Note! Some of the silkscreen markings on the PCB are incorrect. This doesnt affect soldering.

IT DOES AFFECT FUNCTIONALITY, but can be mitigated in code.

This ‘meergranen’ module is based on Ginko Syntheses ‘Grains’ and is compatible with their arduino firmware (download link below). To make these work on this more hacker friendly version you need to...wait for it... hack a bit:

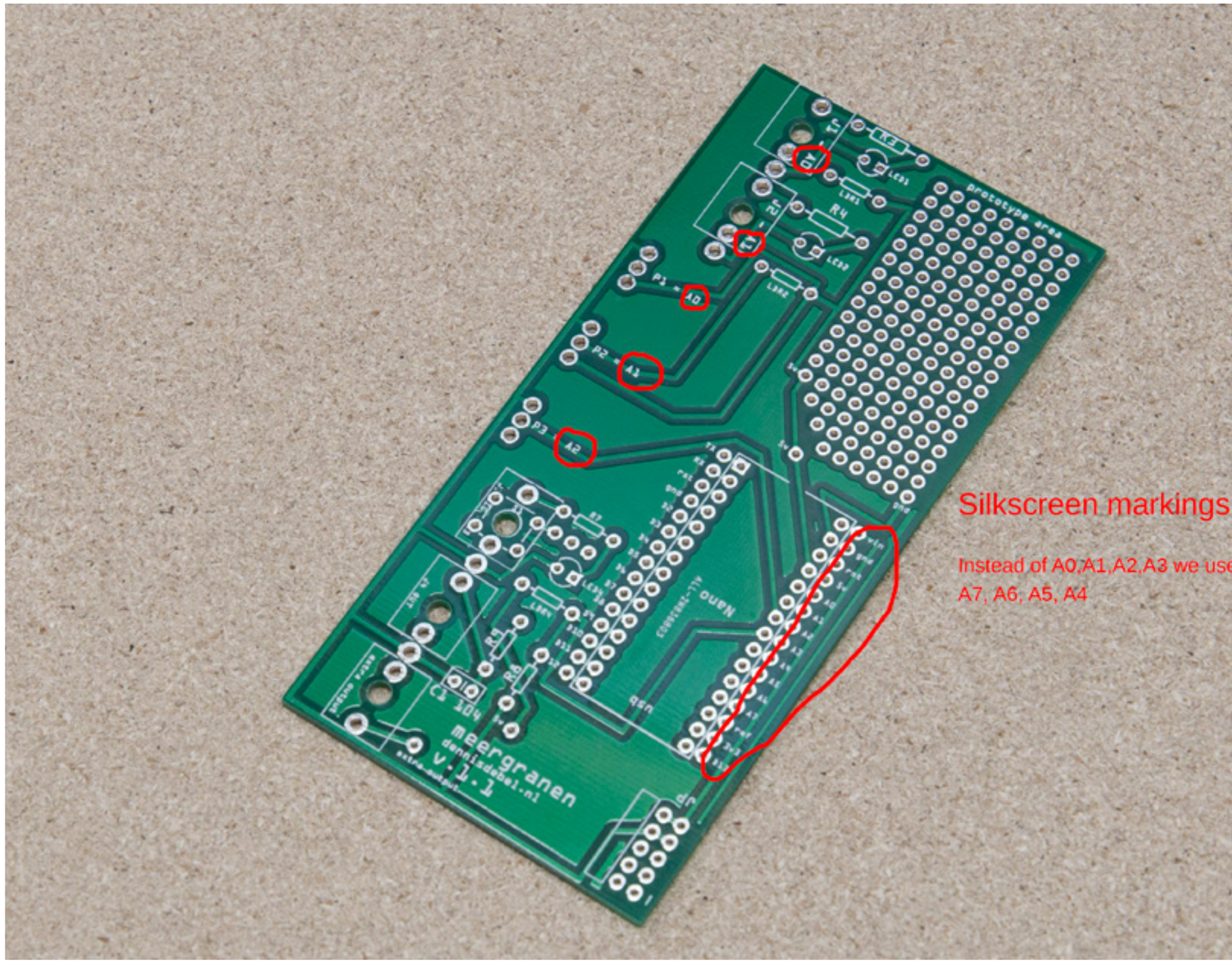
The original grains uses A0, A1, A2, A4 as analog inputs. This meergranen version uses A7, A6, A5, A4. You will have to change this in the grains firmwares. So:

A0 = A7
A1 = A6
A2 = A5
A3 = A4

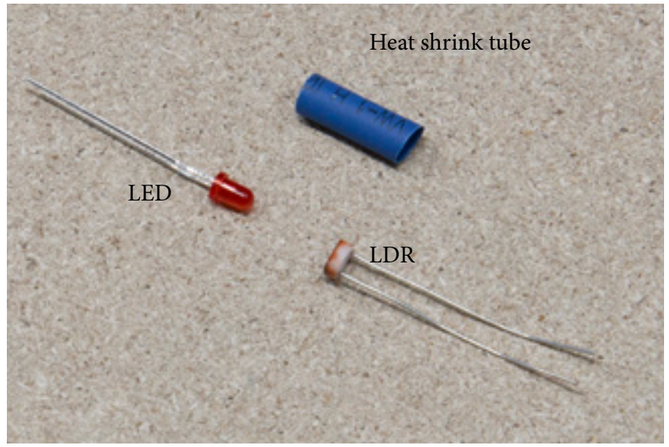
Most of the example code actually needs a trigger input on pin A0 (or in our case A4) to produce sound. Be sure to have that handy (or edit the code so you dont need that).

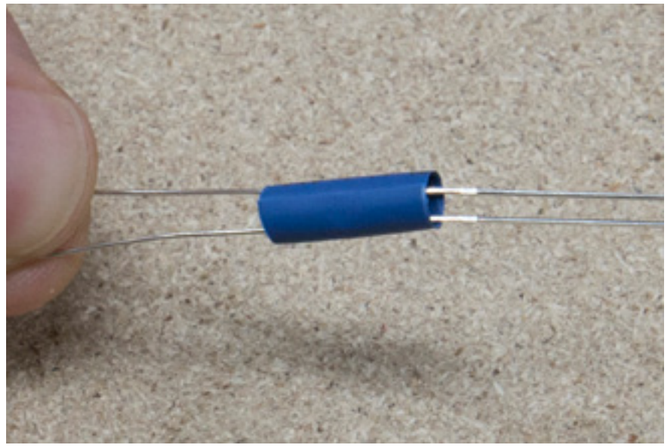
Firmware:
http://dennisdebel.nl/downloads/xpub/example-firmware/

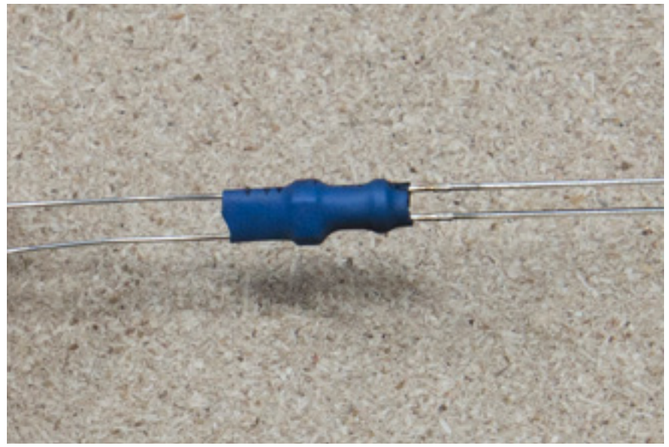
(‘memphis’ will make sound without any external triggers!)

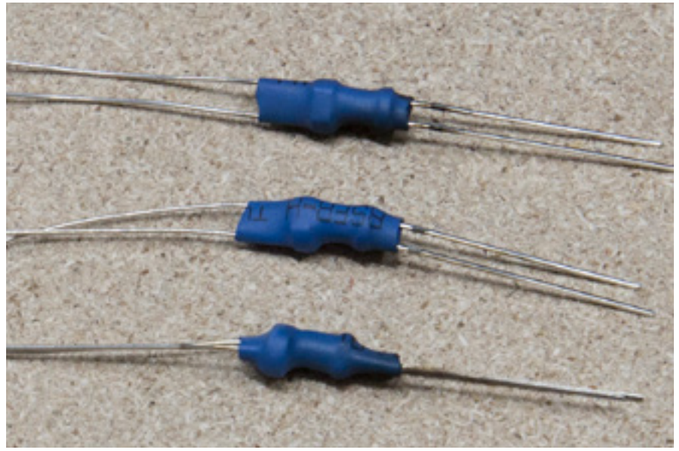


1 Vactrols - Vactrols are voltage controlled resistors consisting of a LED and Light Dependant Resistor (LDR). The more voltage means more bright LED and thus lowering the resistance through the LDR. The LED side are connected to an input jack and the LDR are connected as a voltage divider. The vactrols also prevent dangerous voltages/currents from entering the Arduino. Vactrols can be bought off the shelf (expensive!) or constructed yourself:





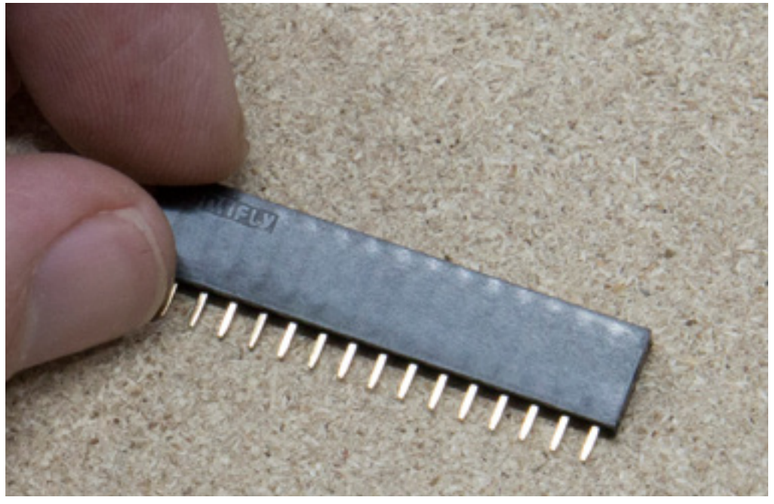


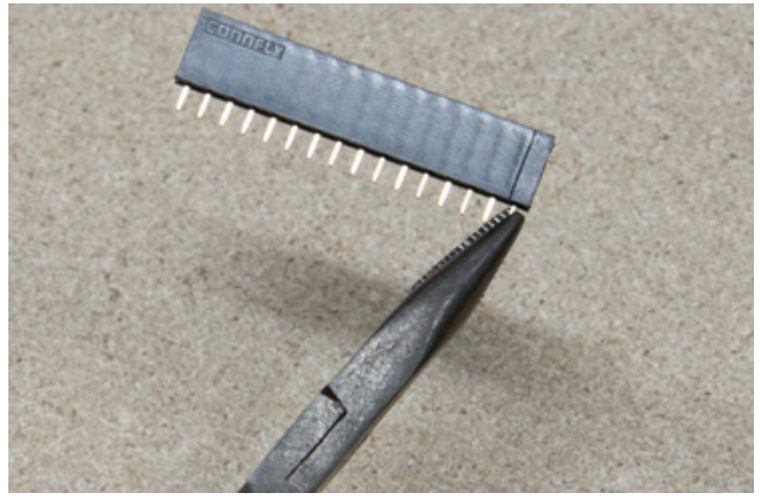


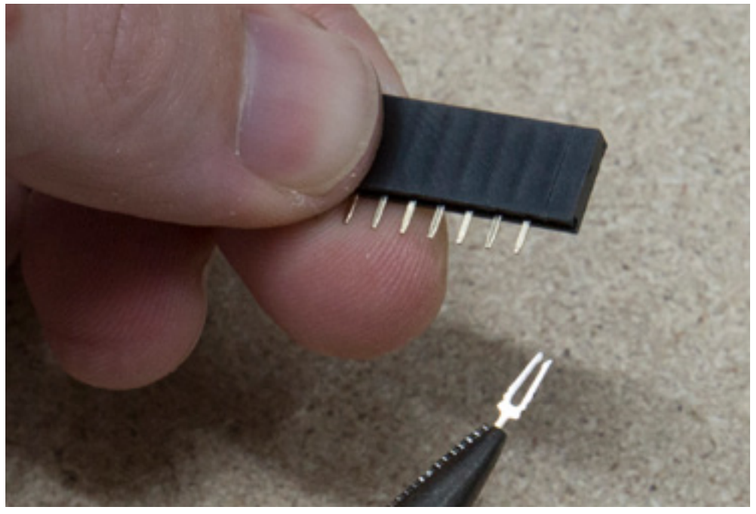
Instructions (build 4x): 1x LED light, 1x LDR (Light dependent resistor), 1x heat shrink tube.

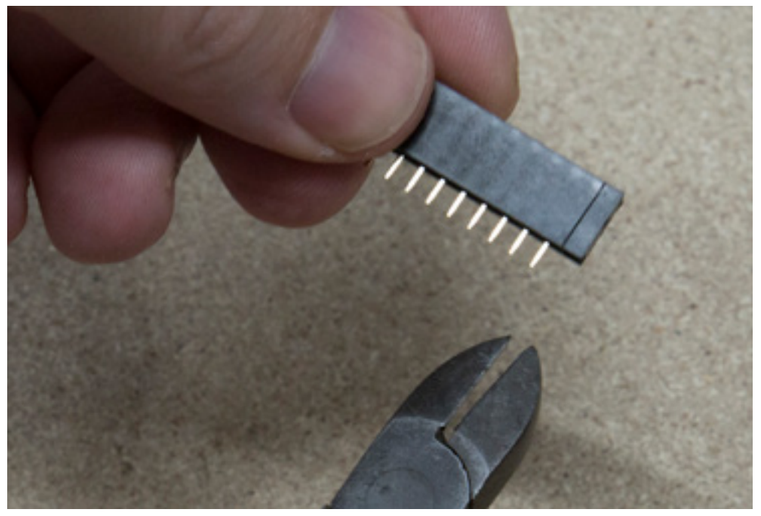
Place the LED and LDR inside heat shrink tube, facing eachother. U se lighter to shrink the tube. The LDR does not have polarity (it does not matter which leg goes where). The LED however has polarity, a positive (anode) and negative (cathode) leg. The longest leg is the positive one, keep this in mind when bending and placing the legs into the PCB.

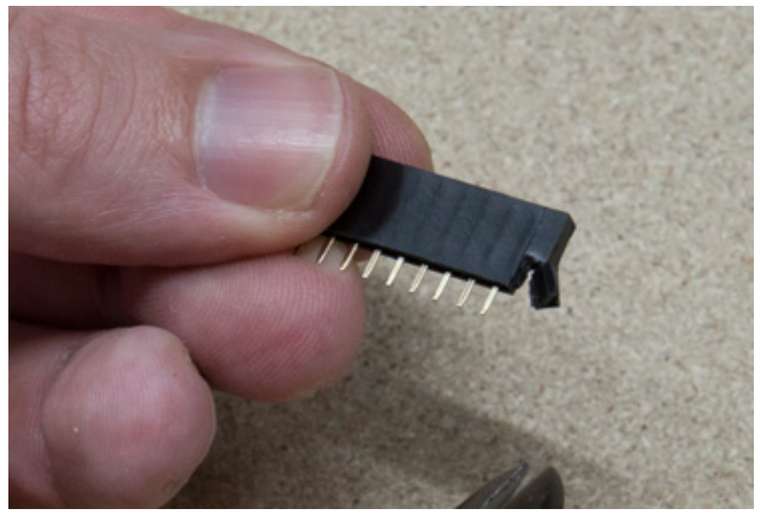
2 The female headers have one pin to much, score the header between the last and second last pin. Pull out the last pin using pliers. Use cutting pliers to cut awa the now excess plastic





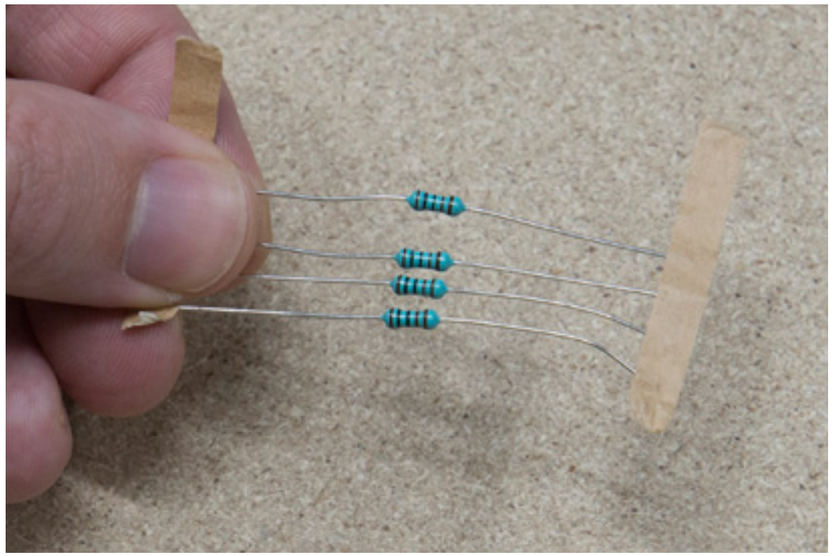


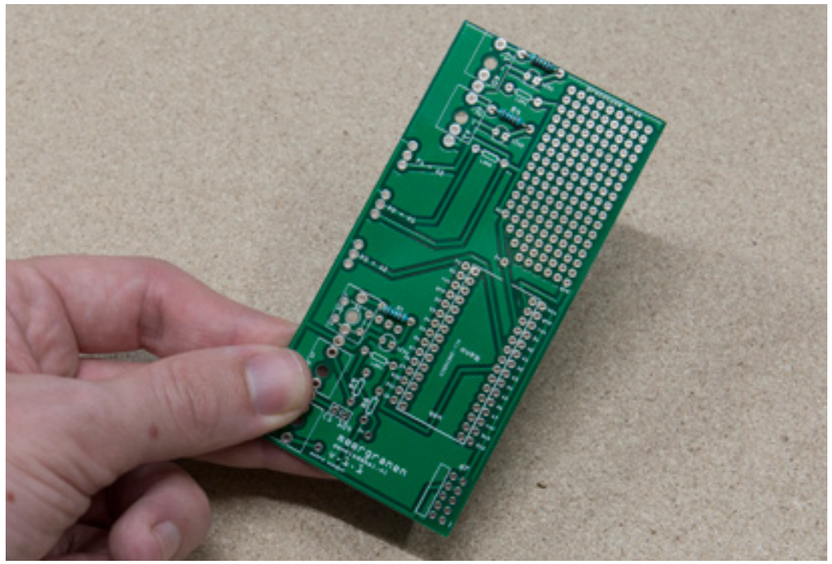


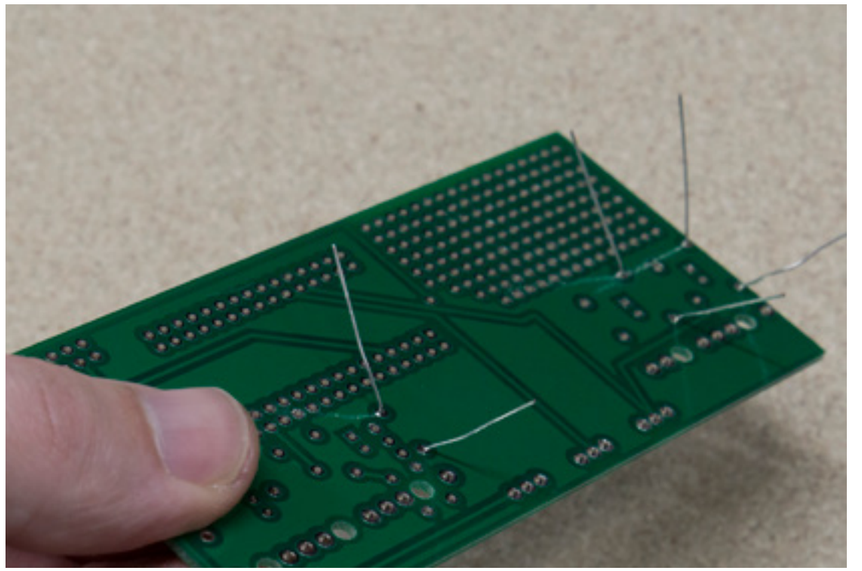


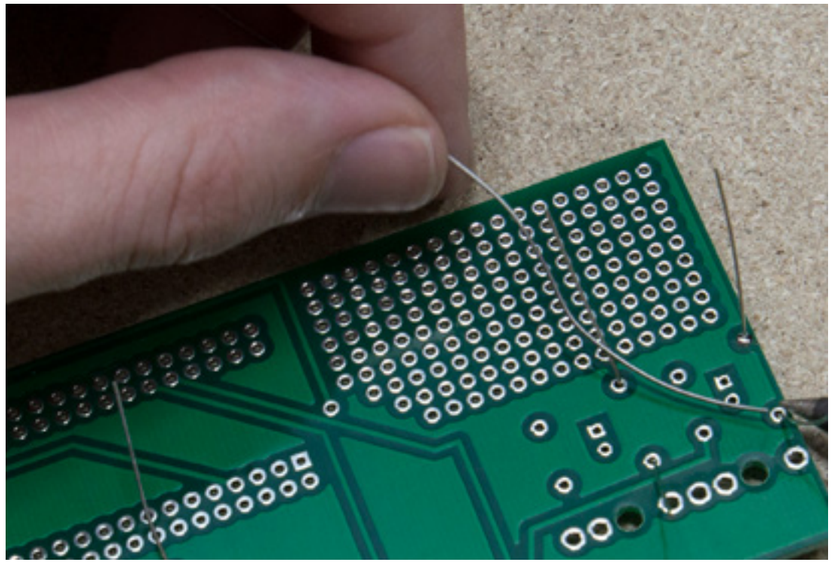
3 Place the resistors (R3,R4,R7 as market on pcb): 3x 1k Ohm

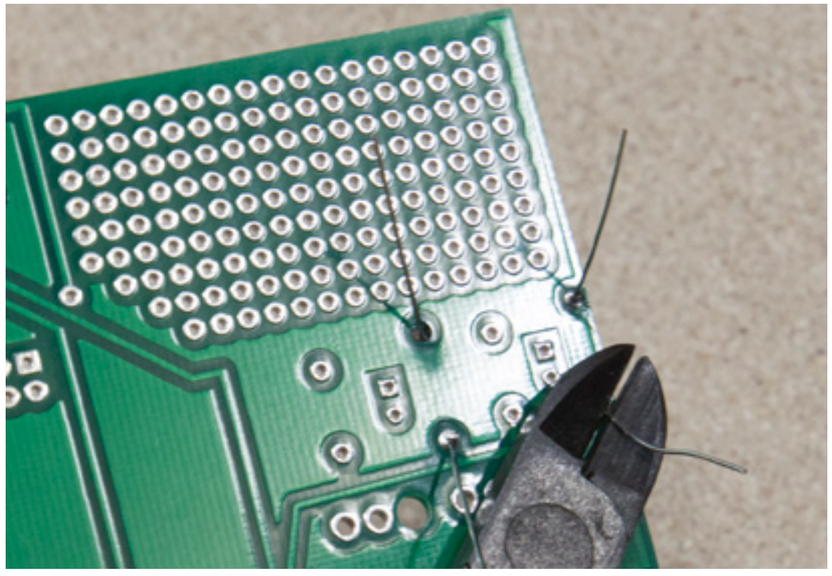
Bend the legs 90 degrees, insert into PCB, on the other side, bend the legs outward so the resistors don't fall out! Solder and cut the remaining legs flush with the pcb. Keep the cut legs as you need them later!

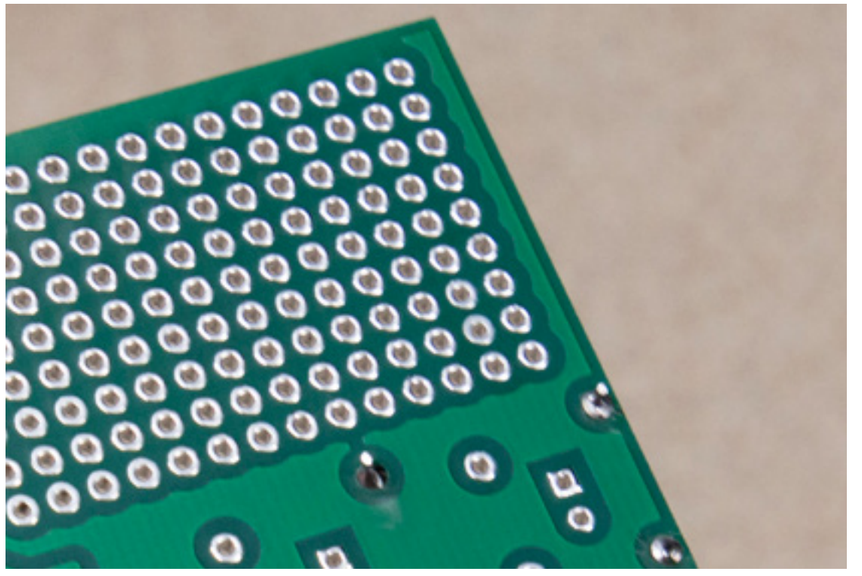




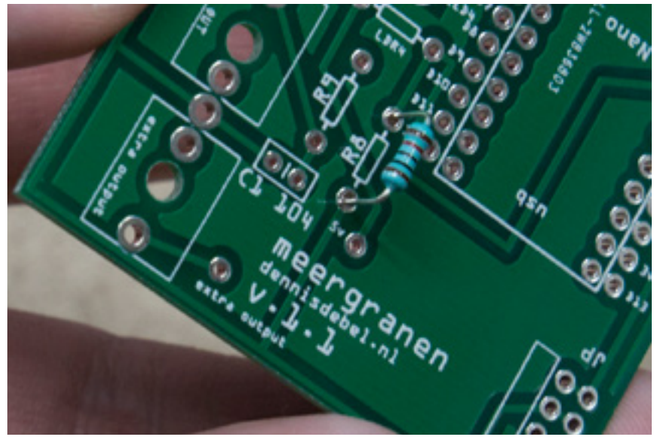


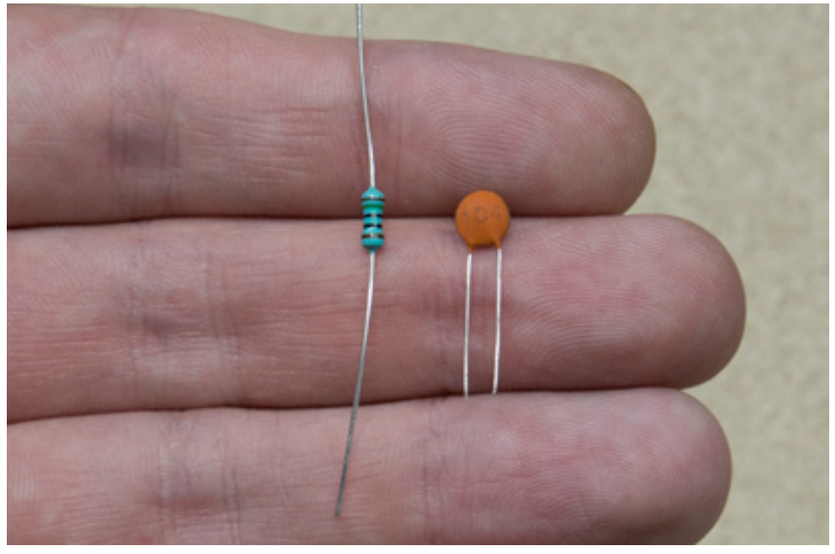


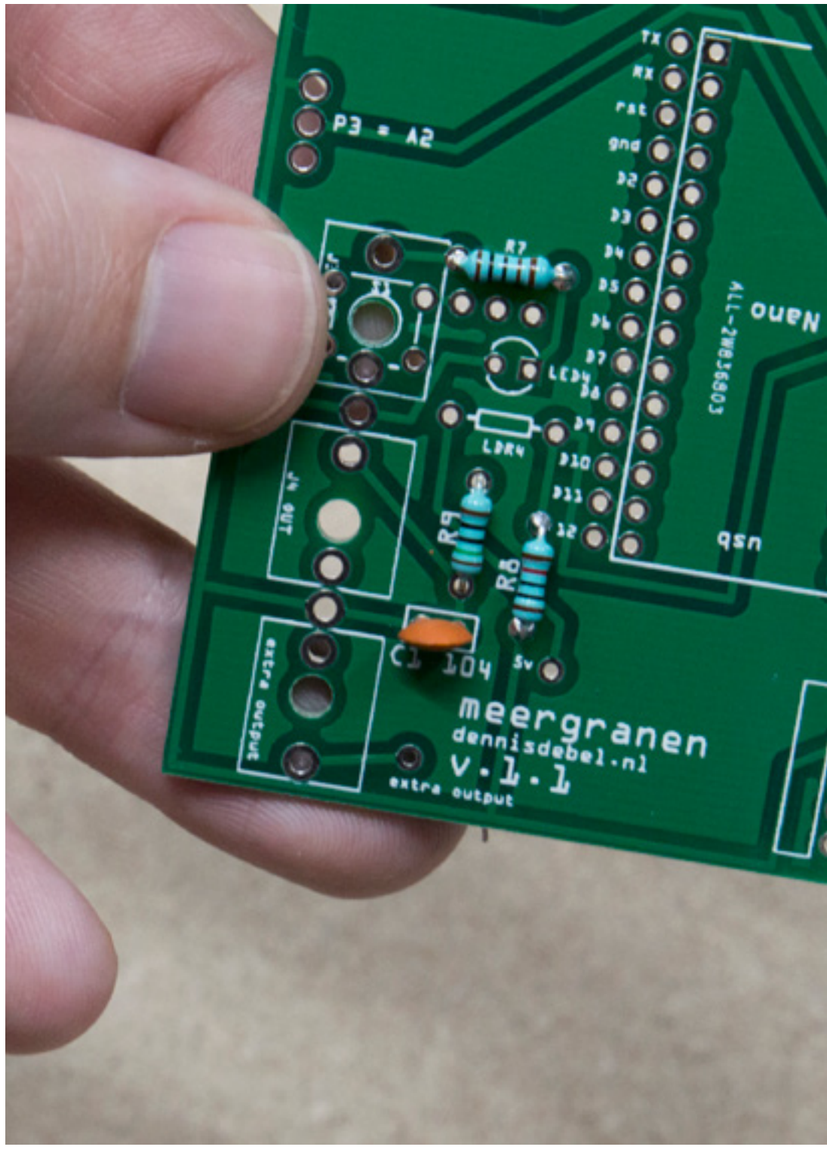




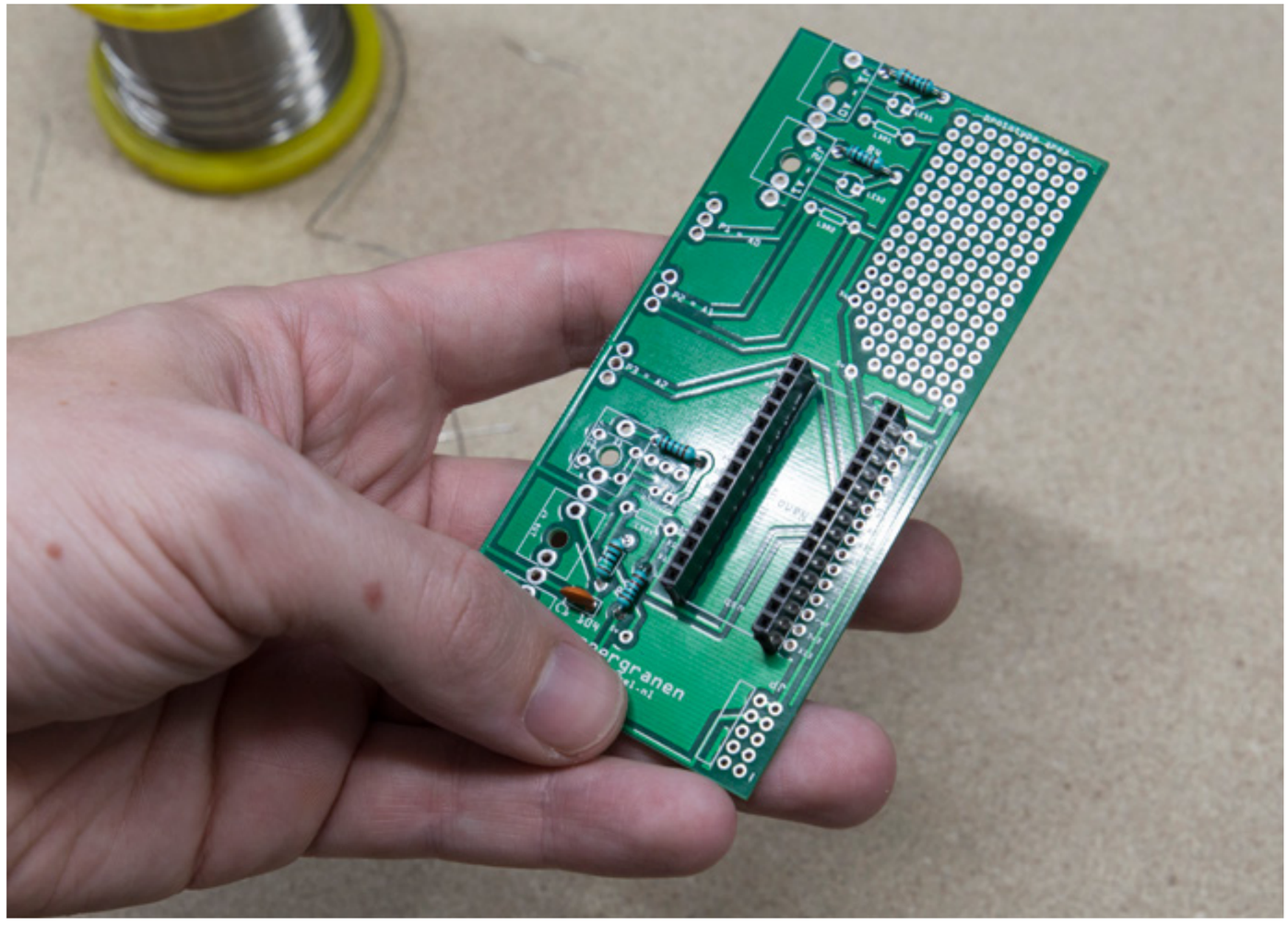
4 Repeat for R8 (10k ohm), R9 (150 Ohm), ceramic capacitor C1 (104, 100nF).
Insert and solder, trim. If you are unsure about the value, read the color bands or measure with multimeter.



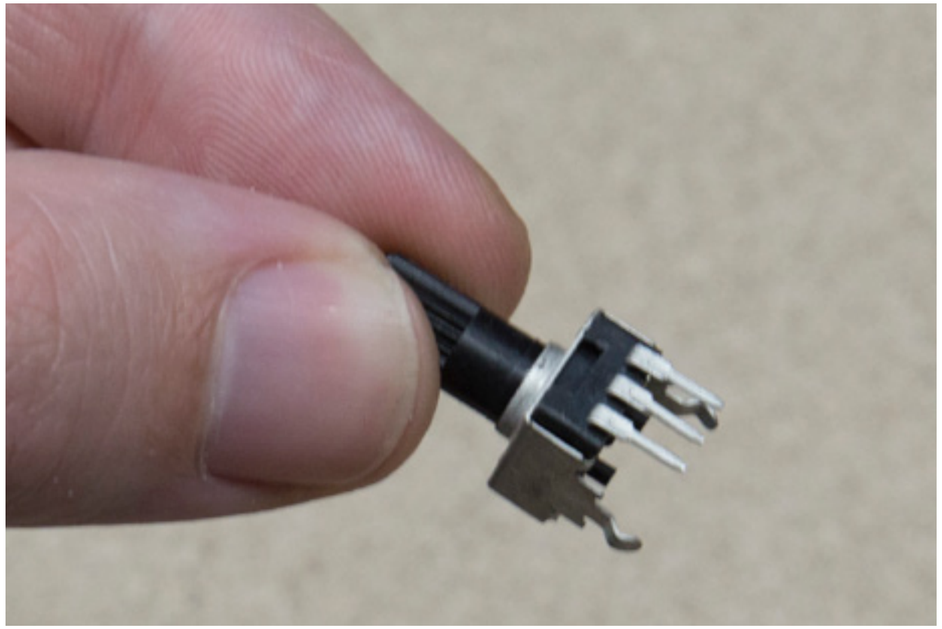


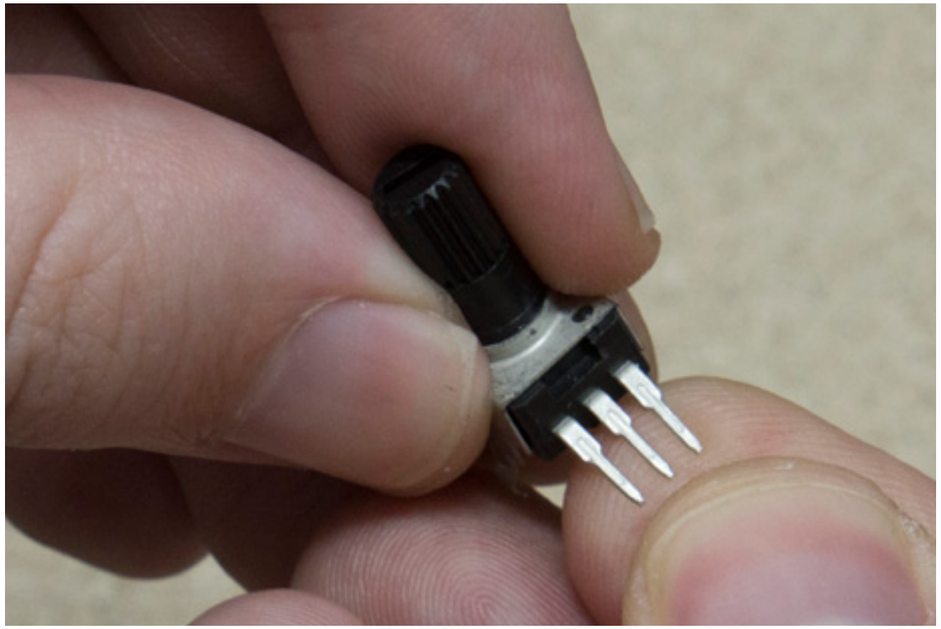


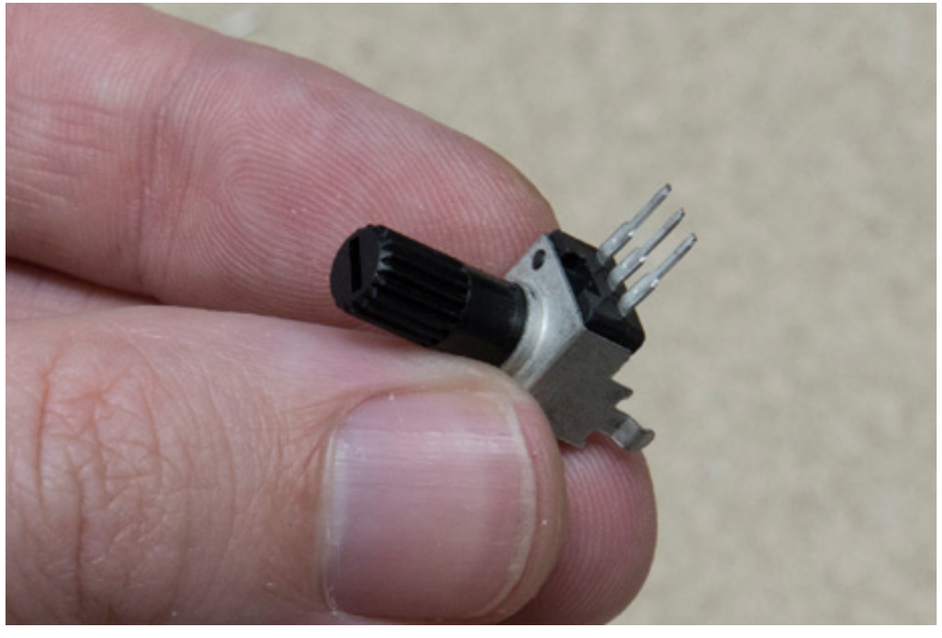
5 Insert and solder the female headers.



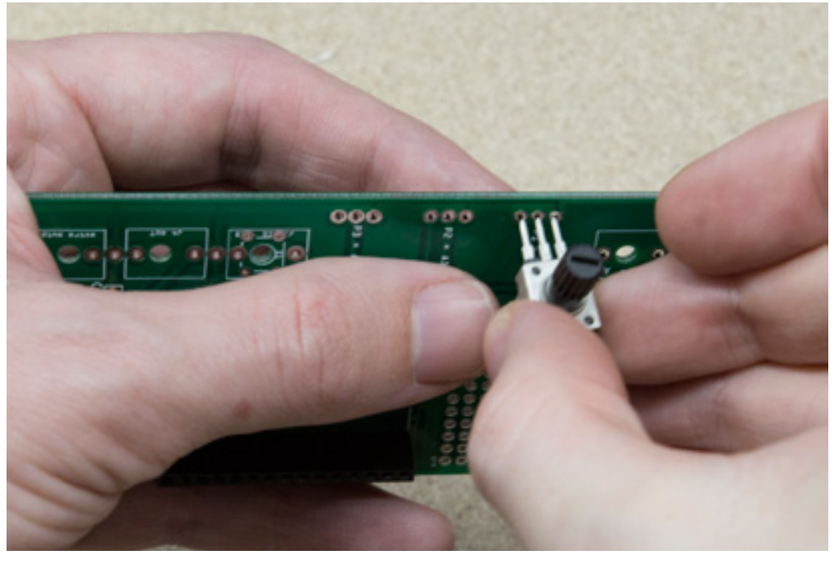
6 Bend the legs of the potentiometers straight

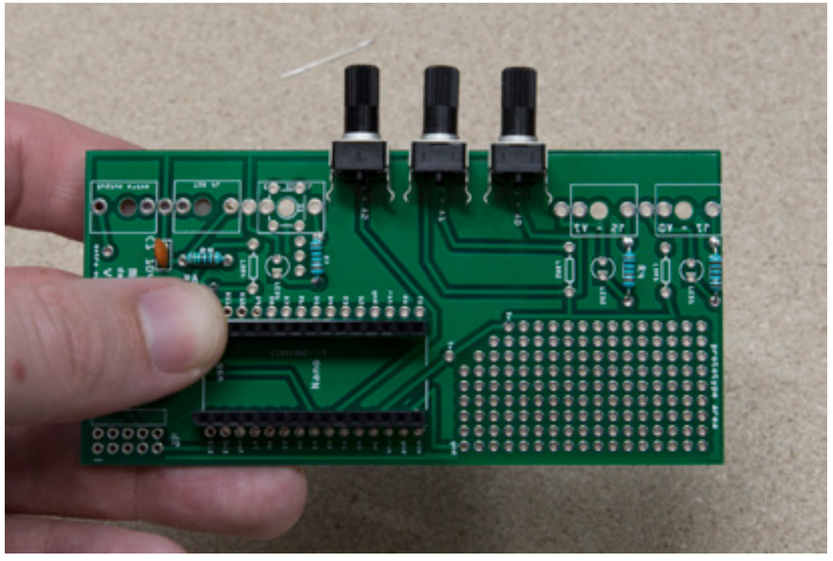


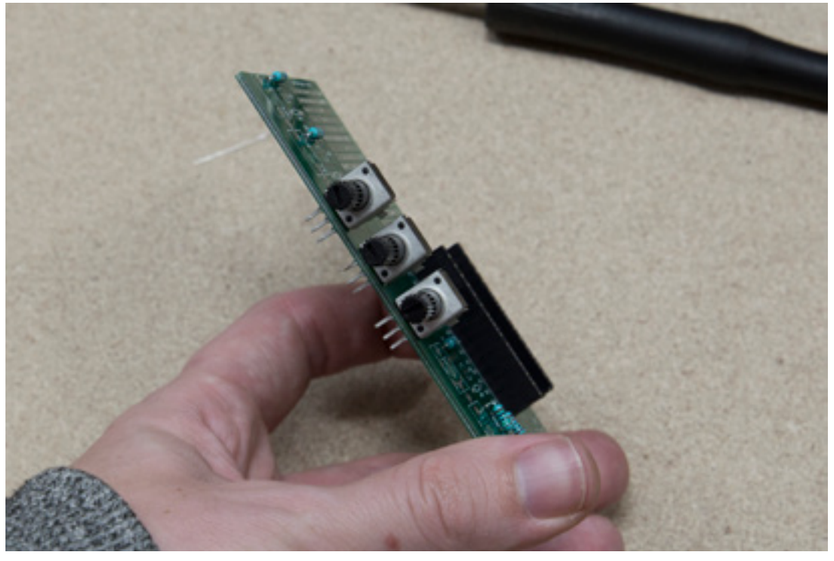




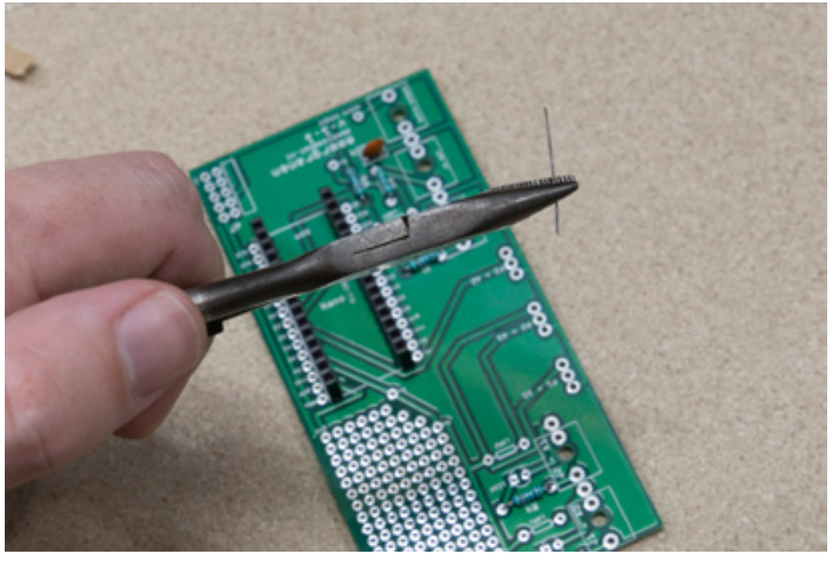
7 Insert the potentiometers in pcb. Make sure they are neatly aligned and straight.

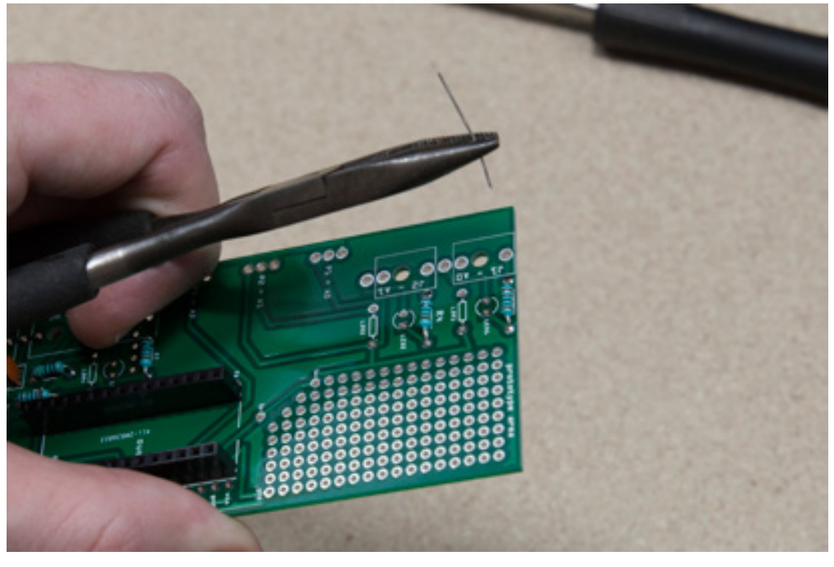


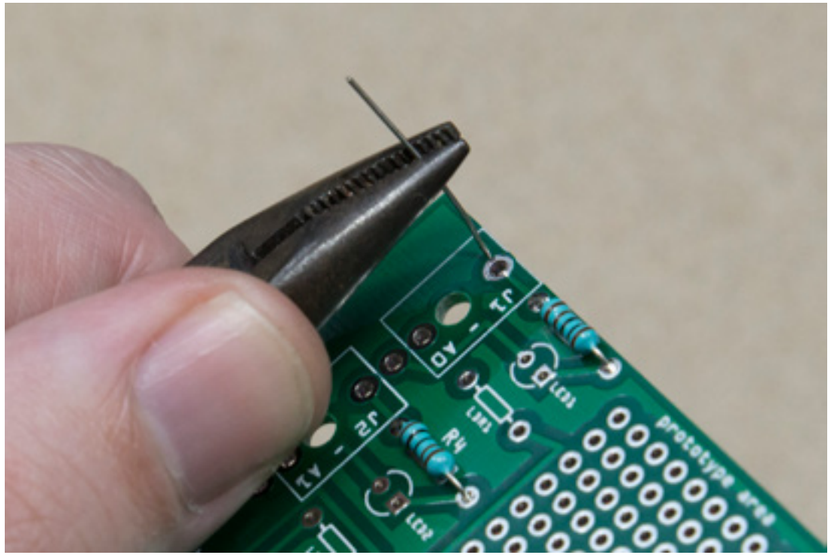


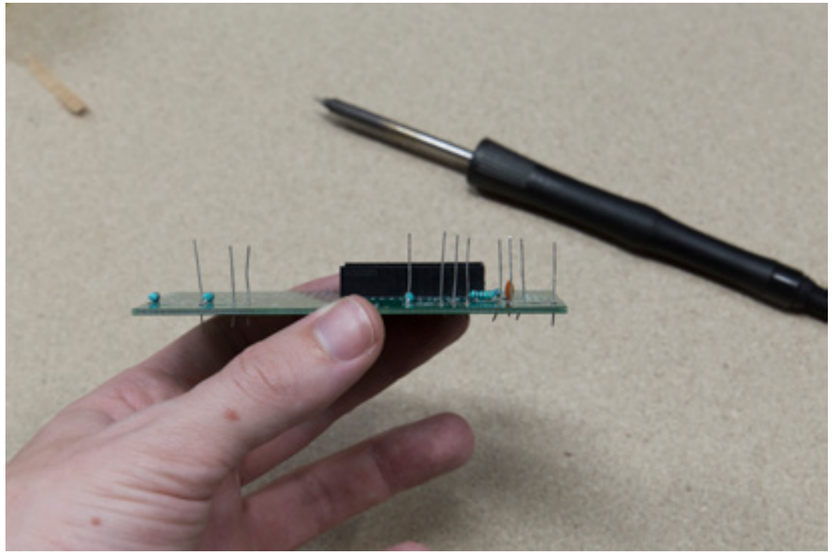


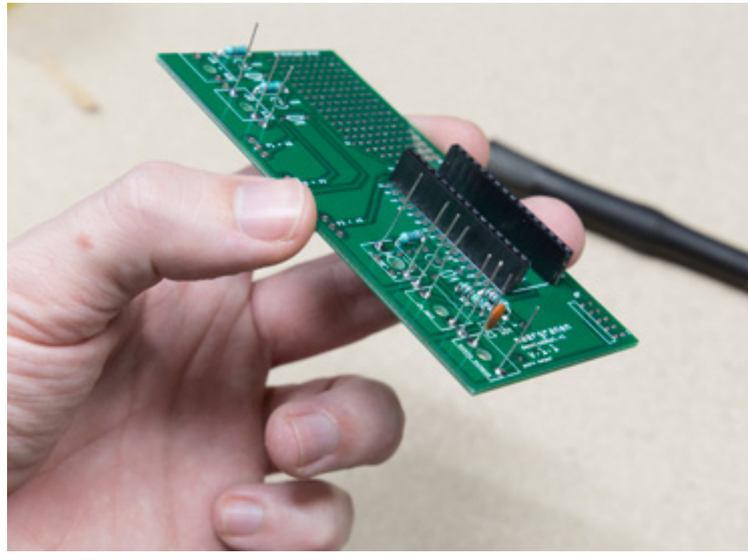
8 To mount the jack sockets you need to solder some wire to the pcb first. Use solid core wire or the legs you cut off in previous steps (you need 11 pieces). Make sure the pins are somewhat straight.



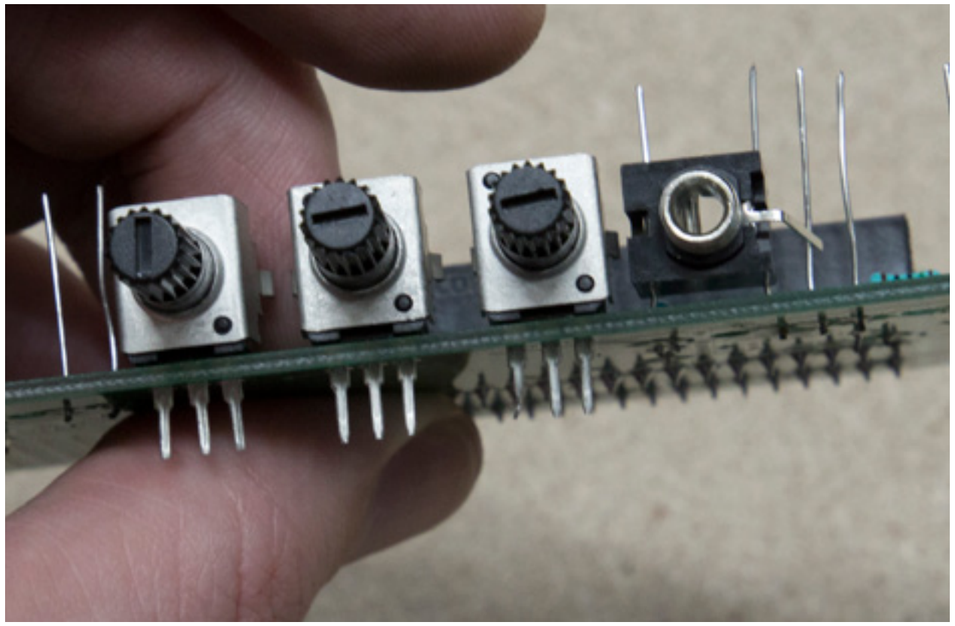


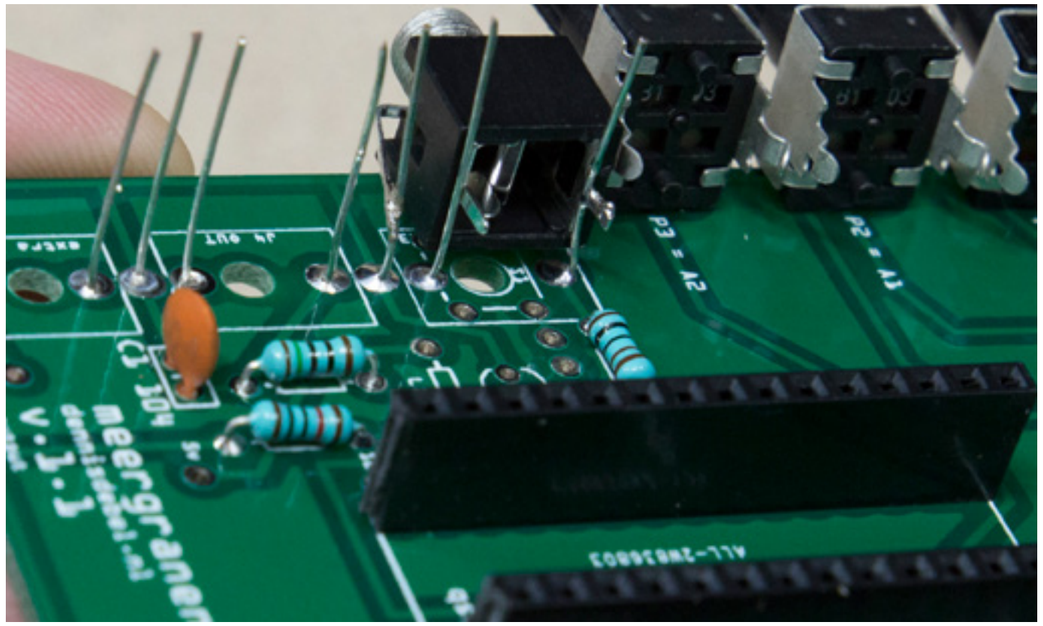


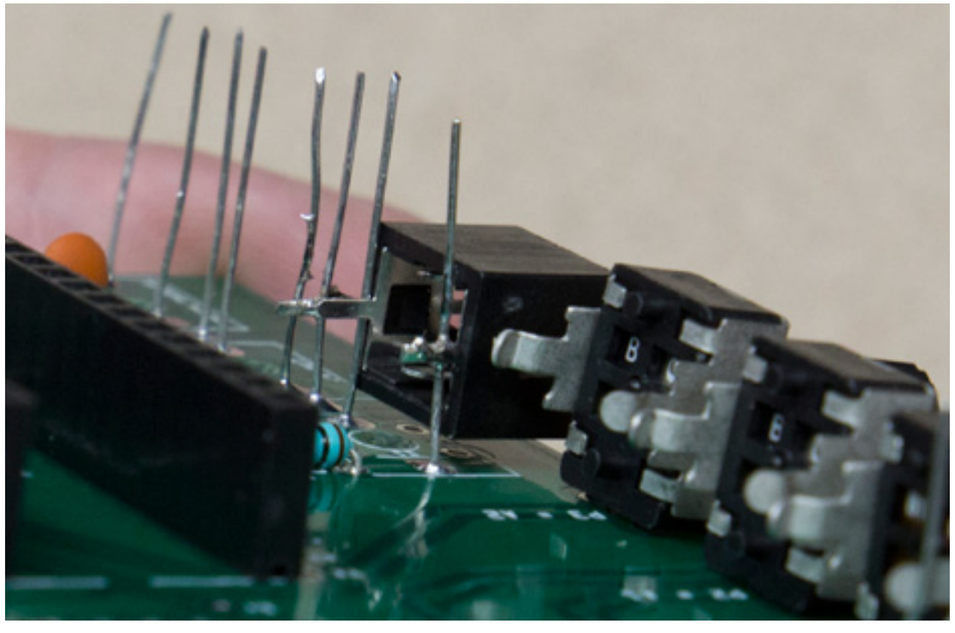


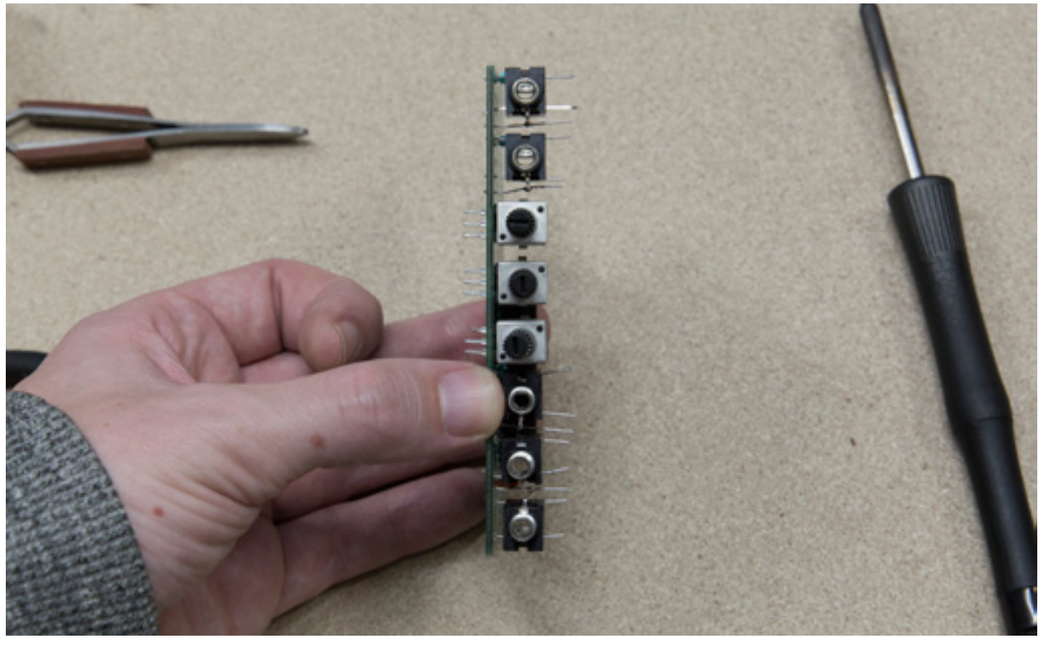


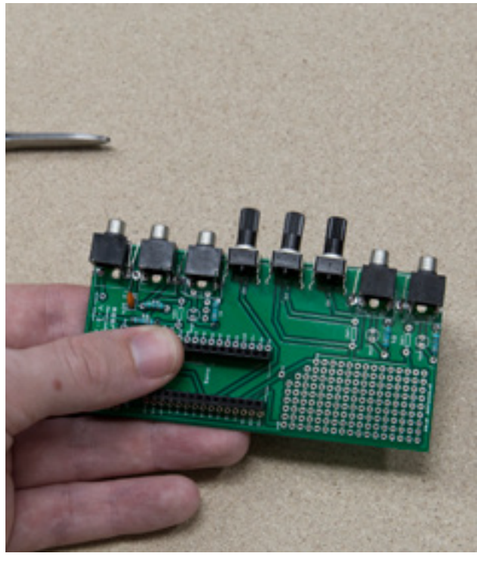
9 Solder the jacks in place, the holes should align with the potentiometers (the jacks will ‘float’ a bit above the pcb). Align the black plastic casing with the edge of the pcb. Make shure the long ground pin on the jack goes to the ground on the board. Tip: you could use the frontpanel (see step 13) to align everything! (screw the jacks in the frontpanel and then mount it over the potentiometers). Trim the excess standing pins. The hardest part is now over!



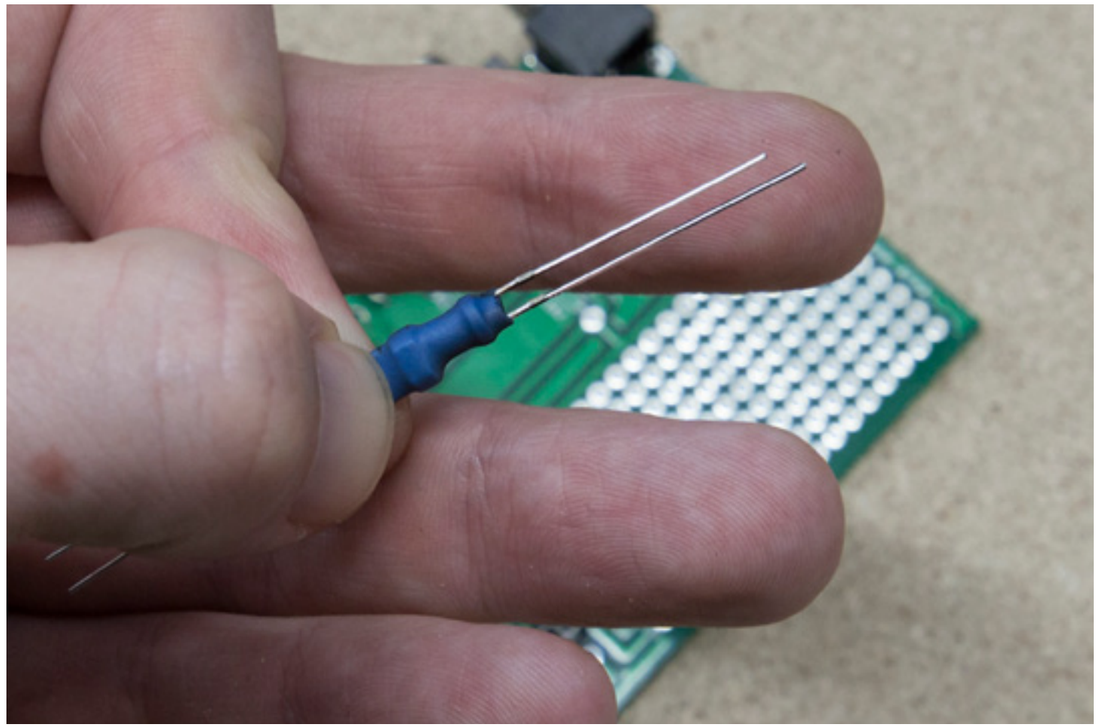


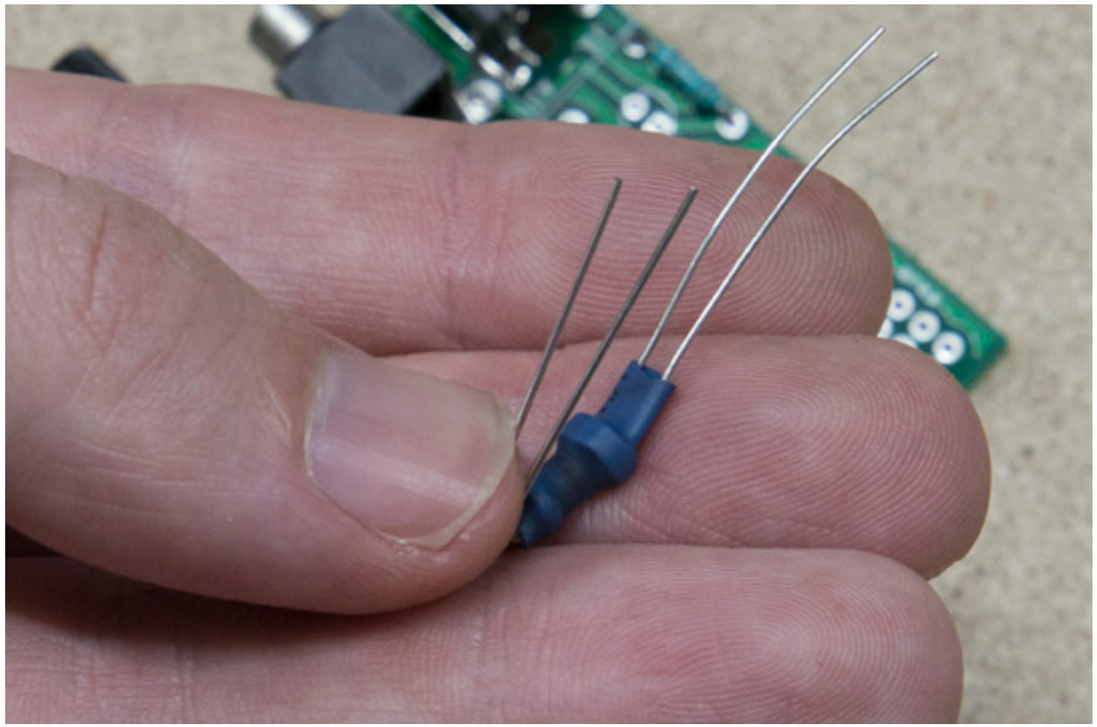


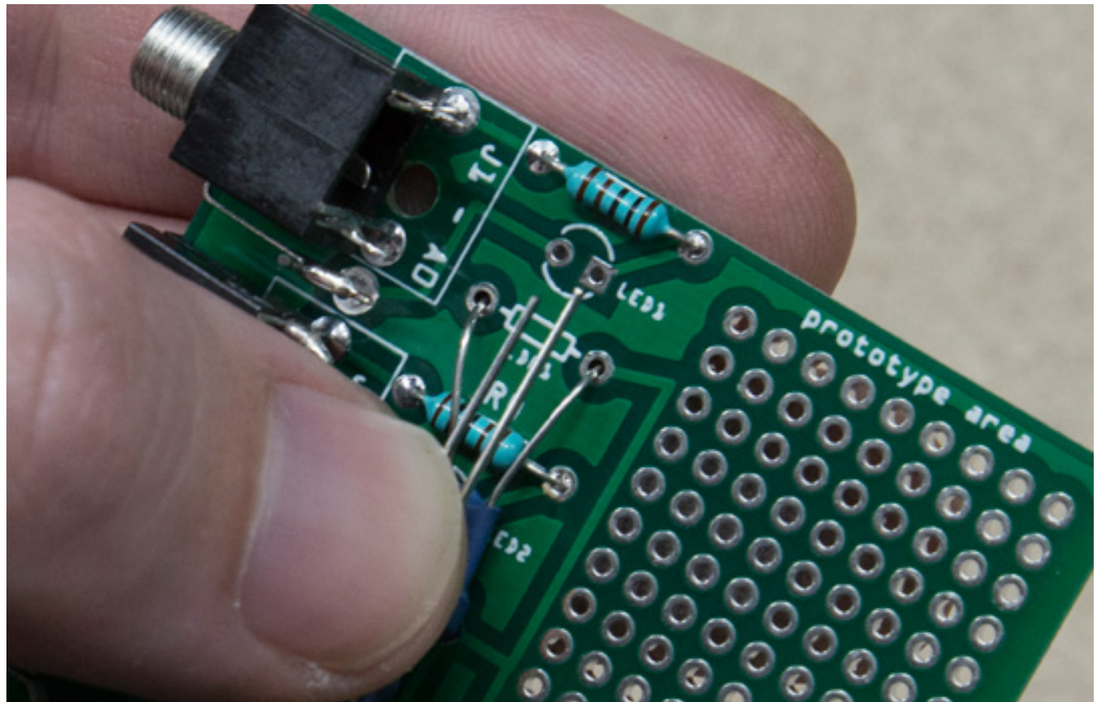


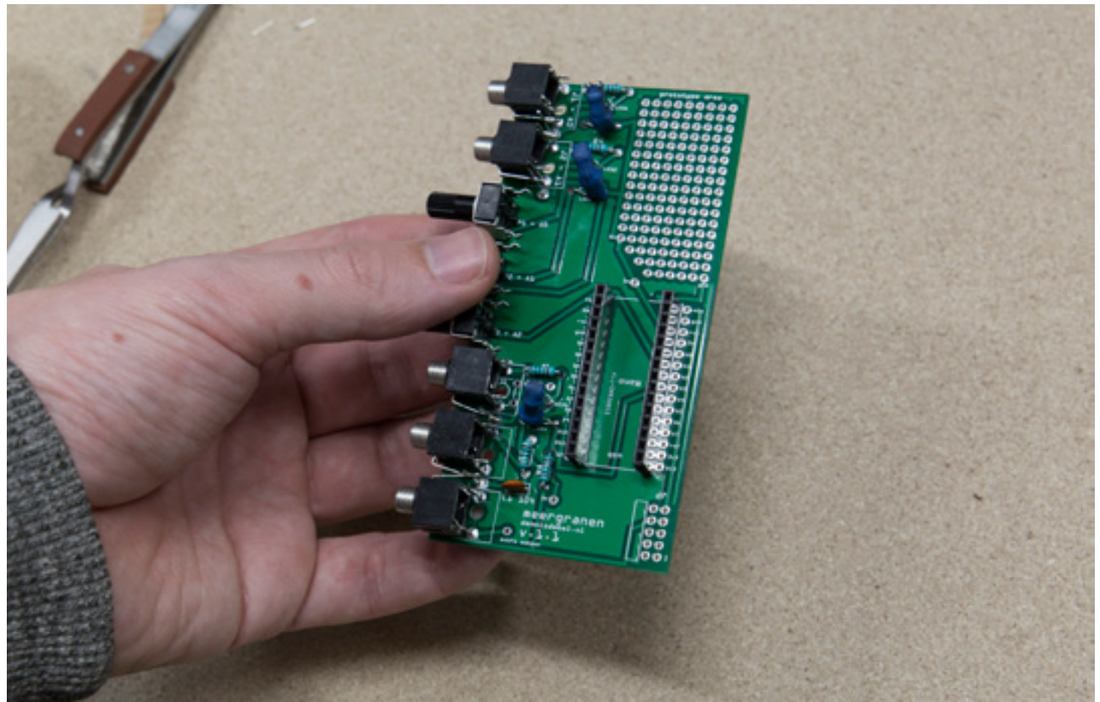


10 Solder the vactrols. Bend the legs of the vactrols in such a way, the LED can be inserted correctly: The long leg of the LED should go into the square hole.

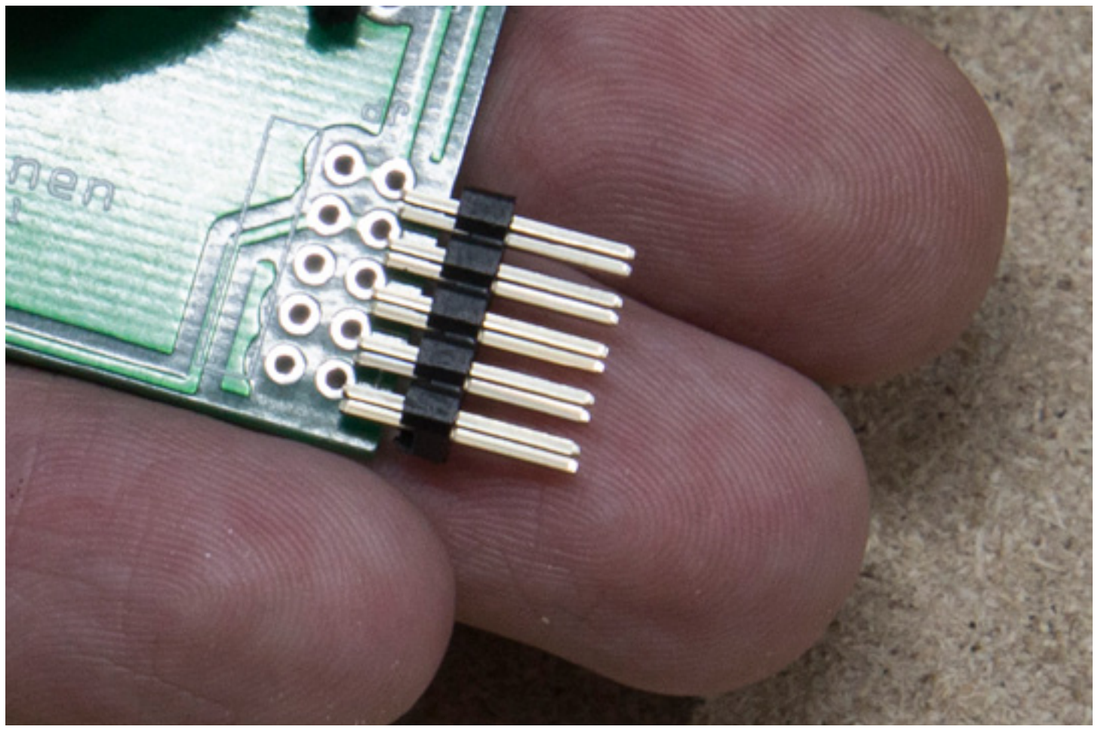


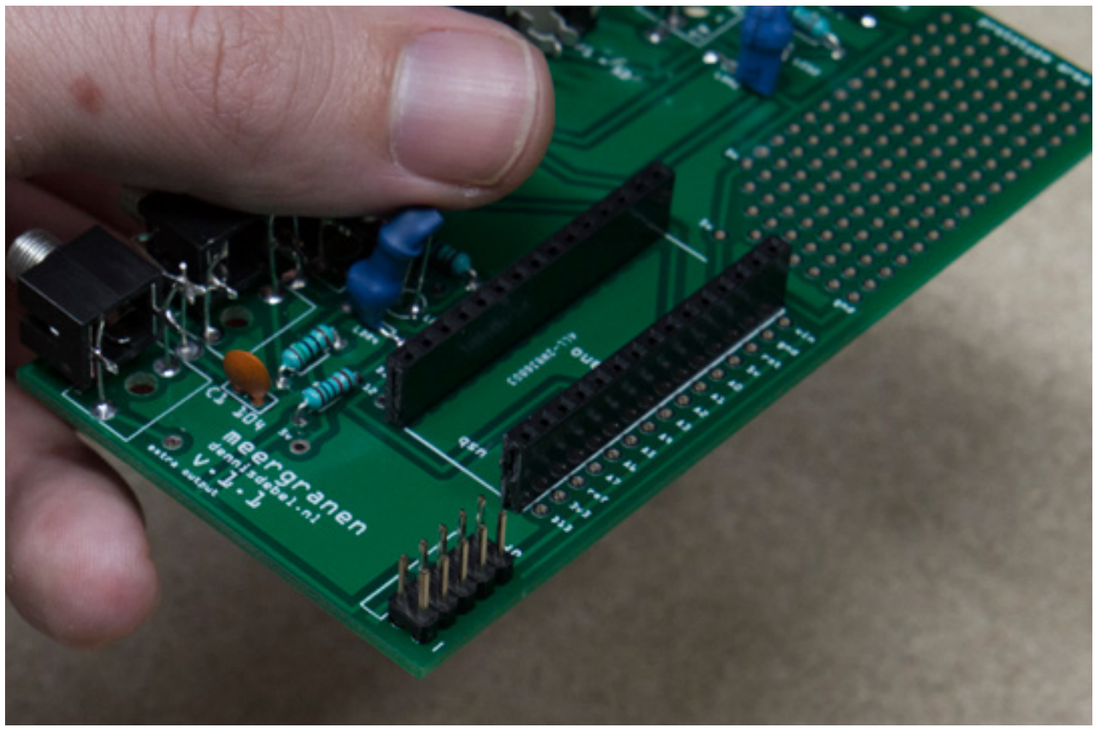




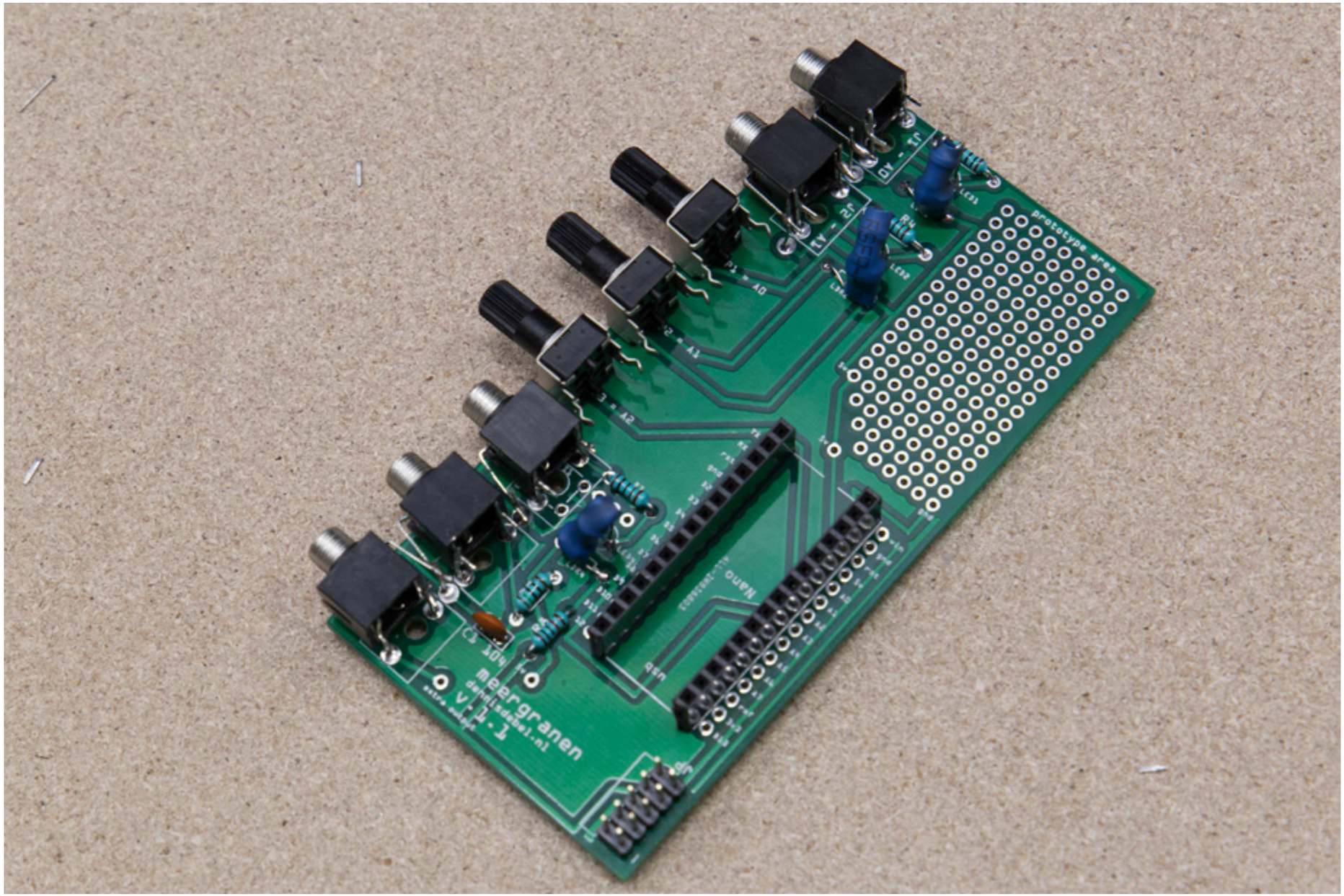


11 Solder the power header

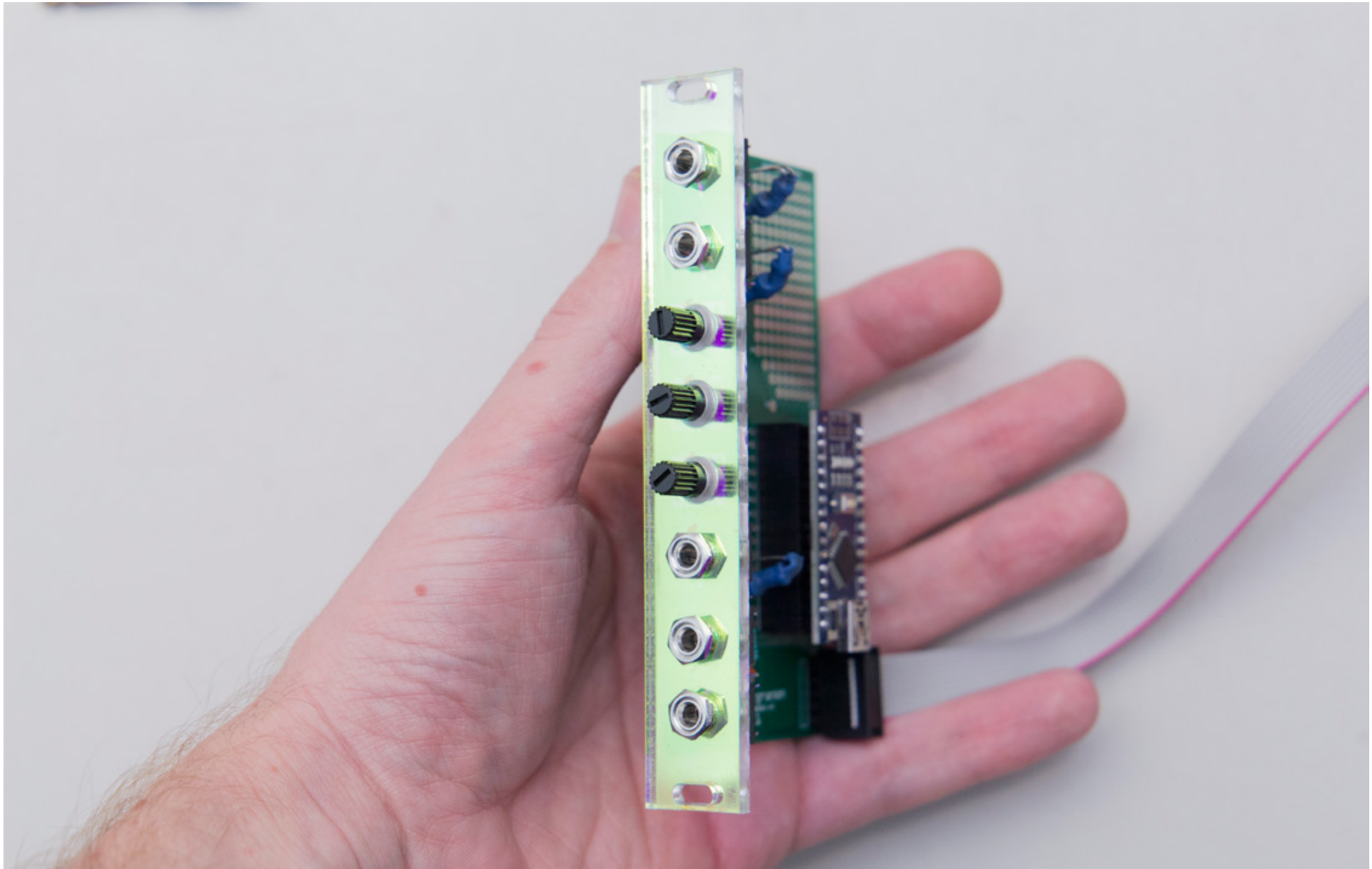




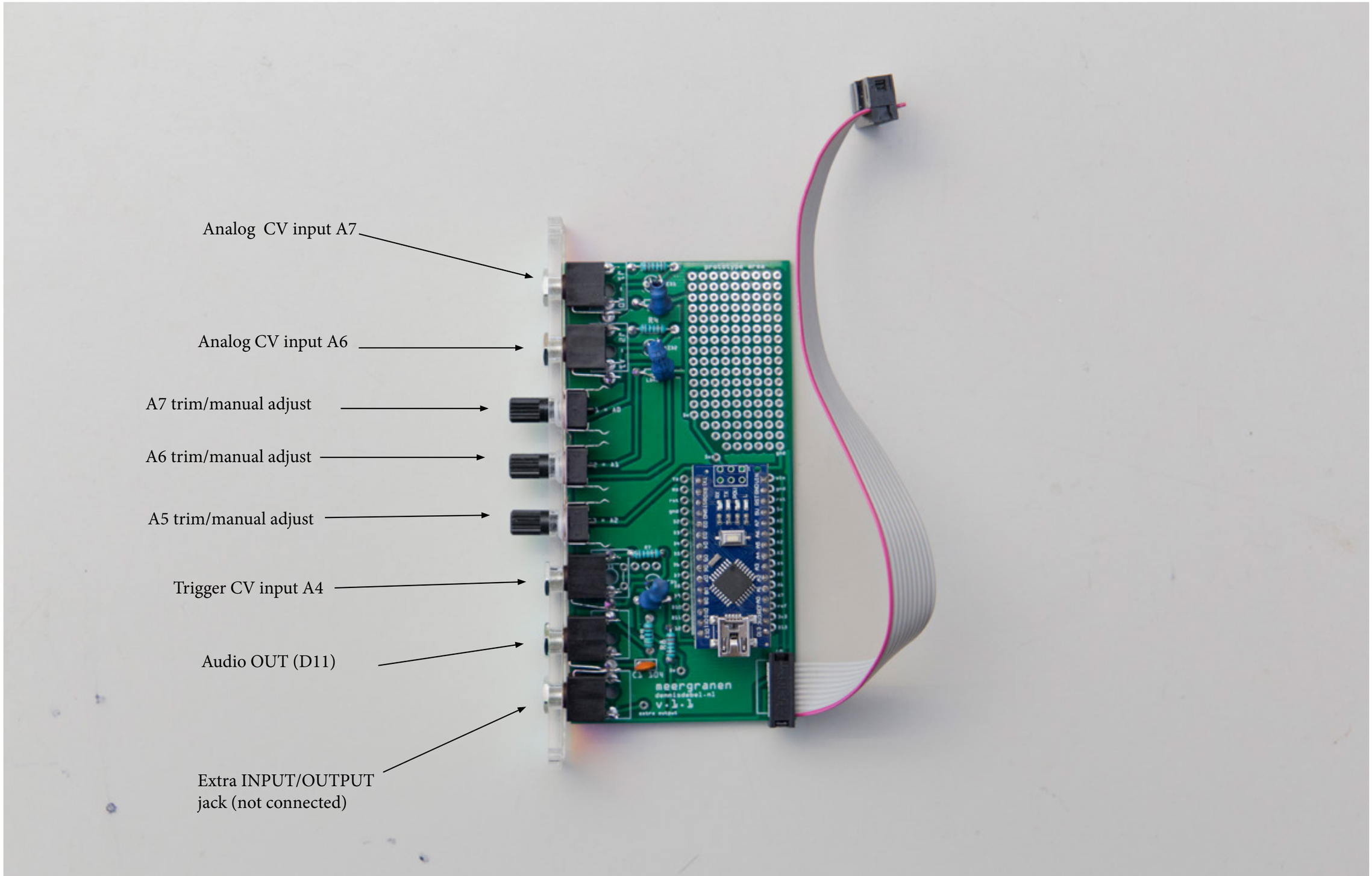
12 Done Soldering!



13 Mount front panel



Mount arduino and power cable (red side = -12v)

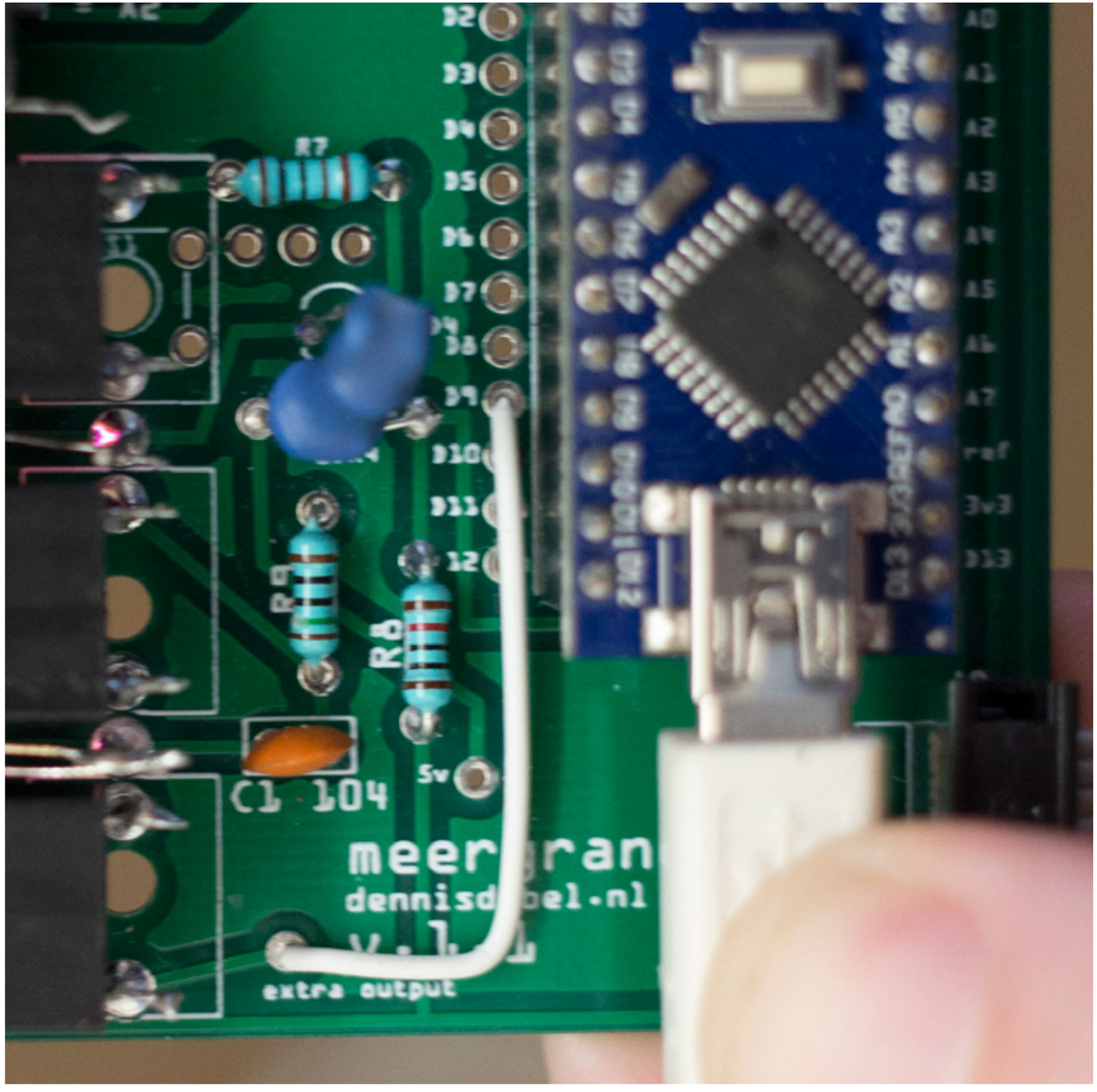


Troubleshooting:

No Sound:
-Arduino inserted correctly? Check the Arduino's orientation and check if all the pins are inserted correctly.

Arduino not showing up in serial ports:
-Installed the correct drivers? (Chaser CH34*)

Arduino showing up in ports list, but is 'out of sync':
-Try different processor/bootloder. In Arduino Ide > Tools > Processor > Select 'Old bootloader' option and try again.

Mods

The meergranen v1.1 offers an extra input/or output jack. Use this for example with Arduino sound libraries like MOZZI that use pin 9 as output (instead of pin 11). Just solder a wire from pin 9 to the extra jack to add this compatibility!