Trinity Assembly

by **bastl-instruments** on October 4, 2013

Intro: Trinity Assembly

Hey dudes! Lets build the trinity synth!
!

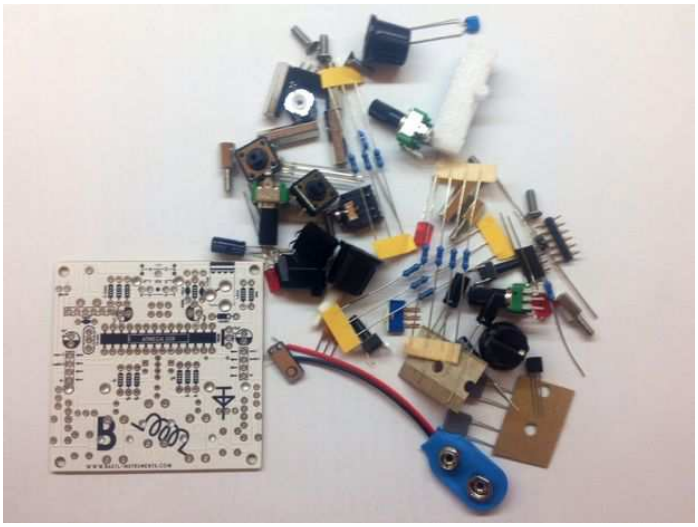
More information about the synth at: www.bastl-instruments.com

Before you start: the board solders from both sides and the component goes always above its printed sign so it hides the sign!

You should know that there are some differences between some of the versions.

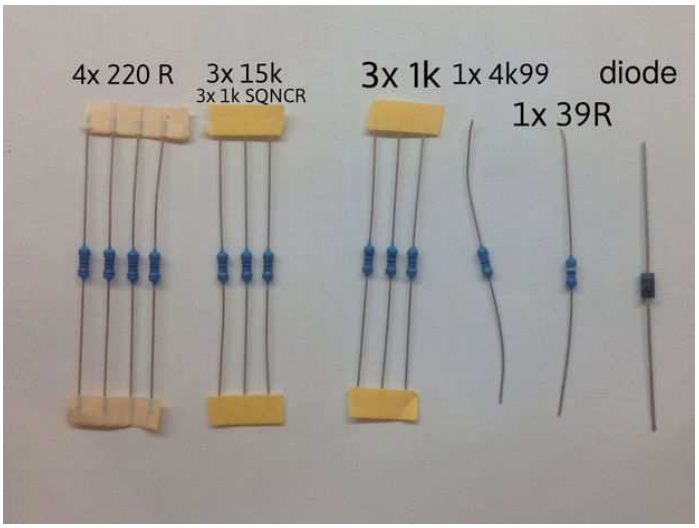
SQNCR has more buttons and 3 small leds insteas of the rgb led and therefore different resistors too.
Mozzi library development kit has no casing and the small buttons are not tall.

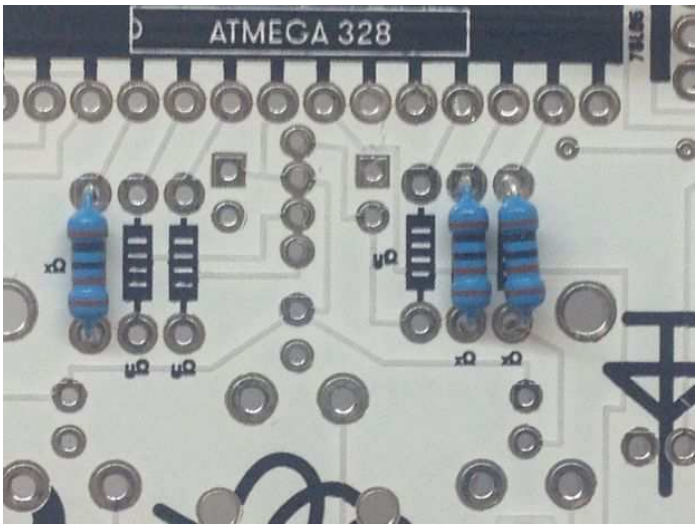
This instructable is now updated for both versions 1.0 and 1.1 - please read the instructions CAREFULLY - especially for the power switch !

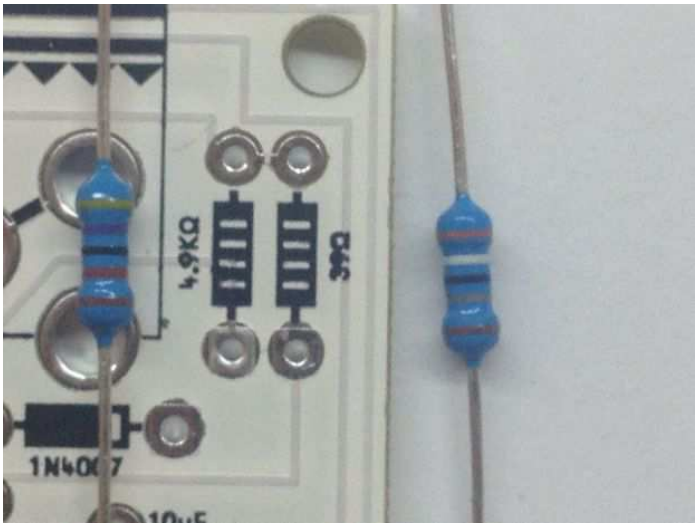


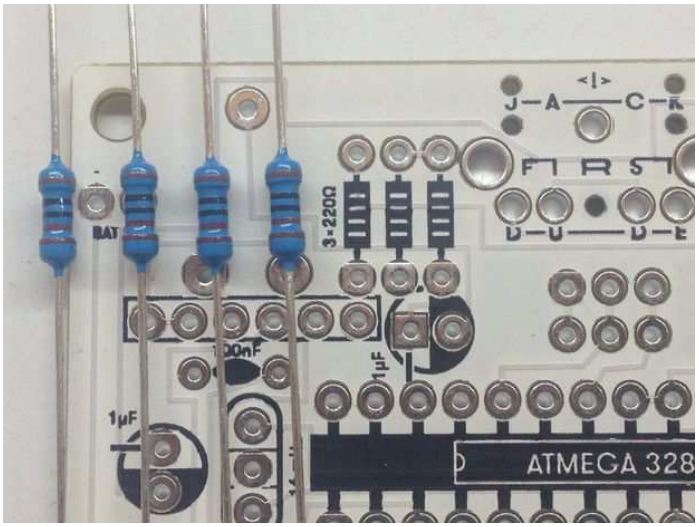
Step 1: Placing Resistors

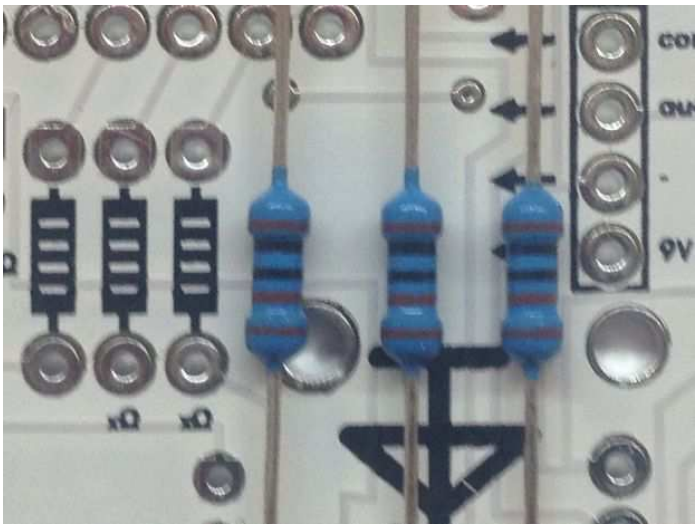
First lets solder all components on the component side of the pcb.
Different slots for resistors have different values of resistors. Read the color stripes or measure the values with multimeter.
-4x 220R - red red brown (on board 1.1 three of these 220r are labeled zOhm)
-1x 4.9k - yellow white white brown (4.7k also works yellow violet red)
-1x 39R - orange white black
!!!
-3x xOhm are 1k brown black red !read the board carefully!
-3x yOhm are 15k brown green orange BUT on SQNCR they are 1k brown black red !

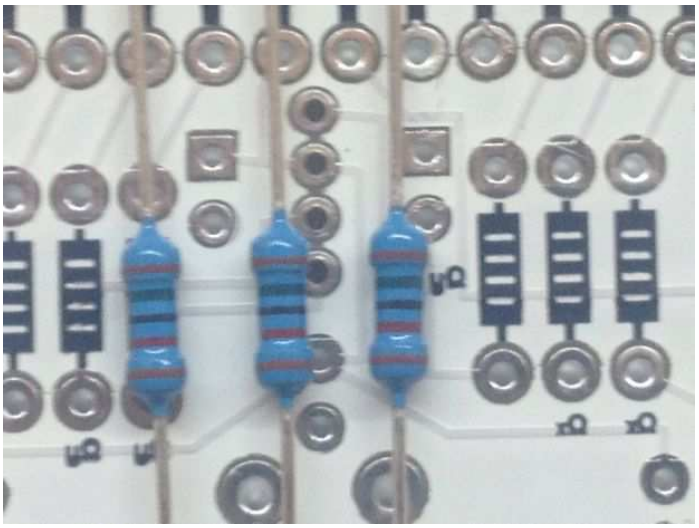

4x 220 R
3x 15k
3x 1k SQNCR
3x 1k
1x 4k99
diode
1x 39R

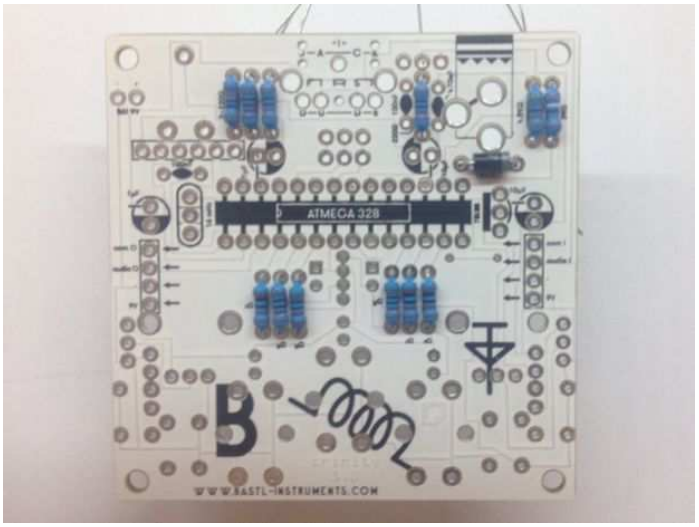

ATMEGA 328


4.9KΩ
39Ω


ATMEGA 328

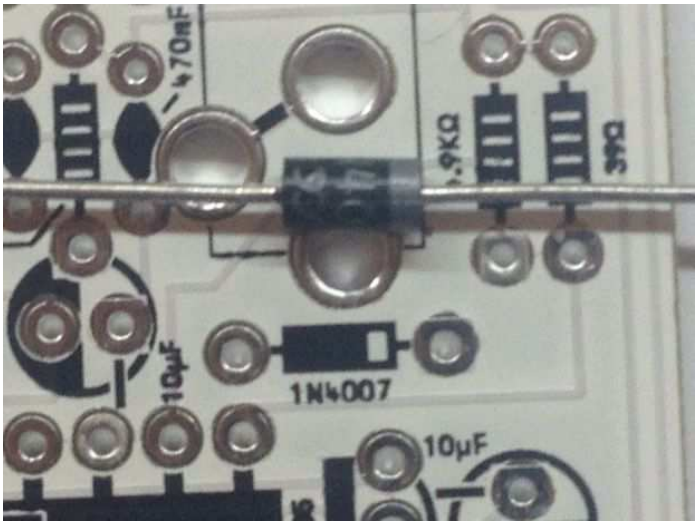






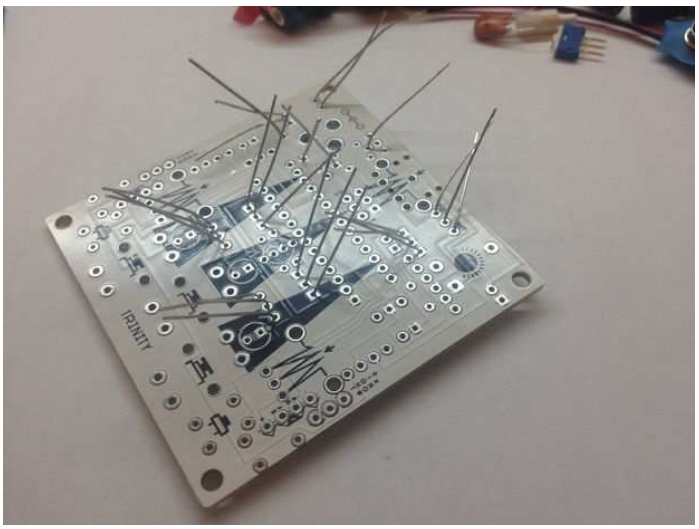
Step 2: Place the protective diode

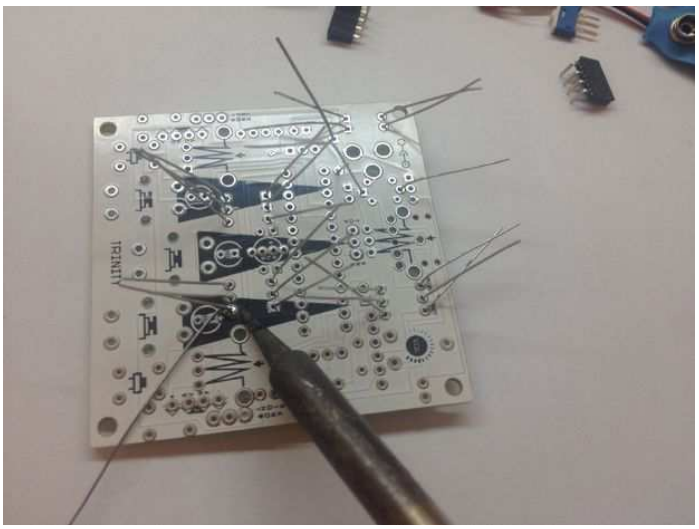
Care of the polarity indicated by the stripe

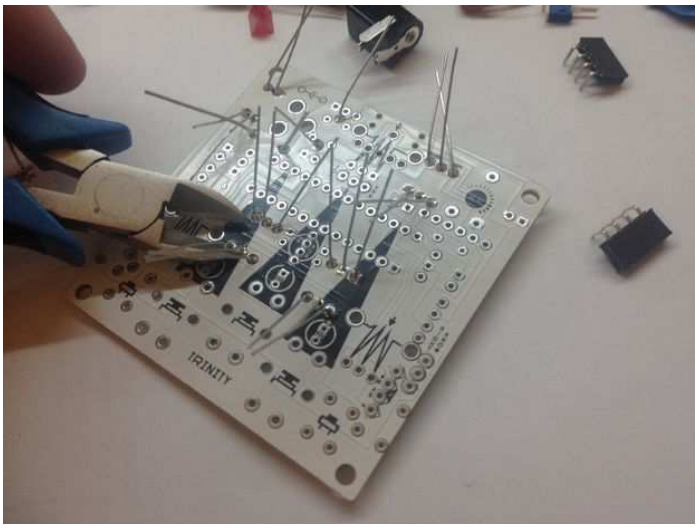


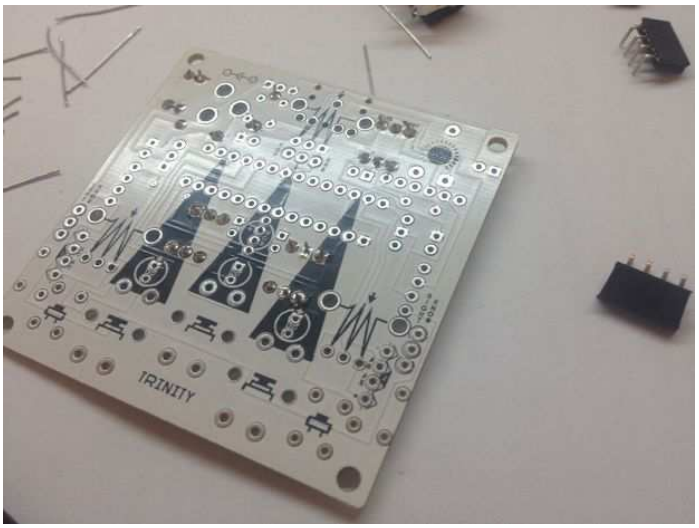
Step 3: Solder

Bend the legs or the components slightly and turn the board upside down and solder each connection properly. Than cut the legs.





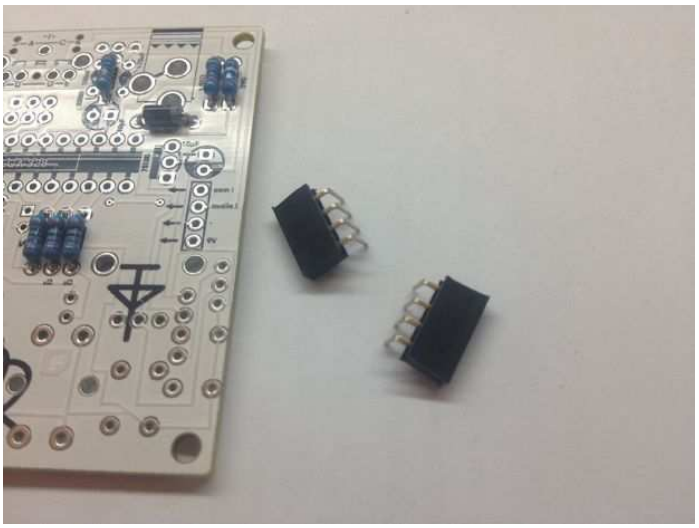


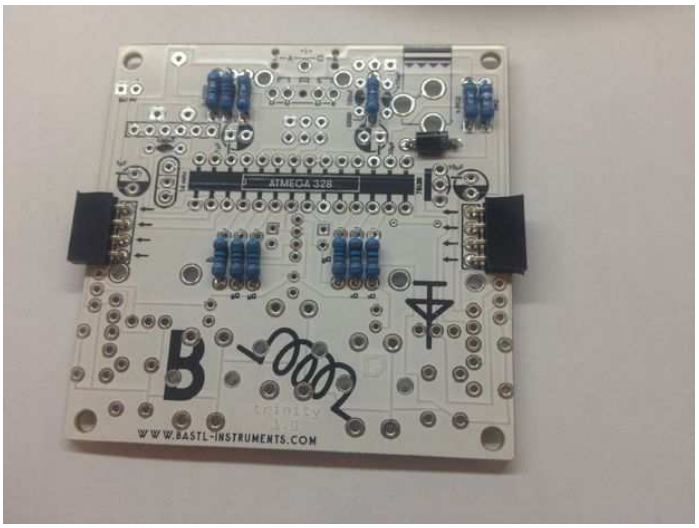


Step 4: Chain Connectors

Take these an solder now.

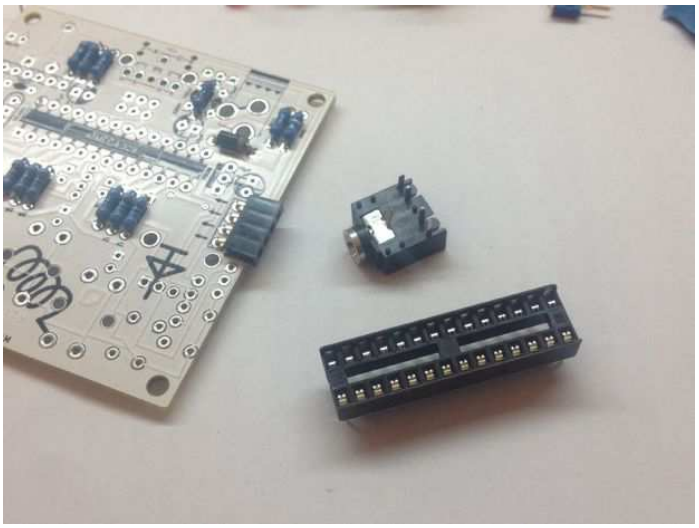
Tip: it is always good to solder the least tall parts first.

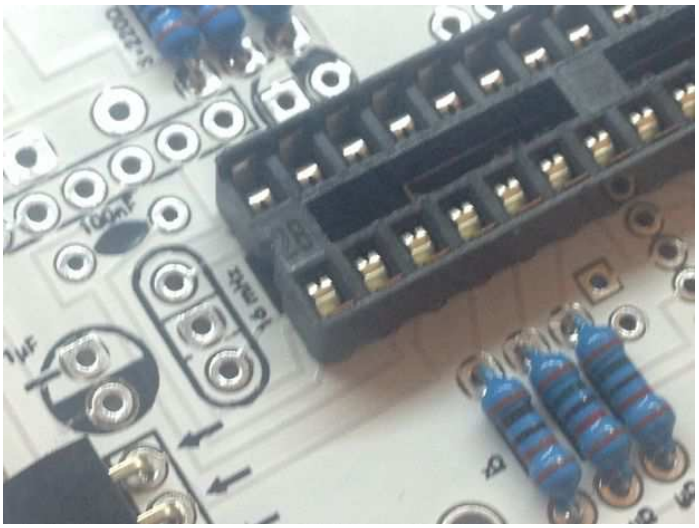


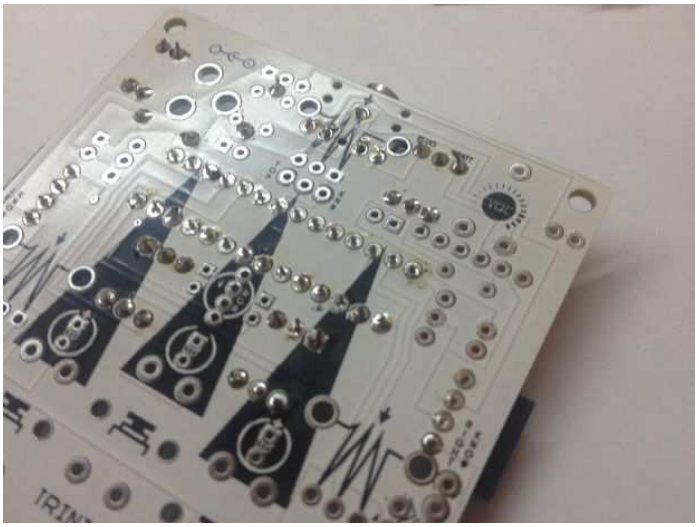


Step 5: Atmega Socket and Audio Jack

On the chip socket mind the polarity indicated by the notch. On the audio connector try to solder it the way that there is NO gap between the connector and the pcb. Than cu the remaining legs of the jack. Double check that you solder from the correct side of the pcb!

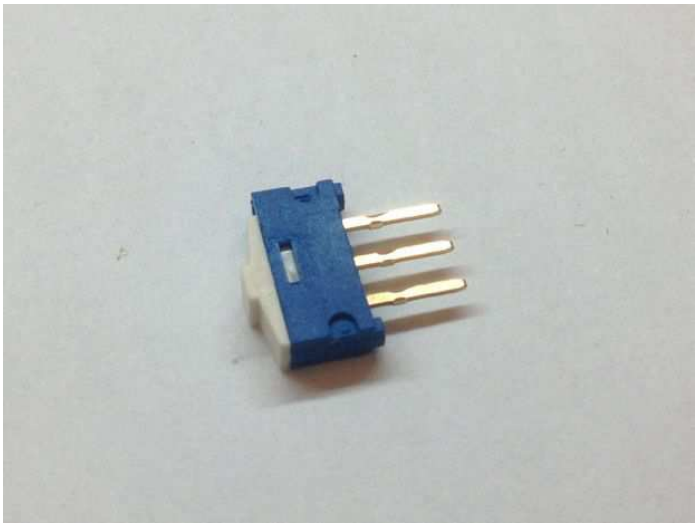


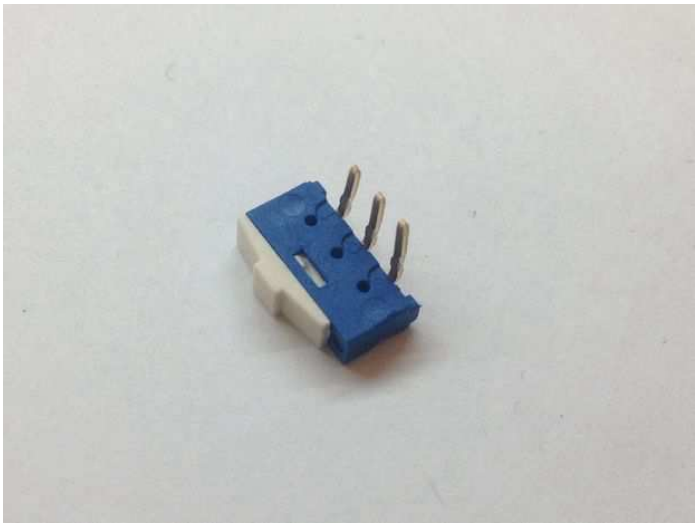




Step 6: Bend The Switch

Carrefully bend the legs ! ONE BY ONE ! of the slide switch into right angle. It does not matter to which side you bend them, but by not gentle bending you might damage the switch.

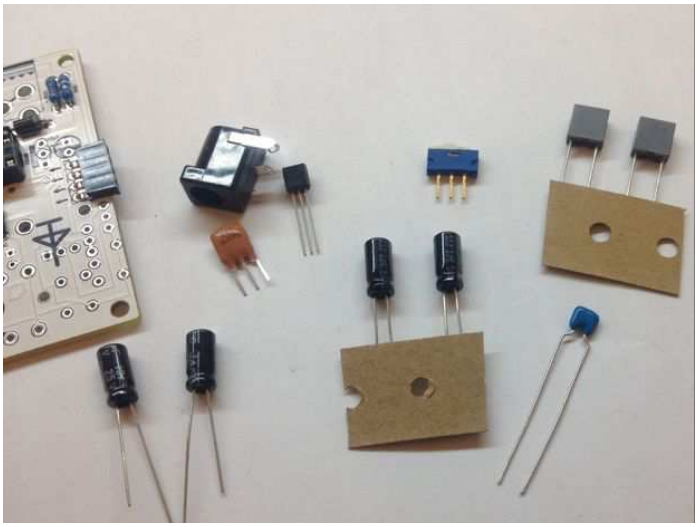


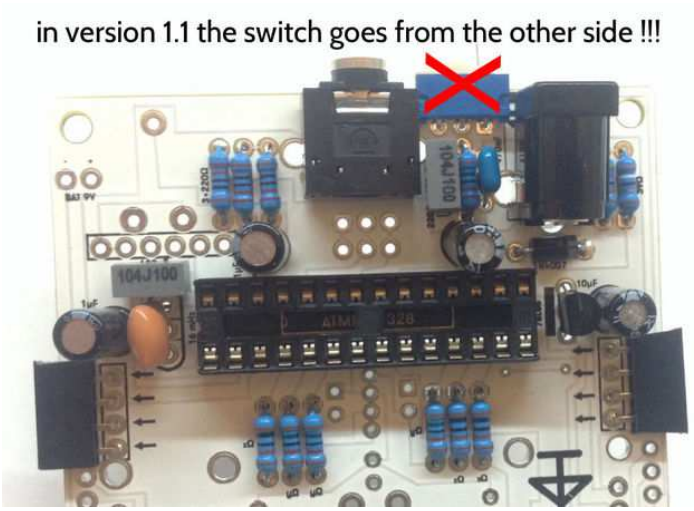


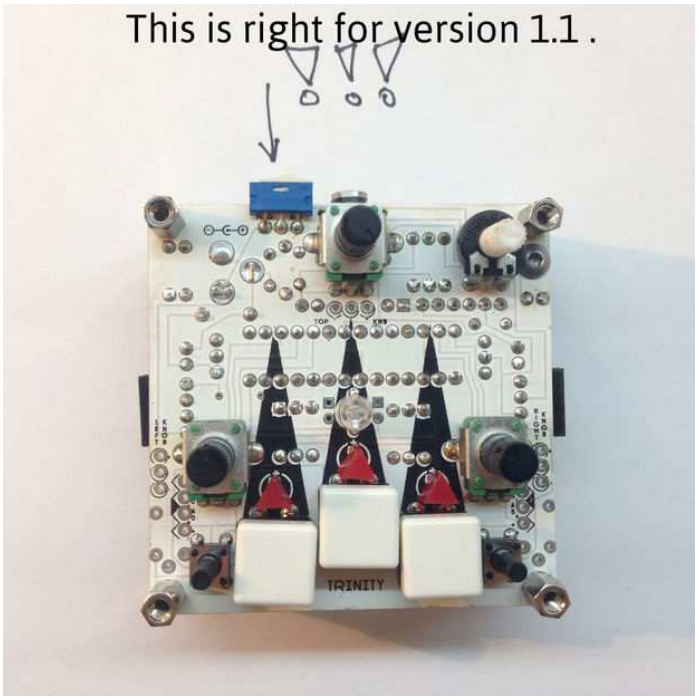
Step 7: Capacitors, Resonator Regulator Switch Power Jack

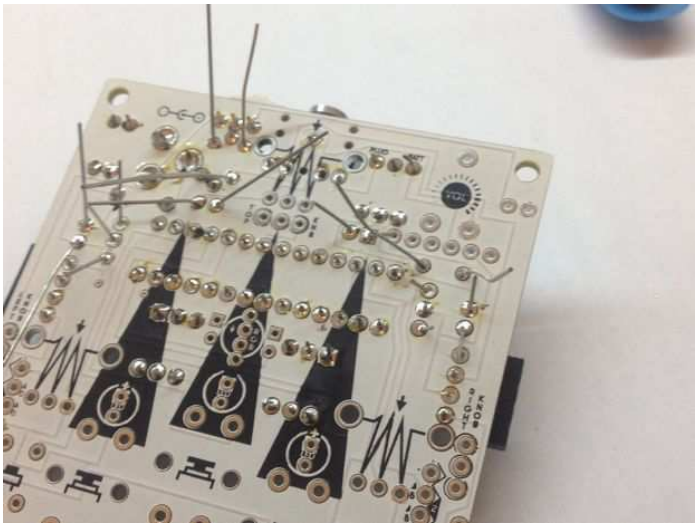
IMPORTANT: in version 1.1 with full plastic housing the switch has to go from the other side of the board ! as on the pictures !

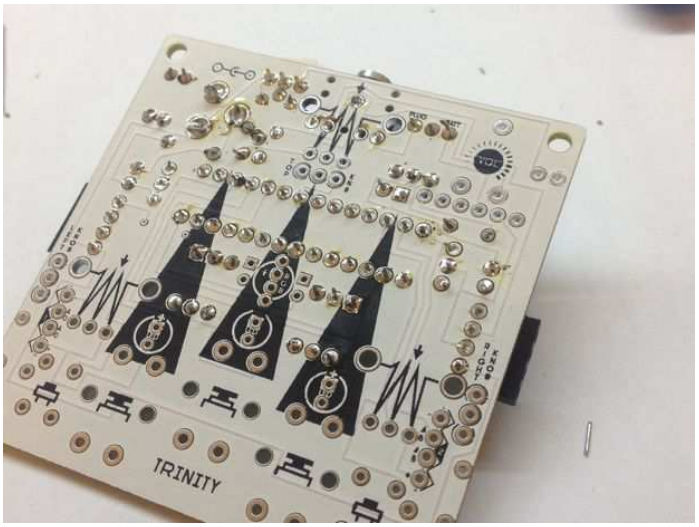
All the other components go now on the board. Put the components and bend their legs slughtly. Take care of polarity and value of electrolitic capacitors- the big ones. Resonator 16mhz has no polarity. Voltage regulator 78l05 has polarity indicated. On power jack fill the holes with tin and make NO gap between the connector and the pcb.




in version 1.1 the switch goes from the other side !!!

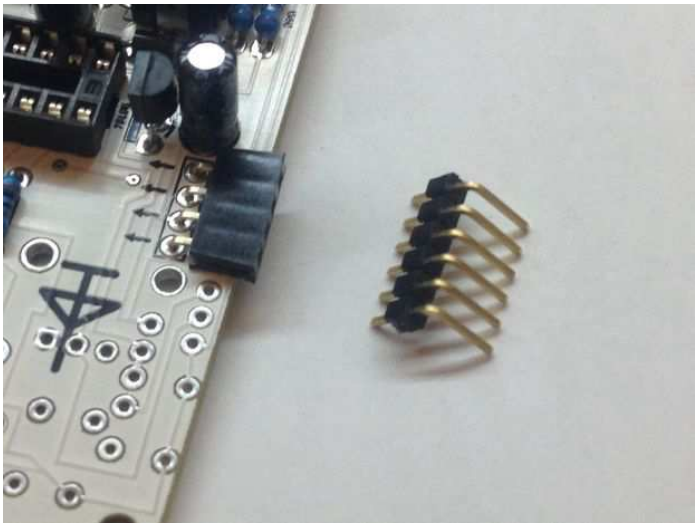

This is right for version 1.1 .
IRINITY

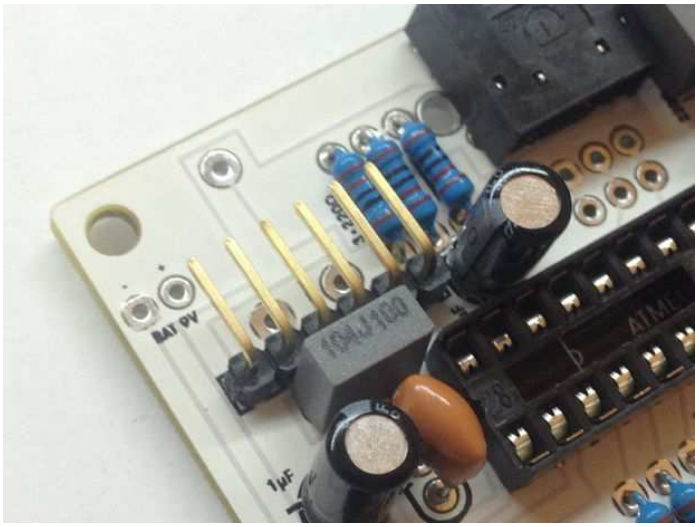


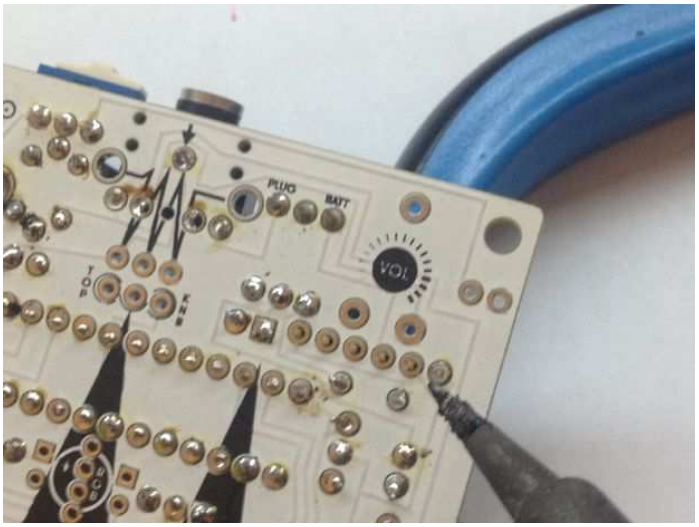

IRINITY

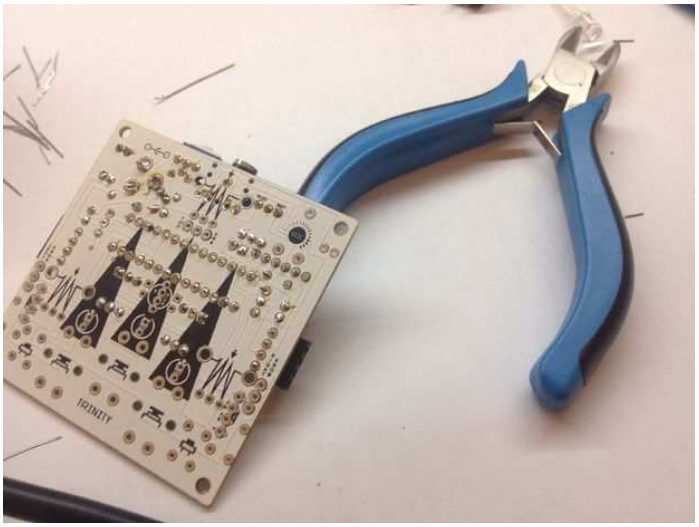
Step 8: FTDi Break Out Connecor- The Hack Port

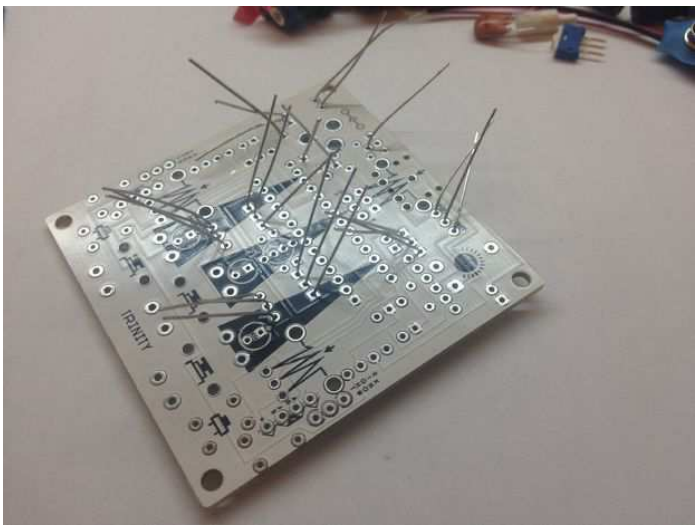
Solder the 6 pin bent header on the right place. To hold it in the place put something like pliers underneath.





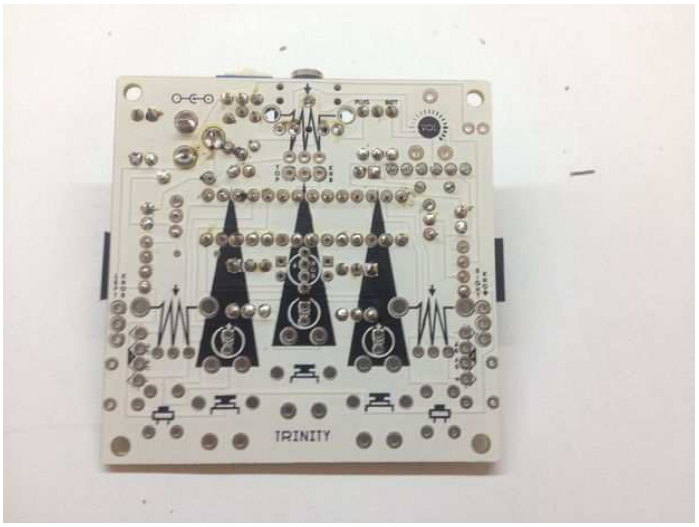






Step 9: Interface Side

The component side is ready so lets solder from the Interface side.
!
Important: all the components have to be soldered straight - right angle to the board. If they are not straight you might have problems of putting the front plate on them.

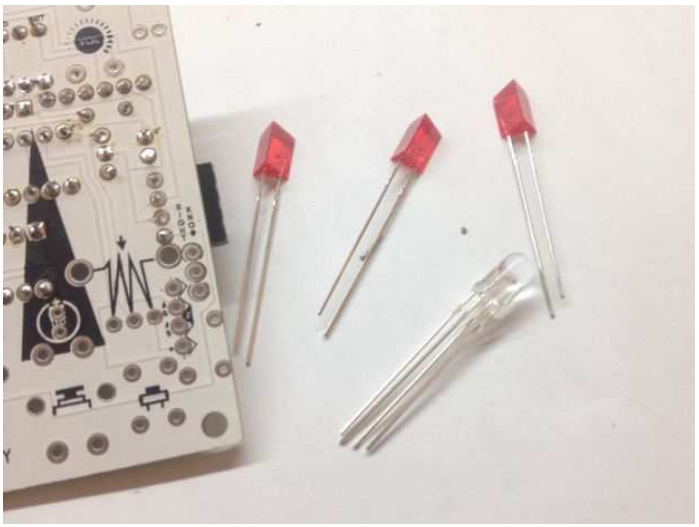


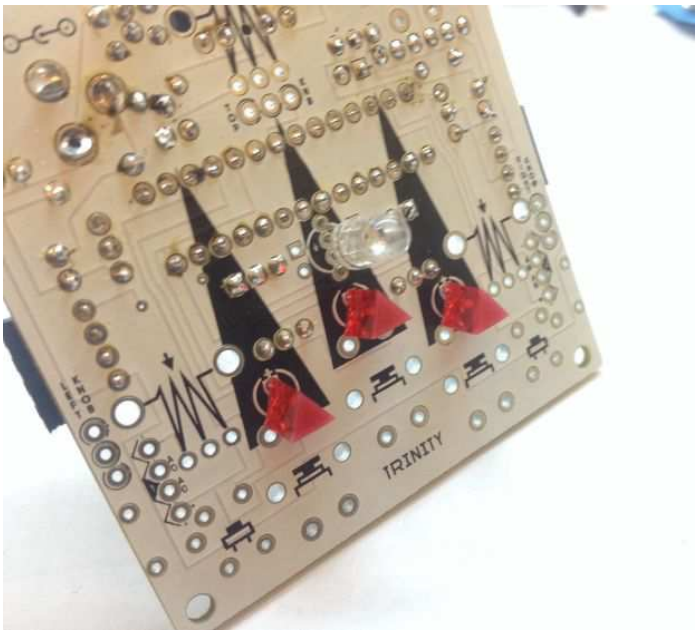
Step 10: Leds

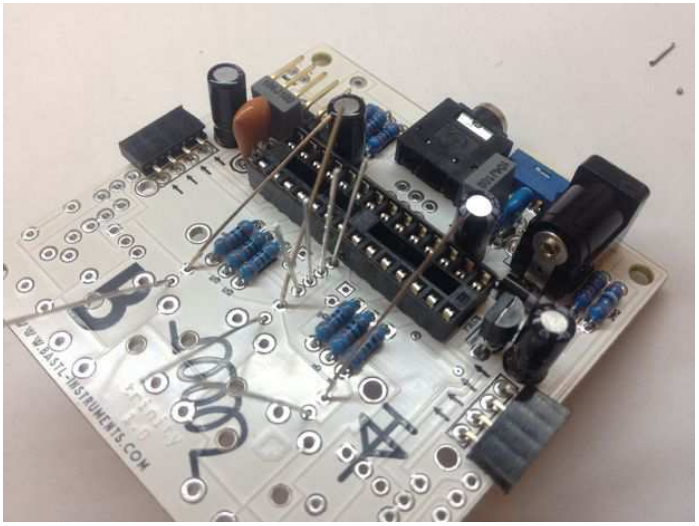
The leds have polarity indicated on the board. The longest leg of the led is +
The RGB led goes as deep as the stoppers on its legs are.

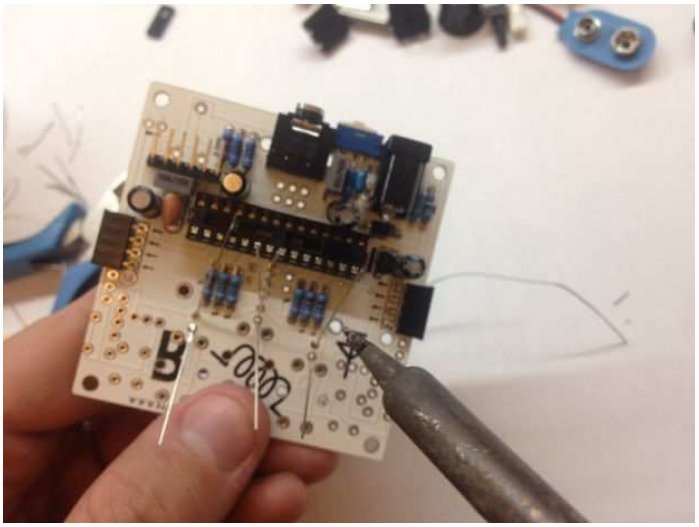
Note: on trinity board v1.0 we had the enlarge the holes of RGB led by drilling so the thru hole connections might got lost! for the rgb led put a bit of solder from both sides of the board to make sure the connection is there.

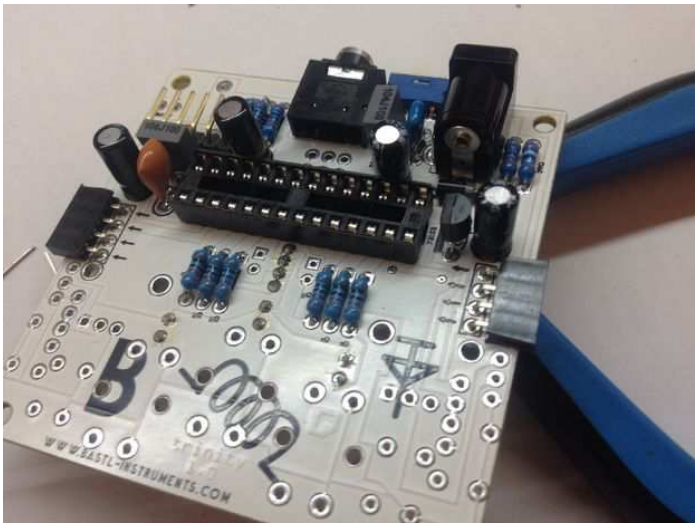
For soldering LEDs ob SQNCR see the next step!









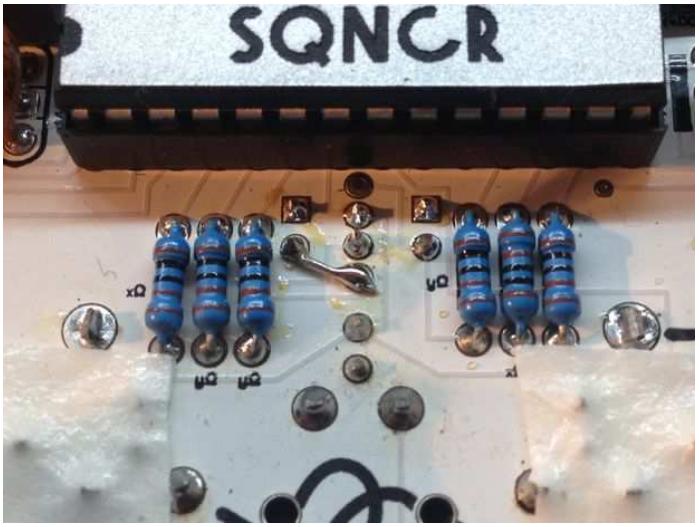


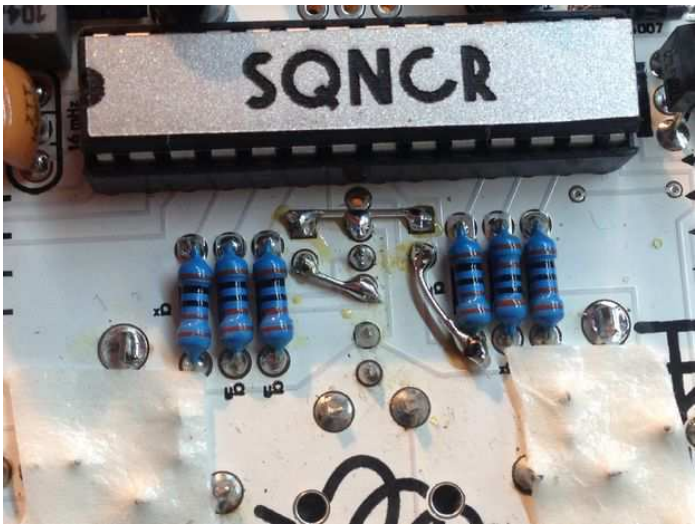
Step 11: Leds On SQNCR

If you are not soldering SQNCR please go to the next step.
On SQNCR there are 3 small leds instead of the the one rgb led. The middle one goes to the middle 2 holes of the rgb led and the other 2 go to their slots with the same polarity. + on the top side.

On board version 1.0 there might be issues with the 3 LEDs Because some od the holes had to be drilled bigger therefore it might have happenned that some of the connections here got lost. If one of your little leds doesn't work try to remake the traces as on the pictures.

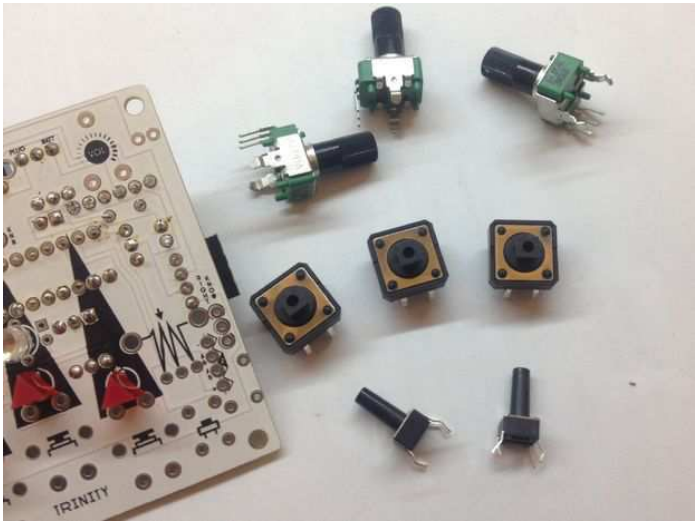
This is fixed on 1.1 board.

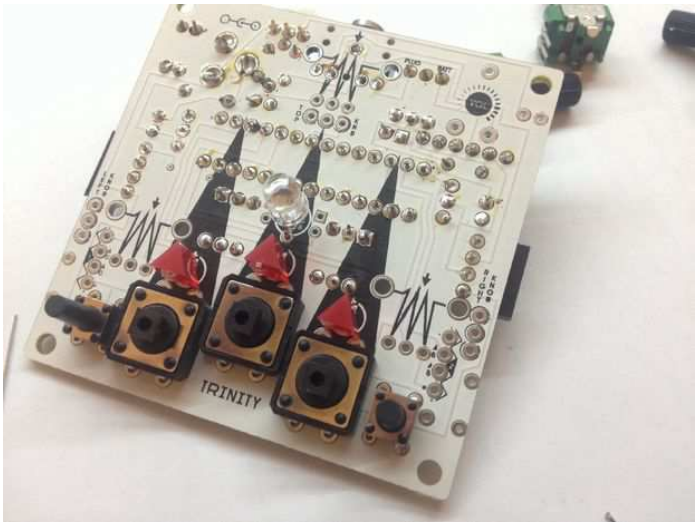


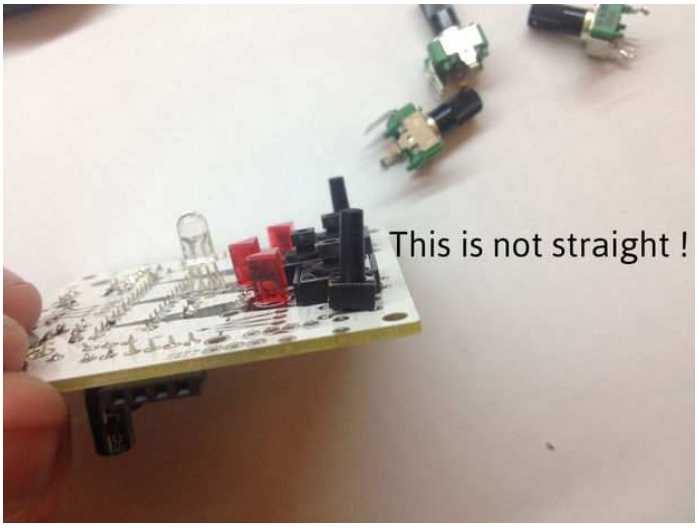


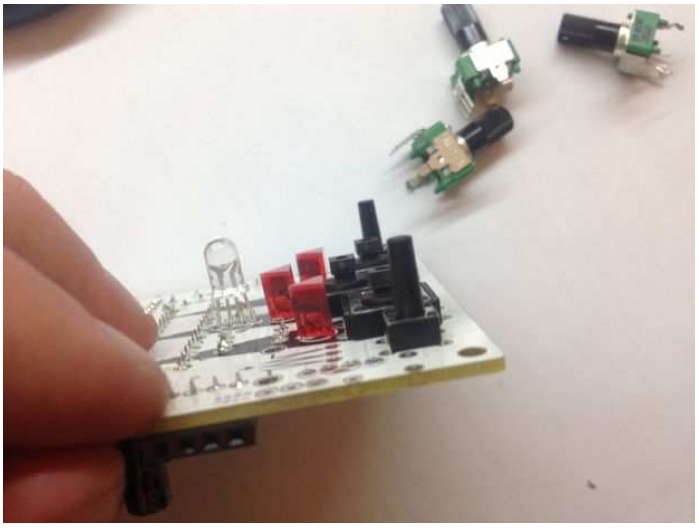
Step 12: Buttons

Place and solder the buttons. Make sure they are straight. You might have problems with putting it into the housing if they are not !



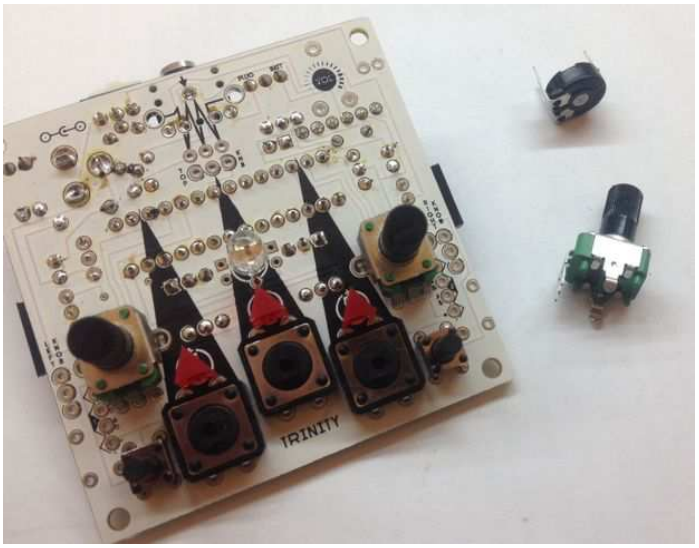


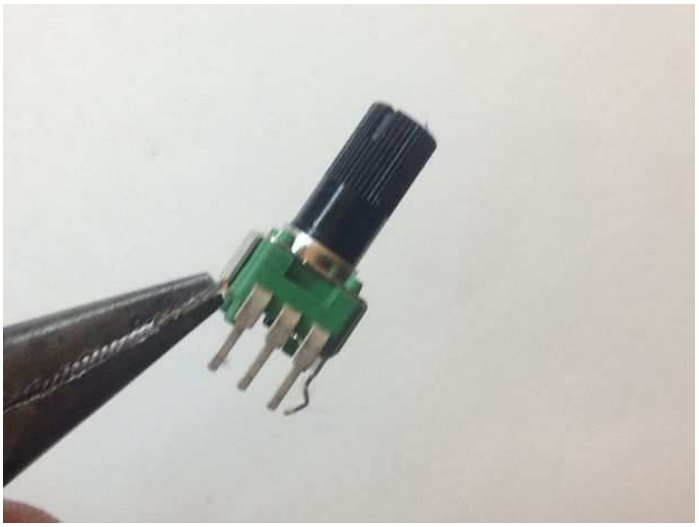


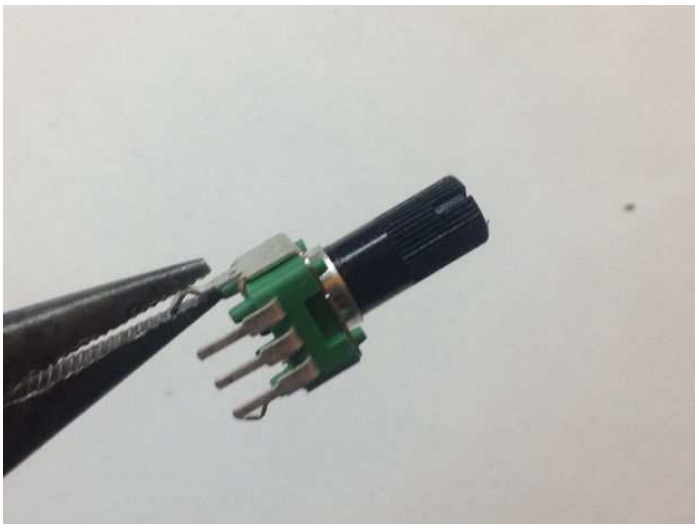


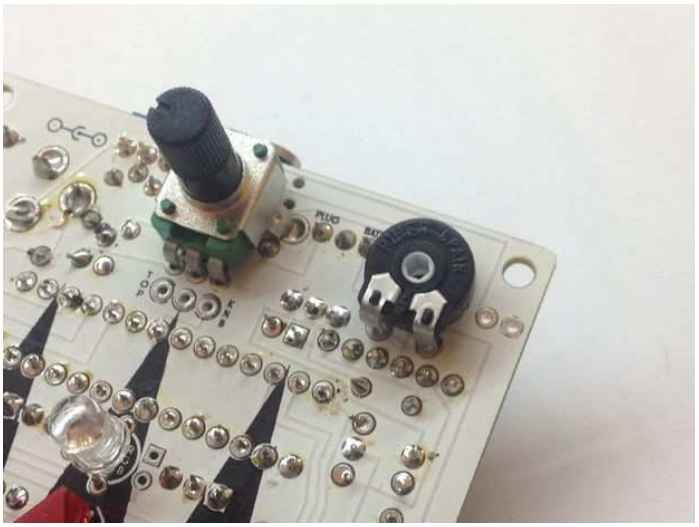
Step 13: Knobs

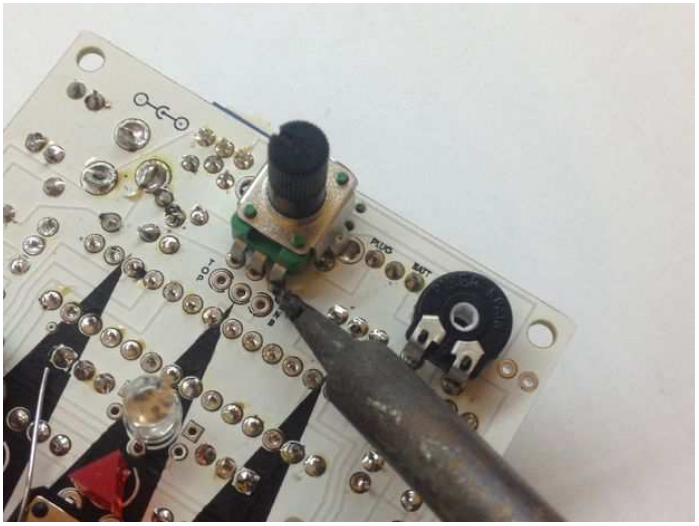
For left and right knob it is easy to place them and solder them.
The top knob needs a bit of adjustment so it fits.
Make sure the knobs are soldered straight and as close to the pcb ad its construction allows. Otherwise the PCB might not fit correctly into the housing !!!
The volume knob might also need a bit of adjustment so it fits the holes. (only for version 1.0)
For the volume knob yoz might need to solder it a bit from both sides ju to make sure the connection never breaks and yoz always have a good sound output.

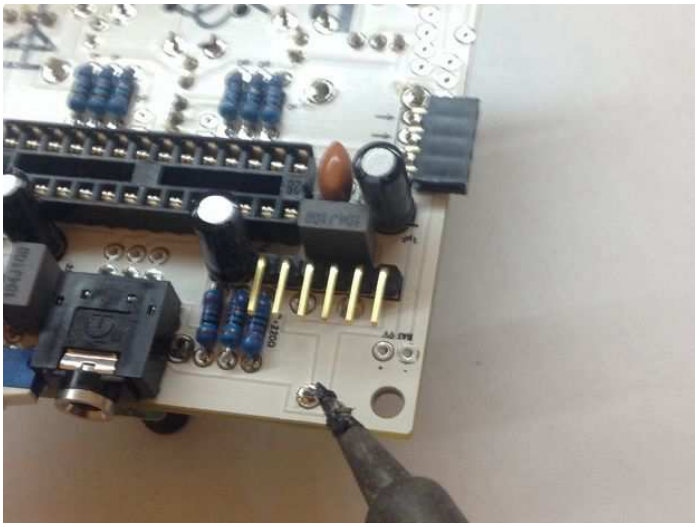






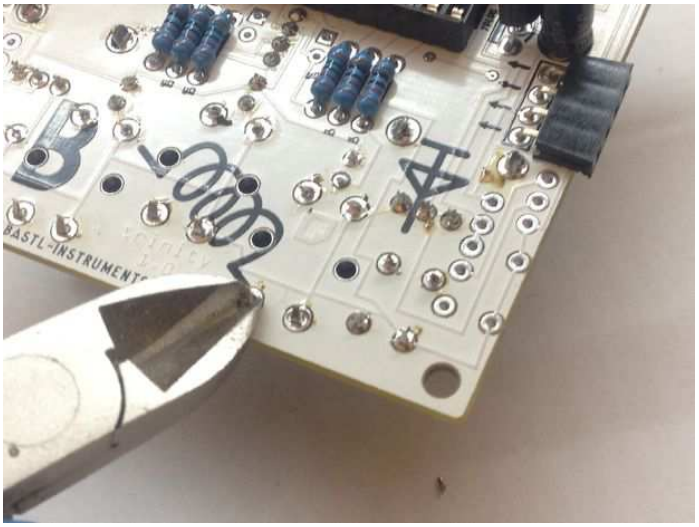


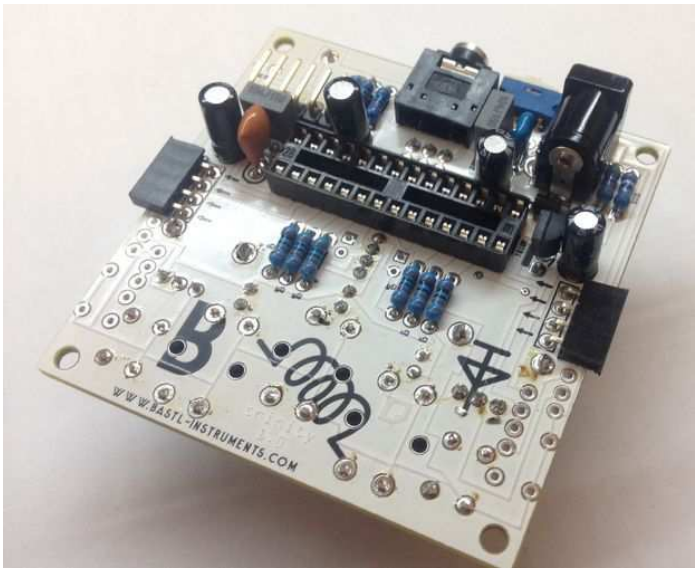


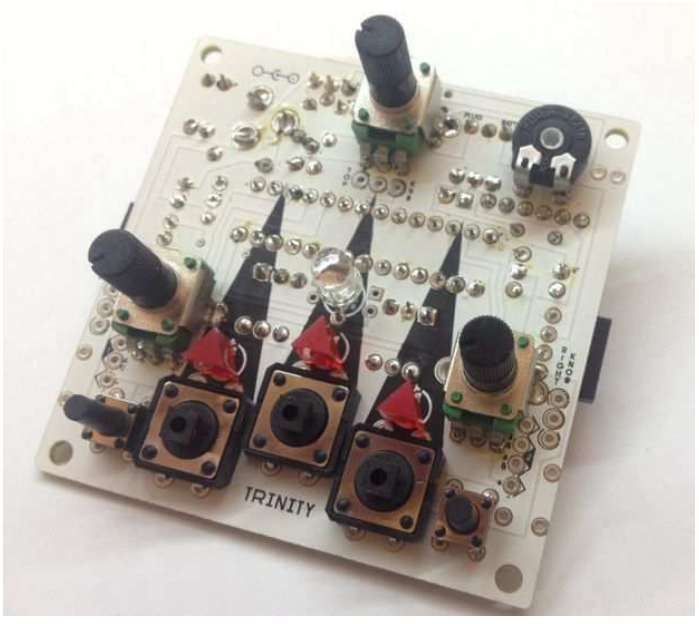


Step 14: Finishing

Make sure everything is soldered. Than cut the remaining pieces of buttons so the felt piece doesn't make a gap.



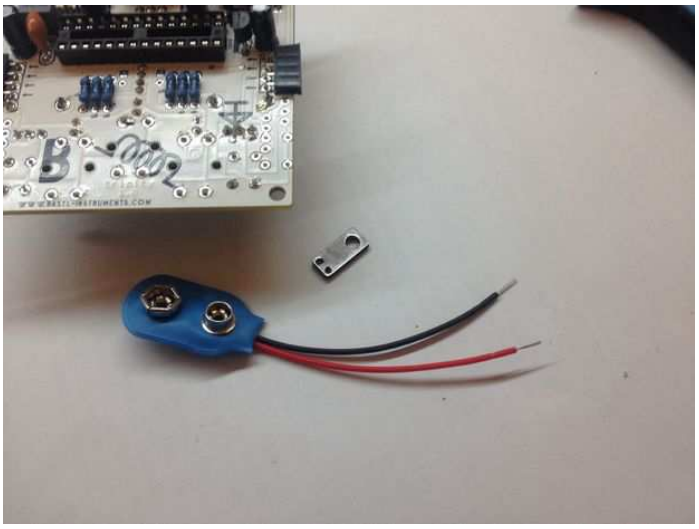


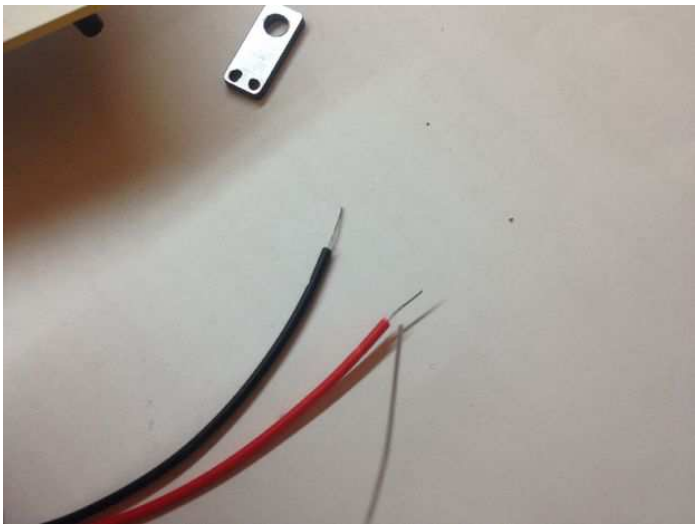


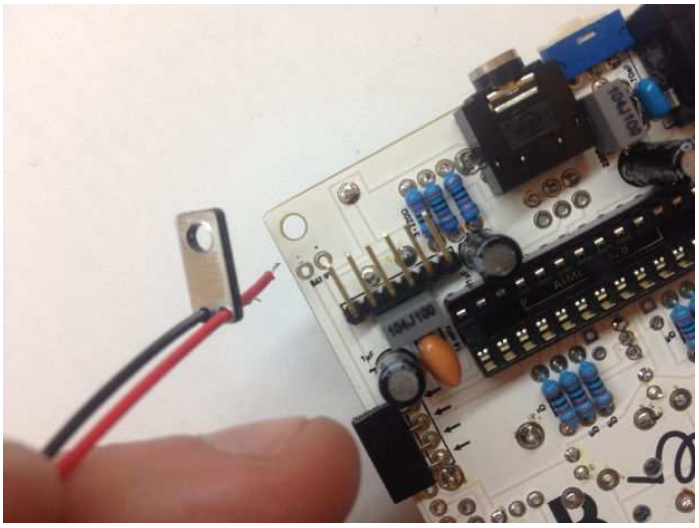
Step 15: Battery Clip

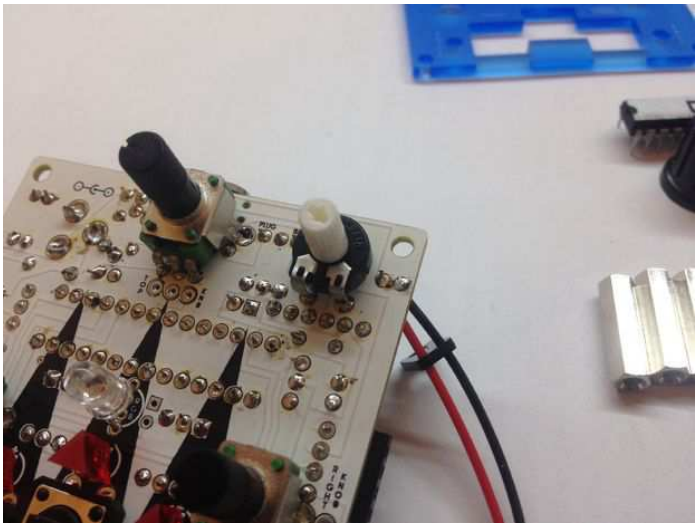
It is easier to put a bit of solder on the cable before you put it thru the holes. Use the silver plastic piece which holds the cable so it doesnot break. Follow the polarity signs. Red is + and black is - .

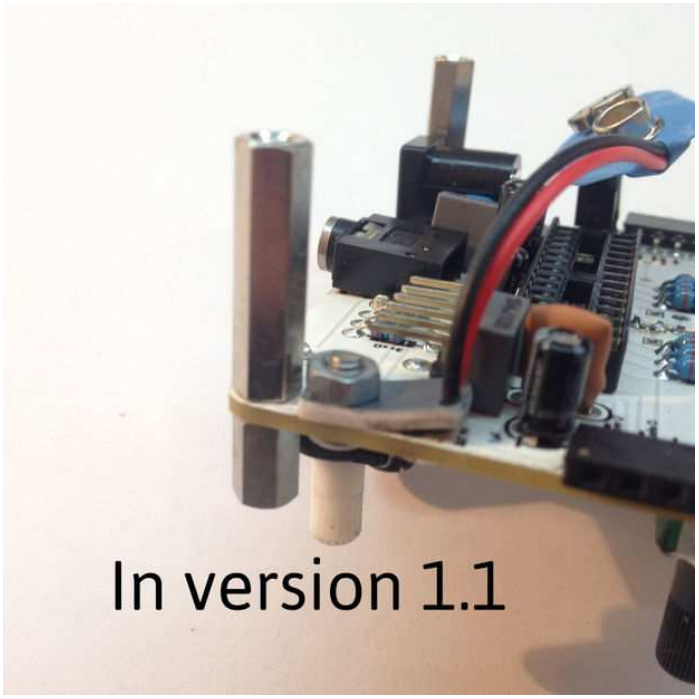
NOTE: on version 1.1 there is extra hole for holding the battery clip and plastic piece - put screw and bolt to fix that (the last picture of this step).









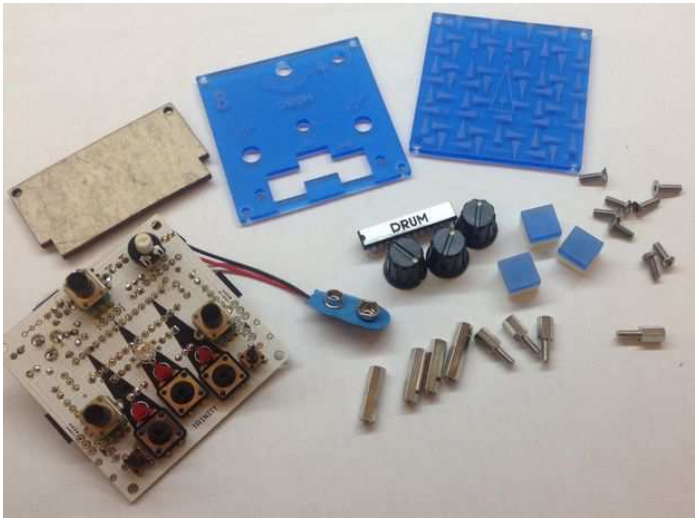


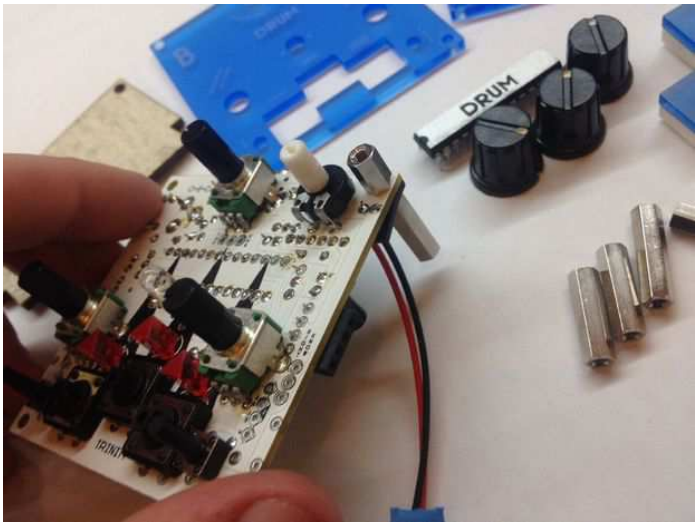
Step 16: Test Now!

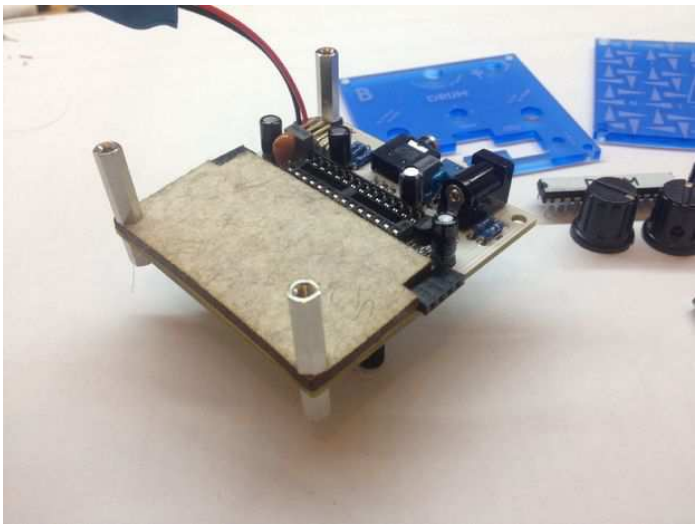
Well done the soldering is over. Before you dress up your trinity is really good idea to test that everything works.
I am gonna put a debugging tutorial online soon!
Everything works? Time to dress up!

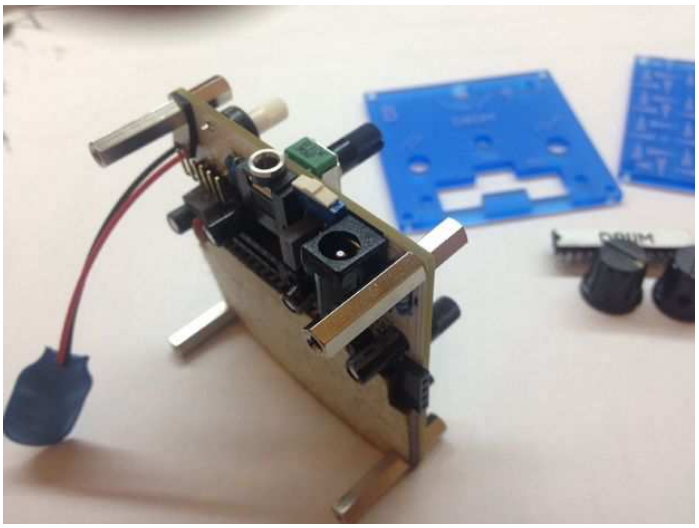
On version 1.0 there are 3 long spacers of the same length and one longer which compensates the hight difference. Do the 3 first and the longer one goes next to the power jack.

On version 1.1 all the pacers are the same length.







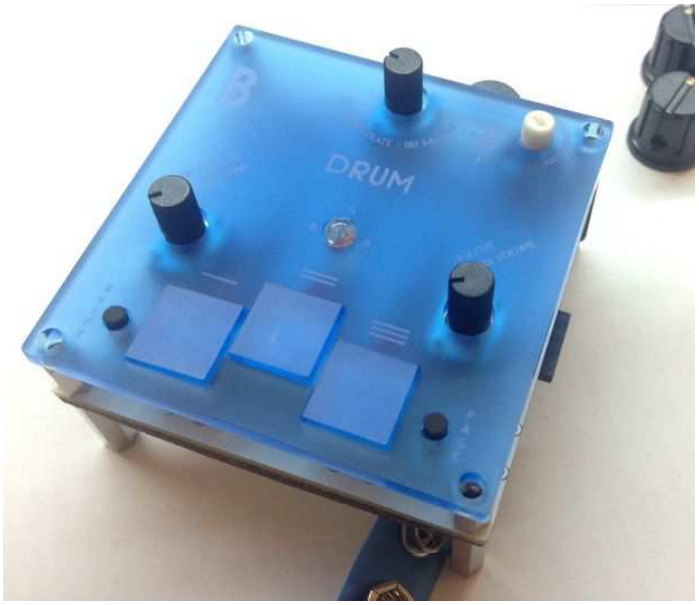


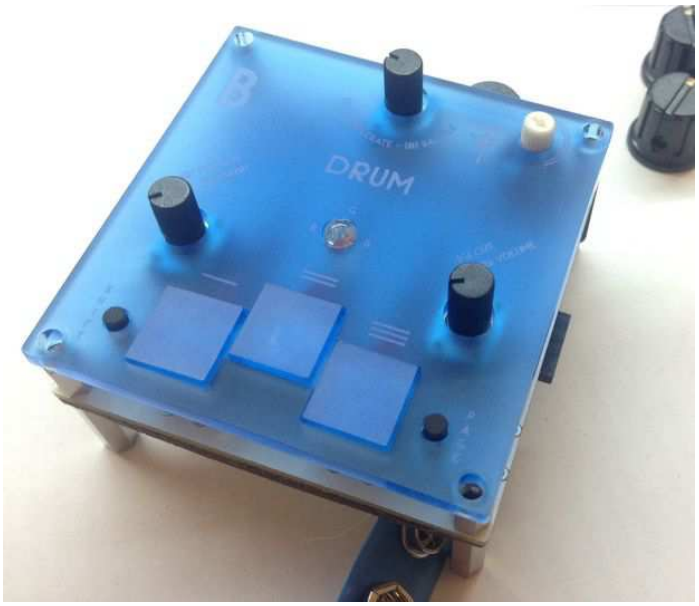
Step 17: Place The Chip

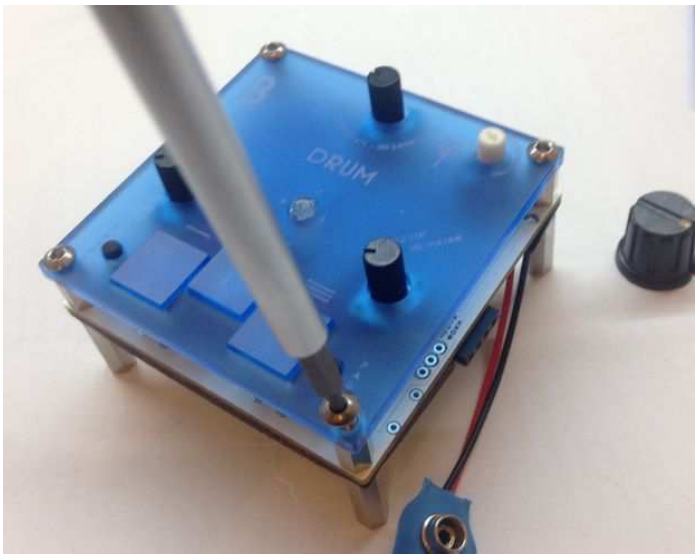
Follow the polarity indicated by the notch of the socket.

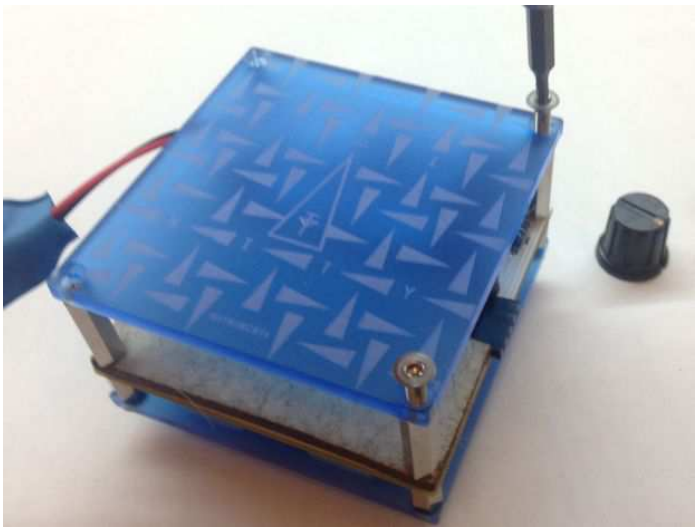
Step 18: Dress Up 1.0 - for 1.1 see the next step !!!

Put the buttons first. Match the front plate so all knobs and buttons go thru and can be operated easily. Than screw it. Than pot the bottom plate.
Note: dont screw anything with strong force! Screw the bottom plate just right so your battery holds nicely without too much tension.







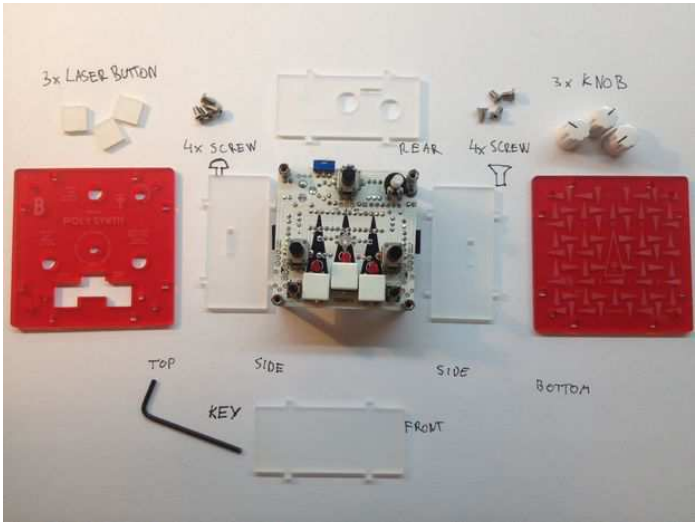


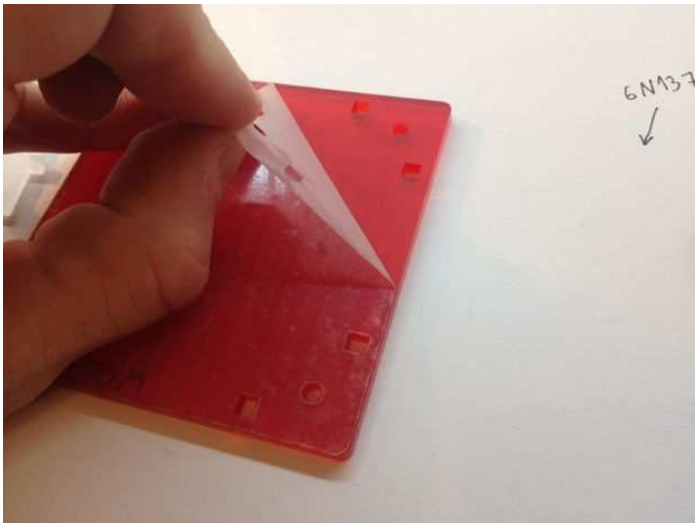
Step 19: Dress up and finish for version 1.1

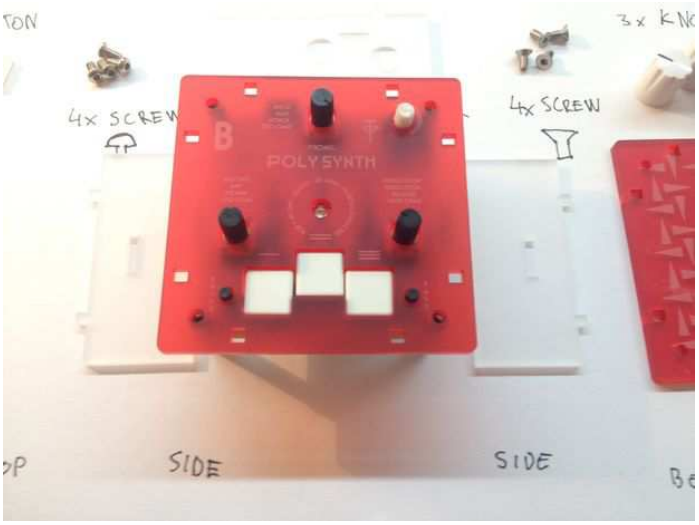
The first picture shows where everything goes.

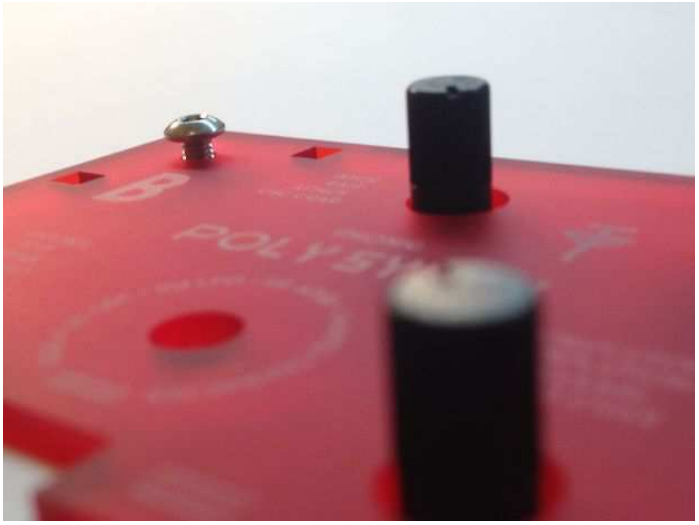
- If there are any foils on the plastic remove them first.
- Put the front side plate and put the screws very loosely !
- put in the rear plate and the side plates (let the lasered triangles face the outside - they are not visible much but will help you to put on the mushroom tape).
- Screw the top plastic now.
- Check if you can press easily all the buttons and tweak all the knobs - if not try to fix that by making them straight again.
- Now you can put in the felt protector and a 9V battery if you have.
- Put in the front side plate.
- Now fix the bottom plastic board with screws. Make sure the writings are aligned with the top board.
- Remove the tape protector from the lasered plastic button covers and glue them into place.
- Align the knobs with the markers on the potentiometers and fix them with small flat screwdriver.

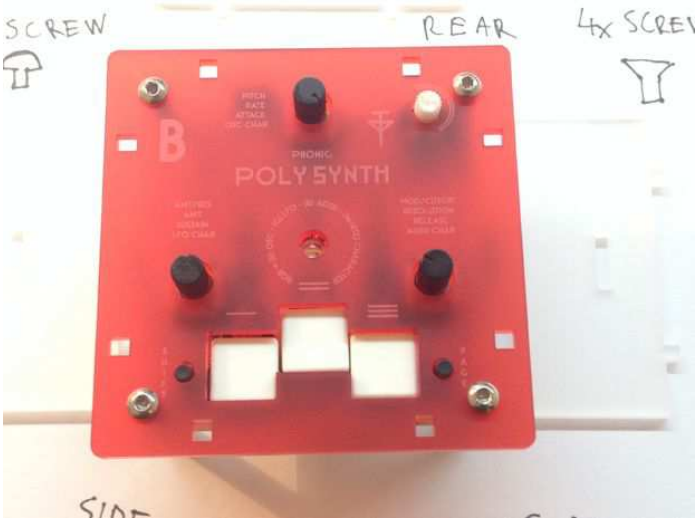
Congratulations ! You are now done !

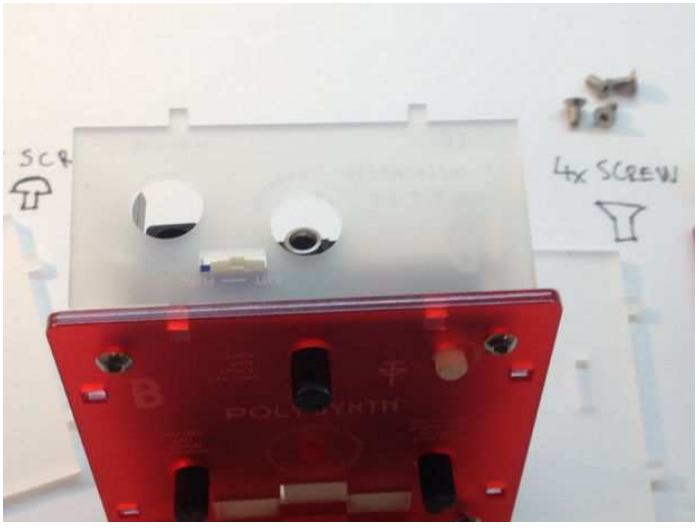

3x LASER BUTTON
4x SCREW
REAR
4x SCREW
3x KNOB
TOP
SIDE
SIDE
BOTTOM
KEY
FRONT

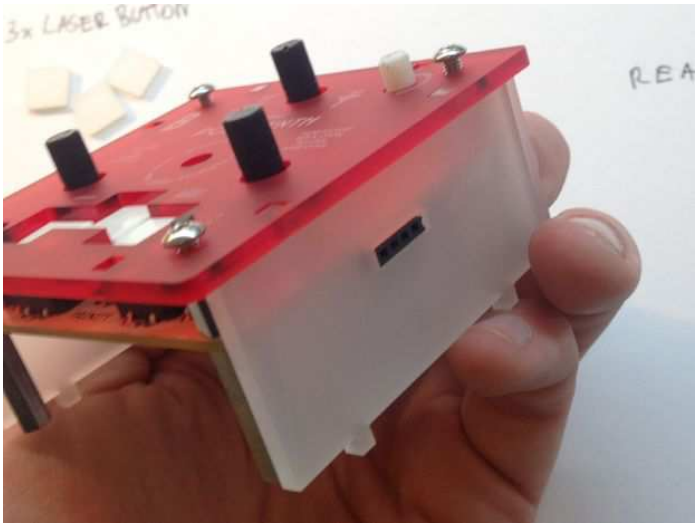


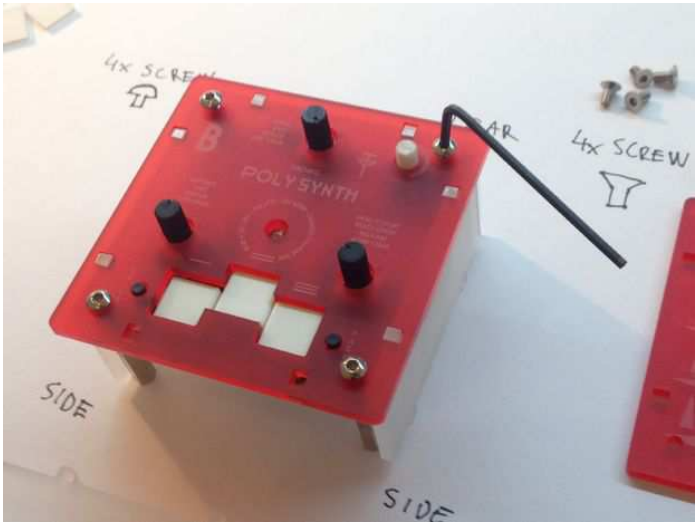

4x SCREW
4x SCREW
POLY SYNTH
SIDE
SIDE

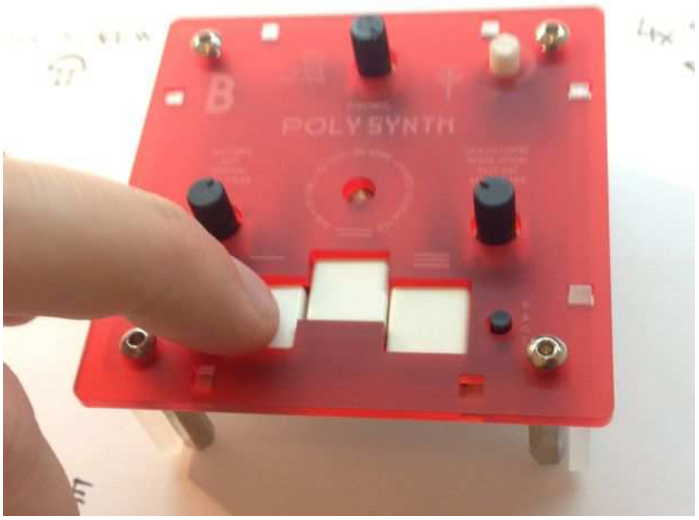


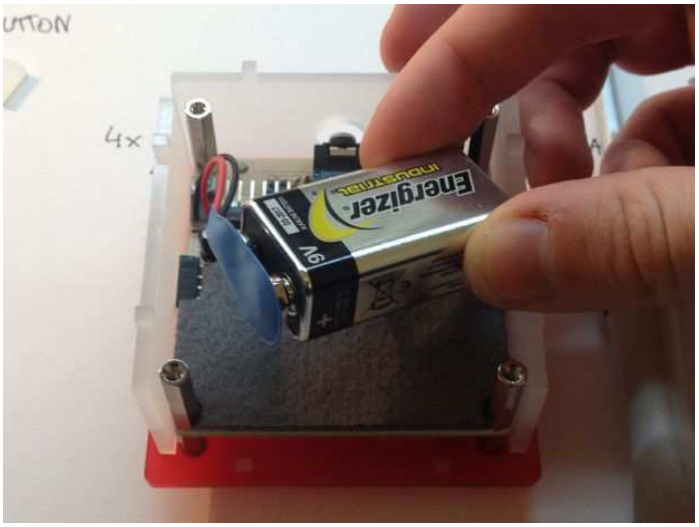

SCREW
REAR
POLY SYNTH

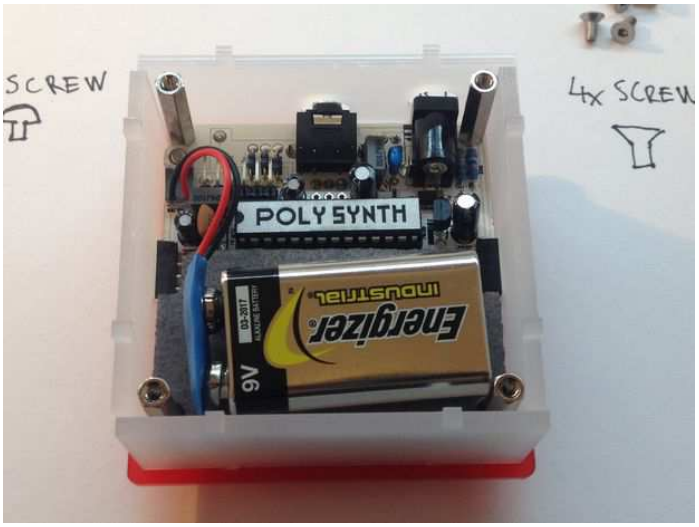

4x SCREW

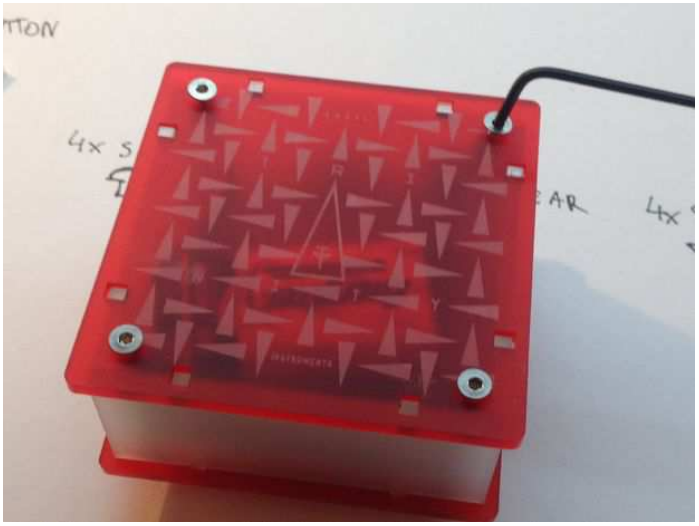

3x LASER BUTTON

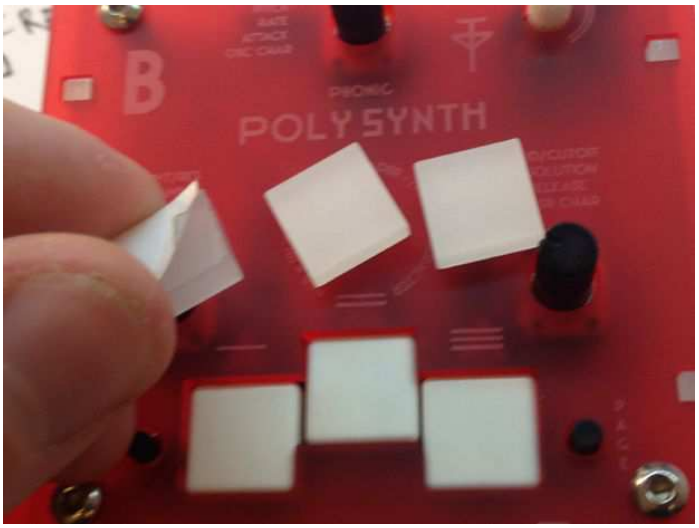

4x SCREW
4x SCREW
POLYSYNTH
SIDE
SIDE

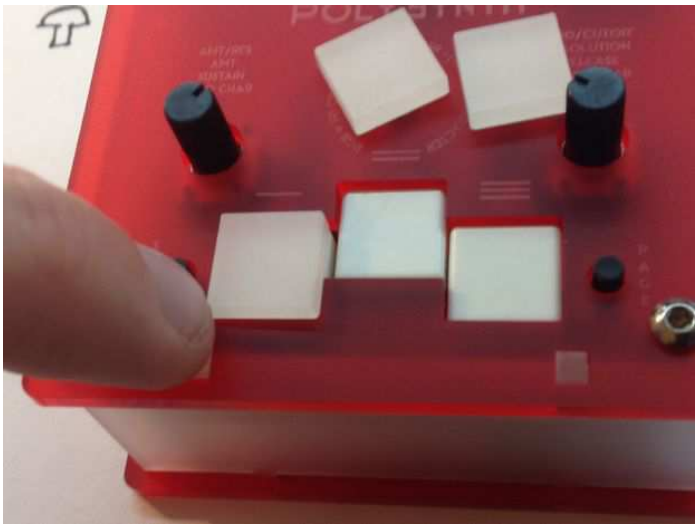

POLYSYNTH


4x
Energizer
INDUSTRIAL
9V

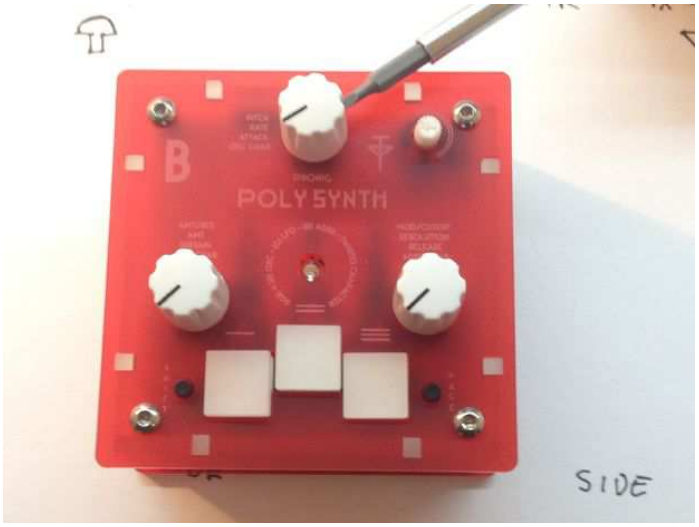

SCREW
4x SCREW
POLY SYNTH
Energizer
INDUSTRIAL
9V

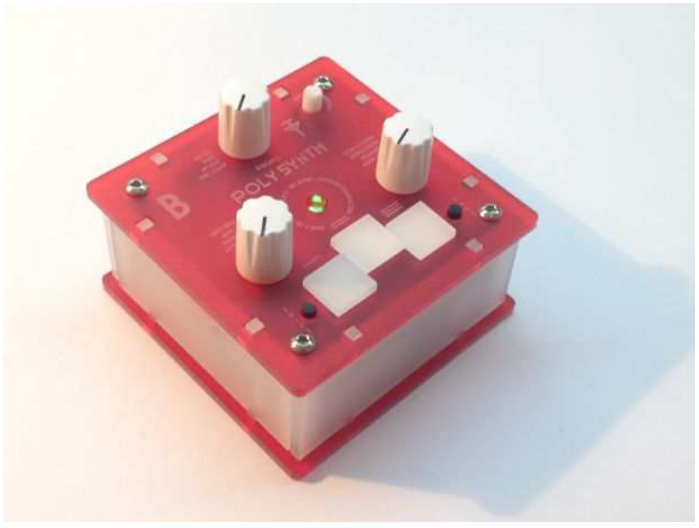

4x


POLY SYNTH

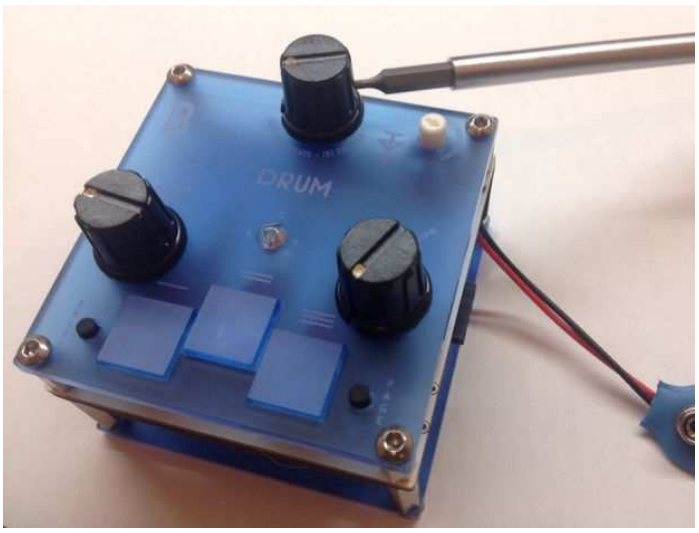
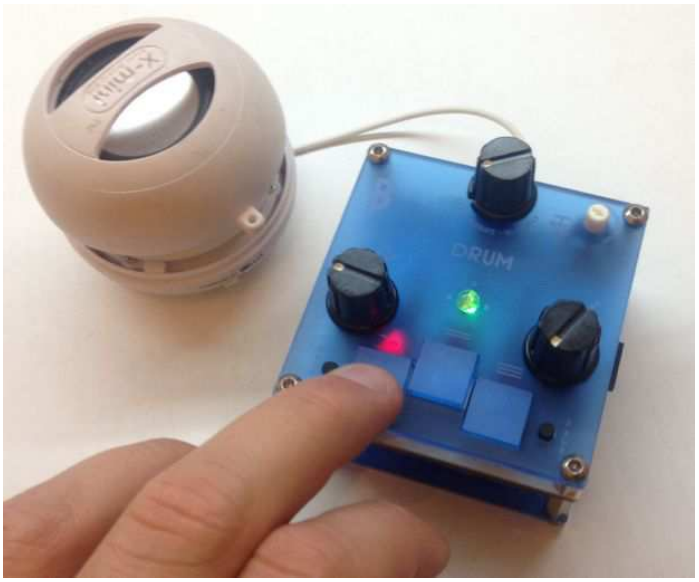


4x SCREW
4x SCREW


POLY SYNTH
SIDE


POLY SYNTH

Step 20: Done!

Fix the knobs that they don't touch the plate while you tweak them.

Put the battery flip the swith to battery position, or plug an adaptor and flip the switch to plug possition and connect speaker or headphones to check that everything works!
Now rock !