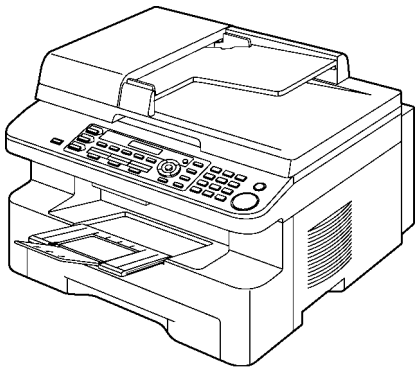
ORDER NO. KMF0711136CE
F7

Service Manual

Multi-Function printer



Model No. KX-MB781C

KX-FA103A

(Optional Handset Unit)

(for Canada)

⚠ WARNING

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

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

Panasonic®

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1 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.

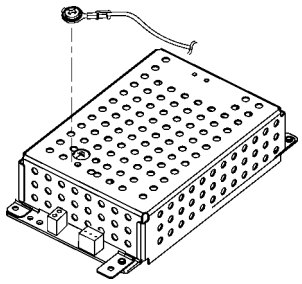
1.1. FOR SERVICE TECHNICIANS

- **Repair service shall be provided in accordance with repair technology information such as service manual so as to prevent fires, injury or electric shock, which can be caused by improper repair work.**
  1. When repair services are provided, neither the products nor their parts or members shall be remodeled.
  2. If a lead wire assembly is supplied as a repair part, the lead wire assembly shall be replaced.
  3. FASTON terminals shall be plugged straight in and unplugged straight out.
- **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.

1.2. AC CAUTION

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

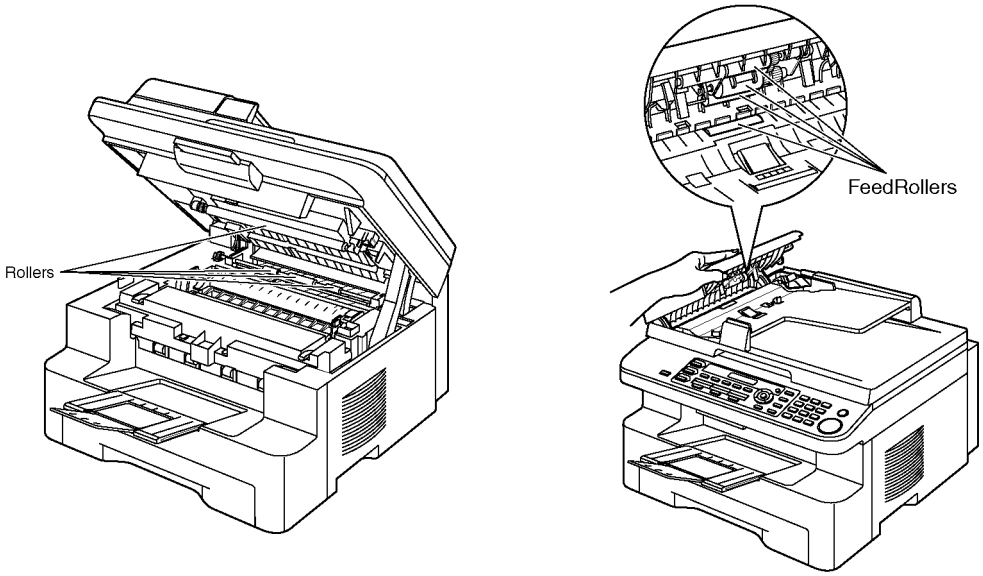
1. The earth lead is fixed with the screw.
2. The AC connector is connected properly.



1.3. PERSONAL SAFETY PRECAUTIONS

1.3.1. 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.



1.3.2. 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.

1.4. SERVICE PRECAUTIONS

1.4.1. PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

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

2 Warning

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

Note:

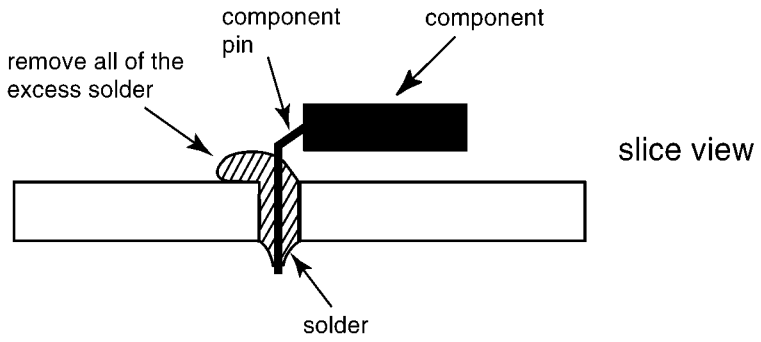
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

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

Caution

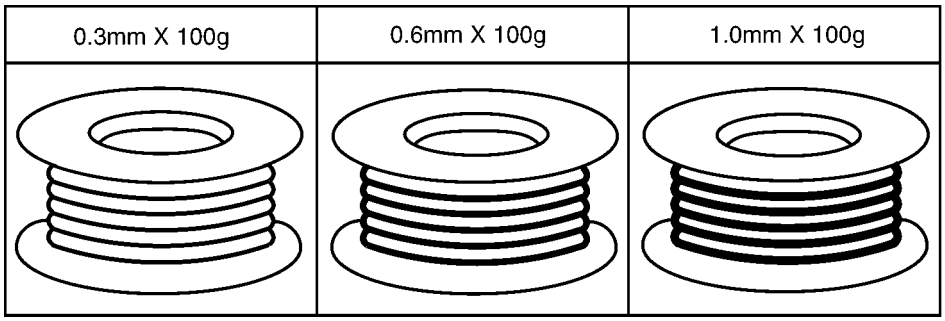
- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend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



2.1.1. SUGGESTED PBF SOLDER

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

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

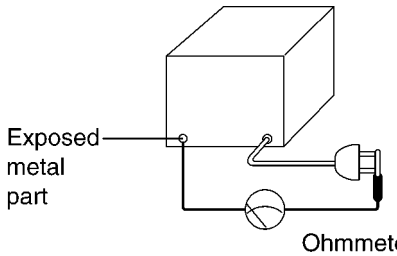


2.2. Discarding of P. C. Board

When discarding P. C. Board, delete all personal information such as telephone directory and caller list or scrap P. C. Board.

2.3. 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.



Resistance = more than 1MΩ (at DC 500 V)

2.4. BATTERY CAUTION

CAUTION

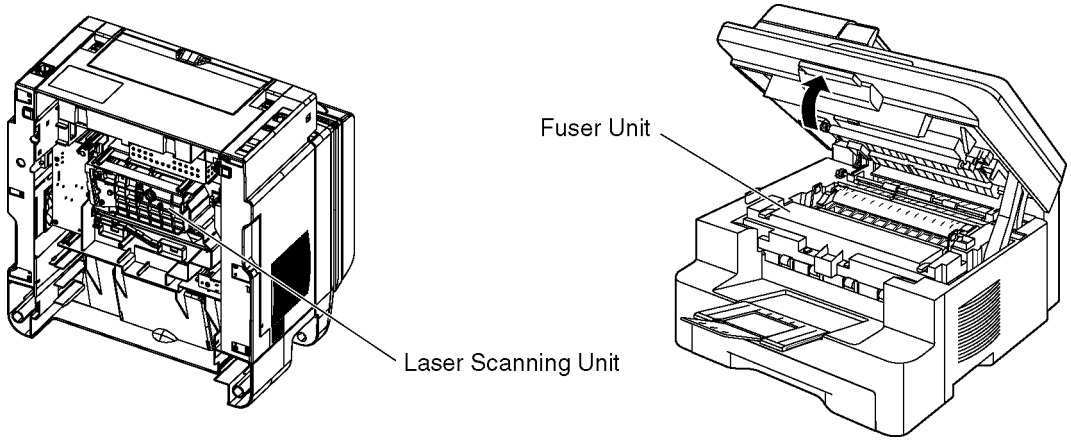
Danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to following caution:

Disposal of lithium batteries should be performed by permitted, professional disposal firms knowledgeable in state government federal and local hazardous materials and hazardous waste transportation and disposal requirements.
A battery continues to have no transportation limitations as long as it is separated to prevent short circuits and packed in strong packaging.
Commercial firms that dispose of any quantity of lithium cells should have a mechanism in place to account for their ultimate disposition. This is a good practice for all types of commercial or industrial waste.

Recommend Type Number:
CR2354 (BAT300) Manufactured by MATSUSHITA

2.5. 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.



3 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:	Letter/ Legal: 208 mm ($8^3/_{16}$")
	A4: 202 mm ($7^{15}/_{16}$")
Transmission Time*:	Approx. 4 s/page (ECM-MMR Memory transmission)**
Scanning Density:	**Scanning resolution:**
	Up to 600 × 1200 dpi (Optical)
	Up to 9600 × 9600 dpi (Interpolated)
	Copy resolution:
	Up to 600 × 600 dpi (Scanner Glass)
	Up to 600 × 300 dpi (Automatic Document Feeder)
	FAX resolution:
	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
	15.4 lines/mm (392 lines/inch)-SUPER FINE
Photo resolution:	64-level
Scanner Type:	Color Contact Image Sensor
Printer Type:	Laser printer
Data Compression System:	Modified Huffman (MH), Modified READ (MR), Modified Modified READ (MMR)
Modem Speed:	33,600 / 31,200 / 28,800 / 26,400 / 24,000 / 21,600 / 19,200 / 16,800 / 14,400 / 12,000 / 9,600 / 7,200 / 4,800 / 2,400 bps; Automatic Fallback
Operating Environment:	10°C—32.5°C (50°F—90.5°F), 20—70% RH (Relative Humidity)
Dimensions (H×W×D):	Approx. height 305 mm × width 420 mm × depth 445 mm(12" x $16^9/_{16}$" x $17^1/_2$")
Mass (Weight):	Approx. 13kg (28.7lb)
Power Consumption:	Standby: Approx. 5.5 W
	Preheat: Approx. 65 W
	Copy: Approx. 320 W
	Maximum: Approx. 900 W (When the fuser lamp turns on)
Power Supply:	120V AC, 60Hz
Memory Capacity (for operation and storing memory):	32 MB
Fax Memory Capacity:	2 MB in total
	Approx. 170 pages of memory reception
	Approx. 150 pages of memory transmission
	(Based on the ITU-T No. 1 Test Chart in standard resolution.)
Laser diode properties:	Laser output: Max. 5 mW
	Wave length: 760 nm—810 nm
	Emission duration: Continuous
Print Speed:	18 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. (Refer to **ITU-T No.1 TEST CHART** (P.235).) If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

Note:

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

4 General/Introduction

4.1. OPTIONAL ACCESSORIES

Model No.	Description	Specifications
KX-FAT92A	Replacement toner cartridge	1 toner cartridge
KX-FAD93A	Replacement drum unit	1 drum unit
KX-FA103A	Handset unit	1 unit

4.2. TRANSLATION LISTS

4.2.1. HELP FUNCTION

ENGLISH	FRENCH
BASIC SETTINGS	RÉGLAGES DE BASE
FEATURE LIST	LISTE FONCTIONS
DIRECTORY	RÉPERTOIRE
FAX RECEIVING	RÉCEPTION FAX
COPIER	PHOTOCOPIE
REPORTS	RAPPORTS
CALL DISPLAY	AFF. DEMANDEUR

4.3. ERROR MESSAGE

4.3.1. DISPLAY

ENGLISH	FRENCH
CALL SERVICE 1	CONTACTER SAV1
CALL SERVICE 2	CONTACTER SAV2
CALL SERVICE 3	CONTACTER SAV3
CALL SERVICE 4	CONTACTER SAV4
CALL SERVICE 5	CONTACTER SAV5
CALL SERVICE 6	CONTACTER SAV6
CARRIAGE ERROR	ERREUR CHARRIOT
CHANGE DRUM	CHANGER CYLINDRE
CHECK DOCUMENT	VÉRIFIER DOC.
CHECK DRUM	VÉRIF. CYLINDRE
CHECK PAPER #1	VÉRIF. PAPIER #1
CHECK PICK UP INPUT TRAY #2	VÉRIF. ENTRAÎNE. BAC ENTRÉE #2
CHECK REAR COVER	VÉRIF.COUV.ARR.
DIRECTORY FULL	RÉPERT. SATURÉ
DRUM LIFE LOW REPLACE SOON	PRÈS FIN CYLIN. CHANGER BIENTÔT
FAX IN MEMORY	FAX EN MÉMOIRE
KEEP COPYING	CONTINUER COPIE
LOW TEMP.	BASSE TEMP.
MEMORY FULL	MÉMOIRE PLEINE
MODEM ERROR	ERREUR MODEM
NO FAX REPLY	AUCUNE RÉPONSE
OUT OF PAPER INPUT TRAY #2	MANQUE PAPIER BAC ENTRÉE #2
PAPER JAMMED	BOURRAGE PAPIER
OPEN TOP COVER	OUVRIR COUV.SUP.
PC FAIL OR BUSY	PC-ÉCHEC/OCCUPÉ
PLEASE WAIT	ATTENDEZ SVP
POLLING ERROR	ERREUR INV.ÉM.
REDIAL TIME OUT	FIN RECOMP.
REMOVE DOCUMENT	RETIRER DOC.
REMOVE PAPER IN INPUT TRAY #2	RETIRER PAP.DANS BAC ENTRÉE #2
REPLACE DRUM CHANGE SUPPLIES	REMPLACER CYLIN. REMP.FOURNITURE
RX MEMORY FULL	MÉM.RÉC.PLEINE
TONER EMPTY	TONER VIDE
CHANGE SUPPLIES	REMP.FOURNITURE
TONER LOW	TONER BAS
TOP COVER OPEN	COUV. SUP.OUVERT
TRANSMIT ERROR	ERREUR ENVOI
WARMING UP	PRÉCHAUFFAGE
WRONG PAPER	MAUVAIS FORMAT

4.3.2. REPORT

ENGLISH	FRENCH
COMMUNICATION ERROR	ERREUR DE COMMUNICATION
DOCUMENT JAMMED	BOURRAGE DE DOCUMENT
ERROR-NOT YOUR UNIT	ERREUR - AUTRE APPAREIL
JUNK FAX PROH. REJECT	REJET COURRIER- REBUT
MEMORY FULL	MÉMOIRE PLEINE
NO DOCUMENT / FAILED PICKUP	DOCUMENT ABSENT / ÉCHEC PAPIER
OTHER FAX NOT RESPONDING	PAS DE RÉPONSE
PRESSED THE STOP KEY	TOUCHE ARRÊTER PRESSÉE
THE COVER WAS OPENED	LE COUVERCLE A ÉTÉ OUVERT
OK	OK

4.3.3. OTHERS

ENGLISH	FRENCH
SYSTEM SET UP	PARAMÉTRAGE
SETUP ITEM [ ]	PROG.PARAM. [ ]
PRINT REPORT	IMP. RAPPORT
SETUP LIST	LISTE PARAMÉT.
USER STOPPED	APPUI SUR STOP

5 Features

5.1. General Features

General

- Help function

  Display:

  1. BASIC SETTINGS
  2. FEATURE LIST
  3. DIRECTORY
  4. FAX RECEIVING
  5. COPIER
  6. REPORTS
  7. CALLER DISPLAY

- LCD (Liquid Crystal Display) readout

Plain Paper Facsimile Machine

Output tray (approx. 100+50 sheets)
Letter/A4/Legal, G3 compatible
Automatic document feeder (Up to 20 sheets)
Quick scan
Resolution: Standard/Fine/Super fine/Photo (64 level).
STANDARD: For printed or typewritten originals with normal-sized characters.
FINE: For originals with small printing.
SUPER FINE: For originals with very small printing.
PHOTO: For originals containing photographs, shaded drawing, etc.
Broadcast

- 250-sheet paper capacity (60 g/m^2 ~ 75 g/m^2 [16 lb ~ 20 lb.])

Distinctive ring detection.

Large Memory... Performed by DRAM
Approx. 150 pages of memory transmission
Approx. 170 pages of memory reception

Enhanced Copier Function

Multi-copy function (up to 99 copies)
Enlargement and reduction
Separator

64-Level halftone

5.2. HARDWARE REQUIREMENTS FOR MULTI-FUNCTION SOFTWARE

To use Multi-Function Station on your computer, the following are required:

Operating System:

Windows 98 / Windows Me / Windows 2000 / Windows XP / Windows Vista^{TM} operating system

CPU:

Windows 98: Pentium® 90 MHz or faster
Windows Me: Pentium 150 MHz or faster
Windows 2000: Pentium 166 MHz or faster
Windows XP: Pentium 300 MHz or faster
Windows Vista: Recent Processor (x86) 800 MHz or higher processor

RAM:

Windows 98: 24 MB (32 MB or more recommended)
Windows Me: 32 MB (64 MB or more recommended)
Windows 2000: 64 MB or more
Windows XP: 128 MB or more
Windows Vista: 512 MB or more

Other Hardware:

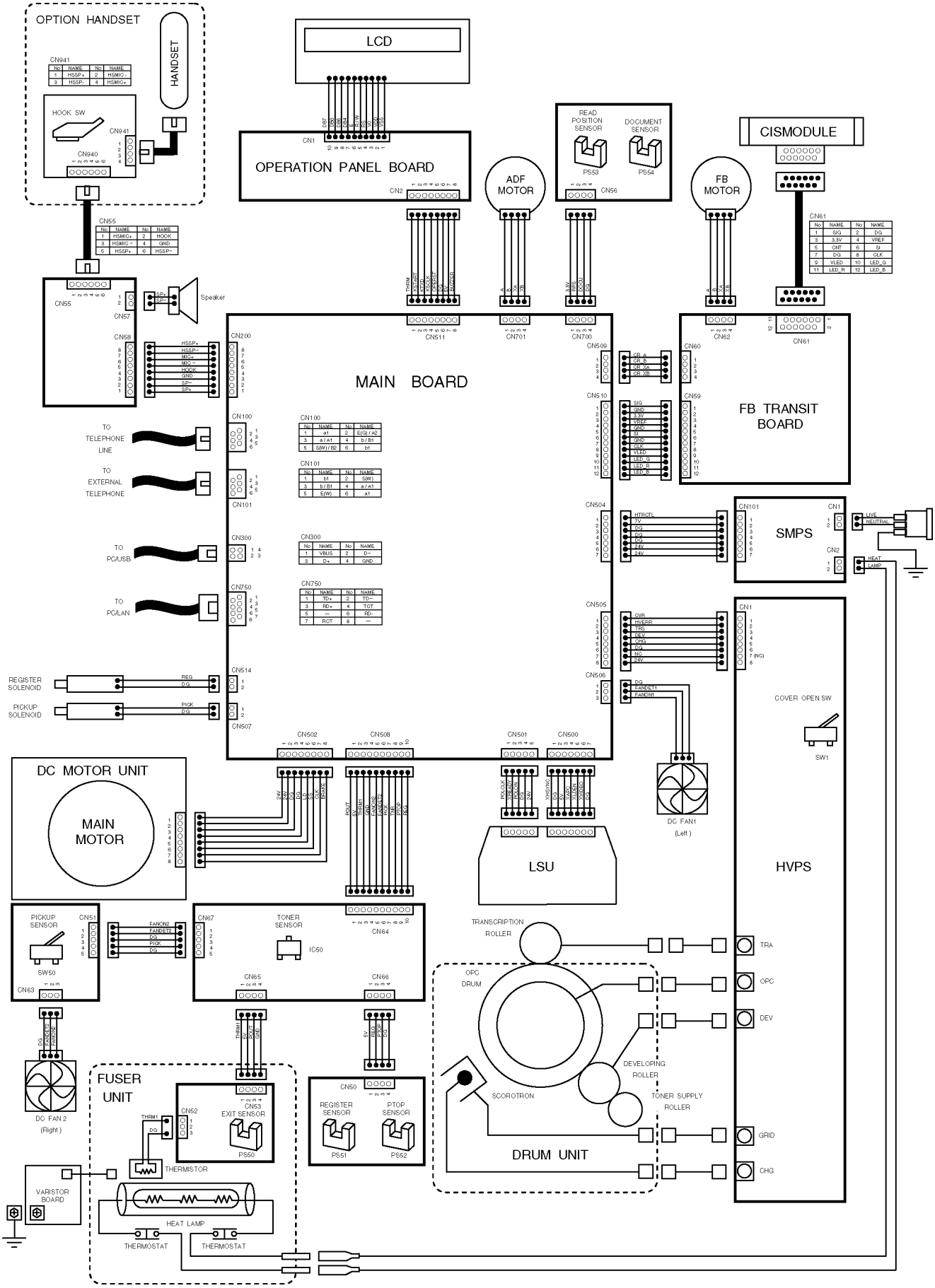
CD-ROM drive
Hard disk drive with at least 150 MB of available space
USB interface
LAN interface (10Base-T / 100Base-TX)

Other:

Internet Explorer® 5.0 or later

6 Technical Descriptions

6.1. CONNECTION DIAGRAM



6.2. GENERAL BLOCK DIAGRAM

MAIN UNIT

SOC (IC300)

This custom IC is used for general MFP operations.

1)	CPU	ARM9 operating at 250MHz.
2)	SDRAM Controller	Controls SDRAM Memory.
3)	USB Controller with PHY	Apply to USB2.0 HS
4)	Scanner I/F	Controls the CIS and AFE, and process the scan images.
5)	LSU I/F	Controls the polygon motor and outputs the VIDEO signal to LSU.
6)	MOTOR I/F	Controls the DC motor and Stepping Motor.
7)	FAN I/F	Controls FAN MOTOR and detect the rotation of FAN MOTOR.
8)	OPERATION PANEL I/F	Serial interface with Operation Panel.
9)	SENSOR I/F	Detects the sensor signal.
10)	I/O PORT	I/O Port Interface.
11)	A/D, D/A converter	Sends beep tones, etc. Convert the analog signal to the digital signal.
12)	RTC	Real time clock.
13)	MODEM	Performs the modulation and the demodulation for FAX communication.
14)	Analog Front End I/F	Controls the DAA device for TEL/FAX function.
15)	LAN Controller	Ethernet Control.

ROM (IC402)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.
And support the backup of user setting and FAX receive data.

SYNCHRONOUS DYNAMIC RAM (IC400)

This 256Mbit SDRAM is used for CPU work and receiving memory and page memory.

POWER SUPPLY

DC-DC converters generate 3.3V and 1.2V for system power.
Regurator generates 5V for peripheral devices.

TEL/FAX I/F

Composed of ITS circuit and NCU circuit.
3 ICs called SDAA(Silicon Direct Access Arrangement) control Telephone line, Speaker, and Handset.

READ SECTION

CIS Unit to read transmitted documents.
CIS Unit is connected to FLATBED transit Unit.
Scan data is converted by AFE(IC503).

MOTOR

This model has 1 DC motor and 2 stepping motors.
IC300 drives the DC motor for printing.
IC502 and IC700 drive the stepping motor for Auto Document Feeder motor and CIS carriage.

LSU

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

SENSORS

Composed of 2 switches and 5 sensors.

POWER SUPPLY BOARD

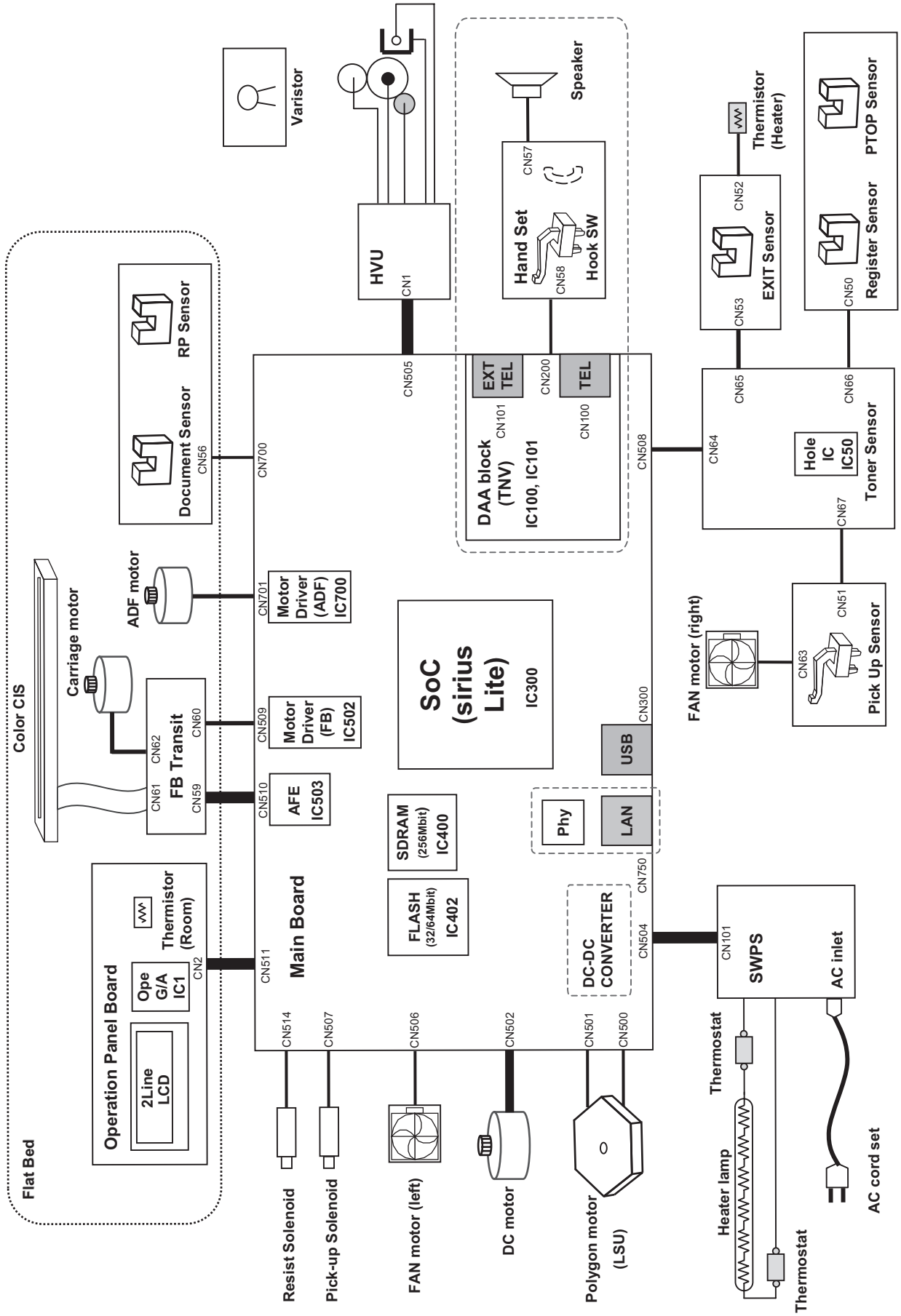
Supplies +24V and +7V to the Main unit and controls the Heat Lamp.

HIGH VOLTAGE POWER SUPPLY BOARD

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

FIXING UNIT

Composed heat lamp, thermistor and thermostats.

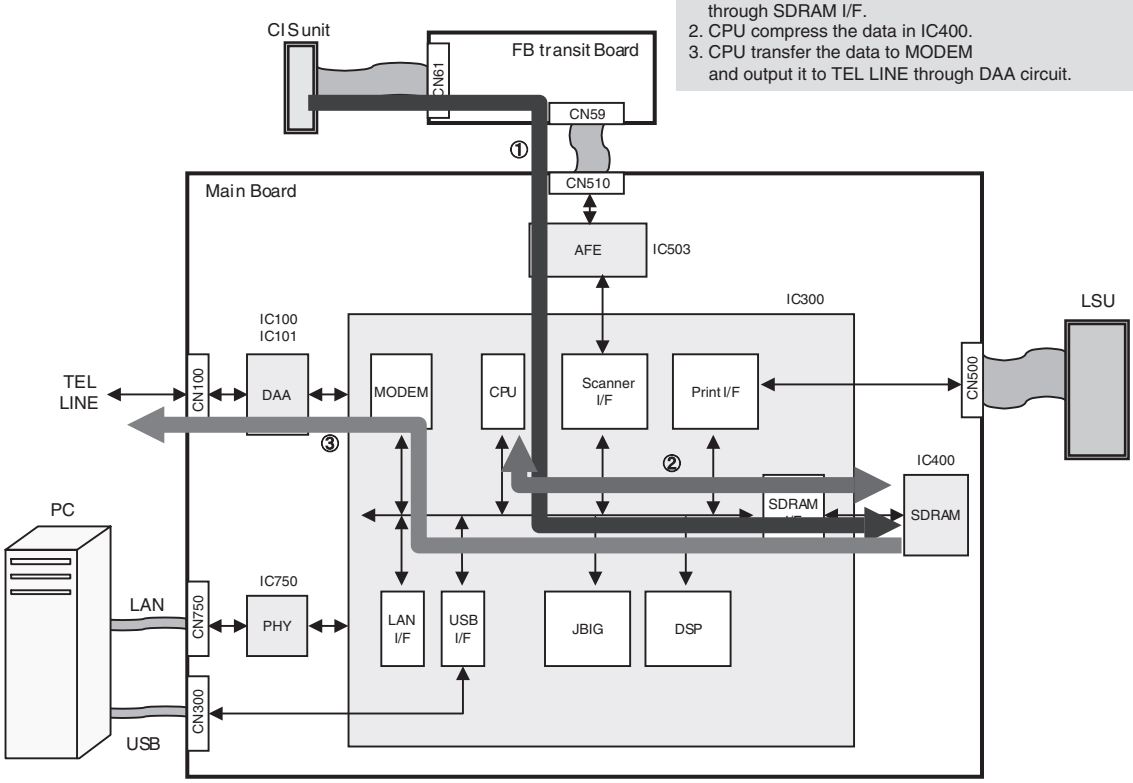


6.3. MAIN BOARD SECTION

6.3.1. Data Flow

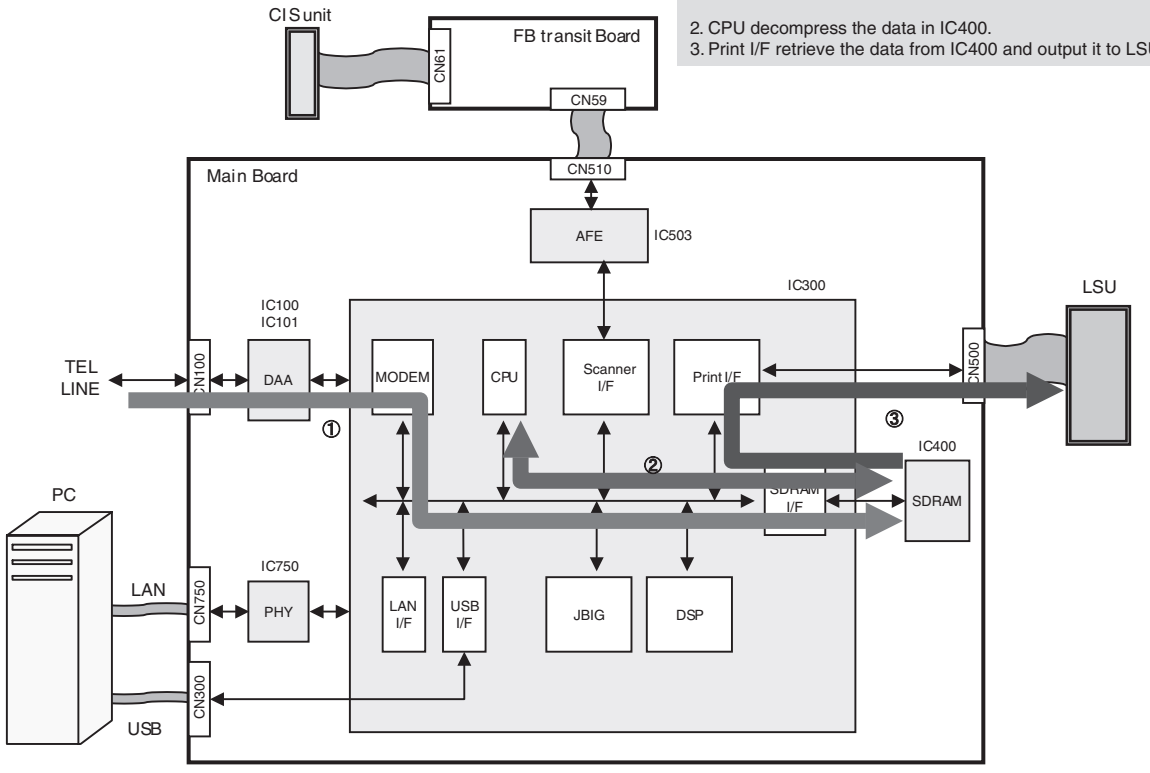
[FAX Tx]

1. An analog image data is output from CIS unit to IC503.
   IC503 decode the analog data to digital data, and output to IC300.
   Scanner I/F in IC300 process image data and store it in IC400 through SDRAM I/F.
2. CPU compress the data in IC400.
3. CPU transfer the data to MODEM and output it to TEL LINE through DAA circuit.



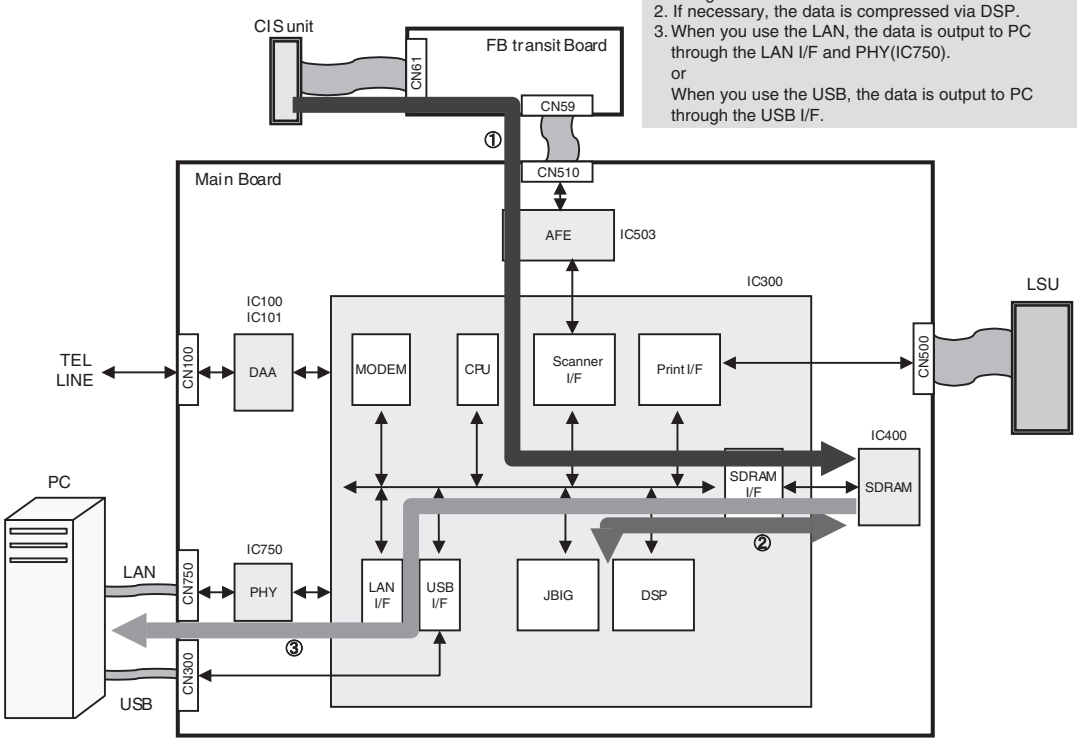
[FAX Rx]

1. FAX data is input from TEL LINE to MODEM in IC300 through DAA circuit.
   And then store it in IC400 through SDRAM I/F.
2. CPU decompress the data in IC400.
3. Print I/F retrieve the data from IC400 and output it to LSU.



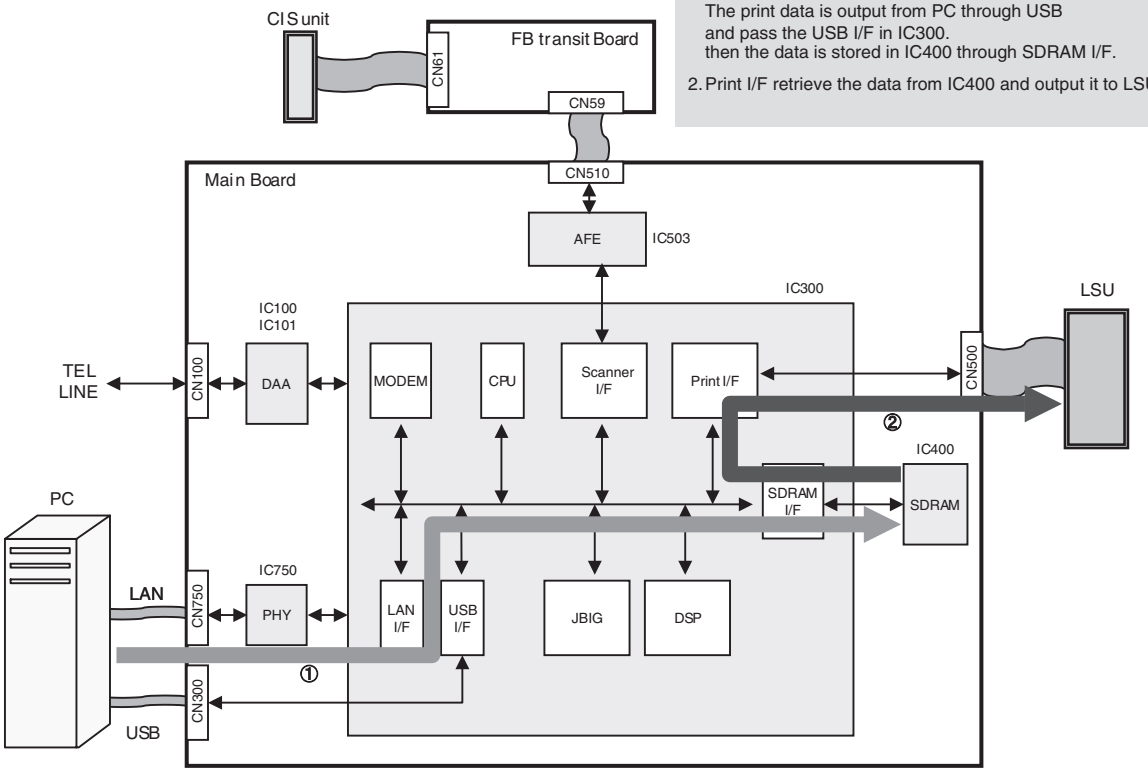
[PC Scan]

1. An analog image data is output from CISunit to IC503.
   IC503 decode the analog data to digital data, and output to IC300.
   Scanner I/F in IC300 process image data and store it in IC400
   through SDRAM I/F.
2. If necessary, the data is compressed via DSP.
3. When you use the LAN, the data is output to PC
   through the LAN I/F and PHY(IC750).
   or
   When you use the USB, the data is output to PC
   through the USB I/F.



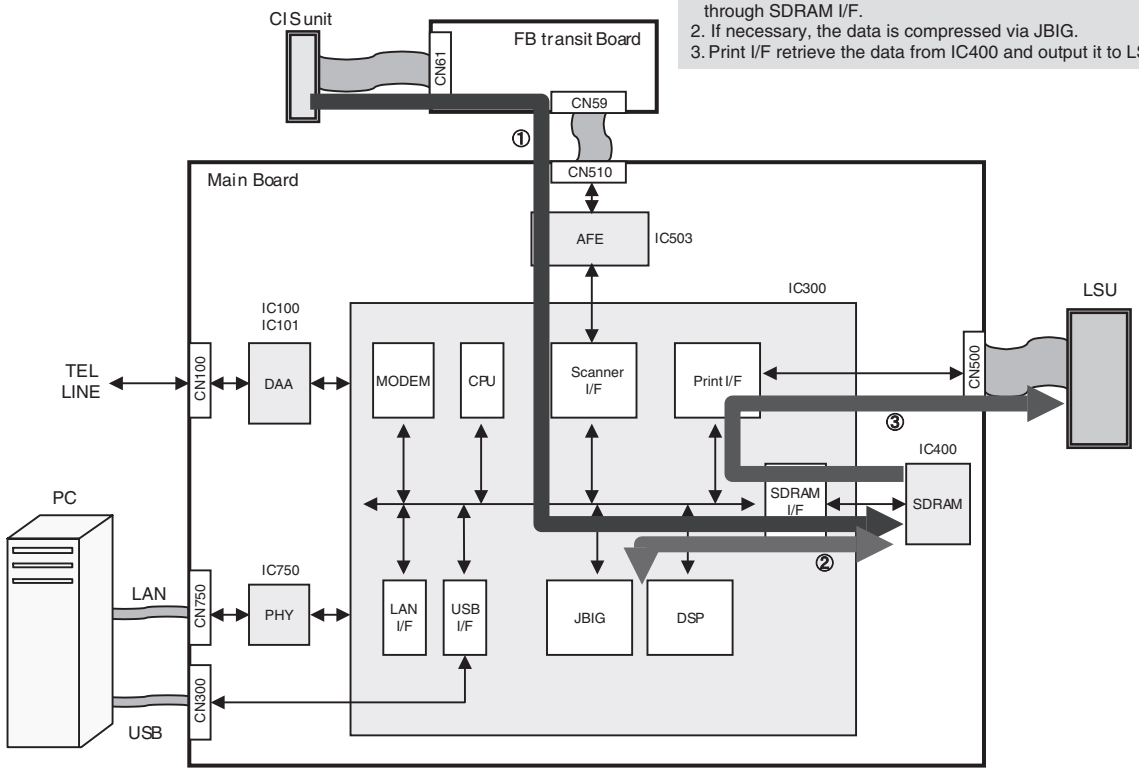
[PC print]

1. The print data is output from PC through LAN
   and pass the PHY(IC750) and LAN I/F in IC300.
   or
   The print data is output from PC through USB
   and pass the USB I/F in IC300.
   then the data is stored in IC400 through SDRAM I/F.
2. Print I/F retrieve the data from IC400 and output it to LSU.



[Copy]

1. An analog image data is output from CISunit to IC503.
   IC503 decode the analog data to digital data, and output to IC300.
   Scanner I/F in IC300 process image data and store it in IC400 through SDRAM I/F.
2. If necessary, the data is compressed via JBIG.
3. Print I/F retrieve the data from IC400 and output it to LSU.



Description of Pin Distribution (IC300) SOC (System On Chip)

PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
A02	LEDONB	O	3.3V	SCANNER INTERFACE
A03	NCCDON	O	3.3V	SCANNER INTERFACE
A04	AFEMCLK	O	3.3V	SCANNER INTERFACE
A05	NCCDCP	O	3.3V	NOT USED
A06	CCDCLK	O	3.3V	NOT USED
A07	PIO29	O	3.3V	OPERATION PANEL INTERFACE
A08	PIO57	O	3.3V	CARRIAGE MOTOR INTERFACE
A09	PIO53	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
A10	PIO50	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
A11	PIO46	O	3.3V	FAN1 CONTROL
A12	PIO42	O	3.3V	DC MOTOR INTERFACE
A13	NFRCE	O	3.3V	FLASH MEMORY CHIP SELECT
A14	FRMD0	I/O	3.3V	FLASH MEMORY DATA BUS 0
A15	FRMD3	I/O	3.3V	FLASH MEMORY DATA BUS 3
A16	FRMD7	I/O	3.3V	FLASH MEMORY DATA BUS 7
A17	FRMA3	O	3.3V	FLASH MEMORY ADDRESS BUS 3
A18	FRMA6	O	3.3V	FLASH MEMORY ADDRESS BUS 6
A19	FRMA10	O	3.3V	FLASH MEMORY ADDRESS BUS 10
A20	THRMAVDD	-	3.3V	POWER SUPPLY
A21	FRMA11	O	3.3V	FLASH MEMORY ADDRESS BUS 11
A22	FRMA15	O	3.3V	FLASH MEMORY ADDRESS BUS 15
A23	FRMA17	O	3.3V	FLASH MEMORY ADDRESS BUS 17
A24	FRMA20	O	3.3V	FLASH MEMORY ADDRESS BUS 20
A25	FRMA22	O	3.3V	FLASH MEMORY ADDRESS BUS 22
AA01	SDMD8	I/O	3.3V	SDRAM DATA BUS 8
AA02	SDMD9	I/O	3.3V	SDRAM DATA BUS 9
AA03	SDMA7	O	3.3V	SDRAM ADDRESS BUS 7
AA04	SDMA6	O	3.3V	SDRAM ADDRESS BUS 6
AA23	VDD1.2	-	1.2V	POWER SUPPLY
AA24	AFERST	O	3.3V	NCU INTERFACE
AA25	RING	I	3.3V	NCU INTERFACE
AA26	EXTINT	I	3.3V	NCU INTERFACE
AB01	SDMD10	I/O	3.3V	SDRAM DATA BUS 10
AB02	SDMD11	I/O	3.3V	SDRAM DATA BUS 11
AB03	SDMA5	O	3.3V	SDRAM ADDRESS BUS 5
AB04	VDD1.2	-	1.2V	POWER SUPPLY
AB23	VSS	-	GND	GND
AB24	BTXD	O	3.3V	NCU INTERFACE
AB25	BRXD	I	3.3V	NCU INTERFACE
AB26	AFECLK	O	3.3V	NCU INTERFACE
AC01	SDMD12	I/O	3.3V	SDRAM DATA BUS 12
AC02	SDMD13	I/O	3.3V	SDRAM DATA BUS 13
AC03	SDMA4	O	3.3V	SDRAM ADDRESS BUS 4
AC04	VSS	-	GND	GND
AC05	VSS	-	GND	GND
AC06	VDD1.2	-	1.2V	POWER SUPPLY
AC07	TXD0	O	3.3V	ETHERNET INTERFACE
AC08	TX_ER	O	3.3V	ETHERNET INTERFACE
AC09	RXD1	I	3.3V	ETHERNET INTERFACE
AC10	VDD3.3	-	3.3V	POWER SUPPLY
AC11	TEST	I	3.3V	NOT USED
AC12	USBREXT	I	3.3V	USB INTERFACE
AC13	VDD1.2	-	1.2V	POWER SUPPLY
AC14	VDD3.3	-	3.3V	POWER SUPPLY
AC15	USBXIN	I	3.3V	CRYSTAL(12MHz) INPUT
AC16	LSI_SCAN_ENABLE	I	3.3V	NOT USED
AC17	VDD1.2	-	1.2V	POWER SUPPLY
AC18	NWDTRST	O	3.3V	WATCH DOG TIMER RESET OUTPUT
AC19	LSI_TN	I	3.3V	NOT USED
AC20	PSCIO2	I	3.3V	INPUT PORT (FANDET1)
AC21	PSCIO6	O	3.3V	NOT USED
AC22	VDD1.2	-	1.2V	POWER SUPPLY
AC23	VSS	-	GND	GND
AC24	ATXD	O	3.3V	NCU INTERFACE
AC25	BBITCLK	I/O	3.3V	NCU INTERFACE

PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
AC26	BSPCLK	I/O	3.3V	NCU INTERFACE
AD01	SDMD14	I/O	3.3V	SDRAM DATA BUS 14
AD02	SDMD15	I/O	3.3V	SDRAM DATA BUS 15
AD03	VSS	-	GND	GND
AD04	NBATRST	I	3.3V	BATTERY RESET INPUT
AD05	VDD2RTC	-	1.2V	POWER SUPPLY
AD06	CRS	I	3.3V	ETHERNET INTERFACE
AD07	TXD1	O	3.3V	ETHERNET INTERFACE
AD08	RX_DV	I	3.3V	ETHERNET INTERFACE
AD09	RXD2	I	3.3V	ETHERNET INTERFACE
AD10	RX_ER	I	3.3V	ETHERNET INTERFACE
AD11	CLKSEL	I	3.3V	NOT USED
AD12	USBVSSA33_BIAS	-	GND	GND
AD13	USBVSSA33	-	GND	GND
AD14	USBVDDA12_SQ	-	1.2V	POWER SUPPLY
AD15	USBVSSA12	-	GND	GND
AD16	LSI_TRSTN	I	3.3V	NOT USED
AD17	LSI_TDO	O	3.3V	NOT USED
AD18	NRST	I	3.3V	SYSTEM RESET INPUT
AD19	HTRCTL	O	3.3V	HEATER CONTROL
AD20	PSCIO3	I	3.3V	INPUT PORT (POUT)
AD21	PSCIO7	O	3.3V	NOT USED
AD22	PSCIO15	I	3.3V	INPUT PORT (RPS)
AD23	NC	-	-	NOT USED
AD24	VSS	-	GND	GND
AD25	ASPCLK	I/O	3.3V	NCU INTERFACE
AD26	ARXD	I	3.3V	NCU INTERFACE
AE01	SDLDM1	O	3.3V	SDRAM DQML1
AE02	VSS	-	GND	GND
AE03	SYSPLLVSS1	-	GND	GND
AE04	RTCCLKOUT	O	3.3V	CRYSTAL(32.768KHz) OUTPUT
AE05	RTCPWRDWN	I	3.3V	RTC POWER DOWN
AE06	TX_CLKI	I	3.3V	ETHERNET INTERFACE
AE07	TXD2	O	3.3V	ETHERNET INTERFACE
AE08	RX_CLKI	I	3.3V	ETHERNET INTERFACE
AE09	RXD3	I	3.3V	ETHERNET INTERFACE
AE10	MDC	O	3.3V	ETHERNET INTERFACE
AE11	NC	-	-	NOT USED
AE12	USBID	O	3.3V	NOT USED
AE13	USBDM	I/O	3.3V	USB INTERFACE
AE14	USBVSSA12_SQ	-	GND	GND
AE15	USBVDDA12PLL	-	1.2V	POWER SUPPLY
AE16	USBVDDA12	-	1.2V	POWER SUPPLY
AE17	LSI_TDI	I	3.3V	NOT USED
AE18	LSI_PROCMON	O	3.3V	NOT USED
AE19	LSI_IDDT	I	3.3V	NOT USED
AE20	PSCIO1	I	3.3V	INPUT PORT (PICK)
AE21	PSCIO5	O	3.3V	NOT USED
AE22	PSCIO13	I	3.3V	INPUT PORT (TNR)
AE23	MDMCLKOUT	O	3.3V	CRYSTAL(24.576MHz) OUTPUT
AE24	MDMPLLVDD	-	3.3V	POWER SUPPLY
AE25	VSS	-	GND	GND
AE26	ABITCLK	I/O	3.3V	NCU INTERFACE
AF02	SYSPLLVDD1	-	3.3V	POWER SUPPLY
AF03	VDD3.3OSC	-	3.3V	POWER SUPPLY
AF04	RTCCLKIN	I	3.3V	CRYSTAL(32.768KHz) INPUT
AF05	COL	I	3.3V	ETHERNET INTERFACE
AF06	TX_EN	O	3.3V	ETHERNET INTERFACE
AF07	TXD3	O	3.3V	ETHERNET INTERFACE
AF08	RXD0	I	3.3V	ETHERNET INTERFACE
AF09	MDIO	I/O	3.3V	ETHERNET INTERFACE
AF10	MGTINT	I	3.3V	ETHERNET INTERFACE
AF11	USBVBUS	O	3.3V	USB INTERFACE
AF12	USBVDDA33_BIAS	-	3.3V	POWER SUPPLY
AF13	USBDP	I/O	3.3V	USB INTERFACE
AF14	USBVDDA33	-	3.3V	POWER SUPPLY
AF15	USBVSSA12PLL	-	GND	GND

PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
AF16	USBXOUT	I	3.3V	CRYSTAL(12MHz) OUTPUT
AF17	LSI_TMS	I	3.3V	NOT USED
AF18	LSI_TCK	I	3.3V	NOT USED
AF19	LSI_CW_TAP	I	3.3V	NOT USED
AF20	PSCIO0	I	3.3V	INPUT PORT (REGIST)
AF21	PSCIO4	O	3.3V	NOT USED
AF22	PSCIO12	I	3.3V	INPUT PORT (POUT)
AF23	PSCIO14	I	3.3V	INPUT PORT (DOCU)
AF24	MDMCLKIN	I	3.3V	CRYSTAL(24.576MHz) INPUT
AF25	MDMPLLVSS	-	GND	GND
B01	AFEADC0	I	3.3V	NOT USED
B02	VSS	-	GND	GND
B03	LEDONG	O	3.3V	SCANNER INTERFACE
B04	AFERSMP	O	3.3V	NOT USED
B05	AFEVSMP	O	3.3V	SCANNER INTERFACE
B06	NCCDRS	O	3.3V	SCANNER INTERFACE
B07	PIO30	I/O	3.3V	OPERATION PANEL INTERFACE
B08	MMPWR	O	3.3V	NOT USED
B09	PIO54	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
B10	PIO51	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
B11	PIO47	O	3.3V	NOT USED
B12	PIO43	O	3.3V	DC MOTOR INTERFACE
B13	NFROE	O	3.3V	FLASH MEMORY CHIP OUTPUT ENABLE
B14	FRMD1	I/O	3.3V	FLASH MEMORY DATA BUS 1
B15	FRMD4	I/O	3.3V	FLASH MEMORY DATA BUS 4
B16	FRMA0	O	3.3V	FLASH MEMORY ADDRESS BUS 0
B17	FRMA4	O	3.3V	FLASH MEMORY ADDRESS BUS 4
B18	FRMA7	O	3.3V	FLASH MEMORY ADDRESS BUS 7
B19	THRMAVSS	-	GND	GND
B20	TONE	O	3.3V	ANALOG(TONE) OUTPUT
B21	FRMA12	O	3.3V	FLASH MEMORY ADDRESS BUS 12
B22	FRMA16	O	3.3V	FLASH MEMORY ADDRESS BUS 16
B23	FRMA19	O	3.3V	FLASH MEMORY ADDRESS BUS 19
B24	FRMA21	O	3.3V	FLASH MEMORY ADDRESS BUS 21
B25	VSS	-	GND	GND
B26	DOTPLLVSS	-	GND	GND
C01	AFEADC3	I	3.3V	NOT USED
C02	AFEADC1	I	3.3V	NOT USED
C03	VSS	-	GND	GND
C04	LEDONR	O	3.3V	SCANNER INTERFACE
C05	OEB	O	3.3V	NOT USED
C06	CCDSH	O	3.3V	SCANNER INTERFACE
C07	PIO31	O	3.3V	OPERATION PANEL INTERFACE
C08	OPMPWR	O	3.3V	NOT USED
C09	PIO55	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
C10	PIO52	O	3.3V	CARRIAGE/ADF MOTOR INTERFACE
C11	PIO49	O	3.3V	OUTPUT PORT(HSSPMUTE)
C12	PIO45	O	3.3V	DC MOTOR INTERFACE
C13	NFRWE	O	3.3V	FLASH MEMORY CHIP WRITE ENABLE
C14	FRMD2	I/O	3.3V	FLASH MEMORY DATA BUS 2
C15	FRMD6	I/O	3.3V	FLASH MEMORY DATA BUS 6
C16	FRMA2	O	3.3V	FLASH MEMORY ADDRESS BUS 2
C17	FRMA5	O	3.3V	FLASH MEMORY ADDRESS BUS 5
C18	FRMA9	O	3.3V	FLASH MEMORY ADDRESS BUS 9
C19	THRMSTR0	I	3.3V	ANALOG INPUT(THERMISTOR)
C20	TONEAVDD	-	3.3V	POWER SUPPLY
C21	FRMA14	O	3.3V	FLASH MEMORY ADDRESS BUS 14
C22	FRMA18	O	3.3V	FLASH MEMORY ADDRESS BUS 18
C23	FRMA23	O	3.3V	FLASH MEMORY ADDRESS BUS 23
C24	VSS	-	GND	GND
C25	DOTPLLVDD	-	3.3V	POWER SUPPLY
C26	DOTCLKIN	I	3.3V	CRYSTAL(20MHz) INPUT
D01	AFEADC5	I	3.3V	SCANNER INTERFACE
D02	AFEADC4	I	3.3V	SCANNER INTERFACE
D03	AFEADC2	I	3.3V	NOT USED
D04	VSS	-	GND	GND
D05	VSS	-	GND	GND

PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
D06	VDD1.2	-	1.2V	POWER SUPPLY
D07	PIO32	O	3.3V	OPERATION PANEL INTERFACE
D08	CRMPWR	O	3.3V	MOTOR CURRENT CONTROL
D09	PIO56	O	3.3V	ADF MOTOR INTERFACE
D10	VDD1.2	-	1.2V	POWER SUPPLY
D11	PIO48	O	3.3V	FAN2 CONTROL
D12	PIO44	O	3.3V	DC MOTOR INTERFACE
D13	VDD3.3	-	3.3V	POWER SUPPLY
D14	VDD1.2	-	1.2V	POWER SUPPLY
D15	FRMD5	I/O	3.3V	FLASH MEMORY DATA BUS 5
D16	FRMA1	O	3.3V	FLASH MEMORY ADDRESS BUS 1
D17	VDD3.3	-	3.3V	POWER SUPPLY
D18	FRMA8	O	3.3V	FLASH MEMORY ADDRESS BUS 8
D19	THRMSTR1	I	3.3V	ANALOG INPUT(THERMISTOR)
D20	TONEAVSS	-	GND	GND
D21	FRMA13	O	3.3V	FLASH MEMORY ADDRESS BUS 13
D22	VDD1.2	-	1.2V	POWER SUPPLY
D23	VSS	-	GND	GND
D24	NC	-	-	NOT USED
D25	DOTCLKOUT	O	3.3V	CRYSTAL(20MHz) OUTPUT
D26	PIO66	O	3.3V	NOT USED
E01	SDUDM0	O	3.3V	SDRAM DQMU0
E02	AFEADC7	I	3.3V	SCANNER INTERFACE
E03	AFEADC6	I	3.3V	SCANNER INTERFACE
E04	VSS	-	GND	GND
E23	VDD1.2	-	1.2V	POWER SUPPLY
E24	FRMA24	O	3.3V	FLASH MEMORY ADDRESS BUS 24
E25	PIO65	O	3.3V	NOT USED
E26	PIO64	O	3.3V	NOT USED
F01	SDMD16	I/O	3.3V	SDRAM DATA BUS 16
F02	SDMD17	I/O	3.3V	SDRAM DATA BUS 17
F03	AFESIFCLK	O	3.3V	SCANNER INTERFACE
F04	VDD1.2	-	1.2V	POWER SUPPLY
F23	PIO24	I	3.3V	LSU INTERFACE
F24	PIO61	O	3.3V	OUTPUT PORT(SPMUTE)
F25	PIO60	O	3.3V	NOT USED
F26	PIO3	O	3.3V	LSU INTERFACE
G01	SDMD18	I/O	3.3V	SDRAM DATA BUS 18
G02	SDMD19	I/O	3.3V	SDRAM DATA BUS 19
G03	AFESIFDIN	I	3.3V	SCANNER INTERFACE
G04	AFESIFEN	O	3.3V	SCANNER INTERFACE
G23	PSCIO24	I	3.3V	LSU INTERFACE
G24	PIO2	O	3.3V	LSU INTERFACE
G25	PIO59	O	3.3V	LAN CONTROLLER RESET
G26	PIO58	O	3.3V	OUTPUT PORT(CIDRLY)
H01	SDMD20	I/O	3.3V	SDRAM DATA BUS 20
H02	SDMD21	I/O	3.3V	SDRAM DATA BUS 21
H03	NSDCS2	O	3.3V	SDRAM CHIP SELECT 2
H04	AFESIFDOUT	O	3.3V	SCANNER INTERFACE
H23	PIO63	O	3.3V	LSU INTERFACE
H24	PIO62	O	3.3V	LSU INTERFACE
H25	PIO28	O	3.3V	NOT USED
H26	PIO21	O	3.3V	LSU INTERFACE
J01	SDMD22	I/O	3.3V	SDRAM DATA BUS 22
J02	SDMD23	I/O	3.3V	SDRAM DATA BUS 23
J03	SDMA3	O	3.3V	SDRAM ADDRESS BUS 3
J04	SDMA2	O	3.3V	SDRAM ADDRESS BUS 2
J23	PIO6	O	3.3V	HIGH VOLTAGE UNIT INTERFACE
J24	PIO27	O	3.3V	NOT USED
J25	PIO5	O	3.3V	HIGH VOLTAGE UNIT INTERFACE
J26	PIO4	O	3.3V	HIGH VOLTAGE UNIT INTERFACE
K01	VSS	-	GND	GND
K02	SDCLK2	O	3.3V	SDRAM CLOCK 2
K03	VSS	-	GND	GND
K04	VDD3.3	-	3.3V	POWER SUPPLY
K23	VDD1.2	-	1.2V	POWER SUPPLY
K24	PIO41	O	3.3V	NOT USED

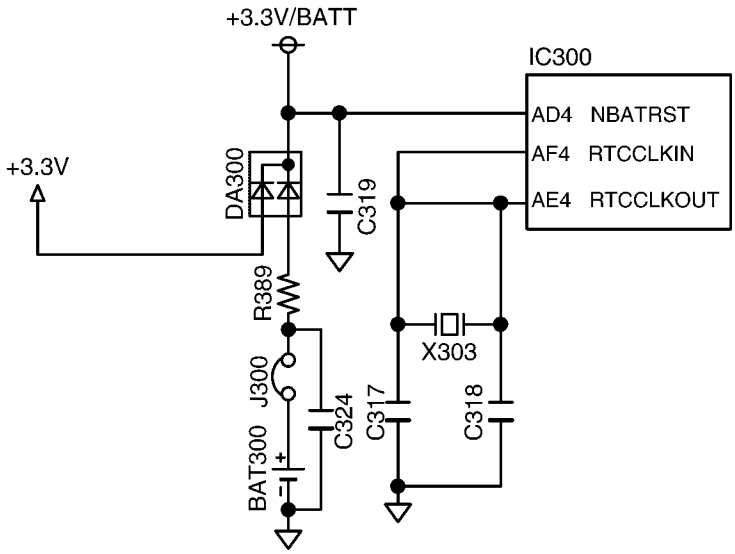
PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
K25	PIO40	O	3.3V	NOT USED
K26	PIO39	O	3.3V	NOT USED
L01	SDMD24	I/O	3.3V	SDRAM DATA BUS 24
L02	SDMD25	I/O	3.3V	SDRAM DATA BUS 25
L03	SDMA1	O	3.3V	SDRAM ADDRESS BUS 1
L04	SDMAÇO	O	3.3V	SDRAM ADDRESS BUS 0
L11	VSS	-	GND	GND
L12	VSS	-	GND	GND
L13	VSS	-	GND	GND
L14	VSS	-	GND	GND
L15	VSS	-	GND	GND
L16	VSS	-	GND	GND
L23	PIO37	I	3.3V	INPUT PORT (RING)
L24	PIO38	O	3.3V	NOT USED
L25	PIO36	O	3.3V	NOT USED
L26	PIO35	O	3.3V	NOT USED
M01	SDMD26	I/O	3.3V	SDRAM DATA BUS 26
M02	SDMD27	I/O	3.3V	SDRAM DATA BUS 27
M03	SDMA10	O	3.3V	SDRAM ADDRESS BUS 10
M04	SDBA1	O	3.3V	SDRAM BANK ADDRESS 1
M11	VSS	-	GND	GND
M12	VSS	-	GND	GND
M13	VSS	-	GND	GND
M14	VSS	-	GND	GND
M15	VSS	-	GND	GND
M16	VSS	-	GND	GND
M23	PIO33	O	3.3V	NOT USED
M24	PIO34	O	3.3V	NOT USED
M25	PIO26	O	3.3V	NOT USED
M26	PIO25	O	3.3V	OUTPUT PORT(CNGMUTE)
N01	SDMD28	I/O	3.3V	SDRAM DATA BUS 28
N02	SDMD29	I/O	3.3V	SDRAM DATA BUS 29
N03	SDBA0	O	3.3V	SDRAM BANK ADDRESS 0
N04	VDD1.2	-	1.2V	POWER SUPPLY
N11	VSS	-	GND	GND
N12	VSS	-	GND	GND
N13	VSS	-	GND	GND
N14	VSS	-	GND	GND
N15	VSS	-	GND	GND
N16	VSS	-	GND	GND
N23	VDD3.3	-	3.3V	POWER SUPPLY
N24	PIO23	O	3.3V	NOT USED
N25	PIO22	O	3.3V	NOT USED
N26	PIO20	O	3.3V	NOT USED
P01	SDMD30	I/O	3.3V	SDRAM DATA BUS 30
P02	SDMD31	I/O	3.3V	SDRAM DATA BUS 31
P03	NSDCS	O	3.3V	SDRAM CHIP SELECT 1
P04	VDD3.3	-	3.3V	POWER SUPPLY
P11	VSS	-	GND	GND
P12	VSS	-	GND	GND
P13	VSS	-	GND	GND
P14	VSS	-	GND	GND
P15	VSS	-	GND	GND
P16	VSS	-	GND	GND
P23	VDD1.2	-	1.2V	POWER SUPPLY
P24	PIO16	O	3.3V	NOT USED
P25	PIO17	O	3.3V	NOT USED
P26	PIO18	I	3.3V	HIGH VOLTAGE UNIT INTERFACE
R01	SDUDM1	O	3.3V	SDRAM DQMU1
R02	SDLDM0	O	3.3V	SDRAM DQML0
R03	BZVDD33	-	3.3V	POWER SUPPLY
R04	BZRST33	-	3.3V	POWER SUPPLY
R11	VSS	-	GND	GND
R12	VSS	-	GND	GND
R13	VSS	-	GND	GND
R14	VSS	-	GND	GND
R15	VSS	-	GND	GND

PIN NO.	PinName	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
R16	VSS	-	GND	GND
R23	PIO13	O	3.3V	NOT USED
R24	PIO12	O	3.3V	NOT USED
R25	PIO14	O	3.3V	NOT USED
R26	PIO15	O	3.3V	NOT USED
T01	SDMD0	I/O	3.3V	SDRAM DATA BUS 0
T02	SDMD1	I/O	3.3V	SDRAM DATA BUS 1
T03	NSDCAS	O	3.3V	SDRAM CAS
T04	NSDRAS	O	3.3V	SDRAM RAS
T11	VSS	-	GND	GND
T12	VSS	-	GND	GND
T13	VSS	-	GND	GND
T14	VSS	-	GND	GND
T15	VSS	-	GND	GND
T16	VSS	-	GND	GND
T23	PIO9	O	3.3V	OUTPUT PORT(SNPICK)
T24	PIO8	O	3.3V	NOT USED
T25	PIO10	O	3.3V	NOT USED
T26	PIO11	O	3.3V	OUTPUT PORT(SNREG)
U01	SDMD2	I/O	3.3V	SDRAM DATA BUS 2
U02	SDMD3	I/O	3.3V	SDRAM DATA BUS 3
U03	NSDWE	O	3.3V	SDRAM WRITE ENABLE
U04	VDD1.2	-	1.2V	POWER SUPPLY
U23	VDD3.3	-	3.3V	POWER SUPPLY
U24	PIO0	I	3.3V	INPUT PORT (HOOK)
U25	PIO1	O	3.3V	OUTPUT PORT(EXTRLY)
U26	PIO7	O	3.3V	NOT USED
V01	SDMD4	I/O	3.3V	SDRAM DATA BUS 4
V02	SDMD5	I/O	3.3V	SDRAM DATA BUS 5
V03	SDCKE	O	3.3V	SDRAM CLOCK ENABLE
V04	SDMA12	O	3.3V	SDRAM ADDRESS BUS 12
V23	PSCIO20	O	3.3V	NOT USED
V24	PSCIO21	O	3.3V	NOT USED
V25	PSCIO22	O	3.3V	NOT USED
V26	PSCIO23	O	3.3V	NOT USED
W01	SDMD6	I/O	3.3V	SDRAM DATA BUS 6
W02	SDMD7	I/O	3.3V	SDRAM DATA BUS 7
W03	SDMA11	O	3.3V	SDRAM ADDRESS BUS 11
W04	SDMA9	O	3.3V	SDRAM ADDRESS BUS 9
W23	PSCIO16	O	3.3V	NOT USED
W24	PSCIO17	I	3.3V	INPUT PORT (FANDET2)
W25	PSCIO18	I	3.3V	INPUT PORT (TOPCVR)
W26	PSCIO19	I	3.3V	INPUT PORT (PSTART)
Y01	VSS	-	GND	GND
Y02	SDCLK	O	3.3V	SDRAM CLOCK 1
Y03	SDMA8	O	3.3V	SDRAM ADDRESS BUS 8
Y04	VSS	-	GND	GND
Y23	AFESEL0	I	3.3V	NCU INTERFACE
Y24	AFESEL1	I	3.3V	NCU INTERFACE
Y25	EXMDMCS	O	3.3V	NOT USED
Y26	DP	O	3.3V	NCU INTERFACE

6.3.2. RTC BACKUP CIRCUIT

1. **Function**
   This unit has a lithium battery (BAT300) which works for the Real Time Clock IC (RTC: inside IC300).
   The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.
2. **RTC Inside (IC300) Backup Circuit Operation**
   When the power switch is turned ON, power is supplied to the RTC (inside IC300). At this time, the voltage at pin AD4 of the IC300 is +3.3V. When the power switch is turned OFF, the BAT300 supplies power to RTC through DA300.
   When the power switch is OFF and the voltage of +3.3V decreases, pin AD4 of RTC (IC300) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram



6.3.3. MODEM CIRCUIT OPERATION

The modem (Included IC300) has all the hardware satisfying the CCITT standards mentioned previously.
ALL processing is controlled by the SOC (IC300) according to CCITT procedures.
This modem (Included IC300) has an automatic application equalizer. With training signal 1 or 2 at the time of G3 reception, it can automatically establish the optimum equalizer.

Facsimile Transmission/DTMF Line Send

The digital image data sent on ATXD line from modem (Included IC300) .
DAA IC100(6→9,10), Line side DAA IC101 and the NCU section to the telephone line.

Facsimile Reception

The analog image data which is received from the telephone line passes through the NCU section and enters line side DAA*1 IC100. The signals are changed to digital data in IC101 (5,6) ,IC100(9,10→5) and IC300. In this case, the image signals from the telephone line are transmitted serially. 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.

Busy/Dial Tone Detection

The path is the same as Facsimile Reception.

Call Tone Transmission

This is the call signal which is generated the SOC (IC300) and sent to the speaker.

*1 DAA : Direct Access Arrangement

6.3.4. TEL LINE SECTION

Composed of ITS circuit and NCU circuit.

6.3.4.1. DESCRIPTION OF BLOCK DIAGRAM IN ANALOG SECTION

Function

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

DAA control ITS circuit and NCU circuit.

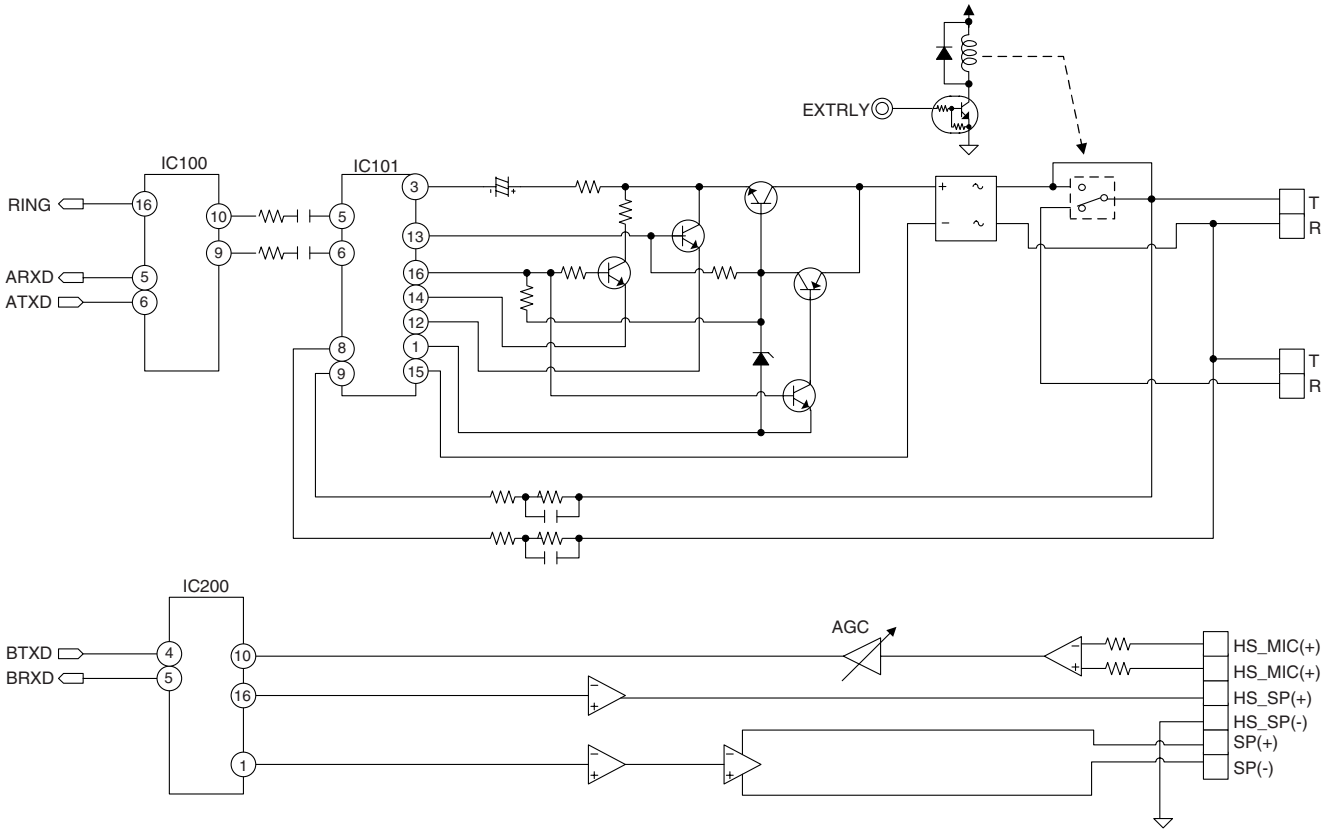
DAA control signals are output from Soc IC300.

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; Remote fax activation circuit.

Refer to **NCU SECTION** (P.27) for the details.

6.3.4.2. BLOCK DIAGRAM



KX-MB781C: MAIN BOARD BLOCK DIAGRAM

6.4. NCU SECTION

6.4.1. GENERAL

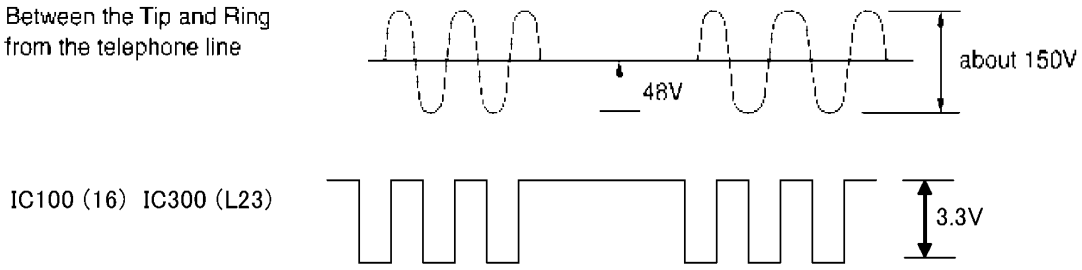
This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RLY100), bell detection circuit, TAM interface circuit and line amplifier.

6.4.2. EXT. TEL. LINE RELAY (RY100)

1. **Circuit Operation**
   Normally, this relay switches to the external telephone side and switches to the open side while OFF-HOOK.
   IC300 (U25) High Level→Q100 ON→RY100 (ON)

6.4.3. BELL DETECTION CIRCUIT

1. **Circuit Operation**
   The signal waveform is indicated below. The bell signal input to IC101 and ring detected signal output from pin 16 of IC100. IC300 monitor this signal and judged as bell.
   TEL LINE→IC101 (8,9 - 5,6)→IC100 (9,10 - 16)→IC300(L23)



6.4.4. 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**
   The caller ID signal input from TEL LINE is processed with Soc (IC300).
   TEL LINE→IC101 (8,9 - 5,6)→IC100 (9,10 - 5)→IC300(AD26)

6.4.5. REMOTE FAX ACTIVATION CIRCUIT

1. **Function**
   Another telephone connected to same line activates the unit to the FAX mode by using a DTMF signal.
2. **Signal Path**
   TEL LINE→IC101 (8,9 - 5,6)→IC100 (9,10 - 5)→IC300(AD26)

6.4.6. TAM INTERFACE CIRCUIT

This circuit is to switch between FAX receiving and the external TAM’s message recording automatically.
For details, please refer to **TAM INTERFACE SECTION** (P.28).

6.5. ITS (Integrated telephone System) and MONITOR SECTION

6.5.1. GENERAL

The general ITS operation is performed by IC200 which has a handset circuit. The alarm tone, the key tone, and the beep are output from Soc IC300.

6.5.1.1. 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**
   TEL LINE→D103→Q104→C106→IC101(3-5,6)→IC100(9,10-5)→IC300(AD26-AB24)→IC200(4-1)→IC202(2-1)→IC204(4-5,8)→CN200(1,2)→CN58(1,2)→CN57(1,2)→SPEAKER

6.5.1.2. 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)**
   OPTION HANDSET UNIT→CN58(5,6)→CN200(5,6)→IC202(5,6-7)→IC201(3-5)→IC200(10-5)→IC300(AB25-AC24)→IC100(6-9,10)→IC101(5,6-3)→C106→Q104→D103→TEL LINE
3. **Signal path (Reception signal)**
   TEL LINE→D103→Q104→C106→IC101(3-5,6)→IC100(9,10-5)→IC300(AD26-AB24)→IC200(4-16)→IC203(4-8)→CN200(7,8)→CN58(7,8)→OPTION HANDSET UNIT

6.5.1.3. 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)
      IC300(AB24)→IC200(4-1)→IC202(2-1)→IC204(4-5,8)→CN200(1,2)→CN58(1,2)→CN57(1,2)→SPEAKER
      (Handset Operation)
      IC300(AB24)→IC200(4-16)→IC203(4-8)→CN200(7,8)→CN58(7,8)→OPTION HANDSET UNIT
   b. **ALARM/BEEP/KEY TONE/BELL**
      IC300(B20)→IC202(2-1)→IC204(4-5,8)→CN200(1,2)→CN58(1,2)→CN57(1,2)→SPEAKER

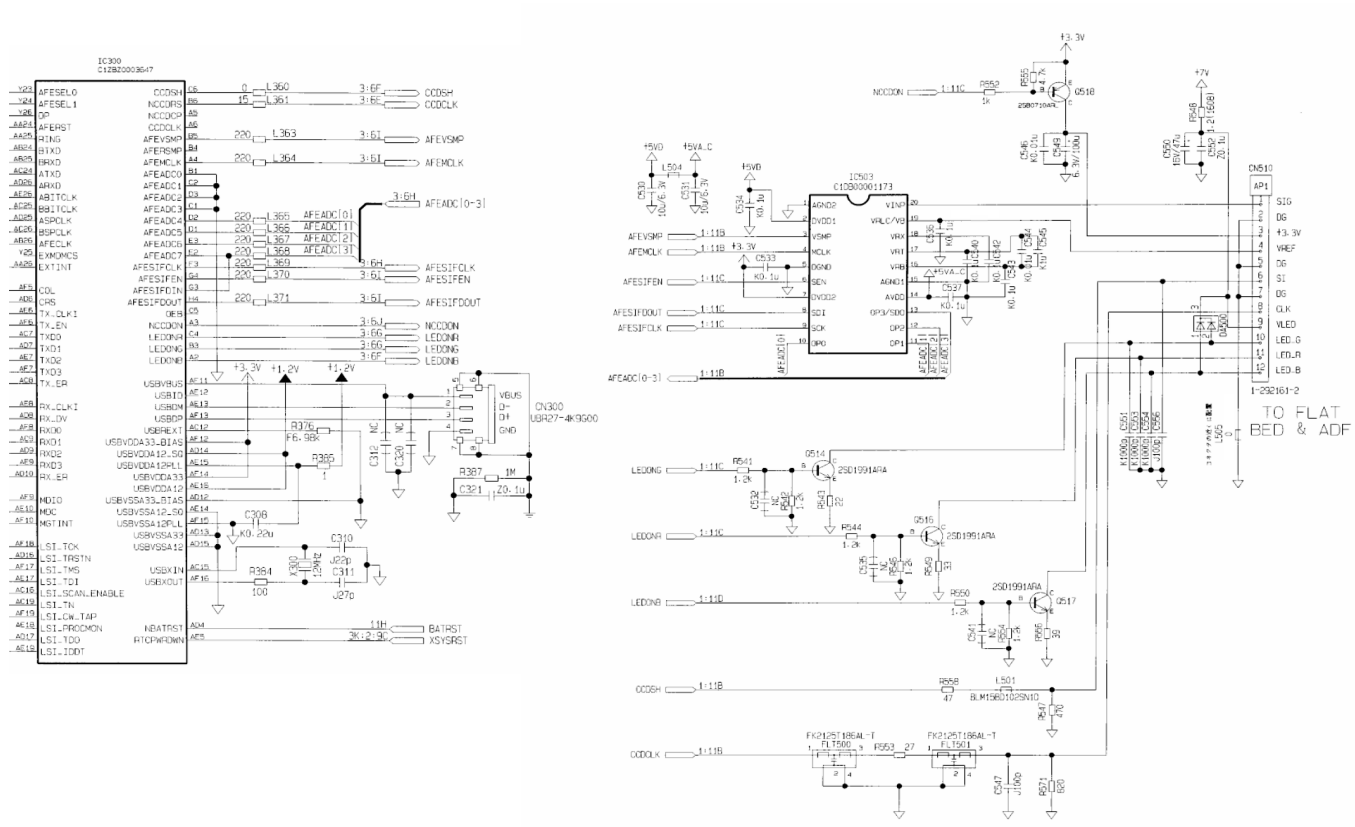
6.5.1.4. TAM INTERFACE SECTION

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 Soc(IC300) to detect the other party CNG signal, and RLY100 to separate EXT.TAM.
   a. **CNG signal detection circuit**
      The CNG signal from the other party's FAX is detected in Soc IC300
      (Signal path)
      TEL LINE→IC101 (8,9 - 5,6)→IC100 (9,10 - 5)→IC300(AD26)
   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)
      TEL LINE→IC101 (8,9 - 5,6)→IC100 (9,10 - 5)→IC300(AD26)

6.6. CIS CONTROL SECTION

The scanning block of this device consists of a control circuit and a CIS (contact image sensor), and AFE (Analog Front End) include A/D Converter.



When an original document is inserted and the start button pressed, pin A3 of IC300 goes to a low level and the transistor Q518 turns on. This applies voltage to the CIS. The CIS is driven by each of the CCDSH , CCDCLK signals output from IC300, and the original image illuminated by the LED to output an analog image signal.

The analog image signal is input to the AFE on VINP(20pin of IC503) and converted into 16-bit data by the A/D converter inside IC503. Then this signal undergoes digital processing in order to obtain a high-quality image.

6.7. MOTOR DRIVE SECTION

6.7.1. Engine Motor Control Circuit

1. **Functions**

All driving forces of printer engine part are supplied by this engine motor.
Engine motor is controlled so as to rotate at constant speed during printing and copying.

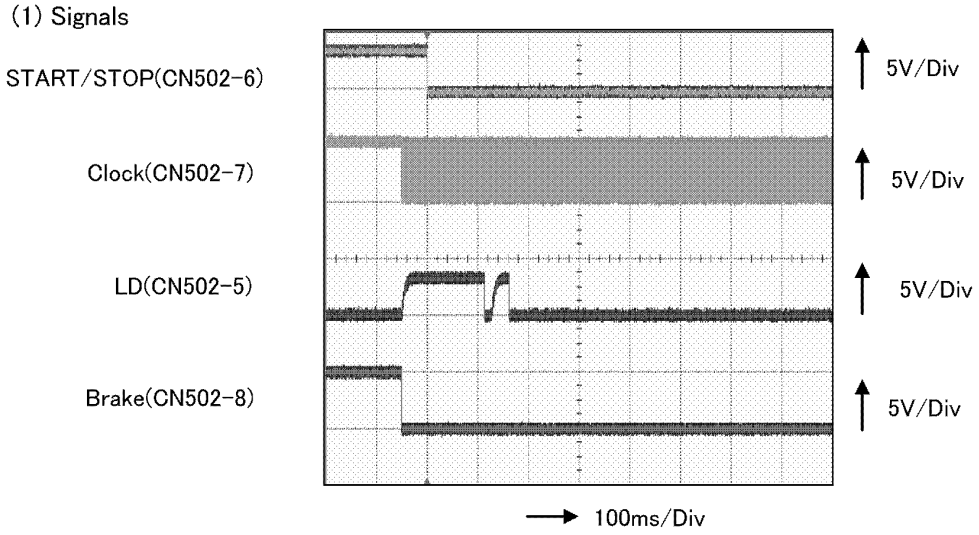
2. **Motor operation**

<Start operation>
In order to start the motor rotation, following 3 signals are supplied from IC300.
1. SS signal (Output pin: Pin B12/Output Signal: "H")
When this signal is inverted by transistor Q502 and becomes "L", motor recognize this signal as "start" signal.
2. Clock signal (Output pin: Pin A12/Output Signal: Pulse)
Pulse frequency :approx. 1.9KHz (at normal printing speed,)
Pulse frequency :approx. 0.5KHz.(at half printing speed)
This signal is also inverted by transistor Q525, and supplied to motor as "clock" signal .
3. Brake signal (Output pin: Pin C12/Output Signal: "H")
When this signal is inverted by transistor Q526 and becomes "L", motor recognize this signal as "brake off" signal.

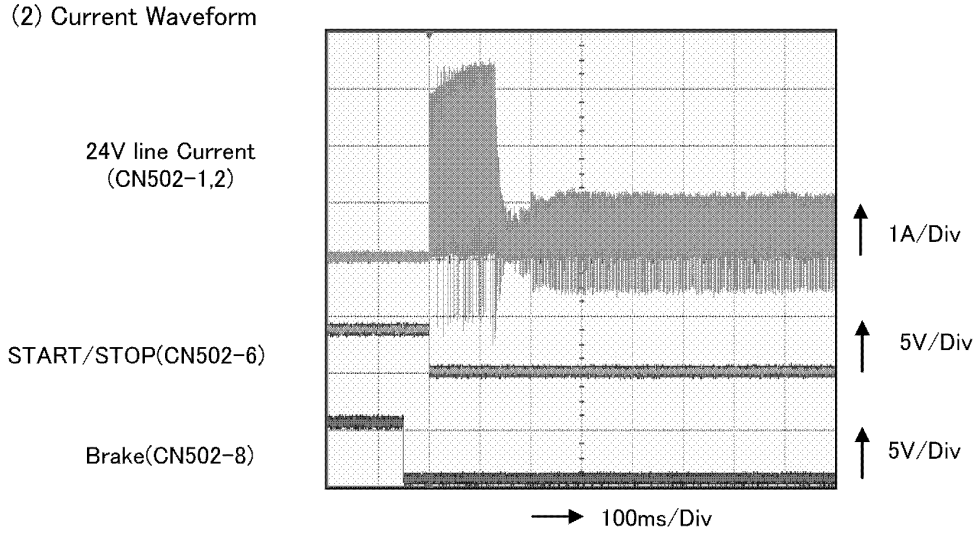
When motor reaches constant speed, "L" signal is supplied from motor to IC300 pin B12 as "Lock detect (LD)" signal.
if "LD" signal does not becomes "L" within predetermined period after "SS" signal becomes "H", or if "LD" signal becomes "H" during rotation, it is judged that motor Error occurred.

Timing Chart of Start operation

(1) Signals



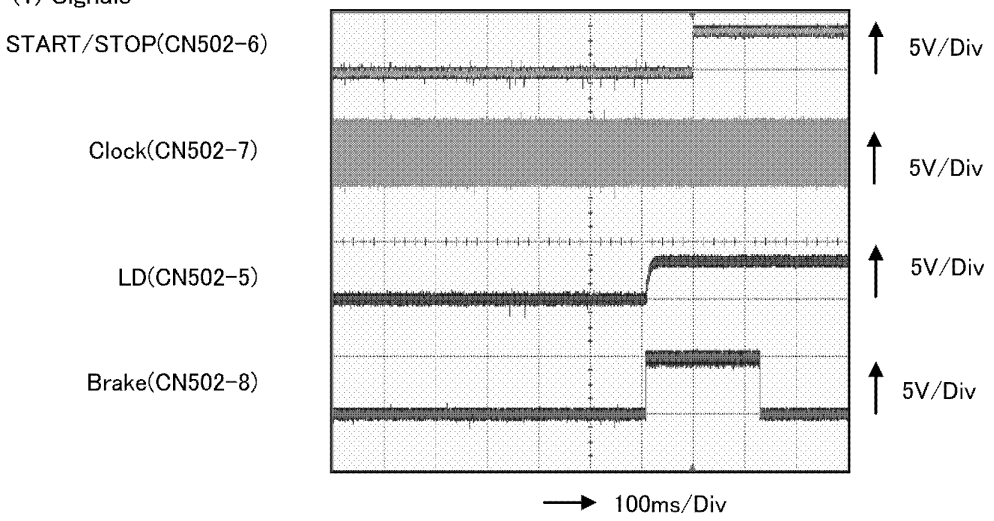
(2) Current Waveform



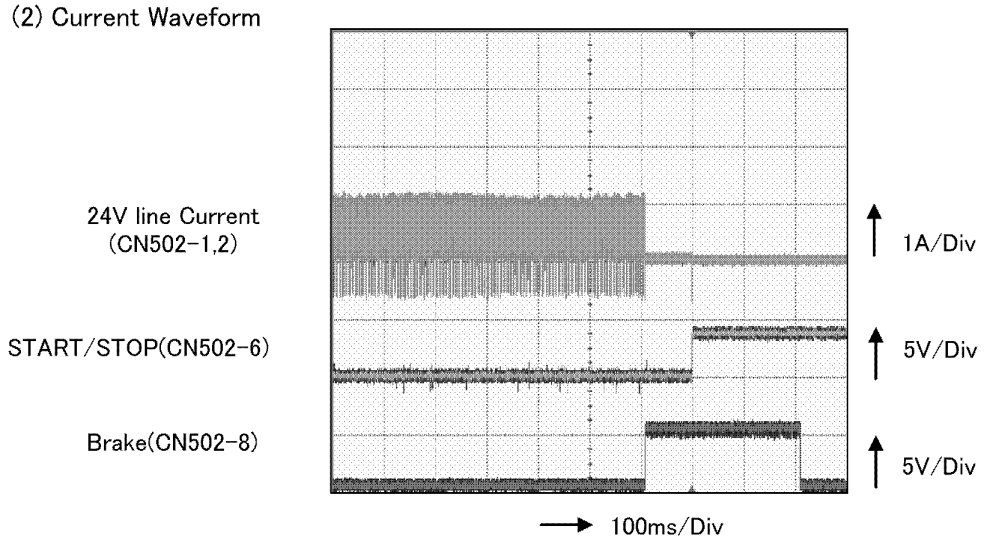
<Stop operation>
In order to stop the motor rotation, following 2 signals are supplied from IC300.
1. SS signal (Output pin: Pin B12/Output Signal: "L")
When this signal is inverted by transistor Q502 and becomes "H", motor recognize this signal as "stop" signal.
2. Brake signal (Output pin: Pin C12/Output Signal: "L")
When this signal is inverted by transistor Q526 and becomes "H", motor recognize this signal as "brake on" signal.

Timing Chart of Stop operation

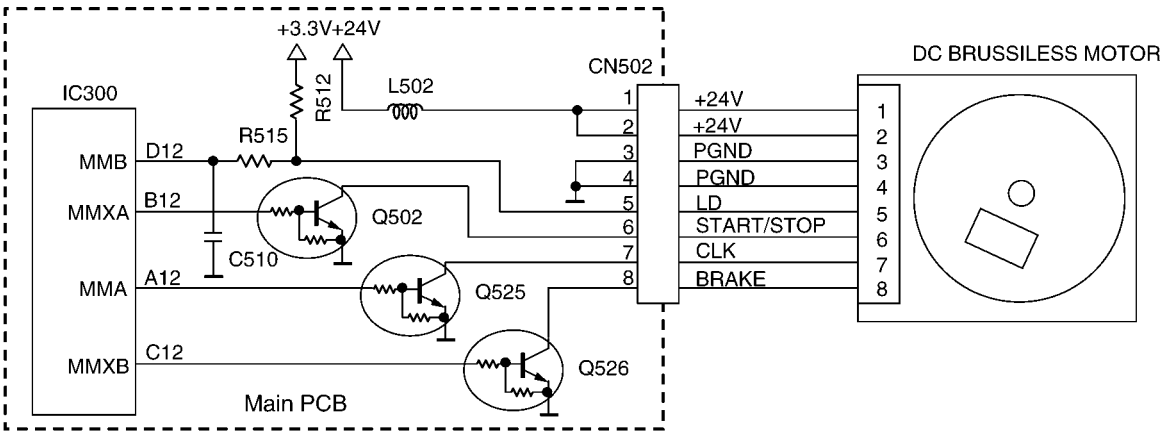
(1) Signals



(2) Current Waveform



6.7.1.1. ENGINE MOTOR DRIVE CIRCUIT



6.7.2. SCANNER MOTOR DRIVE CIRCUIT

General

Scanner motor drive circuit is consist of motor current control circuit ,FB (Flat Bed) motor driver and ADF (Auto Document Feeder: equipped model only) motor driver .

6.7.2.1. MOTOR CURRENT CONTROL CIRCUIT

1. Circuit explanation

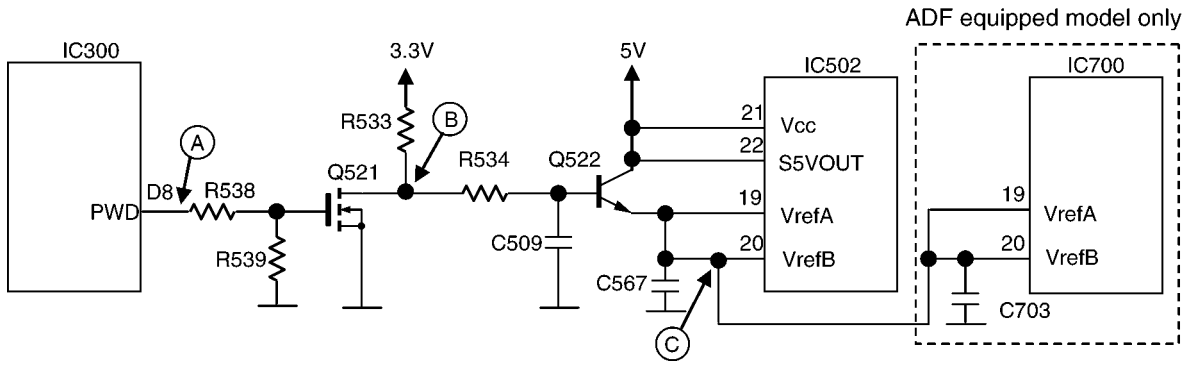
   According to the scan speed, each motor current is controlled for appropriate value.
   When scan speed is low, motor current is reduced to prevent the vibration during motor rotation.
   When scan speed is high, motor needs much driving force. so much current should be supplied.

   For the control of motor current, Vref voltage of each motor driver is controlled.
   When Vref voltage is high, motor current is increased, and the voltage is low, motor current is reduced.
   In order to control Vref voltage, PWM pulse is supplied from IC300 pin D8 .
   PWM pulse is inverted by Q521 and integrated by R533, R534, and C567, then convert to DC voltage.

   This DC voltage is supplied to Vref pin of each motor driver through Q522.
   When duty of PWM pulse is high, Vref voltage is decreased and when duty is low, Vref voltage is increased.

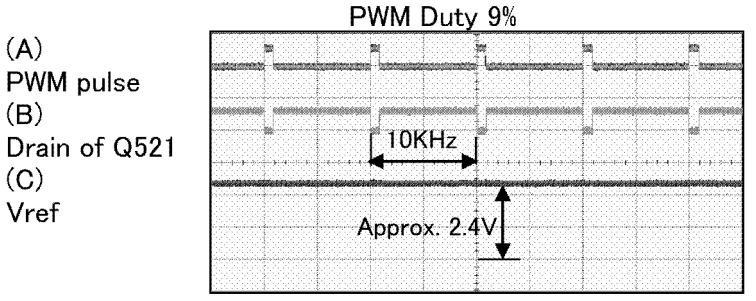
   For FB motor, motor current is controlled approx. 0.1A-0.25A.
   For ADF motor, motor current is controlled approx. 0.2A-0.35A (ADF epuipped model only).

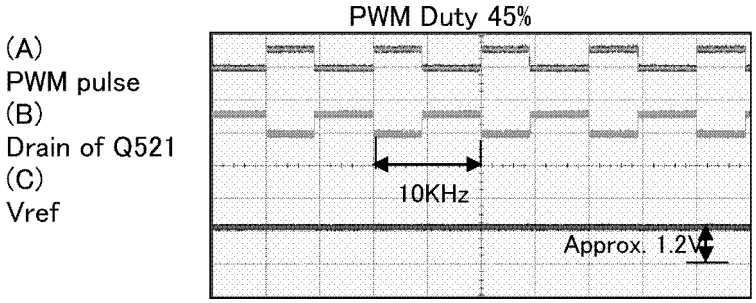
2. Circuit diagram



3. Timing chart

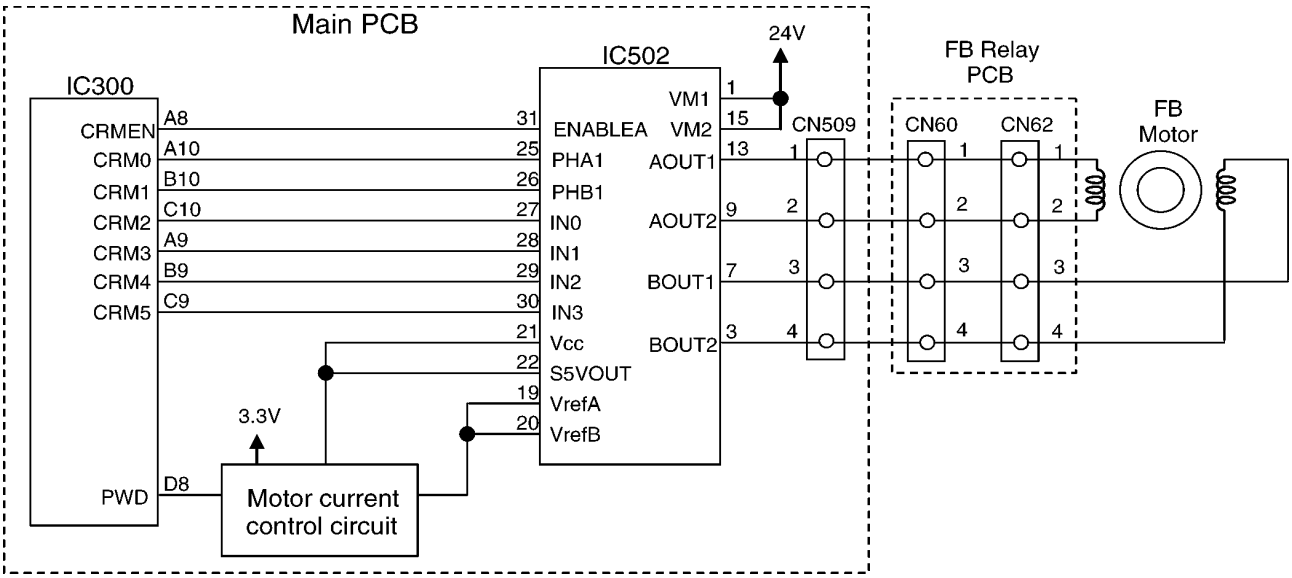
   Following timing charts are the example when PWM pulse duty are approx 9% and 45%.





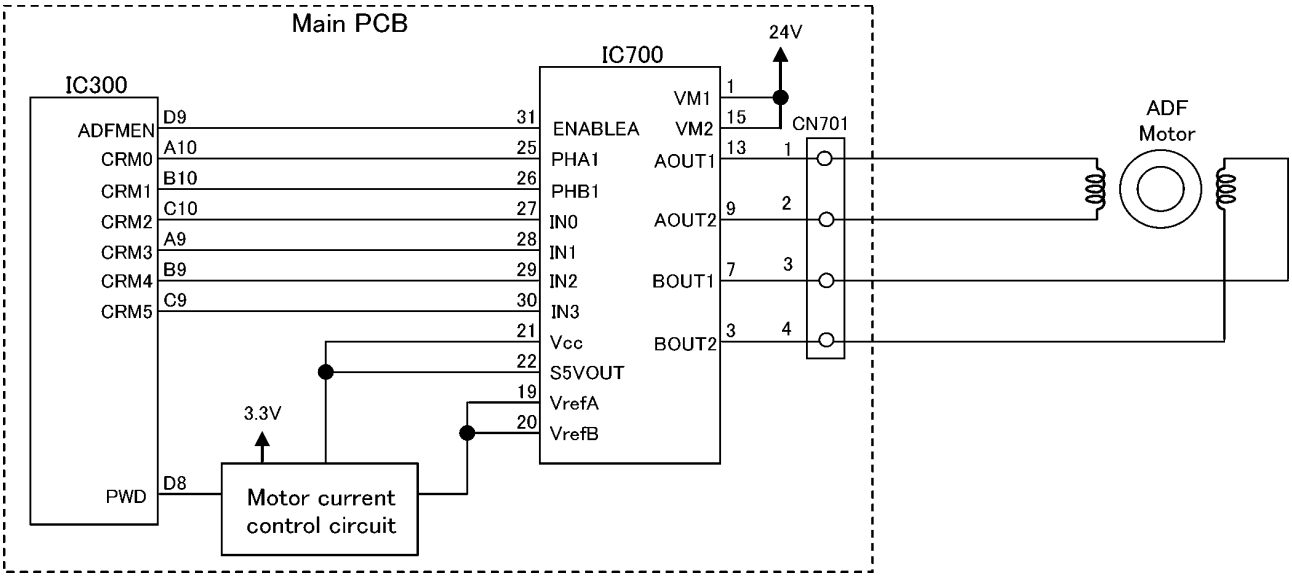
6.7.2.2. FB (FLAT BED) MOTOR DRIVE CIRCUIT

1. Functions
   This motor functions for main operations including FAX transmission, FB copy and PC scan.
   This motor feeds CIS unit with synchronizing for reading.
2. Motor operation
   During motor driving, pin A8 of IC 300 become low level, then motor driver IC502 is activated.
   Stepping pulses are output from IC300 pins A9, B9, C9,A10, B10, and C10, causing driver IC502 pin 3, 7, 9 and 13 to drive the motor coil.
   A 1-step rotation of this motor feeds 0.021mm of CIS unit.
3. Circuit Diagram



6.7.2.3. ADF (AUTO DOCUMENT FEEDER) MOTOR DRIVE CIRCUIT (ADF EQUIPPED MODEL ONLY)

1. Functions
   This motor functions for main operations including FAX transmission, ADF copy and PC scan.
   This motor feeds document which are set to ADF with synchronizing for reading.
2. Motor operation
   During motor driving, pin D9 of IC 300 become low level, then motor driver IC700 is activated.
   Stepping pulses are output from IC300 pins A9, B9, C9, A10, B10, and C10, causing driver IC700 pin 3, 7, 9 and 13 to drive the motor coil.
   A 1-step rotation of this motor feeds 0.042mm of document.
3. Circuit Diagram

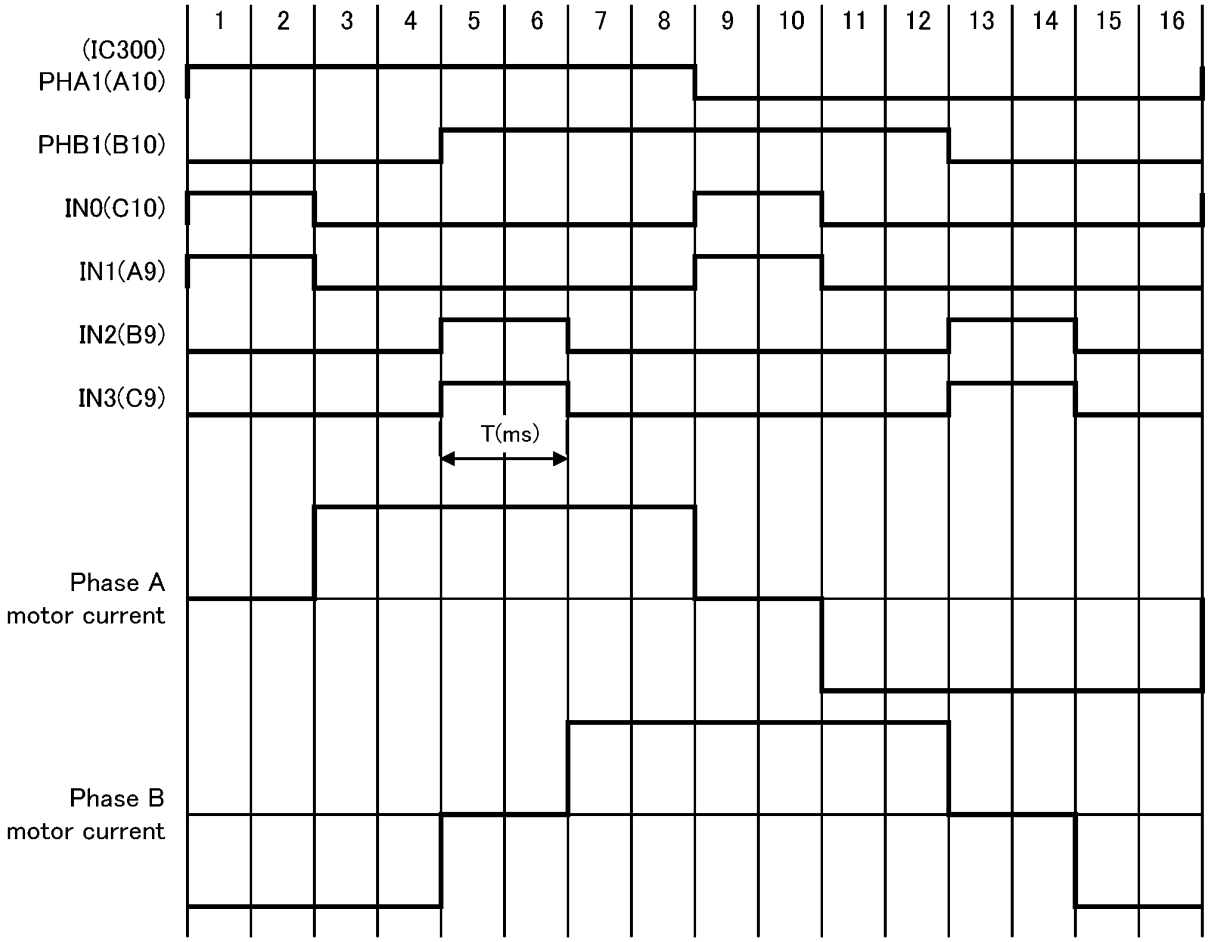


6.8. TIMING CHART AND WAVE FORM OF SCANNER MOTORS

Control sequence and waveform of both FB and ADF motor are almost same.

6.8.1. NORMAL 1-2 PHASE EXCITATION (HALF STEP)

1. Timing chart



2. Wave form

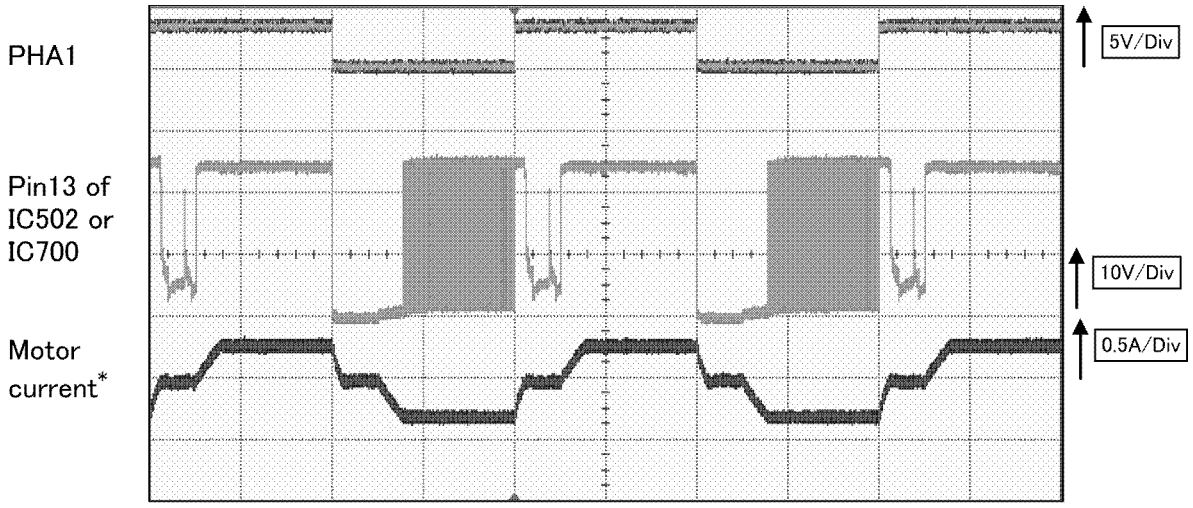
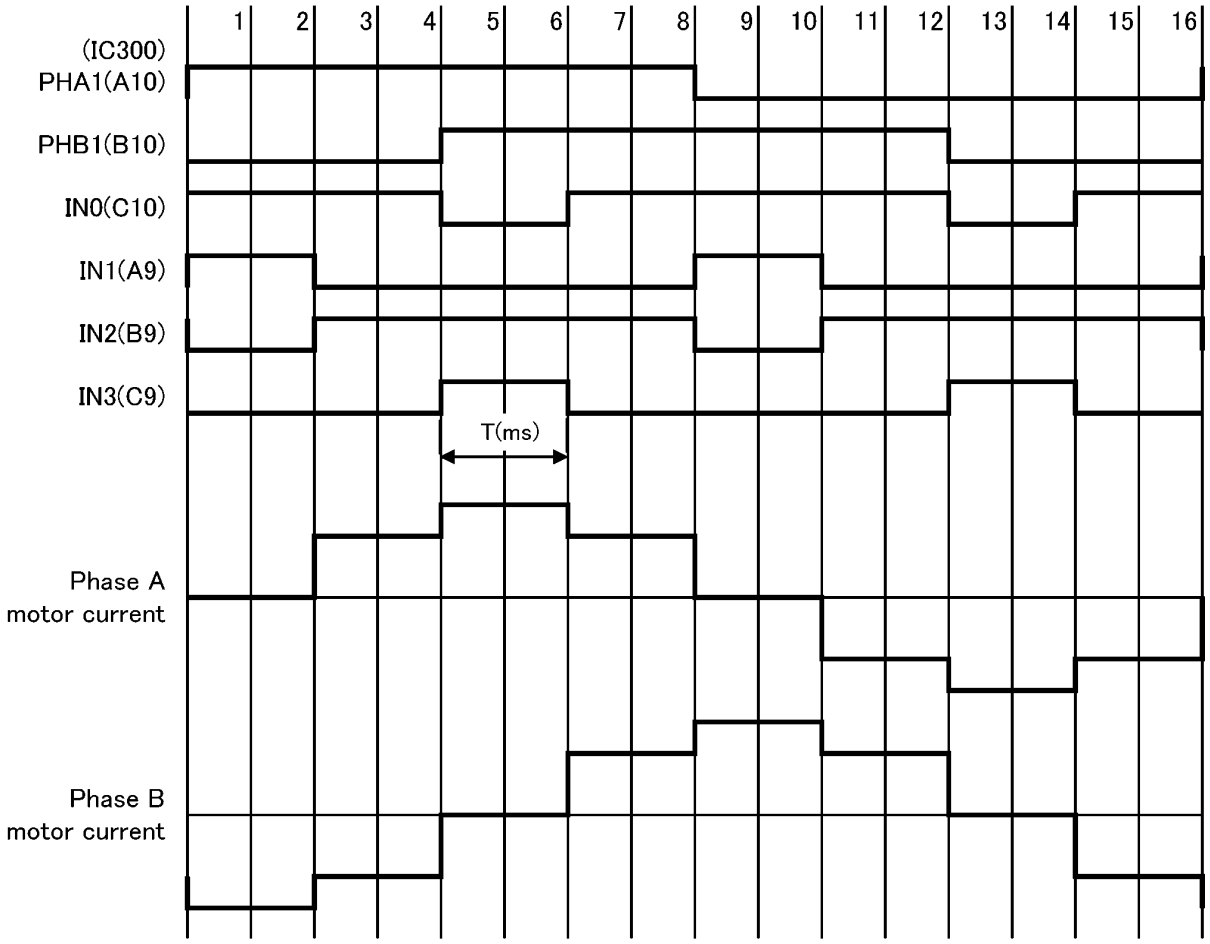


Fig. 1

*Motor current is changed according to the scan speed.

6.8.2. FLAT TORQUE 1-2 PHASE EXCITATION (HALF STEP)

1. Timing chart



2. Wave form

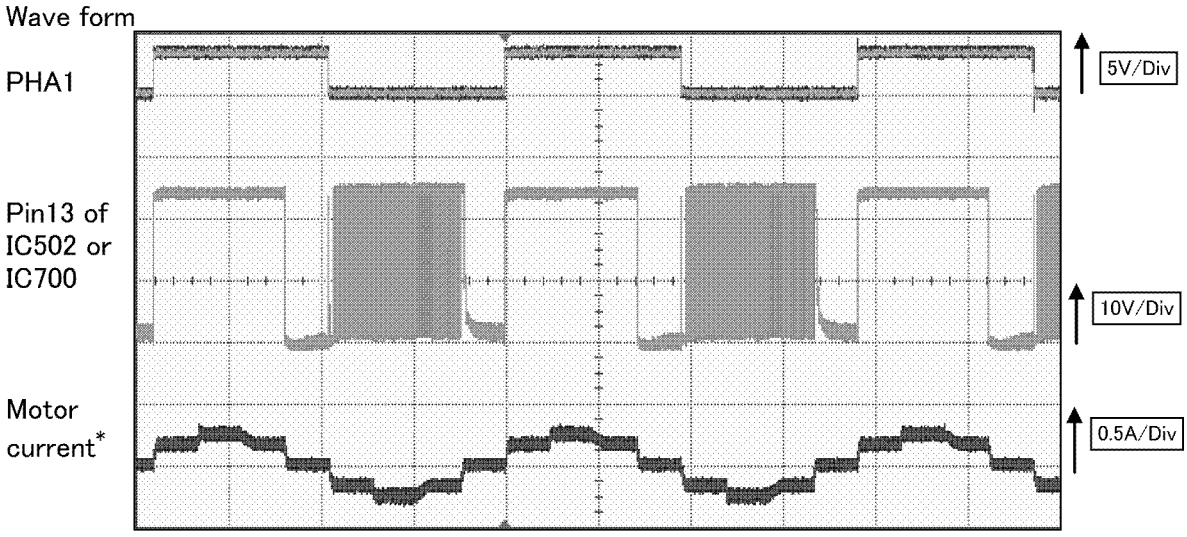
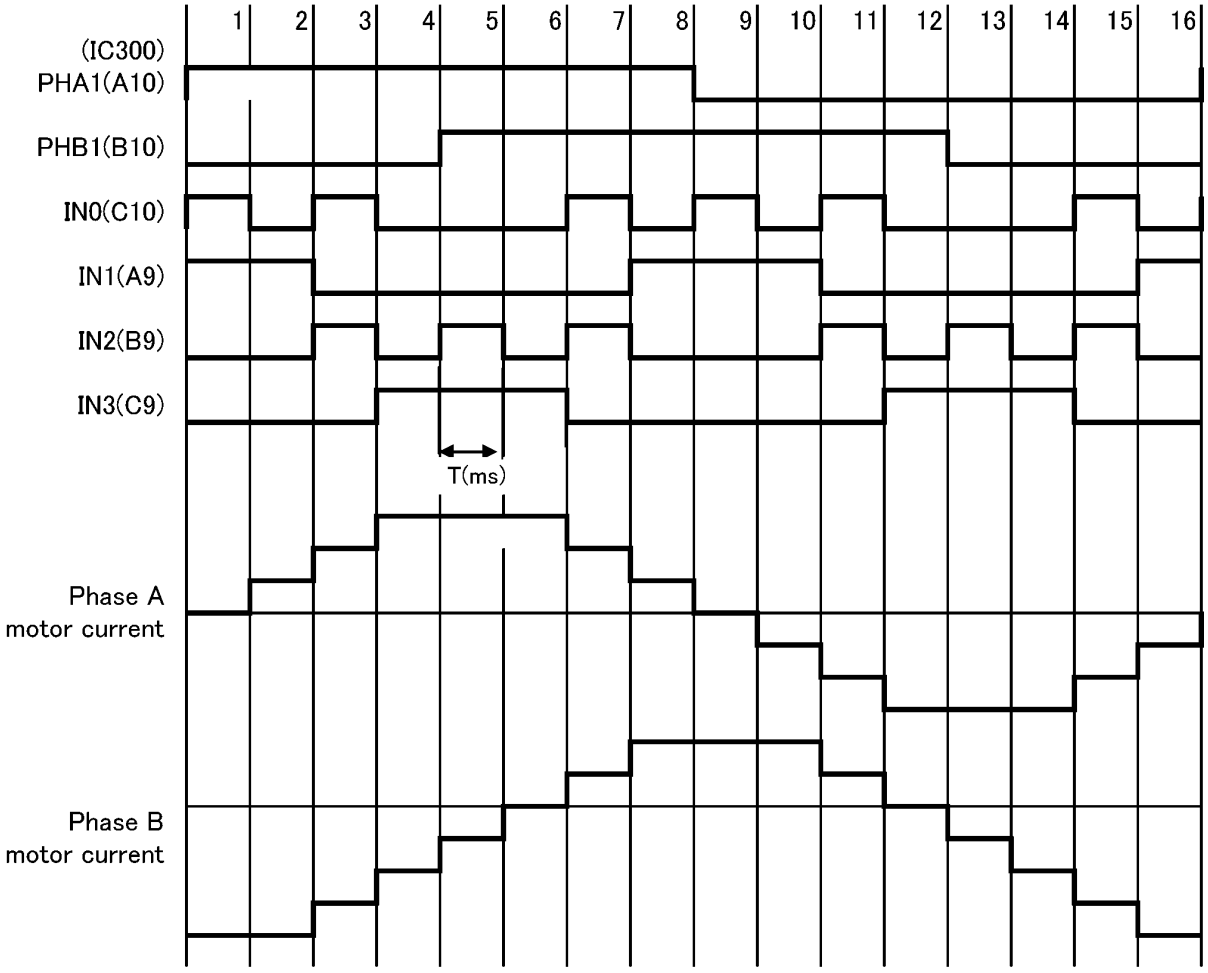


Fig. 2

*Motor current is changed according to the scan speed.

6.8.3. W 1-2 PHASE EXCITATION (QUARTER STEP)

1. Timing chart



2. Wave form

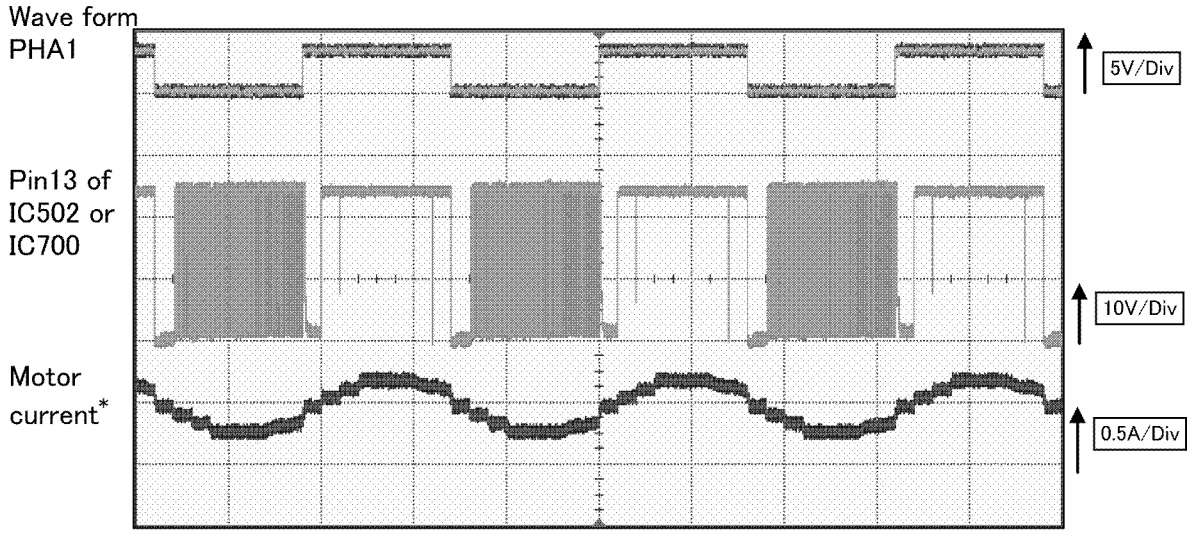


Fig. 3

*Motor current is changed according to the scan speed.

6.8.4. DRIVE MODE OF FB AND ADF MOTOR

Correspondent table of operation

Operation	Color mode	ADF/FB	Time & Figure	Pre Scan	75 x 75	100 x 100	150 x 150	200 x 200	300 x 300	400 x 400	600 x 600	1200 x 1200	>1200
PC scan	Color	ADF	T(msec)		1.0			2.5		2.0			
			Figure		②					③			
		FB	T(msec)		0.5			2.0					
			Figure		②							③	
	Black & White	ADF	T(msec)		0.67				1.33				
			Figure		①				②				
		FB	T(msec)		0.22			0.67				1.33	
			Figure		①			②					

Operation	Color mode	ADF/FB	Time & Figure	Copy magnification: 100% / Copy mode: Photo/Text	100% / Text	100% / Photo	other than 100% / Photo/Text	other than 100% / Text	other than 100% / Photo
Copy	Black & White	ADF	T(msec)	0.67		1.33	0.67		1.33
			Figure	①		②	①		②
		FB	T(msec)	0.67					
			Figure	②					

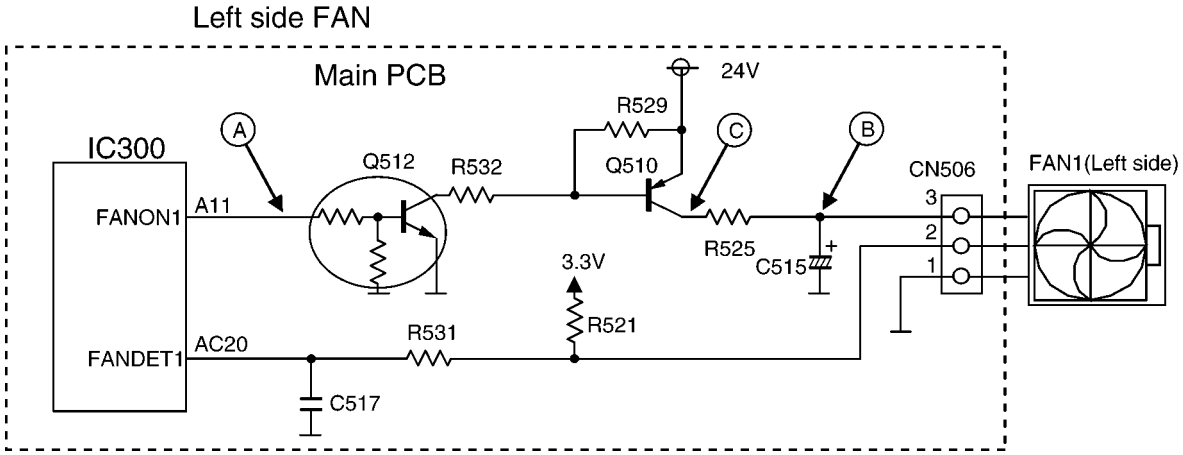
Operation	Color mode	ADF/FB	Time & Figure	FAX mode: Standard	Fine	Super Fine	Photo
FAX	Black & White	ADF	T(msec)	1.33			
			Figure	②			
		FB	T(msec)	1.33			
			Figure	②			

6.9. FAN MOTOR SECTION

These FAN are used to radiate the heat inside of the unit.

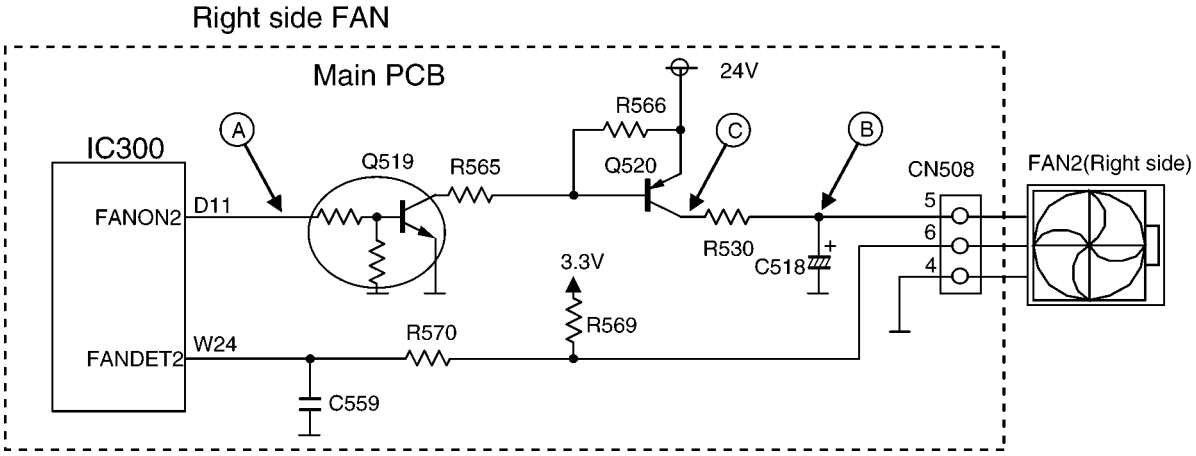
6.9.1. LEFT SIDE FAN (FAN1)

When the output of pin A11 of IC300 becomes high level or pulse, Left side FAN (FAN1) is activated.
During the FAN rotation, the pulse signal is output from pin 2 of FAN1 and input to pin AC20 of IC300.
When this pulse is stopped, it is judged that FAN error occurred.



6.9.2. RIGHT SIDE FAN (FAN2)

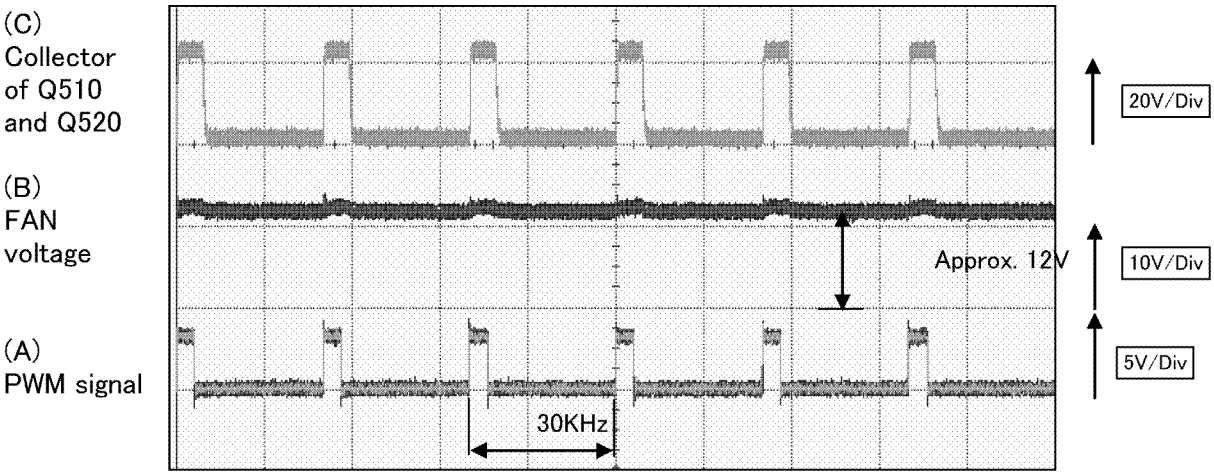
When the output of pin D11of IC300 becomes high level or pulse, Right side FAN (FAN2) is activated.
During the FAN rotation, the pulse signal is output from pin 2 of FAN2 and input to pin W24 of IC300.
When this pulse is stopped, it is judged that FAN error occurred.



6.9.3. FAN CONTROL

This unit is equipped with two FANs to prevent the developing devices from overheating during printing.
The FAN rotates at high speed (Approx. 3000rpm) while printing (controlling the developing devices).
After printing is finished, FAN rotates at low speed (Approx.2200rpm) while predetermined period.

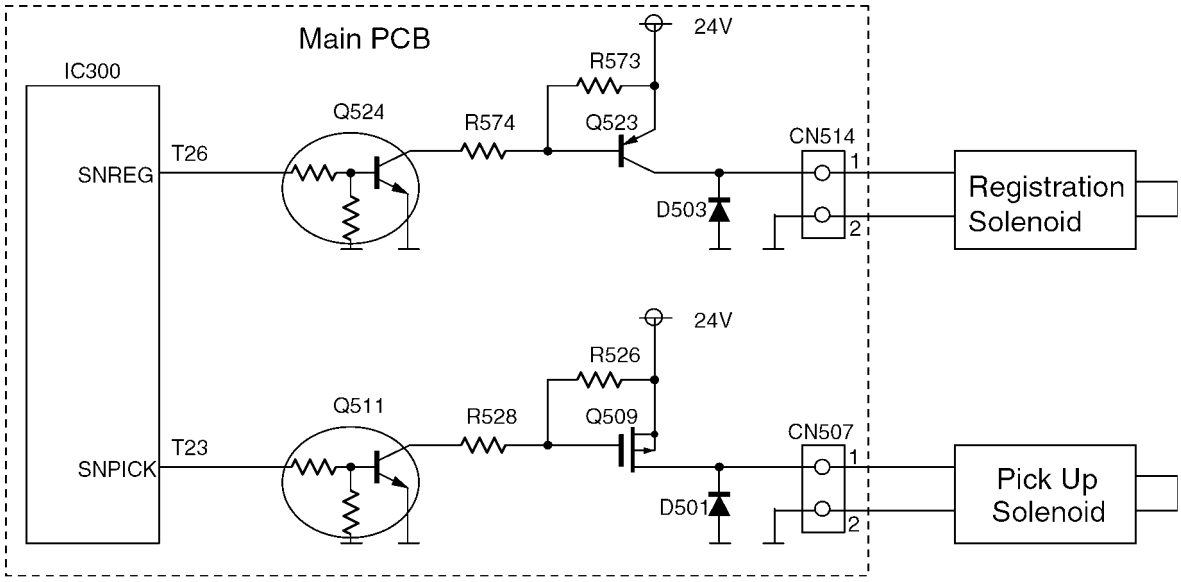
1. Full speed control
   To rotate the FANs with full speed, constant high level are output from A11 and D11 of IC300. Then Q512/Q510 and Q519/Q520 are all turned on. So 24V are output from collectors of Q510 and Q520. Since each FAN consumes approx. 0.1A, approx. 4V is reduced through R525 and R530. Then approx. 20V are supplied to each FANs.
2. Half speed control
   To rotate the FANs with half speed, pulse signals are output from A11 and D11 of IC300. Then all Q512/Q510 and Q519/Q520 repeat ON and OFF according to the pulse duty (30KHz/12.5%). These pulses are integrated by R525/C515 and R530/C518 and converted to DC voltage. So approx. 12V are supplied to each FANs.



Pin No.	Level	FAN operation mode
IC300 A11	High	Left side FAN Full speed
	Pulse	Left side FAN halfl speed
	Low	Left side FAN stop
IC300 D11	High	Right side FAN Full speed
	Pulse	Right side FAN Half speed
	Low	Right side FAN stop

6.10. SOLENOID DRIVER SECTION

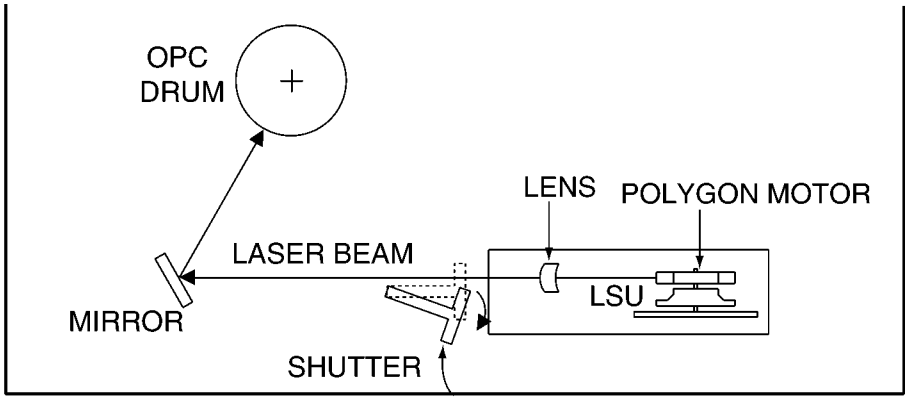
The solenoid drive circuit controls Registration solenoid and Pick up Solenoid. These solenoids are designed to be driven 24V. The diodes protect transistors from reverse generated voltage when solenoids are turned off.



RESISTANCE	
MODE	IC300_T26
Solenoid ON	High level
Solenoid OFF	Low level

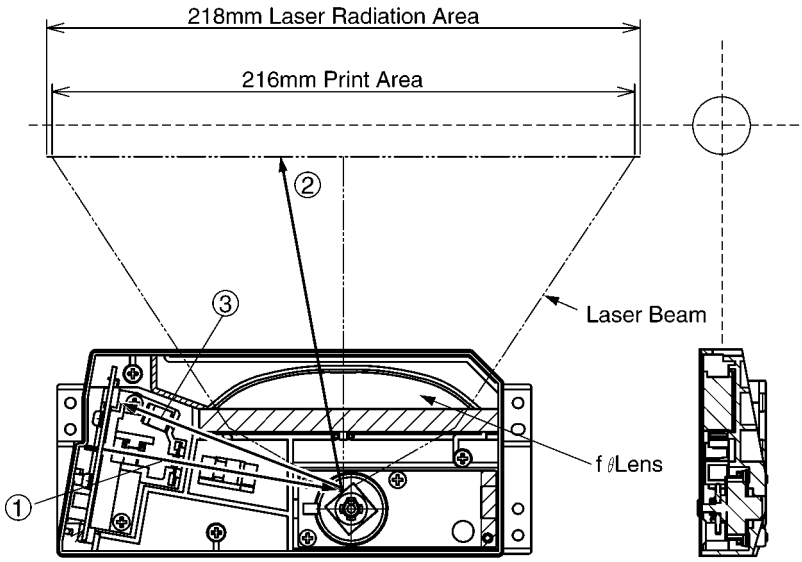
PICKUP	
MODE	IC300_T23
Solenoid ON	High level
Solenoid OFF	Low level

6.11. LSU (Laser Scanning Unit) SECTION



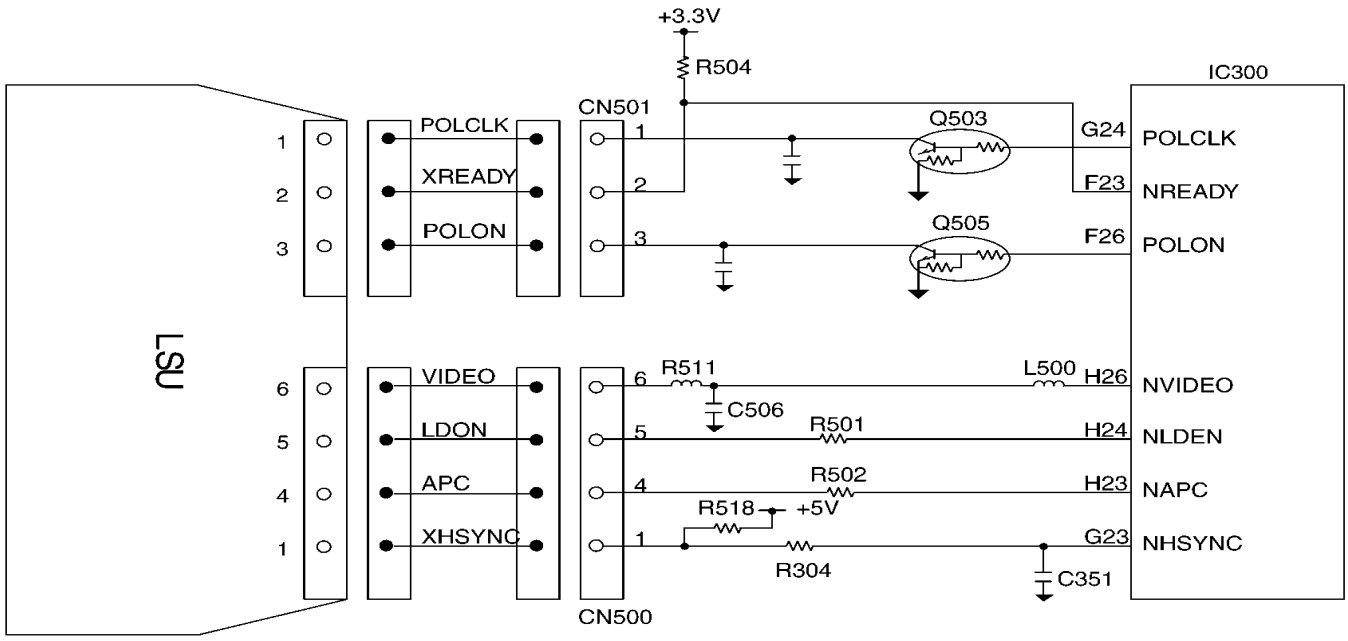
The mechanical shutter will be opened by setting DRUM UNIT properly.

LSU Layout

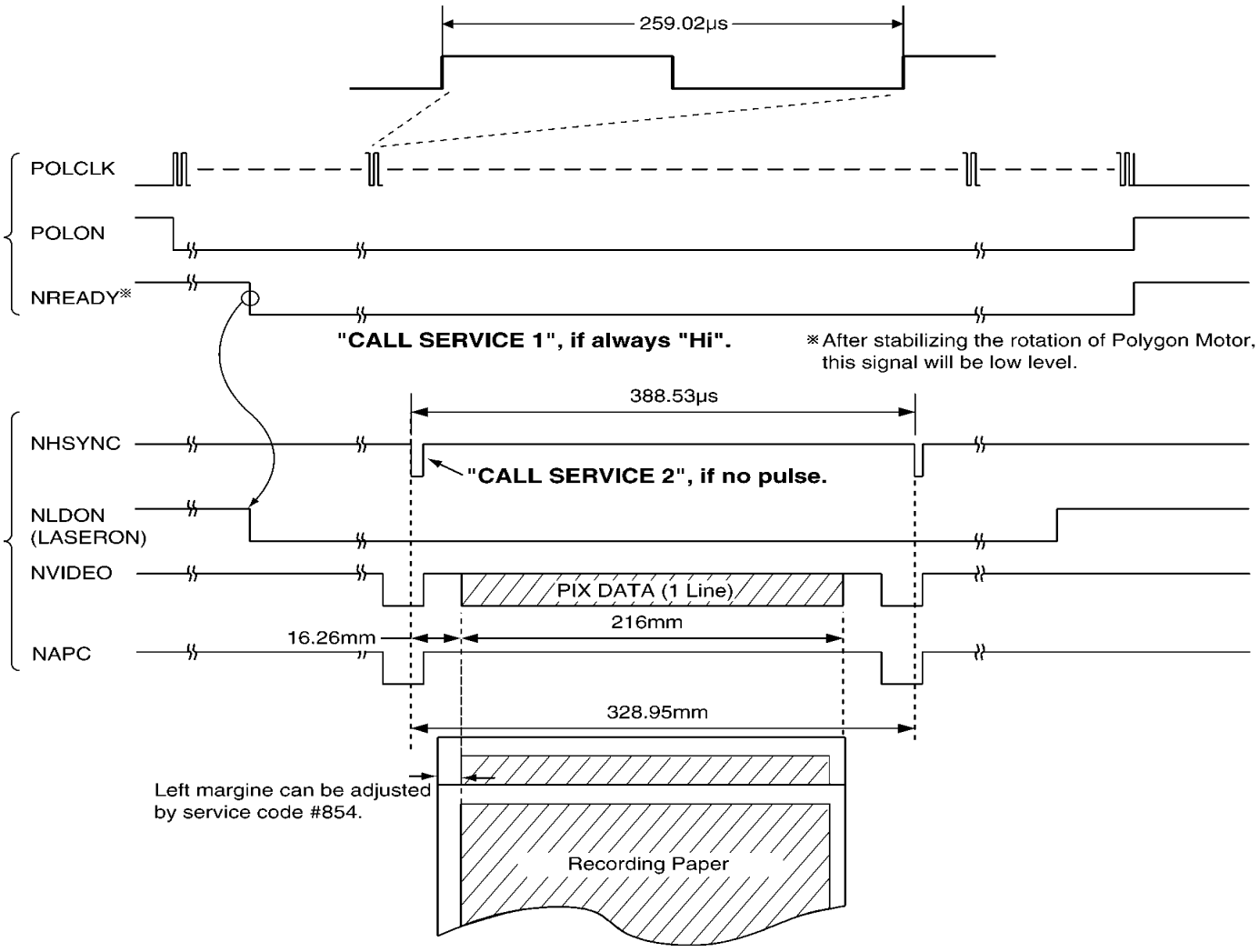


① Laser output
② OPC DRUM is irradiated with a laser.
③ The sensor outside the effective printing area detects the 1-line operation (scanning).

Circuit Diagram



Timing Chart



6.12. SENSORS AND SWITCHES SECTION

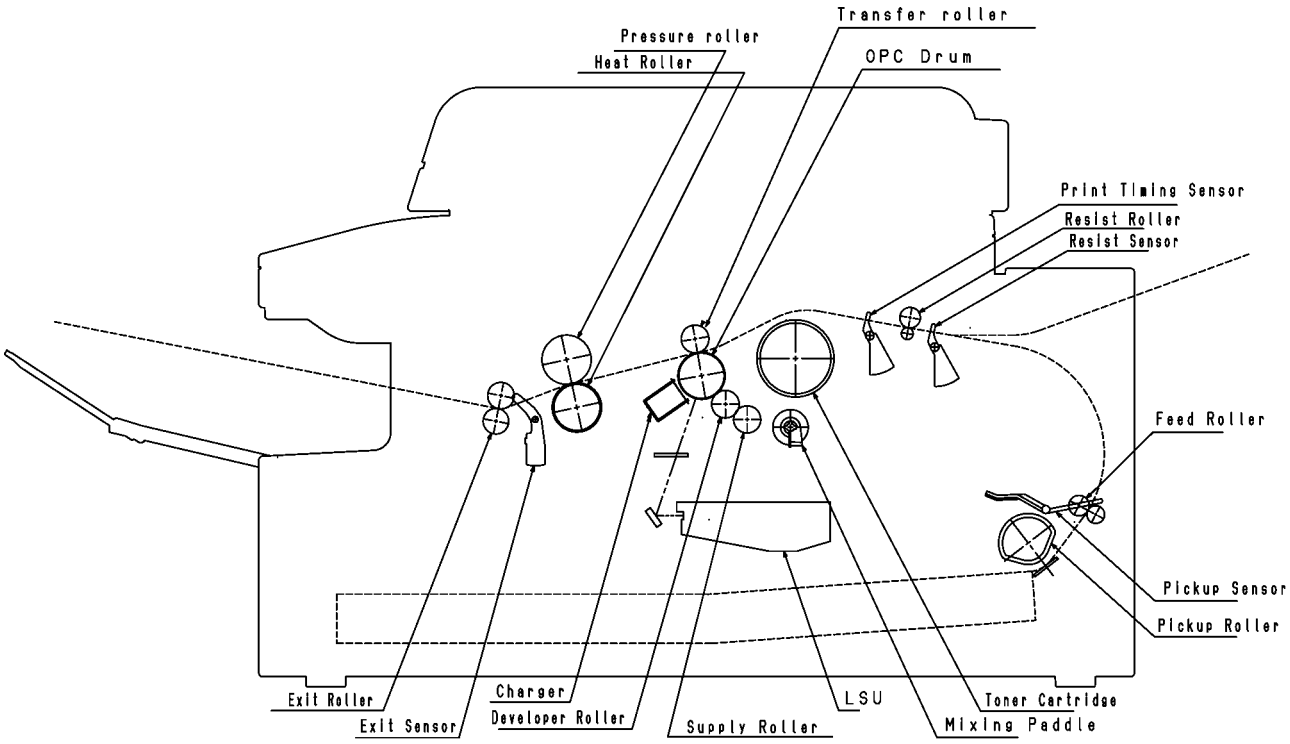
All of the sensor and switches are shown below.

Sensor Name	Sensor Location	Reference number	Message Error
Pickup sensor	Pickup & Fan2 PCB	SW50	[PAPER JAMMED] [CHECK REAR CVR] [WRONG PAPER & PRESS START]
Exit sensor	Fuser PCB	PS50	[PAPER JAMMED]
Read position sensor	Sensor PCB	PS53	[CHECK DOCUMENT]
Resistance& Manual paper sensor	Resist & PTOP PCB	PS51	[PAPER JAMMED]
Print timing sensor	Resist & PTOP PCB	PS52	[PAPER JAMMED]
Document sensor	Sensor PCB	PS54	-
Top cover sensor	H.V.P.S	SW1	[TOP COVER OPEN]
Toner sensor	Sensor PCB	IC50	[TONER EMPTY] [TONER LOW] [CHECK DRUM]
Option handset hook switch	Op handset PCB	SW940	-

Note:

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

(#815 of Service Mode test. Refer to **TEST FUNCTIONS** (P.83).

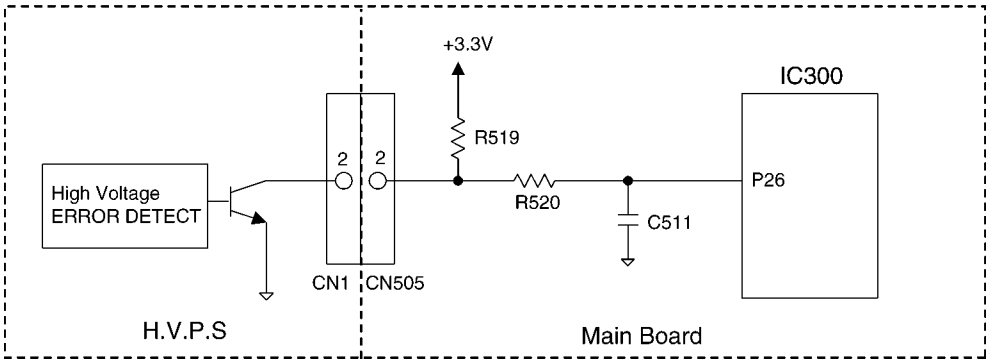


6.12.1. DRUM DETECTION

DRUM SENSOR is not arranged.

DRUM unit is detected when HVERR SENSOR arranged in H.V.P.S becomes effective.

[HVERR Sensor]



High Voltage ERROR Status	Drum sensor	Signal (IC300-P26)
Abnormal	DRUM can not be detected	Low level
Normal	DRUM can be detected	High level

6.12.2. PICKUP SENSOR

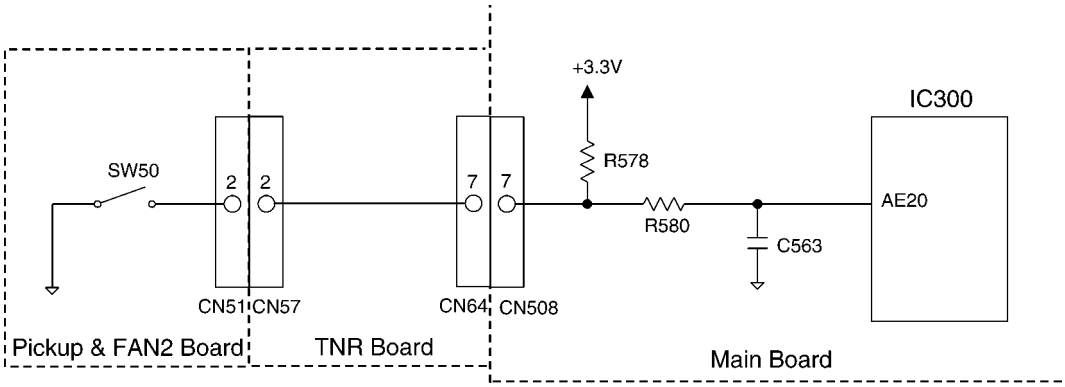
Paper SENSOR is not arranged.

Paper is detected when PICKUP SENSOR described as follows becomes effective.

This Switch detects whether a recording paper is picked up or not, and whether Rear Cover is opened or closed.

When there is a recording paper at the position of the switch, the input signal of IC300-AE20pin becomes low level.

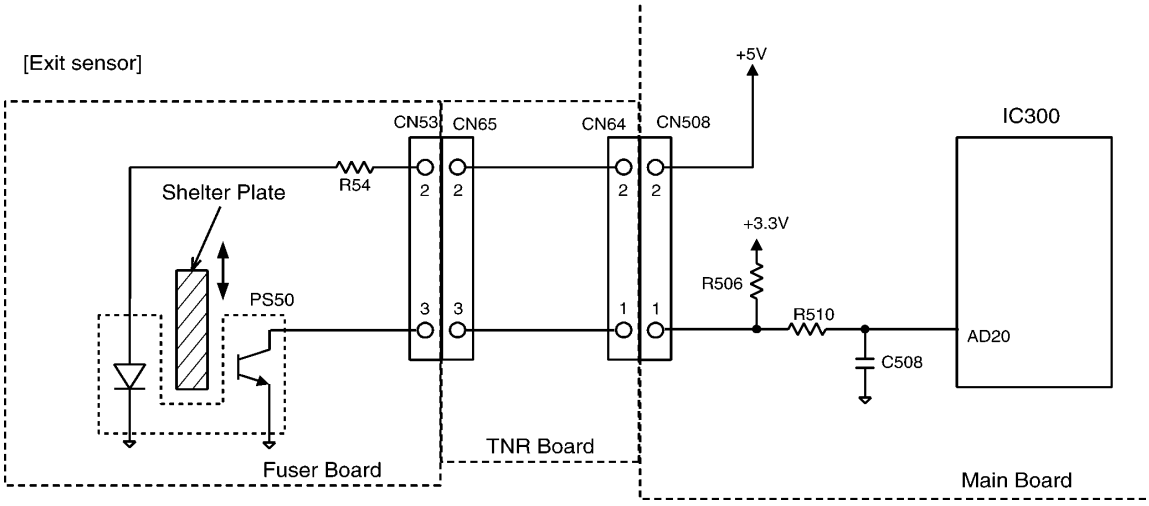
When there is no recording paper at the position of the switch, the input signal of IC300-AE20pin becomes high level.



Pickup status	Idling status	Signal (IC300-AE20pin)
A paper exists	Rear Cover opened	Low level
No papers	Rear Cover closed	High level

6.12.3. EXIT SENSOR

This sensor detects whether the recording paper exits or not.
When there is a recording paper at the position of the sensor, the input signal of IC300-AD20pin becomes low level.
When there is no recording paper at the position of the sensor, the input signal of IC300-AD20pin becomes high level.
HOME SENSOR is not arranged.
Home position is detected by CIS finding the special bar code pattern back side of the FB cabinet.



	Signal (IC300-AD20pin)
A paper exists	Low level
No papers	High level

6.12.4. READ POSITION SENSOR

This sensor detects the front edge of the document.
When the front edge of the document is detected, the shelter plate closes the sensor light.
So the photo-transistor turns off and the input signal of IC300-AD22pin becomes high level.
When the front edge of the document is not detected, the shelter plate lets the sensor light pass.
So the photo-transistor turns on and the input signal of IC300-1AD22pin becomes low level.

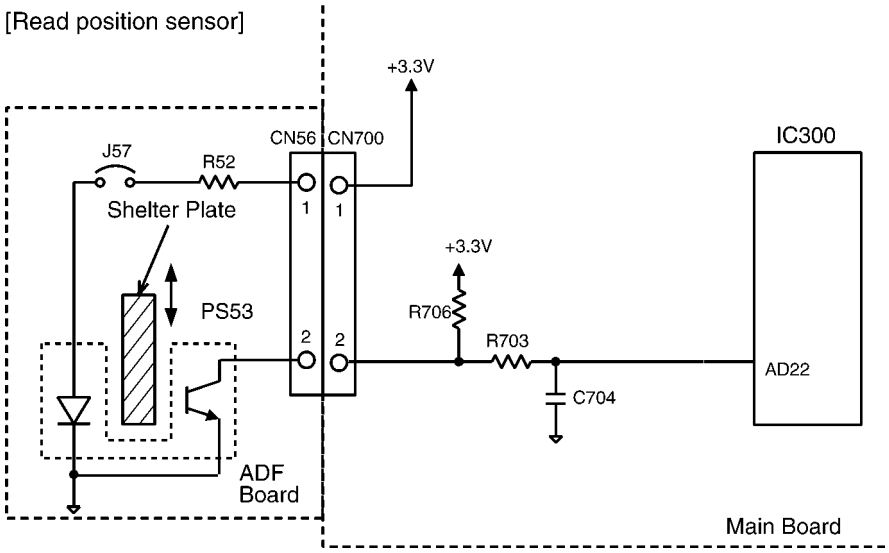


	Photo-transistor	Signal (IC300-AD22pin)
A document exists	OFF	High level
No document	ON	Low level

6.12.5. REGISTRATION & MANUAL PAPER SENSOR

This sensor detects whether the recording paper is at the sensor position.
When the recording paper is detected, the shelter plate lets the sensor light pass.
So the photo-transistor turns on, and input signal of IC300-AF20pin becomes low level.
When the recording paper is not detected, the shelter plate closes the sensor light.
So the photo-transistor turns off, and input signal of IC300-AF20pin becomes high level.

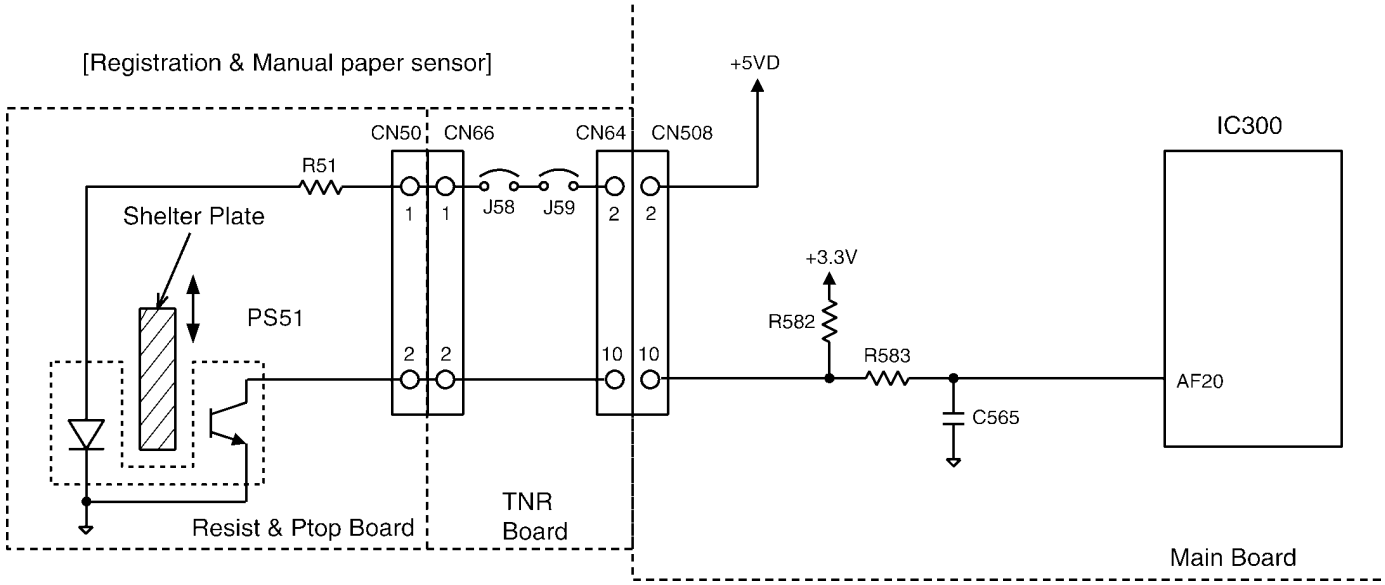


	Photo-transistor	Signal (IC300-AF20pin)
Paper exists	ON	Low level
No paper	OFF	High level

6.12.6. PRINT TIMING SENSOR

This sensor detects whether the recording paper is at the printing position.
When the recording paper is detected, the shelter plate lets the sensor light pass.
So the photo-transistor turns on, and input signal of IC300-W26pin becomes low level.
When the recording paper is not detected, the shelter plate closes the sensor light.
So the photo-transistor turns off, and input signal of IC300-W26pin becomes high level.

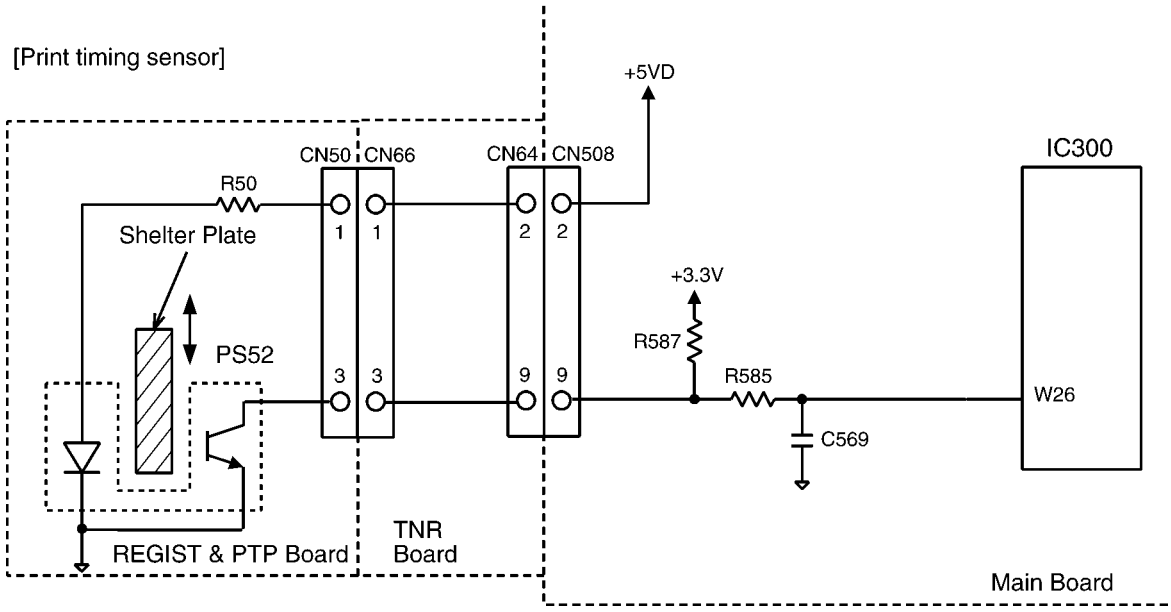


	Photo-transistor	Signal (IC300-113pin)
Paper exists	ON	Low level
No paper	OFF	High level

6.12.7. DOCUMENT SENSOR

This sensor detects whether a document is set in ADF or not.
When a document is set in ADF, the shelter plate closes the sensor light.
So the photo-transistor turns off, and input signal of IC300-AF23pin becomes high level.
When a document is not set in ADF, the shelter plate lets the sensor light pass.
So the photo-transistor turns on, and input signal of IC300-AF23pin becomes low level.

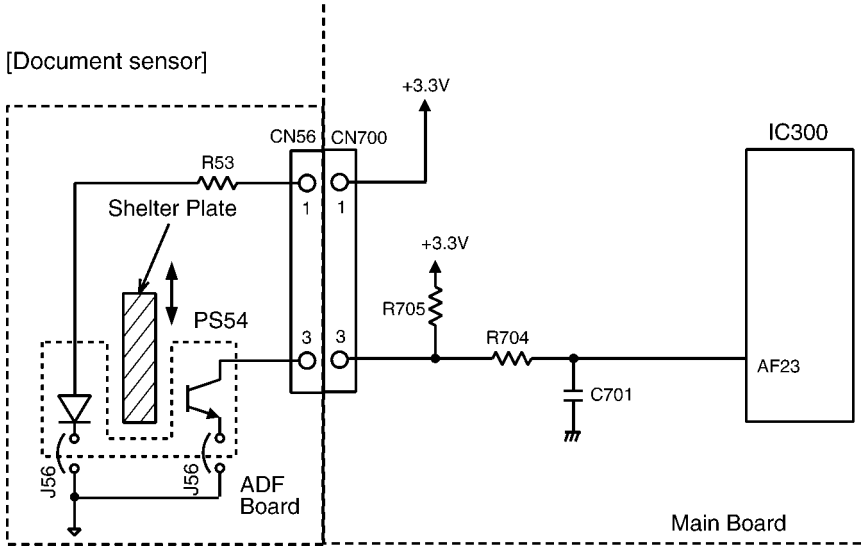
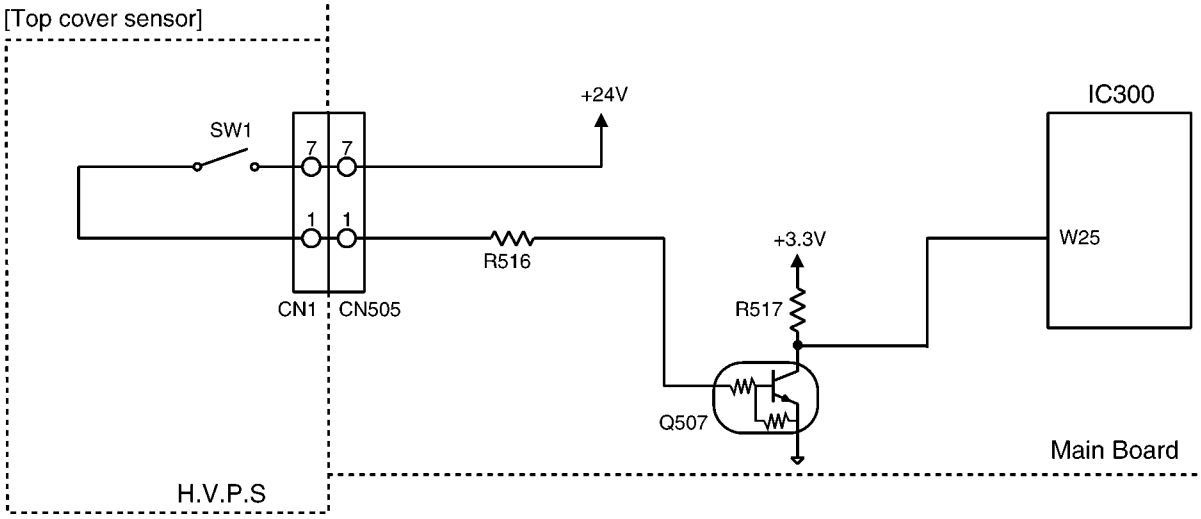


	Photo-transistor	Signal (IC300-AF23)
document exists	OFF	High level
No document	ON	Low level

6.12.8. TOP COVER SENSOR

The Switches detect whether the top cover is open or closed.
When the top cover is closed, the switches turn ON, and the input signal of IC300-W25pin becomes a low level.
When the top cover is open, the switches turns OFF, and the input signal of IC300-W25pin becomes a high level.

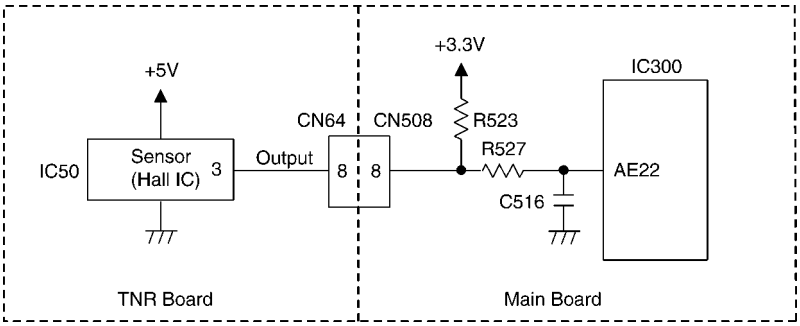


	Switch	Signal (IC300-W25pin)
Open	OFF	High level
Close	ON	Low level

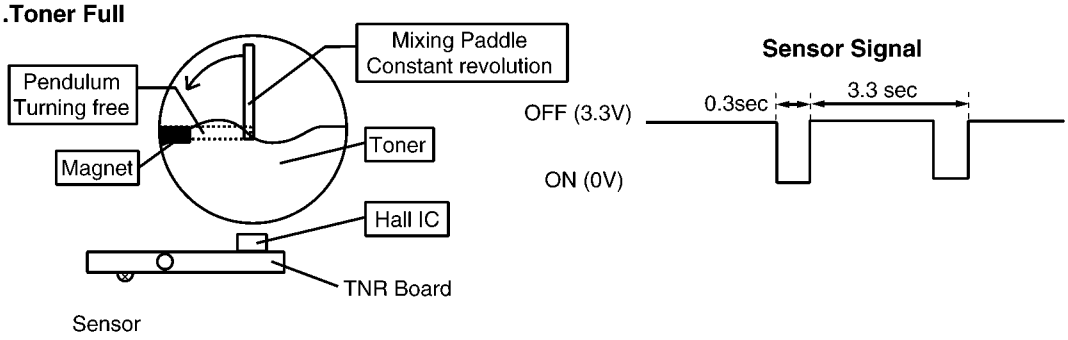
6.12.9. TONER SENSOR.... “TONER EMPTY”, “TONER LOW”, “CHANGE DRUM”

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

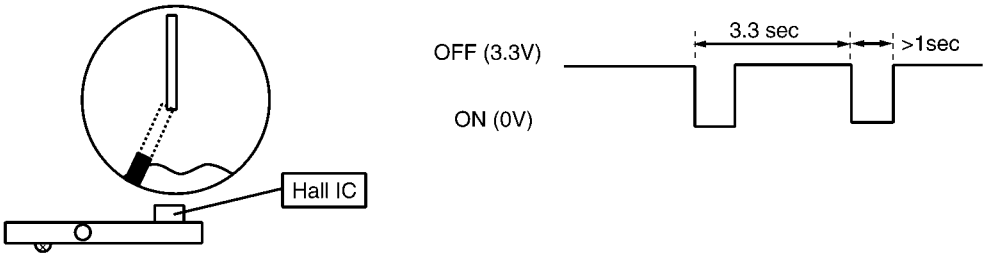
When there is not Drum unit, Hall IC (IC50) turns off, and the input signal of IC300-AE22pin (Main Board) becomes a High level over 9s. When the Drum unit is set, Hall IC (IC50) turns ON/OFF. If the time of IC300-AE22pin's Low level is under 600ms, there is enough toner in Drum unit, if not, toner is near empty.



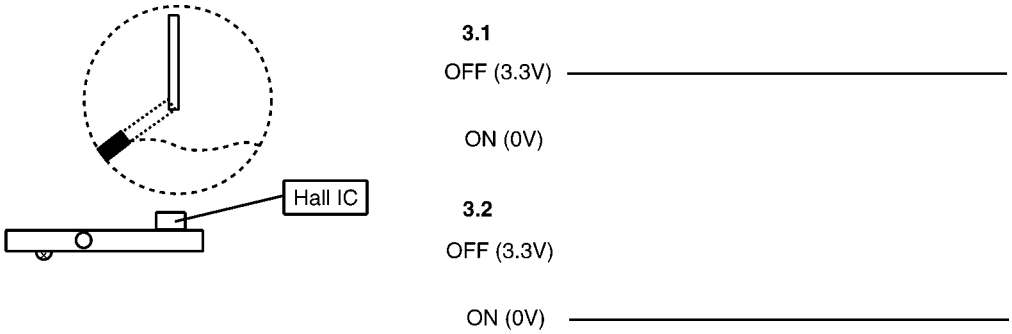
1.Toner Full



2. Toner Low



3. In case the Mixing Paddle does not rotate

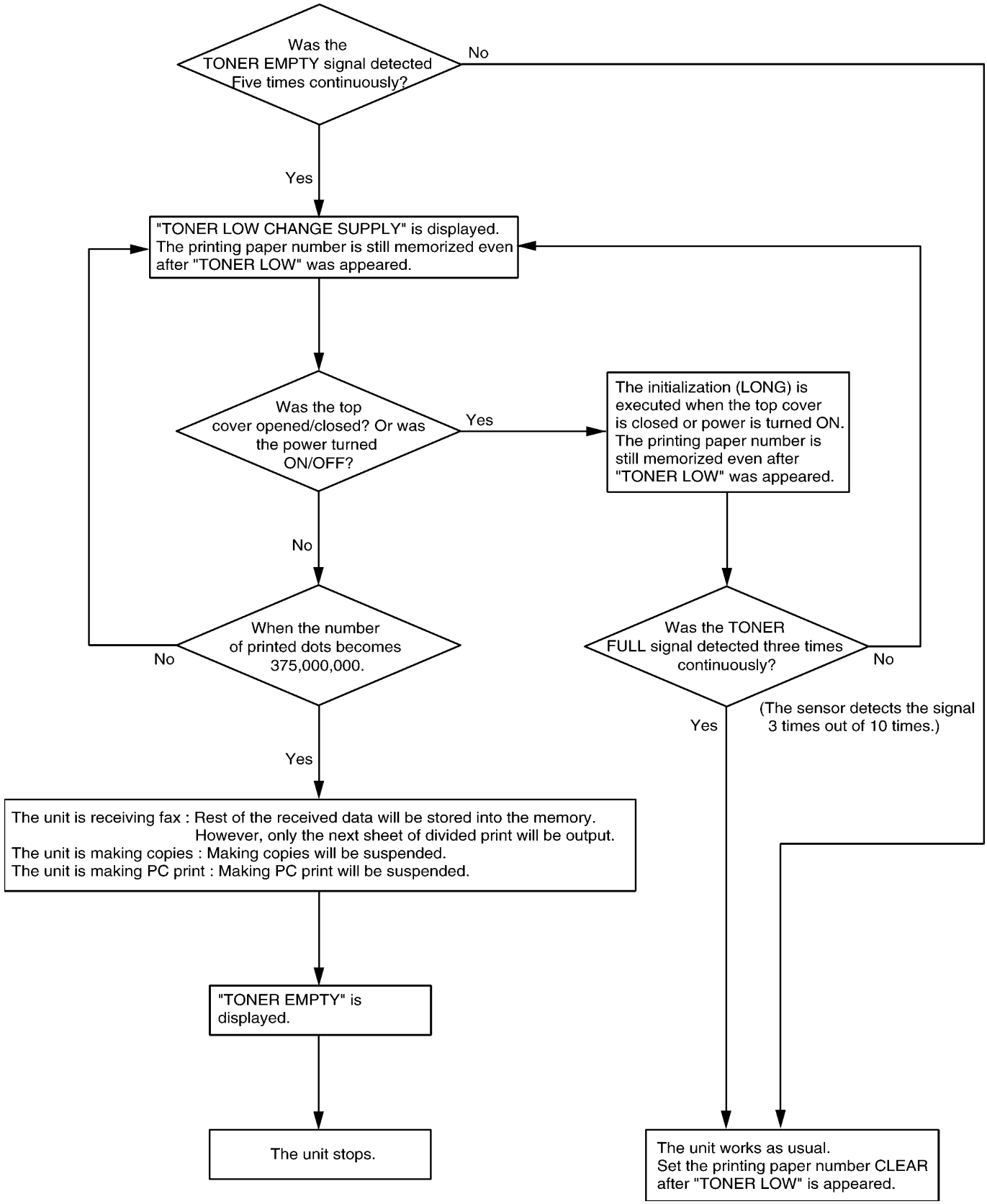


Toner Sensor

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 Hall IC becomes short when toner is left and long with no toner.

State	Display	Signal (IC300-AE22pin)
Toner Set (full)	-	level = about 0.3s
Near Empty Toner	TONER LOW	Low level>1s
Mixing Paddle does not rotate (“CHANGE DRUM”)	CHANGE DRUM	High level fix or Low level fix

6.12.9.1. TONER DETECTION FLOW

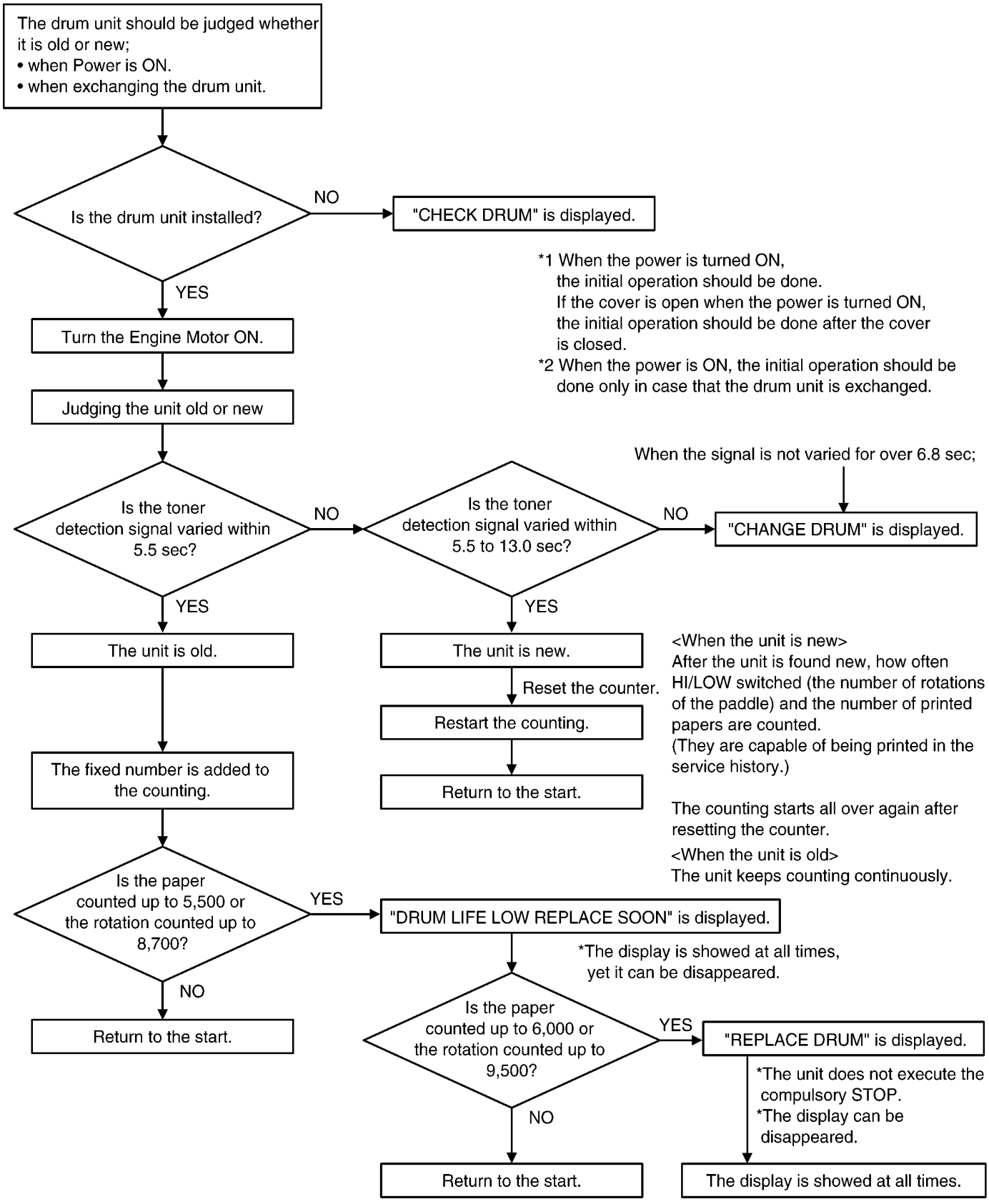


CAUTION:

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 3.3 seconds.

6.12.9.2. Drum Detection

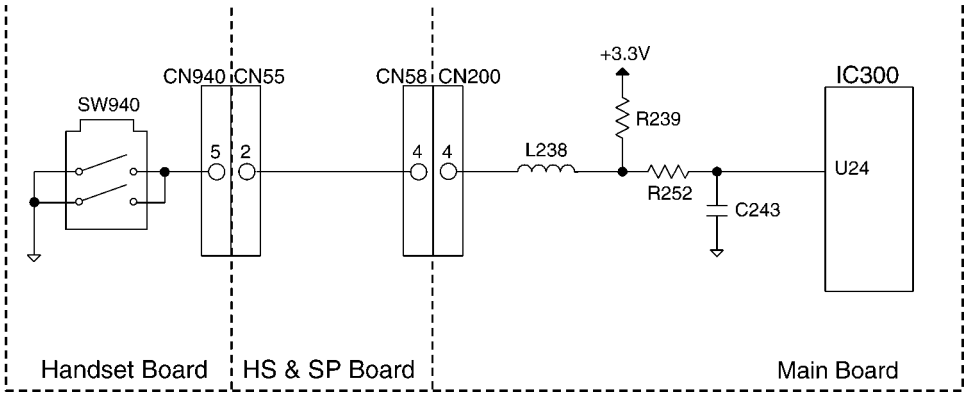
Detection Flowchart



6.12.10. HANDSET HOOK SWITCH

When the handset is raised, the switch is turned off, and the signal of IC300-U24pin becomes low level.
When the handset is settled, the switch is turned on, and the signal of IC300-U24pin becomes high level.

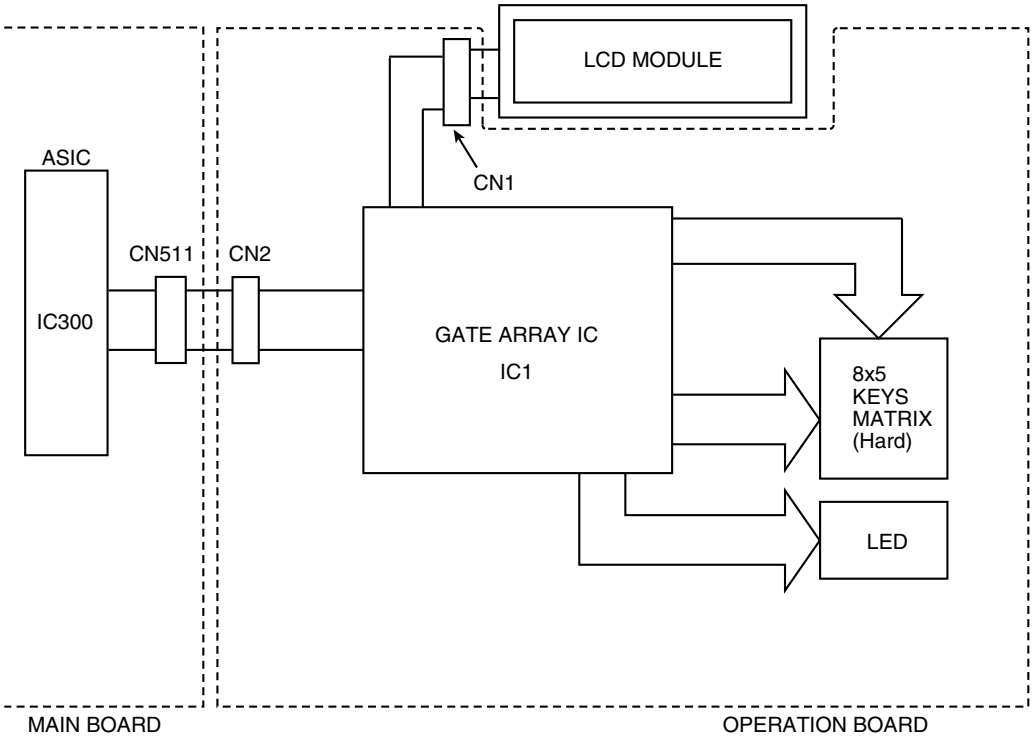
[Handset Hook SW sensor]



	SW940	Signal (IC300-U24pin)
ON HOOK	OPEN	High level
OFF HOOK	CLOSE	Low level

6.13. OPERATION BOARD SECTION

The unit consists of a LCD (Liquid crystal display), KEYs and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC1) on Operation board and IC300 on Main 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	S1	S3	MONITOR	↓	*	#	-
KSL1	FAX	S2	ZOOM	FLASH	←	7	0	START
KSL2	COPY	COLLATE		REDIAL	SET	4	9	6
KSL3		CONTRAST	N in 1	MENU	↑	2	5	STOP
KSL4 (LED7)	SCAN	RESOLUTION	LOWER	CALLER ID	→	1	8	3

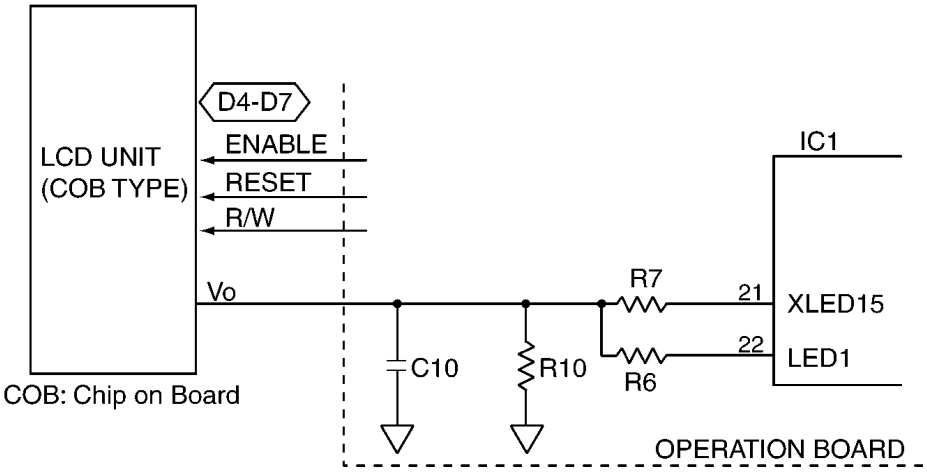
*LED7 should be set to KSL4. "8 x 5" key matrix is executed by hardware scanning.

2. **LED**
   - AUTO ANSWER LED ON/OFF port---LED6 (IC1-2pin)
   - FAX MODE LED ON/OFF port---XLED8 (IC1-5pin)
   - COPY MODE LED ON/OFF port---LED5 (IC1-41pin)
   - SCAN MODE LED ON/OFF port---LED2 (IC1-36pin)

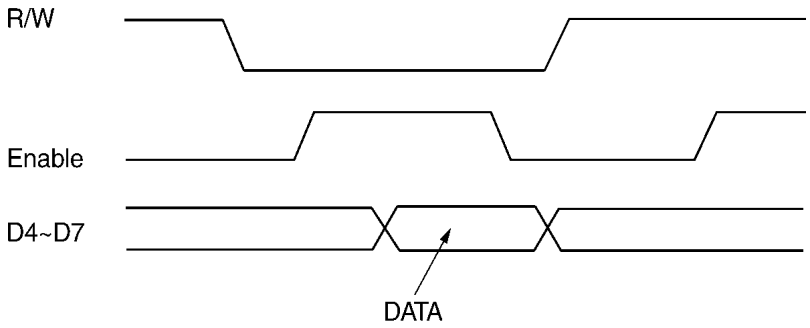
6.14. LCD SECTION

The Gate Array (IC1) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the LCD drive. R118 and R117 are density control resistors.
Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC1).

Circuit Diagram



Timing Chart



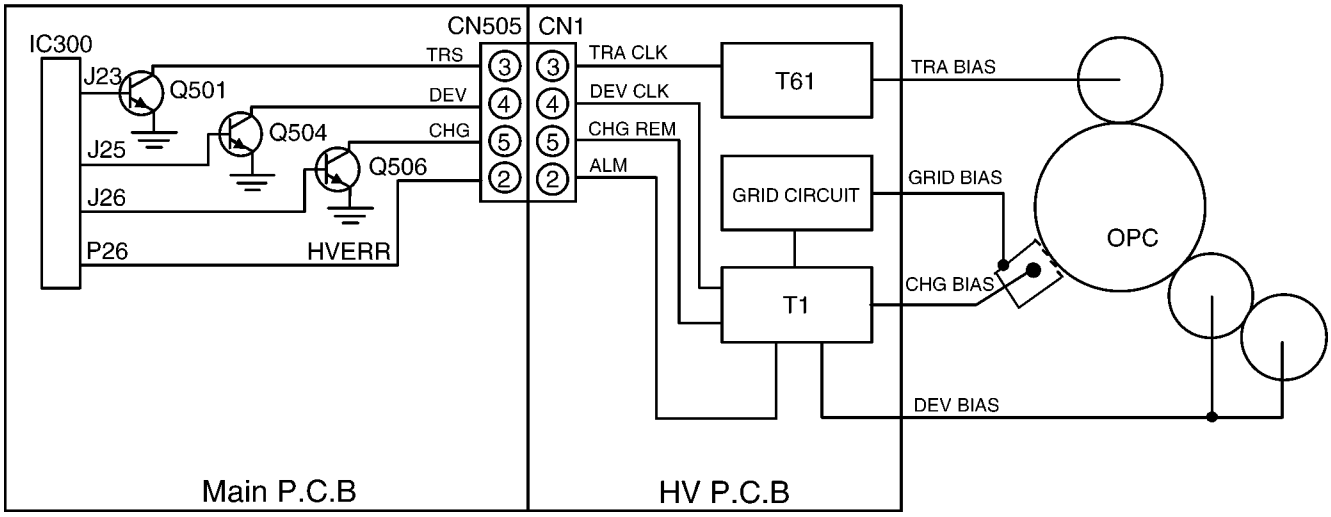
6.15. HVPS (High Voltage Power Supply) SECTION

6.15.1. HVPS SPECIFICATION

	Charge (CHG)	Grid	Developing DC	Developing AC	Transfer (TRA) -	Transfer (TRA) +
Output Characteristics	Constant current	Constant voltage	Constant voltage	Constant voltage	Constant current (Variable)	Constant voltage
Nominal Output Voltage	4.35KV	475±10V	230V±15V (50~300V) PWM20% 300MΩ/220pF	330V±15Vp-p 34KHz	100MΩ (-1.48KV)	785V±100V
Nominal Output Current	200±15μA (19.4MΩ)	200μA	0.73μA	-----	-14.8μA±1μA (0μA~25μA) PWM 35%	1000MΩ (0.8μA)
Load Range	18.1MΩ~20.6MΩ	-----	100MΩ~2000MΩ	-----	33.8MΩ~284MΩ	10MΩ~1000MΩ
Constant Current Range	4.1~4.6KV	-----	-----	-----	-0.5KV ~ -4.2KV	-----

As for the developing voltage, the DC voltage and AC voltage are overlapped and output from an output terminal.
There is one terminal for transcription output and + and - are switched to be output.

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



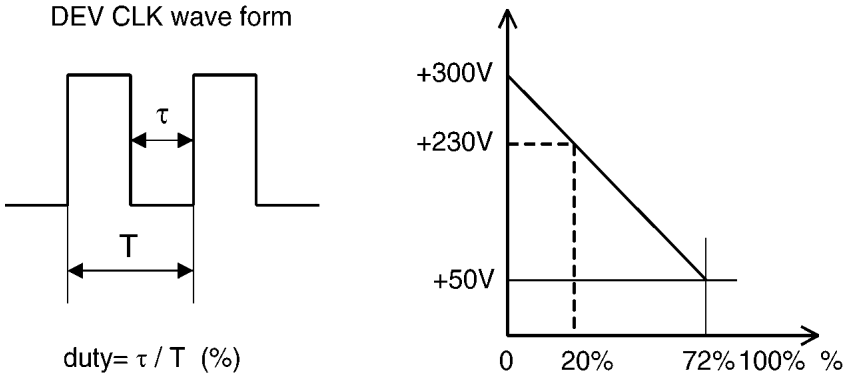
6.15.2. CHG-BIAS (Charge BIAS)/GRID/ UNIT

When IC300 turns on the transistor Q506, CHG REM becomes “L”, and Charge BIAS (200μA) is output from CHG OUTPUT. GRID BIAS is generated by the current flowing in the GRID circuit via charge wire and GRID.

6.15.3. DEV DC BIAS UNIT

When CHG REM is “L”, 5.425kHz PWM (Pulse Width Modulation) is input from IC300 to DEV CLK through Q504, developing voltage corresponding to the DUTY of PWM signal is output from DEV OUTPUT. Also DUTY is adjusted by the utilization of the developing unit and environmental temperature.

Transfer Current Variation by PWM Input



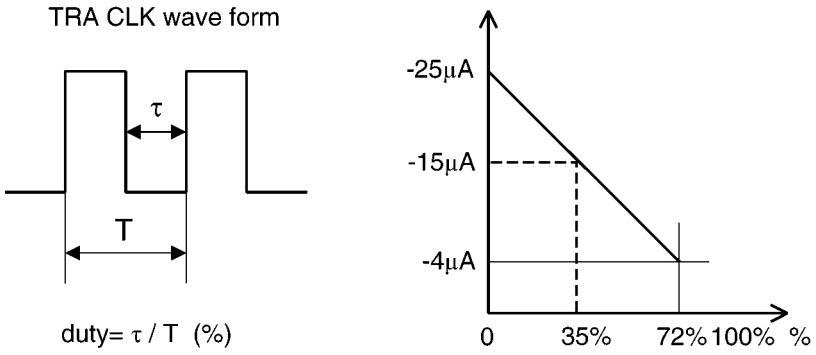
6.15.4. DEV AC BIAS UNIT

330 Vp-p 34 kHz wave of developing AC voltage is output from DEV OUTPUT. This voltage is overlapped with developing DC voltage and output as AC voltage that includes the development DC voltage.

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

When CHG REM is “L” and TRA CLK is “open”, Charge BIAS (200μA) is output from CHG OUTPUT, and at the same time Transfer (+) BIAS (785V) is output from TRA OUTPUT. When 5.086kHz PWM (Pulse Width Modulation) signal is input to TRA CLK through transistor Q501, Transfer (-) CURRENT BIAS corresponding to PWM signal is output from TRA OUTPUT.

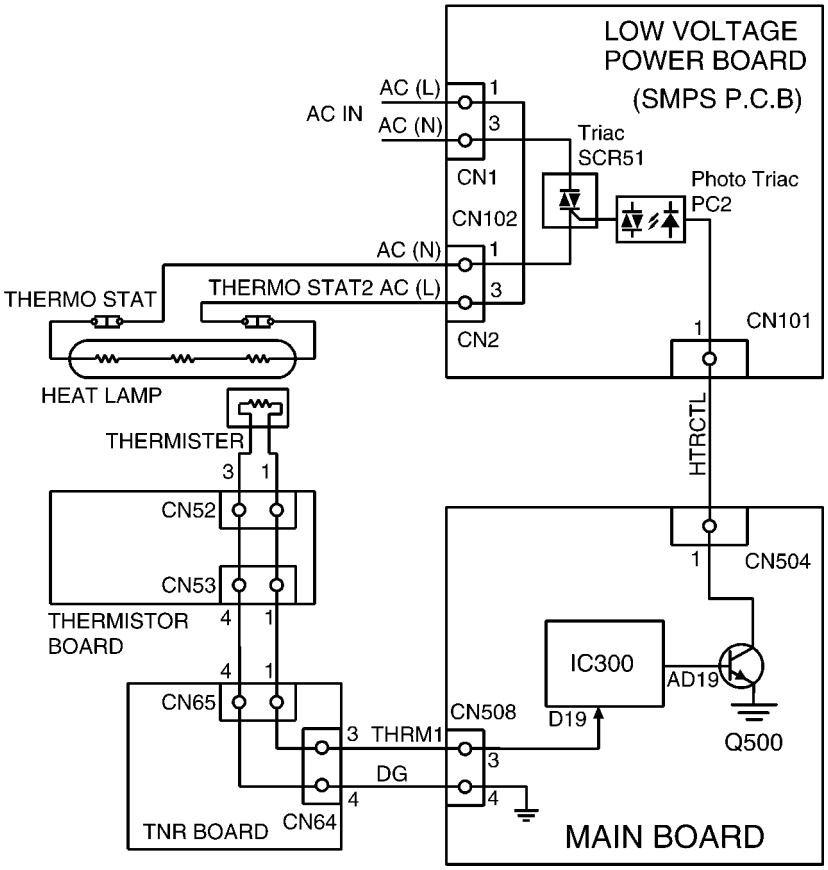
Transcription current variation corresponding to PWM input



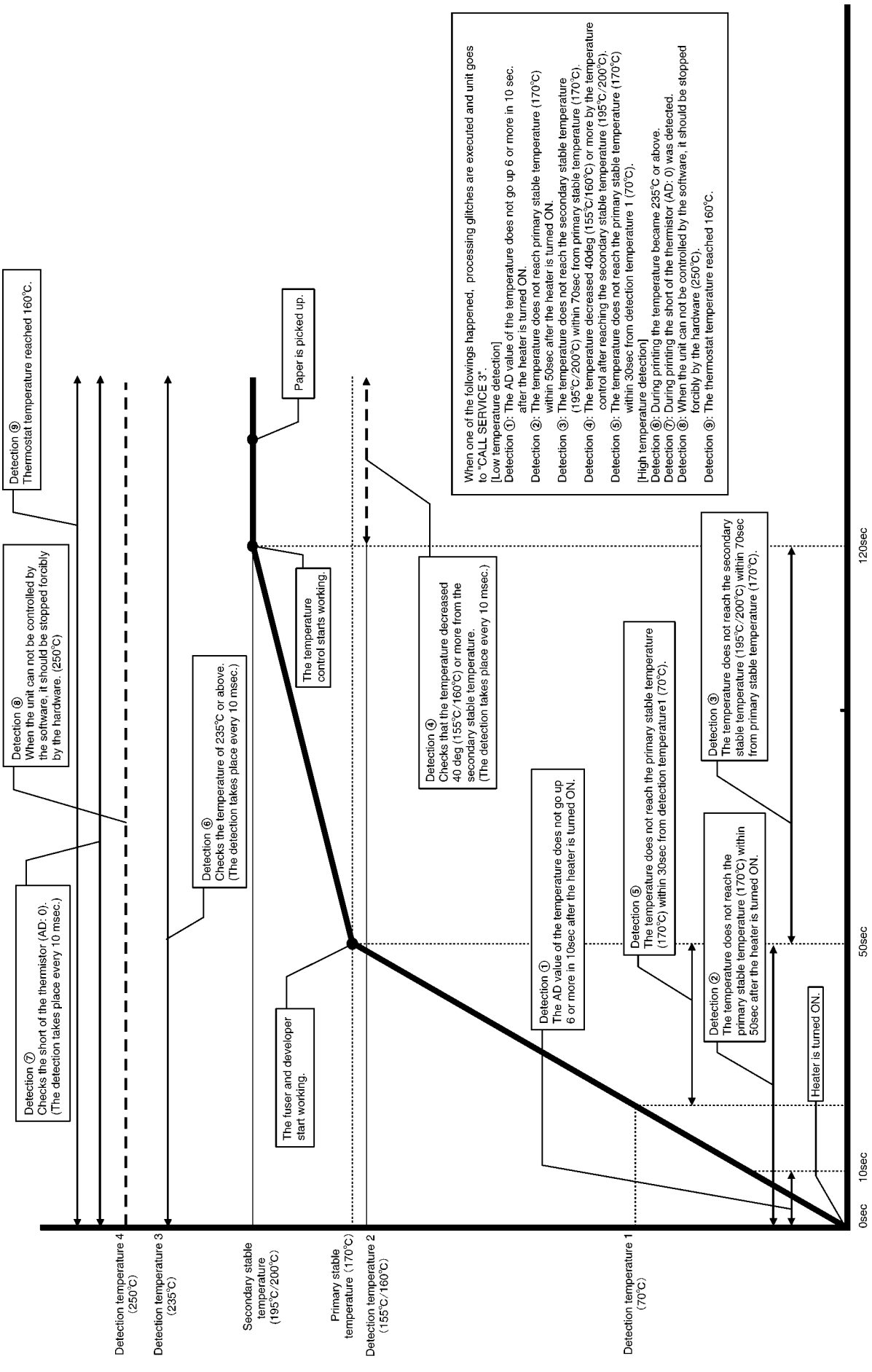
6.16. HEAT LAMP CONTROL CIRCUIT

The temperature of the fixing part of the Fuser Unit is converted to a voltage by THERMISTOR and input to IC300-D19pin. The heat lamp is turned on/off by the HTRCTL signal (IC300-AD19pin) through the photo triac (PC2) and the triac (SCR51). And two thermostats are set on the AC line as the safety devices.

Circuit Diagram



1. **Control at Printing**
   a. After the printing signal is received, turn ON the heater.
   b. After that, turn ON the motor at the Primary Stable Temperature (170°C).
   c. After that, control at the Secondary Stable temperature (195°C/200°C), and feed papers.

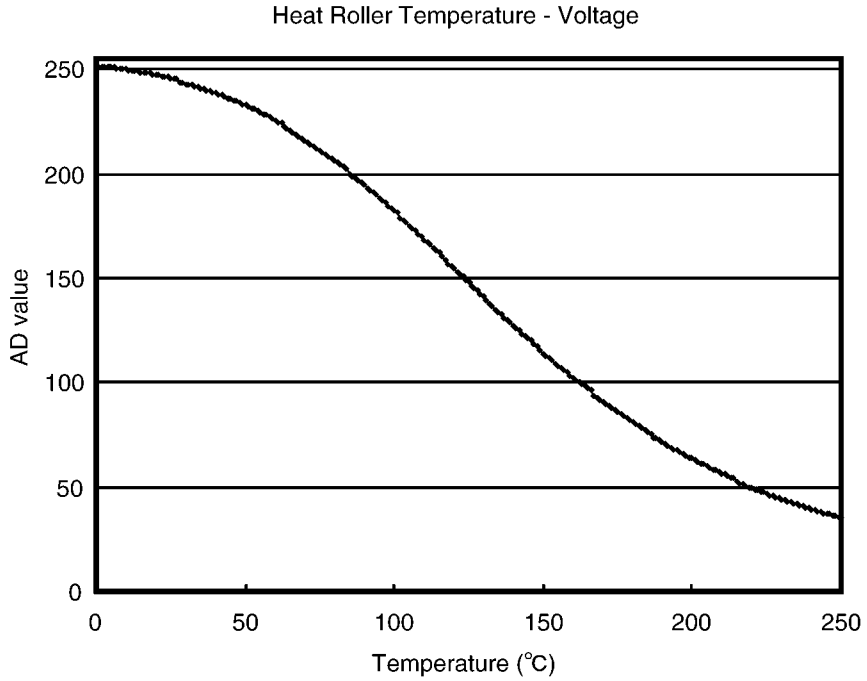


2. Safety Protection

a. 2 thermostats are provided with the unit, and the heater circuit is shut down when their surface temperatures became over 160°C.

b. The heater control circuit of IC300 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 250°C, the heater control circuit of IC300 is turned off forcedly and system reset (IC300-AC18pin becomes Low) will be executed.



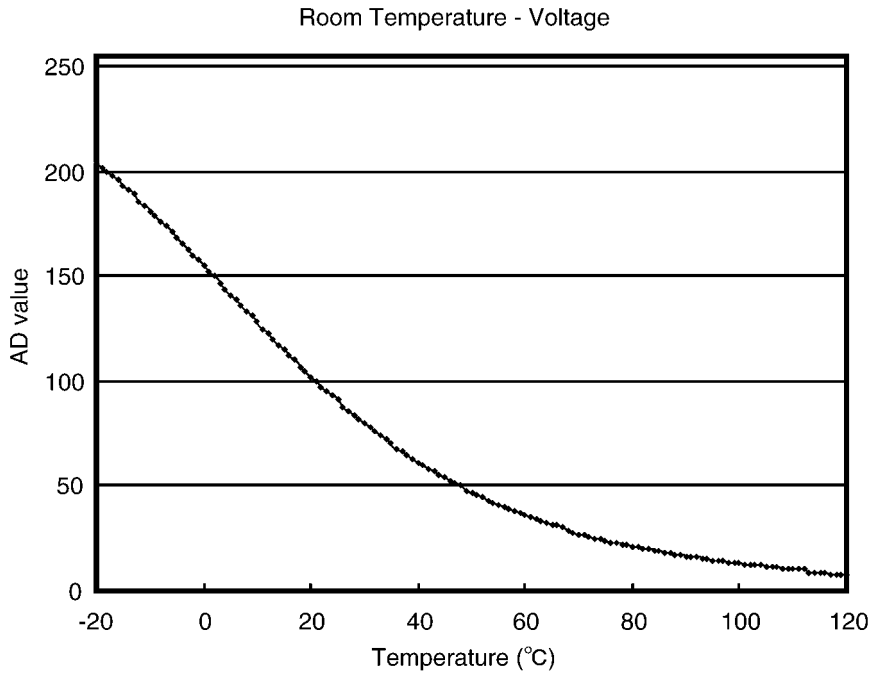
The correspondence readings between temperature measured by thermistor and HEX readings

Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading
0	252	FC	84	202	CA	168	93	5D
1	251	FB	85	200	C8	169	92	5C
2	251	FB	86	199	C7	170	91	5B
3	251	FB	87	198	C6	171	90	5A
4	251	FB	88	197	C5	172	89	59
5	251	FB	89	196	C4	173	88	58
6	251	FB	90	195	C3	174	87	57
7	250	FA	91	193	C1	175	86	56
8	250	FA	92	192	C0	176	85	55
9	250	FA	93	191	BF	177	84	54
10	250	FA	94	190	BE	178	83	53
11	249	F9	95	188	BC	179	82	52
12	249	F9	96	187	BB	180	81	51
13	249	F9	97	186	BA	181	80	50
14	249	F9	98	184	B8	182	79	4F
15	248	F8	99	183	B7	183	78	4E
16	248	F8	100	182	B6	184	77	4D
17	248	F8	101	181	B5	185	76	4C
18	248	F8	102	179	B3	186	75	4B
19	247	F7	103	178	B2	187	74	4A
20	247	F7	104	177	B1	188	74	4A
21	247	F7	105	175	AF	189	73	49
22	246	F6	106	174	AE	190	72	48
23	246	F6	107	173	AD	191	71	47
24	246	F6	108	171	AB	192	70	46
25	245	F5	109	170	AA	193	69	45
26	245	F5	110	168	A8	194	68	44
27	245	F5	111	167	A7	195	68	44
28	244	F4	112	166	A6	196	67	43
29	244	F4	113	164	A4	197	66	42
30	243	F3	114	163	A3	198	65	41
31	243	F3	115	162	A2	199	64	40

Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading
32	243	F3	116	160	A0	200	64	40
33	242	F2	117	159	9F	201	63	3F
34	242	F2	118	157	9D	202	62	3E
35	241	F1	119	156	9C	203	61	3D
36	241	F1	120	155	9B	204	61	3D
37	240	F0	121	153	99	205	60	3C
38	240	F0	122	152	98	206	59	3B
39	239	EF	123	151	97	207	58	3A
40	239	EF	124	149	95	208	58	3A
41	238	EE	125	148	94	209	57	39
42	238	EE	126	146	92	210	56	38
43	237	ED	127	145	91	211	56	38
44	236	EC	128	144	90	212	55	37
45	236	EC	129	142	8E	213	54	36
46	235	EB	130	141	8D	214	54	36
47	235	EB	131	139	8B	215	53	35
48	234	EA	132	138	8A	216	52	34
49	233	E9	133	137	89	217	52	34
50	233	E9	134	135	87	218	51	33
51	232	E8	135	134	86	219	50	32
52	231	E7	136	133	85	220	50	32
53	231	E7	137	131	83	221	49	31
54	230	E6	138	130	82	222	49	31
55	229	E5	139	129	81	223	48	30
56	228	E4	140	127	7F	224	48	30
57	228	E4	141	126	7E	225	47	2F
58	227	E3	142	125	7D	226	46	2E
59	226	E2	143	123	7B	227	46	2E
60	225	E1	144	122	7A	228	45	2D
61	224	E0	145	121	79	229	45	2D
62	224	E0	146	120	78	230	44	2C
63	223	DF	147	118	76	231	44	2C
64	222	DE	148	117	75	232	43	2B
65	221	DD	149	116	74	233	43	2B
66	220	DC	150	114	72	234	42	2A
67	219	DB	151	113	71	235	42	2A
68	218	DA	152	112	70	236	41	29
69	217	D9	153	111	6F	237	41	29
70	216	D8	154	109	6D	238	40	28
71	215	D7	155	108	6C	239	40	28
72	214	D6	156	107	6B	240	39	27
73	213	D5	157	106	6A	241	39	27
74	212	D4	158	105	69	242	38	26
75	211	D3	159	103	67	243	38	26
76	210	D2	160	102	66	244	37	25
77	209	D1	161	101	65	245	37	25
78	208	D0	162	100	64	246	37	25
79	207	CF	163	99	63	247	36	24
80	206	CE	164	98	62	248	36	24
81	205	CD	165	97	61	249	35	23
82	204	CC	166	96	60	250	35	23
83	203	CB	167	94	5E			

Note:

The value is displayed on LCD at **TEST FUNCTIONS** (P.83) [#815].



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

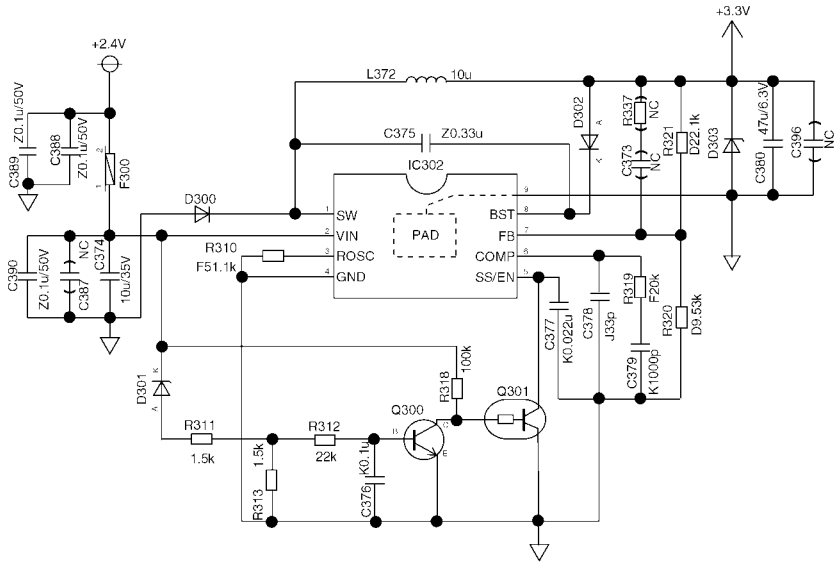
Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading
-20	204	CC	27	86	56	74	25	19
-19	202	CA	28	84	54	75	24	18
-18	200	C8	29	82	52	76	23	17
-17	198	C6	30	80	50	77	23	17
-16	196	C4	31	78	4E	78	22	16
-15	193	C1	32	76	4C	79	22	16
-14	191	BF	33	74	4A	80	21	15
-13	189	BD	34	72	48	81	21	15
-12	186	BA	35	70	46	82	20	14
-11	184	B8	36	68	44	83	20	14
-10	181	B5	37	67	43	84	19	13
-9	179	B3	38	65	41	85	19	13
-8	176	B0	39	63	3F	86	18	12
-7	174	AE	40	61	3D	87	18	12
-6	171	AB	41	60	3C	88	17	11
-5	168	A8	42	58	3A	89	17	11
-4	166	A6	43	57	39	90	16	10
-3	163	A3	44	55	37	91	16	10
-2	160	A0	45	54	36	92	16	10
-1	158	9E	46	52	34	93	15	0F
0	155	9B	47	51	33	94	15	0F
1	152	98	48	50	32	95	14	0E
2	150	96	49	48	30	96	14	0E
3	147	93	50	47	2F	97	14	0E
4	144	90	51	46	2E	98	13	0D
5	141	8D	52	45	2D	99	13	0D
6	139	8B	53	43	2B	100	13	0D
7	136	88	54	42	2A	101	12	0C
8	133	85	55	41	29	102	12	0C
9	131	83	56	40	28	103	12	0C
10	128	80	57	39	27	104	12	0C
11	125	7D	58	38	26	105	11	0B
12	123	7B	59	37	25	106	11	0B
13	120	78	60	36	24	107	11	0B
14	117	75	61	35	23	108	10	0A
15	115	73	62	34	22	109	10	0A
16	112	70	63	33	21	110	10	0A
17	110	6E	64	32	20	111	10	0A
18	107	6B	65	31	1F	112	10	0A
19	105	69	66	31	1F	113	9	09

Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading	Temperature [C°]	AD value	HEX reading
20	102	66	67	30	1E	114	9	09
21	100	64	68	29	1D	115	9	09
22	97	61	69	28	1C	116	9	09
23	95	5F	70	27	1B	117	8	08
24	93	5D	71	27	1B	118	8	08
25	91	5B	72	26	1A	119	8	08
26	88	58	73	25	19	120	8	08

6.17. Main Board Section

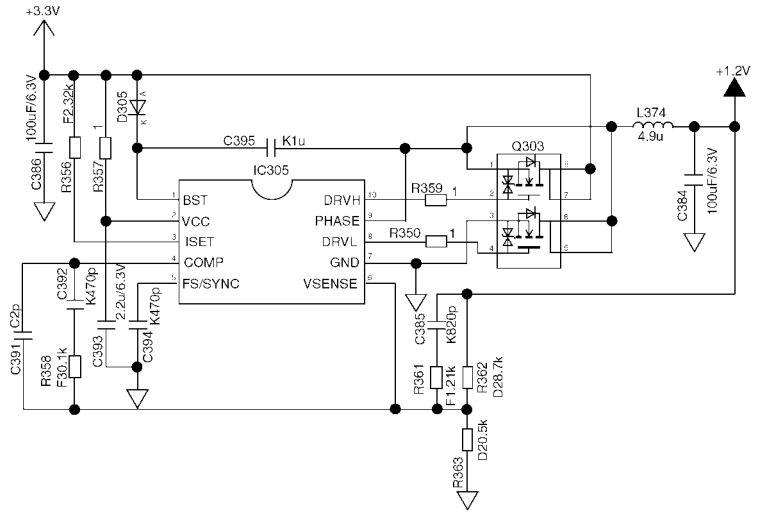
3.3V Power Supply descriptions

- IC 302 decreases the output voltage when NPN transistor installed chopper amplifier type switching regulator produces 2.3A min or over at the output voltage.
  Oscillation frequency is set at approximately 500kHz.
- C375 and D302 are boost circuits as a base driving voltage for buit-in transistors.
- D301,R311,R312,R313,C375,Q300,R318,Q301are UVLO (Under Voltage Lock Out) circuit.
  Q301 turns on when the in-out voltage is 17V or less and SS/SE terminal becomes low so that IC302's operation is stopped.
- D303 controls no to be a over voltage at 3.3V output when ICs including IC302 break down.



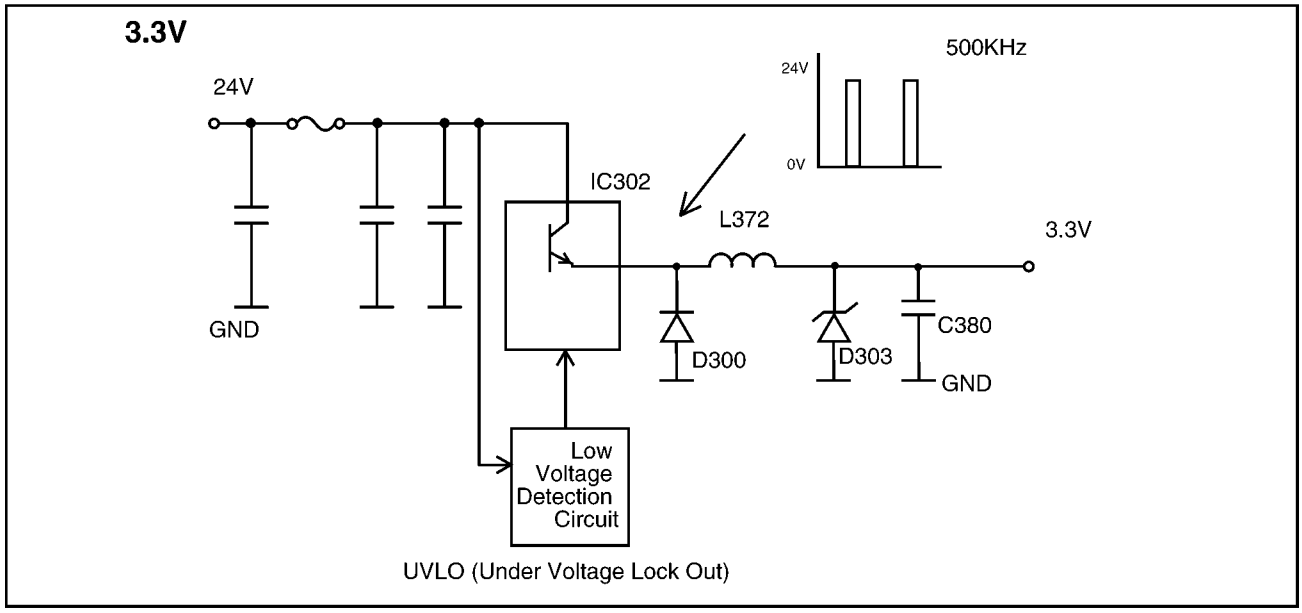
1.2V Power Supply descriptions

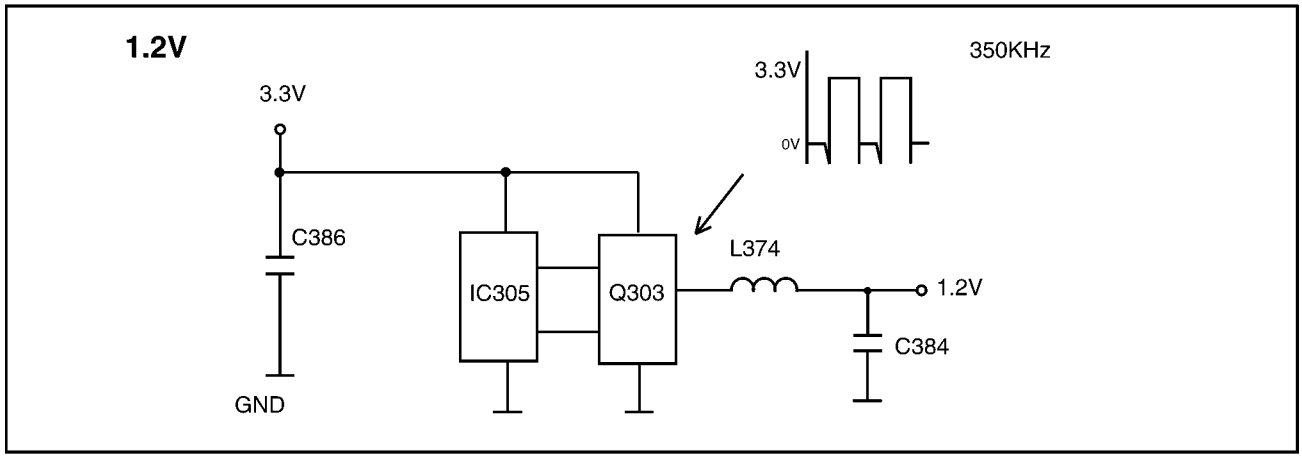
- IC305 is Nch FET used Switching Regulator with synchronous rectification system.
  Oscillation frequency is set at approximately 350kHz.
- R356 is a resistor for decreasing the output voltage when the output current shows high.
  The value is compared with the voltage drop at FET.
- C395 and D305 are FET's boost circuit as a gate driving voltage.

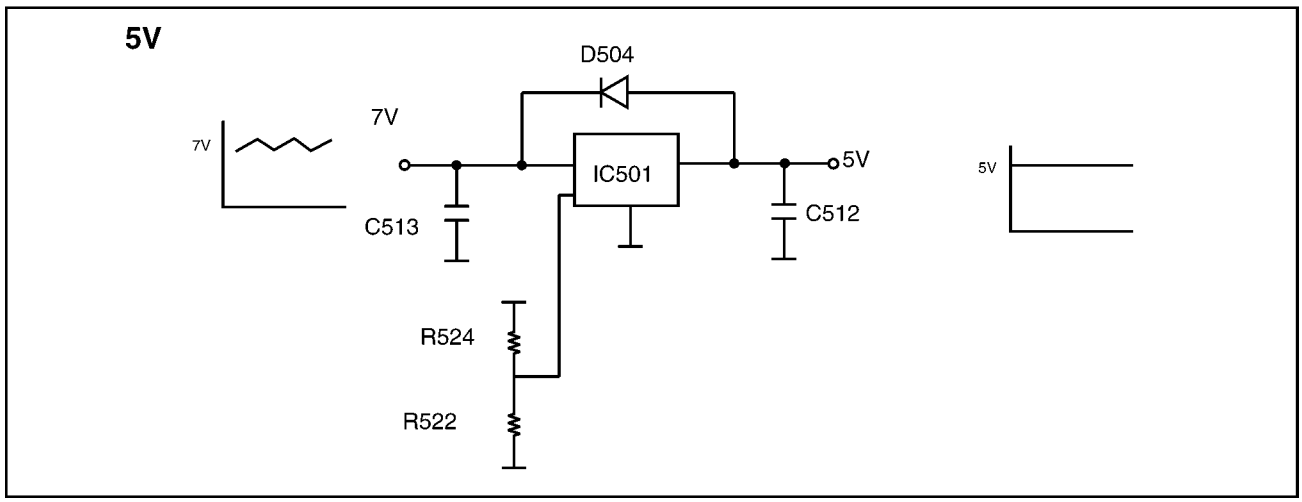


DC-DC Main Board Supply

DC-DC POWER SUPPLY

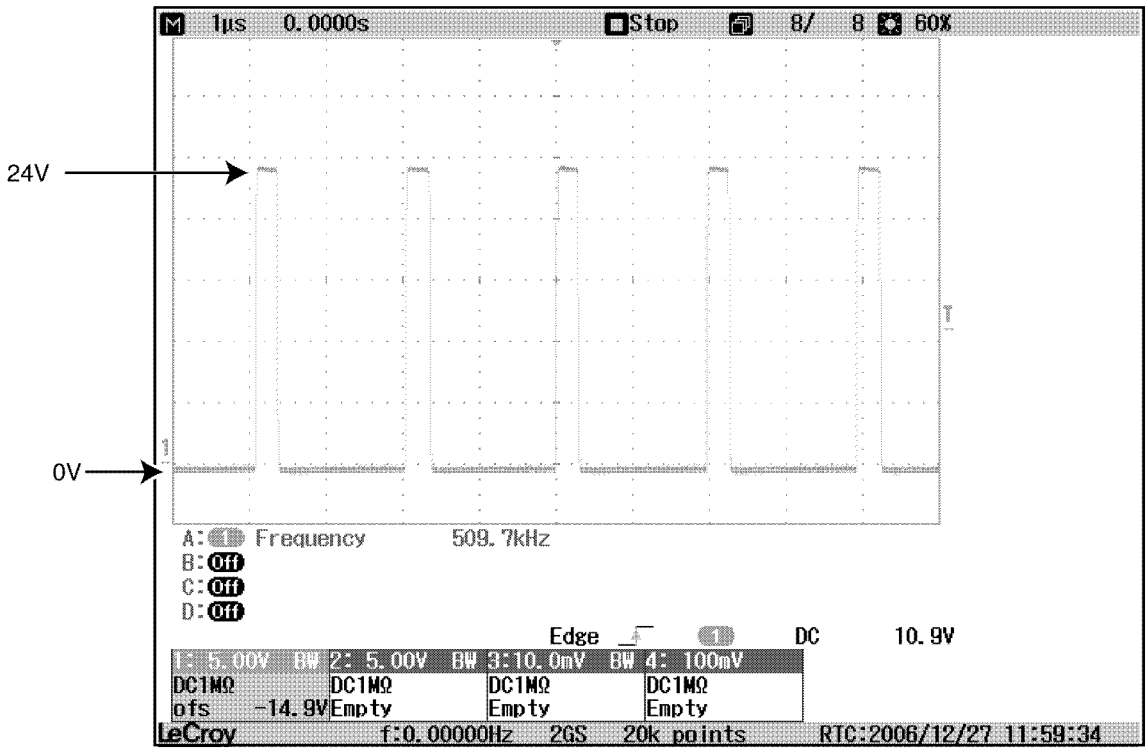




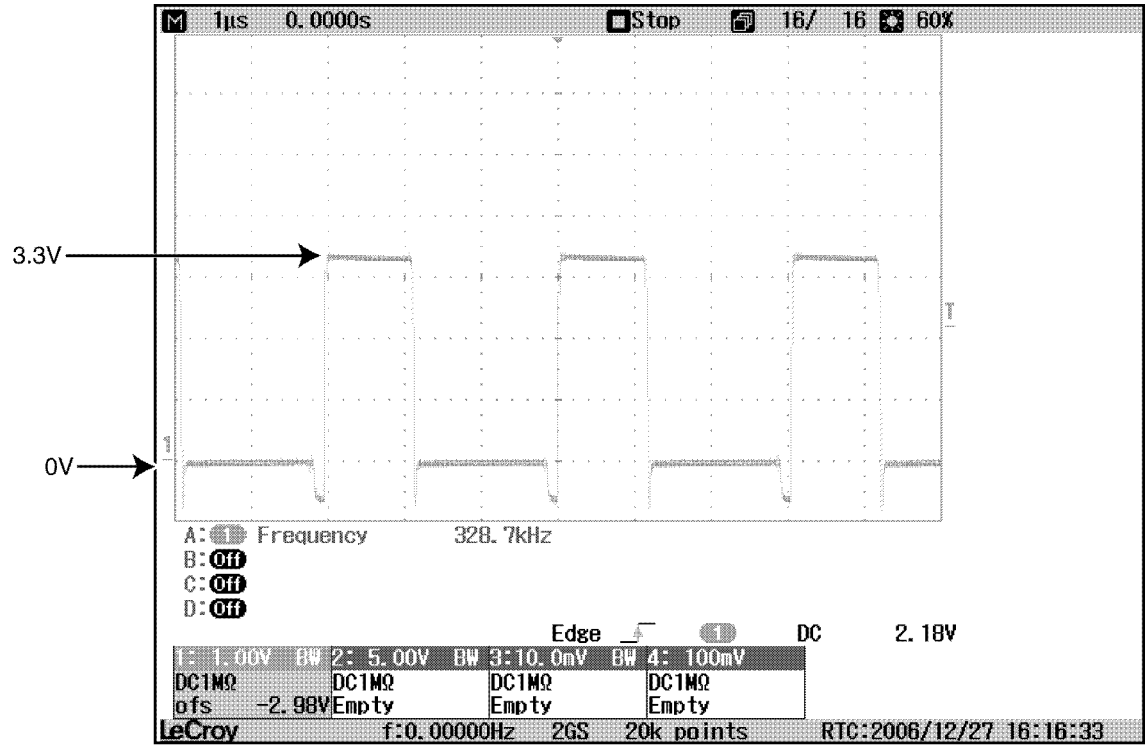


wave form

3.3V



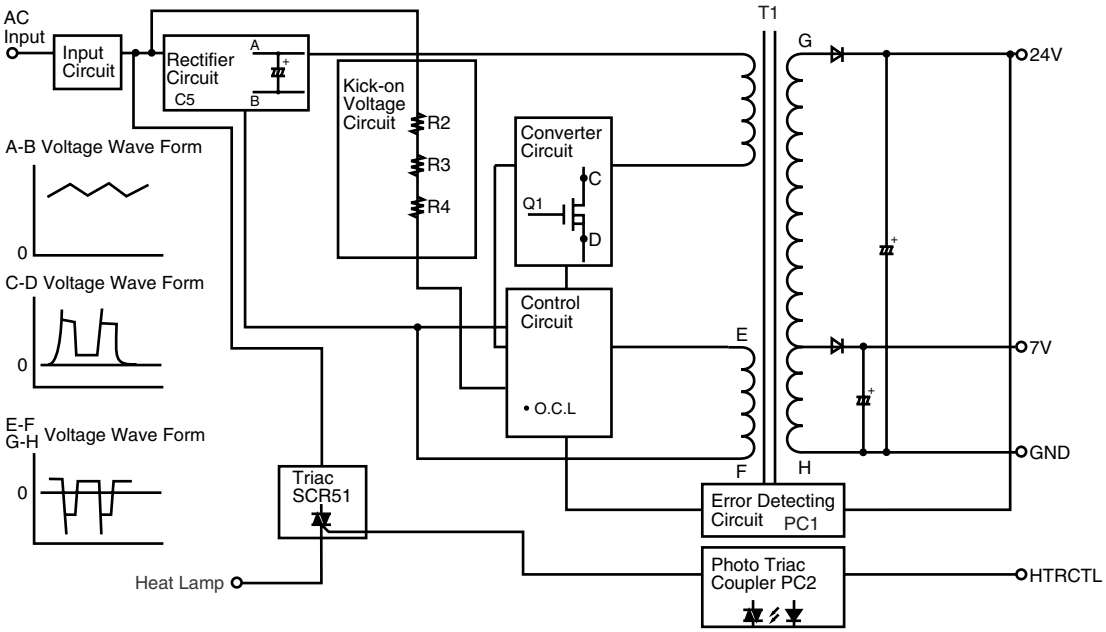
1.2V



6.18. POWER SUPPLY BOARD SECTION

The power supply board circuit generates +7V and +24Vdc. It also supplies AC voltage to the halogen heat lamp in the fuser unit.
The power supply board uses the switching regulator method.

Block Diagram



[Input Circuit]

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

[Rectifier Circuit]

The input circuit is rectified by D10 to D13 and charge C5 to make DC voltage.
Then it supplies power to the converter circuit.

[Kick-on Voltage Circuit]

Bias is applied to the Q1 gate via this circuit when the AC power is turned on and Q1 begins operating.

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

The highest drain current of Q1 is limited by a limit current circuit. The 24V output is limited by this circuit.

[Over Voltage Circuit]

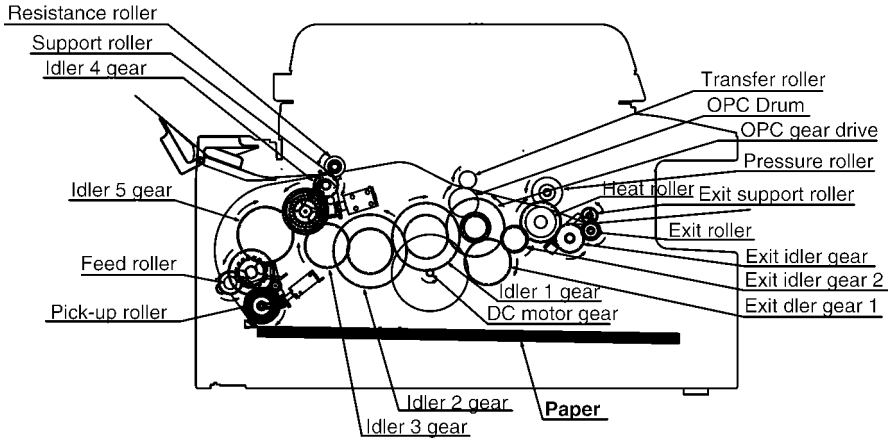
If the 24V output increases because the error detecting circuit or control circuit is broken, Control circuit will recognize this signal and output becomes 0V. D104 and D503 also prevent over voltage.

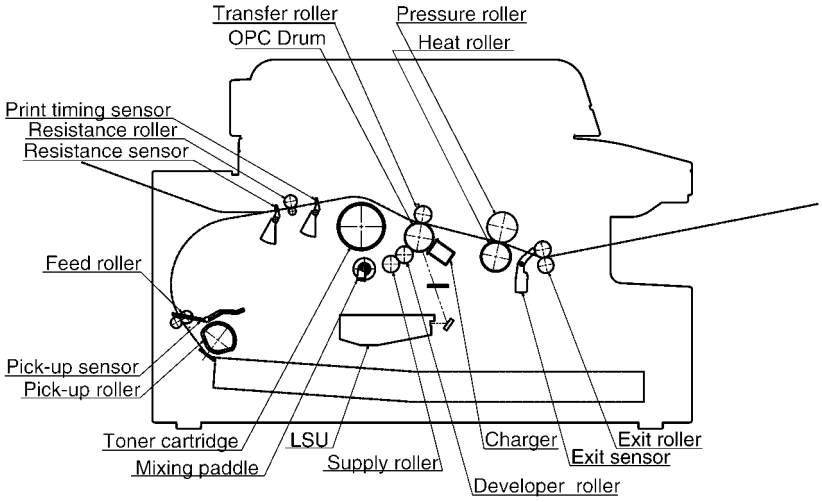
Dummy load method (to quickly check the power supply output)

Refer to **POWER SUPPLY BOARD SECTION** (P.181).

6.19. Mechanical Operation

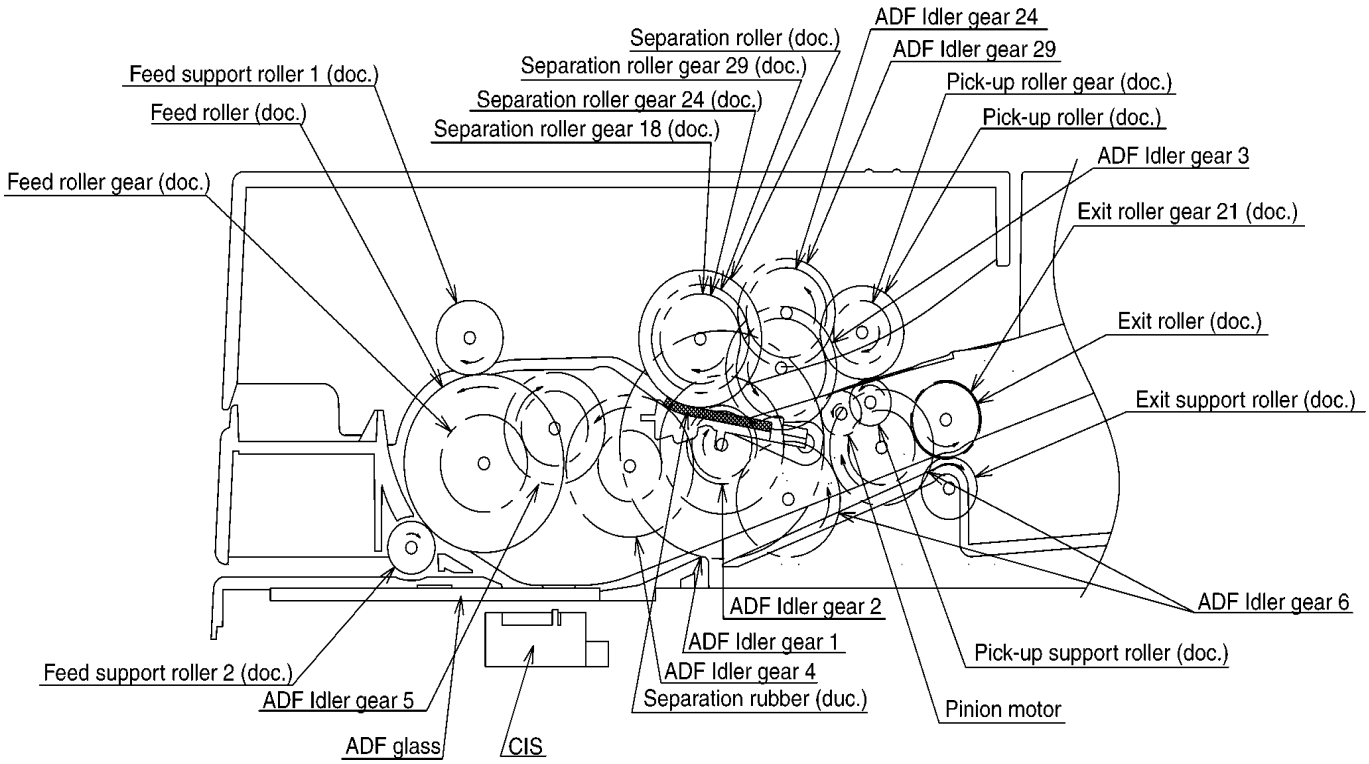
6.19.1. PRINTING





The main motor gear rotates as shown in figure.
GEAR DRIVE OPC drives each part of fixing and developing.
When paper is fed from the standard cassette, the plunger of solenoid is pulled to drive PICK UP ROLLER (STANDARD), then the roller starts feeding paper.
When paper is fed manually, first the plunger of solenoid is pulled to stop RESISTANT ROLLER. After a few moments turn off the solenoid to drive RESISTANT ROLLER, then the roller starts feeding paper.

6.19.2. SCANNING (ADF)



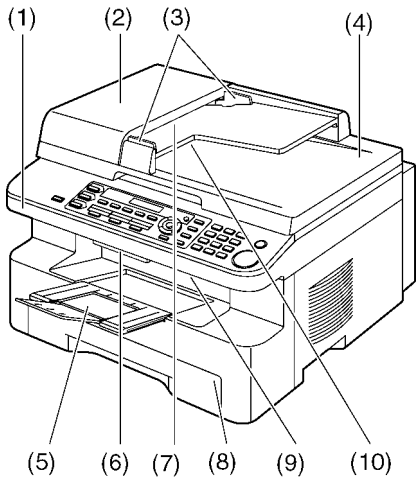
• DOCUMENT TRANSMISSION (ADF)
The frictional force between SEPARATION ROLLER (DOC.)and SEPARATION RUBBER makes PICK UP ROLLER (DOC.) move downward from standby position to pick up paper.
Pick-upped paper is separated by SEPARATION ROLLER (DOC.) and SEPARATION RUBBER (DOC.), and then fed by FEED ROLLER (DOC.).
After being read by CIS, the paper is ejected by ROLLER DOC EJECT.

• DOCUMENT TRANSMISSION (SCANNER GLASS)
CIS Module is carried by the belt timing along the shaft carriage to the reading start position.
Then it goes back to the home position reading the document through the glass.

7 Location of Controls and Components

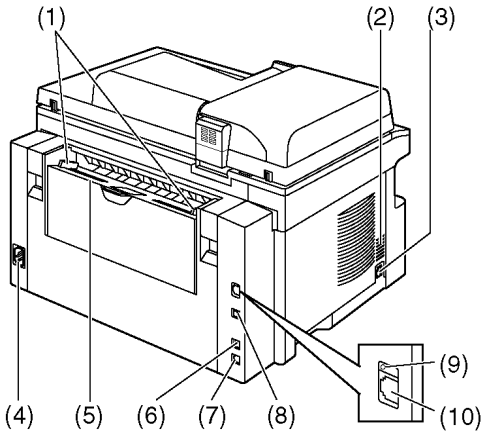
7.1. OVERVIEW

7.1.1. Front view



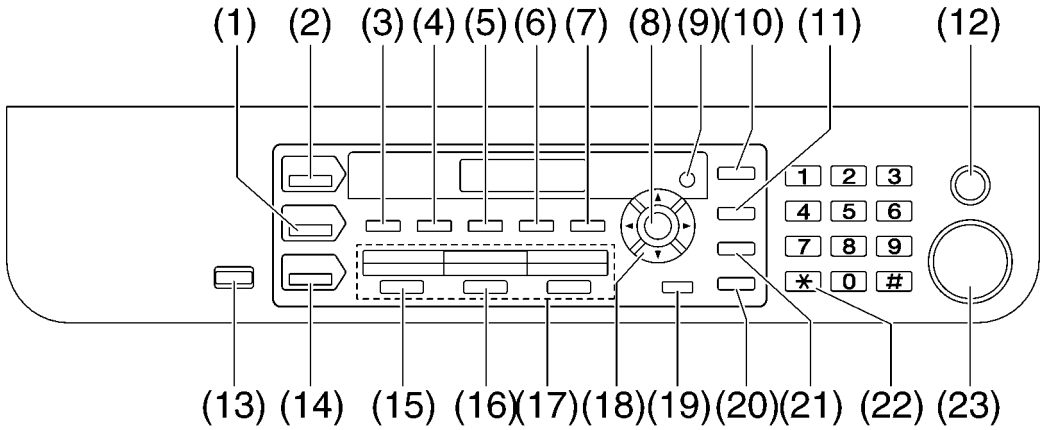
(1) Top cover
(2) ADF (Auto Document Feeder) cover
(3) Document guides
(4) Document cover
(5) Output tray
(6) Top cover release lever
(7) Document entrance
(8) Paper input tray
(9) Recording paper exit
(10) Document exit

7.1.2. Rear view



(1)Recording paper guides
(2) Speaker
(3) Handset unit (Optional) connection jack
(4) Power inlet
(5) Manual input tray (Rear cover)
(6) External telephone jack
(7) Telephone line jack
(8) USB interface connector
(9) LED
(10) LAN interface connector

7.2. CONTROL PANEL



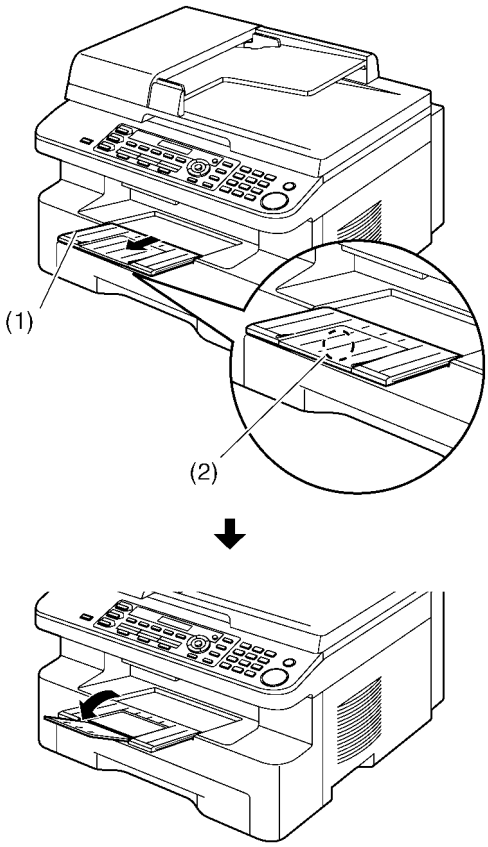
(1) COPY
(2) SCAN
(3) COLLATE
(3) DIRECTORY
(4) CONTRAST
(5) RESOLUTION
(6) ZOOM
(6) QUICK SCAN
(7) PAGE LAYOUT
(8) SET
(9) MENU
(10) CALL DISPLAY
(11) REDIAL/PAUSE
(12) STOP
(13) FAX AUTO ANSWER
(14) FAX
(15) BROADCAST
(16) MANUAL BROAD
(17) Station keys
(18) Navigator key
(19) LOWER
(20) MONITOR
(21) FLASH
(22) TONE
(23) START

8 Installation Instructions

8.1. INSTALLATION

8.1.1. OUTPUT TRAY

1. Pull the output tray extender (1) forward gently until it clicks into place, then press the centre part of the extender (2) to open.



Note:

- The output tray can hold up to approximately 150 sheets of printed paper. Remove the printed paper before the output tray becomes full.
- Do not place the unit in an area where the output tray may be easily bumped into.

8.1.2. RECORDING PAPER

8.1.2.1. Using the paper input tray

The paper input tray unit can hold:

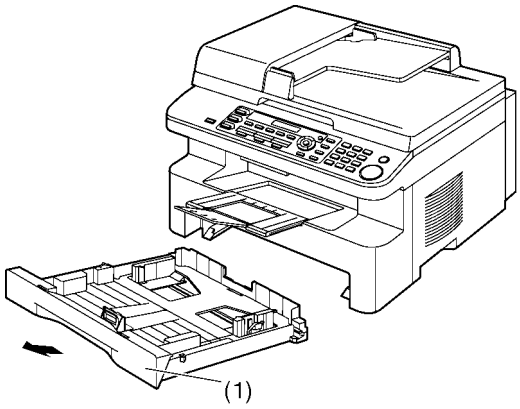
— Up to 250 sheets of 60 g/m^2 to 75 g/m^2 paper.

— Up to 230 sheets of 80 g/m^2 paper.

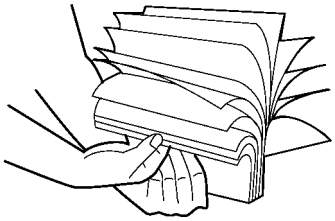
— Up to 200 sheets of 90 g/m^2 paper.

• The unit is set for printing letter size paper by default. If you want to use A4 or legal size paper, change the setting: (Refer to **PROGRAM MODE TABLE** (P.100).)

1. Pull the paper input tray (1) until it clicks into place, then pull it completely out, lifting the front part of the tray.



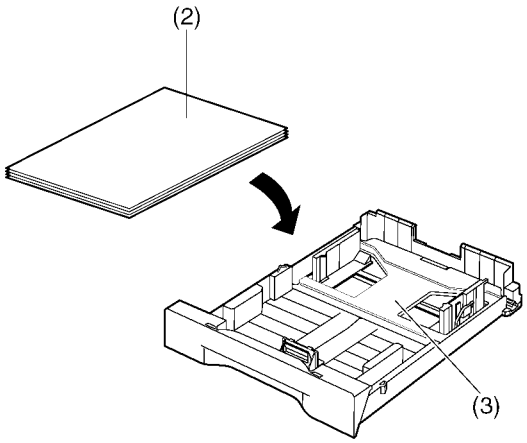
2. Before loading a stack of paper, fan the paper to prevent paper jams.



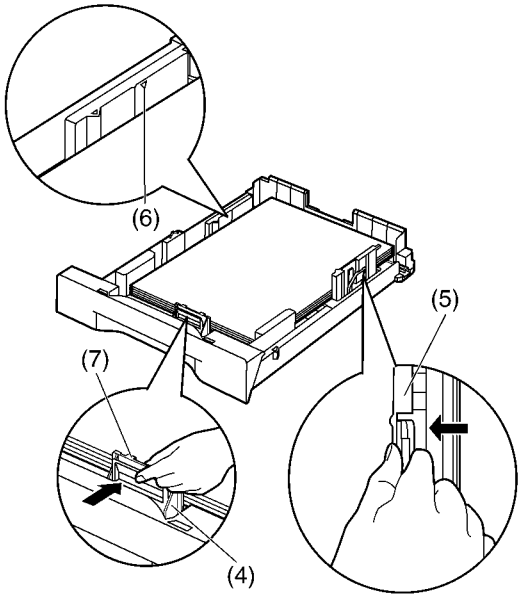
3. Load the paper, print-side up (2).

Important:

• **Push and lock the plate (3) in the paper input tray, if it is lifted.**

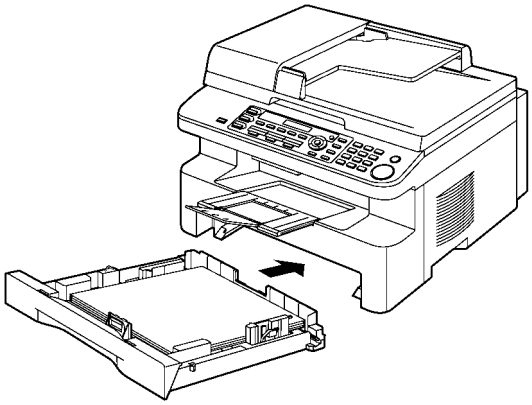


4. Adjust the recording paper guides. Pinch the front side of the recording paper guide (4), then slide it to match the paper size mark. Pinch the right side of the recording paper guide (5), then slide it to adjust the width to the size of the recording paper.
- Make sure that the recording paper is under the paper limit mark (6), and the paper should not be loaded over the snubbers (7).



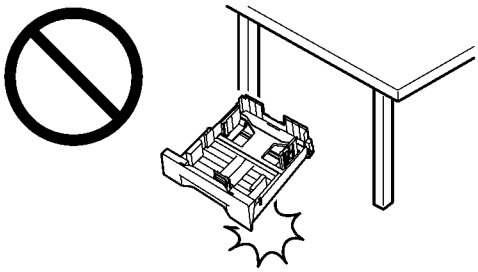
5. Insert the paper input tray to the unit, lifting the front part of the tray. Then push it completely into the unit.

Note:
- If the paper is not loaded correctly, re-adjust the paper guides, or the paper may jam.
- If the paper input tray does not close, the plate in the paper input tray may be lifted. Push the paper and make sure that the paper is laid flat in the paper input tray.

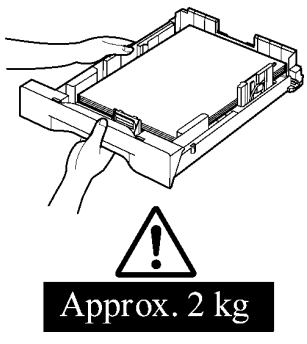


Caution for the paper input tray

- Do not drop the input tray.

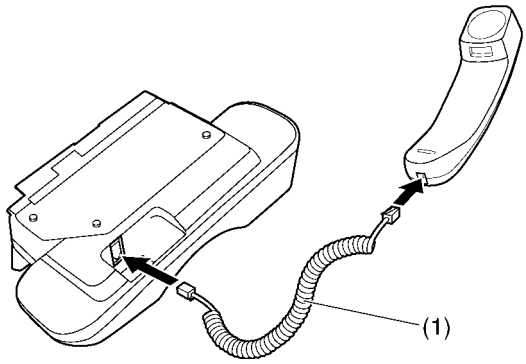


- Hold the paper input tray with both hands when removing or installing. The input tray weighs approximately 2 kg when the recording paper is fully installed.

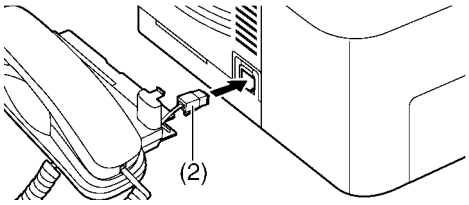


8.1.2.2. Handset unit

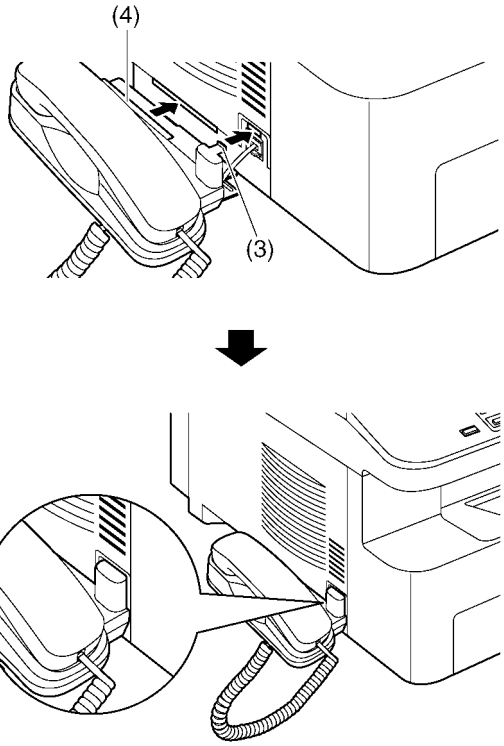
1. Connect the handset cord (1).



2. Connect the handset connector (2).
- Remove the seal from the handset unit connection jack if attached.

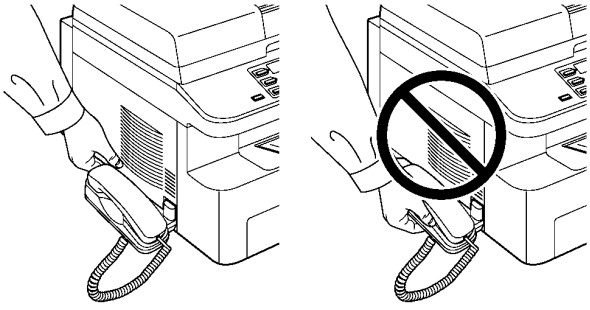


3. Insert the tab (3) and rib (4).



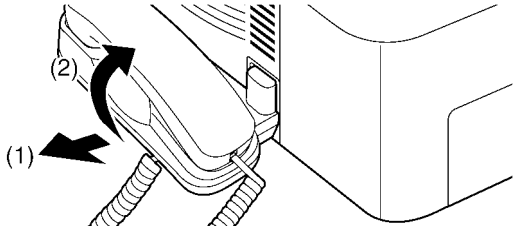
Caution:
- When moving the unit, be sure to hold by the grip. Do not hold by the handset unit.

Correct **Incorrect**

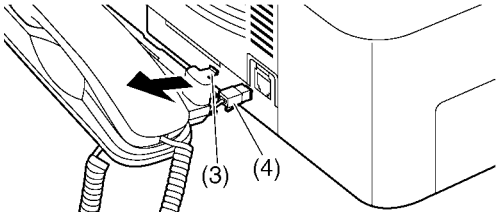


To remove the handset unit

1. Pull the handset unit slightly forward (1), then lift it in the direction of the arrow (2) to remove the rib.



2. Remove the tab (3), then disconnect the handset connector (4).



8.1.2.3. Using the manual input tray

You can print on plain paper and labels.

The manual input tray is used only for printing with the computer and can hold one page at a time. When printing multiple pages, add a next page after the first page has been fed into the unit.

• Please refer to Page 89 in Operating Instructions.

Load the recording paper after you start printing with the computer.

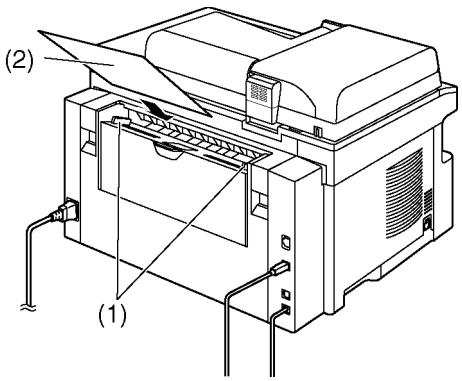
1. Adjust the width of the guides (1) to the size of the recording paper.
2. Insert the paper, print-side down (2) until the unit grasps the paper and a single beep is heard.

Note:

- If the paper is not inserted correctly, re-adjust the paper, or the paper may jam.
- Make sure the unit grasps the recording paper as specified in step 2. The display shows the following.

```
PAPER IN TRAY #2
FOR PC PRINTING
```

- To use the manual input tray, you must change the paper source in the **[Basic]** tab when setting the printer properties. You can also select desired media type.



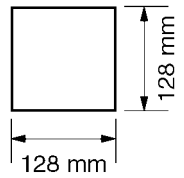
8.1.3. DOCUMENTS THE UNIT CAN SEND

Note:

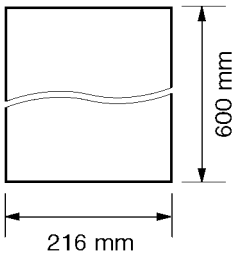
- Confirm that there are no documents on the scannerglass.
- Check that ink, paste or correction fluid has dried completely.
- Remove clips, staples or other fasteners.
- Do not set the following types of documents: (Make a copy of the document using the scanner glass and set the copy instead.)
  -Chemically 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 printing on the opposite side that can be seen through the other side, such as newsprint
- The total height of the documents when laid flat, must be less than 4 mm. If the documents exceed the capacity of the auto document feeder, they may fall or cause a jam in the feeder.
- To set a document with a width of less than 210 mm, we recommend using the scanner glass to copy the original document onto A4 or letter-sized paper, then setting the copied document.
- Do not set documents that do not satisfy the requirements of size and weight. Make a copy of the document using the scanner glass and set the copy.
- Available document size, document weight and effective scanning area are as follows:

8.1.3.1. Using the auto document feeder

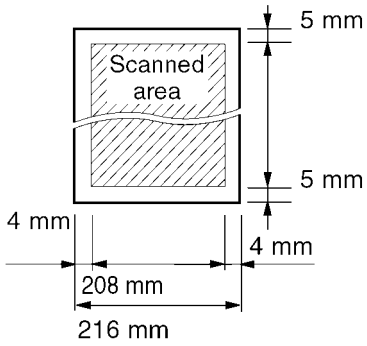
Minimum document size



Maximum document size



Effective scanning area



Document weight

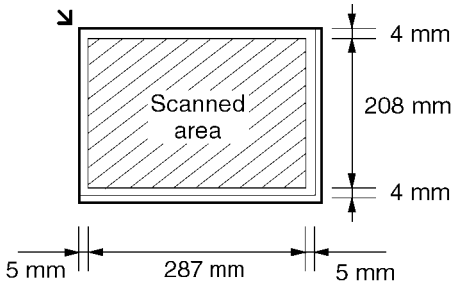
Single sheet:
60 g/m^2 to 75 g/m^2
Multiple sheets:
60 g/m^2 to 75 g/m^2

8.1.3.2. Using the scanner glass

Note:

- Confirm that there are no documents in the auto document feeder.
- Place the original onto the scanner glass gently and do not press down too firmly to avoid malfunction.
- If the original is a thick book, do not close the document cover.
- Check that ink, paste or correction fluid has dried completely.
- Effective scanning area is as follows:

Effective scanning area



8.1.4. REPLACING THE TONER CARTRIDGE AND THE DRUM UNIT

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

Display: TONER LOW or TONER EMPTY

To check the drum life and quality, please print the printer test list. If printing quality is still poor or **"REPLACE DRUM"** appears on the display, replace the toner cartridge and drum unit. To ensure that the unit operates properly, we recommend the use of **Panasonic toner cartridge (Model No. KX-FAT92A) and drum unit (Model No. KX-FAD93A)**.

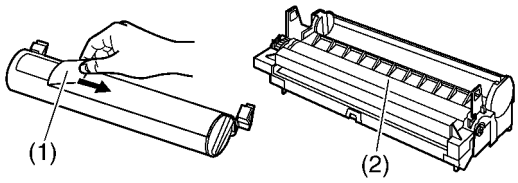
To maintain print quality and machine life, we recommend you to clean slots and openings and the inside of the unit when replacing the toner cartridge and/or drum unit.

Caution:

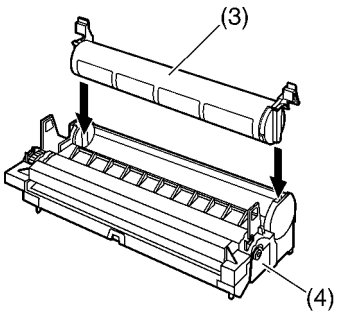
- **We cannot be responsible for any damage to the unit or degradation of print quality which may occur from the use of a non-Panasonic toner cartridge and drum unit.**
- **The drum unit contains a photosensitive drum. Exposing it to light may damage the drum. Once you have opened the protection bag:**
  - **— Do not expose the drum unit to light for more than 5 minutes.**
  - **— Do not touch or scratch the black 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 leave the toner cartridge out of the protection bag for a long time. It will decrease the toner life.**
- **Do not add toner to the toner cartridge.**

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

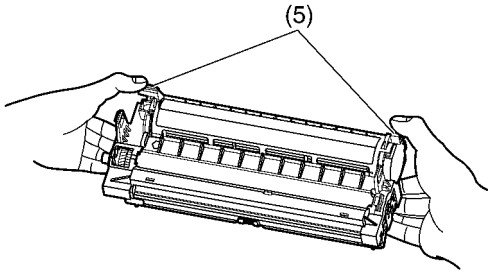
2. Remove the toner cartridge and drum unit from the protection bags. Peel off the seal (1) from the toner cartridge.
- Do not touch or scratch the black drum surface (2).



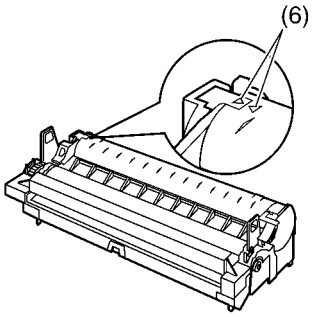
3. Place the toner cartridge (3) into the drum unit (4) vertically.



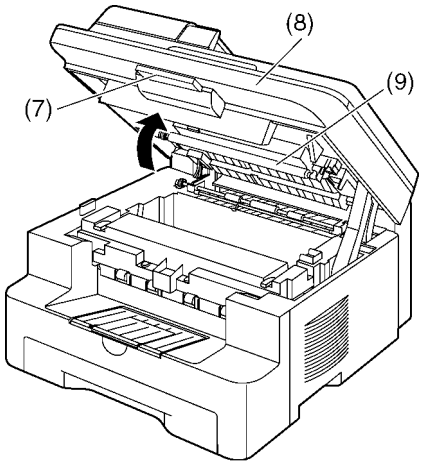
4. Turn the lever (5) on each side of the toner cartridge while pressing down firmly.



5. Make sure that the triangles (6) match, to install the toner cartridge correctly.

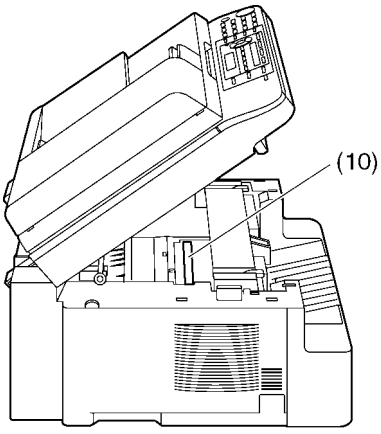


6. Lift the top cover release lever (7) and open the top cover (8).

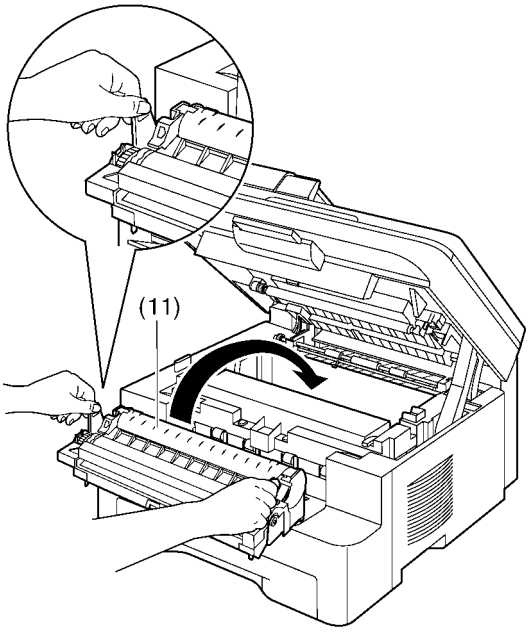


Note:

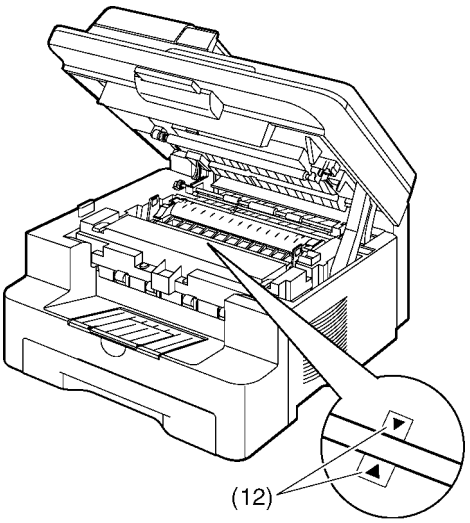
- Do not touch the transfer roller (9).
- If the lower glass (10) is dirty, clean it with a soft and dry cloth.



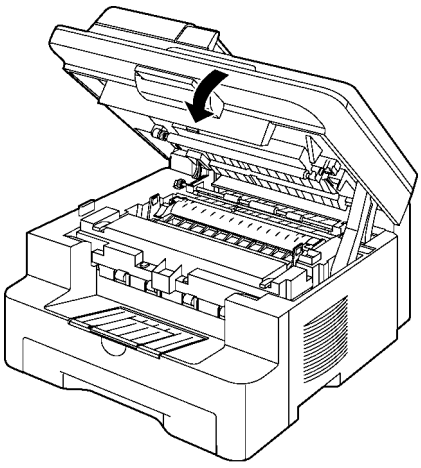
7. Install the drum and toner unit (11) by holding the tabs.



- Make sure that the triangles (12) match, to install the drum and toner unit correctly.

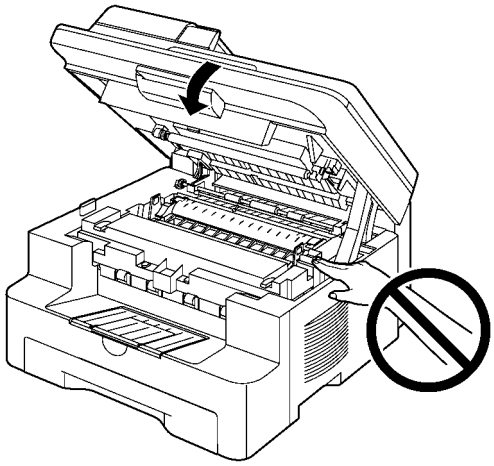


8. Close the top cover until locked.



Caution:

- To prevent injuries, be careful not to put your hands under the top cover.



Note:

- While the unit displays “PLEASE WAIT”, do not open the top cover, or disconnect the power cord.

Waste disposal method

Waste material should be disposed of under conditions which meet all national and local environmental regulations.

8.1.5. CONNECTING TO A COMPUTER

Panasonic Multi-Function Station software enables the unit to carry out the following functions:
- Printing on plain paper and labels
- Scanning documents and converting an image into text with OCR software
- Scanning from other applications for Microsoft® Windows® that support TWAIN scanning
- Storing, editing or erasing items in directories using your computer
- Programming the features using your computer
- Sending, receiving fax documents using your computer

To use Multi-Function Station on your computer, the following are required:

Operating System:

Works with Windows 98/Me/2000/XP/Vista™

CPU:

Windows 98: Pentium® 90 MHz or faster
Windows Me: Pentium 150 MHz or faster
Windows 2000: Pentium 166 MHz or faster
Windows XP: Pentium 300 MHz or faster
Windows Vista: Recent Processor (x86) 800 MHz or higher processor

RAM:

Windows 98: 24 MB (32 MB or more recommended)
Windows Me: 32 MB (64 MB or more recommended)
Windows 2000: 64 MB or more
Windows XP: 128 MB or more
Windows Vista: 512 MB or more

Other Hardware:

CD-ROM drive
Hard disk drive with at least 150 MB of available space
USB interface
LAN interface (10Base-T/100Base-TX cable)

Other:

Internet Explorer 5.0 or later

8.1.6. INSTALLING MULTI-FUNCTION STATION

- **Install Multi-Function Station before connecting the unit to a computer with USB cable. If the unit is connected to a computer before installing Multi-Function Station, the [Found New Hardware Wizard] dialogue box will appear. Click [Cancel] to close it.**
- **The screenshots shown in these instructions are for Windows XP and are included for reference only.**
- **The screenshots shown in these instructions may differ slightly from those of the actual product.**
- **Software features and appearance are subject to change without notice.**

1 Start Windows and exit all other applications.
- For Windows XP, Windows 2000 and Windows Vista users, you must be logged in as an administrator in order to install Multi-Function Station.

2 Insert the included CD-ROM into your CD-ROM drive.
- If the **[Select Language]** dialogue box appears, select the desired language that you want to use with this software. Click **[OK]**.
- If the installation does not start automatically:
  Click **[Start]**. Choose **[Run...]**. Type “D:\install” (where “D:” is the drive letter of your CD-ROM drive). Click [OK].
  (If you are not sure what the drive letter is for your CD-ROM drive, use Windows Explorer and look for the CD-ROM drive.)

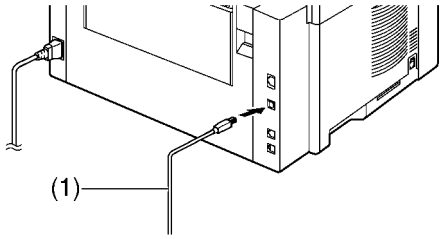
3 [Install Multi-Function Station]
- The installation will start.

4 When the setup program starts, follow the on-screen instructions.

5 When the **[Setup Type]** dialogue box appears.

For USB connection

1. **[Connect directly with a USB cable.]** → **[Next]**
   - The **[Connect Device]** dialogue box will appear.
2. Connect the unit with the USB cable (1), then click **[Next]**.



   - If the unit is connected to your computer, the model name will be automatically detected.
   - You can change the name of the unit if necessary.
3. Click **[Install]**, then follow the on-screen instructions.
   - The files will be copied to your computer.

For LAN connection

1. **[Connect via the Network.]** → **[Next]**
   - The **[Select a Network Device]** dialogue box will appear.
2. Check **[Select in the searched list]** and select the unit from the list.
   - If the name of the desired unit is not displayed on the list, and the IP address for the unit has been assigned, check **[Direct input]** and enter the IP address.
3. **[Next]**
   - You can change the names for the printer, PC fax and scanner if necessary.
4. Click **[Install]**, then follow the on-screen instructions.
   - The files will be copied to your computer.

Important notice

If you use Windows XP or Windows Vista, the following message may appear: This is normal and the software will not cause any difficulties with your operating system. You can continue the installation with no problem.

- **For Windows XP users**

  “The software you are installing for this hardware has not passed Windows Logo testing to verify its compatibility with Windows XP”
- **For Windows Vista users**

  "Would you like to install this device software?"

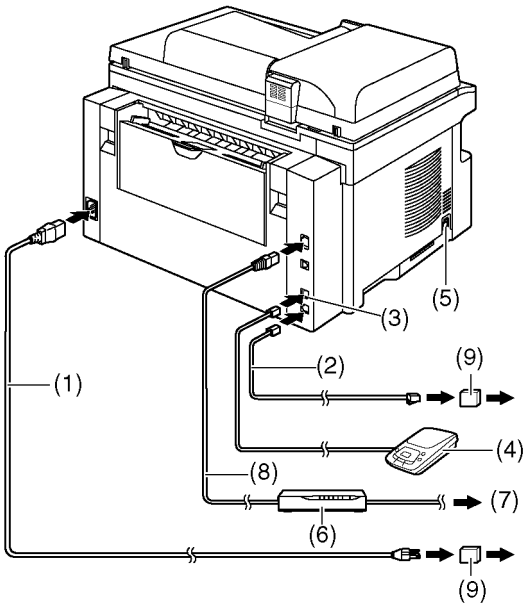
Note:

- If the screen prompts to insert the CD-ROM for operating system when installing Multi-Function Station, insert it into your CD-ROM drive.

8.2. CONNECTIONS

Caution:

- **When you operate this product, the power outlet should be near the product and easily accessible.**
  (1) Power cord
- Connect to a power outlet.
  (120 V, 60 Hz).
  (2) Telephone line cord
- Connect to a single telephone line jack (RJ11C).
  (3) **[EXT]** jack
- You can connect an answering machine or an extension telephone. Remove the stopper if attached.
  (4) Answering machine (not included)
  (5) Handset unit (optional) connection jack
- You can connect the optional handset unit. Remove the seal if attached.
  (6) Network Router/Network Hub (not included)
- Also connect networked computers.
  (7) To the internet
  (8) LAN cable (not included)
- To assure continued emission limit compliance use only shielded LAN cable (category 5 straight cable).



Important notice for the USB connection

- Do not connect the USB cable before installing Multi-Function Station. Be sure to connect the USB cable in step 2 on P.77.

Note:

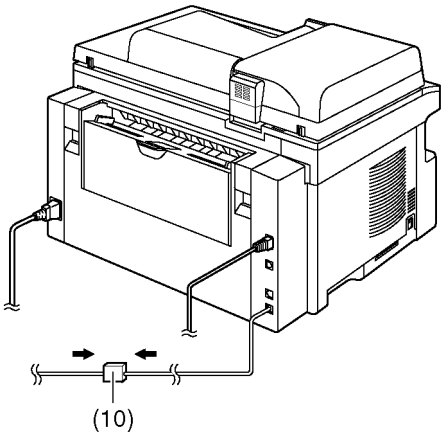
- If any other device is connected to the same telephone line, this unit may disturb the network condition of the device .

Using surge protectors

- The warranty does not cover damage due to power line surges or lightning. For additional protection, we recommend using surge protectors (9).

If the unit shares a single telephone line with a DSL service

Fax transmission/ reception may be disturbed, noise interference may be heard during telephone conversations, or Caller ID may not function properly. A filter to prevent this is provided by your provider. Please attach the filter (10) to the telephone line cord of the unit.

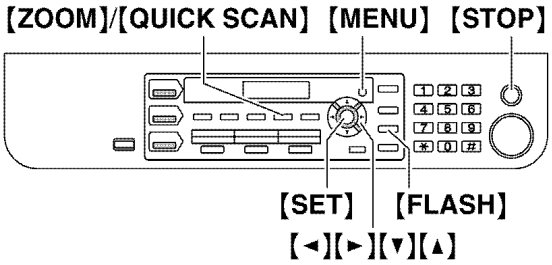


9 Operating Instructions

9.1. YOUR LOGO

You can program your logo (name, company name, etc.) so that it appears on the top of each page sent.

• For entering characters, only the English alphabet, numbers and symbols are available. Chinese characters cannot be entered.



1 【MENU】 → 【#】【1】【0】【2】 → 【SET】.

LOGO=

2 Enter your logo, up to 30 characters (see next page for character entry). → 【SET】

3 Press 【MENU】 to exit.

To correct a mistake

Press 【◄】 or 【►】 to move the cursor to the incorrect character, and make the correction.

- To erase all characters, press and hold 【STOP】.

9.1.1. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

The dial keypad is used to enter characters and numbers.
- Press **[◀]** or **[▶]** to move the cursor.
- Press dial keys to enter characters and numbers.
- Press **[STOP]** to erase the character or number highlighted by the cursor. Press and hold **[STOP]** to erase all characters or numbers.
- To enter another character located on the same dial key, press **[▶]** to move the cursor to the next space, then press the appropriate dial key.

Keys	Characters
【1】	1 [ ] { } + - / = , . _ ` : ; ? |
【2】	A B C a b c 2
【3】	D E F d e f 3
【4】	G H I g h i 4
【5】	J K L j k l 5
【6】	M N O m n o 6
【7】	P Q R S p q r s 7
【8】	T U V t u v 8
【9】	W X Y Z w x y z 9
【0】	0 ( ) 〈 〉 ! " # $ % & ¥ ∗ @ ^ ' →
【⌗】	To switch between uppercase or lowercase letters.
【FLASH】	To enter a hyphen.
【ZOOM】	To insert a space.
【STOP】	To delete a character.

9.1.2. TO SELECT CHARACTERS USING [▼] OR [▲]

Instead of pressing the dial keys, you can select characters using 【▼】 or 【▲】.

1. Press 【▼】 repeatedly to display the desired character.
   Characters will be displayed in the following order:
   ① Uppercase letters
   ② Number
   ③ Symbol
   ④ Lowercase letters
   - If you press 【▲】, the order will be reversed.
2. Press 【►】 to insert the character.
3. Return to step 1 to enter the next character.

10 Test Mode

10.1. 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 Operation after code input	Function
MEMORY CLEAR	Service Mode	"5" "5" "0" SET	Clear the memory where the users can store data.
MOTOR TEST	Service Mode	"5" "5" "6" SET	00:printer motor feed 10:auto document feed 20:carriage
MODEM TEST	Service Mode	"5" "5" "4" SET	Telephone line circuit is connected automatically, output the following signals on the circuit line. 1) OFF 2) 1100Hz 3) 2100Hz 4) V21 ter 300bps 5) V27 ter 2400bps 6)V27 ter 4800bps 7) V29 7200bps 8) V29 9600bps 9) V17 7200bps 10) V17 9600bps 11) V17 12000bps 12) V17 14400bps 13)V34 2400bps 14)V34 4800bps 15) V34 7200bps 16) V34 9600bps 17)V34 12000bps 18)V34 14400bps 19) V34 16800bps 20) V34 19200bps 21)V34 21600bps 22)V34 24000bps 23) V34 26400bps 24) V34 28800bps 25)V34 31200bps 26)V34 33600bps
ROM CHECK	Service Mode	"5" "5" "1" SET	Indicates the version and checks the sum of the ROM.
LCD TEST	Service Mode	"5" "5" "8" SET	Checks the LCD indication. Illuminates all the dots to check if they are normal.
DTMF SINGLE TONE TEST	Service Mode	"5" "5" "2" 1....ON 2....OFF	Outputs the DTMF as single tones. Used to check the frequencies of the individual DTMF tones. Refer to **DTMF SINGLE TONE TRANSMIT SELECTION** (P.85).
LED TEST	Service Mode	"5" "5" "7"	All LEDs above the operation panel board flash on and off, or are illuminated.
KEY TEST	Service Mode	"5" "6" "1" START (any key)	Checks the button operation. Indicates the button code on the LCD while the button is pressed. Refer to **BUTTON CODE TABLE** (P.85).
SCANNER TEST	Service Mode	"5" "5" "5"	LED lights up, Scanner scanning. 1:RED / 2:GREEN / 3:BLUE / 4:monochrome / 5:color
LSU TEST	Service Mode	"6" "3" "9"	Laser radiates, Polygon rotates
High Voltage Power Supply Board CHECK	Service Mode	"6" "2" "8" SET	Refer to **HIGH VOLTAGE VALUE CHECK POINT** (P.165).
FAN TEST	Service Mode	"6" "7" "7"	1:TEST OFF 2:FAN 1 High-speed rotation (LEFT FAN) 3:FAN 1 Low-speed rotation (LEFT FAN) 4:FAN 2 High-speed rotation (Right FAN) 5:FAN 2 Low-speed rotation (Right FAN)
MEMORY CLEAR (except History data)	Service Mode	"7" "1" "0" SET	Refer to **Memory Clear Specification** (P.90).

<table>
<tr><th>Test Mode</th><th>Type of Mode</th><th>Code
Operation after code input</th><th>Function</th></tr>
<tr><td>SENSOR CHECK</td><td>Service Mode</td><td>“8” “1” “5”</td><td>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.42).
LCD DISPLAY:
D S C P R E D T ∗ 3 F ∗ D F ∗ V
∗U T∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗ ∗
D: Document
D: Document set
-: No document
S: Read position
S: Docu detect
-: No document
C: Top cover
C: Cover open
-: Cover close
R: Registration
R: Paper detect
-: No paper
E: Paper exit
E: Paper detect
-: No paper
D: Drum
D: DRUM set
-: No DRUM
T: Toner
T: Toner detect
-: No toner
*: None
3F: Fuser thermistor
3F: 00 (high temp.) - FF (low temp.)
*: None
DF: Fuser thermistor
DF: 00 (high temp.) - FF (low temp.)
*: None
*: None
U: Pickup/Rear Cover
U: Paper detect
-: No paper
T: Print timing
T: Paper detect
-: No paper
*: None
*: None
*: None
*: None
*: None
*: None
*: None
*: None
*: None
*: None</td></tr>
<tr><td>PRINT TEST PATTERN</td><td>Service Mode</td><td>“8” “5” “2”</td><td>1. Press “852” then the SET key in the service mode.
2. As “PATNO. =” is displayed on the LCD, enter the test pattern No. and press the SET key.
3. When “No. = “is displayed on the LCD, enter the printing number and press the SET key. (Press “00” for the infinite printing.)
4. “MODE” is displayed on the LCD. Press “0” to start printing or press “1” to go to the next screen.
5. When “1” is pressed at MODE, “INTVL = “is displayed on the LCD. Enter the printing interval (000~999 sec).
6. The printing repeats the designated number of times at the programmed printing intervals.</td></tr>
</table>

Note:

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

10.1.1. 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.

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

Note:

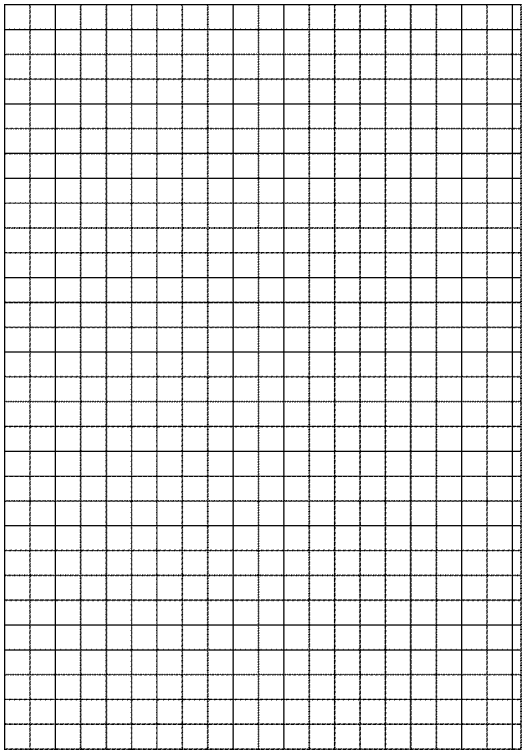
After performing this check, do not forget to turn the setting off. otherwise, dialing in DTMF signal will not work.

10.1.2. BUTTON CODE TABLE

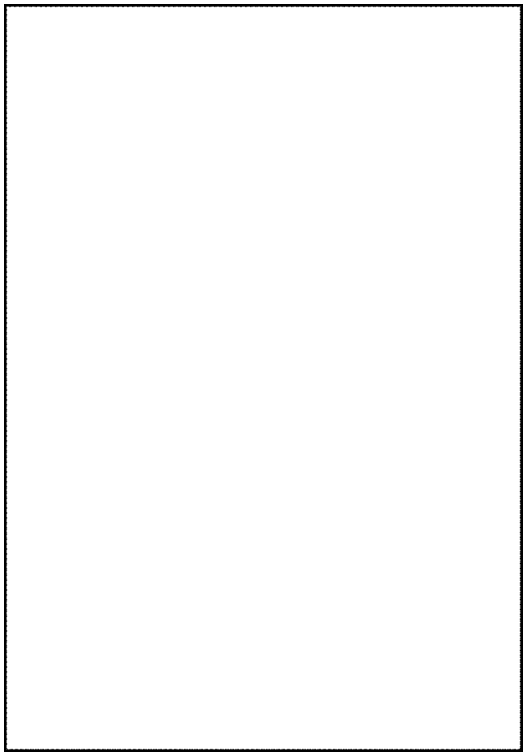
Code	Button Name	Code	Button Name	Code	Button Name
31	1	41	START	5F	ZOOM
32	2	-	STOP	51	AUTO ANSWER
33	3	40	SET	48	STATION 1
34	4	44	MENU	49	STATION 2
35	5	58	CALL DISPLAY	4A	STATION 3
36	6	66	NAVIGATOR ←	67	LOWER
37	7	65	NAVIGATOR →	52	PAGE LAYOUT
38	8	46	NAVIGATOR ↑		
39	9	47	NAVIGATOR ↓		
30	0	60	FAX MODE		
3B	*	61	COPY MODE		
3C	#	62	SCAN MODE		
3D	REDIAL	81	COLLATE		
57	FLASH	5D	CONTRAST		
54	MONITOR	5C	RESOLUTION		

10.1.3. PRINT TEST PATTERN

1. NO.01



2. NO.06



3. NO.03

- These print test patterns are just image printing, and different from actual ones.
- When it is required to judge the print quality, compare with the printing of a nondefective machine.

11 Service Mode

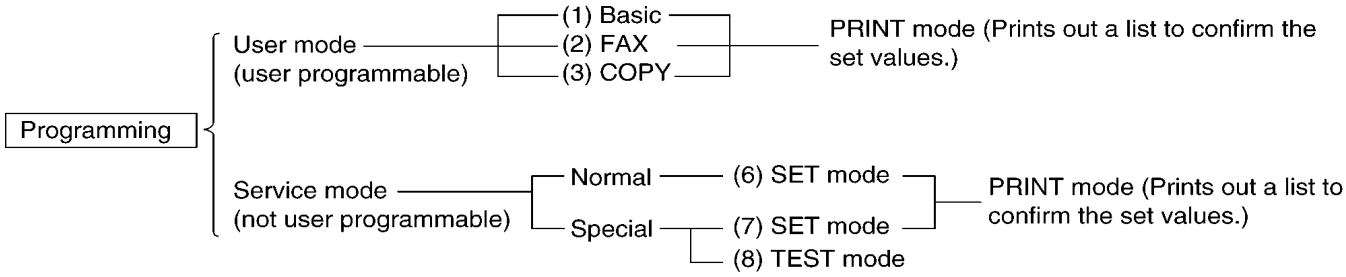
The programming functions are used to program the various features and functions of the machine, and to test the machine. This facilitates communication between the user and the service man while programming the unit.

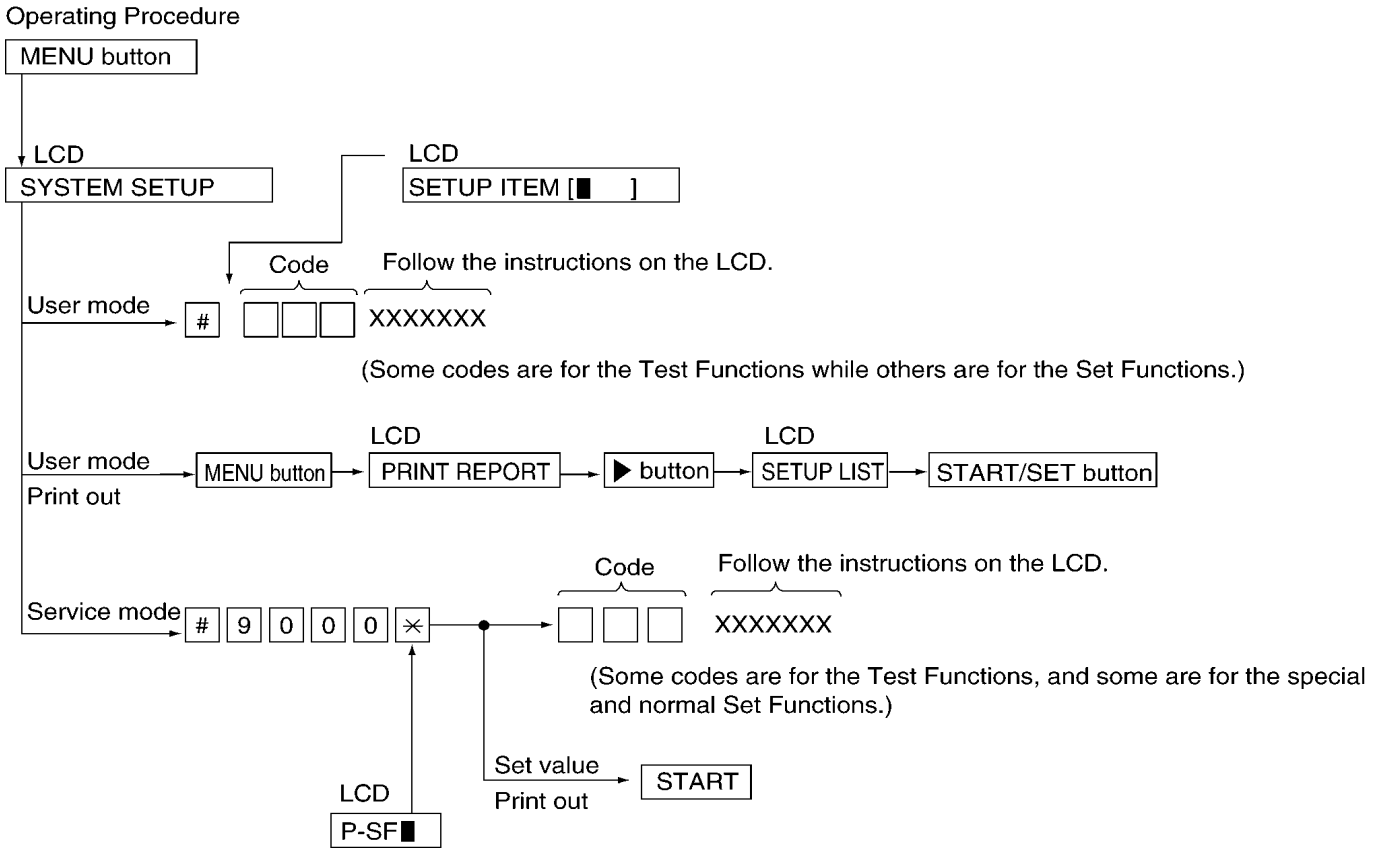
11.1. PROGRAMMING AND LISTS

11.1.1. 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.

11.1.2. OPERATION FLOW





11.1.3. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	----------
503	Dial speed select	1:10 pps 2:20 pps	1, 2	1	----------
507	V34 transmission start speed	0: Disable 1: 33.6 2: 31.2 3: 28.8 4: 26.4 5: 24.0 6: 21.6 7: 19.2 8: 16.8	0~8	1	If the code 527 is set at 2, the code 507 and 508 work.
508	V34 reception start speed	0: Disable 1: 33.6 2: 31.2 3: 28.8 4: 26.4 5: 24.0 6: 21.6 7: 19.2 8: 16.8	0~8	1	If the code 527 is set at 2, the code 507 and 508 work.
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.143).
521	International mode select	1:ON 2:OFF	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in (P.143).
522	Auto standby select	1:ON 2:OFF	1, 2	1	The resolution reverts to the default when transmission is complete.
523	Receive equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	Set RX equalizer to automatic mode.
524	Transmission equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	
527	V.8 function select	1:OFF 2:ON	1, 2	2	
529	Call Service Clear				
550	Memory clear				Refer to **Memory Clear Specification** (P.90).
551	ROM check				See (P.83).
552	DTMF single tone test	1:ON 2:OFF	1, 2	2	See (P.83).
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.83).
555	Scanner test				See (P.83).
556	Motor test			0	See (P.83).
557	LED test				See (P.83).
558	LCD test				See (P.83).
561	KEY test				See (P.83).
567	T0 timer	001~255	001~255	052	Sets a higher value when the response from the other party needs more time during automatic FAX transmission.
570	BREAK % select	1:61% 2:67%	1, 2	1	Sets the % break of pulse dialing according PBX.
573	Remote turn-on ring number set	X number of rings	00~99	10	Sets the number of rings before the unit starts to operate TAM in the TEL mode.
590	FAX auto redial time set	X number of times	00~99	01	Selects the number of redial times during FAX communication (not including the first dial).
591	FAX auto redial time disconnection time set	X second	001~999	065	Sets the FAX redial interval during FAX communication.
592	CNG transmit select	1:OFF 2:ALL 3:AUTO	1~3	2	Lets you select the CNG output during FAX transmission. ALL: CNG is output at phase A. AUTO: CNG id output only when automatic dialing is performed. OFF: CNG id not output at phase A. Refer to (P.136).

Code	Function	Set Value	Effective Range	Default	Remarks
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.143). Refer to (P.137) and (P.143).
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.143). Refer to (P.136) and (P.143).
595	Receive error limit value set	1: 5% 2: 10% 3: 15% 4: 20%	1~4	2	If the number of errors during transmission exceeds this value, the sending side terminates the call.
596	Transmit level set	X dBm	- 15~00	10	Selects the FAX transmission level. Refer to (P.136) and (P.137).
598	Receiving sensitivity	43= -43 dBm	20~48	48	Used when there is an error problem. Refer to (P.143).
599	ECM frame size	1:256 2:64	1, 2	1	----------
628	H.V.P.S. check				See (P.83).
639	LSU test				See (P.83).
655	Cause Distinction Code of Call Service 3				See (P.110).
677	FAN test				See (P.83).
710	Memory clear except History data				Refer to **Memory Clear Specification** (P.90).
717	Transmit speed select	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	If the code 527 is set at 1, the code 717 and 718 work.
718	Receive speed select	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	If the code 527 is set at 1, the code 717 and 718 work.
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	2	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.
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 check				See (P.83).
852	Print test pattern				See (P.83).
853	Top margin		1~5	5	----------
854	Left margin		1~7	7	----------
874	DTMF ON time	X msec	060~200	100	----------
875	DTMF OFF time	X msec	060~200	100	----------
880	History list				See (P.93).
881	Journal 2 list				See (P.140).
882	Journal 3 list				See (P.141).

11.1.4. Memory Clear Specification

Item	Status after Memory Clear	
	Service Mode **#550** *1	Service Mode **#710** *2
Date and time (user mode #101)	—	Default
Your logo (user mode #102)	—	Default
Your Fax Number (user mode #103)	—	Default
Password (user mode #155)	—	Default
One touch dial and Directory	—	Default
History	—	—
Top margin (service mode #853)	—	—
Left margin (service mode #854)	—	—
Other Setting data (User setting and Service setting data)	Default	Default

— : Not changed

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

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

Note:

Please restart a power supply after clearing a memory.

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

SETUP LIST

[BASIC FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#101	SET DATE & TIME	Jan. 01 2007 12:00AM	
#102	YOUR LOGO		
#103	YOUR FAX NUMBER		
#110	LANGUAGE	ENGLISH	[ENGLISH,FRENCH]
#120	DIALING MODE	TONE	[TONE,PULSE]
#121	SET FLASH TIME	700ms	[900,700,600,400,300,250, 200,160,110,100,90,80(ms)]
#145	LCD CONTRAST	NORMAL	[NORMAL,DARKER]
#155	CHANGE PASSWORD		
#161	RINGER PATTERN	A	[A,B,C]
#210	FAX RING COUNT	3	[1...5] *5 FOR EXTERNAL TAM
#216	AUTO CALLER'S LIST	OFF	[OFF,ON]
#226	TIME ADJUSTMENT	AUTO	[MANUAL,AUTO]
#380	PAPER SIZE	LETTER	[LETTER,A4,LEGAL]
#403	POWER SAVE	15min	[5min,15min,30min,1h]
#463	DEFAULT MODE	COPY	[COPY,FAX]
#464	MODE TIMER	1min	[OFF,30s,1min,2min,5min]
#482	TONER SAVE	OFF	[OFF,ON]

Code → #101 (SET DATE & TIME)

Set Value → OFF

[FAX FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#401	PRINT CONFIRMATION REPORT	ERROR	[OFF,ON,ERROR]
#402	JOURNAL AUTO PRINT	ON	[OFF,ON]
#411	OVERSEAS MODE	ERROR	[NEXT FAX,ERROR,OFF]
#412	DELAYED TRANSMISSION	OFF	[OFF,ON]
	DESTINATION =		
	START TIME =	12:00AM	
#413	ECM SELECTION	ON	[OFF,ON]
#416	CONNECTING TONE	ON	[OFF,ON]
#430	DISTINCTIVE RING	OFF	[OFF,ON]
#431	FAX RING PATTERN	B-D	[B-D,A,B,C,D]
#432	AUTO REDUCTION	ON	[OFF,ON]
#434	FAX ACTIVATION CODE	OFF	[OFF,ON]
	CODE =	*#9	
#437	MEMORY RECEIVE ALERT	ON	[OFF,ON]
#438	FRIENDLY RECEPTION	ON	[OFF,ON]
#442	PCFAX SETTING	OFF	[OFF,ALWAYS,CONNECTED]
#443	PCFAX RCV PC	USB HOST	
#459	SET FAX DEFAULT		

Code → #442 (PCFAX SETTING)

Set Value → USB HOST

[COPY FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#461	COPY RESOLUTION	TEXT	[TEXT/PHOTO,TEXT,PHOTO]
#462	CONTRAST HOLD	DISABLED	[DISABLED,ENABLED]
#467	PAGE LAYOUT HOLD	DISABLED	[DISABLED,ENABLED]
#468	ZOOM HOLD	DISABLED	[DISABLED,ENABLED]
#469	COLLATE HOLD	DISABLED	[DISABLED,ENABLED]

[PC PRINT FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#774	DATA TIMEOUT	60s	[5...600(s)]

Code → #774 (DATA TIMEOUT)

[SCAN FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#493	SCAN MODE	VIEWER	[VIEWER,FILE,E-MAIL,OCR]
#494	SCAN PARAM. HOLD	DISABLED	[DISABLED,ENABLED]

[LAN FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#500	DHCP	ENABLED	[DISABLED,ENABLED]
#501	IP ADDRESS	0.0.0.0	
#502	SUBNET MASK	0.0.0.0	
#503	DEFAULT GATEWAY	0.0.0.0	
#504	PRIMARY DNS SERVER	0.0.0.0	
#505	SECONDARY DNS SERVER	0.0.0.0	
#507	MACHINE NAME	MB781C_8A87D3	
#508	MAC ADDRESS	00:80:F0:8A:87:D3	
#532	IP FILTERING	DISABLED	[DISABLED,ENABLED]
#533	AUTO IP	DISABLED	[DISABLED,ENABLED]
#534	HTTPD	ENABLED	[DISABLED,ENABLED]
	FIRMWARE VERSION	GAV1CB	

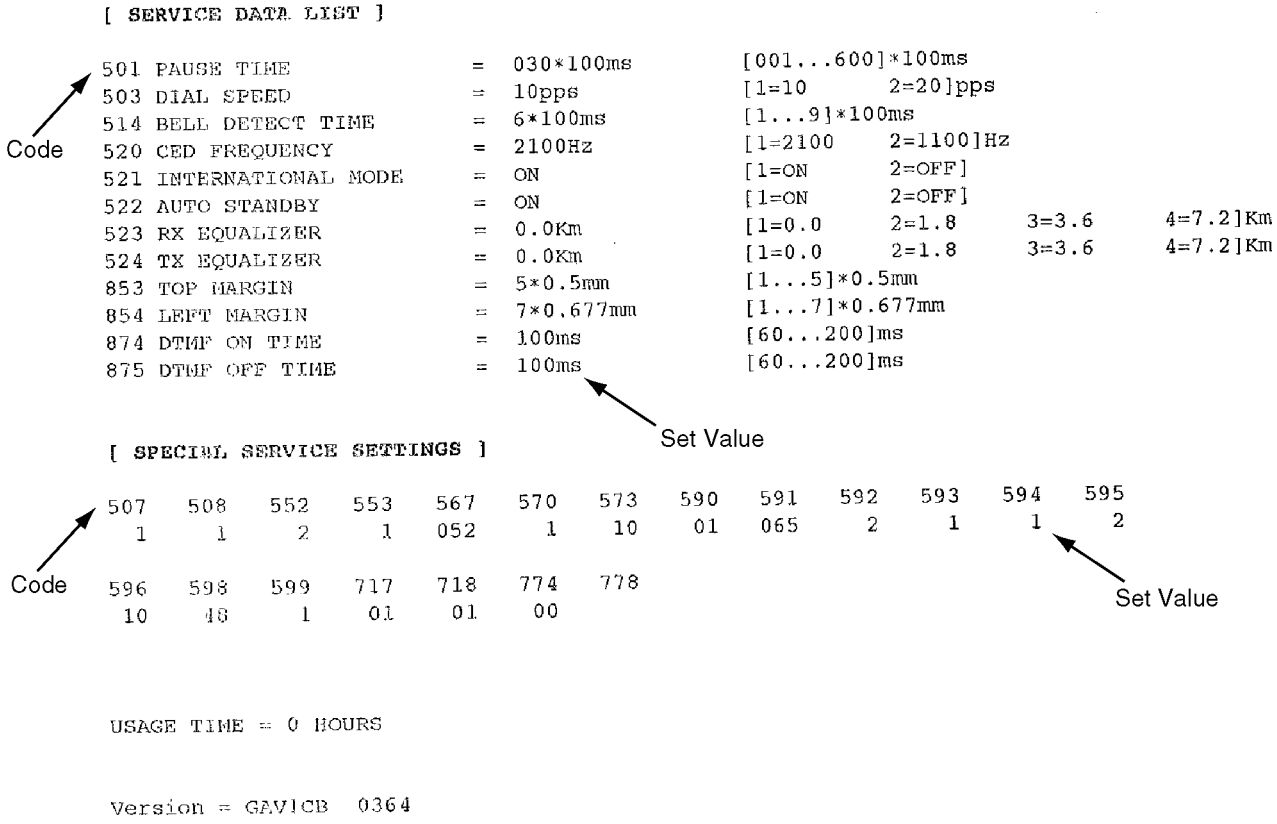
Set Value → GAV1CB

FOR FAX ADVANTAGE ASSISTANCE, PLEASE CALL 1-800-263-5008.

Note:

The above values are the default values.

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

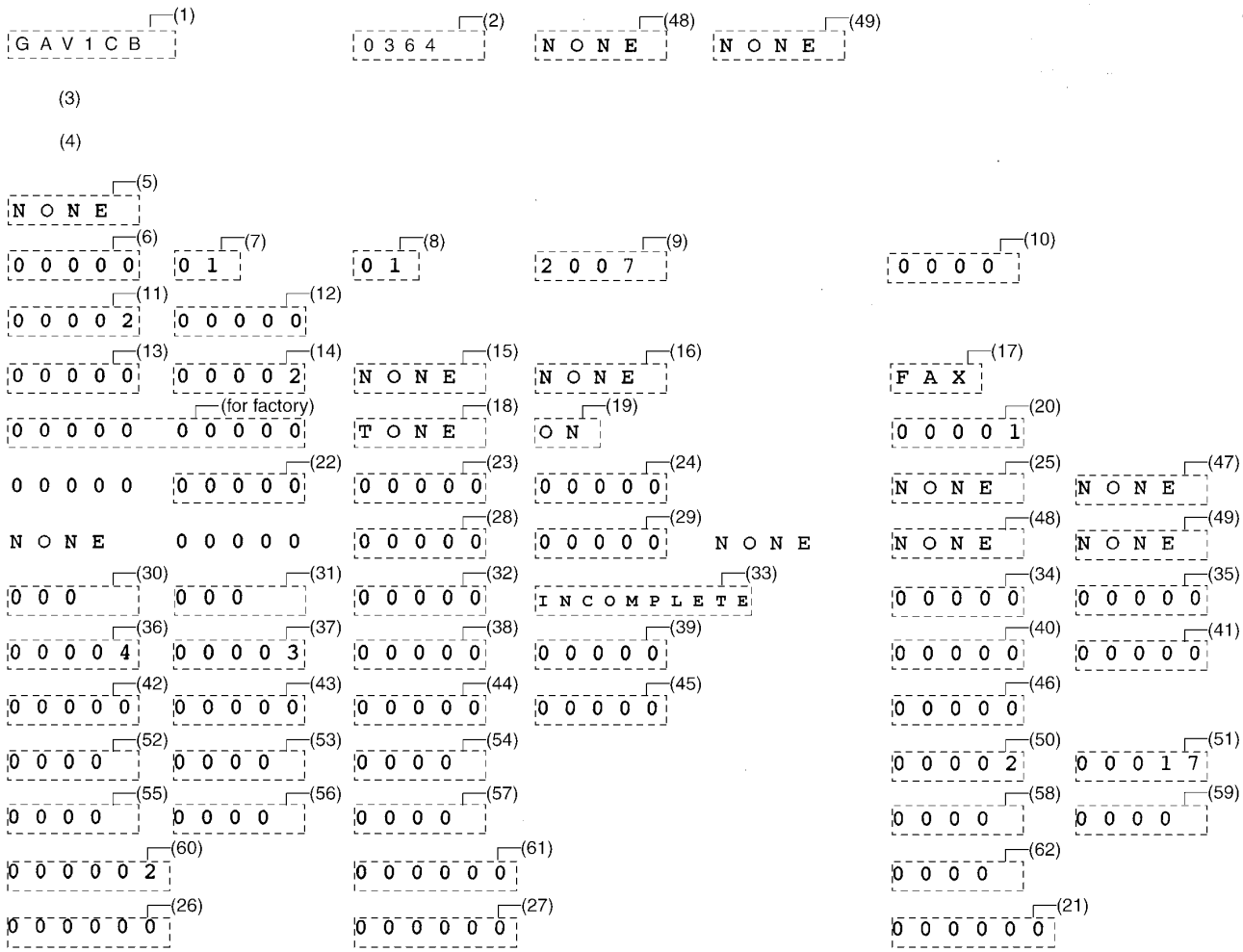


Note:

The above values are the default values.

11.4. HISTORY (Example of a printed out list)

[HISTORY]



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.94).

11.4.1. DESCRIPTIONS OF THE HISTORY REPORT

(1) ROM VERSION
FLASH ROM version
(2) SUM
FLASH ROM internal data calculation.
(3) YOUR LOGO
The user logo recorded in the unit. If it is not recorded, NONE will be displayed.
(4) YOUR TELEPHONE NUMBER
The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed.
(5) Not used
(6) FACTORY - CUSTOMER
This shows how many days from factory production until the user turns ON the unit.
(7) MONTH
The shows the very first month, date, year and time set by the user after they purchased the unit.
(8) DAY
The shows the very first month, date, year and time set by the user after they purchased the unit.
(9) YEAR
The shows the very first month, date, year and time set by the user after they purchased the unit.
(10) TIME
The shows the very first month, date, year and time set by the user after they purchased the unit.
(11) USAGE TIME
The amount of time the unit has been powered ON.
(12) FACTORY - NOW
This shows how many days from factory production until the user prints out this history list.
(13) TEL MODE
The amount of time the TEL mode setting was used.
(14) FAX MODE
The amount of time the FAX mode setting was used.
(15) Not used
(16) Not used
(17) FINAL RECEIVE MODE
The last set receiving mode by the user.
(18) TONE/PULSE SELECTION
The most recently used setting used, either TONE or PULSE.
(19) RECEIVE REDUCTION
The compression rate when receiving.
(20) SETTING NO. OF DIRECTORY
The recorded directory stations (one touch dial).
(21) NUMBER OF COPY
The number of pages copied.
(22) NUMBER OF RECEIVE
The number of pages received.
(23) NUMBER OF SENDING
The number of pages sent.
(24) NUMBER OF CALLER ID
The number of times Caller ID was received.
(25) Not used
(26) NUMBER OF PC SCAN
The number of times multifunction was used for the Scanner. (The number of pages scanned. If the unit does not have a PC interface, NONE will be printed.)
(27) NUMBER OF PC-PRINT
The number of times multifunction was used for the Printer. (The number of pages printed. If the unit does not have a PC interface, NONE will be printed.)
(28) NUMBER OF RECEIVING TO PC
The number of times received in the PC through the USB cable. (The number of pages received. If the unit does not have a PC interface, NONE will be printed.)
(29) NUMBER OF SENDING FROM PC
The number of times transmitted from the PC through the USB cable. (The number of pages transmitted. If the unit does not have a PC interface, NONE will be printed.)
(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)
(55) NUMBER OF DOCUMENT JAM
(56) NUMBER OF PAPER JAM
(57) NUMBER OF PICK UP ERROR OF RECORDING PAPER TRAY #1
(58) NUMBER OF PICK UP ERROR OF RECORDING PAPER TRAY #2

(59) Not used
(60) Total number of printing (The number of printed papers including copy, reception printing, report, etc.)
(61) Not used
(62) Not used

12 Troubleshooting Guide

12.1. USER RECOVERABLE ERRORS

If the unit detects a problem, one or more of the following messages will appear on the display.
The explanations given in the [ ] are for servicemen only.

DISPLAY MESSAGE	CAUSE AND REMEDY
CALL SERVICE 1	• Polygon motor error. Refer to **CALL SERVICE 1** (P.111).
CALL SERVICE 2	• Laser beam error. Replace LSU unit. Refer to **CALL SERVICE 2** (P.112).
CALL SERVICE 3	• Fuser unit cannot heat up. Replace fuser unit. Refer to **CALL SERVICE 3** (P.113).
CALL SERVICE 4	• Fan motor error. Replace fan motor. Refer to **CALL SERVICE 4** (P.114).
CALL SERVICE 5	• Print motor error. (only for DC motor) Refer to **CALL SERVICE 5** (P.115).
CALL SERVICE 6	• Charge unit error (An error occurred in the Charge unit including High voltage unit. (Also the Charger went wrong.)) Refer to **CALL SERVICE 6** (P.116).
CARRIAGE ERROR	• There is something wrong with the carriage sensor.
CHANGE DRUM	• There is something wrong with the drum unit. Replace the drum unit and the toner cartridge.
CHECK DOCUMENT	• The document was not fed into the unit properly. Remove the document, then press **[STOP]** to clear the message. Re-insert the document. If misfeeding occurs frequently, clean the document feeder rollers and try again.
CHECK DRUM	• The drum unit is not inserted properly. Re-insert it correctly.
CHECK PAPER #1	• Recording paper is not installed or the paper input tray has run out of paper. Install paper. • Recording paper was not fed into the unit properly. Re-insert the recording paper. • The paper input tray is not installed or is not inserted completely. Insert the paper input tray into the unit.
CHECK PICK UP INPUT TRAY #2	- "#2": Manual input tray • Recording paper was not fed into the unit properly. Re-insert the recording paper.
CHECK REAR COVER	• The rear cover is open. Close it. • A recording paper jam occurred near the manual input tray. Remove the jammed paper.
DIRECTORY FULL	• There is no space to store new items in navigator directory. Erase unnecessary items.
DRUM LIFE LOW REPLACE SOON	• The drum life is near to an end. Replace the drum unit as soon as possible.
FAX IN MEMORY	• The unit has a document in memory. See the other displayed message instructions to print out the document. • If feature #442 is set to "ALWAYS", check the connection between the computer and the unit.
KEEP COPYING	• Copying has stopped due to a recording paper jam. See the other displayed message instructions to continue copying.
LOW TEMP.	• 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	• When performing memory transmission, the document being stored exceeded the memory capacity of the unit. Send the entire document manually. • When making a copy, the document being stored exceeded the memory capacity of the unit. Press **[STOP]** to clear the message. Divide the document into sections.
MODEM ERROR	• There is something wrong with the unit's modem.
NO FAX REPLY	• The other party's fax machine is busy or has run out of recording paper. Try again.

DISPLAY MESSAGE	CAUSE AND REMEDY
OUT OF PAPER INPUT TRAY #2	- "#2": Manual input tray • Recording paper is not installed or the paper input tray has run out of paper. Install paper. • Recording paper is not fed into the unit properly. Reinstall paper. • The paper input tray is not installed or is not inserted completely. Insert the paper input tray into the unit.
PAPER JAMMED ↕ OPEN TOP COVER	• A recording paper jam occurred. Remove the jammed paper.
PC FAIL OR BUSY	• The cable or the computer power cord is not connected correctly. Check the connections. • The software is not running on the computer. Restart the software and try again.
PLEASE WAIT	• The unit is warming up. Wait for a while.
REDIAL TIME OUT	• The other party's fax machine is busy or has run out of recording paper. Try again.
REMOVE DOCUMENT	• The document is jammed. Remove the jammed document. • Attempted to send or copy a document longer than 600 mm using the auto document feeder. Press **[STOP]** to remove the document. Divide the document into two or more sheets and try again.
REMOVE PAPER IN INPUT TRAY #2	• The recording paper is installed in the manual input tray when trying to copy, receive faxes or print reports. Remove the recording paper from manual input tray.
REPLACE DRUM CHANGE SUPPLIES	• The drum unit's service life is finished. Replace the drum unit immediately.
RX MEMORY FULL	• The memory is full of received documents due to a lack of recording paper or a recording paper jam. Install paper or remove the jammed paper. • If feature #442 is set to "ALWAYS", check the connection between the computer and the unit.
TONER EMPTY CHANGE SUPPLIES	• The toner's service life is finished. Replace the toner cartridge immediately.
TONER LOW CHANGE SUPPLIES	• The toner's service life is near to an end. Replace the toner cartridge as soon as possible.
TOP COVER OPEN	• The top cover is open. Close it.
TRANSMIT ERROR	• A transmission error occurred. Try again.
WARMING UP	• The inside of the unit is cold. Let the unit warm up. Wait for a while.
WRONG PAPER	• The fax message was printed on paper which is shorter than letter size paper. Use the appropriate size paper.

12.2. REMOTE PROGRAMMING

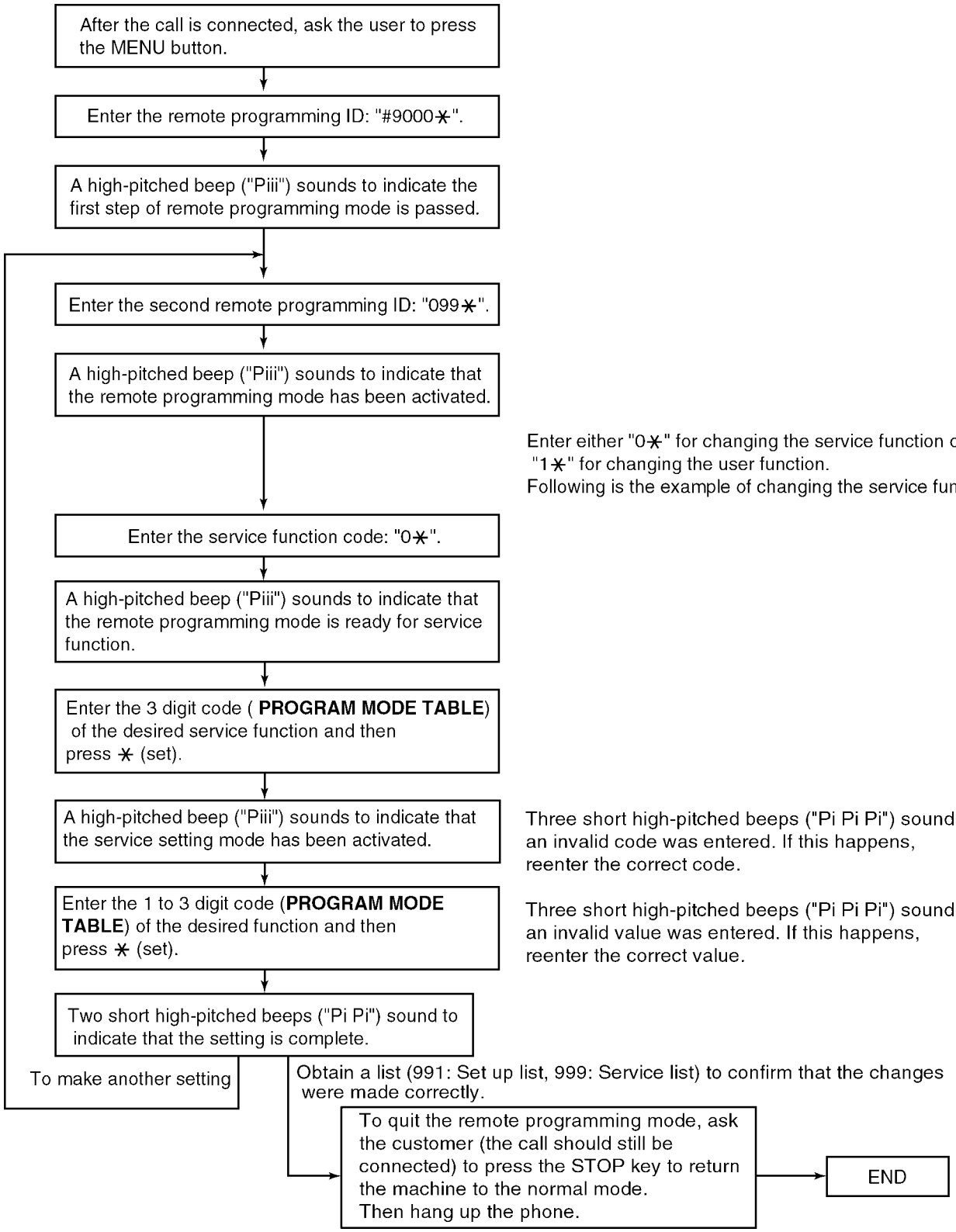
If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (**PROGRAM MODE TABLE**(P.100)). 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.99). 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.

12.2.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES



CROSS REFERENCE:

PROGRAM MODE TABLE (P.100)

12.2.2. PROGRAM MODE TABLE

12.2.2.1. USER FUNCTION

Basic features

Code	Function	Set Value	Default	Remote Setting
100	QUICK SETUP	---------	None	NG
101	SET DATE & TIME	mm/dd/yy hh:mm	07/01/01	NG
102	YOUR LOGO	---------	None	NG
103	YOUR FAX NUMBER	---------	None	NG
110	LANGUAGE	2:English / 3:French	English	OK
120	DIALING MODE	1:Pulse / 2:Tone	Tone	OK
121	SET FLASH TIME	90:900 / 70:700 / 60:600 / 40:400 / 30:300 / 25:250 / 20:200 / 16:160 / 11:110 / 10: 100 / 9: 90 / 8: 80 (ms)	700ms	OK
145	LCD CONTRAST	1:NORMAL / 2:DARKER	NORMAL	NG
155	CHANGE PASSWORD	---------	DEFAULT=1234	OK
161	RINGER PATTERN	1:A / 2:B / 3:C	A	NG
210	FAX RING COUNT	1 to 5 rings (for ext. tam)	3	OK
216	AUTO CALLER ID LIST	2:ON / 1:OFF	OFF	OK
226	TIME ADJUSTMENT	2:AUTO / 1:MANUAL	AUTO	OK
380	PAPER SIZE	1:LETTER / 2:A4 / 3:LEGAL	LETTER	OK
403	POWER SAVE	5:5min / 15:15min / 30:30min / 60:1h	15min	OK
463	DEFAULT MODE	1:COPY / 2:FAX	COPY	OK
464	MODE TIMER	0:OFF / 1:30S / 2:1min / 3:2min / 4:5min	1min	OK
482	TONER SAVE	2:ON / 1:OFF	OFF	OK

Fax features

Code	Function	Set Value	Default	Remote Setting
401	PRINT SENDING REPORT	1:Error / 2:ON / 3:OFF	Error	OK
402	JOURNAL AUTO PRINT	2:ON / 1:OFF	ON	OK
411	OVERSEAS MODE	1:NEXT FAX / 2:ERROR / 3:OFF	ERROR	OK
412	DELAYED TRANSMISSION	1:ON / 0:OFF	OFF	NG
413	ECM SELECTION	2:ON / 1:OFF	ON	OK
416	CONNECTING TONE	2:ON / 1:OFF	ON	OK
430	DISTINCTIVE RING	2:ON / 1:OFF	OFF	OK
431	FAX RING PATTERN	1:B-D / 2:A / 3:B / 4:C / 5:D	B-D	OK
432	AUTO REDUCTION	2:ON / 1:OFF	ON	OK
434	FAX ACTIVATION CODE	ON / OFF	ON CODE=*#9	NG
437	MEMORY RECEIVE ALERT	2:ON / 1:OFF	ON	OK
438	FRIENDLY RECEPTION	2:ON / 1:OFF	ON	OK
442	PCFAX SETTING	1:OFF / 2:ALWAYS / 3:CONNECTED	OFF	OK
443	PCFAX RCV PC	---------	USB HOST	NG
459	SET FAX DEFAULT	YES / NO	NO	NG

Copy features

Code	Function	Set Value	Default	Remote Setting
461	COPY RESOLUTION	1:TEXT/PHOTO / 2:TEXT / 3:PHOTO	TEXT	OK
462	CONTRAST SAVE	1:ENABLED / 0:DISABLED	DISABLED	OK
467	PAGE LAYOUT HOLD	1:DISABLED / 2:ENABLED	DISABLED	OK
468	ZOOM HOLD	1:DISABLED / 2:ENABLED	DISABLED	OK
469	COLLATE HPLD	1:DISABLED / 2:ENABLED	DISABLED	OK

PC print features

Code	Function	Set Value	Default	Remote Setting
774	DATA TIMEOUT	5~600s	60s	NG

Scan features

Code	Function	Set Value	Default	Remote Setting
493	SCAN MODE	1:VIEWER / 2:FILE / 3:E-MAIL / 4:OCR	VIEWER	OK
494	SCAN PARAM. HOLD	1:DISABLED / 2:ENABLED	DISABLED	OK

LAN features

Code	Function	Set Value	Default	Remote Setting
500	DHCP	1:DISABLED / 2:ENABLED	ENABLED	OK
501	IP ADDRESS	---------		NG
502	SUBNET MASK	---------		NG
503	DEFAULT GATEWAY	---------		NG
504	PRIMARY DNS SERVER	---------		NG
505	SECONDARY DNS SERVER	---------		NG
507	MACHINE NAME	---------		NG
508	MAC ADDRESS	---------		NG
532	APPROVED USERS	1:DISABLED / 2:ENABLED	DISABLED	OK
533	AUTO IP	1:DISABLED / 2:ENABLED	DISABLED	OK
534	HTTPD	1:DISABLED / 2:ENABLED	ENABLED	OK

12.2.2.2. SERVICE FUNCTION

Code	Function	Set Value	Default	Remote Setting
501	Pause time set	001~600 x 100msec	030	OK
503	Dial speed	1:10pps / 2:20 pps	10pps	OK
507	V34 transmission start speed	(0:Disable/1:33.6/2:31.2/3:28.8/4:26.4/ 5:24.0/6:21.6/7:19.2/8:16.8/)	33600bps	OK
508	V34 reception start speed	(0:Disable/1:33.6/2:31.2/3:28.8/4:26.4/ 5:24.0/6:21.6/7:19.2/8:16.8/)	33600bps	OK
514	Bell signal detect time	1~9 x 100msec	6	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100	OK
521	International mode select	1:ON / 2:OFF	ON	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
524	Transmission equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
527	V8 function select	1:OFF / 2:ON	ON	OK
529	Memory clear for Call Service	---	---	NG
550	Memory clear	---	---	NG
551	ROM check	---	---	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication select	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	---	---	NG
555	Scanner test	---	---	NG
556	Motor test	---	---	NG
557	LED test	---	---	NG
558	LCD test	---	---	NG
561	Key test	---	---	NG
567	T0 timer	001~255sec	052	OK
570	Break % select	1:61% / 2:67%	61%	OK
573	Remote turn-on ring number set	00~99	10	OK
590	FAX auto redial time set	00~99	01	OK
591	FAX auto redial line disconnection time set	001~999sec	065	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection select	1:1st / 2:2nd	1st	OK
595	Receive error limit value set	1:5% / 2:10% / 3:15% / 4:20%	10%	OK
596	Transmit level set	-15~00dBm	10	OK
598	Receiving Sensitivity	20~48	48	OK
599	ECM Frame size	1:256 / 2:64	256byte	OK
628	H.V.P.S check	---	---	NG
639	LSU test	---	---	NG
655	Cause distinction code of call service 3	---	---	NG
717	Transmit speed select	1: 14400bps / 2:12000bps / 3:9600bps / 4:7200bps / 5:4800bps / 6:2400bps	14400bps	OK
718	Receive speed select	1: 14400bps / 2:12000bps / 3:9600bps / 4:7200bps / 5:4800bps / 6:2400bps	14400bps	OK
721	Pause tone detect	1:ON / 2:OFF	OFF	OK
722	Redial tone detect	1:ON / 2:OFF	OFF	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
774	T4 timer	00~99 × 100msec	00	OK
815	Sensor check	---	---	NG
852	Print test pattern	---	---	NG
853	Top margin	1~5	5	OK
854	Left margin	1~7	7	OK
874	DTMF ON time	060~200msec	100	OK
875	DTMF OFF time	060~200msec	100	OK
880	History list	---	---	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.88) for descriptions of the individual codes.

Example:

If you want to set value in the “401 PRINT SENDING REPORT”, press the dial key number 1, 2 or 3 corresponding to the Set Value you want to select. (1:ERROR/2:ON/3:OFF)

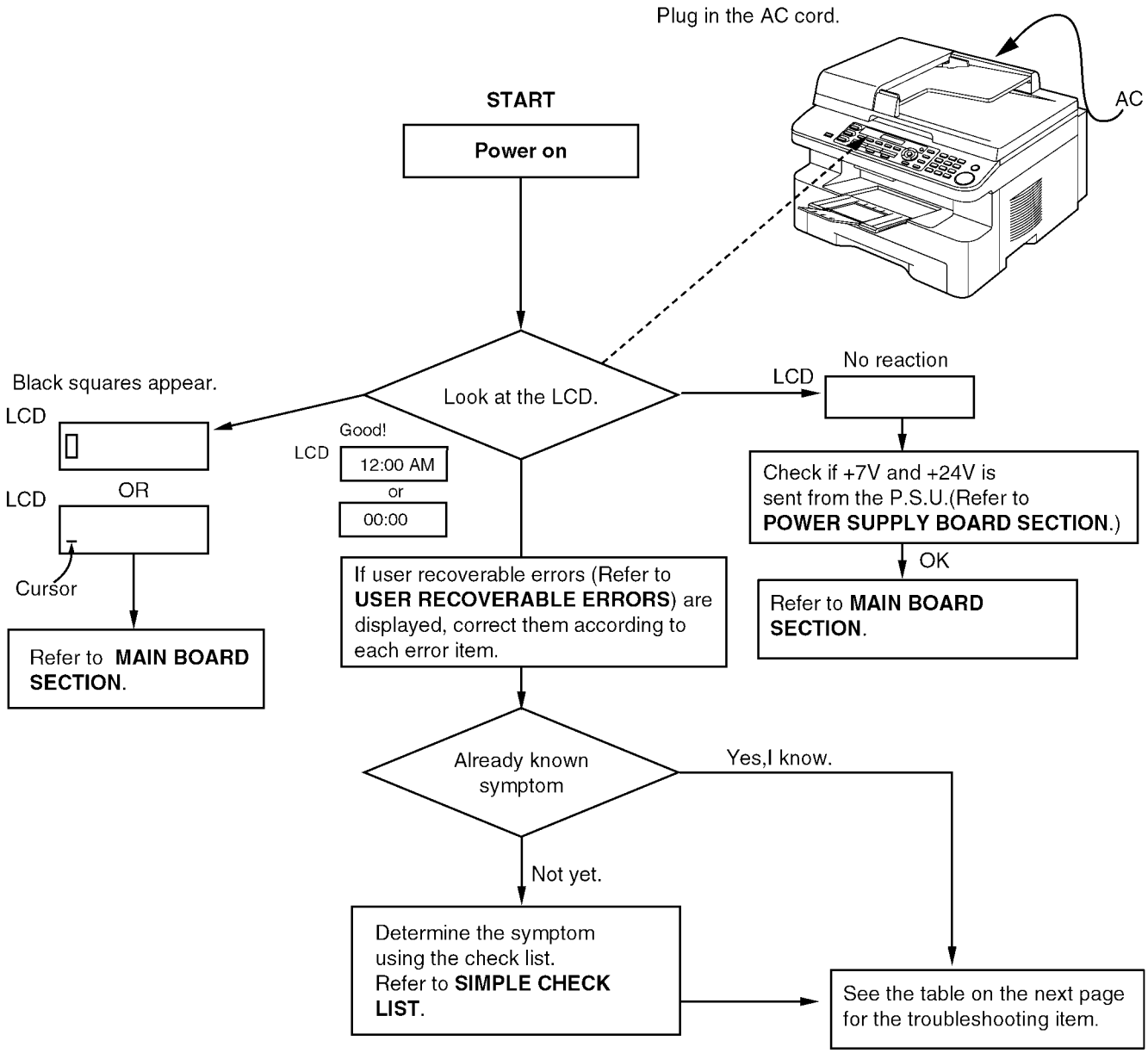
12.3. TROUBLESHOOTING DETAILS

12.3.1. OUTLINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Main PCB, Sensor 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.106). Difficult problems may be hard to determine, so repeated testing is necessary.

12.3.2. STARTING TROUBLE SHOOTING

Determine the symptom and the troubleshooting method.

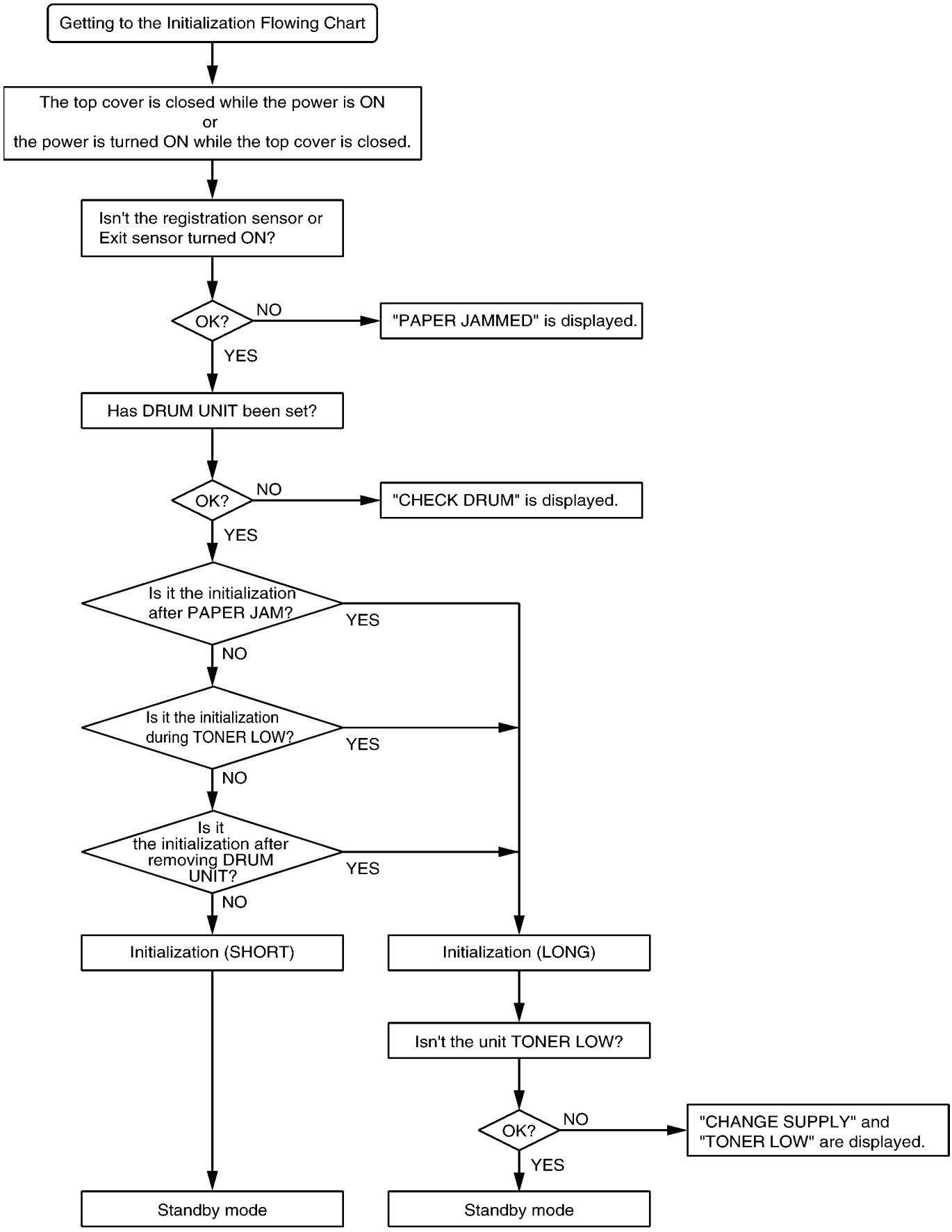


CROSS REFERENCE:

USER RECOVERABLE ERRORS(P.96)
SIMPLE CHECK LIST(P.106)
MAIN BOARD SECTION(P.233)
POWER SUPPLY BOARD SECTION(P.62)

12.3.3. 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.



12.3.4. SIMPLE CHECK LIST

SERIAL NO. _____ DATE _____

FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	Copy by ADF	OK / NG	
	Copy by Flat Bed	OK / NG	
PC operation	USB PC print	OK / NG	
	LAN Color Scan	OK / NG	
Telephone operation	Handset transceiver/ receiver (With optional Handset)	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.83)

12.3.5. SIMPLIFIED TROUBLESHOOTING GUIDE

12.3.5.1. PRINTING

No.	Symptom	Cause	Countermeasure
1	**GHOST IMAGE** (P.117)	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.167)
		Failed fuser unit	Check the heat roller and the pressurized roller and the spring and the heat lamp and the thermistor
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
2	**DARK OR WHITE VERTICAL LINE** (P.118)	Dirty the cover glass or the reflecting mirror	Clean the cover glass and the reflecting mirror
		Dust on the path of the laser beam	Clean the path of the laser beam
		Failed drum unit	Replace drum unit
		Failed the heat roller or the pressurized roller	Check the heat roller and the pressurized roller
		Failed LSU	Go to **LSU (Laser Scanning Unit) SECTION** (P.40)
3	**DARK OR WHITE HORIZONTAL LINE** (P.119)	Failed drum unit	Replace drum unit
		Failed the gear	Check the gear
		Failed the engine motor	Go to **FB (Flatbed) MOTOR** (P.160)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **HIGH VOLTAGE SECTION** (P.167)
		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 HALF DARKNESS BACKGROUND** (P.120)	Failed drum unit	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.167)
		Dirty the recording paper path	Clean the recording paper path
5	**BLACK PRINT** (P.121)	Failed drum unit	Replace drum unit
		Failed LSU	Go to **LSU (Laser Scanning Unit) SECTION** (P.40)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **HIGH VOLTAGE SECTION** (P.167)
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to **CIS CONTROL SECTION** (P.163)
6	**LIGHT PRINT** (P.122) **OR BLACK PRINT** (P.121)	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the cover glass or the reflecting mirror	Clean the cover 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.167)
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to **CIS CONTROL SECTION** (P.163)
7	**BLACK OR WHITE POINT** (P.123)	Failed the developer roller (32mm pitch)	Replace drum unit
		Failed the OPC drum (75mm pitch)	Replace drum unit
		Failed the heat roller (79mm pitch)	Check the heat roller
		Failed the high voltage power supply board	Go to **HIGH VOLTAGE SECTION** (P.167)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb

12.3.5.2. RECORDING PAPER FEED

No.	Symptom	Cause	Countermeasure
1	**MULTIPLE FEED** (P.123)	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.124)	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
		Separator of heat roller a check	Replace separator
		Dust on the recording paper path	Clean the recording paper path
		Too thin recording paper	Use the recording paper from 16lb to 24lb
3	**SKEW** (P.125)	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.126)	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 solenoid	Check the solenoid
		Failed the engine motor	Go to **FB (Flatbed) MOTOR** (P.160)
		Failed the pickup sensor lever	Check the pickup sensor lever
		Failed the pickup sensor	Go to **SENSOR SECTION** (P.156)
5	**THE RECORDING PAPER JAM**(P.127) ”PAPER JAMMED” ON THE LCD	Dirty or failed the pressure roller	Clean or replace the pressure roller
		Dirty or failed the heat roller	Clean or replace the heat roller
		Separator of heat roller a check	Replace separator
		Dust on the recording paper path	Clean the recording paper path
		Failed the paper feed roller	Replace the resistance roller
		Failed the pickup sensor lever	Check the pickup sensor lever
		Failed the pickup sensor	Go to **SENSOR SECTION** (P.156)
		Failed the resist sensor lever	Check the Registration & Manual paper sensor (paper top sensor) lever
		Failed the resist sensor	Go to SENSOR SECTION(P.156)
		Failed the exit sensor	Check the Paper Exit sensor lever
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
		Not set the toner bottle	Set toner bottle
6	**BACK SIDE OF THE RECORDING PAPER IS DIRTY**(P.128)	Dirty the recording paper path	Clean the recording paper path
		Dirty the pressure roller	Clean the pressure roller
		Dirty the regist roller	Clean the resistance roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **HIGH VOLTAGE SECTION** (P.167)

12.3.5.3. COPY AND FAX

No.	Symptom	Cause	Countermeasure
1	**NO DOCUMENT FEED** (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.129)	Failed the document sensor lever	Replace the document sensor lever
		Failed the document sensor	Go to **SENSOR SECTION** (P.156)
		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
	DOCUMENT JAM (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.129)	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 (ADF provided model only)** (P.161)
		Failed the ADF cover open switch lever	Replace the ADF cover open switch lever
	MULTIPLE DOCUMENT FEED(NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) (P.129)	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.131)	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.132)	The cause of ADF	Go to SKEW (ADF)(P.131)
		The cause of scanner glass	----
		Problem with the other FAX machine	
4	**THE RECEIVED FAX DATA IS SKEWED** (P.132)	The cause of printing	Go to SKEW (ADF)(P.131)
		Problem with the other FAX machine	
5	**THE RECEIVED OR COPIED DATA IS EXPANDED** (P.132)	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 FB motor
6	**BLACK OR WHITE VERTICAL LINE IS COPIED** (P.133)	Dirty or failed the white plate and sheet (2 places)	Clean or replace the white plate and sheet
		Dirty or failed the glass board	Clean or replace the glass board
		The cause of printing	Go to **DARK OR WHITE VERTICAL LINE** (P.118)
		Failed CIS	Go to **CIS CONTROL SECTION** (P.163)
7	**AN ABNORMAL IMAGE IS COPIED** (P.134)	Dirty or failed the white plate and sheet (2 places)	Clean or replace the white plate and sheet
		Dirty or failed the glass board	Clean or replace the glass board
		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 FB motor
		Failed CIS	Go to **CIS CONTROL SECTION** (P.163)
		The cause of printing	Go to **DARK OR WHITE VERTICAL LINE** (P.118)

12.3.6. 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.40).

- 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.40)

- This can be judged only by referring to signal. Check 5V line, XHSYNC, XAPC, XVIDEO, XLDON.

Call Service 3 ----- Detection of fixing temperature..... Refer to **HEAT LAMP CONTROL CIRCUIT** (P.54)

- *Service mode *655 tells the detection number and 3 latest temperatures of the thermistor. The detection point of the Call Service 3 and the thermistor temperature is displayed. Maximum 3 latest temperatures are displayed showing the newest on the left. [AABB CCDD EEFF] AA, CC and EE show the detection points and BB, DD and FF show their temperature detection points.
  00: CALL SERVICE 3 was not occurred.
  01: means that the value of AD did not increased by 6 steps or more within 10 sec soon after the heater was turned ON. (thermistor's open detection)
  02: means that it did not reach the first stabilizing temperature (170°C: 5Bh) within 50 seconds.
  03: means that it did not reach the second stabilizing temperature (195°C: 44h/200°C: 40h) within 70 seconds after reaching the first stabilizing temperature (170°C: 5Bh).
  04: means that it dropped to 155°C: 6Ch/160°C: 66h (-40 deg) or below by the temperature control after reaching the second stabilizing temperature (195°C: 44h/200°C: 40h).
  05: means that it did not reach the first stabilizing temperature (170°C: 5Bh) within 30 seconds from detection temperature 1 (70°C: D8h).
  06: means that it became 235°C: 2Ah or over during printing.
  07: means that during printing the short of the thermistor (AD: 00h) was detected.
  08: means that the thermistor's short (AD: 00h) and open (AD: FFh or over) were detected.

<Note>

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

Call Service 4 ----- Rotation of Fan..... Refer to **FAN MOTOR SECTION** (P.37)

- Connector isn't inserted firmly, dust is caught in and the fan is broken.
- Rotation of the Fan can be confirmed by following Test Mode.
  Service mode *677
  :1... Normal operation (default)
  :2... Right Fan ON (High speed)
  :3... Right Fan ON (Low speed)
  :4... Left Fan ON (High speed)
  :5... Left Fan ON (Low speed)
  :6... Both Fan OFF

Call service 5 ----- Rotation of Engine motor..... Refer to **MOTOR DRIVE SECTION** (P.30)

- Engine motor's rotation detection signal LD did not become Low within rated speed ±6.25%.
- Service mode *556: the operation of Main Motor can be checked by pressing 0 and SET buttons.

Call service 6 ----- Detection of Charger error..... Refer to the **HVPS (High Voltage Power Supply) SECTION** (P.52)

- Breaking of charger's wire of Drum Unit and/or loose connection of High voltage terminals (CHRG, GRID).
- First, replace the Drum unit even so, it doesn't function check the high voltage power supply.

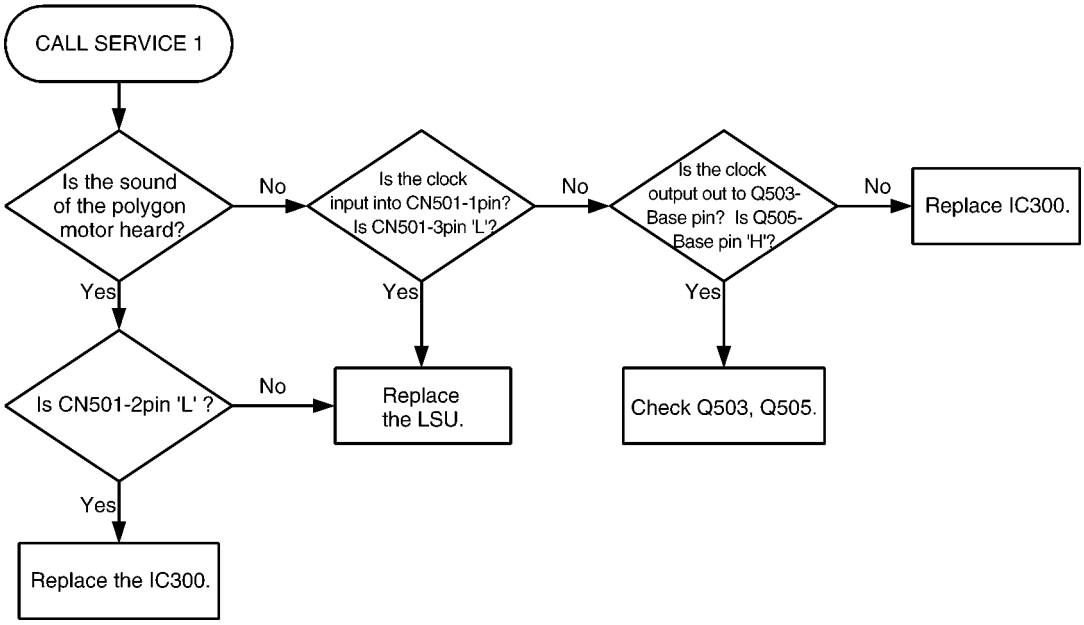
* As for Call Service 1, 2, 4, 5 and 6, turn the power OFF then ON to restart.

12.3.6.1. 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 IC300-F23pin (NREADY).

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.

* You can check the LSU function by service mode ✳639.

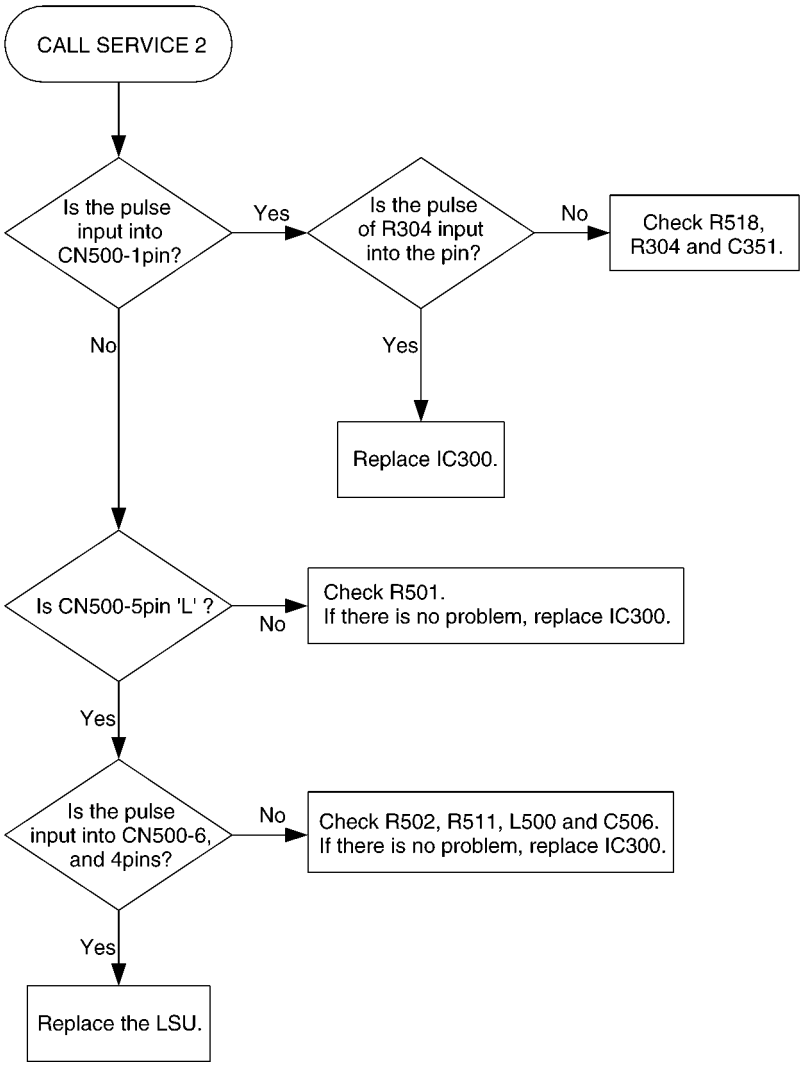


12.3.6.2. CALL SERVICE 2

"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 300-G23pin. (NHSYNC)

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

* You can check the LSU function by service mode ✳639.



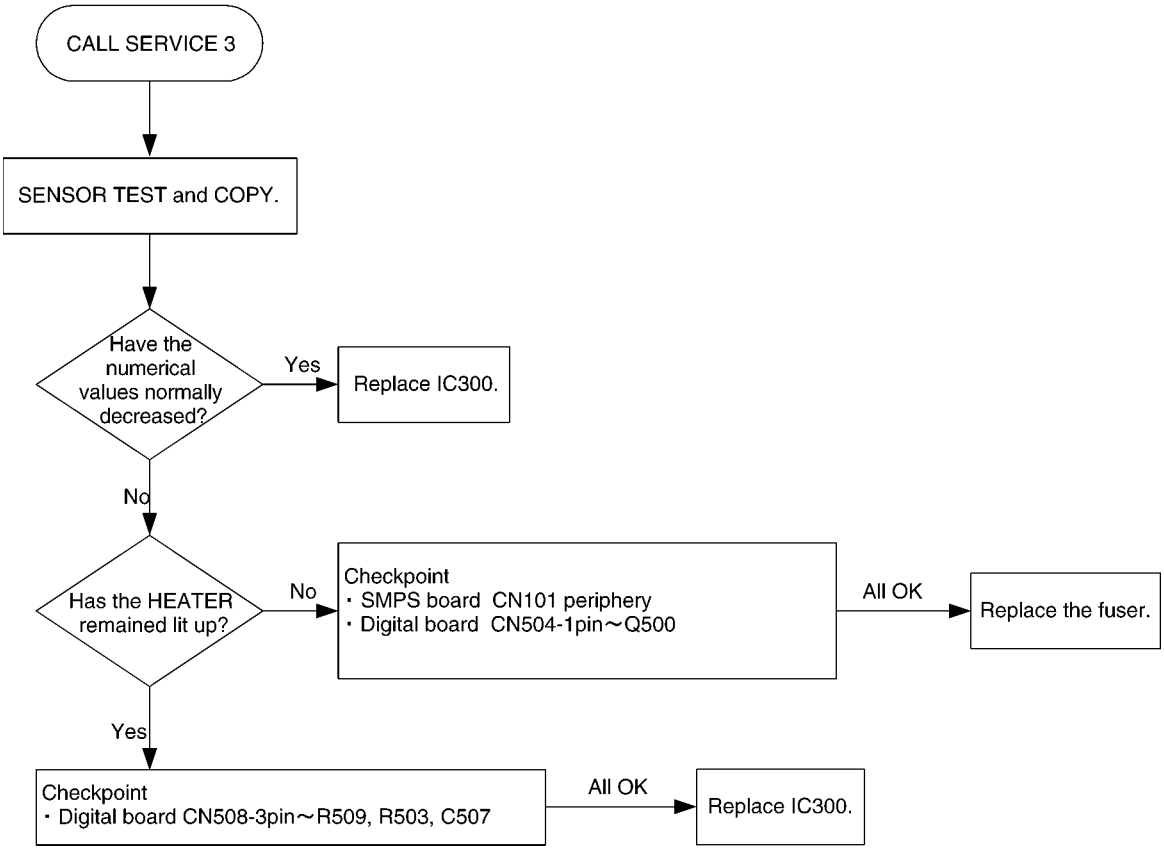
Note:

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

12.3.6.3. 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 300-D19.

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, 'F5(25ºC)' is displayed in the waiting state, and '3ch(205ºC)' or its approximate numbers are displayed during printing.

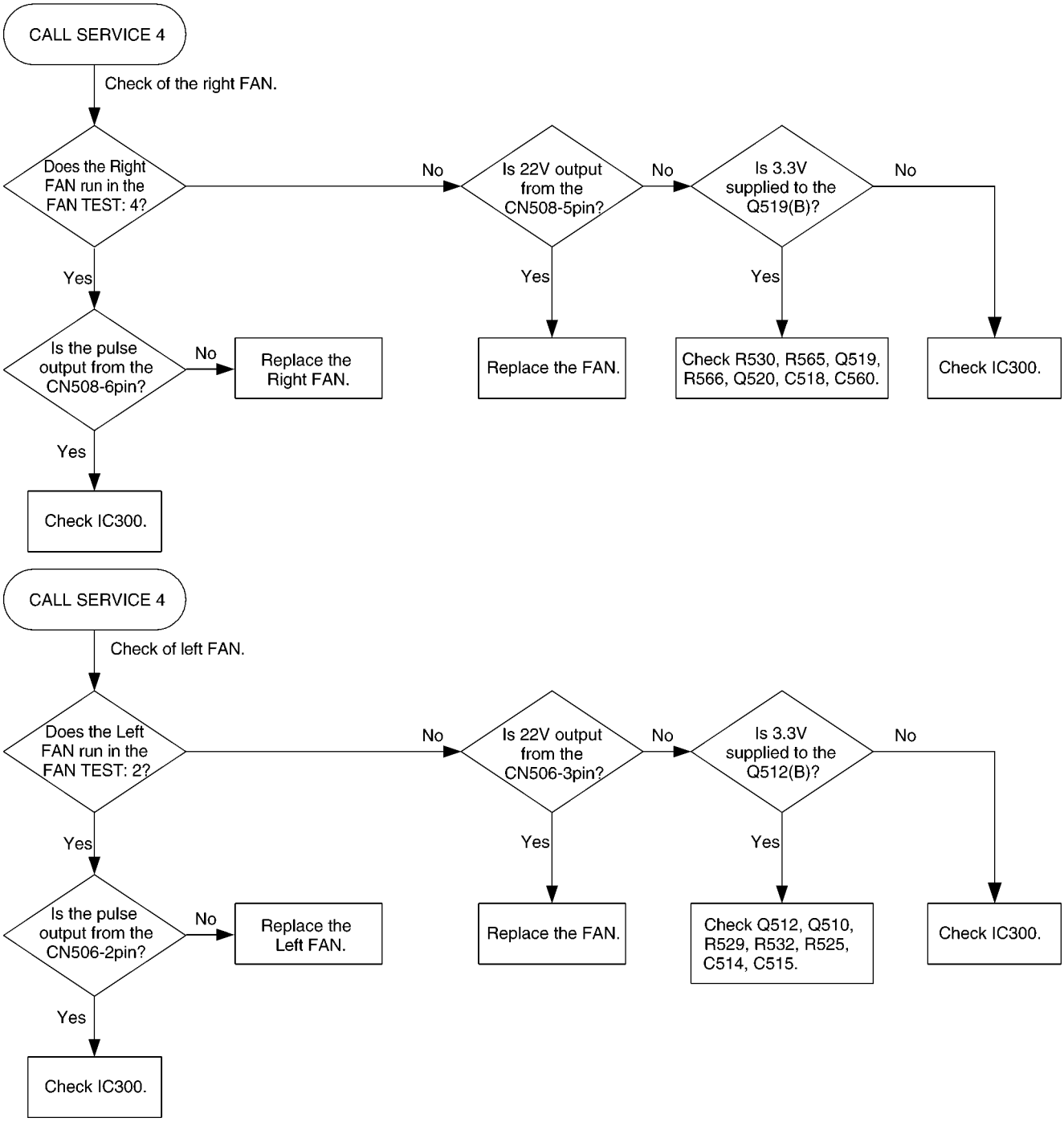


* When Call Service 3 is occurred, the cause can be distinguished by service mode ✳655.
Refer to P.110 for details.

12.3.6.4. 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 IC300-AC20 and W24pin. "CALL SERVICE 4" is displayed when it detects NG three times continuously.
After repairing, copy three times.If “CALL SERVICE 4 “ is displayed, check again.

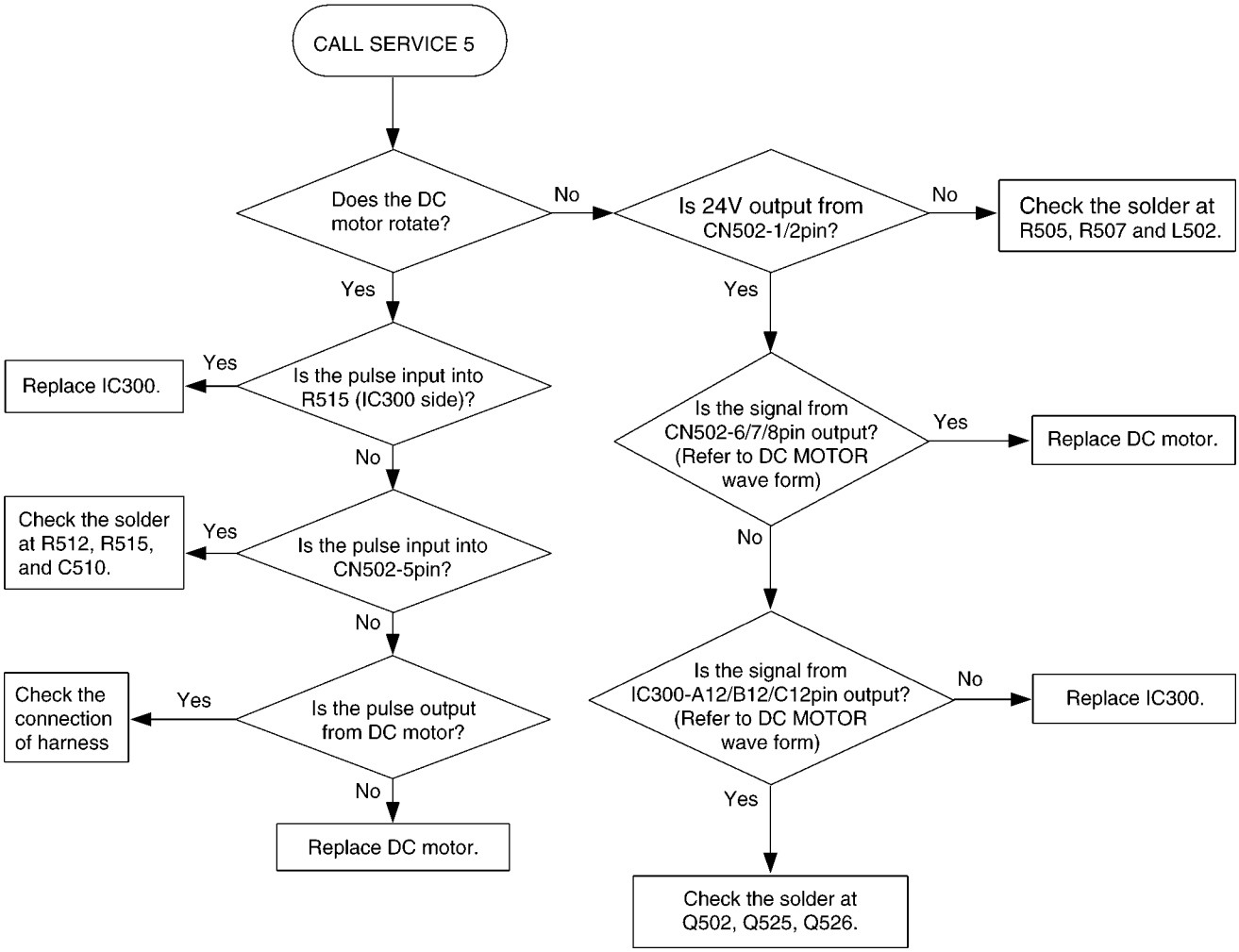
After the LCD indicates "CALL SERVICE 4 " , turn the power OFF/ON.
Then, perform the FAN TEST in service mode.
This can be performed by pressing MENU→#→9000→✳677.
1: OFF (Default)
2: Left FAN: ON (High Speed)
3: Left FAN: ON (Low Speed)
4: Right FAN: ON (High Speed)
5: Right FAN: ON (Low Speed)



12.3.6.5. CALL SERVICE 5

"CALL SERVICE 5" means that Engine DC motor's rotation detection signal (LD) does not become Low.

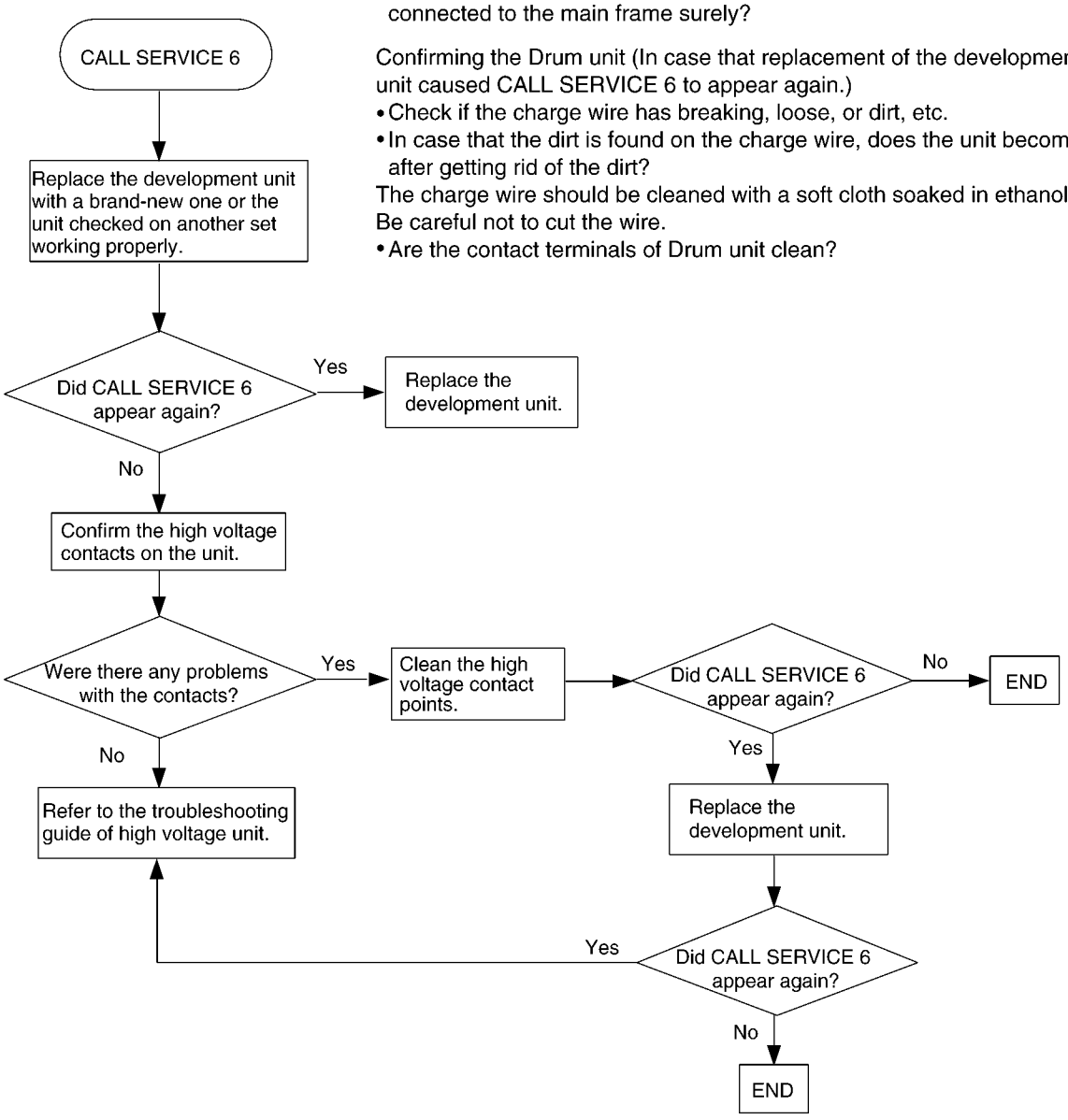
After the LCD indicates "CALL SERVICE 5", turn the power OFF/ON.
Perform the MOTOR TEST in service mode.
MOTOR TEST can be performed by pressing MENU → # → 9000 → ∗556.
And Press 0 and SET buttons.



12.3.6.6. CALL SERVICE 6

"CALL SERVICE 6" indicates that abnormal charge voltage is output from the high voltage unit.

CALL SERVICE 6 appears when the charge voltage turns into abnormal voltage caused by charge wire breaking, short circuit, defect, and contact failure between Drum unit and main frame through charge and GRID terminals.
When the charge voltage becomes abnormal, the high voltage unit shuts off the charge output, and then trouble detection signal (HVERR) is output from pin 2 of CN1.
When the main PCB detects the trouble detection signal, the unit displays CALL SERVICE 6.
CALL SERVICE 6 is canceled by turning the power OFF then ON. (When the problem is not solved, CALL SERVICE 6 will be displayed again.)



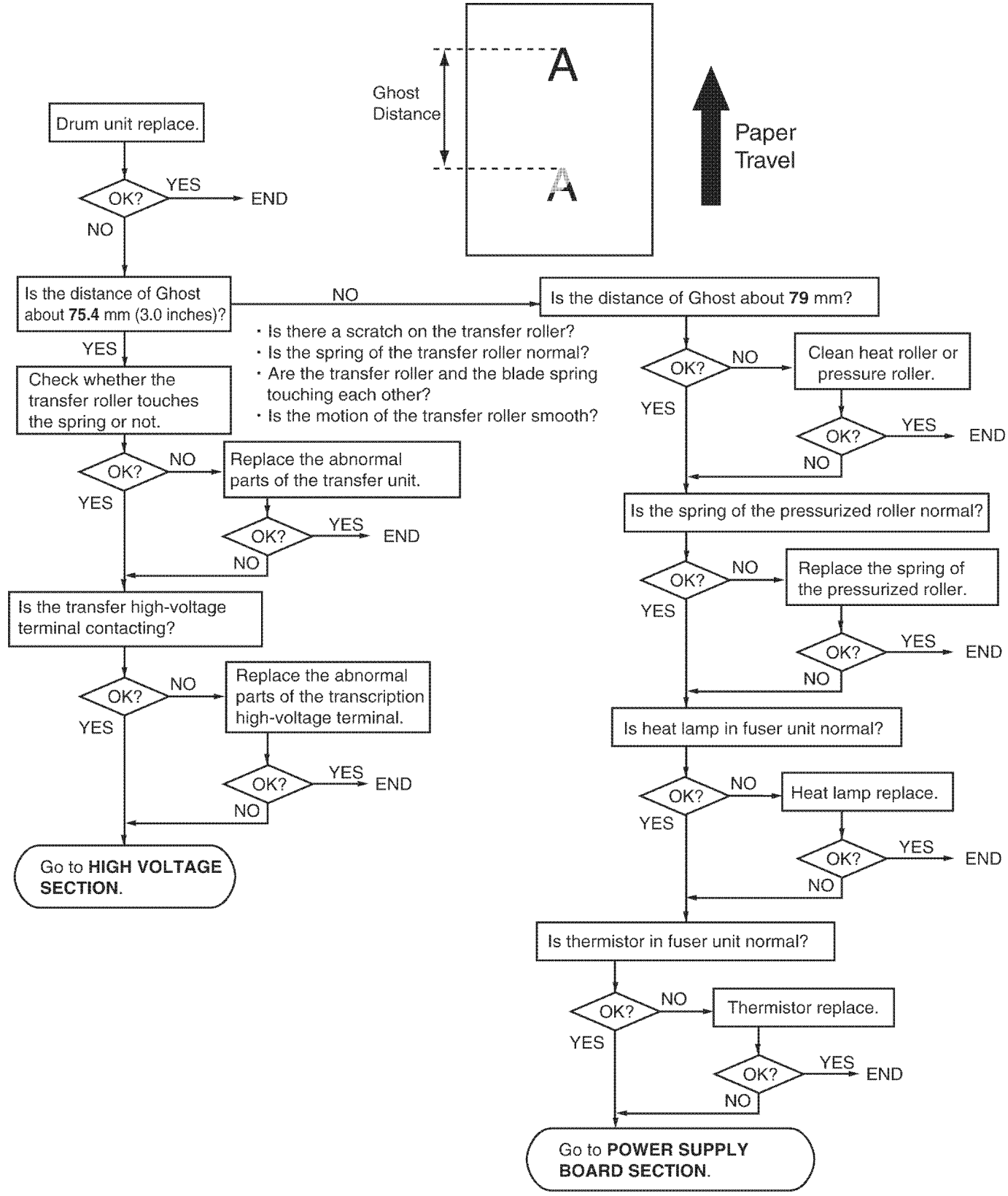
Confirming the contact points of the main frame
- Check the dirt on the high voltage terminals.
- Check if the spring pressure of each high voltage terminal is strong enough. (Isn't it distorted or bent?)
- When a Drum unit is installed on the main frame, are the terminals connected to the main frame surely?

Confirming the Drum unit (In case that replacement of the development unit caused CALL SERVICE 6 to appear again.)
- Check if the charge wire has breaking, loose, or dirt, etc.
- In case that the dirt is found on the charge wire, does the unit become normal after getting rid of the dirt?

The charge wire should be cleaned with a soft cloth soaked in ethanol.
Be careful not to cut the wire.
- Are the contact terminals of Drum unit clean?

12.3.7. PRINT

12.3.7.1. GHOST IMAGE

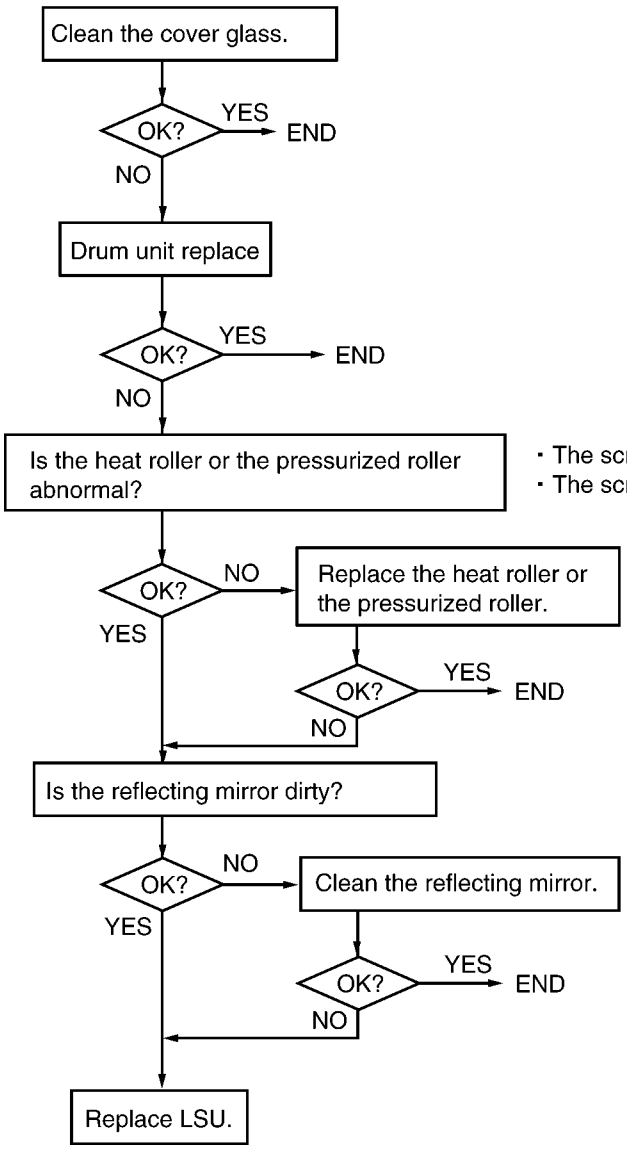


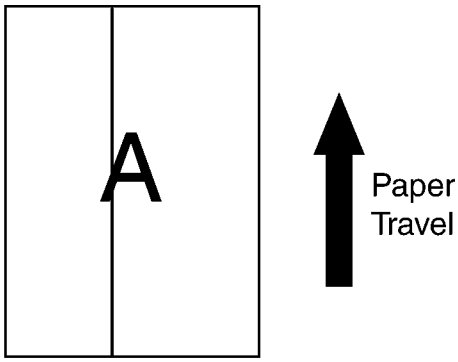
CROSS REFERENCE:

HIGH VOLTAGE SECTION(P.167)

POWER SUPPLY BOARD SECTION(P.62)

12.3.7.2. DARK OR WHITE VERTICAL LINE



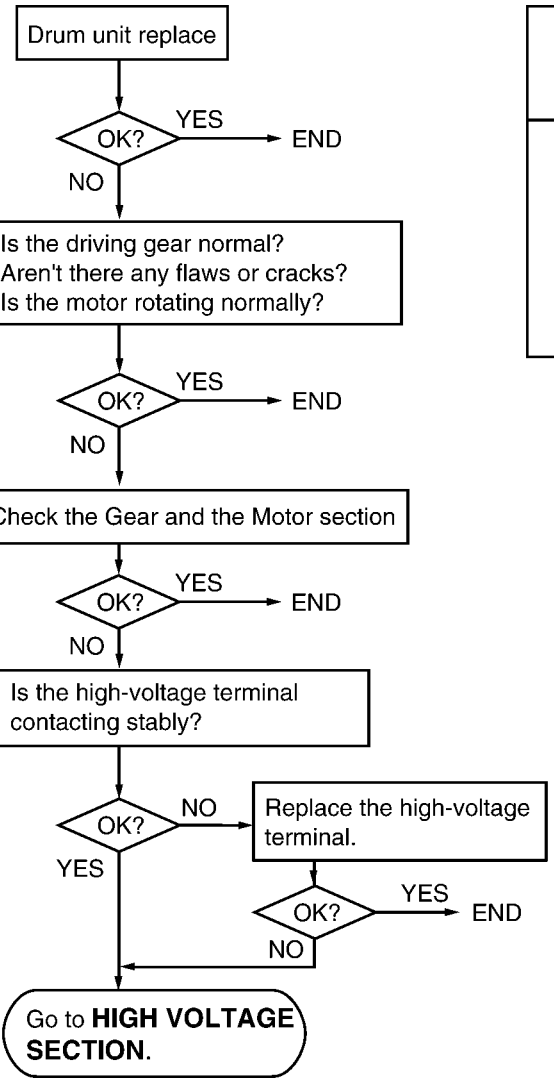


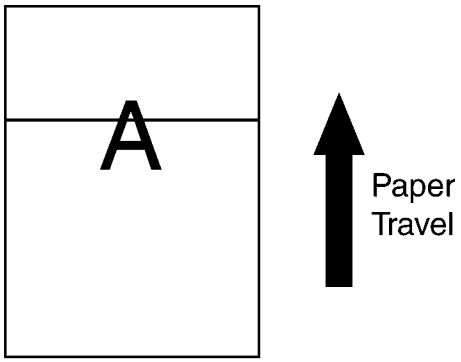
- The scratch and dirt of the heat roller
- The scratch and dirt of the pressurized roller

Note:

When wiping the cover glass, reflecting mirror, use a dry and soft cloth.

12.3.7.3. DARK OR WHITE HORIZONTAL LINE

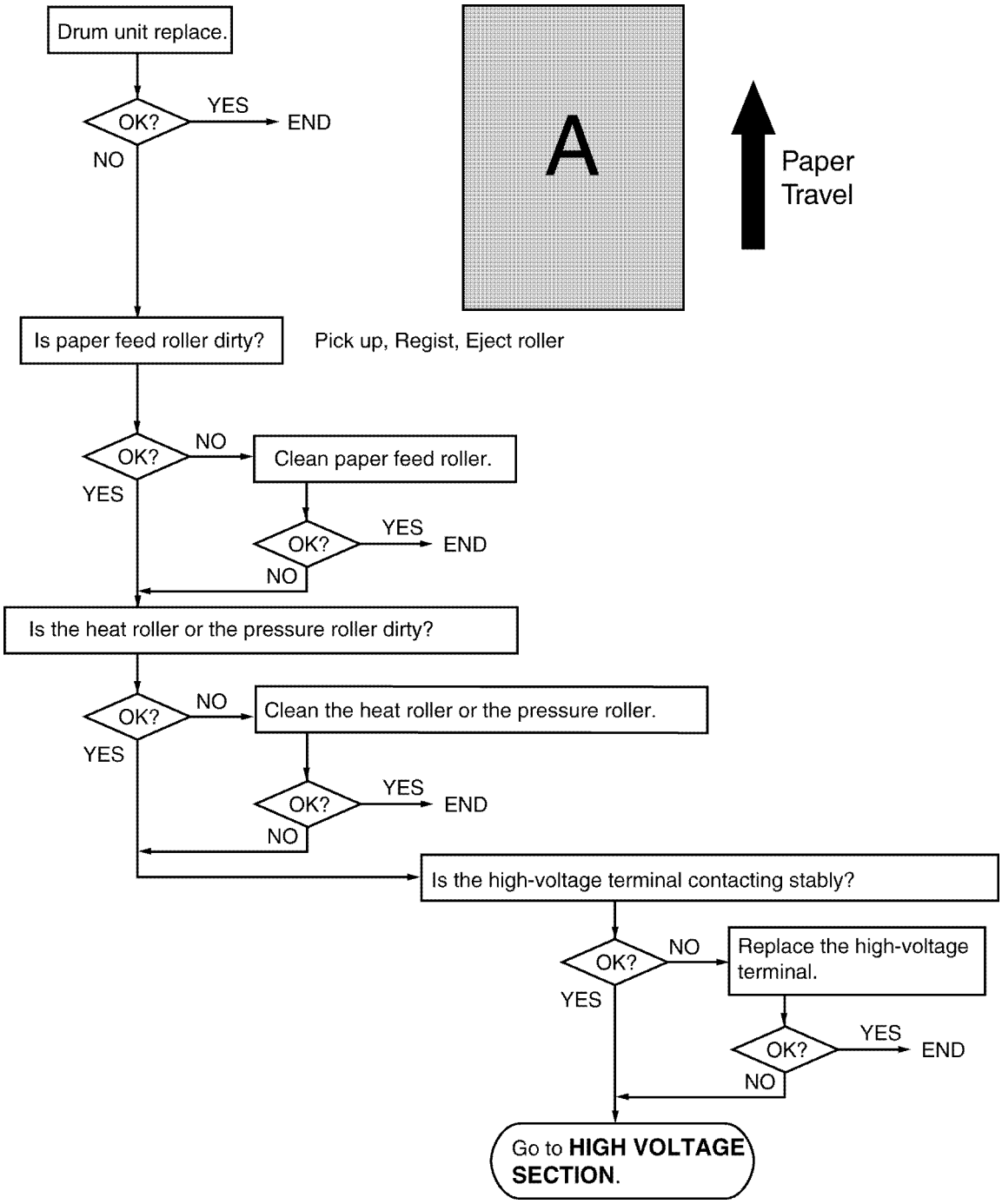




・It is necessary to describe the information about the lines that cannot be troubleshooted in such as halftone.
・When there is the information about the troubleshooted horizontal line, please add the description of it.

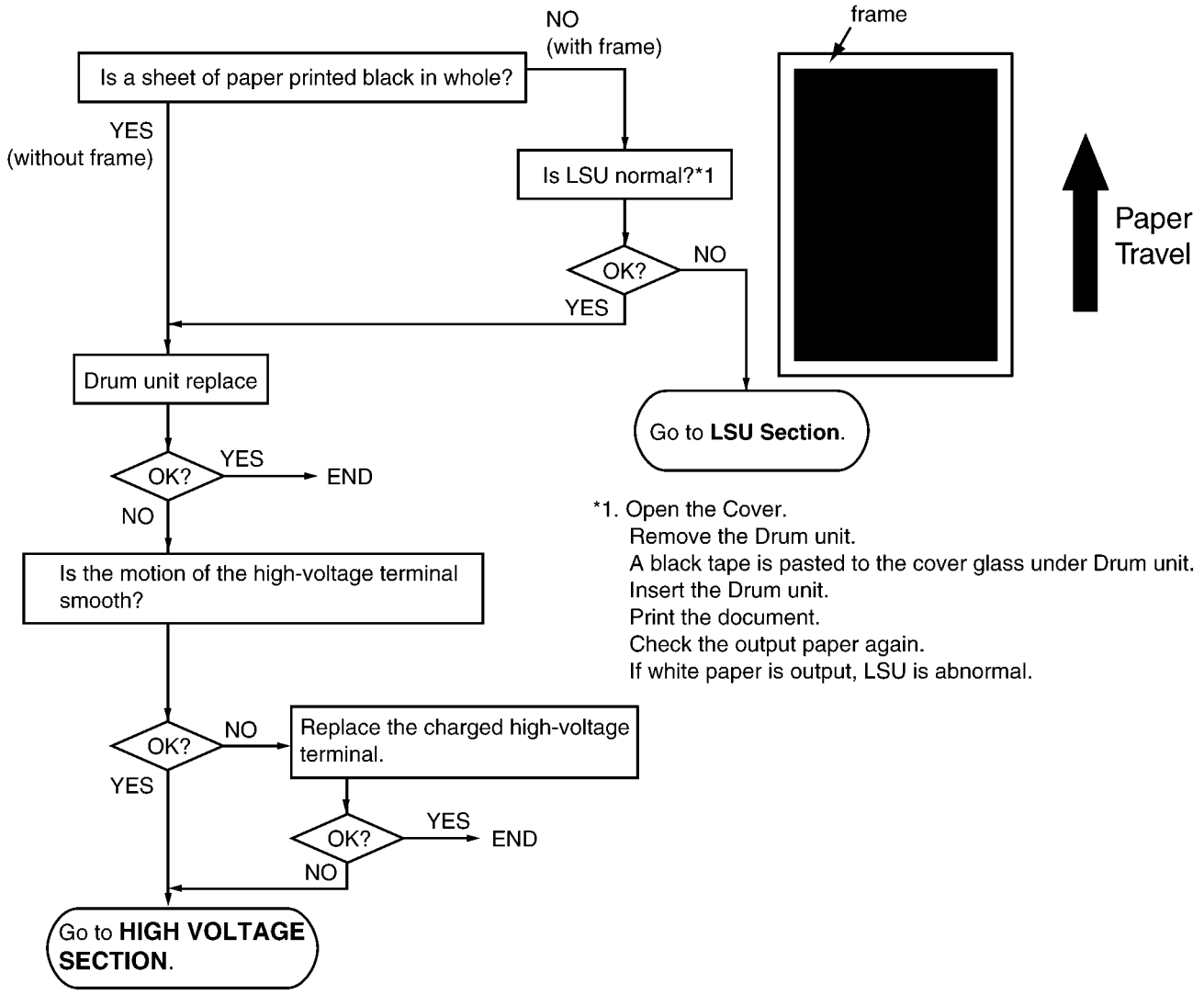
CROSS REFERENCE:
HIGH VOLTAGE SECTION (P.167)

12.3.7.4. DIRTY OR HALF DARKNESS BACKGROUND



CROSS REFERENCE:
HIGH VOLTAGE SECTION (P.167)

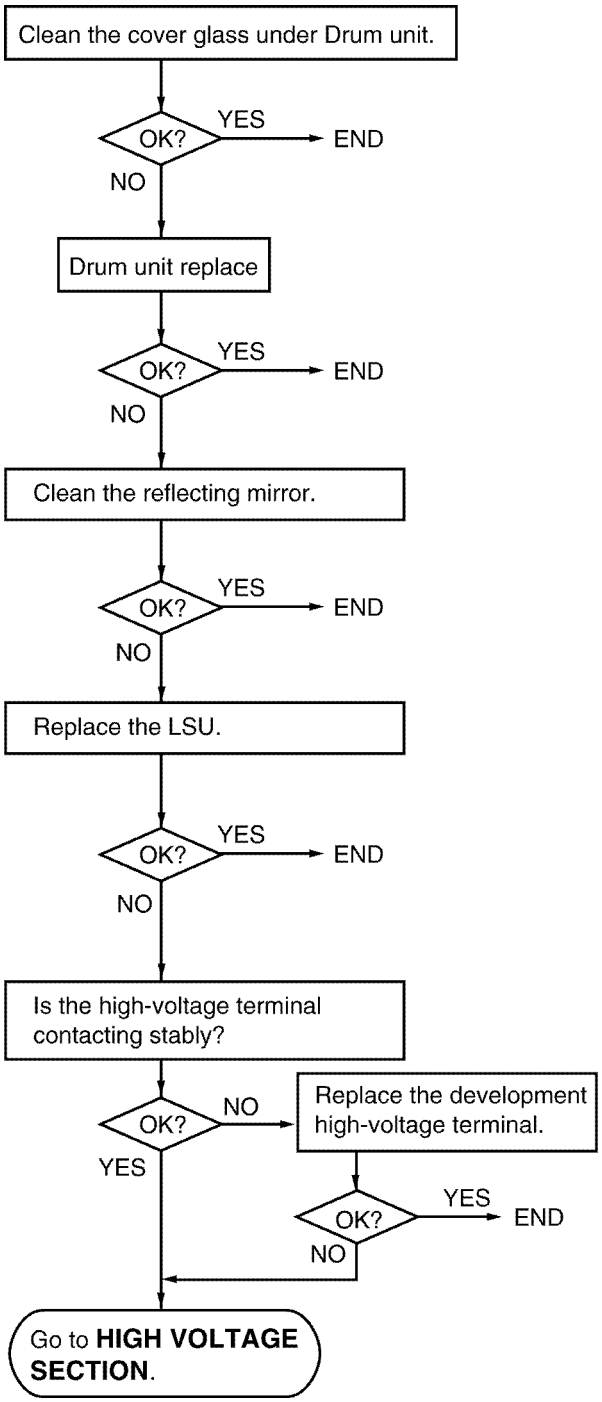
12.3.7.5. BLACK PRINT

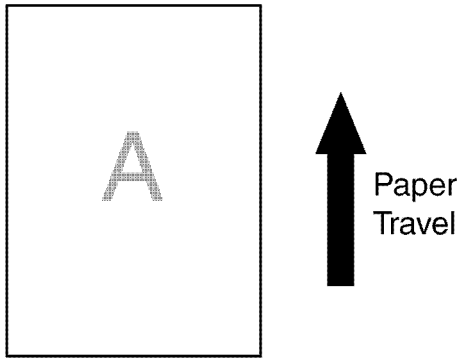


*1. Open the Cover.
Remove the Drum unit.
A black tape is pasted to the cover glass under Drum unit.
Insert the Drum unit.
Print the document.
Check the output paper again.
If white paper is output, LSU is abnormal.

CROSS REFERENCE:
HIGH VOLTAGE SECTION (P.167)
LSU (Laser Scanning Unit) SECTION (P.40)

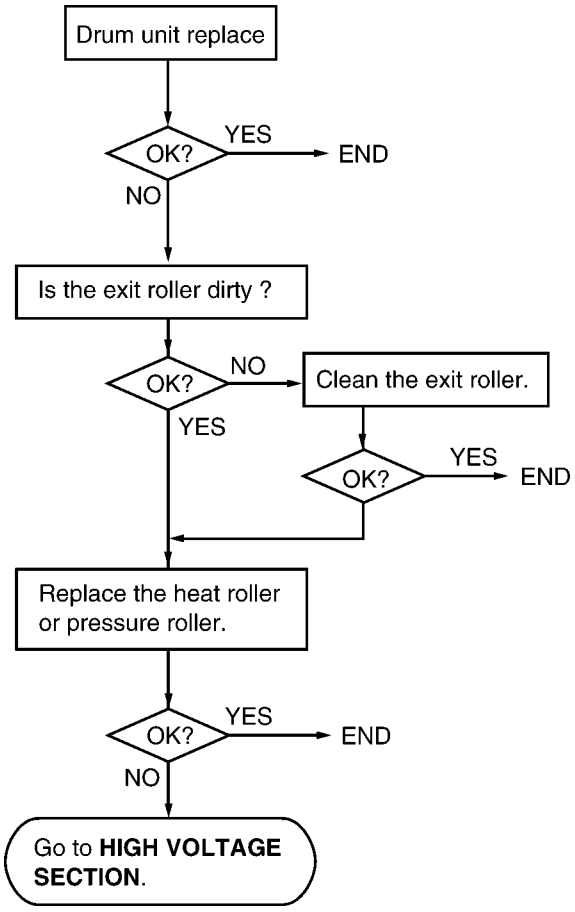
12.3.7.6. LIGHT PRINT

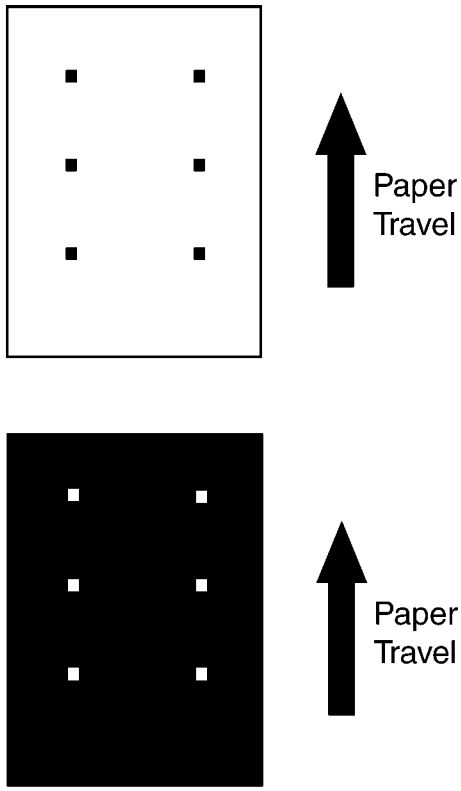




CROSS REFERENCE:
HIGH VOLTAGE SECTION (P.167)

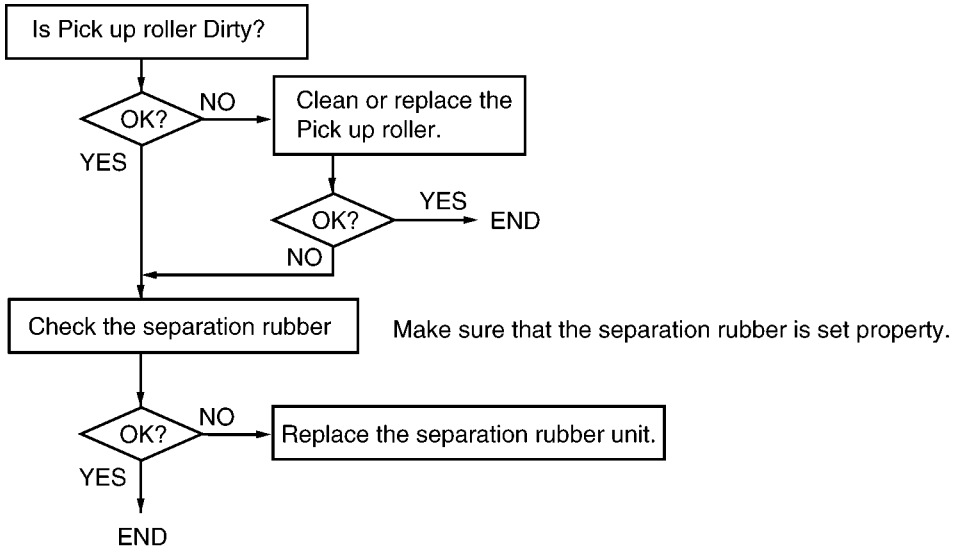
12.3.7.7. BLACK OR WHITE POINT



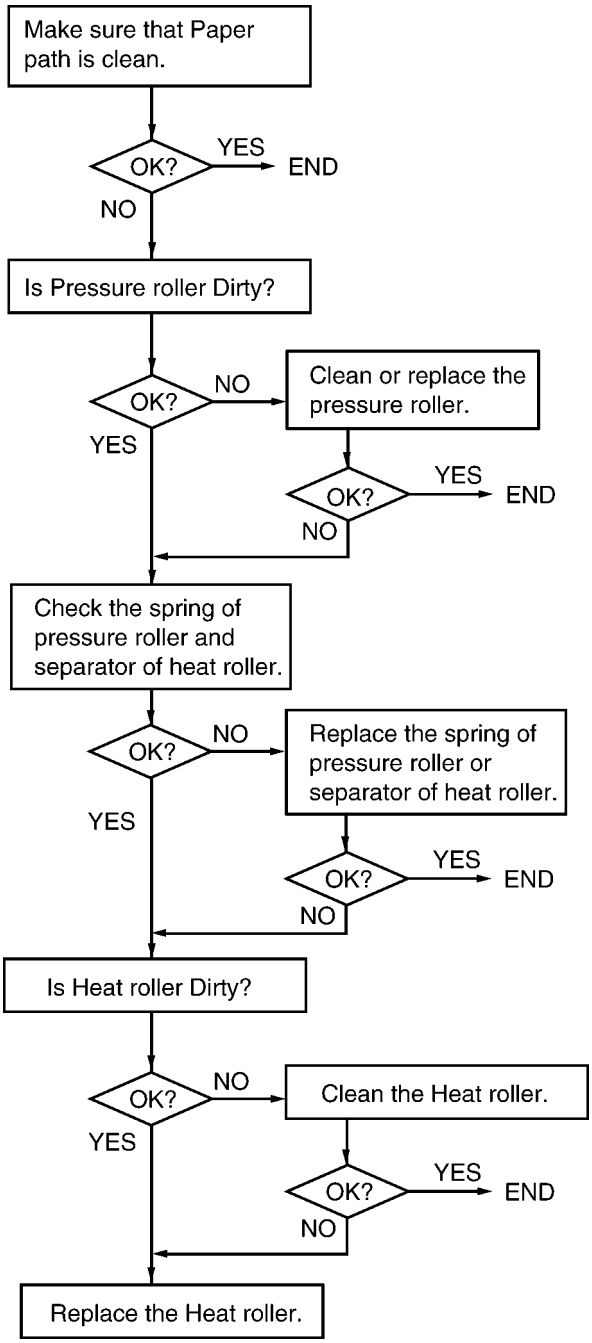


12.3.8. RECORDING PAPER FEED

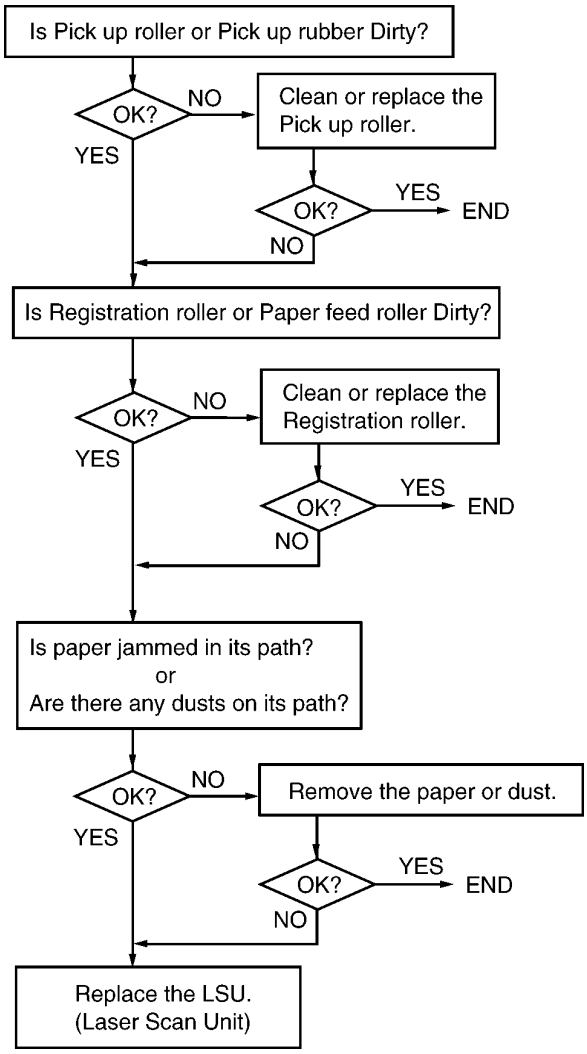
12.3.8.1. MULTIPLE FEED



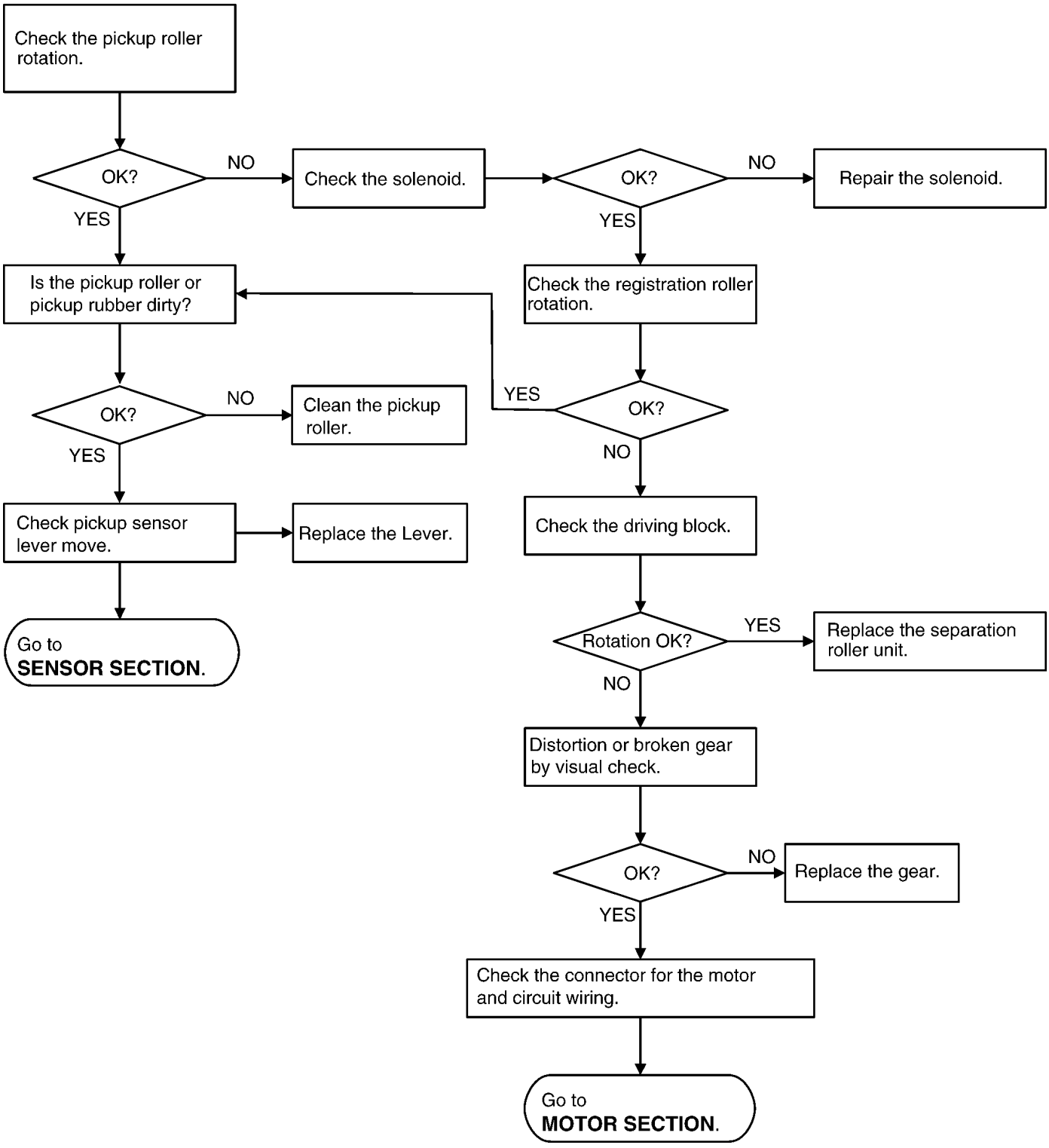
12.3.8.2. THE RECORDING PAPER IS WAVED OR WRINKLED



12.3.8.3. SKEW


Is Pick up roller or Pick up rubber Dirty?
OK?
NO
YES
Clean or replace the Pick up roller.
OK?
YES
END
NO
Is Registration roller or Paper feed roller Dirty?
OK?
NO
YES
Clean or replace the Registration roller.
OK?
YES
END
NO
Is paper jammed in its path?
or
Are there any dusts on its path?
OK?
NO
YES
Remove the paper or dust.
OK?
YES
END
NO
Replace the LSU.
(Laser Scan Unit)

12.3.8.4. THE RECORDING PAPER DOES NOT FEED

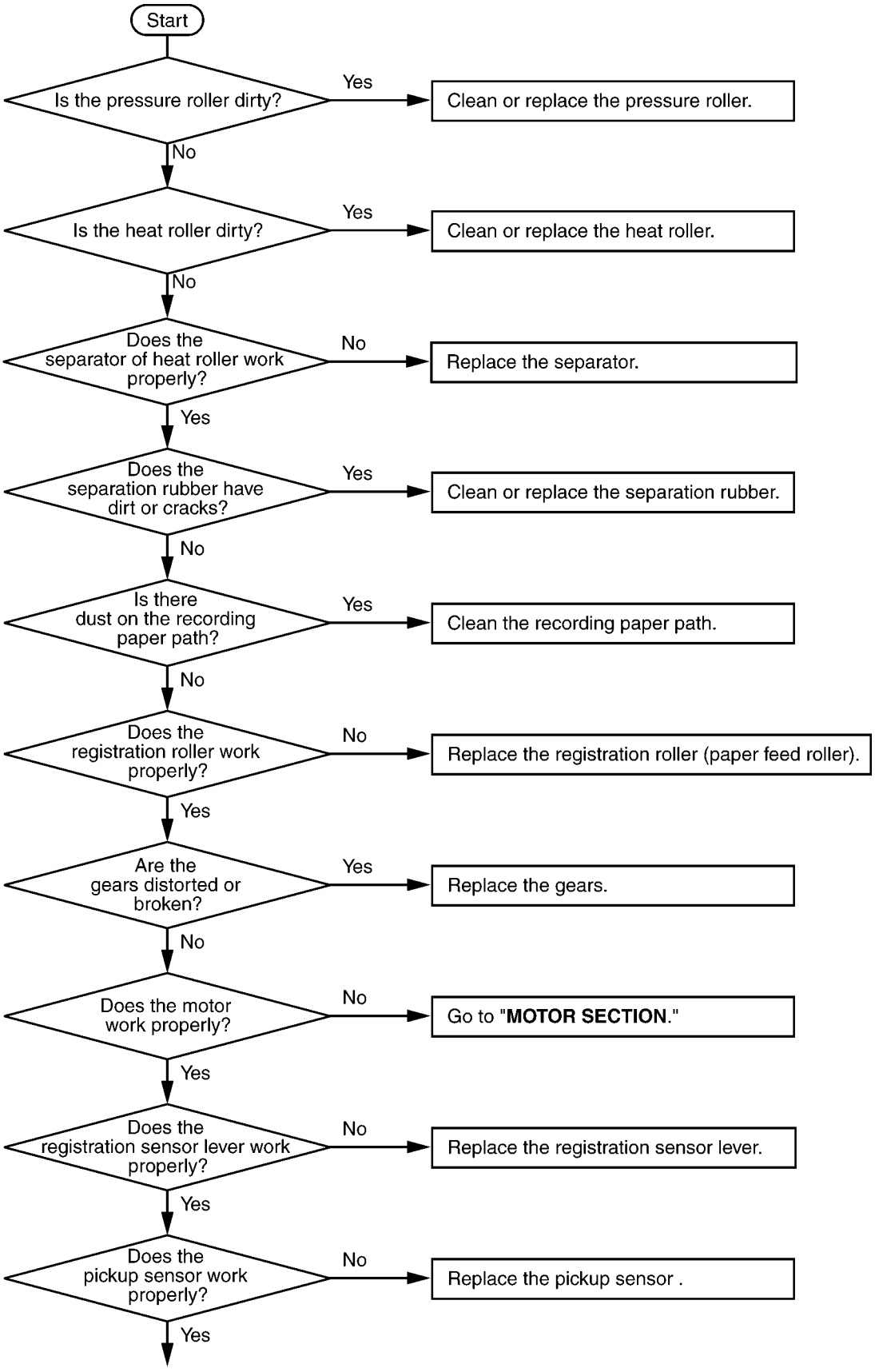


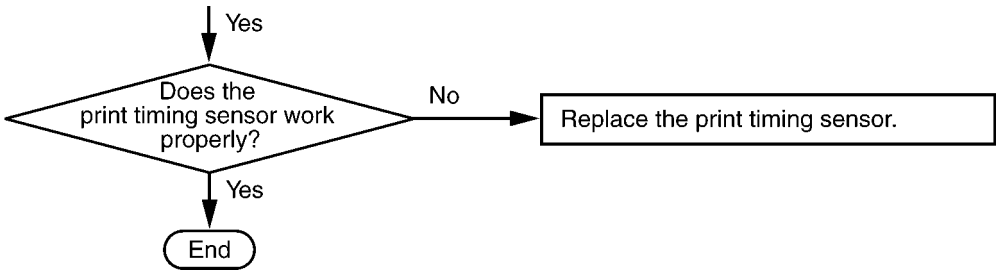
CROSS REFERENCE:

SENSOR SECTION (P.156)

ENGINE MOTOR (P.159)

12.3.8.5. THE RECORDING PAPER JAM

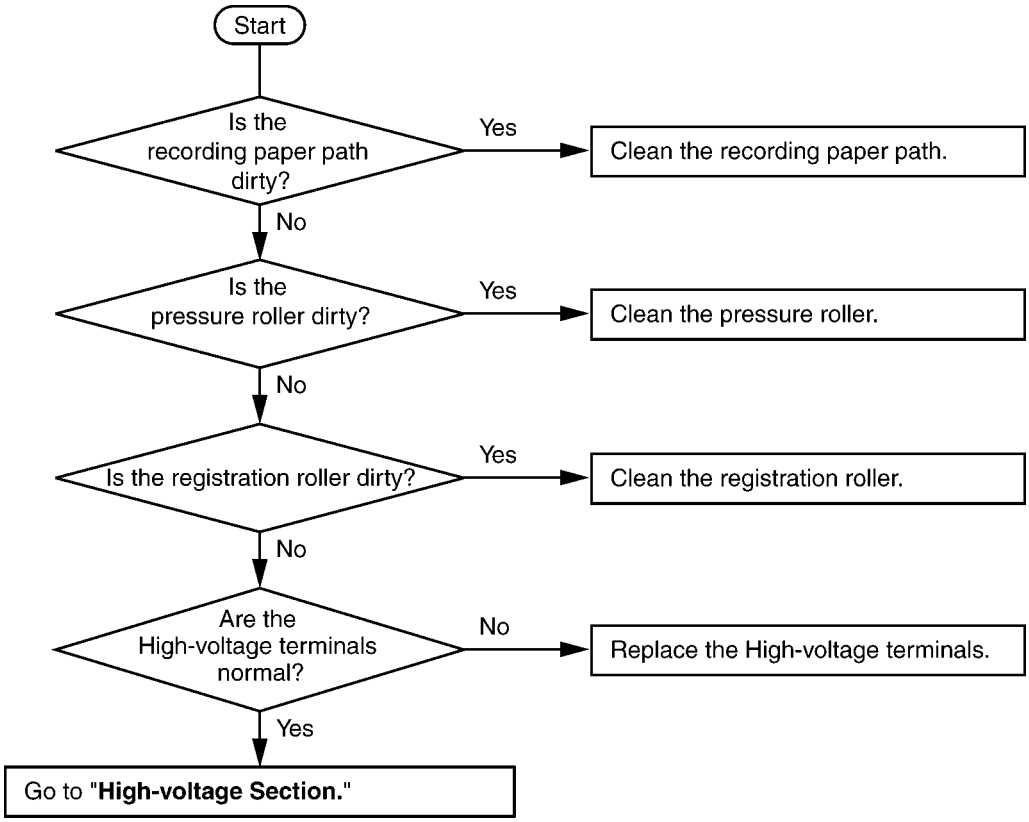




CROSS REFERENCE:
FAN MOTOR SECTION (P.37)

When the recording paper jam is occurred, the service mode *630 distinguishes the cause.
0:No Paper Jam
1:The paper was pulled into the unit.
2:The paper was longer than the maximum length of the Resistance 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 Resistance & Manual paper sensor or paper exit sensor was turned ON before the motor started to rotate.
6:The Resistance& Manual paper sensor chattered.
7:The sorter enter sensor chattered.

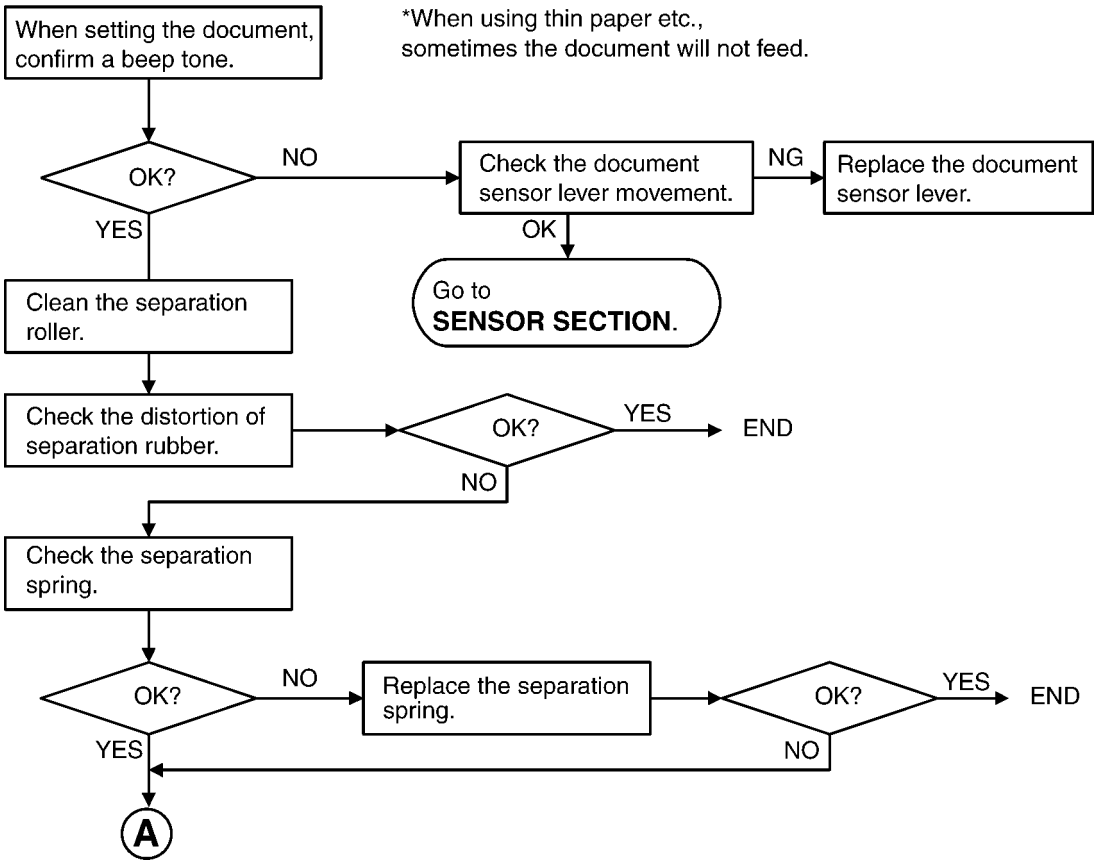
12.3.8.6. BACK SIDE OF THE RECORDING PAPER IS DIRTY



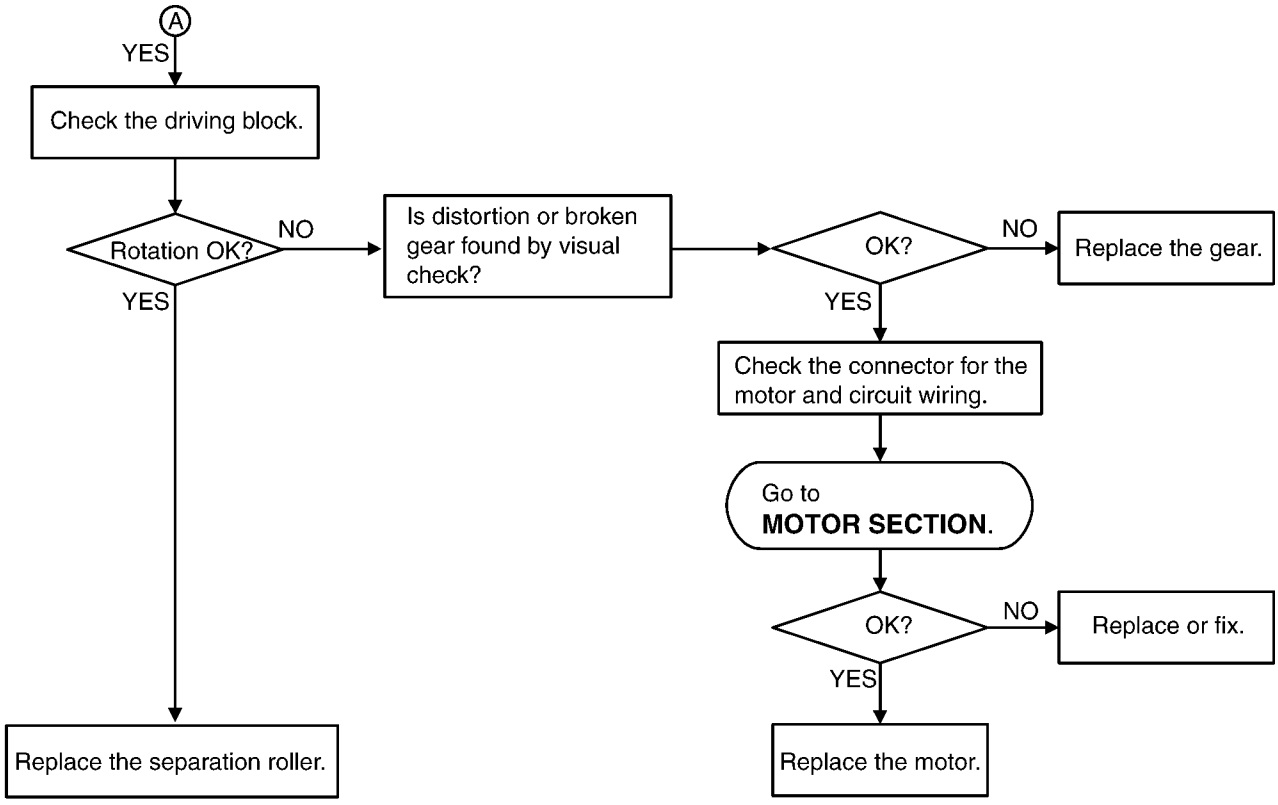
CROSS REFERENCE:
HIGH VOLTAGE SECTION (P.167)

12.3.9. ADF (Auto Document Feeder) SECTION

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



CROSS REFERENCE:
SENSOR SECTION (P.156)



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

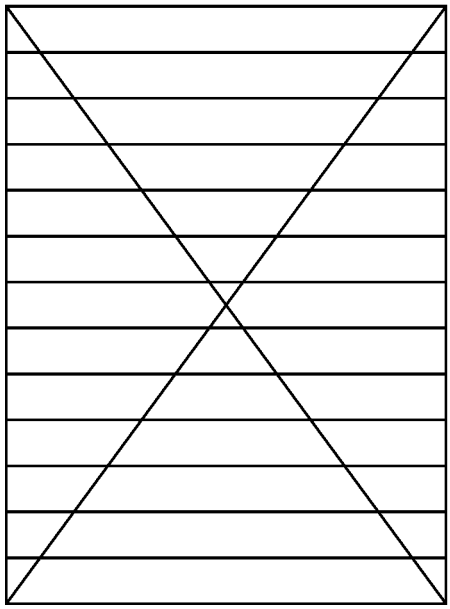
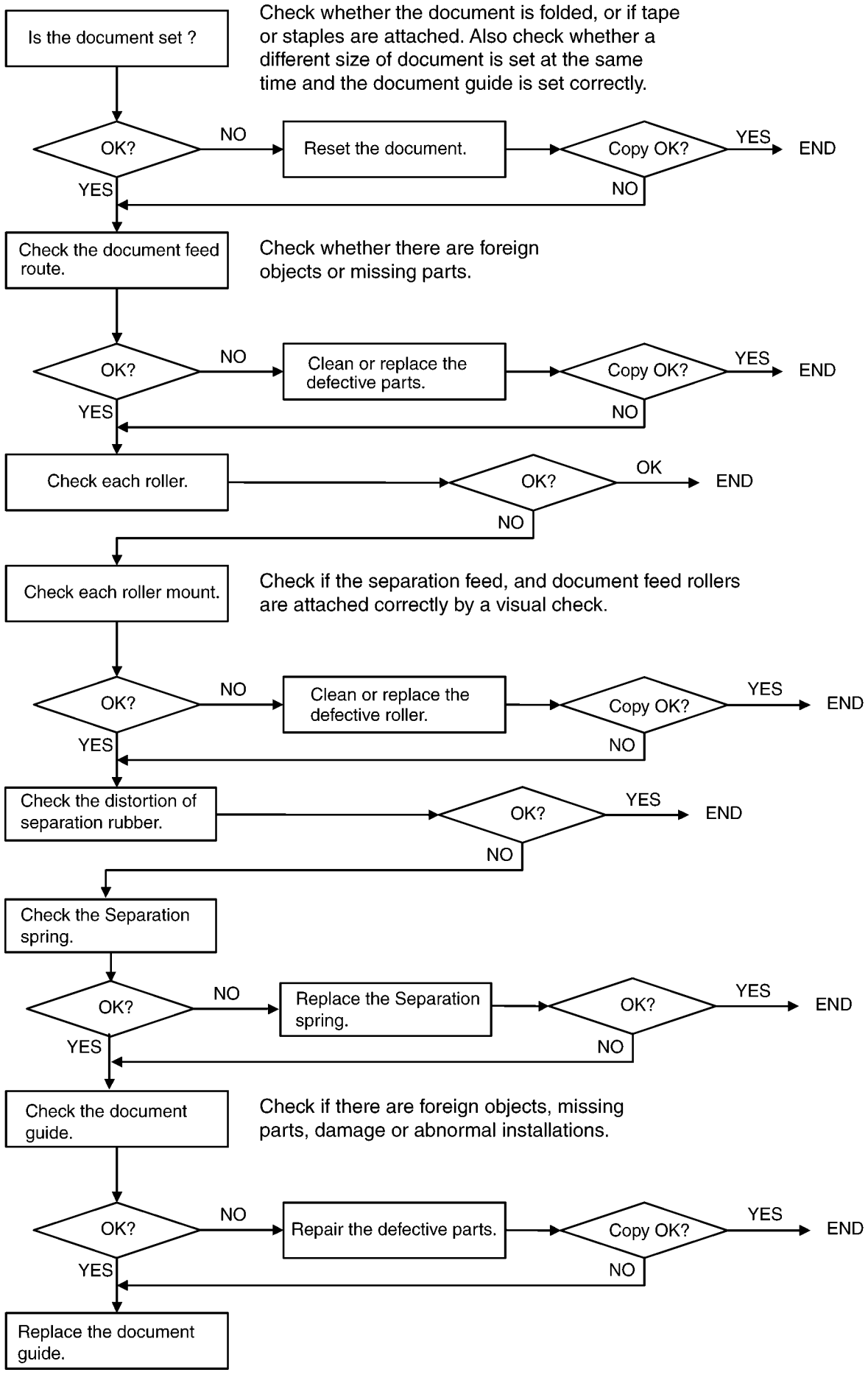


Fig. b

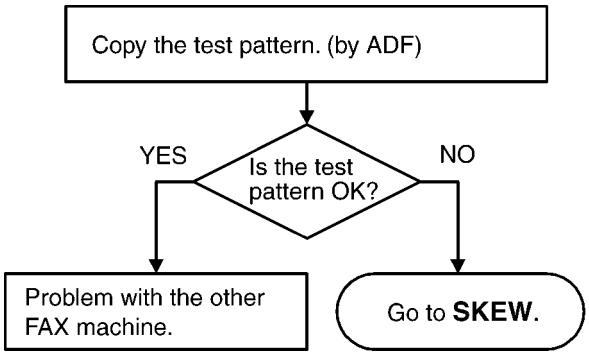
When confirming if the characters are extended or distorted on,if the feed problem occurs,use this test chart. (Fig b)

CROSS REFERENCE:
ENGINE MOTOR (P.159)

12.3.9.2. SKEW (ADF)

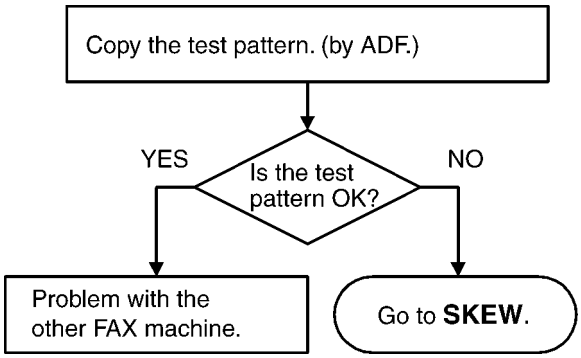


12.3.9.3. THE SENT FAX DATA IS SKEWED



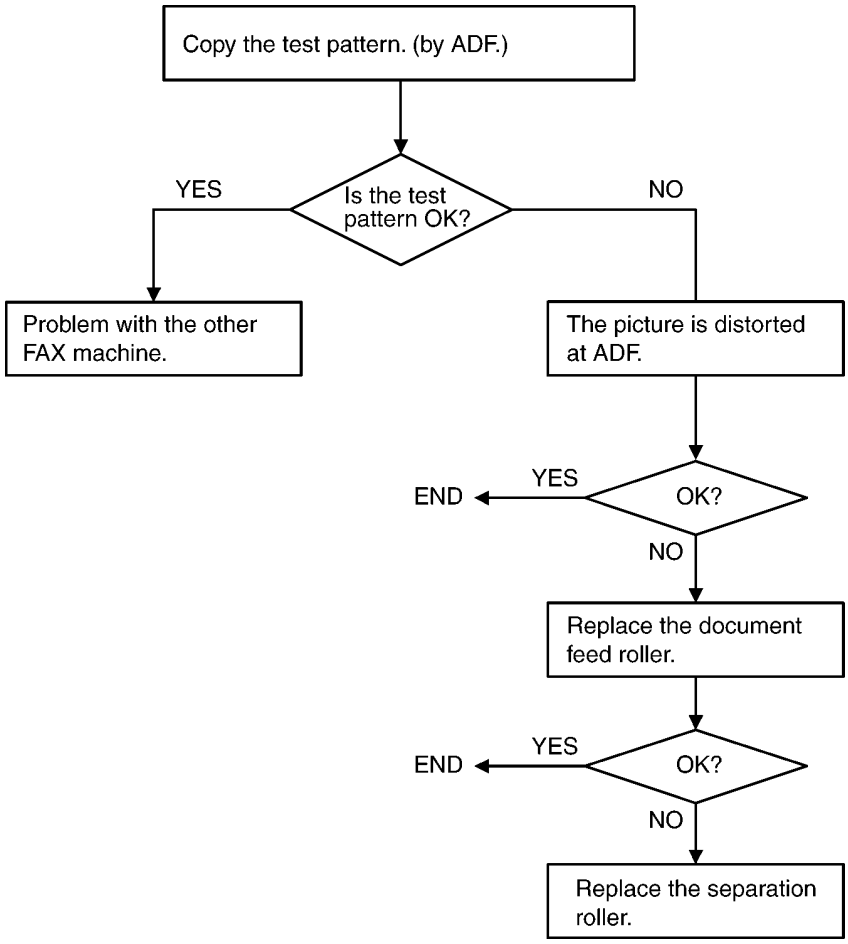
CROSS REFERENCE:
SKEW (ADF) (P.131)

12.3.9.4. THE RECEIVED FAX DATA IS SKEWED

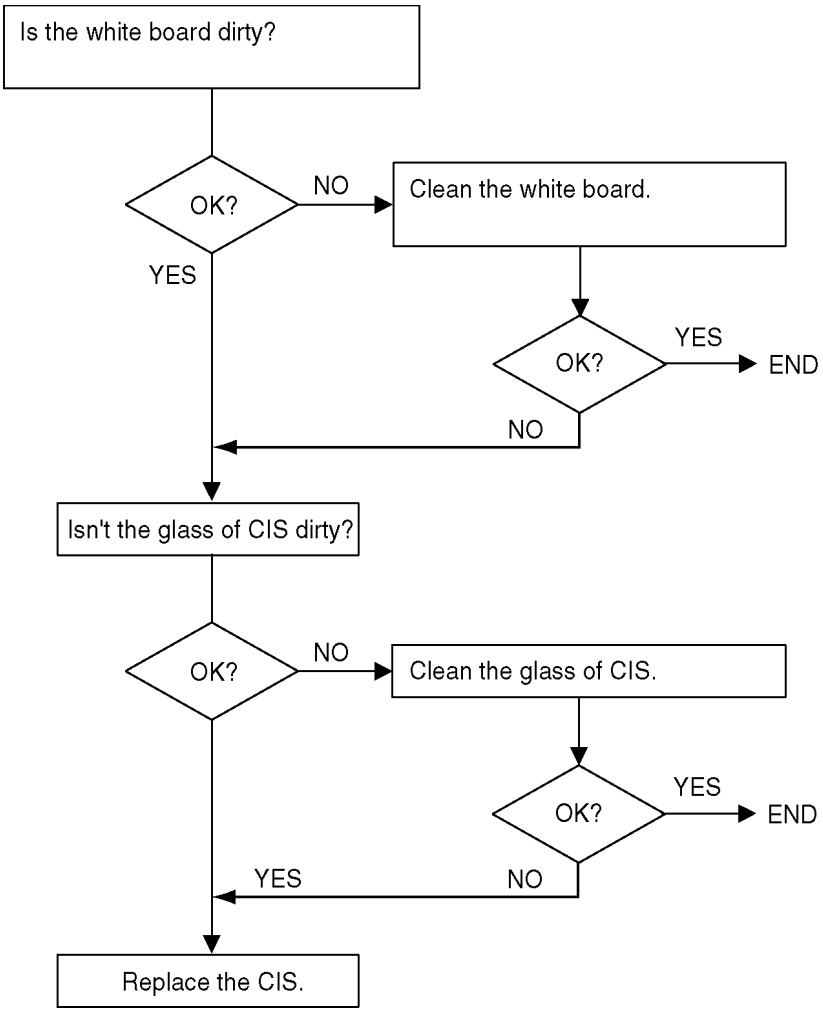


CROSS REFERENCE:
SKEW (P.125)

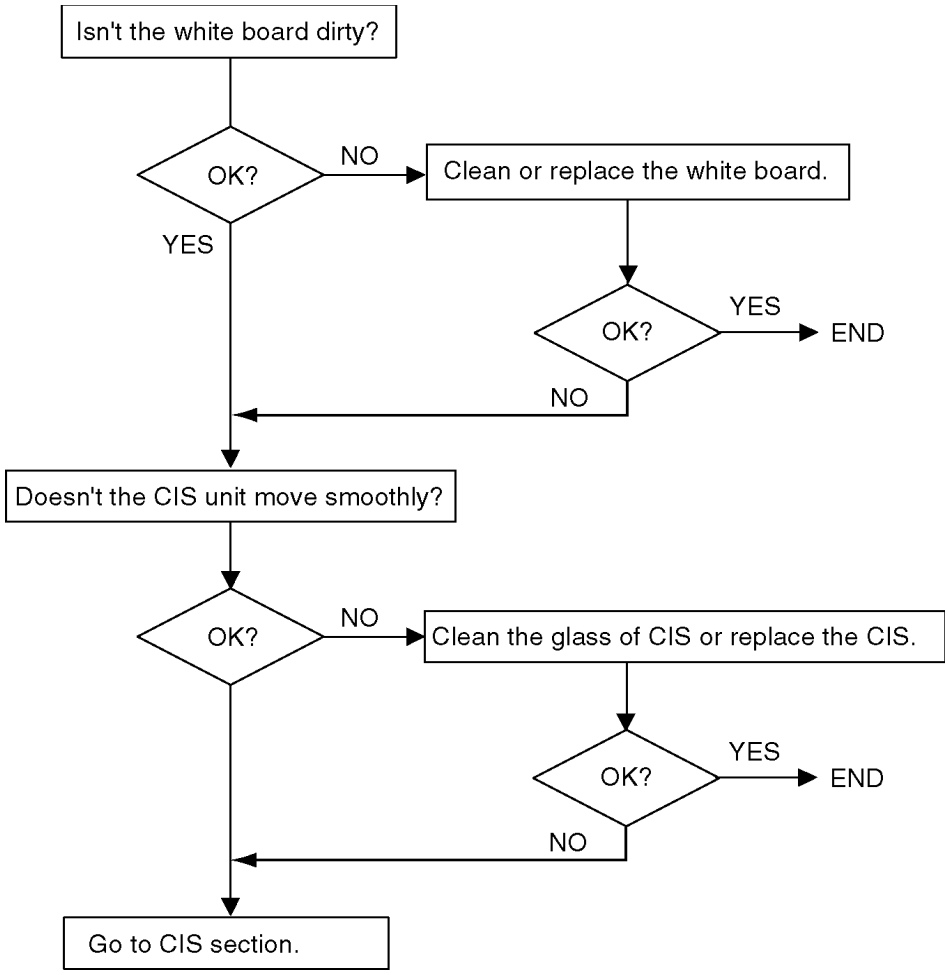
12.3.9.5. THE RECEIVED OR COPIED DATA IS EXPANDED



12.3.9.6. BLACK OR WHITE VERTICAL LINE IS COPIED



12.3.10. AN ABNORMAL IMAGE IS COPIED



CROSS REFERENCE:

CIS CONTROL SECTION (P.163)

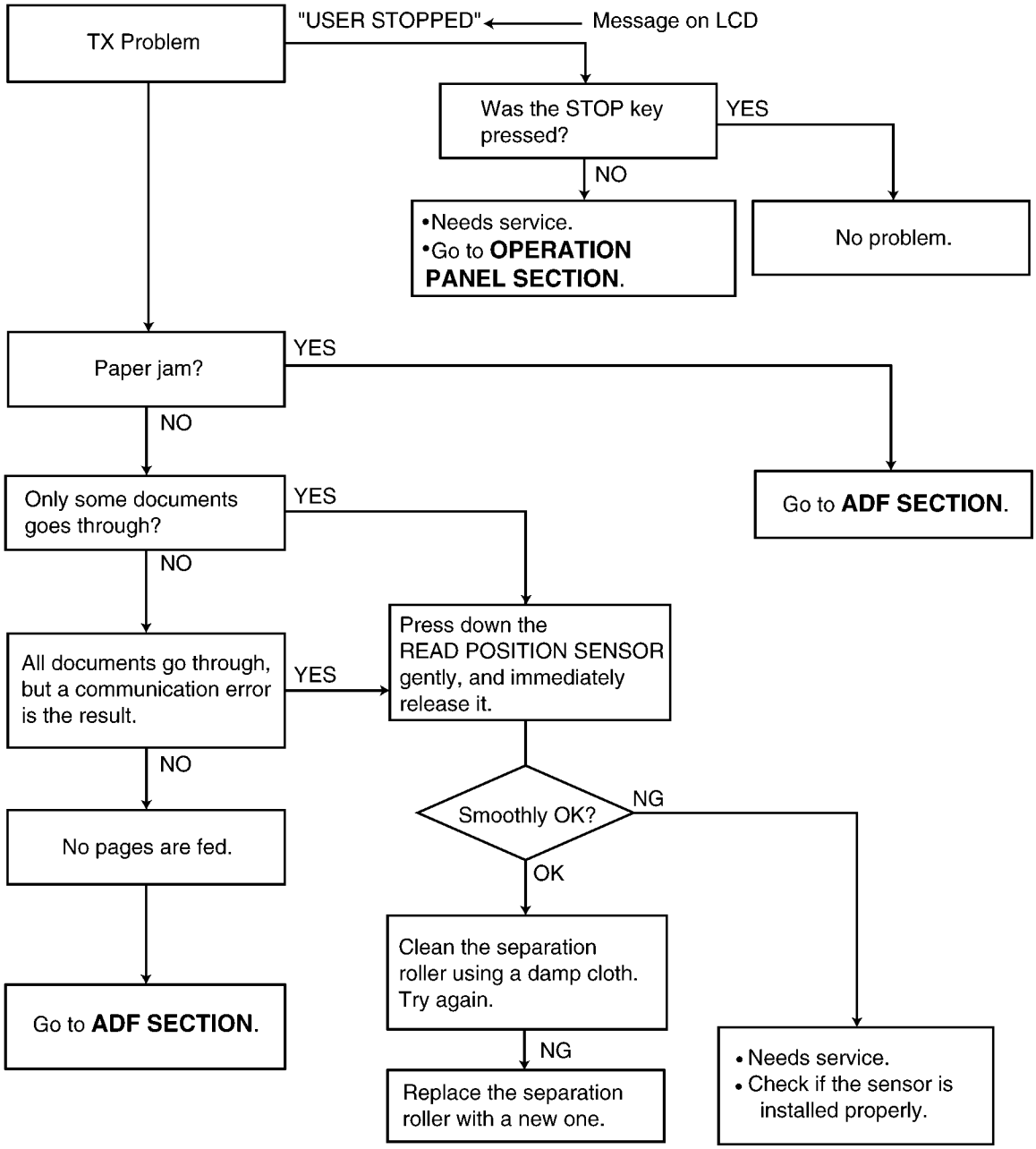
12.3.11. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **DEFECTIVE FACSIMILE SECTION** (P.135).

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.135)
2	The fax transmits successfully 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.136)
3	The fax receives successfully 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.137)
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.138)
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.143)

12.3.11.1. DEFECTIVE FACSIMILE SECTION

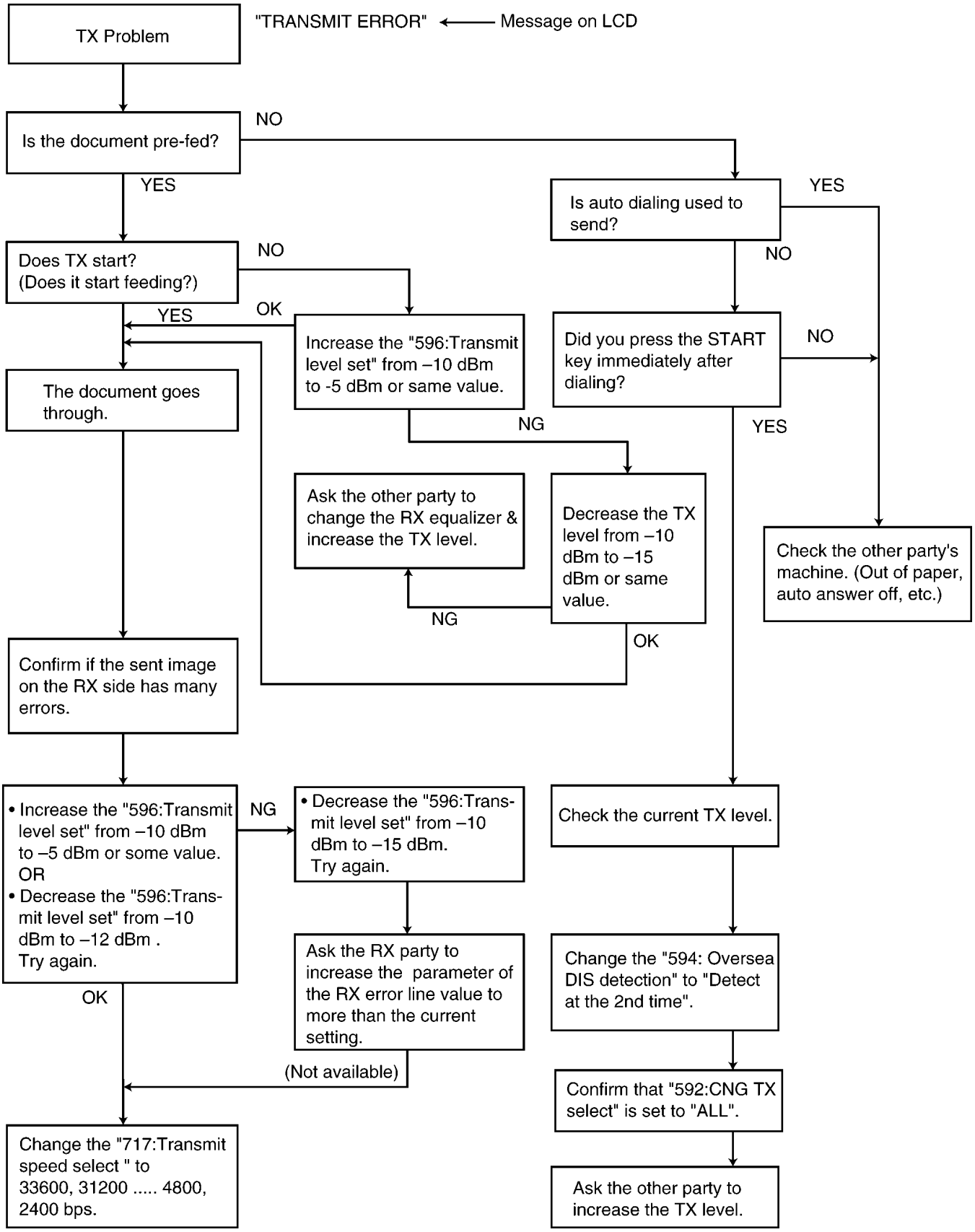
12.3.11.1.1. TRANSMIT PROBLEM



CROSS REFERENCE:

CLEANING THE WHITE PLATE AND GLASSES (P.219)
ADF (Auto Document Feeder) SECTION (P.129)
OPERATION PANEL SECTION (P.156)

12.3.11.1.2. SOMETIME THERE IS A TRANSMIT PROBLEM



Note:

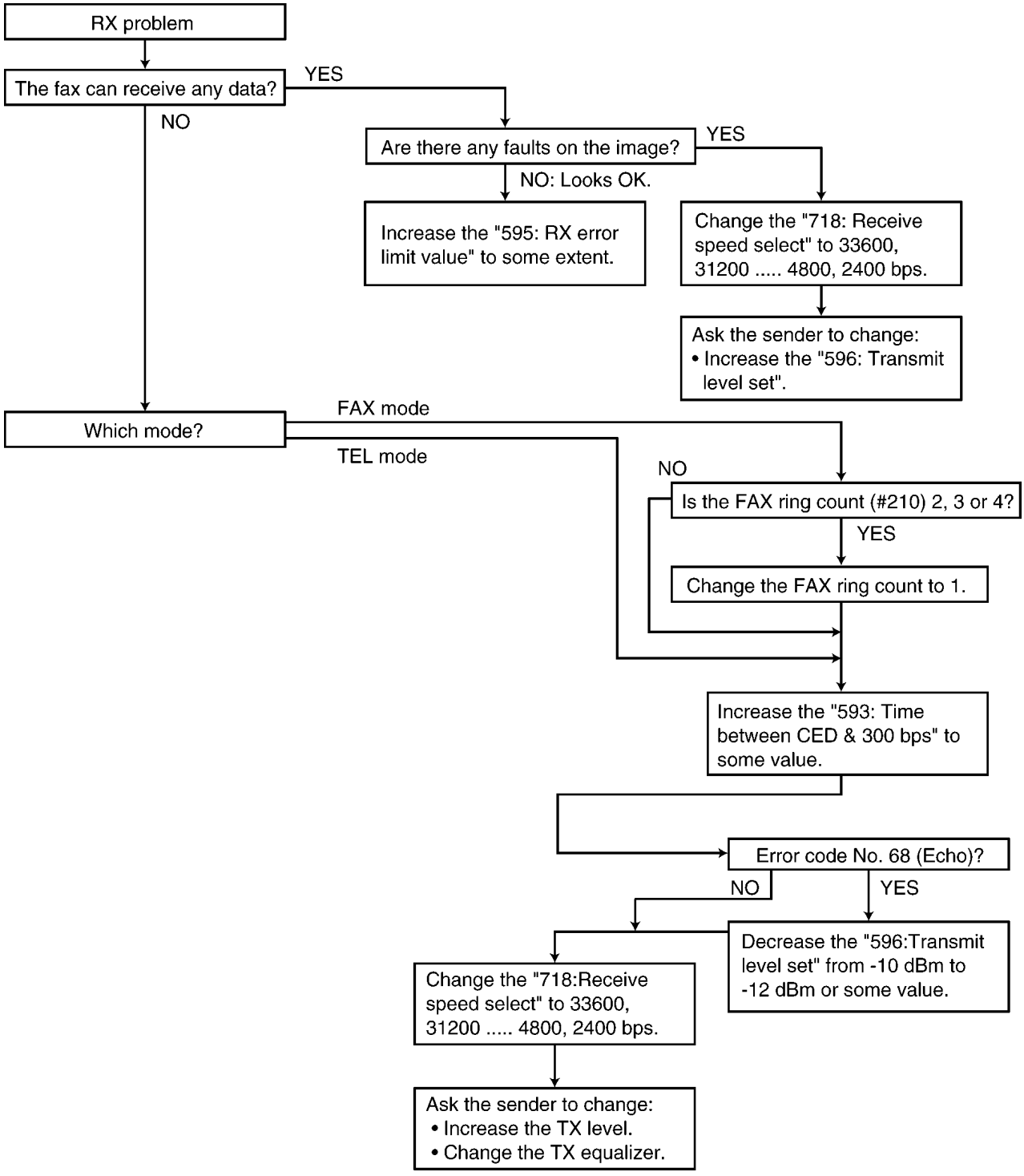
"596: Transmit level set" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.88).

"717: Transmit speed select" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.88).

12.3.11.1.3. 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.88).

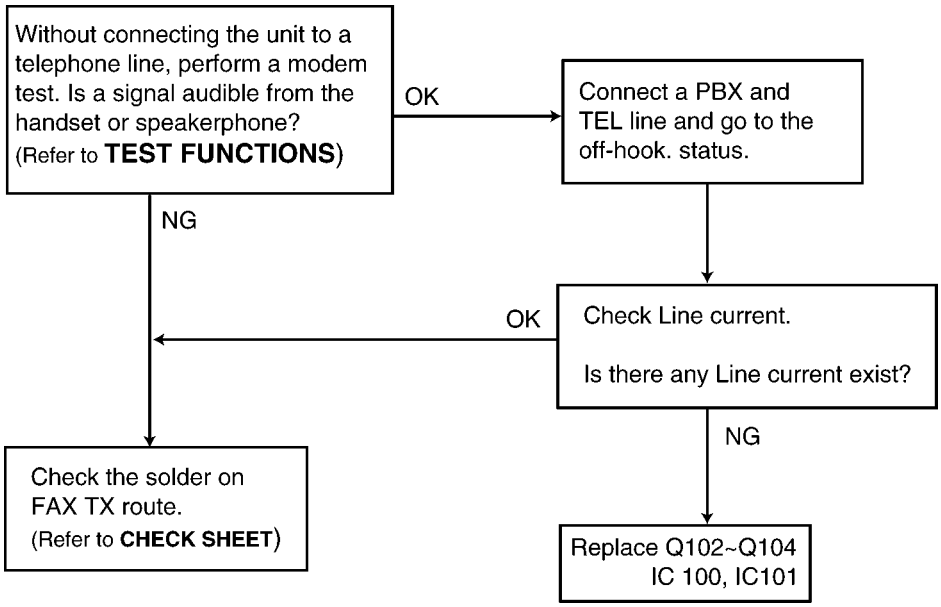
"718: Receive speed select" represents a service code. Refer to the **SERVICE FUNCTION TABLE** (P.88).

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

Please refer to **USER RECOVERABLE ERRORS** (P.96) for the above items.

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

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



CROSS REFERENCE:

TEST FUNCTIONS (P.83)

CHECK SHEET (P.153)

12.3.12. 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.100).) 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	43

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:

1. Look at **NO. 01** in the JOURNAL. If you want to know about the details about that item, see **NO. 01** in the JOURNAL 2 and the JOURNAL 3. You can get the following information.
   * MODE: Fax transmission
   * RCV. MODE: TEL
   * TX SPEED: 9.6 kbps
   * RESOLUTION: standard
   * ENCODE: MH
   * MAKER CODE: 79
2. Look at **NO. 04** in the JOURNAL 2. CNG (0003) indicates that the CNG signal has been received three times since the purchase date.

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

12.3.12.1. JOURNAL 2

Refer to JOURNAL 2 in **PRINTOUT EXAMPLE**(P.141).
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.141). 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.141), 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.

12.3.12.2. JOURNAL 3

Refer to JOURNAL 3 in **PRINTOUT EXAMPLE**(P.141).

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

12.3.12.3. PRINTOUT EXAMPLE

JOURNAL2

Jan. 01 2007 12:21AM

NO.	RCV MODE	SPEED	RESOLUTION	RCV-TRIG.(CNT.)	ERROR->MEMORY
01	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00039)	
02	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00040)	
03	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00041)	
04	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00042)	
05	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00043)	
06	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00044)	
07	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00045)	
08	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00046)	
09	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00047)	
10	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00048)	
11	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00049)	
12	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00050)	
13	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00051)	
14	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00052)	
15	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00053)	
16	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00054)	
17	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00055)	
18	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00056)	
19	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00057)	
20	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00058)	
21	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00059)	
22	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00060)	
23	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00061)	
24	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00062)	
25	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00063)	
26	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00064)	
27	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00065)	
28	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00066)	
29	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00067)	
30	FAX ONLY	V34-336(- 0dBm)	STD.	FAX MOD(00068)	

NO RESPONSE DISAPPEARED ON JOURNAL

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

YOUR LOGO :
YOUR FAX NO. :

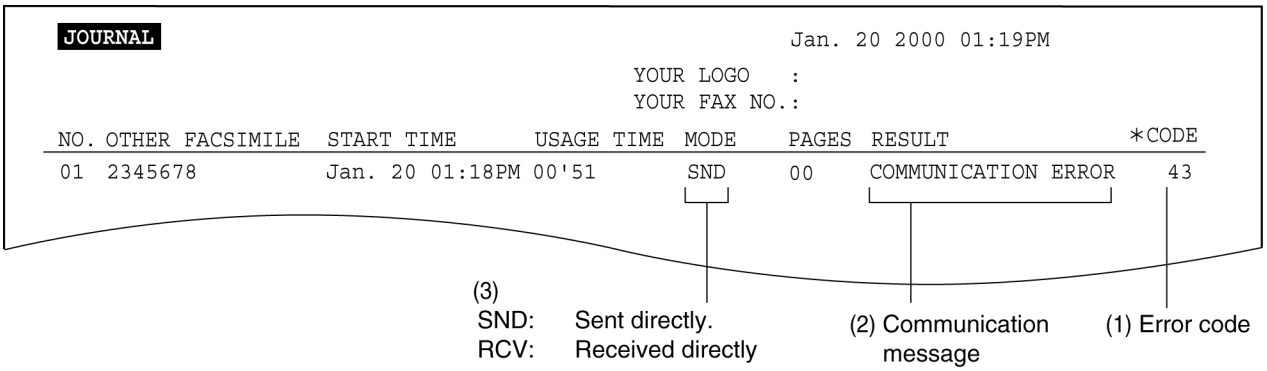
JOURNAL3

Sep. 09 2007 02:18PM

NO.	ENCODE	MSLT	EQM(RX)		ERROR LINE(RX)	MAKER CODE
01	MMR	0msec	0000		00000/00000	0E
02	MMR	0msec	0000		00000/00000	0E
03	MMR	0msec	0000		00000/00000	00
04	MMR	0msec	0000		00000/00000	0E
05	MMR	0msec	0000		00000/00000	0E
06	MH	20msec	0000		00000/00000	00
07	MH	20msec	0000		00000/00000	00
08	MH	20msec	0000		00000/00000	00
09	MH	20msec	0000		00000/00000	00
10	MH	20msec	0000		00000/00000	00
11	MMR	0msec	0000		00000/00000	0E
12	MMR	0msec	0000		00000/00000	0E
13	MMR	0msec	0000		00000/00000	0E
14	MMR	0msec	0000		00000/00000	0E
15	MMR	0msec	0000		00000/00000	0E
16	MMR	0msec	1600	SNR=38dB	00000/04606	0E
17	MMR	0msec	0000		00000/00000	0E
18	MMR	0msec	0000		00000/00000	0E
19	MMR	0msec	0000		00000/00000	0E
20	MMR	0msec	0000		00000/00000	0E
21	MMR	0msec	0000		00000/00000	0E
22	MMR	0msec	0000		00000/00000	0E
23	MMR	0msec	0000		00000/00000	0E
24	MMR	0msec	0000		00000/00000	0E
25	MMR	0msec	0000		00000/00000	0E
26	MMR	0msec	0000		00000/00000	0E
27	MMR	0msec	0000		00000/00000	0E
28	MMR	0msec	0000		00000/00000	0E
29	MMR	0msec	0000		00000/00000	0E
30	MMR	0msec	0000		00000/00000	0E

12.3.12.4. HOW TO OUTPUT THE JOURNAL REPORT

1. Press the MENU button 3 times.
2. Press “#”, then “3”.
3. Press the SET button.
4. The report prints out.



CROSS REFERENCE:

Features(P.11)

Error code table:

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
	PRESSED THE STOP KEY	SND & RCV	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	SND	The document paper is jammed.	
	NO DOCUMENT	SND	No document paper.	
	THE COVER WAS OPENED	SND	The cover is open.	
28	COMMUNICATION ERROR	SND	Invalid signal is received during PHASE-B of PHASE-D.	
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 **NCU SECTION** (P.27).**ITS (Integrated telephone System) and MONITOR SECTION** (P.28).	12

SND=TRANSMISSION / RCV=RECEPTION

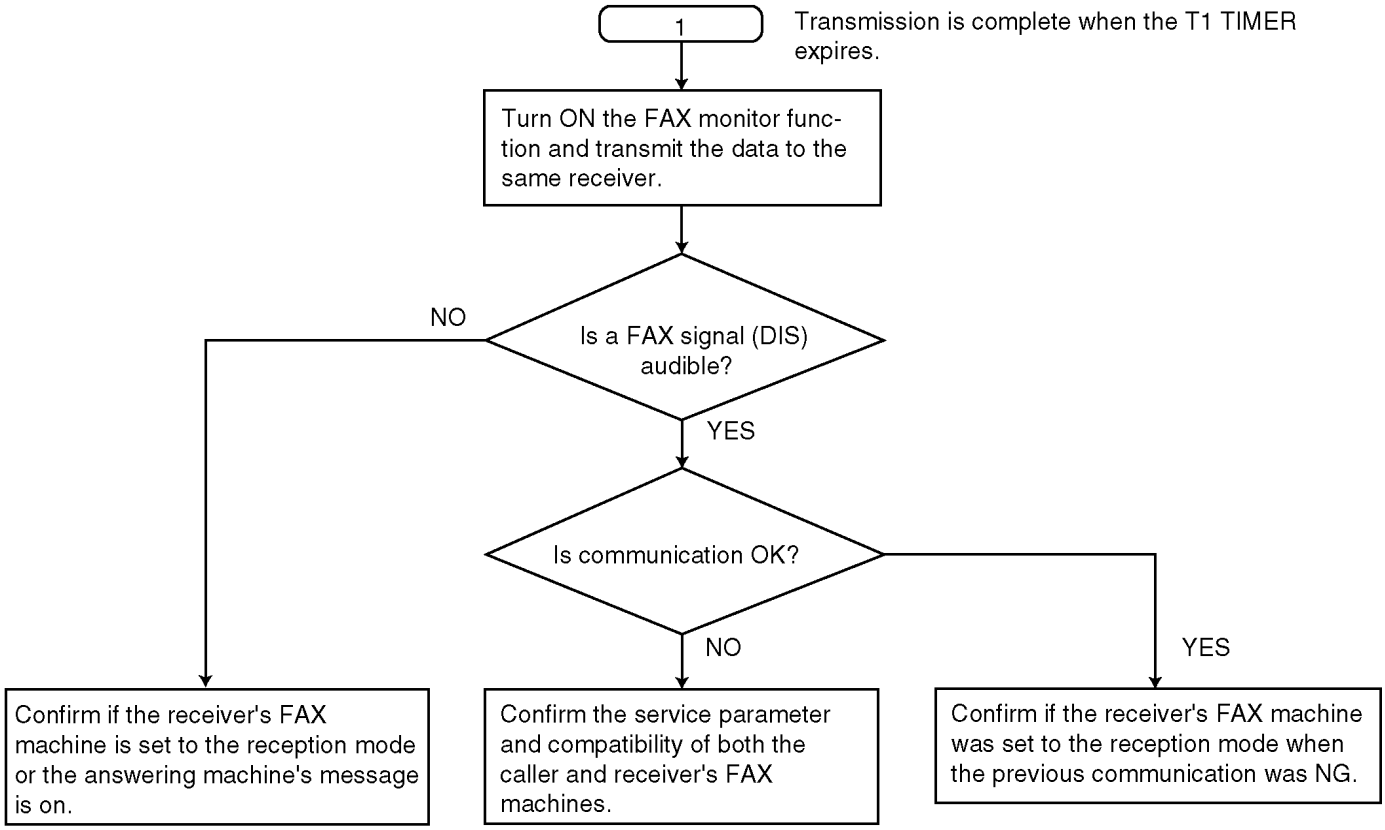
Most fax communication problems can be resolved by the following steps.

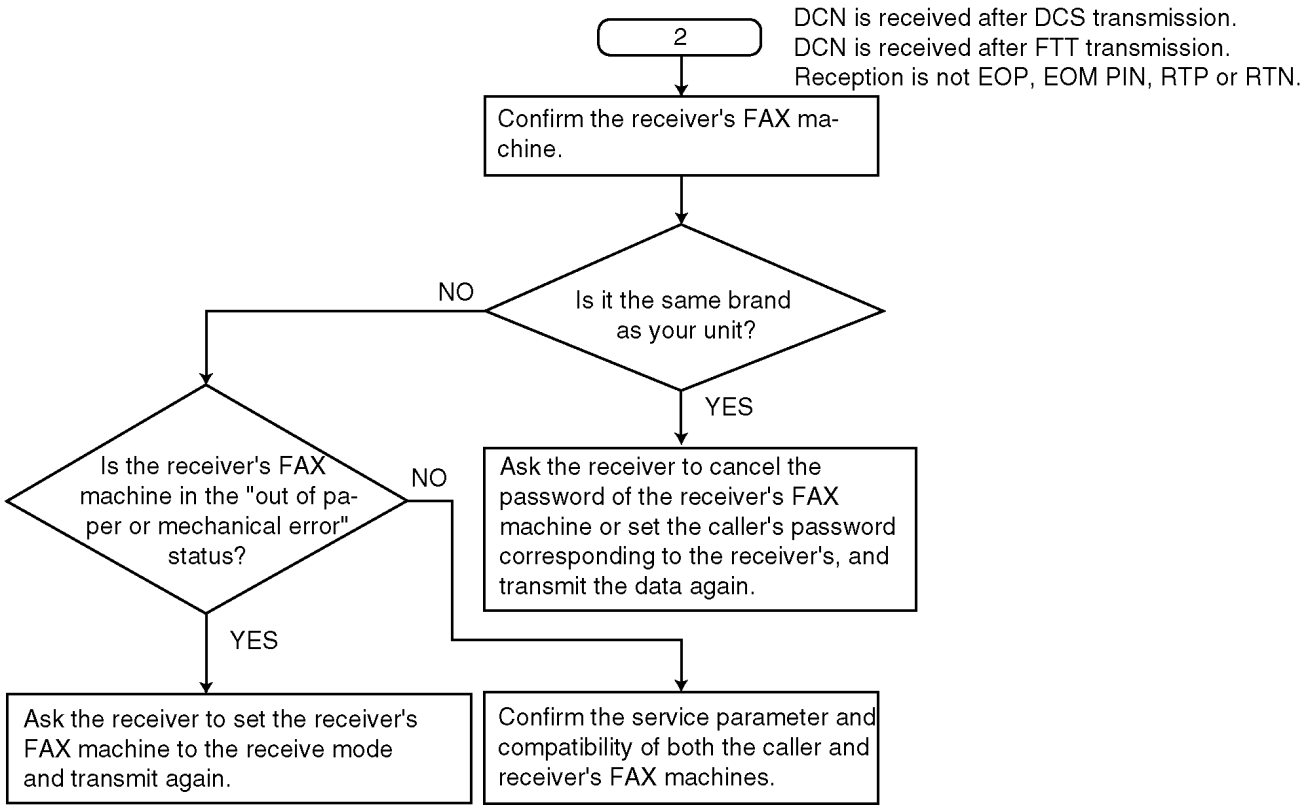
1. Change the transmit level. (Service code: 596, refer to **SERVICE FUNCTION TABLE**(P.88).)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to **SERVICE FUNCTION TABLE**(P.88).)

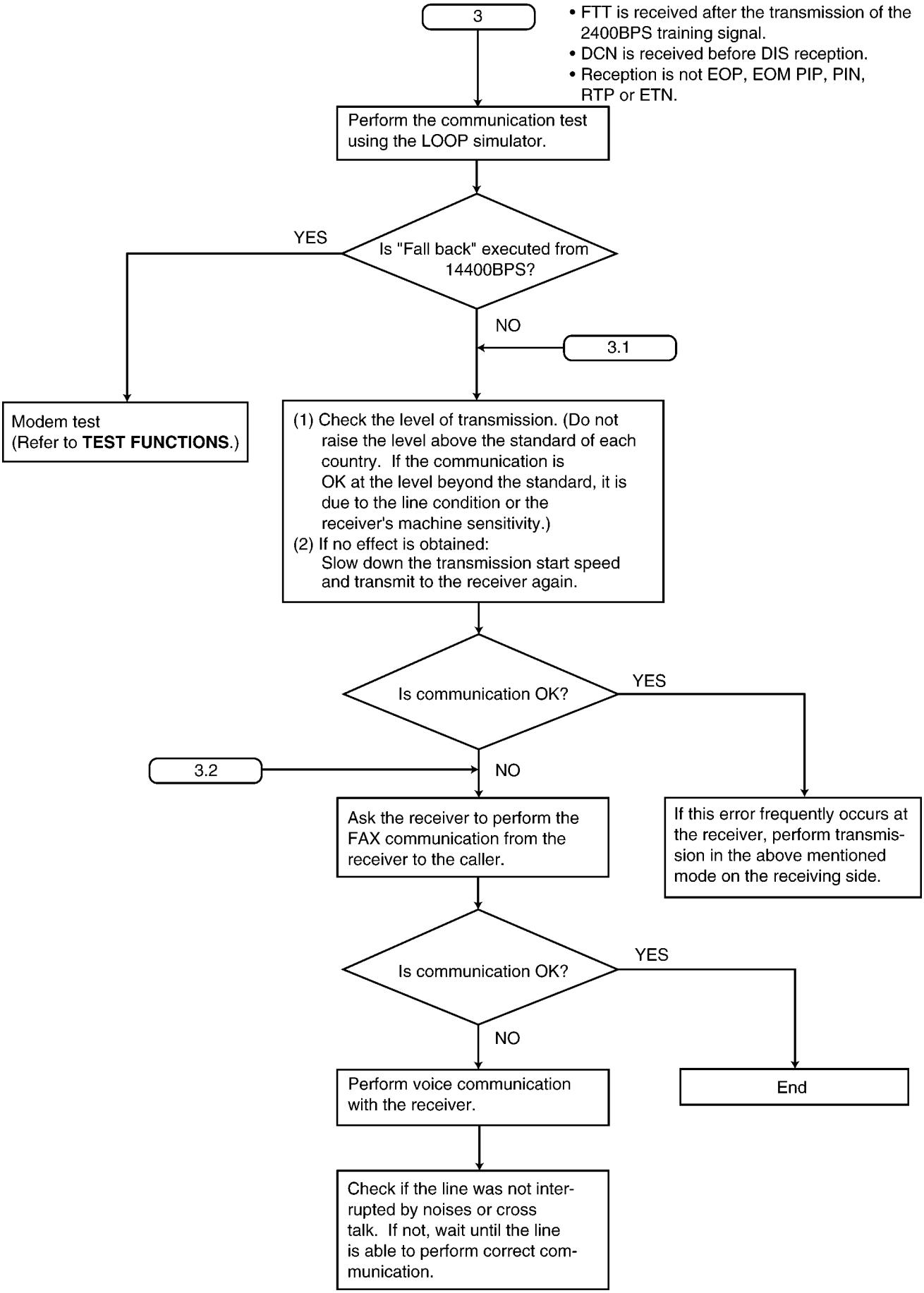
Note*:

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

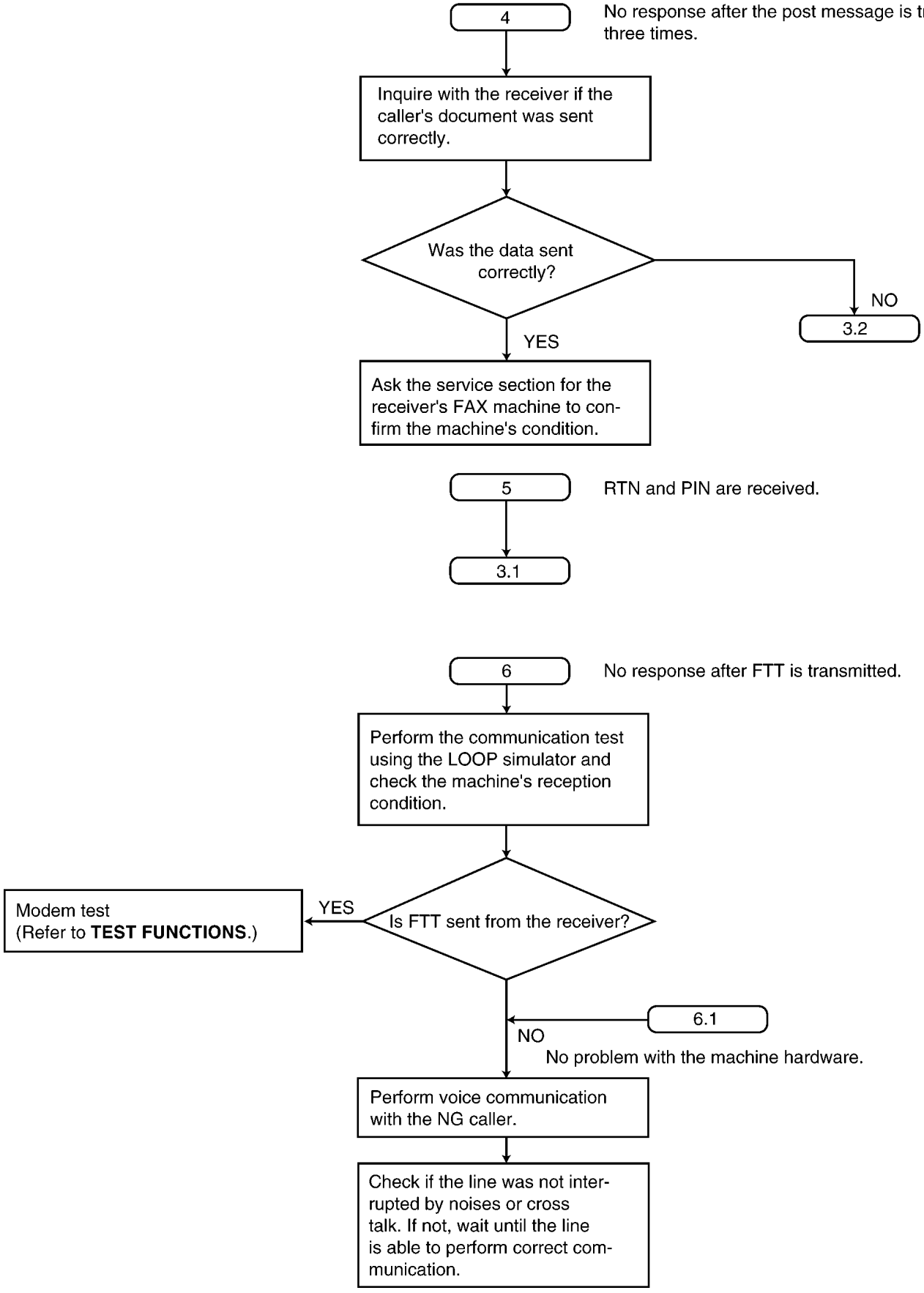
Countermeasure



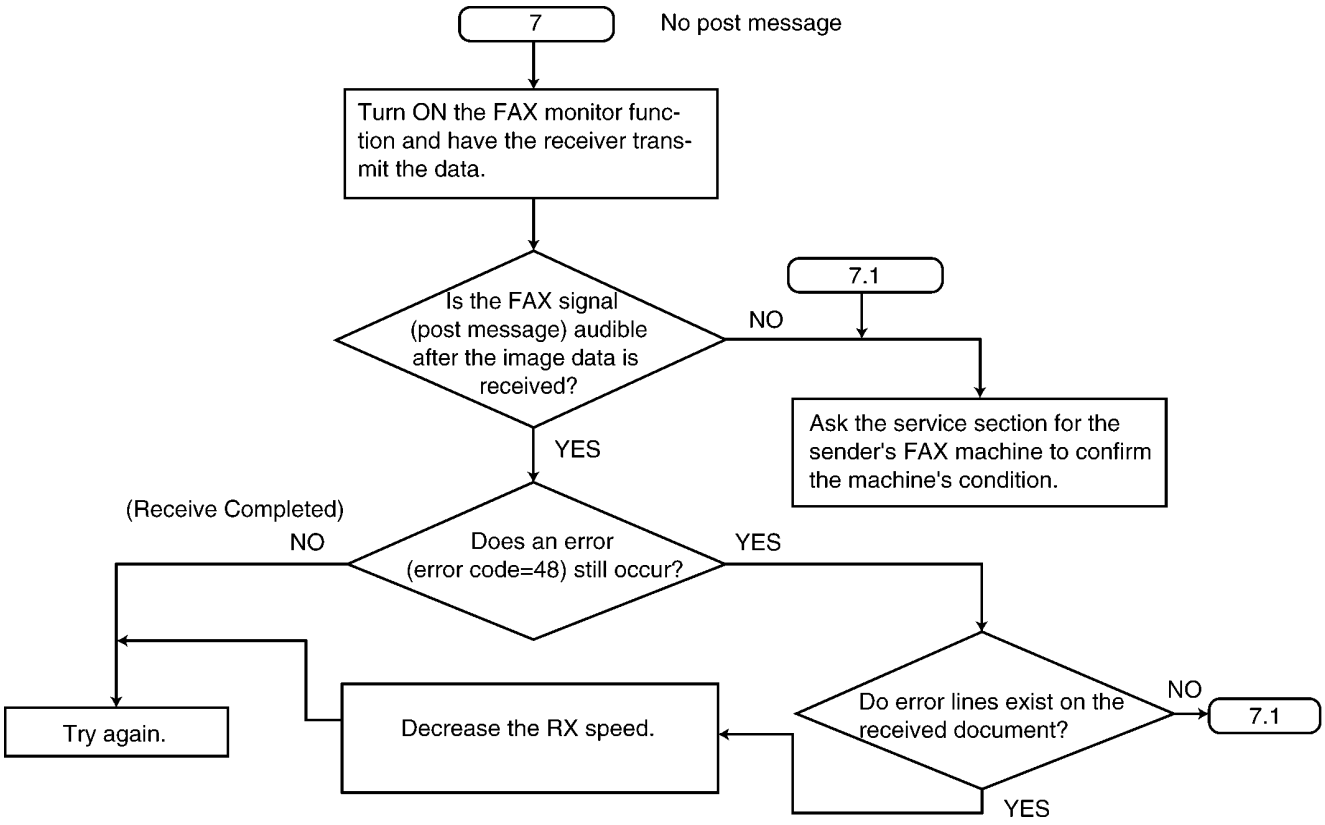


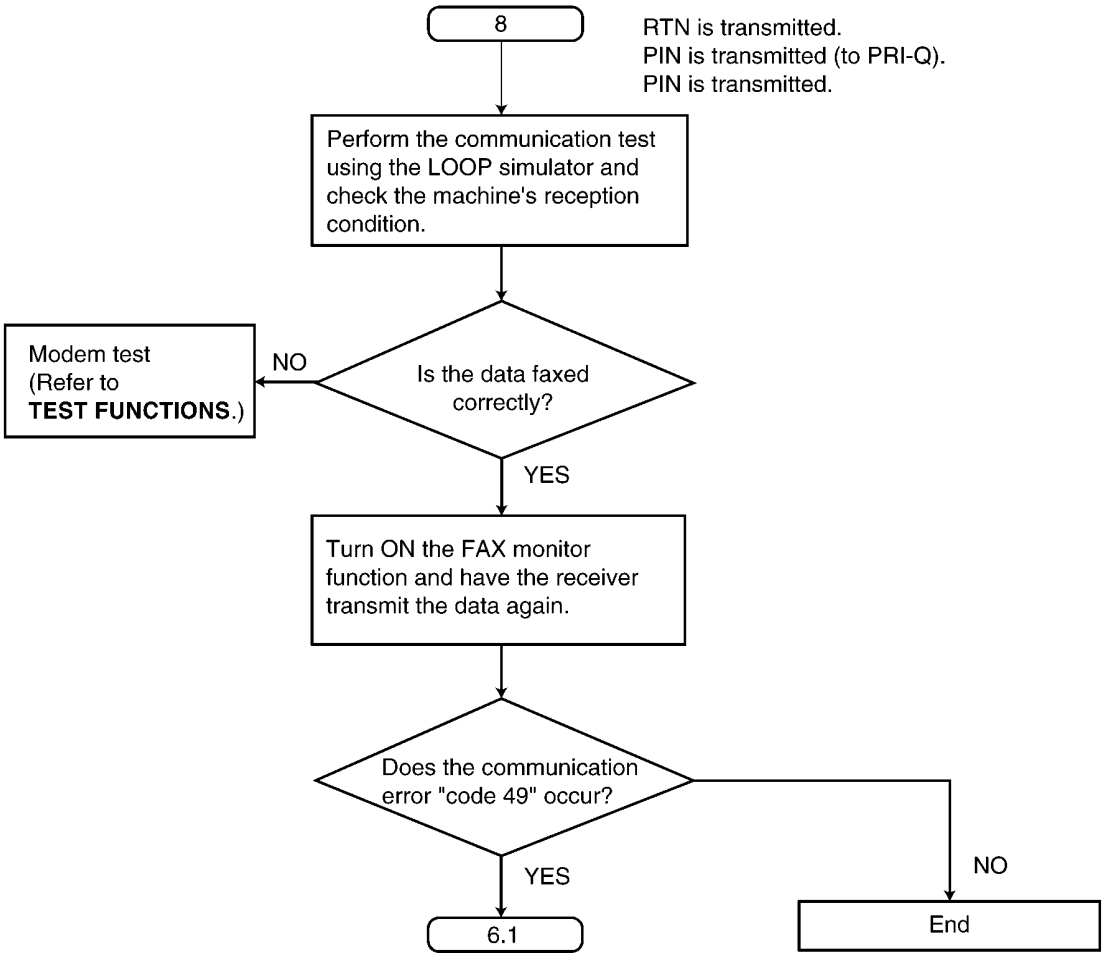


CROSS REFERENCE:
TEST FUNCTIONS (P.83)

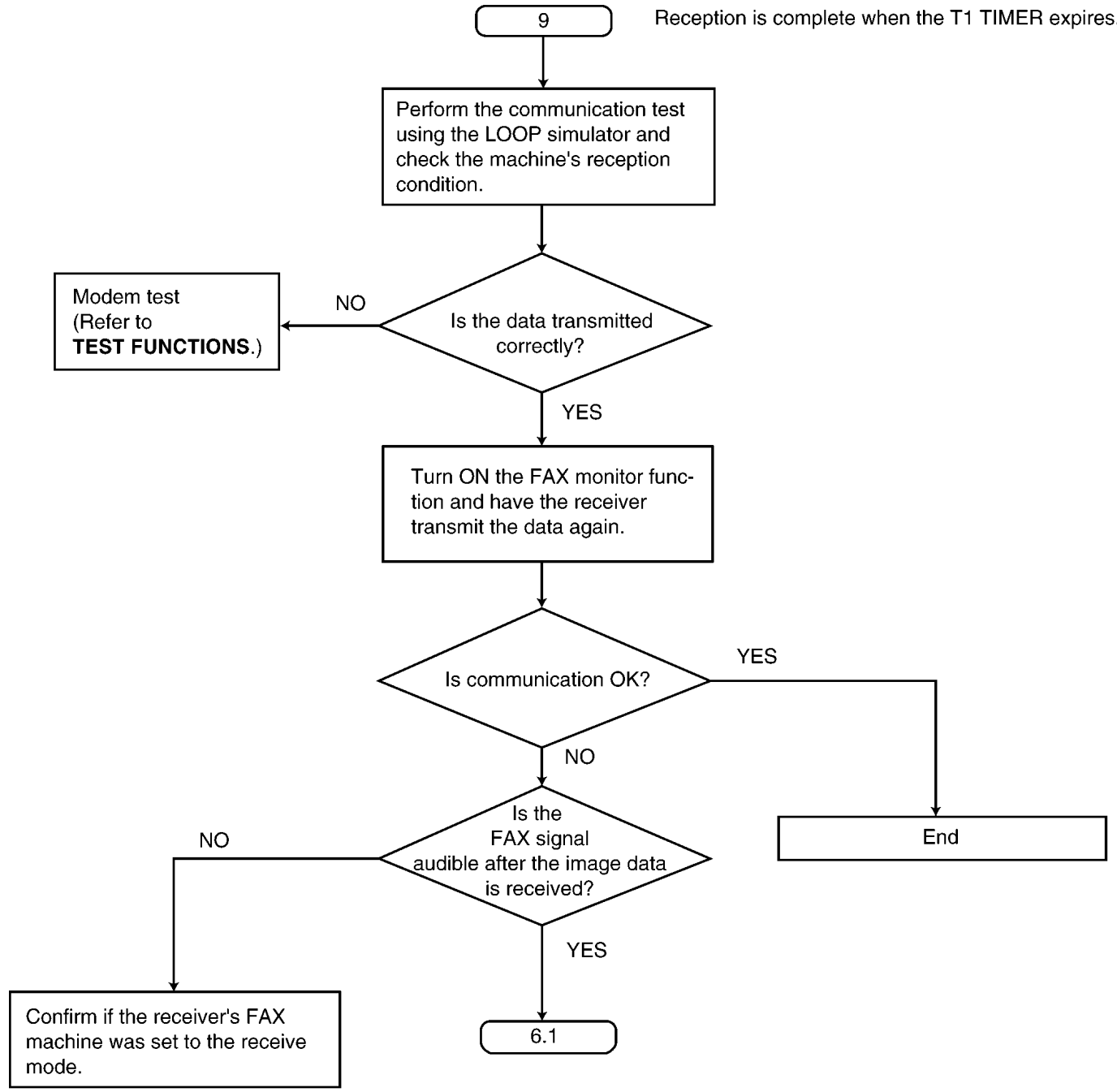


CROSS REFERENCE:
TEST FUNCTIONS (P.83)

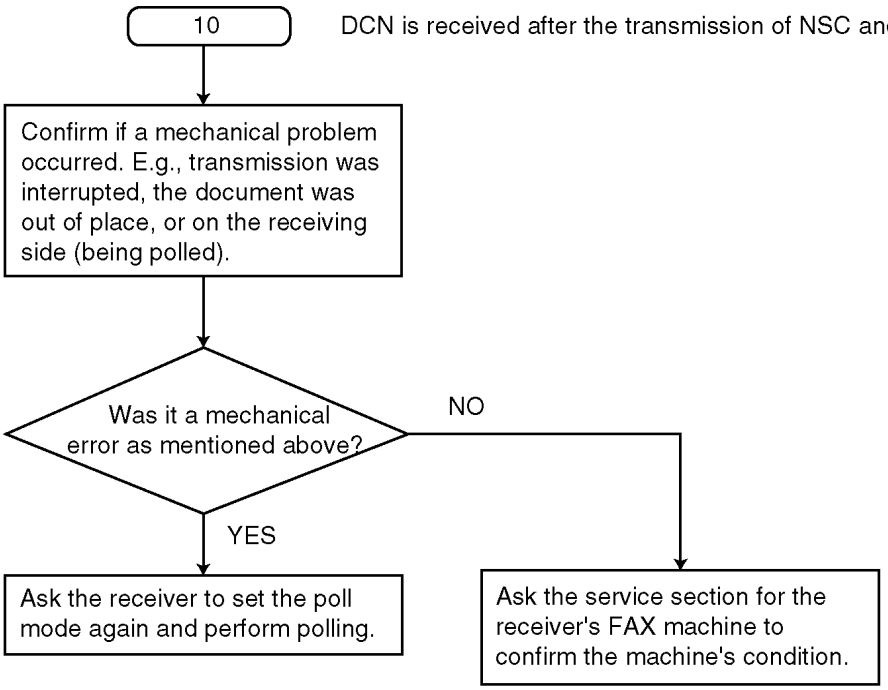


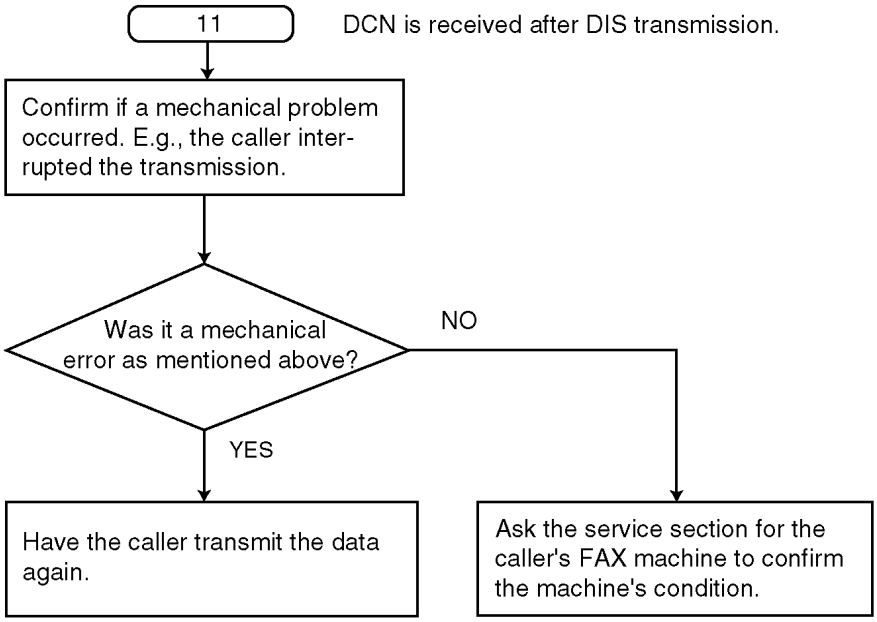


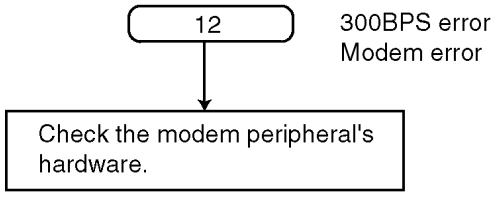
CROSS REFERENCE:
TEST FUNCTIONS (P.83)

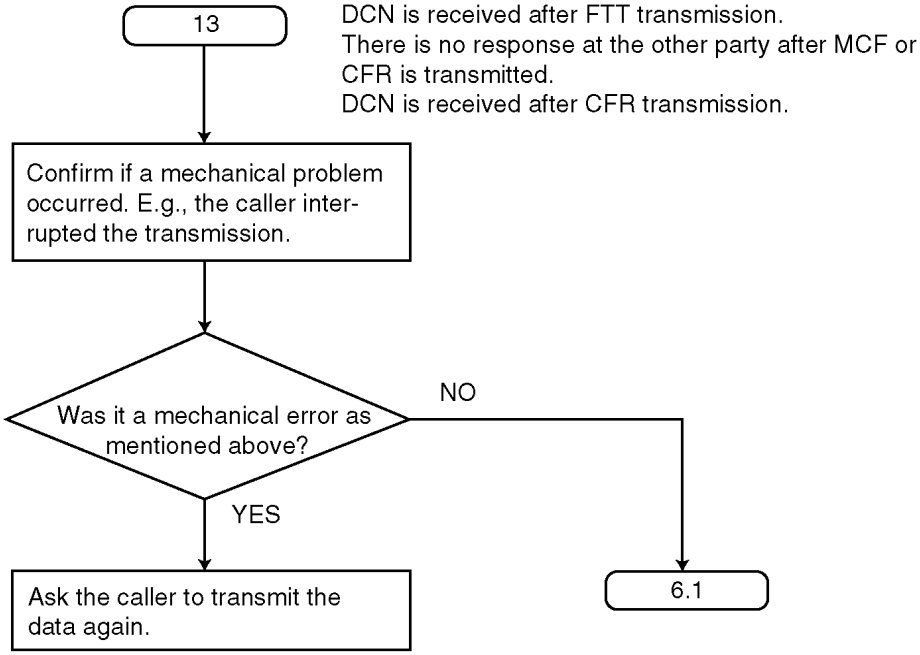


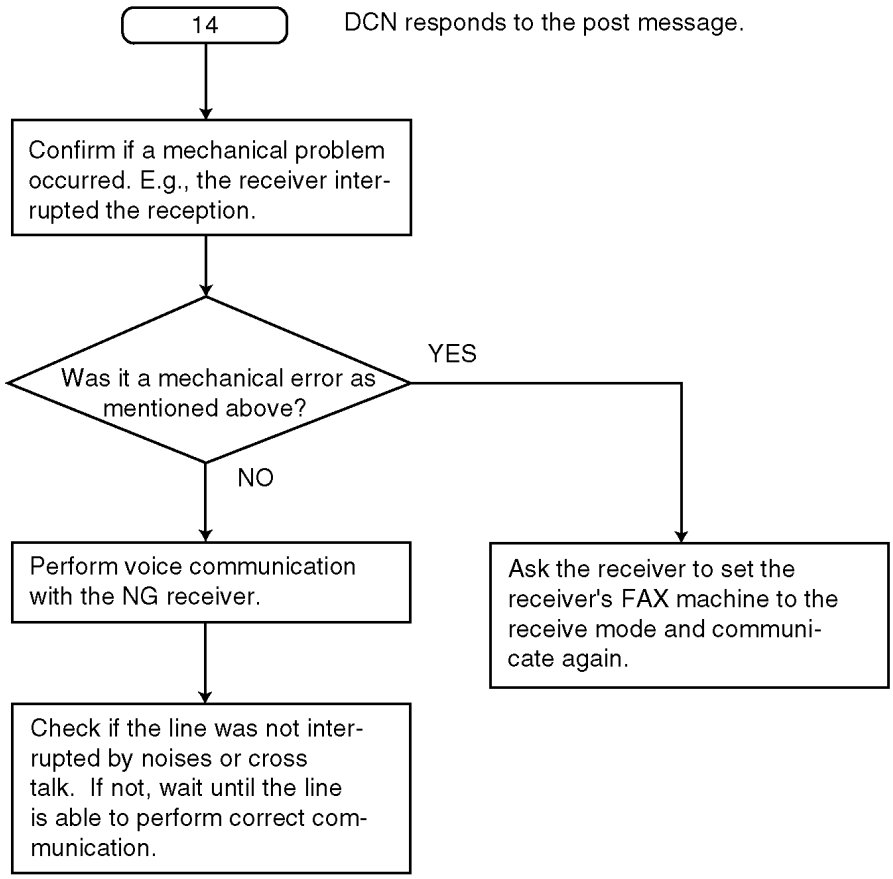
CROSS REFERENCE:
TEST FUNCTIONS (P.83)

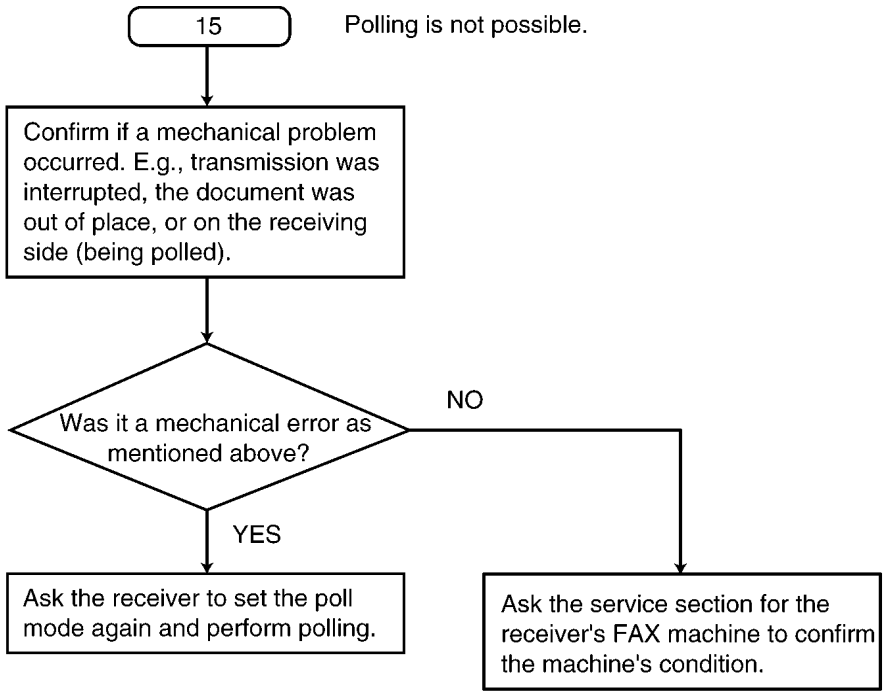


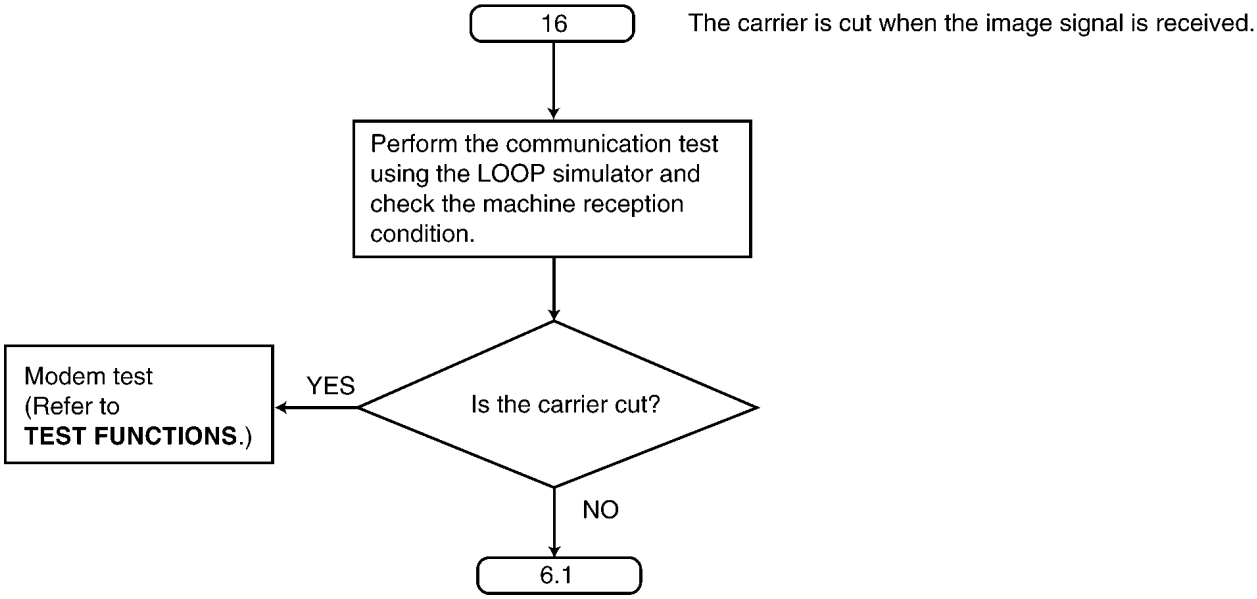








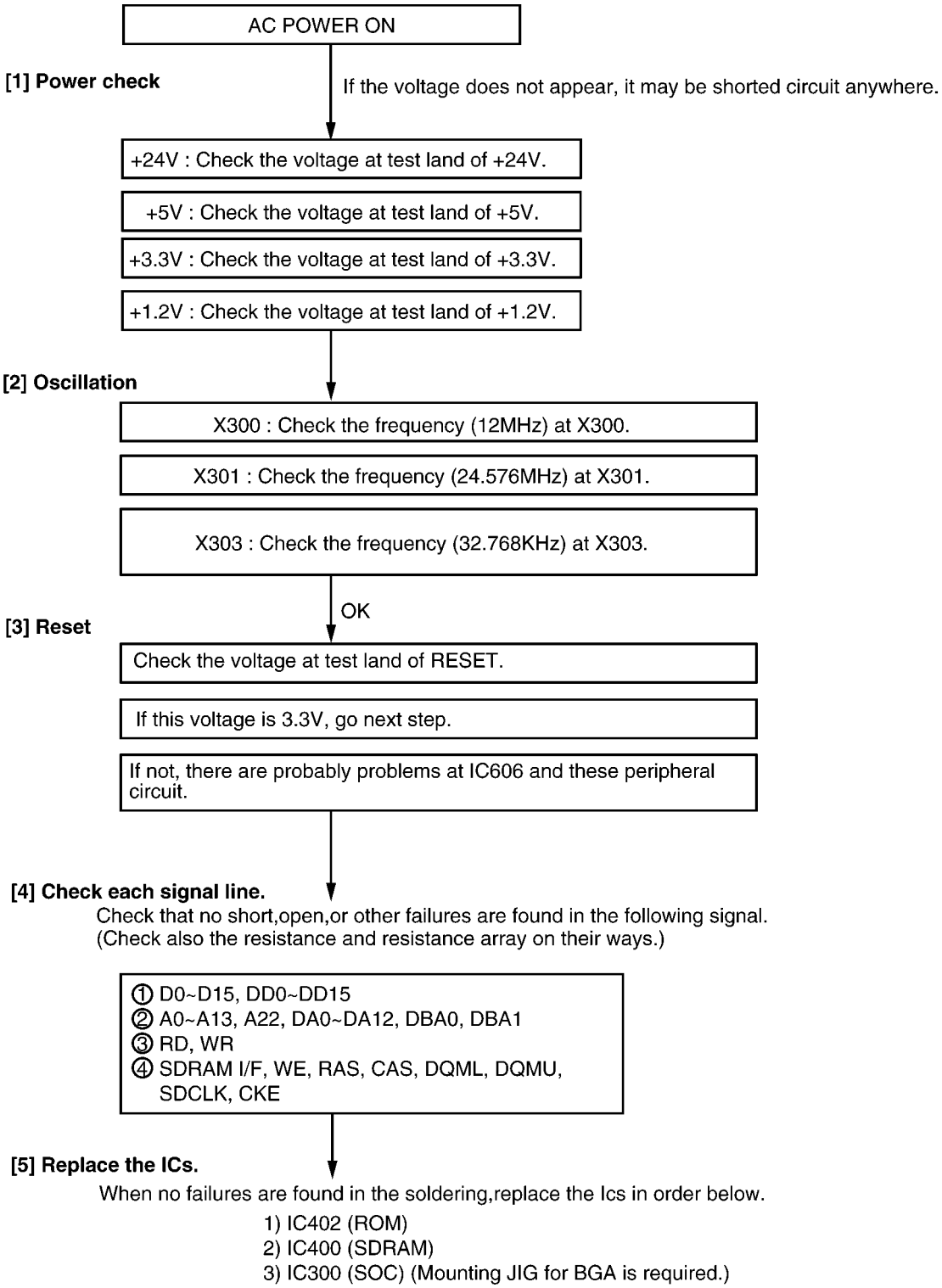




CROSS REFERENCE:
TEST FUNCTIONS (P.83)

12.3.13. INITIALIZING ERROR

After the power is turned on, the SOC (IC300) initializes and checks each IC.
The ROM (IC402) and SDRAM (IC400) 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.234)

POWER SUPPLY BOARD SECTION (P.62)

12.3.14. ANALOG 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.

12.3.14.1. CHECK SHEET

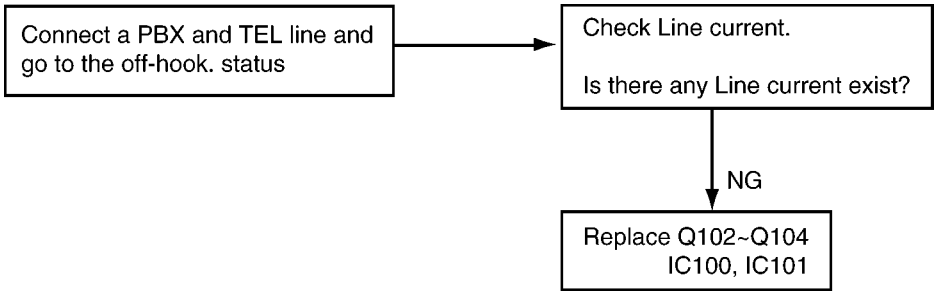
(SYMPTOM) CHECK ITEMS		Signal ROUTE IN → OUT
MONITOR RX		TEL LINE-CN100(3,4)-F100-L106-L107-R135-L111-L100-D103-Q104-R114-C106-IC101(3-5,6)-IC100(8,9)-IC300-IC200(1)-C203-R210-R253-C247-L210-IC202(2-1)-R235-C231-L220-IC204(4-5,8)-CN200(1,2)-CN58(1,2)-speaker
HANDSET Tx		Handset MIC-CN58(6)-CN200(6)-L221-R230-C226-L213-IC202(6-7)-R218-C215-C238-L208-IC201-R209-R206-C202-L203-IC200(10)-IC300-IC100(9,10)-IC101(5,6-3)-C106-R114-Q104-D103-L100-L111-R135-L106-F100-CN100(3,4)-TEL LINE
HANDSET Rx		TEL LINE-CN100(3,4)-F100-L106-L107-R135-L111-L100-D103-Q104-R114-C106-IC101(3-5,6)-IC100(9,10)-IC300-IC200(16)-C204-R211-L212-IC203(4-8)-L232-C246-R228-CN200(8)-CN58(8)-Handset speaker
DTMF Monitor	Speaker	IC300-IC200(1)-C203-R210-R253-C247-L210-IC202(2-1)-R235-C231-L220-IC204(4-5,8)-CN200(1,2)-CN58(1,2)-Speaker
	Handset	IC300-IC200(16)-C204-R211-L212-IC203(4-8)-L232-C246-R228-CN200(8)-CN58(8)-Handset speaker
DTMF for TEL Line FAX Tx		IC300-IC100(9,10)-IC101(5,6-3)-C106-R114-Q104-D103-L100-L111-R135-L106-F100-CN100(3,4)-TEL LINE
Ringing/Alarm/ Beep/Key tones		IC300(B20)-R205-C205-R212-L210-IC202(2-1)-R235-C231-L220-IC204(4-5,8)-CN200(1,2)-CN58(1,2)-Speaker
CNG/DTMF/Caller ID detection		TEL LINE-CN100(3,4)-F100-L106-L108,L109-R112,R113-R106,R107-IC101(8,9-5,6)-IC100(9,10)-IC300
DTMF detection (ON-HOOK)		EXT TEL LINE-CN101(3,4)-L108,L109-R112,R113-R106,R107-IC101(8,9-5,6)-IC100(9,10)-IC300
Bell detection		TEL LINE-CN100(3,4)-F100-L106-L108,L109-R112,R113-R106,R107-IC101(8,9-5,6)-IC100(9,10-15)-IC300(L23)

12.3.14.2. DEFECTIVE ITS (Integrated Telephone System) SECTION

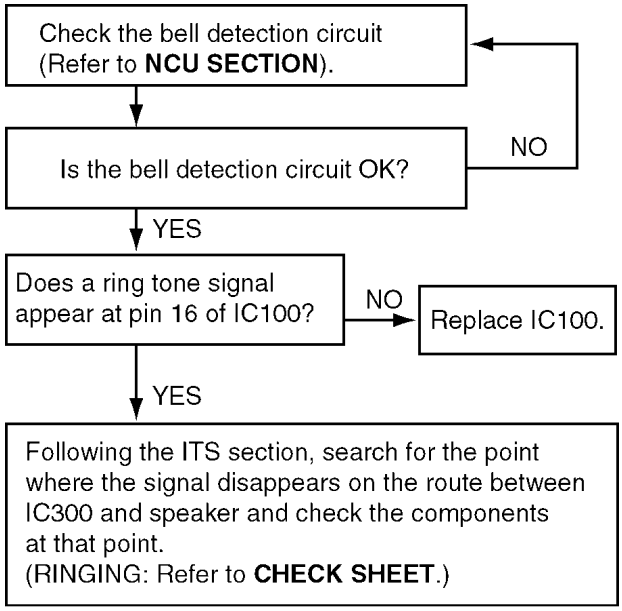
1. No handset and speakerphone transmission / reception

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.153) is useful for this investigation.

2. No pulse dialing



3. No ring tone (or No bell)



CROSS REFERENCE:

CHECK SHEET (P.153)

NCU SECTION (P.27)

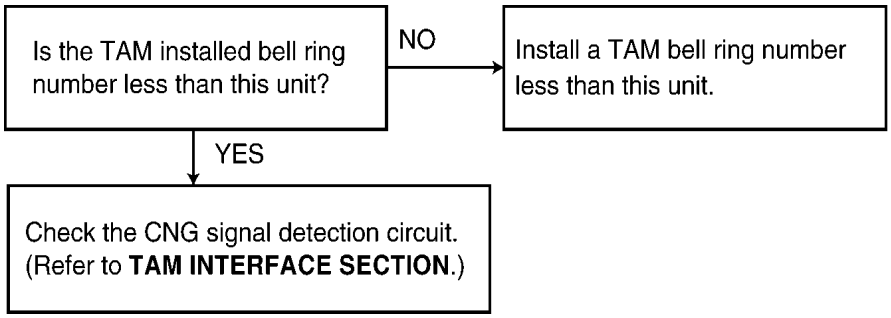
4. No tone dialing

Following the NCU section and ITS section, search for the point where the signal disappears on the route the telephone jack and check the components at that point.
(DTMF for TEL LINE: Refer to **CHECK SHEET**.)

CROSS REFERENCE:
CHECK SHEET (P.153)

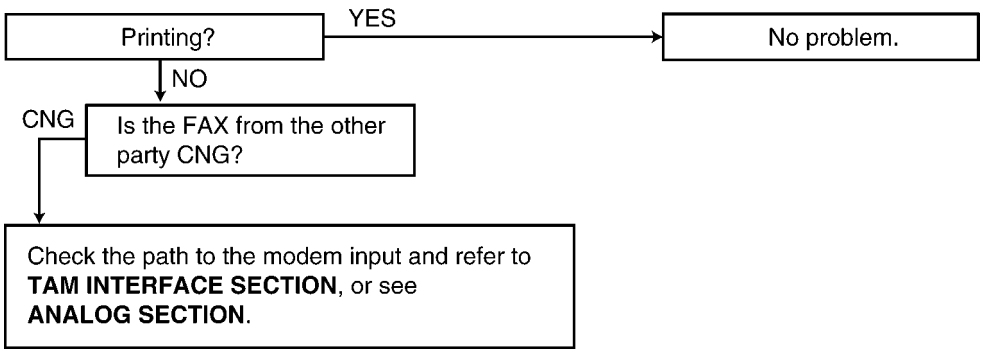
12.3.14.3. DETECTIVE TAM INTERFACE SECTION

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



CROSS REFERENCE:
TAM INTERFACE SECTION (P.28)

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

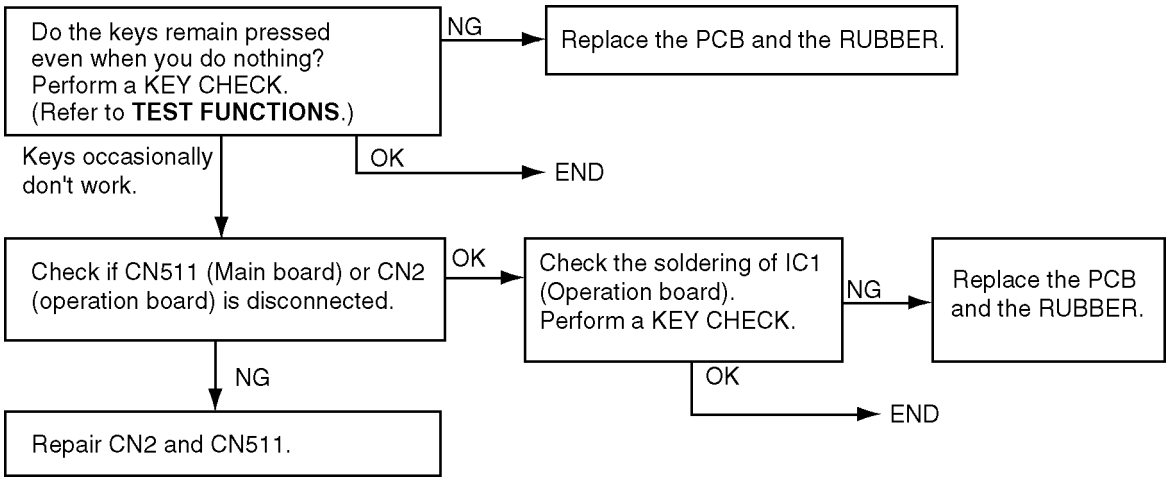


CROSS REFERENCE:
ANALOG SECTION (P.153)
TAM INTERFACE SECTION (P.28)

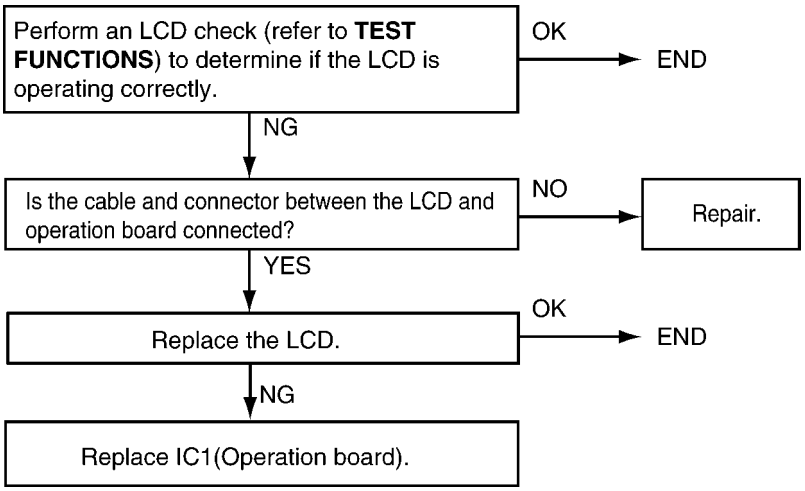
12.3.15. OPERATION PANEL SECTION

Refer to **TEST FUNCTIONS** (P.83).

1. NO KEY OPERATION



2. NO LCD INDICATION



CROSS REFERENCE:

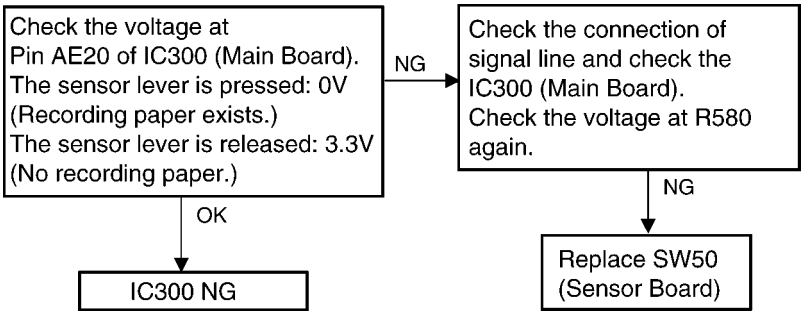
TEST FUNCTIONS (P.83)

12.3.16. SENSOR SECTION

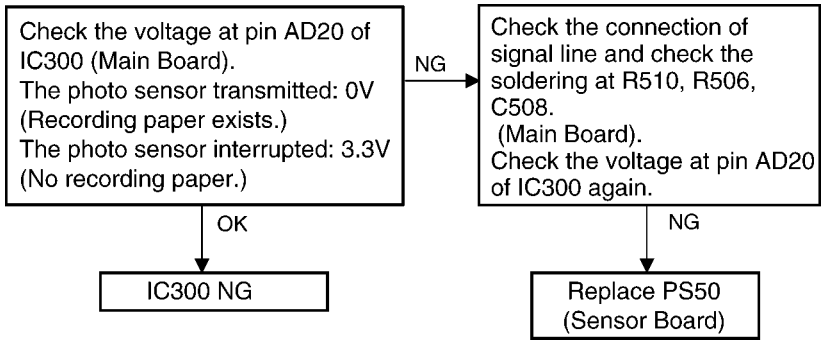
Refer to SENSORS AND SWITCHES for the circuit description.

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

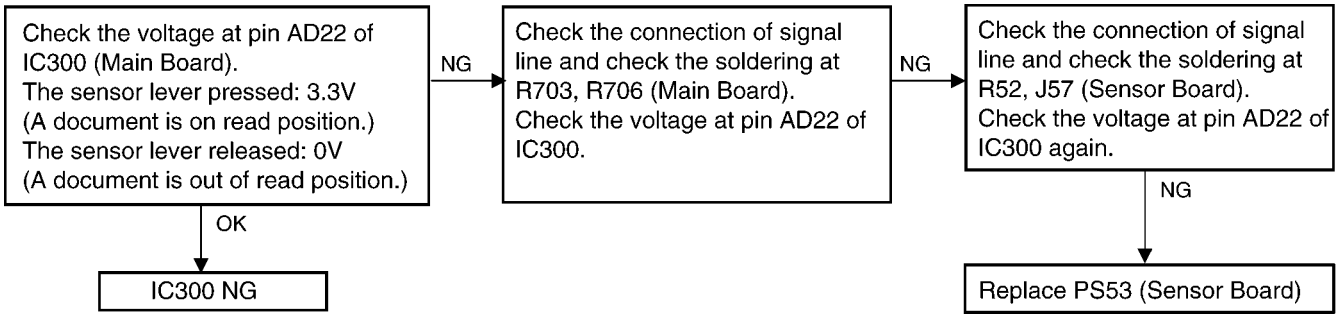
1. Check the pickup sensor ..... "FAILED PICKUP"



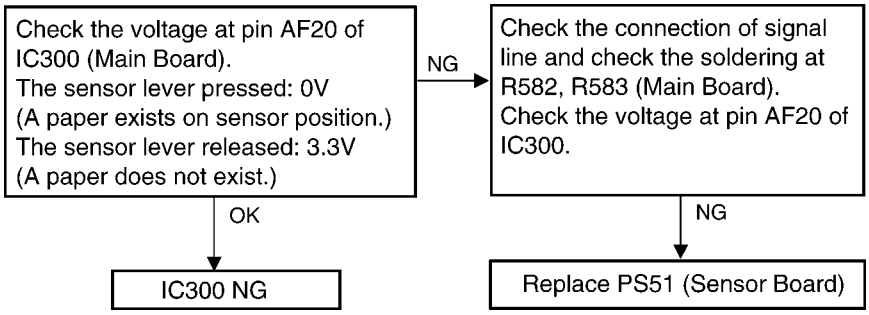
2. Check the paper exit sensor..... "PAPER JAMMED"



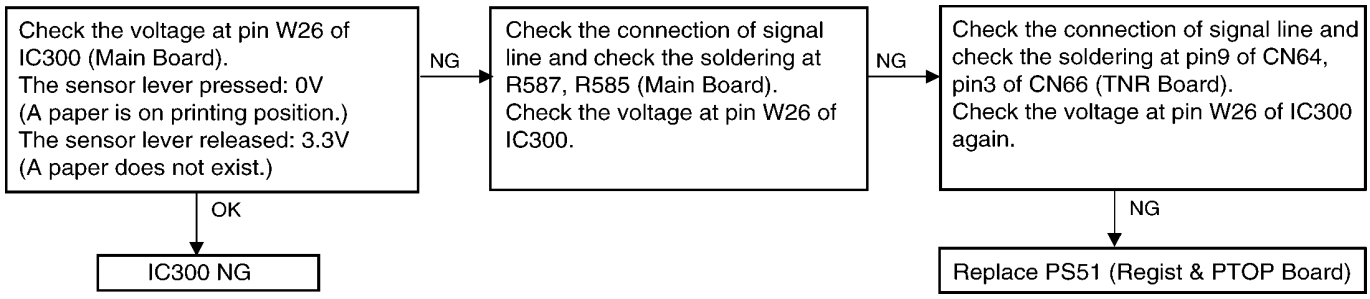
3. Check the read position sensor ..... "CHECK DOCUMENT"



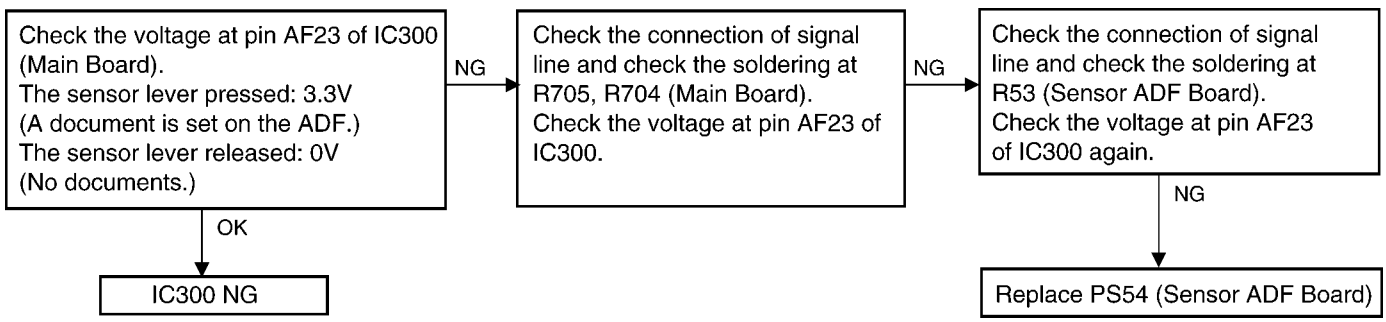
4. Check the registration & manual paper sensor ..... "PAPER JAMMED"



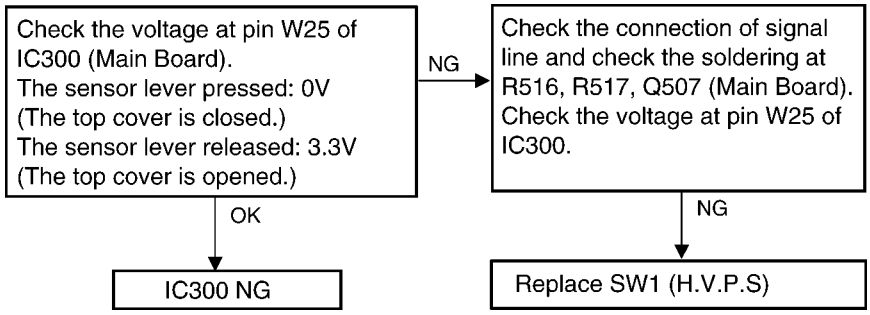
5. Check the print timing sensor ..... "PAPER JAMMED"



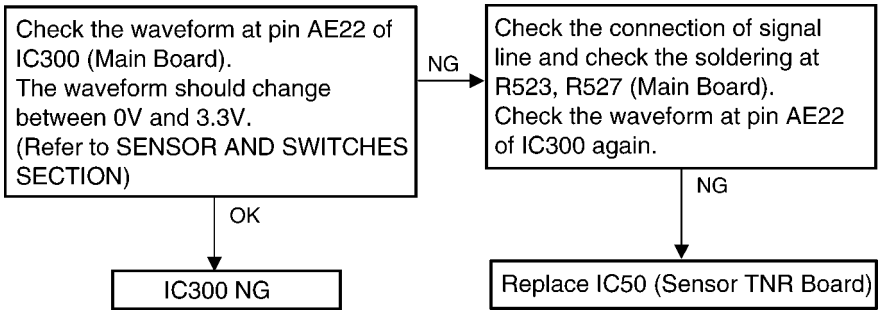
6. Check the document sensor



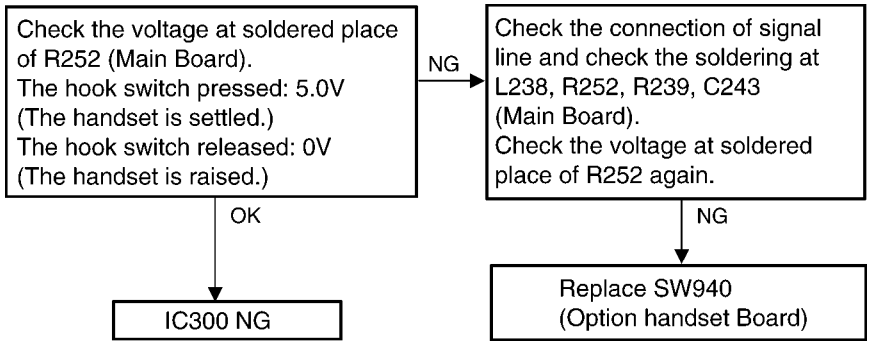
7. Check the top cover sensor ..... "TOP COVER OPEN"



8. Check the toner sensor ..... "TONER LOW", "CHANGE DRUM"



9. Check the option handset hook switch

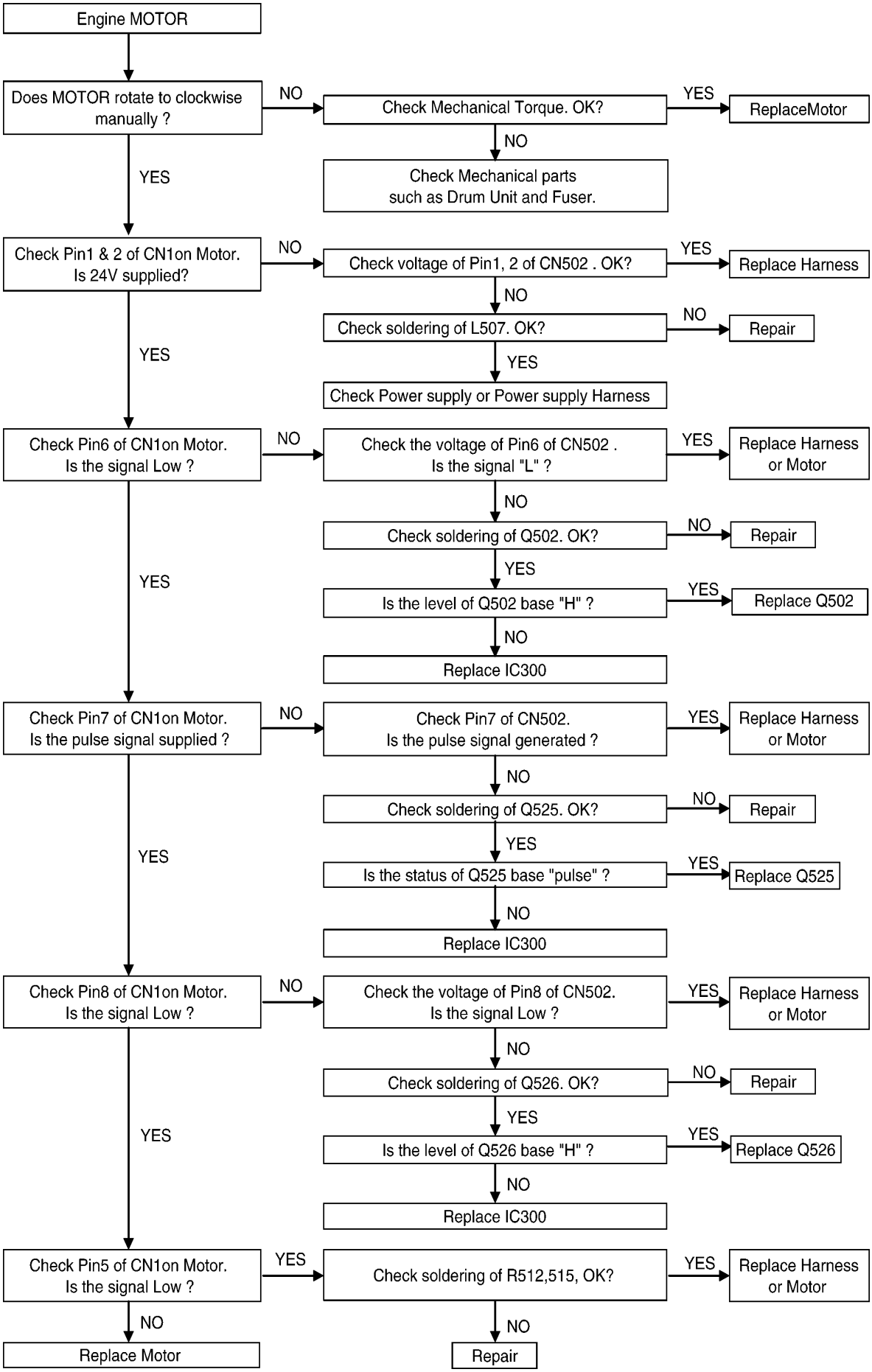


CROSS REFERENCE:

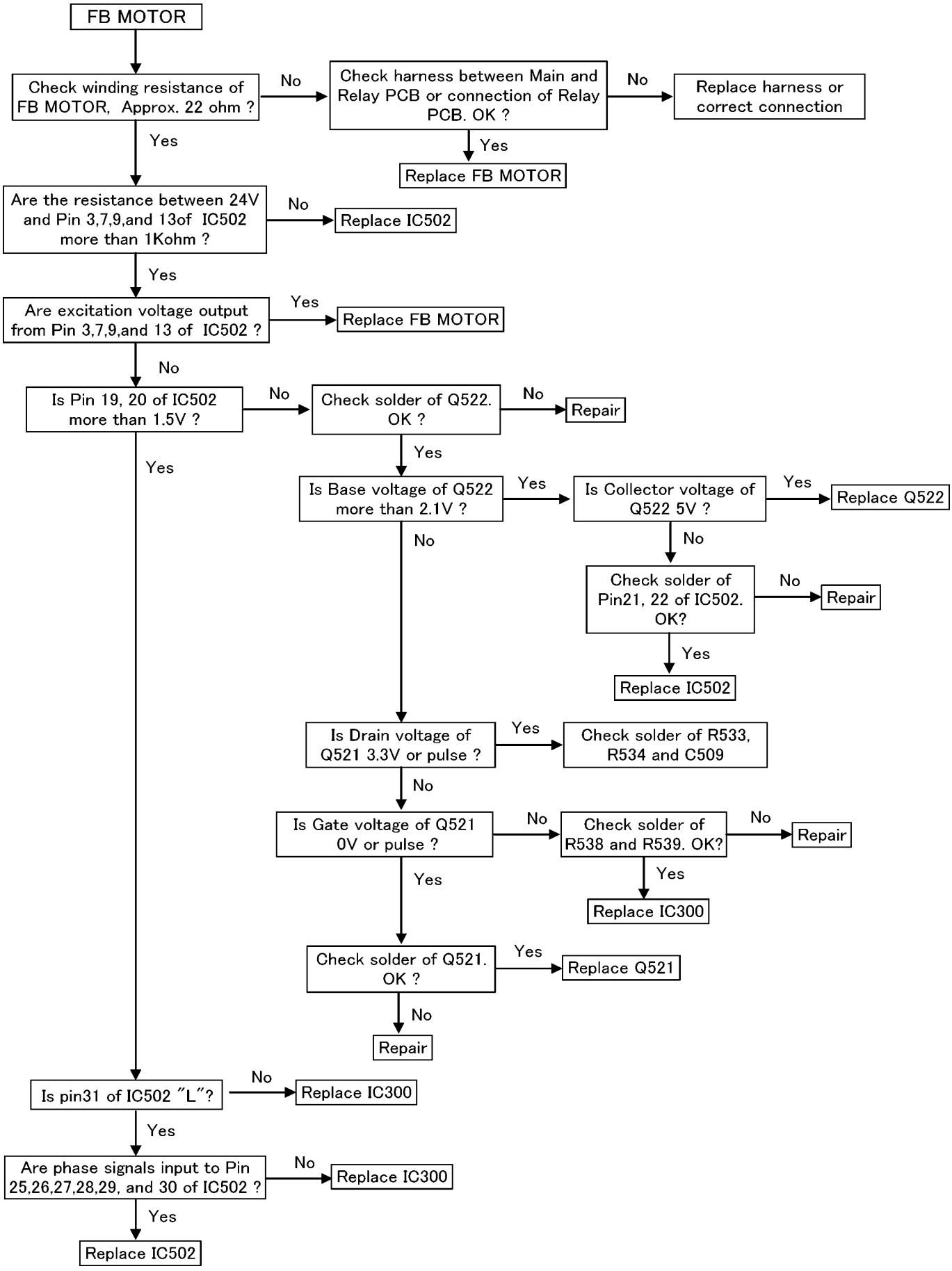
SENSORS AND SWITCHES SECTION (P.42)

12.3.17. MOTOR SECTION

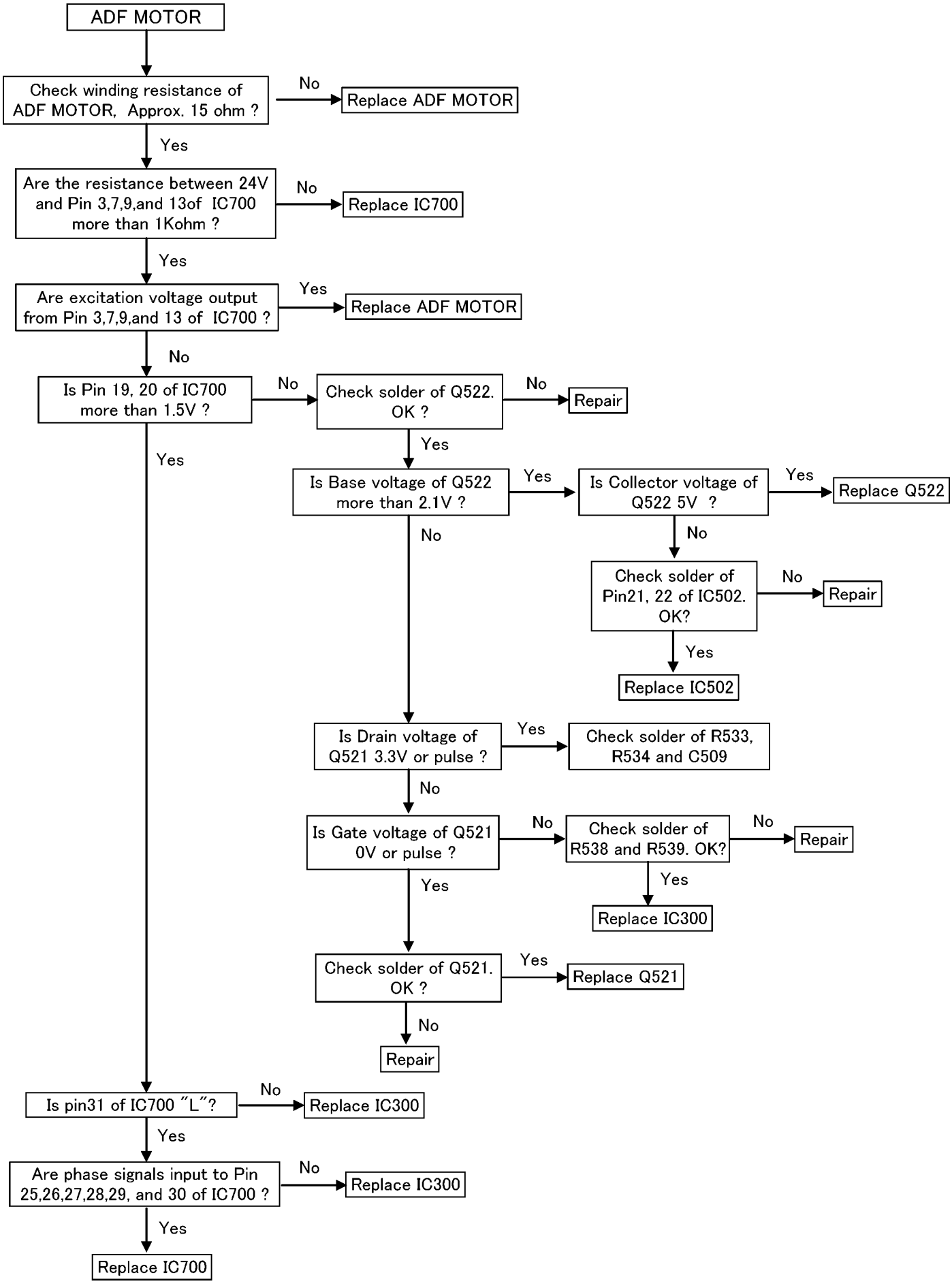
12.3.17.1. ENGINE MOTOR



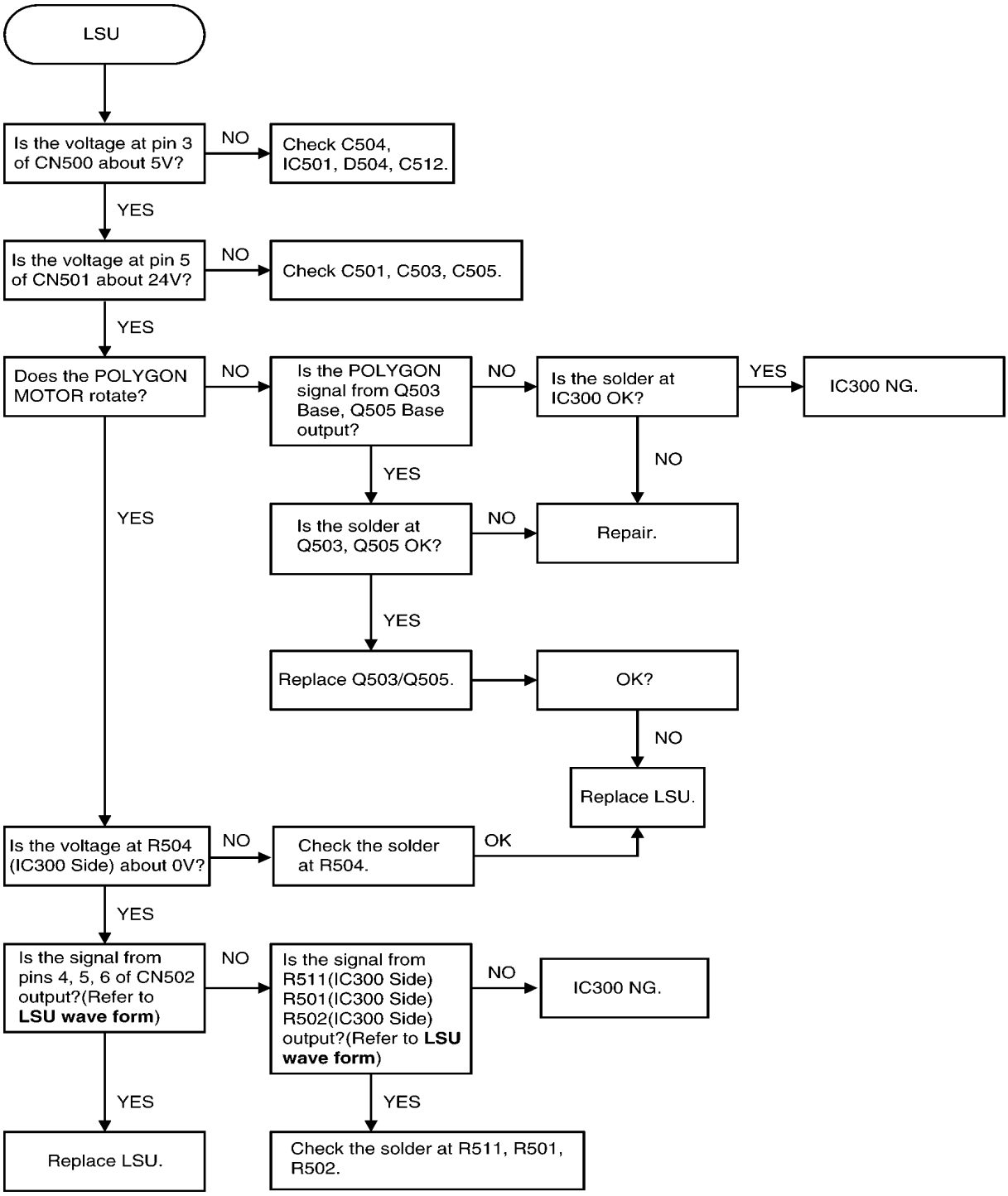
12.3.17.2. FB (Flatbed) MOTOR



12.3.17.3. ADF MOTOR (ADF provided model only)



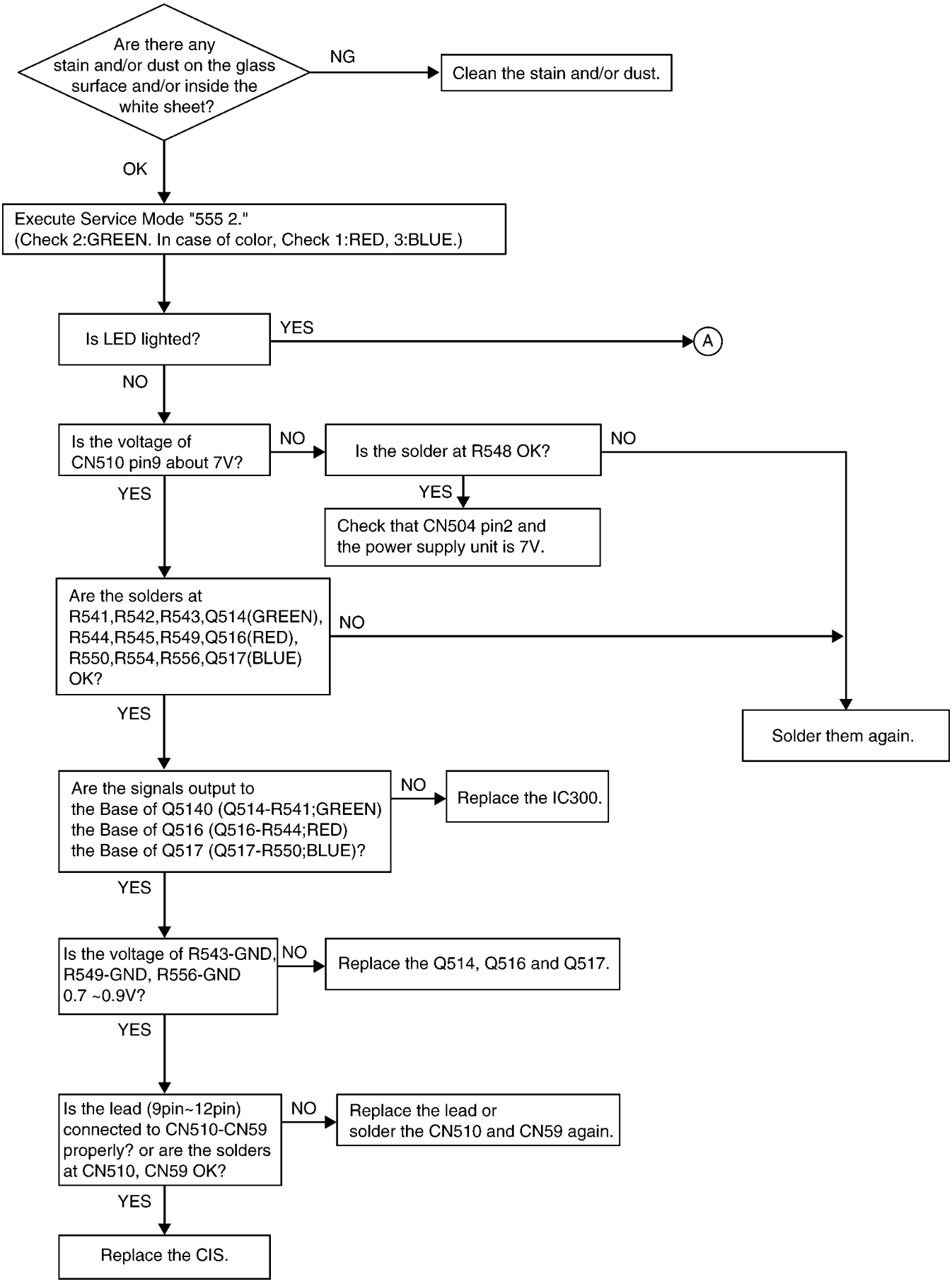
12.3.18. LSU SECTION

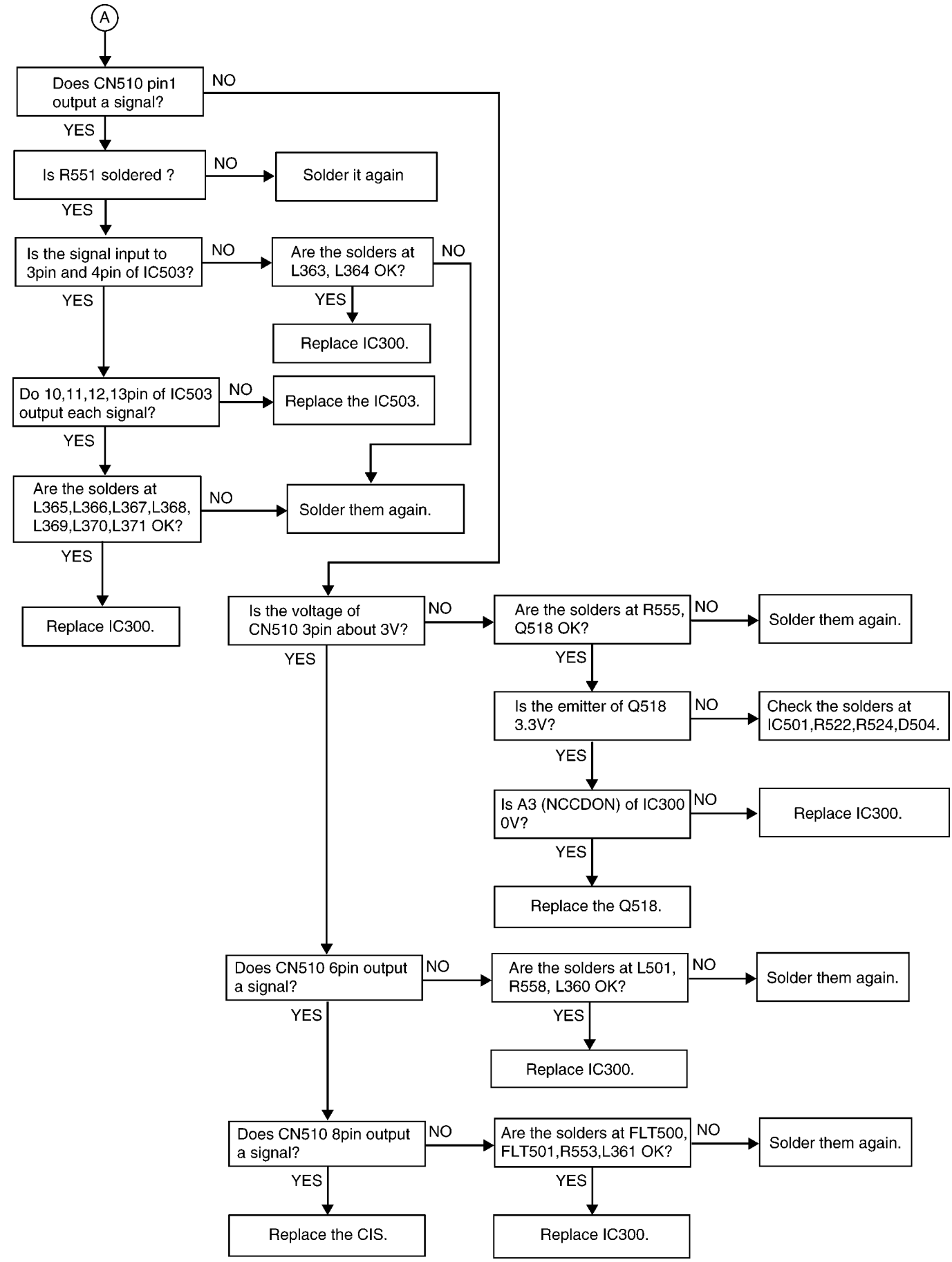


CROSS REFERENCE:

LSU (Laser Scanning Unit) SECTION (P.40)

12.3.19. CIS CONTROL SECTION





CROSS REFERENCE:
TEST FUNCTIONS (P.83)

12.3.20. HIGH VOLTAGE VALUE CHECK POINT

Measurement Procedure

1. Turn Off the unit, and open the unit cover.
2. Remove the developing unit, if it is equipped.
3. Connect the wire to the terminal to be measured (Fig. 2). The wire should be put out of the unit not to interfere in other terminals (Fig. 3). See Fig 4 and 5 for fixing the wire to the terminal No.4.
4. Reinstall the developing unit and close the unit cover.
5. Connect the wire fixed to the terminal to be measured and high voltage probe. Connect the earth of the high voltage probe to the screw located under the bottom plate of the unit without the paper cassette. (Fig.1)
6. Turn On the unit. It causes the unit to start the initial operation. Be careful, high voltage is output at that moment. (Avoid measuring then.)
7. The unit enters the service mode. Then push *628_0.
8. Push the SET button.
   (High voltage will be added to the unit in the hereafter. Avoid touching the wire and the tip of high voltage probe where high voltage is supplied.)
9. When the measurement is finished, push the STOP button.
   (The high voltage output is stopped.)
10. Remove the wire fixed to the output terminal after measuring.

Each terminal's output voltage

No.	BIAS Name	Rated Output	Rated Output Range
1	CHG (Charge)	200μA	200±15μAOutput voltage about 4.1~4.6KV
2	GRID (Grid)	475V	475± 10V
3	DEV (Developing)	230V	170~240V
4	TRA (Transfer)	785V	785± 100V

* FLUKE85 (MULTIMETER) + HIOKI (HV PROVE 9014) or the equivalent should be used as the high voltage measuring instrument. (Fig.6)

* As for measuring TRA, start measuring within 9 seconds after pressing the SET button. The output value will be changed in 9 seconds.

Fig. 1 Each terminal and the earth point.

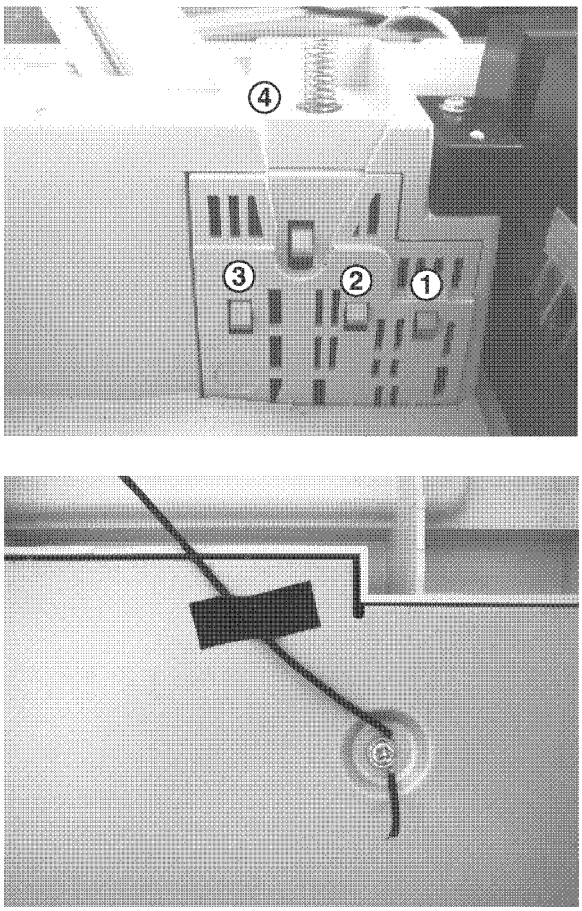


Fig. 2

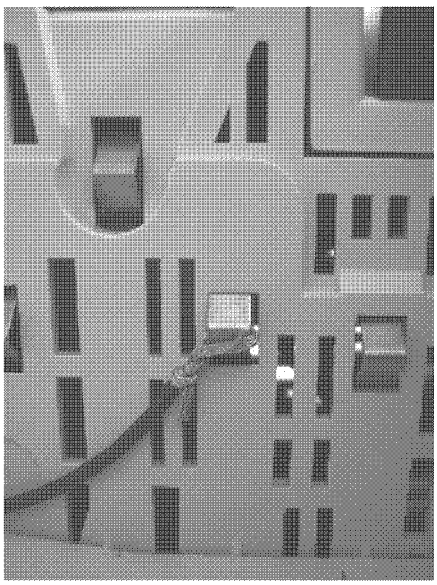


Fig. 3

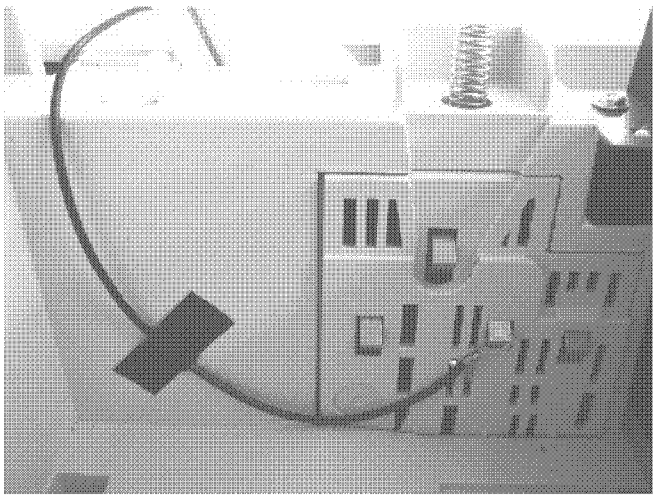


Fig. 4

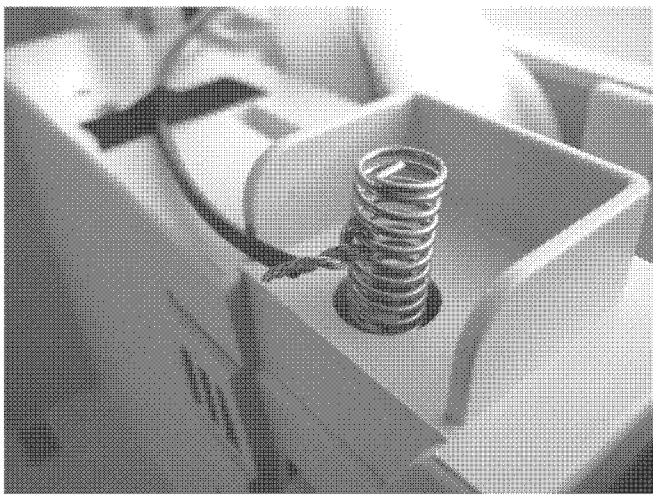


Fig. 5

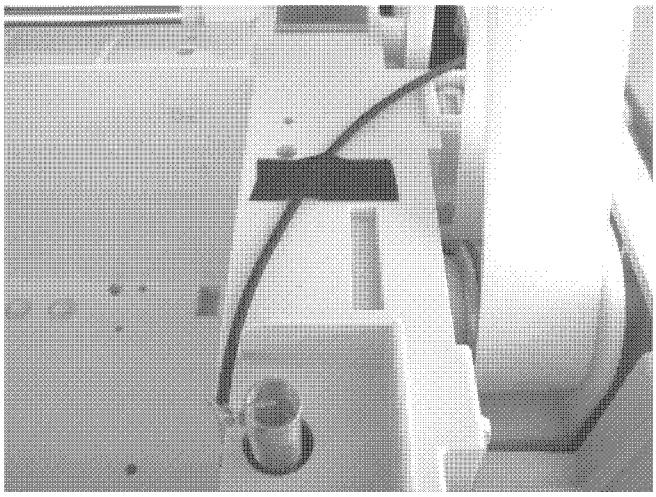
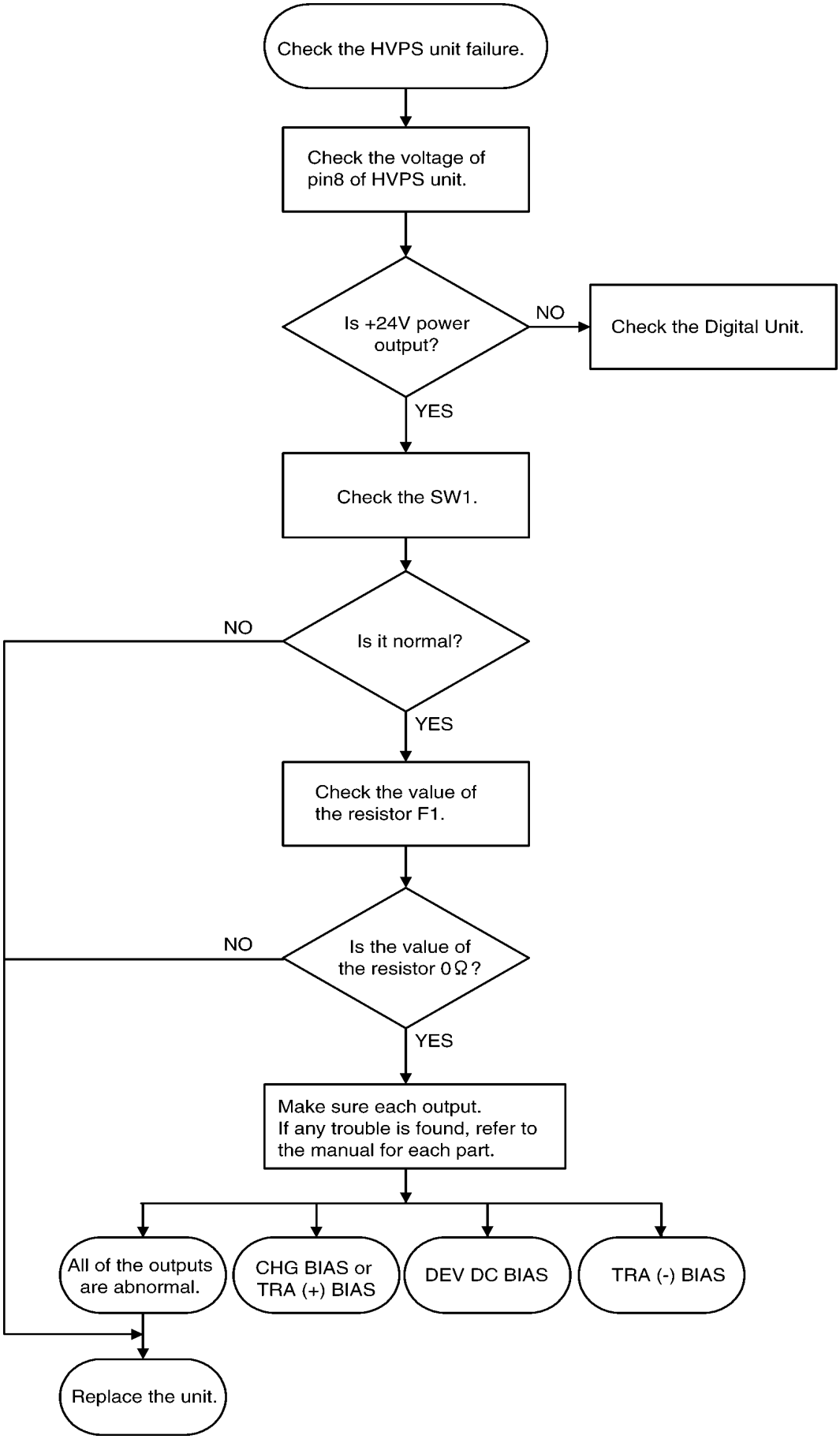


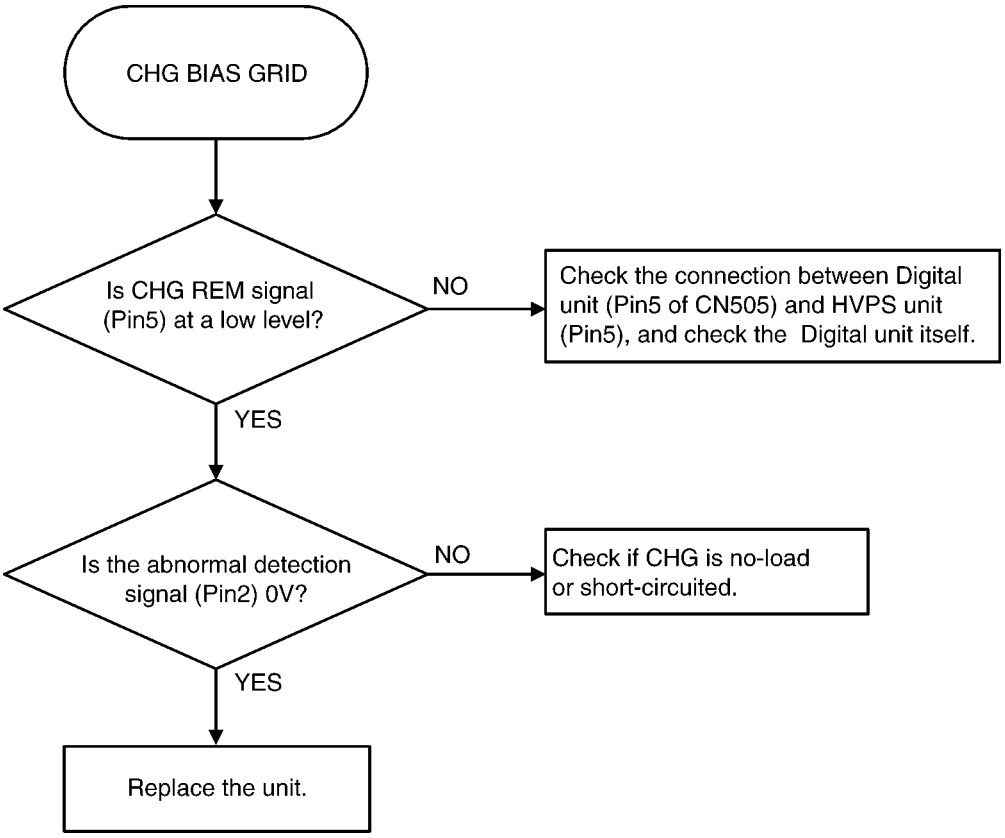
Fig. 6

12.3.21. HIGH VOLTAGE SECTION

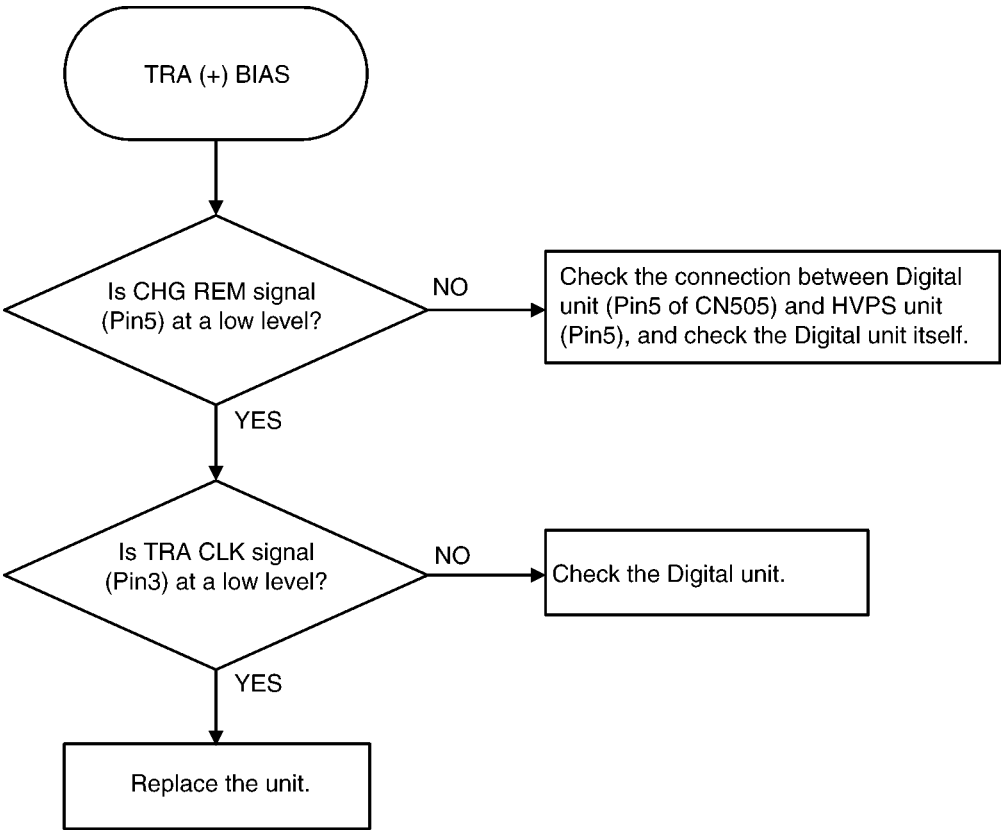
1. Main



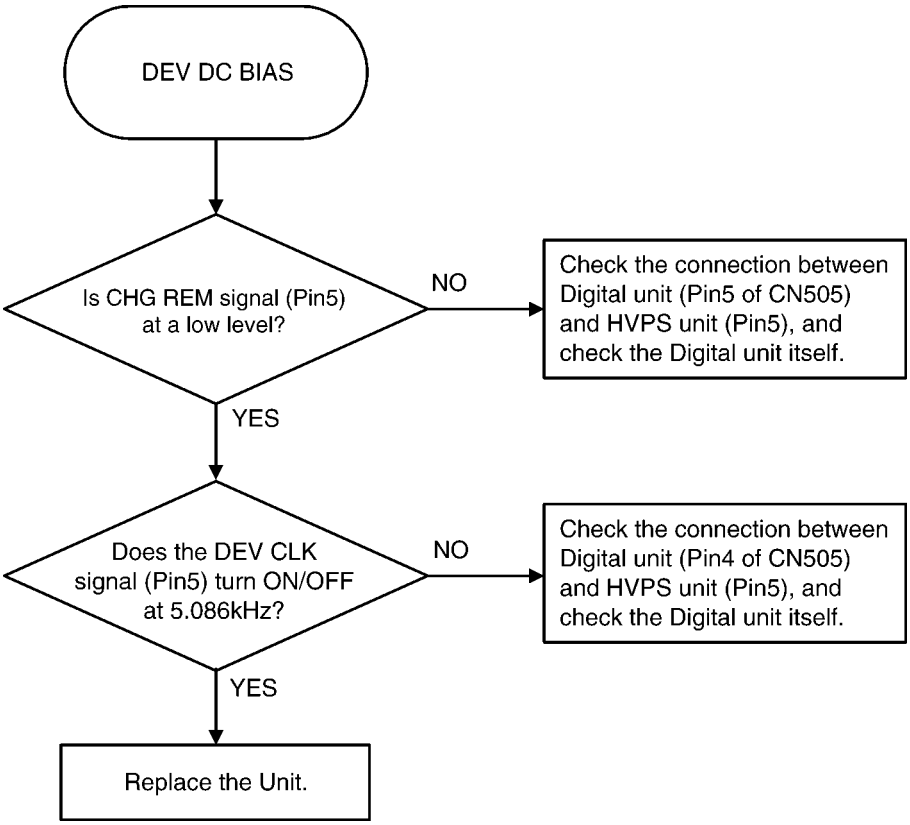
2. CHG, GRID



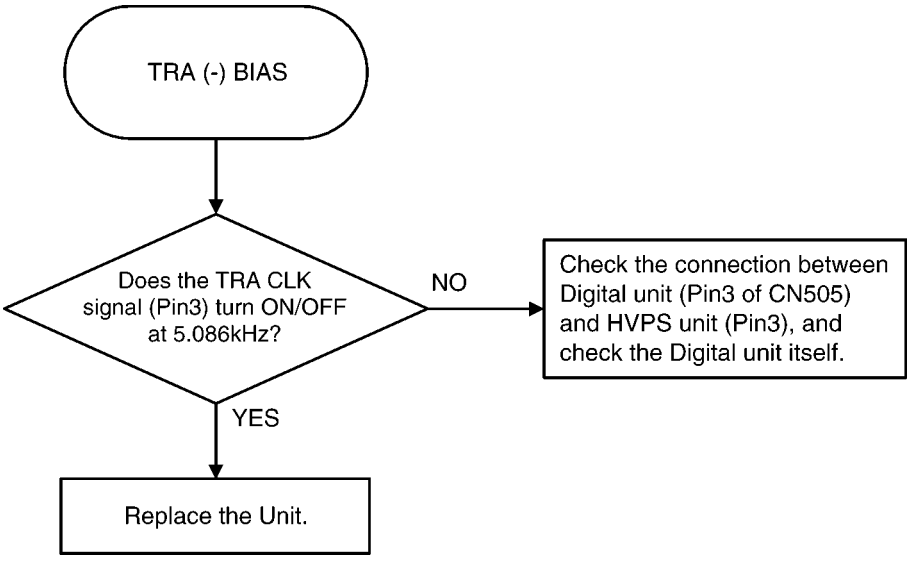
3. TRA (+)



3. DEV DC



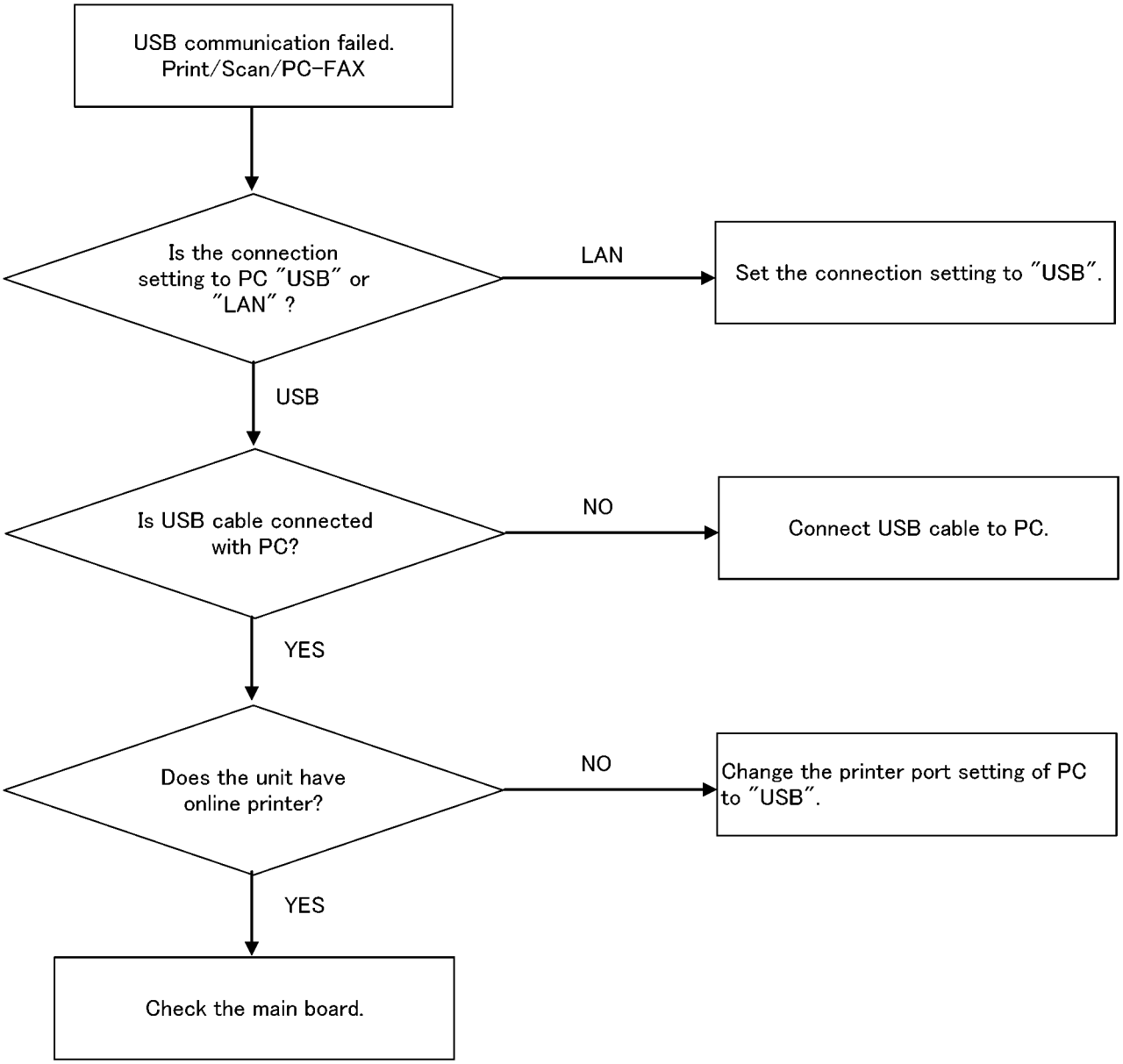
TRA (-)



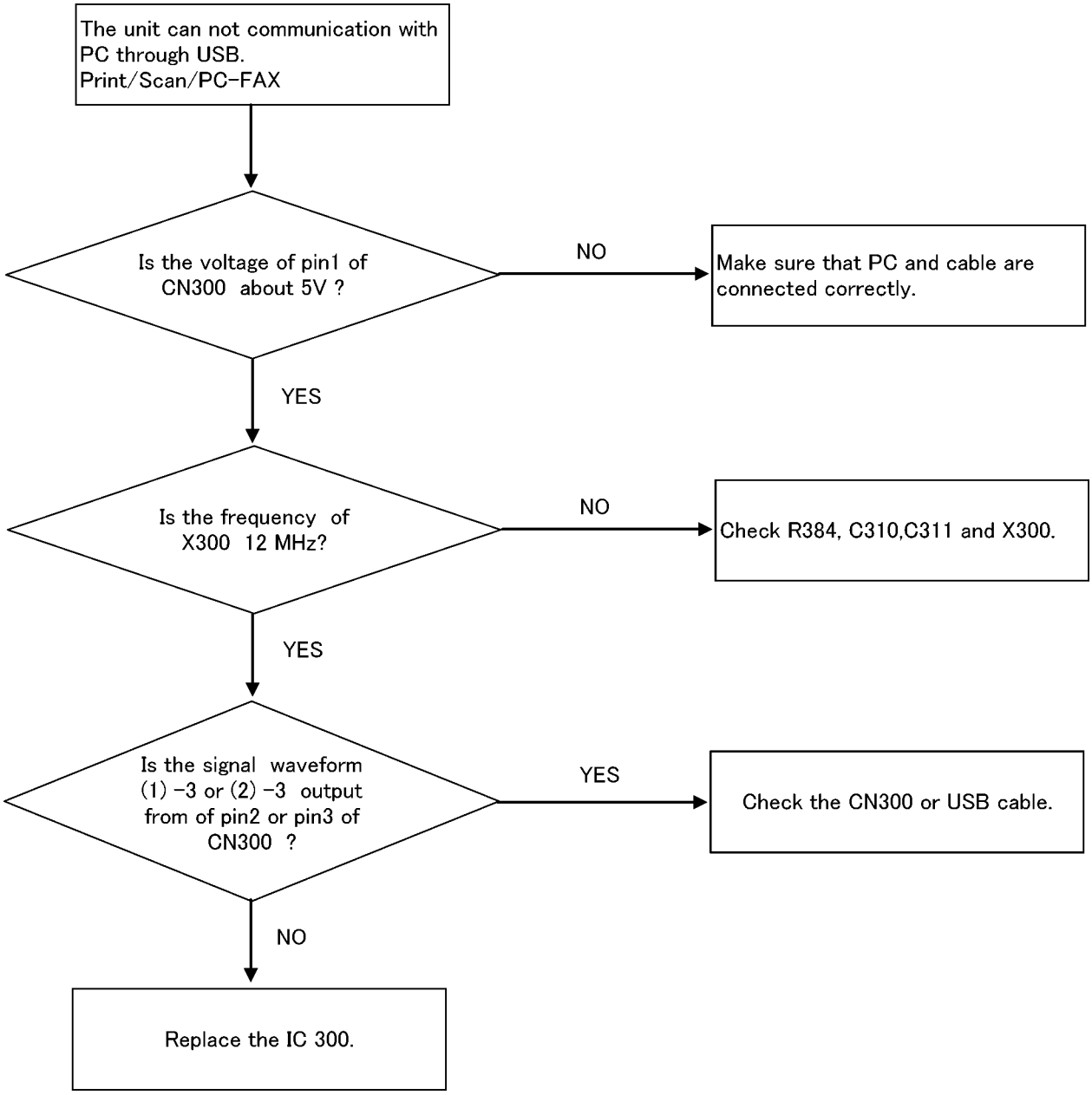
12.3.22. USB SECTION

Troubleshooting

1. Confirmation of the PC settings



2. Confirmation of the main unit



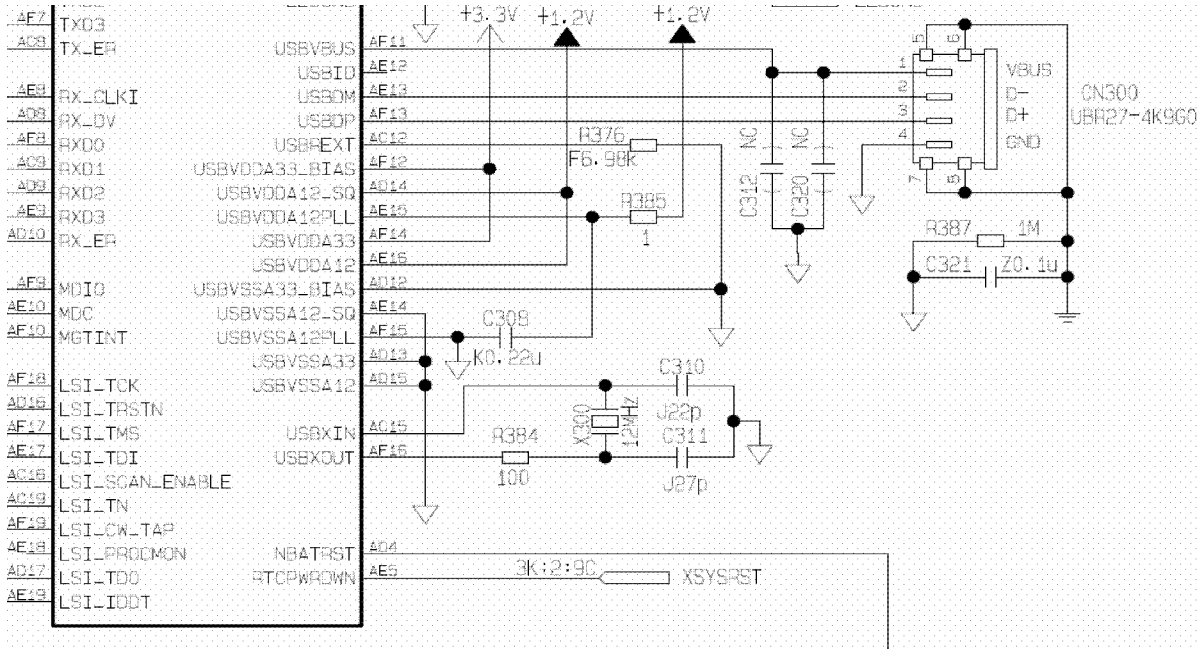
USB (Universal Serial Bus) block

Description

This is a USB block for data communication with PC.
Two signal lines (D+/D-) are differential signals which work in reverse phase.

VBUS: CN300 1pin
D+: CN300 3pin
D-: CN300 2pin
GND: CN300 4pin

Circuit Diagram



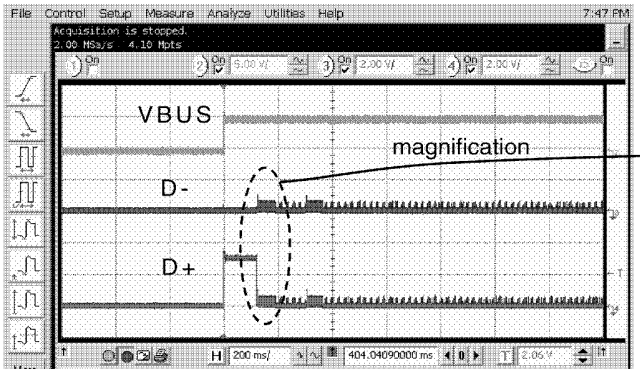
Sequence of normal operation

When USB cable from PC is connected to CN300, VBUS voltage goes up to 5V, and IC300 recognize the connection with PC.
Then D+ becomes about 3V : waveform (1)-1
The D+ becomes 0V, then communication between IC300 and PC is started : waveform (2)-1
When a few seconds elapsed after USB cable was inserted into CN300 ,the unit enters stand-by mode.
When PC is at Hi-Speed , waveforms are (1)-1 ~ (1)-4.
When PC is at Full Speed ,waveforms are (2)-1 ~ (2)-4.

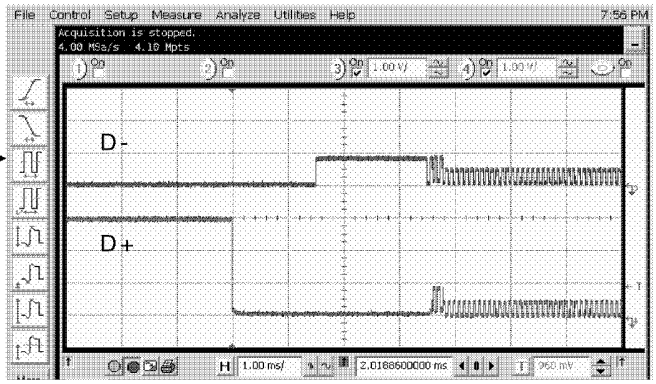
Waveform of normal operation

(1) The condition during communication establishment between PC and Main unit at Hi-Speed.

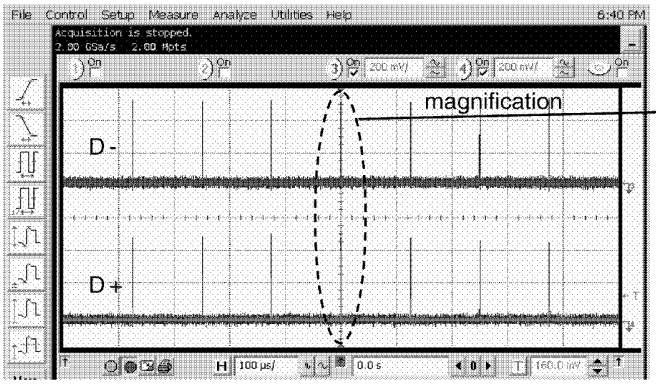
Waveform (1)-1 at Hi-Speed



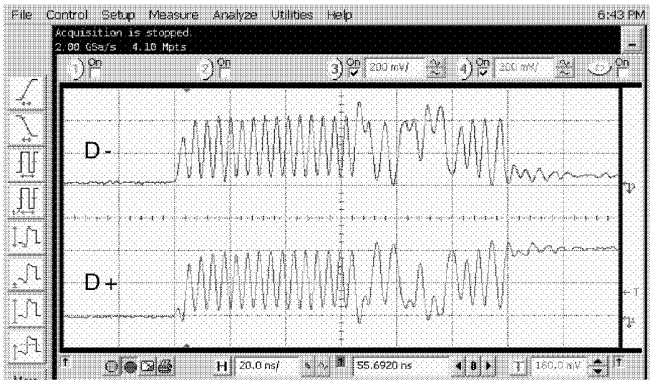
Waveform (1)-2 at Hi-Speed



Waveform (1)- 3 at Hi-Speed

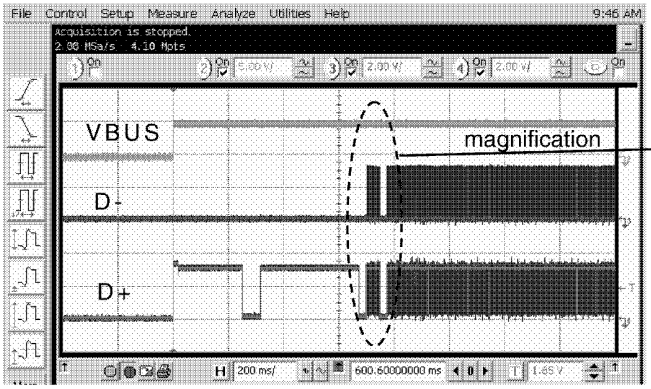


Waveform (1)-4 at Hi-Speed

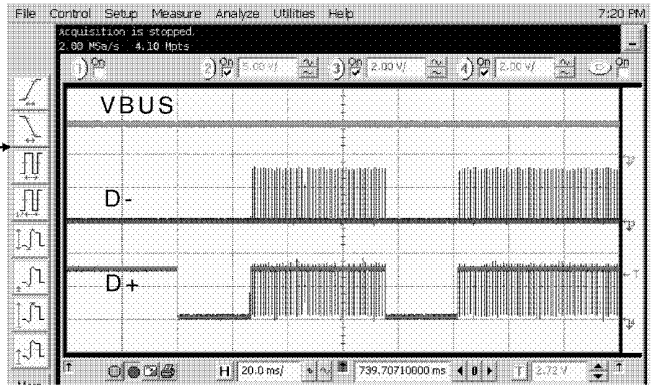


(2) The condition during communication establishment between PC and Main unit at Full Speed.

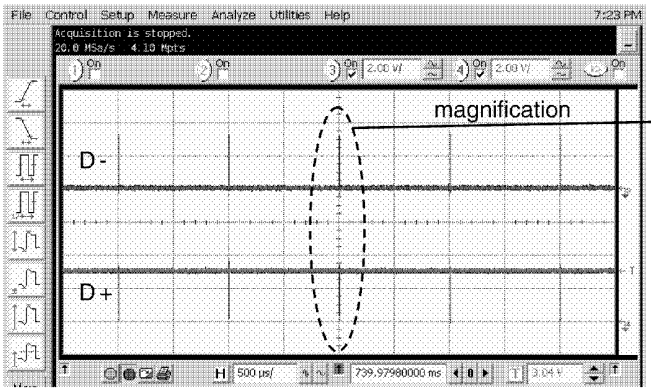
Waveform (2)- 1 at Full Speed



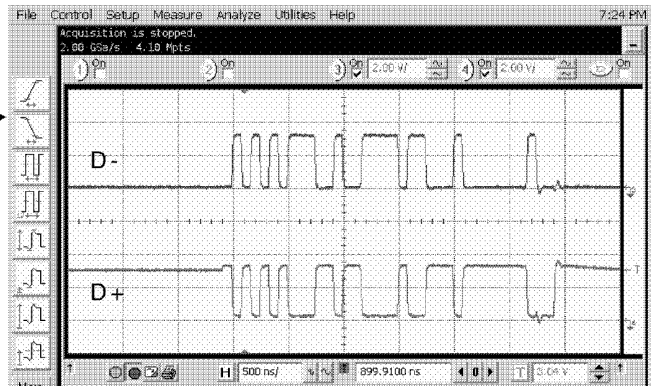
Waveform (2)-2 at Full Speed



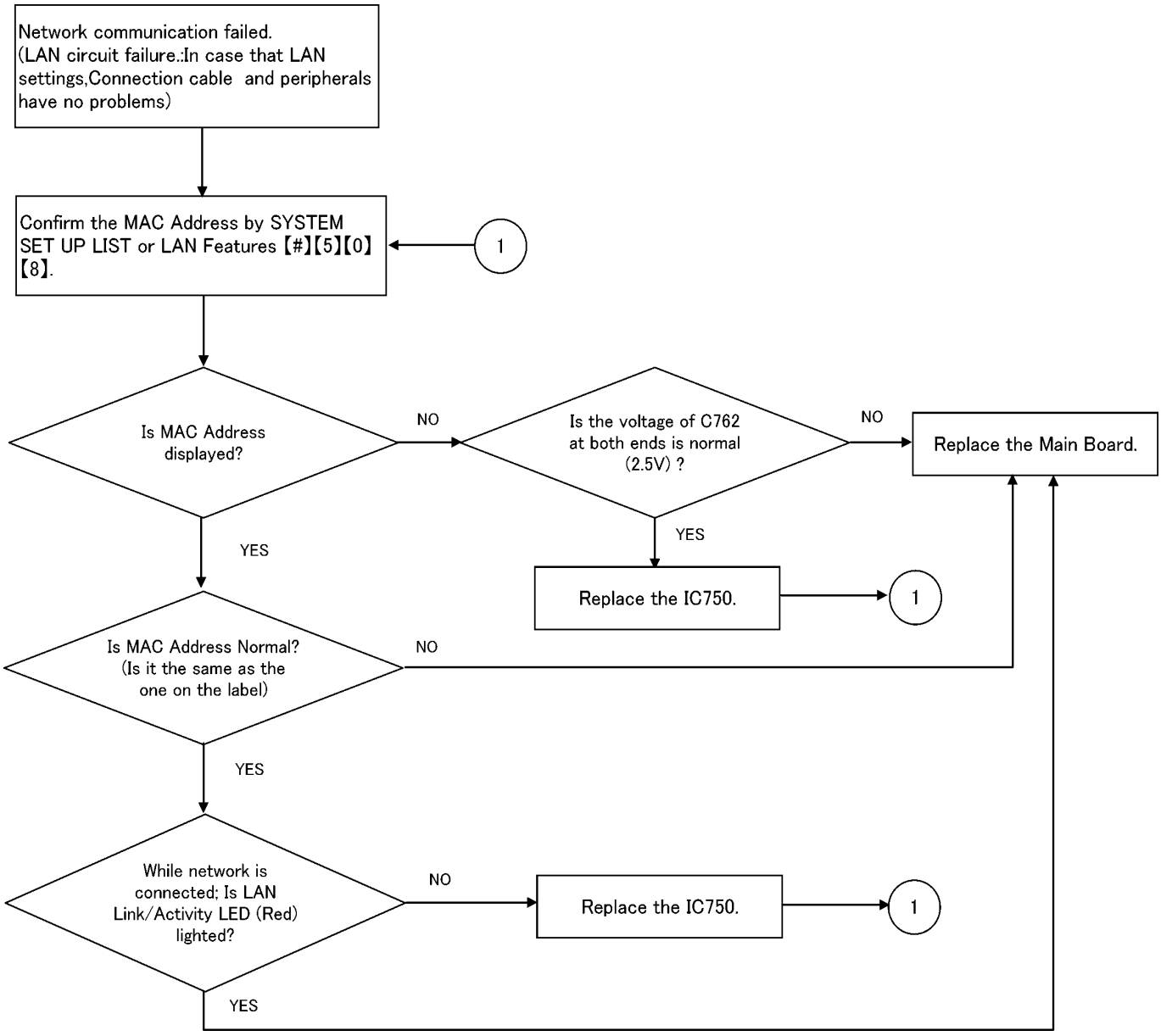
Waveform (2)-3 at Full Speed



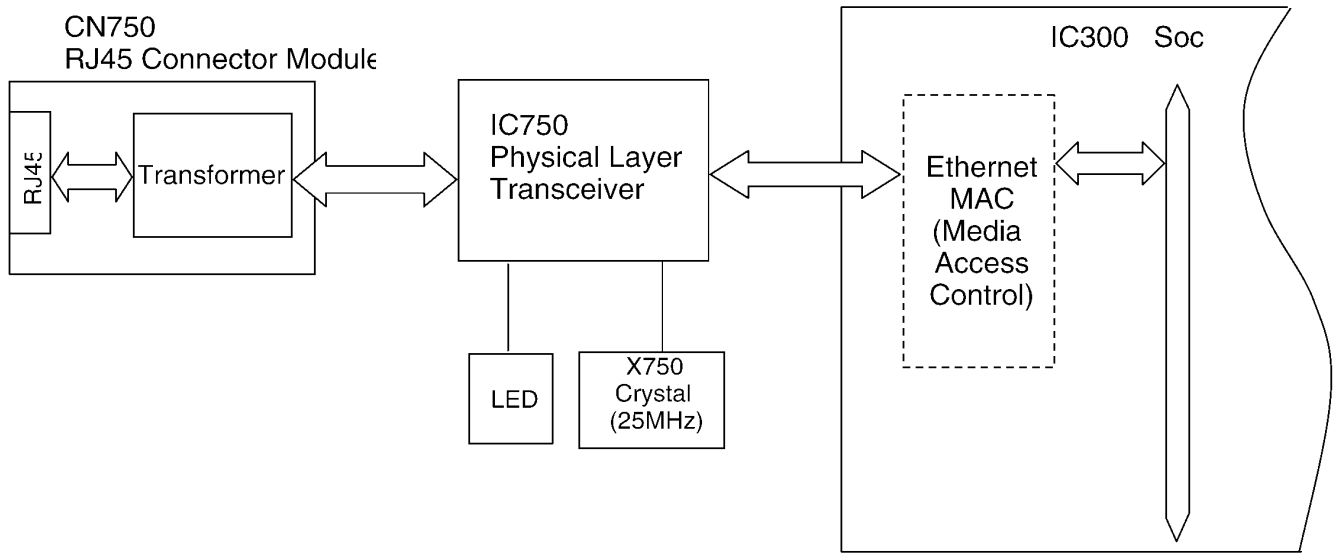
Waveform (2)-4 at Full Speed



12.3.23. LAN SECTION



LAN Block Diagram

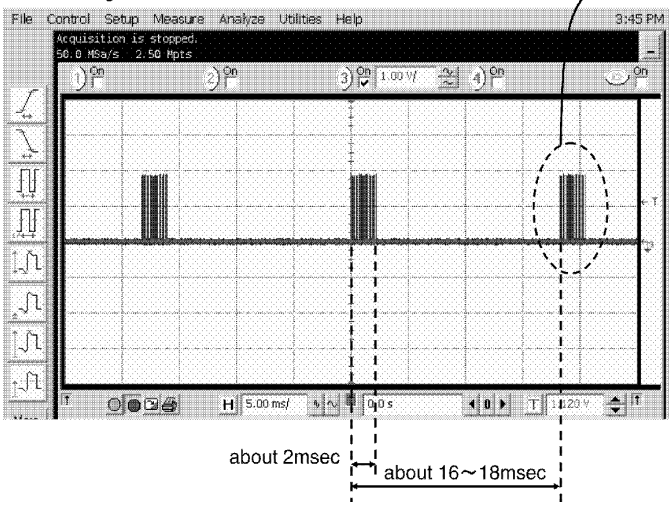


LAN Circuit signal waveform (Normal)

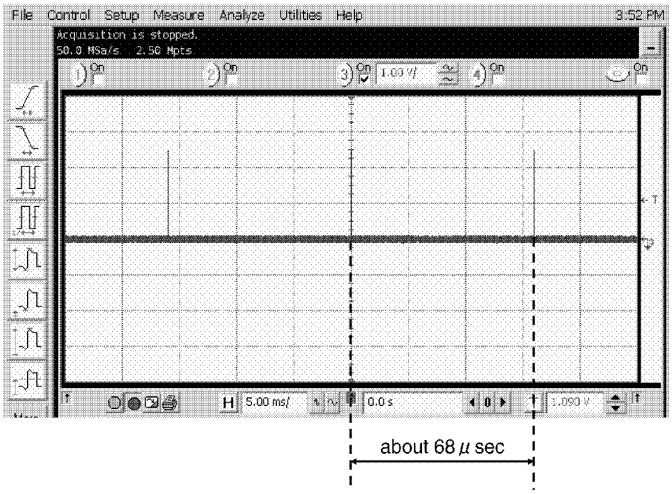
Transmitter waveform [TD+ (CN750 pin1), TD- (CN750 pin2) differential voltage] : Differential probe is used.

1. When network equipment is not connected (LAN cable is not connected);

① Auto negotiation waveform 1

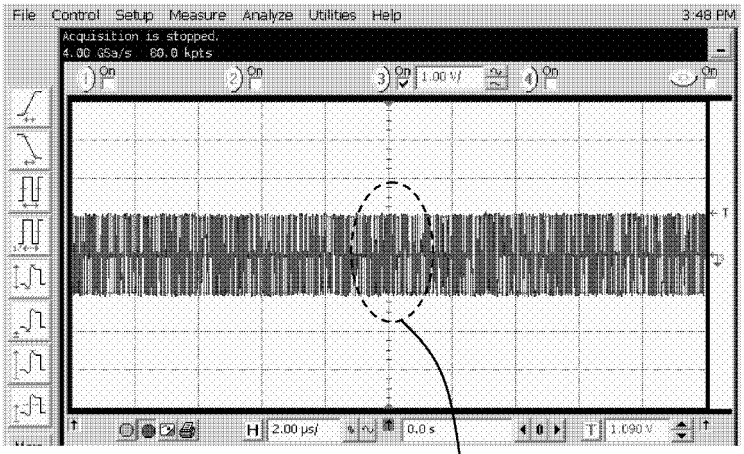


② Auto negotiation waveform 2 （A part of the waveform1 is magnified.)

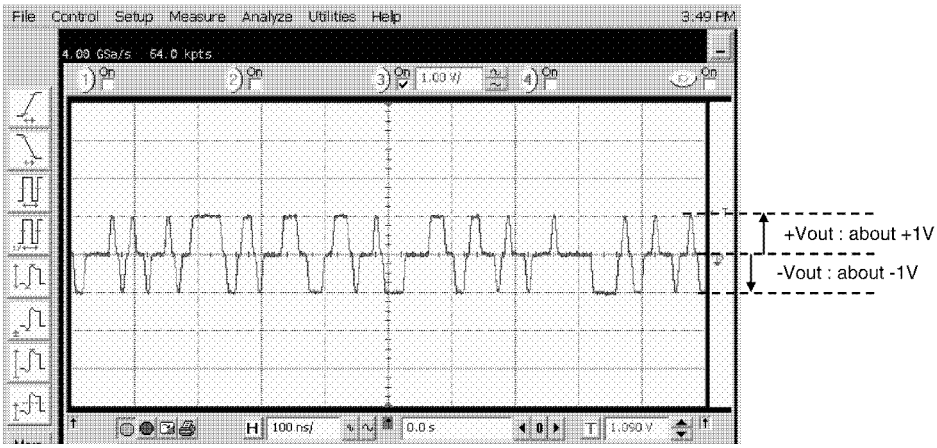


2. When 100Base-TX-enabled deviced is connected;

① 100Base-TX waveform 1

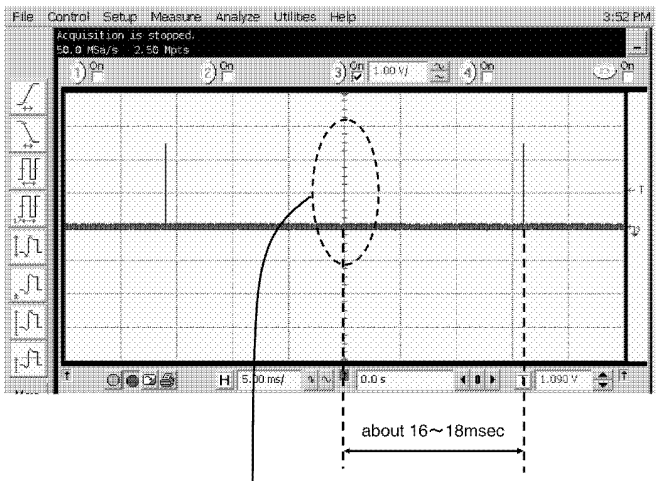


② 100Base-TX waveform 2 (A part of the waveform1 is magnified.)

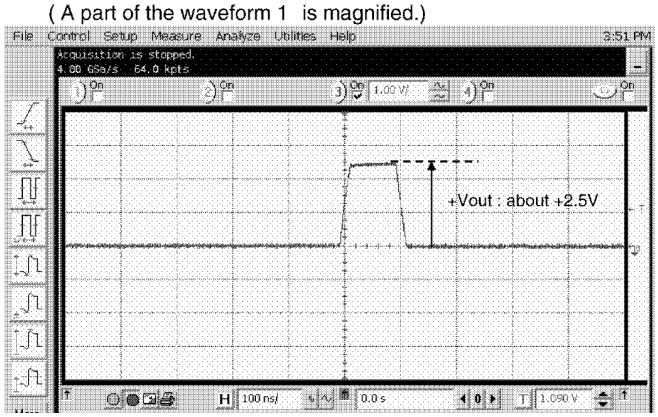


3. When 10Base-T-enabled device is connected.

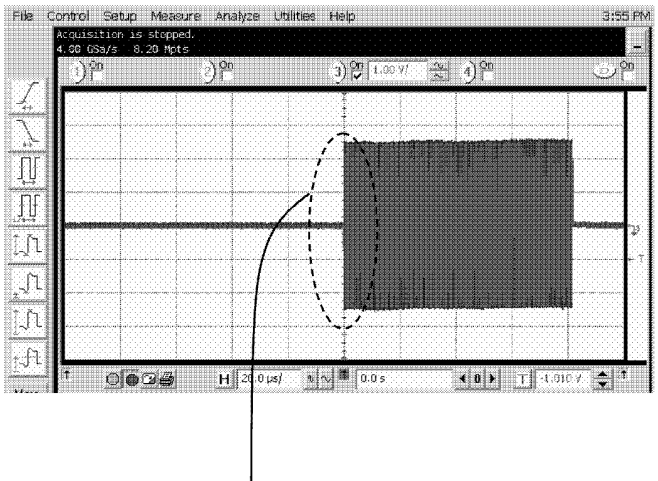
① 10Base-T waveform 1 [Link Pulse]



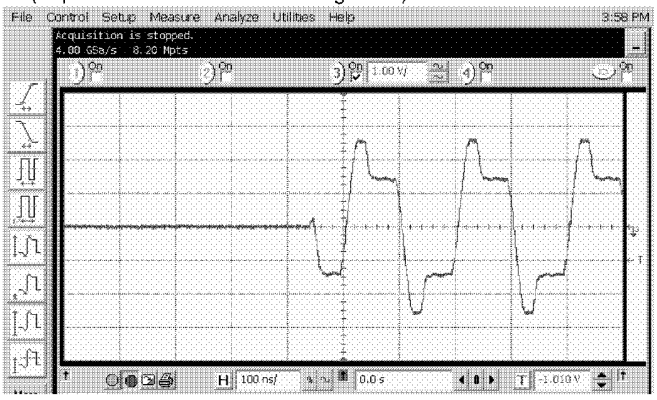
② 10Base-T waveform 2 [Link Pulse]
(A part of the waveform 1 is magnified.)



③ 10Base-T waveform 3 [during data commnication]



④ 10Base-T waveform 4 [during data commnication]
(A part of the waveform 3 is magnified.)



IC750 (C1CB00002227 : 3.3V Single Power Supply) Pin Description

<table>
<tr><th>Pin No</th><th>Signal Name</th><th>Input/Output(*)</th><th>Description</th></tr>
<tr><td>1</td><td>MDIO</td><td>I/O</td><td>Management Independent Interface (MII) Data I/O</td></tr>
<tr><td>2</td><td>MDC</td><td>I</td><td>MII Clock Input</td></tr>
<tr><td>3</td><td>RXD3/PHYAD1</td><td>Ipd /O</td><td>MII Receive Data Output</td></tr>
<tr><td>4</td><td>RXD2/PHYAD2</td><td>Ipd /O</td><td>MII Receive Data Output</td></tr>
<tr><td>5</td><td>RXD1/PHYAD3</td><td>Ipd /O</td><td>MII Receive Data Output</td></tr>
<tr><td>6</td><td>RXD0/PHYAD4</td><td>Ipd /O</td><td>MII Receive Data Output</td></tr>
<tr><td>7</td><td>VDDIO</td><td>-</td><td>Digital IO 2.5V/3.3V tolerance power supply</td></tr>
<tr><td>8</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>9</td><td>RXDV/
CRSDV/
PCS_LPBK</td><td>Ipd /O</td><td>MII Receive Data Valid Output</td></tr>
<tr><td>10</td><td>RXC</td><td>O</td><td>MII Receive Clock Output</td></tr>
<tr><td>11</td><td>RXER/ISO</td><td>Ipd /O</td><td>MII Receive Error Output</td></tr>
<tr><td>12</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>13</td><td>VDDC</td><td>-</td><td>Digital core 2.5V only power supply</td></tr>
<tr><td>14</td><td>TXER</td><td>Ipd</td><td>MII Transmit Error Input</td></tr>
<tr><td>15</td><td>TXC/REFCLK</td><td>I/O</td><td>MII Transmit Clock Output / RMII(Reduced MII) Reference Clock Iunput</td></tr>
<tr><td>16</td><td>TXEN</td><td>Ipd</td><td>MII Transmit Enable Input</td></tr>
<tr><td>17</td><td>TXD0</td><td>Ipd</td><td>MII Transmit Data Input</td></tr>
<tr><td>18</td><td>TXD1</td><td>Ipd</td><td>MII Transmit Data Input</td></tr>
<tr><td>19</td><td>TXD2</td><td>Ipd</td><td>MII Transmit Data Input</td></tr>
<tr><td>20</td><td>TXD3</td><td>Ipd</td><td>MII Transmit Data Input</td></tr>
<tr><td>21</td><td>COL/RMII</td><td>Ipd /O</td><td>MII Collision Detect Output</td></tr>
<tr><td>22</td><td>CRS/RMII_BTB</td><td>Ipd /O</td><td>MII Carrier Sense Output</td></tr>
<tr><td>23</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>24</td><td>VDDIO</td><td>-</td><td>Digital IO 2.5V/3.3V tolerance power supply</td></tr>
<tr><td>25</td><td>INT#/
PHYAD0</td><td>Ipu/O</td><td>Management Interface (MII) Interrupt Out</td></tr>
<tr><td>26</td><td>LED0/TEST</td><td>Ipu/O</td><td>Link/Activity LED Output
<table>
<tr><th>Lnk/Act</th><th>Pin State</th><th>LED Definition</th></tr>
<tr><td>No Link</td><td>H</td><td>"off"</td></tr>
<tr><td>Link</td><td>L</td><td>"on"</td></tr>
<tr><td>Act</td><td>Toggle</td><td>"Blink"</td></tr>
</table></td></tr>
<tr><td>27</td><td>LED1/ SPD100/
nFEF</td><td>Ipu/O</td><td>Speed LED Output
<table>
<tr><th>Speed</th><th>Pin State</th><th>LED Definition</th></tr>
<tr><td>10BT</td><td>H</td><td>"off"</td></tr>
<tr><td>100BT</td><td>L</td><td>"on"</td></tr>
</table></td></tr>
<tr><td>28</td><td>LED2/DUPLEX</td><td>Ipu/O</td><td>Full-duplex LED Output
<table>
<tr><th>Duplex</th><th>Pin State</th><th>LED Definition</th></tr>
<tr><td>Half</td><td>H</td><td>"off"</td></tr>
<tr><td>Full</td><td>L</td><td>"on"</td></tr>
</table></td></tr>
<tr><td>29</td><td>LED3/NWAYEN</td><td>Ipu/O</td><td>Collision LED Output
<table>
<tr><th>Collision</th><th>Pin State</th><th>LED Definition</th></tr>
<tr><td>No Collision</td><td>H</td><td>"off"</td></tr>
<tr><td>Collision</td><td>L</td><td>"on"</td></tr>
</table></td></tr>
<tr><td>30</td><td>PD#</td><td>Ipu</td><td>Power Down 1= Normal operation 0=Power-down.</td></tr>
<tr><td>31</td><td>VDDRX</td><td>-</td><td>Analog 2.5V power supply</td></tr>
<tr><td>32</td><td>RX-</td><td>I</td><td>Receive Input</td></tr>
<tr><td>33</td><td>RX+</td><td>I</td><td>Receive Input</td></tr>
<tr><td>34</td><td>FXSD/FXEN</td><td>Ipd/O</td><td>Fiber Mode Enable/Signal Detection in Fiber Mode</td></tr>
<tr><td>35</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>36</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>37</td><td>REXT</td><td>I</td><td>External resister(6.49kΩ) connects to REXT and GNDRX</td></tr>
<tr><td>38</td><td>VDDRCV</td><td>-</td><td>2.5V power output of voltage regulator.</td></tr>
<tr><td>39</td><td>GND</td><td>-</td><td>Ground</td></tr>
<tr><td>40</td><td>TX-</td><td>O</td><td>Transmit Outputs</td></tr>
<tr><td>41</td><td>TX+</td><td>O</td><td>Transmit Outputs</td></tr>
<tr><td>42</td><td>VDDTX</td><td></td><td>Transmitter 2.5V power supply</td></tr>
<tr><td>43</td><td>GND</td><td>-</td><td>Ground</td></tr>
</table>

Pin No	Signal Name	Input/Output(*)	Description
44	GND	-	Ground
45	XO	O	XTAL feedback
46	XI	I	Crystal Oscillator Input
47	VDDPLL	-	Analog PLL 2.5V power supply
48	RST#	Ipu	Chip Reset ;Active low

NOTE:

I=input

o=output

I/O = bi-directional

Ipu = input w/ internal pull-up

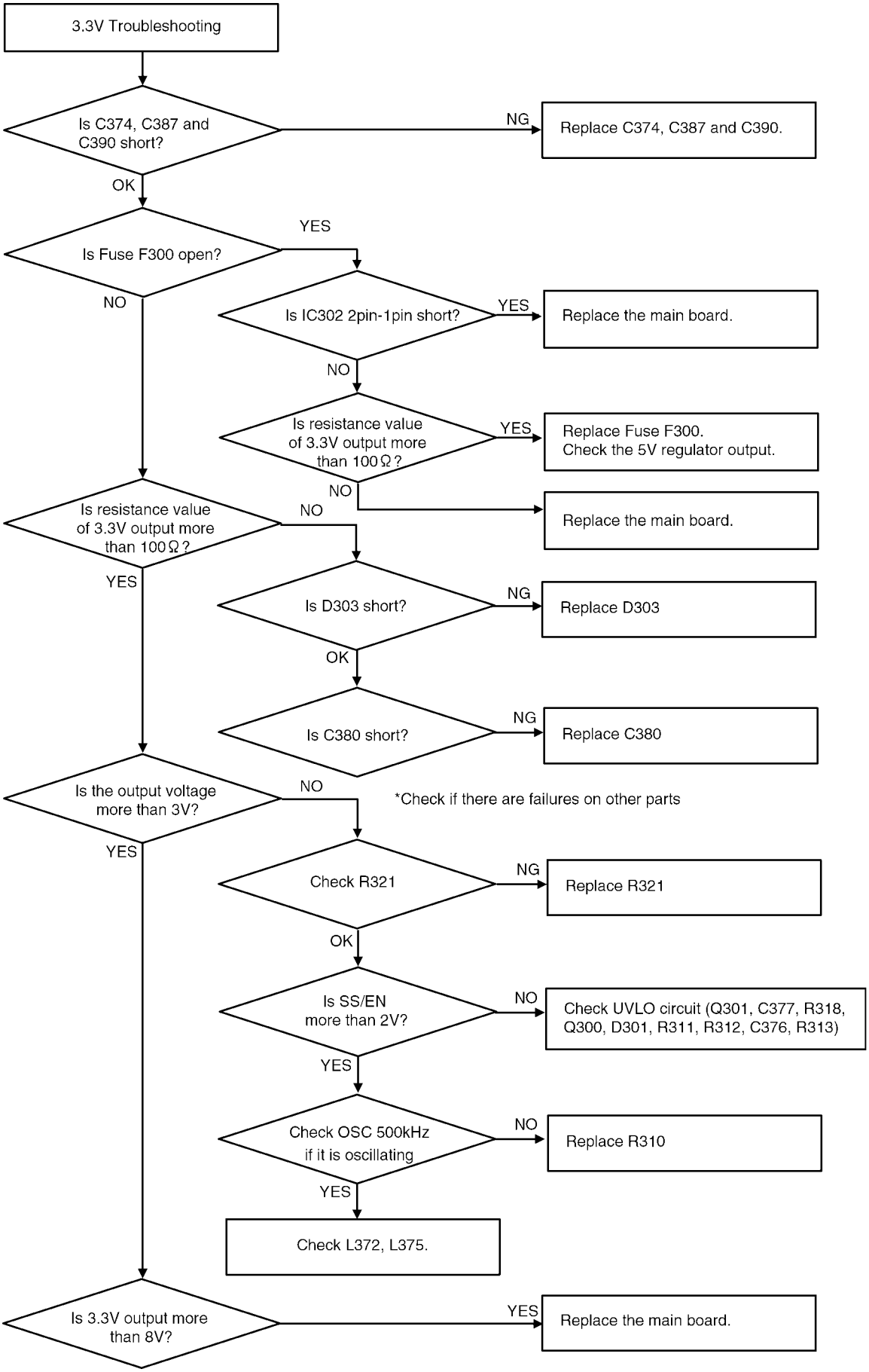
Ipd = input w/ internal pull-down

Ipd/O = input w/ internal pull-down during reset, output pin otherwise

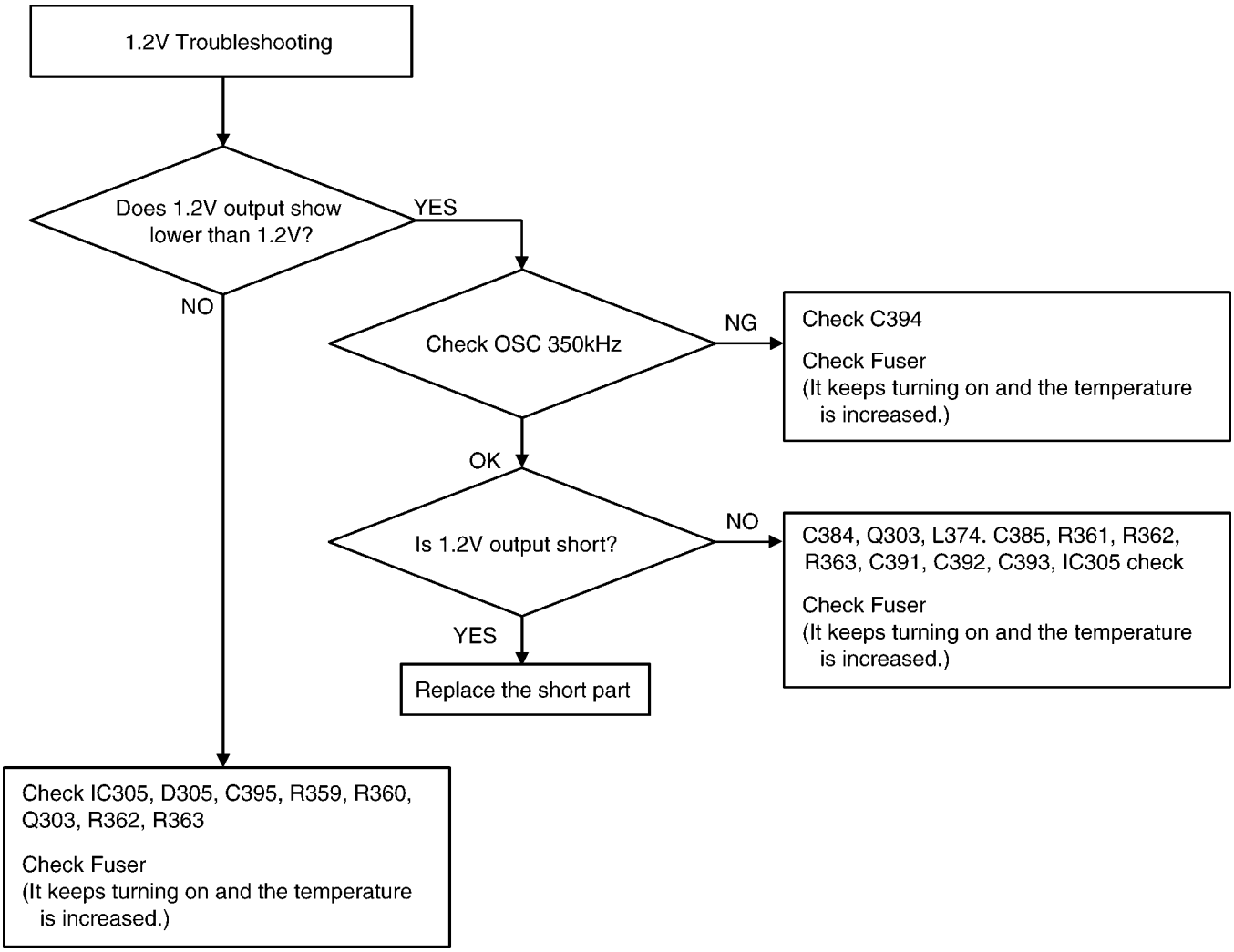
Ipu/O = input w/ internal pull-up during reset, output pin otherwise

12.3.24. MAIN BOARD SECTION

3.3V TROUBLESHOOTING GUIDE



1.2V TROUBLESHOOTING GUIDE



12.3.25. POWER SUPPLY BOARD SECTION

12.3.25.1. KEY COMPONENTS FOR TROUBLESHOOTING

Check the following parts first: F1, F2, D10-D13, C5, Q1 and PC1.

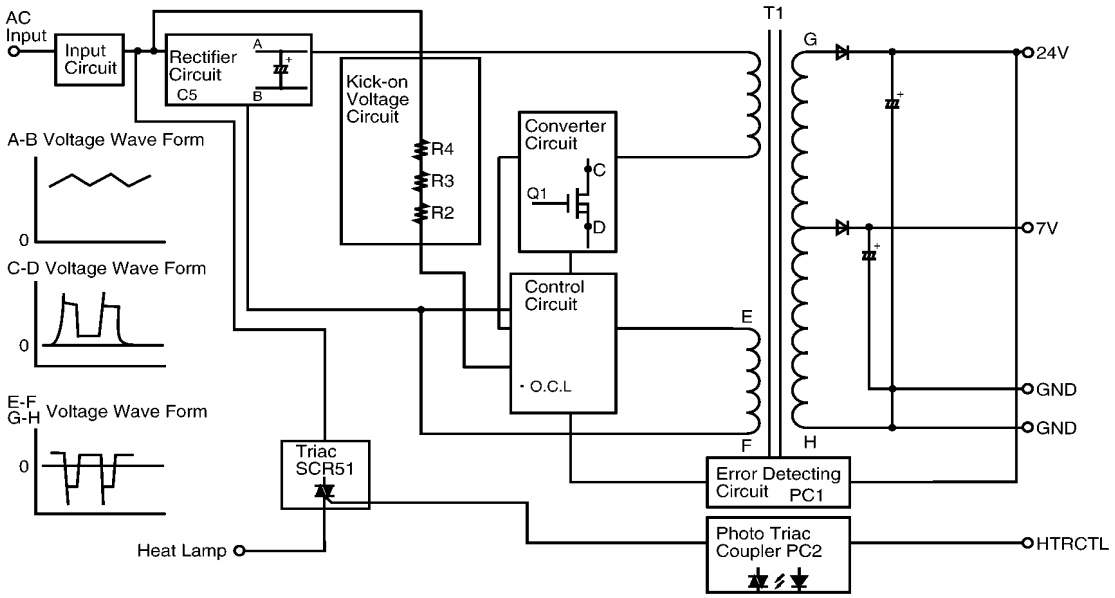
This comes from our experience with experimental test. For example: power supply and lightning surge voltage test, with standing voltage test, intentional short circuit test, etc.

Caution:

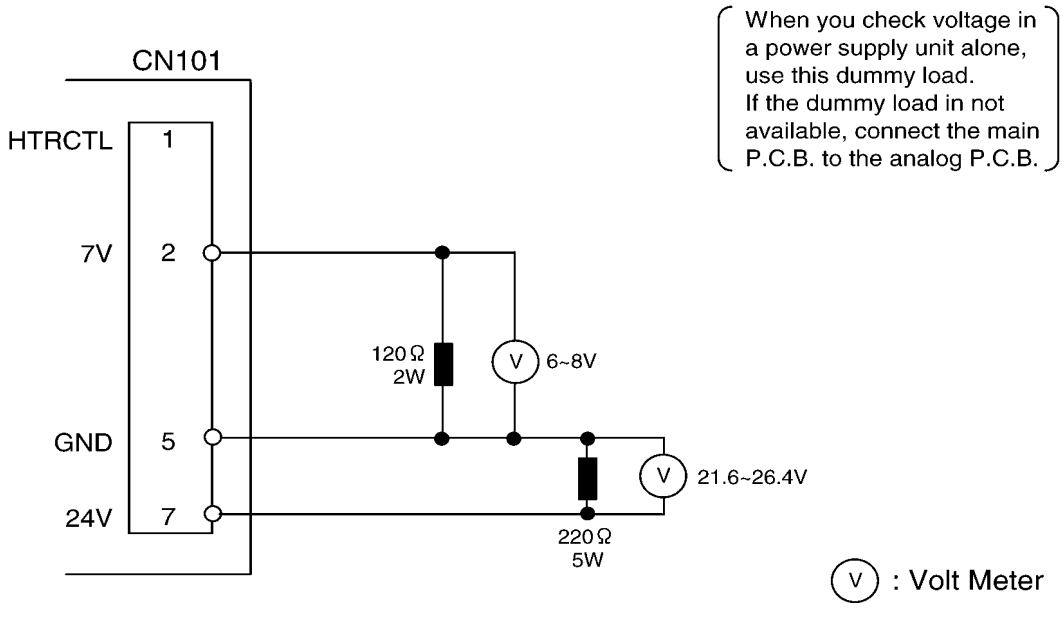
If you find a melted fuse in the unit, do not turn on the power until you located and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

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.

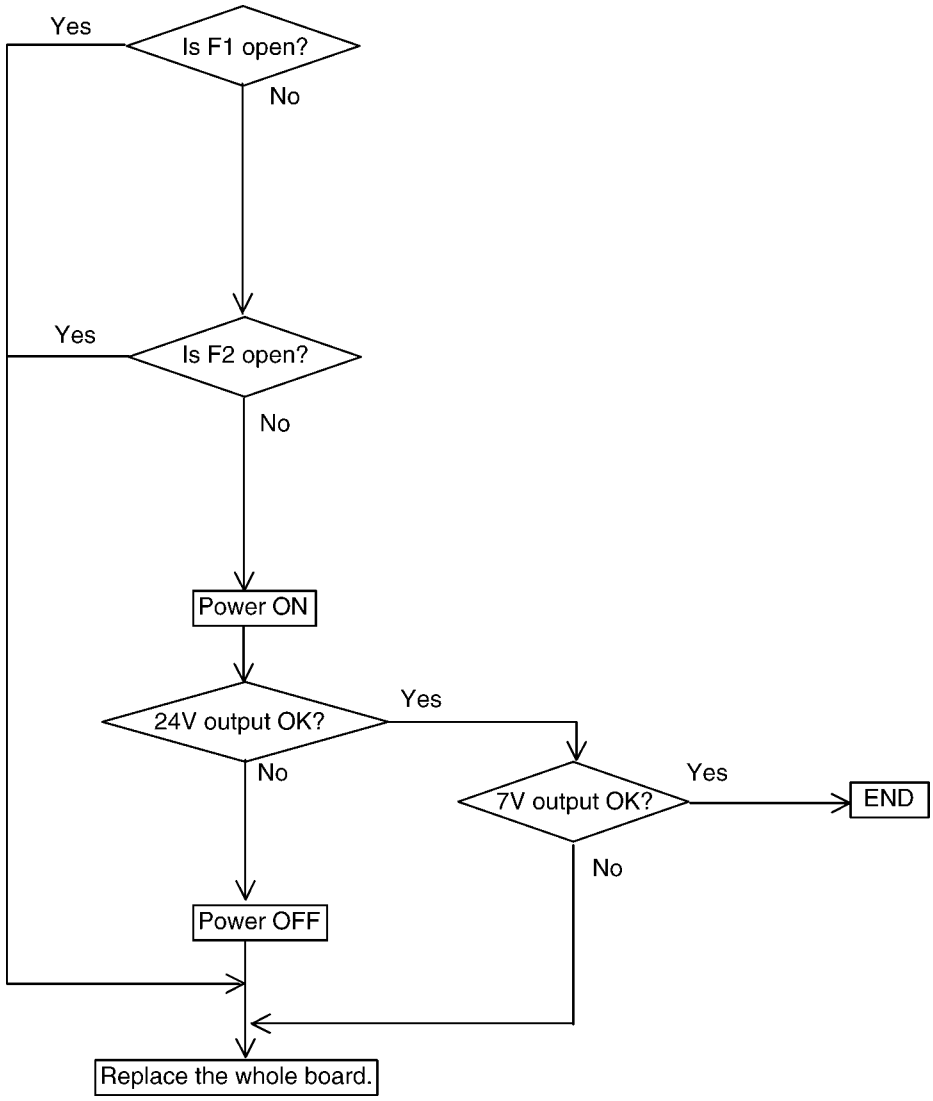
Block Diagram



DUMMY LOAD to check voltage



12.3.25.2. TROUBLESHOOTING FLOW CHART



12.3.25.3. BROKEN PARTS REPAIR DETAILS

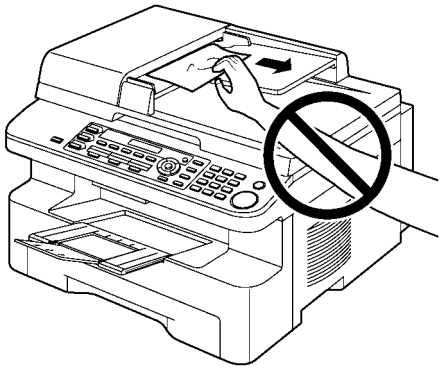
(D10~D13)
Check for a short-circuit in terminal 4. If D10~D13 is short-circuit, F2 will melt (open).
In this case, replace all of the parts (D10 - D13, F2).

(D101)
If D101 is broken, the oscillation circuit in the power supply cannot operate. Check it with an electric tester.

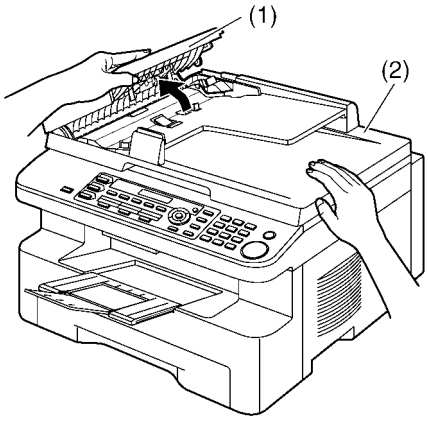
12.4. DOCUMENT JAMS (AUTO DOCUMENT FEEDER)

Caution:

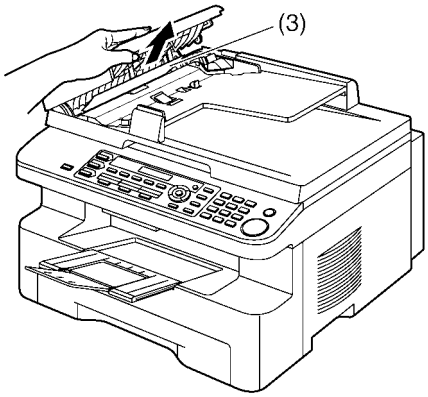
- **Do not pull out the jammed document forcibly before lifting the ADF cover.**



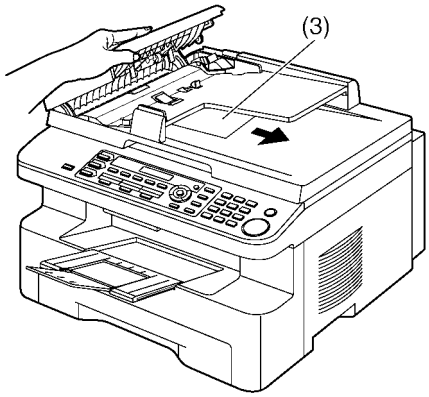
1. Open the ADF cover (1) while holding the document cover (2).



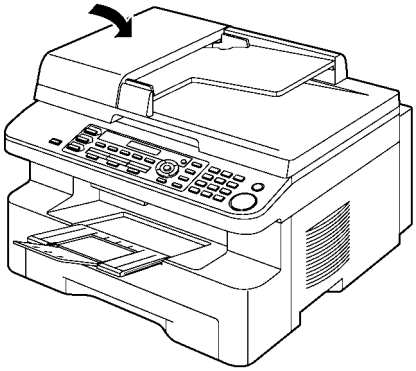
2. Remove the jammed document (3) carefully.
When the document has jammed near the document entrance:



When the document has jammed near the document exit:



3. Close the ADF cover.



12.5. RECORDING PAPER JAM

12.5.1. When the recording paper has jammed inside of the unit

The display will show the following.

PAPER JAMMED

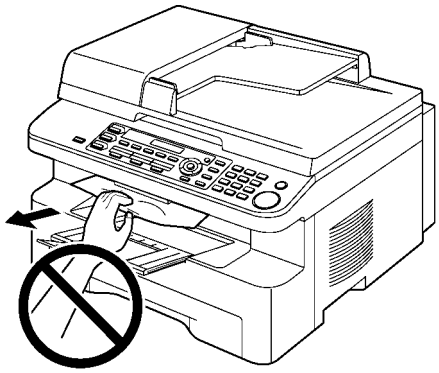
↕

OPEN TOP COVER

CHECK REAR COVER

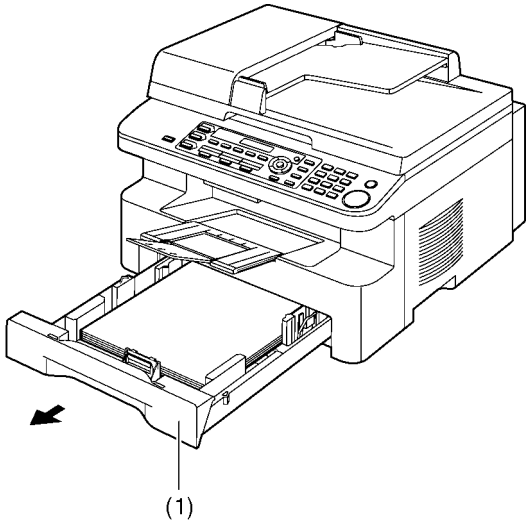
Caution:

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

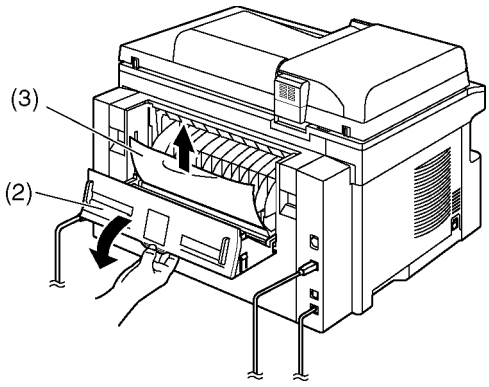


Case 1:
When the recording paper has jammed near the manual input tray:

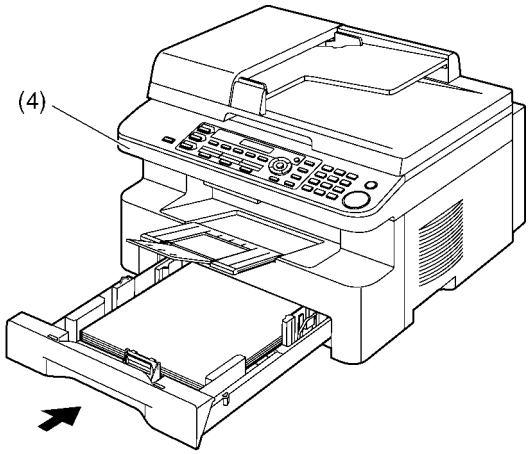
1. Pull open the paper input tray (1).



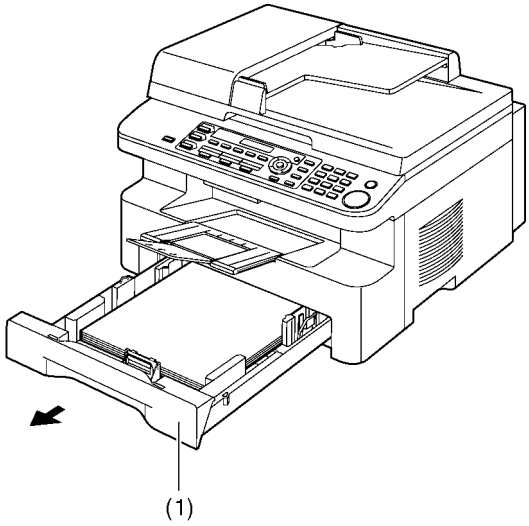
2. Open the manual input tray (2) and remove the jammed paper (3) carefully by pulling it upwards. Then close the manual input tray.



3. Close the paper input tray.
   • Open and close the top cover (4) to clear the error message.

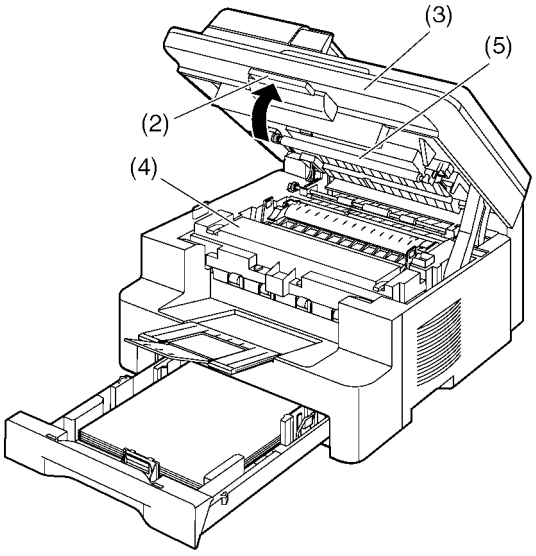


Case 2:
When the recording paper has jammed near the drum and toner unit:
1. Pull open the paper input tray (1).



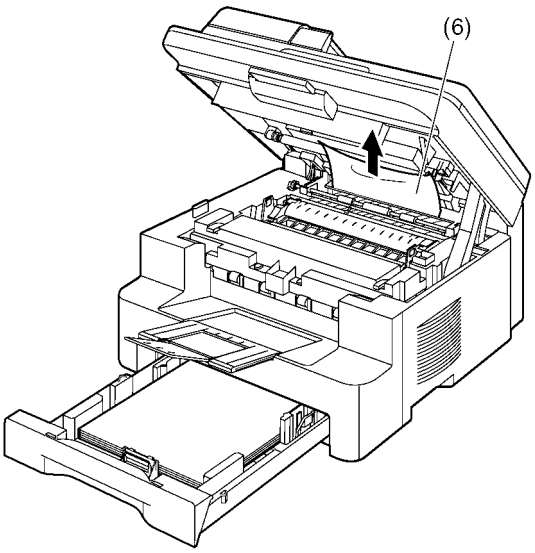
2. Lift the top cover release lever (2) and open the top cover (3).

Note:
   • Do not touch the transfer roller (5)

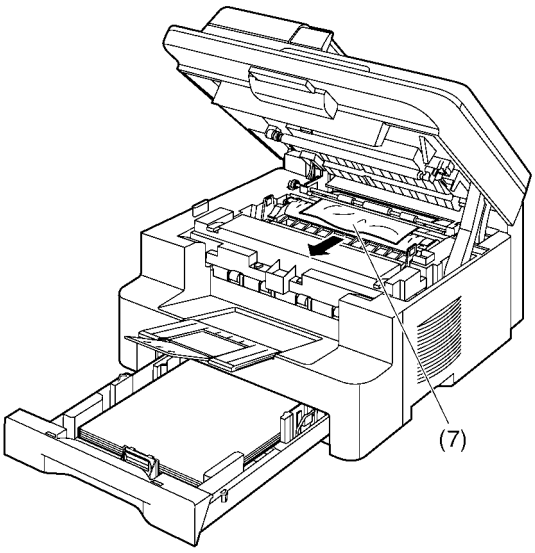


Caution:
The fuser unit (④) gets hot. Do not touch it.

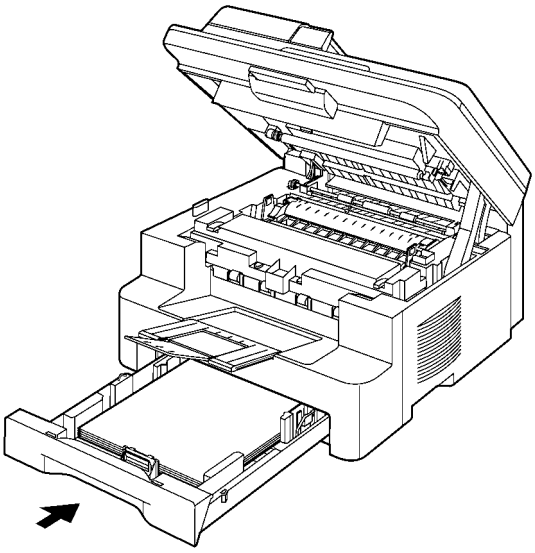
3. Remove the jammed paper (6) carefully by pulling it upwards.



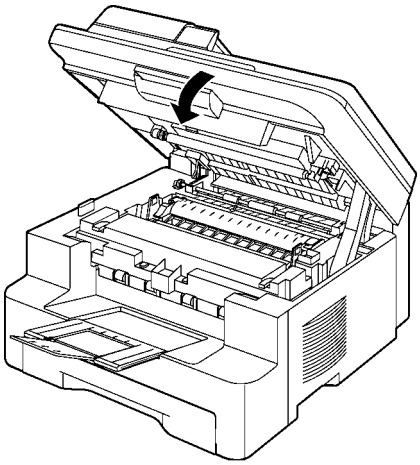
Remove the jammed paper (7) carefully by pulling it toward you.



4. Close the paper input tray.

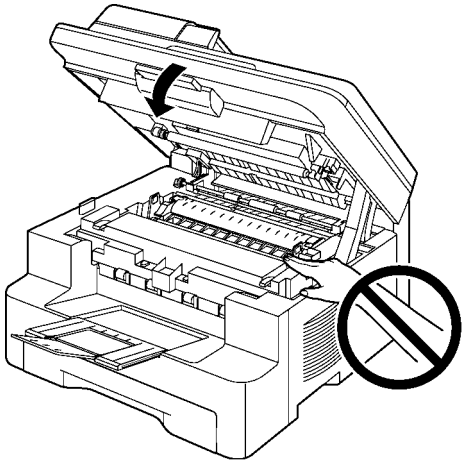


5. Close the top cover until locked.



Caution:

- To prevent injuries, be careful not to put your hands under the top cover.



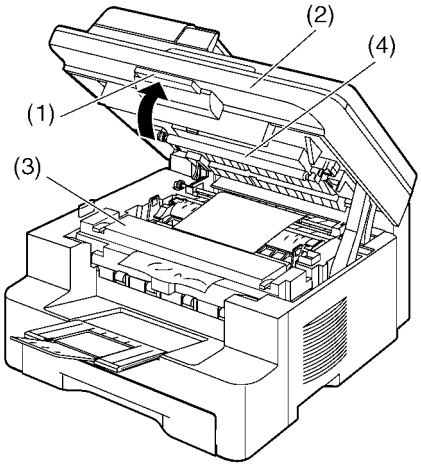
Case 3:

When the recording paper has jammed near the fuser unit:

1. Lift the top cover release lever (1) and open the top cover (2).

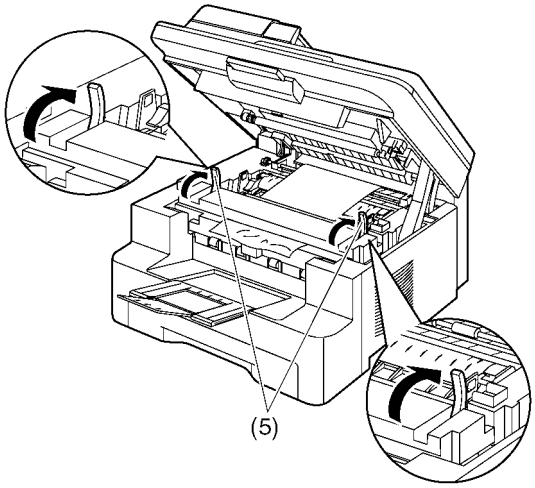
Note:

- Do not touch the transfer roller (4).

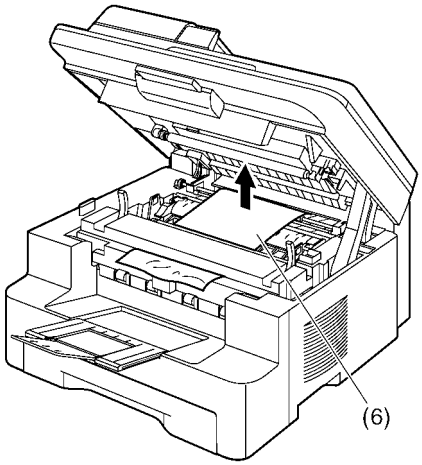


Caution:
The fuser unit (③) gets hot. Do not touch it.

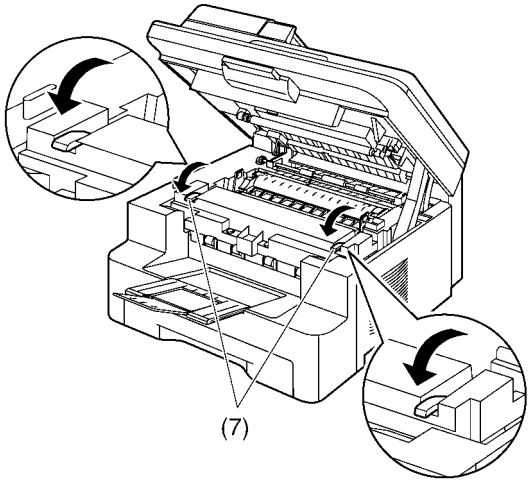
2. Lift both green levers (5) until they stop.



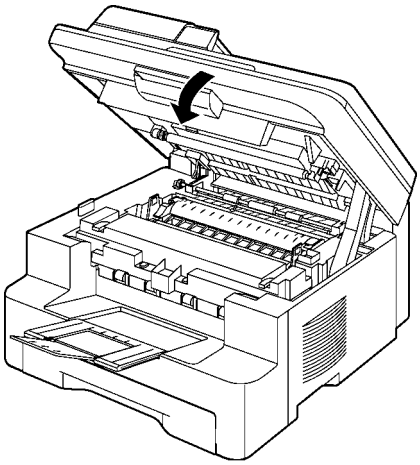
3. Remove the jammed paper (6) carefully by pulling it upwards.



4. Push back the green levers (7) to the original position.



5. Close the top cover until locked.

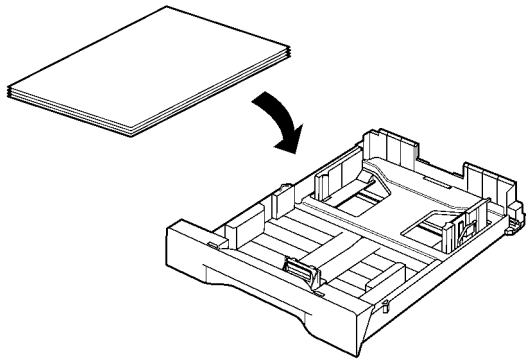


12.5.2. When the recording paper is not fed into the unit properly

The display will show the following.

```
CHECK PAPER #1
PRESS START
```

1. Pull the paper input tray until it clicks into place, then put it completely out, lifting the front part of the tray. Remove the recording paper and straighten.
2. Re-load the recording paper.



3. Insert the paper input tray to the unit, lifting the front part of the tray. Then push it completely into the unit.

Note:

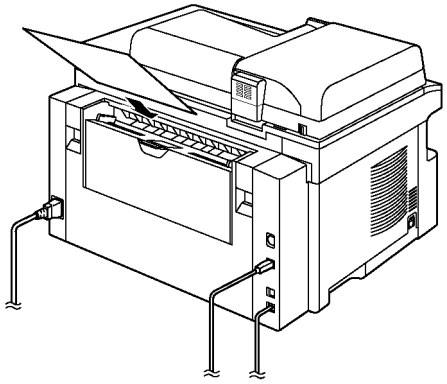
- If the error message is still displayed, check the recording paper specifications and re-install recording paper.

12.5.3. When the recording paper in the manual input tray is not fed into the unit properly

The display will show the following.

```
CHECK PICK UP
INPUT TRAY #2
```

1. Remove the recording paper.
2. Re-insert the recording paper.



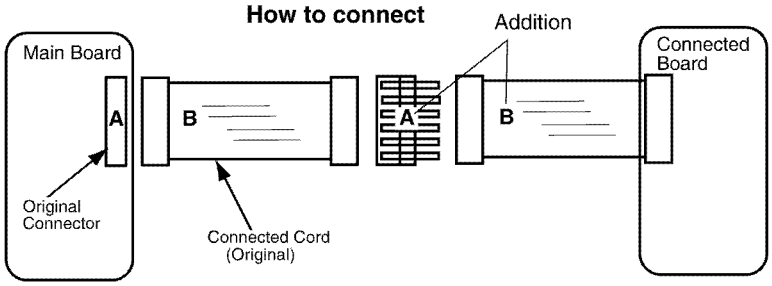
Note:

- If the error message is still displayed, check the recording paper specifications and re-install recording paper.

13 Service Fixture & Tools

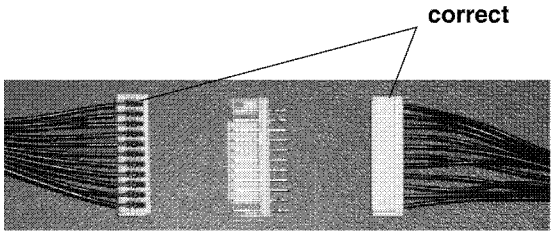
How to extend cords

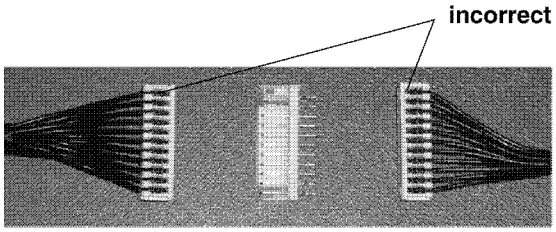
When extending cords, you need 2 pairs of A,B (A=connector,B=cord)
(One pair is connected to the Main board.)
If you do not have 2 pairs, order the necessary parts.

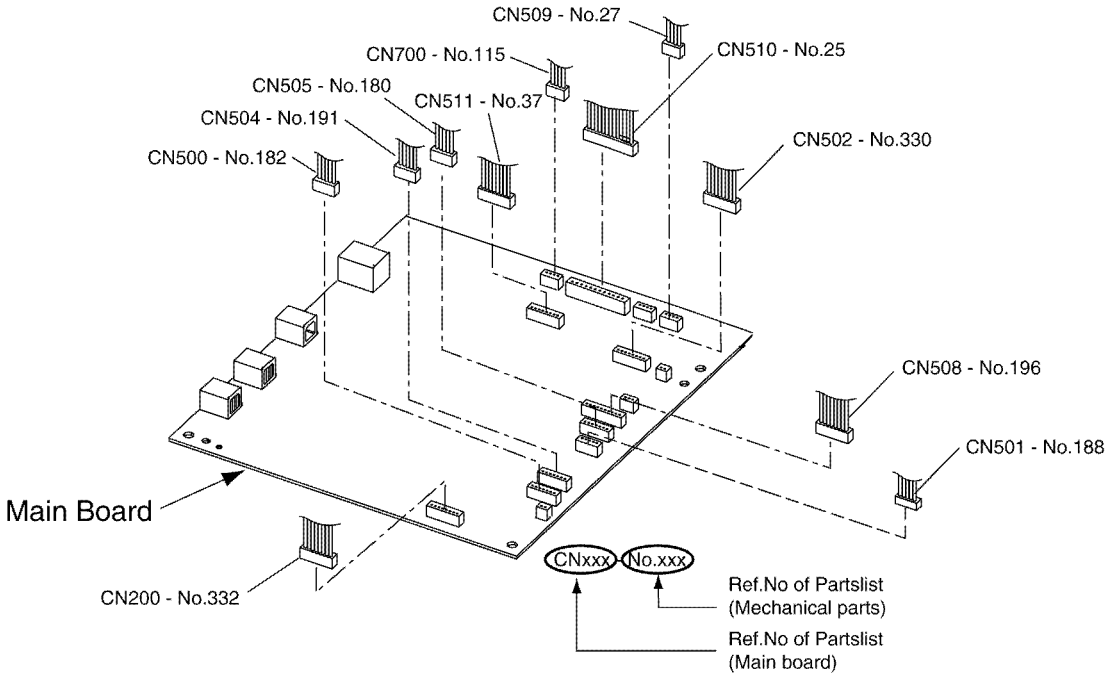


NOTE

Be sure if the direction of the connectrs is correct.







14 Disassembly and Assembly Instructions

Note:

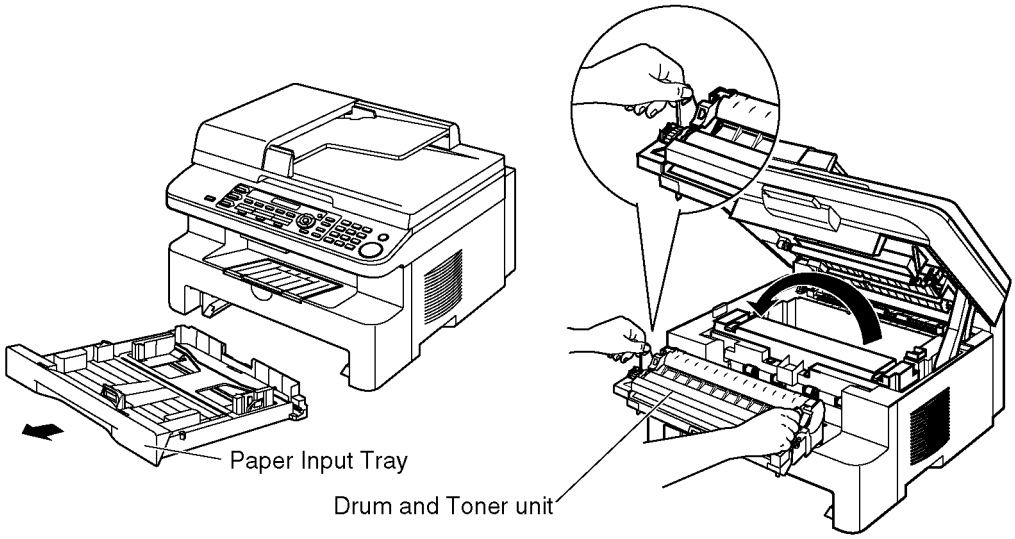
Remove the Document Cover, the Paper Input tray and the drum and toner cartridge before reassembling.

First of all

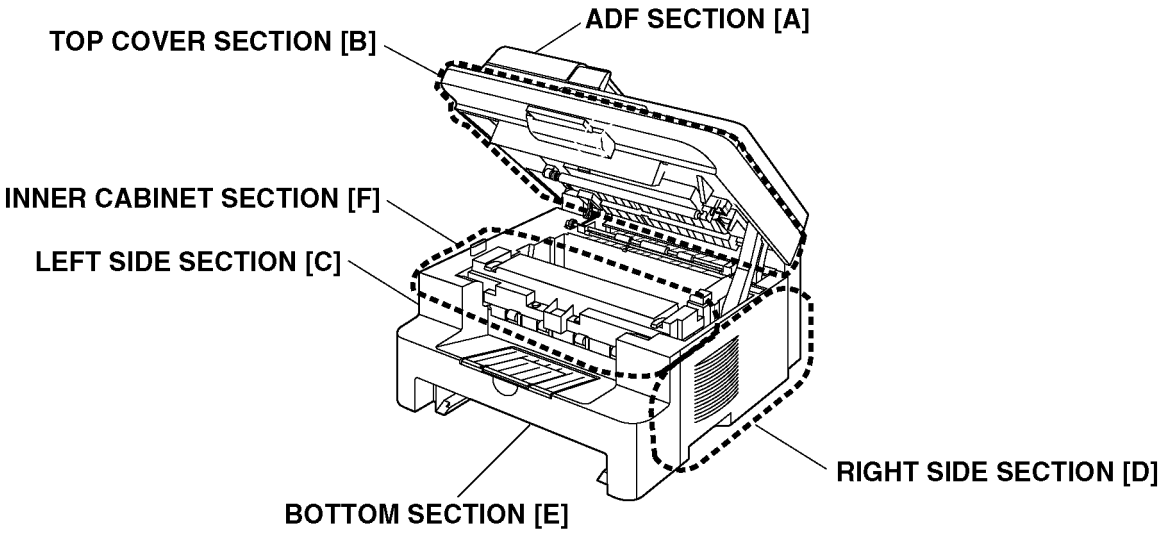
Before disassembling, do the following things.

(1) Pull the Paper Input Tray until it clicks into place, then pull it completely out, lifting the front part of the try.

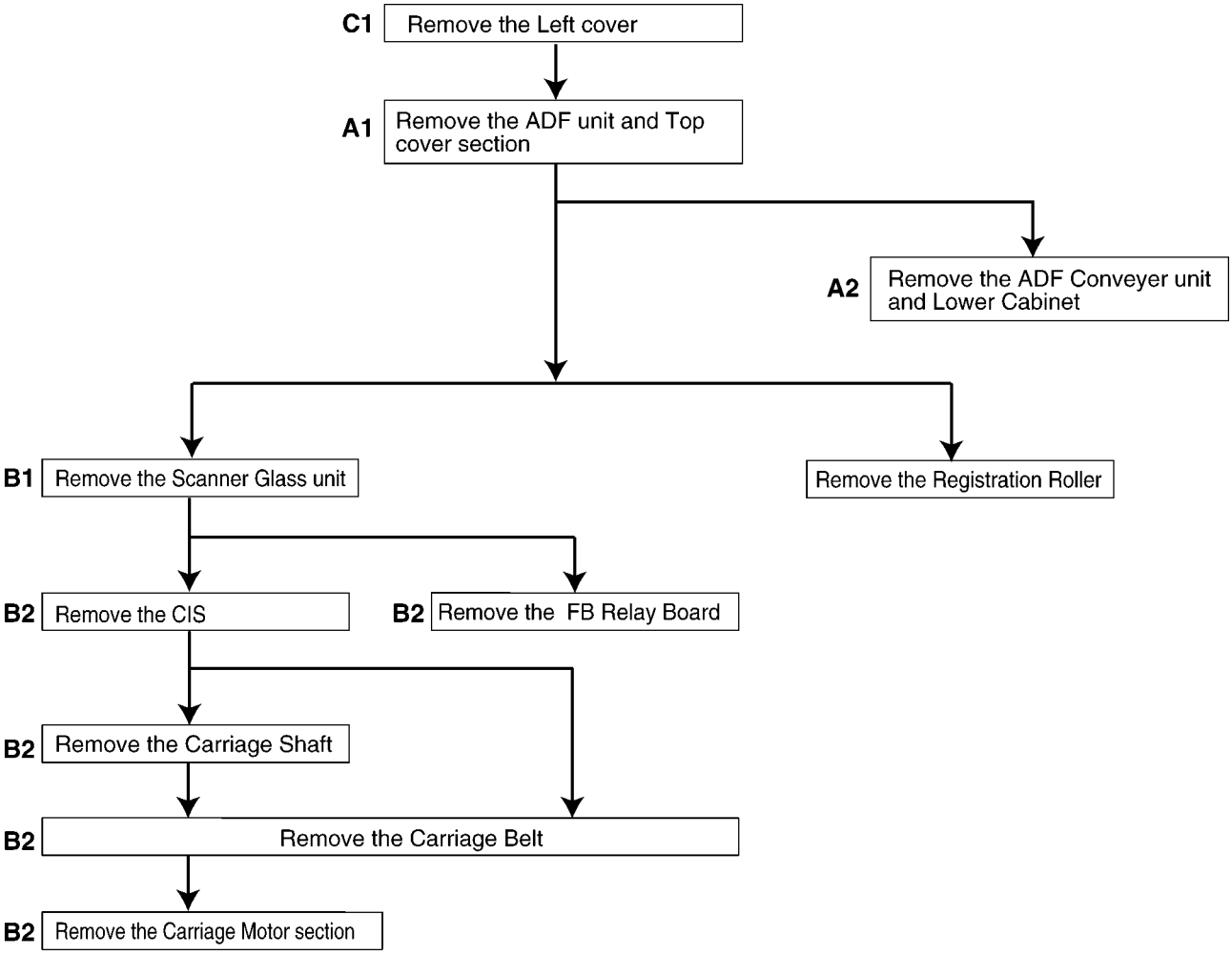
(2) Take the Drum and Toner unit out by holding the tabs.



GENERAL SECTION



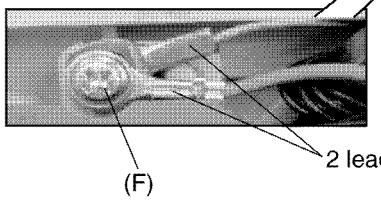
14.1. ADF SECTION

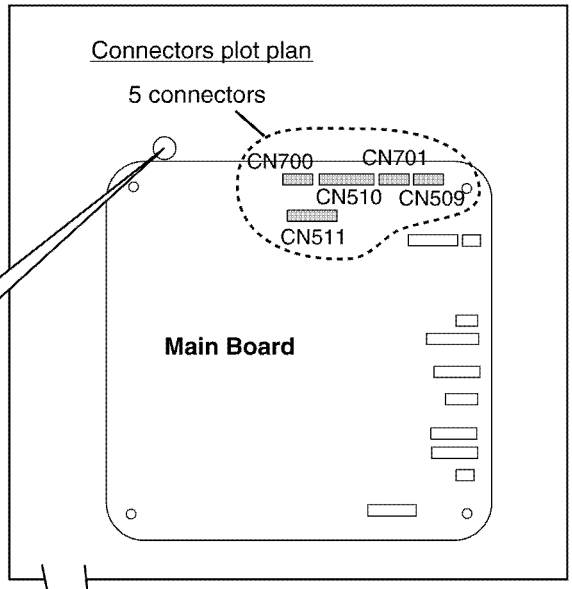


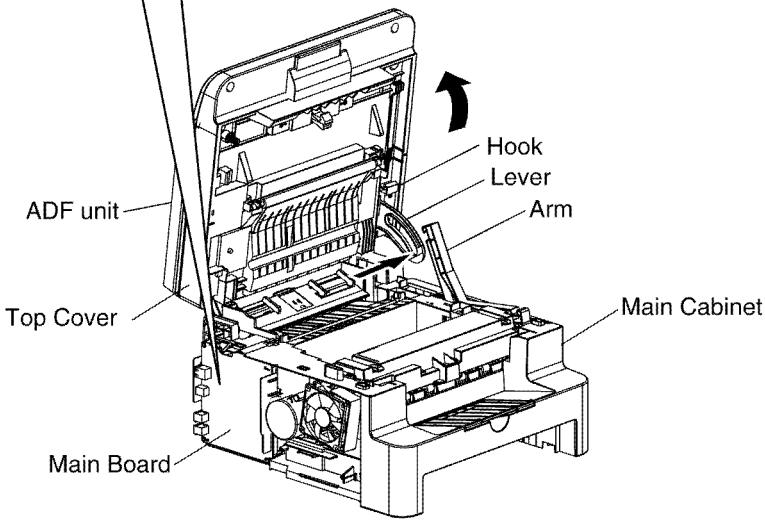
14.2. REMOVE ADF SECTION (1)

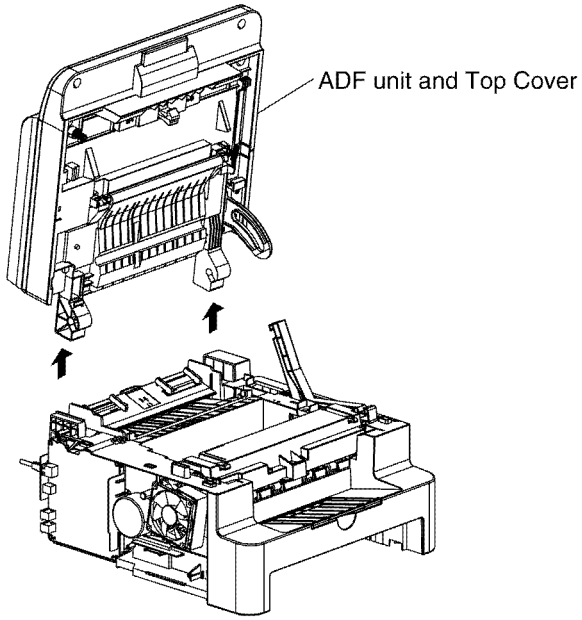
A1

(1) Remove the Left Side Cover.
(See the No. C1)
(2) Remove the 5 connectors.
(3) Removet the screw (F) to remove the 2 leads.
(4) Push the lever in the direction of the arrow to release from the Main Cabinet.
(5) Release the Arm from the Hook of the Top Cover.
(6) Lift up the ADF unt and Top Cover.





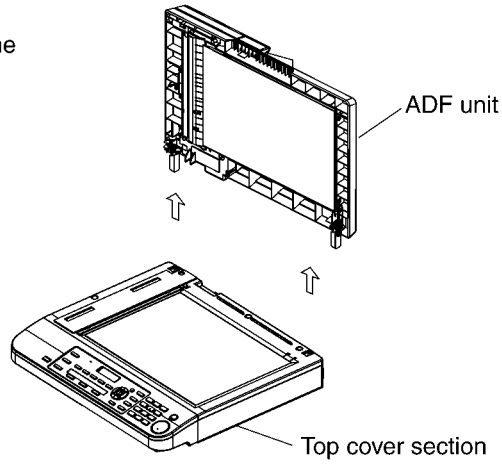




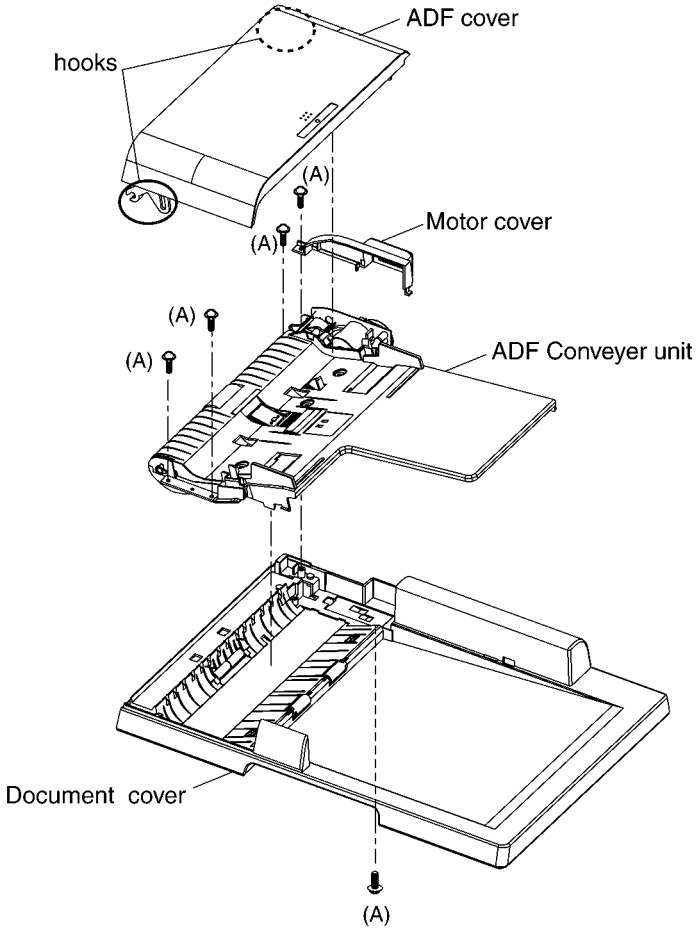
14.3. REMOVE ADF SECTION

A2

(1) Lift up the ADF unit from the Top cover section as shown in the right illustration.



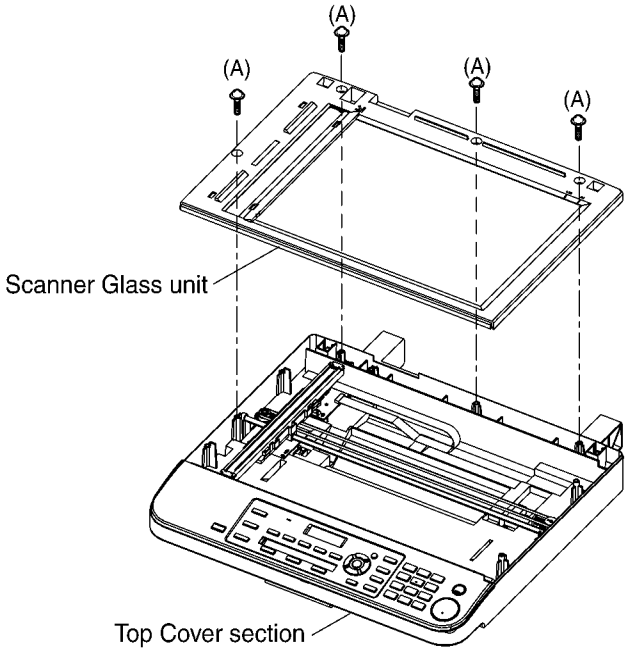
(2) Release the both side hooks to remove the ADF Cover.
(3) Remove the 5 screws (A)
(4) Remove the Motor cover and the ADF Conveyer unit.



14.4. REMOVE TOP COVER SECTION

B1

(1) Remove the 4 screws(A)
(2) Remove the Scanner Glass unit



14.5. REMOVE SCANNER GLASS SECTION

B2

(1) Lift up the 2 spacers from the CIS carriage to remove the CIS.
(2) Pick up the CIS Carriage.
(3) Remove the 1 screw (B) and remove the Carriage Shaft.
(4) Push the spring in the direction of the arrow to remove the Timing Belt. (Fig-1)
(5) Remove the 3 screws (A)-b.
Remove the Carriage Motor section.

(1) Remove the screws (A)-a.
(2) Remove all the connectors on the FB Relay Board.
(3) Remove the FB Relay board.

Note: *Spacers
Be careful not to lose these spacers and springs when disassembling.
Especially, the spacers too small to find.

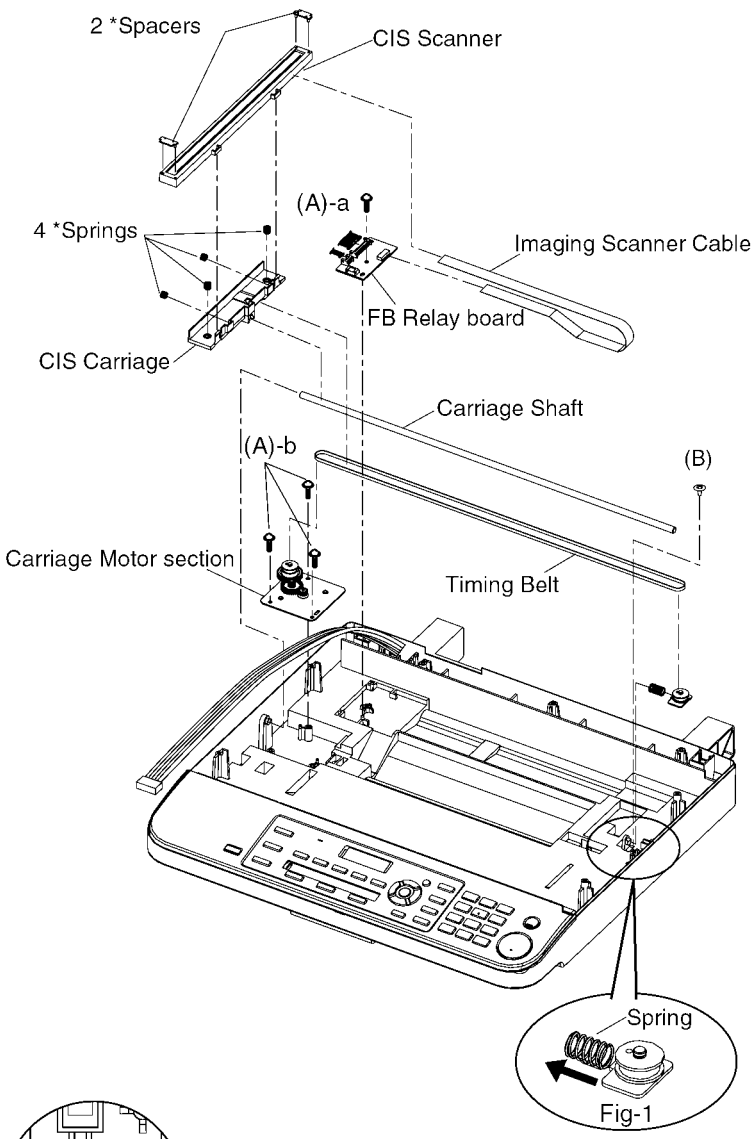
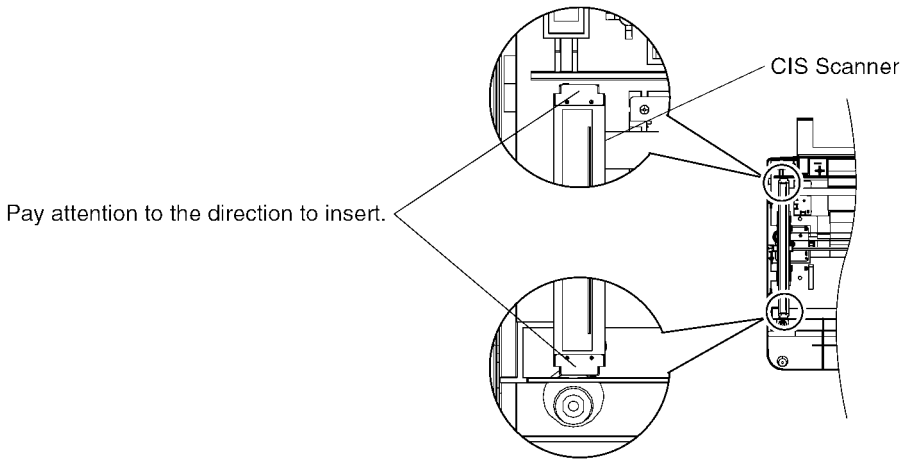
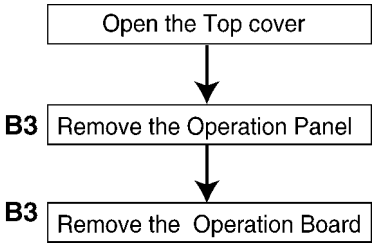


Fig-1

Note for assembling the 2 "Spacers

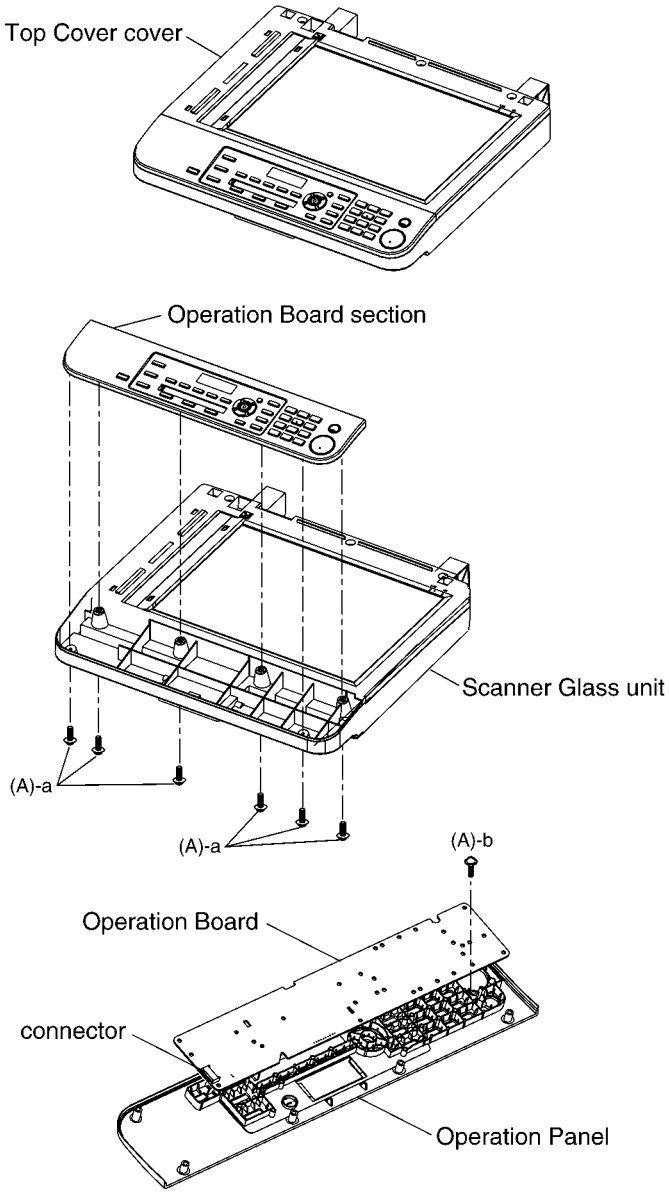


14.6. REMOVE OPERATION PANEL SECTION

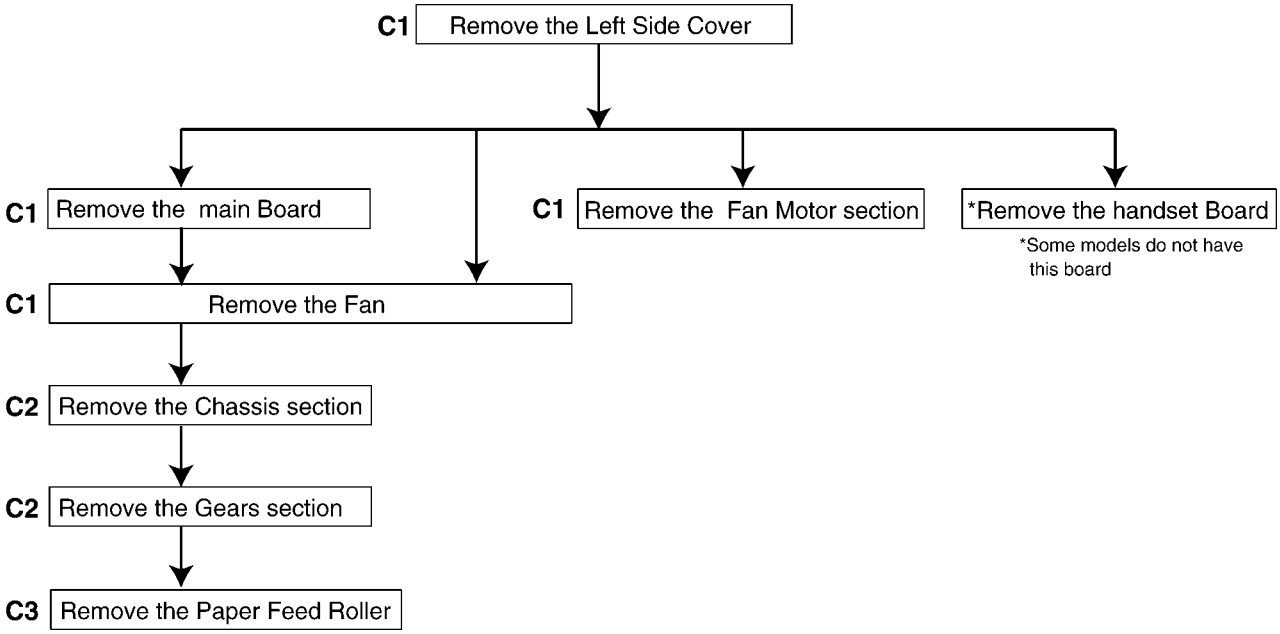


B3

(1) Remove the 6 screws (A).
(2) Remove the Operation Board section.
(3) Remove the 1 screw (A)-b.
(4) Remove the connector.
(5) Remove the Operation Board from the Operation Panel.



14.7. LEFT SIDE SECTION



14.8. REMOVE MAIN BOARD

C1

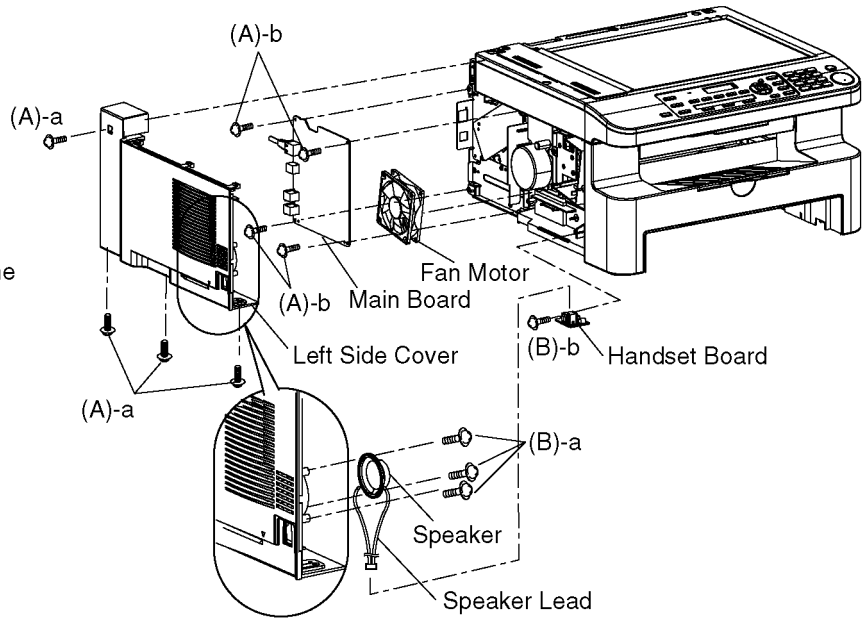
(1) Remove 4 screws (A)-a
(2) Remove the Left Side Cover.

Fan Motor
(3) Removet the Fan Motor.

Main Board
(3) Remove the 4 screws (A)-b.
(4) Remove the all the connectors on the Main Board.
(5) Remove the Main Board.

Speaker
(3) Remove the 3 screws (B)-a and
(4) Remove the Speaker Lead.
(5) Remove the Speaker.

Handset Board
(3) Remove the screw (B)-b.
(4) Remove the Speaker Lead.
(5) Remove the handset Board.



14.9. REMOVE GEAR CHASSIS SECTION

C2

(1) Remove the 4 screws (F)-a.
(2) Remove the Motor Unit.
(3) Remove the 2 screws (F)-b.
(4) Remove the Protect Cover.
(5) Remove the 3 screws (J)-a and 2 screw (F)-c. [Fig-01]
(6) Remove the Cover Plate.
(7) Remove the 6 screws (J) at which is marked "CH". [Fig-01]

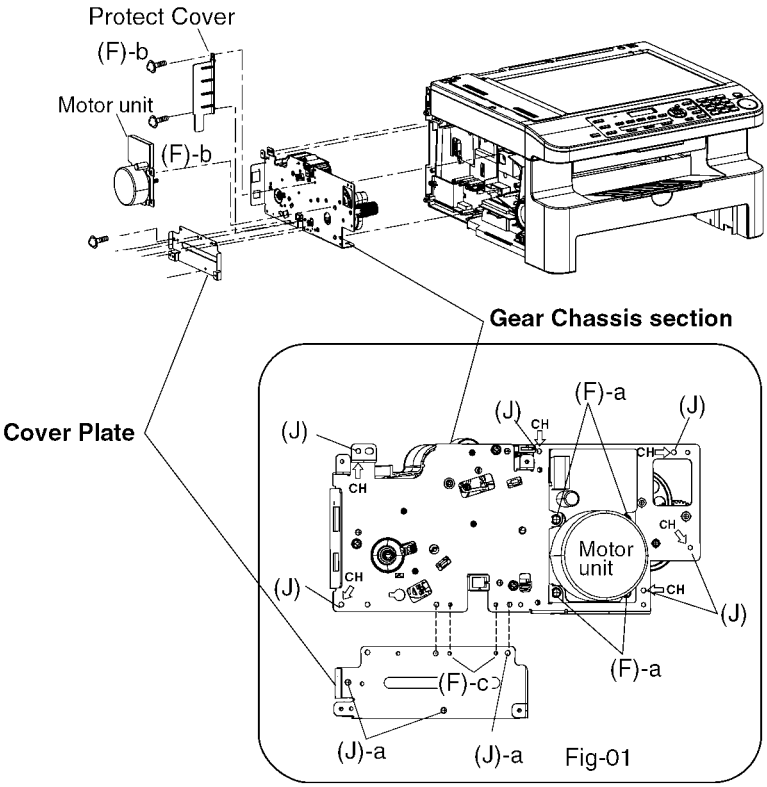


Fig-01

(8) Remove the 3 screws (A)at which is marked "CS". [Fig-02]
(9) Remove the Protection Sheet.
(10) Remove the Gear section from the Gear chassis. [Fig-02]

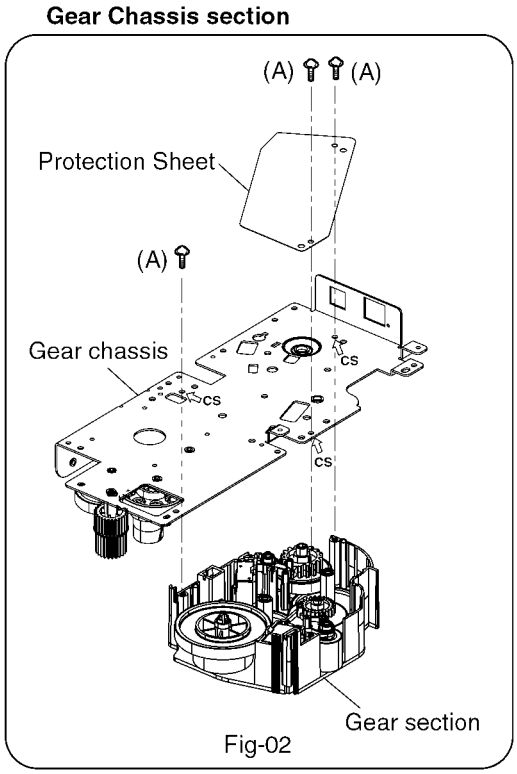
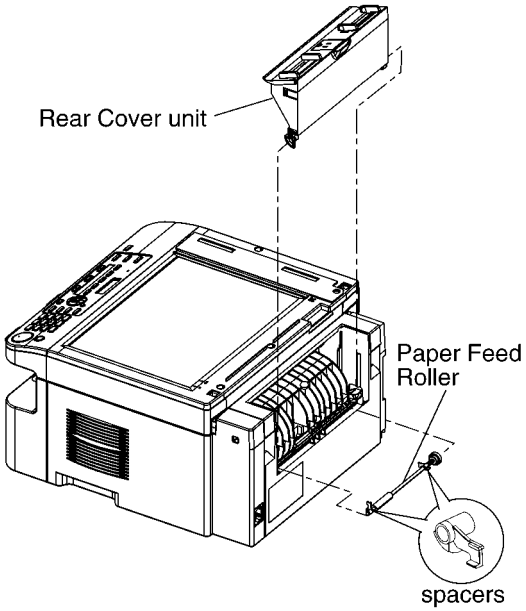


Fig-02

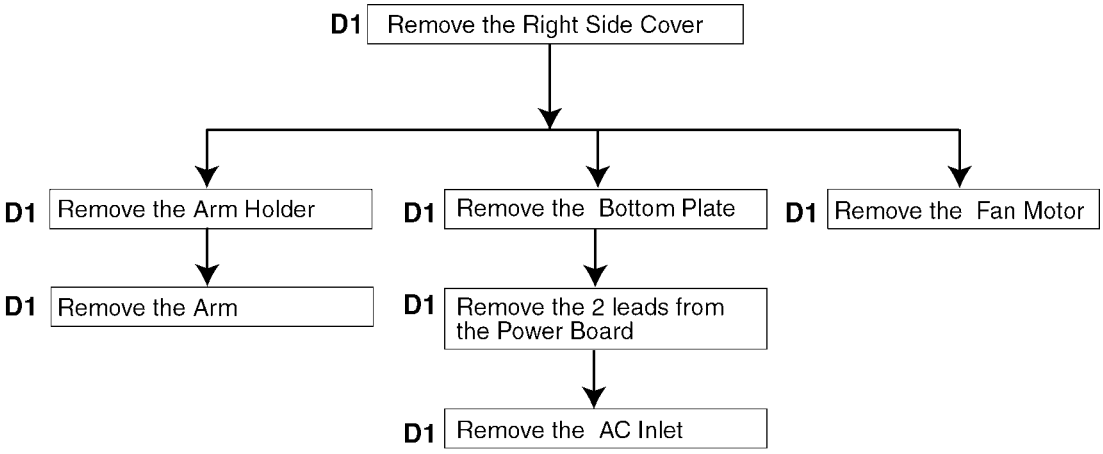
14.10. REMOVE PAPER FEED ROLLER

C3

1) Remove the Rear Cover unit.
2) Release the 2 spacers to remove the Paper Feed Roller.



14.11. RIGHT SIDE SECTION



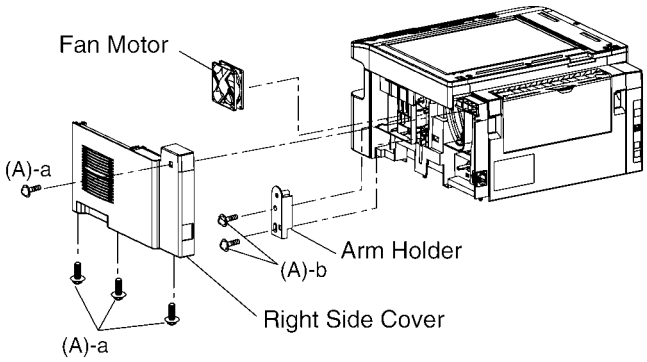
14.12. REMOVE RIGHT SIDE COVER SECTION

D1

1) Remove the 4 screws (A)-a.
2) Remove the Right Side Cover.

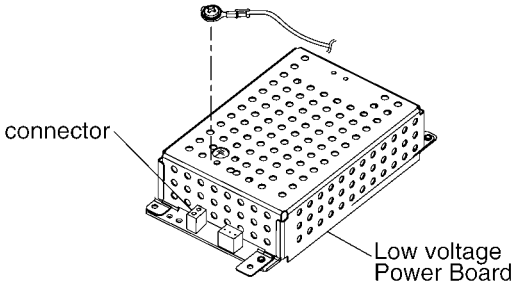
Fan Motor

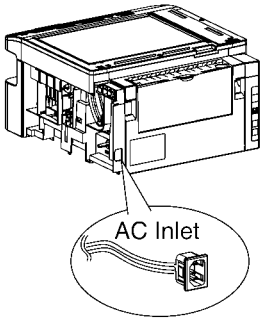
3) Remove the Fan.
4) Remove the 2 screws (A)-b.
5) Remove the Arm Holder.



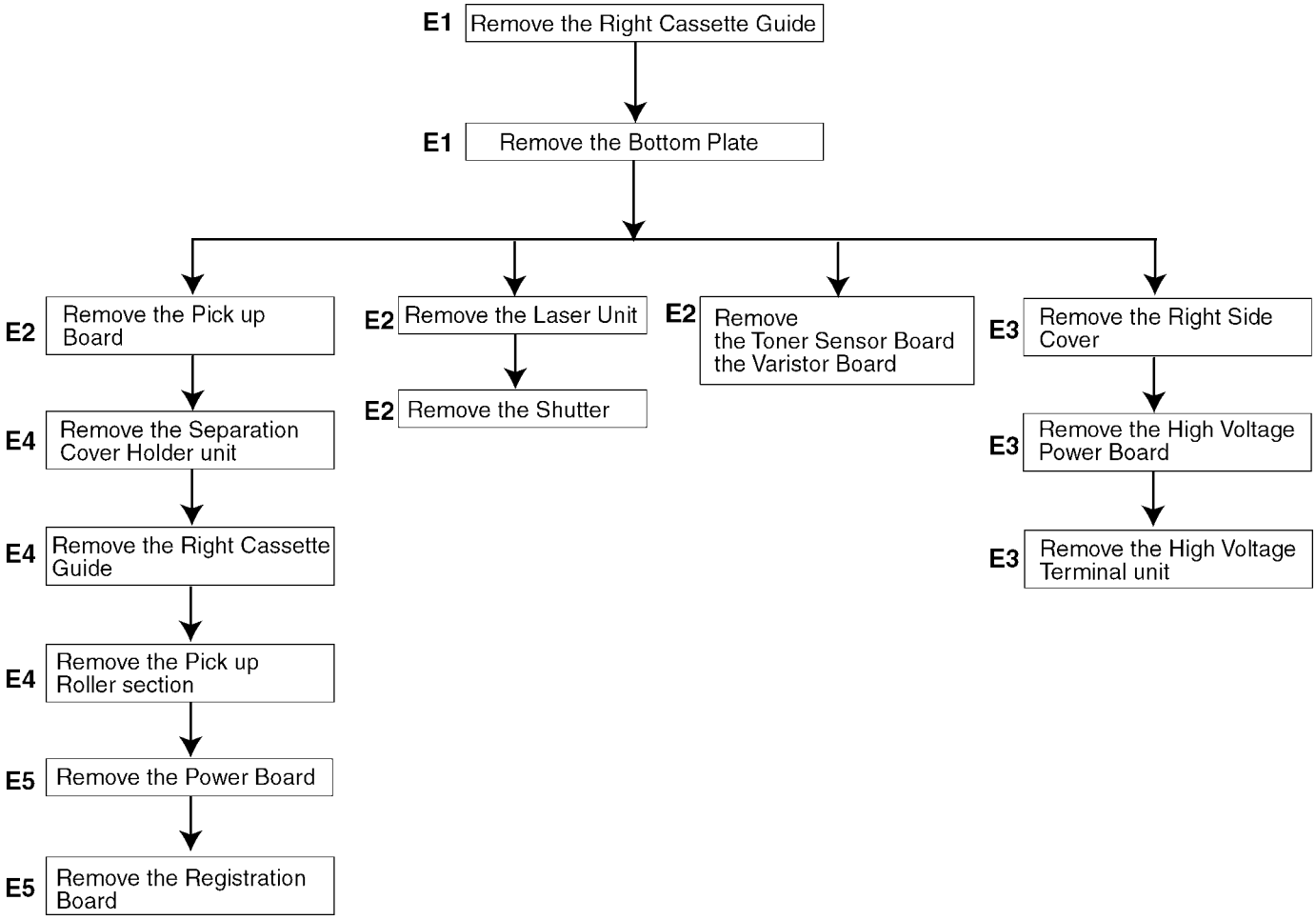
AC Inlet

3) Remove the Bottom Plate.
   (See the No.E1)
4) Remove the connector on the Power Board.
5) Remove the AC Inlet.





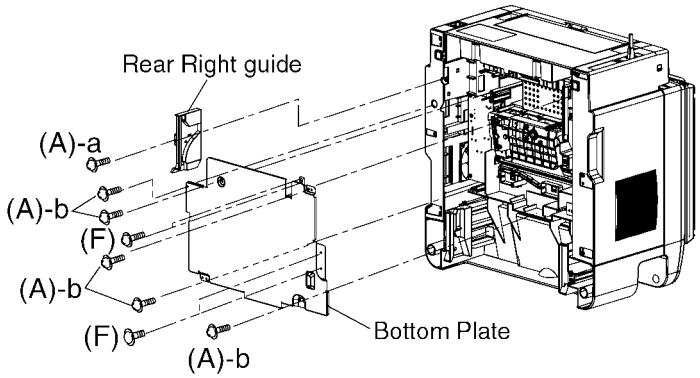
14.13. LOWER SIDE CABINET SECTION



14.14. REMOVE RIGHT CASSETTE GUIDE

E1

(1) Remove the 1 screw(A)-a.
(2) Remove the Rear Right guide
(3) Remove the 5 screws(A)-b and 4 (F).
(4) Remove the Bottom Plate.



14.15. REMOVE PICK UP BOARD

E2

Laser Unit & Shutter

(1) Remove the 3 screws (A)-a.
(2) Reomove the laeads connecting to Laser unit.
(2) Remove the Laser Unit.
(3) Remove the Shutter.

Pick up Board

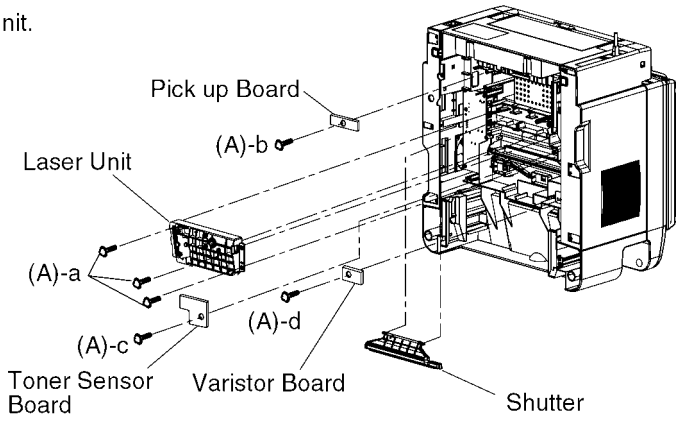
(1) Remove the (A)-b.
(2) Remove all the connectors
on the Pick up Board.
(3) Remove the Pick up Board

Toner Sensor Board

(1) Remove all the connectors
on the Toner Sensor Board.
(2) Remove the screw (A)-c.
(3) Remove the Toner Sensor Board

Varistor Board

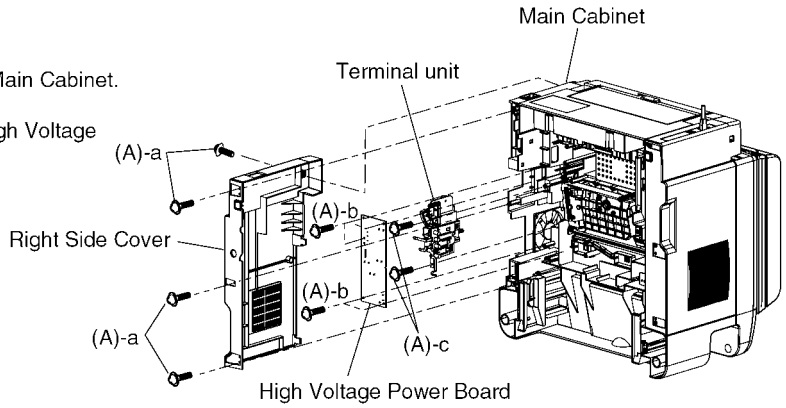
(1) Remove all the leads on the Varistor Board.
(2) Remove the screw (A)-d.
(3) Remove the Varistor Board.



14.16. REMOVE HIGH VOLTAGE POWER BOARD

E3

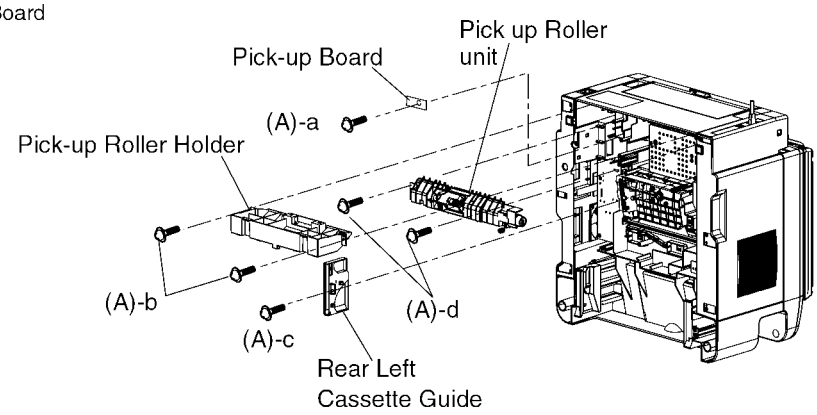
(1) Remove the 4 screws(A)-a.
(2) Remove the Right Side Cover from the Main Cabinet.
(3) Remove the 5 screws (A)-b.
(4) Remove the all the connectors on the High Voltage Power Board.
(5) Remove the High Voltage Power Board.
(6) Remove the 2 screws(A)-c.
(7) Remove the Terminal unit.



14.17. REMOVE PICK UP ROLLER UNIT

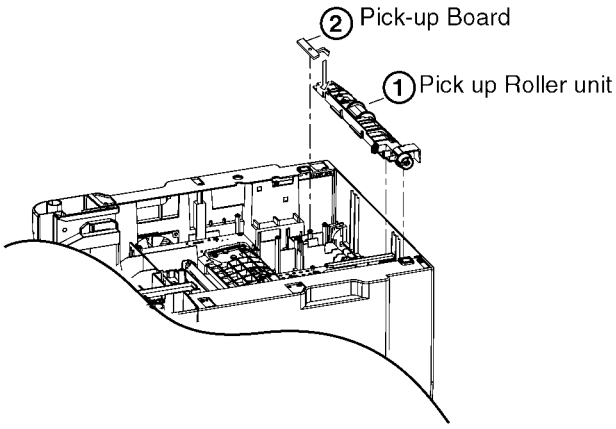
E4

(1) Remove the screw (A)-a.
(2) Remove all the connectors on the Pick up Board
(3) Remove the Pick-up Board.
(4) Remove the 2 screws (A)-b.
(5) Remove the Pick-up Roller Holder.
(6) Remove the screw (A)-c.
(7) Remove the Rear Left Cassette Guide.
(8) Remove the 2 screws (A)-d.
(9) Remove the Pick up Roller unit.



Note for assembling

After assembling the ①, assemble the ②.

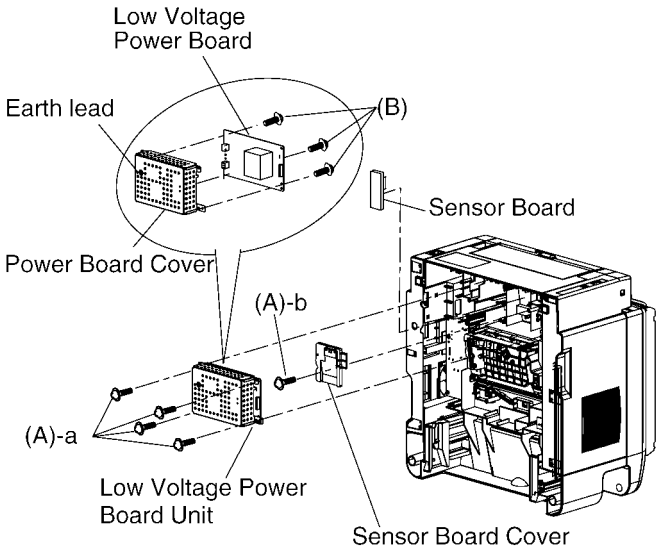


14.18. REMOVE LOW VOLTAGE POWER BOARD

E5

1) Remove the 4 screw (A)-a.
2) Remove the all the connectors and the Earth lead.
3) Remove the Low Voltage Power Board Unit.
4) Remove the screw (A)-b.
4) Remove the Sensor Board Cover.
5) Remove the Sensor Board.

3) -->Remove the 3 screws(B) to separate the Power Board Cover from the Low Voltage Power Board.

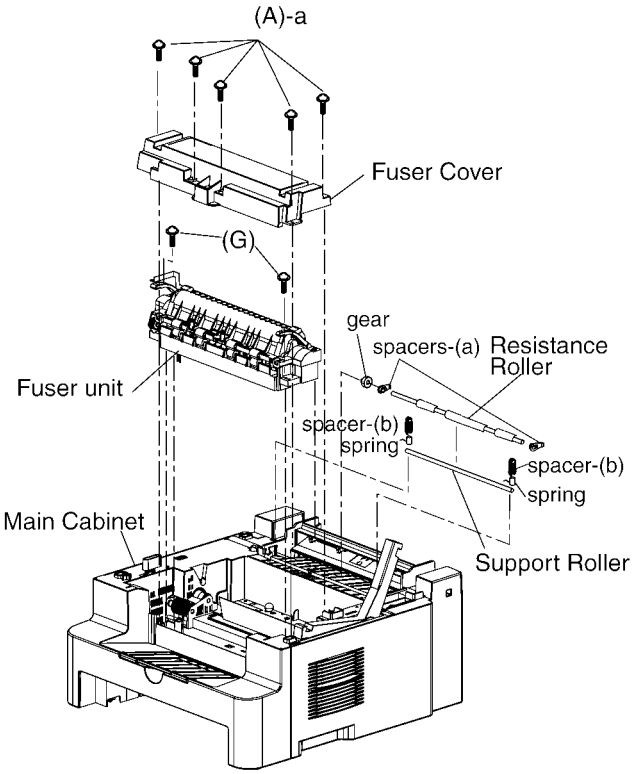


14.19. REMOVE FUSER UNIT

F1

Fuser Cover and **Fuser unit**
(1) Remove the Bottom Plate
(2) Remove the 2 Fuser leads.
[Fig-01]
(3) Remove the 5 screws (A)-a.
(4) Remove the Fuser Cover.
(5) Remove the 4 screws (G).
(6) Remove the Fuser unit.

Resistance Roller and Support Roller.
(1) Release the 2 hooks of the spacers from the Main Cabinet to remove the Pinch Roller
(2) Remove the Resistance Roller.
(3) remove the 2 spacers-(b) and 2 springs.
(4) Remove the Support Roller.



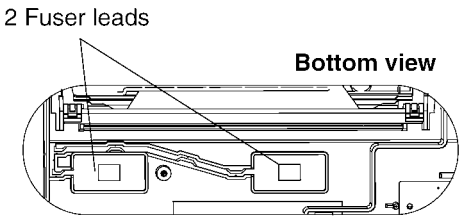
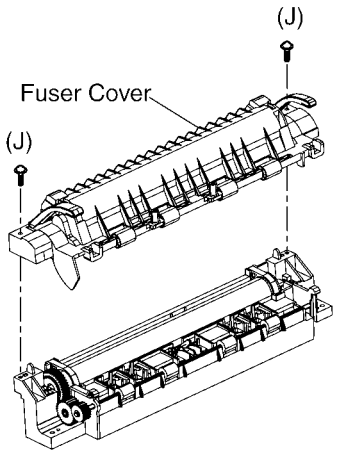


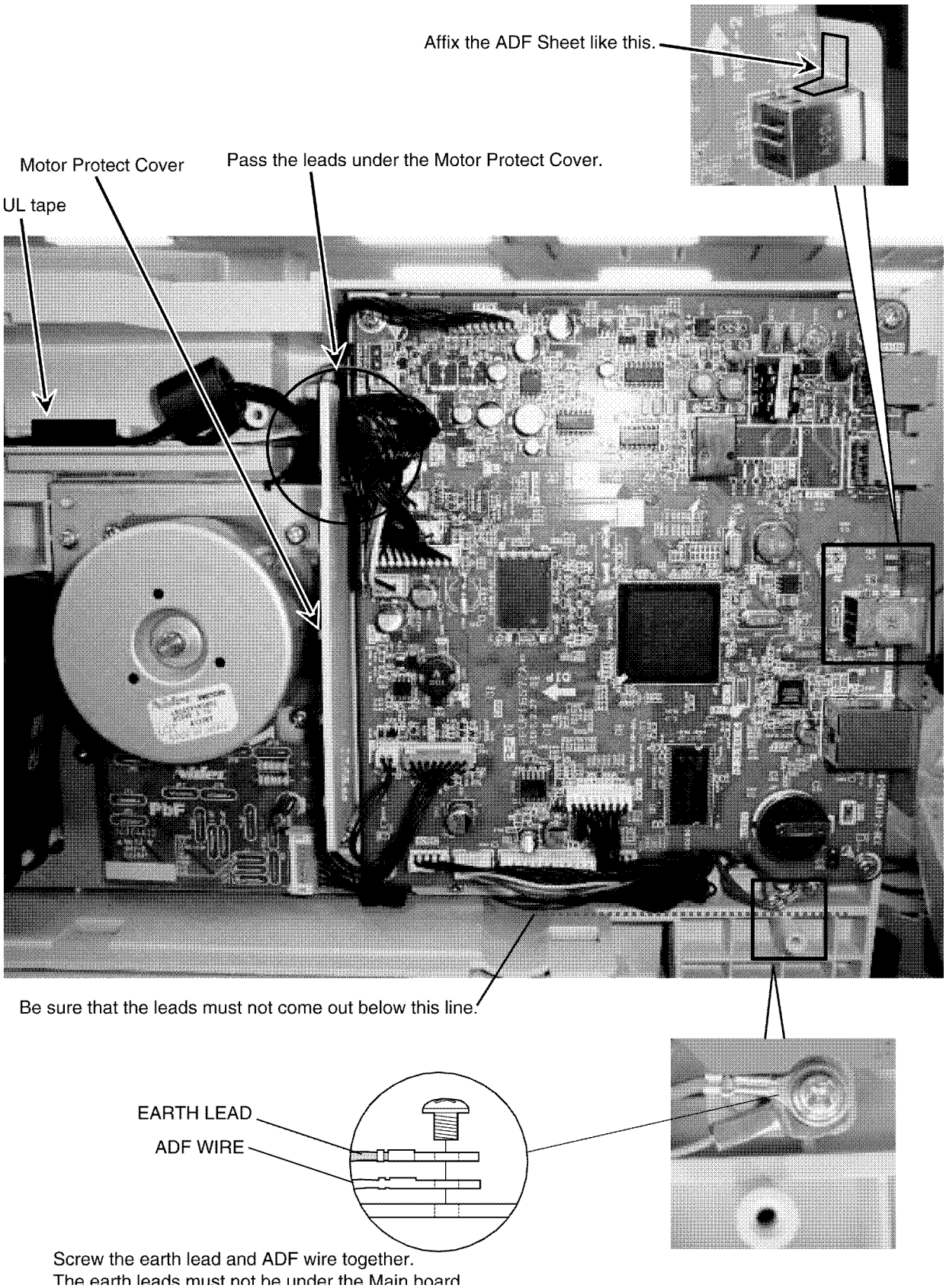
Fig-01

Fuser section
(1) Remove the 2 screws (J)
(2) Remove the Fuser Cover.



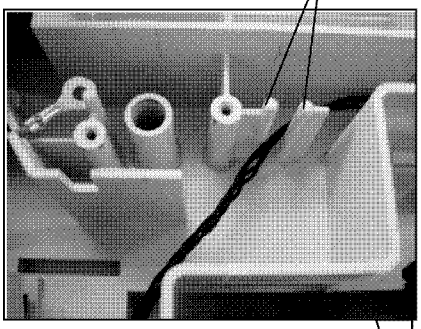
14.20. Installation Position of The Lead

14.20.1. MAIN BAORD SECTION

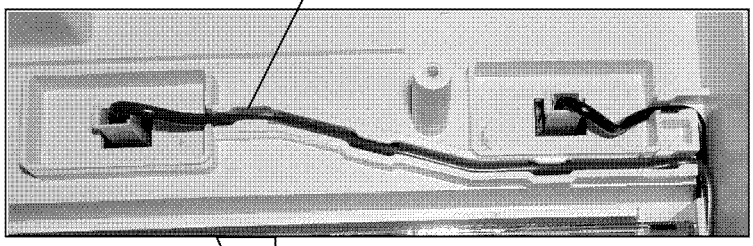


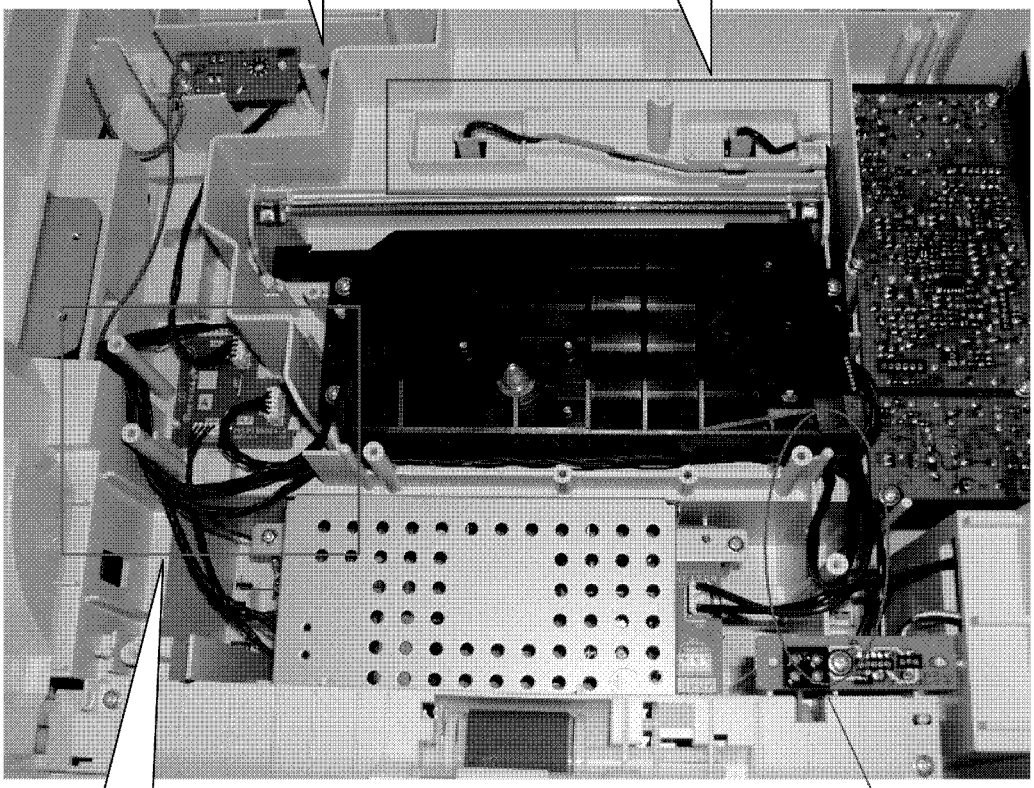
14.20.2. BOTTOM PART SECTION

Pass the lead
between these bosses.

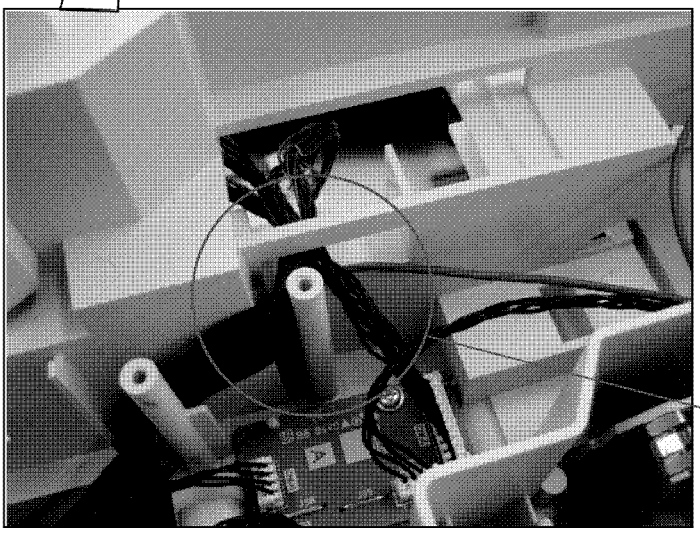


Pass these leads through the groove.
Enter to Hook completely



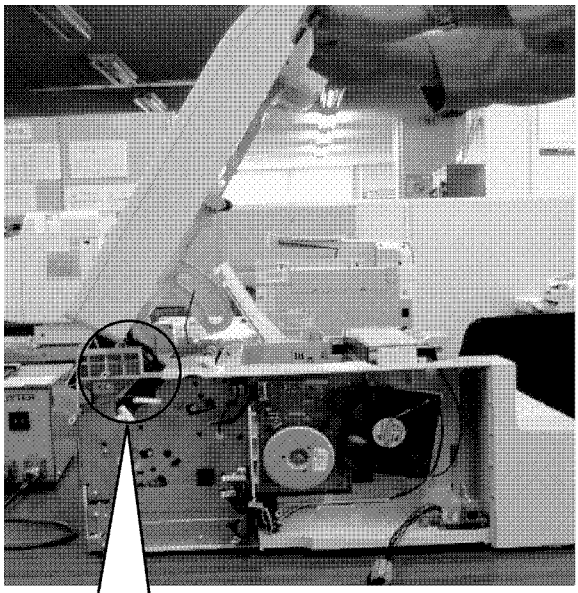


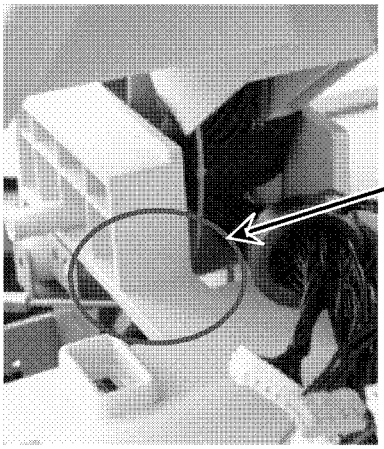
Pass the leads through
in this figure



Pass the leads through the hole
as shown in this figure .

14.20.3. SIDE CABINET SECTION

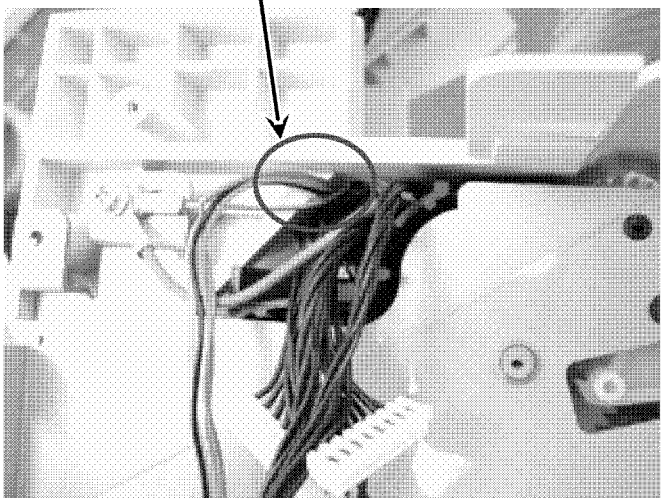


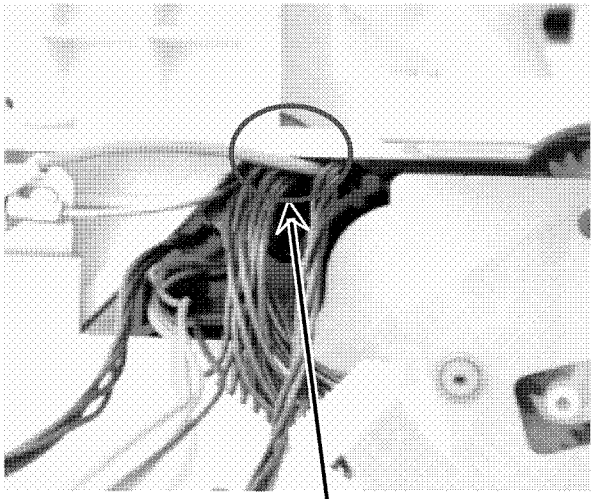


Be sure there are no leads between Maincabi and the wire.

The lead shouldn't be coming between Maincabi and a wire like this.

NG

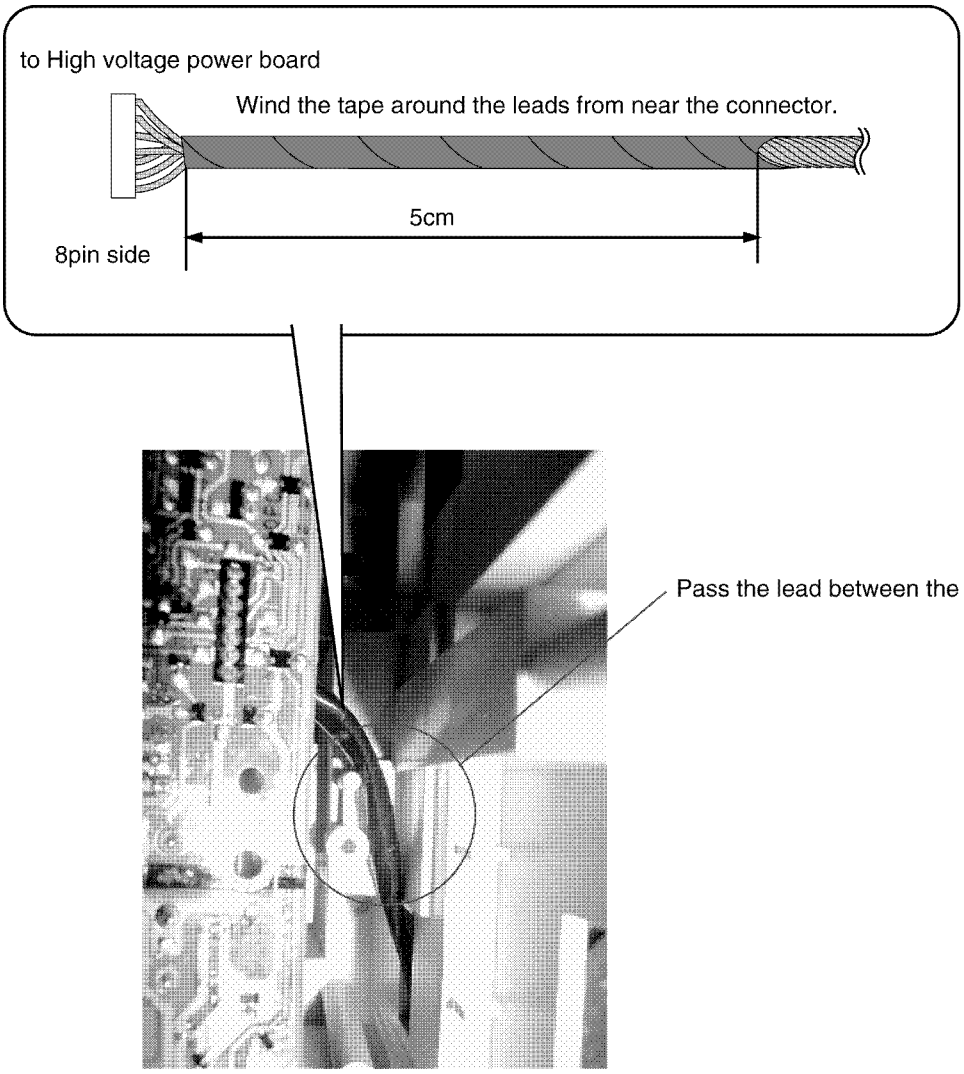




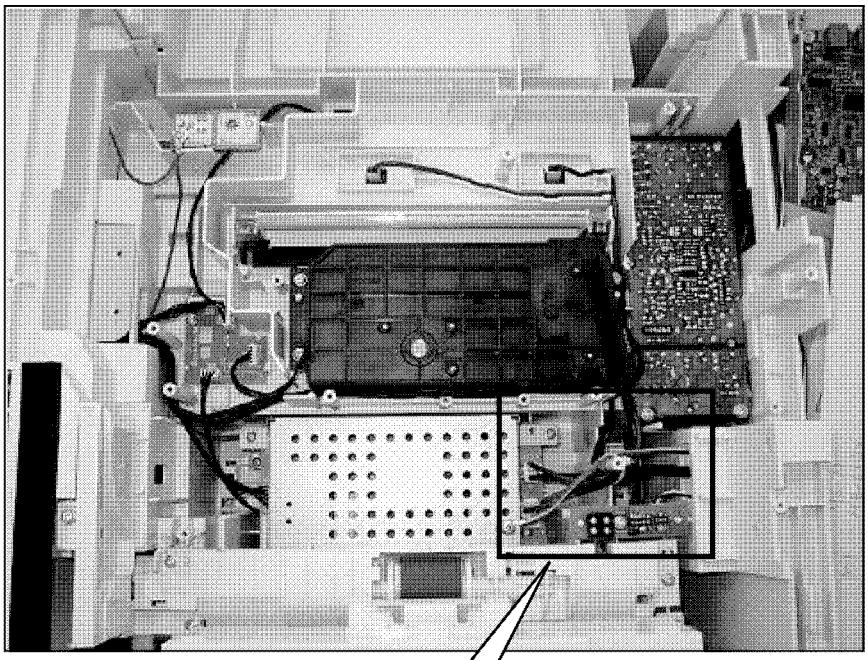
OK

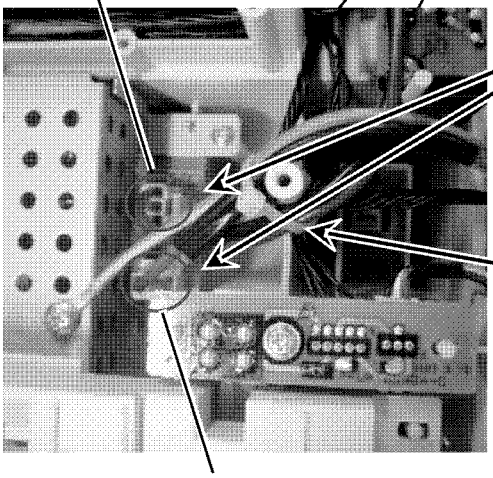
Be sure that the leads are not coming between Maincabi and a wire like this.

14.20.4. HIGH VOLTAGE POWER SUPPLY BOARD SECTION

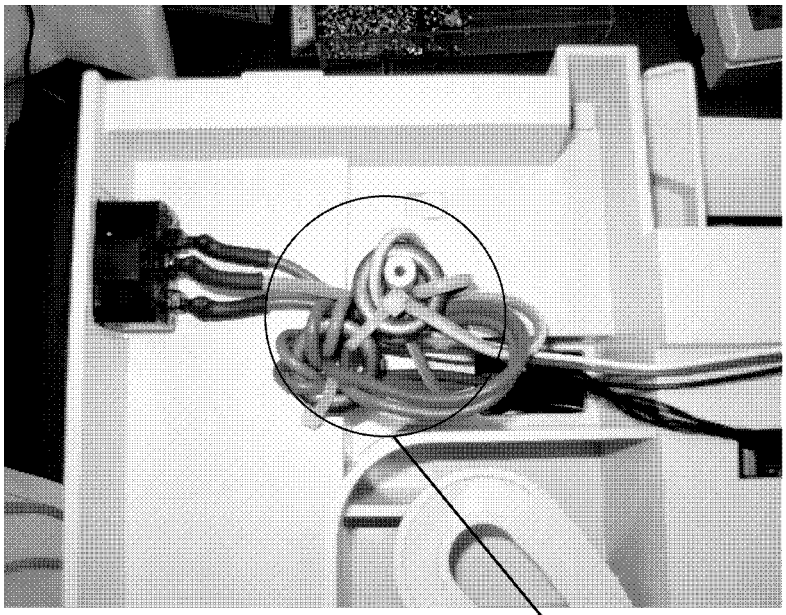


14.20.5. LOW VOLTAGE POWER SUPPLY BOARD SECTION



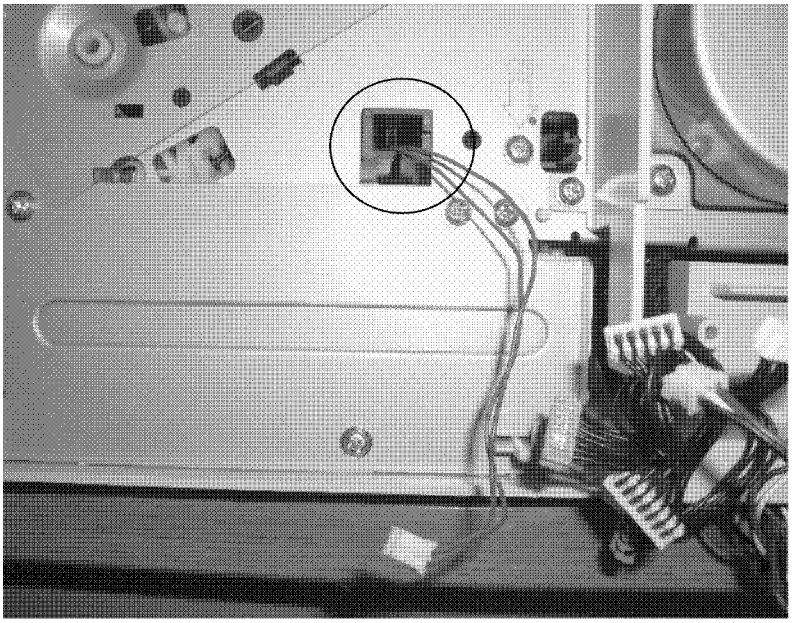


14.20.6. AC INLET SECTION



Pass the LEAD/AC EARTH core through the boss

14.20.7. SOLENOID LEAD SECTION



Don't press SOLENOID LEAD
with the metal plate.

15 Maintenance

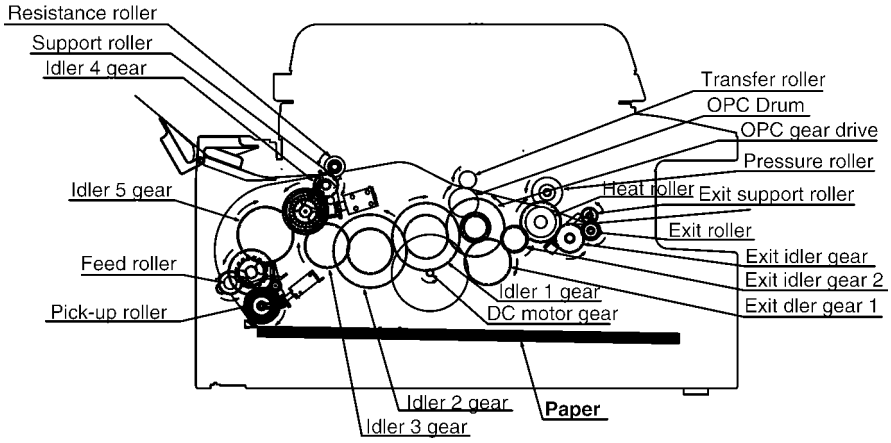
15.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

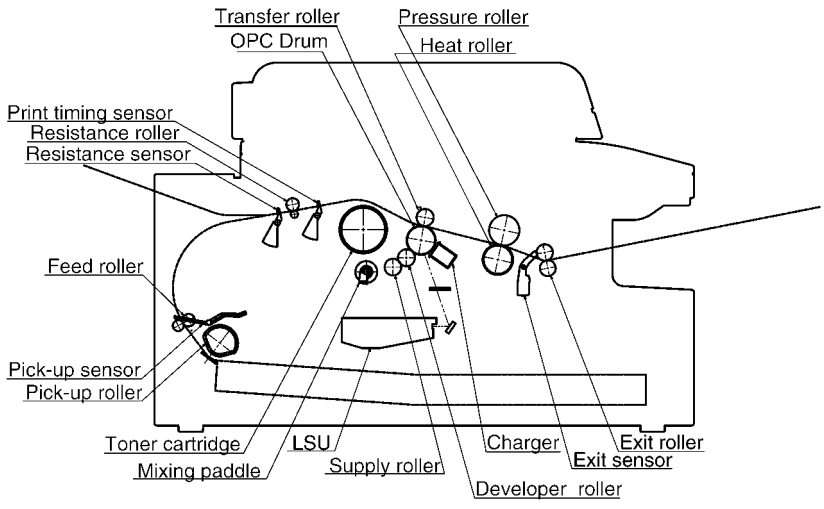
15.1.1. OUTLINE

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.

15.1.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS





15.1.2.1. 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.217)
3	Sensors	Document sensor (PS54), Read position sensor (PS53), Registration sensor (PS51), Pickup sensor (SW50), Print timing sensor (PS52), Toner sensor (IC50), Top cover sensor (SW1),Exit sensor (PS50), confirm the operation of the sensors.	See **MAINTENANCE CHECK ITEMS/ COMPONENT LOCATIONS(**P.217) and **SENSORS AND SWITCHES SECTION**(P.42)**TEST FUNCTIONS**(P.83)
4	Glass	If the glass is dirty, clean them with a dry soft cloth.	Refer to **MAINTENANCE**(P.219).
5	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

15.1.2.2. Maintenance Cycle (Document & Paper)

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Procedure
1	ADF Document Feed Roller (Ref.No.116)	3 months	5 years* (65,000 documents)	Refer to **REMOVE ADF SECTION** (P.197)., **ADF SECTION** (P.261).
2	ADF Separation Rubber (Ref. No.103)	3 months	5 years (65,000 documents)	Refer to **REMOVE ADF SECTION** (P.197)., **ADF SECTION** (P.261).
3	ADF Eject Roller (Ref.No.121)	3 months	5 years (65,000 documents)	Refer to **REMOVE ADF SECTION** (P.197)., **ADF SECTION** (P.261).
4	Pick up Roller (Ref No.216)	----------	5 years (65,000 documents)	Refer to **REMOVE PICK UP ROLLER UNIT** (P.208)., **LOWER CABINET SECTION** (P.263).
5	Separation Rubber (Ref. No.224)	----------	5 years (65,000 documents)	Refer to **REMOVE PICK UP ROLLER UNIT** (P.208)., **LOWER CABINET SECTION** (P.263).
6	Feed Roller (Ref.No.255)	3 months	5 years (65,000 documents)	Refer to **REMOVE PAPER FEED ROLLER** (P.203)., **UPPER CABINET SECTION** (P.264).
7	Transfer Roller (Ref.No.61)	----------	5 years (65,000 documents)	Refer to **REMOVE TOP COVER SECTION** (P.198)., **TOP COVER SECTION** (P.260).
8	Resistance Roller (Ref.No.248)	3 months	5 years (65,000 documents)	Refer to **REMOVE FUSER UNIT** (P.210)., **UPPER CABINET SECTION** (P.264).
9	Heat Roller (Ref.No.281)	----------	5 years (65,000 documents)	Refer to **REMOVE FUSER UNIT** (P.210)., **FUSER SECTION** (P.265).
10	Exit Roller (Ref.No.292)	3 months	5 years (65,000 documents)	Refer to **REMOVE FUSER UNIT** (P.210)., **FUSER SECTION** (P.265).

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.

15.2. MAINTENANCE

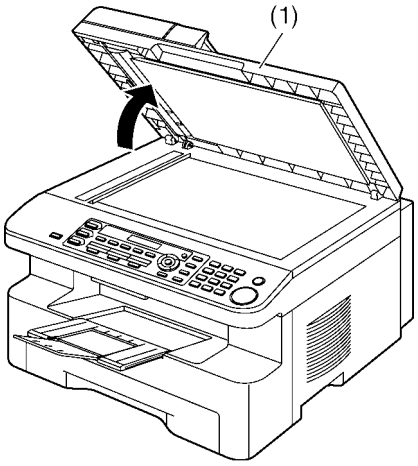
15.2.1. CLEANING THE WHITE PLATE AND GLASSES

Clean the white plate and glasses when a black line, a white line or a dirty pattern appears on:
— your recording paper,
— the original document,
— the scanned data, or
— the fax document received by the other party.

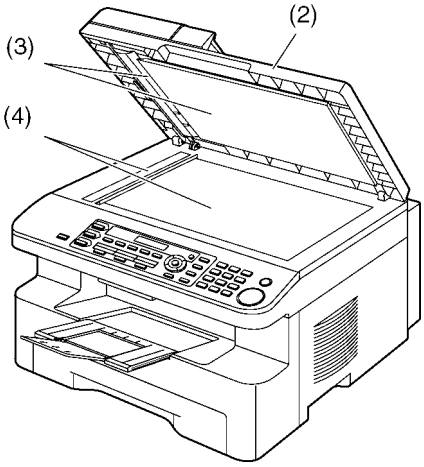
Caution:
- **Be careful when handling the drum and toner unit.**
- **Do not use paper products, such as paper towels or tissues, to clean the inside of the unit.**

15.2.1.1. White plate and scanner glasses

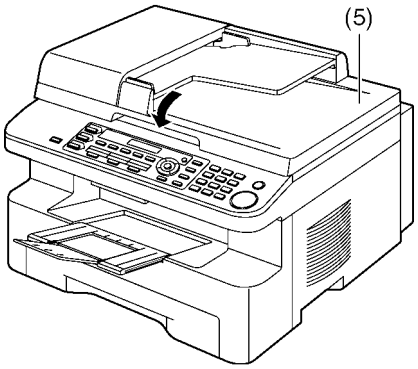
1. Open the document cover (1).



2. Hold the document cover (2) while cleaning the white plate (3) and the scanner glasses (4).

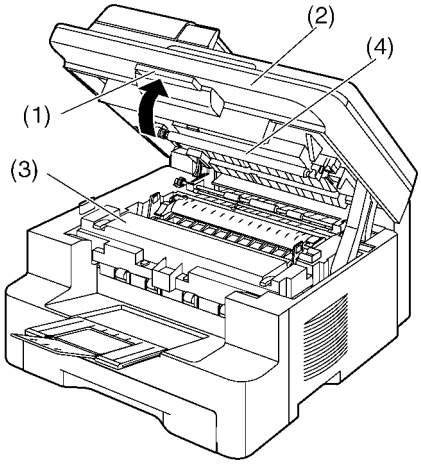


3. Close the document cover (5).



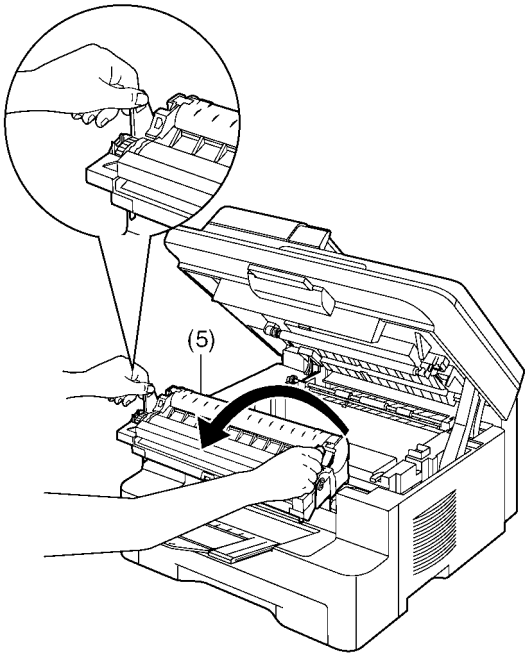
15.2.1.2. Lower glass

1. Disconnect the power cord.
2. Lift the top cover release lever (1) and open the top cover (2).
   Note:
   • Do not touch the transfer roller (4).

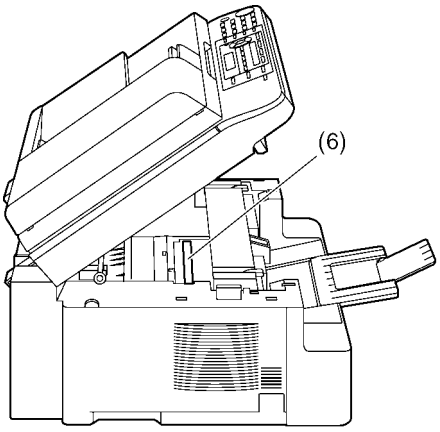


Caution:
The fuser unit (③) gets hot. Do not touch it.

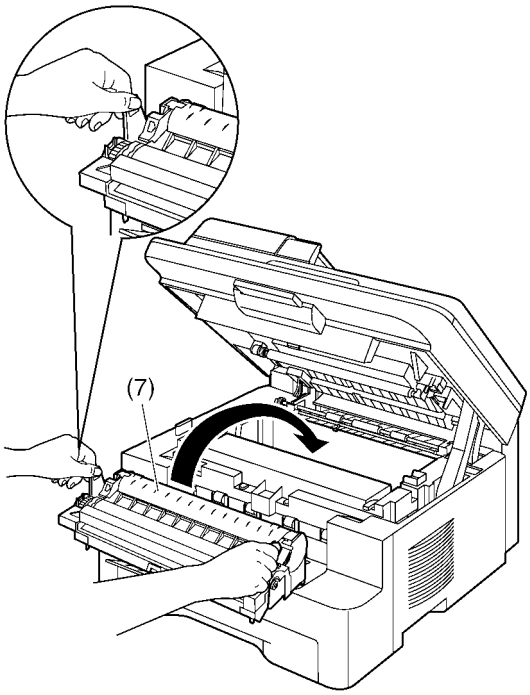
3. Remove the drum and toner unit (5) by holding the tabs.



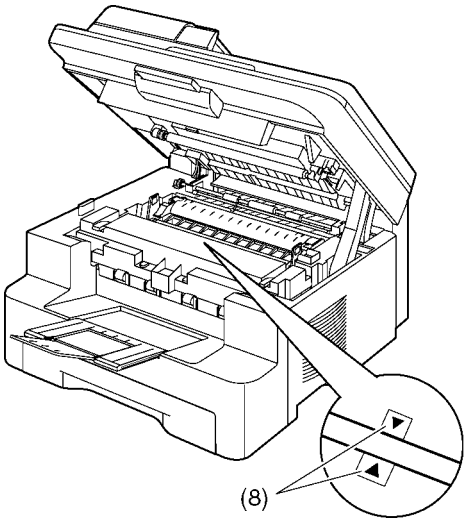
4. Clean the lower glass (6) with a soft and dry cloth.



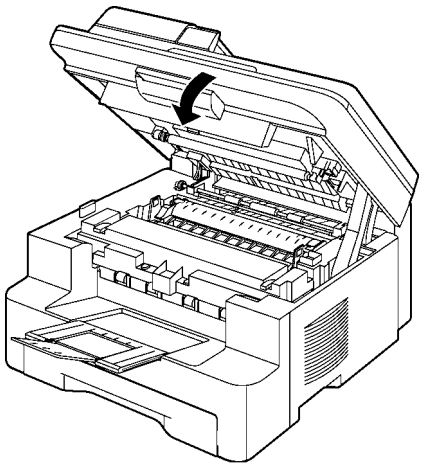
5. Reinstall the drum and toner unit (7) by holding the tabs.



- Make sure that the triangles (8) match, to install the drum and toner unit correctly.

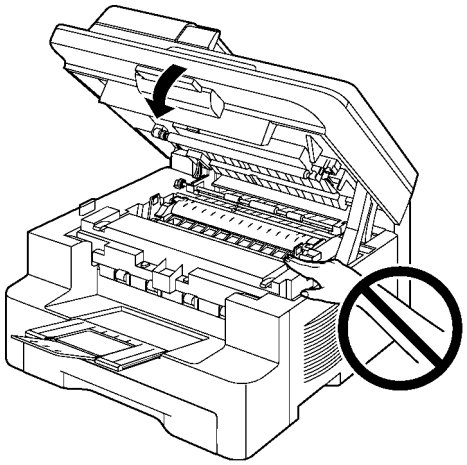


6. Close the top cover until locked.



Caution:

- To prevent injuries, be careful not to put your hands under the top cover.

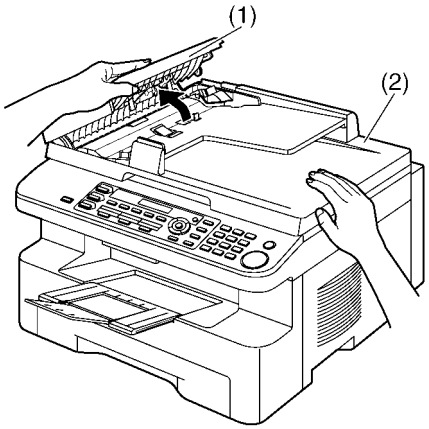


7. Re-connect the power cord.

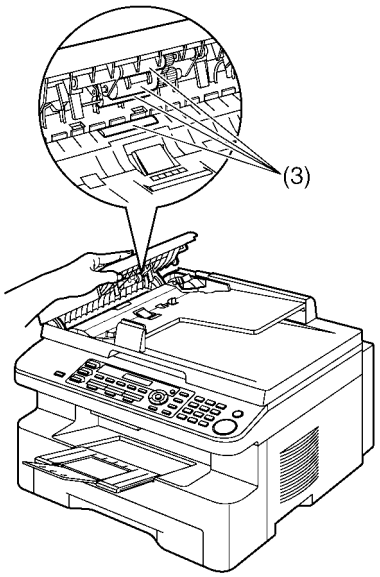
15.2.2. CLEANING THE DOCUMENT FEEDER ROLLERS

Clean the rollers when the document or recording paper frequently misfeeds.

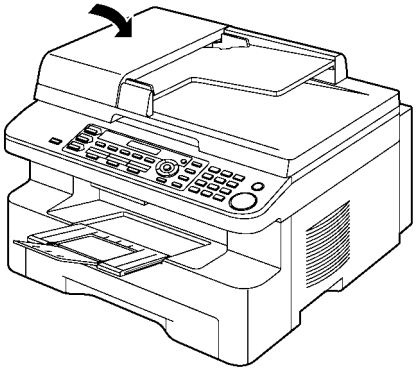
1. Disconnect the power cord.
2. Open the ADF cover (1) while holding the document cover (2).



3. Clean the document feeder roller's surface (3) and separation rubber (4) with a cloth moistened with isopropyl rubbing alcohol, while rotating them.Let all parts dry thoroughly.



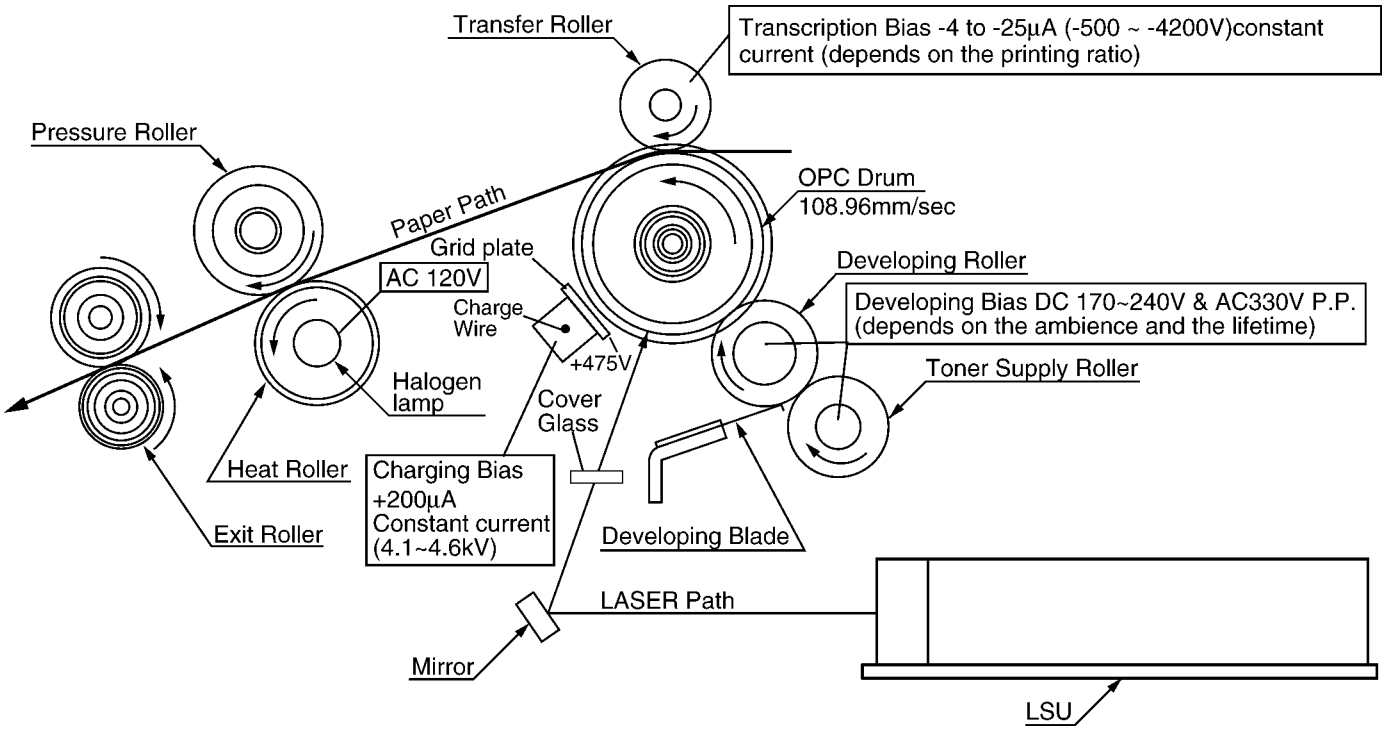
4. Close the ADF cover.



5. Re-connect the power cord.

15.3. PRINTING OPERATION PRINCIPLE

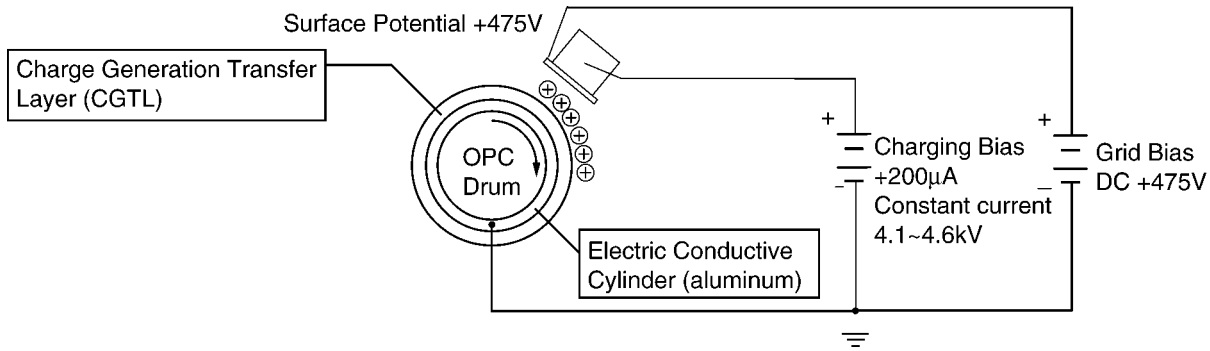
15.3.1. PROCESS CHART AND PROCESS BIAS



15.3.2. 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 Transfer Layer (CGTL).

When the charging bias (DC +4.35kv) is added and the plus charge is supplied to the OPC surface while charging, the whole surface potential of the drum is +475V.

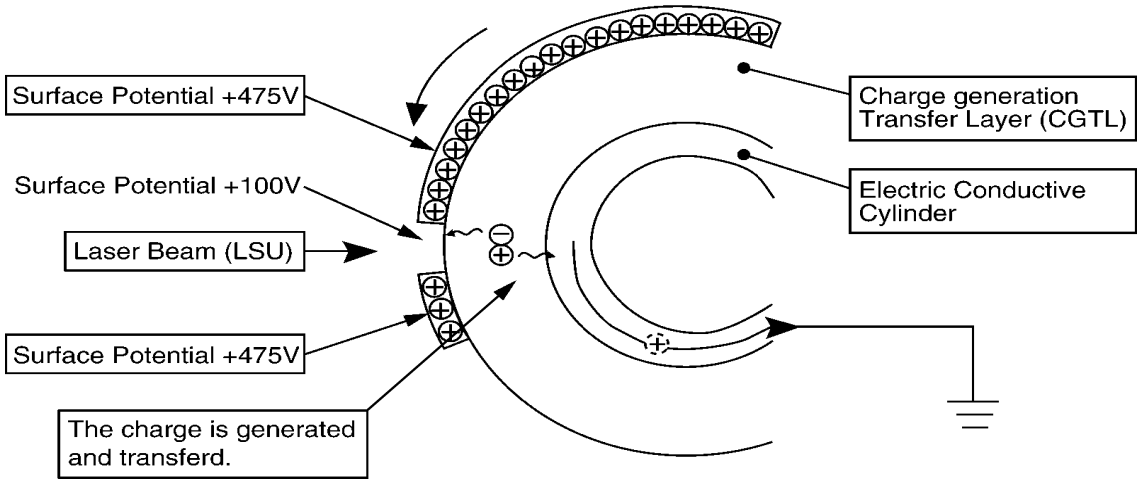


Charging Part

15.3.3. 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 Transfer Layer. Passing through the Charge Generation Transfer Layer which conducts the minus charge, the plus-charged drum's surface is neutralized to be skipped. Then the plus 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.

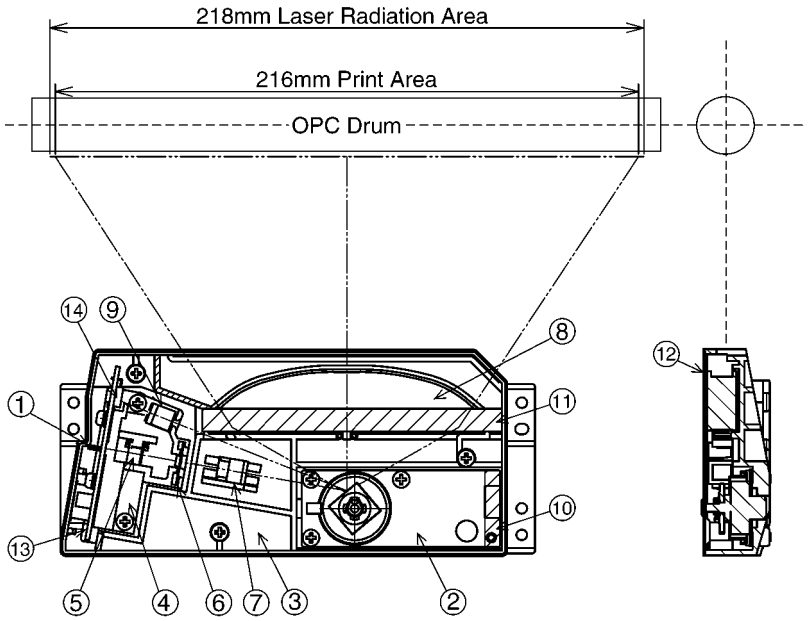
At that time an invisible image is created on the drum.



Exposing Part

15.3.4. LASER SCANNING UNIT LOCATIONS

LSU Layout & Parts List

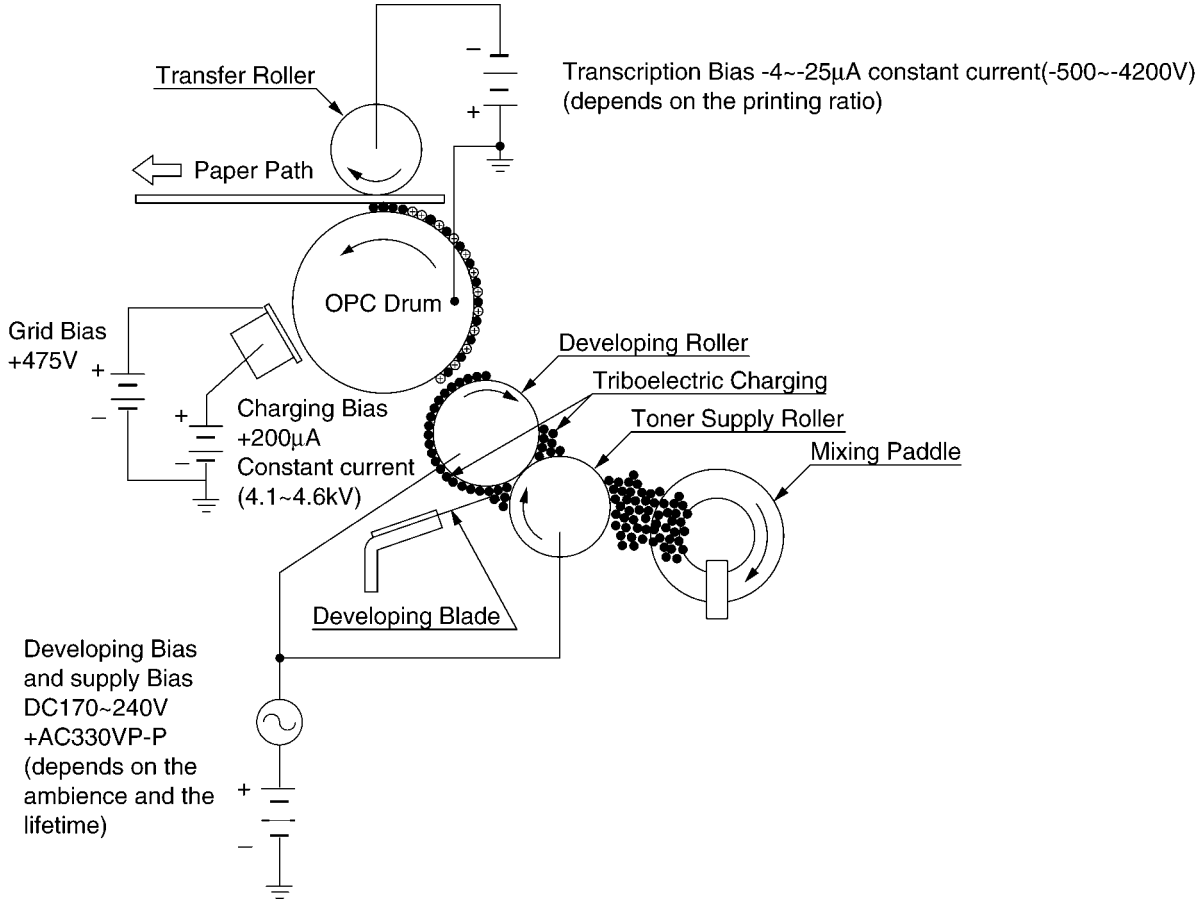


	Parts Name		Parts Name
1	Laser Diode	8	fϕ Lens
2	Polygon Motor Unit	9	BD Lens
3	Frame	10	Sponge
4	LD Block	11	Sponge
5	Collimator Lens	12	Cover
6	Aperture	13	LD PCB
7	Cy Lens	14	Pin Photodiode

15.3.5. DEVELOPING AND TRANSCRIPTION

The developing is the stage that the OPC drum with an invisible image is changed to visible by the toner. The drum unit consists of mixing paddle, toner supply roller, developing roller, developing blade, charge wire, grid plate and OPC drum. The bias voltage is added to the developing roller and toner supply roller. Firstly the toner is mixed up in the mixing paddle and plus-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.

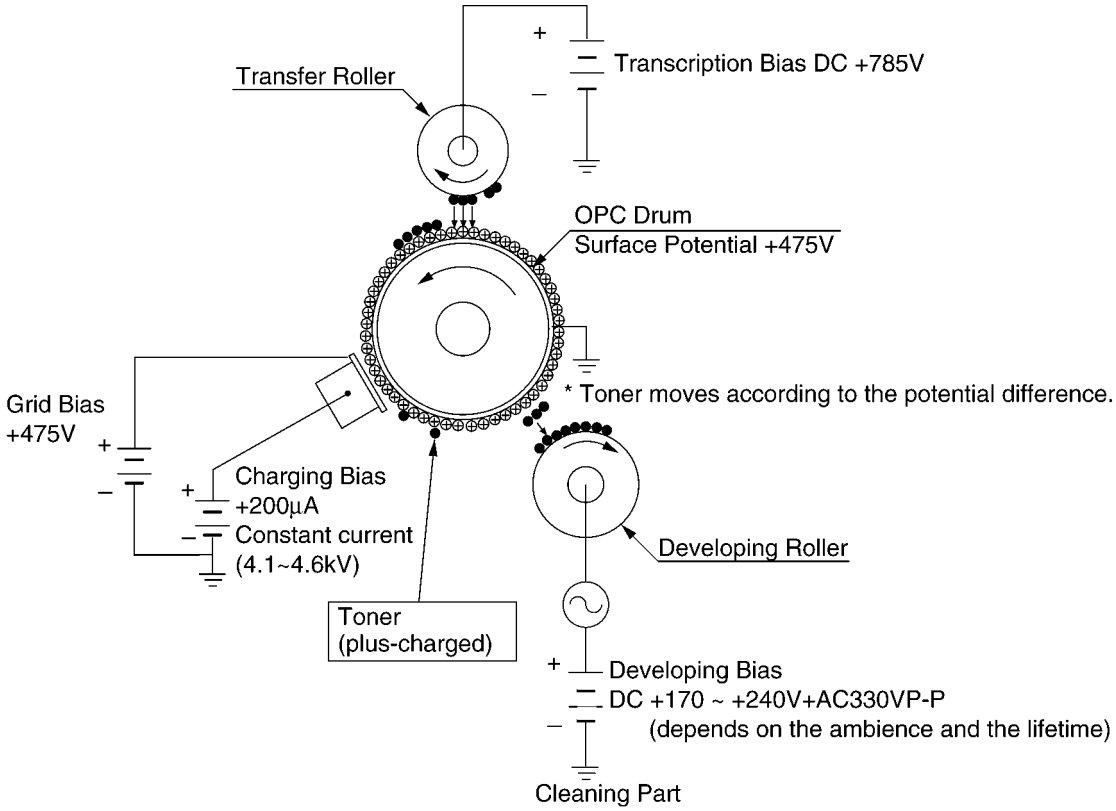
The transfer is the stage that the created image on the OPC drum is transferred to the paper. When the transfer roller is minus-charged with the image, the plus-charged toner particles are gathered on the surface of the drum and transferred to the paper.



Developing and Transcription Part

15.3.6. CLEANING OF TRANSFER ROLLER

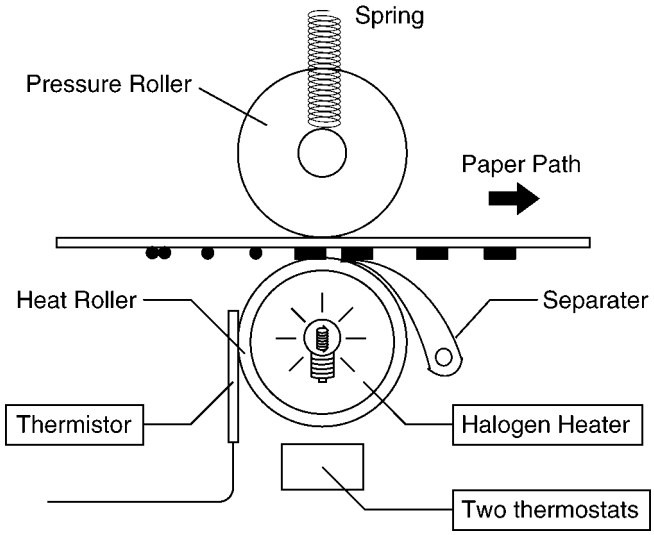
The toner attached to the surface of the OPC drum is transferred to the paper at the transcription stage, but a part of the toner remains. The cleaning is the stage that cleans the remain toner after the transcription stage. The remain toner on the drum and the toner which was attached to the place where the laser beam didn't scan are gathered to the developing roller to be used again. After paper jam or replacing toner and drum unit, the transfer roller is plus-charged to eliminate the plus-charged toner.



Cleaning Part

15.3.7. FIXING

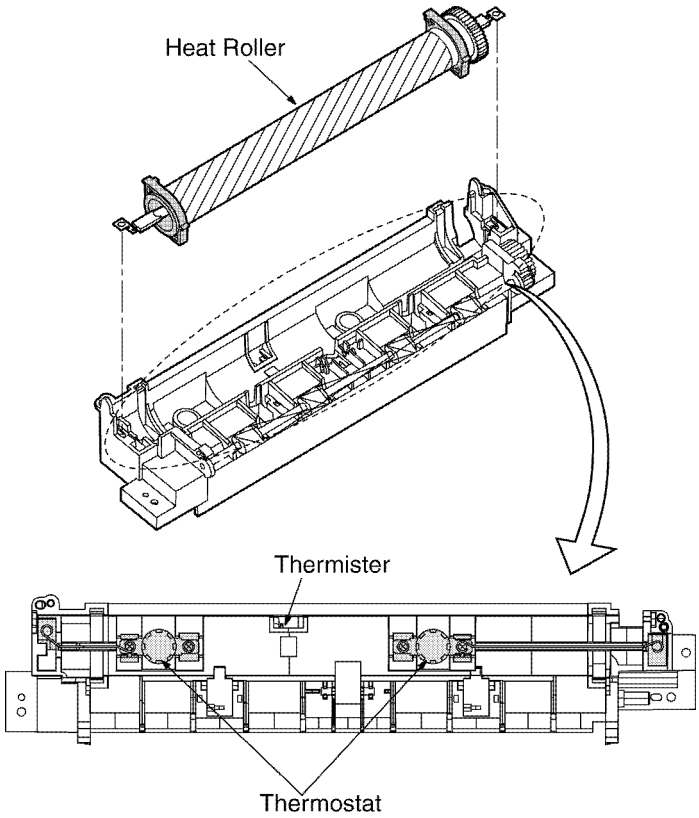
On the process of the transfer, the transferred toner is weakly attached on the paper. Fixing means the process to fix the toner on the paper permanently. The fixing part melts the toner at the high temperature using the halogen heater. The toner is fixed on the paper by the heat and pressure through 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.



Fixing Part

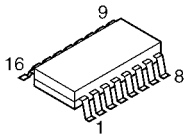
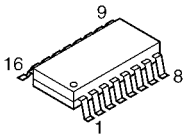
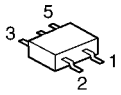
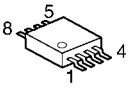
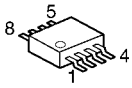
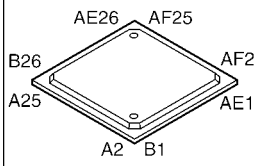
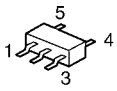
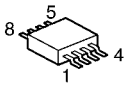
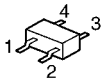
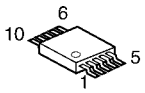
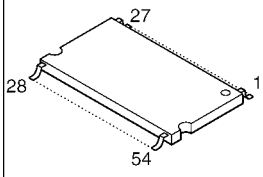
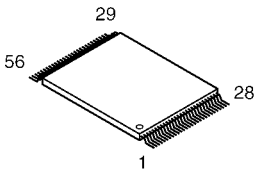
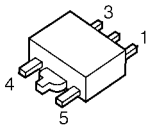
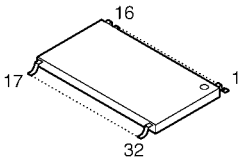
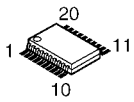
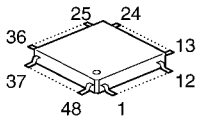
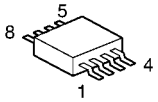
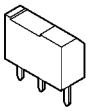
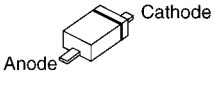
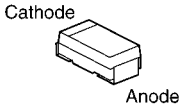
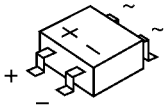
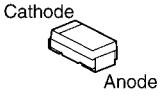
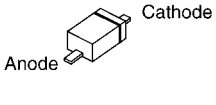
The fixing part becomes high temperature, so the thermistor and the two thermostats are provided.

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 195°C while printing.
2. Thermostat
   The thermostat is located near the heat roller, and it turns OFF the power when the temperature around the thermostat becomes over 160°C.

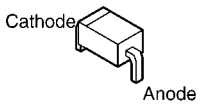
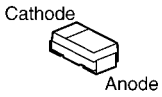
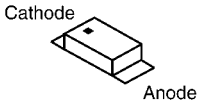


15.4. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES

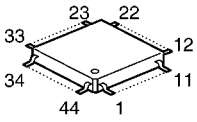
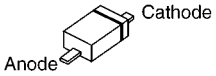
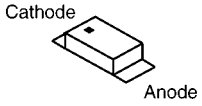
15.4.1. MAIN BOARD (1)

 C1CB00002689 C1CB00002690	 C1CB00001769	 AN6123MS-TXL	 C0ABEB000083	 C1AB00002556
 C1ZBZ0003716	 C0EBE0000504	 C0DBAYY00291	 C0CBAAA00035	 C0DBAYY00294
 C3ABRG000037	 PFWIMB*****	 C0DBGYY00330	 AN44063A-VF	 C1DB00001173
 C1CB00002227	 UNR92ANJ0L UNR92ALJ0L UNR9215J0L	 B1ABFJ000001	 B1BBAP000021 B1BDAP000015	 B1ABCF000020
 B1MBECA00001	 B1CHND000004	 2SB0710ARL	 2SD1991ARA	 B1CBGD000001
 MA2J11100L	 MAZY43000L	 B0EDER000009	 B0JCPD000033	 B0BC01600013

15.4.2. MAIN BOARD (2)

				
B0ACEL000004	B0BC5R900006	MA3J142E0L	LNJ826W83RA	

15.4.3. OPERATION BOARD

				
C1ZBZ0002089	B1ABGE000006	MA111	LNJ826W83RA	

15.5. HOW TO REPLACE THE FLAT PACKAGE IC

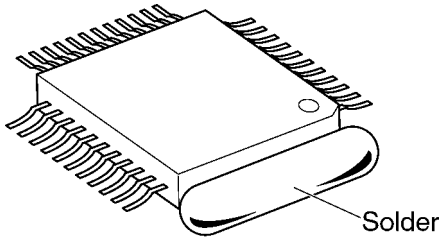
Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

15.5.1. PREPARATION

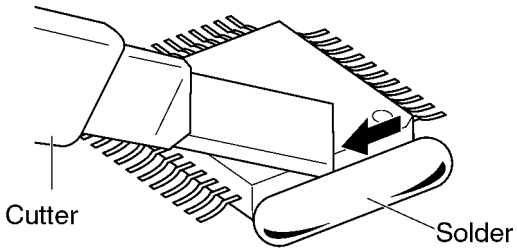
- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
  Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Flux
  Recommended Flux: Specific Gravity → 0.82.
  Type → RMA (lower residue, non-cleaning type)
  Note: See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.5.)

15.5.2. FLAT PACKAGE IC REMOVAL PROCEDURE

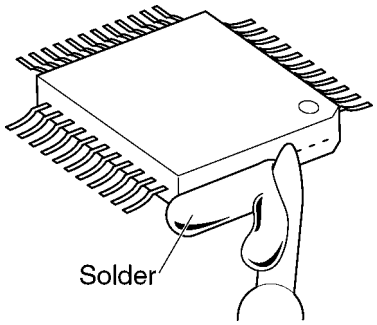
1. Put plenty of solder on the IC pins so that the pins can be completely covered.
   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



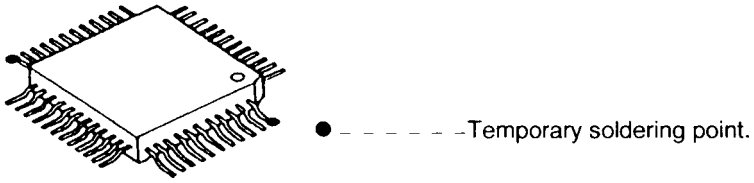
3. While the solder melts, remove it together with the IC pins.



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.

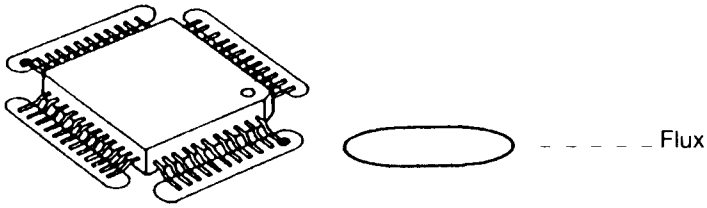
15.5.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

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

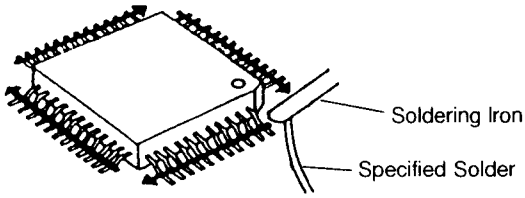


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

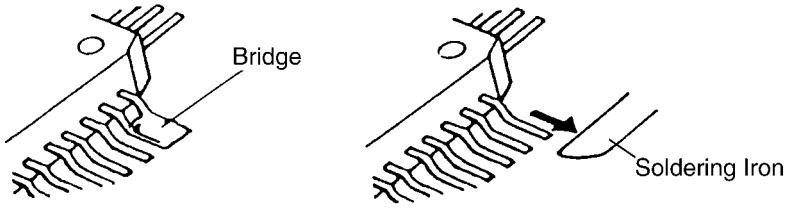


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



15.5.4. 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.

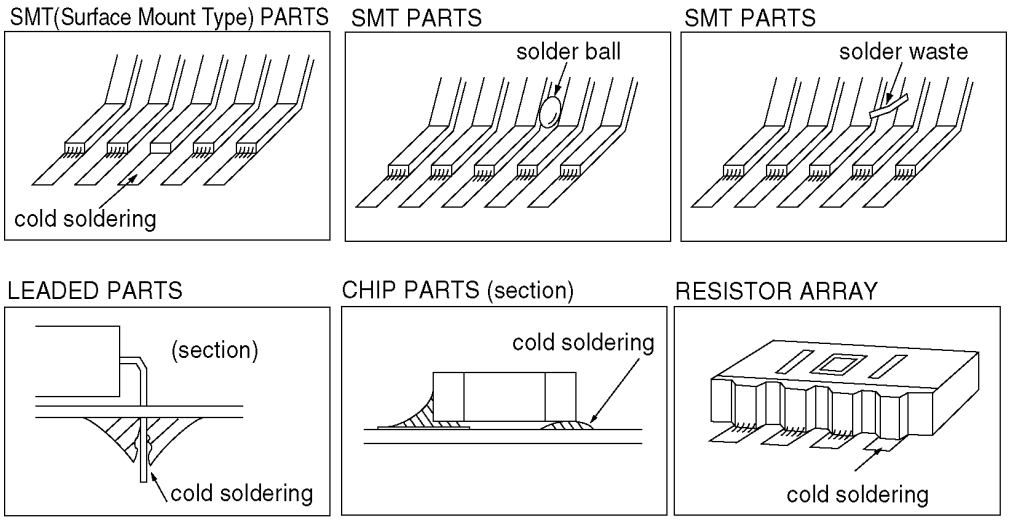


15.6. MAIN BOARD SECTION

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.

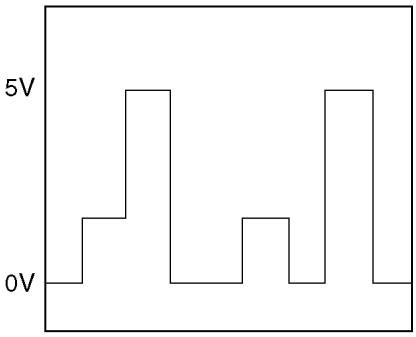
> Don't replace ICs or stop repairing until checking the signal lines.
> An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?

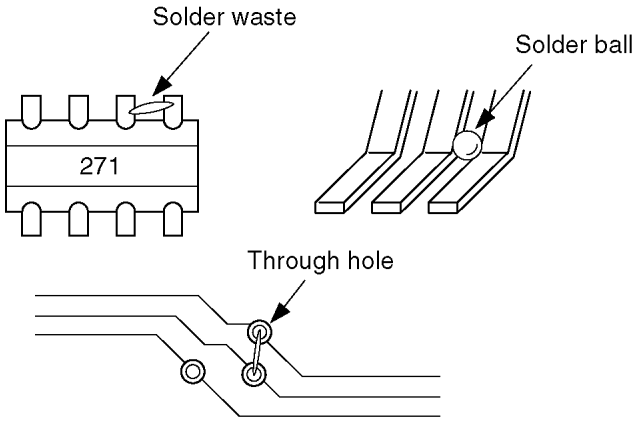
Please refer to **GENERAL BLOCK DIAGRAM** (P.13).
The ASIC (IC300) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC402), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned 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).

15.6.1. NG EXAMPLE

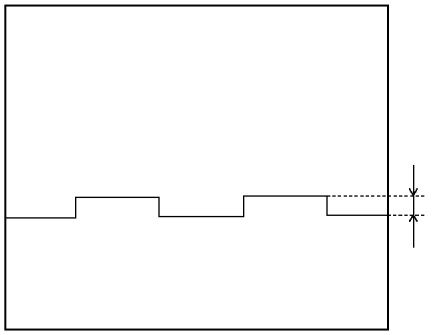
1.



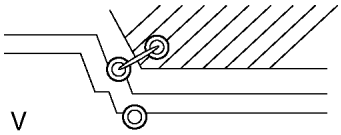
Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.



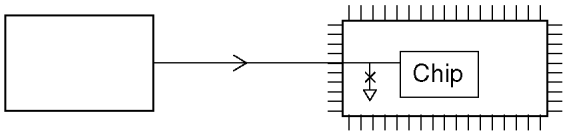
2.



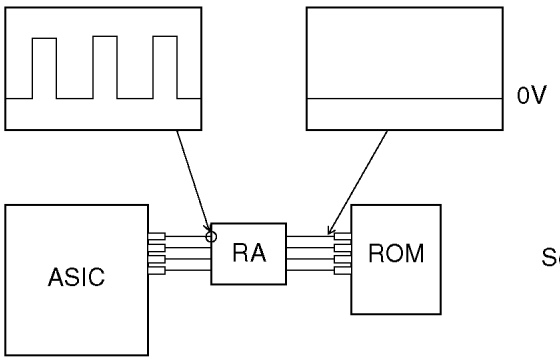
Short between the signal line and GND.



OR IC malfunction



3.



Solder fault on RA.

15.7. TEST CHART

15.7.1. 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.

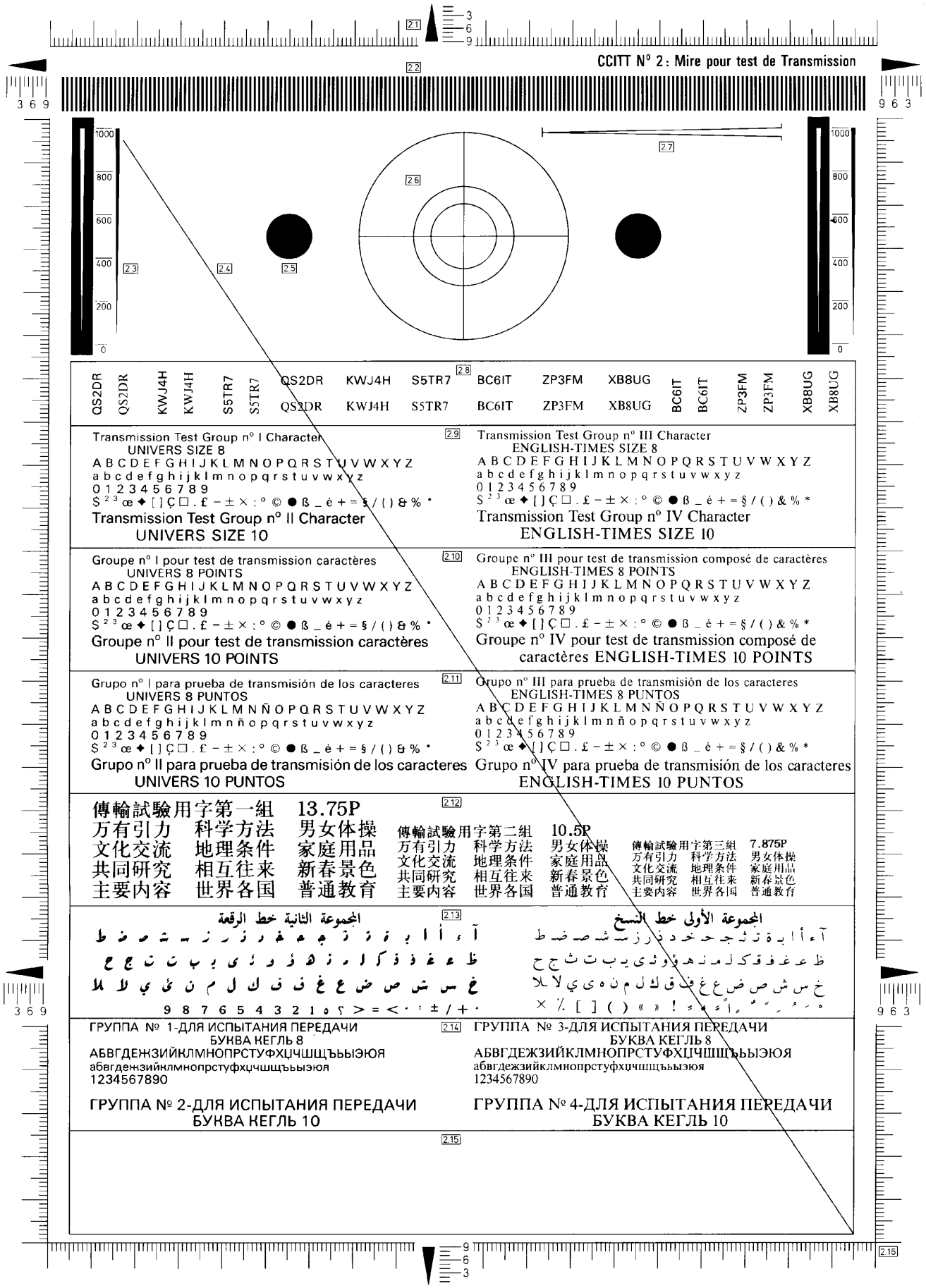
Yours sincerely,

Phil.

P.J. CROSS
Group Leader - Facsimile Research

Registered in England: No. 2038
Registered Office: 60 Vicara Lane, Ilford. Essex.

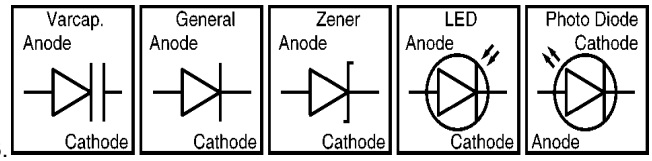
15.7.2. ITU-T No.2 TEST CHART



16 Schematic Diagram

16.1. For Schematic Diagram

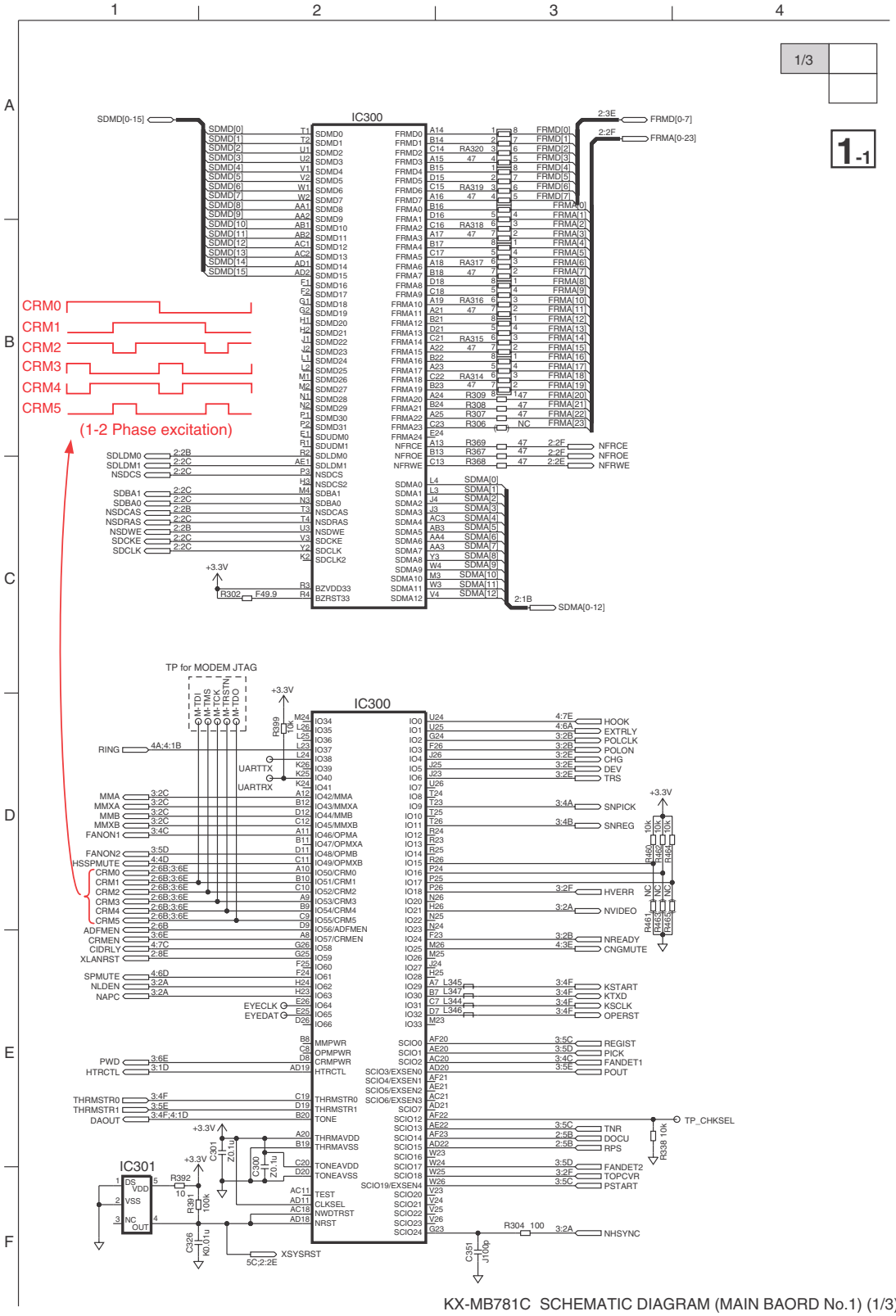
Note:

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. 

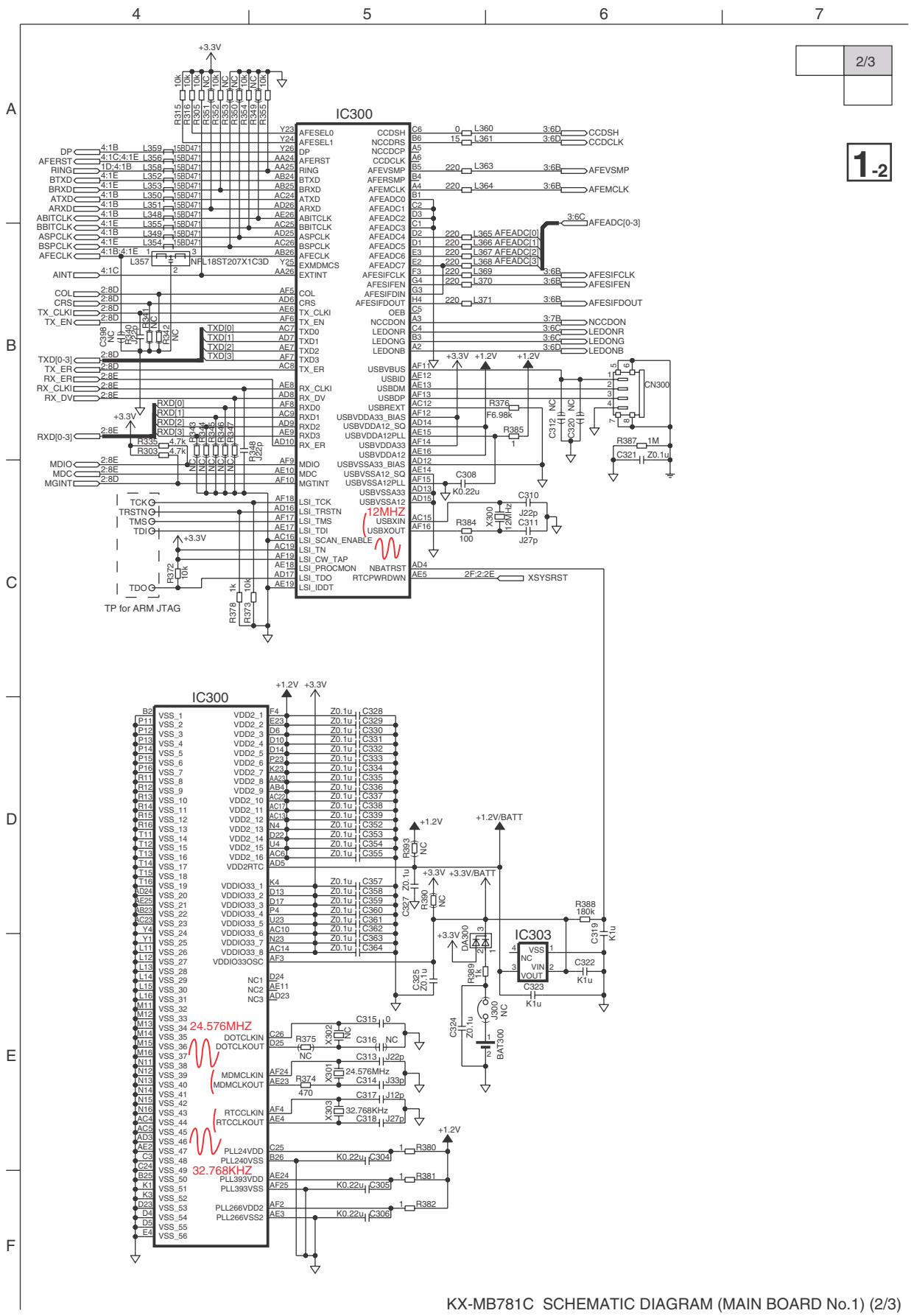
Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

16.2. MAIN BOARD

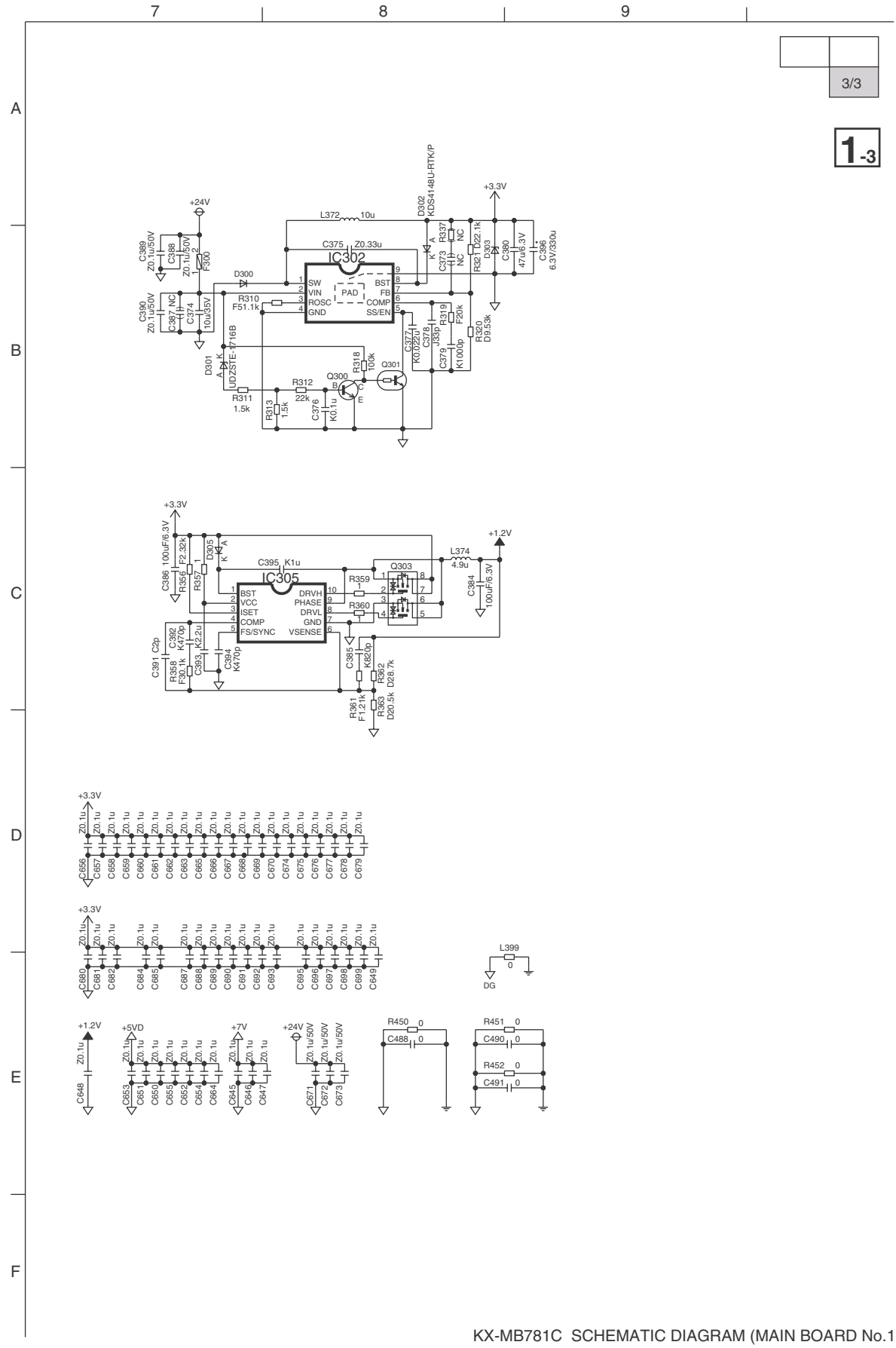
16.2.1. MAIN BOARD (1)



KX-MB781C SCHEMATIC DIAGRAM (MAIN BAORD No.1) (1/3)



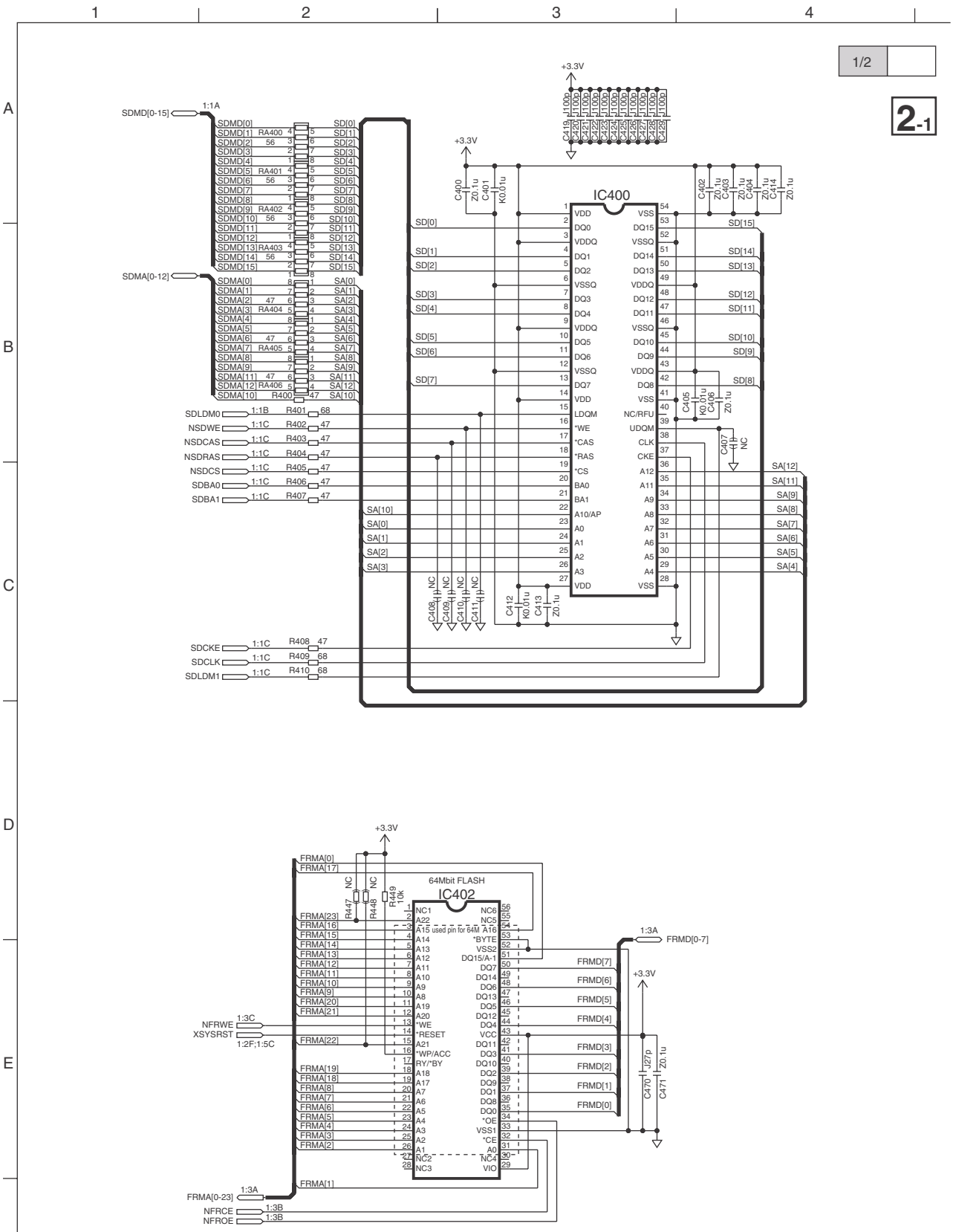
KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.1) (2/3)



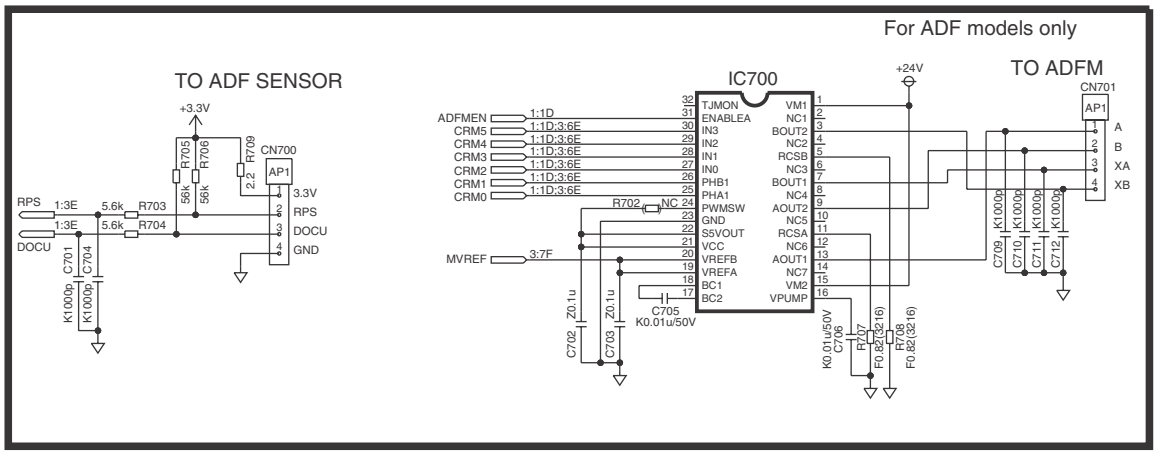
KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.1) (3/3)

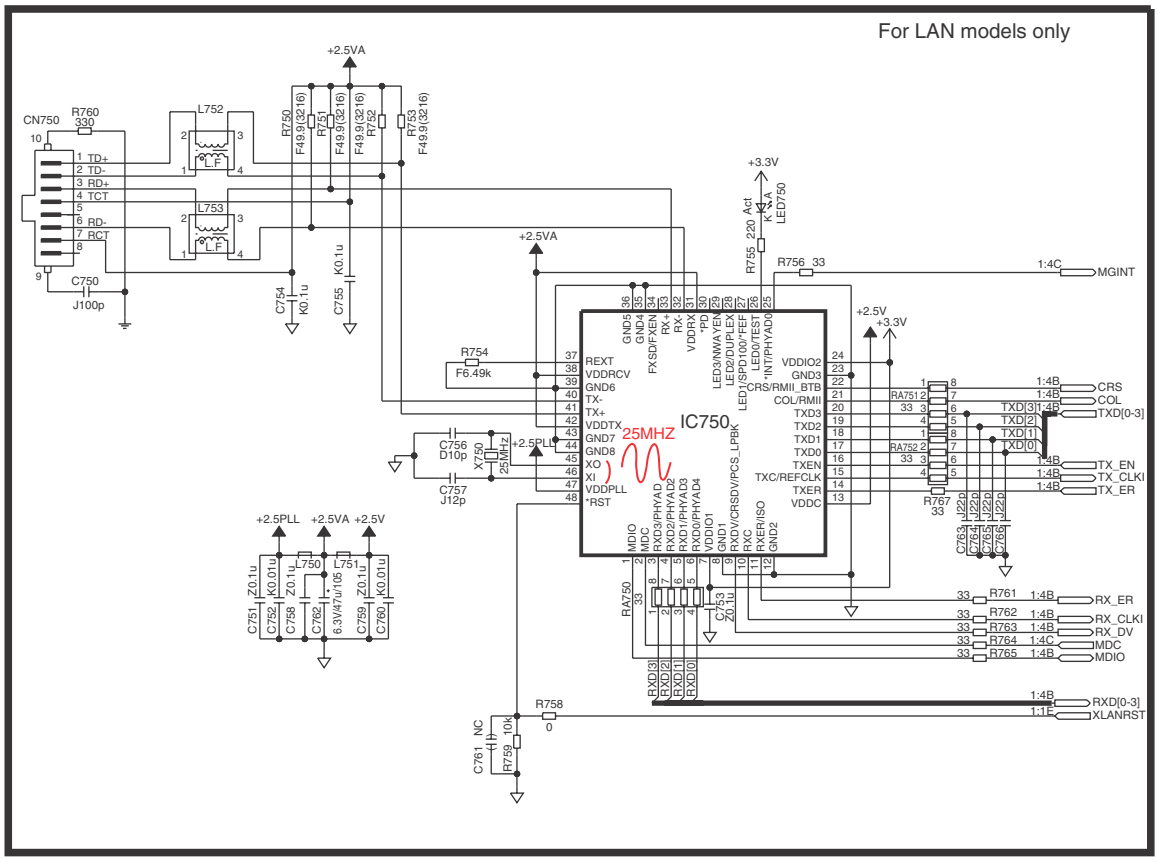
MEMO

16.2.2. MAIN BOARD (2)



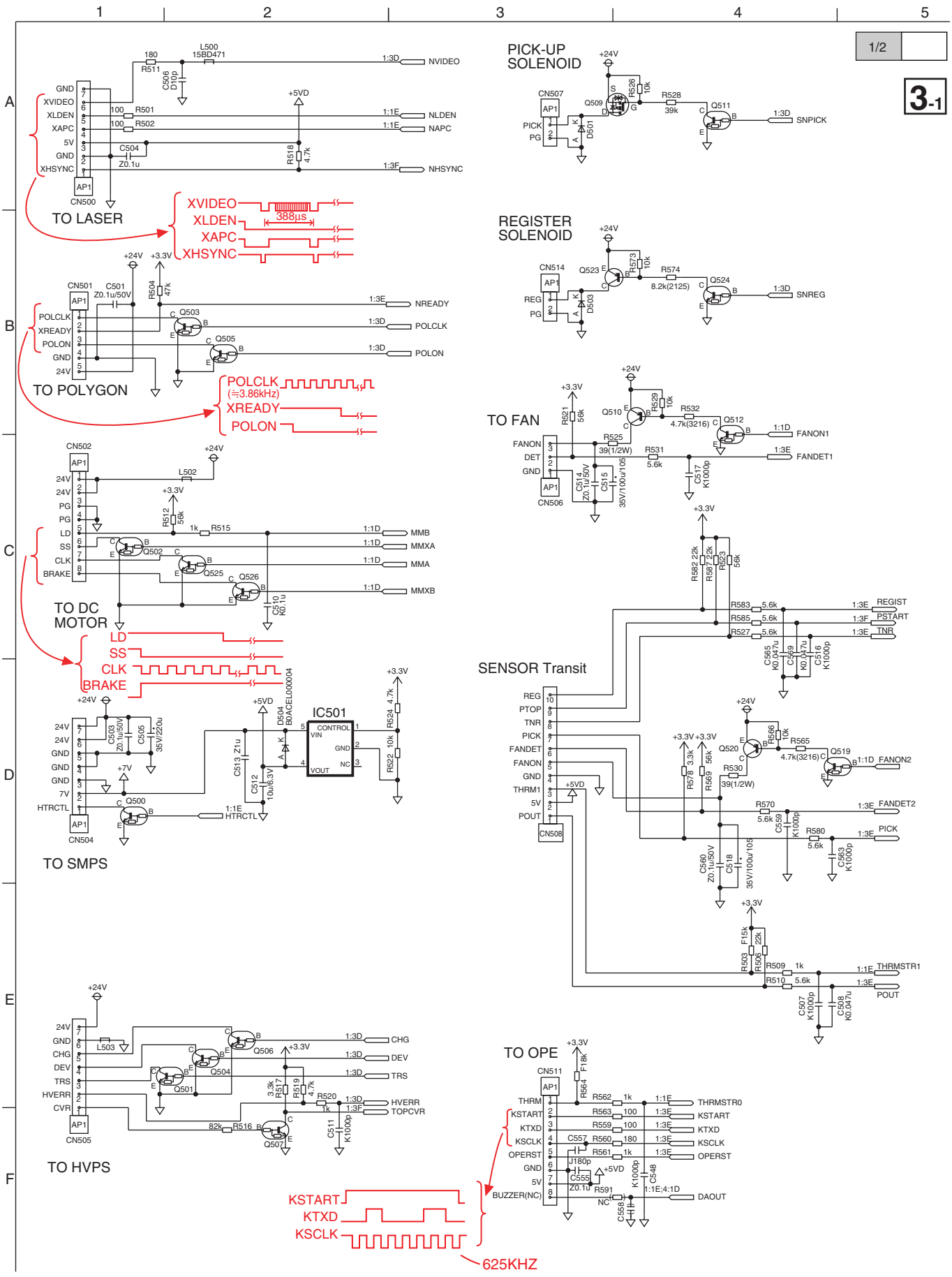
KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.2) (1/2)





KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.2) (2/2)

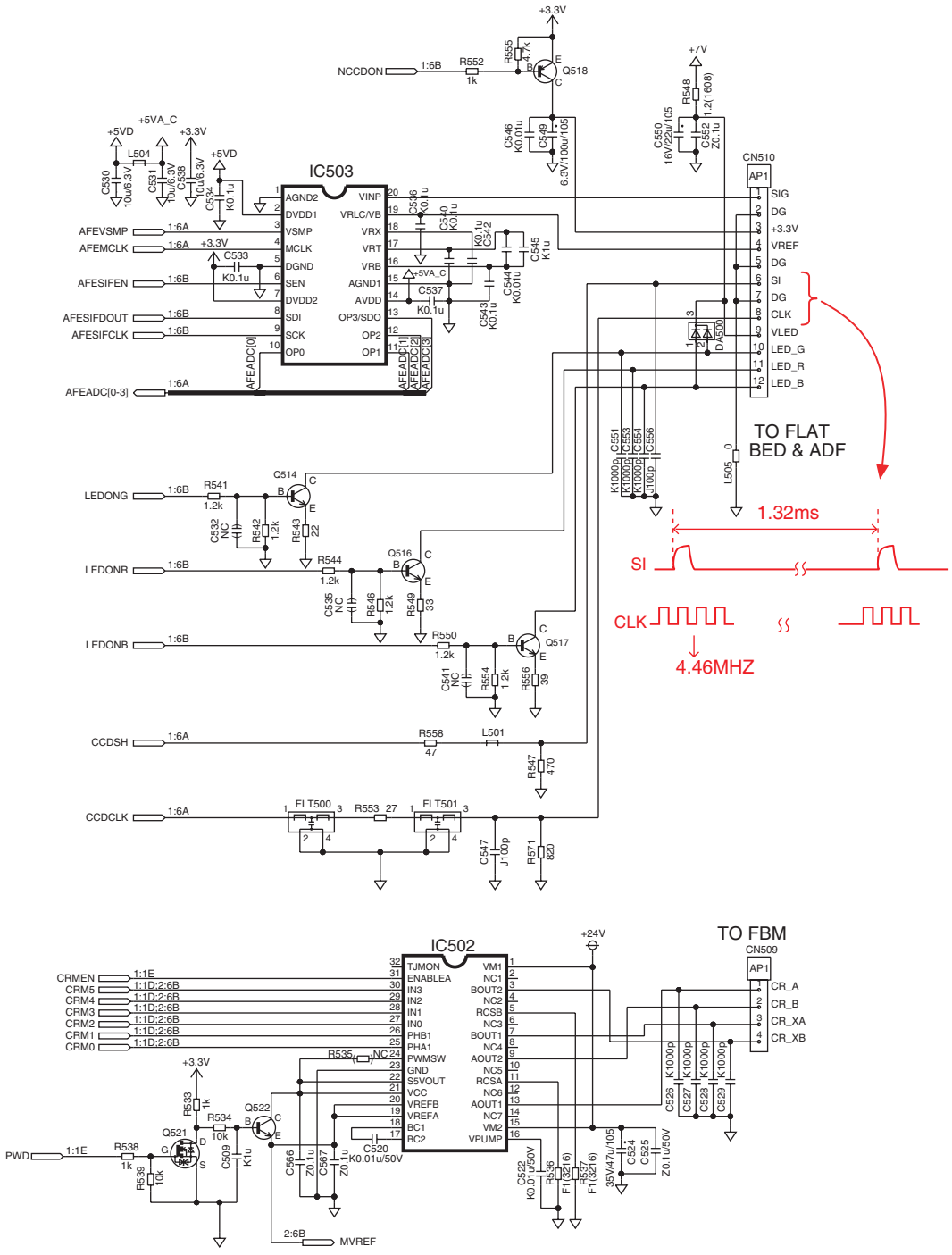
16.2.3. MAIN BOARD (3)



KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.3) (1/2)

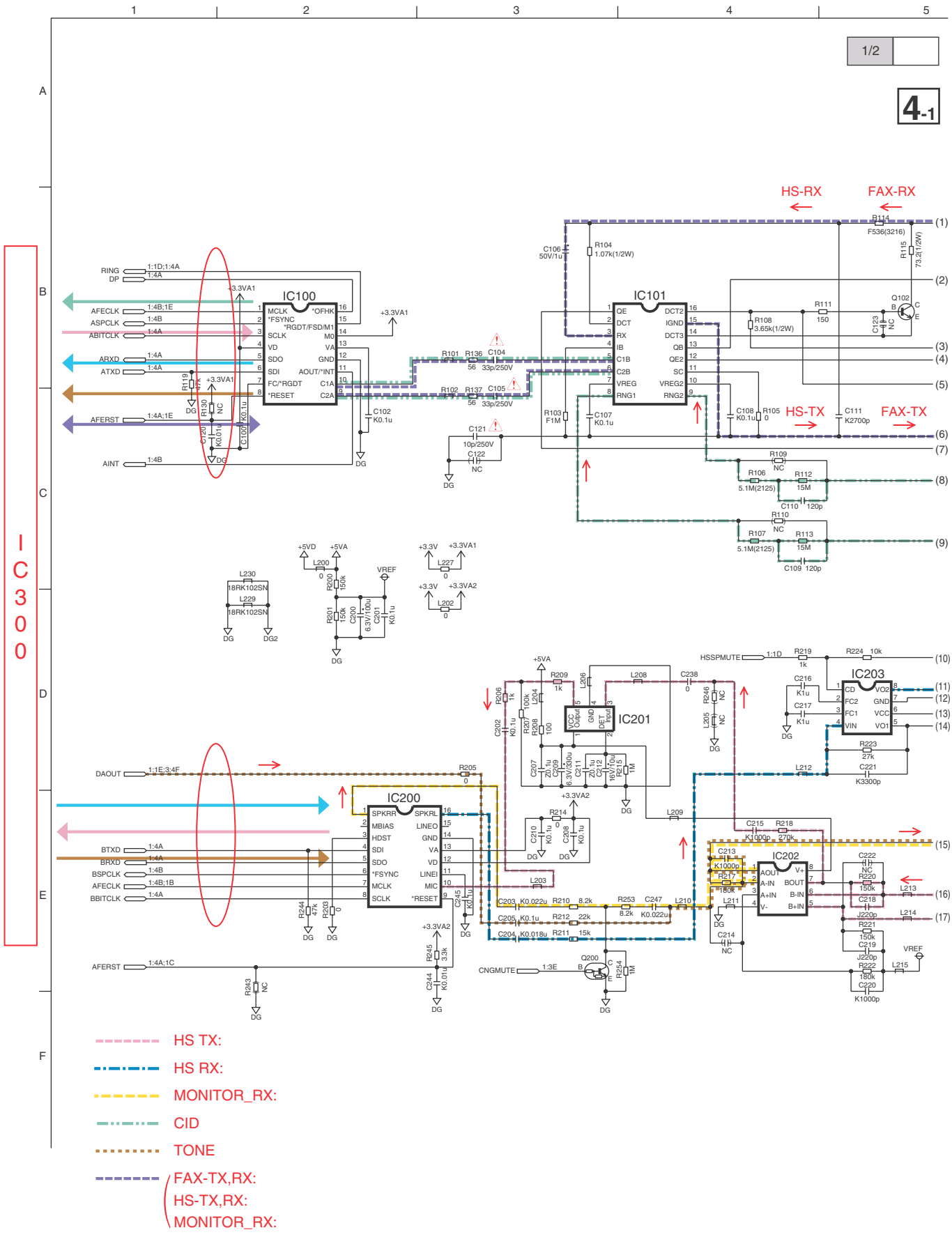
2/2

3-2

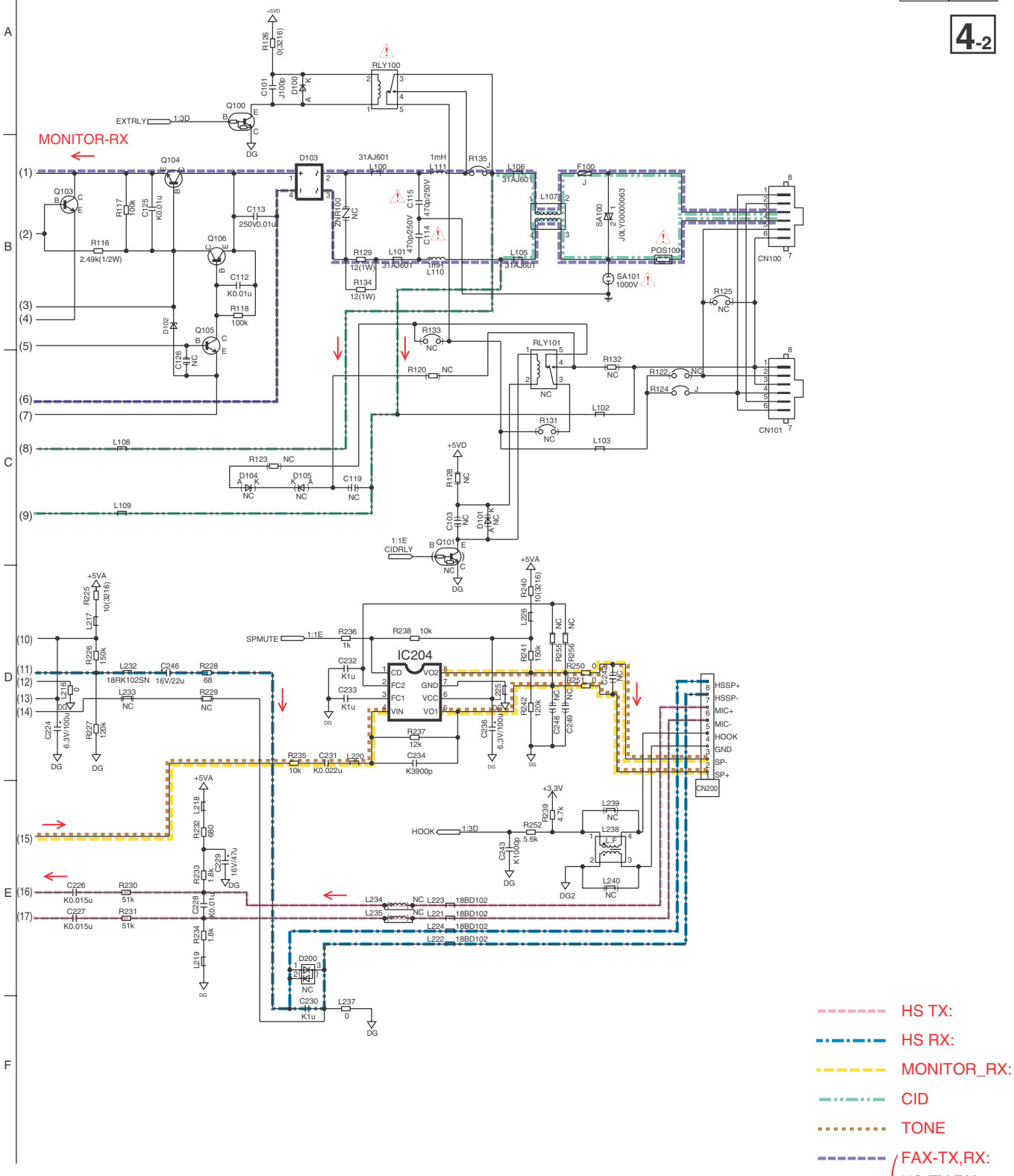


KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.3) (2/2)

16.2.4. MAIN BOARD (4)

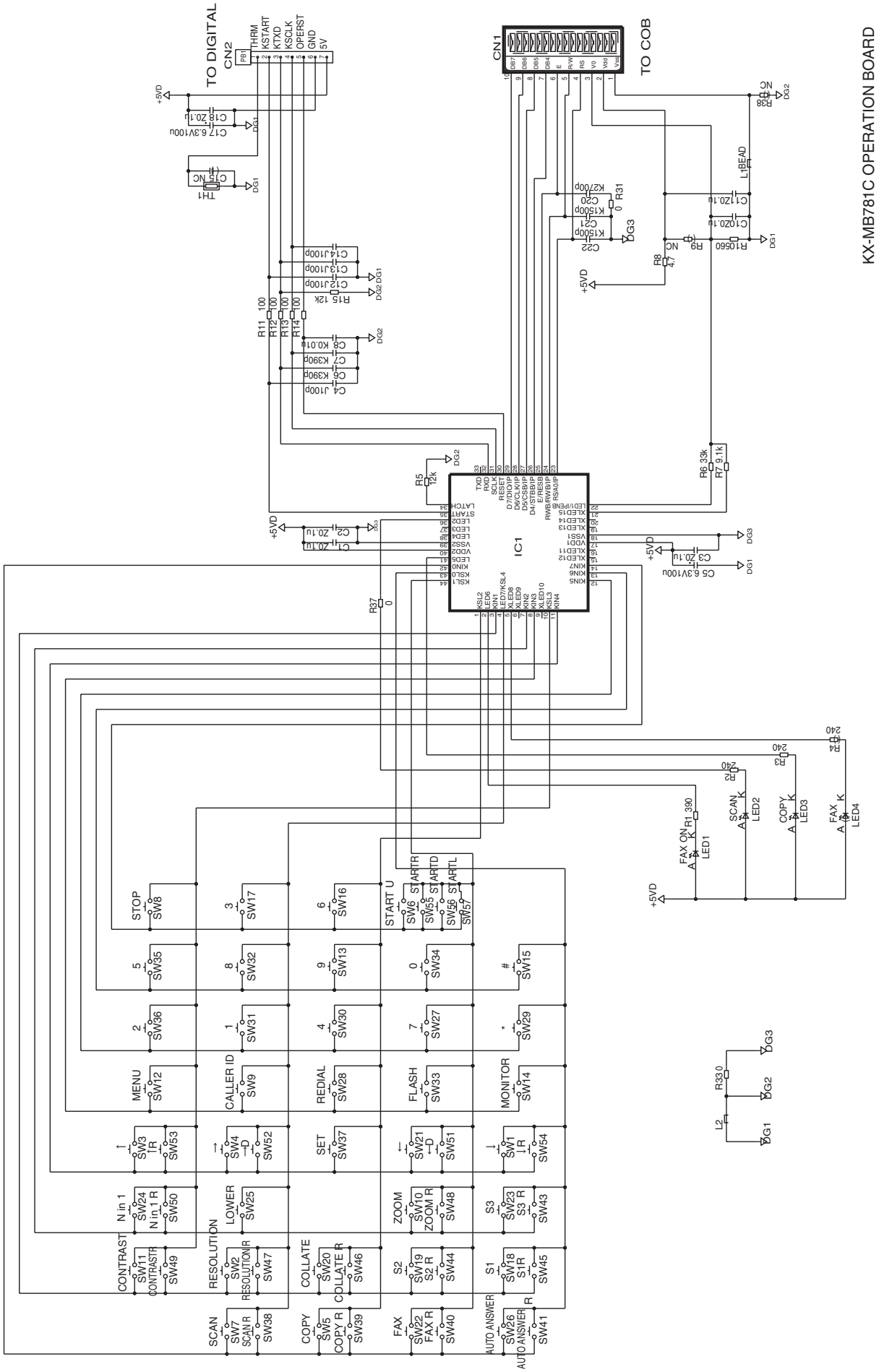


KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.04) (1/2)



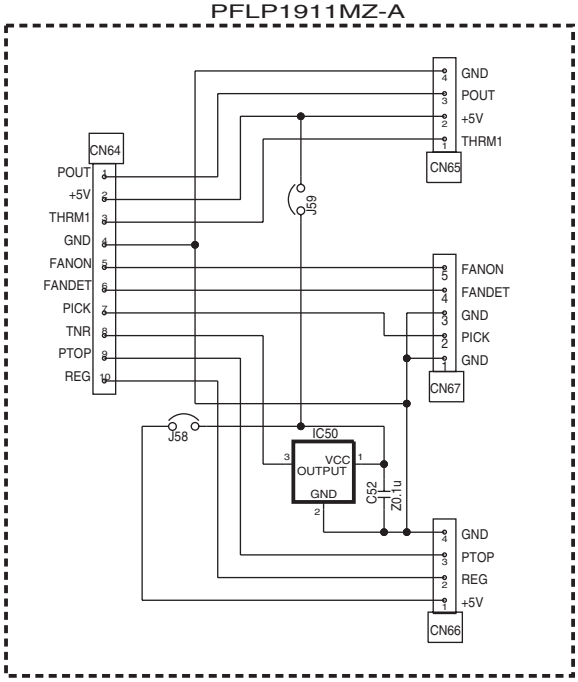
KX-MB781C SCHEMATIC DIAGRAM (MAIN BOARD No.4) (2/2)

16.3. OPERATION BOARD

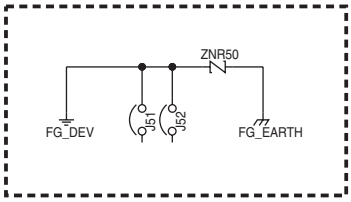


16.4. SENSOR BOARD

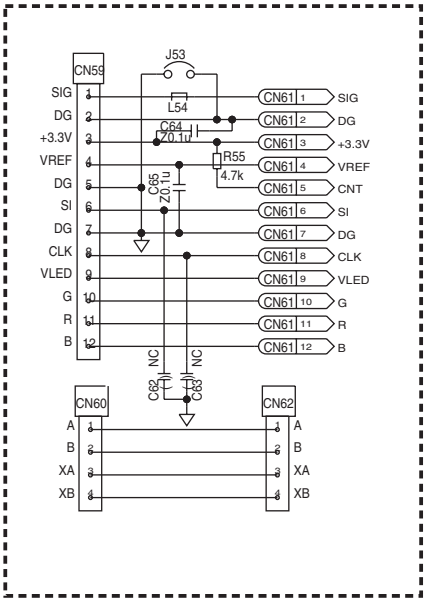
TNR
PFLP1911MZ-A



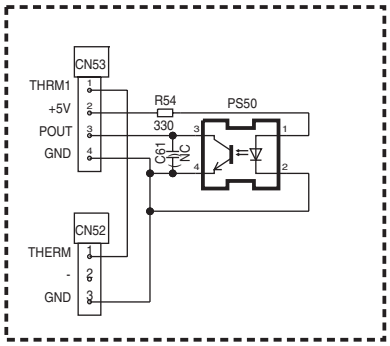
Varistor
PFLP1911MZA-E



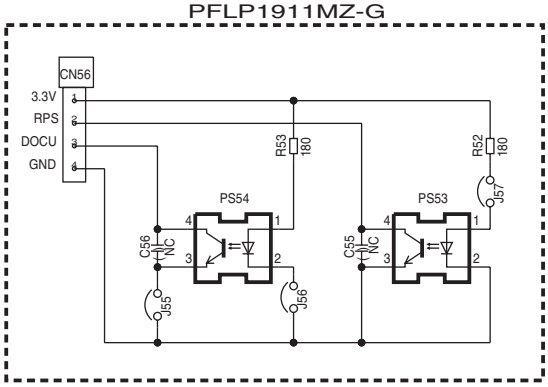
FB
PFLP1911MZ-F



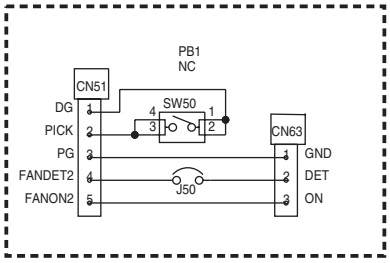
Fuser (Exit Sensor)
PFLP1911MZ-B



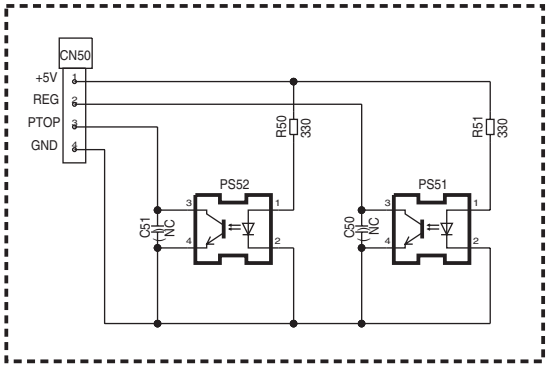
ADF
PFLP1911MZ-G



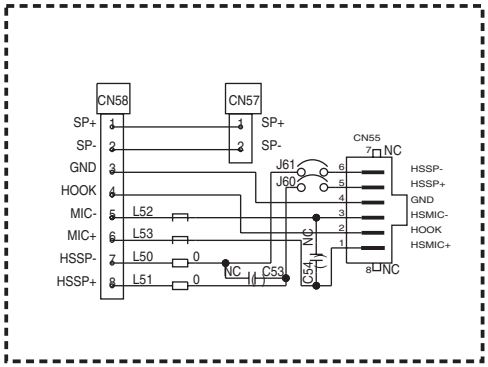
PICKUP & FAN2
PFLP1911MZ-C



REGIST & PTOP
PFLP1911MZ-D

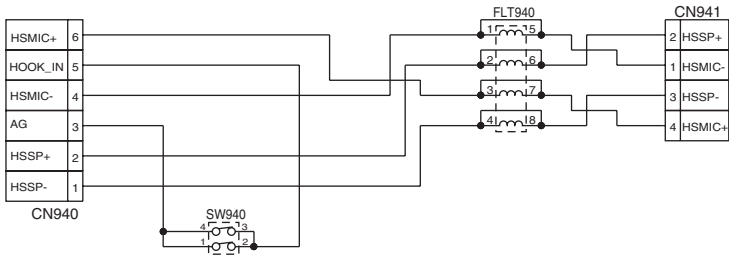


HS & SP
PFLP1911MZ-H



KX-MB781C SENSOR BOARD

16.5. HOOK SWITCH BOARD

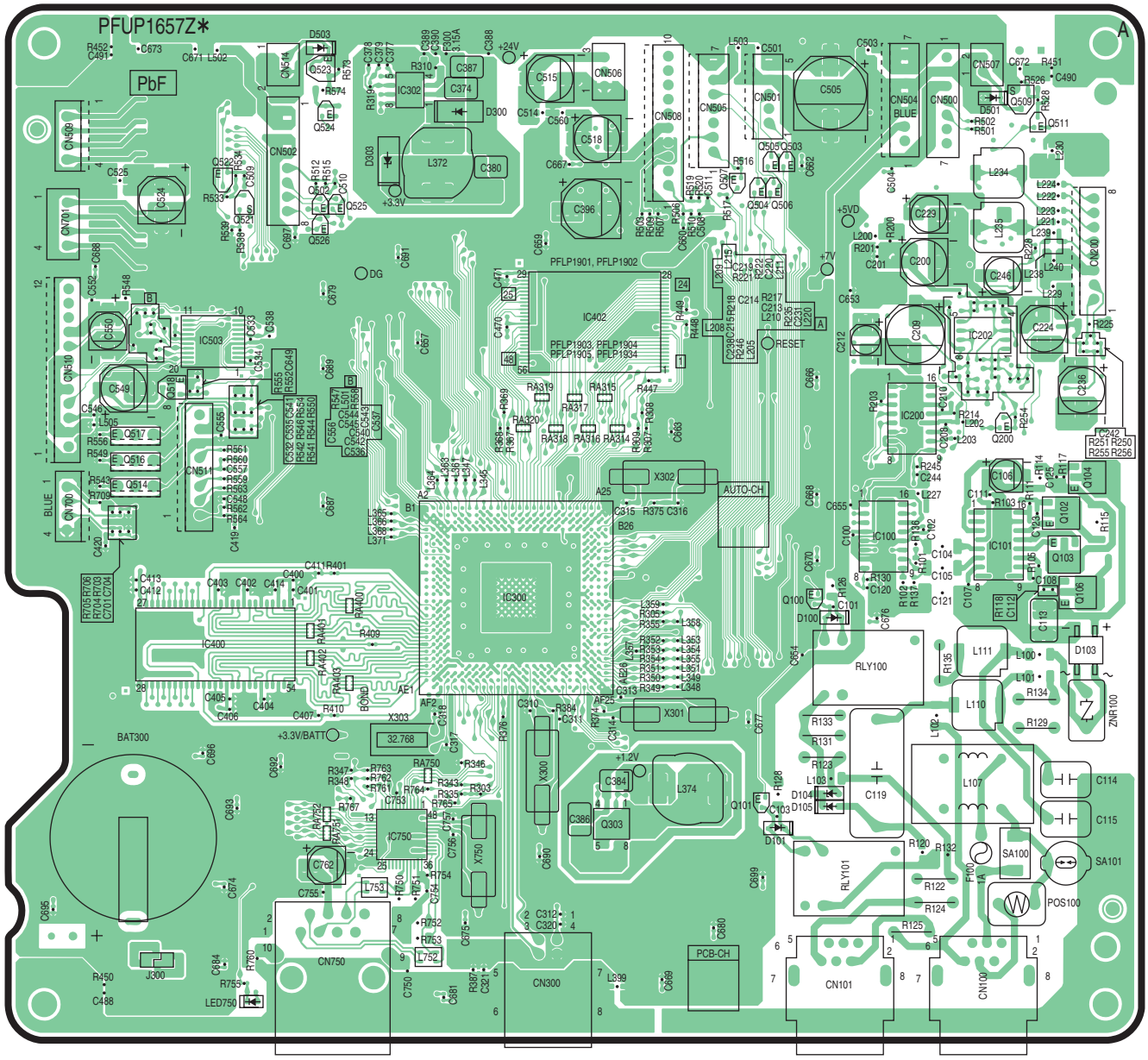


KX-MB781C: HOOK SWITCH BOARD

17 Printed Circuit Board

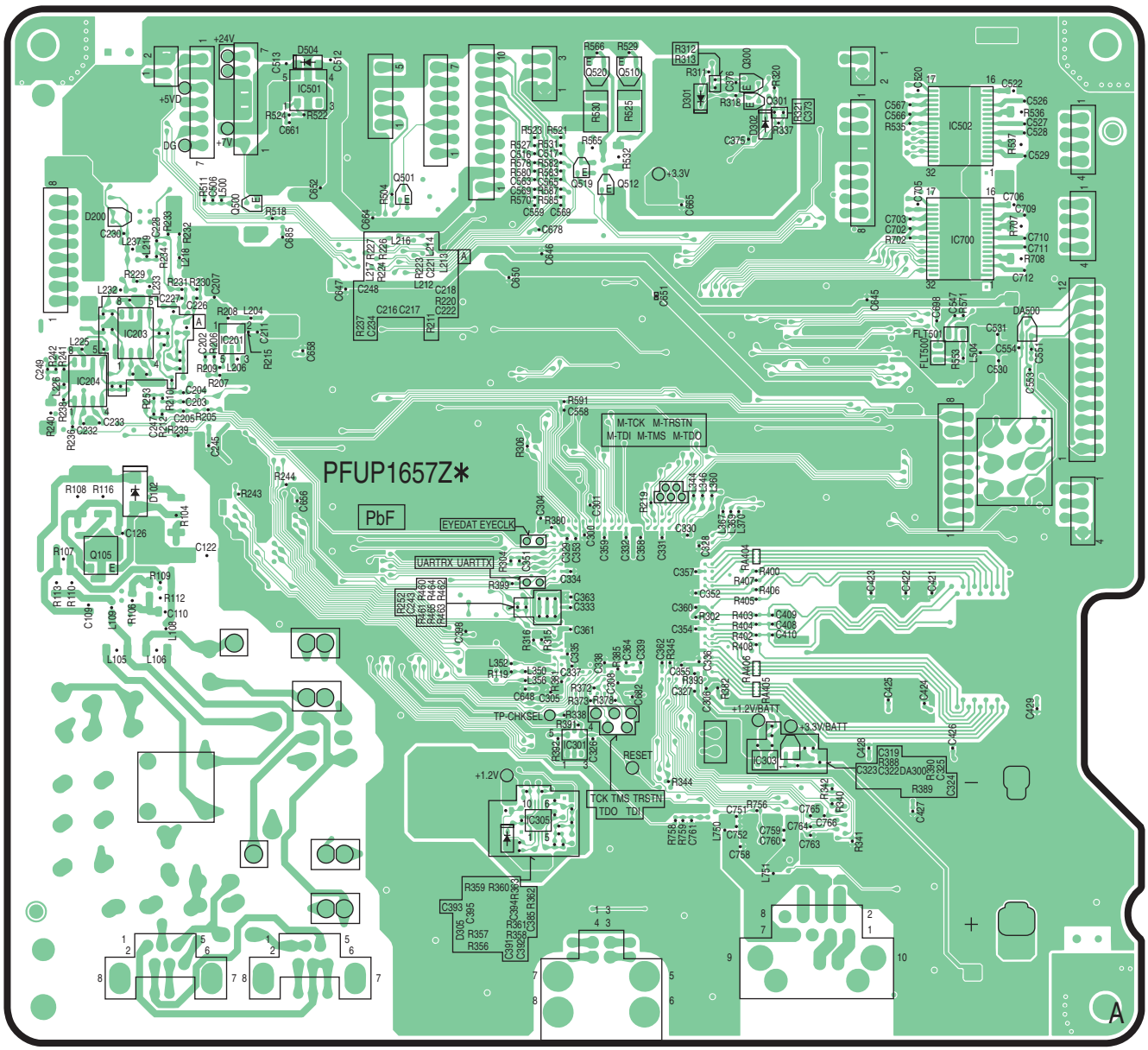
17.1. MAIN BOARD

17.1.1. MAIN BOARD: COMPONENT VIEW



KX-MB781C MAIN BOARD COMPONENT VIEW

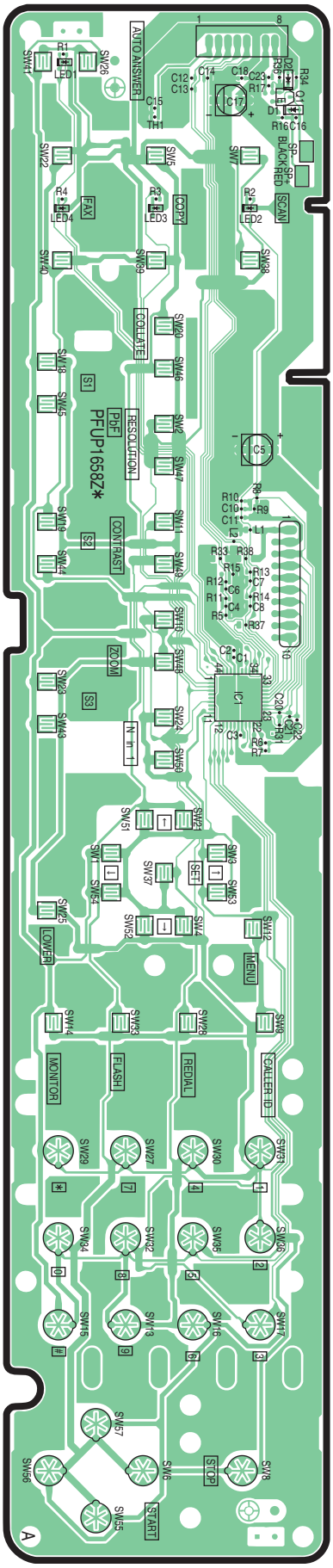
17.1.2. MAIN BOARD: BOTTOM VIEW



KX-MB781C MAIN BOARD BOTTOM VIEW

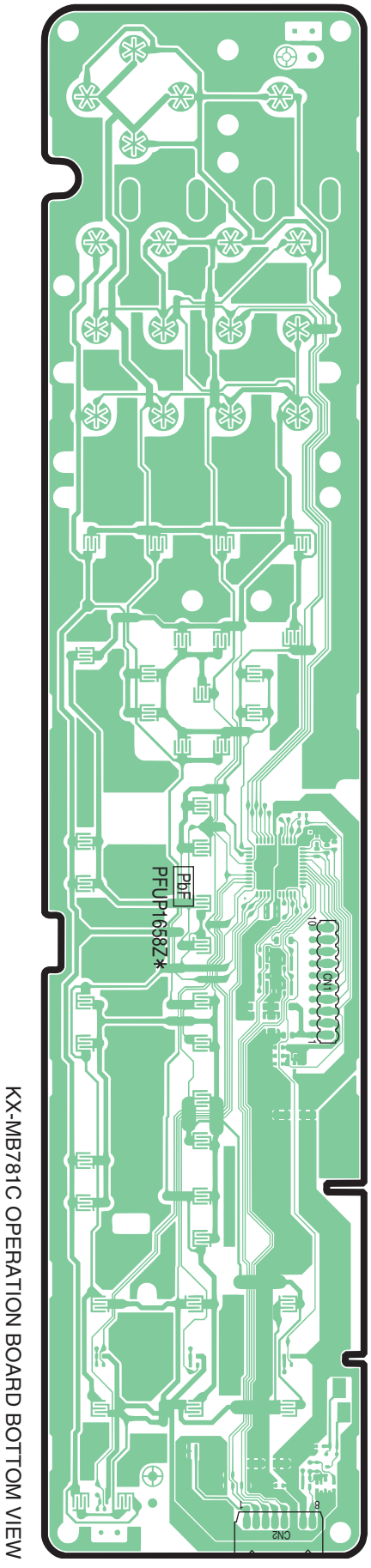
17.2. OPERATION BOARD

17.2.1. OPERATION BOARD: COMPONENT VIEW



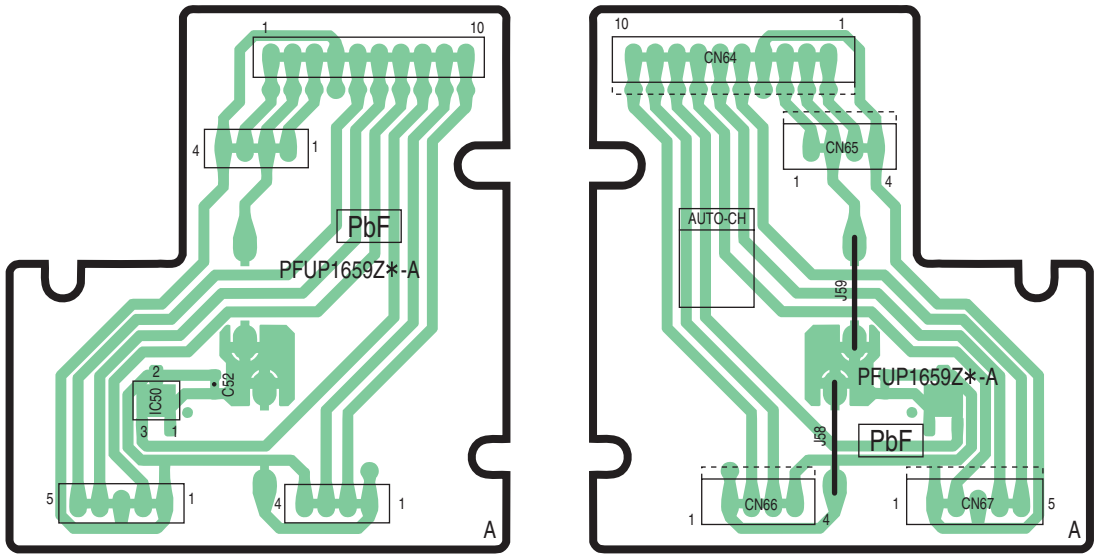
KX-MB781C OPERATION BOARD COMPONENT VIEW

17.2.2. OPERATION BOARD: BOTTOM VIEW



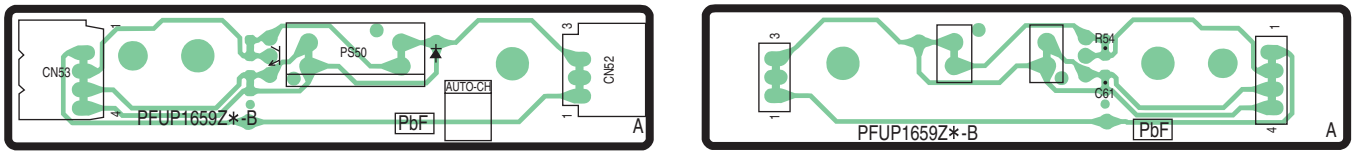
17.3. SENSOR BOARD

17.3.1. TONER SENSOR BOARD



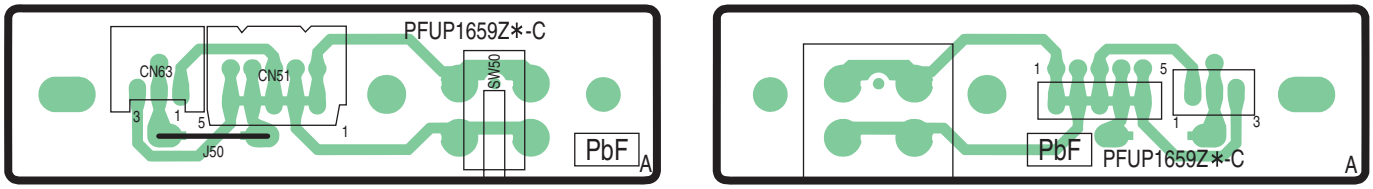
KX-MB781C TONER SENSOR BOARD

17.3.2. FUSER BOARD (EXIT SENSOR BOARD)



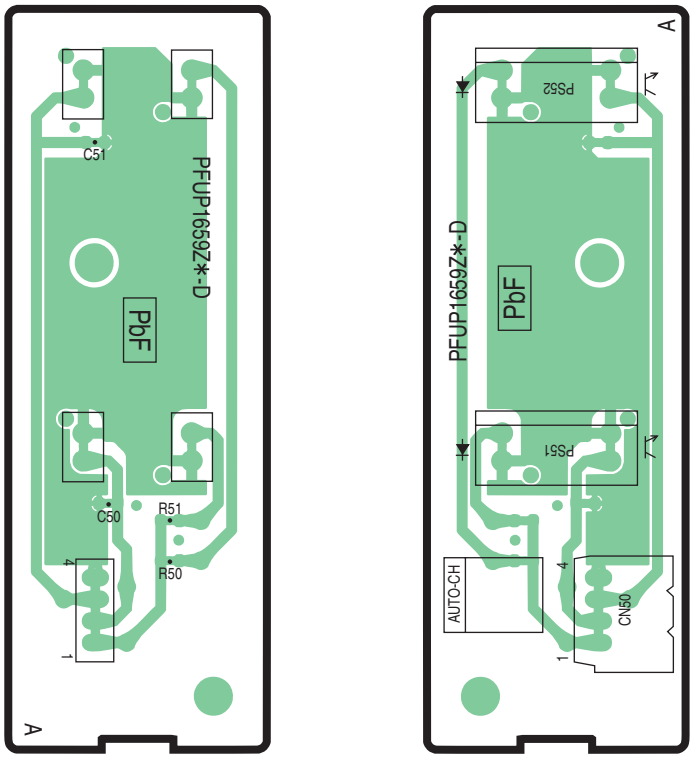
KX-MB781C FUSER SENOSR BOARD

17.3.3. PICKUP SENSOR BOARD



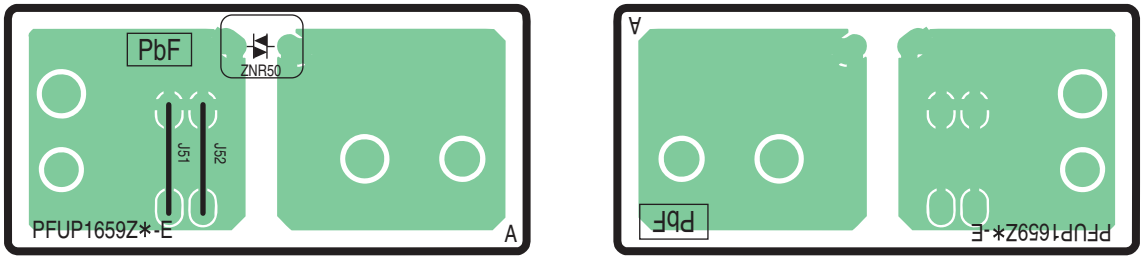
KX-MB781C PICKUP SENSOR BOARD

17.3.4. REGISTRATION BOARD



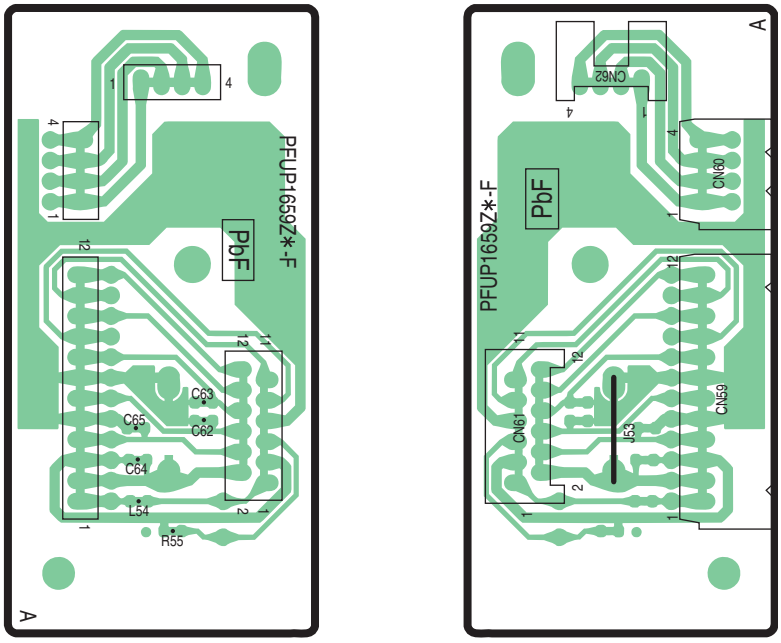
KX-MB781C REGISTRATION BOARD

17.3.5. VARISTOR SENSOR BOARD



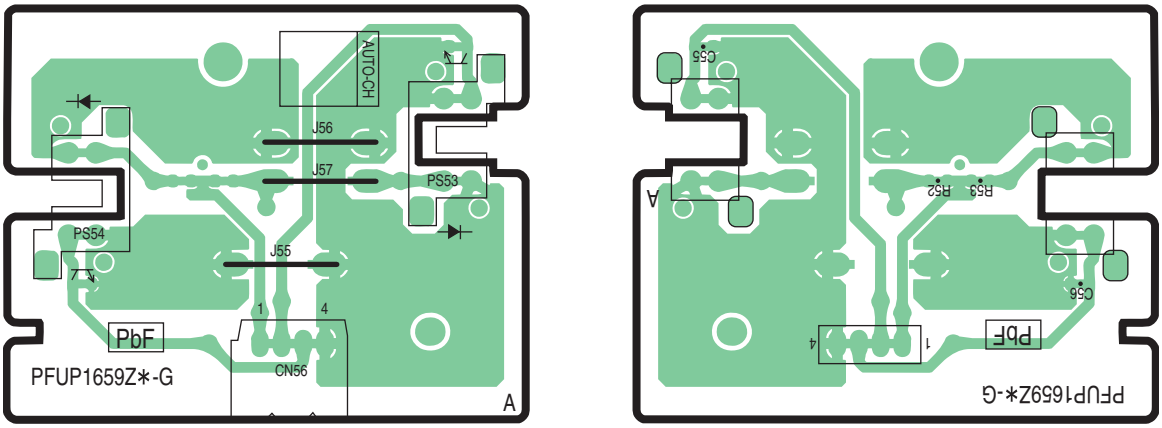
KX-MB781C VARISTOR SENSOR BOARD

17.3.6. FLATBED RELAY BOARD



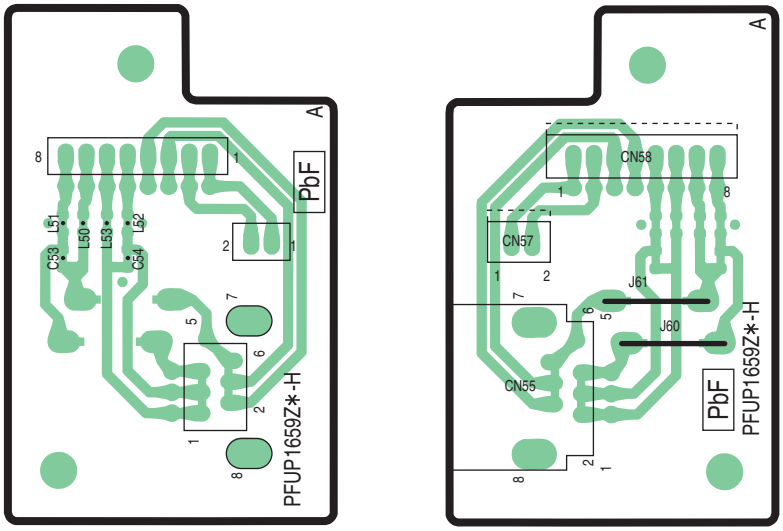
KX-MB781C FLATBED RELAY BOARD

17.3.7. ADF SENSOR BOARD



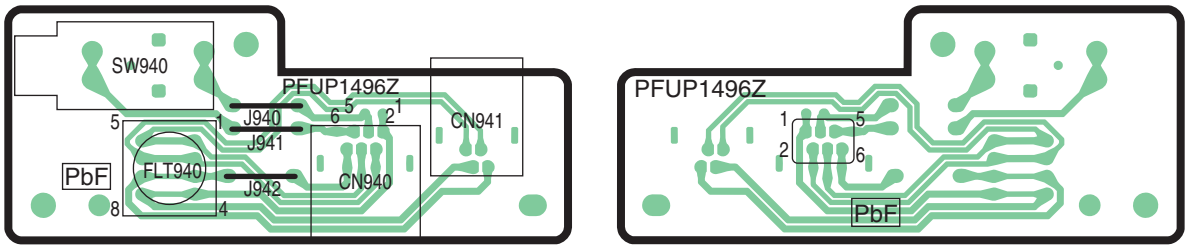
KX-MB781C ADF SENSOR BOARD

17.3.8. HANDSET RELAY BOARD



KX-MB781C HANDSET RELAY BOARD

17.4. HOOK SWITCH BOARD

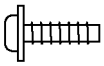


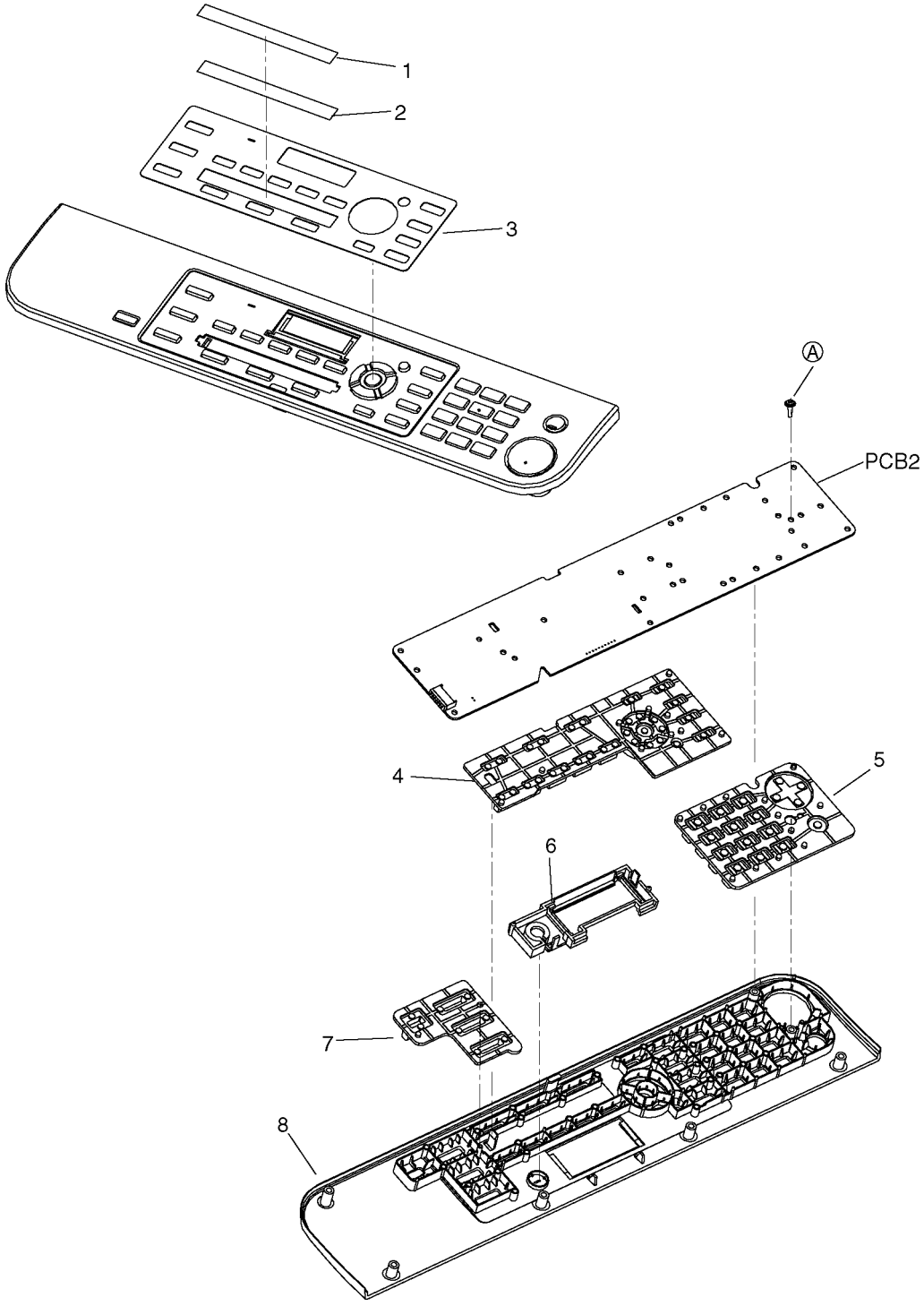
KX-MB781C: HOOK SWITCH BOARD

18 Exploded View and Replacement Parts List

18.1. CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

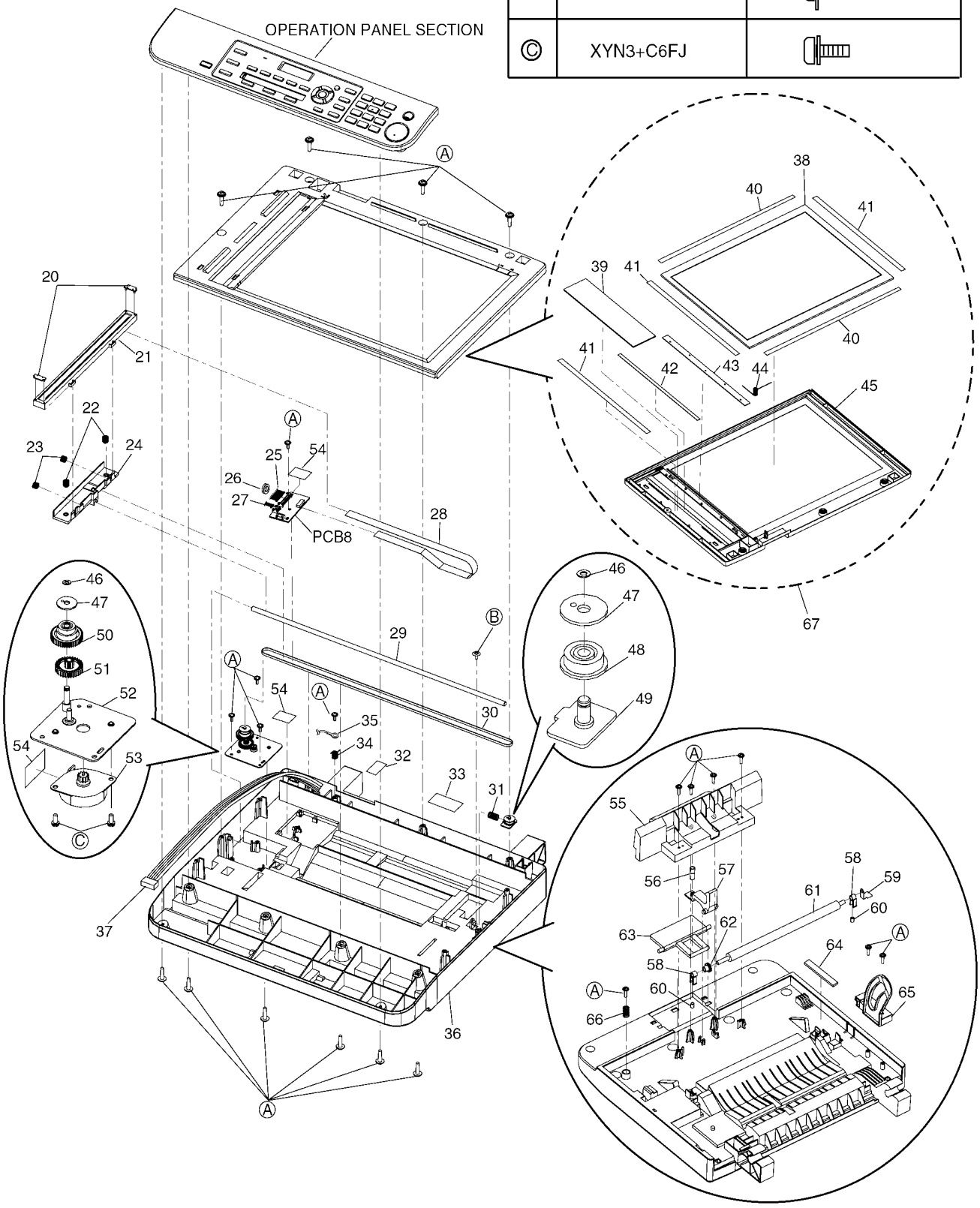
18.1.1. OPERATION PANEL SECTION

	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	

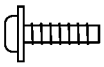


18.1.2. TOP COVER SECTION

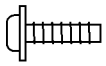
	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓑ	XTW3+W10PFJ	
Ⓒ	XYN3+C6FJ	

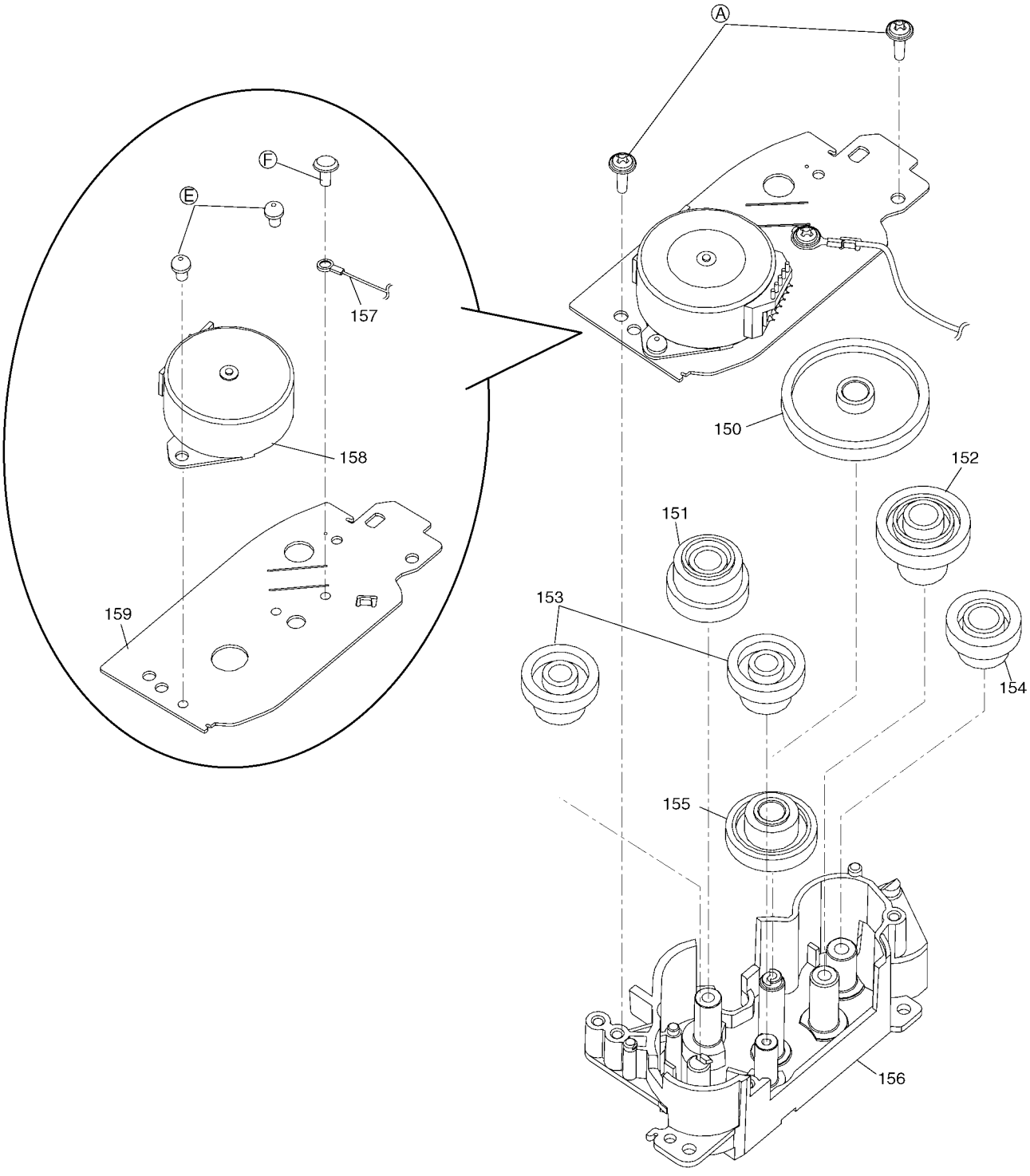


18.1.3. ADF SECTION

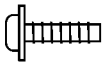
	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	

18.1.4. MOTOR SECTION

	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓔ	XYC3+CF5FJ	
Ⓕ	XTW3+6LFJ7	

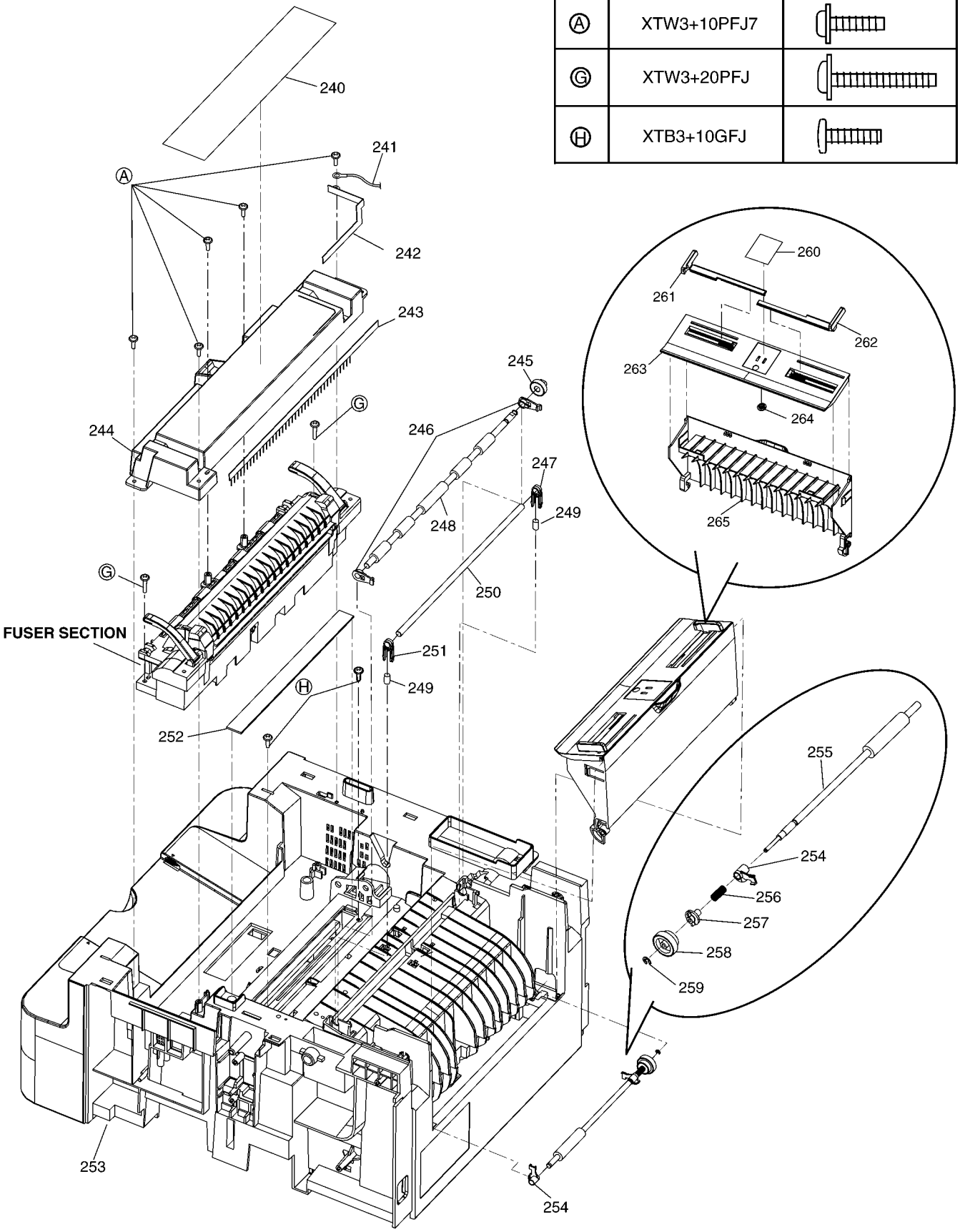


18.1.5. LOWER CABINET SECTION

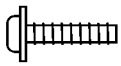
	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓕ	XTW3+6LFJ7	

18.1.6. UPPER CABINET SECTION

	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓖ	XTW3+20PFJ	
Ⓗ	XTB3+10GFJ	

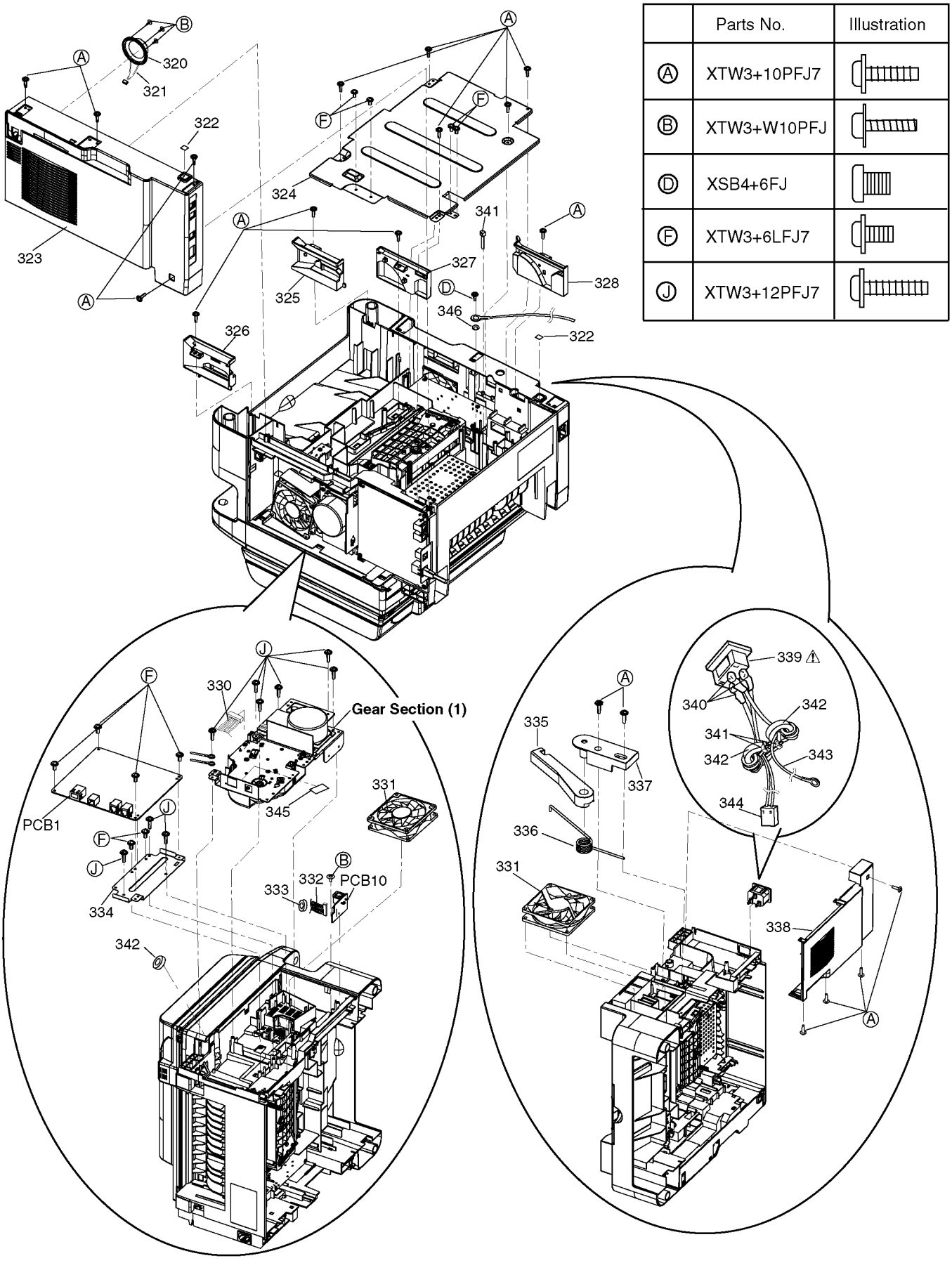


18.1.7. FUSER SECTION

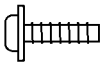
	Parts No.	Illustration
Ⓙ	XTW3+12PFJ7	
Ⓚ	XYC3+FF8FJ	

18.1.8. LOWERSIDE CABINET

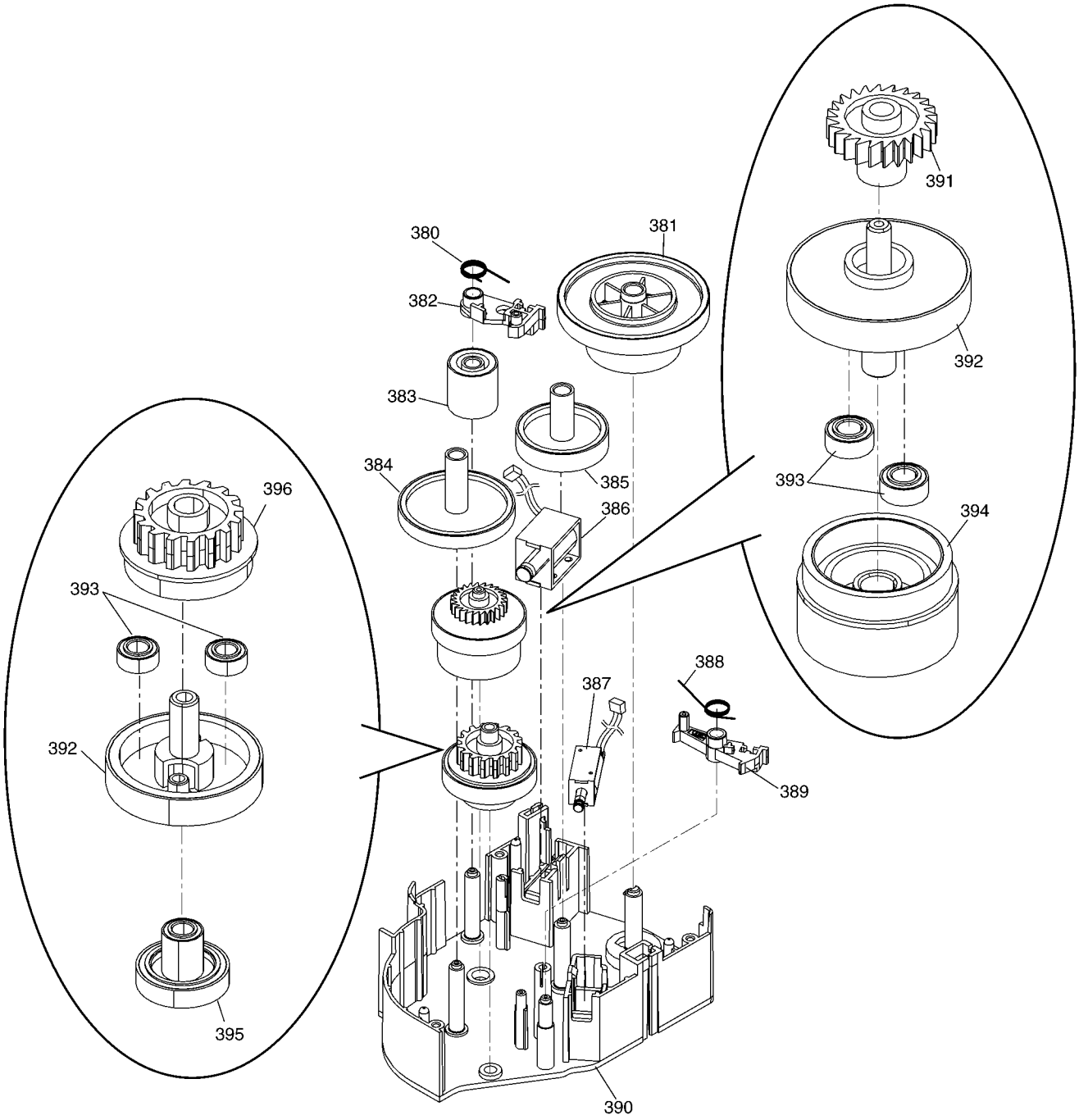
	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓑ	XTW3+W10PFJ	
Ⓓ	XSB4+6FJ	
Ⓕ	XTW3+6LFJ7	
Ⓙ	XTW3+12PFJ7	



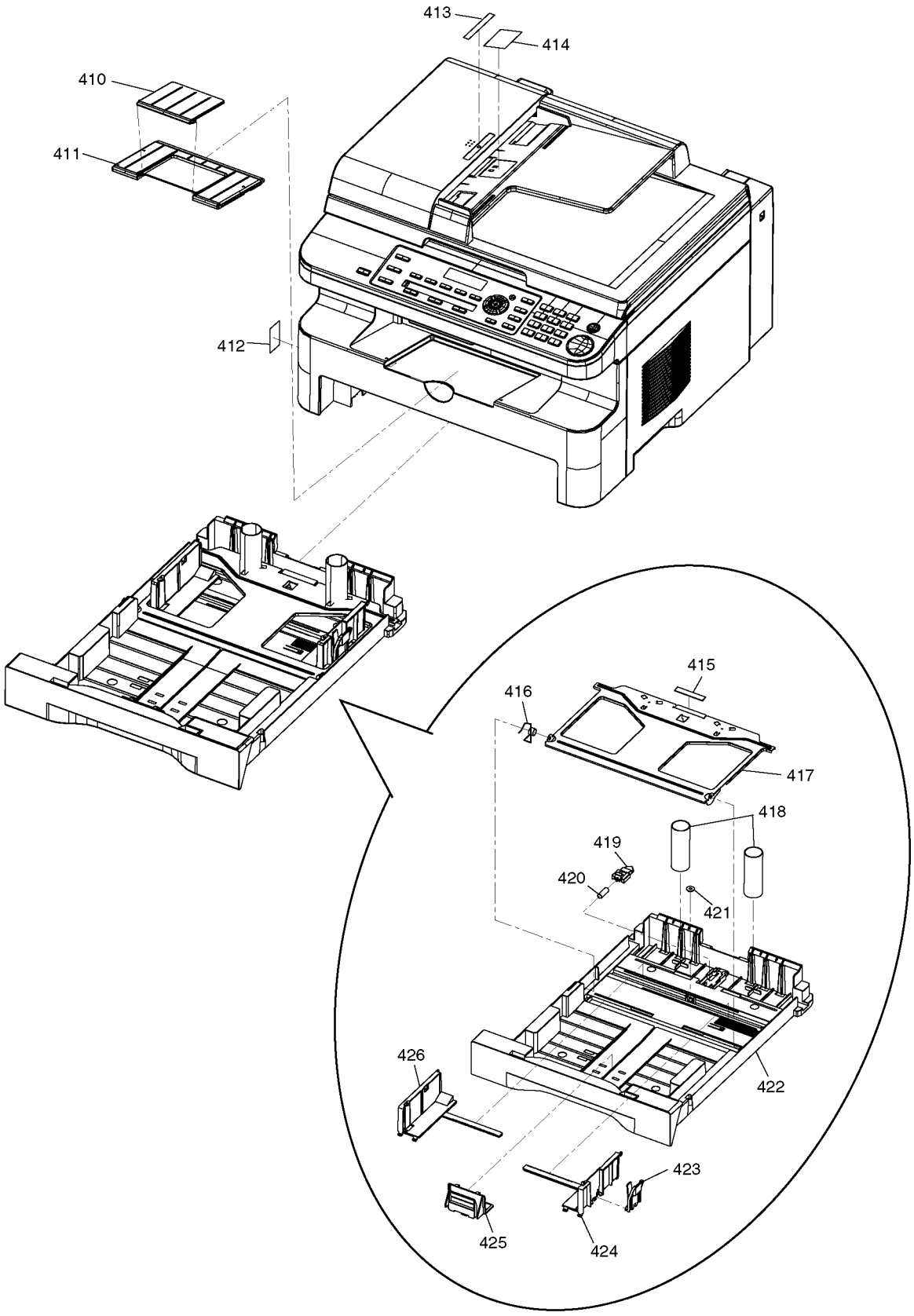
18.1.9. GEAR SECTION (1)

	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓕ	XTW3+6LFJ7	

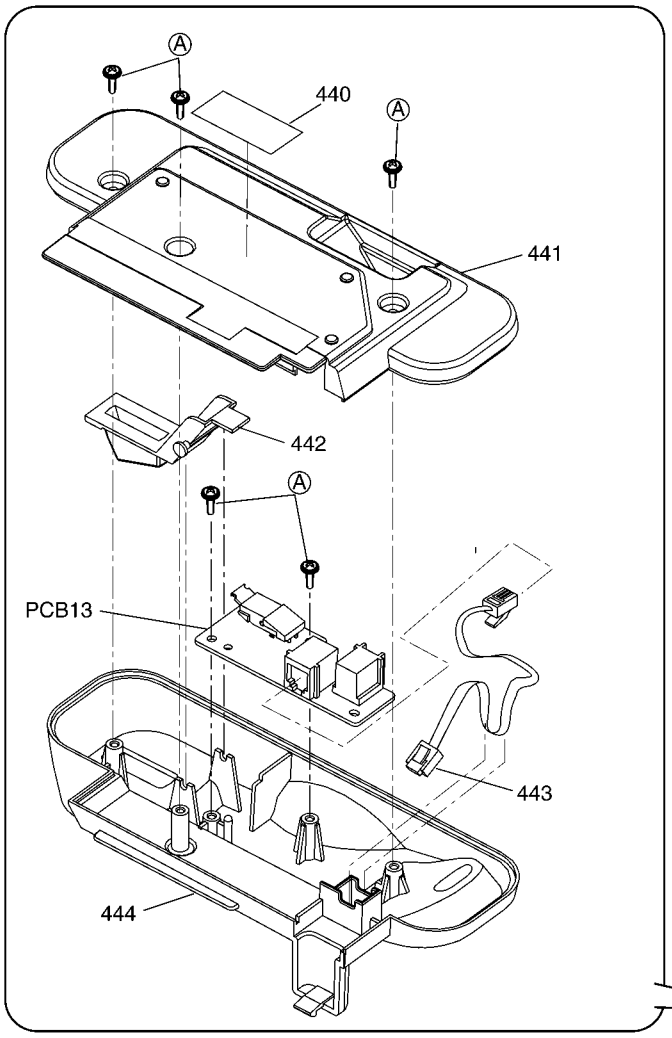
18.1.10. GEAR SECTION (2)



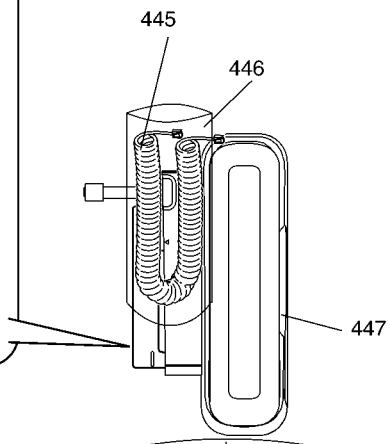
18.1.11. CASSETTE / OUTPUT TRAY

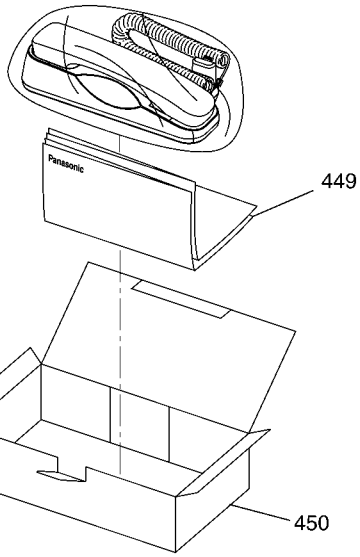


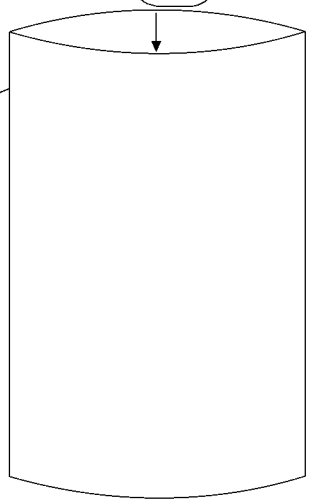
18.1.12. KX-FA103A OPTIONAL HANDSET



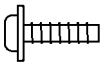
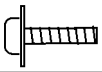
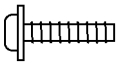
	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	



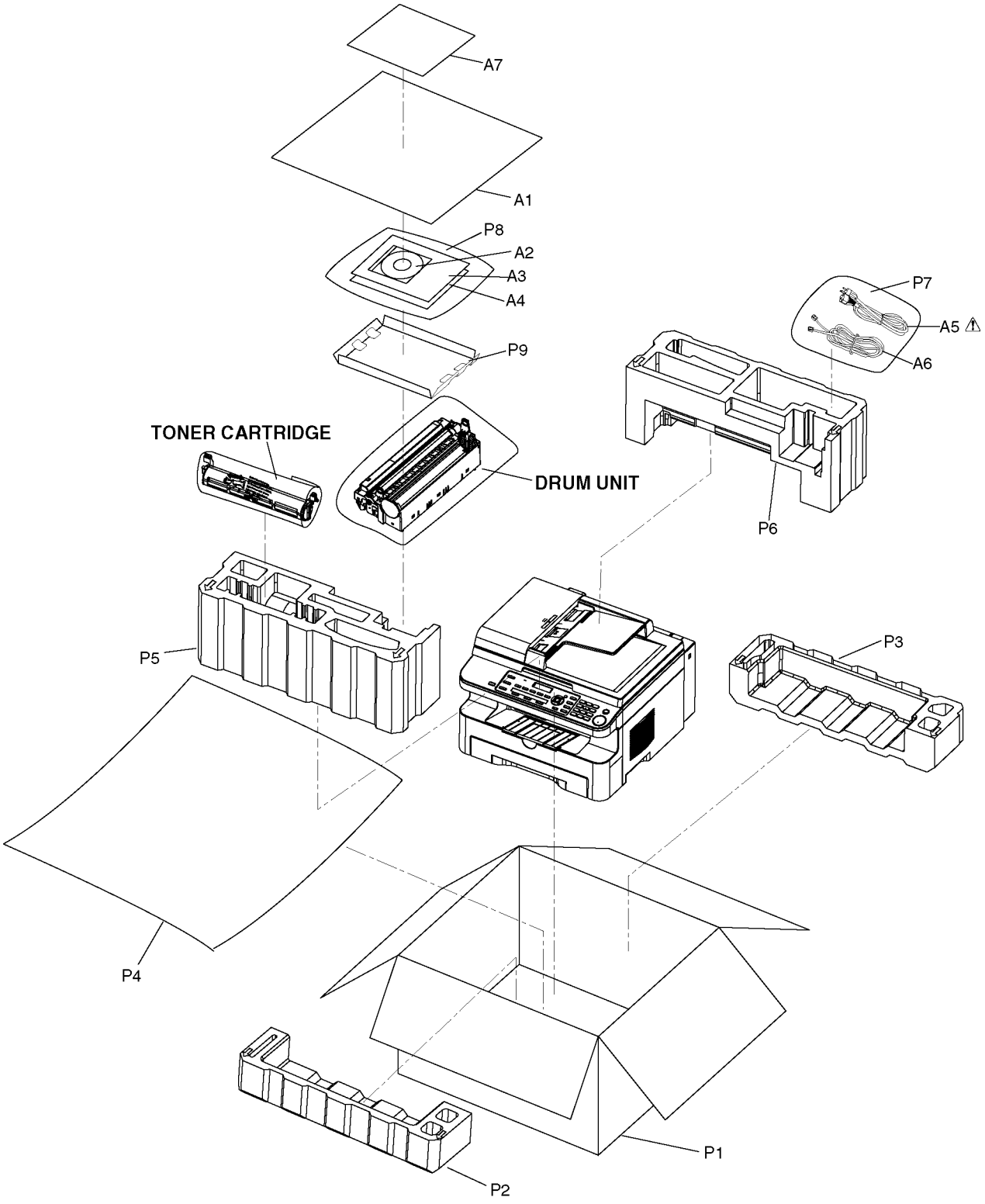




18.1.13. ACTUAL SIZE OF SCREWS AND WASHERS

	Illustration
Ⓐ	
Ⓑ	
Ⓒ	
Ⓓ	
Ⓔ	
Ⓕ	
Ⓖ	
Ⓗ	
Ⓙ	
Ⓚ	

18.1.14. ACCESSORIES AND PACKING MATERIALS



18.2. REPLACEMENT PARTS LIST

RTL (Retention Time Limited)

Notes:

1. The “RTL” marking indicates that its Retention Time is Limited.
   When production is discontinued, this item will continue to be available only for a specific period of time. This period of time depends on the type of item, and the local laws governing parts and product retention.
   At the end of this period, the item will no longer be available.
2. Important safety notice
   Components identified by ⚠ 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=1000Ω, M=1000kΩ
   All capacitors are in MICRO FARADS (μF) P=μμF
   *Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor 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 ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

18.2.1. CABINET AND ELECTRICAL PARTS

18.2.1.1. OPERATION PANEL SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PFGV1023Z	COVER	
	2	PFGD1082Y	CARD	
	3	PFGP1422K	PANEL	
	4	PFBX1285P	PUSH BUTTON	
	5	PFBX1284Z	PUSH BUTTON	
	6	PFHR1709Z	PLASTIC PARTS	ABS
	7	PFBX1286Z	PUSH BUTTON	
	8	PFGG1310G1	GRILLE	PS

18.2.1.2. TOP COVER SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	20	PFDE1303X	SPACER	POM
	21	N2GAYY000002	IMAGE SENSOR	
	22	PFUS1642Y	COIL SPRING	
	23	PFUS1344Z	COIL SPRING	
	24	PFDC1005Y	GUIDE	POM
	25	PFJS12M80Y	LEAD WIRE	
	26	PQLB1E1	INSULATOR	
	27	PFJS04M74Z	LEAD WIRE	
	28	PFJE1068Z	LEAD WIRE	
	29	PFDF1188Z	SHAFT	
	30	PFDV1005Z	ANGULAR BELT	
	31	PFUS1817Z	COIL SPRING	
	32	PFHE1319Z	PLASTIC PARTS	
	33	PFHX2134Z	PLASTIC PARTS	
	34	PFUS1819Z	TORSION SPRING	
	35	WLL20YG18M3M	LEAD WIRE	
	36	PFKM1228Y1	CABINET BODY	PS
	37	PFJS08M78Z	LEAD WIRE	
	38	PF0G1016Z	GLASS	
	39	PF0G1017Z	GLASS	
	40	PFHE1304Z	TAPE	
	41	PFHE1306Z	TAPE	
	42	PFHX1796Z	PLASTIC PARTS	
	43	PFMH1256Z	ANGLE	
	44	PFUS1820Z	TORSION SPRING	
	45	PFKF1205Y1	CABINET COVER	PS
	46	PFNPD031054C	WASHER	
	47	PFDE1170Z	PULLEY	POM
	48	PFDE1169Z	PULLEY	POM
	49	PFMH1257Z	PLATE	
	50	PFDE1168Z	PULLEY	POM
	51	PFDG1551Y	PIN	POM
	52	PFMH1258Z	PLATE	
	53	L6HAYYYK0013	DC MOTOR	
	54	PFHX2126Z	PLASTIC PARTS	
	55	PFKV1165Y1	COVER	PS
	56	PFUS1818Y	COIL SPRING	
	57	PFDE1301Z	LEVER	POM
	58	PFDJ1042Z	SPACER	POM
	59	PFMH1159Z	METAL PARTS	
	60	PFUS1269Y	COIL SPRING	
	61	PFDS1030Y	ROLLER	
	62	PFDG1294Z	GEAR	POM
	63	PFBS1004Z	KNOB	ABS
	64	PFHG1287Y	RUBBER PARTS	
	65	PFDE1302Z	ARM	PS
	66	PFUS1851Z	COIL SPRING	
	67	PFZXMB781M	PARTS KIT	

18.2.1.3. ADF SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	80	PFUS1822Z	COIL SPRING	
	81	PFDF1190Z	SHAFT	
	82	PQDR9685Y	ROLLER	
	83	PFDJ1044Z	SPACER	
	84	PFUS1826Z	COIL SPRING	
	85	PFDF1095Z	PIN	
	86	PFDE1247X	LEVER	POM
	87	PFKV1166Z1	COVER	PS
	88	PFKR1110Z1	GUIDE	ABS
	89	PFKE1084Z1	COVER	PS
	90	PFHG1284Z	RUBBER PARTS	
	91	PFKV1167Z1	COVER	PS
	92	PFHG1282Z	RUBBER PARTS	
	93	PFDE1307Z	GUIDE	ABS
	94	PFKR1111Z1	GUIDE	ABS
	95	PFUS1620Z	COIL SPRING	
	96	PFUS1918Z	COIL SPRING	
	97	PFDG1015Y	GEAR	POM
	98	PFDR1062Z	ROLLER	
	99	PFDG1417Z	GEAR	POM
	100	XUC2FJP	RETAINING RING	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PFDE1244Z	LEVER	POM
	102	PFDG1416Z	GEAR	POM
	103	PFDR1065Z	ROLLER	
	104	PFDG1413Z	GEAR	POM
	105	PFHR1479Z	GUIDE	POM
	106	PFDF1189Z	SHAFT	
	107	XUC3FJP	RETAINING RING	
	108	PFDR1064Z	ROLLER	
	109	PFDF1125Z	SHAFT	
	110	PFHX2126Z	PLASTIC PARTS	
	111	PFUS1325Z	COIL SPRING	
	112	PFDG1558Z	GEAR	POM
	113	PFDG1559Z	GEAR	POM
	114	PQUS10038Z	COIL SPRING	
	115	PFJS04M81Z	LEAD WIRE	
	116	PFDR1103Y	ROLLER	
	117	PFDG1415Y	GEAR	POM
	118	PFDJ1116Y	SPACER	POM
	119	PFUS1824Z	COIL SPRING	
	120	PFDE1306Z	LEVER	POM
	121	PFDR1104Z	ROLLER	
	122	PFDE1308Y	LEVER	POM
	123	PFUS1629Z	TORSION SPRING	
	124	PFHE1298Z	METAL PARTS	
	125	PFDJ1116Z	SPACER	POM
	126	PFUG1049Y	GUIDE	PS
	127	PFUE1048Z	FRAME	PS
	128	PFUS1825Z	TORSION SPRING	
	129	PFDR1073Z	ROLLER	POM
	130	PFDF1191Z	SHAFT	
	131	PFHX2130Y	PLASTIC PARTS	
	132	PFHR1710Y	CAM	POM
	133	PFHR1290Z	CHASSIS	POM
	134	PFHR1292Z	PLASTIC PARTS	POM
	135	PFUS1350Z	COIL SPRING	
	136	PFKM1229X1	CABINET BODY	PS
	137	PFUS1621Z	BAR SPRING	
	138	PFHR1289Z	CHASSIS	POM
	139	PFDR1066Z	ROLLER	POM
	140	PQHR945Z	BAND	

18.2.1.4. MOTOR SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	150	PFDG1552Z	GEAR	POM
	151	PFDG1554Z	GEAR	POM
	152	PFDG1555Z	GEAR	POM
	153	PFDG1557Z	GEAR	POM
	154	PFDG1556Z	GEAR	POM
	155	PFDG1553Z	GEAR	POM
	156	PFUA1096Y	CHASSIS	
	157	PFDW1001Z	LEAD WIRE	
	158	L6HAYYYK0015	DC MOTOR, STEPPING	
	159	PFMH1259Z	ANGLE	

18.2.1.5. LOWER CABINET SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	180	PFJS07M77Z	LEAD WIRE	
	181	NOT USED		
	182	PFJS07M84Z	LEAD WIRE	
⚠	183	LPA1622K	LASER UNIT	
	184	PFUS1028Z	LEAF SPRING	
	185	PF0M1008Z	MIRROR	
	186	PFUE1046Z	COVER	PS
	187	PFUS1592Z	TORSION SPRING	
	188	PFJS05M75Z	LEAD WIRE	
	189	PFQT2643Z	INDICATION PLATE-LABEL	
	190	PFJS02M95Z	LEAD WIRE	
	191	PFJS07M82Z	LEAD WIRE	
	192	PFJS05M76Z	LEAD WIRE	
	193	PFUV1111Z	COVER	PS
	194	PFJS04M72Z	LEAD WIRE	
	195	PFDE1252Z	LEVER	POM
	196	PFJS10M79Z	LEAD WIRE	
	197	WLL20YG24M3M	LEAD WIRE	
	198	PFUS1811Z	COIL SPRING	
	199	PFUS1612Z	COIL SPRING	
	200	PFUE1045Z	LEVER	PS
	201	PFUS1916Z	TORSION SPRING	
	202	PFUS1809Z	TORSION SPRING	
	203	PFUE1044Z	CHASSIS	PS
	204	PFUS1808Z	BAR SPRING	
	205	PFUS1807Z	BAR SPRING	
	206	PFUS1806Z	BAR SPRING	
	207	PFUS1805Z	BAR SPRING	
	208	PFDG1418Z	GEAR	POM
	209	PFDF1187Z	SHAFT	
	210	PFDJ1084Z	SPACER	POM
	211	PFUG1043Z	GUIDE	PS
	212	PFDJ1098Z	SPACER	POM
	213	PFDE1300Z	LEVER	POM
	214	PFDR1067Z	PULLEY	POM
	215	PFDE1246Z	CHASSIS, HOLDER	POM
	216	PFDN1088Z	ANGULAR BELT	
	217	PFMH1255Z	COVER	
	218	PFDF1097Z	SHAFT	
	219	PFUS1685Z	COIL SPRING	
	220	PFDR1071Y	ROLLER	POM
	221	PFUS1658Z	COIL SPRING	
	222	PFHE1178Z	SPACER	
	223	PFUG1044Z	GUIDE	PS
	224	PFHG1155Z	RUBBER PARTS	
	225	PFHR1537Z	ARM	
	226	PFHR1706Z	COVER, HOLDER	ABS
	227	PFUS1609Z	COIL SPRING	

18.2.1.6. UPPER CABINET SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	240	PFQT2938Z	INDICATION PLATE-LABEL	
	241	WLL20YG24M3M	LEAD WIRE	
	242	PFSE1054Z	ANGLE	
	243	PFJV1013Z	METAL PARTS	
	244	PFUE1047Y	ANGLE	ABS+GF20%
	245	PFDG1420Z	GEAR	POM
	246	PFDJ1044Z	SPACER	POM
	247	PFDJ1086Y	SPACER	POM
	248	PFDN1080Z	ROLLER	
	249	PFUS1613Z	COIL SPRING	
	250	PFDF1137Z	SHAFT	
	251	PFDJ1086Z	SPACER	POM
	252	PF0G1015Z	GLASS	
	253	PFKM1225Z1	CABINET BODY	PS
	254	PFDJ1085Z	SPACER	POM
	255	PFDN1091Z	ROLLER	
	256	PFUS1812Z	COIL SPRING	
	257	PFDE1299Z	ROLLER, DELAY	POM
	258	PFDG1550Z	GEAR	POM
	259	XUC2FJP	RETAINING RING	
	260	PFQT2937Z	INDICATION PLATE-LABEL	
	261	PFKR1079Z1	GUIDE	ABS
	262	PFKR1080Z1	GUIDE	ABS
	263	PFKE1083Z1	PLASTIC PARTS	PS
	264	PFDG1015Y	GEAR	
	265	PFKK1050Z1	DOOR-LID	PS

18.2.1.7. FUSER SECTION

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	280	PFDJ1115Z	SPACER	PPS
	281	PFDS1015Y	ROLLER	
⚠	282	A4DP3L000002	HALOGEN LAMP	
	283	PFDJ1114Z	SPACER	PPS
	284	PFDG1421Z	GEAR	PPS
	285	PFJT1030Z	TERMINAL-TERMINAL PLATE	
⚠	286	K0BDB0000073	THERMOSTAT	
	287	PFJT1031Z	TERMINAL-TERMINAL PLATE	
	288	PFJT1032Z	TERMINAL-TERMINAL PLATE	
	289	PFMH1085Z	METAL PARTS	
	290	PFHR1711Z	ARM	PPS
	291	PFUS1640Z	COIL SPRING	
	292	PFDR1068Z	ROLLER	
	293	PFDG1422Z	GEAR	Polya-mide
	294	XUC2FJP	RETAINING RING	
	295	PFDG1423Z	GEAR	POM
	296	PFDS1025Z	ROLLER	
	297	PFDJ1113Z	SPACER	POLY-ETHER-IMIDE
	298	PFUS1426Z	COIL SPRING	
	299	PFHR1705Z	ARM	PBT+ABS-GF30
	300	PFHR1495Z	LEVER	PBT+GF30
	301	PFUA1094Y	CHASSIS,BASE	PBT+ABS GF30%
	302	PFDR1069Z	ROLLER	POM
	303	PFHR1496Z	LEVER	PBT+GF30
	304	PFUS1568Z	BAR SPRING	
	305	PFJS04M73Z	LEAD WIRE	
	306	PFRT003	THERMISTOR	S
	307	PFUA1095X	CHASSIS,HOUSING	PBT+ABS GF30%
	308	PFUS1686Z	TORSION SPRING	
	309	PFDE1310Z	LEVER	

18.2.1.8. LOWERSIDE CABINET

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	320	L0AA05A00048	SPEAKER	
	321	PFJS02M47Z	LEAD WIRE	
	322	PFHA1001Z	RUBBER PARTS	
	323	PFKM1230Z1	CABINET BODY	PS
	324	PFMD1112Z	PLATE	
	325	PFUG1046Z	GUIDE	ABS
	326	PFUG1045Z	GUIDE	ABS
	327	PFUG1047Z	GUIDE	ABS
	328	PFUG1048Z	GUIDE	ABS
	329	NOT USED		
	330	PFJS08M85Z	LEAD WIRE	
	331	L6FAYYYK0001	DC MOTOR	
	332	PFJS08M83Z	LEAD WIRE	
	333	J0KE00000119	INSULATOR	
	334	PFMH1253Y	COVER	
	335	PFDE1305Z	ARM	POM
	336	PFUS1821Z	TORSION SPRING	
	337	PFDE1304Z	ANGLE	POM
	338	PFKM1227Y1	CABINET BODY	PS
⚠	339	K2AH3G000011	JACK	
	340	PQMX10010Z	COVER	
	341	PQHR945Z	BAND	
	342	PQLB1E1	INSULATOR	
	343	WLR18YK39CM4	LEAD WIRE	
	344	PFJS02M86Z	CORD	
	345	PFHX1937Z	COVER	
	346	XWC4BFJ	WASHER	

18.2.1.9. GEAR SECTION (1)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	360	PFDG1548Z	GEAR	POM
	361	PFNPD052080	SPACER	
	362	PFDG1549Z	GEAR	POM
	363	PFDG1544Z	GEAR	POM
	364	PFDG1543Z	GEAR	POM
	365	PFUV1114Z1	COVER	S
	366	L6CCYYYK0002	DC MOTOR	
	367	PFMD1111Y	CHASSIS	
	368	PFHX2127Y	COVER,SHEET	

18.2.1.10. GEAR SECTION (2)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	380	PFUS1803Z	TORSION SPRING	
	381	PFDG1545Z	GEAR	POM
	382	PFDE1298Z	LEVER	POM
	383	PFDG1391Z	GEAR	POM
	384	PFDG1546Z	GEAR	POM
	385	PFDG1390Z	GEAR	POM
	386	L9AAAYYB0001	ERECTROMAGNETIC COIL	
	387	L9AAAYYB0006	ERECTROMAGNETIC COIL	
	388	PFUS1802Z	TORSION SPRING	
	389	PFDE1297Z	LEVER	POM
	390	PFUA1092Z	CHASSIS	PBT+ABS
	391	PFDG1547Z	GEAR	POM
	392	PFDG1402Z	GEAR	POM
	393	PFDG1403Z	GEAR	POM
	394	PFDG1404Z	GEAR	POM
	395	PFDG1401Z	GEAR	POM
	396	PFDG1407Z	GEAR	POM

18.2.1.11. CASSETTE / OUTPUT TRAY

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	410	PFKS1157Z1	TRAY	PS
	411	PFKS1156Z1	TRAY	PS
	412	PFHX1993Z	INDICATION PLATE-LABEL	
	413	PFQT2932Z	INDICATION PLATE-LABEL	
	414	PFQT2933Z	INDICATION PLATE-LABEL	
	415	PFHG1245Z	RUBBER PARTS	
	416	PFUS1814Z	TORSION SPRING	
	417	PFMD1113Z	FRAME	
	418	PFUS1815Z	COIL SPRING	
	419	PFHR1491Z	LEVER	POM
	420	PFUS1608Z	COIL SPRING	
	421	PFDG1015Y	GEAR	
	422	PFKS1158Z1	TRAY	PS
	423	PFHR1707Z	LEVER	POM
	424	PFKR1109Z	GUIDE	ABS
	425	PFKR1085Y	GUIDE	POM
	426	PFKR1108Z	GUIDE	ABS

18.2.1.12. KX-FA103A OPTIONAL HANDSET

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	440	PFGT2907Z-M	NAME PLATE, AL	S
	441	PFKF1085Y1	CABINET COVER	
	442	PFBH1032Z1	PUSH BUTTON	
	443	PFJA06B002Z	CORD,TEL	
	444	PFKM1181X1	CABINET BODY	
	445	PFJA1029Z	CORD	
	446	PQPH75Z	PROTECTION COVER	
	447	PFJXE0841Z	HANDSET	
	448	XZB20X30A04	PROTECTION COVER	
	449	PFQW2318Y	INSTRUCTION BOOK	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	450	PFPK2920Z-M	PACKING CASE	S

18.2.1.13. SCREWS

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTW3+10PFJ7	TAPPING SCREW,STEEL	
	B	XTW3+W10PFJ	TAPPING SCREW, STEEL	
	C	XYN3+C6FJ	SCREWWITHWASHER,TEEL	
	D	XSB4+6FJ	SMALL SCREW, STEEL	
	E	XYC3+CF5FJ	SCREWWITHWASHER,TEEL	
	F	XTW3+6LFJ7	TAPPING SCREW, STEEL	
	G	XTW3+20PFJ	TAPPING SCREW, STEEL	
	H	XTB3+10GFJ	TAPPING SCREW, STEEL	
	J	XTW3+12PFJ7	TAPPING SCREW, STEEL	
	K	XYC3+FF8FJ	SCREWWITHWASHER,TEEL	

18.2.1.14. ACCESSORIES AND PACKING MATERIALS

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A1	PFQW2639Y	LEAFLET	
	A2	PFJKMB271Z	MEMORY PARTS	
	A3	PFQW2667Z	INSTRUCTION BOOK, ENGLISH	
	A4	PFQW2668Z	INSTRUCTION BOOK, FRENCH	
⚠	A5	PFJA1030Z	POWER CORD	
	A6	PQJA10075Z	CORD	
	A7	PFQW2798Z	LEAFLET	
	P1	PFPK3548Z-M	PACKING CASE	S
	P2	PFPN1477Z	CUSHION	
	P3	PFPN1478Z	CUSHION	
	P4	PFPP1041Z	PROTECTION COVER	
	P5	PFPN1475X	CUSHION	
	P6	PFPN1476W	CUSHION	
	P7	XZB20X35A04	PROTECTION COVER	
	P8	XZB32X45A04	PROTECTION COVER	
	P9	PFPD1355Z	CUSHION	

18.2.2. MAIN BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PFWP1MB781C	MAIN BOARD ASS'Y (RTL)	
			(ICs)	
	IC100	C1CB00002689	IC	
	IC101	C1CB00002690	IC	
	IC200	C1CB00001769	IC	
	IC201	AN6123MS	IC	
	IC202	C0ABEB000083	IC	
	IC203	C1AB00002556	IC	
	IC204	C1AB00002556	IC	
	IC300	C1ZBZ0003716	IC	
	IC301	C0EBE0000504	IC	
	IC302	C0DBAYY00291	IC	
	IC303	C0CBAAA00035	IC	
	IC305	C0DBAYY00294	IC	
	IC400	C3ABRG000037	IC	
	IC402	PFWIMB781C	IC(ROM)	
	IC501	C0DBGYY00330	IC	
	IC502	AN44063A	IC	
	IC503	C1DB00001173	IC	
	IC700	AN44063A	IC	
	IC750	C1CB00002227	IC	
			(TRANSISTORS)	
	Q100	UNR92ANJ0L	TRANSISTOR(SI)	
	Q102	B1ABFJ000001	TRANSISTOR(SI)	
	Q103	B1ABFJ000001	TRANSISTOR(SI)	
	Q104	B1BBAP000021	TRANSISTOR(SI)	
	Q105	B1BBAP000021	TRANSISTOR(SI)	
	Q106	B1BDAP000015	TRANSISTOR(SI)	
	Q200	UNR921LJ0L	TRANSISTOR(SI)	S
	Q300	2SC4081R	TRANSISTOR(SI)	S
	Q301	UNR9215J0L	TRANSISTOR(SI)	
	Q303	B1MBECA00001	TRANSISTOR(SI)	
	Q500	UNR92ANJ0L	TRANSISTOR(SI)	
	Q501	UNR92ANJ0L	TRANSISTOR(SI)	
	Q502	UNR92ANJ0L	TRANSISTOR(SI)	
	Q503	UNR92ANJ0L	TRANSISTOR(SI)	
	Q504	UNR92ANJ0L	TRANSISTOR(SI)	
	Q505	UNR92ANJ0L	TRANSISTOR(SI)	
	Q506	UNR92ANJ0L	TRANSISTOR(SI)	
	Q507	UNR921LJ0L	TRANSISTOR(SI)	S
	Q509	B1CHND000004	TRANSISTOR(SI)	
	Q510	2SB1197KQ	TRANSISTOR(SI)	S
	Q511	UNR92ANJ0L	TRANSISTOR(SI)	
	Q512	UNR92ANJ0L	TRANSISTOR(SI)	
	Q514	2SD1991A	TRANSISTOR(SI)	
	Q516	2SD1991A	TRANSISTOR(SI)	
	Q517	2SD1991A	TRANSISTOR(SI)	
	Q518	2SB1197KQ	TRANSISTOR(SI)	S
	Q519	UNR92ANJ0L	TRANSISTOR(SI)	
	Q520	2SB1197KQ	TRANSISTOR(SI)	S
	Q521	2SK3018	TRANSISTOR(SI)	S
	Q522	2SC4081R	TRANSISTOR(SI)	S
	Q523	2SB1197KQ	TRANSISTOR(SI)	S
	Q524	UNR92ANJ0L	TRANSISTOR(SI)	
	Q525	UNR92ANJ0L	TRANSISTOR(SI)	
	Q526	UNR92ANJ0L	TRANSISTOR(SI)	
			(DIODES)	
	D100	MA111	DIODE(SI)	S
	D102	MAZY43000L	DIODE(SI)	
	D103	B0EDER000009	DIODE(SI)	
	D300	B0JCPD000033	DIODE(SI)	
	D301	B0BC01600013	DIODE(SI)	
	D302	B0ACEL000004	DIODE(SI)	
	D303	B0BC5R900006	DIODE(SI)	
	D305	B0ACEL000004	DIODE(SI)	
	D501	B0ACEL000004	DIODE(SI)	
	D503	B0ACEL000004	DIODE(SI)	
	D504	B0ACEL000004	DIODE(SI)	
	DA300	MA142WKTX	DIODE(SI)	S
	DA500	MA142WKTX	DIODE(SI)	S
	LED750	LNJ826W83RA	DIODE(SI)	
			(BATTERY)	
⚠	BAT300	CR-2354/1HF1	LITHIUM BATTERY	
			(CAPACITORS)	
	C100	ECUE1A104KBQ	0.1	
	C101	ECUE1H101JCQ	100p	
	C102	ECUE1A104KBQ	0.1	
⚠	C104	F1LAF3300002	33p	
⚠	C105	F1LAF3300002	33p	
	C106	EEE1HA010SR	1	S
	C107	ECUE1A104KBQ	0.1	
	C108	ECUE1A104KBQ	0.1	
	C109	F1J2E121A023	120p	
	C110	F1J2E121A023	120p	
	C111	ECUE1H272KBQ	0.0027	
	C112	ECUE1E103KBQ	0.01	
	C113	F1LAF1030001	0.01	
⚠	C114	F1BAF471A049	470p	
⚠	C115	F1BAF471A049	470p	
	C120	ECUE1C103KBQ	0.01	
⚠	C121	F1LAF100A009	10p	
	C125	ECUE1E103KBQ	0.01	
	C200	F2G0J1010014	100	
	C201	ECUE1A104KBQ	0.1	
	C202	ECUE1A104KBQ	0.1	
	C203	ECUE1C223KBQ	0.022	
	C204	ECUE1C183KBQ	0.018	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C205	ECUE1A104KBQ	0.1	
	C207	ECJ0EF1C104Z	0.1	
	C208	ECUE1A104KBQ	0.1	
	C209	F2G0J3310015	330	
	C210	ECUE1A104KBQ	0.1	
	C211	ECJ0EF1C104Z	0.1	
	C212	F2G1C1000014	10	
	C213	ECUE1H102KBQ	0.001	
	C215	ECUE1H102KBQ	0.001	
	C216	ECUE0J105KBQ	1	
	C217	ECUE0J105KBQ	1	
	C218	ECUE1H221JCQ	220p	
	C219	ECUE1H221JCQ	220p	
	C220	ECUE1H102KBQ	0.001	
	C221	ECUE1H332KBQ	0.0033	
	C224	F2G0J1010014	100	
	C226	ECUE1C153KBQ	0.015	
	C227	ECUE1C153KBQ	0.015	
	C228	ECUE1E103KBQ	0.01	
	C229	F2G1C4700026	47	
	C230	ECUE0J105KBQ	1	
	C231	ECUE1C223KBQ	0.022	
	C232	ECUE0J105KBQ	1	
	C233	ECUE0J105KBQ	1	
	C234	ECUE1E392KBQ	0.0039	
	C236	F2G0J1010014	100	
	C238	ERJ2GE0R00	0	
	C243	ECUE1H102KBQ	0.001	
	C244	ECUE1C103KBQ	0.01	
	C245	ECUE1A104KBQ	0.1	
	C246	F2G1C2200024		S
	C247	ECUE1C223KBQ	0.022	
	C300	ECJ0EF1C104Z	0.1	
	C301	ECJ0EF1C104Z	0.1	
	C304	ECJ0EB0J224K	0.22	S
	C305	ECJ0EB0J224K	0.22	S
	C306	ECJ0EB0J224K	0.22	S
	C308	ECJ0EB0J224K	0.22	S
	C310	ECUE1H220JCQ	22p	
	C311	ECUE1H270JCQ	27p	
	C313	ECUE1H220JCQ	22p	
	C314	ECUE1H330JCQ	33p	
	C315	ERJ2GE0R00	0	
	C317	ECUE1H120JCQ	12p	
	C318	ECUE1H270JCQ	27p	
	C319	ECUE0J105KBQ	1	
	C321	ECJ0EF1C104Z	0.1	
	C322	ECUE0J105KBQ	1	
	C323	ECUE0J105KBQ	1	
	C324	ECJ0EF1C104Z	0.1	
	C325	ECJ0EF1C104Z	0.1	
	C326	ECUE1E103KBQ	0.01	
	C327	ECJ0EF1C104Z	0.1	
	C328	ECJ0EF1C104Z	0.1	
	C329	ECJ0EF1C104Z	0.1	
	C330	ECJ0EF1C104Z	0.1	
	C331	ECJ0EF1C104Z	0.1	
	C332	ECJ0EF1C104Z	0.1	
	C333	ECJ0EF1C104Z	0.1	
	C334	ECJ0EF1C104Z	0.1	
	C335	ECJ0EF1C104Z	0.1	
	C336	ECJ0EF1C104Z	0.1	
	C337	ECJ0EF1C104Z	0.1	
	C338	ECJ0EF1C104Z	0.1	
	C339	ECJ0EF1C104Z	0.1	
	C351	ECUE1H101JCQ	100p	
	C352	ECJ0EF1C104Z	0.1	
	C353	ECJ0EF1C104Z	0.1	
	C354	ECJ0EF1C104Z	0.1	
	C355	ECJ0EF1C104Z	0.1	
	C357	ECJ0EF1C104Z	0.1	
	C358	ECJ0EF1C104Z	0.1	
	C359	ECJ0EF1C104Z	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C360	ECJ0EF1C104Z	0.1	
	C361	ECJ0EF1C104Z	0.1	
	C362	ECJ0EF1C104Z	0.1	
	C363	ECJ0EF1C104Z	0.1	
	C364	ECJ0EF1C104Z	0.1	
	C374	F1L1V106A003	10	
	C375	ECUV1C334ZFV	0.33	
	C376	ECUE1A104KBQ	0.1	
	C377	ECUE1C223KBQ	0.022	
	C378	ECUE1H330JCQ	33p	
	C379	ECUE1H102KBQ	0.001	
	C380	F1L0J476A017	47	
	C384	F1L0J107A017	100	
	C385	ECUE1H821KBQ	820p	
	C386	F1L0J107A017	100	
	C388	ECUV1H104ZFV	0.1	
	C389	ECUV1H104ZFV	0.1	
	C390	ECUV1H104ZFV	0.1	
	C391	ECUE1H2R0CCQ	2	
	C392	ECUE1H471KBQ	470p	
	C393	ECJ1VB0J225K	2.2	
	C394	ECUE1H471KBQ	470p	
	C395	ECUE0J105KBQ	1	
	C396	F2G0J3310015	330	
	C400	ECJ0EF1C104Z	0.1	
	C401	ECUE1C103KBQ	0.01	
	C402	ECJ0EF1C104Z	0.1	
	C403	ECJ0EF1C104Z	0.1	
	C404	ECJ0EF1C104Z	0.1	
	C405	ECUE1C103KBQ	0.01	
	C406	ECJ0EF1C104Z	0.1	
	C412	ECUE1C103KBQ	0.01	
	C413	ECJ0EF1C104Z	0.1	
	C414	ECJ0EF1C104Z	0.1	
	C419	ECUE1H101JCQ	100p	
	C420	ECUE1H101JCQ	100p	
	C421	ECUE1H101JCQ	100p	
	C422	ECUE1H101JCQ	100p	
	C423	ECUE1H101JCQ	100p	
	C424	ECUE1H101JCQ	100p	
	C425	ECUE1H101JCQ	100p	
	C426	ECUE1H101JCQ	100p	
	C427	ECUE1H101JCQ	100p	
	C428	ECUE1H101JCQ	100p	
	C429	ECUE1H101JCQ	100p	
	C470	ECUE1H270JCQ	27p	
	C471	ECJ0EF1C104Z	0.1	
	C501	ECUV1H104ZFV	0.1	
	C503	ECUV1H104ZFV	0.1	
	C504	ECJ0EF1C104Z	0.1	
	C505	F2G1V2210003	220	
	C506	ECUE1H100DCQ	10p	
	C507	ECUE1H102KBQ	0.001	
	C508	ECJ0EB1A473K	0.047	S
	C509	ECUE0J105KBQ	1	
	C510	ECUE1A104KBQ	0.1	
	C511	ECUE1H102KBQ	0.001	
	C512	F1J0J1060006	10	
	C513	ECUV1A105ZFV	1	
	C514	ECUV1H104ZFV	0.1	
	C515	F2G1V1010021	100	
	C516	ECUE1H102KBQ	0.001	
	C517	ECUE1H102KBQ	0.001	
	C518	F2G1V1010021	100	
	C520	ECUV1H103KBV	0.01	
	C522	ECUV1H103KBV	0.01	
	C524	F2G1V4700028	47	
	C525	ECUV1H104ZFV	0.1	
	C526	ECUE1H102KBQ	0.001	
	C527	ECUE1H102KBQ	0.001	
	C528	ECUE1H102KBQ	0.001	
	C529	ECUE1H102KBQ	0.001	
	C530	F1J0J1060006	10	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C531	F1J0J1060006	10	
	C533	ECUE1A104KBQ	0.1	
	C534	ECUE1A104KBQ	0.1	
	C536	ECUE1A104KBQ	0.1	
	C537	ECUE1A104KBQ	0.1	
	C538	F1J0J1060006	10	
	C540	ECUE1A104KBQ	0.1	
	C542	ECUE1A104KBQ	0.1	
	C543	ECUE1A104KBQ	0.1	
	C544	ECUE1E103KBQ	0.01	
	C545	ECUE0J105KBQ	1	
	C546	ECUE1E103KBQ	0.01	
	C547	ECUE1H101JCQ	100p	
	C548	ECUE1H102KBQ	0.001	
	C549	F2G0J1010015	100	
	C550	F2G1C2200013	22	
	C551	ECUE1H102KBQ	0.001	
	C552	ECJ0EF1C104Z	0.1	
	C553	ECUE1H102KBQ	0.001	
	C554	ECUE1H102KBQ	0.001	
	C555	ECJ0EF1C104Z	0.1	
	C556	ECUE1H101JCQ	100p	
	C557	ECUE1H181JCQ	180p	
	C559	ECUE1H102KBQ	0.001	
	C560	ECUV1H104ZFV	0.1	
	C563	ECUE1H102KBQ	0.001	
	C565	ECJ0EB1A473K	0.047	S
	C566	ECJ0EF1C104Z	0.1	
	C567	ECJ0EF1C104Z	0.1	
	C569	ECJ0EB1A473K	0.047	S
	C645	ECJ0EF1C104Z	0.1	
	C646	ECJ0EF1C104Z	0.1	
	C647	ECJ0EF1C104Z	0.1	
	C648	ECJ0EF1C104Z	0.1	
	C649	ECJ0EF1C104Z	0.1	
	C650	ECJ0EF1C104Z	0.1	
	C651	ECJ0EF1C104Z	0.1	
	C652	ECJ0EF1C104Z	0.1	
	C653	ECJ0EF1C104Z	0.1	
	C654	ECJ0EF1C104Z	0.1	
	C655	ECJ0EF1C104Z	0.1	
	C656	ECJ0EF1C104Z	0.1	
	C657	ECJ0EF1C104Z	0.1	
	C658	ECJ0EF1C104Z	0.1	
	C659	ECJ0EF1C104Z	0.1	
	C660	ECJ0EF1C104Z	0.1	
	C661	ECJ0EF1C104Z	0.1	
	C662	ECJ0EF1C104Z	0.1	
	C663	ECJ0EF1C104Z	0.1	
	C664	ECJ0EF1C104Z	0.1	
	C665	ECJ0EF1C104Z	0.1	
	C666	ECJ0EF1C104Z	0.1	
	C667	ECJ0EF1C104Z	0.1	
	C668	ECJ0EF1C104Z	0.1	
	C669	ECJ0EF1C104Z	0.1	
	C670	ECJ0EF1C104Z	0.1	
	C671	ECUV1H104ZFV	0.1	
	C672	ECUV1H104ZFV	0.1	
	C673	ECUV1H104ZFV	0.1	
	C674	ECJ0EF1C104Z	0.1	
	C675	ECJ0EF1C104Z	0.1	
	C676	ECJ0EF1C104Z	0.1	
	C677	ECJ0EF1C104Z	0.1	
	C678	ECJ0EF1C104Z	0.1	
	C679	ECJ0EF1C104Z	0.1	
	C680	ECJ0EF1C104Z	0.1	
	C681	ECJ0EF1C104Z	0.1	
	C682	ECJ0EF1C104Z	0.1	
	C684	ECJ0EF1C104Z	0.1	
	C685	ECJ0EF1C104Z	0.1	
	C687	ECJ0EF1C104Z	0.1	
	C688	ECJ0EF1C104Z	0.1	
	C689	ECJ0EF1C104Z	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C690	ECJ0EF1C104Z	0.1	
	C691	ECJ0EF1C104Z	0.1	
	C692	ECJ0EF1C104Z	0.1	
	C693	ECJ0EF1C104Z	0.1	
	C695	ECJ0EF1C104Z	0.1	
	C696	ECJ0EF1C104Z	0.1	
	C697	ECJ0EF1C104Z	0.1	
	C698	ECJ0EF1C104Z	0.1	
	C699	ECJ0EF1C104Z	0.1	
	C701	ECUE1H102KBQ	0.001	
	C702	ECJ0EF1C104Z	0.1	
	C703	ECJ0EF1C104Z	0.1	
	C704	ECUE1H102KBQ	0.001	
	C705	ECUV1H103KBV	0.01	
	C706	ECUV1H103KBV	0.01	
	C709	ECUE1H102KBQ	0.001	
	C710	ECUE1H102KBQ	0.001	
	C711	ECUE1H102KBQ	0.001	
	C712	ECUE1H102KBQ	0.001	
	C750	ECUE1H101JCQ	100p	
	C751	ECJ0EF1C104Z	0.1	
	C752	ECUE1E103KBQ	0.01	
	C753	ECJ0EF1C104Z	0.1	
	C754	ECUE1A104KBQ	0.1	
	C755	ECUE1A104KBQ	0.1	
	C756	ECUE1H100DCQ	10p	
	C757	ECUE1H120JCQ	12p	
	C758	ECJ0EF1C104Z	0.1	
	C759	ECJ0EF1C104Z	0.1	
	C760	ECUE1E103KBQ	0.01	
	C762	F2G0J4700013	0.1	
	C763	ECUE1H220JCQ	22p	
	C764	ECUE1H220JCQ	22p	
	C765	ECUE1H220JCQ	22p	
	C766	ECUE1H220JCQ	22p	
			(CONNECTORS & JACKS)	
	CN100	K2LB1YYB0002	JACK	
	CN101	K2LB1YYB0002	JACK	
	CN750	K2LC108B0045	JACK	
	CN200	K1KA08A00440	CONNECTOR,8 PIN	
	CN300	K1FA104B0017	CONNECTOR,10 PIN	
	CN500	K1KA07AA0193	CONNECTOR,7 PIN	
	CN501	K1KA05A00364	CONNECTOR,5 PIN	
	CN502	K1KA08AA0193	CONNECTOR,8 PIN	
	CN504	K1KA07A00280	CONNECTOR,7 PIN	
	CN505	K1KA07A00257	CONNECTOR,7 PIN	
	CN506	K1KA03AA0193	CONNECTOR,3 PIN	
	CN507	K1KA02AA0193	CONNECTOR,2 PIN	
	CN508	K1KA10A00412	CONNECTOR,10 PIN	
	CN509	K1KA04A00527	CONNECTOR,4 PIN	
	CN510	K1KA12A00315	CONNECTOR,12 PIN	
	CN511	K1KA08A00440	CONNECTOR,8 PIN	
	CN514	K1KA02AA0193	CONNECTOR,2 PIN	
	CN700	K1KA04A00644	CONNECTOR,4 PIN	
	CN701	K1KA04AA0193	CONNECTOR,4 PIN	
			(FUSE)	
	F300	K5H312200002	FUSE	
			(COILS)	
	L100	PQLQR1E32A07	COIL	S
	L101	PQLQR1E32A07	COIL	S
	L102	PQLQR1E32A07	COIL	S
	L103	PQLQR1E32A07	COIL	S
	L105	PQLQR1E32A07	COIL	S
	L106	PQLQR1E32A07	COIL	S
	L107	G0B862C00003	COIL	
	L110	G1A102BA0002	COIL	
	L111	G1A102BA0002	COIL	
	L221	PQLQR2KB113T	COIL	S
	L222	PQLQR2KB113T	COIL	S
	L223	PQLQR2KB113T	COIL	S
	L224	PQLQR2KB113T	COIL	S
	L229	J0JBC0000040	COIL	
	L230	J0JBC0000040	COIL	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L372	G1A100ZA0007	COIL	
	L374	G1A4R9ZA0006	COIL	
	L502	PFVF2P221SG	COIL	S
			(FILTERS)	
	FLT500	J0HAAB000021	IC FILTER	
	FLT501	J0HAAB000021	IC FILTER	
	L108	J0JBC0000040	IC FILTER	
	L109	J0JBC0000040	IC FILTER	
	L203	J0JCC0000276	IC FILTER	
	L204	J0JCC0000276	IC FILTER	
	L206	J0JBC0000040	IC FILTER	
	L208	J0JCC0000276	IC FILTER	
	L209	J0JCC0000276	IC FILTER	
	L210	J0JCC0000276	IC FILTER	
	L211	J0JCC0000276	IC FILTER	
	L212	J0JCC0000276	IC FILTER	
	L213	J0JBC0000040	IC FILTER	
	L214	J0JBC0000040	IC FILTER	
	L215	J0JCC0000276	IC FILTER	
	L217	J0JCC0000276	IC FILTER	
	L218	J0JCC0000276	IC FILTER	
	L219	J0JCC0000276	IC FILTER	
	L220	J0JCC0000276	IC FILTER	
	L225	J0JCC0000276	IC FILTER	
	L226	J0JCC0000276	IC FILTER	
	L232	J0JBC0000040	IC FILTER	
	L238	J0MAB0000185	IC FILTER	
	L344	J0JCC0000286	IC FILTER	
	L345	J0JCC0000286	IC FILTER	
	L346	J0JCC0000286	IC FILTER	
	L347	J0JCC0000286	IC FILTER	
	L348	J0JCC0000277	IC FILTER	
	L349	J0JCC0000277	IC FILTER	
	L350	J0JCC0000277	IC FILTER	
	L351	J0JCC0000277	IC FILTER	
	L352	J0JCC0000277	IC FILTER	
	L353	J0JCC0000277	IC FILTER	
	L354	J0JCC0000277	IC FILTER	
	L355	J0JCC0000277	IC FILTER	
	L356	J0JCC0000277	IC FILTER	
	L357	J0MAB0000146	IC FILTER	
	L358	J0JCC0000277	IC FILTER	
	L359	J0JCC0000277	IC FILTER	
	L500	J0JCC0000277	IC FILTER	
	L501	J0JCC0000276	IC FILTER	
	L503	J0JGC0000020	IC FILTER	
	L504	J0JGC0000020	IC FILTER	
	L750	J0JCC0000276	IC FILTER	
	L751	J0JCC0000276	IC FILTER	
	L752	J0MAB0000185	IC FILTER	
	L753	J0MAB0000185	IC FILTER	
	R101	J0JCC0000002	CERAMIC FILTER	
	R102	J0JCC0000002	CERAMIC FILTER	
			(THERMISTOR)	
⚠	POS100	PFRT002	THERMISTOR	
			(CAPACITOS)	
	C488	ERJ2GE0R00	0	
	C490	ERJ2GE0R00	0	
	C491	ERJ2GE0R00	0	
	L200	ERJ3GEY0R00	0	
	L202	ERJ3GEY0R00	0	
	L216	ERJ2GE0R00	0	
	L227	ERJ3GEY0R00	0	
	L237	ERJ3GEY0R00	0	
	L399	ERJ3GEY0R00	0	
	L505	ERJ2GE0R00	0	
	L360	ERJ2GE0R00	0	
	L361	ERJ2GEJ150	15	
	L363	ERJ2GEJ221	220	
	L364	ERJ2GEJ221	220	
	L365	ERJ2GEJ221	220	
	L366	ERJ2GEJ221	220	
	L367	ERJ2GEJ221	220	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L368	ERJ2GEJ221	220	
	L369	ERJ2GEJ221	220	
	L370	ERJ2GEJ221	220	
	L371	ERJ2GEJ221	220	
	R103	ERJ2RKF1004		
	R104	ERJ12SF1071	1.07k	
	R105	ERJ2GE0R00	0	
	R106	ERJ6GEYJ515	5.1M	
	R107	ERJ6GEYJ515	5.1M	
	R108	ERJ12SF3651	3.65k	
	R111	ERJ2GEJ151	150	
	R112	D0GF156JA051		
	R113	D0GF156JA051		
	R114	ERJ8ENF5360	536	
	R115	ERJ12SF73R2	78.2	
	R116	ERJ12SF2491	2.49k	
	R117	ERJ2GEJ104	100k	
	R118	ERJ2GEJ104	100k	
	R119	ERJ2GEJ473	47k	
	R126	ERJ8GEY0R00	0	
	R129	ERG1SJ120E	12	
	R134	ERG1SJ120E	12	
	R136	ERJ3GEYJ560	56	
	R137	ERJ3GEYJ560	56	
	R200	ERJ2GEJ154	150k	
	R201	ERJ2GEJ154	150k	
	R203	ERJ2GE0R00	0	
	R205	ERJ2GE0R00	0	
	R206	ERJ2GEJ102	1k	
	R207	ERJ2GEJ104	100k	
	R208	ERJ2GEJ101	100	
	R209	ERJ2GEJ102	1k	
	R210	ERJ2GEJ822	8.2k	
	R211	ERJ2GEJ153	15k	
	R212	ERJ2GEJ223	22k	
	R214	ERJ2GE0R00	0	
	R215	ERJ2GEJ105X	1M	
	R217	ERJ2GEJ184	180k	
	R218	ERJ2GEJ274	270k	
	R219	ERJ2GEJ102	1k	
	R220	ERJ2GEJ154	150k	
	R221	ERJ2GEJ154	150k	
	R222	ERJ2GEJ184	180k	
	R223	ERJ2GEJ273X	27k	
	R224	ERJ2GEJ103	10k	
	R225	PQ4R18XJ100	10	S
	R226	ERJ2GEJ154	150k	
	R227	ERJ2GEJ124	120k	
	R228	ERJ2GEJ680	68	
	R230	ERJ2GEJ513X	51k	
	R231	ERJ2GEJ513X	51k	
	R232	ERJ2GEJ681	680	
	R233	ERJ2GEJ182	1.8k	
	R234	ERJ2GEJ182	1.8k	
	R235	ERJ2GEJ103	10k	
	R236	ERJ2GEJ102	1k	
	R237	ERJ2GEJ123	12k	
	R238	ERJ2GEJ103	10k	
	R239	ERJ2GEJ472X	4.7k	
	R240	PQ4R18XJ100	10	S
	R241	ERJ2GEJ154	150k	
	R242	ERJ2GEJ124	120k	
	R244	ERJ2GEJ473	47k	
	R245	ERJ2GEJ332	3.3k	
	R250	ERJ2GE0R00	0	
	R251	ERJ2GE0R00	0	
	R252	ERJ2GEJ562X	5.6k	
	R253	ERJ2GEJ822	8.2k	
	R254	ERJ2GEJ105X	1M	
	R302	ERJ2RKF49R9	49.9	
	R303	ERJ2GEJ472X	4.7k	
	R304	ERJ2GEJ101	100	
	R305	ERJ2GEJ103	10k	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R307	ERJ2GEJ470	47	
	R308	ERJ2GEJ470	47	
	R309	ERJ2GEJ470	47	
	R310	ERJ2RKF5112	51.1k	
	R311	ERJ2GEJ152	1.5k	
	R312	ERJ2GEJ223	22k	
	R313	ERJ2GEJ152	1.5k	
	R315	ERJ2GEJ103	10k	
	R316	ERJ2GEJ103	10k	
	R318	ERJ2GEJ104	100k	
	R319	ERJ2RKF2002	20k	
	R320	ERJ2RHD9531	9.53k	
	R321	ERJ2RHD2212	22.1k	
	R335	ERJ2GEJ472X	4.7k	
	R338	ERJ2GEJ103	10k	
	R340	ECUE1H220JCQ	22P	
	R348	ECUE1H220JCQ	22P	
	R352	ERJ2GEJ103	10k	
	R354	ERJ2GEJ103	10k	
	R355	ERJ2GEJ103	10k	
	R356	ERJ2RKF2321	2.232k	
	R357	ERJ2GEJ1R0	1	
	R358	ERJ2RKF3012	30.1k	
	R359	ERJ2GEJ1R0	1	
	R360	ERJ2GEJ1R0	1	
	R361	ERJ2RKF1211	1.21k	
	R362	ERJ2RHD2872	28.7k	
	R363	ERJ2RHD2052	20.5k	
	R367	ERJ2GEJ470	47	
	R368	ERJ2GEJ470	47	
	R369	ERJ2GEJ470	47	
	R372	ERJ2GEJ103	10k	
	R373	ERJ2GEJ103	10k	
	R374	ERJ2GEJ471	470	
	R376	ERJ2RKF6981	6.98k	
	R378	ERJ2GEJ102	1k	
	R380	ERJ2GEJ1R0	1	
	R381	ERJ2GEJ1R0	1	
	R382	ERJ2GEJ1R0	1	
	R384	ERJ2GEJ101	100	
	R385	ERJ2GEJ1R0	1	
	R387	ERJ2GEJ105X	1M	
	R388	ERJ2GEJ184	180k	
	R389	ERJ2GEJ102	1k	
	R391	ERJ2GEJ104	100k	
	R392	ERJ2GEJ100	10	
	R399	ERJ2GEJ103	10k	
	R400	ERJ2GEJ470	47	
	R401	ERJ2GEJ680	68	
	R402	ERJ2GEJ470	47	
	R403	ERJ2GEJ470	47	
	R404	ERJ2GEJ470	47	
	R405	ERJ2GEJ470	47	
	R406	ERJ2GEJ470	47	
	R407	ERJ2GEJ470	47	
	R408	ERJ2GEJ470	47	
	R409	ERJ2GEJ680	68	
	R410	ERJ2GEJ680	68	
	R449	ERJ2GEJ103	10k	
	R450	ERJ2GE0R00	0	
	R451	ERJ2GE0R00	0	
	R452	ERJ2GE0R00	0	
	R460	ERJ2GEJ103	10k	
	R462	ERJ2GEJ103	10k	
	R464	ERJ2GEJ103	10k	
	R501	ERJ2GEJ101	100	
	R502	ERJ2GEJ101	100	
	R503	ERJ2RKF1502	15k	
	R504	ERJ2GEJ473	47k	
	R506	ERJ2GEJ223	22k	
	R509	ERJ2GEJ102	1k	
	R510	ERJ2GEJ562X	5.6k	
	R511	ERJ2GEJ181	180	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R512	ERJ2GEJ563	56k	
	R515	ERJ2GEJ102	1k	
	R516	ERJ2GEJ823	82k	
	R517	ERJ2GEJ332	3.3k	
	R518	ERJ2GEJ472X	4.7k	
	R519	ERJ2GEJ472X	4.7k	
	R520	ERJ2GEJ102	1k	
	R521	ERJ2GEJ563	56k	
	R522	ERJ2GEJ103	10k	
	R523	ERJ2GEJ563	56k	
	R524	ERJ2GEJ472X	4.7k	
	R525	ERJ12YJ390	39	
	R526	ERJ2GEJ103	10k	
	R527	ERJ2GEJ562X	5.6k	
	R528	ERJ2GEJ393X	39k	
	R529	ERJ2GEJ103	10k	
	R530	ERJ12YJ390	39	
	R531	ERJ2GEJ562X	5.6k	
	R532	PQ4R18XJ472	4.7k	S
	R533	ERJ2GEJ102	1k	
	R534	ERJ2GEJ103	10k	
	R536	ERJ8RQF1R0	1	
	R537	ERJ8RQF1R0	1	
	R538	ERJ2GEJ102	1k	
	R539	ERJ2GEJ103	10k	
	R541	ERJ2GEJ122	1.2k	
	R542	ERJ2GEJ122	1.2k	
	R543	ERJ2GEJ220	22	
	R544	ERJ2GEJ122	1.2k	
	R546	ERJ2GEJ122	1.2k	
	R547	ERJ2GEJ471	470	
	R548	ERJ3GEYJ1R2	1.2	
	R549	ERJ2GEJ330	33	
	R550	ERJ2GEJ122	1.2k	
	R552	ERJ2GEJ102	1k	
	R553	ERJ2GEJ270	27	
	R554	ERJ2GEJ122	1.2k	
	R555	ERJ2GEJ472X	4.7k	
	R556	ERJ2GEJ390	39	
	R558	ERJ2GEJ470	47	
	R559	ERJ2GEJ101	100	
	R560	ERJ2GEJ181	180	
	R561	ERJ2GEJ102	1k	
	R562	ERJ2GEJ102	1k	
	R563	ERJ2GEJ101	100	
	R564	ERJ2RKF1802	18k	
	R565	PQ4R18XJ472	4.7k	S
	R566	ERJ2GEJ103	10k	
	R569	ERJ2GEJ563	56k	
	R570	ERJ2GEJ562X	5.6k	
	R571	ERJ2GEJ821	820	
	R573	ERJ2GEJ103	10k	
	R574	PQ4R10XJ822	8.2k	S
	R578	ERJ2GEJ332	3.3k	
	R580	ERJ2GEJ562X	5.6k	
	R582	ERJ2GEJ223	22k	
	R583	ERJ2GEJ562X	5.6k	
	R585	ERJ2GEJ562X	5.6k	
	R587	ERJ2GEJ223	22k	
	R703	ERJ2GEJ562X	5.6k	
	R704	ERJ2GEJ562X	5.6k	
	R705	ERJ2GEJ563	56k	
	R706	ERJ2GEJ563	56k	
	R707	ERJ8RQFR82	0.82	
	R708	ERJ8RQFR82	0.82	
	R709	D0GA222JA015		S
	R750	ERJ8ENF49R9	49.9	
	R751	ERJ8ENF49R9	49.9	
	R752	ERJ8ENF49R9	49.9	
	R753	ERJ8ENF49R9	49.9	
	R754	ERJ2RKF6491	49.9	
	R755	ERJ2GEJ221	220	
	R756	ERJ2GEJ330	33	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R758	ERJ2GE0R00	0	
	R759	ERJ2GEJ103	10k	
	R760	ERJ2GEJ331	330	
	R761	ERJ2GEJ330	33	
	R762	ERJ2GEJ330	33	
	R763	ERJ2GEJ330	33	
	R764	ERJ2GEJ330	33	
	R765	ERJ2GEJ330	33	
	R767	ERJ2GEJ330	33	
			(COMPONENTS PARTS)	
	RA314	EXB28V470JX	RESISTOR ARRAY	
	RA315	EXB28V470JX	RESISTOR ARRAY	
	RA316	EXB28V470JX	RESISTOR ARRAY	
	RA317	EXB28V470JX	RESISTOR ARRAY	
	RA318	EXB28V470JX	RESISTOR ARRAY	
	RA319	EXB28V470JX	RESISTOR ARRAY	
	RA320	EXB28V470JX	RESISTOR ARRAY	
	RA400	EXB28V560JX	RESISTOR ARRAY	
	RA401	EXB28V560JX	RESISTOR ARRAY	
	RA402	EXB28V560JX	RESISTOR ARRAY	
	RA403	EXB28V560JX	RESISTOR ARRAY	
	RA404	EXB28V470JX	RESISTOR ARRAY	
	RA405	EXB28V470JX	RESISTOR ARRAY	
	RA406	EXB28V470JX	RESISTOR ARRAY	
	RA750	EXB28V330	RESISTOR ARRAY	
	RA751	EXB28V330	RESISTOR ARRAY	
	RA752	EXB28V330	RESISTOR ARRAY	
			(RELAY)	
⚠	RLY100	K6B1CYY00005	RELAY	
			(VARISTORS)	
	SA100	J0LY00000063	VARISTOR (SURGE ABSORBER)	
⚠	SA101	PFRZRA102P6T	VARISTOR (SURGE ABSORBER)	
			(CRYSTAL OSXILLATOR)	
	X300	H0J120500055	CRYSTAL OSCILLATOR	
	X301	H0J245500087	CRYSTAL OSCILLATOR	
	X303	H0A327200147	CRYSTAL OSCILLATOR	
	X750	H0J250500086	CRYSTAL OSCILLATOR	

18.2.3. OPERATION BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PFLP1907MZ	OPERATION BOARD ASS'Y (RTL)	
			(IC)	
	IC1	C1ZBZ0002089	IC	
			(DIODES)	
	LED1	LNJ826W83RA	DIODE(SI)	
	LED2	LNJ326W83RA	DIODE(SI)	
	LED3	LNJ326W83RA	DIODE(SI)	
	LED4	LNJ326W83RA	DIODE(SI)	
			(CAPACITORS)	
	C1	ECUV1C104ZFV	0.1	
	C2	ECUV1C104ZFV	0.1	
	C3	ECUV1C104ZFV	0.1	
	C4	ECUV1H101JCV	100p	
	C5	F2G0J1010014	100	
	C6	ECUV1H391JCV	390p	S
	C7	ECUV1H391JCV	390p	S
	C8	ECUV1H103KBV	0.01	
	C10	ECUV1C104ZFV	0.1	
	C11	ECUV1C104ZFV	0.1	
	C12	ECUV1H101JCV	100p	
	C13	ECUV1H101JCV	100p	
	C14	ECUV1H101JCV	100p	
	C17	F2G0J1010014	100	
	C18	ECUV1C104ZFV	0.1	
	C20	ECUV1H272KBV	0.0027	
	C21	ECUV1H152KBV	0.0015	
	C22	ECUV1H152KBV	0.0015	
			(LCD)	
	CN1	L5DAAFB00001	LIQUID CRYSTAL DISPLAY	S
			(CONNECTOR)	
	CN2	K1KA08B00243	CONNECTOR,8 PIN	
			(COILS)	
	L1	PQLQR2BT	COIL	S
	L2	PQLQR1E32A07	COIL	S
			(RESISTORS)	
	R1	ERJ3GEYJ391	390	
	R2	ERJ3GEYJ241	240	
	R3	ERJ3GEYJ241	240	
	R4	ERJ3GEYJ241	240	
	R5	ERJ3GEYJ123	12k	
	R6	ERJ3GEYJ333	33k	
	R7	ERJ3GEYJ912	9.1k	
	R8	ERJ3GEYJ4R7	4.7	
	R10	ERJ3GEYJ561	560	
	R11	ERJ3GEYJ101	100	
	R12	ERJ3GEYJ101	100	
	R13	ERJ3GEYJ101	100	
	R14	ERJ3GEYJ101	100	
	R15	ERJ3GEYJ123	12k	
	R31	ERJ3GEY0R00	0	
	R33	ERJ8GEY0R00	0	
	R37	ERJ8GEY0R00	0	
			(THERMISTOR)	
	TH1	D4CCY1030002	THERMISTOR	

18.2.4. SENSOR BOARD PARTS

18.2.4.1. TONER SENSOR BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB3	PFLP1911MZ-A	TONER SENSOR BOARD ASS'Y (RTL)	
			(IC)	
	IC50	B4ABC0000001	PHOTO ELECTRIC TRANS-DUCER	
			(CAPACITORS)	
	C52	ECUV1C104ZFV	0.1	
			(CONNECTORS)	
	CN64	K1KA10A00412	CONNECTOR,10 PIN	
	CN65	K1KA04A00527	CONNECTOR,4 PIN	
	CN66	K1KA04A00527	CONNECTOR,4 PIN	
	CN67	K1KA05A00364	CONNECTOR,5 PIN	

18.2.4.2. FUSER BOARD (EXIT SENSOR BOARD)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB4	PFLP1911MZ-B	FUSER BOARD ASS'Y (RTL)	
			(CONNECTORS)	
	CN52	K1KA03BA0012	CONNECTOR,3 PIN	
	CN53	K1KA04B00225	CONNECTOR,4 PIN	
			(PHOTO ELECTRIC TRANS-DUCERS)	
	PS50	PFVIRM574SL	PHOTO ELECTRIC TRANS-DUCER	S
			(RESISTOR)	
	R54	ERJ3GEYJ331	330	

18.2.4.3. PICKUP SENSOR BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB5	PFWP2MB781M	PICK UP BOARD ASS'Y (RTL)	
	SW50	PFSH1A003Z	PUSH SWITCH	
			(CONNECTORS)	
	CN51	K1KA05B00189	CONNECTOR,5 PIN	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	CN63	K1KA03BA0061	CONNECTOR,3 PIN	

18.2.4.4. REGISTRATION BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB6	PFLP1911MZ-D	REGISTRATION BOARD ASS'Y (RTL)	
			(CONNECTOR)	
	CN50	K1KA04B00225	CONNECTOR,4 PIN	
			(PHOTO ELECTRIC TRANS-DUCERS)	
	PS51	PFVIRM574SL	PHOTO ELECTRIC TRANS-DUCER	S
	PS52	PFVIRM574SL	PHOTO ELECTRIC TRANS-DUCER	S
			(RESISTORS)	
	R50	ERJ3GEYJ331	330	
	R51	ERJ3GEYJ331	330	

18.2.4.5. VARISTOR SENSOR BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB7	PFLP1911MZ-E	VARISTOR SENSOR BOARD ASS'Y (RTL)	
			(VARISTOR)	
	ZNR50	PFRV271NS05K	VARISTOR	

18.2.4.6. FLATBED RELAY BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB8	PFLP1911MZ-F	FLATBED REALY BOARD ASS'Y (RTL)	
			(CAPACITORS)	
	C64	ECUV1C104ZFV	0.1	
	C65	ECUV1C104ZFV	0.1	
			(CONNECTORS)	
	CN59	K1KA12B00138	CONNECTOR,12 PIN	
	CN60	K1KA04B00225	CONNECTOR,4 PIN	
	CN61	K1MN12BA0222	CONNECTOR,12 PIN	
	CN62	K1KA04BA0061	CONNECTOR,4 PIN	
			(OTHERS)	
	L54	PQLQR2KB113T	COIL	S
	R55	ERJ3GEYJ472	4.7K	

18.2.4.7. ADF SENSOR BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB9	PFLP1911MZ-G	ADF SENSOR BOARD ASS'Y (RTL)	
			(CONNECTOR)	
	CN56	K1KA04B00225	CONNECTOR,4 PIN	
			(PHOTO ELECTRIC TRANS-DUCERS)	
	PS53	B3NAA0000105	PHOTO SENSOR	
	PS54	B3NAA0000105	PHOTO SENSOR	
			(RESISTORS)	
	R52	ERJ3GEYJ181	180	
	R53	ERJ3GEYJ181	180	

18.2.4.8. HANDSET RELAY BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB10	PFLP1911MZ-H	HANDSET RELAY BOARD ASS'Y (RTL)	
			(CONNECTORS & JACK)	
	CN55	K2LB106B0023	JACK	
	CN57	K1KA02A00587	CONNECTOR,2 PIN	
	CN58	K1KA08A00440	CONNECTOR,8 PIN	
			(RESISTORS)	
	L50	ERJ3GEY0R00	0	
	L51	ERJ3GEY0R00	0	
			(FILTERS)	
	L52	J0JAC0000008	IC FILTER	
	L53	J0JAC0000008	IC FILTER	

18.2.5. HIGH VOLTAGE POWER BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	PCB11	N0GG4E000006	HIGH VOLTAGE POWER BOARD ASS'Y (RTL)	1

18.2.6. LOW VOLTAGE POWER BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	PCB12	N0AB2GG00003	LOW VOLTAGE POWER BOARD ASS'Y (RTL)	1

18.2.7. HOOK SWITCH BOARD

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB13	PFLP1696MZ	HOOK SWITCH BOARD (RTL)	
			(JACKS)	
	CN940	K2LB106B0023	JACK	S
	CN941	K2LA104B0019	JACK	
			(SWITCH)	
	SW940	ESE14A211	SWITCH	