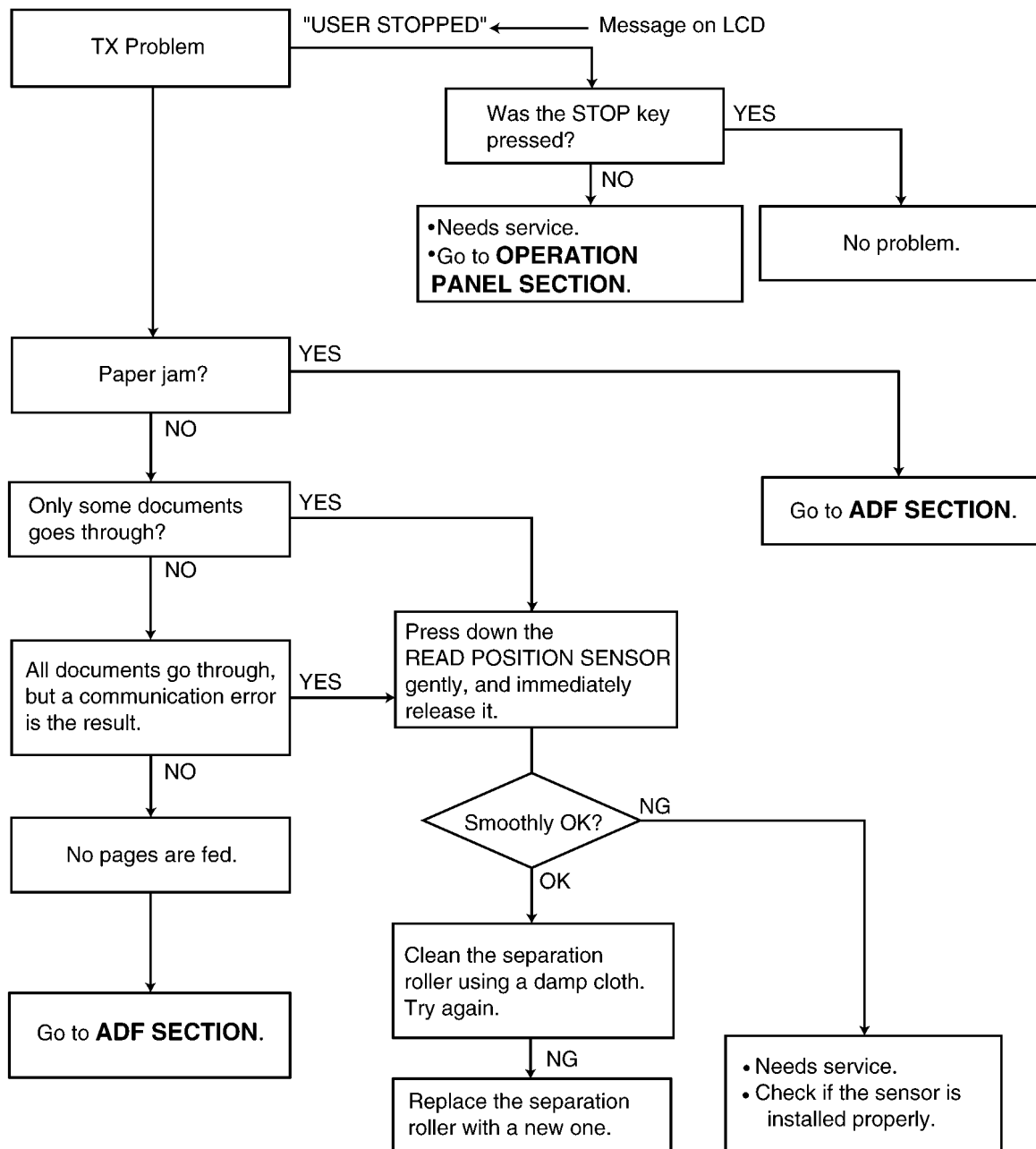
Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **DEFECTIVE FACSIMILE SECTION** (P.111).

| No. | Symptom | Content | Possible cause |
|-----|--|---|---|
| 1 | The paper dose not feed properly when faxing. (Copying is also not possible.) | Troubleshooting | Problem with the feeding mechanism. (Refer to TRANSMIT PROBLEM (P.111)) |
| 2 | The fax transmits successsfully one time and fails another. (Copying is also possible.) | Troubleshooting | Problem with the service line or with the receiver's fax. (Refer to SOMETIME THERE IS A TRANSMIT PROBLEM (P.112)) |
| 3 | The fax receives successsfully one time and fails another. (Copying is also possible.) | Troubleshooting | Problem with the service line or with the transmitter's fax. (Refer to RECEIVE PROBLEM (P.113)) |
| 4 | The fax completely fails to transmit or receive. (Copying is also possible.) | Troubleshooting | Problem with the electric circuit. (Refer to THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE (P.114)) |
| 5 | The fax fails either to transmit or receive when making a long distance or an international call. (Copying is also possible.) | Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.) | Problem with the service line. |
| 6 | The fax image is poor when transmitting or receiving during a long distance or international call. | | |
| 7 | No.1-No.5 | The troubleshooting procedure for each error code will be printed on the communication result report. | (Refer to HOW TO OUTPUT THE JOURNAL REPORT (P.119)) |

6.5.10.1. DEFECTIVE FACSIMILE SECTION

6.5.10.1.1. TRANSMIT PROBLEM

Refer to **LCD MESSAGE** (P.4).



CROSS REFERENCE:

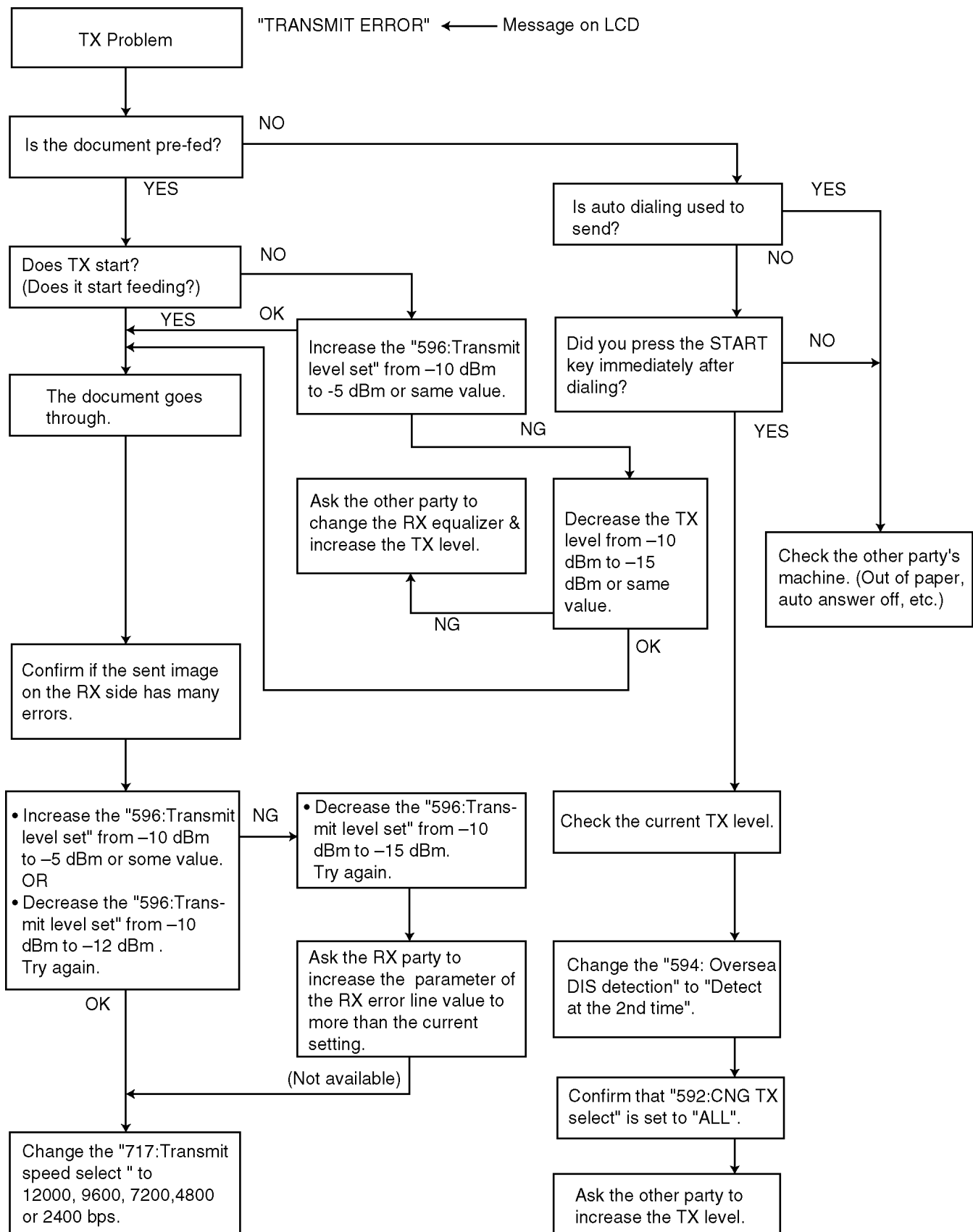
CLEANING THE INSIDE OF THE UNIT (P.34)

ADF (Auto document feed) SECTION (P.103)

OPERATION PANEL SECTION (P.132)

6.5.10.1.2. SOMETIME THERE IS A TRANSMIT PROBLEM

Refer to **LCD MESSAGE** (P.4).



Note:

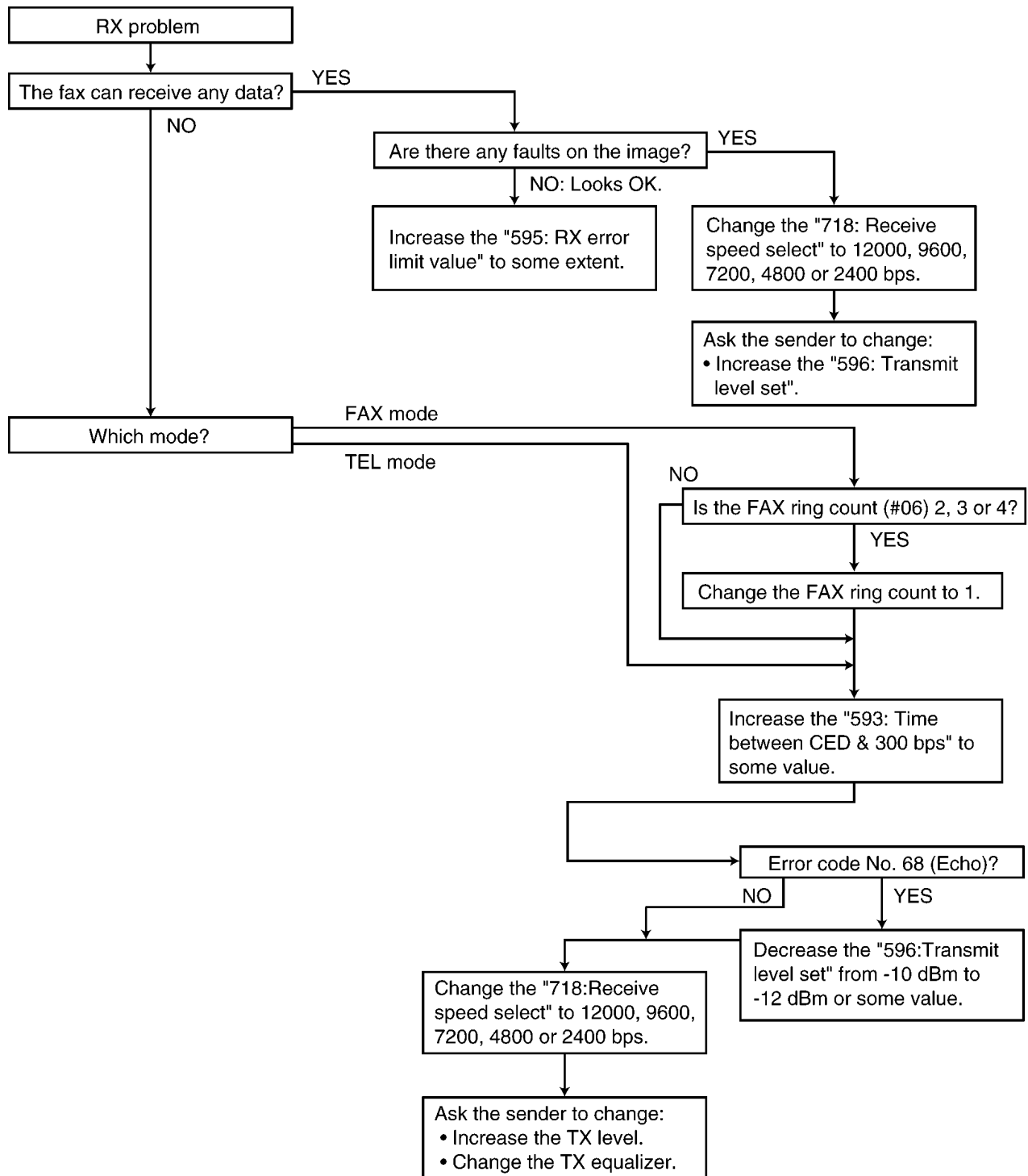
"596: Transmit level set" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.63).

"717: Transmit speed select" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.63).

6.5.10.1.3. RECEIVE PROBLEM

Confirm the following before starting troubleshooting.

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



Note:

"596: Transmit level set" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.63).

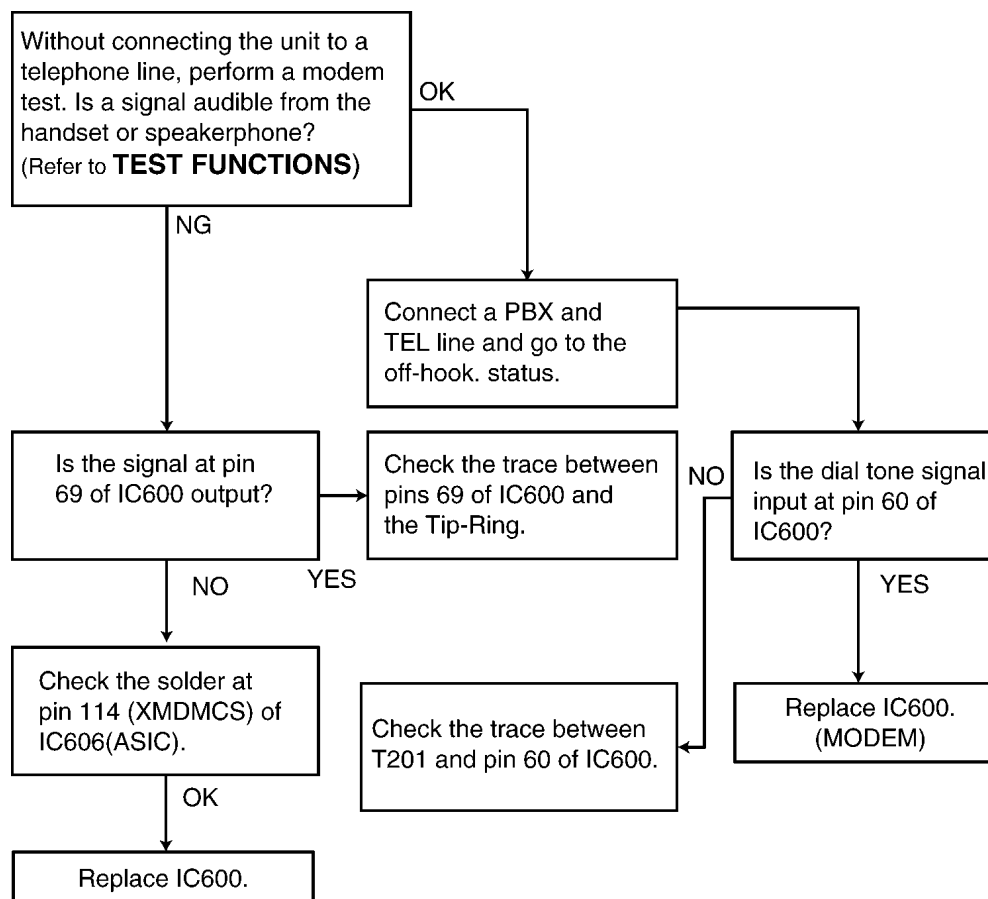
"718: Receive speed select" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.63).

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

Please refer to **USER RECOVERABLE ERRORS** (P.60) for the above items.

Also, when it actually becomes a hardware deformity, please check each sensor.

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



CROSS REFERENCE:

TEST FUNCTIONS (P.65)

6.5.11. SPECIAL SERVICE JOURNAL REPORTS

Journal 2 and Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 881 or 882. Remote printing function for the journal reports (JOURNAL, JOURNAL 2 and JOURNAL 3) is also available for service technicians. (Refer to **PROGRAM MODE TABLE**(P.70).) 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).

JOURNAL

Mar. 23 2002 09:51AM

YOUR LOGO :
YOUR FAX NO:

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

JOURNAL 2

Mar. 23 2000 09:51AM

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

NO RESPONSE DISAPPEARED ON JOURNAL

| NO. | START TIME | (1) RCV MODE | (4) RCV-TRIG (CNT.) |
|-----|------------|-----------------|------------------------|
|-----|------------|-----------------|------------------------|

YOUR LOGO
YOUR FAX NUMBER

JOURNAL 3

Mar. 23 2000 09:51AM

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

HOW TO READ JOURNAL REPORTS:

Example:

- 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

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

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

6.5.11.1. JOURNAL 2

Refer to JOURNAL 2 in **PRINTOUT EXAMPLE**(P.117).

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

Descriptions:

(1) RCV. MODE

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

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

(2) SPEED

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

(3) RESOLUTION

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

(4) RCV-TRIG. (CNT.)

Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 2 in **PRINTOUT EXAMPLE**(P.117). The values in parentheses indicate how many times the trigger has been used. (For example, "0003" means three times.)

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

(5) ERROR→MEMORY

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

If you look at No.11 in the JOURNAL 2 in **PRINTOUT EXAMPLE**(P.117), it shows the fax message was received in memory due to "PAPER OUT" error.

NO RESPONSE DISAPPEARED ON JOURNAL

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

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

6.5.11.2. JOURNAL 3

Refer to JOURNAL 3 in **PRINTOUT EXAMPLE**(P.117).

Description

(6) ENCODE

Compression Code: MH/MR/MMR

(7) MSLT

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

(8) EQM

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

(9) ERROR LINE (RX)

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

(10) MAKER CODE

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

0E: "KX" model

00: Unknown

79: "UF" model

19: "Xerox" model

6.5.11.3. PRINTOUT EXAMPLE

JOURNAL2

Mar. 25 2000 01:59PM

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

NO RESPONSE DISAPPEARED ON JOURNAL

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

JOURNAL3

Mar. 25 2000 01:58PM

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

6.5.11.4. HOW TO OUTPUT THE JOURNAL REPORT

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

| JOURNAL | | | | | | | |
|---------|-----------------|-----------------|------------|----------------------|-------|---------------------|-------|
| | | | | Jan. 20 2000 01:19PM | | | |
| | | | | YOUR LOGO : | | | |
| | | | | YOUR FAX NO: | | | |
| NO. | OTHER FACSIMILE | START TIME | USAGE TIME | MODE | PAGES | RESULT | *CODE |
| 01 | 2345678 | Jan. 20 01:18PM | 00'51 | SND | 00 | COMMUNICATION ERROR | (43) |

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

(2) Communication message

(1) Error code message

CROSS REFERENCE:

FEATURES(P.12)

Error code table: Refer to **ERROR CODE TABLE** (P.5).

| (1) CODE | (2) RESULT | (3) MODE | SYMPTOM | Counter-measure* |
|----------|----------------------|-----------|---|------------------|
| | PRESSED THE STOP KEY | SND & RCV | Communication was interrupted by the STOP button. | |
| | DOCUMENT JAMMED | SND | The document paper is jammed. | |
| | NO DOCUMENT | SND | No document paper. | |
| | THE COVER WAS OPENED | SND | The cover is open. | |
| 28 | COMMUNICATION ERROR | SND & RCV | ----- | |
| 40 | COMMUNICATION ERROR | SND | Transmission is finished when the T1 TIMER expires. | 1 |
| 41 | COMMUNICATION ERROR | SND | DCN is received after DCS transmission. | 2 |
| 42 | COMMUNICATION ERROR | SND | FTT is received after transmission of a 2400BSP training signal. | 3 |
| 43 | COMMUNICATION ERROR | SND | No response after post message is transmitted three times. | 4 |
| 44 | COMMUNICATION ERROR | SND | RTN and PIN are received. | 5 |
| 46 | COMMUNICATION ERROR | RCV | No response after FTT is transmitted. | 6 |
| 48 | COMMUNICATION ERROR | RCV | No post message. | 7 |
| 49 | COMMUNICATION ERROR | RCV | RTN is transmitted. | 8 |
| 50 | COMMUNICATION ERROR | RCV | PIN is transmitted (to PRI-Q). | 8 |
| 51 | COMMUNICATION ERROR | RCV | PIN is transmitted. | 8 |
| 52 | COMMUNICATION ERROR | RCV | Reception is finished when the T1 TIMER expires. | 9 |
| 54 | ERROR-NOT YOUR UNIT | RCV | DCN is received after DIS transmission. | 11 |
| 58 | COMMUNICATION ERROR | RCV | DCN is received after FTT transmission. | 13 |
| 59 | ERROR-NOT YOUR UNIT | SND | DCN responds to the post message. | 14 |
| 65 | COMMUNICATION ERROR | SND | DCN is received before DIS reception. | 2 |
| 65 | COMMUNICATION ERROR | RCV | Reception is not EOP, EOM PIP, PIN, RTP or RTN. | 2 |
| 68 | COMMUNICATION ERROR | RCV | No response at the other party after MCF or CFR is transmitted. | 13 |
| 70 | ERROR-NOT YOUR UNIT | RCV | DCN is received after CFR transmission. | 13 |
| 72 | COMMUNICATION ERROR | RCV | Carrier is cut when the image signal is received. | 16 |
| 75 | MEMORY FULL | RCV | The document was not received due to memory full. | |
| 79 | CANCELED | SND | The multi-station transmission was rejected by the user. | |
| FF | COMMUNICATION ERROR | SND & RCV | Modem error. For the DCN, DCN, etc. abbreviations, refer to MODEM SECTION (P.211). | 12 |

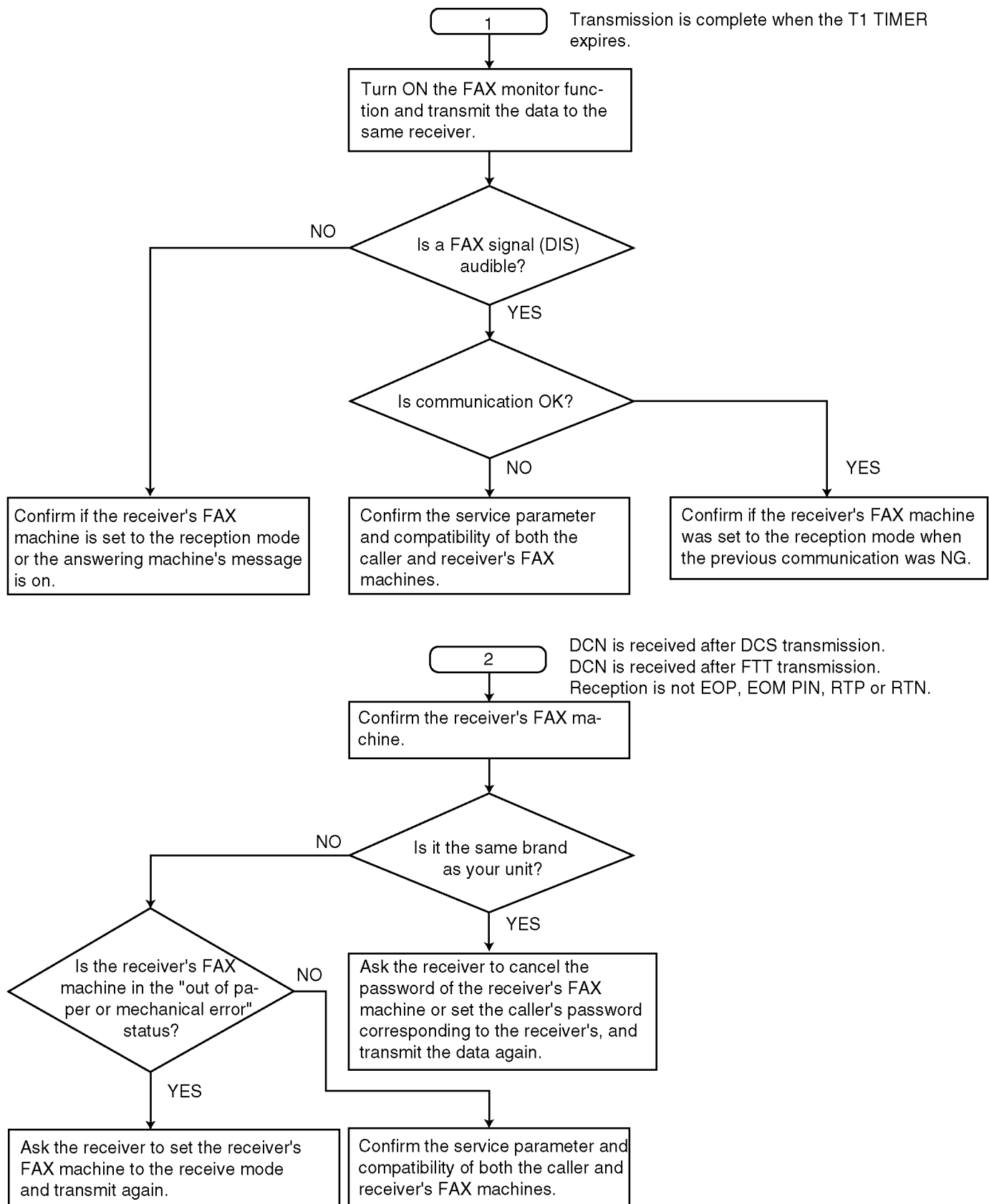
SND=TRANSMISSION / RCV=RECEPTION

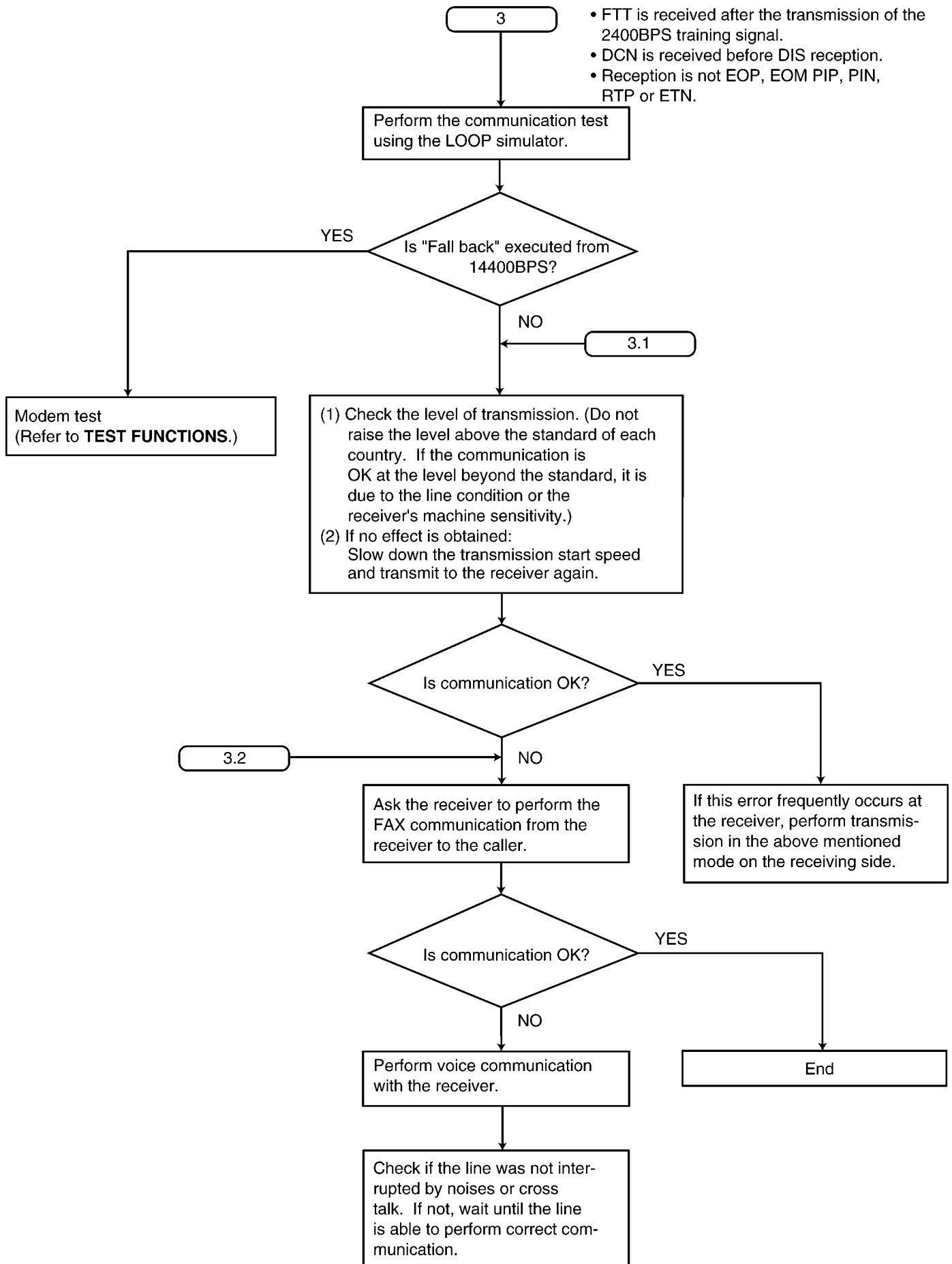
Most fax communication problems can be resolved by the following steps.

1. Change the transmit level. (Service code: 596, refer to **SERVICE FUNCTION TABLE**(P.63).)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to **SERVICE FUNCTION TABLE** (P.63).)

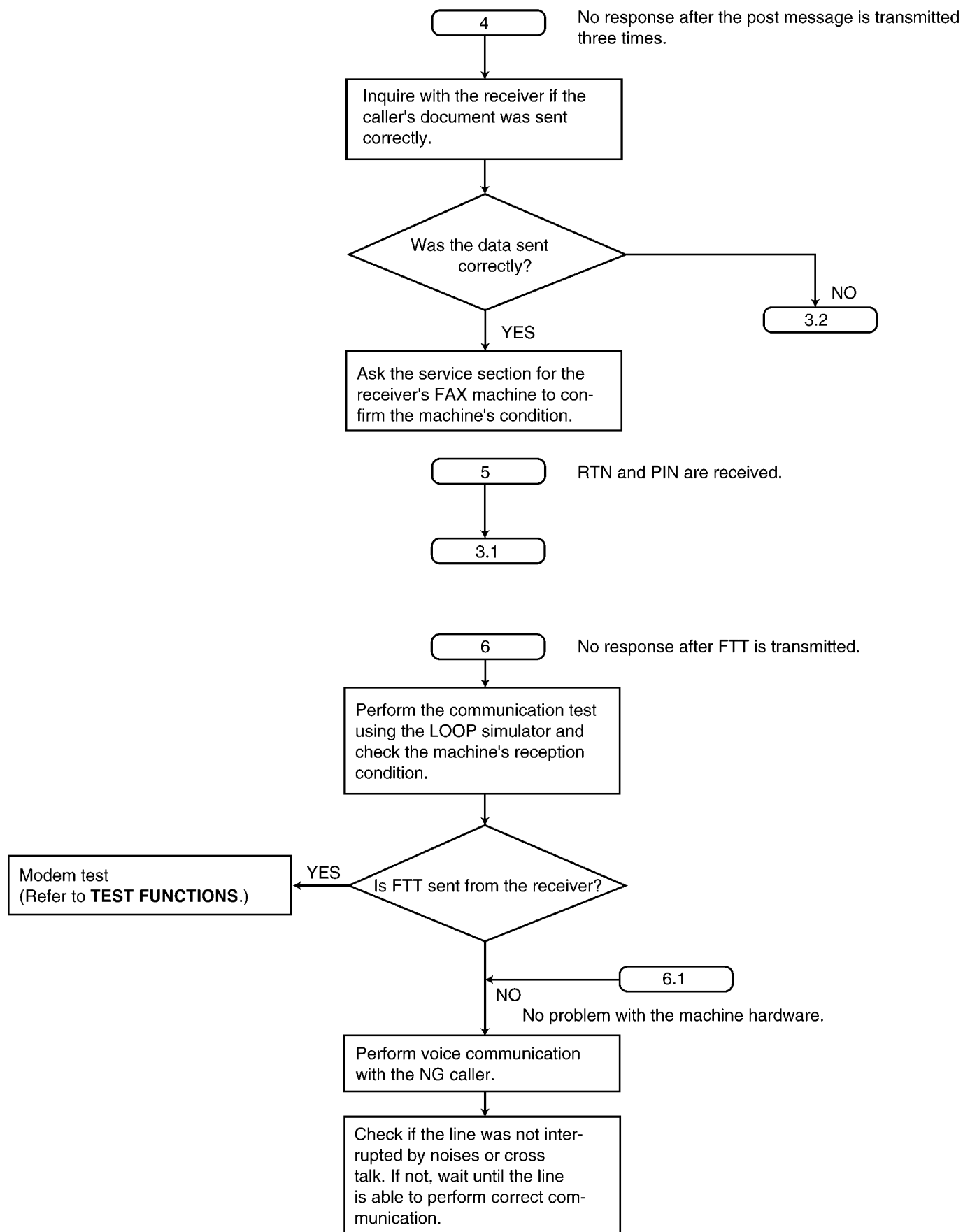
Note*:

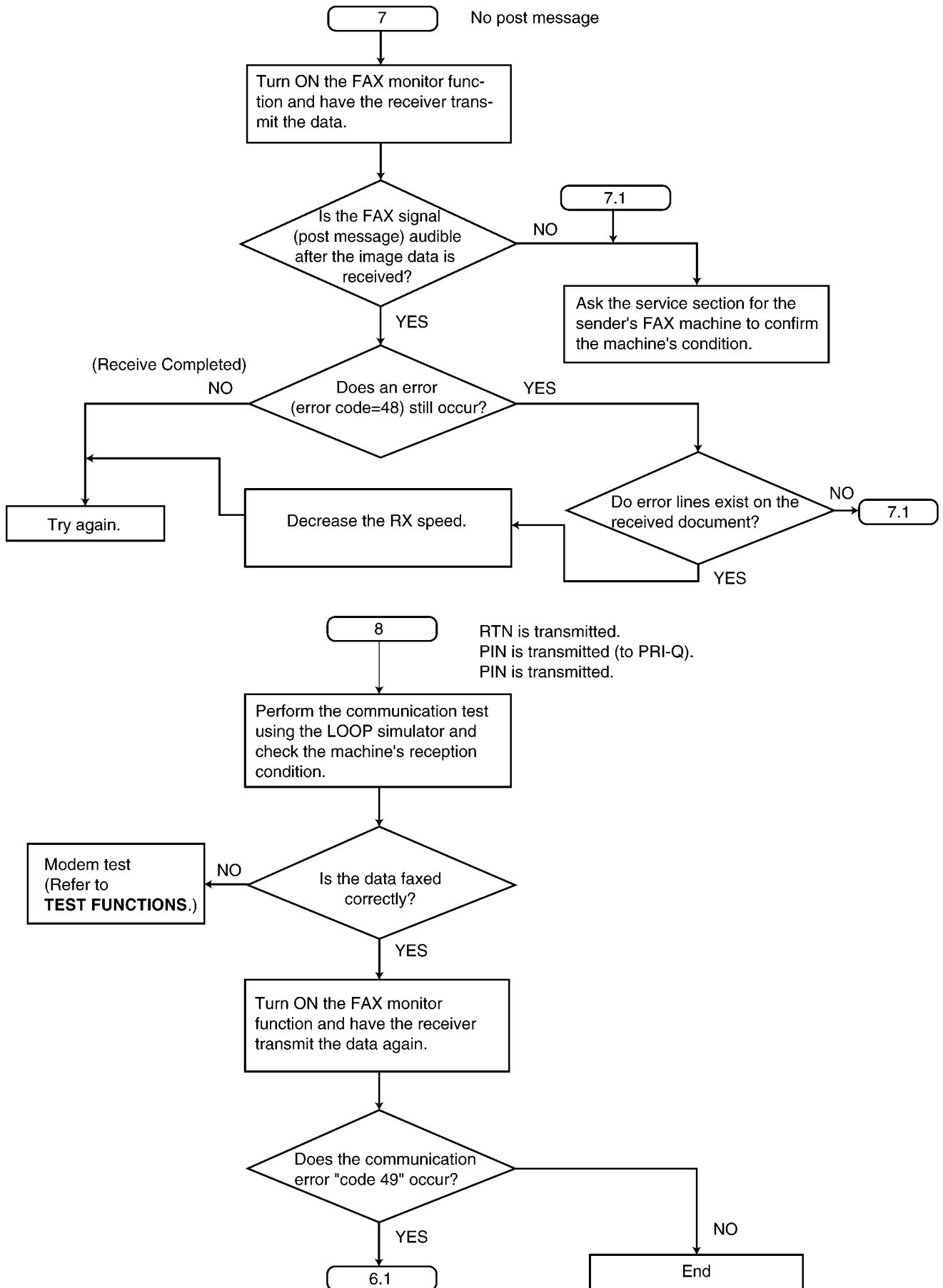
If the problem remains, see the following "Countermeasure" flow chart.

Countermeasure

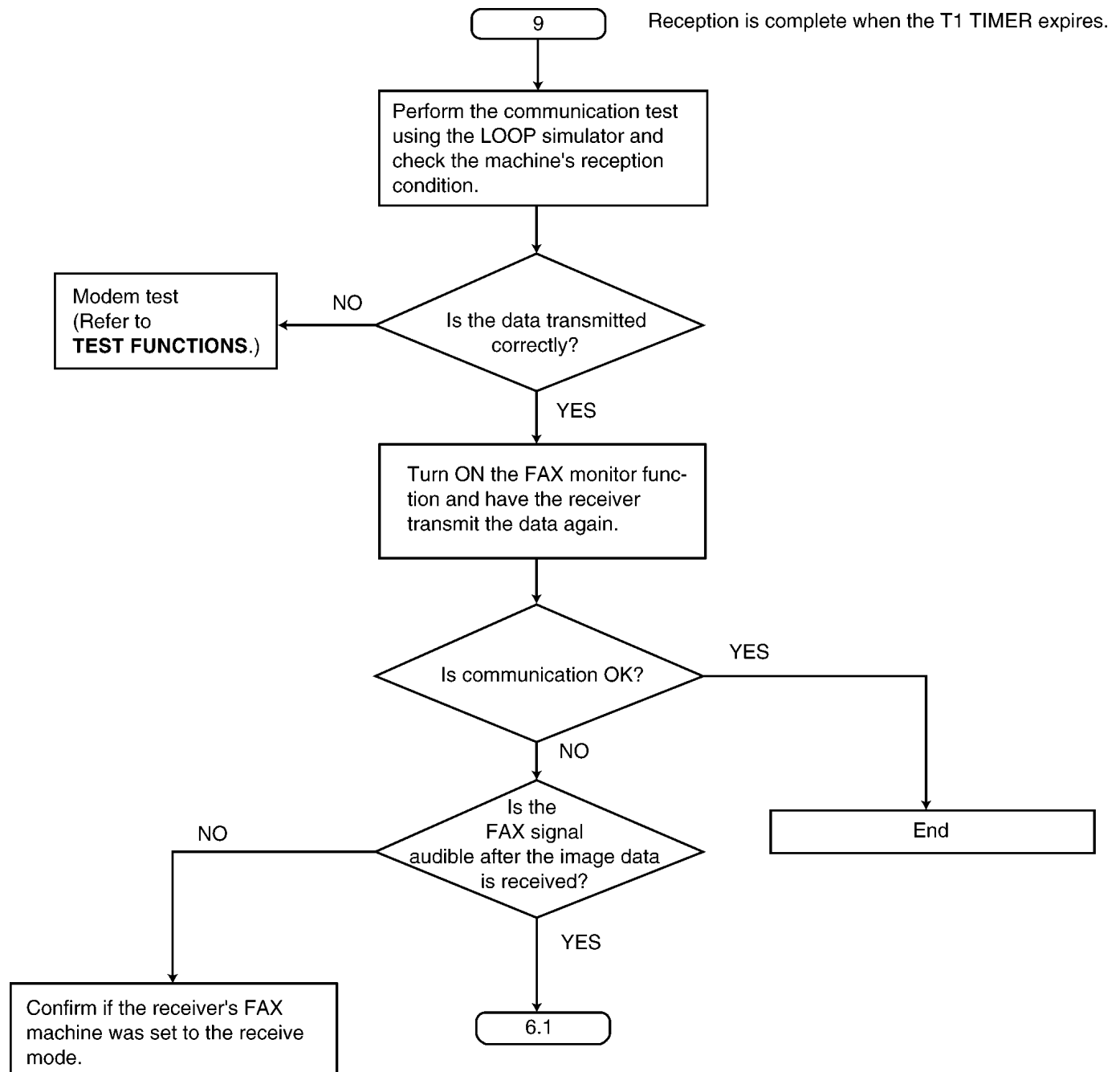


CROSS REFERENCE:
TEST FUNCTIONS (P.65)

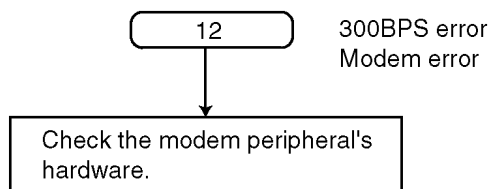
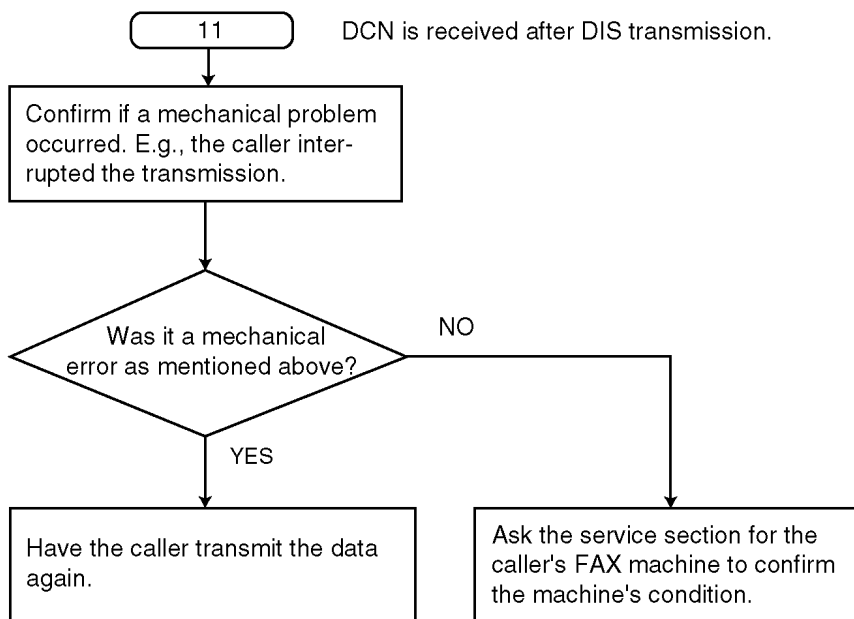
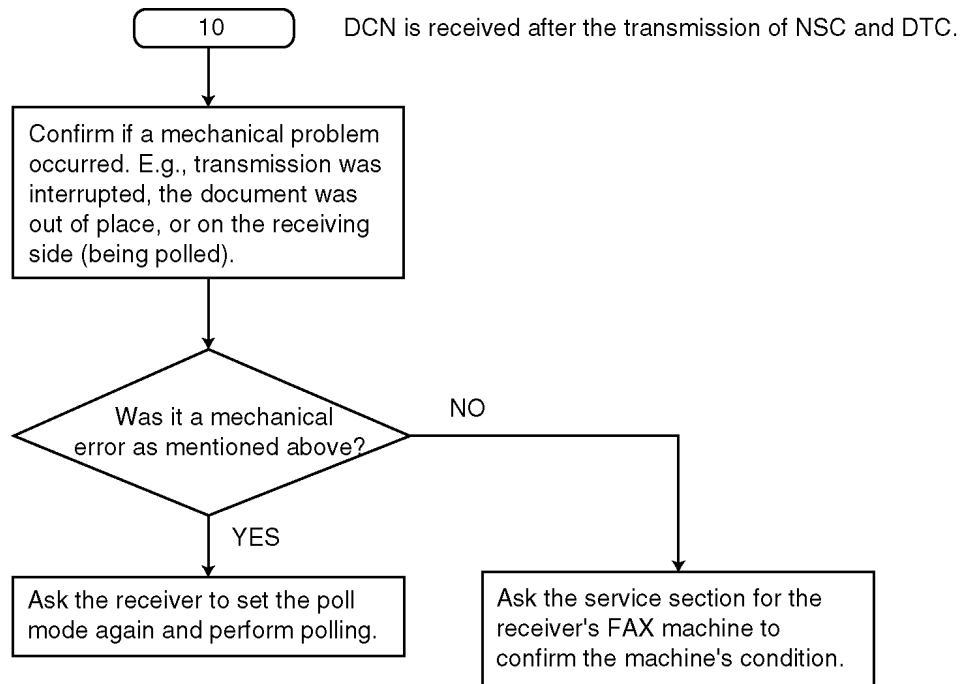
**CROSS REFERENCE:****TEST FUNCTIONS** (P.65)

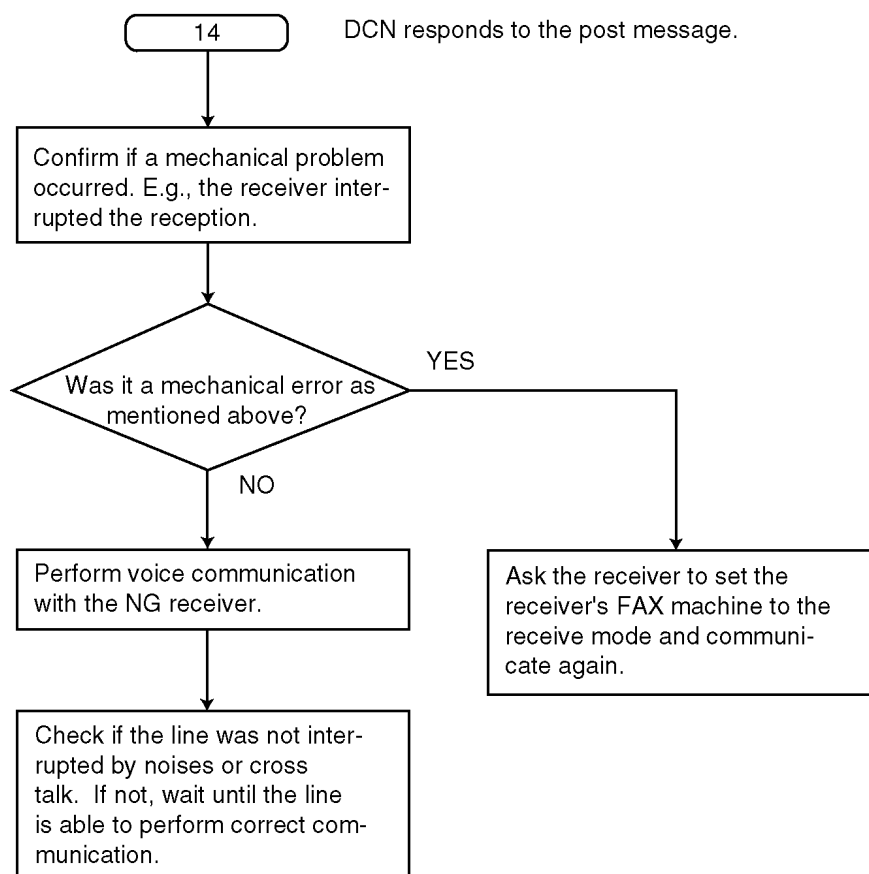
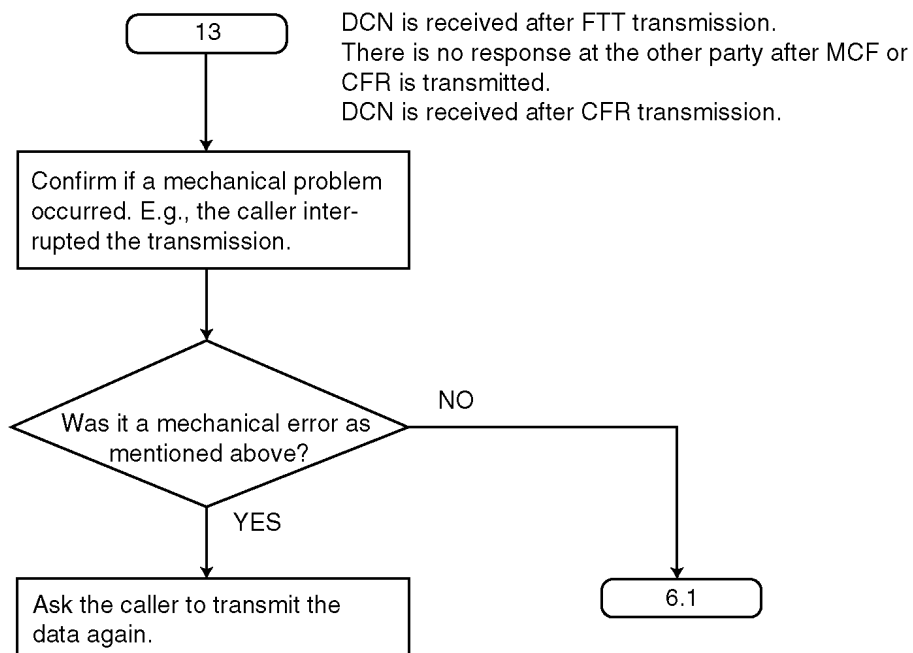


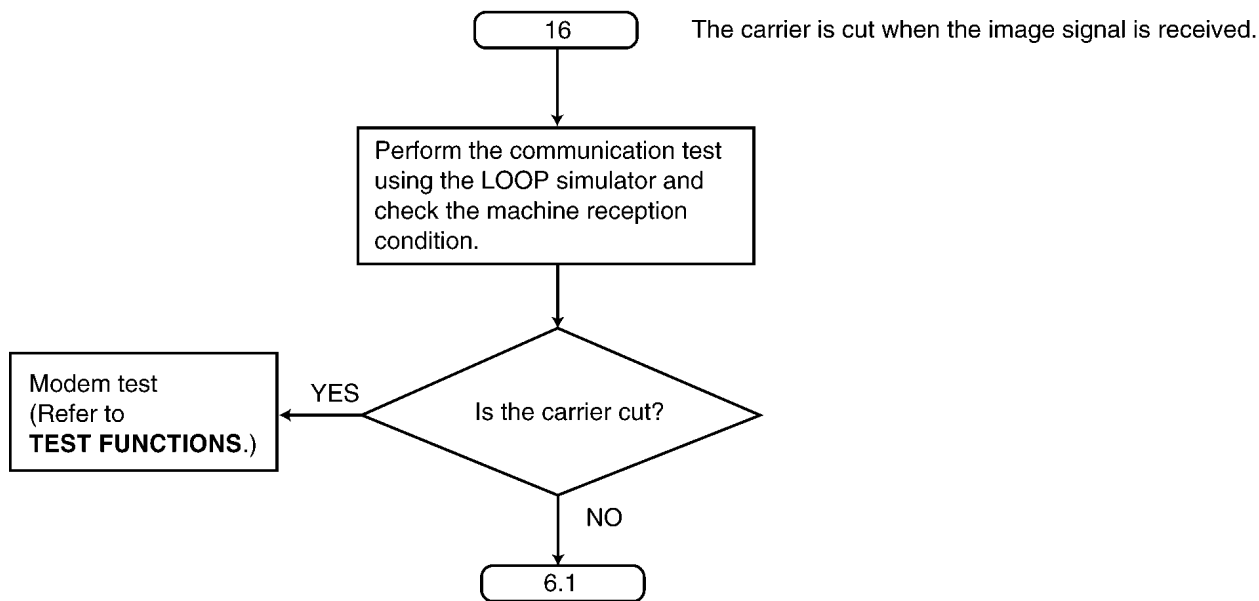
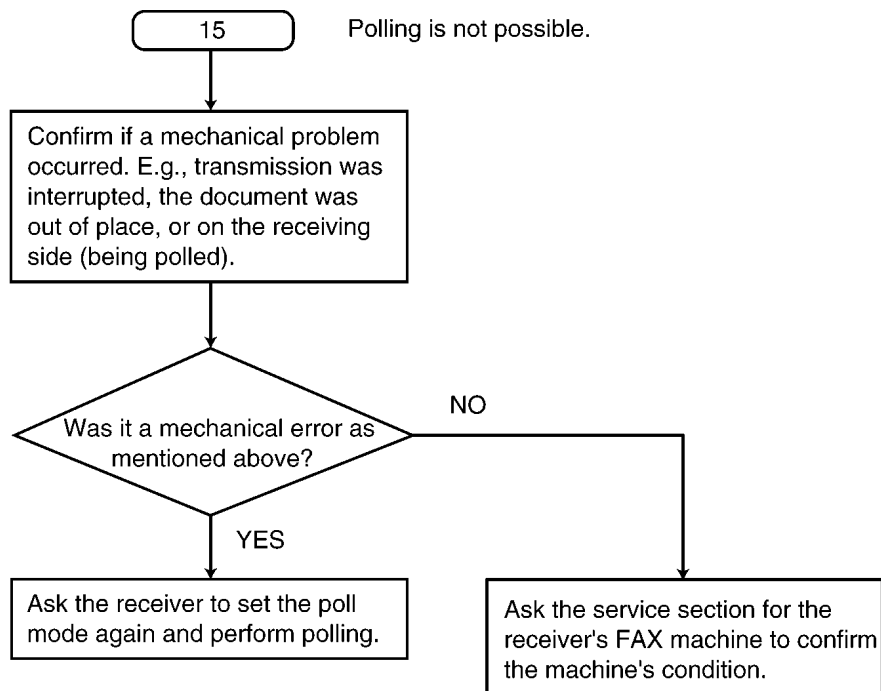
CROSS REFERENCE:
TEST FUNCTIONS (P.65)



CROSS REFERENCE:
TEST FUNCTIONS (P.65)







CROSS REFERENCE:
TEST FUNCTIONS (P.65)

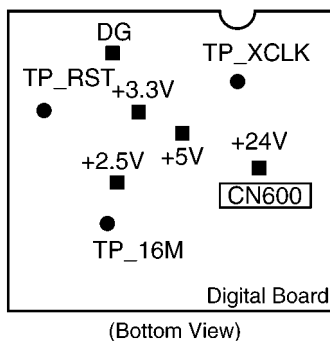
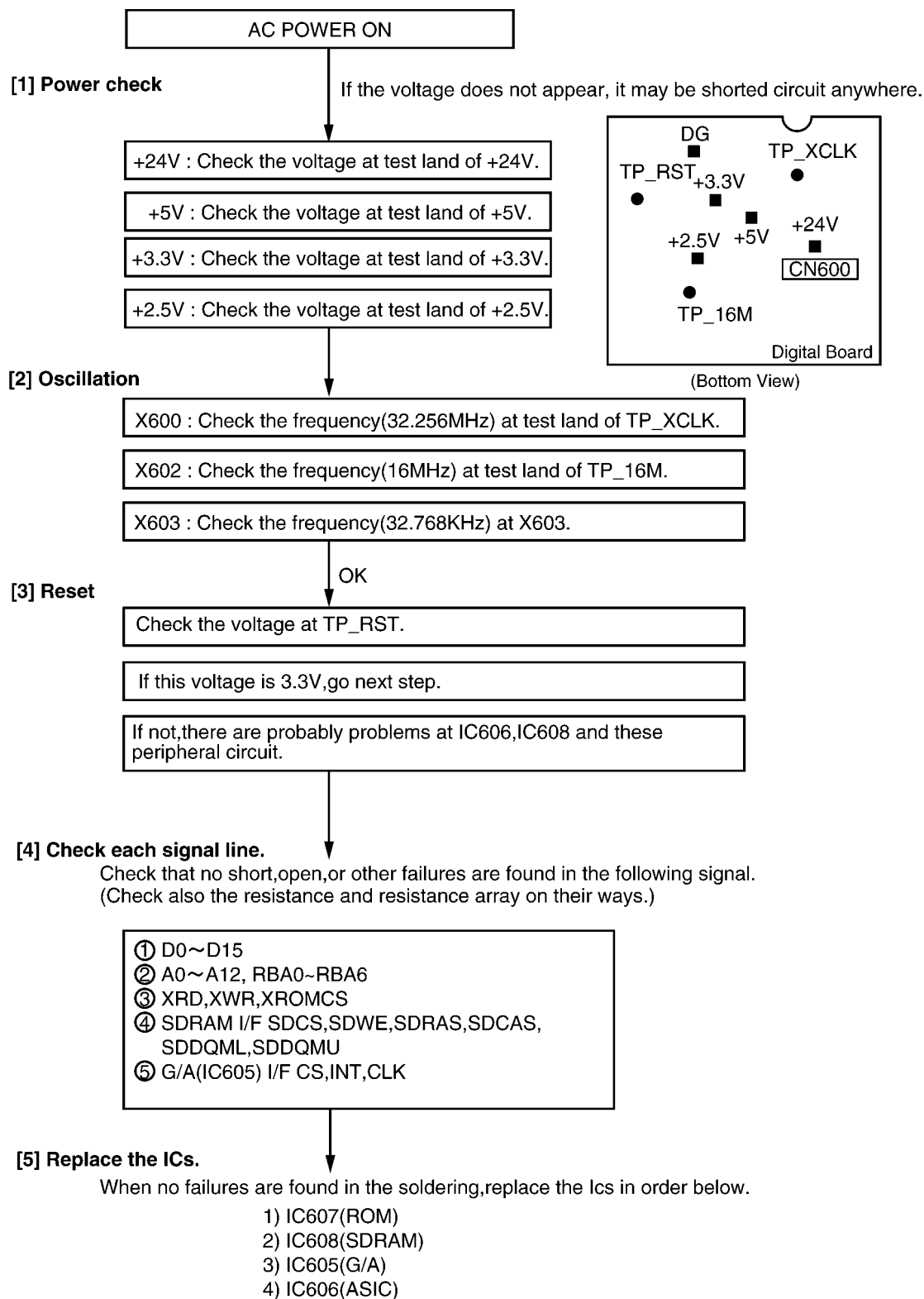
6.5.12. INITIALIZING ERROR

After the power is turned on, the ASIC (IC606) initializes and checks each IC.

The ROM (IC607), SDRAM (IC604), and MODEM (IC600) 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.210)

POWER SUPPLY BOARD SECTION (P.145)

6.5.13. ANALOG BOARD SECTION

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

6.5.13.1. CHECK SHEET

| (SYMPTOM) CHECK ITEMS | | Signal IN → ROUTE → OUT |
|--|---------|---|
| MONITOR | | TEL LINE-CN203(3)-F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220-IC204(2-1)- [LPF]-R202-C200-IC207(23-34)-C324-CN201(11)-{CN600(18)-IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}- CN201(9)-R343-C325-IC207(32-35)-R251-C246-IC206(4-5,8) [CN200(1)] SPEAKER [CN200(2)] |
| HANDSET Tx | | HANDSET MIC [CN202(1)-FLT201(1-5)-C318-R335-L237-IC202(5-7)] [CN202(4)-FLT201(3-7)-C317-R334-L209-IC202(6-7)] L222-C314-R331-L259- IC208(3-5)-R329-C309-R327-L255-IC207(15-22)-C224-R232-R332-L225-IC204(6-7)-L230-C237-R244- R243-T201-C253-R278-Q211-D210-FLT200-L239-F200-CN203(3)-TEL LINE |
| HANDSET Rx | | TEL LINE-CN203(3)-F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220-IC204(2-1)- [LPF]-R202-C200-IC207(23-34)-C324-CN201(11)-{CN600(18)-IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}- CN201(9)-R343-C325-IC207(32-11)-C292-FLT201(8-4)-CN202(2)-HANDSET SPEAKER |
| DTMF Monitor | Speaker | {IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-34)-C324-CN201(11)-{CN600(18)- IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-35)-R251-C246- IC206(4-5,8) [CN200(1)] SPEAKER [CN200(2)] |
| | Handset | {IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-34)-C324-CN201(11)-{CN600(18)- IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-11)-C292-FLT201(8-4)- CN202(2)-HANDSET SPEAKER |
| DTMF for TEL Line FAX Tx | | {IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-22)-C224-R232-R332-L225-IC204(6-7)- L230-C237-R244-R243-T201-C253-R278-Q211-D210-FLT200-L239-F200-CN203(3)-TEL LINE |
| Ringing/Alarm/ Beep/Key tones | | {IC606(113)-C602-R603-L602-CN600(14)}-CN201(15)-R277-C266-IC207(27-34)-C324-CN201(11)- {CN600(18)-IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-35)- R251-C246-IC206(4-5,8) [CN200(1)] SPEAKER [CN200(2)] |
| DTMF/CNG detection (OFF-HOOK) FAX Rx | | TEL LINE-CN203(3)-F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220-IC204(2-1)- [LPF]-R202-C200-IC207(23-31)-CN201(13)-{CN600(16)-L601-C613-R628-IC600(60)} |
| DTMF/CNG detection (ON-HOOK) | | TEL LINE-T202-R317-C299-IC202(2-1)-R318-C202-IC207(20-31)-CN201(13)-{CN600(16)-L601-C612- R627-R658-C630-IC600(62)} |
| CALLER ID (FSK) detection | | TEL LINE-T202-R317-C299-IC202(2-1)-R318-C202-IC207(20-31)-CN201(13)-{CN600(16)-L601-C754- R770-IC602(2-10)-IC605(19)} |

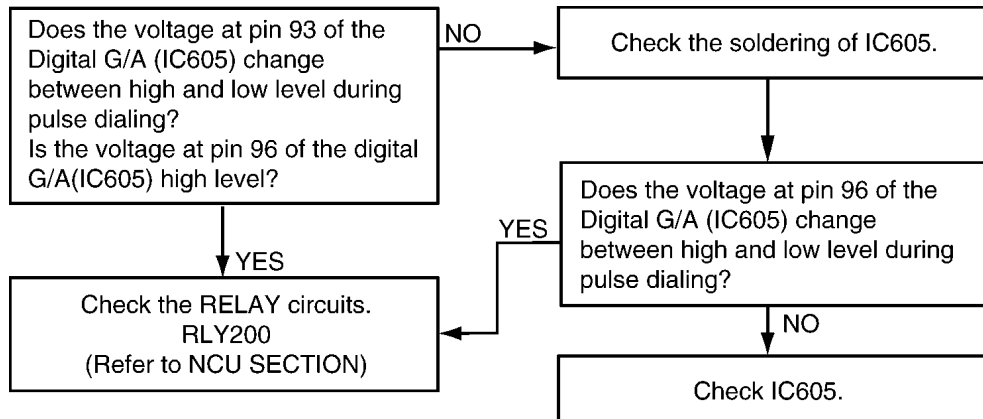
Note: { }: Inside the digital board

6.5.13.2. DEFECTIVE ITS (Integrated Telephone System) SECTION

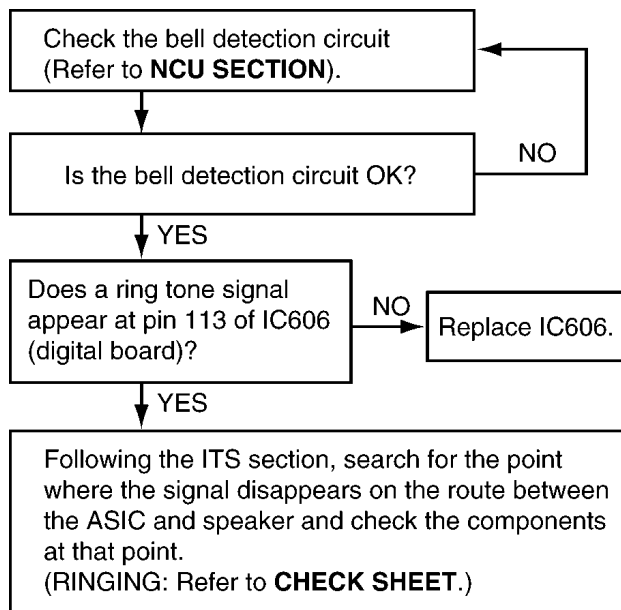
1. No handset and speakerphone transmission / reception

Perform a signal test in the **ITS or the NCU section** and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. **CHECK SHEET** (P.129) is useful for this investigation.

2. No pulse dialing



3. No ring tone (or No bell)

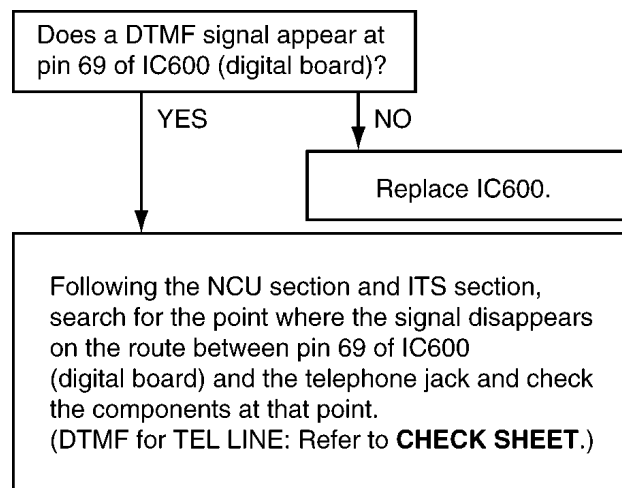


CROSS REFERENCE:

CHECK SHEET (P.129)

NCU SECTION (P.162)

4. No tone dialing

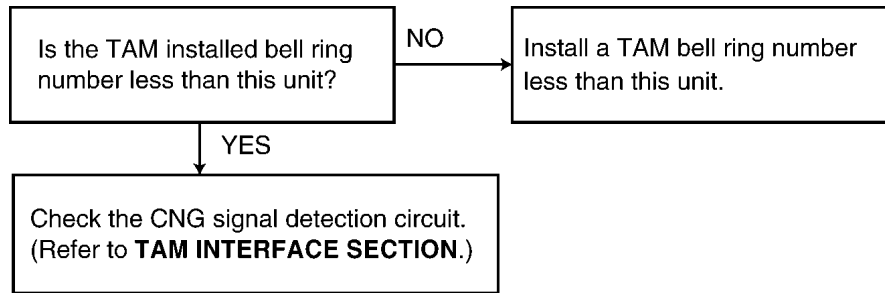


CROSS REFERENCE:

CHECK SHEET (P.129)

6.5.13.3. DETECTIVE TAM INTERFACE SECTION

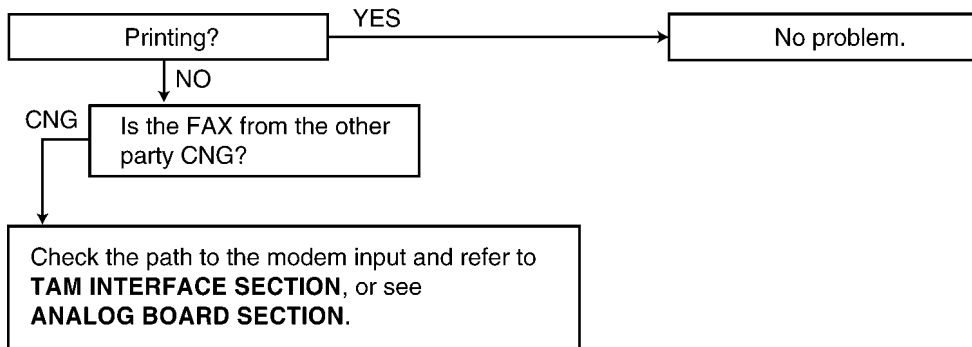
1. The FAX turns on, but does not arrive through TAM.



CROSS REFERENCE:

TAM INTERFACE SECTION (P.165)

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



CROSS REFERENCE:

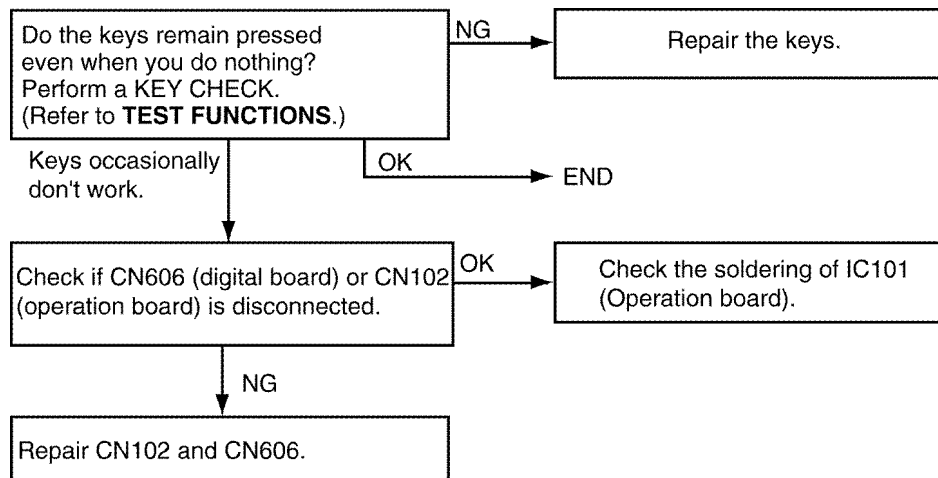
ANALOG BOARD SECTION (P.129)

TAM INTERFACE SECTION (P.165)

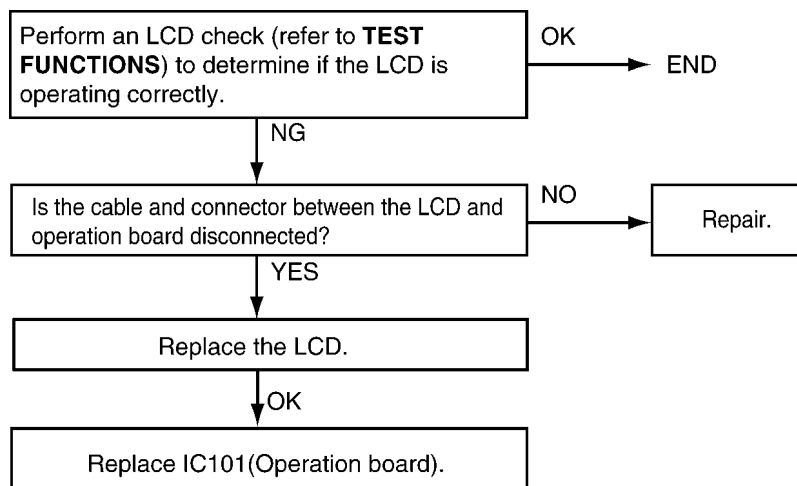
6.5.13.4. OPERATION PANEL SECTION

Refer to **TEST FUNCTIONS** (P.65).

1. NO KEY OPERATION



2. NO LCD INDICATION



CROSS REFERENCE:

TEST FUNCTIONS (P.65)

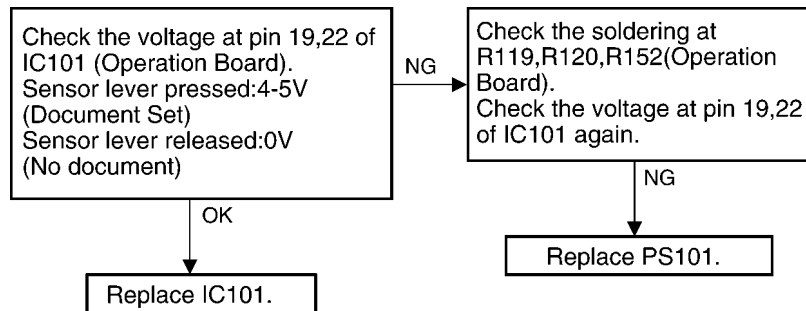
6.5.13.5. SENSOR SECTION

Refer to SENSORS AND SWITCHES for the circuit description.

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

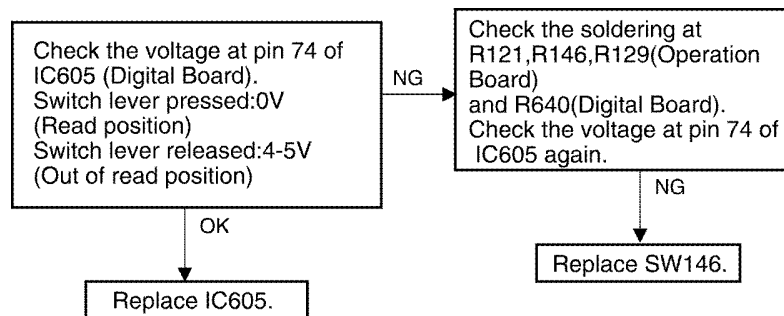
1. Check the “CHECK DOCUMENT”

Refer to LCD MESSAGE (P.4).

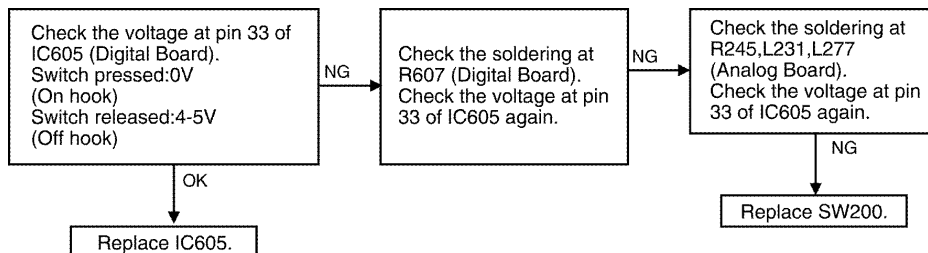


2. Check the paper feed sensor..... “REMOVE DOCUMENT”

Refer to LCD MESSAGE (P.4).

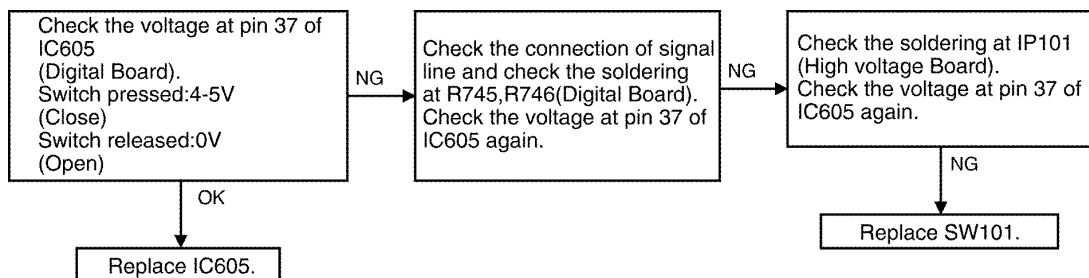


3. Check the hook switch



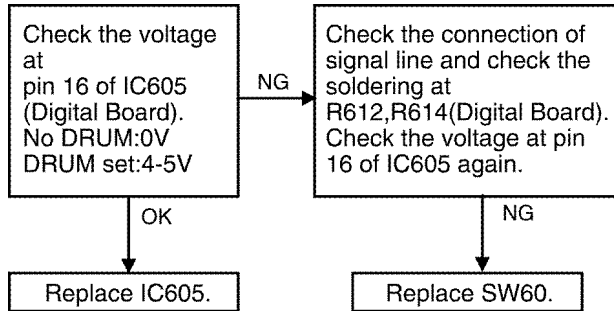
4. Check the cover open switch..... “COVER OPEN”

Refer to LCD MESSAGE (P.4).



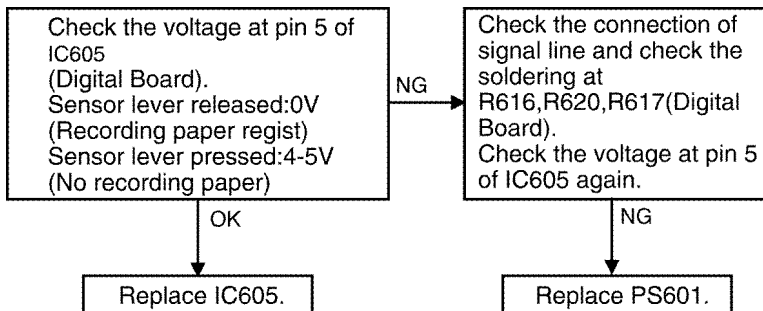
5. Check the DRUM sensor..... “CHECK DRUM”

Refer to **LCD MESSAGE** (P.4).



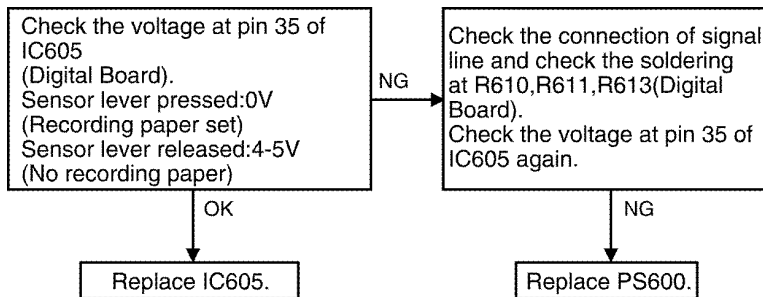
6. Check the regist sensor..... “FAILED PICKUP”

Refer to **LCD MESSAGE** (P.4).



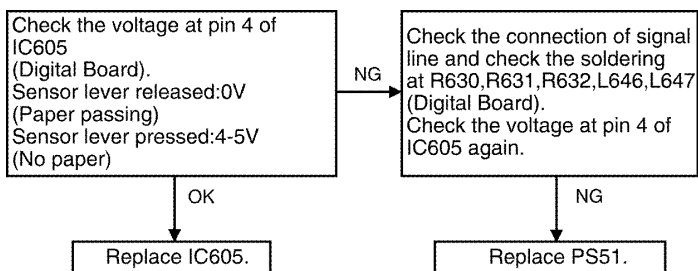
7. Check the paper sensor..... “OUT OF PAPER”

Refer to **LCD MESSAGE** (P.4).



8. Check the exit switch..... “PAPER JAMMED”

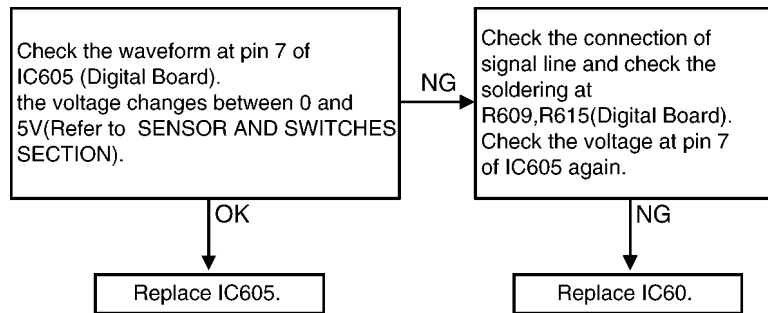
Refer to **LCD MESSAGE** (P.4).



9. Check the toner sensor..... “TONER LOW”, “CHANGE DRUM”

Refer to **LCD MESSAGE** (P.4).

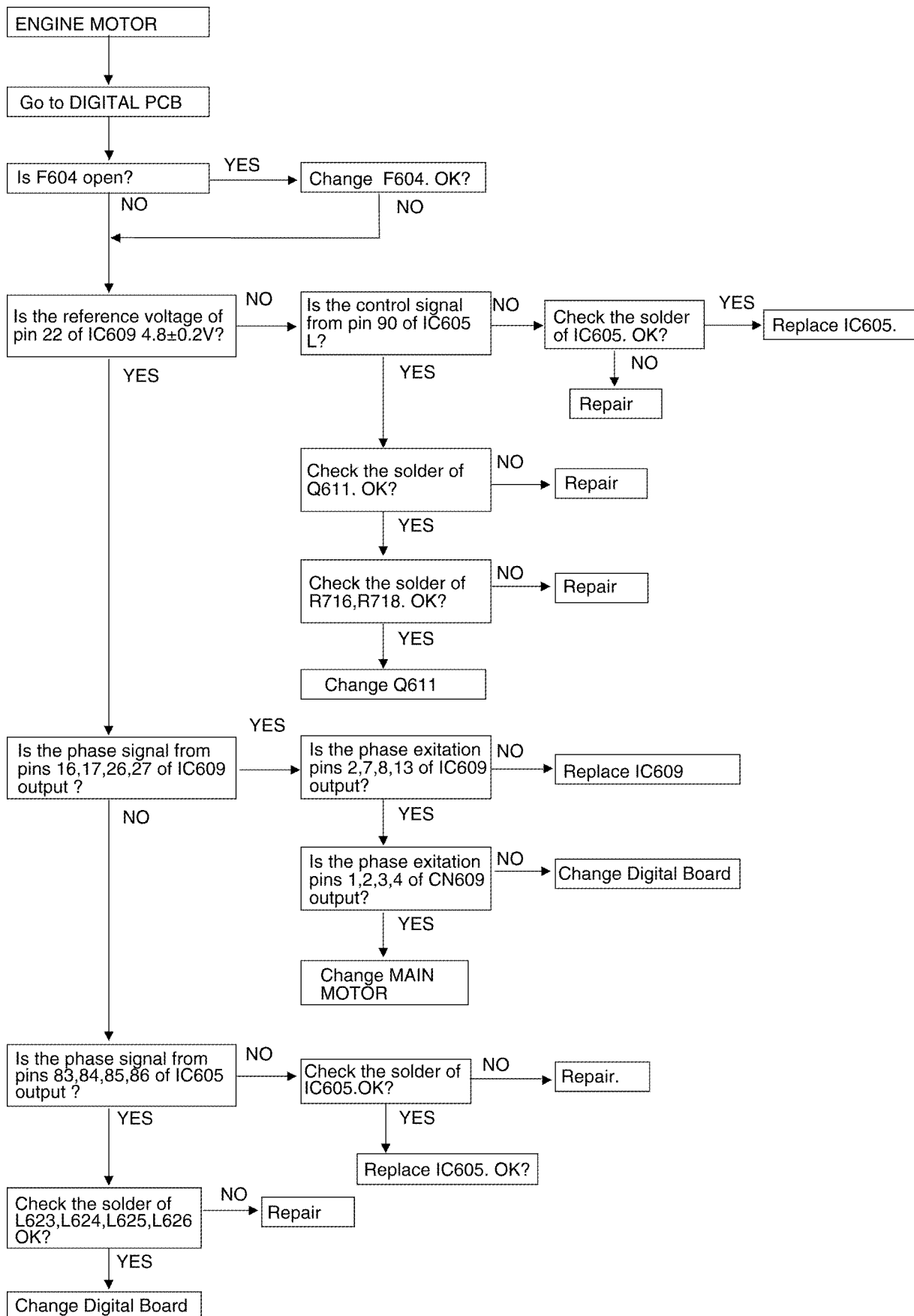
As for the following check, remove the drum from the main body, set it again and close the cover, then perform that check during initializing operation. Refer to **SENSORS AND SWITCHES SECTION** (P.176).

**CROSS REFERENCE:**

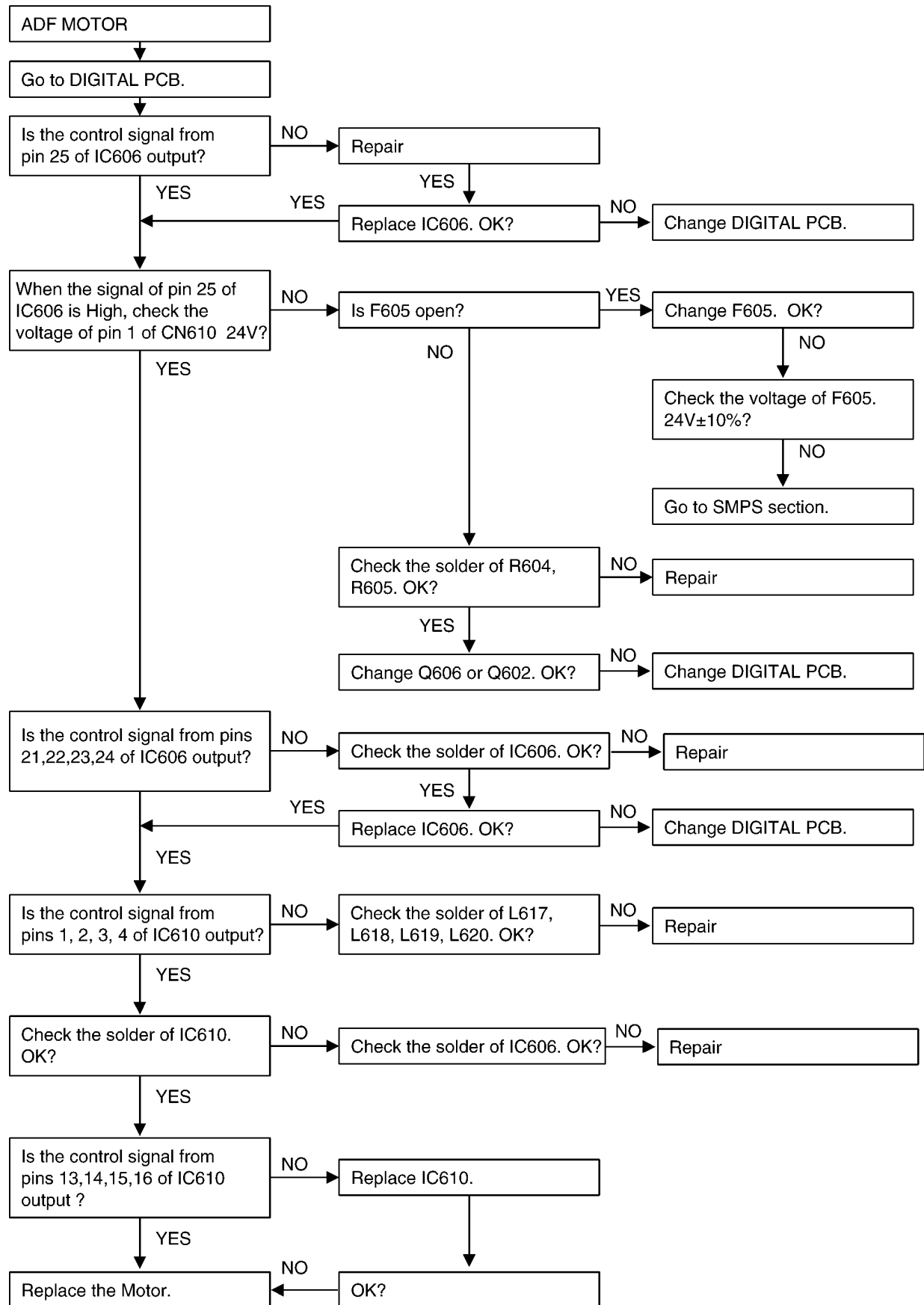
SENSORS AND SWITCHES SECTION (P.176)

6.5.13.6. MOTOR SECTION

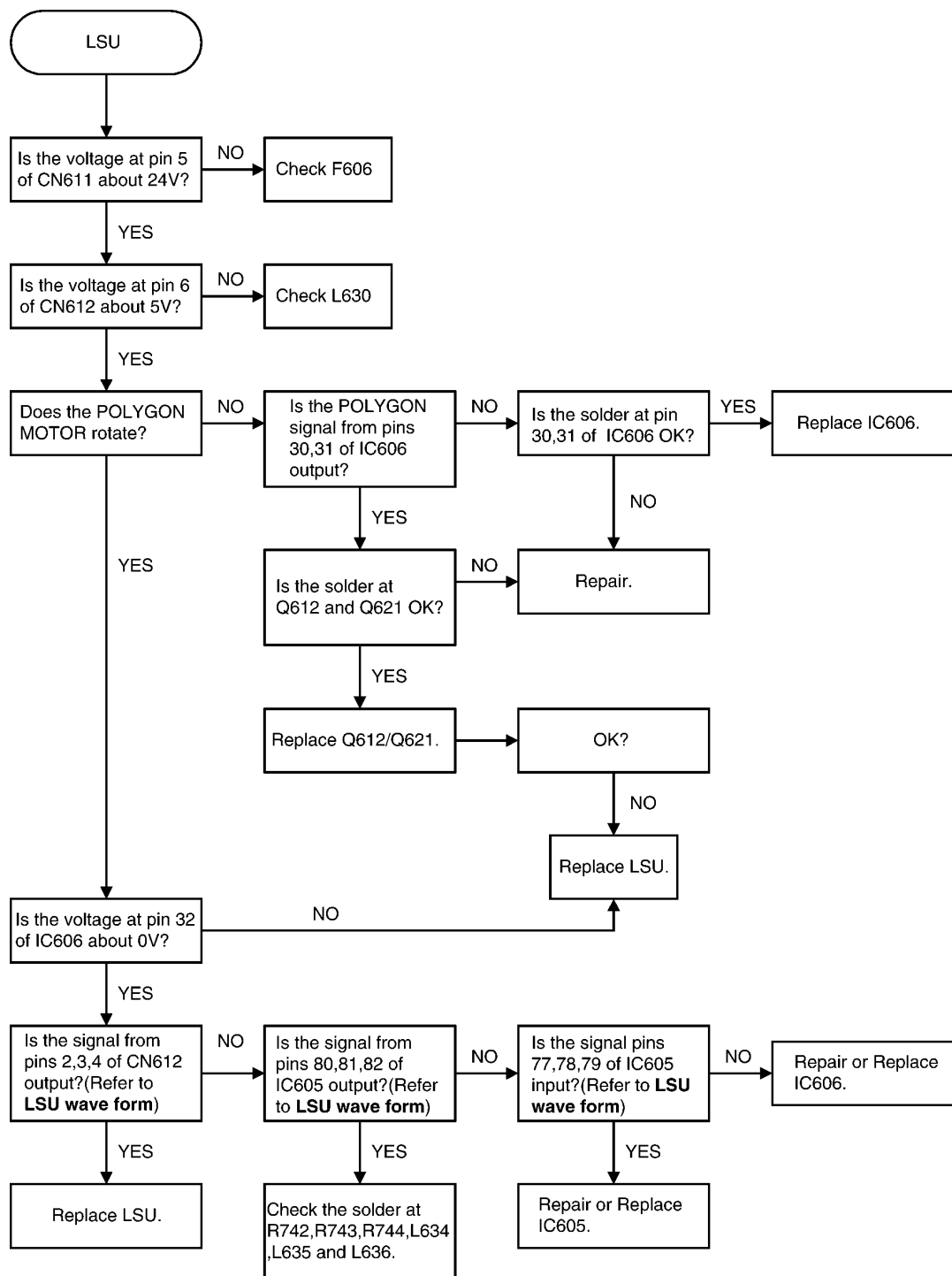
6.5.13.6.1. ENGINE MOTOR



6.5.13.6.2. ADF MOTOR



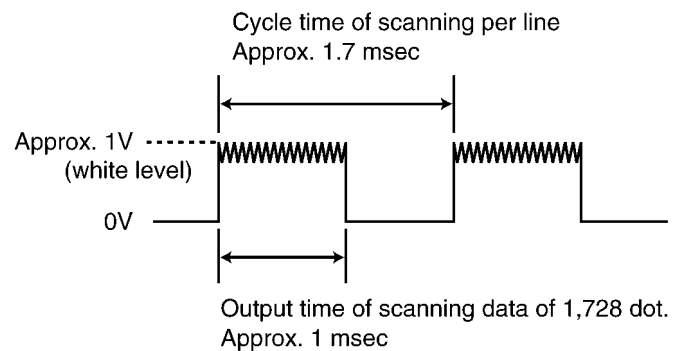
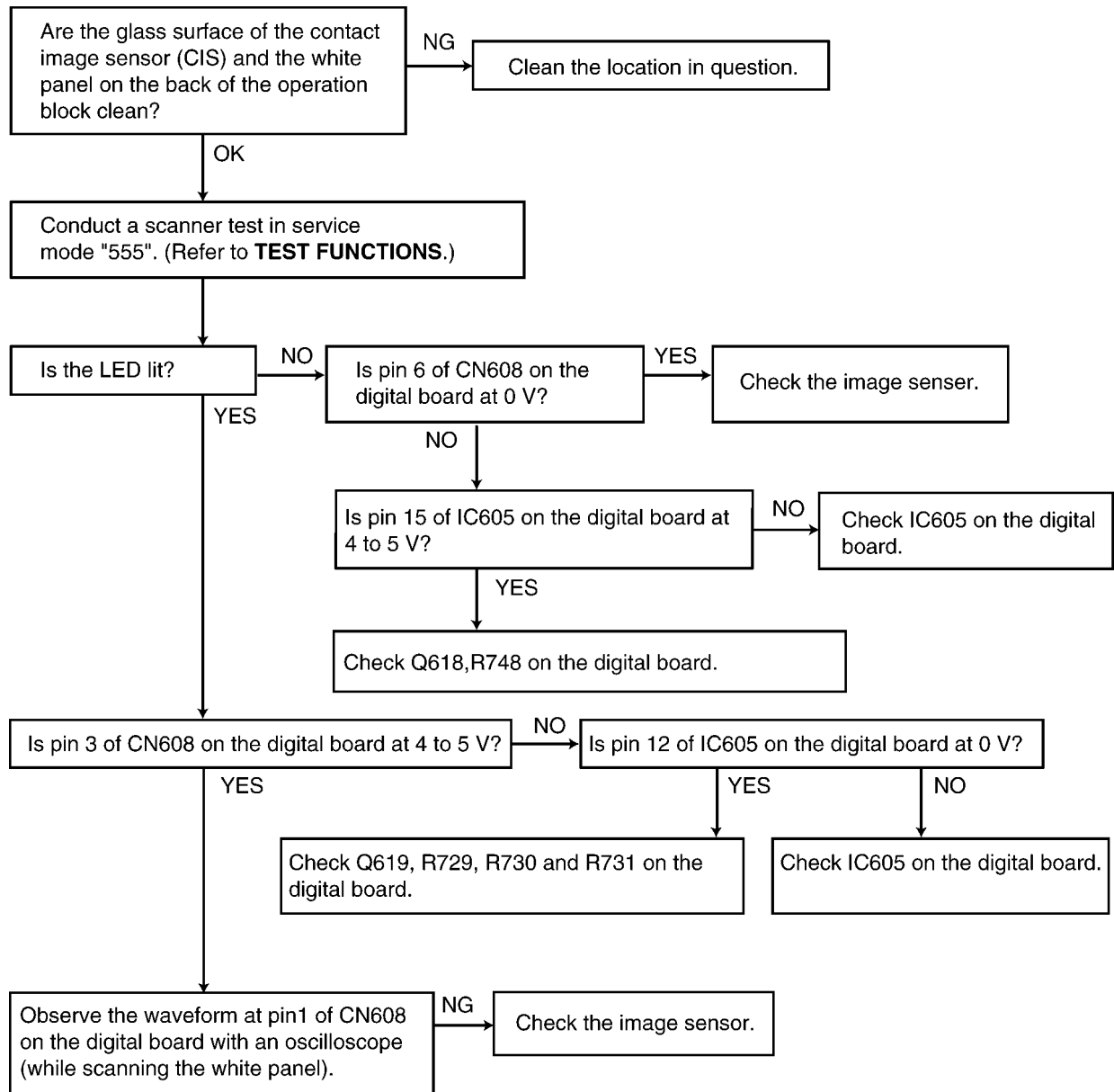
6.5.13.7. LSU SECTION



CROSS REFERENCE:

LSU (Laser Scanning Unit) SECTION (P.174)

6.5.14. CIS (Contact Image Sensor) SECTION



CROSS REFERENCE:
TEST FUNCTIONS (P.65)

6.5.15. HIGH VOLTAGE VALUE CHECK POINT

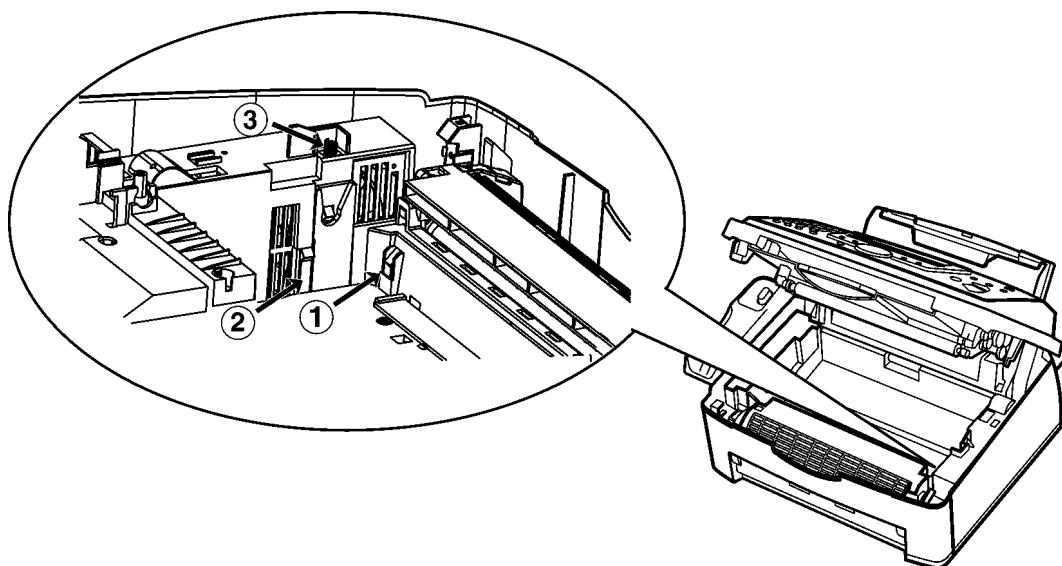
Measurement Procedure

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

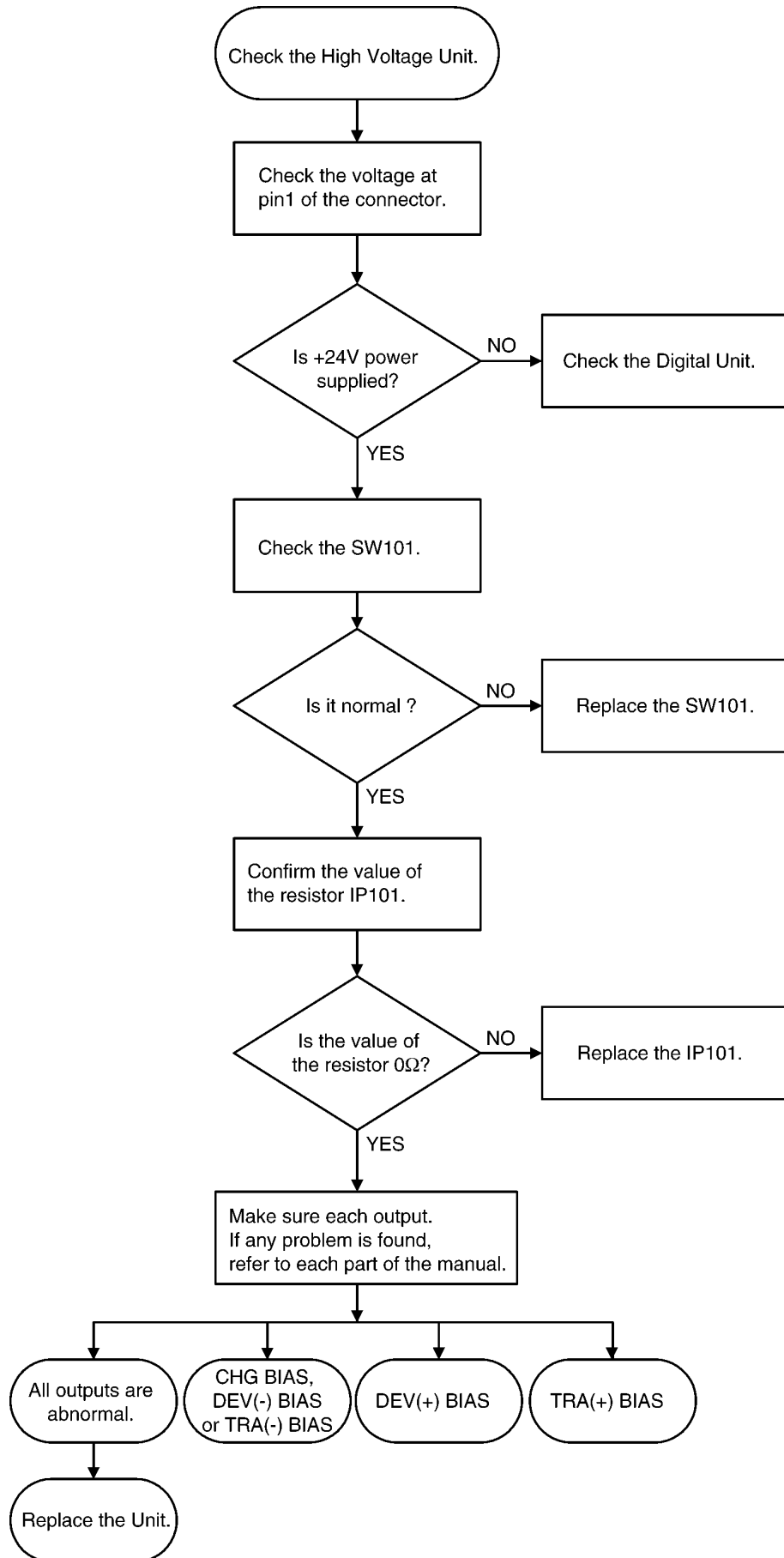
Output voltage of each terminal

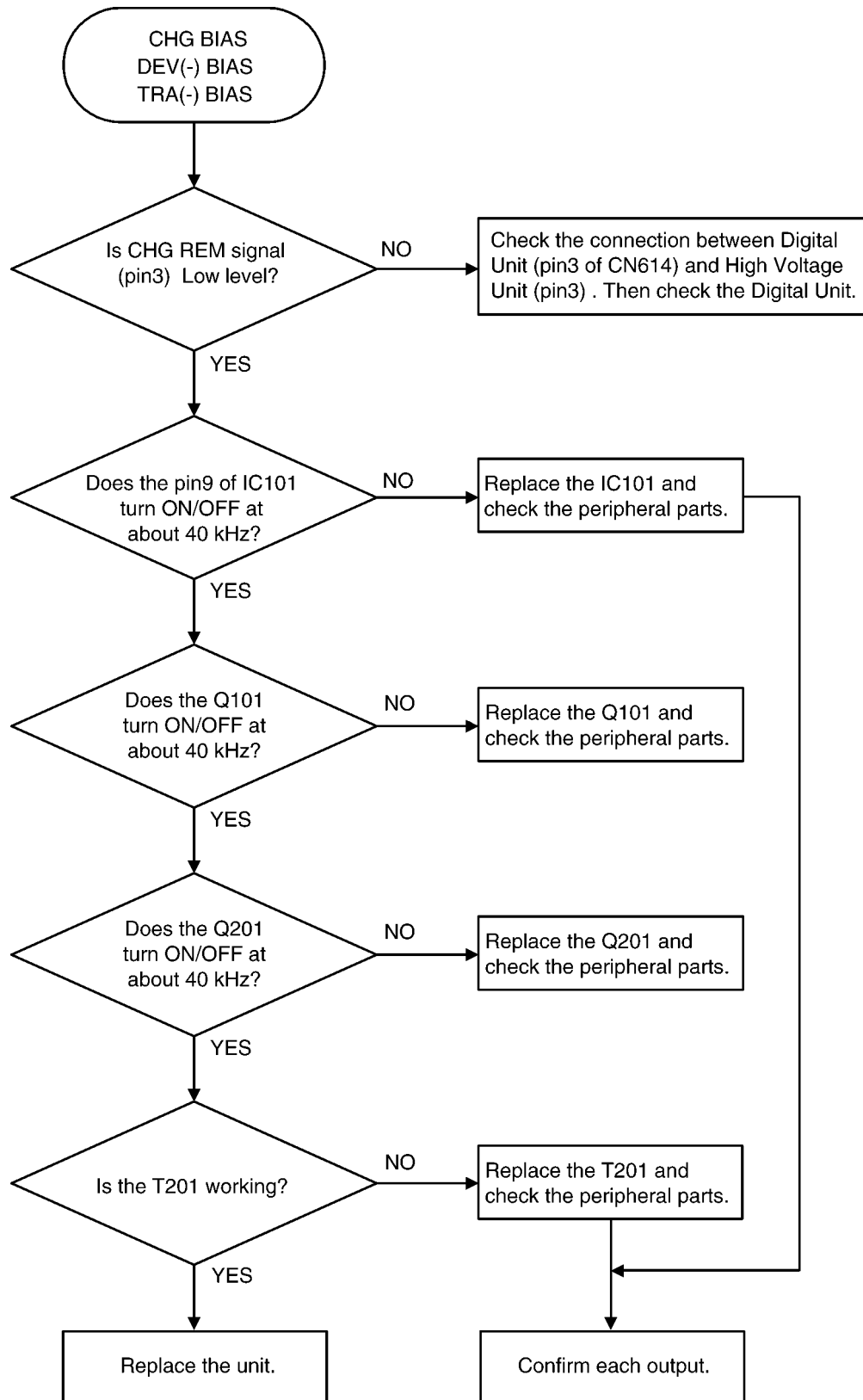
| No. | BIAS Name | Specified output voltage | The range of specified output voltage |
|-----|------------------|--------------------------|---------------------------------------|
| ① | CHG (Charge) | -1000V | -1000V± 30V |
| ② | DEV (Developing) | -200V | -200V± 15V |
| ③ | TRA (Transfer) | -1000V | -1000V± 100V |

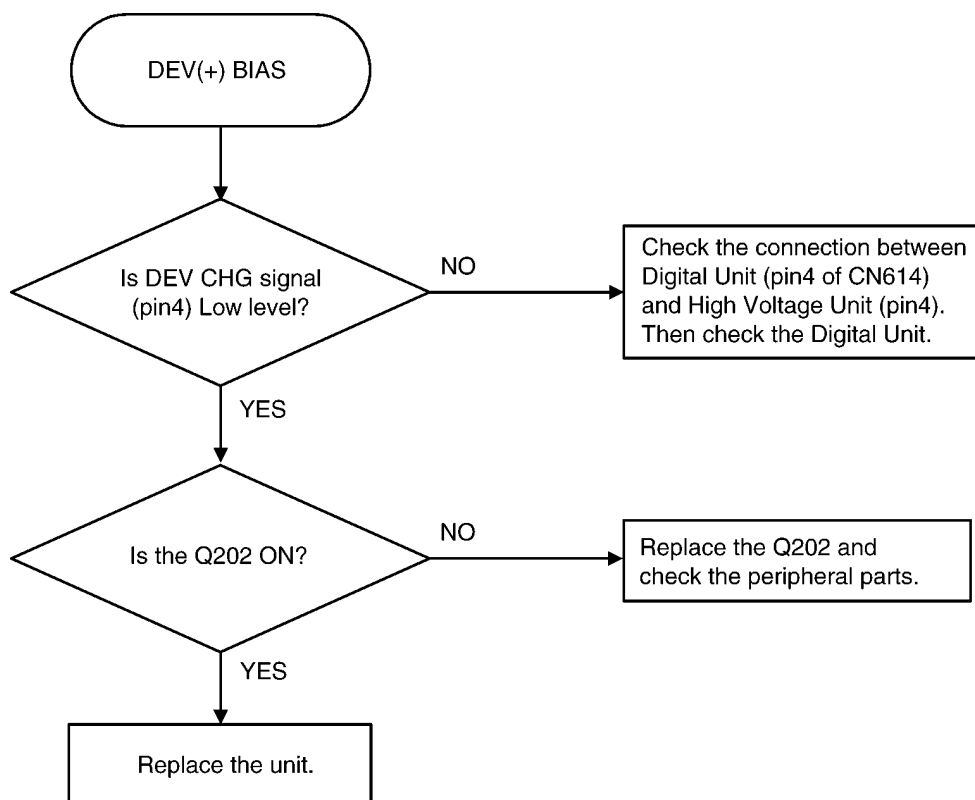
* As for the High Voltage test equipment, FLUKE 85 (MULTI METER)+ HIOKI (HV PROBE 9014) or the equivalent should be used.

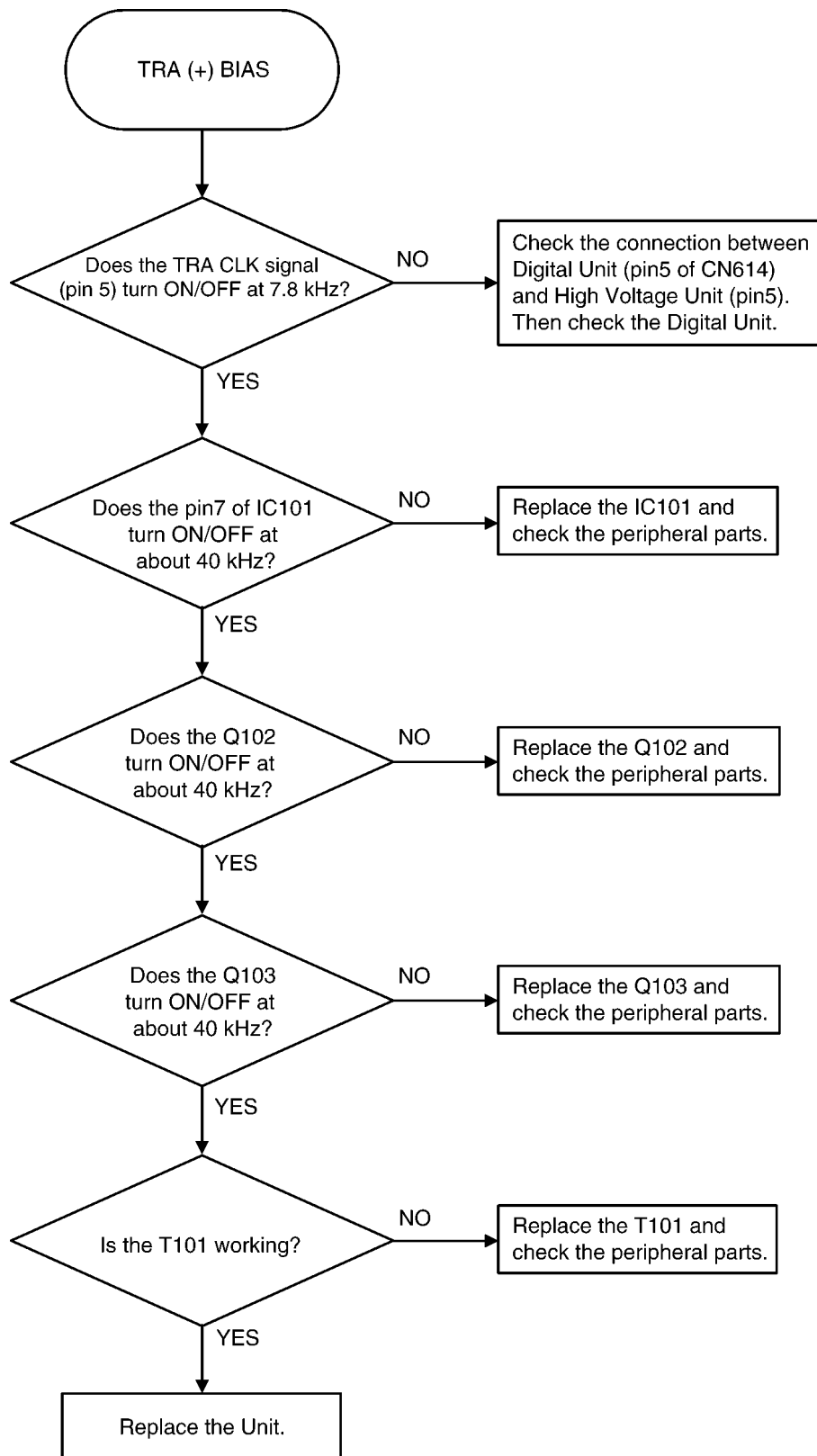


6.5.16. HIGH VOLTAGE SECTION









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

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

* As for the tester, FLUKE 85 III multi meter or the equivalent should be used.

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

6.5.17. POWER SUPPLY BOARD SECTION

6.5.17.1. KEY COMPONENTS FOR TROUBLESHOOTING

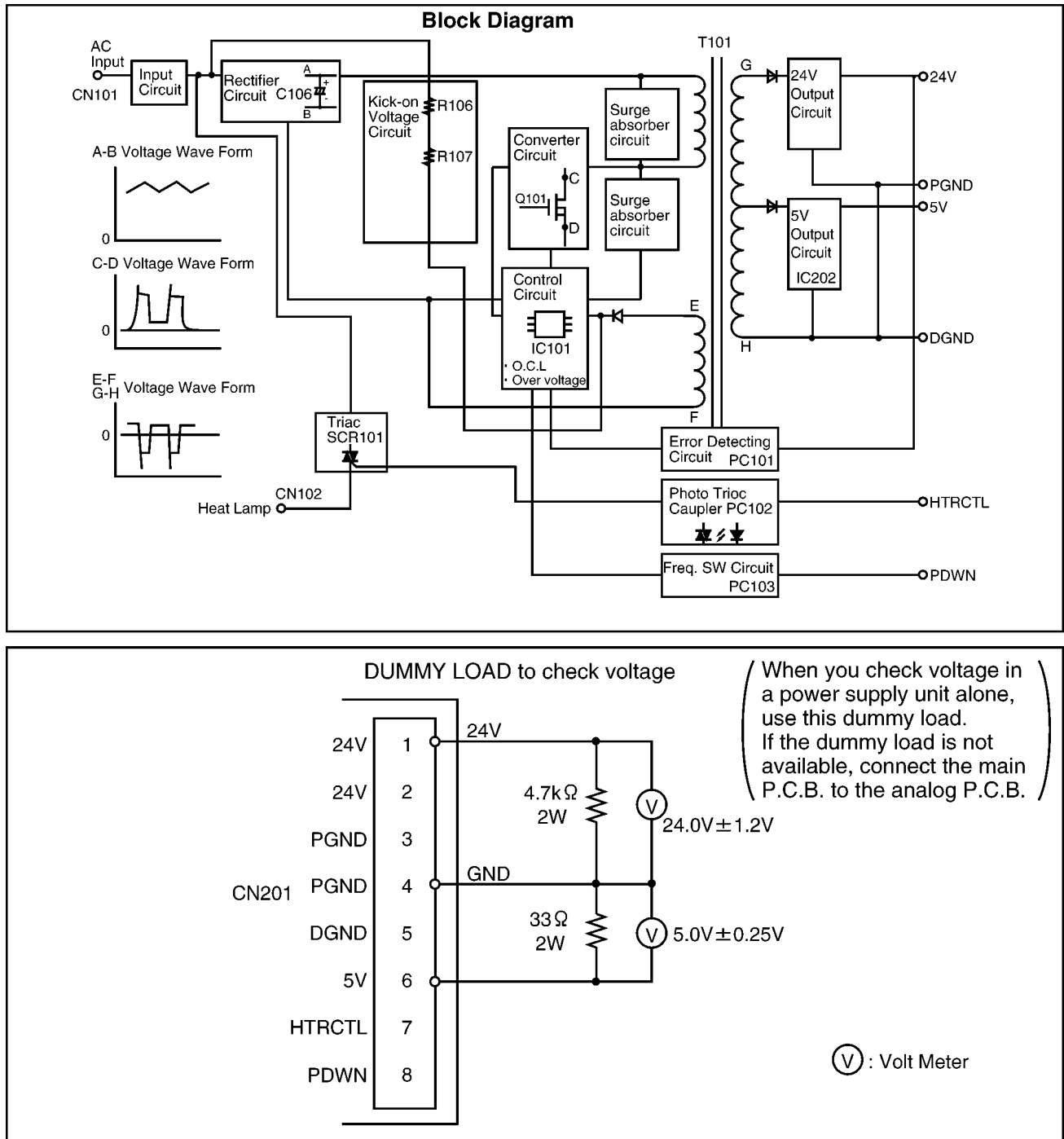
Check the following parts first: F101, D101-D104, C106, Q101, PC101 and IC101.

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

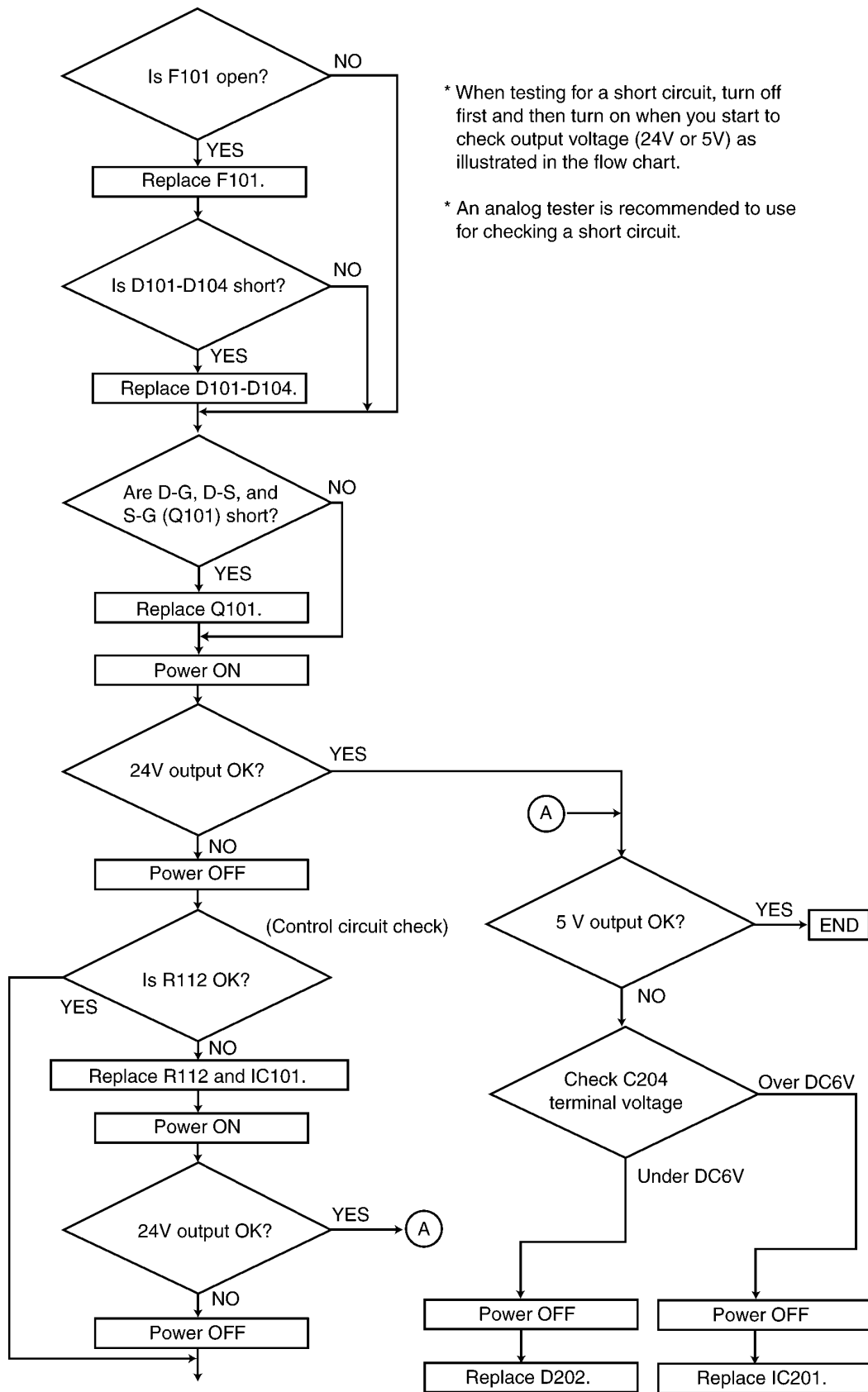
Caution:

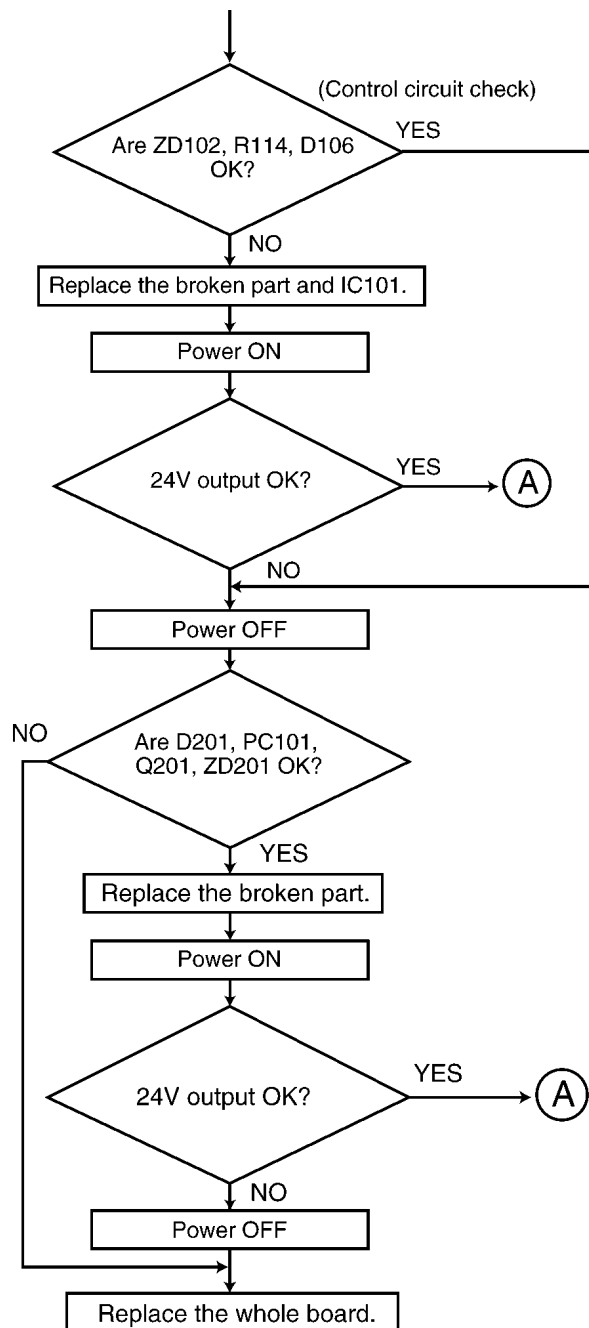
If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

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



6.5.17.2. TROUBLESHOOTING FLOW CHART





6.5.17.3. BROKEN PARTS REPAIR DETAILS

(D101~D104)

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

(Q101)

The worst case of Q101 is a short-circuit between the Drain and Gate because damage expands to the peripheral circuit of Q101.
This is due to a very high voltage through the Gate circuit which is composed of R109 and IC101.

You should change all of the parts listed as follows.

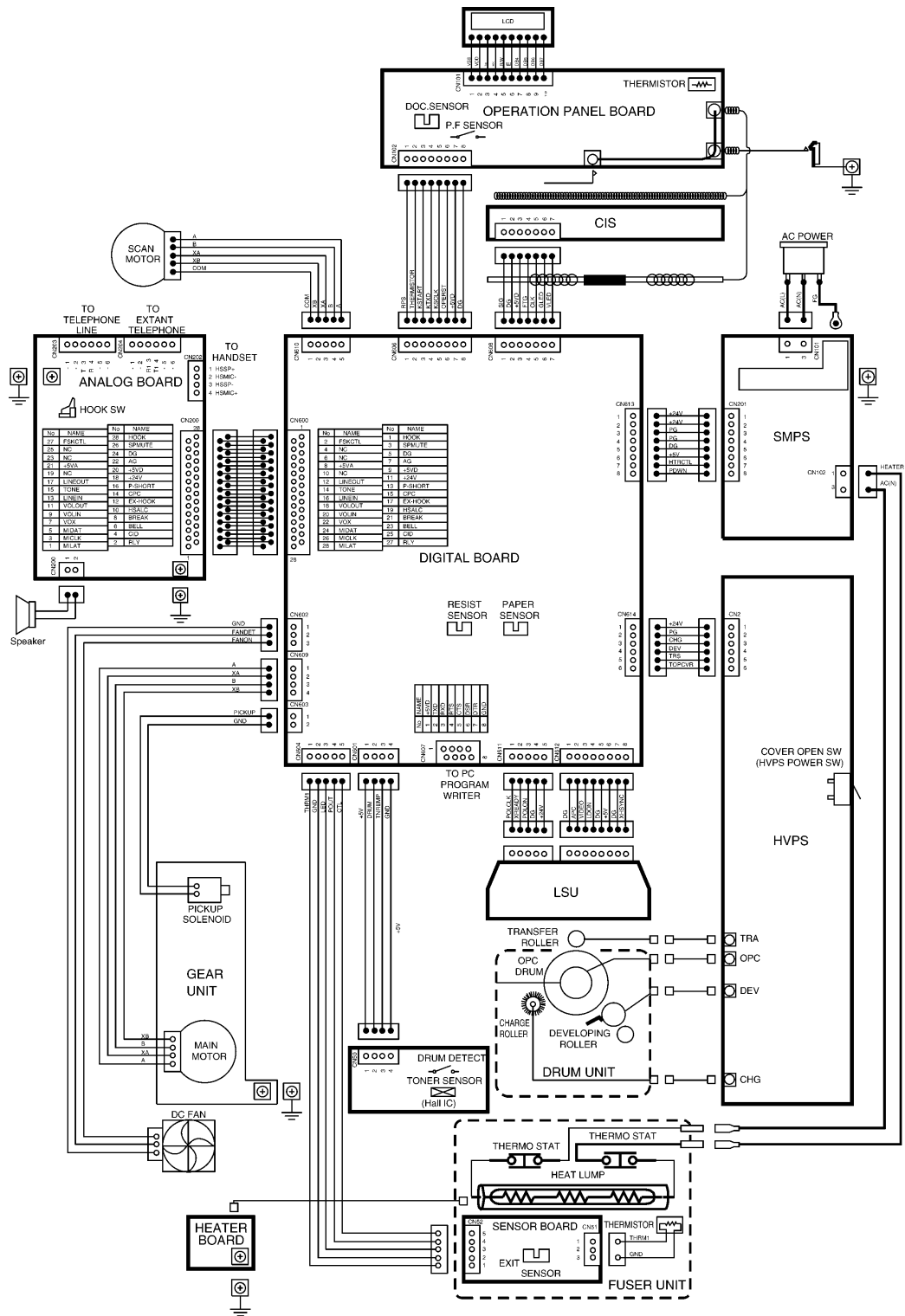
F101, Q101, R109, IC101

(D201)

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

7 CIRCUIT OPERATIONS

7.1. CONNECTION DIAGRAM



7.2. GENERAL BLOCK DIAGRAM

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

1. ASIC (IC606)

This custom IC is used for general FAX operations.

| | | |
|-----|--------------|--|
| (1) | CPU: | This model uses a Z80 equivalent CPU operating at 16MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the results. |
| (2) | RTC: | Real time clock. |
| (3) | DECODER: | Decodes the address. |
| (4) | ROM/RAM I/F: | Controls the SELECT signal of ROM or RAM and bank switching. |
| (5) | LSU I/F: | Controls the polygon motor and outputs the VIDEO signal to LSU. |
| (6) | I/O PORT: | I/O Port Interface. |
| (7) | ANALOG UNIT: | Sends beep tones, etc. Convert the analog signal to the digital signal. |
| (8) | MOTOR I/F: | Controls the SCAN Motor. |

2. G/A (IC605)

- (1) OPERATION PANEL I/F: Serial interface with Operation Panel.
- (2) ANALOG GATE ARRAY I/F: Controls the ANALOG GATE ARRAY.
- (3) MOTOR I/F: Controls the ENGINE Motor.
- (4) FAN I/F: Controls FAN MOTOR and detect the rotation of FAN MOTOR.
- (5) SENSOR I/F: Controls the LED and detect the sensor signal.
- (6) I/O PORT: I/O Port Interface.

3. ROM (IC607)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.

4. Synchronous Dynamic RAM (IC604)

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

5. MODEM (IC600)

Performs the modulation and the demodulation for FAX communication.

Detects the CALLER ID signal.

6. Read Section

CIS image sensor to read transmitted documents.

7. LSU (Laser Scanning Unit)

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

8. Analog Board

Composed of ITS circuit and NCU circuit.

9. Sensor Section

Composed of 4 switches and 5 sensors.

10. Power Supply Board Switching Section

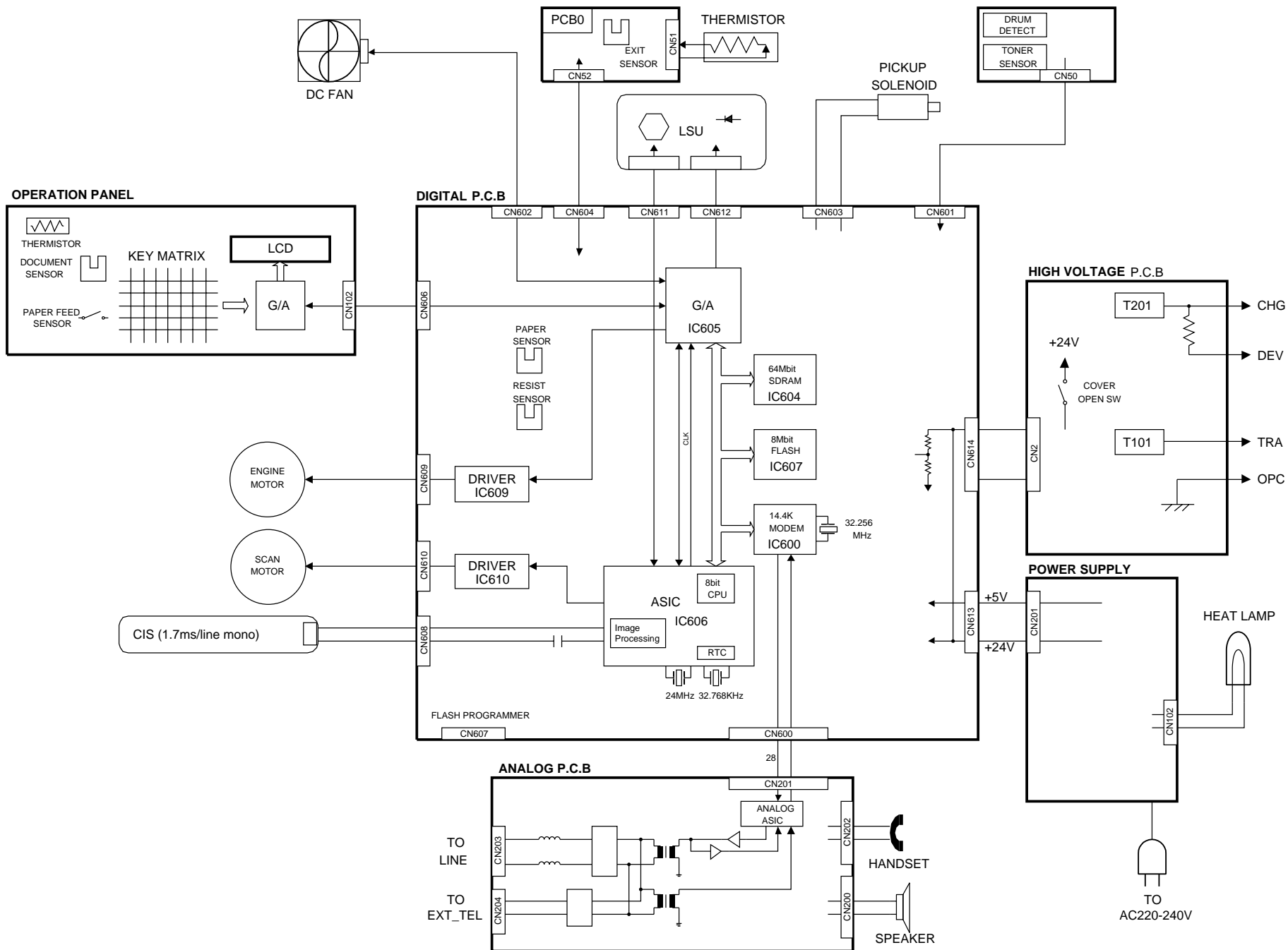
Supplies +5V and +24V to the unit and controls the HEATER.

11. High Voltage Power Supply Board Section

Supplies bias need for the printing operation: bias of the DRUM, Developing and Transcription.

12. Fixing Unit

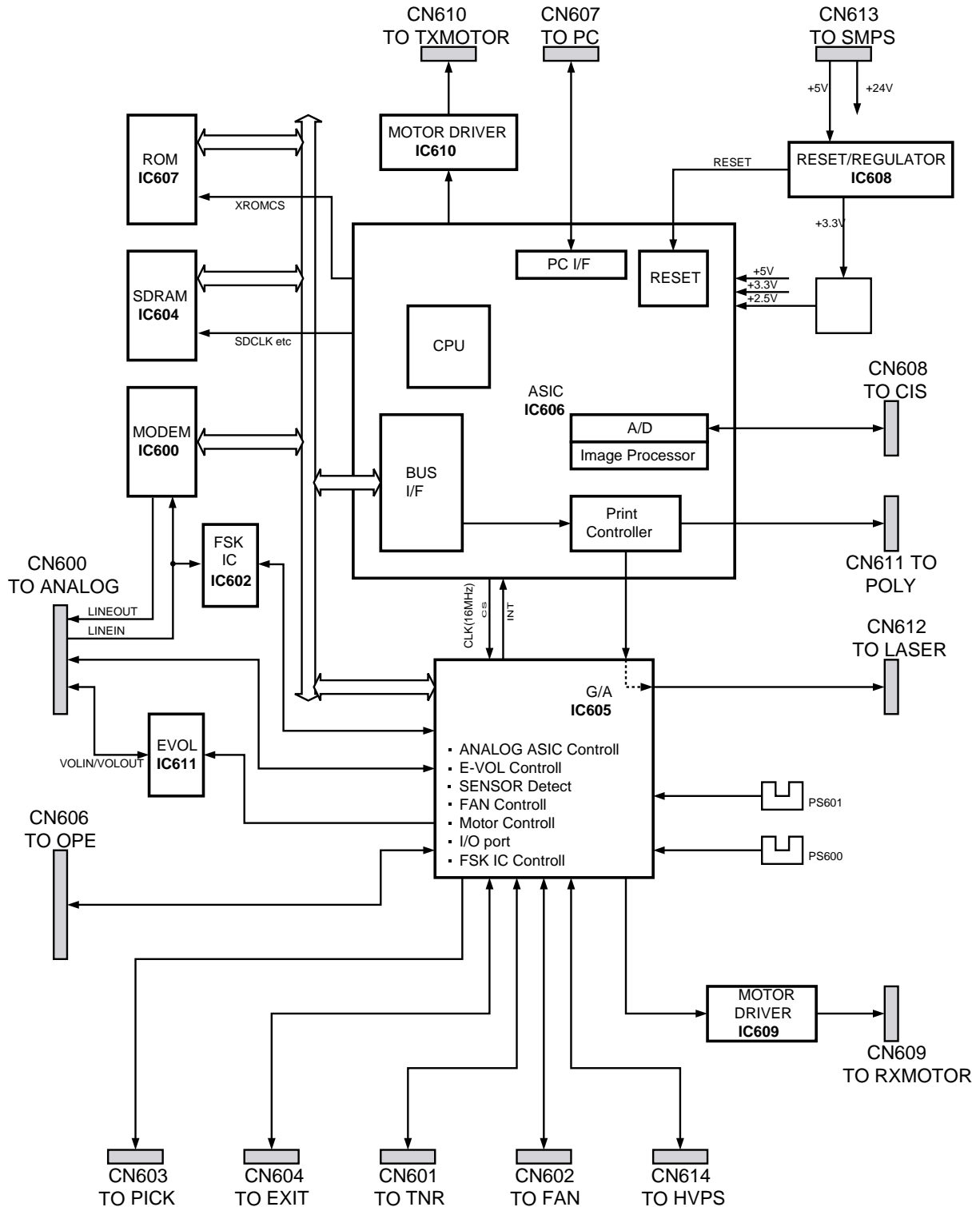
Composed heat lamp, thermistor and thermal fuse.



7.3. FACSIMILE SECTION

7.3.1. DIGITAL SECTION

7.3.1.1. DIGITAL BLOCK DIAGRAM



7.3.1.2. ASIC (IC606)

This custom IC is used for general FAX operations.

| | | |
|-----|--------------|--|
| (1) | CPU: | This model uses a Z80 equivalent CPU operating at 16MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the results. |
| (2) | RTC: | Real time clock. |
| (3) | DECORDER: | Decodes the address. |
| (4) | ROM/RAM I/F: | Controls the SELECT signal of ROM or RAM and bank switching. |
| (5) | LSU I/F: | Controls the polygon motor and outputs the VIDEO signal to LSU. |
| (6) | I/O PORT: | I/O Port Interface. |
| (7) | ANALOG UNIT: | Sends beep tones, etc. Convert the analog signal to the digital signal. |
| (8) | MOTOR I/F: | Controls the SCAN Motor. |

7.3.1.3. ROM (IC607)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.

7.3.1.4. GATE ARRAY (IC605)

- (1) OPERATION PANEL I/F: Serial interface with Operation Panel.
- (2) ANALOG GATE ARRAY I/F: Controls the ANALOG GATE ARRAY.
- (3) MOTOR I/F: Controls the ENGINE Motor.
- (4) FAN I/F: Controls FAN MOTOR and detect the rotation of FAN MOTOR.
- (5) SENSOR I/F: Controls the LED and detect the sensor signal.
- (6) I/O PORT: I/O Port Interface.

7.3.1.5. SYNCHRONOUS DYNAMIC RAM (IC604)

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

7.3.1.6. MODEM(IC600)

Performs the modulation and the demodulation for FAX communication.

Detects the CALLER ID (DTMF) signal.

7.3.1.7. FSK RECEIVER (IC602)

Detects the CALLER ID (FSK) signal.

Description of Pin Distribution (IC606)

| PIN No. | SIGNAL | I/O | POWER SUPPLIED VOLTAGE | EXPLANATION |
|---------|------------------|-----|------------------------|--------------------------------------|
| 1 | VSS | GND | GND | GND |
| 2 | VDD3.3A | PWR | 3.3V | POWER SOURCE |
| 3 | AIN1 | AI | 3.3V | IMAGE DATA FROM CIS |
| 4 | AIN2 | AI | 3.3V | THERMISTOR ON FUSE UNIT |
| 5 | AIN3 | AI | 3.3V | THERMISTOR ON OPE UNIT |
| 6 | AMON | AO | 3.3V | NOT USED |
| 7 | VSS | GND | GND | GND |
| 8 | X32OUT | O | 3.3VBATT | RTC(32.768KHz) |
| 9 | X32IN | I | 3.3VBATT | RTC(32.768KHz) |
| 10 | 3.3VBATIN | I | 3.3VBATT | POWER SOURCE(+3.3V/LITHIUM BATTERY) |
| 11 | XBACKEN | I | 3.3VBATT | BACKUP ENABLE(CONNECT TO RESET LINE) |
| 12 | RESCS2/CLKE/OP02 | O | 3.3VBATT | NOT USED |
| 13 | 3.3VBATOUT | O | 3.3VBATT | POWER SOURCE(+3.3V/LITHIUM BATTERY) |
| 14 | 2.5VBATIN | I | 2.5VBATT | POWER SOURCE(+2.5V/LITHIUM BATTERY) |
| 15 | XRESET | I | 3.3V | RESET FOR INTERNAL CIRCUIT OF IC606 |
| 16 | XORESET | O | 3.3V | SYSTEM RESET OUTPUT |
| 17 | VSS | GND | GND | GND |
| 18 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 19 | XRESETI | I | 3.3V | RESET INPUT |
| 20 | XWDERR | O | 3.3V | WATCH DOG ERROR OUTPUT |
| 21 | TM0/IOP10 | O | 3.3V | TX MOTOR CONTROL |
| 22 | TM1/IOP11 | O | 3.3V | TX MOTOR CONTROL |

| PIN No. | SIGNAL | I/O | POWER SUPPLIED VOLTAGE | EXPLANATION |
|---------|---------------------|-----|------------------------|------------------------------------|
| 23 | TM2/IOP12 | O | 3.3V | TX MOTOR CONTROL |
| 24 | TM3/IOP13 | O | 3.3V | TX MOTOR CONTROL |
| 25 | TXE/IOP14 | O | 3.3V | TX MOTOR POWER CONTROL |
| 26 | VSS | GND | GND | GND |
| 27 | VDD2.5V | PWR | 2.5V | POWER SOURCE |
| 28 | TRS/OP06 | O | 3.3V | TRANSFER BIAS CONTROL |
| 29 | HTRCTL | O | 3.3V | HEATER CONTROL |
| 30 | POLCLK | O | 3.3V | LSU CONTROL(POLYGON MOTOR CLOCK) |
| 31 | POLON | O | 3.3V | LSU CONTROL(POLYGON MOTOR) |
| 32 | XREADY | I | 3.3V | LSU CONTROL |
| 33 | XHSYNC | I | 3.3V | LSU CONTROL |
| 34 | LDON | O | 3.3V | LSU CONTROL |
| 35 | APC | O | 3.3V | LSU CONTROL |
| 36 | VIDEO | O | 3.3V | LSU CONTROL(VIDEO SIGNAL) |
| 37 | XHSTRD/RBA[9]/IP00 | I | 3.3V | NOT USED |
| 38 | XHSTWR/RBA[10]/IP01 | I | 3.3V | NOT USED |
| 39 | RESINT | I | 3.3V | INTERRUPT FROM IC605 |
| 40 | XRESCS1 | O | 3.3V | CHIP SELECT FOR IC605 |
| 41 | RESCLK | O | 3.3V | CLOCK FOR IC605 |
| 42 | VSS | GND | GND | GND |
| 43 | VDD2.5V | PWR | 2.5V | POWER SOURCE |
| 44 | XOUT | O | 3.3V | SYSTEM CLOCK(24MHz) |
| 45 | XIN | I | 3.3V | SYSTEM CLOCK(24MHz) |
| 46 | VSS | GND | GND | GND |
| 47 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 48 | IOP07 | O | 3.3V | OUTPUT PORT(FLASH WRITE PROTECT) |
| 49 | XCHKCS/ÇnÇo03 | O | 3.3V | NOT USED |
| 50 | XROMCS | O | 3.3V | ROM(IC607) CHIP SELECT |
| 51 | XRD | O | 3.3V | CPU RD |
| 52 | XWR | O | 3.3V | CPU WR |
| 53 | DB0 | I/O | 3.3V | DATA BUS 0 |
| 54 | DB1 | I/O | 3.3V | DATA BUS 1 |
| 55 | DB2 | I/O | 3.3V | DATA BUS 2 |
| 56 | DB3 | I/O | 3.3V | DATA BUS 3 |
| 57 | DB4 | I/O | 3.3V | DATA BUS 4 |
| 58 | DB5 | I/O | 3.3V | DATA BUS 5 |
| 59 | DB6 | I/O | 3.3V | DATA BUS 6 |
| 60 | DB7 | I/O | 3.3V | DATA BUS 7 |
| 61 | DB8 | I/O | 3.3V | DATA BUS 8 |
| 62 | DB9 | I/O | 3.3V | DATA BUS 9 |
| 63 | DB10 | I/O | 3.3V | DATA BUS 10 |
| 64 | VSS | GND | GND | GND |
| 65 | VDD2.5V | PWR | 2.5V | POWER SOURCE |
| 66 | DB11 | I/O | 3.3V | DATA BUS 11 |
| 67 | DB12 | I/O | 3.3V | DATA BUS 12 |
| 68 | DB13 | I/O | 3.3V | DATA BUS 13 |
| 69 | DB14 | I/O | 3.3V | DATA BUS 14 |
| 70 | DB15 | I/O | 3.3V | DATA BUS 15 |
| 71 | VDD5V | PWR | 5V | POWER SOURCE |
| 72 | VSS | GND | GND | GND |
| 73 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 74 | SDCS | O | 3.3V | SDRAM(IC604) CHIP SELECT |
| 75 | RAS | O | 3.3V | SDRAM(IC604) ROW ADDRESS STROBE |
| 76 | CAS | O | 3.3V | SDRAM(IC604) COLUMN ADDRESS STROBE |
| 77 | SDWE | O | 3.3V | SDRAM(IC604) WR SIGNAL |
| 78 | SDDQMU | O | 3.3V | SDRAM(IC604) CONTROL |
| 79 | SDDQML | O | 3.3V | SDRAM(IC604) CONTROL |
| 80 | VSS | GND | GND | GND |
| 81 | SDCLK | O | 3.3V | SDRAM(IC604) CLOCK |
| 82 | VSS | GND | GND | GND |
| 83 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 84 | ADR0 | O | 3.3V | ADDRESS BUS 0 |
| 85 | ADR1 | O | 3.3V | ADDRESS BUS 1 |
| 86 | ADR2 | O | 3.3V | ADDRESS BUS 2 |
| 87 | ADR3 | O | 3.3V | ADDRESS BUS 3 |
| 88 | ADR4 | O | 3.3V | ADDRESS BUS 4 |

| PIN No. | SIGNAL | I/O | POWER SUPPLIED VOLTAGE | EXPLANATION |
|---------|-------------|-----|------------------------|--------------------------------------|
| 89 | ADR5 | O | 3.3V | ADDRESS BUS 5 |
| 90 | ADR6 | O | 3.3V | ADDRESS BUS 6 |
| 91 | ADR7 | O | 3.3V | ADDRESS BUS 7 |
| 92 | ADR8 | O | 3.3V | ADDRESS BUS 8 |
| 93 | ADR9 | O | 3.3V | ADDRESS BUS 9 |
| 94 | ADR10 | O | 3.3V | ADDRESS BUS 10 |
| 95 | ADR11 | O | 3.3V | ADDRESS BUS 11 |
| 96 | ADR12 | O | 3.3V | ADDRESS BUS 12 |
| 97 | VSS | GND | GND | GND |
| 98 | VDD2.5V | PWR | 2.5V | POWER SOURCE |
| 99 | RBA0 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 0 |
| 100 | RBA1 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 1 |
| 101 | RBA2 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 2 |
| 102 | RBA3 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 3 |
| 103 | RBA4 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 4 |
| 104 | RBA5 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 5 |
| 105 | RBA6 | O | 3.3V | ROM/RAM BAKN ADDRESS BUS 6 |
| 106 | RBA7/OP04 | O | 3.3V | NOT USED |
| 107 | RBA8/OP05 | O | 3.3V | NOT USED |
| 108 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 109 | VSS | GND | GND | GND |
| 110 | EVOLIN | AI | 3.3V | NOT USED |
| 111 | EVOLOUT | AO | 3.3V | NOT USED |
| 112 | EVOLREF | AI | 3.3V | NOT USED |
| 113 | TONE | AO | 3.3V | TONE OUTPUT |
| 114 | XMDMCS | O | 3.3V | MODEM(IC600) CHIP SELECT |
| 115 | XMDMINT | I | 3.3V | MODEM(IC600) INTERRUPT |
| 116 | CPC/IOP27 | O | 3.3V | NOT USED |
| 117 | ADR13/IOP15 | O | 3.3V | NOT USED |
| 118 | ADR14/IOP16 | O | 3.3V | NOT USED |
| 119 | ADR15/IOP17 | O | 3.3V | NOT USED |
| 120 | XNMI/XINT | I | 3.3V | NOT USED |
| 121 | TEST1 | I | 3.3V | NOT USED |
| 122 | TEST2 | I | 3.3V | NOT USED |
| 123 | TEST3 | I | 3.3V | NOT USED |
| 124 | TEST4 | I | 3.3V | NOT USED |
| 125 | VDD2.5V | PWR | 2.5V | POWER SOURCE |
| 126 | VSS | GND | GND | GND |
| 127 | F1 | O | 3.3V | CLOCK FOR CIS |
| 128 | FTG | O | 3.3V | STROBE FOR CIS |
| 129 | TXD/IOP20 | O | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 130 | RXD/IOP21 | I | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 131 | RTS/IOP22 | O | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 132 | CTS/IOP23 | I | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 133 | DSR/IOP24 | I | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 134 | DTR/IOP25 | O | 3.3V | RS232C CONTROL(FOR SERVICE FUNCTION) |
| 135 | DCD/IOP26 | O | 3.3V | RESET FOR MODEM |
| 136 | ADSEL1 | O | 3.3V | CHANNEL SELECT FOR AIN |
| 137 | ADSEL2 | O | 3.3V | CHANNEL SELECT FOR AIN |
| 138 | VDD3.3V | PWR | 3.3V | POWER SOURCE |
| 139 | VSS | GND | GND | GND |
| 140 | VDD2.5A | PWR | 2.5V | POWER SOURCE |
| 141 | VREFB | AO | 3.3V | STANDARD VOLTAGE FOR A/D |
| 142 | VCL | AO | 3.3V | STANDARD VOLTAGE FOR A/D |
| 143 | VREFT | AO | 3.3V | STANDARD VOLTAGE FOR A/D |
| 144 | VSSA | GND | GND | GND |

Description of Pin Distribution (IC605)

| PIN No. | SIGNAL | I/O | POWER SUPPLY VOLTAGE | EXPLANATION |
|---------|---------------|-----|----------------------|--------------------------|
| 1 | VSS | 0V | GND | GND |
| 2 | SENCTL2/IOP06 | O | 5V | NOT USED |
| 3 | SENCTL3/IOP07 | I | 5V | INPUT PORT(EX-HOOK) |
| 4 | SENIN0/IOP00 | I | 5V | INPUT FROM EXIT SENSOR |
| 5 | SENIN1/IOP01 | I | 5V | INPUT FROM REGIST SENSOR |
| 6 | SENIN2/IOP02 | I | 5V | INPUT PORT(BELL) |

| PIN No. | SIGNAL | I/O | POWER SUPPLY VOLTAGE | EXPLANATION |
|---------|---------------------|------|----------------------|-------------------------|
| 7 | SENIN3/IOP03 | I | 5V | INPUT PORT(TNREMP) |
| 8 | IOP63/XCBUSY1 | O | 5V | NOT USED |
| 9 | IOP64/XCBUSY2 | O | 5V | NOT USED |
| 10 | IOP30(XHSYNC) | I | 5V | INPUT PORT(XHSYNC) |
| 11 | IOP31 | O | 5V | NOT USED |
| 12 | IOP32 | O | 5V | OUTPUT PORT(CISON) |
| 13 | 5V | 5V | 5V | POWER SOURCE |
| 14 | VSS | 0V | GND | GND |
| 15 | IOP33 | O | 5V | OUTPUT PORT(CISLEDON) |
| 16 | IOP34 | I | 5V | INPUT PORT(DRUM) |
| 17 | IOP35 | O | 5V | OUTPUT PORT(PICKUP) |
| 18 | IOP36 | O | 5V | NOT USED |
| 19 | IOP37 | O | 5V | NOT USED |
| 20 | IOP40 | O | 5V | NOT USED |
| 21 | IOP41 | O | 5V | NOT USED |
| 22 | IOP42 | O | 5V | OUTPUT PORT(OPERST) |
| 23 | IOP43 | O | 5V | OUTPUT PORT(VOL0) |
| 24 | IOP44 | O | 5V | OUTPUT PORT(VOL1) |
| 25 | 5V | 5V | 5V | POWER SOURCE |
| 26 | VSS | 0V | GND | GND |
| 27 | MILAT/IOP10 | O | 5V | ANALOG ASIC CONTROL |
| 28 | MIDAT/IOP11 | O | 5V | ANALOG ASIC CONTROL |
| 29 | MICLK/IOP12 | O | 5V | ANALOG ASIC CONTROL |
| 30 | IOP45 | O | 5V | OUTPUT PORT(VOL2) |
| 31 | IOP46 | O | 5V | OUTPUT PORT(SPMUTE) |
| 32 | IOP47 | O | 5V | NOT USED |
| 33 | IOP50 | I | 5V | INPUT PORT(HOOK) |
| 34 | IOP51 | O | 5V | OUTPUT PORT(LEDCTL) |
| 35 | IOP52 | I | 5V | INPUT PORT(PAPER) |
| 36 | IOP53 | O | 5V | OUTPUT PORT(PDWN) |
| 37 | IOP54 | I | 5V | INPUT PORT(TOPCVR) |
| 38 | IOP55 | O | 5V | OUTPUT PORT(DEV) |
| 39 | IOP56 | O | 5V | OUTPUT PORT(CHG) |
| 40 | 3.3V | 3.3V | 3.3V | POWER SOURCE |
| 41 | VSS | 0V | GND | GND |
| 42 | DB0 | I/O | 3.3V | DATA BUS 0 |
| 43 | DB1 | I/O | 3.3V | DATA BUS 1 |
| 44 | DB2 | I/O | 3.3V | DATA BUS 2 |
| 45 | DB3 | I/O | 3.3V | DATA BUS 3 |
| 46 | DB4 | I/O | 3.3V | DATA BUS 4 |
| 47 | DB5 | I/O | 3.3V | DATA BUS 5 |
| 48 | DB6 | I/O | 3.3V | DATA BUS 6 |
| 49 | DB7 | I/O | 3.3V | DATA BUS 7 |
| 50 | 3.3V | 3.3V | 3.3V | POWER SOURCE |
| 51 | VSS | 0V | GND | GND |
| 52 | ADR0 | I | 3.3V | ADDRESS BUS 0 |
| 53 | ADR1 | I | 3.3V | ADDRESS BUS 1 |
| 54 | ADR2 | I | 3.3V | ADDRESS BUS 2 |
| 55 | ADR3 | I | 3.3V | ADDRESS BUS 3 |
| 56 | ADR4 | I | 3.3V | ADDRESS BUS 4 |
| 57 | ADR5 | I | 3.3V | ADDRESS BUS 5 |
| 58 | ADR6 | I | 3.3V | ADDRESS BUS 6 |
| 59 | TEST0 | I | 5V | NOT USED |
| 60 | TEST1 | I | 5V | NOT USED |
| 61 | XWR | I | 3.3V | WR SIGNAL |
| 62 | XRD | I | 3.3V | RD SIGNAL |
| 63 | 3.3V | 3.3V | 3.3V | POWER SOURCE |
| 64 | VSS | 0V | GND | GND |
| 65 | CLK | I | 3.3V | CLOCK INPUT |
| 66 | VSS | 0V | GND | GND |
| 67 | XRESET | I | 3.3V | RESET INPUT |
| 68 | XCS | I | 3.3V | CHIP SELECT INPUT |
| 69 | INT | O | 3.3V | INTERRUPT INPUT |
| 70 | KSTART | O | 3.3V | OPERATION PANEL CONTROL |
| 71 | KLATCH/OP24/SENCTL3 | O | 3.3V | NOT USED |
| 72 | KSCLK | O | 3.3V | OPERATION PANEL CONTROL |

| PIN No. | SIGNAL | I/O | POWER SUPPLY VOLTAGE | EXPLANATION |
|---------|------------------|------|----------------------|---------------------------------|
| 73 | KTXD | I/O | 3.3V | OPERATION PANEL CONTROL |
| 74 | KRXD/IP23/SENIN3 | I | 3.3V | INPUT FROM READ POSITION SENSOR |
| 75 | 3.3V | 3.3V | 3.3V | POWER SOURCE |
| 76 | VSS | 0V | GND | GND |
| 77 | VIN0/IP20(APC) | I | 3.3V | INPUT TO INVERTER |
| 78 | VIN1/IP21 | I | 3.3V | INPUT TO INVERTER |
| 79 | VIN2/IP22 | I | 3.3V | INPUT TO INVERTER |
| 80 | VOUT0/OP25 | O | 5V | OUTPUT FROM INVERTER |
| 81 | VOUT1/OP26 | O | 5V | OUTPUT FROM INVERTER |
| 82 | VOUT2/OP27 | O | 5V | OUTPUT FROM INVERTER |
| 83 | RM0 | O | 5V | RX MOTOR CONTROL |
| 84 | RM1 | O | 5V | RX MOTOR CONTROL |
| 85 | RM2 | O | 5V | RX MOTOR CONTROL |
| 86 | RM3 | O | 5V | RX MOTOR CONTROL |
| 87 | RXE | O | 5V | NOT USED |
| 88 | 5V | 5V | 5V | POWER SOURCE |
| 89 | VSS | 0V | GND | GND |
| 90 | IOP57 | O | 5V | NOT USED |
| 91 | FANDET1/IOP14 | I | 5V | DETECT FAN ROTATION |
| 92 | FANON1/IOP15 | O | 5V | FAN CONTROL |
| 93 | FANDET2/IOP16 | O | 5V | OUTPUT PORT(BREAK) |
| 94 | FANON2/IOP17 | O | 5V | FAN CONTROL |
| 95 | IOP60/CSI | O | 5V | NOT USED |
| 96 | IOP61/CCLK | O | 5V | OUTPUT PORT(RLY) |
| 97 | IOP62/CSO | I | 5V | INPUT PORT(VOX) |
| 98 | SENCTL0/IOP04 | O | 5V | LED CONTROL FOR EXIT SENSOR |
| 99 | SENCTL1/IOP05 | O | 5V | LED CONTROL FOR REGIST SENSOR |
| 100 | 5V | 5V | 5V | POWER SOURCE |

7.3.2. RTC BACKUP CIRCUIT

1. Function

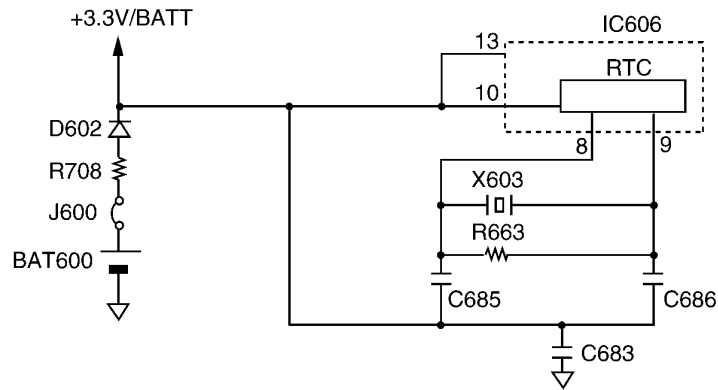
This unit has a lithium battery (BAT600) which works for the Real Time Clock IC (RTC: inside IC606).

The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.

2. RTC Inside (IC606) Backup Circuit Operation

When the power switch is turned ON, power is supplied to the RTC (inside IC606). At this time, the voltage at pin 10 of the IC606 is +3.3V. When the power switch is turned OFF, the BAT600 supplies power to RTC through D602. The voltage at pin 10 of IC606 is about +2.5V. When the power switch is OFF and the voltage of +3.3V decreases, pin 10 of RTC (IC606) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram



7.3.3. MODEM CIRCUIT OPERATION

The modem (IC600) has all the hardware satisfying the CCITT standards mentioned previously.

When the ASIC IC606 (114) is brought to a low level, the modem (IC600) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC606) ADR0-ADR4(pin 84~88). Commands are written through the data bus, and all processing is controlled by the ASIC (IC606) according to CCITT procedures. Here, the INT signal dispatched from IRQ (pin 108 of IC600) to the ASIC (IC606) implements post processing.

This modem (IC600) has an automatic application equalizer. With training signal 1 or 2 at the time of G3 reception, it can automatically establish the optimum equalizer. The modem (IC600) operates using the 32.256MHz clock (X600).

1. Facsimile Transmission/DTMF Line Send

The digital image data on the data bus is modulated in the modem (IC600), and sent from pin 69 via modem IC600, Analog gate array IC207(24→22), amplifier IC204(6→7) and the NCU section to the telephone line.

Refer to **CHECK SHEET**(P.129).

2. Facsimile Reception

The analog image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC600). The signals that enter pin 60 of the modem (IC600) 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 around 3 kHz and maintain a constant receiving sensitivity.

It can be set in the service mode.

Refer to **CHECK SHEET**(P.129).

3. DTMF Transmission (Monitor tone)

The DTMF signal generated in the modem (IC600) is output from pin 69, and the NCU section to the telephone line the same as facsimile transmission signals.

(DTMF Monitor Tone)

Refer to **CHECK SHEET**(P.129).

4. 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 (IC600) becomes 1, and this status is monitored by ASIC (IC606).

5. Call Tone Transmission

This is the call signal which is generated the ASIC (IC606) and sent to the speaker.

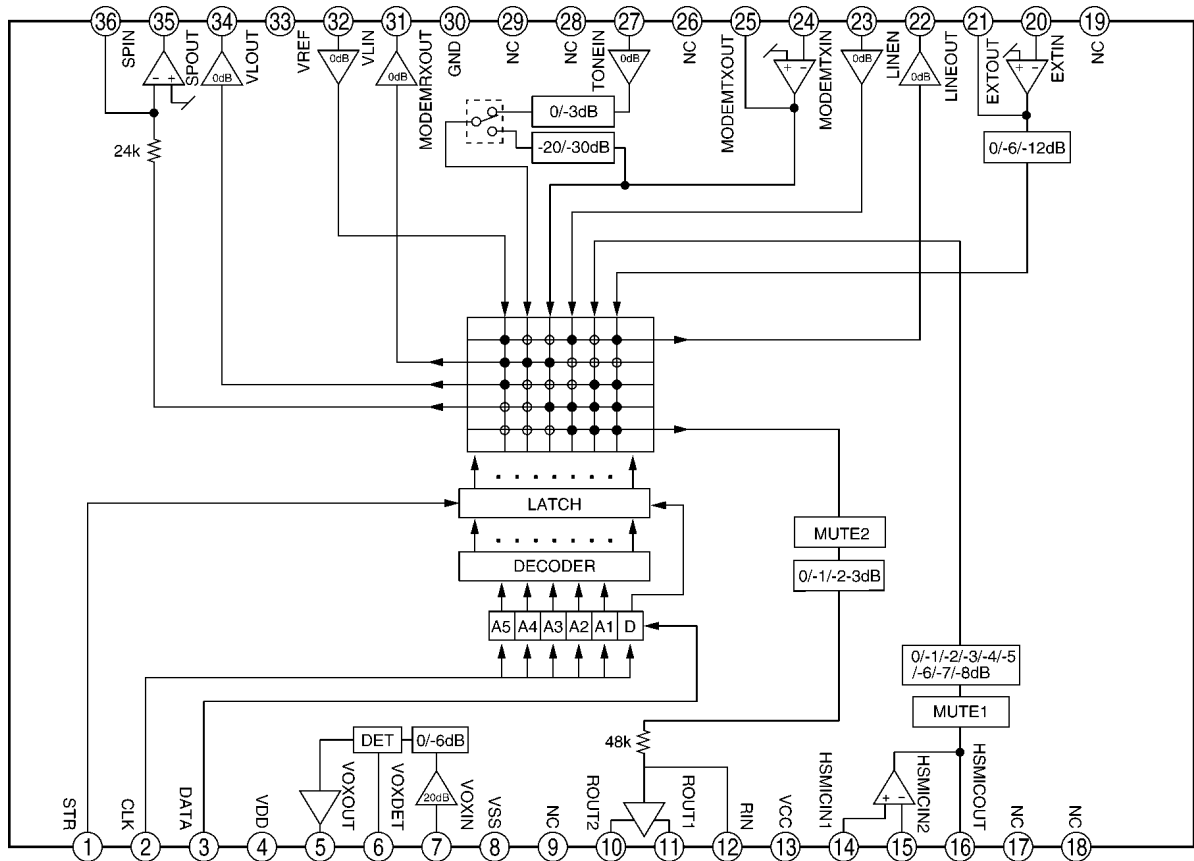
7.3.4. ANALOG SECTION

Composed of ITS circuit and NCU circuit.

7.3.4.1. ANALOG GATE ARRAY (IC207)

The cross-point switch installed in this IC makes it possible to change the circuit configuration for any analog signals such as the fax signals sent from the digital board. In addition, this analog gate array integrates a handset circuit, input/output ports, etc.

This IC is controlled by ASIC(IC606) through GATE ARRAY (IC605) on the digital board.



Explanation of ANALOG GATE ARRAY (IC207 on the ANALOG Board)

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

7.3.4.2. DESCRIPTION OF BLOCK DIAGRAM IN ANALOG SECTION

1. Function

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

The analog ASIC (IC207) on the analog board exchanges FAX TX and RX signals between the MODEM (IC600) and the analog section.

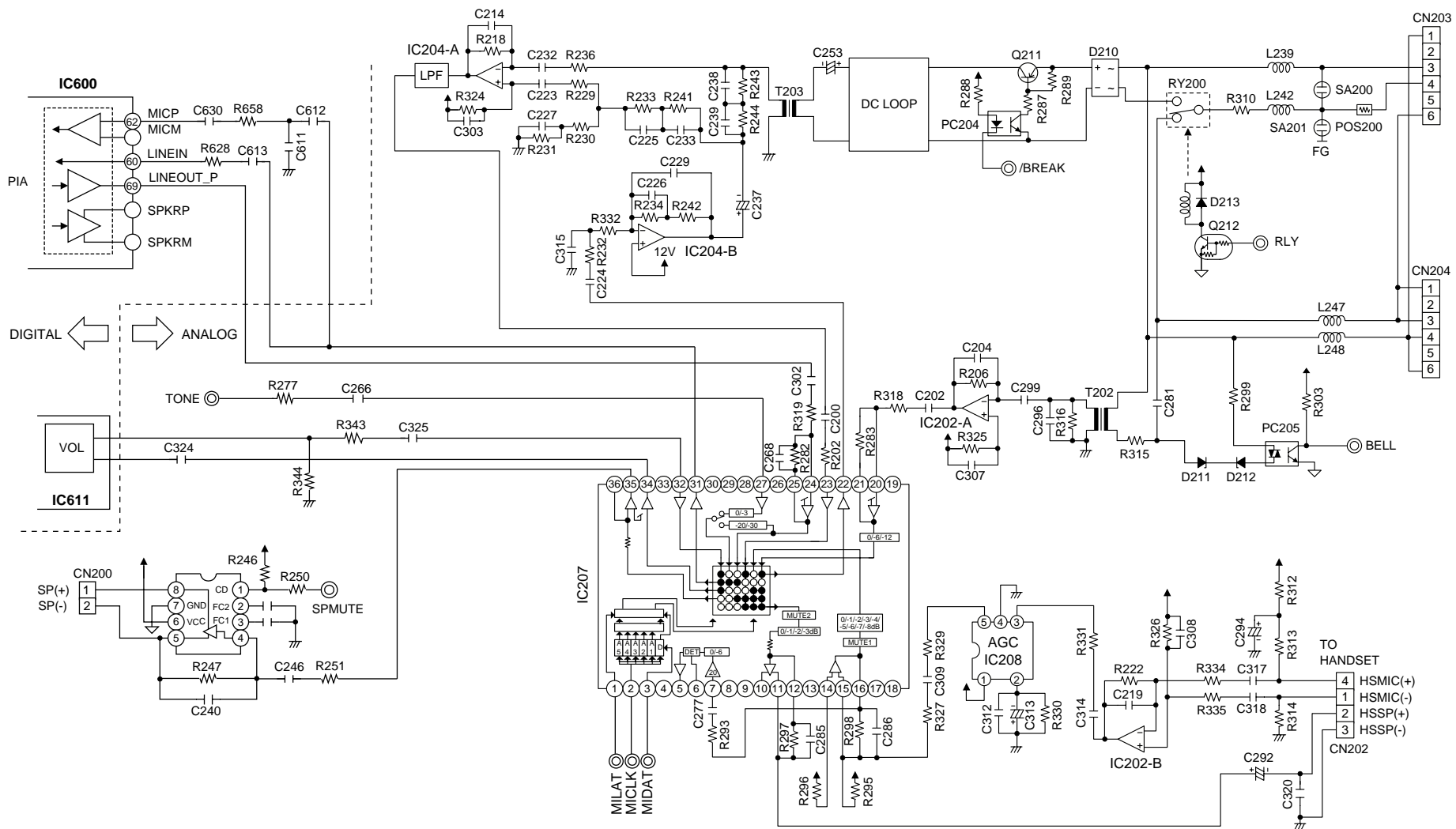
The control signals transmitted to the analog section are output mainly from G/A IC605, and the analog status is stored as data in G/A IC605.

2. Circuit Operation

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

Refer to **NCU SECTION** (P.162) for the details.

7.3.4.3. BLOCK DIAGRAM



KX-FL513RU : ANALOG BOARD : BLOCK DIAGRAM

7.4. NCU SECTION

7.4.1. GENERAL

This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RLY200), bell detection circuit, TAM interface circuit, line amplifier and side tone circuits and a multiplexer.

7.4.2. EXT. TEL. LINE RELAY (RLY200)

1. Circuit Operation

Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.

{ IC605 (95) High Level→CN600 (27) High Level} →CN201 (2) High Level→Q212 ON→RLY200 (ON)→(make)

{ IC605 (93) LOW Level→CN600 (21) LOW Level} →CN201 (8) LOW Level→PC204 ON→Q211 (ON)→(make)

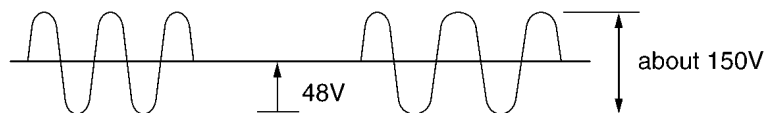
7.4.3. BELL DETECTION CIRCUIT

1. Circuit Operation

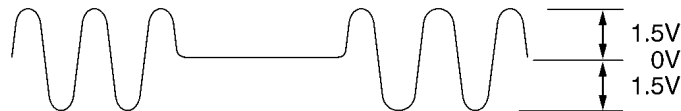
The signal waveform for each point is indicated below. The signal (low level section) input to pin 6 of gate array IC605 on the digital board is read by ASIC and judged as a bell.

TEL LINE→PC205 (1, 2 - 4)→IC605 (6)

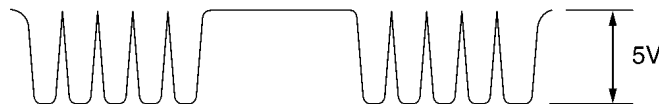
Between the Tip and Ring
from the telephone line



Between PC205 (1) and (2)



PC204 (4)G/A IC605 (6)



7.4.4. 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 1200 Hz sine wave, and data 1 a 2200 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

FSK signal of the caller ID signal input from TEL LINE is processed with FSK receiver (IC602).

Refer to **CHECK SHEET** (P.129) for the route of caller ID signal.

7.4.5. LINE AMPLIFIER AND SIDE TONE CIRCUIT

1. Circuit Operation

The reception signal output from the line transformer T201 is input to pin (2) of IC204 via C232, R236 and then the signal is amplified at pin (1) of IC204 and sent to the reception system.

The transmission signal goes through C224, R232 and enters IC204-pin (6), where the signal is amplified. Then, it is output from pin (7) of IC204 and transmitted to T201 via L230, C237, R244, R243. Without a side tone circuit, the transmission signal will return to the reception amplifier via R236, C232. When the side tone circuit is active, the signal output from IC204 pin (7) passes through L230, C237, R241, R233, C233, C225, C223, and R229 and goes into the amplifier IC204 pin (3). This circuit is used to cancel the transmission return signal.

The TX signal is output to the circuit analog the route from the IC204 7 pin→L230→C237→R244→R243→T201→TEL LINE.

However, if balance is lost in the bridge, a voltage occurs between the IC207 6 pin and 5 pin and a side tone results, because the balance cannot be maintained completely at all frequencies in the audio range some side tone always occur.

7.4.6. LOW PASS FILTER AND NOTCH FILTER

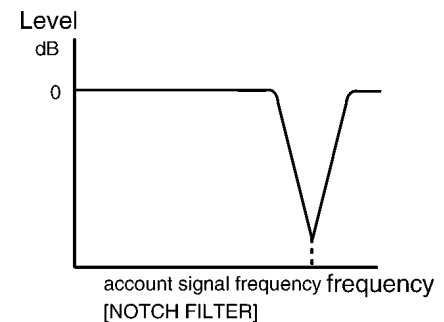
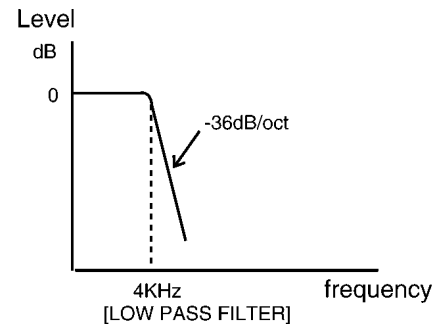
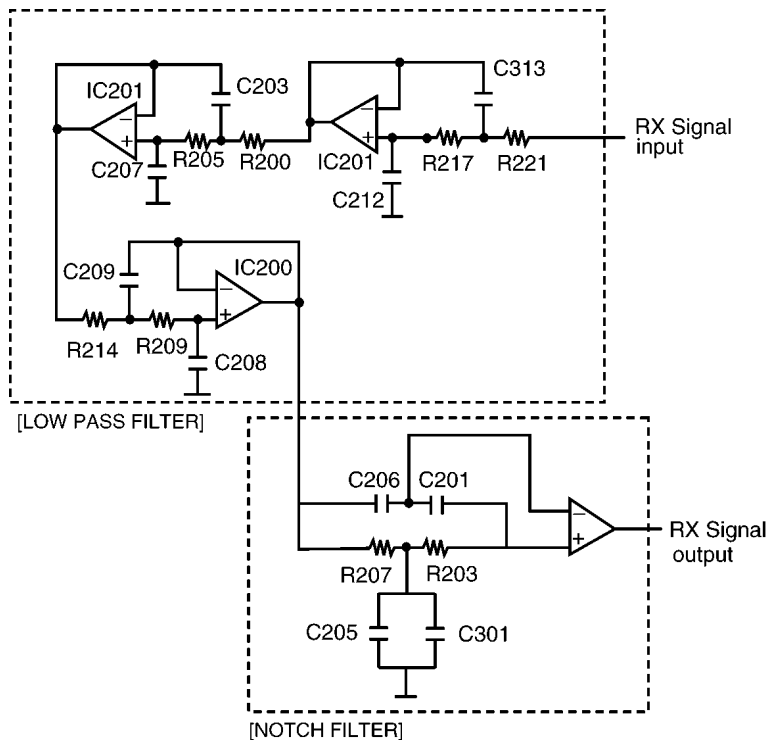
1. Function

This low pass filter and notch filter attenuates the account signal from the commutator to eliminate influence on the conversation and communication.

2. Circuit Operation

This low pass filter is an eight-order active filter, and the cutoff frequency is approximately 4 kHz.

NOTCH FILTER has filter pole of account signal frequency.



7.4.7. REMOTE FAX ACTIVATION CIRCUIT

1. Function

Another telephone connected to same line activates the unit to the FAX mode by using a DTMF signal.

2. Signal Path

Refer to **CHECK SHEET** (P.129).

7.4.8. TAM INTERFACE CIRCUIT

This circuit is to switch between FAX receiving and the external TAM's message recording automatically. This circuit consists of the monitor, transformer and amplifier.

For details, please refer to **TAM INTERFACE SECTION** (P.165).

7.5. ITS (Integrated telephone System) and MONITOR SECTION

7.5.1. GENERAL

The general ITS operation is performed by the special IC207 which has a handset circuit. The alarm tone, the key tone, and the beep are output from the ASIC IC606 (digital board).

7.5.1.1. TELEPHONE MONITOR

1. Function

This is the function when you are not holding the handset and can hear the caller's voice from the line.

2. Circuit Operation

(Telephone Monitor Signal Path)

Signals received from the telephone line are output through at the speaker via the following path.

3. Signal Path

Refer to **CHECK SHEET**.

7.5.1.2. HANDSET CIRCUIT

1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

2. Signal Path (Transmission signal)

Refer to **CHECK SHEET**.

3. Signal path (Reception signal)

Refer to **CHECK SHEET**.

7.5.1.3. MONITOR CIRCUIT

1. Function

This circuit monitors various tones, such as (1) DTMF tone, (2) Alarm/Beep/Key tone/Bell.

2. Signal Path

a. DTMF MONITOR

(Speaker Operation)

Refer to **CHECK SHEET**.

(Handset Operation)

Refer to **CHECK SHEET**.

b. ALARM/BEEP/KEY TONE/BELL

Refer to **CHECK SHEET**.

7.5.1.4. TAM INTERFACE SECTION

1. Function

When TAM is connected to this unit, the unit receives documents for FAX calls or the external TAM records a voice message automatically.

2. Circuit Operation

The TAM INTERFACE circuit consists of the transformer (T202), amplifier (IC202), analog ASIC (IC207), MODEM (IC600) on the digital board to detect the other party CNG signal, and RLY200 to separate EXT.TAM.

a. CNG signal detection circuit

The CNG signal from the other party's FAX is detected in MODEM IC600 (digital board).

(Signal path)

Refer to **CHECK SHEET**(P.129).

b. Remote receiving

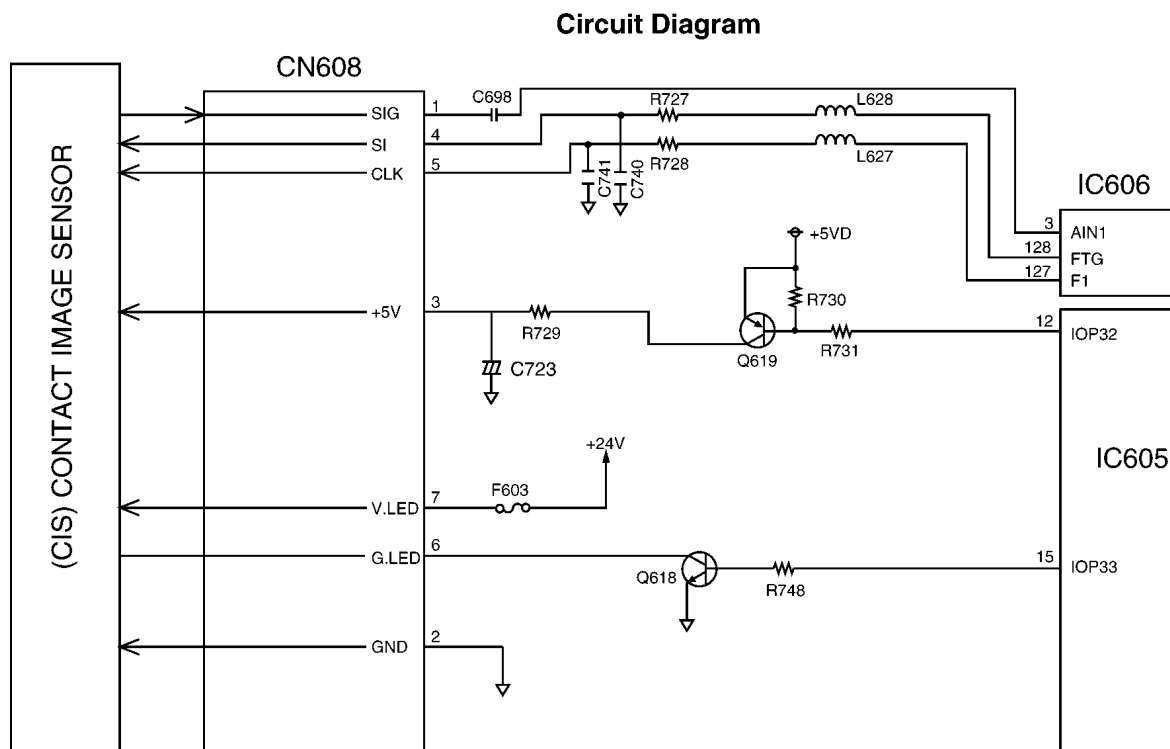
This is the parallel-connected DTMF signal for the TEL or EXT.TEL mode between T and R. When the other party is a FAX, the unit switches to FAX receiving.

(Signal Path)

Refer to **CHECK SHEET**(P.129).

7.6. CIS CONTROL SECTION

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



When an original document is inserted and the start button pressed, pin 15 of IC605 goes to a high level and the transistor Q618 turns on. This applies voltage to the LED to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC606, and the original image illuminated by the LED undergoes photoelectric conversion to output an analog image signal (SIG). The analog image signal is input to the system ASIC on AIN1 (pin 3 of IC606) and converted into 8-bit data by the A/D converter inside IC606. Then this signal undergoes digital processing in order to obtain a high-quality image.

7.7. STEPPING MOTOR DRIVE SECTION

7.7.1. ENGINE MOTOR DRIVE CIRCUIT

1. Functions

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

This feed recording paper synchronized for printing.

2. Motor operation

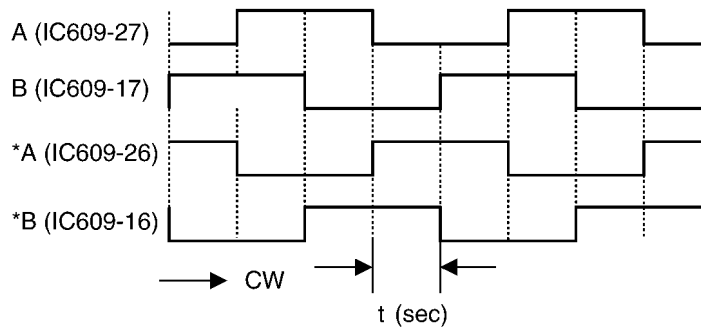
Excitation pulses is output from G/A (IC605) pins 83, 84, 85 and 86. Then stepping pulses are output from driver IC (IC609) pin No 2, 7, 8 and 13, and drives the motor coil.

During motor driving, pin 90 of G/A IC605 becomes a low level.

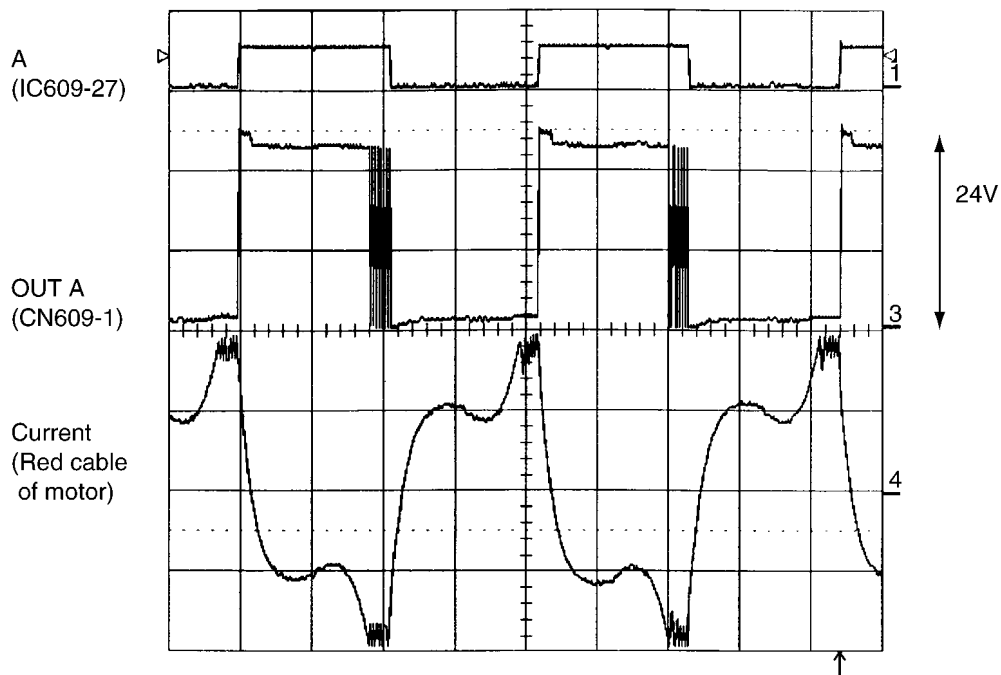
As a result, a current of about 1A are supplied to the motor coil.

7.7.1.1. TIMING CHART

① 2 phase excitation



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

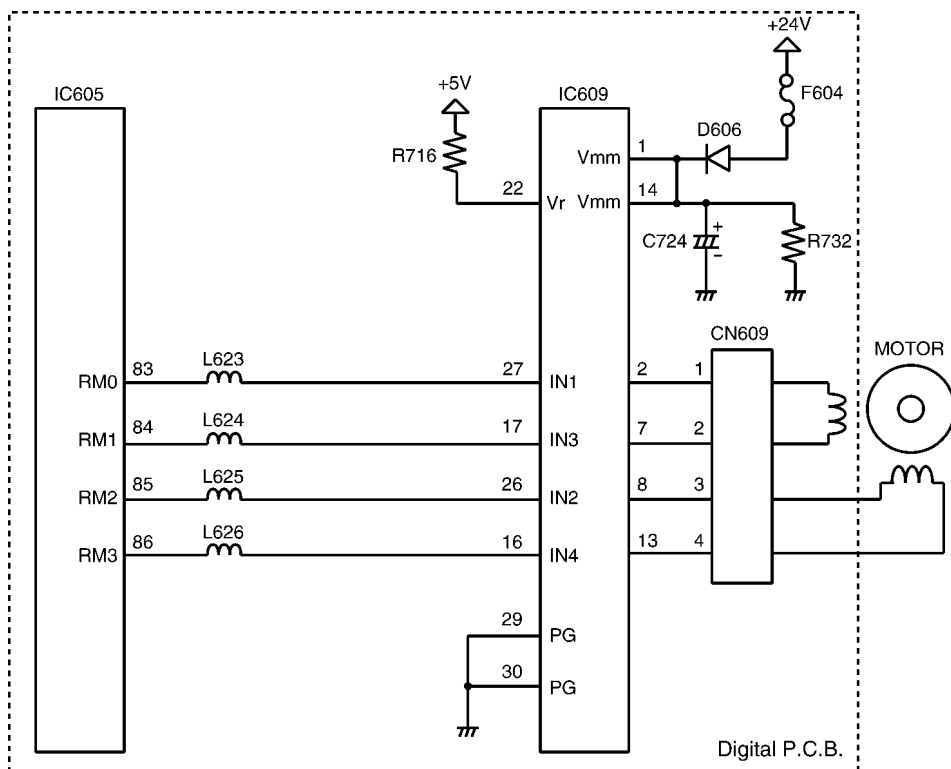


Other phase (B, *A, *B) operates as A phase does.

DRIVE MODE

| FUNCTION | MODE | PHASE PATTERN | SPEED | CURRENT |
|----------|------|---------------|--------|---------|
| PRINT | - | 2 phase | 951pps | 1A |

7.7.1.2. ENGINE MOTOR DRIVE CIRCUIT



7.7.2. SCAN MOTOR DRIVE CIRCUIT

1. Functions

This motor functions for main operations including FAX transmission.

This feed document paper synchronized for reading.

2. Motor operation

During motor driving, pin 25 of ASIC IC606 becomes a high level, and Q613, Q620 turns ON.

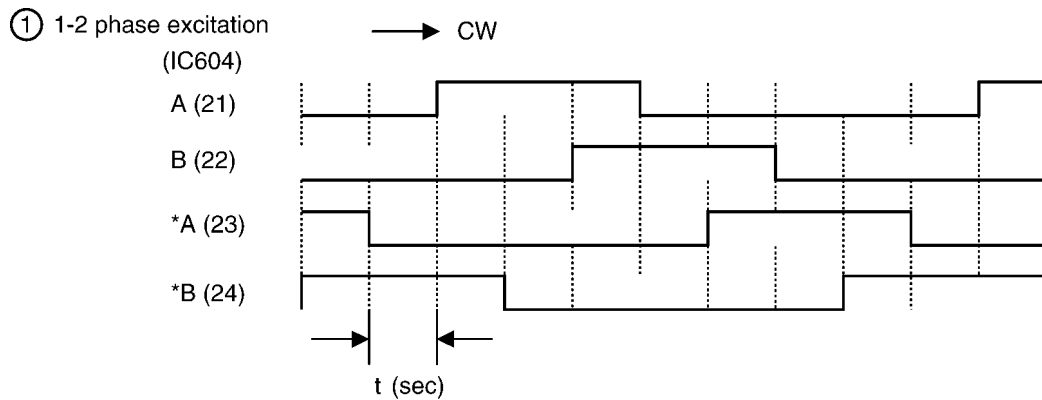
As a result, +24V is supplied to the motor coil.

Stepping pulses are output from ASIC IC606 pins, 21, 22, 23, 24, causing driver IC610 pins, 16 ~ 13 to drive the motor coil.

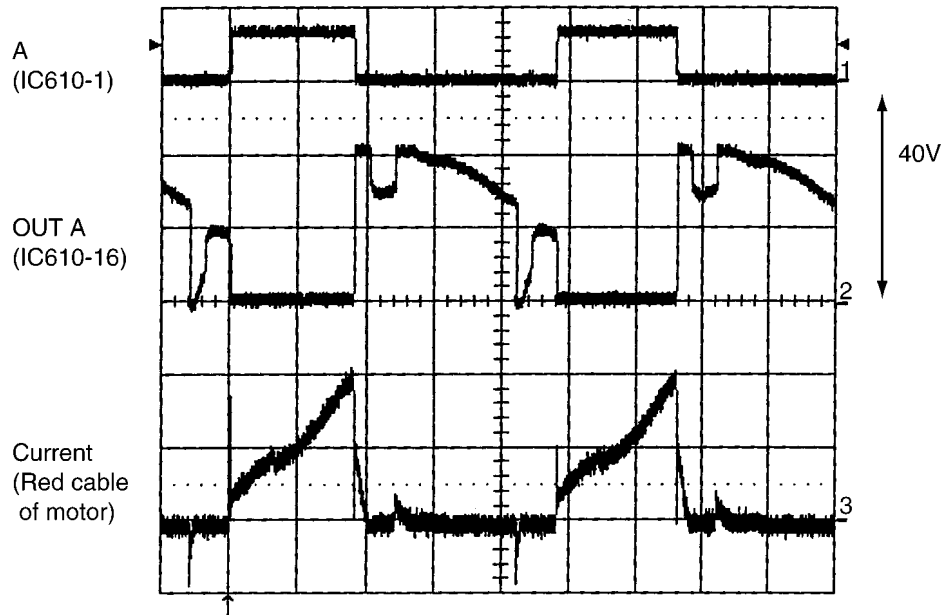
The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation.

A 1-step rotation feeds 0.065mm of document paper.

7.7.2.1. TIMING CHART

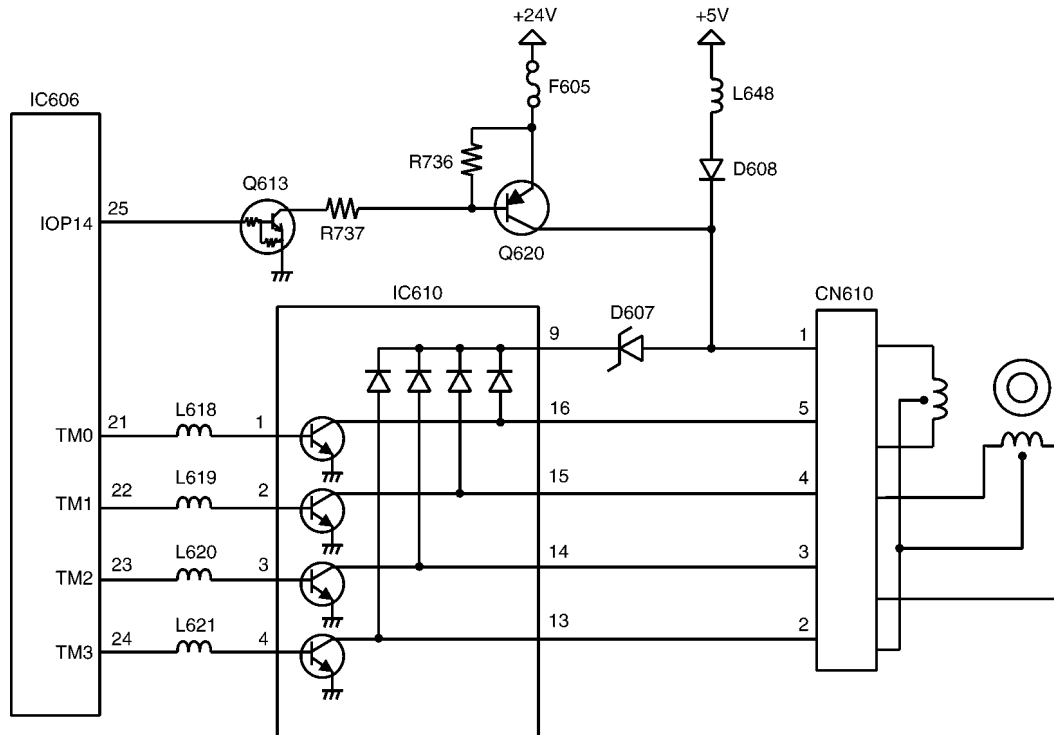


② 1-2 phase excitation output wave form (example "A Phase")



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

7.7.2.2. SCAN MOTOR (ADF MOTOR) DRIVE CIRCUIT



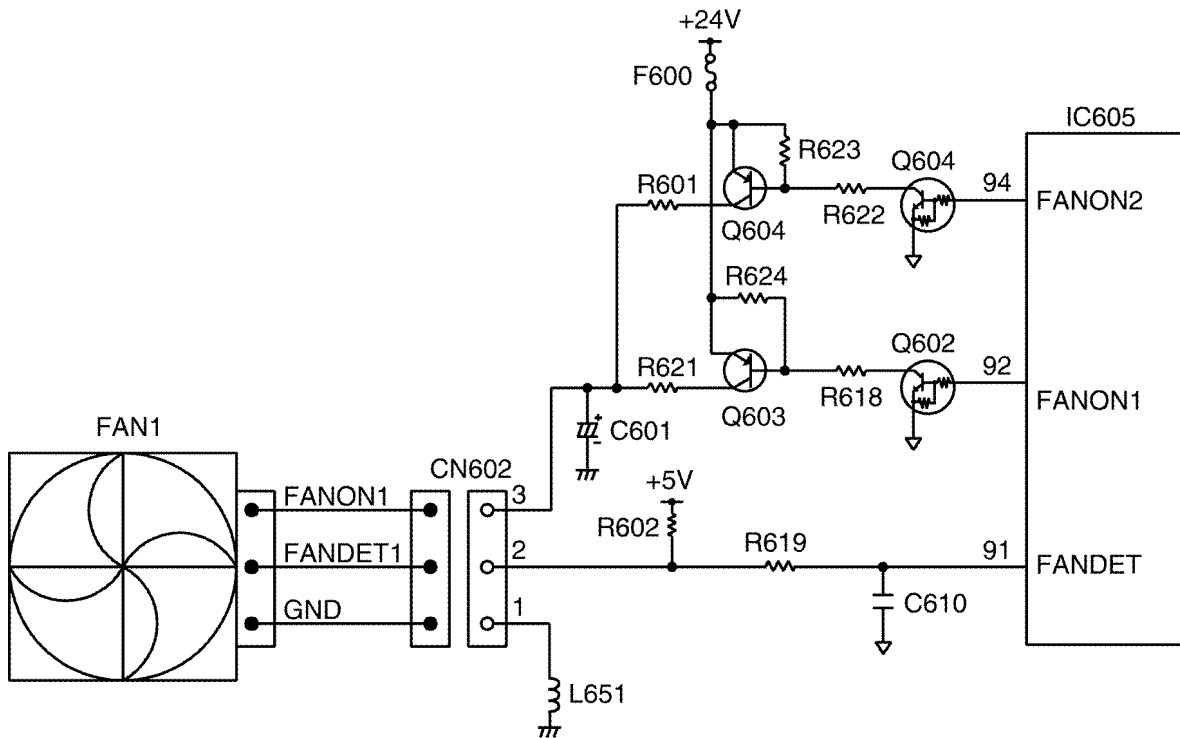
DRIVE MODE

| FUNCTION | | MODE | PHASE PATTERN | SPEED |
|----------|-------------------|-----------------|---------------|--------|
| SCAN | FAX | STANDARD | 2 phase | 579pps |
| SCAN | FAX/COPY | FINE/PHOTO | 2 phase | 579pps |
| SCAN | FAX/COPY | SUPER FINE | 1-2 phase | 579pps |
| SCAN | FAX/COPY | PHOTO WITH TEXT | 2 phase | 579pps |
| SCAN | DOC.PREFEED/EJECT | - | 2 phase | 579pps |
| STAND-BY | | - | ALL PHASE OFF | - |

7.8. FAN MOTOR SECTION

This FAN is used to radiate heat in the unit.

The signal level at pin 92/94 of IC605 becomes high, the FAN is activated. In this case, the pulse signal as shown below input to pin 91 of IC605 and the rotation of the FAN is detected.



7.8.1. FAN CONTROL

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

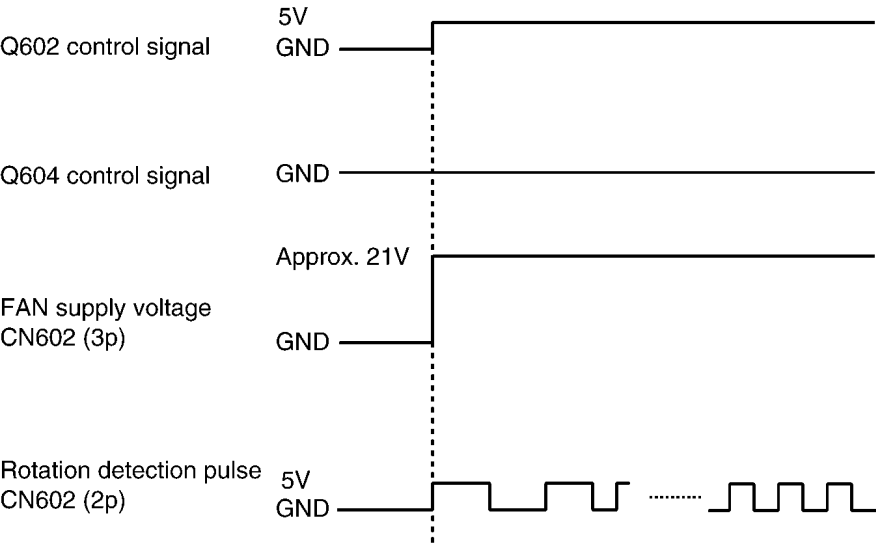
The air is inhaled from the right side of the unit.

The fan rotates at high speed (Approx. 3000 rpm) while printing (controlling the developing device). After printing is finished, it rotates at low speed (Approx. 2200 rpm) when the temperature of the unit goes up over a fixed one or depending on the number of printed papers (frequency).

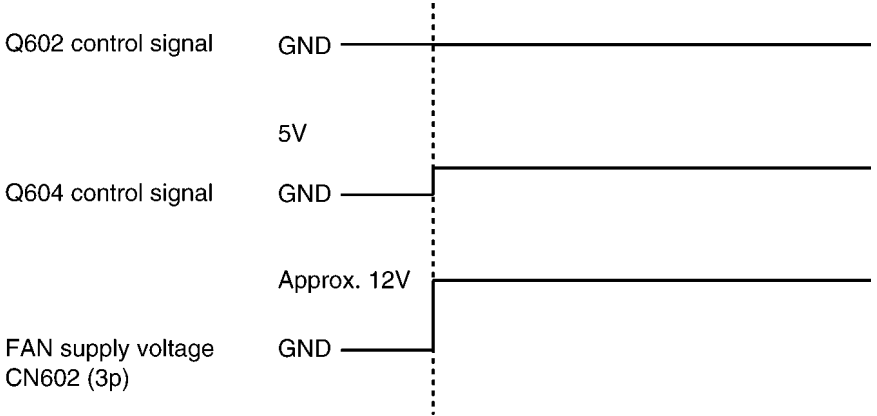
While the fan is rotating at high speed, the voltage of Approx. 21 V is supplied to the fan, however, while rotating at low speed, the supply voltage is decreased to Approx. 12V.

Each signal wave is as follows:

1. High-speed rotation (typ. 3000 rpm)



2. Low-speed rotation (typ. 2200 rpm)

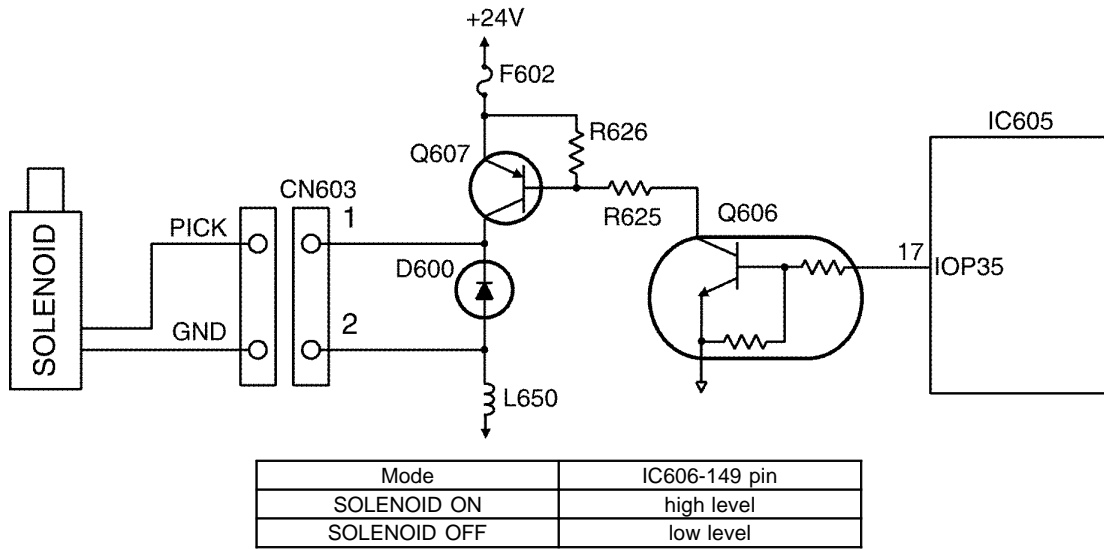


7.9. SOLENOID DRIVE SECTION

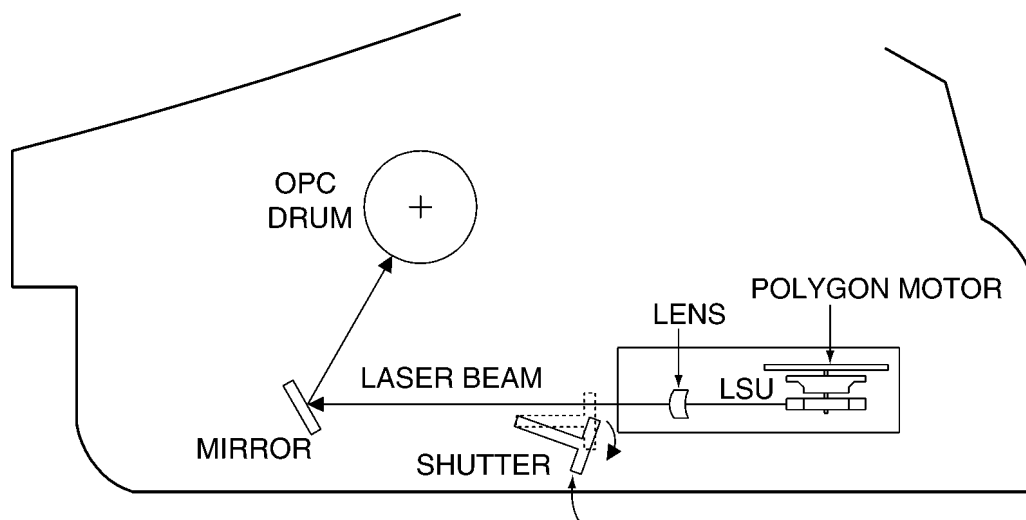
The solenoid drive circuit controls the pick-up clutch.

The solenoid is designed to be driven by +24V, driven by IC605-17 pin.

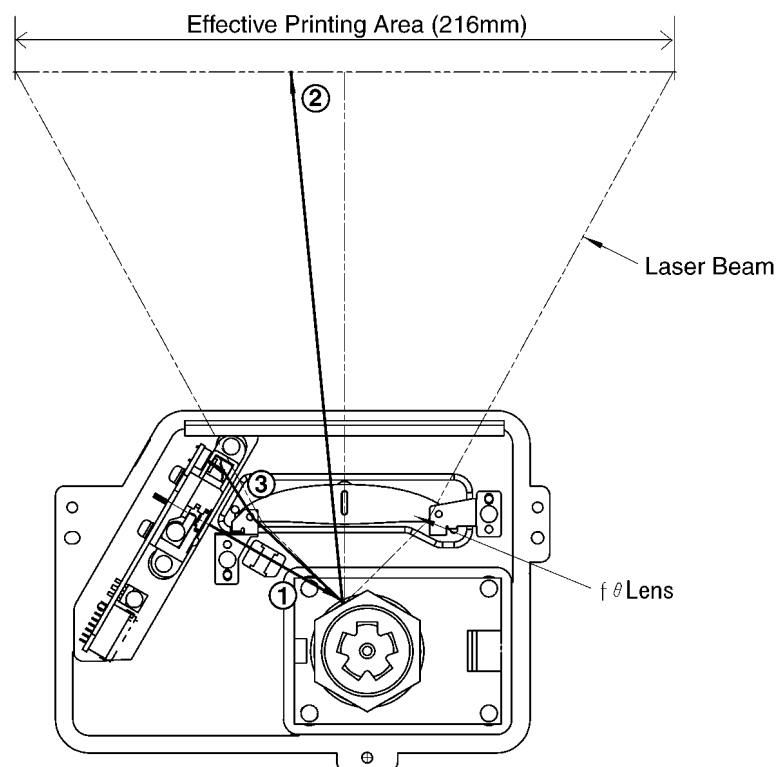
Diode D600 protects Q607 from backward voltage when the solenoid is driven.



7.10. LSU (Laser Scanning Unit) SECTION

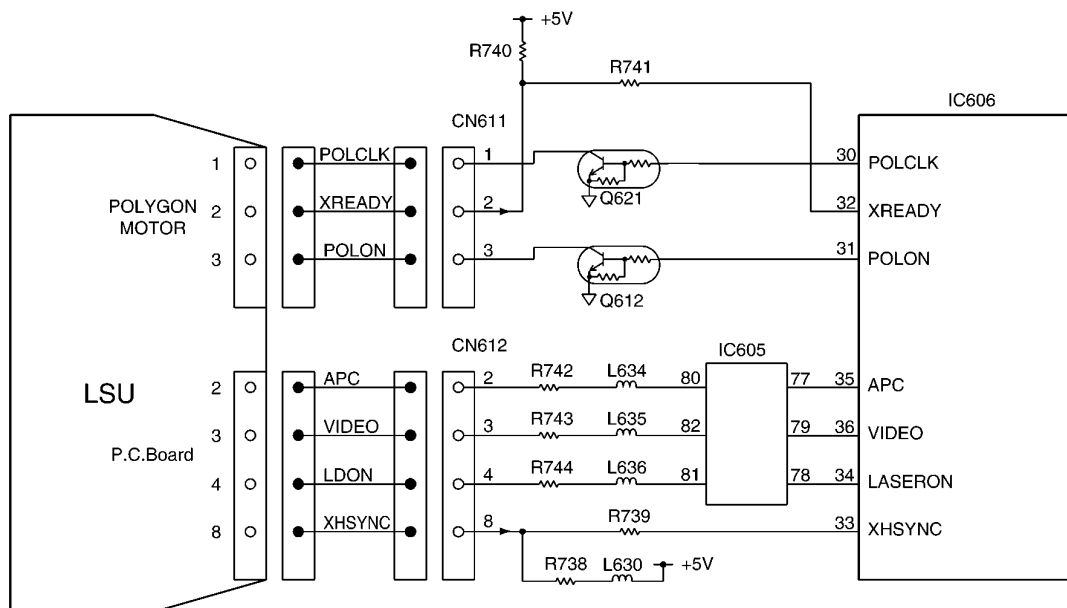


The mechanical shutter will be opened by setting DRUM UNIT properly.

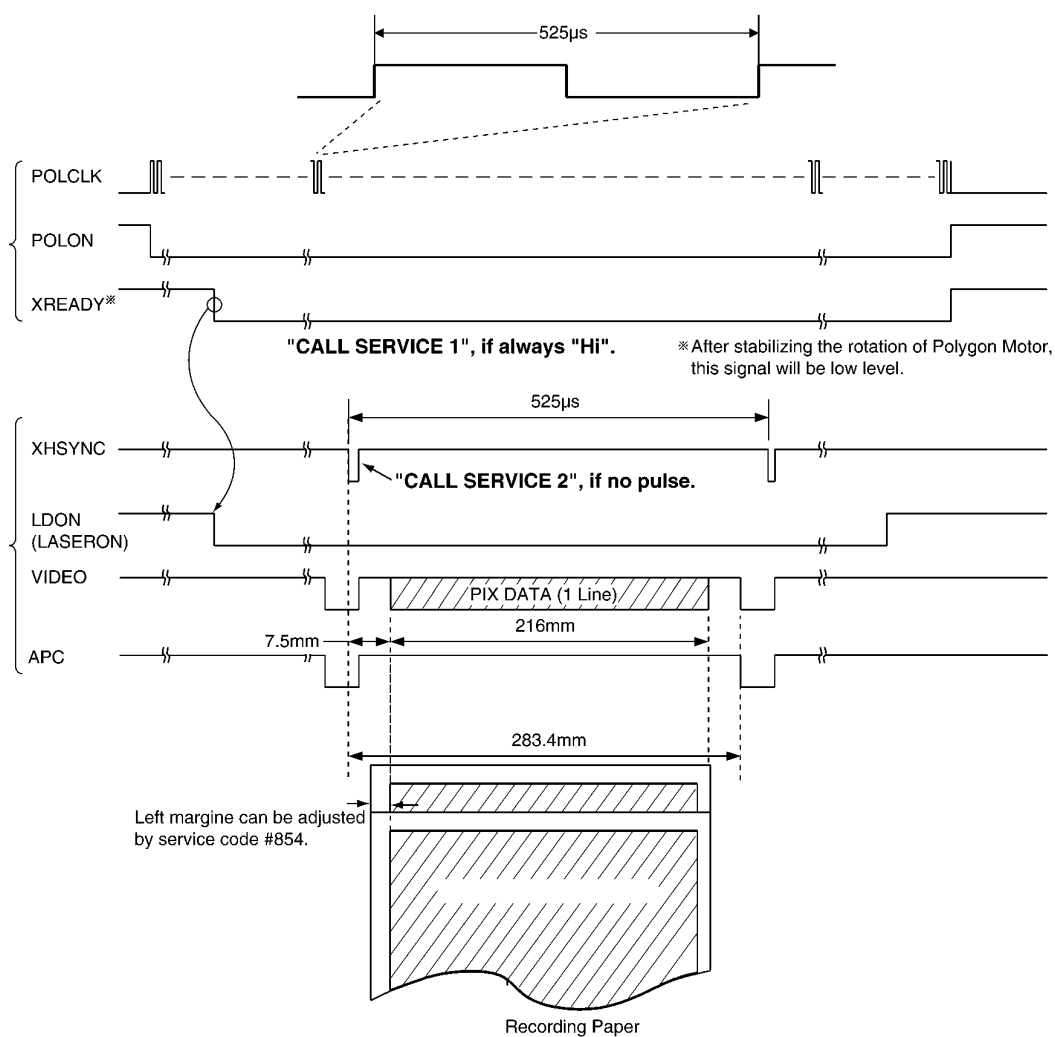


- ① Laser output
- ② Laser reflecting on the drum
- ③ Laser towards the effective printing outside range onto the sensor

Circuit Diagram



Timing Chart



7.11. SENSORS AND SWITCHES SECTION

All of the sensor and switches are shown below.

| Sensor Circuit Location | Sensor | Sensor or Switch Name | Message Error |
|-------------------------|-----------|-----------------------|--|
| Operation Panel | PS101 | Document set | [CHECK DOCUMENT] |
| Operation Panel | SW146 | Paper Feed | [REMOVE DOCUMENT] |
| High Voltage PCB | SW101 | Printer Open | [COVER OPEN] |
| Toner Sensor PCB | SW60 | OPC Set | [CHECK DRUM] |
| Digital PCB | PS601 | Register | [FAILED PICKUP] |
| Digital PCB | PS600 | Paper | [OUT OF PAPER] |
| Exit Sensor PCB | PS51 | Exit | [PAPER JAMMED] |
| Toner Sensor PCB | SW60,IC60 | Dev & Toner Set | [TONER EMPTY] [TONER LOW] [CHECK DRUM] |
| Analog PCB | SW200 | Hook | ————— |

Note:

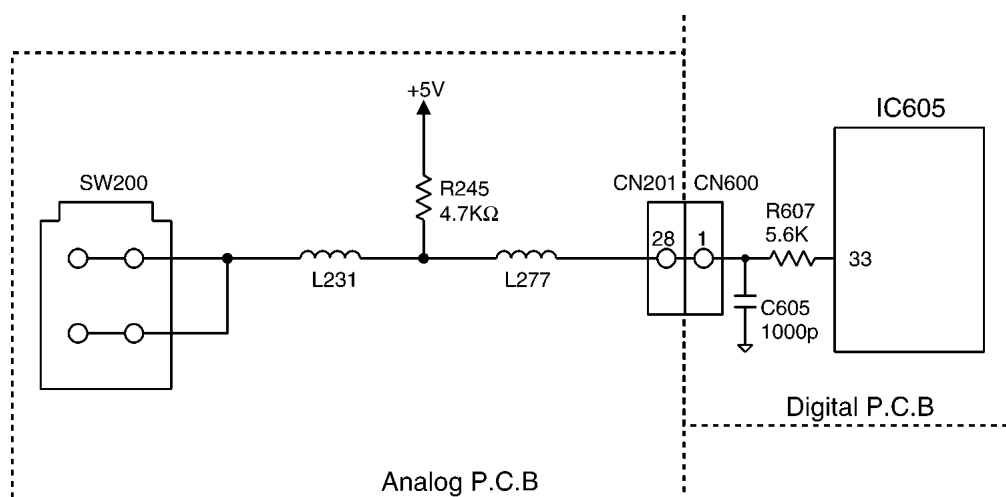
See TEST FUNCTIONS - SENSOR CHECK SECTION for the sensor test.

(#815 of Service Mode test. Refer to **TEST FUNCTIONS** (P.65).

7.11.1. HOOK SWITCH

When the handset is raised, the switch is turned OFF, and the signal at pin 33 of IC605 is high.

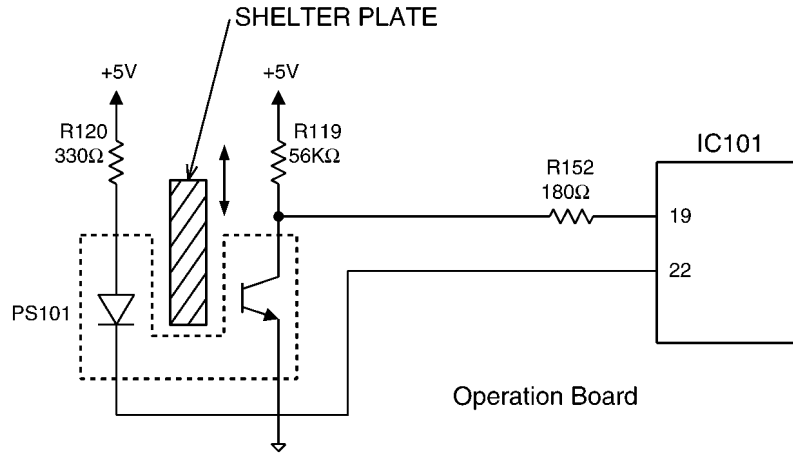
When the handset is returned, the switch is turned ON, and the signal at pin 53 of IC605 is low.



7.11.2. DOCUMENT SENSOR

The Sensor detects whether or not a document is in place.

When a document is detected, the shelter plate shuts off the sensor light, the photo-transistor turns OFF, and the input signal of IC101-19pin becomes a high level. When there is no document, the shelter plate let the sensor light pass through, the photo-transistor turns ON, and the input signal of IC101-19pin becomes a low level.

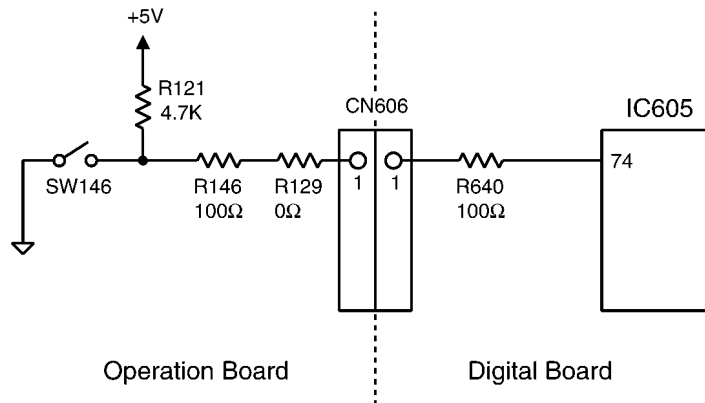


| | Photo-transistor | Signal (IC101-19pin) |
|--------------|------------------|----------------------|
| Document Set | OFF | High level |
| No Document | ON | Low level |

7.11.3. PAPER FEED SENSOR

The Sensor detects the front edge of the document.

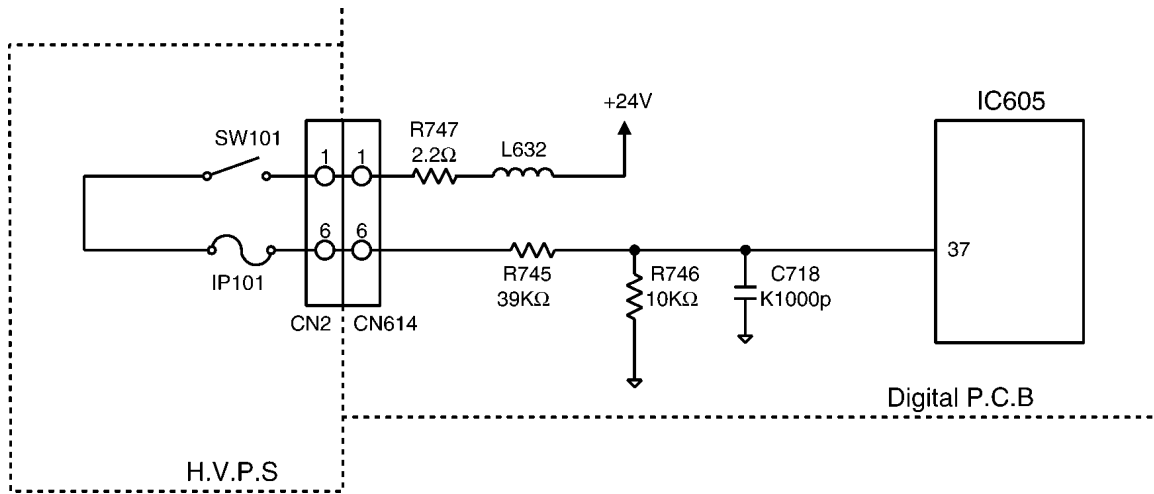
When a document is detected, the switch turns ON, and the input signal of IC605-74pin becomes a low level. When there is no document, the switch turns OFF, and the input signal of IC605-74pin becomes a high level.



| | Switch | Signal (IC605-74pin) |
|-------------------|--------|----------------------|
| Read Position | ON | Low level |
| Non Read Position | OFF | High level |

7.11.4. TOP COVER OPEN SWITCH

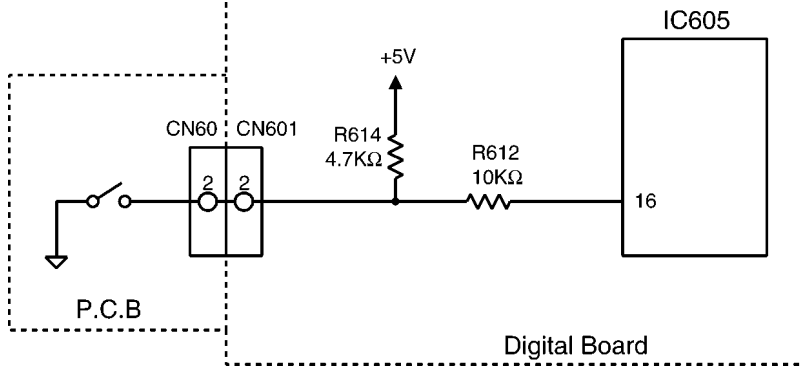
The Switches detect whether the printer cover is open or closed.
When the printer cover is closed, the switches turn ON, and the input signal of IC605-37pin becomes a high level.
When the printer cover is open, the switches turns OFF, and the input signal of IC605-37pin becomes a low level.



| | Switch | Signal (IC605-37 pin) |
|-------|--------|-----------------------|
| Open | OFF | Low level |
| Close | ON | High level |

7.11.5. DRUM SENSOR

The Switch detects whether the OPC unit is set or not.
When there is the DRUM unit, the input signal of IC605-16pin becomes a high level.
When there is no DRUM unit, the input signal of IC605-16pin becomes a low level.



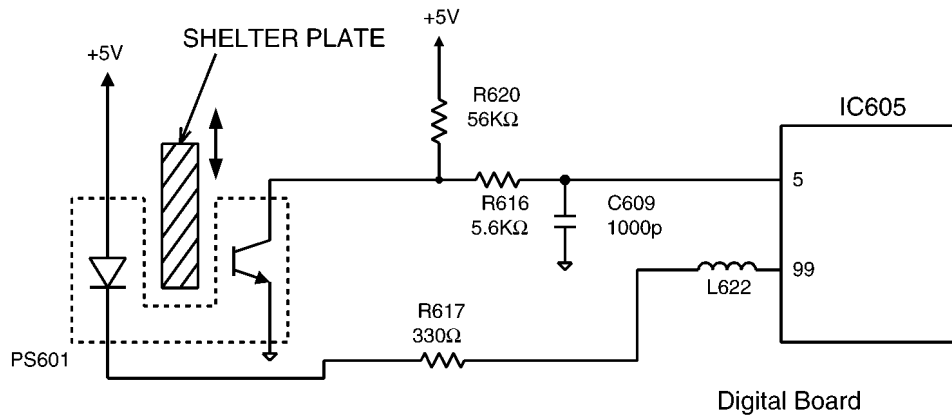
| | Signal (IC605-16 pin) |
|----------|-----------------------|
| DRUM Set | High level |
| No DRUM | Low level |

7.11.6. REGIST SENSOR

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

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC605-5pin becomes a low level.

When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC605-5pin becomes a high level.



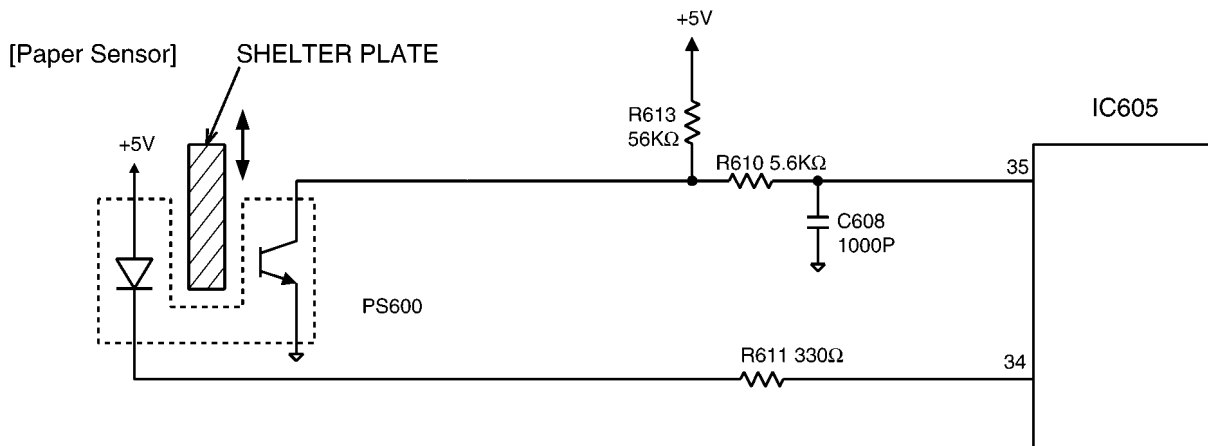
| | Photo-transistor | Signal (IC605-5 pin) |
|------------------------|------------------|----------------------|
| No Recording Paper | OFF | High level |
| Recording Paper Regist | ON | Low level |

7.11.7. PAPER SENSOR..... “OUT OF PAPER”

The Sensor detects the recording paper are in place.

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC605-35 pin becomes a low level.

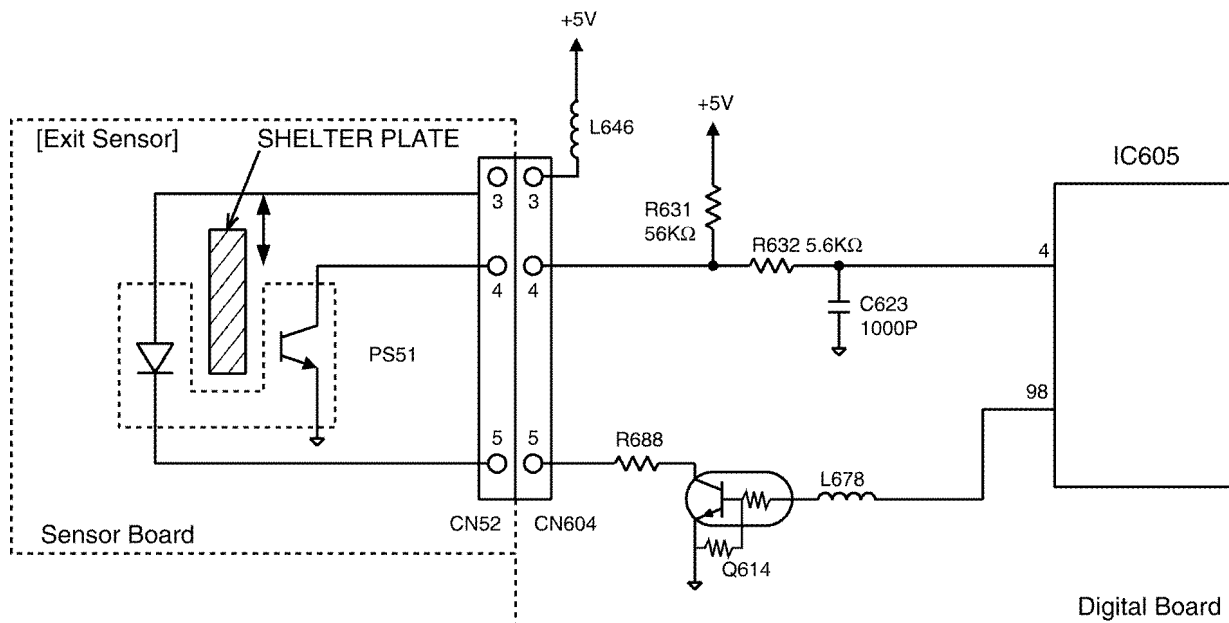
When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC605-35 pin becomes a high level.



[Paper Sensor]

| | Photo-transistor | Signal (IC605-35 pin) |
|---------------------|------------------|-----------------------|
| Recording Paper Set | OFF | Low level |
| No Recording Paper | ON | High level |

7.11.8. PAPER EXIT SENSOR..... “PAPER JAMMED”



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

When there is no recording paper at the position of the sensor, the shelter plate closes the sensor light, the photo-transistor fot tarius OFF, and the input signal of IC605-4pin becomes high level.

When the recording paper reach the exit sensor, the shelter plate let the sensor light passing through, the photo-transistor ON, and the input signal of IC605-4pin becomes a low level.

[Exit Sensor]

| | Photo-transistor | Signal (IC605-4 pin) |
|-------------|------------------|----------------------|
| No Paper | OFF | High level |
| Paper Exist | ON | Low level |

7.11.9. Detecting New Drum Units

Purpose

To investigate the actual number of printed papers with the drum units

(Investigating how the returned sets' drum units were used)

Method

Whether the drum unit is new or old should be judged by detecting the turn delay of Mixing Paddle (Toner detection sensor).

- When shipping the drum unit, the mixing paddle gear is set to the position that has the space of more than one turn (max. 600).
- After the main motor starts, when the toner detection signal is not varied within the fixed time (max. 4.5 sec), the drum unit is found new.

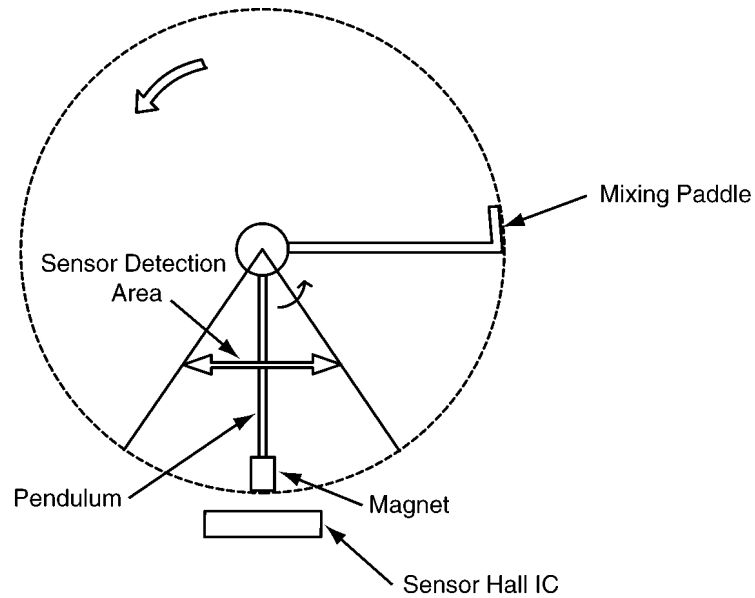
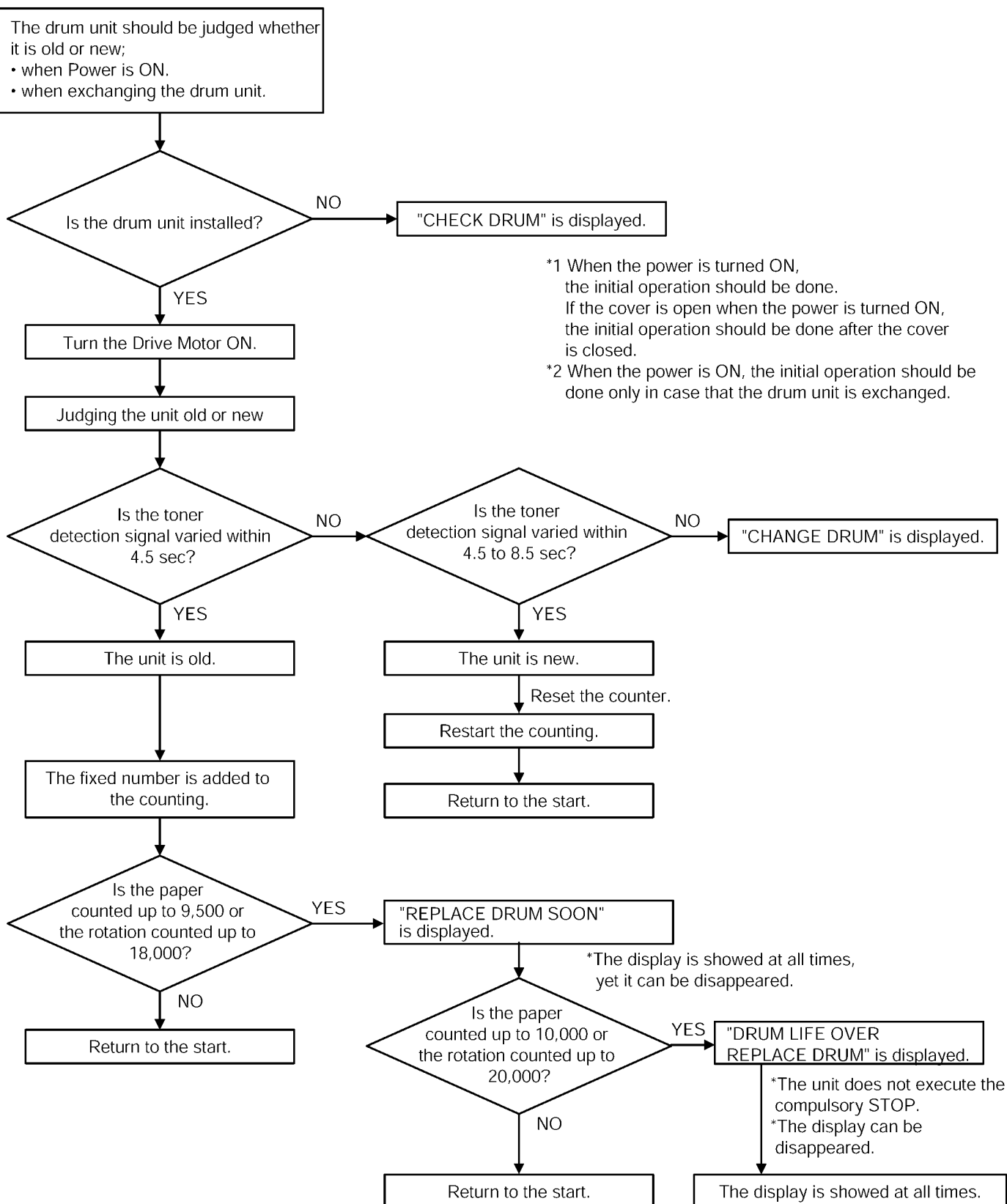


Fig. a

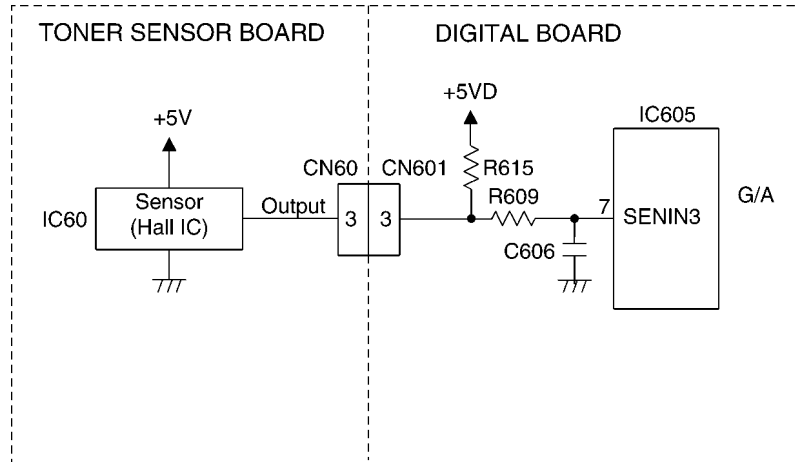
Detection Flowchart



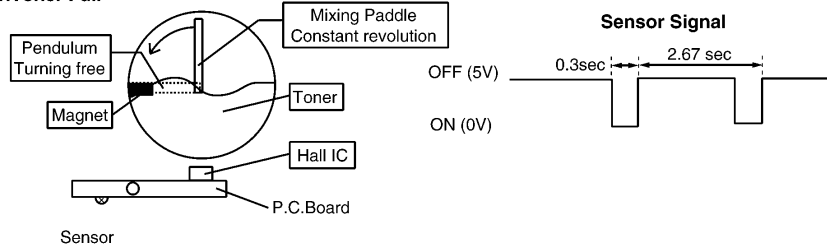
7.11.10. TONER SENSOR.... “TONER EMPTY”, “TONER LOW”, “CHANGE DRUM”

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

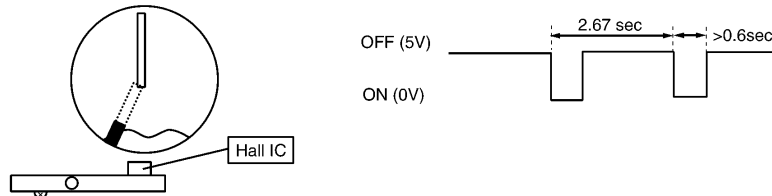
When there is not Drum unit, Hall IC (IC60) turns off, and the input signal of IC605-7 pin (Digital P.C.B) becomes a High level over 9s. When the Developer unit is set, Hall IC (IC60) turns ON/OFF. If the time of IC605-7 pin's Low level is under 600ms, there is enough toner in Developer unit, if not, toner is near empty.



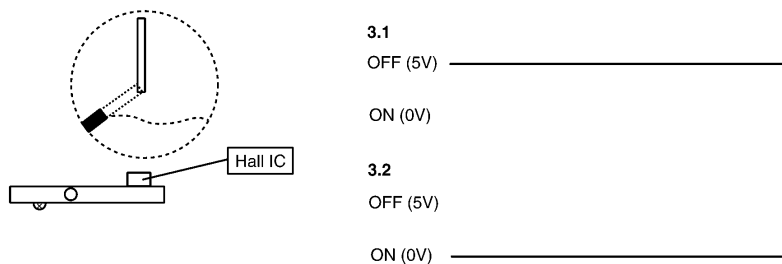
1. Toner Full



2. Toner Low



3. In case the Mixing Paddle does not rotate

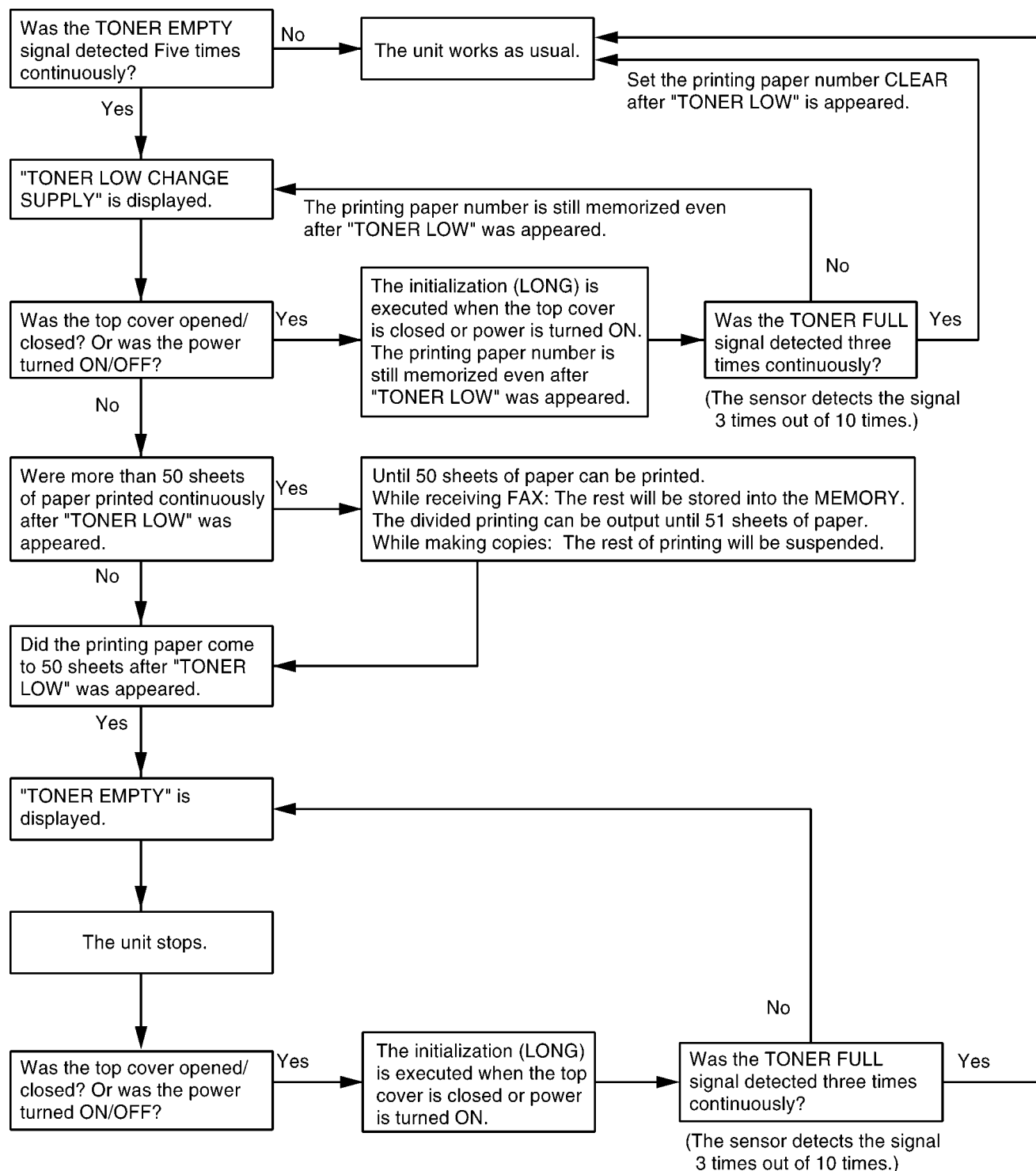


Toner Sensor

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

| State | Display | Signal (IC605-7pin) |
|---|-------------|---------------------------------|
| Toner Set (full) | - | Low level = about 0.3s |
| Near Empty Toner | TONER LOW | Low level > 0.6s |
| Mixing Paddle does not rotate ("CHANGE DRUM") | CHANGE DRUM | High level fix or Low level fix |

7.11.10.1. TONER DETECTION FLOW



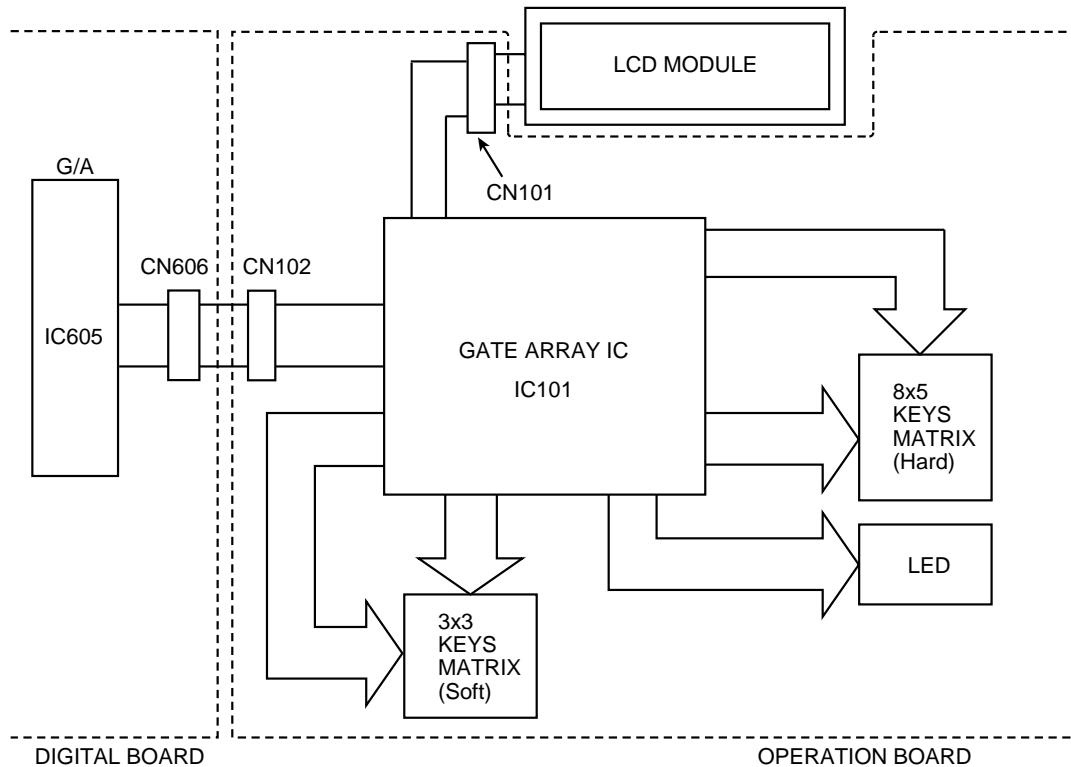
CAUTION:

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

7.12. OPERATION BOARD SECTION

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

The key matrix table is shown below.



1. Key Matrix

a. Hard Scan

| | KIN0 | KIN1 | KIN2 | KIN3 | KIN4 | KIN5 | KIN6 | KIN7 |
|------|-------------|-----------|-------|------------|-----------------------|-------|----------|--------------|
| KSL0 | AUTO ANSWER | CALLER IQ | NEXT | STOP | MENU | FLASH | H/S MUTE | REDIAL/PAUSE |
| KSL1 | QUICK SCAN | S6 | VOL- | CID-SEARCH | DIRECTORY/ PROGRAM | # | 0 | * |
| KSL2 | COPY | ----- | PREV | CID-PRINT | ----- | 9 | 8 | 7 |
| KSL3 | RESOLUTION | COLLATE | ----- | S12 | MONITOR | 3 | 2 | 1 |
| KSL4 | FAX START | ----- | VOL+ | S11 | HELP | 6 | 5 | 4 |

*LED7 should be set to KSL4. "8 x 5" key matrix is executed by hardware scanning.

b. Soft Scan

| | SKIN0 (XLED8) | KIN1 (XLED12) | KIN2 (XLED11) |
|---------------|---------------|---------------|---------------|
| SKS0 (LED6) | S10 | S7 | S9 |
| SKS1 (XLED9) | S4 | S2 | S3 |
| SKS2 (XLED10) | S5 | S1 | S8 |

2. LED

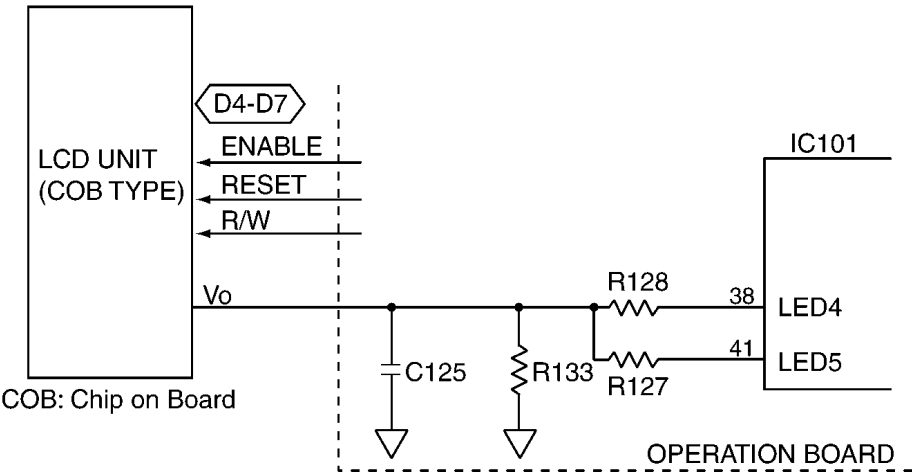
- AUTO ANSWER LED ON/OFF port---LED2
- CALLER IQ LED ON/OFF port---LED3

7.13. LCD SECTION

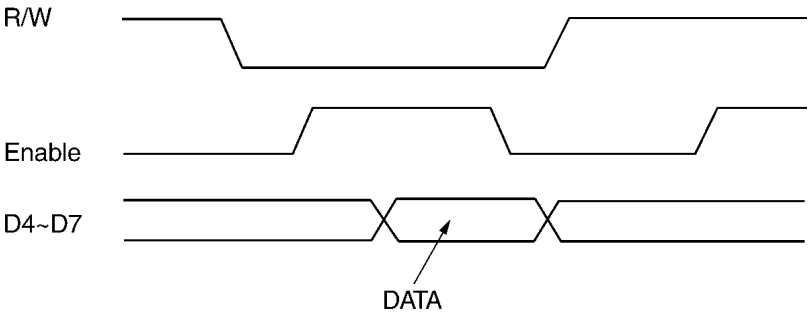
The Gate Array (IC101) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive. R130 and R134 are density control resistors.

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

Circuit Diagram



Timing Chart



<Density>

| Display mode | User setting | LED4 | LED5 |
|--------------|--------------|------|------|
| 2 LINE | NORMAL | H | L |
| | DARKER | L | L |
| Large | NORMAL | H | H |
| | DARKER | H | L |

7.14. HVPS (High Voltage Power Supply) SECTION

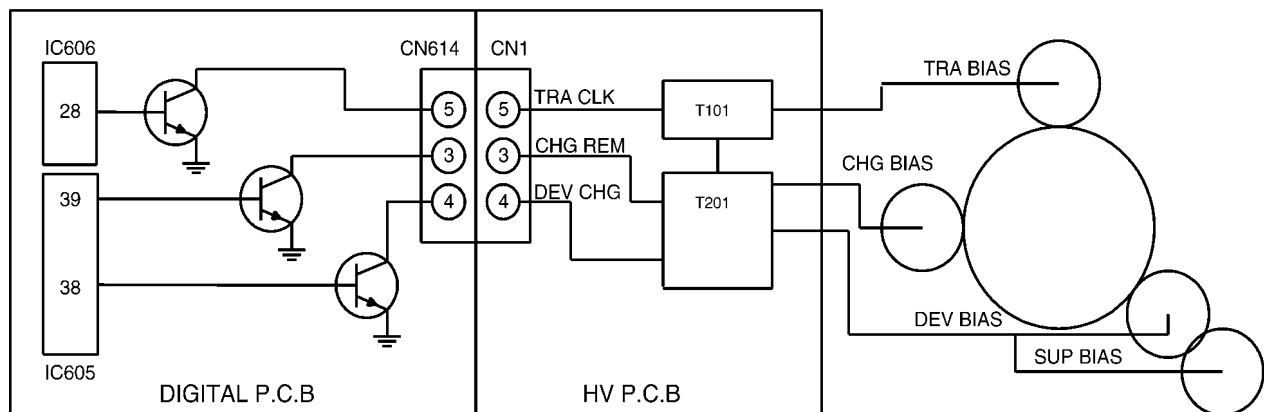
7.14.1. HVPS SPECIFICATION

| No | Output voltage | Item | Specification | Notes |
|----|-------------------------------------|-------------------------|---------------------------|--|
| 1 | Electrostatic Charge CHG BIAS | Rate output voltage | -1000±30V | |
| | | Impedance range | 50M~1000MΩ | |
| | | Output format | Constant voltage | |
| 2 | Developing DEV(-) BIAS | Rate output voltage | -200±15V | |
| | | Impedance range | 10M~2000MΩ | |
| | | Output format | Constant voltage | |
| | Developing DEV(+) BIAS | Rate output voltage | +150±20V | |
| | | Output format | Constant voltage | |
| 3 | Transfer TRA(+) BIAS | Variable output current | +4~25μA | Output current varies with the printed rate. |
| | | Output voltage | +3500V Max. | |
| | | Output format | Variable Constant current | |
| | Transfer TRA(-) BIAS | Rate output voltage | -1000±100V | |
| | | Output format | Constant voltage | |

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

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

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



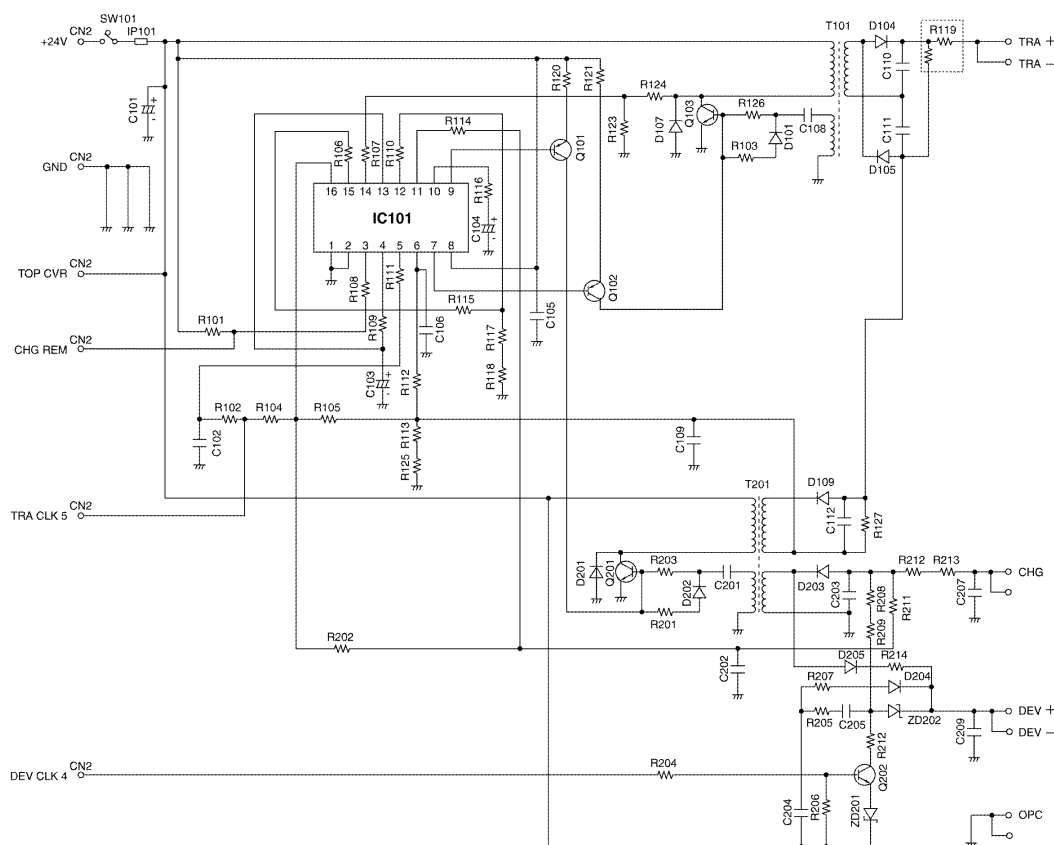
7.14.2. CHG-BIAS (Charge BIAS)/DEV(-) BIAS (Developing(-) BIAS)/DEV(+) BIAS (Developing(+) BIAS) UNIT

When the CHG REM terminal becomes "L", the transistor Q201 turns ON by IC101, Charge BIAS(-1000V) is output from CHG OUTPUT, Developing(-) BIAS(-200V) is output from DEV(-) BIAS. After that, when DEV CHG terminal becomes "L", Q202 turns ON, and Developing(+) BIAS(+150V) is output from DEV(+) BIAS.

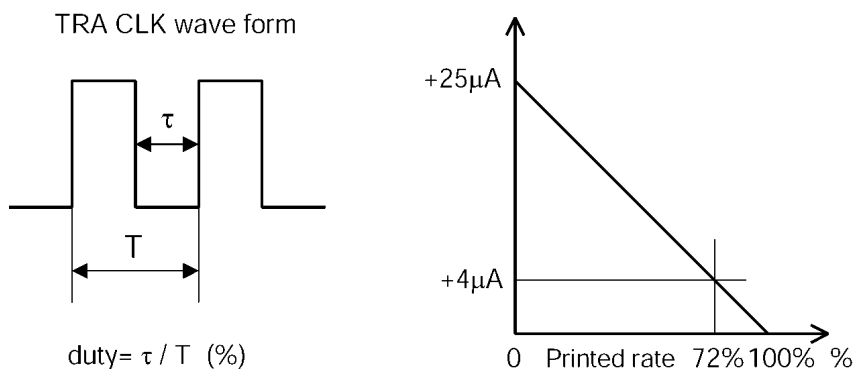
7.14.3. TRA(+) BIAS (Transfer(+) BIAS)/TRA(-) BIAS (Transfer(-) BIAS) UNIT

When the CHG REM terminal is "L" and the TRA CLK terminal is "Open", Transfer(-) BIAS(-1000V) is output from TRA OUTPUT the moment Charge BIAS(-1000V) is output from CHG OUTPUT. When 7.8KHz PWM (pulse-width modulation) signal is input to the TRA CLK terminal, Q103 turns ON by IC101, and TRA(+) CURRENT BIAS according to the PWM signal is output from TRA OUTPUT. The PWM signal will be turned to a constant voltage by the resistor and the condenser, and input to the IC101. The IC101 compares this voltage with the feedback voltage from T101 and controls the Q103. As for the transfer current, +25 μ A is output when DUTY of the TRA CLK input signal is 0%, or +4 μ A is output when that is 72%.

Circuit Diagram



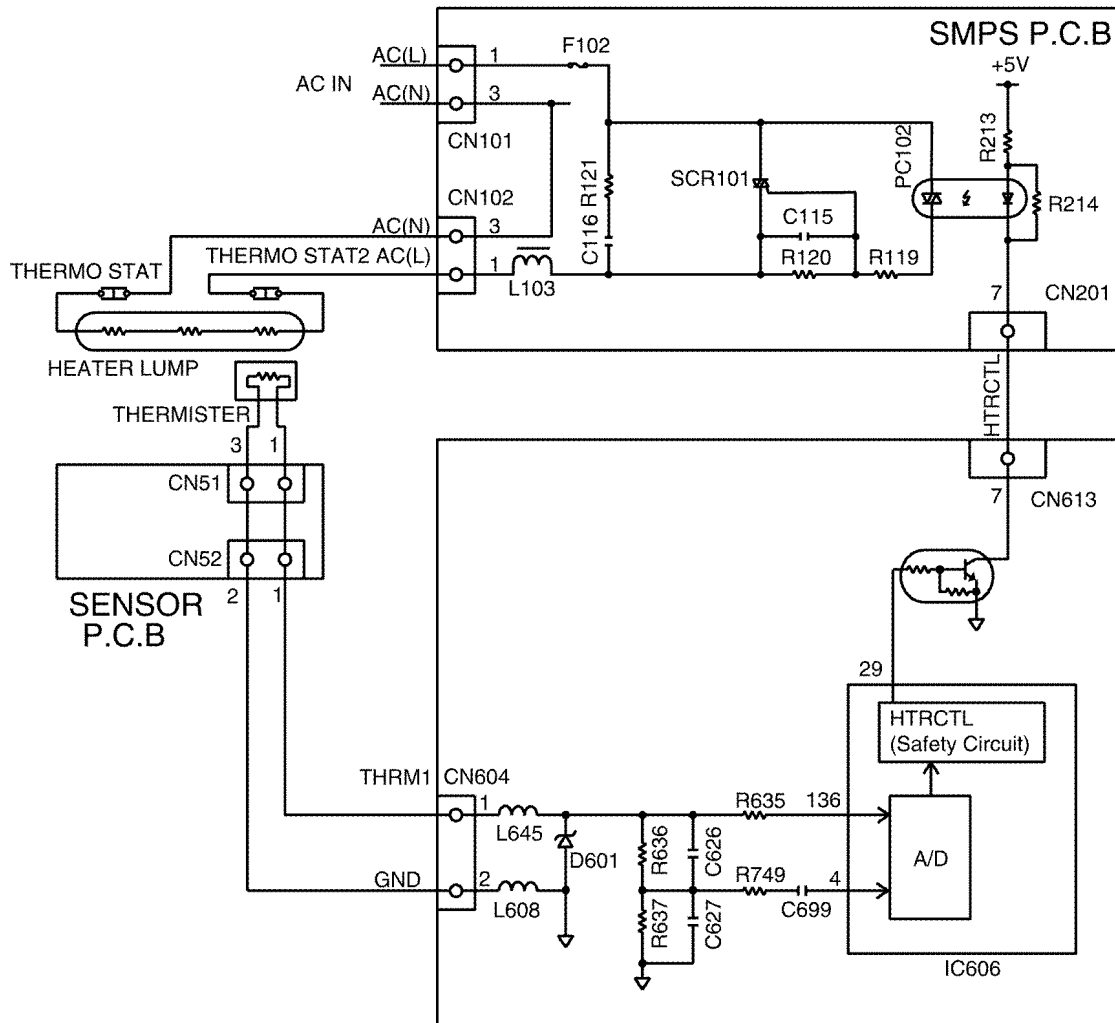
Transfer Current Variation by PWM Input



7.15. HEAT LAMP CONTROL CIRCUIT

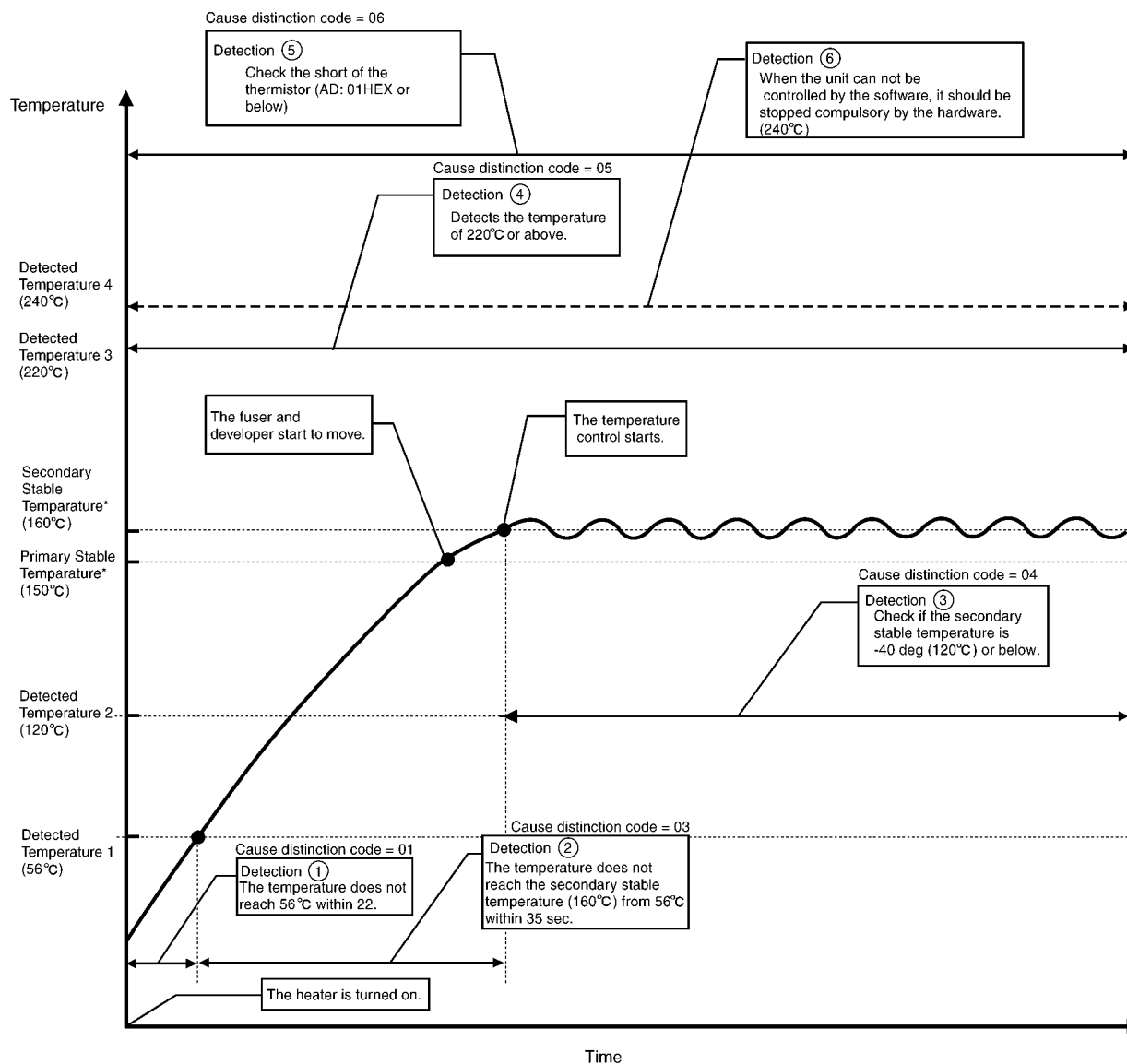
The temperature of the fixing part of the Fixing Unit is converted to a voltage by THERMISTOR and input to IC606-4pin. The heater turns ON/OFF the photo-coupler PC102 at the heater control port (IC606-29pin), and is turned ON/OFF at the triac SCR101. And two thermostats are set on the AC line as the safety devices.

Circuit Diagram



1. Control at Printing

- After the printing signal is received, turn ON the heater.
- After that, turn ON the motor at the Primary Stable Temperature (150°C).
- After that, control at the Secondary Stable temperature (160°C), and feed papers.



When one of the followings happened, the process against a failure is executed and the unit goes to "CALL SERVICE 3".

[Low temperature detection]

Detection ① : When the temperature does not reach 56 °C within 22 sec after the heater is turned ON.

Detection ② : When the temperature does not reach the secondary stable temperature (160 °C) from 56 °C within 35 sec.

Detection ③ : When the temperature went under the secondary stable temperature -40 deg (120 °C) by the temperature control after it reached the secondary stable temperature (160 °C).

[High temperature detection]

Detection ④ : When the temperature became 220 °C or above during printing.

Detection ⑤ : When the short of the thermistor (AD: 01HEX or below) is detected during printing.

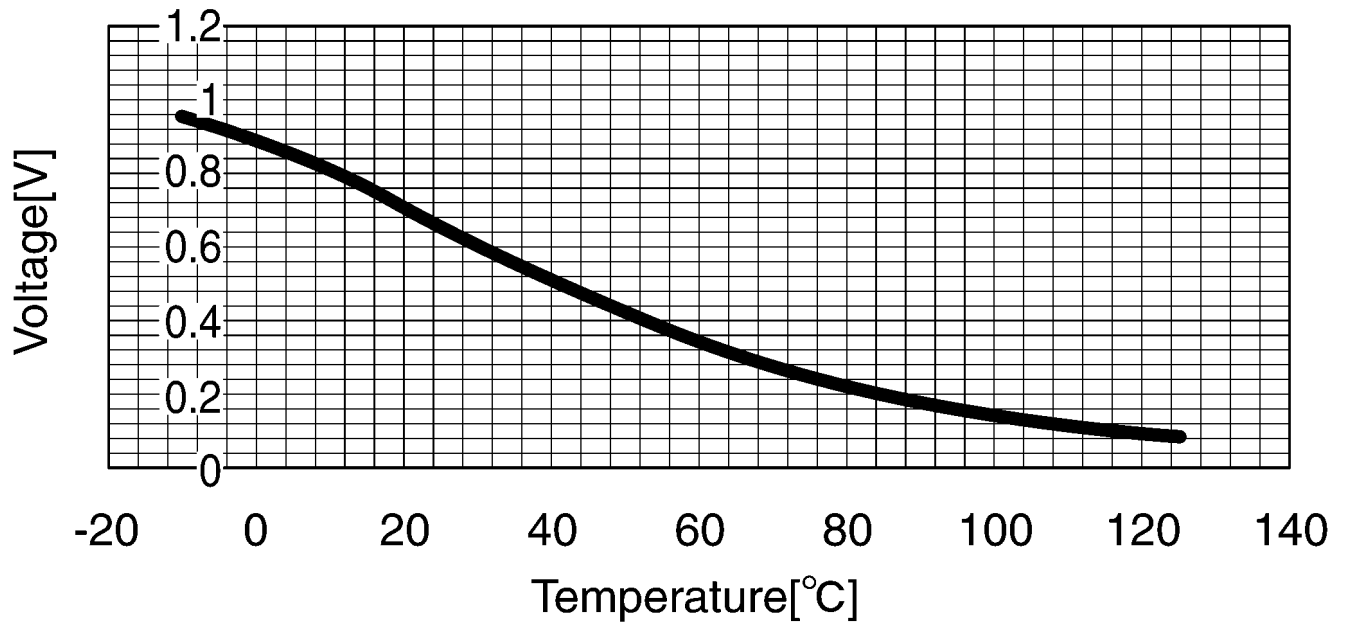
Detection ⑥ : When the unit can not be controlled by the software, it should be stopped compulsorily by the hardware. (240 °C).

Detection ⑦ : When the temperature of the thermostat reached 135°C .

2. Safety Protection

- a. 2 thermostats are provided with the unit, and the heater circuit is shut down when their surface temperatures became over 135°C.
- b. The heater control circuit of IC606 has the built-in function that the software turns off the heater control automatically if the heater is not turned ON every a fixed time.
- c. When the temperature became over 240°C, the heater control circuit of IC606 is turned off forcibly and system reset (IC606 pin 20 becomes Low) will be executed.

Room Temperature – Voltage



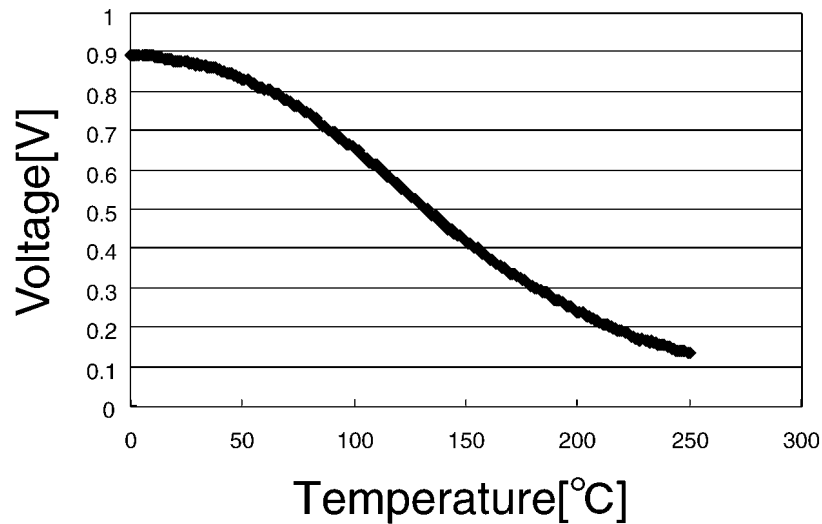
The correspondence readings between temperature measured by thermistor and HEX readings

| Temperature(°C) | HEX reading | Temperature(°C) | HEX reading | Temperature(°C) | HEX reading |
|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| -10 | C2 | 36 | 41 | 82 | 12 |
| -9 | BF | 37 | 40 | 83 | 12 |
| -8 | BC | 38 | 3E | 84 | 11 |
| -7 | B9 | 39 | 3C | 85 | 11 |
| -6 | B5 | 40 | 3A | 86 | 10 |
| -5 | B2 | 41 | 39 | 87 | 10 |
| -4 | AF | 42 | 37 | 88 | 10 |
| -3 | AB | 43 | 36 | 89 | 0F |
| -2 | A8 | 44 | 34 | 90 | 0F |
| -1 | A5 | 45 | 33 | 91 | 0E |
| 0 | A2 | 46 | 31 | 92 | 0E |
| 1 | 9E | 47 | 30 | 93 | 0E |
| 2 | 9B | 48 | 2F | 94 | 0D |
| 3 | 98 | 49 | 2D | 95 | 0D |
| 4 | 95 | 50 | 2C | 96 | 0D |
| 5 | 91 | 51 | 2B | 97 | 0C |
| 6 | 8E | 52 | 2A | 98 | 0C |
| 7 | 8B | 53 | 29 | 99 | 0C |
| 8 | 88 | 54 | 27 | 100 | 0C |
| 9 | 85 | 55 | 26 | 101 | 0B |
| 10 | 82 | 56 | 25 | 102 | 0B |
| 11 | 7F | 57 | 24 | 103 | 0B |
| 12 | 7C | 58 | 23 | 104 | 0A |
| 13 | 79 | 59 | 22 | 105 | 0A |
| 14 | 76 | 60 | 21 | 106 | 0A |
| 15 | 73 | 61 | 20 | 107 | 0A |
| 16 | 70 | 62 | 20 | 108 | 09 |
| 17 | 6D | 63 | 1F | 109 | 09 |
| 18 | 6A | 64 | 1E | 110 | 09 |
| 19 | 68 | 65 | 1D | 111 | 09 |
| 20 | 65 | 66 | 1C | 112 | 09 |
| 21 | 63 | 67 | 1B | 113 | 08 |
| 22 | 60 | 68 | 1B | 114 | 08 |
| 23 | 5D | 69 | 1A | 115 | 08 |
| 24 | 5B | 70 | 19 | 116 | 08 |
| 25 | 59 | 71 | 19 | 117 | 08 |
| 26 | 56 | 72 | 18 | 118 | 07 |
| 27 | 54 | 73 | 17 | 119 | 07 |
| 28 | 52 | 74 | 17 | 120 | 07 |
| 29 | 4F | 75 | 16 | 121 | 07 |
| 30 | 4D | 76 | 15 | 122 | 07 |
| 31 | 4B | 77 | 15 | 123 | 07 |
| 32 | 49 | 78 | 14 | 124 | 06 |
| 33 | 47 | 79 | 14 | 125 | 06 |
| 34 | 45 | 80 | 13 | | |
| 35 | 43 | 81 | 13 | | |

Note:

The value is displayed on LCD at **TEST FUNCTIONS** (P.65) [#815].

Heat Roller Temperature-Voltage



The correspondence readings between temperature measured by fixing thermistor and HEX readings

| Temperature(°C) | HEX reading | Temperature(°C) | HEX reading | Temperature(°C) | HEX reading |
|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| 0 | E4 | 84 | B8 | 168 | 58 |
| 1 | E4 | 85 | B7 | 169 | 57 |
| 2 | E4 | 86 | B6 | 170 | 56 |
| 3 | E4 | 87 | B5 | 171 | 56 |
| 4 | E4 | 88 | B4 | 172 | 55 |
| 5 | E4 | 89 | B3 | 173 | 54 |
| 6 | E3 | 90 | B2 | 174 | 53 |
| 7 | E3 | 91 | B1 | 175 | 52 |
| 8 | E3 | 92 | B0 | 176 | 51 |
| 9 | E3 | 93 | AE | 177 | 50 |
| 10 | E3 | 94 | AD | 178 | 4F |
| 11 | E2 | 95 | AC | 179 | 4E |
| 12 | E2 | 96 | AB | 180 | 4D |
| 13 | E2 | 97 | AA | 181 | 4C |
| 14 | E2 | 98 | A9 | 182 | 4C |
| 15 | E1 | 99 | A8 | 183 | 4B |
| 16 | E1 | 100 | A7 | 184 | 4A |
| 17 | E1 | 101 | A6 | 185 | 4A |
| 18 | E1 | 102 | A5 | 186 | 49 |
| 19 | E0 | 103 | A3 | 187 | 48 |
| 20 | E0 | 104 | A2 | 188 | 47 |
| 21 | E0 | 105 | A1 | 189 | 46 |
| 22 | E0 | 106 | A0 | 190 | 45 |
| 23 | DF | 107 | 9E | 191 | 44 |
| 24 | DF | 108 | 9D | 192 | 44 |
| 25 | DF | 109 | 9C | 193 | 43 |
| 26 | DE | 110 | 9C | 194 | 42 |
| 27 | DE | 111 | 9A | 195 | 41 |
| 28 | DE | 112 | 99 | 196 | 40 |
| 29 | DD | 113 | 98 | 197 | 40 |
| 30 | DE | 114 | 96 | 198 | 3F |
| 31 | DD | 115 | 95 | 199 | 3E |
| 32 | DD | 116 | 94 | 200 | 3D |
| 33 | DD | 117 | 93 | 201 | 3C |
| 34 | DC | 118 | 91 | 202 | 3C |
| 35 | DC | 119 | 90 | 203 | 3B |
| 36 | DB | 120 | 8F | 204 | 3A |
| 37 | DB | 121 | 8D | 205 | 3A |
| 38 | DB | 122 | 8D | 206 | 39 |
| 39 | DA | 123 | 8B | 207 | 38 |
| 40 | DA | 124 | 8A | 208 | 37 |
| 41 | D9 | 125 | 89 | 209 | 37 |
| 42 | D9 | 126 | 88 | 210 | 36 |

| Temperature(°C) | HEX reading | Temperature(°C) | HEX reading | Temperature(°C) | HEX reading |
|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| 43 | D8 | 127 | 86 | 211 | 35 |
| 44 | D7 | 128 | 85 | 212 | 35 |
| 45 | D7 | 129 | 84 | 213 | 34 |
| 46 | D6 | 130 | 82 | 214 | 33 |
| 47 | D6 | 131 | 81 | 215 | 33 |
| 48 | D5 | 132 | 80 | 216 | 32 |
| 49 | D5 | 133 | 7F | 217 | 32 |
| 50 | D4 | 134 | 7D | 218 | 31 |
| 51 | D3 | 135 | 7C | 219 | 30 |
| 52 | D3 | 136 | 7B | 220 | 30 |
| 53 | D2 | 137 | 79 | 221 | 2F |
| 54 | D1 | 138 | 78 | 222 | 2F |
| 55 | D1 | 139 | 77 | 223 | 2E |
| 56 | D0 | 140 | 76 | 224 | 2D |
| 57 | CF | 141 | 74 | 225 | 2D |
| 58 | CF | 142 | 73 | 226 | 2C |
| 59 | CE | 143 | 72 | 227 | 2C |
| 60 | CD | 144 | 72 | 228 | 2A |
| 61 | CD | 145 | 70 | 229 | 2B |
| 62 | CD | 146 | 6F | 230 | 2A |
| 63 | CC | 147 | 6E | 231 | 2A |
| 64 | CB | 148 | 6D | 232 | 29 |
| 65 | CA | 149 | 6C | 233 | 2A |
| 66 | CA | 150 | 6A | 234 | 29 |
| 67 | C9 | 151 | 69 | 235 | 29 |
| 68 | C8 | 152 | 69 | 236 | 28 |
| 69 | C7 | 153 | 68 | 237 | 28 |
| 70 | C6 | 154 | 67 | 238 | 27 |
| 71 | C5 | 155 | 66 | 239 | 27 |
| 72 | C4 | 156 | 64 | 240 | 26 |
| 73 | C3 | 157 | 63 | 241 | 26 |
| 74 | C2 | 158 | 62 | 242 | 25 |
| 75 | C2 | 159 | 61 | 243 | 25 |
| 76 | C1 | 160 | 60 | 244 | 24 |
| 77 | C0 | 161 | 5F | 245 | 24 |
| 78 | BF | 162 | 5E | 246 | 24 |
| 79 | BE | 163 | 5D | 247 | 23 |
| 80 | BD | 164 | 5C | 248 | 23 |
| 81 | BC | 165 | 5B | 249 | 22 |
| 82 | BB | 166 | 5A | 250 | 22 |
| 83 | BA | 167 | 59 | | |

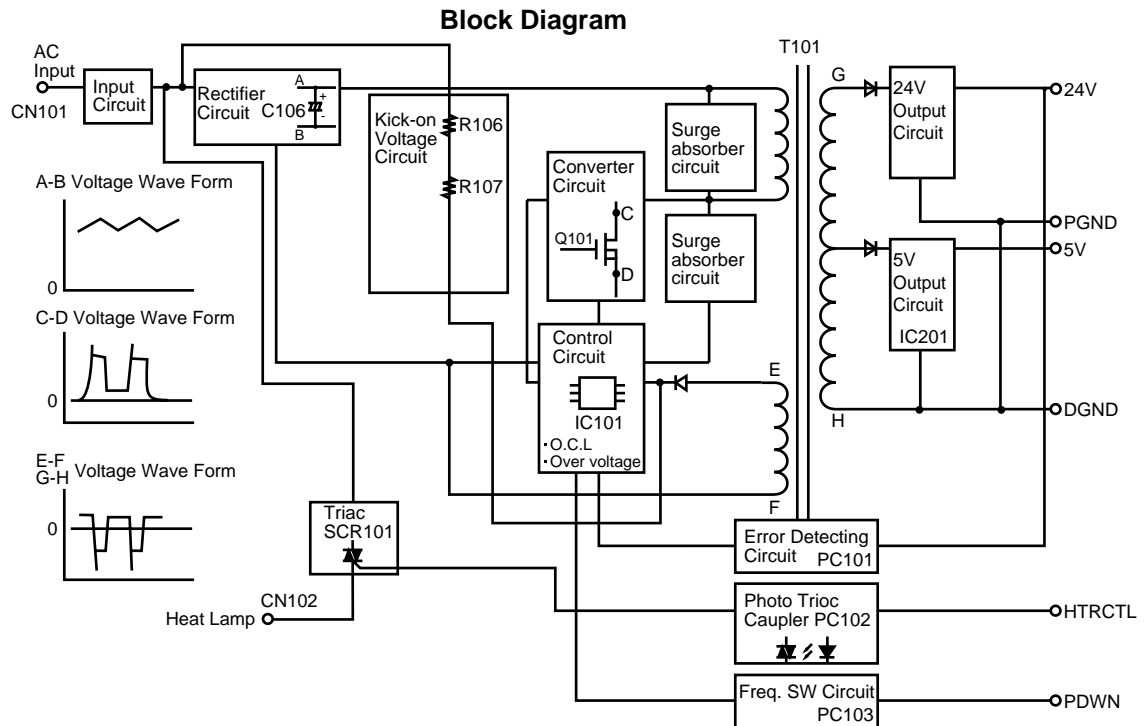
Note:

Hex reading : 01h or below = Short of Thermistor

Hex reading : F9h or over = Open of Thermistor

7.16. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.



[Input Circuit]

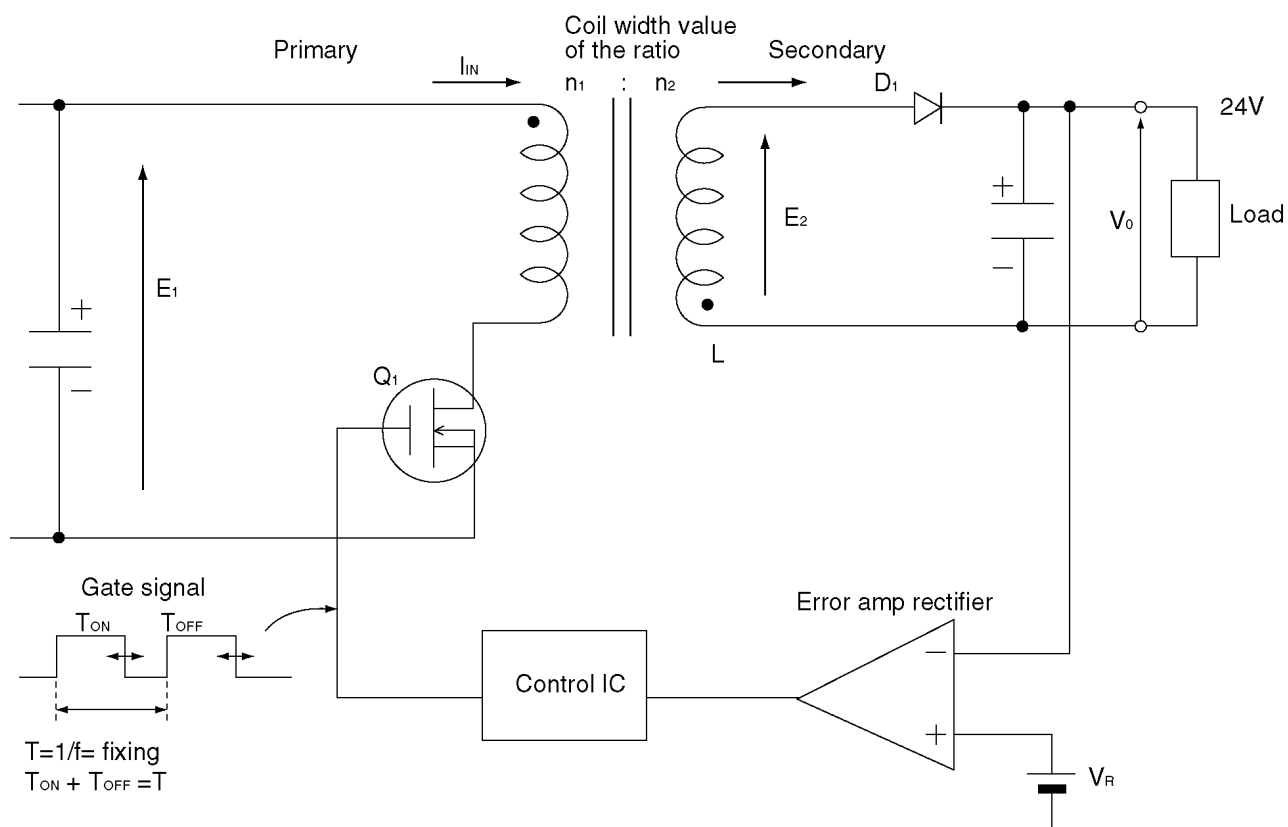
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

[Rectifier Circuit]

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

[Kick-on voltage circuit]

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



The following is an overview of how the power supply unit is controlled.

The control method of this power supply unit is pulse width modulation.

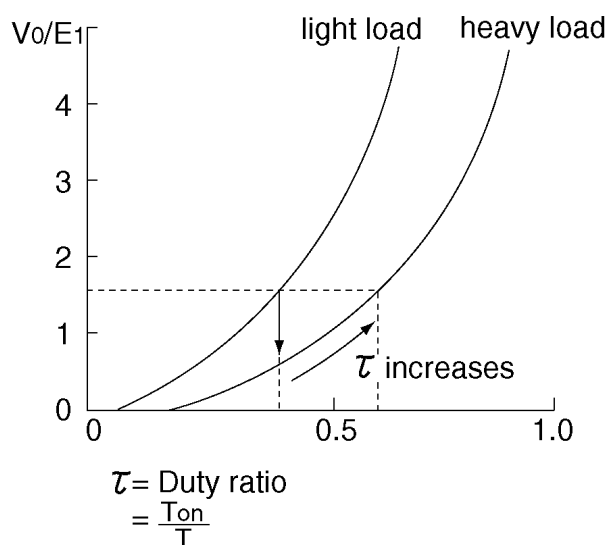
When Q_1 is ON, the energy is charged in the transfer primary coil according to E_1 . When Q_1 is OFF, the energy is output from the secondary transfer as follows.

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

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

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

Output/Input voltage value of ratio



[Surge Absorber Circuit]

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

[Control Circuit and Detecting Circuit]

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

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

This is shown as follows.

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

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

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

[Over Voltage Circuit]

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

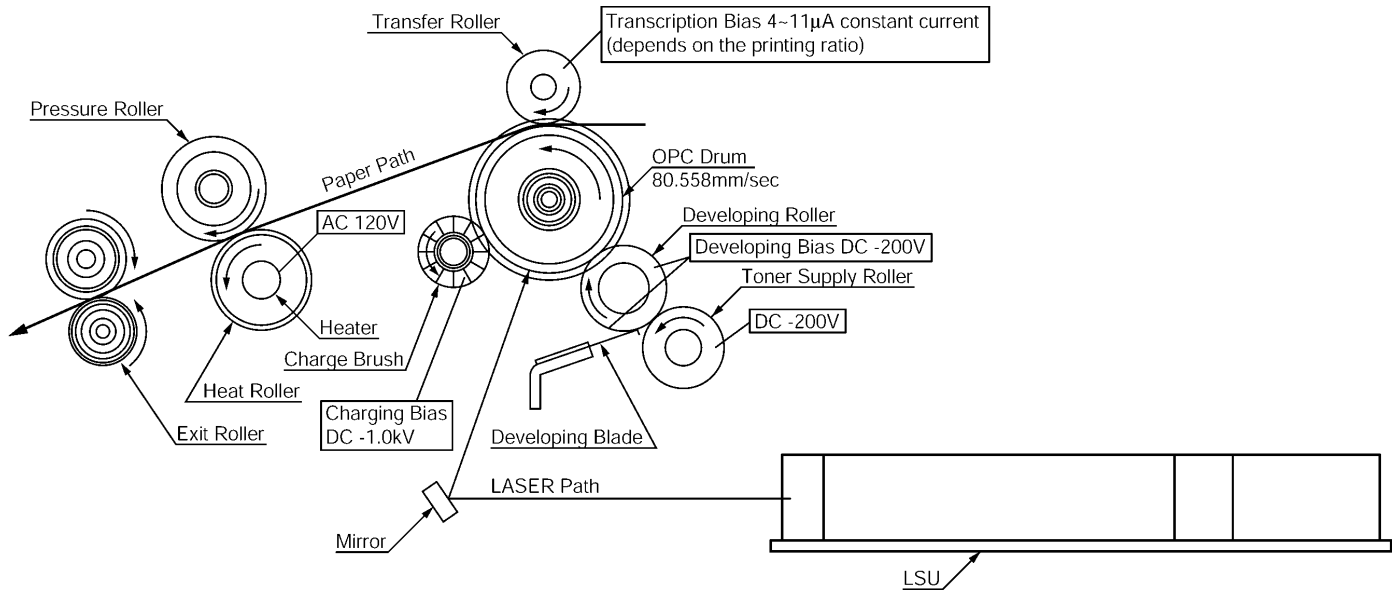
Dummy load method (to quickly check the power supply output)

Refer to **POWER SUPPLY BOARD SECTION,]** (P.145).

8 REFERENCE MATERIALS DATA

8.1. PRINTING OPERATION PRINCIPLE

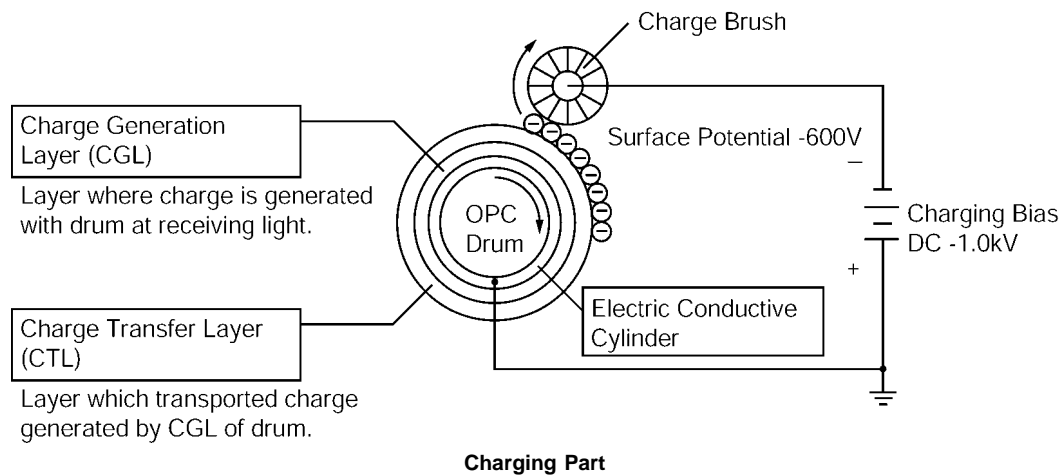
8.1.1. PROCESS CHART AND PROCESS BIAS



8.1.2. CHARGING

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

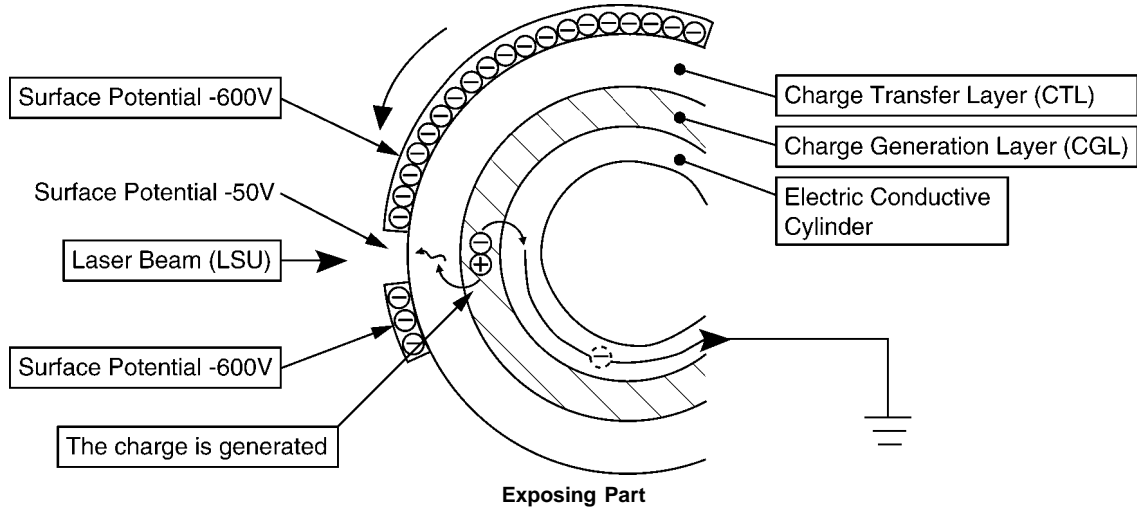
When the charging bias (DC -1.0 kiev) is added and the minus charge is supplied to the charge brush while charging, the whole surface potential of the drum is -600V.



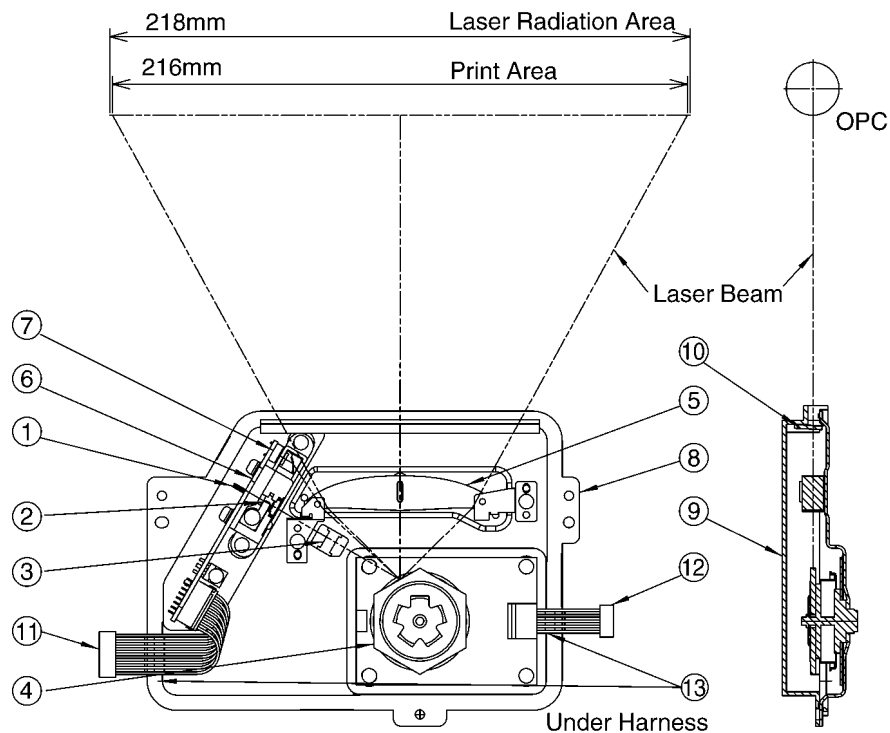
8.1.3. EXPOSING

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

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



8.1.4. LASER SCANNING UNIT LOCATIONS

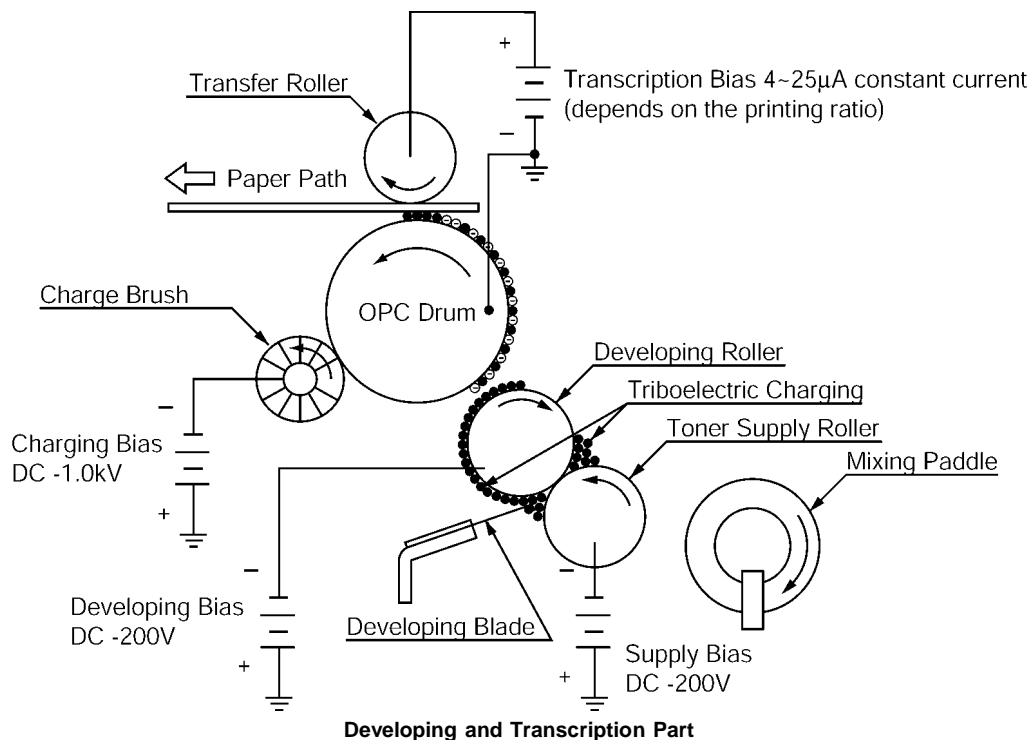


| Parts Name | | Parts Name | |
|------------|--------------------|------------|---------------|
| 1 | Laser Diode | 8 | Frame |
| 2 | Collimator Lens | 9 | Cover |
| 3 | Cyrindorical Lens | 10 | Cover Glass |
| 4 | Polygon Motor Unit | 11 | LD Harness |
| 5 | f θ Lens | 12 | Motor Harness |
| 6 | LD Driving Circuit | 13 | Sponge |
| 7 | Pin Photodiode | | |

8.1.5. DEVELOPING AND TRANSCRIPTION

The developing is the stage that the OPC drum with an invisible image is changed to visible by the toner. The developer consists of mixing paddle, toner supply roller, developing roller, developing blade and OPC drum. The bias voltage is added to the developing roller (DC -200V) and toner supply roller (DC -200V). Firstly the toner is mixed up in the mixing paddle and minus-charged by triboelectricity, then led to the toner supply roller. Secondly the potential difference causes to send the toner to the developing roller from the toner supply roller. The supplied toner to the developing roller is kept to a certain layer thickness by the developing blade and also it is charged by triboelectricity. Consequently the toner is transferred to the surface of the exposed OPC drum by the potential difference between the developing roller and OPC drum's surface.

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



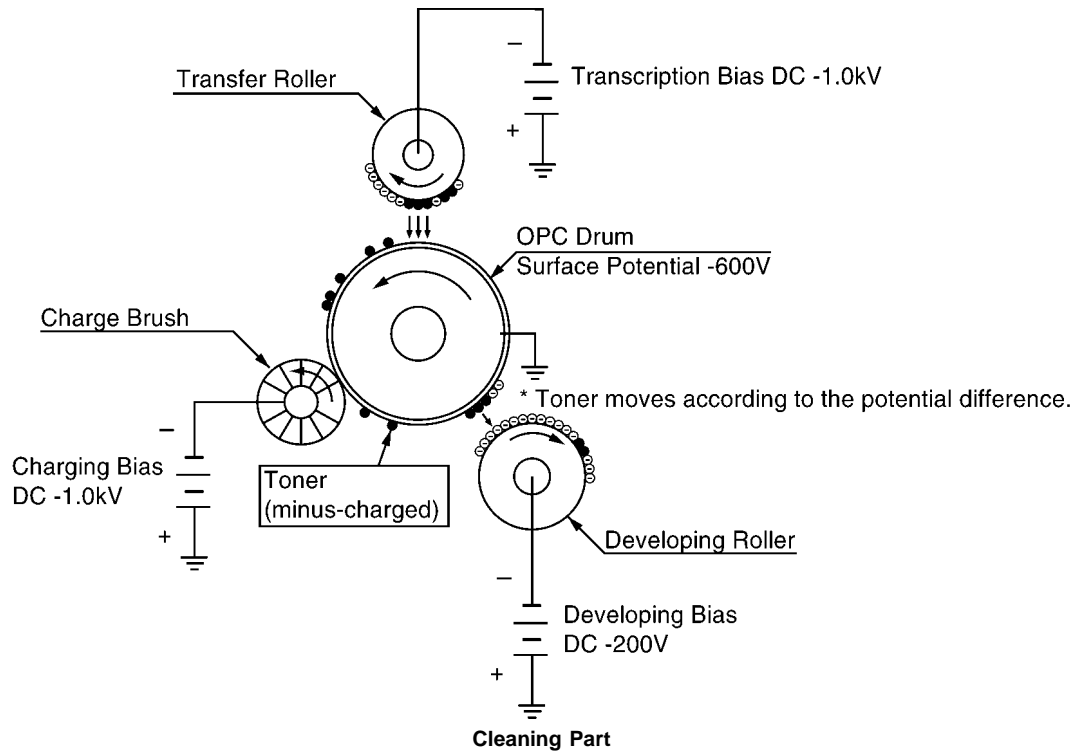
The values of developing bias and supply bias are different from the ones described in the Service Manual for FL501.

The biases output from the unit of FL501, FLM551 and FLB751 (FLB750) have the same voltage. However, the developing device of FA78X (FA78A) converts the developing and supply biases inside the developing device to improve the image quality.

| | FA77X(FA77A) developing device | FA78X(FA78A) developing device | FA84X(FA84A/FA84E) developing device |
|-----------------|--------------------------------|--------------------------------|--------------------------------------|
| Developing bias | -350V | -180V | -200V |
| Supply bias | -550V | -350V | -200V |

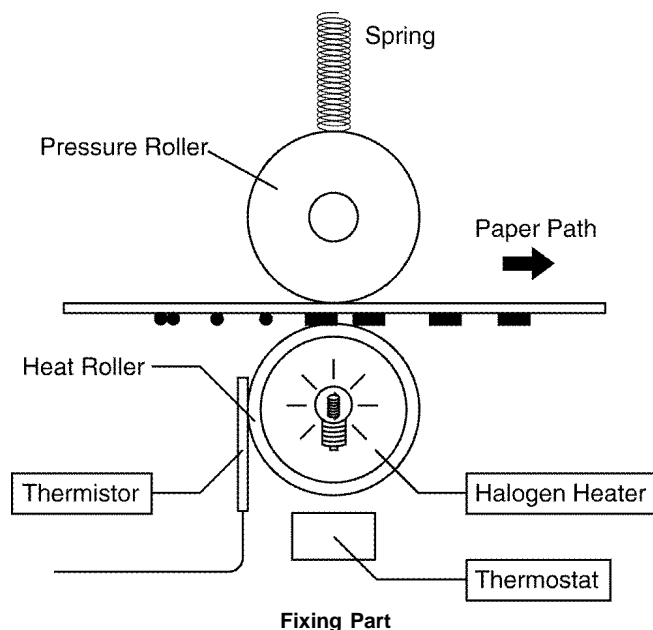
8.1.6. CLEANING

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



8.1.7. FIXING

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



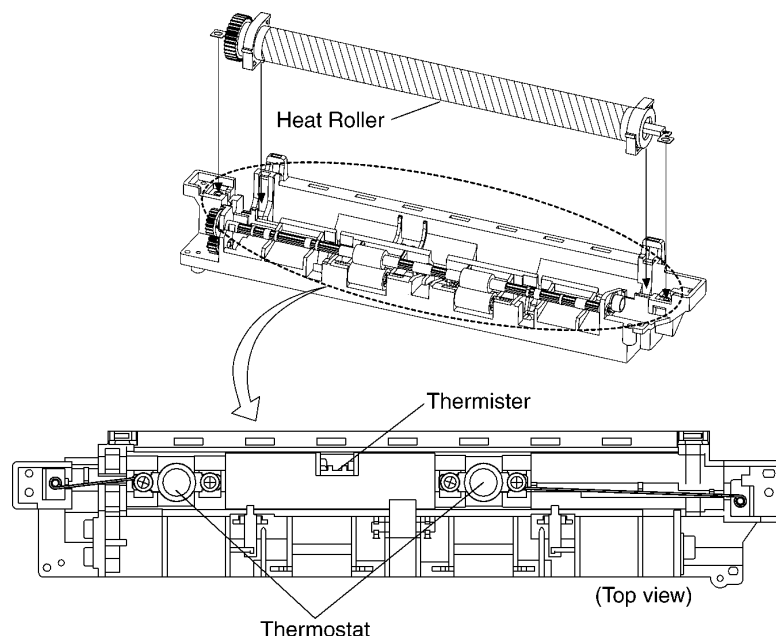
The fixing part becomes high temperature, so the thermistor and the thermal fuse are provided.

1. Thermistor

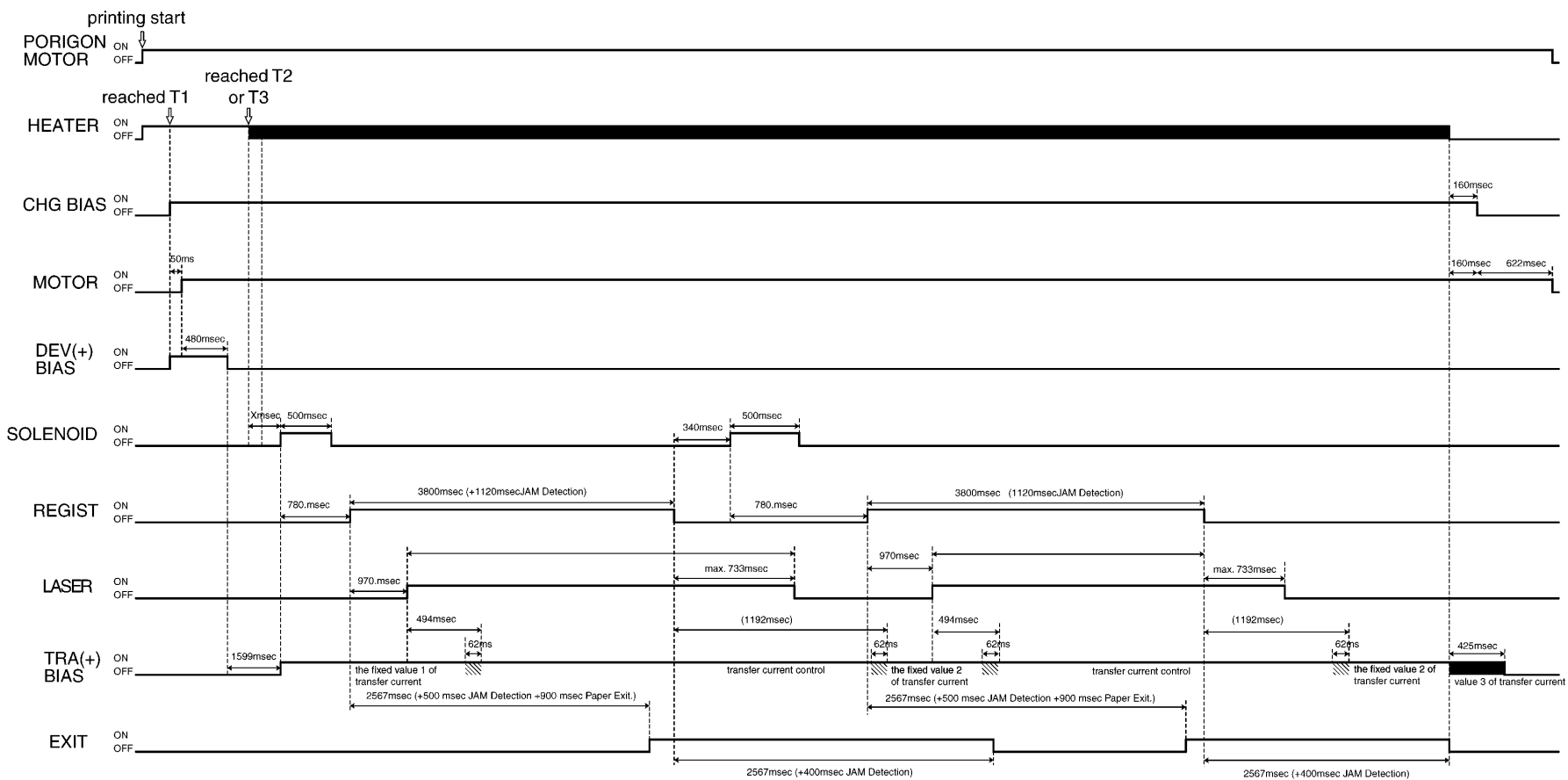
The thermistor touches the heat roller and check the temperature to feed back to the control circuit. The surface temperature should be kept 160 °C while printing.

2. Thermostat

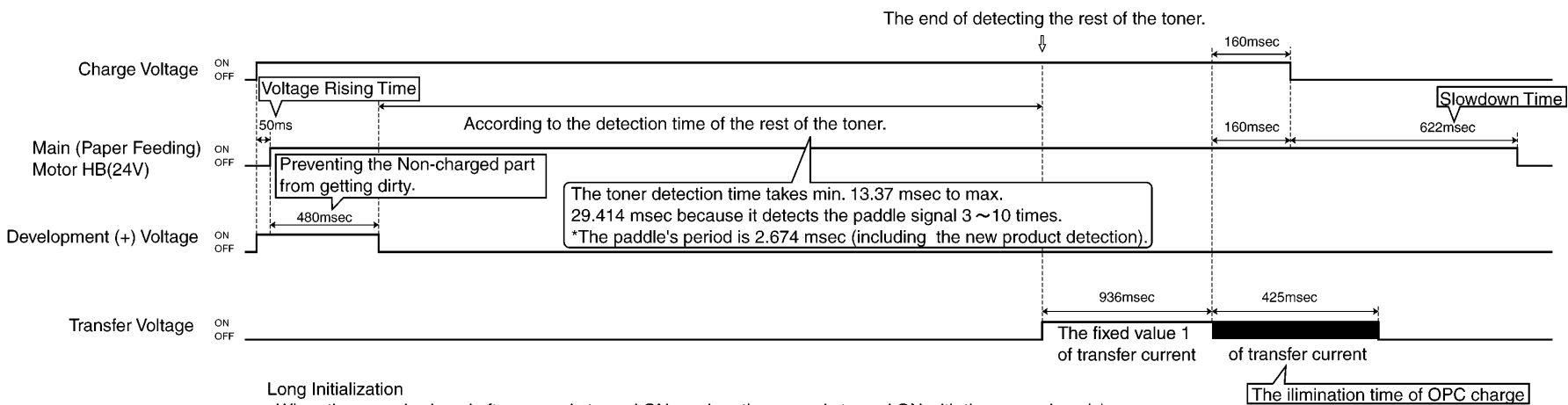
The thermostat takes the same role with the thermal fuse. The thermostat is located near the heat roller, and it turns OFF the power when the temperature around the thermostat becomes over 135°C.



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



8.1.9. Timing Chart [Initializing (Long)]



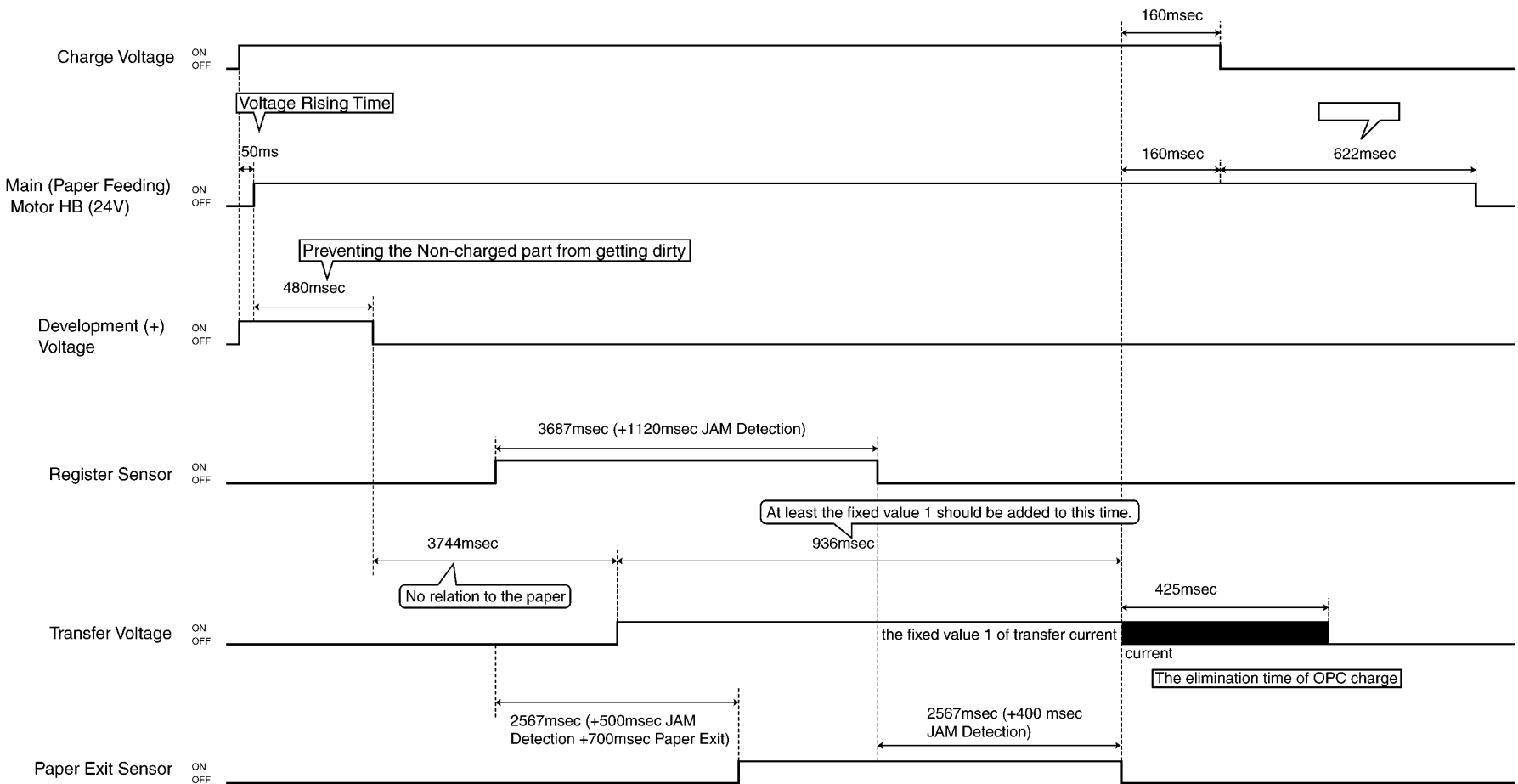
Long Initialization

- When the cover is closed after power is turned ON or when the power is turned ON with the cover closed.)
- When the developer is removed. (When the cover is closed after the developer is removed.)
- When the cover is closed after the toner becomes LOW.
- When the cover is closed after the Jam is released.
- After FAILED PICK UP is released. The initialization of the pick up roller position
- Aging: Once/day

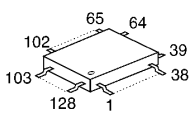
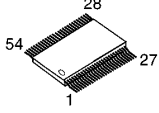
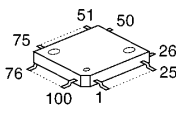
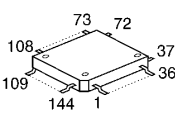
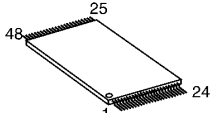
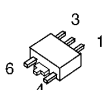
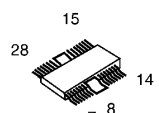
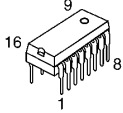
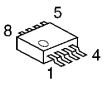
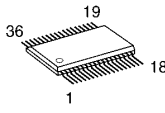
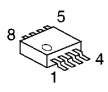
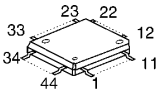
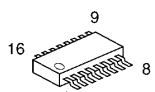

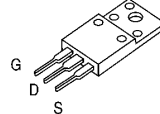




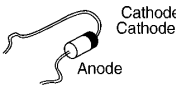

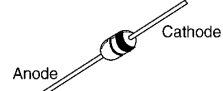
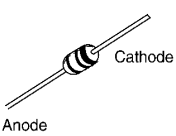
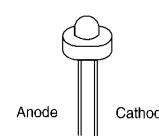
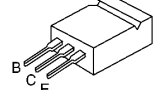
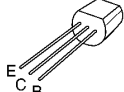

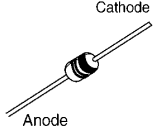
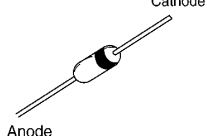
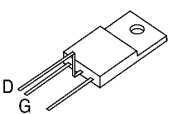

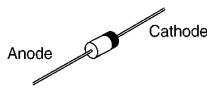
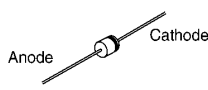
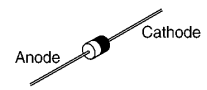
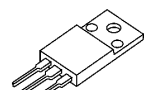
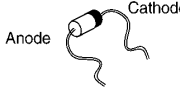
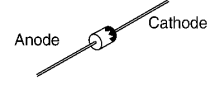
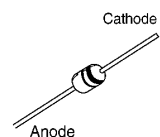
* In case that the abnormal paddle signal is detected during initialization, the motor is forced to stop without completion processing, on the other hand when it is detected during printing the process will be completed as usual.

To prevent the unit from being destructed by the OPC transfer voltage

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



8.2. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES

| | | | | |
|---|--|--|---|---|
|  <p>PFVIR676811</p> |  <p>C3ABPG000102</p> |  <p>C1CB00001566</p> |  <p>C1CB00001551</p> |  <p>PFWIFL513RU</p> |
|  <p>C0DBFGD00012</p> |  <p>C0GBH0000015</p> |  <p>PFVIT2003APS</p> |  <p>C0JBAR000386</p> |  <p>AN6384SB</p> |
|  <p>PQVINJM4558M/ PQVIMC34119D</p> |  <p>C1ZBZ0002089</p> |  <p>AN6742S</p> |  <p>PFVIFA5317P</p> |  <p>PFVIPQ05RD11</p> |
|  <p>PQVDNDCD56DT</p> |  <p>2SB1322</p> |  <p>PQVTDTC143E/ 2SB1197K/ PQVTD143Z106/ 2SD1819A</p> |  <p>PQVDRLS73T/ PFVDRMRLS245</p> |  <p>B0JAME000005</p> |
|  <p>MA7160</p> |  <p>PFVDRMRLS245/ PQVDRLS73T/ 1SS133</p> |  <p>MA4056</p> |  <p>PQVDSLRL325MC/ PQVDR325CA47</p> |  <p>2SD2137A</p> |
|  <p>2SA1699</p> |  <p>2SB709A</p> |  <p>PFVDRD62ESAB</p> |  <p>PFVDRD150EB</p> |  <p>2SK2543</p> |
|  <p>2SC1740S</p> |  <p>h:PFVDDHM3FJ60/ PFVDDHM3M20/ PFVDGPP20JT3</p> |  <p>PFVDERA1504</p> |  <p>PFVD05NU42/ PSVD10ELS4</p> |  <p>PFVDYG901C2R</p> |
|  <p>PFVD21DQ04</p> |  <p>PFVDERA9102</p> |  <p>MA4300/MA4180</p> | | |

8.3. 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.

8.3.1. PREPARATION

8.3.1.1. For Power Supply Board

- SOLDER

Sparkle Solder 115A-1, 115B-1 OR Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption is between 30 W to 40 W.

Temperature of Copper Rod $662 \pm 50^{\circ}\text{F}$ ($350 \pm 10^{\circ}\text{C}$)

(An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)

- Flux

HI115 Specific gravity 0.863

(Original flux should be replaced daily.)

8.3.1.2. For P.C.Board with “PbF” marking

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of $700^{\circ}\text{F} \pm 20^{\circ}\text{F}$ ($370^{\circ}\text{C} \pm 10^{\circ}\text{C}$)

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 $\rightarrow 0.82$.

Type \rightarrow RMA (lower residue, non-cleaning type)

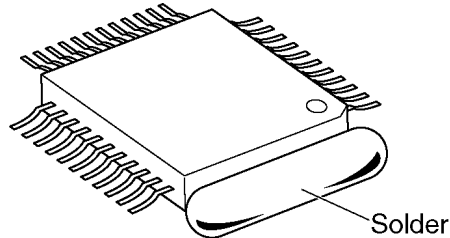
Note: See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.6).

8.3.2. FLAT PACKAGE IC REMOVAL PROCEDURE

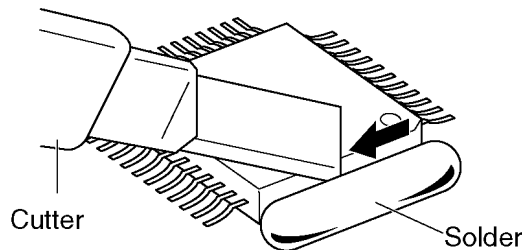
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

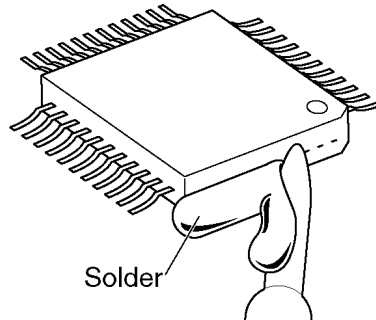
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



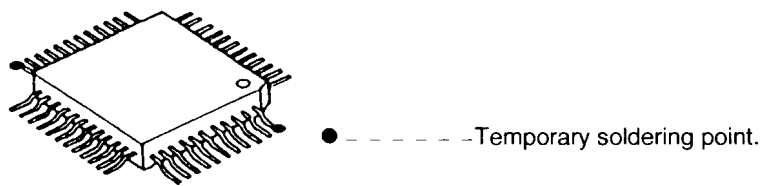
3. While the solder melts, remove it together with the IC pins.



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.

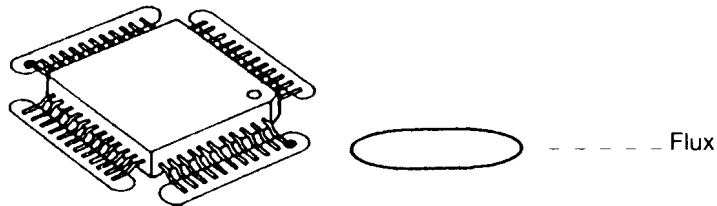
8.3.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

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

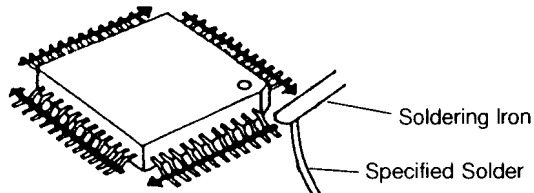


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

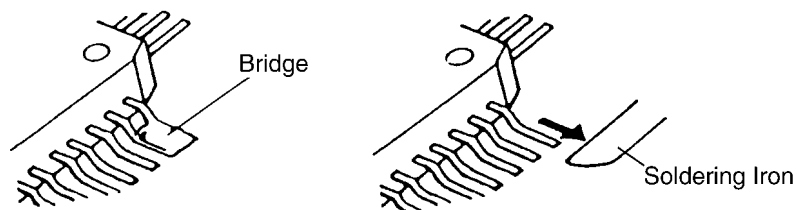


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



8.3.4. 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.



8.4. DIGITAL BOARD SECTION

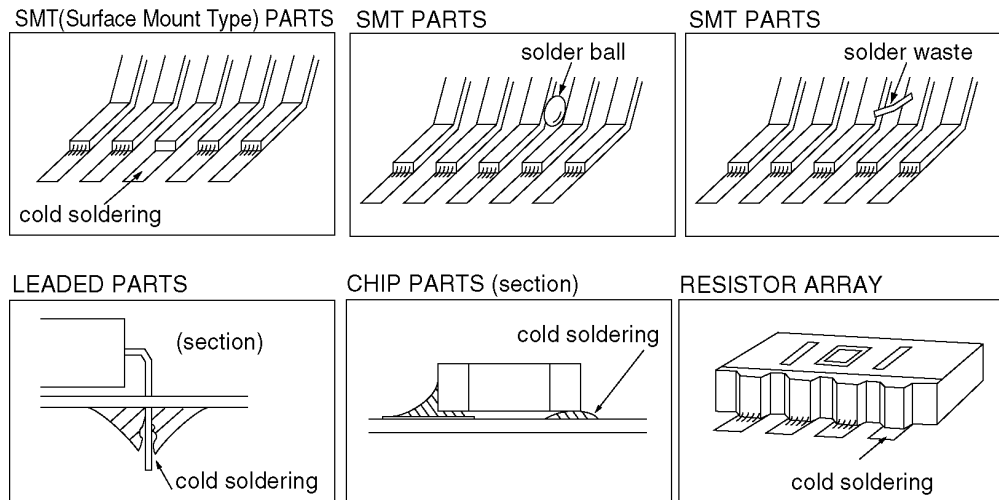
When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.

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

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

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

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



Note:

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

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

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

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

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

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

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

What are the main signals for booting up the unit?

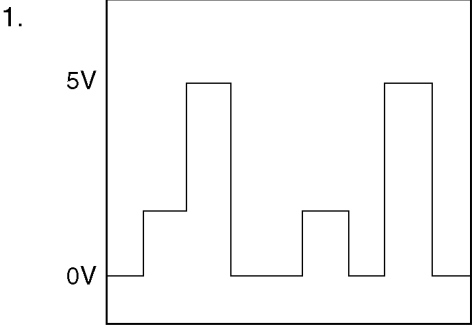
Please refer to **DIGITAL BLOCK DIAGRAM** (P.151).

The ASIC (IC606) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC607), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.

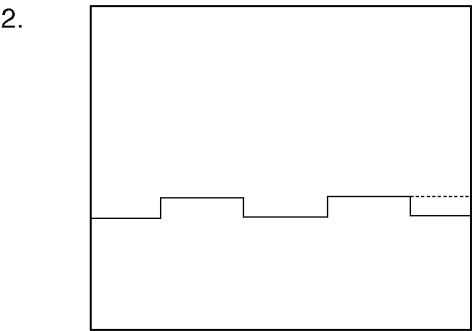
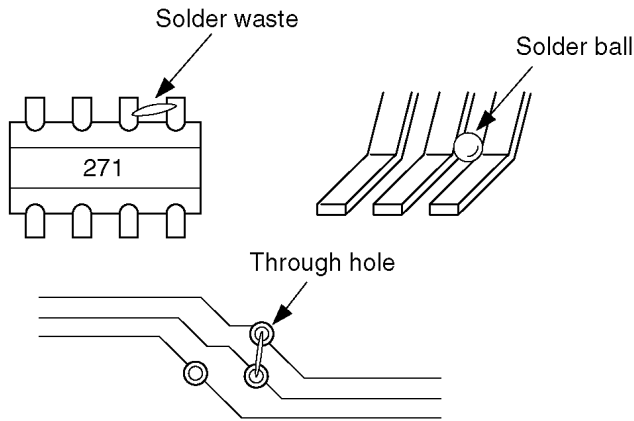
It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.

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

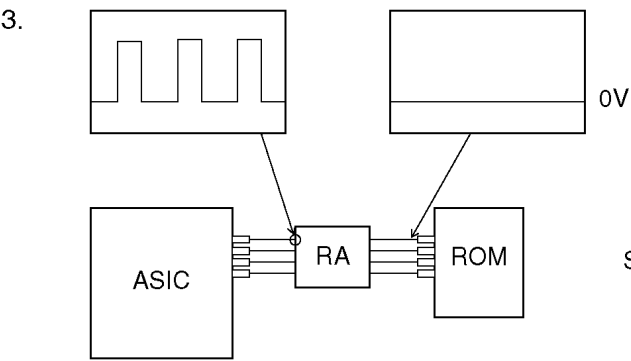
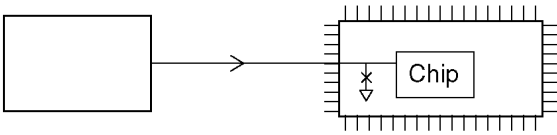
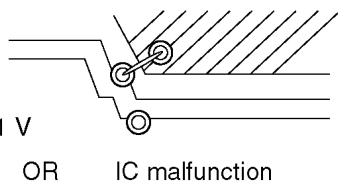
8.4.1. NG EXAMPLE



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



Short between the signal line and GND.



Solder fault on RA.

8.5. MODEM SECTION

8.5.1. FUNCTION

The unit uses MODEM (IC600) that serves as an interface between the control section for FAX transmission and reception and the telephone line. During a transmitting operation, the digital image signals are modulated and sent to the telephone line.

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

It can be controlled by writing commands from the ASIC (IC606: inside ASIC).

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

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

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

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

2. Definition of Each Group

- Group I (G1)

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

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

- Group II (G2)

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

Methods to suppress redundancy are not used.

Determined in 1976.

- Group III (G3)

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

Determined in 1980.

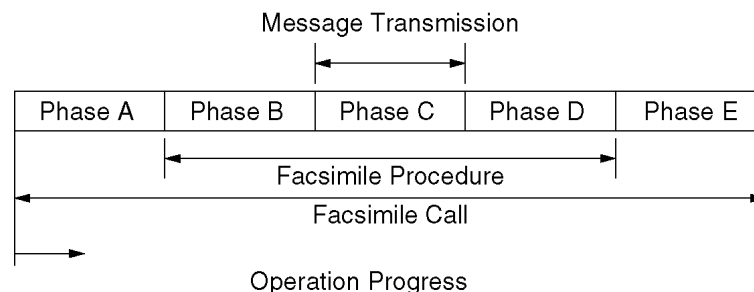
- Group IV (G4)

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

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

3. Facsimile Call Time Series

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



Phase A : Call setting

Call setting can be manual/automatic.

Phase B : Pre-message procedure

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

Phase C : Message transmission

Phase C is the procedure for the transmitting facsimile messages.

Phase D : Post message procedure

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

Phase E : Call retrieval

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

4. Concerning Transmission Time

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

Transmission time consists of the following.

Control time:

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

Image transmission time:

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

Hold time:

This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

5. Facsimile Standards

| Item | Telephone Network Facsimile |
|--|---|
| | G3 Machine |
| Connection Control Mode | Telephone Network Signal Mode |
| Terminal Control Mode | T. 30 Binary |
| Facsimile Signal Format | Digital |
| Modulation Mode | PSK (V. 27 ter) or QAM (V. 29) |
| Transmission Speed | 300 bps (Control Signal) 2400, 4800, 7200, 9600, 12000, 14400 bps (FAX Signal) |
| Redundancy Compression Process (Coding Mode) | 1 dimension: MH Mode 2 dimension: MR Mode (K=2.4) |
| Resolution | Main Scan: 8 pel/mm Sub Scan: 3.85, 7.7l/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. |

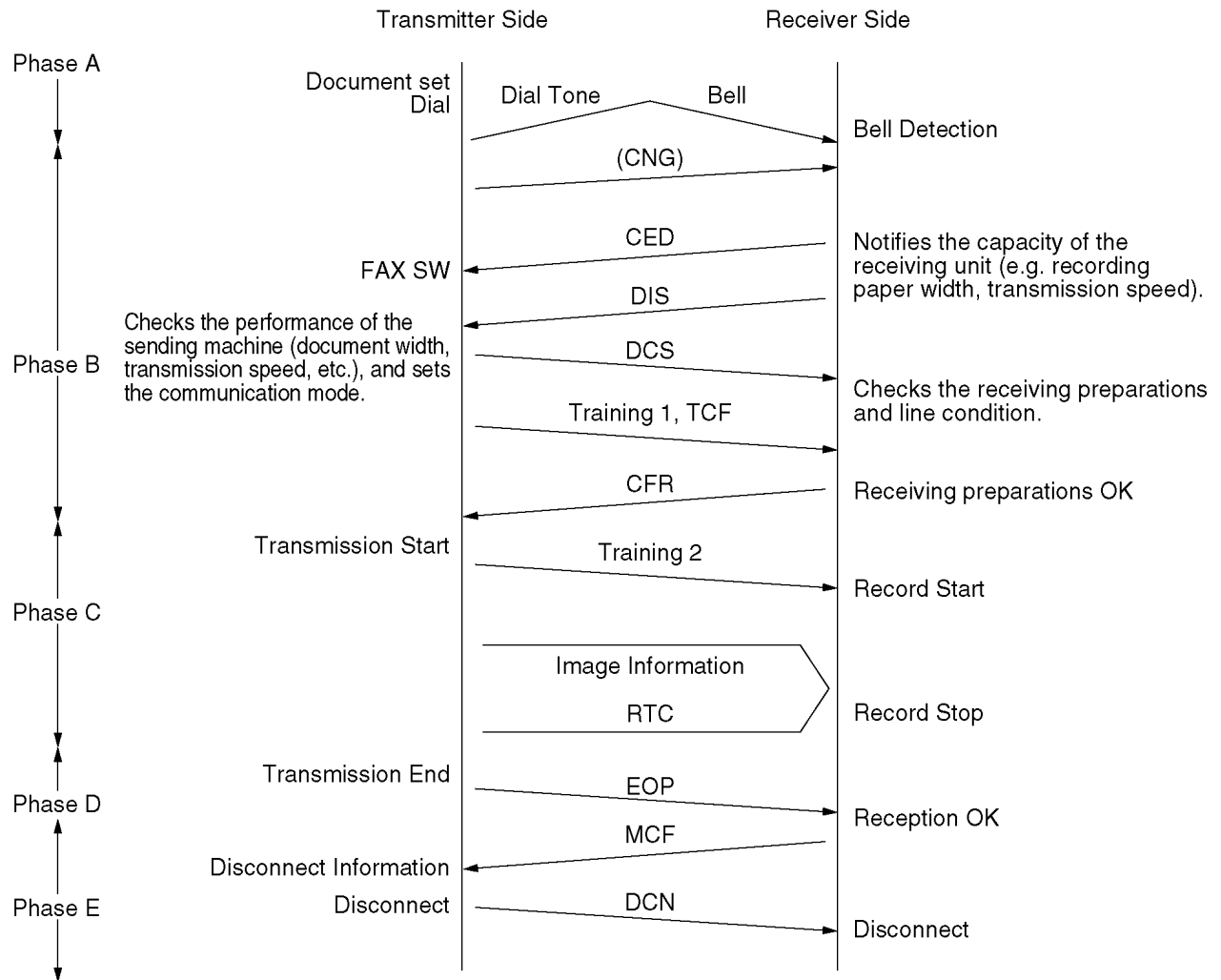
6. Explanation of Communication and Compression Technology

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. | |
| 8 | Reserved for future T.3 operation features. | |
| 9 | Transmitter --- T.4 operation | |
| 10 | Receiver --- T.4 operation | Receiver --- T.4 operation |

| Bit No. | DIS/DTC | DCS |
|--|---|---|
| 11, 12, 13, 14 0, 0, 0, 0 0, 1, 0, 0 1, 0, 0, 0 1, 1, 0, 0 0, 0, 1, 0 0, 1, 1, 0 1, 0, 1, 0 1, 1, 1, 0 0, 0, 0, 1 0, 1, 0, 1 1, 0, 0, 1 1, 1, 0, 1 0, 0, 1, 1 0, 1, 1, 1 1, 0, 1, 1 1, 1, 1, 1 | Data signaling rate V.27 ter fall back mode V.27 ter V.29 V.27 ter and V.29 Not used Reserved Not used V.27 ter and V.29 and V.33 Not used Reserved Not used V.27 ter and V.29 and V.33 and V.17 Not used Reserved Not used Reserved Not used Reserved | Data signaling rate 2400 bit/s, V.27 ter 4800 bit/s, V.27 ter 9600 bit/s, V.29 7200 bit/s, V.29 14400 bit/s, V.33 12000 bit/s, V.33 Reserved 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 \pm 1% 1728 picture elements along scan line length of 215 mm \pm 1% 2048 picture elements along scan line length of 255 mm \pm 1% 2432 picture elements along scan line length of 303 mm \pm 1% 1728 picture elements along scan line length of 215 mm \pm 1% 2048 picture elements along scan line length of 255 mm \pm 1% Invalid | Recording width 1728 picture elements along scan line length of 215 mm \pm 1% 2432 picture elements along scan line length of 303 mm \pm 1% 2048 picture elements along scan line length of 255 mm \pm 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) (0, 1, 1) (1, 0, 0) (1, 0, 1) (1, 1, 0) (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 \pm mm 1% | Middle 1216 elements of 1728 picture elements |
| 35 | Recording width capability 864 picture elements along scan line length of 107 \pm mm 1% | Middle 864 elements of 1728 picture elements |
| 36 | Recording width capability 1728 picture elements along scan line length of 151 \pm mm 1% | Invalid |
| 37 | Recording width capability 1728 picture elements along scan line length of 107 \pm mm 1% | Invalid |
| 38 | Reserved for future recording width capability. | |
| 39 | Reserved for future recording width capability. | |
| 40 | Extend field | Extend field |
| 41 | R8x15.4 lines/mm | R8x15.4 lines/mm |
| 42 | 300x300 pels/25.4 mm | 300x300 pels/25.4 mm |
| 43 | R16x15.4 lines/mm and/or 400x400 pels/25.4 mm | R16x15.4 lines/mm and/or 400x400 pels/25.4 mm |

| Bit No. | DIS/DTC | DCS |
|---------|--|---|
| 44 | Inch based resolution preferred | Resolution type selection "0": neuritic based resolution "1": inch based resolution |
| 45 | Metric based resolution preferred | Don't care |
| 46 | Minimum scan line time capability for higher resolutions "0": $T_{15.4} = T_{7.7}$ "1": $T_{15.4} = 1/2T_{7.7}$ | Don't care |
| 47 | Selective Polling capability | Set to "0". |
| 48 | Extend field | Extend field |

Note 1 - Standard facsimile units conforming to T.2 must have the following capability: Index of cooperation (IOC)=264.

Note 2 - Standard facsimile units conforming to T.3 must have the following capability: Index of cooperation (IOC)=264.

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

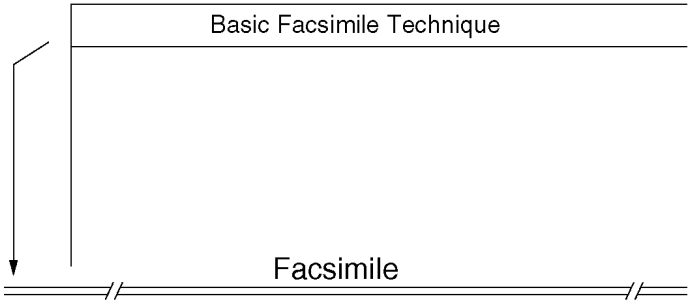
| Signal | Identification Signal Format | Function |
|--|------------------------------|--|
| Training 1 | _____ | A fixed pattern is transmitted to the receiving side at a speed (2400 to 14400 bps) designated by DCS, and the receiving side optimizes the automatic equalizer, etc., according to this signal. |
| TCF (Training Check) | _____ | Sends 0 continuously for 1.5 seconds at the same speed as the training signal. |
| CFR (Confirmation to Receive) | X0100001 | Notifies the sending side that TCF has been properly received. If TCF is not properly received, FTT (Failure To Train) X0100010 is relayed to the sender. The sender then reduces the transmission speed by one stage and initiates training once again. |
| Training 2 | _____ | Used for reconfirming the receiving side like training 1. |
| Image Signal | Refer to the next page. | _____ |
| RTC (Return to Control) | _____ | Sends 12 bits (0...01 × 6 times) to the receiver at the same speed as the image signal and notifies completion of transmission of the first sheet. |
| EOP (End of Procedure) | X1110100 | End of one communication |
| MCF (Message Confirmation) | X0110001 | End of 1 page reception |
| DCN (Disconnect) | X1011111 | Phase E starts. |
| MPS (Multi-Page Signal) | X1110010 | Completion of transmission of 1 page. If there are still more documents to be sent, they are output instead of EOP. After MCF reception, the sender transmits an image signal of the second sheet. |
| PRI-EOP (Procedural Interrupt-EOP) | X1111100 | If there is an operator call from the sender, it is output after RTC. |
| PIP (Procedural Interrupt Positive) | X0110101 | This is output when an operator call is received. |

b. Redundancy Compression Process Coding Mode

This unit uses one-dimensional MH format.

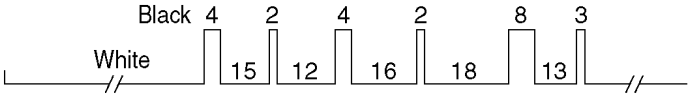
| Modified Huffman (MH) Code | | |
|----------------------------|---------------------|---------------------|
| Run length | Code for White Line | Code for Black Line |
| 0 | 00110101 | 000011011 |
| 1 | 000111 | 010 |
| 2 | 0111 | 11 |
| 3 | 1000 | 10 |
| 4 | 1011 | 011 |
| 5 | 1100 | 0011 |
| 6 | 1110 | 0010 |
| 7 | 1111 | 00011 |
| 8 | 10011 | 000101 |
| 9 | 10100 | 000100 |
| 10 | 00111 | 0000100 |
| 11 | 01000 | 0000101 |
| 12 | 001000 | 0000111 |
| 13 | 000011 | 00000100 |
| 14 | 110100 | 00000111 |
| 15 | 110101 | 000011000 |
| 16 | 101010 | 0000010111 |
| 17 | 101011 | 0000011000 |
| 18 | 0100111 | 0000001000 |

(a) Document



(b) Part of document

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



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

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. TEST CHART

8.6.1. 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.

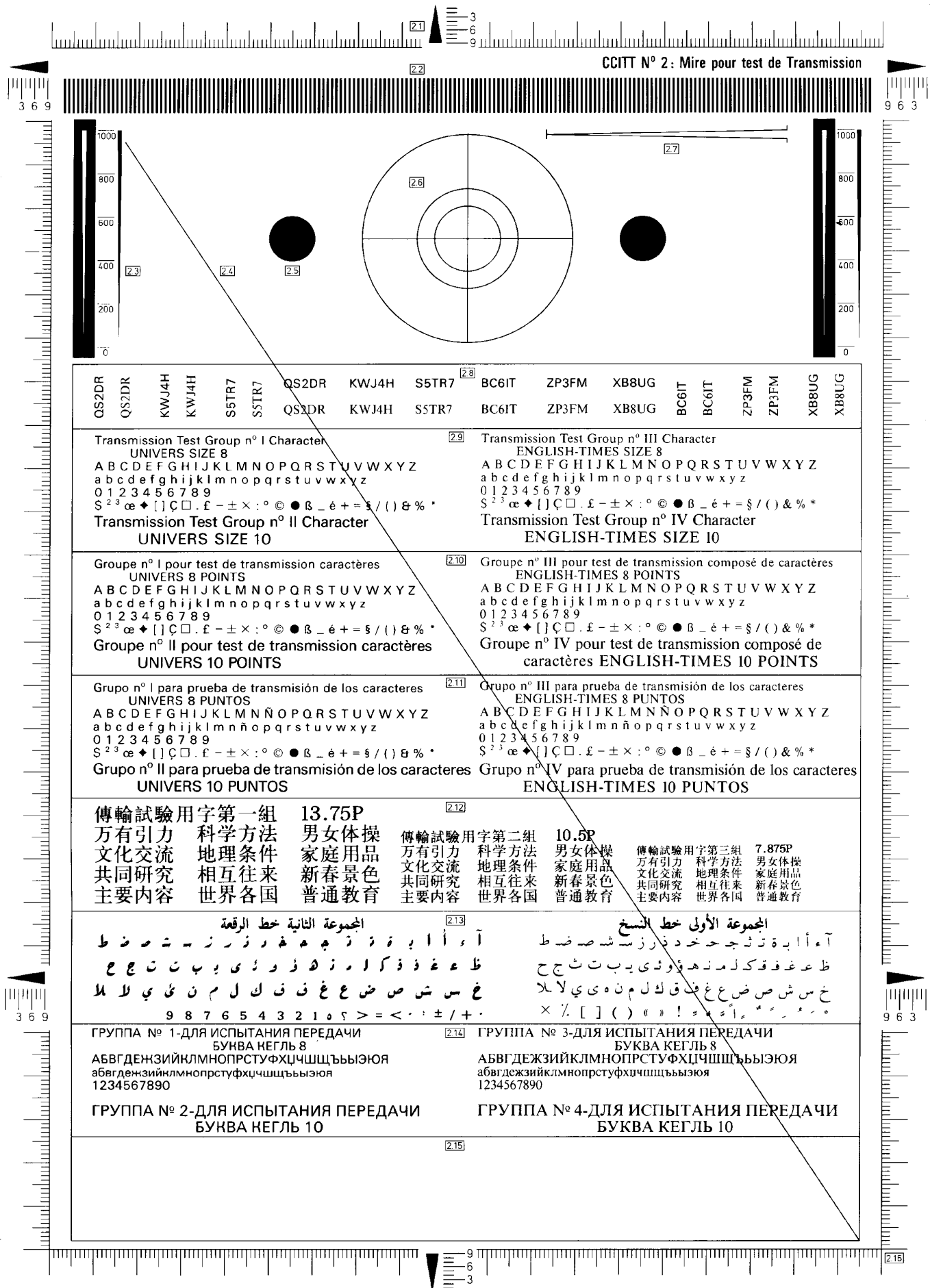
Probably you have uses for this facility in your organisation.

Yours sincerely,

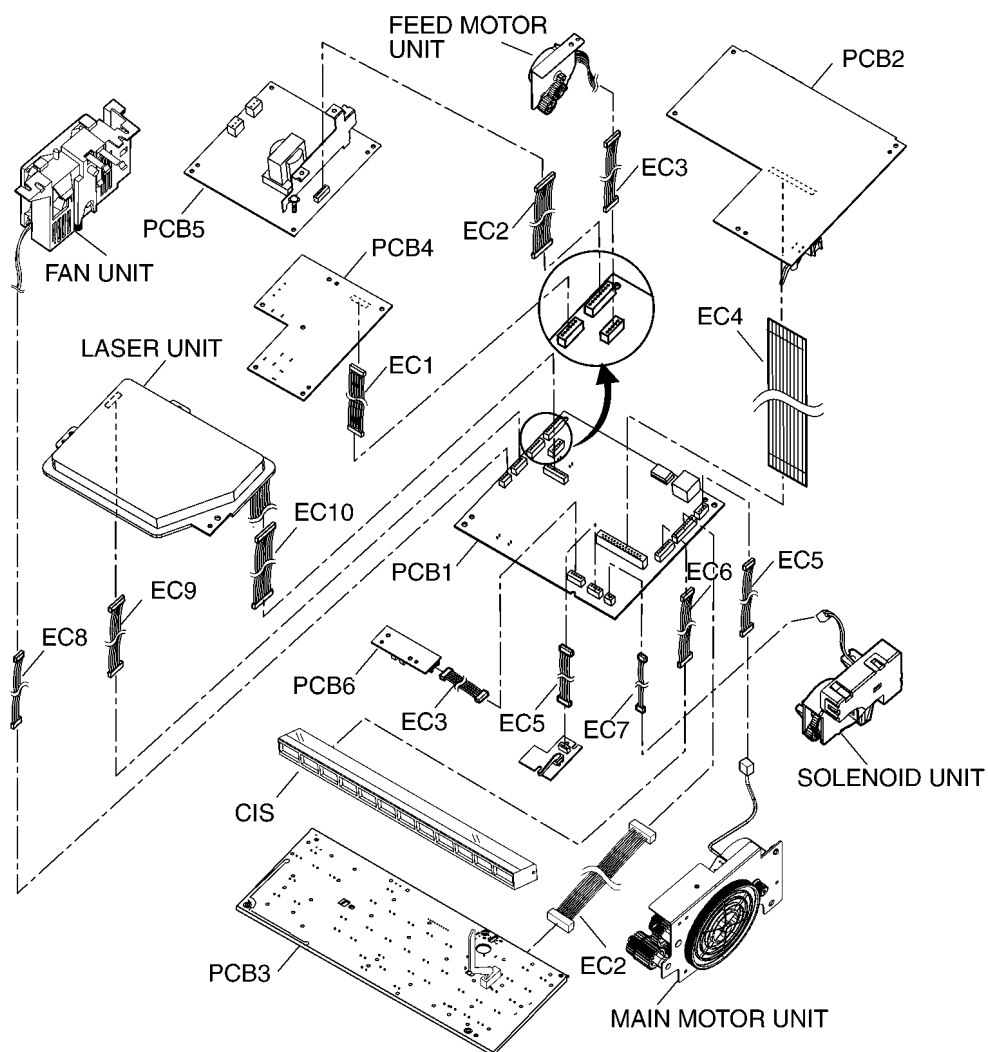
Phil.

P.J. CROSS
Group Leader - Facsimile Research

8.6.2. ITU-T No.2 TEST CHART

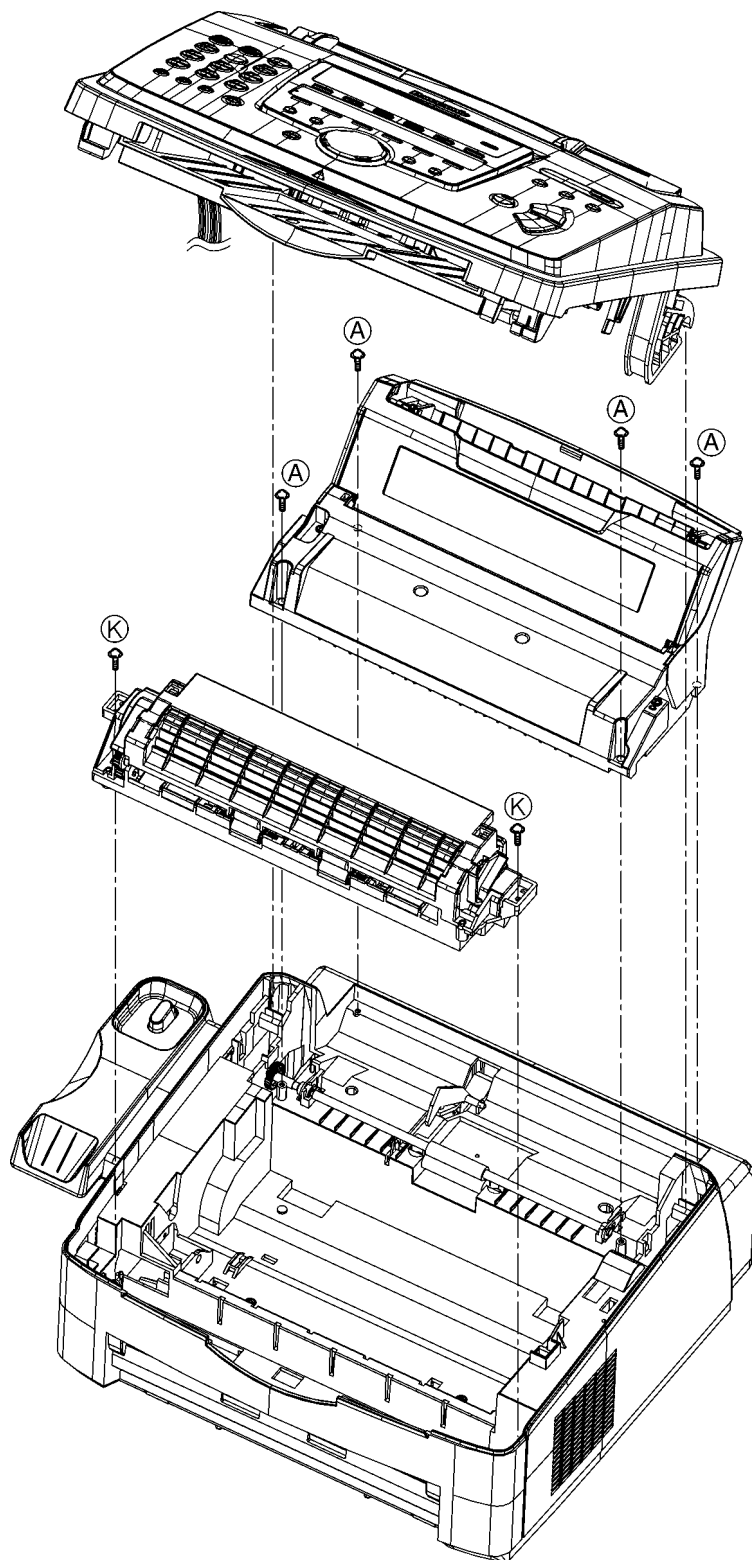


9 FIXTURES AND TOOLS

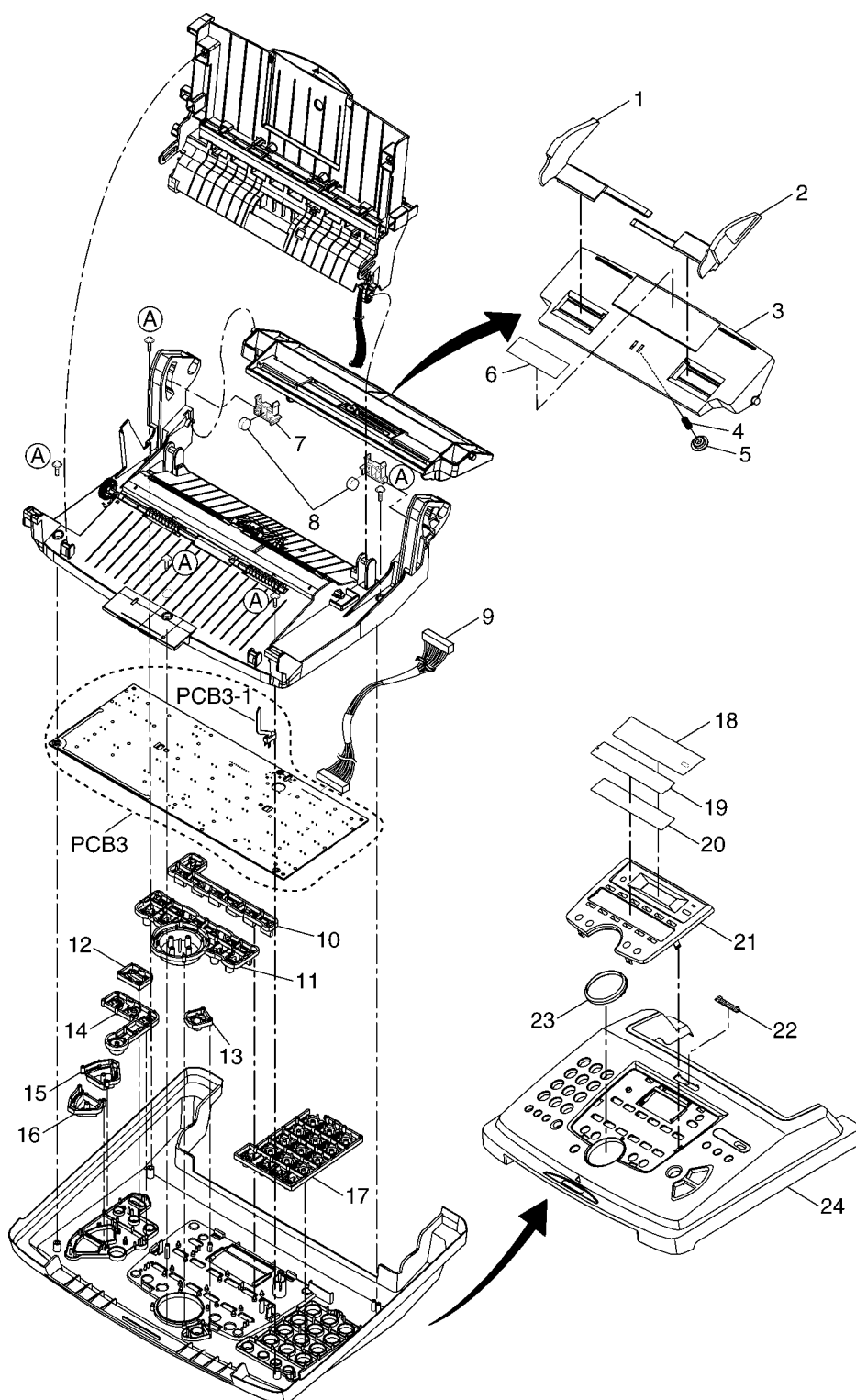


10 CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

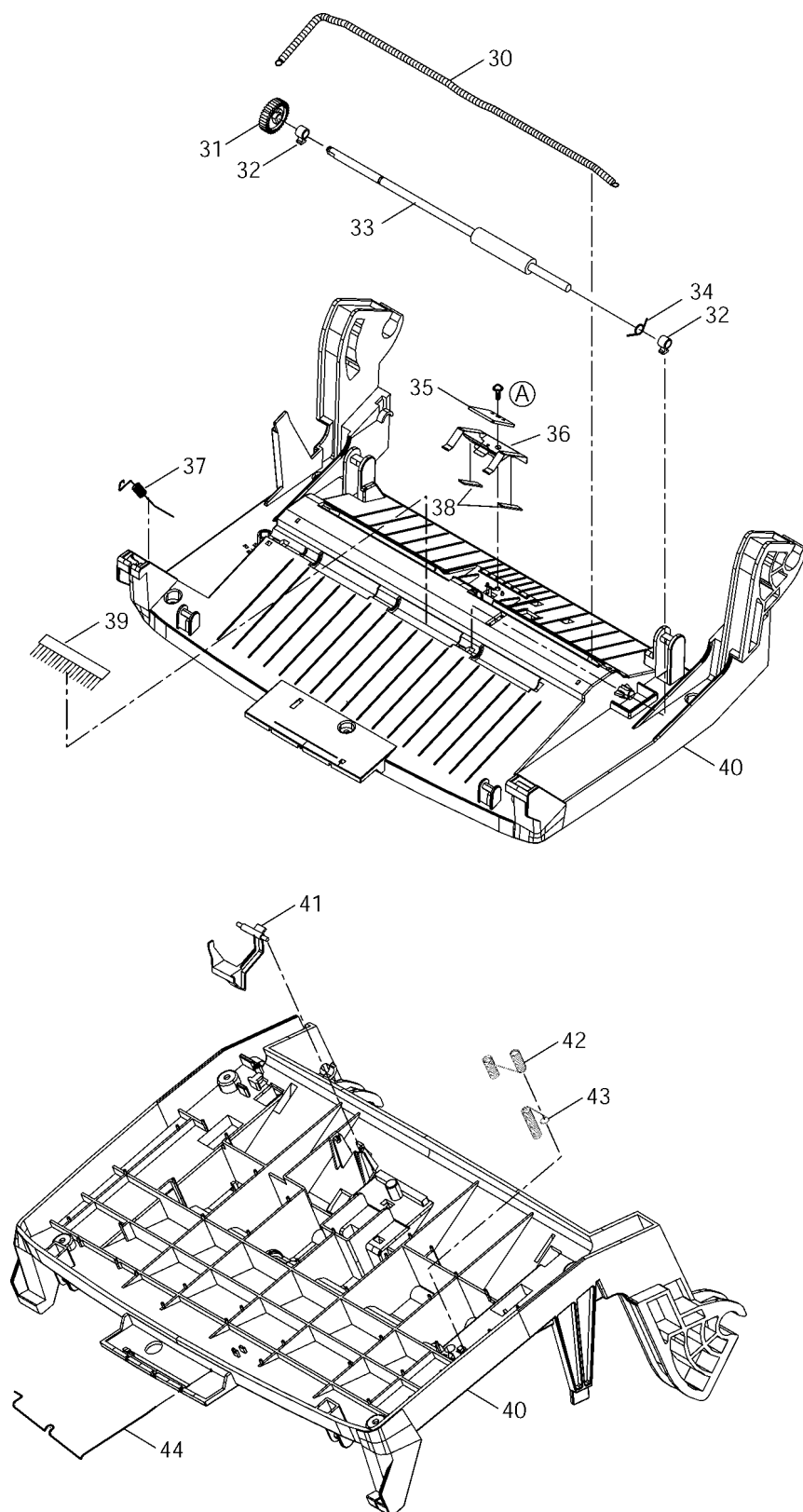
10.1. GENERAL SECTION



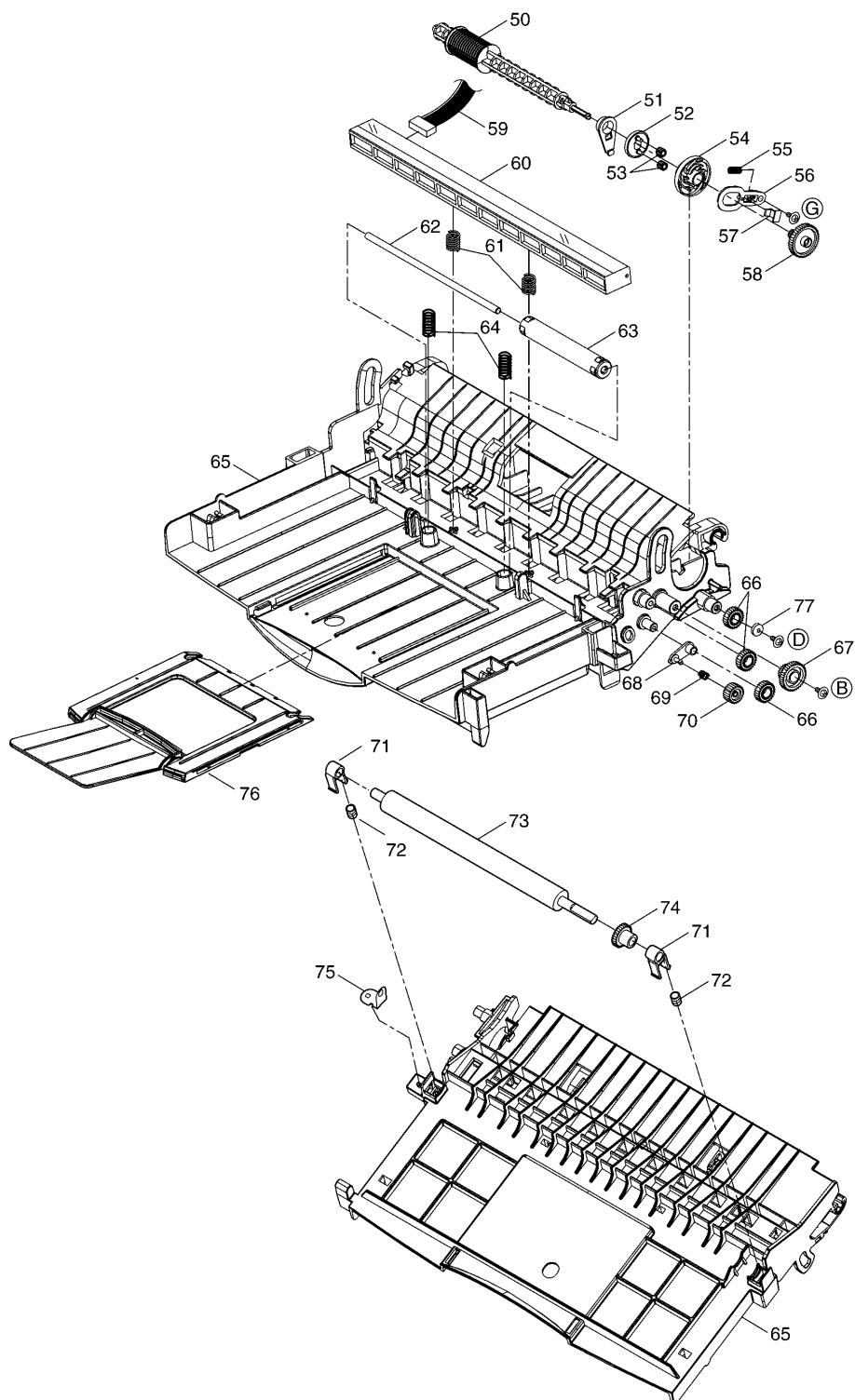
10.2. OPERATION COVER SECTION (1)



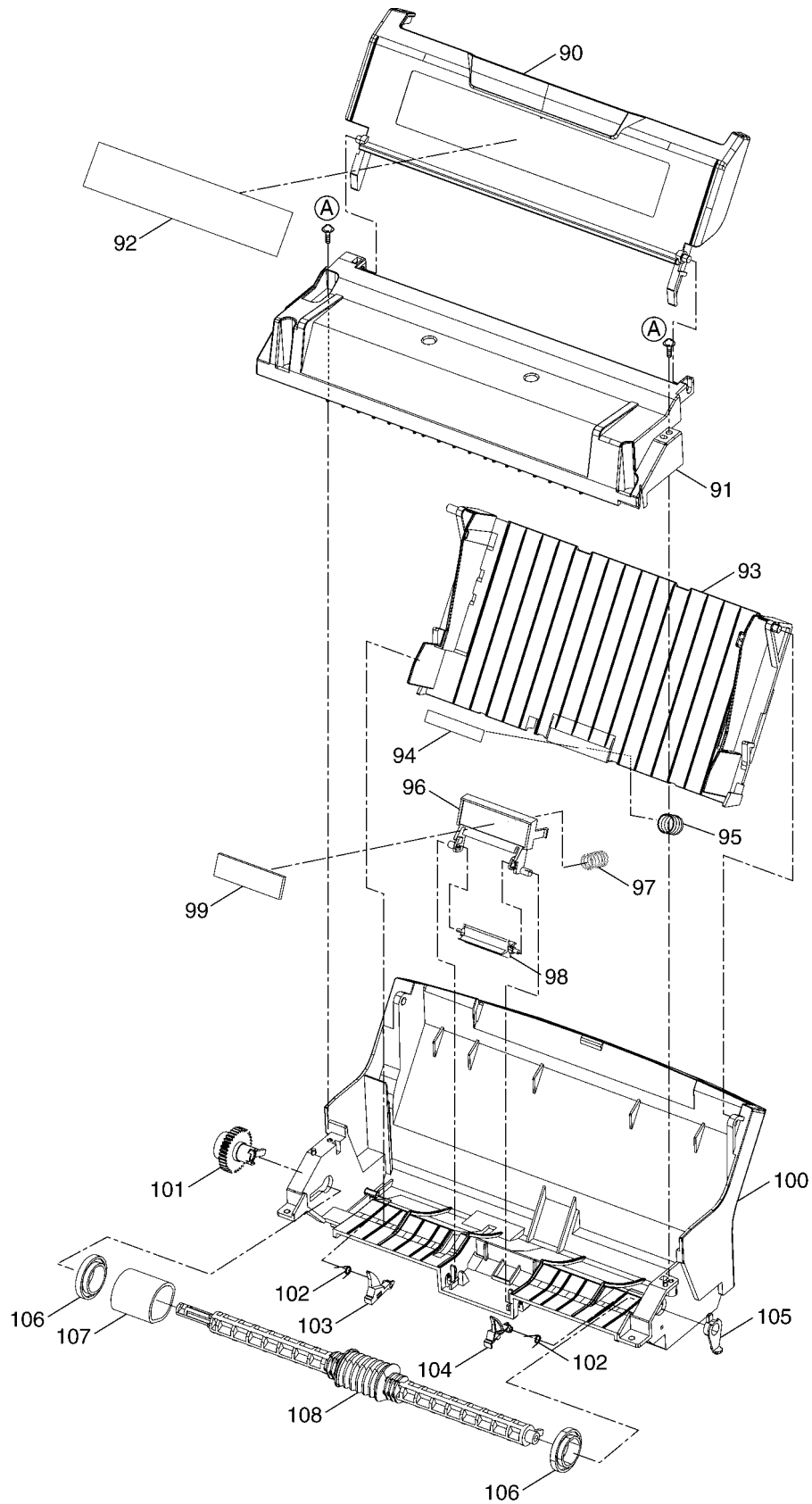
10.3. OPERATION COVER SECTION (2)



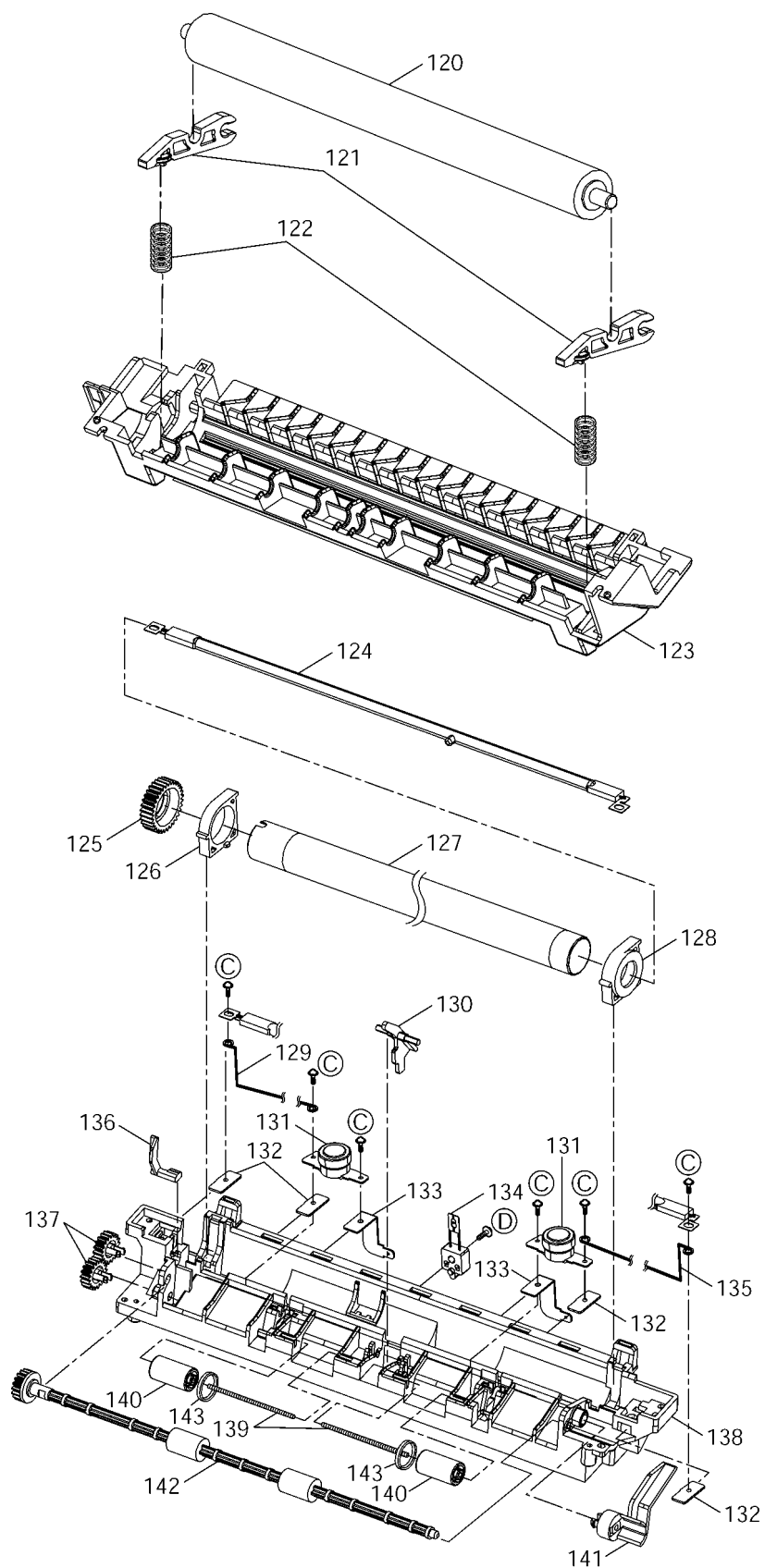
10.4. OPERATION COVER SECTION (3)



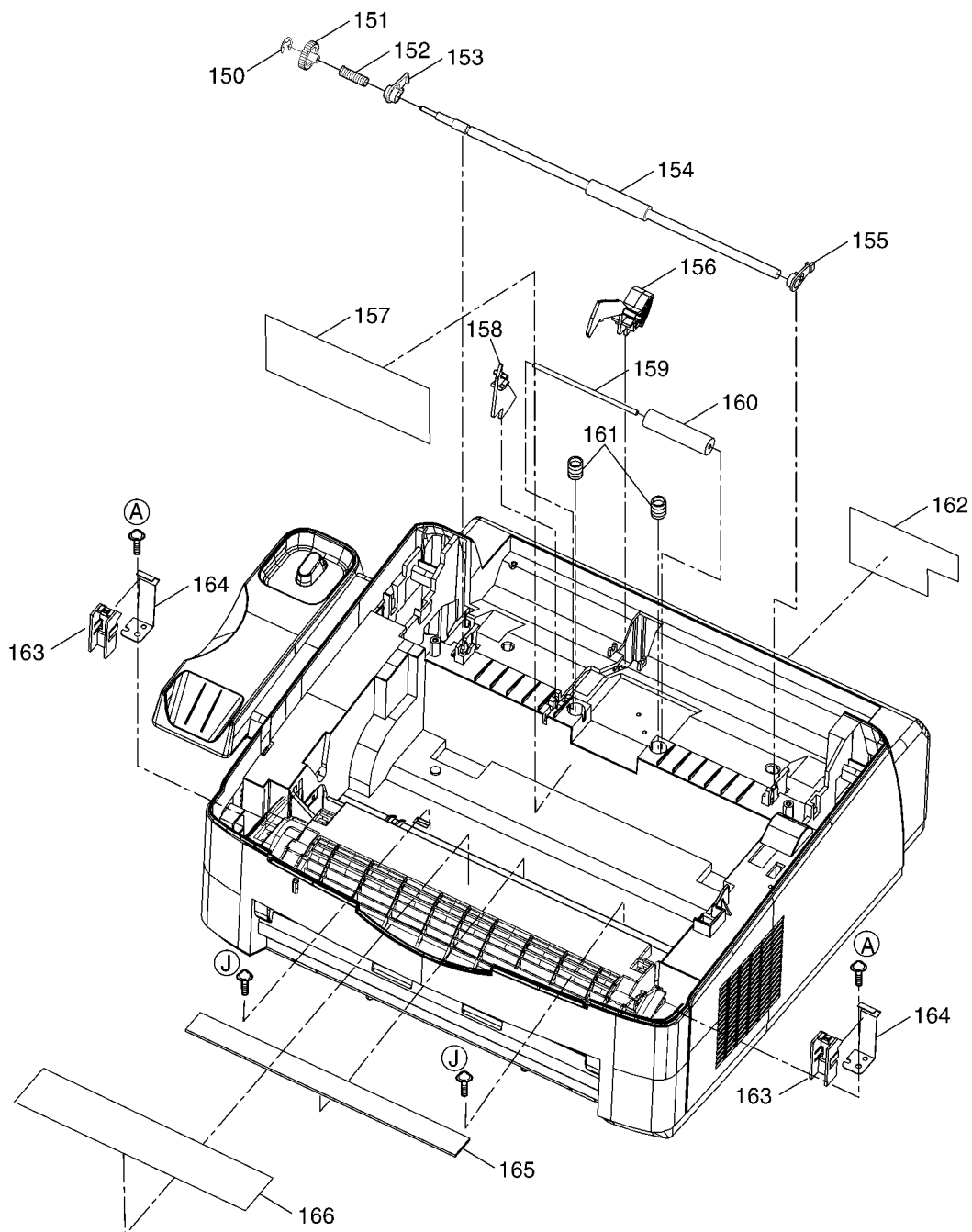
10.5. PICK UP SECTION



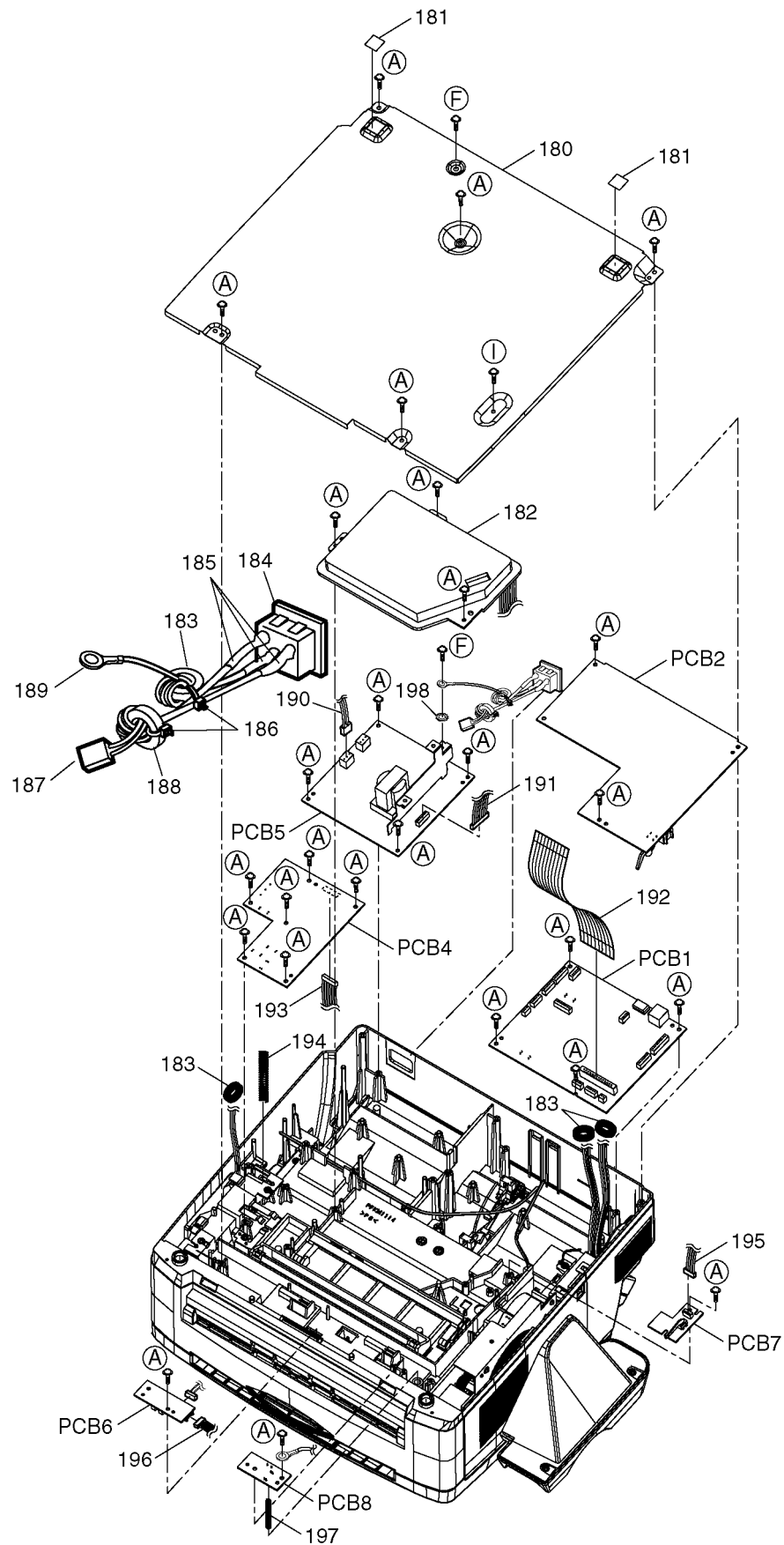
10.6. FUSER SECTION



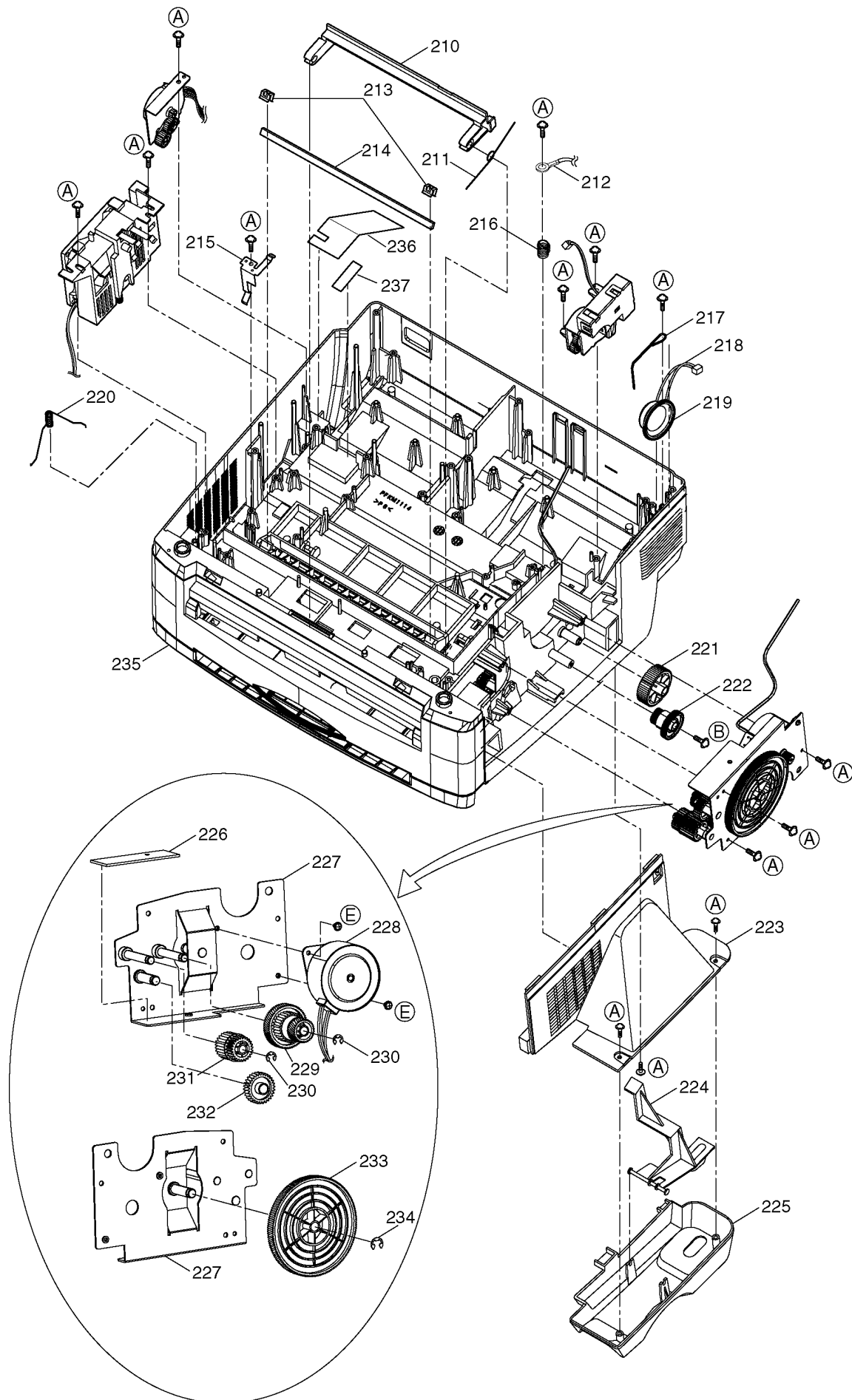
10.7. UPPER MAIN CABINET SECTION



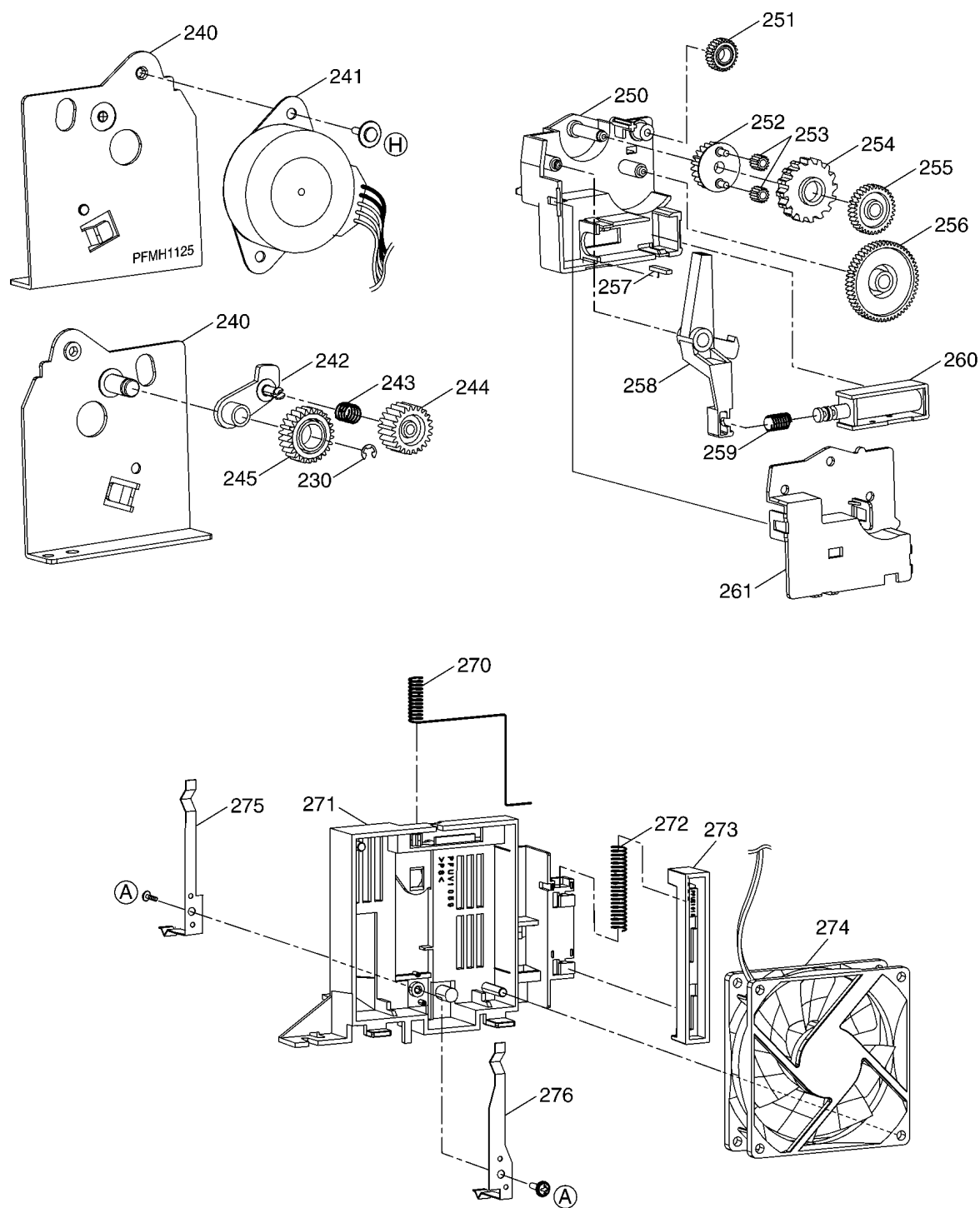
10.8. LOWER MAIN CABINET SECTION (1)



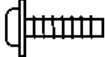


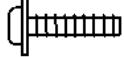





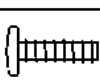
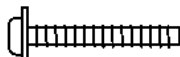
10.9. LOWER MAIN CABINET SECTION (2)



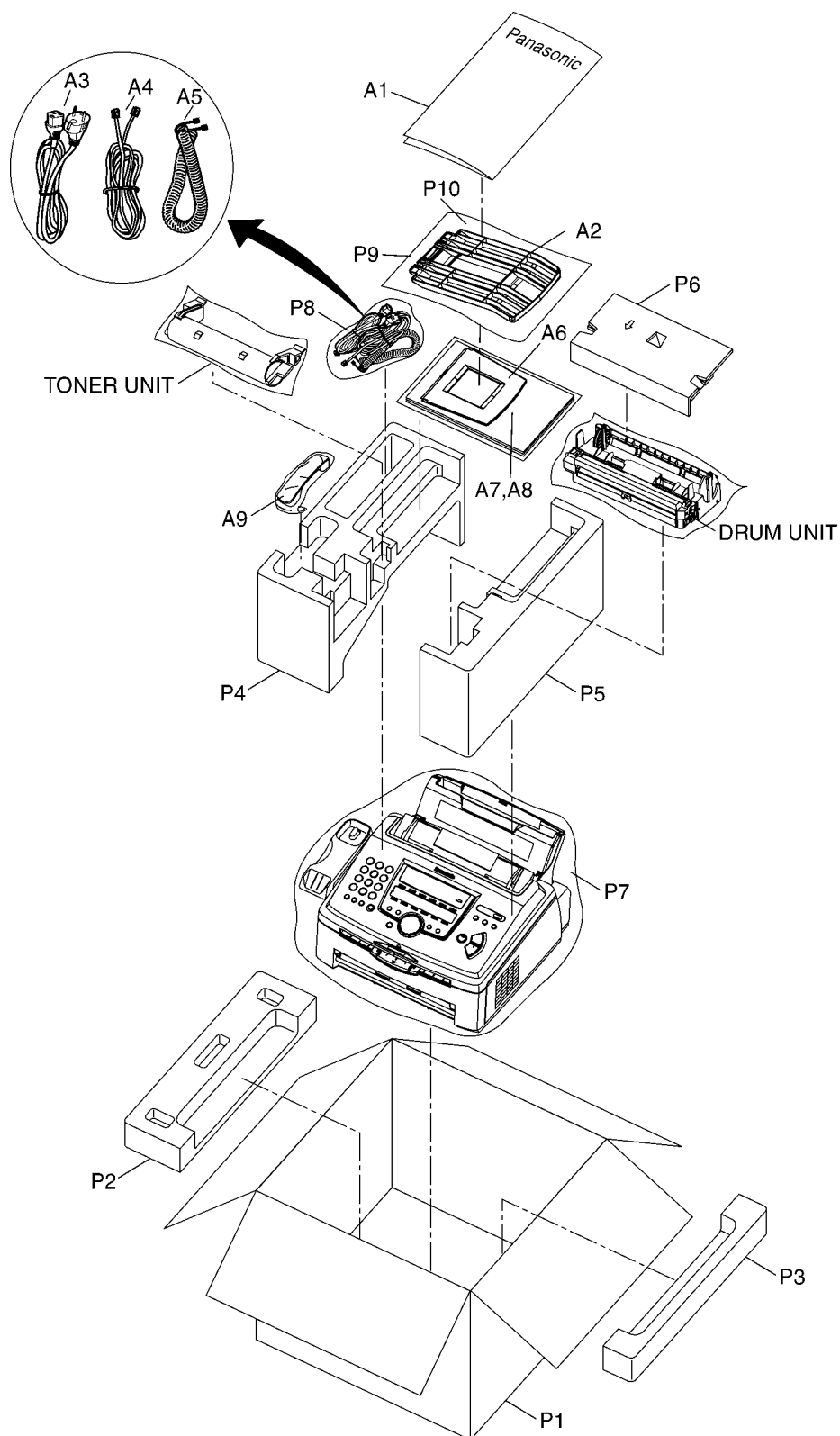
10.10. LOWER CABINET SECTION (3)



10.11. ACTUAL SIZE OF SCREWS AND WASHER

| | Parts No. | Illustration |
|---|-----------|---|
| Ⓐ | XTW3+S10P |  |
| Ⓑ | XTW3+W10P |  |
| Ⓒ | XYC3+FF8C |  |
| Ⓓ | XTW3+S12P |  |
| Ⓔ | XTW3+5LFZ |  |
| Ⓕ | XSB4+6 |  |
| Ⓖ | XTW4+W8P |  |
| Ⓗ | XYN3+C6 |  |
| Ⓘ | XTW3+6L |  |
| Ⓙ | XTB3+10G |  |
| Ⓚ | XTW3+S20P |  |

11 ACCESSORIES AND PACKING MATERIALS



12 REPLACEMENT PARTS LIST

RTL (Retention Time Limited)

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.

After the end of this period, the assembly will no longer be available.

2. Important safety notice

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

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

4. ISO code (Example : ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) k=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ F

*Type & Wattage of Resistor

Type

| | | |
|-------------|-----------------|----------------------|
| ERC:Solid | ERX:Metal Film | PQ4R:Carbon |
| ERD:Carbon | ERG:Metal Oxide | ERS:Fusible Resistor |
| PQRD:Carbon | ER0:Metal Film | ERF:Cement Resistor |

Wattege

| | | | | | |
|------------|------------|---------|------|------|------|
| 10,16:1/8W | 14,25:1/4W | 12:1/2W | 1:1W | 2:2W | 3:3W |
|------------|------------|---------|------|------|------|

*Type & Voltage of Capacitor

Type

| | |
|---------------------|-------------------------------|
| ECFD:Semi-Conductor | ECDD,ECKD,ECBT,PQCBC: Ceramic |
| ECQS:Styrol | ECQE,ECQV,ECQG: Polyester |
| PQCUV:Chip | ECEA,ECSZ:Electlytic |
| ECQMS:Mica | ECQP: Polypropylene |

Voltage

| ECQ Type | ECQG ECQV Type | ECSZ Type | Others | | |
|----------|-------------------|-----------|-----------|-----------|--|
| 1H:50V | 05:50V | 0F:3.15V | 0J :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 | | 0J:6.3V | 1E,25:25V | 2A :100V | |

12.1. CABINET AND ELECTRICAL PARTS

12.1.1. OPERATION COVER SECTION (1)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|------------|-------------------------|---------|
| 1 | PFKR1029Z1 | GUIDE,DOCUMENT L | ABS-HB |
| 2 | PFKR1030Z1 | GUIDE,DOCUMENT R | ABS-HB |
| 3 | PFKE1030X1 | GUIDE,DOCUMENT | PS-HB |
| 4 | PFUS1222Z | COIL SPRING,SLIDER | |
| 5 | PFDG1015Y | GEAR,SLIDER | |
| 6 | PFQT2112Z | LABEL,FACE DOWN | |
| 7 | PFME1001Z | SPACER ,DUMPER | |
| 8 | PFHG1094Z | RUBBER,DUMPER | |
| 9 | PFJS08P33Z | CONNECTOR,8P | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|------------|-------------------------|---------|
| 10 | PFBX1192Z1 | PUSH BUTTON,DERC | ABS-HB |
| 11 | PFBX1191Z1 | PUSH BUTTON,NAVI | ABS-HB |
| 12 | PFBC1100Z1 | PUSH BUTTON,AUTO ANSWER | ABS-HB |
| 13 | PFBC1098Z1 | PUSH BUTTON,MENU | ABS-HB |
| 14 | PFBX1193Z1 | PUSH BUTTON,STP | ABS-HB |
| 15 | PFBC1101Z1 | PUSH BUTTON,COPY START | ABS-HB |
| 16 | PFBC1099Z1 | PUSH BUTTON,START | ABS-HB |
| 17 | PFBX1190Z1 | PUSH BUTTON,DIAL | ABS-HB |
| 18 | PFGP1234W1 | PANEL,LCD | |
| 19 | PFGV1015Z | COVER,TEL CARD | |
| 20 | PFGD1050Z | CARD,TEL NO | |
| 21 | PFGG1190Z1 | GRILL,SUB | PS-HB |
| 22 | PFGB1003Z3 | BADGE | |
| 23 | PFGX1009Z | RING,NAVI | ABS-HB |
| 24 | PFGG1189R1 | GRILLE,OPERATION | PS-HB |

12.1.2. OPERATION COVER SECTION (2)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|-----------|-------------------------|---------|
| 30 | PFUS1444Z | SPRING,ERATH DOC.A | |
| 31 | PFDG1320Z | GEAR,DOC.FEED ROLLER | POM |
| 32 | PFDJ1006Z | SPACER,ROLLER | POM |
| 33 | PFDN1066Z | ROLLER | |
| 34 | PFUS1506Z | SPRING | |
| 35 | PFHG1104Y | RUBBER,SEPARATION | |
| 36 | PFUS1437Y | LEAF SPRING | |
| 37 | PFUS1443Z | SPRING,EARTH OP B | |
| 38 | PFHX1679Z | COVER,SHEET | |
| 39 | PFJV1003Z | COVER,DISCHARGE BRUSH | |
| 40 | PFUV1065X | COVER,OPERATION PANEL | PS-HB |
| 41 | PFDE1209Z | LEVER,DOC,DETECTION | POM |
| 42 | PFUS1445Z | SPRING,EARTH DOCUMENT B | |
| 43 | PFUS1447Z | SPRING,EARTH DOC ROLLER | |
| 44 | PFUS1442Z | SPRING,EARTH OP A | |

12.1.3. OPERATION COVER SECTION (3)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|---------------------------|---------|
| 50 | PFDS1010Z | ROLLER,SEPARATION | POM |
| 51 | PFDJ1063Y | SPACER,SEPARATION ROLLER | POM |
| 52 | PFDE1198Z | ARM | POM |
| 53 | PFDG1189Z | GEAR | |
| 54 | PFDG1295Z | GEAR | POM |
| 55 | PFUS1422Z | COIL SPRING ,LOCK ARM | |
| 56 | PFDE1199Z | ARM,LOCK | POM |
| 57 | PFDE1200Y | SPACER,LOCK ARM | POM |
| 58 | PFDG1296Z | GEAR,SEPARATION | POM |
| 59 | PFJS07P32Z | CONNECTOR,7P | |
| 60 | N2GZBE000006 | CIS(CONTACT IMAGE SENSOR) | |
| 61 | PFUS1440Y | COIL SPRING,CIS | |
| 62 | PFDF1098Z | SHAFT,SUPPORT ROLLER | |
| 63 | PFDR1044Y | ROLLER ,DOC.SUPPORT | POM |
| 64 | PFUS1441Y | COIL SPRING,SUPPOR ROLLER | |
| 65 | PFUG1017Z | GUIDE,MIDDLE | PS-HB |
| 66 | PFDG1297Z | GEAR | POM |
| 67 | PFDG1298Z | GEAR | POM |
| 68 | PFDE1201X | ARM | |
| 69 | PFUS1019Z | TORSION SPRING | |
| 70 | PFDG1299Z | GEAR | POM |
| 71 | PFDJ1042Z | SPACER,TRANSFER ROLLER | |
| 72 | PFUS1269Y | COIL SPRING | |
| 73 | PFDS1009Z | ROLLER,TRANSFER | |
| 74 | PFDG1294Z | GEAR | POM |
| 75 | PFMH1124Z | METAL PARTS | |
| 76 | PFZX2FL511M | TRAY,DOCUMENT | |
| 77 | PFDJ1051X | SPACER | |

12.1.4. PICK UP SECTION

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|------------|-------------------------|---------|
| 90 | PFKE1029Y1 | TRAY,PICK UP ROLLER | PS-HB |
| 91 | PFKV1075Z1 | COVER,TRAY | PS-HB |
| 92 | PFQT2097W | LABEL,PAPER SET | |
| 93 | PFKS1084W1 | TRAY ,LIFT PAPER | PS-HB |
| 94 | PFHG1154Z | RUBBER,LIFT PLATE | |
| 95 | PFUS1424Z | SPRING,PLATE LIFT | |
| 96 | PFHR1370Z | CASE,SEPARATION PAPER | ABS-HB |
| 97 | PFUS1425Z | SPRING,PAPER SEPARATION | |
| 98 | PFHR1371Z | SHEET,PAPER | POM |
| 99 | PFHG1155Z | RUBBER,SEPARATION PAPER | |
| 100 | PFKE1028X1 | TRAY,BOTTOM | PS-HB |
| 101 | PFDG1300Z | GEAR,PICK UP PAPER | POM |
| 102 | PFUS1423Z | SPRING,LIFT LOCK | |
| 103 | PFHR1368Z | LEVER,LOCK LIFT L | POM |
| 104 | PFHR1369Z | LEVER,LOCK LIFT R | POM |
| 105 | PFDJ1038Z | SPACER,PICK UP PAPER | POM |
| 106 | PFDR1018Z | ROLLER,PICK UP GUIDE | POM |
| 107 | PFDN1048Z | ROLLER,PICK UP | |
| 108 | PFDR1041Z | ROLLE,PICK UP PAPER | ABS-HB |

12.1.5. FUSER SECTION

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| 120 | PFDS1014Z | ROLLER,PRESSURE PFA | |
| 121 | PFDJ1066Y | SPACER,PRESSURE ROLLER | |
| 122 | PFUS1426Z | COIL SPRING | |
| 123 | PFUA1044Z | CHASSIS,FUSER | PBT+ABS |
| 124 | A4DP7K000001 | HEATER | |
| 125 | PFDG1301Z | GEAR,HEAT ROLLER | |
| 126 | PFDJ1065Z | SPACER,HEAT ROLLER A | |
| 127 | PFDS1011Y | ROLLER,HEAT | |
| 128 | PFDJ1064Z | SPACER,HEAT ROLLER A | |
| 129 | PFJT1023Z | TERMINAL PLATE,WIRE B | |
| 130 | PFDE1207Z | LEVER,EXIT SENSOR | |
| 131 | PFTA1001Z | THERMOSTAT,FUSER | △ |
| 132 | PFMH1085Z | METAL PARTS,HEATER | |
| 133 | PFJT1021Z | TERMINAL PLATE,FUSER | |
| 134 | PFRT003 | SENSOR | S |
| 135 | PFJT1022Z | TERMINAL PLATE,WIRE A | |
| 136 | PFHR1408Z | LEVER | |
| 137 | PFDG1302Z | GEAR,EJECT IDLER | POM |
| 138 | PFUA1043X | CHASSIS,FUSER | PBT+ABS |
| 139 | PFUS1435Z | SPRING,SUPPORT EJECT | |
| 140 | PFDR1043Z | ROLLER,SUPPORT EJECT | POM |
| 141 | PFHR1372Y | LEVER | ABS |
| 142 | PFDR1042X | ROLLER,EJECT | POM |
| 143 | PFHG1187Z | RUBBER,SUPPORT EJECT | |

12.1.6. UPPER MAIN CABINET SECTION

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|-------------|-------------------------|---------|
| 150 | XUC2FY | RETAINING RING | |
| 151 | PFDG1201Z | GEAR,FEED ROLLER | POM |
| 152 | PFUS1325Z | SPRING | |
| 153 | PFDJ1067Z | SPACER,FEED ROLLER | POM |
| 154 | PFDN1065Z | ROLLER,FEED | |
| 155 | PFDJ1044Z | SPACER | POM |
| 156 | PFDE1203Z | LEVER | ABS |
| 157 | PFQT2076W | INDICATION PLATE-LABEL | |
| 158 | PFDE1204W | LEVER | POM |
| 159 | PFDF1097Z | SHAFT | |
| 160 | PQDR9685Y | ROLLER | POM |
| 161 | PFUS1275Z | COIL SPRING | |
| 162 | PFGT2266Z-M | NAME PLATE | |
| 163 | PFUE1022Z | CASE,COVER | |
| 164 | PFUS1448Z | LEAF SPRING | |
| 165 | PF0G1006Z | GLASS | |
| 166 | PFQT2077R | LABEL | |

12.1.7. LOWER MAIN CABINET SECTION (1)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| 180 | PFMD1065Z | COVER | |
| 181 | PFHG1169Z | RUBBER PARTS,FOOT | |
| 182 | LPA1603K | LASER UNIT | △ |
| 183 | PQLB1E1 | INSULATOR | |
| 184 | PFJP03S04Z | AC SOCKET | △ S |
| 185 | PQMX10010Z | CASE,COVER | |
| 186 | PQHR945Z | BAND | |
| 187 | PFJS02P02Z | CONNECTOR | |
| 188 | KR06TT251508 | INSULATOR | |
| 189 | WLR18YK26CM4 | LEAD WIRE | |
| 190 | PFJS02P34Z | CONNECTOR | |
| 191 | PFJS08P31Z | CONNECTOR | |
| 192 | PFJE1021Z | LEAD WIRE | |
| 193 | PFJS06P30Z | CONNECTOR,6P | |
| 194 | PFUS1431Z | COIL SPRING | |
| 195 | PFJS04P28Z | CONNECTOR | |
| 196 | PFJS05P29Z | CONNECTOR,5P | |
| 197 | PFUS1449Z | COIL SPRING | |
| 198 | XWC4B | WASHER | |

12.1.8. LOWER MAIN CABINET SECTION (2)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| 210 | PFUE1015Z | PLASTIC PARTS | ABS |
| 211 | PFUS1450Z | TORSION SPRING | |
| 212 | WLL20YG24M3M | LEAD WIRE | |
| 213 | PFUS1028Z | LEAF SPRING | |
| 214 | PF0M1005Z | MIRROR | |
| 215 | PFUS1429Z | LEAF SPRING | |
| 216 | PFUS1439Z | COIL SPRING | |
| 217 | PFUS1502Z | TORSION SPRING | |
| 218 | PFJS02P12Z | CONNECTOR | |
| 219 | PFAS50P006Z | SPEAKER | |
| 220 | PFUS1456Z | TORSION SPRING | |
| 221 | PFDG1310Z | GEAR,IDLER | POM |
| 222 | PFDG1311Z | GEAR,IDLER | POM |
| 223 | PFKF1058Z1 | CABINET COVER,HANDSET | PS |
| 224 | PFBH1024Z1 | PUSH BUTTON,HOOK | ABS-HB |
| 225 | PFKM1115Z1 | CABINET BODY,HANDSET | PS |
| 226 | PFHX1657Z | SPACER | |
| 227 | PFUA1045Z | CHASSIS,GERA MAIN | |
| 228 | 55SPM25D3NA | DC MOTOR | |
| 229 | PFDG1304Y | GEAR,IDLER 67 | POM |
| 230 | XUC4FY | E-RING | |
| 231 | PFDG1306Y | GEAR,FISER IDLER 2 | POM |
| 232 | PFDG1305Z | GEAR,FUSER IDLER | POM |
| 233 | PFDG1303Z | GEAR,IDLER | POM |
| 234 | XUC5FY | RETAINING RING | |
| 235 | PFKM1114Z1 | CABINET BODY,MAIN | PS |
| 236 | PFHX1674Z | COVER,PROTECTION SHEET | |
| 237 | PFHX1668Z | COVER,CABINET SHEET | |

12.1.9. LOWER CABINET SECTION (3)

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| 240 | PFMH1125Z | PLATE,MOTOR | |
| 241 | PFJQ35S1S15D | DC MOTOR | S |
| 242 | PFDE1201X | ARM | POM |
| 243 | PFUS1019Z | SPRING | |
| 244 | PFDG1299Z | GEAR,PLANET | POM |
| 245 | PFDG1297Z | GEAR,IDLER | POM |
| 250 | PFUA1046Z | CHASSIS | PBT+ABS |
| 251 | PFDG1297Z | GEAR,IDLER | |
| 252 | PFDG1307Z | GEAR,PICK CLUTCH B | POM |
| 253 | PFDG1189Z | GEAR | |
| 254 | PFDG1308Z | GEAR | POM |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|---------------------------|---------|
| 255 | PFDG1309Z | GEAR,PICK CLUTCH A | POM |
| 256 | PFDG1176Z | GEAR, IDLER B | |
| 257 | PFHG1165Z | RUBBER, SOLENOID | |
| 258 | PFDE1202Z | LEVER,PICK UP CLUTCH | POM |
| 259 | PFUS1259Y | SPRING, SOLENOID | |
| 260 | PFPP1003Z | PLUNGER, SOLENOID | |
| 261 | PFUA1047Z | CHASSIS, GERA CHASSIS | ABS |
| 270 | PFUS1430Z | SPRING, TERMINAL TRS | |
| 271 | PFUV1059Y | CASE, FAN | PS |
| 272 | PFUS1451Z | SPRING, COVER OPEN | |
| 273 | PFUE1016Z | LEVER | ABS |
| 274 | L6FALDGK0001 | MOTOR, FAN | |
| 275 | PFUS1428Z | LEAF SPRING, TERMINAL DEV | |
| 276 | PFUS1427Z | LEAF SPRING | |

12.2. ACCESSORIES AND PACKING MATERIALS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|-------------|------------------------------|---------|
| A1 | PFQW2061Z | LEAFLET | |
| A2 | PFKS1096Z1 | TRAY, PAPER STACKER | |
| A3 | PQJA10038Y | CORD, POWER | △ |
| A4 | PFJA02B002Z | CORD, TEL | |
| A5 | PFJA1029Z | CORD, CURL | |
| A6 | PFKS1085Z1 | TRAY, PAPER TRAY | PS-HB |
| A7 | PFQX1905Z | INSTRUCTION BOOK (RUSSIAN) | |
| A8 | PFQX1906Z | INSTRUCTION BOOK (UKRAINIAN) | |
| A9 | PFJXE1005Z | HANDSET | △ |
| P1 | PFZE1141Z-M | GIFT BOX | |
| P2 | PFPPN1307Z | CUSHION | |
| P3 | PFPPN1308Y | CUSHION | |
| P4 | PFPPN1305Y | CUSHION | |
| P5 | PFPPN1306Y | CUSHION | |
| P6 | PFPPD1165Y | CUSHION | |
| P7 | PFPPH1040Y | PROTECTION COVER | |
| P8 | XZB20X35A04 | PROTECTION COVER | |
| P9 | XZB32X45A04 | PROTECTION COVER | |
| P10 | PFPPH1046Z | PROTECTION COVER | |

12.3. DIGITAL BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|---------------------------|---------|
| PCB1 | PFWP1FL513RU | DIGITAL BOARD ASS'Y (RTL) | |
| | | (ICs) | |
| IC600 | PFVIR676811 | IC | |
| IC602 | C1CB00001637 | IC | |
| IC604 | C3ABPG000102 | IC | |
| IC605 | C1CB00001566 | IC | |
| IC606 | C1CB00001551 | IC | |
| IC607 | PFWIFL513RU | IC(ROM) | |
| IC608 | C0DBFGD00012 | IC | |
| IC609 | C0GBH0000015 | IC | |
| IC610 | PFVIT2003APS | IC | S |
| IC611 | C0JBAR000386 | IC | |
| | | (TRANSISTORS) | |
| Q602 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q603 | 2SB1197K | TRANSISTOR(SI) | S |
| Q604 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q605 | 2SB1197K | TRANSISTOR(SI) | S |
| Q606 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q607 | 2SB1197K | TRANSISTOR(SI) | S |
| Q609 | 2SD1819A | TRANSISTOR(SI) | S |
| Q612 | PQVTD143Z106 | TRANSISTOR(SI) | S |
| Q613 | PQVTD143Z106 | TRANSISTOR(SI) | S |
| Q614 | 2SD1819A | TRANSISTOR(SI) | S |
| Q615 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q616 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q617 | PQVTD143Z106 | TRANSISTOR(SI) | S |
| Q618 | 2SD1819A | TRANSISTOR(SI) | S |
| Q619 | 2SB1197K | TRANSISTOR(SI) | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| Q620 | 2SB1322 | TRANSISTOR(SI) | S |
| Q621 | PQVTD143Z106 | TRANSISTOR(SI) | S |
| Q622 | PQVTD143Z106 | TRANSISTOR(SI) | S |
| Q623 | PQVTDTC143E | TRANSISTOR(SI) | S |
| | | (DIODES) | |
| D600 | PQVDRLS73T | DIODE(SI) | S |
| D601 | PQVDNDCD56DT | DIODE(SI) | S |
| D602 | PFVDRMRLS245 | DIODE(SI) | S |
| D606 | B0JAME000005 | DIODE(SI) | |
| D607 | MA7160 | DIODE(SI) | S |
| D608 | PFVDRMRLS245 | DIODE(SI) | S |
| | | (BATTERY) | |
| BAT600 | CR-2032/V9A | LITHIUM BATTERY | |
| | | (CONNECTORS) | |
| CN600 | PQJS28X59Z | CONNECTOR, 28P | |
| CN601 | PQJP4G30Z | CONNECTOR, 4P | S |
| CN602 | PQJP3G30Z | CONNECTOR, 3P | S |
| CN603 | PQJP02G100Z | CONNECTOR, 2P | |
| CN604 | PQJP5G30Z | CONNECTOR, 5P | S |
| CN606 | PQJP8G30Z | CONNECTOR, 8P | S |
| CN607 | PQJS08X53Z | CONNECTOR, 8P | |
| CN608 | PQJP7G30Z | CONNECTOR, 7P | S |
| CN609 | PQJP4G30Z | CONNECTOR, 4P | S |
| CN610 | PQJP5G30Z | CONNECTOR, 5P | S |
| CN611 | PQJP05G100Z | CONNECTOR, 5P | |
| CN612 | PQJP08G100Z | CONNECTOR, 8P | |
| CN613 | PQJP8G30Z | CONNECTOR, 8P | S |
| CN614 | PQJP6G30Z | CONNECTOR, 6P | S |
| | | (FUSES) | |
| F600 | PFRR0031063 | FUSE | |
| F602 | PFRR0031063 | FUSE | |
| F603 | PFRR0031031T | FUSE | S |
| F604 | PFRR0032315T | FUSE | S |
| F605 | PFRR002122KZ | FUSE | S |
| F606 | PFRR0031200 | FUSE | S |
| | | (CRYSTAL OSCILLATORS) | |
| X600 | PFVC32256ZAT | CRYSTAL OSCILLATOR | S |
| X601 | PFVCK3.6N9Z | CRYSTAL OSCILLATOR | S |
| X602 | PFVCCSA24Z | CRYSTAL OSCILLATOR | S |
| X603 | H0A327200079 | CRYSTAL OSCILLATOR | |
| | | (COILS) | |
| L601 | PFVF1B102SP | COIL | |
| L602 | PFVF1B102SP | COIL | |
| L603 | PFVF1B102SP | COIL | |
| L604 | PFVF1B102SP | COIL | |
| L605 | PFVF1B102SP | COIL | |
| L606 | PFVF1B102SP | COIL | |
| L607 | PQLQR2BT | COIL | S |
| L610 | PQLQR2BT | COIL | S |
| L612 | PQLQR2BT | COIL | S |
| L613 | PQLQR2BT | COIL | S |
| L614 | PQLQR1ET | COIL | S |
| L615 | PQLQR2BT | COIL | S |
| L616 | PQLQR1ET | COIL | S |
| L630 | PFVF2P221SG | COIL | S |
| L631 | PQLQR2BT | COIL | S |
| L634 | PQLQR2KA20T | COIL | S |
| L635 | PQLQR2KA20T | COIL | S |
| L636 | PQLQR2KA20T | COIL | S |
| L648 | PQLQR2BT | COIL | S |
| L649 | PFVF2P221SG | COIL | S |
| L650 | PFVF2P221SG | COIL | S |
| L651 | PFVF2P221SG | COIL | S |
| L652 | PFVF2P221SG | COIL | S |
| L653 | PFVF1B102SP | COIL | |
| L654 | PFVF1B102SP | COIL | |
| L655 | PFVF1B102SP | COIL | |
| L656 | PFVF1B102SP | COIL | |
| L657 | PFVF1B102SP | COIL | |
| L658 | PFVF1B102SP | COIL | |
| L659 | PFVF1B102SP | COIL | |
| L660 | PFVF1B102SP | COIL | |
| L661 | PFVF1B102SP | COIL | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|---------------|------------------------------|---------|
| R663 | PQLQR2KA20T | COIL | S |
| R759 | PQLQR2KA20T | COIL | S |
| R760 | PQLQR2KA20T | COIL | S |
| | | (CERAMIC FILTERS) | |
| L608 | PFVFB1B601ST | CERAMIC FILTER | S |
| L618 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L619 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L620 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L621 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L627 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L628 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L633 | PFVFB1A102ST | CERAMIC FILTER | |
| L637 | PFVFB1A102ST | CERAMIC FILTER | |
| L638 | PFVFB1A102ST | CERAMIC FILTER | |
| L639 | PFVFB1A102ST | CERAMIC FILTER | |
| L641 | PFVFB1B601ST | CERAMIC FILTER | S |
| L642 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L643 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L644 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L645 | PFVFB1B601ST | CERAMIC FILTER | S |
| L646 | PFVFB1B601ST | CERAMIC FILTER | S |
| L647 | PFVFB1B252SDT | CERAMIC FILTER | S |
| | | (PHOTO ELECTRIC TRANSDUCERS) | |
| PS600 | PFVIRM574SL | PHOTO SENSOR | S |
| PS601 | PFVIRM574SL | PHOTO SENSOR | S |
| | | (COMPONENTS PARTS) | |
| L632 | EXCELDR35 | RESISTOR ARRAY | |
| RA600 | PFXBV8V101JV | RESISTOR ARRAY | S |
| RA601 | PFXBV8V101JV | RESISTOR ARRAY | S |
| RA602 | PFXBV8V101JV | RESISTOR ARRAY | S |
| RA603 | EXB38V220JV | RESISTOR ARRAY | S |
| RA604 | EXB38V220JV | RESISTOR ARRAY | S |
| RA605 | EXB38V220JV | RESISTOR ARRAY | S |
| RA606 | EXB38V220JV | RESISTOR ARRAY | S |
| RA607 | EXB38V220JV | RESISTOR ARRAY | S |
| RA608 | EXB38V220JV | RESISTOR ARRAY | S |
| RA609 | EXB38V220JV | RESISTOR ARRAY | S |
| RA610 | EXB38V220JV | RESISTOR ARRAY | S |
| RA611 | EXB38V220JV | RESISTOR ARRAY | S |
| RA612 | EXB38V220JV | RESISTOR ARRAY | S |
| RA613 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA614 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA615 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA616 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA617 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA618 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA619 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA620 | EXRV8V470JV | RESISTOR ARRAY | S |
| RA621 | EXRV8V470JV | RESISTOR ARRAY | S |
| | | (RESISTORS) | |
| L609 | PQ4R10XJ000 | 0 | S |
| L611 | PQ4R10XJ000 | 0 | S |
| L617 | PQ4R10XJ000 | 0 | S |
| L622 | PQ4R10XJ000 | 0 | S |
| L640 | PQ4R10XJ000 | 0 | S |
| L623 | ERJ3GEYJ271 | 270 | |
| L624 | ERJ3GEYJ271 | 270 | |
| L625 | ERJ3GEYJ271 | 270 | |
| L626 | ERJ3GEYJ271 | 270 | |
| R601 | ERG2SJ271 | 270 | |
| R602 | ERJ3GEYJ103 | 10k | |
| R603 | ERJ3GEYJ563 | 56k | |
| R607 | ERJ3GEYJ562 | 5.6k | |
| R608 | ERJ3GEYJ562 | 5.6k | |
| R609 | ERJ3GEYJ562 | 5.6k | |
| R610 | ERJ3GEYJ562 | 5.6k | |
| R611 | PQ4R10XJ331 | 330 | S |
| R612 | ERJ3GEYJ103 | 10k | |
| R613 | ERJ3GEYJ563 | 56k | |
| R614 | ERJ3GEYJ472 | 4.7k | |
| R615 | ERJ3GEYJ563 | 56k | |
| R616 | ERJ3GEYJ562 | 5.6k | |
| R617 | PQ4R10XJ331 | 330 | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| R618 | D0GG472JA002 | 4.7k | |
| R619 | ERJ3GEYJ101 | 100 | |
| R620 | ERJ3GEYJ563 | 56k | |
| R621 | ERJ12YJ390 | 39 | |
| R622 | D0GG472JA002 | 4.7k | |
| R623 | ERJ3GEYJ103 | 10k | |
| R624 | ERJ3GEYJ103 | 10k | |
| R625 | D0GG472JA002 | 4.7k | |
| R626 | ERJ3GEYJ103 | 10k | |
| R627 | ERJ3GEYJ102 | 1k | |
| R628 | ERJ3GEYJ103 | 10k | |
| R629 | ERJ3GEYJ101 | 100 | |
| R630 | PQ4R10XJ331 | 330 | S |
| R631 | ERJ3GEYJ563 | 56k | |
| R632 | ERJ3GEYJ562 | 5.6k | |
| R633 | ERJ3GEYF393 | 39k | S |
| R634 | ERJ3GEYF393 | 39k | S |
| R635 | ERJ3EKF2202 | 220k | |
| R636 | ERJ3EKF2202 | 220k | |
| R637 | ERJ3EKF1802 | 180k | |
| R638 | ERJ3EKF3302 | 330k | |
| R640 | ERJ3GEYJ101 | 100 | |
| R641 | ERJ3GEYJ101 | 100 | |
| R642 | ERJ3GEYJ101 | 100 | |
| R643 | ERJ3GEYJ181 | 180 | |
| R644 | ERJ3GEYJ102 | 1k | |
| R645 | ERJ3GEYJ103 | 10k | |
| R647 | ERJ3GEYJ473 | 47k | |
| R649 | ERJ3GEYJ473 | 47k | |
| R650 | ERJ3GEYJ473 | 47k | |
| R652 | ERJ3GEYJ101 | 100 | |
| R653 | ERJ3GEYJ101 | 100 | |
| R654 | ERJ3GEYJ103 | 10k | |
| R655 | ERJ3GEYJ272 | 2.7k | |
| R656 | ERJ3GEYJ222 | 2.2k | |
| R657 | ERJ3GEYJ102 | 1k | |
| R658 | ERJ3GEYJ102 | 1k | |
| R659 | ERJ3GEYJ391 | 390 | |
| R660 | ERJ3GEYJ472 | 4.7k | |
| R664 | ERJ3GEYJ203 | 20k | |
| R668 | ERJ3GEY0R00 | 0 | |
| R675 | ERJ3GEYJ473 | 47k | |
| R678 | ERJ3GEYJ470 | 47 | |
| R679 | ERJ3GEYJ105 | 1M | |
| R680 | ERJ3GEY0R00 | 0 | |
| R681 | ERJ3GEY0R00 | 0 | |
| R682 | ERJ3GEY0R00 | 0 | |
| R683 | ERJ3GEYJ220 | 22 | |
| R687 | ERJ3GEYJ473 | 47k | |
| R688 | ERJ3GEYJ473 | 47k | |
| R690 | ERJ3GEYJ101 | 100 | |
| R691 | ERJ3GEYJ101 | 100 | |
| R695 | ERJ3GEYJ220 | 22 | |
| R696 | ERJ3GEYJ220 | 22 | |
| R697 | ERJ3GEYJ220 | 22 | |
| R698 | ERJ3GEYJ220 | 22 | |
| R701 | ERJ3GEYJ473 | 47k | |
| R704 | ERJ3GEYJ475 | 4.7M | |
| R705 | ERJ3GEYJ4R7 | 4.7 | |
| R707 | ERJ3GEYJ334 | 330k | |
| R708 | ERJ3GEYJ222 | 2.2k | |
| R709 | ERJ3GEYJ472 | 4.7k | |
| R710 | ERJ3GEYJ4R7 | 4.7 | |
| R716 | ERJ3GEY0R00 | 0 | |
| R719 | ERJ3GEYJ183 | 18k | |
| R721 | ERJ3GEY0R00 | 0 | |
| R722 | ERJ3EKF1101 | 1.1 | |
| R723 | ERJ3EKF3602 | 360k | |
| R724 | ERJ8GEYJ2R2 | 2.2 | |
| R726 | ERJ3GEYJ103 | 10k | |
| R727 | ERJ3GEYJ101 | 100 | |
| R728 | ERJ3GEYJ101 | 100 | |
| R729 | PQ4R18XJ100 | 10 | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| R730 | ERJ3GEYJ472 | 4.7k | |
| R731 | ERJ3GEYJ222 | 2.2k | |
| R732 | ERJ3GEYJ333 | 33k | |
| R733 | D0C1R47GA003 | 0.47 | |
| R734 | D0C1R47GA003 | 0.47 | |
| R735 | ERJ3GEYJ222 | 2.2k | |
| R736 | ERJ3GEYJ102 | 1k | |
| R737 | ERDS1VJ152 | 1.5k | S |
| R738 | ERJ3GEYJ473 | 47k | |
| R739 | ERJ3GEYJ101 | 100 | |
| R740 | ERJ3GEYJ473 | 47k | |
| R741 | ERJ3GEYJ101 | 100 | |
| R742 | ERJ3GEYJ101 | 100 | |
| R743 | ERJ3GEYJ101 | 100 | |
| R744 | ERJ3GEYJ101 | 100 | |
| R745 | ERJ3GEYJ393 | 39k | |
| R746 | ERJ3GEYJ103 | 10k | |
| R747 | ERX1SJ2R2 | 2.2 | |
| R748 | ERJ3GEYJ472 | 4.7k | |
| R749 | ERJ3GEYJ102 | 1k | |
| R750 | ERJ3GEYJ102 | 1k | |
| R751 | ERJ3GEYJ303 | 30k | |
| R752 | ERJ3GEYJ683 | 68k | |
| R753 | ERJ3GEYJ104 | 100k | |
| R754 | ERJ3GEYJ473 | 47k | |
| R755 | ERJ3GEYJ103 | 10k | |
| R756 | ERJ3GEYJ562 | 5.6k | |
| R757 | ERJ3GEYJ222 | 2.2k | |
| R758 | ERJ3GEYJ183 | 18k | |
| R764 | ERJ3GEYJ220 | 22 | |
| R766 | ERJ3GEY0R00 | 0 | |
| R767 | ERJ3GEYJ181 | 180 | |
| R768 | ERJ3GEYJ181 | 180 | |
| R769 | ERJ3GEYJ181 | 180 | |
| R770 | ERJ3GEYJ103 | 10k | |
| R771 | ERJ3GEYJ273 | 27k | |
| R772 | ERJ3GEYJ100 | 10 | |
| R773 | ERJ3GEYJ103 | 10k | |
| R775 | ERJ3GEYJ103 | 10k | |
| R778 | ERJ3GEYJ103 | 10k | |
| R780 | ERJ3GEYJ181 | 180 | |
| | | (CAPACITORS) | |
| C600 | ECUV1C104ZFV | 0.1 | |
| C601 | ECEA1VKA101 | 100 | S |
| C602 | ECUV1C104ZFV | 0.1 | |
| C604 | ECUV1H102KBV | 0.001 | |
| C605 | ECUV1H102KBV | 0.001 | |
| C606 | ECUV1H102KBV | 0.001 | |
| C607 | ECUV1H102KBV | 0.001 | |
| C608 | ECUV1H102KBV | 0.001 | |
| C609 | ECUV1H102KBV | 0.001 | |
| C610 | ECUV1H102KBV | 0.001 | |
| C611 | ECUV1H103KBV | 0.01 | |
| C612 | ECUV1H103KBV | 0.01 | |
| C613 | ECUV1C104KBV | 0.1 | |
| C614 | ECUV1C104ZFV | 0.1 | |
| C615 | ECUV1C104ZFV | 0.1 | |
| C616 | ECEA1CKS100 | 10 | S |
| C617 | ECEA1CKS100 | 10 | S |
| C618 | ECEA1AU101 | 100 | S |
| C619 | ECUV1C104ZFV | 0.1 | |
| C621 | ECUV1A105ZFV | 1 | |
| C622 | ECUV1C104ZFV | 0.1 | |
| C623 | ECUV1H102KBV | 0.001 | |
| C624 | ECUV1H102KBV | 0.001 | |
| C625 | ECUV1H102KBV | 0.001 | |
| C626 | ECUV1H102KBV | 0.001 | |
| C627 | ECUV1H102KBV | 0.001 | |
| C628 | ECUV1C104ZFV | 0.1 | |
| C629 | ECUV1C104KBV | 0.1 | |
| C630 | ECUV1H103KBV | 0.01 | |
| C631 | ECUV1H100DCV | 10p | S |
| C632 | ECUV1H100DCV | 10p | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| C633 | ECUV1C104ZFV | 0.1 | |
| C634 | ECUV1H330JCV | 33p | |
| C647 | ECUV1C104ZFV | 0.1 | |
| C648 | ECEA1VKA101 | 100 | S |
| C652 | ECUV1H222KBV | 0.0022 | |
| C654 | ECUV1H222KBV | 0.0022 | |
| C655 | ECUV1H120JCV | 12p | |
| C656 | ECUV1H150JCV | 15p | |
| C659 | ECUV1H150JCV | 15p | |
| C661 | ECUV1C104ZFV | 0.1 | |
| C662 | ECUV1C104ZFV | 0.1 | |
| C663 | ECUV1C104ZFV | 0.1 | |
| C664 | ECUV1C104ZFV | 0.1 | |
| C665 | ECUV1H270JCV | 27p | |
| C666 | ECUV1C104ZFV | 0.1 | |
| C667 | ECUV1C104ZFV | 0.1 | |
| C668 | ECUV1C104ZFV | 0.1 | |
| C669 | ECUV1C104ZFV | 0.1 | |
| C670 | ECUV1C104ZFV | 0.1 | |
| C671 | ECUV1C104ZFV | 0.1 | |
| C672 | ECUV1C104ZFV | 0.1 | |
| C673 | ECUV1C104ZFV | 0.1 | |
| C674 | ECUV1H150JCV | 15p | |
| C675 | ECUV1H150JCV | 15p | |
| C676 | ECUV1H150JCV | 15p | |
| C677 | ECUV1H270JCV | 27p | |
| C678 | ECUV1C104ZFV | 0.1 | |
| C679 | ECUV1C104ZFV | 0.1 | |
| C680 | ECUV1H270JCV | 27p | |
| C681 | ECUV1C104ZFV | 0.1 | |
| C682 | ECUV1C104ZFV | 0.1 | |
| C683 | ECUV1C104ZFV | 0.1 | |
| C684 | ECUV1C104ZFV | 0.1 | |
| C685 | ECUV1H120JCV | 12p | |
| C686 | ECUV1H150JCV | 15p | |
| C687 | ECUV1C104ZFV | 0.1 | |
| C689 | ECUV1C104ZFV | 0.1 | |
| C690 | ECUV1C104ZFV | 0.1 | |
| C691 | ECUV1H270JCV | 27p | |
| C692 | ECUV1C104ZFV | 0.1 | |
| C693 | ECUV1C104ZFV | 0.1 | |
| C694 | ECUV1C104ZFV | 0.1 | |
| C695 | ECUV1C104ZFV | 0.1 | |
| C696 | ECUV1C104ZFV | 0.1 | |
| C698 | ECUV1C104KBV | 0.1 | |
| C699 | ECUV1C104KBV | 0.1 | |
| C700 | ECUV1C104KBV | 0.1 | |
| C701 | ECUV1C104ZFV | 0.1 | |
| C702 | ECUV1C104ZFV | 0.1 | |
| C703 | ECUV1C104ZFV | 0.1 | |
| C704 | ECUV1C104ZFV | 0.1 | |
| C705 | ECUV1C104KBV | 0.1 | |
| C706 | ECUV1C104KBV | 0.1 | |
| C708 | ECUV1C104ZFV | 0.1 | |
| C710 | ECUV1C104ZFV | 0.1 | |
| C711 | ECUV1H332KBV | 0.0033 | |
| C712 | ECUV1C104ZFV | 0.1 | |
| C713 | ECUV1C104ZFV | 0.1 | |
| C716 | ECUV1H102KBV | 0.001 | |
| C717 | ECUV1C104ZFV | 0.1 | |
| C718 | ECUV1H102KBV | 0.001 | |
| C719 | ECUV1C104ZFV | 0.1 | |
| C720 | ECEA1AU221 | 220 | S |
| C721 | ECUV1C104ZFV | 0.1 | |
| C723 | ECEA1AU221 | 220 | S |
| C724 | PFCA1HYK331M | 330p | S |
| C725 | ECUV1H104ZFV | 0.1 | S |
| C726 | ECUV1H104ZFV | 0.1 | S |
| C727 | ECEA1VKA101 | 100 | S |
| C729 | ECUV1C104ZFV | 0.1 | |
| C730 | ECUV1H104ZFV | 0.1 | S |
| C731 | ECUV1C104ZFV | 0.1 | |
| C732 | ECUV1H104ZFV | 0.1 | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| C733 | ECEALVKA101 | 100 | S |
| C734 | ECEALAU101 | 100 | S |
| C735 | ECUV1C104ZFB | 0.1 | |
| C736 | ECUV1C104ZFB | 0.1 | |
| C737 | ECUV1C104ZFB | 0.1 | |
| C738 | ECUV1H680JCV | 68p | |
| C739 | ECUV1C104ZFB | 0.1 | |
| C740 | ECUV1H181JCV | 180p | S |
| C741 | ECUV1H181JCV | 180p | S |
| C742 | ECUV1C104ZFB | 0.1 | |
| C743 | ECUV1H222KBV | 0.0022 | |
| C745 | ECUV1H181JCV | 180p | S |
| C746 | ECUV1H181JCV | 180p | S |
| C747 | ECUV1H181JCV | 180p | S |
| C748 | ECUV1H181JCV | 180p | S |
| C749 | ECUV1H104ZFB | 0.1 | S |
| C754 | ECUV1C104KBV | 0.1 | |
| C755 | ECUV1H101JCV | 100p | |
| C756 | ECUV1C104ZFB | 0.1 | |
| C757 | ECUV1C104ZFB | 0.1 | |
| C758 | ECEALCKS100 | 10 | S |
| C761 | ECUV1H181JCV | 180p | S |

12.4. ANALOG BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|--------------------------|---------|
| PCB2 | PFLP1481RU-A | ANALOG BOARD ASS'Y (RTL) | |
| | | (ICs) | |
| IC200 | COABEB000038 | IC | |
| IC201 | COABEB000038 | IC | |
| IC202 | COAABB000025 | IC | |
| IC204 | COABEB000038 | IC | |
| IC206 | PQVIMC34119D | IC | S |
| IC207 | AN6384SB | IC | |
| IC208 | AN6123MS | IC | |
| | | (TRANSISTORS) | |
| Q202 | 2SC2235 | TRANSISTOR(SI) | S |
| Q207 | 2SB1218ARL | TRANSISTOR(SI) | |
| Q210 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q211 | 2SA1627 | TRANSISTOR(SI) | S |
| Q212 | PQVTDTC143E | TRANSISTOR(SI) | S |
| Q213 | 2SB1218ARL | TRANSISTOR(SI) | |
| | | (DIODES) | |
| D200 | MA4056 | DIODE(SI) | S |
| D201 | MA4056 | DIODE(SI) | S |
| D202 | 1SS133 | DIODE(SI) | S |
| D203 | 1SS133 | DIODE(SI) | S |
| D204 | 1SS133 | DIODE(SI) | S |
| D208 | 1SS133 | DIODE(SI) | S |
| D209 | 1SS133 | DIODE(SI) | S |
| D210 | BOEBHR000001 | DIODE(SI) | |
| D211 | MA4056 | DIODE(SI) | S |
| D212 | MA4056 | DIODE(SI) | S |
| D213 | 1SS133 | DIODE(SI) | S |
| | | (CONNECTORS & JACKS) | |
| CN200 | PQJP02G100Z | CONNECTOR, 2P | |
| CN201 | PQJS28X59Z | CONNECTOR, 28P | |
| CN202 | PQJJ1TB18Z | JACK | S |
| CN203 | PQJJ1TC5Z | JACK | S |
| CN204 | PQJJ1TC5Z | JACK | S |
| | | (FUSES) | |
| F200 | PQBA1N10NMAL | FUSE | S |
| | | (COILS) | |
| FLT200 | PFLE003 | COIL | S |
| FLT201 | PFLE126 | COIL | S |
| L239 | PQLQR1E32A07 | COIL | |
| L242 | PQLQR1E32A07 | COIL | S |
| L247 | PQLQR1E32A07 | COIL | S |
| L248 | PQLQR1E32A07 | COIL | S |
| L277 | PFVFB1B102SP | COIL | |
| | | (RELAYS) | |
| RLY200 | PFSL003Z | RELAY | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|---------------|------------------------------|---------|
| | | (VARISTORS) | |
| SA200 | PQVDDSS301L | VARISTOR (SURGE ABSORBER) | S △ |
| SA201 | PFRZ001Z | VARISTOR (SURGE ABSORBER) | S |
| ZNR200 | ERZVA7D151 | VARISTOR | |
| | | (SWITCH) | |
| SW200 | PFSH1A011Z | SWITCH | |
| | | (TRANSFORMERS) | |
| T201 | PFLT8E003 | TRANSFORMER | S |
| T202 | PFLT8E004 | TRANSFORMER | S |
| | | (PHOTO ELECTRIC TRANSDUCERS) | |
| PC202 | ON3131SKU | PHOTO COUPLER | S |
| PC203 | ON3131SKU | PHOTO COUPLER | S |
| PC204 | PQVITLP627 | PHOTO COUPLER | S △ |
| PC205 | PQVITLP620K | PHOTO COUPLER | S |
| | | (CERAMIC FILTERS) | |
| L200 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L201 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L202 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L205 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L206 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L207 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L208 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L209 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L211 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L212 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L213 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L214 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L216 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L217 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L218 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L220 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L221 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L222 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L223 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L224 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L225 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L230 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L232 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L234 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L235 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L236 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L237 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L249 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L250 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L253 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L255 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L256 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L257 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L258 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L259 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L260 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L261 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L265 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L285 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L286 | PFVFB1B252SDT | CERAMIC FILTER | S |
| L287 | PFVFB1B252SDT | CERAMIC FILTER | S |
| R219 | PFVFB1B252SDT | CERAMIC FILTER | S |
| | | (RESISTORS) | |
| J200 | ERJ3GEY0R00 | 0 | |
| J201 | ERJ3GEY0R00 | 0 | |
| J202 | ERJ3GEY0R00 | 0 | |
| J211 | ERJ3GEY0R00 | 0 | |
| J212 | ERJ3GEY0R00 | 0 | |
| J213 | ERJ3GEY0R00 | 0 | |
| L226 | ERJ3GEY0R00 | 0 | |
| L227 | ERJ3GEY0R00 | 0 | |
| L228 | ERJ3GEY0R00 | 0 | |
| L231 | ERJ3GEY0R00 | 0 | |
| L240 | ERJ3GEY0R00 | 0 | |
| L241 | ERJ3GEY0R00 | 0 | |
| L262 | ERJ3GEY0R00 | 0 | |
| L263 | ERJ3GEY0R00 | 0 | |
| L264 | ERJ3GEY0R00 | 0 | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|-------------|-------------------------|---------|
| L266 | ERJ3GEYJ101 | 100 | |
| L267 | ERJ3GEYJ101 | 100 | |
| L268 | ERJ3GEY0R00 | 0 | |
| L270 | ERJ3GEYJ101 | 100 | |
| L271 | ERJ3GEYJ101 | 100 | |
| L274 | ERJ3GEYJ101 | 100 | |
| L275 | ERJ3GEYJ101 | 100 | |
| L276 | ERJ3GEY0R00 | 0 | |
| L278 | ERJ3GEY0R00 | 0 | |
| L279 | ERJ3GEY0R00 | 0 | |
| L280 | ERJ3GEY0R00 | 0 | |
| L283 | ERJ3GEY0R00 | 0 | |
| L284 | ERJ3GEY0R00 | 0 | |
| R200 | ERJ3GEYJ103 | 10k | |
| R201 | ERJ3GEYJ622 | 6.2k | |
| R202 | ERJ3GEYJ153 | 15k | |
| R203 | ERJ3GEYJ333 | 33k | |
| R205 | ERJ3GEYJ103 | 10k | |
| R206 | ERJ3GEYJ333 | 33k | |
| R207 | ERJ3GEYJ752 | 7.5k | |
| R209 | ERJ3GEYJ103 | 10k | |
| R214 | ERJ3GEYJ103 | 10k | |
| R215 | ERJ3GEYJ104 | 100k | |
| R216 | ERJ3GEYJ104 | 100k | |
| R217 | ERJ3GEYJ103 | 10k | |
| R218 | ERJ3GEYJ114 | 110k | |
| R221 | ERJ3GEYJ103 | 10k | |
| R222 | ERJ3GEYJ104 | 100k | |
| R226 | PQ4R18XJ100 | 10 | S |
| R229 | ERJ3GEYJ473 | 47k | |
| R230 | ERJ3GEYJ621 | 620 | |
| R231 | ERJ3GEYJ621 | 620 | |
| R232 | ERJ3GEYJ183 | 18k | |
| R233 | ERJ3GEY0R00 | 0 | |
| R234 | ERJ3GEY0R00 | 0 | |
| R236 | ERJ3GEYJ473 | 47k | |
| R237 | ERJ3GEYJ154 | 150k | |
| R238 | ERJ3GEYJ124 | 120k | |
| R240 | ERJ3GEYJ100 | 10 | |
| R241 | ERJ3GEYJ102 | 1k | |
| R242 | ERJ3GEYJ334 | 330k | |
| R243 | ERJ3GEYJ102 | 1k | |
| R244 | ERJ3GEY0R00 | 0 | |
| R245 | ERJ3GEYJ472 | 4.7k | |
| R246 | ERJ3GEYJ103 | 10k | |
| R247 | ERJ3GEYJ103 | 10k | |
| R248 | ERJ3GEYJ222 | 2.2k | |
| R250 | ERJ3GEYJ102 | 1k | |
| R251 | ERJ3GEYJ103 | 10k | |
| R253 | ERJ3GEYJ183 | 18k | |
| R266 | ERJ3GEYJ103 | 10K | |
| R268 | ERJ3GEYJ103 | 10K | |
| R270 | ERJ3GEYJ562 | 5.6K | |
| R275 | ERJ3GEYJ821 | 820 | |
| R276 | ERJ3GEYJ223 | 22k | |
| R277 | ERJ3GEYJ563 | 56k | |
| R278 | ERDS2TJ150 | 15 | S |
| R279 | ERJ3GEYJ102 | 1k | |
| R280 | ERJ3GEYJ101 | 100 | |
| R281 | ERJ3GEYJ394 | 390k | |
| R282 | ERJ3GEYJ244 | 240k | |
| R283 | ERJ3GEYJ134 | 130k | |
| R284 | ERJ3GEYJ392 | 3.9k | |
| R285 | ERJ3GEYJ183 | 18k | |
| R287 | ERJ3GEYJ472 | 4.7k | |
| R288 | ERJ3GEYJ102 | 1k | |
| R289 | ERJ3GEYJ104 | 100k | |
| R291 | ERJ3GEYJ124 | 120k | |
| R293 | ERJ3GEYJ683 | 68k | |
| R295 | ERJ3GEYJ224 | 220k | |
| R296 | ERJ3GEYJ224 | 220k | |
| R297 | ERJ3GEYJ683 | 68k | |
| R298 | ERJ3GEYJ204 | 200k | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| R299 | ERDS1TJ682 | 6.8k | S |
| R300 | ERJ3GEYJ820 | 82 | |
| R301 | ERJ3GEYJ820 | 82 | |
| R302 | ERJ3GEYJ820 | 82 | |
| R303 | ERJ3GEYJ822 | 8.2k | |
| R304 | ERJ3GEYJ222 | 2.2k | |
| R305 | ERJ3GEYJ473 | 47k | |
| R308 | ERJ3GEY0R00 | 0 | |
| R310 | ERDS1TJ6R8 | 6.8 | S |
| R312 | ERJ3GEYJ681 | 680 | |
| R313 | ERJ3GEYJ102 | 1k | |
| R314 | ERJ3GEYJ102 | 1k | |
| R315 | ERDS1VJ333 | 33k | S |
| R316 | ERJ3GEYJ103 | 10k | |
| R317 | ERJ3GEYJ563 | 56k | |
| R318 | ERJ3GEYJ103 | 10k | |
| R319 | ERJ3GEYJ563 | 56k | |
| R320 | ERJ3GEYJ100 | 10 | |
| R324 | ERJ3GEYJ114 | 110k | |
| R325 | ERJ3GEYJ334 | 330k | |
| R326 | ERJ3GEYJ104 | 100k | |
| R327 | ERJ3GEYJ223 | 22k | |
| R328 | ERJ3GEYJ104 | 100k | |
| R329 | ERJ3GEYJ103 | 10k | |
| R330 | ERJ3GEYJ105 | 1M | |
| R331 | ERJ3GEYJ154 | 150k | |
| R332 | ERJ3GEYJ183 | 18k | |
| R334 | ERJ3GEYJ243 | 24k | |
| R335 | ERJ3GEYJ243 | 24k | |
| R340 | ERJ3GEYJ4R7 | 4.7 | |
| R341 | ERJ3GEYJ101 | 100 | |
| R342 | ERJ3GEYJ4R7 | 4.7 | |
| R343 | ERJ3GEYJ102 | 1k | |
| R344 | ERJ3GEYJ103 | 10k | |
| | | (CAPACITORS) | |
| C200 | ECUV1C104KBV | 0.1 | |
| C201 | ECUV1H621JCV | 620p | |
| C202 | ECUV1C333KBV | 0.033 | |
| C203 | ECUV1H562KBV | 0.0056 | |
| C204 | ECUV1H471JCV | 470p | S |
| C205 | ECUV1H621JCV | 620p | |
| C206 | ECUV1H621JCV | 620p | |
| C207 | ECUV1H272KBV | 0.0027 | |
| C208 | ECUV1H102KBV | 0.001 | |
| C209 | ECUV1H153KBV | 0.015 | |
| C212 | ECUV1H392KBV | 0.0039 | |
| C213 | ECUV1H392KBV | 0.0039 | |
| C214 | ECJ1VC1H151J | 150p | |
| C216 | ECUV1C104ZFV | 0.1 | |
| C218 | ECEA1CKS100 | 10 | S |
| C219 | ECUV1H391JCV | 390p | |
| C221 | ECUV1C104ZFV | 0.1 | |
| C222 | ECEA1VU101 | 100 | S |
| C223 | ECUV1C273KBV | 0.027 | |
| C224 | ECUV1C104KBV | 0.1 | |
| C227 | ECUV1A224KBV | 0.22 | |
| C229 | ECUV1H680JCV | 68p | |
| C230 | ECUV1C104KBV | 0.1 | |
| C231 | ECUV1H681JCV | 680p | S |
| C232 | ECUV1C273KBV | 0.027 | |
| C234 | ECEA1CK101 | 100 | S |
| C236 | ECUV1H681JCV | 680p | S |
| C237 | ECEA1HKS4R7 | 4.7 | S |
| C240 | ECUV1H222KBV | 0.0022 | |
| C241 | ECUV1H682KBV | 0.0068 | S |
| C242 | ECUV1A105ZFV | 1 | |
| C243 | ECUV1A105ZFV | 1 | |
| C244 | ECUV1H100DCV | 10p | S |
| C245 | ECUV1H100DCV | 10p | S |
| C246 | ECUV1C473KBV | 0.047 | |
| C248 | ECEA1CK470 | 47 | S |
| C250 | ECUV1H101JCV | 100p | |
| C253 | ECEA1HU2R2 | 2.2 | S |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| C256 | ECEA1CKS100 | 10 | S |
| C260 | ECUV1H103KBV | 0.01 | |
| C265 | ECEA1HKS010 | 1 | S |
| C266 | ECUV1C104KBV | 0.1 | |
| C267 | ECUV1H820JCV | 82p | |
| C268 | ECUV1H820JCV | 82p | |
| C269 | ECUV1H680JCV | 68p | |
| C270 | ECEA1HU101 | 100 | S |
| C271 | ECUV1H332KBV | 0.0033 | |
| C272 | ECEA0JK221 | 220 | S |
| C273 | ECEA1CKS100 | 10 | S |
| C274 | ECUV1C104ZFB | 0.1 | |
| C275 | ECUV1C104ZFB | 0.1 | |
| C276 | ECUV1C104ZFB | 0.1 | |
| C277 | ECUV1C104KBV | 0.1 | |
| C278 | ECKD2H681KB | 680p | S |
| C279 | ECKD2H681KB | 680p | S |
| C281 | ECQE2E105KZ | 1 | S |
| C282 | ECUV1H820JCV | 82p | |
| C283 | ECUV1H820JCV | 82p | |
| C284 | ECUV1H820JCV | 82p | |
| C285 | ECUV1H471JCV | 470p | S |
| C286 | ECUV1H561JCV | 560p | S |
| C287 | ECUV1H101JCV | 100p | |
| C292 | ECEA1CKS100 | 10 | S |
| C293 | ECUV1H103KBV | 0.01 | |
| C294 | ECEA1CK470 | 47 | S |
| C296 | ECUV1H103KBV | 0.01 | |
| C297 | ECUV1C104ZFB | 0.1 | |
| C298 | ECEA1CK101 | 100 | S |
| C299 | ECUV1C123KBV | 0.012 | |
| C301 | ECUV1H621JCV | 620p | |
| C302 | ECUV1C273KBV | 0.027 | |
| C303 | ECJ1VC1H151J | 150p | |
| C307 | ECUV1H680JCV | 68p | |
| C308 | ECUV1H391JCV | 390p | |
| C309 | ECUV1H822KBV | 0.0082 | S |
| C310 | ECUV1C104ZFB | 0.1 | |
| C311 | ECEA0JK331 | 330 | S |
| C312 | ECUV1C104ZFB | 0.1 | |
| C313 | ECEA1CKS100 | 10 | S |
| C314 | ECUV1H472KBV | 0.0047 | S |
| C315 | ECUV1H272KBV | 0.0027 | |
| C317 | ECUV1C104KBV | 0.1 | |
| C318 | ECUV1C104KBV | 0.1 | |
| C320 | ECUV1H103KBV | 0.01 | |
| C321 | ECUV1H100DCV | 10p | S |
| C323 | ECEA1CK101 | 100 | S |
| C324 | ECUV1A224KBV | 0.22 | |
| C325 | ECUV1C683KBV | 0.068 | |
| C326 | ECUV1H100DCV | 10p | S |
| C327 | ECUV1C104ZFB | 0.1 | |
| C328 | ECUV1A105ZFB | 1 | |
| C329 | ECUV1A105ZFB | 1 | |

12.5. OPERATION BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-----------------------------|---------|
| PCB3 | PFWP2FL511M | OPERATION BOARD ASS'Y (RTL) | |
| PCB3-1 | K0L1AA000001 | SWITCH, SET | |
| | | (IC) | |
| IC101 | C1ZBZ0002089 | IC | |
| | | (DIODES) | |
| LED101 | PQVDSL325MC | LED | S |
| LED102 | PQVDR325CA47 | LED | S |
| D101 | 1SS133 | DIODE(SI) | S |
| D102 | 1SS133 | DIODE(SI) | S |
| D103 | 1SS133 | DIODE(SI) | S |
| | | (CONNECTOR) | |
| CN102 | PQJP8G43Y | CONNECTOR, 8P | S |
| | | (LIQUID CRYSTAL DISPLAY) | |
| CN101 | L5DAAF00001 | LCD | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-----------------------------|---------|
| | | (PHOTO ELECTRIC TRANSDUCER) | |
| PS101 | CNA1006N | PHOTO SENSOR | |
| | | (THERMISTOR) | |
| TH101 | D4CC11030019 | THERMISTOR | |
| | | (SWITCHES) | |
| SW101 | EVQ11Y05B | SWITCH | |
| SW102 | EVQ11Y05B | SWITCH | |
| SW103 | EVQ11Y05B | SWITCH | |
| SW104 | EVQ11Y05B | SWITCH | |
| SW105 | EVQ11Y05B | SWITCH | |
| SW106 | EVQ11Y05B | SWITCH | |
| SW107 | EVQ11Y05B | SWITCH | |
| SW108 | EVQ11Y05B | SWITCH | |
| SW109 | EVQ11Y05B | SWITCH | |
| SW110 | EVQ11Y05B | SWITCH | |
| SW111 | EVQ11Y05B | SWITCH | |
| SW112 | EVQ11Y05B | SWITCH | |
| SW113 | EVQ11Y05B | SWITCH | |
| SW114 | EVQ11Y05B | SWITCH | |
| SW115 | EVQ11Y05B | SWITCH | |
| SW116 | EVQ11Y05B | SWITCH | |
| SW117 | EVQ11Y05B | SWITCH | |
| SW118 | EVQ11Y05B | SWITCH | |
| SW119 | EVQ11Y05B | SWITCH | |
| SW120 | EVQ11Y05B | SWITCH | |
| SW121 | EVQ11Y05B | SWITCH | |
| SW122 | EVQ11Y05B | SWITCH | |
| SW123 | EVQ11Y05B | SWITCH | |
| SW124 | EVQ11Y05B | SWITCH | |
| SW125 | EVQ11Y05B | SWITCH | |
| SW126 | EVQ11Y05B | SWITCH | |
| SW127 | EVQ11Y05B | SWITCH | |
| SW128 | EVQ11Y05B | SWITCH | |
| SW129 | EVQ11Y05B | SWITCH | |
| SW130 | EVQ11Y05B | SWITCH | |
| SW131 | EVQ11Y05B | SWITCH | |
| SW132 | EVQ11Y05B | SWITCH | |
| SW133 | EVQ11Y05B | SWITCH | |
| SW134 | EVQ11Y05B | SWITCH | |
| SW135 | EVQ11Y05B | SWITCH | |
| SW136 | EVQ11Y05B | SWITCH | |
| SW137 | EVQ11Y05B | SWITCH | |
| SW138 | EVQ11Y05B | SWITCH | |
| SW139 | EVQ11Y05B | SWITCH | |
| SW140 | EVQ11Y05B | SWITCH | |
| SW141 | EVQ11Y05B | SWITCH | |
| SW142 | EVQ11Y05B | SWITCH | |
| SW143 | EVQ11Y05B | SWITCH | |
| SW144 | EVQ11Y05B | SWITCH | |
| SW145 | EVQ11Y05B | SWITCH | |
| SW146 | K0L1AA000001 | SWITCH | POM |
| | | (RESISTORS) | |
| J164 | ERJ3GEY0R00 | 0 | |
| J165 | ERJ3GEY0R00 | 0 | |
| J166 | ERJ3GEY0R00 | 0 | |
| J167 | ERJ3GEY0R00 | 0 | |
| R102 | ERJ3GEYJ123 | 12k | |
| R103 | ERJ3GEYJ181 | 180 | |
| R104 | ERJ3GEYJ123 | 12k | |
| R105 | ERJ3GEYJ181 | 180 | |
| R106 | ERJ3GEYJ123 | 12k | |
| R107 | ERJ3GEYJ181 | 180 | |
| R110 | ERJ3GEYJ181 | 180 | |
| R112 | ERJ3GEYJ181 | 180 | |
| R113 | ERJ3GEYJ181 | 180 | |
| R114 | ERJ3GEYJ181 | 180 | |
| R115 | ERJ3GEYJ181 | 180 | |
| R116 | ERJ3GEYJ181 | 180 | |
| R117 | ERJ3GEYJ181 | 180 | |
| R118 | ERJ3GEYJ181 | 180 | |
| R119 | ERJ3GEYJ563 | 56k | |
| R120 | ERJ3GEYJ331 | 330 | |
| R121 | ERJ3GEYJ472 | 4.7k | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| R123 | ERJ3GEYJ123 | 12k | |
| R127 | ERJ3GEYJ103 | 10k | |
| R128 | ERJ3GEYJ223 | 22k | |
| R129 | ERJ3GEY0R00 | 0 | |
| R130 | ERJ3GEYJ101 | 100 | |
| R131 | ERJ3GEYJ101 | 100 | |
| R133 | ERJ3GEYJ122 | 1.2k | |
| R134 | ERJ3GEYJ101 | 100 | |
| R135 | ERJ3GEYJ101 | 100 | |
| R138 | ERJ3GEYJ331 | 330 | |
| R139 | ERJ3GEYJ331 | 330 | |
| R146 | ERJ3GEYJ101 | 100 | |
| R147 | ERJ3GEYJ123 | 12k | |
| R148 | ERJ3GEYJ4R7 | 4.7 | |
| R149 | ERJ3GEYJ123 | 12k | |
| R152 | ERJ3GEYJ181 | 180 | |
| | | (CAPACITORS) | |
| C103 | ECEA1CK101 | 100 | S |
| C104 | ECUV1C104ZFV | 0.1 | |
| C105 | ECUV1C104ZFV | 0.1 | |
| C106 | ECUV1H103KBV | 0.01 | |
| C110 | ECUV1C104ZFV | 0.1 | |
| C111 | ECUV1C104ZFV | 0.1 | |
| C112 | ECEA1CKS100 | 10 | S |
| C115 | ECUV1H101JCV | 100p | |
| C117 | ECUV1H101JCV | 100p | |
| C118 | ECUV1H101JCV | 100p | |
| C119 | ECUV1H103KBV | 0.01 | |
| C120 | ECUV1C104ZFV | 0.1 | |
| C122 | ECUV1C104ZFV | 0.1 | |
| C125 | ECUV1C104ZFV | 0.1 | |
| C128 | ECUV1H101JCV | 100p | |
| C129 | ECUV1H101JCV | 100p | |
| C130 | ECUV1H101JCV | 100p | |
| C132 | ECEA1CK101 | 100 | S |
| C133 | ECUV1C104ZFV | 0.1 | |
| C139 | ECUV1C104ZFV | 0.1 | |

12.6. HIGH VOLTAGE POWER SUPPLY BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|---|---------|
| PCB4 | EUKMBN889HA | HIGH BOLTAGE POWER SUPPLY BOARD ASS'Y (RTL) | |
| | | (IC) | |
| IC101 | AN6742S | IC | |
| | | (TRANSISTORS) | |
| Q101 | 2SB709A | TRANSISTOR (SI) | |
| Q102 | 2SB709A | TRANSISTOR (SI) | |
| Q103 | 2SD2137A | TRANSISTOR (SI) | |
| Q201 | 2SD2137A | TRANSISTOR (SI) | |
| Q202 | 2SA1699 | TRANSISTOR (SI) | |
| | | (DIODE) | |
| D104 | PFVDDHM3FJ60 | DIODE (SI) | S |
| D105 | PFVDDHM3FJ60 | DIODE (SI) | S |
| D107 | PFVDERA1504 | DIODE (SI) | S |
| D109 | PFVDDHM3M20 | DIODE (SI) | S |
| D201 | PFVDERA1504 | DIODE (SI) | S |
| D203 | PFVDDHM3M20 | DIODE (SI) | S |
| D204 | PFVDERA1504 | DIODE (SI) | S |
| D205 | PFVDDHM3M20 | DIODE (SI) | S |
| ZD201 | PFVDRD62ESAB | ZENER DIODE | S |
| ZD202 | PFVDRD150EB | ZENER DIODE | S |
| | | (CONNECTOR) | |
| CN2 | PFJFP06B01Z | CONNECTOR, 6P | |
| | | (CAPACITORS) | |
| C101 | PFEUKMG1V470 | 47 | S |
| C102 | ECQV1H473JZ | 0.047 | |
| C103 | PFEUKMG1H2R2 | 2.2 | S |
| C104 | PFEUKMG1H010 | 1 | S |
| C105 | ECJ2VB1H103K | 0.01 | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| C108 | ECJ2FB1H473K | 0.047 | |
| C109 | ECJ2VB1H153K | 0.015 | |
| C110 | ECKK3F471KBP | 470p | |
| C111 | ECKK3D471KBB | 470p | |
| C112 | ECKK3D471KBB | 470p | |
| C201 | ECJ2FB1H473K | 0.047 | |
| C202 | ECJ2VB1H102K | 0.001 | |
| C203 | ECKK3D221KB | 220p | |
| C204 | ECJ2VB1H103K | 0.01 | |
| C205 | ECKR2H102KB | 0.001 | |
| C207 | ECKK3D102KB | 0.001 | |
| C209 | ECKR2H101KB5 | 100p | |
| | | (FUSE) | |
| IP101 | PFBAICPN38 | FUSE | S △ |
| | | (RESISTORS) | |
| R101 | PQ4R10XJ473 | 47k | S |
| R102 | ERDS2TJ104 | 100k | |
| R104 | ERDS2TJ103 | 10k | |
| R105 | ERJ6ENF2003 | 200k | |
| R106 | PQ4R10XJ103 | 10k | S |
| R107 | ERDS2TJ103 | 10k | |
| R108 | ERDS2TJ103 | 10k | |
| R109 | ERDS2TJ272 | 2.7k | |
| R110 | PQ4R10XJ103 | 10k | S |
| R111 | PQ4R10XJ103 | 10k | S |
| R112 | PQ4R10XJ103 | 10k | S |
| R113 | ERJ6ENF1004 | 1M | |
| R114 | PQ4R10XJ103 | 10k | S |
| R116 | PQ4R10XJ272 | 2.7k | S |
| R117 | PQ4R10XJ000 | 0 | S |
| R118 | PQ4R10XJ000 | 0 | S |
| R119 | PFRGH16A306N | 30M | S |
| R120 | ERDS2TJ152 | 1.5k | |
| R121 | ERDS2TJ152 | 1.5k | |
| R123 | ER0S2TKF8451 | 8.45k | |
| R124 | ERJ6ENF1003 | 100k | |
| R125 | PQ4R10XJ000 | 0 | S |
| R126 | PQ4R10XJ102 | 1k | S |
| R127 | PFRGVR25J106 | 10M | S |
| R202 | ERJ6ENF4872 | 48.7k | |
| R203 | PQ4R10XJ102 | 1k | S |
| R204 | ERDS2TJ473 | 47k | |
| R205 | ERDS1TJ224 | 220k | |
| R206 | ER0S2TKF4532 | 45.3k | S |
| R207 | PFRGR25F1504 | 1.5M | S |
| R208 | PFRGVR25J105 | 1M | S |
| R209 | PFRGVR25J105 | 1M | S |
| R210 | ERDS2TJ333 | 33k | |
| R211 | PFRGR25F1005 | 10M | S |
| R212 | PFRGVR25J105 | 1M | |
| R213 | PFRGVR25J105 | 1M | |
| R214 | PFRGVR25J106 | 10M | S |
| | | (SWITCH) | |
| SW101 | PFSEDE2LCJ33 | SWITCH | S △ |
| | | (COILS) | |
| T101 | ETB20DKA1 | COIL | △ |
| T201 | ETB20DKD1 | COIL | △ |

12.7. LOW VOLTAGE POWER SUPPLY BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|------------------------------------|---------|
| PCB5 | ETXKM450E5B | LOW VOLTAGE POWER BORD ASS'Y (RTL) | |
| | | (ICs) | |
| IC101 | PFVIFA5317P | IC | S |
| IC201 | PFVIPQ05RD11 | IC | S |
| | | (TRANSISTORS) | |
| Q101 | 2SK2717 | TRANSISTOR (SI) | |
| Q201 | 2SC1740S | TRANSISTOR (SI) | S |
| | | (DIODES) | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|------------------------------|---------|
| D101 | PFVDLT1505 | DIODE(SI) | S △ |
| D102 | PFVDLT1505 | DIODE(SI) | S △ |
| D103 | PFVDLT1505 | DIODE(SI) | S △ |
| D104 | PFVDLT1505 | DIODE(SI) | S △ |
| D105 | PFVD05NU42 | DIODE(SI) | S |
| D106 | PFVDERA9102 | DIODE(SI) | S |
| D108 | PFVDERA9102 | DIODE(SI) | S |
| D109 | PSVD10ELS4 | DIODE(SI) | S |
| D110 | PFVDERA9102 | DIODE(SI) | S |
| D201 | PFVDYG901C2R | DIODE(SI) | S |
| D202 | PFVD21DQ06 | DIODE(SI) | S |
| ZD101 | MA4300 | ZENER DIODE | |
| ZD102 | MA4180 | ZENER DIODE | |
| ZD201 | MA4062N | ZENER DIODE | |
| | | (CONNECTORS) | |
| CN101 | PQJP2D98Z | CONNECTOR, 2P | S |
| CN102 | PQJP2D98Z | CONNECTOR, 2P | S |
| CN201 | PFJP08B01Z | CONNECTOR, 8P | S |
| | | (CAPACITORS) | |
| C101 | ECQU2A224ML | 0.22 | |
| C102 | ECQU2A224ML | 0.22 | |
| C103 | PFCKDCS222MY | 0.0022 | S △ |
| C104 | PFCKDCS222MY | 0.0022 | S △ |
| C105 | PFCKDCD222MY | 0.0022 | S △ |
| C106 | PFCKLH2W560H | 56P | S △ |
| C107 | ECQE6103 | 0.01 | |
| C109 | ECKN3A221KRP | 220P | |
| C110 | EEUFC1V390 | 39 | |
| C111 | ECQB1H102JF | 0.001 | |
| C112 | ECQV1H224JZ | 0.22 | |
| C113 | ECQB1H471JF | 470p | |
| C115 | ECQB1H103JF | 0.01 | |
| C116 | ECQU2A104ML | 0.1 | △ |
| C201 | PFCKD2R102K | 1000p | S |
| C202 | EEUFC1V102 | 1000 | |
| C204 | EEUFC1C102 | 1000 | |
| C206 | EEUFC1A151 | 150 | |
| C208 | ECQV1H474JZ | 0.47 | |
| C212 | ECQV1H474JZ | 0.47 | |
| | | (COILS) | |
| L101 | ELF15N010A | COIL | S △ |
| L102 | ELF15N010A | COIL | S △ |
| L103 | PQLQSTP03694 | COIL | S △ |
| L105 | PQLE53 | COIL | S |
| L202 | PQLE53 | COIL | S |
| | | (PHOTO ELECTRIC TRANSDUCERS) | |
| PC101 | 0N3171S | PHOTO COUPLER | |
| PC102 | PFVIS21ME6NY | PHOTO COUPLER | S △ |
| PC103 | 0N3171S | PHOTO COUPLER | |
| | | (RESISTORS) | |
| R101 | ERDS1TJ105 | 1M | |
| R102 | ERG2SJ104 | 100k | |
| R103 | ERG2SJ221 | 220 | |
| R104 | ERDS2TJ472 | 4.7k | |
| R105 | ERX2SJR33 | 0.33 | |
| R106 | ERDS2TJ823 | 82k | |
| R107 | ERDS2TJ823 | 82k | |
| R110 | ER0S2TKF2000 | 200 | |
| R111 | ERDS2TJ150 | 15 | |
| R112 | ERDS2TJ181 | 180 | |
| R113 | ERDS2TJ220 | 22 | |
| R114 | ERDS2TJ682 | 6.8k | |
| R115 | ER0S2TKF1502 | 15k | |
| R116 | ER0S2TKF1000 | 100 | |
| R117 | ERDS2TJ123 | 12k | |
| R119 | PFRDRF16J331 | 330 | S |
| R120 | ERDS2TJ470 | 47 | |
| R121 | ERG1SJ121 | 120 | |
| R122 | ER0S2TKF1202 | 12k | |
| R203 | ERDS2TJ272 | 2.7k | |
| R204 | ERDS2TJ102 | 1k | |
| R205 | ERDS2TJ472 | 4.7k | |
| R206 | ERDS2TJ562 | 5.6k | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|
| R207 | ERDS2TJ103 | 10k | |
| R208 | ER0S2TKF6801 | 6.8k | |
| R209 | ER0S2TKF1801 | 1.8k | |
| R212 | ER0S2TKF3301 | 3.3k | |
| R213 | ERDS2TJ221 | 220 | |
| R214 | ERDS2TJ102 | 1k | |
| R215 | ERDS2TJ562 | 5.6k | |
| | | (FUSES) | |
| F101 | PFBA215315 | FUSE | S △ |
| F102 | PFBA215005 | FUSE | S △ |
| | | (TRANSFORMER) | |
| T101 | ETB29AC1V8AD | TRANSFORMER | △ |
| | | (THERMISTOR) | |
| TH101 | PFRTD207D8R0 | THERMISTOR | S |
| | | (VARISTOR) | |
| ZNR101 | ERZVGAD751 | VARISTOR | △ |
| | | (COMPONENTS PART) | |
| SCR101 | PFXFTM1661SE | TRIAC | S △ |

12.8. EXIT SENSOR BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------------|---------|
| PCB6 | PFLP1481MZ-B | EXIT SENSOR BOARD ASS'Y (RTL) | |
| | | (PHOTO ELECTRIC TRANSDUCER) | |
| PS51 | PFVIRM574SL | PHOTO SENSOR | S |
| | | (CONNECTORS) | |
| CN51 | PQJP03A21Z | CONNECTOR, 3P | S |
| CN52 | PQJP5G43Y | CONNECTOR, 5P | S |
| | | (CAPACITOR) | |
| C52 | ECUV1H271KBV | 270p | |

12.9. DRUM AND TONER SENSOR BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|--------------------------------------|---------|
| PCB7 | PFLP1481MZ-C | DRUM & TONER SENSOR BORD ASS'Y (RTL) | |
| | | (IC) | |
| IC60 | B4ABC0000001 | IC | |
| | | (CONNECTOR) | |
| CN60 | PQJP4G30Z | CONNECTOR, 4P | S |
| | | (SWITCH) | |
| SW60 | PFSH1A005Z | SWITCH | S |
| | | (CAPACITOR) | |
| C60 | ECUV1C104ZFV | 0.1 | |

12.10. VARISTOR BOARD PARTS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|----------------------------|---------|
| PCB8 | PFLP1481MZ-D | VARISTOR BOARD ASS'Y (RTL) | |
| | | (VARISTOR) | |
| ZNR71 | PFRV271NS05K | VARISTOR | |

12.11. FIXTURES AND TOOLS

| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|------------|--|---------|
| EC1 | PQZZ6K7Z | EXTENSION CORD, 6P | |
| EC2 | PQZZ8K18Z | EXTENSION CORD, 8P | |
| EC3 | PFZZ5K13Z | EXTENSION CORD, 5P | |
| EC4 | PQZZ28F1Z | EXTENSION CORD, 28P | |
| EC5 | PQZZ4K5Z | EXTENSION CORD, 4P | |
| EC6 | PQZZ7K5Z | EXTENSION CORD, 7P | |
| EC7 | PQZZ2K12Z | EXTENSION CORD, 2P | |
| EC8 | PQZZ3K5Z | EXTENSION CORD, 3P | |
| EC9 | PQZZ5K6Z | EXTENSION CORD, 5P | |
| EC10 | PQZZ8K15Z | EXTENSION CORD, 8P | |
| | PFZZFL501M | TOOL FOR WRITING PROGRAM IN THE FLASH ROM. | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|-------------|--------------|--|---------|
| | KM79811245C0 | BASIC FACSIMILE TECHNIQUE (for training service technicians) | |

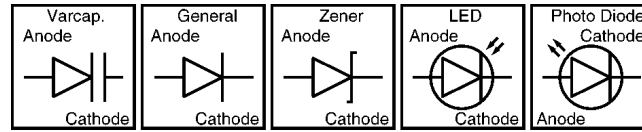
Note:

Tools and Extension Cords are useful for servicing.
(They make servicing easy.)


13 FOR THE SCHEMATIC DIAGRAMS

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.
- 3.



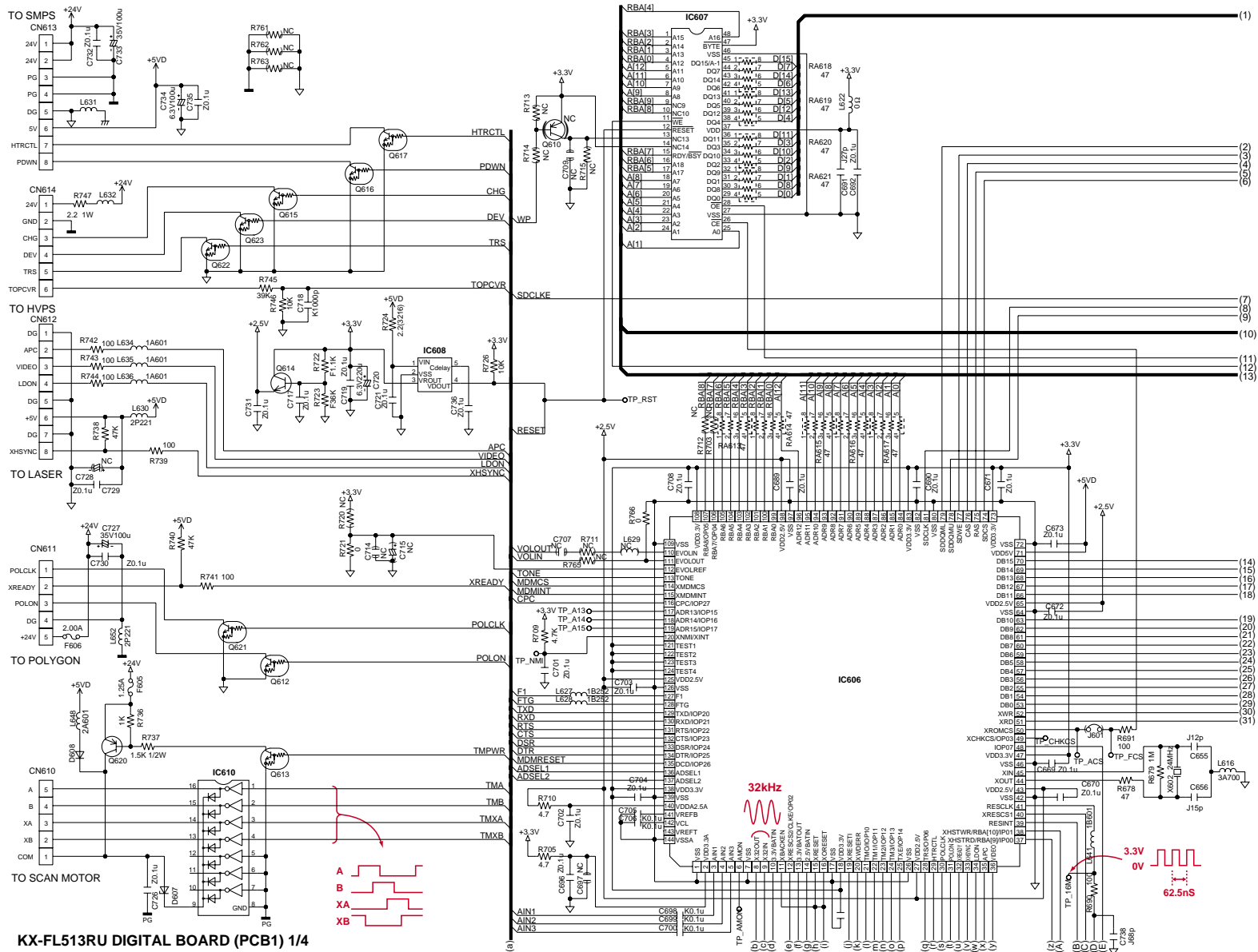
Important safety notice

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

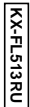
14 SCHEMATIC DIAGRAM

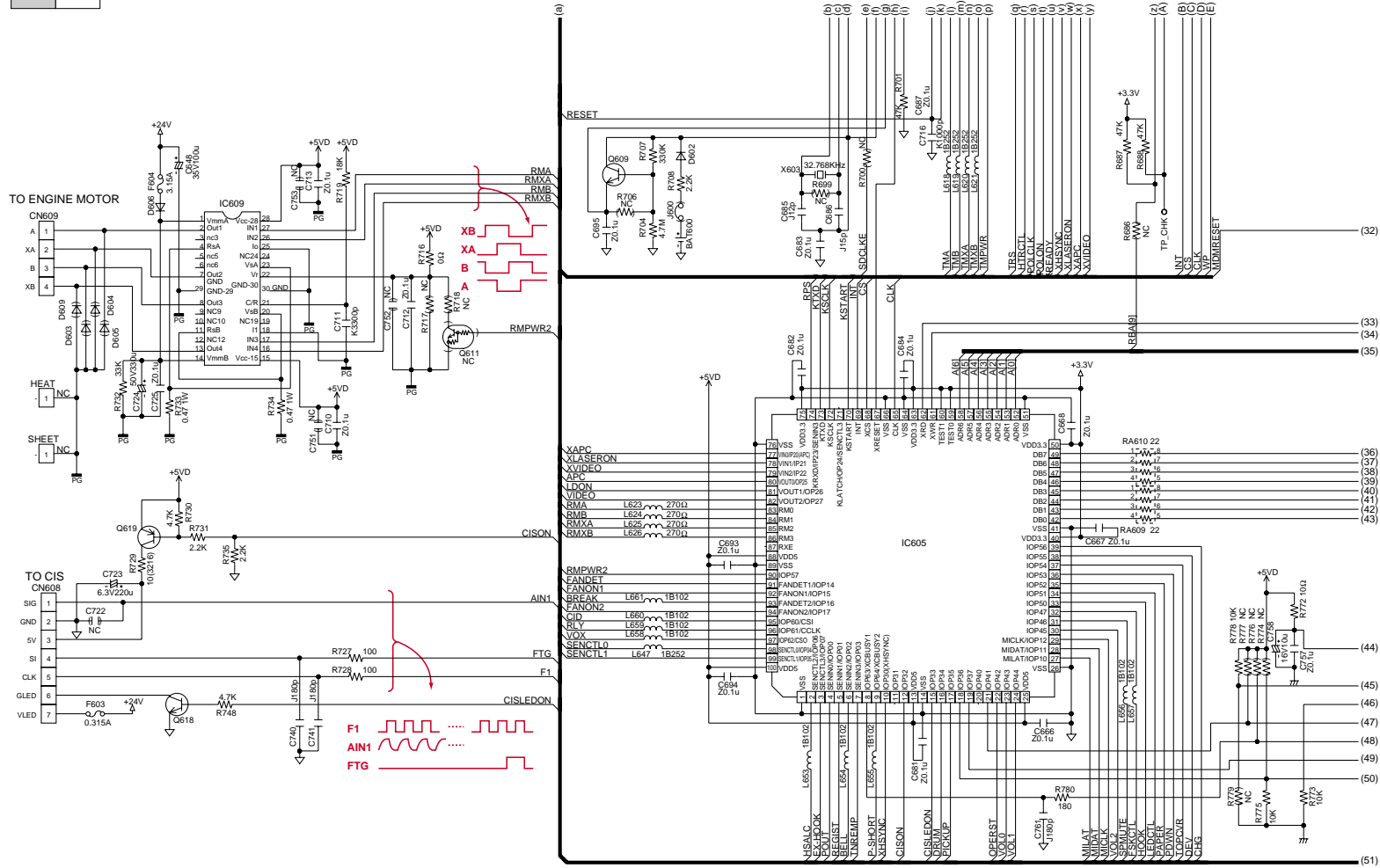
14.1. DIGITAL BOARD (PCB1)

| | |
|-----|--|
| 1/4 | |
| | |

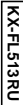


KX-FL513RU DIGITAL BOARD (PCB1) 1/4



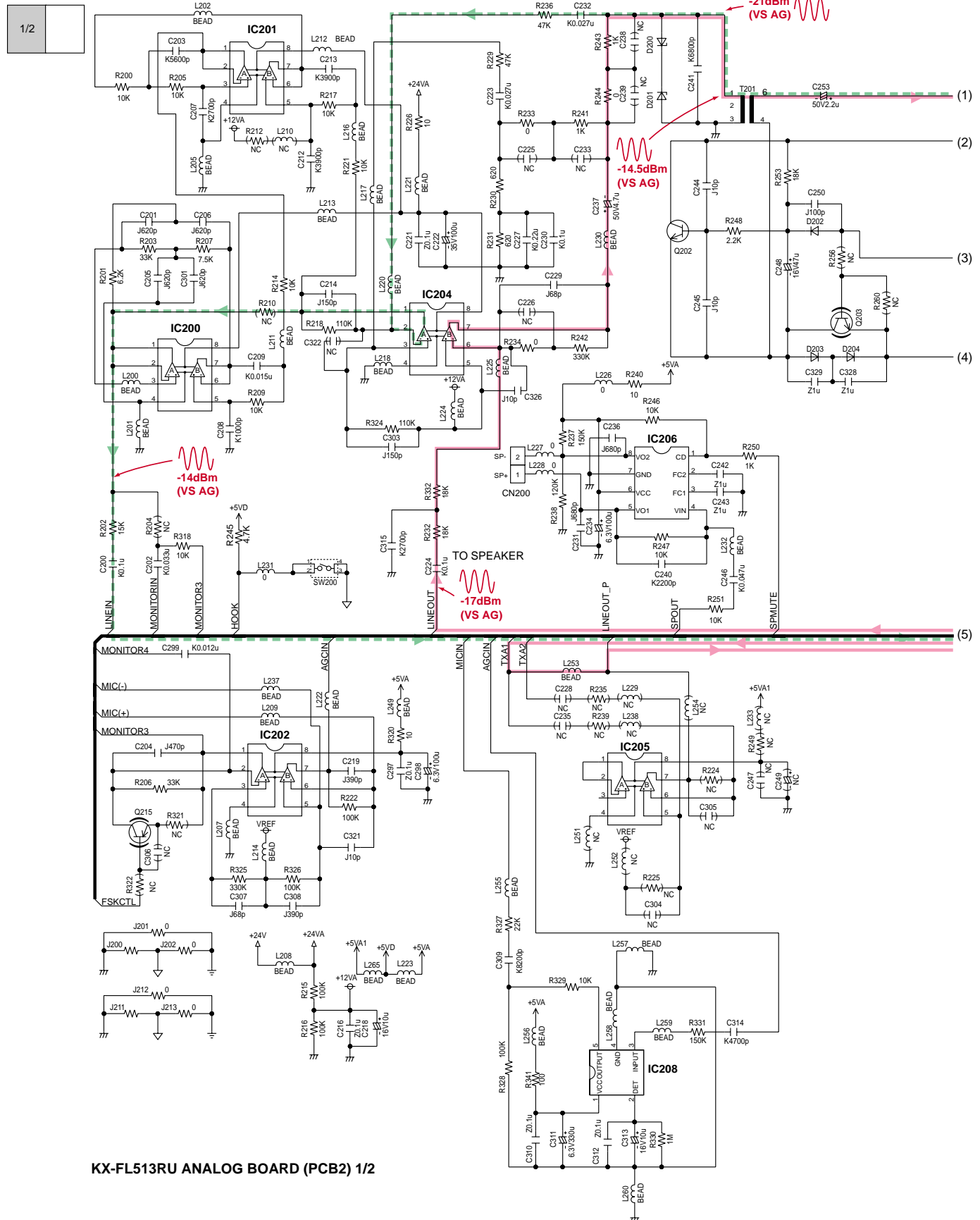


KX-FL513RU DIGITAL BOARD (PCB1) 3/4



15 SCHEMATIC DIAGRAM

15.1. ANALOG BOARD (PCB2)

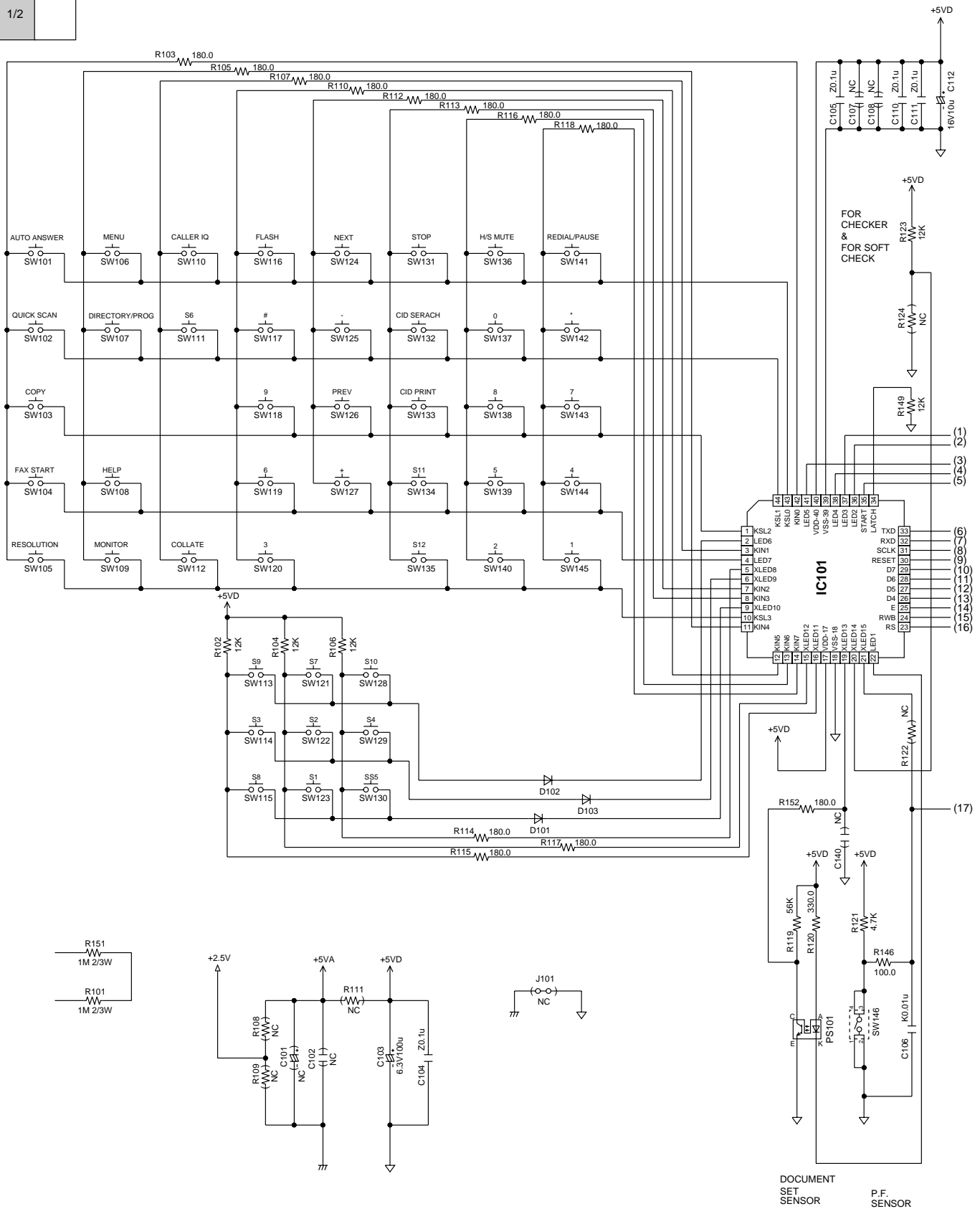


KX-FL513RU ANALOG BOARD (PCB2) 1/2

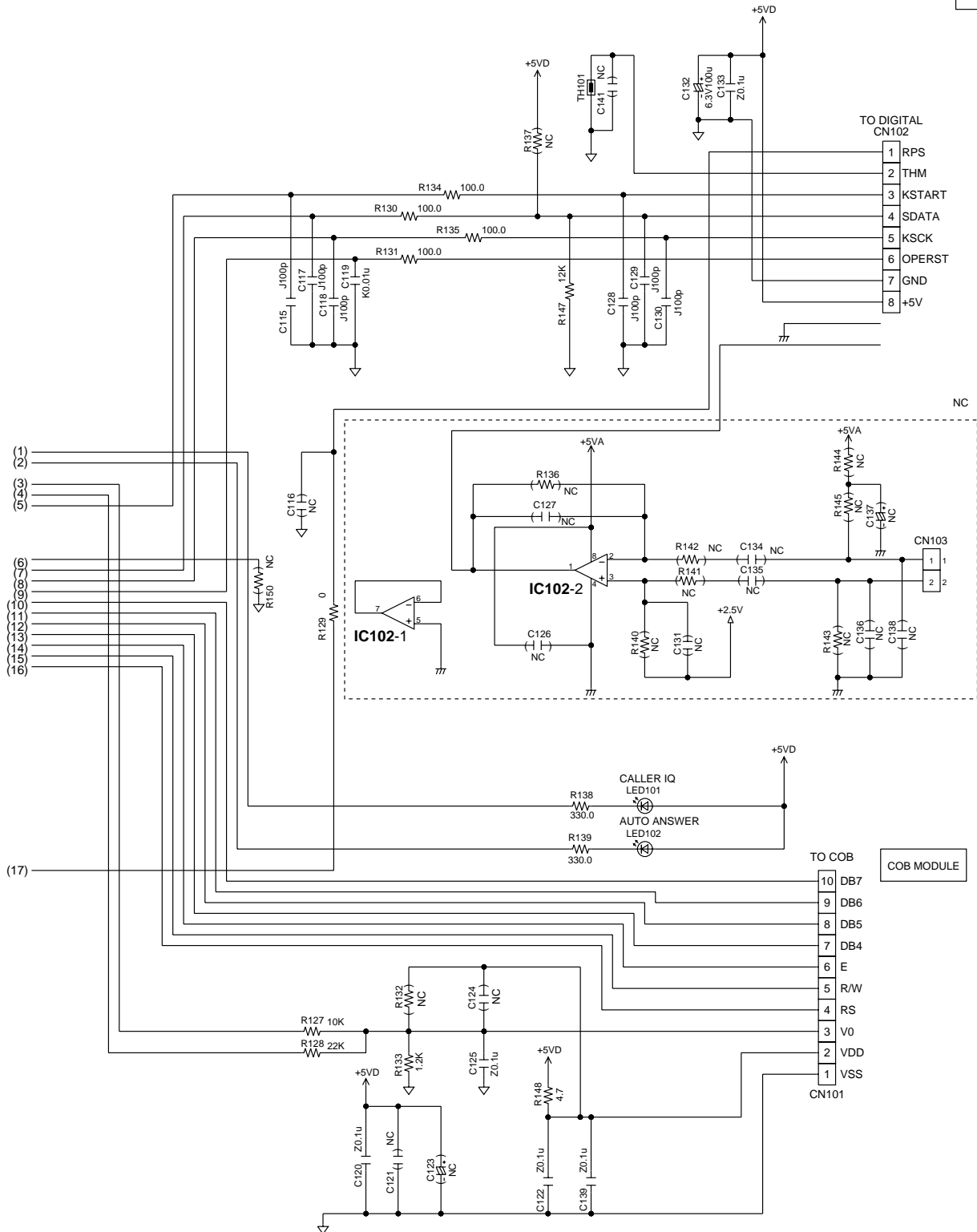


15.2. OPERATION BOARD (PCB3)

1/2

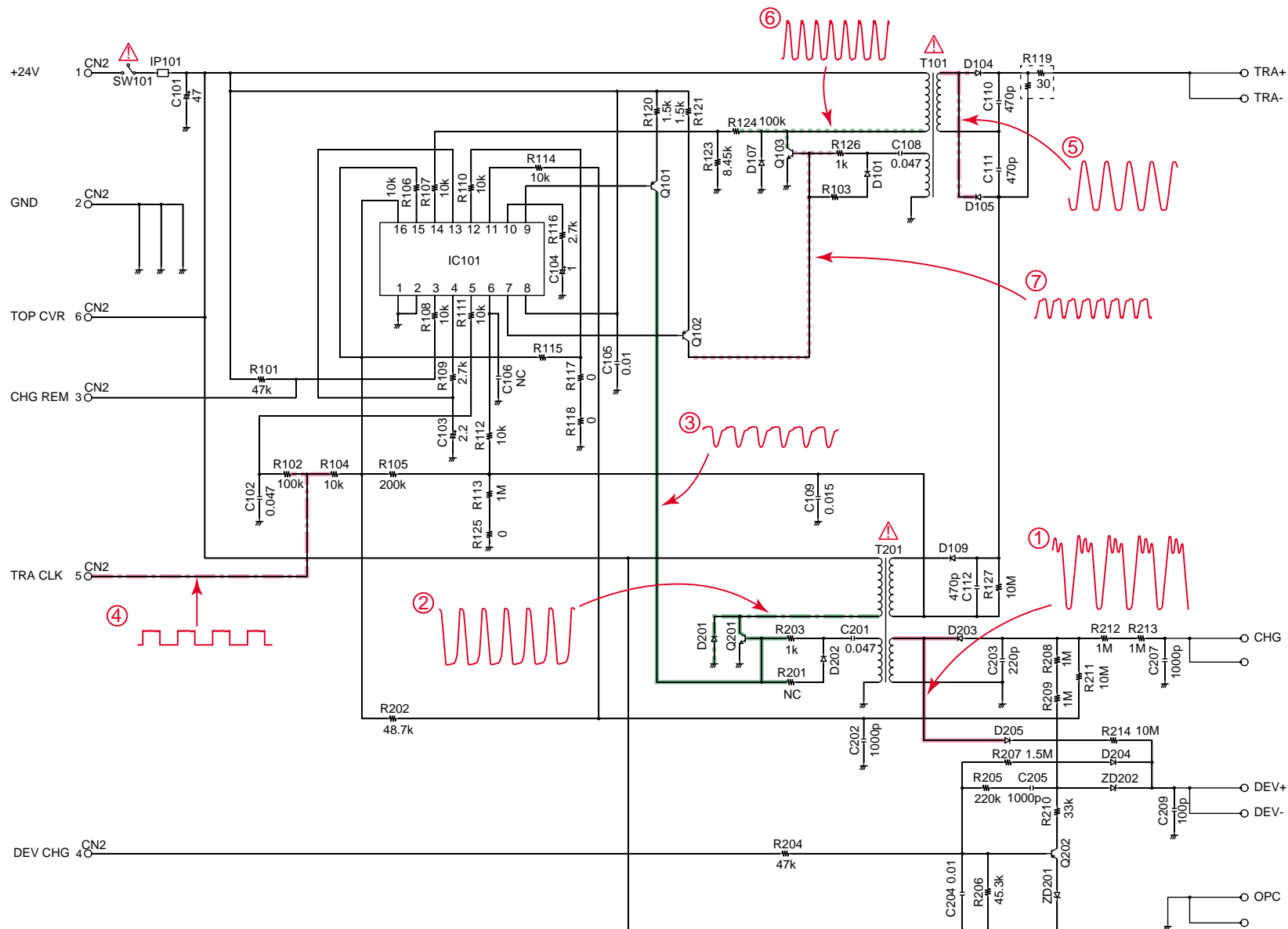


KX-FL513RU OPERATION BOARD (PCB3) 1/2



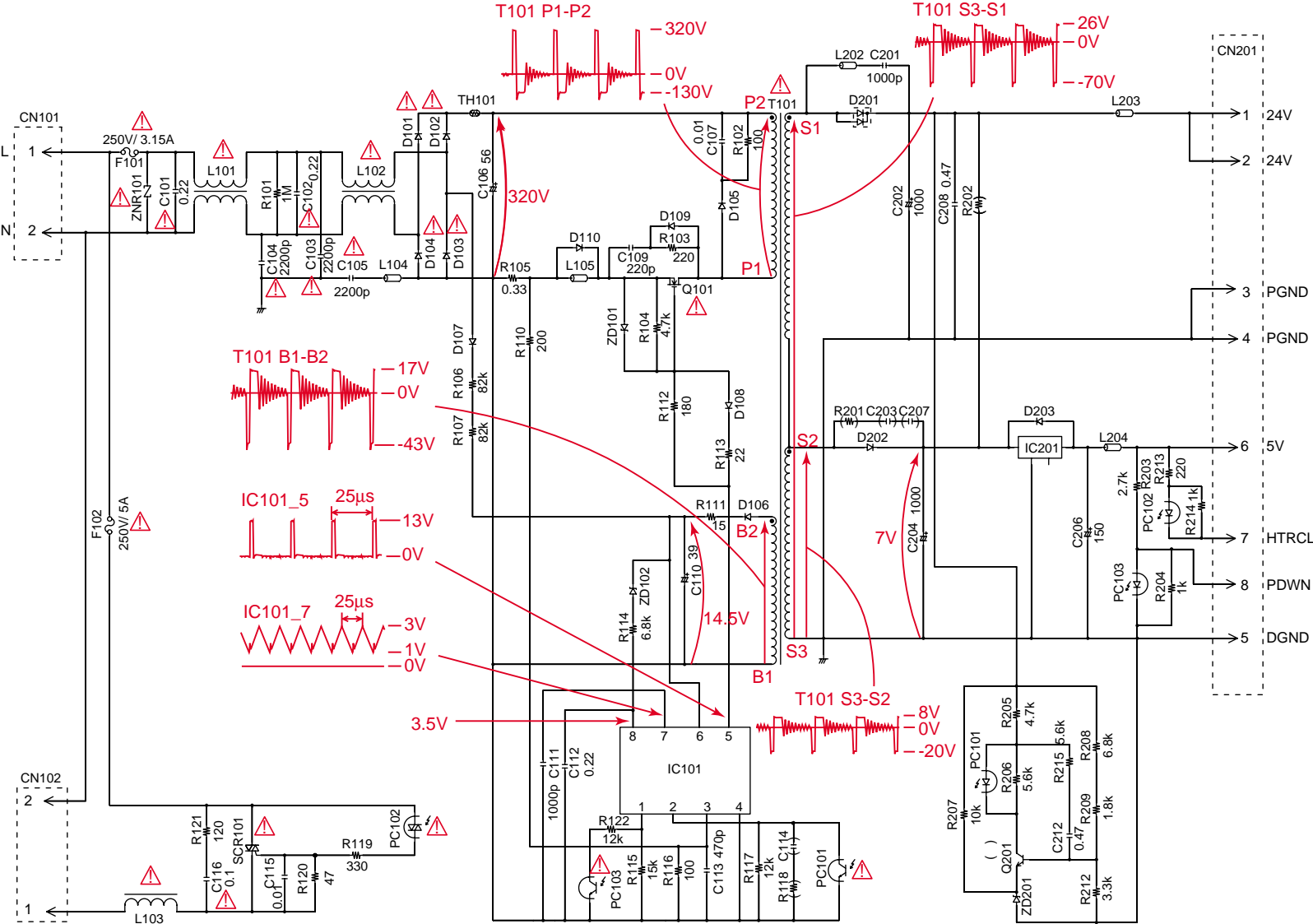
KX-FL513RU OPERATION BOARD (PCB3) 2/2

15.3. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)



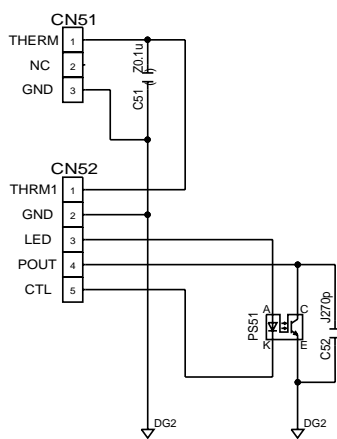
KX-FL513RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

15.4. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)



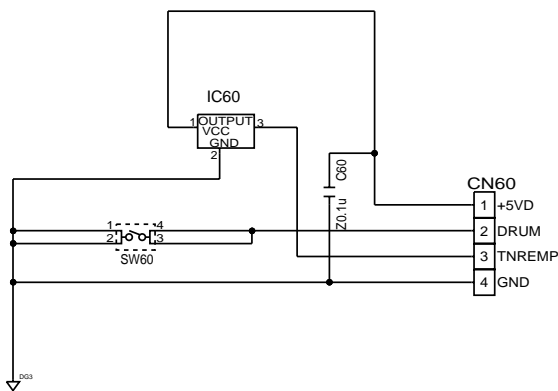
KX-FL513RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5)

15.5. EXIT SENSOR BOARD (PCB6)



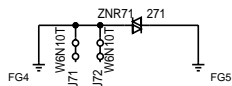
KX-FL513RU EXIT SENSOR BOARD (PCB6)

15.6. DRUM AND TONER SENSOR BOARD (PCB7)



KX-FL513RU DRUM AND TONER SENSOR BOARD (PCB7)

15.7. VARISTOR BOARD (PCB8)

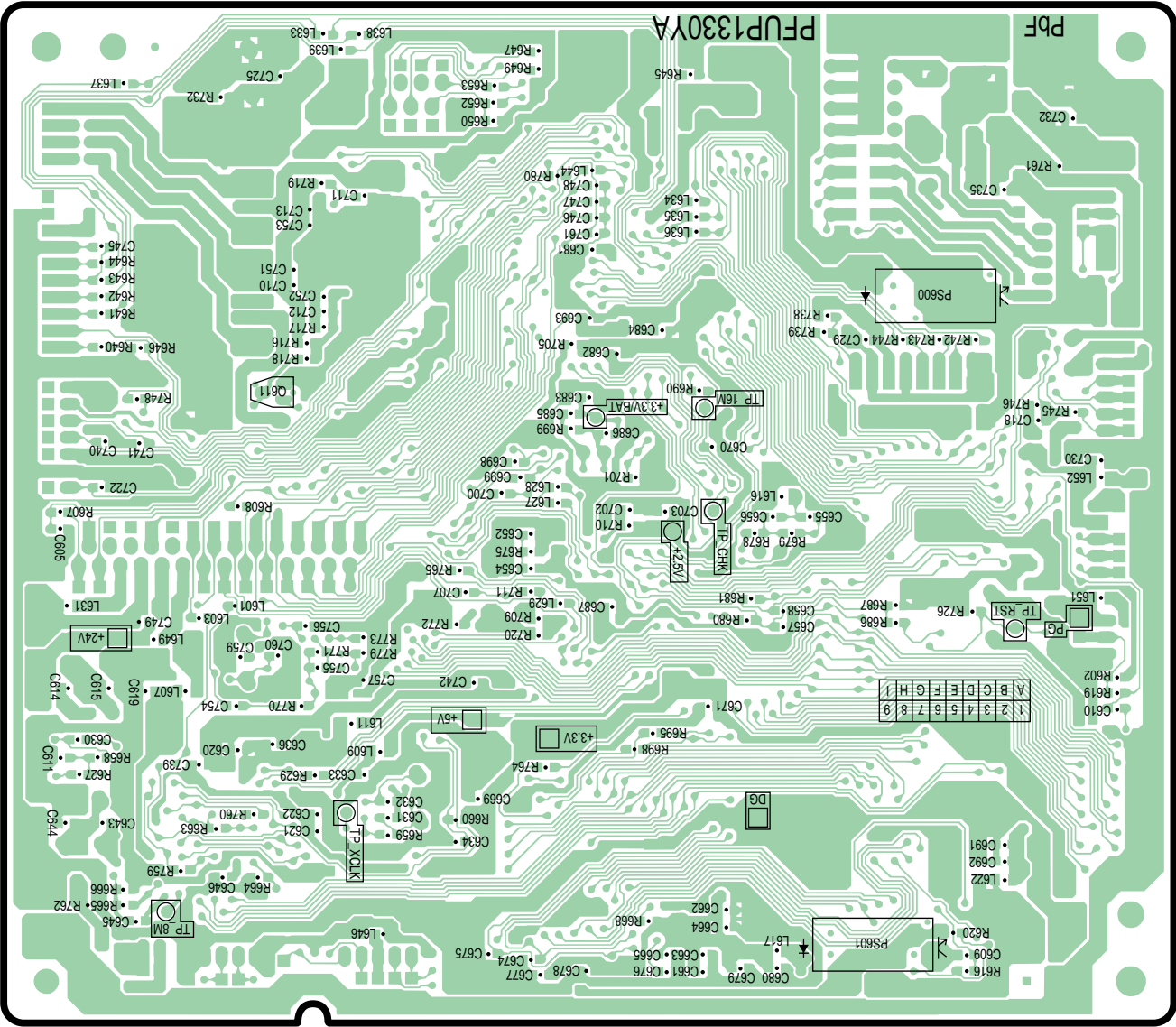


KX-FL513RU VARISTOR BOARD (PCB8)

16.1.1. DIGITAL BOARD: COMPONENT VIEW

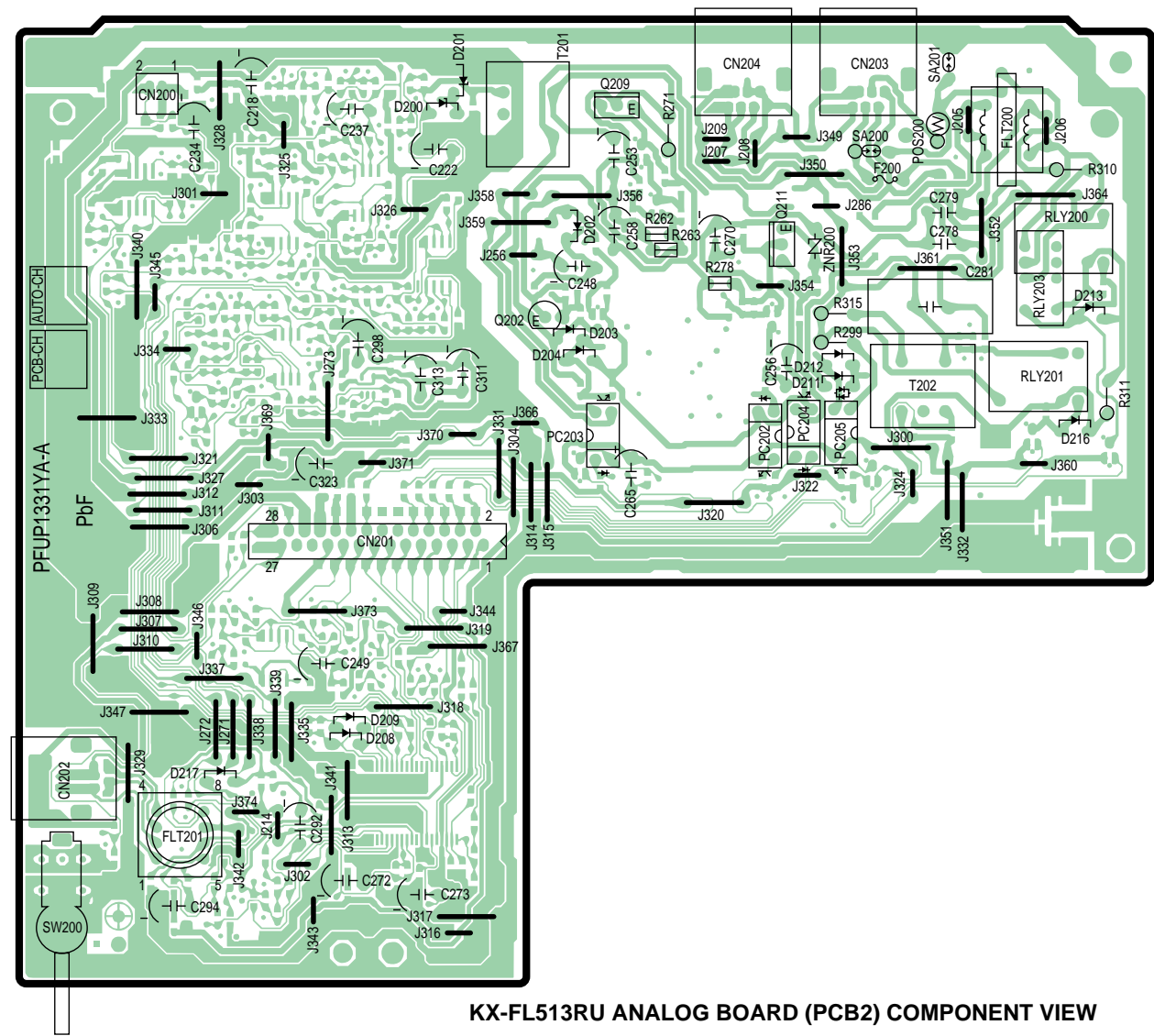


KX-FL513RU DIGITAL BOARD (PCB4) BOTTOM VIEW



16.2. ANALOG BOARD (PCB2)

16.2.1. ANALOG BOARD: COMPONENT VIEW

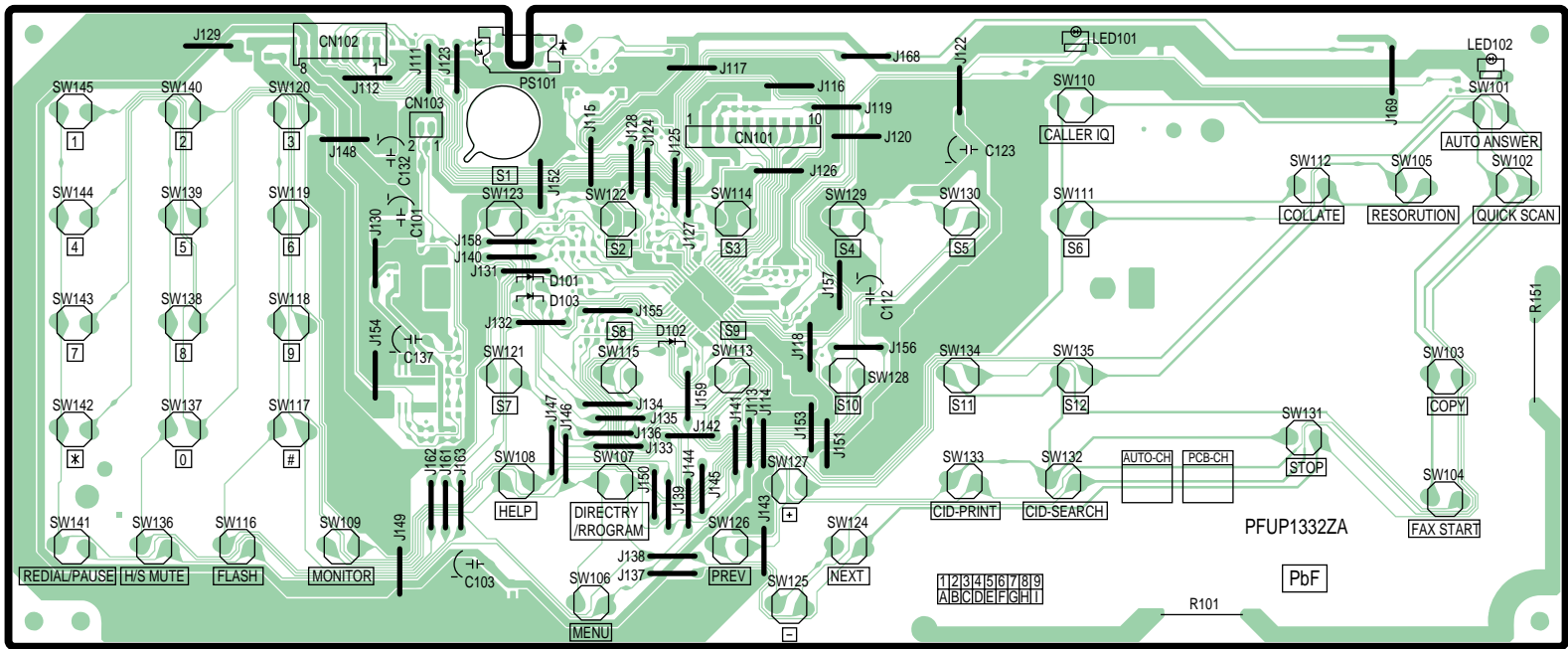


[illegible]

KX-FL513RU ANALOG BOARD (PCB2) BOTTOM VIEW

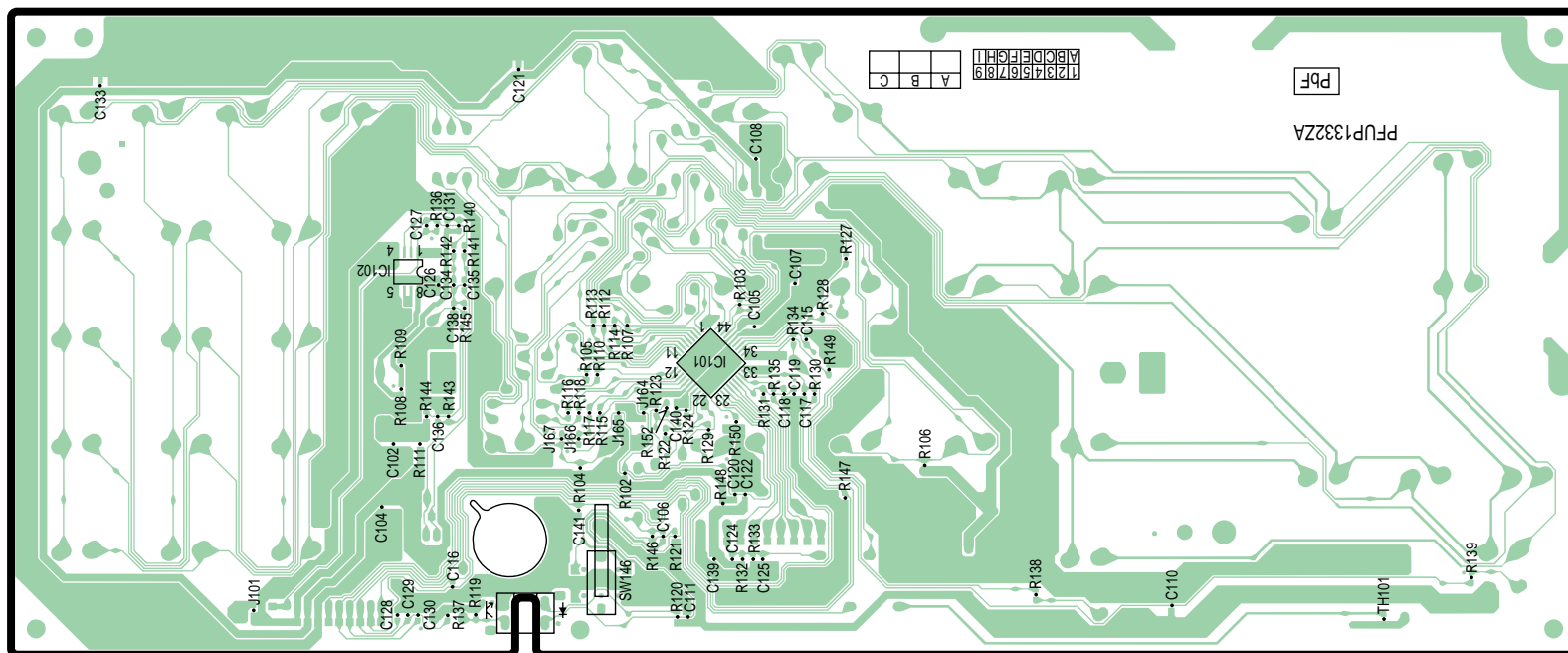
16.3. OPERATION BOARD (PCB3)

16.3.1. OPERATION BOARD:COMPONENT VIEW



KX-FL513RU OPERATION BOARD (PCB3) COMPONENT VIEW

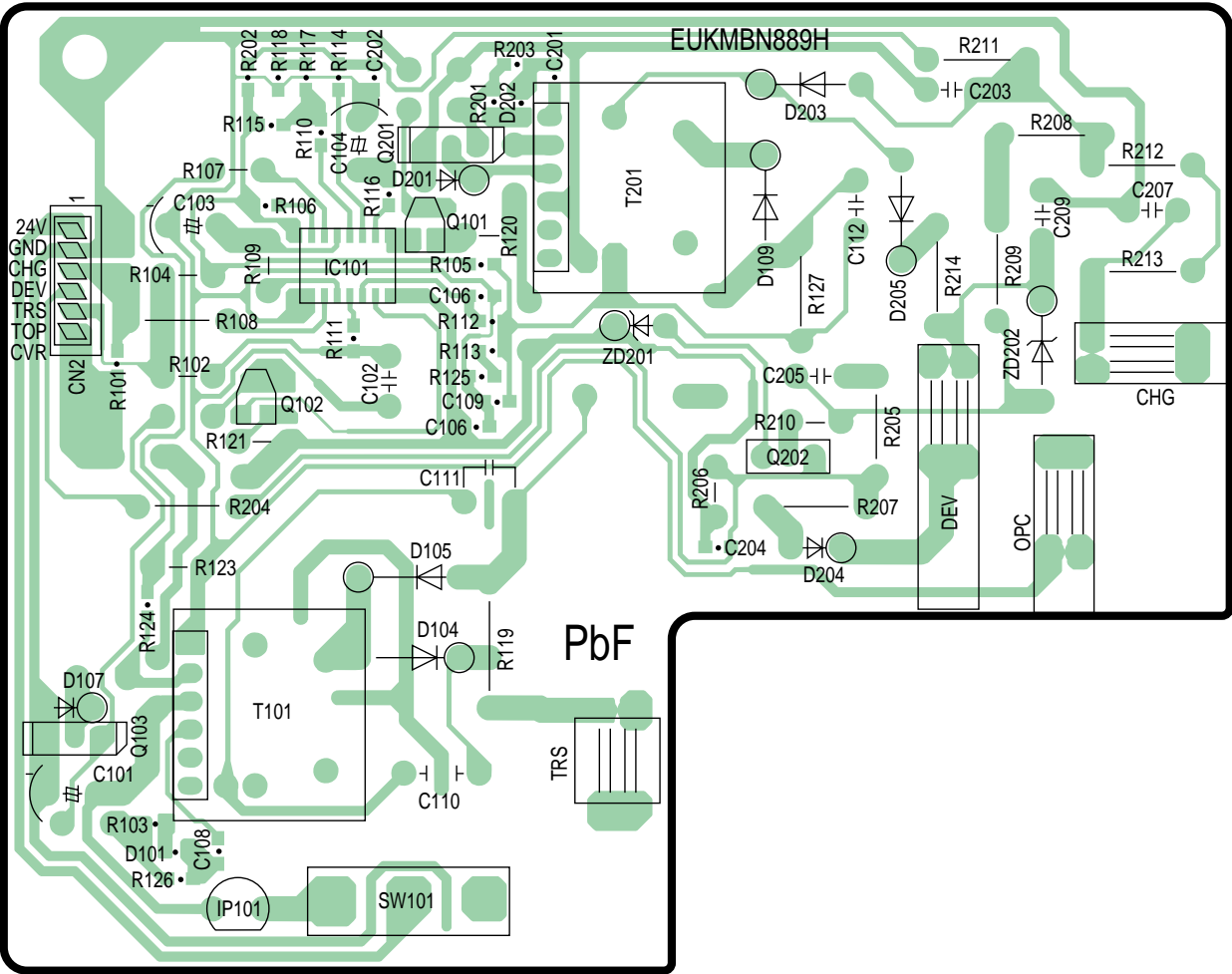
16.3.2. OPERATION BOARD:BOTTOM VIEW



KX-FL513RU OPERATION BOARD (PCB3) BOTTOM VIEW

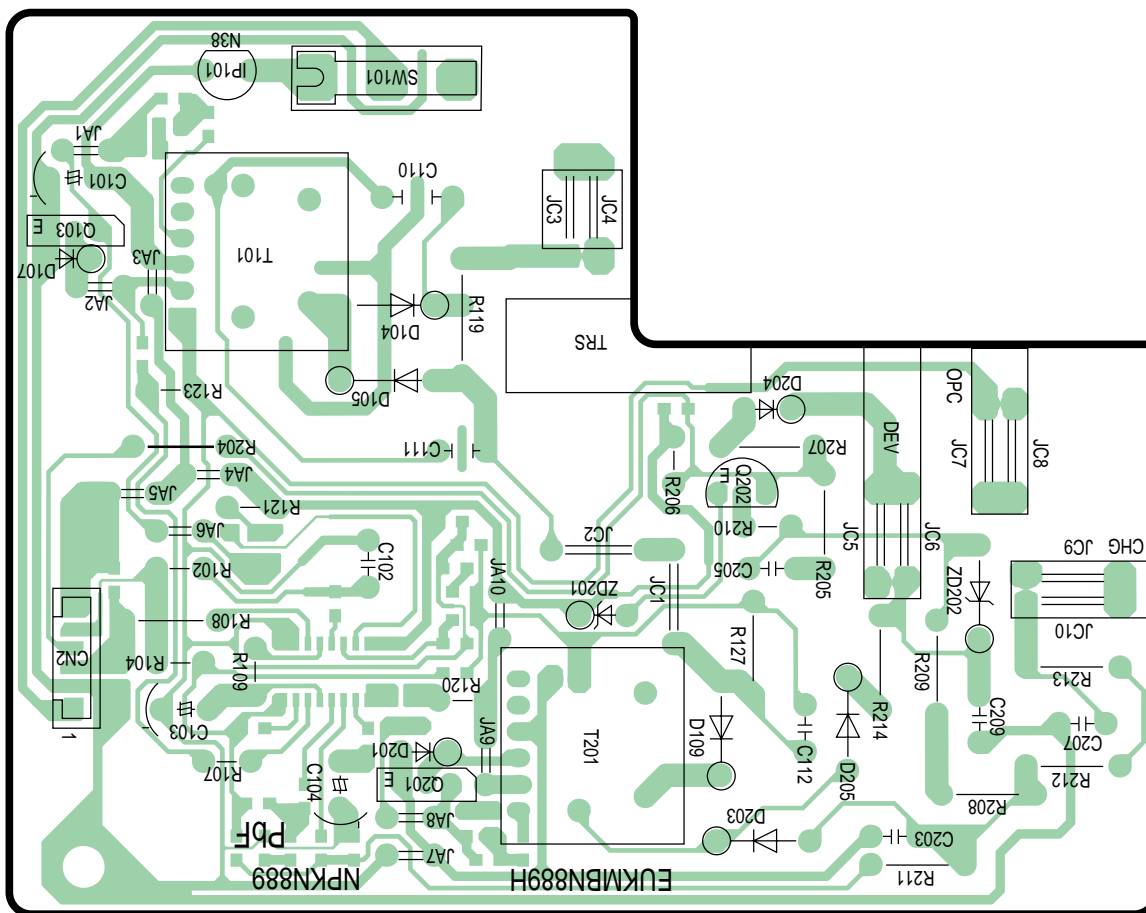
16.4. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

16.4.1. HIGH VOLTAGE POWER SUPPLY BOARD:COMPONENT VIEW



KX-FL513RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) COMPONENT VIEW

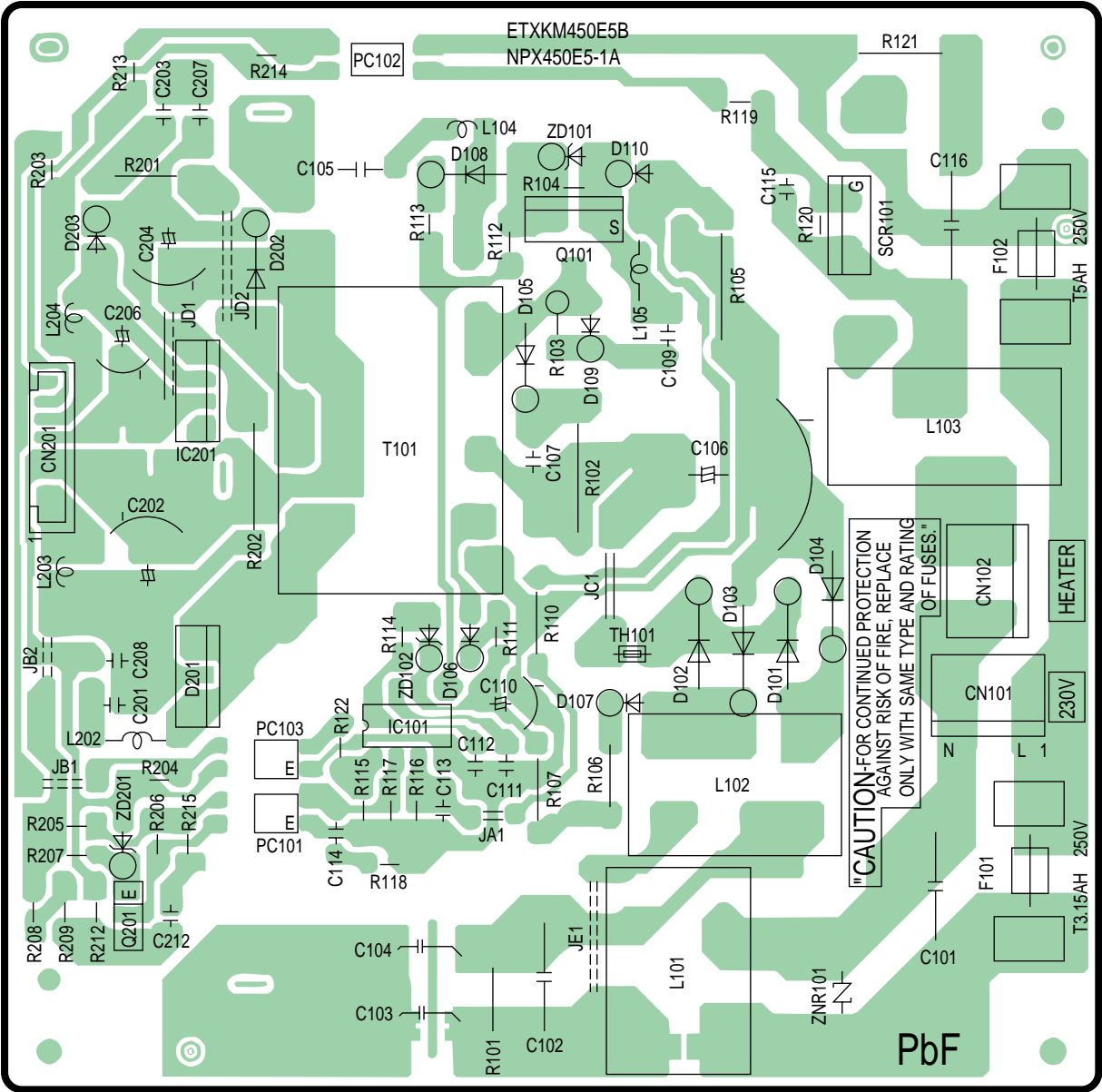
16.4.2. HIGH VOLTAGE POWER SUPPLY BOARD:BOTTOM VIEW



KX-FL513RU HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) BOTTOM VIEW

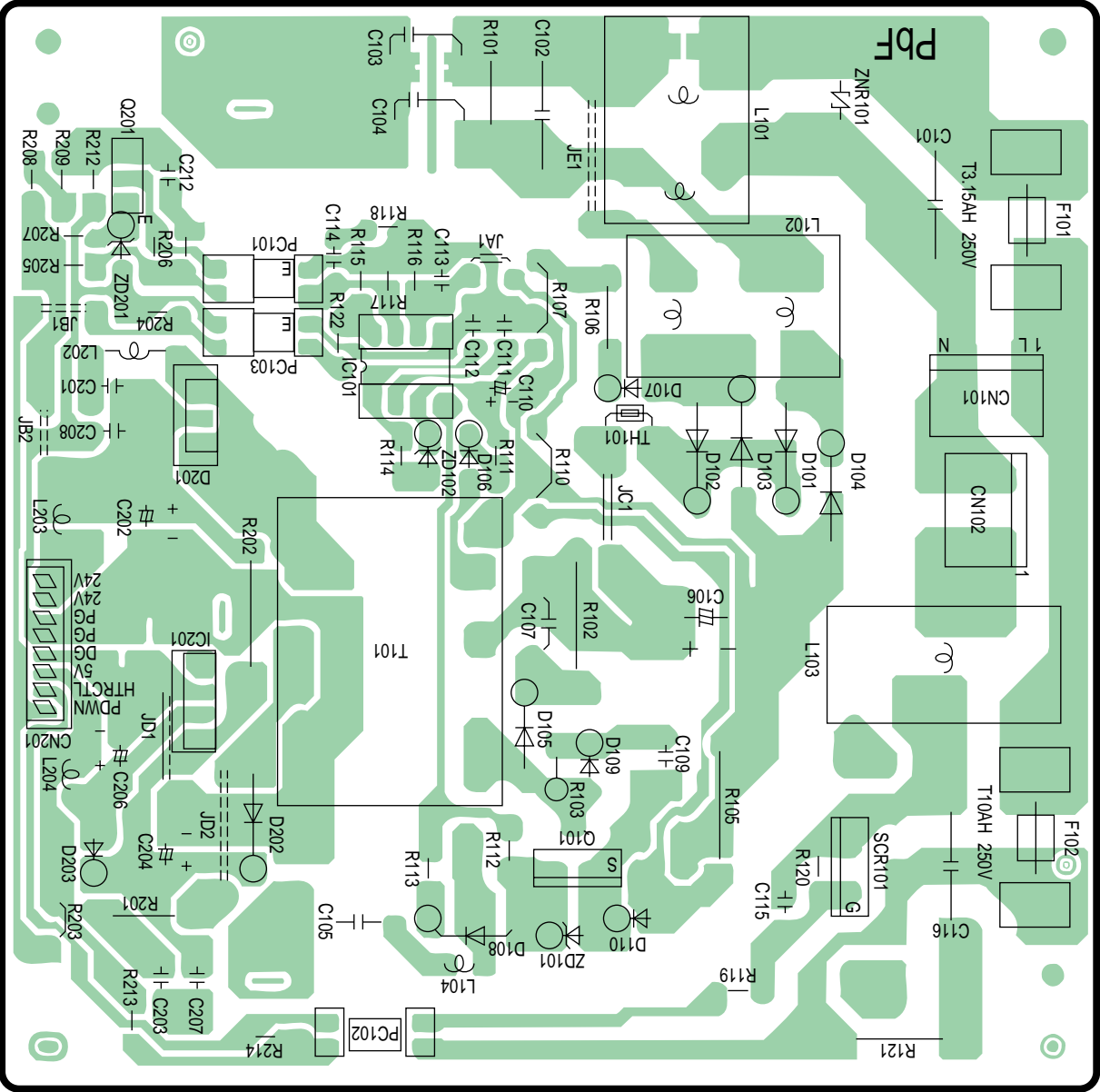
16.5. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)

16.5.1. LOW VOLTAGE POWER SUPPLY BOARD:COMPONENT VIEW



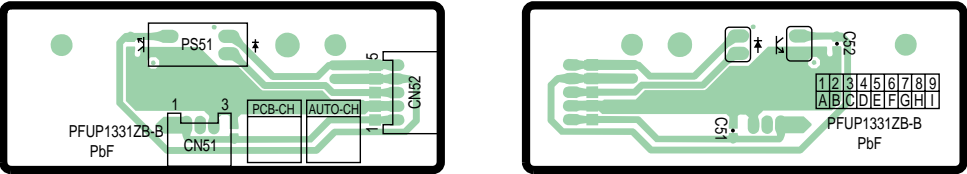
KX-FL513RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) COMPONENT VIEW

16.5.2. LOW VOLTAGE POWER SUPPLY BOARD:BOTTOM VIEW



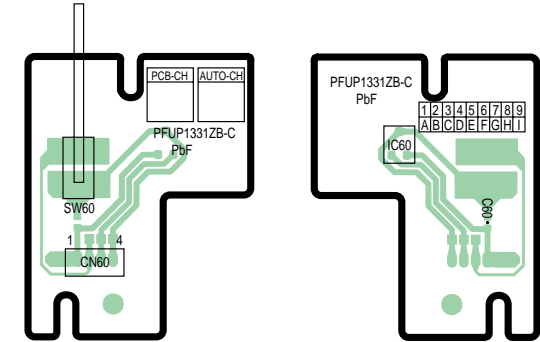
KX-FL513RU LOW VOLTAGE POWER SUPPLY BOARD (PCB5) BOTTOM VIEW

16.6. EXIT SENSOR BOARD PARTS (PCB6)



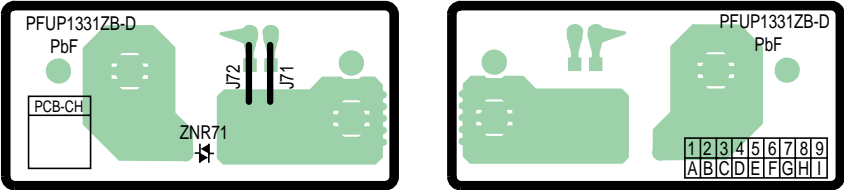
PFUP1331ZB-B (PFUP1331YA-B)
KX-FL513RU EXIT SENSOR BOARD (PCB6)

16.7. DRUM AND TONER SENSOR BOARD (PCB7)



PFUP1331ZB-C (PFUP1331YA-C)
KX-FL513RU DRUM AND TONER SENSOR BOARD (PCB7)

16.8. VARISTOR BOARD (PCB8)



PFUP1331ZB-D (PFUP1331YA-D)
KX-FL513RU VARISTOR BOARD (PCB8)

