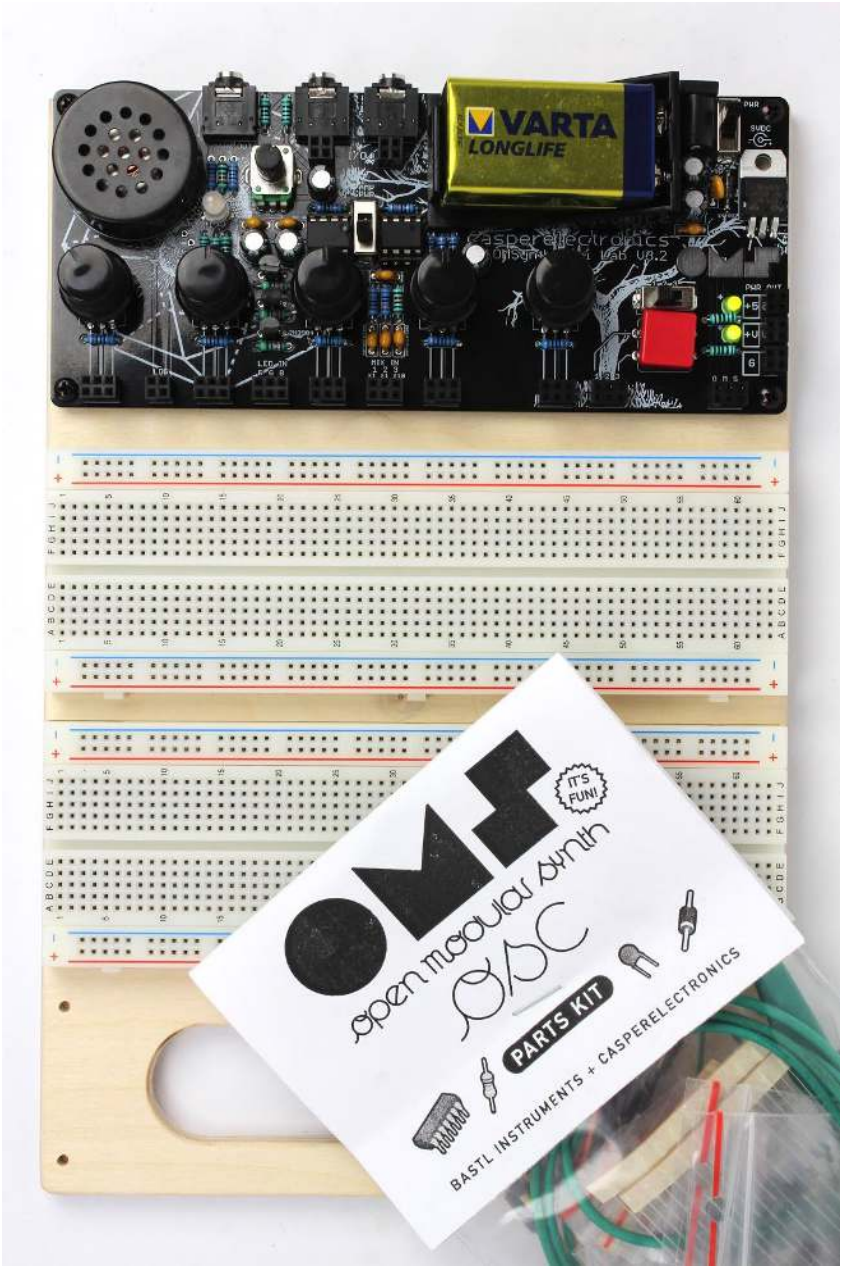
OMSynth Mini Lab v3.2 - Assembly Guide

http://casperelectronics.com/finished-pieces/omsynth-minilab/



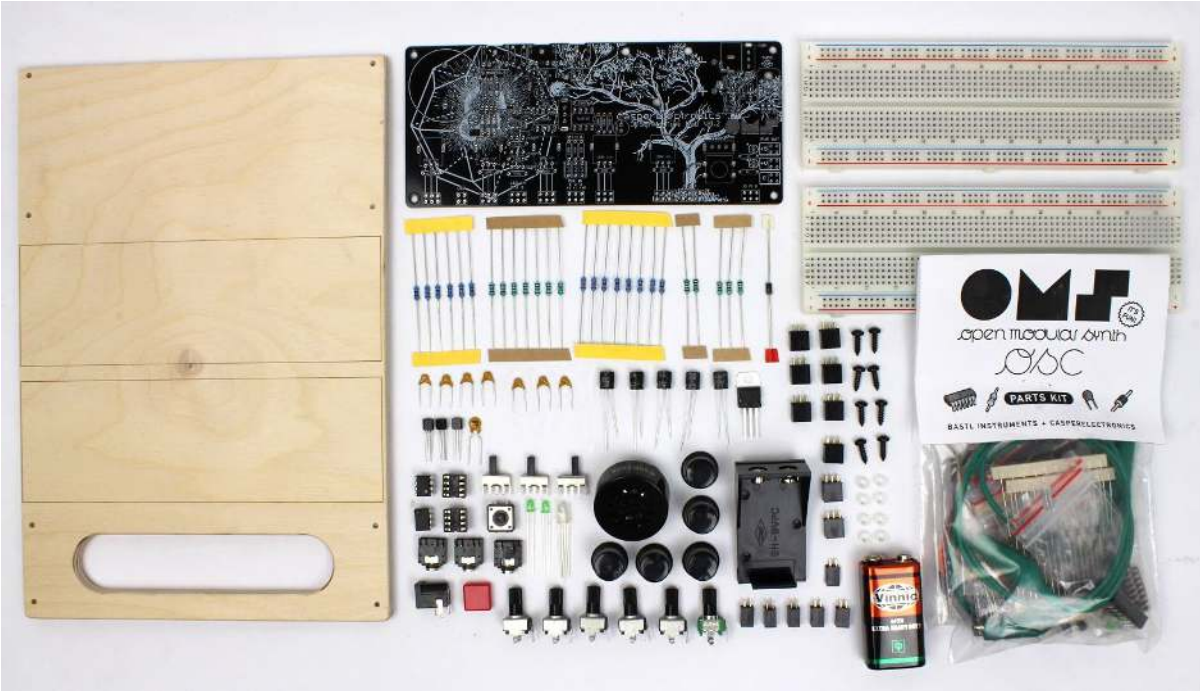
INTRODUCTION

Welcome to the assembly guide for the kit of OMSynth Mini Lab v3.2. For more info about the instrument go to www.casperelectronics.com. This document will guide you through the whole assembly of the kit. It is good to have basic soldering skills and to be able to identify electronic components before starting this kit. However if you have never soldered before, check out some of the tutorials here[1] or here[2] first.

[1] https://cdn-learn.adafruit.com/downloads/pdf/adafruit-guide-excellent-soldering.pdf
[2] http://www.ladyada.net/learn/soldering/thm.html

BEFORE STARTING THE KIT...

Your kit comes with everything you need to assemble and experiment with the OMSynth. Please check all of your parts BEFORE you begin assembly to make sure you are not missing anything. See the bill of materials for details.



OMSYNTH v3.2 Bill of Materials		
qty	**value**	**part**
RESISTORS		
6	100R	R-EU_0207/7
7	1k	R-EU_0207/7
2	10k	R-EU_0207/7
8	100k	R-EU_0207/7
3	470k	R-EU_0207/7
CAPACITORS		
1	47pF	ceramic capacitor
3	100nF	ceramic capacitor
3	1uF	ceramic capacitor
6	100uF/16V	electrolytic capacitor
SEMICONDUCTORS		
1	1N4007	DIODE-D-7.5
3	2N3904	NPN, BULK
1	7805	voltage regulator
1	LM386	IC in foam
1	TL072	IC in foam

HARDWARE		
2	8 pin DIL	DIL socket - in foam
1	2.1mm	power barrel connector
3	jack TRS 3.5mm	audio connector
1	difuse red 3mm	LED
1	difuse green 3mm	LED
1	rgb 5mm common anode difůzní	RGB led
1	KSSG-3108	Speaker 8 OHM
6	2x2pin	double female pinheader
9	2x3pin	double female pinheader
1	TACTS-24K-F	big button
1	P-B17172S	big button cover - square RED
1	BH-9VPC	HOLDER BATTERY 9V
3	A-5111	2p - slide switch
1	B10k	linear potentiometer
5	B100k	RV09 linear pots
1	200mA	fuse
1		lasered wood board
8		black screws
8		spacers
1		screw
1		PCB
1	9V	battery
2	mb102	breadboard
5	WH148	knob

Also prepare the following tools:

- Soldering iron
- Flush cutters / nippers
- Cross screwdriver
- Protective eyewear

We suggest you to work in a clean and a well lit and ventilated environment.

PCB ASSEMBLY

Start soldering from the smallest components to the bigger ones. You will begin with the **resistors**. There are 5 values of them: **100R** (6x), **1k** (7x), **10k** (2x), **100k** (8x), **470k** (3x).

Before you will start soldering them, check the values by using a multimeter[3]. After soldering snip the leads close to the PCB (be sure to make this step on all remaining leads in the course of this guide) and **set aside a few of them**. You will use them later.

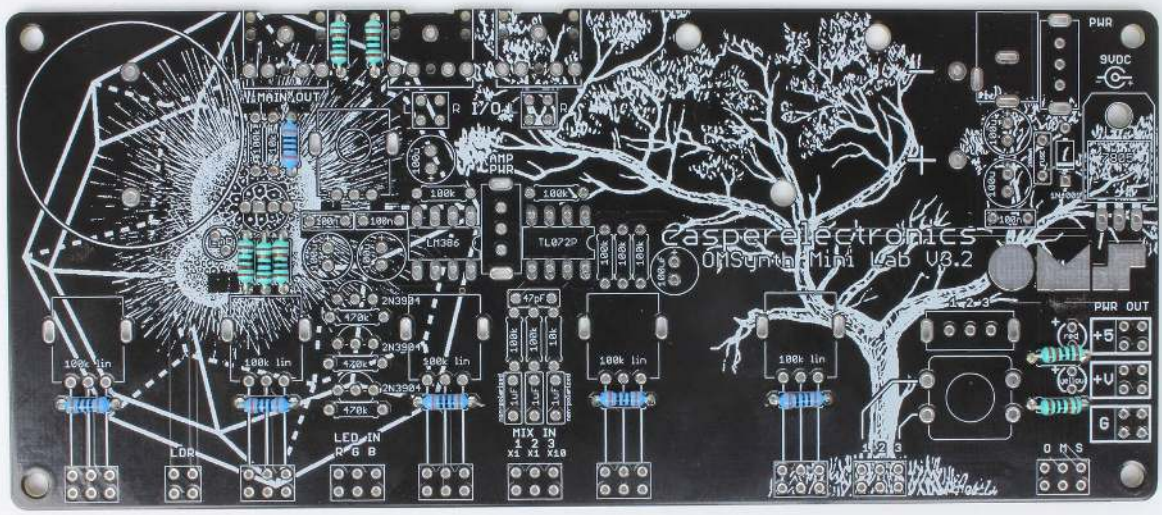
[3] https://learn.sparkfun.com/tutorials/how-to-use-a-multimeter/measuring-resistance


insert
resistors

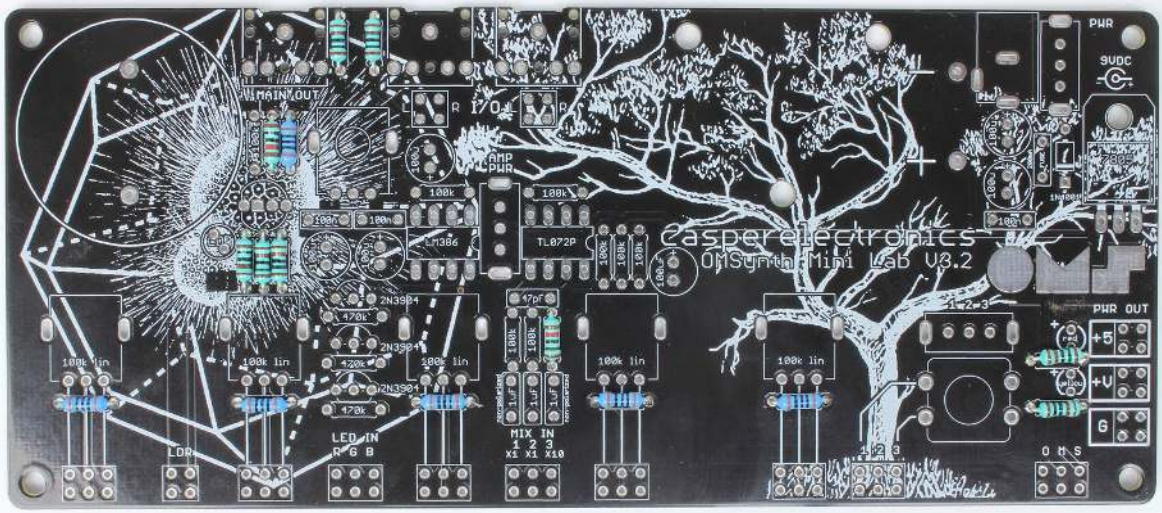

cut the leads


100R
casperelectronics
OMSynth Mini Lab V3.2
PWR
9VDC
PWR OUT
+5
+V
G
MAIN OUT
LDR
LED IN
R G B
MIX IN
1 2 3
x1 x1 x10
TL072P
LM386
2N3904

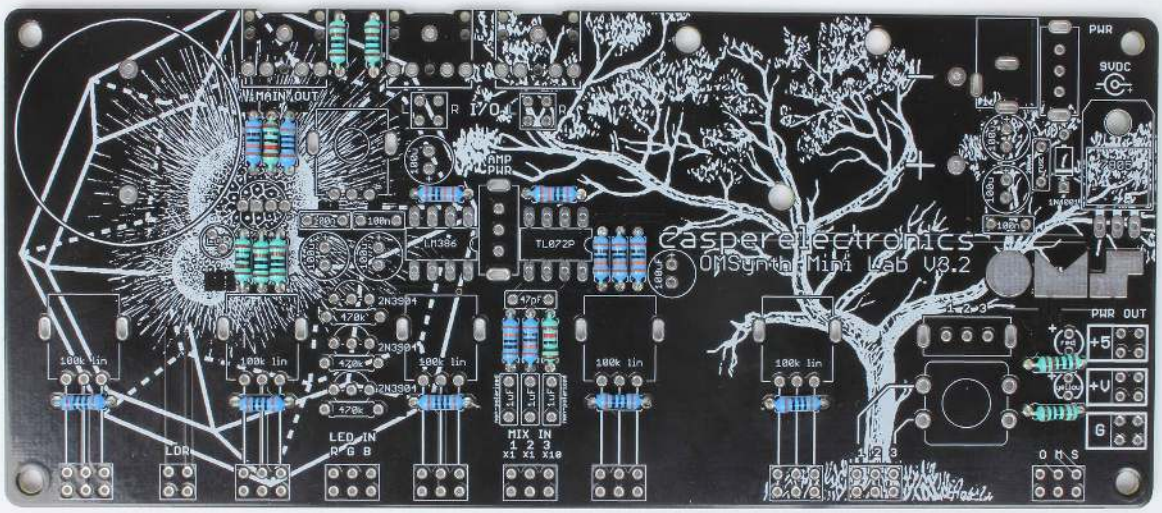
100R + 1k



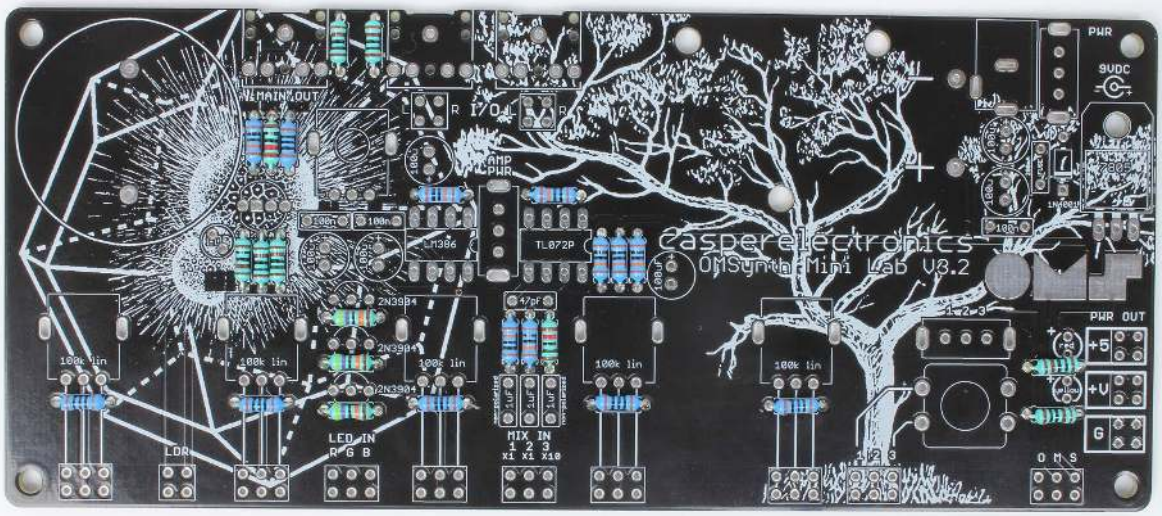
100R + 1k + 10k



100R + 1k + 10k + 100k

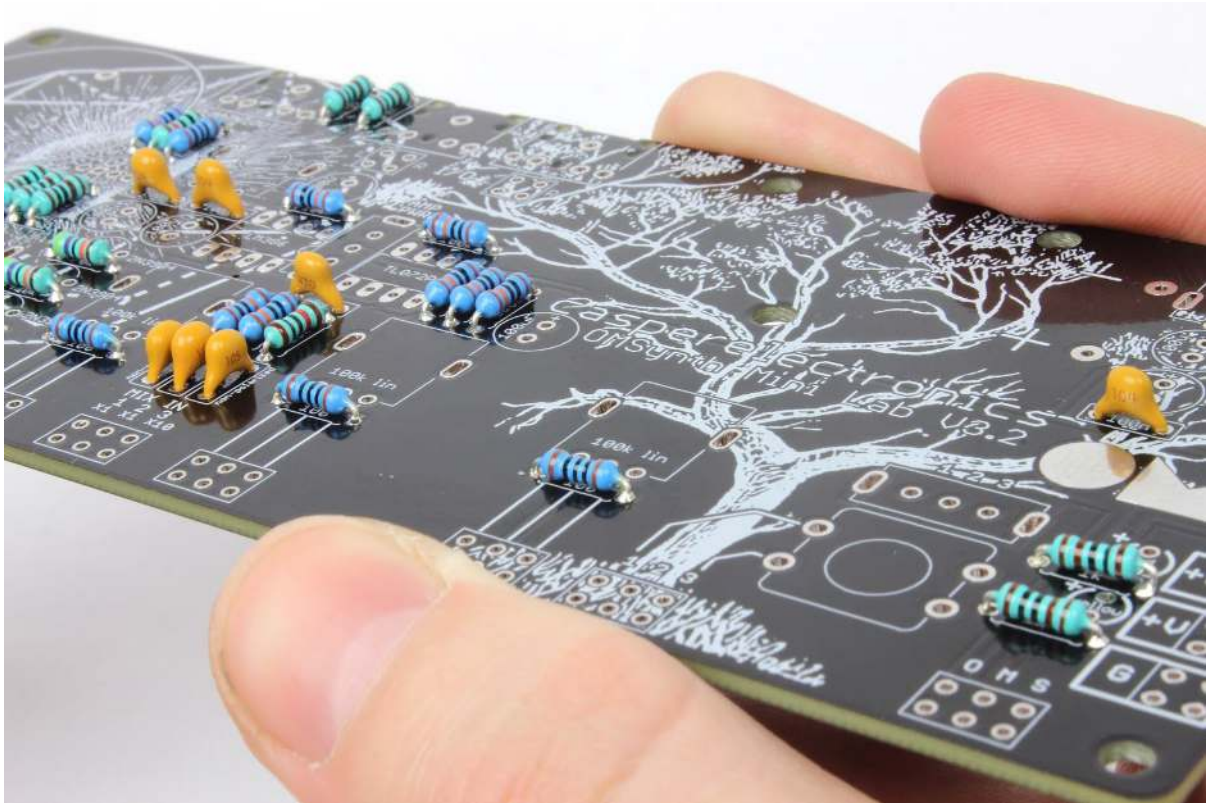


100R + 1k + 10k + 100k + 470k

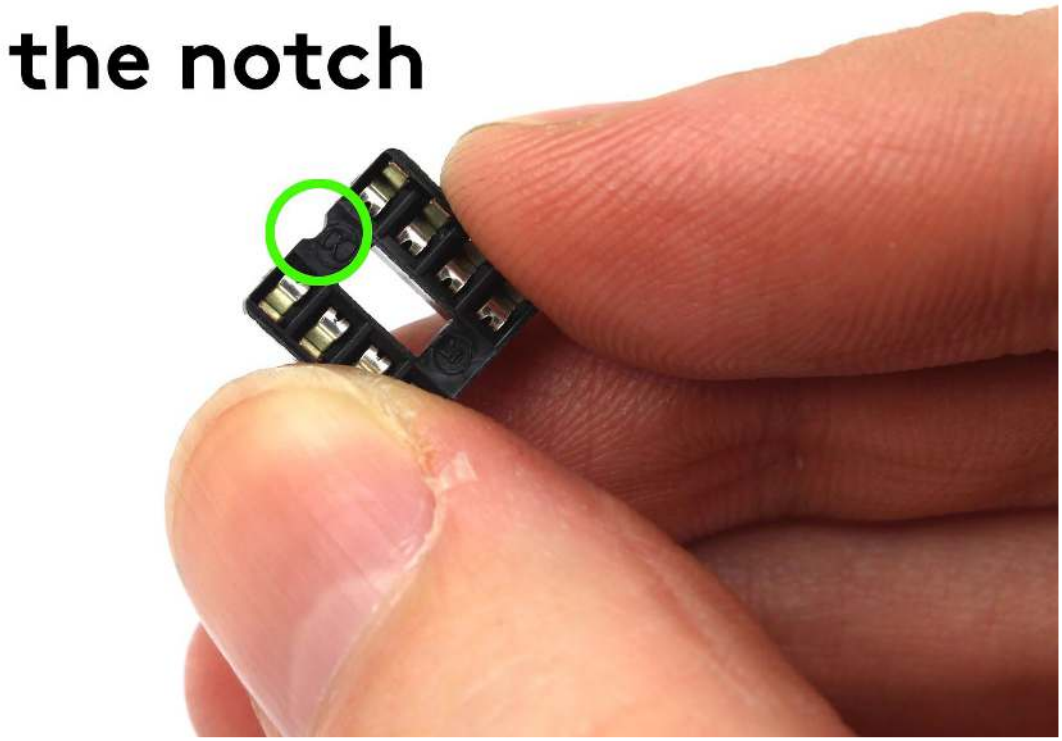


Next solder the one **diode** (1N4007). The spot is signed "1N4001", don't be confused by that that. Just **be careful, diodes are polarized!** Make sure that the stripe on the diode matches the stripe on the PCB.

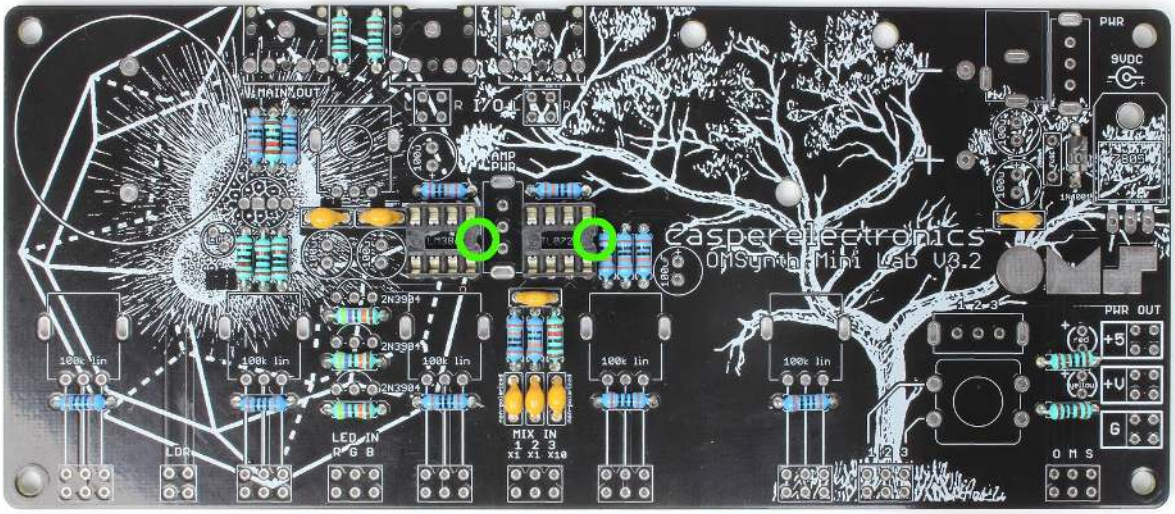
Insert **ceramic capacitors** now into the corresponding rectangles. There is one **47pF** (marked "470" on itself), three **100nF** (marked "104”) and three **1uF ceramic capacitors** (marked "105”).



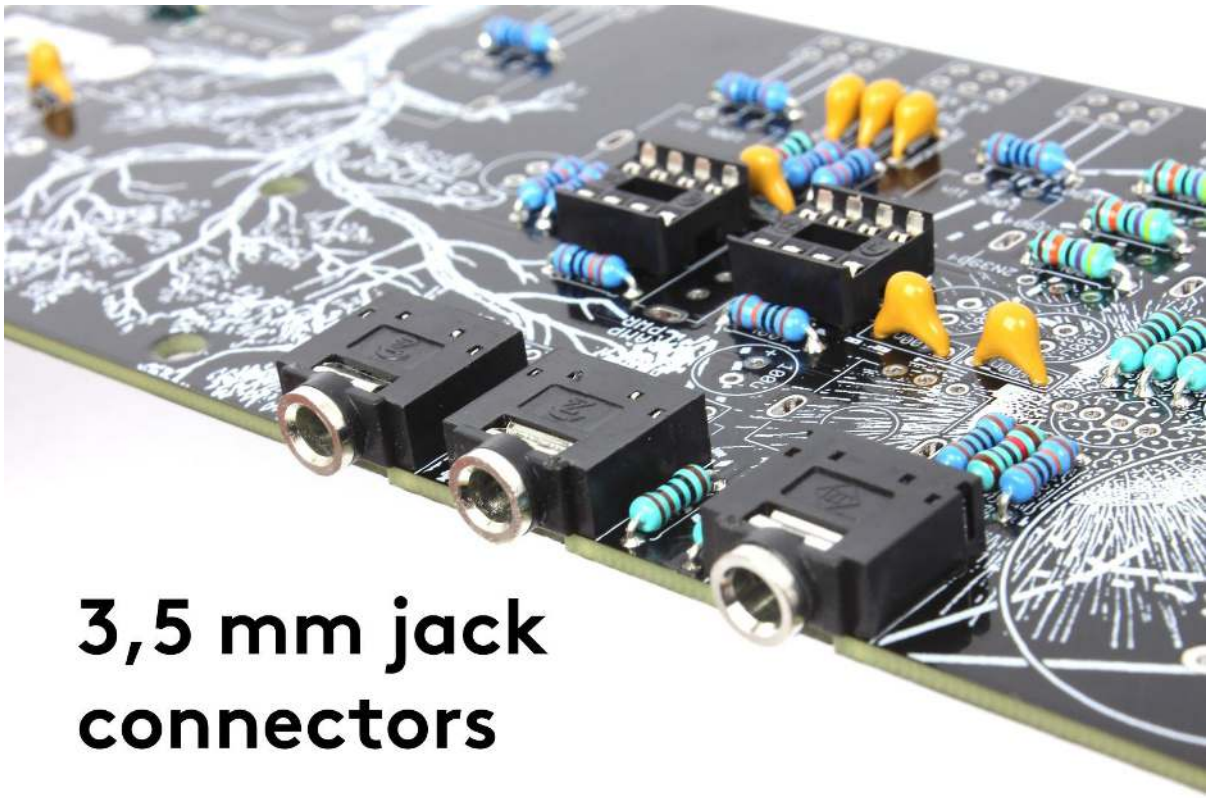
Now you can add two **IC sockets**. Just be aware of the **right direction of sockets** - there is a notch on each socket that has to match with the notch on the PCB.



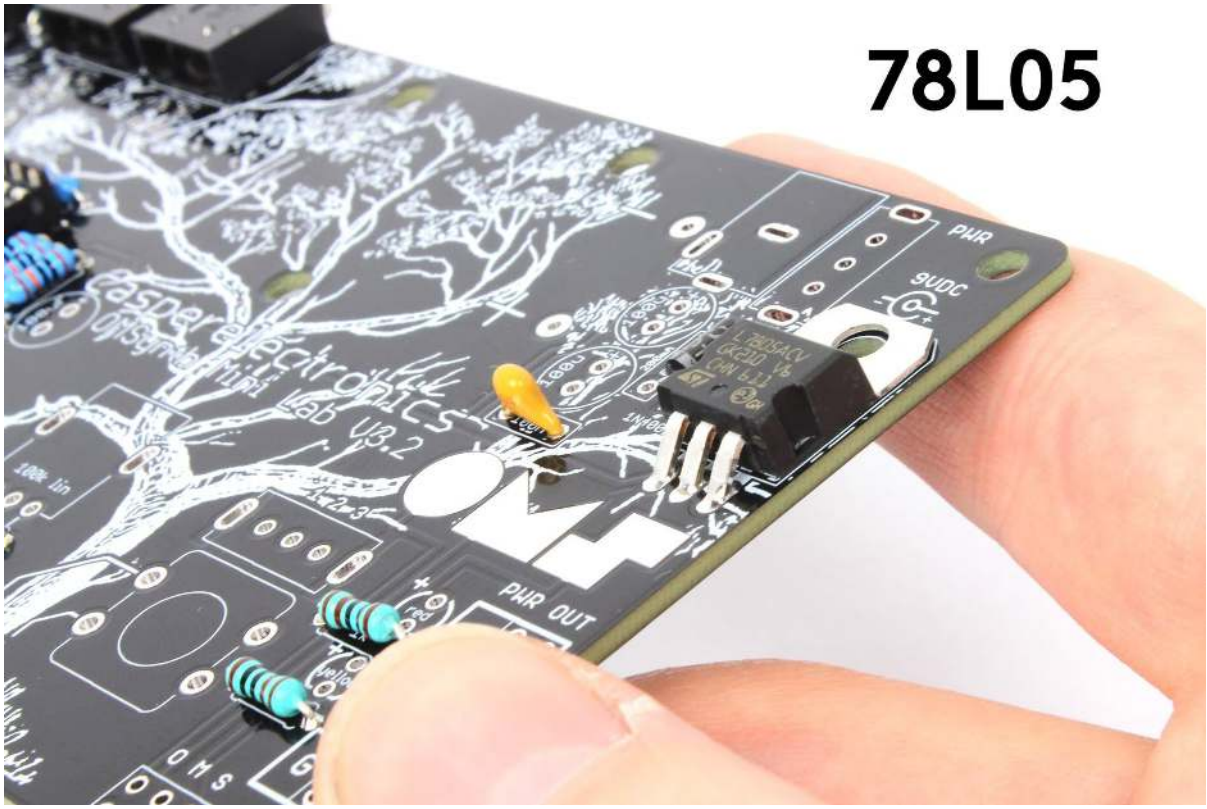
IC sockets



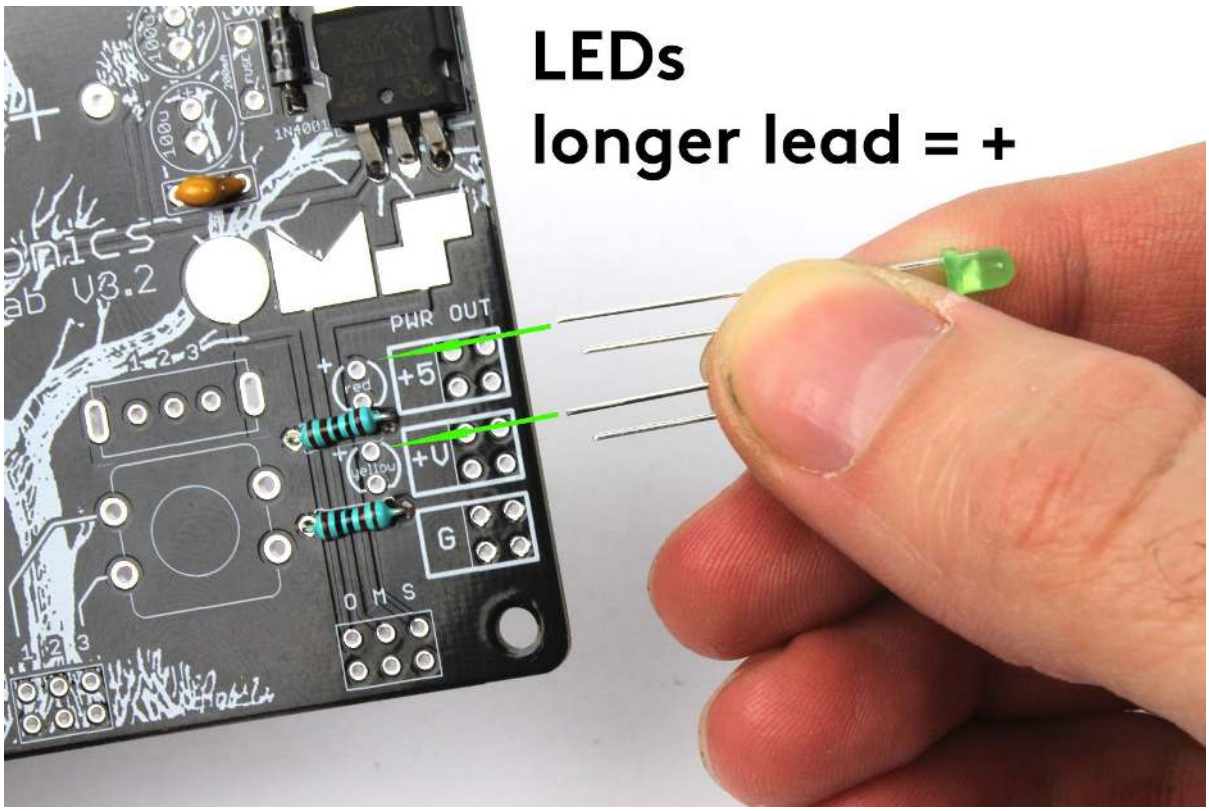
Add also three **3,5mm jack connectors**.

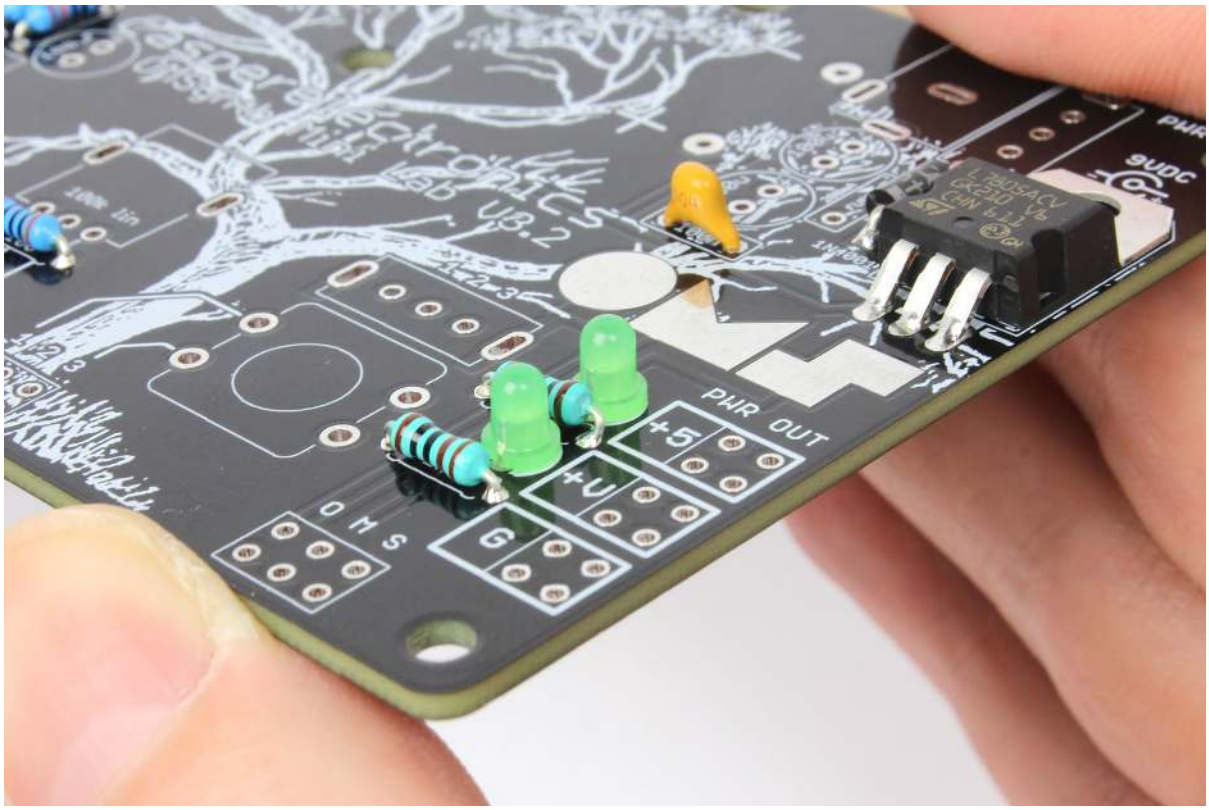


Take the **7805 regulator**, bend its leads at a right angle, place in the board and solder it.



Move to soldering **green LEDs**. Be sure to **insert the longer lead into the plus (+) hole**.



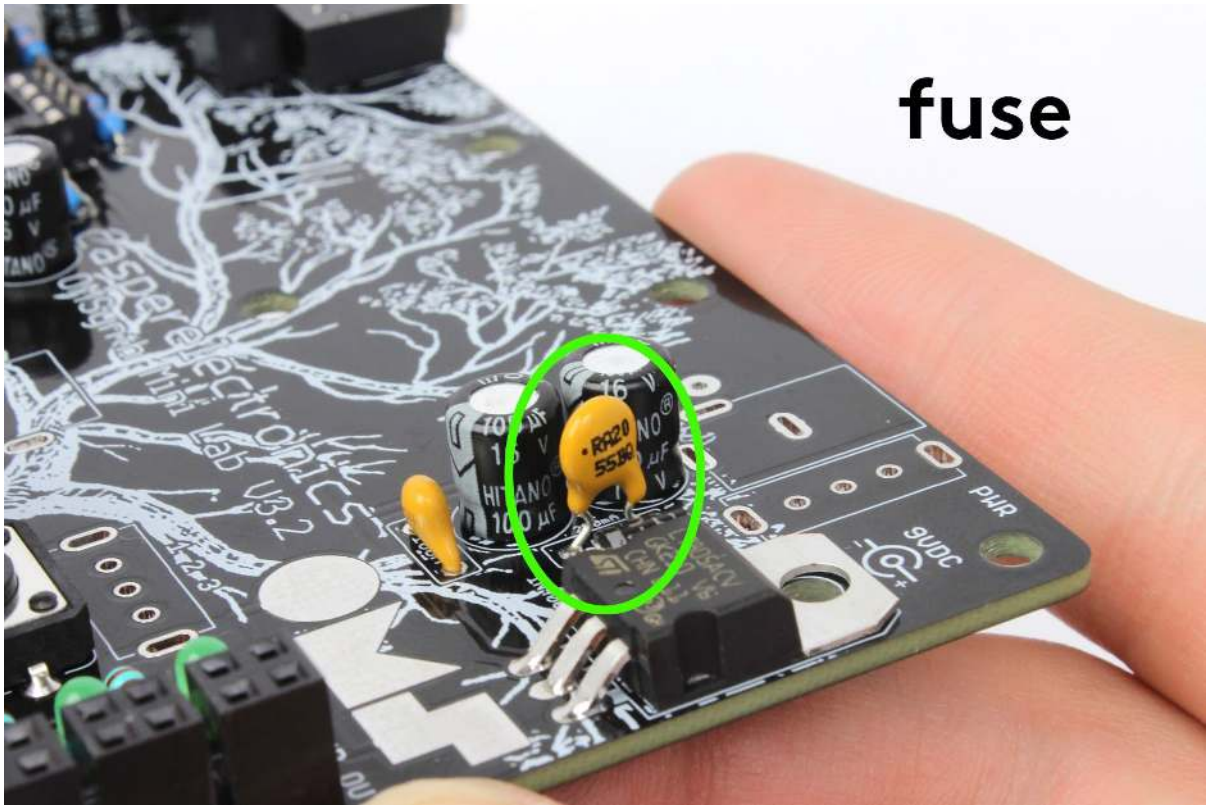


Push the **button** down to the PCB and solder it as well.

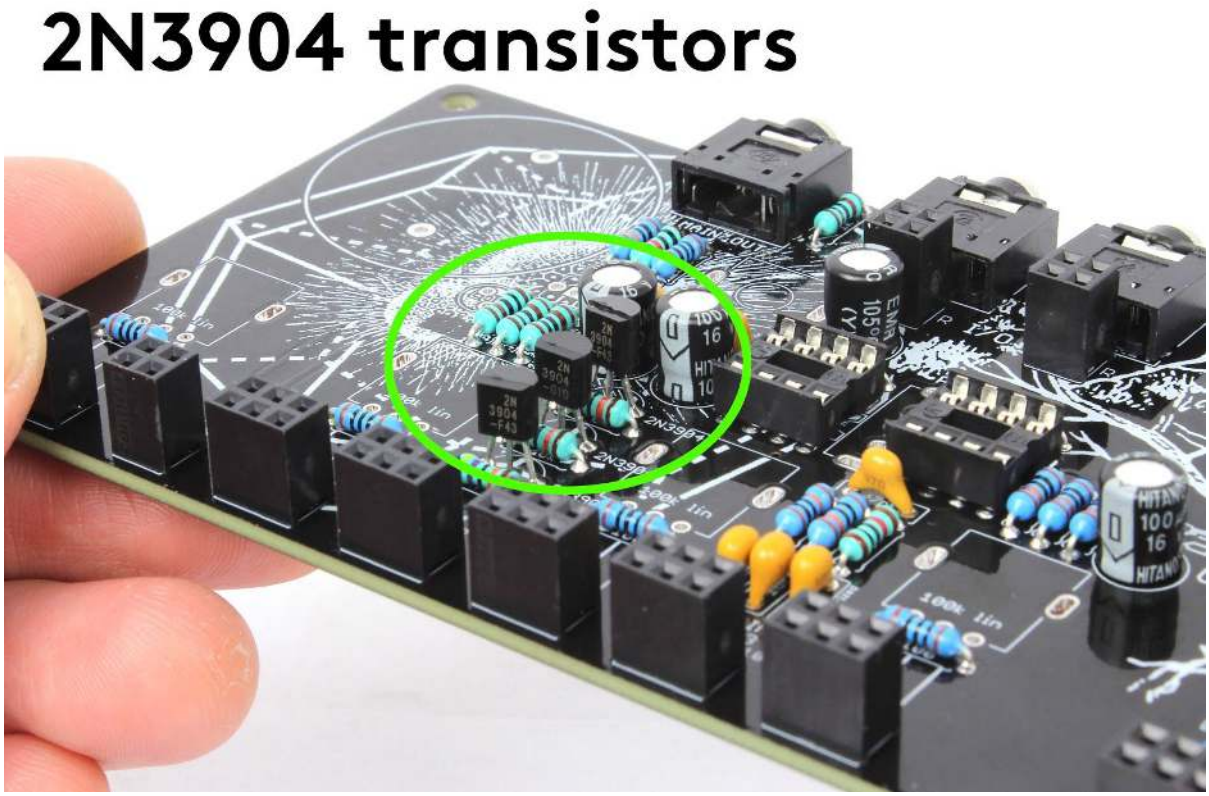
Let's do the **electrolytic capacitors**. Use the six **100uF/16V** ones. **Be careful, these capacitors are polarized!** The longer lead goes to the plus hole on the PCB (signed +).

Now you will do the **female headers** (six 2x2 pin, nine 2x3 pin). They fit on the PCB quite well. Just be sure to solder them straight and down to the PCB.

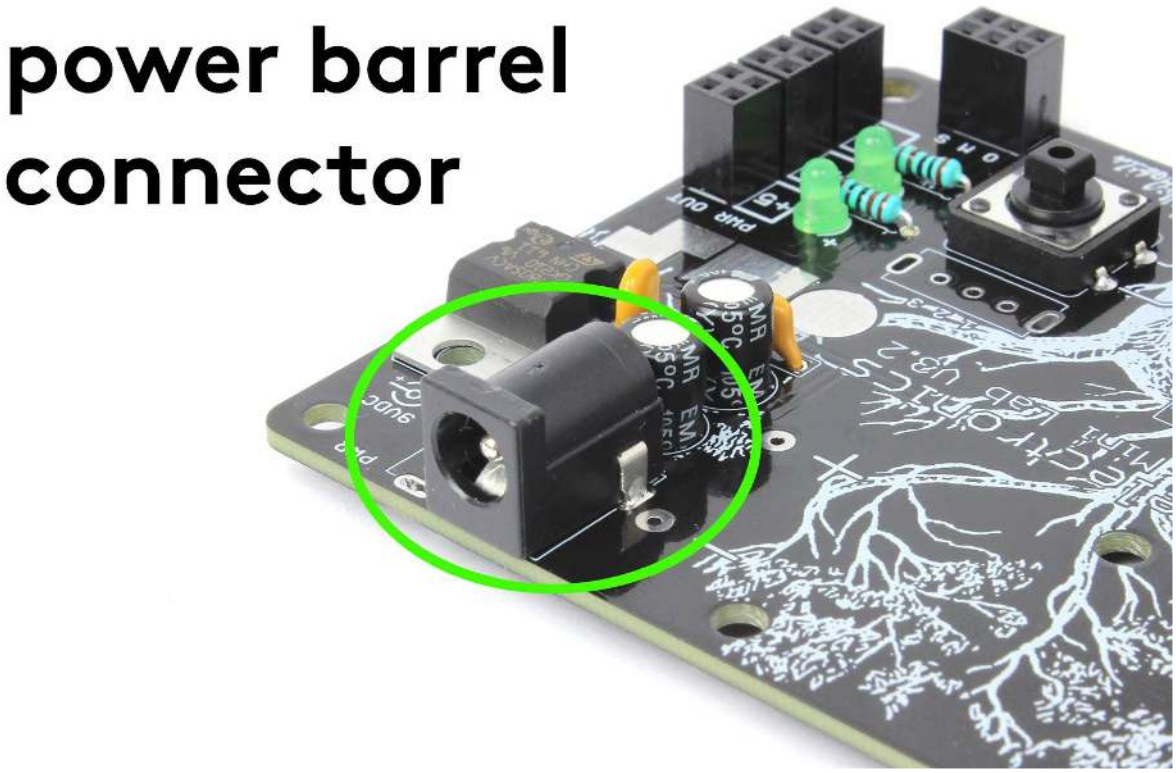
Solder the **200mA fuse**.



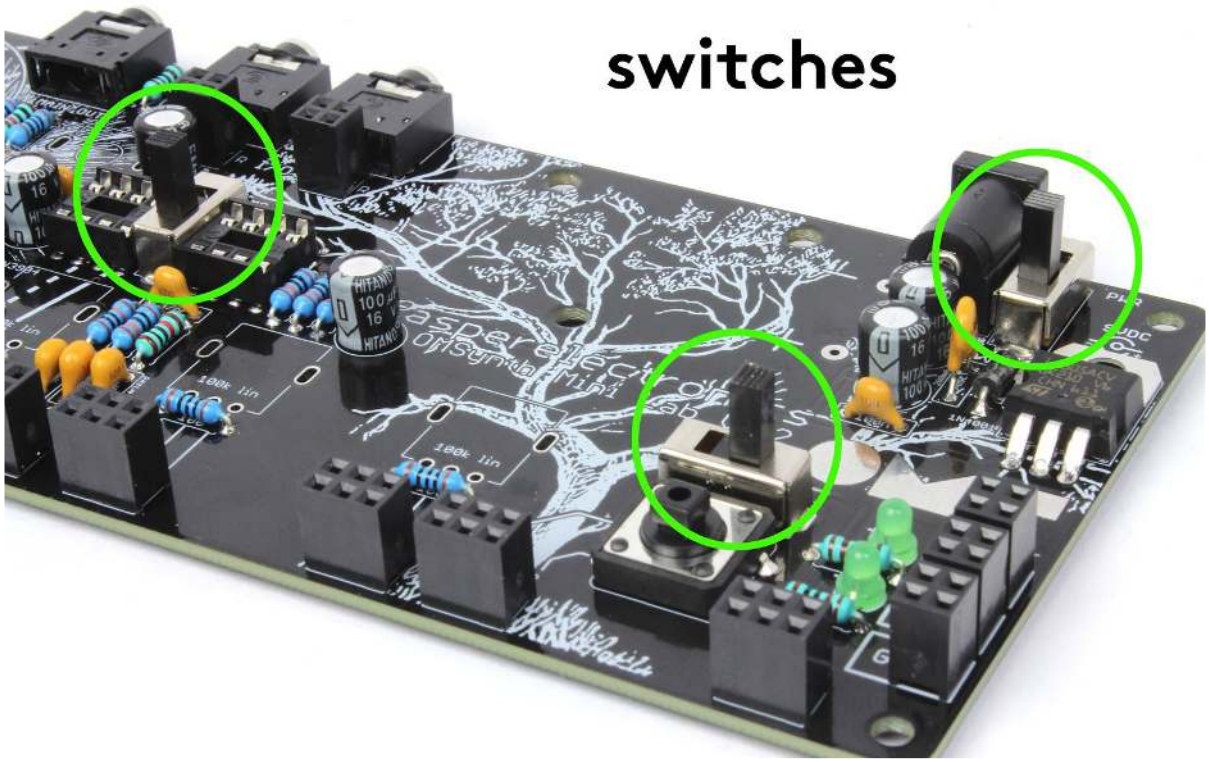
Move to the three **2N3904 transistors**. Transistors are polarised. Make sure they are installed correctly with the flat side pointing down.



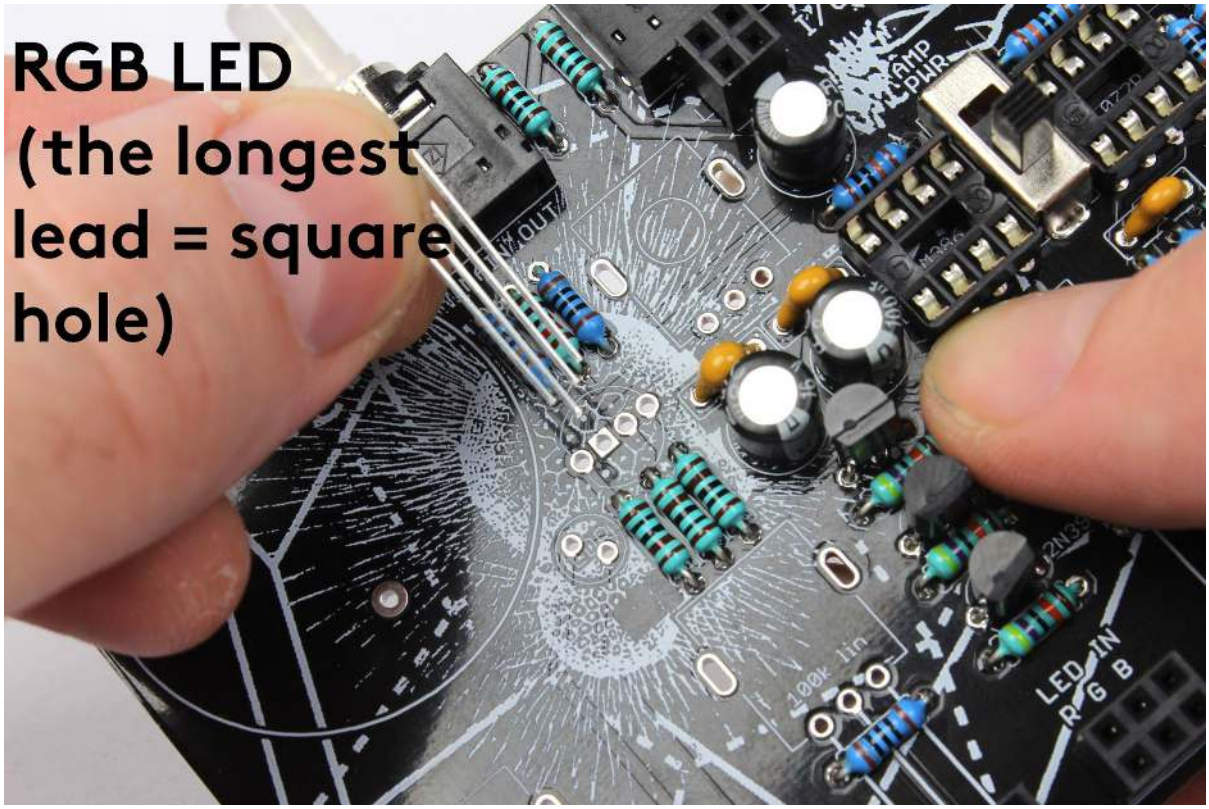
Solder the **power barrel connector**.



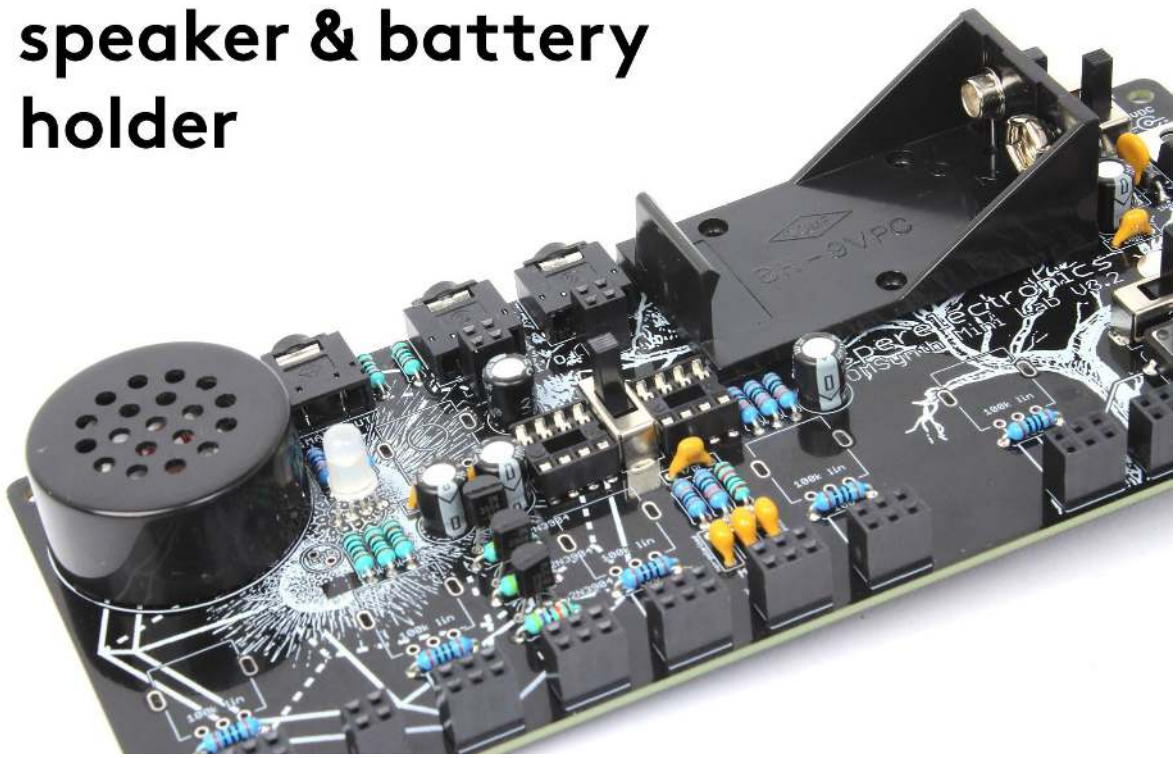
Use the three **switches** now. Place them on the board. Then solder JUST ONE solder point on EACH switch. Double check if the switches are in straight. If there is a problem simply melt the solder on the single point and reposition the switch.



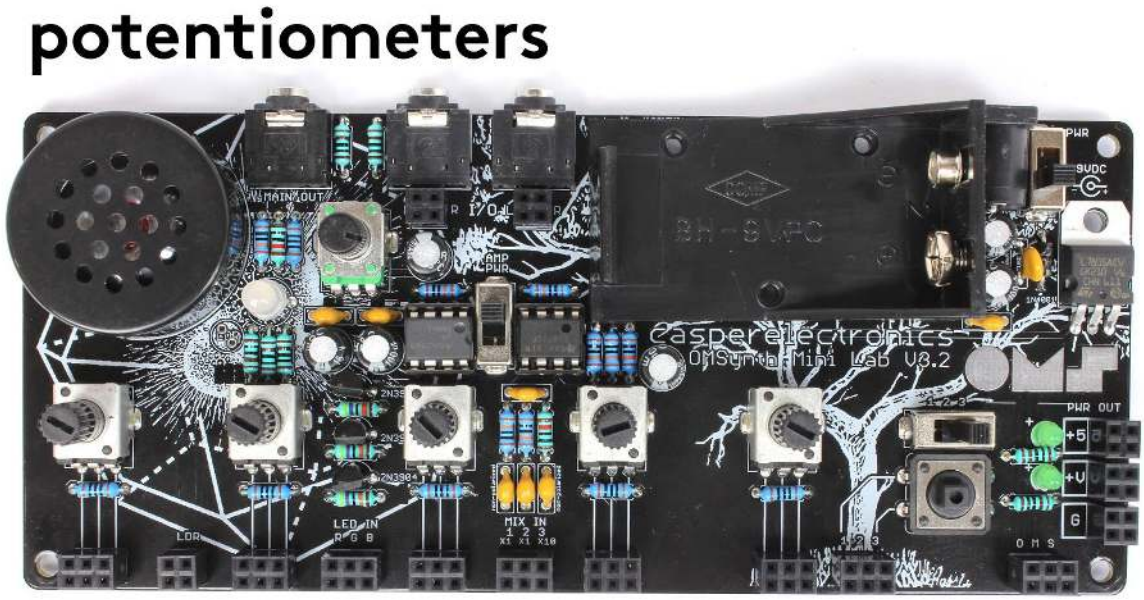
Insert and solder the **RGB LED**. Again, the LED is polarized. Make sure to **insert the LONGEST lead into the SQUARE hole**.



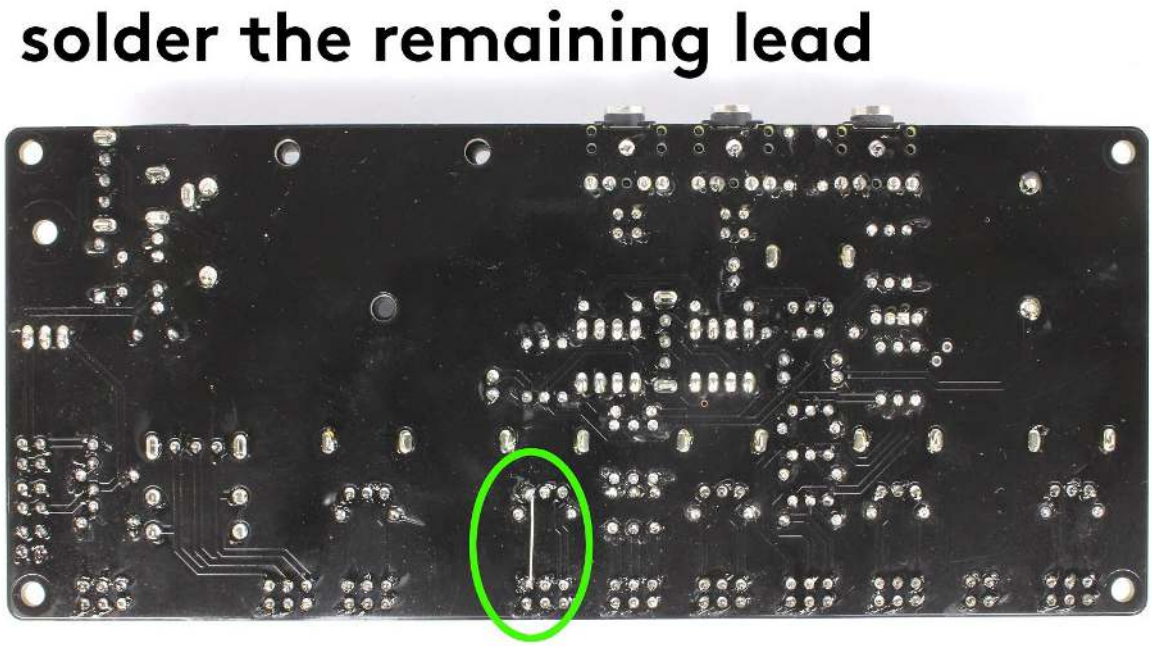
Now solder the **speaker** (the orientation doesn't matter) and the **battery holder** then.



Move to soldering the last parts - six **potentiometers**. There are two values of them: one **10k linear** and five **100k linear**. Pots take a little care and patience to install correctly. Push the pots on the place and look closely to see if they are in straight. Solder just ONE leg on each pot (as you did at switches). Do the check then and once they look good finish soldering.



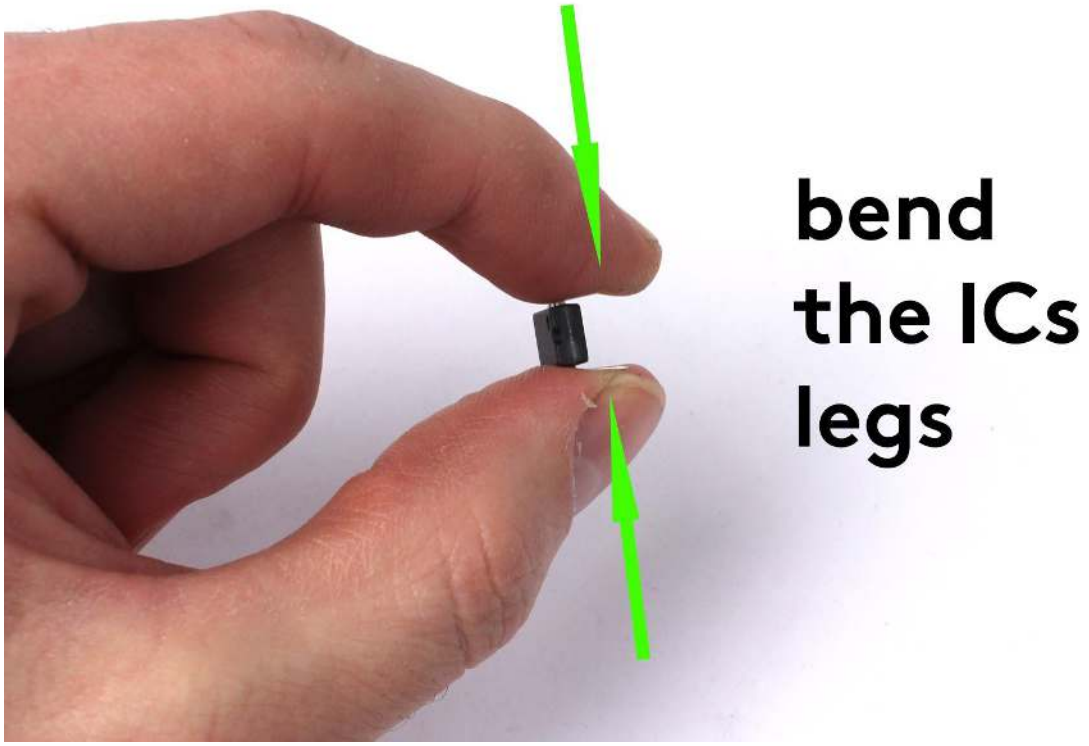
And now the last soldering. You have to connect two joints from the back side by the lead from resistor. See the photo below.



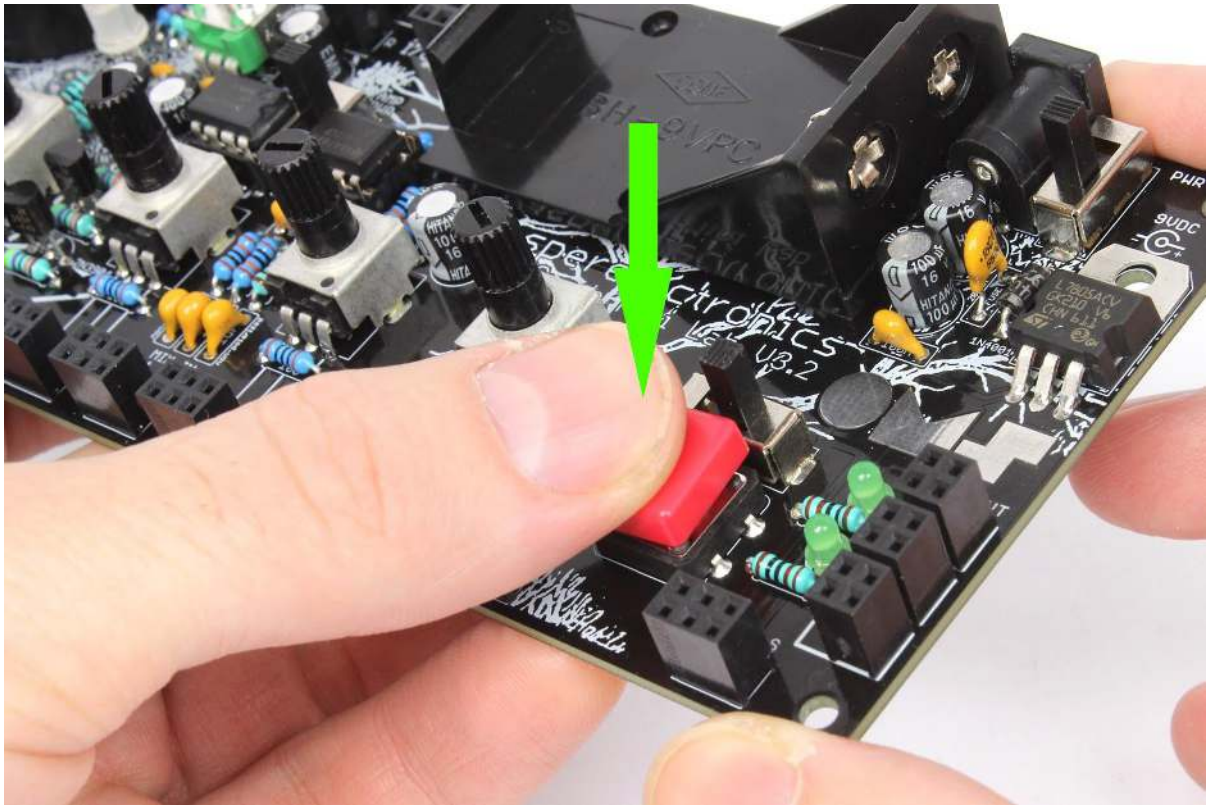
FINISHING THE OMSYNTH

Now you can move to the completing the OMSynth.

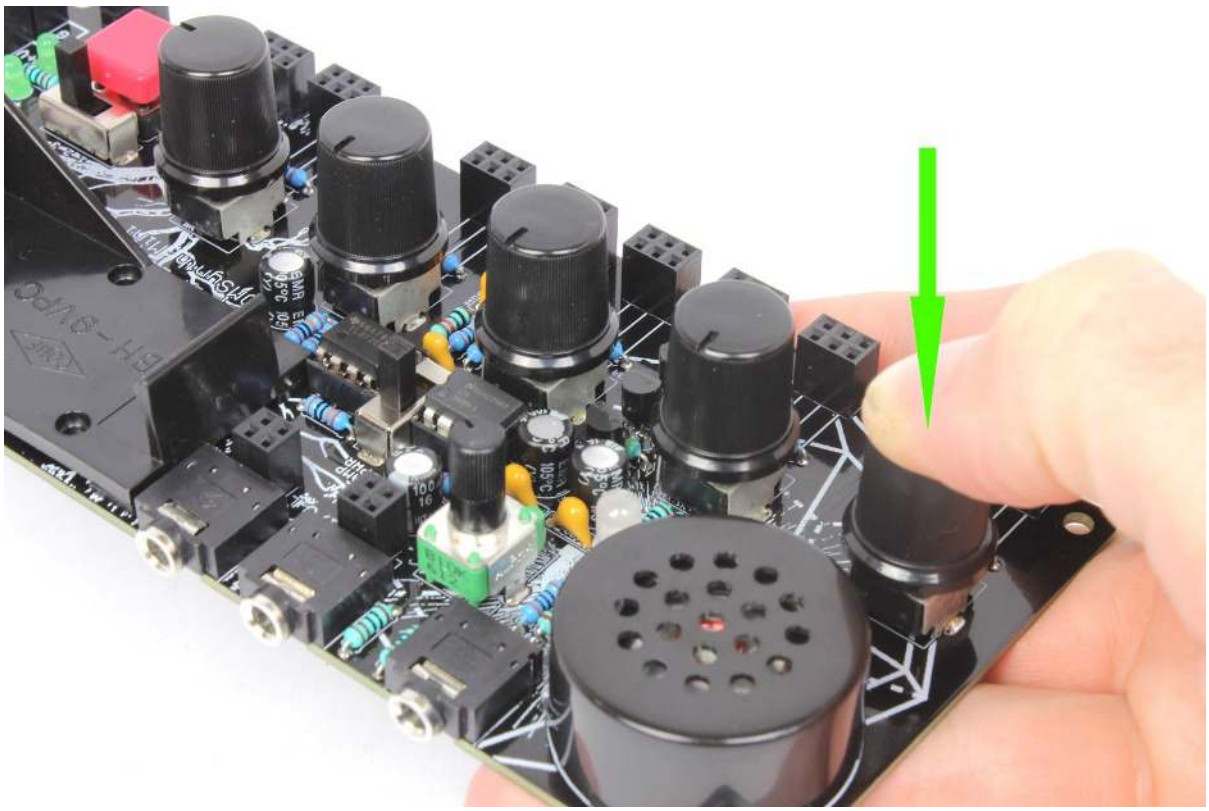
First insert the **ICs** (TL072P, LM386). They are polarized. There is a little half circle notch or dot on one side of each IC. This should match the notch drawn on the PCB. Installing the ICs can be a little tricky. The IC leads are flared out a bit wider than the socket will accept. Bend them in slightly with your fingers, and then try to press all the leads into the sockets in one shot.



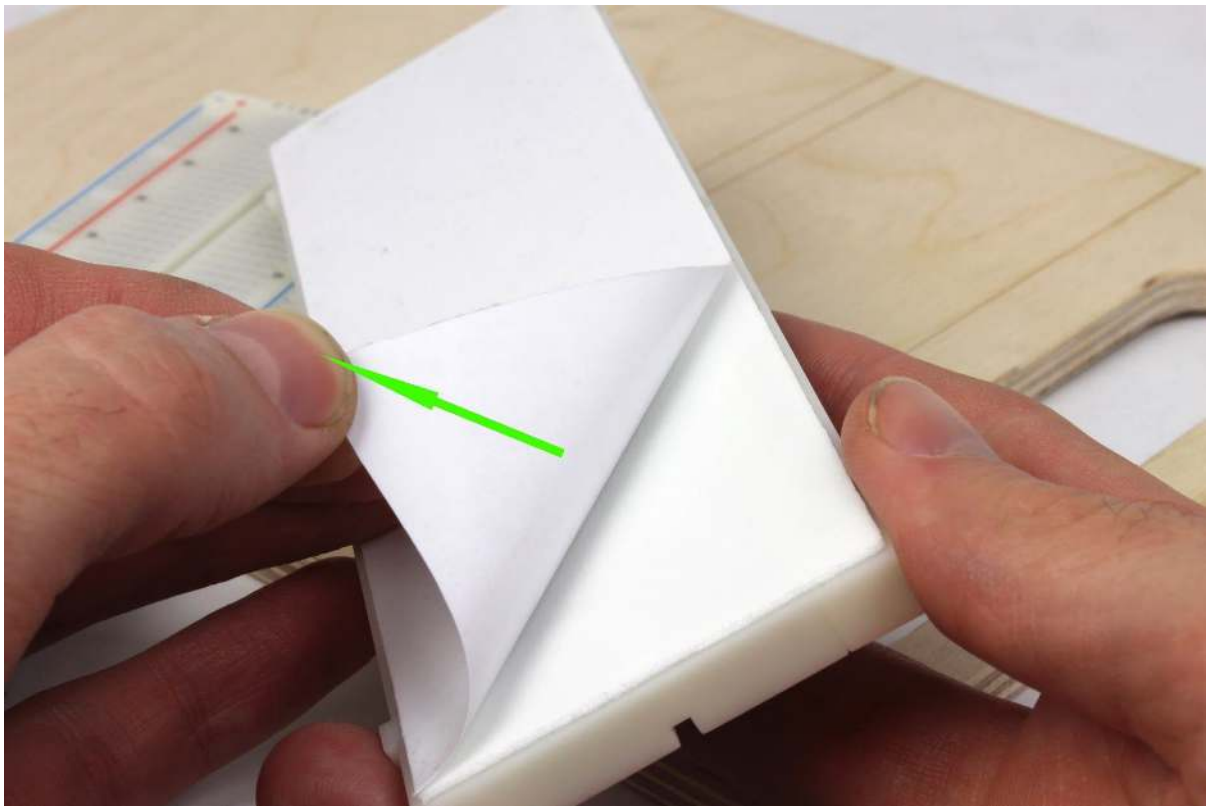
Install the **cover** on the button as well.

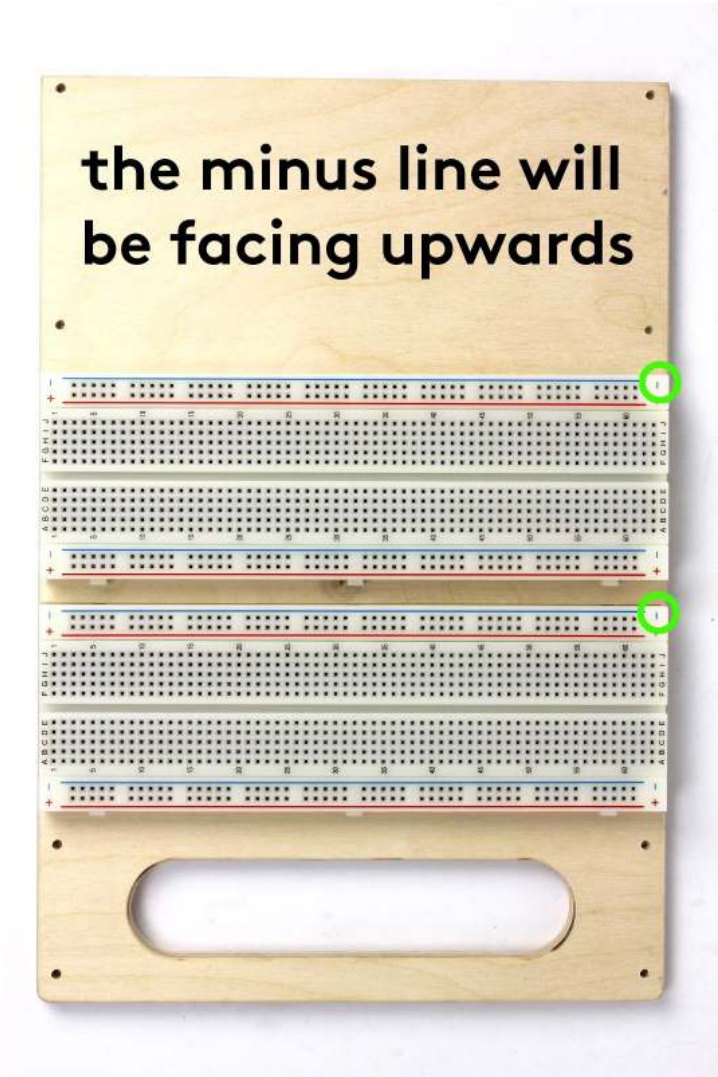


Set the pots to the central position and push the **knobs** on.

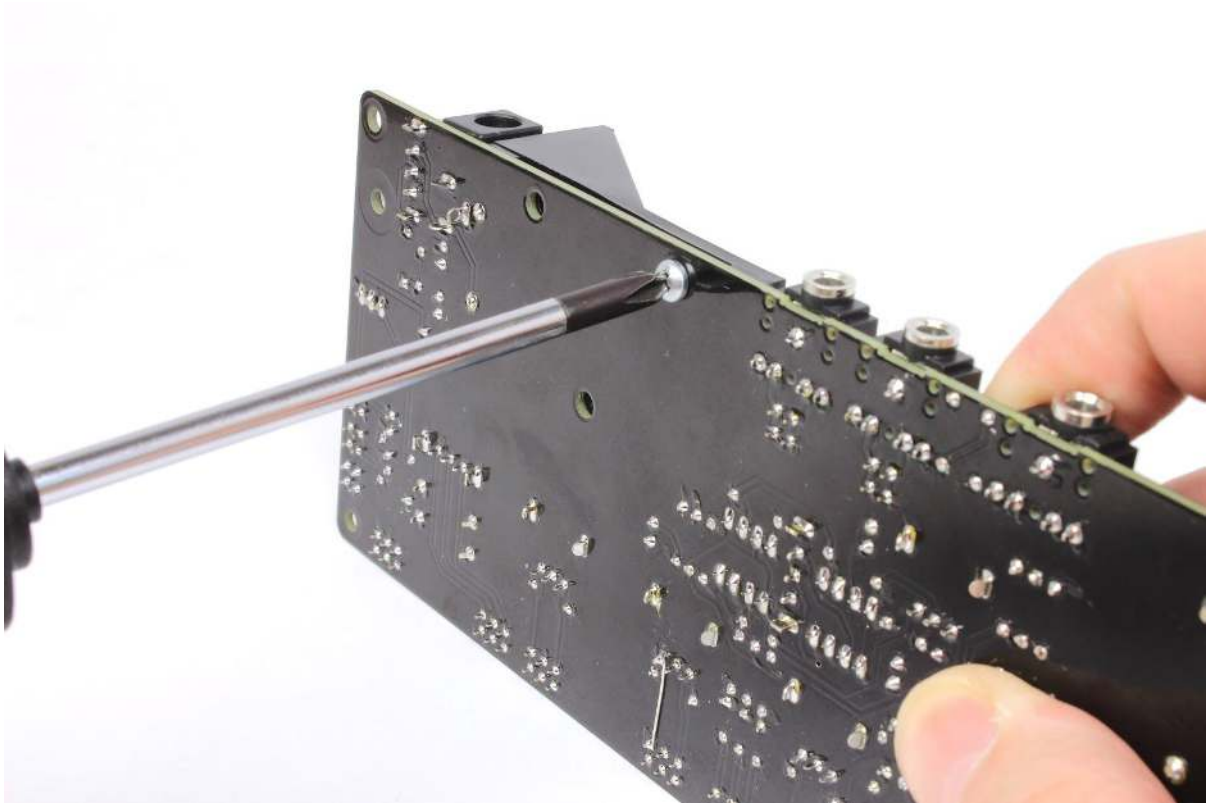


Prepare the **breadboards** with the **wooden desk** now. Tear off the cover from the back side of breadboards and stick them carefully right in the signed rectangles. The placement of the breadboards is REALLY important to make the OMSynth compatible with other products. See the pictures below.

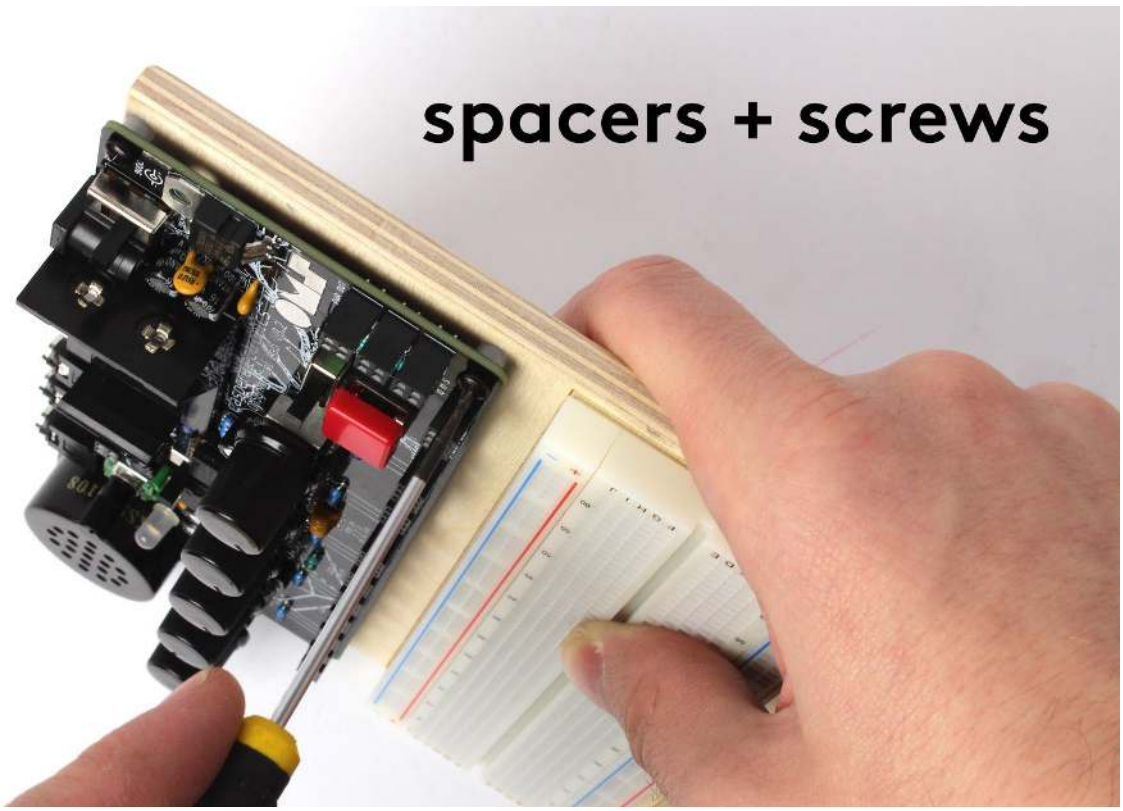




Mount the screw into the battery holder to keep it tight to the PCB.



The last step is to mount the PCB to the wood. Use the enclosed spacers and screws.



Congratulations! Install just the 9V battery now and your OMSynth is ready to go!