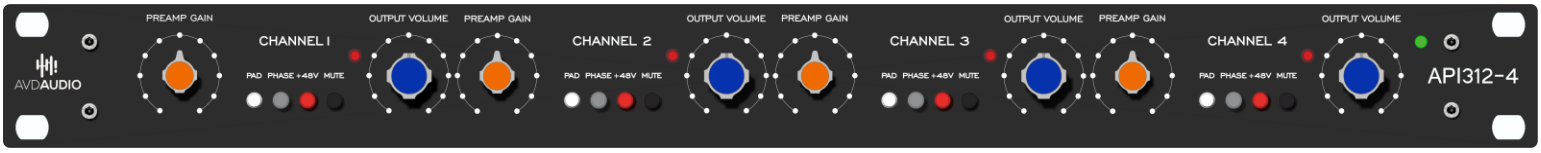
Assembly Manual
MP312-4 Four Channels Mic Preamp.



Hello DIY lovers!

Thanks for choosing AVDAUDIO!

We are proud to introduce our new MP312-4 Four Channels Mic Preamp. This unit was made based on vintage API312 version preamp.

Unit has four independent channels. Each channel has:

- **input gain and output attenuator**
- **phantom power supply bottom +48v**
- **-20Db pad input gain bottom**
- **phase reverse bottom**
- **mute bottom**

The box is with external power supply.

If you had bought this DIY Kit, hope this manual help you to complete this unit. And we hope it will be easy to build and will give you pleasure!

We wish you happy DIY moments with this kit and please contact us at info@avdaudio.com if you have any questions.

Let's start this build!

- **Descriptions and material for building.**

The MP312-4 DIY kit contains:

- Metal case with front panel and power supply case.
- PCBs (Main PCB and power supply boards)
- Power transformer (115V or 230V included)
- Four variable potentiometers for preamp gain
- Four T-Pad 600ohm attenuators

All parts are marked on PCB. This includes two markings – NAME and VALUE.

These parts can be found in the BOM here [download MP312-4 BOM>>>]

Or follow this link: http://www.avdaudio.com/files/boms/BOM3124.pdf

What you will need for build:

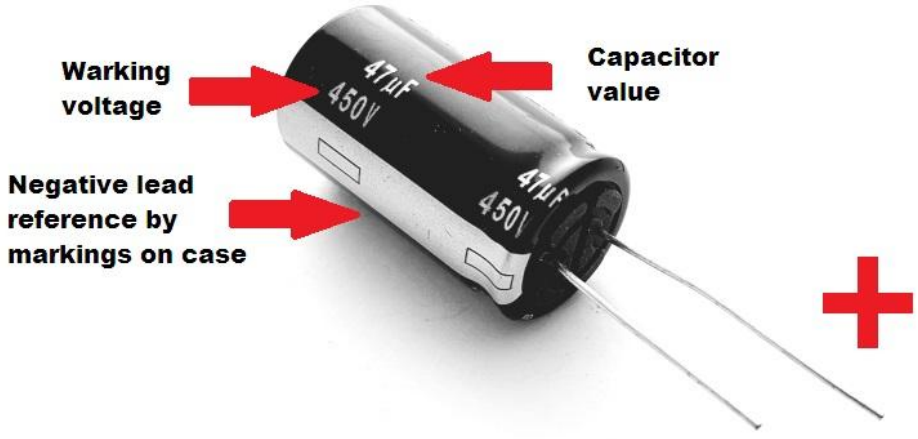
DIGITAL MULTIMETER

- soldering station
- basic understanding of components
- DIGITAL MULTIMETER to check VALUE of capacitors and resistors.
- You can also use a table with resistor color codes, which can be found here: [resistor color code information>>>>]

  Or copy this link: http://www.resistorguide.com/resistor-color-code/

All capacitors (electrolytic, ceramic) are clearly labeled, but you may also check these values with a digital MULTIMETER!

Electrolytic capacitor:



Ceramic capacitor:

IMPORTANT!

To avoid any mistakes after the order of the components check each component by multimeter! Make sure that it corresponds to the nominal value indicated on the PCB and place them on a blank sheet with the measured values. Want to remind to you:

- Resistors are **not polarized** elements
- All diodes are **directional**! Make sure you insert them in the correct direction.
- Film capacitors are **polarized** elements
- But ceramic capacitors are **not polarized**

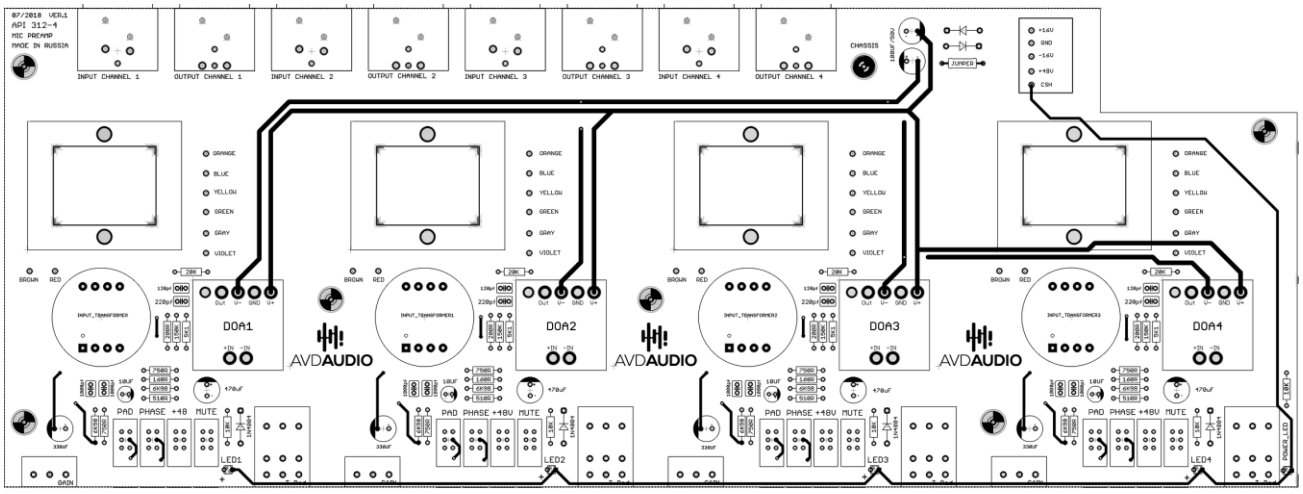
Remember please!

Unit has four same channels. We will build this, based only on the one channel. Others channels be assembled by the same way. But other important steps we will show separately.

2) Second step we start to build preamp with main PCB.

All parts you need for this board you can find in the BOM. Marked “Preamp parts”

Here is a picture of Preamp PCB:

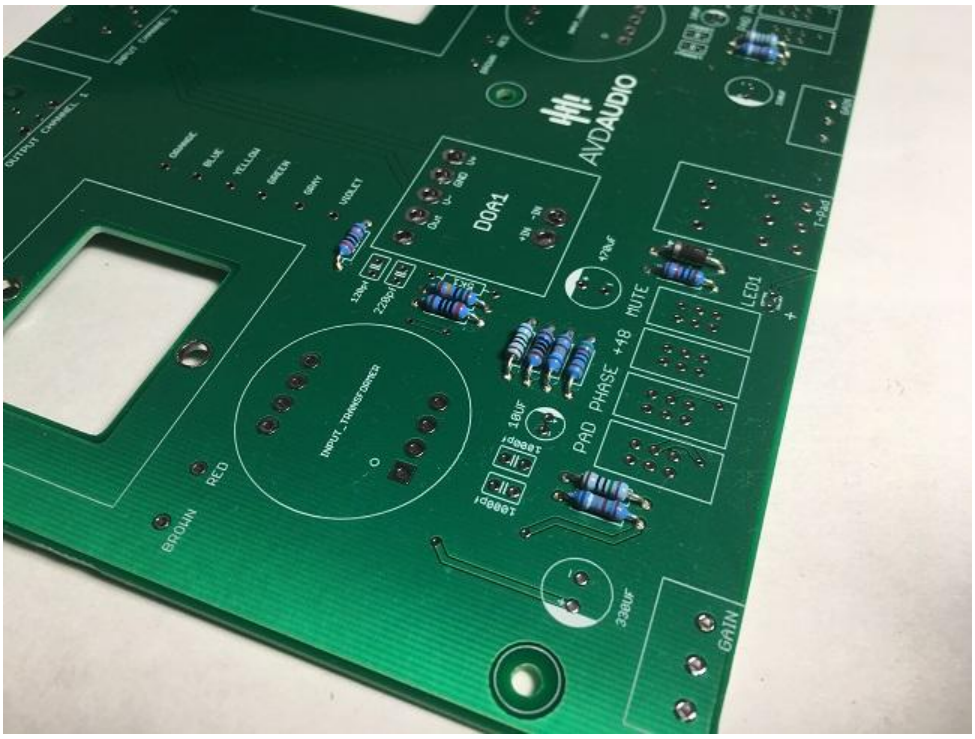


Preamp PCB has four same channels. All channels are identical. Manual shows building of one channel only. Build other channels by the same way. Others important moment will show you separately.

Let's start main PCB!

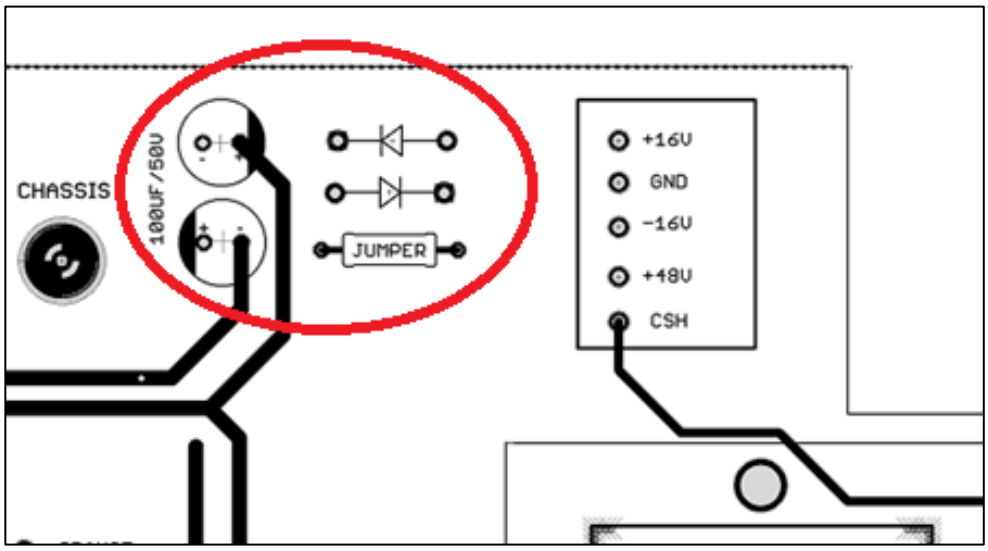
Solder all resistors and diodes.

Each channel has one diode 1N4004 and eleven resistors. Next nominal of resistors you can use per channel: 160R, 200R, 510R, two of 750R, 5K1, two of 6K98, 10K, 20K, 150K.

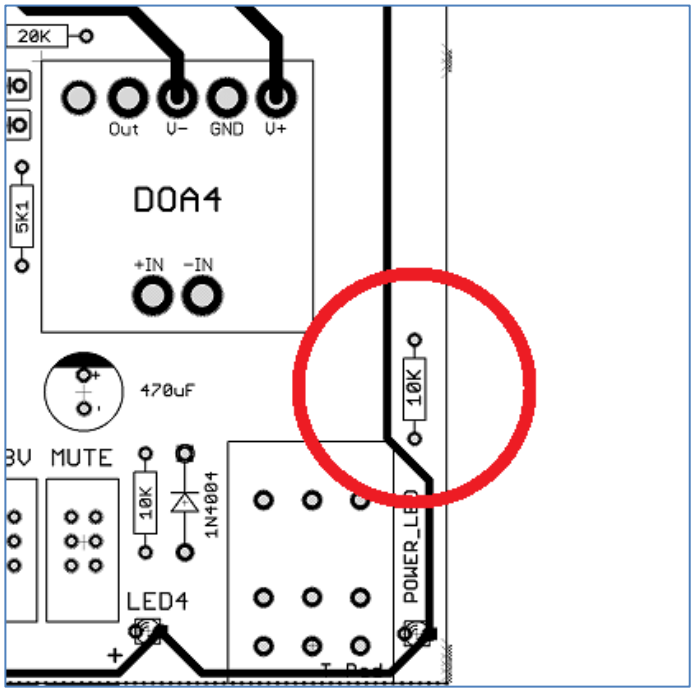


Do the same on each other channels!

In the end of this step you must solder two diodes 1N4004 on the power side of the board! You can soldering two power capacitor (100uf/50v) this step as well. Or soldering as we do it after! But it helps you to do this easily now!



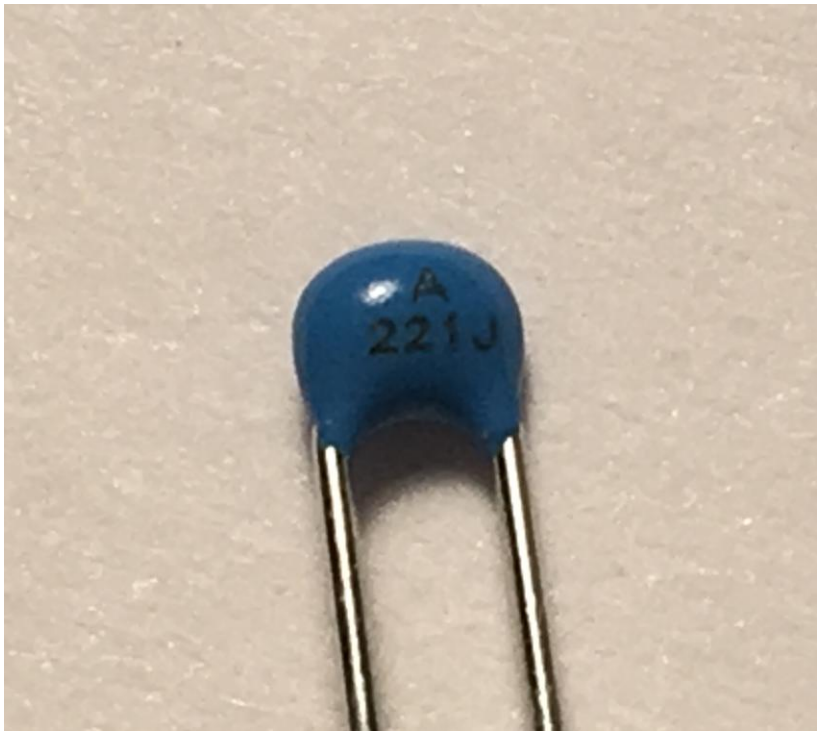
Don’t forget about one 10K resistor. It is on the right side of board for power led diode!



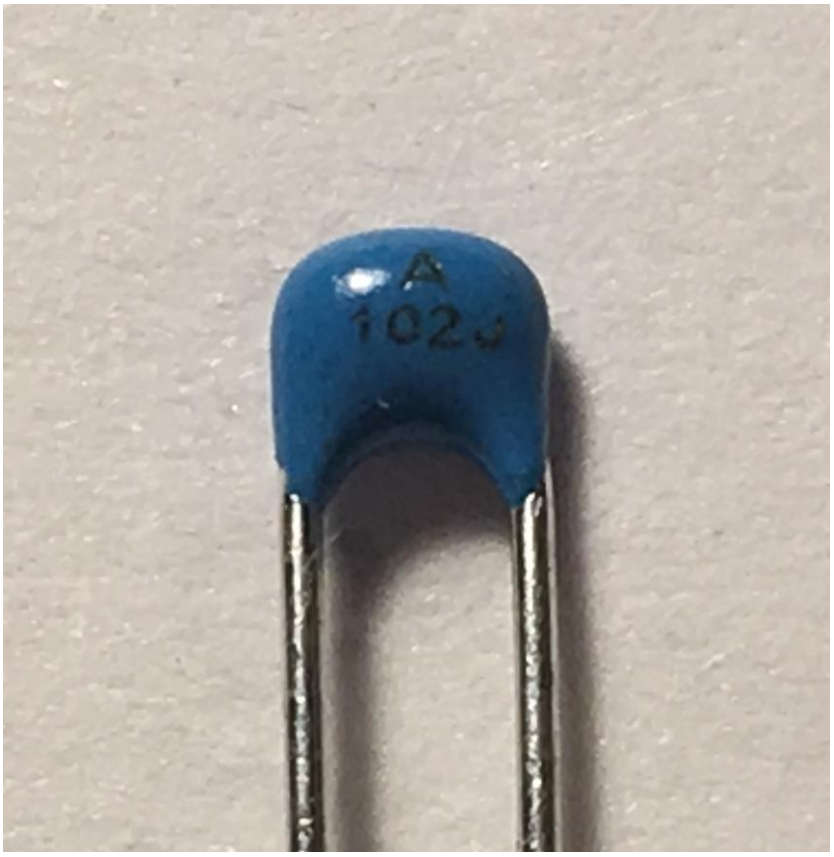
Find three different ceramic capacitors on the each channel: 120pf, 220pf and two ps of 1000pf. Each capacitor is marked:

120pf capacitors are marked as:

220pf capacitors are marked as:



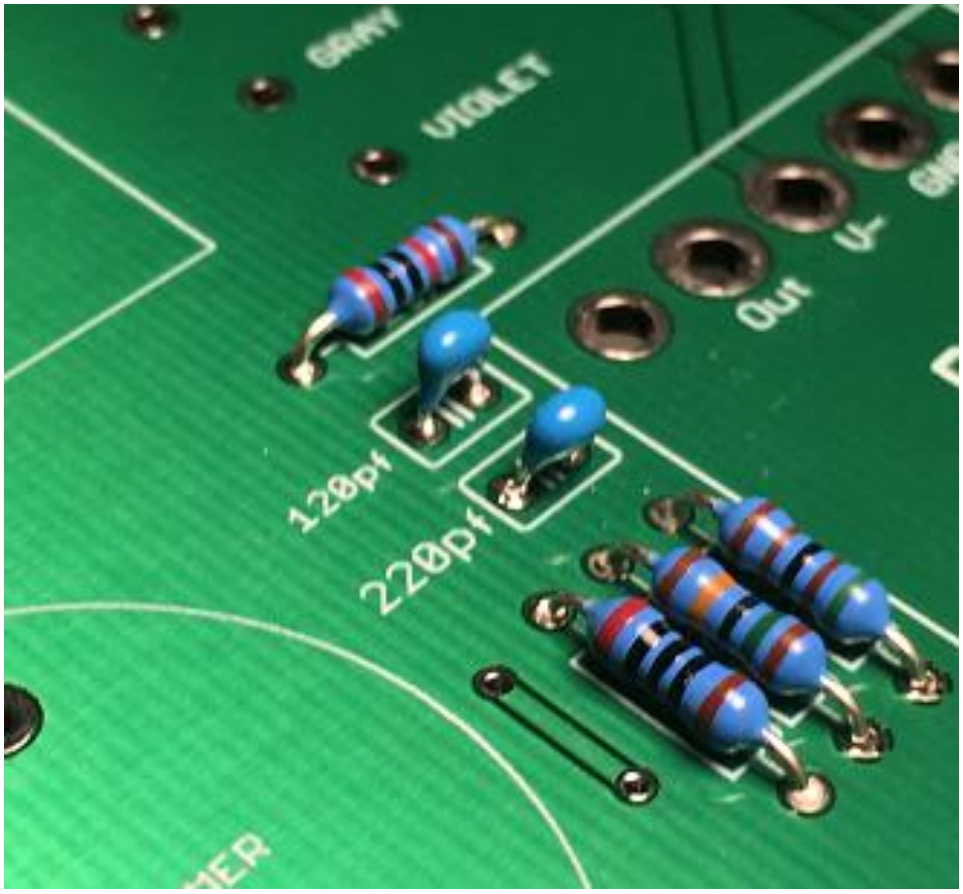
1000pf capacitors are marked as:



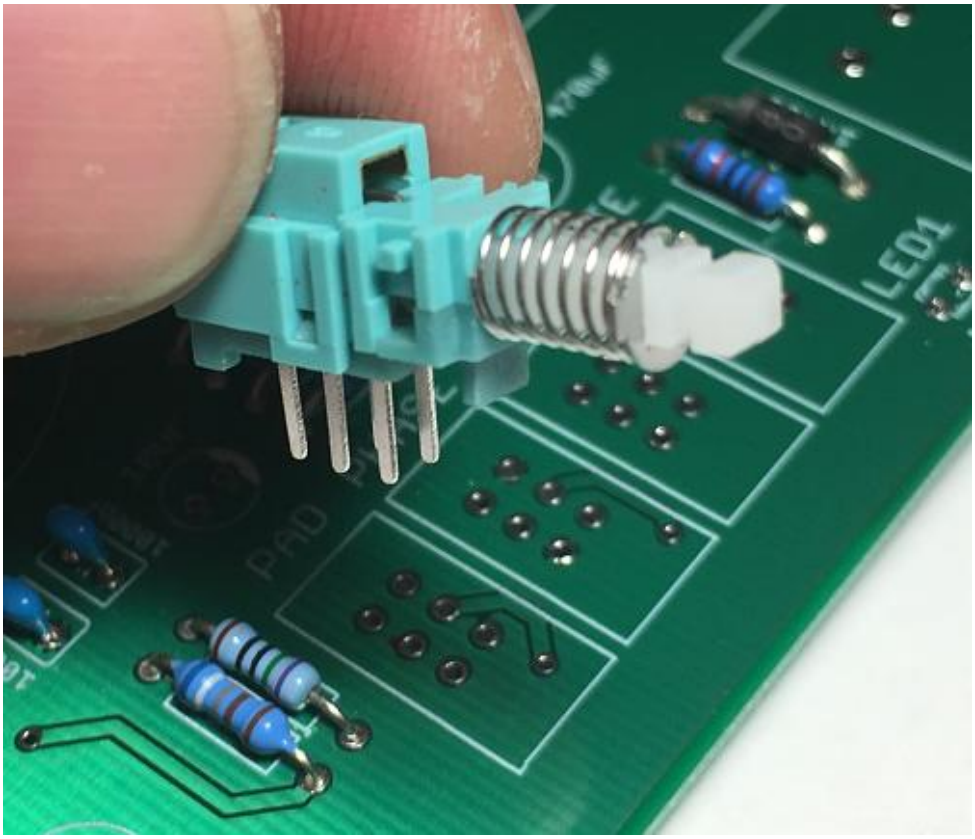
Placed each capacitor and solder these:

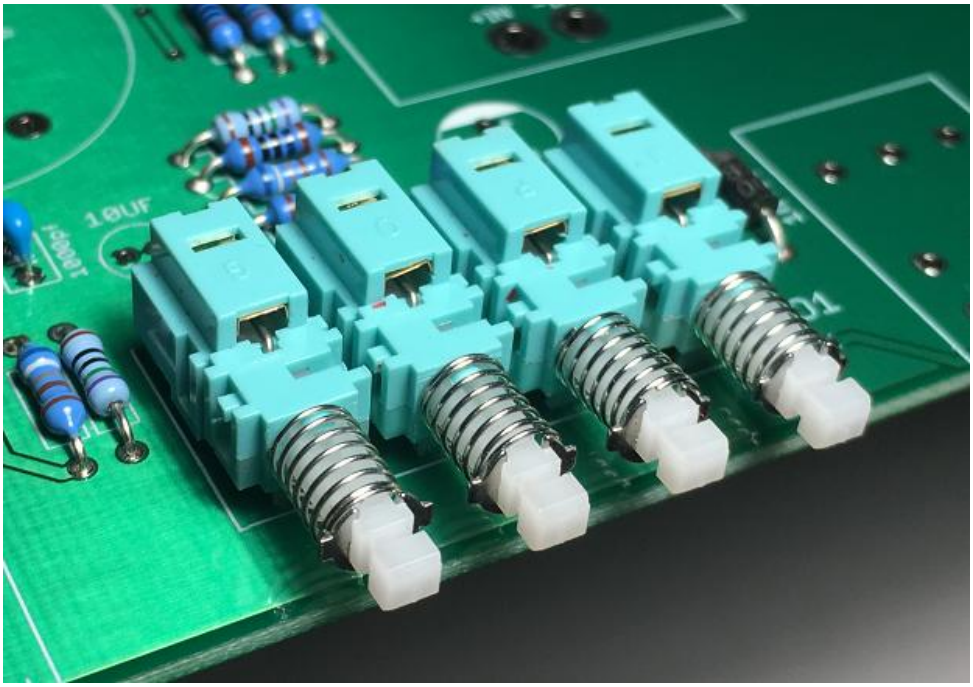
1000pf capacitor is (two ps):

220pf and 120pf capacitors are placed:



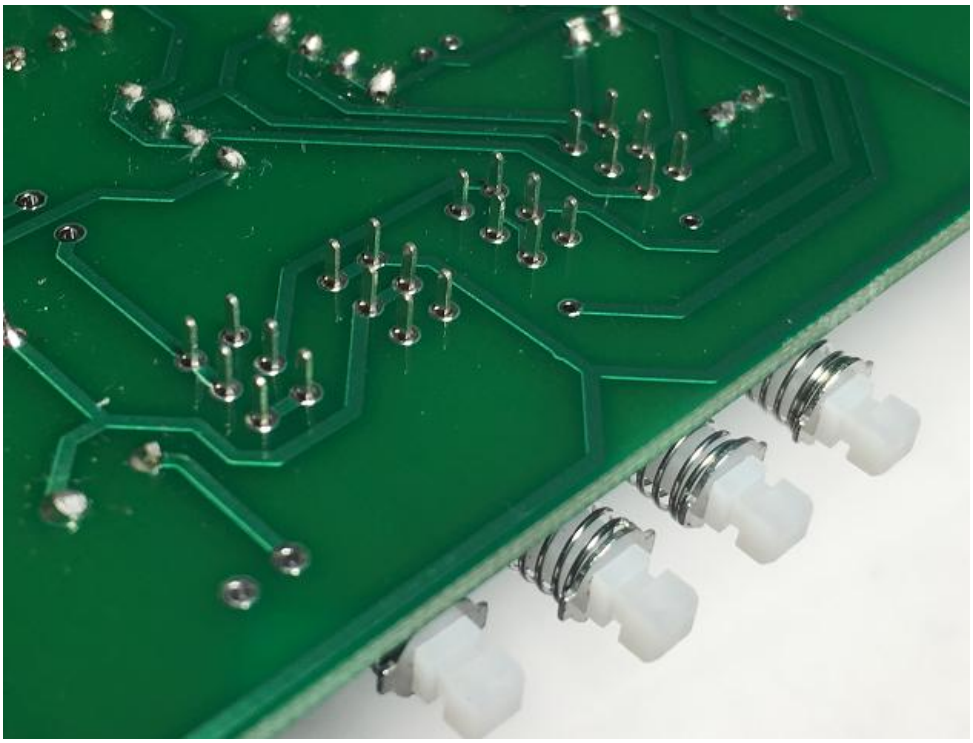
Place 4 pushbuttons per each channel on the board:



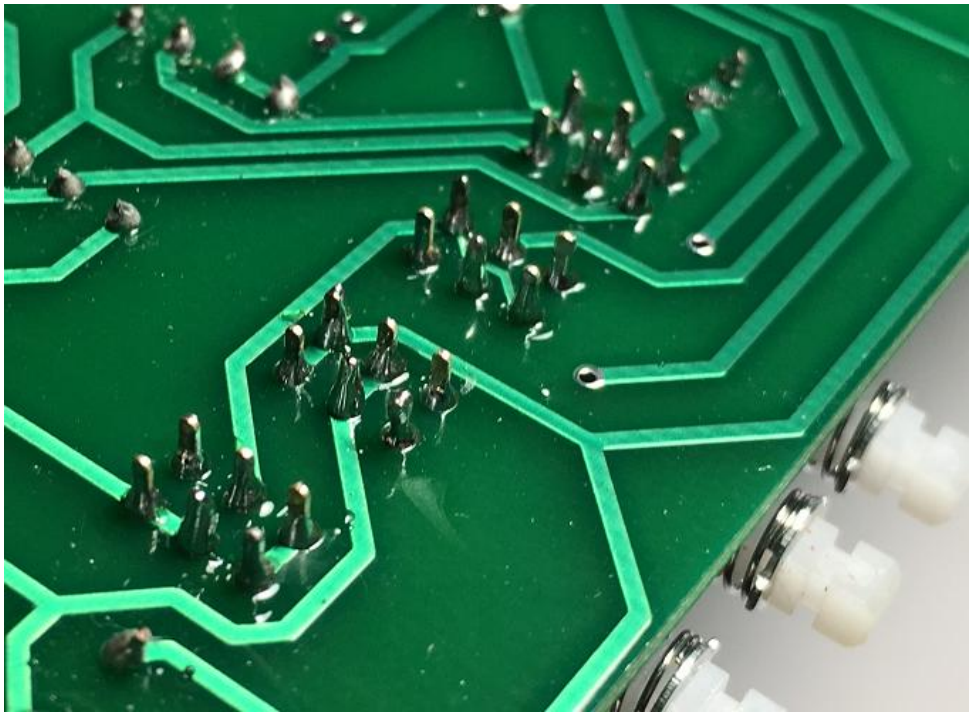


To be sure before solder! Push button placed directly on the PCB. Must not have any distance from PCB!

Turn up board and solder each push button. You can solder at first only one leg of each pushbutton. Try to press switch to pin on PCB. Then check you have all switches directly on PCB. And solder other legs.

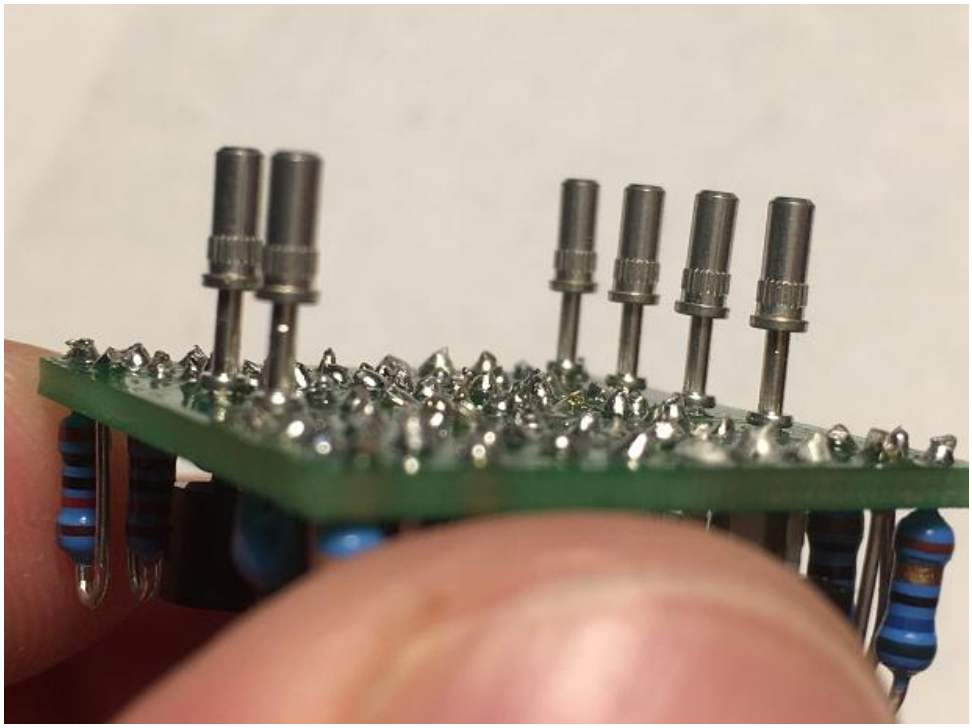


Do not recommend cut push button’s legs.



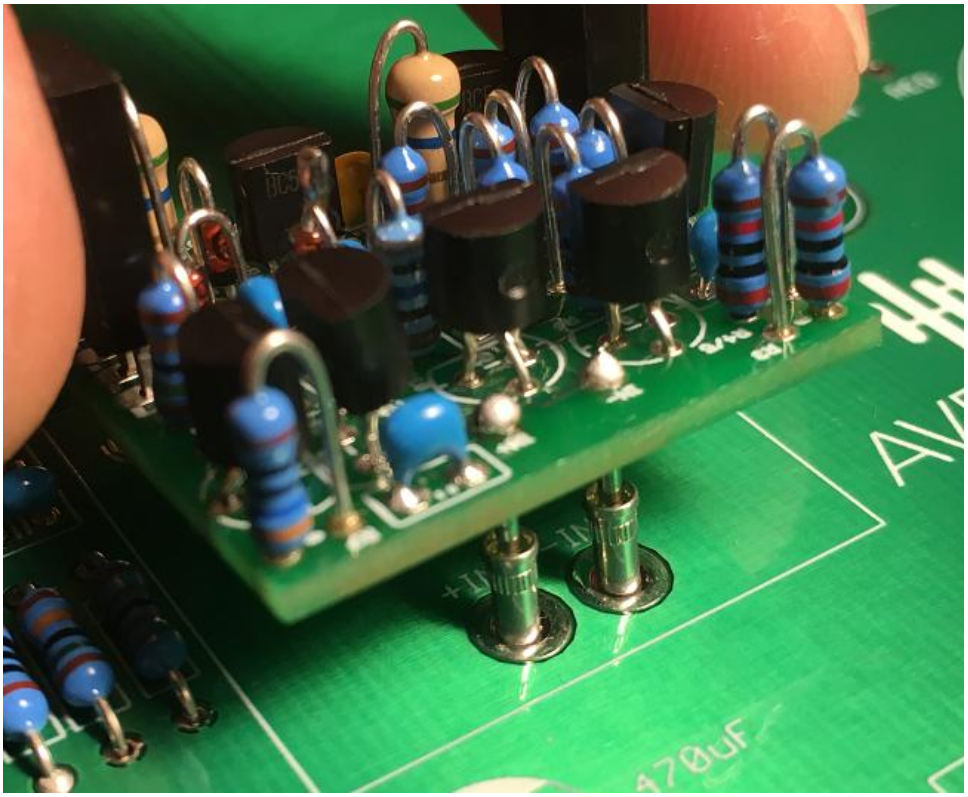
For DOA we use HARWIN sockets.

You need one completed DOA. Insert sockets to DOA as I show below:

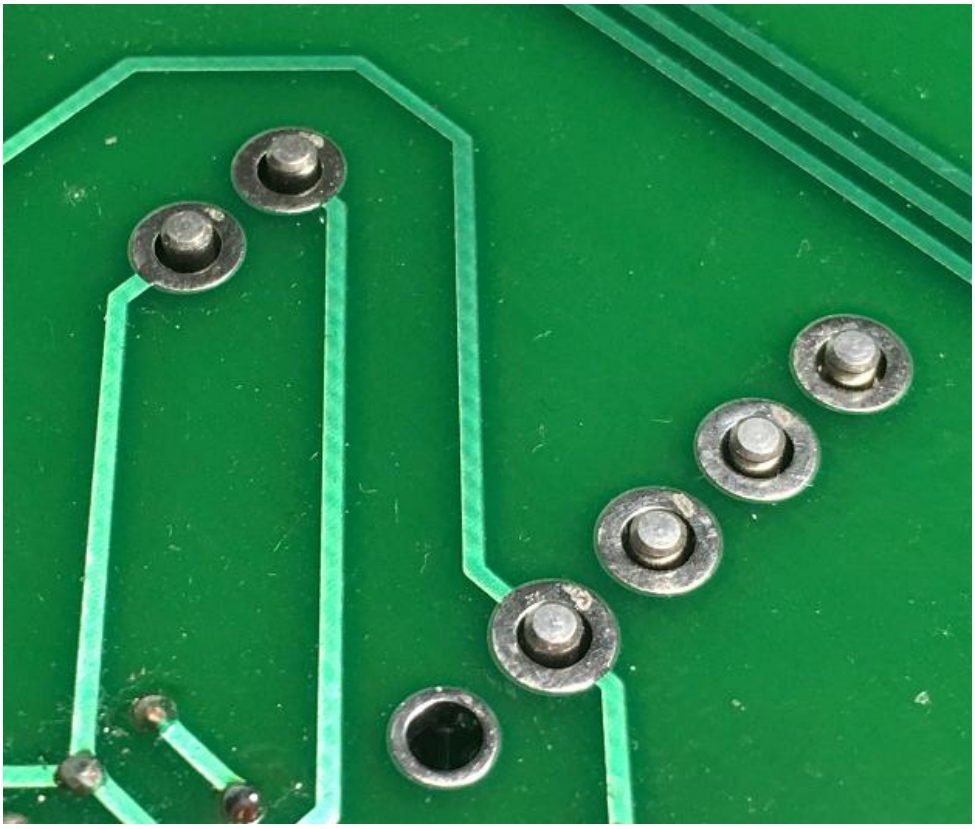


To be sure all sockets are installed fully on DOA!

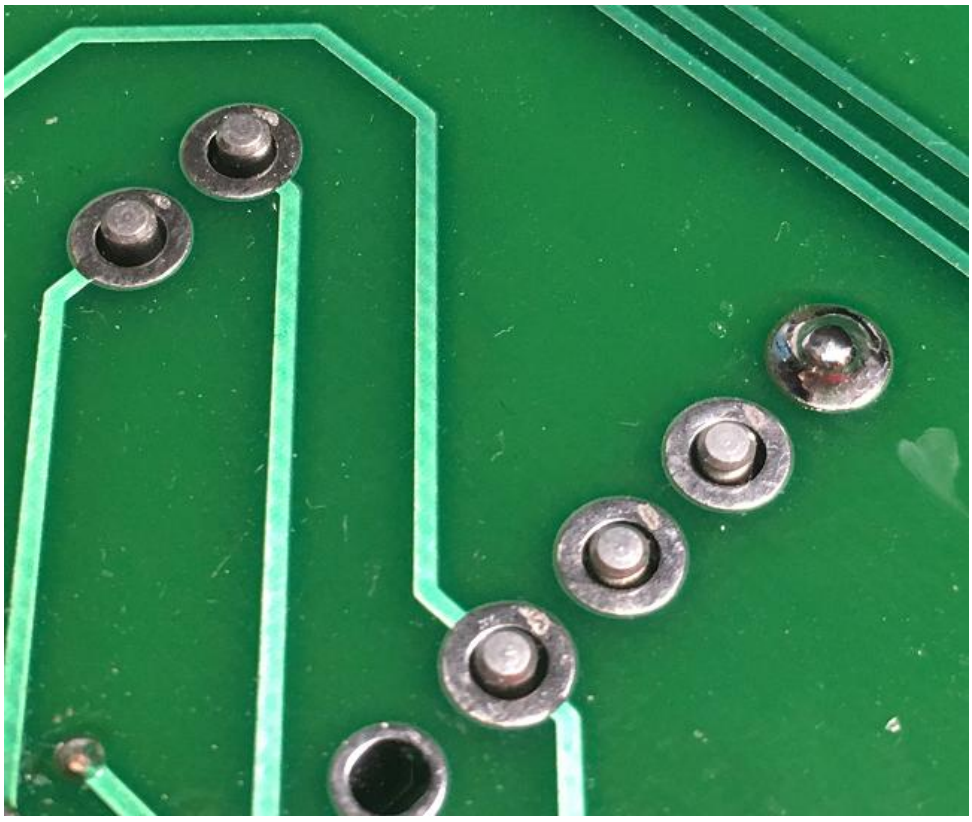
Install this to PCB.

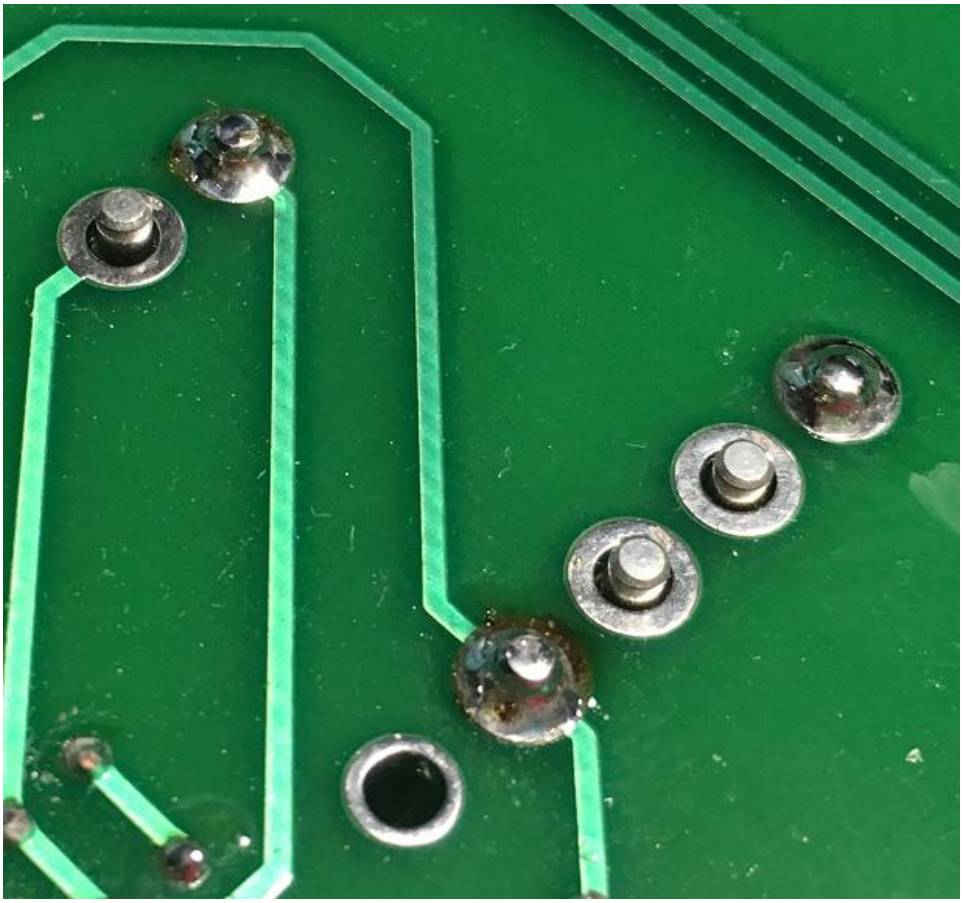


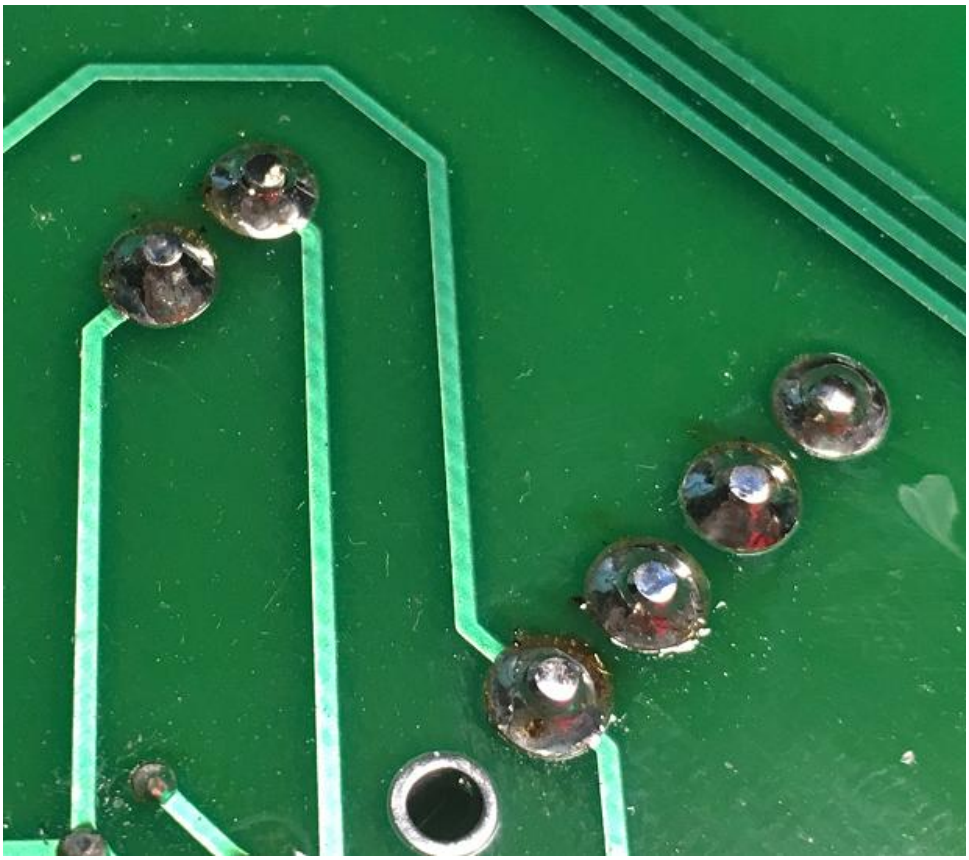
Pull the sockets on 1mm from PCB.



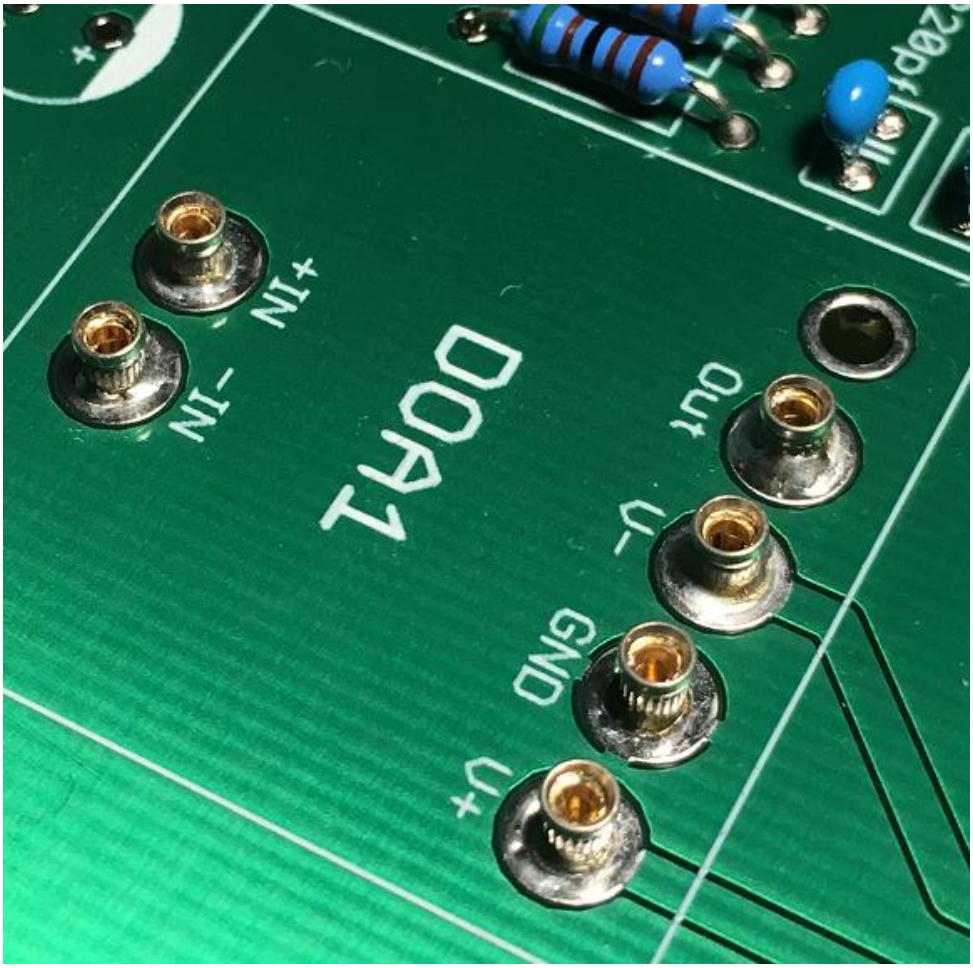
Solder only one leg first! Then solder on the other side. Solder the three far legs. Then solder the rest. Or do as we do below:





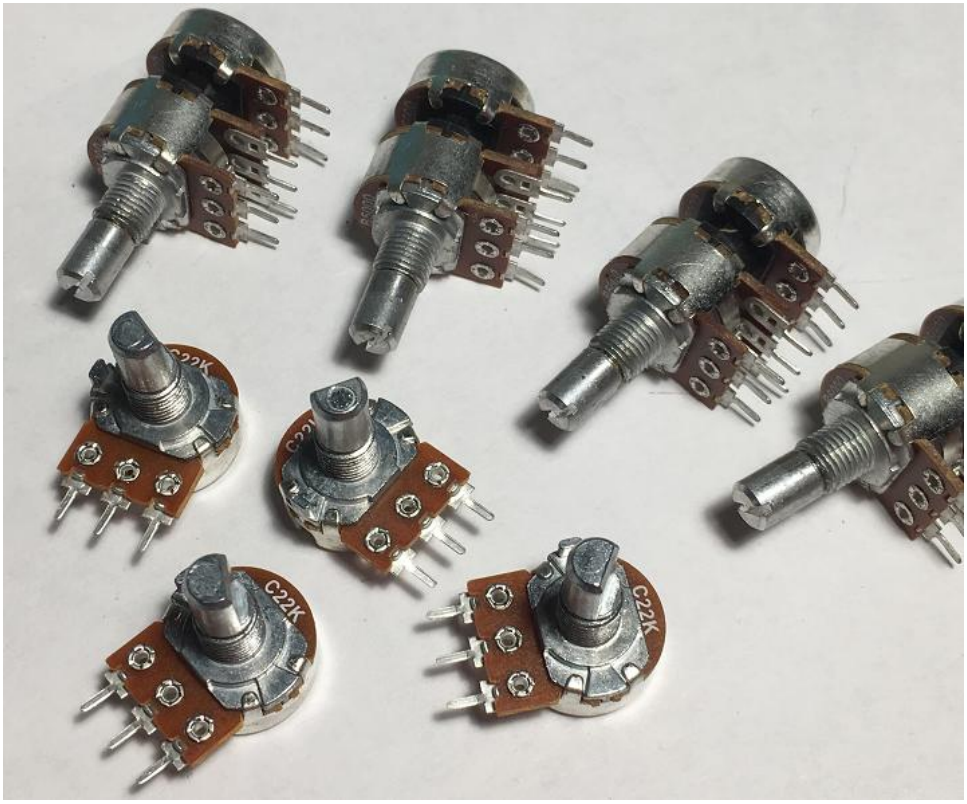


Check our result from other side.

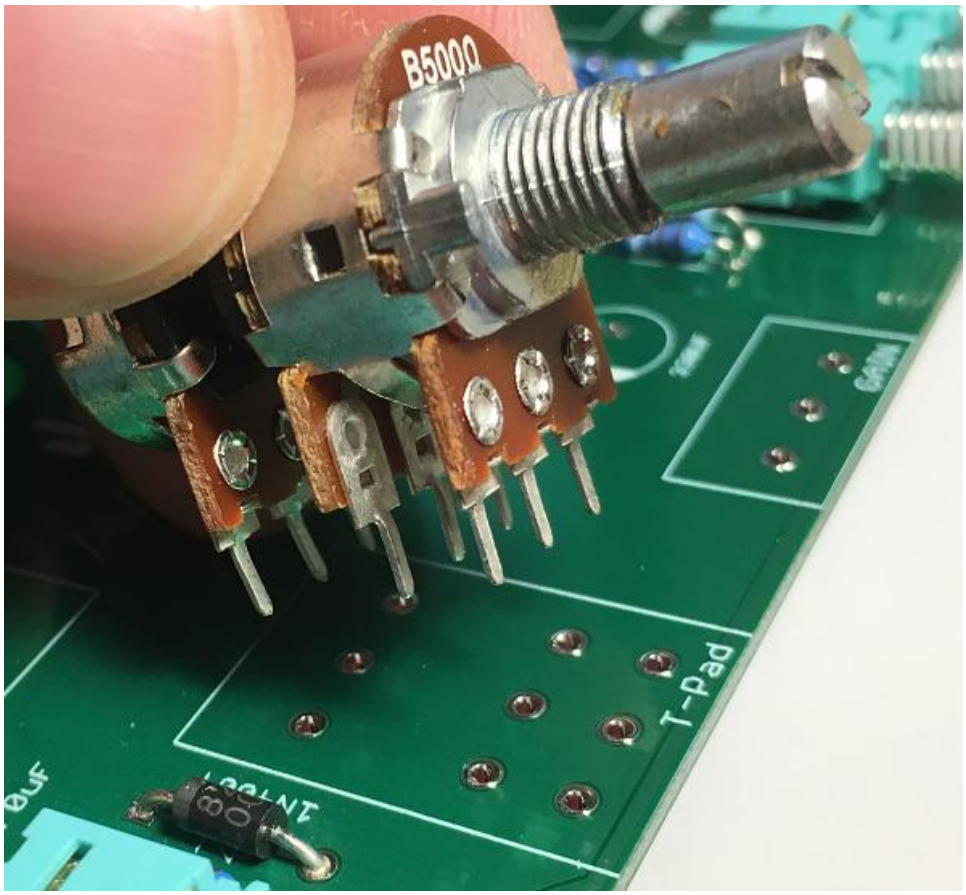


Ready to do to next step!

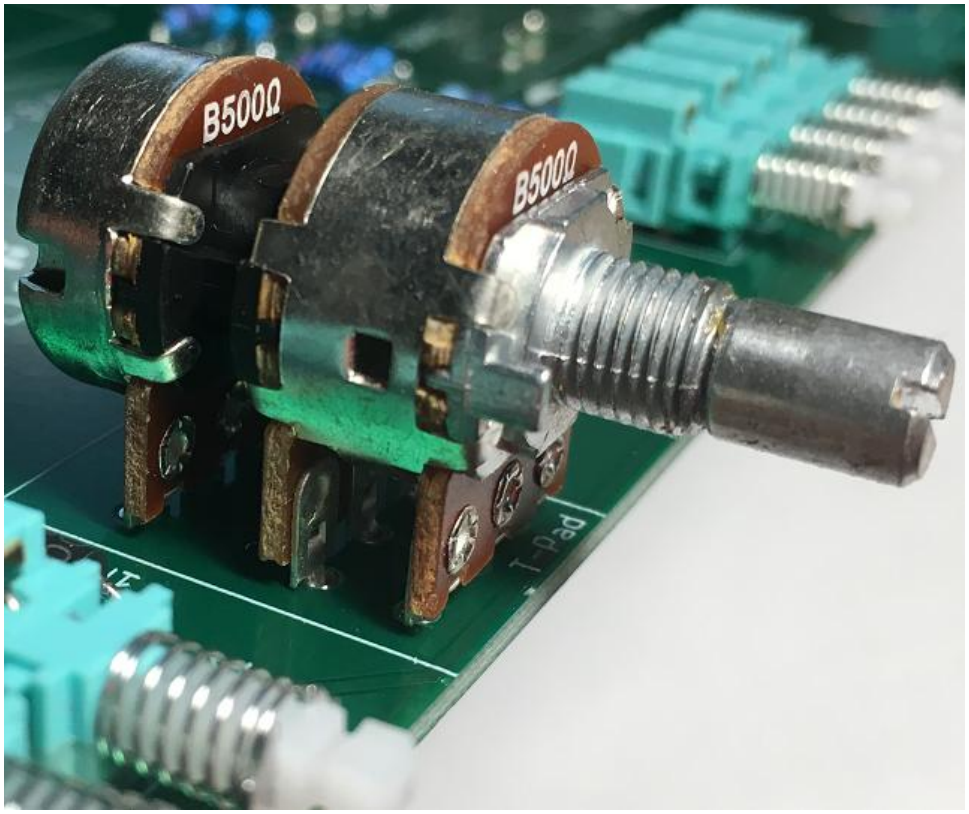
Find four T-Pads and four Gain potentiometers:



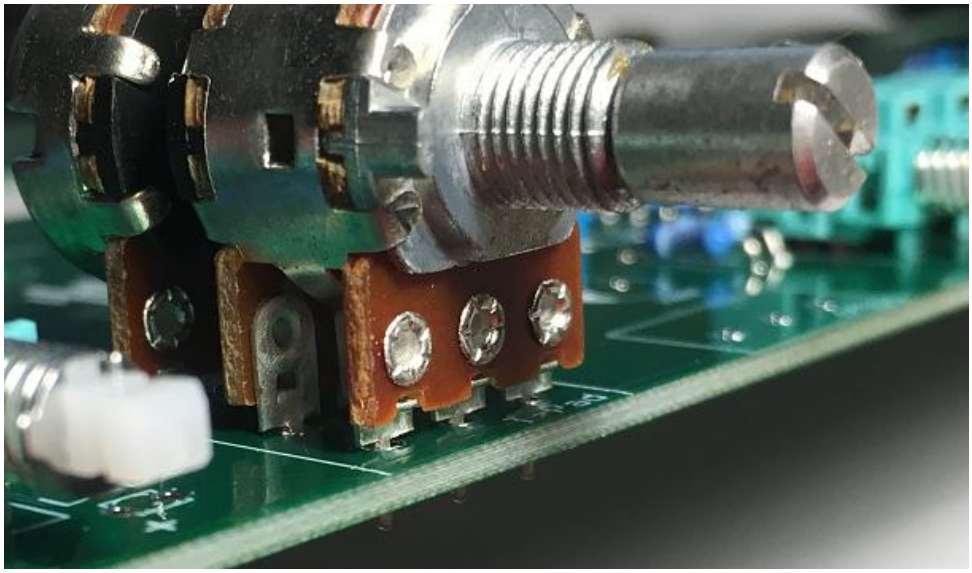
Install each T-Pad to T-Pad's place on the board marked T-Pad:



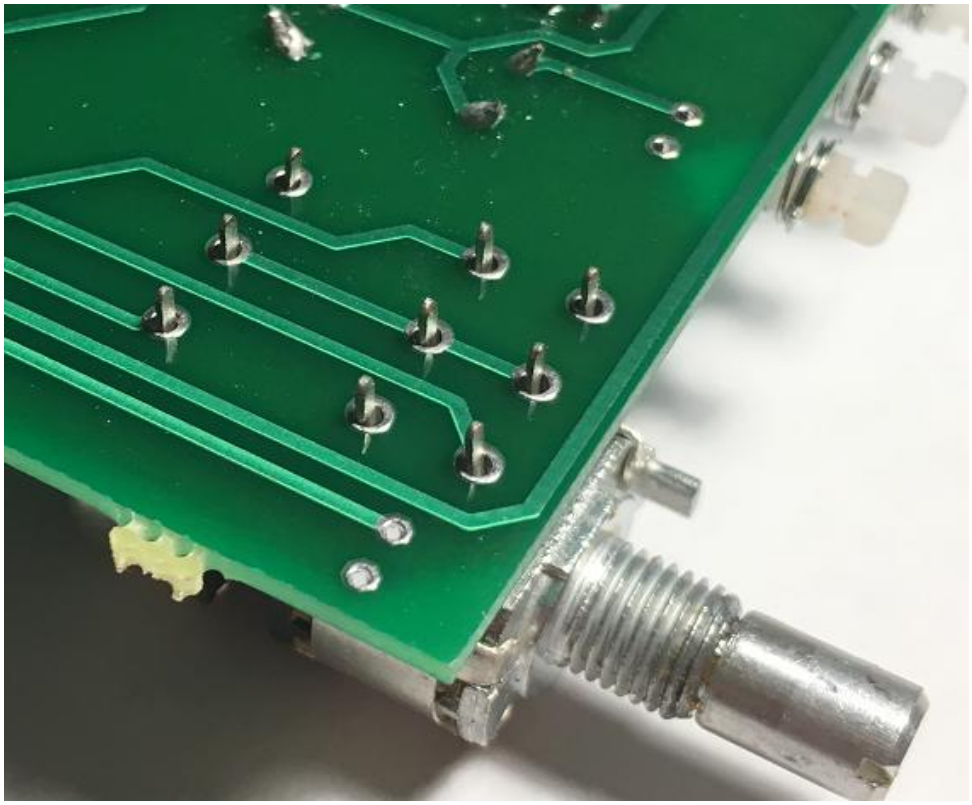
Place the potentiometer directly on the PCB!



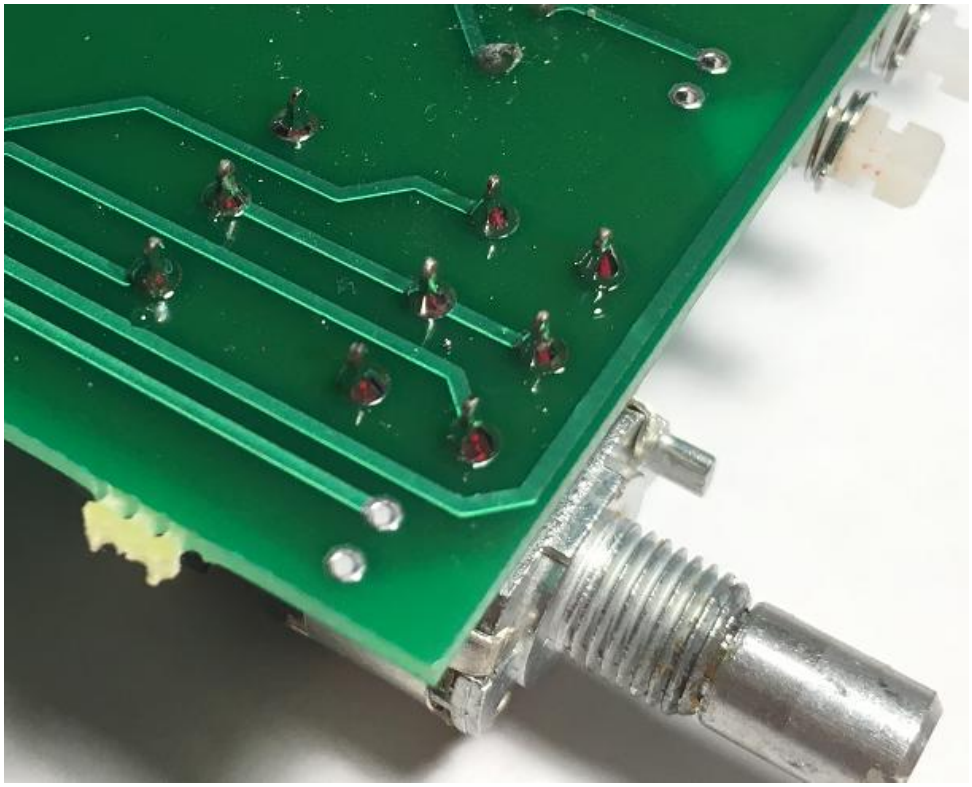
Check again the distance from PCB. We must have not any distance!



Go to the down side and solder T-Pads.

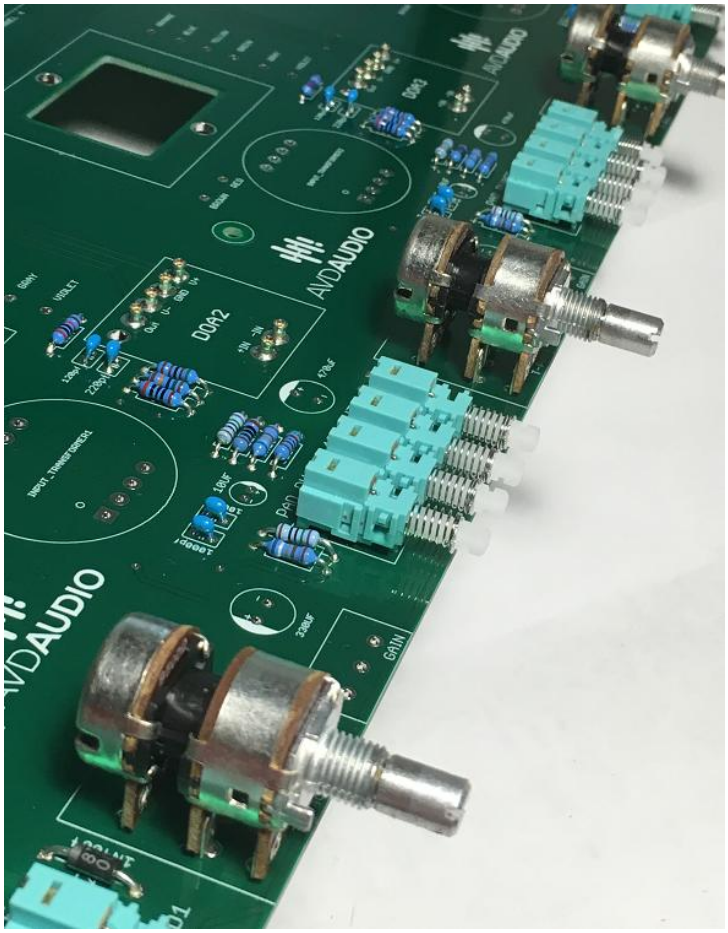


Solder first only one leg. During soldering push T-pad. Then you solder other legs. We are not recommend to cut this legs after.



Check you are done right.

And all T-Pads are on the board:



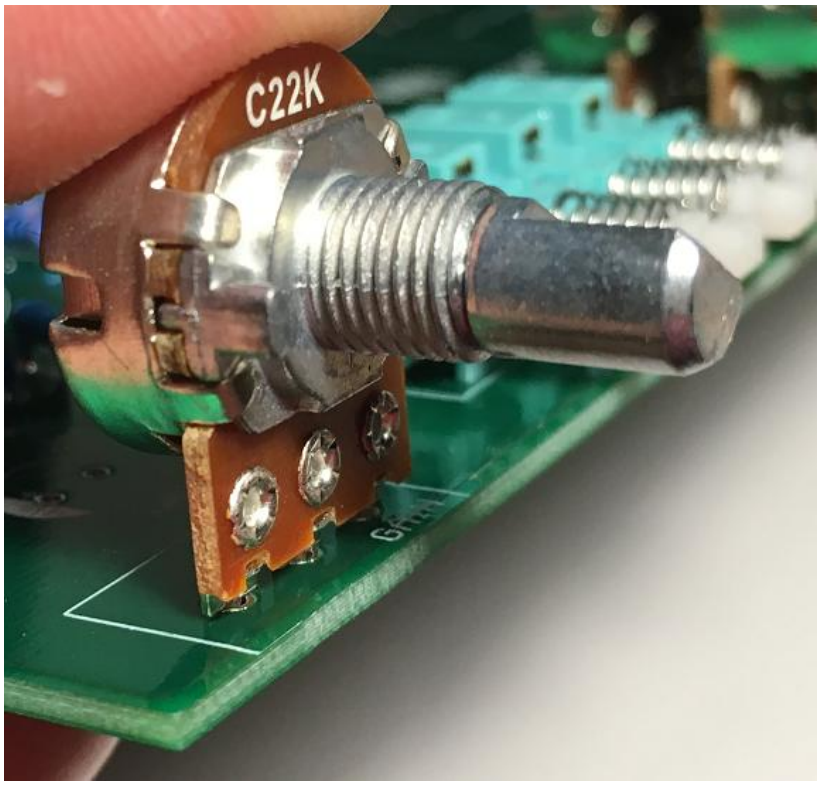
Hope you have done this step good!

And we are ready to go the next step.

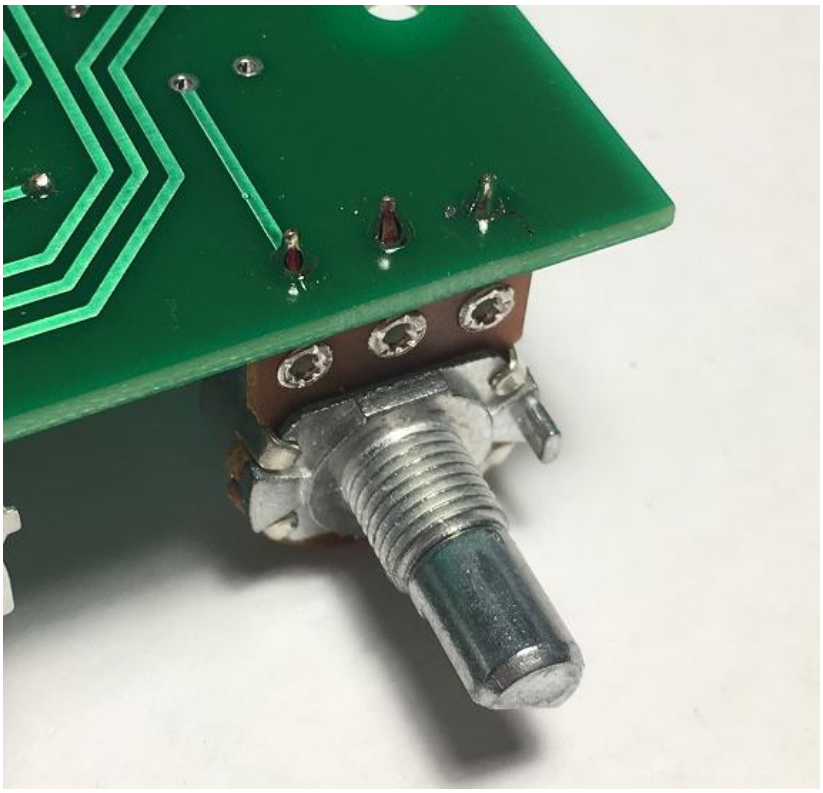
Take four Gain potentiometers. This one must to be placed directly on PCB too.

Look to the next picture and start solder Gain potentiometers.

Install Gain potentiometer to their place marked GAIN:



Check please the potentiometer is directly on the PCB and solder this:



- Break off the locking pin on all potentiometers and T-pads!

You need 9ps from 14 black screws. This screws are in the ordered package.

Tighten all bolts on back wall and bottom cover.

How to looks the case with installed bottom cover:

The bottom cover has 7 standoffs for PCB. Near future will install PCB to these places.

Stick rubber feet in each corner on the bottom cover.

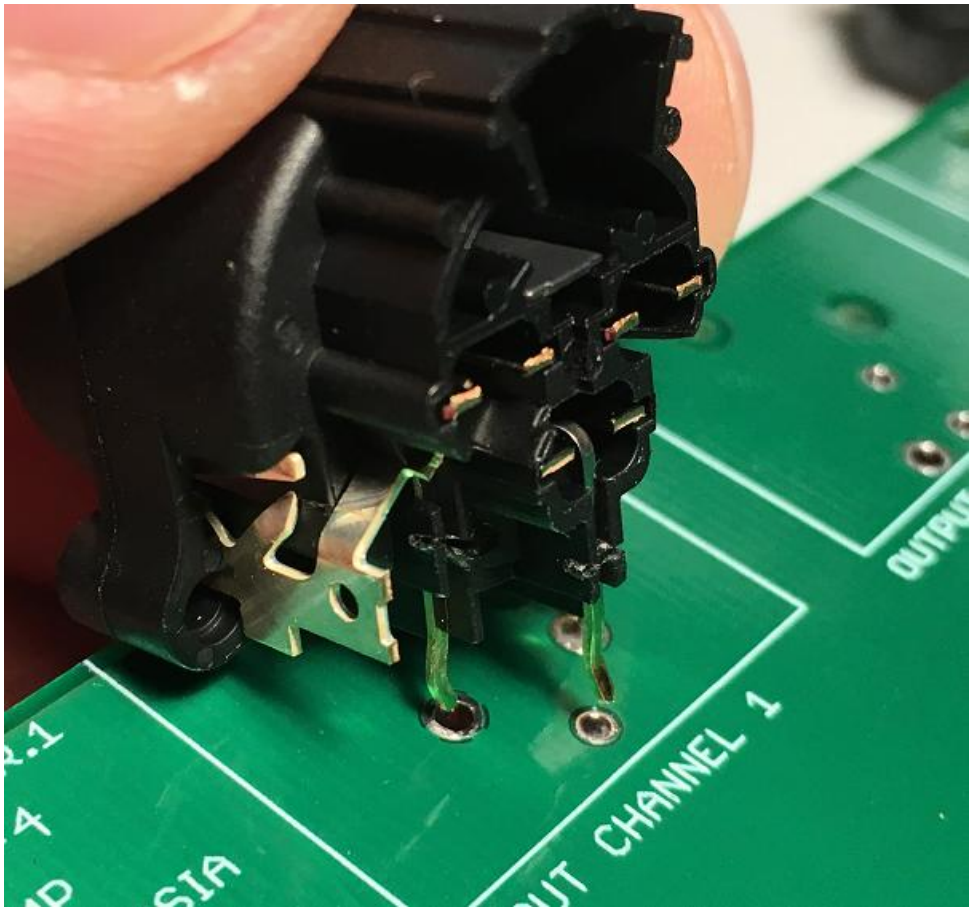
This will protect your cover from scratches.

But now you need XLR connectors. Four are MALE and FEMALE.

See picture below:

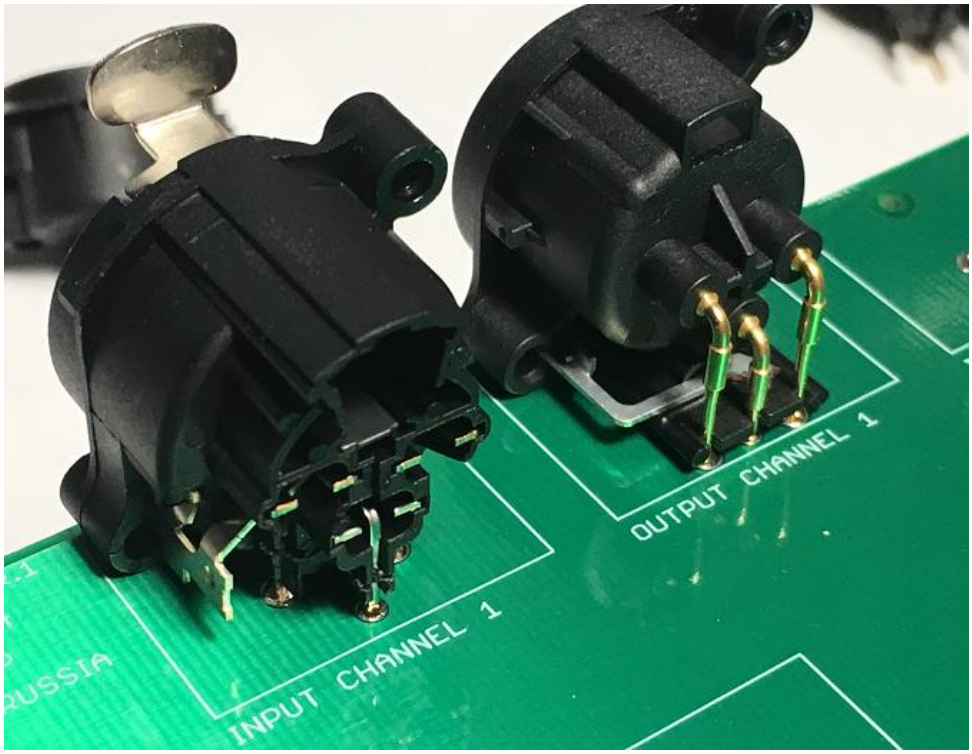
Install each to their place on PCB.

Installation sites have a different mount and you will not confuse them!



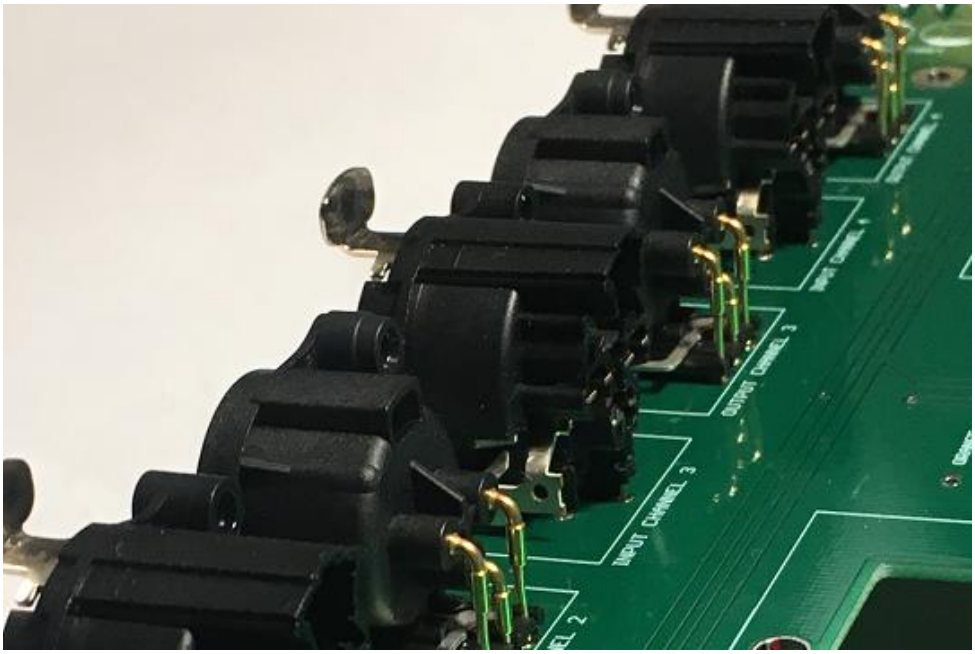
In the each input we use FEMALE XLR.

In output we use MALE XLR.



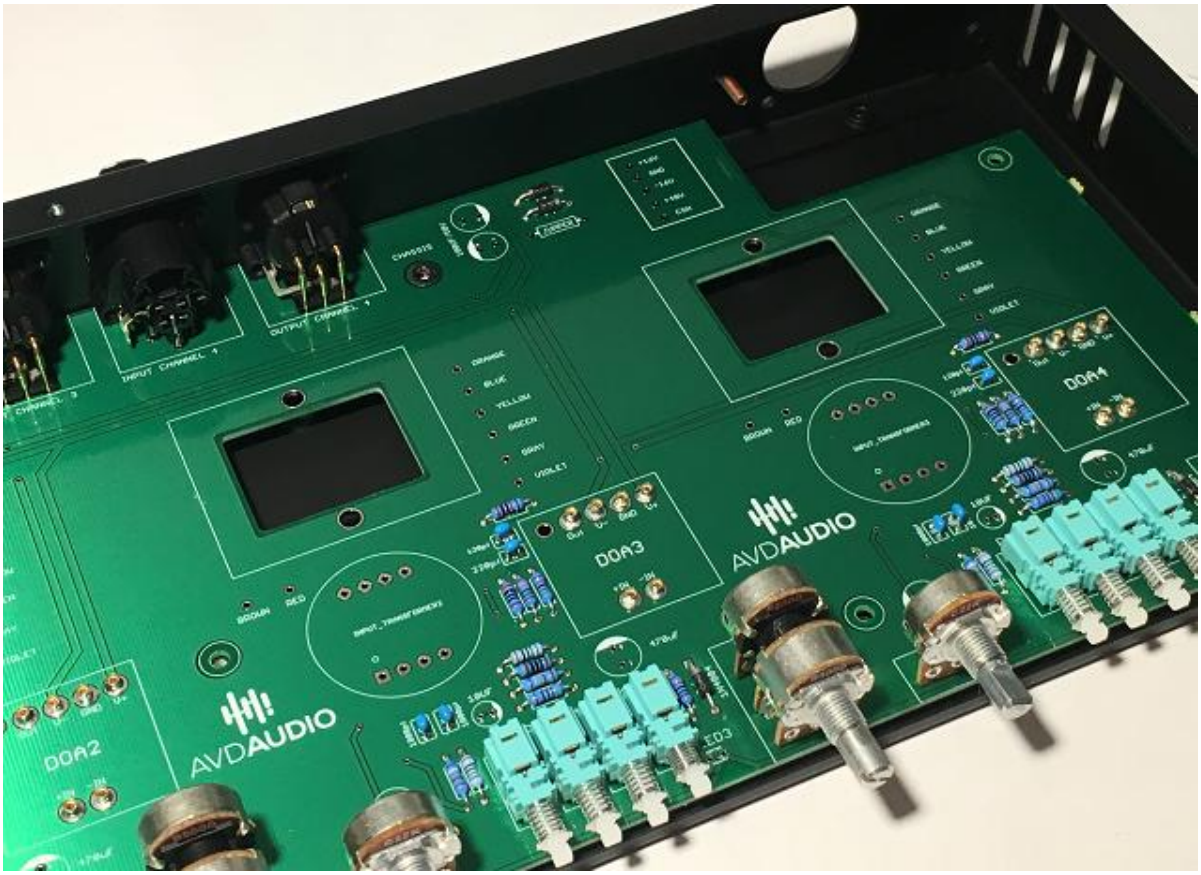
Install all directly on PCB all XLR.

Don’t solder on this step! We need to fix all before soldering!



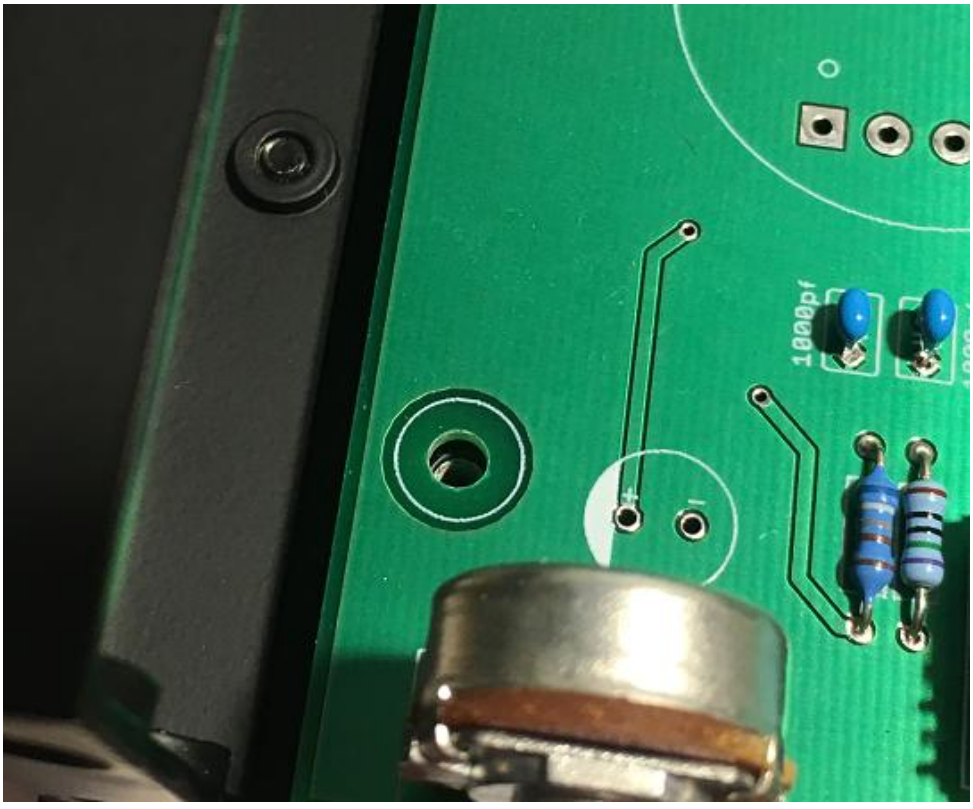
Install the connector with board into the enclosure as shown:

And lower the board to the bottom cover:

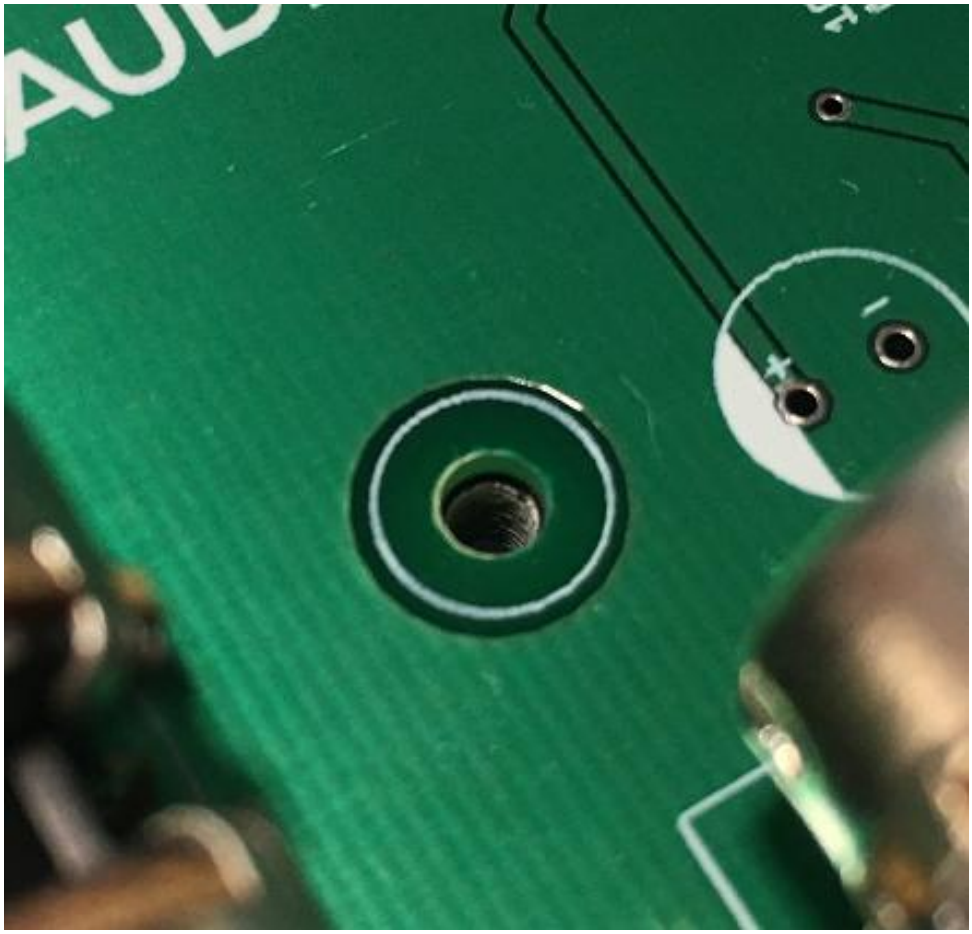


Make sure the Board is on the bottom cover racks and all XLR connectors are in the holes:

And all the holes on the Board and the cover rack are the same!

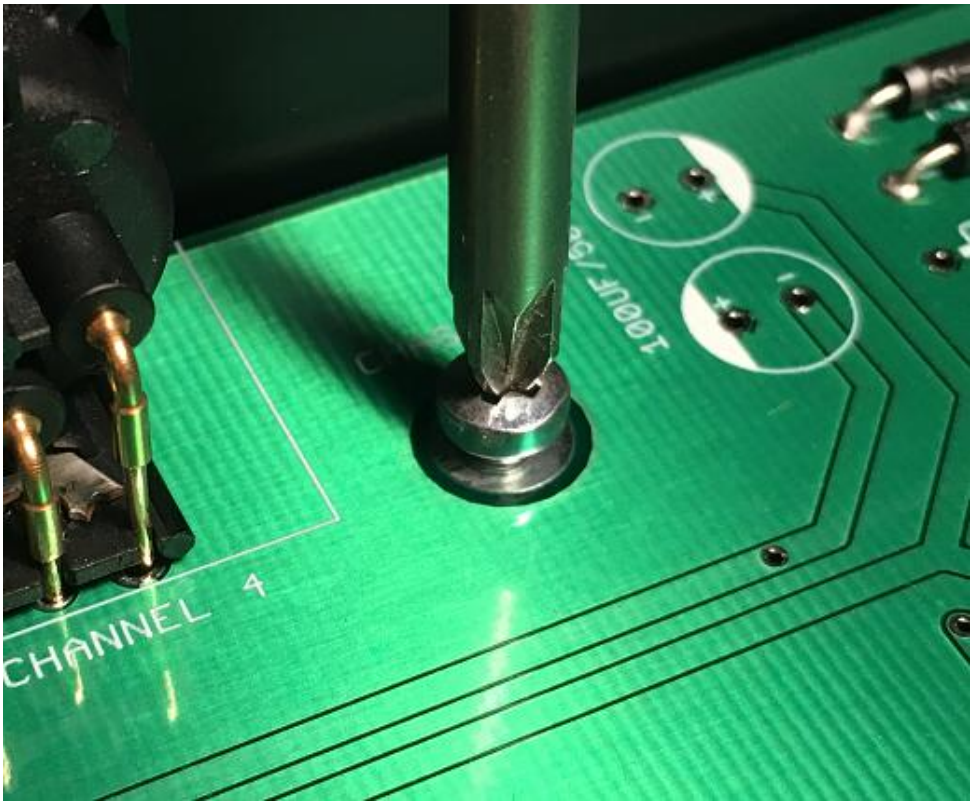


Check each side of PCB:



Find the seven bolts in the order as shown:

And screw the Board to the bottom cover.



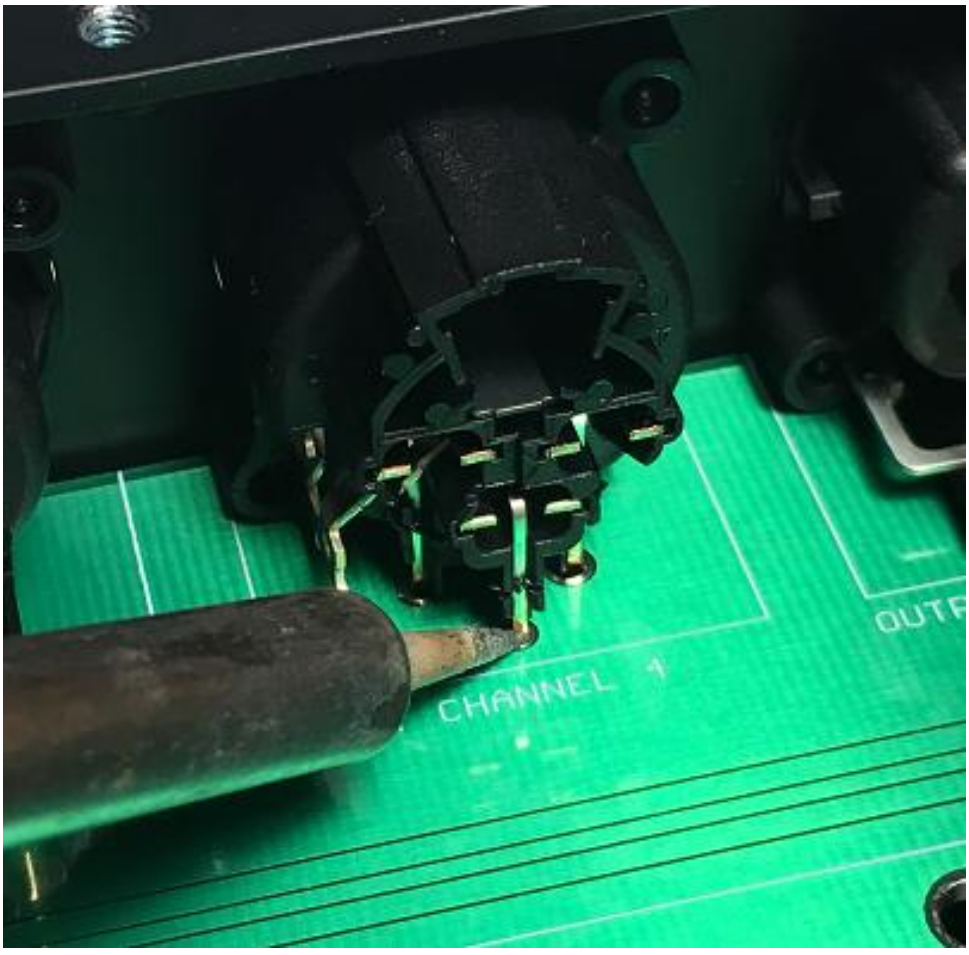
Tighten all bolts.

In the order there are also 16 screws for XLRs:

Tighten all screws too on the back side.

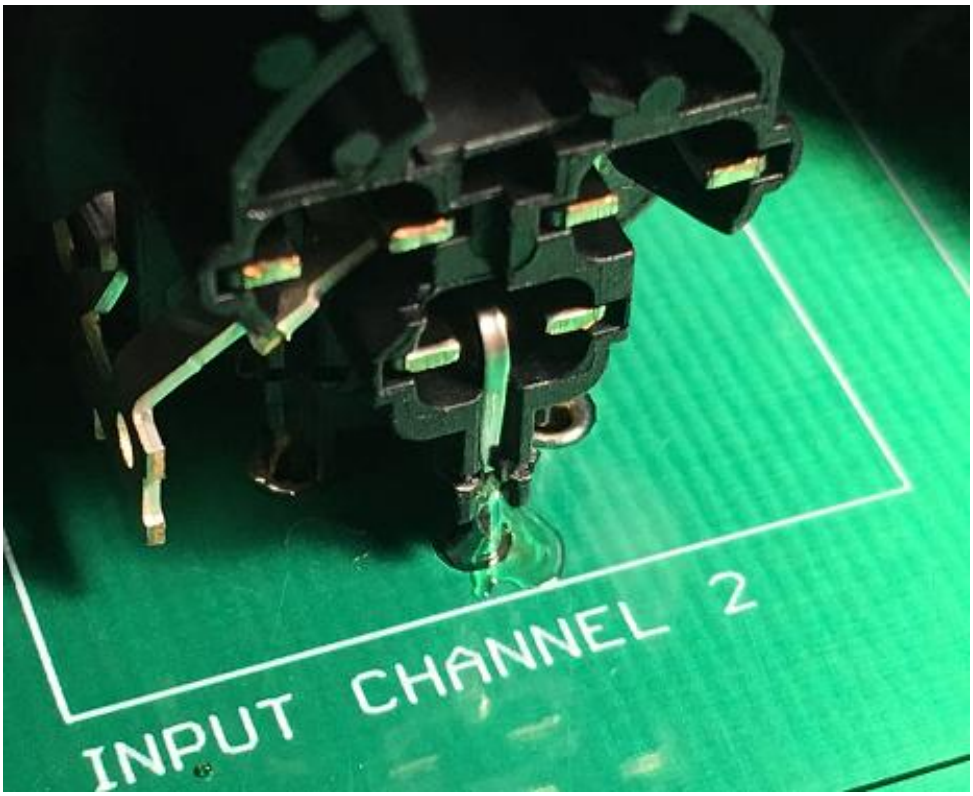
Solder one leg to the board on each XLR.

Solder more than one if you can!

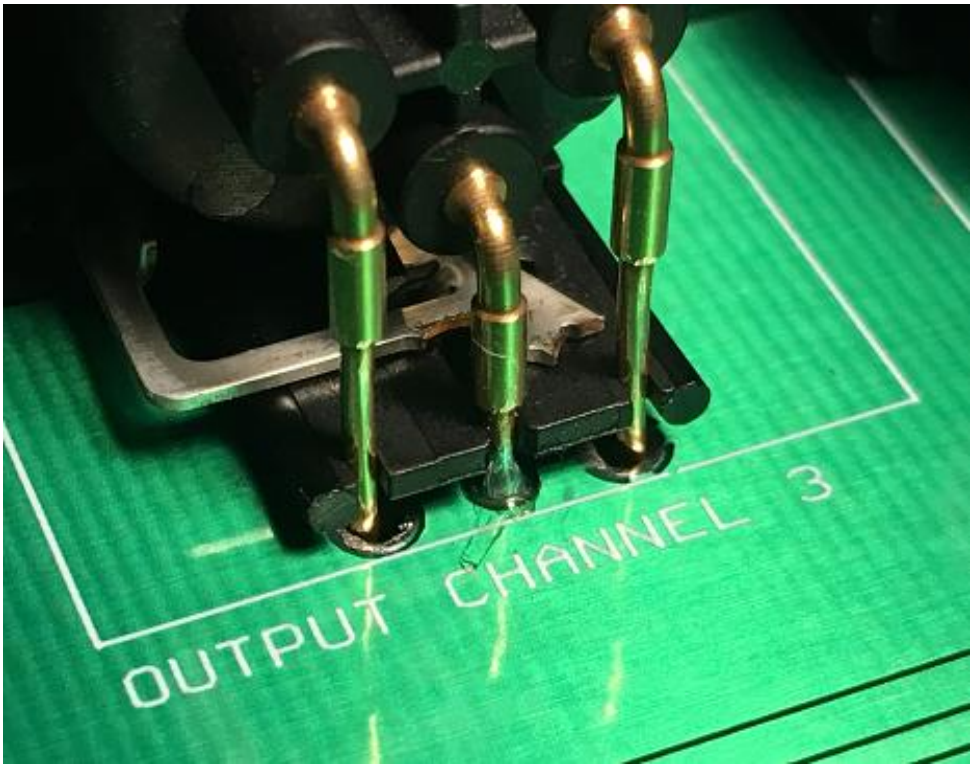


But one will be enough!

Solder any convenient leg.



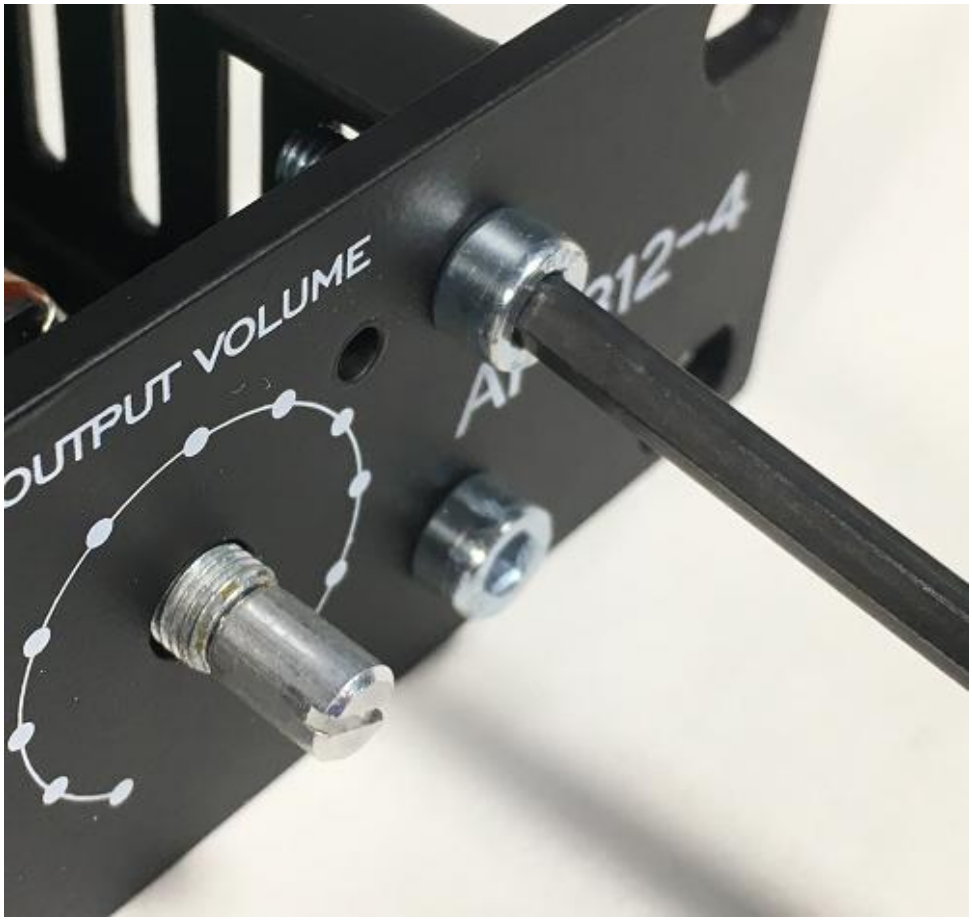
We soldered each of the central leg.



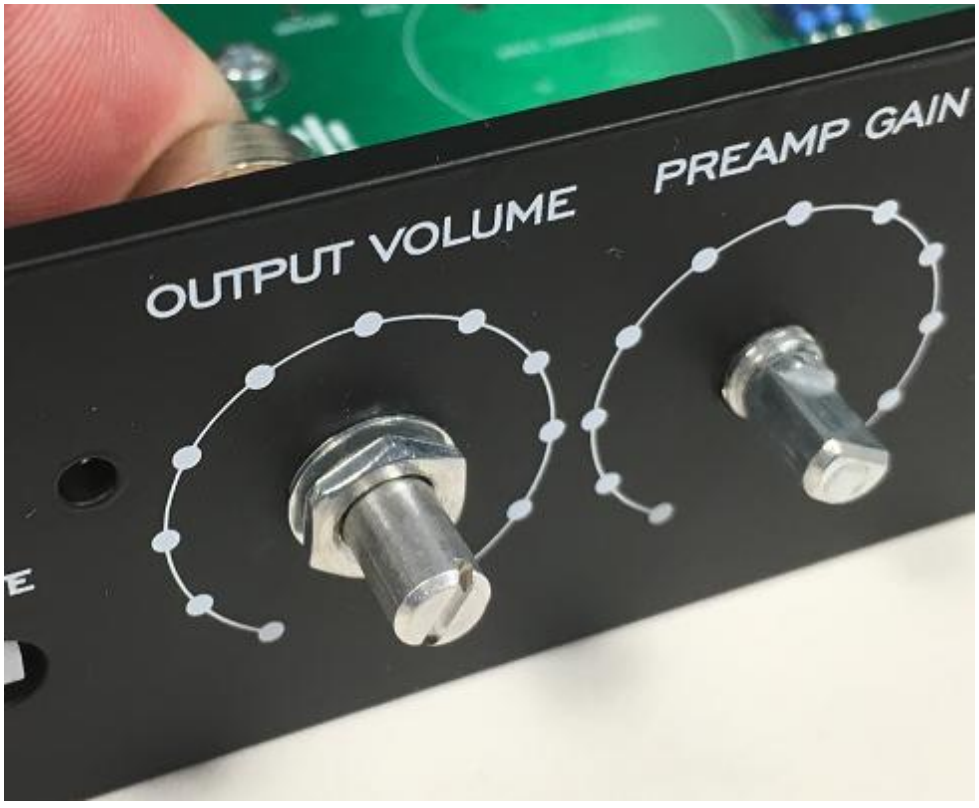
Find it in the order the following bolts for mounting the front panel:

Take the front panel.

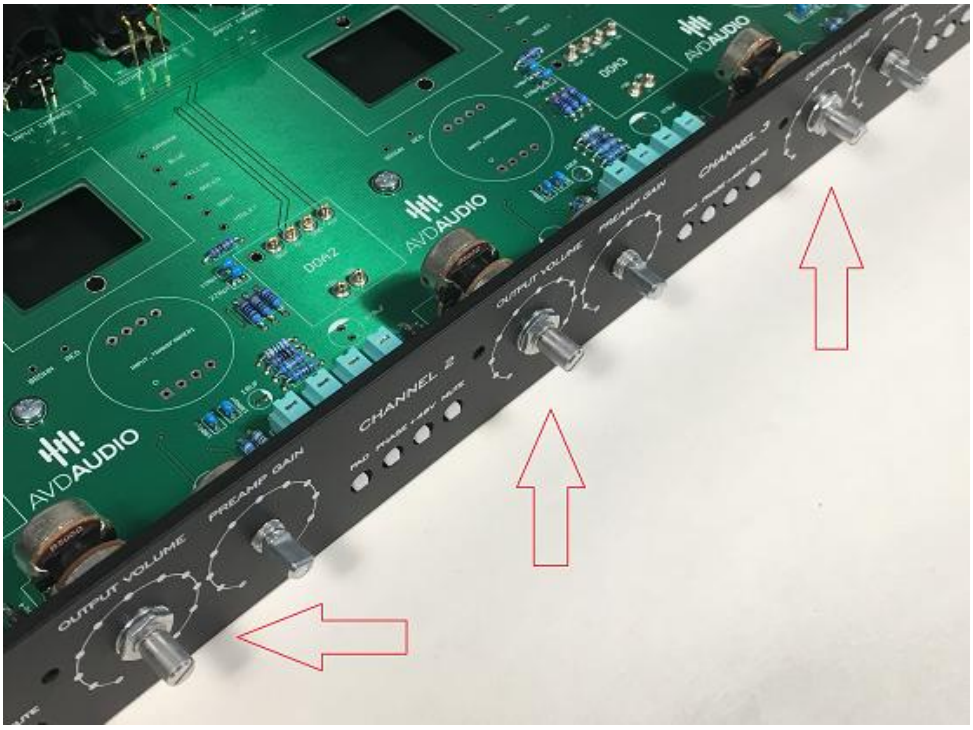
Tighten all bolts on the front panel and front panel:



Tighten the nut and washer a few (can to all) T-Pads



We use this on three T-Pads:



Now! Remove all bolts from the PCB:

We fixed the PCB using T-pads and XLR connectors.

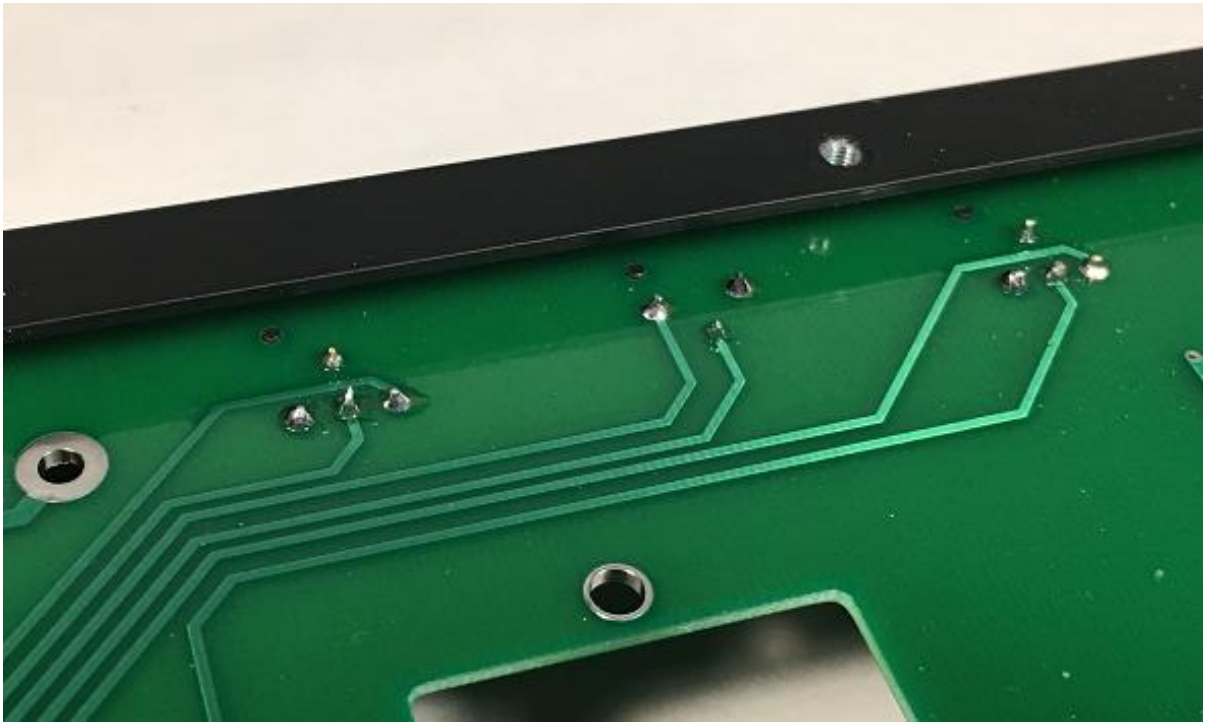
We soldered, on each XLR, one leg, as you remember!

This step help us to fix the board into the case.

And now we can solder and not think that the board can move!

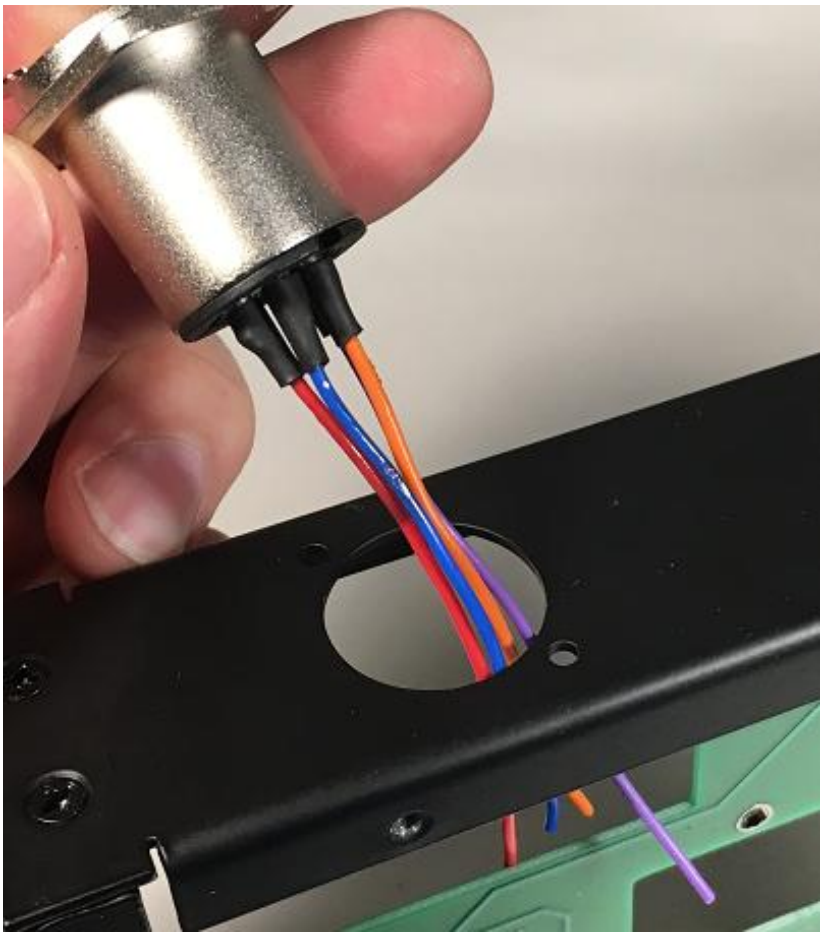
Solder all XLR connectors on the bottom side:

As shows below:



Find in order next positions in the picture:

You need for this step: two of screws, washers, spring washers and nuts.



We soldered wires to power connector before!

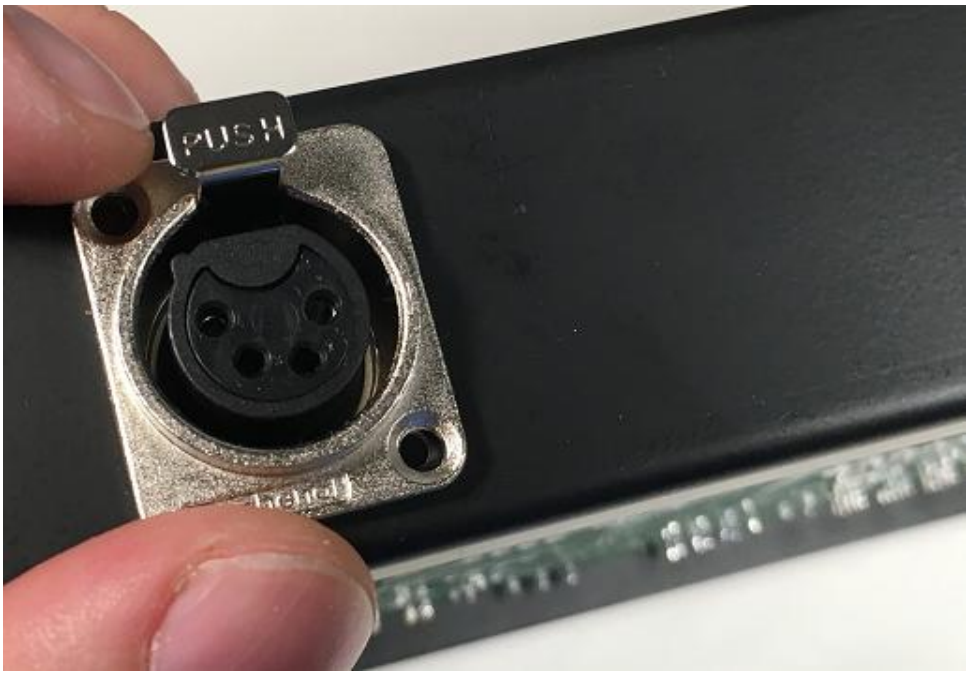
And now we can install and soldering this to PCB.

Install Power XLR into the power hole on the right side on the back.

IMPORTANT!

Usually I using cut wires from output transformer. I had these before. And will not show how I do this. If you want, see next step about install output transformer. And do this step after install output transformer.

After install the power XLR we must to tighten screws.



Install on the back side – washer, spring washer and nut.

Do it for each screw.

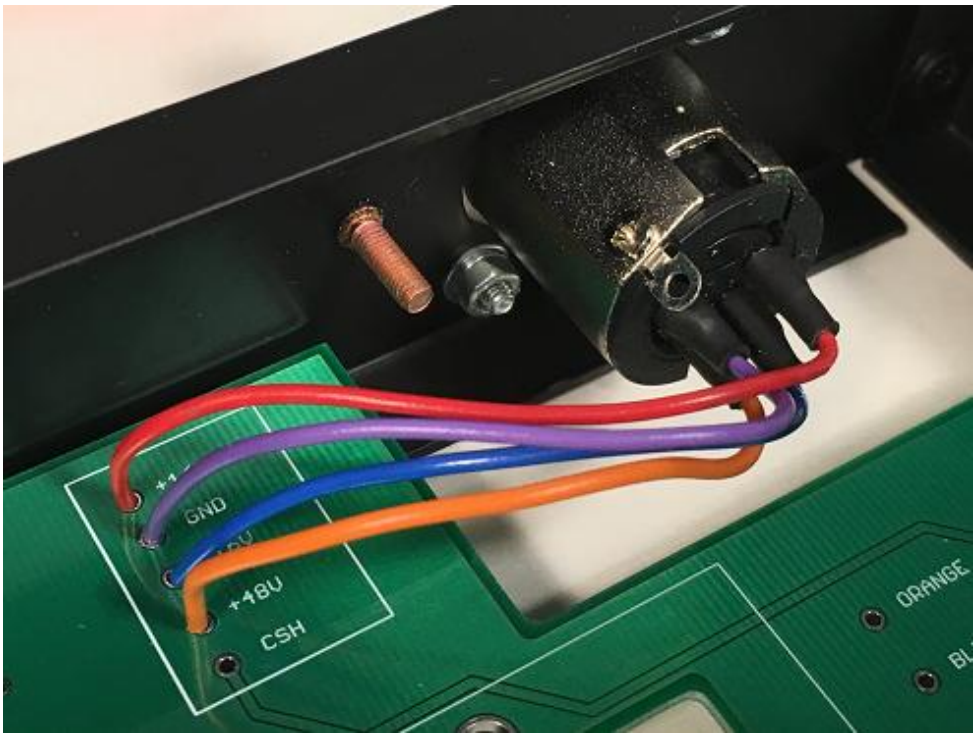
Tighten as we shows it in the next picturies.

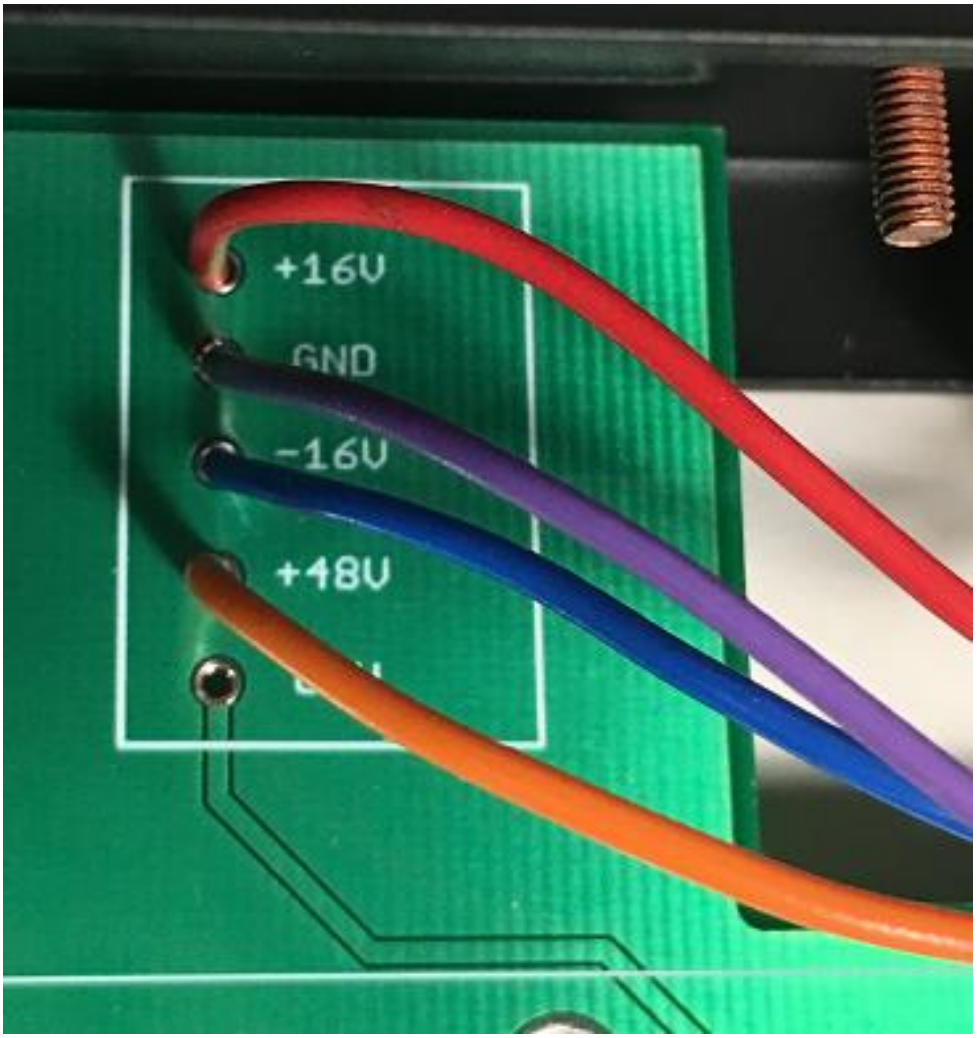
Use a screwdriver and wrench to hold the nut on the back side.

On the back side:

And on the front side:

To be sure! You use wires on the Power XLR. And lengths of these wires be be enough to solder on PCB!





Be careful!

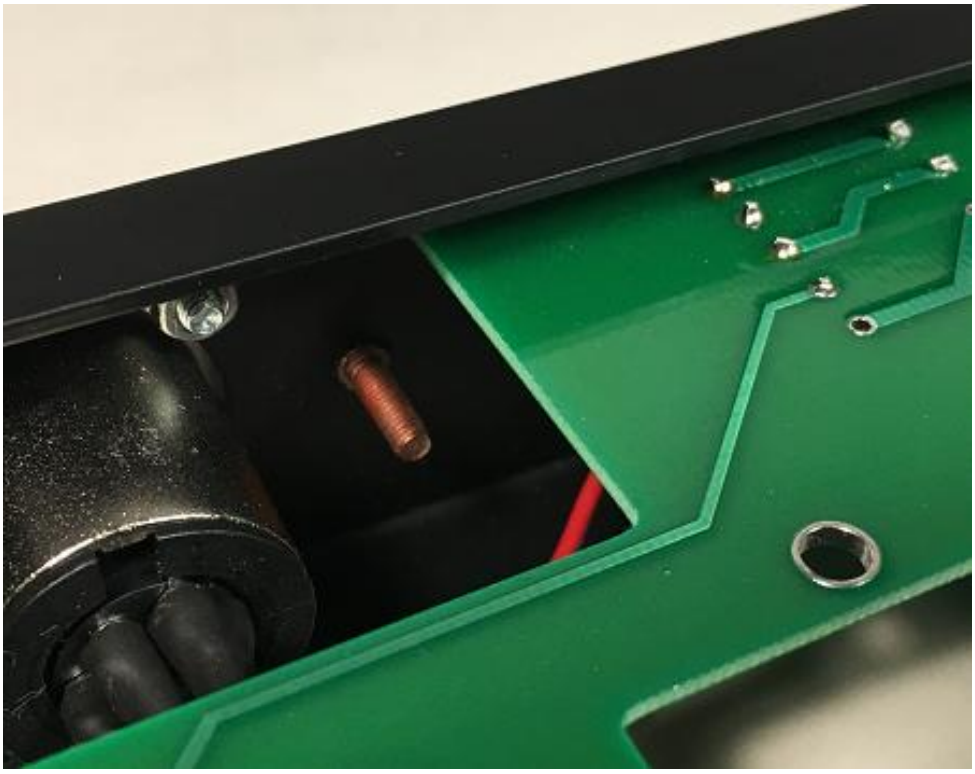
We use the same wire colors as the XLR on the power supply!

This will help to connect all the wires correctly! If you have other colors of wires! or they are different (on XLR power supply and preamp)!

Make sure!

You solder them correctly, to the right place!

And solder all wires!



Trim excess and long legs.

Check all again!

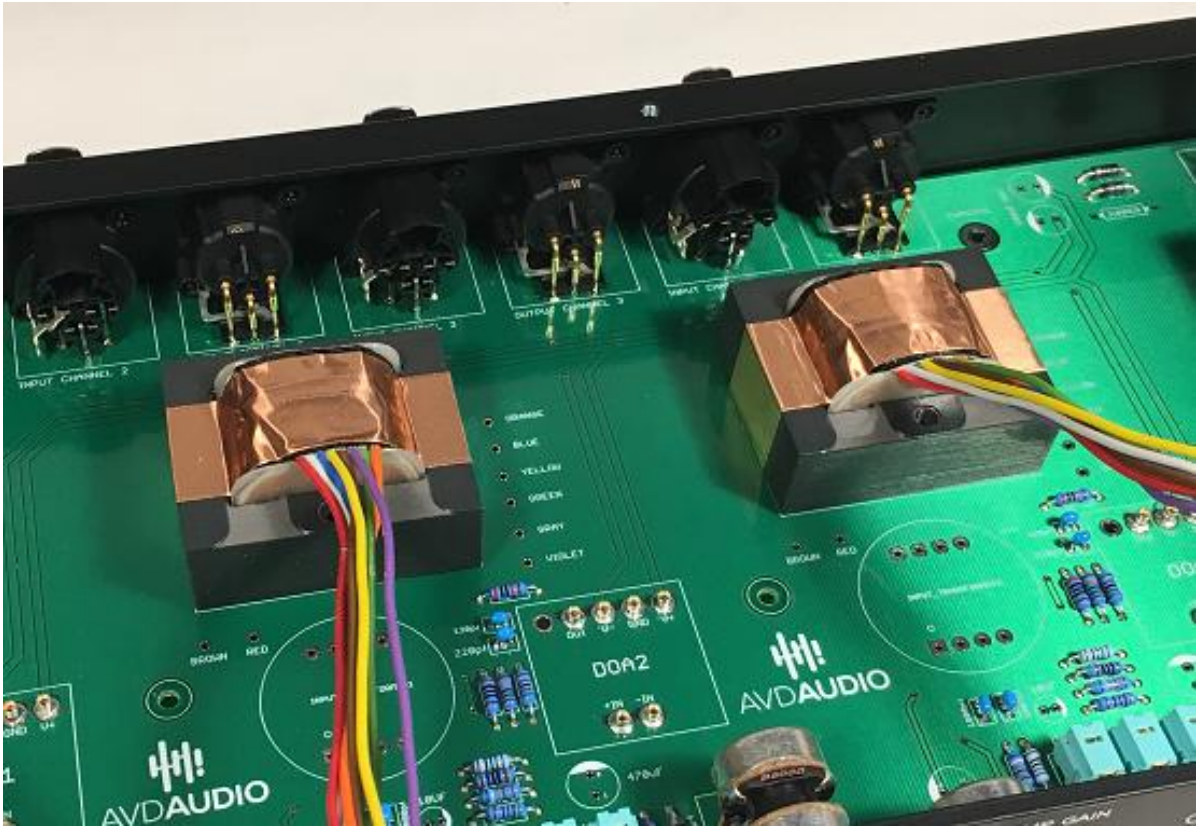
If you don’t have any questions and everything done good…

And we going to the next step now!

The next step is soldering output transformers.

For this step you need:

Four output transformers:

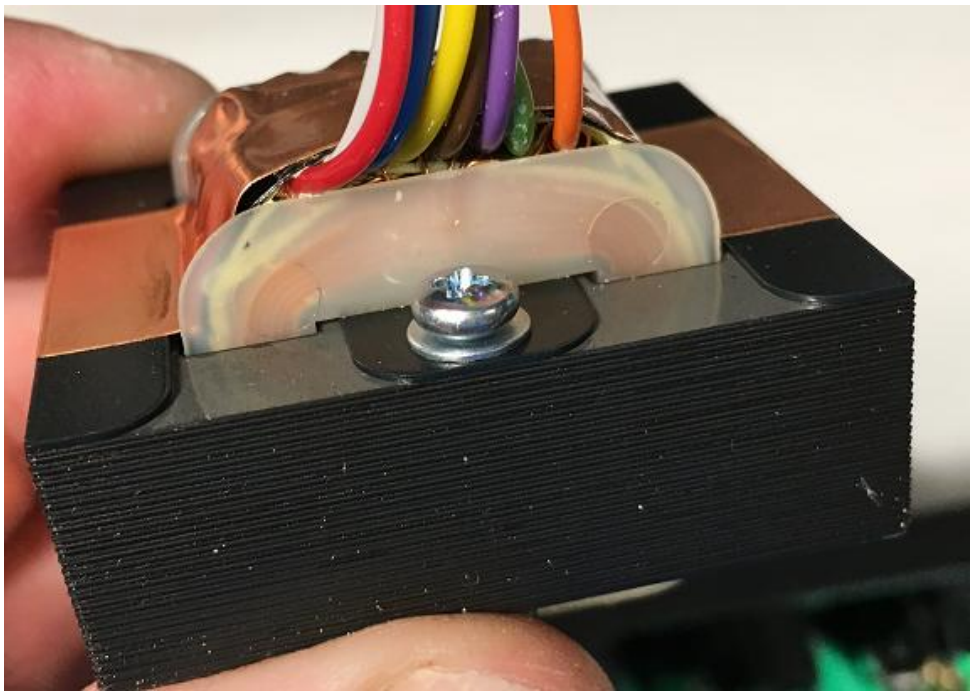


And you will need next:

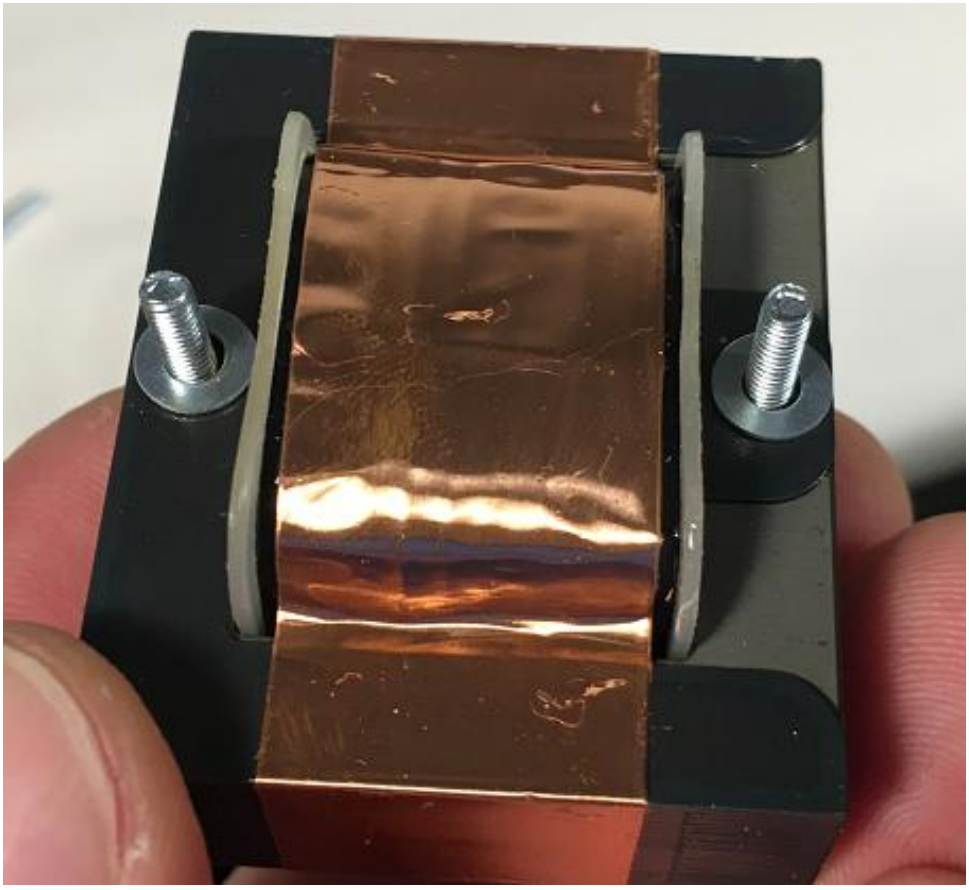
8 bolts, 16 washers, 8 spring washers and 8 nuts.

One washer I use on the top side of transformer

Same for two holes!

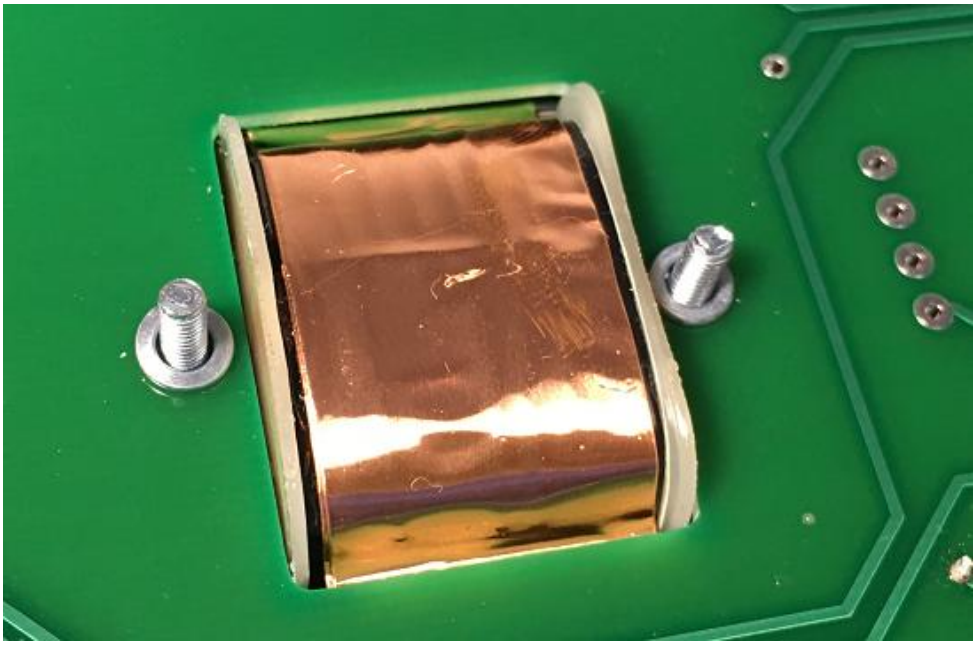


Same washer I use on the bottom side (two ps between transformer and PCB)

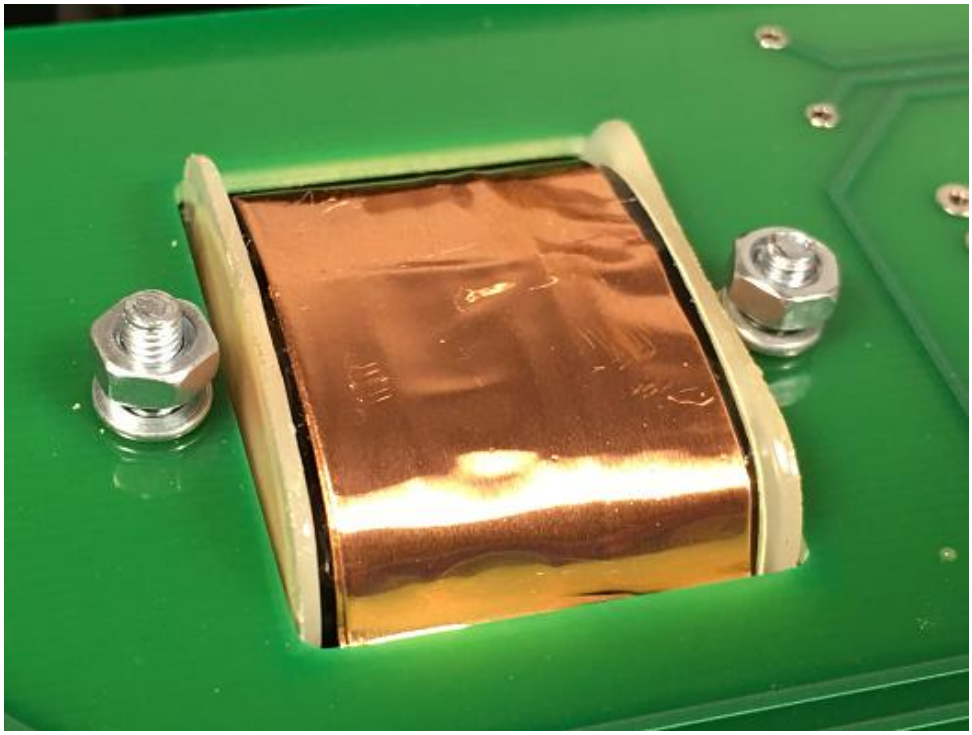


And in the end!

Use spring washer on the bottom side of PCB:



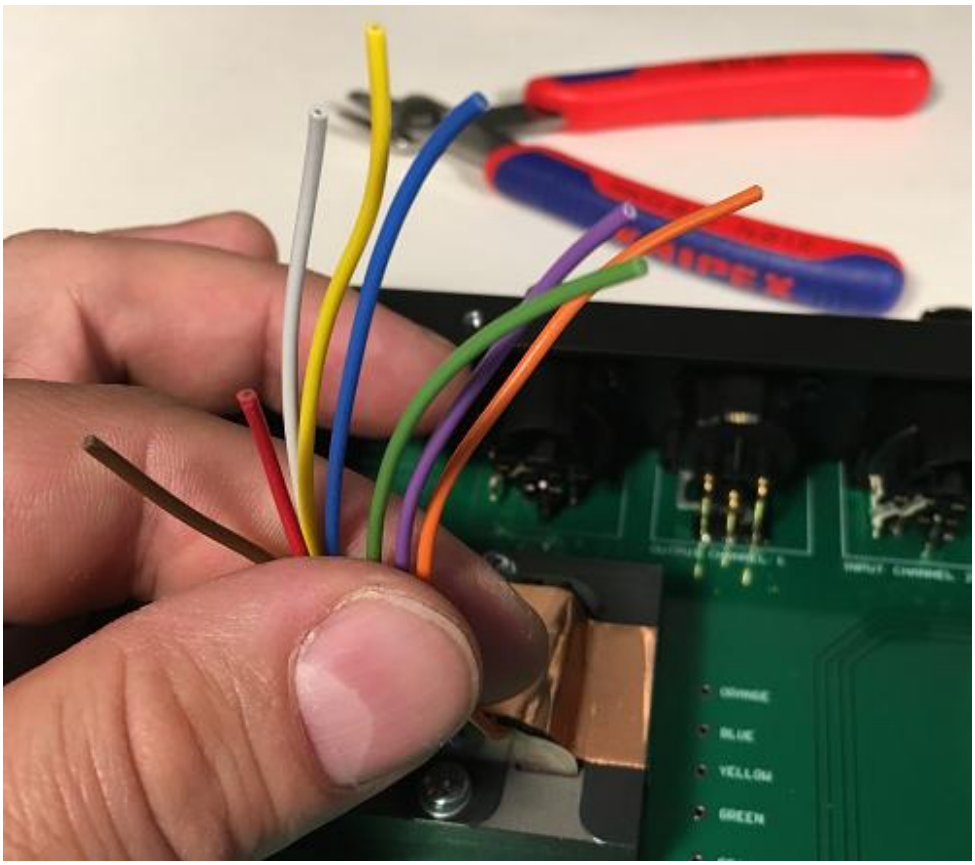
And lock them with nuts:

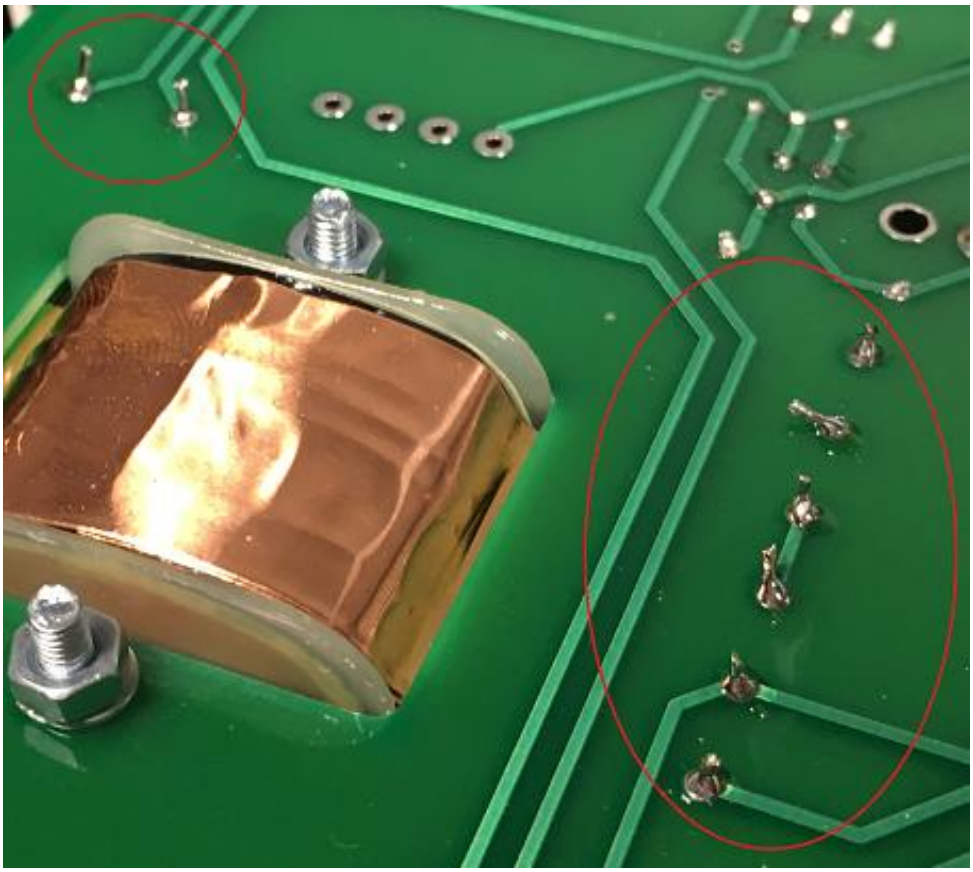


Cut each wires of transformer.

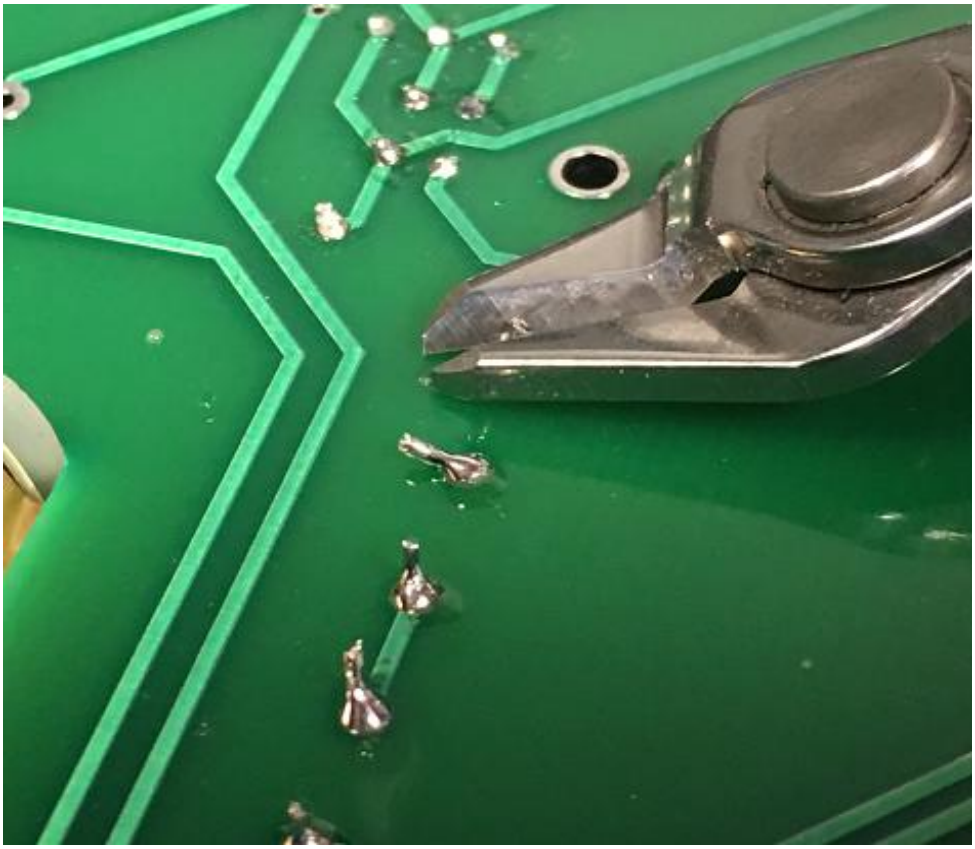
Be sure! Length of each wire enough to solder to PCB!

Check length of each wire before cutting!

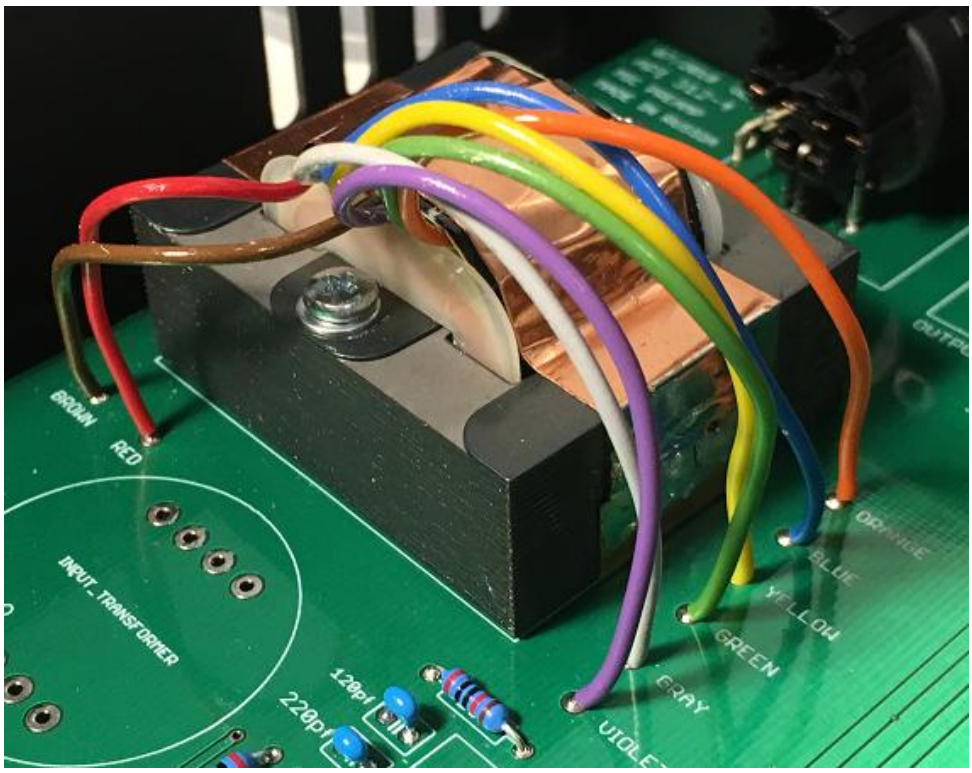




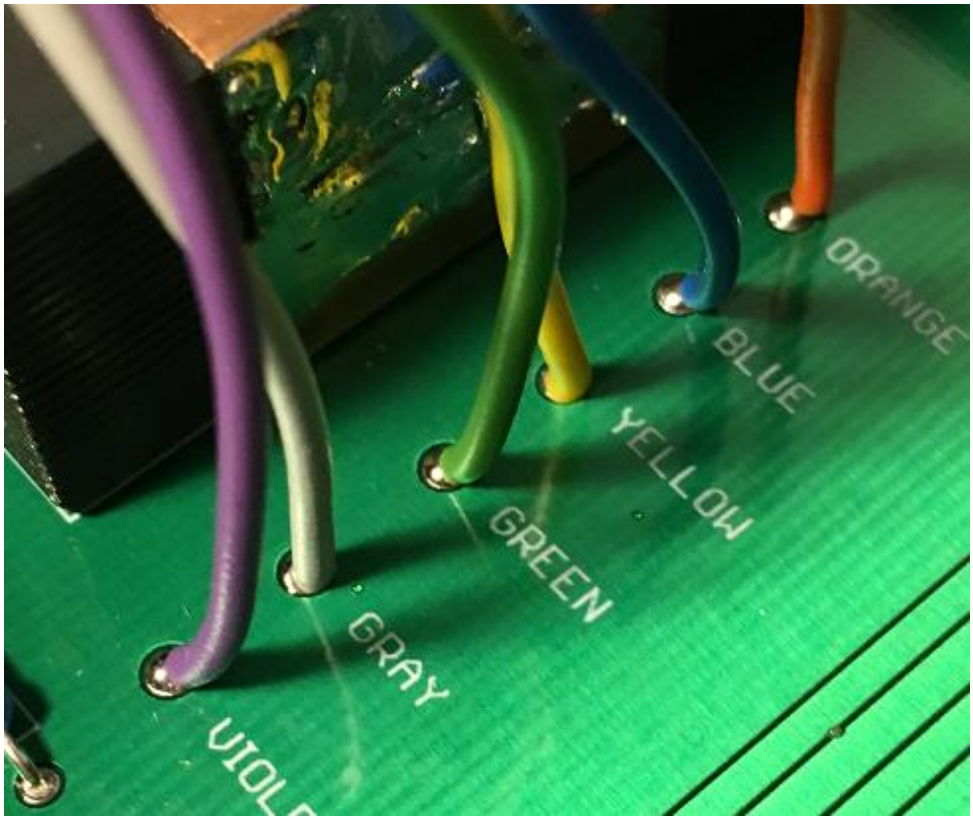
Trim excess and long legs.



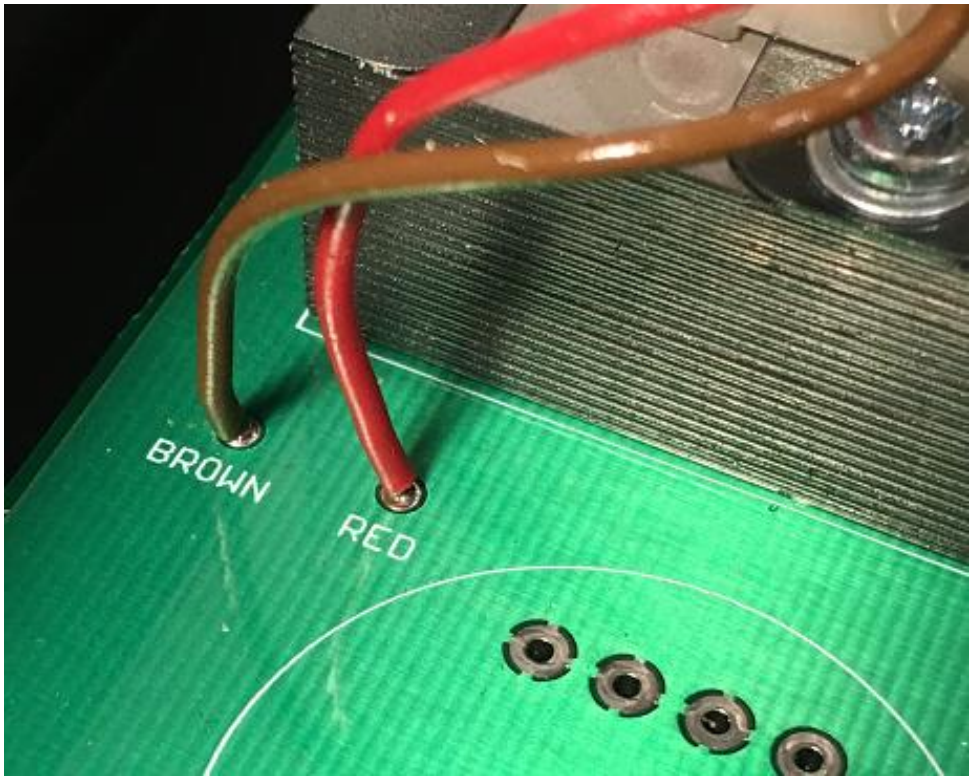
Look how it looks like after soldering!



Be sure! Each color has right place:



BROWN and RED wire are here:



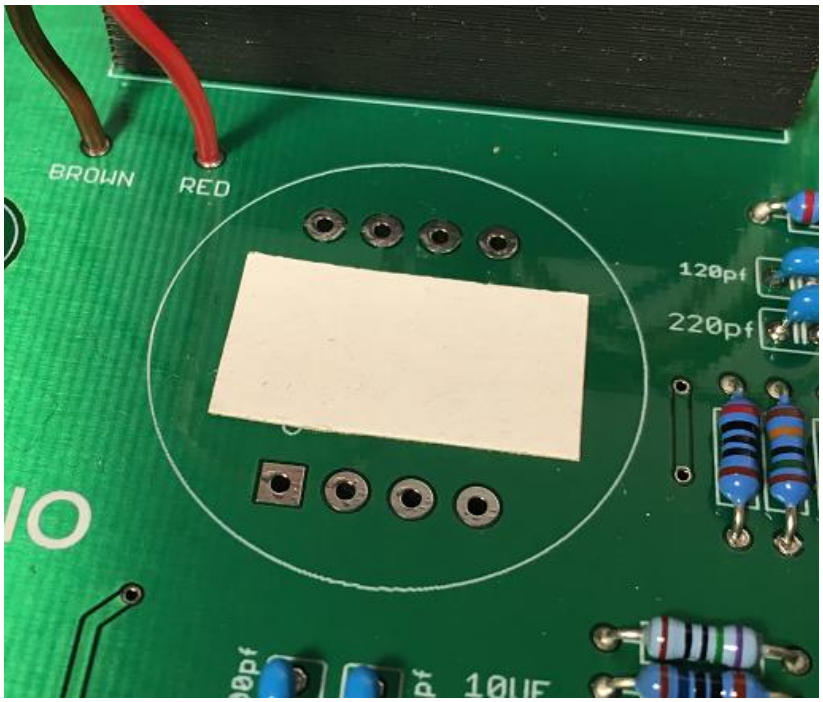
For the next step we need four Input transformer.

This manual we use our TR2622 input transformers.

But if you ordered other transformers! Check you have correct schematic or you to change something on the PCB. Sometimes it could be different Zobel or sometimes without Zobel.

If you don’t sure, contact us please! Or contact with manufacture of transformer.

Use double-sided tape for the input transformer.



Install input transformer.

Be sure!

The black dot on the transformer coincides the dot on the PCB! It is the first pin of transformer!

Flip the board and solder the input transformer as shows below:

How to looks our preamp after this step:

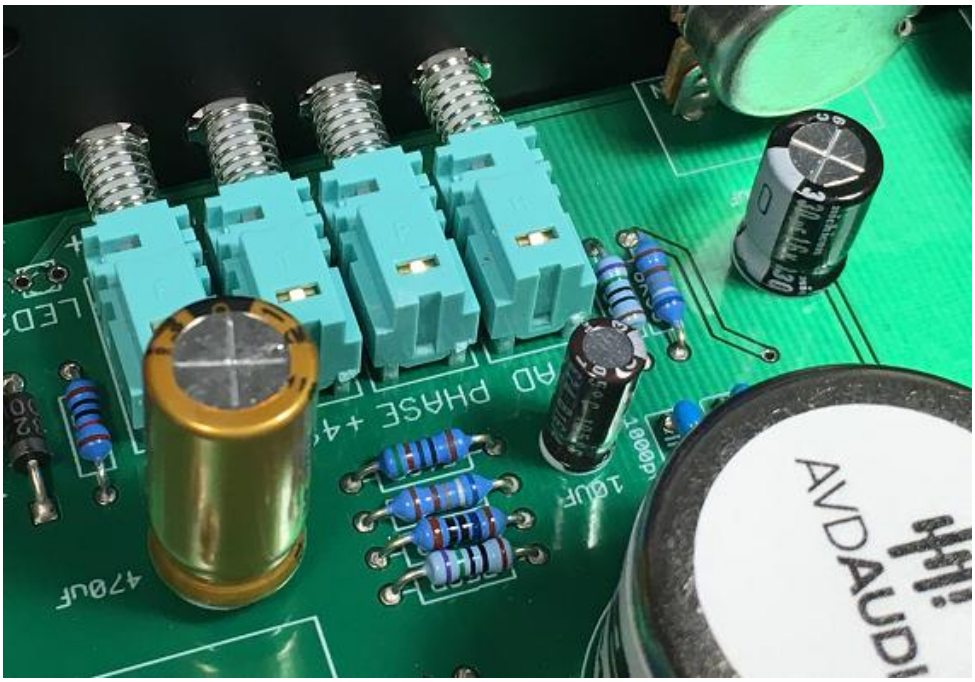
We need to solder some capacitors per channel.

It is 470uf, 330uf and 10uf capacitor.

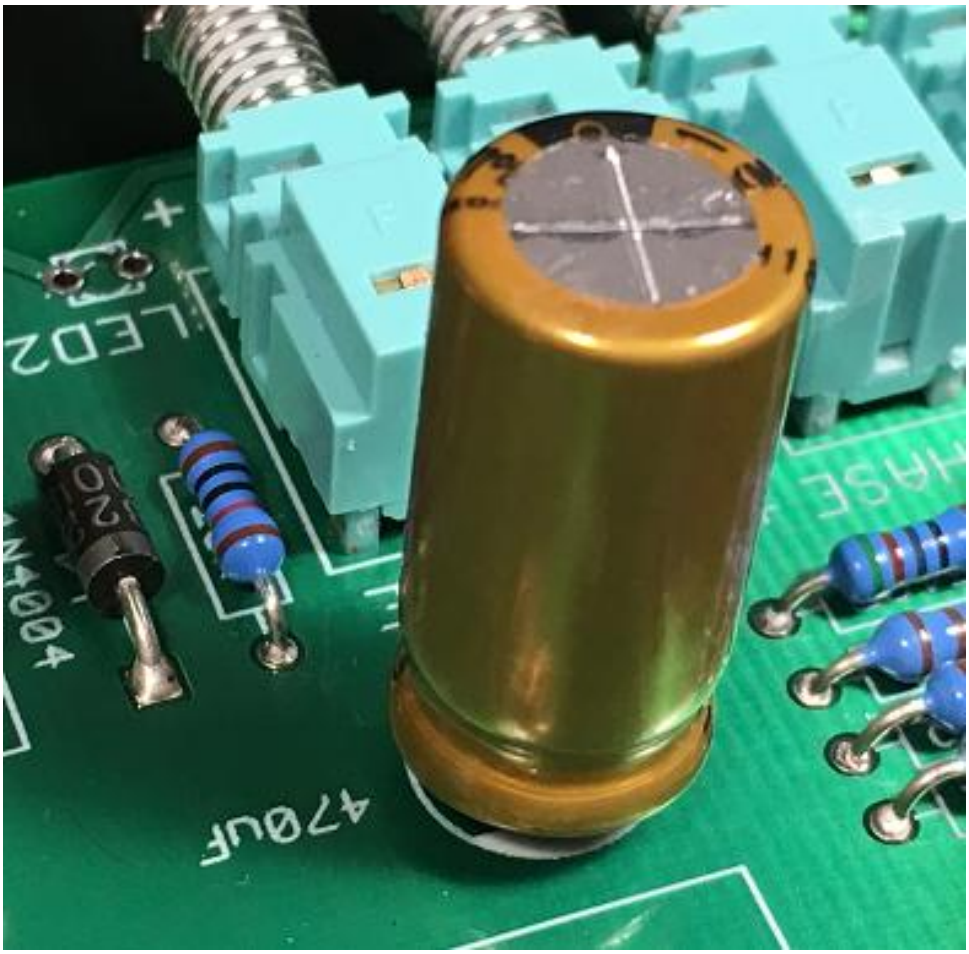
In the picture below you can see all these capacitors.

From left to right side: 470uf, 10uf and 330uf.

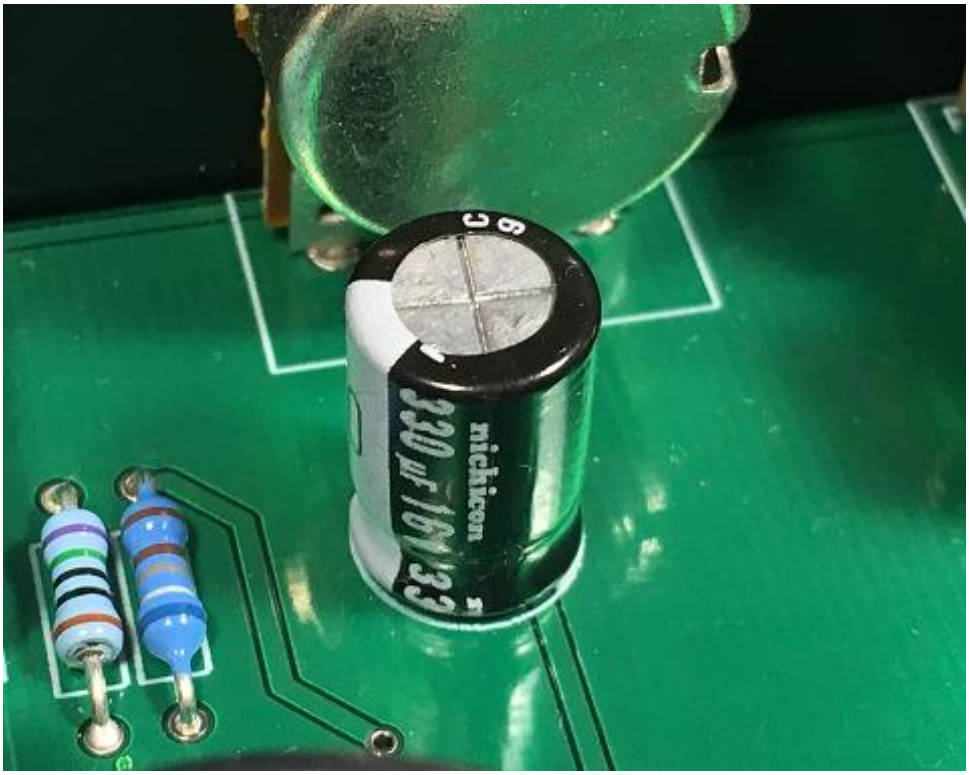
Same volume you can find on PCB.



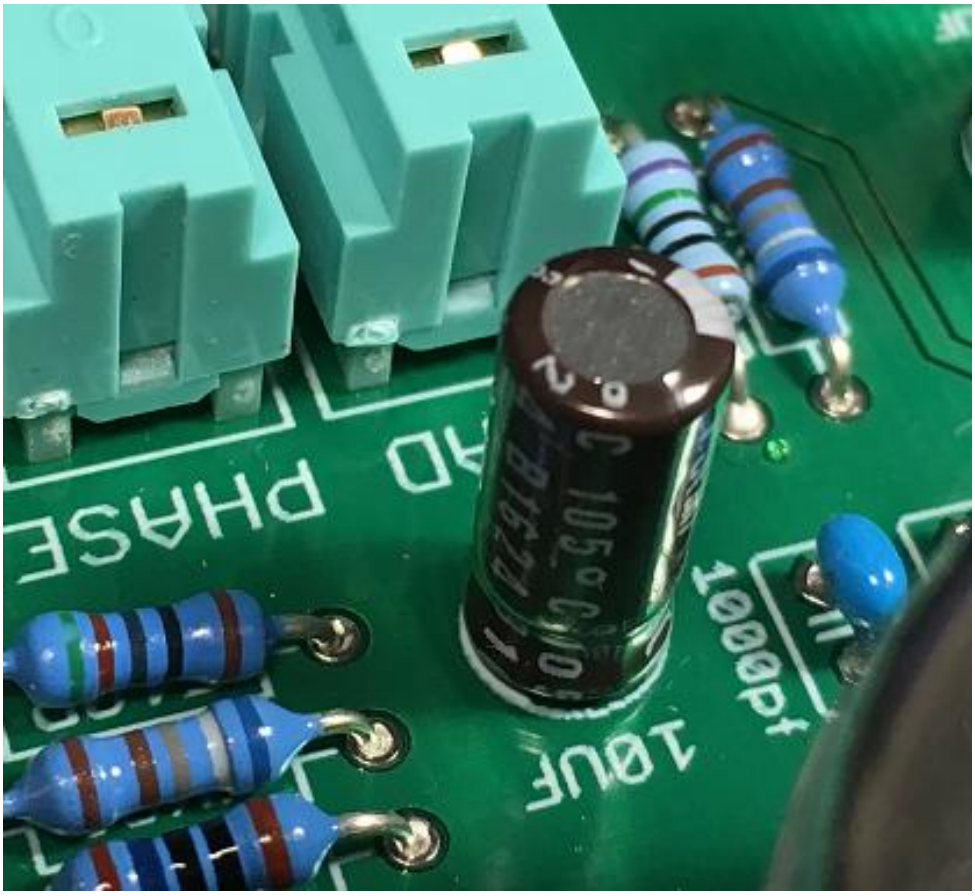
Before soldering! Be sure! You have right position of each capacitor! 470uf is in the picture below:



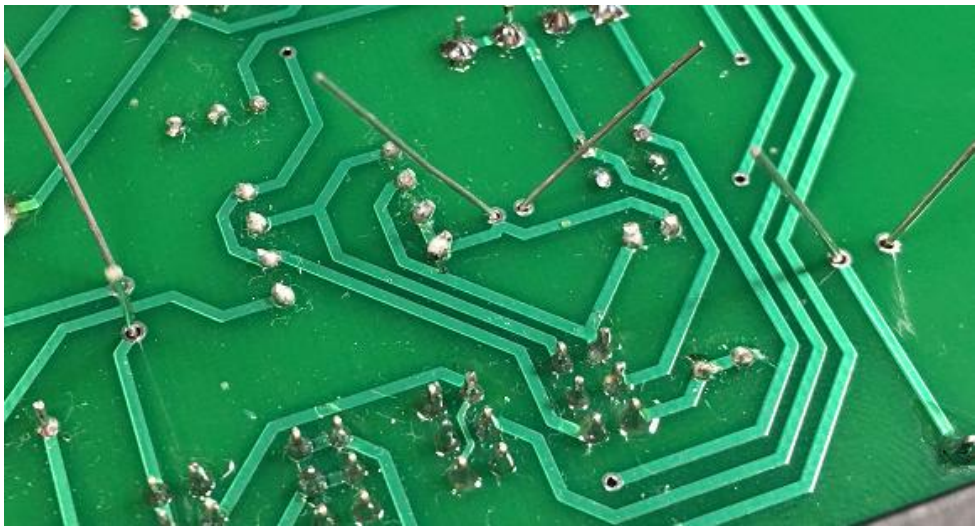
330uf capacitor is bellow:



And 10uf capacitor:

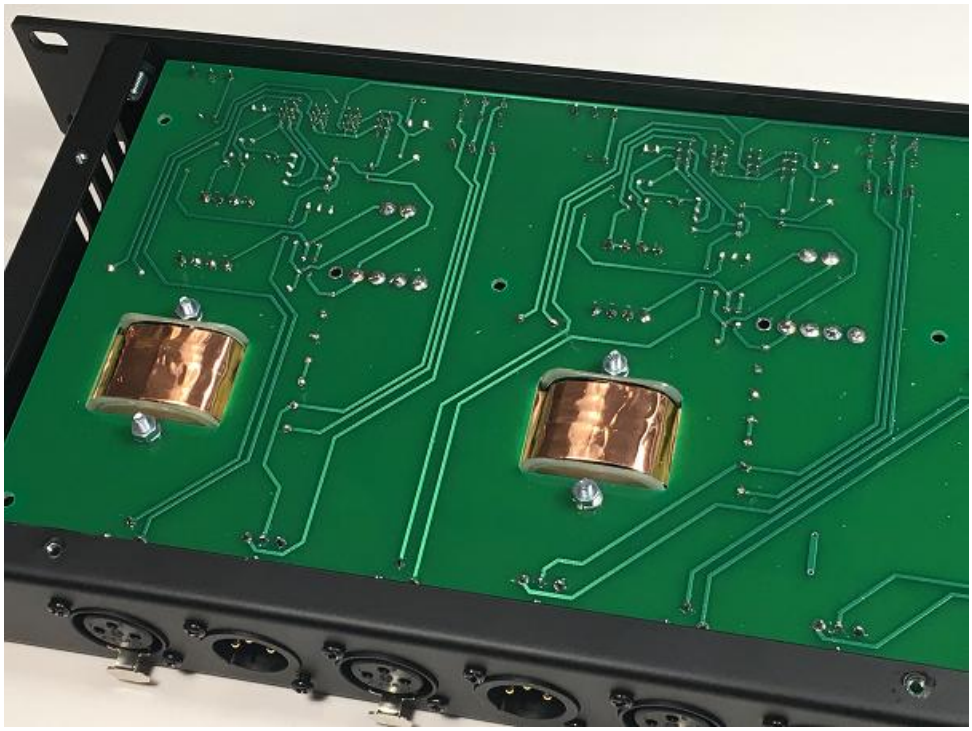


Flip the board and solder each legs.



Trim excess and long legs!

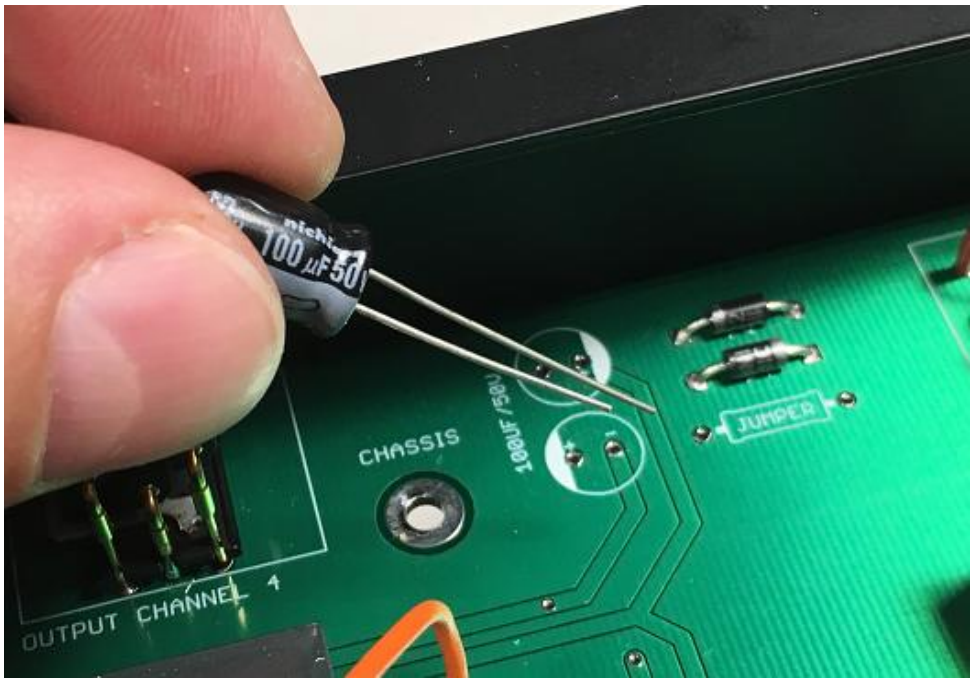
After soldering capacitors check you have everything done correct.



And we need to solder two 100uf power capacitors on the right side of PCB.

Near to Power XLR.

If you do it with completed case. One capacitor near to us be placed with long legs.

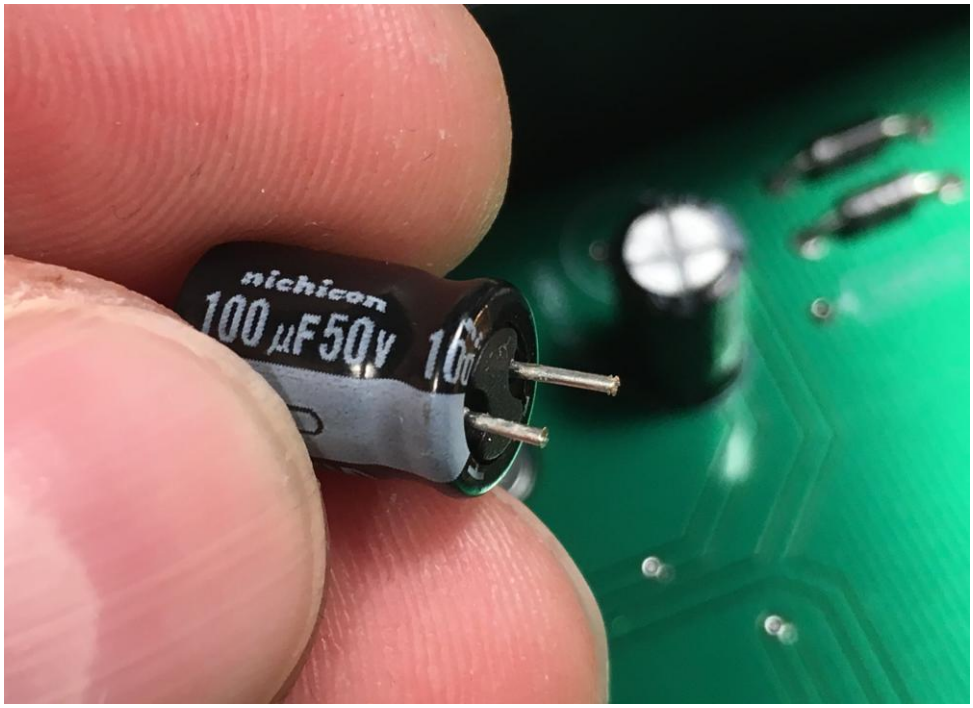


But second one must cut to install on the PCB.

Otherwise, it will rest against by legs into the case!

PCB is 1,5mm thickness. You must have 2,5mm length legs on capacitor!

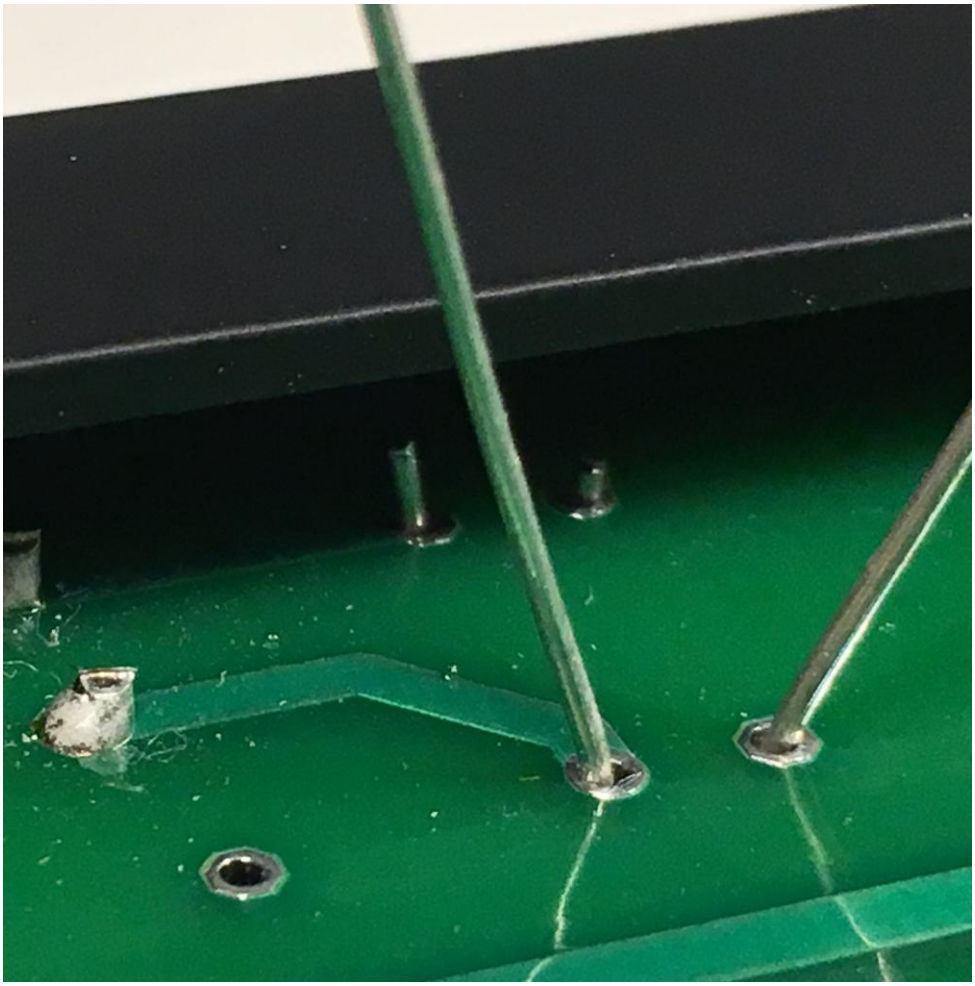
Not less!



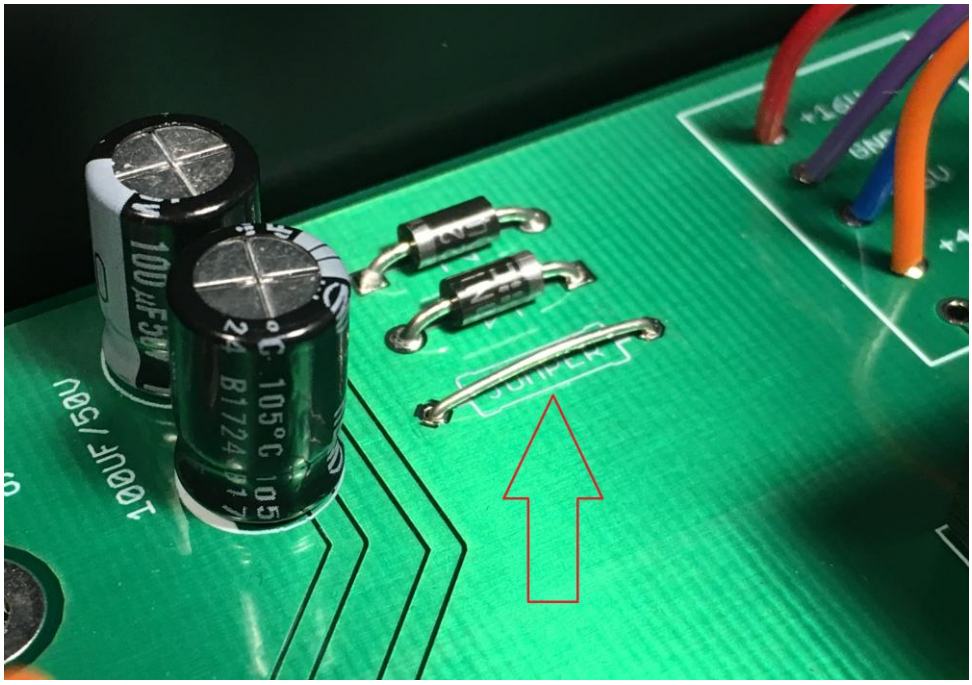
Instal this capacitor first:

Then instal the second:

And soldering all these:



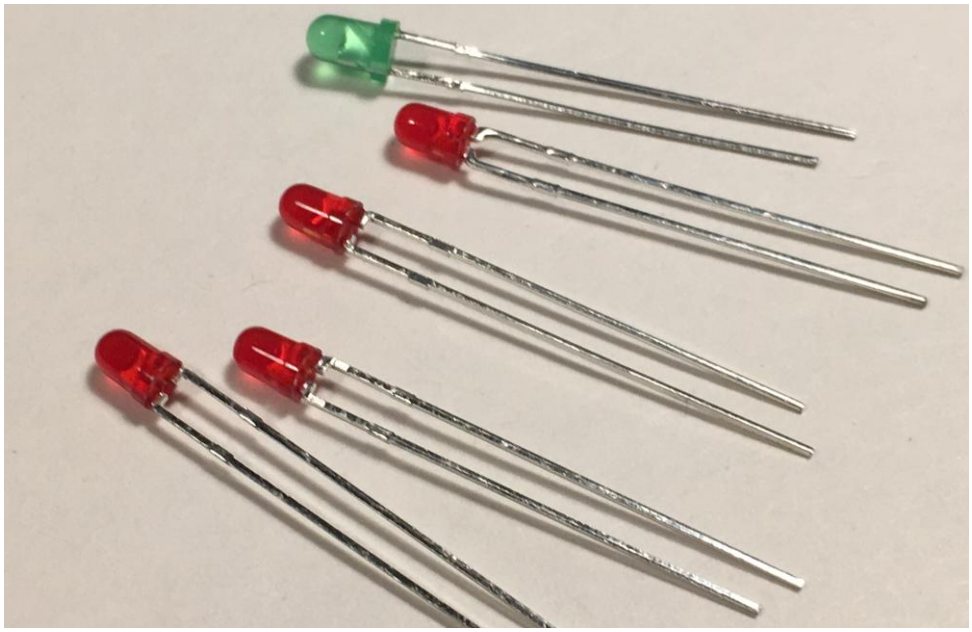
Solder JUMPER to the jumper place:



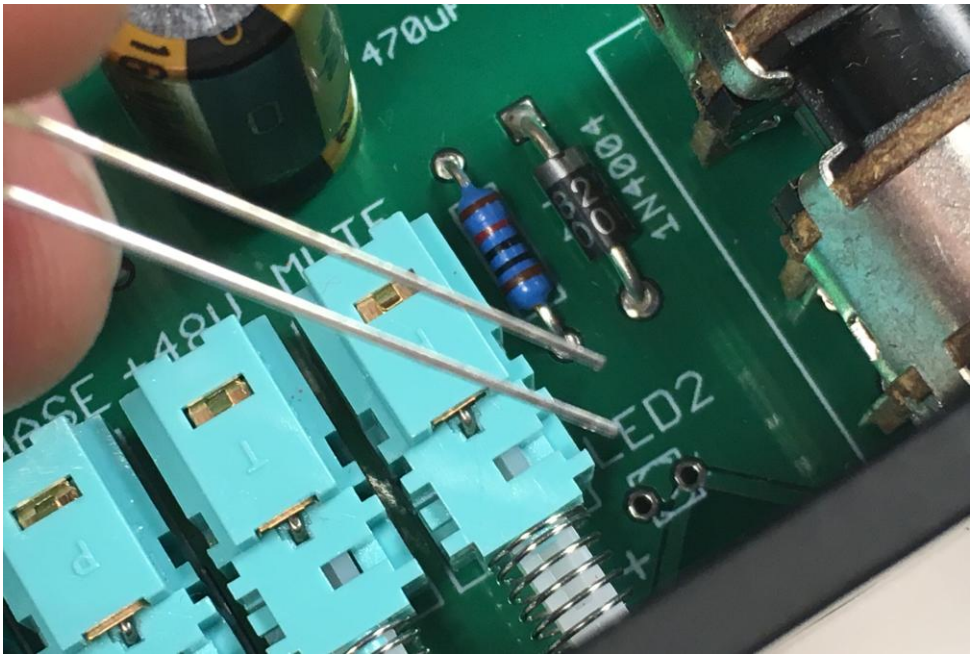
You ordered LED diodes separately.

Find this in your order. I will show you how to install this.

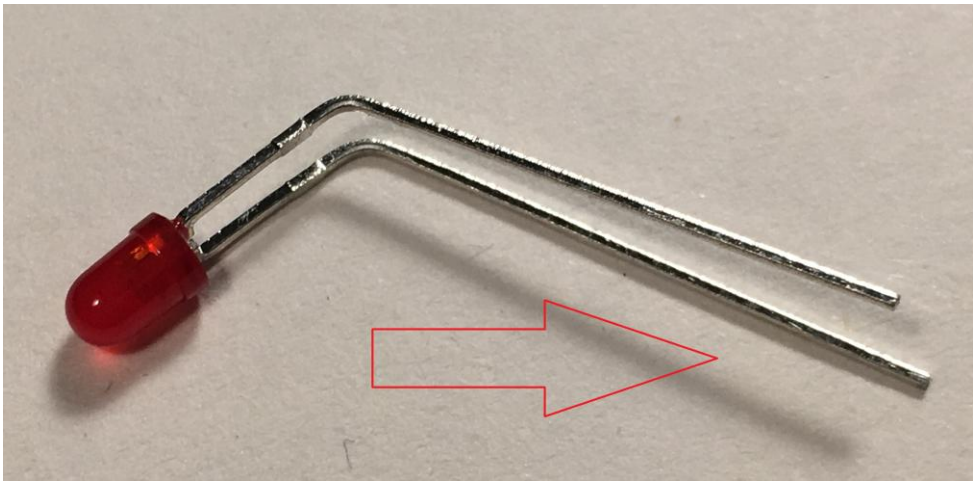
You need four of RED color (+48V) and one GREEN color for power detection.



Longer leg must be solder to left hole marked as “+”



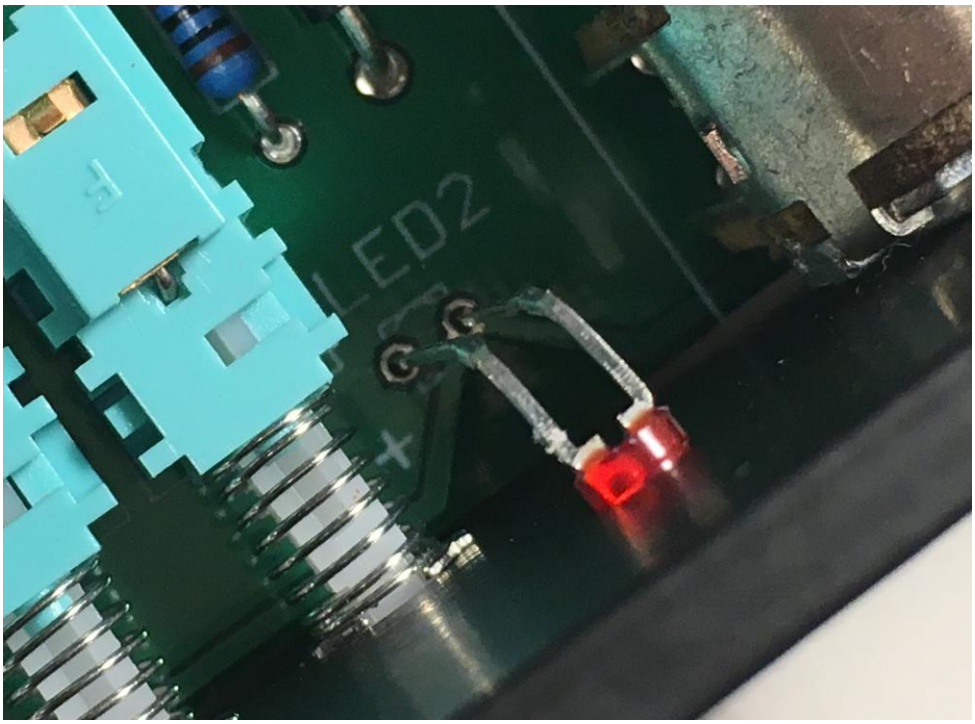
Need to bend LED diode as shown below:



The red arrow indicates: longer leg must be on the left side.

Insert the diode into the hole on the PCB. Then, insert the diode head into the hole on the front panel. The diode should fit very tightly, like a spring. If it comes loose and dangles, you can bend just above to the diode head. Usualy it sits down very tightly.

See picture below:



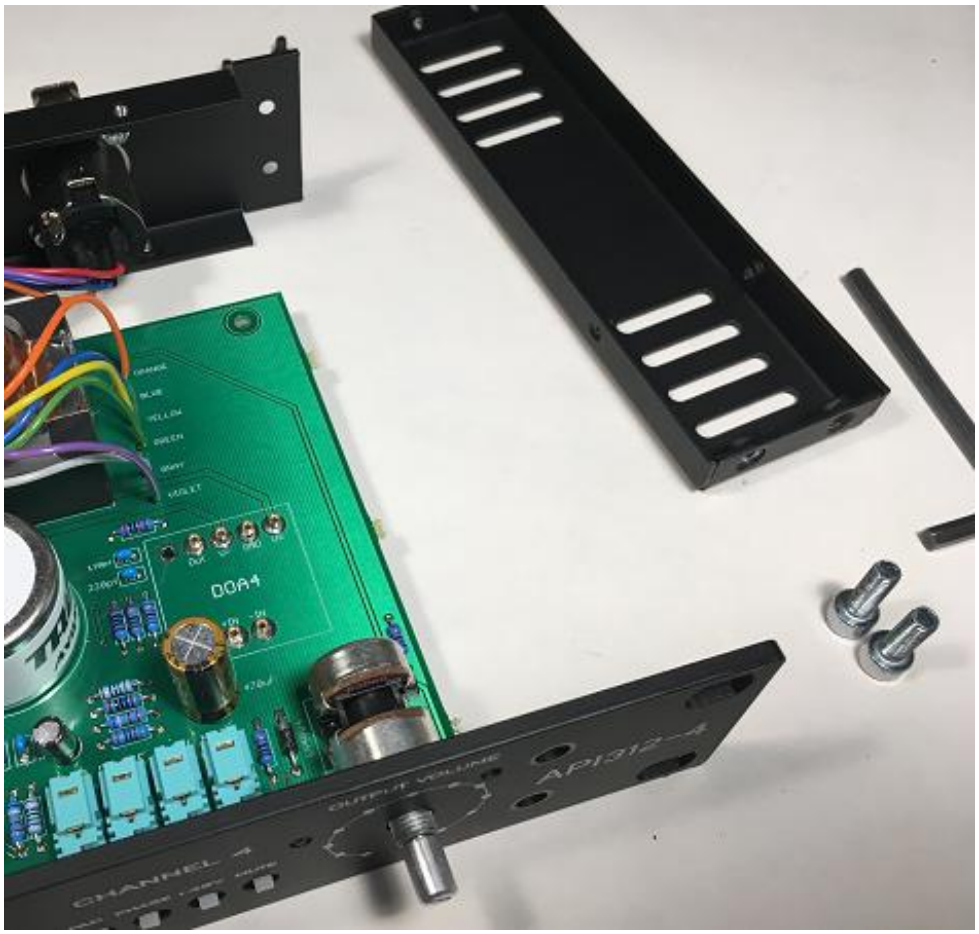
For best result you can press to one leg on the bottom side. And solder other one.

It really can help you to install this diode good.

See below:

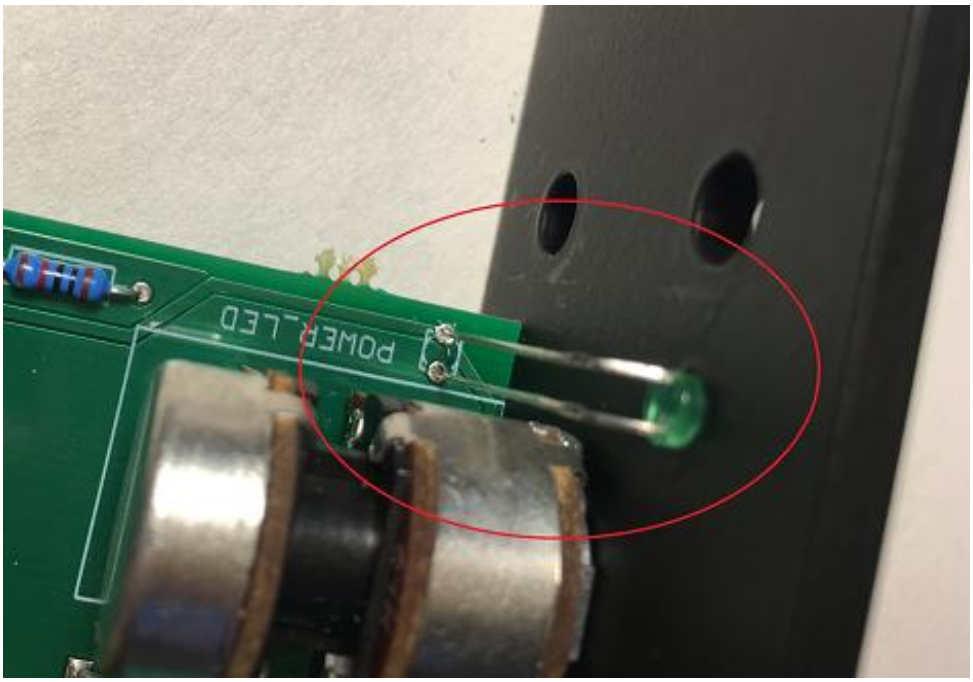
Solder all legs:

Disassemble the right side of the preamp as shown in the figure below:

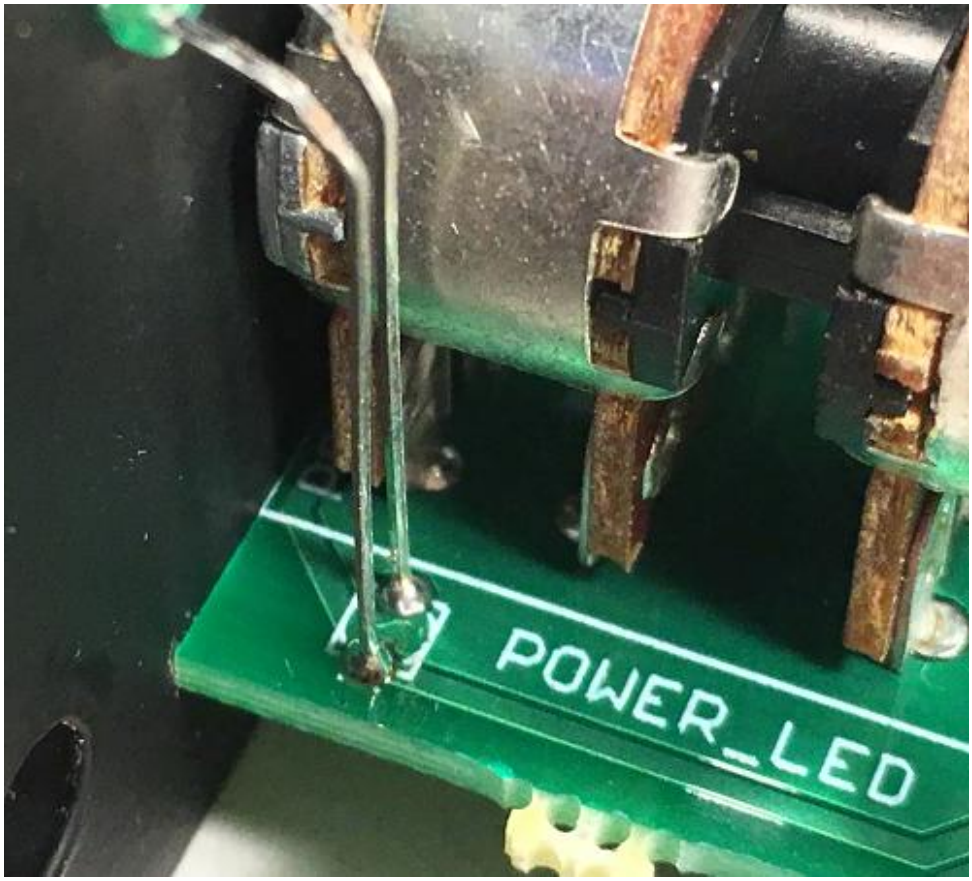


Take Green Led Diode.

Bend and install in the same way as the red diode.



Solder this one from top side of PCB.



Assemble the right side of the preamp again! Or…

At this step we recommend wash the Board!

Use only professional detergent or alcohol to wash the boards. We recommend that you completely disassemble the case and remove the Board. Although it is possible to wash and not remove the PCB. If you have such experience!

Be careful, the board contains components, the ingress of liquid which can lead to their breakage!

Remember! You can also damage or stain the case!

After washing install DOA in each channel:

Install the top cover and tighten all bolts:

Install the caps on the push buttons:

After the last step!

Take the knobs you ordered.

Set all control knobs to GAIN and OUTPUT.

The MP312-4 Preamp is now complete!

Congratulations!

Wish you the best recordings with our staff!

For comments or recommendations send mail please to: info@avdaudio.com