CONFIDENTIAL

SERVICE MANUAL

MODEL: OK75

MINI HI-FI SYSTEM
SERVICE MANUAL

MODEL: OK75

CAUTION
BEFORE SERVICING THE UNIT, READ THE “SAFETY PRECAUTIONS” IN THIS MANUAL.

P/NO : AFN78511834

SEPTEMBER, 2018

LG

CONTENTS

SECTION 1

SUMMARY

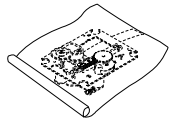
CONTENTS

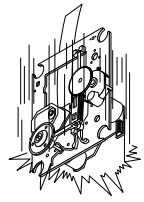
SERVICING PRECAUTIONS

NOTES REGARDING HANDLING OF THE PICK-UP

1. Notes for transport and storage

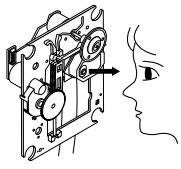
1) The pick-up should always be left in its conductive bag until immediately prior to use.
2) The pick-up should never be subjected to external pressure or impact.

Storage in conductive bag 

 Drop impact

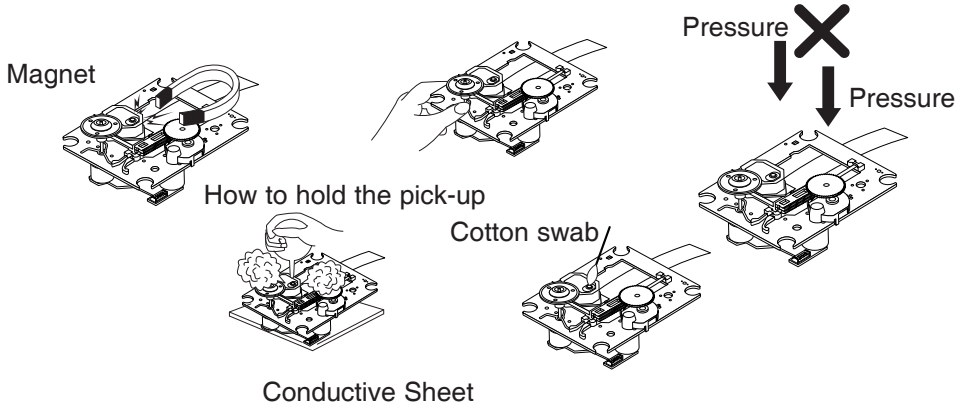
2. Repair notes

1) The pick-up incorporates a strong magnet, and so should never be brought close to magnetic materials.
2) The pick-up should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed-circuit board.
3) Each and every pick-up is already individually adjusted to a high degree of precision, and for that reason the adjustment point and installation screws should absolutely never be touched.
4) Laser beams may damage the eyes!
   Absolutely never permit laser beams to enter the eyes!
   Also NEVER switch ON the power to the laser output part (lens, etc.) of the pick-up if it is damaged.



NEVER look directly at the laser beam, and don't allow contact with fingers or other exposed skin.

5) Cleaning the lens surface
   If there is dust on the lens surface, the dust should be cleaned away by using an air bush (such as used for camera lens). The lens is held by a delicate spring. When cleaning the lens surface, therefore, a cotton swab should be used, taking care not to distort lens.



6) Never attempt to disassemble the pick-up.
   Spring has excess pressure. If the lens is extremely dirty, apply isopropyl alcohol to the cotton swab. (Do not use any other liquid cleaners, because they will damage the lens.) Take care not to use too much of this alcohol on the swab, and do not allow the alcohol to get inside the pick-up.

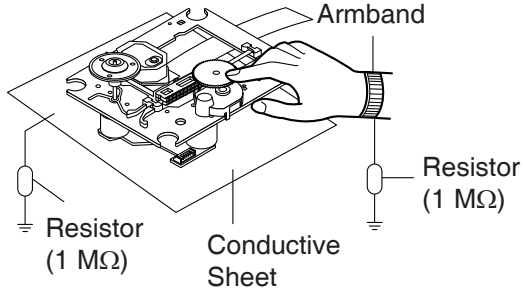
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

1. Preparations

1) Compact disc players incorporate a great many ICs as well as the pick-up (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
2) The pick-up is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature or humidity is high, where strong magnetism is present, or where there is excessive dust.

2. Notes for repair

1) Before replacing a component part, first disconnect the power supply lead wire from the unit
2) All equipment, measuring instruments and tools must be grounded.
3) The workbench should be covered with a conductive sheet and grounded.
   When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
5) Workers should be grounded by an armband (1 MΩ)
6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will by installed.

CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

8. Minimize bodily motions when handing unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

CAUTION. GRAPHIC SYMBOLS

	THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED “DANGEROUS VOLTAGE” THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

HIDDEN KEY MODE

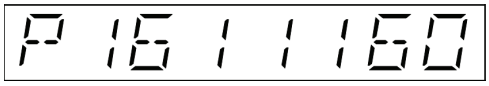
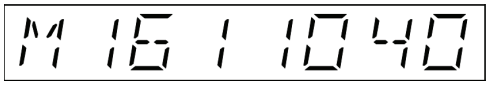
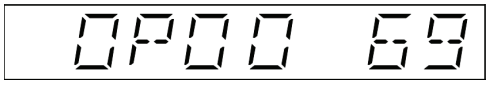
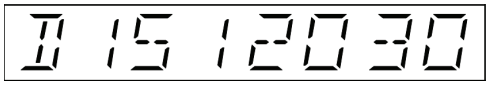
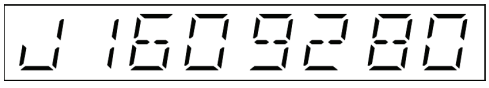
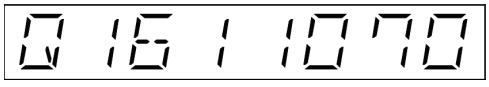
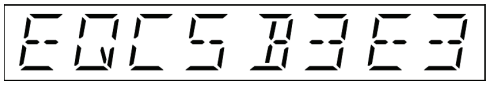
1. HIDDEN KEY MODE TABLE

HIDDEN MODE	ENTRANCE KEY(Audio)	EXIT KEY
Version Check	Front 'Stop' ■ + Remote Control Key 'Play' ▶/II for 5s	Remote Control Key 'Play' ▶/II for 1.5s
EEPROM INITIAL	Front 'Stop' ■ + Remote Control Key ' ⏮ ' for 5s	Auto exit

2. HIDDEN KEY MODE DESCRIPTION

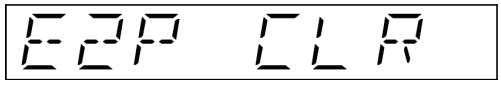
2-1. Version Check

- Function : Version Check.
- Entrance Key : Front 'Stop' + Remote Control Key 'Play' for 5s.
- Exit Key : Remote Control Key 'Play' for 1.5s.
- Operation explanation : Remote Control Key ⏮ OR ⏭.

VFD Display (Example)	Result
	MCS Version
	MICOM Version
	OPTION Version
	DEMO Version
	DJ PRO Version
	EQ Version
	EQ Check sum Version

2-2. EEPROM Initial

- Function : Initialize data stored in EEPROM and BACKUP RAM data.
- Entrance Key : Front 'Stop' + Remote Control Key ' ⏮ ' for 5s.
- Exit Key : Auto exit.
- Explanation : 'E2P CLR' is displayed on the VPD and turn off the power automatically.



PROGRAM DOWNLOAD GUIDE

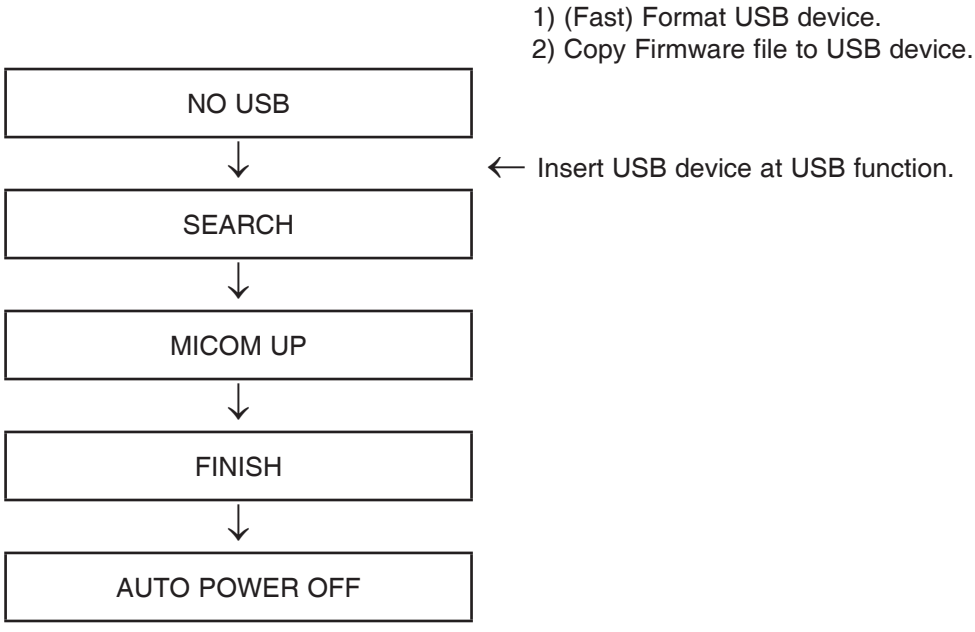
1. AUDIO PROGRAM

Download program file name must be MICOM_OK75_YYMMDDX.HEX

If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.
Downloading file proceeds in the same way at USB1 function and USB2 function.

Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN



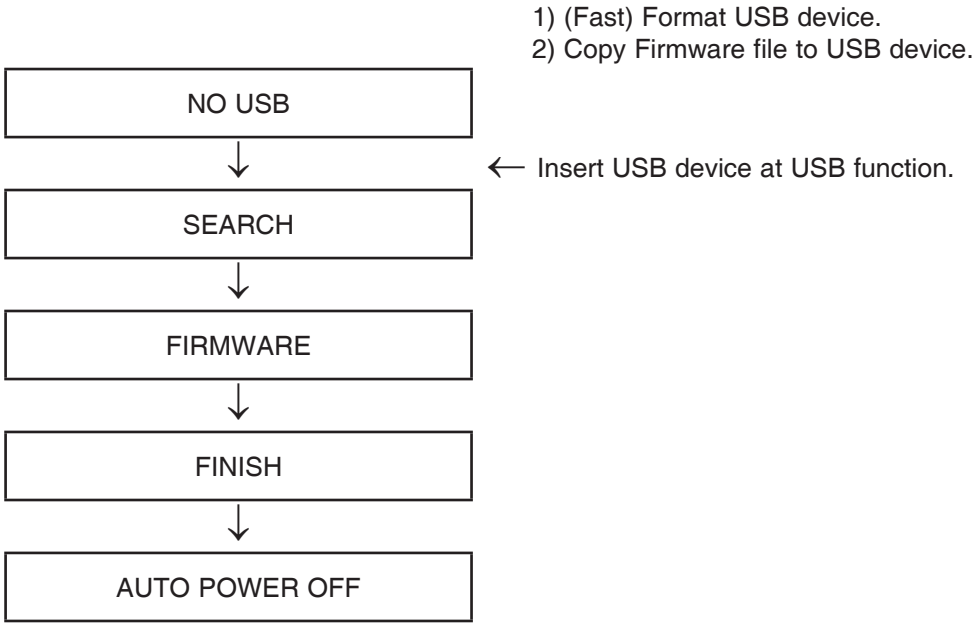
2. CD PROGRAM

Download program file name must be HG790_OK75_YYMMDDX.bin

If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.
Downloading file proceeds in the same way at USB1 function and USB2 function.

Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN



3. EQ & DEMO PROGRAM

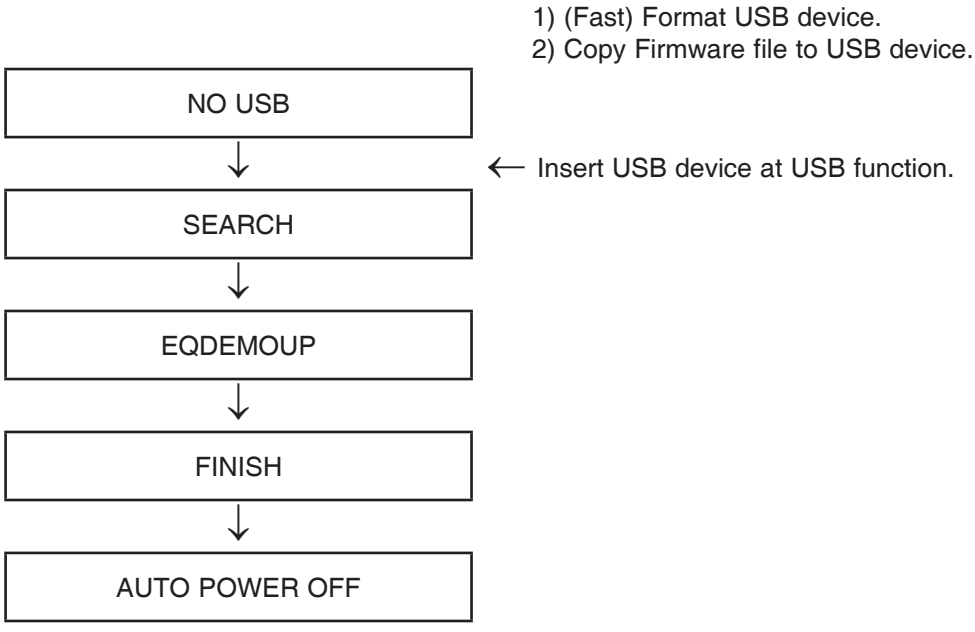
Download program file name must be EQ_DEMO_PRG_OK75_XXXX.BIN

If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.

Downloading file proceeds in the same way at USB1 function and USB2 function.

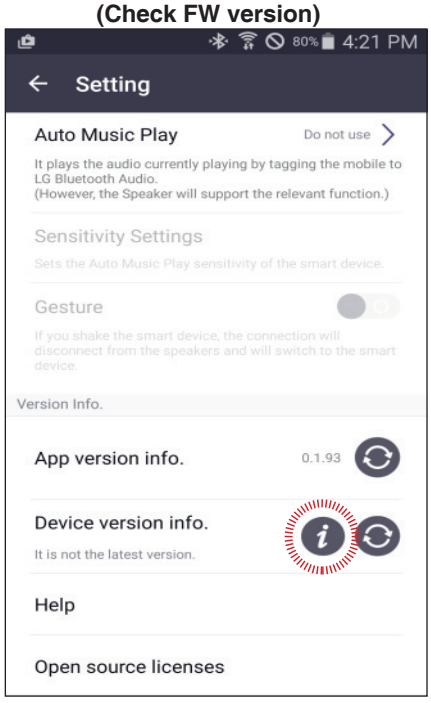
Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN



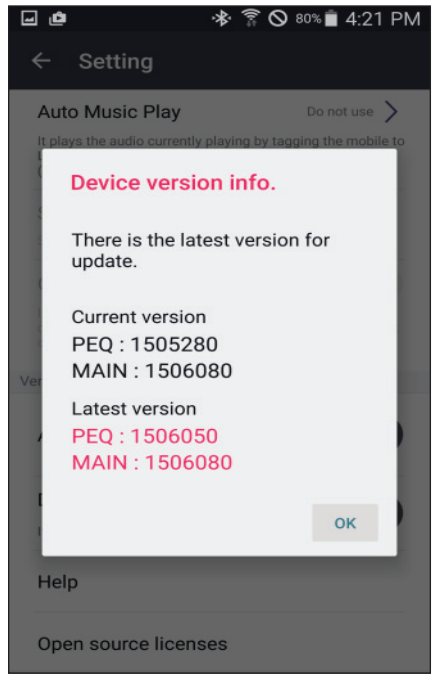
FOTA UPDATE STEP USING BT APP

Step1 : App connecting (Check FW version)



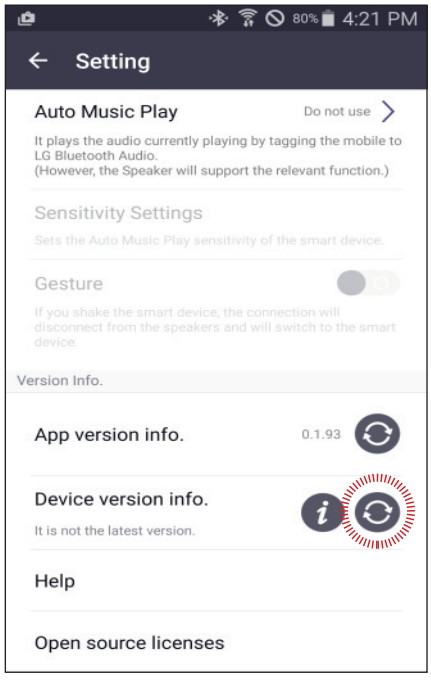
After connecting the BT App with SET, the user could find the “Device Version info” on Setting tab.

Step2 : Device version info



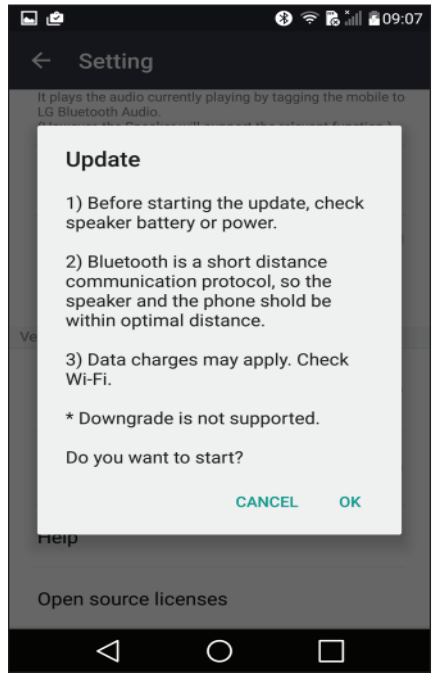
When touch the “Device Version info” button, user could find the current and latest SET version on pop-up menu.

Step3 : Select update button



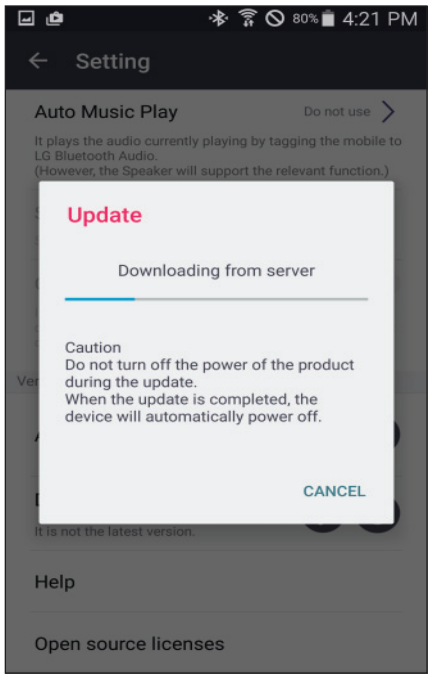
When touch the “Update” button, user could update the SET firmware using FOTA.

Step4 : Confirm update



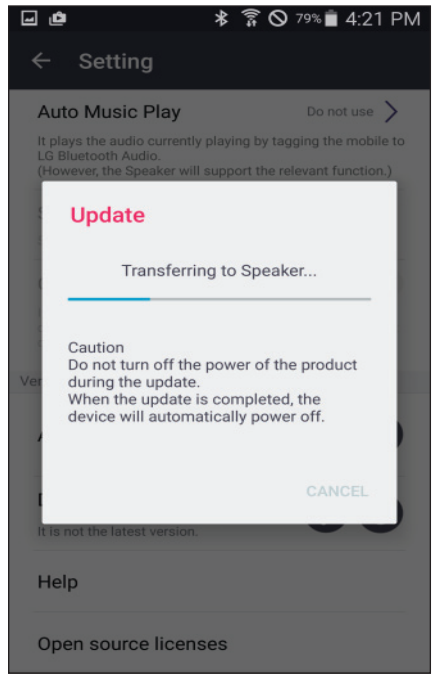
Select the OK button on the caution message.

Step5 : Download from CDN server



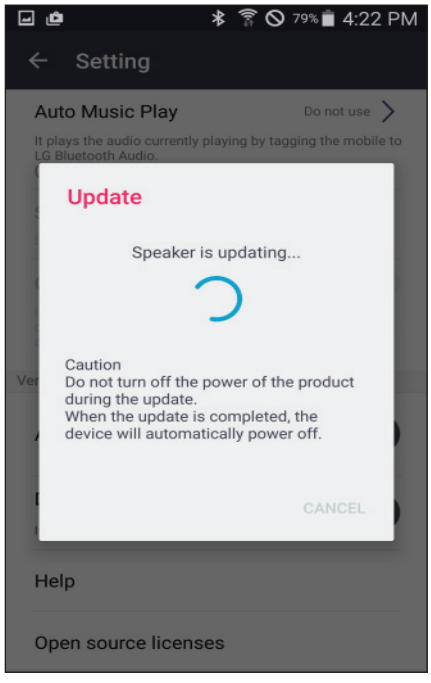
1st step is download from CDN server to smart phone. The progress bar is displayed on BT App.

Step6 : Transfer FW



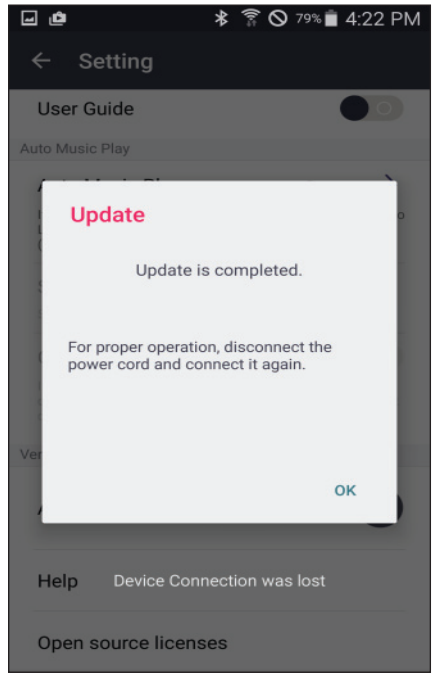
After completed the download from server, smart phone start to transfer the firmware to the SET. The progress bar is displayed on BT App.

Step7 : FW Flash Writing



After completed the download from the smart phone, the SET overwrite the firmware to flash memory.

Step8 : FOTA complete



When finishing the flash memory writing, pop-up message about finish is displayed and the SET auto power off.

SPECIFICATIONS

• GENERAL

Power requirements	Refer to the main label on the unit.
Power consumption	Refer to the main label on the unit.
Dimensions (W x H x D)	Approx. 330 mm x 925 mm x 360 mm
Operating temperature	5 °C to 35 °C (41 °F to 95 °F)
Operating humidity	60 %

• INPUTS

Digital audio in (OPTICAL IN)	3.3 V (p-p), Optical jack x 1
Analog audio in (AUX IN)	2.0 Vrms (1 kHz, 0 dB), 600 Ω, RCA jack (L, R)
Portable in (PORT. IN)	1.0 Vrms (3.5 mm stereo jack) x 1
Microphone (MIC 1/2)	Sensitivity 20 mV (1 kHz), 6.3 mm jack x 2

• TUNER

FM Tuning Range	87.5 to 108.0 MHz or 87.50 to 108.00 MHz

• SYSTEM

Frequency Response	40 to 20,000 Hz
Signal-to-noise ratio	More than 75 dB
Dynamic range	More than 80 dB
Bus Power Supply (USB)	5 V ⎓ 500 mA
Available Digital Input Audio Sampling Frequency	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz

• AMPLIFIER (RMS Output power)

Total output	1,000 W RMS
HIGH	295 W RMS × 2 (4 Ω at 1kHz, 10% THD)
LOW	410 W RMS (3 Ω at 200Hz, 10% THD)

• Design and specifications are subject to change without notice.

SECTION 2

CABINET & MAIN CHASSIS

CONTENTS

DISASSEMBLY INSTRUCTIONS

1) Remove the 6 screws.

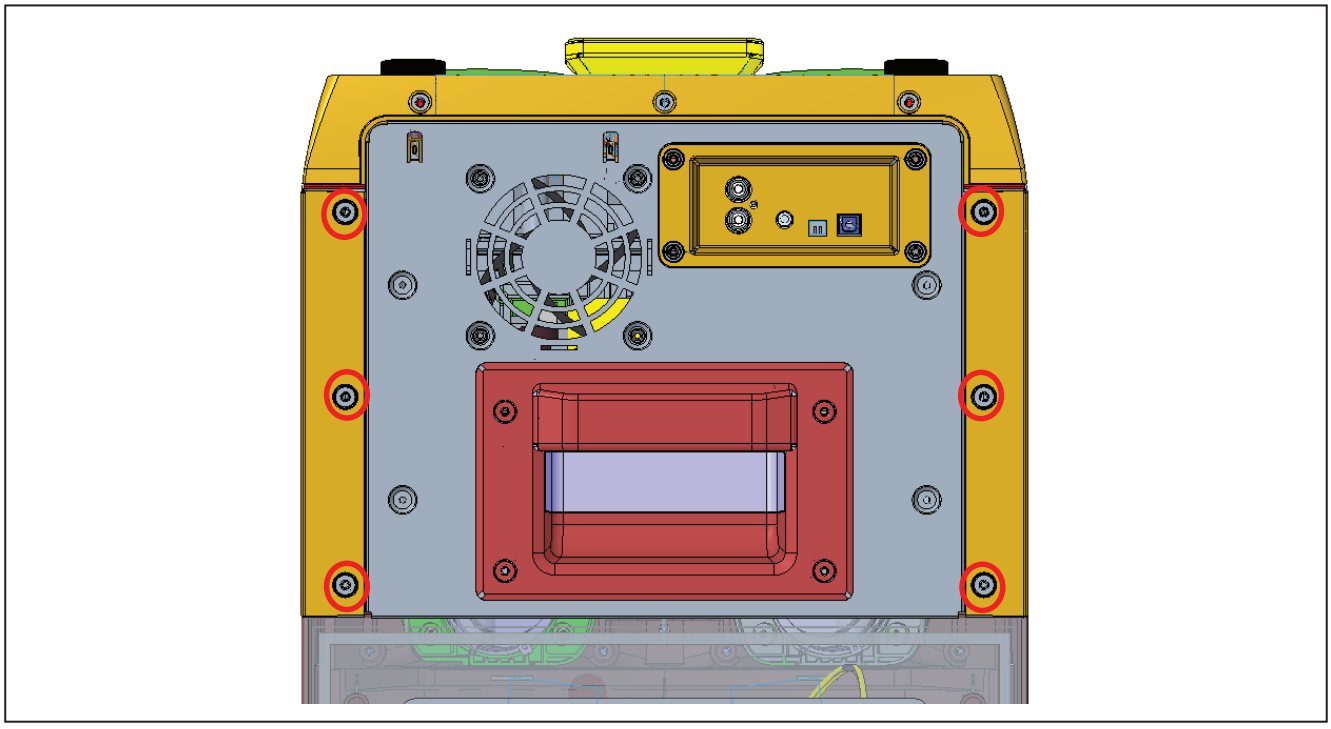


Figure 1. Panel Side L/R disassembly - 1

2) Disassemble each of the two screws located inside the handle.

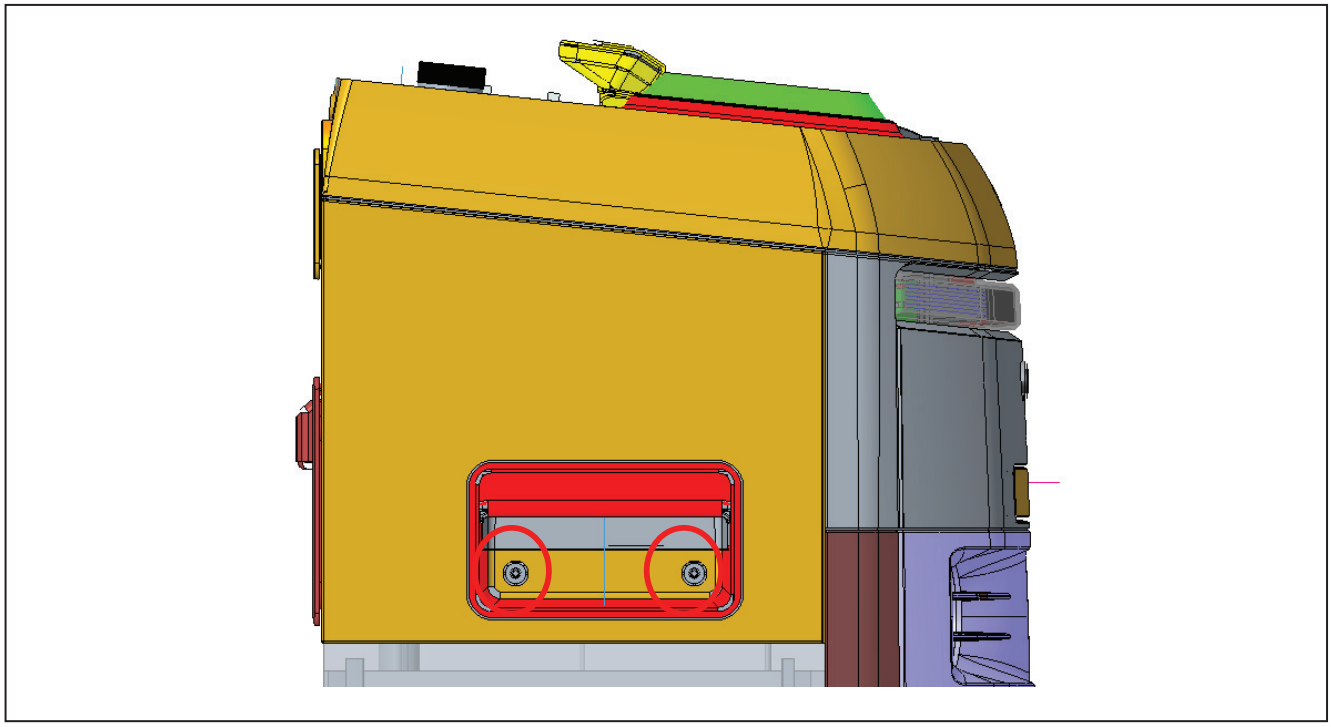


Figure 2. Panel Side L/R disassembly - 2

3) Pull out Cover Side Assembly L/R in the backward direction.

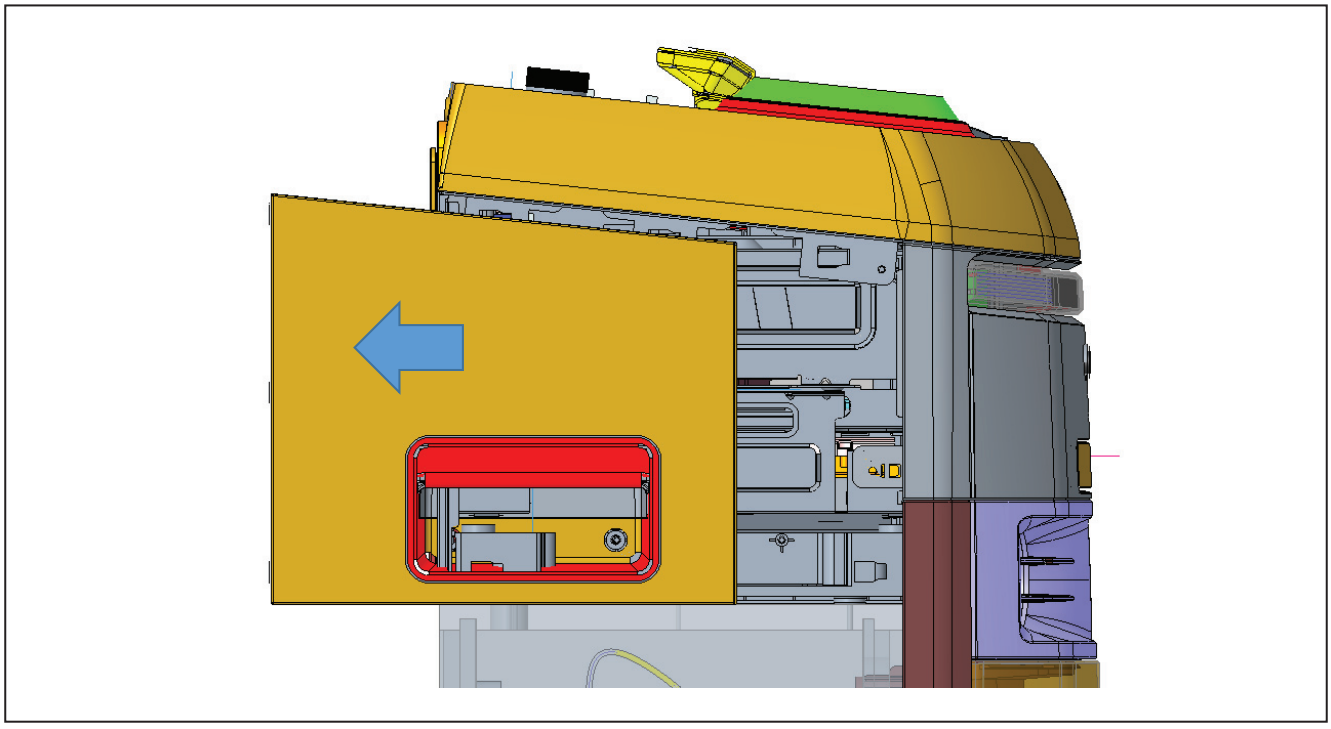


Figure 3. Panel Side L/R disassembly - 3

4) Remove the 3 screws.

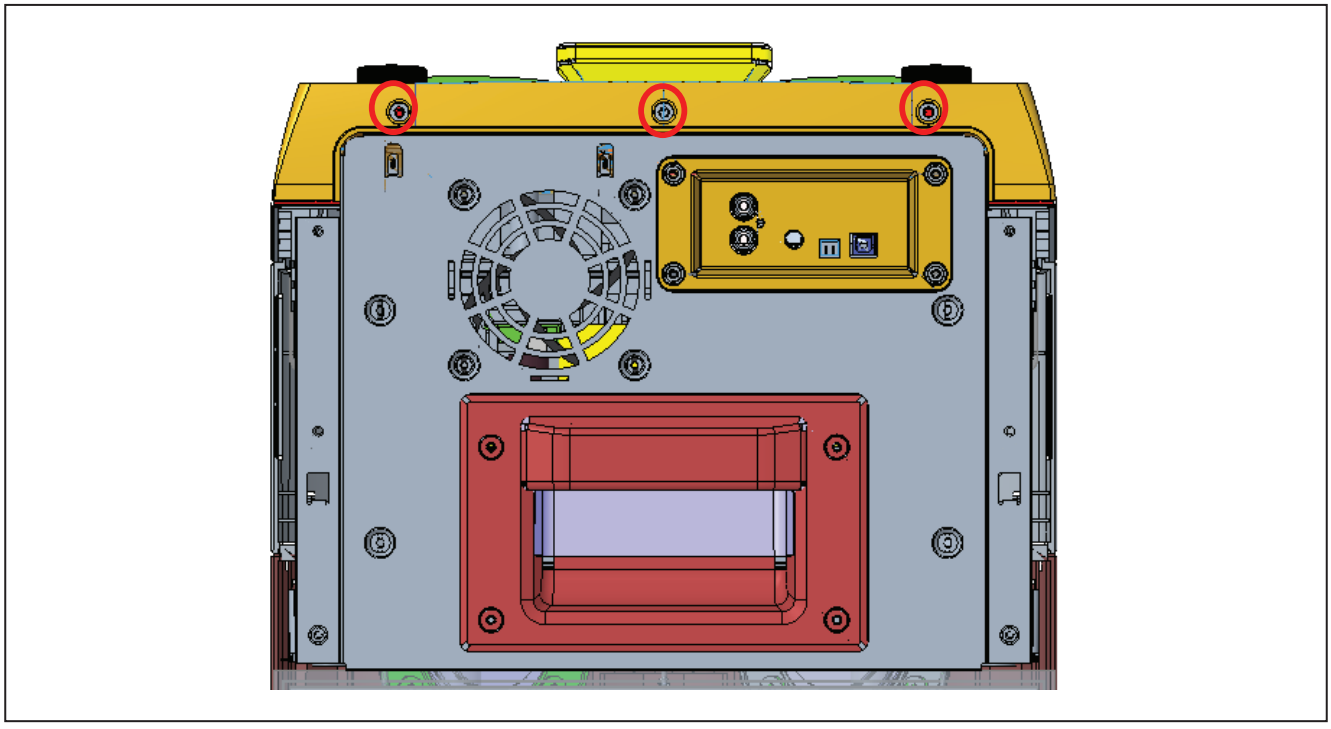


Figure 4. Panel Top disassembly - 1

5) Remove the two screws on the left and right sides.

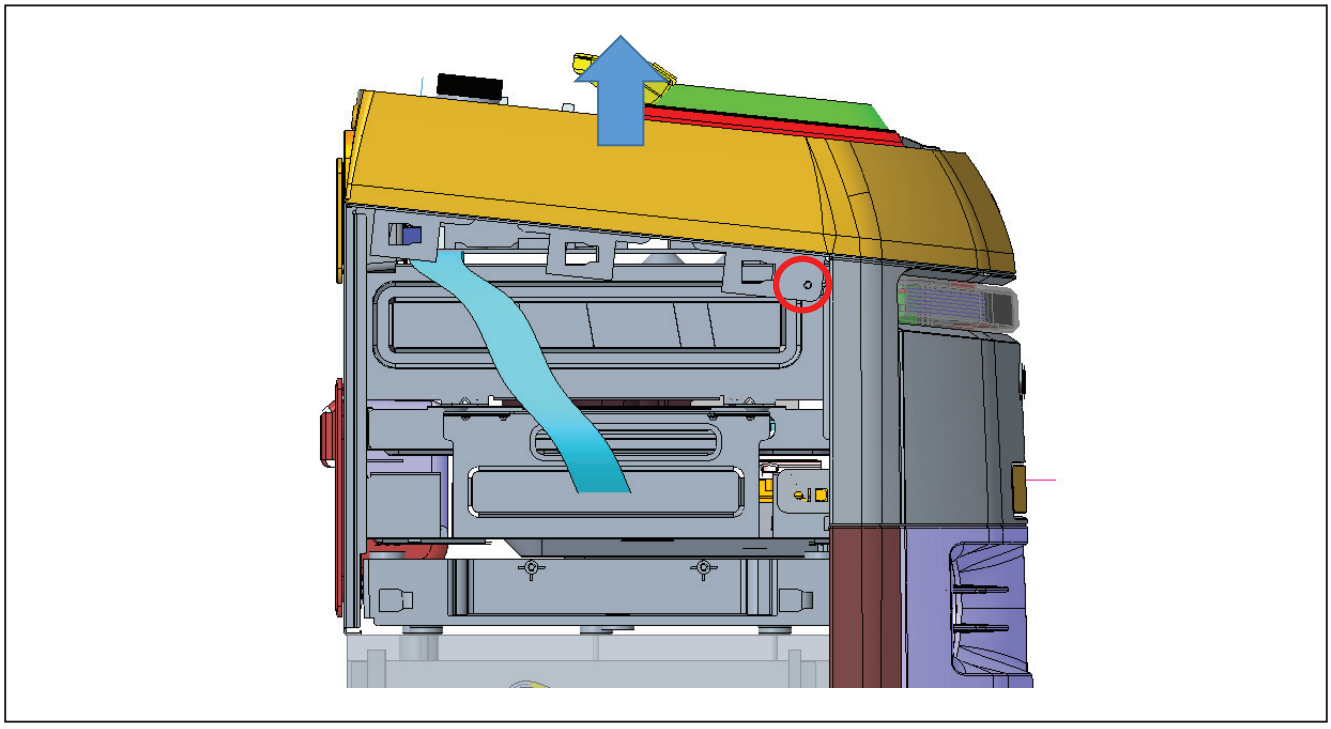


Figure 5. Panel Top disassembly - 2

6) As shown in the figure, remove the Panel Top by pushing the front part and lifting the rear part.

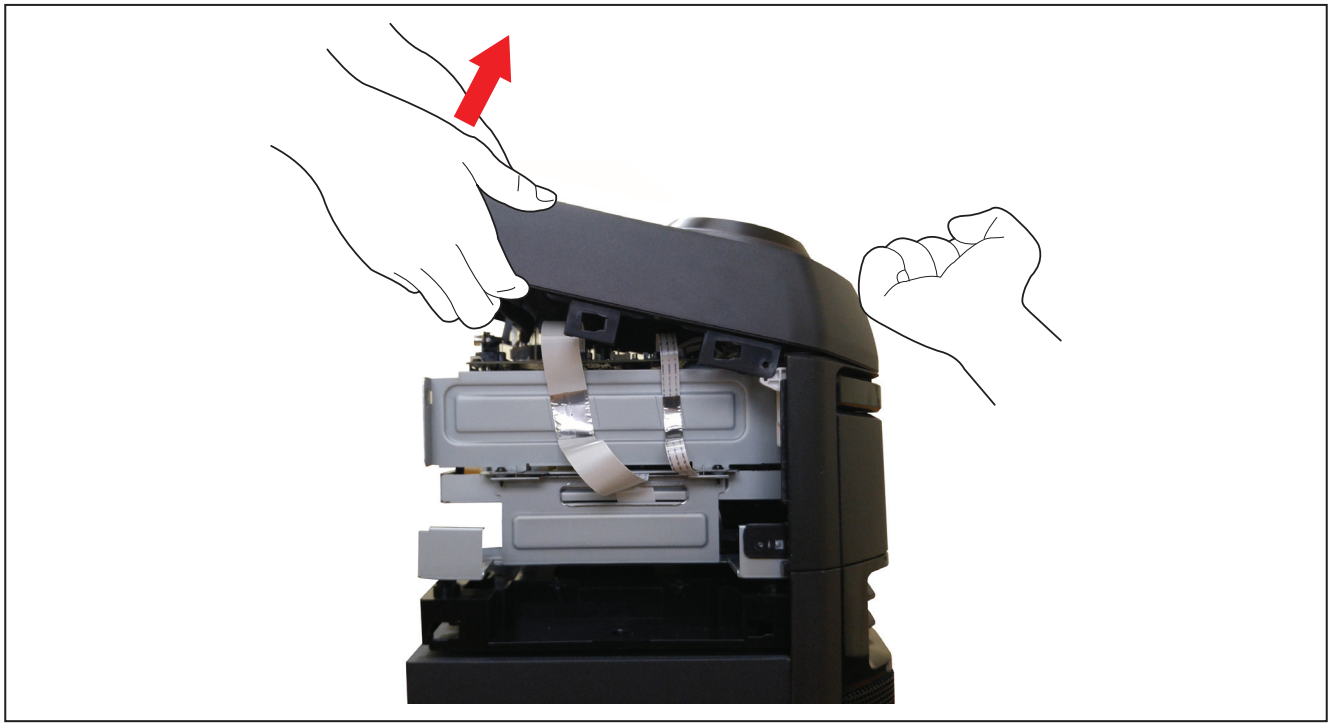


Figure 6. Panel Top disassembly - 3

7) Remove the 9 screws on the Panel Rear.

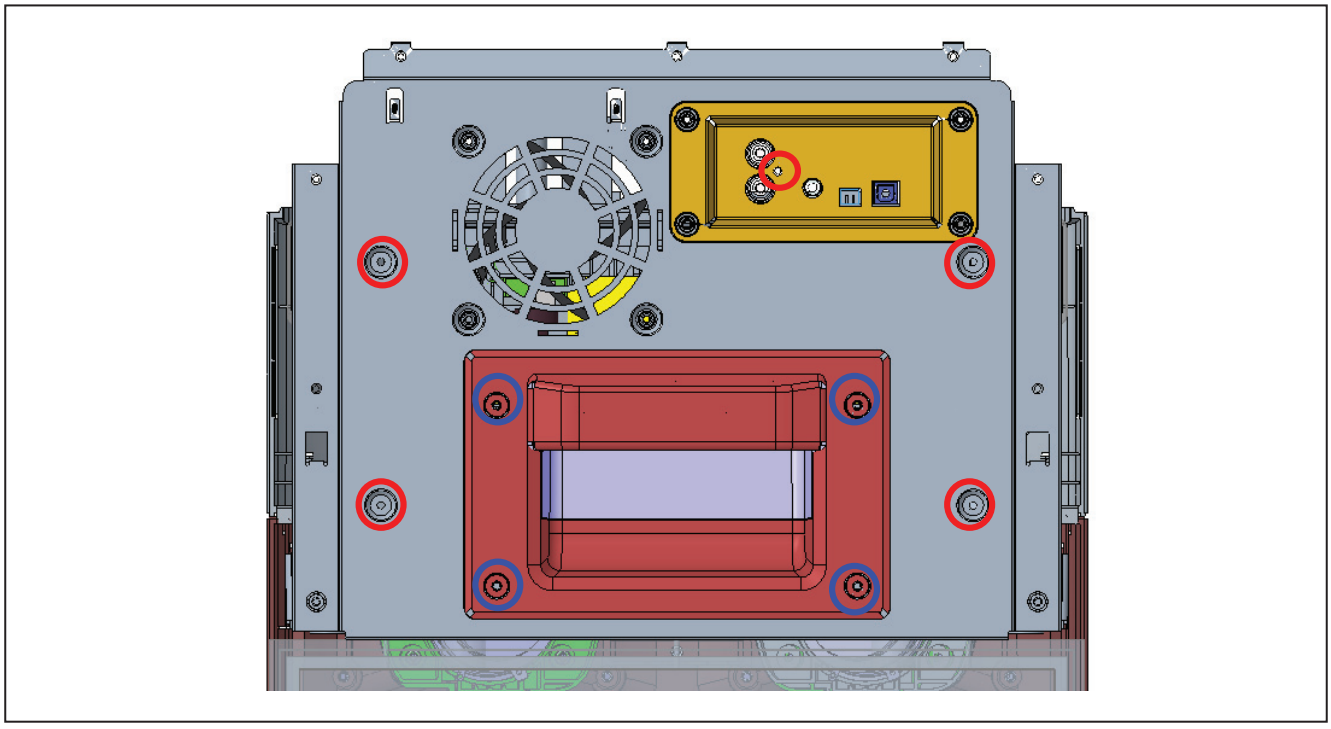


Figure 7. Panel Rear disassembly

8) Bracket MD + Frame Main Screw 4 EA Disassembly

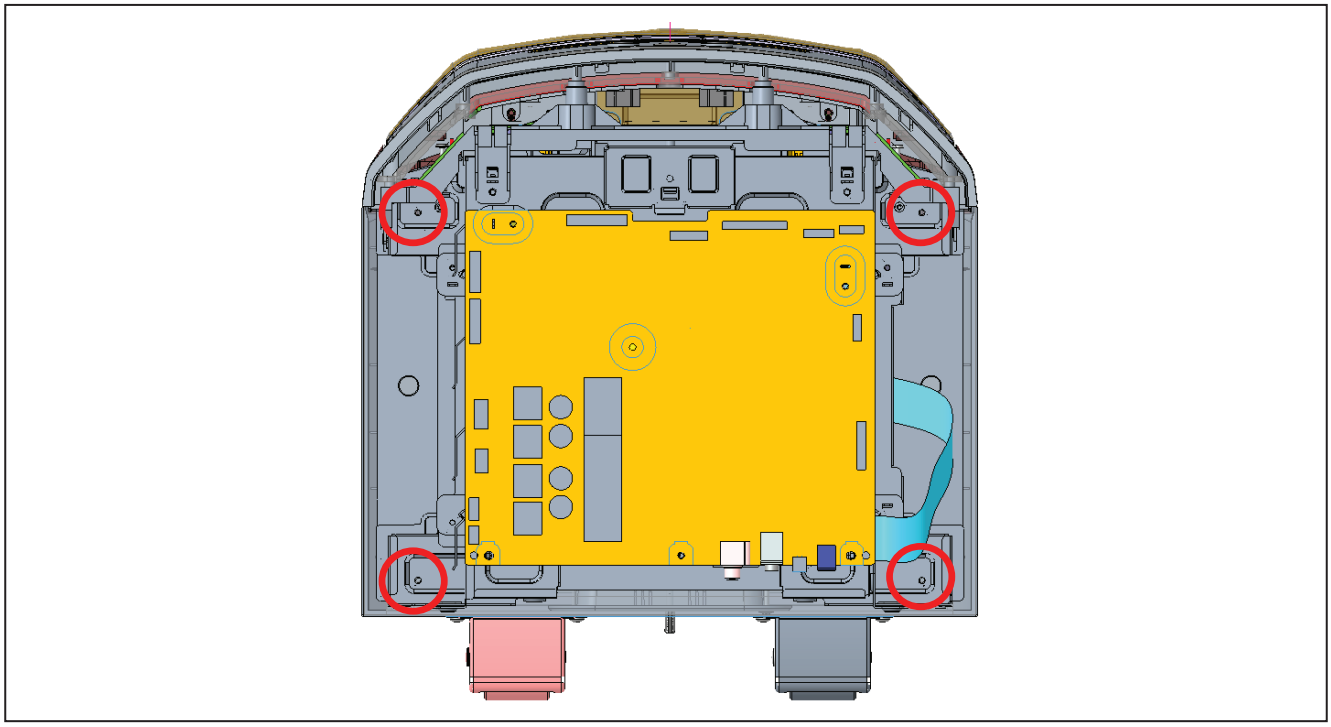


Figure 8. Main Set disassembly - 1

9) Remove the Set LED Connector / Speaker LED Connector / Speaker Network cable.

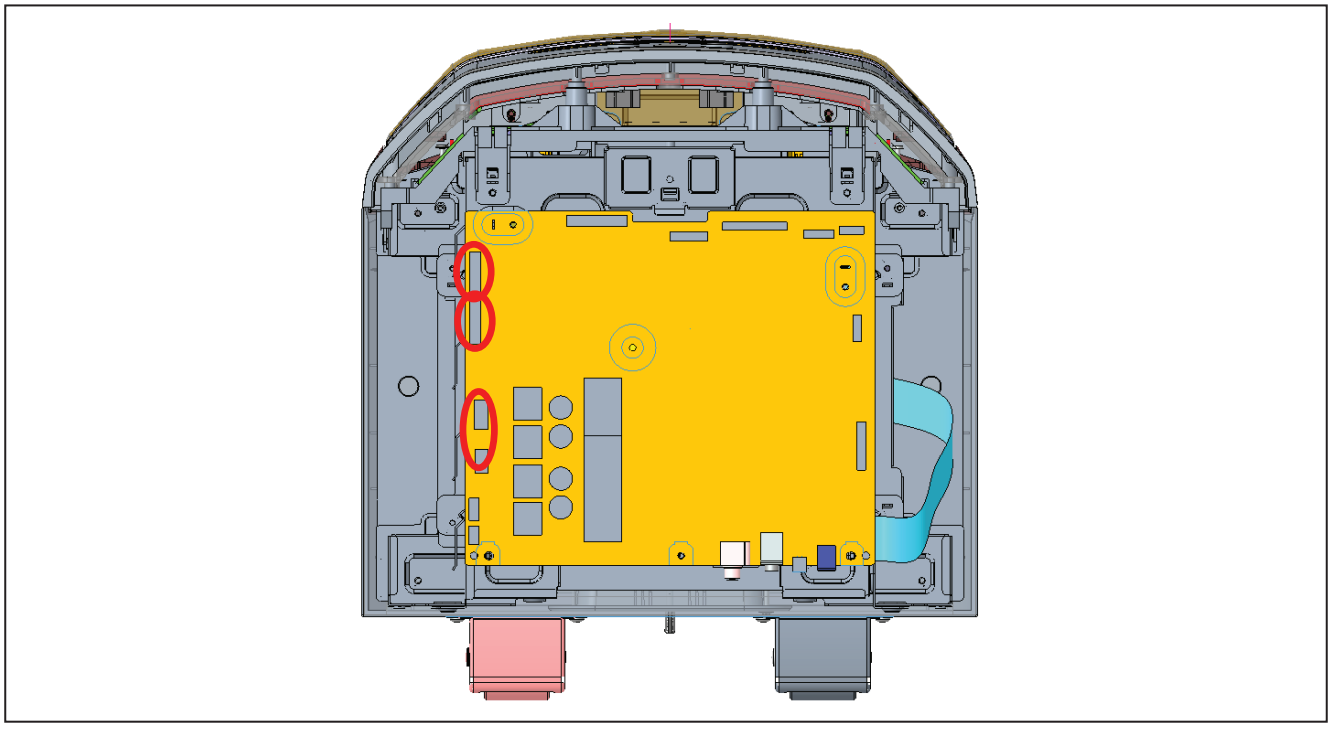


Figure 9. Main Set disassembly - 2

10) Power Cable Disconnection

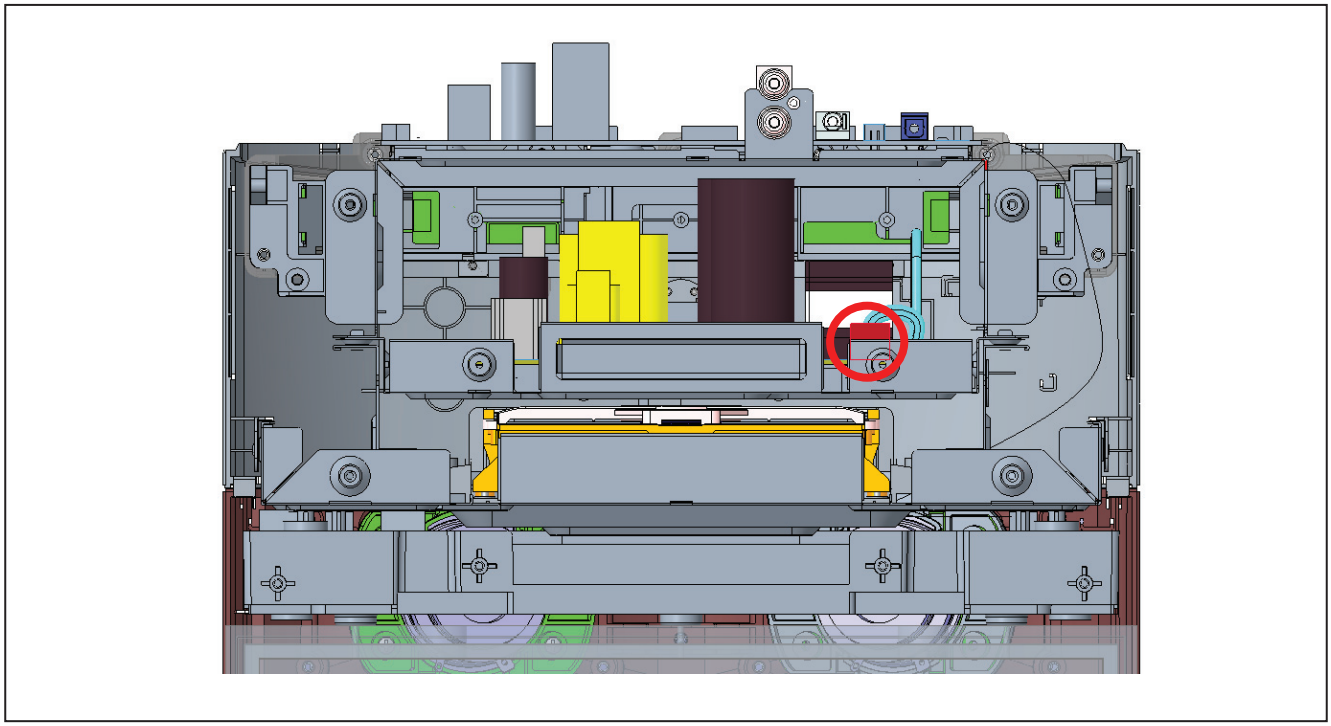


Figure 10. Main Set disassembly - 3

11) Grasp both sides and pull upward to remove the assembly.

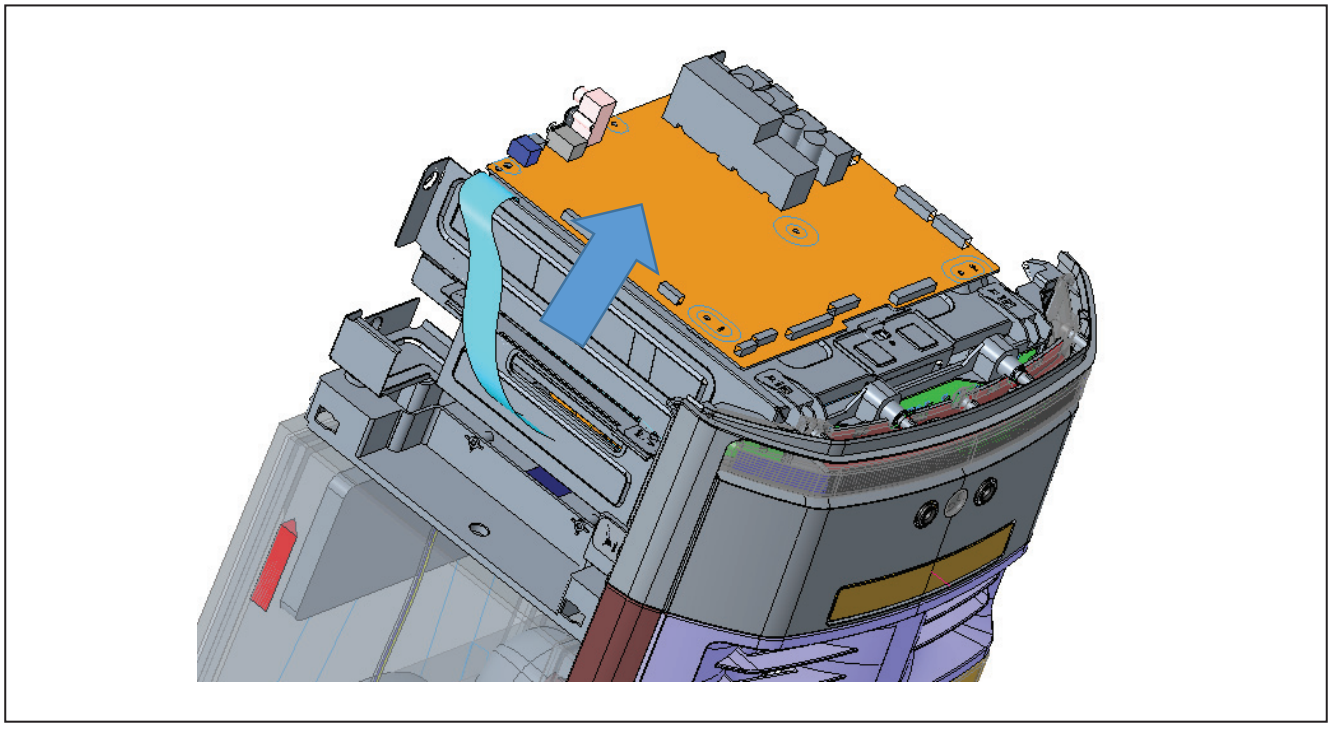


Figure 11. Main Set disassembly - 4

12) Complete removal of the Main Set.

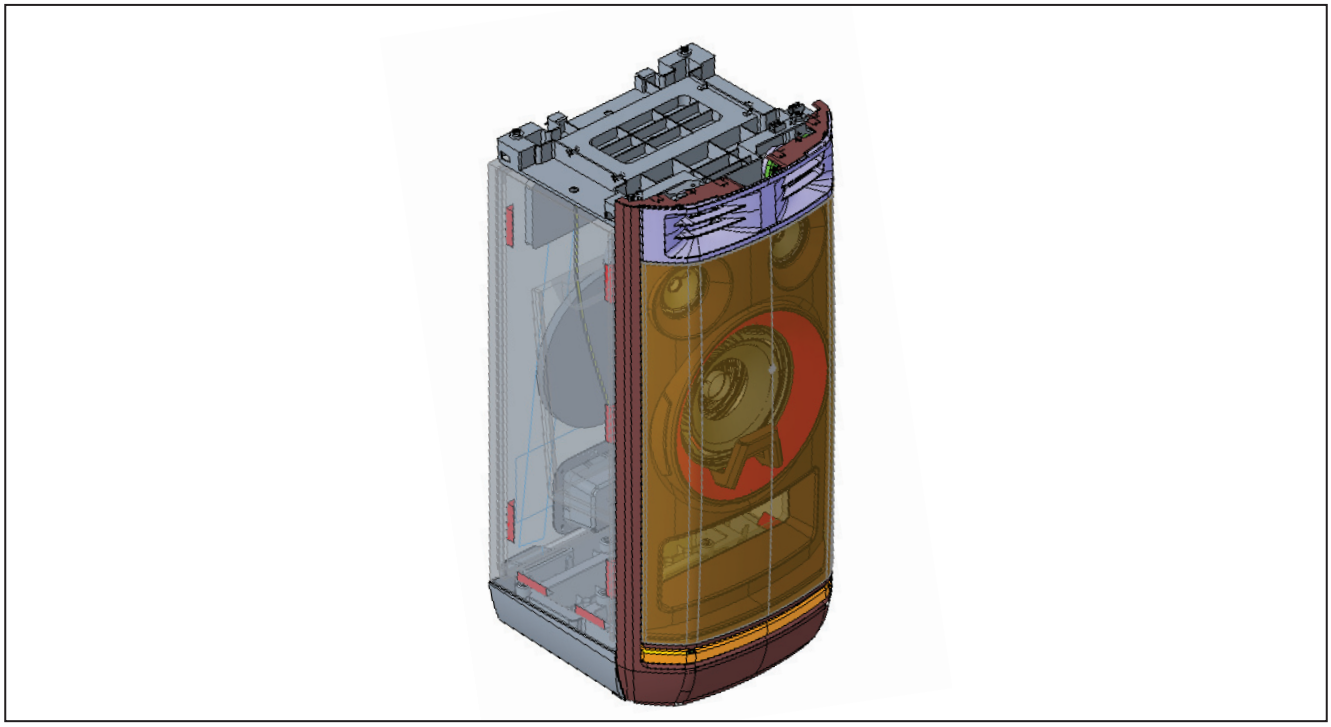
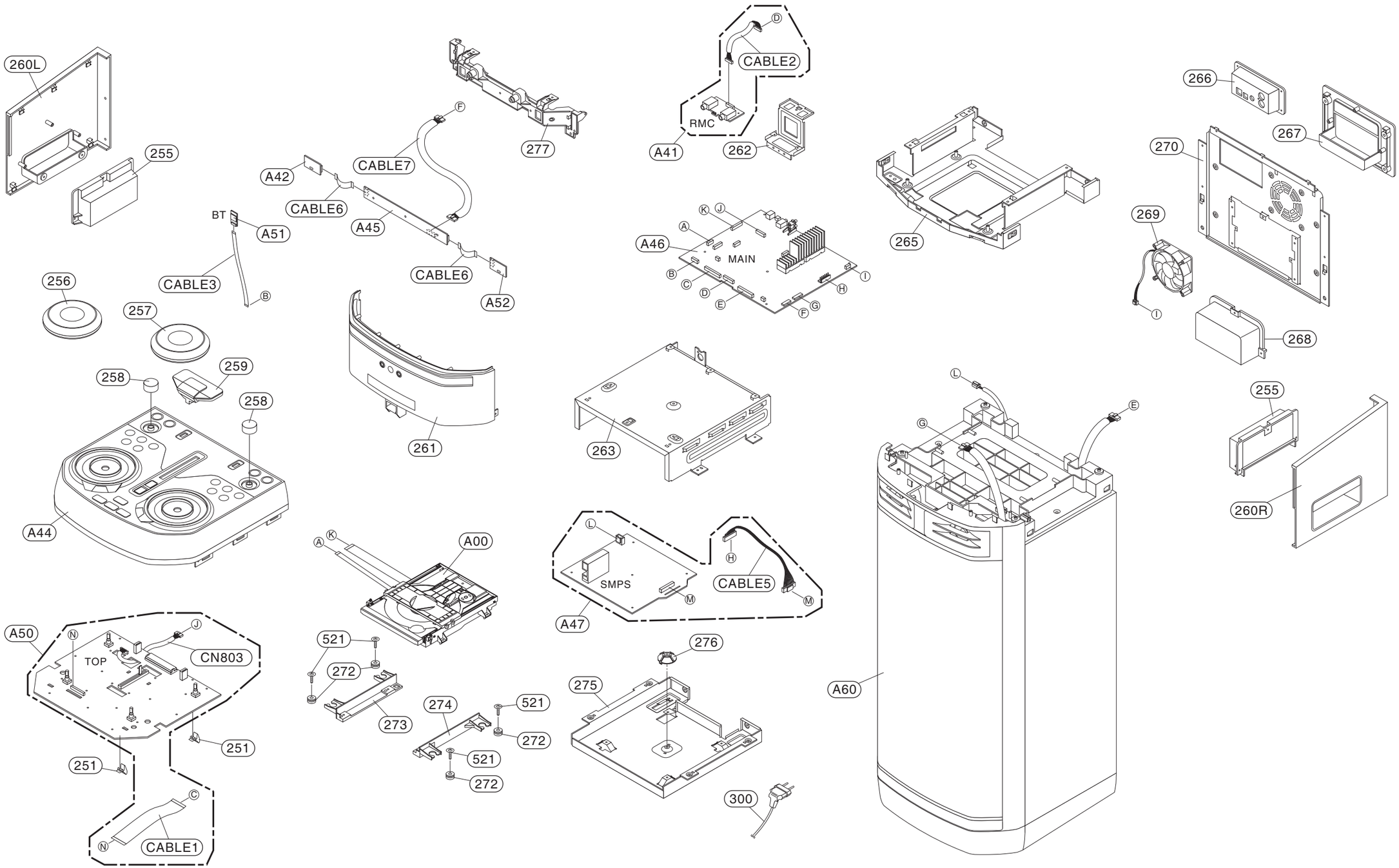


Figure 12. After detaching the Main Set

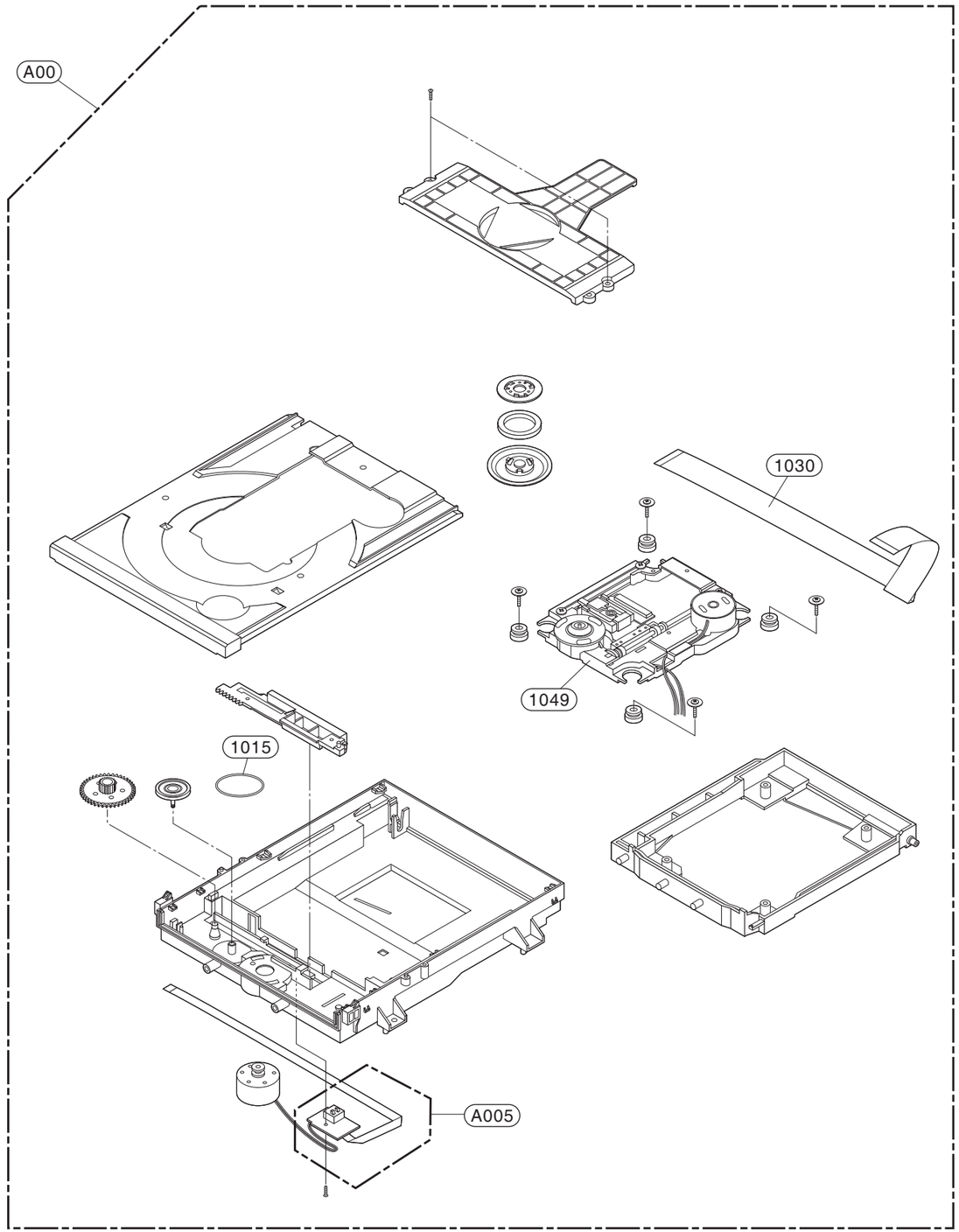
MEMO

EXPLODED VIEWS

1. CABINET AND MAIN FRAME SECTION



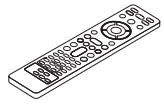
2. DECK MECHANISM SECTION (DM19D)



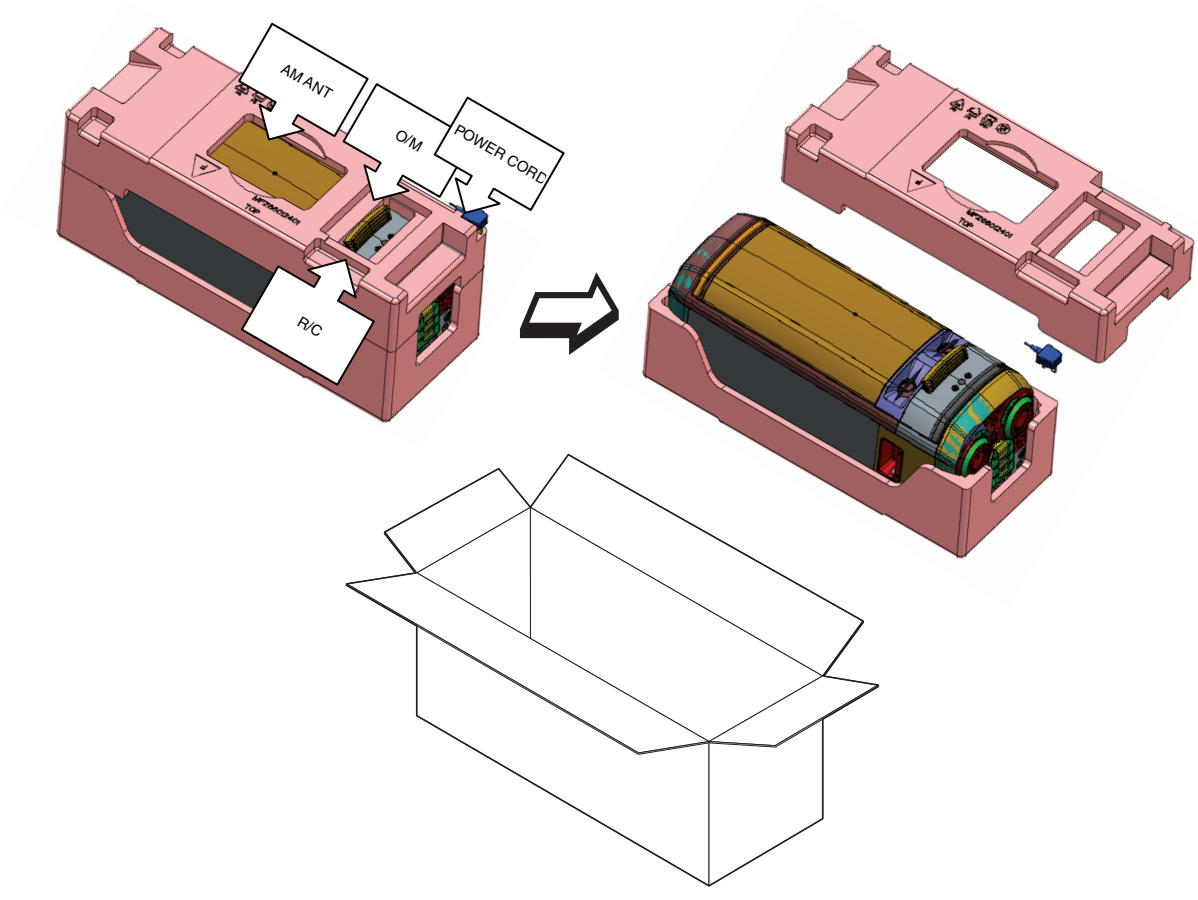
3. PACKING ACCESSORY SECTION

825 FM Wire Antenna

826 Filter, Ferrite Core



900 Remote Control



MEMO

SECTION 3
ELECTRICAL

CONTENTS

ONE POINT REPAIR GUIDE

1. NO POWER

If the unit doesn't work by no power problem, repair the set according to the following guide.

1-1. FUSE/ THERMISTOR/ BRIDGE DIODE

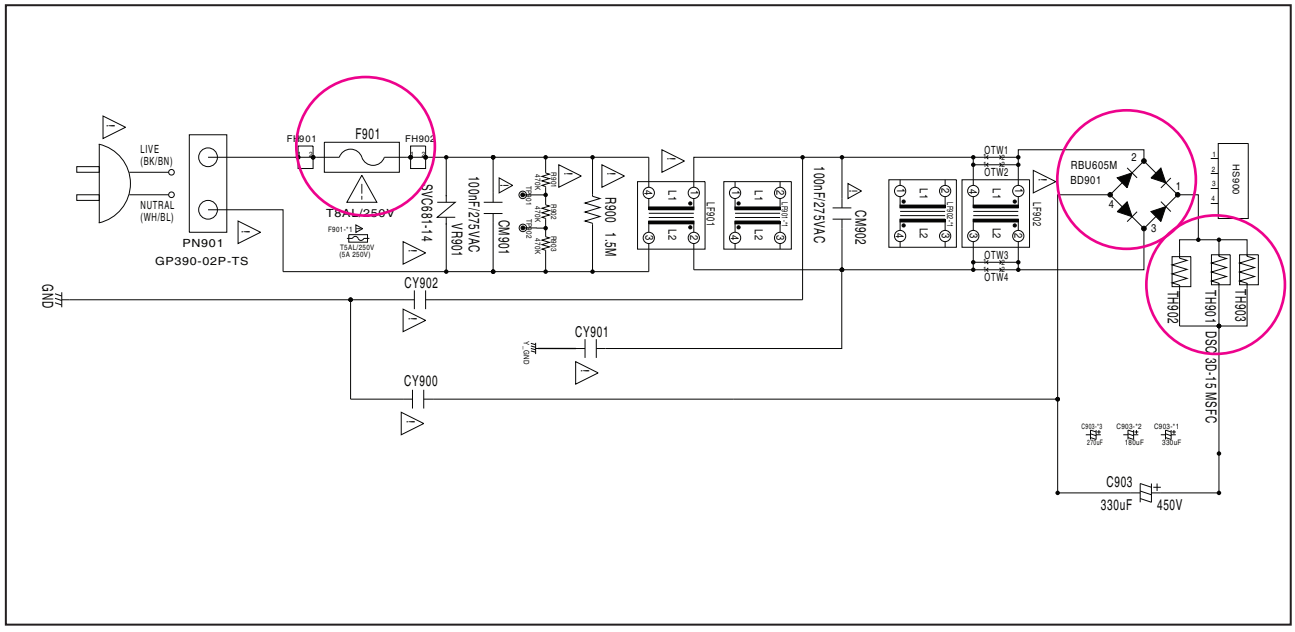
1-1-1. Solution

Please check and replace F901, TH901 or TH903, BD901 on SMPS board.

1-1-2. How to troubleshoot (Countermeasure)

1) Check if the fuse F901 is open or short-circuit.
2) Check if the NTC thermistor TH900 or TH903 is normal or open.
3) Check if the bridge diode BD901 is short-circuit by over current with a digital multi-meter.

1-1-3. Service hint (Any picture/ Remark)



< F901 >
If F901 is not short-circuit, replace it with a same specifications one.

<TH901 or TH903 >
If TH901 or TH903 is open, replace it with a new one.

< BD901 >
If BD901 is short-circuit, replace it with a new one.

ONE POINT REPAIR GUIDE

NO POWER

If the unit doesn't work by no PVDD problem, repair the set according to the following guide.

1-2. FUSE/ FET

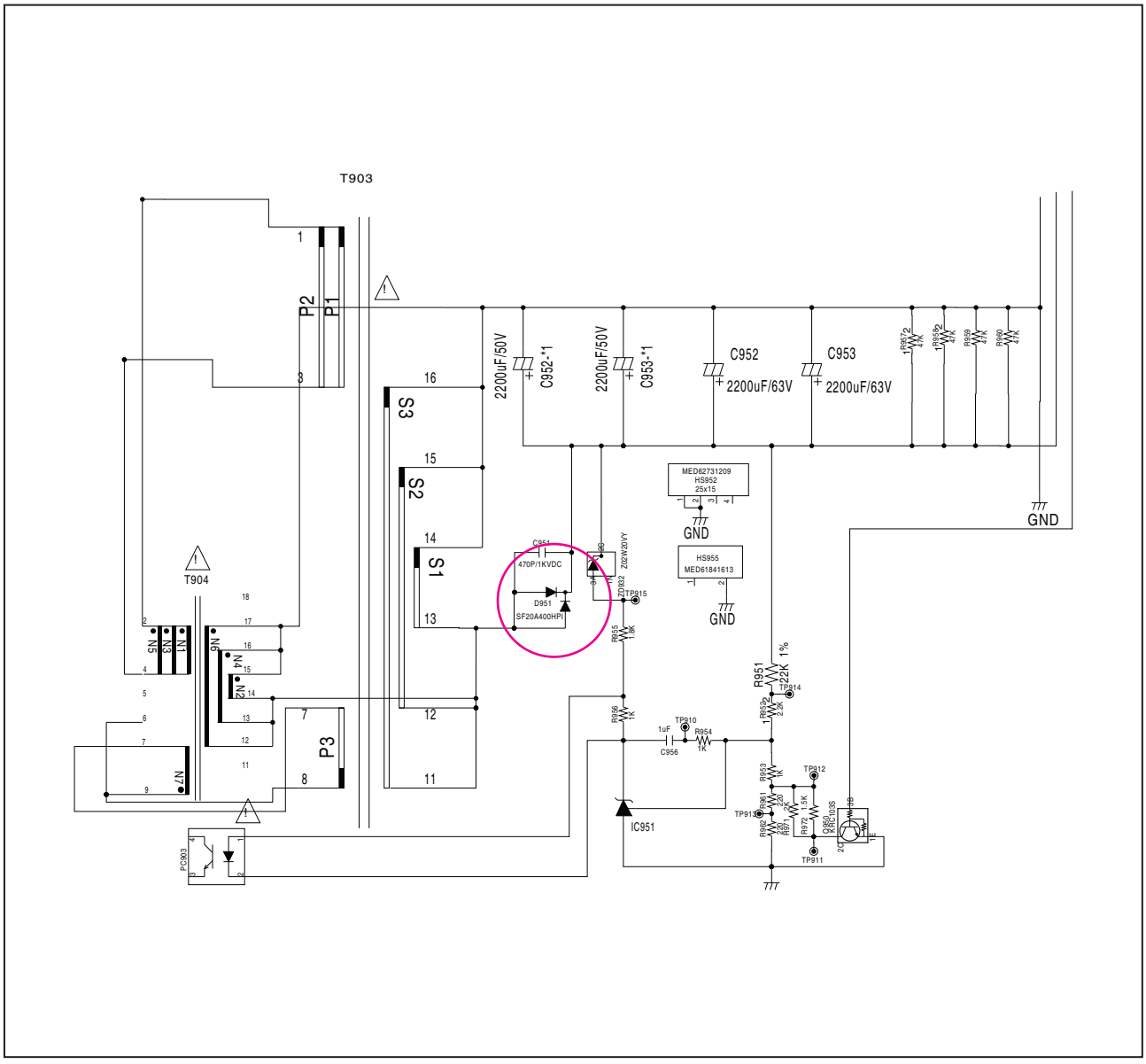
1-2-1. Solution

Please check and replace F901, Q901 on SMPS board.

1-2-2. How to troubleshoot (Countermeasure)

1) Check if the fuse F901 is open or short-circuit.
2) Check the anode-cathod voltage of D951 with a digital multi-meter, it is normally 0.2 ~ 0.3 V.
   ⇨ If it doesn't have any voltage, it's destroyed. Replace it with a new one.

1-2-3. Service hint (Any picture/ Remark)



< SMPS circuit >

ONE POINT REPAIR GUIDE

2. NO BOOTING WHEN POWER ON THE SET

The set doesn't work when press the power button on the top board or the remote control.

2-1. IC501

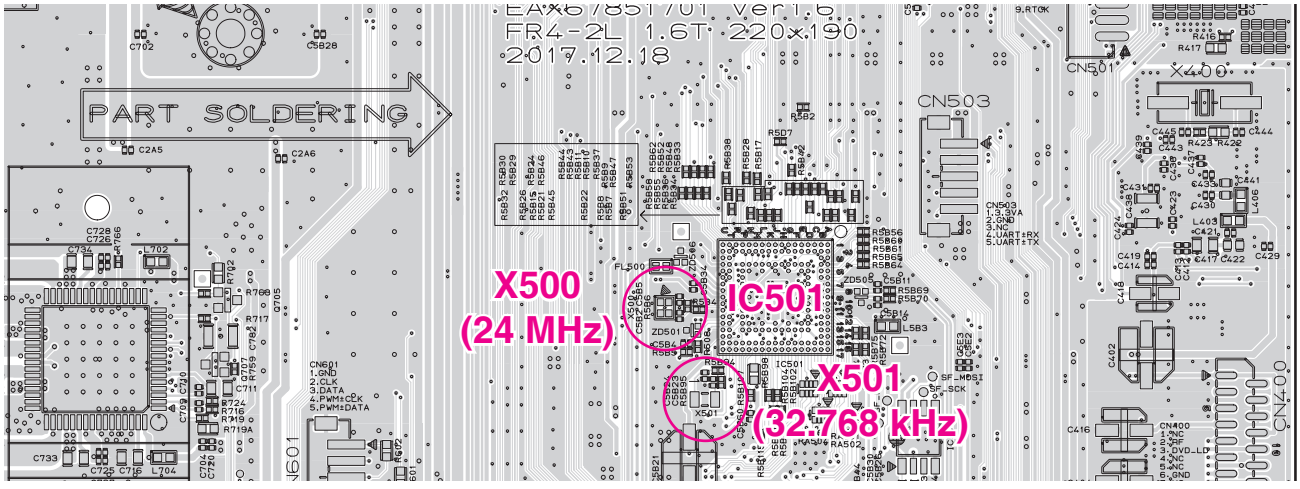
2-1-1. Solution

Replace IC501 on MAIN board.

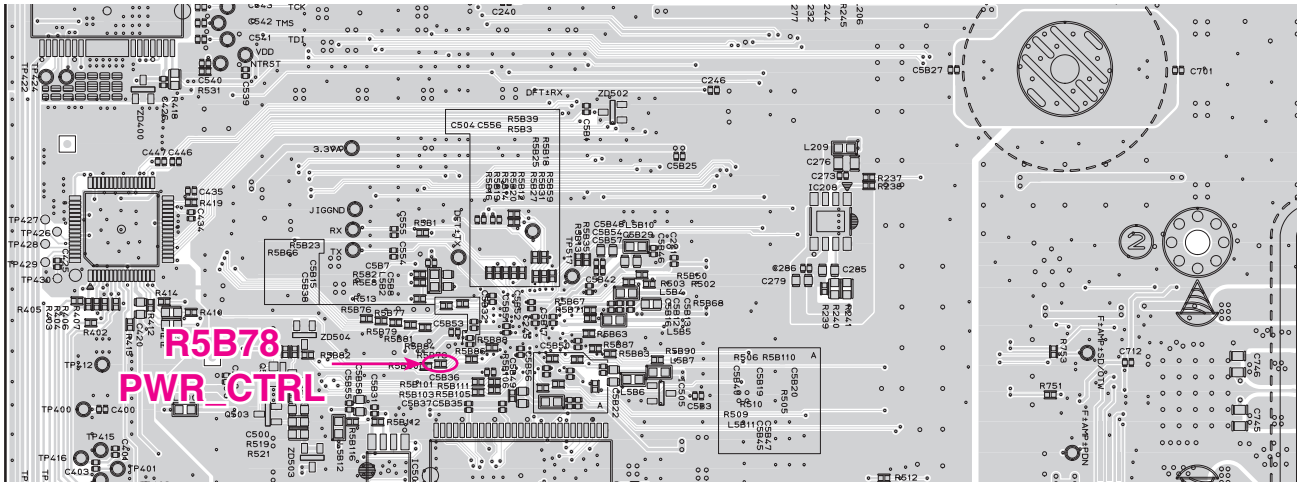
2-1-2. How to troubleshoot (Countermeasure)

1) Check the +12 V (CN201) and 3.3 VA (IC202) in standby mode.
   ⇨ If there is no 12 VA, check the SMPS and if doesn't appear 3.3 VA, check IC202.
2) Check +12 V, +5.1 VA, 3.3 VA, DVCC_5V and DVCC_3.3V when power on the set.
   - If the set doesn't work regardless of what the KEY1 changes high to low while pressing the power button. X500 and X501 work normally but, if you can not power on the set, replace the IC501 with a new one on the main board.

2-1-3. Service hint (Any picture/ Remark)



< MAIN board top view >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

3. VFD IS NOT DISPLAYED WHEN POWER ON THE SET

When power on the set, any icons or characters on VFD are not displayed.

3-1. VFD (VFD801)

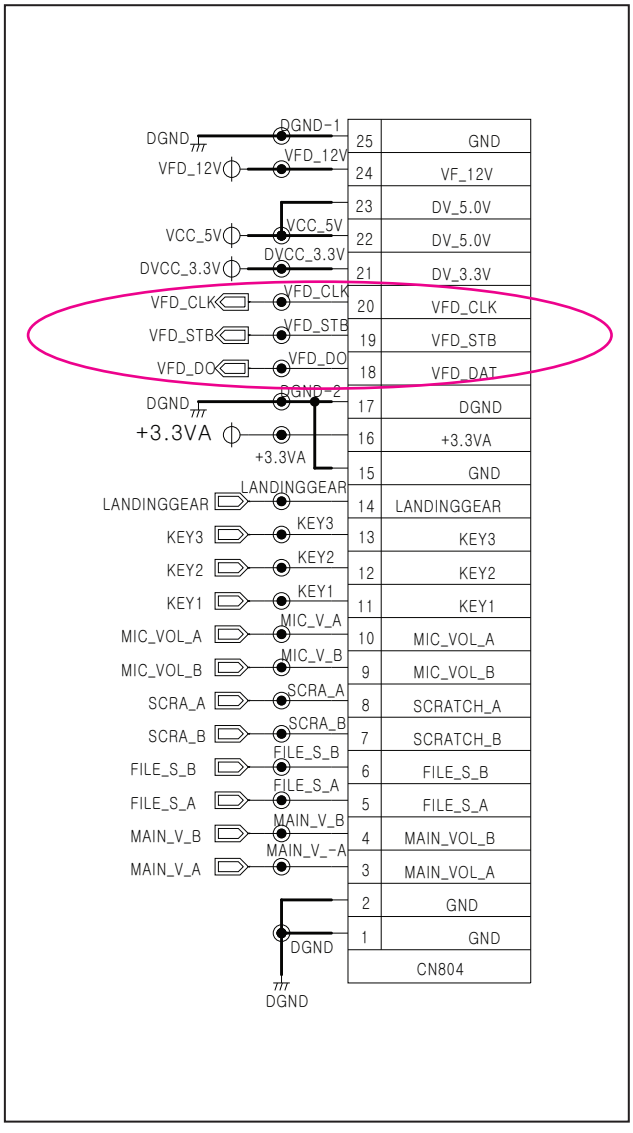
3-1-1. Solution

Please check and replace VFD301 on TOP FRONT board.

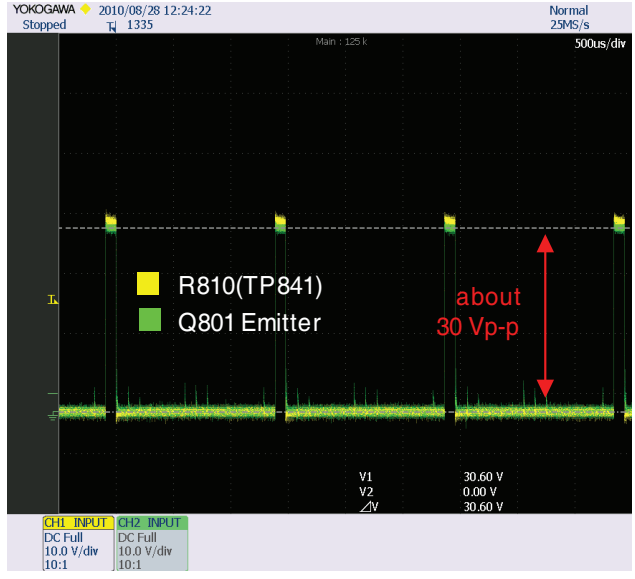
3-1-2. How to troubleshoot (Countermeasure)

1) Check if VFD_12V, DVCC_3.3V and VCC_5V are output from SMPS to VFD via the main board.
2) Check if the IC501 outputs VFD_CLK, VFD_STB, and VFD_DAT to the top board.
3) Check if the VFD grid current amplifier circuit on the top board.
   Check the drive signal to the transistor's(Q801,2) base.
   ⇨ If the control signals from VFD (DGND, VDD) isn't output, replace VFD with a new one.

3-1-3. Service hint (Any picture/ Remark)



< TOP FRONT circuit >



< Waveform of the grid current driver>

ONE POINT REPAIR GUIDE

4. NO BOOTING (IN CD/USB FUNCTION)

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ CD or USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-1. NO DVCC_3.3V, 1.2 VA

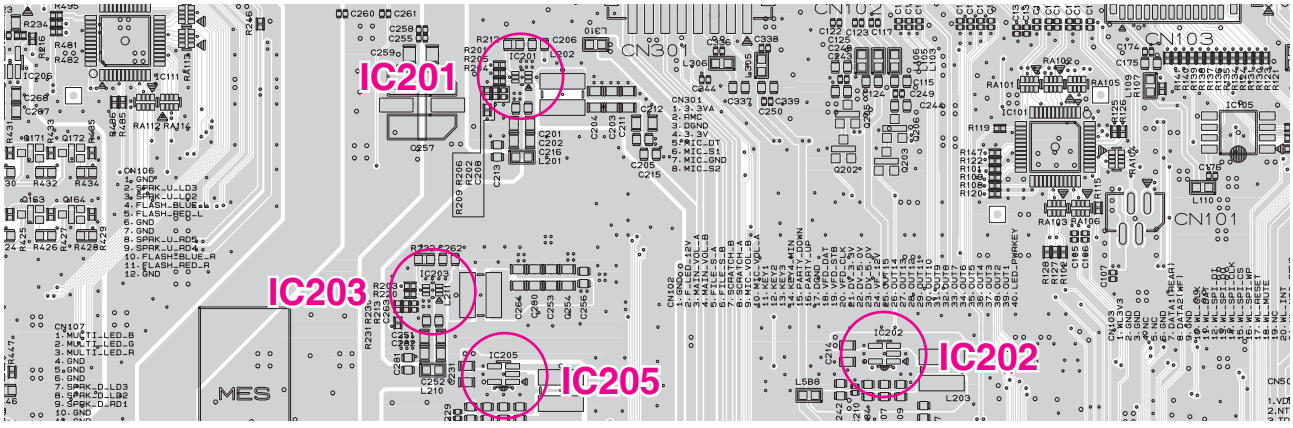
4-1-1. Solution

Please check and replace IC202, IC205 on MAIN board.

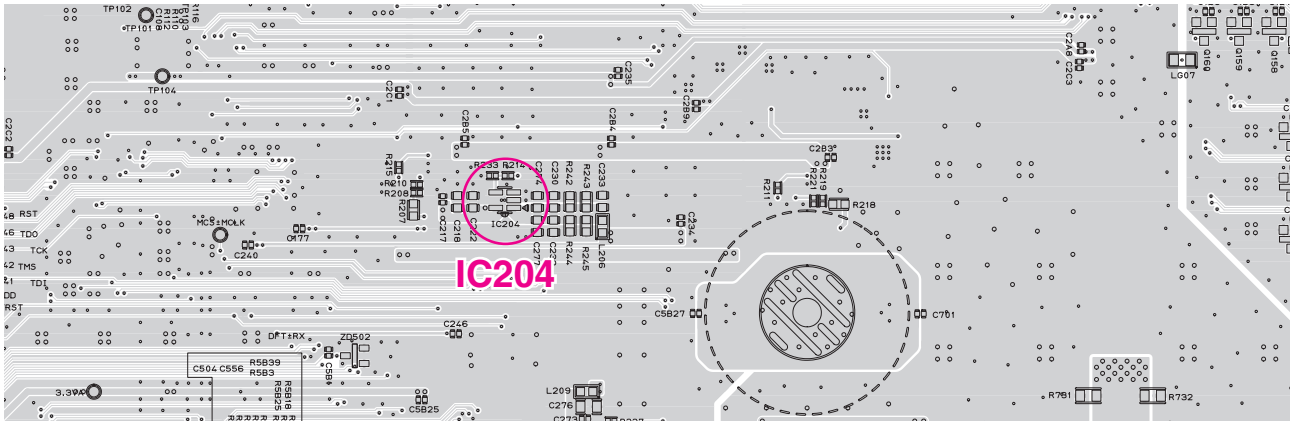
4-1-2. How to troubleshoot (Countermeasure)

1) Check Voltage of IC202 pin3 on MAIN board.
   ⇨ If IC202 pin3 (about 3.3 V) & pin1 Input 5.1 VA doesn't come out, check IC201 & +12 V from SMPS board.
2) If IC201 pin2 (about 5.1 V) is normal, check voltage of IC205 pin3 (about 1.2 VA).
   If IC205 pin3 (about 1.2 VA) doesn't come out, check R218, R219, R221.
   If there's no defective component then replace IC205.
3) PWR_CTRL is high, check R214, R233 and if there's no defective component then check DVCC_3.3V short with GND.
   PWR_CTRL (IC204 pin3) is high (about 3.2 V)
   ⇨ If PWR_CTRL isn't high, check pin D11 of IC501 & R512, R513
4) If PWR_CTRL is high, check R5B78 and if there's no defective component then replace IC204.

4-1-3. Service hint (Any picture/ Remark)



< MAIN board top view >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO BOOTING (IN CD/USB FUNCTION)

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ CD or USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-2. CRYSTAL (X500)

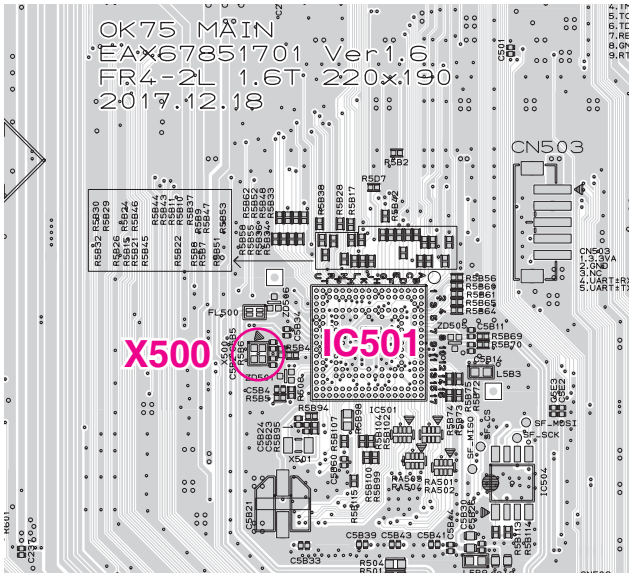
4-2-1. Solution

Replace X500 on MAIN board.

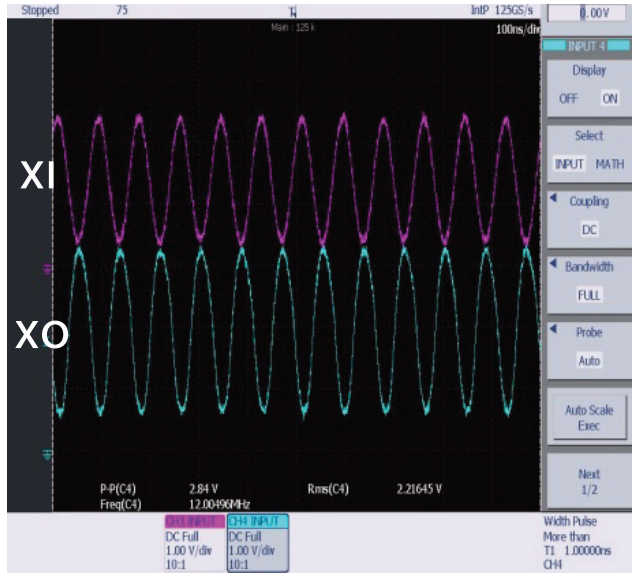
4-2-2. How to troubleshoot (Countermeasure)

1) If 3.3 VA & 1.2 VA is normal, check reset 'High' of IC501 pin T12 on MAIN board.
   ⇨ If MAIN_RESET isn't high, check MICOM (IC101) pin40.
2) If MAIN_RESET is high, check the soldering status of 24 MHz crystal (X500).
3) If the crystal (X500) doesn't oscillate, check R5B4, R5B6, C5B2, C5B5 around crystal (X500).
   ⇨ If there's no defective component, then replace X500.

4-2-3. Service hint (Any picture/ Remark)



< MAIN board top view >



X500
< Signal waveform >

ONE POINT REPAIR GUIDE

NO BOOTING (IN CD/USB FUNCTION)

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ CD or USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-3. SERIAL FLASH (IC503)

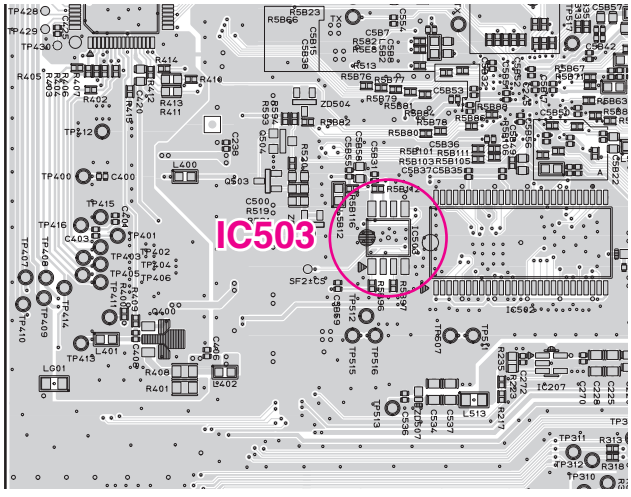
4-3-1. Solution

Please check and replace IC503 on MAIN board.

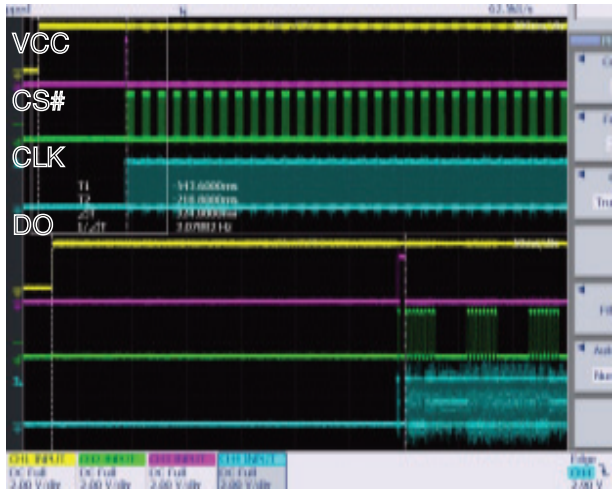
4-3-2. How to troubleshoot (Countermeasure)

1) If the crystal (X500) does oscillate, check serial flash (IC503) on MAIN board.
   ⇨ Check pin8 (VCC), pin6 (CLK), pin1 (CS), pin2 (DO), pin5 (DI) of below waveform.
2) If pin1, 2, 5, 6 doesn't come out, check registers (R5B72 ~ 5) of IC503.
   ⇨ If registers of IC503 is OK, then replace IC503. (it need to download program.)
3) After change IC503, if It is still not below waveform, check IC501 (DSP IC).

4-3-3. Service hint (Any picture/ Remark)



< MAIN board bottom view >



< Signal waveform >

ONE POINT REPAIR GUIDE

5. NO OPERATION OF MD

When no sound output in the CD function, you can not listen to music reading data from a CD disc if the servo motors in MD don't work. This step is for checking the SPINDLE MOTOR among them.

5-1. SPINDLE MOTOR

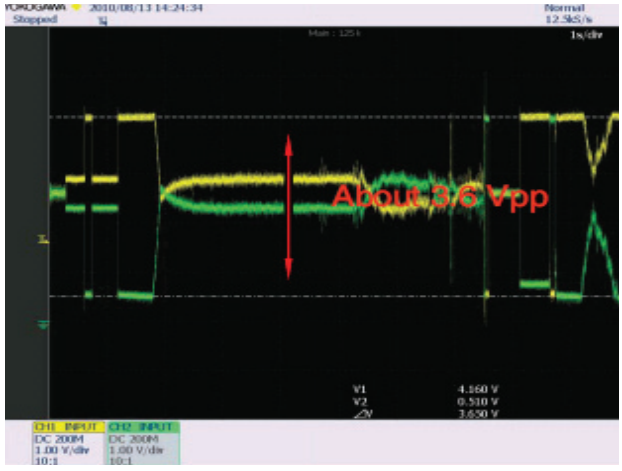
5-1-1. Solution

Replace IC400 on MAIN board.

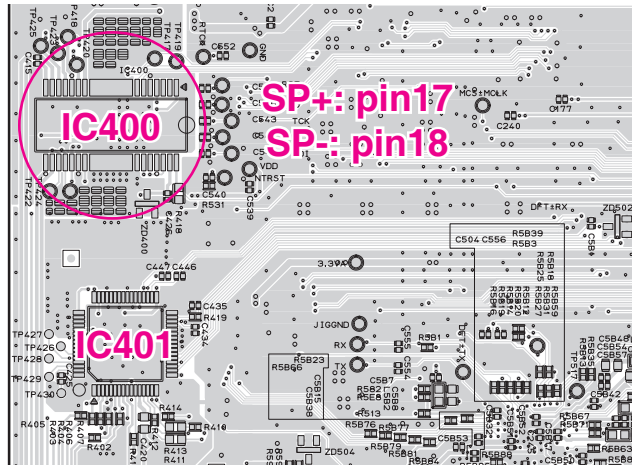
5-1-2. How to troubleshoot (Countermeasure)

1) Check the SPDO signal from pin16 of IC401.
   ⇨ If no signal, check DVCC_3.3V and X400.
2) Check the SPIN+ & SPIN- from IC400 to CN401 for driving SPINDLE motor. It is about 3.6 Vp-p.
   ⇨ If no signal, check M_5 V for IC400.
3) Check if the FFC cable is solidly connected between CN401 and MD.
4) Check the MD.
   ⇨ If the spindle motor is sort-circuit or has any trouble, it can not rotate CD discs.
   Please check the function after changing another MD.

5-1-3. Service hint (Any picture/ Remark)



< Waveform of SP- & SP+
for driving SPINDLE motor >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO OPERATION OF MD

When no sound output in the CD function, you can not listen to music reading data from a CD disc if the servo motors in MD don't work. This step is for checking the SLED MOTOR among them.

5-2. SLED MOTOR

5-2-1. Solution

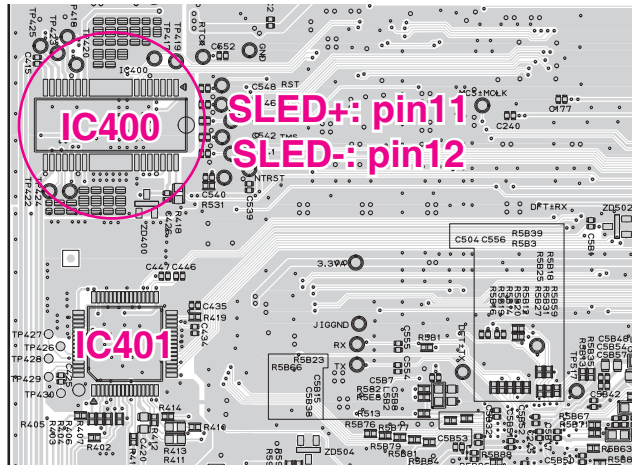
Replace IC400 on MAIN board.

5-2-2. How to troubleshoot (Countermeasure)

1) Check the SLDO signal from pin15 of IC401.
   ⇨ If no signal, check DVCC_3.3V and X400.
2) Check the SPED+ & SLED- from IC400 to CN401 for driving SPINDLE motor. It is about 2.9 Vp-p.
   ⇨ If no signal, check M_5 V for IC400.
3) Check if the FFC cable is solidly connected between CN401 and MD.
4) Check the MD.
   ⇨ If the spindle motor is sort-circuit or has any trouble, it can not rotate CD discs.
   Please check the function after changing another MD.

5-2-3. Service hint (Any picture/ Remark)

< Waveform of SLED- & SLED+
for driving SLED motor >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO OPERATION OF MD

When no sound output in the CD function, you can not listen to music reading data from a CD disc if the servo motors in MD don't work. This step is for checking the TRAY OPEN / CLOSE MOTOR among them.

5-3. TRAY OPEN/ CLOSE MOTOR

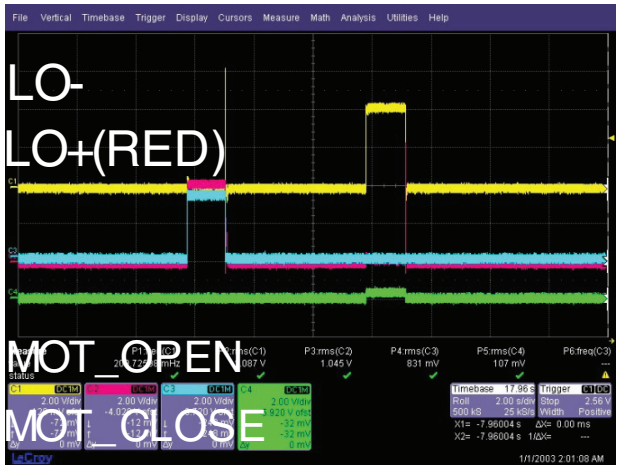
5-3-1. Solution

Replace IC400 on MAIN board.

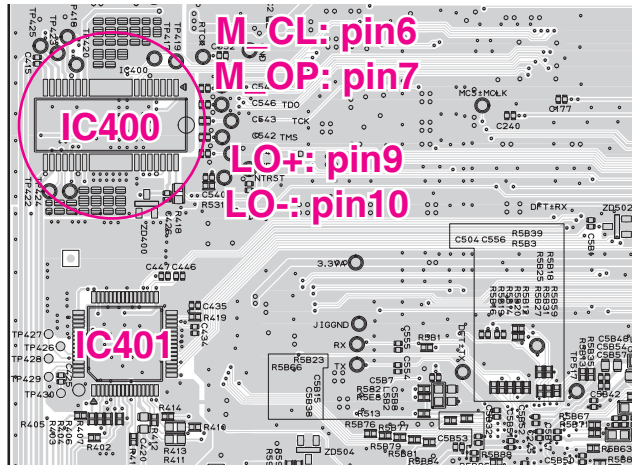
5-3-2. How to troubleshoot (Countermeasure)

1) Check MOT_OPEN & MOT_CLOSE signals from pin P5, L4 of IC501 to IC400.
   ⇨ If no signal, check M_5V to IC400.
2) Check LOAD± from IC400 to CN401 for driving the tray open / close motor. It is about 3.85 Vp-p.
   ⇨ If no signal, check M_5V to IC400. If it has any trouble, replace it with a new one.
3) Check if the FFC cable is solidly connected between CN401 and MD.
4) Check the MD.
   ⇨ If the tray motor is sort-circuit or has any trouble, it can not open or close the tray.
   Please check the function after changing another MD.

5-3-3. Service hint (Any picture/ Remark)



< Waveform
for driving tray open/ close motor >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO OPERATION OF MD

When no sound output in the CD function, you can not listen to music reading data from a CD disc if the pickup module in MD doesn't work. This step is for checking the LASER TRACKING ACTUATOR.

5-4. LASER TRACKING ACTUATOR

5-4-1. Solution

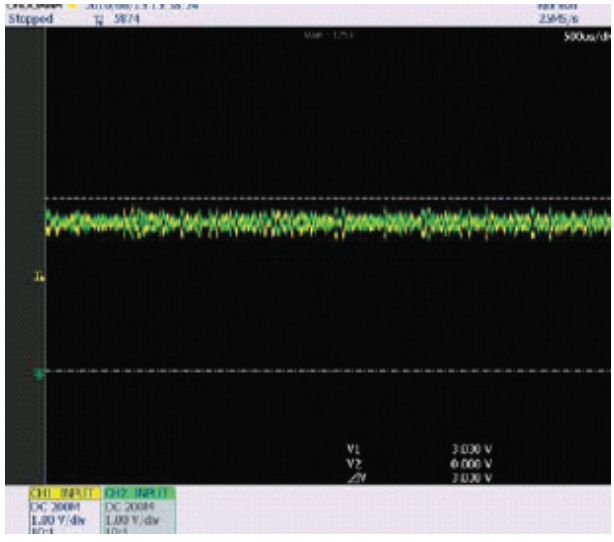
Replace IC400 on MAIN board.

5-4-2. How to troubleshoot (Countermeasure)

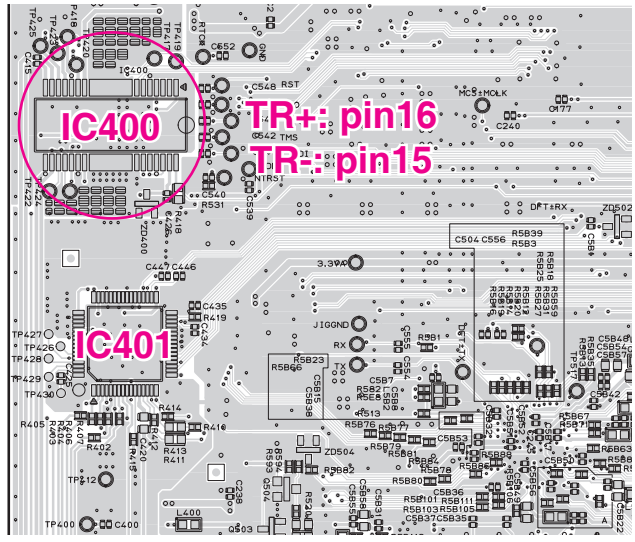
The tracking actuator makes the laser beam be positioned in the center of a track on CD disc.

1) Check the TRD signal from pin14 of IC401.
   ⇨ If no signal, check DVCC_3.3V and X400.
2) Check TR- & TR+ from IC400 to CN400 for driving the tracking actuator.
   ⇨ If no signal, check M_5V for IC400.
3) Check if the FFC cable is solidly connected between CN400 and MD.
4) Check the MD.
   ⇨ If the pickup module has any trouble, it can not move the laser beam on the left or right side.
   Please check the function after changing another MD.

5-4-3. Service hint (Any picture/ Remark)



< Waveform of TR±
for driving tracking actuator >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO OPERATION OF MD

When no sound output in the CD function, you can not listen to music reading data from a CD disc if the pickup module in MD doesn't work. This step is for checking the LASER FOCUSING ACTUATOR.

5-5. LASER FOCUSING ACTUATOR

5-5-1. Solution

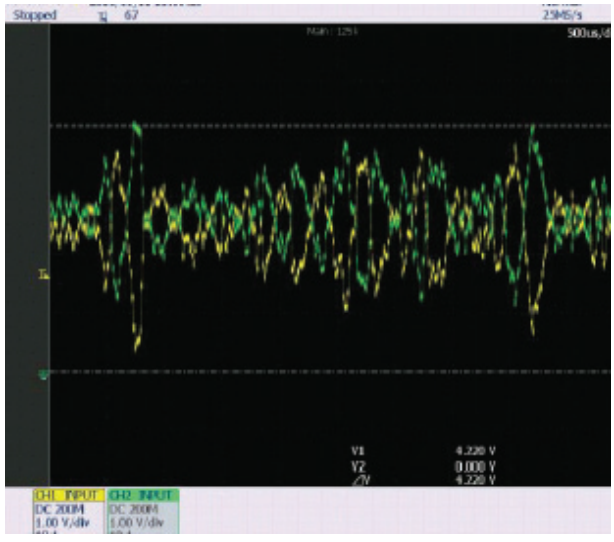
Replace IC400 on MAIN board.

5-5-2. How to troubleshoot (Countermeasure)

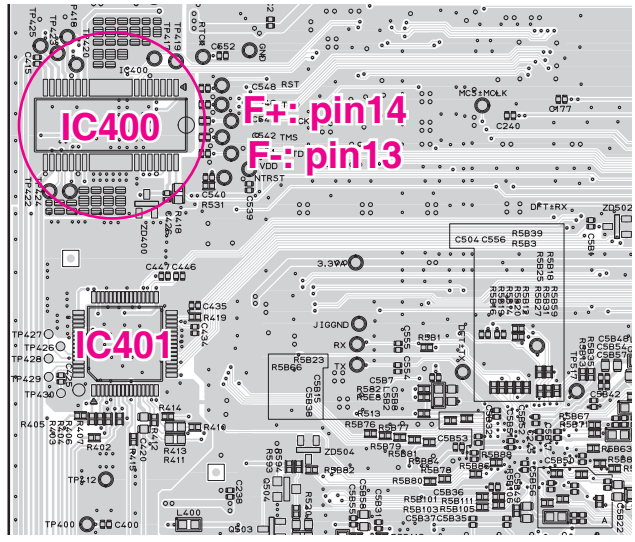
The focusing actuator makes the laser beam keep a regular interval with the surface of a CD disc.

1) Check the FDO signal from pin13 of IC401.
   ⇨ If no signal, check DVCC_3.3 and X400.
2) Check F- & F+ from IC400 to CN400 for driving the focusing actuator.
   ⇨ If no signal, check M_5V for IC400.
3) Check if the FFC cable is solidly connected between CN400 and MD.
4) Check the MD.
   ⇨ If the pickup module has any trouble, it can not move the laser beam on the top or bottom side. Please check the function after changing another MD.

5-5-3. Service hint (Any picture/ Remark)



< Waveform of F±
for driving focusing actuator >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

6. NO SOUND

There is no sound output by DIGITAL AUDIO AMP DAMAGE, repair the set according to the following guide.

6-1. DIGITAL AUDIO AMP DAMAGE

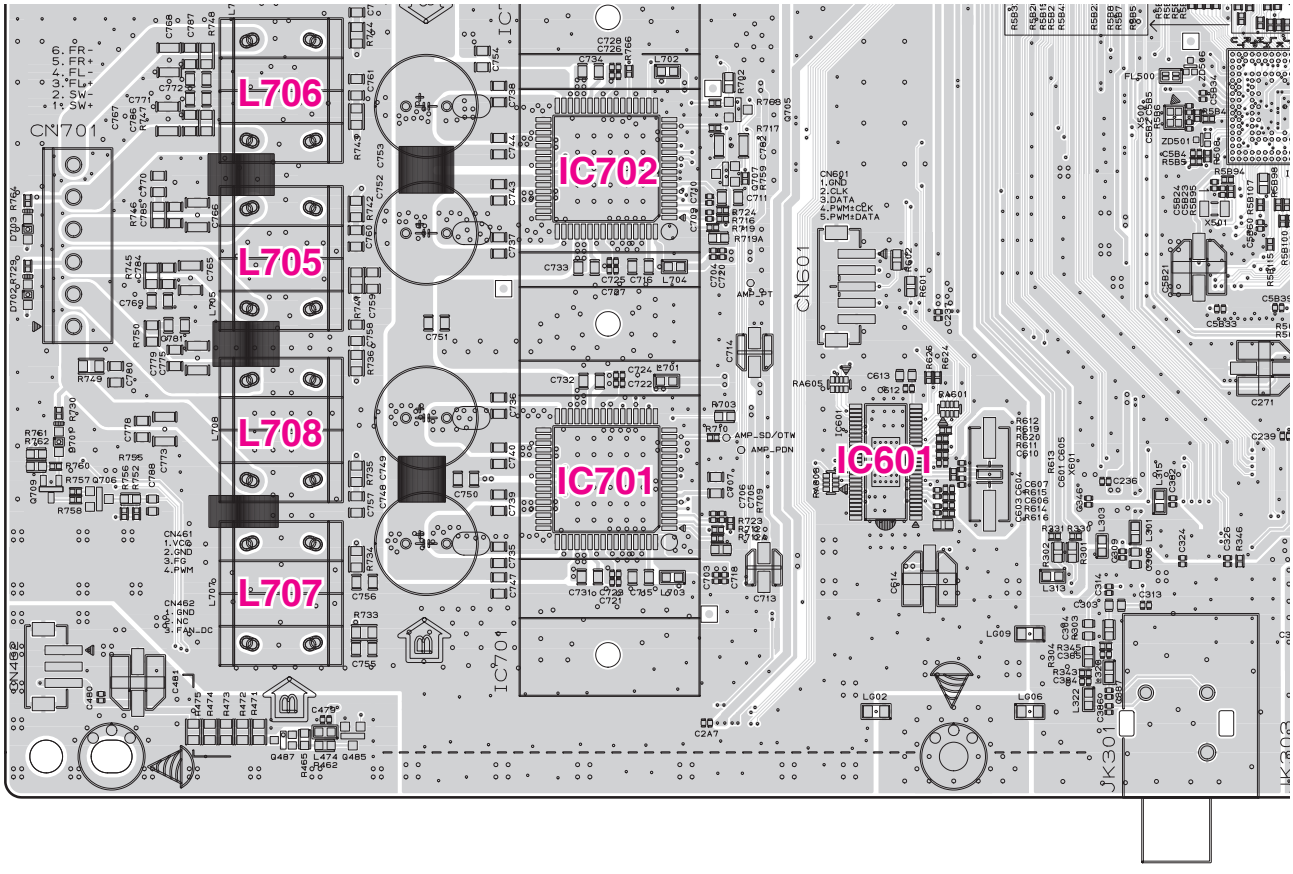
6-1-1. Solution

Replace IC701, IC702 on MAIN board.

6-1-2. How to troubleshoot (Countermeasure)

1) Check PWM_FL±, PWM_FR± & PWM_SW± signals from IC601 to IC701 & 702 each input function.
   ⇨ If no signal, check if I2S audio signals are entered to IC601.
2) Check PVDD.
   ⇨ If PVDD is abnormal, check the SMPS.
3) Check AMP_12V for driving the gate of AMP IC.
   a. All the powers are normal, but if AMP_12V is low, there is possible for AMP IC to be damaged.
   b. Remove L705, L706, L707 and L708 one by one.
      When removed a inductance, if AMP_12V is recovered, the IC connected to it was damaged.
   c. Replace the IC with a new one.
4) Check the impedance between IC701/IC702_OUT_A/OUT_B & GND.
   a. If the impedance is 0 Ω, the IC must be damaged.
   b. After removing the heat sink, replace it with a new one.

6-1-3. Service hint (Any picture/ Remark)



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the CD FUNCTION, repair the set according to the following guide.

6-2. CD FUNCTION

6-2-1. Solution

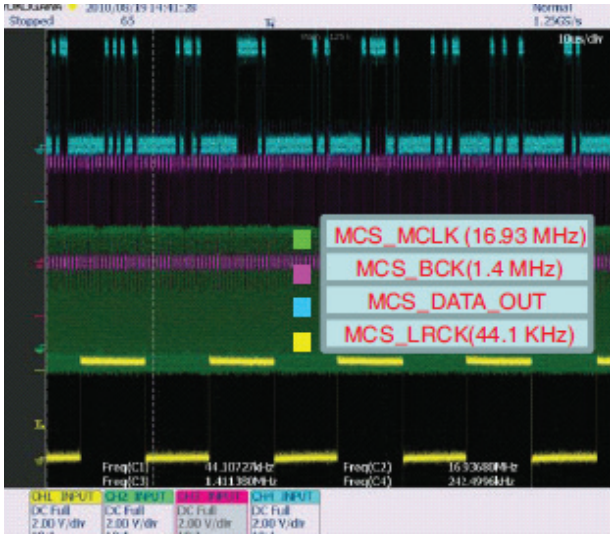
Replace IC501 on MAIN board.

6-2-2. How to troubleshoot (Countermeasure)

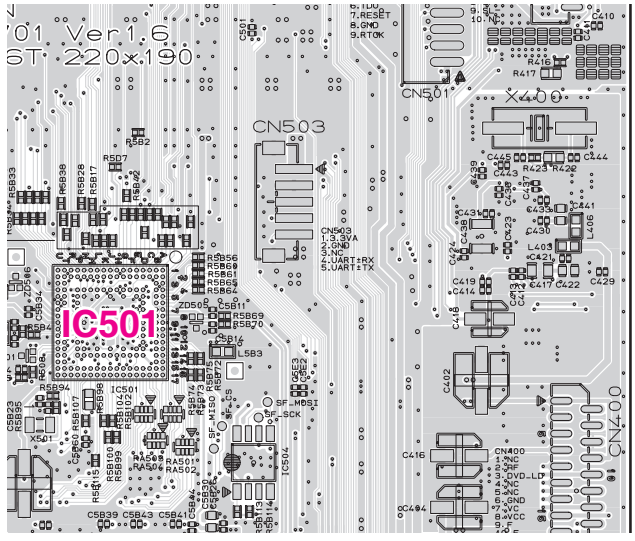
1) Check CD_BCK, CD_LRCK, & CD_DATA signals from IC501 to IC401.
   ⇨ If no signal, check if the RF & servo signals from MD is entered to IC401.
   Refer to the “No operation of MD” guide on Item 5.
2) Check the following I2S signal flow. < I2S audio signal Interface >
   - MCS_BCK : IC501_pin E1 --> IC601_pin23
   - MCS_LRCK : IC501_pin D1 --> IC601_pin22 (44.1 kHz)
   - MIX_DATA0_OUT : IC501_pin E2 --> IC601_pin24
   - MIX_DATA2_OUT : IC501_pin R2 --> IC601_pin26

   ⇨ If there is any trouble, check the power for each IC.
   The power is normal but, if the signal waveform to the IC is distorted or no signal, replace it with a new one.

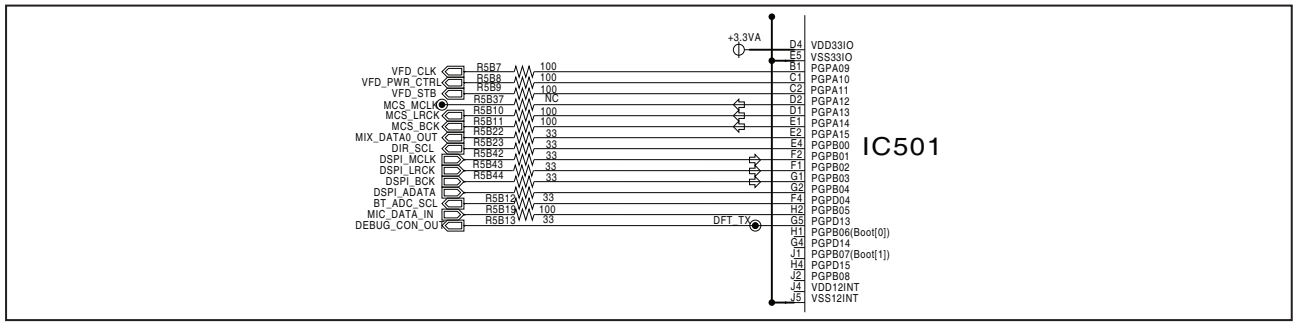
6-2-3. Service hint (Any picture/ Remark)



< Waveform of I2S audio interface signals >



< MAIN board top view >



< MAIN - CD DSP circuit >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the USB Function, repair the set according to the following guide.

6-3. USB FUNCTION

6-3-1. Solution

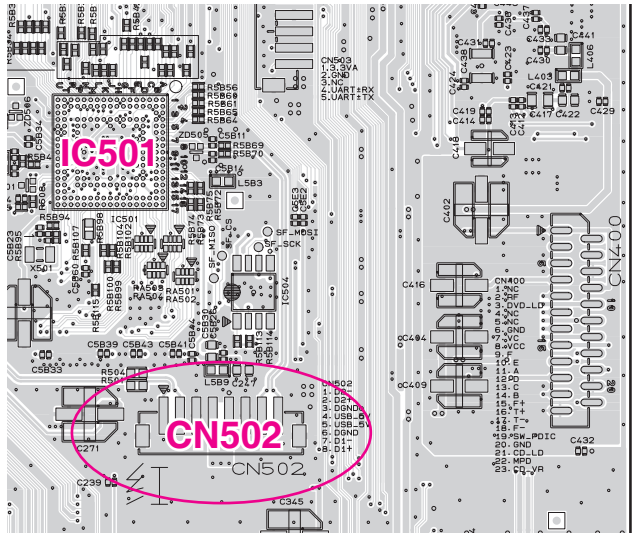
Replace IC204 on MAIN board.

6-3-2. How to troubleshoot (Countermeasure)

1) Check +5V_USB to USB board.
   ⇨ If the USB LED are turned on, the voltage is okay, if so not, check USB_5V to pin4, 5 of CN803.
2) Check USB D1± or USB D2± from MAIN board to TOP board.
   a. Check 2.0_D1±signals(pin U7, U8) or 1.1_D1± signals(pin A7, A8) to IC501.
   b. Check USB± signals to CN502(pin1, 2, 7, 8).
   ⇨ If there is any trouble, check the power for IC207.
   The power is normal but, if the signal waveform to the IC is distorted or no signal, replace it with a new one.
3) Check if “Digital audio AMP block” on item 6-1 is normal.

6-3-3. Service hint (Any picture/ Remark)

USB D-/D+ (CN502 pin1, 2 & pin7, 8)
< Waveform of USB D± signal >



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the AUX Function, repair the set according to the following guide.

6-4. AUX FUNCTION

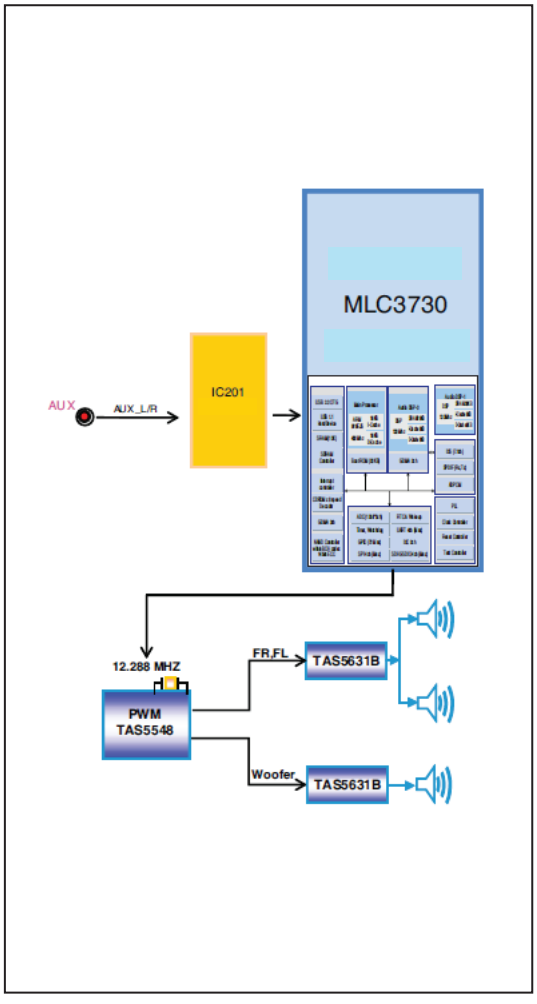
6-4-1. Solution

Replace IC301 on MAIN board.

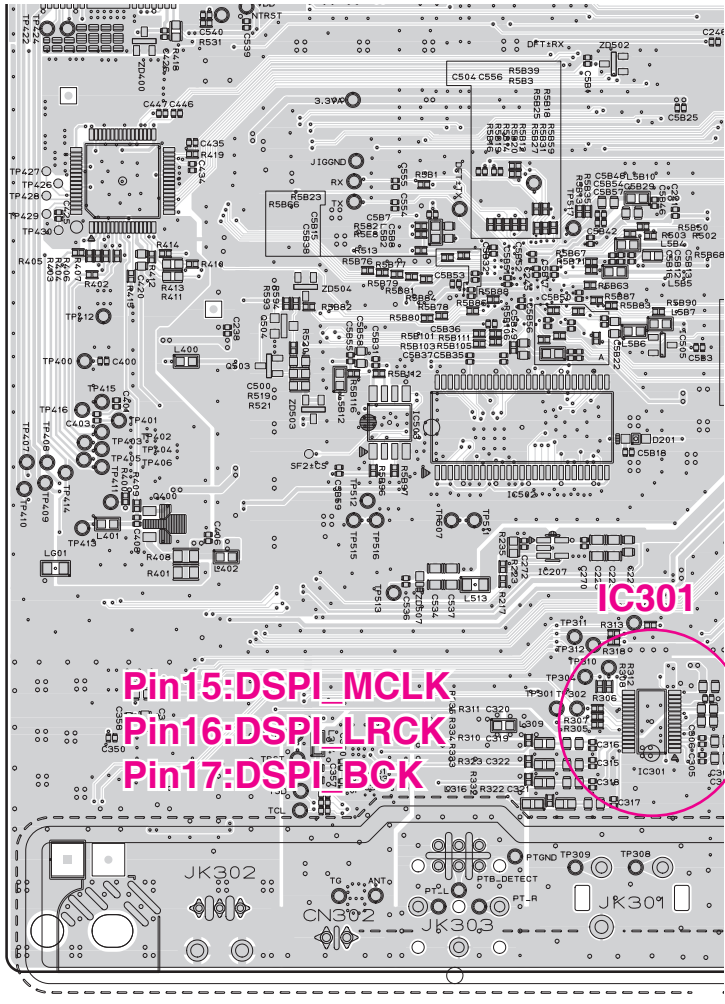
6-4-2. How to troubleshoot (Countermeasure)

1) Check AUX_L/R signals to IC301 (pin1, 2).
2) Check if DSPI_BCK, LRCK, MCLK are entered from IC501 to IC301.
3) Check if ADC_DATA is entered from IC301 to IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V (ADC) for IC301. If is NG, replace it a new one.
4) Check the following I2S signal flow from IC501 to IC601. (Refer to Item 6-2.)
   ⇨ If there is any trouble, check the power for each IC. The power is normal but, if the signal waveform to the IC is distorted or no signal, replace it with a new one.
5) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on Item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-4-3. Service hint (Any picture/ Remark)



< AUX function signal flow >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the TUNER function, repair the set according to the following guide.

6-5. TUNER FUNCTION

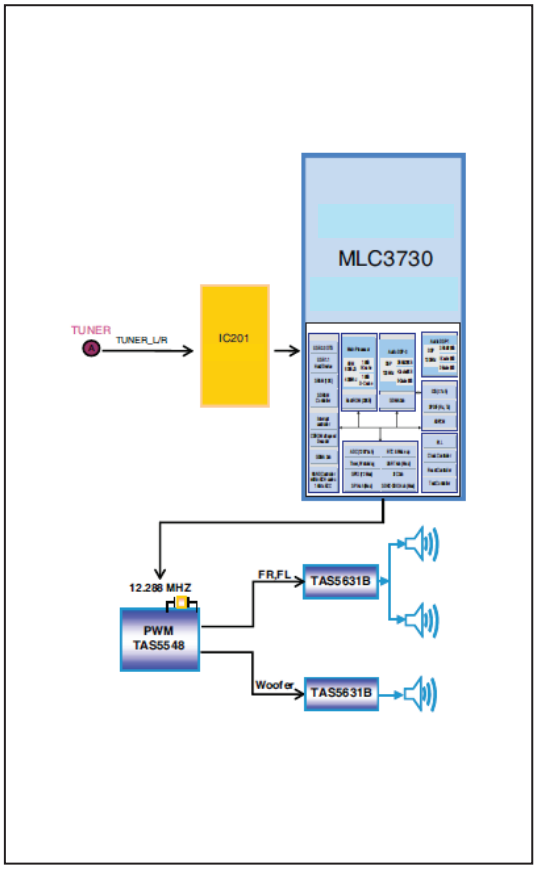
6-5-1. Solution

Replace IC301 on MAIN board.

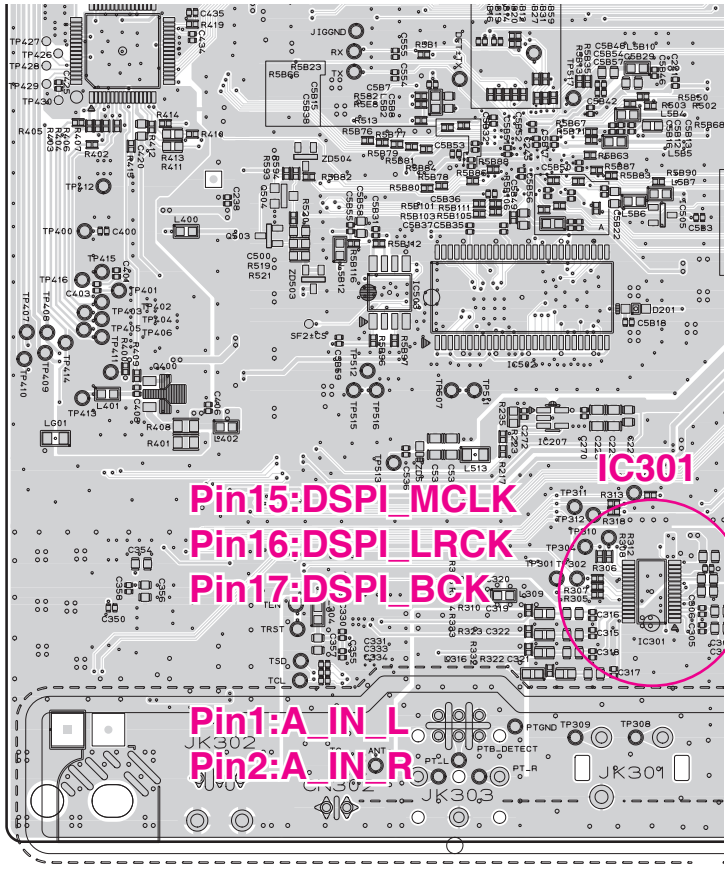
6-5-2. How to troubleshoot (Countermeasure)

1) Check if TUNER_LR is entered from pin13, 14 of IC302 to IC301(pin27, 28)
   ⇨ If no signals, check AVCC_3.3V for tuner power.
   ⇨ Check if the tuner control signals (CLK, DAT, CE, RST, SLT) are entered from IC501 to IC302.
   If it doesn't work, replace IC302 with a new one.
2) Check if MCS_BCK, MCS_LRCK, & MCS_MCLK are entered from IC501 to IC201.
3) Check if ADC_DATA is entered from IC301 to IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V (ADC) for IC301. If is NG, replace it with a new one.
4) Check the following I2S audio signal flow from IC501 to IC601. (Refer to Item 6-2.)
   ⇨ If there is any trouble, check the power for each IC.
   The power is normal but, if the signal waveform to the IC is distorted or no signal,
   replace it with a new one.
5) Check if the digital audio AMP block is okay. Refer to "Digital Audio AMP" guide on Item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-5-3. Service hint (Any picture/ Remark)



< TUNER function signal flow >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the PORTABLE Function, repair the set according to the following guide.

6-6. PORTABLE FUNCTION,

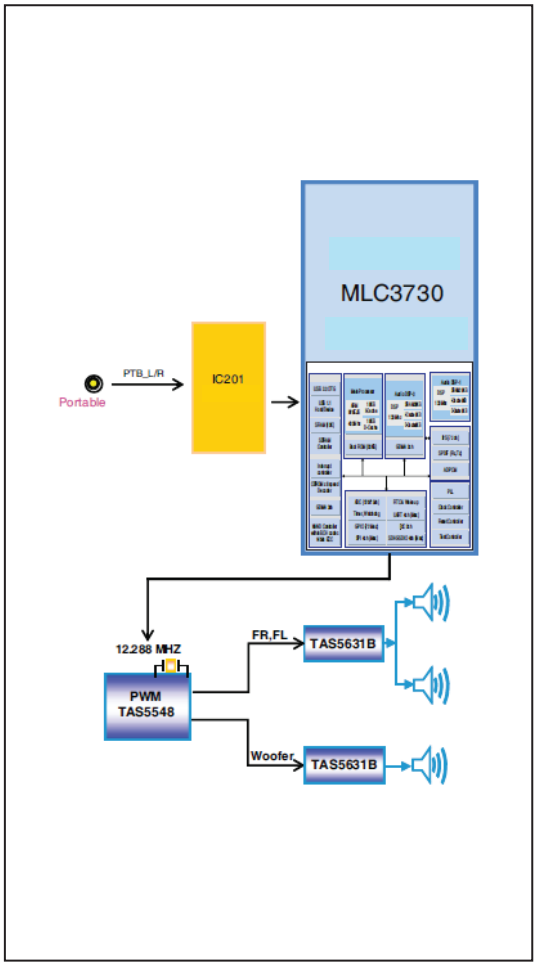
6-6-1. Solution

Replace IC301 on MAIN board.

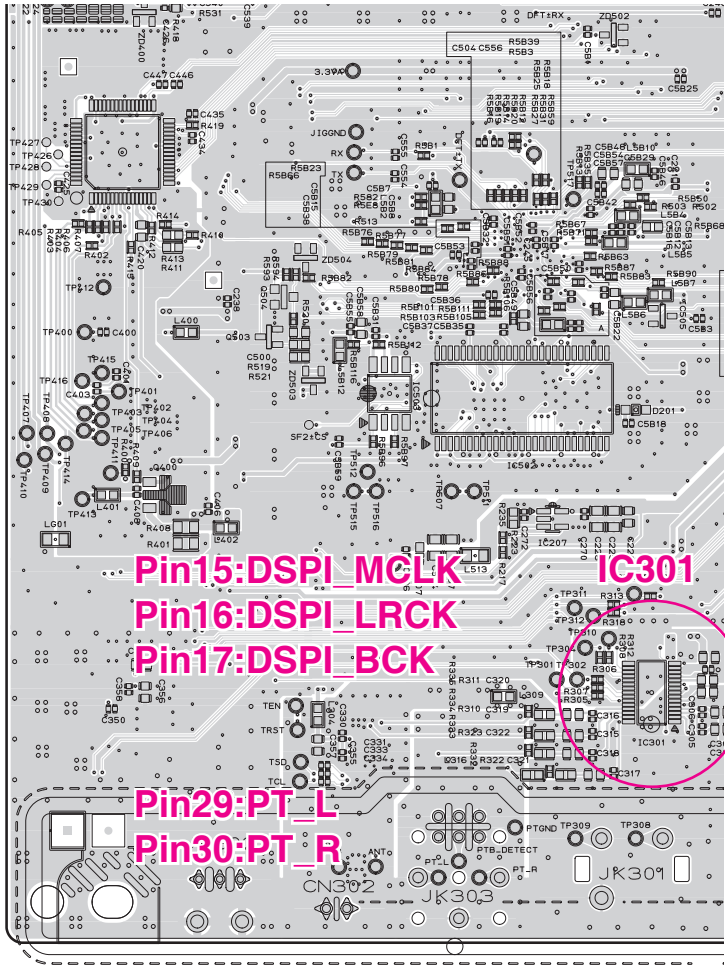
6-6-2. How to troubleshoot (Countermeasure)

1) Check if PT_LR signals to IC301 (pin29, 30).
2) Check if DSPI_BCK, LRCK, MCLK are entered from IC501 to IC301.
3) Check if ADC_DATA is entered from IC201 to IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V (ADC) for IC301. If is NG, replace it with a new one.
4) Check the following I2S audio signal flow from IC501 to IC601. (Refer to Item 6-2.)
   ⇨ If there is any trouble, check the power for each IC.
   The power is normal but, if the signal waveform to the IC is distorted or no signal, replace it with a new one.
5) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on Item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-6-3. Service hint (Any picture/ Remark)



< PORT. IN function signal flow >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the MIC IN function, repair the set according to the following guide.

6-7. MIC IN function

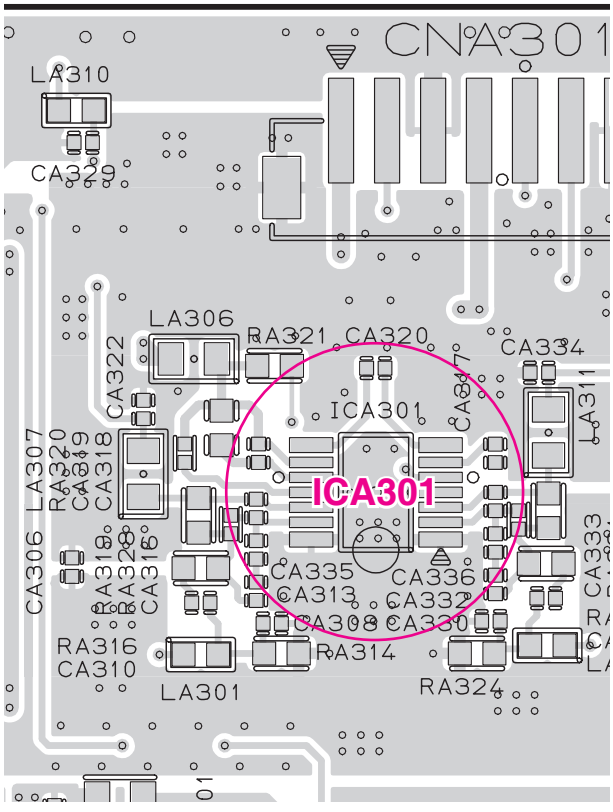
6-7-1. Solution

Replace IC206 on MAIN board, ICA301 on MIC & RMC board.

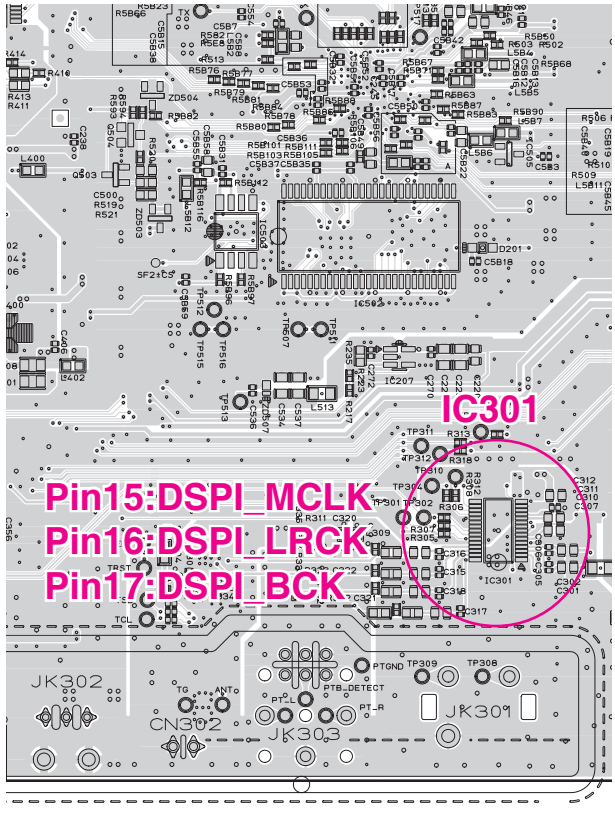
6-7-2. How to troubleshoot (Countermeasure)

1) Check MIC_SI & MIC_S2 signal to pin6, 8 of CN301.
   ⇨ If no signal, Check the signals to pin6 & 8 of CNA301 on the MIC & RMC board.
   Check if the signal is entered from pin6 & 8 of CNA301 to pin6, 8 of CN301.
2) Check if MIC_SIG is entered from pin2 of JK302 & JKA303 to pin2, 13 to ICA301 (PRE AMP).
3) Check if the amplified signal comes out from pin3 &12 of ICA301.
   ⇨ If no signal output, check DVCC_3.3V for ICA301, replace ICA301 with a new one if it has a problem.
4) Check if DSPI_BCK, LRCK,MCLK are entered from IC501 to IC301.
   Check if MIC_DATA_IN is entered from pin19 of IC301 to pin H2 of IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V for IC301.
   If it is abnormal, change replace it a new one.
5) Check the following I2S signal flow from IC301 to IC501.
   ⇨ If there is any trouble, check the power for each IC.
   If the signals are abnormal, replace it a new one.
6) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-7-3. Service hint (Any picture/ Remark)



< MIC & RMC board top view >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the Bluetooth function, repair the set according to the following guide.

6-8. BLUETOOTH FUNCTION

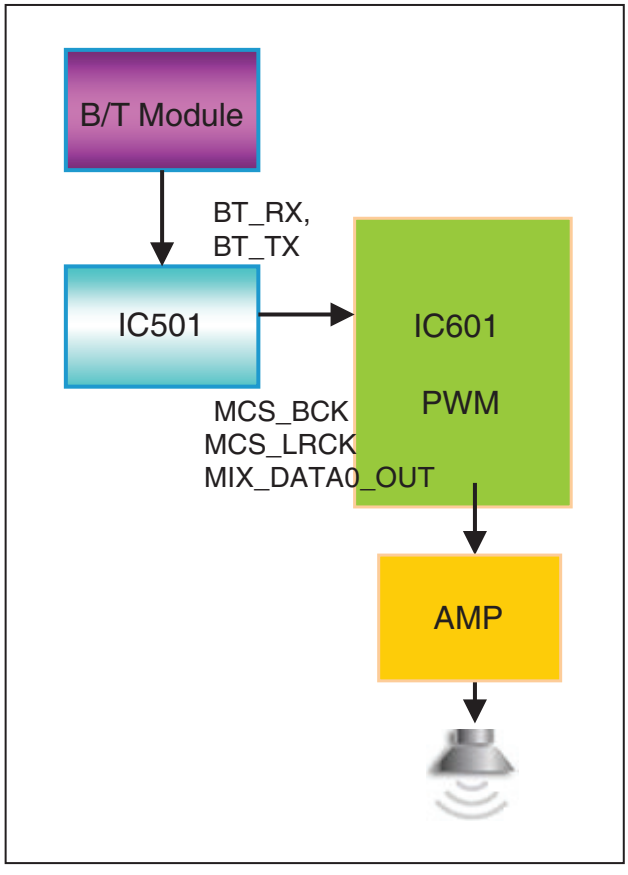
6-8-1. Solution

Replace IC501 on the MAIN board or bluetooth module on the FRONT Panel.

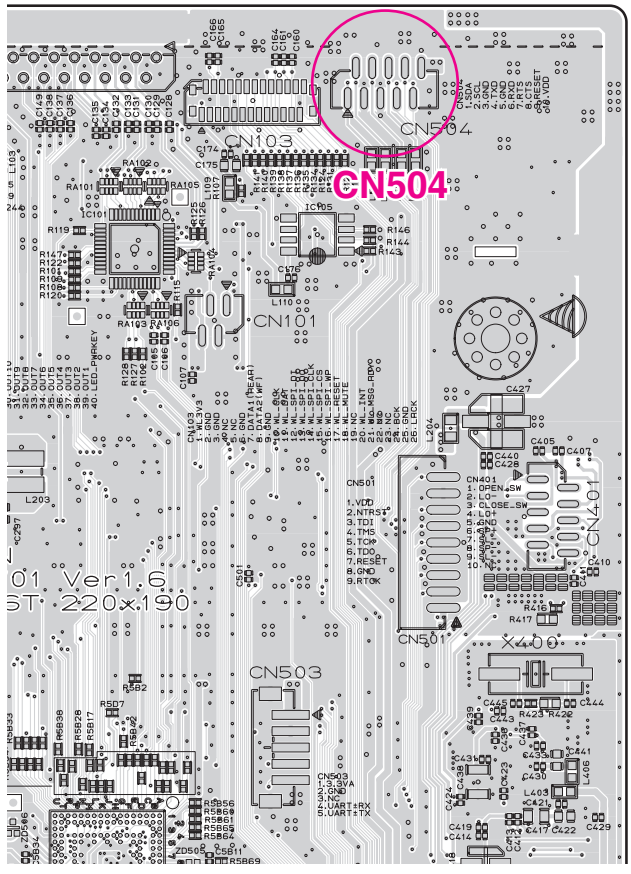
6-8-2. How to troubleshoot (Countermeasure)

1) Check BT_RX, BT_TX signal to pin6, 4 of CN504.
   ⇨ If no signal, check the signal to pin4, 6 and pin10 (3.3 VA) of on the Bluetooth module and cable connection state.
   ⇨ If there are no signal out from module, replace new module.
2) Check if BT_RX/TX is entered from pin6, 4 of CN504 to pin L1,K1 to IC501 (DSP).
3) Check if MCS_BCK, MCS_LRCK & MIX_DATA IN is entered from IC501 to IC601.
   ⇨ If no signal, check +3.3 VA & +1.2 VA for IC501.
   If it is abnormal, change replace it a new one.
4) Check the following I2S signal flow from IC501 to IC601.
   ⇨ If there is any trouble, check the power for each IC.
   If the signals are abnormal, replace it a new one.
5) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-8-3. Service hint (Any picture/ Remark)



< Bluetooth function signal flow >



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the OPTICAL function, repair the set according to the following guide.

6-9. OPTICAL FUNCTION

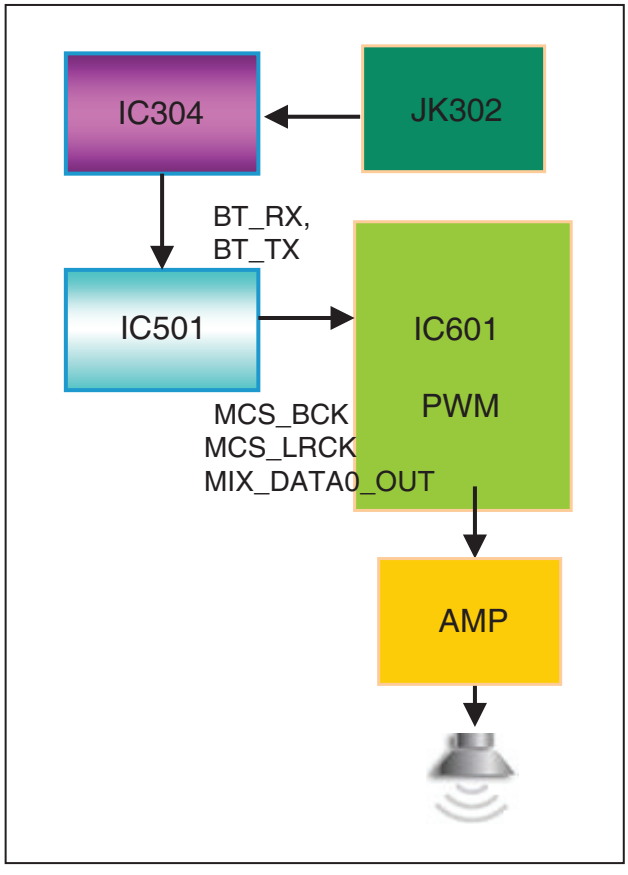
6-9-1. Solution

Replace IC304 on the MAIN board.

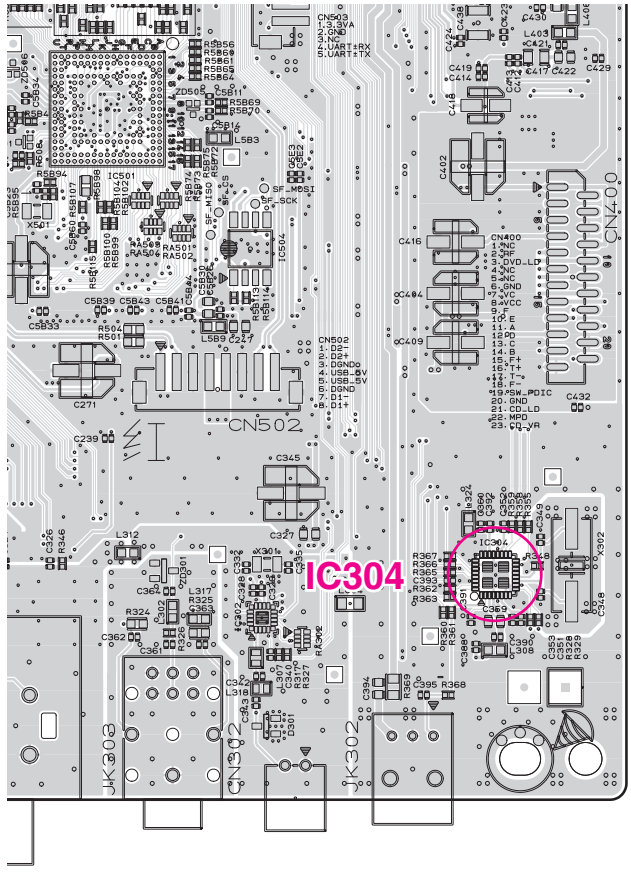
6-9-2. How to troubleshoot (Countermeasure)

1) Check DSPI_BCK, LRCK, MCLK, ADATA of IC304(pin27, 28, 29, 31).
   ⇨ If no signal, check the signal from JK302 pin1 to IC304 pin1 and cable connection state.
   ⇨ If there are no signal out from JK302, replace new connector and cable.
2) Check if MCS_BCK, MCS_LRCK & MIX_DATA IN is entered from IC501 to IC601.
   ⇨ If no signal, check +3.3 VA & +1.2 VA for IC501.
   If it is abnormal, change replace it a new one.
3) Check the following I2S signal flow from IC501 to IC601.
   ⇨ If there is any trouble, check the power for each IC.
   If the signals are abnormal, replace it a new one.
4) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

6-9-3. Service hint (Any picture/ Remark)



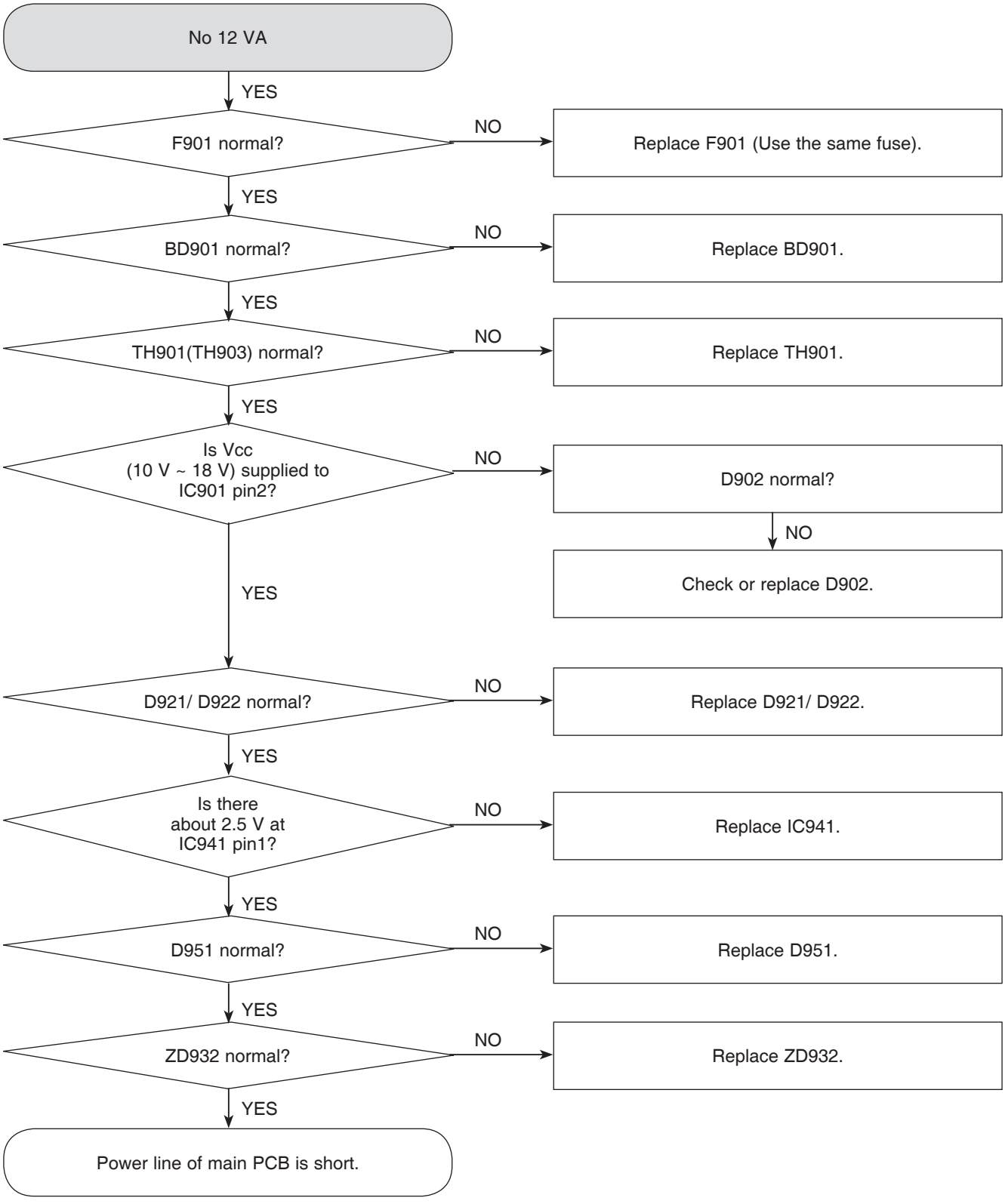
< OPTICAL function signal flow >



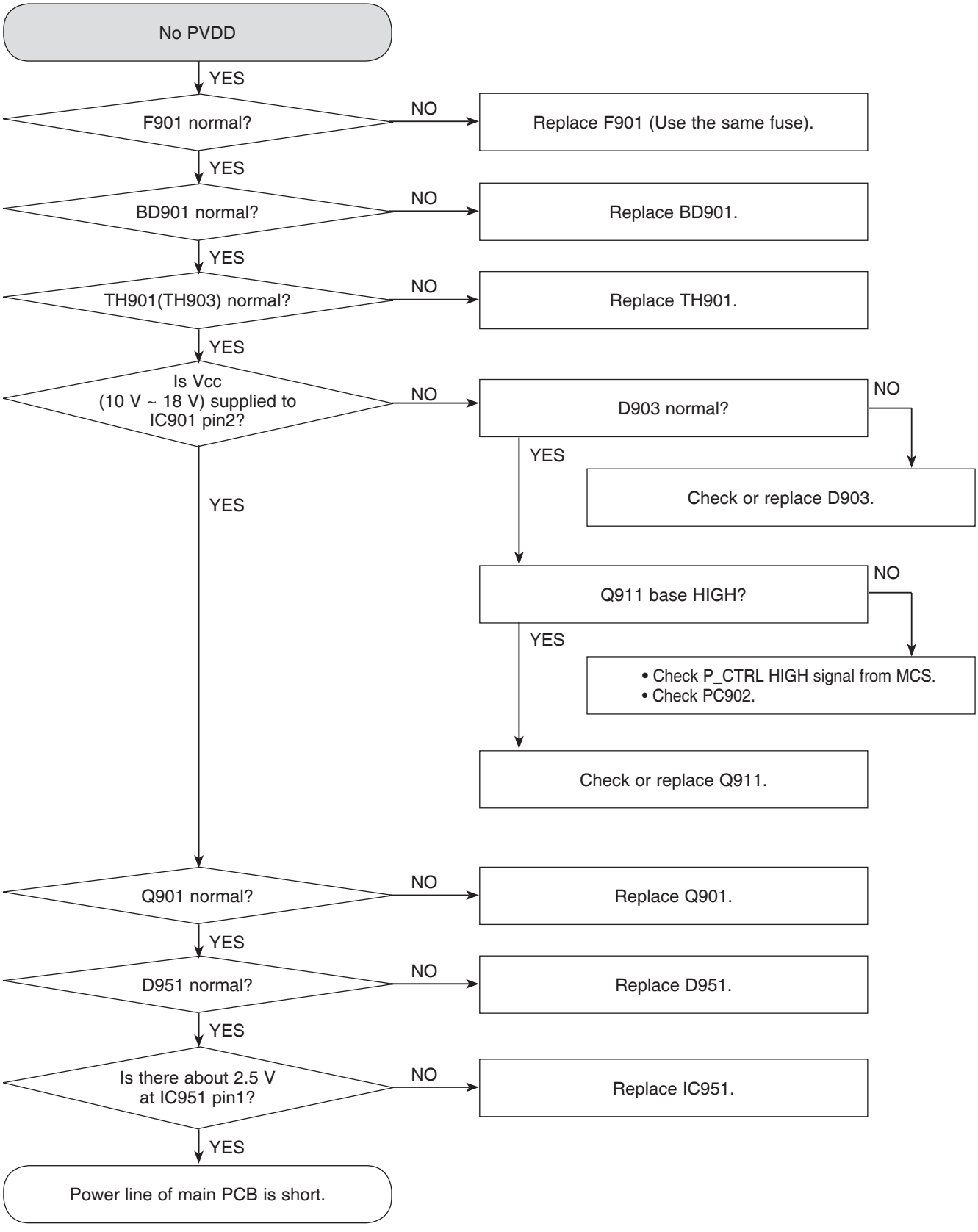
< MAIN board top view >

ELECTRICAL TROUBLESHOOTING GUIDE

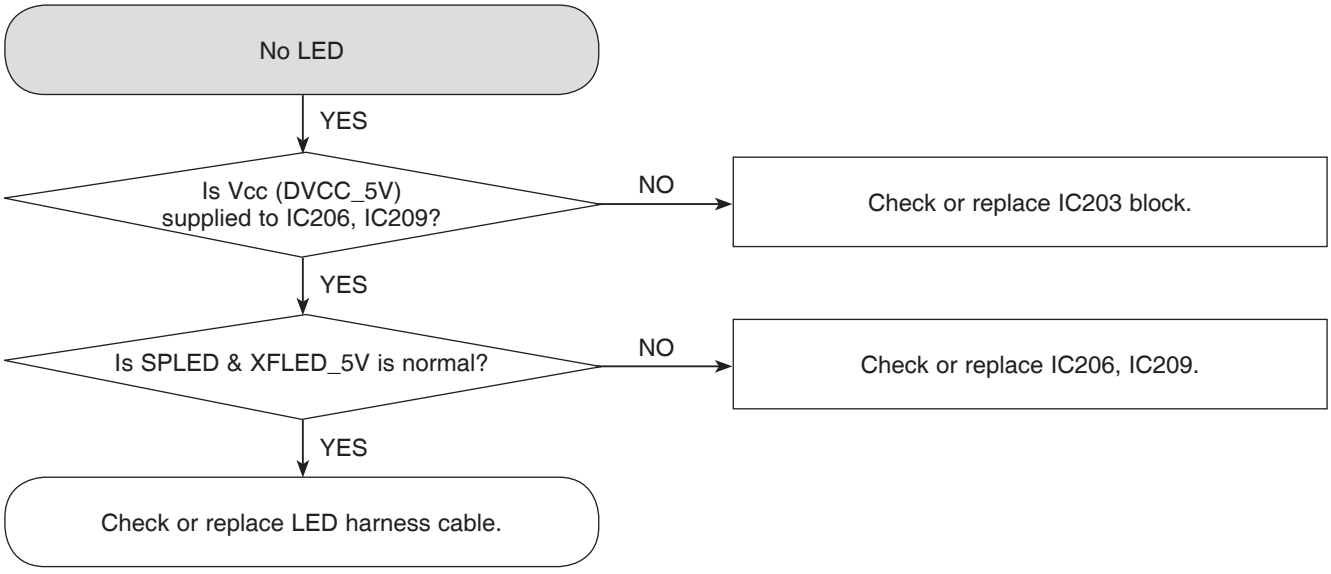
1. POWER (SMPS)

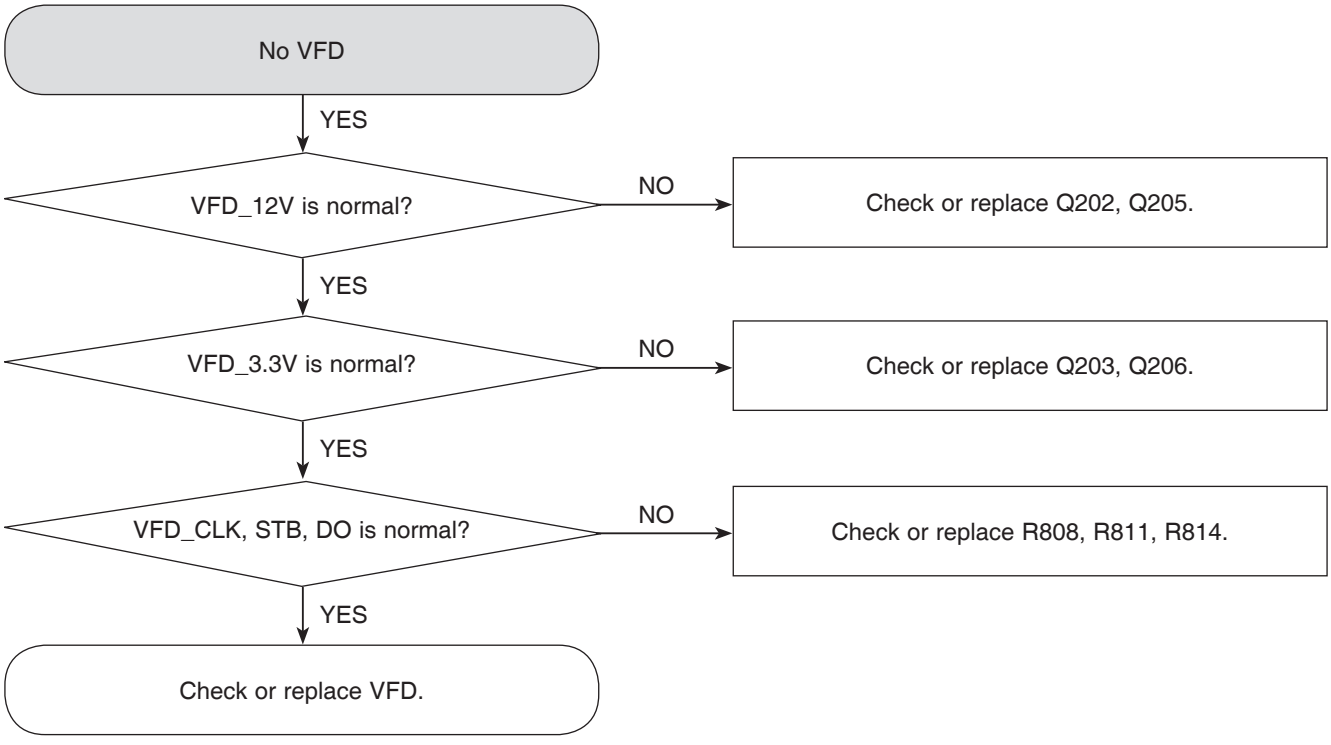


ELECTRICAL TROUBLESHOOTING GUIDE

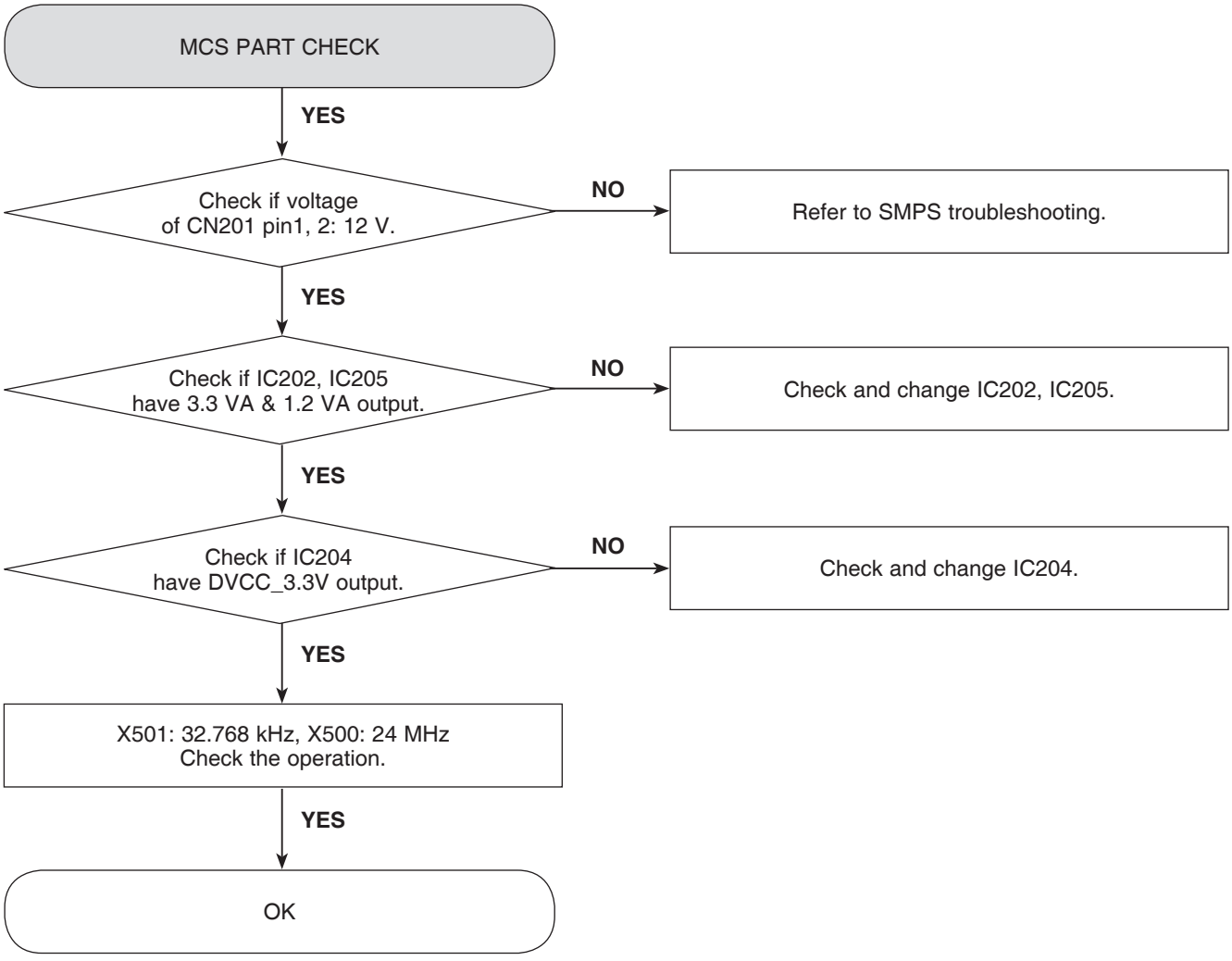


ELECTRICAL TROUBLESHOOTING GUIDE



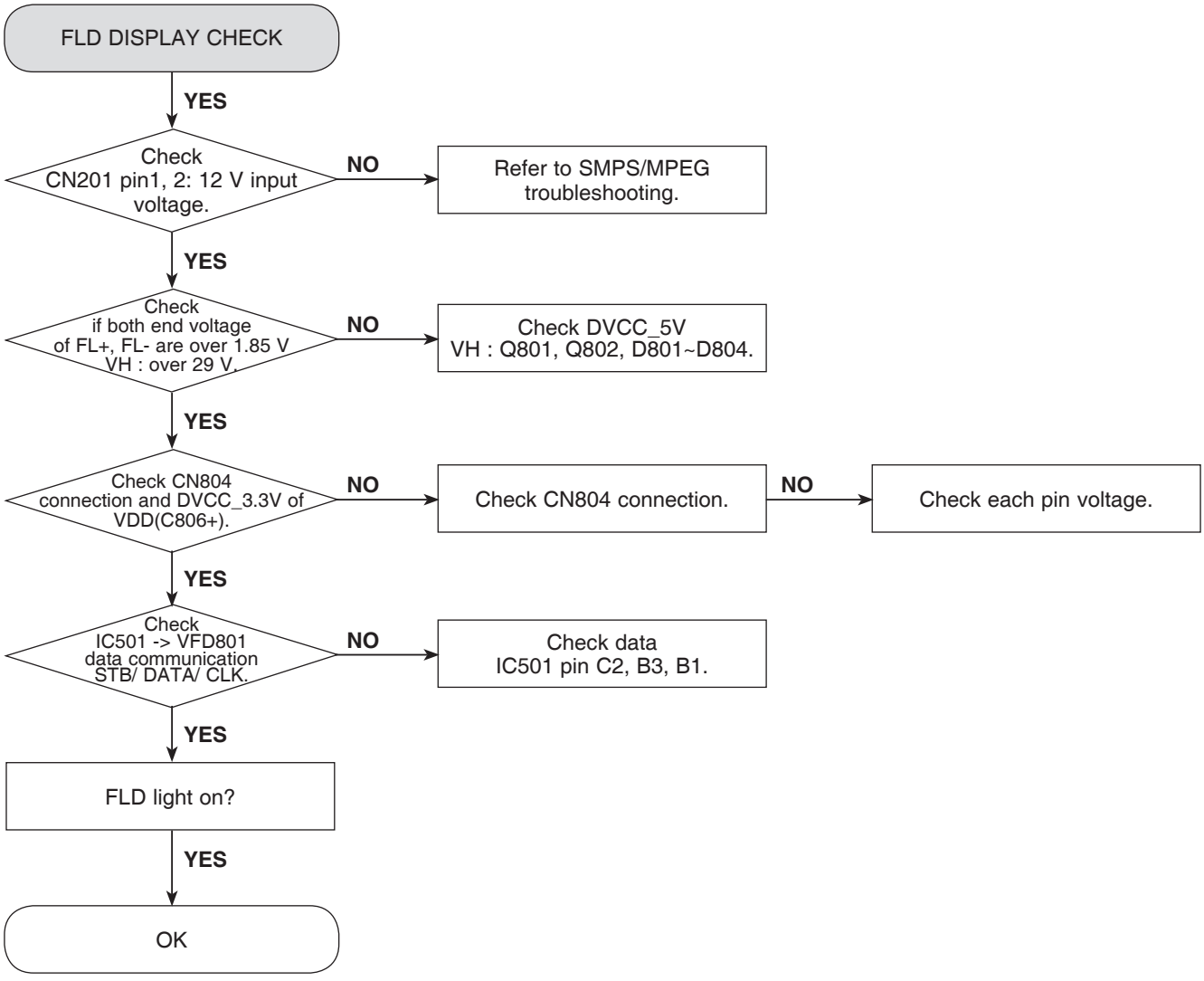


2. MCS PART CHECK



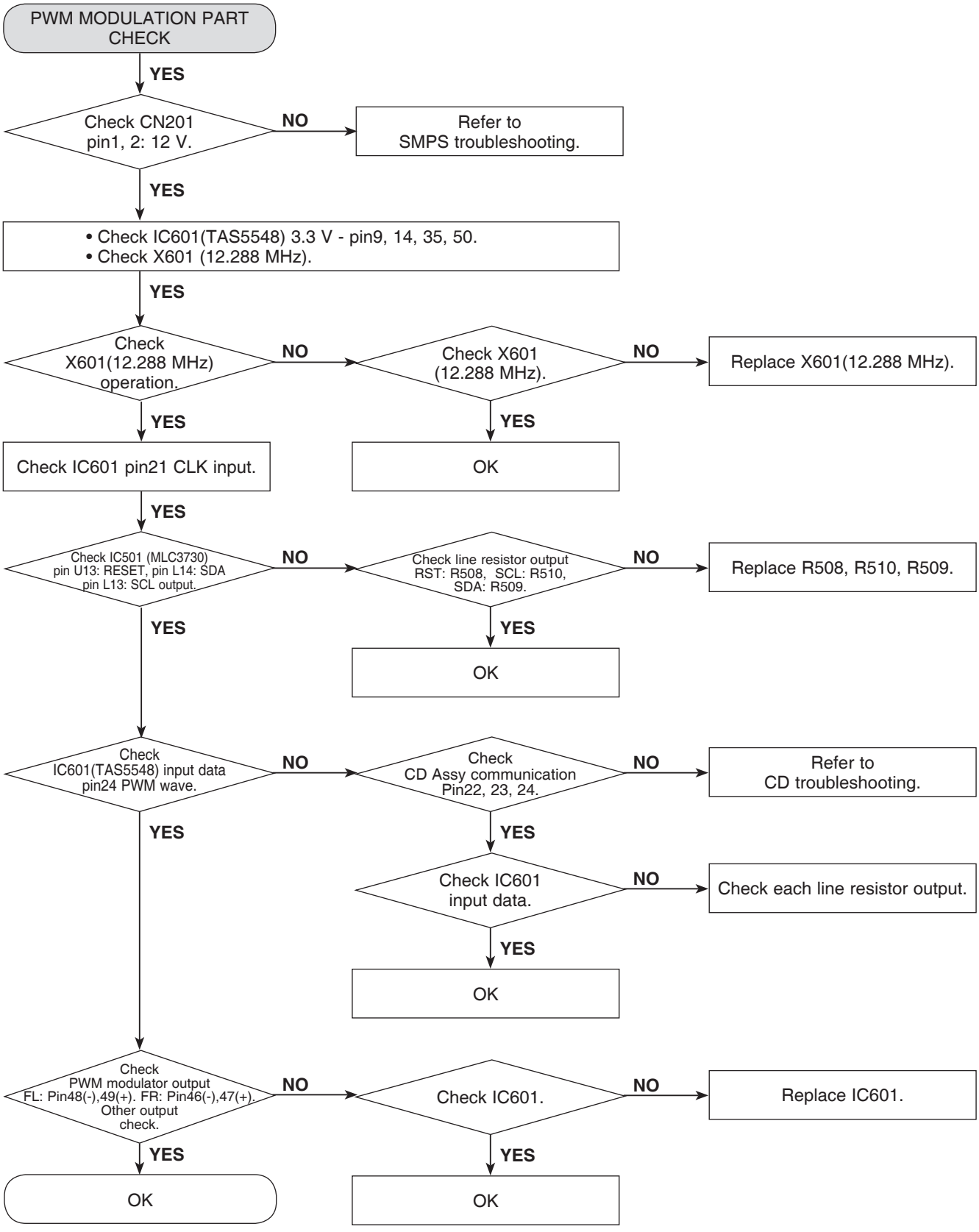
ELECTRICAL TROUBLESHOOTING GUIDE

3. FLD DISPLAY CHECK



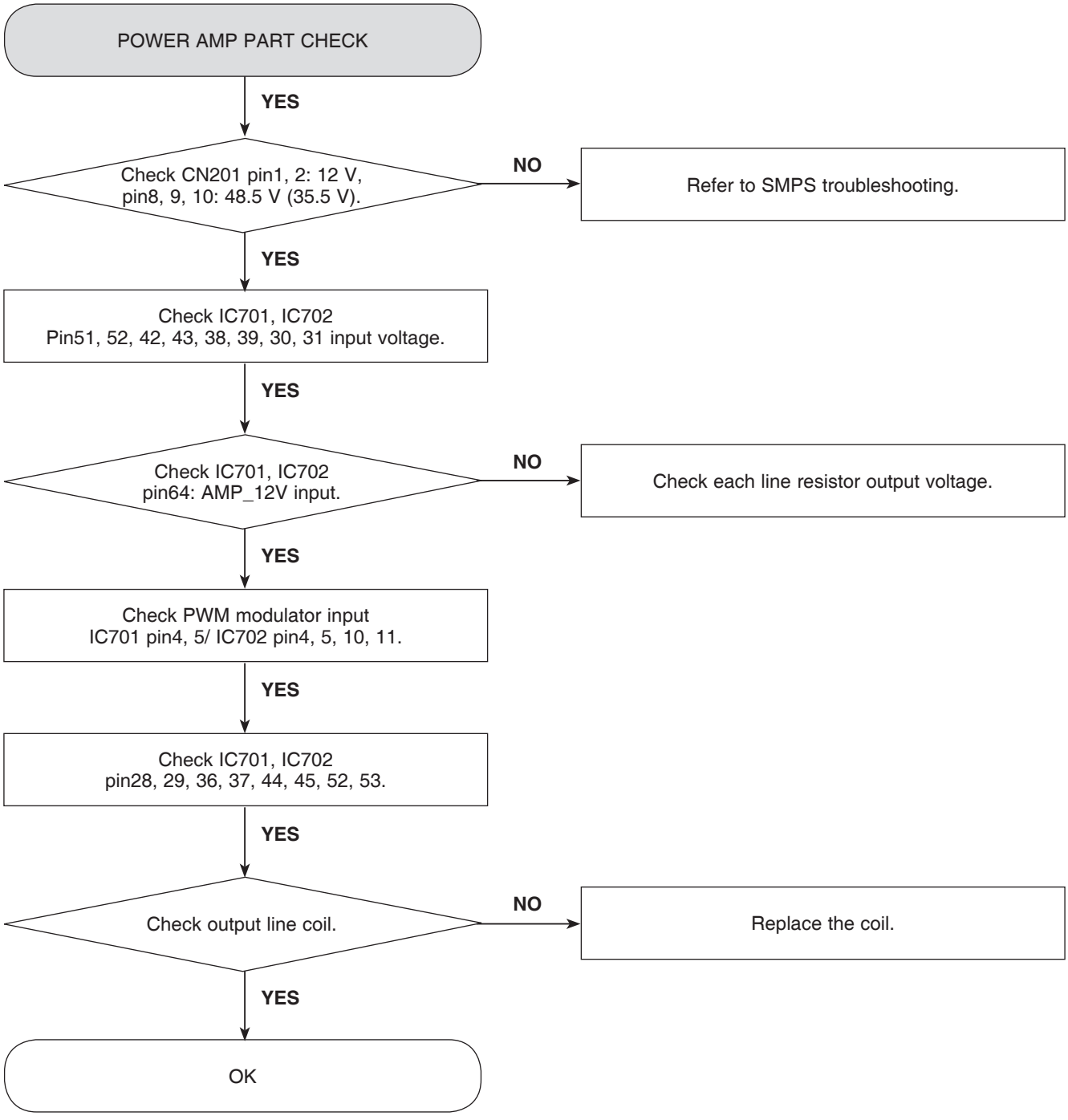
ELECTRICAL TROUBLESHOOTING GUIDE

4. PWM MODULATION CHECK



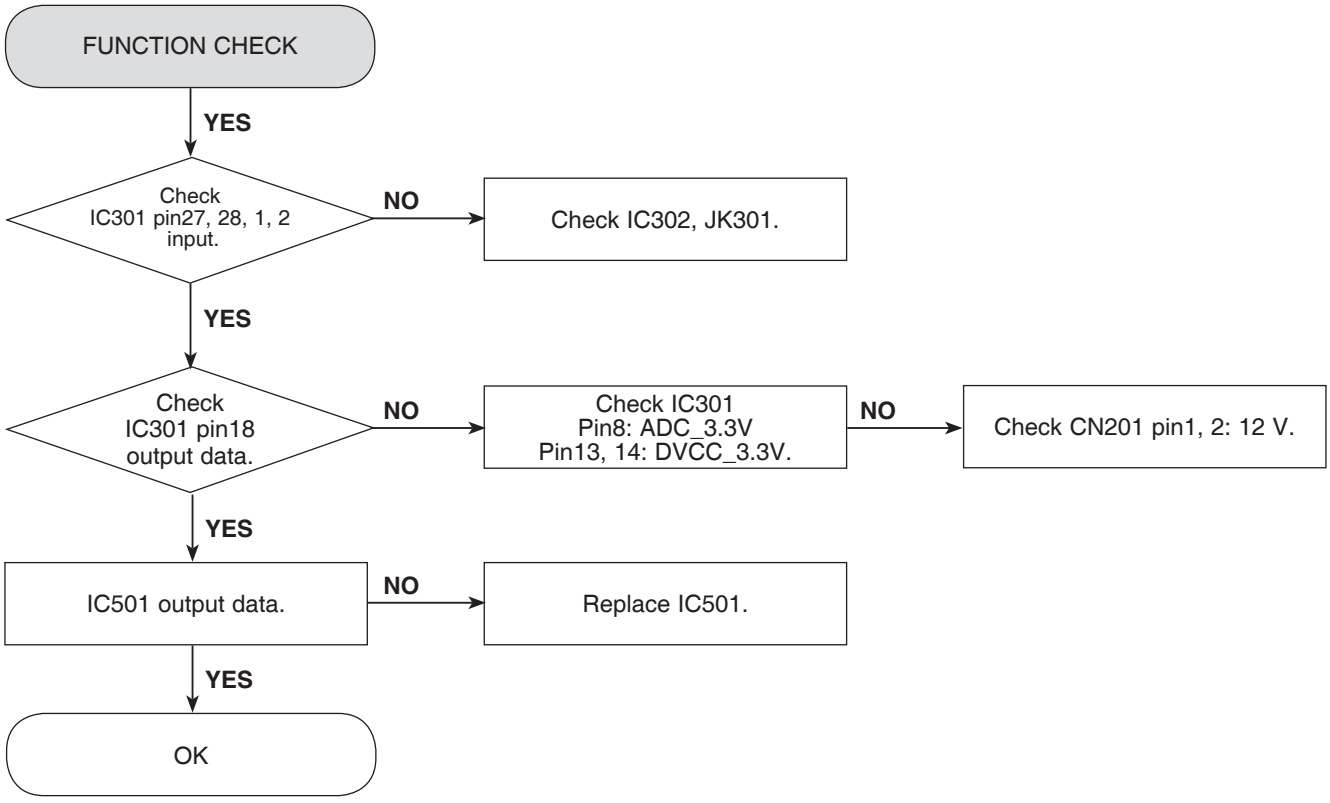
ELECTRICAL TROUBLESHOOTING GUIDE

5. POWER AMP PART CHECK



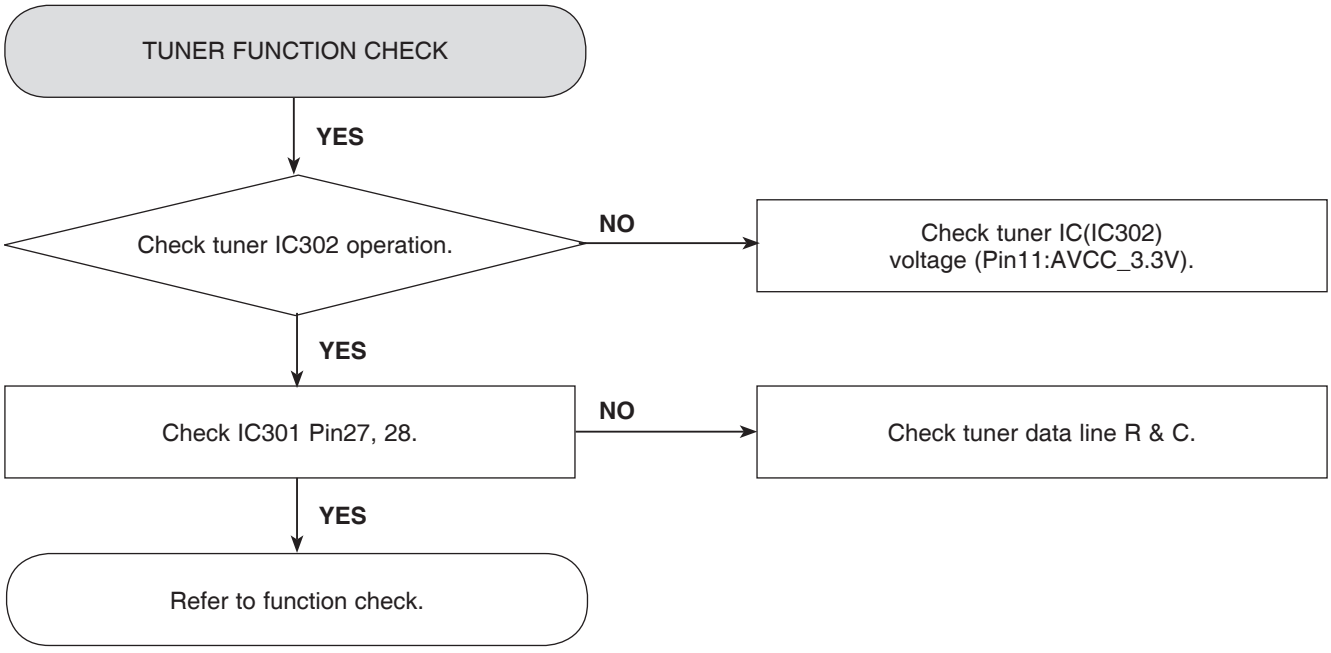
ELECTRICAL TROUBLESHOOTING GUIDE

6. TUNER / AUX FUNCTION CHECK



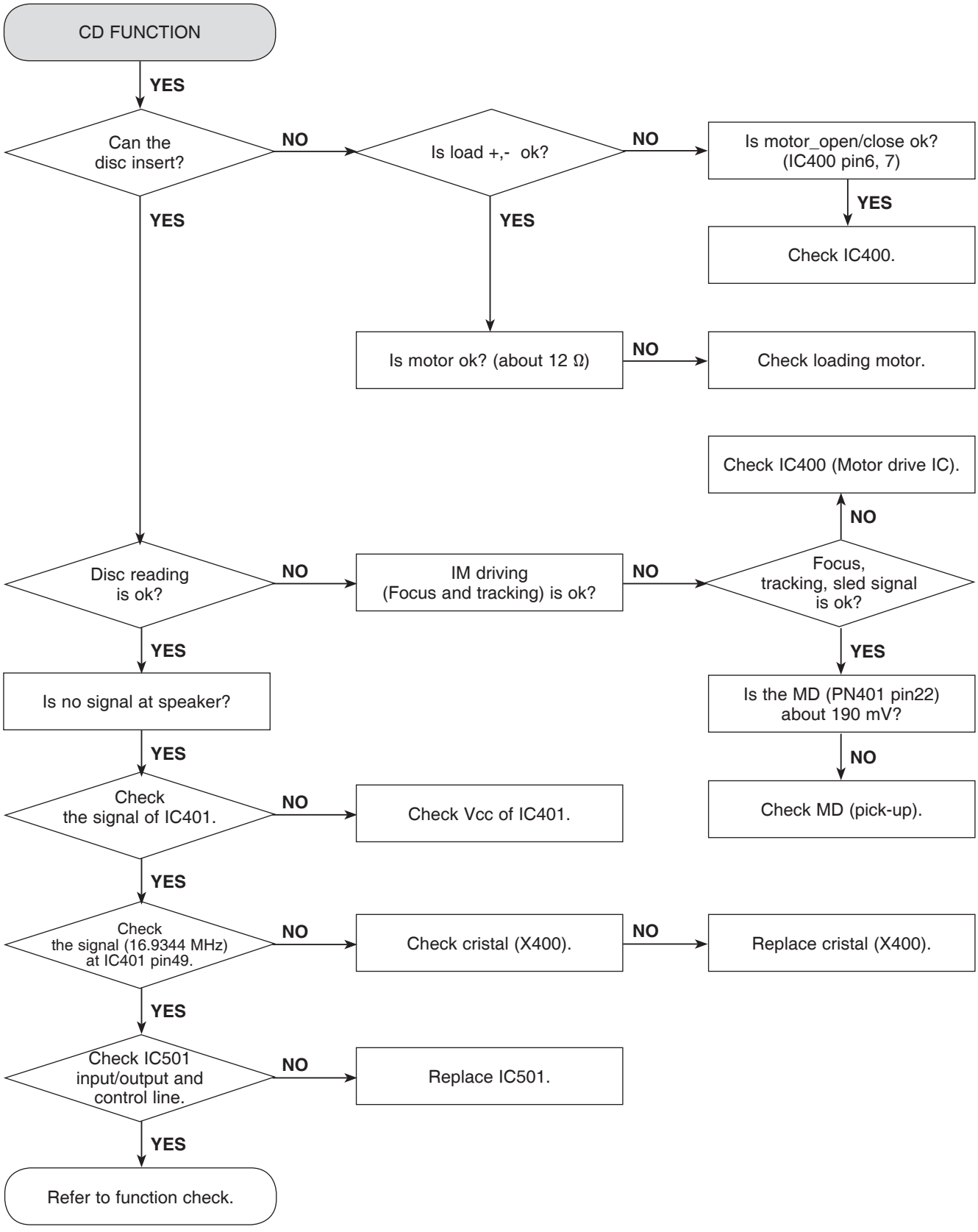
ELECTRICAL TROUBLESHOOTING GUIDE

7. TUNER FUNCTION CHECK



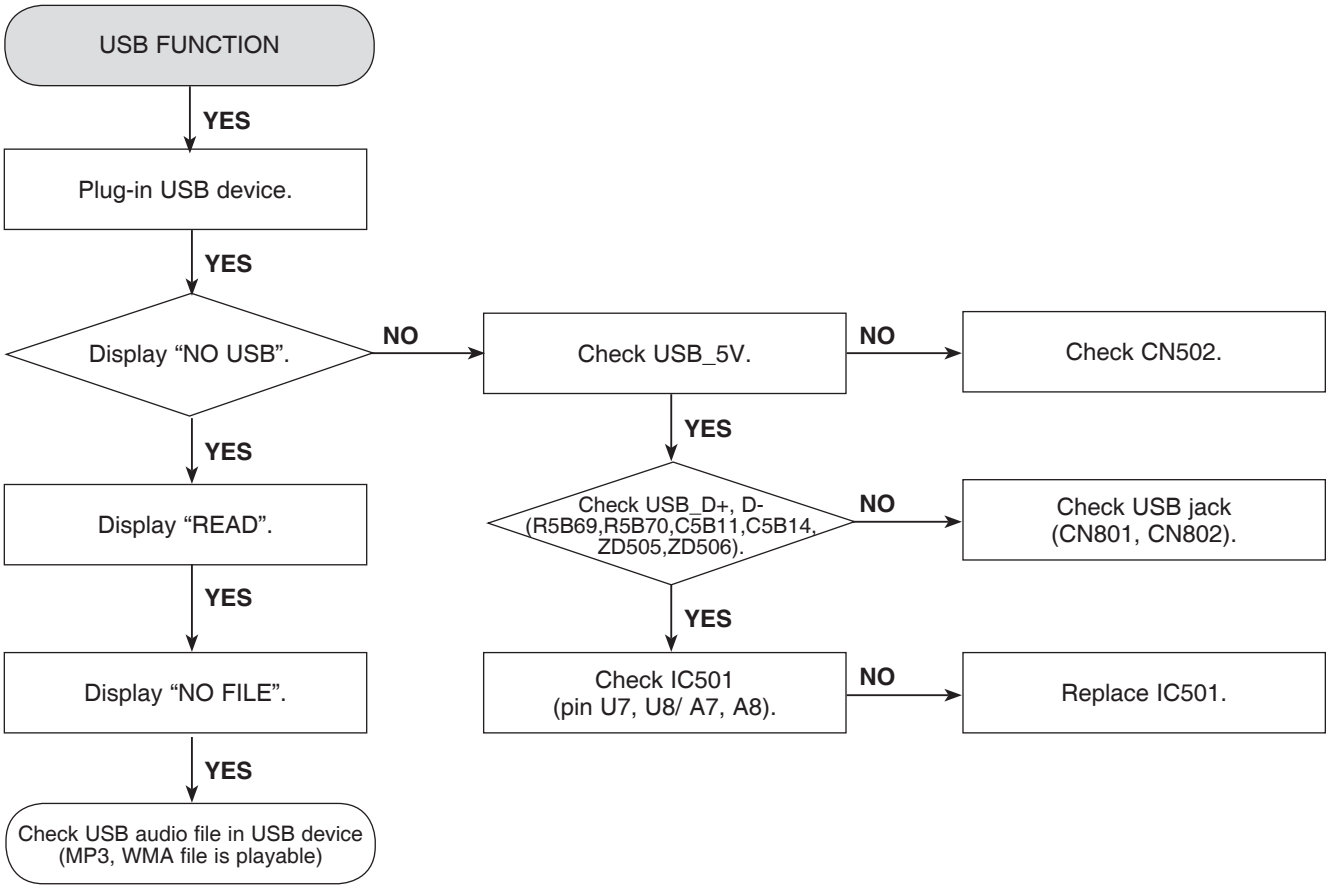
ELECTRICAL TROUBLESHOOTING GUIDE

8. CD FUNCTION CHECK



ELECTRICAL TROUBLESHOOTING GUIDE

9. DOUBLE USB FUNCTION



WAVEFORMS OF MAJOR CHECK POINT

1. DSP (IC501)

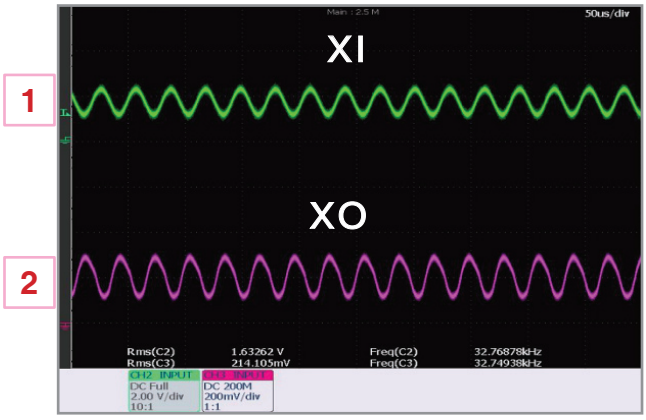


Fig 1-1. X501: Crystal of RTC 32.768 MHz
(R5B94 both side)

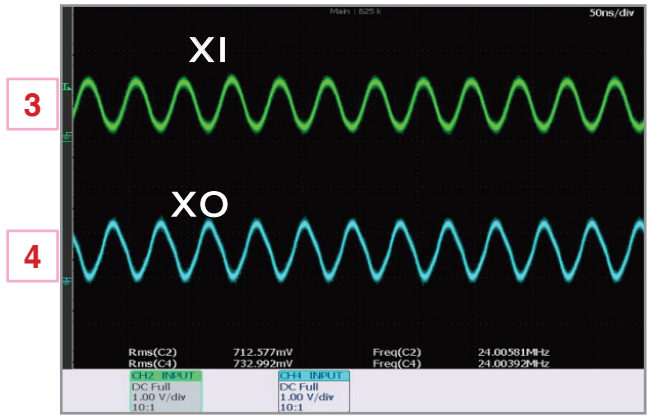
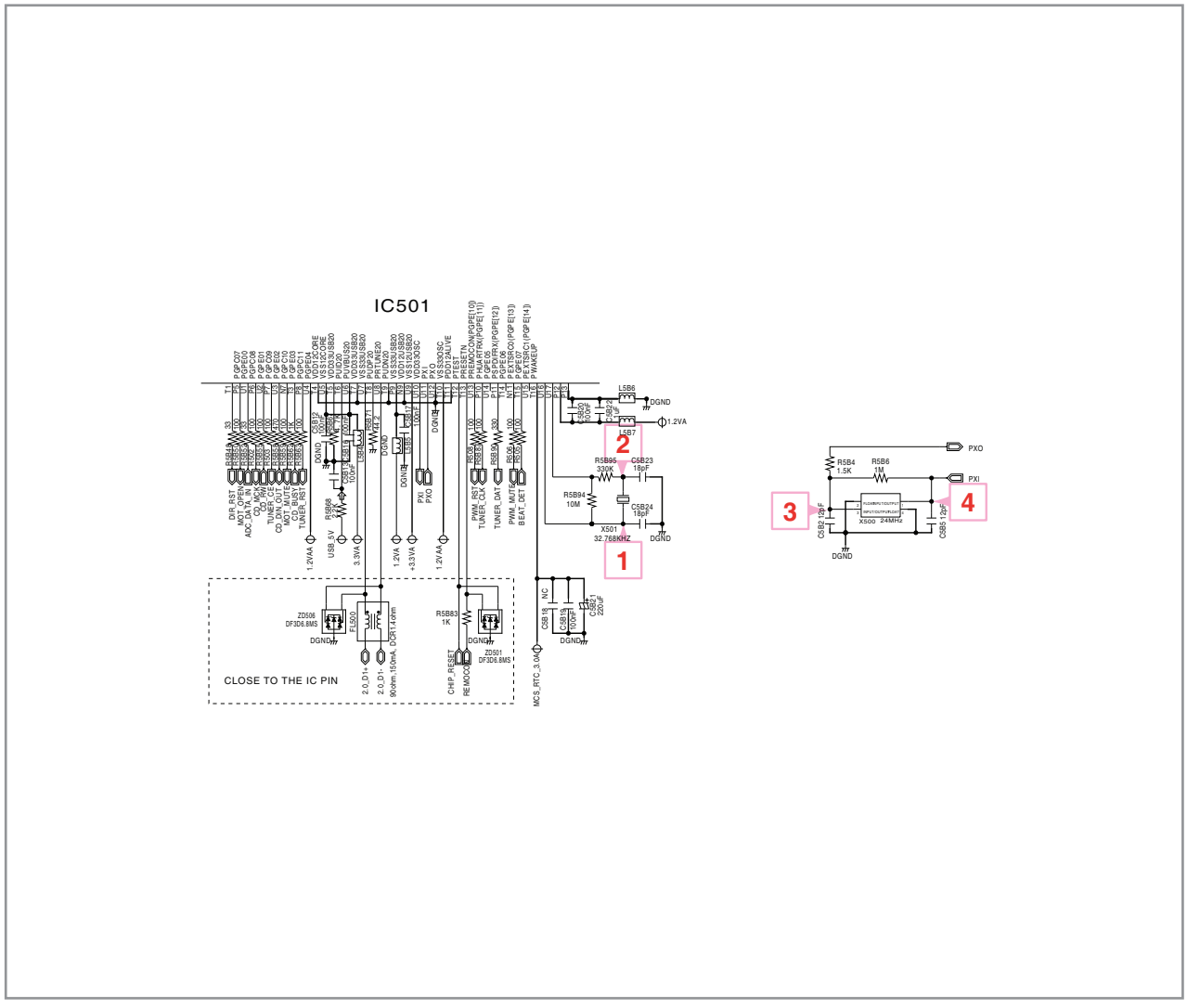
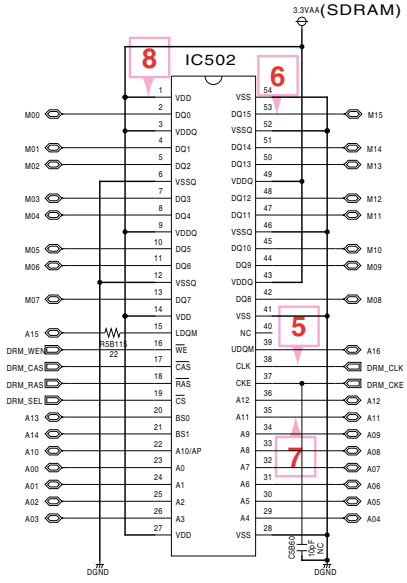


Fig 1-2. X500: Crystal of system 24 MHz
(MAIN DSP : R5B6, C5B5)



2. SDRAM (IC502)

Fig 2. SDRAM



3. SERVO (IC401)

Fig 3-1. X400: Crystal 16.9344 MHz

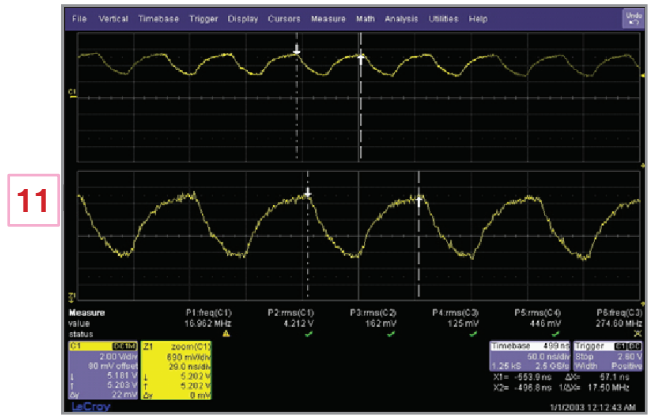
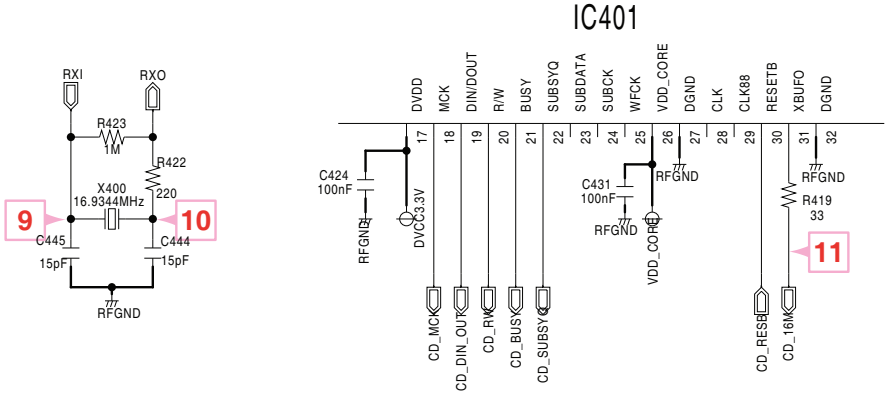


Fig 3-2. CD-16M
(IC401 pin31)

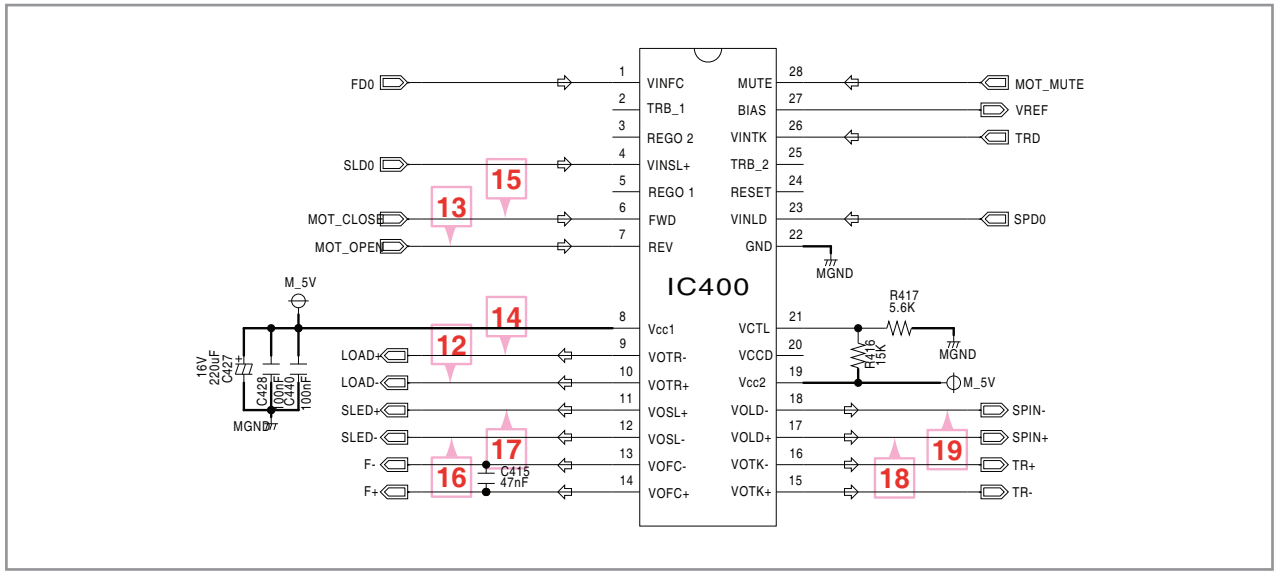


4. MOTOR DRIVER (IC400)

Fig 4-1. LO- & LO+ / MOT_OPEN &MOT_CLOSE for Driving TRAY Motor (IC400 Pin6, 7, 9, 10)

Fig 4-2. SL- & SL+ for Driving SPINDLE Motor (IC400 Pin11, 12)

Fig 4-3. SP- & SP+ for Driving SPINDLE Motor (IC400 Pin17, 18)



5. ADC (IC301)

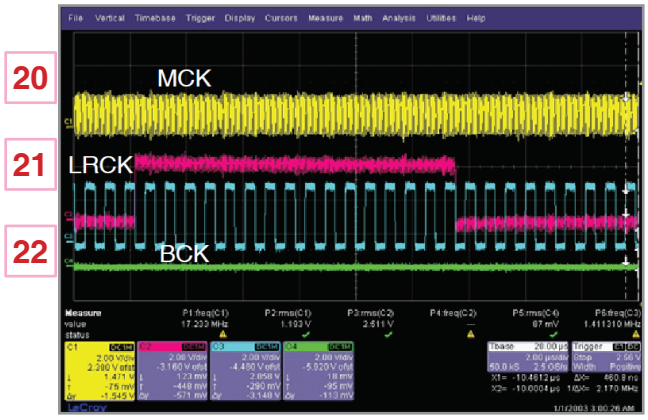


Fig 5. ADC I2S
(IC301 Pin15, 16, 17)

6. USB (CN502)

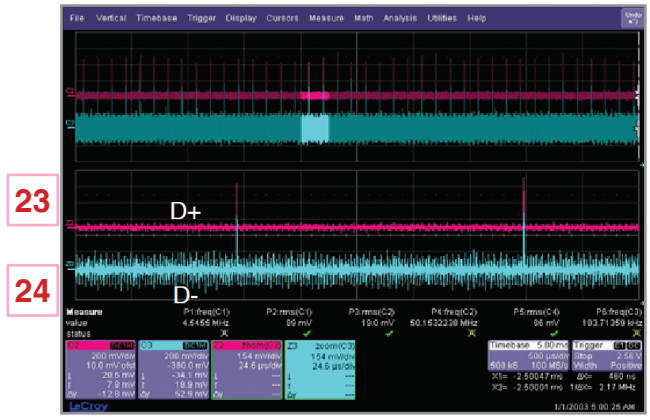
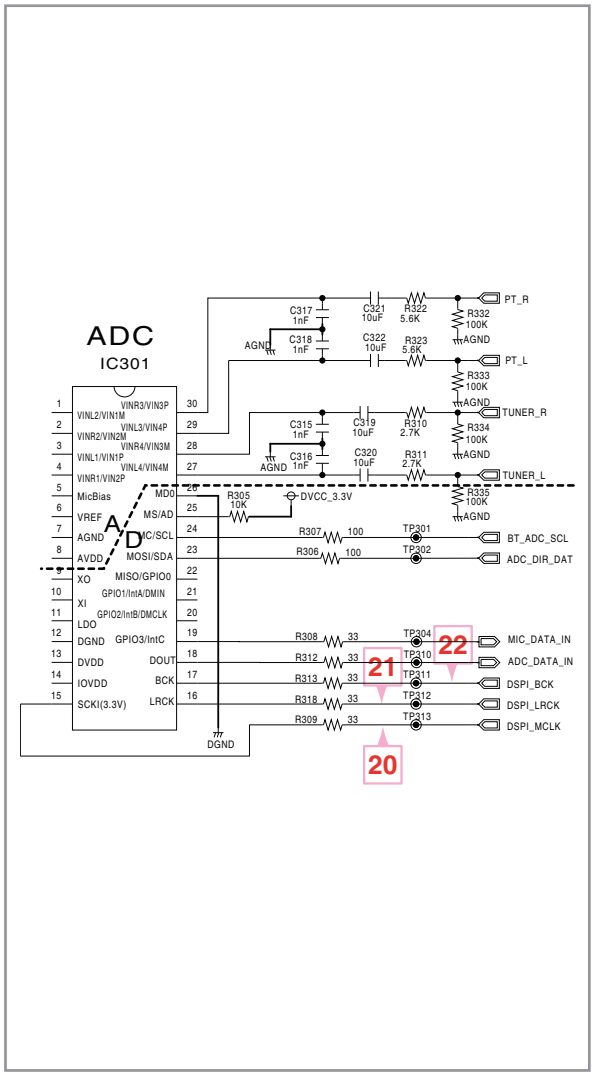
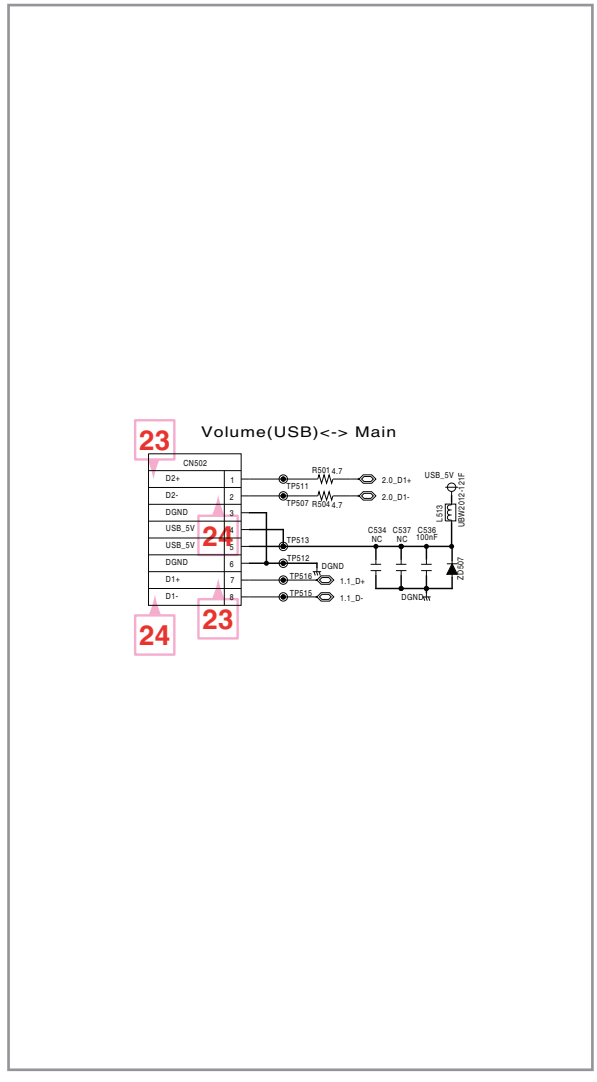


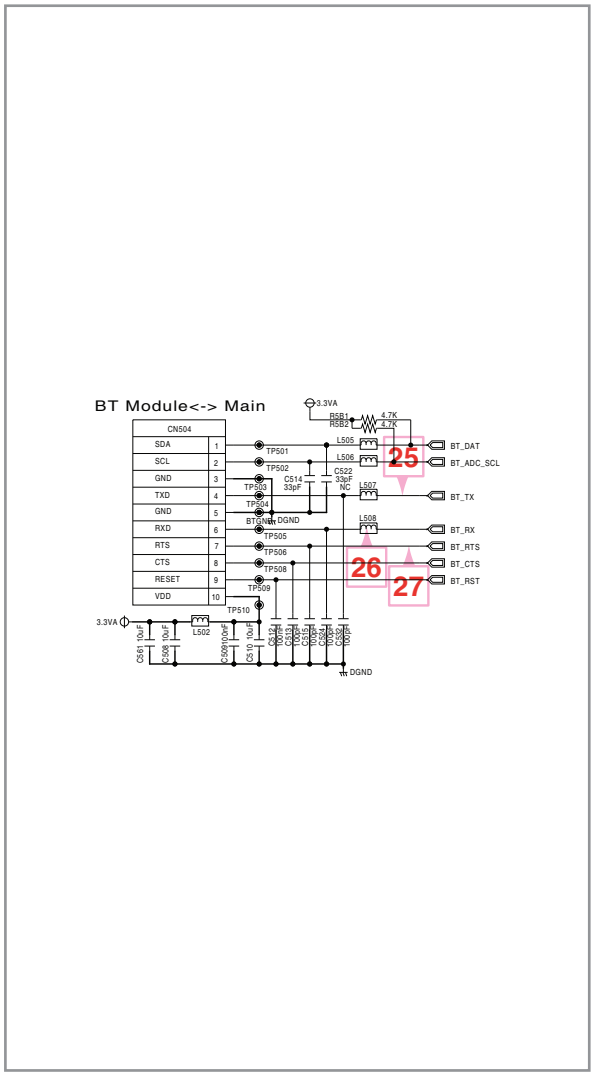
Fig 6. USB D+/D-
(CN502 Pin1, 2, 7, 8)





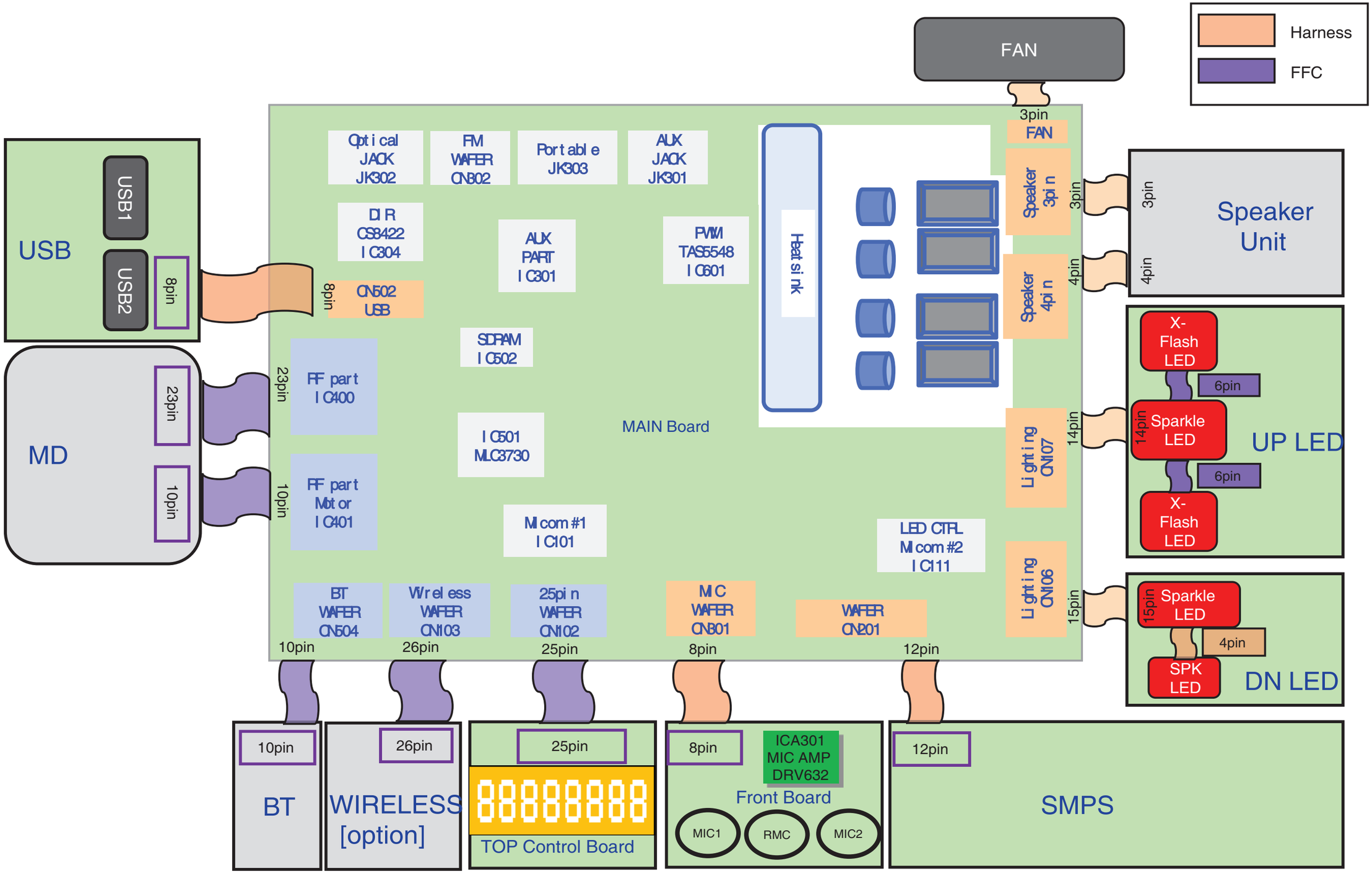
7. BLUETOOTH (CN504)

Fig 7. BT_TX / BT_RX / BT_RST

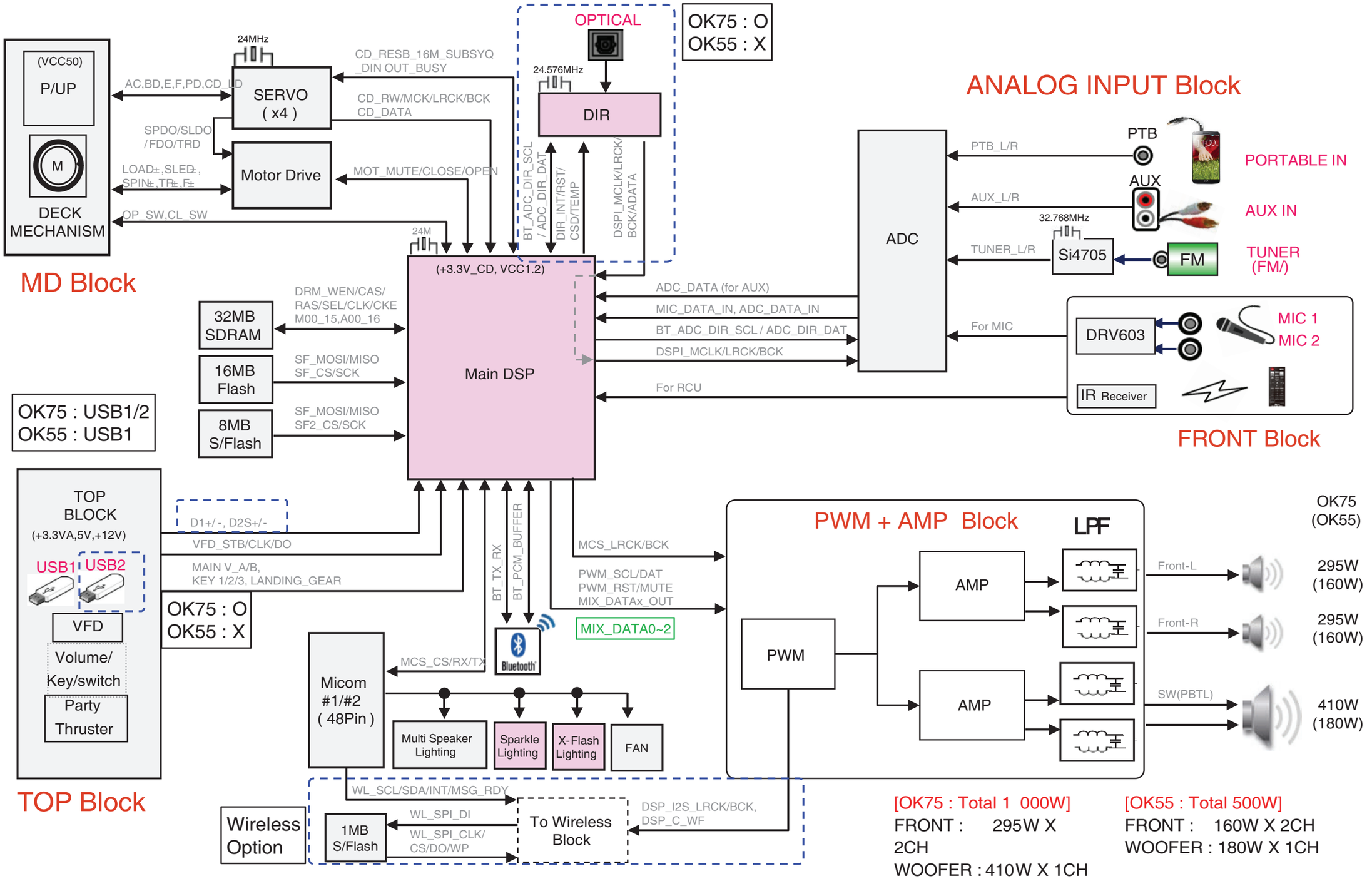


MEMO

WIRING DIAGRAM



BLOCK DIAGRAM



CIRCUIT VOLTAGE CHART

1. IC VOLTAGE

NO.	SYMBOL	SPEC (V, mV)	Rating -20 % Rating +20 %	Measured Voltage	IC function	IC TC TEMPERATURE SPEC
			Voltage (V)	Voltage (V)	Description of operation	
1	**IC101 IC,Microcontrollers**	VDD : -0.5~+6.5V	VDD : 3.1 ~ 3.3V	VDD : 3.29V	IC,Microcontrollers	125 °C
2	**IC111 IC,Microcontrollers**	VDD : -0.5~+6.5V	VDD : 3.1 ~ 3.3V	VDD : 3.28V	Sub IC,Microcontrollers	125 °C
3	**IC201 DC,DC Converter**	VIN : 4.5V TO 24V	Vin : 12VA, Vout : 5.1VA	Vin : 12.01VA, Vout : 5.15VA	High Efficiency 3A, 24V, 500kHz Synchronous Step Down Converter	125 °C
4	**IC202 DC-DC Converter**	VIN : 2.7V TO 5.6V	Vin : 3.3VA, Vout : 3.3V	Vin : 5.15VA Vout : 3.34VA	Step-Down Converters	125 °C
5	**IC203 DC,DC Converter**	VIN : 4.5V TO 24V	Vin : 12VA, Vout : 5.1VA	Vin : 12.01VA, Vout : 5.11V	High Efficiency 3A, 24V, 500kHz Synchronous Step Down Converter	125 °C
6	**IC204 Limit Switch**	VIN : 2.5V TO 5.5V	Vin : 5.1VA, Vout : 5V	Vin : 3.34VA Vout : 3.29V	ultra-low RDS(ON) switch with current limiting	125 °C
7	**IC205 DC-DC Converter**	VIN : 2.7V TO 5.6V	Vin : 5.1VA, Vout : 1.2VA	Vin : 5.14VA, Vout : 1.22V	Step-Down Converters	125 °C
8	**IC206 Limit Switch**	VIN : 2.5V TO 5.5V	Vin : 5.1VA, Vout : 5.0V	Vin : 5.1VA Vout : 5.0V	ultra-low RDS(ON) switch with current limiting	125 °C
9	**IC207 Limit Switch**	VIN : 2.5V TO 5.5V	Vin : 5.1VA, Vout : 5V	Vin : 5.15VA Vout : 5.14V	ultra-low RDS(ON) switch with current limiting	125 °C
10	**IC208 DC-DC Converter**	VIN : 4.5V TO 5V	Vin : 5.1V Vout : 3.3V	Vin : 5.14VA Vout : 3.3V	Step-Down Converters	125 °C
11	**IC209 Limit Switch**	VIN : 2.5V TO 5.5V	Vin : 5.1A, Vout : 5.0V	Vin : 5.1VA Vout : 5.0V	ultra-low RDS(ON) switch with current limiting	125 °C
12	**IC301 4ch Audio ADC**	VIN : -0.3V to 3.9V	AVDD : 3.3V	AVDD : 3.31V	4ch Audio ADCs with Universal Front End Input Mux	125 °C
13	**IC302 TUNER**	VDD:3~3.6V	VDD:3.3V	AVDD:3.32V	Tuner ic	150 °C
14	**IC304 OPTICAL**	VDD:3~3.6V	VDD:3.3V	AVDD:3.32V	Optical	125 °C
15	**IC400 Motor Driver**	VCC1 : 4.3~13.2V VCC2 : 4.3~VCC1	VCC1 : 5.0V VCC2 : 5.0V	VCC1 : 5.11V VCC2 : 5.11V	5-channel BTL Driver	150 °C
16	**IC401 digital servo signal processing**	VDD1 : 2.7~3.6V (Analog) VDD_CORE : 1.4~1.65V	VCC : 3.3V	VCC : 3.28V	Servo signal processor for compact disc player	125 °C
17	**IC501 IC,Digital Signal Processors**	Digital Power 3.3V or 1.2V	VDD33 : 3.3VA VDD12 : 1.2VA	VDD : 3.33VA VDD : 1.21VA	IC,Digital Signal Processors	150 °C
18	**IC502 SDRAM**	VDD : 3.0~3.6V	VCC : 3.3V	VCC : 3.33V	4 M x 4 BANKS x 16 BITS SDRAM	150 °C
19	**IC503 Serial Flash Memory**	VDD : 3.0~3.6V	VCC : 3.3V	VCC : 3.33V	SERIAL FLASH MEMORY	150 °C
20	**IC504 Serial Flash Memory**	VDD : 3.0~3.6V	VCC : 3.3V	VCC : 3.33V	SERIAL FLASH MEMORY	150 °C
21	**IC505 RESET**	VIN:1.1~5.5V	Vin : 3.1~3.3VA	Vin : 3.32VA	3-PIN MICROPROCESSOR RESET CIRCUITS	125 °C
22	**IC601 Sound/Audio Processor**	VCC : 2.97V TO 3.63V	VDD : 3.3V	VDD : 3.27V	Digital Audio Processor	125 °C
23	**IC700~IC702 AUDIO AMPLIFIER**	VCC : 11.6V To 12.4V	VDD : 11.68V PVDD : 48.2V	VDD : 11.68V PVDD : 48.2V	PROTECTED DIGITAL AUDIO AMPLIFIER	125 °C
24	**ICA301 Line Driver**	VDD:3~3.6V	VDD : 3.3V	VDD : 3.32V	2-VRMS Audio Line Driver With Adjustable Gain	150 °C

2. FAN MOTOR VOLTAGE

NO.	Check MODE	SPEC	Check Result	Check Method
1	**FAN MOTOR Input Voltage**	12V	11.98V	Check the Voltage on the CN462 Pin3(FAN_DC), Not connect FAN Module.(12V)
2	**FAN MOTOR Operation Voltage**	VOL14↓ : 4.6~5.6V VOL15~40 : 7.8~9.6V	VOL14↓ : 5.1V VOL15~40 : 8.7V	During the FAN Operate, Check the Voltage of FAN Module.

3. SMPS CAPACITOR & ZENER DIODE

Capacitor			
NO	**LOC**	**SPEC**	**Sales AREA**
1	C903	450V/ 330uF	W/W
2	C904	450V/ 330uF	W/W

SMPS ZENER DIODE		
NO	**LOC**	**CHECK**
1	ZD902, ZD906	13V
2	ZD901, ZD904	33V
3	ZD905, ZD912	20V

4. MAIN CAPACITOR

NO.	LOCATION NO.	Value	110V-20% (88V/60Hz) V	220V+20% (288V/50Hz) V
1	**C257**	470uF	+12V	12.06
2	**C271**	220uF	USB_5V	5.03
3	**C345**	220uF	DVCC_3.3V	3.28
4	**C402**	100uF	DVCC_5V	5.03
5	**C404**	47uF	DVCC_3.3V	3.27
6	**C409**	47uF	DVCC_3.3V	3.27
7	**C416**	47uF	DVCC_3.3V	3.27
8	**C418**	3.3uF	VREF	1.63
9	**C427**	220uF	M_5V	5.03
10	**C481**	100uF	FAN_DC	11.98
11	**C5B21**	220uF	VDD_CORE	1.26
12	**C614**	100uF	DVCC_3.3V	3.28
13	**C713**	10uF	+12V	11.91
14	**C714**	10uF	+12V	11.91
15	**C748**	680uF	+B +66V	48.30
16	**C749**	680uF	-B -66V	48.30
17	**C752**	680uF	+B +66V	48.30
18	**C753**	680uF	-B -66V	48.30
19	**C801**	100uF	USB_5V	5.21
20	**C802**	47uF	F-	3.07
21	**C805**	1uF	VFD_12V	11.95
22	**C806**	1uF	DVCC_3.3V	3.29
23	**C813**	100uF	USB_5V	5.21
24	**C821**	47uF	F+	5.18
25	**C831**	1uF	VH	29.81
26	**C832**	1uF	VH	20.90
27	**C833**	1uF	VH	20.90
28	**C834**	1uF	VH	16.80
29	**C903**	330uF	122.30	372.10
30	**C904**	330uF	122.30	372.10
31	**C933**	2200uF	12.10	12.10
32	**C934**	470uF	12.10	12.10
33	**C952**	2200uF	49.10	49.10
34	**C953**	2200uF	49.10	49.10

5. CONNECTOR VOLTAGE

NO.	LOCATION NO.	Connector Name	PIN NO.	PIN MANE	Voltage(V) Vin	Voltage(V) Vout	LOCATION NO.
1	**CN502**	MAIN ⇔ TOP(USB)	1	D2+	0.01	0.01	CN803
			2	D2-	0.07	0.07	
			3	DGND	0.00	0.00	
			4	USB_5V	5.17	5.17	
			5	USB_5V	5.17	5.17	
			6	DGND	0.00	0.00	
			7	D1+	0.03	0.03	
			8	D1-	0.01	0.01	
2	**CN504**	MAIN ⇔ BT Moudle	1	SDA	0.12	0.12	BT Module
			2	SCL	3.33	3.33	
			3	GND	0.00	0.00	
			4	TXD	3.33	3.33	
			5	GND	0.00	0.00	
			6	RXD	3.33	3.33	
			7	RTS	1.49	1.49	
			8	CTS	1.51	1.51	
			9	RESET	3.33	3.33	
			10	VDD	3.33	3.33	
3	**CN102**	MAIN ⇔ TOP 12511HS-25SS-K	1	GND	0.00	0.00	CN804
			2	GND	0.00	0.00	
			3	MAIN_VOL_A	3.33	3.33	
			4	MAIN_VOL_B	3.32	3.32	
			5	FILE_S_A	3.29	3.29	
			6	FILE_S_B	3.29	3.29	
			7	SCRATCH_B	3.29	3.29	
			8	SCRATCH_A	3.29	3.29	
			9	MIC_VOL_B	3.29	3.29	
			10	MIC_VOL_A	3.29	3.29	
			11	KEY1	3.27	3.27	
			12	KEY2	3.27	3.27	
			13	KEY3	3.27	3.27	
			14	LANDING GEAR	3.33	3.33	
			15	GND	0.00	0.00	
			16	+3.3V	3.35	3.35	
			17	DGND	0.00	0.00	
			18	VFD_DAT	3.14	3.14	
			19	VFD_STB	3.14	3.14	
			20	VFD_CLK	3.14	3.14	
			21	DV_3.3V	3.33	3.33	
			22	DV_5.0V	5.05	5.05	
			23	DV_5.0V	5.05	5.05	
			24	VF_12V	12.02	12.02	
			25	GND	0.00	0.00	

CONNECTOR VOLTAGE

NO.	LOCATION NO.	Connector Name	PIN NO.	PIN MANE	Voltage(V)		LOCATION NO.
					Vin	Vout	
4	**CN201**	MAIN ⇔ SMPS	1	12V	12.06	12.06	CN901
			2	12V	12.06	12.06	
			3	DGND	0.00	0.00	
			4	P_CTRL	3.33	3.33	
			5	DGND	0.00	0.00	
			6	DGND	0.00	0.00	
			7	DGND	0.00	0.00	
			8	PVDD	48.30	48.30	
			9	PVDD	48.30	48.30	
			10	PVDD	48.30	48.30	
			11	DGND	0.00	0.00	
			12	PVDD CTRL	2.83	2.83	
5	**CN301**	MAIN ⇔ MIC SMW200-H8G	1	RMC3.3VA	3.33	3.33	CNA301
			2	RMC	3.19	3.19	
			3	DGND	0.00	0.00	
			4	MIC_3.3V	3.28	3.28	
			5	MIC_DET	3.29	3.29	
			6	MIC_S1	0.00	0.00	
			7	MIC_GND	0.00	0.00	
			8	MIC_S2	0.00	0.00	
6	**CN400**	MAIN ⇔ MD	1	NC/FHM-VCC	5.05		MD
			2	RF	0.02		
			3	DVD_LD	0.02		
			4	MON(COM)/5V	0.02		
			5	DVD_VR	0.03		
			6	GND	0.00		
			7	VREF/VC	1.63		
			8	VCC	5.05		
			9	F	1.63		
			10	E	1.63		
			11	A	1.63		
			12	D	1.63		
			13	C	1.63		
			14	B	1.63		
			15	F(+)	2.47		
			16	T(+)	2.46		
			17	T(-)	2.46		
			18	F(-)	2.47		
			19	SW_PDIC	4.69		
			20	GND	0.00		
			21	CD_LD	0.02		
			22	MON_MPD	0.21		
			23	CD_VR	0.00		

NO.	LOCATION NO.	Connector Name	PIN NO.	PIN MANE	Voltage(V)		LOCATION NO.
					Vin	Vout	
7	**CN401**	MAIN ⇔ MD	1	OPEN_SW	3.29		MD
			2	LO-	0.00		
			3	CLOSE_SW	3.33		
			4	LO+	0.01		
			5	GND	0.00		
			6	SP+	2.47		
			7	SL+	2.47		
			8	SP-	2.47		
			9	SL-	2.47		
			10	NC	0.00		
8	**CN701**	MAIN ⇔ SPK	1	SW+	24.40		SPK
			2	SW-	24.40		
			3	FL+	24.40		
			4	FL-	24.40		
			5	FR+	24.40		
			6	FR-	24.40		
9	**CN106**	MAIN ⇔ SPARKLING LIGHTING(UP) 1.25MM	1	GND	0.00	0.00	CNS101
			2	SPRK_U_LD3	0~3	0~3	
			3	SPRK_U_LD2	0~3	0~3	
			4	FLASH_ BLUE_L	0~3	0~3	
			5	FLASH_RED_L	0~3	0~3	
			6	GND	0.00	0.00	
			7	GND	0.00	0.00	
			8	SPRK_U_RD5	0~3	0~3	
			9	SPRK_U_RD4	0~3	0~3	
			10	FLASH_ BLUE_R	0~3	0~3	
			11	FLASH_RED_R	0~3	0~3	
			12	GND	0.00	0.00	
10	**CN107**	MAIN ⇔ SPARKLING LIGHTING(DN) 1.25MM	1	MULTI_LED_B	0~3	0~3	CNS102
			2	MULTI_LED_G	0~3	0~3	
			3	MULTI_LED_R	0~3	0~3	
			4	GND	0.00	0.00	
			5	GND	0.00	0.00	
			6	SPRK_D_LD3	0~3	0~3	
			7	SPRK_D_LD2	0~3	0~3	
			8	SPRK_D_LD1	0~3	0~3	
			9	GND	0.00	0.00	
			10	GND	0.00	0.00	
			11	SPRK_D_LD6	0~3	0~3	
			12	SPRK_D_LD5	0~3	0~3	
			13	SPRK_D_LD4	0~3	0~3	

CONNECTOR VOLTAGE

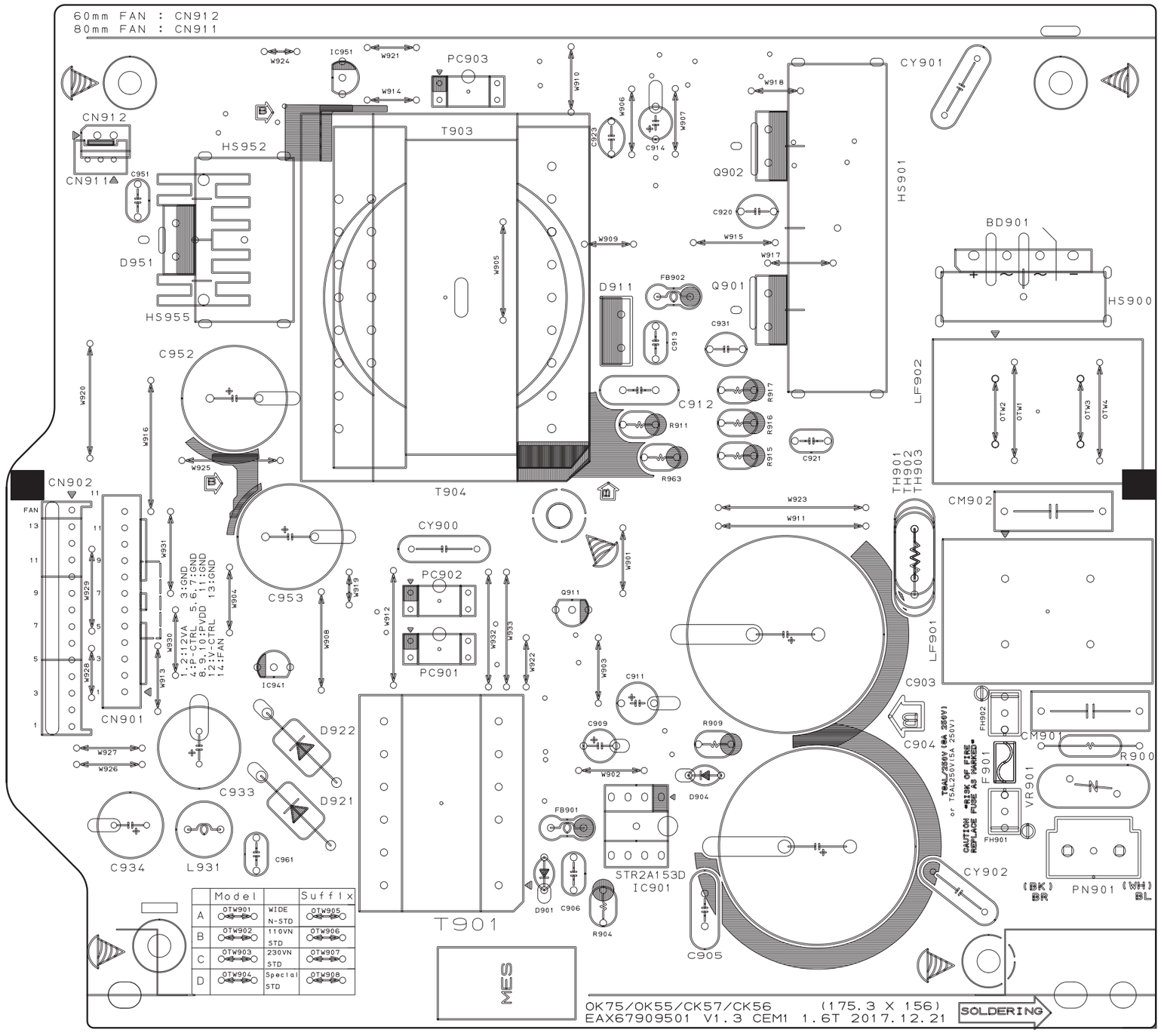
NO.	LOCATION NO.	Connector Name	PIN NO.	PIN MANE	Voltage(V)		LOCATION NO.
					Vin	Vout	
10	**CN107**	MAIN ⇔ SPARKLING LIGHTING(DN) 1.25MM	14	GND	0.00	0.00	CNS102
			15	GND	0.00	0.00	
11	**CN462**	MAIN ⇔ FAN CONTROL	1	GND	0.00	0.00	FAN
			2	NC	0.00	0.00	
			3	FAN_DC	8.70	8.70	
12	**CNS103**	SPAKLING DN ⇔ SPK LED	1	SPKLED_B	0~3	0~3	CNS301
			2	SPKLED_G	0~3	0~3	
			3	SPKLED_R	0~3	0~3	
			4	GND	0.00	0.00	
13	**CNF103**	FRONT ⇔ FRONT	1	GND	0.00	0.00	CNF101
			2	GND	0.00	0.00	
			3	FLASH_ BLUE_L_UP	0~3	0~3	
			4	FLASH_ BLUE_L_UP	0~3	0~3	
			5	FLASH_ RED_L_UP	0~3	0~3	
			6	FLASH_ RED_L_UP	0~3	0~3	
			7	GND	0.00	0.00	
			8	GND	0.00	0.00	
14	**CNF104**	FRONT ⇔ FRONT	1	GND	0.00	0.00	CNF102
			2	GND	0.00	0.00	
			3	FLASH_ BLUE_R_UP	0~3	0~3	
			4	FLASH_ BLUE_R_UP	0~3	0~3	
			5	FLASH_ RED_R_UP	0~3	0~3	
			6	FLASH_ RED_R_UP	0~3	0~3	
			7	GND	0.00	0.00	
			8	GND	0.00	0.00	

MEMO

PRINTED CIRCUIT BOARD DIAGRAMS

1. SMPS P.C.BOARD DIAGRAM

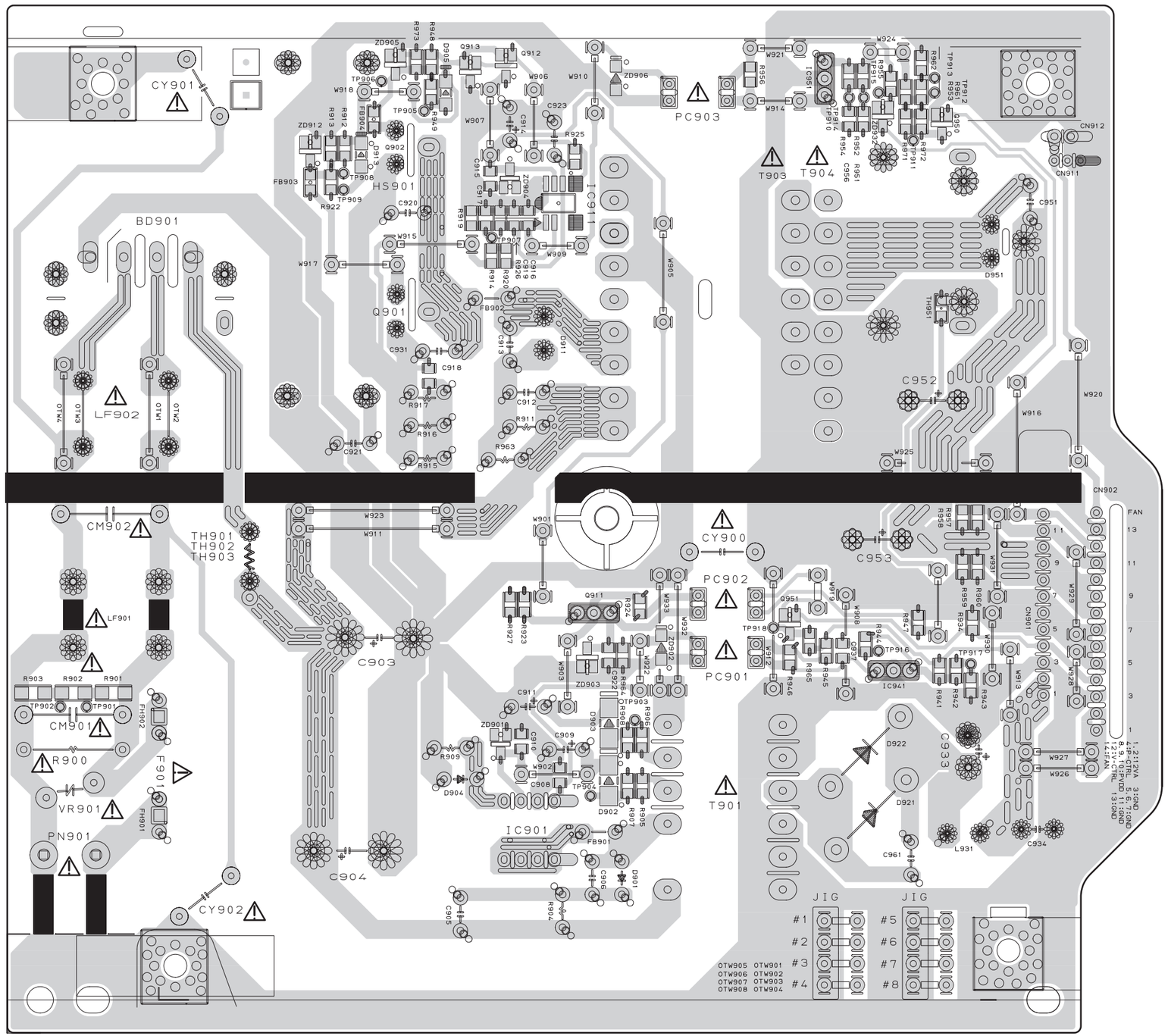
(TOP VIEW)



	Model		Suffix
A	OTW901	WIDE N-STD	OTW905
B	OTW902	110VN STD	OTW906
C	OTW903	230VN STD	OTW907
D	OTW904	Special STD	OTW908

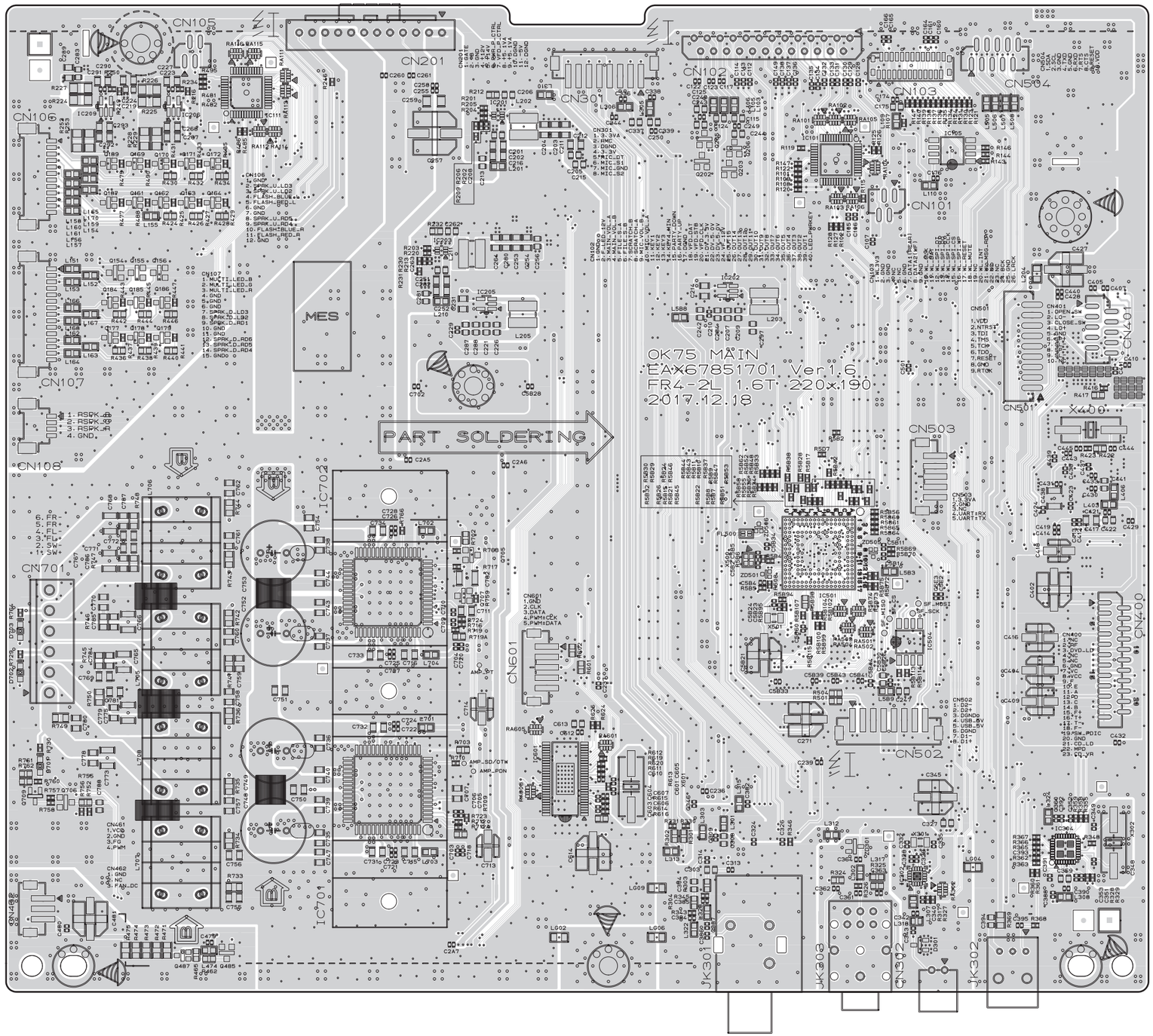
SMPS P.C.BOARD DIAGRAM
(BOTTOM VIEW)

NOTE) Warning
⚠ Parts that are critical with respect to risk of fire or electrical shock.

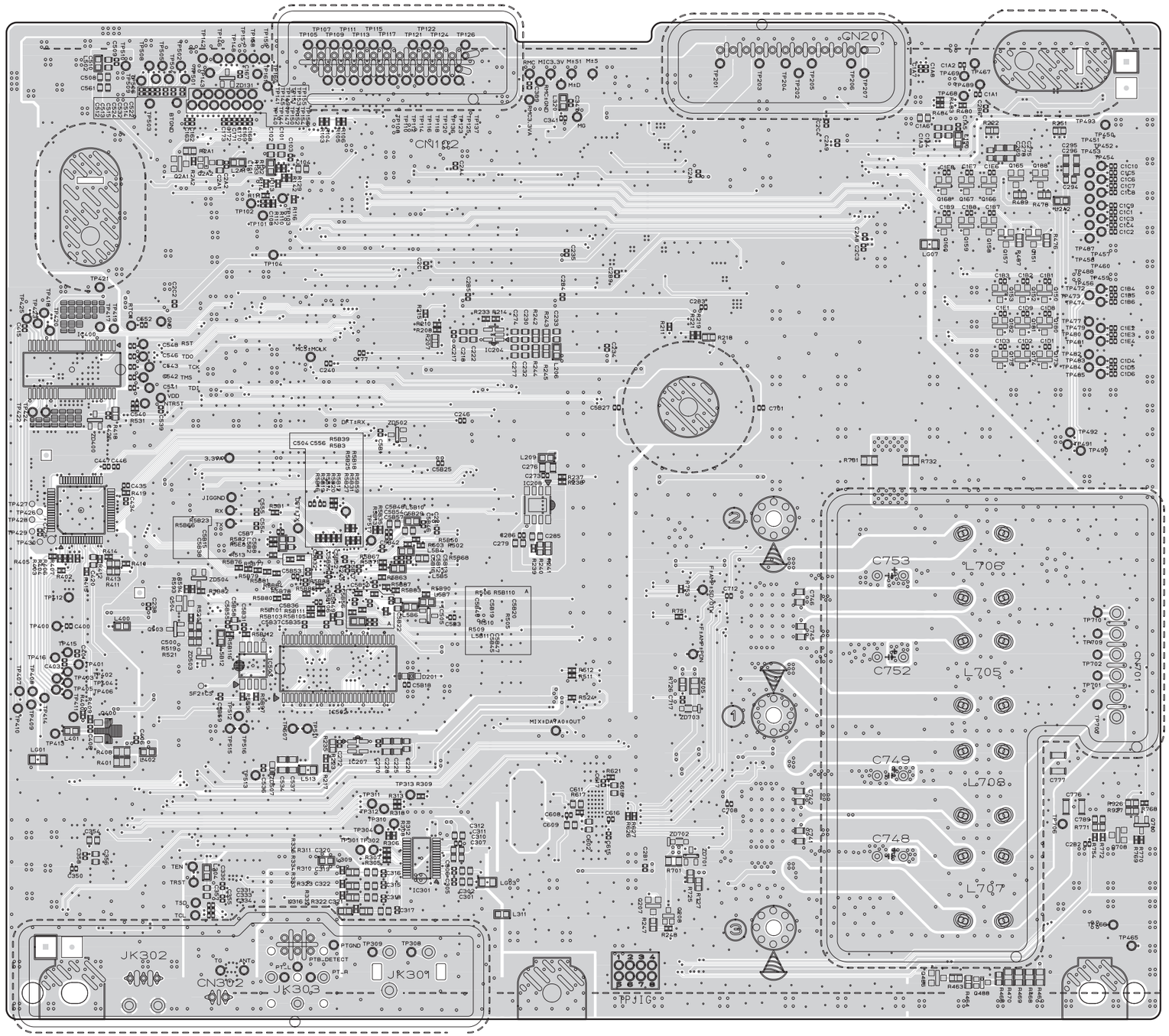


2. MAIN P.C.BOARD DIAGRAM

(TOP VIEW)

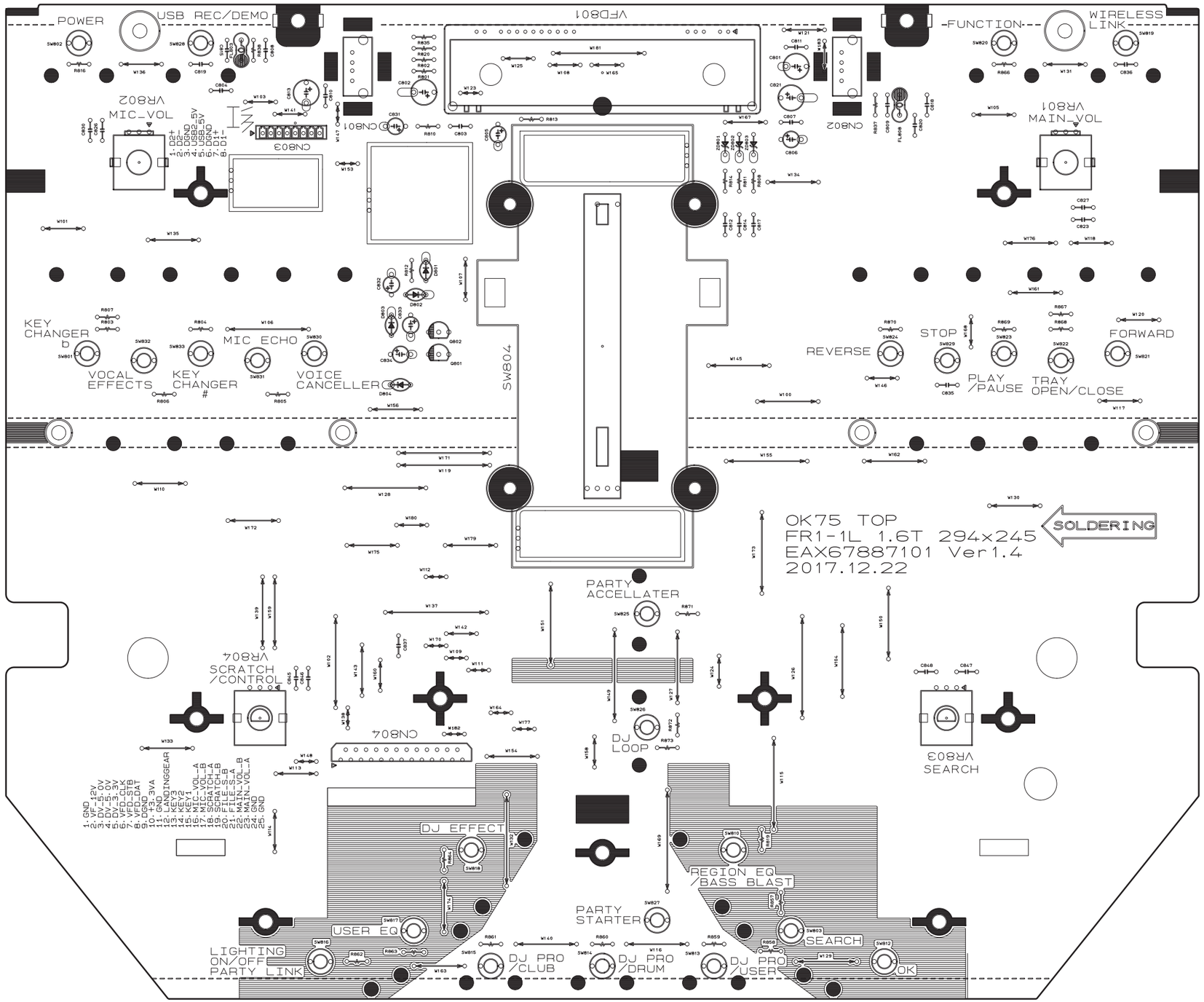


MAIN P.C.BOARD DIAGRAM
(BOTTOM VIEW)

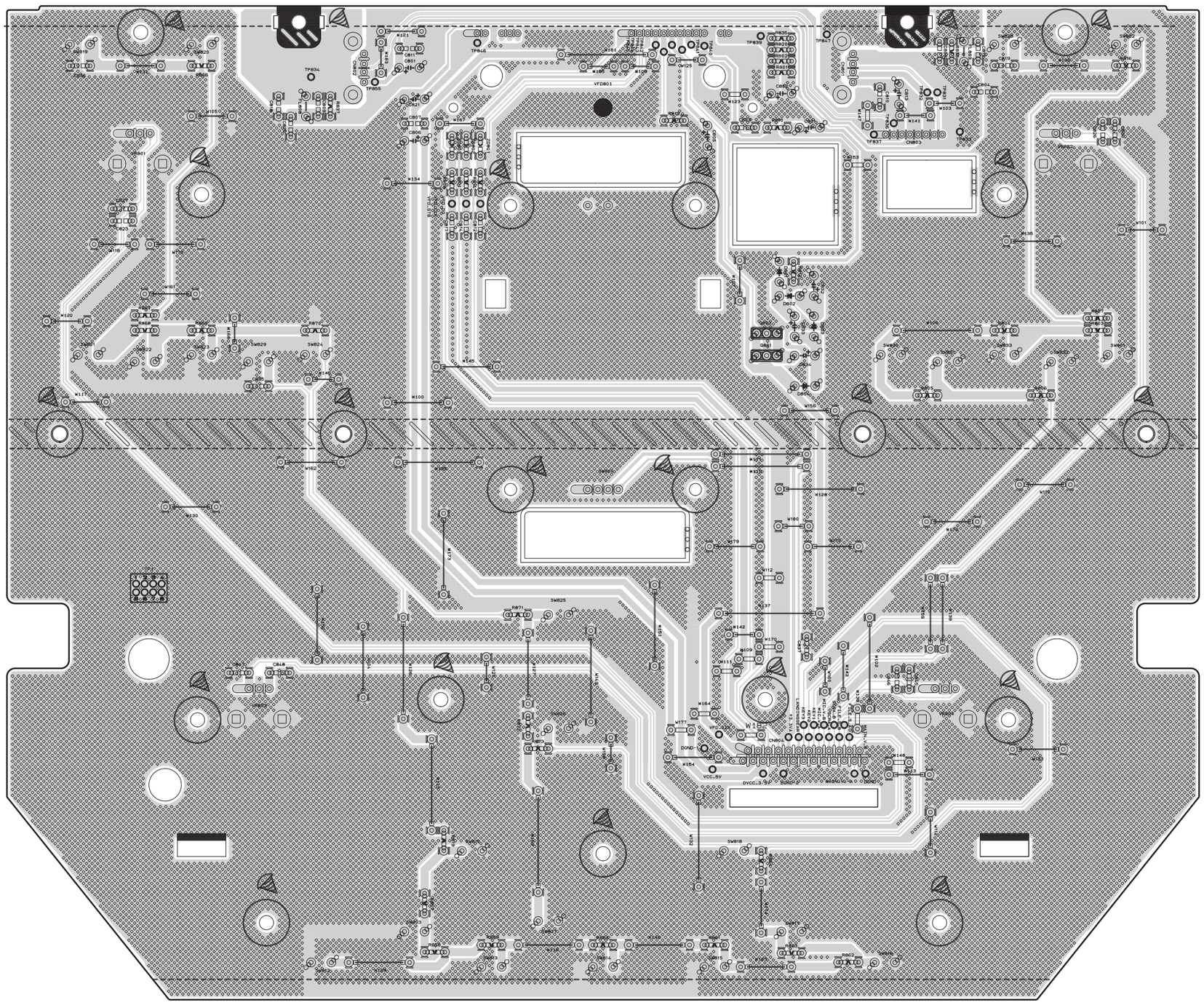


3. TOP P.C.BOARD DIAGRAM

(TOP VIEW)

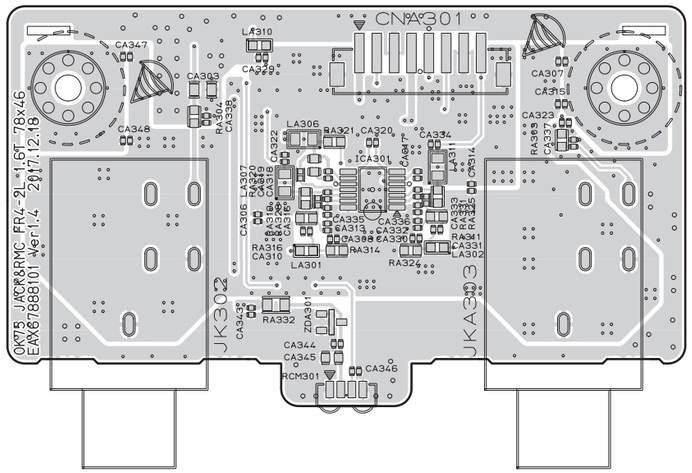


TOP P.C.BOARD DIAGRAM
(BOTTOM VIEW)

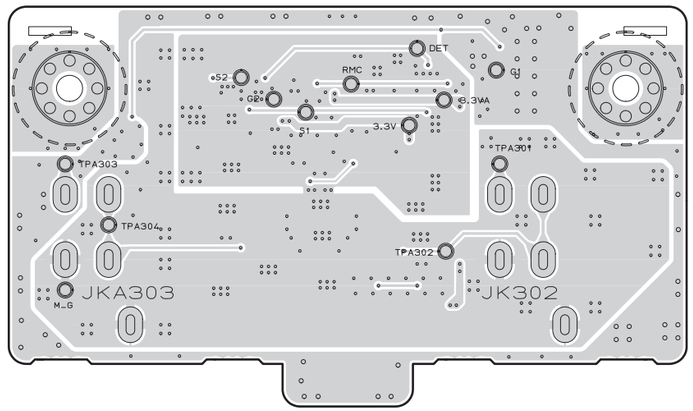


4. JACK & RMC P.C.BOARD DIAGRAM

(TOP VIEW)

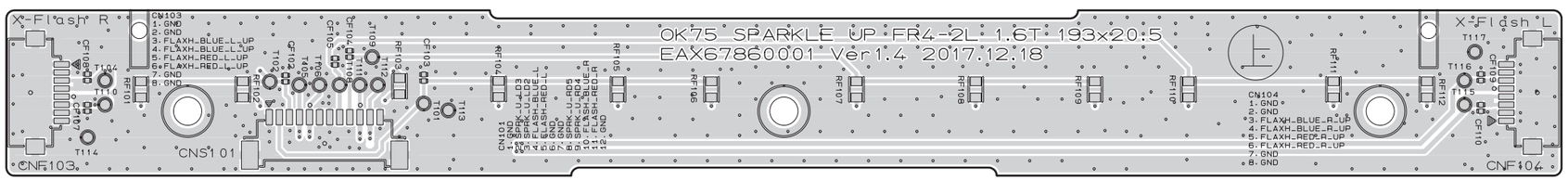


(BOTTOM VIEW)

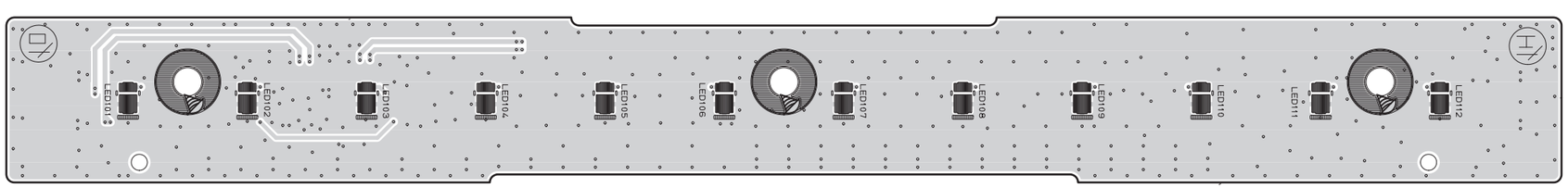


5. SPARKLE LED UP P.C.BOARD DIAGRAM

(TOP VIEW)

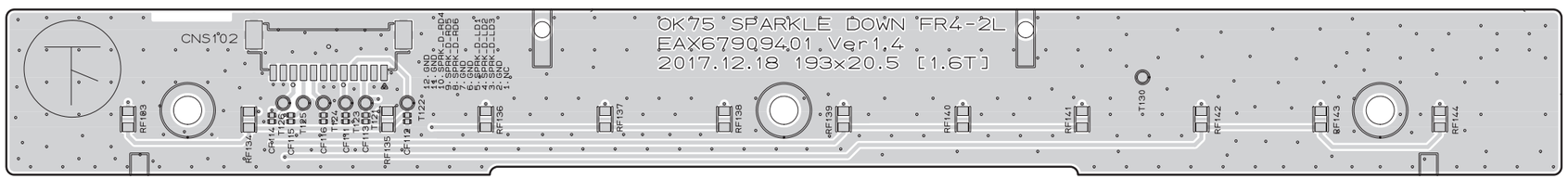


(BOTTOM VIEW)

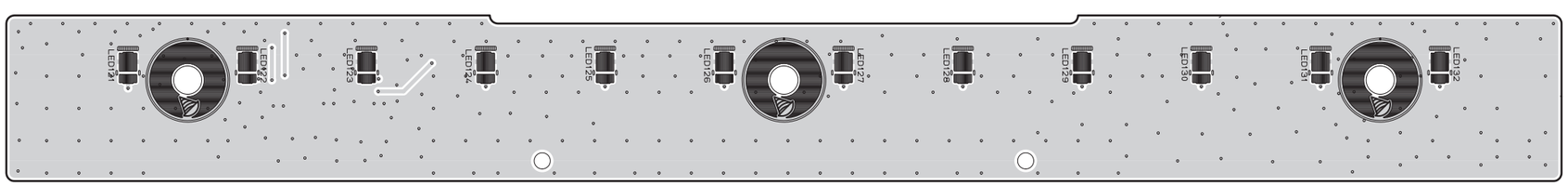


6. SPARKLE LED DOWN P.C.BOARD DIAGRAM

(TOP VIEW)

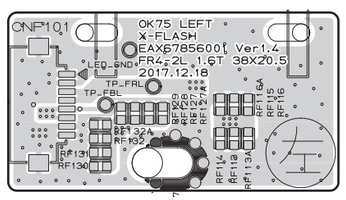


(BOTTOM VIEW)

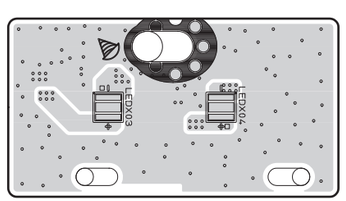


7. X-FLASH LED UP LEFT P.C.BOARD DIAGRAM

(TOP VIEW)

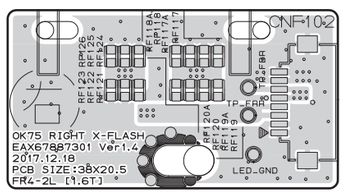


(BOTTOM VIEW)

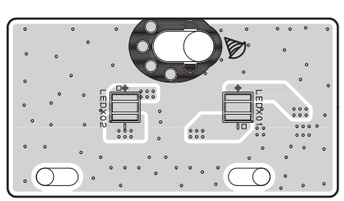


8. X-FLASH LED UP RIGHT P.C.BOARD DIAGRAM

(TOP VIEW)

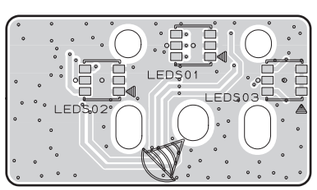


(BOTTOM VIEW)

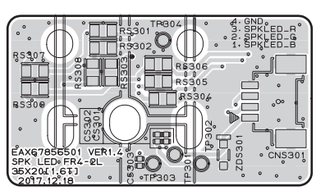


9. SPEAKER LED P.C.BOARD DIAGRAM

(TOP VIEW)



(BOTTOM VIEW)



MEMO

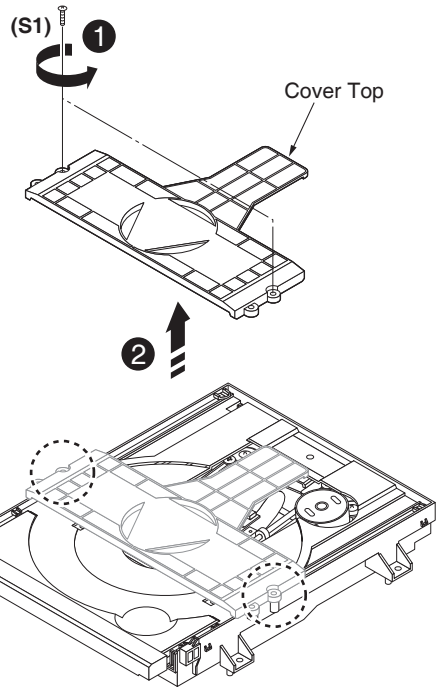
MEMO

SECTION 4

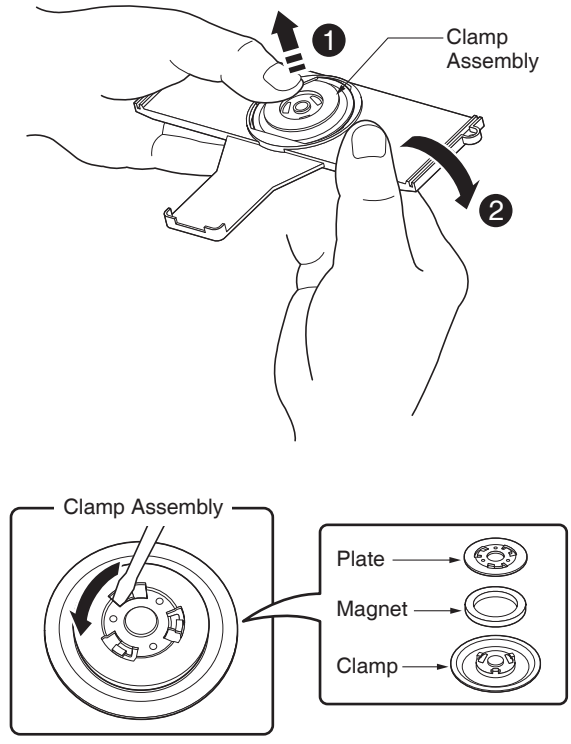
MECHANISM (DM19D)

CONTENTS

DECK MECHANISM DISASSEMBLY



< Figure A >



< Figure B >

1. Cover Top

1) Remove the 2 screws (S1).
2) Remove the Cover Top.

2. Clamp Assembly

1) Place the Clamp Assembly as **Figure B**.
2) Bending the Cover Top in direction of arrow (2) as **Figure B**.
3) Separate the Clamp Assembly from the Cover Top.

2-1. Plate

1) Turn the Plate to a counterclockwise direction and then lift up the Plate.
2) Remove the Plate.

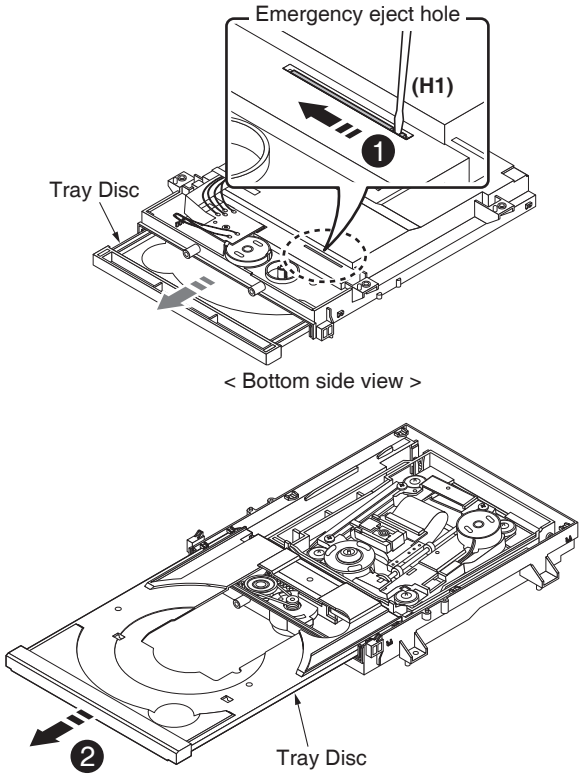
2-2. Magnet

Remove the Magnet.

2-3. Clamp

Remove the Clamp.

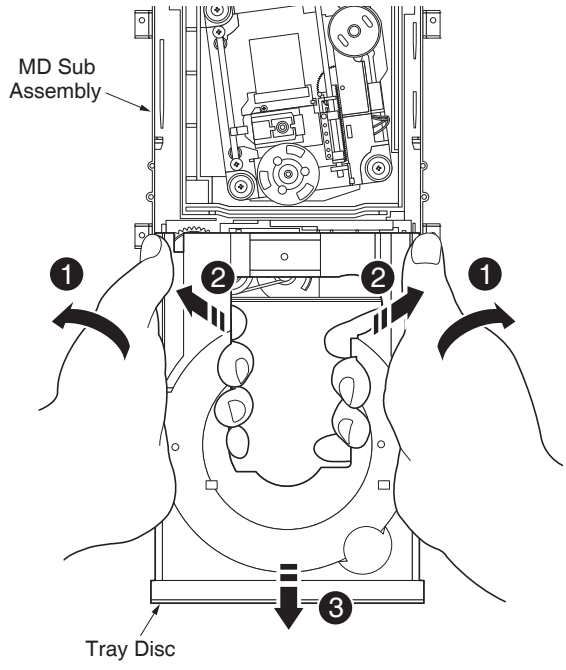
DECK MECHANISM DISASSEMBLY



< Figure C >

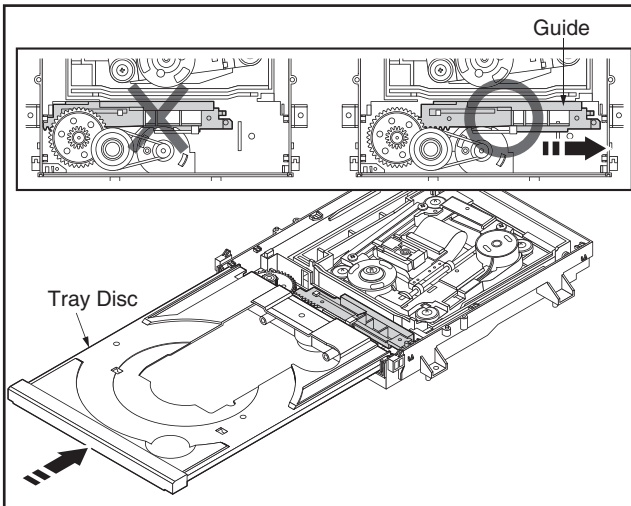
3. Tray Disc

1) Insert and push a flat-head screwdriver in the Emergency eject hole (H1) at the right side, so that the Tray Disc is ejected about 15 ~ 20 mm.
2) Pull the Tray Disc until it is locked.



< Figure D >

3) Grasp the both sides of the Tray Disc and lift it up as **Figure D**, and then pull the Tray Disc until it is separated from the MD Sub Assembly completely.

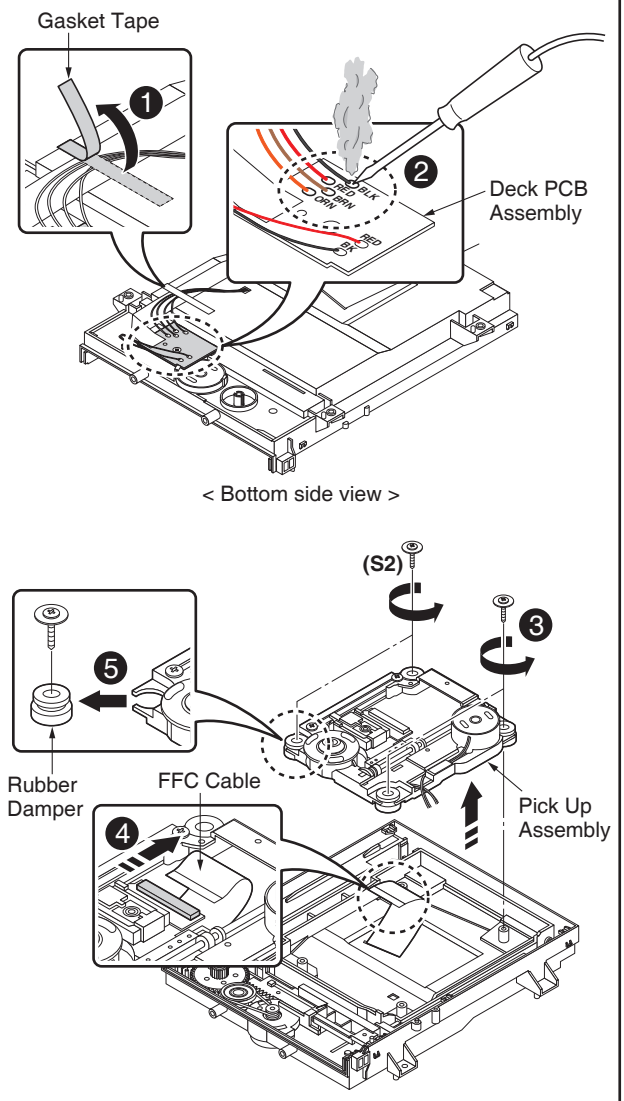


< Figure E >

Note

• When reassembling place the Guide as **Figure E**.

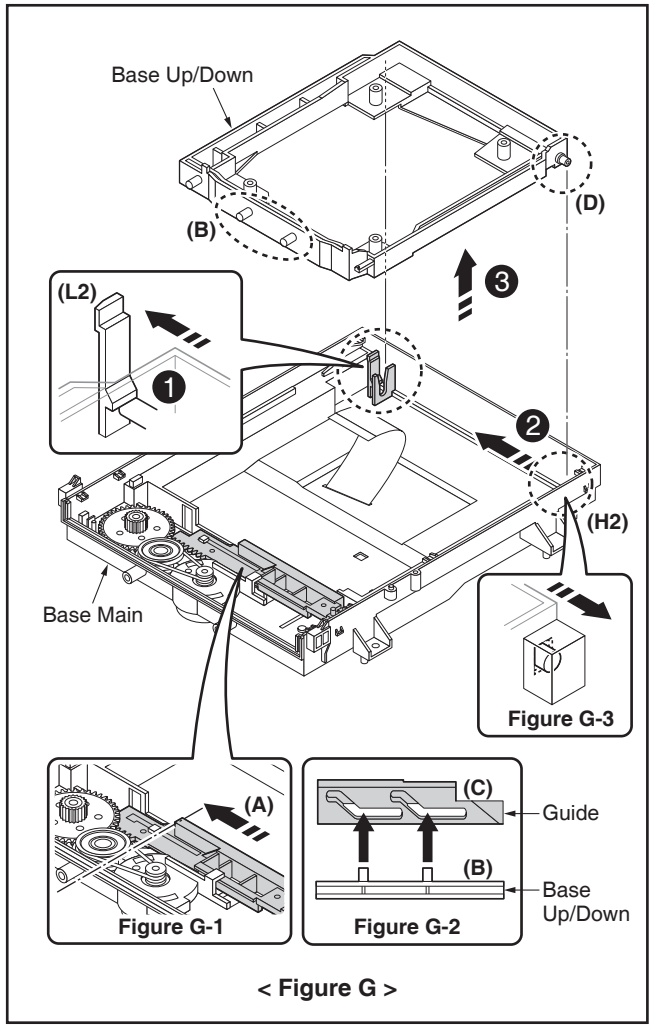
DECK MECHANISM DISASSEMBLY



< Figure F >

4. Pick Up Assembly

1) Detach the Gasket Tape.
2) Disconnect the wires (BLK, RED, BRN, ORN) from the Deck PCB Assembly by desoldering.
3) Remove the 4 screws (S2).
4) Disconnect the FFC Cable from the Pick Up Assembly.
5) Remove the 4 Rubber Dampers.



< Figure G >

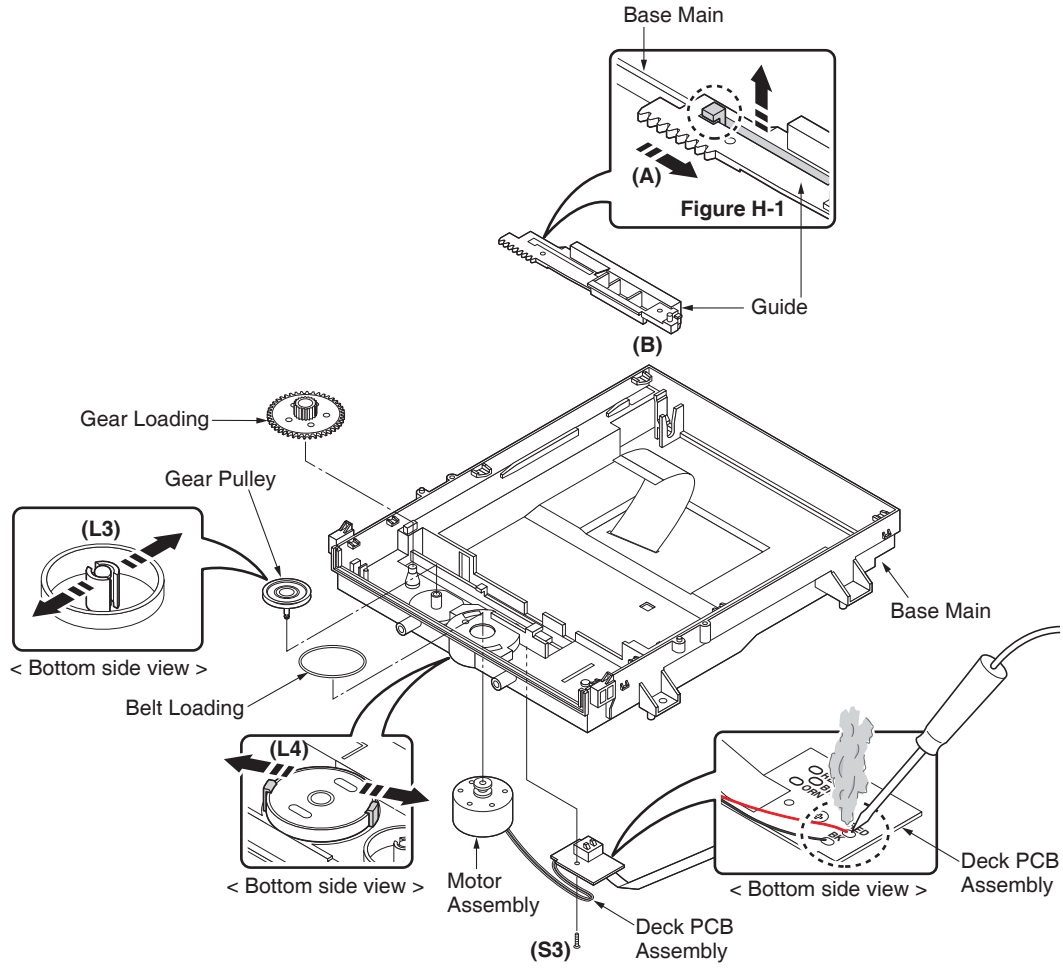
5. Base Up/Down

Unlock the Locking Tab (L2) in direction of arrow and then lift up the Base Up/Down to separate it from the Base Main.

Note

- When reassembling move the Guide in direction of arrow (A) until it is positioned as **Figure G-1**.
- When reassembling insert the (B) portion of the Base Up/Down in the (C) portion of the Guide as **Figure G-2**.
- When reassembling insert the (D) portion of the Base Up/Down in the Hole (H2) of the Base Main as **Figure G-3**.

DECK MECHANISM DISASSEMBLY



< Figure H >

6. Belt Loading

Remove the Belt Loading.

7. Gear Pulley

Unlock the Locking Tab (L3) in direction of arrow and then separate the Gear Pulley from the Base Main.

8. Gear Loading

Remove the Gear Loading.

9. Guide

1) Move the Guide in direction of arrow (A) as **Figure H-1**.
2) Separate the Guide from the Base Main.

10. Deck PCB Assembly

1) Disconnect the wires (RED, BK) form the Deck PCB Assembly by desoldering.
2) Remove the 1 screw (S3).
3) Separate the Deck PCB Assembly from the Base Main.

11. Motor Assembly

Unlock the Locking Tab (L4) in direction of arrow and then separate the Motor Assembly from the Base Main.

12. FFC Cable

Remove the FFC Cable.

DECK MECHANISM EXPLODED VIEW (DM19D)