Lot.No.

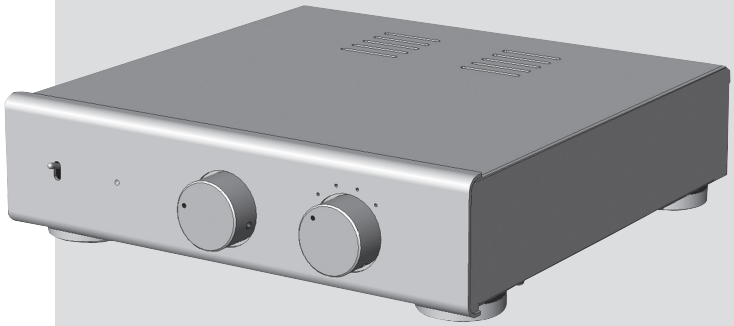
8500-02

Tube Preamp Kit TU-8500

Assembly Instruction Manual

This is a preamp kit with a phono equalizer.
The features of this preamp include:

- Uncompromising measures taken for reduction of power supply hum and noise. A low leakage flux R-core transformer is used for the main power supply with a FET ripple filter and DC heater supply.
- 12AU7(ECC82) tubes mounted horizontally for slim profile. Switchable gain of 0dB and 10dB.
- Low noise OP amp has been selected for the equalizer amp stage. (IC socket offers easy exchange with other commercially available OP amp ICs).
- CR equalizer circuitry is used for its renowned sound quality. Supports both MM and MC phono cartridges.
- The power transformer supports 4 different power/voltage environments: 100V, 115V, 200V, and 230V. (Voltage is selected at assembly by matching the correct connector for voltage requirements).



•Contents

⚠ CAUTION DURING ASSEMBLY

For your own safety, please read this "Assembly Instruction Manual" carefully before you begin assembling the preamplifier. Please follow the instructions step by step for correct assembly and operation. Keep this manual close to hand.

◆Do not work near any source of water or allow any components to get wet which may cause machine failure, fire and electric shock. Also, do not put containers with water on the work table such as vases, cups, cosmetics and drugs. Spilling water on components may cause fire and electrical shock.

◆Be careful when handling tools, such as a soldering iron, diagonal cutter, pen knife, and other sharp tools in particular to prevent breakage and injury. Use a pair of gloves and protective glasses according to need.

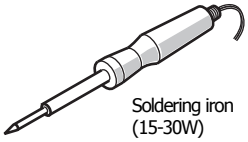
◆Some essential pieces in this kit include small and sharp objects that are made of glass or metal. Be extremely careful when handling.

◆Please discard packing waste and any waste from assembling the kit according to local standards for safety and protection of the environment.

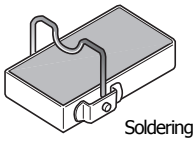
◆Do not work, keep or place the product near young children due to safety concerns. Children must not play with tools, plastic bags, and electronic parts as they may cause harm. In case a child swallows a part, immediately consut with a doctor.

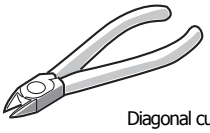
◆The specifications, forms and contents of this product are subject to change for improvement without prior notice.

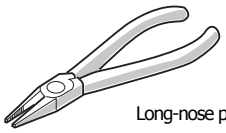
Necessary tools

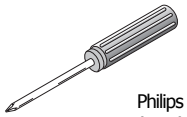

Soldering iron (15-30W)


Solder (for electronic parts) (Diameter 0.8-1.2mm)


Soldering iron stand


Diagonal cutter

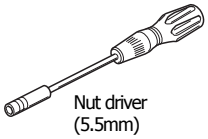

Long-nose pliers


Philips screwdriver (No.2)


Hexagonal wrench (1.5mm)


Scissors

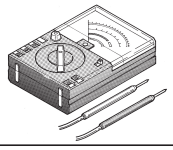
Helpful tools


Nut driver (5.5mm)


Tweezers (For labels)


File or sand paper


Scotch tape


Multimeter
Optional voltage check and connection check is suggested.
*Both analog and digital are OK.

 EK JAPAN CO.,LTD. Tofuro-minami 2-19-30, Dazaifu-shi, Fukuoka, 818-0105, Japan Phone: +81-92-923-8235

Website: http://www.elekit.co.jp
E-mail: info@elekit.co.jp

1. Part list

* Please check off the box in front of each item to ensure they have been included with the kit.
* There may be more screws and nuts than indicated. Keep them as spare parts.

□Top chassis 1pc

* Top and bottom chassis and the front panel are temporarily fixed with screws.

□Power transformer 1pc

□PCB 1pc
Some units may be already separated from the PCB at the perforated line.

□Function label (Silver) 1 sheet

□Warning label (yellow) 1pc

□Insulator foot 4pcs

□Vacuum tube 12AU7(ECC82) 2pcs

* The getter, the metallic silver coating inside the tube, indicates it is a sealed vacuum tube. If this turns white, it means that the vacuum of the tube is broken and the tube can no longer be used.
* All vacuum tubes have been examined to ensure quality. Some may have a minor scratch, stain, or rust-like object that does not affect the function of the tube. Also,the shape, heater brightness, or the printing direction vary in each tube.

□Front panel 1pc

□Bottom chassis 1pc

□Connector cable 1pc

□AC power cord 1pc

A screw for knob is included in the same plastic bag as the knob. Make sure to take it out from the plastic bag.

Screw for knob

□Knob 2pcs
(A screw for knob included)

□Tube socket (9-pin) 2pcs

□AC inlet 1pc

Connector
□2-pin 2pcs
□4-pin 1pc
□7-pin 1pc

□Midget fuse (0.5A 250V) 1pc
□Fuse holder 2pcs

Metal shaft
□Long (φ6x150mm) 2pcs
□Short (φ3x25mm) 2pcs

□Vinyl tube 1pc

□Ceramic coupling 2pcs

□Flange bushing 2pcs

□Pin jack (RCA jack) 5pcs

□4-pole mini jack 1pc

□Relay 1pc

□Toggle switch (with a nut and a washer) 1pc

The pins may be bent, Adjust them to match PCB holes before mounting

□Push switch 2pcs

□Rotary switch 1pc
(With a nut and a washer)

□Volume (50kΩA, Dual) 1pc
(With a nut and a washer)

□Hex screw spacer 5pcs
(Hex, M3x17 female-female)

Binding screw
□Small(M3x8) 23pcs
□Large(M4x8) 4pcs

□Binding tapping screw (M3x10) 5pcs

□Finger screw (M3x8) 1pc

□Nut (M3) 1pc

□Claw washer (M3) 7pcs

□PCB terminal 3pcs

□Masking felt (Black) 1pc

□LED mask (Opaque white) 1pc

Resistor Color indication

Metal-film resistor(1/4W)
□ 100Ω(BRN-BLK-BLK-BLK-GLD) 6pcs
□ 390Ω(ORN-WHT-BLK-BLK-BRN) 4pcs
□ 3.3kΩ(ORN-ORN-BLK-BRN-BRN) 4pcs
□ 10kΩ(BRN-BLK-BLK-RED-BRN) 5pcs
□ 33kΩ(ORN-ORN-BLK-RED-BRN) 4pcs
□100kΩ(BRN-BLK-BLK-ORN-BRN)19pcs
□470kΩ(YEL-VIO-BLK-ORN-BRN)18pcs

Resistor(1/4W)
□ 2.2Ω(RED-RED-GLD-GLD) 3pcs
□ 3.3MΩ(ORN-ORN-GRN-GLD) 2pcs

Cement resistor(5W)
□15Ω (printed 15Ω or 150 or15R) 1pc

□PTC (Mustard) 1pc

Film capacitor
□ 0.022μF(printed 223) 3pcs
□ 0.033μF(printed 333) 2pcs
□ 0.1μF(printed 104) 2pcs
□ 0.47μF(printed 474) 4pcs

□Spark killer (RE1201) 1pc

Electrolytic capacitor
□ 10μF(200V) 4pcs
□ 100μF(160V) 4pcs
□ 220μF(25V) 5pcs
□ 2200μF(25V) 2pcs
□ 120μF (20V,Low-ESR) 8pcs

□Zener diode (made of glass) 3pcs

□Bridge diode (printed ～,+,and−) 6pcs

□LED 1pc

□FET 02N60Z 1pc

IC
□LM2940CT-12 1pc
□LM2990T-12 1pc
□2068DD 2pcs
□40106B (or 4584B) 1pc
□4040B 1pc

□IC socket (8-pin) 2pcs

2. PCB assembly

* Follow the instructions step by step. Check off the box after each component has been soldered.

Before soldering

①Before soldering, follow the cut lines (grooved lines) on the PCB to break it into 8 pieces.
Use an edge of a desk to break the PCB easily.
②Use a sandpaper or file to make the broken surface smooth to avoid injury.

* There will be 5pcs of PCBs, UNIT1-5.

IMPORTANT!

Here are the marks indicating the sides to mount parts and the mounting orientations.

Caution! Check the SIDE	Mount the part with this mark on SIDE-B. If this is not shown, mount the part on SIDE-A.
Caution! Check the ORIENTATION	There is a polarity, such as + and -, and has a specific orientation for mounting. If mounted incorrectly, you may not achieve a proper operation or it can be hazardous for some parts.
[Not orientation specific]	There is no polarity, such as + and -, and no specific orientation when mounting.
No indication	There is a polarity, such as + and -, but as the shapes of the parts and the PCB do not allow the parts to be mounted incorrectly, there is no need to mention the polarity.

Tips

In this kit, the components on the right and left channels are assigned even and odd numbers, respectively. For example, R1 and C1 are Left channel, and R2 and C2 are Right channel.
Most of the components on UNIT-1 PCB are located symmetrically on the board for ease of locating and mounting the components upon assembly.

UNIT-1 assembly

1 Resistor (1/4W) [Not orientation specific]

Indication by color

Resistor (1/4W)

2.2Ω (RED-RED-GLD-GLD)
□R59 □R60 □R66

3.3MΩ(ORN-ORN-GRN-GLD)
□R55 □R62

Metal-film resistor(1/4W)

100Ω (BRN-BLK-BLK-BLK-BRN)
□R5 □R6 □R25
□R26 □R53 □R54

390Ω (ORN-WHT-BLK-BLK-BRN)
□R7 □R8 □R21 □R22

10kΩ (BRN-BLK-BLK-RED-BRN)
□R13 □R14 □R23
□R24 □R58

470kΩ (YEL-VIO-BLK-ORN-BRN)
□R27 □R28 □R29
□R30 □R31 □R32
□R33 □R34 □R35
□R36 □R41 □R42
□R51 □R52 □R56
□R57 □R63 □R64

3.3kΩ (ORN-ORN-BLK-BRN-BRN)
□R19 □R20

33kΩ (ORN-ORN-BLK-RED-BRN)
□R15 □R16

100kΩ (BRN-BLK-BLK-ORN-BRN)
□R1 □R2 □R3
□R4 □R9 □R10
□R11 □R12 □R17
□R18 □R37 □R38
□R43 □R44 □R45
□R46 □R65

2pcs each of 3.3kΩ, 33kΩ, and 100kΩ are to be used in a later steps.

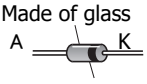
Mark on PCB

Correct mounting

2 Zener diode

Caution! Check the ORIENTATION

Made of glass



The side with a black line is K.

□ZD1 □ZD2 □ZD3

Mark on PCB

Correct mounting

3 Bridge diode

Caution! Check the ORIENTATION

Marks of ~,+,−

Check the indication and make sure the mounting orientation.

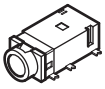
□D1 □D4
□D2 □D5
□D3 □D6

Mark on PCB

Correct mounting

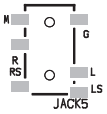
4 4-pole mini jack

Caution! Check the ORIENTATION

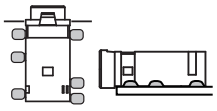


□JACK5

Mark on PCB

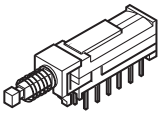


Correct mounting



Set the mini jack so that the jack inlet faces outward, mount on SIDE-A, and solder on SIDE-A.
Make sure the jack is fully seated against the PCB before soldering.

5 Push switch

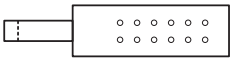


Caution! Check the ORIENTATION

Caution! Check the SIDE

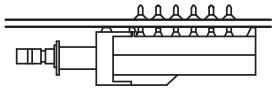
□SW1
□SW3

Mark on PCB



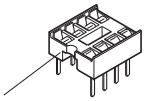
Correct mounting

Insert from SIDE-B, solder from SIDE-A.

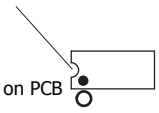


6 IC socket

Caution! Check the ORIENTATION



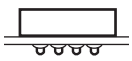
Match the shapes.



Mark on PCB

□IC1
□IC2

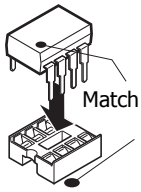
Correct mounting



7 IC 2068DD

Caution! Check the ORIENTATION

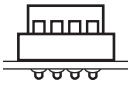
Insert the IC to the socket mounted in Step 6 .



Match the marks.

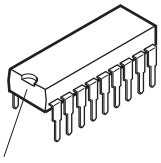
□IC1 2068DD
□IC2 2068DD

Correct mounting



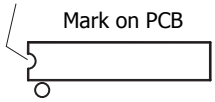
8 IC 40106B, 4040B

Caution! Check the ORIENTATION



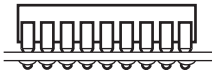
Match the shapes.

Mark on PCB



□IC3 40106B
(or 4584B)
□IC4 4040B

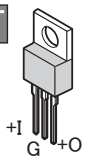
Correct mounting



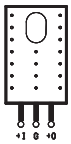
9 IC LM2940CT-12

Caution! Check the DIRECTION

* Do not mix up with LM2990T-12 which has the similar appearance.

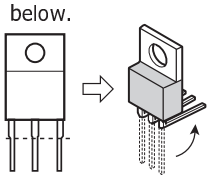


Mark on PCB



□IC5 LM2940CT-12

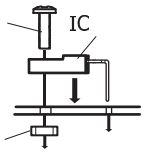
①Bend the lead to the right angle as shown below.



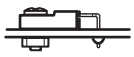
②Fix it to the PCB with a screw.

Binding screw small (M3x8)

Nut (M3)



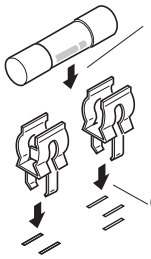
③Solder the leads.



* Make sure to fix with a screw before soldering.

10 Midget fuse, fuse holder

Caution! Check the DIRECTION (Fuse holder only)

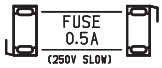


①Set the fuse to the fuse holder. (No soldering)

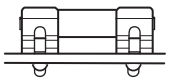
②Set the holders to the PCB, and solder. (No direction specific)

□FUSE

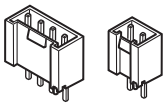
Mark on PCB



How to set



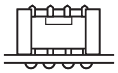
11 Connector



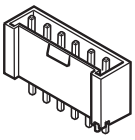
□CN1 4-pin
□CN6 2-pin

Mark on PCB

How to set



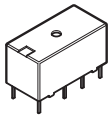
Make sure to select the correct voltage for your region when installing this connector to the PCB. Verify before soldering.
In Japan, set to CN2 (100V).



□CN2 7-pin

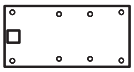
In other countries...
110-120V(USA, Canada) ---------- □CN3
200V(Air conditioner in Japan, etc) ---------- □CN4
220-240V(Many other countries i.e., UK, Germany, Australia, etc) ---------- □CN5

12 Relay

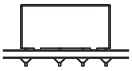


□RY

Mark on PCB



How to set



13 PTC

[Not direction specific]

□PTC(Mustard)

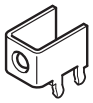
Mark on PCB

How to set

14 PCB terminal

Caution! Check the SIDE

Caution! Check the DIRECTION



□TM1 (Mount on SIDE-A)
□TM2 (Mount on SIDE-B)

Mark on PCB

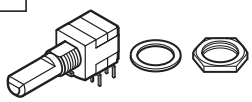
How to set

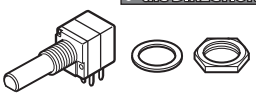
TM1

TM2

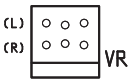
15 Volume, Rotary switch

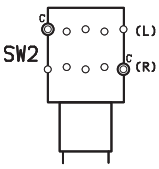
Caution! Check the DIRECTION





Mark on PCB





□VR Volume
□SW2 Rotary switch

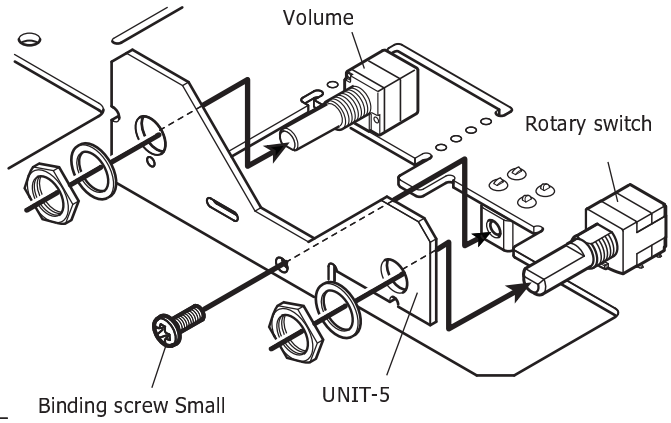
How to install

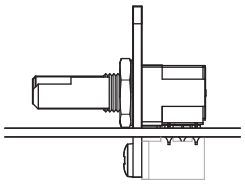
①Put the shaft through the big opening on UNIT-5.

②Fix UNIT-5 with a binding screw small.

③Fix the volume and the rotary switch with washers and nuts.

④Solder the volume and the rotary switch.

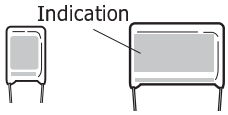




16 Film capacitor

[Not direction specific]

Indication



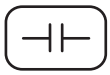
0.022μF(Printed as 223)
□C19 □C20 □C21

0.033μF(Printed as 333)
□C3 □C4

0.1μF(Printed as 104)
□C5 □C6

0.47μF(Printed as 474)
□C11 □C12 □C15 □C16

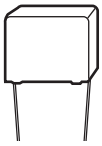
Mark on PCB



How to set

17 Spark killer

[Not direction specific]



□C35 RE1201 (Black)

Mark on PCB

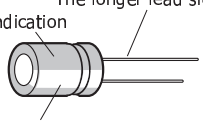
How to set

18 Electrolytic capacitor

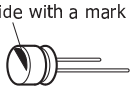
Caution! Check the DIRECTION

The longer lead side is +.

Indication



The side with a mark is −.



220μF(25V)
□C22 □C23 □C24
□C25 □C26

2200μF(25V)
□C27 □C28

100μF(160V)
□C29 □C30
□C31 □C32

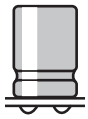
120μF(20V Low ESR)
□C1 □C2 □C7
□C8 □C9 □C10

10μF(200V)
□C33 □C34

120μF and 10μF will be used in later steps.

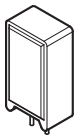
Mark on PCB

How to set



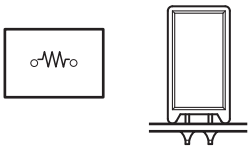
UNIT-1 assembly

19 Cement resistor (5W) [Not direction specific]

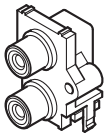


□R61 15Ω
(printed either 15Ω or 150 or 15R)

Mark on PCB | How to set

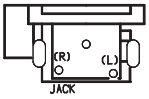


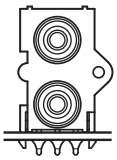
20 Pin jack (RCA jack)



□JACK1
□JACK2
□JACK3
□JACK4
□JACK6

Mark on PCB | How to set



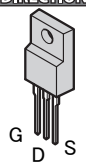


Make sure the jack is fully seated and level on the PCB before soldering.

Trim the leads of JACK1 after soldering.

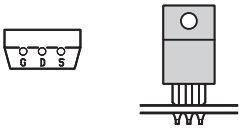
21 FET 02N60Z

Caution! Check the DIRECTION



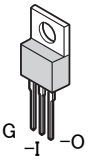
□FET 02N60Z

Mark on PCB | How to set



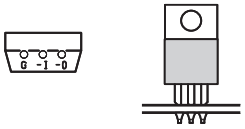
22 IC LM2990T-12

Caution! Check the DIRECTION



□IC6 LM2990T-12

Mark on PCB | How to set



UNIT-2 assembly

1 Metal-film resistor [Not direction specific]

Color indication

3.3kΩ (ORN-ORN-BLK-BRN-BRN)
□R39 □R40

33 kΩ (ORN-ORN-BLK-RED-BRN)
□R49 □R50

100kΩ (BRN-BLK-BLK-ORN-BRN)
□R47 □R48

Mark on PCB

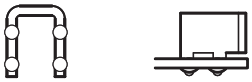
How to set

2 PCB terminal

Caution! Check the DIRECTION

□TM3

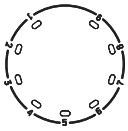
Mark on PCB | How to set



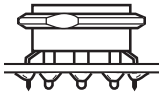
3 Tube socket

□V1 □V2

Mark on PCB



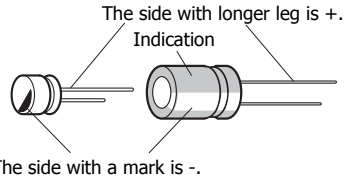
How to set



Make sure the socket is fully seated and level on the PCB before soldering.

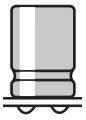
4 Electrolytic capacitor

Caution! Check the DIRECTION



120μF(20V) □C13 □C14
10μF(200V) □C17 □C18

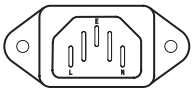
Mark on PCB | How to set



5 AC inlet installation

Caution! Check the SIDE

Mark on PCB



How to install

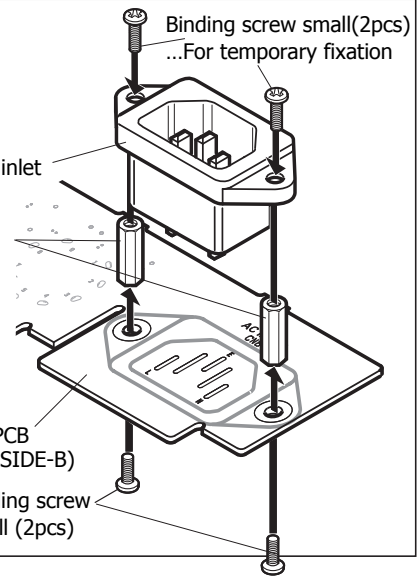
①Fix 2pcs of hex spacer to the PCB SIDE-B with 2pcs of binding screw small.

②Set AC inlet and temporarily fix it with 2pcs of binding screw small.

③Solder the terminals of AC inlet at 3 locations, on PCB SIDE-A.

④Remove the screws used temporary fixation in Step ②

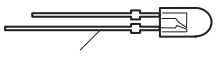
□CN8 AC inlet



UNIT-4 assembly

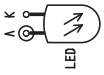
1 LED

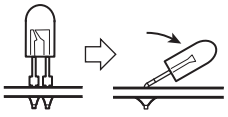
Caution! Check the DIRECTION



□LED The side with longer leg is A.

Mark on PCB | How to set





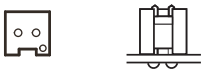
Set the LED at the right angle first, and solder. Then bend the leads as shown on the right.

Tilt for 30-45 degree, not 90 degree.

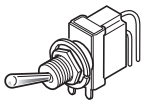
2 Connector 2-pin

□CN7 2-pin

Mark on PCB | How to set



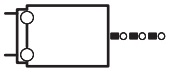
3 Toggle switch



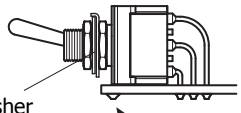
* The pins may be bent. Adjust them with long-nose pliers to match PCB holes before mounting.

□SW4

Mark on PCB



How to set

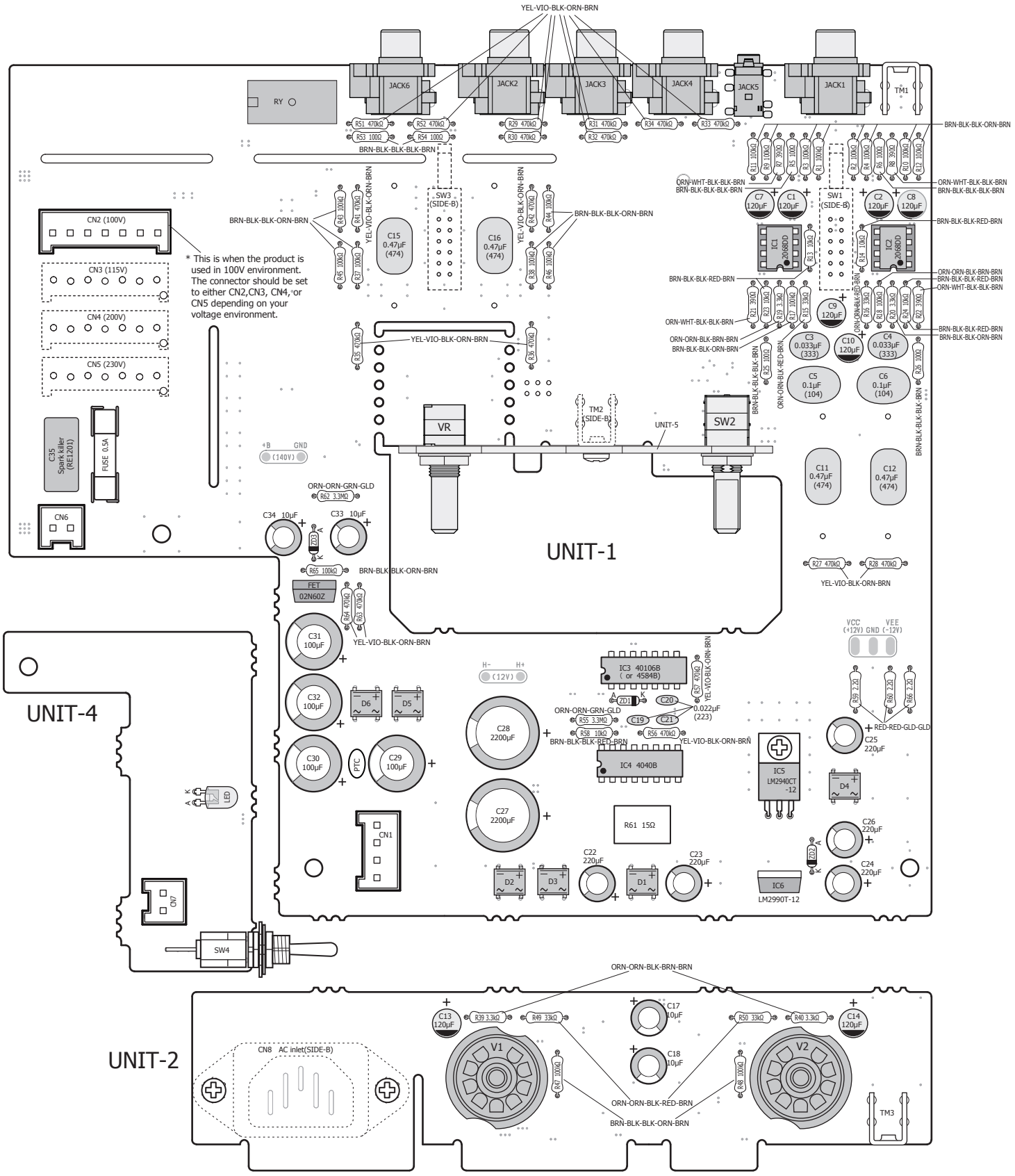


Make sure the switch is set closely and horizontally to the PCB upon soldering.

The nut and washer will be used in a later step.

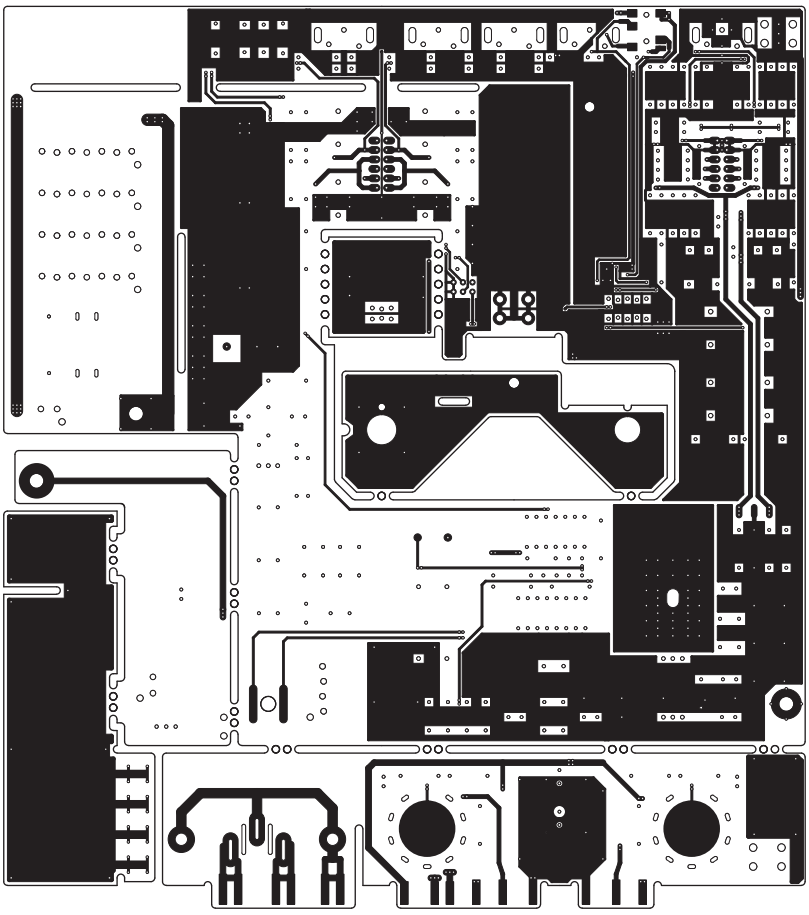
Solder the fixing pin as well.

●Complete PCB * Compare your PCB with the PCB image below. Check for any unsoldered leads or pins, or any components with insufficient solder, bridged solder joints between leads/pins or components, and components that may not be fully seated on the PCB. Check the setting directions of the parts, especially electrolytic capacitors, diodes, IC, FET, etc.

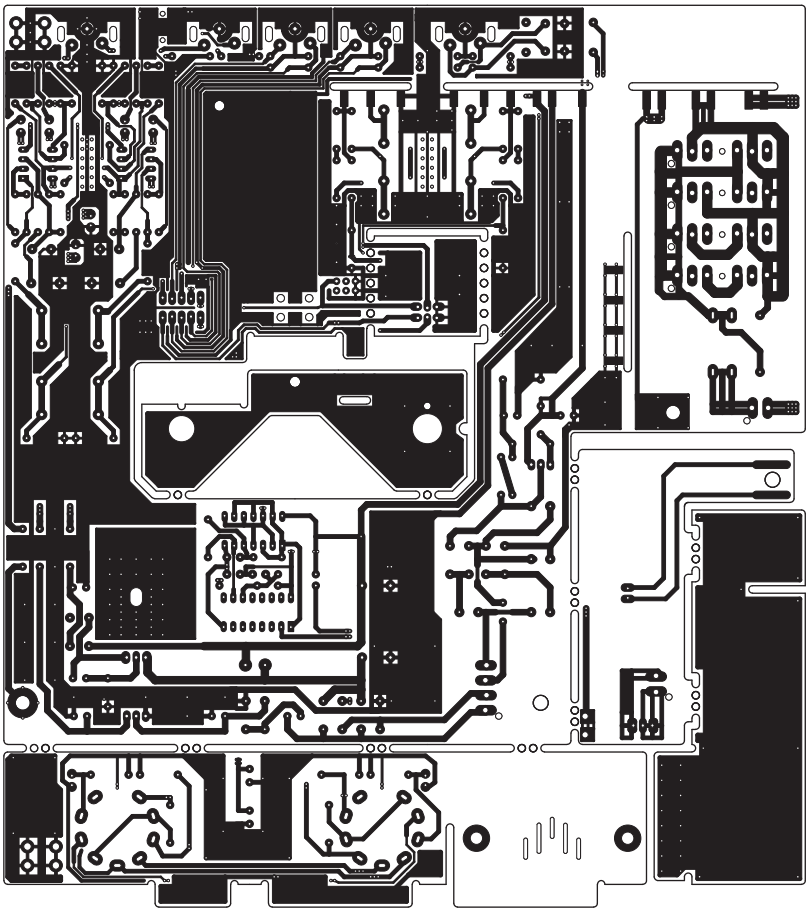


●PCB pattern　　* Please refer to the diagram below and check the PCB condition.

SIDE-A



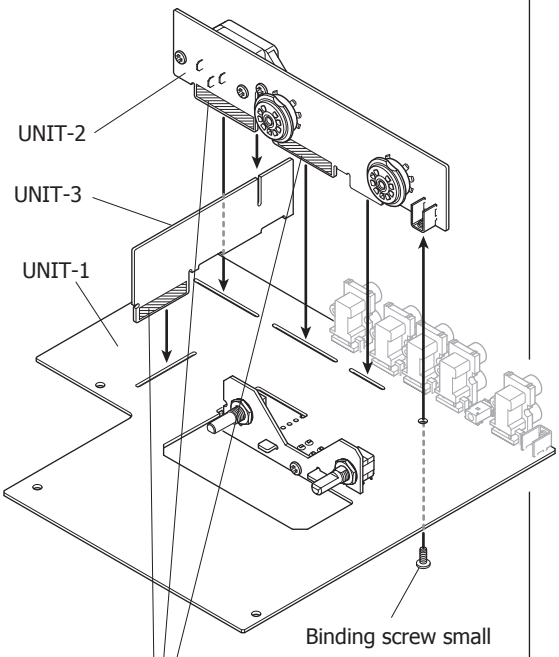
SIDE-B



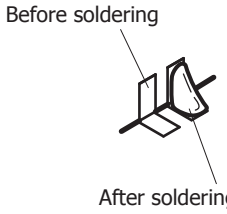
● UNIT-2 and 3 installation to UNIT-1

After checking the parts setting and soldering condition on Page 6, install UNIT-2 and UNIT-3 to UNIT-1.

①Install UNIT-2 and UNIT-3 to UNIT-1 as shown below.



②Solder these terminals A-S, 19 locations, of these 3 units.

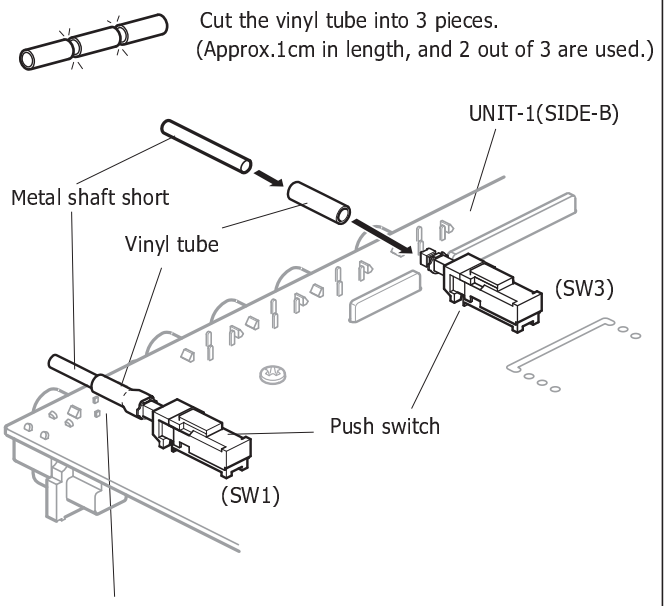


⚠ Melt an adequate amount of solder for a strong joint. If the solder amount is not enough, the terminals may not be connected properly.

Now all the parts are soldered.
Let's go on to the chassis assembly.

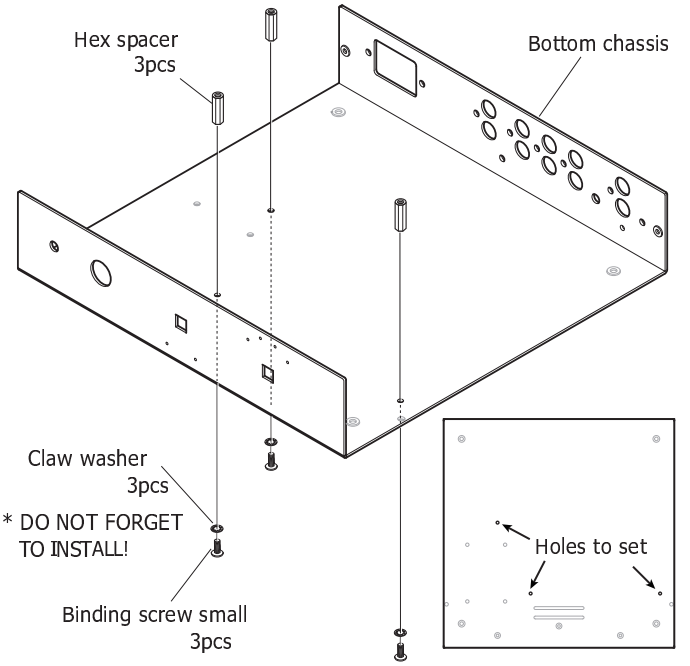
3. Body assembly

1 Attach the metal shaft short to the push switch.



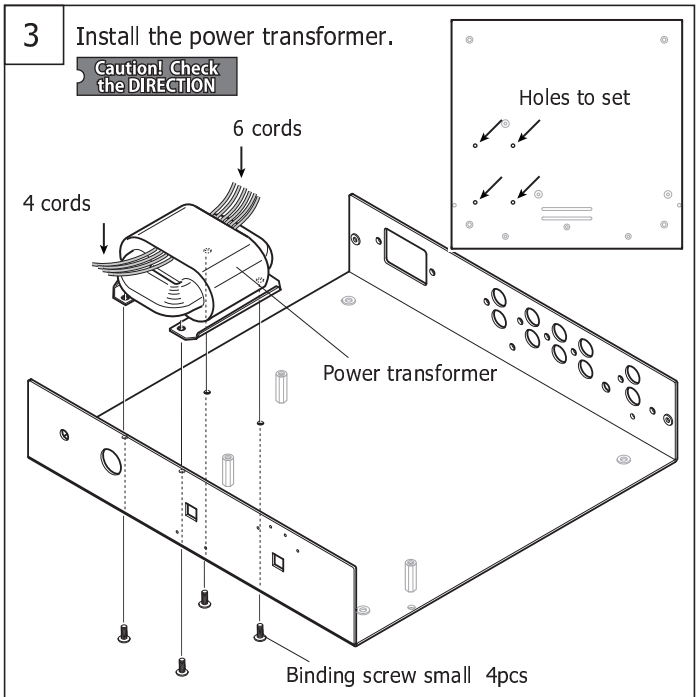
* Trim the leads of JACK1 before installing the metal shaft.

2 Set the hex spacers to the bottom chassis.

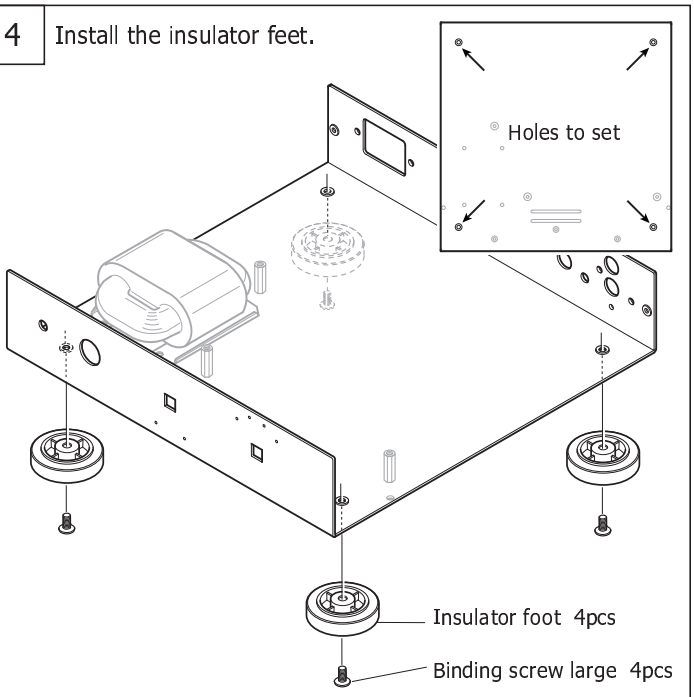


3 Install the power transformer.

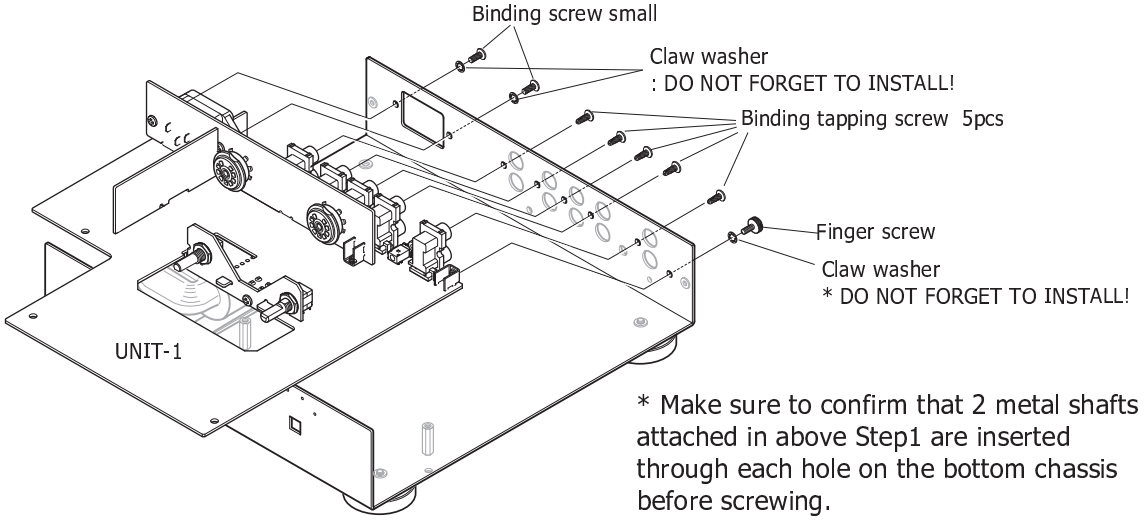
Caution! Check the DIRECTION



4 Install the insulator feet.



5 Install UNIT-1.

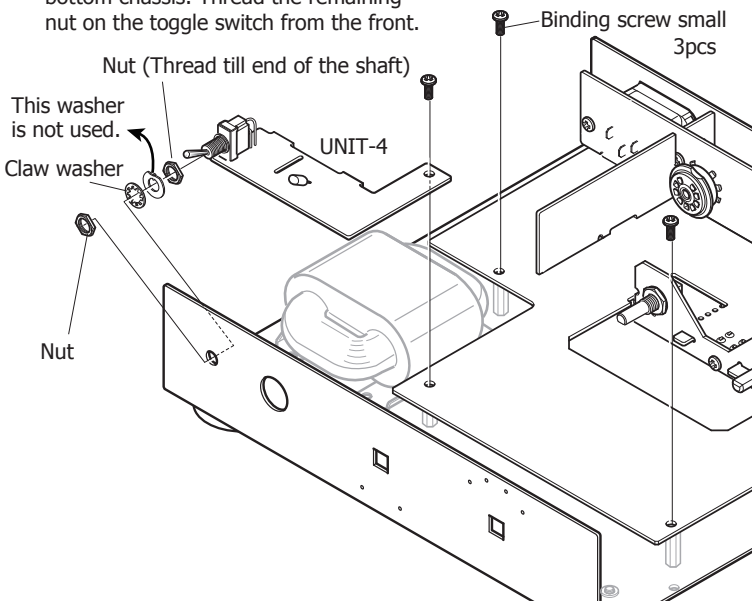


* Make sure to confirm that 2 metal shafts attached in above Step1 are inserted through each hole on the bottom chassis before screwing.

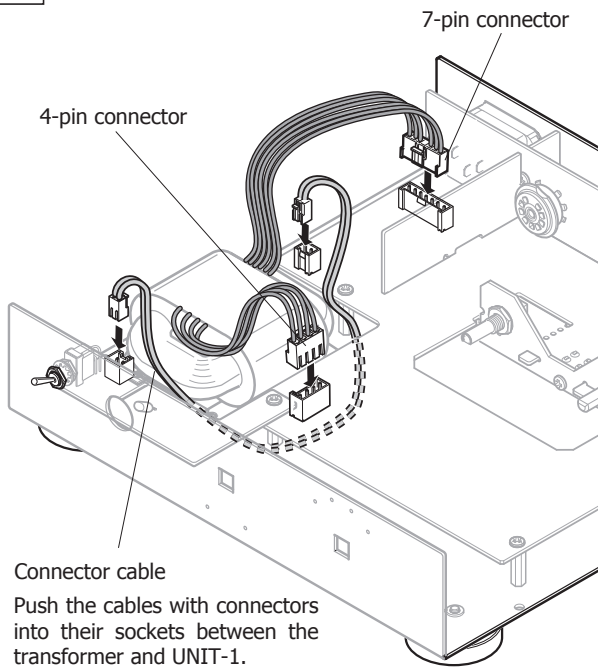
6 Install UNIT-4.

❶ Remove the nut and washer from the toggle switch. Install Unit-4 to the bottom chassis. Thread the remaining nut on the toggle switch from the front.

❷ Fix UNIT-1 and UNIT-4 with binding screw small.

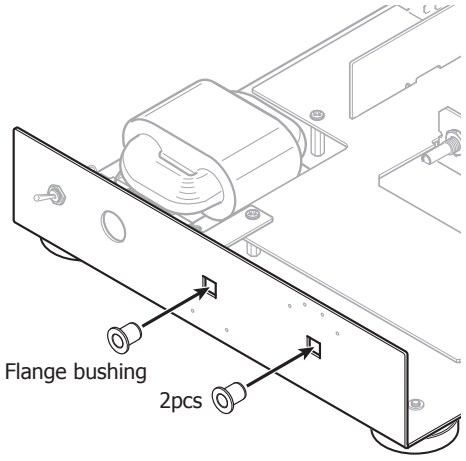


7 Install the cables with connectors as shown.



Push the cables with connectors into their sockets between the transformer and UNIT-1.

8 Install flange bushings.

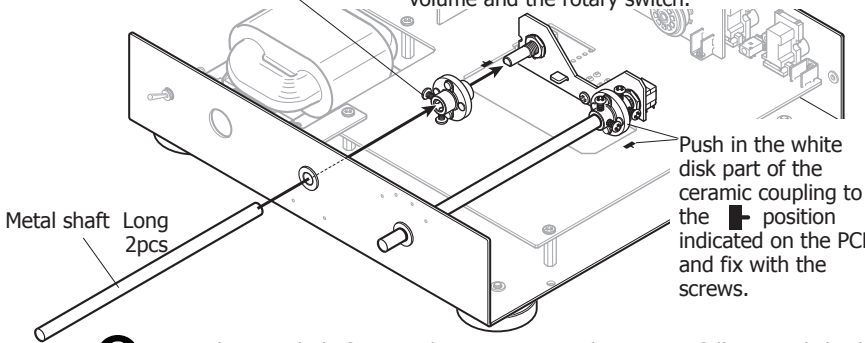


Push hard into the square holes.

9 Install metal shafts.

Ceramic coupling 2pcs

❶ Set ceramic couplings to the shafts of the volume and the rotary switch.



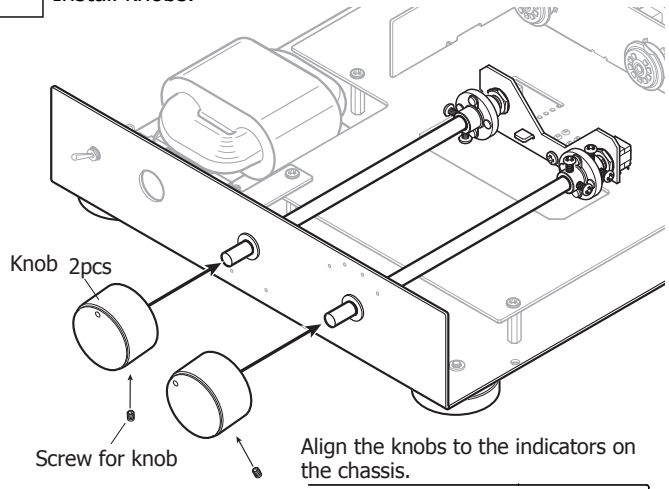
Push in the white disk part of the ceramic coupling to the ▮- position indicated on the PCB and fix with the screws.

❷ Insert the metal shafts into the ceramic coupling. Once fully seated, back the shaft out approx. 1mm from the coupling and tighten the set screws.

TIPS!

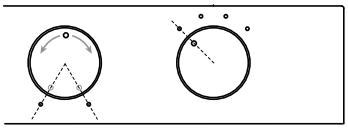
There must be a clearance between the shaft and the flange bushings in order for the shaft to rotate smoothly. However, due to this allowance the shaft may not sit firmly in the bushing. Adding a small amount of grease between the bushing and shaft is recommended. Select a high viscosity grease (Catagory 3 or higher) for best results. Mixing baby powder at a 1:1 ratio with a lower viscosity grease (below Catagory 3) can be substituted if needed.

10 Install knobs.



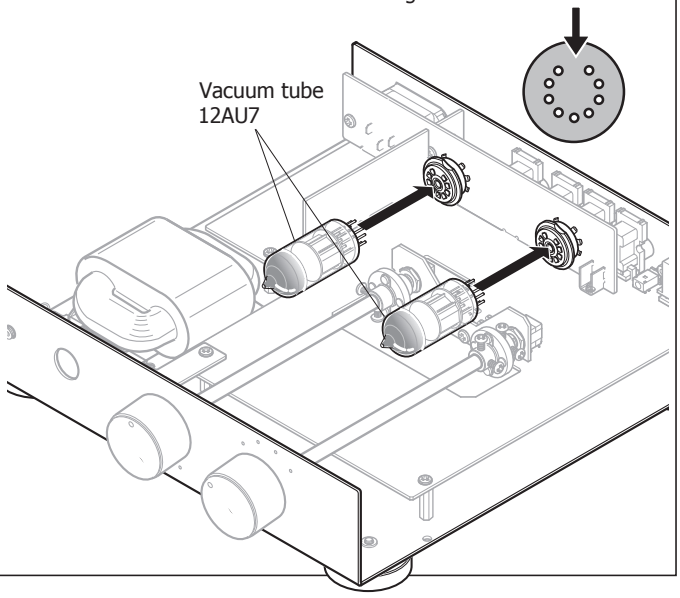
Leaving 1-2mm clearance between the knob and chassis, fix the knobs with attached screws to each shaft.

Align the knobs to the indicators on the chassis.

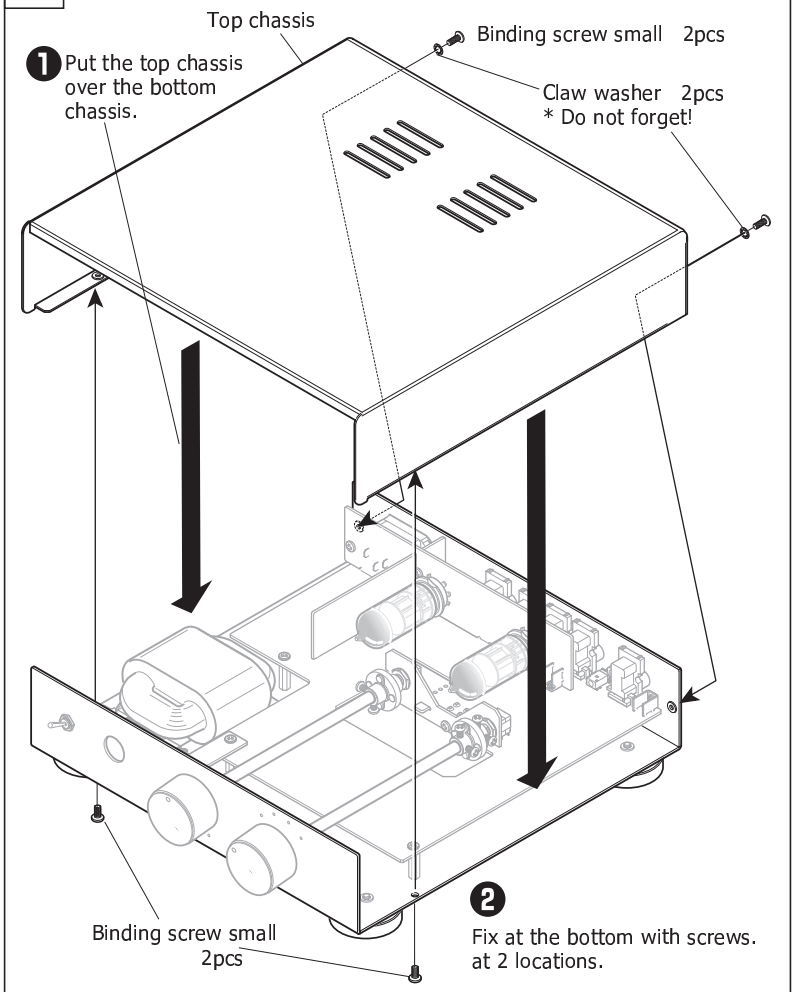


11 Install vacuum tubes to the socket.

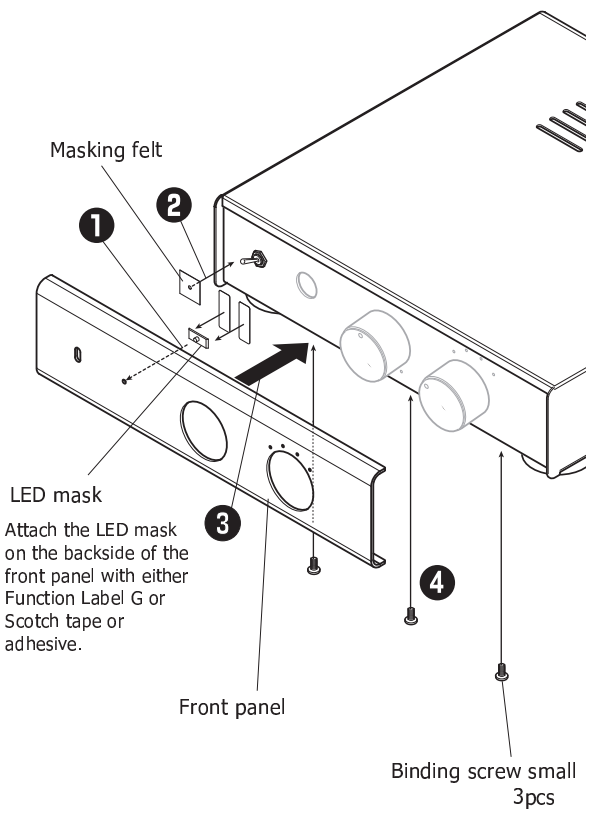
Check if the pins are correctly aligned to the socket.



12 Install the top chassis.



13 Install the front panel.



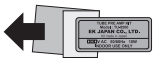
14 Put the labels.

【Tips】

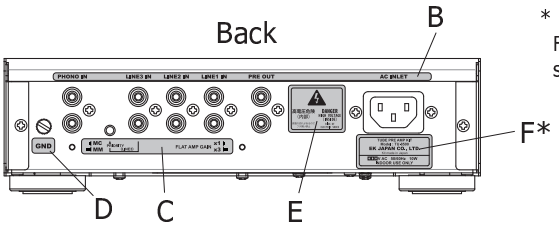
① Cut each label with a pair of scissors.

② Peel a small portion of the label backing off and cut with scissors so that the small portion of the label adhesive back is exposed.

③ Place the label in the desired location and attach it wth the exposed adhesive.

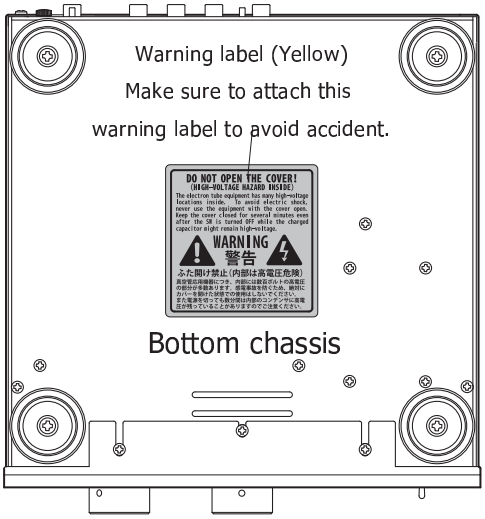


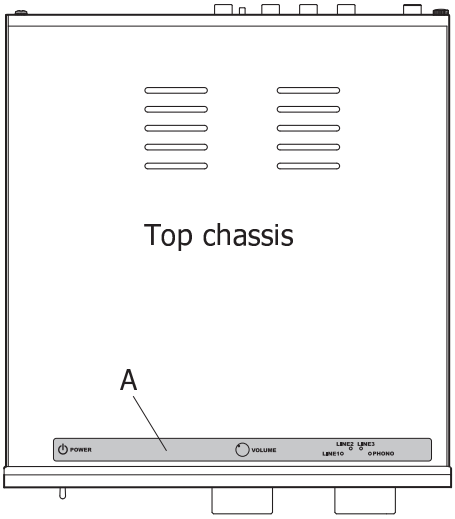
④ Once the label is in the approproate location, slowly remove the rest of the label backing to expose the rest of the adhesive.



* Select an appropriate label from F-1 to F-4 according to the voltage setting you selected in UNIT-7 assembly.

100V	-> F-1
110-120V	-> F-2
200V	-> F-3
220-240V	-> F-4





* There is an extra label for each. Please use them as spares.

Complete!

4. Safety precautions and safety check before and after powering up the preamplifier (Be sure to read for safety use)

Incorrect use or handling of the product may cause electric shock, bodily harm, and damage to the product and other connected components. Please read the cautions below to avoid accidents.

⚠ CAUTION

◆Before closing the chassis after assembly or repair, make sure to verify that all the parts are installed correctly, there are no mistakes in wiring and soldering before turning ON the power.

◆Electronic components in a vacuum tube amplifier/preamplifier exceed several hundred volts. To prevent electric shock, do not remove the top chassis when powered ON.

◆When operating the preamplifier with the cover open by necessity (as to test the device), do not touch the parts, terminals, and metal parts with bare hands. Make sure to wear a pair of gloves. Find a safe place away from others who may come into contact with the preamplifier while testing. Even when the power plug is pulled out, there is electricity remaining in the capacitors. Make sure to wait at least 10 minutes after the power plug has been disconnected before touching any components inside the preamplifier.

◆If you find anything unusual while using the preamplifier, immediately turn OFF the power and unplug the power plug from the outlet, and refer to "Troubleshooting" on page 12. If you cannot solve the problem, consult your local dealer or EK JAPAN.

◆Do not use the preamplifier under an electric environment other than the preset power supply voltages. Normal household current is Alternating Current (AC). Do not connect to a DC power supply.

◆When connecting and disconnecting the preamplifier with other devices, be sure to turn OFF the power and unplug the power cord plug from the power outlet. Read the instruction manuals of the connected devices carefully and follow their instructions.

◆When connecting or disconnecting the preamplifier to/from other devices, make sure to have the power of all the devices turned OFF. Failing to do so may cause damage to the preamplifier and connected devices.

◆Before turning ON, switching inputs, or plug/unplug the headphone terminal, turn the volume control to minimum in order to prevent sudden bursts of high volume that may cause auditory disorder or speaker and headphone damage.

◆Adjust the sound volume slowly to an appropriate level, especially with headphones, to prevent sudden burst of high volume that may cause ear injury and auditory disorder.

◆If water or any unwanted substance gets into the main body of the preamplifier, immediately turn OFF the power and unplug the AC power cord. Wait for at least 10 minutes, open the chassis and remove/wipe off the substance, and consult with your local dealer or EK JAPAN. Failing to do so may cause failure, fire, or electric shock.

◆Hold onto the AC plug or connectors when unplugging. Do not unplug by yanking the AC power cord, as it may cause potential injury, fire, or electric shock.

◆Do not put heavy items on or under the AC power cord. Do not place the preamplifier near any source of heat, such as a heater. Doing so may damage the AC power cord and cause fire or electric shock. Do not use damaged AC power cord.

◆Do not plug/unplug AC power cord with wet hands. Doing so may result in electric shock.

◆Handle the preamplifier gently, especially the vacuum tubes as they are made of glass.

◆Place the preamplifier on a stable surface to avoid a falling hazard. Place the preamplifier in a location where nothing could fall onto the preamplifier.

◆Keep out of direct sun, extreme hot and cold, humid or dusty areas as they may cause accidents and damage. Do not allow gas or corrosive substances to come into contact with the preamplifier. Failing to do so may cause damage or hazard.

◆Make sure the preamplifier is placed at least 3cm away from walls and surrounding objects as the preamplifier will radiate heat. Do not place the preamplifier on a thick carpet, or in an enclosed space such as a drawer, or a box that will obstruct ventilation. Do not cover the preamplifier with table cloths, towels, pillows or anything that may cause fire.

◆Clean the preamplifier regularly. If dust accumulates on the circuit board, it may cause fire or other hazards. It is recommended to clean the preamplifier before the start of humid or rainy seasons.

◆The preamplifier is designed for home use. Do not use it in environments that it would push the preamplifier beyond it's limitations.

◆Discard the preamplifier according to the rules and standards in your region. Failing to do so may cause damage to the environment and others.

◆When transporting the preamplifier, remove the vacuum tubes from inside the chassis to prevent damage to the tubes.

5. Operation check

* Check the prepamplifier in the following order.
Turn the preamplifier OFF immediately if there is anything not in order during the operation check.

* As for the connection, please refer to "Connection on Page13.

□ ① Connect the power only and turn ON the power. Confirm that the power indicator LED blinks for 20 seconds, or 32 times, and after making a clicking sound, indicating the relay has begun, the LED stops blinking and stays ON. If there is no problem for several minutes, turn OFF the power.

□ ② Connect the power amp to PRE OUT, a sound source to LINE1 IN, and for the input selector, select LINE1 IN, and select x3 for the FLAT AMP GAIN switch on the backside of the chassis. Turn ON the power, and when the LED stops blinking, turn up the volume and confirm that the sound comes out normally.

□ ③ Select other LINE INs and confirm that no sound is output when LINE INs other than LINE1 IN is selected.

□ ④ Turn OFF the power, connect a sound source to LINE2 IN and execute the above ② and ③. Also, do the same for LINE3 IN as well.

□ ⑤ If you have a portable sound source, connect it to LINE3 IN 3.5mm jack (PRIORITY INPUT). Confirm that the music from this portable sound source is being output.

□ ⑥Press the FLAT AMP GAIN switch to "x1" position. Confirm that the sound output is at a lower volume than the "x3" setting.

* When all the above check points are OK, the Flat/Line Amp section is OK. If not, do not proceed to Step ⑦.

□ ⑦Connect a record player to PHONO IN (and GND), and use the switch to select the appropriate cartridge type (either MM or MC).
Verify there is sound output from the record player.

6. Troubleshooting

Please refer to the below troubleshooting steps upon use or during operation check.
If you cannot solve the problem, please consult with your local dealer or EK JAPAN.

Symptom	Check point
①Will not turn ON when the power SW is turned ON (Both power indicator LED and the tube heaters will not turn ON.).	・Are both ends of the power cord plugged in securely? ・Is the power cord damaged? ・Are connectors 1-8 connected securely? Or are the parts, such as SW3 and FUSE properly soldered? ・Is the midget fuse blown?
②The preamp functions but the power indicator LED does not illuminate.	・Is the power indicator LED set in a correct orientation? ・Is the binding screws attaching UNIT-4 loose? ・Are the parts such as LED, R58, and IC4 soldered correctly?
③When the power is turned ON, the power indicator LED does not blink but immediately stay ON, or the it starts blinking and never stops.	・Are IC3, IC4, and the parts around them, as well as RY set or soldered securely?
④Only one channel of the Flat/Line Amp section (Line In 1, 2, or 3) is not working.	・Swap right and left tubes and see if the symptom follows the tubes. If so, it is attributed to tube itself. If not, the problem is in the circuitry. ・When there is a problem in the circuitry, and only a certain input is malfunctioning, check the soldering condition of the input jack or SW2. ・If the symptom appears in all the inputs, check if the parts are set or soldered correctly between SW2 to output jack (JACK6). *Please refer to the circuit diagram on Page15 to see the range for checking. The soldered parts between UNIT-1 to UNIT-2 are also in the range.
⑤Both channels of Flat/Line Amp section (Line In 1, 2, or 3) are not working.	・There is a high possibility that the problem is in the power section common for both right and left circuits. Check the voltage at the voltage check points on UNIT-1, between +B and GND(140V), and between +H and -H(12V). ・When each check point show right figure, check the soldering condition of UNIT-1 to UNIT-2. ・If it does not show 140V, check the setting and soldering condition of CN1, PTC, D5-6, C29-C34, R62-65, FET and ZD3. ・If it does not show 12V, check the setting and soldering condition of CN1, D2-4, C27-28 and R61.
⑥Only one channel of the "Phono In" amp section is not working.	・Are the parts set on the malfunctioning side of channel, and between JACK6 to equalizer amp part and SW2, set or soldered properly? *Please refer to the circuit diagram on Page15 to see the range for checking.
⑦Both channels of the "Phono In" amp section are not working.	・There is high possibility that the problem is in the power related parts common for both right and left circuits. Measure the voltage check points on UNIT-1, between VCC and GND(+12V), and between VEE and GND (-12V). ・When each check point shows right figures, do the same checkings as in the above ⑥. ・If it does now show ±12V, check the setting and soldering condition of D1-2, D4, IC5-6, ZD2, C23-27, and R59-60.
⑧A popping noise occurs when the push switches on the back of the preamp are pressed.	・This is normal. The push switches should not be pressed while the preamp is in operation. There is no countermeasure used for the popping noise. Please press the switches at low volume or when the power is OFF.
⑨Difference in the brightness of the heaters of the right and left tubes	・The heater of the tube is to heat up the cathode electrode, and the excess heat is seen as the glow of the heater. The brightness of the heater glowing will vary from tube to tube. It has nothing to do with tube quality.

7. Connection

* Cords and cables to connect devices are not included. Please prepare ones that match the devices you use.

⚠ Caution! Make sure to turn OFF the power of all the devices before connecting/disconnecting cords.

Stationary CD player, DA converter, Tuner, etc

Power amp and speakers

Stereo pin (RCA) plug cord

Record player
* For a player with built in equalizer, connect to LINE IN.

Ground wire
* Some players do not have one.

R L R L R L R L

BACK

PHONO IN | LINE3 IN | LINE2 IN | LINE1 IN | PRE OUT | AC INLET

GND | MC MM | PRIORITY (LINE3) | FLAT AMP GAIN x1 x3

Cartridge type selector
Pressed : MC
Not pressed : MM

Stereo mini plug (3-pole) (without resistors)

LINE3 IN is equipped with a pin(RCA) jack and a mini jack.
Mini jack has the priority.

Flat/Line amp part Gain SW
Pressed : Approx. x1
Not pressed: Approx. x3

Plug into outlet

AC cord

When the amp is used outside Japan, make sure to set the VH connector to appropriate position in Page7 according to your local voltage engironment, and use a plug converter that matches the outlet of your residence.

If the outlet is equipped with a terminal, connect the ground terminal to it.

Portable music player, etc

FRONT

Volume control

Input selector
LINE2 LINE3
LINE1 PHONO

Power SW
ON
OFF

Power indicator LED

After power ON, it blinks 32 times until it warms up.

8. Enjoy TU-8500 to the fullest

① Tube rolling

There are a number of vacuum tube manufacturers that make the same model (or equivalent) tube that can be found from various tube vendors. Although the model is the same tubes from different manufacturers will have variations in the way they sound. To experience different sounds by changing tubes is one of the real thrills of tube amplifiers.

The tubes used for this product are the 12AU7/ECC82 (medium gain dual triode). The ECC82 is the European equivalent- and tube models with additional letters at the end of model can be used (12AU7a, 12AU7wa).
Please note that other tubes such as the 12AX7/ECC83 (high gain dual triode) cannot be used in this product.

② Exchange OP-AMPs

The phono equalizer amp stage uses a general-purpose IC referred to as an OP-AMP. The OP-AMP fits into socket on the PCB that allows it to be swapped for other commercially available OP-AMPs that use the standard DIP8-dual pin configuration and use a ±12V power source.
A phono equalizer amp deals with micro signals that benefits using an OP-AMP with low noise specifications. The OP-AMP for this product is a low noise variant. Some users may want to experiment with swapping an OP-AMP that may generate sightly more noise but may offer a more enjoyable listening experience.

③ Exchange capacitors

In some instances switching components with higher grade components may improve the sound. Capacitors are one of those that affect the sound. Switching capacitors randomly may not improve the sound- and may even cause problems. Here are some guidelines for exchanging the capacitors for better sound quality.

Sufficient space has been provided on the PCB for substitution of larger or different sized coupling capacitors (C11, C12, C15, and C16). The capacitors provided with this kit are non-inductive polypropylene film that can support high frequencies. Changing with other capacitors may not improve the sound quality. If substituting capacitors, make sure the capacitance is approx. 0.47-2.2uF and are rated for at least 200v, and that they fit on the PCB.

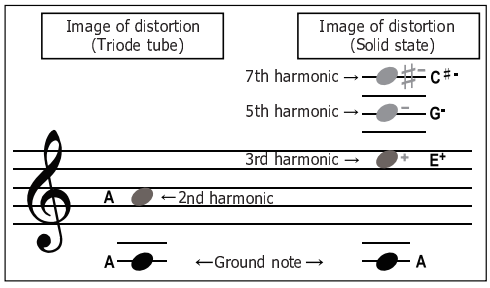
* We are not liable or responsible for any problems/failures caused by component exchange or modifications, and kindly ask you to conduct such component exchange and modification at your own risk and responsibility.
* We do not provide capacitors or tubes for exchange. Please purchase them from a reputable electronic or vacuum tube vendor.

9. Why do vacuum tubes attract audiophiles?

In former times,vacuum tube used to be adopted for every electronic circuit found in radios, TVs, communication broadcasting devices, sound amplification and computers. However, rise of semiconductors almost wiped them out in a moment. Although vacuum tubes are no longer found in most elctronic devices, they have a strong following and are popular amongst audiophiles in sound amplification. A solid state amplifier shows almost ideal measured values whereas a vacuum tube amplifier have high level of noise and distortion. From a viewpoint of measured values, a vacuum tube amplifier must be obviously inferior to a solid state amplifier. So why is it said to have a better sound quality?

The biggest factor is that the vacuum tube characteristics curve is quadratic function by which a vacuum tube produces a distortion so called second harmonic. The second harmonic is a frequency double the original sound, and an overtone factor which are abundantly produced by various musical instruments and gives depth and richness to the sound. On the other hand, the distortion produced by a solid state amplifier is mostly the multiples of odd numbers, such as tertiary and quintic. Therefore a sound different from the original sound is produced, which is unpleasant to listeners. This is why various countermeasures are taken for a solid state amplifier to lessen the distortion to have it close to zero as much as possible.

Although a vacuum tube amplifier may not match a solid state amplifier in terms of measured audio specifications, the quality of the sound produced by its distortion is superior to that of a solid state amplifier and attracts many audiophiles.

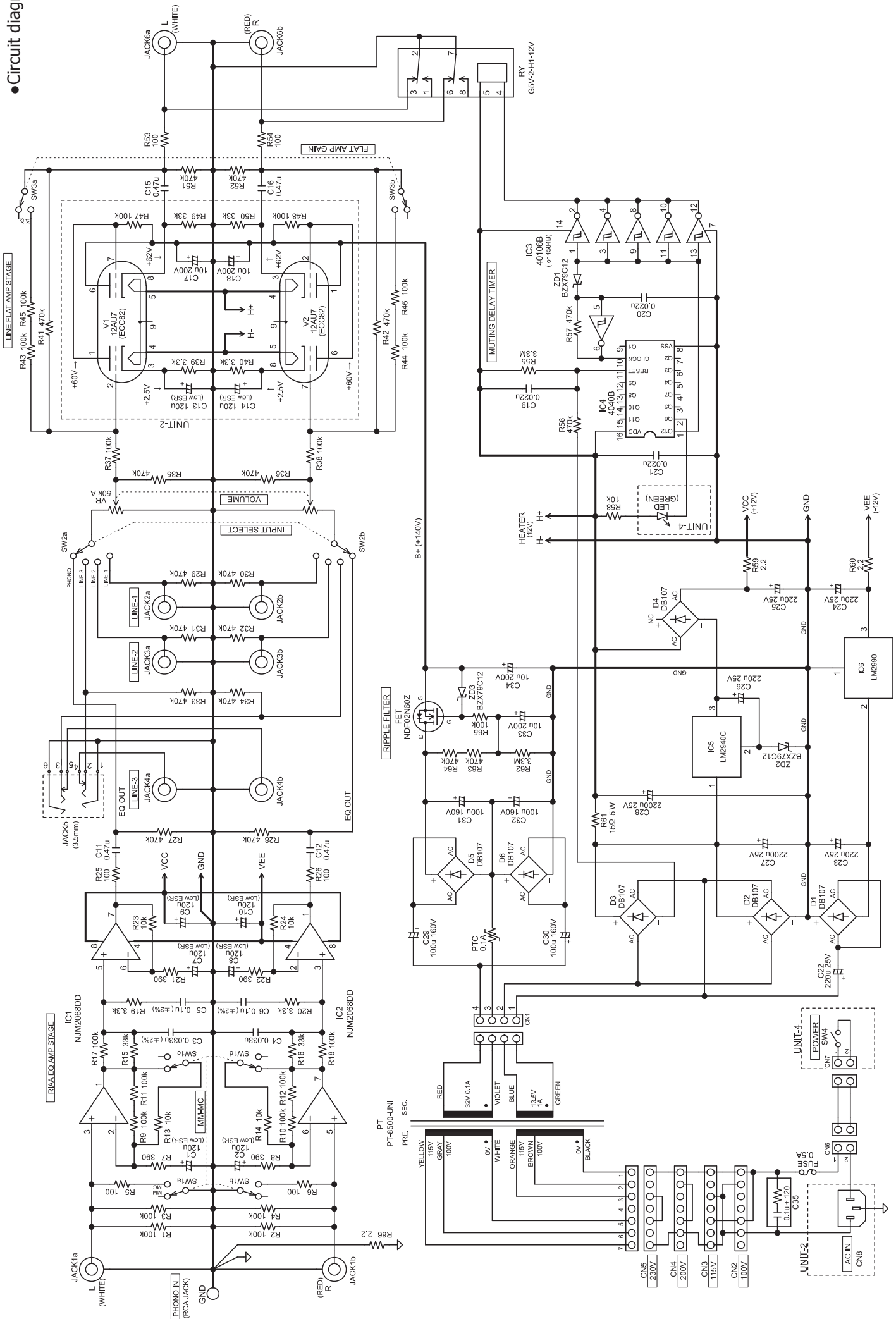


10. Technical data

●Specifications

Product name and model number	Tube Preamp Kit TU-8500
Circuit configuration	Flat/Line amp stage: 12AU7 Single ended flat/line amp Phono equalizer stage: CR cartridge and RIAA equalizer by OP-AMP A-power: DC power supply B-power: MOSFET ripple filter on board Power source for OP-AMP: ±12V (stabilized)
[FLAT/LINE AMP STAGE]	
Max. output voltage	22V rms (1kHz)
Gain	x3.1 (9.8dB) / x1.15 (1.2dB)
Frequency response(-3dB)	2Hz - 70kHz / 2Hz - 280kHz
SN ratio (IHF-A)	122dB / 129dB
[EQUALIZER AMP STAGE]	
Max. output voltage	7.4V rms (1kHz)
Gain (1kHz)	[MM] 37dB / [MC] 63dB
SN ratio (IHF-A)	[MM] 108dB / [MC] 88dB
Input resistance	[MM] 50kΩ / [MC] 100Ω
RIAA equalization	Within ±0.5dB (20Hz-20kHz)
Input terminal	RCA jack 4 lines (PHONO, LINE1-3) 3.5mm stereo jack 1 line (LINE3 has the priority)
Output terminal	RCA jack 1 line (PRE OUT)
Power voltage	AC 100V 50/60Hz (select from 100V, 115V, 200V, and 230V upon assembly) IEC standard 3P inlet type
Power consumption	8W (10W when tubes which heater current is 225mA are used)
Dimensions	W 252 x H 73 x D 270 mm (including projections)
Weight	Approx. 3.1kg (assembled, excluding AC cord)

●Circuit diagram



11. Warranty

Since this is an electronic product assembled by a user, EK JAPAN cannot provide a standard warranty like those found with a regular electronic product. Instead, EK JAPAN can provide help to resolve your problems via troubleshooting support from your local EK JAPAN dealer or you can e-mail EK JAPAN directly.
If you experience problems with the assembled product, please contact an EK JAPAN dealer in your region or the store from where you purchased the product for further assistance.
If you do not know who to contact, please send us an e-mail describing the problem you are facing to the e-mail address below. Throughout the instruction manual, there are many check points, and in many instances the problem can be solved if you review these points closely, and use the troubleshooting on Page 12 before consulting to your dealer or EK JAPAN.

Contact information

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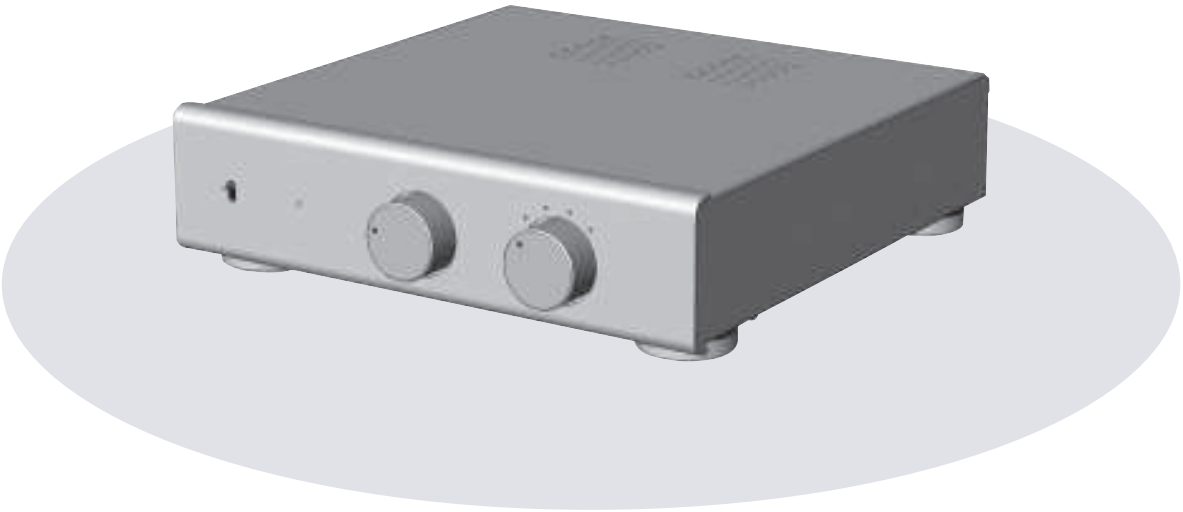

ATTENTION