



VC Divider Assembly manual

Thank you for your purchase of the SSSR Labs VC Divider DIY Kit!

This manual will help you assemble the VC Divider quickly and easily. Follow the instructions!

As you may know, the kit is available as a set of options:

- PCB (+ required micro-controllers)
- Aluminium front panel
- Parts kit

If you have decided to purchase just a PCB and maybe panel, you may need to purchase the rest of the parts from another source. However we suggest that you purchase the full kit if you do not have most of the required components.

Regular electronic parts can be purchased at component stores. For your convenience we have made a Mouser project containing all the necessary parts, except the hardware.

<http://www.mouser.com/ProjectManager/ProjectDetail.aspx?AccessID=21f3c123e1>

Basic recommendations

For assembly you need: a soldering iron, solder, flux or rosin, a few sheets of paper, small side cutters, pliers and a small screwdriver.

It's a good idea to place some sheets of paper on the table before soldering, especially if it is your mom's glossy dining table. (Mum's for you Brits). It's also good to use a wet cellulose sponge to clean the tip of the iron as it gets dirty.

The fastest soldering can be achieved with a temperature controlled soldering iron with a clean and sharp tip and rosin-core solder. You may also use regular thin solder (less than or equal to 1mm diameter) and liquid flux such as rosin powder dissolved in alcohol. The key to fast and accurate soldering is proper heat distribution. Solder needs a clean and hot surface to trans-

Suitable right-angled mini-jack sockets can be purchased at Thonk:

<http://www.thonk.co.uk/shop/pj302m/>

Suitable potentiometers and knobs can be purchased at Small Bear Electronics:

<http://www.smallbearelec.com/servlet/Detail?no=693>

<http://www.smallbearelec.com/servlet/Detail?no=707>

It's OK to use pots of any value between 10K and 100K with linear (B) characteristic. The Full kit contains 50K pots. You can only use miniature 1/2" (12.7mm) knobs with the bundled front-panel.

Attention! If you are an experienced DIYer and you are going to build the Eurorack version, please read carefully steps 7-12 of the "PCB Assembly" section before soldering any hardware. You may skip the rest of the manual. You have probably already read similar instructions many times before.

fer. Flux dissolves the fat on the surface it is applied to, and boosts thermal exchange between the iron and the surface.

So, instructions are simple: apply some flux to a pad, insert the lead, heat the pad for a few seconds and then apply solder. With proper heating it will distribute quickly and uniformly and you will get a small and accurate soldering joint. The ideal soldering joint should cover the pad all round and should form a concave cone shape around the lead. Don't heat up semiconductors such as diodes, transistors and ICs for more than about 10 seconds. (You may check the exact critical time and temperature in the datasheet) When soldering an IDC header, it is practical to connect a cable to hold the header's pins.

It is recommended to check the actual val-

ues of resistors *R1*, *R2*, *R4*, *R5*, *R12*, *R13*, *R15* and *R16*. (7.5K, 30K, 5.6K, 27K). For this project it's important that these resistors are within the tolerance, so if some of the resistors have an actual value beyond 1% of the rated value, you should find another that matches correctly.

Keeping the recommended assembly sequence, you can simplify the process: fit succeeding groups of components on the PCB, then flip the PCB over, put it on a table, keep it pressed to the table by one

hand and solder with the other hand.

It's recommended to remove the remains of the flux from the soldered PCB. One of the best removers is Flux-off spray. You may also scrub the board with a toothbrush wetted in ethyl-benzine 50%/50% compound, acetone or isopropyl alcohol. Immediately after cleaning, dry the board with a hairdryer.

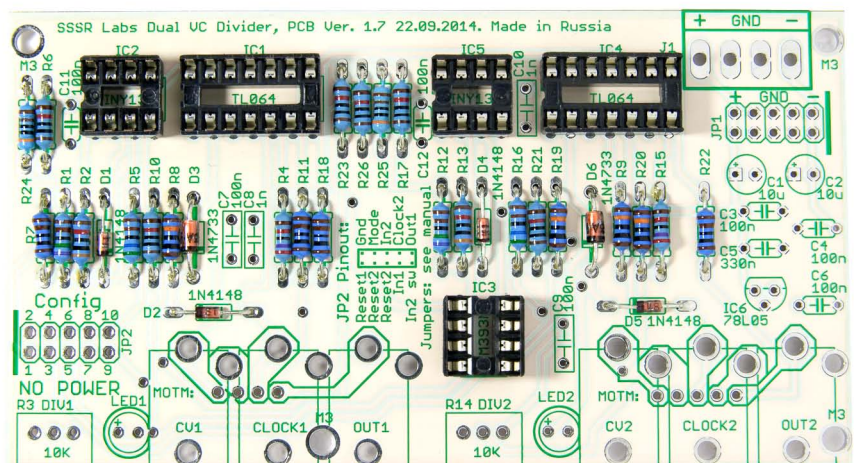
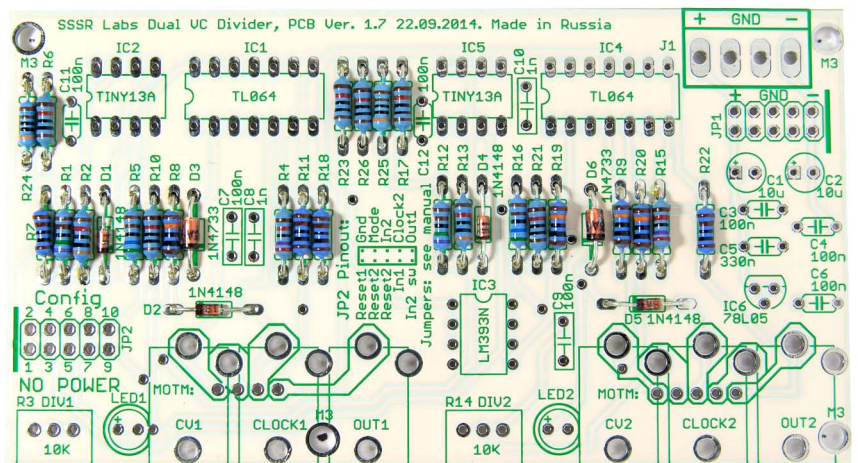
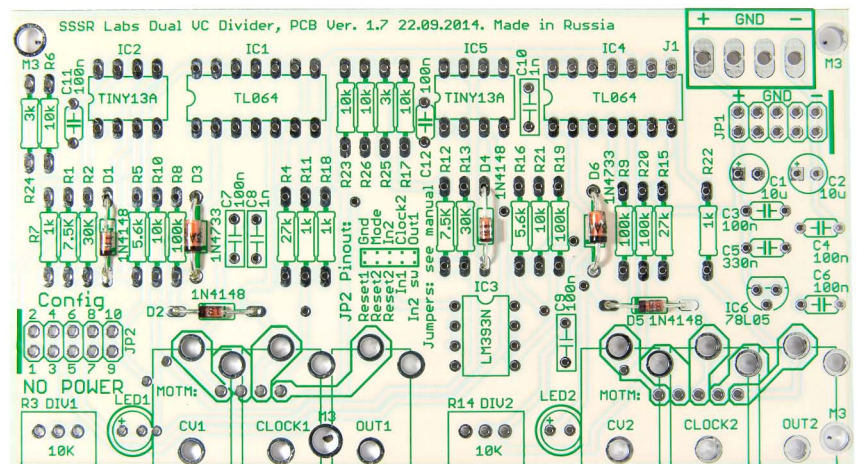
PCB Assembly

All used components must be mounted on the silk-screen side of the PCB.

1. Solder the 1n4148 and the 1n4733 diodes. The negative lead of the diode can be identified by a black stripe. This stripe must be oriented in the same direction as shown on the overlay. Cut the leads.

2. Solder all resistors. You need enough illumination to identify each resistor by the color code. Once you've picked a group of the same resistors, check the value of one of them with an ohmmeter. Cut the leads.

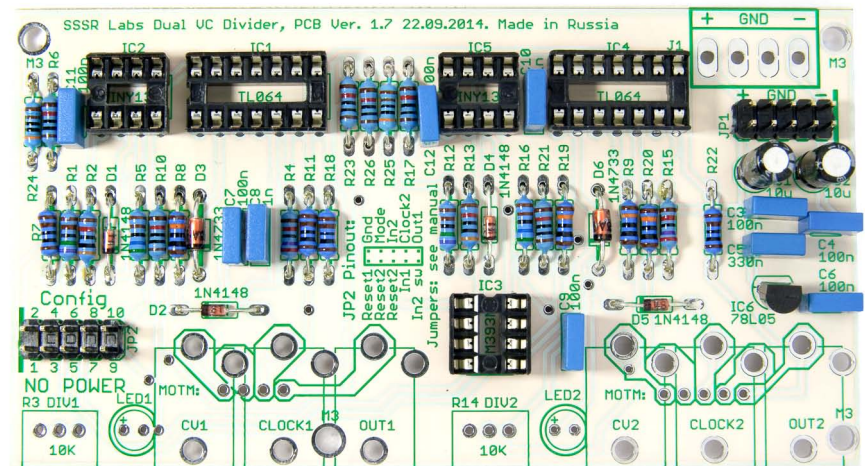
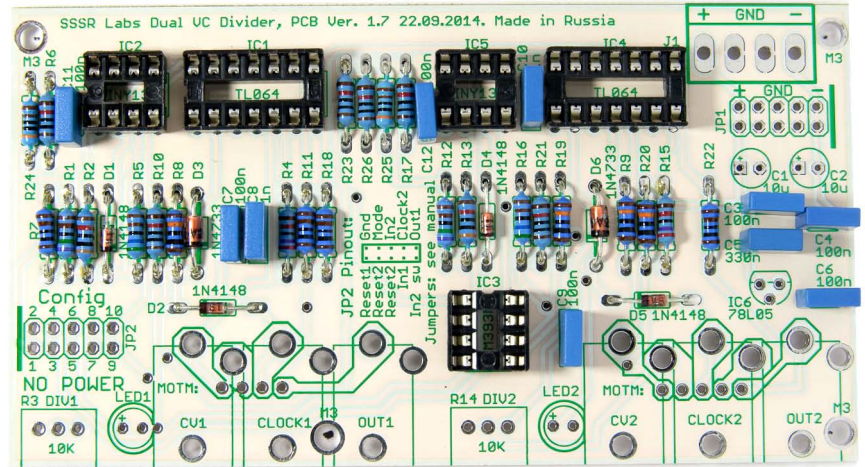
3. Solder five IC sockets. Notice the orientation of the notches. It must correspond to the drawing on the PCB. **A reverse inserted IC will die within 5 seconds of powering-on**, so you need to be careful. It can help to solder two pins on opposite corners of each socket and then solder the remaining pins.



4. Solder all capacitors except electrolytics. There is no polarity requirement on these. If you're using box or mylar capacitors, make sure that the power capacitors fit and do not rise higher than 15mm above the board. They are quite close to each other.

5. Solder IDC headers and the 78L05 voltage regulator. Insert the regulator accordingly to the drawing on the PCB.

6. Solder two electrolytic capacitors. The polarity of these is critical. The positive lead is longer than the negative and there is a stripe from the side of the capacitor's body near the negative lead. The holes for positive leads are marked by + signs and can also be identified by the square shape of the pad. Cut remaining leads.

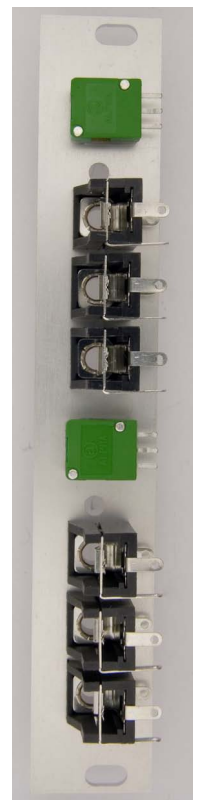


For Eurorack users:

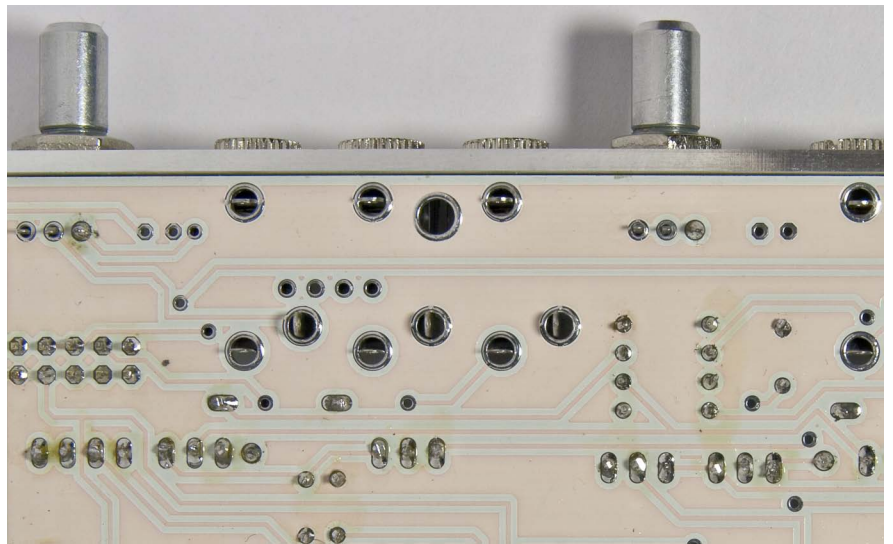
7. Break out the front tabs on the potentiometers with pliers. It is not necessary to use side-cutters. They will probably get blunted if you try.



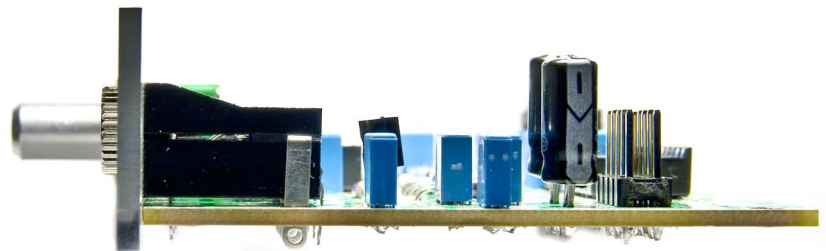
8. Insert two potentiometers and six jack sockets into the respective holes in the Eurorack panel. **Do not solder anything yet!** Screw on all nuts by hand. Adjust rotation of each component to direct all legs to the right (From the rear point of view)



9. Now insert the resulting construction into the PCB. Adjust orientation of the hardware again if necessary and then solder just one leg of each **potentiometer**, making sure the pots are firmly and flatly seated on the board. Sockets will slightly float above the board - this is by design, so do not push them! The legs will stick out enough to solder all sockets firmly.



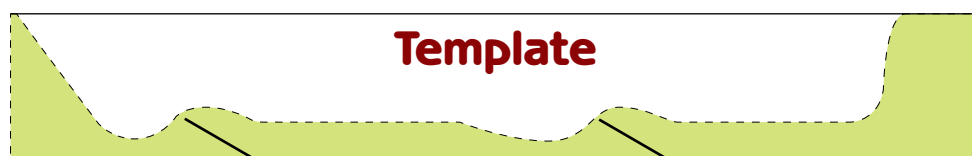
10. Solder the mini-jack sockets, handling the board vertically. It's better to bend the legs a bit to establish a physical contact between the legs and the holes. With a properly heated hole, the solder can be fed in to flow inside the hole due to surface tension.



11. Bend the leads of the two light-emitting diodes as shown in the picture. Notice the longer lead identifying the anode. Then insert the diodes to make them fit into the hole on the front panel. Push them in if necessary. Then solder.

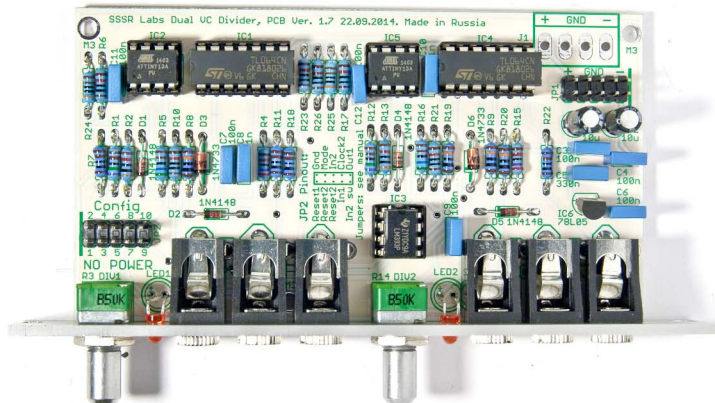


12. Turn each potentiometer fully counterclockwise, then install the knob. For your convenience, we have made a template, helping you to align the knob. Print the template at the original size, then cut the green shape and align it with the panel. Fit the grub screw in the knob, place the knob on the pot shaft and turn the knob according to the stripes on the template, then tighten the grub screw.



13. Insert all integrated circuits into the respective IC sockets. Some integrated circuits have notches, some just have dots near the 1st pin. Please notice the position of the notches and dots.

14. Fasten all nuts. Install jumpers according to your chosen configuration of the module or connect the expansion module.



Congratulations!

The module is ready to power-on. It does not need any adjustment. Now you just need to connect the power cable and mount the module in your rack. Take a rest for your eyes and hands; drink a cup of tea with cracknel.

One more time, ensure that all semiconductors are correctly orientated, all values are correct and there are no bridged solder joints.

Please notice the stripe on the PCB and the minus sign near the power connector header. These marks indicate the negative supply side, so make sure that the red line on the power cable is on the same side as those marks.

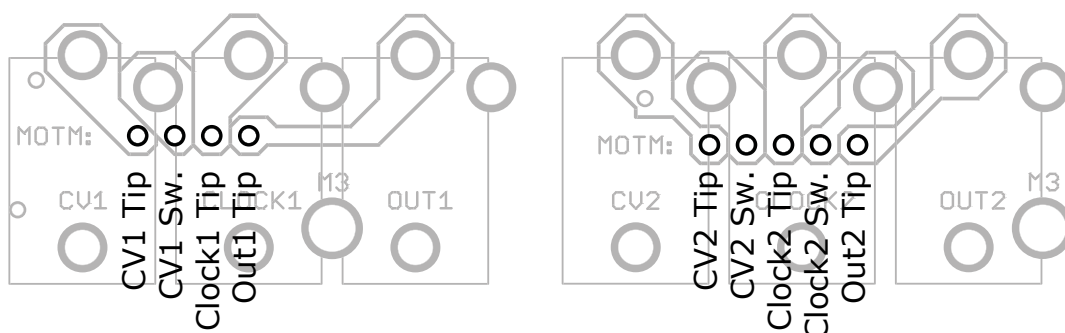
For non-Eurorack users:

The PCB has holes for M3 screws, allowing you to mount the PCB any way you want.

The Eurorack power header can be used as an internal power/ground distribution connector.

The PCB has holes for 4-pin and 5-pin IDC connectors allowing connection of external jack sockets.

The pinouts of the connectors are as following:



What to do if module doesn't work as expected

Please follow this checklist:

Did you connect the power properly?

Do you have good power cables? Does it follow Doefer (**not Cwejman**) standard?

Have you placed the polarised components correctly?

Are the resistor values not messed up?

Make sure there are no bridged joints, or breaks like non-soldered pads or damaged traces.

If all seems to be OK and you are still encountering problems, please contact **SSSR Labs** via Email: sssrlabs@yandex.ru and describe your problem in detail, attaching quality photographs of the completed PCB (both sides). We will try to help you remotely.