

# **STEREOPING**

**Synth Controller**

**Building instructions V3.0**

(Platine V3.2T 02/2024)

**Hi**

and thank you for having chosen the 'Stereoping Synth Controller' assembly kit. If you were looking for the manual you are unfortunately wrong here, this is the building instructions for getting together the assembly kit. You can find the manual here: [www.stereoping-shop.com](http://www.stereoping-shop.com) -> SynthController -> Downloads

With version 3.x the Synth Controller will be produced in SMD technology (Surface Mounted Device). This means the majority of electronic parts is already soldered correctly onto the circuit board. You only need to populate the following parts:

- 3 LED resistors
- 1 IC socket
- 16 potentiometers
- 3 jacks (all 3 are populated from the backside of the pcb!)

If you have any questions while building this kit ... we are looking forward to receiving your eMail:

**[hello@stereoping.com](mailto:hello@stereoping.com)**

The kit and the instructions were developed very thoroughly and are verified multiple times. We can not be held responsible for any problems or damage caused by the building or usage of this assembly kit.

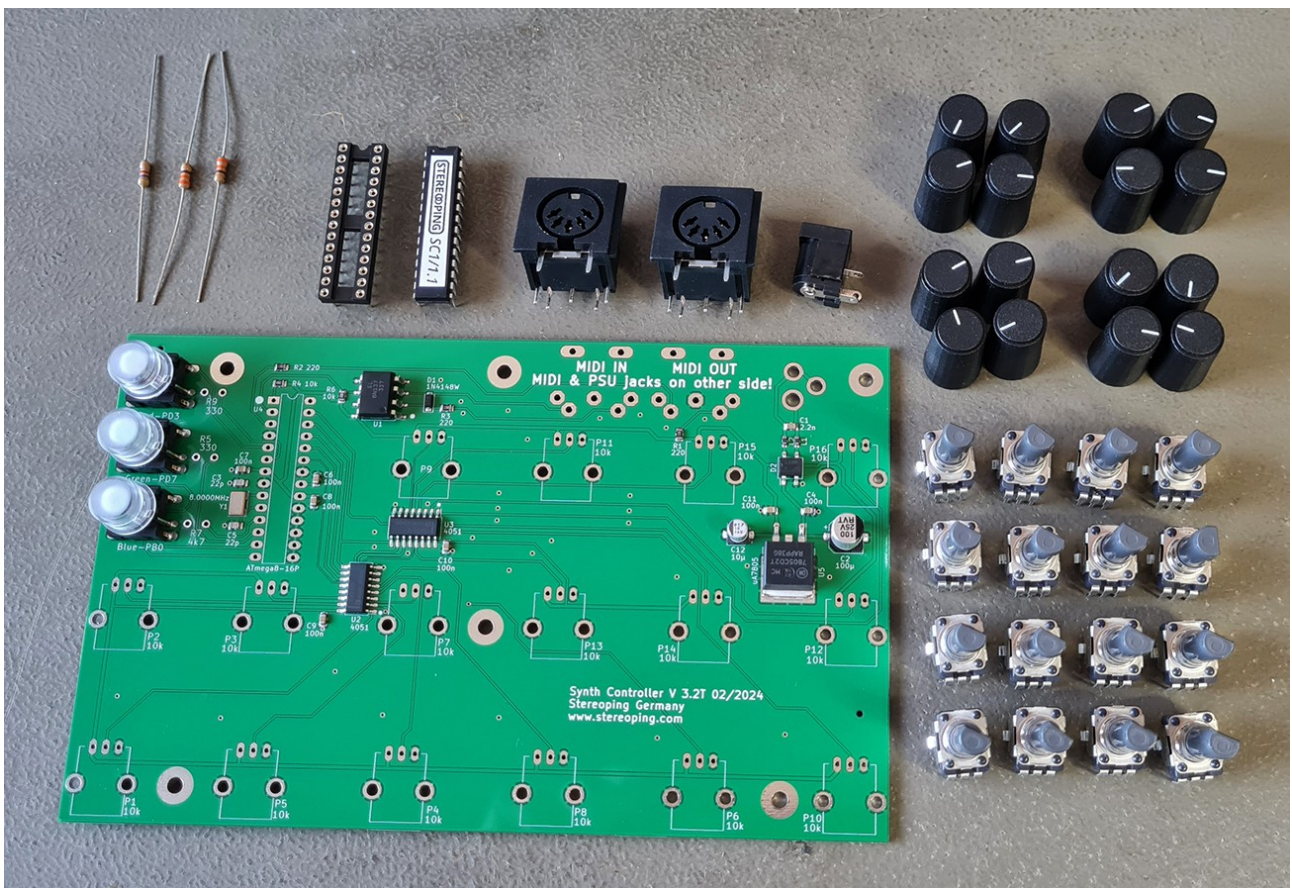
These instructions contain the following parts:

- 1. Content of the kit**
- 2. Building the kit**
- 3. First time operation & knobs**
- 4. Technical data**
- 5. Imprint**

## 1. Content of the kit

Note: some editions (Juno66, 1OH1, SixTweak) have a special led color combination. These editions come with the led resistors already soldered on the PCB.

- PCB with preassembled buttons, LEDs and buttoncaps
- 2 x resistor 330 ohm, Orange-Orange-Brown-Gold
- 1 x resistor 4,7 k ohm, Yellow-Magenta-Red-Gold
- 16 x potentiometer 10 k linear
- 1 x Atmega8
- 1 x IC-Socket 28pin
- 2 x Midi-jack
- 1 x Power-jack
- 16 x knob



Building instructions 'Stereoping Synth Controller' V3.0  
Stereoping Germany, Meschede 2024

## 2. Building the kit

### Tools you will need

To build the kit you will need the following tools:

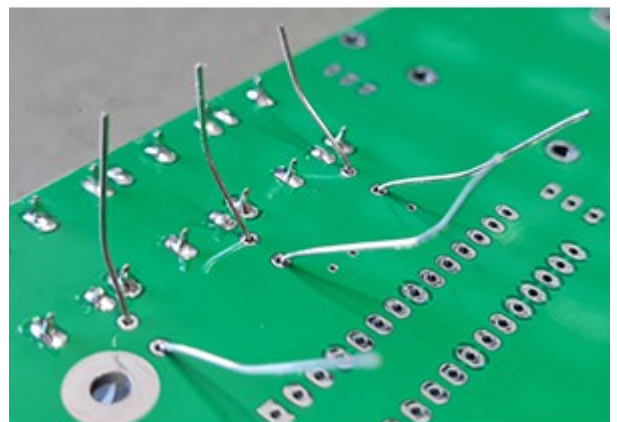
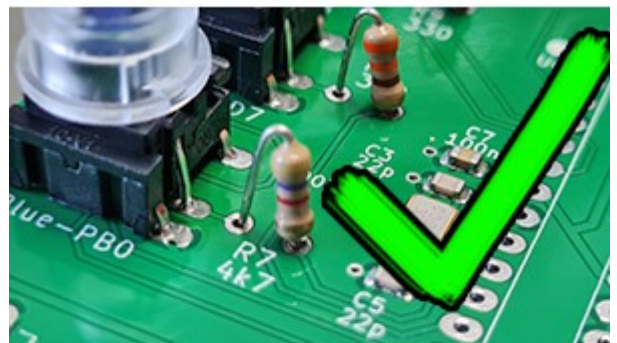
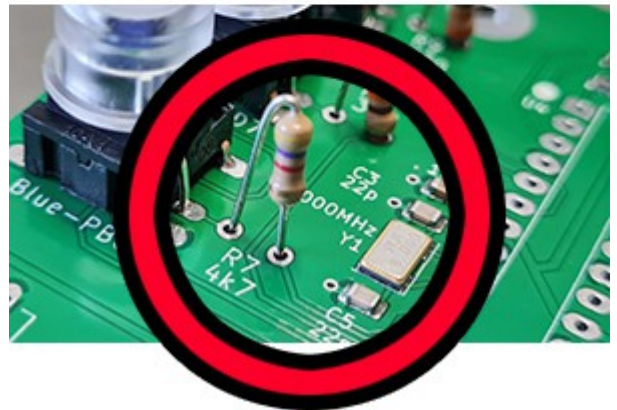
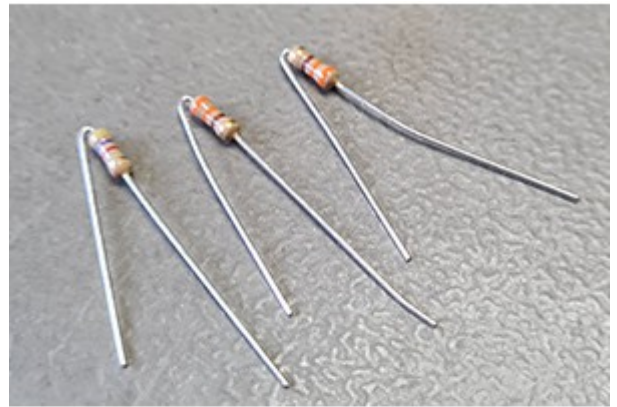
- solder iron or better a solder station
- lead free or leaded solder (works perfect with both)
- wire cutter for resistor's legs
- a philips screwdriver mid size for the screws holding the pcb into the upper half of the case and to screw the two halves of the case together

### Resistors

We continue with the resistors which are marked with a "R" on the silkscreen. Its value (e.g. '330' for 330 Ohm) stands right beside. The resistors are color coded, you find the appropriate colors in the bill of material at the beginning of this document.

Bend one leg by 180 degree as shown in the 1st picture. Put it into position, bend the legs on the other side of the PCB (last picture) to prevent the part slipping out of position. Now solder the joints and cut the wires right above the soldering joint.

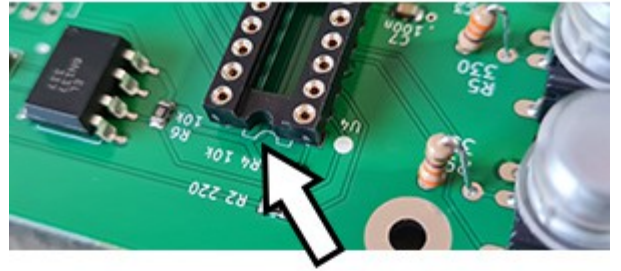
Resistors have no polarity, the direction you put them on the pcb does not matter. But try to keep them lying flat on the pcb to ensure, their legs will not have electrical contact with the metalcase later.





## IC-socket

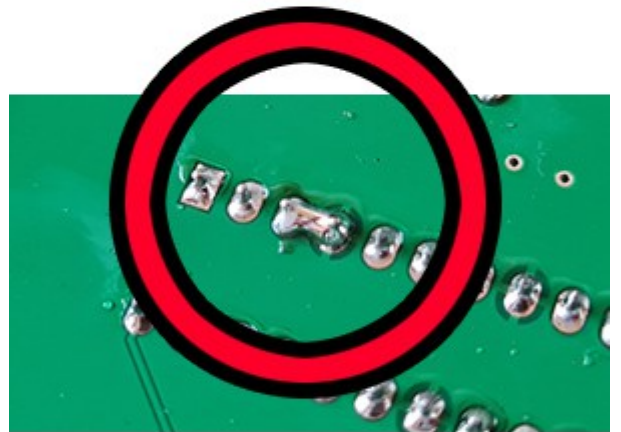
The 28 pin IC socket has a small notch on one of its shorter sides. This notch should match the printed outline of the socket on the pcb. See upper photo to the right.



The notch can also be found on the IC and tells you where to find pin 1 of the IC, which in fact is important. A wrongly attached IC gets a wrong power supply which might destroy the chip! Some ICs have a notch, others have a small circular indentation or printed circle on the top of the body to mark their pin 1.



Attach the socket according to the printed outline on the pcb now. Start by just soldering one leg in a corner. Have a look from all sides to ensure, the IC is lying perfectly flat on the pcb (2<sup>nd</sup> picture) and solder the other legs.



Pay attention not to connect two adjacent legs like in the 3rd photo. All legs should be isolated as shown in the last picture.



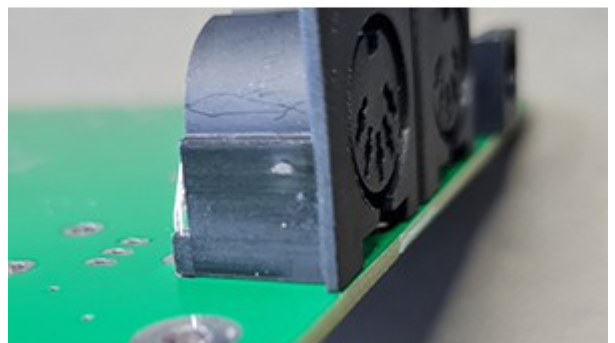
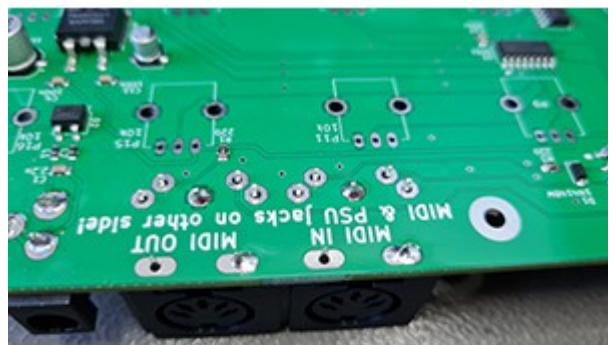
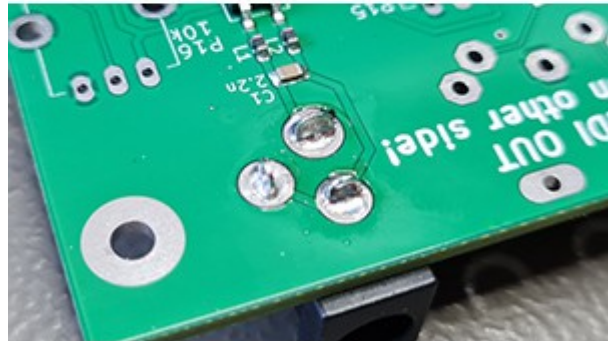
## Power- and Midi-jacks

**Caution! The jacks for power and midi will be put on the pcb's backside.** It is important to have all 3 jacks aligned flat on the pcb like in pics to the right. Otherwise your midi- or power-cables plugged in later will sit crooked. That's not what you want.

First populate the power jack and place the PCB with the part side upwards as in the 1<sup>st</sup> picture. Also have a look from above to insure it's rectangular to the PCB's edge, then solder it in this position.

For the Midi jacks it's best practice to first solder one of the front pins and the middle pin of the 5 back pins. Turn the PCB around and have a thorough look onto the area where the jack hits the pcb. There should not be any gap. If there is one, press the jack onto the pcb with forefinger and thumb and heat up the solder again, the jack should jump into the flat position then.

Solder all pins of the jack and do not be stingy with solder. If you own a soldering station, give it another extra heat now.



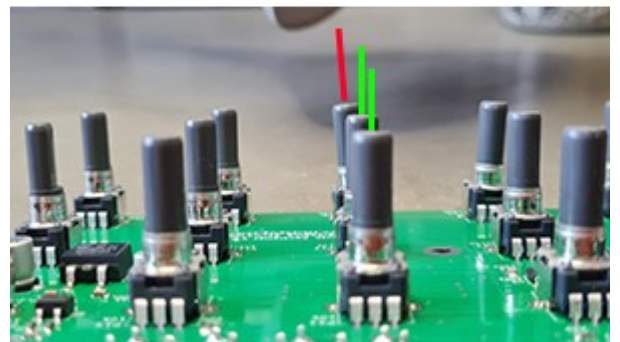
## Potentiometer

**There are some serious traps here. To get a pot straight again after it was soldered in a crooked orientation is NOT fun. Put them all in place but do not solder them yet!**

**Trap 1:** have a careful look on all 3 pins to find their drilling holes before pushing the pot down onto the pcb. The pins could be bent from transportation. It happened to ourselves we overlooked one leg and twisted it seriously while pressing the pot's metal brackets into the pcb with force.

In addition both cones of the bracket on both sides of the pot must lie flat on the pcb. In the second picture you see a bracket snapped into the pcb but the pot is touching the PCB.

**Trap 2:** the pots have some slight freedom to move. There might be the one or other pot pointing into a crooked direction. You therefore have to examine each of the 16 pots for being in line with the others when you look with one eye straight through the lines.



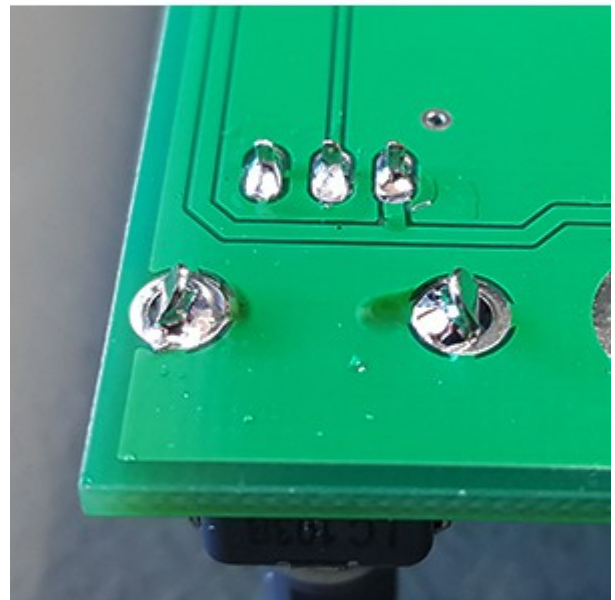
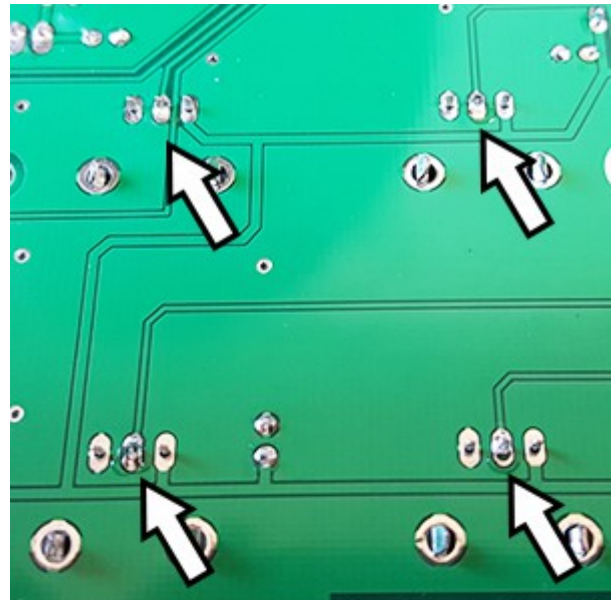


If you are sure each pot is perfectly vertical you can put the pcb on the table with the pot axis facing down and start to solder the middle pin of each pot. Then check all pots again. It also makes sense to lay the pcb into the upper half of the steelcase for having a look with another reference.

If everything is still in position you can finally solder all the other pins.

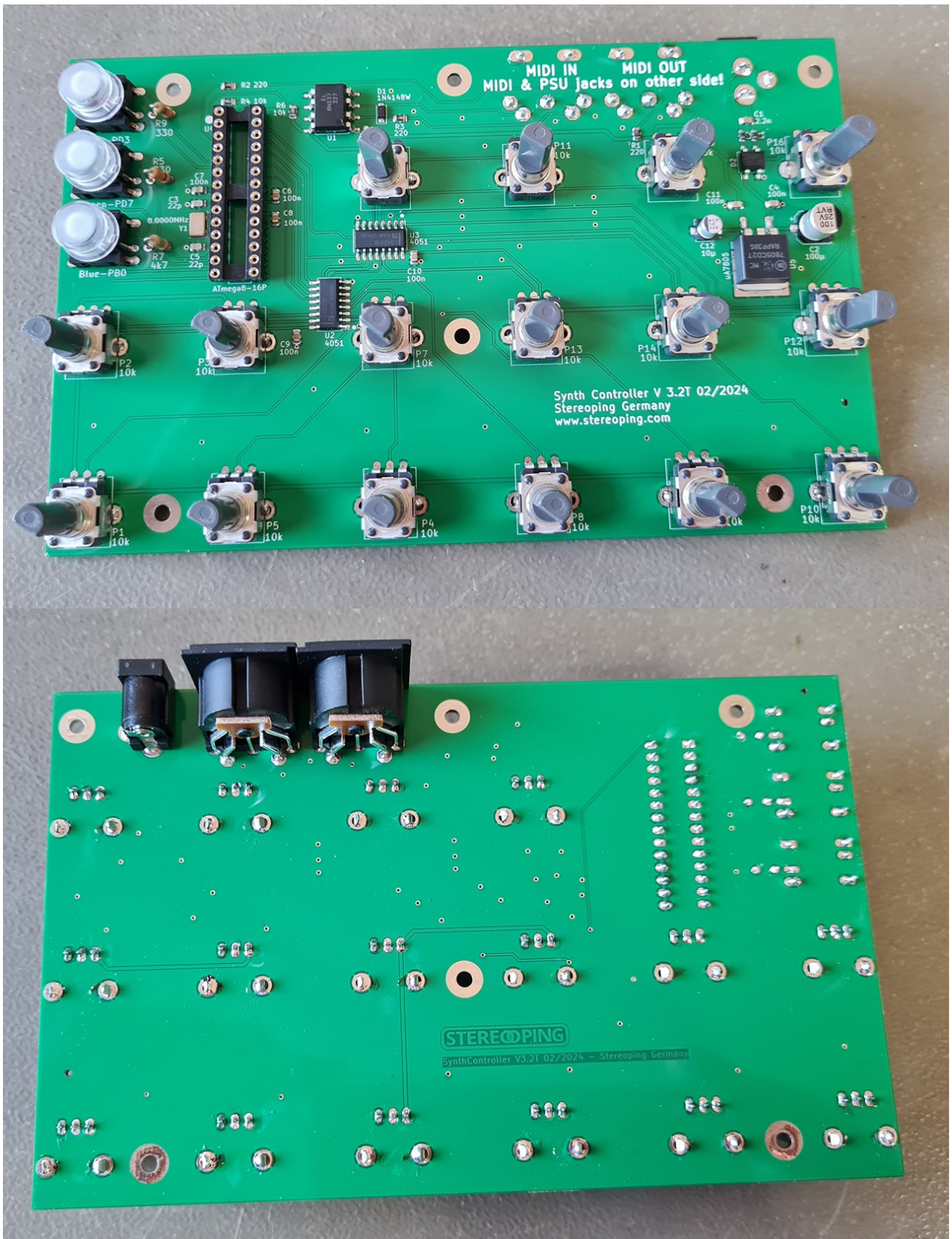
I increase the temperature of my solder station because the metal brackets conduct a lot of the heat away from where we want it. It works better with more heat. After having soldered some brackets i clean the tip to get rid of the slag. New solder will not get tainted by the slag, resulting in a better fluid characteristics and heat conduction and therefore a better soldering result.

A quite good solder result is shown in the pictures to the right.





Your built should look like by now



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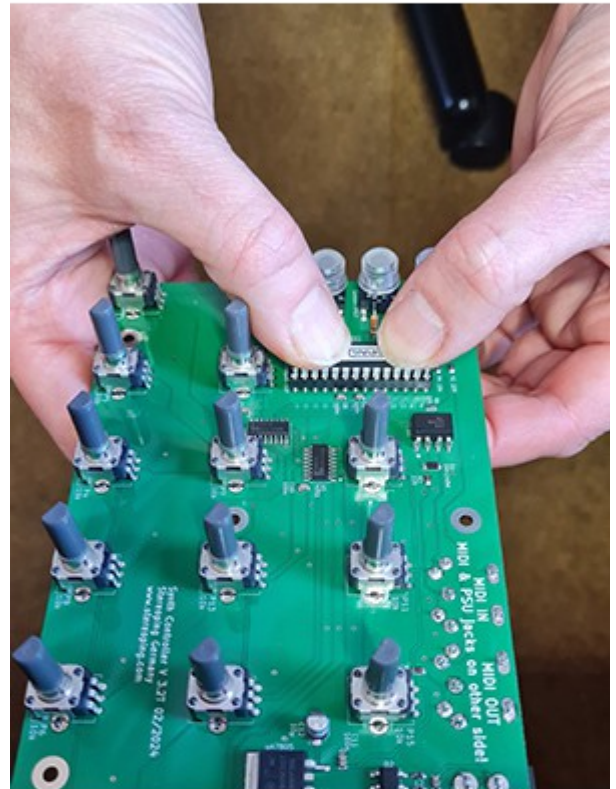
### Putting the processor into place

Finally the main processor finds its place. Take care that all of its legs find their position in the appropriate holes of the socket. They must dive a bit into the socket's holes slightly (first picture) otherwise it's likely they will be bent when trying to press the IC into the socket. If they won't fit perfectly use a tool or your fingers to bend the unaligned legs into the right position. Also have a look onto the pin row of the other side.

If all legs are fitting press the IC parallel into the socket with two thumbs holding the PCB from the other side with the index fingers.

If all goes wrong and you bent one or more legs: get the IC out again (you can use one or two flat screwdrivers to hinge it out), straighten the legs and try it again. You will have some chances but at one point the legs will break apart.

To the end everything should look like in the last picture.





### 3. First time operation

Now you screw the PCB into the upper half of the steelcase using the 6 threaded screws. Screw all 6 loosely first to allow the pcb to center itself. Then screw them tight, well not too tight, a bit tight will do.

Next step is flashing the firmware. Connect the power supply and press the first button, the second LED should light up. The Synth Controller is in bootloader mode, ready to be programmed with the edition firmware on MIDI IN (see manual for flashing the firmware).

At least use the black self tapping screws to connect the halves of the steelcase. Make it the same way: all 4 screws loosely first to center the steelcase halves, then screw them in fully.

#### *Putting the knobs onto the pots*

You can't do anything wrong when putting them onto the pots, they center themselves automatically. The flattening of the knob must suit the flattening of the potentiometer of course.

The knobs we used from 2019 are taller to allow throwing the faceplate over the knobs. Unfortunately the dimension of their D-axis does not fit 100% the dimensions of the pot's axis. They can - with a little force - be turned +/- 5-10 degrees on the pot's axis. All the knob caps are put onto the knob's body for the marking to be correct if the pot is turned fully counterclockwise. If a marking of a knob does not seem to go far enough when turned fully ccw and at the same time go to far when turned clockwise: turn the knob fully to the left (ccw) and - with a little bit of force - keep turning. You will feel the knob slide on the axis until it hits the limit of the possible movement.

#### **Congrats**

**Your Synth Controller is finally finished and you can be proud for having it built on your own. Now we wish you happy knobbing.**



#### **4. Technical data**

Do It Yourself assembly kit for Hardware Midi Controller

Connections: Midi In, Midi Out, Power supply

Operation voltage: 9-12 V, any polarity will work, even 9V AC power supplies can be used direct current, middle pin is Negative

Current flow ~30 mA

Size incl. knobs 180 x 130 x 60 mm

Weight incl. plastic knobs 661 Gramm

## 5. Imprint

All text and Fotos in this manual are copyrighted and need permission of the author for any use.

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